Technical Manual (TeM)

Doc No: TeM-1228651-0101

Machine No: T5845930043

This manual consists of the documents stated below

Doc No	Description	Tag
Safety precautions		1
1213348-0101	Safety precautions	
General information		2
1213449-0102	General information	
Installation		3
1210063-0101	Installation	
Commissioning		4
1210083-0101	Commissioning	
Maintenance		5
1211049-0101	Maintenance	
Preventive maintenance recommendations list		6
PMR 5845930043	Preventive maintenance recommendations list	
PMR appendix	Preventive maintenance recommendations list	
Spare parts list/Spare parts kit list		7
SPL 5845930043	Spare parts list/Spare parts kit list	
SPL appendix	Spare parts list/Spare parts kit list	
Technical data		8
30107-33658	Heat exchanger	
Heat exchanger manual	0,5 - 6,0 M²	
TD 5845930043	Technical data	
Flow diagram		9
1217604-01	Flow diagram symbols	
32574-9440	Flow diagram	
Item list		10
IL 5845930043	Item list	

For Component instructions, see separate headline or binder

Technical Manual (TeM)

Doc No: TeM-1228651-0101

Machine No: T5845930043

This manual consists of the documents stated below

Doc No	Description	Tag
Layout		11
32574-9477-2	Assembly layout	
32574-9477-3	Installation Layout	
Service media		12
1212707-0101	Service media	
Cleaning		13
1210149-0101	Cleaning	
Certificates		14
DC 5845930043	Declaration of conformity	
De-commissioning		15
1242576-0101	De-commissioning	

For Component instructions, see separate headline or binder

Safety precautions

Introduction 1
- **Use of hazard information** 1
- **General** 2
- **Emergency stop** 3

Cleaning solution 4
- **Handling of cleaning solution** 4
- **Emergency precautions** 4

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Introduction

To ensure maximum safety for the operator, always read this section carefully before carrying out any work on the machine or making any adjustments.

Use of hazard information

Hazard information in this documentation have the following significance:



DANGER! Failure to observe this information results in immediate danger to life.



WARNING! Failure to observe this information can result in major personal injury or loss of life

Caution! Failure to observe this information can result in minor personal injury or damage to the equipment.

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General

Only trained personnel are allowed to operate the machine. The machine may only be used in accordance with the instructions given in the manuals delivered with the equipment.

If the safety precautions are not followed, there is risk of personal injury.

The machine is not to be used to process explosive and inflammable liquids In case of fire, use the fire-fighting equipment stated below:

- **Carbon dioxide (CO_2)** (control panel and other electrical equipment),
- **Water** (other parts).

This is a filtration equipment controlled automatically. It uses high temperatures during operation.

All personnel must therefore:

- stay outside the safety area,
- regard all electrical equipment as live,
- regard all pipes as hot,
- use hearing protection.

Before carrying out maintenance and repair:

- switch off power,
- allow the machine to cool down and adjust to atmospheric pressure,
- inform the operator and other relevant personnel about the work you intend to do,
- post warning signs in prominent places.

During operation:

- Pipes and other parts of this machine may be hot. Contact with hot equipment may result in severe burns. Avoid contact with hot equipment.
- There is a risk of splashes from the balance tank. Keep the lid on the balance tank at all times. Be very careful when you lift the lid during inspections.
- Never try to open manhole covers on closed balance tanks while machine is operated.

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(Cont'd)

This machine operates under pressurized conditions. All personnel must therefore:

- watch out for leakage,
- depressurize the equipment before attempting maintenance and repair work,
- watch out for liquid from drain pipes.

Keep the doors of the control panel closed to protect it from water and steam.

At inspection of function above normal working level:

- use proper ladder to avoid risk of falling.



Hot surfaces

Pipes and heat exchangers may have hot surfaces. Do not remove covers during normal operation

WARNING! Hot surfaces can cause serious injuries. Never run the equipment if any safety cover is not fitted.



Hearing protection

Always wear hearing protection while the machine is running Actual noise level on this plant. Please refer to: TeM - Noise level

WARNING! **Risk of impaired hearing!**
Use hearing protection to minimize the risk of impaired hearing.

Emergency stop

In case of danger to people or risk of damage to the machine, the emergency stop means must immediately be operated.

The exact location of the emergency stop operation device must be known so that the machine can be stopped immediately when there is risk of personal injury or damage to the machine.

Electrical cabinet

Work inside the electrical cabinet must be performed by skilled or instructed persons only.

Always make sure that the electrical cabinet doors are closed during normal operation.

DANGER! **Risk of electrochock!**
The voltage inside the electrical cabinet can cause electrochock or serious injury. In case of accident, immediately call for medical attention.

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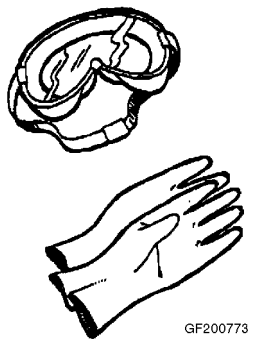
Cleaning solution

Handling of cleaning solution

Cleaning solutions normally contain caustic soda (NaOH), sodium hypochlorite (NaOCl) or nitric acid (HNO_3). These chemicals may cause burning to skin and eyes. Follow the instructions given by the supplier.

DANGER!

Avoid to mix acid and chlorine as this will result in chlorine gas which is poison. To prevent accidently mixing of different chemicals all equipment for cleaning solutions should be marked with type of chemical (Acid, Caustic, Chlorine etc.) and the product name (Divos 2, Ultrasil 75). If a chemical is available in different concentrations the right concentration should be stated also.



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Whenever there is a risk of exposure to these chemicals, always wear:

- safety glasses
- protective gloves
- shoes made of PVC or PE plastic, or rubber
- apron.

In the case of an accident involving cleaning solution, the basic rule is to rinse the affected area as soon as possible with as much water as possible.

For this reason, always make sure that the showers work, that there are additional washing facilities, and that an eyewash device is available at or near each machine site.

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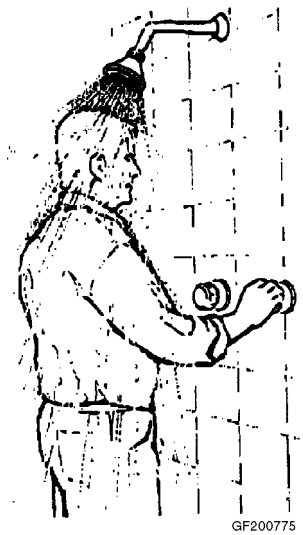
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Emergency precautions

If swallowed

If you happen to swallow cleaning solution:

- drink large amounts of lukewarm water (in order to dilute the cleaning solution); then seek medical attention immediately.



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Contact with eyes

If cleaning solution is splashed into your eyes:

- wash the eyes thoroughly with lukewarm water for 15 minutes (keep eyelids widely apart); then seek medical attention immediately.

Contact with skin or clothes

If cleaning solution comes into contact with skin or clothes:

- rinse immediately with plenty of water
- thoroughly wash the clothes before they are worn again. If skin burns appear, seek medical advice immediately.

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If inhaled

If you experience irritation or pain due to having inhaled vaporized cleaning solution:

- leave the affected area to get fresh air. If the symptoms become worse, seek medical advice.

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Tetra Pak

General information

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Intended use of this Tetra Pak equipment 1

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Manufacturer. 1

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Machine introduction

WARNING! To ensure maximum safety for the technicians, always read the “Safety precautions” pages before doing any work on the machine or making any adjustments.

Intended use of this Tetra Pak equipment

This unit is intended for use according to the specifications in **Technical data** (see **Technical Manual**) and related documents.

Tetra Pak will not be held responsible for injury or damage if the equipment is used for any other purpose.

Service

In case of problems when operating the machine, contact the nearest Tetra Pak service station.

Manufacturer

This Tetra Pak equipment was produced by:

Tetra Pak Dairy & Beverage Systems AB
Ruben Rausings gata
S-221 86 LUND
Sweden

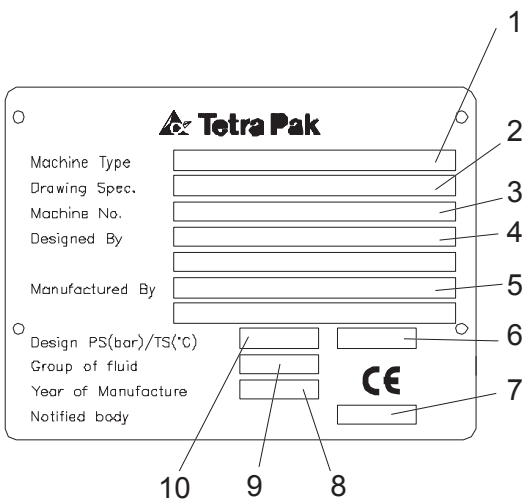
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Machine identification

All units carry a machine plate stating:

- unit identification
- data unique to the unit

Have this information available before contacting Tetra Pak concerning this particular unit.



1 Machine type
2 Drawing specifications
3 Machine serial number
4 Designed by
5 Manufacturer
6 Design TS (°C)
7 Notified body
8 Year of manufacture
9 Group of fluid
10 Design PS (bar)

Document information

Product Documentation

The documentation for this equipment consists of the following parts:

- Operation Manual
- Technical Manual
- Electrical Manual (if applicable)

It is important that you:

- keep the manuals for the life of the equipment,
- pass the manuals on to any subsequent holder or user of the equipment.

Design modifications

The directives in this document are in accordance with the design and construction of the machine at the time it was released by the Tetra Pak machine production facility.

Document producer

This document has been produced by:

Tetra Pak Dairy & Beverage Systems AB
Ruben Rausings gata
S-221 86 LUND
Sweden

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Further copies

Additional copies can be ordered from nearest Tetra Pak service station. When ordering technical publications, always quote the document number.

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Tetra Pak

Installation

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Introduction

Prior to Operation

Between the time of ordering and normal running, several phases must be executed:

- Preparation of site
- Installation
- Commissioning

Preparation of Site

Preparation of the site can take place prior to equipment delivery. For detailed information, see **Preparatory work**.

Installation

Installation covers all work from receipt of the equipment to assembled and partly tested equipment, e.g.:

- Lifting
- Mechanical erection
- Cabeling
- Testing of parts of the plant

For detailed instructions see **Installation instructions**.

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Commissioning

Commissioning covers check of installation, first cleaning, membrane installation, water test and tuning of the plant to bring it into commercial production.

To ensure an efficient commissioning the following work must be completed before the commencement of commissioning:

- Preparatory work
- Installation work

Furthermore, all required services must be connected and available:

- Raw material to be processed must be available at short notice.
- Correct CIP detergents must be available.

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The following personnel are requested to be available for training purposes and to assist the commissioning engineer:

- Operators
- Electrician
- TIG welder
- Utility welder and erector

IMPORTANT!
Pre-commissioning is a detailed check-list giving conditions which must be fulfilled before the commencement of commissioning.

Your Tetra Pak service station will have the check list shortly after the equipment is delivered

Note! You can not start commissioning before the list is completed.

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Preparatory Work.

General

To ensure correct and efficient preparation, always refer to the **Technical data** and the installation drawings provided for the plant. If you have any questions - please contact Tetra Pak.

Site

Prior to delivery, the premises should be made ready to receive the equipment.

Prepare:

- Floor (quality, load, surface)
- Foundation (if applicable)
- Ventilation (if applicable)
- Lifting devices (if applicable)
- Insulation (if applicable)

Check that doorways and passages are:

- Of sufficient width and height to allow the equipment to pass
- Clear of obstructions

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Services

To facilitate the installation and save time, the required media supplies should be installed in advance.

Connections from these services to the Tetra Pak equipment should be located approximately as shown in the assembly drawings, ready to be attached to the Tetra Pak equipment.

Ensure that the services fully satisfy the specifications laid down in the **Technical Data** and related documents.

Floor Drains

Floor drains are necessary to collect liquid waste from the equipment.

When preparing floor drains consider the following:

- Capacities (see **Technical Data**)
- Locations (see **Installation Drawings**)

Installation instructions

Requirements on personnel

Operators

The operators who operate the Tetra Alcross plant must have knowledge of hygienic liquid processes and process equipment. The operators must read and become familiar with the information given in this manual before start up.

Electrician

Certified according to local regulations with at least 3 years' experience of similar types of installations. Proven skills in reading and working from drawings and cable lists. Knowledge of local safety regulations for power and automation.

Furthermore the electrician must ensure that the electrical installation, including the equipment or device that work has been carried out on, has been adequately checked regarding the safety of personnel and property before it is put into operation.

TIG Welder

At least 3 years' previous experience of similar types of installations, including argon gas welding with stainless steel, thin-walled material. Proven skills in reading installation drawings and isometric drawings.

Utility Welder and Erector

At least 3 years' previous experience of similar types of installations, covering arc and gas welding in e.g. steam pipes and compressed air pipes.

Proven skills in reading installation drawings and isometric drawings.

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Caution! Operation by unauthorized personnel may endanger personnel and property.

Storage

To avoid damage to the equipment during storage the following requirements should be met:

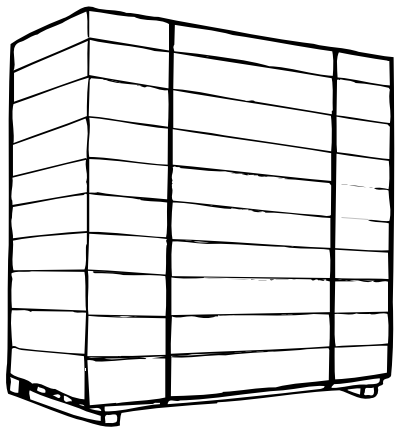
Storage class A

Type of equipment:

- Control panels
- Electronic equipment
- Electric control equipment (contractors, instruments etc.)
- Machines with build in control equipment

To be stored indoor, warm and dry.

- Temperatures +10°C - +40°C
- Humidity 20% - 85%



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Caution! Noncompliance with these requirements may damage the equipment.

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Unloading and Transportation

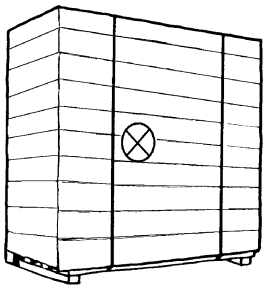
Unloading and transportation of the crates are made most conveniently by use of a fork lift, for dimensions and mass see **Technical Data**.

Check measure and weight of the crate before lifting.

These data can be found in the packing list which is normally placed at one end of the crate.

Make sure the lifting point is at the crates center of gravity.

Note! Special kinds of packing can be used depending on transportation or special agreement.



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Unpacking and Inspection

To avoid the risk of damaging the equipment, the crate must be opened and unpacked in the presence of a Tetra Pak or a customer representative. Check the equipment against the packing lists attached to the crates.

Report any damage to Tetra Pak immediately.

Caution! Ceramic membranes are extremely fragile

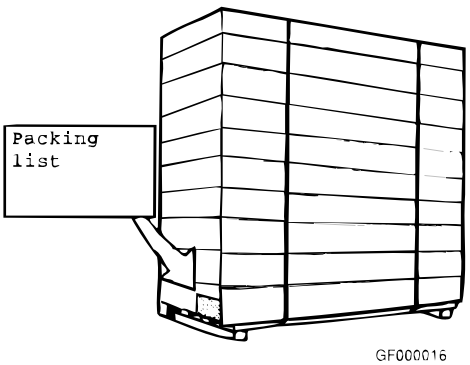
Do as follows:

1 Remove the top

2 Unpack easily accessible parts

3 Lower the sides (unfold)

4 Unpack remaining equipment



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Connections

Connections are clearly marked on the equipment and in drawings supplied under the tag **Installation drawing**.

The following mechanical connections are to be made:

- CIP water
- Cooling water
- Seal water
- Drain
- Product inlet
- Product outlet
- Air supply
- Supply of CIP detergents

The following electrical connections are to be made:

- Signal cabling (if not enclosed)
- Electrical supply

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Positioning and Erection

Before positioning any equipment make sure that the floor is of adequate quality:

- Concrete composition and floor construction are determined by local ground conditions
- Surface flat and reasonably smooth.
  Max slope is 1%.
  Max 50 mm from lowest to highest floor level

For an efficient erection always use the assembly drawing and flow diagrams.

Do as follows:

a) Position the HTT-feed sections (if applicable).

b) Position the plate heat exchanger.

c) Assemble the HTT section (if applicable). .

d) Position the the frames with the circulation pumps.
   - Use two hand pallet trucks. Put the forks under the pallet and place the section.
   - Adjust the frames in horizontal position with the adjustable feet (turn leg clockwise to raise the frame). Each leg has a 50mm adjustment span.

e) Install the intermediate pipes.

f) Connect to external supply.

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Caution! Risk of falling objects.
Falling objects may severely injure personnel or cause damage to equipment.
Use appropriate lifting device. Use hard-hat. Do not enter the area beneath lifted equipment.

Check after Installation

To insure a good quality of the installation the following checks are to be made

Caution! **Warranty will be void!**
Do not turn on electrical power before TPFS commissioning engineer is present on site, warranty on electrical parts, pumps etc. will be void

External Utility

Check that all connections are in accordance with the requirements set out in **DATA**.

Flush through new pipes to ensure that debris etc. not will enter and block valves etc. and damage the membranes.

Pressurize

To ensure that no leakage exists (water, air, steam).

Pumps and Motors

Check all motor connections, overload protections, fuses, rated current and voltage.

Valves

Check appropriate function Activate/deactivate from solenoid valve and check movement

Instrument - Probes

Check reading on instrument and display

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Cleaning after installation

The pipe system (including filter module "dummy pipes"), balance tank, pumps and valves must be cleaned before the installation of membrane modules and the commissioning.

The following services and product connections have to be ready:

- Soft water for CIP.
- Cooling water (Tap water or Ice water)
- Seal water for feed pump and circulation pump
- Supply- and outlet connections.
- Detergents for CIP.
- Test kits for measuring pH and chlorine.

Note! This cleaning must be done only under supervision of an Tetra Pak filtration systems commissioning engineer

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When to start commissioning

Check list to be considered before ordering/commencing commissioning, see following page.

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FAX MESSAGE

TO: Lars Laursen	**Fax No:**
From:	Fax No:
Company:	Date:

Pre-Commissioning check list

Project name .....Our order no:.....

MC contact person .....MC order No.....

To utilize our resources in the best way and to keep your costs down a careful planning is required.
Therefore we kindly ask you to fill in this form and return it to us minimum one week prior to the arrival of our Process Specialist.
Point 1 to 13 must be completed before our Process Specialist arrives on the site. If not, we will charge you separately for waiting hours and/or for travel cost due to that the Process Specialist is called back.
If you have any questions please contact our Service Manager. (Fax +45 86 20 95 33)

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	Description	**Rdy at date of ordering**	**If not - ready date:**
1	Plant erected	☐	.....
2	Plant internally connected (Loops,feed section etc)	☐	.....
3	Product lines in and out connected	☐	.....
4	CIP lines connected	☐	.....
5	CIP detergent available : Type :.....	☐	.....
6	Electrícial connections: Control panel <-> components	☐	.....
7	Electrical connections: MCC panel <-> components	☐	.....
8	Power available *according to Technical Data*	☐	.....
9	Air connected and available *according to Technical Data*	☐	.....
10	Seal water connected and available *according to Technical Data*	☐	.....
11	Steam / hot water connected and available *according to Technical Data*	☐	.....
12	Cooling media connected and available *according to Technical Data*	☐	.....
13	Drains connected	☐	.....
14	Up and Down stream equipment ready for operation	☐	.....
15	Product available according to Order data	☐	.....
16	Operators available	☐	.....

Above items checked by: ..... at.....

Name Signature Date

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Tetra Pak

Commissioning

General 1

Cleaning 2

Settings 3

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General

The installation of the membrane modules must be carried out and the Tetra Alcross Unit is to be commissioned before it is put in commercial operation.

Caution! Must be done only under supervision of an Tetra Pak filtration systems commissioning engineer. Membrane warranty is depending on commissioning by Tetra Pak commissioning engineer. Reed the warranty conditions on next page

Concerned operators and maintenance people are requested to be available during commissioning to assist the Tetra Pak engineer and to learn how to deal with the equipment.

Under tag Certificate you will find a certificate to be filled in when commissioning is ended. This is to certify that membranes are operating within limits given by membrane supplier. Incorrect filled in certificate may cause warranty void.

Note! During commissioning adjustment of Supervisors parameters values should be recorded in the parameters list as plant values see “Settings” in this chapter.

Operators parameters list and Alarm list is to be found in Operators Manual (OM)

The filling of plastic ball instruction is to be find in chapter Maintenance

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Cleaning

Before the membrane installation, a caustic cleaning must always be done followed by an acid cleaning to remove grease, oil and metal dust from the system.

To be filled in and recorded in the CIP log by Tetra Pak commissioning engineer during commissioning		
Application:		
	Long CIP	**Short CIP**
1	Flush out with water for ____min. Water temperature ____ °C	Flush out with water for ____min. Water temperature ____ °C
2	Recycle wash, _____add slowly approx. _____ g. of_____ until pH _____ Water temperature ____ °C Recirculation for _____ min.	Recycle wash, _____add slowly approx. _____ g. of_____ until pH _____ Water temperature ____ °C Recirculation for _____ min.
3	Flush out with water for ____min. Water temperature ____ °C	Flush out with water for ____min. Water temperature ____ °C
4	Recycle wash, _____add slowly approx. _____ g. of_____ until pH _____ Water temperature ____ °C Recirculation for _____ min.	Recycle wash, _____add slowly approx. _____ g. of_____ until pH _____ Then add approx. _____ g. of_____ until ppm _____ Water temperature ____ °C Recirculation for _____ min.
5	Flush out with water for ____min. Water temperature ____ °C	Flush out with water for ____min. Water temperature ____ °C
6	Recycle wash, _____add slowly approx. _____ g. of_____ until pH _____ Then add approx. _____ g. of_____ until ppm _____ Water temperature ____ °C Recirculation for _____ min.	Water flux test
7	Flush out with water for ____min. Water temperature ____ °C	-
8	Water flux test	-

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Settings

Assorted parameter lists for this Tetra Alcross equipment is to be found under the tag “Appendics”

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Tetra Pak

Maintenance

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Introduction

To minimize breakdowns and maximize working life of the Tetra Alcross plant regular maintenance is recommended. The plant must be maintained by trained personnel in accordance with the instructions given below and/or in accordance with instructions given in **Component Instructions.**

Before commencing work maintenance personnel must read, and become familiar with, the information given in this manual.

Requirements on personnel

Mechanic:

Skilled mechanic with at least two years experience of industrial maintenance. Proven skill in reading engineering drawings. During maintenance and repair, take all necessary precautions to guarantee the safety of personnel and machine integrity (e.g. switch off power, post signs, fence of a safety area).

If you need assistance or have questions - please contact Tetra Pak.



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Caution! Unauthorized personnel
Operation by unauthorized personnel may endanger personnel and property.

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Preventive maintenance

Preventive maintenance primarily requires that the equipment is visually inspected and that adjustments are made where necessary. When the plant is in operation the sound of the plant could also tell the maintenance something about the condition of the plant.

For maintenance and spare parts of components not described in this section see suppliers manuals in **Component Instructions.**

Maintenance intervals

Following inspection intervals are recommended:

Daily checks	**Comments**
Check instrument readings against previous production and CIP data when filling in logs.	Increasing TMP values is a typical sign of poor CIP sequence
Check shaft seal flush water flow at each pump (pumps with flushed shaft seals)	Missing seal water destroy the lip seal and might cause breakdown during production etc.
Check plate counts on each loop	Increasing plate counts could be a sign on leaking gaskets or broken element See also: Check for damage (“Bubble test”)
Weekly checks	**Comments**
Check all unions and pipe lines for leakage	Tighten unions if necessary. Torques to be found in Component instruction. Renew gasket if leakage is detected and tightening does not help immediately.
Annually checks	**Comments**
	Renew all gaskets and other rubber parts in unions, valves and pumps

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Lubrication chart

Changes on ABB motor bearings and introduction of Brook Hansen motors

Motor size and manufacturer	Bearing type D-end / N-end	Grease type "After"	Grease interval (3000 / 3600 rpm)	Expected lifetime of bearings (L10)
Size 160 ABB	Before 9811: 6209-2Z/C3 6209-2Z/C3 After 9811: 6309-2Z/C3WT 6209-2Z/C3HT	Greased perma-nently with: Klüber Asonic GHY72 (WT grease) and SKF LGHQ 3 (HT grease)	none	Before 9811: 2900 h / 3000 rpm 3000 h / 3600 rpm After 9811: 11000 h / 3000 rpm 9000 h / 3600 rpm
Size 160 ABB for high pressure pump (LKHP)	Before 9811: 6209/C3 3309/C3 After 9811: 6309/C3 3309/C3	Grease through nip-ple with: Shell Albida EMS 2	3600 h / 3000 rpm 3000 h / 3600 rpm	20000 h / 3000 rpm 17000 h / 3600 rpm
Size 180 ABB	Before 9903: 6210-2Z/C3 6209-2Z/C3 After 9903: 6310-2Z/C3WT 6209-2Z/C3HT	Greased perma-nently with: Klüber Asonic GHY72 (WT grease) and SKF LGHQ 3 (HT grease)	none	Before 9903: 1300 h / 3000 rpm 2500 h / 3600 rpm After 9903: 10000 h / 3000 rpm 16000 h / 3600 rpm
Size 180 ABB for high pressure pump (LKHP)	Before 9903: 6210/C3 3309/C3 After 9903: 6310/C3 3309/C3	Grease through nip-ple with: Shell Albida EMS 2	3600 h / 3000 rpm 3000 h / 3600 rpm	23000 h / 3000 rpm 21000 h / 3600 rpm
Size 200 Brook Hansen	6313-C4 6313-C3	Grease through nip-ple with: ESSO Unirex N3	4300 h / 3000 rpm 3500 h / 3600 rpm	13700 h / 3000 rpm 11400 h / 3600 rpm
Size 250 Brook Hansen	6314-C4 6314-C3	Grease through nip-ple with: ESSO Unirex N3	3960 h / 3000 rpm 3200 h / 3600 rpm	18700 h / 3000 rpm 15600 h / 3600 rpm

The above table is for 100°C internal bearing temperature. An increase in temperature of 15° (ambient or internal in bearings), will reduce the greasing interval and bearing lifetime by 50 %.

All standard motors used by AL Flow will have bearings fixed in the D-end, except the motors for the LKHP versions, which have angled contact bearings.

Motors with grease nipples have to be greased thoroughly by the customer before installation. Motor sizes 200 and larger sizes, plus motors for high pressure pumps (LKHP) have grease nipples as standard.

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The recommended grease is a lithium based grease for roller / ball bearings. Suitable high temperature resistant greases:

- Mobilith SHC220
- ESSO Unirex N3
- Castrol LMX
- Shell Liplex EP2
- SKF LGHT3

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Filter module

Caution! Do not expose the filter module to heavy knocks or other mechanical shocks. This will damage the elements and this kind of damage is not covered by the warranty. Reed the warranty conditions in chapter “Commissioning”.

Check for damage (“Bubble test”)

By means of the “Bubble test” it is possible to determine if any filter elements in the filter module are damaged.

This test is normally made by the manufacture with a special liquid on the retentate side. Therefore this test described with water must be evaluated with care.

The air pressure necessary to permeate the membrane is determined by adding an air pressure on the permeate side of the membrane when having water on the retentate side.

Proceed as follows:

a) The top manifold/topbend connecting the filter modules is removed.

b) The permeate pipes on the filter module in question are removed.

c) The upper permeate connection is blinded.

d) An air regulation valve is mounted on the lower permeate connection.

e) Water is filled on the retentate side of the filter i.e. from the top where the top bend used to be.

As the water surface on the top of the filter module is monitored the air pressure is **slowly increased until air bubbles occurs** from one or more of the filter elements.

If one or more elements are damaged the bubbles will **occurs powerful at a remarkable low pressure** comparing to an intact filter

Air bubbles break through pressure for an undamaged membrane	
Pressure (approx.)	Membrane type
0.4 bar	(Sterilox 1.4 my)
0.23 bar	(Membralox 1.4 my)

f) After removing the upper filter modules the lower filter modules can be tested (only applicable for loop types M114 and M76).

g) Place new filter modules on the loop and filter modules with damaged membranes must be send to supplier for repair.

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Change of element

Caution! Do not expose the filter module to heavy knocks or other mechanical shocks. This will damage the elements and this kind of damage is not covered by the warranty. Reed the warranty conditions in chapter “Commissioning”.

Proceed as follows:

a) Place the module horizontally on a soft support with the permeate ports upwards

b) Remove the ball stoppers from both permeate ports. (**Note**: Not applicable for Tetra Alcross UC).

c) Remove the plastic balls from the permeate chamber.(**Note**: Not applicable for Tetra Alcross UC).

d) Place the filter module horizontally on a soft support..

e) Unscrew the end clamps at both ends of the module. Take care of the distance pieces (3 at each end)..

f) Mark the rubber gaskets and the elements carefully, as the gaskets have to follow the element on which they were previously mounted. By assembling, you have to place the gasket in the same position as previously.

g) Use a special tool (can be ordered from TPFS) to remove the gaskets at one end of the elements. Push the elements, one by one, out through the other end of the filter module.

h) Place the gaskets on the elements. Store elements well protected against damage.

i) Mount the new elements. Mark gaskets and elements. Remove gaskets and place the elements in the filter housing. Remount gaskets. (Do it one by one to prevent mixing the gaskets).

j) Mount the end clamp in the end where the gaskets have not been removed. Do not forget the distance pieces. Tighten the 6 screws.

k) Place the filter module vertically with the connected end clamp down. Push the gaskets into position at the upper end. Check that no contact between retainer plate and ceramic occurs.

l) Mount the clamp and distance pieces. Check if the gaskets are placed properly.

m) Fill in dry plastic balls following the "Ball filling instruction". (**Note**: Not applicable for Tetra Alcross UC).

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Filling of plastic balls

Note! (Not applicable for Tetra Alcross UC)

Fill must be done first time at the commissioning. When refilling after the equipment been taken in operation filling should be done through the permeate inlet.

Principle

The purpose of the plastic balls in the filter module is to create a specific back pressure in the permeate circuit to obtain a Uniform Transmembrane Pressure (UTP)

To keep the plastic balls inside the filter module a ball stopper is placed in the two permeate connections.

Proceed as follows:

a) Place the filter module horizontal on a soft support (wood or cardboard) with the permeate connections upwards.

b) Turn the ball stopper end 180 degrees to make access for filling balls inside the filter module.

Caution! Be sure that the ball stopper is not squeezing the elements

c) Use a plastic cup or similar to fill in some original balls

d) Raise the filter module horizontally and shake carefully to settle the balls inside the module.

e) Lay down the module again and fill up with more balls.

f) Repeat step c, d and e until the module is full. (Do not overfill!)

g) Turn back the ball stopper to original position.

Caution! Be sure that the ball stopper not squeezing the elements

h) New filter module must be flushed at the permeate side with water for a few minutes . Flush in the same direction as you filled the plastic balls.

i) Add if possible more plastic ball as described above.

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High temperature treatment equipment

During normal operation water is added automatically through the the valve V157, this is controlled by the pressure transmitter PS 021-20-05.

Refilling of water

Proceed as follows:

a) Closed valve V156.

b) Open valve V158.

c) Activate valve V150 and V154.

d) Open valve V157 to feed water into the HTT.

When water is coming out from the valve V158 it is free from air.

e) Activate valve V151 and deactivate V150.

When water is coming out from the valve V158 it is free from air.

f) Activate valve V153 and deactivate V154.

When water is coming out from the valve V158 it is free from air.

g) Close valve V158 and V 73 at the same time.

Caution! If the pressure in the vessel exceeds approx. 5 bar the safety valve on the vessel will blow.

h) Open valve V156.

i) Deactivate valve V151 and V153.

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Tetra Pak

Tetra Pak CPS A/S **Tetra Alcross Bactocatch, Preventive maintenance recommendations. Serial Number: T584 593 0043, IssueDate: 28-09-2010**

Pre maintenance checks

WARNING! Before starting any service work , read the safety precaution in the corresponding TeM (Technical Manual)
Daily/Weekly checks - Have they been carried out? If not carry them out before starting the service.

At any interval - Check - Leaks, Noise, Vibrations, Pressures and Temperatures

Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
M111	90503-5885	Centrifugal pump	CRN5-8 DN32 1.1kW 50Hz SiC/SiC EPDM Voltage:3x220-240VD/380-415VY EFF1 SS Baseplate	1218037-0101	6000	Change	Spare part kit(Shaft seal)	6-00990425-69	Shaft seal	1	
M111	90503-5885	Centrifugal pump	CRN5-8 DN32 1.1kW 50Hz SiC/SiC EPDM Voltage:3x220-240VD/380-415VY EFF1 SS Baseplate	1218037-0101	12000	Change	Spare part kit(Wear parts)	6-00990425-85	Service kit	1	
	90503-0788	Coupling	PJE DN32	No Doc.	18000	Change	Gasket PJE coupling DN32 EPDM	90503-1052	Gasket	2	
020-12-1	90503-2064	Conductivity meter	CLD132 ISO Cl51 4-20mA 24V AC/DC Display SS house w.10m cable Cable gland M20x1.5	1218800-0101	3000	Check	Function				
020-51-1	90503-2064	Conductivity meter	CLD132 ISO Cl51 4-20mA 24V AC/DC Display SS house w.10m cable Cable gland M20x1.5	1218800-0101	3000	Check	Function				
FT24-15	90503-8940	Magnetic Flow meter	Promag 50H ISO W04 0-420l/h Display 20-55V AC/16-62V DC SS house Pulse signal / 4-20mA HART 0.5% cal.	1218415-0101	12000	Change	Seal kit	90503-3358	Gasket	1	
020-11-1	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-12-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-49-1	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
021-01-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-11-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
021-01-4	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
021-01-5	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
021-02-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
022-01-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-11-2	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
022-01-4	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
022-01-5	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-51-1	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
020-51-1	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-51-2	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	1218205-0101	6000	Calibration	Function				
020-60-1	90503-3248	Pressure switch	PTP31 G1/2" A 0-4bar(g) 12-30V DC 3-wire PNP with display SS house IP66 Cable gland M12x1.5	1218198-0101	3000	Check	Function				
020-21-1	90503-3248	Pressure switch	PTP31 G1/2" A 0-4bar(g) 12-30V DC 3-wire PNP with display SS house IP66 Cable gland M12x1.5	1218198-0101	3000	Check	Function				
V001	6-9613-32-0031	Single seat valve	Unique-SSV-W-51-200-NC-EPDM Maintainable actuator	1221121-0101	6000	Check	Function				
V001	6-9613-32-0031	Single seat valve	Unique-SSV-W-51-200-NC-EPDM Maintainable actuator	1221121-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6503	Service kit	1	
V001	6-9613-32-0031	Single seat valve	Unique-SSV-W-51-200-NC-EPDM Maintainable actuator	1221121-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V002	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Check	Function				
V002	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V002	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V004	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Check	Function				
V004	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V004	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V006	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V006	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V006	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V007	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V007	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V007	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V011	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V011	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V011	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V021	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V021	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V021	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V020	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Check	Function				
V020	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V020	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V022	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V022	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V022	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V024	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V024	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V024	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V003	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V003	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-6579	Service kit	1	
V003	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V092	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V092	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V092	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V093	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V093	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V093	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V086	6-9613-32-0035	Single seat valve	Unique-SSV-W-51-300-NC-EPDM Maintainable actuator	1221121-0101	6000	Check	Function				
V086	6-9613-32-0035	Single seat valve	Unique-SSV-W-51-300-NC-EPDM Maintainable actuator	1221121-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6503	Service kit	1	
V086	6-9613-32-0035	Single seat valve	Unique-SSV-W-51-300-NC-EPDM Maintainable actuator	1221121-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V087	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Check	Function				

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
V087	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V087	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V088	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Check	Function				
V088	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6581	Service kit	1	
V088	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6498	Service kit	1	
V013	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V013	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V013	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V014	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V014	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V014	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V015	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V015	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V015	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V131-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V131-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V131-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V081	6-9613-32-0036	Single seat valve	Unique-SSV-W-38-300-NC-EPDM Maintainable actuator	1221121-0101	6000	Check	Function				
V081	6-9613-32-0036	Single seat valve	Unique-SSV-W-38-300-NC-EPDM Maintainable actuator	1221121-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6502	Service kit	1	
V081	6-9613-32-0036	Single seat valve	Unique-SSV-W-38-300-NC-EPDM Maintainable actuator	1221121-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V082	6-9613-36-0843	Single seat valve	Unique SSV-W-38-210-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V082	6-9613-36-0843	Single seat valve	Unique SSV-W-38-210-NO-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V082	6-9613-36-0843	Single seat valve	Unique SSV-W-38-210-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V083	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V083	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V083	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V131-02	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V131-02	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V131-02	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V231-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V231-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V231-01	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V101	6-9613-32-0030	Single seat valve	Unique-SSV-W-38-200-NC-EPDM Maintainable actuator	1221121-0101	6000	Check	Function				
V101	6-9613-32-0030	Single seat valve	Unique-SSV-W-38-200-NC-EPDM Maintainable actuator	1221121-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6502	Service kit	1	
V101	6-9613-32-0030	Single seat valve	Unique-SSV-W-38-200-NC-EPDM Maintainable actuator	1221121-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V102	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V102	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V102	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V104	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V104	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V104	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V106	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V106	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V106	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V107	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V107	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V107	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V121	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V121	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V121	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V103	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
V103	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-6579	Service kit	1	
V103	6-9613-32-0514	Single seat valve	Unique SSV-W-25-210-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V120	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V120	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V120	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V123	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V123	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V123	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V124	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Check	Function				
V124	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	6000	Change	Spare part kit (Wet end)	6-9611-92-6580	Service kit	1	
V124	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	1221122-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-6497	Service kit	1	
V190	6-9612-30-5503	Constant pressure valve	CPMI-2-W-51-Kvs 2/15 EPDM	1214498-0101	6000	Change	Spare parts kit	6-9611-92-0218	Service kit	1	
CV003	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV023	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV004	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV006	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV016	6-9612-22-0008	Non-return valve	LKC-2-W-38.0-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4006	Spare part kit	1	
CV113	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4008	Spare part kit	1	
CV114	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4008	Spare part kit	1	
CV123	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4008	Spare part kit	1	
CV124	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4008	Spare part kit	1	
CV213	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV214	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4007	Spare part kit	1	
CV155	6-9612-22-0008	Non-return valve	LKC-2-W-38.0-316L EPDM	1241273-0101	12000	Change	Spare part kit	6-9611-92-4006	Spare part kit	1	
V089	6-9612-55-3721	Regulating valve	SPC-2-W-51-NC-Kvs=32.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V089	6-9612-55-3721	Regulating valve	SPC-2-W-51-NC-Kvs=32.0-E%-EPDM	1215537-0101	6000	Check	Function				
V191-01	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Check	Function				
V191-01	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V193-13	6-9612-55-3719	Regulating valve	SPC-2-W-38-NC-Kvs=16.0-E%-EPDM	1215537-0101	6000	Check	Function				
V193-13	6-9612-55-3719	Regulating valve	SPC-2-W-38-NC-Kvs=16.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V193-14	6-9612-55-3719	Regulating valve	SPC-2-W-38-NC-Kvs=16.0-E%-EPDM	1215537-0101	6000	Check	Function				
V193-14	6-9612-55-3719	Regulating valve	SPC-2-W-38-NC-Kvs=16.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V191-02	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Check	Function				
V191-02	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V291-01	6-9612-55-3715	Regulating valve	SPC-2-W-38-NC-Kvs=1.0-E%-EPDM	1215537-0101	6000	Check	Function				
V291-01	6-9612-55-3715	Regulating valve	SPC-2-W-38-NC-Kvs=1.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V293-13	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Check	Function				
V293-13	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V293-14	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Check	Function				
V293-14	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	1215537-0101	6000	Change	Service kit (Wet end)	6-9611-92-0419	Service kit	1	
V-S08	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection	1211608-0101	6000	Change	Spare part (Gasket)	6-9611-25-2176	Spindle	1	
V-S08	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection	1211608-0101	6000	Change	Spare part (O-ring)	6-9611-99-0026	O-ring	1	
V-S09	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection	1211608-0101	6000	Change	Spare part (Gasket)	6-9611-25-2176	Spindle	1	
V-S09	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection	1211608-0101	6000	Change	Spare part (O-ring)	6-9611-99-0026	O-ring	1	
V005	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V005	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3028	Service kit	1	
V005	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V085	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V085	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3030	Service kit	1	
V085	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V198	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
V198	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3030	Service kit	1	
V198	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V205	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V205	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3028	Service kit	1	
V205	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V136-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V136-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3030	Service kit	1	
V136-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V136-02	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V136-02	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3030	Service kit	1	
V136-02	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V290	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V290	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3028	Service kit	1	
V290	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V236-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V236-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3030	Service kit	1	
V236-01	6-9612-62-8567	Butterfly valve	LKB-W-51-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V105	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	6000	Check	Function				
V105	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	12000	Change	Spare part kit (Wet end)	6-9611-92-3028	Service kit	1	
V105	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V060A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	6000	Check	Function				
V060A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V062A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	6000	Check	Function				
V062A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V068A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	6000	Check	Function				
V068A	6-9612-19-4002	Actuator	LKLA-T-85-NC-25-63.5	1215850-0101	18000	Change	Spare part kit (Actuator)	6-9611-92-3021	Service kit	1	
V171A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V171A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V165A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V165A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V150A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V150A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V151A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V151A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V153A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V153A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V154A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V154A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V157A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V157A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V052A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	6000	Check	Function				
V052A	6-9612-19-4001	Actuator	LKLA-T-85-NC	1215850-0101	18000	Change	Spare parts kit (Actuator)	6-9611-92-3021	Service kit	1	
V001A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V002A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V004A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V005A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V006A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V007A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V011A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V021A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V085A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
V020A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V022A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V024A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V003A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V092A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V093A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V201A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V086A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V087A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V088A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V198A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V205A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V013A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V014A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V015A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V131-01A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V081A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V082A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V083A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V136-01A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V131-02A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V136-02A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V231-01A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V290A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V236-01A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V101A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V102A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V104A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V105A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V106A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V107A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V121A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V103A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V060C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V062C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V065C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V065C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V068C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V120A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V123A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V124A	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V171C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V165C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V150C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V151C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V153C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V154C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V157C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
V052C	6-9612-57-8901	Top unit	Think Top PNP/NPN 8-30VDC 1xsol 24VDC 6m	1213513-0101	3000	Check	Function				
CV051	6-31801-2768-5	Non-return valve	AJ1174-DN40-Flange-DIN2545 1.4021-Kvs=18.0	1241228-0101	6000	Check	Function	6-31801-2768-5	Non-return valve	1	
CV063	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0	1241228-0101	6000	Check	Function	6-31801-2768-3	Non-return valve	1	

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Label	Material No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
CV067	6-31801-2768-5	Non-return valve	AJ1174-DN40-Flange-DIN2545 1.4021-Kvs=18.0	1241228-0101	6000	Check	Function	6-31801-2768-5	Non-return valve	1	
CV172	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0	1241228-0101	6000	Check	Function	6-31801-2768-3	Non-return valve	1	
CV167	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0	1241228-0101	6000	Check	Function	6-31801-2768-3	Non-return valve	1	
V240-01	90510-4379	Regulating valve	3321 Reg valve GG DN 32 kvs 16 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	6000	Check	Function	90510-4762	Positioner	1	
V240-01	90510-4379	Regulating valve	3321 Reg valve GG DN 32 kvs 16 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	12000	Change	Spare part kit	6-990417-55	Spare part kit	1	
V240-01	90510-4379	Regulating valve	3321 Reg valve GG DN 32 kvs 16 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	18000	Change	Diaphragm	90510-4815	Diaphragm	1	
V061	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	6000	Check	Function	90510-4762	Positioner	1	
V061	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	12000	Change	Spare part kit	6-990417-56	Spare part kit	1	
V061	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	18000	Change	Diaphragm	90510-4815	Diaphragm	1	
V066	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	6000	Check	Function	90510-4762	Positioner	1	
V066	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	12000	Change	Spare part kit	6-990417-56	Spare part kit	1	
V066	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	18000	Change	Diaphragm	90510-4815	Diaphragm	1	
V170	90503-5663	Regulating valve	2702 W25x1.2 SS/PTFE manual Kvs15.0	1217942-0101	6000	Change	Spare part kit (Wet End)	90503-5760	Spare part kit	1	
V166	90510-4377	Regulating valve	3321 Reg valve GG DN 25 kvs 10 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	6000	Check	Function	90510-4762	Positioner	1	
V166	90510-4377	Regulating valve	3321 Reg valve GG DN 25 kvs 10 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	12000	Change	Spare part kit	6-990417-54	Spare part kit	1	
V166	90510-4377	Regulating valve	3321 Reg valve GG DN 25 kvs 10 3372/3730-1 H15 120cm² 2,1-3,3	1212101-0101	18000	Change	Diaphragm	90510-4815	Diaphragm	1	
V069	6-31801-9077-1	Safety valve	AJ 4543 Flange DIN DN20/40 GS-C25 Op 3.5bar(e)	1213620-0101	6000	Check	Function	6-31801-9077-1	Safety valve	1	
V060	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit (Wet end)	6-31801-2190-1	Spare part kit	1	
V062	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit (Wet end)	6-31801-2190-1	Spare part kit	1	
V065	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit (Wet end)	6-31801-2190-1	Spare part kit	1	
V068	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit (Wet end)	6-31801-2190-1	Spare part kit	1	
V171	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V165	6-31801-9113-1	Ball valve	A59-6666TT-W-DN25-25x1.2-full bore A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit (Wet end)	6-31801-2190-5	Spare part kit	1	
V150	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V151	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V153	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V154	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V156	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V157	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V158	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-6	Spare part kit	1	
V160	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-4	Spare part kit	1	
V052	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-4	Spare part kit	1	
V053	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-	1241241-0101	12000	Change	Spare part kit	6-31801-2190-4	Spare part kit	1	
020-60-1	6-31801-5035-2	Expansion vessel	IPX 25L G3/4" PREPRESS. 1.0 BAR Max temp C. -10 +99	1210315-0101	6000	Check	Leakage and pressure	6-31801-5035-2	Expansion vessel	1	
330-01	90510-8628	Pressure regulator	FR G3/8-10 IDO228/1 1.5-10bar(g) 5um Switch 0.45MPa Pressure	1224023-0101	6000	Check	Spare part	90511-1072	Pressure switch	1	
330-01	90510-8628	Pressure regulator	FR G3/8-10 IDO228/1 1.5-10bar(g) 5um Switch 0.45MPa Pressure	1224023-0101	6000	Check	Spare part	90510-8980	Filter element	1	
330-01	90510-8628	Pressure regulator	FR G3/8-10 IDO228/1 1.5-10bar(g) 5um Switch 0.45MPa Pressure	1224023-0101	6000	Check	Spare part	90512-4005	Pressure relief valve	1	
020-17-0	6-31801-2772-3	Steam trap	FT47-4.5TV, DN25, PN40	1241199-0101	6000	Change	Spare part kit	90503-6591	Spare part kit	1	
020-59-0	6-31801-2772-3	Steam trap	FT47-4.5TV, DN25, PN40	1241199-0101	6000	Change	Spare part kit	90503-6591	Spare part kit	1	

After maintenance checks

At any interval - Check - Leaks, Noise, Vibrations, Pressures, temperatures and flow according to start up protocol

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Tetra Pak CPS A/S **Tetra Alcross Bactocatch, Preventive**

Pre maintenence checks

WARNING! Before starting any service work , read the safety precaution in the corresponding TeM (Technical Manual)
Daily/Weekly checks - Have they been carried out? If not carry them out before starting the service.

At any interval - Check - Leaks, Noise, Vibrations, Pressures and Temperatures

Label	Article No.	Denomination	Type	Doc No Reference	Interval (hr.) Normal	Action	Description	SparePart No.	Denomination	Qty	Action performed Date / Result
Exampel	2588968-0100	Centrifugal pump	LKH-25-ISO Cl-15/17kW-EPDM iscr	1214246-0101	3000	Change	Spare parts kit	6-9611922226	Spare part kit	1	
Exampel	2588989-0100	Centrifugal pump	LKH-60-ISO Cl-30/35kW-EPDM iscr	1214246-0101	3000	Change	Spare parts kit	6-9611922234	Spare part kit	1	
					3000	Check	Grease bearings 25 gram each bearing. Use Mobilith SHC200 or equivalent.			1	

After maintenance checks

At any interval - Check - Leaks, Noise, Vibrations, Pressures, temperatures and flow according to start up protocol

Tetra Pak CPS A/S **Tetra Alcross Bactocatch, SparePartsList**

Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	330-01	**1**	**90510-8628**	**Pressure regulator**	**1224023-0101**	
		1	90510-8980	Filter element		
		1	90511-1072	Pressure switch		
		1	90512-4005	Pressure relief valve		
	M010	**1**	**2588957-0100**	**Centrifugal pump**	**1214246-0101**	
		1	6-9611-92-2114	Spare part kit		
		1	6-9611-92-2118	Spare part kit		
		1	6-9611-92-2210	Spare part kit		
		1	6-9612-12-9605	Shaft seal		
		1	6-9612-12-9617	Shaft seal		
		1	6-9612-12-9629	Shaft seal		
	020-11·	**1**	**90503-2084**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2084	Pressure transmitter	1218205-0101	
	V001	**1**	**6-9613-32-0031**	**Single seat valve**	**1221121-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6503	Service kit		
	V001A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V002	**1**	**6-9613-36-0833**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V002A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V004	**1**	**6-9613-36-0833**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V004A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V005	**1**	**6-9612-62-8565**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3028	Service kit		
	V005A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	CV003	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	V006	**1**	**6-9613-32-1527**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V006A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V007	**1**	**6-9613-32-0123**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V007A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V011	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V011A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V021	**1**	**6-9613-32-0123**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V021A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V085	**1**	**6-9612-62-8567**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3030	Service kit		
	V085A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V-S08	**1**	**6-31350-0020-1**	**Sampling valve**	**1211608-0101**	
		1	6-223404-10	O-ring		
		1	6-32249-0018-1	Gasket		
		1	6-9611-25-2176	Spindle		
		1	6-9611-99-0026	O-ring		
	V-S09	**1**	**6-31350-0020-1**	**Sampling valve**	**1211608-0101**	
		1	6-223404-10	O-ring		
		1	6-32249-0018-1	Gasket		
		1	6-9611-25-2176	Spindle		
		1	6-9611-99-0026	O-ring		
	M012	**1**	**2588957-0100**	**Centrifugal pump**	**1214246-0101**	
		1	6-9611-92-2114	Spare part kit		
		1	6-9611-92-2118	Spare part kit		
		1	6-9611-92-2210	Spare part kit		
		1	6-9612-12-9605	Shaft seal		
		1	6-9612-12-9617	Shaft seal		
		1	6-9612-12-9629	Shaft seal		
	020-12·	**1**	**90503-2064**	**Conductivity meter**	**1218800-0101**	
		1	90503-2064	Conductivity meter	1218800-0101	
	020-12·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	V020	**1**	**6-9613-36-0833**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V020A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V022	**1**	**6-9613-32-1527**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V022A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	CV023	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	V024	**1**	**6-9613-32-0123**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V024A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V003	**1**	**6-9613-32-0514**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6579	Service kit		
	V003A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	FT24-1	**1**	**90503-8940**	**Magnetic Flow meter**	**1218415-0101**	
		1	6-31801-9746-1	Spare part		
		1	6-31801-9746-2	Kit display		
		1	6-31801-9746-3	Fuse		
		1	90503-3358	Gasket		
	020-11	**1**	**90503-1903**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0442	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
		2	**6-736853-07**	**Flange seal**	**No Doc.**	
		2	6-736853-07	Flange seal	No Doc.	
	V092	**1**	**6-9613-32-0123**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V092A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V093	**1**	**6-9613-32-0123**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V093A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	M015	**1**	**2588957-0100**	**Centrifugal pump**	**1214246-0101**	
		1	6-9611-92-2114	Spare part kit		
		1	6-9611-92-2118	Spare part kit		
		1	6-9611-92-2210	Spare part kit		
		1	6-9612-12-9605	Shaft seal		
		1	6-9612-12-9617	Shaft seal		
		1	6-9612-12-9629	Shaft seal		
	020-49·	**1**	**90503-1903**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0442	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	020-49·	**1**	**90503-2084**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2084	Pressure transmitter	1218205-0101	
	CV004	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	V086	**1**	**6-9613-32-0035**	**Single seat valve**	**1221121-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6503	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V086A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V087	**1**	**6-9613-36-0833**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V087A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	CV006	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	V088	**1**	**6-9613-36-0833**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6498	Service kit		
		1	6-9611-92-6581	Service kit		
	V088A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V089	**1**	**6-9612-55-3721**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V198	**1**	**6-9612-62-8567**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3030	Service kit		
	V198A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V205	**1**	**6-9612-62-8565**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3028	Service kit		
	V205A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V013	**1**	**6-9613-32-0602**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V013A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V014	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V014A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V015	**1**	**6-9613-32-0315**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V015A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	CV016	**1**	**6-9612-22-0008**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4006	Spare part kit		
	021-01·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	020-11·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	CV113	**1**	**6-9612-22-0010**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4008	Spare part kit		
	CV114	**1**	**6-9612-22-0010**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4008	Spare part kit		
	V131-0	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V131-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	021-01·	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		
	021-01·	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
021-01		**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		
021-01		**1**	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
021-01		**1**	**90503-1879**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0439	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
021-01		**1**	**90503-1879**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0439	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
021-01		**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
021-01		**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
V191-0		**1**	**6-9612-55-3717**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V193-1	**1**	**6-9612-55-3719**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V193-1	**1**	**6-9612-55-3719**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V081	**1**	**6-9613-32-0036**	**Single seat valve**	**1221121-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6502	Service kit		
	V081A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V082	**1**	**6-9613-36-0843**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V082A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V083	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V083A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V136-0	**1**	**6-9612-62-8567**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3030	Service kit		
	V136-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	021-02·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	CV123	**1**	**6-9612-22-0010**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4008	Spare part kit		
	CV124	**1**	**6-9612-22-0010**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4008	Spare part kit		
	V131-0	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V131-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	021-02	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		
	V191-0	**1**	**6-9612-55-3717**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	021-02	**1**	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	V136-0	**1**	**6-9612-62-8567**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3030	Service kit		
	V136-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	M224-0	**1**	**2588989-0100**	**Centrifugal pump**	**1214246-0101**	
		1	6-9611-92-2130	Spare part kit		
		1	6-9611-92-2134	Spare part kit		
		1	6-9611-92-2234	Spare part kit		
		1	6-9612-12-9605	Shaft seal		
		1	6-9612-12-9617	Shaft seal		
		1	6-9612-12-9629	Shaft seal		
	022-01·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	020-11·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	CV213	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	CV214	**1**	**6-9612-22-0009**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4007	Spare part kit	No Doc.	
	V231-0	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V231-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	022-01·	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	022-01	**1**	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	V291-0	**1**	**6-9612-55-3715**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V290	**1**	**6-9612-62-8565**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3028	Service kit		
	V290A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	022-01	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		
	022-01	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	022-01	**1**	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	022-01	**1**	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	022-01	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	022-01	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	V293-1	**1**	**6-9612-55-3717**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V293-1	**1**	**6-9612-55-3717**	**Regulating valve**	**1215537-0101**	
		1	6-9611-92-0419	Service kit		
		1	6-9612-53-3602	Actuator Comp		
		1	6-990409-96	Spare part kit		
	V236-0	**1**	**6-9612-62-8567**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3030	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V236-0	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V240-0	**1**	**90510-4379**	**Regulating valve**	**1212101-0101**	
		1	90510-4762	Positioner		
		1	90510-4815	Diaphragm		
		1	6-990417-55	Spare part kit		
	CV051	**1**	**6-31801-2768-5**	**Non-return valve**	**1241228-0101**	
		1	6-31801-2768-5	Non-return valve	1241228-0101	
	V069	**1**	**6-31801-9077-1**	**Safety valve**	**1213620-0101**	
		1	6-31801-9077-1	Safety valve	1213620-0101	
	M119	**1**	**2589011-0100**	**Centrifugal pump**	**1214248-0101**	
		1	6-9611-92-2108	Spare part kit		
		1	6-9611-92-2111	Spare part kit		
		1	6-9612-36-2204	Shaft seal		
	020-51·	**1**	**90503-2084**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2084	Pressure transmitter	1218205-0101	
	020-51·	**1**	**90503-1891**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-3351	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	020-51·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	V101	**1**	**6-9613-32-0030**	**Single seat valve**	**1221121-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6502	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V101A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V102	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V102A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V104	**1**	**6-9613-32-0602**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V104A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V105	**1**	**6-9612-62-8565**	**Butterfly valve**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
		1	6-9611-92-3028	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V105A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V106	**1**	**6-9613-32-0315**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V106A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V107	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V107A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V121	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V121A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	020-51·	**1**	**90503-2064**	**Conductivity meter**	**1218800-0101**	
		1	90503-2064	Conductivity meter	1218800-0101	
	V103	**1**	**6-9613-32-0514**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6579	Service kit		
	V103A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	020-51·	**1**	**90503-1891**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-3351	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	020-17·	**1**	**6-31801-5609-5**	**Strainer**	**1248674-0101**	
		1	6-990411-88	Spare part kit		
	020-17·	**1**	**6-31801-2772-3**	**Steam trap**	**1241199-0101**	
		1	90503-6591	Spare part kit		
	V060	**1**	**6-31801-9113-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-1	Spare part kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V060A	**1**	**6-9612-19-4002**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V060C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V061	**1**	**90510-4381**	**Regulating valve**	**1212101-0101**	
		1	90510-4762	Positioner		
		1	90510-4815	Diaphragm		
		1	6-990417-56	Spare part kit		
	V062	**1**	**6-31801-9113-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-1	Spare part kit		
	V062A	**1**	**6-9612-19-4002**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V062C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	CV063	**1**	**6-31801-2768-3**	**Non-return valve**	**1241228-0101**	
		1	6-31801-2768-3	Non-return valve	1241228-0101	
	V065	**1**	**6-31801-9113-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-1	Spare part kit		

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Tetra Pak CPS A/S **Tetra Alcross Bactocatch, SparePartsList**

Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V065C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V065C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V066	**1**	**90510-4381**	**Regulating valve**	**1212101-0101**	
		1	90510-4762	Positioner		
		1	90510-4815	Diaphragm		
		1	6-990417-56	Spare part kit		
	CV067	**1**	**6-31801-2768-5**	**Non-return valve**	**1241228-0101**	
		1	6-31801-2768-5	Non-return valve	1241228-0101	
	V068	**1**	**6-31801-9113-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-1	Spare part kit		
	V068A	**1**	**6-9612-19-4002**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V068C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V190	**1**	**6-9612-30-5503**	**Constant pressure valve**	**1214498-0101**	
		1	6-9611-92-0218	Service kit		
	020-51·	**1**	**90503-2136**	**Pressure transmitter**	**1218205-0101**	
		1	90503-2136	Pressure transmitter	1218205-0101	
	020-11·	**1**	**6-9612-02-5703**	**Filter**	**1241330-0101**	
		1	6-9611-99-1360	Seal ring	No Doc.	
		1	6-9612-02-5403	Seal ring		
		1	6-9612-02-5703	Filter	1241330-0101	
	020-52·	**1**	**6-9612-02-5702**	**Filter**	**1241330-0101**	
		1	6-9611-99-1359	Seal ring	No Doc.	
		1	6-9612-02-5402	Seal ring		
		1	6-9612-02-5702	Filter	1241330-0101	
	V120	**1**	**6-9613-32-0602**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V120A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V123	**1**	**6-9613-32-0315**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		

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Tetra Pak CPS A/S **Tetra Alcross Bactocatch, SparePartsList**

Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V123A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V124	**1**	**6-9613-32-0173**	**Single seat valve**	**1221122-0101**	
		1	6-9611-92-6497	Service kit		
		1	6-9611-92-6580	Service kit		
	V124A	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V170	**1**	**90503-5663**	**Regulating valve**	**1217942-0101**	
		1	90503-5760	Spare part kit		
	V171	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V171A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V171C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Tetra Pak CPS A/S **Tetra Alcross Bactocatch, SparePartsList**

Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	CV172	**1**	**6-31801-2768-3**	**Non-return valve**	**1241228-0101**	
		1	6-31801-2768-3	Non-return valve	1241228-0101	
	020-59·	**1**	**6-31801-5609-3**	**Strainer**	**1248674-0101**	
		1	6-990411-86	Spare part kit		
	020-59·	**1**	**6-31801-2772-3**	**Steam trap**	**1241199-0101**	
		1	90503-6591	Spare part kit		
	V165	**1**	**6-31801-9113-1**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-5	Spare part kit		
	V165A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V165C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V166	**1**	**90510-4377**	**Regulating valve**	**1212101-0101**	
		1	90510-4762	Positioner		
		1	90510-4815	Diaphragm		
		1	6-990417-54	Spare part kit		
	CV167	**1**	**6-31801-2768-3**	**Non-return valve**	**1241228-0101**	
		1	6-31801-2768-3	Non-return valve	1241228-0101	
	020-60·	**1**	**6-9612-14-1407**	**Sight glass**	**1241295-0101**	
		1	6-9611-99-0530	Glass		
		1	6-9611-99-1977	Seal ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	020-60·	**1**	**90503-1891**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-3351	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	020-60·	**1**	**90503-3248**	**Pressure switch**	**1218198-0101**	
		1	90503-3248	Pressure switch	1218198-0101	
	020-60·	**1**	**6-31801-5035-2**	**Expansion vessel**	**1210315-0101**	
		1	6-31801-5035-2	Expansion vessel	1210315-0101	
	020-60·	**1**	**6-31801-5036-1**	**Valve set**	**1241090-0101**	
		1	6-31801-5036-2	Pipe	1241090-0101	
		1	6-31801-5036-3	Pressure gauge	1241090-0101	
		1	6-31801-5036-4	PURG-O-MAT G3/8" A	1241090-0101	
		1	6-31801-5036-5	3.5BAR(G) G3/4" A - G1"	1241090-0101	
	020-60·	**1**	**6-990431-57**	**Air vent valve**	**1212676-0101**	
		1	6-31801-9451-1	Type:DN15 Spirotop PN10 Material:Brass		
		1	6-31801-9453-1	Ball valve		
	M111	**1**	**90503-5885**	**Centrifugal pump**	**1218037-0101**	
		1	6-990418-71	Spare part kit		
		1	6-990425-69	Shaft seal		
		1	6-990425-85	Service kit		
		2	**90503-0788**	**Coupling**	**No Doc.**	
		1	90503-1052	Gasket		
	V150	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V150A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V150C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V151	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V151A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V151C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V153	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V153A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V153C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V154	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V154A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V154C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	CV155	**1**	**6-9612-22-0008**	**Non-return valve**	**1241273-0101**	
		1	6-9611-92-4006	Spare part kit		
	V156	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V157	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V157A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V157C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
	V158	**1**	**6-31801-9096-3**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-6	Spare part kit		
	V160	**1**	**6-31801-9096-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-4	Spare part kit		
	020-21·	**1**	**6-31801-5609-2**	**Strainer**	**1248674-0101**	
		1	6-990411-85	Spare part kit		
	V052	**1**	**6-31801-9096-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-4	Spare part kit		
	V052A	**1**	**6-9612-19-4001**	**Actuator**	**1215850-0101**	
		1	6-9611-92-3021	Service kit		
	V052C	**1**	**6-9612-57-8901**	**Top unit**	**1213513-0101**	
		2	6-9611-99-3349	O-ring		
		1	6-9611-99-3350	O-ring		
		1	6-9611-99-3526	Keypad	1213518-0101	
		1	6-9611-99-3627	Cable	1213513-0101	
		1	6-9612-56-2701	Sensor unit		
		1	6-9612-56-9601	X-ring		
	V053	**1**	**6-31801-9096-2**	**Ball valve**	**1241241-0101**	
		1	6-31801-2190-4	Spare part kit		
	020-21·	**1**	**90503-3248**	**Pressure switch**	**1218198-0101**	
		1	90503-3248	Pressure switch	1218198-0101	
		1	**90503-1879**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0439	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		

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Item No.	Label	Qty	Article No.	Denomination	Doc No	Rev.
		1	**90503-1891**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-3351	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
		1	**90503-1867**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0533	Fuse kit		
		1	90503-2263	Gasket		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
		1	**90503-1903**	**Magnetic Flow meter**	**1218415-0101**	
		1	90503-0442	Gasket		
		1	90503-0533	Fuse kit		
		1	90503-3390	Power supply		
		1	90503-3391	Display		
		1	90503-3392	Communication card		
	M124	**1**		**Centrifugal pump**	**1214246-0101**	
		1	6-9611-92-2968	Spare part kit		
		1	6-9612-5151-13	Shaft seal		
				Filter modules		
		1	6-31826-0023-8	Element		
		1	6-31826-0024-2	Filter		
		4	6-31826-0014-7	Filter Module gasket		
		12	6-31826-0014-8	Filter Module gasket		

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Item No.	Label	Qty	Article No.	Denomination	Rev.
		1	6-9611 99 1358	Seal CL25 22.80/52.70x5.50 EPDM	
		1	6-9611 99 1359	Seal CL38 35.80/52.70x5.50 EPDM	
		1	6-9611 99 1360	Seal CL51 48.80/66.20x5.50 EPDM	
		1	6-9611 99 1361	Seal CL63.5 60.50/79.70x5.50 EPDM	
		1	6-9611 99 1362	Seal CL76.1 73.10/93.20x5.50 EPDM	
		1	6-9611 99 1363	Seal CL101.6 97.80/121.20x5.50 EPDM	
		1	6-9611 9913 66	Seal ring for clamp ø168,3, EPDM	
		1	6-31816 0028 9	Lip Seal for 6,3"ATD	
		1	6-31816-0028-3	Lip seal for 3,8" ATD	
				Other special seals or spares.	

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Sign:

Fabrication No from
30107-33658
Fabrication No to

PARTS LIST

Unit type: **C6-SM**

Block	Block description	Item no	Item description	Qty
39507469 03	CHANNEL PLATE	39005608 27	Field Gasket	59
		39007068 03	RAW PLATE	59
39507469 04	CHANNEL PLATE	39005608 27	Field Gasket	12
		39007068 16	RAW PLATE	12
39507469 05	CHANNEL PLATE	39005608 27	Field Gasket	1
		39007068 16	RAW PLATE	1
39507469 09	CHANNEL PLATE	39005608 27	Field Gasket	1
		39007068 16	RAW PLATE	1
39507469 11	CHANNEL PLATE	39005608 27	Field Gasket	10
		39007068 16	RAW PLATE	10
39507469 64	END PLATE I	39005608 27	Field Gasket	2
		39007068 76	RAW PLATE	2
39507469 71	END PLATE I	39005608 27	Field Gasket	3
		39007068 76	RAW PLATE	3
39507469 84	END PLATE II	39005609 27	End Plate Gasket	1
		39007068 16	RAW PLATE	1
39507469 91	END PLATE II	39005609 27	End Plate Gasket	4
		39007068 16	RAW PLATE	4
39507470 03	CHANNEL PLATE	39005608 27	Field Gasket	26
		39007069 03	RAW PLATE	26
39507470 05	CHANNEL PLATE	39005608 27	Field Gasket	12
		39007069 16	RAW PLATE	12
39507470 06	CHANNEL PLATE	39005608 27	Field Gasket	14
		39007069 16	RAW PLATE	14
39507470 09	CHANNEL PLATE	39005608 27	Field Gasket	12
		39007069 16	RAW PLATE	12
39507470 10	CHANNEL PLATE	39005608 27	Field Gasket	14
		39007069 16	RAW PLATE	14
CLIP6 FRH BA04	BARS	1623262 04	CARRYING BAR	1
		1623416 04	GUIDING BAR	1
		1640044 04	L=1800	1
CLIP6 FRH CC01	CONNECTION PLATE	221803 29	M10	16
		223101 61	BRB 10.5 X 22 - 2343	16
		3350001046	CONNECTION PLATE COMPL.	4
CLIP6 FRH CF01	CONNECTION FRAME PLATE	1640498 01	GASKET RING	2
		32324 7500 1	51	2
CLIP6 FRH CG03	NBRFF, FRAME PLATE AND CORNER	34505262 01	NBRFF, ARTICLE REPLACES ART.NO	10
		34505262 01	NBRFF, ARTICLE REPLACES ART.NO	2
CLIP6 FRH CO01	BLIND CORNER	1625417 02	BLIND CORNER	6
CLIP6 FRH CO03	SINGLE CORNER	1624196 01	L=45	2
		1625395 01	SINGLE CORNER CLIP6	2
CLIP6 FRH CO06	SINGLE CORNER	1624196 01	L=45	2
		1625395 01	SINGLE CORNER CLIP6	2
CLIP6 FRH CO07	DOUBLE CORNER	1624196 01	L=45	3
		1625396 01	DOUBLE CORNER CLIP6	3
CLIP6 FRH CO08	DOUBLE CORNER	1624196 01	L=45	3
		1625396 01	DOUBLE CORNER CLIP6	3
CLIP6 FRH CP01	CONNECTION PRESS PLATE	1640499 01	FLANGE	2
		32324 7500 1	51	2
CLIP6 FRH FI12	CLAMP 51	1644805 03	CLAMP 51 NIPPLE	10

CLIP6 FRH FI12		1644805 03	CLAMP 51 NIPPLE	10
CLIP6 FRH FO01	FOOT LOW	1640543 01	LOW FOOT FRAMEPLATE	1
		1640546 01	LOW FOOT SUPPORTCOLUMN	1
		1640848 01	L=200 M30	4
CLIP6 FRH FP24	HOLE IN : S1 S4~FOR M24 BOLT	1640770 08	FRAME PLATE	1
CLIP6 FRH FX01	FIXED ITEMS	1620780 01	SHAFT	1
		1620781 01	WHEEL	1
		221041 01	ISO 4017 - M10 X 30 - A4-70	1
		221041 06	ISO 4014 - M10 X 50 - A4-70	2
		221046 03	ISO 4017 - M12 X 30 - A4-70	4
		221046 09	ISO 4014 - M12 X 60 - A4-70	2
		2210463 01	ISO 4017 - M16 X 25 - A4-70	2
		221803 22	NUT	2
		223101 35	BRB 13 X 24 - 2343	8
		223101 37	BRB 17 X 30 - 2343	2
		223101 61	BRB 10.5 X 22 - 2343	3
		260080 04	STOP SCREW	1
		528402 03	NEEDLE BEARING	1
CLIP6 FRH NP17	TETRA PAK, ENGLISH, SS, CE-MAR	34500130 01	SS, ENGLISH TEXT, CE-MARK	1
		34501810 01	TETRA PLEX 260x38	1
		34501811 01	TETRA PAK 260x38	2
		34503298	INSTRUCTION MANUAL	1
		6 31801 9520 1	BLUE STRIPE 35 MM	4
		6 31801 9520 2	TETRA PAK H=21 WHITE	2
		66169	DRIVE SCREW	4
CLIP6 FRH PP24	HOLE IN : T1 T4~FOR M24 BOLT	1640771 08	PRESSURE PLATE T1,T4	1
		1641270 01	ROLLER HOLDER	1
CLIP6 FRH PR09	PROTECTING PLATE	1640995 04	PROTECTION SHEET WITH CONN	2
		1640996 04	PROTECTION SHEET WITH CONN	2
		1640997 02	PROTECTION SHEET WITH CONN	4
		1641000 04	PROTECTION SHEET WITH CONN	2
		1641001 04	PROTECTION SHEET WITH CONN	2
		3350000635		4
CLIP6 FRH PR11	PROTECTING PLATE	1640997 02	PROTECTION SHEET WITH CONN	6
		1640998 04	PROTECTION SHEET BETWEEN	6
		1640999 04	PROTECTION SHEET BETWEEN	6
		3350000635		6
CLIP6 FRH SC01	SUPPORTING COLUMN	1640390 01	SUPPORTING COLUMN	1
CLIP6 FRH TB25	TIGHTENING BOLTS	1624183 01	BEARING BOX M24	6
		1640815 04	L=1460	2
		1640815 05	L=1760	4
		1640840 01	LOCK WASHER	6
		1641357 xx	PROTECTION TUBE	11
		1641360 03	PROTECTIVE CAP	6
		1641667 01	L=50 MM	6
		32220 3101 6	RATCHET SPANNER	1
CLIP6 FRH YP10	CRATE ON SKID BASE	1641251 02	CRATE ON SKIDBASE	1
ZC02	CERTIFICATES			1
ZD119	DOCUMENTS	34506155	INSTRUCTION MANUAL CD-ROM	1
ZD43	DOCUMENTS	34503298	INSTRUCTION MANUAL	1
ZI10	INSPECTION			1

Alfa Laval, Plate Heat Exchanger

Model : Tetra Plex C6-SM

Manufacturing no.	30107-33658	Date	2011-09-26 700286
Plate Heat Exchanger Type: Drawing no:	Tetra Plex C6-SM	Quantity:	1
Customer: KUNTEJ, HUNGARY		Ref:	
Agent: TP Dairy and Beverage Systems AB		Ref: 907264505/T5845930043	
Supplier: ALFA LAVAL		Ref: O11-37079	

Plates with parallel flow.

The plate pack is tightened to 1038 mm.

Always observe plate from its gasket side. In the upper part of the plate a ten figure part number is stamped. In the same area you will also find the letter 'A'. This means that the other end of the plate is denominated 'B'. Plates with four port holes are normally not stamped with a part number; they are identified by the type marking.
The plates are assembled, counting from the frame plate to the pressure plate, in sequence stated below with the gasket side facing the pressure plate. Plates in the list marked with a 'B' are mounted with the stamped 'A' facing downwards. 'H'/'L' or '1'/'2' correspond to the pattern on the plate.

For information about installation, running, cleaning etc. see the instruction book.

Measurements (see drawing): mm

A =	1038	AA =	83
LT =	1760	AB =	97
C =	1935	AC =	397
		AD =	397
		AE =	64

Net weight:
651 kg

Liquid volume:
118 l

Design pressure:
16 bar

Total Area:
29 m²

Connection standard:	CLAMP 51
Pressure Vessel Code:	PED
PED Risk Category:	2

	- Side 1 -	- Side 2 -	
Test pressure:	22.9	22.9	bar
Design temperature:	150.0	150.0	℃
Min temperature:	0.0	0.0	℃

Bolts: M24

Sect□on □nfor□ at□on

Section Area:	Flowrate kg/h	Media	FDG	Temperature progr. (℃)	dP kPa	Vol. (l):	Inlet	Outlet	Grouping:
□	□**6**□□	□□□□□ **S**□□□ □ **l**□	□	**6**□□□ **-**□ □□□□	□□□□□	□	**A**□□	**S**□	□□□**L**
□**6**□□ □ □	□□□□□	**C**□	□	□**6**□□ □**-** □□□□	□□□□□	□	**S**□	**A**□□□	□□□**L**
□	□□□□□	□□□□□ **Crea**□	□	□□□□□ **-**□ □□□□	□**6**□□	□	**A**□□□	**A**□□□	□□□**MH**
□□□□□□ □ □	□□□□□	**H**□	□	□□□□ □**-** □□□□	□□□□□	□	**A**□□	**A**□□	□□□**ML**
□	□□□□□	□□□□□ **Crea**□	□	□□□□ **-**□ □□□□	□□□□□	□**6**	**A**□□□	**A**□□	□□□□**MH**
□□□□□□ □ □	□□□□□	**H**□	□	□□□□ □**-** □□□□	□□□□□	□**6**	**A**□□□	**A**□□	□□□□**ML**
□	□□□□□	□□□□□ **Crea**□	□	□□□□ **-**□ □□□□	□□□□□	□**6**	**A**□□	**A**□□	□□□□**MH**
□□□□□□ □ □	□□□□□	**H**□	□	□□□□ □**-** □□□□	□□□□□	□**6**	**A**□□□	**A**□□	□□□□**ML**
□	□□□□□	□□□□□ **Crea**□	□	□□□□ **-**□ □□□□	□□□□□	□	**T**□	**A**□□	□□□**MH**
□□□□□□ □ □	□□□□□	□□□□□ **Crea**□	□	□□□□ □**-** □□□□	□□□**6**□	□	**A**□□	**T**□	□□□**ML**

Mea□□re□ ent□

Manufacturing no.	30107-33658	Date	2011-09-26 700286
Plate Heat Exchanger Type: Drawing no:	Tetra Plex C6-SM	Quantity:	1
Customer: KUNTEJ, HUNGARY		Ref: Slutland: Ungern	

Total A-measurement:	1038 mm	Total weight:	651 Kg
A-measure □free space:	1354 mm	Total volume:	118 l
C - measure:	1935 mm		
B - Measure	1835 mm	H - Measure:	1800 mm

Connection standard: CLAMP 51

Per Section

Section No.	Plate Area: m²	Volume in ltr: - Side 1 -	- Side 2 -	A-measure: mm
AA	1.620	3.55	3.55	83
AB	0.9000	2.13	2.13	97
AC	12.78	25.56	25.56	397
AD	12.78	25.56	25.56	397
AE	0.9000	2.13	2.13	64

Carrying Bars

Carrying Bar length:	1800 mm
Extendible by (plates):	29 Pcs

Tightening Bolts

Tightening Bolt length:	1760 mm
Tightening Bolt dimension:	M24
Extendible by (plates):	29 Pcs

Centre of gravity:	Empty	Filled
Hori□ontal:	569 mm	483 mm

Foundation Load:	Opened	Operating	(N)
Support Column side:	3838	1979	
Frame side:	4408	5531	

Connect□on □nfor□ at□on

Connection on the FRAME PLATE	
Connection at **S**□ Connection block: CLIP6 FRH CF01 Fitting on connection: CLAMP 51 CLIP6 FRH FI12	Connection at **S**□ Connection block: CLIP6 FRH CF01 Fitting on connection: CLAMP 51 CLIP6 FRH FI12
Connection at **S**□ No Hole	Connection at **S**□ No Hole

CONNECTION PLATE A1 CLIP6 FRH CC01	
Corner at **A**□□ Corner block: CLIP6 FRH CO01	Corner at **A**□□ Corner block: CLIP6 FRH CO01
Corner at **A**□□ Corner block: CLIP6 FRH CO07 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12	Corner at **A**□□ Corner block: CLIP6 FRH CO08 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12

CONNECTION PLATE A2 CLIP6 FRH CC01	
Corner at **A**□□ Corner block: CLIP6 FRH CO08 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12	Corner at **A**□□ Corner block: CLIP6 FRH CO07 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12
Corner at **A**□□ Corner block: CLIP6 FRH CO01	Corner at **A**□□ Corner block: CLIP6 FRH CO01

CONNECTION PLATE A3 CLIP6 FRH CC01	
Corner at **A**□□ Corner block: CLIP6 FRH CO08 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12	Corner at **A**□□ Corner block: CLIP6 FRH CO07 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12 Fitting on vertical connection: CLAMP 51 CLIP6 FRH FI12
Corner at **A**□□ Corner block: CLIP6 FRH CO01	Corner at **A**□□ Corner block: CLIP6 FRH CO01

CONNECTION PLATE A4 CLIP6 FRH CC01	
Corner at **A**□□ Corner block: CLIP6 FRH CO03 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12	Corner at **A**□□ Corner block: CLIP6 FRH CO06 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51 CLIP6 FRH FI12
Corner at **A**□□ Corner block: CLIP6 FRH CO03 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51	Corner at **A**□□ Corner block: CLIP6 FRH CO06 Conn. gasket block: CLIP6 FRH CG03 Fitting on hori□ontal connection: CLAMP 51

CLIP6 FRH FI12	CLIP6 FRH FI12

Connection on the PRESSURE PLATE	
Connection at **T**□ Connection block: CLIP6 FRH CP01 Fitting on connection: CLAMP 51 CLIP6 FRH FI12	Connection at **T**□ Connection block: CLIP6 FRH CP01 Fitting on connection: CLAMP 51 CLIP6 FRH FI12
Connection at **T**□ No Hole	Connection at **T**□ No Hole

30107-33658

Alfa Laval, Plate Heat Exchanger 2011-09-26
Channel Plate Installation Description

Customer: KUNTEJ, HUNGARY SU Order No: O11-37079-10
Model : Tetra Plex C6-SM Serial No: 30107-33658
Customer PO: Slutland: Ungern

Plate material and Thickness: ALLOY 316 0.60 mm

A Dimension: 1038 mm

Sealing material: NBRFF CLIP-ON

Port hole with flow on the gasket side: U
Port hole sealed with O-ring: O
Plates are assembled with the gasket side facing the pressure plate.

Plate no.	Plate code no.	Plate Pattern		Punched corner of the plate upper left S1	lower left S2	lower right S3	upper right S4	Spare part number incl. gasket
	FRAME PLATE							
	Section 1							
1	3900706871	CLIP6 L	B	O			U	39507469 71
2	3900706809	CLIP6 L	A	U		O	O	39507469 09
3	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
4	CLIP6 L	CLIP6 L	A	U	U	O	O	39507469 03
5	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
6	CLIP6 L	CLIP6 L	A	U	U	O	O	39507469 03
7	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
8	CLIP6 L	CLIP6 L	A	U	U	O	O	39507469 03
9	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
10	3900706805	CLIP6 L	A	U	U	O		39507469 05
11	3900706884	CLIP6 L	B		O	O		39507469 84
A1	CONNECTION PLATE							
	Section 2							
1	3900706864	CLIP6 L	B		O	U		39507469 64
2	3900706906	CLIP6 H	A		U	O	O	39507470 06
3	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
4	CLIP6 H	CLIP6 H	A	U	U	O	O	39507470 03
5	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
6	3900706910	CLIP6 H	A	U	U		O	39507470 10
7	3900706891	CLIP6 L	B	O			O	39507469 91
A2	CONNECTION PLATE							
	Section 3							
1	3900706871	CLIP6 L	B	O			U	39507469 71
2	3900706909	CLIP6 H	A	U		O	O	39507470 09
3	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
4	CLIP6 H	CLIP6 H	A	U	U	O	O	39507470 03
5	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03
6	3900706905	CLIP6 H	A	U	U	O		39507470 05
7	3900706804	CLIP6 L	B		O	U		39507469 04
8	3900706906	CLIP6 H	A		U	O	O	39507470 06
9	CLIP6 L	CLIP6 L	B	O	O	U	U	39507469 03

10	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
11	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
12	3900706910	CLIP6 H	A	U	---□--	U			O	39507470 10
13	3900706811	CLIP6 L	B	O				--□---	U	39507469 11
14	3900706909	CLIP6 H	A	U	--□---		O		O	39507470 09
15	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
16	CLIP6 H	CLIP6 H	A	U	--□---	U	O		O	39507470 03
17	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
18	3900706905	CLIP6 H	A	U	--□---	U	O			39507470 05
19	3900706804	CLIP6 L	B			O	U	---□--		39507469 04
20	3900706906	CLIP6 H	A		---□--	U	O		O	39507470 06
21	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
22	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
23	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
24	3900706910	CLIP6 H	A	U	---□--	U			O	39507470 10
25	3900706811	CLIP6 L	B	O				--□---	U	39507469 11
26	3900706909	CLIP6 H	A	U	--□---		O		O	39507470 09
27	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
28	CLIP6 H	CLIP6 H	A	U	--□---	U	O		O	39507470 03
29	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
30	3900706905	CLIP6 H	A	U	--□---	U	O			39507470 05
31	3900706804	CLIP6 L	B			O	U	---□--		39507469 04
32	3900706906	CLIP6 H	A		---□--	U	O		O	39507470 06
33	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
34	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
35	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
36	3900706910	CLIP6 H	A	U	---□--	U			O	39507470 10
37	3900706811	CLIP6 L	B	O				--□---	U	39507469 11
38	3900706909	CLIP6 H	A	U	--□---		O		O	39507470 09
39	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
40	CLIP6 H	CLIP6 H	A	U	--□---	U	O		O	39507470 03
41	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
42	3900706905	CLIP6 H	A	U	--□---	U	O			39507470 05
43	3900706804	CLIP6 L	B			O	U	---□--		39507469 04
44	3900706906	CLIP6 H	A		---□--	U	O		O	39507470 06
45	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
46	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
47	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
48	3900706910	CLIP6 H	A	U	---□--	U			O	39507470 10
49	3900706811	CLIP6 L	B	O				--□---	U	39507469 11
50	3900706909	CLIP6 H	A	U	--□---		O		O	39507470 09
51	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
52	CLIP6 H	CLIP6 H	A	U	--□---	U	O		O	39507470 03
53	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
54	3900706905	CLIP6 H	A	U	--□---	U	O			39507470 05
55	3900706804	CLIP6 L	B			O	U	---□--		39507469 04
56	3900706906	CLIP6 H	A		---□--	U	O		O	39507470 06
57	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
58	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
59	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
60	3900706910	CLIP6 H	A	U	---□--	U			O	39507470 10
61	3900706811	CLIP6 L	B	O				--□---	U	39507469 11
62	3900706909	CLIP6 H	A	U	--□---		O		O	39507470 09
63	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
64	CLIP6 H	CLIP6 H	A	U	--□---	U	O		O	39507470 03
65	CLIP6 L	CLIP6 L	B	O		O	U	--□---	U	39507469 03
66	3900706905	CLIP6 H	A	U	--□---	U	O			39507470 05
67	3900706804	CLIP6 L	B			O	U	---□--		39507469 04
68	3900706906	CLIP6 H	A		---□--	U	O		O	39507470 06
69	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03
70	CLIP6 H	CLIP6 H	A	U	---□--	U	O		O	39507470 03
71	CLIP6 L	CLIP6 L	B	O		O	U	---□--	U	39507469 03

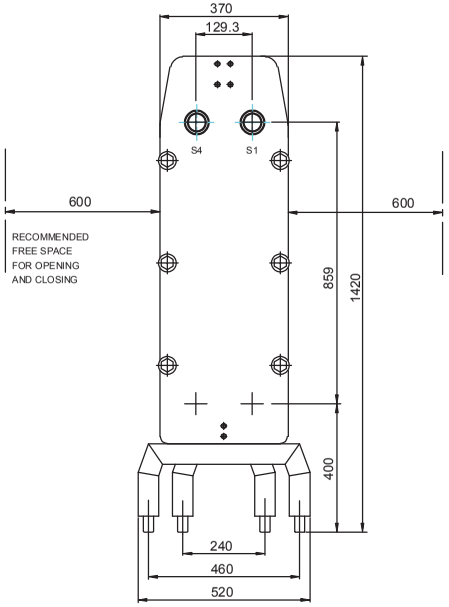
72	3900706910	CLIP6 H	A	U	---□--	U				O		39507470 10
73	3900706891	CLIP6 L	B	O						O		39507469 91
				=□=						=□=		
A3	CONNECTION PLATE											
	Section 4			=□=						=□=		
1	3900706871	CLIP6 L	B	O				--□---		U		39507469 71
2	3900706909	CLIP6 H	A	U	--□---		O			O		39507470 09
3	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
4	CLIP6 H	CLIP6 H	A	U	--□---	U	O			O		39507470 03
5	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
6	3900706905	CLIP6 H	A	U	--□---	U	O					39507470 05
7	3900706804	CLIP6 L	B			O	U	---□--				39507469 04
8	3900706906	CLIP6 H	A		---□--	U	O			O		39507470 06
9	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
10	CLIP6 H	CLIP6 H	A	U	---□--	U	O			O		39507470 03
11	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
12	3900706910	CLIP6 H	A	U	---□--	U				O		39507470 10
13	3900706811	CLIP6 L	B	O				--□---		U		39507469 11
14	3900706909	CLIP6 H	A	U	--□---		O			O		39507470 09
15	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
16	CLIP6 H	CLIP6 H	A	U	--□---	U	O			O		39507470 03
17	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
18	3900706905	CLIP6 H	A	U	--□---	U	O					39507470 05
19	3900706804	CLIP6 L	B			O	U	---□--				39507469 04
20	3900706906	CLIP6 H	A		---□--	U	O			O		39507470 06
21	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
22	CLIP6 H	CLIP6 H	A	U	---□--	U	O			O		39507470 03
23	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
24	3900706910	CLIP6 H	A	U	---□--	U				O		39507470 10
25	3900706811	CLIP6 L	B	O				--□---		U		39507469 11
26	3900706909	CLIP6 H	A	U	--□---		O			O		39507470 09
27	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
28	CLIP6 H	CLIP6 H	A	U	--□---	U	O			O		39507470 03
29	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
30	3900706905	CLIP6 H	A	U	--□---	U	O					39507470 05
31	3900706804	CLIP6 L	B			O	U	---□--				39507469 04
32	3900706906	CLIP6 H	A		---□--	U	O			O		39507470 06
33	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
34	CLIP6 H	CLIP6 H	A	U	---□--	U	O			O		39507470 03
35	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
36	3900706910	CLIP6 H	A	U	---□--	U				O		39507470 10
37	3900706811	CLIP6 L	B	O				--□---		U		39507469 11
38	3900706909	CLIP6 H	A	U	--□---		O			O		39507470 09
39	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
40	CLIP6 H	CLIP6 H	A	U	--□---	U	O			O		39507470 03
41	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
42	3900706905	CLIP6 H	A	U	--□---	U	O					39507470 05
43	3900706804	CLIP6 L	B			O	U	---□--				39507469 04
44	3900706906	CLIP6 H	A		---□--	U	O			O		39507470 06
45	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
46	CLIP6 H	CLIP6 H	A	U	---□--	U	O			O		39507470 03
47	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03
48	3900706910	CLIP6 H	A	U	---□--	U				O		39507470 10
49	3900706811	CLIP6 L	B	O				--□---		U		39507469 11
50	3900706909	CLIP6 H	A	U	--□---		O			O		39507470 09
51	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
52	CLIP6 H	CLIP6 H	A	U	--□---	U	O			O		39507470 03
53	CLIP6 L	CLIP6 L	B	O		O	U	--□---		U		39507469 03
54	3900706905	CLIP6 H	A	U	--□---	U	O					39507470 05
55	3900706804	CLIP6 L	B			O	U	---□--				39507469 04
56	3900706906	CLIP6 H	A		---□--	U	O			O		39507470 06
57	CLIP6 L	CLIP6 L	B	O		O	U	---□--		U		39507469 03

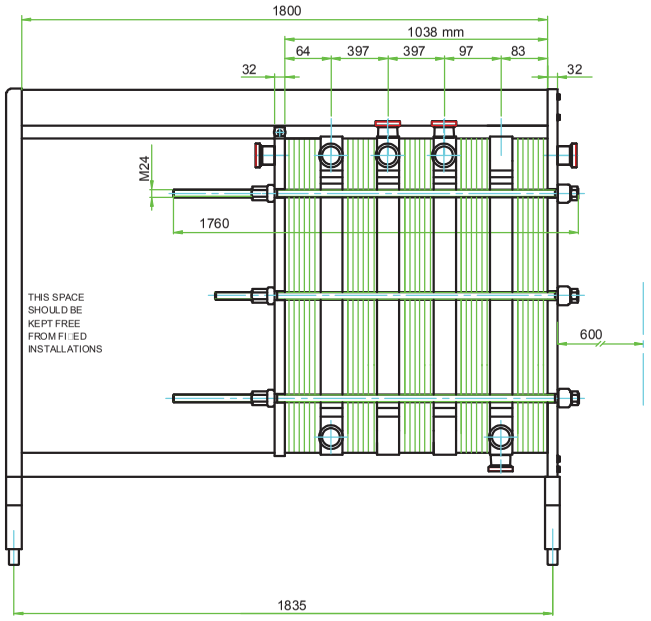
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59	CLIP6 L	CLIP6 L	B	O		O		U	---□--	U	39507469 03
60	3900706910	CLIP6 H	A	U	---□--	U				O	39507470 10
61	3900706811	CLIP6 L	B	O					--□---	U	39507469 11
62	3900706909	CLIP6 H	A	U	--□---			O		O	39507470 09
63	CLIP6 L	CLIP6 L	B	O		O		U	--□---	U	39507469 03
64	CLIP6 H	CLIP6 H	A	U	--□---	U		O		O	39507470 03
65	CLIP6 L	CLIP6 L	B	O		O		U	--□---	U	39507469 03
66	3900706905	CLIP6 H	A	U	--□---	U		O			39507470 05
67	3900706804	CLIP6 L	B			O		U	---□--		39507469 04
68	3900706906	CLIP6 H	A		---□--	U		O		O	39507470 06
69	CLIP6 L	CLIP6 L	B	O		O		U	---□--	U	39507469 03
70	CLIP6 H	CLIP6 H	A	U	---□--	U		O		O	39507470 03
71	CLIP6 L	CLIP6 L	B	O		O		U	---□--	U	39507469 03
72	3900706910	CLIP6 H	A	U	---□--	U				O	39507470 10
73	3900706891	CLIP6 L	B	O						O	39507469 91
				=□=						=□=	
A4	CONNECTION PLATE										
	Section 5					=□=		=□=			
1	3900706864	CLIP6 L	B			O		U	---□--		39507469 64
2	3900706906	CLIP6 H	A		---□--	U		O		O	39507470 06
3	CLIP6 L	CLIP6 L	B	O		O		U	---□--	U	39507469 03
4	CLIP6 H	CLIP6 H	A	U	---□--	U		O		O	39507470 03
5	CLIP6 L	CLIP6 L	B	O		O		U	---□--	U	39507469 03
6	3900706910	CLIP6 H	A	U	---□--	U				O	39507470 10
7	3900706891	CLIP6 L	B	O						O	39507469 91
	PRESSURE PLATE			=□=						=□=	
				T1		T2		T3		T4	

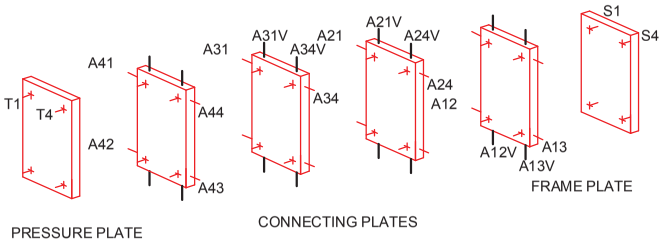
Article No:	Quantity:
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39507469 09	1
39507469 03	59
39507469 05	1
39507469 84	1
39507469 64	2
39507470 06	14
39507470 03	26
39507470 10	14
39507469 91	4
39507470 09	12
39507470 05	12
39507469 04	12
39507469 11	10
	171

FRAME PLATE

(FI□ED)

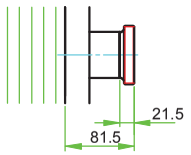






CLAMP 51

AISI 316L



TOTAL LENGTH	1935
TOTAL □IDTH	520
TOTAL HEIGHT	1420

ALL DIMENSIONS IN MILLIMETERS

CUSTOMER	KUNTEJ, HUNGARY / Slutland: Ungern
CUSTOMER REF.	
NAME	118381_1
AGENT	TP Dairy and Beverage Systems AB
AGENTREF.	/ 907264505/T5845930043
MANUFACT./YEAR	Alfa Laval AB / 2011
SUPPLIER/REF.	OM_SEH / O11-37079-10

ORIGINAL FLO□ ALTERNATIVE

NO	SEC.	MEDIA	INLET	OUTLET
1	1	9.00□ Skim milk	A12	S1
2	1	C□	S4	A13V
3	2	40.0□ Cream	A21V	A12V
4	2	H□	A13	A24
5	3	H□	A24V	A34
6	3	40.0□ Cream	A31V	A21
7	4	H□	A34V	A44
8	4	40.0□ Cream	A41	A31
9	5	40.0□ Cream	A43	T4
10	5	40.0□ Cream	T1	A42

CONSTRUCTION OF ONE UNIT

CLAMP 51 : S1, S4, T1, T4, A12, A12V, A13, A13V, A21, A21V
CLAMP 51 : A24, A24V, A31, A31V, A34, A34V, A41, A42, A43, A44

PLATEPACKTIGHTENINGTO	1038 mm
TOTALNOOFPLATES	171
NET□ EIGHT	651 kg
□ EIGHT □ ITH □ ATER	769 kg
TOTAL VOLUME	118 l
DESIGN PRESSURE	16 bar / 16 bar
TEST PRESSURE	22,9 bar / 22,9 bar
DESIGN TEMPERATURE MIN	0 ℃ / 0 ℃
DESIGN TEMPERATURE MA□	150 ℃ / 150 ℃
RISK CATEGORY	2
FLUID DANGER GROUP	2

E□TRAS

PLATE HEAT E□CHANGER

Tetra Plex C6-SM

PED

Tetra Pak

PREPARED	DATE	SERIAL NUMBER	REV
700286	2011-09-26	30107-33658	0

WILA Maskinfabrik A/S

MULTITUBE-HEATEXCHANGER

0,5 - 6,0 M²

INSTALLATION AND OPERATION

SPECIFICATION

DATO 01-01 2008

Installation

Installation & Safety parameters

Before installing the Heat-exchanger follow these requirement:

1 Make sure that all connections (product,water,cooling media,steam,condensate Is made so that it is not possible to overheat/cool the heat-exchanger.

2 Make sure that the heat-exchanger is installed technical correct. (weldnings, construction,pipeholders.seal, etc)

3 It is the users responsibility that the installation is made correct in reference too saafety valves and other security installations, check your local authority.

4 Make sure that that if the heat-exchanger is supplied with steam, the condensate is taking out of the lowest point of the installation.

5 Make sure that Warnings signs is placed on the heat-exchanger and the heat-exchanger incl. Pipes is installed without danger too the operators.

6 **Never run** the heat-exchanger above the following limits.

Product:	Max. Pressure	45	Bar
	Max. Temperature	85	°C
Steam:	Max. Pressure	4	Bar
	Max. Temperature	140	°C
Coolong:	Max. Pressure	20	Bar
	Max. Temperature	-0	°C

The heat-exchanger is connected as on drawning (see page 4). The heat-exchanger should be installed horisontal or vertically

Operation

The heat-exchanger is normally used in connection too processystems the application is cooling or heating off products ore water, only with the above-standings limits

Technical Specification Multitube heatexchanger 0,5 - 6,0m

TYPE: W.0,5.51.51 to W-06-150-51

APPLICATION: In connection for cooling and heating off water and product

DESIGN: Sanitary design outside Ø129x2,0 or Ø209x3mm pipes made of stainless steel aisi 316L. Inside Ø12x1,0mm pipes stainless steel aisi 316L. The cooling/heating flow is outside off the ø12x1,0mm pipes.

CONNECTION: Ø38 - 63,5 neck up pipe with Ø38 - 63,5 clamp for inlet/outlet cooling and heating Ø51 - 150 clamp for inlet/outlet off the product

TECHNICAL DATA Max pressure 6 MPa (870 psi)
Min pressure 1,5 Mpa (217 psi)

WILA Maskinfabrik A/S

KEY FOR ORDERING : Multitube Heatexchangers

EXCAMPLE W - 02 - 101 - 51

Type

M²

Connection size, product

Connection size, cooling/heating medium

GENERAL DESCRIPTION:

APPLICATION: In connection with filtration modules or other sanitary applications for cooling/heating of the product

STANDARD: Sanitary design An external pipe made of stainless steel aisi 316L sorrounds internal pipe also made of stainless steel aisi 316L
The cooling/ heating medium flow is on the outside of internal pipes.

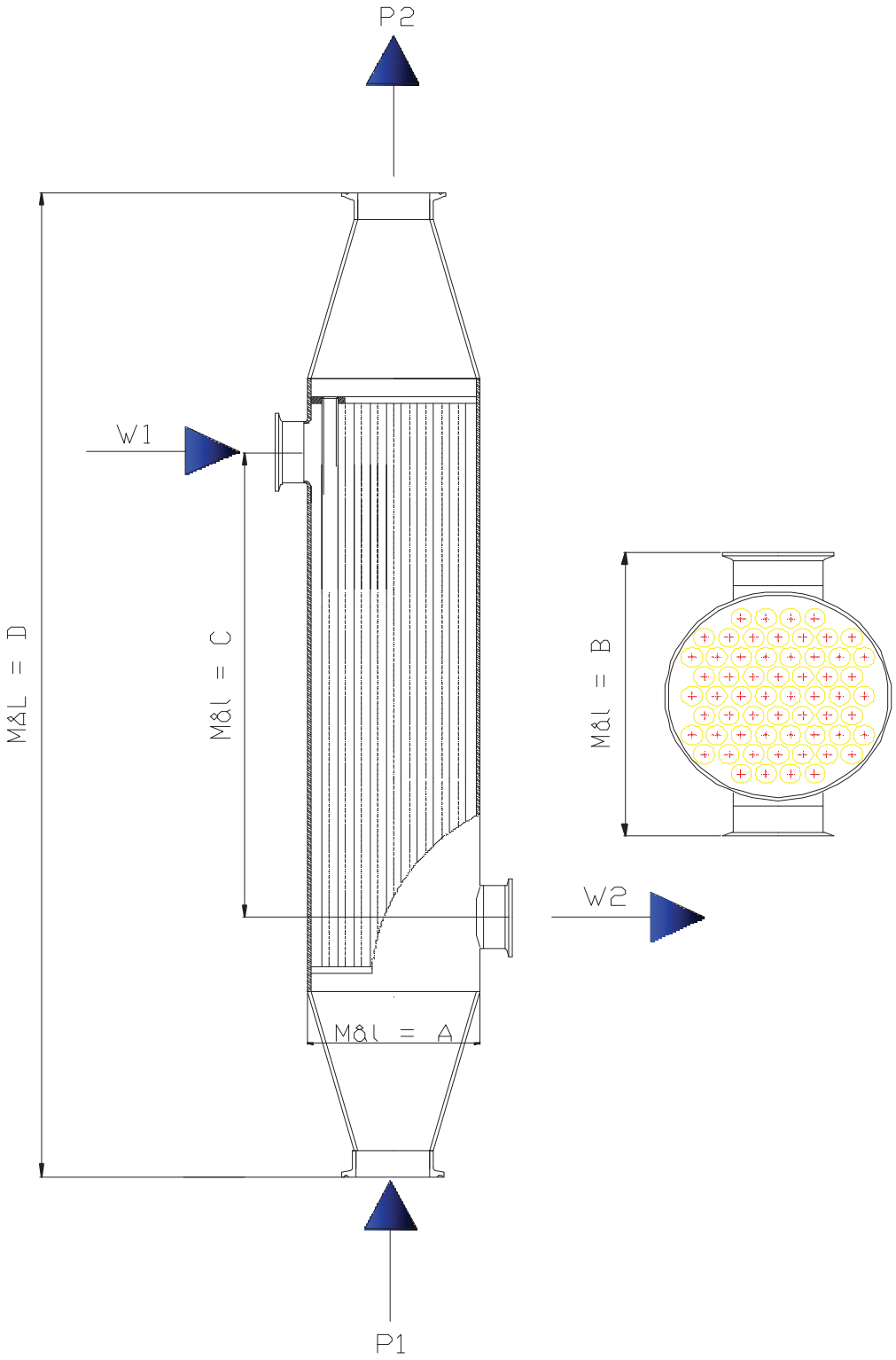
CONNECTION: See above key for orderring, clamps both for inlet and outlet of the cooling/heating medium and for inlet and outlet of the product

TECHNICAL DATA Example: Cooling capacity 2,3 Kw/°C with 75 m³ product flow,
1 CP viscosity and 3 m³/h cooling flow.
max. Product pressure 6 mpa (870 psi)
max. Medium pressure 1,5 mpa (217 psi)
heat transfer area = 2,0m²
Liquid volume = Product 6,7 L Medium 7,3 L

FDA APPROVED MATERIALS: 3.1.B certificate, welding certificate and pressure test-sheet.

DIMENSIONS

Multitube Heatexchanger 0,5 - 6 m²



TYPE	P1 -P2	W1 - W2	Mål = A	Mål = B	Mål = C	Mål = D
W-0,5-104-51	Ø104	Ø38-51	Ø129	186	129	396
W-0,5-101-51	Ø101,6	Ø38-51	Ø129	186	129	393
W-0,5-85-51	Ø85	Ø38-51	Ø129	186	129	466
W-0,5-76-51	Ø76,1	Ø38-51	Ø129	186	129	494
W-0,5-63,5-51	Ø63,5	Ø38-51	Ø129	186	129	544
W-0,5-51-51	Ø51	Ø38-51	Ø129	186	129	583

TYPE	P1 -P2	W1 - W2	Mål = A	Mål = B	Mål = C	Mål = D
W-01-129-51	Ø129	Ø38-51	Ø129	186	379	634
W-01-104-51	Ø104	Ø38-51	Ø129	186	379	646
W-01-101-51	Ø101,6	Ø38-51	Ø129	186	379	643
W-01-80-51	Ø85	Ø38-51	Ø129	186	379	716
W-01-76-51	Ø76,1	Ø38-51	Ø129	186	379	744
W-01-63,5-51	Ø63,5	Ø38-51	Ø129	186	379	794
W-01-51-51	Ø51	Ø38-51	Ø129	186	379	833

TYPE	P1 -P2	W1 - W2	Mål = A	Mål = B	Mål = C	Mål = D
W-02-129-51	Ø129	Ø38-51	Ø129	186	869	1124
W-02-104-51	Ø104	Ø38-51	Ø129	186	869	1136
W-02-101-51	Ø101,6	Ø38-51	Ø129	186	869	1133
W-02-80-51	Ø85	Ø38-51	Ø129	186	869	1206
W-02-76-51	Ø76,1	Ø38-51	Ø129	186	869	1234
W-02-63,5-51	Ø63,5	Ø38-51	Ø129	186	869	1284
W-02-51-51	Ø51	Ø38-51	Ø129	186	869	1323

TYPE	P1 -P2	W1 - W2	Mål = A	Mål = B	Mål = C	Mål = D
W-04-150-51	Ø154	Ø51-63,5	Ø209	266	660	1136
W-04-129-51	Ø129	Ø51-63,5	Ø209	266	660	1116
W-04-104-51	Ø104	Ø51-63,5	Ø209	266	660	1206
W-04-101-51	Ø101,6	Ø51-63,5	Ø209	266	660	1203
W-04-80-51	Ø85	Ø51-63,5	Ø209	266	660	1276
W-04-76-51	Ø76,1	Ø51-63,5	Ø209	266	660	1304
W-04-63,5-51	Ø63,5	Ø51-63,5	Ø209	266	660	1354

TYPE	P1 -P2	W1 - W2	Mål = A	Mål = B	Mål = C	Mål = D
W-06-150-63,5	Ø154	Ø51-63,5	Ø209	266	1040	1516
W-06-129-63,5	Ø129	Ø51-63,5	Ø209	266	1040	1496
W-06-104-63,5	Ø104	Ø51-63,5	Ø209	266	1040	1586
W-06-101-63,5	Ø101,6	Ø51-63,5	Ø209	266	1040	1583
W-06-80-63,5	Ø85	Ø51-63,5	Ø209	266	1040	1656
W-06-76-63,5	Ø76,1	Ø51-63,5	Ø209	266	1040	1684

Tetra Pak TP Hungary
Att: Peter Mikoczi

Aarhus, 31. augusti 2011

Customer: Kuntej

CPS Quotation number: Q1711703-rev6

Technical data

TETRA ALCROSS M74+19

Automation degree: Automatic
Application: Milk

Plant design basis:

1	Feed		7535	l/h
	Retentate		75	l/h
	Permeate		7460	l/h
1	Average Flux at	50 Deg.C	229	l/(m2)*h
2	Operating hours:	Between CIP	9	hrs
3	Concentration Factor (CF):		100,00	
4	Pore size and membrane type:	GP-TYPE	1,4	µm
-	Flow char dwg.no.		32574-9440	dwg.
-	Lay-out, dwg.no.		32574-9477-2	dwg.

CONSUMPTION FIGURES FOR MICROFILTRATION SECTION:

Note: rinse water consumption depend on water hardness, calculation is based on 15 german deg.

Power supply:		3x400 VAC , 50 hz	
Total installed:		85	KW
Power consumption section:			
During production:	approx.	72	KW
During CIP:	approx.	72	KW
Rinse water consumption:			
- minimum capacity	approx.	19530	l/h
- consumption pr. total CIP:	approx.	7462	l
Cooling water consumption:			
- minimum capacity:	approx.	2584	l/h
- consumption pr. total CIP:	approx.	431	l
- consumption During production:	approx.	2584	l/h
- Inlet temperature:		10	deg.C.
- Outlet temperature:	Max	45	deg.C.
Seal water consumption			
- consumption whenever the plant is activated:	approx.	150	l/h
Dead volumen of Plant	approx.	771	l
Steam consumption:			
- minimum capacity:	approx.	513	kg/h
- consumption During production:	approx.	0	kg/h
- consumption pr. total CIP:	approx.	162	kg
Chemical consumption:			
Caustic type:		Divos 120 cl	
- Concentration:		1,5%	vol./vol.
- Volumen pr. CIP sequence (1 cleaning)		11,565	l
Acid type, Nitric acid - 62 %:		Nitric Acid	
- Concentration:		0,3-0,5%	vol./vol.
- Volumen pr. CIP sequence (1 cleaning)		2,313	l

CONSUMPTION FIGURES FOR HTT SECTION:

Installed power:			
Total:		4,75	KW
Electricity consumption:			
During production:	approx.	4	KW
During CIP:	approx.	4	KW
Rinse water consumption:			
- minimum capacity	approx.	1046	l/h
- consumption pr. total CIP:	approx.	421	l
Dead volumen of HTT- section	approx.	100	l
Steam consumption:			
- minimum capacity:	approx.	135	kg/h
- consumption During production:	approx.	57	kg
- consumption pr. total CIP:	approx.	42	kg
Chemical consumption:			
Caustic type:		NAOH	
- Concentration:		2,00%	vol./vol.
- Volumen pr. CIP sequence (1 cleaning)		2	l
Acid type, Nitric acid - 62 %:		HNO3	
- Concentration:		1,00%	vol./vol.
- Volumen pr. CIP sequence (1 cleaning)		0,6	l
Sound pressure level at operators possition		<85 dba	

IMPORTANT!!

WATER QUALITY FOR THE PLANT

All water introduced to the membranes,MUST comply with the following specifications
Exeeding or not complying with theese specifications will void the warranty on the installed membranes:

Physical and chemical quality	
Turbidity:	< 1.0 NTU
Total organic content	< 8.0 ppm.
Iron (Fe):	< 0.5 ppm
Manganese (Mn):	< 0.2 ppm
Silicate (SiO2):	< 5.0 ppm
Total hardness:	<20.0 (German degrees)*
Silt Density Index (Fouling Index)	<3
Total undissolved residue	none
Total plate count (37 deg.C):	< 20 per ml
Total plate count (21 deg.C):	< 200 per ml
Total amount of coliform	absent 100 ml
Process water supply line	
A minimum 20µm pore size deep filter unit must be installed in the process water supply line The filter housing must be in stainless steel or food grade polymeric material. The process water supply line must from and after this point be of stainless steel only	

This drawing must not without the consent of Tetra Pak be copied, transmitted or disclosed to any third party. Only to the extent expressly agreed by us this document may constitute a contractual obligation on our part.

Rev	Description	Designer	Appr. By	Date
3	atmospheric pressure added	MBN	MBN	040428

FLOW DIAGRAM SYMBOLS

PIPING SYMBOLS

- PROCESS MEDIA, RED
- CLEANING MEDIA, MAGENTA
- SERVICE MEDIA, CYAN
- ELECTRICAL CONTROL, GREEN
- AIR CONTROL, BLUE
- LIQUID CONTROL, ORANGE
- FLEXIBLE HOSE
- PIPE WITH HEATING OR COOLING JACKET
- PIPE WITH HEATING OR COOLING COIL
- CAP ON PIPE END
- UNION
- INSULATED PIPE
- LIMIT OF DELIVERY
- ORIFICE

DENOMINATION

A	AIR
IA	INSTRUMENT AIR
SA	SANITARY AIR
C	CONDENSATE
D	DRAIN
S	STEAM
W	WATER
CW	COOLING WATER
HW	HOT WATER
IW	ICE WATER
SW	SOFTENED WATER
TW	TOWER WATER
GW	GLYCOL WATER
G	GAS
--R	RETURN
--C	CIRCULATION
CIP PR	CLEANING PRESSURE LINE
CIP R	CLEANING RETURN LINE

INSTRUMENTS

- COMMON INSTRUMENT LOCALLY MOUNTED
- COMMON INSTRUMENT PANEL MOUNTED OR SOFT-WARE FUNCTION
- DUMMY

FIRST LETTER

Measured or initiation variable

- (D) DENSITY
- (F) FLOWRATE (L/H), MASSFLOW (KG/H) OR VOLUME (L)
- (G) POSITION
- (L) LEVEL
- (P) PRESSURE/VACUUM
- (Pd) PRESSURE DIFFERENCE
- (Q) QUALITY*
- (T) TEMPERATURE
- (W) WEIGHT
- (S) FREQUENCY/SPEED

SECOND LETTER

Display of output function

- (C) CONTROLLING
- (E) SENSING ELEMENT
- (I) INDICATING
- (R) RECORDING
- (S) SWITCHING
- (T) TRANSMITTING
- (X) CONVERTING

THIRD LETTER

Qualifying letter

- (H) HIGH
- (M) MEDIUM
- (L) LOW

*TYPE OF QUALITY

- (Q Brix) BRIX
- (Q pH) pH
- (Q COND) CONDUCTIVITY
- (Q TURB) TURBIDITY

HYGIENIC VALVES

- ASEPTIC VALVE GENERAL SYMBOL
- MANUAL PLUG COCK 2-WAY
- MANUAL PLUG COCK 3-WAY
- MANUAL SANITARY CONTROL VALVE
- FLOW CONTROL VALVE
- SANITARY MODULATING VALVE
- SANITARY NON-RETURN VALVE
- SANITARY MANUAL VALVE
- SANITARY AUTOMATIC VALVE
- SANITARY MANUAL BUTTERFLY VALVE
- SANITARY AUTOMATIC BUTTERFLY VALVE NORMALLY CLOSED, NC
- SANITARY AUTOMATIC BUTTERFLY VALVE NORMALLY OPEN, NO
- SANITARY MIXPROOF VALVE CLEANING OF SPINDLE AND CHAMBER
- SANITARY MIXPROOF VALVE
- SANITARY MIXPROOF VALVE TANK OUTLET
- ASEPTIC SAMPLING VALVE
- SANITARY SAMPLING VALVE
- AIR BLOW VALVE

NON-HYGIENIC VALVES

- NORMALLY OPEN VALVE WAY
- NORMALLY CLOSED VALVE WAY
- MANUAL SHUT-OFF VALVE
- MANUAL CHANGE-OVER VALVE
- MANUAL CONTROL VALVE
- AIR RELEASE VALVE
- VACUUM RELEASE VALVE
- PRESSURE RELEASE VALVE
- CONSTANT FLOW/PRESSURE VALVE
- NON-RETURN VALVE
- AUTOMATIC SHUT-OFF VALVE
- AUTOMATIC CHANGE- OVER VALVE
- AUTOMATIC MODULATING VALVE 2-WAY
- AUTOMATIC MODULATING VALVE 3-WAY
- SOLENOID VALVE

ACTUATOR FUNCTIONS

- HAND ACTUATOR
- MODULATING ACTUATOR
- ON/OFF ACTUATOR
- SOLENOID ACTUATOR
- ELECTRIC MOTOR
- SPRING
- FLOAT
- TOP UNIT
- FEEDBACK UNIT

PUMPS

- CENTRIFUGAL PUMP
- POSITIVE PUMP
- VACUUM PUMP
- LIQUID RING PUMP
- SCREW PUMP

COMPONENTS

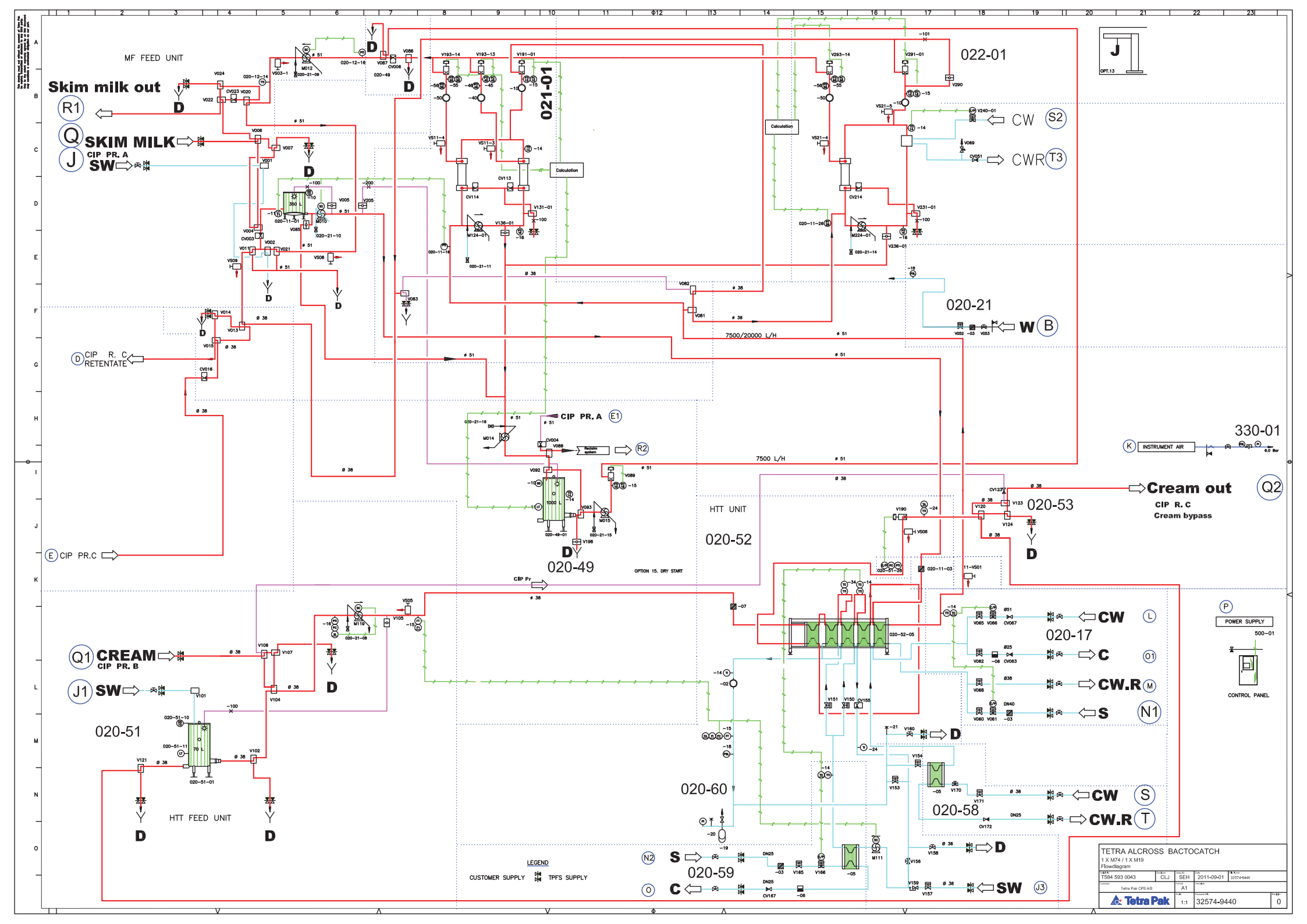
- STEAM TRAP
- FILTER, STRAINER
- SIGHT GLASS
- AGITATOR
- CLEANING DEVICE
- EJECTOR/INJECTOR
- DRAIN/FUNNEL Atmospheric pressure
- EXPANSION VESSEL
- SILENCER
- PLATE HEAT EXCHANGER
- TUBULAR HEAT EXCHANGER
- STATIC MIXER

PSD Flow Diagram Symbols

Machine No	Designer	Appr. By	Date	File Name
	MBN		2004-04-28	

Company	Format	Template
Tetra Pak Dairy & Beverage Systems AB	A1	

Tetra Pak	Scale	Document No	Revision
	1:1	1217604 -01	1


MF FEED UNIT
Skim milk out
R1
Q SKIM MILK
J CIP PR. A SW
022-01
021-01
J
OPT.13
CW S2
CWR T3
Calculation
020-21
W B
7500/20000 L/H
D CIP R. C RETENTATE
CIP PR. A E1
R2
7500 L/H
330-01
K INSTRUMENT AIR
Cream out Q2
CIP R. C
Cream bypass
020-53
HTT UNIT
020-52
E CIP PR.C
020-49
OPTION 15. DRY START
CIP Pr
P POWER SUPPLY
500-01
CONTROL PANEL
Q1 CREAM CIP PR. B
J1 SW
020-51
HTT FEED UNIT
020-17
CW L
C O1
CW.R M
S N1
020-60
020-58
CW S
CW.R T
N2 S
020-59
O C
SW J3
LEGEND
CUSTOMER SUPPLY
TPFS SUPPLY
TETRA ALCROSS BACTOCATCH
1 X M74 / 1 X M19
Flowdiagram
T584 593 0043
CLJ
SEH
2011-09-01
32574-9440
Tetra Pak CPS A/S
A1
1:1
32574-9440
0

Tetra Pak CPS A/S

Tetra Alcross Bactocatch,Item list.

ORDER TEXT

Sales Administrator : CBI
Process Engineer : CLJ
Automation Engineer : OEK

Doc No: IL584 593 0043

Date/Sign	Description	Rev.
01-08-2011 / CLJ	Dry Start section added	A
11-08-2011/CLJ	Vacuum breaker removed. CV123 added	B
06-10-2011/CLJ	FT on loop corrected	C

This ITEMLIST refers to the following drawings:
Flowchart drwg.no: 32574-9440
Installation drwg.no:

Machine Type: Tetra Alcross Bactocatch
Drawing Spec: T584 593 0043
Machine No: T584 593 0043
Designed by: Tetra Pak CPS A/S
Søren Nymarksvej 13
DK8270 Højbjerg
Manufactured by: Tetra Pak Dairy & Beverage Production AB
Box 64
Lund Sweden

Year of manufacture: 2009

Tetra Alcross Bactocatch		Order. No.		
Kuntej		**114383673**		
		Sign.	Tetra Pak	
		0	**LUND SWEDEN**	
CreateDate	Department	Appr.	File	Doc. No.	RevNo
2011.07.26	**CPS**	**0**	**T584 593 0043**	**IL584 593 0043**	**0**

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				Tetra Alcross Bactocatch, Item list.			**Doc No: IL584 593 0043**		
Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
					Main module				
	1	S	2632771-0100	MF feed (filter feed)					
	1	S	2632770-0100	HTT section					
	1	S	2632772-0100	HTT feed					
	1	S	2632773-0100	1 Loop					
500-01	1	S	2565722-0100	CCP T Alcross PLC					
330-01	1	A	90510-8628	Pressure regulator	FR G3/8-10 IDO228/1 1.5-10bar(g) 5um Switch 0.45MPa Pressure gauge		1224023-0101		
	2	T	6-31826-0010-7	Module	37P37-30 Incl. 1.4um EPDM Sterilox GP 500/2.3		No doc.		
	1	T		Module	19P37-30 i stage 2 1,4µ stx HP		No doc.		
	4	A	6-31826-0014-8	Module gasket	EPDM 12" , FDA, Code AA 6A BG				
	4	A	6-31826-0014-7	Module gasket	EPDM 8" , FDA, Code AA 6A BG				
	1	S	2797729-0100	Packing					
	1	S	2982557-0100	Documentation					
	1	A	2982558-0101	Shipping					
	1	A	359710-0001	Warning Sign ISO, Hot Surface			No doc.		
	3	A	90511-8562	Stripe	Blue, height 50mm Supplied on roll length 25m				
	12	A	6-31801-9520-4	Sign	"Tetra Pak" 30x228mm white		No doc.		
	1	A	90194-0144	Mandatory sign			No doc.		
	4	A	90459-7583	Warning Sign ISO, Hot Outlets			No doc.		
	1	S	2749214-0100	Pipes & fittings Interconnections					
	200	A	6-990408-89	Air hose	PTFE 6/4mm		No doc.		
	50	A	6-990408-88	Air hose	PTFE 10/8mm		No doc.		
	15	A	6-31801-5932-2	Cable track	53x4x2500mm EN 1.4301 According to drawing 31801-5932 Rev.02		No doc.		
	10	A	6-31801-5932-3	Cable track	120x5x2500mm EN 1.4301 According to drawing 31801-5932 Rev.02		No doc.		
	1	A	6-31816-0052-9	Rotary crane	VSK 125/1,2 with conection plate				
	1	A	6-31816-0053-1	Electric chain telpher	Kito Delta ED 180 D/1				
	1	A	6-31801-9640-1	Strap	Maxy.02 length 2.0m				
					MF-Feed				
	1	S	2576329-0101	Machine body 1			No doc.		
	1	S	2749214-0101	Pipes & fittings Module 1					
M010	1	S	2588957-0100	Centrifugal pump	LKH-10-ISO Cl-5.5/6.3kW EPDM iscr	x= Yes	1214246-0101		
				AL code	9613269046				
				Configuration	P(1):PCL10EDSBC5HH2NLC163SYYNNADCNNNN				
				Impeller	163				
				Fittings	ISO clamp. Inlet ø63,5 Outlet ø51				
				Motor	Standard				
				Power supply	3x400/690 50 Hz 5,5kW				
				Shroud	Yes				
				Legs	Yes				
				Shaft Seal	DMS SIC/SIC				
				Elastomer	EPDM				
				Special	Impeller Screw.				
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
020-21-10	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
020-11-01	1	S	2642088-0101	Tank 1			No doc.		
11 10	1	T	90511-0919	Safety interlock Switch	440G-T27127	X			
11 10B	1	T	90511-0920	Fork	For Switch 440G-A27011				

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				Tetra Alcross Bactocatch, Item list.			**Doc No: IL584 593 0043**		
Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
Y005		T		Festo air solonoid valve	Valve, 3/2 MFB: 7802 / Solonoid: 34411	X			
020-11-11	1	A	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
V001	1	A	6-9613-32-0031	Single seat valve	Unique-SSV-W-51-200-NC-EPDM Maintainable actuator	x= Yes	1221121-0101		
V002	1	A	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V004	1	A	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V005	1	A	6-9612-62-8353	Butterfly valve	LKB-W-25-316L-EPDM-P85-NC	x= Yes	1215850-0101		
CV003	1	A	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM		1241273-0101		
V006	1	A	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V007	1	A	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V011	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V021	1	A	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
020-11-100	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
020-11-200	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
V-S08	1	A	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection		1211608-0101		
V-S09	1	A	6-31350-0020-1	Sampling valve	Type 20 AISI304 socket connection		1211608-0101		
V-S03-1	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
M012	1	S	2588957-0100	Centrifugal pump	LKH-10-ISO Cl-5.5/6.3kW EPDM iscr	x= Yes	1214246-0101		
				AL code	9613269046				
				Configuration	P(1):PCL10EDSBC5HH2NLC163SYYNNADCNNNN				
				Impeller	163				
				Fittings	ISO clamp. Inlet ø63,5 Outlet ø51				
				Motor	Standard				
				Power supply	3x400/690 50 Hz 5,5kW				
				Shroud	Yes				
				Legs	Yes				
				Shaft Seal	DMS SIC/SIC				
				Elastomer	EPDM				
				Special	Impeller Screw.				
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
020-21-09	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
020-12-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x= Yes	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
020-12-16	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
V020	1	A	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V022	1	A	6-9613-32-1527	Single seat valve	Unique SSV-W-51-220-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
CV023	1	A	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM		1241273-0101		
V024	1	A	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V085	1	A	6-9612-62-8355	Butterfly valve	LKB-W-51-316L-EPDM-P85-NC	x= Yes	1215850-0101		
					020-13 retentate				
V013	1	A	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V014	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V015	1	A	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
CV016	1	A	6-9612-22-0008	Non-return valve	LKC-2-W-38.0-316L EPDM		1241273-0101		
	30	A	90503-0903	L-Fitting	R31 Push-in rotary Male G1/8A-6mm ISO228/1 Nickel plated Brass				
					Drystart				
020-49-01	1	S	2642088-0103	Tank 3					
V092	1	A	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V093	1	A	6-9613-32-0123	Single seat valve	Unique SSV-W-51-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		

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				Tetra Alcross Bactocatch, Item list.			**Doc No: IL584 593 0043**		
Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
M015	1	S	2588955-0100	Centrifugal pump	LKH-10-ISO Cl-3/3.5kW EPDM iscr	x= Yes	1214246-0101		
				AL code	9613283587				
				Configuration	P(1):PCL10EDSBC5FL2NLC147SYYNNADCNNNN				
				Impeller	147				
				Fittings	ISO clamp. Inlet ø63,5 Outlet ø51				
				Motor	Standard				
				Power supply	3x400/690 50 Hz				
				Shroud	Yes				
				Legs	Yes				
				Shaft Seal	DMS SIC/SIC				
				Elastomer	EPDM				
				Special	Impeller Screw.				
020-21-15	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
020-49-15	1	A	90503-1900	Magnetic Flow meter	Promag 50H ISO W51.0 0-66000l/h PFA Display 20-55V AC/16-62V DC SS house Pulse signal / 4-20mA HA	x= Yes	1218415-0101		
020-49-11	1	A	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
020-49-10	1	T	90511-0919	Safety interlock Switch	440G-T27127	x= Yes			
	1	T	90511-0920	Fork	For Switch 440G-A27011				
Y205		T		Festo air solonoid valve	Valve, 3/2 MFB: 7802 / Solonoid: 34411	X			
020-49-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x= Yes	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
M014	1	S	2589066-0101	Pump		x= Yes			
				AL code	9613253872				
				Configuration	PCS10EFSBC5EL2NLC163SYYNNADCNNNN				
				Impeller	FULL SIZE(163 MM)				
				Fittings	ISO clamp. Inlet ø63,5 Outlet ø51				
				Motor	STANDARD				
				Power supply	Motor:2,2KW 3x400VAC 50Hz.				
				Shroud	YES				
				Legs	YES				
				Shaft Seal	FSS SIC/SIC				
				Elastomer	EPDM				
				Special	Impeller Screw				
020-21-16	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
CV004	1	A	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM		1241273-0101		
V086	1	A	6-9613-32-0035	Single seat valve	Unique-SSV-W-51-300-NC-EPDM Maintainable actuator	x= Yes	1221121-0101		
V087	1	A	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
CV006	1	A	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM		1241273-0101		
V088	1	A	6-9613-36-0833	Single seat valve	Unique-SSV-W-51-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V089	1	A	6-9612-55-3721	Regulating valve	SPC-2-W-51-NC-Kvs=32.0-E%-EPDM	x= Yes	1215537-0101		
V198	1	A	6-9612-62-8355	Butterfly valve	LKB-W-51-316L-EPDM-P85-NC	x= Yes	1215850-0101		
V205	1	A	6-9612-62-8353	Butterfly valve	LKB-W-25-316L-EPDM-P85-NC		1215850-0101		
					Loop 021-01				
	1	S	2741803-0100	Basic Loop Assembly 1					
	1	S	2749214-0102	Pipes & fittings Module 2					
	4	A	6-31826-0014-8	Module gasket	EPDM 12" , FDA, Code AA 6A BG				
M124-01	1	S	3058162-0100	Centrifugal pump	LKH-85- DN150 -55/63kW EPDM iscr	x= Yes			

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				Tetra Alcross Bactocatch, Item list.			**Doc No: IL584 593 0043**		
Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
				AL code	9613281984				
				Configuration	P(1):PCL85EDSBE5QH2NLJ217SYYNNAGGNNNN				
				Impeller	217 MM				
				Fittings	Inlet/outlet: Clamp DN150/ISO clamp 101				
				Motor	Standard				
				Power supply	3x400 50 Hz 55kW				
				Shroud	Yes				
				Legs	Yes				
				Shaft Seal	DMS SIC/SIC				
				Elastomer	EPDM				
				Special	**Outlet: Horizontal out below**				
	1	A	6-31801-5159-3	Adaptor	R6 Plug-in 10mm Male ISO228/1-G1/4A Nickel plated Brass		No doc.		
	2	A	6-526335-01	Socket reducer	DN8/6 Rp 1/4" x1/8" 1.4404 L=28,0mm				
	1	A	6-990046-02	Cutting ring Straight-coupling	GE Male ISO 228/1-G1/4A - 10mm EN 1.4404 According to DIN 2353 / EN ISO 8434-1		No doc.		
	1	A	6-526337-03	Reduced hexagon nipple	DN15/DN8 R 1/2"x1/4" 1.4404 L=36,5mm				
	1	A	6-31801-5159-1	L-Connection	RL4 Push-in 10mm Nickel plated Brass				
	1	A	6-526338-04	Reducing bush	DN15/10 R/Rp 1/2"x3/8" 1.4404 L=21,0mm				
020-21-11	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
021-01-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x= Yes	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
021-01-16	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
020-11-16	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
CV113	1	A	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM		1241273-0101		
CV114	1	A	6-9612-22-0010	Non-return valve	LKC-2-W-63.5-316L EPDM		1241273-0101		
V131-01	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
VS11-3	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
VS11-4	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
021-01-10	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
021-01-40	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
021-01-50	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
021-01-15	1	A	90503-1867	Magnetic Flow meter	Promag 50H ISO W15.0 0-6000l/h PFA Display 20-55V AC/16-62V DC w.10m cable Pulse signal / 4-20mA HART 0.5% cal.	x= Yes	1218415-0101		
021-01-45	1	A	90503-1879	Magnetic Flow meter	Promag 50H ISO W25.0 0-18000l/h PFA Display 20-55V AC/16-62V DC w.10m cable Pulse signal / 4-20mA HART 0.5% cal.	x= Yes	1218415-0101		
021-01-55	1	A	90503-1879	Magnetic Flow meter	Promag 50H ISO W25.0 0-18000l/h PFA Display 20-55V AC/16-62V DC w.10m cable Pulse signal / 4-20mA HART 0.5% cal.	x= Yes	1218415-0101		
021-01-46	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
021-01-56	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
V191-01	1	A	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	x= Yes	1215537-0101		
V193-13	1	A	6-9612-55-3718	Regulating valve	SPC-2-W-38-NC-Kvs=8.0-E%-EPDM	x= Yes	1215537-0101		
V193-14	1	A	6-9612-55-3719	Regulating valve	SPC-2-W-38-NC-Kvs=16.0-E%-EPDM	x= Yes	1215537-0101		
V081	1	A	6-9613-32-0036	Single seat valve	Unique-SSV-W-38-300-NC-EPDM Maintainable actuator	x= Yes	1221121-0101		
V082	1	A	6-9613-36-0843	Single seat valve	Unique SSV-W-38-210-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V083	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
021-01-100	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
V136-01	1	A	6-9612-62-8355	Butterfly valve	LKB-W-51-316L-EPDM-P85-NC	x= Yes	1215850-0101		

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Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
					Loop 2 022-01				
	1	S	2741803-0101	Basic Loop Assembly 2					
	4	A	6-31826-0014-7	Module gasket	EPDM 8" , FDA, Code AA 6A BG				
M224-01	1	S	2588984-0100	Centrifugal pump	LKH-50-ISO Cl-15/17kW EPDM iscr	x= Yes	1214246-0101		
				AL code	9613282744				
				Configuration	P(1):PCL50EDSBC5KH2NLC180SYYNNAFENNNN				
				Impeller	180 mm				
				Fittings					
				Motor	Motor: 15KW 3x400VAC 50Hz.				
				Power supply	3x400, 50 Hz				
				Shroud	INCL. Shroud				
				Legs	Legs: Yes				
				Shaft Seal	FSS, SIC/SIC				
				Elastomer	EPDM				
				Special	Impeller Screw				
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
020-21-14	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
022-01-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x= Yes	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
022-01-16	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
020-11-26	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
CV214	1	A	6-9612-22-0009	Non-return valve	LKC-2-W-51-316L EPDM		1241273-0101		
V231-01	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
VS21-4	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
VS21-5	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
022-01-10	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
022-01-15	1	A	90503-1867	Magnetic Flow meter	Promag 50H ISO W15.0 0-6000l/h PFA Display 20-55V AC/16-62V DC w.10m cable Pulse signal / 4-20mA HART 0.5% cal.	x= Yes	1218415-0101		
V291-01	1	A	6-9612-55-3715	Regulating valve	SPC-2-W-38-NC-Kvs=1.0-E%-EPDM	x= Yes	1215537-0101		
V290	1	A	6-9612-62-8565	Butterfly valve	LKB-W-25-316L-EPDM-PT85-NC	x= Yes	1215850-0101		
022-01-50	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
022-01-55	1	A	90503-1867	Magnetic Flow meter	Promag 50H ISO W15.0 0-6000l/h PFA Display 20-55V AC/16-62V DC w.10m cable Pulse signal / 4-20mA	x= Yes	1218415-0101		
022-01-56	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
V293-14	1	A	6-9612-55-3717	Regulating valve	SPC-2-W-38-NC-Kvs=4.0-E%-EPDM	x= Yes	1215537-0101		
V240-01	1	A	90510-4379	Regulating valve	3321 Reg valve GG DN 32 kvs 16 3372/3730-1 H15 120cm² 2,1-3,3 bar 4-20m	x= Yes	1224797-0101		
022-01-100	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
022-01-101	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
CV051	1	A	6-31801-2768-5	Non-return valve	AJ1174-DN40-Flange-DIN2545 1.4021-Kvs=18.0		1241228-0101		
V069	1	A	6-31801-9077-1	Safety valve	AJ 4543 Flange DIN DN20/40 GS-C25 Op 3.5bar(e)		1213620-0101		
V236-01	1	A	6-9612-62-8355	Butterfly valve	LKB-W-51-316L-EPDM-P85-NC	x= Yes	1215850-0101		
	30	A	90503-0903	L-Fitting	R31 Push-in rotary Male G1/8A-6mm ISO228/1 Nickel plated Brass				
					HTT-feed				
	1	S	2576329-0102	Machine body 2			No doc.		
	1	S	2749214-0104	Pipes & fittings Module 4					
020-51-01	1	S	2642088-0102	Tank 2			No doc.		
020-51-10	1	T	90511-0919	Safety interlock Switch	440G-T27127	X			
020-51-10B	1	T	90511-0920	Fork	For Switch 440G-A27011				

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Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
Y105		T		Festo air solonoid valve	Valve, 3/2 MFB: 7802 / Solonoid: 34411	X			
M119	1	S	2589011-0100	Centrifugal pump	LKH-114-ISO Cl-7.5/8.6kW EPDM iscr	x= Yes	1214248-0101		
				AL code	9613252149				
				Configuration	P(1):PCM14EFSBC5IH2NLC163SYYNNACBNNNN				
				Impeller	Impellar:full size (167 MM)				
				Fittings	Con. Outlet/INLET: Tri-Clamp ø38/Tri Clamp ø51				
				Motor	Motor: 7,5KW 3x400VAC 50Hz.				
				Power supply	Standard				
				Shroud	FSS, SIC/SIC, EPDM				
				Legs	Yes				
				Shaft Seal	FSS, SIC/SIC,				
				Elastomer	EPDM				
				Special					
	1	A	6-34144-7011-1	Drain pipe set	for LKH pump submodule		No doc.		
020-21-08	1	A	90503-8200	Constant flow valve	Flow restrictor G 1/2 REG-1200-D 0.5l/mi		1221586-0101		
020-51-11	1	A	90503-2084	Pressure transmitter	PMP45 Tri-Cl.38.0 0-0.1bar(g) 4-20mA HAR 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
020-51-15	1	A	90503-1888	Magnetic Flow meter	Promag 50H ISO W38.0 0-42000l/h PFA Display 20-55V AC/16-62V DC SS house Pulse signal / 4-20mA HA	x= Yes	1218415-0101		
020-51-16	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x= Yes	1218205-0101		
VS05	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
V101	1	A	6-9613-32-0030	Single seat valve	Unique-SSV-W-38-200-NC-EPDM Maintainable actuator	x= Yes	1221121-0101		
V102	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V104	1	A	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	x= Yes	1221122-0101		
V105	1	A	6-9612-62-8353	Butterfly valve	LKB-W-25-316L-EPDM-P85-NC	x= Yes	1215850-0101		
V106	1	A	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V107	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
V121	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x= Yes	1221122-0101		
020-51-100	1	A	6-32572-0563-1	Orifice	USDA 1" AISI316L				
	10	A	90503-0903	L-Fitting	R31 Push-in rotary Male G1/8A-6mm ISO228/1 Nickel plated Brass				
					HTT section				
	1	S	2576329-0100	Machine body			No doc.		
	1	S	2749214-0103	Pipes & fittings Module 3					
					020-17				
020-17-03	1	A	6-31801-5609-5	Strainer	Fig 12 ISO228/1-G1 1/2 PN25 SS screen 0.8mm SG Iron		1248674-0101		
020-17-06	1	A	6-31801-2772-3	Steam trap	FT47-4.5TV, DN25, PN40		1241199-0101		
020-17-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
V060	1	A	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-Kvs=230.0	x	1241241-0101		
V060A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V060B	1	A	6-9612-49-1805	Mounting bracket	LKLA 85 A44 DN40		No doc.		
V061	1	A	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3 bar 4-20m	x	1224797-0101		
V062	1	A	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-Kvs=230.0	x	1241241-0101		
V062A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V062B	1	A	6-9612-49-1803	Mounting bracket	LKLA 85 A44 DN25		No doc.		
CV063	1	A	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0		1241228-0101		
V065	1	A	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-Kvs=230.0	x	1241241-0101		
V065A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V065B	1	A	6-9612-49-1805	Mounting bracket	LKLA 85 A44 DN40		No doc.		

