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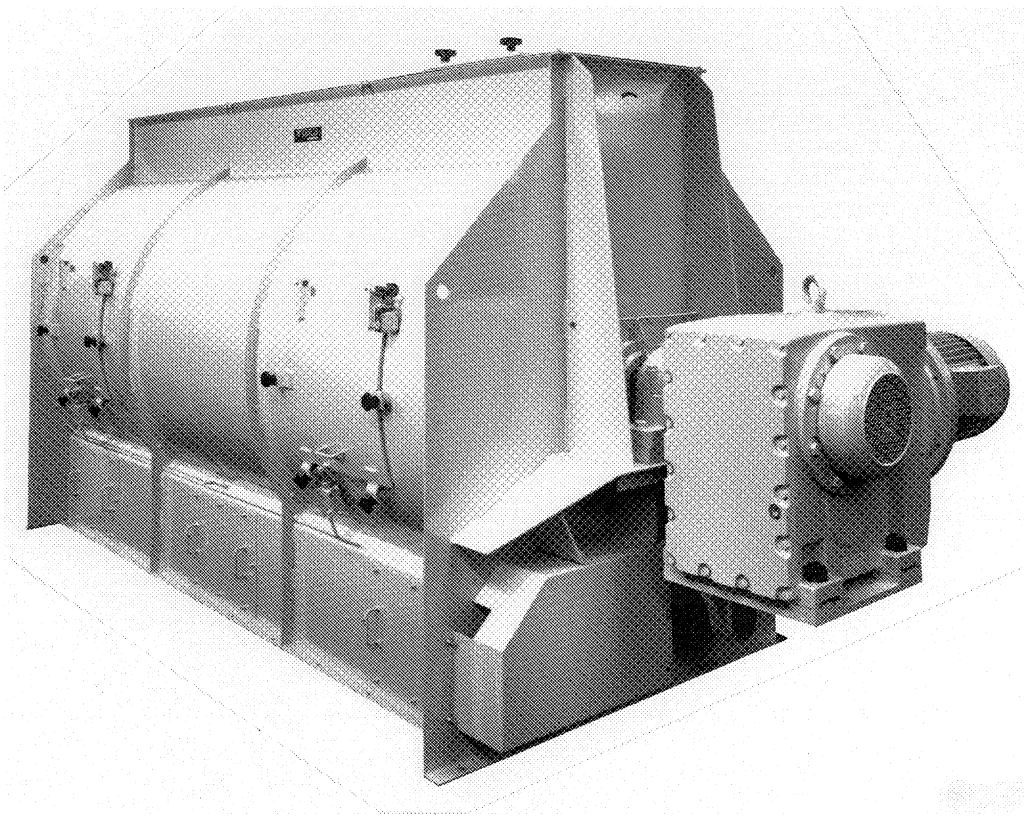
Operating Instructions

☒ Safety
☒ Installation
☒ Operation
☒ Maintenance
☐ Spare parts

66252 - en

8501 9606

Batch mixer DFMF



Important notes

A) Documentation

This instruction manual and/or spare parts list is destined for those persons which are in charge of operating and supervising your BUHLER plant and equipment. It is therefore essential for this present documentation to be actually handed to these persons.

B) Reception

Immediately upon receiving the machines, a visual inspection has to be carried out. If any damage caused by transportation is detected, the necessary measures described in the delivery contract are to be taken to settle a damage claim. The costs for repair are to be covered by the risk bearer.

C) Storage

Machines and equipment that cannot be erected immediately at their predestined sites must be stored in their crates and protected against the influence of the weather and other factors. Damage caused during storage shall only be treated within the framework of the delivery contract.

D) Erection and Installation

BUHLER machines and machine components may only be erected and installed by personnel that has been trained for this purpose, strictly observing all erection and installation instructions supplied with the equipment.

E) Different Models

If several different models of a machine are described in the provided instructions, those instructions shall be applicable which refer to the model that has been delivered. We reserve the right to make modifications up to the point of delivery if these modifications make for progress.

F) Start-up and Adjustment

Start-up and adjustment may only be carried out by instructed, trained personnel. Before the initial start-up, the operation personnel should be familiarized with all the instructions given in the provided documentation and with the operation manual. Before the initial start-up, the lubricating instructions, e.g. to fill up gear oil, must be strictly observed.

G) Accident Prevention

The instructions contained in the provided documentation referring to the prevention of accidents must be carefully observed and strictly followed up. BUHLER is constantly striving to design its machinery in accordance with the latest international safety standards. Local safety regulations must be specified to us by the customer before manufacturing has started. Should this result in additional costs, these shall be borne by the customer.

H) Maintenance/Cleaning

Maintenance work may only be carried out by specialists who have familiarized themselves with the instructions contained in the provided documentation. The aim of these instructions is to preserve the value, reduce the wear and achieve a long useful life of the plant and equipment! Cleaning work must be carried out in accordance with legal regulations and with the instructions contained in the provided documentation.

I) Copyright

We reserve all rights in this document and in the subject thereof. By acceptance of the document the recipient acknowledges these rights and undertakes not to publish the document nor the subject thereof in full or in part, nor to make them available to any third party without our prior express written authorization, nor to use it for any purpose other than for which it was delivered to him.