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Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
V066	1	A	90510-4381	Regulating valve	3321 Reg valve GG DN 40 kvs 25 3372/3730-1 H15 120cm² 2,1-3,3 bar 4-20m	x	1224797-0101		
CV067	1	A	6-31801-2768-5	Non-return valve	AJ1174-DN40-Flange-DIN2545 1.4021-Kvs=18.0		1241228-0101		
V068	1	A	6-31801-9113-2	Ball valve	A59-6666TT-W-DN40-38x1.2-full bore A182F316/AISI316-PTFE/PTFE-Kvs=230.0	x	1241241-0101		
V068A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V068B	1	A	6-9612-49-1805	Mounting bracket	LKLA 85 A44 DN40		No doc.		
					020-52				
020-52-05	1	S	6-30360-0101-2	Tetra Plex	C6				
020-52-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
020-52-24	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
VS06	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
V190	1	A	6-9612-30-5503	Constant pressure valve	CPMI-2-W-51-Kvs 2/15 EPDM		1214498-0101		
V190A	1	A	6-31801-5977-2	I/P converter	R VP50 0-8bar(g) 24V DC 4-20mA/0-10V DC ISO228/1-G1/4 M12 Male 5-pin	x	1223745-0101		
020-52-34	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
020-51-26	1	A	90503-2136	Pressure transmitter	PMP46 Tri-Cl.38.0 0-10bar(g) 4-20mA HART 2-wire without display SS house Cable gland M20x1.5 IP66	x	1218205-0101		
020-11-03	1	A	6-9612-02-5703	Filter	LKIF 51 EPDM Clamp		1241330-0101		
020-52-07	1	A	6-9612-02-5702	Filter	LKIF 38 EPDM Clamp		1241330-0101		
11- VS01	1	A	90512-6716	Sampling valve	Microport Septum type P EPDM		1226617-0101		
					020-53				
V120	1	A	6-9613-32-0602	Single seat valve	Unique SSV-W-38-220-NO-EPDM Maintainable actuator	x	1221122-0101		
V123	1	A	6-9613-32-0315	Single seat valve	Unique SSV-W-38-220-NC-EPDM Maintainable actuator	x	1221122-0101		
V124	1	A	6-9613-32-0173	Single seat valve	Unique SSV-W-38-210-NC-EPDM Maintainable actuator	x	1221122-0101		
CV123	1	A	6-9612-22-0008	Non-return valve	LKC-2-W-38.0-316L EPDM		1241273-0101		
					020-58				
020-58-05	1	A	6-32361-7020-1	Plate heat exchanger brazed	CB76-20H B23 B23 G2" B		1210229-0101		
	1	A	6-32360-0090-1	Insulation	CB76 10-30 plates		No doc.		
V170	1	A	90503-5663	Regulating valve	2702 W25x1.2 SS/PTFE manual Kvs15.0		1217942-0101		
V171	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V171A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V171B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
CV172	1	A	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0		1241228-0101		
					020-59				
020-59-03	1	A	6-31801-5609-3	Strainer	Fig 12 ISO228/1-G1 PN25 SS screen 0.8mm SG Iron		1248674-0101		
020-59-05	1	A	6-32361-7020-1	Plate heat exchanger brazed	CB76-20H B23 B23 G2" B		1210229-0101		
	1	A	6-32360-0090-1	Insulation	CB76 10-30 plates		No doc.		
020-59-06	1	A	6-31801-2772-3	Steam trap	FT47-4.5TV, DN25, PN40		1241199-0101		
020-59-14	1	A	90510-5633	Temperature transmitter	TPT12 4-20mA Measuring range 0-160 deg. C	x	No doc.		
	1	A	351310-0150	Cable with connector	PRKWT 4-07/15M		No doc.		
	1	A	6-31801-1894-1	Weld boss	G1/8" for Pt-100 1.4404		No doc.		
V165	1	A	6-31801-9113-1	Ball valve	A59-6666TT-W-DN25-25x1.2-full bore A182F316/AISI316-PTFE/PTFE-Kvs=71.0	x	1241241-0101		
V165A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		

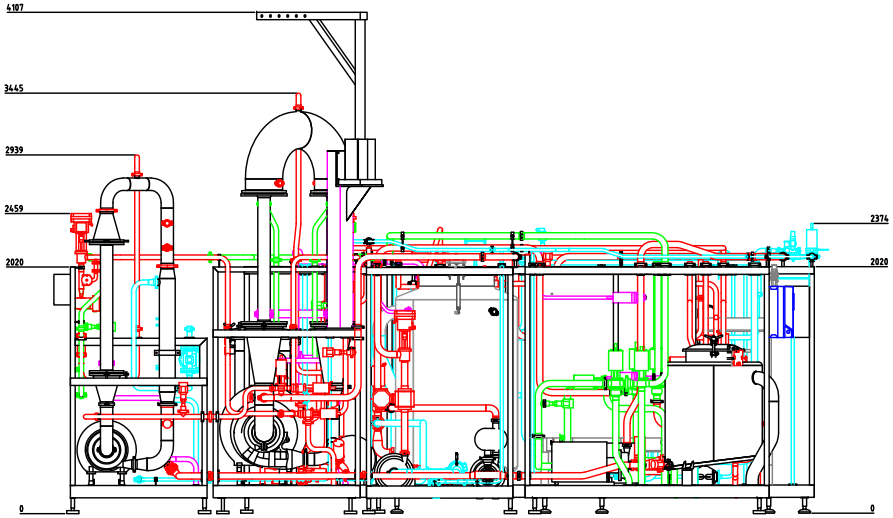
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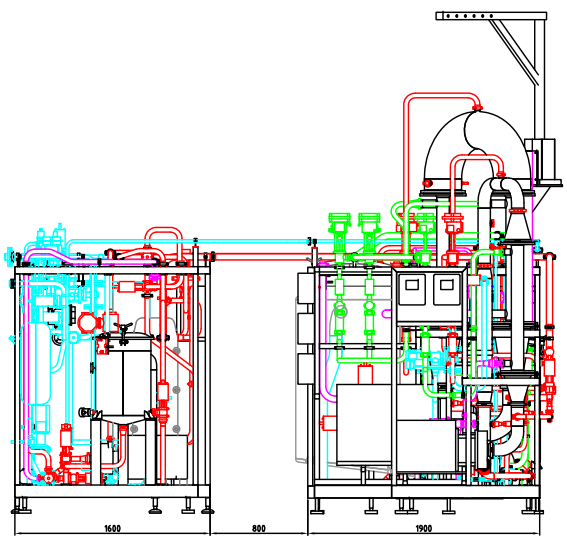
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Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
V165B	1	A	6-9612-49-1803	Mounting bracket	LKLA 85 A44 DN25		No doc.		
V166	1	A	90510-4377	Regulating valve	3321 Reg valve GG DN 25 kvs 10 3372/3730-1 H15 120cm² 2,1-3,3 bar 4-20m	x	1224797-0101		
CV167	1	A	6-31801-2768-3	Non-return valve	AJ1174-DN25-Flange-DIN2545 1.4021-Kvs=10.0		1241228-0101		
					020-60				
020-60-02	1	A	6-9612-14-1407	Sight glass	LKGG-1-W-1 1/2" -38mm-316L-EPDM		1241295-0101		
020-60-14	1	A	6-31801-9490-4	Thermometer	0-160°C, Cl. d=38 down		No doc.		
020-60-15	1	A	90503-1888	Magnetic Flow meter	Promag 50H ISO W38.0 0-42000l/h PFA Display 20-55V AC/16-62V DC SS house Pulse signal / 4-20mA HA	x	1218415-0101		
020-60-18	1	A	90503-2249	Pressure switch	PTP31 G1/2" 0-4bar(g) 12-30V DC 4-wire 2PNP with display SS house IP66 Cable gland M12x1.5	x	1218198-0101		
020-60-19	1	A	6-31801-5035-2	Expansion vessel	IPX 25L G3/4" PREPRESS. 1.0 BAR Max temp C. -10 +99		1210315-0101		
020-60-20	1	A	6-31801-5036-1	Valve set	TYPE: IPX COMPACT 3.		1241090-0101		
020-60-21	1	A	90512-7296	Air vent valve	Air vent valve in brass with ball valve DN15 PN10 and SS fitting		1212676-0101		
020-60-24	1	A	6-31801-9490-4	Thermometer	0-160°C, Cl. d=38 down		No doc.		
M111	1	A	90503-5885	Centrifugal pump	CRN5-8 DN32 1.1kW 50Hz SiC/SiC EPDM Voltage:3x220-240VD/380-415VY EFF1 SS Baseplate	x	1218037-0101		
	2	A	90503-0788	Coupling	PJE DN32		No doc.		
	2	A	90503-1512	Welding Nipple	PJE coupling DN32 SS		No doc.		
V150	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V150A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V150B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
V151	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V151A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V151B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
V153	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V153A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V153B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
V154	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V154A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V154B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
CV155	1	A	6-9612-22-0008	Non-return valve	LKC-2-W-38.0-316L EPDM		1241273-0101		
V156	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4		1241241-0101		
V157	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4	x	1241241-0101		
V157A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V157B	1	A	6-9612-49-1804	Mounting bracket	LKLA 85 A44 DN32		No doc.		
V158	1	A	6-31801-9096-3	Ball valve	A44-6666TT-W-DN32-38x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=41.4		1241241-0101		
V160	1	A	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=10.4		1241241-0101		
V159	1	A	90510-7969	Valve	Flamco 17443		case 935		
					020-21				
020-21-03	1	A	6-31801-5609-2	Strainer	Fig 12 ISO228/1-G3/4 PN25 SS screen 0.8mm SG Iron		1248674-0101		
V052	1	A	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=10.4	x	1241241-0101		
V052A	1	A	6-9611-41-6301	Actuator	LKLA-85-NC-25-63.5		1215850-0101		
V052B	1	A	6-9612-49-1802	Mounting bracket	LKLA 85 A44 DN20		No doc.		
	30	A	90503-0903	L-Fitting	R31 Push-in rotary Male G1/8A-6mm ISO228/1 Nickel plated Brass				
V053	1	A	6-31801-9096-2	Ball valve	A44-6666TT-W-DN20-25x1.2 A182F316/AISI316-PTFE/PTFE-Kvs=10.4		1241241-0101		

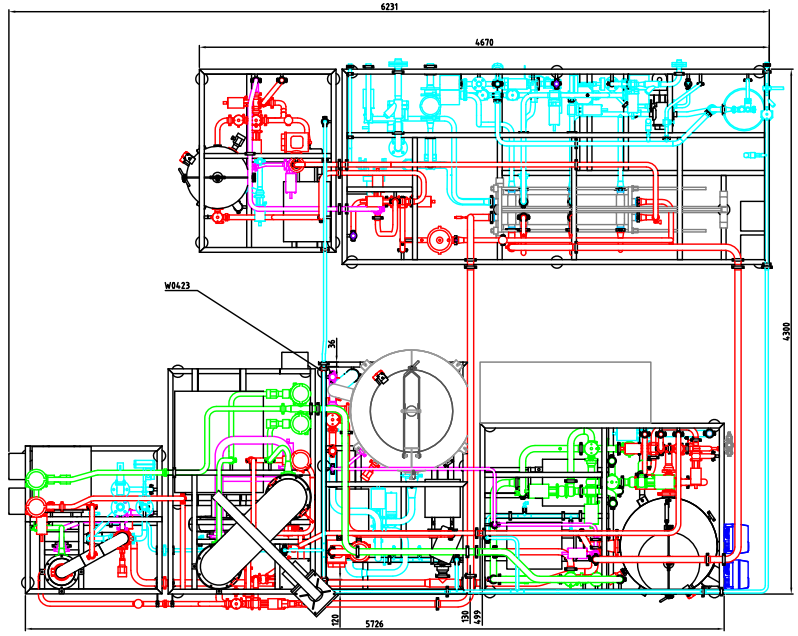
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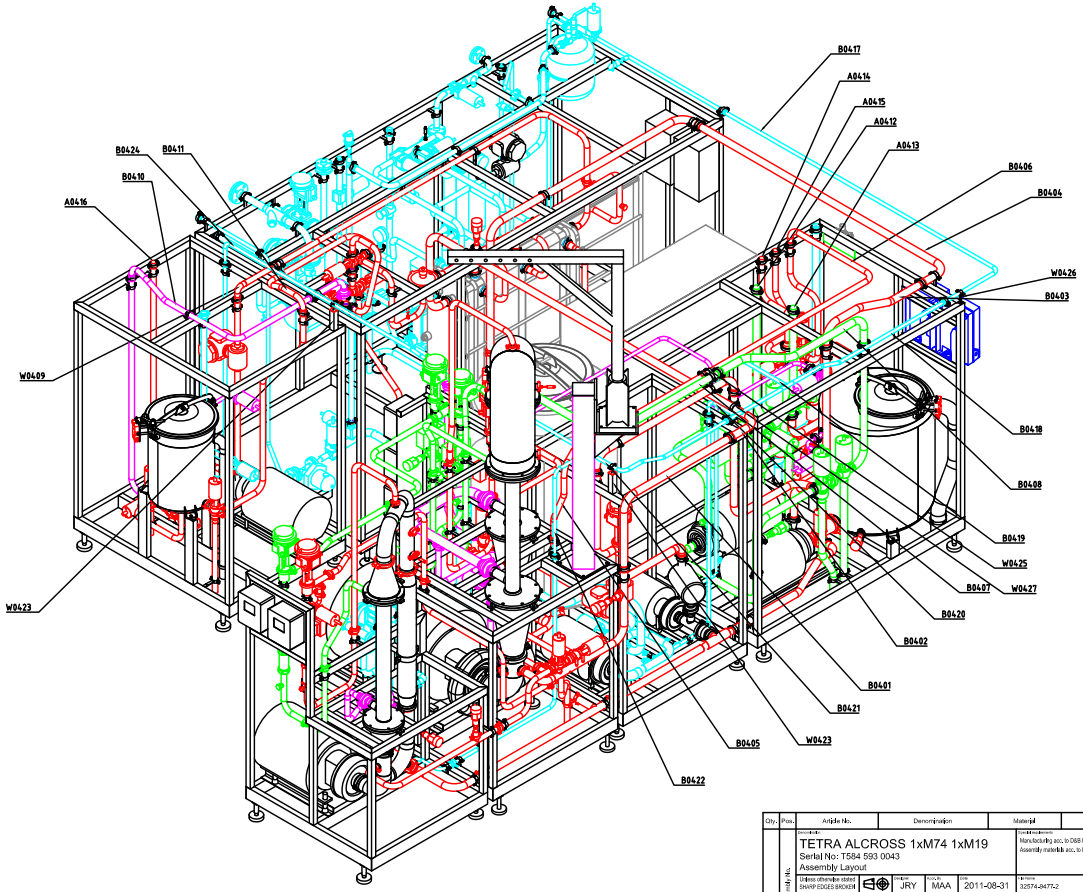
				Tetra Alcross Bactocatch, Item list.			**Doc No: IL584 593 0043**		
Label	No		Article No.	Denomination	Type	Automation	Doc No	Note	Rev.
						x= Yes			
020-21-18	1	A	90503-2249	Pressure switch	PTP31 G1/2" 0-4bar(g) 12-30V DC 4-wire 2PNP with display SS house IP66 Cable gland M12x1.5	x	1218198-0101		

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Rev	Description	Designer	Appr. By	Date

Qty.	Pos.	Article No.	Denomination	Material	Note

Assembly No.

TETRA ALCROSS 1xM74 1xM19
Serial No: T584 593 0043
Assembly Layout

Unless otherwise stated SHARP EDGES BROKEN

Designer: JRY | Appr. By: MAA | Date: 2011-08-31

Manufacturing acc. to: ORB MS 096
Assembly material & acc. to: ORB MSTN 0090

Tetra Pak Sweden

Format: A0

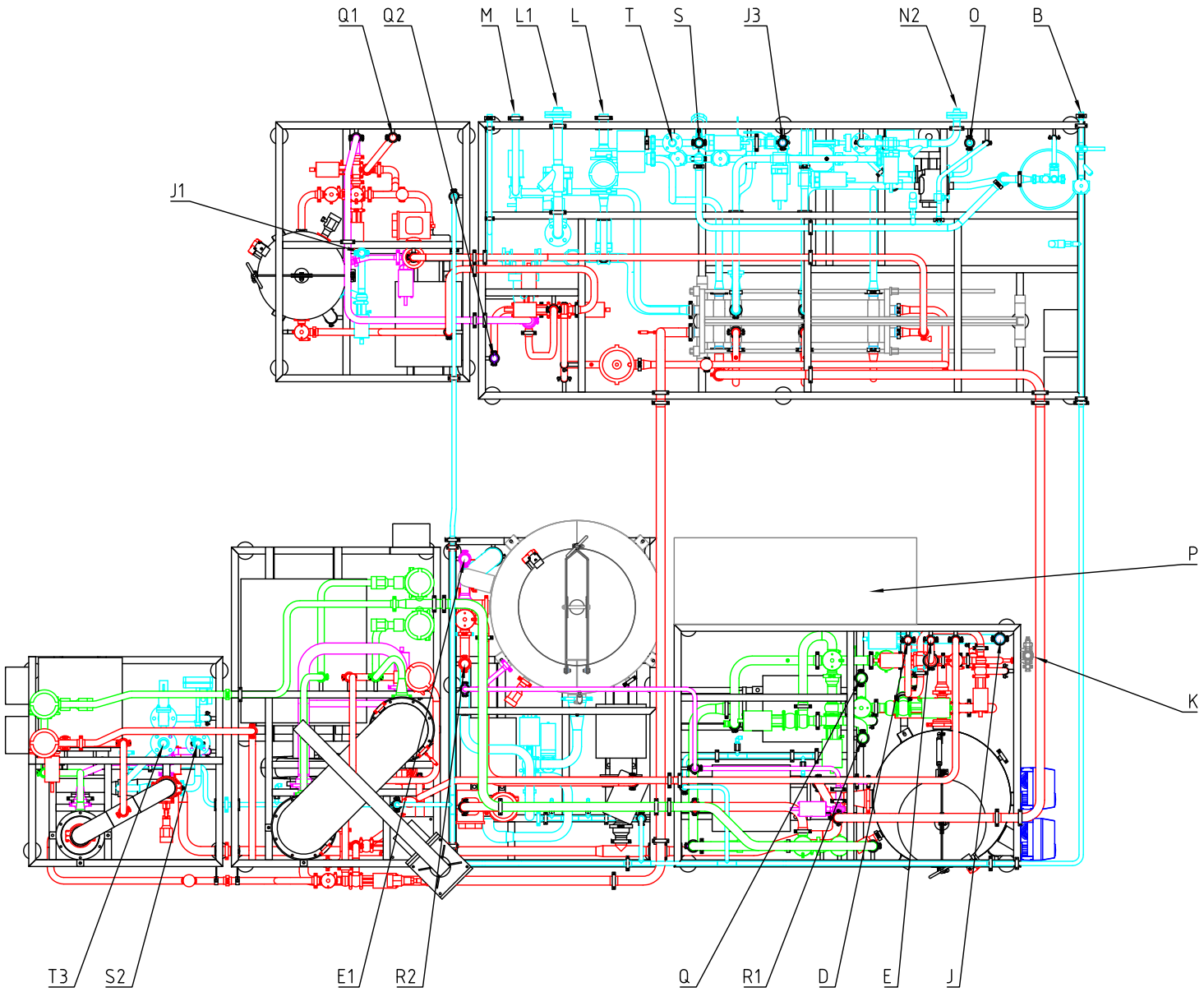
Scale: 1:15

Document No.: 32574-9477-2

Tetra Pak

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Rev	Description	Designer	Appr. By	Date



NR.	CONNECTION	MM/FLOOR	SIZE	INFO
B	Seal water in	2100mm	25	To V053
D	retentate out	2065mm	38	From V015
E	CIP pressure	2065mm	38	To CV016
E1	CIP pressure	2065mm	51	To CV004
J	Soft water in	2065mm	51	To V001
J1	Soft water in	2065mm	38	To V101
J3	WATER in	2065mm	38	TO V157
K	Instrument air	1900mm	3/8"	Close to panel
L	Cooling water in	1880mm	51	TO CV067
M	Cooling water R.	1880mm	38	From V068
N1	Steam inlet	2100mm	DN40	To V061
N2	Steam inlet	2100mm	DN25	To V165
O	CONDENSATE	2065mm	25	FROM CV167
O1	CONDENSATE	2100mm	25	FROM CV063
P	Power supply			To MCC Panel
Q	Skim milk in	2065mm	51	To V006
Q1	Cream inlet	2065mm	38	To V106
Q2	Cream By pass	2065mm	38	from V123
R1	Skim milk out.	2065mm	51	FROM V022
R2	To reclaim sys.	2065mm	51	FROM V088
S	Ice water in	2065mm	38	To V171
S2	Cooling water in	1535mm	38	To V240-01
T	Ice water out	2120 mm	DN25	From CV172
T3	Cooling water out	1630mm	DN40	From CV051

Qty.	Pos.	Article No.	Denomination	Material	Note

Denomination
TETRA ALCROSS 1xM74 1xM19
Serial No: T584 593 0043
Installation Layout

Special requirements
Manufacturing acc. to D&B MS 096
Assembly materials acc. to D&B MS IN 0090

Assembly No.

Unless otherwise stated SHARP EDGES BROKEN

Designer JRY | Appr. By MAA | Date 2011-08-31 | File Name 32574-9477-3

Company Tetra Pak Sweden | Format A1 | Template

Tetra Pak | Scale 1:12 | Document No. 32574-9477-3 | Revision

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Service media

Service Media 1
Steam supply 1
Process water 2
Service water 2

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Service Media

Steam supply

General requirements for the steam supply

The steam supply to a CIP water heat exchanger must conform to the following general requirements:

- The steam supply must be of good quality and free from condensate and air
- The outside diameter of the steam supply lines must exceed of the steam piping within the Tetra Spiraflo unit
- The steam supply line must be equipped with a pressure controller in order to maintain a constant feed pressure.
- Condensate traps must be provided in close proximity to the process line in order to procedure dry steam.
- A master shut off valve must be installed in the steam supply line.
- The steam pipes must be insulated.
- Before connecting the steam supply to the process line, the steam pipes must be blown clear with repeated blasts of steam for a period of 5 to 10 minutes.

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Pressure/capacity for the steam supply

Refer to **Consumption**.

Characteristics of the steam supply

Quality:	Dry saturated steam
Humidity:	Maximum 5% condensate
pH:	7,0 to 8,5
Solid particles:	None
Turbidity:	Maximum 3 ppm $KMnO_4$
Potassium and sodium:	Maximum 0,01 mg/kg
Iron:	Maximum 0,02 mg/kg
Copper:	Maximum 0,003 mg/kg
Nitrogen dioxide:	Maximum 0,02 ppm
Conductivity:	0,3 µ S
Organic matter:	None

Condensate

The condensate system should be designed to the same capacity, pressure an temperature demands as those given for a steam generating system.

Process water

Tetra Alcross M, Tetra Alcross Bactocatch (filter section) and Tetra Alcoss UC

All the water introduced to the above mentioned Tetra Alcross plants must be comply with the following specifications. Exceeding or not complying with these specifications will void the guarantee of the installed membranes:

Physical- and Chemical Quality:	
Turbidity	< 1,0 NTU
Total organic content	< 8,0 ppm (mg/l)
Iron, Fe	< 0,5 ppm (mg/l)
Manganese, Mn	< 0,2 ppm (mg/l)
Silicate, SiO2	< 5,0 ppm (mg/l)
Total hardness	< 20,0 odH (german degrees)[a]
Salt Density Index (Fouling index)	< 3,0 SDI
Total undissolved residue	none

Micro Biological Quality:	
Total plate count, 37 ^{o}C	< 20 per ml
Total plate count, 21 ^{o}C	< 200 per ml
Total amount of coliform bacteria	absent in 100 ml

Process Water Supply Line:

A maximum 20 micron pore size deep filter unit must be installed in the process water supply line. The filter housing must be in stainless steel or food grade polymeric material. The process water supply line must from and after this point only consist of stainless steel.

a. 20 German degrees of hardness - corresponding to.
36 French
24 English
360 USA (PPM)

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Service water

Service water is used for cooling, sealing water, tower water and boiler feedwater. It must be clean and without solid particles. The service water must be free of iron and manganese and must not contain excessive chlorine.

Service water must be soft and should be dehardened if necessary.

If relatively hard water is supplied (corresponding to 10 ^{o} dH or 12,5 ^{o}, lime deposits will acculate within devices such as valves. Deposition accelerates at high temperatures, and the severity of effects is directly proportional to the hardness of the water. In addition the cleaning process is adversely affected and the consumption of detergents is increased.

Water that has a low pH value (high acidity) increases the risk of corrosion in the heat exchanger and pipework. The pH value of the water supply must remain within the range pH 7 to pH 8,5.

The risk of corrosion is also increases by water that contains a high concentration of chlorine and/or chloride. The water supply must contain less than 0.2 ppm chlorine and less than 50 ppm chloride. Corrosion accelerates at high temperatures.

The pipework of the service water supplies must be equipped with master shut off valves. The supply must remain constant within the specified pressure end temperature parameters.

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Tetra Pak

Cleaning

General 1

Cleaning chemicals 2

Cleaning cycles 3

Preservation 4

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Long term membrane storage 4

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General

All chemicals must be approved for use in food equipment and undergo operation limits given by the membrane supplier.

Alternative sanitizing and cleaning chemicals have been used in various applications with mixed success. In general the cleaning effectiveness and the membrane compatibility have not been proven with these chemicals, so before using other chemicals than the recommended ones, please contact **Tetra Pak Filtration Systems A/S** for information and guidelines on how to proceed.

The amounts of detergents to be used to perform a complete cleaning cycle depend of the application and will vary from case to case.

Operation parameters, such as pH and temperature will have a direct impact on the life of the membranes.

It is important that the cleaning parameters remain within the specifications to avoid premature membrane failure.

Also refer to general membrane data in TeM as well as membrane data sheet from supplier of installed membranes.

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Cleaning chemicals

The cleaning chemicals recommended for MFS:

Caustic:	Henkel P3	Ultrasil 25 (1.5%
	Diversey	Divos 124CH (2.0%)
	Diversey	Divos 124 (2.0%)
	Diversey	Divos 120CL (1.5%)
Acid:	Nitric acid HNO_3	

The cleaning chemicals recommended for HTT:

Caustic:	NaOH
Acid:	Nitric acid HNO_3

WARNING! **Chemical hazards**
Cleaning solution contains caustic soda (NaOH) or Nitric acid (HNO_3).
These chemicals may cause severe burning to skin and eyes. Use protective clothes, goggles and gloves during handling.
If exposed - wash with water for at least 15 minutes. Seek medical assistance. Follow the instructions given by the supplier.

Caution! Phosphoric acid or cleaning agents containing Phosphoric acid must NOT be used for ceramic membranes

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Cleaning cycles

The cleaning of a membrane system consists of a series of cycles.

- **Recycle wash**: which is chemical exposure with circulation (caustic, acid).
- **Flush**: which is flushing of either product or chemicals.
- **Sanitation procedure:** Sanitation is chemical exposure with circulation.
- **Water flux test**: Clean water passage across the membrane at low pressure
- **Preservation:** used prior to and during production stop.

The operation of the cleaning sequence for the Tetra Alcross MB is to be found in the Operation manual (OM).

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Preservation

Short time membrane storage

The following procedures are for short term storage of ceramic membrane modules that have previously been used.

- When stop after production the plant is left with acid solution after cleaning.
- Do not forget to place the cover on the BTD when the plant is left with preservation solution.
- Before starting production, flush out the solution thoroughly and perform a CIP.

Long term membrane storage

The following procedures are for long term storage of ceramic membrane modules that have previously been used.

- The elements must be thoroughly cleaned per the procedures recommended by the manufacturer of the filtration system.
- Proper cleaning must result in all foultants (including protein, organic and metallic) is removed from the membrane and support using enzymatic, caustic and acid cleaners.
- Cleaning must be performed with the permeate open.
- Clean water permeability measurements must be taken to indicate whether or not the cleaning was successful.

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Note! All chemical solutions and rising afterwards must be made with 0,2µm filtered D.I water.

	Antifreeze	**Biocide (prevents bacterial growth)**
Liquid storage in temperature below 0°C	50% ethylene glycol	1.000 ppm glutaraldehyde or 0.1% sodium bisulfite solution
Liquid storage in temperature above 0°C	-	1% nitric acid

During storage

- The permeate ports and retentate outlets of the modules must be capped and all valves must remain closed.
- The module must be drained of the spend solution and replaced with fresh solution once a month.

Dry storage in temperatures below 0°C

If a large clean oven is available, an alternative method is to bake the modules at 90 °C for 24 hours to ensure the ceramic elements are completely dry.

The permeate ports must be open during the bake. The temperature of the oven must be ramped from ambient at a rate not exceeding 10 °C per minute until 90 °C is reached.

After 24 hours of bake is completed the modules must be cooled to ambient at a rate not exceeding 10 °C per minute.

Once the elements are completely dry, treatment with antifreeze and biocide is unnecessary.

Storage conditions

- Dust tight wooden crates (recommended)
  If the crates are not dust tight, the modules must be wrapped in plastic and then crated
- Indoors in a cool, dry location (recommended)
  If the crates are stored outside a tarp must be put over the crates to keep the dry to prevent splitting and rotting

After storing for long period of time, and if there is a leak when the modules are put into service, the retainer plates have to be retightned to ensure proper sealing of the ceramic elements in the housing. TPPS must be consulted.

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Caution! Do not expose the filter module to heavy knocks or other mechanical shocks. This will damage the elements and this kind of damage is not covered by the warranty

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Declaration of Conformity

Tetra Pak Cheese and Powder Systems A/S
Søren Nymarksvej 13
8270 Højbjerg
Denmark

declare that this machine/ equipment/ complex installation:

Tetra Alcross MB
T584 593 0043

is in conformity with the following harmonized standards:

EN ISO 12100-1:2003+A1:2009
EN ISO 12100-2:2003+A1:2009
EN ISO 13857:2008
EN ISO 13850:2008
EN 61000-6-2:2005
EN 61000-6-4:2007
EN 60204-1:2006
EN 1672-2:2005+A1:2009

and is in conformity with the provisions of the Directive(s) - including amendments:

[X] 2006/42/EC Machinery

[X] 2004/108/EC Electromagnetic compatibility (EMC)

[X] 2006/95/EC Low Voltage

[X] PED-97/23/EF

The following person is authorised to compile the technical file:

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English
FORM 5292 version 2010-01-14

De-commissioning

General 1

Requirements on Personnel 1

De-commissioning and dismantling 2

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General

To ensure maximum safety, you must read the section **Safety precautions** before carrying out any work on the unit.

Requirements on Personnel

Electrician

Certified according to local regulations with at least 3 years' experience of similar types of installations. Proven skills in reading and working from drawings and cable lists.

Knowledge of local safety regulations for power and automation. Furthermore the electrician must ensure that the electrical installation, including the equipment or device that work has been carried out on, has been adequately checked regarding the safety of personnel and property before it is put into operation.

De-Erector

Experience in similar work. Proven knowledge in local and international safety regulations concerning de-commissioning, dismantling and disposal.

Caution! **Unauthorized personnel.**
Operation by unauthorizedpersonnel may endanger personnel and property.

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De-commissioning and dismantling

Do as follows

- Inform the operator and other concerned personnel about the work you intend to do
- Fence off a safety zone
- Switch off all electrical supplies
- Make sure that up- and downstream can not be started
- Let the equipment adjust to ambient temperature
- Let the equipment adjust to atmospheric pressure
- Drain all pipes by slowly undo unions

Caution! Pipes can contain cleaning liquids

- Disconnect all cables from external sources
- Disconnect all media supply pipes/hoses from external sources
- Disconnect product inlet pipes
- Disconnect product outlet pip

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Disposal

Dispose of used machinery according to local laws and international agreements.

The following equipment need special attention:

- Membranes
- Batteries

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Component Instructions

Doc No	Description	Tag
Heat exchangers		1
1210229-0101	Brazed plate heat exchanger, CB	
Pumps		2
1214246-0101	Centrifugal pump, LKH 5 - 90 / LKHSP 10 - 40	
1214248-0101	Multistage centrifugal pump, LKH 112/113/114/122/123/124	
1218037-0101	Multistage centrifugal pump, CRN(s) 1/3/5/10/15/20/32/45/64	
Valves		3
1211608-0101	Sampling valve, Type 20	
1212676-0101	Air vent valve, Spirotop	
1213620-0101	Safety valve, AT4541-4581	
1214498-0101	Constant-pressure modulating valve, CPM-2	
1215537-0101	Electro-pneumatic modulating valve, SPC-2 / 2A	
1215850-0101	Butterfly valve, LKB	
1217942-0101	Regulating valve, 2702/8802 (Man/Auto) / 2712/8802 (Man/Auto)	
1221121-0101	Unique Single Seat Valve, Standard, SSV Stop valves	
1221122-0101	Unique Single Seat Valve, Standard, SSV Change-over Valves	
1221586-0101	Flow restrictor, REG	
1224797-0101	Regulating Valve, 3321/3372/3730	
1226617-0101	Sampling valve, M4, W9, W15, W25, Micro Port	
1241090-0101	Valve set	
1241228-0101	Non-return valve, AJ 1174	
1241241-0101	Ball valve, A44 / A459	
1241273-0101	Non-return valve, LKC-2	
Sensors and transmitters		4
1218198-0101	Pressure switch, Ceraphant T PTP31/PTP35	
1218205-0101	Pressure transmitter, Cerabar M PMC/PMP 41 - 48	
1218415-0101	Flow transmitter, Promag 10/50/53/55	
Allen Bradley -		
Allen Bradley-en-p		
Allen Bradley-en-p		
SCB-0014-F-EN		
Tanks and vessels		5
1210315-0101	Expansion vessel	
Other process components		6
1223745-0101	Pressure regulator, VP50	
1224023-0101	Filter regulator, FRL	

Component Instructions

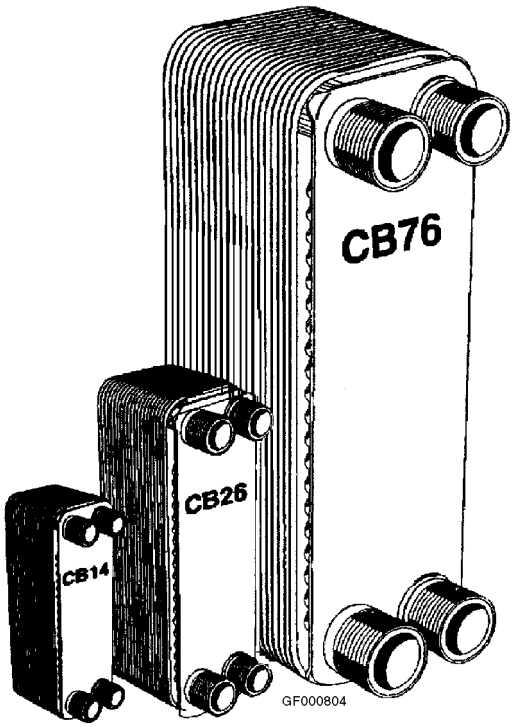
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1241295-0101	Sight glass, LKGG-1	
1241330-0101	In-line filter, LKIF	
1248674-0101	Strainer	

Maintenance & Spare Parts

Brazed plate heat exchanger

(Alfa Laval)

CB



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Tetra Pak

Doc No. 1210229-0101

Brazed plate heat exchanger

This document refers to components specified in Technical Manual, Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 02

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Tetra Pak

Tetra Pak Processing Systems AB

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Not applicable for this component! 3

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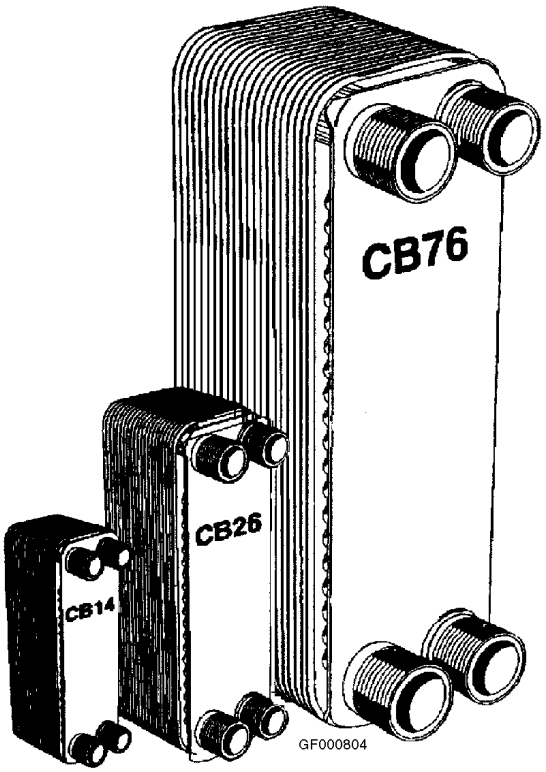
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Maintenance

Brazed plate heat exchanger

General

The brazed heat exchanger (BHE) concept is a variation of the traditional plate heat exchanger. Instead of having gaskets between the plates, the plates have been brazed together.



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Cleaning the heat exchanger

Risk of injury!
Never service the heat exchanger when it is hot!
The heat exchanger and the pipelines must **never** be pressurised when servicing the heat exchanger!
Always use protective gloves and protective eye-wear when handling the cleaning detergent.

If the channels are blocked with lime, it might be impossible to clean them. In that case, replace the unit with a new one.

Note! Never use liquids that are corrosive to copper or stainless steel (AlfaPhos, article number 6-31801-2612-5, is recommended as cleaning detergent).
It is important that the unit is not left on stand-by after cleaning.

a) Drain the heat exchanger.
b) Rinse with fresh water.
c) Drain the rinse water.
d) Fill with diluted AlfaPhos (1 part in 9 parts of water) at 50-70°C (122-158°F).
e) If possible, circulate the solution.
f) Drain the solution.
g) Rinse with fresh water until pH is neutral.

Drain the fresh water.

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Spare Parts

Not applicable for this component!

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Tetra Pak

Maintenance & Spare Parts

Centrifugal pump
(Alfa Laval Flow)
LKH 5 - 90 / LKHSP 10 - 40



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Tetra Pak

Doc No. 1214246-0101

Centrifugal pump

LKH 5 - 90 / LKHSP 10 - 40

This document refers to components specified in Technical Manual, Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 08 Issue 2011-02

Doc No. 1214246-0101

Tetra Pak

Tetra Pak Processing Systems AB

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LKH 5 30

LKH 10 - 60 32

LKH 70 - 90 54

LKHSP 63

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Maintenance

Change shaft seal

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Never service the pump when it is hot.
Never service the pump with pump and pipelines under pressure.
Always disconnect the power supply before servicing the pump.
Never run the pump with both the suction side and the pressure side blocked.
Never start in the wrong direction of rotation when there is liquid in the pump.
Never touch the pump or the pipelines when pumping hot liquids or when sterilizing.

Note! All scrap must be stored/disposed in accordance with current rules/ directives.

FSS: Only for pump with Flushed Shaft Seal.

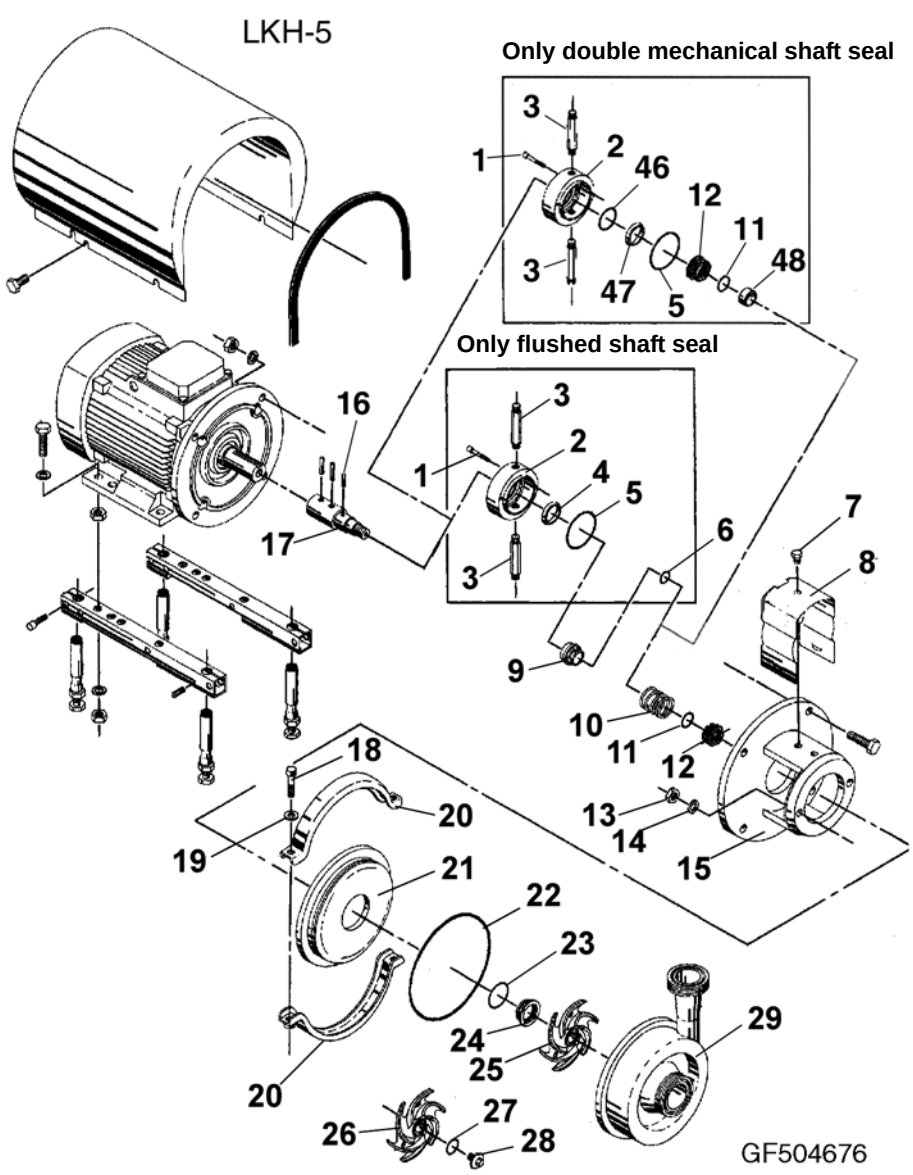
DMS: Only for pump with Double Mechanical shaft Seal.

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Disassemble

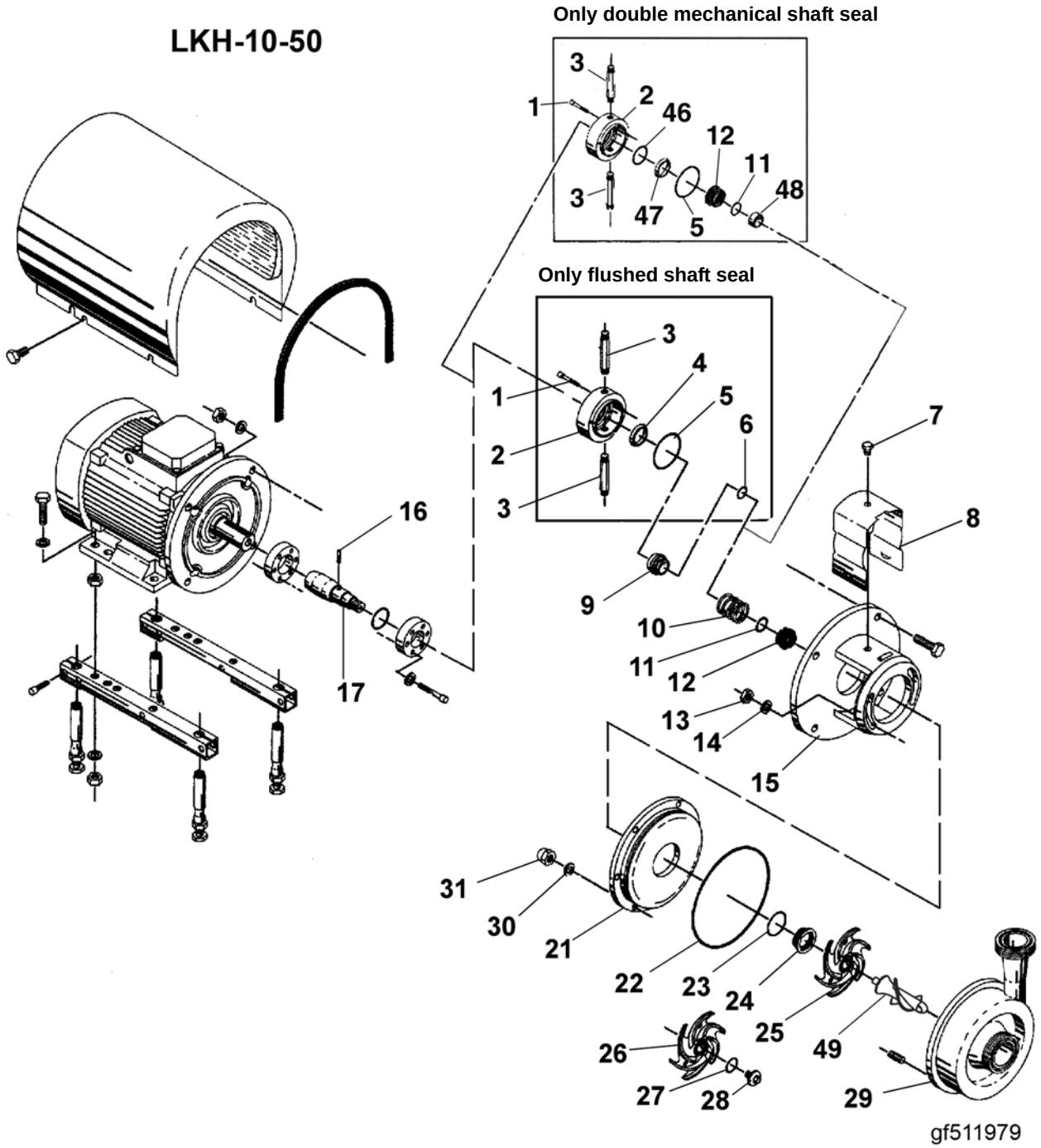
a) **LKH 5:** Remove the screw (18), spring washers (19), clamps (20) and pump casing (29).
b) **LKH 10 - 90:** Remove the cap nuts (31), washers (30), and pump casing (29).
c) **FSS** and **DMS:** Unscrew the tubes (3) using a spanner.
d) Remove screw (7) and safety guard (8).
e) Remove impeller screw (28), if fitted.
f) Remove impeller (25) or (26). If necessary, loosen the impeller by knocking gently on the impeller vanes.
g) Remove O-ring (27) from the impeller, if fitted.
h) Pull off O-ring (22) from the back plate (21).
i) Unscrew nuts (13) and remove washers (14) and the back plate (21).

(Cont'd)



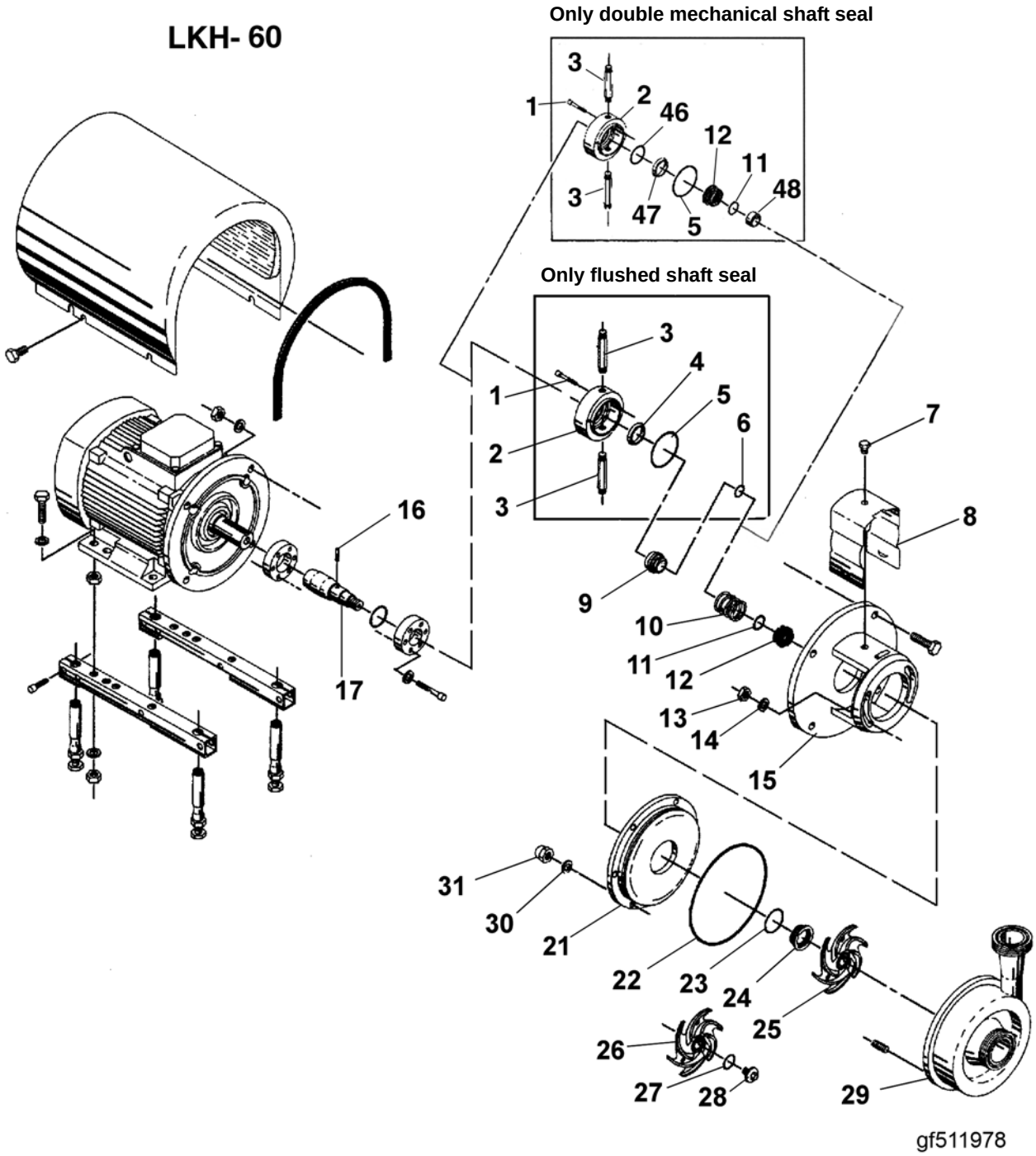
1 Screw
2 Seal housing
3 Tube
4 Lip seal
5 O-ring
6 O-ring
7 Screw
8 Safety guard
9 Drive ring
10 Spring
11 O-ring
12 Rotating seal ring
13 Nut
14 Washer
15 Adaptor
16 Connex pin
17 Stub shaft
18 Screw
19 Spring washer
20 Clamp
21 Back plate
22 O-ring
23 O-ring
24 Stationary seal ring
25 Impeller
26 Impeller for impeller screw
27 O-ring
28 Impeller screw
29 Pump casing
46 O-ring
47 Secondary stationary seal ring
48 Drive ring

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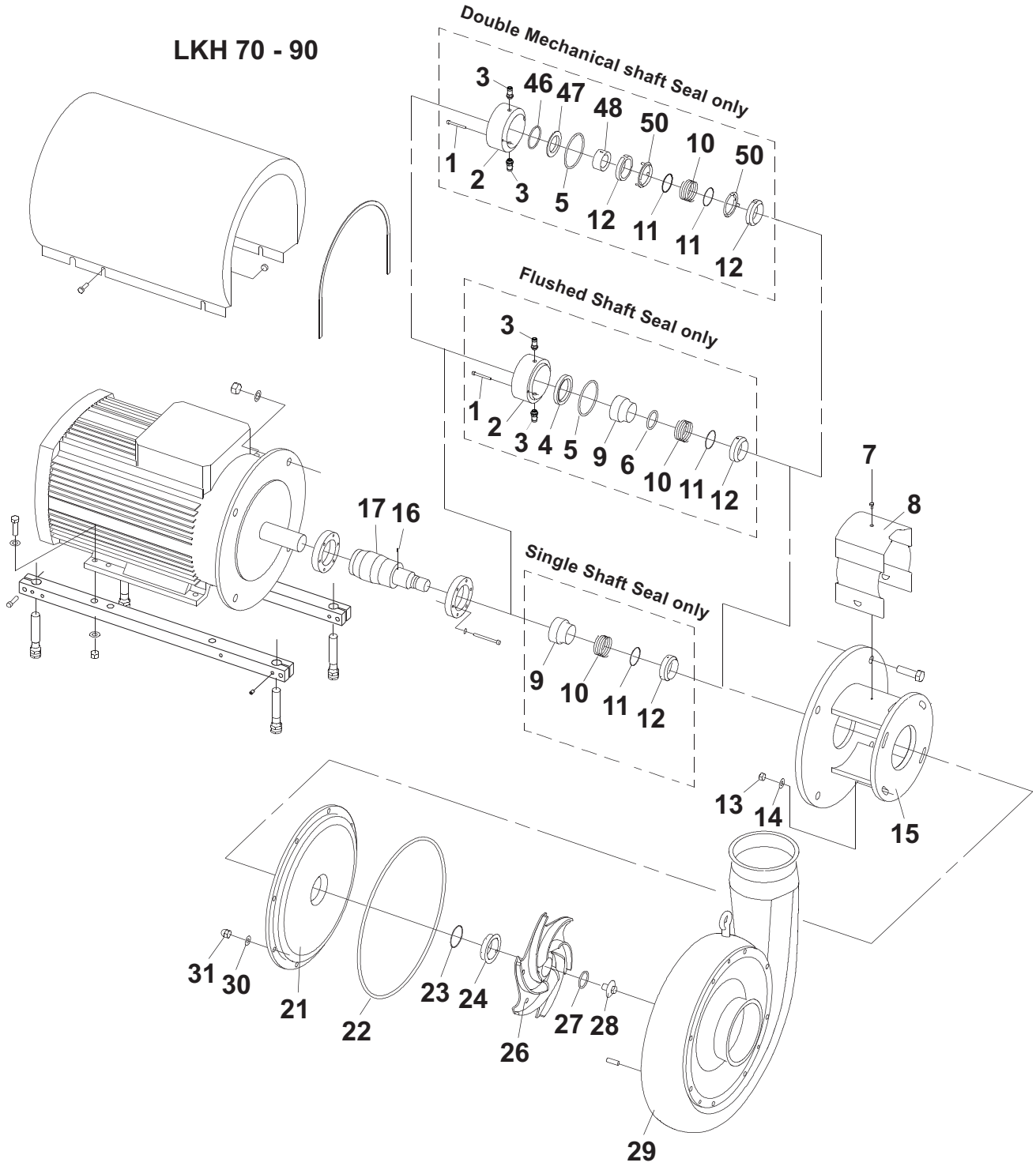


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1	Screw	10	Spring	22	O-ring	30	Washer
2	Seal housing	11	O-ring	23	O-ring	31	Cap nut
3	Tube	12	Rotating seal ring	24	Stationary seal ring	46	O-ring
4	Lip seal	13	Nut	25	Impeller	47	Secondary stationary seal ring
5	O-ring	14	Washer	26	Impeller for impeller screw	48	Drive ring
6	O-ring	15	Adaptor	27	O-ring	49	Inducer
7	Screw	16	Connex pin	28	Impeller screw		
8	Safety guard	17	Stub shaft	29	Pump casing		
9	Drive ring	21	Back plate				



1	Screw	10	Spring	22	O-ring	30	Washer
2	Seal housing	11	O-ring	23	O-ring	31	Cap nut
3	Tube	12	Rotating seal ring	24	Stationary seal ring	46	O-ring
4	Lip seal	13	Nut	25	Impeller	47	Secondary stationary seal ring
5	O-ring	14	Washer	26	Impeller for impeller screw	48	Drive ring
6	O-ring	15	Adaptor	27	O-ring		
7	Screw	16	Connex pin	28	Impeller screw		
8	Safety guard	17	Stub shaft	29	Pump casing		
9	Drive ring	21	Back plate				



1	Screw	9	Drive ring	17	Stub shaft	29	Pump casing
2	Seal housing	10	Spring	21	Back plate	30	Washer
3	Tube	11	O-ring	22	O-ring	31	Cap nut
4	Lip seal	12	Rotating seal ring	23	O-ring	46	O-ring
5	O-ring	13	Nut	24	Stationary seal ring	47	Secondary stationary seal ring
6	O-ring	14	Washer	26	Impeller	48	Drive ring
7	Screw	15	Adaptor	27	O-ring	50	Cup
8	Safety guard	16	Connex pin	28	Impeller screw		

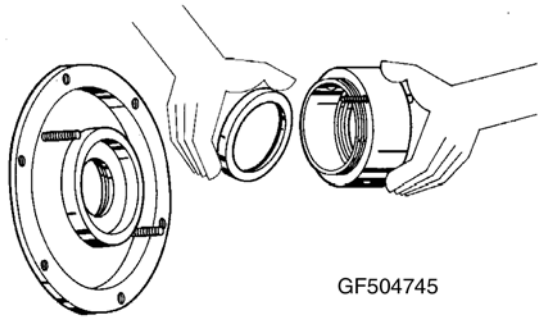
(Cont'd)

j) Remove stationary seal ring (24) (left-hand thread). Use special tool (6-9612-1371-01).

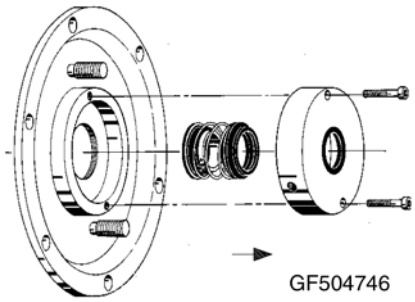
k) Remove O-ring (23) from back plate (21).

l) **FSS** and **DMS:** Remove screws (1) and seal housing (2).

m) **FSS:** Pull out lip seal (4) and O-ring (5) from the seal housing (2).



n) **DMS:** Remove rotating seal rings (12) and drive ring (48) from spring (10).



o) **DMS:** Remove O-rings (11) from rotating seal rings (12).

p) **DMS, LKH 70 - 90:** Remove cups (50) from rotating seal rings (12).

q) **DMS:** Remove stationary seal ring (47) from seal housing (2).

r) **DMS:** Remove O-ring (46) from stationary seal ring (47).

s) **DMS:** Remove O-ring (5) from seal housing (2).

t) Remove drive ring (9), spring (10), O-ring (11), rotating seal ring (12), and if **FSS** also O-ring (6) from stub shaft (17).

u) **LKH 10 - 90:** Remove spring (10), O-ring (11), rotating seal ring (12), and if **FSS** also O-ring (6) from the drive ring (9).

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Reassemble

Tightening torques

Below table specifies the tightening torques for the screws, bolts and nuts. Always use below torques if no other values are stated.

Size	Tightening torgue, Nm
M8	20
M10	40
M12	67
M14	110

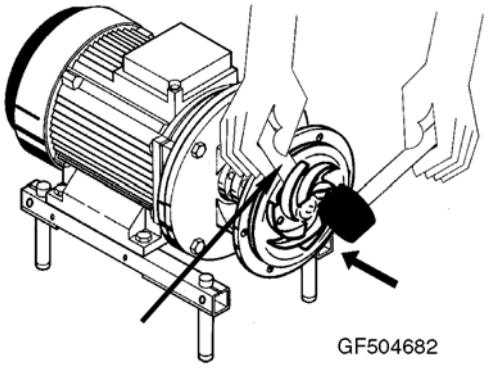
Note! Lubricate O-rings and rubber seals with silicon grease or silicone oil.

FSS: Only for pump with Flushed Shaft Seal.

DMS: Only for pump with Double Mechanical shaft Seal.

a) Ensure that the clearance between the impeller (25 or 26) and the back plate (21) is 0,5 mm for LKH 5 - 60. For LKH 70 - 90 the clearance must be 1 mm.

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LKH 5 - 60 = 0,5 mm
LKH 70 - 90 = 1 mm

b) If no adjusting needed: continue with f).

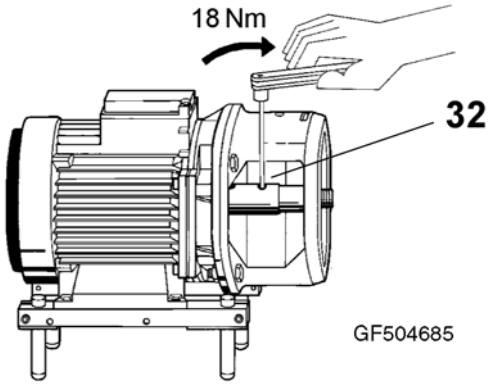
c) Remove impeller (25 or 26), back plate (21) and drive ring (9).

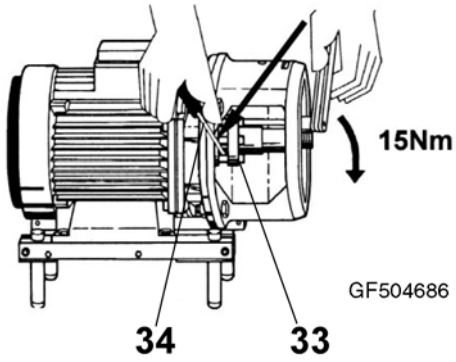
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d) **LKH 5:** Loosen the screws (32) and adjust. Tighten the screws (32) evenly to 18 Nm.

e) **LKH 10 - 90:** Loosen the screws (33) and adjust. Tighten the screws (33) evenly to 15 Nm. Counterhold with a screwdriver (34).

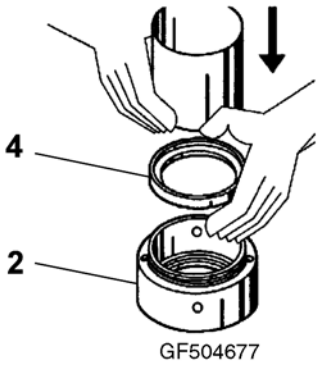




32 Screw
33 Screw
34 Screwdriver

f) Change the parts of the spare parts kit; the O-rings (11, 22, 23) and (27) if use of impeller screw, spring (10), rotating seal ring (12), stationary seal ring (24); for **FSS** also lip seal (4) and O-rings (5, 6) and for **DMS** also O-ring (46) and seal ring (47).

g) **FSS:** Fit lip seal (4) in seal housing (2).
LKH 5 - 60: Use a ø63 mm tube.
LKH 70 - 90: Press in lip seal by hand.



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(Cont'd)

(Cont'd)

h) **FSS:** Fit O-ring (5) onto the seal housing (2).

i) **FSS:** Fit seal housing (2) on back plate (21) and tighten screws (1).

j) **FSS:** Fit O-ring (6) in drive ring (9).

k) **DMS:** Fit O-rings (11) in rotating seal rings (12).

l) **DMS, LKH 70 - 90:** Fit cups (50) on rotating seal rings (12).

m) **DMS:** Fit spring (10) on one of the rotating seal rings (12). Place the drive ring (48) in between.

n) **DMS, LKH 70 - 90:** Turn the drive ring (9) in order to place it correctly on the stub shaft (17).

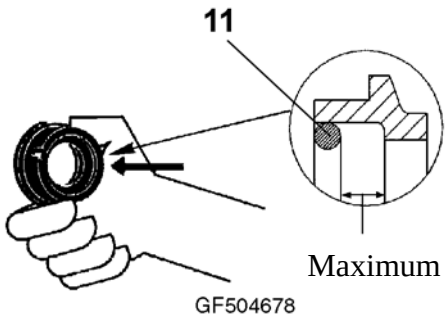
o) **DMS:** Fit the second rotating seal ring (12) on the other end of the spring.

Caution! **DMS:** Ensure that both drive pins on the drive ring enters the notches in the rotating seal rings.

p) **DMS:** Place the parts on the stationary seal ring fitted in the back plate (21).

q) Remove spring (10). Make sure that O-ring (11) has maximum clearance from the sealing surface.

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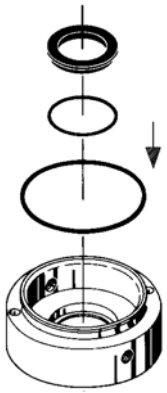
r) Fit spring (10), O-ring (11), rotating seal ring (12), and if **FSS** also O-ring (6) on the drive ring (9).

Caution! Ensure that the driver on the drive ring enters the notch in the rotating seal ring.

(Cont'd)

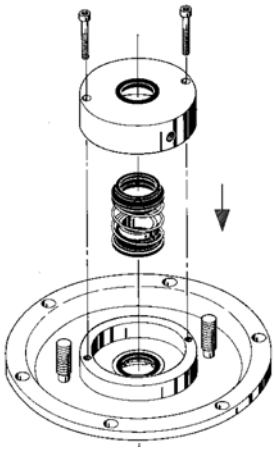
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s) **DMS:** Lubricate the O-ring (5) and slide onto seal housing (2). Lubricate O-ring (46) and fit on stationary seal ring (47) and fit this in the seal housing (2).


GF504747

t) **DMS:** Clean the sealing surfaces with contact cleaner.

u) **DMS:** Fit the seal housing (2) on the back plate (21) and tighten the screws (1).


GF504748

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v) **DMS:** To enable fitting the back plate (21) with the shaft seal, remove the connex pin (16) from the shaft. Carefully guide the back plate onto the adaptor (15). Fit washers (14) and nut (13).

(Cont'd)

(Cont'd)

w) Fit complete shaft seal on the stub shaft (17) so that the connex pin (16) enters the notch in the drive ring (9).

x) Fit O-ring (23) on stationary seal ring (24).

Note! When fitting stationary seal ring (24) (left-hand thread), only tighten by hand to avoid deformation of the stationary seal ring. (Max 7 Nm.)

y) Use special tool (6-9612-1371-01) to screw the stationary seal ring (24) into back plate (21).

z) Clean the sealing surfaces with contact cleaner before fitting back plate (21).

aa) Carefully guide the back plate (21) onto adaptor (15).

ab) Fit washers (14) and nuts (13), but do not tighten.

ac) Fit O-ring (22) onto back plate (21).

ad) Fit O-ring (27) in impeller (26), if use of impeller screw (28).

ae) Lubricate the impeller hub with silicone grease or silicone oil.

af) Fit impeller (25) or (26 (if use of impeller screw)) onto stub shaft (17).

ag) Fit and tighten impeller screw (28) if used.

Note! Torque **LKH 5 - 60** = 20 Nm
Torque **LKH 70 - 90** = 50 Nm

ah) **FSS & DMS:** Screw tubes (3) into seal housing (2) and tighten with a spanner.

ai) Fit safety guard (8) and fit and tighten screw (7).

aj) **LKH 5:** Fit pump casing (29), spring washers (19), screws (18) and clamps (20), but do not tighten.
LKH 10 - 90: Fit pump casing (28), washers (30), and cap nuts (31), but do not tighten.

ak) Adjust pump casing (29) to the right position.

al) **LKH 5:** Tighten nuts (13) and screws (18).
LKH 10 - 90: Tighten nuts (13) and cap nuts (31).

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Relubrication Intervals

Motors without grease nipples are permanently lubricated. For motors with grease nipples relubrication intervals are shown in the table below.

Vendor.
Relubrication interval 50 Hz (3000 rpm) / 60 Hz (3600 rpm).
Quantity in Drive End (DE) / Non Drive End (NDE).

Frame size	Motor power (kW)	LKH 5 - 90 / LKHSP 10 - 40 50/60 Hz
80	0.75	ABB: Permanently lubricated
80	1.1	ABB: Permanently lubricated
90	1.5	ABB: Permanently lubricated
90	2.2	ABB: Permanently lubricated
100	3.0	ABB: Permanently lubricated
112	4.0	ABB: Permanently lubricated
132	5.5	ABB: Permanently lubricated
132	7.5	ABB: Permanently lubricated
160	11	ABB: Permanently lubricated
160	15	ABB: Permanently lubricated
160	18.5	ABB: Permanently lubricated
180	22	ABB: Permanently lubricated
200	30	ABB: Permanently lubricated Brook: 4300h/3500h, DE:23g NDE:23g
200	37	ABB: Permanently lubricated Brook: 4300h/3500h, DE:23g NDE:23g
200	45	ABB: Permanently lubricated Brook: 4300h/3500h, DE:23g NDE:23g
250	55	ABB: Permanently lubricated Brook: 3950h/3200h, DE 26g NDE:26g
250	75	ABB: Permanently lubricated Brook: 3950h/3200h, DE 26g NDE:26g

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Note! The table is for 100°C internal bearing temperature. An increase in temperature of 15°C (ambient or internal in bearings), will reduce the greasing interval and bearing lifetime by 50%.

Note! Lubrication interval for vertically mounted pumps is half the value stated in the table.

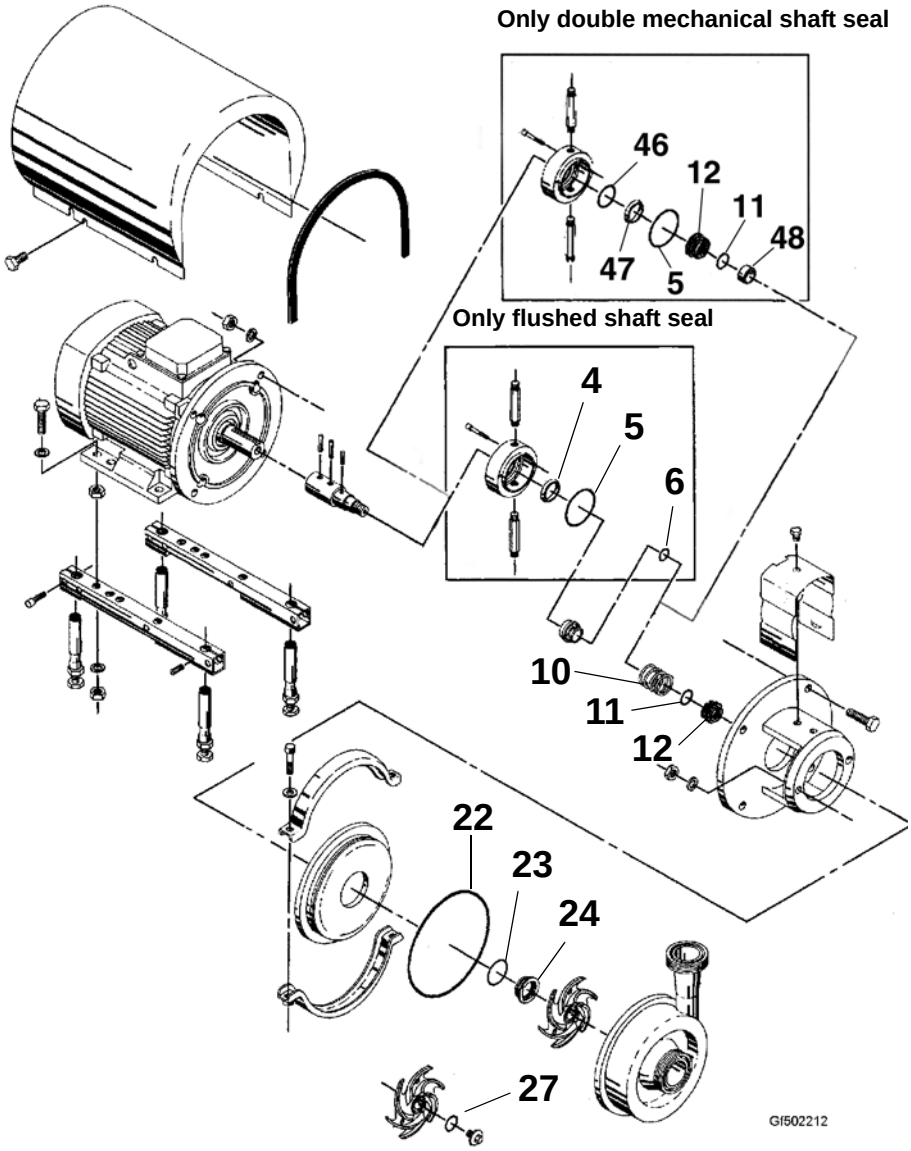
Recommended grease types:

- Mobilgrease HP
- ESSO Unirex N3
- Shell Lipex EP2
- SKF LGHT3
- Castrol LMX

Spare parts

Kit

LKH 5



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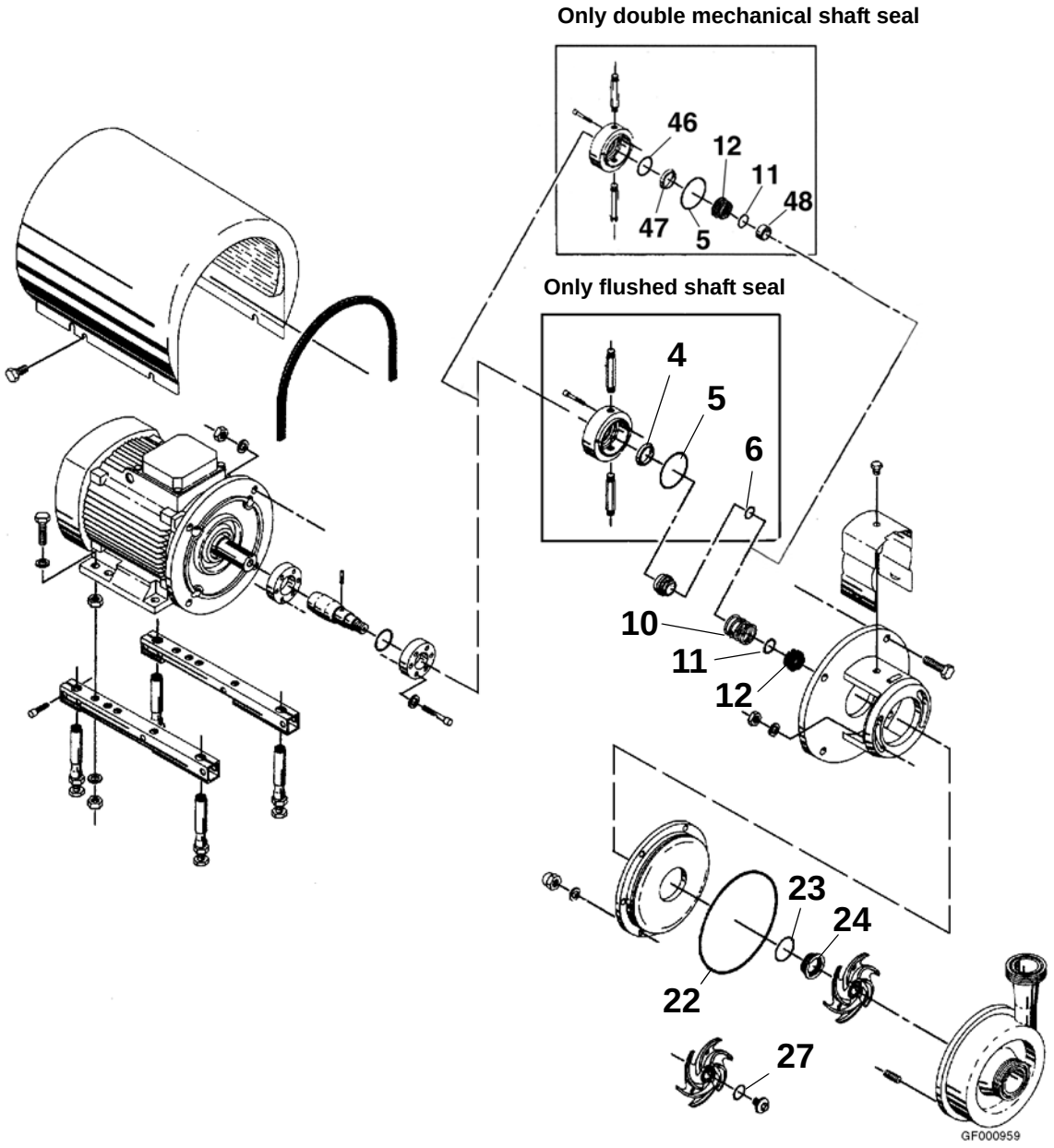
Remarks:

O-ring (27) is not used for versions without impeller screws.

Service kit includes **Spare part kit** and (pos 22 & 27).

Positions are equal to positions in Maintenance.

LKH 10 - 60



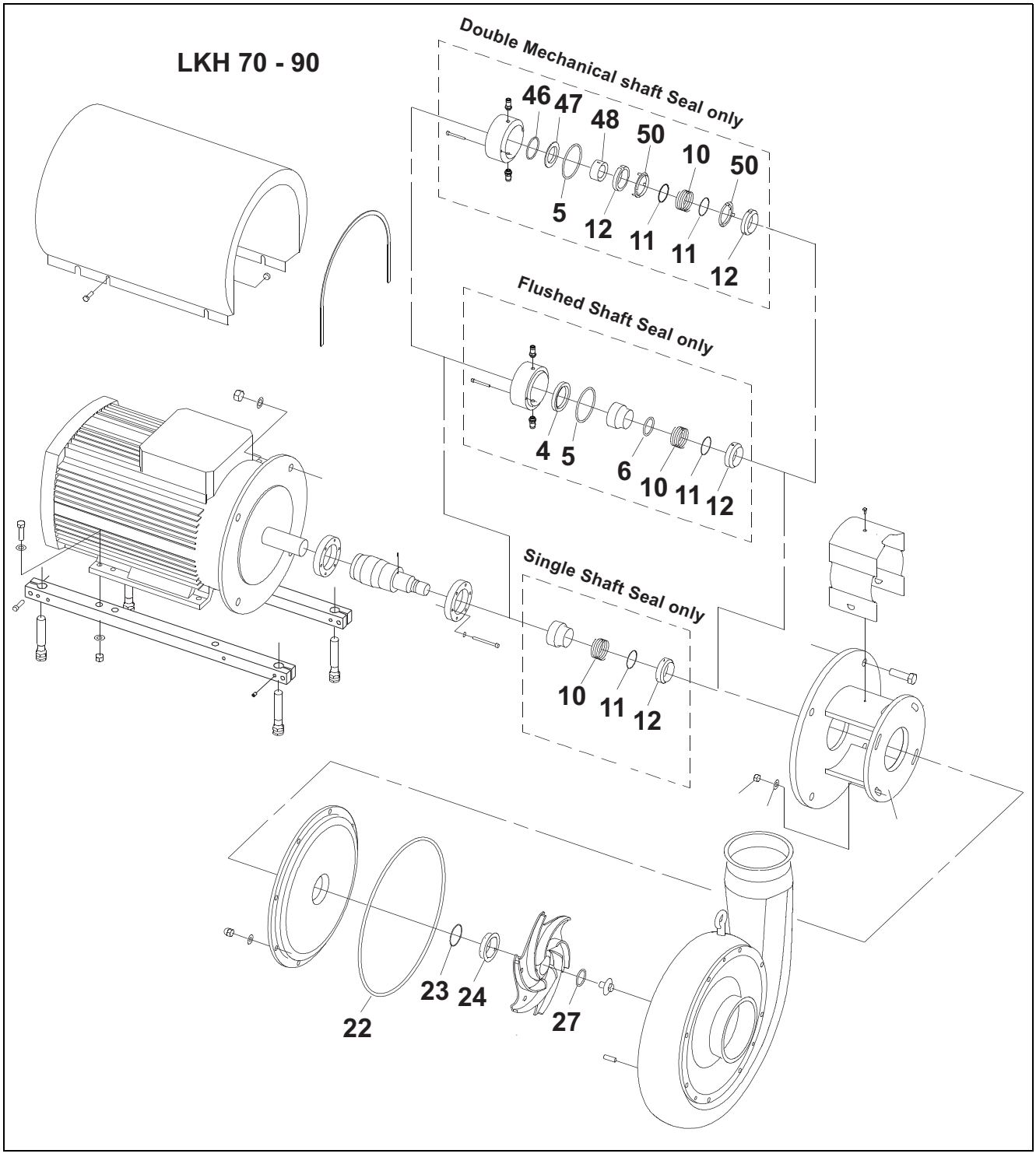
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Remarks:

O-ring (27) is not used for versions without impeller screws.

Service kit includes **Spare part kit** and (pos 22 & 27).

Positions are equal to positions in Maintenance.



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Remarks:

Service kit includes **Spare part kit** and (pos 22 & 27).

Positions are equal to positions in Maintenance.

Spare part kit

LKH 5 - 60, SiC/C

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 5 - 60	6-9612-12-9609	Spare part kit, single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-12-9610	Spare part kit, single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-12-9611	Spare part kit, single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
LKH 5 - 60	6-9612-12-9625	Spare part kit, flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-12-9626	Spare part kit, flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-12-9627	Spare part kit, flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1

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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 5 - 60	6-9612-12-9613	Spare part kit, double mechanical shaft seal, EPDM (standard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1
	6-9612-12-9614	Spare part kit, double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC O-ring, NBR Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1
	6-9612-12-9615	Spare part kit, double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC O-ring, FPM Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1

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LKH 5 - 60, SiC/SiC

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 5 - 60	6-9612-12-9605	Spare part kit, alternatives (SiC/SiC), single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, SiCSiC O-ring, EPDM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-12-9606	Spare part kit, alternatives (SiC/SiC), single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-12-9607	Spare part kit, alternatives (SiC/SiC), single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
LKH 5 - 60	6-9612-12-9629	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-12-9627	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-12-9628	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1

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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 5 - 60	6-9612-12-9617	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, EPDM (stand-ard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1
	6-9612-12-9618	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC O-ring, NBR Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1
	6-9612-12-9619	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC O-ring, FPM Sec. stationary seal ring, SiC Drive ring	5 10 11 12 23 24 46 47 48	1 1 2 2 1 1 1 1 1

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LKH 70 - 90, SiC/C

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 70 - 90	6-9612-51-5101	Spare part kit, single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-51-5102	Spare part kit, single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-51-5103	Spare part kit, single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
LKH 70 - 90	6-9612-51-5109	Spare part kit, flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-51-5110	Spare part kit, flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-51-5111	Spare part kit, flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1

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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 70 - 90	6-9612-51-5117	Spare part kit, double mechanical shaft seal, EPDM (standard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2
	6-9612-51-5118	Spare part kit, double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2
	6-9612-51-5119	Spare part kit, double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2

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LKH 70 - 90, SiC/SiC

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 70 - 90	6-9612-51-5105	Spare part kit, alternatives (SiC/SiC), single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-51-5106	Spare part kit, alternatives (SiC/SiC), single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
	6-9612-51-5107	Spare part kit, alternatives (SiC/SiC), single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC	10 11 12 23 24	1 1 1 1 1
LKH 70 - 90	6-9612-51-5113	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-51-5114	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1
	6-9612-51-5115	Spare part kit, alternatives (SiC/SiC), flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC	4 5 6 10 11 12 23 24	1 1 1 1 1 1 1 1

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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 70 - 90	6-9612-51-5121	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, EPDM (stand-ard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2
	6-9612-51-5122	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2
	6-9612-51-5123	Spare part kit, alternatives (SiC/ SiC), double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM Stationary seal ring, SiC O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup	5 10 11 12 23 24 46 47 48 50	1 1 2 2 1 1 1 1 1 2

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LKH 5 - 90, Tool

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH 5 - 90	6-9612-13-7101	Tool complete Stationary seal ring		-	-

Service kit

LKH 5 - 90, SiC/C

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2306	Service kit, single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM	10 11 12 22 22 23 24 27	1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2114				
LKH-20	6-9611-92-2122				
LKH-25, LKH 35, LKH-45	6-9611-92-2182				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2130				
LKH-70	6-9611-92-2238				
LKH-80	6-9611-92-2843				
LKH-85	6-9611-92-2952				
LKH-90	6-9611-92-2867				
LKH-5	6-9611-92-2307	Service kit, single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR	10 11 12 22 22 23 24 27	1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2115				
LKH-20	6-9611-92-2123				
LKH-25, LKH 35, LKH-45	6-9611-92-2183				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2131				
LKH-70	6-9611-92-2239				
LKH-80	6-9611-92-2844				
LKH-85	6-9611-92-2953				
LKH-90	6-9611-92-2868				
LKH-5	6-9611-92-2308	Service kit, single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM	10 11 12 22 23 24 27	1 1 1 1 1 1 1
LKH-10, LKH-15	6-9611-92-2116				
LKH-20	6-9611-92-2124				
LKH-25, LKH 35, LKH-45	6-9611-92-2184				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2132				
LKH-70	6-9611-92-2240				

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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2314	Service kit, flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM	4 5 6 10 11 12 22 22 23 24 27	1 1 1 1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2118				
LKH-20	6-9611-92-2126				
LKH-25, LKH 35, LKH-45	6-9611-92-2190				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2134				
LKH-70	6-9611-92-2242				
LKH-80	6-9611-92-2847				
LKH-85	6-9611-92-2956				
LKH-90	6-9611-92-2871				
LKH-5	6-9611-92-2315	Service kit, flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR	4 5 6 10 11 12 22 22 23 24 27	1 1 1 1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2119				
LKH-20	6-9611-92-2127				
LKH-25, LKH 35, LKH-45	6-9611-92-2191				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2135				
LKH-70	6-9611-92-2243				
LKH-80	6-9611-92-2848				
LKH-85	6-9611-92-2957				
LKH-90	6-9611-92-2872				
LKH-5	6-9611-92-2316	Service kit, flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM	4 5 6 10 11 12 22 23 24 27	1 1 1 1 1 1 1 1 1 1
LKH-10, LKH-15	6-9611-92-2120				
LKH-20	6-9611-92-2128				
LKH-25, LKH 35, LKH-45	6-9611-92-2192				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2136				
LKH-70	6-9611-92-2244				

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Spare parts

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2322	Service kit, double mechanical shaft seal, EPDM (standard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, carbon O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 - 90 only)	5 10 11 12 22 22 23 24 27 46 47 48 50	1 1 2 2 1 2 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2210				
LKH-20	6-9611-92-2218				
LKH-25, LKH 35, LKH-45	6-9611-92-2226				
LKH-40, LKH-50, LKH-60	6-9611-92-2234				
LKH-70	6-9611-92-2416				
LKH-80	6-9611-92-2851				
LKH-85	6-9611-92-2960				
LKH-90	6-9611-92-2875				
LKH-5	6-9611-92-2323	Service kit, double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, carbon O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR O-ring, NBR Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 - 90 only)	5 10 11 12 22 22 23 24 27 46 47 48 50	1 1 2 2 1 2 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2211				
LKH-20	6-9611-92-2219				
LKH-25, LKH 35, LKH-45	6-9611-92-2227				
LKH-40, LKH-50, LKH-60	6-9611-92-2235				
LKH-70	6-9611-92-2417				
LKH-80	6-9611-92-2852				
LKH-85	6-9611-92-2961				
LKH-90	6-9611-92-2876				
LKH-5	6-9611-92-2324	Service kit, double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, carbon O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM O-ring, FPM Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 only)	5 10 11 12 22 23 24 27 46 47 48 50	1 1 2 2 1 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2212				
LKH-20	6-9611-92-2220				
LKH-25, LKH 35, LKH-45	6-9611-92-2228				
LKH-40, LKH-50, LKH-60	6-9611-92-2236				
LKH-70	6-9611-92-2418				

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LKH 5 - 90, SiC/SiC

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2526	Service kit, single shaft seal, EPDM (standard)	Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM	10 11 12 22 22 23 24 27	1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2550				
LKH-20	6-9611-92-2574				
LKH-25, LKH 35, LKH-45	6-9611-92-2598				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2623				
LKH-70	6-9611-92-2643				
LKH-80	6-9611-92-2855				
LKH-85	6-9611-92-2964				
LKH-90	6-9611-92-2879				
LKH-5	6-9611-92-2527	Service kit, single shaft seal, NBR	Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR	10 11 12 22 22 23 24 27	1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2551				
LKH-20	6-9611-92-2575				
LKH-25, LKH 35, LKH-45	6-9611-92-2599				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2624				
LKH-70	6-9611-92-2644				
LKH-80	6-9611-92-2856				
LKH-85	6-9611-92-2965				
LKH-90	6-9611-92-2880				
LKH-5	6-9611-92-2528	Service kit, single shaft seal, FPM	Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM	10 11 12 22 23 24 27	1 1 1 1 1 1 1
LKH-10, LKH-15	6-9611-92-2552				
LKH-20	6-9611-92-2576				
LKH-25, LKH 35, LKH-45	6-9611-92-2600				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2625				
LKH-70	6-9611-92-2645				

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Spare parts

Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2534	Service kit, flushed shaft seal, EPDM (standard)	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM	4 5 6 10 11 12 22 22 23 24 27	1 1 1 1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2558				
LKH-20	6-9611-92-2582				
LKH-25, LKH 35, LKH-45	6-9611-92-2606				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2631				
LKH-70	6-9611-92-2647				
LKH-80	6-9611-92-2859				
LKH-85	6-9611-92-2968				
LKH-90	6-9611-92-2883				
LKH-5	6-9611-92-2535	Service kit, flushed shaft seal, NBR	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR	4 5 6 10 11 12 22 22 23 24 27	1 1 1 1 1 1 1 2 1 1 1
LKH-10, LKH-15	6-9611-92-2559				
LKH-20	6-9611-92-2583				
LKH-25, LKH 35, LKH-45	6-9611-92-2607				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2632				
LKH-70	6-9611-92-2648				
LKH-80	6-9611-92-2860				
LKH-85	6-9611-92-2969				
LKH-90	6-9611-92-2884				
LKH-5	6-9611-92-2536	Service kit, flushed shaft seal, FPM	Lip seal O-ring for seal housing O-ring for drive ring Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM	4 5 6 10 11 12 22 23 24 27	1 1 1 1 1 1 1 1 1 1
LKH-10, LKH-15	6-9611-92-2560				
LKH-20	6-9611-92-2584				
LKH-25, LKH 35, LKH-45	6-9611-92-2608				
LKH-30, LKH-40, LKH-50, LKH-60	6-9611-92-2633				
LKH-70	6-9611-92-2649				

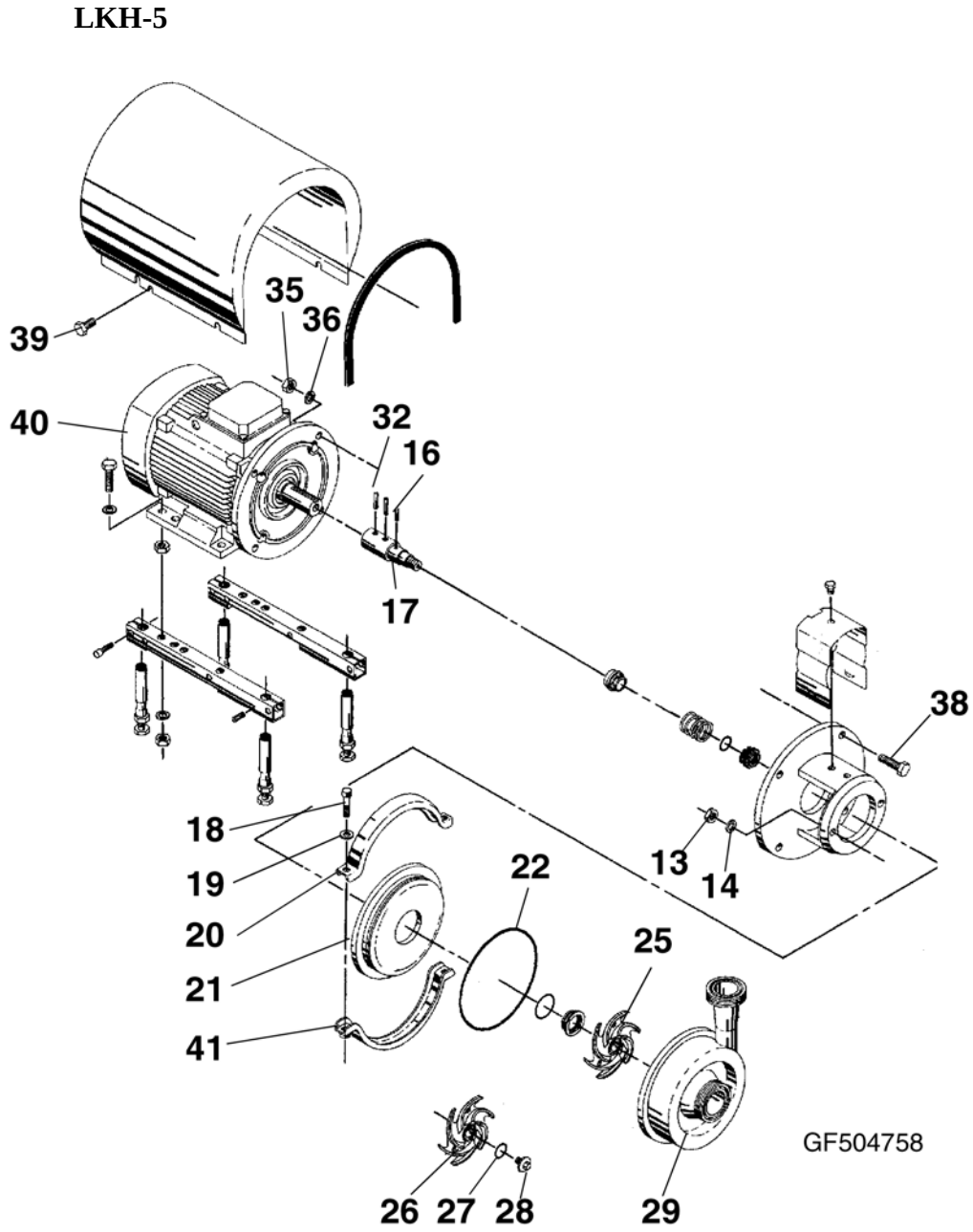
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Pump size	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-5	6-9611-92-2542	Service kit, double mechanical shaft seal, EPDM (standard)	O-ring for seal housing Spring O-ring, EPDM Rotating seal ring, SiC O-ring, EPDM (LKH 5-80) O-ring, EPDM (LKH 85-90) O-ring, EPDM Stationary seal ring, SiC O-ring, EPDM O-ring, EPDM Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 - 90 only)	5 10 11 12 22 22 23 24 27 46 47 48 50	1 1 2 2 1 2 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2566				
LKH-20	6-9611-92-2590				
LKH-25, LKH 35, LKH-45	6-9611-92-2614				
LKH-40, LKH-50, LKH-60	6-9611-92-2639				
LKH-70	6-9611-92-2651				
LKH-80	6-9611-92-2863				
LKH-85	6-9611-92-2972				
LKH-90	6-9611-92-2887				
LKH-5	6-9611-92-2543	Service kit, double mechanical shaft seal, NBR	O-ring for seal housing Spring O-ring, NBR Rotating seal ring, SiC O-ring, NBR (LKH 5-80) O-ring, NBR (LKH 85-90) O-ring, NBR Stationary seal ring, SiC O-ring, NBR O-ring, NBR Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 - 90 only)	5 10 11 12 22 22 23 24 27 46 47 48 50	1 1 2 2 1 2 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2567				
LKH-20	6-9611-92-2591				
LKH-25, LKH 35, LKH-45	6-9611-92-2615				
LKH-40, LKH-50, LKH-60	6-9611-92-2640				
LKH-70	6-9611-92-2652				
LKH-80	6-9611-92-2864				
LKH-85	6-9611-92-2973				
LKH-90	6-9611-92-2888				
LKH-5	6-9611-92-2544	Service kit, double mechanical shaft seal, FPM	O-ring for seal housing Spring O-ring, FPM Rotating seal ring, SiC O-ring, FPM O-ring, FPM Stationary seal ring, SiC O-ring, FPM O-ring, FPM Sec. stationary seal ring, SiC Drive ring Cup (LKH 70 only)	5 10 11 12 22 23 24 27 46 47 48 50	1 1 2 2 1 1 1 1 1 1 1 2
LKH-10, LKH-15	6-9611-92-2568				
LKH-20	6-9611-92-2592				
LKH-25, LKH 35, LKH-45	6-9611-92-2616				
LKH-40, LKH-50, LKH-60	6-9611-92-2641				
LKH-70	6-9611-92-2653				

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Spare parts

LKH 5



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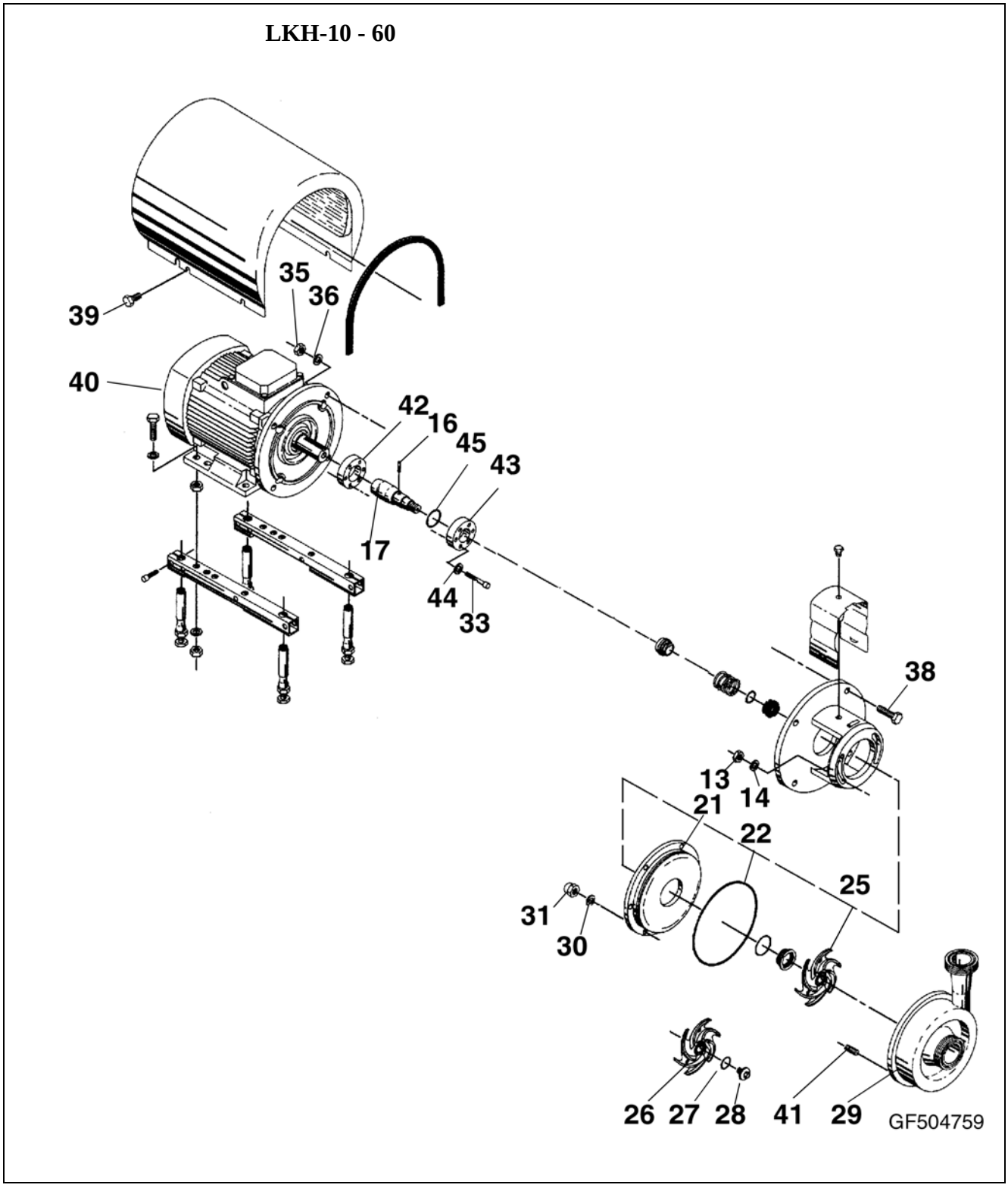
Remarks: Check the impeller size. It might be reduced as a pump option.

LKH 5

Spare parts. LKH-5 0,75 - 2,2 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0360	Nut	13	2
6-9611-99-1831	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-58-8101	**0,75 - 1,1 kW:** Shaft and pin (pos 16)	17	1
6-9612-58-8201	**1,5 - 2,2 kW:** Shaft and pin (pos 16)		
6-9611-99-1126	Screw	18	2
6-9611-99-1831	Spring washer	19	2
6-9612-58-9502	Upper clamp	20	1
6-9612-13-8430	Back plate, Ra 0,8	21	1
6-9611-99-3560	O-ring, EPDM	22	1
6-9611-99-3561	O-ring, NBR		
6-9611-99-2652	O-ring, FPM		
6-9612-5876-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-5876-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2750	O-ring, EPDM	27	1
6-9611-99-2751	O-ring, NBR		
6-9611-99-2752	O-ring, FPM		
6-9612-3627-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-26	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-27	Pump casing, DIN, Ra 0,8		
6-9612-5875-01	**0,75 - 1,1 kW:** Screw	32	2
6-9612-5875-02	**1,5 - 2,2 kW:** Screw		
6-9611-99-0353	Nut for adaptor	35	4
6-9611-99-1887	Washer for adaptor	36	4
6-9611-99-1911	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-9612-4028-38	Motor 220/240 / 380/420 V, 0,75 kW	40	1
6-31801-2062-1	Motor 220/240 / 380/420 V, 1,1 kW		
6-31801-1982-1	Motor 220/240 / 380/420 V, 1,5 kW		
6-31801-1983-1	Motor 220/240 / 380/420 V, 2,2 kW		
6-9612-5896-02	Lower clamp	41	1

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LKH 10 - 60



Remarks: Check the impeller size. It might be reduced as a pump option.

LKH 10

Spare parts. LKH-10 1,5 - 2,2 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1324-02	Shaft, pin and retaining ring (pos 16 + 45)	17	1
6-9612-13-8420	Back plate, Ra 0,8	21	1
6-9611-99-2137	O-ring, EPDM	22	1
6-9611-99-2139	O-ring, NBR		
6-9612-1312-15	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1312-16	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-02	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-03	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer (Period 9211-)	30	6
6-9611-99-2592	Cap nut (Period 9211-)	31	6
6-9611-99-2302	Handle (Period -9210)		
6-9611-99-3196	Screw	33	6
6-9611-99-0353	Nut for adaptor	35	4
6-9611-99-1887	Washer for adaptor	36	4
6-9611-99-2161	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-31801-1982-1	Motor 220/240 / 380/420 V, 1,5 kW	40	1
6-31801-1983-1	Motor 220/240 / 380/420 V, 2,2 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-01	Compression ring with thread	42	1
6-9612-1337-01	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6
6-9611-99-2307	Retaining ring	45	1

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Spare parts. LKH-10 3 - 4 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	Shaft and pin and retaining ring (pos 16)	17	1
6-9612-13-8420	Back plate, Ra 0,8	21	1
6-9611-99-2137	O-ring, EPDM	22	1
6-9611-99-2139	O-ring, NBR		
6-9612-1312-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1312-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-02	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-03	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer (Period 9211-)	30	6
6-9611-99-2592	Cap nut (Period 9211-)	31	6
6-9611-99-2302	Handle (Period -9210)		
6-9611-99-3196	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-31801-1984-1	Motor 220/240 / 380/420 V, 3 kW	40	1
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-02	Compression ring with thread	42	1
6-9612-1337-02	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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LKH 15

Spare parts. LKH-15 1,5 - 2,2 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	Shaft and pin (pos 16)	17	1
6-9612-13-8420	Back plate, Ra 0,8	21	1
6-9611-99-2137	O-ring, EPDM	22	1
6-9611-99-2139	O-ring, NBR		
6-9612-4314-09	Impeller without impeller screw, Ra 0,8	25	1
6-9612-4314-10	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-02	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-03	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer	30	6
6-9611-99-2592	Cap nut	31	6
6-9611-99-3196	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-31801-1982-1	Motor 220/240 / 380/420 V, 1,5 kW	40	1
6-31801-1983-1	Motor 220/240 / 380/420 V, 2,2 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-02	Compression ring with thread	42	1
6-9612-1337-02	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-15 3 - 5,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	Shaft and pin (pos 16)	17	1
6-9612-13-8420	Back plate, Ra 0,8	21	1
6-9611-99-2137	O-ring, EPDM	22	1
6-9611-99-2139	O-ring, NBR		
6-9612-4314-09	**3 kW:** Impeller without impeller screw, Ra 0,8	25	1
6-9612-4314-05	**4 - 5,5 kW:** Impeller without impeller screw, Ra 0,8		
6-9612-4314-10	**3 kW:** Impeller for impeller screw, Ra 0,8	26	1
6-9612-4314-06	**4 - 5,5 kW:** Impeller for impeller screw, Ra 0,8		
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-02	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-03	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer	30	6
6-9611-99-2592	Cap nut	31	6
6-9611-99-3196	**3 kW:** Screw	33	6
6-9611-99-3197	**4 - 5,5 kW:** Screw		
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	**3 kW:** Screw for adaptor	38	4
6-9611-99-2162	**4 - 5,5 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-31801-1984-1	Motor 220/240 / 380/420 V, 3 kW	40	1
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW		
6-9612-4028-15	Motor 220/240 / 380/420 V, 5,5 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-02	**3 kW:** Compression ring with thread	42	1
6-9612-1336-05	**4 - 5,5 kW:** Compression ring with thread		
6-9612-1337-02	**3 kW:** Compression ring without thread	43	1
6-9612-1337-05	**4 - 5,5 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 20

Spare parts. LKH-20 1,5 - 3 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1324-02	**1,5 - 2,2 kW:** Shaft, pin and retaining ring (pos 16 + 45)	17	1
6-9612-1325-02	**3 kW:** Shaft and pin (pos 16)		
6-9612-13-8421	Back plate, Ra 0,8	21	1
6-9611-99-2141	O-ring, EPDM	22	1
6-9611-99-2143	O-ring, NBR		
6-9612-4314-09	Impeller without impeller screw, Ra 0,8	25	1
6-9612-4314-10	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-07	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-08	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer (Period 9211-)	30	6
6-9611-99-2592	Cap nut (Period 9211-)	31	6
6-9611-99-2302	Handle (Period -9210)		
6-9611-99-3196	Screw	33	6
6-9611-99-0353	**1,5 - 2,2 kW:** Nut for adaptor	35	4
6-9611-99-0587	**3 kW:** Nut for adaptor		
6-9611-99-1887	**1,5 - 2,2 kW:** Washer for adaptor	36	4
6-9611-99-0676	**3 kW:** Washer for adaptor		
6-9611-99-2161	**1,5 - 2,2 kW:** Screw for adaptor	38	4
6-9611-99-1834	**3 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-31801-1982-1	Motor 220/240 / 380/420 V, 1,5 kW	40	1
6-31801-1983-1	Motor 220/240 / 380/420 V, 2,2 kW		
6-31801-1984-1	Motor 220/240 / 380/420 V, 3 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-01	**1,5 - 2,2 kW:** Compression ring with thread	42	1
6-9612-1336-02	**3 kW:** Compression ring with thread		
6-9612-1337-01	**1,5 - 2,2 kW:** Compression ring without thread	43	1
6-9612-1337-02	**3 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6
6-9611-99-2307	Retaining ring	45	1

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Spare parts. LKH-20 4 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	**4 kW:** Shaft and pin (pos 16)	17	1
6-9612-1326-02	**5,5 - 7,5 kW:** Shaft and pin (pos 16)		
6-9612-13-8421	Back plate, Ra 0,8	21	1
6-9611-99-2141	O-ring, EPDM	22	1
6-9611-99-2143	O-ring, NBR		
6-9612-1314-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1314-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-07	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-08	Pump casing, DIN, Ra 0,8		
6-9611-99-1888	Washer	30	6
6-9611-99-2592	Cap nut	31	6
6-9611-99-3196	**4 kW:** Screw	33	6
6-9611-99-3197	**5,5 - 7,5 kW:** Screw		
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	**4 kW:** Screw for adaptor	38	4
6-9611-99-2162	**5,5 - 7,5 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW	40	1
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW		
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2168	Bolt	41	6
6-9612-1336-02	**4 kW:** Compression ring with thread	42	1
6-9612-1336-05	**5,5 - 7,5 kW:** Compression ring with thread		
6-9612-1337-02	**4 kW:** Compression ring without thread	43	1
6-9612-1337-05	**5,5 - 7,5 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 25

Spare parts. LKH-25 4 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	**4 kW:** Shaft and pin (pos 16)	17	1
6-9612-1326-02	**5,5 - 7,5 kW:** Shaft and pin (pos 16)		
6-9612-13-8424	Back plate	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-4252-07	Impeller without impeller screw, Ra 1,6	25	1
6-9612-4252-08	Impeller for impeller screw, Ra 1,6	26	1
6-9612-4252-10	Impeller for impeller screw, Ra 0,8		
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-07	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-08	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3196	**4 kW:** Screw	33	6
6-9611-99-3197	**5,5 - 7,5 kW:** Screw		
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-1887	Washer for adaptor	36	4
6-9611-99-1834	**4 kW:** Screw for adaptor	38	4
6-9611-99-2162	**5,5 - 7,5 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW	40	1
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW		
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-02	**4 kW:** Compression ring with thread	42	1
6-9612-1336-05	**5,5 - 7,5 kW:** Compression ring with thread		
6-9612-1337-02	**4 kW:** Compression ring without thread	43	1
6-9612-1337-05	**5,5 - 7,5 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-25 11 - 15 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1327-02	Shaft and pin (pos 16)	17	1
6-9612-13-8424	Back plate, Ra 0,8	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-4252-01	Impeller without impeller screw, Ra 1,6	25	1
6-9612-4252-02	Impeller for impeller screw, Ra 1,6	26	1
6-9612-4252-06	Impeller for impeller screw, Ra 0,8		
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-07	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-08	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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LKH 30

Spare parts. LKH-30 5,5 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	Shaft and pin (pos 16)	17	1
6-9612-13-8406	Back plate, Ra 1,6	21	1
6-9611-99-2171	Joint ring, EPDM	22	1
6-9611-99-2173	Joint ring, NBR		
6-9612-1316-07	Impeller without impeller screw, Ra 1,6	25	1
6-9612-1316-08	Impeller for impeller screw, Ra 1,6	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O-ring, NBR		
6-9612-1396-01	Impeller screw, Ra 1,6	28	1
6-9612-1398-12	Pump casing, SMS, Ra 1,6	29	1
6-9612-1398-13	Pump casing, DIN, Ra 1,6		
6-9611-99-1887	Washer (Period 9211-)	30	6
6-9611-99-2593	Cap nut (Period 9211-)	31	6
6-9611-99-2303	Handle (Period -9210)		
6-9611-99-3197	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-2162	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW	40	1
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-05	Compression ring with thread	42	1
6-9612-1337-05	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-30 11 - 22 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	Shaft and pin (pos 16)	17	1
6-9612-13-8406	Back plate, Ra 1,6	21	1
6-9611-99-2145	Joint ring, EPDM	22	1
6-9611-99-2147	Joint ring, NBR		
6-9612-1316-01	Impeller without impeller screw, Ra 1,6	25	1
6-9612-1316-02	Impeller for impeller screw, Ra 1,6	26	1
6-9611-99-2141	O-ring, EPDM	27	1
6-9611-99-2143	O-ring, NBR		
6-9612-1396-01	Impeller screw, Ra 1,6	28	1
6-9612-1398-12	Pump casing, SMS, Ra 1,6	29	1
6-9612-1398-13	Pump casing, DIN, Ra 1,6		
6-9611-99-1887	Washer (Period 9211-)	30	6
6-9611-99-2593	Cap nut (Period 9211-)	31	6
6-9611-99-2303	Handle (Period -9210)		
6-9611-99-3197	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	**11 - 18,5 kW:** Screw for adaptor	38	4
6-9611-99-2164	**22 kW:** Screw for adaptor		
6-9611-99-3241	**11 - 18,5 kW:** Screw	39	4
6-221036-03	**22 kW:** Screw		
6-31801-0122-1	Motor 220/240 V, 11 kW	40	1
6-31801-0122-3	Motor 380/420 V, 11 kW		
6-31801-1194-1	Motor 220/240 V, 15 kW		
6-31801-1194-3	Motor 380/420 V, 15 kW		
6-31801-1867-1	Motor 220/240 V, 18,5 kW		
6-31801-1867-3	Motor 380/420 V, 18,5 kW		
6-31801-1868-1	Motor 220/240 V, 22 kW		
6-31801-1868-3	Motor 380/420 V, 22 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	**11 - 18,5 kW:** Compression ring with thread	42	1
6-9612-1336-04	**22 kW:** Compression ring with thread		
6-9612-1337-03	**11 - 18,5 kW:** Compression ring without thread	43	1
6-9612-1337-04	**22 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 35

Spare parts. LKH-35 4 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	**4 kW:** Shaft and pin (pos 16)	17	1
6-9612-1326-02	**5,5 - 7,5 kW:** Shaft and pin (pos 16)		
6-9612-13-8424	Back plate, Ra 0,8	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-4341-09	Impeller without impeller screw, Ra 0,8	25	1
6-9612-4341-10	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-12	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-13	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3196	**4 kW:** Screw	33	6
6-9611-99-3197	**5,5 - 7,5 kW:** Screw		
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	**4 kW:** Screw for adaptor	38	4
6-9611-99-2162	**5,5 - 7,5 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW	40	1
6-9612-4028-17	Motor 380/420 / 380/420 V, 5,5 kW		
6-9612-4028-32	Motor 380/420 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-02	**4 kW:** Compression ring with thread	42	1
6-9612-1336-05	**5,5 - 7,5 kW:** Compression ring with thread		
6-9612-1337-02	**4 kW:** Compression ring without thread	43	1
6-9612-1337-05	**5,5 - 7,5 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-35 11 - 15 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1327-02	Shaft and pin (pos 16)	17	1
6-9612-13-8424	Back plate, Ra 0,8	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-4341-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-4341-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-12	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-13	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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LKH 40

Spare parts. LKH-40 7,5 - 11 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	**7,5 kW:** Shaft and pin (pos 16)	17	1
6-9612-1327-02	**11 kW:** Shaft and pin (pos 16)		
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1318-09	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1318-10	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-17	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-18	Pump casing, DIN, Ra 0,8		
6-9611-99-2559	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3197	**7,5 kW:** Screw	33	6
6-9611-99-3198	**11 kW:** Screw		
6-9611-99-0587	**7,5 kW:** Nut for adaptor	35	4
6-9611-99-2160	**11 kW:** Nut for adaptor		
6-9611-99-0676	**7,5 kW:** Washer for adaptor	36	4
6-9611-99-1886	**11 kW:** Washer for adaptor		
6-9611-99-2162	**7,5 kW:** Screw for adaptor	38	4
6-9611-99-2163	**11 kW:** Screw for adaptor		
6-9611-99-3240	**7,5 kW:** Screw	39	4
6-9611-99-3241	**11 kW:** Screw		
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW	40	1
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-05	**7,5 kW:** Compression ring with thread	42	1
6-9612-1336-03	**11 kW:** Compression ring with thread		
6-9612-1337-05	**7,5 kW:** Compression ring without thread	43	1
6-9612-1337-03	**11 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-40 15 - 22 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1327-02	**15 - 18,5 kW:** Shaft and pin (pos 16)	17	1
6-9612-1328-02	**22 kW:** Shaft and pin (pos 16)		
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1318-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1318-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-17	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-18	Pump casing, DIN, Ra 0,8		
6-9611-99-2559	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	**15 - 18,5 kW:** Screw for adaptor	38	4
6-9611-99-2164	**22 kW:** Screw for adaptor		
6-9611-99-3241	**15 - 18,5 kW:** Screw	39	4
6-9611-99-3242	**22 kW:** Screw		
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW	40	1
6-9612-3454-14	Motor 220/240 / 380/420 V, 18,5 kW		
6-9612-3454-16	Motor 220/240 / 380/420 V, 22 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	**15 - 18,5 kW:** Compression ring with thread	42	1
6-9612-1336-04	**22 kW:** Compression ring with thread		
6-9612-1337-03	**15 - 18,5 kW:** Compression ring without thread	43	1
6-9612-1337-04	**22 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 45

Spare parts. LKH-45 4 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1325-02	**4 kW:** Shaft and pin (pos 16)	17	1
6-9612-1326-02	**5,5 - 7,5 kW:** Shaft and pin (pos 16)		
6-9612-13-8424	Back plate, Ra 0,8	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-3630-09	Impeller without impeller screw, Ra 0,8	25	1
6-9612-3630-10	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-17	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-18	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3197	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-1834	**4 kW:** Screw for adaptor	38	4
6-9611-99-2162	**5,5 - 7,5 kW:** Screw for adaptor		
6-9611-99-3240	Screw	39	4
6-9612-4028-07	Motor 220/240 / 380/420 V, 4 kW	40	1
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW		
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-02	**4 kW:** Compression ring with thread	42	1
6-9612-1336-05	**5,5 - 7,5 kW:** Compression ring with thread		
6-9612-1337-02	**4 kW:** Compression ring without thread	43	1
6-9612-1337-05	**5,5 - 7,5 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-45 11 - 15 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1327-02	Shaft and pin (pos 16)	17	1
6-9612-13-8424	Back plate, Ra 0,8	21	1
6-9611-99-2983	O-ring, EPDM	22	1
6-9611-99-2984	O-ring, NBR		
6-9612-3630-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-3630-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4925-17	Pump casing, SMS, Ra 0,8	29	1
6-9612-4925-18	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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LKH 50

Spare parts. LKH-50 5,5 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	Shaft and pin (pos 16)	17	1
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1320-11	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1320-12	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-22	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-23	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer (Period 9211-)	30	6
6-9611-99-2593	Cap nut (Period 9211-)	31	6
6-9611-99-2303	Handle (Period -9210)		
6-9611-99-3197	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-2162	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW	40	1
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-05	Compression ring with thread	42	1
6-9612-1337-05	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-50 11 - 22 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	Shaft and pin (pos 16)	17	1
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1320-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1320-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-4572-22	Pump casing, SMS, Ra 0,8	29	1
6-9612-4572-23	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer (Period 9211-)	30	6
6-9611-99-2593	Cap nut (Period 9211-)	31	6
6-9611-99-2303	Handle (Period -9210)		
6-9611-99-3197	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	**11 - 18,5 kW:** Screw	39	4
6-9611-99-3242	**22 kW:** Screw		
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9612-3454-14	Motor 220/240 / 380/420 V, 18,5 kW		
6-9612-3454-16	Motor 220/240 / 380/420 V, 22 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	**11 - 18,5 kW:** Compression ring with thread	42	1
6-9612-1336-04	**22 kW:** Compression ring with thread		
6-9612-1337-03	**11 - 18,5 kW:** Compression ring without thread	43	1
6-9612-1337-04	**22 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 60

Spare parts. LKH-60 5,5 - 7,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1326-02	Shaft and pin (pos 16)	17	1
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1283-07	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1283-08	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-3554-10	Pump casing, SMS, Ra 0,8	29	1
6-9612-3554-11	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3197	Screw	33	6
6-9611-99-0587	Nut for adaptor	35	4
6-9611-99-0676	Washer for adaptor	36	4
6-9611-99-2162	Screw for adaptor	38	4
6-9611-99-3240	Screw	39	4
6-9612-4028-17	Motor 220/240 / 380/420 V, 5,5 kW	40	1
6-9612-4028-32	Motor 220/240 / 380/420 V, 7,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-05	Compression ring with thread	42	1
6-9612-1337-05	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-60 11 - 18,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1327-02	Shaft and pin (pos 16)	17	1
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1283-09	**11 - 15 kW:** Impeller without impeller screw, Ra 0,8	25	1
6-9612-1283-05	**18,5 kW:** Impeller without impeller screw, Ra 0,8		
6-9612-1283-10	**11 - 15 kW:** Impeller for impeller screw, Ra 0,8	26	1
6-9612-1283-06	**18,5 kW:** Impeller for impeller screw, Ra 0,8		
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-3554-10	Pump casing, SMS, Ra 0,8	29	1
6-9612-3554-11	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9612-3454-14	Motor 220/240 / 380/420 V, 18,5 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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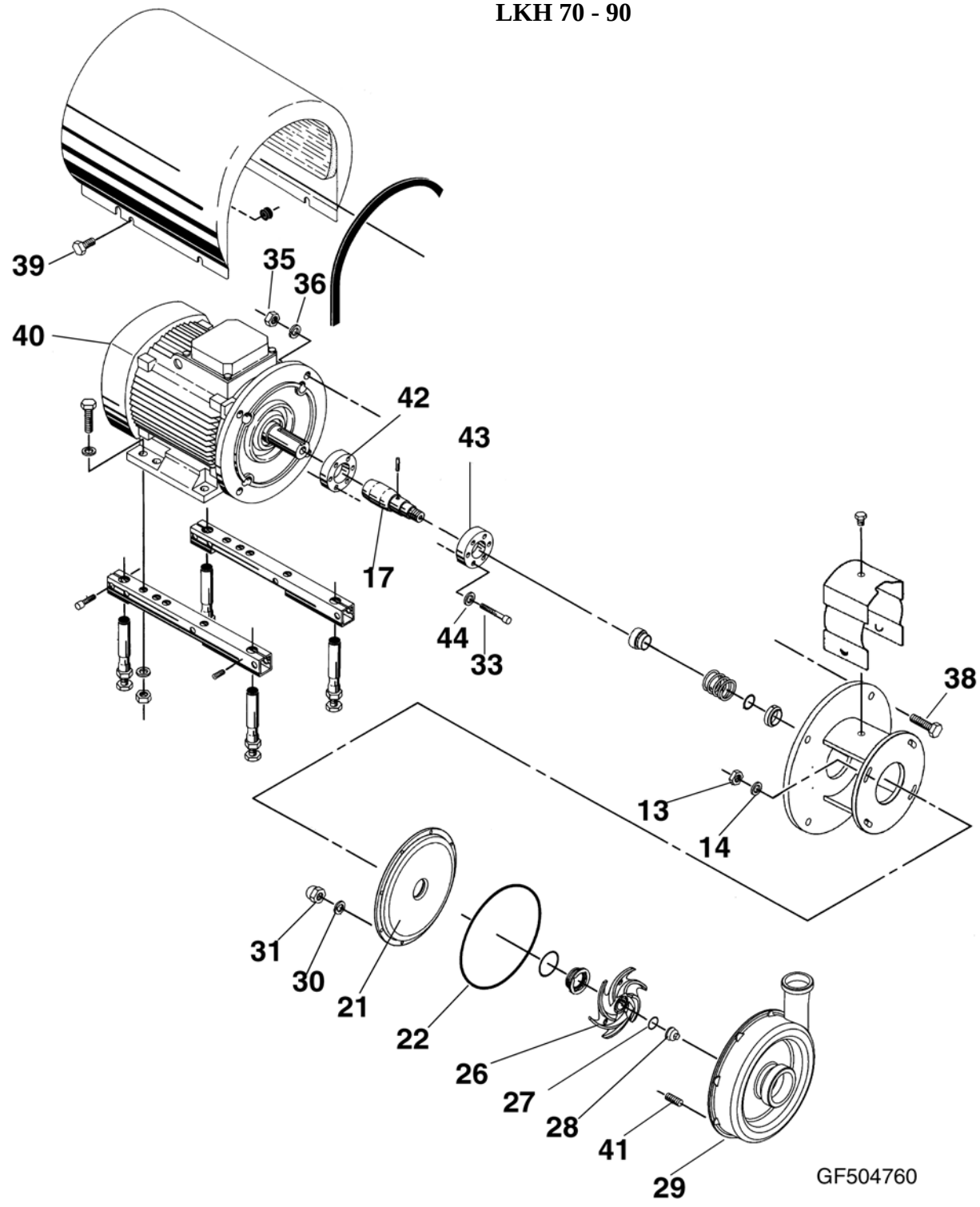
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Spare parts. LKH-60 22 - 30 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	2
6-9611-99-2559	Washer	14	2
6-9611-99-0622	Connex pin	16	1
6-9612-1328-02	**22 kW:** Shaft and pin (pos 16)	17	1
6-9612-1329-02	**30 kW:** Shaft and pin (pos 16)		
6-9612-13-8422	Back plate, Ra 0,8	21	1
6-9611-99-2171	O-ring, EPDM	22	1
6-9611-99-2173	O-ring, NBR		
6-9612-1283-05	Impeller without impeller screw, Ra 0,8	25	1
6-9612-1283-06	Impeller for impeller screw, Ra 0,8	26	1
6-9611-99-2145	O-ring, EPDM	27	1
6-9611-99-2147	O- ring, NBR		
6-9612-1396-03	Impeller screw, Ra 0,8	28	1
6-9612-3554-10	Pump casing, SMS, Ra 0,8	29	1
6-9612-3554-11	Pump casing, DIN, Ra 0,8		
6-9611-99-1887	Washer	30	6
6-9611-99-2593	Cap nut	31	6
6-9611-99-3198	Screw	33	6
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-9612-3454-16	Motor 220/240 / 380/420 V, 22 kW	40	1
6-9612-6055-02	Motor 220/240 / 380/420 V, 30 kW		
6-9611-99-2169	Bolt	41	6
6-9612-1336-04	**22 kW:** Compression ring with thread	42	1
6-9612-1336-07	**30 kW:** Compression ring with thread		
6-9612-1337-04	**22 kW:** Compression ring without thread	43	1
6-9612-1337-07	**30 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 70 - 90



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LKH 70

Spare parts. LKH-70 11 - 18,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5126-01	Shaft and pin	17	1
6-9612-5146-07	Back plate	21	1
6-9611-99-3211	O-ring, EPDM	22	1
6-9611-99-3212	O-ring, NBR		
6-9612-4994-12	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-07	Pump casing, SMS	29	1
6-9612-5147-08	Pump casing, DIN		
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	Screw	33	8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 / 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 / 380/420 V, 15 kW		
6-9612-3454-14	Motor 220/240 / 380/420 V, 18,5 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-70 22 - 37 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5123-01	**22 kW:** Shaft and pin	17	1
6-9612-5122-01	**30 - 37 kW:** Shaft and pin		
6-9612-5146-07	Back plate	21	1
6-9611-99-3211	O-ring, EPDM	22	1
6-9611-99-3212	O-ring, NBR		
6-9612-4994-12	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-07	Pump casing, SMS	29	1
6-9612-5147-08	Pump casing, DIN		
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	Screw	33	8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2164	Screw for adaptor	38	4
6-9611-99-3242	**22 kW:** Screw	39	4
6-9611-99-3243	**30 - 37 kW:** Screw		
6-9612-3454-16	Motor 220/240 / 380/420 V, 22 kW	40	1
6-9612-6055-02	Motor 220/240 / 380/420 V, 30 kW		
6-9612-6055-04	Motor 220/240 / 380/420 V, 37 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-04	**22 kW:** Compression ring with thread	42	1
6-9612-1336-07	**30 - 37 kW:** Compression ring with thread		
6-9612-1337-04	**22 kW:** Compression ring without thread	43	1
6-9612-1337-07	**30 - 37 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-70 45 - 75 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5122-01	**45 kW:** Shaft and pin	17	1
6-9612-5010-01	**55 - 75 kW:** Shaft and pin		
6-9612-5146-07	Back plate	21	1
6-9611-99-3211	O-ring, EPDM	22	1
6-9611-99-3212	O-ring, NBR		
6-9612-4994-03	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-07	Pump casing, SMS	29	1
6-9612-5147-08	Pump casing, DIN		
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	**45 kW:** Screw	33	8
6-9611-99-3266	**55 - 75 kW:** Screw		
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2164	**45 kW:** Screw for adaptor	38	4
6-9611-99-2200	**55 - 75 kW:** Screw for adaptor		
6-9611-99-3243	Screw	39	4
6-9612-6055-06	Motor 220/240 380/420 V, 45 kW	40	1
6-9612-6055-08	Motor 220/240 380/420 V, 55 kW		
6-9612-6055-10	Motor 220/240 380/420 V, 75 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-07	**45 kW:** Compression ring with thread	42	1
6-9612-1336-08	**55 - 75 kW:** Compression ring with thread		
6-9612-1337-07	**45 kW:** Compression ring without thread	43	1
6-9612-1337-08	**55 - 75kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 80

Spare parts. LKH-80 11 - 18,5 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5126-01	Shaft and pin	17	1
6-9612-5146-08	Back plate	21	1
6-9611-99-3396	O-ring, EPDM	22	1
6-9611-99-3397	O-ring, NBR		
6-9612-5197-05	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-25	Pump casing, DIN	29	1
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	Screw	33	8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2163	Screw for adaptor	38	4
6-9611-99-3241	Screw	39	4
6-31801-0122-3	Motor 220/240 380/420 V, 11 kW	40	1
6-31801-1194-3	Motor 220/240 380/420 V, 15 kW		
6-9612-3454-14	Motor 220/240 380/420 V, 18,5 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-03	Compression ring with thread	42	1
6-9612-1337-03	Compression ring without thread	43	1
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-80 22 - 37 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5123-01	**22 kW:** Shaft and pin	17	1
6-9612-5122-01	**30 - 37 kW:** Shaft and pin		
6-9612-5146-08	Back plate	21	1
6-9611-99-3396	O-ring, EPDM	22	1
6-9611-99-3397	O-ring, NBR		
6-9612-5197-05	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-25	Pump casing, DIN	29	1
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	Screw	33	8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2164	Screw for adaptor	38	4
6-9611-99-3242	**22 kW:** Screw	39	4
6-9611-99-3243	**30 - 37 kW:** Screw		
6-9612-3454-16	Motor 220/240 380/420 V, 22 kW	40	1
6-9612-6055-02	Motor220/240 380/420 V, 30 kW		
6-9612-6055-04	Motor220/240 380/420 V, 37 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-04	**22 kW:** Compression ring with thread	42	1
6-9612-1336-07	**30 - 37 kW:** Compression ring with thread		
6-9612-1337-04	**22 kW:** Compression ring without thread	43	1
6-9612-1337-07	**30 - 37 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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Spare parts. LKH-80 45 - 75 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-5122-01	**45 kW:** Shaft and pin	17	1
6-9612-5010-01	**55 - 75 kW:** Shaft and pin		
6-9612-5146-08	Back plate	21	1
6-9611-99-3396	O-ring, EPDM	22	1
6-9611-99-3397	O-ring, NBR		
6-9612-5197-02	Impeller	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-5011-02	Impeller nut	28	1
6-9612-9271-02	Impeller screw		
6-9612-5147-25	Pump casing, DIN	29	1
6-9611-99-1887	Spring washer	30	8
6-9611-99-2593	Cap nut	31	8
6-9611-99-3198	Screw	33	8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2164	**45 kW:** Screw for adaptor	38	4
6-9611-99-2200	**55 - 75 kW:** Screw for adaptor		
6-9611-99-3243	Screw	39	4
6-9612-6055-06	Motor 220/240 380/420 V, 45 kW	40	1
6-9612-6055-08	Motor 220/240 380/420 V, 55 kW		
6-9612-6055-10	Motor 220/240 380/420 V, 75 kW		
6-9611-99-2169	Pinbolt	41	8
6-9612-1336-07	**45 kW:** Compression ring with thread	42	1
6-9612-1336-08	**55 - 75 kW:** Compression ring with thread		
6-9612-1337-07	**45 kW:** Compression ring without thread	43	1
6-9612-1337-08	**55 - 75 kW:** Compression ring without thread		
6-9611-99-3199	Washer	44	6

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LKH 85

Spare parts. LKH-85 30- 110 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353	Nut	13	4
6-9611-99-2559	Washer	14	4
6-9612-51-2203	**30 - 45 kW:** Shaft and pin	17	1
6-9612-50-1003	**55 - 75 kW:** Shaft and pin		
6-9613-40-6501	**90 - 110 kW:** Shaft and pin		
6-9612-51-4614	Back plate, Ra < 0,8 µm	21	1
6-9611-99-4249	O-ring, EPDM	22	2
6-9611-99-4250	O-ring, NBR		
6-9613-41-6102	Impeller, Ra < 0,8 µm	26	1
6-9611-99-3215	O-ring, EPDM	27	1
6-9611-99-3216	O- ring, NBR		
6-9612-92-7105	Impeller screw, Ra < 0,8 µm	28	1
6-9613-40-5508	Pump casing, DIN, Ra < 0,8 µm	29	1
6-9611-99-1887	Spring washer	30	16
6-9611-99-2593	Cap nut	31	16
6-9611-99-3198	**30 - 45 kW:** Screw	33	6
6-9611-99-3266	**55 - 75 kW:** Screw		
	90 - 110 kW: Screw		8
6-9611-99-2160	Nut for adaptor	35	4
6-9611-99-1886	Washer for adaptor	36	4
6-9611-99-2164	**30 - 45 kW:** Screw for adaptor	38	4
6-9611-99-2200	**55 - 110 kW:** Screw for adaptor		
6-9611-99-3243	Screw	39	4
6-9611-99-2169	Pinbolt	41	16
6-9612-13-3607	**30 - 45 kW:** Compression ring with thread	42	1
6-9612-13-3608	**55 - 75 kW:** Compression ring with thread		
6-9612-13-3609	**90 - 110 kW:** Compression ring with thread		
6-9612-13-3707	**30 - 45 kW:** Compression ring without thread	43	1
6-9612-13-3708	**55 - 75 kW:** Compression ring without thread		
6-9612-13-3709	**90 - 110 kW:** Compression ring without thread		
6-9611-99-3199	**30 - 75 kW:** Washer	44	6
	90 - 110 kW: Washer		8

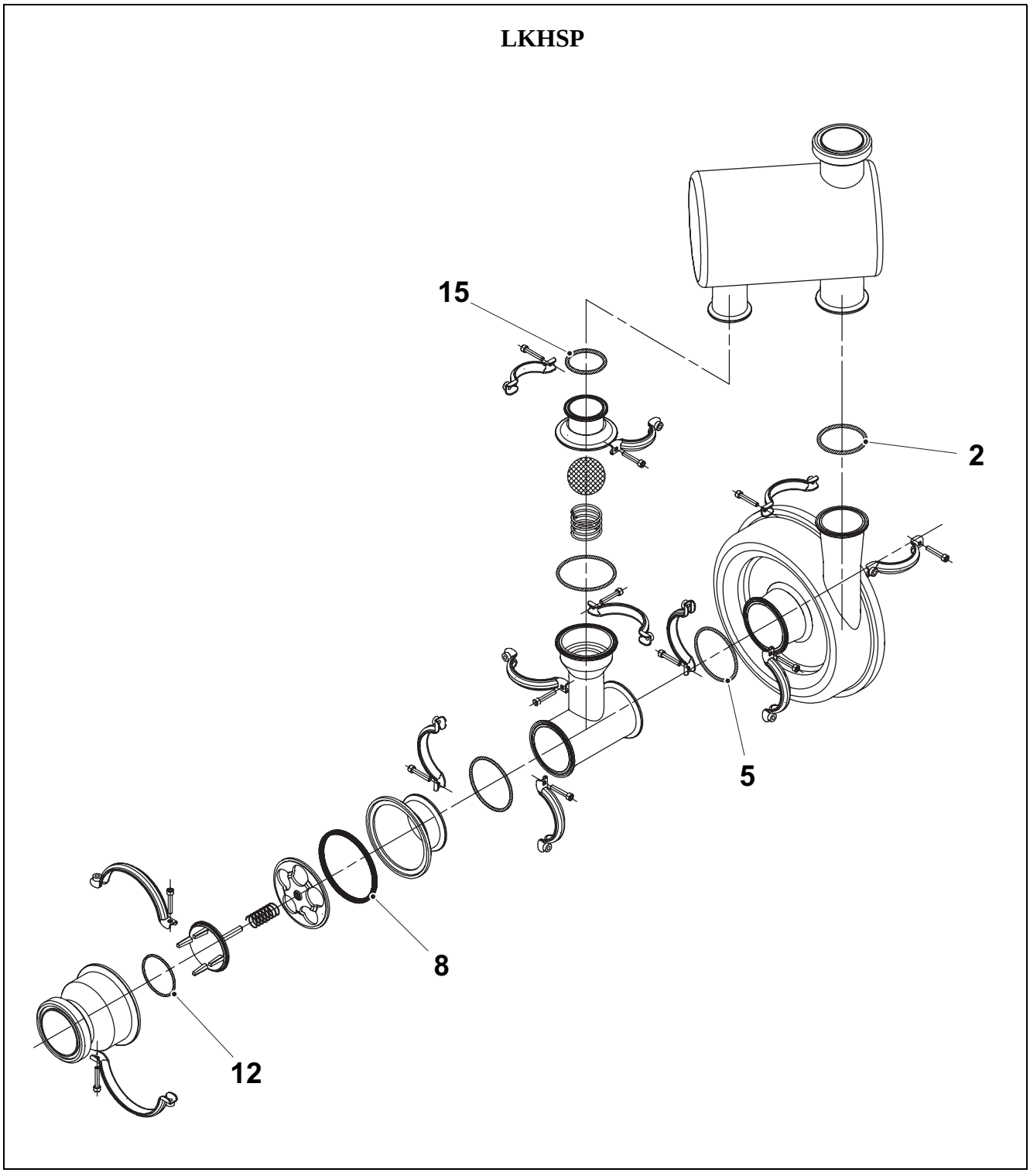
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LKH 90

Spare parts. LKH-90 30- 75 kW, 50 Hz			
Article No.	**Description**	**Pos.**	**Qty.**
6-9611-99-0353x	Nut	13	4
6-9611-99-2559x	Washer	14	4
6-9612-51-2203x	**30 - 45 kW:** Shaft and pin	17	1
6-9613-40-6501x	**55 - 75 kW:** Shaft and pin		
6-9612-51-4611x	Back plate, Ra < 0,8 µm	21	1
6-9613-40-4701x	O-ring, EPDM	22	2
6-9613-40-4702x	O-ring, NBR		
6-9613-40-5902x	Impeller, Ra < 0,8 µm	26	1
6-9611-99-3215x	O-ring, EPDM	27	1
6-9611-99-3216x	O- ring, NBR		
6-9612-92-7104x	Impeller screw, Ra < 0,8 µm	28	1
6-9613-40-5504x	Pump casing, DIN, Ra < 0,8 µm	29	1
6-9611-99-1887x	Spring washer	30	16
6-9611-99-2593x	Cap nut	31	16
6-9611-99-3198x	**30 - 45 kW:** Screw	33	6
6-9611-99-3266x	**55 - 75 kW:** Screw		8
6-9611-99-2160x	Nut for adaptor	35	4
6-9611-99-1886x	Washer for adaptor	36	4
6-9611-99-2164x	**30 - 45 kW:** Screw for adaptor	38	4
6-9611-99-2200x	**55 - 75 kW:** Screw for adaptor		
6-9611-99-3243x	Screw	39	4
6-9611-99-2169x	Pinbolt	41	16
6-9612-13-3607x	**30 - 45 kW:** Compression ring with thread	42	1
6-9612-13-3609x	**55 - 75 kW:** Compression ring with thread		
6-9612-13-3707	**30 - 45 kW:** Compression ring without thread	43	1
6-9612-13-3709	**55 - 75 kW:** Compression ring without thread		
6-9611-99-3199	**30 - 45 kW:** Washer	44	6
	55 - 75 kW: Washer		8

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LKHSP



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Non-specified information is identical with the data for the standard LKH pump.

Spare parts Article No.	Description	Included parts	Pos.	Qty.
6-9611-92-2248	Spare part kit, LKHSP-10, 20, 35, EPDM	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1
6-9611-92-2249	Spare part kit, LKHSP-10, 20, 35, NBR	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1
6-9611-92-2250	Spare part kit, LKHSP-10, 20, 35, FPM	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1
6-9611-92-2251	Spare part kit, LKHSP-25, 40, EPDM	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1
6-9611-92-2252	Spare part kit, LKHSP-25, 40, NBR	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1
6-9611-92-2253	Spare part kit, LKHSP-25, 40, FPM	Seal ring Seal ring Seal ring O-ring Seal ring	2 5 8 12 15	1 1 1 1 1

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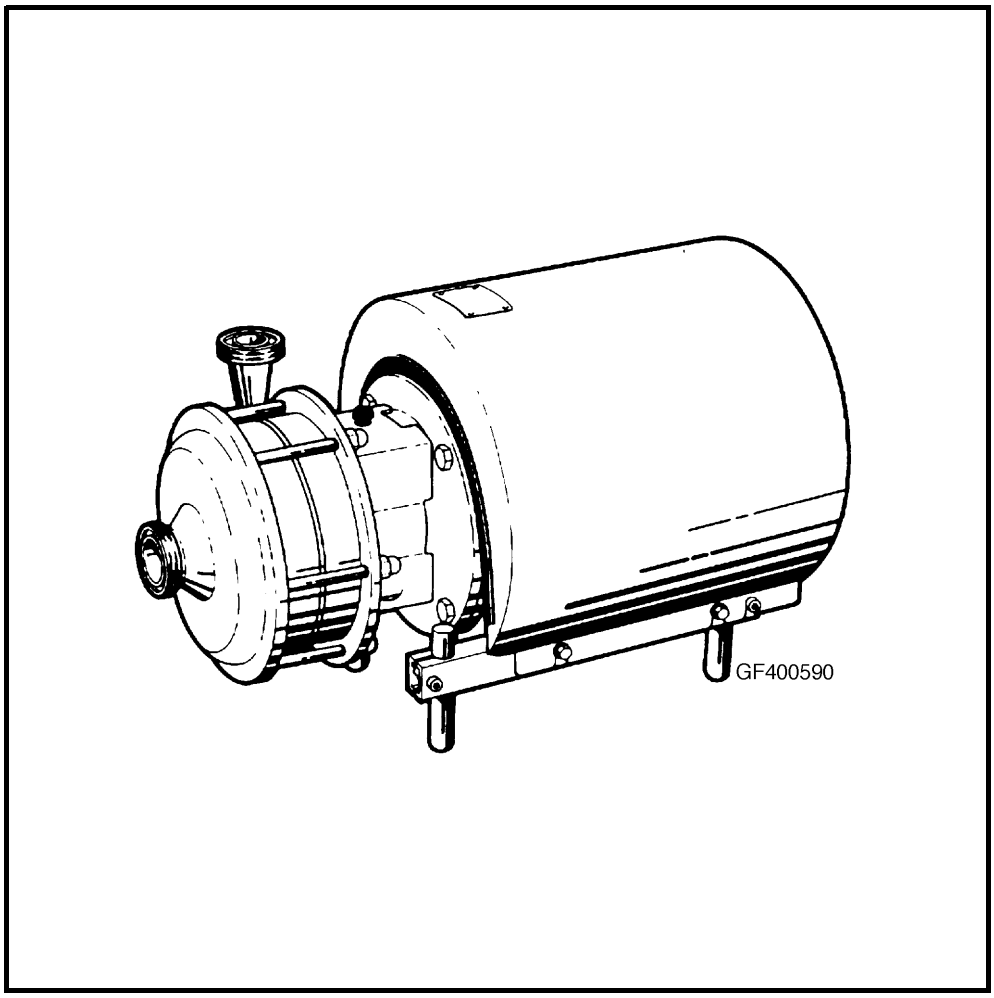
Tetra Pak

Maintenance & Spare Parts

Multistage centrifugal pump

(Alfa Laval Flow)

LKH 112/113/114/122/123/124



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Tetra Pak

Doc No. 1214248-0101

Multistage centrifugal pump

LKH 112/113/114/122/123/124

This document refers to components specified in Technical Manual, Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 05 Issue 2007-08

Doc No. 1214248-0101

Tetra Pak

Tetra Pak Processing Systems AB

Maintenance **1**

General 1

Change shaft seal. 1

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Spare parts **14**

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Maintenance

General

The LKH-110 series includes the multistage centrifugal pumps LKH-112, LKH-113, LKH-114, LKH-122, LKH-123 and LKH-124. The last digit indicates the number of stages of the pump.

Change shaft seal

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

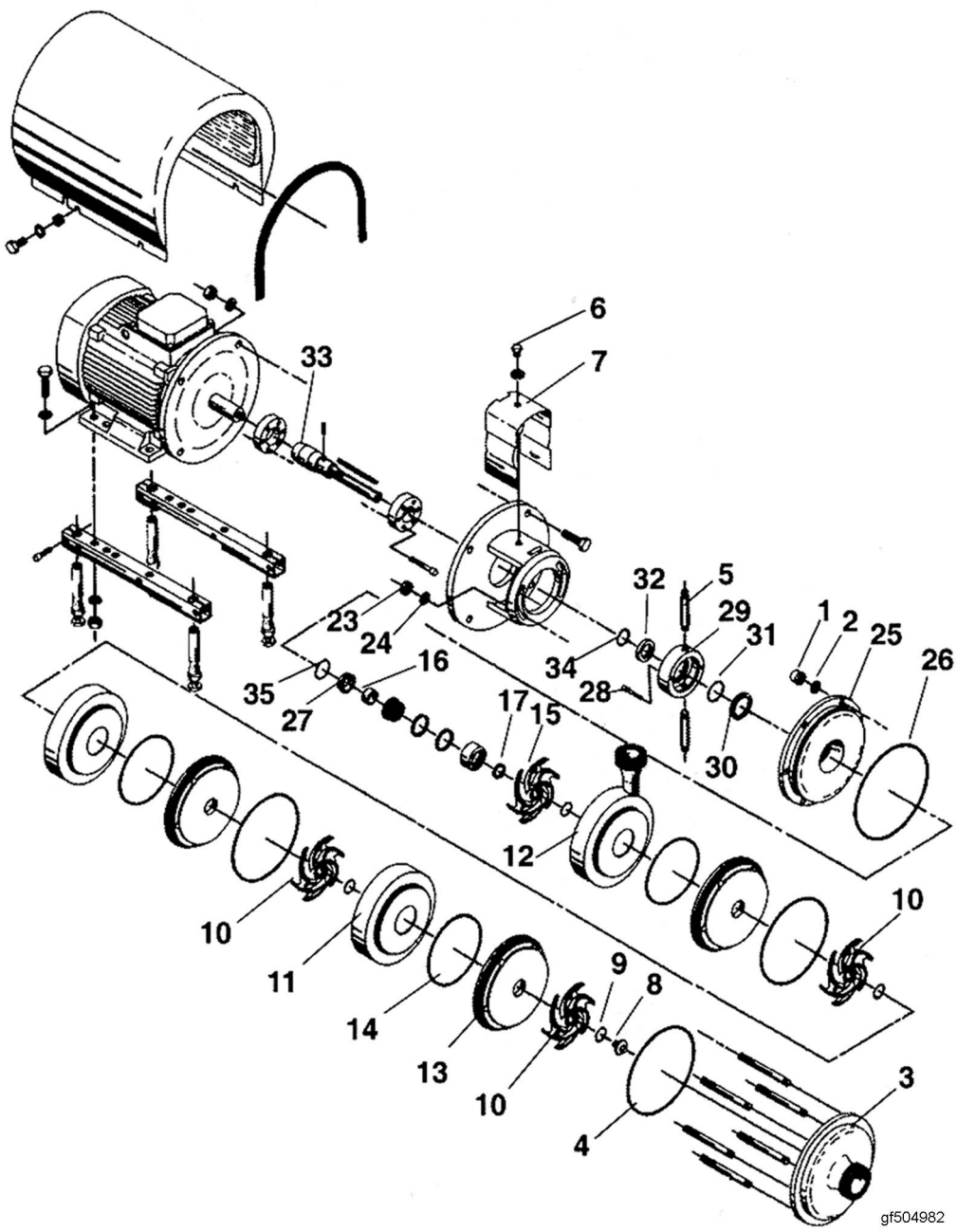
Never service the pump when it is hot.
Never service the pump with pump and pipelines under pressure.
Always disconnect the power supply before servicing the pump.
Never run the pump with both the suction side and the pressure side blocked.
Never start in the wrong direction of rotation when there is liquid in the pump.
Never touch the pump or the pipelines when pumping hot liquids or when sterilizing.

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Note! All scrap must be stored/disposed in accordance with current rules/ directives.

Disassemble

a) Remove the cap nuts (1), washer (2), pump cover (3), and O-ring (4).
b) **If flushed shaft seal:** Remove the tubes (5).
c) Remove the screw (6) and adaptor guard (7).
d) Remove the impeller screw (8), O-ring (9), and impeller (10).
e) Remove the intermediate casing (11) (LKH-113/114/123/124) and/or pump casing (12). Use a rubber mallet if necessary.
f) Remove the impeller (10) in between the stages.
g) Remove the guide vanes (13) and the O-ring (14) from the intermediate casing (LKH-113/114/123/124)and/or pump casing (12).
h) Remove the impeller (15) and the rotating part of the shaft seal.
i) Remove the space ring (16), the rotating part of the shaft seal and quad ring (17) from the impeller (15).

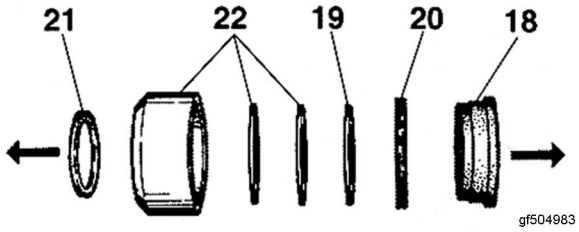


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1	Cap nut	13	Guide vane	25	Back plate
2	Washer	14	O-ring	26	O-ring
3	Pump cover	15	Impeller	27	Seal ring
4	O-ring	16	Space ring	28	Screw
5	Tube	17	Quad ring	29	Seal housing
6	Screw	18	Seal ring	30	Lip seal
7	Adaptor guard	19	Support ring	31	O-ring
8	Impeller screw	20	Quad ring	32	Seal ring
9	O-ring	21	Quad ring	33	Stub shaft
10	Impeller	22	Seal housing	34	O-ring
11	Intermediate casing	23	Nut	35	O-ring
12	Pump casing	24	Washer		

(Cont'd)

j) Remove the rotating seal ring (18), support ring (19), and the Quad rings (20) and (21) from the rotating seal housing (22), see figure.



18 Seal ring
19 Support ring
20 Quad ring
21 Quad ring
22 Seal housing

k) Remove the nuts (23), the washers (24), and the back plate (25).

l) Remove the O-ring (26) from the back plate.

m) Remove the stationary seal ring (27).

n) Remove the O-ring (35) from the stationary seal ring (27).

Note! **The paragraphs o) - r) only applies for pumps with flushed shaft seal.**

o) Remove the screws (28) and seal housing (29).

p) Remove the lip seal (30) and O-ring (31) from the seal housing (29).

q) Remove the seal ring (32) from the stub shaft (33).

r) Remove the O-ring (34) from the seal rings.

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Reassemble

Before reassembling, change the parts of the service kit.

Note! Lubricate O-rings, quad rings, and rubber seals with silicon grease or silicone oil.

a) Assemble the rotating part of the shaft seal, see figure.

b) Fit the rotating part and space ring (16) on impeller (15).

Caution! Ensure that the driver in the rotating seal housing enters the notch in the rotating seal ring.

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c) Fit the impeller (15) and (10) on the stub shaft (33).

d) Ensure that the clearance between the impeller (15) and back plate (25) is 1 mm.

e) Remove the impeller (15) and (10), and back plate (25).

f) Fit the O-ring (35) on the stationary seal ring (27).

g) Press the stationary seal ring in back plate (25).

Note! The paragraphs h) - j) only applies for pumps with flushed shaft seal.

h) Fit the lip seal (30) and O-ring (31) in the seal housing (29).

i) Fit the seal housing (29) on back plate (25) and tighten the screws (28).

j) Fit the seal ring (32) with O-ring (34) on the stub shaft (33).

k) Fit the back plate (35), washers (24), and nuts (23).

l) Fit the impeller (15).

m) Fit the O-ring (4) on the back plate.

n) Fit the pump casing (12) on back plate (25).

o) Fit the impeller (10) on the stub shaft (33).

p) Fit the O-ring (14) and guide vanes (13) on intermediate casing (11) (LKH-113/114/123/124) and/or pump casing (12).

q) Fit the intermediate casing (11).

r) Fit the impeller (10) and O-ring (9).

s) Fit and tighten the impeller screw (8). Counterhold with a screwdriver.

t) Fit the O-ring (4) and pump cover (3).

u) Fit the washers (2) and the cap nuts (1).

v) Fit the adaptor guard (7) and screw (6).

w) **If flushed shaft seal:** Fit the tubes (5) on seal housing (29).

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Relubrication Intervals

Motors without grease nipples are permanently lubricated. For motors with grease nipples relubrication intervals are shown in the table below.

Relubrication interval 50 Hz (3000 rpm)/Relubrication interval 60 Hz (3600 rpm).

(Vendor) quantity in Drive End/quantity in Non Drive End.

Frame size	Motor power (kW)	LKH-5 - 80 LKHI-10 - 60* LKH-110* LKHSP LKH Ultra Pure 50/60 Hz	LKH-10 - 60 LKHI-10 - 60 LKH-110 50/60 Hz	LKH-122/P LKH-123/P LKH-124/P 50/60 Hz
80	0.75	Permanently lubricated (ABB)	Not available	Not available
80	1.1	Permanently lubricated (ABB)	Not available	Not available
90	1.5	Permanently lubricated (ABB)	Permanently lubricated (ABB)	Not available
90	2.2	Permanently lubricated (ABB)	Permanently lubricated (ABB)	Not available
100	3.0	Permanently lubricated (ABB)	Not available	Not available
112	4.0	Permanently lubricated (ABB)	4300h/3300h (ABB) DE:10g NDE:10g	Not available
132	5.5	Permanently lubricated (ABB)	3600h/3000h (ABB) DE:15g NDE:15g	Not available
132	7.5	Permanently lubricated (ABB)	3600h/3000h (ABB) DE:15g NDE:15g	Not available
160	11	Permanently lubricated (ABB)	3100h/2300h (ABB) DE:25g NDE:25g	Not available
160	15	Permanently lubricated (ABB)	3100h/2300h (ABB) DE:25g NDE:25	Not available
160	18.5	Permanently lubricated (ABB)	3100h/2300h (ABB) DE:25g NDE:25	Not available
180	22	Permanently lubricated (ABB)	2600h/2000h (ABB) DE:30g NDE:30g	Not available

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Frame size	Motor power (kW)	LKH-5 - 80 LKHI-10 - 60* LKH-110* LKHSP LKH Ultra Pure 50/60 Hz	LKH-10 - 60 LKHI-10 - 60 LKH-110 50/60 Hz	LKH-122/P LKH-123/P LKH-124/P 50/60 Hz
200	30	4300h/3500h (Brook) DE:23g NDE:23g	4300h/3500h (Brook) DE:45g NDE:45g	4300h/3500h (Brook) DE:45g NDE:45g
200	37	4300h/3500h (Brook) DE:23g NDE:23g	4300h/3500h (Brook) DE45g NDE:45g	4300h/3500h (Brook) DE45g NDE:45g
200	45	4300h/3500h (Brook) DE:23g NDE:23g	4300h/3500h (Brook) DE:45g NDE:45g	4300h/3500h (Brook) DE:45g NDE:45g
250	55	3950h/3200h (Brook) DE 26g NDE:26g	Not available	3950h/3200h (Brook) DE:45g NDE:45g
250	75	3950h/3200h (Brook) DE 26g NDE:26g	Not available	3950h/3200h (Brook) DE:45g NDE.45g

* inlet pressure < 10 bar

Note! The table is for 100°C internal bearing temperature. An increase in temperature of 15°C (ambient or internal in bearings), will reduce the greasing interval and bearing lifetime by 50%.

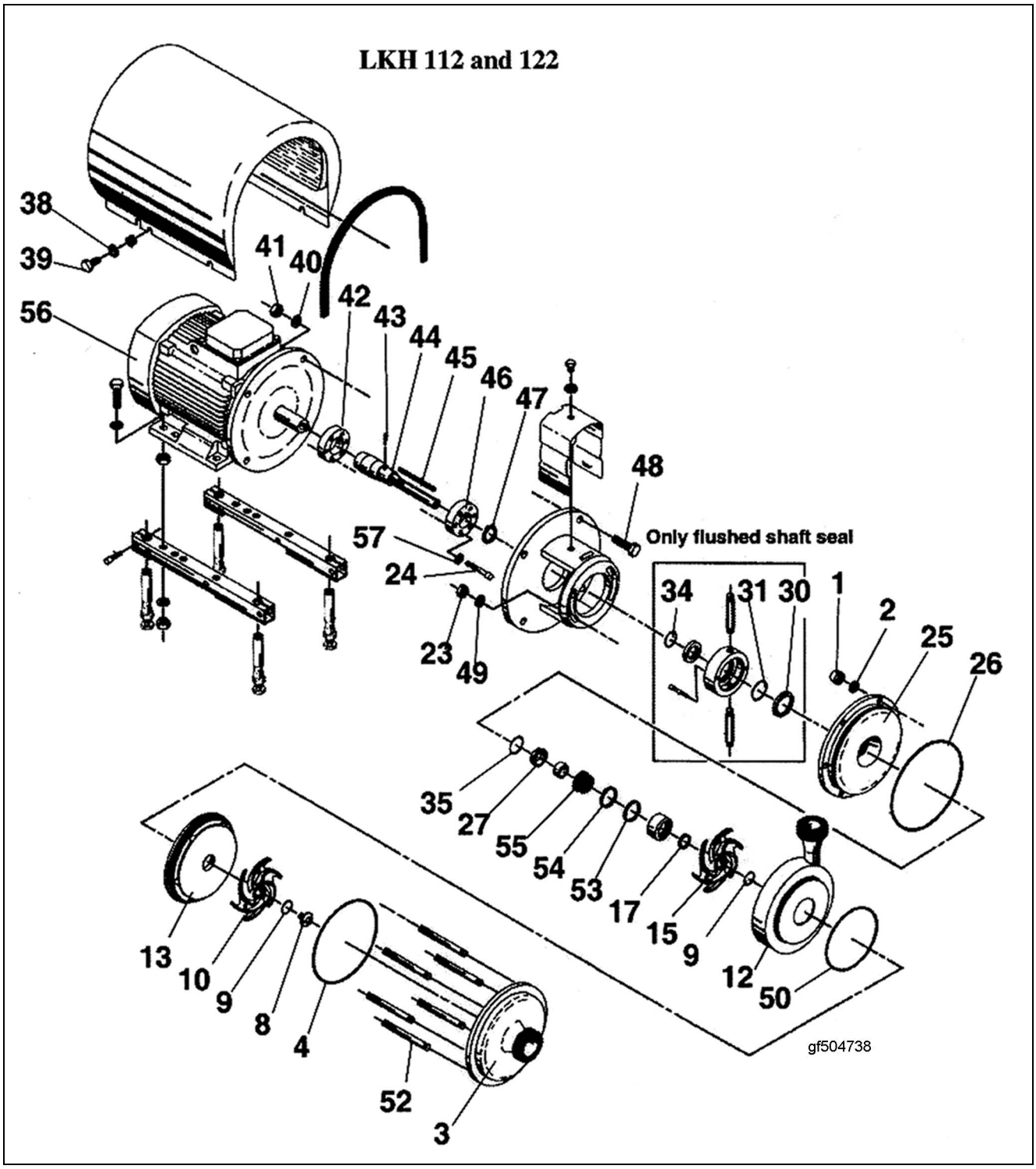
Note! Lubrication interval for vertically mounted pumps is half the value stated in the table.

Recommended grease types:

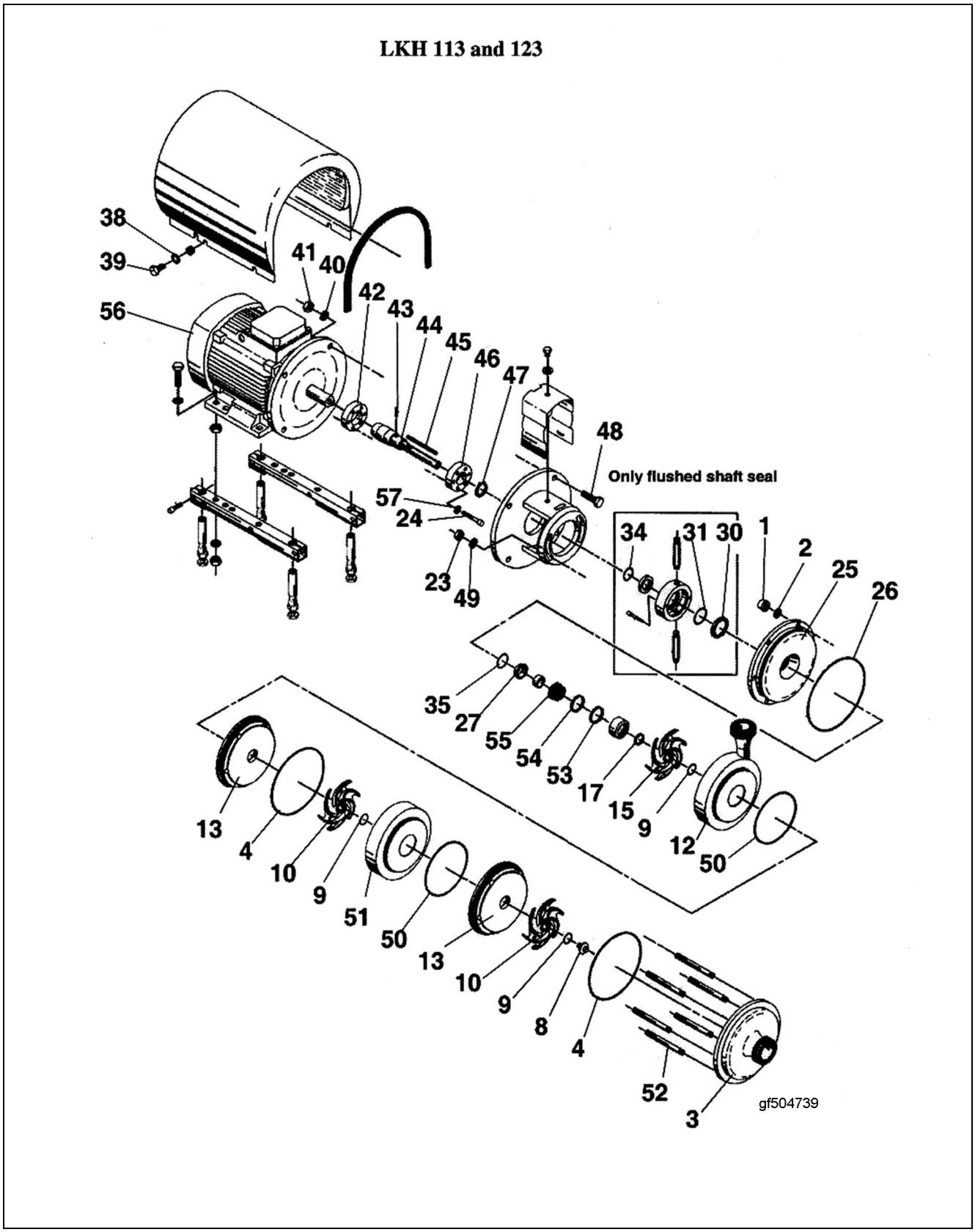
- Mobilgrease HP
- ESSO Unirex N3
- Shell Lipex EP2
- SKF LGHT3
- Castrol LMX

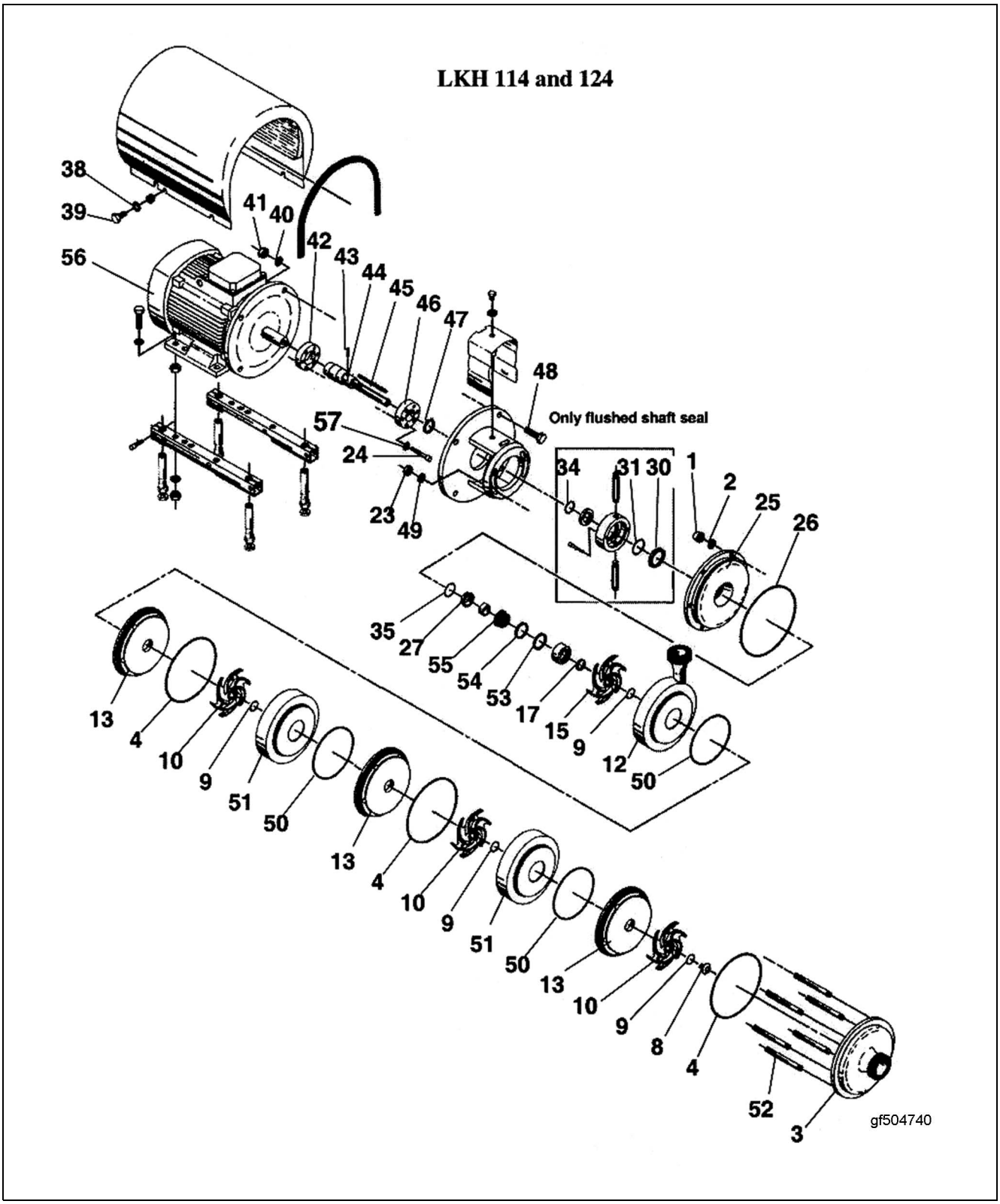
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Spare parts



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LKH 113 and 123
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Only flushed shaft seal
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Remarks:

O-rings (9) is not used for versions without impeller screws.

Service kit includes Shaft seal complete, Sic/Carbon (17, 27, 35, 53, 54, 55).

Positions are equal to positions in Maintenance.

Spare part kits

Pum type	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-112	6-9611-92-2096	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	2 2 1 1
	6-9611-92-2097	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	2 2 1 1
	6-9611-92-2099	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	2 2 1 1 1 1 1
	6-9611-92-2100	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	2 2 1 1 1 1 1
LKH-113	6-9611-92-2102	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	3 3 2 1
	6-9611-92-2103	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	3 3 2 1
	6-9611-92-2105	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	3 3 1 1 1 2 1
	6-9611-92-2106	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	3 3 1 1 1 2 1

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Pum type	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-114	6-9611-92-2108	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	4 4 3 1
	6-9611-92-2112	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	4 4 3 1
	6-9611-92-2111	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	4 4 1 1 1 3 1
	6-9611-92-2109	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	4 4 1 1 1 3 1
LKH-112, LKH-113, LKH-114	6-9612-3622-01	Shaft seal complete, EPDM (standard)	Quad ring, EPDM Stationary ring, Sic O-ring, EPDM Support ring, PTFE Quad ring, EPDM Rotating seal ring, Carbon	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-3622-02	Shaft seal complete, NBR	Quad ring, NBR Stationary ring, Sic O-ring, NBR Support ring, PTFE Quad ring, NBR Rotating seal ring, Carbon	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-3622-04	Shaft seal complete, alternative, EPDM (standard)	Quad ring, EPDM Stationary ring, Sic O-ring, EPDM Support ring, PTFE Quad ring, EPDM Rotating seal ring, Sic	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-3622-05	Shaft seal complete, alternative, NBR	Quad ring, NBR Stationary ring, Sic O-ring, NBR Support ring, PTFE Quad ring, NBR Rotating seal ring, Sic	17 27 35 53 54 55	1 1 1 1 1 1

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Spare parts

Pump type	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-122	6-9611-92-2409	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	2 2 1 1
	6-9611-92-2410	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	2 2 1 1
	6-9611-92-2412	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	2 2 1 1 1 1 1
	6-9611-92-2413	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	2 2 1 1 1 1 1
LKH-123	6-9611-92-2409	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	3 3 2 1
	6-9611-92-2410	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	3 3 2 1
	6-9611-92-2412	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	3 3 1 1 1 2 1
	6-9611-92-2413	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	3 3 1 1 1 2 1

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Pump type	Spare parts Article No.	Description	Included parts	Pos.	Qty.
LKH-124	6-9611-92-2409	Service kit, single shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 50 -	4 4 3 1
	6-9611-92-2410	Service kit, single shaft seal, NBR	O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 50 -	4 4 3 1
	6-9611-92-2412	Service kit, flushed shaft seal, EPDM (standard)	O-ring, EPDM O-ring, EPDM Lip seal O-ring, EPDM O-ring, EPDM O-ring, EPDM Shaft seal complete, EPDM	9 26 30 31 34 50 -	4 4 1 1 1 3 1
	6-9611-92-2413	Service kit, flushed shaft seal, NBR	O-ring, NBR O-ring, NBR Lip seal O-ring, NBR O-ring, NBR O-ring, NBR Shaft seal complete, NBR	9 26 30 31 34 50 -	4 4 1 1 1 3 1
LKH-122, LKH-123, LKH-124	6-9612-6024-01	Shaft seal complete, EPDM (standard)	Quad ring, EPDM Stationary ring, Sic O-ring, EPDM Support ring, PTFE Quad ring, EPDM Rotating seal ring, Carbon	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-6024-02	Shaft seal complete, NBR	Quad ring, NBR Stationary ring, Sic O-ring, NBR Support ring, PTFE Quad ring, NBR Rotating seal ring, Carbon	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-6024-04	Shaft seal complete, alternative, EPDM (standard)	Quad ring, EPDM Stationary ring, Sic O-ring, EPDM Support ring, PTFE Quad ring, EPDM Rotating seal ring, Sic	17 27 35 53 54 55	1 1 1 1 1 1
	6-9612-6024-05	Shaft seal complete, alternative, NBR	Quad ring, NBR Stationary ring, Sic O-ring, NBR Support ring, PTFE Quad ring, NBR Rotating seal ring, Sic	17 27 35 53 54 55	1 1 1 1 1 1

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Spare parts

Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112, LKH-113, LKH-114	6-9611-99-2593	Cap nut	1	6
LKH-122, LKH-123, LKH-124	6-9611-99-3685			11
LKH-112, LKH-113, LKH-114	6-9611-99-1887	Washer	2	6
LKH-122, LKH-123, LKH-124	6-9611-99-3684			11
LKH-112, LKH-113, LKH-114	6-9612-3893-02	Pump cover, SMS	3	1
	6-9612-3893-03	Pump cover, DIN		
LKH-122, LKH-123, LKH-124	6-9612-5924-01	Pump cover, flange		
	6-9612-5924-02	Pump cover, clamp		
LKH-112	6-9611-99-2744	O-ring EPDM (standard)	4	2
	6-9611-99-2745	O-ring NBR		
LKH-113	6-9611-99-2744	O-ring EPDM (standard)		3
	6-9611-99-2745	O-ring NBR		
LKH-114	6-9611-99-2744	O-ring EPDM (standard)		4
	6-9611-99-2745	O-ring NBR		
LKH-122	6-9611-99-3574	O-ring EPDM (standard)		2
	6-9611-99-3575	O-ring NBR		
LKH-123	6-9611-99-3574	O-ring EPDM (standard)		3
	6-9611-99-3575	O-ring NBR		
LKH-124	6-9611-99-3574	O-ring EPDM (standard)		4
	6-9611-99-3575	O-ring NBR		
LKH-112, LKH-113, LKH-114	6-9612-3627-01	Impeller screw	8	1
LKH-122, LKH-123, LKH-124	6-9612-5913-01			
LKH-112	6-9611-99-2750	O-ring EPDM (standard)	9	2
	6-9611-99-2751	O-ring NBR		
LKH-113	6-9611-99-2750	O-ring EPDM (standard)		3
	6-9611-99-2751	O-ring NBR		
LKH-114	6-9611-99-2750	O-ring EPDM (standard)		4
	6-9611-99-2751	O-ring NBR		
LKH-122	6-9611-99-3578	O-ring EPDM (standard)		2
	6-9611-99-3579	O-ring NBR		
LKH-123	6-9611-99-3578	O-ring EPDM (standard)		3
	6-9611-99-3579	O-ring NBR		
LKH-124	6-9611-99-3578	O-ring EPDM (standard)		4
	6-9611-99-3579	O-ring NBR		

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Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112	6-9612-3605-01	Impeller	10	1
LKH-113				2
LKH-114				3
LKH-122	6-9612-9225-04			1
LKH-123				2
LKH-124				3
LKH-112, LKH-113, LKH-114	6-9612-3889-02	Pump casing, SMS	12	1
	6-9612-3889-03	Pump casing, DIN		
LKH-122, LKH-123, LKH-124	6-9612-5923-01	Pump casing, flange		
	6-9612-5923-02	Pump casing, clamp		
LKH-112	6-9612-3613-01	Guide vanes	13	1
LKH-113				2
LKH-114				3
LKH-122	6-9612-5903-02			1
LKH-123				2
LKH-124				3
LKH-112, LKH-113, LKH-114	6-9612-3604-01	Impeller	8	1
LKH-122, LKH-123, LKH-124	6-9612-9225-03			
LKH-112, LKH-113, LKH-114	6-9611-99-0353	Nut	23	2
LKH-122, LKH-123, LKH-124				4
LKH-112	6-9611-99-3196	**2,2 - 4 kW:** Screw	24	6
	6-9611-99-3197	**5,5 - 18,5 kW:** Screw		
LKH-113	6-9611-99-3196	**3 - 4 kW:** Screw		
	6-9611-99-3197	**5,5 - 7,5 kW:** Screw		
	6-9611-99-3198	**11 - 18,5 kW:** Screw		
LKH-114	6-9611-99-3197	**5,5 - 7,5 kW:** Screw		
	6-9611-99-3198	**11 - 18,5 kW:** Screw		
LKH-122	6-9611-99-3198	**11 - 45 kW:** Screw		
LKH-123, LKH 124	6-9611-99-3198	**18,5 - 45 kW:** Screw		
	6-9611-99-3266	**55 - 75 kW:** Screw		
LKH-112, LKH-113, LKH-114	6-9612-3892-08	Back plate (0-10 bar)	25	1
LKH-122, LKH-123, LKH-124	6-9612-3892-24	Back plate		

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Spare parts

Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112	6-9611-99-2744	O-ring EPDM (standard)	26	2
	6-9611-99-2745	O-ring NBR		
LKH-113	6-9611-99-2744	O-ring EPDM (standard)		3
	6-9611-99-2745	O-ring NBR		
LKH-114	6-9611-99-2744	O-ring EPDM (standard)		4
	6-9611-99-2745	O-ring NBR		
LKH-122	6-9611-99-3574	O-ring EPDM (standard)		2
	6-9611-99-3575	O-ring NBR		
LKH-123	6-9611-99-3574	O-ring EPDM (standard)		3
	6-9611-99-3575	O-ring NBR		
LKH-124	6-9611-99-3574	O-ring EPDM (standard)		4
	6-9611-99-3575	O-ring NBR		
LKH-114	6-9611-99-1831	Washer	38	4
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-3240	**2,2 - 7,5 kW:** Screw	39	4
	6-9611-99-3241	**11 - 18,5 kW:** Screw		
	6-9611-99-3242	**22 kW:** Screw		
	6-9611-99-3243	**30 - 75 kW:** Screw		
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-1887	**2,2 kW :** Washer for adaptor	40	4
	6-9611-99-0676	**3 - 7,5 kW:** Washer for adaptor		
	6-9611-99-1886	**11 - 75 kW:** Washer for adaptor		
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-0353	**2,2 kW:** Nut for adaptor	41	4
	6-9611-99-0587	**3 - 7,5 kW:** Nut for adaptor		
	6-9611-99-2160	**11 - 75 kW:** Nut for adaptor		
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9612-1336-01	**2,2 kW:** Compression ring with thread	42	1
	6-9612-1336-02	**3 - 4 kW:** Compression ring with thread		
	6-9612-1336-05	**5,5 - 7,5 kW:** Compression ring with thread		
	6-9612-1336-03	**11 - 18,5 kW:** Compression ring with thread		
	6-9612-1336-04	**22 kW:** Compression ring with thread		
	6-9612-1336-07	**30 - 45 kW:** Compression ring with thread		
	6-9612-1336-08	**55 - 75 kW:** Compression ring with thread		
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-0622	Connex pin	43	1

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Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112	6-9612-3896-01	**2,2 kW:** Shaft with retaining ring (47)	44	1
	6-9612-3896-02	**2,2 kW:** Shaft with retaining ring (47) and pin (43)		
	6-9612-3619-03	**3 - 4 kW:** Shaft with pin (43)		
	6-9612-3620-04	**5,5 - 7,5 kW:** Shaft with pin (43)		
	6-9612-3621-04	**11 - 18,5 kW:** Shaft with pin (43)		
	6-9612-3619-01	**3 - 4 kW:** Shaft		
	6-9612-3620-01	**5,5 - 7,5 kW:** Shaft		
	6-9612-3621-01	**11 - 18,5 kW:** Shaft		
LKH-113	6-9612-3619-04	**3 - 4 kW:** Shaft with pin (43)		
	6-9612-3620-05	**5,5 - 7,5 kW:** Shaft with pin (43)		
	6-9612-3621-05	**11 - 18,5 kW:** Shaft with pin (43)		
	6-9612-3619-02	**3 - 4 kW:** Shaft		
	6-9612-3620-02	**5,5 - 7,5 kW:** Shaft		
	6-9612-3621-02	**11 - 18,5 kW:** Shaft		
LKH-114	6-9612-3620-06	**5,5 - 7,5 kW:** Shaft with pin (43)		
	6-9612-3621-06	**11 - 18,5 kW:** Shaft with pin (43)		
	6-9612-3620-03	**5,5 - 7,5 kW:** Shaft		
	6-9612-3621-03	**11 - 18,5 kW:** Shaft		
LKH-122	6-9612-5919-01	**11 - 18,5 kW:** Shaft with pin (43)		
	6-9612-5920-01	**22 kW:** Shaft with pin (43)		
	6-9612-5921-01	**30 - 45 kW:** Shaft with pin (43)		
LKH-123	6-9612-5919-02	**18,5 kW:** Shaft with pin (43)		
	6-9612-5920-02	**22 kW:** Shaft with pin (43)		
	6-9612-5921-02	**30 - 45 kW:** Shaft with pin (43)		
	6-9612-5922-02	**55 - 75 kW:** Shaft with pin (43)		
LKH-124	6-9612-5920-03	**22 kW:** Shaft with pin (43)		
	6-9612-5921-03	**30 - 45 kW:** Shaft with pin (43)		
	6-9612-5922-03	**55 - 75 kW:** Shaft with pin (43)		
LKH-112	6-9611-99-2756	Key	45	1
LKH-113	6-9611-99-2757			
LKH-114	6-9611-99-2758			
LKH-122	6-9611-99-3476			
LKH-123	6-9611-99-3475			
LKH-124	6-9611-99-3474			

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Spare parts

Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9612-1337-01	**2,2 kW:** Compression ring without thread	46	1
	6-9612-1337-02	**3 - 4 kW:** Compression ring without thread		
	6-9612-1337-05	**5,5 - 7,5 kW:** Compression ring without thread		
	6-9612-1337-03	**11 - 18,5 kW:** Compression ring without thread		
	6-9612-1337-04	**22 kW:** Compression ring without thread		
	6-9612-1337-07	**30 - 75 kW:** Compression ring without thread		
LKH-112	6-9611-99-2307	**2,2 kW:** Reatining ring	47	1
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-2161	**2,2 kW:** Screw for adaptor	48	1
	6-9611-99-1834	**3 - 4 kW:** Screw for adaptor		
	6-9611-99-2162	**5,5 - 7,5 kW:** Screw for adaptor		
	6-9611-99-2163	**11 - 18,5 kW:** Screw for adaptor		
	6-9611-99-2164	**22- 45 kW:** Screw for adaptor		
	6-9611-99-2200	**55 - 75 kW:** Screw for adaptor		
LKH-112, LKH-113, LKH-114	6-9611-99-2559	Washer	49	2
LKH-122, LKH-123, LKH-124				4
LKH-112	6-9611-99-2747	O-ring EPDM (standard)	50	1
	6-9611-99-2748	O-ring NBR		
LKH-113	6-9611-99-2747	O-ring EPDM (standard)		2
	6-9611-99-2748	O-ring NBR		
LKH-114	6-9611-99-2747	O-ring EPDM (standard)		3
	6-9611-99-2748	O-ring NBR		
LKH-122	6-9611-99-3582	O-ring EPDM (standard)		1
	6-9611-99-3583	O-ring NBR		
LKH-123	6-9611-99-3582	O-ring EPDM (standard)		2
	6-9611-99-3583	O-ring NBR		
LKH-124	6-9611-99-3582	O-ring EPDM (standard)		3
	6-9611-99-3583	O-ring NBR		
LKH-113	6-9612-3610-01	Intermediate casing	51	1
LKH-114				2
LKH-123	6-9612-5909-02			1
LKH-124				2
LKH-112	6-9612-3635-01	Bolt	52	6
LKH-113	6-9612-3635-02			
LKH-114	6-9612-3635-03			
LKH-122	6-9612-3635-06			
LKH-123	6-9612-3635-07			
LKH-124	6-9612-3635-08			

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Spare parts				
Pump type	**Article No.**	**Description**	**Pos.**	**Qty.**
LKH-112, LKH-113, LKH-114	6-31801-1983-1	**2,2 kW, 220/240V:** Motor	56	1
	6-31801-1983-2	**2,2 kW, 380/420V:** Motor		
	6-31801-1984-1	**3 kW, 220/240V:** Motor		
	6-31801-1984-2	**3 kW, 380/420V:** Motor		
	6-9612-4028-07	**4 kW, 220/240V:** Motor		
	6-9612-4028-09	**4 kW, 380/420V:** Motor		
	6-9612-4028-15	**5,5 kW, 220/240V:** Motor		
	6-9612-4028-17	**5,5 kW, 380/420V:** Motor		
	6-9612-4028-30	**7,5 kW, 220/240V:** Motor		
	6-9612-4028-32	**7,5 kW, 380/420V:** Motor		
	6-31801-0122-1	**11 kW, 220/240V:** Motor		
	6-31801-0122-3	**11 kW, 380/420V:** Motor		
	6-31801-1194-1	**15 kW, 220/240V:** Motor		
	6-31801-1194-3	**15 kW, 380/420V:** Motor		
	6-9612-3454-13	**18,5 kW, 220/240V:** Motor		
	6-9612-3454-14	**18,5 kW, 380/420V:** Motor		
LKH-122, LKH-123, LKH-124	6-9612-6055-12	**11 kW:** Motor		
	6-9612-6055-14	**15 kW:** Motor		
	6-9612-6055-16	**18,5 kW:** Motor		
	6-9612-6055-18	**22 kW:** Motor		
	6-9612-6055-20	**30 kW:** Motor		
	6-9612-6055-22	**37 kW:** Motor		
	6-9612-6055-24	**45 kW:** Motor		
	6-9612-6055-26	**55 kW:** Motor		
	6-9612-6055-28	**75 kW:** Motor		
LKH-112, LKH-113, LKH-114, LKH-122, LKH-123, LKH-124	6-9611-99-3199	Washer	57	6

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Tetra Pak

Maintenance & Spare Parts

Multistage centrifugal pump

(Grundfos)

CRN(s) 1/3/5/10/15/20/32/45/64



Gf504100

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Tetra Pak

Doc No. 1218037-0101

Multistage centrifugal pump

CRN(s) 1/3/5/10/15/20/32/45/64

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 08 Issue 2010-10

Doc No. 1218037-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

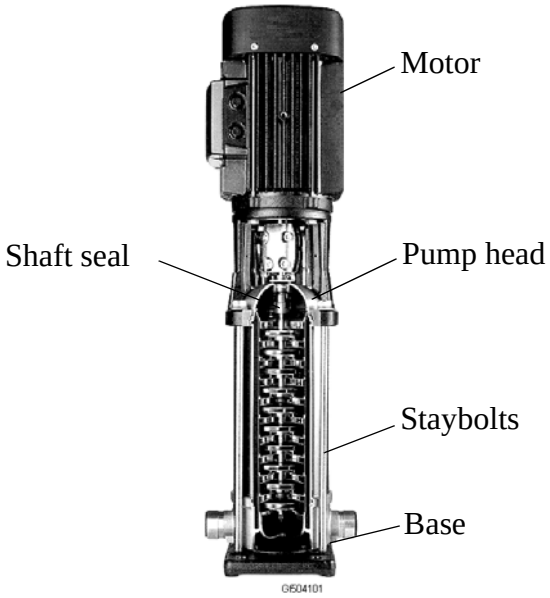
Description

The multistage centrifugal pump is a non self-priming, vertical multistage pump. The main parts are base, pump head, and motor. The pump body and the outer sleeve are fixed between the base and the pump head by means of stay bolts. The pump is equipped with a maintenance-free mechanical shaft seal.

Caution! Never let the pump run against a closed discharge valve. This will cause an increase in temperature/formation of steam in the pump, which may cause damage to the pump.

Caution! Never start the pump until it has been primed and vented.

Caution! Always disconnect the power supply before working on, or servicing, the pump.



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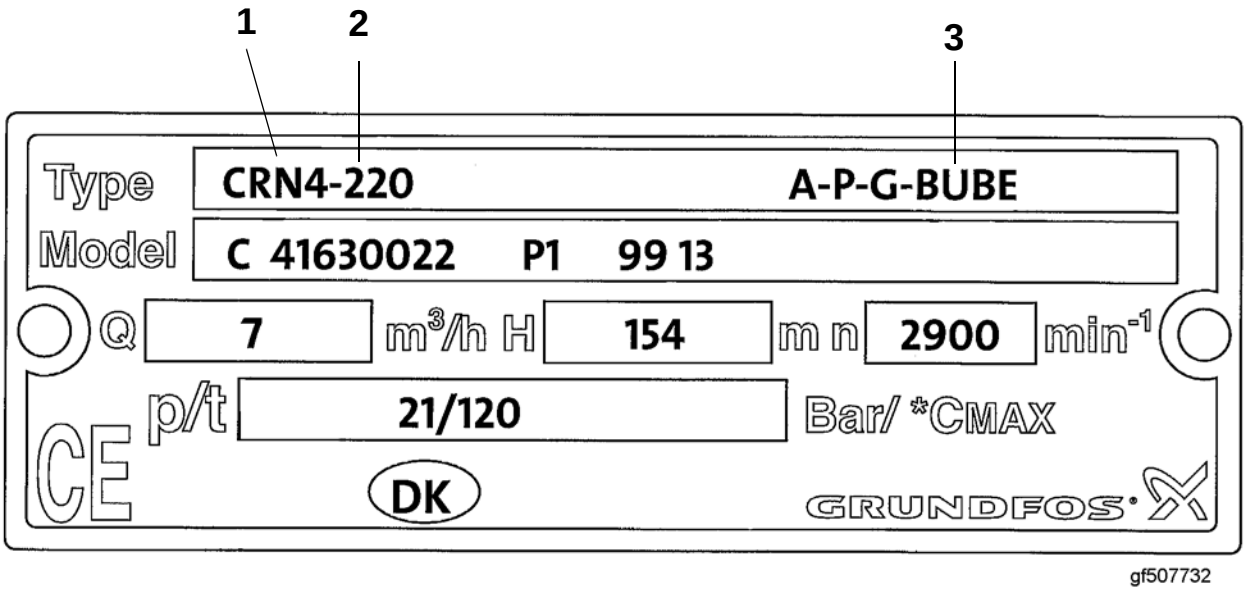
Pump identification

In order too select correct spare parts identify following from the pump sign mounted on the pump.

a) Pump model (1).

b) Number of pump wheels (2). The number shown is x10.

c) Gasket material. (3).



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CRN(s) 1/3/5/10/15/20

Check shaft seal for leakage

Check that the pump is not leaking.

If there is a leakage, change the shaft seal see chapter **Change shaft seal**.

Change shaft seal

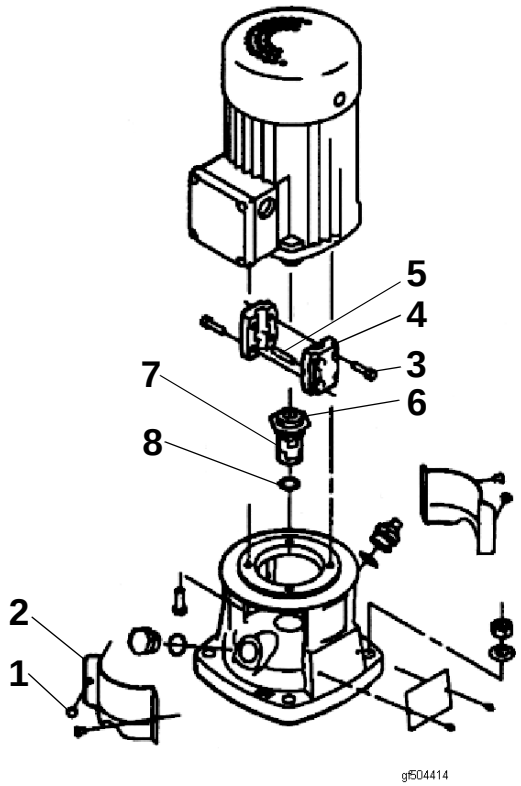
DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

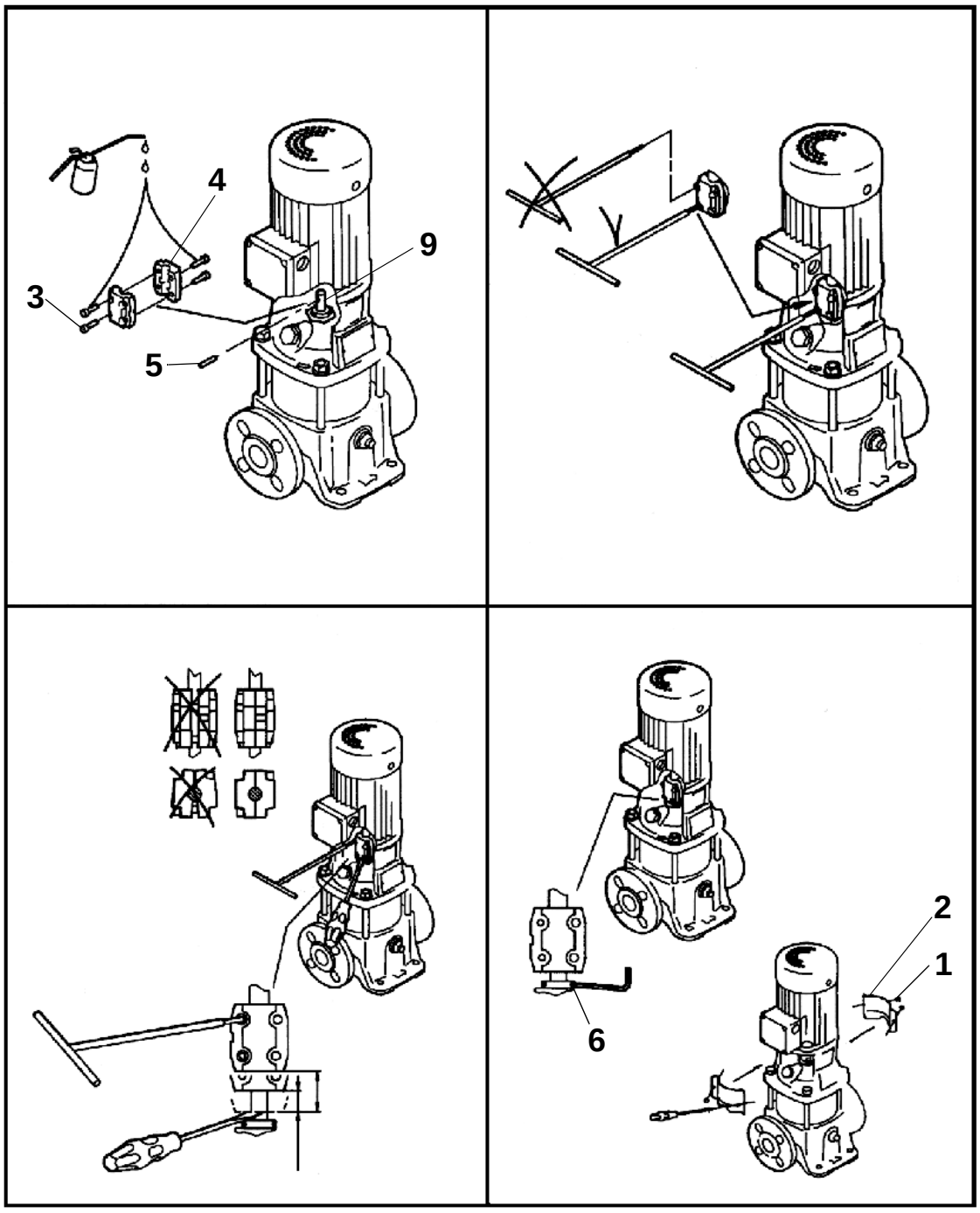
Risk of injury!
Make sure that the pipeline is drained and free from media before dismantling!

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gf504414

1 Screw
2 Coupling guard
3 Hexagon socket head screw
4 Coupling half
5 Shaft pin
6 Hexagon socket head screw
7 Shaft seal
8 O-ring



gf504413

2.2Tf503481.en

1 Screw
2 Coupling guard
3 Hexagon socket head screw
4 Coupling half
5 Shaft pin
6 Hexagon socket head screw
9 Shaft

Disassemble

a) Disconnect inlet and outlet product pipe.

b) Unscrew the four screws (1) and remove the coupling guards (2).

c) Unscrew the hexagon socket head screws (3), and remove the coupling halves (4) and the shaft pin (5).

d) Unscrew the hexagon socket head screws (6), and remove the shaft seal (7) and O-ring (8) from the shaft (9).

Assemble

Note! Do not twist the new shaft seal when fitting it to the shaft.

Note! See torque and lubricant table below.

a) Change shaft seal (7) and O-ring (8).

b) Fit the shaft pin (5) and coupling halves (4) on the shaft (9). Screw the hexagon socket head screws (3) by hand.

c) Screw the two bottom hexagon socket head screws (3) tight with a hexagon socket head wrench.

Note! Do not tilt the coupling halves (4) against each other when you tight them, see graphic above.

d) Push up the coupling halves (4) with a screw driver until they stops. Lower the coupling halves (4) half way down and hold them, see graphic above. Screw the two upper hexagon socket head screws (3) tight.

e) Screw the hexagon socket head screws (6).

f) Fit the coupling guards (2) and screw the screws (1).

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Position	Name	Dimension	Torque (Nm)	Lubricant
1	Screw	M4	2	-
3	Hexagon socket head screw	M6 M8 M10	13 31 62	Thread-Eze
6	Hexagon socket head screws	M5	2.5	-
7	Shaft seal	M28	35	-

Change spare parts kit

DANGER!

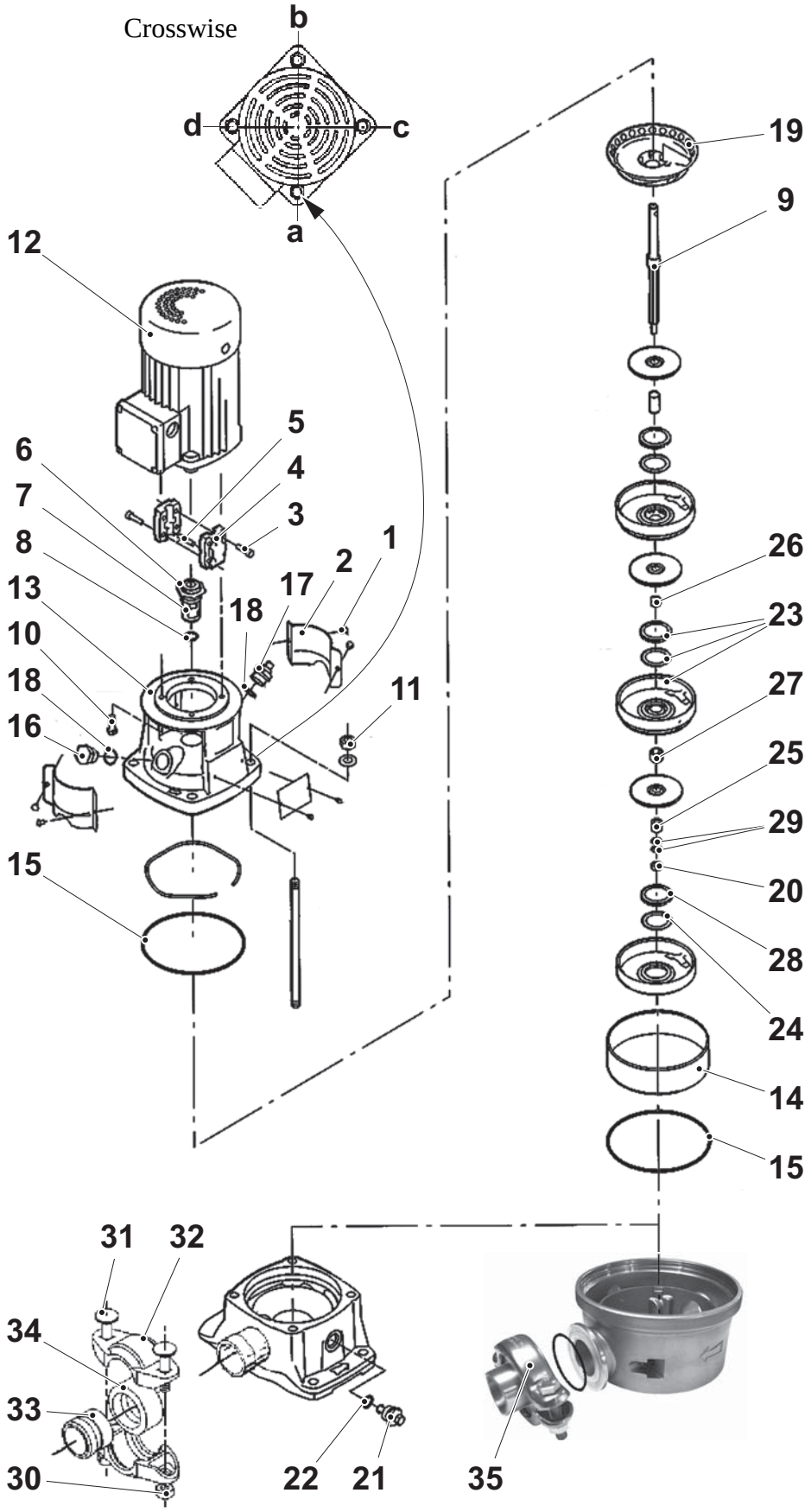
Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Risk of injury!
Make sure that the pipeline is drained and free from media before dismantling!

2.2Tf503481.en

1 Screw
2 Coupling guard
3 Hexagon socket head screw
4 Coupling half
5 Shaft pin
6 Hexagon socket head screws
7 Shaft seal
8 O-ring
9 Shaft
10 Hexagon head screw
11 Nut
12 Motor
13 Pump head
14 Outer sleeve
15 O-ring
16 Plug
17 Air vent screw
18 O-ring
19 Intermediate chamber
20 Lock nut
21 Priming valve
22 O-ring
23 Chamber with bearing
24 Neck ring
25 Bearing ring rotating
26 Spacing pipe
27 Clamp splined
28 Neck ring retainer
29 Lock washer set
30 Nut
31 Bolt
32 Coupling
33 Pipe stub
34 Gasket
35 Clamp coupling



2.2Tf503481.en

Disassemble

a) Disconnect inlet and outlet product pipe.

b) Unscrew the four screws (1) and remove the coupling guards (2).

c) Unscrew the hexagon socket head screws (3), and remove the coupling halves (4) and the shaft pin (5).

d) Unscrew the hexagon socket head screws (6) with a hexagon socket head wrench, and remove the shaft seal (7) and O-ring (8) from the shaft (9).

e) Unscrew the hexagon head screw (10) and the nuts (11).

f) Remove the motor (12) and the pump head (13).

g) Remove the outer sleeve (14) to expose the sleeve O-rings (15).

h) Unscrew the plug (16) and the air vent screw (17) and remove O-rings (18).

i) Lift up the intermediate chamber (19).

j) Hold the shaft (9) tightly with a chain spanner while unscrewing the lock nut (20).

k) Unscrew the priming valve (21) and remove O-ring (22).

l) Separate the parts of the intermediate chambers and remove all parts included in the spare part kit (20,23,24,25,26,27,28,29).

m) Loosen nuts (30) and bolts (31) with a spanner.

n) Dismantle coupling (32) and pipe stub (33).

o) Remove gasket (34).

2.2Tf503481.en

Assemble

Note! See torque and lubricant table below.

a) Change gasket (34).

b) Fit coupling (32) and pipe stub (33).

c) Screw nuts (30) and bolts (31) with a spanner.

d) Change the parts of the intermediate chambers and remove all parts included in the spare part kit (20,23,24,25,26,27,28,29).

e) Change O-ring (22) screw the priming valve (21).

f) Hold the shaft (9) tightly with a chain spanner and screw the lock nut (20).

g) Fit the intermediate chamber (19).

h) Change O-rings (18) and screw the plug (16) and air vent screw (17).

i) Change the sleeve O-rings (15) and fit the outer sleeve (14).

j) Fit the pump head (13) and the motor (12).

k) Screw the nuts (11) and hexagon head screws (10) crosswise, see graphic above.

Note! Do not twist the new shaft seal when fitting it to the shaft.

a) Change shaft seal (7) and O-ring (8).

b) Fit the shaft pin (5) and coupling halves (4) on the shaft (9). Screw the hexagon socket head screws (3) by hand.

c) Screw the two bottom hexagon socket head screws (3) tight with a hexagon socket head wrench.

Note! Do not tilt the coupling halves (4) against each other when you tight them, see graphic above.

d) Push up the coupling halves (4) with a screw driver until they stops. Lower the coupling halves (4) half way down and hold them, see graphic above. Screw the two upper hexagon socket head screws (3) tight.

e) Screw the hexagon socket head screws (6).

f) Fit the coupling guards (2) and screw the screws (1).

(Cont'd)

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(Cont'd)

Position	Name	Dimension	Torque (Nm)	Lubricant
1	Screw	M4	2	-
3	Hexagon socket head screw	M6 M8 M10	13 31 62	Thread-Eze
6	Hexagon socket head screw	M5	2.5	-
7	Shaft seal	M28	35	-
10	Hexagon head screw	M6 M8 M12	10 12 40	Thread-Eze
11	Nut	M12	50	Bonderlube
15	O-ring	137.5 x 3.3		Rocol 22
16	Plug	1/2”	35	Soapy water
17	Air vent screw	1/2” (M8)	35	
20	Lock nut	M8	18	Bonderlube
21	Priming valve	1/2” (M10)	35	Soapy water
27	Bearing ring, rotating	-	-	Rocol 22
-	Staybolt	M12	-	Bonderlube

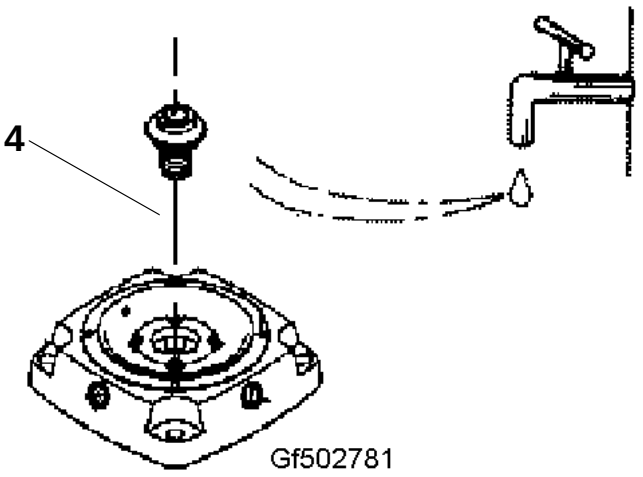
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CRN(s) 32/45

Check

Check that the pump is not leaking.

If there is a leakage, change the shaft seal (4) see chapter **Change spare parts**.



4 Shaft seal

Change shaft seal

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Note! See graphics below and later in the chapter.

g) Unscrew the four screws (7) and remove the coupling guards (8).

h) Unscrew the four screws (9) and remove the coupling halves (10).

i) Unscrew the four screws (1) and prize up the washer (2) with a screwdriver.

j) Loosen, but not remove, the three screws (3). Prize up the shaft seal (4) and remove it from the drive shaft (25).

k) Scrub the drive shaft and clean it with soap.

l) Mount the new shaft seal (4) on the drive shaft.

m) Mount the washer (2) and oil and screw the four screws (1).

n) Screw the three screws (3) and measure the gap between washer (2) and shaft seal with the distance tool.

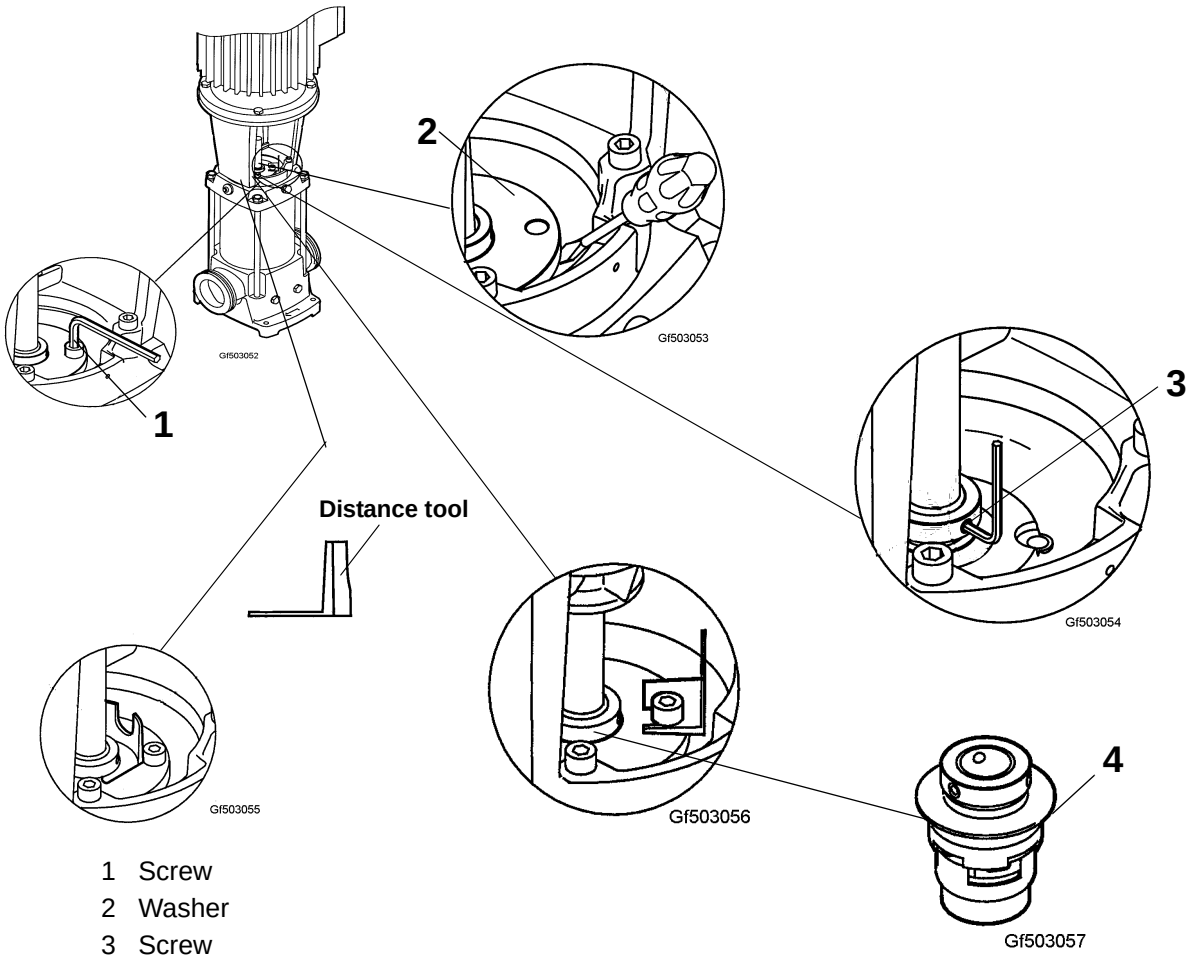
o) Reassemble in reverse order and park the distance tool under all of the screws (1).

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Pos.	Description	Dimension	Torque (Nm)	Lubricant
1	Screw	M10	62	Thread-eze
9	Screw	M10	85	Thread-eze

(Cont'd)

(Cont'd)



1 Screw
2 Washer
3 Screw
4 Shaft seal

2.2Tf503481.en

Change gasket kit

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Note! See graphic later in the chapter.

a) Disconnect inlet and outlet product pipe.

b) Unscrew the four nuts (5) and bolts (6) with a spanner, unscrew the four screws (7) and remove the coupling guards (8).

c) Unscrew the four screws (9) and remove the coupling halves (10).

d) Remove the motor (11) from the pump head (12).

e) Change the shaft seal (4), see c-h in chapter **Change shaft seal**.

f) Unscrew the four nuts (13) and bolts (14) and remove the outer sleeve (15).

g) Change spring (16) and O-ring (17).

h) Unscrew the four plugs (18) with a spanner and change O-rings (19).

i) Unscrew the plug (20) and air vent screw (21) with a spanner and change the two O-rings (22).

j) Reassemble in reverse order.

2.2Tf503481.en

Pos.	Description	Dimension	Torque (Nm)	Lubricant
5	Screw	M12	40	Thread-eze
	Screw	M16	80	
6	Screw	M8	12	
		M12	40	
		M16	80	
9	Screw	M10	85	
13	Screw	M16	100	
18	Plug	1/2”	35	
20				

Change Wear parts kit

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Note! See graphic later in the chapter.

a) Disconnect inlet and outlet product pipe.

b) Disassemble a-g under chapter **Change gasket kit**.

c) Loosen and remove the clips (23).

d) Lift up the intermediate chambers (24) from theres sleeve.

e) Separate all parts from the drive shaft (25) and replace all parts in the wear parts kit. Change neck ring (26), Sleeve (27), lock ring (28), wear ring (29) and seal carrier (30).

f) Reassemble in reverse order.

2.2Tf503481.en

Change bottom bearing kit

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Note! See graphic later in the chapter.

a) Disconnect inlet and outlet product pipe.

b) Disassemble a-g in under chapter **Change gasket kit** and a-d under chapter **Change wear parts kit**.

c) Loosen and remove the drive shaft (25).

d) Separate all parts and replace all parts in the bottom bearing kit. Change Bearing ring (31), hex. soc. head screw (32), washer (33), bearing ring (34), washer (35), lock washer (36), hex. soc. head screw (37).

e) Reassemble in reverse order.

2.2Tf503481.en

Pos.	Description	Dimension	Torque (Nm)	Lubricant
32	Hex. soc. head screw	M6	8	Bonderlube 403/3
37	Hex. soc. head screw	M8	31	Bonderlube 403/3

Change bearing kit

DANGER!

Risk of electrical shock!
Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

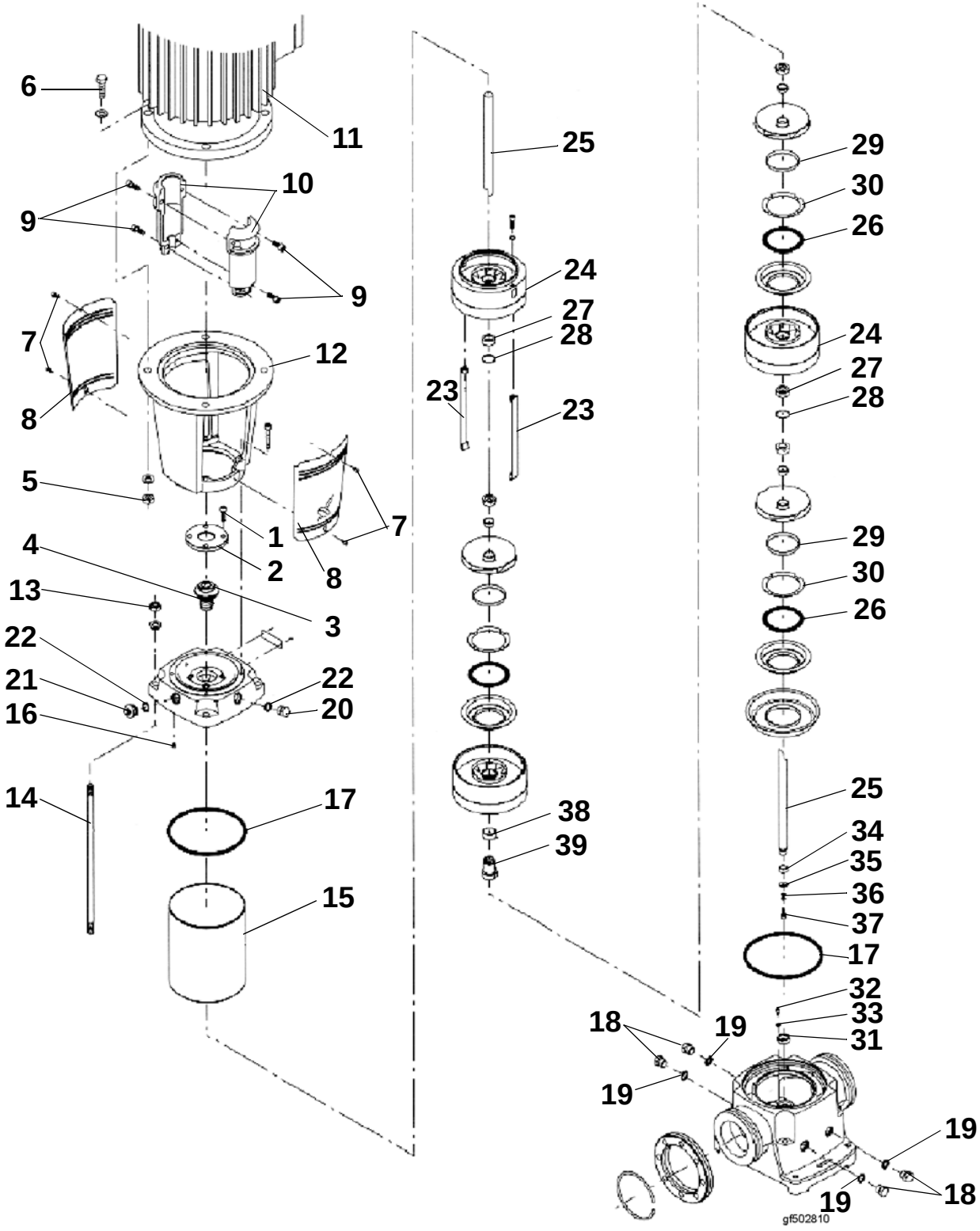
WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Note! See graphic later in the chapter.

a) Disconnect inlet and outlet product pipe.
b) Disassemble a-g in under chapter **Change gasket kit** and a-e under chapter **Change wear parts kit**.
c) Loosen and remove the drive shaft (25).
d) Change bearings (38,39).
e) Reassemble in reverse order.

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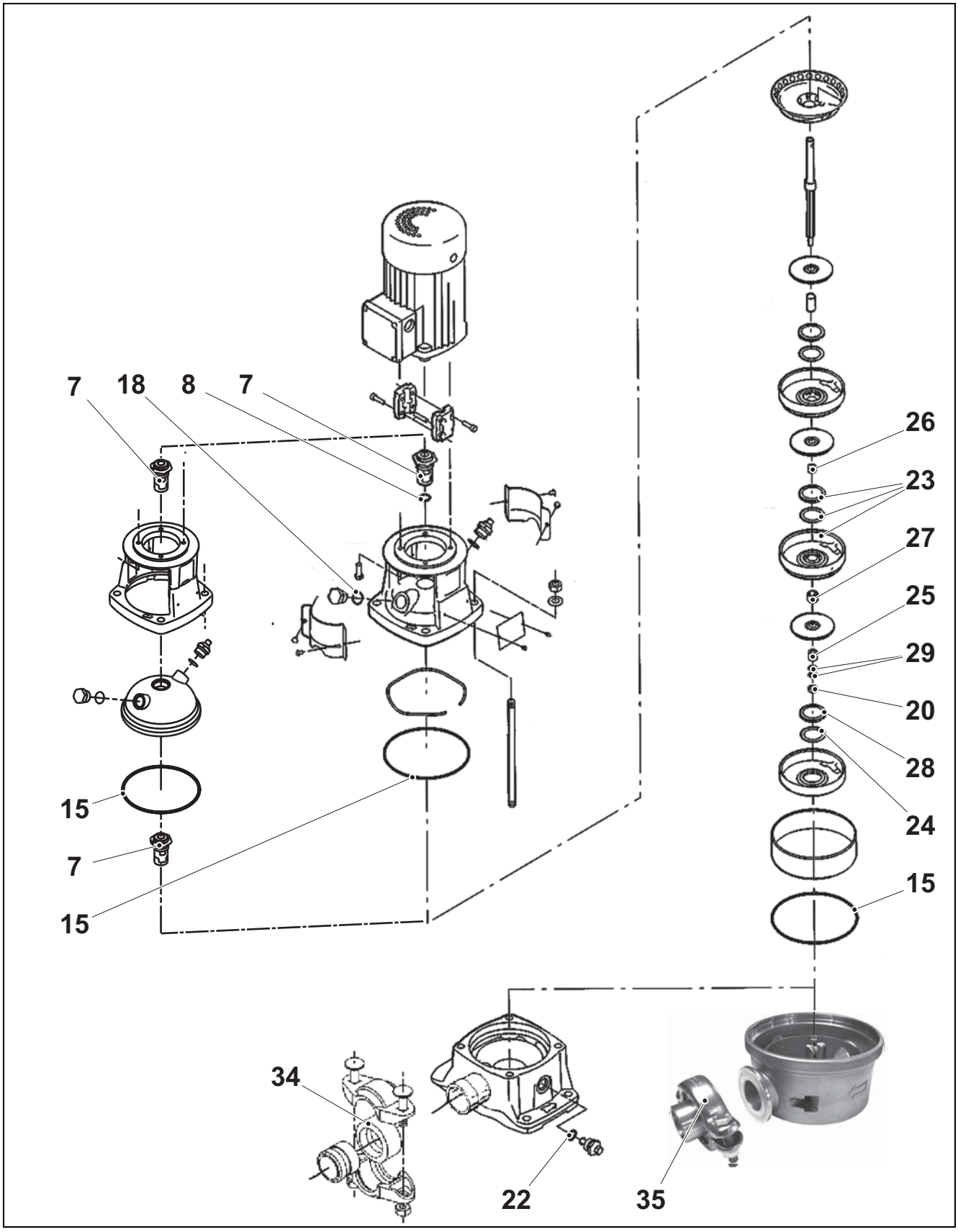
(Cont'd)

1 Screw
2 Washer
3 Screw
4 Shaft seal
5 Nuts
6 Bolts
7 Screw
8 Coupling guard
9 Screw
10 Coupling halve
11 Motor
12 Pump head
13 Nuts
14 Bolts
15 Outer sleeve
16 Spring
17 O-ring
18 Plug
19 O-ring
20 Plug
21 Air vent screw
22 O-ring
23 Clips
24 Intermediate chamber
25 Drive shaft
26 Neck ring
27 Sleeve
28 Lock ring
29 Wear ring
30 Seal carrier
31 Bearing ring, stationary
32 Hex. soc. head screw
33 Washer
34 Bearing ring, rotating
35 Washer
36 Lock washer
37 Hex. soc. head screw
38 Bearing
39 Bearing

2.2Tf503481.en

Spare parts

CRN1/3/5/10/15/20



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Spare parts, CRN 1/3				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
6-990425-69	Shaft seal, SiC/SiC	Shaft seal	7	1
CRN Flushed Shaft seal				
6-990425-69	Shaft seal, SiC/SiC	Shaft seal	7	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-71	Spare parts kit, PJE coupling DN 32, EPDM	Gasket	34	2
90511-6116	Clamp coupling	Clamp coupling 37,2 mm EPDM	35	2
6-990425-80	Spare parts kit, CRN 1/3-2 - 9, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring, rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 1 8 1 1 1 8 1
6-990425-81	Spare parts kit, CRN 1/3-10 - 19, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 2 17 1 2 2 17 1
6-990425-82	Spare parts kit, CRN 1/3-20 - 27, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 3 24 1 3 3 24 1

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Spare parts, CRN 1/3				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-990425-83	Spare parts kit, CRN 1/3- 28 - 36, Shaft seal SiC/SiC, EPDM	O-ring, EPDM	8	1
		O-ring, EPDM	15	2
		O-ring, EPDM	18	2
		Lock nut	20	1
		O-ring, EPDM	22	1
		Chamber with bearing, silicone carbide	23	4
		Neck ring	24	32
		Clamp splined	25	1
		Spacing pipe, 4.5 mm	26	4
		Bearing ring rotating	27	4
		Neck ring retainer	28	32
		Lock washer set	29	1

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Spare parts, CRN 5				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
6-990425-69	Shaft seal, SiC/SiC	Shaft seal	7	1
CRN Flushed Shaft seal				
6-990425-69	Shaft seal, SiC/SiC	Shaft seal	7	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-71	Spare parts kit, PJE coupling DN 32, EPDM	Gasket	34	2
90511-6116	Clamp coupling	Clamp coupling 37,2 mm EPDM	35	2
6-990425-84	Spare parts kit, CRN 5 -2-7, Shaft seal SiC/ SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring, rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 1 8 1 1 1 8 1
6-990425-85	Spare parts kit, CRN 5- 8-12, Shaft seal SiC/ SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 2 17 1 2 2 17 1
6-990425-86	Spare parts kit, CRN 5- 13-16, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 3 24 1 3 3 24 1

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Spare parts, CRN 5				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-990425-87	Spare parts kit, CRN 5- 17-22, Shaft seal SiC/SiC, EPDM	O-ring, EPDM	8	1
		O-ring, EPDM	15	2
		O-ring, EPDM	18	2
		Lock nut	20	1
		O-ring, EPDM	22	1
		Chamber with bearing, silicone carbide	23	4
		Neck ring	24	32
		Clamp splined	25	1
		Spacing pipe, 4.5 mm	26	4
		Bearing ring rotating	27	4
		Neck ring retainer	28	32
		Lock washer set	29	1
6-990425-88	Spare parts kit, CRN 5- 23-26, Shaft seal SiC/SiC, EPDM	O-ring, EPDM	8	1
		O-ring, EPDM	15	2
		O-ring, EPDM	18	2
		Lock nut	20	1
		O-ring, EPDM	22	1
		Chamber with bearing, silicone carbide	23	4
		Neck ring	24	32
		Clamp splined	25	1
		Spacing pipe, 4.5 mm	26	4
		Bearing ring rotating	27	4
		Neck ring retainer	28	32
		Lock washer set	29	1
6-990425-89	Spare parts kit, CRN 5- 27-36, Shaft seal SiC/SiC, EPDM	O-ring, EPDM	8	1
		O-ring, EPDM	15	2
		O-ring, EPDM	18	2
		Lock nut	20	1
		O-ring, EPDM	22	1
		Chamber with bearing, silicone carbide	23	4
		Neck ring	24	32
		Clamp splined	25	1
		Spacing pipe, 4.5 mm	26	4
		Bearing ring rotating	27	4
		Neck ring retainer	28	32
		Lock washer set	29	1

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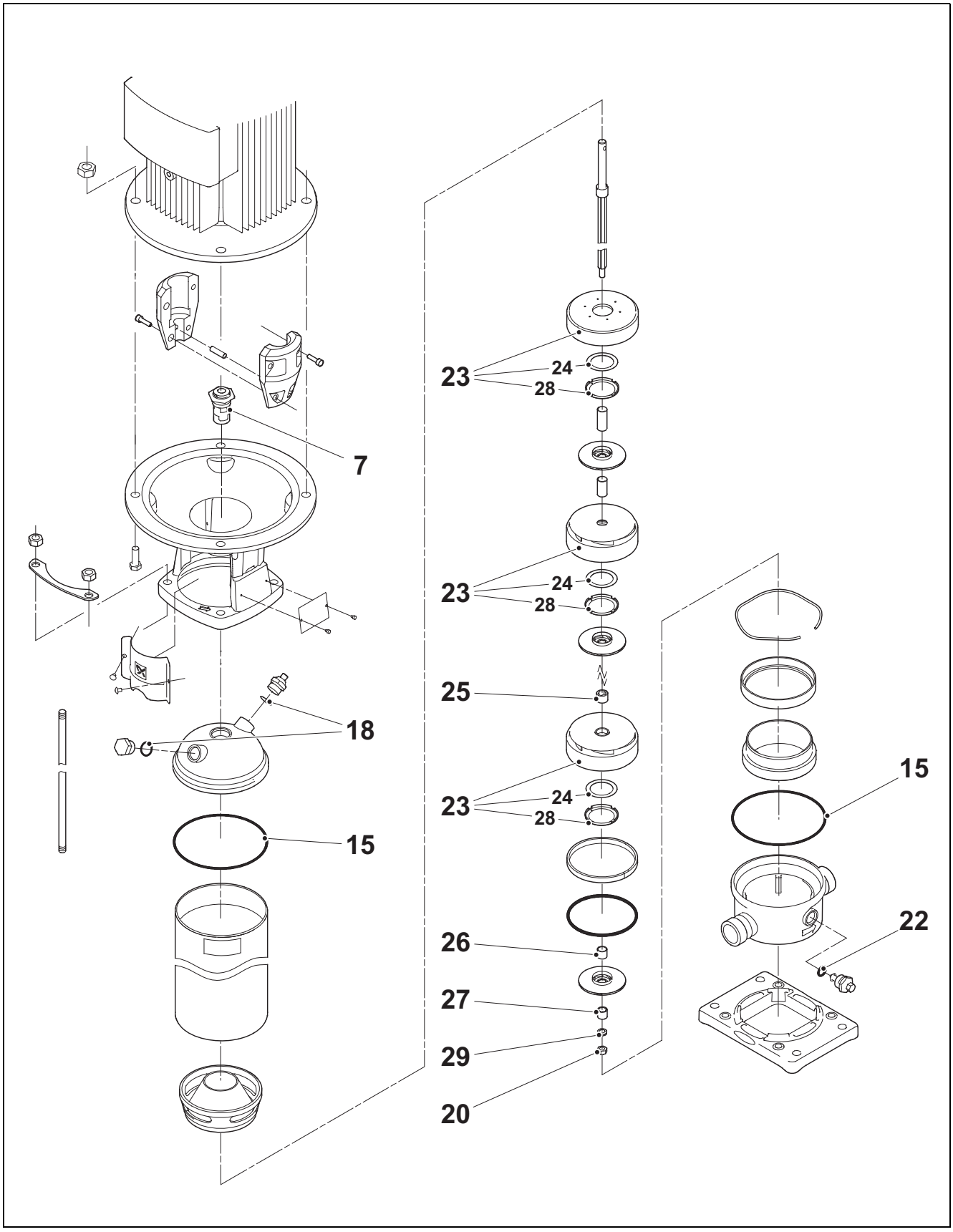
Spare parts, CRN 10				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
90503-2293	Shaft seal SiC/SiC,	Shaft seal	7	1
CRN Flushed Shaft seal				
90503-2293	Shaft seal SiC/SiC,	Shaft seal	7	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-72	Spare parts kit, PJE coupling DN 50, EPDM	Gasket	34	2
90511-6117	Clamp coupling	Clamp coupling 54,5 mm EPDM	35	2
90503-2916	Spare parts kit, CRN 10 -2-8, Shaft seal SiC/ SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring, rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 1 8 1 1 1 8 1
90503-2917	Spare parts kit, CRN 10- 9-14, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 2 17 1 2 2 17 1
90503-2918	Spare parts kit, CRN 10- 15-22, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 3 24 1 3 3 24 1

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Spare parts, CRN 15/20				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
90503-2293	Shaft seal SiC/SiC,	Shaft seal	7	1
CRN Flushed Shaft seal				
90503-2293	Shaft seal SiC/SiC,	Shaft seal	7	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-72	Spare parts kit, PJE coupling DN 50, EPDM	Gasket	34	2
90511-6117	Clamp coupling	Clamp coupling 54,5 mm EPDM	35	2
90503-2919	Spare parts kit, CRN 15/20 -2-6, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring, rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 1 8 1 1 1 8 1
90503-2920	Spare parts kit, CRN 15/20- 7-10, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 2 17 1 2 2 17 1
90503-2921	Spare parts kit, CRN 15/20- 11-17, Shaft seal SiC/SiC, EPDM	O-ring, EPDM O-ring, EPDM O-ring, EPDM Lock nut O-ring, EPDM Chamber with bearing, silicone carbide Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	8 15 18 20 22 23 24 25 26 27 28 29	1 2 2 1 1 3 24 1 3 3 24 1

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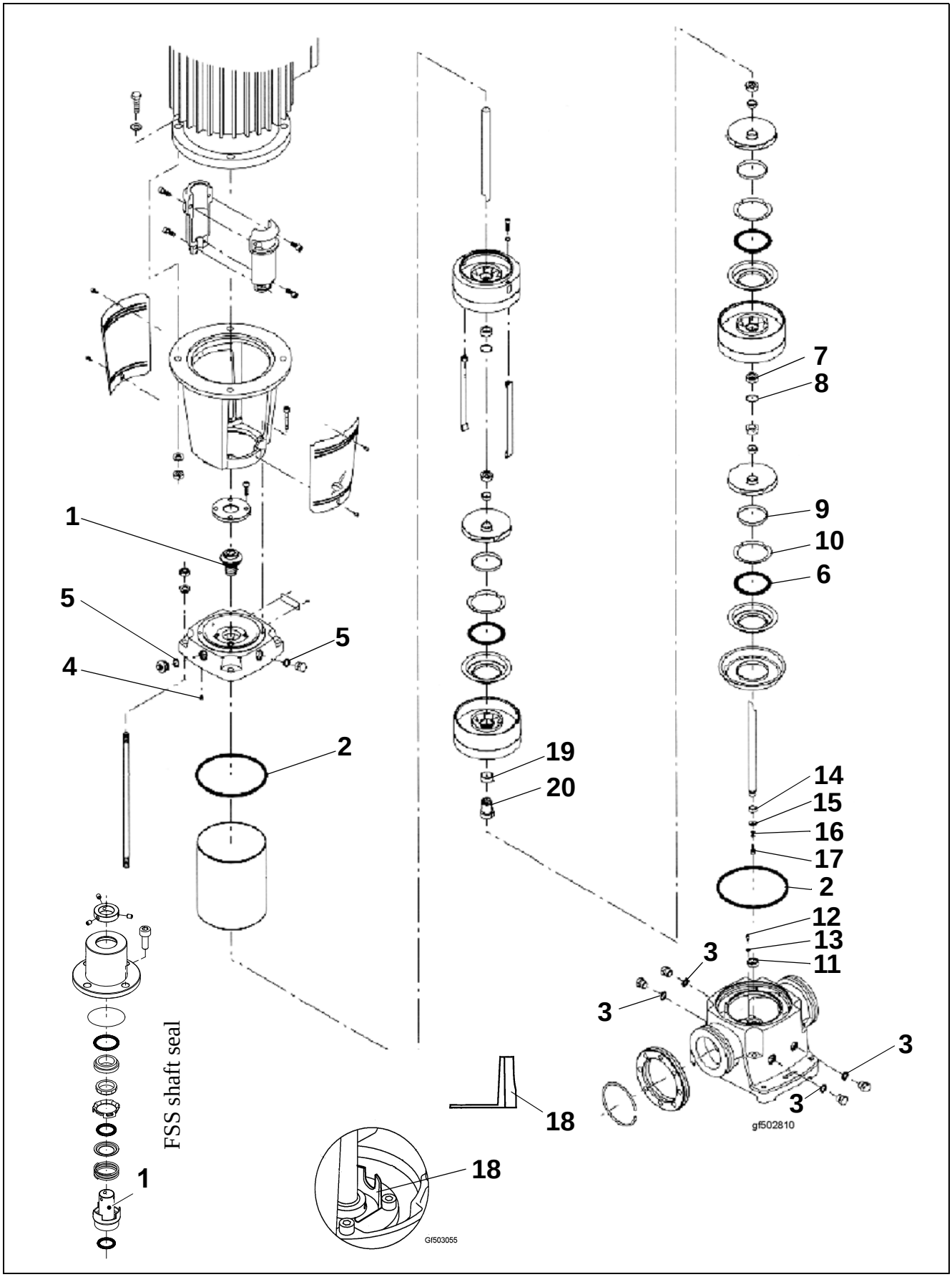
CRN5 -SF



Spare parts, CRN 5-SF				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
90512-7324	Seal kit, CRN 5 -2-7, HQQE, EPDM	Shaft seal O-ring, EPDM O-ring, EPDM O-ring, EPDM	7 15 18 22	1 2 2 1
	Wear parts kit, silicone carbide	Lock nut Chamber with bearing Neck ring Clamp splined Spacing pipe, 4.5 mm Bearing ring rotating Neck ring retainer Lock washer set	20 23 24 25 26 27 28 29	1 2 17 1 2 2 17 1

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CRN 32/45/64


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18
FSS shaft seal
1
gf502810
Gf503055
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Spare parts, CRN 32				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	1
CRN Flushed Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-72	Spare parts kit, PJE coupling DN 50, EPDM	Gasket	34	2
6-990409-58	Spare parts kit, CRN 32 -2, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1
6-990409-59	Spare parts kit, CRN 32 3-7, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1
6-990409-60	Spare parts kit, CRN 32 8-11, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1

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Spare parts, CRN 32				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-990409-61	Spare parts kit, CRN 32 12-14, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1

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Spare parts, CRN 45				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	1
CRN Flushed Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-72	Spare parts kit, PJE coupling DN 50, EPDM	Gasket	34	2
90503-2922	Spare parts kit, CRN 45-2, Shaft seal SiC/ SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1
90503-2923	Spare parts kit, CRN 45 3-7, Shaft seal SiC/ SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1
90503-2924	Spare parts kit, CRN 45 8-10, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1

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Spare parts, CRN 64				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
CRN Single Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	1
CRN Flushed Shaft seal				
90510-1490	Shaft seal SiC/SiC,	Shaft seal	1	2
CRN Single Shaft seal/Flushed Shaft seal				
6-990418-72	Spare parts kit, PJE coupling DN 50, EPDM	Gasket	34	2
6-990418-85	Spare parts kit, CRN 64-2, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1
6-990418-83	Spare parts kit, CRN 64 3-4, Shaft seal SiC/SiC, EPDM	O-ring O-ring Spring (rubber) O-ring Distance tool (shaft seal) Neck ring Sleeve Lock ring Wear ring Seal carrier Bearing, PTFE Bearing, bron. Distance tool	2 3 4 5 18 6 7 8 9 10 19 19 -	2 4 4 2 1 7 6 7 7 7 1 1 1

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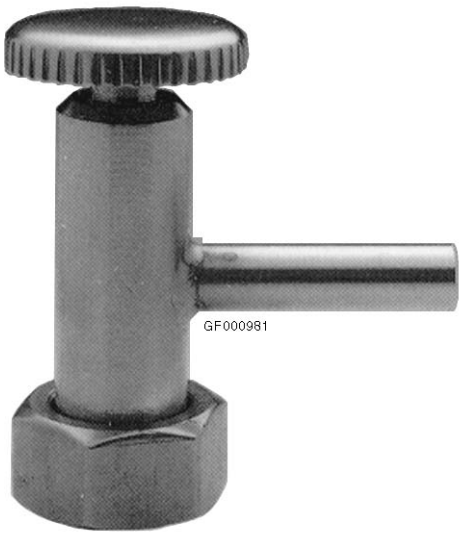
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Tetra Pak

Maintenance & Spare Parts

Sampling valve
(LKM)
Type 20



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Tetra Pak

Doc No. 1211608-0101

Sampling valve

Article No.	Connection	Gasket
6-31350-0020-1	G3/4”	NBR

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Version 01

Doc No. 1211608-0101

Tetra Pak

Tetra Pak Processing Systems AB

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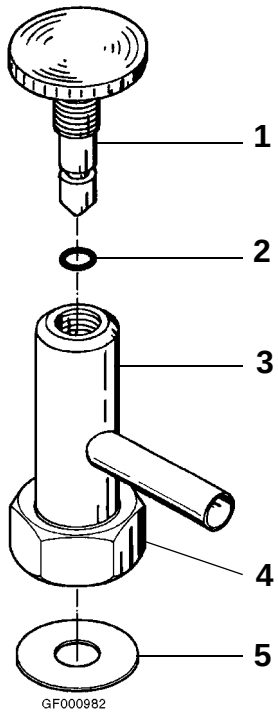
Maintenance

Change spare parts

WARNING!

Risk of injury!
Never service the valve when it is hot.
Make sure that the pipeline is drained and free from media before servicing the valve.
The valve and pipelines must **never** be pressurised when serviced.

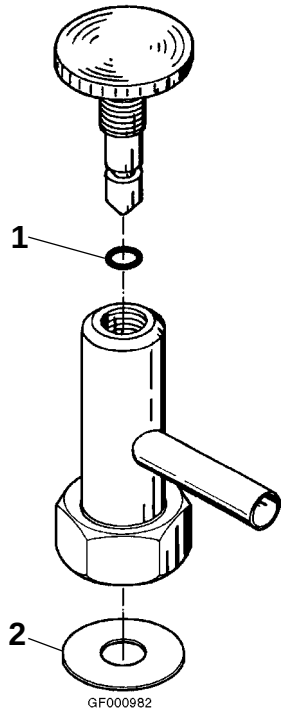
a) Unscrew nut (4) and remove the valve body (3) from the pipeline.
b) Remove packing (5).
c) Unscrew spindle (1) and remove O-ring (2).
d) Change the O-ring (2) and the packing (5).
e) Reassemble in reverse order.



1 Spindle
2 O-ring
3 Valve body
4 Nut
5 Packing

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Spare parts



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Component article No.	Spare part Article No.	Description	Pos.	Qty.
6-31350-0020-1	6-9611-99-0026	O-ring, NBR	1	1
	6-32249-0018-1	Packing	2	1

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Tetra Pak

Maintenance & Spare Parts

Air vent valve

(Armatec)
AT8060/AT3537



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Tetra Pak

Doc No. 1212676-0101

Air vent valve

AT8060/AT3537

Article No.	Type	Connection	Material
90512-7296	PN 10	DN 15	Brass
90512-8240	PN 10	DN 15	AISI 316

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Version 03 Issue 2010-12

Doc No. 1212676-0101

Tetra Pak

Tetra Pak Processing Systems AB

Maintenance **1**

Check. 1

Change. 2

Spare parts **3**

1.0 1212676-0101.TOC

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Maintenance

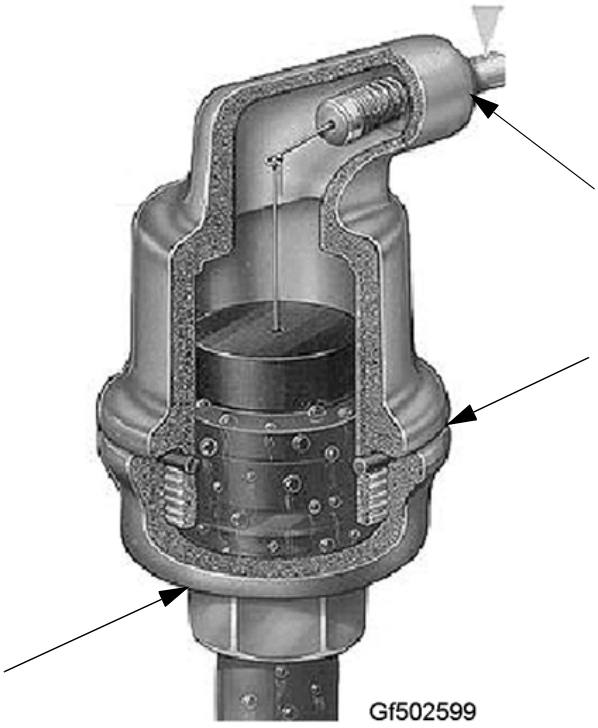
Check

WARNING!

Risk of burns!
Make sure before dismantling, that the pipeline is drained and free from media.

The air vent valve is maintenance free.

a) Check the valve for leakage (see arrows on figure below).
b) If the valve is leaking, dismantle the valve (see chapter **Change)**.
c) Wash through and wash off the valve with water.
d) Reassemble the valve and check for leakage (see arrows on figure below).
e) Change the valve if it still leaking (see chapter **Change).**



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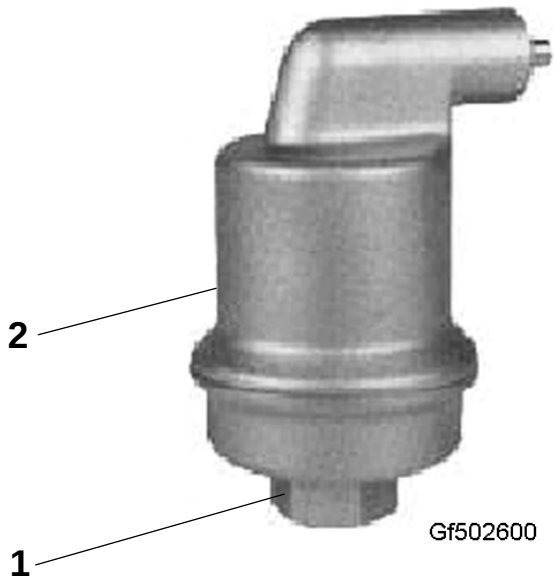
Change

WARNING!

Risk of burns!
Make sure before dismantling, that the pipeline is drained and free from media.

Air vent valve

a) Unscrew the nut (1) on the bottom of the valve (2) with a spanner.
b) Change the air vent valve (2).
c) Reassemble in reverse order.

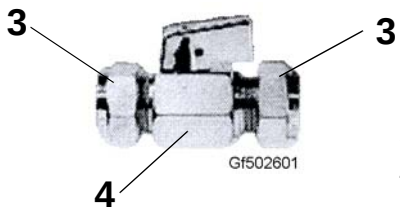


1 Nut
2 Air vent valve

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Ball valve

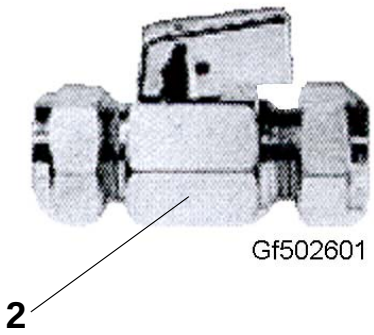
a) Dismantle the air vent valve (see above).
b) Unscrew nuts (3) on ball valve (4) with a spanner.
c) Change ball valve.
d) Reassemble in reverse order, be gentle when mounting the o-ring.



3 Nut
4 Ball valve

Spare parts





Component article No.	Spare part Article No.	Description	Pos.	Qty.
90512-8240	6-31801-9452-1	Air vent valve	1	1
	90512-8915	Ball valve	2	1
90512-7296	6-31801-9451-1	Air vent valve	1	1
	90512-8915	Ball valve	2	1

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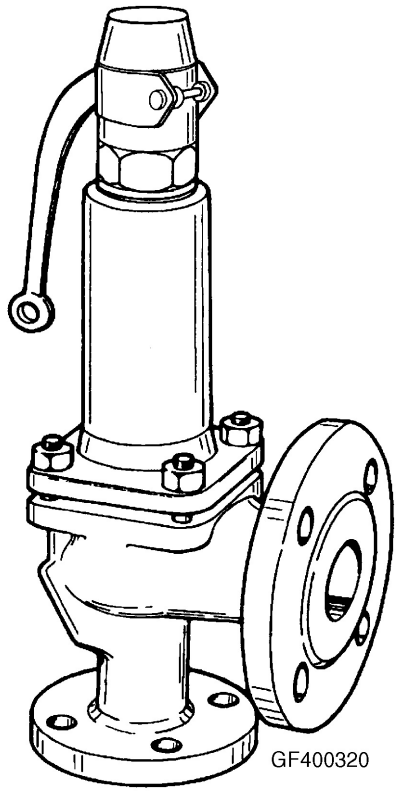
Tetra Pak

Maintenance & Spare Parts

Safety valve

(Leser)

AT4541-4581



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Tetra Pak

Doc No. 1213620-0101

Safety valve

Article No.	Type	DN	Opening pressure
6-31801-5501-1	AT4543	20/40	3.2 bar (g)
6-31801-5501-2	AT4543	25/40	3.2 bar (g)
6-31801-5501-3	AT4543	32/50	3.2 bar (g)
6-31801-5501-4	AT4543	40/65	3.2 bar (g)
6-31801-5501-5	AT4543	50/80	3.2 bar (g)
6-31801-5501-6	AT4543	65/100	3.2 bar (g)
6-31801-5501-7	AT4543	80/125	3.2 bar (g)
6-31801-9077-1	AT4543	20/40	3.5 bar (g)
90503-8871	AT4581	40/65	4.7 bar (g)

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Version 03 Issue 200612

Doc No. 1213620-0101

Tetra Pak

Tetra Pak Processing Systems AB

Maintenance **1**

Description 1

Check. 1

Change. 2

Spare Parts **3**

Not applicable for this component! 3

1.0 1213620-0101.TOC

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Maintenance

Description

The safety valve is spring-loaded and equipped with a lifting lever. It is intended for both gases and liquids.

Check

WARNING!

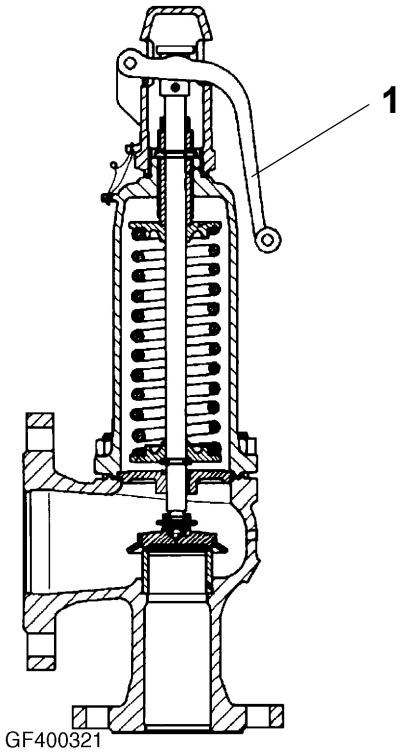
Risk of burning!
Make sure before dismantling, that the system is drained and free from media.

a) Open the valve manually by pulling the lever (1).

b) Close the valve by a sudden relief of the lever (this is to avoid particles in the sealing area).

It is important to ensure that the lifting lever does not engage the spindle cap after the lifting procedure. The lever must be deflected towards the centre line of the bonnet until the lifting forks are disengaged.

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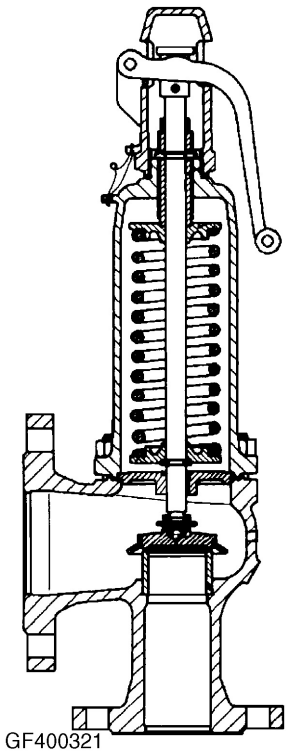
1 Lifting lever

Change

WARNING!

Risk of burning!
Make sure before dismantling, that the system is drained and free from media.

a) Depressurize the system.
b) Unscrew the nuts on the flanges, and remove the valve.
c) Change the flange gaskets if damaged.
d) Refit in the reverse order. Never use Teflon tape when refitting.



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Spare Parts

Not applicable for this component!

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Tetra Pak

Maintenance & Spare Parts

Constant-pressure modulating valve

(Alfa Laval)

CPM-2



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Tetra Pak

Doc No. 1214498-0101

Constant-pressure modulating valve

CPM-2

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

1.0 1214498-0101.fro

Version 04 Issue 2009-04

Doc No. 1214498-0101

Tetra Pak

Tetra Pak Processing Systems AB

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CPMO-2-Kv2/15 9

CPMI-2-Kv7 10

CPMO-2-Kv9 11

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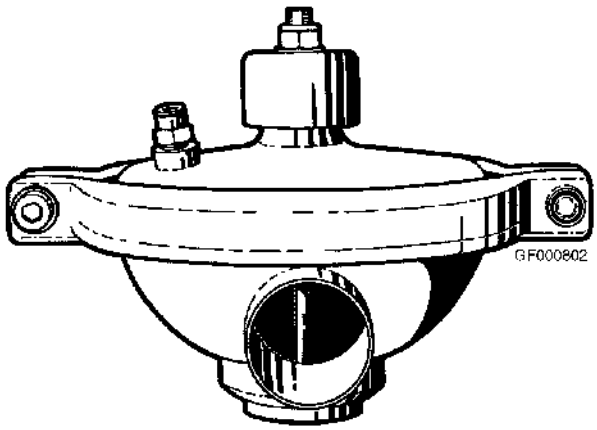
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Maintenance

Constant-pressure modulating valve

General

CPMI-2 and CPMO-2 are sanitary constant-pressure valves for use in stainless steel pipe systems. The CPMI-2 (Constant-Pressure Modulating Inlet) maintains a constant pressure in the process line at the inlet side of the valve. CPMI-2 is often used after separators and heat exchangers or as an overflow valve. The CPMO-2 (Constant-Pressure Modulating Outlet) maintains a constant pressure in the process line at the outlet side of the valve. Typical applications are before filling/bottling machines etc.

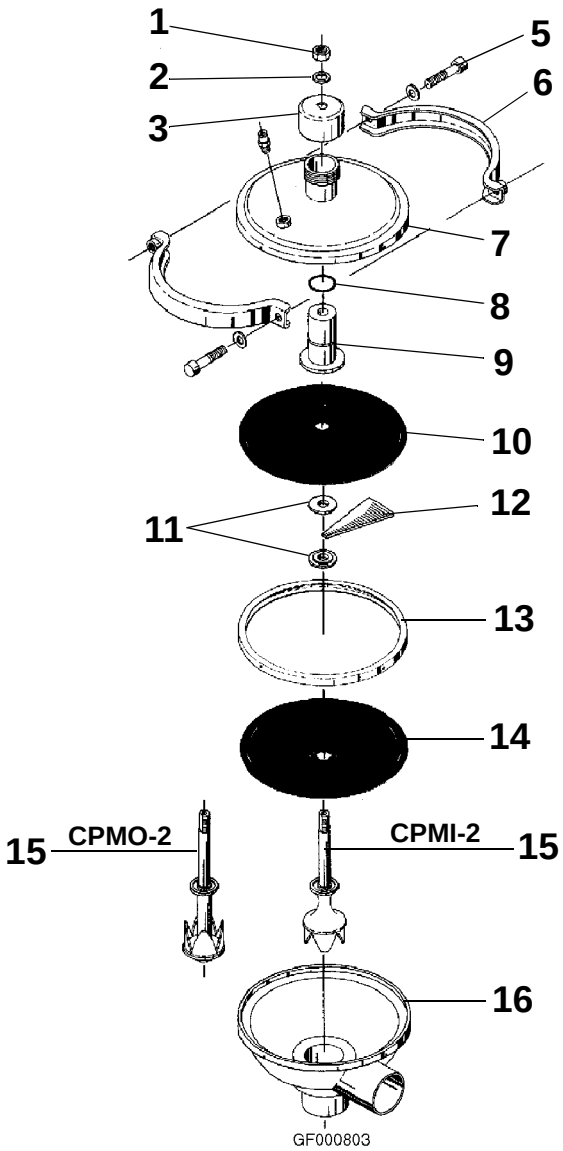


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Change spare part kit

WARNING!

Risk of injury!
Make sure that the pipelines are drained and free from media before servicing the valve!
Never service the valve when it is hot!
Always disconnect compressed air before service!
The valve and the pipelines must **never** be pressurised when servicing the valve!



1 Top nut
2 Washer
3 Top
5 Screw
6 Clamp
7 Cover
8 O-ring
9 Guide
10 Upper diaphragm
11 Inner ring
12 Sector
13 Outer ring
14 Lower diaphragm
15 Valve plug
16 Valve body

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Disassemble

a) Loosen screws (5) and remove clamp (6).

b) **CPMI-2:** Remove cover (7) together with the internal parts of the valve from the valve body (16).

c) Remove top nut (1), washer (2), and top (3) from the plug (15).

Note! In “d” ensure that the cover (7) is turned downwards and plug (15) is pulled upwards so that sectors (12) are not separated from the diaphragms (10,14).

d) **CPMI-2:** Remove plug (15) from the diaphragm unit and guide (9).
CPMO-2: Remove plug (15) from valve body (16), and remove cover (7) and internal parts of the valve.

e) Remove lower inner ring (11) and lower diaphragm (14).

f) Remove sectors (12).

g) Remove outer ring (13), upper inner ring (11), and upper diaphragm (10).

h) Remove guide (9) from cover (7).

i) Remove O-ring (8) from guide (9).

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Reassemble

Change the parts of the spare part kit; the O-ring (8) and the diaphragms (10,14).

Lubricate the guide, the sectors, and the threads with food grade grease before reassembly.

a) Fit O-ring (8) on guide (9).

b) Fit lubricated guide (9) into cover (7).

Note! Turn cover (7) downwards before continuing, and make sure that the diaphragms are fitted correctly. One side of the lower diaphragm (which is in contact with the product) has a grey-blue colour. The flat side of the upper diaphragm should be fitted towards the cover.

c) Fit upper diaphragm (10), upper inner ring (11), and outer ring (13) on guide (9) and cover (7).

d) Fit sectors (12) between upper inner ring (11) and outer ring (13).

e) Fit lower inner ring (11) and lower diaphragm (14).

f) **CPMI-2:**Fit plug (15) in the diaphragm unit and guide (9) until the flange of the lug contacts the lower diaphragm (14).

g) Fit valve body (16) in cover (7).

h) **CPMO-2**: Fit plug (15) through valve body (16) and in the diaphragm unit and guide (9) until the flange of the plug contacts the lower diaphragm (14).