K) Warranty

Warranties are only given within the framework of the contractual agreements. They are only valid if ‹genuine BUHLER› spares are used. The warranty does not cover damage caused by the use of non BUHLER spares. Damage which is the result of inexpert handling, disregard of our instructions, or operating errors made by untrained personnel, can in no case be charged to the manufacturer.

L) Obligation to instruct

The user or owner of BUHLER machines and installations is obliged to instruct the personnel which has the task of operating these machines or installations, on these operating manuals, and in particular, to point out the hazards which may arise in connection with the operation of these machines and installations. Upon explicit request and against charge, BUHLER is willing to cooperate in the instructing.

CONTENTS

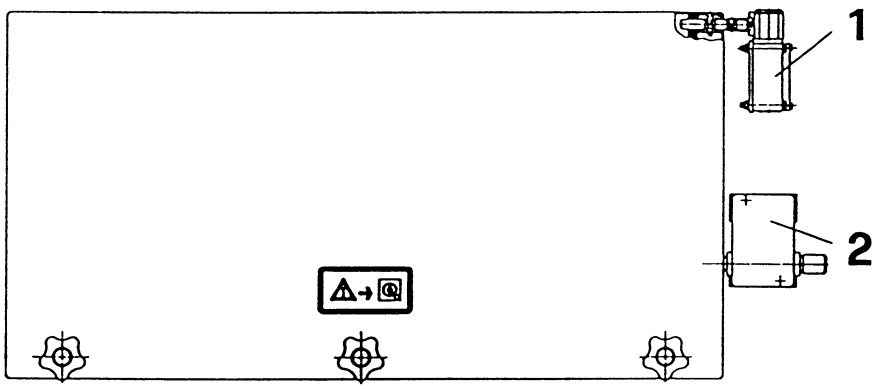
DFMF - 66252 - E

1. Safety

The safety of people operating the batch mixer is ensured by means of the following safety measures:

- The system of levers for operating the flaps is covered.
- In the case of the upper inspection cover the safety of people is ensured by a screwed-on grating.
- The lateral cleaning doors are equipped with two locking switches. In addition, one locking switch has a locking facility in that a screw with a fine-pitch thread has to be unscrewed before the cover can be swung off. In this way the lateral cleaning door is electrically and mechanically locked.
- The cleaning door cannot be opened during operation.
- The machine will not start if the cleaning door is open.

Fig. 1 *1 Switch-on protection*
2 Lock, mechanically and electrical



Important

The machine control has to be supplied by 'Bühler' or to be checked by a 'Bühler' specialist prior to starting.

Otherwise the responsibility of the supplier with regard to safety does not apply.

--->> Also see the additional important note given in the diagram section (chapter 6 and 8).

Geräuschdatenblatt 89/392/EWG

BÜHLER

Sound data sheet / Données acoustiques / Foglio dati di rumorosità
Hoja de datos de ruido / Folha de dados de acústica
Informatieblad geluigegevens / Лист с данными по эвоковому иэлучению

Messwerte / Measured values / Valeurs mesurées / Valori misurati / Valores medidos Valores de medição / Meetwaarden / Измеряемые значения	
Äquivalenter Schall-Druckpegel im Maschinenumfeld Equivalent sound pressure level in machine surroundings *Niveau de pression acoustique à la périphérie de la machine* Livello della pressione acustica equivalente nell'ambiente periferico della macchina *Nivel de presión acústica equivalente en el entorno de la máquina* Nível de pressão acústica equivalente, ao redor da máquina *Equivalent geluidsdrukniveau in omgeving van de machine* Эквивалентное эвуковое давление в окружности машины	1) L_{eq} = **69** dB (A)
Schall-Leistungspegel Sound power level *Niveau de puissance acoustique* Livello della potenza sonora *Nivel de potencia acústica* Nível de rendimento acústico *Geluidsvermogensniveau* Уровень эвуковой мощности	2) L_W = **89** dB (A)

Messverfahren *Measuring process* Méthode de mesure	1)	☐	**ISO 6081**
Procedimento di misura *Procedimiento de medición* Método de medição	2)	☐	**ISO 9614**
Meetmethode Процесс измерения	2)	☐	**DIN 45635**

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Personal protection

Safety precautions for accident prevention

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1. The machines and apparatus of BUHLER are provided at the manufacturing works with safety devices in accordance with today's standards of engineering, and in compliance with the generally valid regulations for the prevention of accidents, consideration having been given to the application for which the machine was designed.

2. The operator of the machine is expected to observe the regulations stated below with a view to achieving maximum safety of the operators working at the machines.

3. Belt and chain guards must **always** be installed and closed. Open or removed guards are extremely frequent causes of very serious injuries through bruising and shearing. The same applies for the guards of handling devices (robots).

4. Safety limit switches, interlock cylinders, speed monitors, and solenoid valves or locking magnets for the interlock of doors, must always be maintained in good working condition. Safety limit switches must never be bridged or put out of action.

5. Grates, bars or safety grids are usually permanently fixed to the machines. They can only be removed by means of tools. Machines provided with such devices may only be operated with these safety features fixed.

6. When carrying out overhaul, setup, inspection and maintenance work, always **put the drive motor out of action by completely separating all phases** (electrical conductors). This is done by means of a switch which isolates all the poles and can be locked, and which is installed next to the machine or in the control desk or control panel of the plant.

   The mere removal of the fuses is not enough!