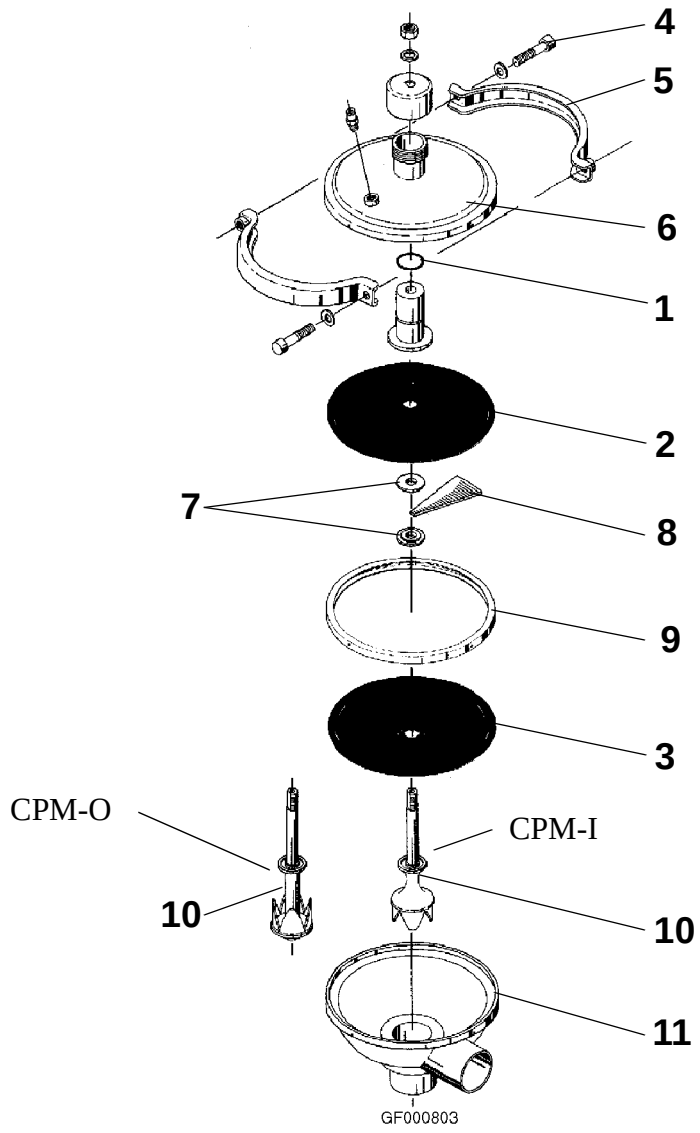
i) Fit top (3), washer (2) an top nut (1) on plug (15).

j) Fit and tighten clamp (6) and screws (5) to a torque of 10-15 Nm.

Note! **Pre-use check:** Lift and lower the valve top several times to ensure that the valve operates smoothly.

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Spare parts



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CPMI-2-Kv23

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-3059-01	Valve plug	-	10	1
6-9612-3340-01	Valve body, ISO	-	11	1
6-9612-3343-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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CPMO-2-Kv23

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-3060-01	Valve plug	-	10	1
6-9612-3341-01	Valve body, ISO	-	11	1
6-9612-3344-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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CPMI-2-Kv2/15

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-3061-01	Valve plug	-	10	1
6-9612-3342-01	Valve body, ISO	-	11	1
6-9612-3345-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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CPMO-2-Kv2/15

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-3062-01	Valve plug	-	10	1
6-9612-3342-01	Valve body, ISO	-	11	1
6-9612-3345-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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CPMI-2-Kv7

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-4687-01	Valve plug	-	10	1
6-9612-3342-01	Valve body, ISO	-	11	1
6-9612-3345-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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CPMO-2-Kv9

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-99-1222	Screw	-	4	2
6-9612-3352-01	Clamp	-	5	2
6-31356-0067-1	Cover	-	6	1
6-00223-406-49	O-ring, NBR (Standard)	-	1	1
6-9611-99-2253	O-ring, FPM	-	1	1
6-31356-0014-2	Upper diaphragm, NBR (Standard)	-	2	1
6-31356-0014-4	Upper diaphragm, EPDM/PTFE	-	2	1
6-9612-3057-02	Upper diaphragm, PTFE	-	2	1
6-31356-0063-1	Inner ring	-	7	2
6-31356-0062-1	Support sector	-	8	12
6-9612-3058-01	Outer ring	-	9	1
6-9612-3066-01	Lower diaphragm, EPDM/PTFE (Standard)	-	3	1
6-9612-3057-01	Lower diaphragm, PTFE	-	3	1
6-9612-4625-01	Valve plug	-	10	1
6-9612-3342-01	Valve body, ISO	-	11	1
6-9612-3345-01	Valve body, DIN	-	11	1
6-9611-92-0218	Service kit (Standard)	O-ring, NBR Upper diaphragm, NBR Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0515	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE	1 2 3	1 1 1
6-9611-92-0516	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, EPDM-PTFE	1 2 3	1 1 1
6-9611-92-0517	Service kit (Option)	O-ring, FPM Upper diaphragm, FPM Lower diaphragm, PTFE/EPDM-PTFE	1 2 3	1 1 1

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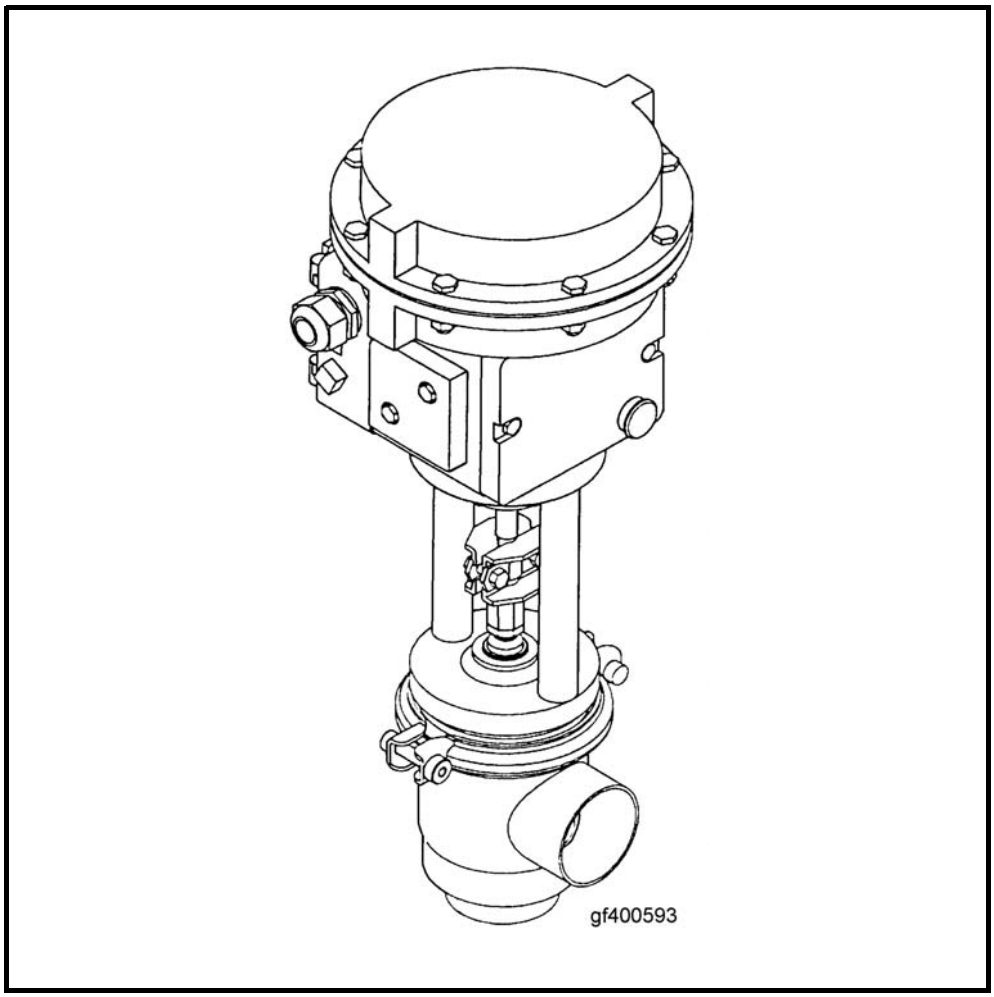
Tetra Pak

Maintenance & Spare Parts

Electro-pneumatic modulating valve

(Alfa Laval Flow / Samson actuator)

SPC-2 / 2A



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Tetra Pak

Doc No. 1215537-0101

Electro-pneumatic modulating valve

SPC-2 / 2A

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 02

Doc No. 1215537-0101

Tetra Pak

Tetra Pak Processing Systems AB

Maintenance 1

General 1

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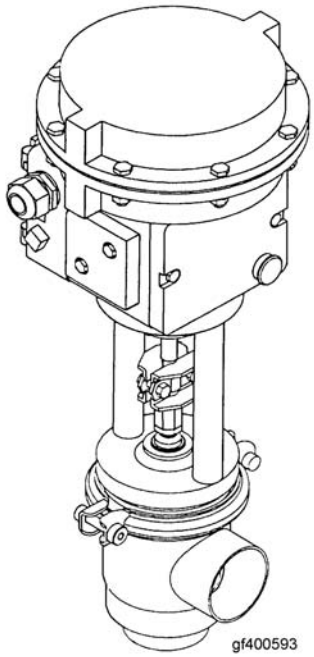
Maintenance

General

The valve is a sanitary process valve. It includes an electro-pneumatic converter and is operated by a pneumatically driven actuator with springs.

NO = Normally Open

NC = Normally Closed



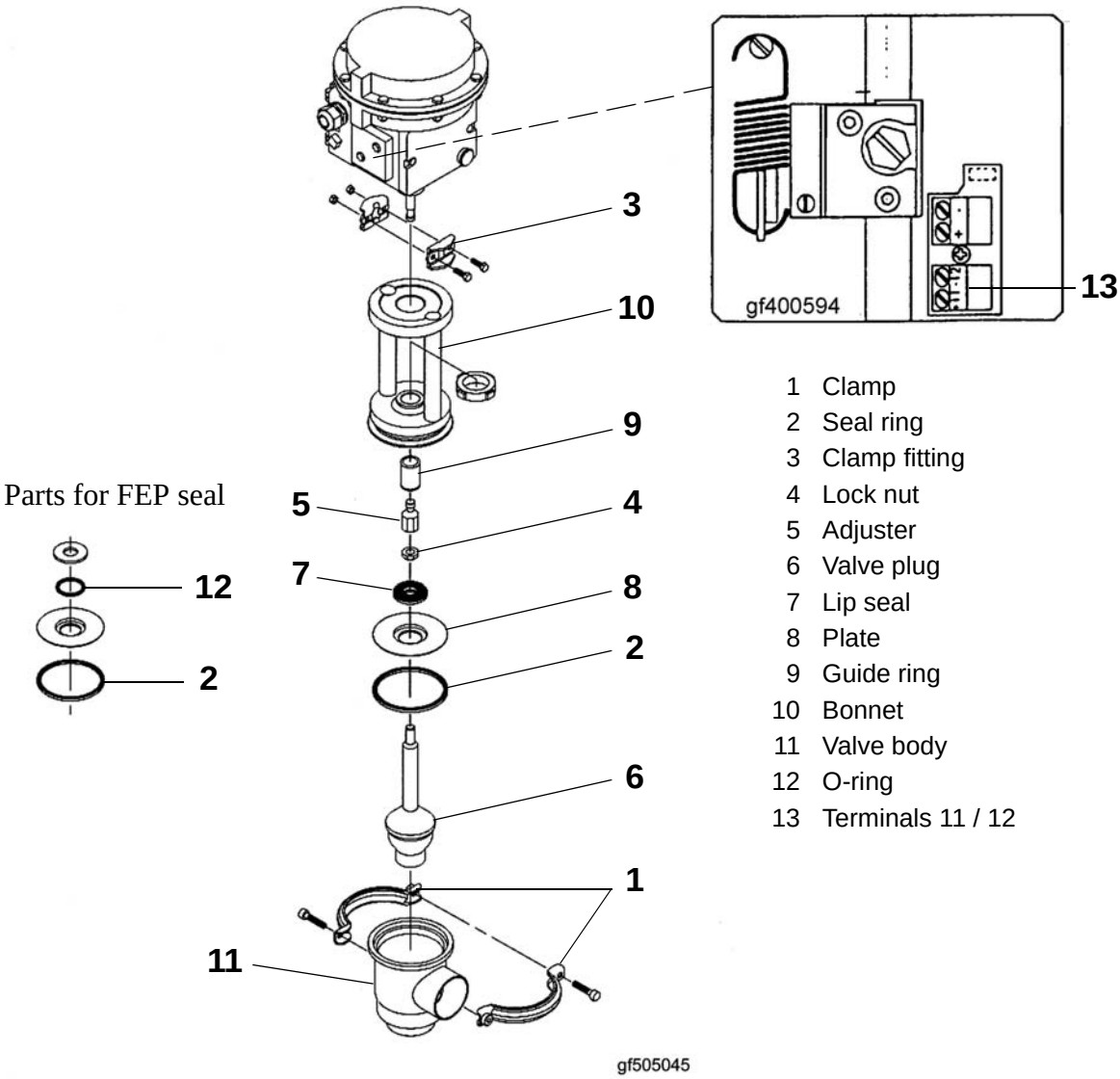
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Change valve

WARNING!

Risk of injury!
- Make sure that the pipelines are drained and free from media before servicing the valve!
- **Never** service the valve when it is hot!
- **Never** service the valve with valve and pipelines under pressure.
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- **Never** put your fingers through the valve ports if the actuator is supplied with compressed air!

Change service kit, SPC-2



Parts for FEP seal

1 Clamp
2 Seal ring
3 Clamp fitting
4 Lock nut
5 Adjuster
6 Valve plug
7 Lip seal
8 Plate
9 Guide ring
10 Bonnet
11 Valve body
12 O-ring
13 Terminals 11 / 12

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WARNING!

Risk of injury!
- Make sure that the pipelines are drained and free from media before servicing the valve!
- **Never** service the valve when it is hot!
- **Never** service the valve with valve and pipelines under pressure.
- **Always** release compressed air after use.

(Cont'd)

(Cont'd)

- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- **Never** put your fingers through the valve ports if the actuator is supplied with compressed air!

WARNING! **Risk of entanglement!**
The valve has springs under pressure. The clamp (1) must only be removed and refitted when the valve is depressurized.

Caution! Always disconnect the main system before servicing the valve.

Note! The I/P-converter of the actuator is adjusted before delivery and must never be opened.

Note! All scrap must be stored/disposed of in accordance with current rules/ directives.

Disassemble

a) Supply compressed air and current of 20 mA (+ on terminal block no. 11 and - on terminal block no. 12, see pos. 13 in graphic on previous page) to depressurize the NC (Normally Closed) version.
b) Remove the clamp (1).
c) Disconnect compressed air and current of 20 mA (NC version).
d) Remove the bonnet (10) with actuator and internal valve parts from the valve body (11).
e) Remove the seal ring (2).
f) Loosen and remove the clamp fitting (3).
g) Remove the valve plug (6) with its attached parts from the bonnet (10).
h) Remove the lip seal (7) and plate (8) (for **FEP seal:** Remove the o-ring (12) and plate (8)).
i) Remove the guide ring (9).
j) Change the seal ring (2), guide ring (9) and lip seal (7) (for **FEP seal** the o-ring (12)).

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Reassemble

a) Fit the new guide ring (9) in the bonnet (10).

b) Grease the new lip seal (7) (for **FEP seal** the o-ring (12)).

c) Fit the lip seal (7) (for **FEP seal** the o-ring (12)) and plate (8) on the valve plug (6).

d) Supply compressed air and current of 20 mA to depressurize the NC version.

e) Fit the new seal ring (2) in the valve body (11).

f) Fit the bonnet (10) with actuator and internal valve parts in the valve body (11).

g) Fit and tighten the clamp (1).

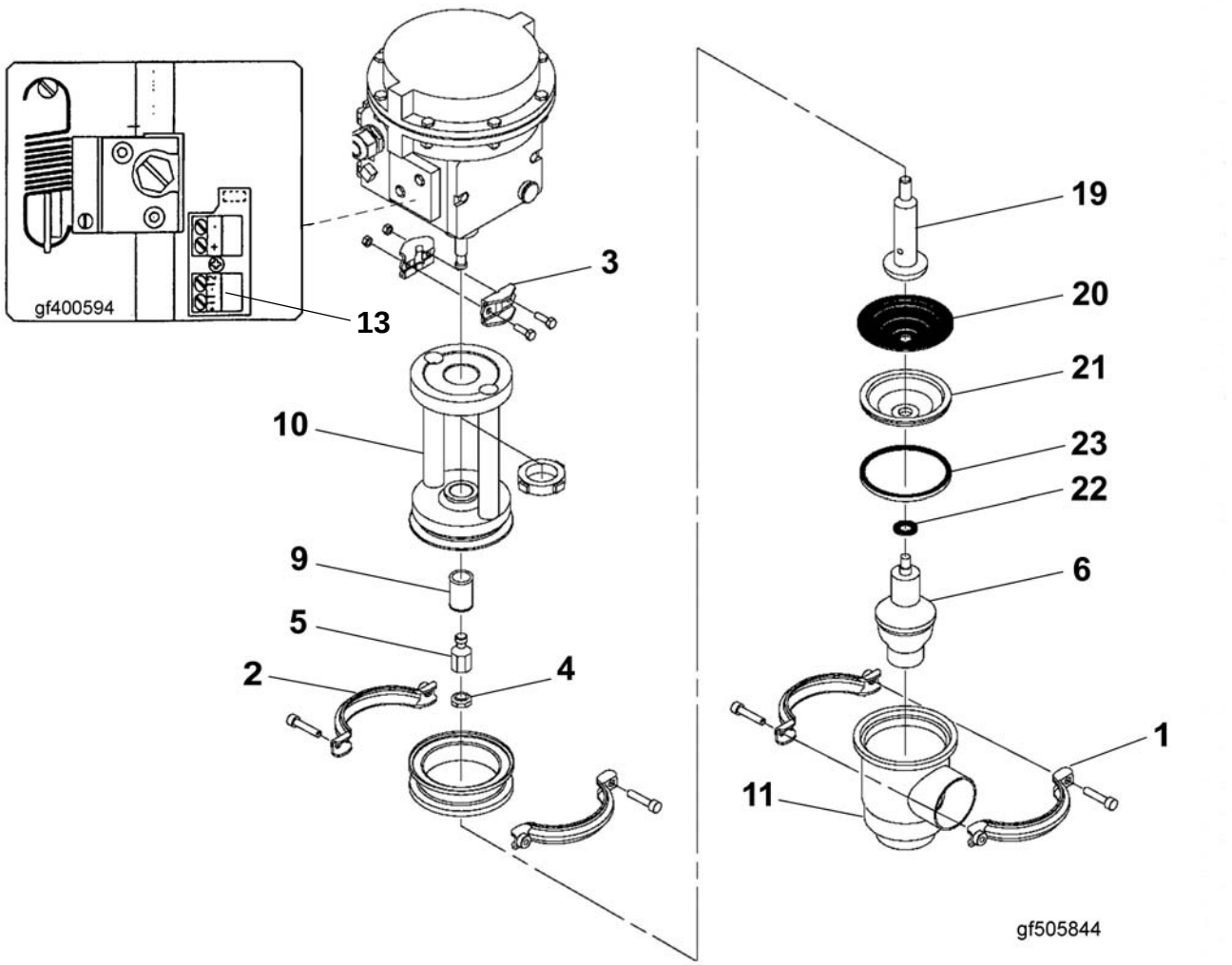
h) Check that the valve plug adjuster (5) is in contact with the actuator piston rod. Adjust if necessary and tighten the lock nut (4) using a spanner.

i) Fit and tighten the clamp fitting (3) to connect the actuator piston rod with the valve plug (6).

j) Move the valve plug (6) up and down several times and check that the valve plug is still in closed position. If not, set the valve in accordance with *"Electro-pneumatic modulating valve - set"***.**

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Change service kit, SPC-2A with ARC plug



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1	Clamp	11	Valve body
2	Clamp	13	Terminals 11/12
3	Clamp fitting	19	Upper stem
4	Lock nut	20	Diaphragm support
5	Valve plug adjuster	21	Diaphragm
6	Valve plug	22	Stem seal
9	Guide ring	23	L-seal

Disassemble

a) Supply compressed air and current of 20 mA (+ on terminal block no. 11 and - on terminal block no. 12) to open the NC (Normally Closed) version.

b) Remove the clamps (1) and (2).

c) Disconnect compressed air and current of 20 mA (NC version).

d) Remove the bonnet (10) with actuator and internal valve parts from the valve body (11).

e) Loosen and remove the clamp fitting (3).

f) Remove the complete diaphragm/stem unit from bonnet (10).

g) Turn upper stem (19) counterclockwise and remove it from valve plug (6). Counterhold with a spanner.

h) Remove diaphragm support (20), diaphragm (21) (with L-seal (23)) and stem seal (22) from plug (6).

i) Remove the guide ring (9) from bonnet (10).

Reassemble

a) Fit the new guide ring (9) in the bonnet (10).

b) Grease the new stem seal (22) and fit it on the valve plug (6).

c) Fit the L-seal (23) on the diaphragm (21) and place the complete unit together with the diaphragm support (20) on the valve plug (6).

d) Put together upper stem (19) and valve plug (6).

e) Supply compressed air and current of 20 mA to depressurize the NC version.

f) Place the complete diaphragm/stem unit in the bonnet (10).

g) Fit and tighten the clamps (1) and (2).

h) Disconnect compressed air and current of 20 mA (NC version).

i) Check that the valve plug adjuster (5) is in contact with the actuator piston rod. Adjust if necessary and tighten the lock nut (4) using a spanner.

j) Fit and tighten the clamp fitting (3) to connect the actuator piston rod with the valve plug (6).

Move the valve plug (6) up and down several times and check that the valve plug is still in closed position. If not, set the valve in accordance with *"Electro-pneumatic modulating valve - set"***.**

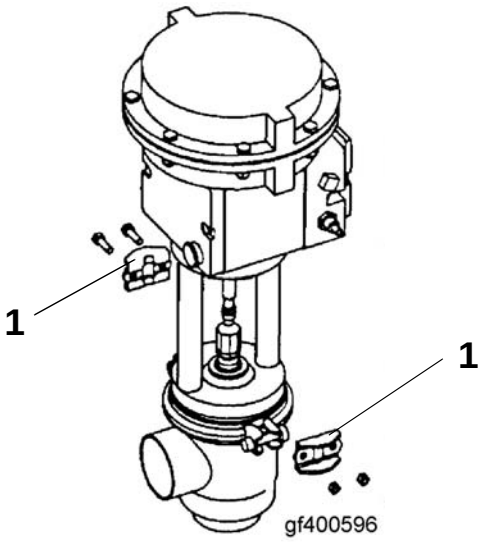
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Set

The valve is set and tested before delivery. These setting instructions are only to be used if further setting is required!

a) Release compressed air.

b) Loosen and remove clamp fitting (1).

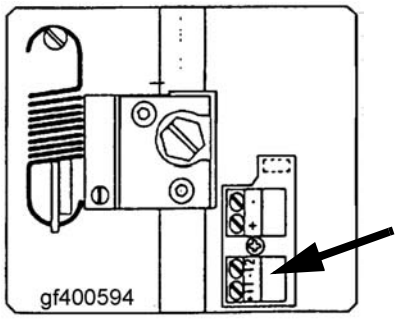


1 Clamp fitting

c) Supply compressed air (4 bar).

d) Set the highest signal (20 mA), + on terminal block no. 11 and - on terminal block no. 12, see graphic below.

Note! For NC valve the signal must be 4mA.



e) Make sure that the valve plug (2) is pressed against the valve seat, see graphic on next page

f) Set the valve plug adjuster (3) so that it is in contact with the actuator piston rod (4). (Give 1/4 extra turn to set the plug under pressure).

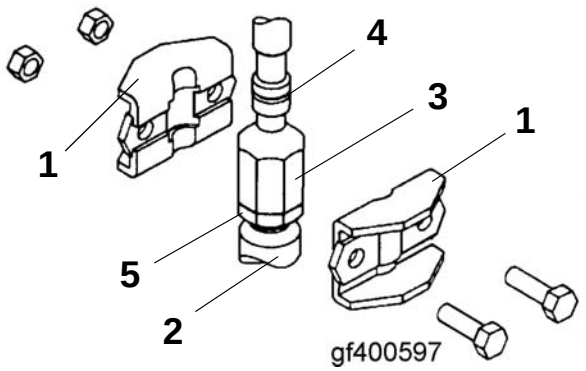
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g) Tighten the lock nut (5) using a spanner.

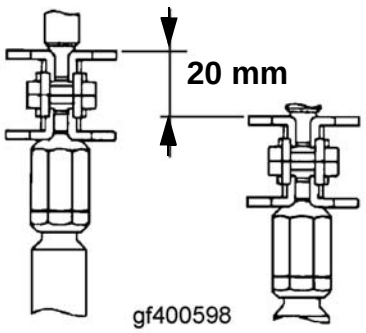
h) Fit and tighten the clamp fitting (1) to connect the actuator piston rod (4) with the valve plug (2).



1 Clamp fitting
2 Valve plug
3 Plug adjuster
4 Piston rod
5 Lock nut

i) Check the stroke by changing the signal from 20 to 4 mA (NO; opposite if NC). The stroke should be 20±1mm.

j) In case of deviation from the 20 mm stroke, see "*Electro-pneumatic modulating valve - set in case of stroke deviation*".



k) Move the valve plug (2) up and down several times and check that the valve plug is still in closed position. If not, start over from a).

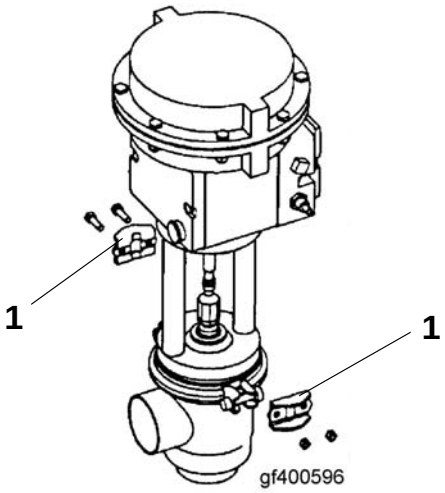
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Set in case of stroke deviation

The valve is set and tested before delivery. These setting instructions are only to be used if further setting is required!

a) Release compressed air.

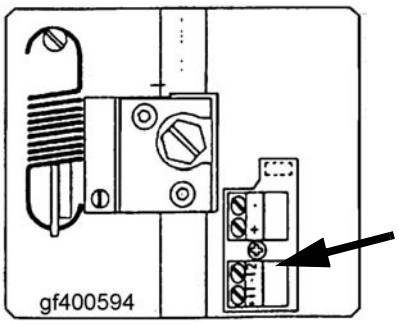
b) Remove the clamp fitting (1).



1 Clamp fitting

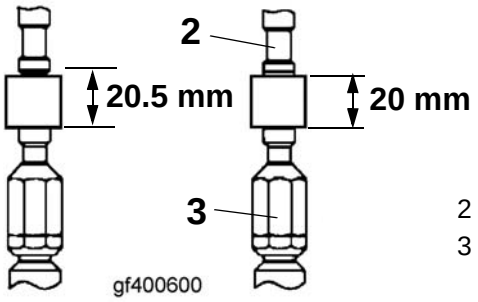
c) Supply compressed air (4 bar).

d) Set the lowest signal (4 mA), + on terminal block no. 11 and - on terminal block no. 12 (20 mA for NC valve).



e) Set with the zero-screw (clockwise) to ensure max. open position, see graphic on next page.
Note! Maximum stroke is 21 mm.

f) Place a 20 mm block between the actuator piston rod (2) and the valve plug adjuster (3).



2 Piston rod
3 Plug adjuster

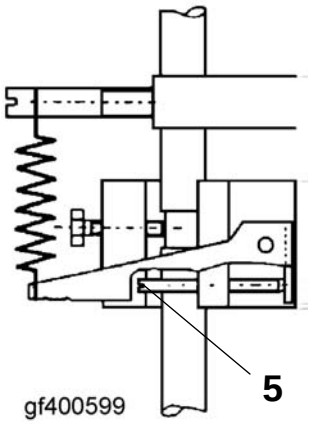
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(Cont'd)

g) Set the valve plug adjuster (4) to a position with a distance of 0.5 mm + the 20 mm block between the actuator piston rod and the valve plug (use a gauge blade to determine the 0.5 mm).

h) Set with the zero-screw (5) (counter-clockwise) until the actuator piston rod is in contact with the 20 mm block and can be moved slightly. Turn the zero-screw 1/2 round (counter-clockwise) to set the valve plug under pressure.



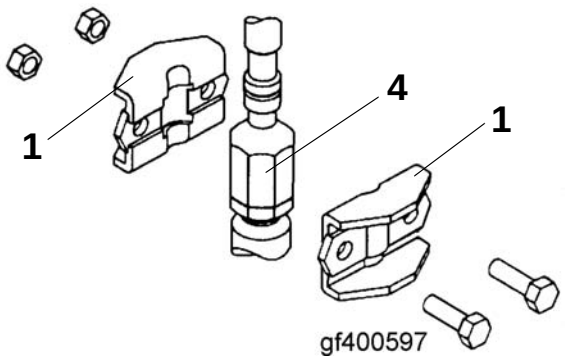
5 Zero-screw

Note! Do not touch the zero-screw.

i) Pull the spring lever gently down to release the 20 mm block, and remove the 20 mm block.

j) Set the highest signal (20 mA), + on terminal block no. 11 and - on terminal block no. 12 (4 mA for NC valve). The actuator piston rod is in contact with the valve plug adjuster (4) and sets the plug under pressure.

k) Fit and tighten the clamp fitting (1) to connect the actuator piston rod with the valve plug.



1 Clamp fitting
4 Plug adjuster

l) Check that the stroke is 20 mm.

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Change actuator

The fitted actuator is complete with positioner and is not possible to service. In case of failure in these parts the complete unit should be exchanged.

WARNING!

Risk of injury!
- Make sure that the pipelines are drained and free from media before servicing the valve!
- **Never** service the valve when it is hot!
- **Never** service the valve with valve and pipelines under pressure.
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- **Never** put your fingers through the valve ports if the actuator is supplied with compressed air!

a) Apply a pressure of approx. 3 bar to the “Supply” connection and additionally connect a control signal of approx. 10 mA to retract the actuator stem.

Note! Should no signal pressure or electric control signal be available during the mounting procedure, the hexagon nut (14) must be tightened to hold the pre-tensioned springs.

b) Remove the hexagon nut (14) from the valve bonnet (10) and remove the old actuator.

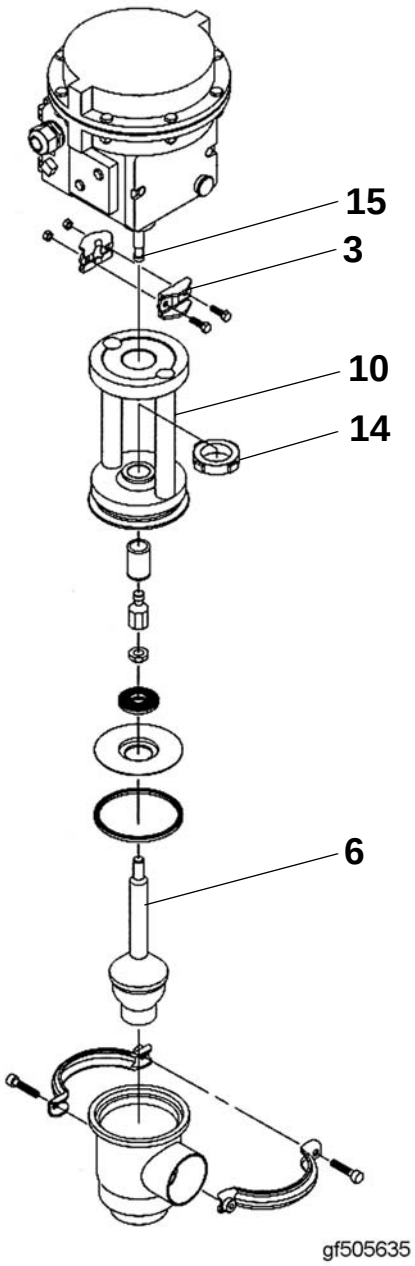
c) Place the new actuator with its stem retracted on the valve bonnet.

d) Make sure the actuator is in proper position and secure with the hexagon nut (14) applying a tightening torque of min. 150 Nm.

e) Pull up the valve plug stem (6) until it contacts the actuator piston rod (15).

f) Attach the clamp fitting (3) to each stem and screw tight using the fastening screws.

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3 Clamp fitting
6 Valve plug
10 Bonnet
14 Hexagon nut
15 Actuator piston rod

Cleaning

DANGER!

Risk of injury!
Always handle lye and acid with great care!
Always use rubber gloves!
Always use protective goggles!

WARNING!

Risk of burning!
Never touch the pump or the pipelines when sterilizing.

WARNING!

Risk of injury!
Always rinse well with clean water after the cleaning.

Note! The cleaning agents must be stored/discharged in accordance with current rules/directives.

Note! Avoid excessive concentration of the cleaning agent, dose gradually.
Adjust the cleaning flow to the process:
Milk sterilization/viscous liquids →
Increase the cleaning flow!

Examples of cleaning agents:
Use clean water, free from chlorides.

– 1% by weight NaOH at 70°C.

1 kg NaOH + 100 litre water = Cleaning agent

2.2 litre 33% NaOH + 100 litre water = Cleaning agent

– 0.5% by weight HNO_3 at 70°C.

0.7 litre 53% HNO3 + 100 litre water = Cleaning agent

NaOH = Caustic soda
HNO_3= Nitric acid

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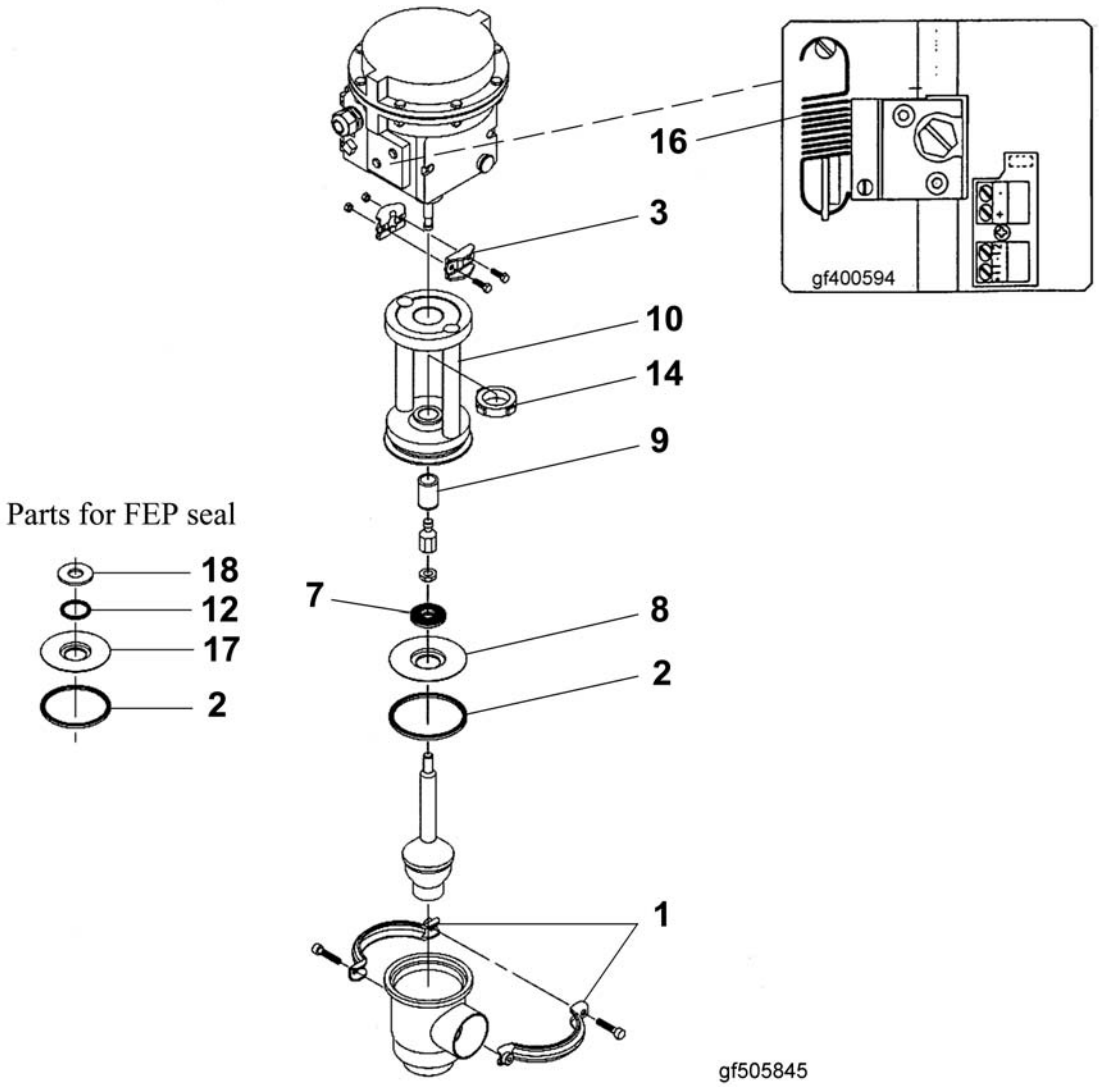
Troubleshooting

Problem	Cause	Action
Leaking lip seal at the piston	Worn lip seal	Replace the lip seal
Leaking seal at the valve body	Incorrect rubber grade	Replace with a seal of a different rubber grade
Deviation in the flow regulation	- Worn valve plug - Mechanical parts have come loose (vibrations)	- Replace the plug and adjust - Tighten and adjust
Actuator does not regulate	Actuator errors	Return the actuator to the supplier

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Spare parts

SPC-2



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Spare part article No.	Description	Included parts	Pos.	Qty
6-9612-5336-01	Actuator complete, NO, 38-101.6 mm, NW40-100	-	-	1
6-9612-5336-02	Actuator complete, NC, 38-76 mm, NW40-80	-	-	1

Spare part article No.	Description	Included parts	Pos.	Qty
6-9612-5336-03	Actuator complete, NC 101.6 mm, NW100	-	-	1
6-9611-92-0419	Service kit, EPDM, 38-51 mm, NW40-50	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0423	Service kit, EPDM, 63.5-101.6 mm, NW65-100	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0420	Service kit, NBR, 38-51 mm, NW40-50	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0424	Service kit, NBR, 63.5-101.6 mm, NW65-100	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0421	Service kit, FPM, 38-51 mm, NW40-50	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0425	Service kit, FPM, 63.5-101.6 mm, NW65-100	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0422	Service kit, PTFE, 38-51 mm, NW40-50	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0426	Service kit, PTFE, 63.5-101.6 mm, NW65-100	Lip seal O-ring Seal ring Guide ring	7 12 2 9	1 1 1 1
6-9611-92-0078	Lip seal kit, EPDM (standard), 38-51 mm, NW40-50	Lip seal Plate Seal ring	7 8 2	1 1 1
6-9611-92-0142	Lip seal kit, EPDM (standard), 63.5-101.6 mm, NW65-100	Lip seal Plate Seal ring	7 8 2	1 1 1

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Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-0079	Lip seal kit, NBR, 38-51 mm, NW40-50	Lip seal Plate Seal ring	7 8 2	1 1 1
6-9611-92-0143	Lip seal kit, NBR, 63.5-101.6 mm, NW65-100	Lip seal Plate Seal ring	7 8 2	1 1 1
6-9611-92-0080	Lip seal kit, FPM, 38-51 mm, NW40-50	Lip seal Plate Seal ring	7 8 2	1 1 1
6-9611-92-0144	Lip seal kit, FPM, 63.5-101.6 mm, NW65-100	Lip seal Plate Seal ring	7 8 2	1 1 1
6-9611-92-0445	Lip seal kit, PTFE, 38-51 mm, NW40-50	Plate for FEP seal Seal ring Washer O-ring	17 2 18 12	1 1 1 1
6-9611-92-0446	Lip seal kit, PTFE, 63.5-101.6 mm, NW65-100	Plate for FEP seal Seal ring Washer O-ring	17 2 18 12	1 1 1 1
6-9612-2806-01	Lip seal, EPDM, 38-51 mm, NW40-50	-	7	1
6-9612-3088-01	Lip seal, EPDM, 63.5-101.6 mm, NW65-100	-	7	1
6-9612-2806-02	Lip seal, NBR, 38-51 mm, NW40-50	-	7	1
6-9612-3088-02	Lip seal, NBR, 63.5-101.6 mm, NW65-100	-	7	1
6-9612-2806-03	Lip seal, FPM, 38-51 mm, NW40-50	-	7	1
6-9612-3088-03	Lip seal, FPM, 63.5-101.6 mm, NW65-100	-	7	1
6-9612-2805-01	Plate, 38-51 mm, NW40-50	-	8	1
6-9612-3087-01	Plate, 63.5-101.6 mm, NW65-100	-	8	1

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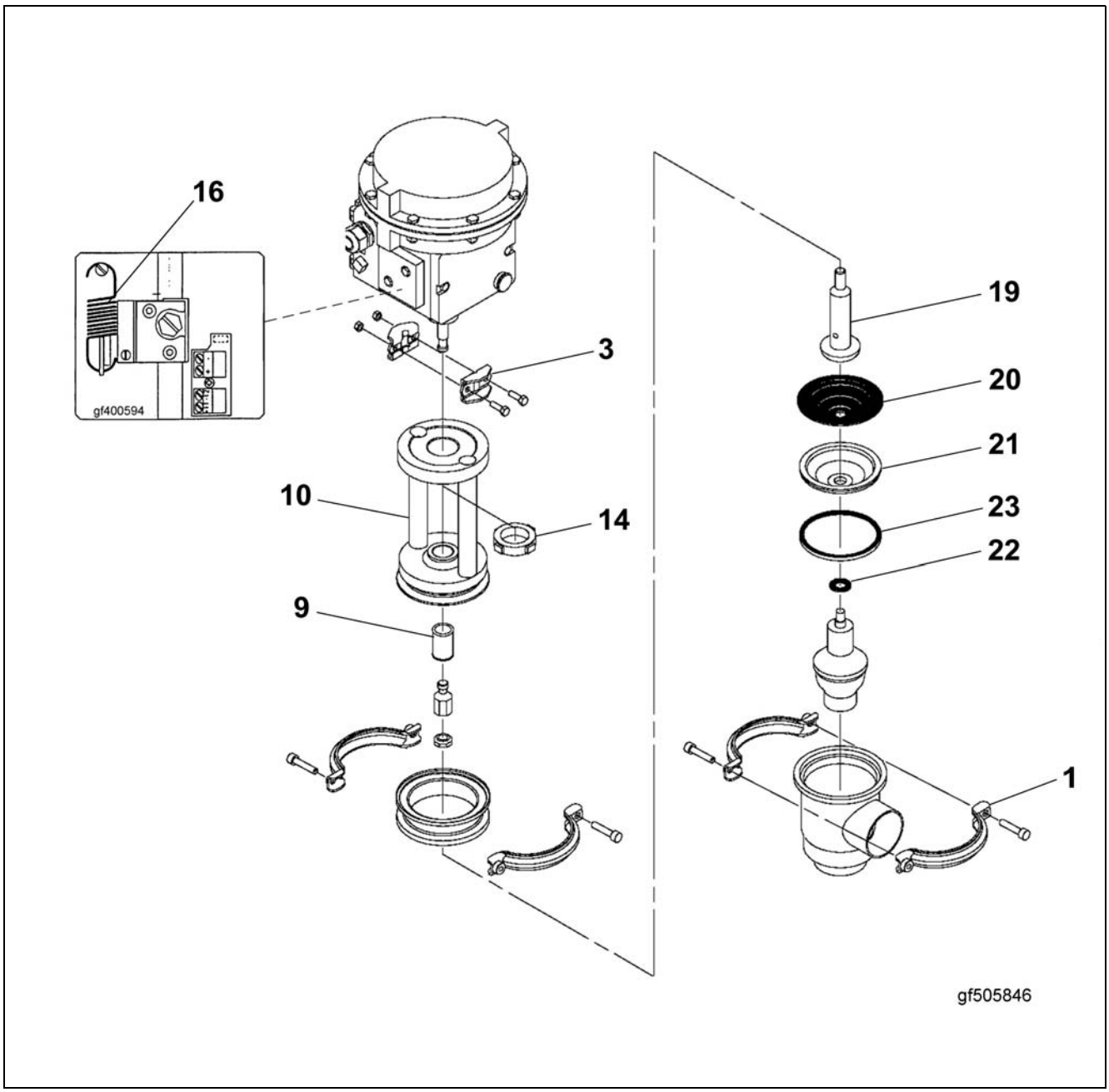
Spare part article No.	Description	Included parts	Pos.	Qty
6-31353-0453-1	Plate for FEP seal, 38-51 mm, NW40-50	-	17	1
6-31353-0454-1	Plate for FEP seal, 63.5-101.6 mm, NW65-100	-	17	1
6-31353-0128-1	Seal ring, EPDM, 38-51 mm, NW40-50	-	2	1
6-31353-0205-1	Seal ring, EPDM, 63.5-101.6 mm, NW65-100	-	2	1
6-31353-0128-2	Seal ring, NBR, 38-51 mm, NW40-50	-	2	1
6-31353-0205-2	Seal ring, NBR, 63.5-101.6 mm, NW65-100	-	2	1
6-31353-0128-3	Seal ring, FPM, 38-51 mm, NW40-50	-	2	1
6-31353-0205-3	Seal ring, FPM, 63.5-101.6 mm, NW65-100	-	2	1
6-31353-0451-1	Seal ring, PTFE, 38-51 mm, NW40-50	-	2	1
6-31353-0451-2	Seal ring, PTFE, 63.5-101.6 mm, NW65-100	-	2	1
6-31353-0452-1	Washer, 38-51 mm, NW40-50	-	18	1
6-31353-0452-2	Washer, 63.5-101.6 mm, NW65-100	-	18	1
6-9611-99-2909	O-ring, 38-51 mm, NW40-50	-	12	1
6-9611-99-2910	O-ring, 63.5-101.6 mm, NW65-100	-	12	1
6-9612-5331-01	Bonnet complete, 38-51 mm, NW40-50	-	10	1
6-9612-5331-02	Bonnet complete, 63.5-101.6 mm, NW65-100	-	10	1

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Spare part article No.	Description	Included parts	Pos.	Qty
6-31320-0027-3	Clamp complete, 38-51 mm, NW40-50	-	1	1
6-31320-0027-5	Clamp complete, 63.5-101.6 mm, NW65-100	-	1	1
6-9612-5342-01	Clamp fitting	-	3	1
6-9612-5339-01	Striking nut	-	14	1
6-0099-0409-96	Measuring spring, positioner	-	16	1

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SPC-2A with ARC plug



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Spare part article No.	Description	Included parts	Pos.	Qty
6-9612-5336-01	Actuator complete, NO, 38-101.6 mm, NW40-100	-	-	1
6-9612-5336-02	Actuator complete, NC, 38-76 mm, NW40-80	-	-	1
6-9612-5336-03	Actuator complete, NC, 101.6 mm, NW100	-	-	1

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-0427	Service kit, EPDM, 38-51 mm, NW40-50	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0433	Service kit, EPDM, 63.5-101.6 mm, NW65-100	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0428	Service kit, NBR, 38-51 mm, NW40-50	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0434	Service kit, NBR, 63.5-101.6 mm, NW65-100	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0429	Service kit, FPM, 38-51 mm, NW40-50	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0435	Service kit, FPM, 63.5-101.6 mm, NW65-100	Diaphragm support, EPDM Diaphragm, PTFE L-seal Stem seal Guide ring	20 21 23 22 9	1 1 1 1 1
6-9611-92-0001	Diaphragm set, PTFE, EPDM, 38-76 mm, NW40-80	-	-	1
6-9611-92-0007	Diaphragm set, PTFE, EPDM, 101.6 mm, NW100	-	-	1
6-9611-92-0081	Diaphragm set, NBR, 38-51 mm, NW40-50	-	-	1

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Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-0083	Diaphragm set, NBR, 63.5-101.6 mm, NW65-100	-	-	1
6-9611-92-0082	Diaphragm set, FPM, 38-51 mm, NW40-50	-	-	1
6-9611-92-0084	Diaphragm set, FPM, 63.5-101.6 mm, NW65-100	-	-	1
6-31353-0820-1	Diaphragm, PTFE	-	21	1
6-31353-0817-1	L-seal, EPDM (standard)	-	23	1
6-31353-0817-2	L-seal, NBR	-	23	1
6-31353-0817-3	L-seal, FPM	-	23	1
6-31353-0818-1	Stem seal, EPDM (standard), 38-51 mm, NW40-50	-	22	1
6-31353-0818-2	Stem seal, EPDM (standard), 63.5-101.6 mm, NW65-100	-	22	1
6-31353-0818-3	Stem seal, NBR, 38-51 mm, NW40-50	-	22	1
6-31353-0818-4	Stem seal, NBR, 63.5-101.6 mm, NW65-100	-	22	1
6-31353-0818-5	Stem seal, FPM, 38-51 mm, NW40-50	-	22	1
6-31353-0818-6	Stem seal, FPM, 63.5-101.6 mm, NW65-100	-	22	1
6-9612-5331-01	Bonnet complete, 38-51mm, NW40-50	-	10	1
6-9612-5331-02	Bonnet complete, 63.5-101.6 mm, NW65-100	-	10	1
6-31320-0027-3	Clamp complete, 38-51mm, NW40-50	-	1	1
6-31320-0027-5	Clamp complete, 63.5-101.6 mm, NW65-100	-	1	1
6-9612-5342-01	Clamp fitting	-	3	1

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Spare part article No.	Description	Included parts	Pos.	Qty
6-9612-5339-01	Striking nut	-	14	1
6-9612-5274-01	Stem upper, 38-51mm, NW40-50	-	19	1
6-9612-5275-01	Stem upper, 63.5-101.6 mm, NW65-100	-	19	1
6-0099-0409-96	Measuring spring, positioner	-	16	1

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Tetra Pak

Maintenance & Spare Parts

Butterfly valve

(Alfa Laval Flow)

LKB



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Tetra Pak

Doc No. 1215850-0101

Butterfly valve

LKB

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 01

Doc No. 1215850-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

Butterfly valve

Change spare part kit

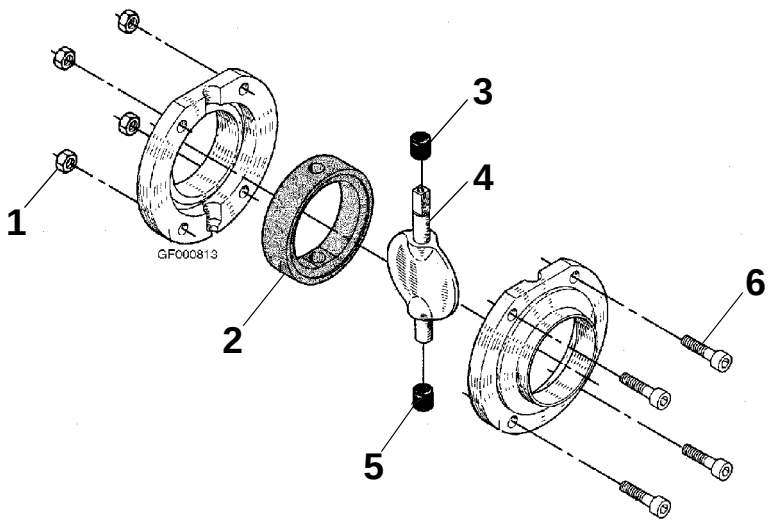
WARNING!

Risk of injury!
Make sure that the pipelines are drained and free from media before servicing the valve!
Never service the valve when it is hot!

Disassemble

a) Remove the complete handle.
b) Remove screws (6) and nuts (1).
c) Remove seal ring (2) together with valve disc (4).
d) Remove bushes (3) from the disc stems.
e) Remove valve disc (4) from seal ring (2).
f) Change the parts of the spare part kit; the seal ring (2) and the bushes (3).

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1 Nut
2 Seal ring
3 Bush
4 Valve disc
5 Bush
6 Screw

(Cont'd)

(Cont'd)

Reassemble

a) Lubricate the pin holes in the seal ring (2). Use USDA-H1 approved grease: Unisilcon L641, Paraliq GTE 703, or Molycote 111.

b) Fit valve disc (4) in the seal ring (2)

c) Fit bushes (3) on the disc stem.

d) Fit seal ring (2) together with valve disc (4) between the two valve body halves.

Caution! Rotate the valve disc so that the valve is open before tightening screws (6) and nuts (1).

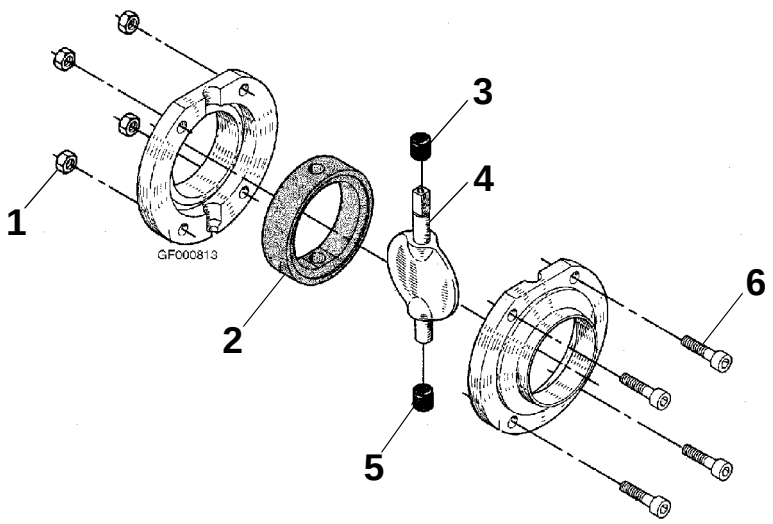
e) Fit screws (6) and nuts (1) and torque tighten with Allen keys according to the table below.

Valve size	NW25	NW40	NW50	NW65	NW80	NW100	NW150
Allen key **Recom. torque**	5 mm 18 Nm	5 mm 18 Nm	6 mm 20 Nm	6 mm 20 Nm	6 mm 20 Nm	8 mm 38 Nm	8 mm 38 Nm

f) Fit the complete handle on the disc connection and tighten the screw on the handle.

Pre-use check: Check that the valve disc moves smoothly against the seal ring.

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1 Nut
2 Seal ring
3 Bush
4 Valve disc
5 Bush
6 Screw

Actuator

General

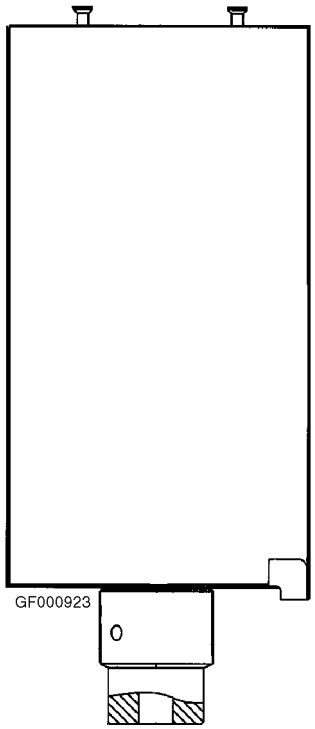
The pneumatic actuator is designed so that an axial movement of a piston is transformed into a 90° rotation of the shaft. The torque of the actuator increases at the end of the movement to improve the closing security.

Check operation

WARNING!

Risk of entanglement!
Always disconnect supply circuits prior to changing any parts.

Check by operating the valve manually if it opens and closes correctly.



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Change spare part kit

Disassemble

WARNING!

Risk of injury!
Normally closed and Normally open valves have a spring under pressure. Be careful when removing the end cap.
Never use compressed air for removing the end cap of the actuator.
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.
Never service the actuator when it is pressurised.
Never stick your fingers through the valve ports if the valve is supplied with compressed air.
Never touch the coupling between the valve body and the actuator if compressed air is supplied to the actuator.
Always fit the end cap with the “mushrooms” turned outwards and position it correctly before supplying compressed air to the actuator.

Note! The number of spare parts depend on which actuator is used. See spare part list for details.

a) Remove the actuator from the valve by unscrewing the connecting screws on the bracket.

b) **LKLA (Air/Air):** If applicable, unscrew screw (1) and remove the retaining plate (2).

c) Press the end cap (4) into the air cylinder (15) using a vice.

d) Remove the retaining ring (3).

e) Release the pressure on the end cap (4) carefully. **Pay attention to the warnings!**

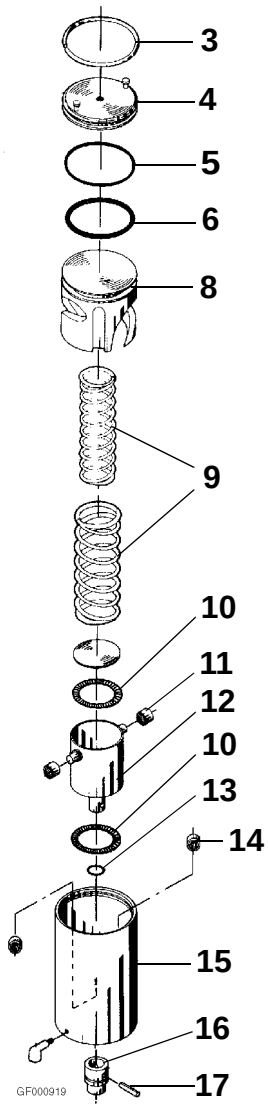
f) Remove end cap (4) by hand.

g) Remove the piston (8), and for NC and NO valves also the springs (9).

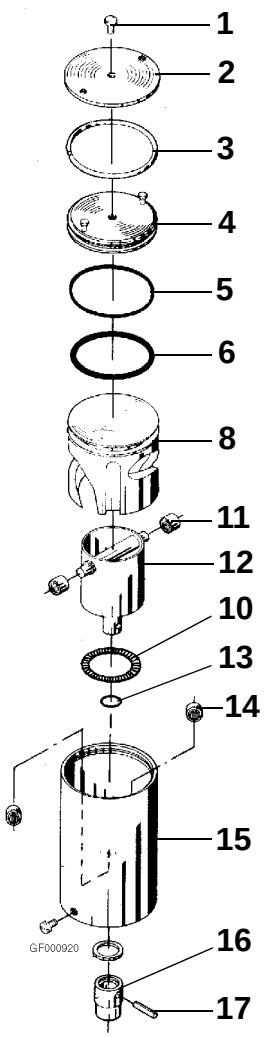
h) Remove the rotating cylinder (12) and the remaining internal parts from the air cylinder(15).

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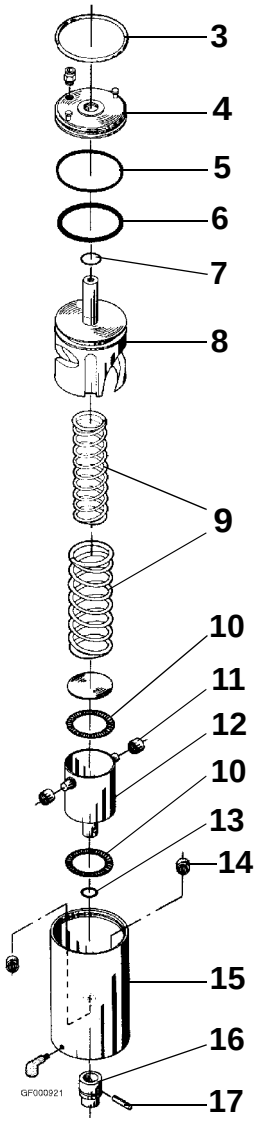
LKLA (NC/NO)



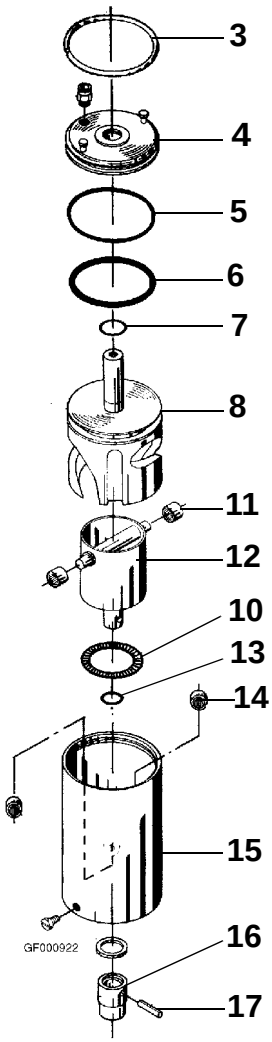
LKLA (Air/Air)



LKLA-T (NC/NO)



LKLA-T (Air/Air)



1 Screw
2 Retaining plate
3 Retaining ring
4 End cap
5 O-ring
6 O-ring
7 O-ring
8 Piston
9 Spring
10 Thrust bearing
11 Needle bearing
12 Rotating cylinder
13 O-ring
14 Needle bearing
15 Air cylinder
16 Coupling
17 Pin

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Reassemble

a) Change the parts of the spare part kit; the O-rings, needle bearings, and thrust bearing(s).

b) Check that all bearing and O-ring groves are clean and smooth.

c) Fit O-rings in place.

d) Fit needle bearings (14) in the air cylinder (15).

e) Fit needle bearings (11) on the rotating cylinder (12).

f) Fit thrust bearing(s) (10).

g) Fit the rotating cylinder (12) in the air cylinder (15).

Caution! Fit the piston correctly in relation to the bearings.

h) Fit the springs in the rotating cylinder and fit the piston (8) carefully. (Air/air actuator has no spring.)

i) Press the end cap (4) into the air cylinder (15) (using a vice for air/spring actuator).

j) Fit the retaining ring (3). Release the pressure for air/spring actuator.

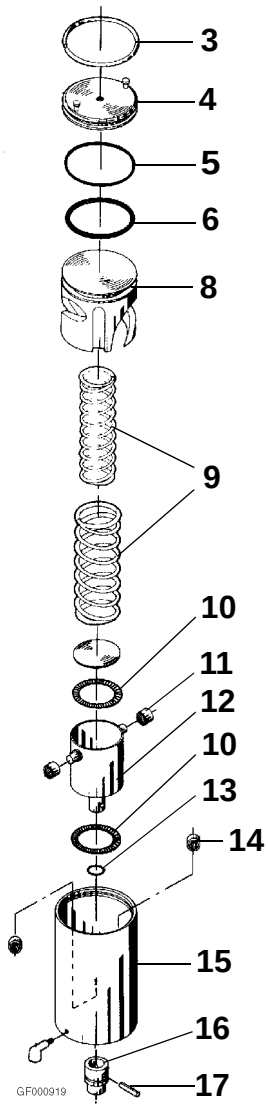
k) **LKLA (Air/Air):** If applicable, fit retaining plate (2) and fit and tighten screw (1).

l) Activate the actuator several times to ensure that it operates smoothly.

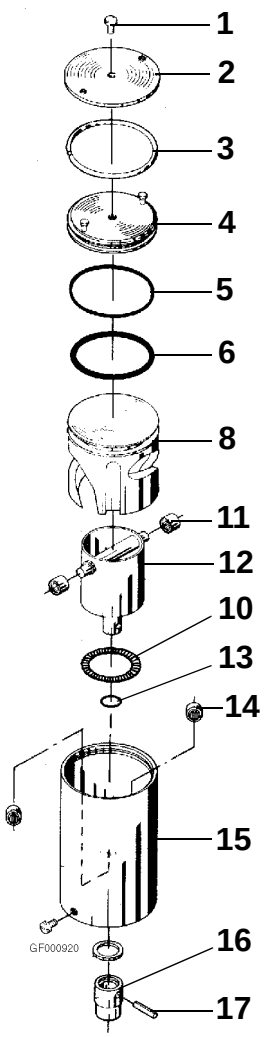
m) Fit the actuator to the valve by fitting and tightening the connecting screws on the bracket.

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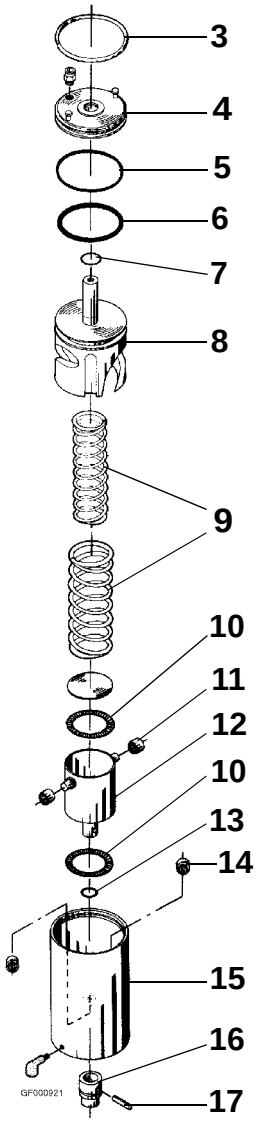
LKLA (NC/NO)



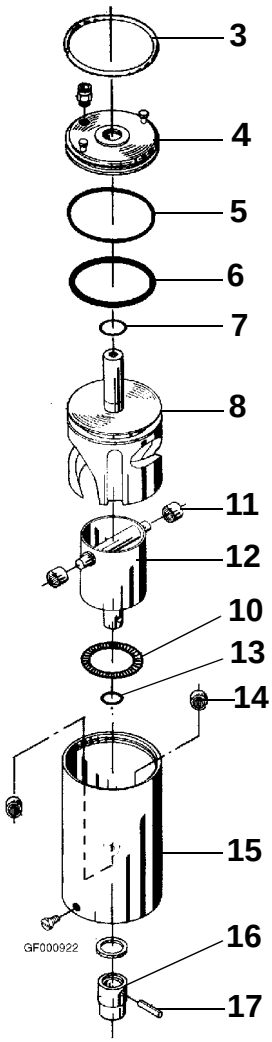
LKLA (Air/Air)



LKLA-T (NC/NO)



LKLA-T (Air/Air)



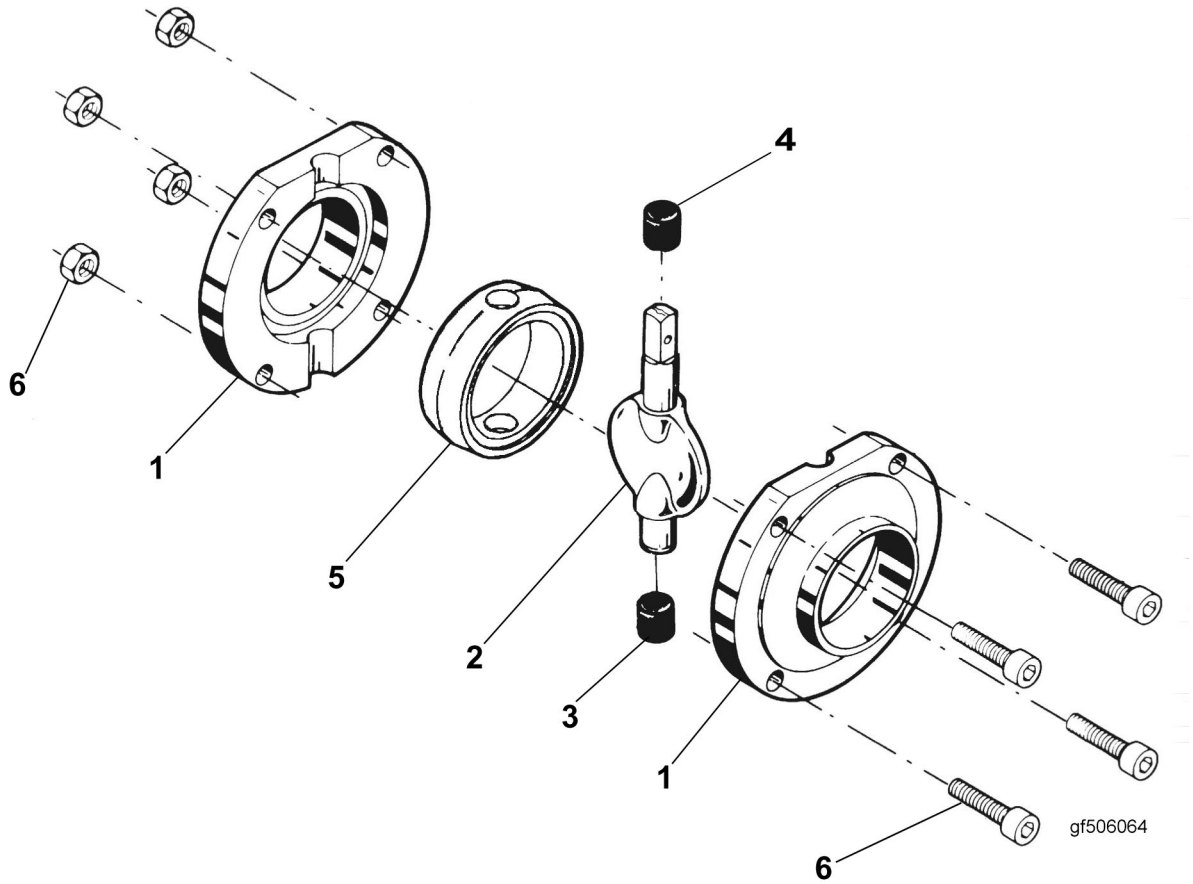
1 Screw
2 Retaining plate
3 Retaining ring
4 End cap
5 O-ring
6 O-ring
7 O-ring
8 Piston
9 Spring
10 Thrust bearing
11 Needle bearing
12 Rotating cylinder
13 O-ring
14 Needle bearing
15 Air cylinder
16 Coupling
17 Pin

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Spare parts

Butterfly Valve

Type LKB ISO



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Spare parts, LKB ISO, 25mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3028	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3034	Service kit, Silicone Q			
6-9611-92-3040	Service kit, FPM			
6-9611-44-365-0	Valve body half, AISI 304	-	1	2
6-9611-44-365-1	Valve body half, AISI 316L			
6-9611-41-368-1	Disc, AISI 316L	-	2	1
6-9611-41-413-0	Seal ring, EPDM	-	5	1
6-9611-41-372-0	Seal ring, Silicone Q			
6-9611-41-413-3	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	6	1

Spare parts, LKB ISO, 38mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3029	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3035	Service kit, Silicone Q			
6-9611-92-3041	Service kit, FPM			
6-9611-44-322-0	Valve body half, AISI 304	-	1	2
6-9611-44-322-1	Valve body half, AISI 316L			
6-9611-41-169-1	Disc, AISI 316L	-	2	1
6-9611-41-409-0	Seal ring, EPDM	-	5	1
6-9611-41-174-0	Seal ring, Silicone Q			
6-9611-41-409-3	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	6	1

Spare parts, LKB ISO, 51mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3030	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3036	Service kit, Silicone Q			
6-9611-92-3042	Service kit, FPM			
6-9611-44-323-0	Valve body half, AISI 304	-	1	2
6-9611-44-323-1	Valve body half, AISI 316L			
6-9611-41-177-1	Disc, AISI 316L	-	2	1
6-9611-41-410-0	Seal ring, EPDM	-	5	1
6-9611-41-182-0	Seal ring, Silicone Q			
6-9611-41-410-3	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	6	1

Spare parts, LKB ISO, 63,5mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3031	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3037	Service kit, Silicone Q			
6-9611-92-3043	Service kit, FPM			
6-9611-44-324-0	Valve body half, AISI 304	-	1	2
6-9611-44-324-1	Valve body half, AISI 316L			
6-9611-41-185-1	Disc, AISI 316L	-	2	1
6-9611-41-411-0	Seal ring, EPDM	-	5	1
6-9611-41-190-0	Seal ring, Silicone Q			
6-9611-41-411-3	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	6	1

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Spare parts, LKB ISO, 76mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3032	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3038	Service kit, Silicone Q			
6-9611-92-3044	Service kit, FPM			
6-9611-44-307-0	Valve body half, AISI 304	-	1	2
6-9611-44-307-1	Valve body half, AISI 316L			
6-9611-41-193-1	Disc, AISI 316L	-	2	1
6-9611-41-406-0	Seal ring, EPDM	-	5	1
6-9611-41-198-0	Seal ring, Silicone Q			
6-9611-41-406-3	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	6	1

Spare parts, LKB ISO, 101,6mm, AISI 304 and 316 for INCH				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3033	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3039	Service kit, Silicone Q			
6-9611-92-3045	Service kit, FPM			
6-9611-44-325-0	Valve body half, AISI 304	-	1	2
6-9611-44-325-1	Valve body half, AISI 316L			
6-9611-41-412-0	Seal ring, EPDM	-	5	1
6-9611-41-207-0	Seal ring, Silicone Q			
6-9611-41-412-3	Seal ring, Viton FPM			
6-9611-41-737-0	Set of screw M10 + Nut M10	-	6	1

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Spare parts, LKB ISO, NW 25				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3028	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3034	Service kit, Silicone Q			
6-9611-92-3040	Service kit, FPM			
6-9611-44-364-0	Valve body half, AISI 304	-	1	2
6-9611-44-364-1	Valve body half, AISI 316L			
6-9611-41-368-1	Disc, AISI 316L	-	2	1
6-9611-41-413-0	Seal ring, EPDM	-	5	1
6-9611-41-372-0	Seal ring, Silicone Q			
6-9611-41-413-3	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	6	1

Spare parts, LKB ISO, NW 40				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3029	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3035	Service kit, Silicone Q			
6-9611-92-3041	Service kit, FPM			
6-9611-44-304-0	Valve body half, AISI 304	-	1	2
6-9611-44-304-1	Valve body half, AISI 316L			
6-9611-41-169-1	Disc, AISI 316L	-	2	1
6-9611-41-409-0	Seal ring, EPDM	-	5	1
6-9611-41-174-0	Seal ring, Silicone Q			
6-9611-41-409-3	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	6	1

Spare parts, LKB ISO, NW 50				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3030	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3036	Service kit, Silicone Q			
6-9611-92-3042	Service kit, FPM			
6-9611-44-305-0	Valve body half, AISI 304	-	1	2
6-9611-44-305-1	Valve body half, AISI 316L			
6-9611-41-177-1	Disc, AISI 316L	-	2	1
6-9611-41-410-0	Seal ring, EPDM	-	5	1
6-9611-41-182-0	Seal ring, Silicone Q			
6-9611-41-410-3	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	6	1

Spare parts, LKB ISO, NW 65				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3031	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3037	Service kit, Silicone Q			
6-9611-92-3043	Service kit, FPM			
6-9611-44-306-0	Valve body half, AISI 304	-	1	2
6-9611-44-306-1	Valve body half, AISI 316L			
6-9611-41-185-1	Disc, AISI 316L	-	2	1
6-9611-41-411-0	Seal ring, EPDM	-	5	1
6-9611-41-190-0	Seal ring, Silicone Q			
6-9611-41-411-3	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	6	1

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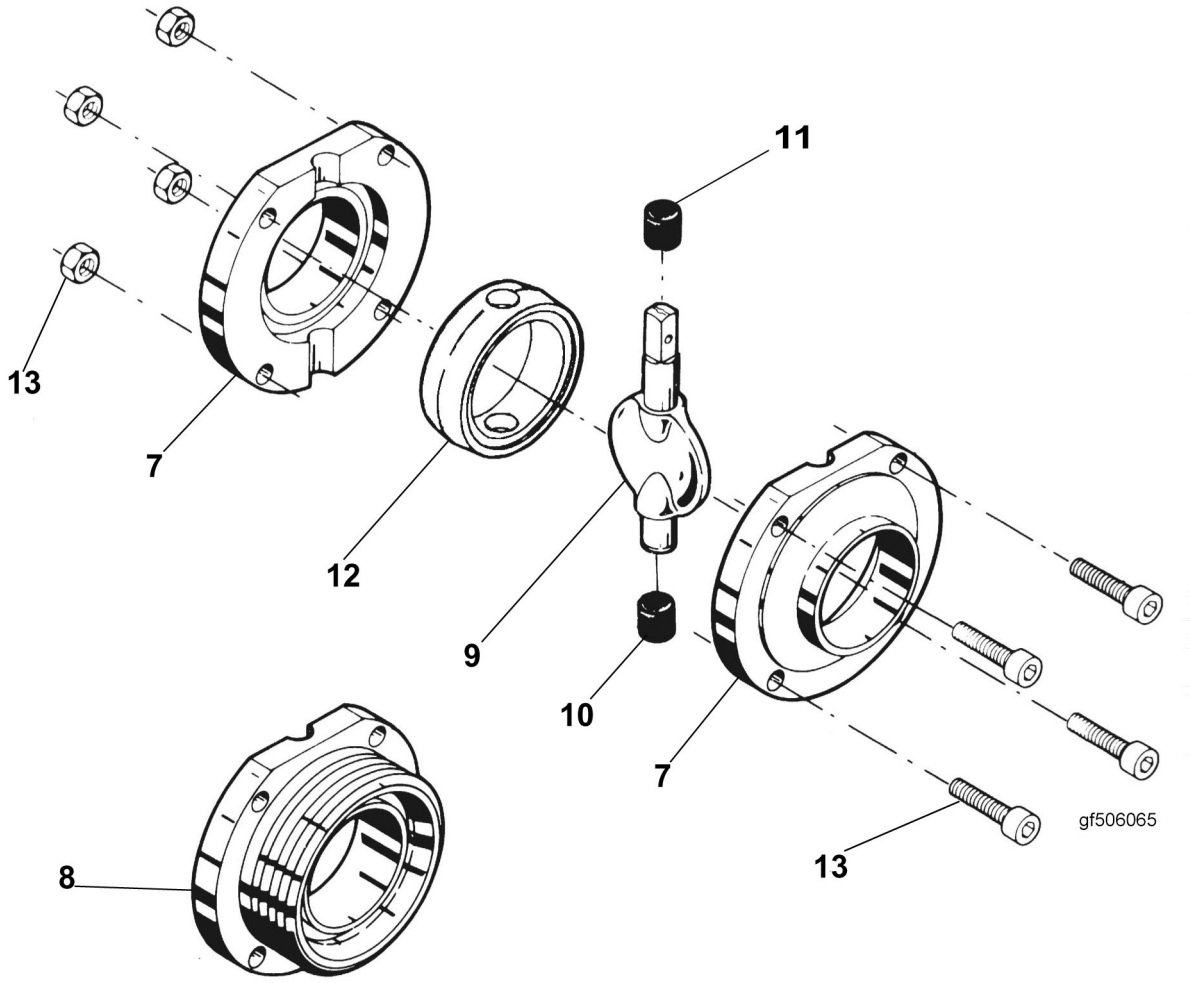
Spare parts, LKB ISO, NW 80				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3051	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3052	Service kit, Silicone Q			
6-9611-92-3053	Service kit, FPM			
6-9611-44-309-0	Valve body half, AISI 304	-	1	2
6-9611-44-309-1	Valve body half, AISI 316L			
6-9611-41-212-1	Disc, AISI 316L	-	2	1
6-9611-41-416-0	Seal ring, EPDM	-	5	1
6-9611-41-216-0	Seal ring, Silicone Q			
6-9611-41-216-1	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	6	1

Spare parts, LKB ISO, NW 100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3033	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3039	Service kit, Silicone Q			
6-9611-92-3045	Service kit, FPM			
6-9611-44-308-0	Valve body half, AISI 304	-	1	2
6-9611-44-308-1	Valve body half, AISI 316L			
6-9611-41-412-0	Seal ring, EPDM	-	5	1
6-9611-41-207-0	Seal ring, Silicone Q			
6-9611-41-412-3	Seal ring, Viton FPM			
6-9611-41-737-0	Set of screw M10 + Nut M10	-	6	1

Spare parts, LKB ISO, NW 150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3046	Service kit, EPDM	Bush Bush Seal ring	3 4 5	1 1 1
6-9611-92-3047	Service kit, Silicone Q			
6-9611-92-3048	Service kit, FPM			
6-9611-44-367-0	Valve body half, AISI 304	-	1	2
6-9611-44-367-1	Valve body half, AISI 316L			
6-9611-41-415-0	Seal ring, EPDM	-	5	1
6-9611-41-347-0	Seal ring, Silicone Q			
6-9611-41-415-3	Seal ring, Viton FPM			
6-9611-41-738-0	Set of screw M10 + Nut M10	-	6	1

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Type LKB-2 DIN



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Spare parts, LKB-2 DIN, NW 25, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3075	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3083	Service kit, Silicone Q			
6-9611-92-3091	Service kit, FPM			
6-9612-3236-01	Valve body half, welding AISI 304	-	7	2
6-9612-3236-02	Valve body half, welding AISI 316L			
6-9612-3243-01	Valve body half, male part AISI 304	-	8	2
6-9612-3243-02	Valve body half, male part AISI 316L			
6-9612-0736-04	Disc, AISI 316L	-	9	1

Spare parts, LKB-2 DIN, NW 25, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0700-01	Seal ring, EPDM	-	12	1
6-9612-0709-01	Seal ring, Silicone Q			
6-9612-0718-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

Spare parts, LKB-2 DIN, NW 32, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3076	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3084	Service kit, Silicone Q			
6-9611-92-3092	Service kit, FPM			
6-9612-3237-01	Valve body half, welding AISI 304	-	7	2
6-9612-3237-02	Valve body half, welding AISI 316L			
6-9612-3244-01	Valve body half, male part AISI 304	-	8	2
6-9612-3244-02	Valve body half, male part AISI 316L			
6-9612-0737-04	Disc, AISI 316L	-	9	1
6-9612-0701-01	Seal ring, EPDM	-	12	1
6-9612-0710-01	Seal ring, Silicone Q			
6-9612-0719-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

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Spare parts, LKB-2 DIN, NW 40, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3077	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3085	Service kit, Silicone Q			
6-9611-92-3093	Service kit, FPM			
6-9612-3238-01	Valve body half, welding AISI 304	-	7	2
6-9612-3238-02	Valve body half, welding AISI 316L			
6-9612-3245-01	Valve body half, male part AISI 304	-	8	2
6-9612-3245-02	Valve body half, male part AISI 316L			
6-9612-0738-04	Disc, AISI 316L	-	9	1

Spare parts, LKB-2 DIN, NW 40, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0702-01	Seal ring, EPDM	-	12	1
6-9612-0711-01	Seal ring, Silicone Q			
6-9612-0720-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

Spare parts, LKB-2 DIN, NW 50, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3078	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3086	Service kit, Silicone Q			
6-9611-92-3094	Service kit, FPM			
6-9612-3239-01	Valve body half, welding AISI 304	-	7	2
6-9612-3239-02	Valve body half, welding AISI 316L			
6-9612-3246-01	Valve body half, male part AISI 304	-	8	2
6-9612-3246-02	Valve body half, male part AISI 316L			
6-9612-0739-04	Disc, AISI 316L	-	9	1
6-9612-0703-01	Seal ring, EPDM	-	12	1
6-9612-0712-01	Seal ring, Silicone Q			
6-9612-0721-01	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	13	1

Spare parts, LKB-2 DIN, NW 65, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3079	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3087	Service kit, Silicone Q			
6-9611-92-3095	Service kit, FPM			
6-9612-3240-01	Valve body half, welding AISI 304	-	7	2
6-9612-3240-02	Valve body half, welding AISI 316L			
6-9612-3247-01	Valve body half, male part AISI 304	-	8	2
6-9612-3247-02	Valve body half, male part AISI 316L			
6-9612-0740-04	Disc, AISI 316L	-	9	1

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Spare parts, LKB-2 DIN, NW 65, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0704-01	Seal ring, EPDM	-	12	1
6-9612-0713-01	Seal ring, Silicone Q			
6-9612-0722-01	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	13	1

Spare parts, LKB-2 DIN, NW 80, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3080	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3088	Service kit, Silicone Q			
6-9611-92-3096	Service kit, FPM			
6-9612-3241-01	Valve body half, welding AISI 304	-	7	2
6-9612-3241-02	Valve body half, welding AISI 316L			
6-9612-3248-01	Valve body half, male part AISI 304	-	8	2
6-9612-3248-02	Valve body half, male part AISI 316L			
6-9612-0741-04	Disc, AISI 316L	-	9	1
6-9612-0705-01	Seal ring, EPDM	-	12	1
6-9612-0714-01	Seal ring, Silicone Q			
6-9612-0723-01	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	13	1

Spare parts, LKB-2 DIN, NW 100, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3081	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3089	Service kit, Silicone Q			
6-9611-92-3097	Service kit, FPM			
6-9612-3242-01	Valve body half, welding AISI 304	-	7	2
6-9612-3242-02	Valve body half, welding AISI 316L			
6-9612-3249-01	Valve body half, male part AISI 304	-	8	2
6-9612-3249-02	Valve body half, male part AISI 316L			
6-9612-0742-04	Disc, AISI 316L	-	9	1

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Spare parts, LKB-2 DIN, NW 100, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0706-01	Seal ring, EPDM	-	12	1
6-9612-0715-01	Seal ring, Silicone Q			
6-9612-0724-01	Seal ring, Viton FPM			
6-9611-41-737-0	Set of screw M10 + Nut M10	-	13	1

Spare parts, LKB-2 DIN, NW 125, For valves with bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3082	Service kit, EPDM	Bush Bush Seal ring	10 11 12	1 1 1
6-9611-92-3090	Service kit, Silicone Q			
6-9611-92-3098	Service kit, FPM			
6-9612-0774-01	Valve body half, welding AISI 304	-	7	2
6-9612-0774-02	Valve body half, welding AISI 316L			
6-9612-0772-01	Valve body half, male part AISI 304	-	8	2
6-9612-0772-02	Valve body half, male part AISI 316L			
6-9612-0769-04	Disc, AISI 316L	-	9	1
6-9612-0771-01	Seal ring, EPDM	-	12	1
6-9612-0783-01	Seal ring, Silicone Q			
6-9612-0784-01	Seal ring, Viton FPM			
6-9611-41-777-0	Set of screw M10 + Nut M10	-	13	1

Spare parts, LKB-2 DIN, NW 25, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0727-01	Valve body half, welding AISI 304	-	7	2
6-9612-0727-02	Valve body half, welding AISI 316L			
6-9612-0613-01	Valve body half, male part AISI 304	-	8	2
6-9612-0613-02	Valve body half, male part AISI 316L			
6-9612-0736-04	Disc, AISI 316L	-	9	1
6-9612-0700-01	Seal ring, EPDM	-	12	1
6-9612-0709-01	Seal ring, Silicone Q			
6-9612-0718-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

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Spare parts, LKB-2 DIN, NW 32, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0728-01	Valve body half, welding AISI 304	-	7	2
6-9612-0728-02	Valve body half, welding AISI 316L			
6-9612-0619-01	Valve body half, male part AISI 304	-	8	2
6-9612-0619-02	Valve body half, male part AISI 316L			
6-9612-0737-04	Disc, AISI 316L	-	9	1
6-9612-0701-01	Seal ring, EPDM	-	12	1
6-9612-0710-01	Seal ring, Silicone Q			
6-9612-0719-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

Spare parts, LKB-2 DIN, NW 40, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0729-01	Valve body half, welding AISI 304	-	7	2
6-9612-0729-02	Valve body half, welding AISI 316L			
6-9612-0614-01	Valve body half, male part AISI 304	-	8	2
6-9612-0614-02	Valve body half, male part AISI 316L			
6-9612-0738-04	Disc, AISI 316L	-	9	1
6-9612-0702-01	Seal ring, EPDM	-	12	1
6-9612-0711-01	Seal ring, Silicone Q			
6-9612-0720-01	Seal ring, Viton FPM			
6-9611-41-734-0	Set of screw M6 + Nut M6	-	13	1

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Spare parts, LKB-2 DIN, NW 50, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0730-01	Valve body half, welding AISI 304	-	7	2
6-9612-0730-02	Valve body half, welding AISI 316L			

Spare parts, LKB-2 DIN, NW 50, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0615-01	Valve body half, male part AISI 304	-	8	2
6-9612-0615-02	Valve body half, male part AISI 316L			
6-9612-0739-04	Disc, AISI 316L	-	9	1
6-9612-0703-01	Seal ring, EPDM	-	12	1
6-9612-0712-01	Seal ring, Silicone Q			
6-9612-0721-01	Seal ring, Viton FPM			
6-9611-41-735-0	Set of screw M8 + Nut M8	-	13	1

Spare parts, LKB-2 DIN, NW 65, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0731-01	Valve body half, welding AISI 304	-	7	2
6-9612-0731-02	Valve body half, welding AISI 316L			
6-9612-0616-01	Valve body half, male part AISI 304	-	8	2
6-9612-0616-02	Valve body half, male part AISI 316L			
6-9612-0740-04	Disc, AISI 316L	-	9	1
6-9612-0704-01	Seal ring, EPDM	-	12	1
6-9612-0713-01	Seal ring, Silicone Q			
6-9612-0722-01	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	13	1

Spare parts, LKB-2 DIN, NW 80, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0732-01	Valve body half, welding AISI 304	-	7	2
6-9612-0732-02	Valve body half, welding AISI 316L			
6-9612-0617-01	Valve body half, male part AISI 304	-	8	2
6-9612-0617-02	Valve body half, male part AISI 316L			
6-9612-0741-04	Disc, AISI 316L	-	9	1
6-9612-0705-01	Seal ring, EPDM	-	12	1
6-9612-0714-01	Seal ring, Silicone Q			
6-9612-0723-01	Seal ring, Viton FPM			
6-9611-41-736-0	Set of screw M8 + Nut M8	-	13	1

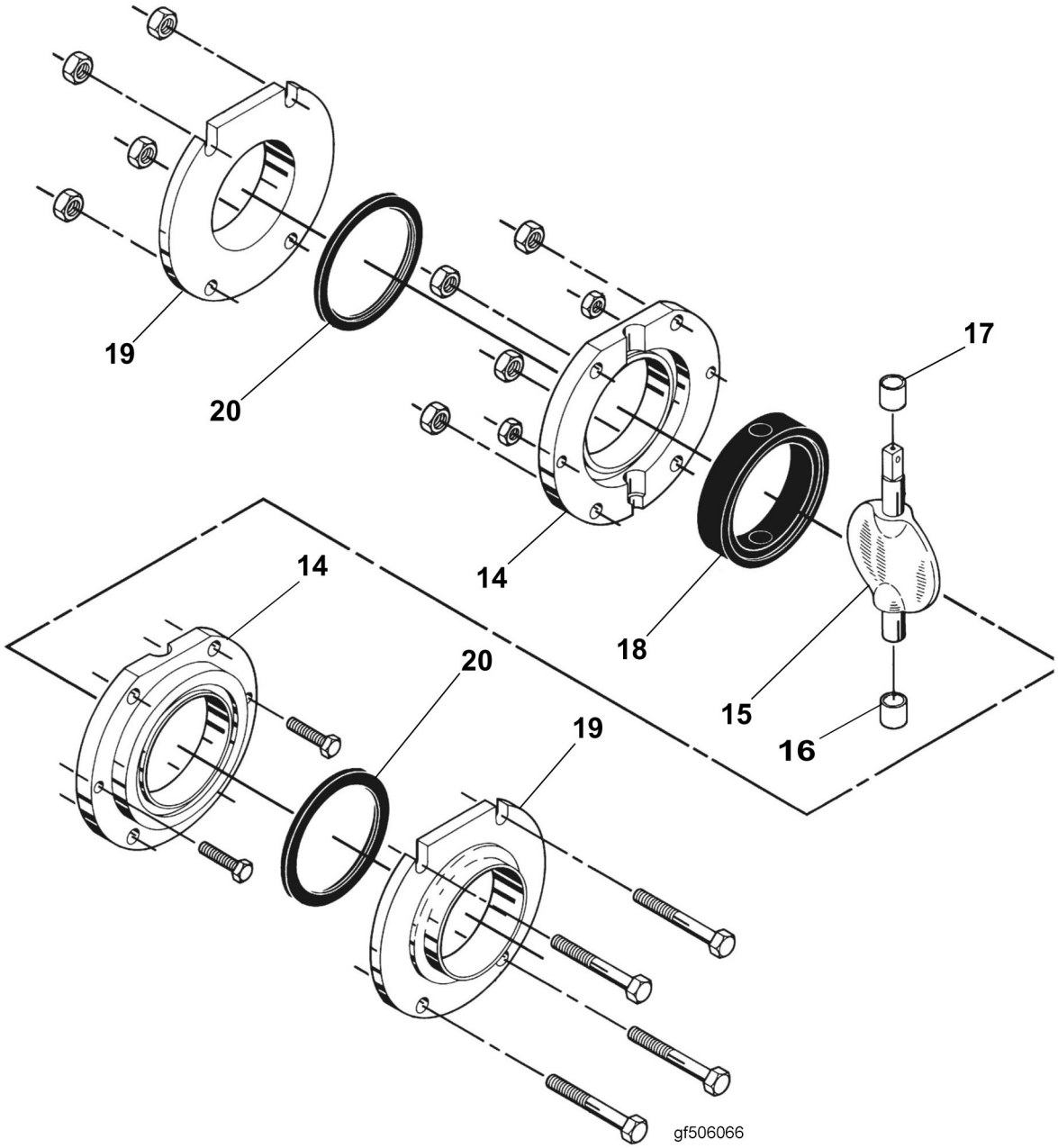
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Spare parts, LKB-2 DIN, NW 100, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0733-01	Valve body half, welding AISI 304	-	7	2
6-9612-0733-02	Valve body half, welding AISI 316L			
6-9612-0618-01	Valve body half, male part AISI 304	-	8	2
6-9612-0618-02	Valve body half, male part AISI 316L			
6-9612-0742-04	Disc, AISI 316L	-	9	1
6-9612-0706-01	Seal ring, EPDM	-	12	1
6-9612-0715-01	Seal ring, Silicone Q			
6-9612-0724-01	Seal ring, Viton FPM			
6-9611-41-737-0	Set of screw M10 + Nut M10	-	13	1

Spare parts, LKB-2 DIN, NW 125, For valves without bushes				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0774-01	Valve body half, welding AISI 304	-	7	2
6-9612-0774-02	Valve body half, welding AISI 316L			
6-9612-0772-01	Valve body half, male part AISI 304	-	8	2
6-9612-0772-02	Valve body half, male part AISI 316L			
6-9612-0769-04	Disc, AISI 316L	-	9	1
6-9612-0771-01	Seal ring, EPDM	-	12	1
6-9612-0783-01	Seal ring, Silicone Q			
6-9612-0784-01	Seal ring, Viton FPM			
6-9611-41-777-0	Set of screw M10 + Nut M10	-	13	1

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Type LKB-F



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Spare parts, LKB-F, 25mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3058	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3064	Service kit, Silicone Q			
6-9611-92-3070	Service kit, FPM			

Spare parts, LKB-F, 25mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-4024-10	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-25	Valve body half, welding AISI 304			
6-9611-41-368-1	Disc, AISI 316L	-	15	1
6-9611-41-413-0	Seal ring, EPDM	-	18	1
6-9611-41-372-0	Seal ring, Silicone Q			
6-9611-41-413-3	Seal ring, Viton FPM			
6-9612-4001-01	Set of screws and nut.	-	-	1
6-9612-4025-10	Flange, AISI 316L	-	19	2
6-9612-4025-25	Flange, AISI 304			
6-9612-4026-31	Seal ring, EPDM	-	20	2
6-9612-4026-41	Seal ring, Silicone Q			
6-9612-4026-51	Seal ring, Viton FPM			

Spare parts, LKB-F, 38mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3059	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3065	Service kit, Silicone Q			
6-9611-92-3071	Service kit, FPM			
6-9612-4024-11	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-26	Valve body half, welding AISI 304			
6-9611-41-369-1	Disc, AISI 316L	-	15	1
6-9611-41-409-0	Seal ring, EPDM	-	18	1
6-9611-41-174-0	Seal ring, Silicone Q			
6-9611-41-369-3	Seal ring, Viton FPM			
6-9612-4001-01	Set of screws and nut.	-	-	1
6-9612-4025-11	Flange, AISI 316L	-	19	2
6-9612-4025-26	Flange, AISI 304			
6-9612-4026-32	Seal ring, EPDM	-	20	2
6-9612-4026-42	Seal ring, Silicone Q			
6-9612-4026-52	Seal ring, Viton FPM			

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Spare parts, LKB-F, 51mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3060	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3066	Service kit, Silicone Q			
6-9611-92-3072	Service kit, FPM			
6-9612-4024-12	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-27	Valve body half, welding AISI 304			
6-9611-41-177-1	Disc, AISI 316L	-	15	1
6-9611-41-410-0	Seal ring, EPDM	-	18	1
6-9611-41-182-0	Seal ring, Silicone Q			
6-9611-41-410-3	Seal ring, Viton FPM			
6-9612-4001-02	Set of screws and nut.	-	-	1
6-9612-4025-12	Flange, AISI 316L	-	19	2
6-9612-4025-27	Flange, AISI 304			
6-9612-4026-33	Seal ring, EPDM	-	20	2
6-9612-4026-43	Seal ring, Silicone Q			
6-9612-4026-53	Seal ring, Viton FPM			

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Spare parts, LKB-F, 63,5mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3061	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3067	Service kit, Silicone Q			
6-9611-92-3073	Service kit, FPM			
6-9612-4024-13	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-28	Valve body half, welding AISI 304			
6-9611-41-185-1	Disc, AISI 316L	-	15	1
6-9611-41-411-0	Seal ring, EPDM	-	18	1
6-9611-41-190-0	Seal ring, Silicone Q			
6-9611-41-411-3	Seal ring, Viton FPM			
6-9612-4001-02	Set of screws and nut.	-	-	1
6-9612-4025-13	Flange, AISI 316L	-	19	2
6-9612-4025-28	Flange, AISI 304			
6-9612-4026-34	Seal ring, EPDM	-	20	2
6-9612-4026-44	Seal ring, Silicone Q			
6-9612-4026-54	Seal ring, Viton FPM			

Spare parts, LKB-F, 76mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3062	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3068	Service kit, Silicone Q			
6-9611-92-3074	Service kit, FPM			
6-9612-4024-14	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-29	Valve body half, welding AISI 304			
6-9611-41-193-1	Disc, AISI 316L	-	15	1
6-9611-41-406-0	Seal ring, EPDM	-	18	1
6-9611-41-198-0	Seal ring, Silicone Q			
6-9611-41-406-3	Seal ring, Viton FPM			
6-9612-4001-03	Set of screws and nut.	-	-	1
6-9612-4025-14	Flange, AISI 316L	-	19	2
6-9612-4025-29	Flange, AISI 304			
6-9612-4026-35	Seal ring, EPDM	-	20	2
6-9612-4026-45	Seal ring, Silicone Q			
6-9612-4026-55	Seal ring, Viton FPM			

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Spare parts, LKB-F, 101,6mm, ISO				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3063	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3069	Service kit, Silicone Q			
6-9611-92-3099	Service kit, FPM			
6-9612-4024-15	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-30	Valve body half, welding AISI 304			
6-9612-0463-02	Disc, AISI 316L	-	15	1
6-9611-41-412-0	Seal ring, EPDM	-	18	1
6-9611-41-207-0	Seal ring, Silicone Q			
6-9611-41-412-3	Seal ring, Viton FPM			
6-9612-4001-04	Set of screws and nut.	-	-	1
6-9612-4025-15	Flange, AISI 316L	-	19	2
6-9612-4025-30	Flange, AISI 304			
6-9612-4026-36	Seal ring, EPDM	-	20	2
6-9612-4026-46	Seal ring, Silicone Q			
6-9612-4026-56	Seal ring, Viton FPM			

Spare parts, LKB-F, NW 25, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3100	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3109	Service kit, Silicone Q			
6-9611-92-3118	Service kit, FPM			
6-9612-4024-01	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-16	Valve body half, welding AISI 304			
6-9612-0736-04	Disc, AISI 316L	-	15	1
6-9612-0700-01	Seal ring, EPDM	-	18	1
6-9612-0709-01	Seal ring, Silicone Q			
6-9612-0718-01	Seal ring, Viton FPM			
6-9612-4001-01	Set of screws and nut.	-	-	1
6-9612-4025-01	Flange, AISI 316L	-	19	2
6-9612-4025-16	Flange, AISI 304			
6-9612-4026-01	Seal ring, EPDM	-	20	2
6-9612-4026-11	Seal ring, Silicone Q			
6-9612-4026-21	Seal ring, Viton FPM			

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Spare parts, LKB-F, NW 32, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3101	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3110	Service kit, Silicone Q			
6-9611-92-3119	Service kit, FPM			
6-9612-4024-02	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-17	Valve body half, welding AISI 304			
6-9612-0737-04	Disc, AISI 316L	-	15	1
6-9612-0701-01	Seal ring, EPDM	-	18	1
6-9612-0710-01	Seal ring, Silicone Q			
6-9612-0719-01	Seal ring, Viton FPM			
6-9612-4001-01	Set of screws and nut.	-	-	1
6-9612-4025-02	Flange, AISI 316L	-	19	2
6-9612-4025-17	Flange, AISI 304			
6-9612-4026-02	Seal ring, EPDM	-	20	2
6-9612-4026-12	Seal ring, Silicone Q			
6-9612-4026-22	Seal ring, Viton FPM			

Spare parts, LKB-F, NW 40, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3102	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3111	Service kit, Silicone Q			
6-9611-92-3120	Service kit, FPM			
6-9612-4024-03	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-18	Valve body half, welding AISI 304			
6-9612-0738-04	Disc, AISI 316L	-	15	1
6-9612-0702-01	Seal ring, EPDM	-	18	1
6-9612-0711-01	Seal ring, Silicone Q			
6-9612-0720-01	Seal ring, Viton FPM			
6-9612-4001-01	Set of screws and nut.	-	-	1
6-9612-4025-03	Flange, AISI 316L	-	19	2
6-9612-4025-18	Flange, AISI 304			
6-9612-4026-03	Seal ring, EPDM	-	20	2
6-9612-4026-13	Seal ring, Silicone Q			
6-9612-4026-23	Seal ring, Viton FPM			

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Spare parts, LKB-F, NW 50, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3103	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3112	Service kit, Silicone Q			
6-9611-92-3121	Service kit, FPM			
6-9612-4024-04	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-19	Valve body half, welding AISI 304			
6-9612-0739-04	Disc, AISI 316L	-	15	1
6-9612-0703-01	Seal ring, EPDM	-	18	1
6-9612-0712-01	Seal ring, Silicone Q			
6-9612-0721-01	Seal ring, Viton FPM			
6-9612-4001-02	Set of screws and nut.	-	-	1
6-9612-4025-04	Flange, AISI 316L	-	19	2
6-9612-4025-19	Flange, AISI 304			
6-9612-4026-04	Seal ring, EPDM	-	20	2
6-9612-4026-14	Seal ring, Silicone Q			
6-9612-4026-24	Seal ring, Viton FPM			

Spare parts, LKB-F, NW 65, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3104	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3113	Service kit, Silicone Q			
6-9611-92-3122	Service kit, FPM			
6-9612-4024-05	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-20	Valve body half, welding AISI 304			
6-9612-0740-04	Disc, AISI 316L	-	15	1
6-9612-0704-01	Seal ring, EPDM	-	18	1
6-9612-0713-01	Seal ring, Silicone Q			
6-9612-0722-01	Seal ring, Viton FPM			
6-9612-4001-03	Set of screws and nut.	-	-	1
6-9612-4025-05	Flange, AISI 316L	-	19	2
6-9612-4025-20	Flange, AISI 304			
6-9612-4026-05	Seal ring, EPDM	-	20	2
6-9612-4026-15	Seal ring, Silicone Q			
6-9612-4026-25	Seal ring, Viton FPM			

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Spare parts, LKB-F, NW 80, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3105	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3114	Service kit, Silicone Q			
6-9611-92-3123	Service kit, FPM			
6-9612-4024-06	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-21	Valve body half, welding AISI 304			
6-9612-0741-04	Disc, AISI 316L	-	15	1
6-9612-0705-01	Seal ring, EPDM	-	18	1
6-9612-0714-01	Seal ring, Silicone Q			
6-9612-0723-01	Seal ring, Viton FPM			
6-9612-4001-03	Set of screws and nut.	-	-	1
6-9612-4025-06	Flange, AISI 316L	-	19	2
6-9612-4025-21	Flange, AISI 304			
6-9612-4026-06	Seal ring, EPDM	-	20	2
6-9612-4026-16	Seal ring, Silicone Q			
6-9612-4026-26	Seal ring, Viton FPM			

Spare parts, LKB-F, NW 100, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3106	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3115	Service kit, Silicone Q			
6-9611-92-3124	Service kit, FPM			
6-9612-4024-07	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-22	Valve body half, welding AISI 304			
6-9612-0742-04	Disc, AISI 316L	-	15	1
6-9612-0706-01	Seal ring, EPDM	-	18	1
6-9612-0715-01	Seal ring, Silicone Q			
6-9612-0724-01	Seal ring, Viton FPM			
6-9612-4001-04	Set of screws and nut.	-	-	1
6-9612-4025-07	Flange, AISI 316L	-	19	2
6-9612-4025-22	Flange, AISI 304			
6-9612-4026-07	Seal ring, EPDM	-	20	2
6-9612-4026-17	Seal ring, Silicone Q			
6-9612-4026-27	Seal ring, Viton FPM			

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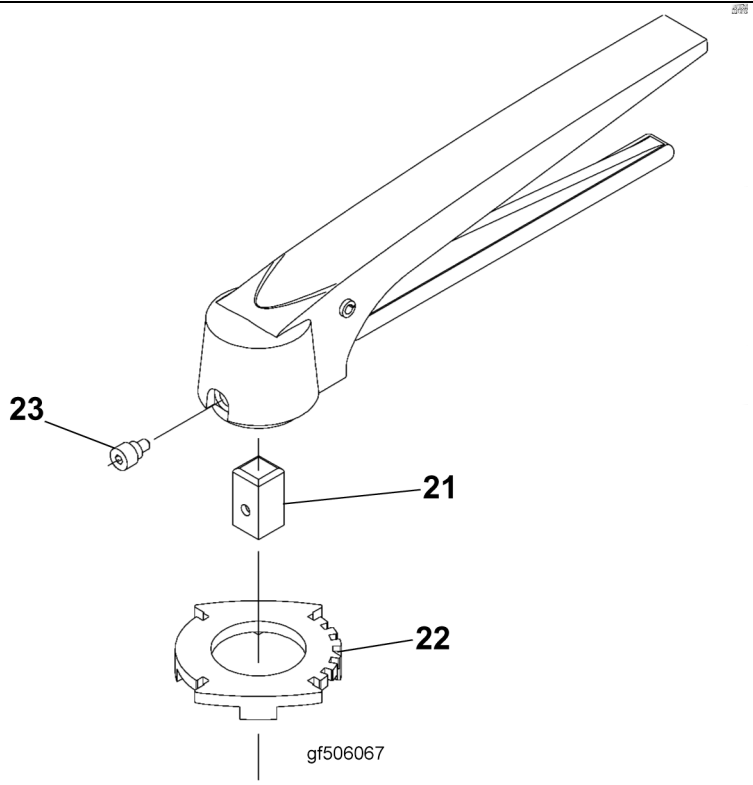
Spare parts, LKB-F, NW 125, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3107	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3116	Service kit, Silicone Q			
6-9611-92-3125	Service kit, FPM			
6-9612-4024-08	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-23	Valve body half, welding AISI 304			
6-9612-0769-04	Disc, AISI 316L	-	15	1
6-9612-0771-01	Seal ring, EPDM	-	18	1
6-9612-0783-01	Seal ring, Silicone Q			
6-9612-0784-01	Seal ring, Viton FPM			
6-9612-4001-05	Set of screws and nut.	-	-	1
6-9612-4025-08	Flange, AISI 316L	-	19	2
6-9612-4025-23	Flange, AISI 304			
6-9612-4026-08	Seal ring, EPDM	-	20	2
6-9612-4026-18	Seal ring, Silicone Q			
6-9612-4026-28	Seal ring, Viton FPM			

Spare parts, LKB-F, NW 150, DIN				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3108	Service kit, EPDM	Bush Bush Seal ring Seal ring	16 17 18 20	1 1 1 2
6-9611-92-3117	Service kit, Silicone Q			
6-9611-92-3126	Service kit, FPM			
6-9612-4024-09	Valve body half, welding AISI 316L	-	14	2
6-9612-4024-24	Valve body half, welding AISI 304			
6-9611-41-370-1	Disc, AISI 316L	-	15	1
6-9611-41-415-0	Seal ring, EPDM	-	18	1
6-9611-41-374-0	Seal ring, Silicone Q			
6-9611-41-415-3	Seal ring, Viton FPM			
6-9612-4001-06	Set of screws and nut.	-	-	1
6-9612-4025-09	Flange, AISI 316L	-	19	2
6-9612-4025-24	Flange, AISI 304			
6-9612-4026-09	Seal ring, EPDM	-	20	2
6-9612-4026-19	Seal ring, Silicone Q			
6-9612-4026-29	Seal ring, Viton FPM			

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Handles

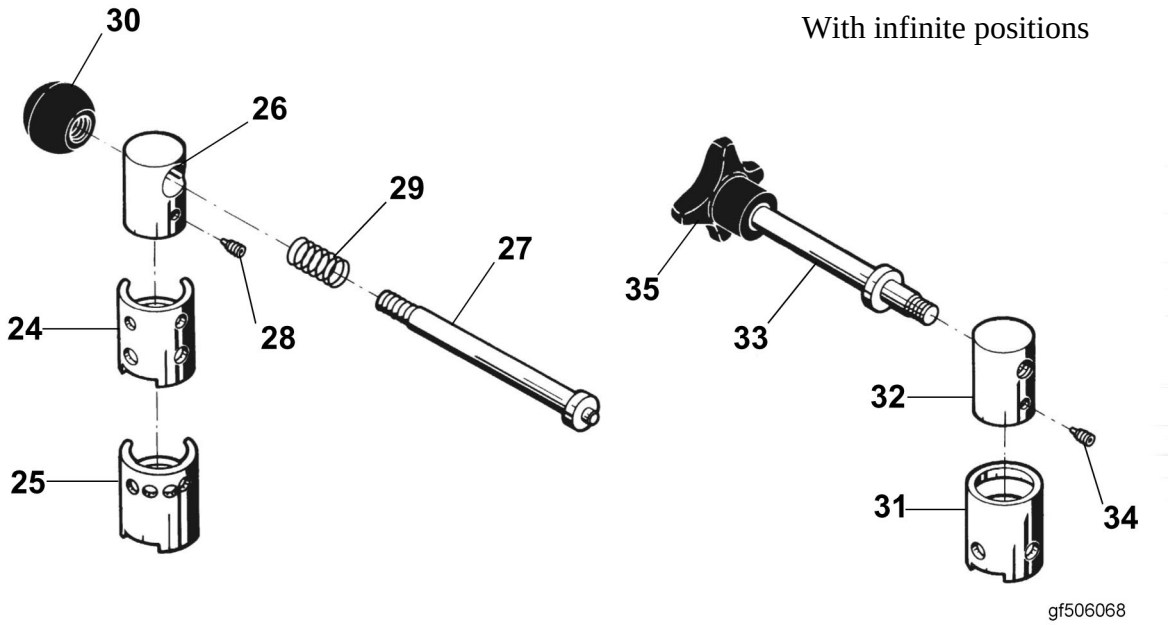
Lockable multiposition handle



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Spare parts, Lockable multiposition handles				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-5928-01	Handle complete, 25-63,5mm /NW25-50	-	-	1
6-9612-5928-02	Handle complete, 76mm/ NW65-80			
6-9612-5928-03	Handle complete, 101,6mm/ NW100			
6-9612-5889-01	Insert, 25-63,5mm/NW25-50	-	21	1
6-9612-5889-02	Insert, 76mm/NW65-80			
6-9612-5887-01	Positioning cap, 25-63,5mm/ NW25-50	-	22	1
6-9612-5888-01	Positioning cap, 76-101,6mm /NW65-100			
6-9612-0453-02	Screw, 25-63,5mm/NW25-50	-	23	1
6-9612-0453-01	Screw, 76mm/NW65-80			
6-9612-0453-01	Screw, 101,6mm/NW100			

Handle 1.1



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Spare parts, Handle 1.1, 25-63,5mm/NW 25-50				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0450-01	Handle complete, 2 pos	-	-	1
6-9612-0450-02	Handle complete, 4 pos			
6-9611-41-138-0	Locking cap, 2 pos	-	24	1
6-9611-41-739-0	Locking cap, 4 pos	-	25	1
6-9612-0454-01	Transfer block	-	26	1
6-9611-41-140-0	Handle	-	27	1
6-9612-0452-01	Screw with pin	-	28	1
6-9611-99-1998	Spring	-	29	1
6-9611-99-1970	Ball	-	30	1

Spare parts, Handle 1.1, 76mm/NW 65-80				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0451-01	Handle complete, 2 pos	-	-	1
6-9612-0451-02	Handle complete, 4 pos			
6-9611-41-143-0	Locking cap, 2 pos	-	24	1

Spare parts, Handle 1.1, 76mm/NW 65-80				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-41-740-0	Locking cap, 4 pos	-	25	1
6-9612-0455-01	Transfer block	-	26	1
6-9611-41-140-1	Handle	-	27	1
6-9612-0453-01	Screw with pin	-	28	1
6-9611-99-1998	Spring	-	29	1
6-9611-99-1970	Ball	-	30	1

Spare parts, Handle 1.1, 101,6mm/NW 100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0459-01	Handle complete, 2 pos	-	-	1
6-9612-0459-02	Handle complete, 4 pos			
6-9612-0464-01	Locking cap, 2 pos	-	24	1
6-9612-0465-01	Locking cap, 4 pos	-	25	1
6-9612-0462-01	Transfer block	-	26	1
6-9612-0461-01	Handle	-	27	1
6-9612-0453-01	Screw with pin	-	28	1
6-9611-99-1982	Spring	-	29	1
6-9611-99-1981	Ball	-	30	1

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Spare parts, Handle 1.1, NW 125				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0782-01	Handle complete, 4 pos	-	-	1
6-9612-0777-01	Locking cap, 4 pos	-	25	1
6-9612-0778-01	Transfer block	-	26	1
6-9612-0779-01	Handle	-	27	1
6-9612-0453-01	Screw with pin	-	28	1
6-9612-0781-01	Spring	-	29	1
6-9611-99-2512	Ball	-	30	1

Spare parts, Handle 1.1, NW 150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0791-01	Handle complete, 4 pos	-	-	1
6-9612-0792-01	Locking cap, 4 pos	-	25	1
6-9612-0793-01	Transfer block	-	26	1
6-9612-3685-01	Handle	-	27	1
6-9612-0453-01	Screw with pin	-	28	1

Spare parts, Handle 1.1, NW 150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-3651-01	Spring	-	29	1
6-9611-99-2713	Ball	-	30	1

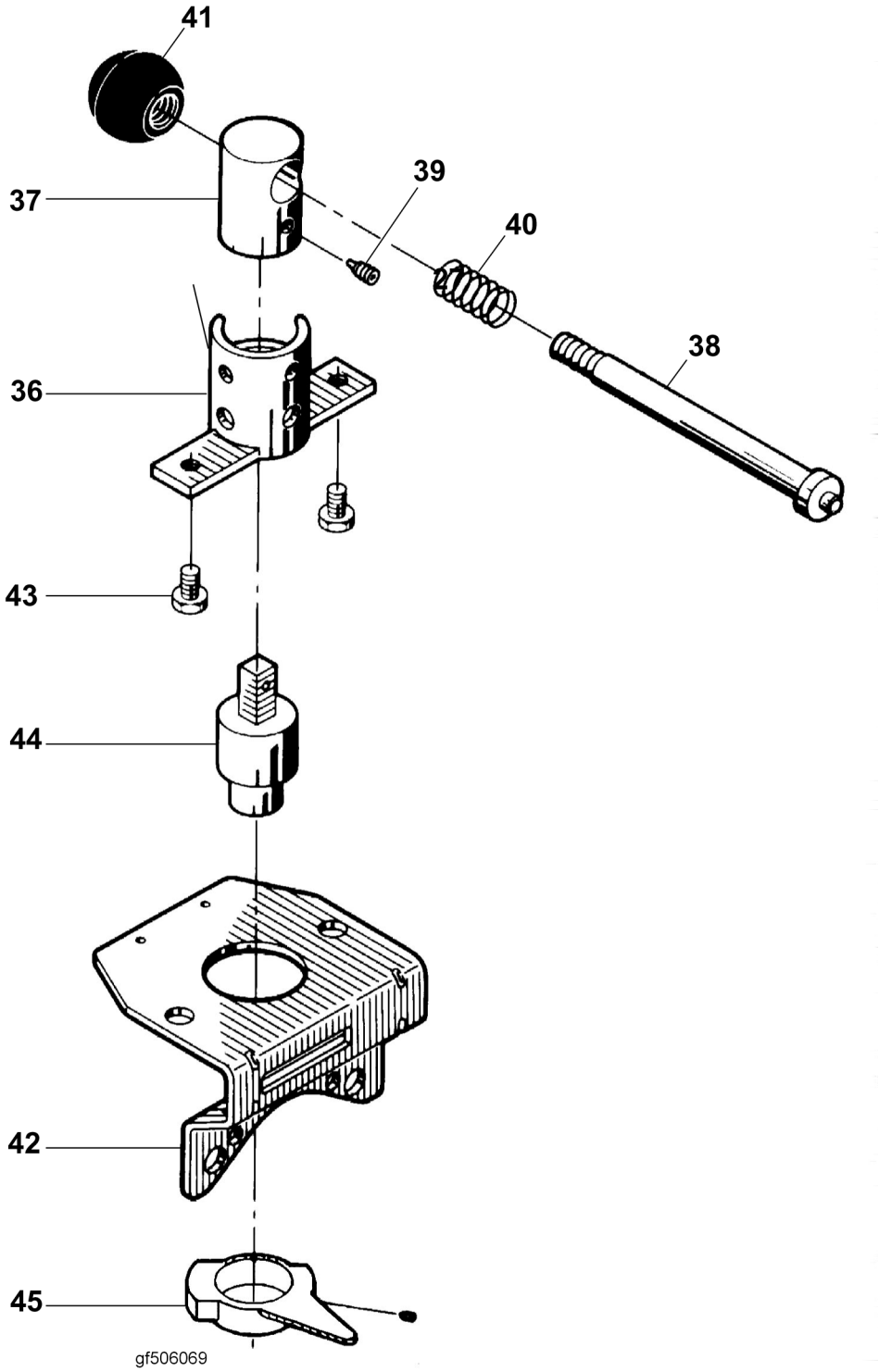
Spare parts, Handle 1.1, 25-63,5mm/NW 25-50, with infinite positions				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0474-01	Handle complete	-	-	1
6-9612-0471-01	Locking cap	-	31	1
6-9612-0470-01	Transfer block	-	32	1
6-9612-0472-01	Handle	-	33	1
6-9612-0452-01	Screw with pin	-	34	1
6-9611-99-1995	Crosshead	-	35	1

Spare parts, Handle 1.1, 76mm/NW 65-80, with infinite positions				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0474-02	Handle complete	-	-	1
6-9612-0471-02	Locking cap	-	31	1
6-9612-0470-02	Transfer block	-	32	1
6-9612-0472-02	Handle	-	33	1
6-9612-0453-01	Screw with pin	-	34	1
6-9611-99-1996	Crosshead	-	35	1

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Spare parts, Handle 1.1, 101,6mm/NW 100, with infinite positions				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0474-03	Handle complete	-	-	1
6-9612-0471-03	Locking cap	-	31	1
6-9612-0470-03	Transfer block	-	32	1
6-9612-0472-02	Handle	-	33	1
6-9612-0453-01	Screw with pin	-	34	1
6-9611-99-1996	Crosshead	-	35	1

Handle 1.1 for indication unit



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Spare parts, Handle 1.1 for indication unit, 25-63,5mm/NW 25				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0475-01	Handle complete	-	-	1
6-9611-41-766-1	Locking cap	-	36	1

Spare parts, Handle 1.1 for indication unit, 25-63,5mm/NW 25				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0454-01	Transfer block	-	37	1
6-9611-41-140-0	Handle	-	38	1
6-9612-0452-01	Screw with pin	-	39	1
6-9611-99-1998	Spring	-	40	1
6-9611-99-1970	Ball	-	41	1
6-9611-41-647-1	Bracket	-	42	1
6-9611-99-1686	Screw	-	43	2
6-9611-41-771-1	Coupling	-	44	1
6-9611-41-669-0	Activating ring with screw	-	45	1

Spare parts, Handle 1.1 for indication unit, 76mm/NW 80				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0475-02	Handle complete	-	-	1
6-9611-41-767-1	Locking cap	-	36	1
6-9612-0455-01	Transfer block	-	37	1
6-9611-41-140-1	Handle	-	38	1
6-9612-0453-01	Screw with pin	-	39	1
6-9611-99-1998	Spring	-	40	1
6-9611-99-1970	Ball	-	41	1
6-9611-41-648-1	Bracket	-	42	1
6-9611-99-1686	Screw	-	43	2
6-9611-41-770-1	Coupling	-	44	1
6-9611-41-669-0	Activating ring with screw	-	45	1

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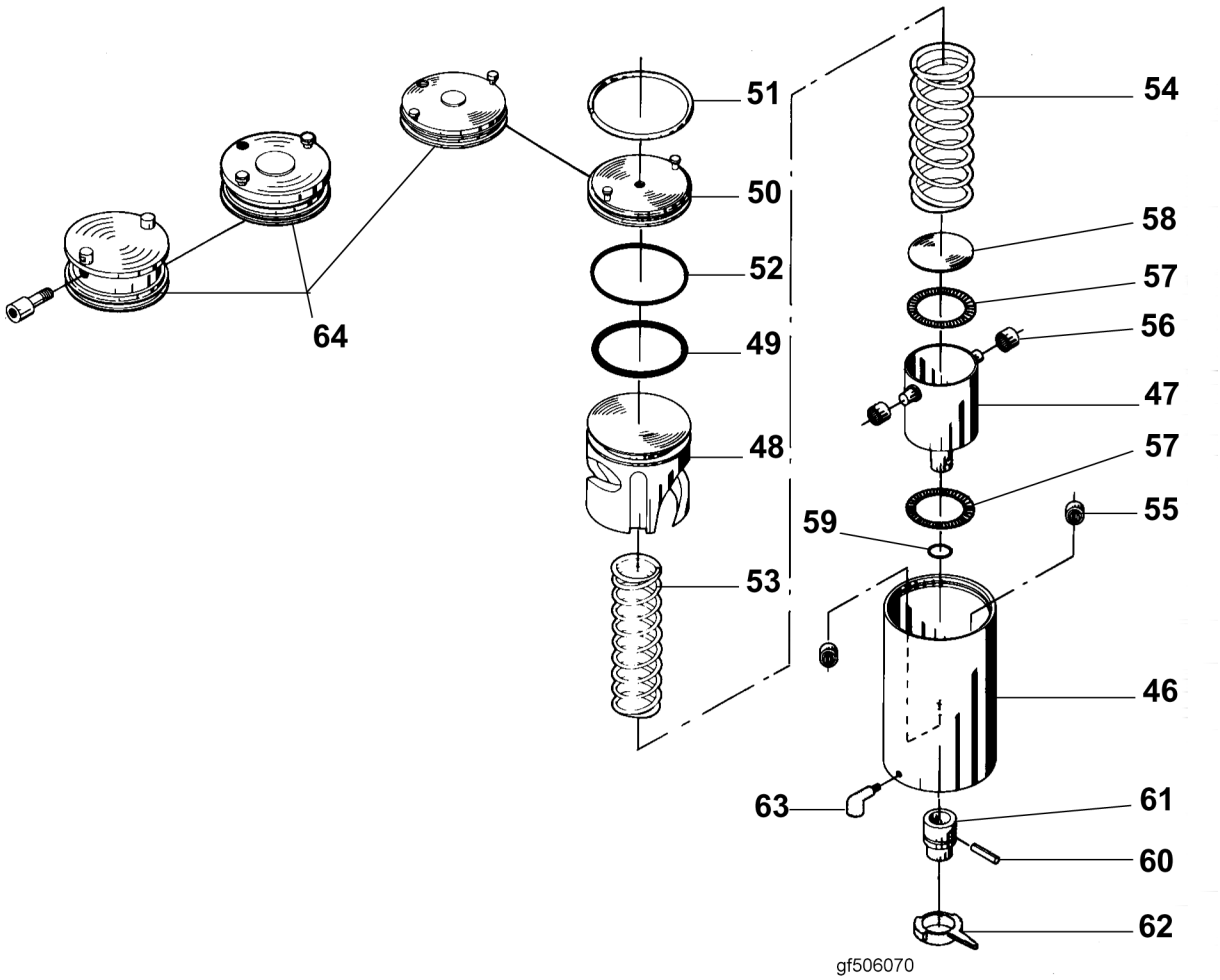
Spare parts, Handle 1.1 for indication unit, 101,6mm/NW 100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0475-03	Handle complete	-	-	1
6-9612-0469-01	Locking cap	-	36	1
6-9612-0462-01	Transfer block	-	37	1
6-9612-0461-01	Handle	-	38	1
6-9612-0453-01	Screw with pin	-	39	1
6-9611-99-1982	Spring	-	40	1
6-9611-99-1981	Ball	-	41	1
6-9612-0815-01	Bracket	-	42	1
6-9611-99-1686	Screw	-	43	2
6-9612-0468-01	Coupling	-	44	1
6-9611-41-669-0	Activating ring with screw	-	45	1

Spare parts, Handle 1.1 for indication unit, (LKB-DIN) NW 65				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-0475-04	Handle complete	-	-	1
6-9611-41-767-1	Locking cap	-	36	1
6-9612-0455-01	Transfer block	-	37	1
6-9611-41-140-1	Handle	-	38	1
6-9612-0453-01	Screw with pin	-	39	1
6-9611-99-1998	Spring	-	40	1
6-9611-99-1970	Ball	-	41	1
6-9612-0815-01	Bracket	-	42	1
6-9611-99-1686	Screw	-	43	2
6-9611-41-770-1	Coupling	-	44	1
6-9611-41-669-0	Activating ring with screw	-	45	1

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Actuators

Air/Spring Type - LKLA (NC-NO) Ø85



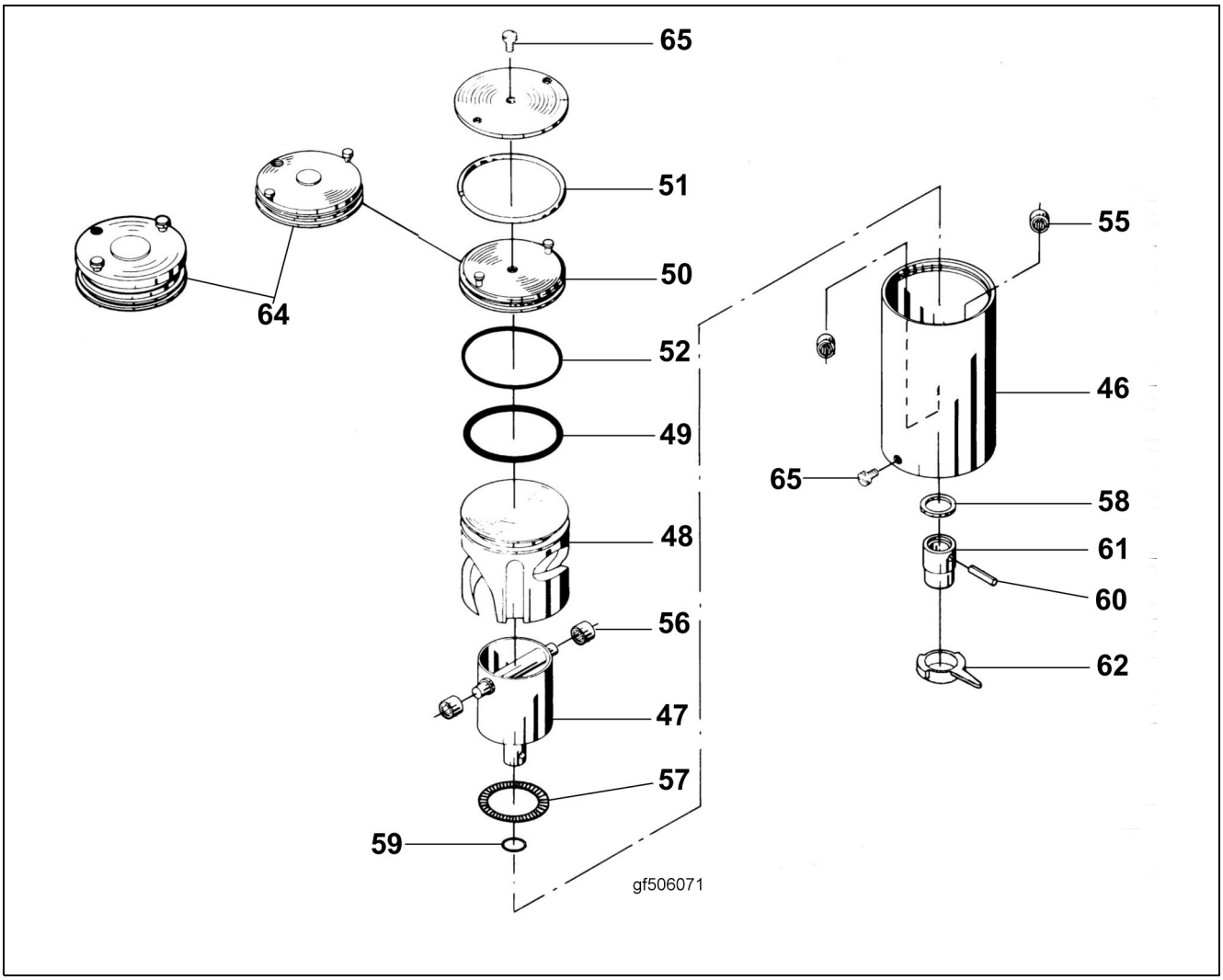
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Spare parts, NC, NO, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-41-630-1	Actuator, complete, NC 25-63,5mm/NW25-50	-	-	1
6-9611-41-630-2	Actuator, complete NC 76mm/NW65-80			
6-9611-41-630-6	Actuator, complete, NC 101,6mm/NW100			
6-9611-41-630-4	Actuator, complete, NO 25-63,5mm/NW25-50			
6-9611-41-630-5	Actuator, complete NO 76mm/NW65-80			
6-9611-41-630-7	Actuator, complete, NO 101,6mm/NW100			

Spare parts, NC, NO, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3010	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring	49 52 55 56 57 59	1 1 2 2 2 1
6-9611-41-758-0	Air cylinder	-	46	1
6-9611-41-638-0	Rotating cylinder	-	47	1
6-9611-41-631-0	Piston, NC	-	48	1
6-9611-41-741-0	Piston, NO	-	48	1
6-9611-99-0052	O-ring	-	49	1
6-31357-0740-1	End cap	-	50	1
6-9611-40-202-1	Retaining ring	-	51	1
6-9611-99-0396	O-ring	-	52	1
6-9611-99-1629	Inner spring	-	53	1
6-9611-99-1631	Outer spring	-	54	1
6-9611-41-646-0	Thrust plate	-	58	1
6-9611-99-1233	O-ring	-	59	1
6-9611-99-1235	Connex pin	-	60	1
6-9611-41-644-0	Coupling, 25-63,5mm/ NW25-50	-	61	1
6-9611-41-645-0	Coupling, 76mmm/NW65-80			
6-9612-0447-03	Coupling, 101,6mm/NW100			
6-9611-41-669-0	Activating ring	-	62	1
6-9611-41-775-0	Water rejector	-	63	1
NC/NO for AlTop				
6-9611-41-678-1	Actuator, complete, NC 25-63,5mm/NW25-50	-	-	1
6-9611-41-678-2	Actuator, complete NC 76mm/NW65-80			
6-9611-41-678-6	Actuator, complete, NC 101,6mm/NW100			
6-9611-41-678-4	Actuator, complete, NO 25-63,5mm/NW25-50			
6-9611-41-678-5	Actuator, complete NO 76mm/NW65-80			
6-9611-41-678-7	Actuator, complete, NO 101,6mm/NW100			
6-9611-41-674-0	End cap	-	64	1

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Air/Air Type - LKLA Ø85



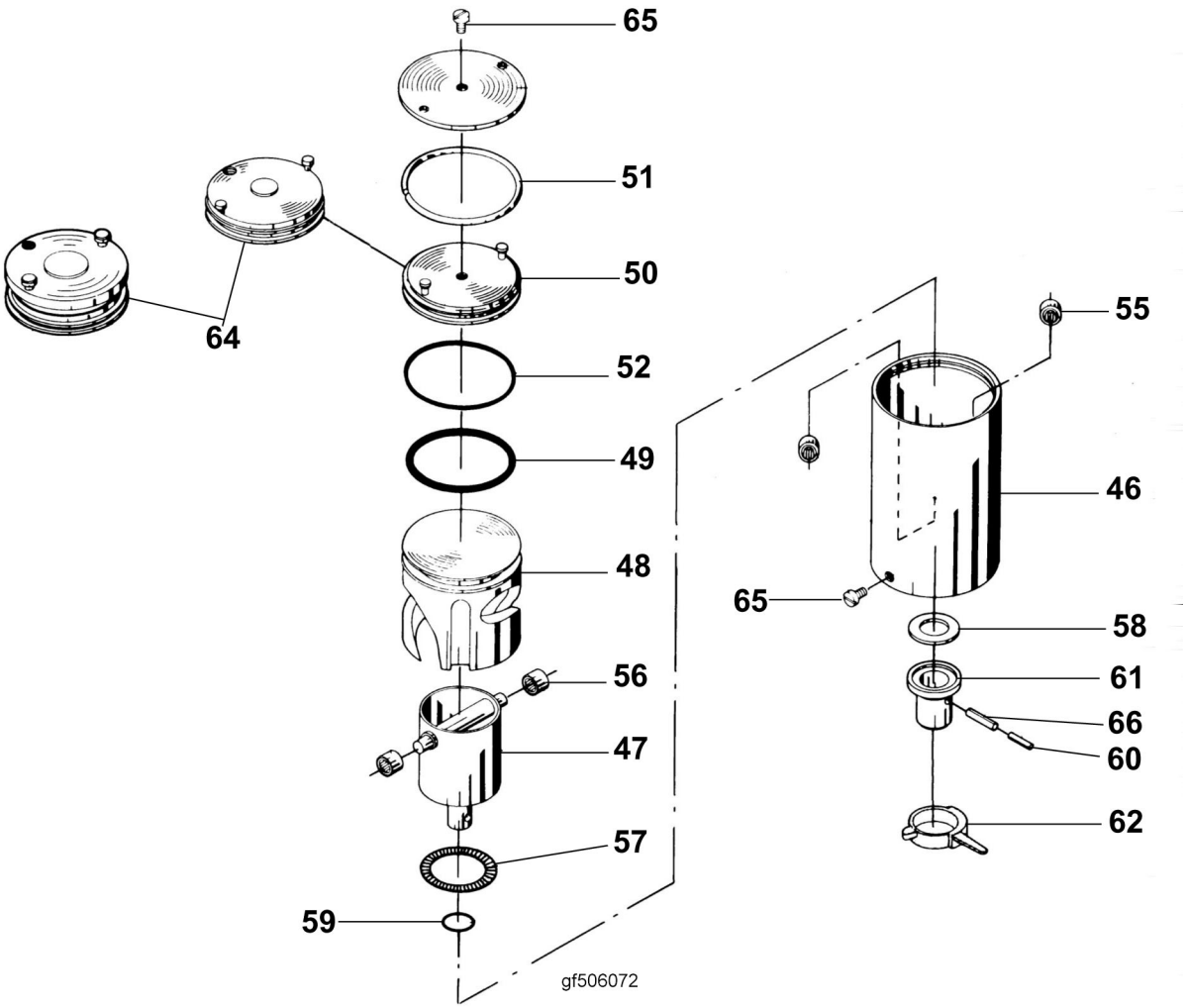
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Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-41-749-1	Actuator, complete, 25-63,5mm/NW25-50	-	-	1
6-9611-41-749-2	Actuator, complete, 76mm/ NW65-80			
6-9611-41-749-3	Actuator, complete, 101,6mm/NW100			
6-9611-92-3011	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring	49 52 55 56 57 59	1 1 2 2 1 1
6-9611-41-758-0	Air cylinder	-	46	1
6-9611-41-744-1	Rotating cylinder	-	47	1
6-9611-41-752-0	Piston	-	48	1

Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-99-0052	O-ring	-	49	1
6-31357-0740-1	End cap	-	50	1
6-9611-40-202-1	Retaining ring	-	51	1
6-9611-99-0396	O-ring	-	52	1
6-9611-41-757-0	Thrust plate	-	58	1
6-9611-99-1233	O-ring	-	59	1
6-9611-99-1235	Connex pin	-	60	1
6-9611-41-7551-0	Coupling, 25-63,5mm/ NW25-50	-	61	1
6-9611-41-756-1	Coupling, 76mmm/NW65-80			
6-9612-0448-02	Coupling, 101,6mm/NW100			
6-9611-41-669-0	Activating ring	-	62	1
6-9611-99-1221	Threaded plug	-	65	2
Air/Air for AlTop				
6-9612-0812-2	Actuator, complete, 25-63,5mm/NW25-50	-	-	1
6-9612-0812-3	Actuator, complete 76mm/ NW65-80			
6-9612-0812-4	Actuator, complete, 101,6mm/NW100			
6-9611-41-674-0	End cap, Mask III	-	64	1
6-9611-41-858-1	End cap, Mask II W fixation screw			

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Air/Air Type - LKLA NW125-150 Ø85



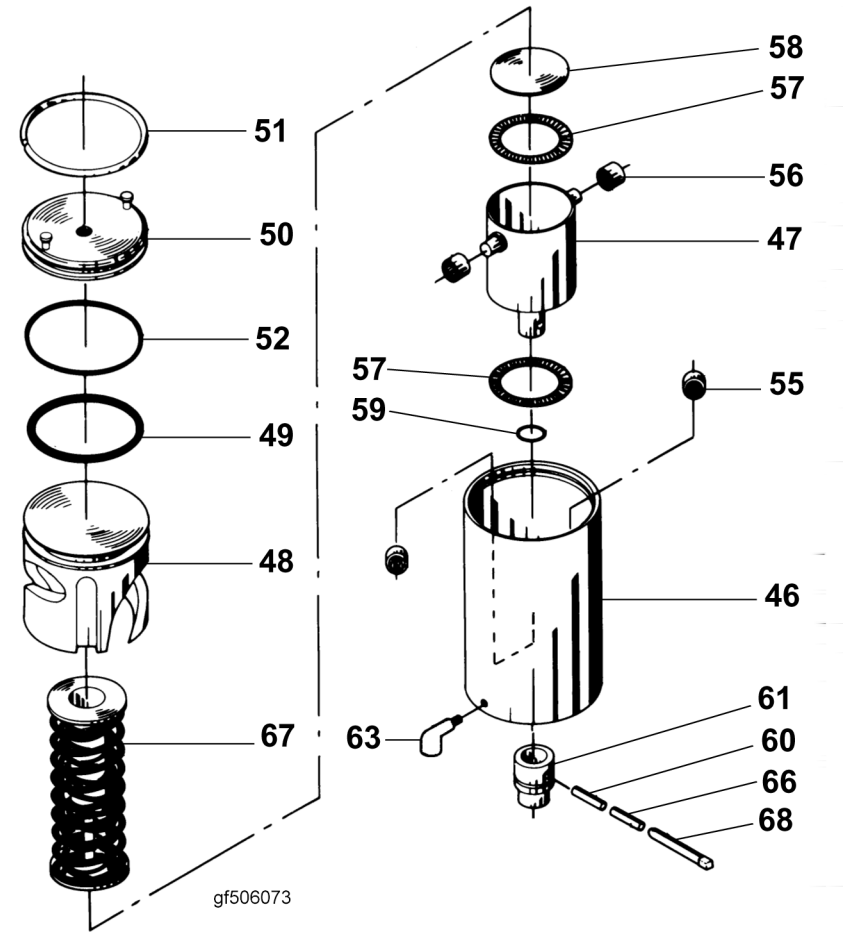
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Spare parts, NW125-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-41-750-2	Actuator, complete, NW125	-	-	1
6-9611-41-750-0	Actuator, complete, NW150			
6-9611-92-3012	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring	49 52 55 56 57 59	1 1 2 2 1 1
6-9611-41-742-0	Air cylinder	-	46	1
6-9611-41-744-0	Rotating cylinder	-	47	1
6-9611-41-752-0	Piston	-	48	1
6-9611-99-0052	O-ring	-	49	1
6-31357-0740-1	End cap	-	50	1
6-9611-40-202-1	Retaining ring	-	51	1

Spare parts, NW125-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-99-0396	O-ring	-	52	1
6-9611-99-1314	Connex pin	-	66	1
6-9611-41-754-0	Thrust plate	-	58	1
6-9611-99-0030	O-ring	-	59	1
6-9611-99-1313	Connex pin	-	60	1
6-9612-2856-02	Coupling, NW125	-	61	1
6-9611-41-747-1	Coupling, NW150			
6-9611-41-665-0	Activating ring	-	62	1
6-9611-99-1221	Threaded plug	-	65	2
Air/Air for AlTop				
6-9612-0813-02	Actuator, complete, NW125	-	-	1
6-9612-0813-01	Actuator, complete, NW150			
6-9611-41-674-0	End cap, Mask III	-	64	1
6-9611-41-858-1	End cap, Mask II W fixation screw			

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Air/Spring Type - LKLA (NC-NO) Ø133



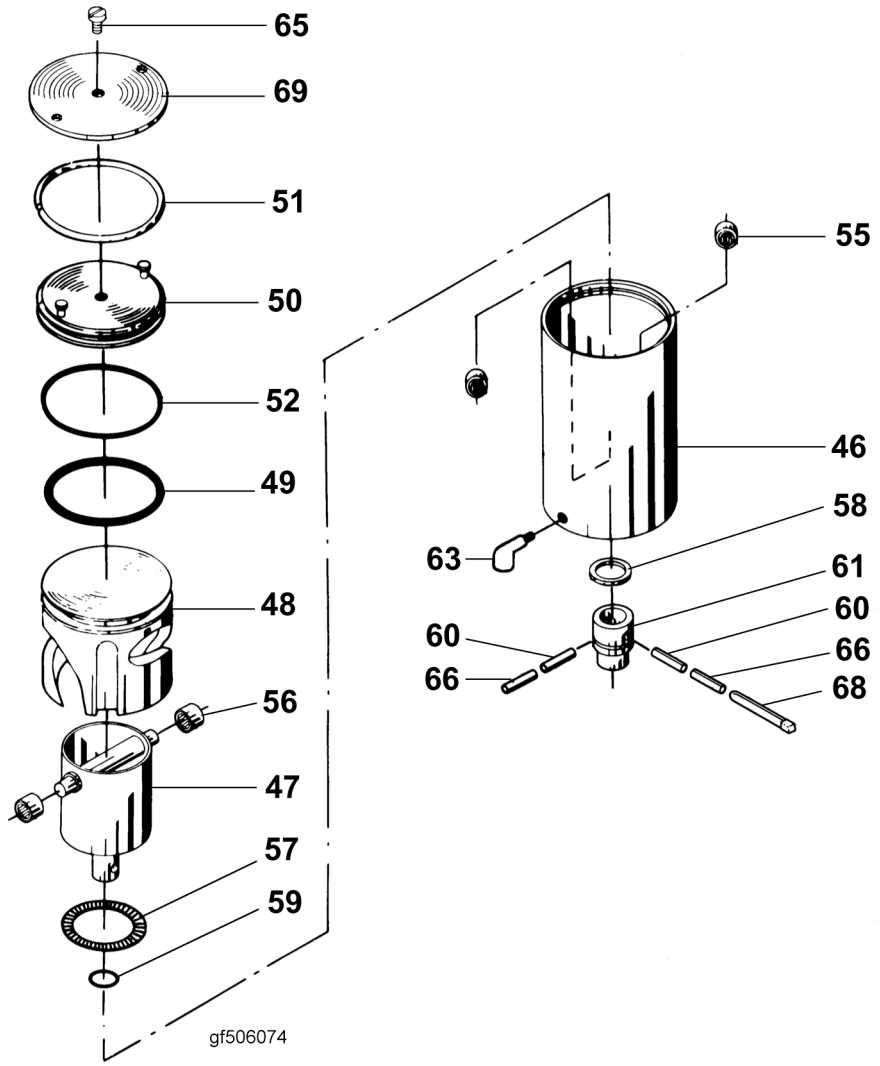
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Spare parts, NC, NO, 101,6mm/NW100-NW150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-2713-06	Actuator, complete, NC 101,6mm/NW100	-	-	1
6-9612-2713-11	Actuator, complete, NC NW125			
6-9612-2713-16	Actuator, complete, NC NW150			
6-9612-2713-07	Actuator, complete, NO 101,6mm/NW100			
6-9612-2713-12	Actuator, complete, NO NW125			
6-9612-2713-17	Actuator, complete, NO NW150			

Spare parts, NC, NO, 101,6mm/NW100-NW150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3020	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring	49 52 55 56 57 59	1 1 2 2 2 1
6-9612-2685-01	Air cylinder	-	46	1
6-9612-2678-01	Rotating cylinder	-	47	1
6-9612-2700-01	Piston, NC	-	48	1
6-9612-2680-01	Piston, NO			
6-9611-99-2367	O-ring	-	49	1
6-9612-2714-01	End cap	-	50	1
6-9612-2682-01	Retaining ring	-	51	1
6-9611-99-0035	O-ring	-	52	1
6-9612-2701-01	Spring assembly	-	67	1
6-9611-99-2357	Connex pin	-	66	1
6-9612-2671-01	Thrust plate	-	58	1
6-9611-99-0079	O-ring	-	59	1
6-9611-99-2358	Connex pin	-	60	1
6-9612-2715-01	Coupling, 101,6mm/NW100	-	61	1
6-9612-2715-02	Coupling, NW125			
6-9612-2715-03	Coupling, NW150			
6-9612-2719-01	Indication pin	-	68	1
6-9611-41-775-0	Waret rejector	-	63	1

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Air/Air Type - LKLA Ø133



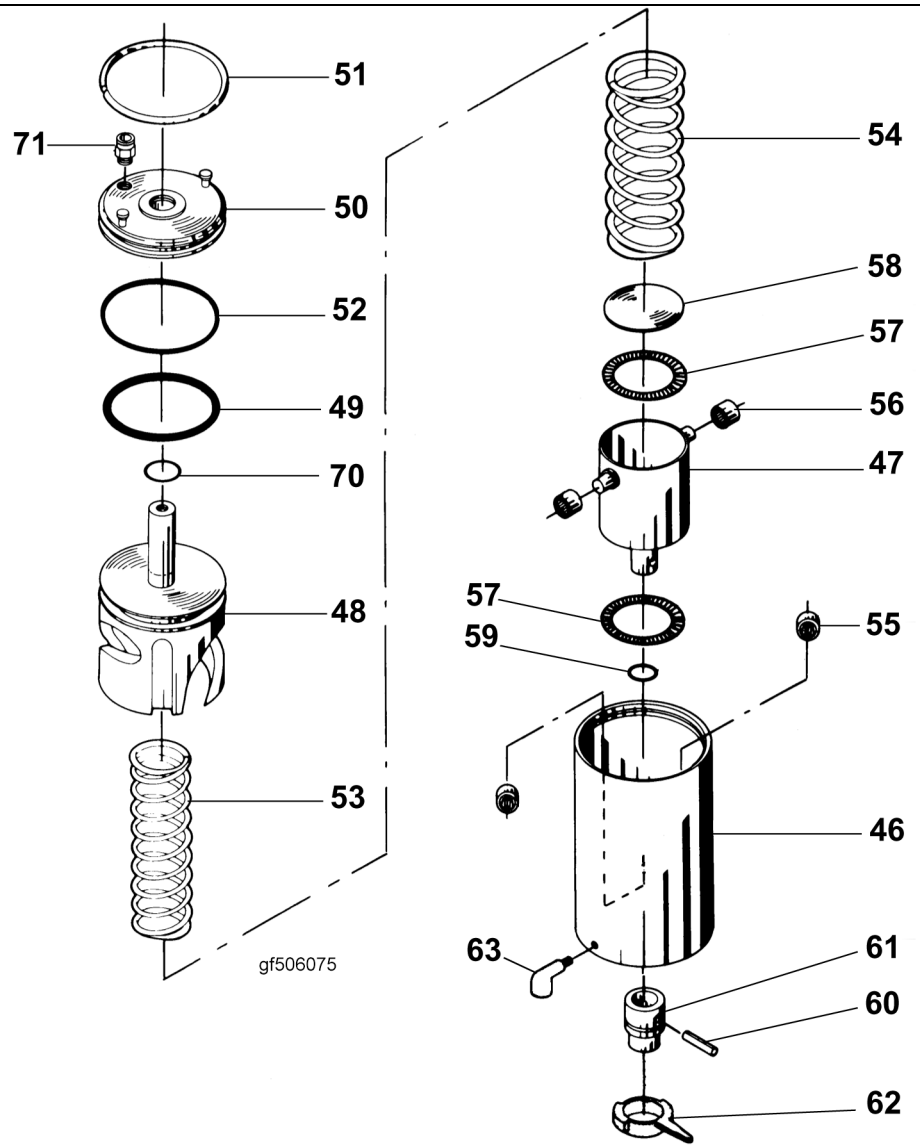
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Spare parts, 101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-2713-08	Actuator, complete, 101,6mm/NW100	-	-	1
6-9612-2713-13	Actuator, complete, NW125			
6-9612-2713-18	Actuator, complete, NW150			
6-9611-92-3022	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring	49 52 55 56 57 59	1 1 2 2 1 1
6-9612-2685-01	Air cylinder	-	46	1
6-9612-2678-01	Rotating cylinder	-	47	1
6-9612-2680-01	Piston	-	48	1

Spare parts, 101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-99-2367	O-ring	-	49	1
6-9612-2714-01	End cap	-	50	1
6-9612-2682-01	Retaining ring	-	51	1
6-9611-99-0035	O-ring	-	52	1
6-9611-99-2358	Connex pin	-	66	2
6-9612-2804-01	Thrust plate	-	58	1
6-9611-99-0079	O-ring	-	59	1
6-9611-99-2357	Connex pin	-	60	2
6-9612-2827-01	Coupling, 101,6mm/NW100	-	61	1
6-9612-2827-02	Coupling, NW125			
6-9612-2827-03	Coupling, NW150			
6-9612-2719-01	Indication pin	-	68	1
6-9611-41-775-0	Waret rejector	-	63	1
6-9612-3486-01	Retaining Plate	-	69	1
6-9611-99-1221	Threaded plug	-	65	1

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Air/Spring Type - LKLA-T (NO-NC) Ø85



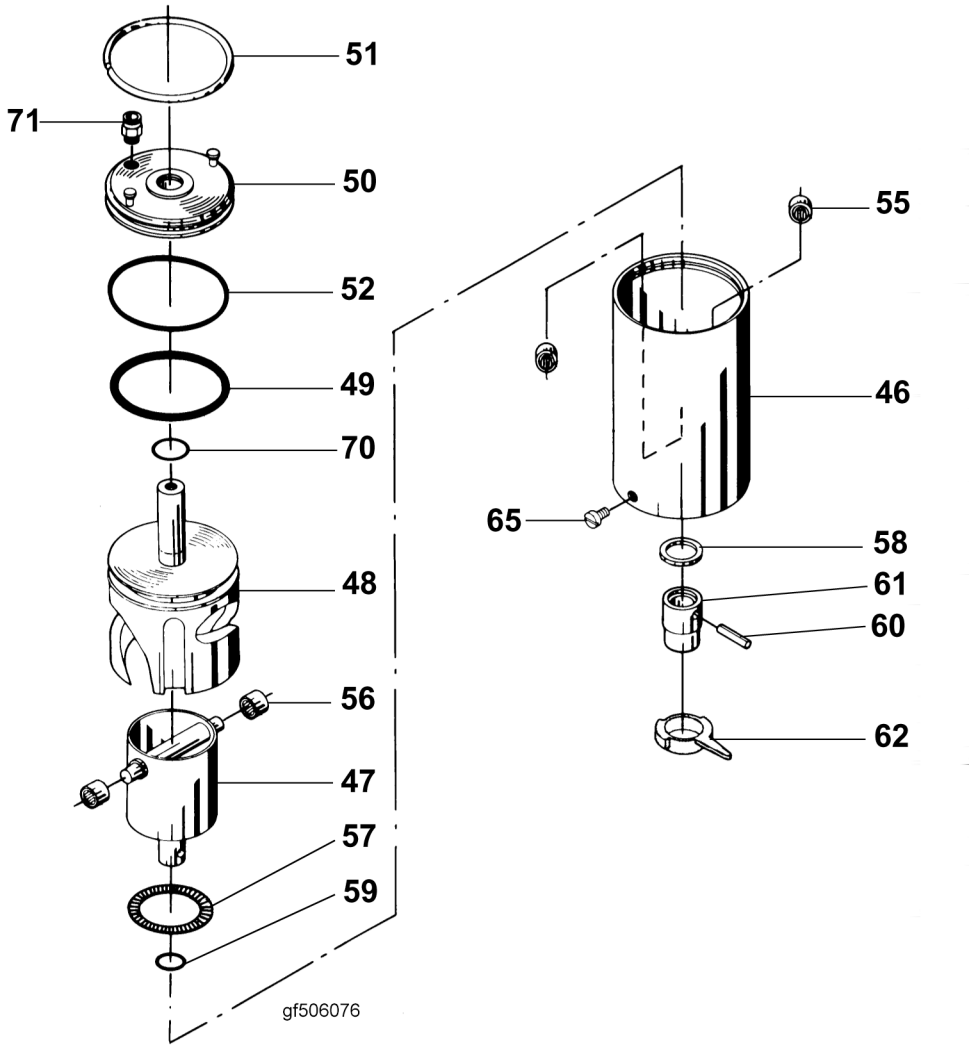
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Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-1940-02	Actuator, complete, NC, 25-63,5mm/NW25-50	-	-	1
6-9612-1940-03	Actuator, complete, NC, 76mm/NW65-80			
6-9612-1940-07	Actuator, complete, NC, 101,6mm/NW100			
6-9612-1940-05	Actuator, complete, NO, 25-63,5mm/NW25-50			
6-9612-1940-06	Actuator, complete, NO, 76mm/NW65-80			
6-9612-1940-08	Actuator, complete, NO, 101,6mm/NW100			

Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3021	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring O-ring	49 52 55 56 57 59 70	1 1 2 2 2 1 1
6-9611-41-758-0	Air cylinder	-	46	1
6-9611-41-638-0	Rotating cylinder	-	47	1
6-9612-1939-02	Piston, NC	-	48	1
6-9612-1939-01	Piston, NO			
6-9611-99-0052	O-ring	-	49	1
6-9612-1936-01	End cap	-	50	1
6-9611-40-202-1	Retaining ring	-	51	1
6-9611-99-0396	O-ring	-	52	1
6-9611-99-1629	Inner spring	-	53	1
6-9611-99-1631	Outer spring	-	54	1
6-9611-41-646-0	Thrust plate	-	58	1
6-9611-99-1233	O-ring	-	59	1
6-9611-99-1235	Connex pin	-	60	1
6-9611-41-644-0	Coupling, 25-63,5mm/ NW25-50	-	61	1
6-9611-41-645-0	Coupling, 76mm/NW65-80			
6-9612-0447-03	Coupling, 101,6mm/NW100			
6-9611-41-669-0	Activating ring	-	62	1
6-9611-41-775-0	Waret rejector	-	63	1
6-00223404-21	O-ring	-	70	1
6-9611-99-2323	Air fitting	-	71	1

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Air/Air Type - LKLA-T Ø85



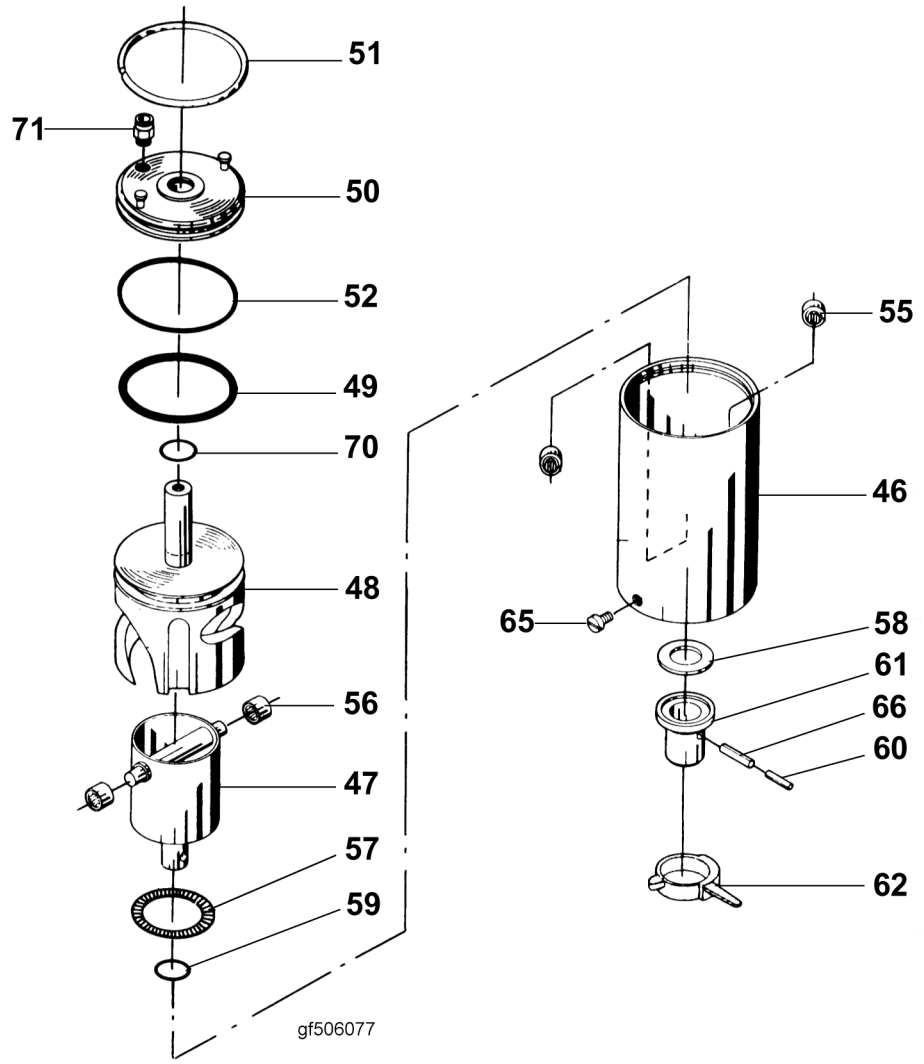
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Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-1941-02	Actuator, complete, 25-63,5mm/NW25-50	-	-	1
6-9612-1941-03	Actuator, complete, 76mm/NW65-80			
6-9612-1941-04	Actuator, complete, 101,6mm/NW100			
6-9611-92-3023	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring O-ring	49 52 55 56 57 59 70	1 1 2 2 1 1 1
6-9611-41-758-0	Air cylinder	-	46	1

Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-41-744-1	Rotating cylinder	-	47	1
6-9612-1939-03	Piston	-	48	1
6-9611-99-0052	O-ring	-	49	1
6-9612-1936-01	End cap	-	50	1
6-9611-40-202-1	Retaining ring	-	51	1
6-9611-99-0396	O-ring	-	52	1
6-9611-41-757-0	Thrust plate	-	58	1
6-9611-99-1233	O-ring	-	59	1
6-9611-99-1235	Connex pin	-	60	1
6-9611-41-755-1	Coupling, 25-63,5mm/ NW25-50	-	61	1
6-9611-41-756-1	Coupling, 76mm/NW65-80			
6-9612-0448-02	Coupling, 101,6mm/NW100			
6-9611-41-669-0	Activating ring	-	62	1
6-00223404-21	O-ring	-	70	1
6-9611-99-2323	Air fitting	-	71	1
6-9611-99-1221	Threaded plug	-	65	1

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Air/Air Type - LKLA-T NW125-150 Ø85



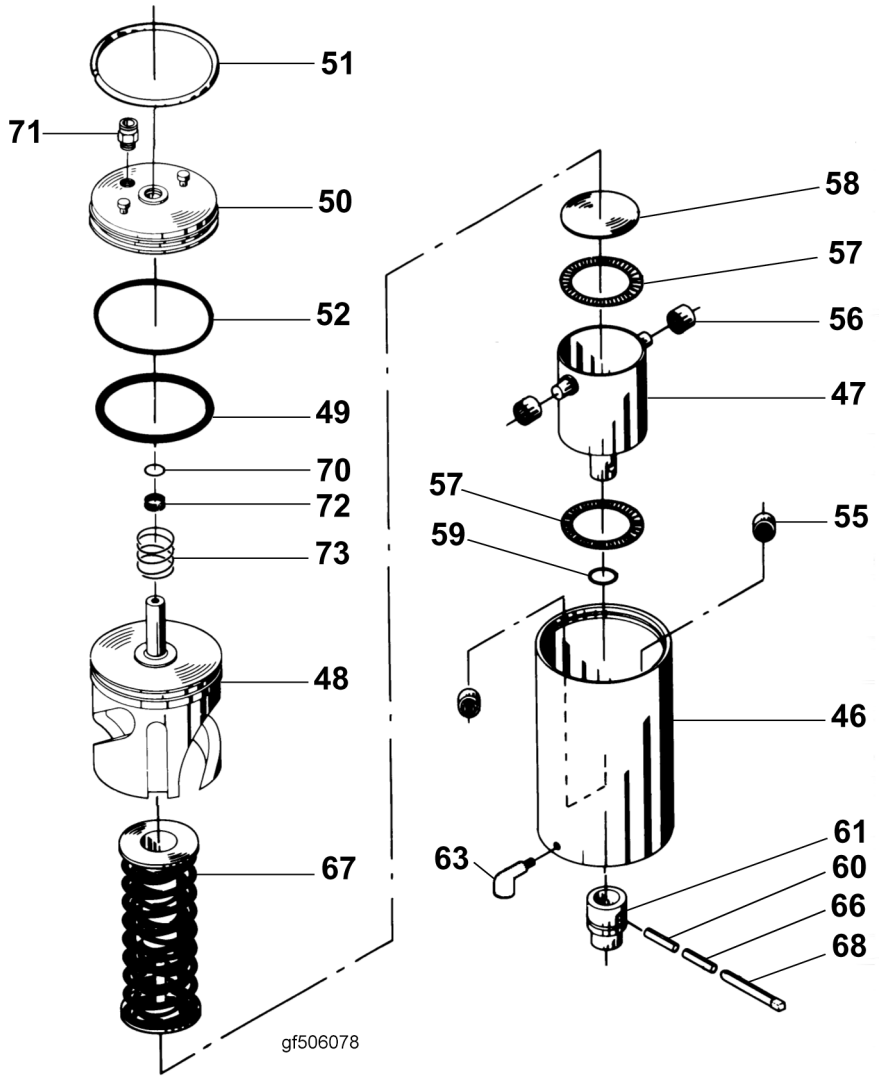
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Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-1941-02	Actuator, complete, NW 125	-	-	1
6-9612-1941-03	Actuator, complete, NW 150			
6-9611-92-3024	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring O-ring	49 52 55 56 57 59 70	1 1 2 2 1 1 1
6-9611-41-742-0	Air cylinder	-	46	1
6-9611-41-744-0	Rotating cylinder	-	47	1
6-9612-1939-03	Piston	-	48	1
6-9611-99-0052	O-ring	-	49	1
6-9612-1936-01	End cap	-	50	1

Spare parts, 25-101,6mm/NW25-100				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-40-202-1	Retaining ring	-	51	1
6-9611-99-0396	O-ring	-	52	1
6-9611-99-1314	Connex pin	-	66	1
6-9611-41-754-0	Thrust plate	-	58	1
6-9611-99-0030	O-ring	-	59	1
6-9611-99-1313	Connex pin	-	60	1
6-9612-2856-02	Coupling, NW 125	-	61	1
6-9611-41-747-1	Coupling, NW 150			
6-9611-41-665-0	Activating ring	-	62	1
6-00223404-21	O-ring	-	70	1
6-9611-99-2323	Air fitting	-	71	1
6-9611-99-1221	Threaded plug	-	65	1

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Air/Spring Type - LKLA-T (NC-NO) Ø133



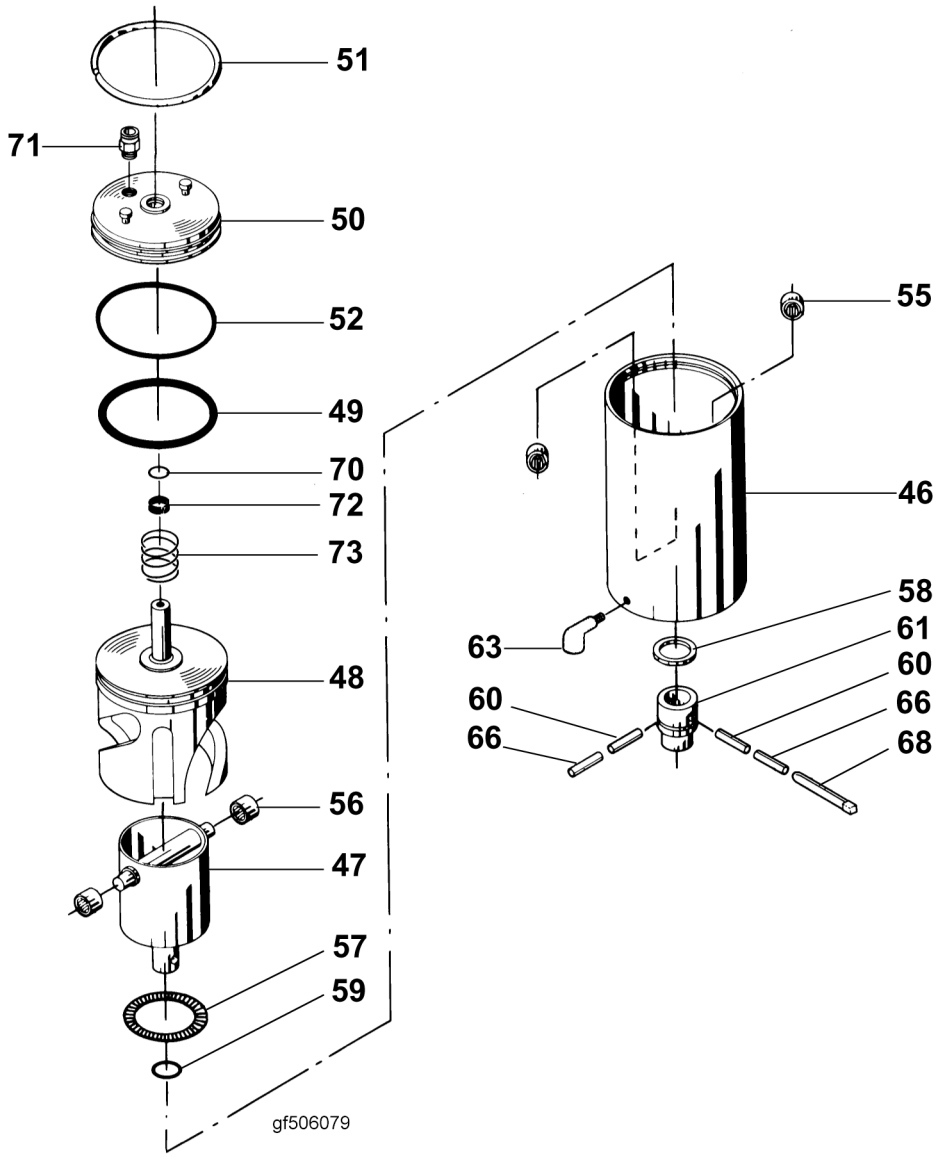
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Spare parts,101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-3749-06	Actuator, complete, NC, 101,6mm/NW100	-	-	1
6-9612-3749-11	Actuator, complete, NC, NW125			
6-9612-3749-16	Actuator, complete, NC, NW150			
6-9612-3749-07	Actuator, complete, NO, 101,6mm/NW100			
6-9612-3749-12	Actuator, complete, NO, NW125			
6-9612-3749-17	Actuator, complete, NO, NW150			

Spare parts,101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9611-92-3056	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring O-ring Guiding ring	49 52 55 56 57 59 70 72	1 1 2 2 2 1 1 1
6-9612-2685-01	Air cylinder	-	46	1
6-9612-2678-01	Rotating cylinder	-	47	1
6-9612-3699-01	Piston	-	48	1
6-9611-99-2367	O-ring	-	49	1
6-9612-2714-02	End cap	-	50	1
6-9612-2682-01	Retaining ring	-	51	1
6-9611-99-0035	O-ring	-	52	1
6-9612-2701-01	Spring assembly	-	67	1
6-9611-99-2357	Connex pin	-	66	1
6-9612-2671-01	Thrust plate	-	58	1
6-9611-99-0079	O-ring	-	59	1
6-9611-99-2358	Connex pin	-	60	1
6-9612-2715-01	Coupling, 101,6mm/NW100	-	61	1
6-9612-2715-02	Coupling, NW 125			
6-9612-2715-03	Coupling, NW 150			
6-9612-2719-01	Indication pin	-	68	1
6-9611-41-775-0	Water rejetor	-	63	1
6-00223404-21	O-ring	-	70	1
6-9611-99-2323	Air fitting	-	71	1
6-9612-3698-01	Guiding ring	-	72	1
6-9612-3700-01	Spring	-	73	1

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Air/Air Type - LKLA-T Ø133



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Spare parts,101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-3749-08	Actuator, complete, 101,6mm/NW100	-	-	1
6-9612-3749-13	Actuator, complete, NW125			
6-9612-3749-18	Actuator, complete, NW150			
6-9611-92-3057	Service kit	O-ring O-ring Needle bearing Needle bearing Thrust bearing O-ring O-ring Guiding ring	49 52 55 56 57 59 70 72	1 1 2 2 1 1 1 1

Spare parts,101,6mm/NW100-150				
Spare part Article No.	**Description**	**Included parts**	**Pos.**	**Qty.**
6-9612-2685-01	Air cylinder	-	46	1
6-9612-2678-01	Rotating cylinder	-	47	1
6-9612-3699-01	Piston	-	48	1
6-9611-99-2367	O-ring	-	49	1
6-9612-2714-02	End cap	-	50	1
6-9612-2682-01	Retaining ring	-	51	1
6-9611-99-0035	O-ring	-	52	1
6-9611-99-2358	Connex pin	-	66	2
6-9612-2804-01	Thrust plate	-	58	1
6-9611-99-0079	O-ring	-	59	1
6-9611-99-2357	Connex pin	-	60	2
6-9612-2827-01	Coupling, 101,6mm/NW100	-	61	1
6-9612-2827-02	Coupling, NW 125			
6-9612-2827-03	Coupling, NW 150			
6-9612-2719-01	Indication pin	-	68	1
6-9611-41-775-0	Water rejetor	-	63	1
6-00223404-21	O-ring	-	70	1
6-9611-99-2323	Air fitting	-	71	1
6-9612-3698-01	Guiding ring	-	72	1
6-9612-3700-01	Spring	-	73	1

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Tetra Pak

Maintenance & Spare Parts

Regulating valve

(Bürkert)

2702/8802 (Man/Auto) / 2712/8802 (Man/Auto)



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Tetra Pak

Doc No. 1217942-0101

Regulating valve

2702/8802 (Man/Auto) / 2712/8802 (Man/Auto)

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 06 Issue 2010-05

Doc No. 1217942-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

Regulating valve and actuator

General

Four different valves are covered in this document; 2702 both manually operated and actuator controlled, and 2712 also both manually operated and actuator controlled with the 2050 actuator.

1067 is a side control positioner that can be combined with the 2702 and 2712 valve. This positioner is always combined with a path measuring system (feedback unit) located at the top of the valve body. A remote version of this side control positioner is also available.

8630 is a Top Control continuos positioner that also can be combined with the 2702 and 2712 valve. In this positioner the feedback unit is built-in compared to the 1067 model.

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Change packbox and valve kit

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

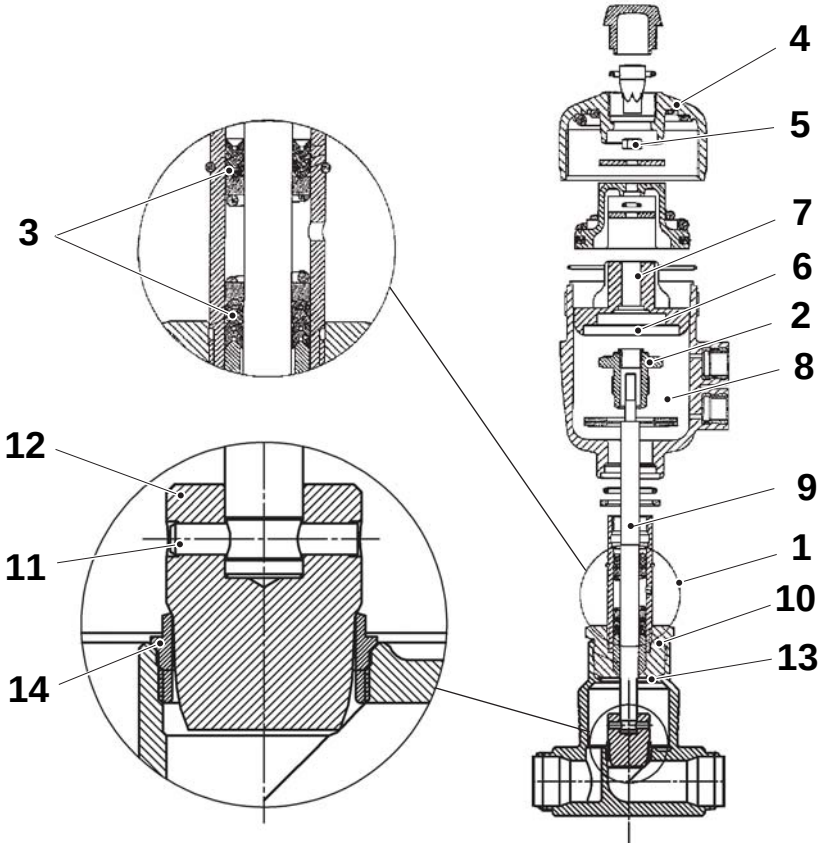
a) Remove the actuator top (4) by turning by hand.

b) Unscrew the nut (5) and remove the piston (6) and volume filler (7).

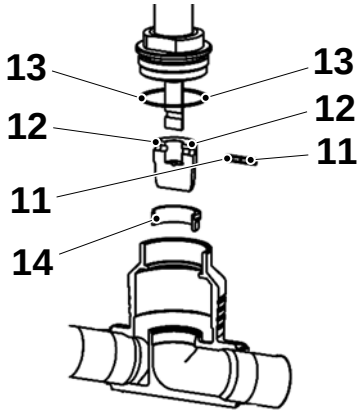
c) Unscrew the packing flange nut (2), and remove the actuator (8) and valve stem (9).

d) Unscrew the bonnet (10) and remove the complete valve assembly.

e) Pull out the old stem seal packing set (3) by means of a hook.



Control cone set



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1 Stem seal
2 Packing flange nut
3 Stem seal packing
4 Actuator top
5 Nut
6 Piston
7 Volume filler
8 Actuator
9 Valve stem
10 Bonnet
11 Dowel pin
12 Control cone
13 Packing (Graphite seal)
14 Valve seat

(Cont'd)

(Cont'd)

f) Clean the packing box and all metal parts.

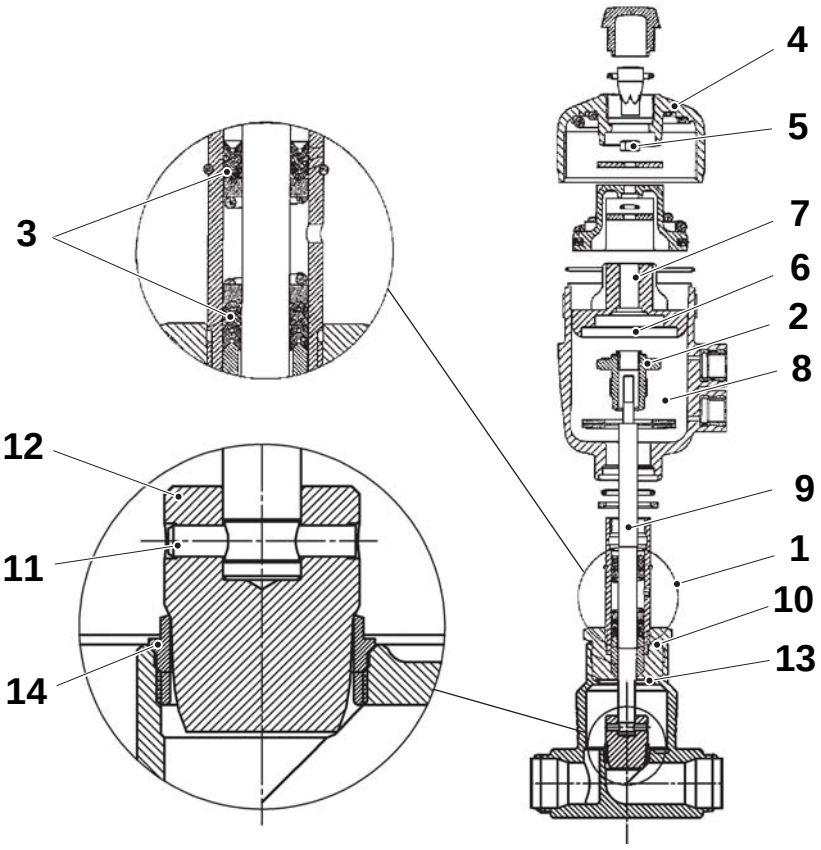
g) Change the parts included in the service kit including the actuator gaskets.

h) Replace the Plug & seal kit (Control cone set) (11,12,13) if necessary.

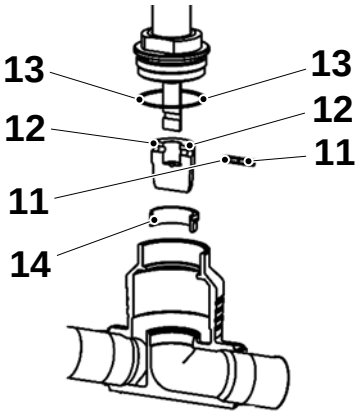
i) Remove Trim kit (Control fittings set) (11,12,13,14).

j) Assemble following the dismantling procedure in the reverse order.

Note! Be careful when reassemble so that the valve stem does not damage stem seal packings.



Control cone set



1 Stem seal
2 Packing flange nut
3 Stem seal packing
4 Actuator top
5 Nut
6 Piston
7 Volume filler
8 Actuator
9 Valve stem
10 Bonnet
11 Dowel pin
12 Control cone
13 Packing (Graphite seal)
14 Valve seat

2.2Tf503453.en

Change control cone

WARNING! **Risk of injury!**
Make sure before dismantling, that the pipeline is drained and free from media.

Note! NO = Normally Open and NC = Normally Closed

Disassemble

a) For 8630: Remove the electrical and pneumatic supplies from the 8630 Top Control positioner.

b) For 8630: Pull of the pneumatic hose between Top Control and drive unit at connection of drive unit.

c) In the case of control function NC, pressurize the lower control connection of the drive unit with compressed air (5 to 7 bar) so that the control cone (1) lifts from the valve seat and is not damaged. With control function NO, no compressed air must be applied for this purpose.

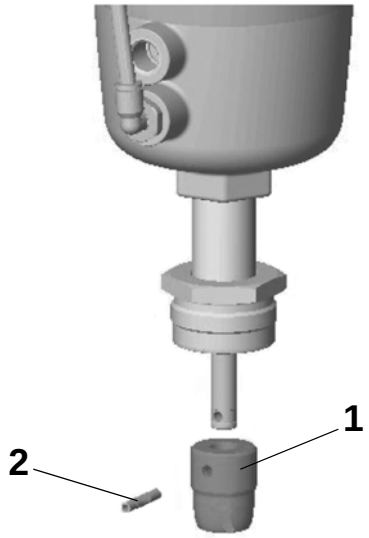
d) Remove the drive unit in the open valve position by unscrewing the threaded nipple of the housing.

e) Before reinstalling the drive (in open valve position), grease the nipple thread with stainless steel lubricant and replace the graphite seal.

f) For 1067: Follow the instructions a-e in section “Change positioner”, part “1067” on page 6-8.

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Pull off the control cone (1) with the aid of two metal strips of equal height that are clamped to the left and right side of the spindle between the control cone (1) and the threaded nipple of the drive unit. To pull off the control cone (1), apply compressed air (approx. 6 bar) to the lower control connection of the drive.



1 Control cone
2 Dowel pin

(Cont'd)

(Cont'd)

Reassemble

a) Knock out the dowel pin (2) with a suitable driver.
Driver diameter:
up to DN 25 diameter 4 mm
from DN 32 diameter 5 mm

b) Push the new control cone (1) over the end of the spindle.

c) Align the bores.

d) Support the control cone (1) at its cylindrical part with the aid of a V-block or the like.

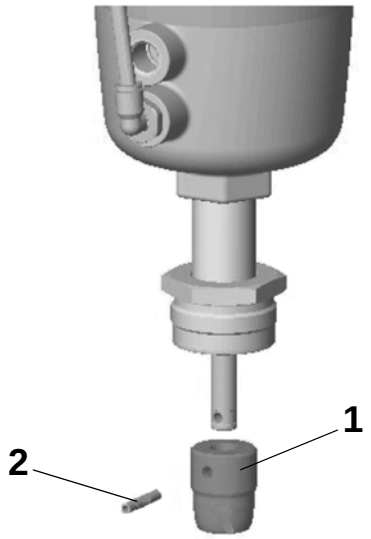
e) Carefully knock the dowel pin (2) into the bore with a hammer.

f) Bring the dowel pin (2) into a central position relative to the spindle axis (knock in as far as the end of the recess).

Note! Do not damage the sealing surface or the control contour!

For control function NO, ask for support!

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1 Control cone
2 Dowel pin

Positioner and feed back unit

Change positioner

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Caution! Always disconnect supply circuits prior to changing positioner. 24 V supply can cause damage to the equipment if not switched off!

8630

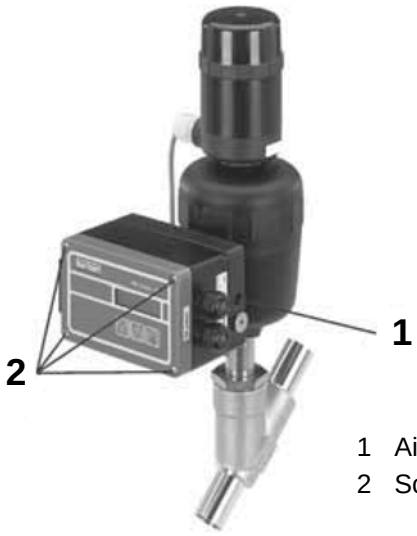
For 8630 the procedure is carried out by trained professionals from Bürkert.

1067

For changing positioner on 1067 follow the procedure below:

a) Connect compressed air at 4.5 to 6 bar to the air connection (1) and remove the blow-out nozzle.

b) Remove the four screws (2) and open the cover.



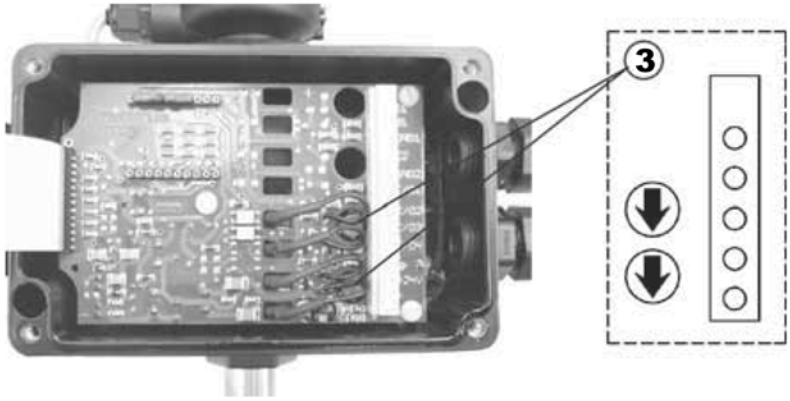
1 Air connection
2 Screws

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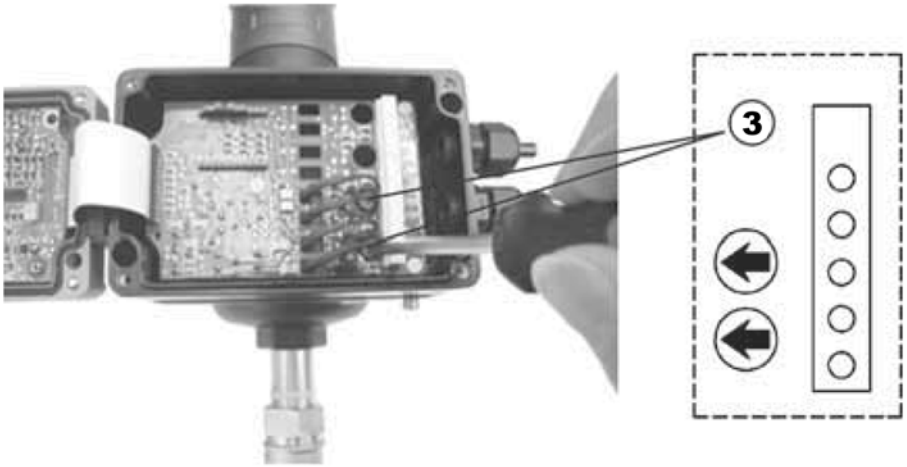
c) The two red buttons (3) located beside the electrical connection terminal block are used to manually control the solenoid valves. They have no effect in their original position, i.e. if the arrow is parallel to the terminal block.



d) Rotate the two buttons (3) (inordinate) 90° clockwise. The actuator piston is placed at the upper position and lifts the swivel plate laying on the valve seat.

Then, only replace the upper manual override in its original position (arrow parallel to terminal block). The actuator piston is locked up, even if the air supply is stopped.

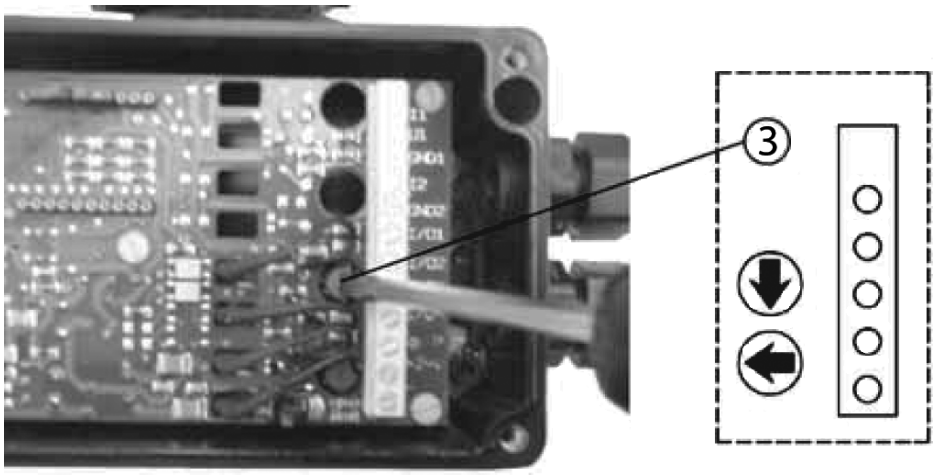
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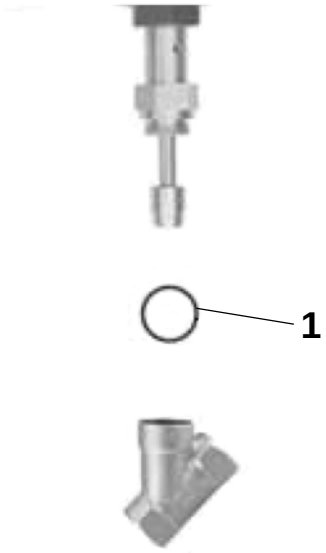
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e) Unscrew the actuator and remove it from the valve body. Since the swivel is in the upper position the valve seat is protected against any damage.



f) Install the body valve pipe, clean or change the swivel plate.

g) When reassembling, it is recommended to change the tightness gasket (1) between the valve body and the actuator.



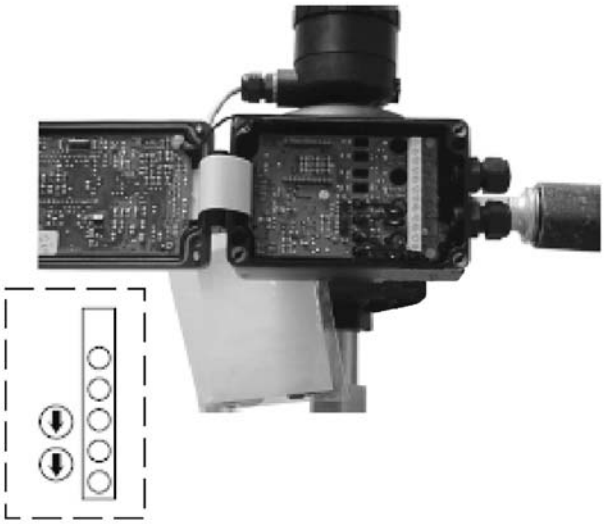
1 Gasket

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(Cont'd)

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h) Replace the lower manual override into its original position (arrow parallel to terminal block), so that the air will be leaked and the valve closed.



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Change remote positioner

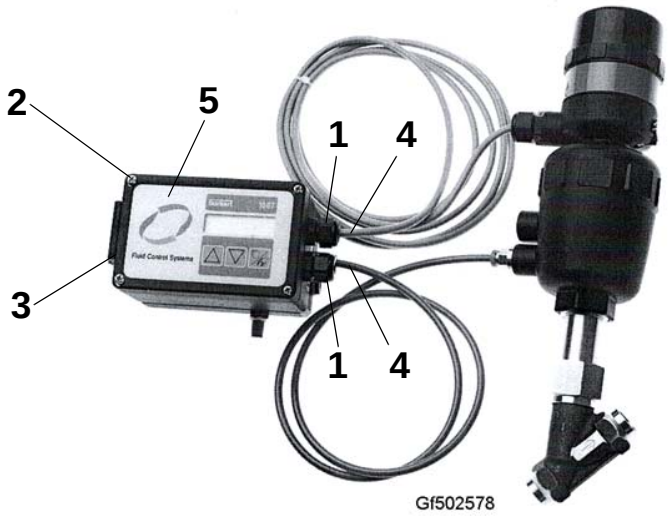
WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Caution! Always disconnect supply circuits prior to changing positioner.
24 V supply can cause damage to the equipment if not switched off!

1067

a) Loosen the cable joints (1).
b) Unscrew the screws (2) with a screwdriver. Open the lid (3).
c) Disconnect the connections (4).
d) Dismount and change the positioner (5).
e) Reassemble the positioner in reverse order.



1 Cable joint
2 Screw
3 Lid
4 Connection
5 Positioner

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Change feedback unit

WARNING!

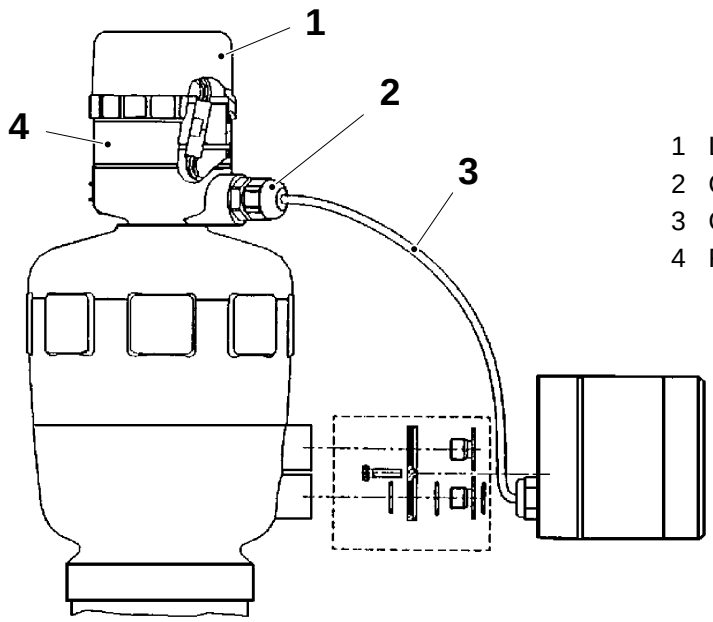
Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Caution! Always disconnect supply circuits prior to changing positioner.
24 V supply can cause damage to the equipment if not switched off!

1067

a) Unscrew the lock screw to be able to turn positioner to desired position.
b) Unscrew the lid of the path-measuring system (1).
c) Unscrew the cable joint (2).
d) Note the wiring and remove the cable (3).
e) Unscrew and change feedback unit (4).
f) Assemble the feedback in reverse order.

Side mounted positioner



1 Lid
2 Cable joint
3 Cable
4 Feedback unit

2.2Tf503453.en

Set positioner

1067

Process operation level is automatically set each time the unit is switched on, it is possible to change between the MANUAL and AUTOMATIC by pressing the MANUAL/AUTOMATIC Key. In manual mode the valve can be opened or closed by operating the “arrow keys”.

The configuration menu can be activated from the process control level by pressing the MANUAL/AUTOMATIC key and holding for 5 seconds.

Basic Settings

Has to be carried out on the initial settings of the positioner.

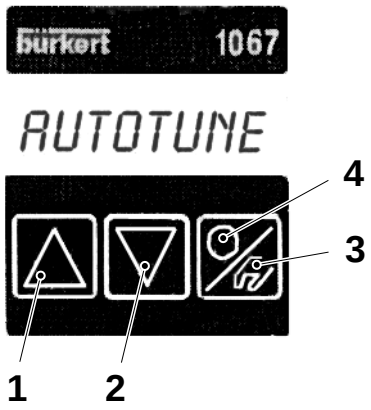
X-SENSE - Direct - Lever	Type of information transfer between the actuator and travel measuring system -Linear -Sinusoidal
INPUT - 4 - 20 mA - 0 - 20 mA - 0 - 10 V	Selected standard signal: - Unit signal current 4 - 20 mA - Unit signal current 0 - 20 mA - Unit signal current 0 - 10 V
ADDFUNCTION	Configuration of adding function
AUTO TUNE	Automatic adaptation of the actuator to the valve
END	End of menu

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- Select the settings applicable to the system.
- Run AUTOTUNE by selecting AUTOTUNE menu item and press the MANUAL/AUTOMATIC key and holding for 5 seconds. TUNE is displayed with a countdown 5 - 0. AUTOTUNE will flash for 30 to 120 sec. TUNE END will be displayed. AUTOTUNE is completed.

Additional functions

Basic functions are activated when supplied from the factory. These are adequate for normal operation. For more demanding tasks ADDITIONAL FUNCTIONS can be selected and specified. Following functions can be reached via the ADDFUNCT in the main menu.



1 UP
2 DOWN
3 MANUAL/AUTOMATIC
4 LED

Additional functions	Parameter	Description
ACTUATE	 - Single intern boost - Double	Function of actuator Single acting actuator with inter or without boost valve Single acting actuator with external boost valve - Double acting actuator
CHARACT	 Linear - 1: 25 - 1: 50 - 25:1 - 50:1 - Free	Selection of the transmission characteristic curve between the input signal and stroke. - Linear characteristic curve. - Equal % characteristic line with a rangability of 1: 25 - Equal % characteristic line with a rangability of 1: 50 - Inverted equal % characteristic line with a rangability of 25:1 - Inverted equal % characteristic line with a rangability of 50:1 - User defined, characteristic line freely programmable
DEADBND	- DBD	Dead band with regard to the closed tight function system deviation
CLTIGHT	- CLT	Close tight function
DIRECTN	 - RISE - FALL	Direction of action of set value input of valve. - Direct direction of action - Inverse direction of action
SPLTRNG	 - MIN - MAX	Signal range splitting, input signal in % for the complete stroke range through which the valve passes - Input of minimum value of input signal - Input of maximum value of input signal
X-LIMIT	 - XMIN - XMAX	Limitation of mechanical range. - Input of initial value of stroke range in % - Input of final value of stroke range in %
X-TIME	 - OPN FAST - OPN SLOW - CLS FAST - CLS SLOW	Limitation of correcting time - No limitation of correcting time during opening. - Limitation of correcting time during opening. - No limitation of correcting time during closing. - Limitation of correcting time during closing.
PCONTROL	 - SETPOINT INTERN EXTERN - PARAM KP TN TV XO - SCALE PV-L PV-H SP-L SP-H	Process controller configuration. - Method of presetting desired value Desired value preset via the keys. Desired value preset externally via signal input - Process controllers parameters Proportional correction value Reset time Rate time Operating point - Scaling Lower scale value for process quantity Upper scale value for process quantity Lower scale value for setpoint Upper scale value for setpoint
BIN-IN	 - INACTIVE - SAFEPOS SPOS - NORM OPN - NORM CLS	Operation of binary input. - Binary input inactive - Safety position Position in % - Binary input open, if not active - Binary input closed, if not active

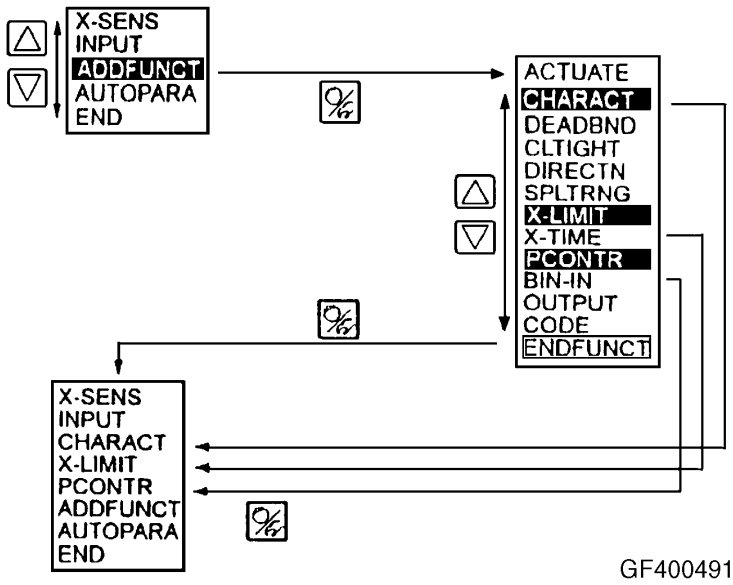
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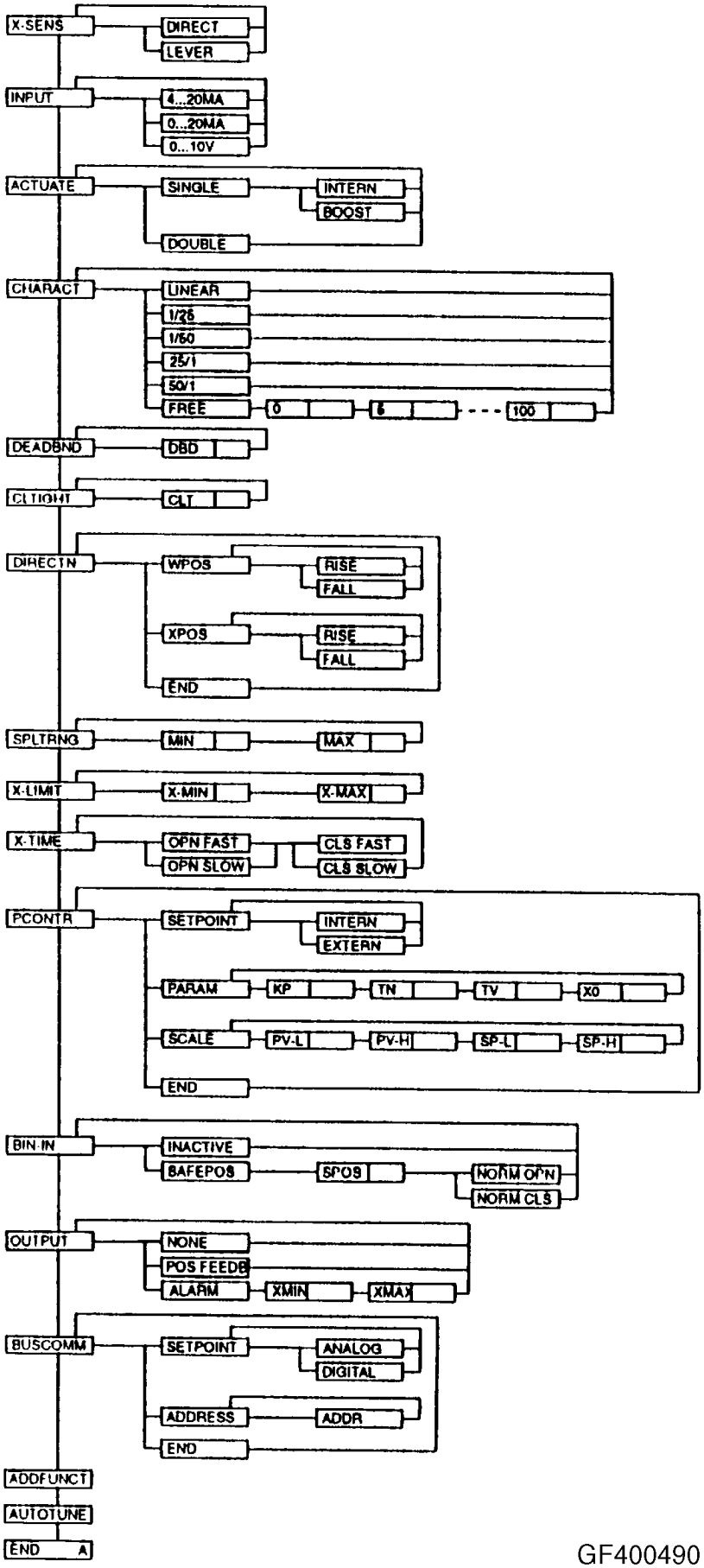
Additional functions	Parameter	Description
OUTPUT	- NONE - POS FEEDB	Analog output
BUSCOMM	- SETPOINT ANALOG DIGITAL - ADRESS	Fieldbus connection - Setpoint setting Setpoint setting via signal input Setpoint setting via bus - BUS-address of device
CODE		User code

Configuration menu, Additional functions

- The configuration menu can be activated from the process control level by pressing the MANUAL/AUTOMATIC key and holding for 5 seconds.
- Select ADDFUNCT Item in main menu and then press the MANUAL/AUTOMATIC key to enter the additional menu. When in the additional menu “Arrow up and “arrow down “keys can be pressed to select the required Additional function. If this Additional function is confirmed by pressing the MANUAL/AUTOMATIC key, it is marked with a (*).
- All the functions marked in this way are brought into the main menu after the ENDFUNCT is confirmed. The Additional functions can now be parameters in the main menu expanded in this way.
- Remove Additional function from main menu.
- Select the ADDFUNCT Item in main menu and then press the MANUAL/AUTOMATIC key in the additional menu. If only one Additional function marked with a (*) is selected and confirmed by pressing the MANUAL/AUTOMATIC key, it will be removed from the main menu.

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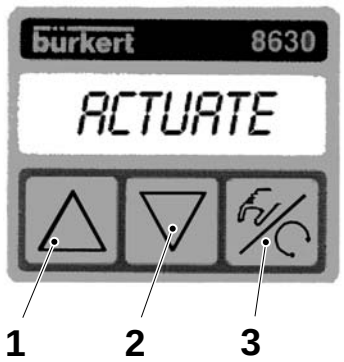
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Keys and display

Process operation level is automatically set each time the unit is switched on, it is possible to change between the MANUAL and AUTOMATIC by pressing the MANUAL/AUTOMATIC key (3). You can confirm functions and also change between main and sub menus with the MANUAL/ AUTOMATIC key (3). In manual mode the valve can be opened or closed by operating the arrow keys (1) and (2). It is also possible to change between functions on the same menu level with the arrow keys (1) and (2).

The configuration menu can be activated from the process control level by pressing the MANUAL/AUTOMATIC key and holding it for 5 seconds.



1 Up
2 Down
3 MANUAL/AUTOMATIC

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Basic configuration

Select following basic configuration for the first operation:

- Indicate actuator mode.
- Indicate unit for the selected input (4..20 mA, 0..20 mA, 0..10 V, 0..5 V).
- Start the automatic calibrating at the Top Control for continuous regulating at the existing operation (autotune).

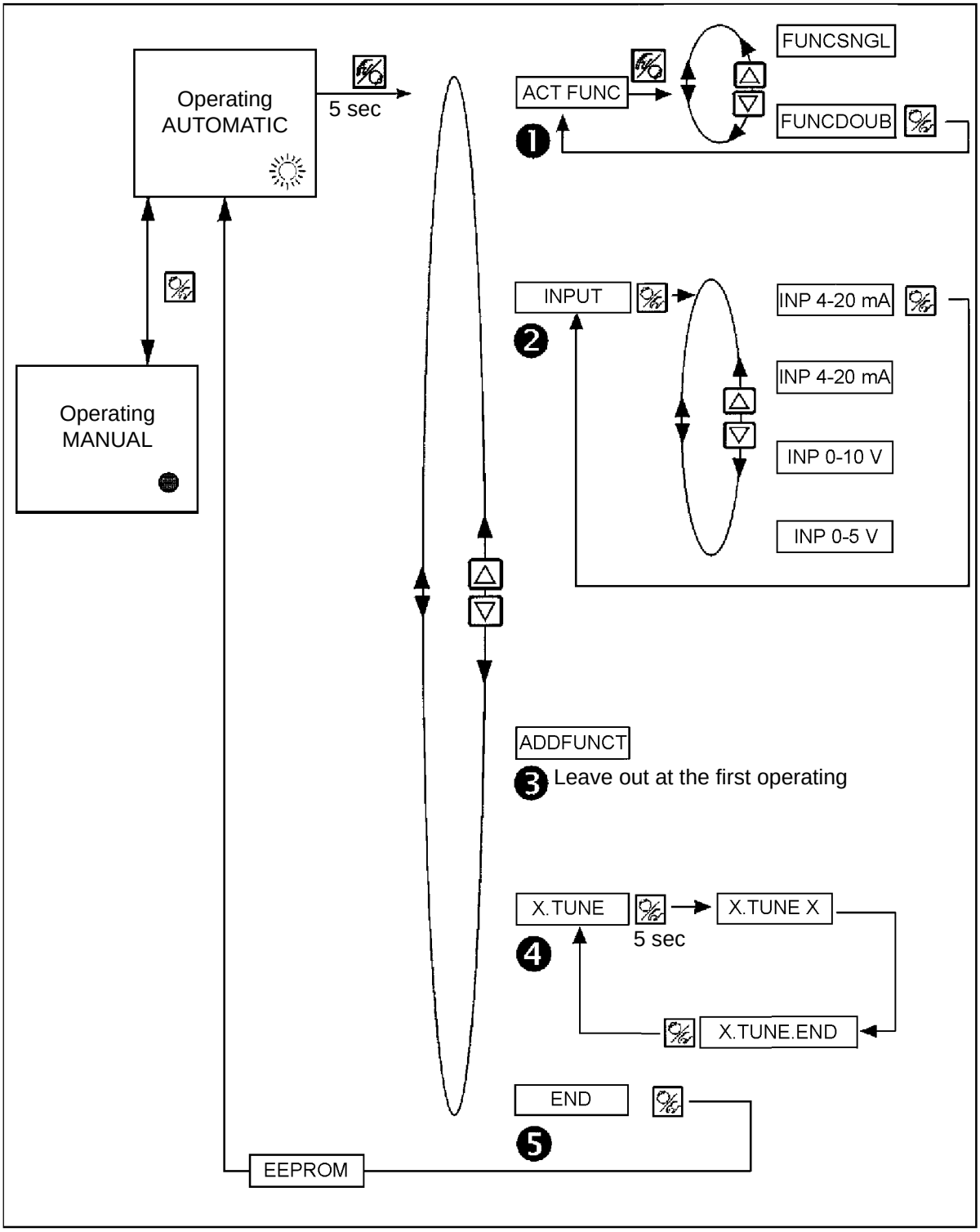
Adjustments in main menu

Voltage connection set the Top Control at continuous regulating in position PROCESSREGULATING, operation AUTOMATIC. To reach the basic configuration on configuring level; press the MANUAL/AUTOMATIC key in 5 seconds. ACTFUNC appears in the sub menu, as a first step in the main menu.

Press shortly at the key MANUAL/AUTOMATIC to a quick reach the sub menu ACTFUNC. One of the functions in the sub menu appears. Press the arrow keys to change between the different functions and change to requested setting. Press the key MANUAL/AUTOMATIC to confirm the selected adjustment.

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Basic adjustments

Has to be carried out on the initial adjustments of the positioner.

ACTFUNC	**Actuator mode** - Indicate the configuration for the pneumatic actuator as been used as Top Control in this sub menu. See the type sign for technical specifications. - FUNCSNGL - Single effected - FUNCDOUB - Double effected
INPUT 4 - 20 mA 0 - 20 mA 0 - 10 V 0 - 5 V	**Selected standard signal:** - Unit signal current 4 - 20 mA - Unit signal current 0 - 20 mA - Unit signal current 0 - 10 V - Unit signal current 0 - 5 V
ADDFUNCT	**Configuration of adding functions** Leave out this function at the first start-up
X.TUNE	**Automatic tune for Top Control for continuous regulation** The sub menu X.TUNE starts a program, which will performs an automatic parametering of the functions of Top Control for continuous regulation. Following parameters calculates automatically: - Adjustment of the transmitter signal to height of lift (piston stroke) for the regulating valve. - Paralysing of the parameters for PWM-signals which steers the internally mounted magnetic valves. - Optimal adjusting of the regulated parameters at the positioner (fastest possible movement to take the position without oscillation). See also automatic adjusting in the table below. Start of the autotune-function: Indicate the option X.TUNE in the main menu. Press the key MANUAL/AUTOMATIC in 5 seconds to leave the main menu.
END	**End of main menu and show the software version** Finish the main menu and show the software version. - Finish the main menu: select the sub menu END with the arrow key and confirm. The software version (END XX) show up at the right side of the display. Press the key MANUAL/AUTOMATIC 3-5 seconds, the messages EEPROM shows up at the display during the storing of changes. The unit puts into this operation (MANUAL or AUTOMATIC) as it has before the main menu was selected.

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Automatic adjusting for Top Control at existing operation

Display	Description
TUNE 5	Countdown from 5 to 0 before “Autotune” starts
TUNE 4	
TUNE 3	
TUNE 2	
TUNE 1	
TUNE 0	
/X.TUNE 1	Shows passed steps under the autotune-procedure (shows with a rotating indicator section at the right side of the display).
/X.TUNE 2	
/X.TUNE 3	
/X.TUNE 4	
/X.TUNE 5	
X.TUNE.END	Flashing display => Autotune-function finished
X.ERR X.X	Shows when an error arises (shows at the right side of the display). See more about errors in section **Troubleshooting.**

The display viewing during the starting and performing of the autotune function.

Note! The basic configuration at Top Control is factory adjusted.

Note! It is an absolute necessity to carry out the autotune-function before operation.

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Additional functions

The basic functions are factory activated. These are adequate for normal operation. For more demanding tasks ADDITIONAL FUNCTIONS can be selected and specified. Following functions can be reached via the ADDFUNCT in the main menu see also figure on **Inputs of numerical values** below. How to use the keys see **Keys and display.**

a) The configuration menu can be activated from the process control level by pressing the MANUAL/AUTOMATIC key and holding for 5 seconds.

b) Select ADDFUNCT in main menu and then press the MANUAL/ AUTOMATIC key to enter the additional menu. When in the additional menu the arrow keys can be pressed to select the required additional function. If this additional function is confirmed by pressing the MANUAL/AUTOMATIC key, it is marked with a (*).

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c) All the functions marked in this way are brought into the main menu after the ENDFUNCT is confirmed. The additional functions can now be parameters in the main menu expanded in this way.

d) Remove additional function from main menu.

e) Select ADDFUNCT in main menu and then press the MANUAL/ AUTOMATIC key to enter the additional menu. Select one function marked with a (*) with the arrow keys. Remove the add function from the main menu by pressing the MANUAL/AUTOMATIC key (The (*) will be removed from the main menu). The function deactivates from the main menu after confirming with ENDFUNCT.

Additional functions	**Parameter**	**Description**
CHARACT		Selection of the transmission characteristic curve between the input signal and stroke.
	CHA LIN	- Linear characteristic curve.
	CHA 1/25	- Equal % characteristic curve, regulation condition 1 : 25
	CHA 1/33	- Equal % characteristic curve, regulation condition 1 : 33
	CHA 1/50	- Equal % characteristic curve, regulation condition 1 : 50
	CHA 25/1	- Inverted equal %, regulation condition 25 : 1
	CHA 33/1	- Inverted equal %, regulation condition 33 : 1
	CHA 50/1	- Inverted equal %, regulation condition 50 : 1
	CHA FREE => 0-100 XXX	- User defined, characteristic curve freely programmable, based on temporary support points
CUTOFF		Zero function
	CUT $_{\perp}$ XX	- Shutting tight exhausted air (0% inactive). Range: 0.0...25.0% for totally exhaust air.
	CUT ^{T} XXX	- Shutting tight air inlet (100% inactive). Range: 75.0...100% for totally air inlet.
DIR.CMD		Condition between input signal and set point. Working direction when activating the actuator.
	DIR.CRISE	- Positive working direction (Ex. 4 mA resp. 0 V → 0%, 20 mA resp. 5/10 V → 100%)
	DIR.CFALL	- Negative working direction (Ex. 4 mA resp. 0 V → 100%, 20 mA resp. 5/10 V → 0%)
DIR.ACT		Condition between indicated value for position and air inlet of the actuator. Condition or working direction for the actuator.
	DIR.ARISE	- Direct working direction (exhausted air → 0%, air inlet → 100%).
	DIR.AFALL	- Inverted working direction (exhausted air → 100%, air inlet → 0%).

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Additional functions	Parameter	Description
SPLTRNG	 SR ⊥ XX SR T XXX	Signal range splitting, input signal in % for the complete stroke range through which the valve passes - Input of minimum value of input signal in % (0...75% of the measured area) - Input of maximum value of input signal in % (25...100% of the measured area)
X-LIMIT	 LIM ⊥ XX LIM T XXX	Mechanical limitation of height of lift to an indicated min/max value. If the limitation exceeds in the process, negative POS-values alt. POS-values more than 100% will be displayed. - Input of sub value of height of lift in % (0...50% of total height of lift) - Input of top value of height of lift in % (50...100% of total height of lift)
X-TIME	 T.OPN XXX T.CLS XXX	Limitation of adjustment speed for opening/closing of valve. Factory adjustment is without limitation. If you need a limitation, put in values (at T.OPN /T.CLS) between min. values as been fixed with X-TUNE and 60 seconds. - Opening speed (in seconds). - Closing speed (in seconds).
X.CONTROL	 KX ⊥ XX.X KX T XX.X	Configuration as positioner. Parameter adjustment for Top Control for continuous regulating. Input of insensitive area in % (automatic = 0, factory setting = 1%). This function protects the magnetic valves in Top Control and the actuator. The adjustment is optimized automatically with X.TUNE. - The proportionally factor for Top Control for continuous regulating (closing of valve) - The proportionally factor for Top Control for continuous regulating (opening of valve) Back to X.CONTROL
P.CONTROL	 P.CO DBND P.CO PARA P.CO SETP P.CO INP P.CO FILT P.CO SCAL P.CO END	Configuration as PID-regulator. - Deadband for the regulator - Parameters for PID-regulator - Type of set point value input - Input of signal type for the process is-value - Filtration of the process is-value input - Scaling for the regulator - Storing of new parameters. End of parameter adjustment for the process regulator
CODE	 CODE KEY CODEMENU CODEXXXX	Protecting code for adjustments and user specific parameters. The factory adjustment is CODE 0000 - Blocking of all actions which will change the process status for the unit. - Blocking of inputs in the configuring menu. - Indicate the 4-figure code. If the code protecting is activated use the code at every time to get access to a blocked processing function. Use the arrow keys to change the flashing position. Use the MANUAL/AUTOMATIC key to change to next place and confirm the input.

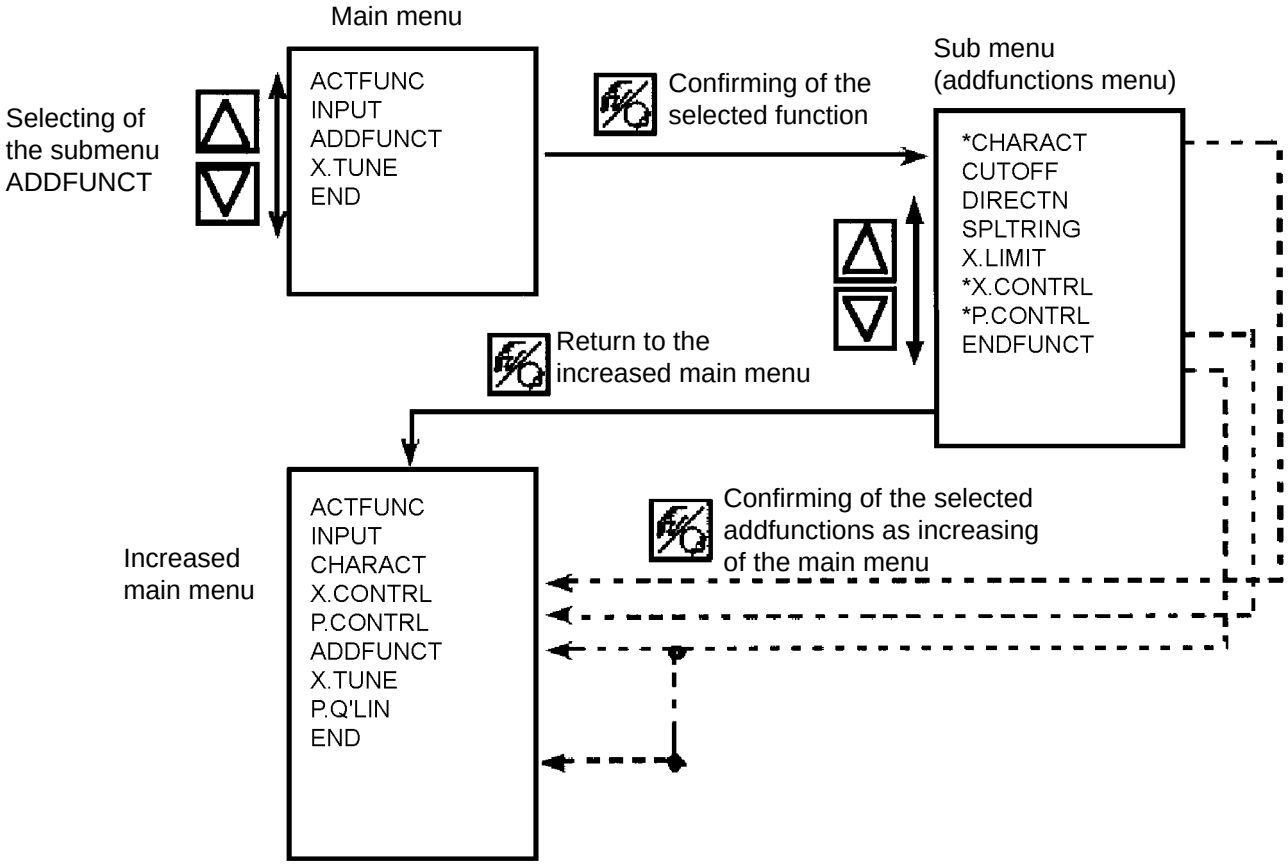
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Additional functions	Parameter	Description
BIN-IN		Activating and configuring of the binary input.
	BIN FUNC	- Select of function for binary input
	FUNC SPOS	- Select a safe position
	FUNC NO	- Binary input inactive
	SPOS XXX	- Supply the safety position (0...100%)*
		Type of binary input
	BIN TYPE	- Normally closed (0...5 V = 1; 10...30 V = 0
	NORM CLS	- Normally open (0...5 V = 0; 10...30 V = 1
	NORM OPN	- End of configuration of binary inputs
	BIN END	* If the safe position is 0 or 100% the actuator become totally exhaust/ pressurised as soon as the relevant signal is given to the binary input.
OUTPUT		Configuration of output signals.
	OUT ANL	- The analogue output signal unit for position
	OUT BIN	- Configuration of the binary output
	OUT END	- End of configuration of the output signals
CAL USER		User calibration.
	CAL POS	- Calibration of position indication (0...100%). Input of min./max. position
	CAL INP	- Calibration of set point for position (4...20 mA; 0...20 mA; 0...5 V; 0...10 V). Input min. input signal (0 mA; 4 mA; 0 V). Input max. input signal (20 mA; 5 V; 10 V)
	CAL OUT	- Calibration of the analogue output signal (4...20 mA; 0...20 mA; 0...5 V; 0...10 V). Adjusting of the min. output signal (0 mA; 4 mA; 0 V). Adjusting of the max. output signal (20 mA; 5 V; 10 V) CAL OUT is only active when there are an analogue indication of the position
	CAL FACT	- Return to the factory adjustments for the function CAL.USER: Press the MANUAL/AUTOMATIC key until the countdown is finished
	CAL END	- End of calibration
SETFACT	—	Return to the factory adjustments. Press the MANUAL/AUTOMATIC key in 3 seconds until the countdown ends
ENDFUNCT	—	Confirms adding and deactivating.

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Input of numerical values

Principals of selection of an additional function in the main menu.



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Troubleshooting

1067

The continuous regulating Top Control is maintenance free.

Error messages on the LC-display

Faults during switch on:

Message	Possible cause	Remedy
INT.ERROR	Internal fault	Not possible - unit defective

Fault messages during AUTOTUNE function:

Message	Possible cause	Remedy
TURN POT	Range of the position transducer exceeded (only with internal feedback transducer option)	Remove the positioner from the actuator, and turn the transducer from 180°
ERR 2	Actuator not adjustable (opening time < 0.5 s)	Fit the positioner with bigger air chambers. Reduce the air pressure
ERR 3	Actuator Volume is too big (opening time > 30 s)	Use a positioner with valves connected in parallel
ERR 4	Miscellaneous failures causes: - Manual operation of valve not in basic setting - No air pressure connected - Position transducer not connected	 - Check manual actuation parameters - Check compressed air supply - Check the electrical connection of the transducer; if external position control system only Check the mechanical coupling of the position controller; if internal position control system

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The continuous regulating Top Control is maintenance free.

Error messages on the LC-display

Error during activating:

Message	Possible cause	Solution
INT.ERROR	Internal error	Not possible - The unit is defect

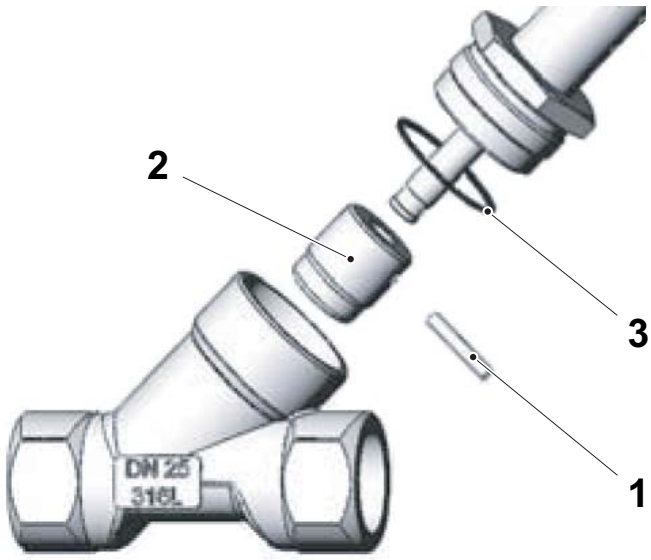
Error during AUTOTUNE function:

Message	Possible cause	Solution
X.ERR 1	Compressed air disconnected	Connect compressed air
X.ERR 2	Reduction of compressed air during AUTOTUNE	Check compressed air
X.ERR 3	Leakage (exhaust air) in actuator alt. regulating system	Not possible - The unit is defect
X.ERR 4	Leakage (supply air) in actuator alt. regulating system	Not possible - The unit is defect

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Spare parts

Manually operated regulating valve 2702



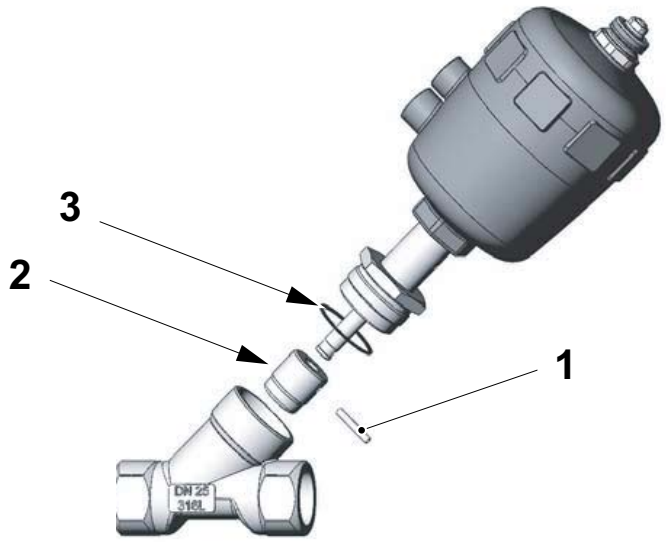
Spare part article No.	Description	Included parts	Pos.	Qty.
90503-5758	Plug set, DN15, (SS/PTFE)	Dowel pin Plug Graphite seal Lubricant	1 2 3 -	1 1 1 1
90503-5759	Plug set, DN20, (SS/PTFE)			
90503-5760	Plug set, DN25, (SS/PTFE)			
90503-5761	Plug set, DN32, (SS/PTFE)			
90503-5762	Plug set, DN40, (SS/PTFE)			
90503-5763	Plug set, DN50, (SS/PTFE)			
90503-5770	Plug set, DN65, (SS/PTFE)			

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Spare part article No.	Description	Included parts	Pos.	Qty.
90503-5764	Plug set, DN15, (SS/SS)	Dowel pin Plug Graphite seal Lubricant	1 2 3 -	1 1 1 1
90503-5765	Plug set, DN20, (SS/SS)			
90503-5766	Plug set, DN25, (SS/SS)			
90503-5767	Plug set, DN32, (SS/SS)			
90503-5768	Plug set, DN40, (SS/SS)			
90503-5769	Plug set, DN50, (SS/SS)			
90503-5771	Plug set, DN65, (SS/SS)			
90510-3541	Spare part kit, Handle	-	-	1

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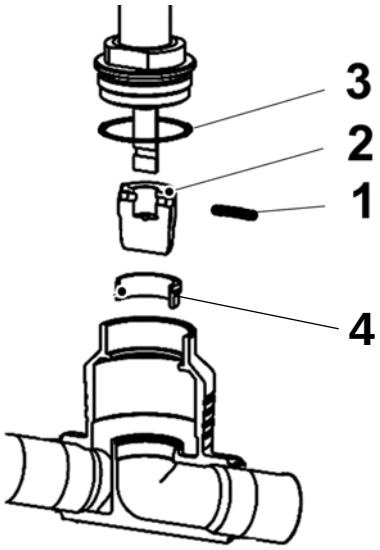
Regulating valve 2702/8802



Spare part article No.	Description	Included parts	Pos.	Qty.
90503-5758	Plug set, DN15, (SS/PTFE)	Dowel pin Plug Graphite seal Lubricant	1 2 3 -	1 1 1 1
90503-5759	Plug set, DN20, (SS/PTFE)			
90503-5760	Plug set, DN25, (SS/PTFE)			
90503-5761	Plug set, DN32, (SS/PTFE)			
90503-5762	Plug set, DN40, (SS/PTFE)			
90503-5763	Plug set, DN50, (SS/PTFE)			
90503-5770	Plug set, DN65, (SS/PTFE)			
90503-5764	Plug set, DN15, (SS/SS)	Dowel pin Plug Graphite seal Lubricant	1 2 3 -	1 1 1 1
90503-5765	Plug set, DN20, (SS/SS)			
90503-5766	Plug set, DN25,(SS/SS)			
90503-5767	Plug set, DN32, (SS/SS)			
90503-5768	Plug set, DN40, (SS/SS)			
90503-5769	Plug set, DN50, (SS/SS)			
90503-5771	Plug set, DN65, (SS/SS)			

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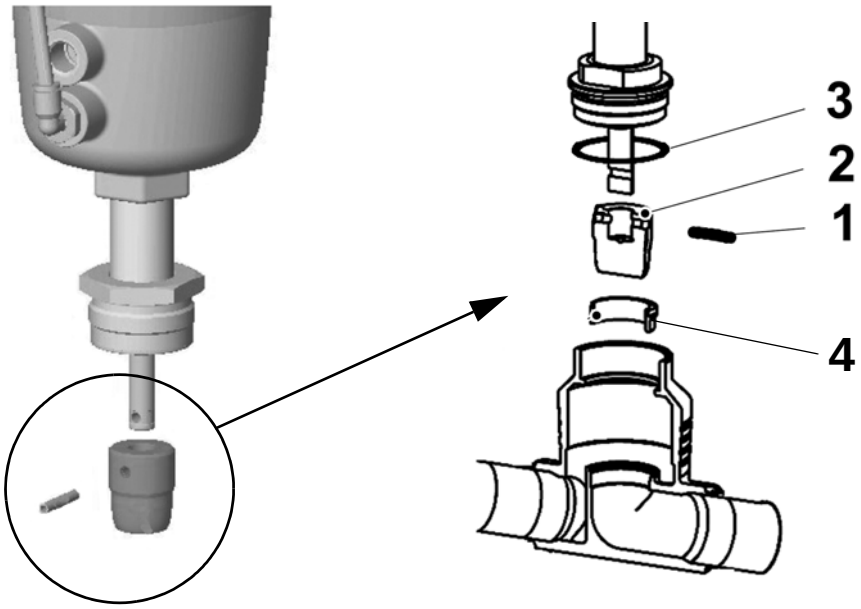
Manually operated regulating valve 2712



Spare part article No.	Description	Included parts	Pos.	Qty.
90511-9170	Trim kit, (SS/PTFE) Valve body DN20 Control plug DN15	Dowel pin Plug Graphite seal Valve seat Lubricant	1 2 3 4 -	1 1 1 1 1
90511-9171	Trimkit, (SS/PTFE) Valve body DN32 Control plug DN20			
90511-9172	Trimkit, (SS/PTFE) Valve body DN32, Control plug DN25	Dowel pin Plug Graphite seal Valve seat (incl O-ring) Lubricant	1 2 3 4 -	1 1 1 1 1
90503-3063	Trimkit, (SS/PTFE) Valve body DN32 Control plug DN32			
90511-9173	Trimkit, (SS/PTFE) Valve body DN40 Control plug DN32			
90511-9174	Trimkit, (SS/PTFE) Valve body DN40 Control plug DN40			

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Regulating valve 2712/8802



Spare part article No.	Description	Included parts	Pos.	Qty.
90503-2468	Trim kit, (SS/PTFE) Valve body DN15 Control plug DN15	Dowel pin Plug Graphite seal Valve seat Lubricant	1 2 3 4 -	1 1 1 1 1
90503-3064	Trimkit, (SS/PTFE) Valve body DN20 Control plug DN20			
90503-3063	Trimkit, (SS/PTFE) Valve body DN32, Control plug DN32	Dowel pin Plug Graphite seal Valve seat (incl O-ring) Lubricant	1 2 3 4 -	1 1 1 1 1
90503-5049	Trimkit, (SS/PTFE) Valve body DN50 Control plug DN50			

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Spare part article No.	Description	Included parts	Pos.	Qty.
90512-3830	Trim kit, (SS/SS) Valve body DN10, DN15 Control plug DN4	Dowel pin Plug Graphite seal Valve seat Lubricant	1 2 3 4 -	1 1 1 1 1
90503-4843	Trim kit, (SS/SS) Valve body DN10 Control plug DN10			
90503-0871	Trim kit, (SS/SS) Valve body DN20 Control plug DN15			
90503-5044	Trim kit, (SS/SS) Valve body DN20 Control plug DN20			
90503-5045	Trim kit, (SS/SS) Valve body DN25 Control plug DN25	Dowel pin Plug Graphite seal Valve seat (incl O-ring) Lubricant	1 2 3 4 -	1 1 1 1 1
90503-0874	Trim kit, (SS/SS) Valve body DN32 Control plug DN32			
90503-5046	Trim kit, (SS/SS) Valve body DN40 Control plug DN40			
90503-5047	Trim kit, (SS/SS) Valve body DN50 Control plug DN50			
90503-5048	Trim kit, (SS/SS) Valve body DN65 Control plug DN65			
90503-0879	Trim kit, (SS/SS) Valve body DN80 Control plug DN80			
90503-1797	Trim kit, (SS/SS) Valve body DN100 Control plug DN100			
90503-0872	Plug set, (SS/SS) Valve body DN20 Control plug DN20	Dowel pin Plug Graphite seal Lubricant	1 2 3 -	1 1 1 1
90503-0880	Plug set, (SS/SS) Valve body DN25 Control plug DN25			
90503-0875	Plug set, (SS/SS) Valve body DN40 Control plug DN40			
90503-0876	Plug set, (SS/SS) Valve body DN50 Control plug DN50			
90503-0878	Plug set, (SS/SS) Valve body DN65 Control plug DN65			

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Actuator 2050 for valve 2702



Note! All kits are complete and include valve stem

Spare part article No.	Description	Included parts	Pos.	Qty.
90503-0882	Actuator F80 NC Size DN15	-	1	1
90503-0883	Actuator F80 NC Size DN20			
90503-0884	Actuator F80 NC Size DN25			
90511-6210	Actuator F80 NC Size DN32			
90503-0886	Actuator G100 NC Size DN40			
90511-6211	Actuator G100 NC Size DN50			
90503-0888	Actuator H125 NC Size DN65			

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Spare part article No.	Description	Included parts	Pos.	Qty.
90503-0892	Actuator F80 NO Size DN15	-	1	1
90503-0893	Actuator F80 NO Size DN20			
90503-0894	Actuator F80 NO Size DN25			
90511-6212	Actuator F80 NO Size DN32			
90503-0896	Actuator G100 NO Size DN40			
90511-6213	Actuator G100 NO Size DN50			

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Actuator 2050 for valve 2712



Note! All kits are complete and include valve stem

Spare part article No.	Description	Included parts	Pos.	Qty.
90503-0882	Actuator F80 NC Size DN15	-	1	1
90503-0883	Actuator F80 NC Size DN20			
90503-0884	Actuator F80 NC Size DN25			
90503-0885	Actuator G100 NC Size DN32			
90503-0886	Actuator G100 NC Size DN40			
90503-0887	Actuator H125 NC Size DN50			
90503-0888	Actuator H125 NC Size DN65			
90503-0889	Actuator K175 NC Size DN65			
90503-0890	Actuator L225 NC Size DN80			
90503-0891	Actuator L225 NC Size DN100			

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Spare part article No.	Description	Included parts	Pos.	Qty.
90503-0892	Actuator F80 NO Size DN15	-	1	1
90503-0893	Actuator F80 NO Size DN20			
90503-0894	Actuator F80 NO Size DN25			
90503-0895	Actuator G100 NO Size DN32			
90503-0896	Actuator G100 NO Size DN40			
90503-0897	Actuator H125 NO Size DN50			
90503-0898	Actuator H125 NO Size DN65			
90503-0899	Actuator K175 NO Size DN65			
90503-0900	Actuator K175 NO Size DN80			
90503-0901	Actuator K175 NO Size DN100			

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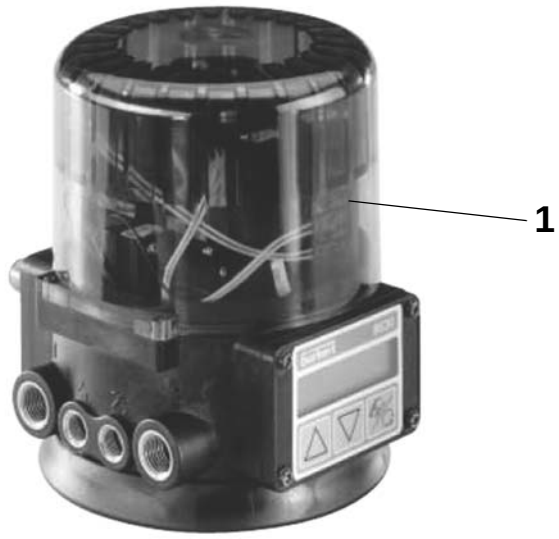
Side control positioner 1067



Spare part article No.	Description	Included parts	Pos.	Qty.
6-990409-02	Side control unit, complete Compact version Actuator F80-H125	-	1	1
90503-2489	Side control unit, complete Compact version Actuator K175-L225			
6-990409-04	Side control unit, complete Remote version Actuator F80-H125	-	1	1
90503-2490	Side control unit, complete Remote version Actuator K175-L225			

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Top control positioner 8630



Spare part article No.	Description	Included parts	Pos.	Qty.
90503-1580	Top control unit complete, Compact full PID, Actuator F80	-	1	1
90503-1583	Top control unit complete, Compact full PID, Actuator G100-L225			
90503-1582	Top control unit complete, Profibus without PID, Actuator F80-G100	-	1	1
90503-1585	Top control unit complete, Profibus without PID, Actuator H125-L225			
90503-1581	Top control unit complete, Without PID, Actuator F80-G100	-	1	1
90503-1584	Top control unit positioner, Without PID, Actuator H125-L225			

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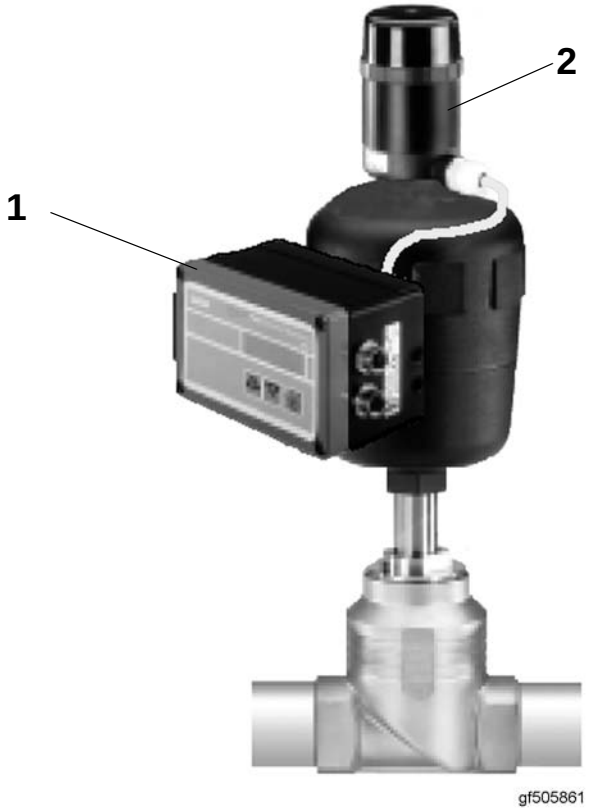
Feedback unit



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Spare part article No.	Description	Included parts	Pos.	Qty.
90503-2806	Feedback unit, complete Actuator F80 Compact/Remote	-	1	1
90503-2807	Feedback unit, complete Actuator G100-H125 Compact/Remote			
90503-2808	Feedback unit, complete Actuator K175-L225 Compact/Remote			

Positioner and feedback unit



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Spare part article No.	Description	Included parts	Pos.	Qty.
6-990418-99	Positioner and feedback unit, complete Actuator E63-F80	Positioner 1067 Feedback unit	1 2	1 1
6-990409-01	Positioner and feedback unit, complete Actuator G100-H125			

Tetra Pak

Maintenance & Spare Parts

Unique Single Seat Valve, Standard

(Alfa Laval Flow)
SSV Stop valves



1.0 1221121-0101.fro

Tetra Pak

Doc No. 1221121-0101

Unique Single Seat Valve, Standard

SSV Stop valves

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

1.0 1221121-0101.fro

Version 03 Issue 2009-11

Doc No. 1221121-0101

Tetra Pak

Tetra Pak Processing Systems AB

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General

Function description

The Unique Single Seat Valve, shut-off version, is an air-operated seat valve in a sanitary and flexible design giving a wide field of applications, e.g. as a shut-off valve with two or three ports.

The valve is remote-controlled by means of compressed air. To reduce the wear of sealings there is a controlled compression of seals by metal to metal contact. The actuator is connected to the valve body using a yoke and all components are assembled with clamp rings.

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Maintenance

Pre-use check

WARNING!

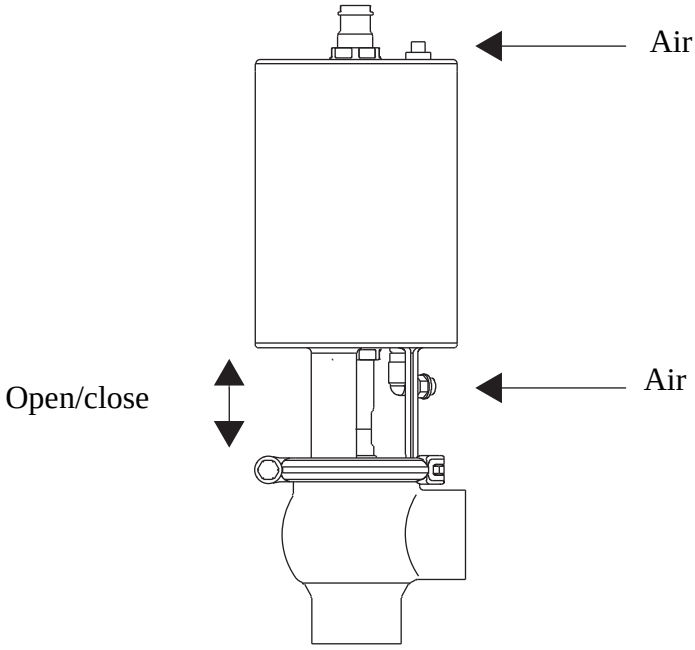
Risk of injury!
Never service the valve when it is hot.
Never service the valve with valve and pipelines under pressure.
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
Always release the compressed air after use.
Always remove the CIP connections, if supplied, before service.

Note! Check the valve for smooth operation after service.

a) Supply compressed air to the actuator.

b) Operate the valve several times to ensure that it operates smoothly.

Note! Pay special attention to the warnings!



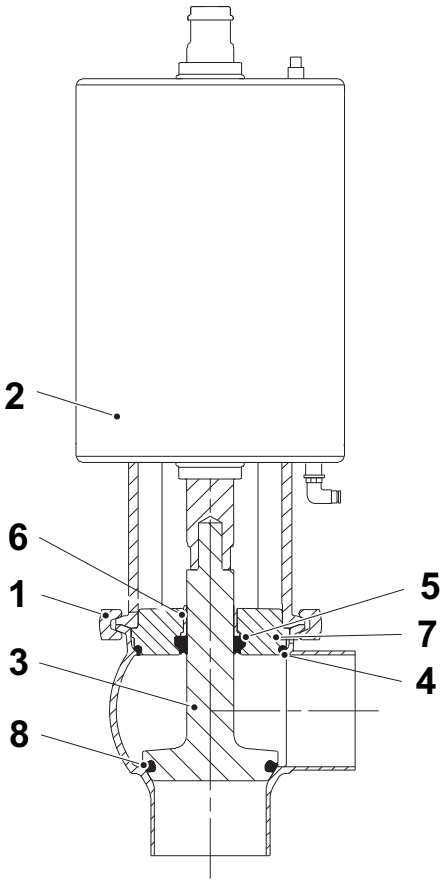
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Valve

Disassemble valve

WARNING!

Risk of injury!
- Never service the valve when it is hot.
- Never service the valve with valve and pipelines under pressure.
- Make sure that the pipeline is drained and free from media before servicing the valve.
- The valve and pipelines must **never** be pressurised when serviced.
- Never stick your fingers through the valve ports if the actuator is supplied with compressed air.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- Always release compressed air after use.



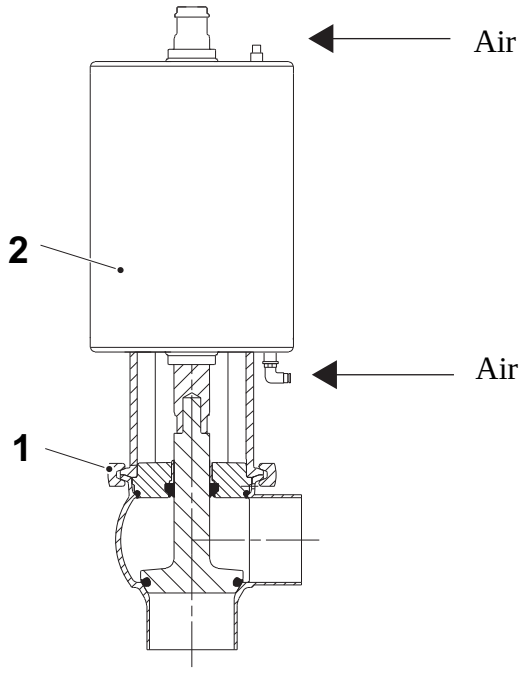
1 Clamp
2 Actuator
3 Valve plug
4 O-ring
5 Lip seal
6 Bushing
7 Bonnet
8 Plug seal

(Cont'd)

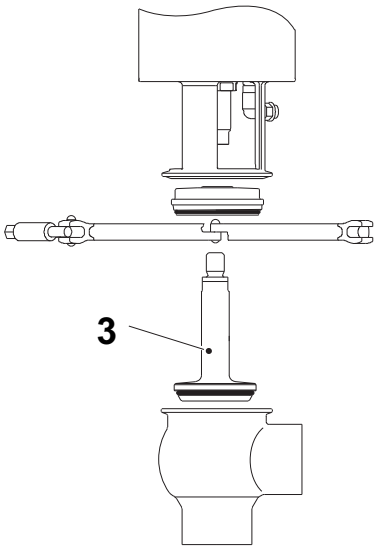
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(Cont'd)

Note! NO: Normally open
NC: Normally closed
A/A: Air/air activated



a) **NC**: Supply compressed air to the actuator.
b) Loosen and remove clamp (1).
c) **NC**: Release compressed air.
d) Lift away the actuator (2).

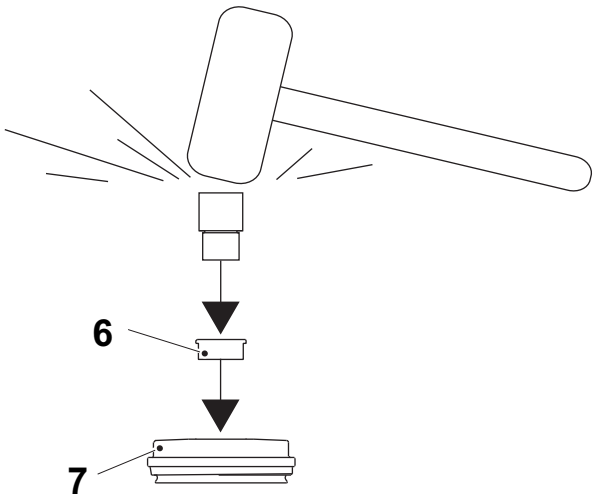


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(Cont'd)

(Cont'd)

e) Unscrew and remove valve plug (3).



f) Remove O-ring (4), lip seal (5) and bushing (6) in bonnet (7).

Note! Use bushing tool and rubber mallet.

Reassemble valve

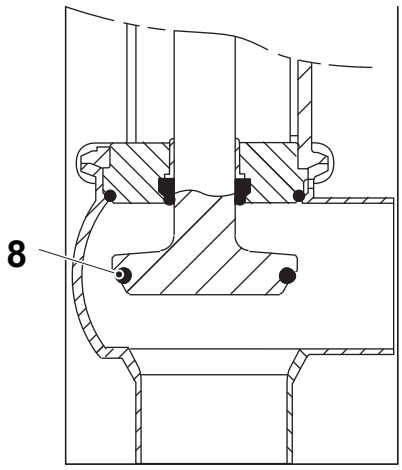
Reassemble in the reverse order to disassemble of the valve.

Note! Lubricate O-ring (4) and lip seal (5) with Klüber Paraliq GTE 703.

1.0 tf505001.en

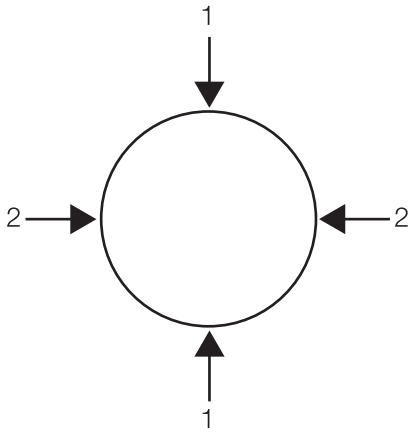
Plug seal replacement

Elastomer plug seal replacement



a) Remove old plug seal (8) using a knife, screwdriver or similar. Be careful not to damage metal parts.

b) Pre-mount plug seal (8) without pressing it into the groove.



1.0 tf505001.en

c) Squeeze plug seal (8) into the groove using opposite pressure points.

d) Release compressed air behind plug seal (8).

(Cont'd)

(Cont'd)

TR2 seat ring replacement

a) Place the plug element on a firm support.

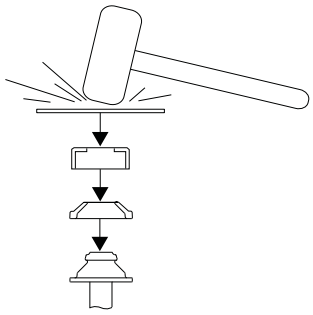
b) Using a utility knife, partially and carefully cut through the upper ring portion of the TR2 plug avoiding contact with stainless steel stem.

c) Force apart both cut ends of the plug for removal from stem.

d) TR2 plugs are installed by applying uniform pressure on all sides. (Pressure can be applied using the seat assembly tool.)

e) Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem. Reverse the tool and tab again to secure proper fit.

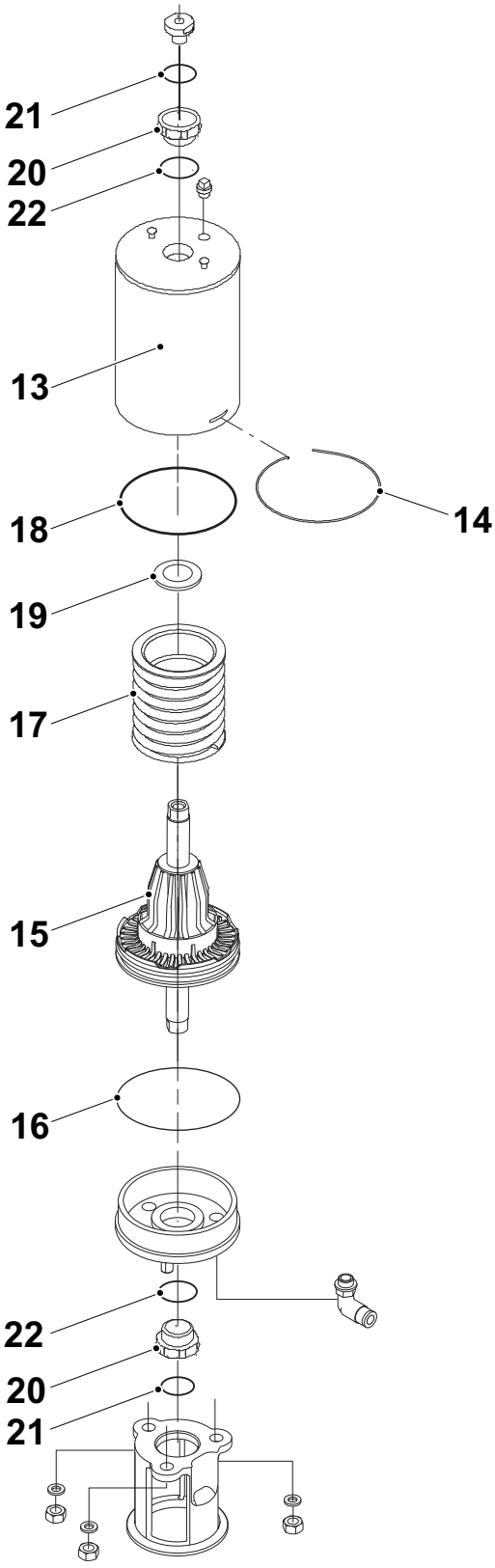
f) Examine seat assembly in one hand - rotate the TR2 plug. (For proper CIP cleaning the TR2 plug should turn freely on the stem.)



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Actuator, optional maintainable version

Change spare part kit



1.0 tf505001.en

13 Cylinder
14 Lock wire
15 Piston
16 O-ring
17 Spring assembly
18 O-ring
19 Support disc
20 Bushing
21 O-ring
22 O-ring

WARNING!

Dismantling/Assembly

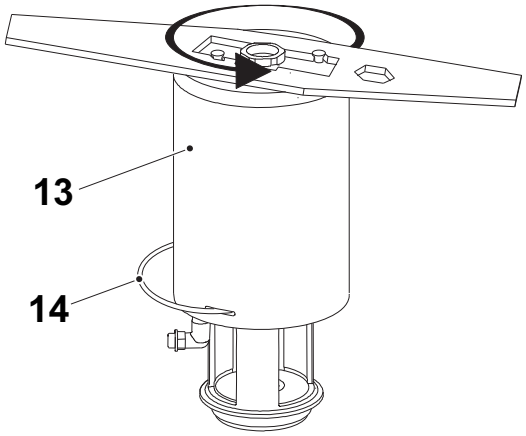
Risk of injury!

- Make sure that the pipelines are drained and free from media before servicing the valve!
- **Never** service the valve when it is hot!
- **Never** service the valve with valve and pipelines under pressure.
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- **Never** put your fingers through the valve ports if the actuator is supplied with compressed air!

Note! NC = Normally closed.

NO = Normally open.

A/A = Air/air activated



a) Rotate cylinder (13).
b) Remove lock wire (14) and pull away cylinder (13).
c) Unscrew nuts and remove yoke.
d) Unscrew top and bottom bushings (20).
e) Remove piston (15) with O-ring (16) and spring assembly (17).
f) Remove O-ring (18) and support disc (19).

Note! The A/A actuator has no spring assembly.

Assembly

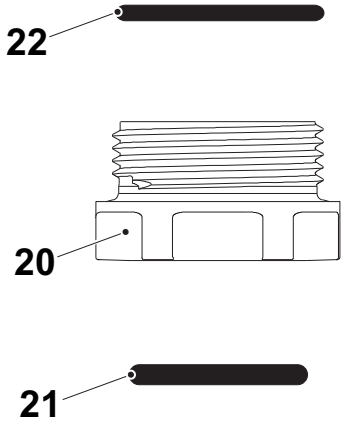
Assembly of the actuator is made in the reverse order to dismantling.

Note! Lubricate O-rings (16) and (18) with Molykote Longterm 2 plus before fitting.

1.0 tf505001.en

Actuator, both standard and optional maintainable version

Actuator bushing replacement



a) Unscrew and remove top and bottom bushings (20) with O-rings (21) and (22).

b) Lubricate O-rings (21) and (22) with Molykote Longterm 2 plus before fitting.

c) Fit bushings (20) and O-rings (21) and (22). Be careful not to overtighten.

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Cleaning

DANGER!

Risk of injury!
Always handle lye and acid with great care!
Always use rubber gloves!
Always use protective goggles!

WARNING!

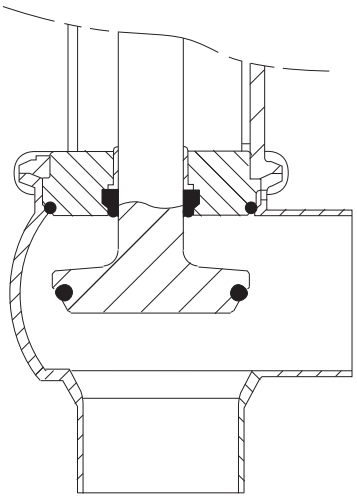
Risk of burning!
Never touch the pump or the pipelines when sterilizing.

WARNING!

Risk of injury!
Always rinse well with clean water after the cleaning.

Note! Clean the plug and seats correctly

Note! Lift and lower valve plug momentarily!



1.0 tf505001.en

Note! The cleaning agents must be stored/discharged in accordance with current rules/directives.

Note! Avoid excessive concentration of the cleaning agent, dose gradually.

Note! Adjust the cleaning flow to the process.

(Cont'd)

(Cont'd)

Examples of cleaning agents:

Use clean water, free from chlorides.

– 1% by weight NaOH at 70°C.

1 kg NaOH + 100 litre water = Cleaning agent

2.2 litre 33% NaOH + 100 litre water = Cleaning agent

– 0.5% by weight HNO_3 at 70°C.