7. If the machine relies on other sources of power for its operation, e.g. pneumatic or hydraulic power, steam or hot water, these supply lines must also be shut off; in addition, the internal system of power lines on the machine must be made **pressureless**.

8. Heated or cooled machine parts must be approached with special care, considering the risk of getting burned.

9. If a machine is put out of action by actuating the emergency stop switch, it must not restart when the switch is reset. The machine must not restart before the master switch is turned on again.

10. Special care must be exercised in connection with machines provided with **partial cutout devices**, e.g. machine tools, die casting machines and similar equipment.
    Strictly observe the instructions supplied with the machine. In operating machinery with partial cutout devices, always be prepared for the buildup of pressures or vacuums, temperature rises, etc. after certain time intervals.

11. If employees of a plant are unable to read or write, the owner of the plant must explicitely draw their attention to any existing hazards and must give them special instructions.

12. Cleaning, greasing and oiling of machines or machine sections must **only** be carried out **when the machine is at a standstill**. If, for this purpose, it is necessary to climb onto the machine or if the machine has to be entered, it is absolutely imperative, without exception, to cut off all the poles of the drive motors and to lock the switch with which this is done!

13. In the case of machines from which material samples are drawn, care must be taken that this can be done without risk. It often proves possible to draw samples from a pipe or spout downstream of the machine instead of from the machine itself.

14. Always remove dust, dirt and material deposits. Clean machines and installations increase the dependability and safety and the degree of cleanliness of a plant. This helps prevent dust explosions.

15. If a machine is losing oil or grease, it must immediately be removed and the leak must be stopped. Grease and oil on the floor increases the danger of accident considerably for the operators.

16. Safety devices must always be kept in working order and must never be removed, made ineffective or put out of action. In such an event we would decline any responsibility and we explicitly reserve the right of recourse to the responsible party.

17. Furthermore, we refer to the special instructions concerning accident prevention in our operating manuals.

18. BUHLER machines and apparatus must be operated exclusively by trained, specialised personnel.

19. At the final putting out of operation of the machine, observe in the interest of the environment and for purposes recycling:
    Drain off into special containers, such fluids as motor oil and gear oil, brake fluid and cooling liquids, and send them to processing facilities. Dispose of toxic refuse (e.g. batteries) according to regulations. Separate plastic materials and provide them for recycling. Separate metal parts according to type for scrapping or for the shredder.

Explosion protection

BÜHLER

Measures to be taken against dust fires and dust explosions

1. General rules for tidiness and cleanliness

1.1 A major condition for safety is that areas in which combustible dust is processed are kept as clean as possible.

1.2 Avoid the storing of goods either in bags or loose around the machines.

1.3 In order to reduce emission of dust into the environment, all transporting units, cyclones and filters are to be kept in good order, i.e. any leaks from pipes and covers are to be avoided as much as possible.

1.4 In order to reduce the danger for explosion, everything is to be cleaned from dust most thoroughly.

1.5 Dust should not be allowed to collect on motors.

2. Routine checks and maintenance

2.1 To prevent belt- and V-belt slipping drives from running hot due to slipping, these are to be checked regularly, at least once a week.

2.2 Speed monitors and similar safety devices are to be routine tested at least once a week.

2.3 All magnetic separators, dry destoners and sieves are to be routine tested and cleaned at least once a day.

2.4 To avoid shafts and bearings running hot, these are to be routine checked at least once a week and lubricated regularly.

3. Electrical installations

3.1 Electrical installations and appliances must be checked and tested regularly.
It is to be noted in particular that:
- portable lamps and lamp fittings without covering or protective glass may not be used.
- extension cables and electrical heaters are not allowed.
- faulty installations and appliances must be repaired or replaced immediately.
- the fastening of loose cables on the floor is not permitted.
- outside working hours the electrical circuit of the installation must be switched off as extensively as possible from a central point.
- at least once a year the entire electrical installation is to be checked by an authorised electrician for faulty insulation, according to the rules for power circuits.

4. Smoking and welding

4.1 **Smoking must not be allowed.** This does not only apply to the personnel of the company, but also to guests, customers, foreign craftsmen, drivers, etc.

4.2 Repairs and erection work that require the use of welders, blow torches, etc. must be done in a separate, specially equipped workshop whenever possible.

4.3 In case welding or the use of an open flame cannot be avoided within the production- or store areas, a written consent must be attained from the responsible manager. Such work must not be done before special safety measures are taken, moistened tarpaulins have been spread out to cover the direct vicinity and fire extinguishers have been placed near the working area. The area and the environment at which the welding work was done, must be kept under supervision for at least 10 hours after work has been finished. The spray of liquid hot metal drops from flame cutting (welding beads) are extremely dangerous since one does not see where they go. These can travel through narrow slits, openings in walls, etc. to adjacent or lower rooms, covering distances of more than 10 meters. If such hot welding beads land in a layer of dust, there is potential danger for a smoulder fire.

4.4 **Under no condition may welding work be done on transport systems that are in operation.** Such work may be carried out only after the systems have been switched off, thoroughly cleaned out and blocked off on both sides for example with mineral wool, so that there is no connection with other transport elements, silos and containers, etc. When working on spouting and conveying pipes, these are to be dismantled and the lower end turned away or blocked, so that no glowing parts can get into conveying lines or silos.

5. Electrostatic charges

In order to make sure of electric conduction, i.e. to prevent an explosion occurring due to spark discharge, **remove any layer of paint** from electrical contact surfaces.

General Safety Sheet

The machine or installation must only be operated, overhauled and maintained by qualified, trained, authorized personnel.

Main switch

to be switched off whenever maintenance or overhaul work is performed ; lock by padlock to rule out any unintentional starting.

Instruction of personnel

Customer personnel must be adequately instructed.
The production manager is responsible for this instruction and for the observance of additional national, local and in-company safety instructions.

Proper use

The machine must not be used for any purposes other than that for which it has been designed.

Warning and instruction plates

must be strictly observed, be kept clean, not be removed, not be concealed.

Safety devices

must not be removed, not be concealed, not be bridged,
are only allowed to be opened when the installation is shut down and must be in proper working condition whenever the machine is started.

Defective parts

must be immediately repaired or replaced by new ones.

Observe when setting up equipment

Take into account the space required for opening, removing and installing the doors.

Leave the machine parts in their original packings until you start installation work.

Carefully cover all machine parts and crates ; store them in a sheltered place ; do not expose them to sunlight and humidity.

Remove the transportation locking devices.

Check hoisting gear for allowable loading. Take into account the weights to be handled.

- Only use the prescribed attachment points.
- Take care to ensure correct and safe fastening of the ropes.
- Do not step underneath suspended loads.

Position conveyor belts so that no damage will be caused.

Immediately report any transportation damage and/or missing parts.

General Safety Sheet

Observe in connection with control system

Installation and maintenance of the control system must only be performed by trained, qualified personnel.

Whenever working on the electronic system, switch off the permanent power supply.

Observe all regulations of local accident prevention authorities.

Provide power supply lines with cutouts in compliance with local regulations.

Make sure that the direction of rotation, voltage and frequency are as stated by the nameplate.

Do not remove or conceal designation numbers on electrical wiring.

Machine and process control systems

The control systems supplied by Buhler are an integral part of the safety concept for the prevention of accidents in connection with our machines and installations.

They must be tested by a Buhler specialist on the basis of a checklist and be cleared for operation by his visa before the installation is put into operation.

If the control systems of Buhler machines and installations are supplied by third parties, they must be designed to Buhler specifications and be carefully checked by a Buhler specialist and be cleared for operation by his visa before the equipment is started up.

Under these conditions, Buhler can only be held responsible for personal injury and property damage, but reserves the right to have recourse against the supplier of the control system.

Buhler shall not be liable toward the contracting partner for errors and their consequential damage of control systems procured by the contracting partner from third parties.

2. Brief Description

The batch mixer DFMF basically consists of a horizontal, cylindrical sheet steel case with feeding part and bottom flap in which the mixing rotor rotates around the horizontal axle.

The bottom flap extends over the full length of the mixer and therefore ensures quick and almost complete emptying of the mixer.

Air operated vibration generators and a special painting on the inside effect a further reduction of the residual quantity.

The bottom flaps are sealed with inflatable hollow section rubber seals.

The models DFMF - 2 ... 20 have **one** bottom flap.
The models DFMF - 33 ... 110 have **two** bottom flaps.

A toggle lever mechanism prevents opening of the bottom flaps in the case of power failure.

The rotor runs on outside pedestal bearings.

Depending on the product paddle or spiral rotors are used.

The rotor shaft is sealed with ground axial face seals which are swept with compressed air after every batch.

The feeding part of the mixer is provided with three covers one of which is designed as an inspection door with a screwed-on protective grating.

The arrangement of the covers can be selected freely with the limitation that the **paddle** rotor has always to be supplied in the center.

All models except for DFMF-2 have two cleaning doors at the sides (DFMF-2 only one door).
These doors are locked electropneumatically in such a way that they cannot be opened during operation, or if they are open the mixer cannot be started.

Table 1

DFMF	Paddle Rotor			Spiral Rotor		
	min. (l)	max. (l)	(kg)	min. (l)	max. (l)	(kg)
2	20 - 40	200	140	140	200	140
10	100 - 200	1000	700	700	1000	700
20	200 - 400	2000	1400	1400	2000	1400
33	330 - 600	3300	2300	2310	3300	2300
44	440 - 800	4400	3000	3080	4400	3000
66	1320	6600	4500	4620	6600	4500
88	1760	8800	6000	6160	8800	6000
110	2200	11000	7500	7700	11000	7500

As all pneumatic connections are led to a central set of valves
only one connection to the compressed-air ductwork system is required.

Because of the different national regulations the electrical connections
have to be made on the spot.

A terminal box can be provided.

The models DFMF-2 ... DFMF-88 are driven by a slip-on gear motor.

In the case of model DFMF-110 the drive is effected via
two slip-on spur gear motors.

The maximum useful capacity is limited either by volume or by weight.

In the case of the paddle rotor partial batches of 10 ... 20 % can be mixed.
An addition of liquid, however, is not possible.

In the case of the spiral rotor the minimum quantity may not be less
than 70 % of the maximum useful capacity (see table 1 on the left side).

The models DFMF-2 ... DFMF-44 are also available in special steel.