0.7 litre 53% HNO3 + 100 litre water = Cleaning agent

NaOH = Caustic soda
HNO_3= Nitric acid

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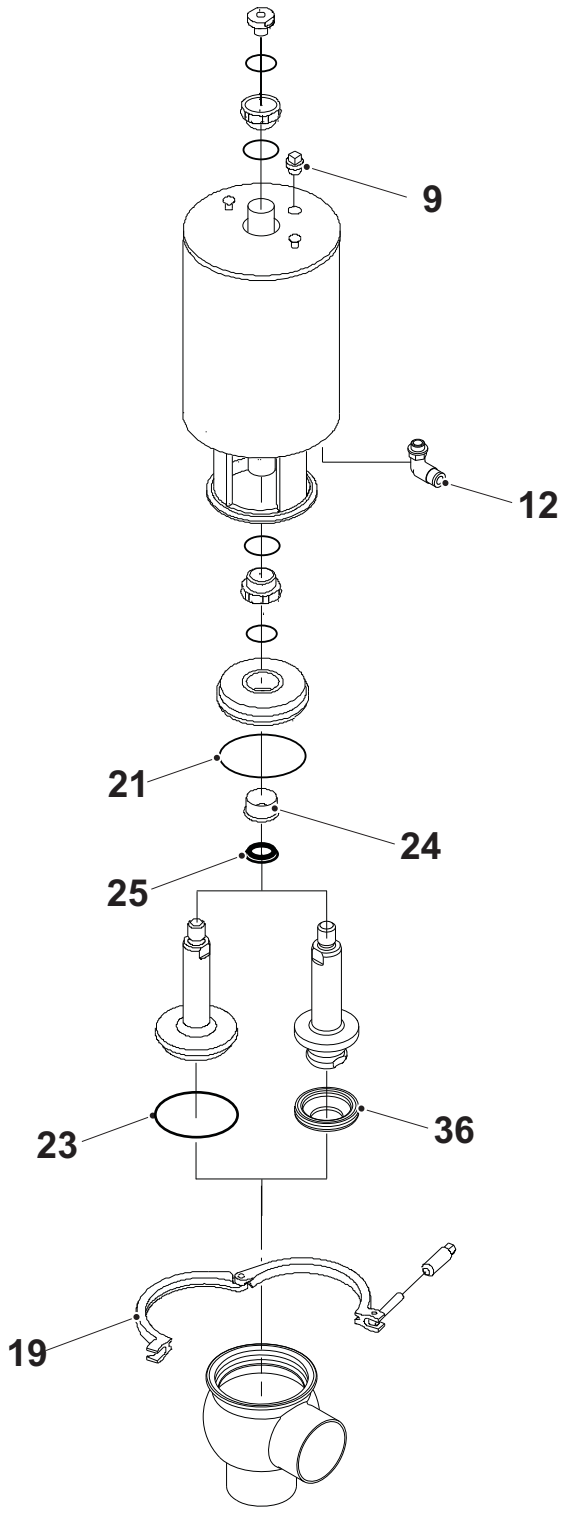
Troubleshooting

Problem	Cause	Action
External product leakage	- Worn or product affected lipseal and/or O-ring	- Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	- Worn or product affected plug seal - Product deposits on the seat and/or plug - Product pressure exceeds actuator specification	- Replace the seal - Frequent cleaning - Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure
Water hammer	- The flow direction is the same as the closing direction	- The flow direction should be against the closing direction - Throttle air release of solenoid in top unit
The valve does not open/close	- Product pressure exceeds actuator specification	- Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure

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Spare parts

Valve - 25-51 mm/DN25-50/1”-2”



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DN 25 / 1”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6501	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6507	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6513	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-03	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6576	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6577	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6578	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-16	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4“)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505002.en

DN 40 / 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6502	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6508	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6514	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-03	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6561	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6566	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6571	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-16	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505002.en

DN 50 / 2”

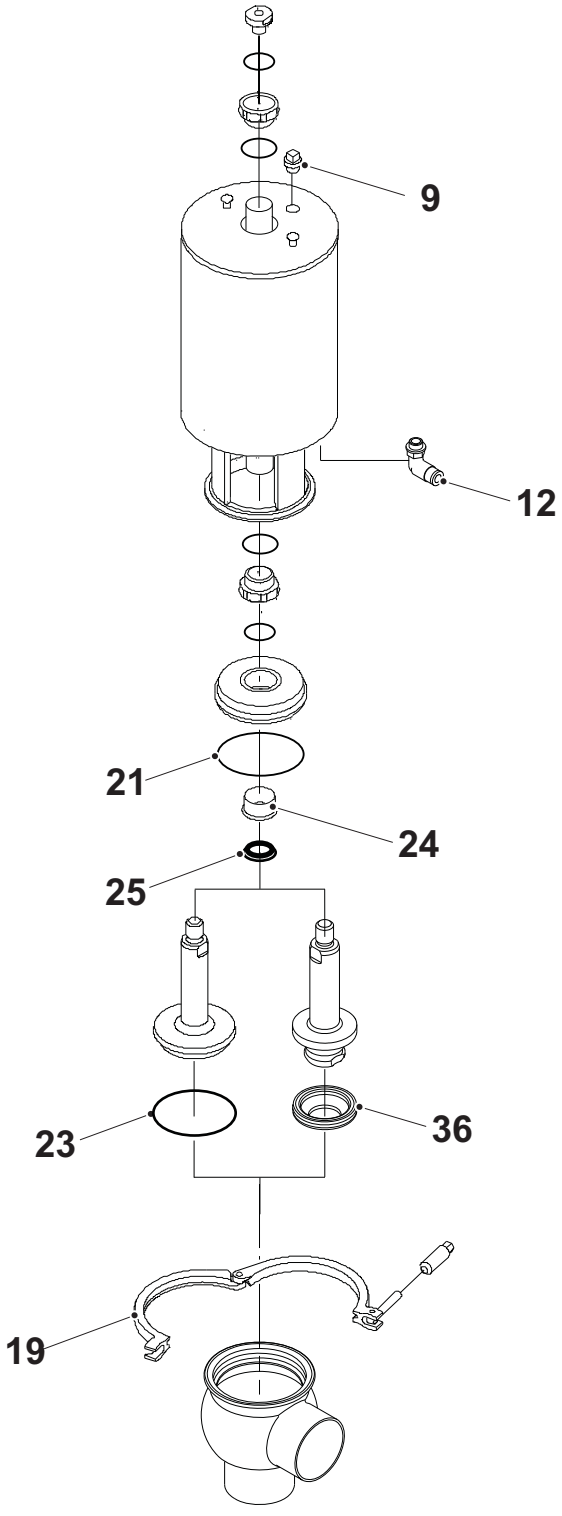
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6503	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6509	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6515	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-04	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6562	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6567	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6572	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-17	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505002.en

Valve - 63.5-101.6 mm/DN65-100/2½”-4”



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DN 65 / 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6504	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6510	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6516	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-05	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6563	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6568	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6573	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-18	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505002.en

DN 80 / 3”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6505	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6511	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6517	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-06	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6564	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6569	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6574	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-19	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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DN 100 / 4”

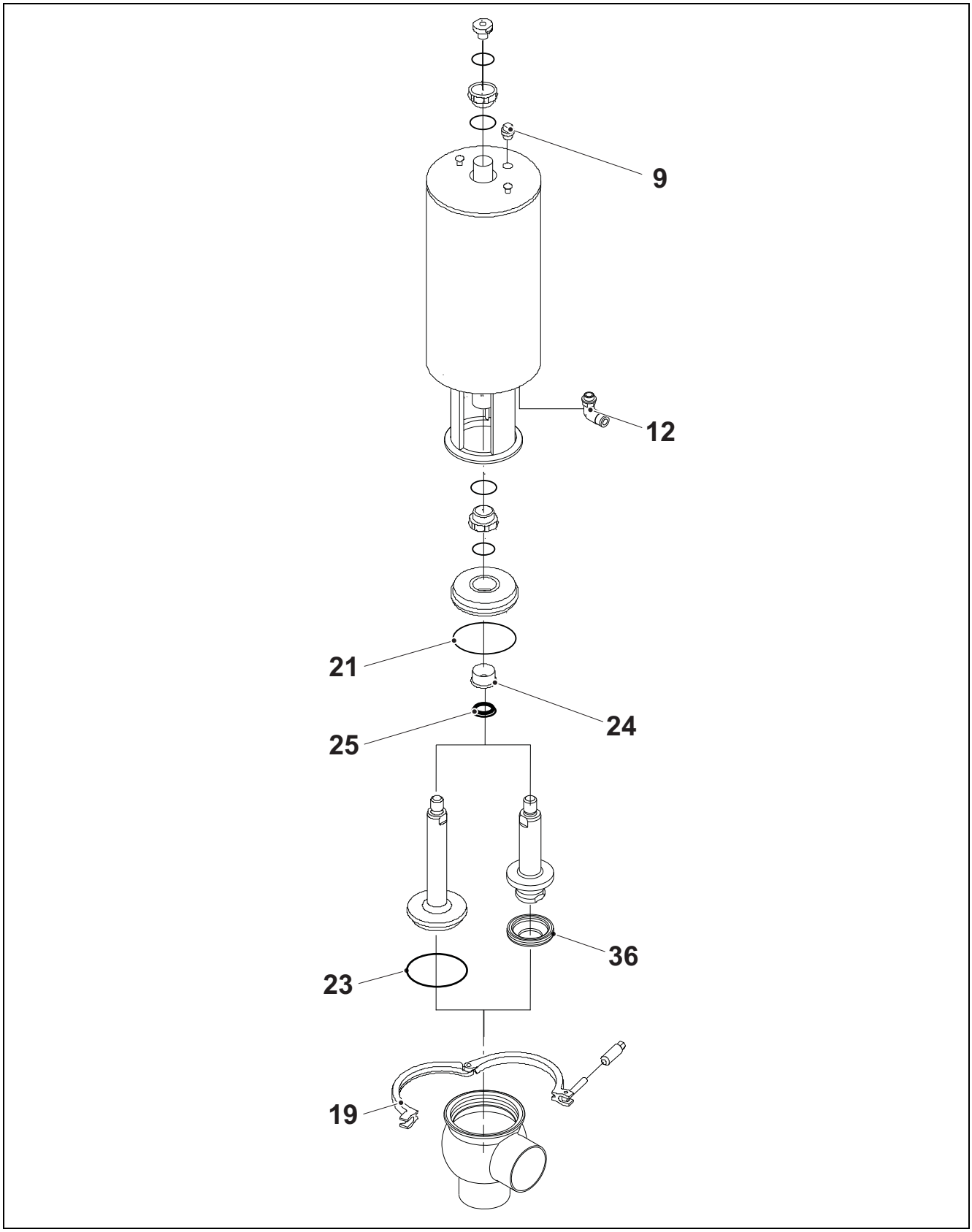
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6506	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6512	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6518	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-07	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6565	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6570	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6575	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-20	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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Valve Long Stroke (LS)
- 38-51 mm/DN40-50/1½”-2”



DN 40 / 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6502	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6508	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6514	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-03	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6561	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6566	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6571	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-16	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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DN 50 / 2”

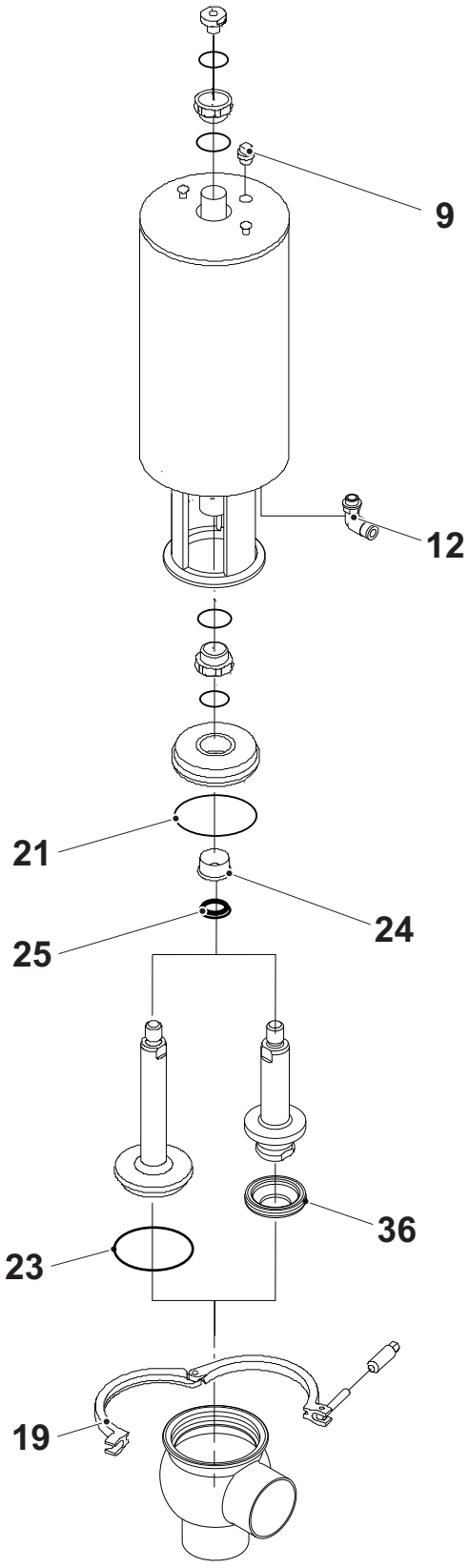
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6503	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6509	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6515	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-04	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6562	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6567	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9611-92-6572	Service kit, FPM	O-ring Lip seal Plug seal	21 25 36	1 1 1
6-9612-9393-17	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505002.en

Valve LS - 63.5-101.6 mm/DN65-100/2½”-4”



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DN 65 / 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6504	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6510	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6516	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-05	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6563	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6568	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6573	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-18	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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DN 80 / 3”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6505	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6511	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6517	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-06	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6564	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6569	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6574	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-19	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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DN 100 / 4”

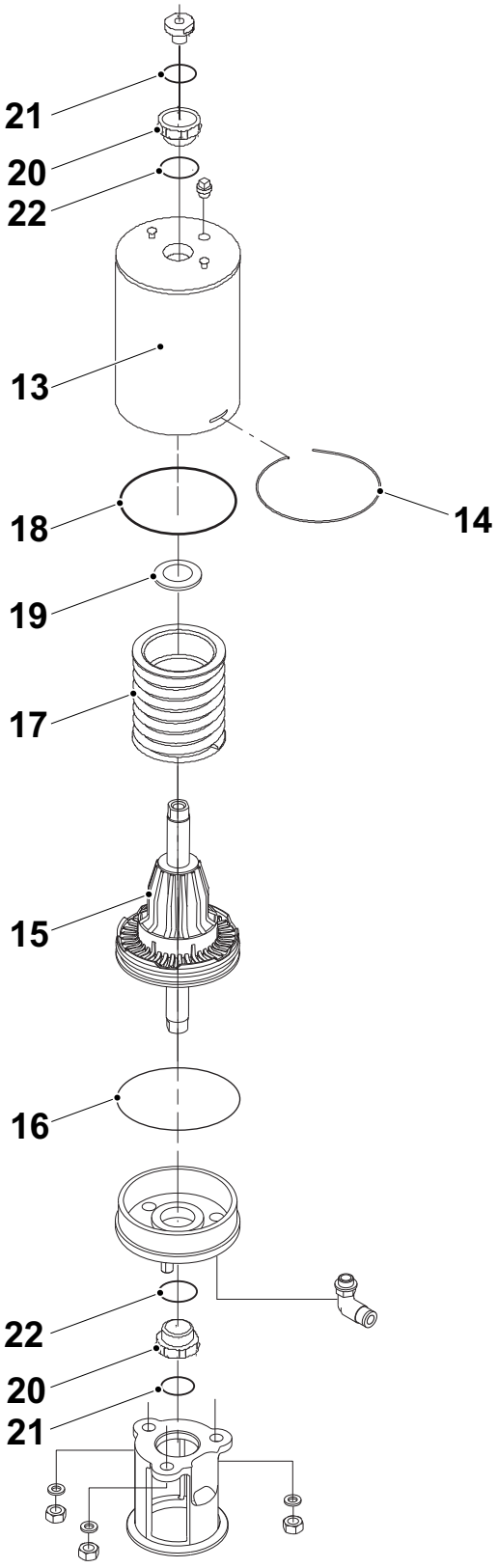
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6506	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6512	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6518	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-07	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6565	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6570	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9611-92-6575	Service kit, FPM	O-ring Lip seal Plug seal	21 25 23	1 1 1
6-9612-9393-20	Clamp	-	19	1
6-9613-4141-01	Plug	-	9	1
6-9611-99-4682	Air fitting (1/4”)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

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Actuator - optional maintainable version 25-101.6mm/DN25-100



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DN 25 - DN 40 / 1”- 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-01	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-04	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-07	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-10	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-13	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-16	Actuator, complete, maintainable (A/A) (USA)	-	-	1
6-9611-92-6497	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6519	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-01	Cylinder	-	13	1
6-9613-1425-04	Cylinder (USA)	-	13	1
6-9613-1322-01	Piston	-	15	1
6-9613-1432-01	Lock wire	-	14	1
6-9613-1325-01	Spring assembly	-	17	1

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DN 50 - DN 65 / 2”- 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-02	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-05	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-08	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-11	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-14	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-17	Actuator, complete, maintainable (A/A) (USA)	-	-	1

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6498	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6520	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-02	Cylinder	-	13	1
6-9613-1425-05	Cylinder (USA)	-	13	1
6-9613-1323-01	Piston	-	15	1
6-9613-1432-02	Lock wire	-	14	1
6-9613-1325-02	Spring assembly	-	17	1

DN 80 - DN 100 / 3”- 4”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-03	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-06	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-09	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-12	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-15	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-18	Actuator, complete, maintainable (A/A) (USA)	-	-	1
6-9611-92-6499	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6521	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-03	Cylinder	-	13	1
6-9613-1425-06	Cylinder (USA)	-	13	1
6-9613-1324-01	Piston	-	15	1
6-9613-1432-03	Lock wire	-	14	1

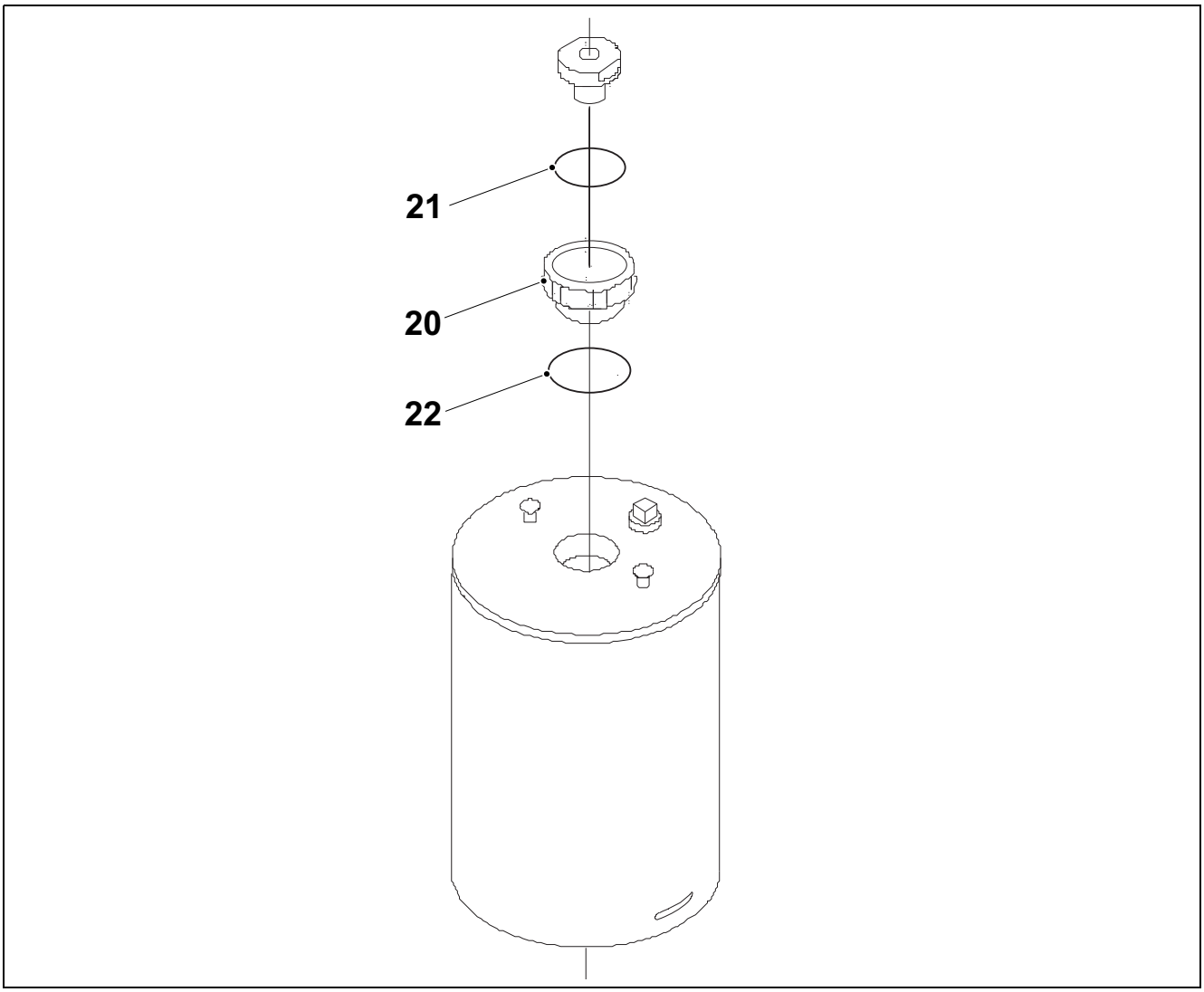
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Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1325-03	Spring assembly	-	17	1

NO = Normally Open
NC = Normally Closed
A/A = Air / Air, pneumatic upward and downward movement.

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Actuator - standard version 25-101.6mm/DN25-100



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DN 25 - DN 40 / 1”- 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-01	Actuator, complete (NO)	-	-	1
6-9613-1548-06	Actuator, complete (NC)	-	-	1
6-9613-1548-11	Actuator, complete (A/A)	-	-	1
6-9613-1548-31	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-36	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-41	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 50 - 2”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-02	Actuator, complete (NO)	-	-	1
6-9613-1548-07	Actuator, complete (NC)	-	-	1
6-9613-1548-12	Actuator, complete (A/A)	-	-	1
6-9613-1548-32	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-37	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-37	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 65 - 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-03	Actuator, complete (NO)	-	-	1
6-9613-1548-08	Actuator, complete (NC)	-	-	1
6-9613-1548-13	Actuator, complete (A/A)	-	-	1
6-9613-1548-33	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-38	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-43	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

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DN 80 - 3”

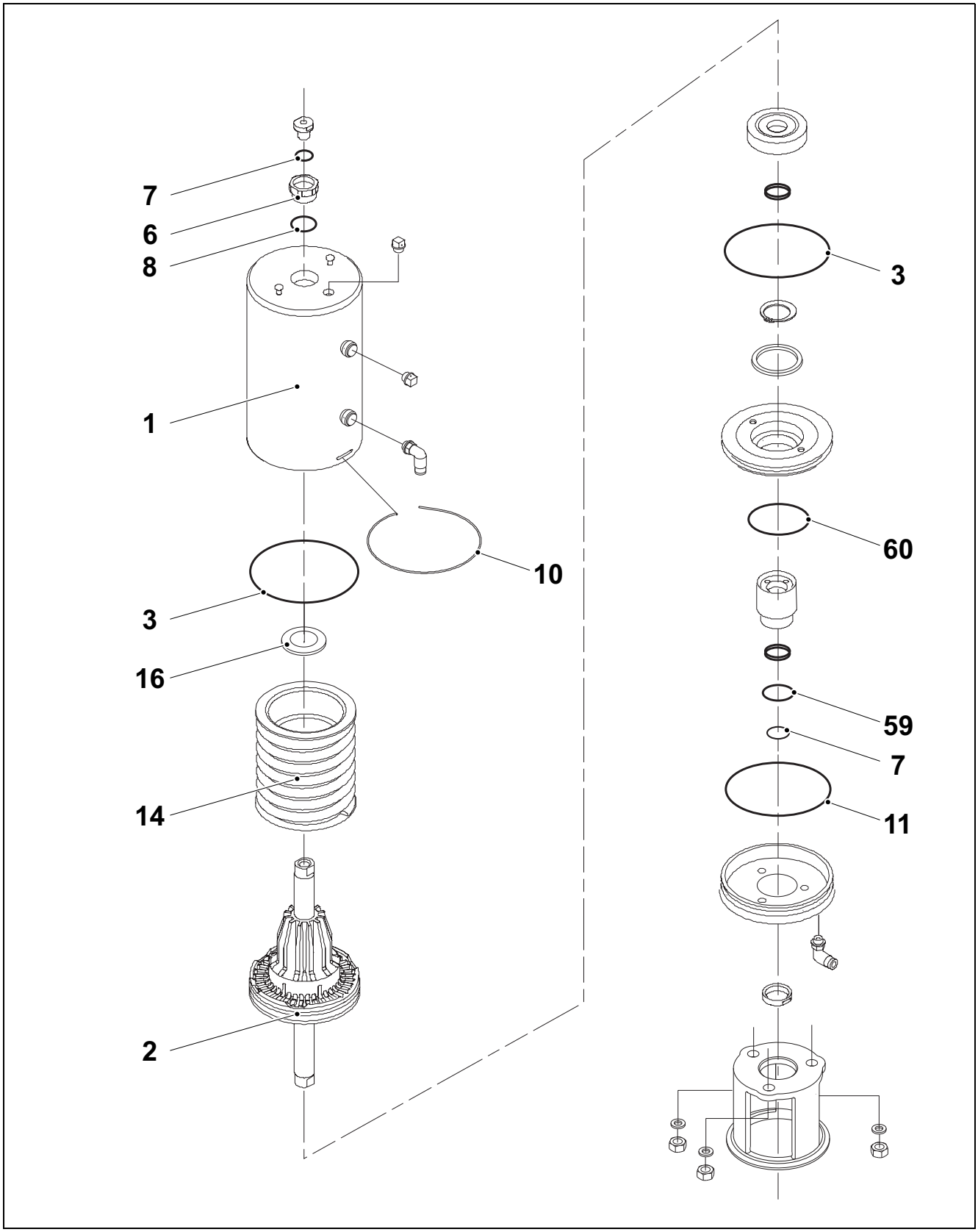
Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-04	Actuator, complete (NO)	-	-	1
6-9613-1548-09	Actuator, complete (NC)	-	-	1
6-9613-1548-14	Actuator, complete (A/A)	-	-	1
6-9613-1548-34	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-39	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-44	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 100 - 4”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-05	Actuator, complete (NO)	-	-	1
6-9613-1548-10	Actuator, complete (NC)	-	-	1
6-9613-1548-15	Actuator, complete (A/A)	-	-	1
6-9613-1548-35	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-40	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-45	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

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Actuator Two Step (TS) - maintainable version 38-101.6mm/DN40-100



DN 40

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-01	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6738	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-05	Cylinder	-	1	1
6-9613-1323-04	Piston	-	2	1
6-9613-1432-02	Lock wire	-	10	1
6-9613-1325-02	Spring assembly	-	14	1

DN 50 - DN 65

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-02	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6738	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-05	Cylinder	-	1	1
6-9613-1323-04	Piston	-	2	1
6-9613-1432-02	Lock wire	-	10	1
6-9613-1325-02	Spring assembly	-	14	1

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DN 80 - DN 100

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-03	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6739	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-06	Cylinder	-	1	1
6-9613-1324-05	Piston	-	2	1
6-9613-1432-03	Lock wire	-	10	1
6-9613-1325-03	Spring assembly	-	14	1

NO = Normally Open
NC = Normally Closed
A/A = Air / Air, pneumatic upward and downward movement.

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Tetra Pak

Maintenance & Spare Parts

Unique Single Seat Valve, Standard

(Alfa Laval Flow)
SSV Change-over Valves



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Tetra Pak

Doc No. 1221122-0101

Unique Single Seat Valve, Standard

SSV Change-over Valves

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 03 Issue 2009-11

Doc No. 1221122-0101

Tetra Pak

Tetra Pak Processing Systems AB

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General

Function description

The Unique Single Seat Valve, change-over version, is an air-operated seat valve in a sanitary and flexible design giving a wide field of applications, e.g. as a change-over valve with three to five ports.

The valve is remote-controlled by means of compressed air. To ensure a high degree of flexibility the valve seat between the two bodies in the change-over version is loose. To reduce the wear of sealings there is a controlled compression of seals by metal to metal contact. The actuator is connected to the valve body using a yoke and all components are assembled with clamp rings.

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Maintenance

Pre-use check

WARNING!

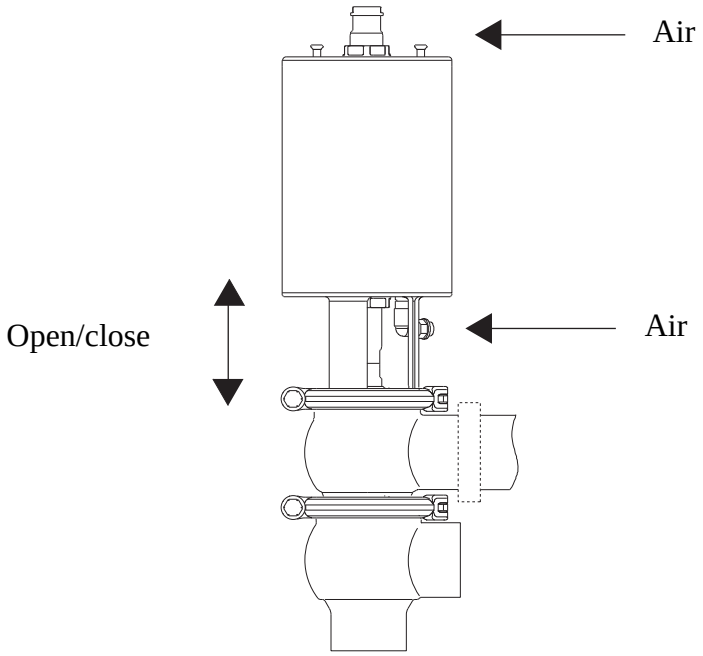
Risk of injury!
Never service the valve when it is hot.
Never service the valve with valve and pipelines under pressure.
Never stick your fingers through the valve ports if the actuator is supplied with compressed air.
Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
Always release the compressed air after use.
Always remove the CIP connections, if supplied, before service.

Note! Check the valve for smooth operation after service.

a) Supply compressed air to the actuator.

b) Operate the valve several times to ensure that it operates smoothly.

Note! Pay special attention to the warnings!



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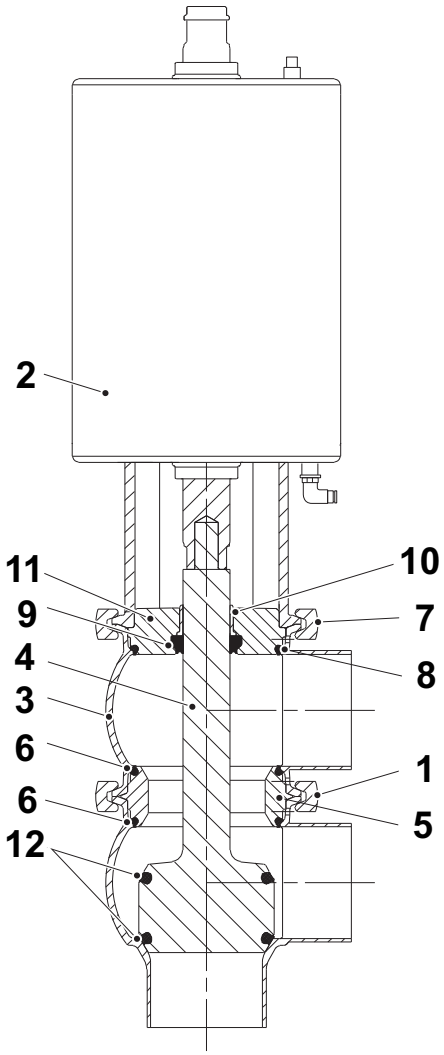
Valve

Disassemble valve

WARNING!

Risk of injury!
- Never service the valve when it is hot.
- Never service the valve with valve and pipelines under pressure.
- Make sure that the pipeline is drained and free from media before servicing the valve.
- The valve and pipelines must **never** be pressurised when serviced.
- Never stick your fingers through the valve ports if the actuator is supplied with compressed air.
- Never touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- Always release compressed air after use.

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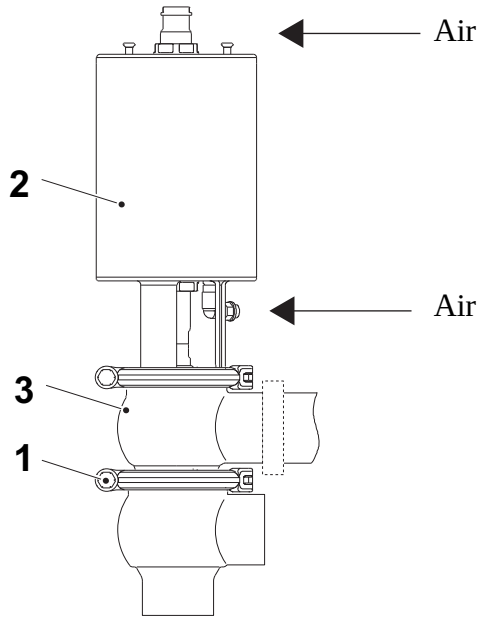


1 Lower Clamp
2 Actuator
3 Upper valve body
4 Valve plug
5 Seat
6 O-ring
7 Upper clamp
8 O-ring
9 Lip seal
10 Bushing
11 Bonnet
12 Plug seal

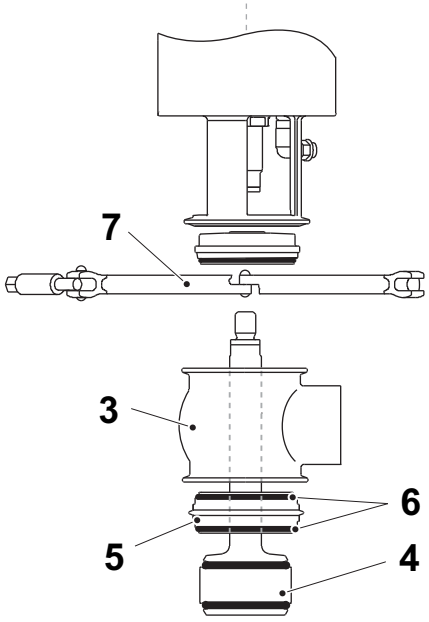
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Note! NO: Normally open
NC: Normally closed
A/A: Air/Air activated



a) **NC**: Supply compressed air to the actuator.
b) Loosen and remove lower clamp (1).
c) **NC**: Release compressed air.
d) Lift away the actuator (2) and upper valve body (3).

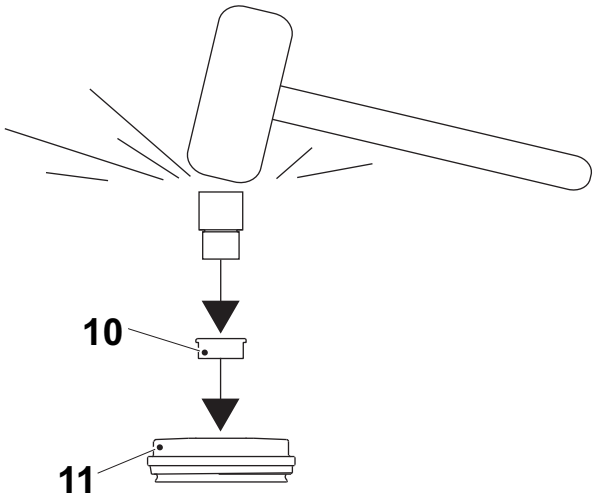


(Cont'd)

1.0 tf505003.en

(Cont'd)

a) **NO**: Supply compressed air to the actuator.
b) Unscrew and remove valve plug (4).
c) **NO**: Release compressed air.
d) Remove seat (5) and O-rings (6).
e) Loosen and remove upper clamp (7).
f) Remove upper valve body (3).



g) Remove O-ring (8), lip seal (9) and bushing (10) in bonnet (11).

Note! Use bushing tool and rubber mallet.

1.0 tf505003.en

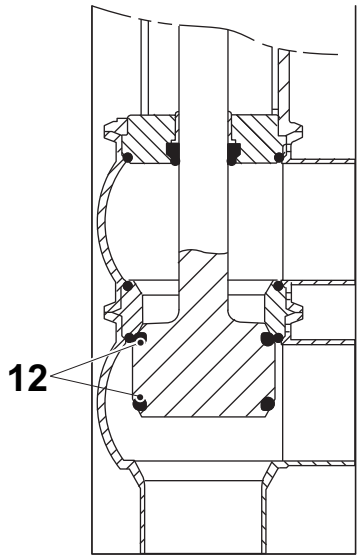
Reassemble valve

Reassemble in the reverse order to disassemble of the valve.

Note! Lubricate O-rings (6), (8) and lip seal (9) with Klüber Paraliq GTE 703.

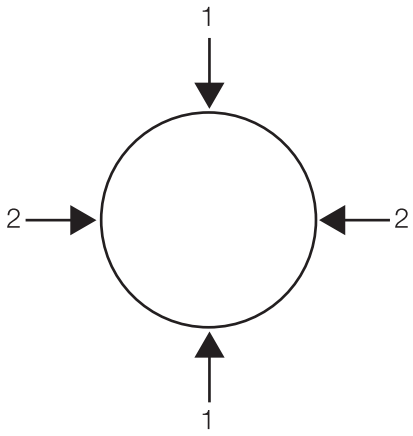
Plug seal replacement

Elastomer plug seal replacement



a) Remove old plug seals (12) using a knife, screwdriver or similar. Be careful not to damage metal parts.

b) Pre-mount plug seals (12) without pressing it into the groove.



1.0 tf505003.en

c) Squeeze plug seals (12) into the groove using opposite pressure points.

d) Release compressed air behind plug seals (12).

(Cont'd)

(Cont'd)

TR2 seat ring replacement

a) Place the plug element on a firm support.

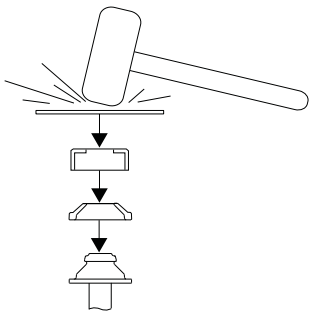
b) Using a utility knife, partially and carefully cut through the upper ring portion of the TR2 plug avoiding contact with stainless steel stem.

c) Force apart both cut ends of the plug for removal from stem.

d) TR2 plugs are installed by applying uniform pressure on all sides. (Pressure can be applied using the seat assembly tool.)

e) Using a piece of metal and a rubber mallet, place a precise tab to make the TR2 plug snap on to the stem. Reverse the tool and tab again to secure proper fit.

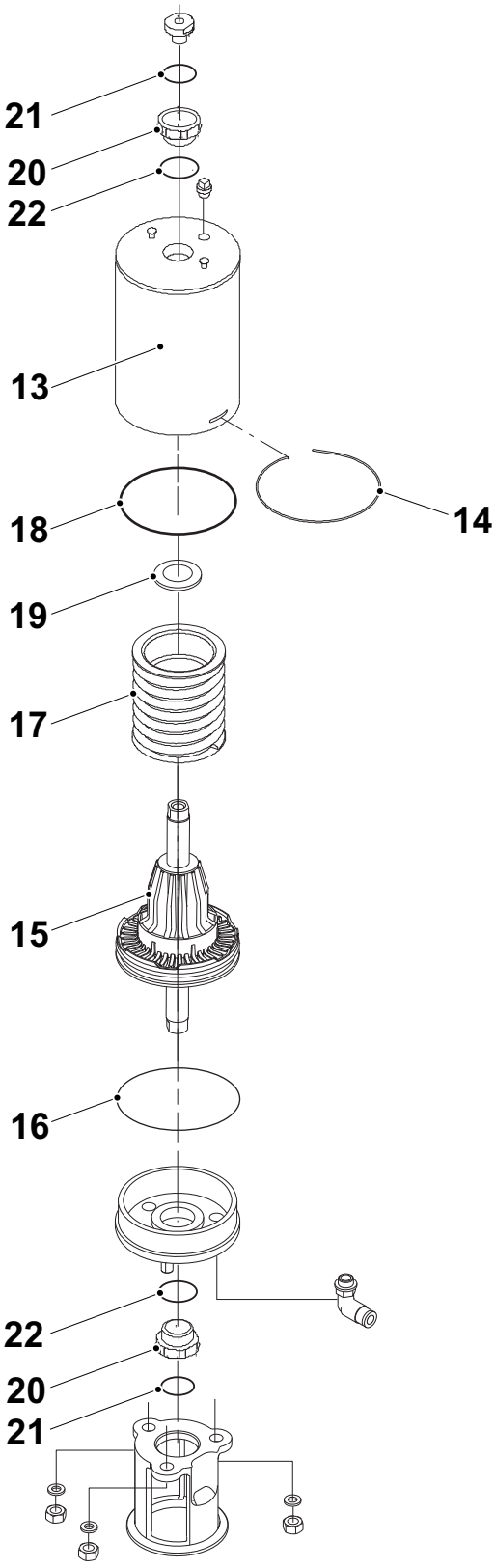
f) Examine seat assembly in one hand - rotate the TR2 plug. (For proper CIP cleaning the TR2 plug should turn freely on the stem.)



1.0 tf505003.en

Actuator, optional maintainable version

Change spare part kit



1.0 tf505003.en

13 Cylinder
14 Lock wire
15 Piston
16 O-ring
17 Spring assembly
18 O-ring
19 Support disc
20 Bushing
21 O-ring
22 O-ring

WARNING!

Dismantling/Assembly

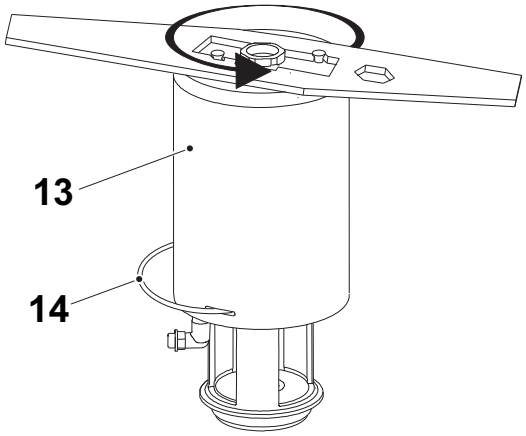
Risk of injury!

- Make sure that the pipelines are drained and free from media before servicing the valve!
- **Never** service the valve when it is hot!
- **Never** service the valve with valve and pipelines under pressure.
- **Always** release compressed air after use.
- **Never** touch the clip assembly or the actuator piston rod if the actuator is supplied with compressed air.
- **Never** put your fingers through the valve ports if the actuator is supplied with compressed air!

Note! NC = Normally closed.

NO = Normally open.

A/A = Air/air activated



a) Rotate cylinder (13).
b) Remove lock wire (14) and pull away cylinder (13).
c) Unscrew nuts and remove yoke.
d) Unscrew top and bottom bushings (20).
e) Remove piston (15) with O-ring (16) and spring assembly (17).
f) Remove O-ring (18) and support disc (19).

Note! The A/A actuator has no spring assembly.

Assembly

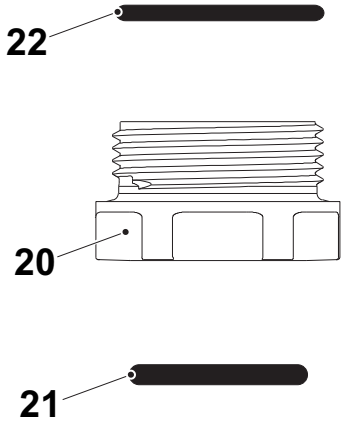
Assembly of the actuator is made in the reverse order to dismantling.

Note! Lubricate O-rings (16) and (18) with Molykote Longterm 2 plus before fitting.

1.0 tf505003.en

Actuator, both standard and optional maintainable version

Actuator bushing replacement



a) Unscrew and remove top and bottom bushings (20) with O-rings (21) and (22).

b) Lubricate O-rings (21) and (22) with Molykote Longterm 2 plus before fitting.

c) Fit bushings (20) and O-rings (21) and (22). Be careful not to overtighten.

1.0 tf505003.en

Cleaning

DANGER!

Risk of injury!
Always handle lye and acid with great care!
Always use rubber gloves!
Always use protective goggles!

WARNING!

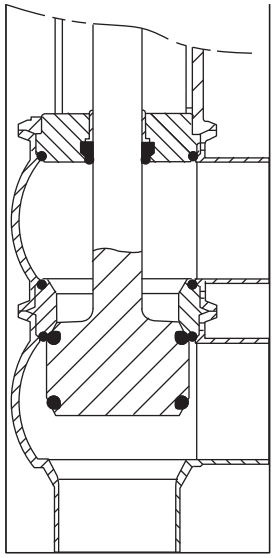
Risk of burning!
Never touch the pump or the pipelines when sterilizing.

WARNING!

Risk of injury!
Always rinse well with clean water after the cleaning.

Note! Clean the plug and seats correctly

Note! Lift and lower valve plug momentarily!



Note! The cleaning agents must be stored/discharged in accordance with current rules/directives.

Note! Avoid excessive concentration of the cleaning agent, dose gradually.

Note! Adjust the cleaning flow to the process.

Examples of cleaning agents:

(Cont'd)

1.0 tf505003.en

(Cont'd)

Use clean water, free from chlorides.

– 1% by weight NaOH at 70°C.

1 kg NaOH + 100 litre water = Cleaning agent

2.2 litre 33% NaOH + 100 litre water = Cleaning agent

– 0.5% by weight HNO_3 at 70°C.

0.7 litre 53% HNO3 + 100 litre water = Cleaning agent

NaOH = Caustic soda
HNO_3= Nitric acid

1.0 tf505003.en

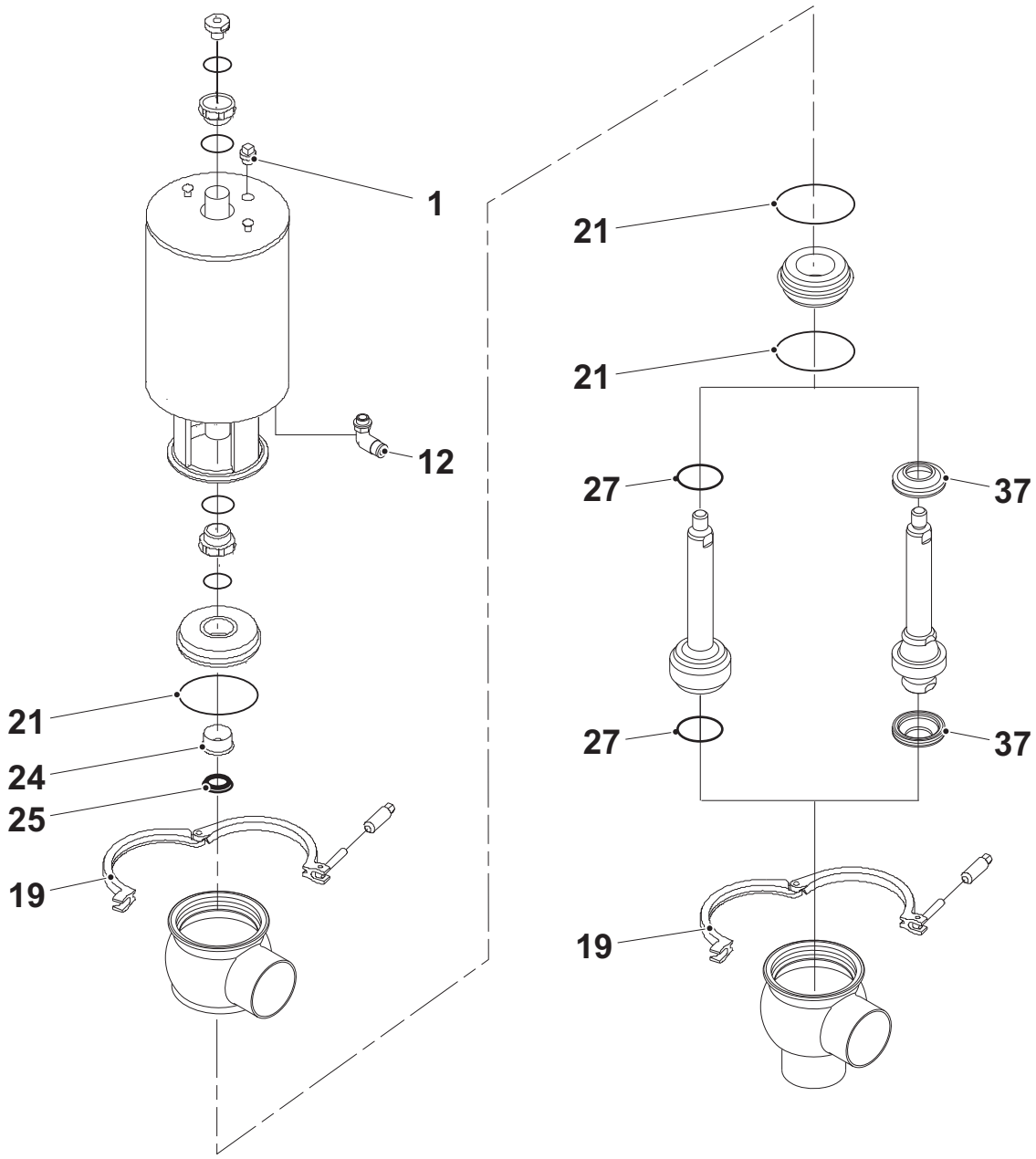
Troubleshooting

Problem	Cause	Action
External product leakage	- Worn or product affected lipseal and/or O-ring	- Replace the seals - Replace with seals of a different rubber grade
Internal product leakage	- Worn or product affected plug seal - Product deposits on the seat and/or plug - Product pressure exceeds actuator specification	- Replace the seal - Frequent cleaning - Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure
Water hammer	- The flow direction is the same as the closing direction	- The flow direction should be against the closing direction - Throttle air release of solenoid in top unit
The valve does not open/close	- Product pressure exceeds actuator specification	- Replace with a high pressure actuator - Use auxiliary air on the spring side - Reduce product pressure

1.0 tf505003.en

Spare parts

Valve - 25-51 mm/DN25-50/1½”-2”



1.0 tf505004.en

DN 25 / 1”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6579	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6585	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6591	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-03	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 40 / 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6580	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6586	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6592	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-03	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6633	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6638	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6643	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-16	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 50 / 2”

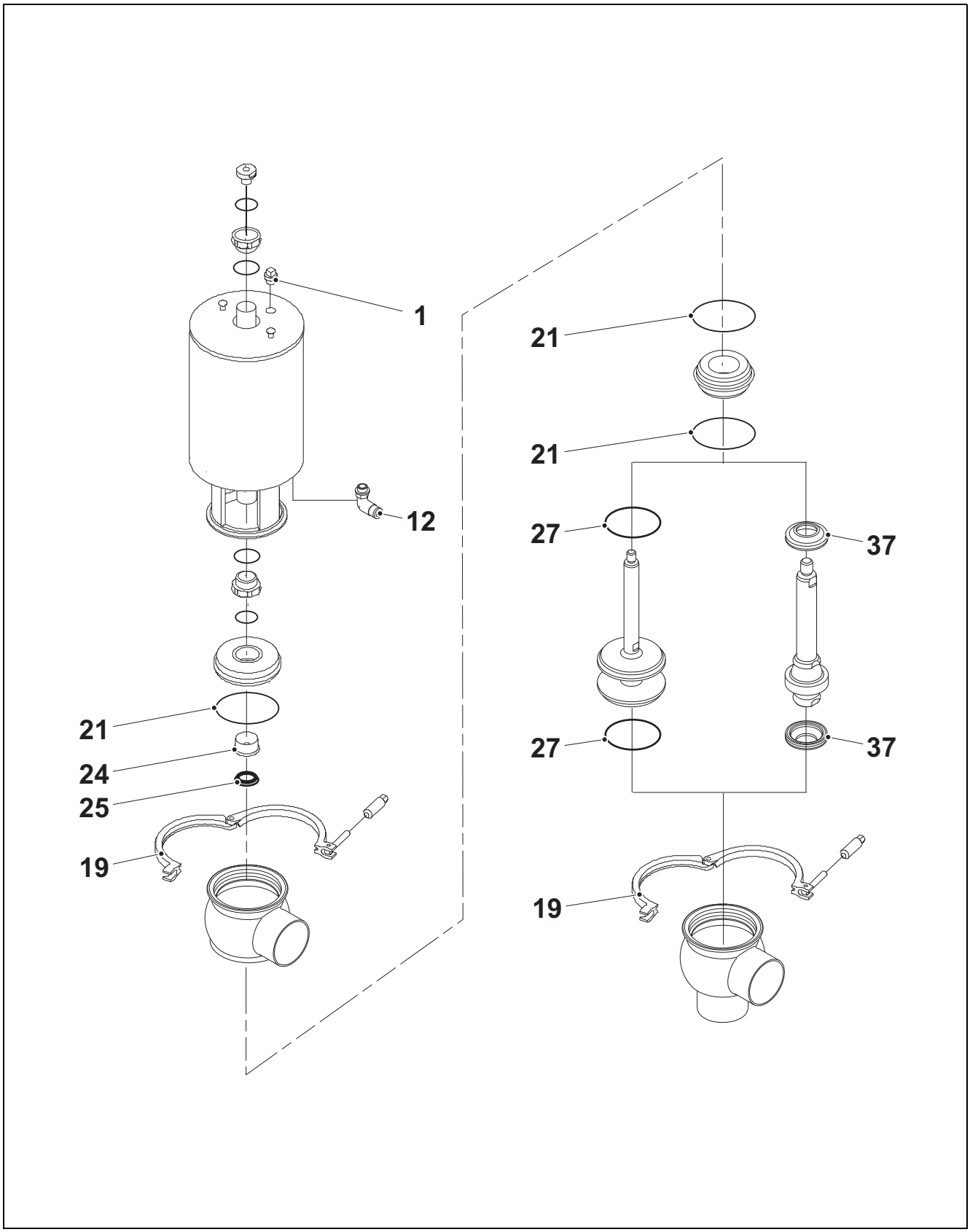
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6581	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6587	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6593	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-04	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6634	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6639	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6644	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-17	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

Valve - 63.5-101.6 mm/DN65-100/2½”-4”



DN 65 / 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6582	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6588	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6594	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-05	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6635	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6640	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6645	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-18	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 80 / 3”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6583	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6589	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6595	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-06	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6636	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6641	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6646	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-19	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 100 / 4”

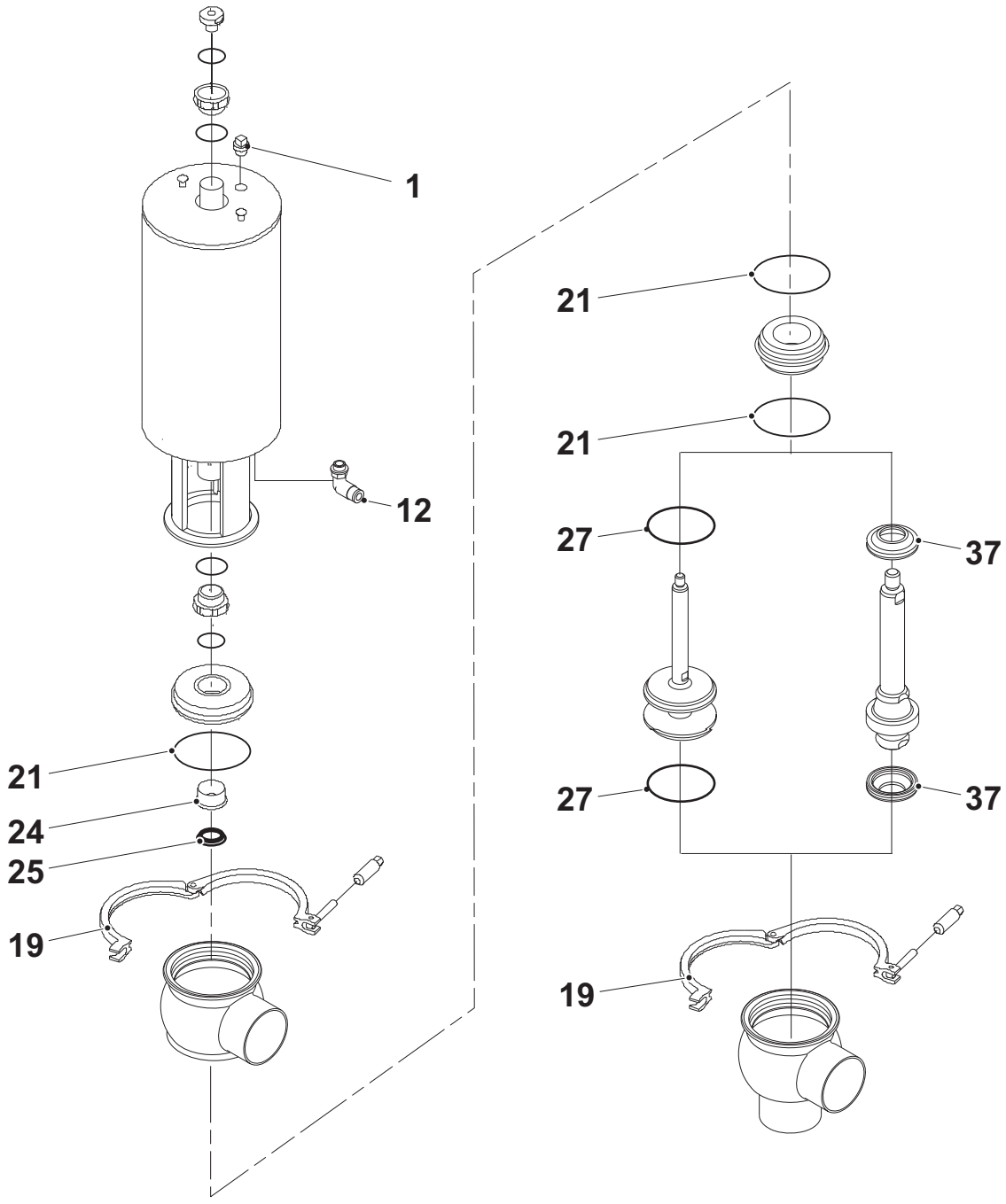
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6584	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6590	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6596	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-07	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6637	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6642	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6647	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-20	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^1/_4$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

Valve Long Stroke (LS)
- 38-51 mm/DN40-50/1½”-2”



1.0 tf505004.en

DN 40 / 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6580	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6586	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6592	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-03	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6633	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6638	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6643	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-16	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 50 / 2”

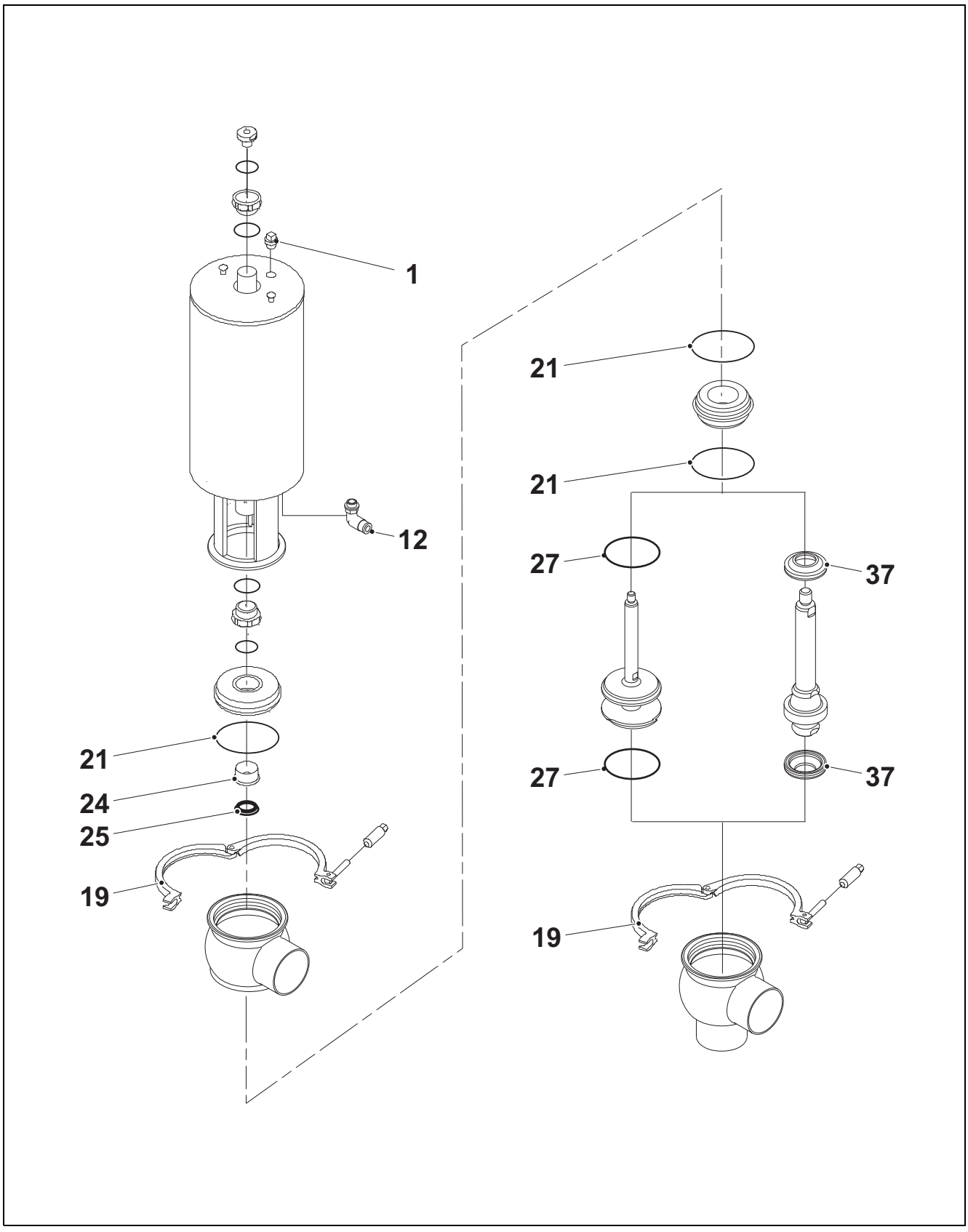
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6581	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6587	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6593	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-04	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6634	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6639	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6644	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-17	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^1/_4$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

Valve Long Stroke (LS)
- 63.5-101.6 mm/DN65-100/2½”-4”



1.0 tf505004.en

DN 65 / 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6582	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6588	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6594	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-05	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6635	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6640	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6645	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-18	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 80 / 3”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6583	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6589	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6595	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-06	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6636	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6641	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6646	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-19	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^1/_4$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

DN 100 / 4”

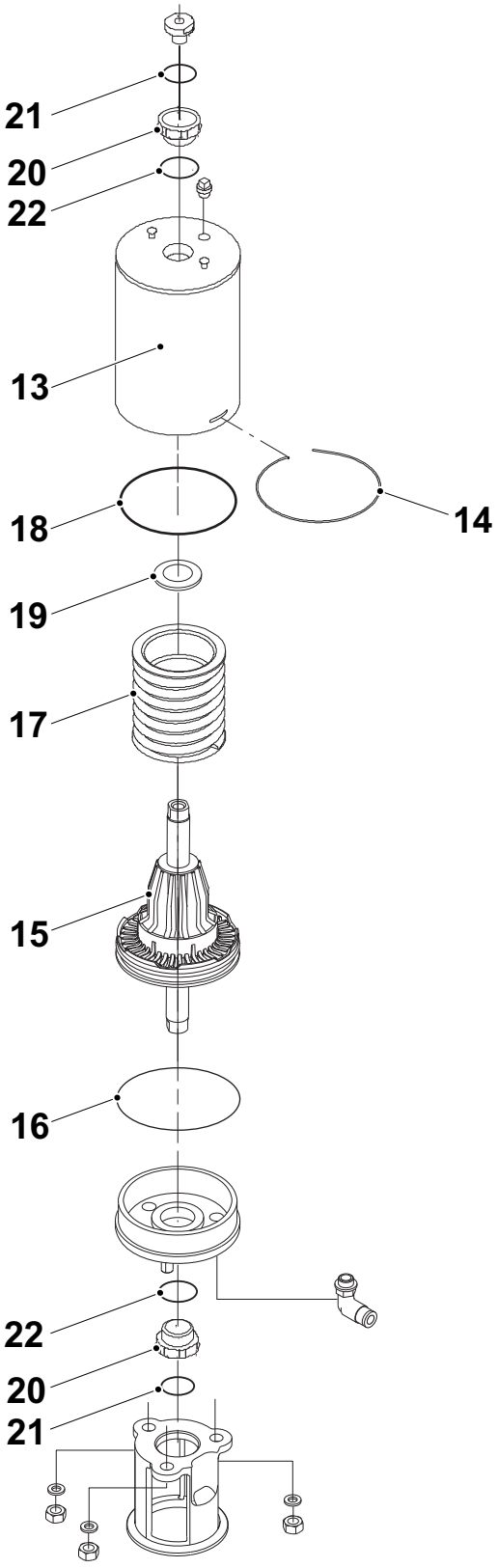
Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6584	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6590	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9611-92-6596	Service kit, FPM	O-ring Lip seal Plug seal	21 25 27	3 1 2
6-9612-9393-07	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-1988	Air fitting (6 mm)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

Alternative TR2

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6637	Service kit, EPDM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6642	Service kit, HNBR	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9611-92-6647	Service kit, FPM	O-ring Lip seal Plug seal	21 25 37	3 1 2
6-9612-9393-20	Clamp	-	19	2
6-9613-4141-01	Plug	-	1	1
6-9611-99-4682	Air fitting ($^{1}/_{4}$ “)	-	12	1
6-9613-1250-02	Bushing	Bushing	24	1

1.0 tf505004.en

Actuator - optional maintainable version 25-101.6mm/DN25-100



1.0 tf505004.en

DN 25 - DN 40 / 1”- 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-01	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-04	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-07	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-10	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-13	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-16	Actuator, complete, maintainable (A/A) (USA)	-	-	1
6-9611-92-6497	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6519	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-01	Cylinder	-	13	1
6-9613-1425-04	Cylinder (USA)	-	13	1
6-9613-1322-01	Piston	-	15	1
6-9613-1432-01	Lock wire	-	14	1
6-9613-1325-01	Spring assembly	-	17	1

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DN 50 - DN 65 / 2”- 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-02	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-05	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-08	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-11	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-14	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-17	Actuator, complete, maintainable (A/A) (USA)	-	-	1

Spare part article No.	Description	Included parts	Pos.	Qty
6-9611-92-6498	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6520	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-02	Cylinder	-	13	1
6-9613-1425-05	Cylinder (USA)	-	13	1
6-9613-1323-01	Piston	-	15	1
6-9613-1432-02	Lock wire	-	14	1
6-9613-1325-02	Spring assembly	-	17	1

DN 80 - DN 100 / 3”- 4”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1447-03	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1447-06	Actuator, complete, maintainable (NC)	-	-	1
6-9613-1447-09	Actuator, complete, maintainable (A/A)	-	-	1
6-9613-1447-12	Actuator, complete, maintainable (NO) (USA)	-	-	1
6-9613-1447-15	Actuator, complete, maintainable (NC) (USA)	-	-	1
6-9613-1447-18	Actuator, complete, maintainable (A/A) (USA)	-	-	1
6-9611-92-6499	Service kit, NO, NC	O-ring Bushing O-ring O-ring O-ring	18 20 21 22 16	1 2 2 2 1
6-9611-92-6521	Service kit, A/A	O-ring Bushing O-ring O-ring O-ring Support disc	18 20 21 22 16 19	1 2 2 2 1 1
6-9613-1425-03	Cylinder	-	13	1
6-9613-1425-06	Cylinder (USA)	-	13	1
6-9613-1324-01	Piston	-	15	1
6-9613-1432-03	Lock wire	-	14	1

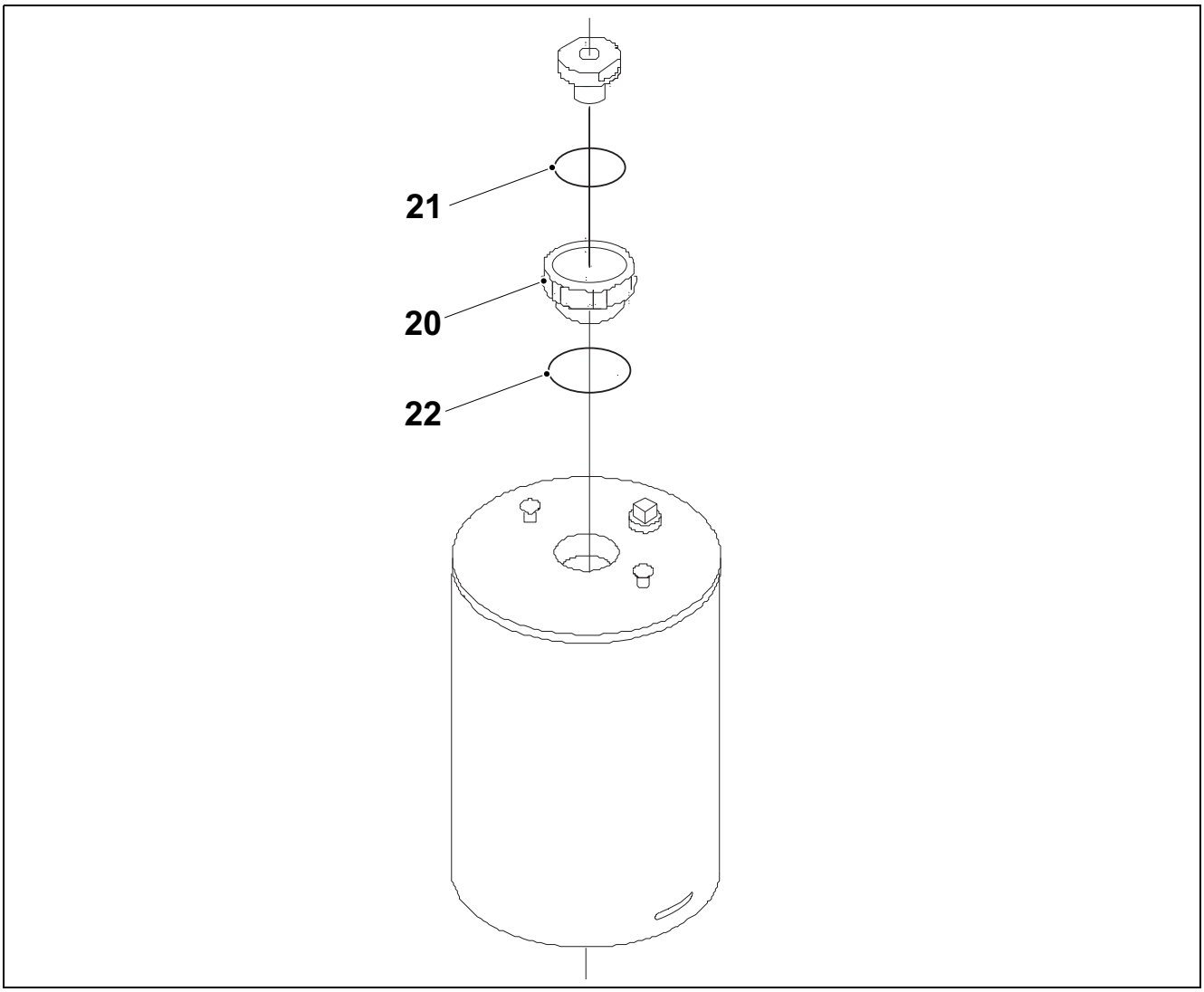
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Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1325-03	Spring assembly	-	17	1

NO = Normally Open
NC = Normally Closed
A/A = Air / Air, pneumatic upward and downward movement.

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Actuator - standard version 25-101.6mm/DN25-100



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DN 25 - DN 40 / 1”- 1½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-01	Actuator, complete (NO)	-	-	1
6-9613-1548-06	Actuator, complete (NC)	-	-	1
6-9613-1548-11	Actuator, complete (A/A)	-	-	1
6-9613-1548-31	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-36	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-41	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 50 - 2”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-02	Actuator, complete (NO)	-	-	1
6-9613-1548-07	Actuator, complete (NC)	-	-	1
6-9613-1548-12	Actuator, complete (A/A)	-	-	1
6-9613-1548-32	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-37	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-37	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 65 - 2½”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-03	Actuator, complete (NO)	-	-	1
6-9613-1548-08	Actuator, complete (NC)	-	-	1
6-9613-1548-13	Actuator, complete (A/A)	-	-	1
6-9613-1548-33	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-38	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-43	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

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DN 80 - 3”

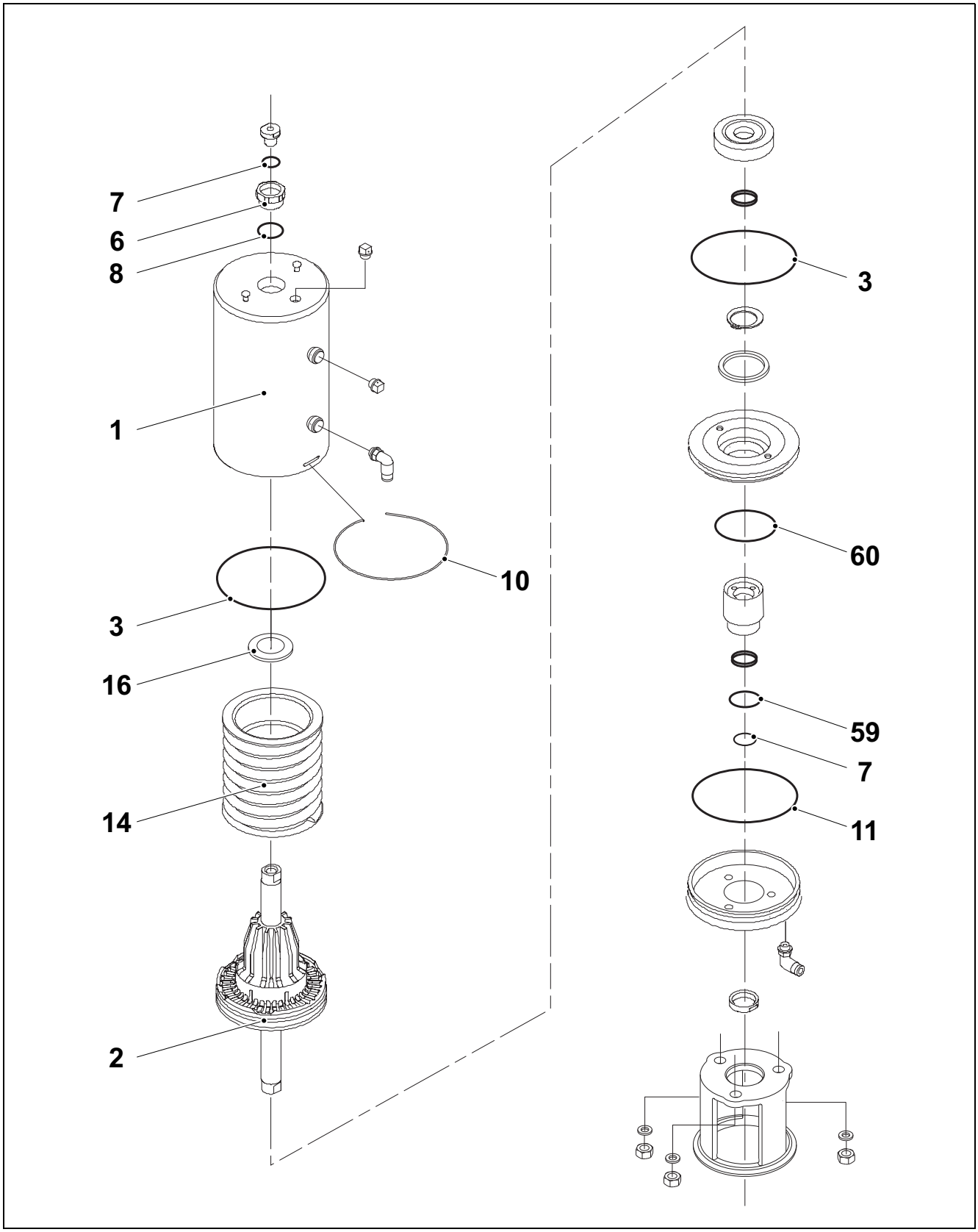
Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-04	Actuator, complete (NO)	-	-	1
6-9613-1548-09	Actuator, complete (NC)	-	-	1
6-9613-1548-14	Actuator, complete (A/A)	-	-	1
6-9613-1548-34	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-39	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-44	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

DN 100 - 4”

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1548-05	Actuator, complete (NO)	-	-	1
6-9613-1548-10	Actuator, complete (NC)	-	-	1
6-9613-1548-15	Actuator, complete (A/A)	-	-	1
6-9613-1548-35	Actuator, complete (NO) (USA)	-	-	1
6-9613-1548-40	Actuator, complete (NC) (USA)	-	-	1
6-9613-1548-45	Actuator, complete (A/A) (USA)	-	-	1
6-9611-92-6500	Service kit	Bushing O-ring O-ring	20 21 22	2 2 2

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Actuator Two Step (TS) - maintainable version 38-101.6mm/DN40-100



DN 40

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-25	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1687-17	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6738	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-05	Cylinder	-	1	1
6-9613-1323-04	Piston	-	2	1
6-9613-1432-02	Lock wire	-	10	1
6-9613-1325-02	Spring assembly	-	14	1

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DN 50

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-25	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1687-17	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6738	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-05	Cylinder	-	1	1
6-9613-1323-04	Piston	-	2	1
6-9613-1432-02	Lock wire	-	10	1
6-9613-1325-02	Spring assembly	-	14	1

DN 65

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-25	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1687-17	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6738	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-05	Cylinder	-	1	1
6-9613-1323-04	Piston	-	2	1
6-9613-1432-02	Lock wire	-	10	1
6-9613-1325-02	Spring assembly	-	14	1

DN 80

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-26	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1687-18	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6739	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-06	Cylinder	-	1	1
6-9613-1324-05	Piston	-	2	1
6-9613-1432-03	Lock wire	-	10	1
6-9613-1325-03	Spring assembly	-	14	1

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DN 100

Spare part article No.	Description	Included parts	Pos.	Qty
6-9613-1687-26	Actuator, complete, maintainable (NO)	-	-	1
6-9613-1687-18	Actuator, complete, maintainable (NC)	-	-	1
6-9611-92-6739	Service kit	O-ring Bushing O-ring O-ring O-ring Support disc O-ring O-ring	3 6 7 8 11 16 59 60	2 1 2 1 1 1 1 1
6-9613-1677-06	Cylinder	-	1	1
6-9613-1324-05	Piston	-	2	1
6-9613-1432-03	Lock wire	-	10	1
6-9613-1325-03	Spring assembly	-	14	1

NO = Normally Open
NC = Normally Closed
A/A = Air / Air, pneumatic upward and downward movement.

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Tetra Pak

Maintenance & Spare Parts

Flow restrictor
(Kobold)
REG



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Tetra Pak

Doc No. 1221586-0101

Flow restrictor

REG

Article No.	Connection	Material	Capacity L/Min
90503-8200	G 1/2	REG-1200-D	0,5
90503-8201	G 1/2	REG-1201-D	1,0
90503-8202	G 1/2	REG-1202-D	2,0
90503-8203	G 1/2	REG-1203-D	3,0
90503-8204	G 1/2	REG-1204-D	4,0
90503-8205	G 1/2	REG-1206-D	6,0
90503-8206	G 1/2	REG-1208-D	8,0
90503-8207	G 1/2	REG-1210-D	10,0
90503-8208	G 1/2	REG-1212-D	12,0
90503-8209	G 1/2	REG-1216-D	16,0
90503-8230	G 1/4	REG-1200-D	0,5
90503-8231	G 1/4	REG-1201-D	1,0
90503-8232	G 1/4	REG-1202-D	2,0
90503-8233	G 1/4	REG-1203-D	3,0
90503-8234	G 3/8	REG-1204-D	4,0
90503-8235	G 3/8	REG-1206-D	6,0
90503-8236	G 3/8	REG-1208-D	8,0
90503-8237	G 3/8	REG-1210-D	10,0

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Version 01 Issue 2007-03

Doc No. 1221586-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Not applicable for this component! 5

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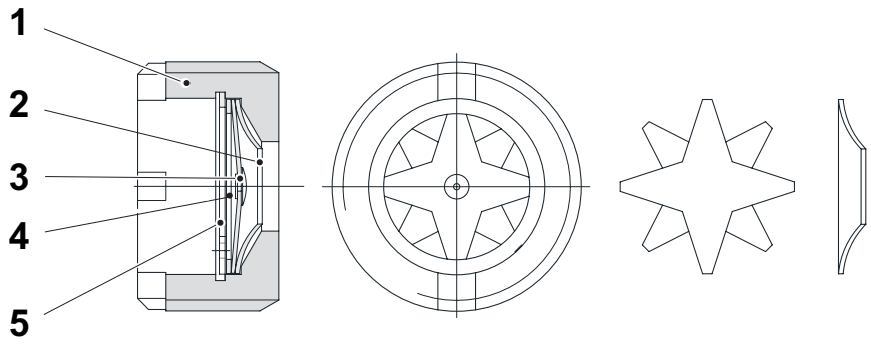
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Function Description

Flow restrictor

General

The adjustable Flow restrictor is designed to control and maintain a constant flow rate. Constant flow is achieved by two stainless steel diaphragms that are crosswise mounted and riveted together. The gap between between the spring-loaded stainless steel plate and seal face is continuously varied as the differential pressure changes. As the differential pressure decreases the gap widens, and it closes as the pressure increases, thus maintaining a constant flow volume through the device.



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1 Valve body
2 Pan
3 Spring star
4 Ring
5 Circlip

Change the Flow restrictor

WARNING!

Risk of injury!
Make sure that the pipeline is drained and free from media before servicing the flow restrictor!
Never service the flow restrictor when it is hot!

Disassemble

Loosen old Flow restrictor and replace with a new one.

Assemble in reverse order.

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Set the Flow restrictor

WARNING!

Risk of injury!
Make sure that the pipeline is drained and free from media before servicing the flow restrictor!
Never service the flow restrictor when it is hot!

The throughput is calculated by adding the regulating inserts. For example the throughput 55 L/Min is obtained with one restrictor with two regulating inserts (30 plus 25 L/Min).

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Spare Parts

Not applicable for this component!

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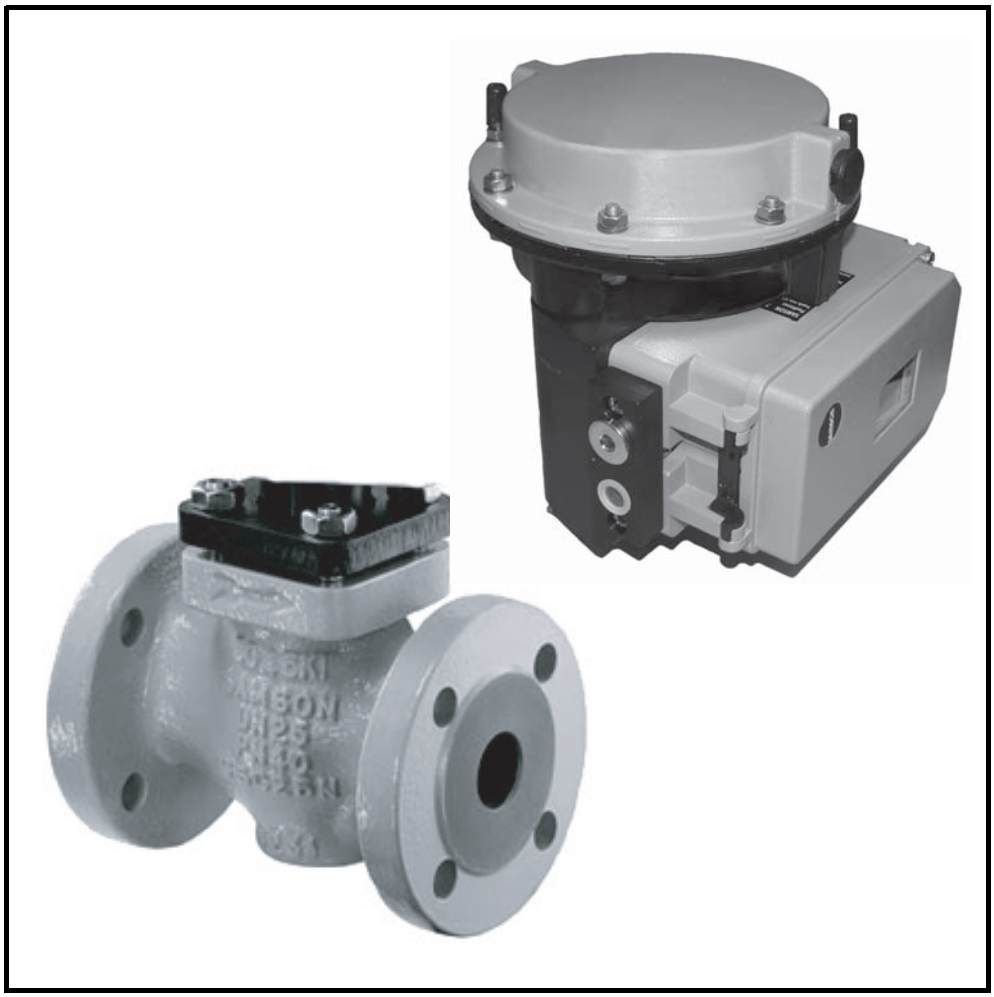
Tetra Pak

Maintenance & Spare Parts

Regulating Valve

(Samson AG)

3321/3372/3730



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Tetra Pak

Doc No. 1224797-0101

Regulating Valve

3321/3372/3730

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 01 Issue 2010-11

Doc No. 1224797-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

General

Valve

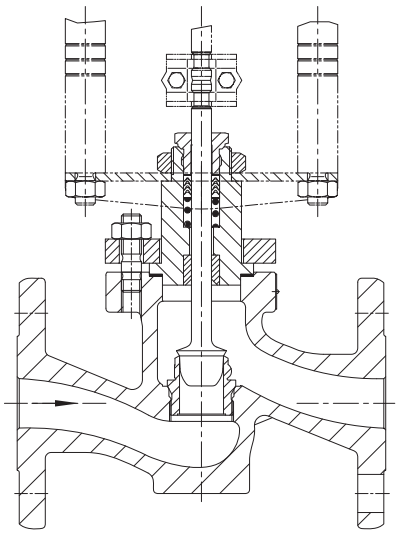
The Type 3321 Globe Valve is based on the modular principle and can be combined with pneumatic actuators as well as electric actuators.

The process medium flows through the valve in the direction indicated by the arrow. The valve plug position determines the cross-sectional area of flow between the seat and the plug.

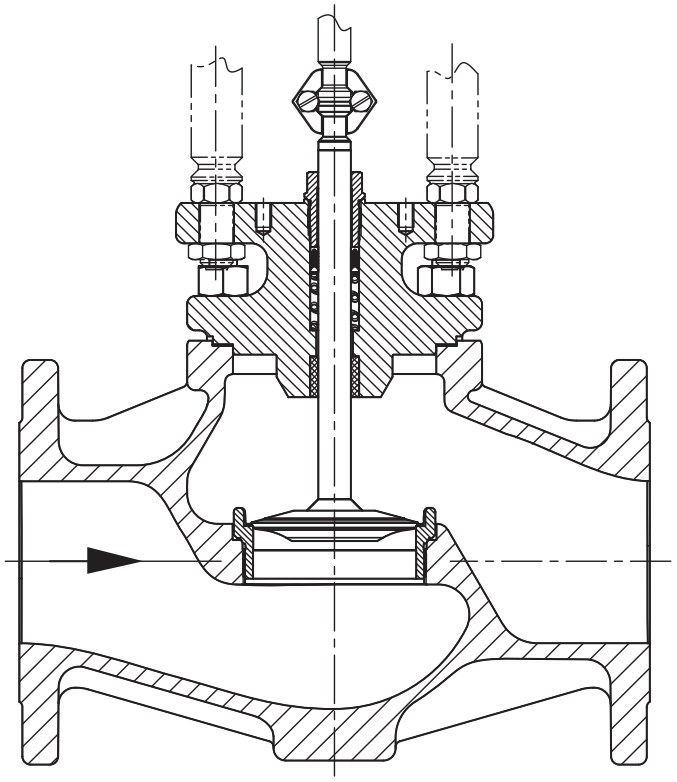
The position of the plug is changed by the control signal acting on the actuator.

The plug stem is sealed by a spring-loaded PTFE V-ring packing and connected to the actuator stem by a stem connector.

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Version DN 15 to 50
(NPS ½” to 2”)



Version DN 65 to 100
(NPS 2 ½” to 4”)

Actuator

The actuators complement the valves to form pneumatic or electro-pneumatic control valves. The actuators basically consist of two diaphragm cases, a rolling diaphragm and springs.

The signal pressure creates a force which acts on the diaphragm. The springs installed in the diaphragm chamber oppose this force, thus ensuring compensation. When the signal pressure fails, the springs installed either in the top or bottom diaphragm chamber determine the actuator's **fail-safe position**.

Actuator stem extends
NC (Normally Closed) = FA

Upon signal pressure failure, the actuator stem extends and closes the valve (globe valve).

Actuator stem retracts
NO (Normally Open) = FE

Upon signal pressure failure, the actuator stem retracts and opens the valve (globe valve).

Tight-closing function

The pneumatic actuator is either fully vented or fully pressurized whenever the reference variable exceeds or falls below a certain preset value.

The lower and the upper range value of the input signal are adjusted to a fixed value at the zero adjuster and the potentiometer for span, however, they can be corrected after attachment to the valve.

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Valve 3321

The control valve is subject to natural wear, especially at the seat, plug and packing. Depending on the application, the valve needs to be checked regularly to prevent against possible failures. If leakage occurs, this could be caused by a damaged packing.

Change Packing

WARNING! **Risk of injury!**
Make sure before dismantling, that the pipeline is drained and free from media. Also, if necessary, allow the control valve to cool down or warm up to ambient temperature prior to starting any work on the valve.

Caution! On performing any work on the valve body, first shut off the supply pressure, disconnect the supply pressure line and remove the actuator. Removing the valve from the pipeline is recommend.

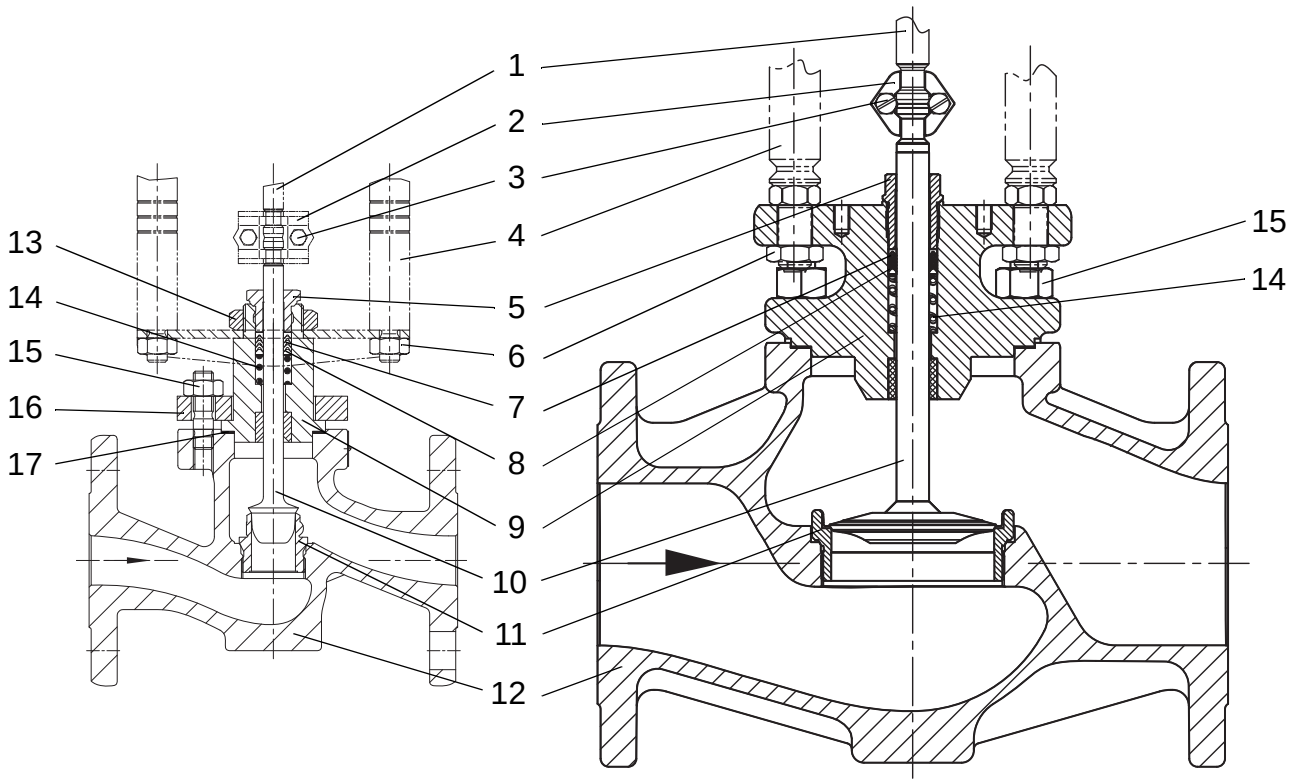
Note! Always separate the actuator and the valve prior to carrying out repairs!

If the valve leaks at the packing assembly, the packing (7) of the packing assembly needs to be exchanged as follows:

(Cont'd)

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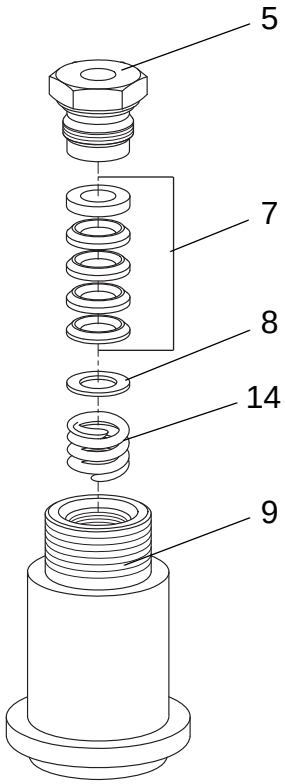
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Version DN 15 to 50
(NPS ½” to 2”)

Version DN 65 to 100
(NPS 2 ½” to 4”)

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1 Actuator stem
2 Stem connector
3 Screw
4 Rod-type yoke
5 Threaded bushing
6 Yoke nut
7 V-ring packing
8 Washer
9 Valve bonnet
10 Plug stem with plug
11 Seat
12 Valve body
13 Hexagonal nut
14 Spring
15 Nut
16 Flange
17 Gasket

(Cont'd)

(Cont'd)

For valves DN 15 to DN 50

a) Separate the actuator from the valve as described in chapter **Separating the Valve From the Actuator**. If the actuator stem extends, first apply a pressure which exceeds the lower range value to the actuator (see nameplate).

b) Unscrew the nuts (15) and remove the valve bonnet (9) and flange (16).

c) Check the gasket (17) in the valve body for damage. It is recommended that the gasket is replaced.

d) Screw off the threaded bushing (5) and pull out the plug (10).

e) Pull out the damaged packing (7) using an appropriate tool. Remove the washer (8) and spring (14) and clean the packing chamber.

f) Apply lubricant (see chapter **Spare Parts**, section **Tools**) to the individual parts of the new packing and the plug stem. Insert the plug (10) in the valve bonnet (9).

g) Place the valve bonnet (9) with flange (16) on the valve body (12) and secure with nuts (15). Observe the tightening torques listed in the table below.

h) Insert the spring (14) and washer (8) and carefully slide the new packing (7) over the plug stem (10) into the packing chamber. Screw in the threaded bushing (5) and tighten.

i) Follow the assebly instructions found in chapter **Separating the Valve From the Actuator**.

(Cont'd)

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(Cont'd)

For valves DN 65 to DN 100

a) Separate the actuator from the valve as described in chapter **Separating the Valve From the Actuator**. If the actuator stem extends, first apply a pressure which exceeds the lower range value to the actuator (see nameplate).

b) Unscrew the nuts (15) and remove the valve bonnet (9).

c) Screw off the threaded bushing (5) and pull out the plug (10).

d) Pull out the damaged packing (7) using an appropriate tool. Remove the washer (8) and spring (14) and clean the packing chamber.

e) Apply lubricant (see chapter **Spare Parts**, section **Tools**) to the individual parts of the new packing and the plug stem. Insert the plug (10) in the valve bonnet (9).

f) Place the valve bonnet (9) on the valve body (12) and secure with nuts (15). Observe the tightening torques listed in the table below.

g) Insert the spring (14) and washer (8) and carefully slide the new packing (7) over the plug stem (10) into the packing chamber. Screw in the threaded bushing (5) and tighten.

h) Follow the assebly instructions found in chapter **Separating the Valve From the Actuator**.

Seat thread (mm)	Body nut thread (mm)	Tightening torque (Nm)
M32 × 1.5	-	170
M58 × 1.5	-	500
M90 × 1.5	-	1050
M110 × 1.5	-	1550
-	M10	10
-	M12	30
-	M16	60
-	M20	100

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Change Valve Plug

When changing the cone it is recommended also to change the sealings and the sealing box V-ring.

Follow the instructions in chapter **Change packing** but install a new plug instead of the used one. Apply lubricant (see chapter **Spare Parts**, section **Tools**) to the plug stem prior to installation.

Change Valve Seat

For valves DN 15 to DN 50

a) Remove the actuator as desribed in chapter **Separating the Valve From the Actuator**.

b) Unscrew the nuts (15) and remove the valve bonnet (9) and flange (16).

c) Unscrew the valve seat (11) using the appropriate tool (see chapter **Spare Parts**, section **Tools**).

d) Apply lubricant (see chapter **Spare Parts**, section **Tools**) to the thread and the sealing cone of the new seat and screw in.

e) Place the valve bonnet (9) with flange (16) on the valve body (12) and secure with nuts (15). Observe the tightening torques!

f) Follow the assembly instructions found in chapter **Separating the Valve From the Actuator**.

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For valves DN 65 to DN 100

a) Remove the actuator as desribed in chapter **Separating the Valve From the Actuator**.

b) Unscrew the nuts (15) and remove the valve bonnet (9).

c) Unscrew the valve seat (11) using the appropriate tool (see chapter **Spare Parts**, section **Tools**).

d) Apply lubricant (see chapter **Spare Parts**, section **Tools**) to the thread and the sealing cone of the new seat and screw in.

e) Place the valve bonnet (9) on the valve body (12) and secure with nuts (15). Observe the tightening torques!

f) Follow the assembly instructions found in chapter **Separating the Valve From the Actuator**.

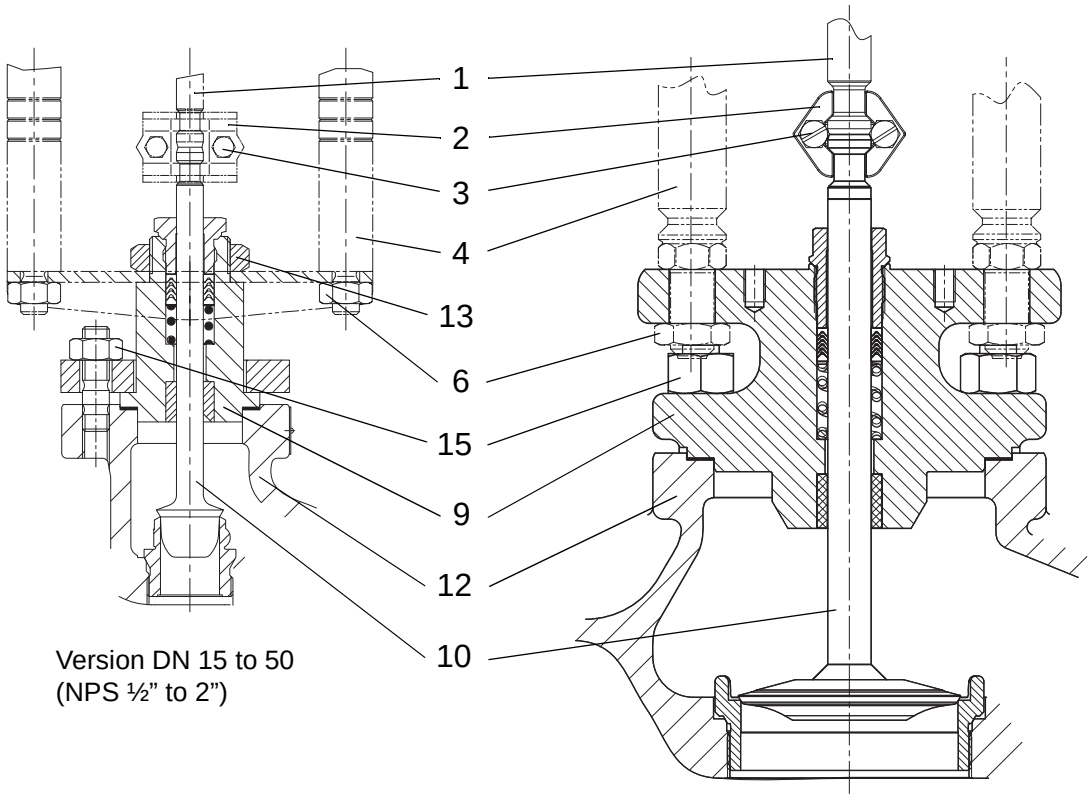
Actuator 3372

Separating the Valve From the Actuator

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media. Also, if necessary, allow the control valve to cool down or warm up to ambient temperature prior to starting any work on the valve.

Note! On dismantling an actuator with **"Actuator stem extends" (NC)** and especially when an actuator has pre-tensions springs, first apply pressure slightly above the lower bench range value (see nameplate on actuator) to the loading pressure connection on the lower diaphragm chamber.



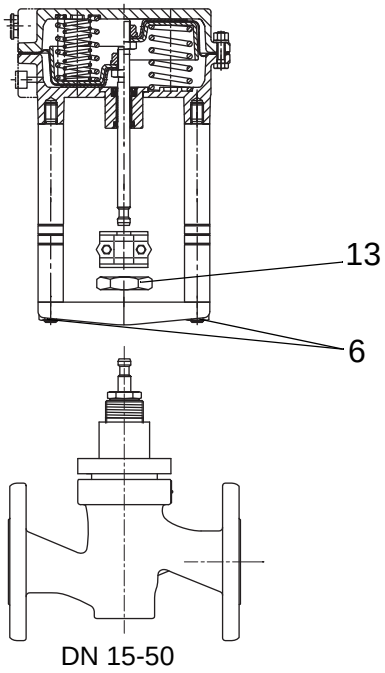
1 Actuator stem
2 Stem connector
3 Screw
4 Rod-type yoke
6 Yoke Nut
9 Valve bonnet
10 Plug stem with plug
12 Valve body
13 Hexagonal nut
15 Nuts

(Cont'd)

(Cont'd)

120 cm² Diaphragm

Caution! The diassembly and assembly of the actuator is different for the two valve sizes (DN15-50 and DN 65-100). It is highly important to preform the correct procedure when mounting and dismounting the actuator.



6 Yoke Nut
13 Nut

2.2tf506817.en

Caution! Do **not** under any circumstances undo the yoke nuts (6) on the rod-type yoke (4) of actuators with 120 cm² diaphragm areas.

Disassembly

a) Remove screws (3) from the stem connector (2).

b) Remove the hexagonal nut (13) from the valve bonnet (9).

c) Lift the actuator off the valve bonnet (9).

Assembly

a) Slightly retract the actuator stem (1) and place the actuator with its rod-type yoke (4) on the valve bonnet (9). Secure with the nuts (15) and the hexagonal nut (13). Observe a tightening torque of at least 150 Nm for the hexagonal nut (13).

b) **Extend** or **retract** the actuator stem (1) until it touches the plug stem (10).

c) Position the stem connector clamps (2) and fasten the screws (3) tight.

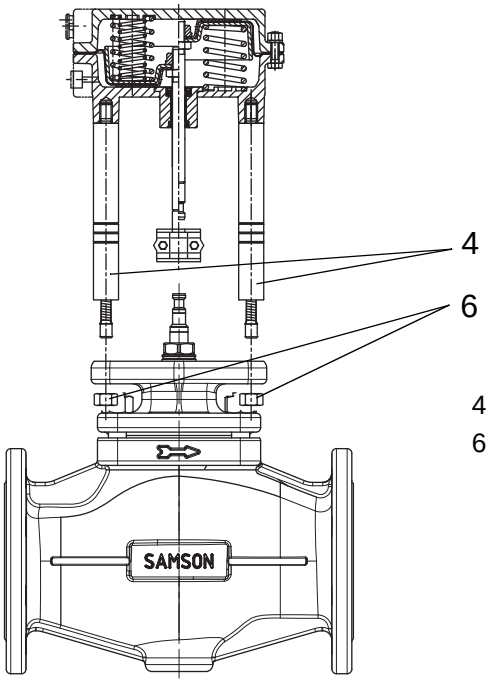
Note! **Always** re-calibrate the zero point when the actuator and the valve have been separated, see chapter **Zero Presetting/Calibration**.

(Cont'd)

(Cont'd)

350 cm² Diaphragm

Caution! The diassembly and assembly of the actuator is different for the two valve sizes (DN15-50 and DN 65-100). It is highly important to preform the correct procedure when mounting and dismounting the actuator.



4 Rod-type yoke
6 Yoke nut

DN 65-100

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Caution! Apply compressed air to actuators with fail-safe action “Actuator stem retracts” so that the actuator stem (1) touches the plug stem (10).

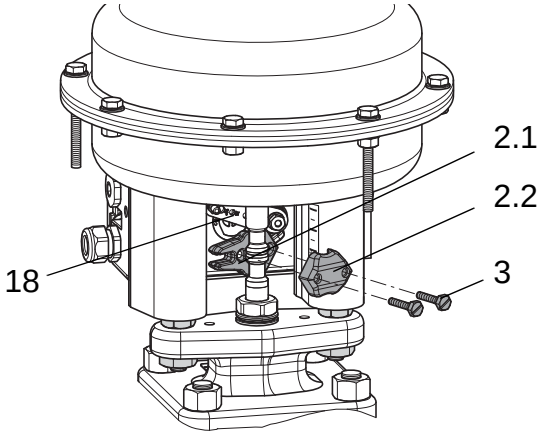
WARNING! **Risk of injury!**
Do not insert your hand into the yoke!

(Cont'd)

(Cont'd)

Disassembly

a) Hold down the spring loaded lever (18), overcoming the spring force, and then remove the screws (3) so the stem connector (2) is separated into a connector clamp (2.1) and a mating clamp (2.2).



2.1 Connector clamp
2.2 Mating clamp
3 Screw
18 Lever

b) Remove the nuts (6) from the rod-type yoke (4) of the actuator.

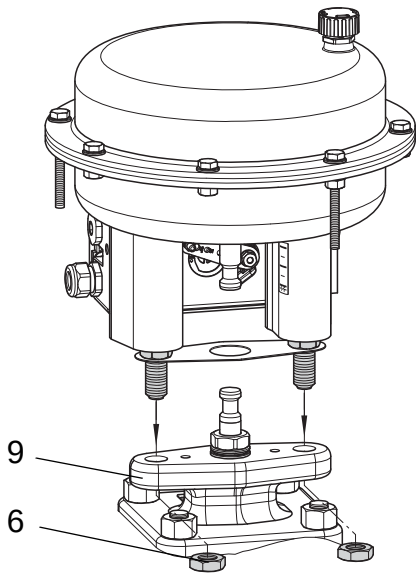
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(Cont'd)

Assembly

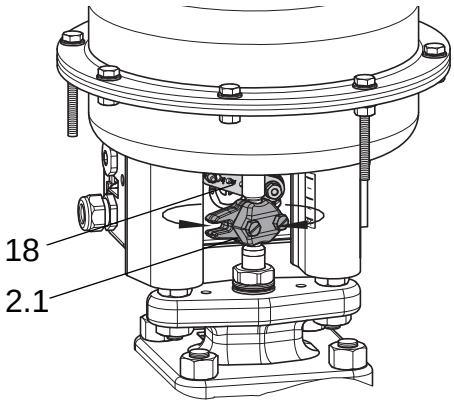
a) Place actuator with the end of the rods onto the valve bonnet (9) and fasten with nuts (6), while holding the rods at the hexagonal surface stationary with an suitable tool.



6 Yoke nut
9 Valve bonnet

b) Place the stem connector clamp (2.1) with the travel pick-off behind the actuator stem (1) and loosely fasten together with the mating clamp (2.2) using the screws (3).

c) Pull the lever (18) downwards, overcoming the spring force. Turn the stem connector clamps (2.1) so that the follower pin of the lever is guided by the stem connector with travel pick-up.



2.1 Connector clamp
18 Lever

d) Tighten the screws (3) of the stem connector (2) evenly.

Note! **Always** re-calibrate the zero point when the actuator and the valve have been separated, see chapter **Zero Presetting/Calibration**.

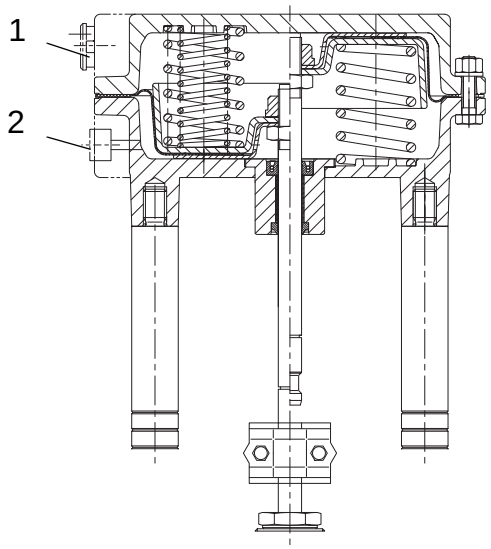
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Change Actuator

a) Remove the actuator as described in chapter **Separating the Valve From the Actuator**.

b) Change actuator.

Pneumatic actuator



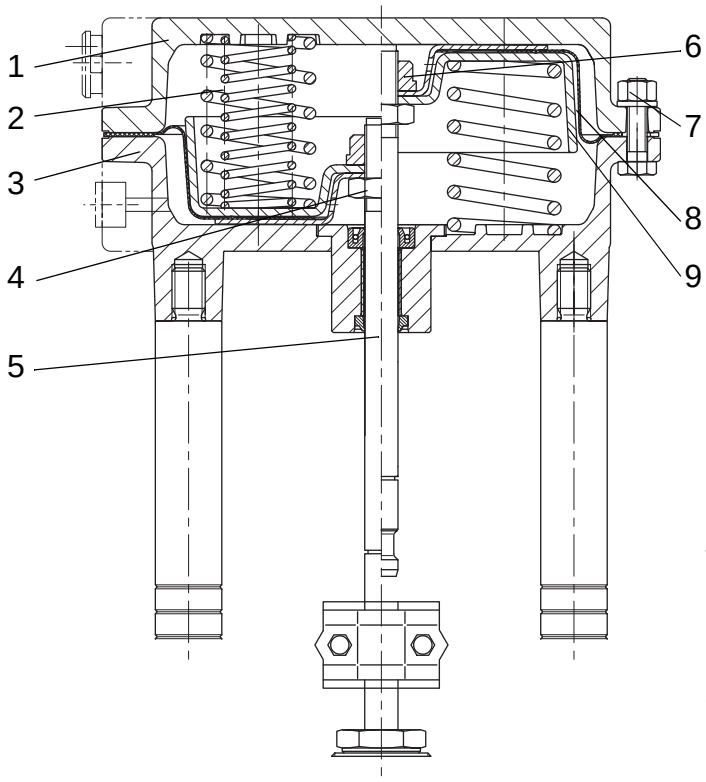
1 Vent plug
2 Signal pressure connection (actuator stem extends)

c) **For the pneumatic actuator:**
Apply a pressure of approximately 3 bar to the lateral signal pressure connection (2) located at the bottom diaphragm chamber.

d) Follow the assebly instructions found in chapter **Separating the Valve From the Actuator**.

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Change Diaphragm and Spare Parts



1 Top actuator case
2 Springs
3 Bottom actuator case
4 Nut
5 Actuator stem
6 Nut
7 Hexagonal bolts and nuts
8 Diaphragm
9 Diaphragm plate

2.2tf506817.en

a) Separate the actuator from the valve as desribed in chapter **Separating the Valve From the Actuator**.

b) Unscrew the hexgonal bolts and nuts (7) connecting both actuator cases.

WARNING! **Risk of injury!**
Loosen the short bolts first, **then slowly and in a criss-cross pattern the long bolts and nuts until the actuator springs are releived of tension**.

Caution! Take special care with actuators whose springs have been pre-loaded at the factory, distingushed by the bolts and nuts on the bottom diaphragm case.

(Cont'd)

(Cont'd)

c) Lift off the top actuator case (1).

d) Remove the springs (2).

e) Pull the actuator stem (5), diaphragm plate (9) and diaphragm (8) out of the bottom actuator case (3).

f) Remove the nut (6) and pull off the diaphragm plate.

Note! Do not touch the lower nut (4).

g) Change diaphragm (8).

h) Assemble the actuator in reversed order.

Note! Align the top actuator case flanges with the flanges of the bottom actuator case before reattaching the hexagonal bolts and nuts.

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Positioner

Change Positioner

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media. Also, if necessary, allow the control valve to cool down or warm up to ambient temperature prior to starting any work on the valve.

WARNING!

Risk of injury!
Shut off the electrical supply and depressurize the positioner before dismantling.



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1 Positioner hatch
2 Mounting screws

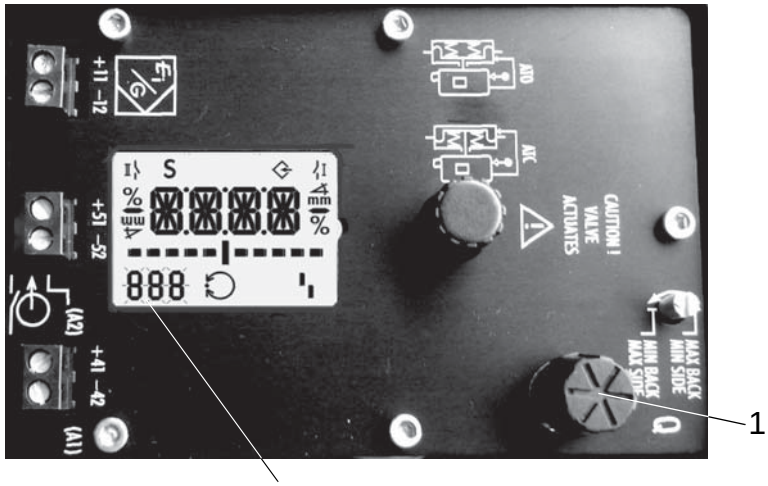
a) Open the positioner hatch (1) and mark the electrical supply cables inside.
b) Dismantle the electrical- and pneumatic connection.
c) Unscrew the mounting screws (2) and remove and change the positioner.
d) Assemble in reverse order.

Zero Presetting/Calibration

In case of inconsistencies in the closing position of the valve, e.g. with soft-sealed plugs, it may be necessary to recalibrate zero.

Note! **Always** re-calibrate the zero point when the positioner and the valve have been separated.

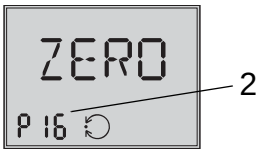
3730-1



1 Rotary push button
2 Parameter/error code

Start the zero calibration by activating Code P16 as follows:

a) Turn rotary push button (1) until Code **P16** appears (2).



b) Press rotary push button (1) 6 seconds long, 6-5-4-3-2-1 is counted down on the display.

c) Zero calibration has started, the display blinks!

d) The positioner moves the control valve to the CLOSED position and recalibrates the internal electric zero point.

e) When the zero calibration has been successfully completed, the positioner returns to closed loop operation (status indication).

Canceling zero calibration

The zero calibration can be canceled by pressing rotary pushbutton (1). The positioner then moves to the fail-safe position (indicated by S on the display).

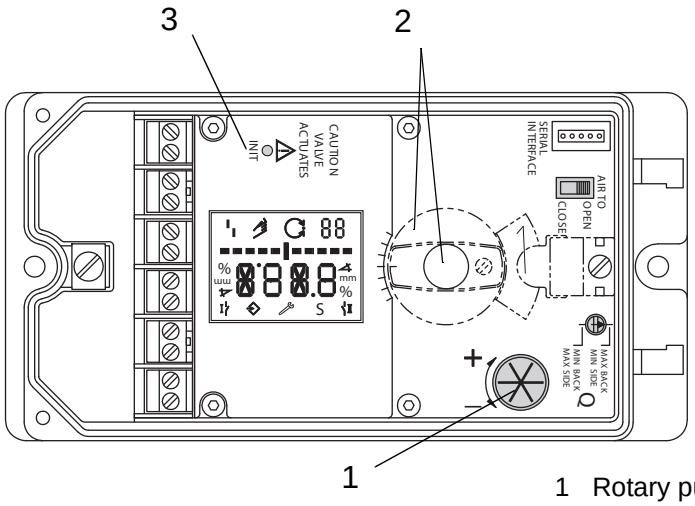
A new zero calibration can be started directly afterwards.

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3730-2, 3730-3

Note! The valve briefly moves from the current travel/angle of rotation position to the closed position.

Note! The positioner must be connected to the supply air to perform the zero calibration.



1 Rotary pushbutton
2 Cap or rotary switch
3 Initialization key

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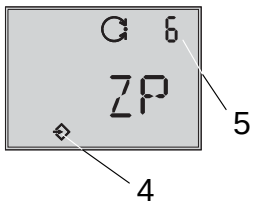
Enable configuration:

a) Turn rotary pushbutton (1) → Code 3, display: No
b) Press rotary pushbutton (1), Code 3 blinks
c) Turn rotary pushbutton (1) → YES
d) Press rotary pushbutton (1) → Display (4)

(Cont'd)

(Cont'd)

Perform zero calibration:



4 Configuration enabled
5 Code

e) Turn pushbutton (1) → Code 6
f) Press pushbutton (1), Code 6 blinks
g) Turn pushbutton (1) → ZP
h) Press pushbutton (1)
i) Press INIT key (3)!

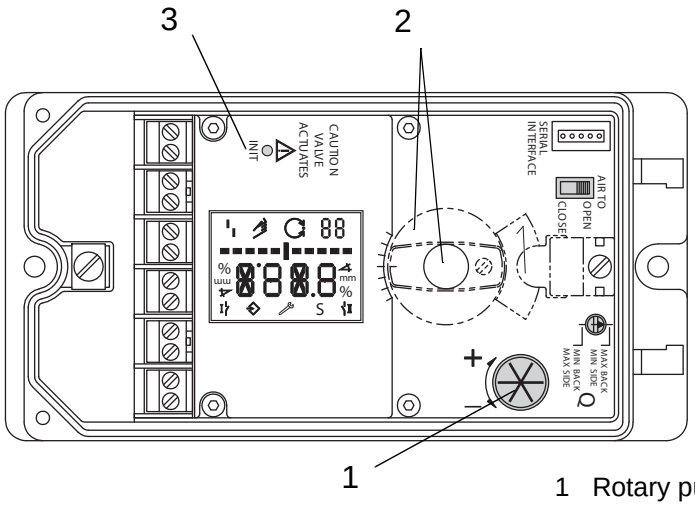
Zero calibration is started, the positioner moves the control valve to the CLOSED position and readjusts the internal electrical zero point.

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3730-4, 3730-5

Note! The valve briefly moves from the current travel/angle of rotation position to the closed position.

Note! The positioner must be connected to the supply air to perform the zero calibration.



1 Rotary pushbutton
2 Cap or rotary switch
3 Initialization key

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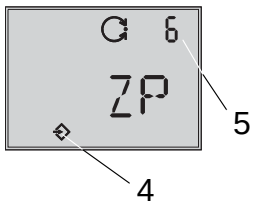
Enable configuration:

a) Turn rotary pushbutton (1) → Code **3**
b) Press rotary pushbutton (1)
c) Turn rotary pushbutton (1) → **ON**
d) Press rotary pushbutton (1) → Display (4)

(Cont'd)

(Cont'd)

Perform zero calibration:



4 Configuration enabled
5 Code

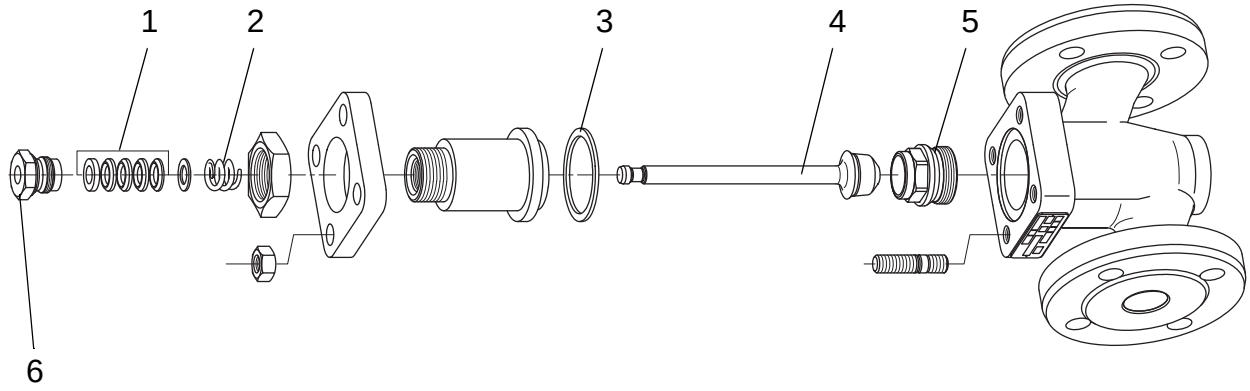
e) Turn pushbutton (1) → Code 6
f) Press pushbutton (1), Code 6 blinks
g) Turn pushbutton (1) → ZP
h) Press pushbutton (1)
i) Press INIT key (3)!

Zero calibration is started, the positioner moves the control valve to the CLOSED position and readjusts the internal electrical zero point.

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Spare Parts

Valve 3321



Description Spare part kit, valve	Spare part article No.	Included parts	Pos.	Qty.
DN 15, Kvs 0.25 SS/SS	90511-3052	PTFE-Ring-V-Packing Spring for Packing Gasket Plug Seat	1 2 3 4 5	1 1 1 1 1
DN 15, Kvs 0.63 SS/SS	90511-3053			
DN 15, Kvs 1.6 SS/SS	90511-3054			
DN 15, Kvs 1.6 SS/PTFE	90511-3055			
DN 15, Kvs 4 SS/SS ANSI 1/2”, Cv 4.68 SS/SS	6-990417-52			
DN 15, Kvs 4 SS/PTFE ANSI 1/2”, Cv 4.68 SS/PTFE	6-990417-58			
DN 20, Kvs 2.5 SS/SS	90511-3056			
DN 20, Kvs 2.5 SS/PTFE	90511-3057			
DN 20, Kvs 6.3 SS/SS ANSI 3/4”, Cv 7.37 SS/SS	6-990417-53			
DN 20, Kvs 6.3 SS/PTFE ANSI 3/4”, Cv 7.37 SS/PTFE	6-990417-59			

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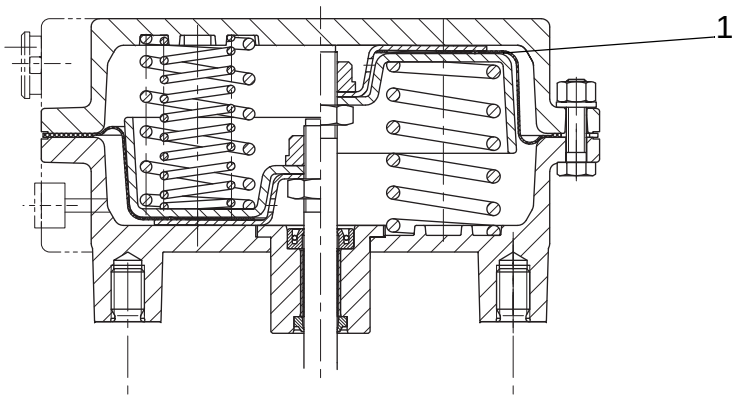
Description Spare part kit, valve	Spare part article No.	Included parts	Pos.	Qty.
DN 25, Kvs 4 SS/SS	6-990417-52	PTFE-Ring-V-Packing Spring for Packing Gasket Plug Seat	1 2 3 4 5	1 1 1 1 1
DN 25, Kvs 4 SS/PTFE	6-990417-58			
DN 25, Kvs 10 SS/SS ANSI 1”, Cv 11.7 SS/SS	6-990417-54			
DN 25, Kvs 10 SS/PTFE ANSI 1”, Cv 11.7 SS/PTFE	6-990417-60			
DN 32, Kvs 6.3 SS/SS	90511-3058			
DN 32, Kvs 6.3 SS/PTFE	90511-3059			
DN 32, Kvs 16 SS/SS	6-990417-55			
DN 32, Kvs 16 SS/PTFE	6-990417-61			
DN 40, Kvs 10 SS/SS	90511-3060			
DN 40, Kvs 10 SS/PTFE	90511-3061			
DN 40, Kvs 25 SS/SS ANSI 1 1/2”, Cv 29.25 SS/SS	6-990417-56			
DN 40, Kvs 25 SS/PTFE ANSI 1 1/2”, Cv 29.25 SS/PTFE	6-990417-62			

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Description Spare part kit, valve	Spare part article No.	Included parts	Pos.	Qty.
DN 50, Kvs 16 SS/SS ANSI 2”, Cv 18.7 SS/SS	6-990417-55	PTFE-Ring-V-Packing Spring for Packing Gasket Plug Seat	1 2 3 4 5	1 1 1 1 1
DN 50, Kvs 16 SS/PTFE	6-990417-61			
DN 50, Kvs 35 SS/SS ANSI 2”, Cv 40.95 SS/SS	6-990417-57			
DN 50, Kvs 35 SS/PTFE ANSI 2”, Cv 40.95 SS/PTFE	6-990417-63			
DN 65, Kvs 40 SS/SS DN 80, Kvs 40 SS/SS	90511-3063			
DN 65, Kvs 40 SS/PTFE DN 80, Kvs 40 SS/PTFE	90511-3064			
DN 65, Kvs 80 SS/SS DN 80, Kvs 100 SS/SS ANSI 2 1/2”, Cv 93.6 SS/SS ANSI 3”, Cv 117 SS/SS	90511-3065			
DN 65, Kvs 80 SS/PTFE DN 80, Kvs 100 SS/PTFE ANSI 2 1/2”, Cv 93.6 SS/PTFE ANSI 3”, Cv 117 SS/PTFE	90511-3066			
DN 100, Kvs 40 SS/SS	90511-3071			
DN 100, Kvs 40 SS/PTFE	90511-3072			
DN 100, Kvs 160 SS/SS ANSI 4”, Cv 187.2 SS/SS	90511-3073			
DN 100, Kvs 160 SS/PTFE ANSI 4”, Cv 187.2 SS/PTFE	90511-3074			
DN 15-50	90510-4809	Threaded bushing	6	1
DN 65-100	90510-4810			

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Actuator 3372



Description Spare part kit, actuator	Spare part article No.	Included parts	Pos.	Qty.
120 cm^2	90510-4815	Diaphragm	1	1
350 cm^2	90510-4816	Diaphragm	1	1

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Positioner



Description Positioner, complete unit	Spare part article No.	Included parts	Pos.	Qty.
3730-1	90510-4762	-	-	1
3730-2	90503-4689	-	-	1
3730-3	90510-4763	-	-	1
3730-4	90510-4764	-	-	1
3730-5	90510-4765	-	-	1

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Tools

Seat tool

Description Seat tool, complete	Spare part article No.	Included parts	Pos.	Qty.
DN 15-25	90519-4298	Seat tool, complete	-	1
DN 32-50	90512-6978	Nut Supporting flange Socket	-	1 1 1
DN 65-80	90510-4301	Seat tool, complete	-	1
DN 100	90510-4304	Seat tool, complete	-	1

Torque wrench

Description Torque wrench	Spare part article No.	Included parts	Pos.	Qty.
10 - 100 Nm	90512-6983	-	-	1
50 - 300 Nm	90510-4303	-	-	1
Torque multiplyer, IP30, 3000 Nm	90510-4302	-	-	1

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Lubrication

Description Lubrication	Spare part article No.	Included parts	Pos.	Qty.
Greese	90512-7283	-	-	1

Tetra Pak

Maintenance & Spare Parts

Sampling valve

(Keofitt)

M4, W9, W15, W25, Micro Port



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Tetra Pak

Doc No. 1226617-0101

Sampling valve

M4, W9, W15, W25, Micro Port

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

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Version 02 Issue 2010-11

Doc No. 1226617-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Sampling valve 1
Sampling port 2
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Valve head tools 3
Maintenance 4
Change valve head membrane 4
Change Micro Port spare parts 6
Sterilization of sampling valve 7
Sterilization of Micro Port 8
Spare Parts 9
Sampling valve 9
Micro Port 10

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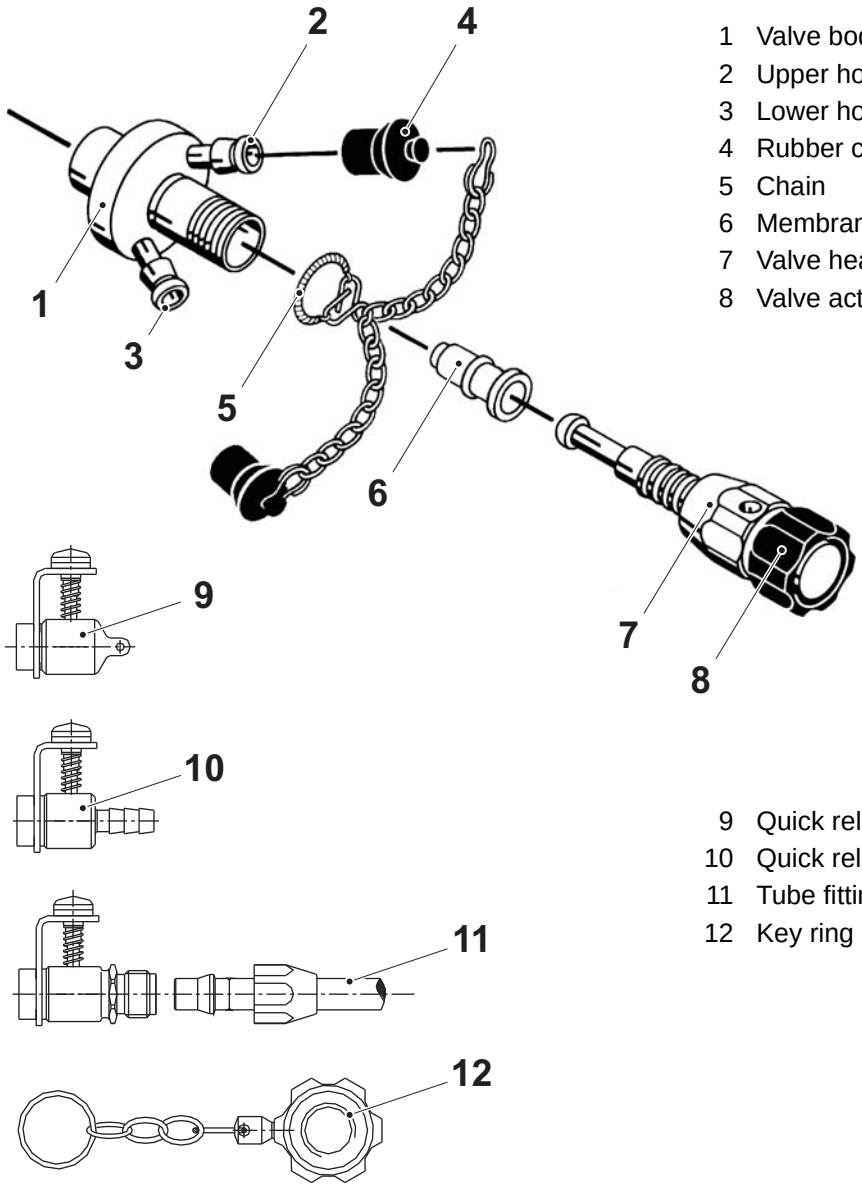
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Function Description

General

Sampling valve

Keofitt aseptic valve consists of three parts: a valve body, a valve head and a membrane. The rubber membrane is placed on the stem of the valve head and works as a stretchable plug. The valve bodies and valve heads are interchangeable.



1 Valve body
2 Upper hose piece
3 Lower hose piece
4 Rubber cap
5 Chain
6 Membrane Q
7 Valve head
8 Valve activator

9 Quick release plug
10 Quick release coupling
11 Tube fitting
12 Key ring

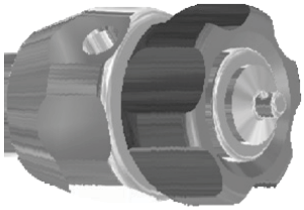
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Sampling port

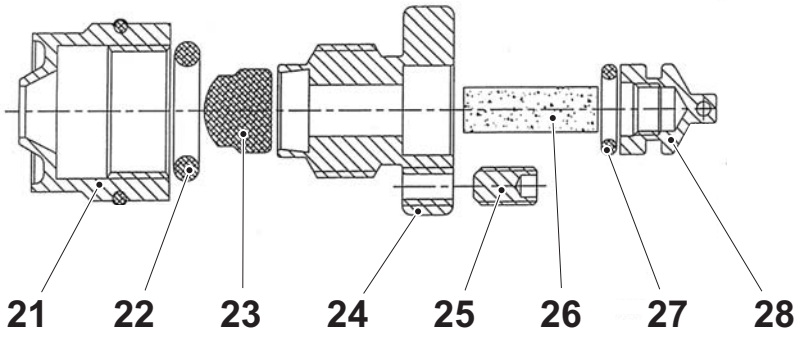
Sampling by piercing a membrane with a hypodermic needle.

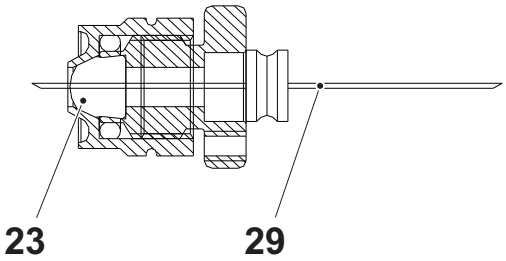


Stand/alone Micro Port



Sampling valve
with Micro Port





21 Base
22 O-ring
23 Rubber membrane
24 Hex nut
25 Pivot screw
26 Cotton wick
27 O-ring
28 Cap
29 Hypodermic needle

2.2tf5075O6.en

Valve head types

Knob, key, lever or pneumatically operated valve heads, threaded or flanged.



Type H Manually operated
Type B (white knob) Pressure resistant



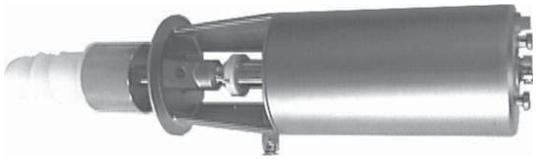
Type K
Manually operated key version



Type Q
Manually operated with lever



Type N
Pneumatically operated



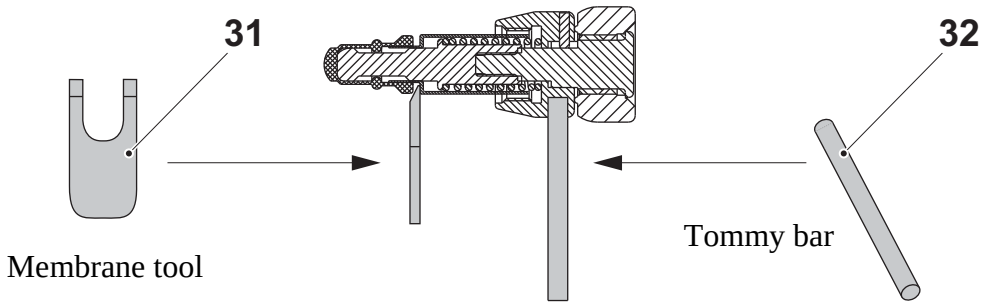
Type N
Pneumatically operated

2.2tf5075O6.en

Valve head tools

Tools to remove valve head and PTFE membrane.

Note! Membrane tool (31) is only required for PTFE membrane.



Maintenance

WARNING!

Risk of injury!
Never service the valve when it is hot.
Make sure that the pipeline is drained and free from media before servicing the valve.
The valve and pipelines must never be pressurized when serviced.

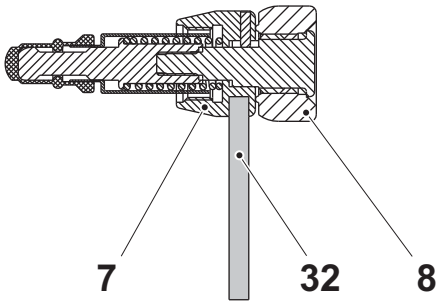
Change valve head membrane

The rubber membrane should be replaced every two months. PTFE membranes should be replaced every 12 months. In the event of intensive sterilization and cleaning it may be necessary to replace it more frequently. For valve heads with Micro Port, approximately 5-10 samples may be drawn off per membrane at 5-2 bar(g) respectively. The rubber plug must be replaced at least once every six months. In each individual case a standard operating procedure including maintenance intervals should be endorsed, based on experience.

Note! When replacing the membrane, set the valve head in the open position before it is screwed loose and pulled out of the valve body. Omitting to do so may result in twisting and cutting of the membrane.

a) Set the valve head at the open position. If it is a knob operated type, turn knob (8) clockwise.

b) Remove the valve head (7). Tommy bar should be used for disassembly and assembly. This is carried out by turning valve head counter-clockwise until loose and then pulling the valve head off.



7 Valve head
8 Knob
32 Tommy bar

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(Cont'd)

(Cont'd)

Note! Use membrane tool if it is a **PTFE** membrane. In all other cases remove the membrane by hand and do not take into account item c) to point f).

Caution! Do not use hammer or other tool that might scratch the surface of the membrane.

c) Push the membrane upwards until the membrane toolfits under it.

d) Insert membrane tool, between the membrane and the bushing.

e) Close valve head.

f) Now the membrane is loosened from the valve head and can be replaced.

Note! Once the membrane has been removed from the valve head the click system in the membrane might be damaged. Therefore the membrane might be unsafe for further use and it is recommended not to use the membrane again.



2.2tf5075O6.en

g) Set the valve head to closed position.

h) Place the new membrane on valve head.

i) Set the valve head in open position.

j) Insert the valve head into the valve body.

k) Tighten with the tommy bar.

Note! Do not use any tools other than hand and tommy bar.

l) Close valve head.

m) Run sterilization. See page 7.

Change Micro Port spare parts

WARNING! **Risk of injury!**
Never service the valve when it is hot.
Make sure that the pipeline is drained and free from media before maintenance.

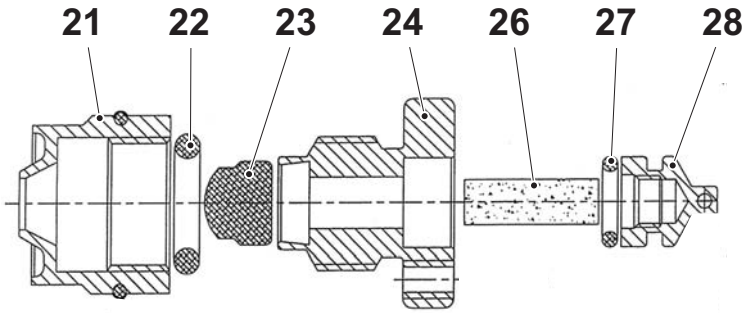
Note! The membrane along with the cotton wick should be replaced with every production batch.

a) Remove cap (28) and cotton wick (26).

b) Turn hex nut (24) counter-clockwise and pull out of the base.

c) Pull out old membrane (23).

d) Check the condition of the O-rings (22,27) and change if they are worn.