Fig. 3.1

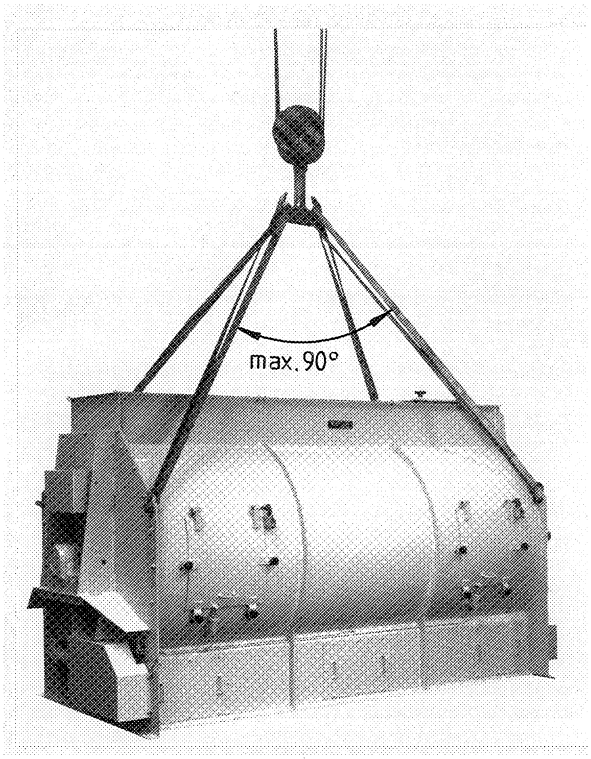


Fig. 3.2

DFMF	2	10	20	33	44	66	88	110
Gewicht ohne Aufsteckgetriebe Weight without slip-on gear Poid sans réducteur à arbre creux Peso senza riduttore ad albero cavo Peso sin engranaje reductor de eje hueco Peso sem engrenagem de encaixe	250 kg	800 kg	1300 kg	1800 kg	2500 kg	3600 kg	4500 kg	6500 kg

DFMF	2	10	20	33	44	66	88	110
Gewicht des Aufsteckgetriebes Weight of slip-on gear Poid de réducteur à arbre creux Peso di riduttore ad albero cavo Peso de engranaje reductor de eje hueco Peso de engrenagem de encaixe	46 kg	216 kg	390 kg	547 kg	788 kg	878 kg	1290 kg	2x 1290 kg

3. Transport / Assembly / Notes on Planning / Place of Application

3.1 Hanging-up at the crane (Fig. 3.1)

The batch mixer is dispatched already mounted. When hanging it up, fix the ropes at the especially provided suspension arrangement and not at the crosshead.

3.2 Assembly (Fig 3.2)

Place the batch mixer on a solid and non-vibrating base. If necessary, reinforce the ground with concrete or iron girders. Weights see figure 3.2.

3.3 Electrical Connections

Make connections according to the connection diagram. Also see diagram in chapter 6.

Direction of rotation according to chapter 4.

3.4 Notes on Planning

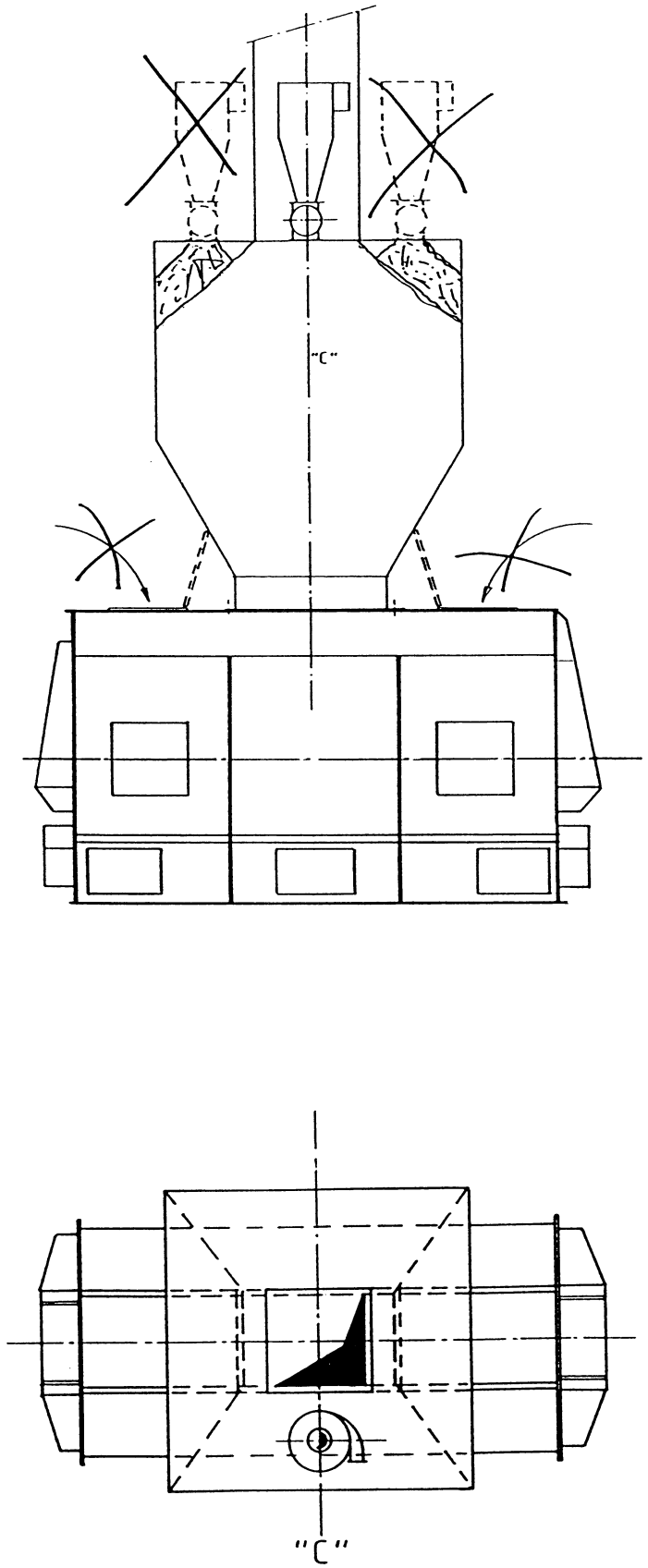
To carry out the following maintenance and inspection work, the distances given in the lists of dimensions have to be observed.

- Opening the cleaning doors
- Mounting and detaching the slip-on gear
- Removing the rotor on the opposite side of the pinion end
- Recirculation air conduit
- Maintenance of the nozzle rods

Dimension the **vessel behind the mixer** so big that there is enough space for a complete batch (volume) and that the discharge flap of the mixer dips not into the product when it is open.

An access door is provided for servicing the bottom flap.

Fig. 3.5



3.5 Feeding the Mixer (Fig. 3.5)

The basically different mixing characteristics of both rotor types (paddle and spiral) have to be considered when planning the feeding vessel.

While the feeding of the spiral rotor can be effected over the full length, the **paddle** mixer can only be filled **in the central third.**

Never use the inspection cover for manual feeding.

If other substances than the main components have to be added (for example premix by means of pneumatic transport), the feeding has to be effected on the center line "C", this means crosswise to the mixer axle (see fig. 3.5).

Fig. 3.6

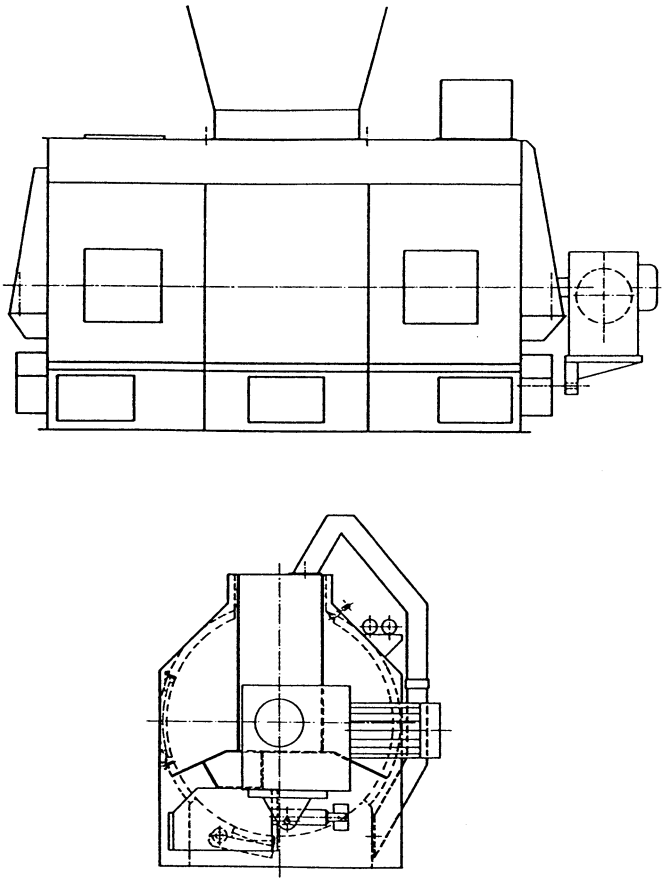
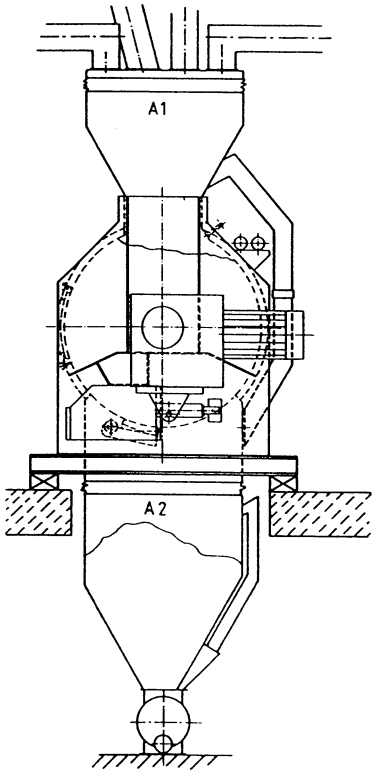


Fig. 3.7



3.6 Deaering (Fig. 3.6)

A recirculation air conduit has to be provided so that the displaced air can escape when filling and emptying the mixer.
It can only be mounted on the side opposite to the cleaning doors.
An additional aspiration is not recommended as it may cause entrainment.

3.7 Mixer Scales (Fig. 3.7)

If the mixer is mounted on electronic measuring cells, it can be used as scales.

In this case the following has to be observed :

- the weighing of the components has to be carried out while the rotor is out of action (accuracy of proportioning !).