21	Base	26	Cotton wick
22	O-ring	27	O-ring
23	Rubber membrane	28	Cap
24	Hex nut	29	Hypodermic needle

2.2tf5075O6.en

e) Put new membrane in place and press until it is firmly in place.

f) Take sanitary precautions, for example run disinfectant-soaked cotton wick over the membrane or autoclave it. See page 8.

g) Put hex nut in base and turn clockwise until the Micro Port is completely assembled.

h) Put new disinfectant-soaked cotton wick in cap.

i) Sterilize inside of Micro Port with the cotton wick. See page 8.

j) Put cap in place along with the cotton wick.

Sterilization of sampling valve

The sampling valve is designed for sterilization before and after each sampling.

WARNING!

Risk of injury!
During sterilization with steam the valve will become hot, and care should thus be taken when handling the valve.
The valve is designed for use in working conditions of up to 6 bar(g) and temperatures of up to 121°C. It is therefore important to be aware that the rubber plug (designed for max. 3 bar(g)) or the steel plug (designed for max. 10 bar(g)) can be forced out at high speed if not seated correctly. Therefore always remember to use safety goggles when taking samples because of the risk to the eyes.
Use saturated steam without condensation at max. 2 bar(g). At higher pressures the membrane can be damaged/split. In most cases the coaxial design ensures absolute cleanliness without the use of CIP or similar.

Caution! Sterilization takes place with valve closed.

Caution! If ATEX requirement: Group IIGD, Category 2 (zone 1), clean the top of valve head and the handle.

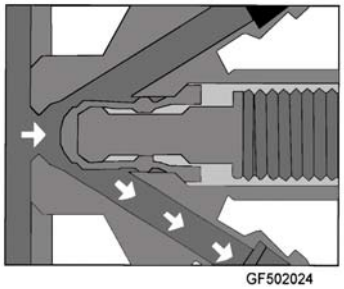
k) Remove the plugs.

l) Connect the steam hose to the valve's upper hose piece.

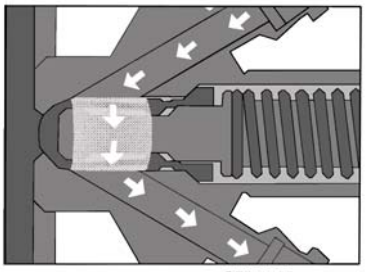
m) Open the steam supply and let it flow through the valve for sterilization, for at least 1 minute, at 121°C (2 bar(g)).

n) Close the steam supply.

Sampling
The valve is open


GF502024

Sterilizing
The valve is closed


GF502025

If using steam a small pressure relief valve (optional) on the outlet is recommended.

Sterilization of Micro Port

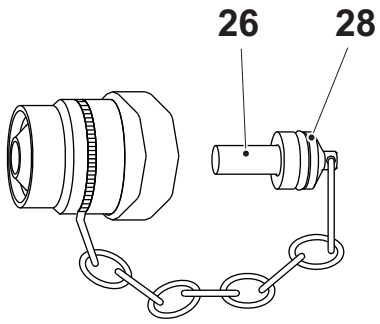
a) Remove cap (28).

b) Soak cotton wick (26) in disinfectant / alcohol.

c) Put the soaked cotton wick (26) in the cap (28).

d) Rub the inside of the Micro Port with the soaked wick (26).

e) Close the cap (28) with cotton wick (26) in place.

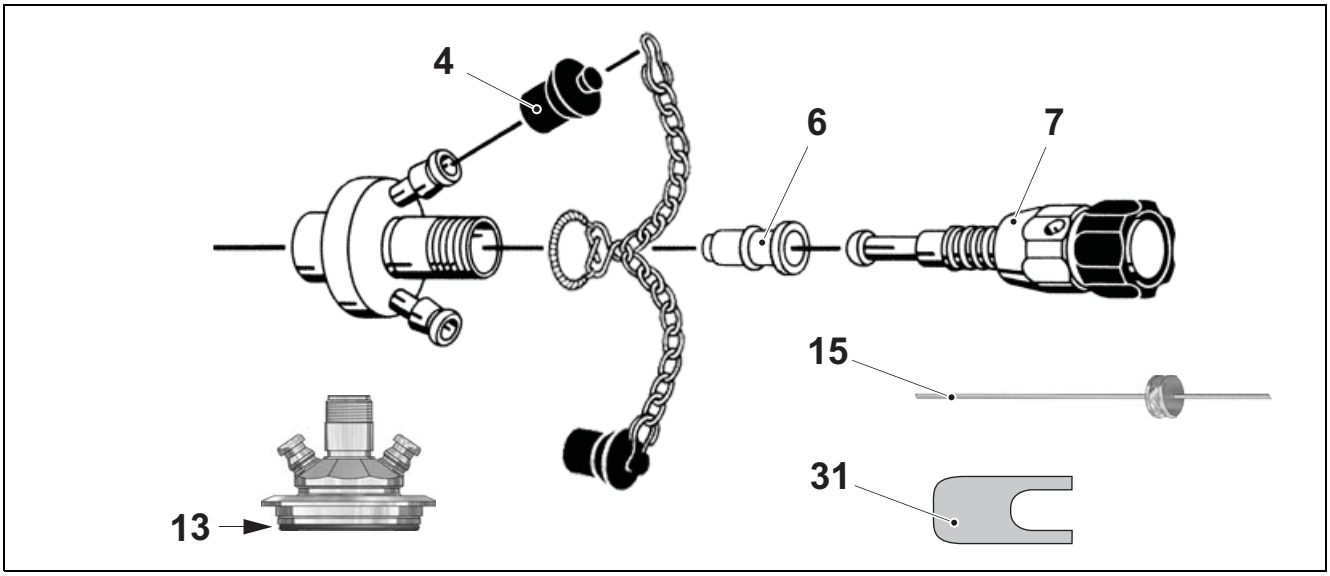


26 Cotton wick
28 Cap

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Spare Parts

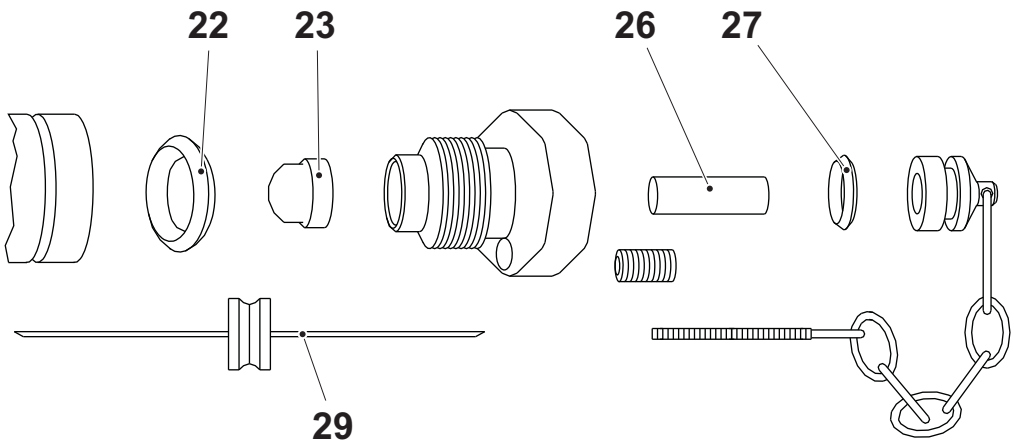
Sampling valve



Component article No.	Spare parts Article No.	Description	Pos.	Qty
Common Sampling valve Spare parts	90512-6903	Hypodermic needle, long	15	1
	90512-6912	Tube PTFE 10/8mm Keofitt valve	-	-
M4 Sampling valve	90512-6896	Membrane, Silicone (10 pcs)	6	1
	90512-6897	Membrane, EPDM (10 pcs)	6	1
	90512-6916	Membrane, sampling valve, PTFE	6	1
	90512-6898	Rubber cap (10 pcs)	4	1
	90512-6926	Tool for removal of PTFE membrane	31	1
W9 Sampling valve	90512-6890	Membrane, EPDM (10 pcs)	6	1
	90512-6891	Membrane, Silicone (10 pcs)	6	1
	90512-6915	Membrane for Micro Port, EPDM (10 pcs)	6	1
	90512-6917	Membrane, PTFE-(TFM 1600), white	6	1
	90512-6899	Rubber cap (10 pcs)	4	1
	90512-6924	O-ring, red silicone	13	1
	90512-6927	Tool for removal of PTFE membrane	31	1
W15 Sampling valve	90512-6918	Membrane, PTFE	6	1
	90512-6919	Tool for removal of PTFE membrane	31	1
W25 Sampling valve	90512-6920	Membrane, PTFE (TFM1600) white	6	1
	90512-6921	Tool for removal of PTFE membrane	31	1

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Micro Port



Spare parts Article No.	Description	Pos.	Qty
90512-6902	Membrane, EPDM (10 pcs)	23	1
90512-6922	O-ring, EPDM, black	27	1
90512-6925	O-ring, EPDM	22	1
90512-6907	Cotton wick (100 pcs)	26	1
90512-6906	Hypodermic needle, short	29	1

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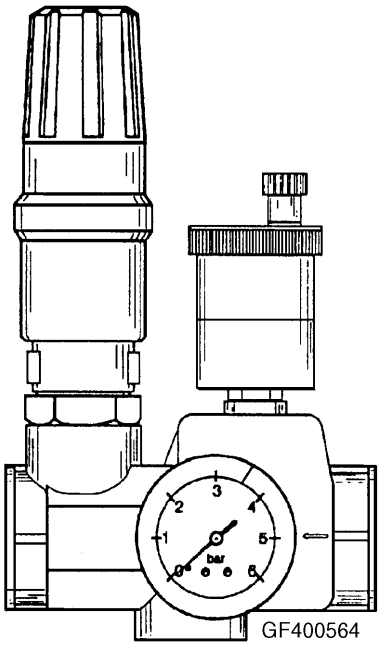
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Tetra Pak

Maintenance & Spare Parts

Valve set
(AKA)



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Tetra Pak

Doc No. 1241090-0101

Valve set

Article No.	Type	Connection
31801-5036-1	Type 3	G1 “

1.0 1241090-0101.fro

Version 01

Doc No. 1241090-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance 1

Valve set 1

Description 1

Check leakage 1

Check pressure 1

Spare parts 2

1.0 1241090-0101.TOC

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Maintenance

Valve set

Description

Caution! Do not exceed maximum pressure of 3.5 bar

Note! Do not exceed maximum temperature of 120°C continuous operation, 110°C for de-aerator.

The valve set contains a collector, a safety valve, a de-aerator and a pressure indicator. It has also connections for incoming product and a connection for an expansion vessel.

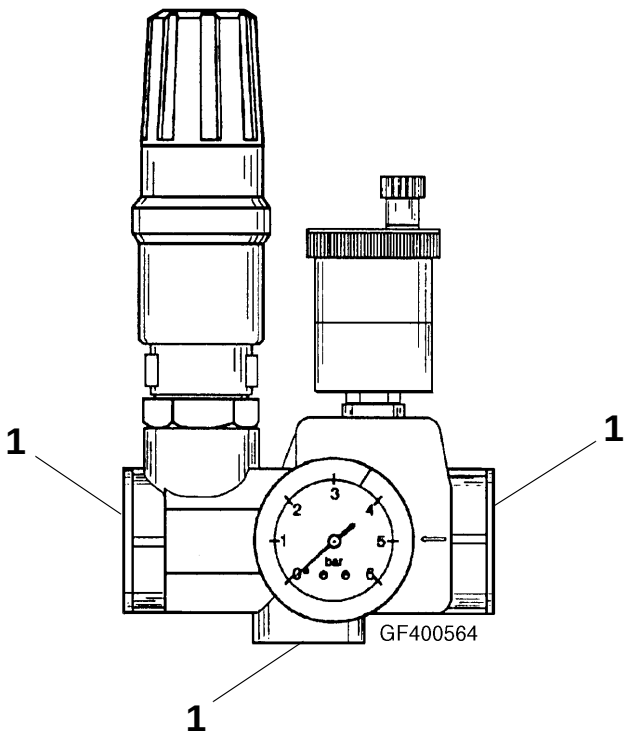
Check leakage

Check for leakage at system connections (1).

Check pressure

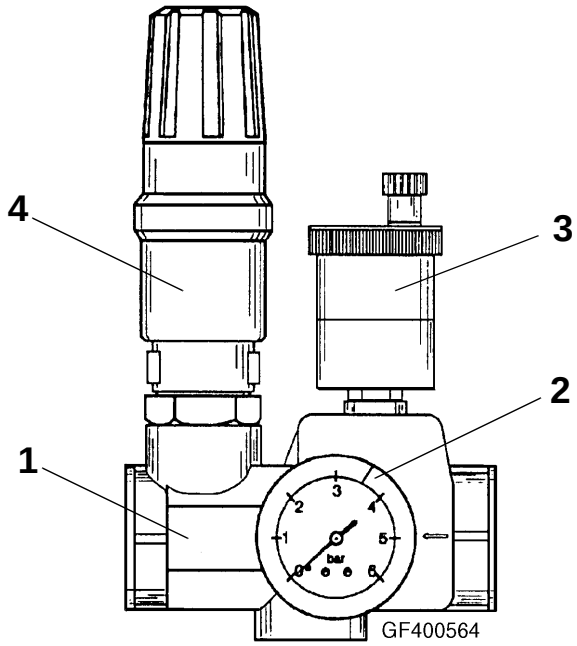
Check the pressure in the system; should not exceed the max. pressure and should not be under pre-pressure. If the pressure is too low, the system has to be filled with nitrogen.

2.2TF400217.EN



1 System connection

Spare parts



Group description	Pos.	Qty	Spare parts Article No.	Description
Spare part	1	1	6-31801-5036-2	Collector
Spare part	2	1	6-31801-5036-3	Pressure gauge
Spare part	3	1	6-31801-5036-4	De-aerator
Spare part	4	1	6-31801-5036-5	Safety valve 3.5 bar

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Tetra Pak

Maintenance & Spare Parts

Non-return valve

(Armaturjonsson)

AJ 1174



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Tetra Pak

Doc No. 1241228-0101

Non-return valve

Article No.	DN	Kvs-value
6-31801-2768-1	15	4.0
6-31801-2768-2	20	7.5
6-31801-2768-3	25	10.0
6-31801-2768-4	32	18.0
6-31801-2768-5	40	27.0
6-31801-2768-6	50	40.0
6-31801-2768-7	65	69.0
6-31801-2768-8	80	90.0

1.0 1241228-0101.fro

Version 01

Doc No. 1241228-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance 1

Non-return valve 1

Check valve 1

Change valve 1

Spare Parts 2

Not applicable for this component! 2

1.0 1241228-0101.TOC

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Maintenance

Non-return valve

Check valve

WARNING!

Risk of injury!
Never service the valve when it is hot.
Make sure that the pipeline is drained and free from media before servicing the valve.
The valve and pipelines must **never** be pressurised when servicing the valve.

a) Disassemble the flange coupling to expose the non-return valve.
b) Visually inspect the conditions of the seat and disc. Change the whole unit if worn.
c) When assembling, replace the old flange gaskets with new ones.

Change valve

WARNING!

Risk of injury!
Never service the valve when it is hot.
Make sure that the pipeline is drained and free from media before servicing the valve.
The valve and pipelines must **never** be pressurised dismantling.

a) Disassemble the flange coupling.
b) Change the non-return valve.
c) When assembling, replace the old flange gaskets with new ones.



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Spare Parts

Not applicable for this component!

2.2TF500785.EN

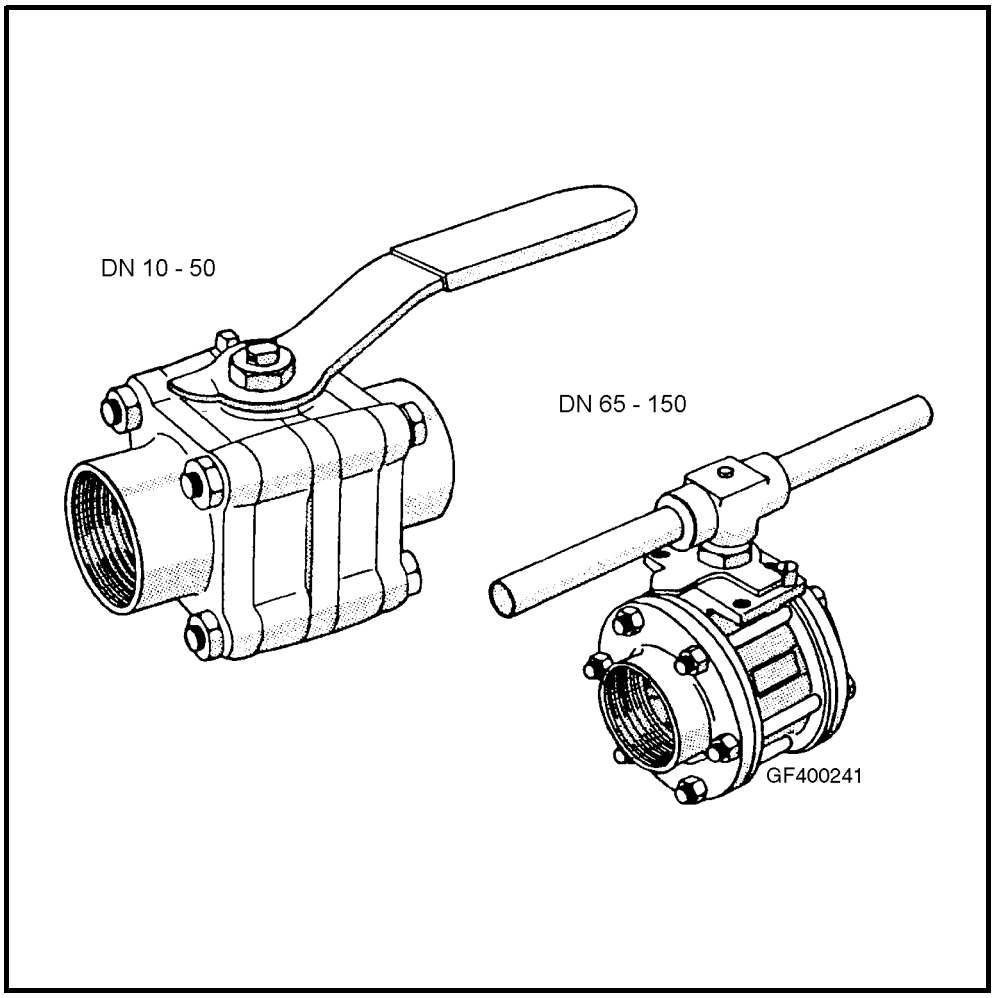
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Tetra Pak

Maintenance & Spare Parts

Ball valve
(Worcester)
A44 / A459



1.0 1241241-0101.fro

Tetra Pak

Doc No. 1241241-0101

Ball valve

A44 / A459

Article No.	Size	Connection	Kvs	Article No.	Size	Connection	Kvs
6-31801-2201-1	DN10	W	7	6-31801-9096-1	DN10	W16x1	7
6-31801-2201-2	DN15	W	7	6-31801-9096-2	DN20	W25x1.2	10
6-31801-2201-3	DN20	W	10	6-31801-9096-3	DN32	W38x1.2	40
6-31801-2201-4	DN25	W	28	6-31801-9096-4	DN50	W51x1.2	90
6-31801-2201-5	DN32	W	40	6-31801-9096-5	DN65	W63.5x1.6	208
6-31801-2201-6	DN40	W	69	6-31801-9096-6	DN80	W76.1x1.6	277
6-31801-2201-7	DN50	W	90	6-31801-9096-7	DN100	W101.6x2.0	501
6-31801-2201-8	DN65	W	208	6-31801-9113-1	DN25	W25x1.2	71
6-31801-2201-9	DN80	W	277	6-31801-9113-2	DN40	W38x1.2	230
6-31801-2202-1	DN100	W	501	6-31801-9936-1	DN10	W17.2x2.6	7
90503-0935	DN150	W	707	6-31801-9936-2	DN15	W21.3x2.6	7
6-31801-2205-1	DN10	Rp	7	6-31801-9936-3	DN20	W26.9x2.6	10
6-31801-2205-2	DN15	Rp	7	6-31801-9936-4	DN25	W33.7x2.6	28
6-31801-2205-3	DN20	Rp	10	6-31801-9936-5	DN32	W42.4x2.6	40
6-31801-2205-4	DN25	Rp	28	6-31801-9936-6	DN40	W48.3x2.6	69
6-31801-2205-5	DN32	Rp	40	6-31801-9936-7	DN50	W60.3x2.6	90
6-31801-2205-6	DN40	Rp	69	6-31801-9936-8	DN65	W76.1x2.6	208
6-31801-2205-7	DN50	Rp	90	6-31801-9936-9	DN80	W88.9x2.6	277
6-31801-2205-8	DN65	Rp	208	6-31801-9965-1	DN25	Clamp	-
6-31801-2205-9	DN80	Rp	277	6-31801-9987-1	DN50	Clamp	90
6-31801-2206-1	DN100	Rp	501	6-31801-2281-4	DN10	W	6.9
6-31801-2206-2	DN150	Rp	709	90513-6529	DN10	W	6.9

W=welded
Rp=threaded

1.0 1241241-0101.fro

Version 06 Issue 2011-12

Doc No. 1241241-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Ball valve 8

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Maintenance

Ball valve

Check stem leakage

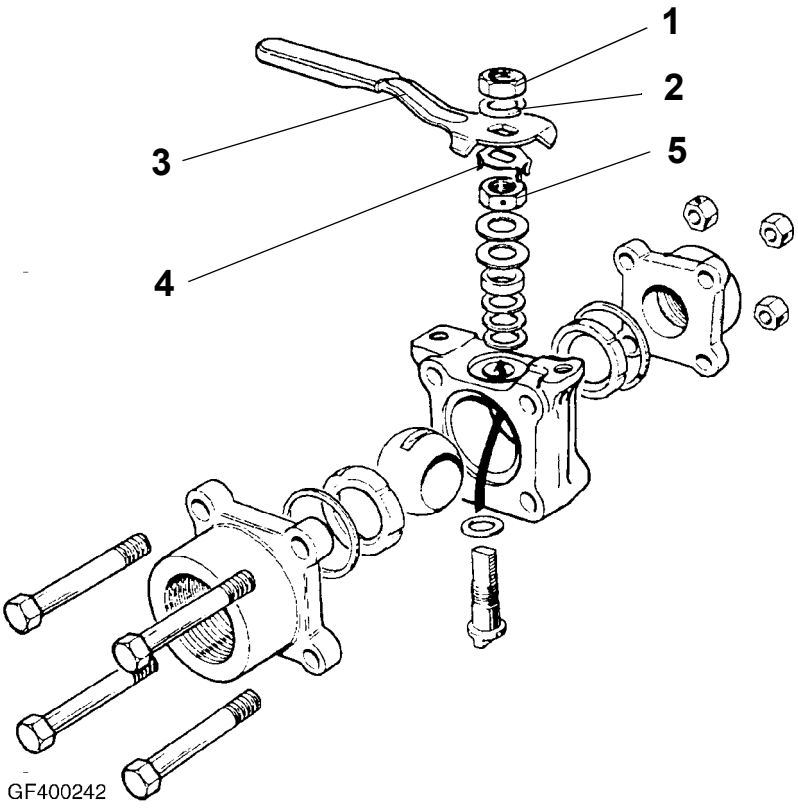
WARNING! **Risk of injury!**
Make sure before dismantling, that the pipeline is drained and free from media.

Check if there is any leakage at the stem. If necessary, the following action has to be taken:

DN10-50

a) Remove the wrench nut (1).
b) Take out the spring washer (2) and the wrench (3).
c) Bend up and remove the gland nut locking clip (4).
d) Tighten and torque the gland nut (5) according to table.
e) Reassemble in the reverse disassembling order.
f) If the leakage still persists, the seals have to be replaced.

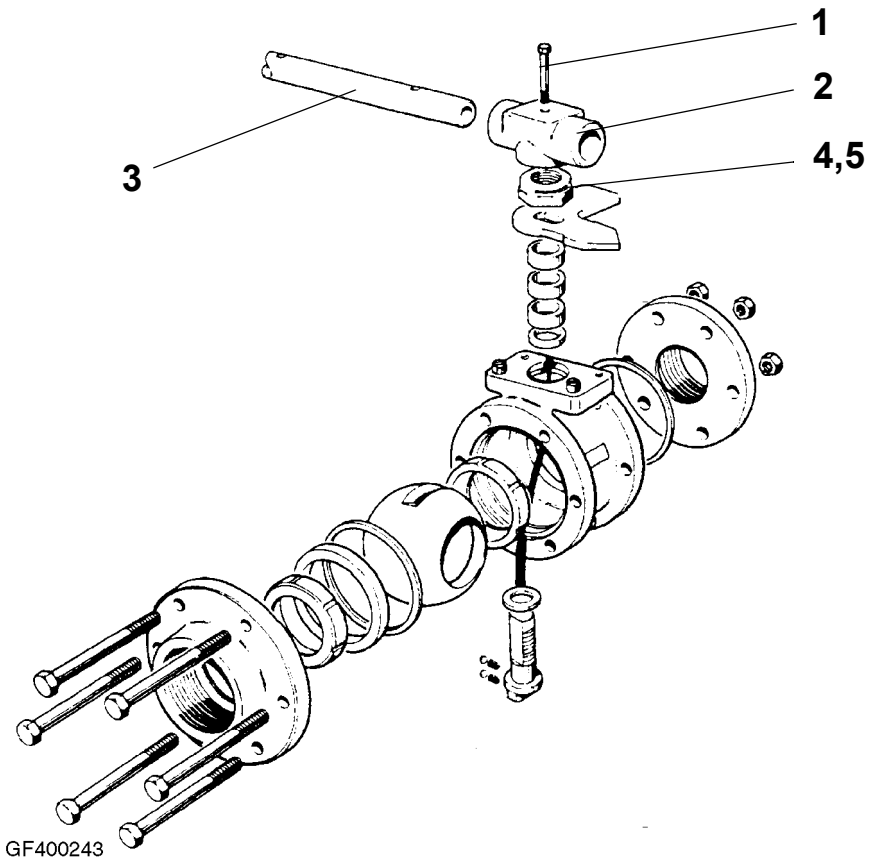
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1 Wrench nut
2 Spring washer
3 Wrench
4 Locking clip
5 Gland nut

DN65-150

a) Remove the wrench screw (1).
b) Take out the wrench (3) and the wrench head (2).
c) On DN65, bend up and remove the gland locking clip (5).
d) Tighten and torque the gland nut (4) according to table.
e) Reassemble in the reverse disassembling order.
f) If the leakage still persists, the seals have to be replaced.



1 Wrench screw
2 Wrench head
3 Wrench
4 Gland nut
5 Locking clip (DN65 only)

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Check body end joints leakage

If the valve is leaking at the body end joints, the following action has to be taken:

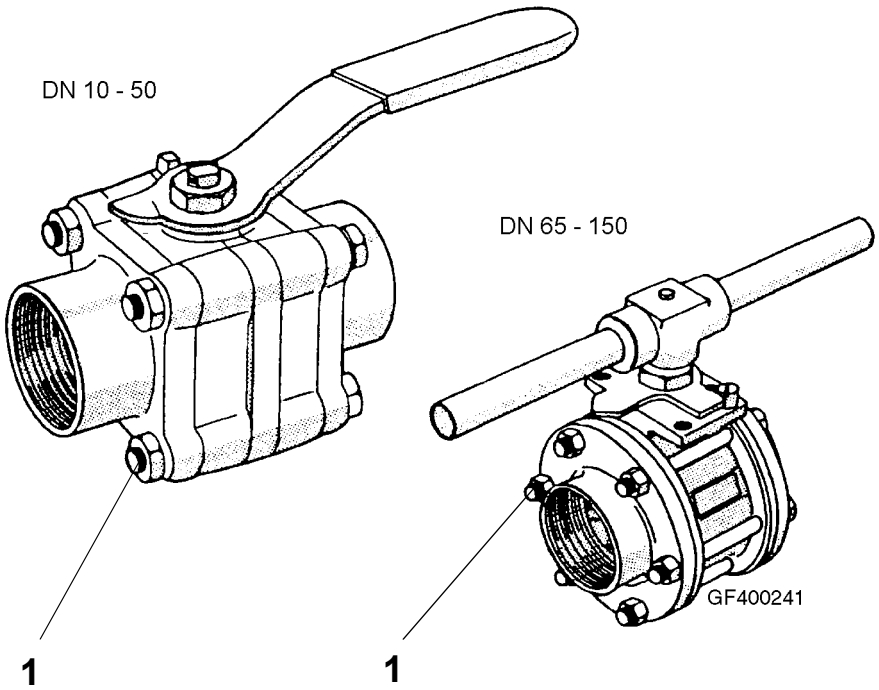
a) Check the tightness of the body screws (1).

b) If slack, tighten to recommended torque, using a torque wrench, according to table below.

c) If the leakage still persists, the seals have to be replaced.

Connection	Torque Nm Body bolt
DN10	10
DN15	12
DN20	14
DN25	26
DN32	30
DN40	35
DN50	40
DN65	77
DN80	117
DN100	117
DN150	117

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1 Body screw

Change spare part kit

WARNING!

Risk of injury!
Before dismantling, ensure that the pipeline is drained and free from media. Any maintenance should be done with the valve at room temperature. When disassembling the valve must be in open position.

DN10-50

a) Remove the body (1) by unscrew the body connector screws (2).

b) Slide out the complete body from the body connectors (3).

c) Close the ball (4) and remove the seat ring (5).

d) When the bal is fully closed, remove the ball (4) by pushing one side of the ball.

e) Remove the body connector seals (6).

f) Dismantle the stem assembly by removing the wrench nut (7), spring washer (8), wrench (9), gland nut locking clip (10), gland nut (11), disc springs (12) and gland (13).

g) Withdraw the stem (14) from the inside of the body. The stem must be aligned across the valve to allow withdrawal of the stem.

h) Remove the stem thrust seal (15) and gland packing (16).

i) All re-usable components should be thoroughly cleaned.

j) Fit a new trust seal on the stem shoulder and insert the stem through the valve body.

k) Fit the new gland packing into the body opening, the gland and new disk spring on to the stem.

l) Fit the gland nut and, using the wrench to prevent the stem to turning, tighten it down onto the gland to fully compress the disc spring.

m) Operate the stem several times and re-adjust the gland nut torque to specified value according to table below.

Connection	Torque Nm
DN10	6-9
DN15	6-9
DN20	8-12
DN25	8-12
DN32	13-18
DN40	13-18
DN50	13-18

n) Fit the wrench, spring washer and wrench nut to the stem assembly and turn to closed position.

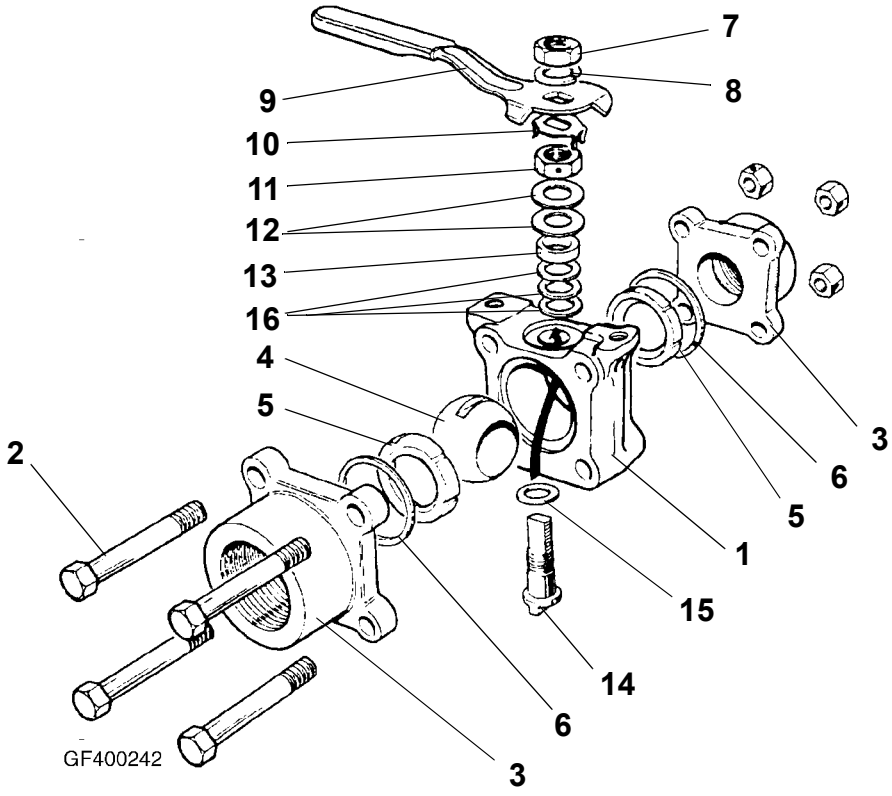
o) Insert the ball into position. Open the valve (to prevent the ball from falling out).

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p) Lubricate and fit the seat rings and the body seals.

q) The body connectors must have there faces cleaned before re-fitting of the valve body. Centre the valve body, replace the body connector screws and tighten diagonally and evenly to specified torque.

1 Body
2 Body connector screw
3 Body connector
4 Ball
5 Seat ring
6 Body connector seal
7 Wrench nut
8 Spring washer
9 Wrench
10 Gland nut locking ring
11 Gland nut
12 Disc spring
13 Gland
14 Stem
15 Stem thrust seal
16 Gland packing



2.2tf000739.en

DN65-150

a) Remove the body (1) by unscrewing the body connector screws (2).

b) Slide out the complete body from the body connectors (3).

c) Close the ball (4) and remove the seat rings (5).

d) When the ball is fully closed, remove the ball (4) by pushing one side of the ball. Watch out for the anti-static ball and spring.

e) Remove the body seals (6) and seat retaining ring (7).

f) Dismantle the stem assembly by removing the wrench bolt (8), wrench (9),wrench head (10), gland nut locking clip (12)(*on DN65 only*), gland nut (11), stop indicator (13), gland follower (14) and gland packing (15).

g) Withdraw the stem (16) from the inside of the body. The stem must be aligned across the valve to allow withdrawal of the stem.

h) Remove the thrust seal (17) and stem location ring (18).

i) All re-usable components should be thoroughly cleaned.

j) Fit a new thrust seal on the stem shoulder and insert the stem through the valve body. Fit the stem locating ring (18), gland packing (15), gland follower (14), stop indicator (13), gland nut locking clip (12)(*on DN65 only*) and gland nut (11).

k) Operate the stem several time and re-adjust the gland nut torque to specified value according to table below:

Connection	Torque Nm
DN65 - 150	19-24

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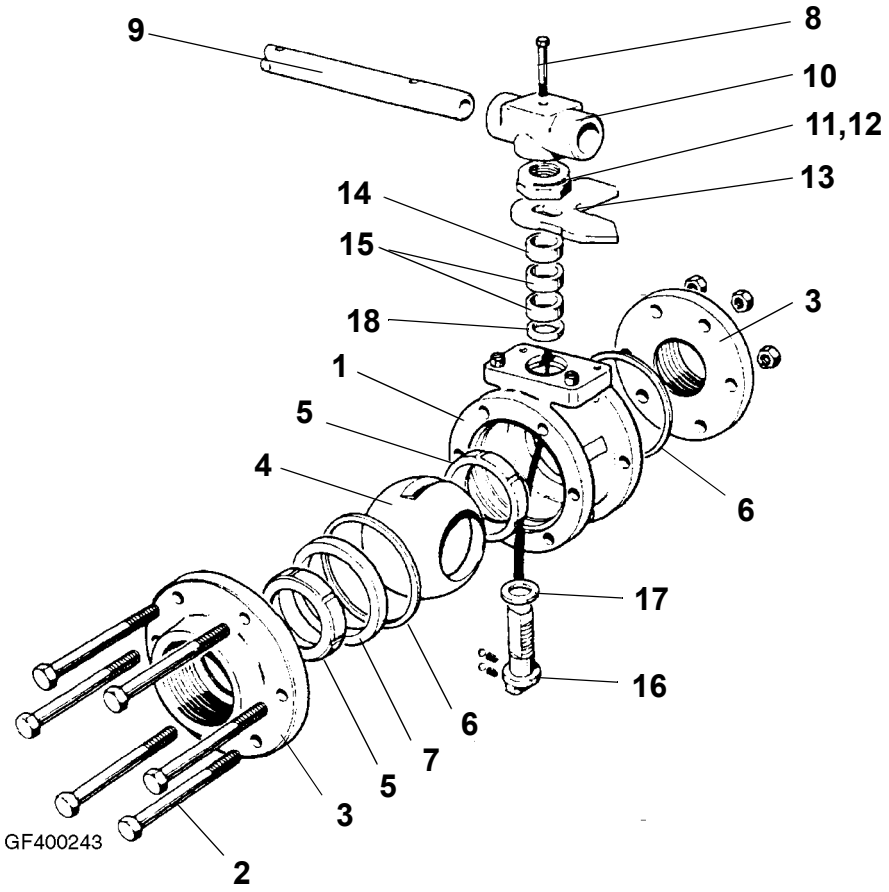
l) Fit the wrench head (10), wrench (9), wrench bolt (8) to the stem assembly and turn to closed position.

m) Insert the ball into position. Open the valve (to prevent the ball from falling out).

n) Lubricate and fit the seat rings and the body seals.

o) The body connectors must have their faces cleaned before re-fitting the valve body. Centre the valve body, replace the body connecting bolts and tighten diagonally and evenly to specified torque.

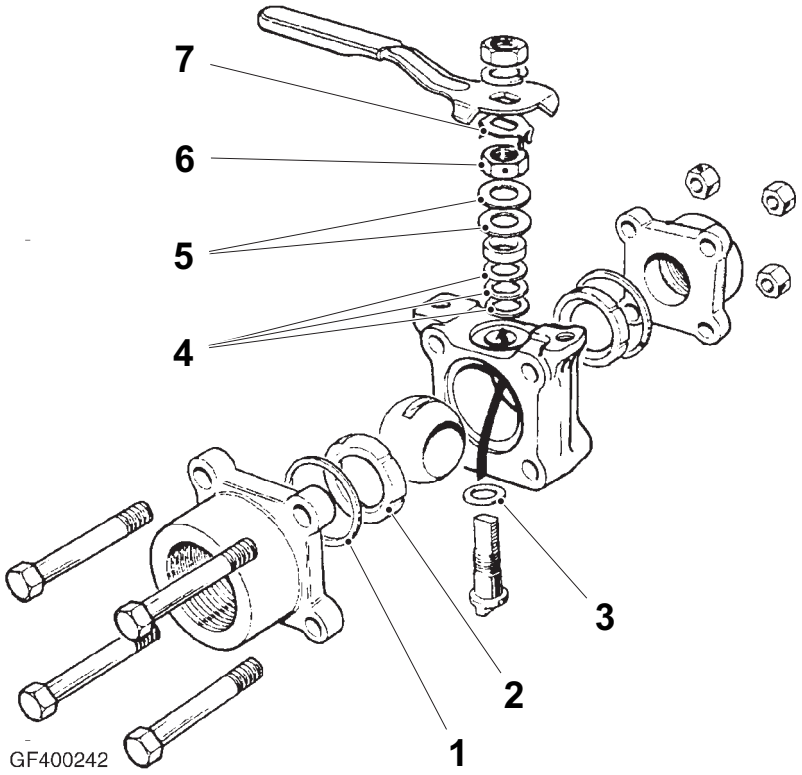
1 Body
2 Body connector screw
3 Body connector
4 Ball
5 Seat Ring
6 Body seal
7 Seat retaining ring
8 Wrench screw
9 Wrench
10 Wrench head
11 Gland/wrench nut
12 Locking clip (DN65 only)
13 Stop indicator
14 Gland follower
15 Gland packing
16 Stem
17 Stem thrust seal
18 Stem location ring



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Spare Parts

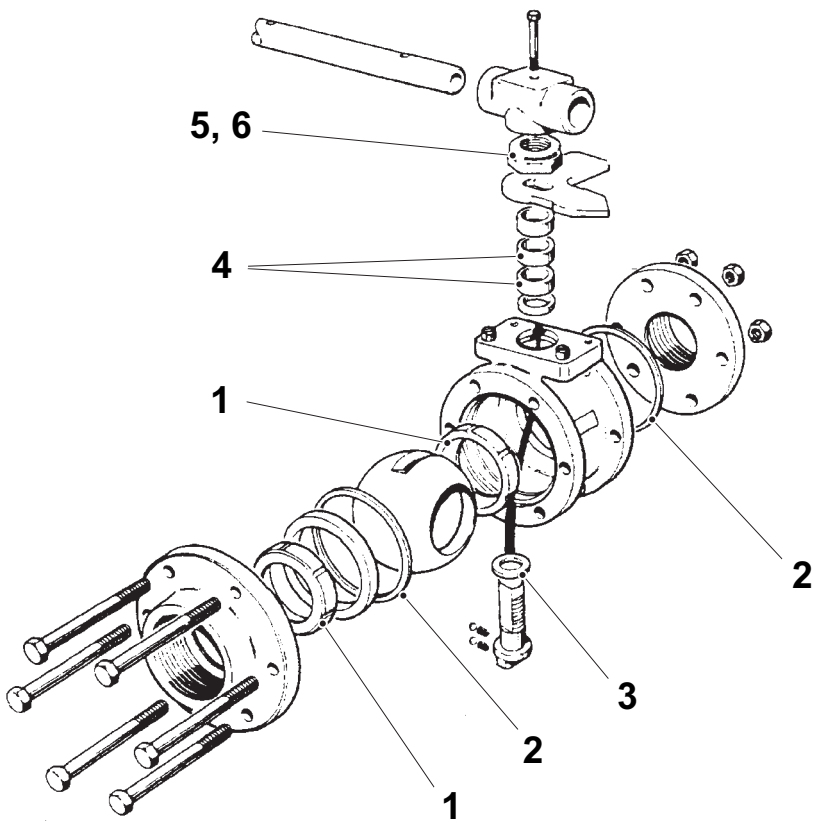
Ball valve



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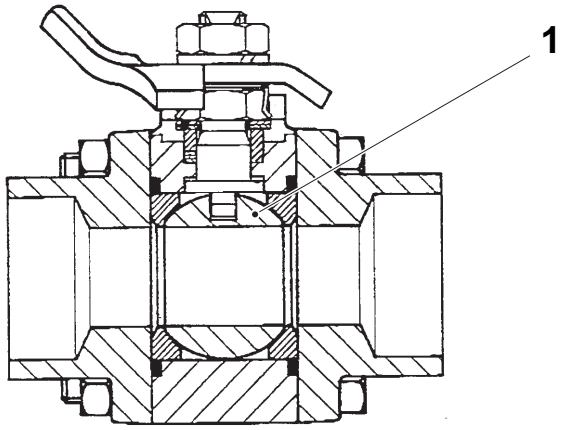
Component article No.	Spare part Article No.	Description	Included parts	Pos.	Qty.
6-31801-2201-1 6-31801-2201-2 6-31801-2205-1 6-31801-2205-2 6-31801-9096-1 6-31801-9936-1 6-31801-9936-2 6-31801-2281-4	6-31801-2190-3 DN8-15	Spare parts kit	Seat Body seal Stem thrust Seal Gland packing Disc spring Gland nut Locking clip	1 2 3 4 5 6 7	2 2 1 3 2 1 1
6-31801-2201-3 6-31801-2205-3 6-31801-9096-2 6-31801-9936-3	6-31801-2190-4 DN20				
6-31801-2201-4 6-31801-2205-4 6-31801-9113-1 6-31801-9936-4 6-31801-9965-1	6-31801-2190-5 DN25				
6-31801-2201-5 6-31801-2205-5 6-31801-9096-3 6-31801-9936-5	6-31801-2190-6 DN32				
6-31801-2201-6 6-31801-2205-6 6-31801-9113-2 6-31801-9936-6	6-31801-2190-1 DN40				
6-31801-2201-7 6-31801-2205-7 6-31801-9096-4 6-31801-9936-7 6-31801-9987-1	6-31801-2190-2 DN50				

2.2tf000741.en



2.2tf0000741.en

Component article No.	Spare part Article No.	Description	Included parts	Pos.	Qty.
6-31801-2201-8 6-31801-2205-8 6-31801-9096-5 6-31801-9936-8	6-31801-2190-7 DN65	Spare parts kit	Seat Body seal Stem thrust seal Gland packing Gland nut Locking Clip	1 2 3 4 5 6	2 2 1 2 1 1
6-31801-2201-9 6-31801-2205-9 6-31801-9096-6 6-31801-9936-9	6-31801-2190-8 DN80	Spare parts kit	Seat Body seal Stem thrust seal Gland packing Gland nut	1 2 3 4 5	2 2 1 2 1
6-31801-2202-1 6-31801-2206-1 6-31801-9096-7	6-00990410-03 DN100				
6-31801-2206-2 90503-0935	6-00990410-04 DN150				



Spare part article No.	Description	Included parts	Pos.	Qty.
90503-1416	SS DN8-15	Ball	1	1
90503-1417	SS DN20			
90503-1418	SS DN25			
90503-1419	SS DN32			
90503-1420	SS DN40			
90503-1421	SS DN50			
90503-1422	SS 44+459 DN65			
90503-1423	SS 45+459 DN80			
90503-1424	SS 45 DN100			
90503-1425	SS 459 DN100			

2.2tf000741.en

Tetra Pak

Maintenance & Spare Parts

Non-return valve

(Alfa Laval)

LKC-2



1.0 1241273-0101.fro

Tetra Pak

Doc No. 1241273-0101

Non-return valve

LKC-2

This document refers to components specified in Technical Manual, Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

1.0 1241273-0101.fro

Version 04 Issue 2008-11

Doc No. 1241273-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Non-return valve 2

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Maintenance

Non-return valve

Change seals

WARNING!

Risk of injury!
Make sure before dismantling that the pipeline is drained and free from media.

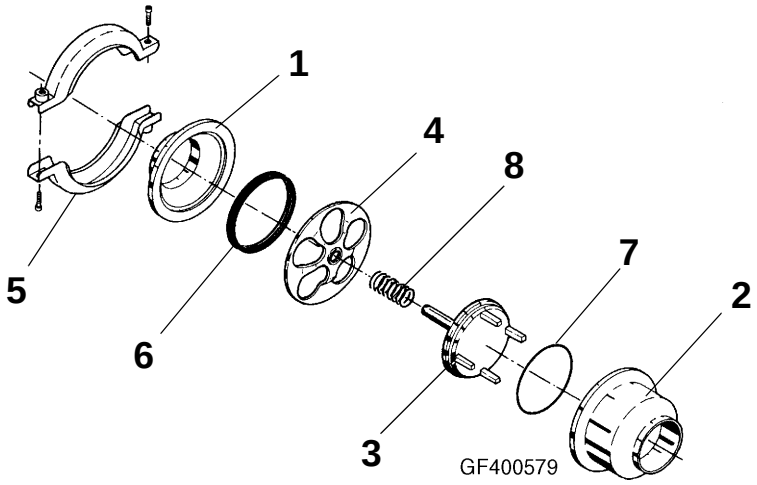
a) Disassemble the clamp ring (5) and pull apart the two coupling halves (1) and (2) to expose the valve cone (3) and guide plate (4).

b) Visually inspect the condition of the seat seal (7) and seal ring (6).

c) Change if required.

d) When assembling, ensure that the valve cone (3) is lined up with the valve body (1).

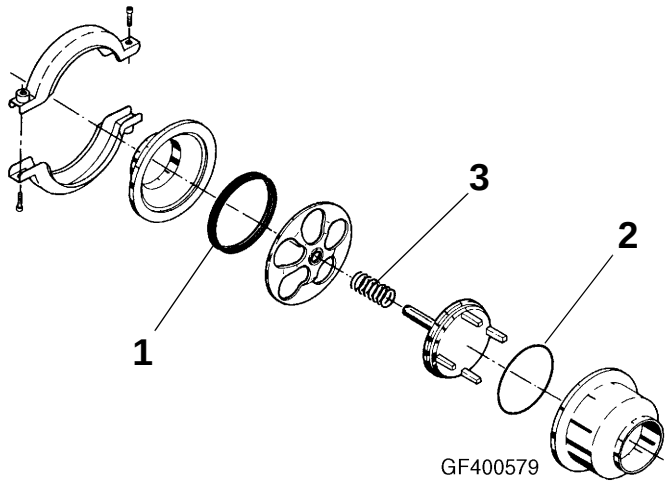
1 Valve body
2 Valve body
3 Valve cone
4 Guide plate
5 Clamp ring
6 Seal ring
7 Seat seal
8 Spring



2.2tf400419.en

Spare parts

Non-return valve



Spare part article No.	Description	Included parts	Pos.	Qty.
6-9611-92-4005	Spare parts kit, EPDM, 25mm/DN25	Seal ring O-ring	1 2	1
6-9611-92-4011	Spare parts kit, NBR, 25mm/DN25			
6-9611-92-4017	Spare parts kit, FPM, 25mm/DN25			
9611-99-1677	Spring, 25mm/DN25	Spring	3	1
6-9611-92-4006	Spare parts kit, EPDM, 38mm/DN40	Seal ring O-ring	1 2	1
6-9611-92-4012	Spare parts kit, NBR, 38mm/DN40			
6-9611-92-4018	Spare parts kit, FPM, 38mm/DN40			
9611-99-1678	Spring, 38mm/DN40	Spring	3	1
6-9611-92-4007	Spare parts kit, EPDM, 51mm/DN50	Seal ring O-ring	1 2	1
6-9611-92-4013	Spare parts kit, NBR, 51mm/DN50			
6-9611-92-4019	Spare parts kit, FPM, 51mm/DN50			
9611-99-1679	Spring, 51mm/DN50	Spring	3	1
6-9611-92-4008	Spare parts kit, EPDM, 63,5mm/DN65	Seal ring O-ring	1 2	1
6-9611-92-4014	Spare parts kit, NBR, 63,5mm/DN65			
6-9611-92-4020	Spare parts kit, FPM, 63,5mm/DN65			
9611-99-1680	Spring, 63,5mm/DN65	Spring	3	1
6-9611-92-4009	Spare parts kit, EPDM, 76mm/DN80	Seal ring O-ring	1 2	1
6-9611-92-4015	Spare parts kit, NBR, 76mm/DN80			
6-9611-92-4021	Spare parts kit, FPM, 76mm/DN80			
9611-99-1681	Spring, 76mm/DN80	Spring	3	1

2.2tf400420.en

6-9611-92-4010	Spare parts kit, EPDM, 101,6mm/DN100	Seal ring O-ring	1 2	1
6-9611-92-4016	Spare parts kit, NBR, 101,6mm/DN100			
6-9611-92-4022	Spare parts kit, FPM, 101,6mm/DN100			
9611-99-2031	Spring, 101,6mm/DN100	Spring	3	1

2.2tf400420.en

Tetra Pak

Maintenance & Spare Parts

Pressure switch

(Endress + Hauser)
Ceraphant T PTP31/PTP35



1.0 1218198-0101.fro

Tetra Pak

Doc No. 1218198-0101

Pressure switch

Ceraphant T PTP31/PTP35

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1.0 1218198-0101.fro

Version 01

Doc No. 1218198-0101

Tetra Pak

Tetra Pak Processing Systems AB

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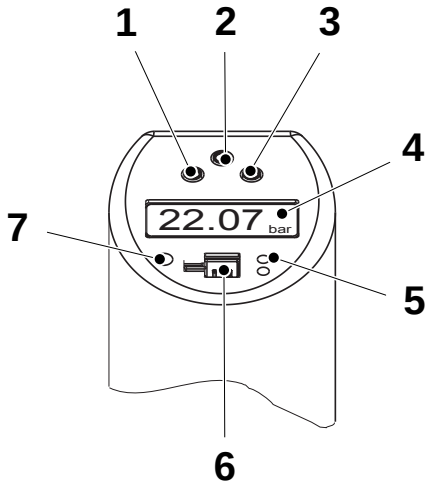
1.0 1218198-0101.TOC

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Maintenance

Description

The Ceraphant T is a pressure switch for measuring and monitoring absolute and gauge pressures. The pressure switch is equipped with a piezoresistive measuring cell and metallic measuring diaphragm. The switch also comes in a hygienic version.



1 Operating key “-”
2 Operating key “E”
3 Operating key “+”
4 Digital display
5 Switching status LED, yellow
6 Communications jack for PC
7 Status LED

Switching status LED yellow:
LED on = switch closed
LED off = switch open

LED for status:
Green = OK
Red = error
Red/ green - flashing = warning

2.2Tf503581.en

Change transmitter

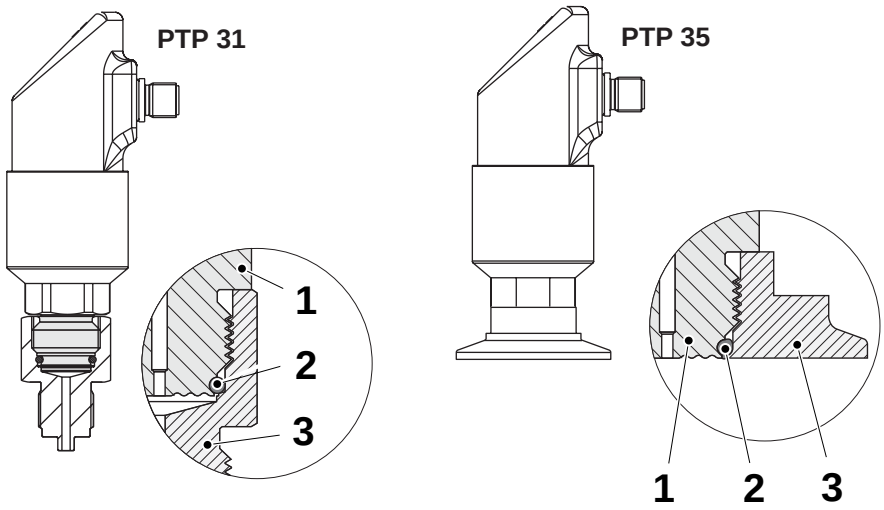
WARNING!

Risk of injury!
Make sure that the pipelines are drained and free from media before changing the transmitter!
Never change the transmitter when it is hot!

WARNING!

Risk of injury!
Shut off the power supply before changing the transmitter!

a) Disconnect the transmitter wires (1) at the plug (2).
b) Remove the transmitter (3) from the process connection.
c) Change the transmitter.
d) Reassemble in reverse order.



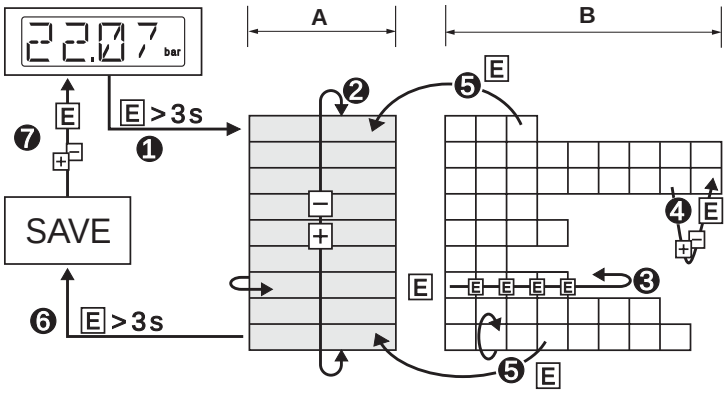
2.2Tf503581.en

1 Cover lid
2 Transmitter wires
3 Terminal
4 Cable bushing
5 Transmitter
6 Process connection

Navigating in the operating menu

A Function group selection
B Function selection





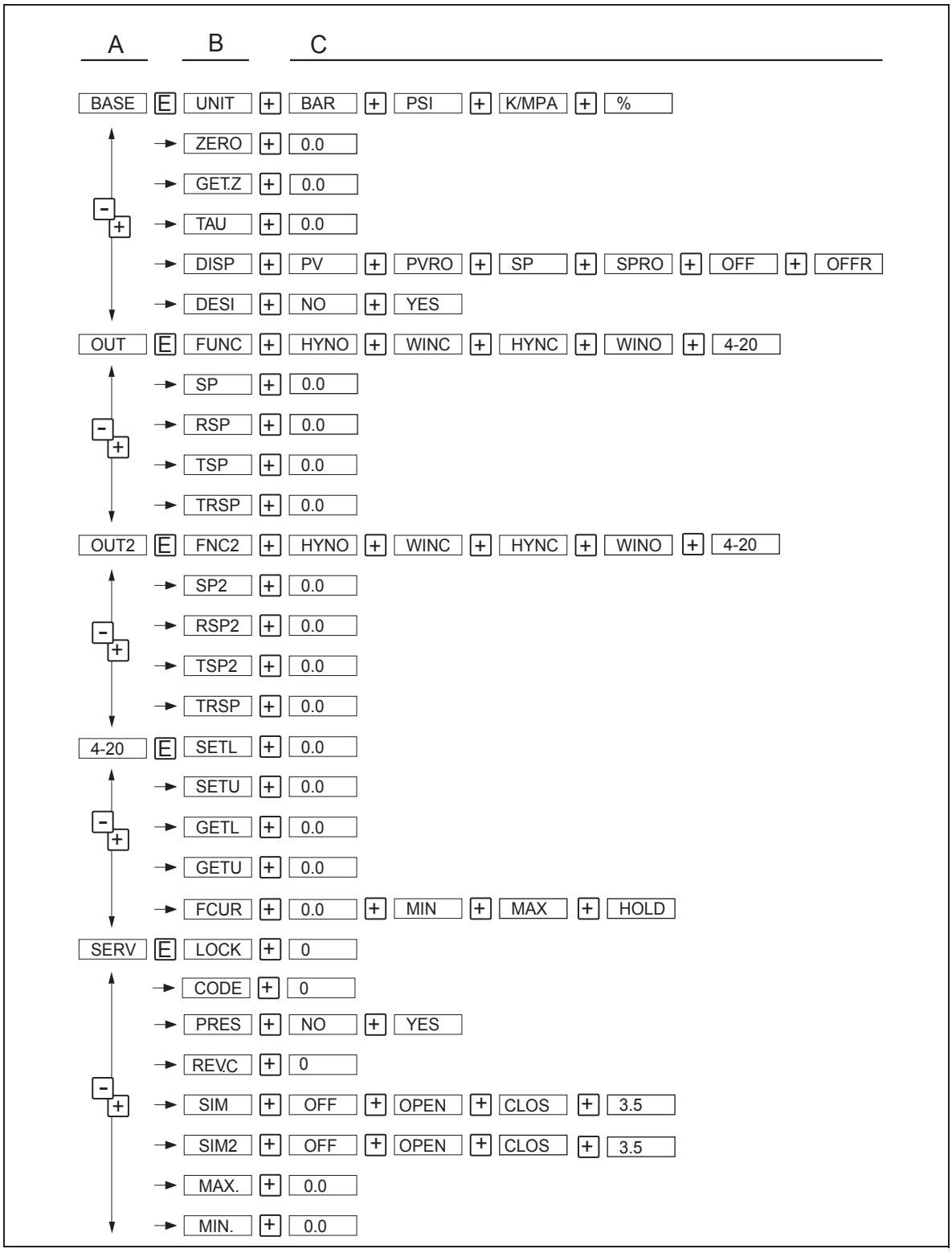
1. Enter the operating menu
   – Press the E key for longer than 3 s
2. Select the "Function group" with the + or - key
3. Select the "Function" with the E key
4. Enter or change parameters with the + or - key
   – Then return to "Function" with the E key Note: If software locking is enabled, it must be disabled before making entries or changes by entering the code selected
5. Press the E key several times to return to the "Function group"
6 Jump back to the measuring position (Home position)
   – Press the E key for longer than 3 s
7. Query to save data (select "YES" or "NO" with the + or - key)
   – Confirm with the E key

Note! Changes to the parameter settings only become effective if you choose "YES" when asked to save data.

2.2Tf503581.en

Operating menu structure

The structure below shows all the possible fields of the operating menu.



2.2Tf503581.en

Trouble-shooting

Errors and warnings

If an error in the device occurs, the colour of the status LED changes from green to red and the background illumination of the digital display changes from white to red.

The display shows:

- E-code for errors.

In the event of an error message, the measured value is uncertain.

Code	Explanation
E011	Device configuration faulty
E012	Error in measurement or underreach/overreach in SIL mode
E015	Error in EEPROM
E019	Power supply has undervoltage/overvoltage
E020	Error in Flash
E021	Error in RAM
E025	Switching contact 1 is not open although it should be
E026	Switching contact 2 is not open although it should be

- W-code for warnings.

In the event of a warning, the measured value is reliable.

Code	Explanation
W107	Simulation active
W202	Pressure outside the sensor range (not SIL mode)
W209	Device starts
W210	Configuration modified
W212	Sensor signal outside the permitted range (not SIL mode)
W250	Number of switch cycles exceeded
W270	Short-circuit at output 1
W280	Short-circuit at output 2

2.2Tf503581.en

Spare Parts

Not applicable for this component!

2.2TF500785.EN

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2.2TF500785.EN

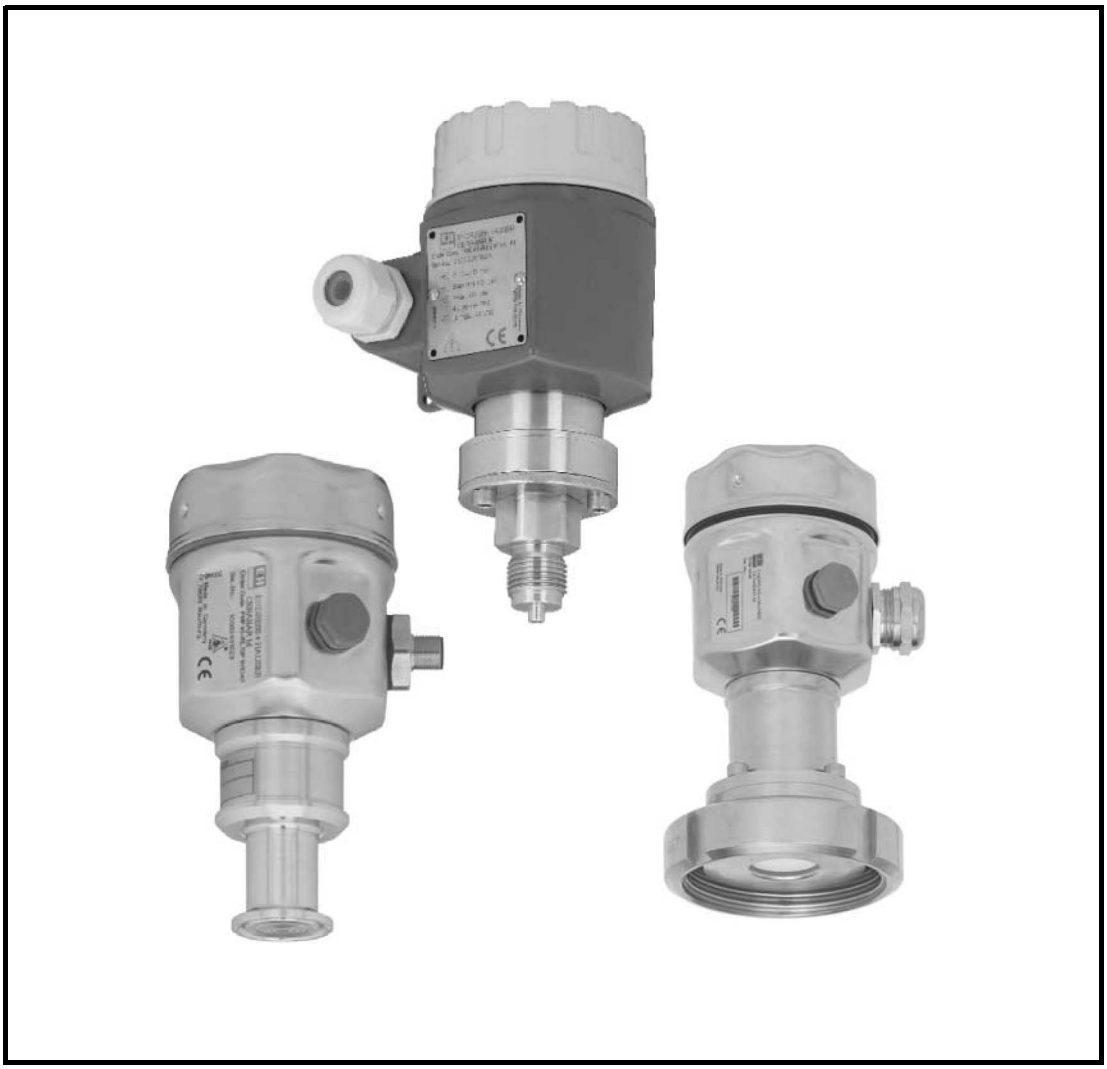
Tetra Pak

Maintenance & Spare Parts

Pressure transmitter

(Endress + Hauser)

Cerabar M PMC/PMP 41 - 48



1.0 1218205-0101.fro

Tetra Pak

Doc No. 1218205-0101

Pressure transmitter

Cerabar M PMC/PMP 41 - 48

This document refers to components specified in Technical Manual, Maintenance & Spare Parts CD/ DVD or on Tetra Pak Intranet.

1.0 1218205-0101.fro

Version 02 Issue 200611

Doc No. 1218205-0101

Tetra Pak

Tetra Pak Processing Systems AB

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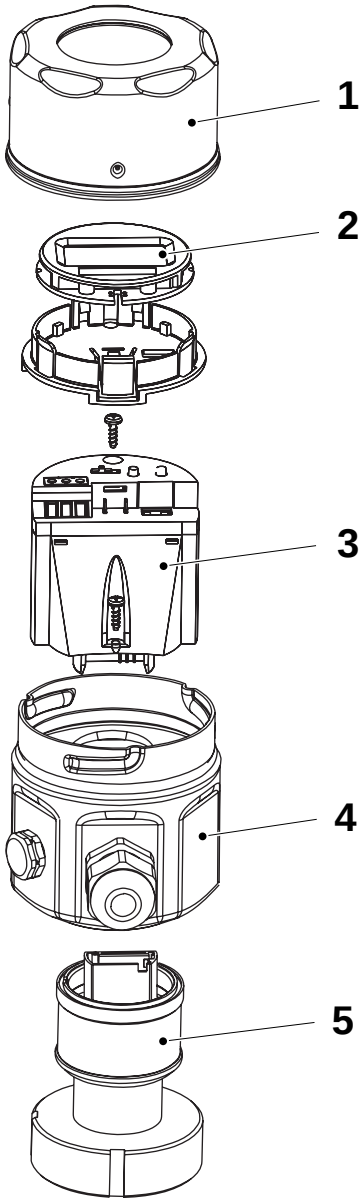
1.0 1218205-0101.TOC

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Maintenance

Description

The PMC 45, PMP 41, PMP 45, PMP 46 and PMP 48 Cerabar M is a hygienic differential pressure transmitter. The pressure transmitter can measure liquids, gases and vapours. Furthermore, the pressure transmitter is operated by various types of electronics.



1 Cover
2 Display
3 Electronic insert
4 Housing
5 Process connection

The transmitter with its electronic equipment and membrane is calibrated together. This implies that if any of those parts is damaged the whole transmitter must be replaced.

2.2Tf503590.en

Change transmitter

WARNING! **Risk of injury!**
Make sure that the pipelines are drained and free from media before changing the transmitter!
Never change the transmitter when it is hot!

WARNING! **Risk of injury!**
Shut off the power supply before changing the transmitter!

a) Unscrew the cover (1) from the housing.
b) Remove the display and the electronic insert to access the terminal chamber.
c) Disconnect the transmitter wires (2) from the terminal (3), mark the wires.

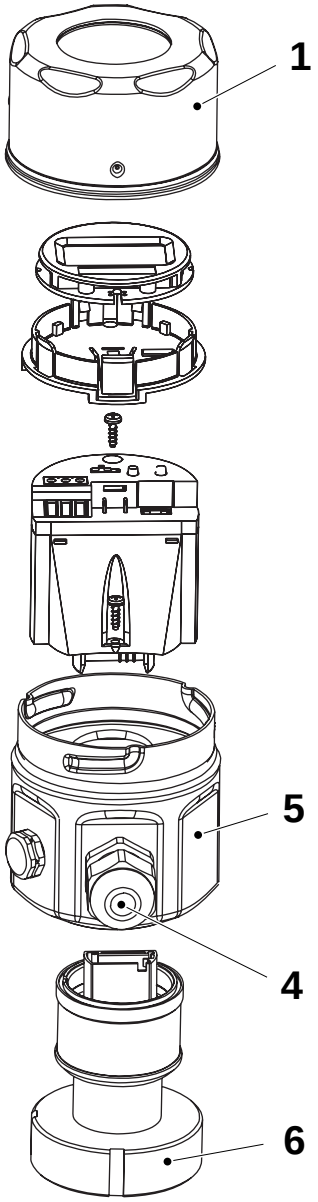
Note! Make sure to isolate the cable wires to avoid short circuit.

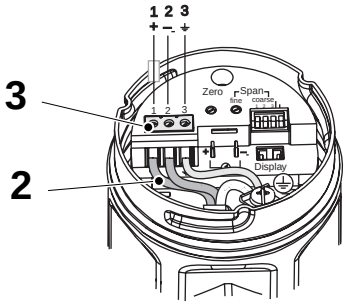
d) Pull out the transmitter cable through the cable bushing (4).
e) Remove the transmitter (5) at the process connection (6).
f) Change the transmitter.
g) Reassemble in reverse order.

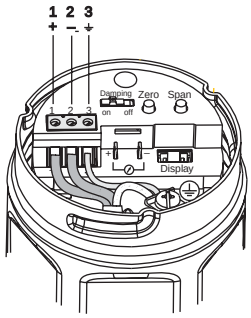
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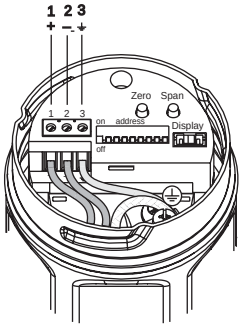
2.2Tf503590.en

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1 Cover
2 Transmitter wires
3 Terminal
4 Cable bushing
5 Transmitter
6 Process connection

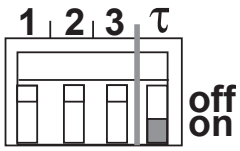
2.2Tf503590.en

Calibrating

Analogue electronics

a) Prepare for calibration as follows:
   - Connect up electrically the pressure transmitter.
   - Connect a multimeter (4-20 mA) to the connection terminals provided.
   - Ensure that a pressure can be generated within the required measuring range.

b) Set the damping on the DIP switches as follows:



off = damping 0 sec
on = damping 2 sec

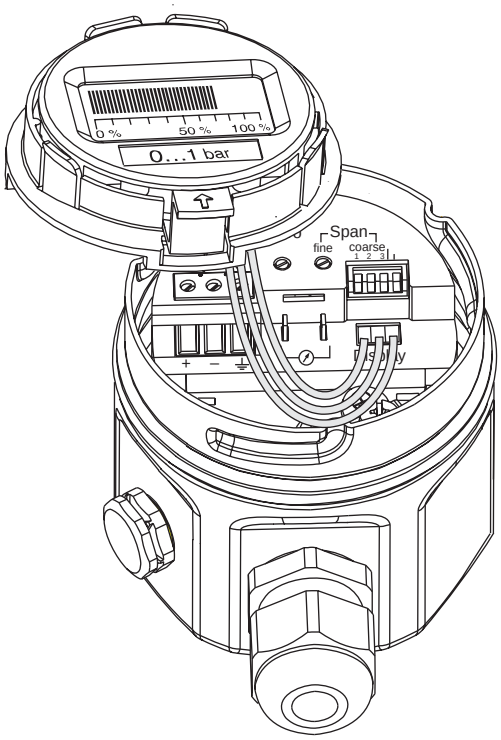
c) Zero point calibration is carried out using the potentiometer for zero point adjustment. Carry out the zero point adjustment as follows:
   - Enter exactly 0 bar for the zero point (ambient pressure for gauge measurements or vacuum for absolute measurements).
   - Adjust the multimeter to exactly 4 mA.

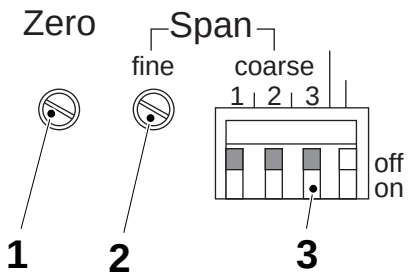
d) Three DIP switches are available for course adjustment of the measuring span. Depending on the switch position, a measuring range spread (also known as turndown or TD) can be selected for 1:1 (to 2:1), 3:1, 6:1 or 10:1. Fine adjustment is carried out using the fine adjustment potentiometer of the measuring span. Carry out the measuring span adjustment as follows:
   - Enter exactly the pressure required for the measuring span.
   - Adjust the multimeter to exactly 20 mA. Proceed as follows:
     Limit the measuring span by selecting one of the measurement range spreads using the DIP switches for coarse adjustment.
     Adjust exactly the measuring span required using the potentiometer for fine adjustment of the measuring span.

(Cont'd)

2.2Tf503590.en

(Cont'd)

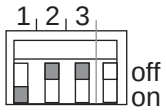




TD 1:1



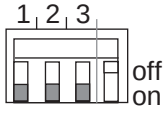
TD 3:1



TD 6:1



TD 10:1



(Cont'd)

2.2Tf503590.en

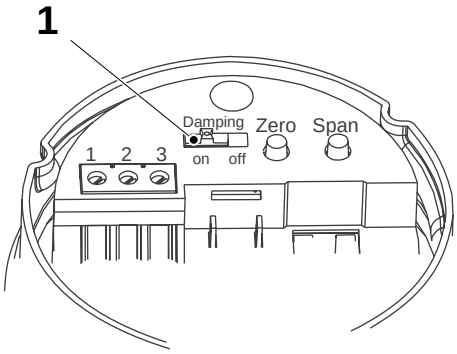
(Cont'd)

HART electronics

a) Prepare for calibration as follows:
   - Connect the pressure transmitter electrically.
   - Connect a multimeter (4-20 mA) to the connection terminals provided (if the digital display is not connected).
   - Ensure that a pressure can be generated within the required measuring range.

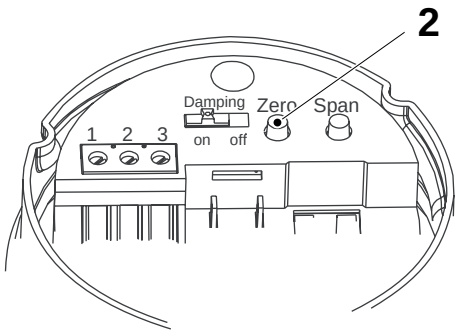
b) Set the damping via the switch (1) on the electronic insert.

off = damping 0 sec
on = damping 2 sec



1 Damping switch

c) Use the “Zero” key (2) to call up the lower range value currently saved or to calibrate the lower range value.
   - Press the “Zero” key to call up the lower range value.
   - Calibrate the lower range value:
     1. Specify the exact pressure for the lower range value (zero point).
     2. Press the “Zero” key.
     3. Release the key and press the key a second time within approx. 2 s. Hold down the key for 3 to 4 seconds.



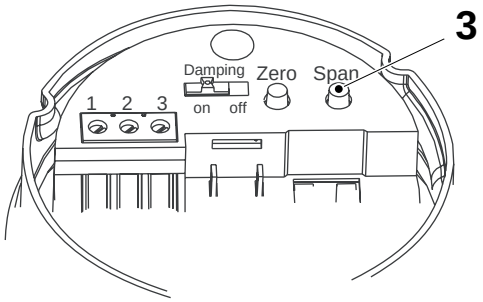
2 Zero key

2.2Tf503590.en

(Cont'd)

(Cont'd)

d) Use the “Span” key (3) calibrate the upper range value.
   - Specify the exact pressure for the upper range value.
   - Press the “Span” key.
   - Release the key and press the key a second time within approx. 2 s. Hold down the key for 3 to 4 seconds.The available pressure is now adopted as the new upper range value.



3 Span key

The Zero and Span keys can also be used to reset to the factory setting:

- Press the Zero and Span keys simultaneously.
- Release the keys, press them a second time within 2 seconds and hold them for at least 7 seconds.

(Cont'd)

2.2Tf503590.en

(Cont'd)

PROFIBUS electronics

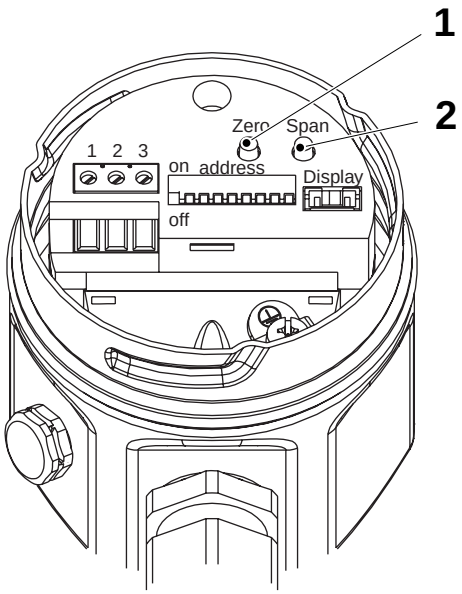
a) Prepare for calibration as follows:
   - Connect the pressure transmitter electrically.
   - Ensure that a pressure can be generated within the required measuring range.

Note! Use the “Zero” and “Span” keys to set the lower range value and upper range value of the bar graph of the display module. These settings do not have any effect on the digital output value or on the measured value.

b) Proceed as follows when calibrating the lower range value:
   - Specify exactly the pressure for the lower range value.
   - Press the Zero key twice.
     The acting pressure is adopted as the lower range value.
     By pressing the Zero key once the value saved as the lower range value can be output on the digital display.

c) Proceed as follows when calibrating the upper range value:
   - Specify exactly the pressure for the upper range value.
   - Press the Span key twice.
     The acting pressure is adopted as the upper range value.
     By pressing the Span key once, the value saved as the upper range value can be output on the digital display.

2.2Tf503590.en



1 Zero key
2 Span key

Spare Parts

Not applicable for this component!

2.2TF000880.en

Tetra Pak

Maintenance & Spare Parts

Flow transmitter

(Endress&Hauser)

Promag 10/50/53/55



1.0 1218415-0101.fro

Tetra Pak

Doc No. 1218415-0101

Flow transmitter

Promag 10/50/53/55

This document refers to components specified in Technical Manual, on Maintenance & Spare Parts CD/DVD or on Tetra Pak Intranet.

1.0 1218415-0101.fro

Version 07 Issue 2011-03

Doc No. 1218415-0101

Tetra Pak

Tetra Pak Processing Systems AB

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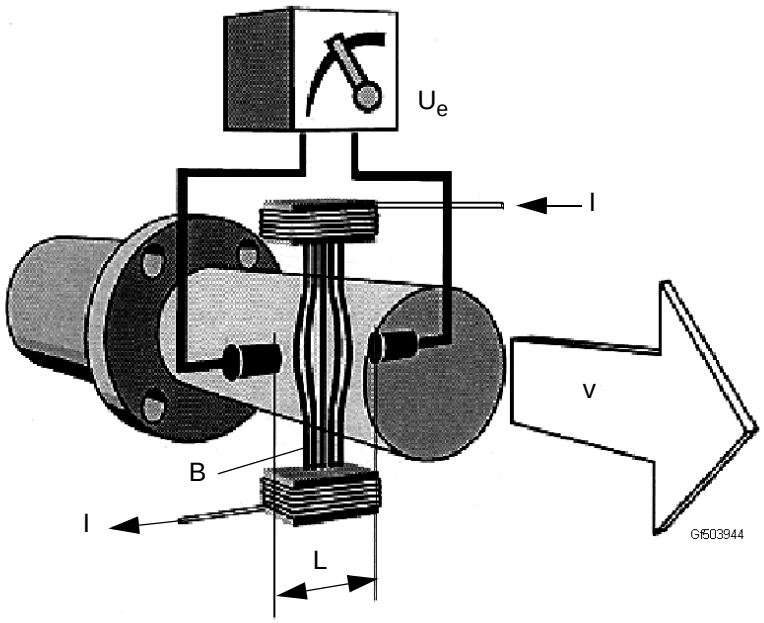
Function description

General

This flow transmitter is using Faraday’s law of induction which states that a voltage is induced in a conductor moving in a magnetic field. In electromagnetic measuring, the flowing medium corresponds to the moving conductor. The induced voltage is proportional to the flow speed and is detected by two measuring electrodes and transmitted to the amplifier. Flow volume is computed on the basis of the pipe's diameter. The constant magnetic field is generated by a switched direct current of alternating polarity.

The measuring system consists of a transmitter and a sensor which form a single mechanical unit. Promag has a touch control used without opening the housing, and has a four-line display.

2.2Tf503725.en

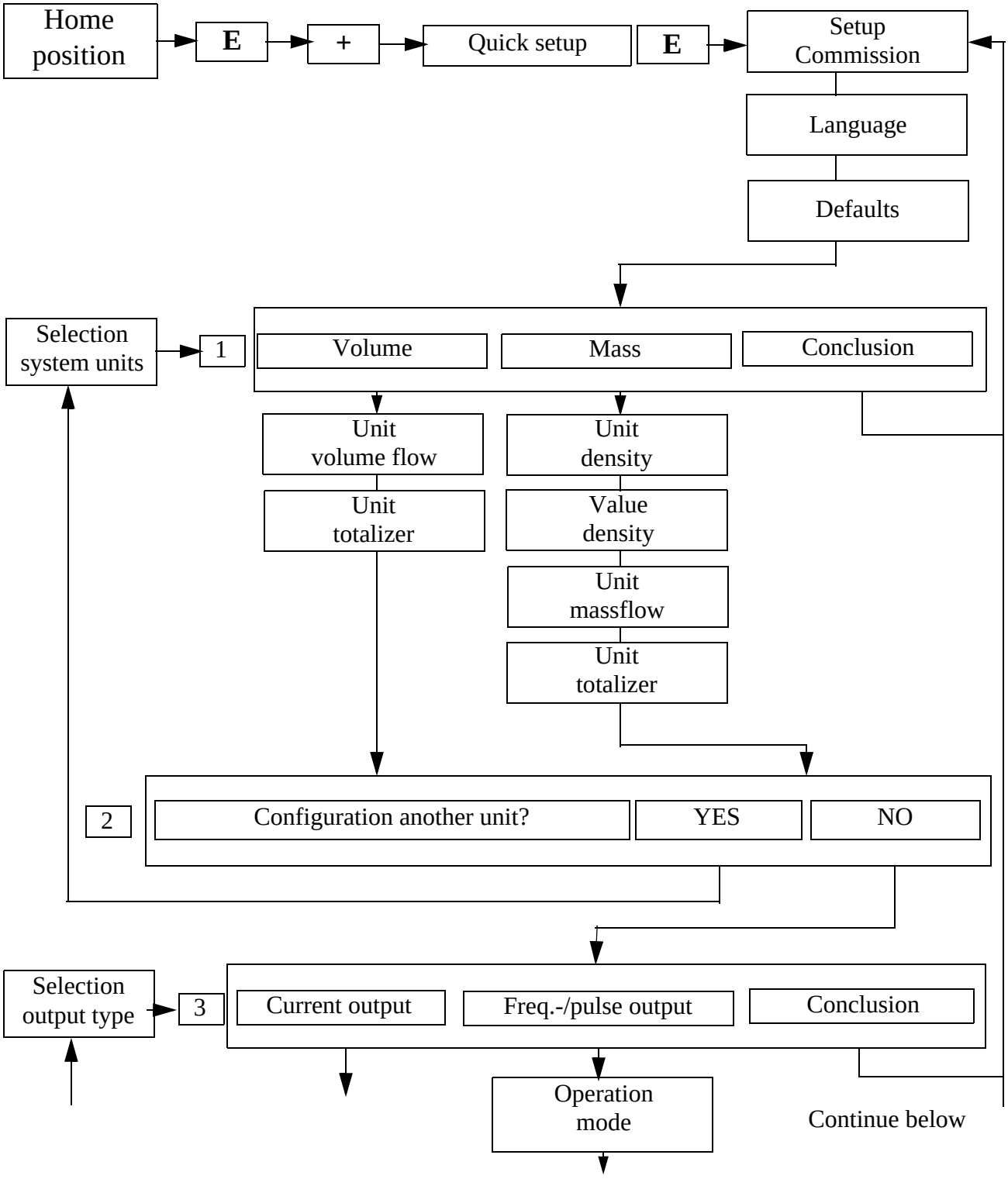


$U_e = B \times L \times v$
$Q = A \times v$

U_e = Induced voltage
B = Magnetic induction (magnetic field)
L = Electrode gap
v = Flow speed
Q = Volume flow
A = Pipe cross-section
I = Current strength

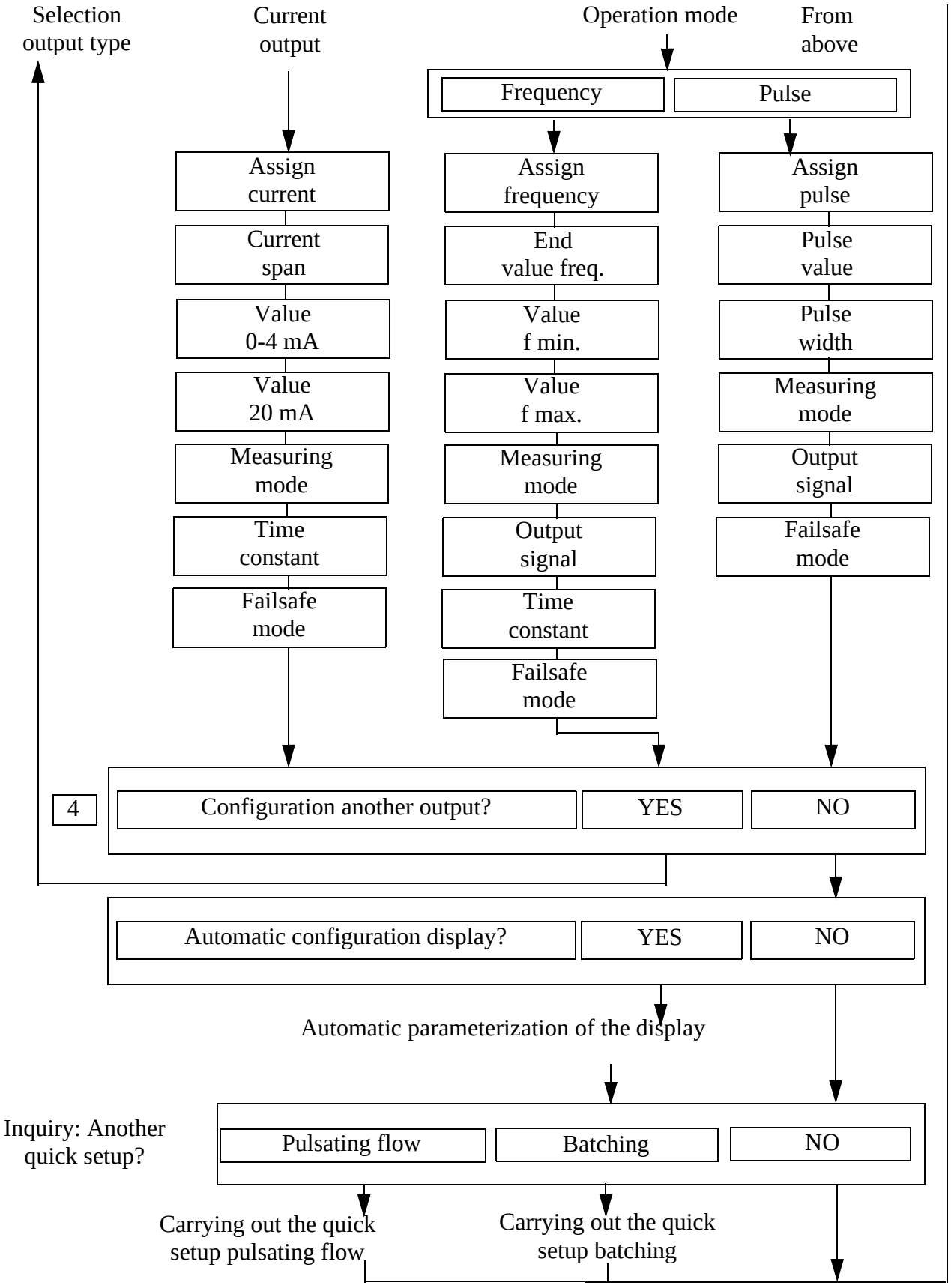
Setup

Also continuing below



(Cont'd)

(Cont'd)



2.2Tf503725.en

Operation display

The local display (17) enables you to read all important parameters directly at the measuring point and configure the device using the setup (see chapter Setup) or the function matrix (see below in Function matrix).

The display as it appears when normal measuring is in progress is known as the HOME position, operating mode.

Keys

Plus / minus keys

- HOME position, direct access to totalizer values and actual values of inputs /output.
- Enter numerical values, select parameters.
- Select different blocks, groups or function groups within the function matrix.

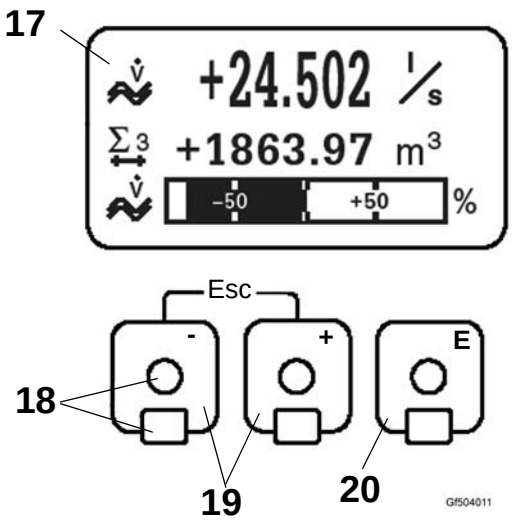
Press the +/- keys simultaneously to trigger the following functions:

- Exit the function matrix step by step, HOME position.
- Press and hold down +/- keys for longer than 3 seconds. Return directly to the home position.
- Cancel data entry.

Enter key

- HOME position, entry into the function matrix.
- Save the numerical values you enter or settings you change.

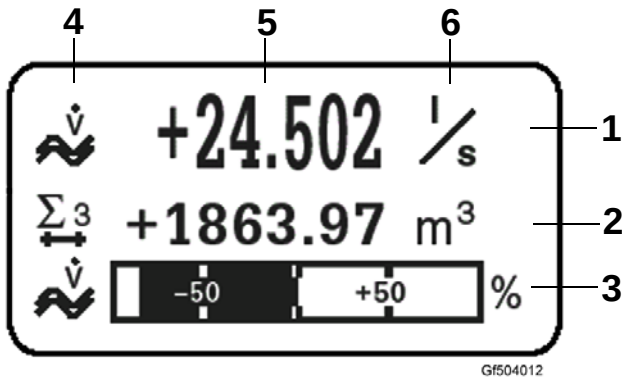
2.2Tf503725.en



17 Display
18 Optical sensors for touch control
19 Plus / minus keys
20 Enter key

Display (operation mode)

The display area consists of three lines in all; this is where measured values are displayed, and/or status variables (direction of flow, partially filled pipe, barg raph, etc.).



1 Main line shows primary measured values, e.g. volume flow in [l/s].
2 Supplementary line shows supplementary measured variables, e.g. totalizer No. 3 in [m3].
3 Information line shows additional information on the measured variables, e.g. bar graph of the limit value reached by the volume flow.
4 Info icons field: Icons representing additional information on the measured values are shown in this field.
5 Measured values field: The current measured values appear in this field.
6 Unit of measure field: The units of measure and time defined for the current measured values appear in this field.

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Function matrix

a) HOME position -> E -> enter the function matrix.

b) Select a block (e.g. OUTPUTS).

c) Select a group (e.g. CURRENT OUTPUT 1).

d) Select a function group (e.g. CONFIGURATION).

e) Select a function (e.g. TIME CONSTANT).

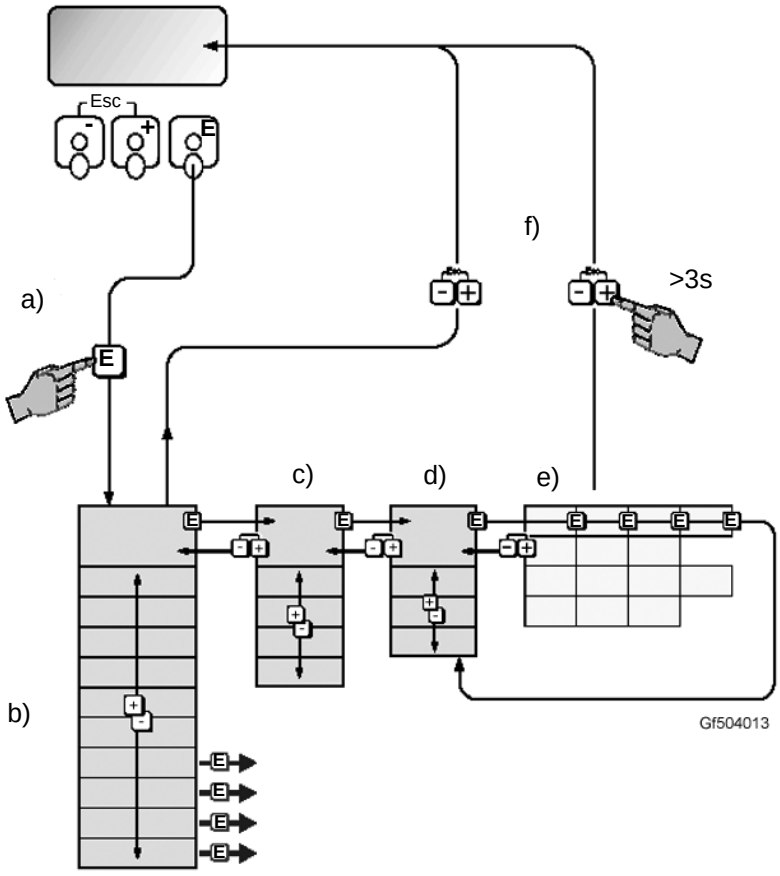
Change parameter / enter numerical values:

+ - -> Select or enter enable code, parameters or numerical values.

E -> Save your entries.

f) Exit the function matrix:

- Press and hold down Esc key - + for longer than 3 seconds -> HOME position.
- – Repeatedly press Esc key - + -> return step by step to HOME position.



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Maintenance

WARNING! **Risk of electrical shock!**
Connect the protective conductor to the ground terminal on the transmitter before the power supply is applied (not necessary if the power supply is galvanically isolated)!

WARNING! **Risk of injury!**
Make sure before dismantling that the pipeline is drained and free from media!

WARNING! **Risk of burns!**
Never service the flow meter when it is hot!

Wiring

Always disconnect supply circuits prior to changing any parts. 24 V supply can cause damage to the equipment if not switched off!

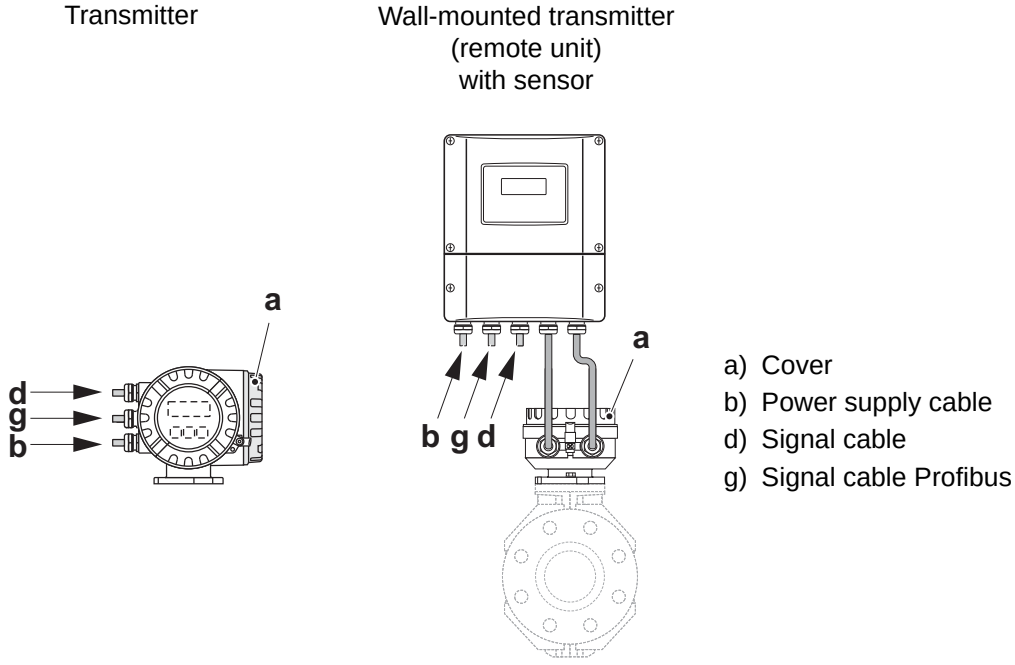
a) Unscrew and remove the cover (a) of the transmitter or sensor junction box.

b) Disconnect the wires from the terminals. Disconnection between remote display and sensor: see next chapter.

c) Unscrew cable glands. Remove the power supply cable (b), signal cables (d) and (g) if it is Profibus interface.

d) Assemble in reverse order. Connect the wires (3) in accordance with the graphic below. Screw the cover (1) firmly onto the transmitter.

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a) Cover of the connection compartment

b) Cable for power supply: 85...260 V AC, 20...55 V AC,16...62 V DC
Terminal No. 1: L1 for AC, L+ for DC
Terminal No. 2: N for AC, L- for DC

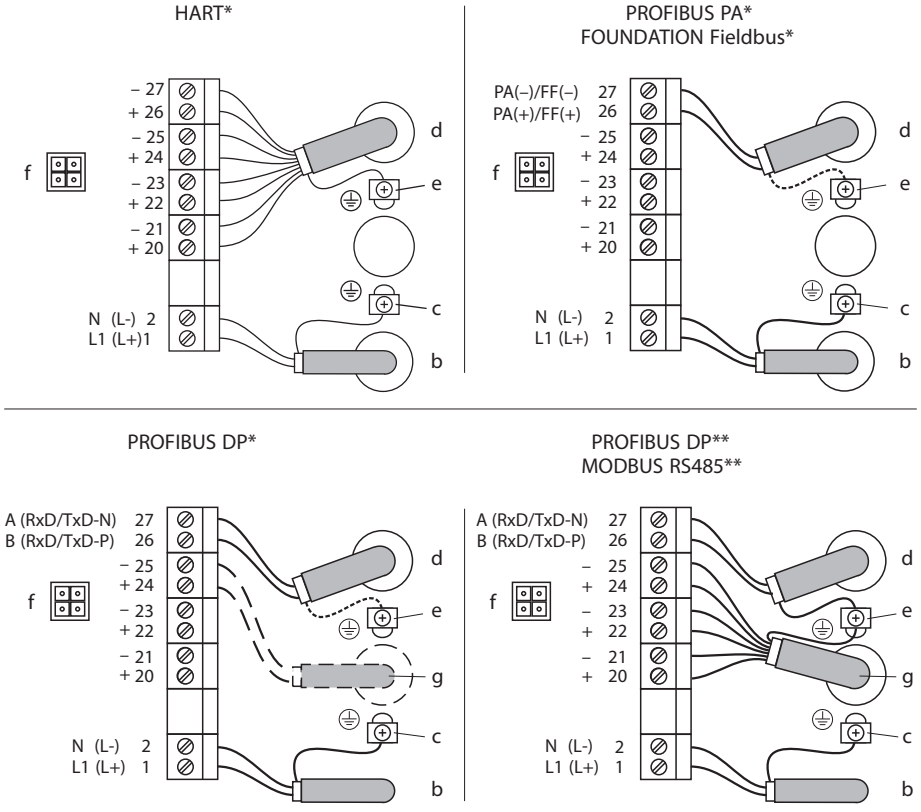
c) Ground terminal for protective conductor

d) Signal cable. Fieldbus cable:
Terminal No. 26: DP (A) / PA (+) / FF (+) / MODBUS RS485 (A) / (PA, FF: with reverse polarity protection)
Terminal No. 27: DP (B) / PA (-) / FF (-) / MODBUS RS485 (B) / (PA, FF: with reverse polarity protection)

e) Ground terminal for signal cable shield / Fieldbus cable / RS485 line

f) Service connector for connecting service interface FXA 193

g) Signal cable. Cable for external termination (only for PROFIBUS DP with fixed assignment communication board):
Terminal No. 24: +5 V
Terminal No. 25: DGND

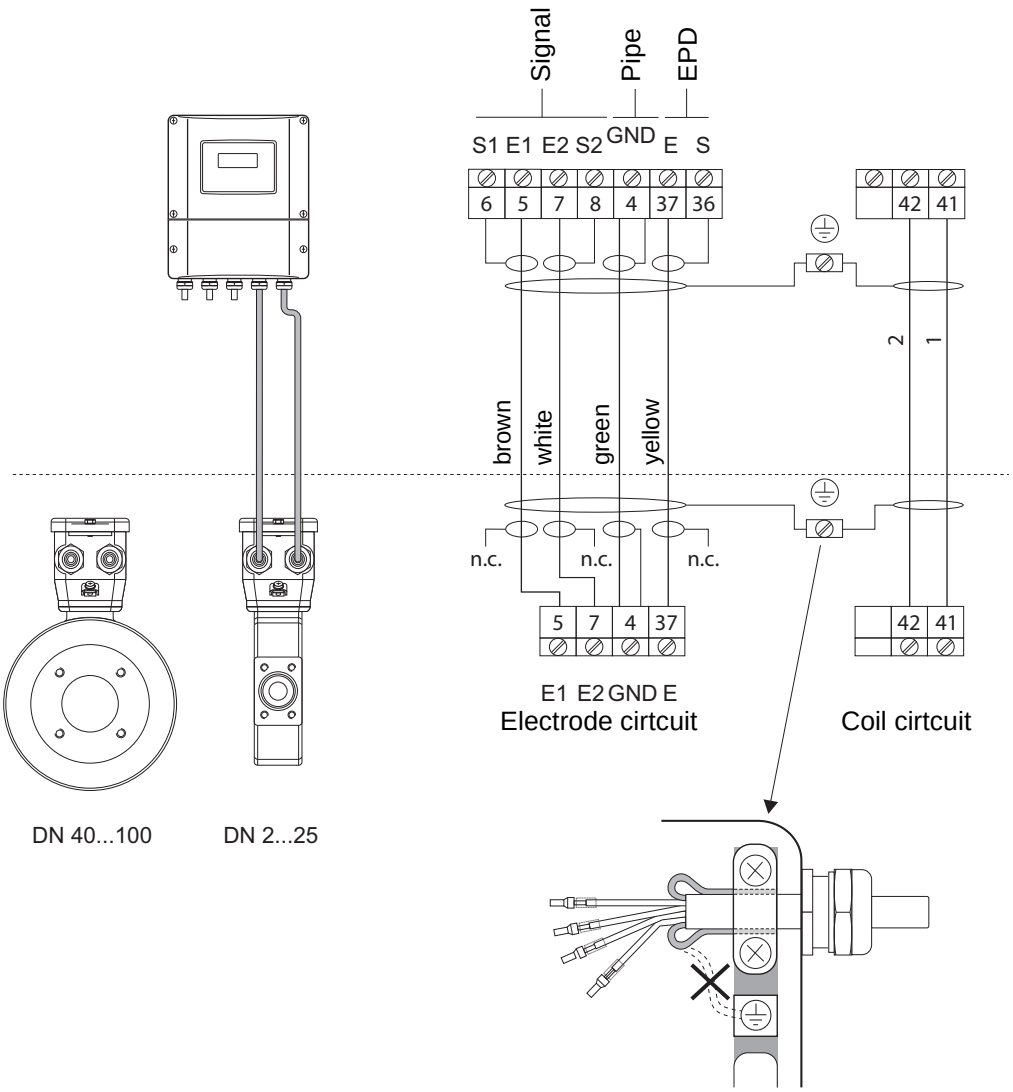


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*) not changeable communication board

**) changeable communication board

Wiring remote version



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Change transmitter

WARNING! **Risk of injury!**
Make sure before dismantling that the pipeline is drained and free from media!

WARNING! **Risk of burns!**
Never service the flow meter when it is hot!

Caution! Always disconnect supply circuits prior to changing any parts. 24 V supply can cause damage to the equipment if not switched off!

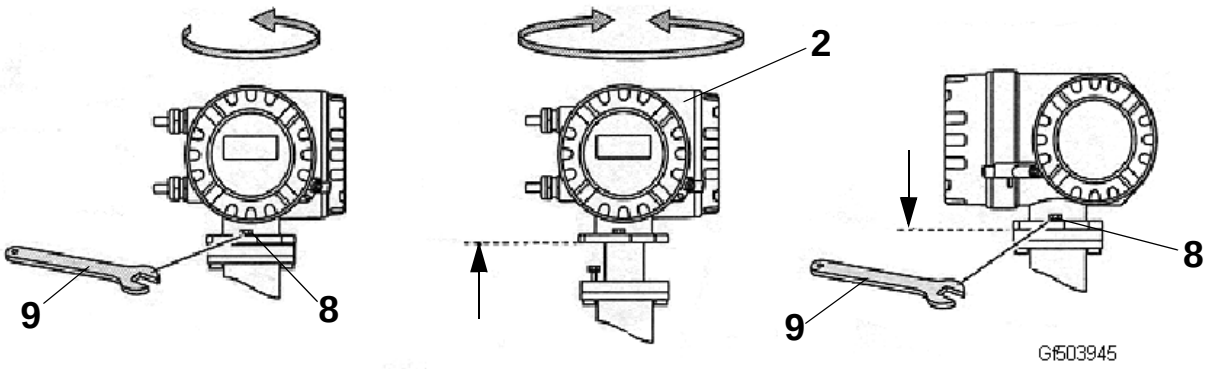
Disassemble

a) Loosen the wiring, see chapter **Wiring**.
b) Loosen the two securing screws (8) with a cap key (9).
c) Turn the bayonet catch, on the transmitter (2), as far as it will go.
d) Carefully lift the transmitter as far as it will go.

Assemble

e) Turn the transmitter (2) to the desired position (max. 2 x 90° in either direction).
f) Lower the transmitter into position and re-engage the bayonet catch, on the transmitter.
g) Retighten the two securing screws (8).

2.2Tf503726.en



2 Transmitter
8 Securing screw
9 Cap key

Change sensor

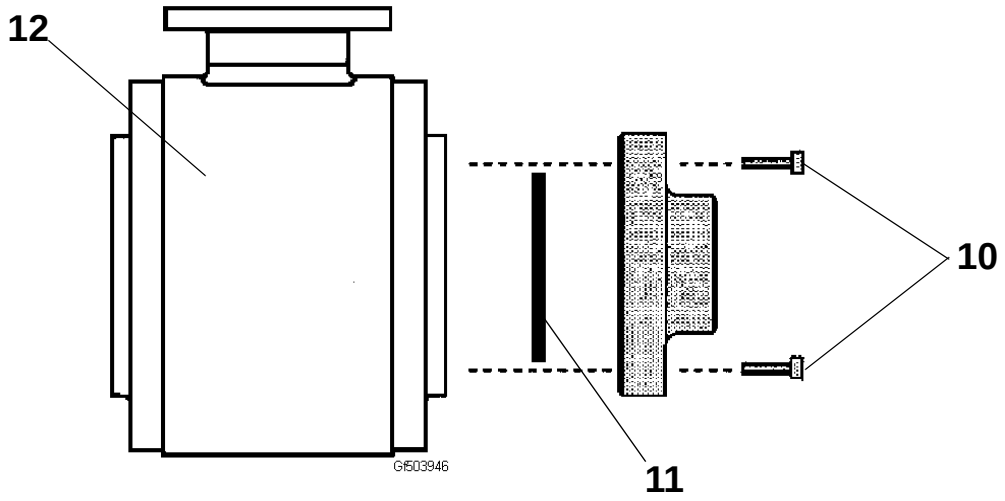
WARNING! **Risk of injury!**
Make sure before dismantling that the pipeline is drained and free from media!

WARNING! **Risk of burns!**
Never service the flow meter when it is hot!

Caution! Always disconnect supply circuits prior to changing any parts. 24 V supply can cause damage to the equipment if not switched off!

a) Loosen the wiring, see chapter **Wiring**.
b) Loosen the transmitter, see chapter **Change transmitter**.
c) Unscrew the bolts (10) with a cap key or a wrench.
d) Change seals (11).
e) Change sensor (12).
f) Assemble in reverse order, make sure that the seals are clean and correctly centered. Fully tighten the bolts. The process connection forms a metallic connection with the sensor, which ensures a defined compression of the seal.

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10 Bolt
11 Seal
12 Sensor

Change display

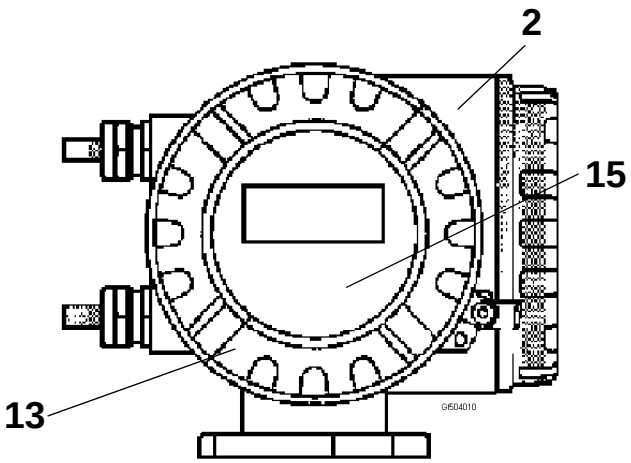
a) Remove the display cover (13) of the transmitter (2).

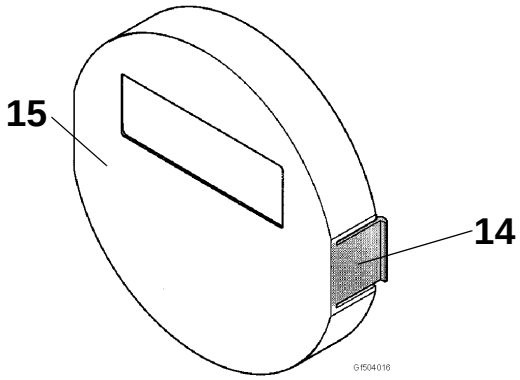
b) Press the side latches (14) on the display module (15) and remove it from the display cover.

c) Rotate the display module to the desired position (max. 4 x 45° in each direction), and place it back into the display cover.

d) Screw the display cover firmly onto the transmitter.

e) Assemble in reverse order.





2 Transmitter
13 Display cover
14 Side latches
15 Display module

2.2Tf503726.en

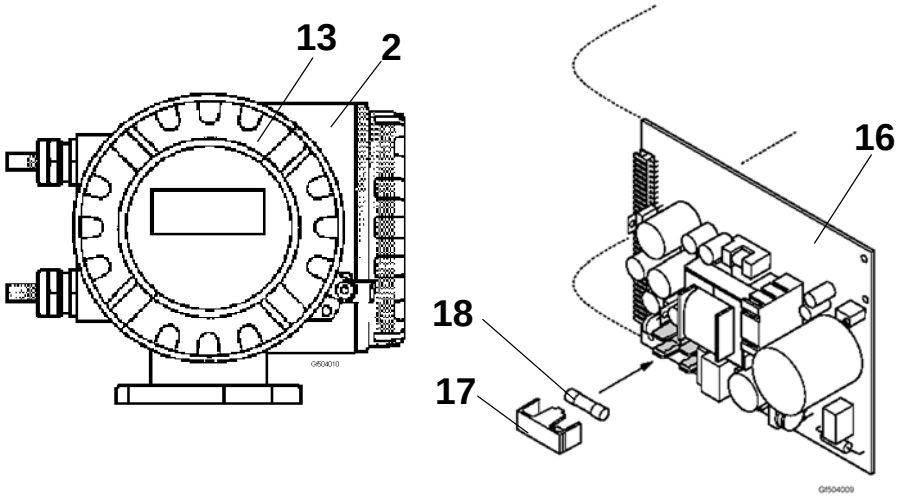
Change fuse

DANGER!

Risk of electrical shock!
Always disconnect supply circuits prior to changing any parts!

The procedure for replacing the fuse is as follows:

a) Switch off power supply.
b) Unscrew the display cover (13) from transmitter (2)
c) Remove the power supply board (16).
d) Remove cap (17) and replace the device fuse (18).
e) Assemble in reverse order.



2 Transmitter
13 Display cover
16 Power supply board
17 Cap
18 Device fuse

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Cleaning

When cleaning the exterior of measuring devices, always use cleaning agents that do not attack the surface of the housing and the seals.

Troubleshooting

Errors which occur during commissioning or measuring operation are displayed immediately. If two or more system or process errors occur, the error with the highest priority is the one shown on the display.

Always start troubleshooting with the checklists below, if faults occur after start-up or during operation. The routine takes you directly to the cause of the problem and the appropriate remedial measures.

Display

Check	Action
No display visible and no output signals present.	- Check the power supply terminals 1, 2. - Check the power line fuse. - Measuring electronics defective.
No display visible, but output signals are present.	- Check whether the ribbon-cable connector of the display module is correctly plugged into the amplifier board. - Display module defective. - Measuring electronics defective.
Display texts are in a foreign language.	Switch off power supply. Press and hold down both the [+] [-] buttons and switch on the measuring device. The display text will appear in English (default) and is displayed at maximum contrast.
Measured value indicated, but no signal at the current or pulse output	Measuring electronics defective

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Error messages on display

Errors which occur during commissioning or measuring operation are displayed immediately. Error messages consist of a variety of icons. The meanings of these icons are as follows (example):

- Error type: **S** = system error, **P** = process error
- Error message type: **Flash symbol** = fault message, **!** = notice message
- **Empty pipe** = Type of error, e.g. measuring tube is only partly filled or completely empty
- **03:00:05** = duration of error occurrence (in hours, minutes and seconds)
- **# 401** = error number

The measuring system distinguishes between two types of errors:

- System errors: This group comprises all device errors, e.g. communication errors, hardware errors, etc.
- Process errors: This group comprises all application errors, e.g. empty pipe, etc.

Caution! The measuring system interprets simulations and positive zero return as system errors, but displays them as notice messages only.

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Error number	Type of error
001 - 399	System error (device error) has occurred.
501 - 699	
401 - 499	Process error (application error) has occurred.

Error message type

Users have the option of weighting certain errors differently, having them classed as “Fault messages” or “Notice messages”. You can define messages in this way with the aid of the function matrix, see chapter **Function matrix** in Function description.

Serious system errors, e.g. module defects, are always identified and classed as “fault messages” by the measuring device.

Notice message (!)

- Displayed as -> Exclamation mark (**!**), error type (**S**: system error, P: process error).
- The error in question has no effect on the inputs or outputs of the measuring device.

Fault message (Flash symbol)

- Displayed as -> Lightning flash (**Flash symbol**), error type (S: system error, **P**: process error).
- The error in question has a direct effect on the inputs or outputs. The response of the inputs or outputs (failsafe mode) can be defined by means of functions in the function matrix, see chapter **Function matrix** in Function description.

Note! For security reasons, error messages should be output via the relay outputs.

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Confirming error messages

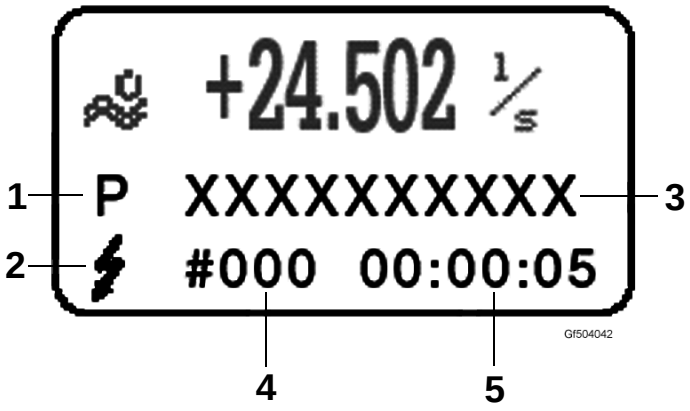
For the sake of plant and process safety, the measuring device can be configured in such a way that fault messages (**Flash symbol**) always have to be rectified and acknowledged locally by pressing E. Only then do the error messages disappear from the display.

Note!

- Fault messages (**Flash symbol**) can also be reset and confirmed via the status input.
- Notice messages (**!**) do not require acknowledgment. Note, however, that they remain visible until the cause of the error has been rectified.

(Cont'd)

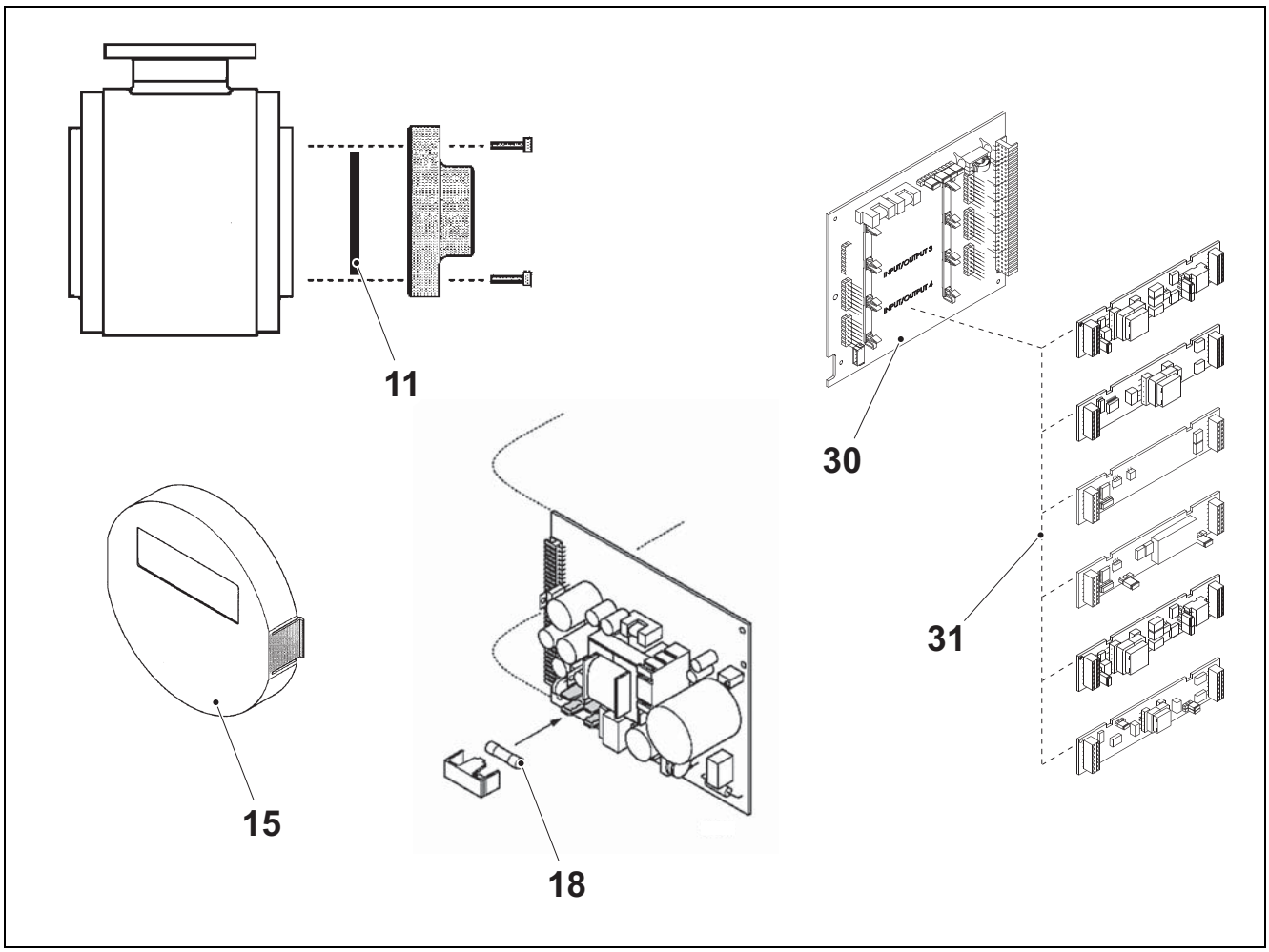
(Cont'd)



1 Error type: Type **P** = process error, **S** = system error
2 Error message type: **Flash symbol** = fault message, **!** = notice message
3 Error designation: e.g. **Empty pipe** = measuring tube is only partly filled or completely empty
4 Error number: e.g. **#401**
5 Duration of most recent error occurrence (in hours, minutes and seconds)

2.2Tf503726.en

Spare parts



Spare part article No.	Description	Included parts	Pos.	Qty.
90503-3396	Device fuse, Promag 10	-	18	1
90503-0533	Device fuse, Promag 50/53/55	kit of 10 fuses	18	1
90503-0435	Gasket, EPDM, Promag 10/50/53/55, DN 2	1 gasket	11	1
90503-3358	Gasket, EPDM, Promag 10/50/53/55, DN 4	1 gasket	11	1
90503-2943	Gasket, EPDM, Promag 10/50/53/55, DN 8	1 gasket	11	1
90503-2263	Gasket, EPDM, Promag 10/50/53/55, DN 15	1 gasket	11	1
90503-0439	Gasket, EPDM, Promag 10/50/53/55, DN 25	1 gasket	11	1
90503-3351	Gasket, EPDM, Promag 10/50/53/55, DN 40	1 gasket	11	1
90503-0442	Gasket, EPDM, Promag 10/50/53/55, DN 50	1 gasket	11	1
90503-3354	Gasket, EPDM, Promag 10/50/53/55, DN 65	1 gasket	11	1
90503-0444	Gasket, EPDM, Promag 10/50/53/55, DN 80	1 gasket	11	1
90503-0445	Gasket, EPDM, Promag 10/50/53/55, DN 100	1 gasket	11	1

Spare part article No.	Description	Included parts	Pos.	Qty.
90503-3357	Seal kit, Silicone, Promag 10/50/53/55, DN 2	10 gaskets	11	1
90503-3359	Seal kit, Silicone, Promag 10/50/53/55, DN 4	10 gaskets	11	1
90503-3359	Seal kit, Silicone, Promag 10/50/53/55, DN 8	10 gaskets	11	1
90503-0437	Seal kit, Silicone, Promag 10/50/53/55, DN 15	10 gaskets	11	1
90503-0441	Seal kit, Silicone, Promag 10/50/53/55, DN 25	10 gaskets	11	1
90503-3352	Seal kit, Silicone, Promag 10/50/53/55, DN 40	10 gaskets	11	1
90503-3353	Seal kit, Silicone, Promag 10/50/53/55, DN 50	10 gaskets	11	1
90503-3355	Seal kit, Silicone, Promag 10/50/53/55, DN 65	10 gaskets	11	1
90503-3356	Seal kit, Silicone, Promag 10/50/53/55, DN 80	10 gaskets	11	1
90503-3350	Seal kit, Silicone, Promag 10/50/53/55, DN 100	10 gaskets	11	1
90503-3391	Display, Promag 50	-	15	1
6-31801-9746-2	Display, Promag 53/55	-	15	1
90503-3390	Kit power supply, Promag 50/53	-	-	1
90511-8437	Kit power supply, Promag 55	-	-	1
90503-3395	Communicationcard, Profibus PA, Promag 50/53	-	-	1
90511-8438	Communicationcard, Profibus PA, Promag 55	-	-	1
90503-3392	Communicationcard, 4-20mA+frequency output, Promag 50	-	-	1
90503-3393	Communicationcard, 4-20mA+frequency output, Promag 53/55	-	-	1
90503-3397	Measuring amplifier, Promag 50	-	-	1
90503-3398	Measuring amplifier, Promag 53	-	-	1
90511-8439	Measuring amplifier, Promag 55	-	-	1
90512-2215	Kit communicationcard Hart, Promag 53/55/8X/93/65	-	30	1
90512-2216	Communication sub card, Hart, Promag 53/55/8X/93/65	-	31	1
90512-8302	Screw service kit	M5 x 14, M5 x 28	-	2

2.2Tf503724.en

Tetra Pak

Centurion

Installation Instructions
Installationsanleitung
Notice d'installation
Istruzioni per l'installazione
Instrucciones de instalación

Allen-Bradley
Guardmaster®

Drg. No: 40554 Issue 4
Change Note: 25391

www.ejaltd.com - www.ab.com/safety

Made by EJA Ltd. Wigan, UK

Installation must be in accordance with the following steps and stated specifications and should be carried out by suitably competent personnel.
The unit is not to be used as a mechanical stop.
Guard stops and guides must be fitted.
Adherence to the recommended maintenance instructions forms part of the warranty.

WARNING: Do not defeat, tamper, remove or bypass this unit. Severe injury to personnel could result.

Bei der Installation müssen die im Folgenden beschriebenen Anweisungen und angegebenen Spezifikationen eingehalten werden.
Zudem darf die Installation nur von entsprechend qualifizierten Mitarbeitern ausgeführt werden.
Das Gerät darf nicht als mechanische Sperre verwendet werden.
Schutzgittersperren und -leitvorrichtungen müssen angebracht werden.
Werden die empfohlenen Wartungsanweisungen nicht eingehalten, entfällt die Gewährleistung.

WARNUNG: Nehmen Sie niemals Eingriffe am Gerät vor, und zerlegen, entfernen oder überbrücken Sie das Gerät nicht. Andernfalls können schwere Körperverletzungen die Folge sein.

L'installation doit être effectuée par un personnel qualifié conformément aux étapes et aux spécifications suivantes.
Cet interrupteur ne doit pas être utilisé comme un arrêt mécanique.
Installer des butées de porte et des dispositifs de guidage.
Le respect des instructions de maintenance recommandée est l'une des conditions de la garantie.

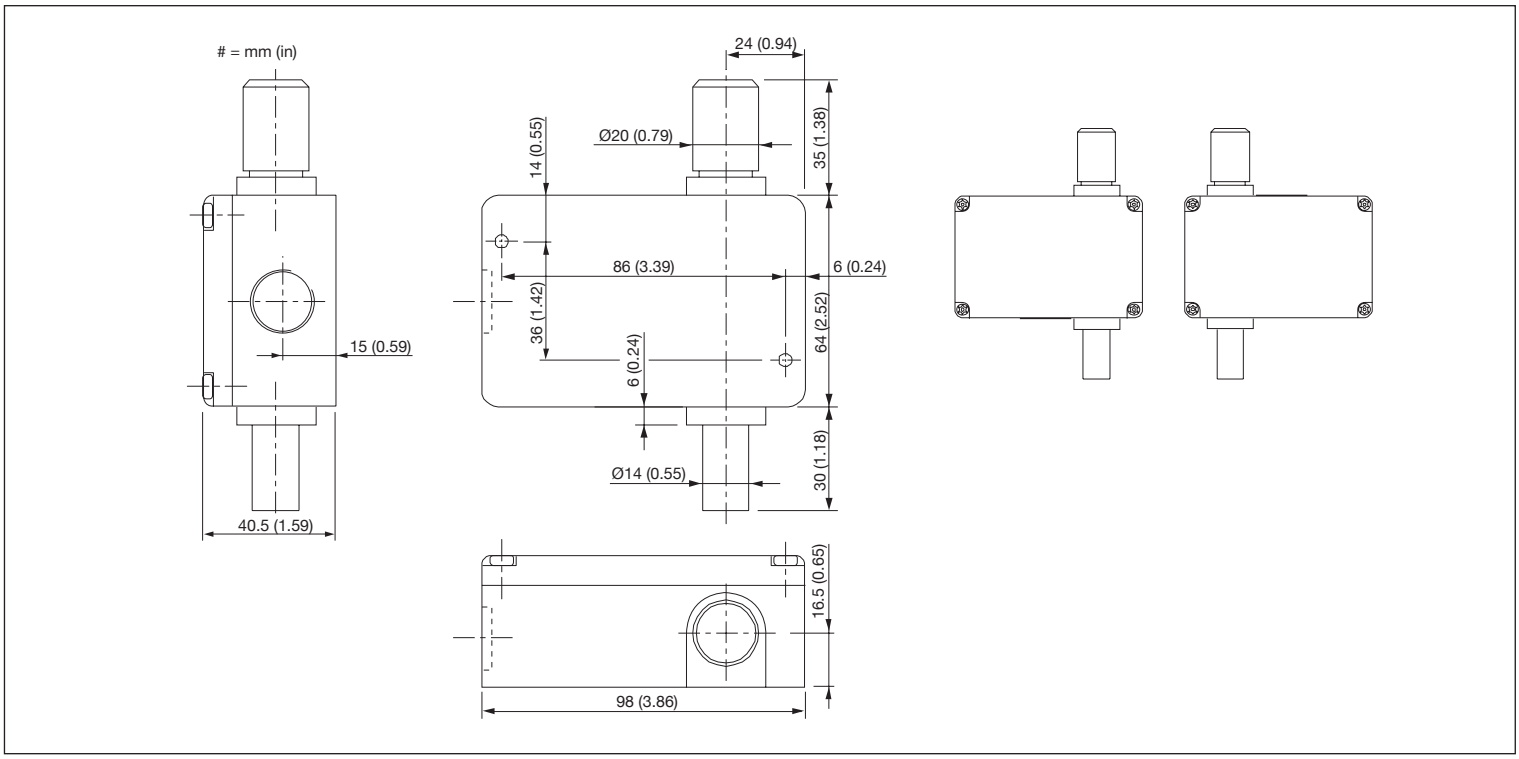
AVERTISSEMENT: ne pas entraver le fonctionnement de cet interrupteur, ne pas le modifier, le retirer ni le contourner au risque de s'exposer à de graves blessures.

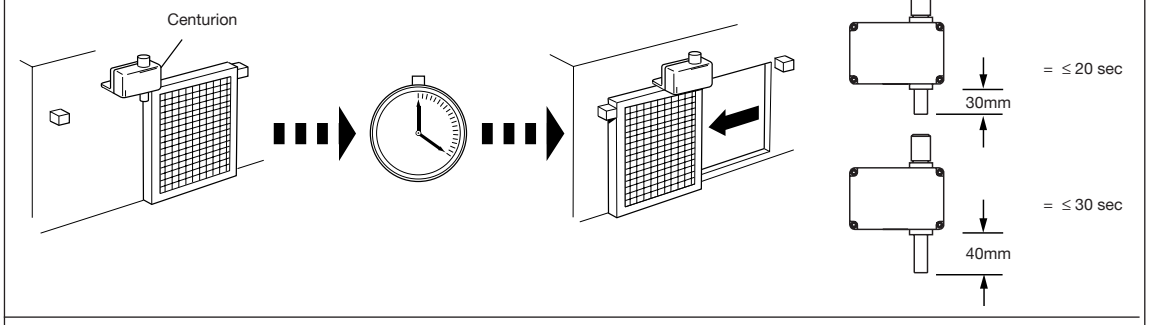
Le operazioni di installazione devono essere eseguite da personale competente conformemente alle fasi qui di seguito illustrate nonché alle specifiche stabilite.
L'unità non va utilizzata come fermo meccanico.
È necessario accoppiare i fermi e le guide della protezione.
Il rispetto delle istruzioni di manutenzione raccomandate costituisce parte della garanzia.

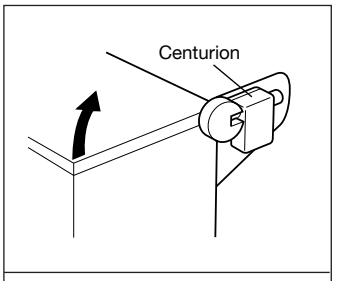
ATTENZIONE: non forzare, manomettere, rimuovere o bypassare questa unità. Pericolo di gravi lesioni alle persone.

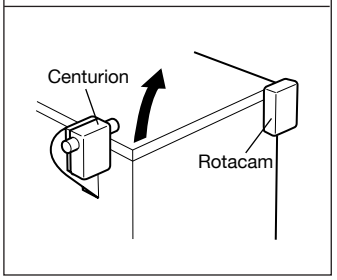
La instalación debe realizarse según los pasos siguientes y las especificaciones establecidas, y debe ser realizada por personal debidamente capacitado.
La unidad no debe usarse como dispositivo de paro mecánico.
Los dispositivos de paros y guías de la guarda deben estar instalados.
El cumplimiento de las instrucciones de mantenimiento recomendadas forma parte de la garantía.