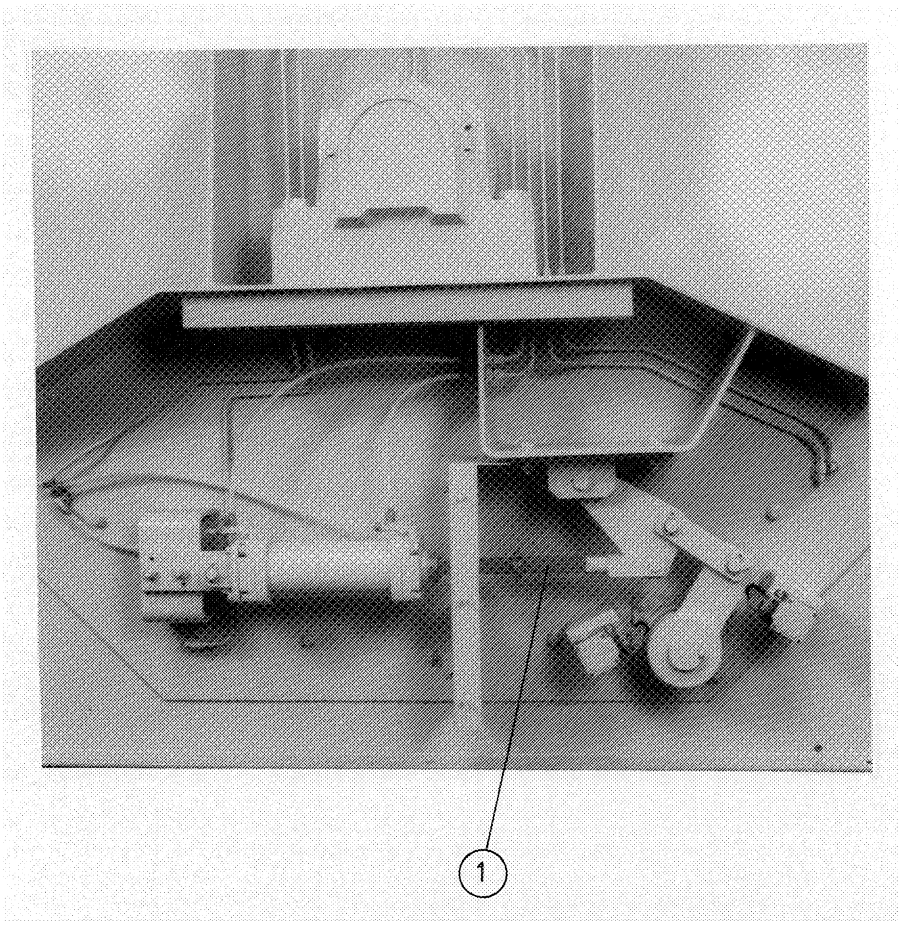
- in the case of a badly flowing product a distribution during the filling is not guaranteed if the mixer is out of action so that there is not enough space for the batch in the mixer.

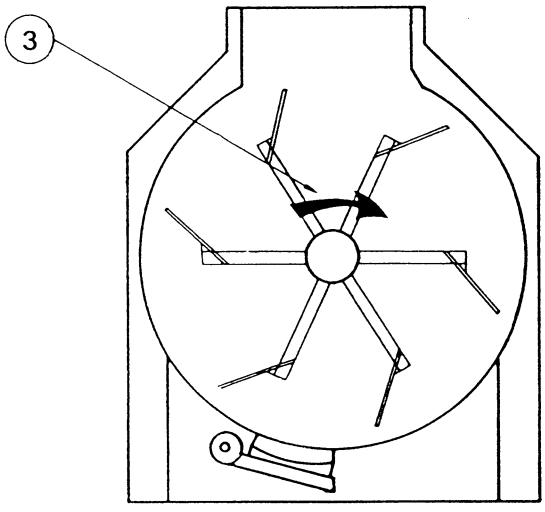
  (Let the mixer run from time to time; use electric smooth start.)

- There has to be an equal surface above and below the mixed product ($A_1 = A_2$) so that the low pressure caused by external influences (aspiration, secondary air, pneumatic transport, etc.) cannot have a negative effect on the mixer scales.
  This is done by placing an additional feeding vessel (see fig. 3.7).

  As now the feeding is possible over the full length only a **spiral** rotor must be used.

Fig. 4.1





4. Operation / Initial Start-Up

4.1 Initial Start-Up (Fig. 4.1)

Remove transport safety device

Remove the yellow marked angles (1) before initial start-up.

Inspections before initial start-up

- The sense of rotation (3) of the rotor seen from the pinion end has to be kept in clockwise direction.
- The rotor must not touch the trough at any point.
- Check the oil-level of the gearing.