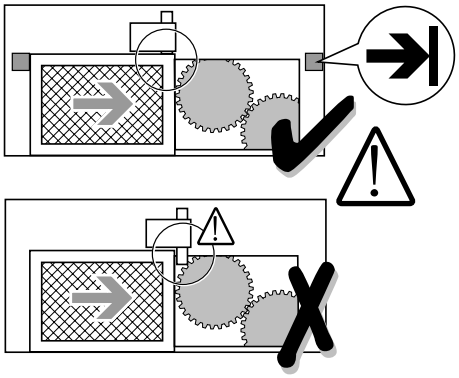
ADVERTENCIA: No cambie ni manipule indebidamente, ni desmonte u omita esta unidad. Esto podría causar lesiones personales graves.

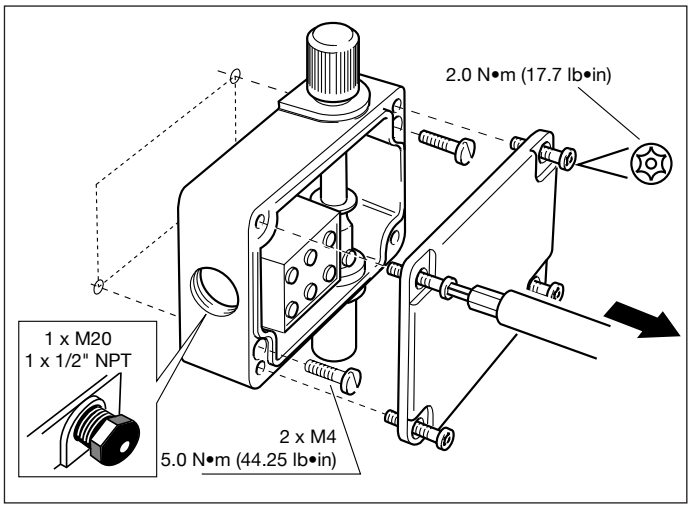


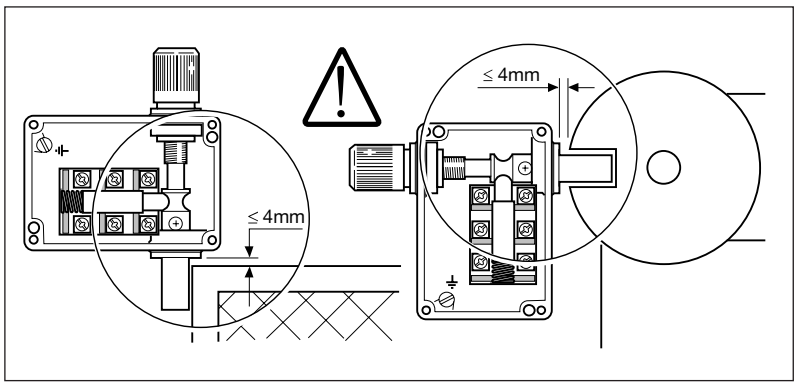


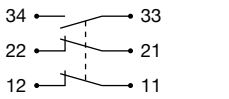




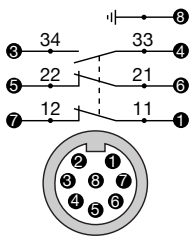




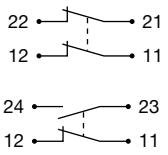




Centurion



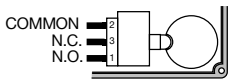
Centurion QD



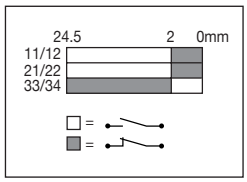
Blue / Brown = 11/12
Blau / Braun
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Azul / Marrón

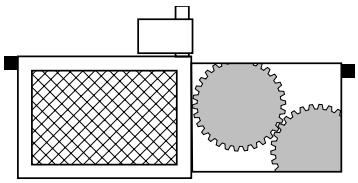
Black / Black = 23/24 ... 21/22
Schwarz / Schwarz
Noir / Noir
Nero / Nero
Negro / Negro

EX Centurion



Pneumatic Centurion





Check the machine is isolated and stopped whenever the interlocked guard door is open.

IMPORTANT: After installation and commissioning, the switch and switch lid fixing screws should be coated with tamper evident varnish or similar compound.

Kontrollieren, dass die Maschine stets isoliert und angehalten wird, wenn die abhängigkeitsgeschaltete Schutzvorrichtungstür geöffnet wird.

WICHTIG: Nach der Installation und Inbetriebnahme sind die Schalter- und Schalterdeckel-Befestigungsschrauben mit manipulation-anzeigendem Lack oder einem ähnlichen Mittel zu versehen.

Vérifier que la machine est isolée et arrêtée chaque fois que la porte de sécurité est ouverte.

IMPORTANT :
Après l'installation et la mise en service, les vis de fixation de l'actionneur, du commutateur et de son couvercle doivent être enduites de vernis témoin ou d'un produit similaire.

Controllare che la macchina sia isolata ed in condizione di arresto ogni volta che la porta di protezione interbloccata sia aperta.

IMPORTANTE: dopo l'installazione e la messa in servizio, l'interruttore ed il coperchio dell'interruttore devono essere spalmati con vernice tamper evident o una sostanza simile.

Compruebe que la máquina esté parada y aislada siempre que la puerta de seguridad esté abierta.

IMPORTANTE: Tras la instalación y la puesta en funcionamiento se deberá cubrir el conmutador y los tonillos de sujeción de la tapa del conmutador con un barniz revelador de intentos de apertura o producto similar.

Maintenance

Every Week
Check the correct operation of the switching circuit. Also check for signs of abuse or tampering. Inspect the switch casing & shaft for damage. Of particular importance is damage which causes loss of sealing at the lid or conduit entry.
At least every 6 months
Isolate all power! Remove the lid. Inspect all terminals for tightness. Clean out any accumulation of fine dirt etc. Check for any sign of wear or damage, e.g. cam assembly wear, contact oxidisation and replace if apparent. Replace covers & tighten screws to specified settings. Reinstate the power & check for correct operation. Re-apply tamper evident varnish or similar compound to fixings.

Repair

If there is any malfunction or damage, no attempts at repair should be made. The unit should be replaced before machine operation is allowed.
DO NOT DISMANTLE THE UNIT.

Information in regard to UL508

When used in elevated ambients, temperature rating of field wiring shall not be less than ambient.
Electrical spec of rating code:
A300
Current, Max:
120V AC - make 60A, break 6A
240V AC - make 30A, break 3A
Max. V/A: make 7200, break 720
Use copper conductors only. Use polymeric conduit only. Use one conduit entrance for field connections.

Wartung

Jede Woche
Auf ordnungsgemäße Funktion des Schaltkreises kontrollieren. Außerdem auf Anzeichen von Missbrauch oder Manipulation untersuchen. Schaltergehäuse & Welle auf Beschädigung kontrollieren. Dabei ist besonders auf Beschädigungen zu achten, die Undichtigkeit am Deckel oder Kabelrohreingang verursachen könnten.
Mindestens alle 6 Monate
Alle Stromversorgungen trennen! Den Deckel abnehmen. Alle Klemmen auf Festigkeit kontrollieren. Etwaige Ansammlungen feiner Schmutzteilchen etc. entfernen. Auf Anzeichen von Verschleiß und Beschädigungen untersuchen, z.B. Nockenbaugruppenverschleiß oder Kontaktoxidation, und ersetzen, wenn diese aufgetreten sind. Abdeckungen wieder anbringen & Schrauben auf die vorgegebenen Werte anziehen. Strom wieder anschließen & auf ordnungsgemäßen Betrieb kontrollieren. Manipulation-anzeigenden Lack oder ein ähnliches Mittel neu auf die Befestigungsteile auftragen.

Reparatur

Bei Fehlfunktion oder Beschädigung dürfen keine Reparaturversuche unternommen werden. Die Einheit muss ersetzt werden, bevor weiterer Betrieb der Maschine zugelassen wird.
DIE EINHEIT DARF NICHT AUSEINANDERGEBAUT WERDEN.

Information betreffs UL508

Bei Einsatz in höheren Umgebungstemperaturen darf die Nenntemperatur für die Feldverdrahtung nicht niedriger sein als die Umgebungstemperatur.
Elektrische Spezifikation des Nennwertcodes:
A300
Strom, Max:
120V AC - Schließen 60A, Öffnen 6A
240V AC - Schließen 30A, Öffnen 3A
Max. V/A: Schließen 7200, Öffnen 720
Nur Kupferleiter benutzen. Nur polymerische Leitungsrohre benutzen. Einen Leitungsrohreingang für die Feldanschlüsse benutzen.

Maintenance

Toutes les semaines
Vérifier le bon fonctionnement du circuit de commutation. Chercher également les signes d'un éventuel tripatouillage. Vérifier l'état du boîtier et de l'axe, en particulier au niveau de l'étanchéité du couvercle ou de l'entrée du conduit.
Tous les 6 mois au minimum
Couper l'alimentation ! Déposer le couvercle. Vérifier le serrage de toutes les bornes. Éliminer la poussière, etc. Vérifier l'état et l'usure (usure de la came, oxydation des contacts, etc.) et remplacer si nécessaire. Remettre les couvercles en place en serrant les vis au couple spécifié. Rétablir l'alimentation et vérifier le bon fonctionnement. Appliquer sur les vis une nouvelle couche de vernis témoin ou de tout autre produit similaire.

Réparation

En cas de défaut de fonctionnement ou d'endommagement, ne jamais essayer de réparer le dispositif. Il doit être remplacé avant de remettre la machine en service.
NE JAMAIS DÉMONTER LE DISPOSITIF.

Informations relatives au dispositif UL508

Lorsque le dispositif est utilisé dans des températures ambiantes élevées, le câblage utilisé doit être prévu pour supporter des températures supérieures à celle de l'application.
Spécifications électriques du code :
A300
Tension maxi. :
120 V ca - fermeture 60 A, ouverture 6A
240 V ca - fermeture 30 A, ouverture 3A
V/A maxi. : fermeture 7200, ouverture 720
Utiliser des conducteurs en cuivre uniquement. Utiliser des conduits en polymère uniquement. Utiliser une seule entrée pour la connexion sur site.

Manutenzione

Ogni settimana
Controllare che il circuito di commutazione funzioni come richiesto. Sincerarsi anche che non esistano indicazioni di un uso non autorizzato o di manomissioni. Esaminare l'involucro dell'interruttore e l'albero per verificare che non siano danneggiati. È di particolare importanza ogni danno che possa determinare la perdita della tenuta sul coperchio o all'ingresso del tubo protettivo.
Almeno ogni 6 mesi
Isolare tutte le alimentazioni di corrente! Rimuovere il coperchio. Controllare che tutti i morsetti siano ben stretti. Rimuovere ogni traccia di polvere ecc. che si sia accumulata. Sincerarsi che non esistano segni di usura o danno, ad es. usura del gruppo camme, ossidazione dei contatti, e sostituire in caso di usura o danno. Rimettere al loro posto i coperchi e serrare le viti con le coppie specificate. Riconnettere l'alimentazione elettrica e verificare il corretto funzionamento. Applicare nuovamente vernice tamper evident o un composto simile ai punti di fissaggio.

Riparazione

In caso di funzionamento anomalo o di danno, non si deve cercare di effettuare una riparazione. L'unità deve essere sostituita prima di ricominciare a far funzionare la macchina.
NON SMONTARE L'UNITÀ.

Informazioni su UL508

Per un utilizzo in temperature ambientali elevate, il cablaggio di campo dovrà essere dimensionato per limiti d'impiego a temperature non inferiori a quelle ambientali
Specifica elettrica del codice delle prestazioni nominali:
A300
Corrente massima:
120V c.a. - chiusura 60A, apertura 6A
240V c.a. - chiusura 30A, apertura 3A
Max. VA: chiusura 7200, apertura 720
Utilizzare solo conduttori di rame. Utilizzare solo tubi protettivi polimerici. Utilizzare una entrata del condotto protettivo per le connessioni di campo.

Mantenimiento

Cada semana
Compruebe que el circuito de conmutación funciona correctamente. Compruebe también que no haya signos de uso incorrecto o manipulación no autorizada. Compruebe que la carcasa y el eje no presenten daños. Fíjese especialmente de que no haya daños que pudieran provocar una pérdida de estanqueidad en la tapa o la entrada del conducto.
Cada 6 meses, como mínimo
Aísle toda entrada de corriente. Retire la tapa. Compruebe el ajuste de todos los terminales. Limpie cualquier acumulación de polvo, etc. Compruebe si hubiera signos de desgaste o daños en el conjunto de la leva, óxido en los contactos, etc., y haga los cambios pertinentes. Vuelva a colocar las tapas y apriete los tornillos con los ajustes correspondientes. Vuelva a conectar la toma de corriente y compruebe que funciona correctamente. Vuelva a aplicar a las sujeciones un barniz revelador de intentos de apertura o compuesto similar.

Reparación

Si hubiera algún defecto o avería, no intente repararlos. Sustituya la unidad antes de autorizar el funcionamiento de la máquina.
NO DESMONTE LA UNIDAD.

Información referente a UL508

Si se utiliza en entornos elevados, la temperatura efectiva del cableado del inductor no deberá ser inferior a la temperatura ambiente.
Especificaciones eléctricas de servicio:
A300
Corriente, máx:
120V CA - apertura 60A, cierre 6A
240V CA - apertura 30A, cierre 3A
V/A máx.: apertura 7200, cierre 720
Use solamente hilos conductores de cobre. Use solamente conductos poliméricos. Use una entrada de conducto para las conexiones inductoras.

CE

Declaration of Conformity

This is to declare that the products shown on this document conforms with the Essential Health and Safety Requirements (EHSR's) of the European Machinery Directive (98/37/EC), the relevant requirements of the Low Voltage Directive (73/23/EEC as amended by 93/68/EEC). These products also conform to EN 60947-5-1, EN 1088, EN 292, EN 60204-1 and have Third Party Approval.

For a comprehensive certificate please visit: www.ab.com/safety

CE

Konformitätserklärung

Hiermit wird bescheinigt, dass die auf diesem Dokument aufgeführten Produkte die grundlegenden Gesundheits- und Sicherheitsanforderungen (EHSR's) der Europäischen Maschinenrichtlinie (98/37/EC), die relevanten Anforderungen der Niederspannungsrichtlinie (73/23/EEC gemäß Änderung durch 93/68/EEC) erfüllen. Diese Produkte entsprechen auch EN 60947-5-1, EN 1088, EN 292, EN 60204-1 und sind für Dritte zugelassen.

Für ein ausführliches Zertifikat besuchen Sie bitte: www.ab.com/safety

CE

Déclaration de conformité

Nous déclarons par la présente que les produits mentionnés dans ce document sont conformes aux prescriptions essentielles d'hygiène et de sécurité de la directive européenne sur les machines (98/37/CEE), aux prescriptions pertinentes de la directive sur les basses tensions (73/23/CEE amendée par la directive 93/68/CEE). Ces produits sont également conformes aux normes EN 60947-5-1, EN 1088, EN 292, EN 60204-1 et bénéficient de l'homologation tierce partie.

Pour le certificat complet, consulter le site : www.ab.com/safety

CE

Dichiarazione di conformità

Con la presente si dichiara che i prodotti illustrati su questo documento sono conformi ai Requisiti essenziali per la salute e la sicurezza (EHSR) della Direttiva europea sui macchinari (98/37/CE), ai requisiti pertinenti della Direttiva per la bassa tensione (73/23/CEE come modificata da 93/68/CEE). Questi prodotti sono anche conformi alle normative EN 60947-5-1, EN 1088, EN 292, EN 60204-1 e sono approvati per un uso da parte di terzi.

Per visualizzare un certificato completo, si prega di visitare il sito: www.ab.com/safety

CE

Declaración de conformidad

Los productos que aparecen en este documento cumplen los requisitos esenciales de seguridad e higiene de la Directiva Europea de Maquinaria (98/37/EC) y los requisitos pertinentes de la Directiva de Bajo Voltaje (73/23/EEC, enmendada por 93/68/EEC). Asimismo, los productos cumplen la normativa EN 60947-5-1, EN 1088, EN 292, EN 60204-1 y cuentan con el sello Third Party Approval.

Para obtener toda la información acerca de seguridad, visite: www.ab.com/safety

English

Safety Contacts	2 N.C. direct opening action
Designation / Utilization Cat.	A600 / AC-15 (Ue/Ie) 600V / 1.2 A, 500V / 1.4 A, 240V / 3 A, 120V / 6 A N600 / DC-13 (Ue/Ie) 600V / 0.4 A, 500V / 0.55 A, 240V / 1.1 A, 120V / 2.2 A
Thermal Current	10 A
Current, Min.	5V 5 mA dc
Auxiliary Contacts	1 N.C.
Ingress Protection Rating	IP66
Operating Temperature	(–20 °C…+60 °C), (–4 °F…+140 °F)
Mechanical Life	1,000,000 operations
Electrical Life	250,000 operations @ A600 125,000 operations @ Q300
Torque Settings, Max.	5.0 N•m (44.25 lb•in) fixing bolts 2.0 N•m (17.7 lb•in) lid screws 1.0 N•m (8.85 lb•in) terminal screws

Note: The safety contacts of these products are described as normally closed (N.C.), ie. with the guard closed, actuator in place (where relevant) and the machine able to be started.

Deutsch

Sicherheitskontakte	2 N.C. direkte Öffnung
Bezeichnung / Einsatzkat.	A600 / AC-15 (Ue/Ie) 600V / 1.2 A, 500V / 1.4 A, 240V / 3 A, 120V / 6 A N600 / DC-13 (Ue/Ie) 600V / 0.4 A, 500V / 0.55 A, 240V / 1.1 A, 120V / 2.2 A
Wärmestrom	10 A
Strom, Min.	5V 5 mA dc
Hilfskontakte	1 N.C.
Eindringen-Schutzgrad	IP66
Betriebstemperatur	(–20 °C…+60 °C), (–4 °F…+140 °F)
Mechanische Lebensdauer	1.000.000 Betätigungen
Elektrische Lebensdauer	250,000 Betätigungen @ A600 125,000 Betätigungen @ Q300
Drehmomenteinstellungen, Max.	5.0 N•m (44.25 lb•in) Befestigungsschrauben 2.0 N•m (17.7 lb•in) Deckelschrauben 1.0 N•m (8.85 lb•in) Klemmenschrauben

Hinweis: Die Sicherheitskontakte dieser Produkte sind als normalerweise geschlossen (N.C.) beschrieben, d.h. bei geschlossener Schutzvorrichtung, Betätigungselement in Position (falls zutreffend) und Maschine startfähig.

Français

Contacts de sécurité	2 N.C. ouverture directe
Désignation/utilisation.	A600 / AC-15 (Ue/Ie) 600V / 1.2 A, 500V / 1.4 A, 240V / 3 A, 120V / 6 A N600 / DC-13 (Ue/Ie) 600V / 0.4 A, 500V / 0.55 A, 240V / 1.1 A, 120V / 2.2 A
Intensité thermique	10 A
Intensité minimale	5V 5 mA c.c.
Contacts auxiliaires	1 N.C.
Protection	IP66
Plage de températures de service	–20 °C…+60 °C
Durée de vie mécanique	1 million de cycles
Durée de vie électrique	250,000 de cycles @ A600 125,000 de cycles @ Q300
Couples de serrage	Vis de fixation 5.0 N•m Vis du couvercle 2.0 N•m Vis des bornes 1.0 N•m

Remarque : Les contacts de sécurité de ces produits sont décrits comme normalement fermés (NF), c'est-à-dire lorsque la protection est fermée, l'actionneur en place (si applicable) et la machine en état de démarrer.

ESPAÑOL

Contactos de seguridad	2 N.C. acción de apertura directa
Cat. designación / utilización	A600 / AC-15 (Ue/Ie) 600V / 1.2 A, 500V / 1.4 A, 240V / 3 A, 120V / 6 A N600 / CC-13 (Ue/Ie) 600V / 0.4 A, 500V / 0.55 A, 240V / 1.1 A, 120V / 2.2 A
Corriente térmica	10 A
Corriente, mín	5V 5 mA c.c.
Contactos auxiliares	1 N.C.
Protección contra el ingreso	IP66
Temperatura operativa	(–20 °C…+60 °C), (–4 °F…+140 °F)
Vida mecánica	1.000.000 operaciones
Vida eléctrica	250,000 operaciones @ A600 125,000 operaciones @ Q300
Ajustes de par, máx.	5.0 N•m (44.25 lb•in) tornillos de sujeción 2.0 N•m (17.7 lb•in) tornillos de la tapa 1.0 N•m (8.85 lb•in) tornillos terminales

Nota: Los contactos de seguridad de estos productos se describen como normalmente cerrados (o N.C.), es decir, con el protector cerrado, el accionador en su lugar (si procede) y la máquina en condiciones de arrancar.

Italiano

Contatti di sicurezza	2 N.C. ad azione diretta di apertura
Designazione / Cat. di utilizzazione	A600 / c.a.-15 (Ue/Ie) 600V / 1.2 A, 500V / 1.4 A, 240V / 3 A, 120V / 6 A N600 / c.c.-13 (Ue/Ie) 600V / 0.4 A, 500V / 0.55 A, 240V / 1.1 A, 120V / 2.2 A
Corrente termica	10 A
Corrente, min.	5V 5 mA c.c.
Contatti ausiliari	1 N.C.
Classificazione IP	IP66
Temperatura d'esercizio	–20 °C…+60 °C
Durata meccanica	1.000.000 di funzionamenti
Durata elettrica	250,000 di funzionamenti @ A600 125,000 di funzionamenti @ Q300
Regolazioni coppia, massima	5.0 N•m per i bulloni di fissaggio 2.0 N•m per le viti del coperchio 1.0 N•m per le viti dei morsetti

NB: i contatti di sicurezza di questi prodotti sono descritti come normalmente chiusi (NC), vale a dire con la protezione chiusa, l'attuatore in funzione (ove sia richiesto) e la macchina in condizione di avviamento.

TLS-GD2

Installation Instructions
Installationsanleitung
Notice d'installation
Istruzioni per l'installazione
Instrucciones de instalación

Allen-Bradley
Guardmaster®

Drg. No: 27961 Issue 12
Change Note: 27800

www.ejaltd.com - www.ab.com/safety

Installation must be in accordance with the following steps and stated specifications and should be carried out by suitably competent personnel.
The unit is not to be used as a mechanical stop.
Guard stops and guides must be fitted.
Adherence to the recommended maintenance instructions forms part of the warranty.
ATTENTION: The presence of spare actuators can compromise the integrity of safety systems. Personal injury or death, property damage or economic loss can result. Appropriate management controls, working procedures and alternative protective measures should be introduced to control their use and availability.

WARNING: Do not defeat, tamper, remove or bypass this unit. Severe injury to personnel could result.

Bei der Installation müssen die im Folgenden beschriebenen Anweisungen und angegebenen Spezifikationen eingehalten werden.
Zudem darf die Installation nur von entsprechend qualifizierten Mitarbeitern ausgeführt werden.
Das Gerät darf nicht als mechanische Sperre verwendet werden.
Schutzgittersperren und -leitvorrichtungen müssen angebracht werden.
Werden die empfohlenen Wartungsanweisungen nicht eingehalten, entfällt die Gewährleistung.
ACHTUNG: Ersatzbetätiger können die Integrität von Sicherheitssystemen beeinträchtigen. Körperverletzungen oder Tod sowie Sachschäden oder wirtschaftliche Verluste können die Folge sein. Es sind geeignete Bedienungselemente, Arbeitsabläufe und alternative Schutzmaßnahmen vorzusehen, um ihre Verwendung und Verfügbarkeit zu steuern.

WARNUNG: Nehmen Sie niemals Eingriffe am Gerät vor, und zerlegen, entfernen oder überbrücken Sie das Gerät nicht. Andernfalls können schwere Körperverletzungen die Folge sein.

L'installation doit être effectuée par un personnel qualifié conformément aux étapes et aux spécifications suivantes.
Cet interrupteur ne doit pas être utilisé comme un arrêt mécanique.
Installer des butées de porte et des dispositifs de guidage.
Le respect des instructions de maintenance recommandée est l'une des conditions de la garantie.
ATTENTION: la présence d'actionneurs supplémentaires peut compromettre l'intégrité des systèmes de sécurité et entraîner des blessures pouvant être mortelles, des dégâts matériels ou des pertes financières.
Des contrôles de gestion, des procédures de travail, ainsi que des mesures de protection alternatives appropriés doivent être mis en place pour en contrôler l'utilisation et la disponibilité.

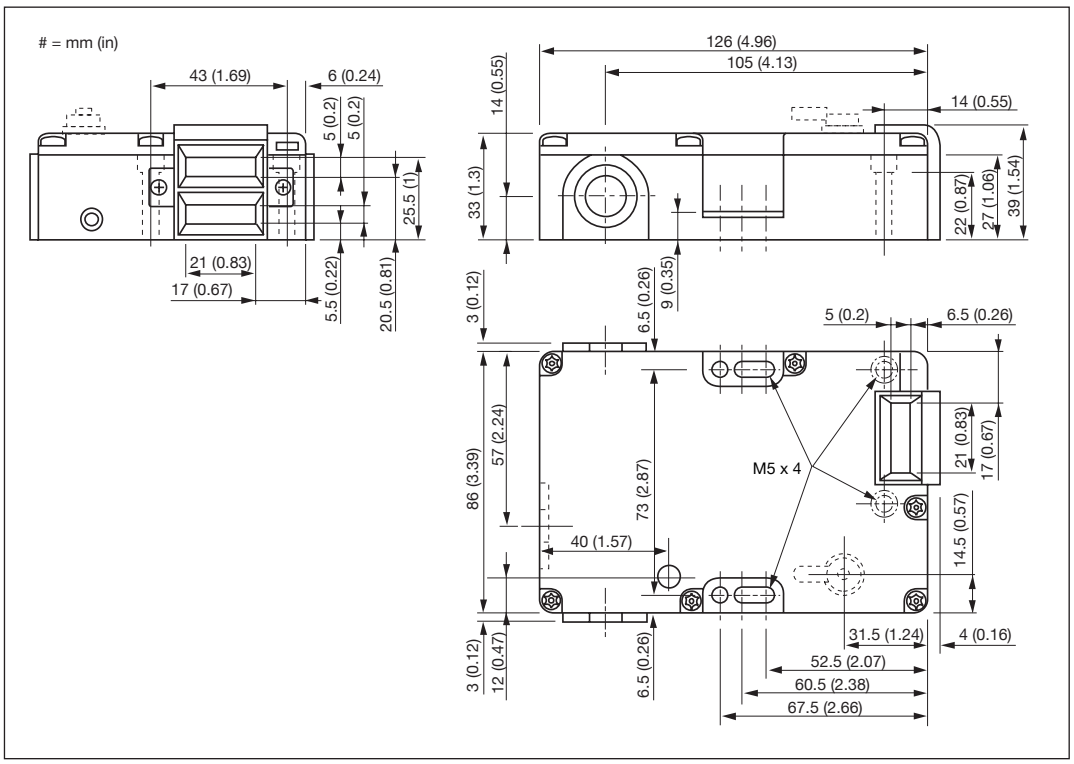
AVERTISSEMENT: ne pas entraver le fonctionnement de cet interrupteur, ne pas le modifier, le retirer ni le contourner au risque de s'exposer à de graves blessures.

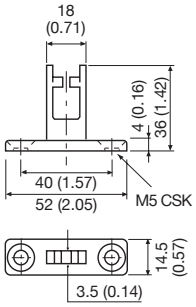
Le operazioni di installazione devono essere eseguite da personale competente conformemente alle fasi qui di seguito illustrate nonché alle specifiche stabilite.
L'unità non va utilizzata come fermo meccanico.
È necessario accoppiare i fermi e le guide della protezione.
Il rispetto delle istruzioni di manutenzione raccomandate costituisce parte della garanzia.
ATTENZIONE: la presenza di attuatori di riserva può compromettere l'integrità dei sistemi di sicurezza.
Pericolo di infortuni o morte, di danni a oggetti o di perdite economiche. È opportuno svolgere adeguati controlli di gestione, procedure di lavoro e adottare altre misure di sicurezza appropriate per controllarne l'uso e la disponibilità.

ATTENZIONE: non forzare, manomettere, rimuovere o bypassare questa unità. Pericolo di gravi lesioni alle persone.

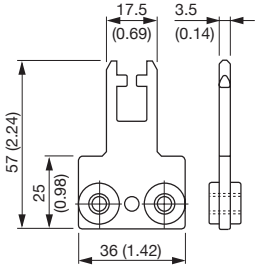
La instalación debe realizarse según los pasos siguientes y las especificaciones establecidas, y debe ser realizada por personal debidamente capacitado.
La unidad no debe usarse como dispositivo de paro mecánico.
Los dispositivos de paros y guías de la guarda deben estar instalados.
El cumplimiento de las instrucciones de mantenimiento recomendadas forma parte de la garantía.
ATENCIÓN: La presencia de accionadores adicionales puede comprometer la integridad de los sistemas de seguridad. Pueden ocurrir lesiones personales o la muerte, daños materiales y pérdidas económicas. Deben introducirse controles de administración apropiados, procedimientos de trabajo y medidas de protección alternativas a fin de controlar su uso y disponibilidad.

ADVERTENCIA: No cambie ni manipule indebidamente, ni desmonte u omita esta unidad. Esto podría causar lesiones personales graves.

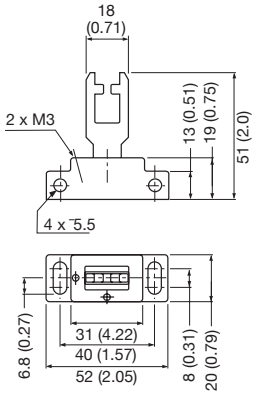




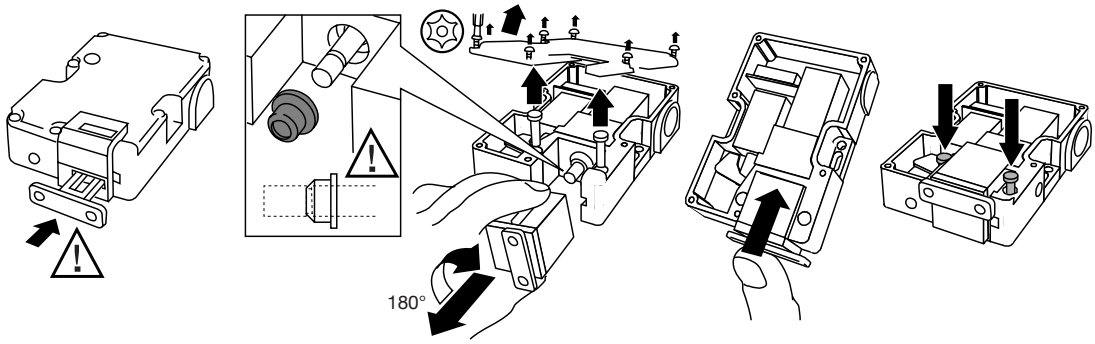
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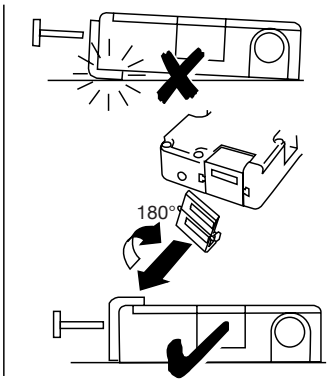


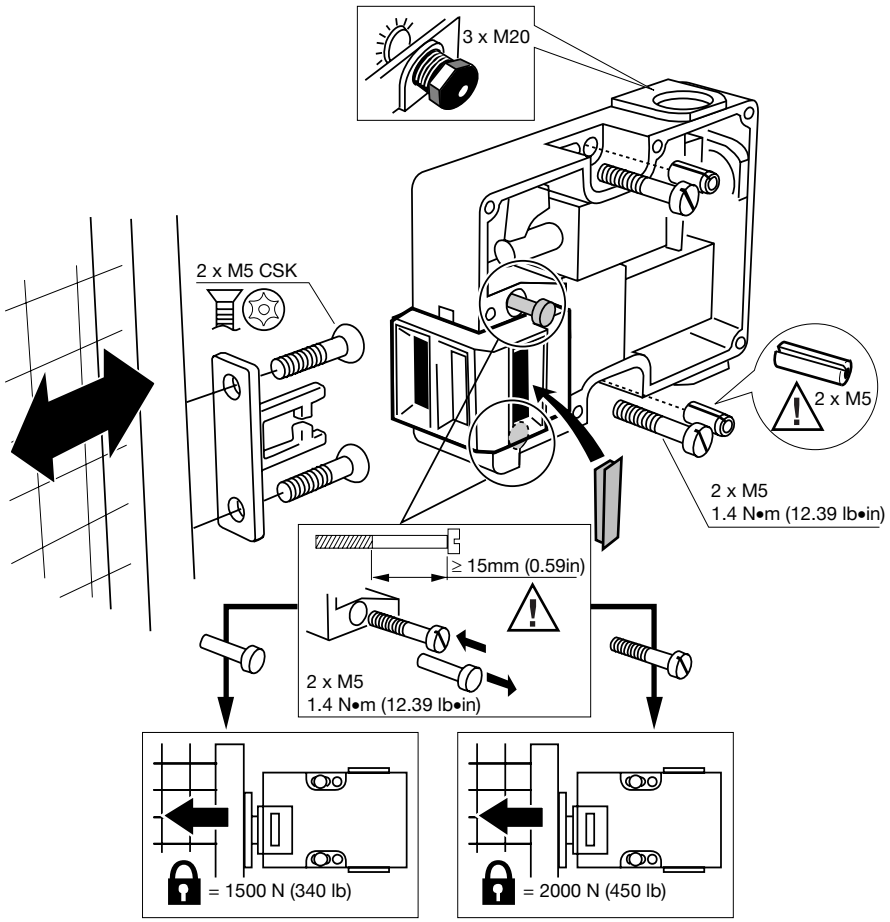
Cat. No: 440K-A11112

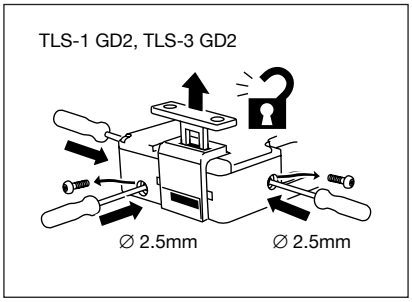


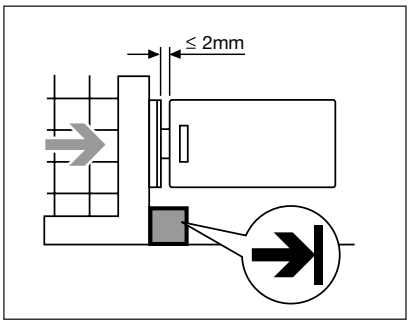
Cat. No: 440G-A27143



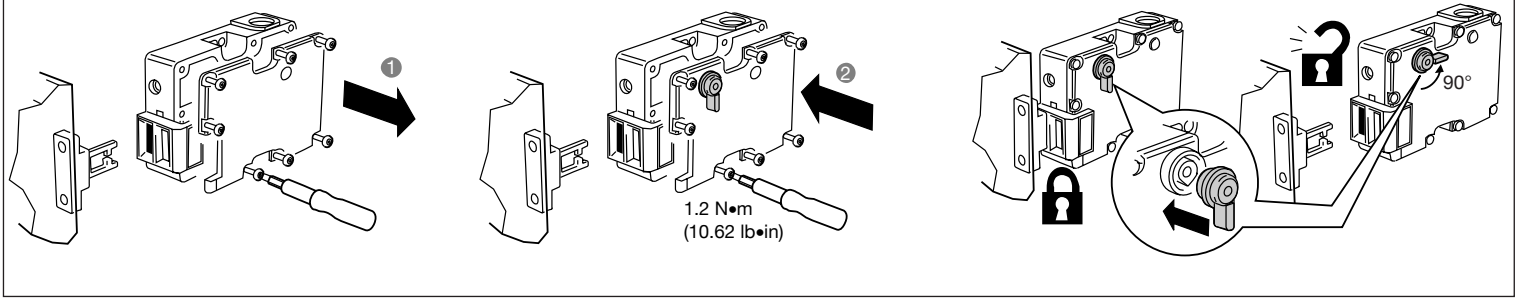








440G-A27011	160mm	160mm	160mm	160mm
440K-A11112	160mm	160mm	160mm	160mm
440G-A27143	80mm	80mm	80mm	80mm



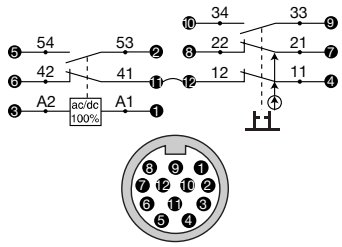
* Monitoring of safety contact(s) AND solenoid feedback (IN SERIES) is available when jumpers are in place, and:
For TLS1 & 2 - Pins 4-6 on the 12-pin M23, or Pink-Yellow wires on the 12 pin cord set are used.
For TLS3, - Pins 4-6 & 7-8 on the 12-pin M23, or Pink-Yellow & White-Red/Blue wires on the 12 pin cord set are used.

* Überwachung von Sicherheitskontakt(en) UND Solenoidrückkopplung (IN SERIENSCHALTUNG) ist vorhanden, wenn die Kurzschlussbrücken eingesetzt sind und:
Für TLS1 & 2 - werden Stifte 4-6 am 12-Stift M23 oder pink-gelbe Drähte am 12-Draht-Litzenkabelset eingesetzt.
Für TLS3 - werden Stifte 4-6 & 7-8 am 12-Stift M23 oder pink-gelbe & weiß-rot/blaue Drähte am 12-Draht-Litzenkabelset eingesetzt.

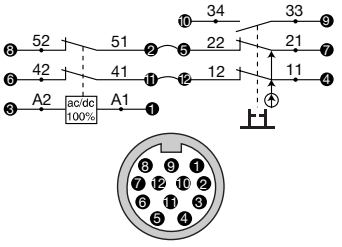
* Le contrôle des contacts de sécurité ET de la rétroaction du solénoïde (EN SÉRIE) est possible lorsque les cavaliers sont en place et :
Pour TLS1 & 2 - les broches 4-6 sur M23 à 12 broches ou les fils rose-jaune sur le cordon à 12 conducteurs sont utilisés.
Pour TLS3 - les broches 4-6 et 7-8 sur M23 à 12 broches ou les fils rose-jaune et blanc-rouge/bleu sur le cordon à 12 conducteurs sont utilisés.

* Il monitoraggio del contatto(i) di sicurezza E del feedback del solenoide (IN SERIE) è disponibile quando i ponticelli sono inseriti, e:
Per TLS1 e 2, - sono utilizzati i piedini 4-6 sull'M23 a 12 piedini, o i fili rosa-giallo sul gruppo cavi a 12 piedini.
Per TLS3, - sono utilizzati i piedini 4-6 e 7-8 sull'M23 a 12 piedini, o i fili rosa-giallo e bianco-rosso/blu sul gruppo cavi a 12 piedini.

* Se dispone de monitorización del contacto o contactos de seguridad Y realimentación del solenoide (EN SERIE) cuando los puentes están colocados y:
Para TLS1 y 2, cuando se usan las patillas 4-6 del M23 de 12 patillas o los hilos rosa-amarillo del juego de cable de 12 hilos.
Para TLS3, cuando se usan las patillas 4-6 y 7-8 del M23 de 12 patillas o los hilos rosa-amarillo y blanco-rojo/azul del juego de cable de 12 hilos.



TLS-1 GD2 and TLS-2 GD2 QD



TLS-3 GD2 QD

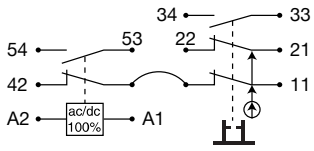
⚠ To monitor INDEPENDENTLY the safety contact(s) AND the solenoid feedback:
- The 12 wire cord set 889M-F12AH-* must be used
AND
- For TLS1 & 2, the jumper between 12-41 must be removed.
- For TLS3, the jumpers between 12-41 & 22-51 must be removed.

⚠ Für UNABHÄNGIGE Überwachung von Sicherheitskontakt(en) UND Solenoidrückkopplung:
- muss der 12-Draht-Litzenkabelset 889M-F12AH-* eingesetzt werden.
UND
- für TLS1 & 2 muss die Kurzschlussbrücke zwischen 12-41 ausgebaut werden,
- für TLS3 müssen die Kurzschlussbrücken zwischen 12-41 & 22-51 ausgebaut werden.

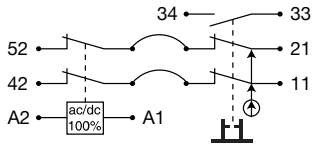
⚠ Pour le contrôle INDÉPENDANT des contacts de sécurité ET de la rétroaction du solénoïde :
- le cordon à 12 conducteurs 889M-F12AH-* doit être utilisé.
ET
- pour TLS1 & 2, le cavalier entre 12-41 doit être enlevé.
- pour TLS3, les cavaliers entre 12-41 et 22-51 doivent être enlevés.

⚠ Per monitorare INDIPENDENTEMENTE il contatto(i) di sicurezza E il feedback del solenoide:
- si deve utilizzare il gruppo cavi a 12 fili 889M-F12AH-*
E
- per TLS1 e 2, deve essere rimosso il ponticello tra 12-41.
- per TLS3, devono essere rimossi i ponticelli tra 12-41 e 22-51

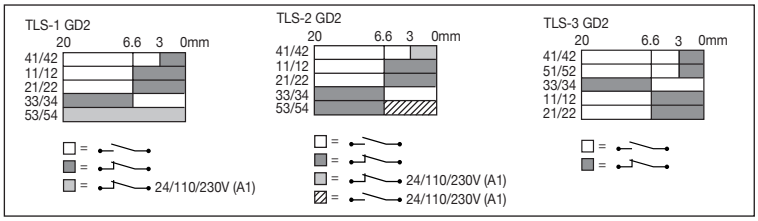
⚠ Par monitorizar INDEPENDIENTEMENTE el contacto o contactos de seguridad Y la realimentación del solenoide:
- Se debe usar el juego de cable de 12 hilos 889M-F12AH-*
Y
- Para TLS1 y 2, se debe retirar el puente entre 12-41.
- Para TLS3, se deben retirar los puentes entre 12-41 y 22-51.



TLS-1 GD2 and TLS2 GD2



TLS-3 GD2



Maintenance

Every Week
Check the correct operation of the switching circuit. Also check for signs of abuse or tampering. Inspect the switch casing for damage. Of particular importance is damage which causes loss of sealing at the lid or conduit entry.
At least every 6 months
Isolate all power! Remove the lid. Inspect all terminals for tightness. Clean out any accumulation of fine dirt etc. Check for any sign of wear or damage, e.g. cam assembly wear, contact oxidisation and replace if apparent. Replace covers & tighten screws to specified settings. Reinstate the power & check for correct operation. Re-apply tamper evident varnish or similar compound to fixings.

Repair

If there is any malfunction or damage, no attempts at repair should be made. The unit should be replaced before machine operation is allowed.
DO NOT DISMANTLE THE UNIT.

Information in regard to UL508

When used in elevated ambients, temperature rating of field wiring shall not be less than ambient.
Electrical spec of rating code:
A300
Current, Max:
120V AC - make 60A, break 6A
240V AC - make 30A, break 3A
Max. V/A: make 7200, break 720
Use copper conductors only. Use polymeric conduit only. Use one conduit entrance for field connections.

Wartung

Jede Woche
Auf ordnungsgemäße Funktion des Schaltkreises kontrollieren. Außerdem auf Anzeichen von Missbrauch oder Manipulation untersuchen. Das Schaltergehäuse auf Beschädigung kontrollieren. Dabei ist besonders auf Beschädigungen zu achten, die Undichtigkeit am Deckel oder Kabelrohreingang verursachen könnten.
Mindestens alle 6 Monate
Alle Stromversorgungen trennen! Den Deckel abnehmen. Alle Klemmen auf Festigkeit kontrollieren. Etwaige Ansammlungen feiner Schmutzteilchen etc. entfernen. Auf Anzeichen von Verschleiß und Beschädigungen untersuchen, z.B. Nockenbaugruppenverschleiß oder Kontaktoxidation, und ersetzen, wenn diese aufgetreten sind. Deckel wieder anbringen & Schrauben auf die vorgegebenen Werte anziehen. Strom wieder anschließen & auf ordnungsgemäßen Betrieb kontrollieren. Manipulation-anzeigenden Lack oder ein ähnliches Mittel neu auf die Befestigungsteile auftragen.

Reparatur

Bei Fehlfunktion oder Beschädigung dürfen keine Reparaturversuche unternommen werden. Die Einheit muss ersetzt werden, bevor weiterer Betrieb der Maschine zugelassen wird.

DIE EINHEIT DARF NICHT AUSEINANDERGEBAUT WERDEN.

Information betreffs UL508

Bei Einsatz in höheren Umgebungstemperaturen darf die Nenntemperatur für die Feldverdrahtung nicht niedriger sein als die Umgebungstemperatur.
Elektrische Spezifikation des Nennwertcodes:
A300
Strom, Max:
120V AC - Schließen 60A, Öffnen 6A
240V AC - Schließen 30A, Öffnen 3A
Max. V/A: Schließen 7200, Öffnen 720
Nur Kupferleiter benutzen. Nur polymerische Leitungsrohre benutzen. Einen Leitungsrohreingang für die Feldanschlüsse benutzen.

Maintenance

Toutes les semaines
Vérifier le bon fonctionnement du circuit de commutation. Chercher également les signes d'un éventuel tripatouillage. Vérifier l'état du boîtier, en particulier au niveau de l'étanchéité du couvercle ou de l'entrée du conduit.
Tous les 6 mois au minimum
Couper l'alimentation ! Déposer le couvercle. Vérifier le serrage de toutes les bornes. Éliminer la poussière, etc. Vérifier l'état et l'usure (usure de la came, oxydation des contacts, etc.) et remplacer si nécessaire. Remettre les couvercles en place en serrant les vis au couple spécifié. Rétablir l'alimentation et vérifier le bon fonctionnement. Appliquer sur les vis une nouvelle couche de vernis témoin ou de tout autre produit similaire.

Réparation

En cas de défaut de fonctionnement ou d'endommagement, ne jamais essayer de réparer le dispositif. Il doit être remplacé avant de remettre la machine en service.

NE JAMAIS DÉMONTER LE DISPOSITIF.

Informations relatives au dispositif UL508

Lorsque le dispositif est utilisé dans des températures ambiantes élevées, le câblage utilisé doit être prévu pour supporter des températures supérieures à celle de l'application.
Spécifications électriques du code :
A300
Tension maxi. :
120 V ca - fermeture 60 A, ouverture 6A
240 V ca - fermeture 30 A, ouverture 3A
V/A maxi. : fermeture 7200, ouverture 720
Utiliser des conducteurs en cuivre uniquement. Utiliser des conduits en polymère uniquement. Utiliser une seule entrée pour la connexion sur site.

Manutenzione

Ogni settimana
Controllare che il circuito di commutazione funzioni come richiesto. Sincerarsi anche che non esistano indicazioni di un uso non autorizzato o di manomissioni. Esaminare l'involucro dell'interruttore per verificare che non sia danneggiato. È di particolare importanza ogni danno che possa determinare la perdita della tenuta sul coperchio o all'ingresso del tubo protettivo.
Almeno ogni 6 mesi
Isolare tutte le alimentazioni di corrente! Rimuovere il coperchio. Controllare che tutte le morsettiere siano ben strette. Rimuovere ogni traccia di polvere ecc. che si sia accumulata. Sincerarsi che non esistano segni di usura o danno, ad es. usura del gruppo camme, ossidazione dei contatti, e sostituire in caso di usura o danno. Rimettere al loro posto i coperchi e serrare le viti con le coppie specificate. Riconnettere l'alimentazione elettrica e verificare il corretto funzionamento. Applicare nuovamente vernice tamper evident o un composto simile ai punti di fissaggio.

Riparazione

In caso di funzionamento anomalo o di danno, non si deve cercare di effettuare una riparazione. L'unità deve essere sostituita prima di ricominciare a far funzionare la macchina.

NON SMONTARE L'UNITÀ.

Informazioni su UL508

Per un utilizzo in temperature ambientali elevate, il cablaggio di campo dovrà essere dimensionato per limiti d'impiego a temperature non inferiori a quelle ambientali
Specifica elettrica del codice delle prestazioni nominali:
A300
Corrente massima:
120V c.a. - chiusura 60A, apertura 6A
240V c.a. - chiusura 30A, apertura 3A
Max. VA: chiusura 7200, apertura 720
Utilizzare solo conduttori di rame. Utilizzare solo tubi protettivi polimerici. Utilizzare una entrata del condotto protettivo per le connessioni di campo.

Mantenimiento

Cada semana
Compruebe que el circuito de conmutación funciona correctamente. Compruebe también que no haya signos de uso incorrecto o manipulación no autorizada. Compruebe que la carcasa no presente daños. Fíjese especialmente de que no haya daños que pudieran provocar una pérdida de estanqueidad en la tapa o la entrada del conducto.
Cada 6 meses, como mínimo
Aísle toda entrada de corriente. Retire la tapa. Compruebe el ajuste de todos los terminales. Limpie cualquier acumulación de polvo, etc. Compruebe si hubiera signos de desgaste o daños en el conjunto de la leva, óxido en los contactos, etc., y haga los cambios pertinentes. Vuelva a colocar las tapas y apriete los tornillos con los ajustes correspondientes. Vuelva a conectar la toma de corriente y compruebe que funciona correctamente. Vuelva a aplicar a las sujeciones un barniz revelador de intentos de apertura o compuesto similar.

Reparación

Si hubiera algún defecto o avería, no intente repararlos. Sustituya la unidad antes de autorizar el funcionamiento de la máquina.

NO DESMONTE LA UNIDAD.

Información referente a UL508

Si se utiliza en entornos elevados, la temperatura efectiva del cableado del inductor no deberá ser inferior a la temperatura ambiente.
Especificaciones eléctricas de servicio:
A300
Corriente, máx:
120V CA - apertura 60A, cierre 6A
240V CA - apertura 30A, cierre 3A
V/A máx.: apertura 7200, cierre 720
Use solamente hilos conductores de cobre. Use solamente conductos poliméricos. Use una entrada de conducto para las conexiones inductoras.

CE

Declaration of Conformity

This is to declare that the products shown on this document conforms with the Essential Health and Safety Requirements (EHSR's) of the European Machinery Directive (98/37/EC), the relevant requirements of the Low Voltage Directive 2006/95/EC. These products also conform to EN 60947-5-1, EN 1088, EN ISO 12100-1, EN 60204-1 and have Third Party Approval.
CCC certified products conform to GB 14048_5.

For a comprehensive certificate please visit: www.ab.com/safety

CE

Konformitätserklärung

Hiermit wird bescheinigt, dass die auf diesem Dokument aufgeführten Produkte die grundlegenden Gesundheits- und Sicherheitsanforderungen (EHSR's) der Europäischen Maschinenrichtlinie (98/37/EC), die relevanten Anforderungen der Niederspannungsrichtlinie 2006/95/EC. Diese Produkte entsprechen auch EN 60947-5-1, EN 1088, EN ISO 12100-1, EN 60204-1 und sind für Dritte zugelassen.
CCC zertifizierte Produkte entsprechen GB 14048_5.

Für ein ausführliches Zertifikat besuchen Sie bitte: www.ab.com/safety

CE

Déclaration de conformité

Nous déclarons par la présente que les produits mentionnés dans ce document sont conformes aux prescriptions essentielles d'hygiène et de sécurité de la directive européenne sur les machines (98/37/CEE), aux prescriptions pertinentes de la directive sur les basses tensions 2006/95/CE. Ces produits sont également conformes aux normes EN 60947-5-1, EN 1088, EN ISO 12100-1, EN 60204-1 et bénéficient de l'homologation tierce partie.
Les produits certifiés par CCC sont en conformité avec GB 14048_5.

Pour le certificat complet, consulter le site : www.ab.com/safety

CE

Dichiarazione di conformità

Con la presente si dichiara che i prodotti illustrati su questo documento sono conformi ai Requisiti essenziali per la salute e la sicurezza (EHSR) della Direttiva europea sui macchinari (98/37/CE), ai requisiti pertinenti della Direttiva per la bassa tensione 2006/95/CE. Questi prodotti sono anche conformi alle normative EN 60947-5-1, EN 1088, EN ISO 12100-1, EN 60204-1 e sono approvati per un uso da parte di terzi.
I prodotti con certificazione CCC si conformano a GB 14048_5.

Per visualizzare un certificato completo, si prega di visitare il sito: www.ab.com/safety

CE

Declaración de conformidad

Los productos que aparecen en este documento cumplen los requisitos esenciales de seguridad e higiene de la Directiva Europea de Maquinaria (98/37/EC) y los requisitos pertinentes de la Directiva de Bajo Voltaje 2006/95/EC. Asimismo, los productos cumplen la normativa EN 60947-5-1, EN 1088, EN ISO 12100-1, EN 60204-1 y cuentan con el sello Third Party Approval.
Los productos certificados CCC se conforman con GB 14048_5.

Para obtener toda la información acerca de seguridad, visite: www.ab.com/safety

English

Safety Contacts	2 N.C. + 1 N.C. direct opening action (TLS-1, TLS-2) 2 N.C. + 2 N.C. direct opening action (TLS-3)
Designation / Utilization Cat.	A300 / AC-15 240V / 3 A, 120V / 6 A
Thermal Current	10 A
Current, Min.	5V 5 mA dc
Auxiliary Contacts	1 N.O. + 1 N.O. (TLS-1, TLS-2) 1 N.O. (TLS-3)
Actuator Holding Force, Max.	2000 N (450 lb)
Actuation Speed, Max.	160 mm (6.29 in) per second
Actuation Speed, Min.	100 mm (3.94 in) per minute
Ingress Protection Rating	IP67
Operating Temperature	(–20 °C…+60 °C), (–4 °F…+140 °F)
Mechanical Life	1,000,000 operations
Electrical Life	1,000,000 operations
Torque Settings, Max.	1.4 N•m (12.39 lb•in) fixing bolts 1.2 N•m (10.62 lb•in) lid screws 1.0 N•m (8.85 lb•in) terminal screws 0.8 N•m (7.08 lb•in) terminal block screws
Lock Type	Power to Release (TLS-1, TLS-3) Power to Lock (TLS-2)
Power supply	24V ac/dc or 110V ac or 230V ac

Note: The safety contacts of these products are described as normally closed (N.C.), ie. with the guard closed, actuator in place (where relevant) and the machine able to be started.

Deutsch

Sicherheitskontakte	2 N.C. + 1 N.C. direkte Öffnung (TLS-1, TLS-2) 2 N.C. + 2 N.C. direkte Öffnung (TLS-3)
Bezeichnung / Einsatzkat.	A300 / AC-15 240V / 3 A, 120V / 6 A
Wärmestrom	10 A
Strom, Min.	5V 5 mA dc
Hilfskontakte	1 N.O. + 1 N.O. (TLS-1, TLS-2) 1 N.O. (TLS-3)
Betätigungselement-Haltekraft Max.	2000 N (450 lb)
Betätigungsgeschwindigkeit Max.	160 mm (6.29 Zoll) pro Sekunde
Betätigungsgeschwindigkeit Min.	100 mm (3.94 Zoll) pro Minute
Eindringen-Schutzgrad	IP67
Betriebstemperatur	(–20 °C…+60 °C), (–4 °F…+140 °F)
Mechanische Lebensdauer	1.000.000 Betätigungen
Elektrische Lebensdauer	1.000.000 Betätigungen
Drehmomenteinstellungen, Max	1.4 N•m (12.39 lb•in) Befestigungsschrauben 1.2 N•m (10.62 lb•in) Deckelschrauben 1.0 N•m (8.85 lb•in) Klemmenschrauben 0.8 N•m (7.08 lb•in) Kopfbolzen
Verriegelungstyp	Strom für Freigabe (TLS-1, TLS-3) Strom für Verriegelung (TLS-2)
Stromversorgung	24V AC/DC oder 110V AC oder 230V AC

Hinweis: Die Sicherheitskontakte dieser Produkte sind als normalerweise geschlossen (N.C.) beschrieben, d.h. bei geschlossener Schutzvorrichtung, Betätigungselement in Position (falls zutreffend) und Maschine startfähig.

Français

Contacts de sécurité	2 N.C. + 1 N.C. ouverture directe (TLS-1, TLS-2) 2 N.C. + 2 N.C. ouverture directe (TLS-3)
Désignation/utilisation	A300 / AC-15 240V / 3 A, 120V / 6 A
Intensité thermique	10 A
Intensité minimale	5V 5 mA cc
Contacts auxiliaires	1 N.O. + 1 N.O. (TLS-1, TLS-2) 1 N.O. (TLS-3)
Force de maintien maxi. de l'actionneur	2000 N
Vitesse maxi. d'activation	160 mm/s
Vitesse mini. d'activation	100 mm/mn
Protection	IP67
Plage de températures de service	–20 °C…+60 °C
Durée de vie mécanique	1,000,000 operations
Durée de vie électrique	1,000,000 operations
Couples de serrage	Vis de fixation 1.4 N•m Vis du couvercle 1.2 N•m Vis des bornes 1.0 N•m Boulons à tête 0.8 N•m
Verrouillage	Ouverture à l'alimentation (TLS-1, TLS-3)Verrouillage à l'alimentation (TLS-2)
Alimentation	24 V ca/cc ou 110 V ca ou 230 V cc

Remarque : Les contacts de sécurité de ces produits sont décrits comme normalement fermés (NF), c'est-à-dire lorsque la protection est fermée, l'actionneur en place (si applicable) et la machine en état de démarrer.

ESPAÑOL

Contactos de seguridad	2 N.C. + 1 N.C. acción de apertura directa (TLS-1, TLS-2) 2 N.C. + 2 N.C. acción de apertura directa (TLS-3)
Cat. designación / utilización	A300 / AC-15 240V / 3 A, 120V / 6 A
Corriente térmica	10 A
Corriente, mín	5V 5 mA c.c.
Contactos auxiliaresv	1 N.O. + 1 N.O. (TLS-1, TLS-2) 1 N.O. (TLS-3)
Fuerza de sujeción del accionador, máx.	2000 N (450 lb)
Velocidad del accionador, máx.	160 mm (6.29 in) por segundo
Velocidad del accionador, min.	100 mm (3.94 in) por minuto
Protección contra el ingreso	IP67
Temperatura operativa	(–20 °C…+60 °C), (–4 °F…+140 °F)
Vida eléctrica	1,000,000 operaciones
Vida eléctrica	1,000,000 operaciones
Ajustes de par, máx.	1.4 N•m (12.39 lb•in) tornillos de sujeción 1.2 N•m (10.62 lb•in) tornillos de la tapa 1.0 N•m (8.85 lb•in) tornillos terminales 0.8 N•m (7.08 lb•in) pernos de cabezales
Tipo de cierre	De liberación eléctrica (TLS-1, TLS-3) De bloqueo eléctrico (TLS-2)
Alimentación	24V ca/cc o 110V ca o 230V ca

Nota: Los contactos de seguridad de estos productos se describen como normalmente cerrados (o N.C.), es decir, con el protector cerrado, el accionador en su lugar (si procede) y la máquina en condiciones de arrancar.

Italiano

Contatti di sicurezza	2 N.C. + 1 N.C. ad azione diretta di apertura (TLS-1, TLS-2) 2 N.C. + 2 N.C. ad azione diretta di apertura (TLS-3)
Designazione / Cat. di utilizzazione	A300 / AC-15 240V / 3 A, 120V / 6 A
Corrente termica	10 A
Corrente, min.	5V 5 mA c.c.
Contatti ausiliari	1 N.O. + 1 N.O. (TLS-1, TLS-2) 1 N.O. (TLS-3)
Forza di tenuta dell'attuatore, massima	2000 N
Velocità attuatore, massima	160 mm per secondo
Velocità attuatore, minima	100 mm per minuto
Classificazione IP	IP67
Temperatura d'esercizio	–20 °C…+60 °C
Durata meccanica	1.000.000 di funzionamenti
Durata elettrica	1.000.000 di funzionamenti
Regolazioni coppia, massima	1.4 N•m per i bulloni di fissaggio 1.2 N•m per le viti del coperchio 1.0 N•m per le viti dei morsetti 0.8 N•m per i bulloni della testa
Tipo di blocco	Potenza di rilascio (TLS-1, TLS-3) Potenza di bloccaggio (TLS-2)
Alimentazione elettrica	24V c.a./c.c. o 110V c.a. o 230V c.a.

NB: i contatti di sicurezza di questi prodotti sono descritti come normalmente chiusi (NC), vale a dire con la protezione chiusa, l'attuatore in funzione (ove sia richiesto) e la macchina in condizione di avviamento.

EC Declaration of Conformity

The undersigned, representing the manufacturer

Rockwell Automation Ltd
Pitfield
Kiln Farm
Milton Keynes
MK11 3DR
United Kingdom

and the authorised representative established within the Community

Rockwell Automation BV
Rivium 1e Straat, 23
2909 LE Capelle aan den IJssel
Netherlands

herewith declare that the Products: ***Guard Locking Key Interlocks***

Product identification (brand and catalogue number/part number): ***Allen-Bradley/Guardmaster, Safety Interlock switch with Guard Locking, Bulletin 440G-S, 440G-T, 440G-MT***
(reference the attached list of catalogue numbers)

Product Safety Function:	***For use on machines where overrun is present or where opening of the guard must not be allowed until the machine is safe.***

are in conformity with the essential requirements of the following EC Directive(s) when installed in accordance with the installation instructions contained in the product documentation:

2006/95/EC	*Low Voltage Directive*
2004/108/EC	*EMC Directive*
2006/42/EC	*Machinery Directive*

and that the standards and/or technical specifications referenced below have been applied:

EN ISO 12100-1:2003 +A1:2009	*Safety of machinery – Basic concepts, general principles for design – Part 1: Basic terminology, methodology*
EN ISO 12100-2:2003 +A1:2009	*Safety of machinery – Basic concepts, general principles for design – Part 2: Technical principles*
EN 60947-1:2007	*Low-voltage switchgear and controlgear – Part 1: General rules.*
EN 60947-5-1:2004 +A1:2009	*Low-voltage switchgear and controlgear – Part 5-1: Control circuit devices and switching elements – Electromechanical control circuit devices.*
EN 1088:1995 +A1:2007 +A2:2008	*Safety of Machinery – Interlocking devices associated with guards – Principles for design and selection.*

Year of CE Marking (Low Voltage Directive):	*2000*

Manufacturer:	*Authorised Representative in the Community:*
Signature	***Signature***
Name: Simon Hudson	*Name:* Viktor Schiffer
Position: Test Manager	*Position:* Engineering Manager
Date: 21-Sep-2010	*Date:* 23-Sep-2010

Catalogue number	*Series* [1]	*Description*	*Directive* [2]			
			EMC	*LVD*	*ATEX*	*MD*
440G-S36001		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36003		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36005		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36007		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36009		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36011		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36044…49		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-S36058…63		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*
440G-SwxNSPyzN[3]		*Spartan tongue operated safety interlock switch with guard locking*	*Yes*	*Yes*	*N/R*	*Yes*

1) If no series number is given, then all series are covered

2) No = Product is not certified to this directive.
Yes = Product is certified to this directive.
N/R = This directive is not required for this product

3) Spartan part number options which are not detrimental to this DoC

w: 2 or 3
x: 1 or N
y: M or T
z: A, B or C

Catalogue number	Series [1]	Description	Directive [2]			
			EMC	LVD	ATEX	MD
440G-T27121		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27121KC-C1…4		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27121KC-L1…4		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27121KC-R1…4		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27123…24		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27127		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27129		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27132		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27134		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27136		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27138		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27166		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27169		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27171…72		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27174…75		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27177…78		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27180…81		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27183…84		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27186		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27191		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27202…03		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27232…41		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27241LQD		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27241RQD		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27242…43		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes
440G-T27245…64		TLS-GD2 tongue operated guard interlock switch	Yes	Yes	N/R	Yes

Catalogue number	*Series* [1]	*Description*	*Directive* [2]			
			EMC	*LVD*	*ATEX*	*MD*
440G-T27353A4R6		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27353A4R6L		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27353A4R6R		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27354…55		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27359…60		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27362		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-T27368		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-TtuvwPxyz[3]		*TLS-GD2 tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*

1) If no series number is given, then all series are covered

2) No = Product is not certified to this directive.
Yes = Product is certified to this directive.
N/R = This directive is not required for this product

3) TLS-GD2 part number options which are not detrimental to this DoC

t: 1, 2, 3 or 4
u: 1, 2 or N
v: A, B or N
w: B, E, G, F or N
x: H, L, M or T
y: 1, 2, 3, 4, 5, 7 or 8
z: B, C, L, N, R or X

Catalogue number	*Series* [1]	*Description*	*Directive* [2]			
			EMC	*LVD*	*ATEX*	*MD*
440G-MT47007…17		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47024		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47037…42		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47042-LQD		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47042-RQD		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47043…50		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47070…83		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47107…08		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47112…20		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47123		*Spare Lid with key release*	*N/R*	*N/R*	*N/R*	*N/R*
440G-MT47126		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MT47129…66		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*
440G-MtuvwDxyz[3]		*440G-MT tongue operated guard interlock switch*	*Yes*	*Yes*	*N/R*	*Yes*

1) If no series number is given, then all series are covered

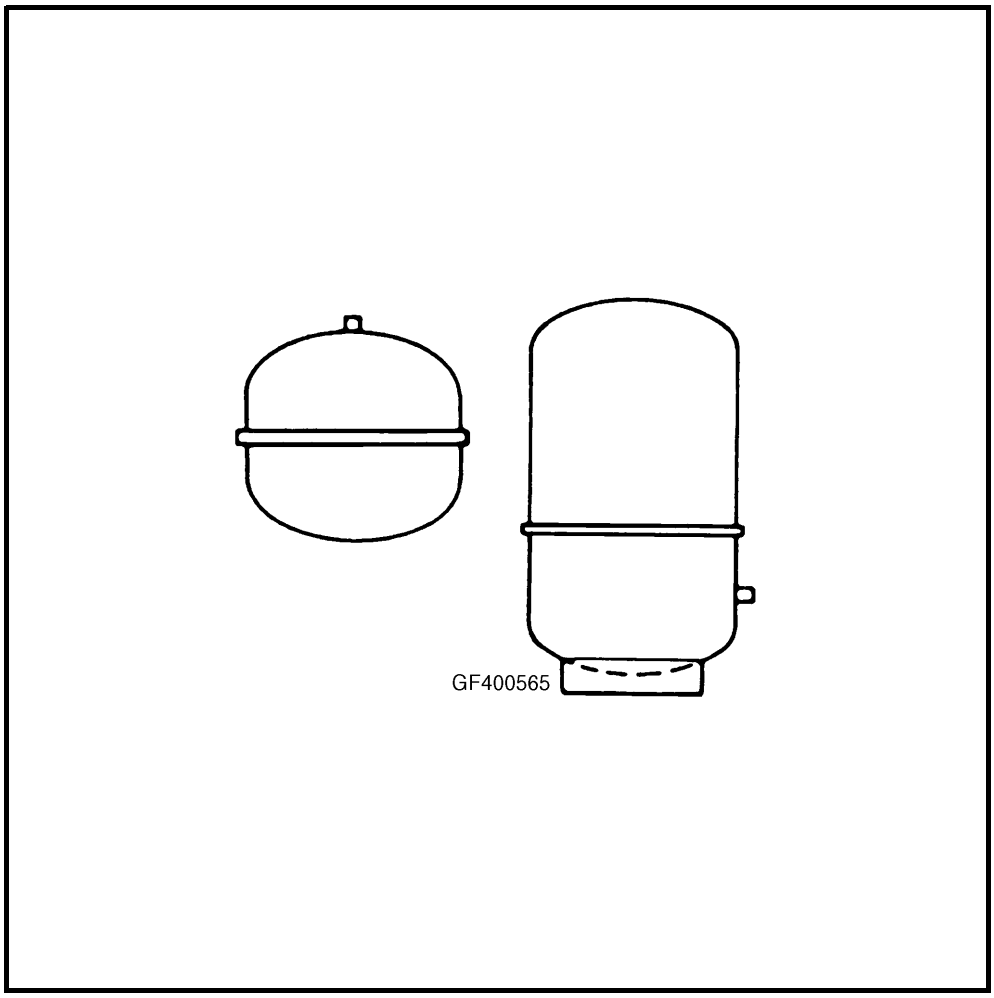
2) No = Product is not certified to this directive.
Yes = Product is certified to this directive.
N/R = This directive is not required for this product

3) 440G-MT part number options which are not detrimental to this DoC

t: 2, 3 or 4
u: 1, 2 or N
v: B or N
w: B, G or N
x: M or T
y: A, B or C
z: L, N or R

Maintenance & Spare Parts

Expansion vessel
(AKA)



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Tetra Pak

Doc No. 1210315-0101

Expansion vessel

Article No.	Volume (l)	Connection	Max working pressure (bar)	Max temp (°C)
6-31801-5035-1	12	G 3/4 “	4	-10 +99
6-31801-5035-2	25	G 3/4 “	4	-10 +99
6-31801-5035-3	50	G 3/4 “	4	-10 +99
6-31801-5035-4	80	G 3/4 “	6	-10 +99
6-31801-5035-5	4	G 3/4 “	5	-10 +99
6-31801-5035-6	8	G 3/4 “	5	-10 +99
6-31801-5035-7	18	G 3/4 “	4	-10 +99
6-31801-5035-8	35	G 3/4 “	4	-10 +99
90503-6565	150	G 3/4 “	3,5	-10 +99

1.0 1210315-0101.fro

Version 04 Issue 200610

Doc No. 1210315-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Check pressure 1

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Maintenance

Expansion vessel

General

Caution! Do not exceed maximum pressure of 3.5 bar.

Note! Do not exceed maximum temperature of 120°C.

The expansion vessel is divided into a pressure chamber and a water magazine by means of a rubber membrane. The purpose is to compensate for pressure variations due to temperature variations in the liquid. The expansion vessel with membrane is equipped with a common in- and outlet connection. Pre-pressure: 1 bar of Nitrogen.

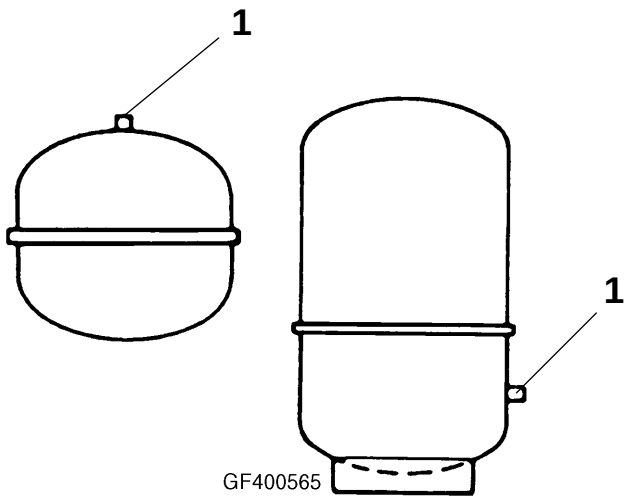
Check leakage

Check for leakage at system connection (1).

Check pressure

Pressure in the system must not exceed the max. pressure and should not be under pre-pressure. If the pressure is too low, the system has to be filled with media (e.g. water).

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1 System connection

Spare Parts

Not applicable for this component!

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Tetra Pak

Maintenance & Spare Parts

Pressure regulator

(Norgren)

VP50



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Tetra Pak

Doc No. 1223745-0101

Pressure regulator

VP50

Article No.	Power supply	Control signal	Supply pressure	Output pressure
6-31801-5977-2	24V DC	4 - 20 mA	0 - 10 bar	0 - 8 bar

1.0 1223745-0101.fro

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Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

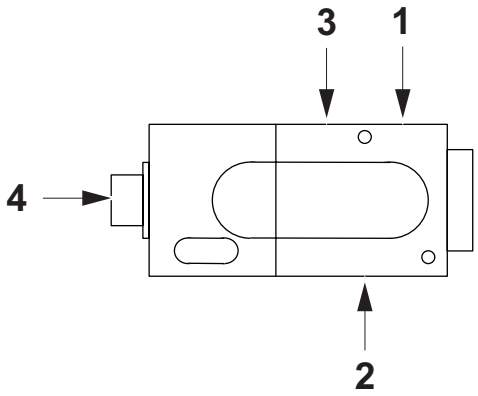
Change regulator

WARNING! **Risk of injury!**
Before dismantling, ensure that the pipeline is free from pressure.

Caution! **Risk of material damages!**
Do not short-circuit signal cables. Always disconnect supply circuits prior to connecting/disconnecting any parts.

a) Turn off the air pressure supply, and power supply.

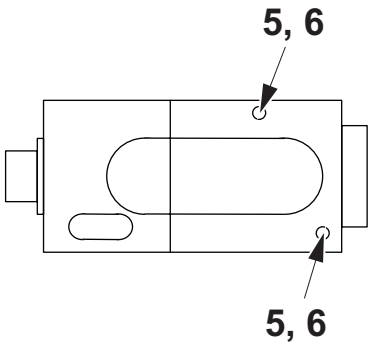
b) Disconnect all connections (1-4).



1 Supply port
2 Output port
3 Exhaust port
4 Electrical connector

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c) Unscrew the two screws (5) and washers (6).



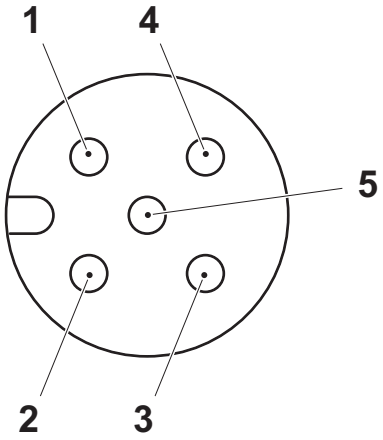
5 Screw, M4
6 Washer, M4

d) Fit the new regulator, and reassemble in reverse order.

Note! When reconnecting piping use a small quantity of pipe thread. **DO NOT** use PTFE tape.

Electrical connector

All electrical connections to the valve are made via the M12, 5 pin connector provided. This plug should be connected to the controller and power supply whilst disconnected from the valve.



1 +24 V DC supply, brown
2 Feedback 0-10 V full range, white
3 Control signal (+ve), blue
4 Common (DC supply, signal and feedback return), black
5 Chassis (earth), yellow/green

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Troubleshooting

Problem	Possible causes	Suggested action
No output pressure	Loss/No control signal	Check connections/wiring
	No power supply	
	Faulty ground wiring	
	Contamination	Use adequate 50 micron filtration
Low output pressure	Insufficient input pressure	Increase input pressure
	Incorrect wiring	Check that all common -ve connections are correct
	Low load volume	Check that pipe size is adequate (i.e>4mm)
Continuous full output pressure	Blocked spool	Use adequate 50 micron filtration
	Non-common grounding	Check that common -ve and earth wiring are correct and separate
Maximum outlet pressure not available	Insufficient input pressure	Increase available input pressure
Minimum outlet pressure too high	Calibration	Check zero and span potentiometer settings
Outlet pressure oscillates (chattering)	Wiring problem	Check common –ve
	Interference effects	Use shielded cable
	Calibration	Reduce gain setting
	Low load volume	Check pipe assembly
Unit behaves above/below specification	Settings changed from factory set-up	Customer to re-adjust zero and span in unison
	Check signs of damage to external casing	
	Age of the unit	
Unit has an air leak	Confirm system set-up. Correct power and pressure inputs	If mishandling of unit has led to failure such as incorrect voltage supplied to PCB or contamination, the unit will be considered beyond repair.
	Has the unit been opened?	

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Spare Parts

Not applicable for this component!

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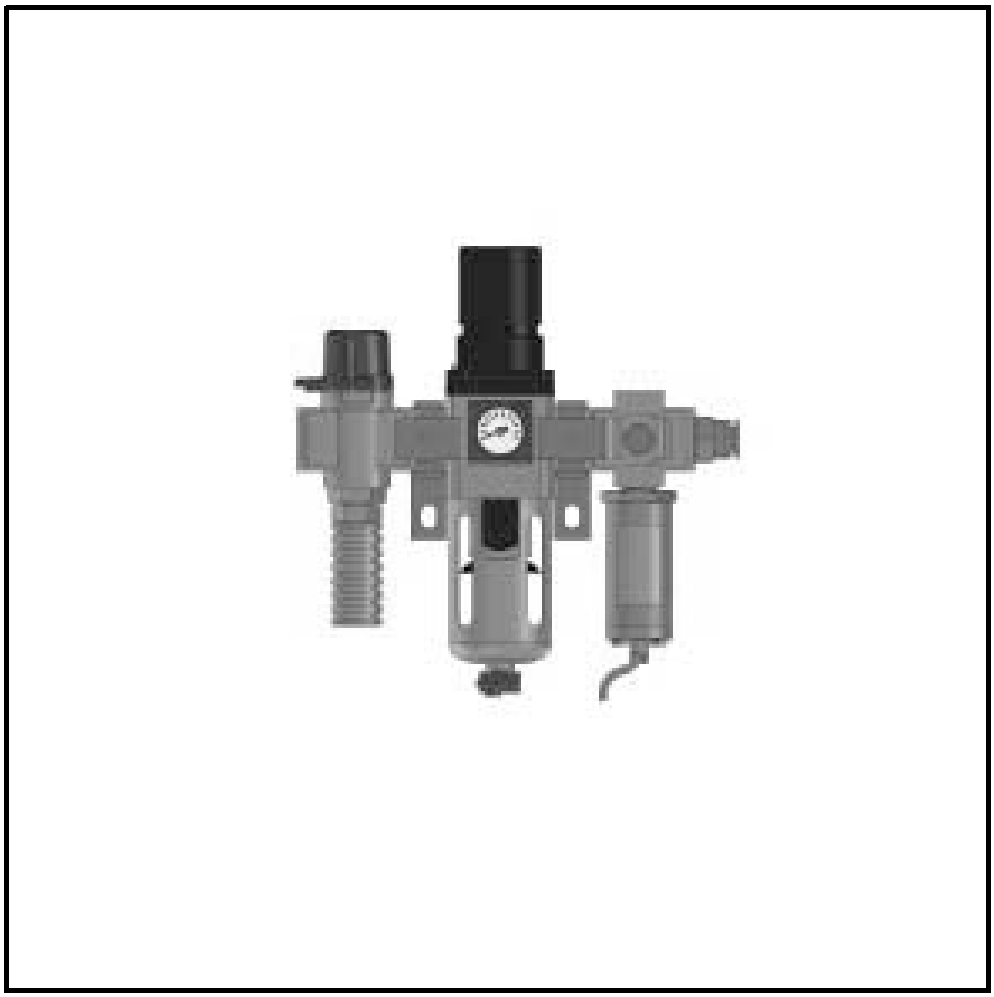
Tetra Pak

Maintenance & Spare Parts

Filter regulator

(SMC)

FRL



1.0 1224023-0101.fro

Tetra Pak

Doc No. 1224023-0101

Filter regulator

FRL

Article No.	Integrated pressure gauge	Pressure range	Pressure switch	Soft starter
90510-8628	yes	FR 1,5-10 bar	yes	no
90511-1073	yes	FR 1,5-10 bar	yes	yes
90511-2907	no	FR 1,5-10 bar	yes	no

1.0 1224023-0101.fro

Version 04 Issue 2010-08

Doc No. 1224023-0101

Tetra Pak

Tetra Pak Processing Systems AB

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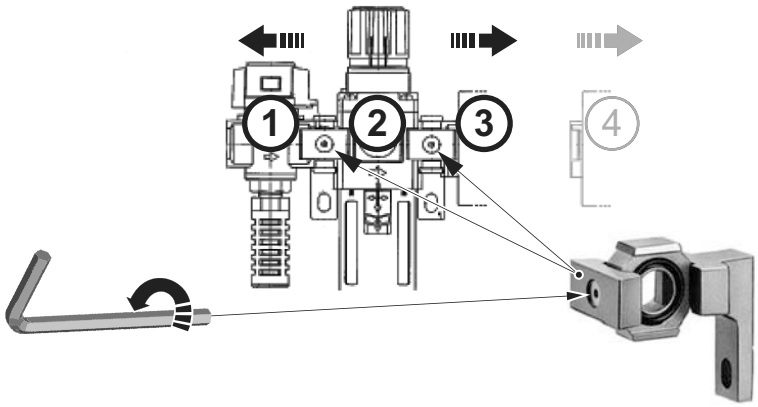
Adjustment procedure for pressure switch 4

Spare Parts 5

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Maintenance



Change filter element

The filter element should be replaced on a regular basis to avoid pressure drop due to clogging of filter. Frequency of replacement depends on the quality of air supply. The filter element should be replaced at least every two years, or before the pressure drop over the filter reaches 0.1 Mpa (1 bar).

Replacement procedure

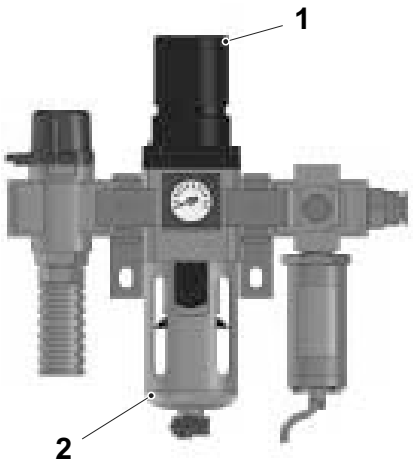
a) Ensure that pressure is turned off and exhausted.

b) Press down locking lever (1).

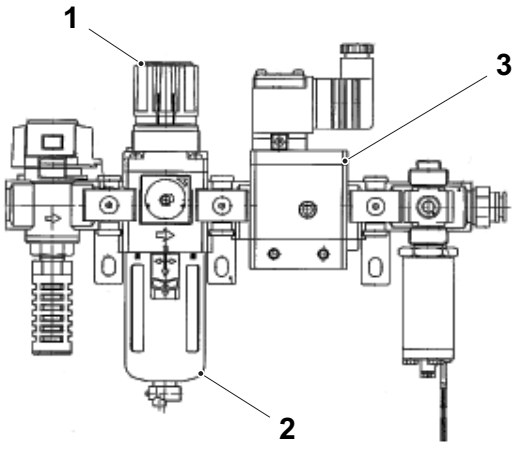
c) Turn bowl (2) clockwise or anti-clockwise with a 40° turn.

d) Pull down bowl (2), and empty the bowl (2) if necessary.

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FRL-unit without soft start-up valve.



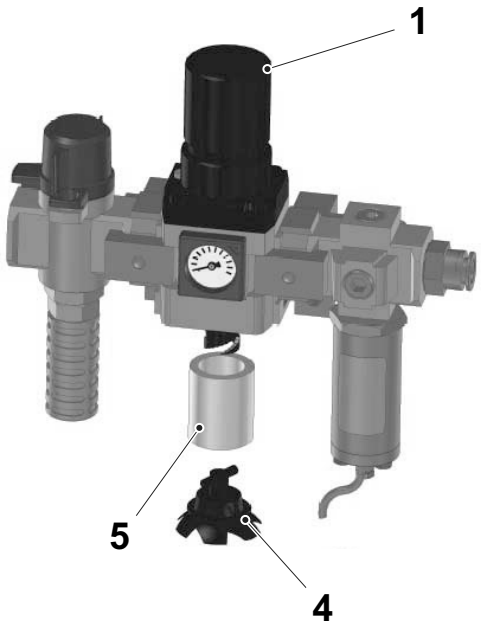
FRL-unit including soft start-up valve (3).

(Cont'd)

(Cont'd)

e) Unscrew filter holder (4) (anti-clockwise).

f) Pull down filter element (5) and replace with a new filter element.



g) Hand-tighten filter holder (4) by turning it clockwise with gentle force.

h) Return bowl to original position whilst holding down locking lever (1).

i) Release locking lever (1).

j) Control that the bowl is securely fastened by trying to remove the bowl without pressing down the release lever - disassembly should not be possible.

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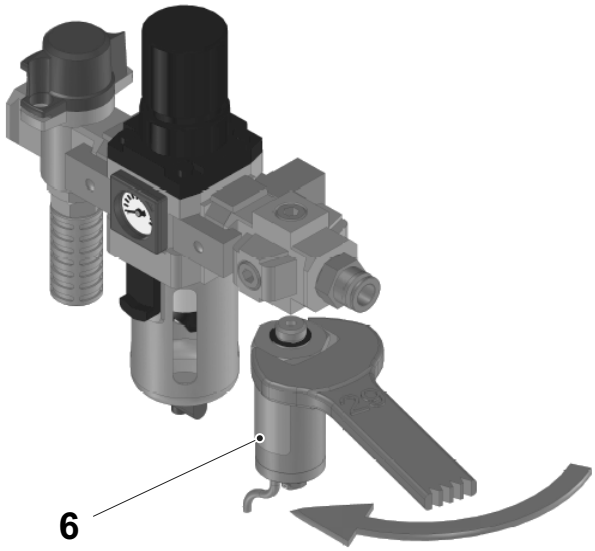
Change pressure switch

The pressure switch is mounted with a R1/4" thread.

Replacement procedure

a) Ensure that pressure is turned off and exhausted, and that electrical connection is disconnected.

b) Use a 29 mm block key around the hexagonal area near the thread. Turn the key carefully anti-clockwise until the pressure switch (6) can be turned by hand.



2.2tf506326.en

c) Turn the pressure switch by hand with one hand placed under the pressure switch until it loosens from the threads.

Note! Be careful so the pressure switch doesn't fall down and causes damage.

Caution! Don't lift the pressure switch in the cable, and avoid hard strikes or bounces on the pressure switch in order to avoid damages.

d) Add sealant on the thread.

e) Hand-tighten the pressure switch.

f) Tighten the pressure switch with the 29 mm block key (7-9 Nm).

(Cont'd)

(Cont'd)

g) Ensure that no load or power is applied to the electrical connection point.

h) Connect the electrical wire according to the electrical circuit. (See illustration below)



i) Ensure that the wire is securely fastened, with adequate cable glands etc as and when required.

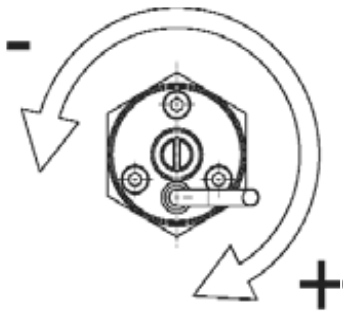
j) Connect load before connecting power source.

k) Apply pressure and check for leakage. Repeat the procedure from point (a) if a leakage is detected.

Adjustment procedure for pressure switch

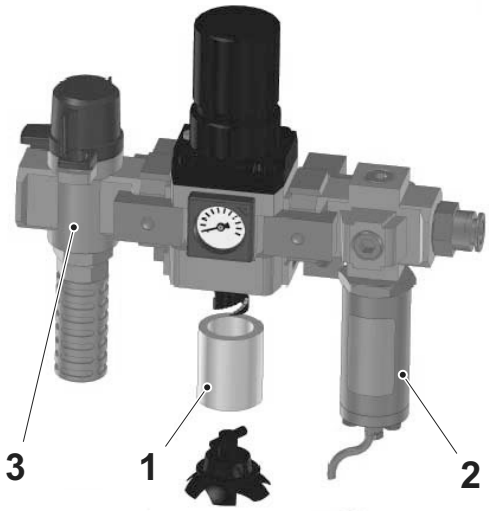
Note! Pressure switch is pre-set to 0.45 MPa (4.5 bar) at factory.

a) Set the pressure switch according to the manual. Anti-clock wise turning of the setting screw (7), decreases the setting, and clock-wise turning increases the pressure setting.



2.2tf506326.en

Spare Parts



Component article No.	Spare parts Article No.	Description	Pos	Qty
90510-8628 90511-1073 90511-2907	90510-8980	Filter element	1	1
	90511-1072	Pressure switch	2	1
	90512-4005	Pressure relief valve	3	1

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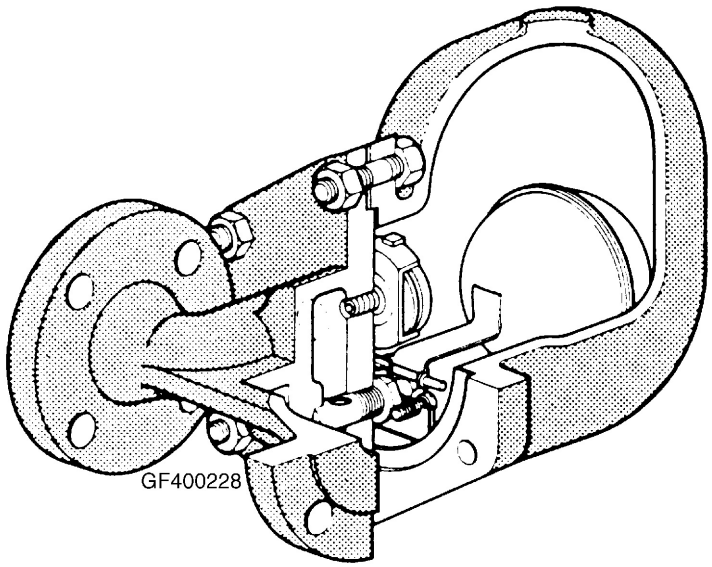
Tetra Pak

Maintenance & Spare Parts

Steam trap

(Spirax-Sarco)

FT47 - 4.5/FT47 - 10



1.0 1241199-0101.fro

Tetra Pak

Doc No. 1241199-0101

Steam trap

FT47 - 4.5/FT47 - 10

Article No.	Type	DN
6-31801-2772-1	FT47-4.5	15
6-31801-2772-2	FT47-4.5	20
6-31801-2772-3	FT47-4.5	25
6-31801-2772-4	FT47-4.5	40
6-31801-2772-5	FT47-4.5	50
6-31801-2773-1	FT47-10 V	15
6-31801-2773-2	FT47-10 V	20
6-31801-2773-3	FT47-10 V	25
6-31801-2773-4	FT47-10 V	40
6-31801-2773-5	FT47-10 V	50

1.0 1241199-0101.fro

Version 02

Doc No. 1241199-0101

Tetra Pak

Tetra Pak Processing Systems AB

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Change main valve, DN 15/20/25 2

Change main valve DN 40/50 4

Change gaskets 5

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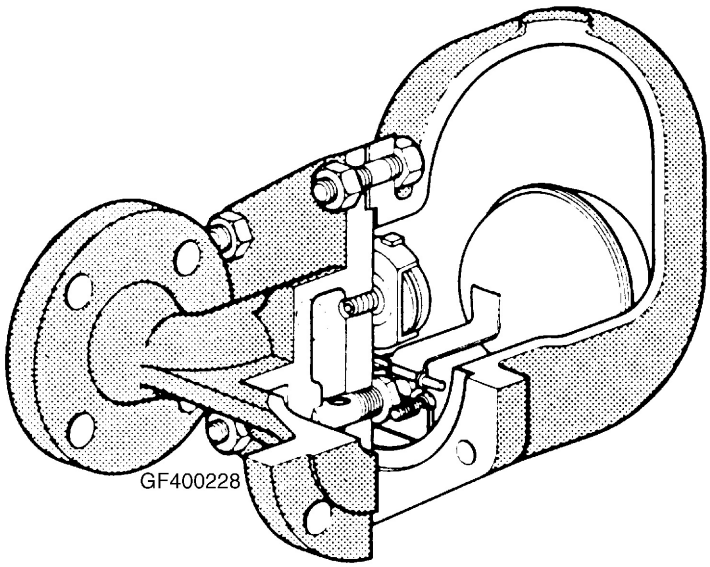
1.0 1241199-0101.TOC

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Maintenance

General

The steam trap is a ball floating steam trap with thermostatic air vent. When the level of condensate rises, the ball float is forced to move vertically, which will make a spindle open for the drainage valve. The level will sink and the drainage valve will then close again.



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Change main valve, DN 15/20/25

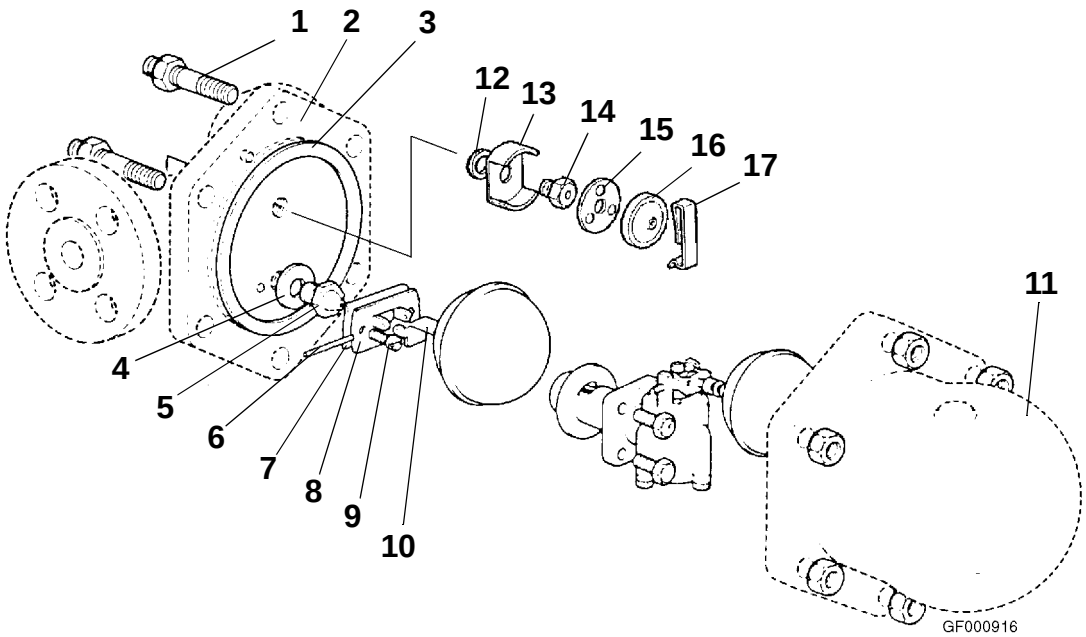
WARNING!

Risk of injury!
Before dismantling, make sure that the pipeline is drained and free from media!
Never service the steam trap when it is hot!

a) Unscrew bolts (1).
b) Remove cover (11).
c) Unscrew screws (9) and remove the complete float (6,7,8,9,10).
d) Remove valve seat (5) and gasket (4).
e) Remove gasket (3).
f) Change gasket (3) and the complete main valve assembly (4,5,6,7,8,9,10)
g) Fit gasket (4) and valve seat (5).
h) Attach the support frame (7) and the pivot frame (8) to the body (2) with screws (9), but do not tighten.
i) Fit the float (10) to the pivot frame (8) by using the pin (6).
j) Center the pivot frame (8) by pushing it against the valve seat (5).
k) Fit and tighten the screws (9).
l) Fit gasket (3).
m) Fit cover (11) and tighten bolts (1) to recommended torque, see table below.

Item no.	Size	Torque
1	DN 15/20/25	29-33 Nm
	DN 40/50	40-45 Nm

2.2TF000670.EN



1	Bolt	7	Support frame	13	Frame
2	Body	8	Pivot frame	14	Seat
3	Gasket	9	Screw	15	Spacer plate
4	Gasket	10	Float	16	Capsule
5	Valve seat	11	Cover	17	Spring clip
6	Pin	12	Gasket		

2.2TF000670.EN

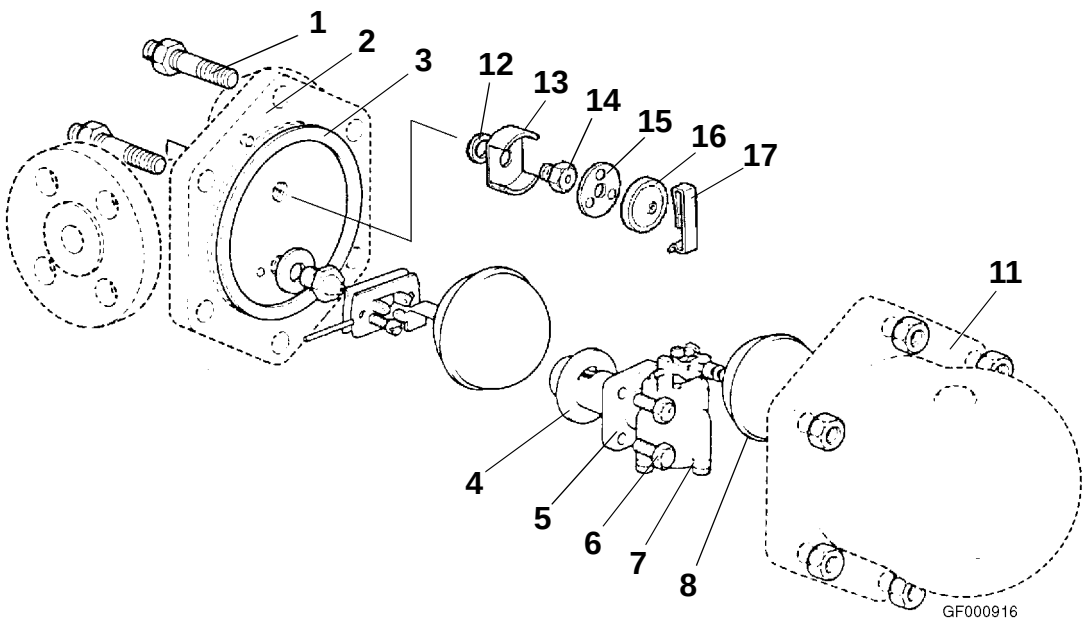
Change main valve DN 40/50

WARNING!

Risk of injury!
Before dismantling, make sure that the pipeline is drained and free from media!
Never service the steam trap when it is hot!

a) Unscrew bolts (1).
b) Remove cover (11).
c) Remove the complete main valve (4,5,6,7,8) by unscrewing the screws (6).
d) Remove float (8) by unscrewing it.
e) Remove gasket (3)
f) Change gasket (3) and the complete main valve assembly (4,5,6,7).
g) Reassemble in reverse order. Tighten bolts (1) to torques according to the table below.

Item no.	Size	Torque
1	DN 15/20/25	29-33 Nm
	DN 40/50	40-45 Nm



2.2TF000670.EN

1	Bolt	6	Screw	13	Frame
2	Body	7	Main valve	14	Seat
3	Gasket	8	Float	15	Spacer plate
4	Gasket	11	Cover	16	Capsule
5	Inlet plate	12	Gasket	17	Spring clip

Change gaskets

WARNING!

Risk of injury!
Before dismantling, make sure that the pipeline is drained and free from media!
Never service the steam trap when it is hot!

Note! Follow the instructions in "*Change main valve...*" to change the seat gasket (4), but without changing the complete main valve assembly.

a) Remove bolts (1).

b) Remove cover (2).

c) Remove spring clip (17), capsule (16), and spacer plate (15).

d) Unscrew seat (14) and remove frame (13).

e) Remove gasket (12).

f) Change gaskets (3,12).

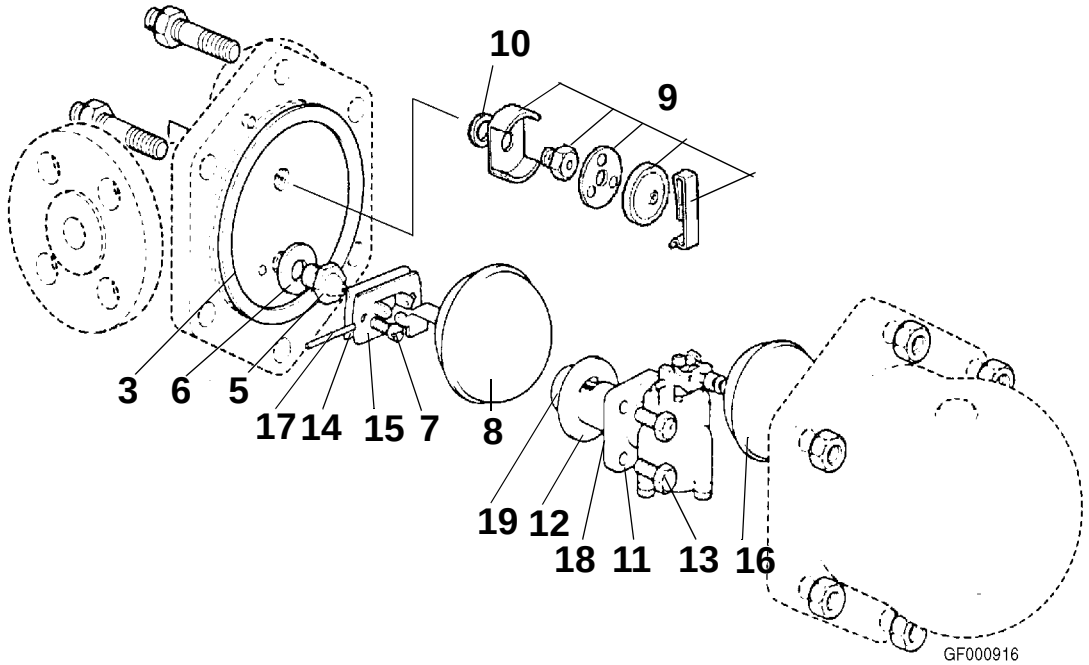
Note! Before reassembling, make sure that all joint faces are clean.
Align the frame (13) horizontally so that it clears the cover.

g) Reassemble in reverse order. Tighten bolts (1) to torques according to the table below.

Item no.	Size	Torque
1	DN 15/20/25	29-33 Nm
	DN 40/50	40-45 Nm

2.2TF000670.EN

Spare parts



2.2TF000671.EN

Component article No.	Spare part article No.	Description	Pos.	Qty
FT47 - 4.5				
6-31801-2772-1 6-31801-2772-2	90503-6589	Spare part kit DN 15-20	3 5 6 7 8 9 10 14 15 17	1 1 1 2 1 1 1 1 1 1
6-31801-2772-3	90503-6591	Spare part kit DN 25		
6-31801-2772-4	90503-6595	Spare part kit DN 40	3 9 10 11 12 13 16 18 19	1 1 1 1 1 2 1 1 1
6-31801-2772-5	90503-6596	Spare part kit DN 50		

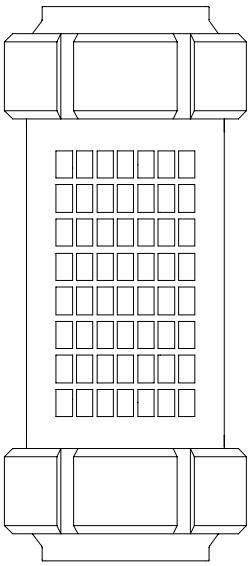
Component article No.	Spare part article No.	Description	Pos.	Qty
FT47 - 10				
6-31801-2773-1 6-31801-2773-2	90503-6590	Spare part kit DN 15-20	3 5 6 7 8 9 10 14 15 17	1 1 1 2 1 1 1 1 1 1
6-31801-2773-3	90503-6592	Spare part kit DN 25		
6-31801-2773-4	90503-3295	Spare part kit DN 40	3 9 10 11 12 13 16 18 19	1 1 1 1 1 2 1 1 1
6-31801-2773-5	90503-6597	Spare part kit DN 50		

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Tetra Pak

Maintenance & Spare Parts

Sight glass
(LKM)
LKGG-1



GF001157

1.0 1241295-0101.fro

Tetra Pak

Doc No. 1241295-0101

Sight glass

LKGG-1

Article No.	Connection	Material
6-31801-9668-1	W 51	PFM / AISI316L
6-9612-1414-01	W 25	EPDM / AISI304
6-9612-1414-02	W 38	EPDM / AISI304
6-9612-1414-03	W 51	EPDM / AISI304
6-9612-1414-04	W 63.5	EPDM / AISI304
6-9612-1414-05	W 76	EPDM / AISI304
6-9612-1414-06	W 25	EPDM / AISI316L
6-9612-1414-07	W 38	EPDM / AISI316L
6-9612-1414-08	W 51	EPDM / AISI316L
6-9612-1414-09	W 63.5	EPDM / AISI316L
6-9612-1414-10	W 76	EPDM / AISI316L
6-9612-1414-11	W 101.6	EPDM / AISI304
6-9612-1414-12	W 101.6	EPDM / AISI316L

1.0 1241295-0101.fro

Version 01

Doc No. 1241295-0101

Tetra Pak

Tetra Pak Processing Systems AB

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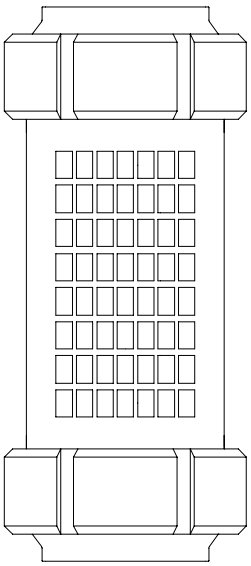
1.0 1241295-0101.TOC

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Function description

The LKGG-1 consists of a perforated stainless steel shield tube fitted with a welding union at each end. A special glass (Borosilicate) tube is fixed in the shield tube so that it is unaffected by possible stresses in the pipelines.

The in-line sight glass type LKGG-1 is used in pipelines to allow visual observation of product flow.



GF001157

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Maintenance

Sight glass

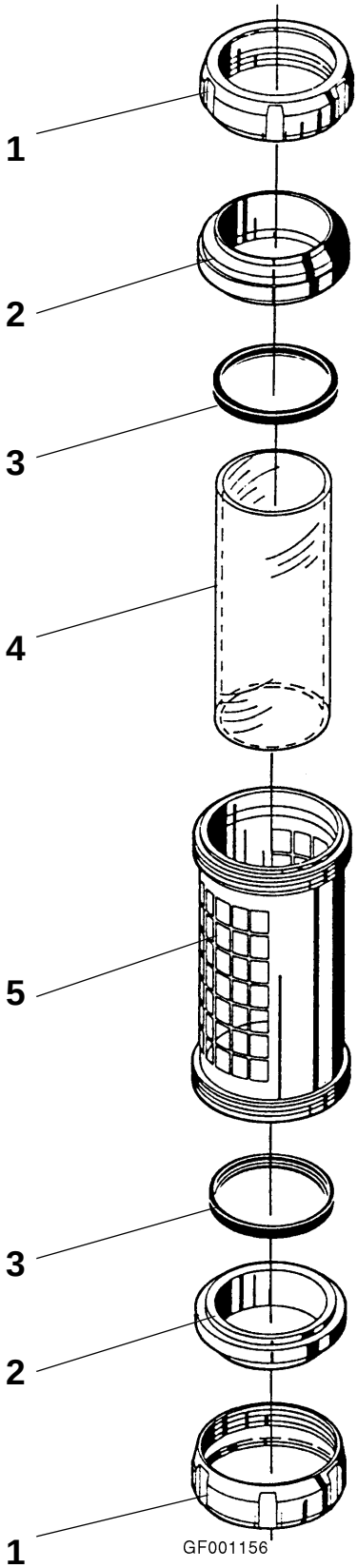
Change glass tube and seal rings

WARNING!

Risk of injury!
Make sure before disassembling that the system is drained and free from media.

a) Unscrew one of the nuts (1), from the protecting tube (5).
b) Remove the liner (2).
c) Remove the seal ring (3).
d) Lift out the glass tube (4).
e) Unscrew the other nut (1), from the protecting tube (5).
f) Remove the protecting tube (5), the other seal ring (3), and the other liner (2).
g) Change spare parts and reassemble in reverse order.

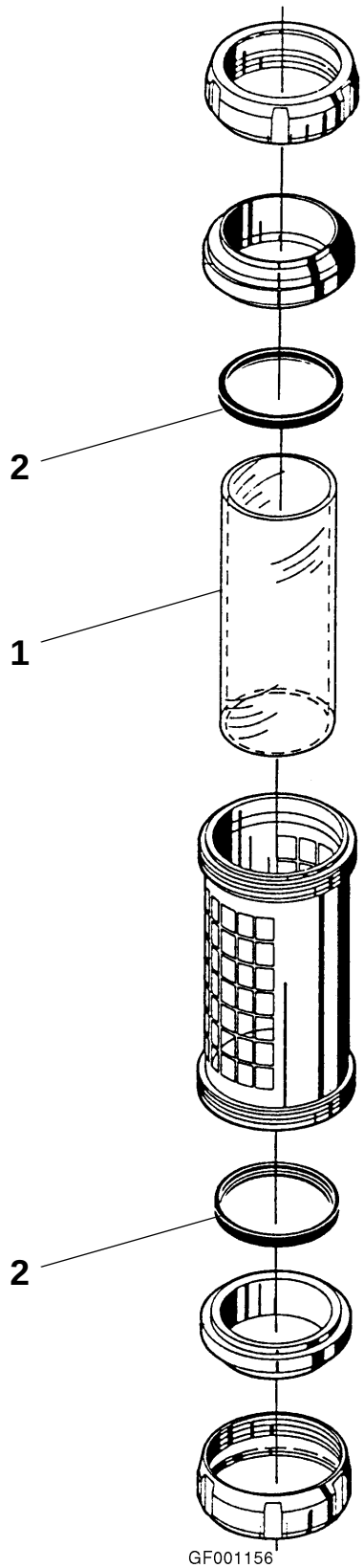
2.2TF000850.EN



1 Nut
2 Liner
3 Seal ring
4 Glass tube
5 Protecting tube

2.2TF000850.EN

Spare parts



2.2TF000851.EN

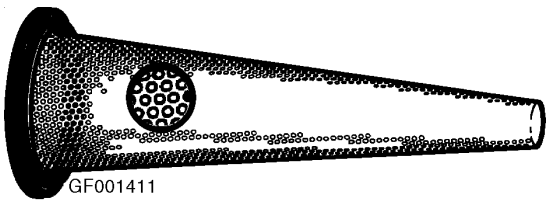
Component article No.	Spare part article No.	Description	Pos.	Qty.
6-31801-9668-1	6-9611-99-0531	Glass tube	1	1
	6-00990455-48	Seal ring, FPM	2	2
6-9612-1414-01	6-9611-99-0529	Glass tube	1	1
	6-9611-99-1976	Seal ring, EPDM	2	2
6-9612-1414-02	6-9611-99-0530	Glass tube	1	1
	6-9611-99-1977	Seal ring, EPDM	2	2
6-9612-1414-03	6-9611-99-0531	Glass tube	1	1
	6-9611-99-1978	Seal ring, EPDM	2	2
6-9612-1414-04	6-9611-99-0532	Glass tube	1	1
	6-9611-99-1979	Seal ring, EPDM	2	2
6-9612-1414-05	6-9611-99-0533	Glass tube	1	1
	6-9611-99-1980	Seal ring, EPDM	2	2
6-9612-1414-06	6-9611-99-0529	Glass tube	1	1
	6-9611-99-1976	Seal ring, EPDM	2	2
6-9612-1414-07	6-9611-99-0530	Glass tube	1	1
	6-9611-99-1977	Seal ring, EPDM	2	2
6-9612-1414-08	6-9611-99-0531	Glass tube	1	1
	6-9611-99-1978	Seal ring, EPDM	2	2
6-9612-1414-09	6-9611-99-0532	Glass tube	1	1
	6-9611-99-1979	Seal ring, EPDM	2	2
6-9612-1414-10	6-9611-99-0533	Glass tube	1	1
	6-9611-99-1980	Seal ring, EPDM	2	2
6-9612-1414-11	6-9611-99-2666	Glass tube	1	1
	6-9611-99-2665	Seal ring, EPDM	2	2
6-9612-1414-12	6-9611-99-2666	Glass tube	1	1
	6-9611-99-2665	Seal ring, EPDM	2	2

2.2TF000851.EN

Tetra Pak

Maintenance & Spare Parts

In-line filter
(Alfa Laval Flow)
LKIF



1.0 1241330-0101.fro

Tetra Pak

Doc No. 1241330-0101

In-line filter

LKIF

Article No.	Connection	Connection size (mm)
6-9612-0257-01	Clamp	25
6-9612-0257-02	Clamp	38
6-9612-0257-03	Clamp	51
6-9612-0257-04	Clamp	63.5
6-9612-0257-05	Clamp	76.1
6-9612-0257-06	Clamp	101.6
6-9612-0258-01	SMS	25
6-9612-0258-02	SMS	38
6-9612-0258-03	SMS	51
6-9612-0258-04	SMS	63.5
6-9612-0258-05	SMS	76.1
6-9612-0258-06	SMS	101.6

1.0 1241330-0101.fro

Version 01

Doc No. 1241330-0101

Tetra Pak

Tetra Pak Processing Systems AB

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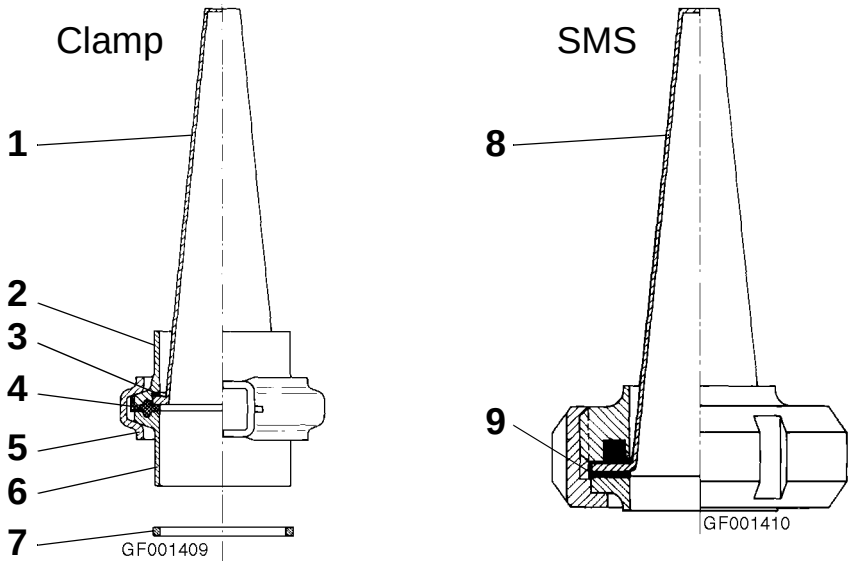
Function description

General

LKIF is a sanitary in-line filter. LKIF is designed for filtering particles from the products, e.g. for protection of pumps and other sensitive equipment.

The filter can be of the following types:

- Clamp type: consists of a filter element (1), clamp (2), (4), (5) and (6) seal ring (3) and replacement ring (7).
- SMS type: consists only of a filter element (8) and a seal ring (9), but is installed as shown below.



1 Filter element
2 Clamp liner
3 Seal ring
4 Clamp seal ring
5 Clamp ring
6 Clamp liner
7 Replacement ring
8 Filter element
9 Seal ring

It is recommended to install the filter so that the flow is upwards in the pictures shown above. The particles will then be accumulated at the inside of the filter which facilitates the cleaning process. The inlet flow can, however, be in the other direction, if required.

1.0TF000994.EN

Maintenance

In-line filter

Change spare part kit

WARNING!

Risk of injury!
Make sure before disassembling that the system is drained and free from media.

SMS

a) Loosen the nut (1).

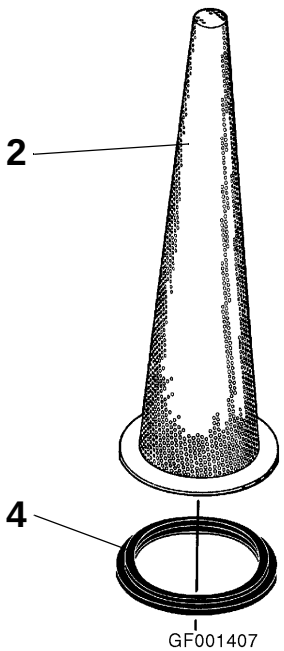
b) Pull the liners (5) apart enough to remove the seal ring (4).

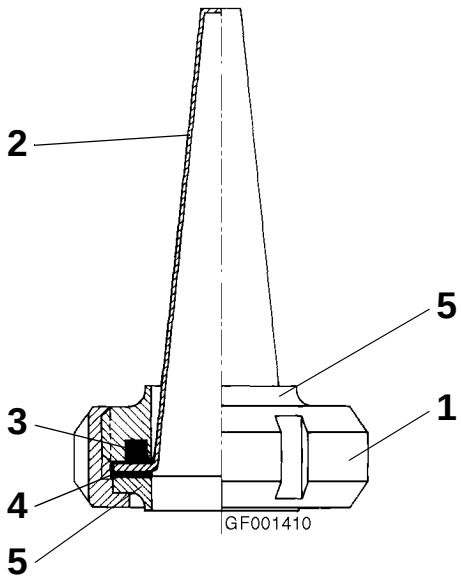
Note! If required loosen other pipes in order to separate the liners (5).

c) Clean the parts carefully.

d) Fit the new seal rings (4).

e) Fit and tighten the nut (1).





1 Nut
2 Filter element
3 Seal ring
4 Seal ring
5 Liner

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Clamp

a) Loosen the screws (1).

b) Remove the clamp ring (2) by opening the two clamp halves.

c) Remove the filter element (3).

Note! If required loosen other pipes in order to pull out the filter element (3)

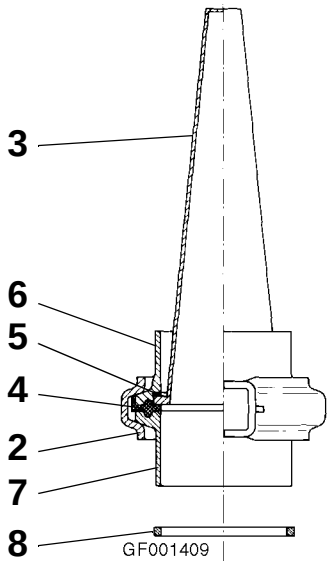
d) Remove the seal rings (4) and (5).

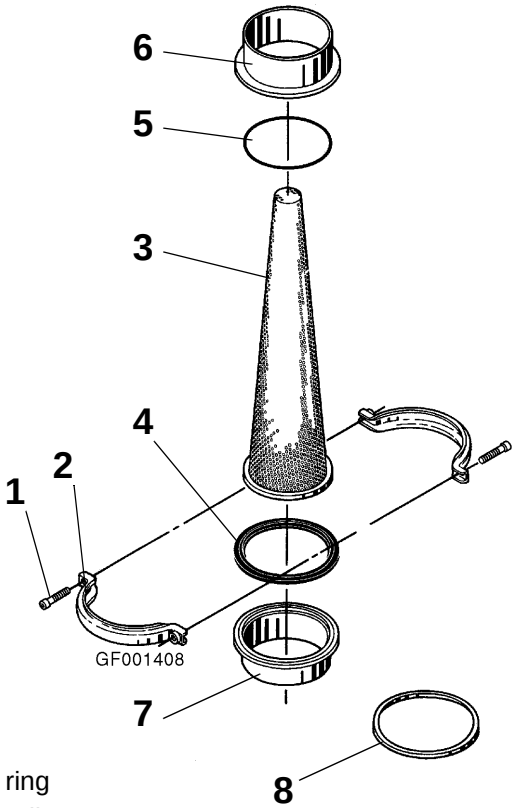
e) Clean the parts carefully.

f) Fit the new seal rings (4) and (5) in the order shown below.

g) Slide the new filter element (3) into the casing (6).

h) Fit the clamp (2) and tighten the screws (1).





1 Screws
2 Clamp ring
3 Filter element
4 Clamp seal ring
5 Seal ring
6 Clamp liner
7 Clamp liner
8 Replacement ring

1.0TF000995.EN

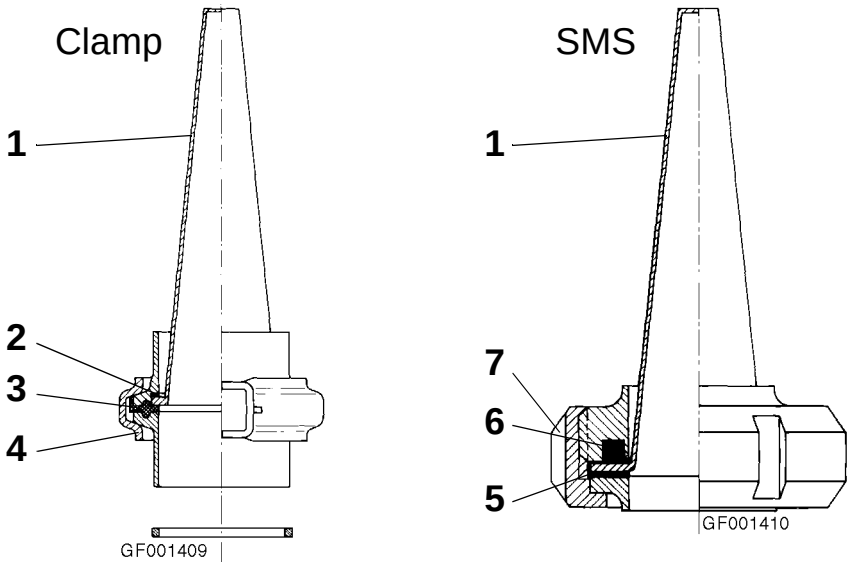
Clean filter element

a) Remove the nut (7) or clamp (4) according to *Change spare part kit*.

b) Remove the filter element (1).

c) Remove accumulated dirt from the filter element (1) and rinse it carefully with water.

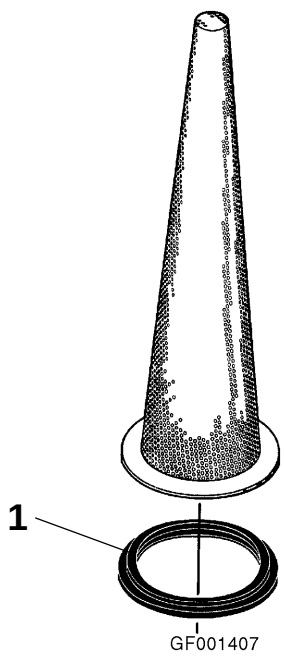
d) Make sure that the seal rings (5) and (6) or (2) and (3) are in place. Assemble in the reverse order.

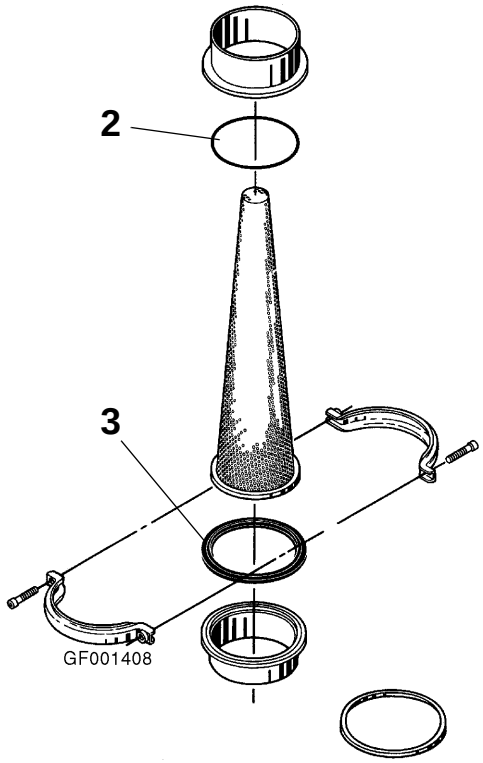


1 Filter element
2 Seal ring
3 Clamp seal ring
4 Clamp
5 Seal ring
6 Seal ring
7 Nut

1.0TF000995.EN

Spare parts





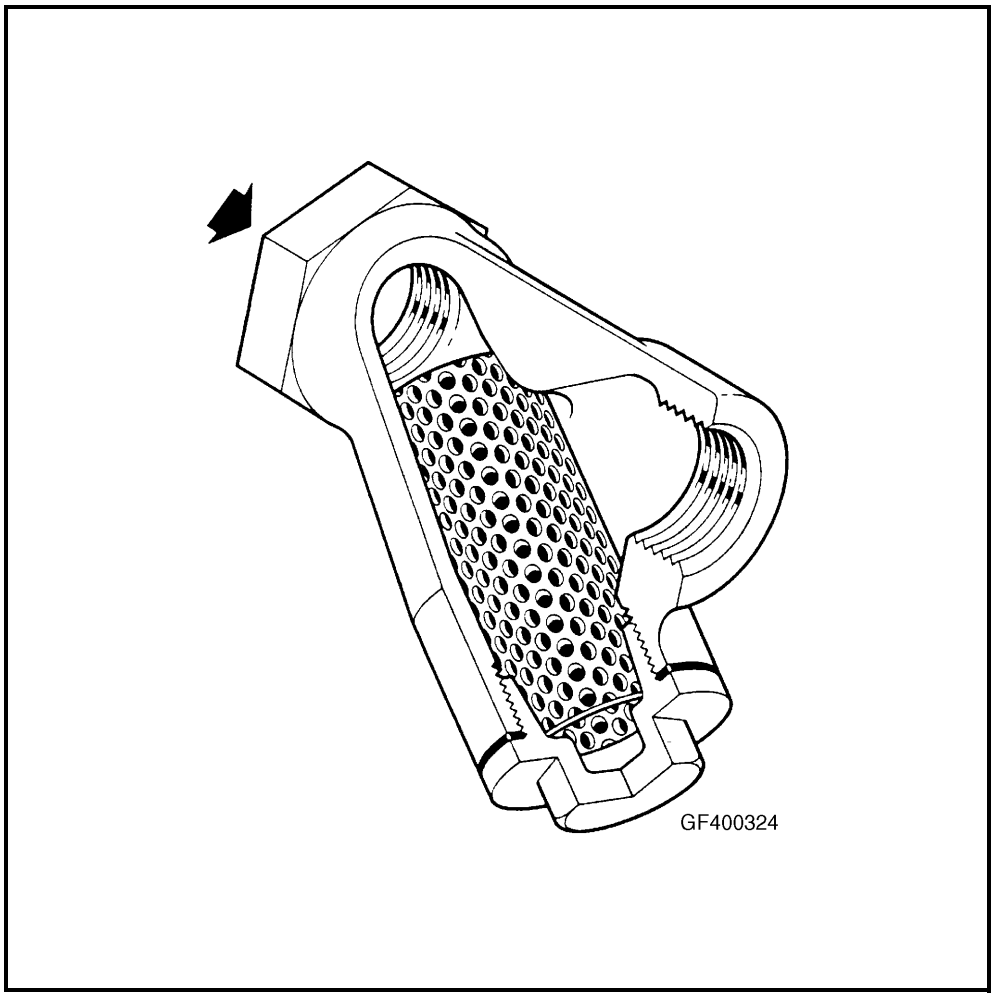
1.0TF000996.EN

Component article No.	Spare part Article No.	Description	Pos.	Qty.
6-9612-0257-01	6-9612-0254-01	Seal ring	2	1
	6-9611-99-1358	Clamp seal ring	3	1
6-9612-0257-02	6-9612-0254-02	Seal ring	2	1
	6-9611-99-1359	Clamp seal ring	3	1
6-9612-0257-03	6-9612-0254-03	Seal ring	2	1
	6-9611-99-1360	Clamp seal ring	3	1
6-9612-0257-04	6-9612-0254-04	Seal ring	2	1
	6-9611-99-1361	Clamp seal ring	3	1
6-9612-0257-05	6-9612-0254-05	Seal ring	2	1
	6-9611-99-1362	Clamp seal ring	3	1
6-9612-0257-06	6-9612-0254-06	Seal ring	2	1
	6-9611-99-1363	Clamp seal ring	3	1
6-9612-0258-01	6-9612-0255-01	Seal ring	1	1
6-9612-0258-02	6-9612-0255-02			
6-9612-0258-03	6-9612-0255-03			
6-9612-0258-04	6-9612-0255-04			
6-9612-0258-05	6-9612-0255-05			
6-9612-0258-06	6-9612-0255-06			

Tetra Pak

Maintenance & Spare Parts

Strainer
(Spirax/Sarco)



1.0 1248674-0101.fro

Tetra Pak

Doc No. 1248674-0101

Strainer

Article No.	Connection	Type	Material
6-31801-5609-1	1/2"	Fig 12	GGG-40
6-31801-5609-2	3/4"	Fig 12	GGG-40
6-31801-5609-3	1"	Fig 12	GGG-40
6-31801-5609-4	1 1/4"	Fig 12	GGG-40
6-31801-5609-5	1 1/2"	Fig 12	GGG-40
6-31801-5609-6	2"	Fig 12	GGG-40
90503-0975	1 1/2"	Fig 16	316L

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Tetra Pak

Tetra Pak Processing Systems AB

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Maintenance

Strainer

Description

Iron strainer with standard sieve of stainless steel with 0.8 mm perforations.

Check

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

Disassemble and check for impurities and mechanical damage.

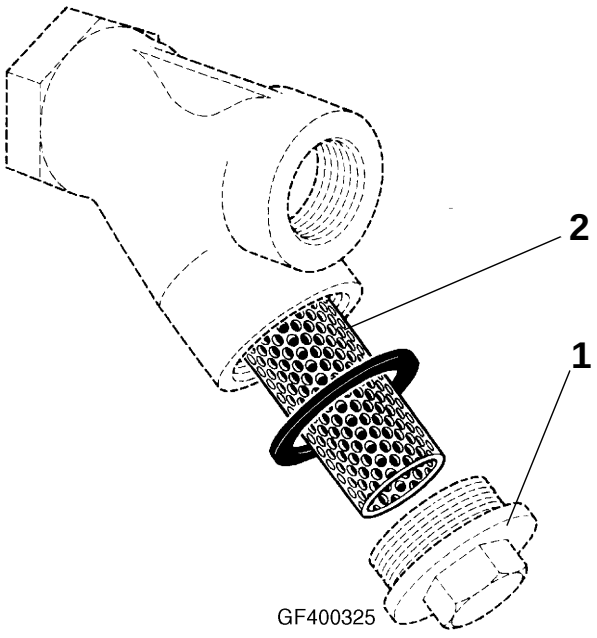
Change

WARNING!

Risk of injury!
Make sure before dismantling, that the pipeline is drained and free from media.

a) Remove the cap (1).
b) Change all parts in the service kit or clean the strainer (2).
c) Refit in the reverse order.

Tighten the cap according to the table below:

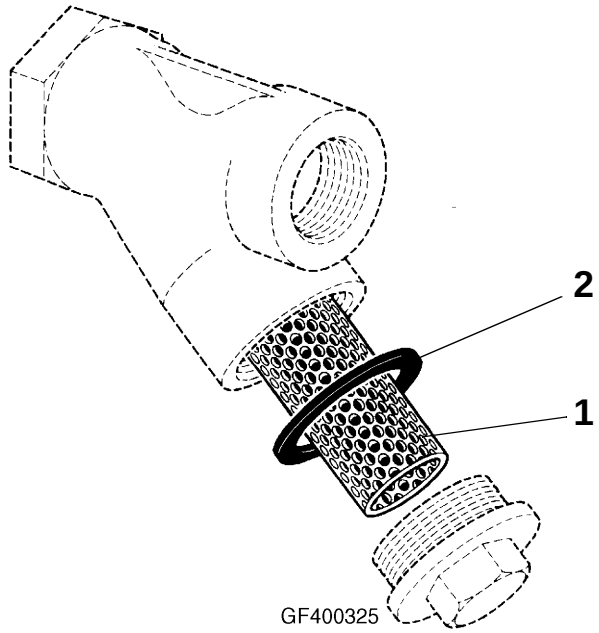


Connection	Torque Nm
1/2"	50/55
3/4"	60/66
1"	100/110
1 1/4"	180/200
1 1/2"	230/250
2"	330/360

1 Cap
2 Strainer

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Spare parts



Component Article No.	Pos.	Qty	Spare parts Article No.	Description
6-31801-5609-1	1	1	6-00990411-84	Strainer screen, 0,8
	2	1		Cap gasket
6-31801-5609-2	1	1	6-00990411-85	Strainer screen, 0,8
	2	1		Cap gasket
6-31801-5609-3	1	1	6-00990411-86	Strainer screen, 0,8
	2	1		Cap gasket
6-31801-5609-4	1	1	6-00990411-87	Strainer screen, 0,8
	2	1		Cap gasket
6-31801-5609-5	1	1	6-00990411-88	Strainer screen, 0,8
	2	1		Cap gasket
6-31801-5609-6	1	1	6-00990411-89	Strainer screen, 0,8
	2	1		Cap gasket
90503-0975	1	1	90503-7763	Strainer screen, Mesh 100
	2	1		Cap gasket

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