4.2 Operation

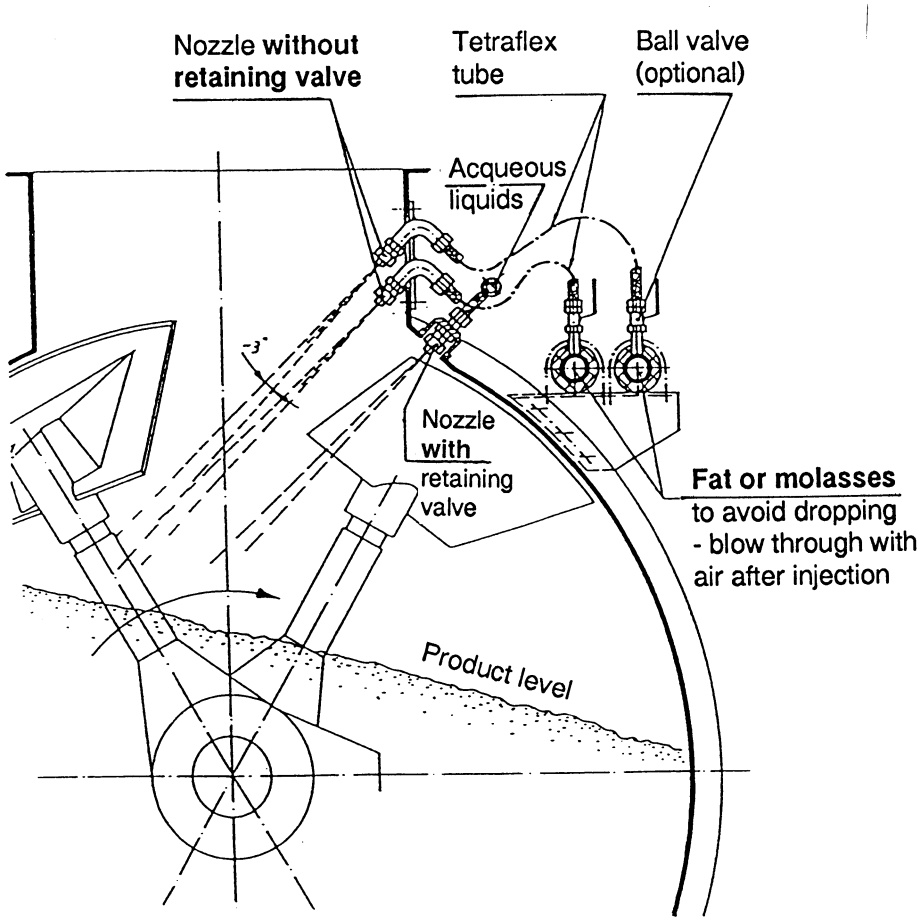
- The mixer is filled and emptied while the rotor is turning. (Exception: mixer scales!)
- **Residues**

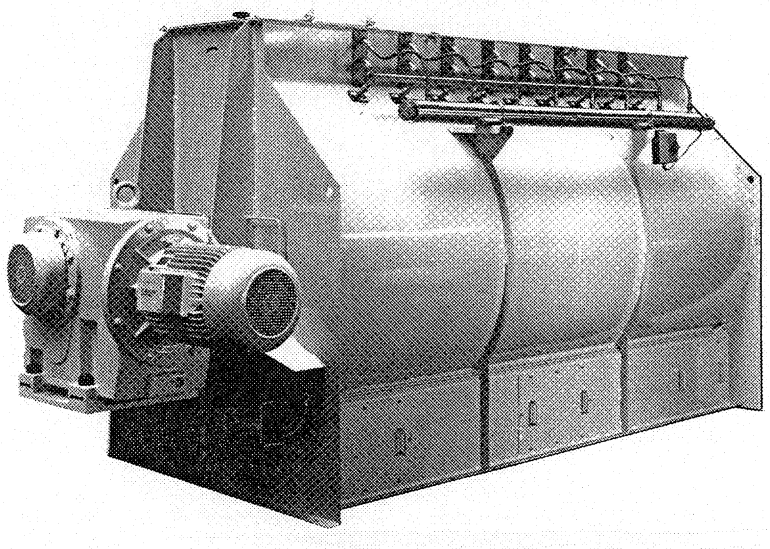
  The mixer is provided with a special anti-adhesion painting on the inside which limits the residual quantity after emptying to a minimum. Nevertheless it may occur that rough parts appear in the mixer after longer interruption of operation.

  By mixing an abrasive product (crushed maize) for 2-3 hours the inside can be polished again. The intensity of the roller vibrator, which is switched on automatically during the time of flap opening, can be adjusted to the conditions via the pressure control valve.

  Set of valves see chapter 6.3.

Fig. 4.4


Nozzle **without retaining valve**
Tetraflex tube
Ball valve (optional)
Acqueous liquids
Nozzle **with** retaining valve
Fat or molasses to avoid dropping - blow through with air after injection
Product level



4.3 Mixing Time

The process of mixing lasts 1 - 5 minutes depending on product and fineness. Products of mean fineness of approx. 500 micrometers and a piled density of approx. 0.5 kg/dm³ require a mixing time of 3 minutes.

Quality of Mixing

The accuracy of mixing (quality) is determined by the coefficient of variation V in %. An indicator (methyl violet, common salt, etc.) is added to the mixed product. After the mixing time is over at least 12 samples are taken from the mixer, the portion of indicator is compared and the standard deviation and the coefficient of variation are calculated. It is called a "homogeneous" mixing if the coefficient of variation is 5% or less.

4.4 Adding Liquids (Fig. 4.4)

Liquids can be added directly during the filling (max. 5%) via special injection devices with appropriate fittings. It should be carried out after 1/2 - 2/3 of the dry mixing time. After adding the liquid the mixing has to be continued for at least the missing 1/2 - 1/3 of the dry mixing time.
Therefore the mixing cycle is prolongated at least by the injection time.

It has to be considered that an addition of liquid is only possible with **complete** batches as in the case of partial batches the liquid is not sprayed onto the product but on the rotor and the walls of the trough and causes heavy contamination and formation of lumps.

A mixing without lumps depends very much on the absorbency of the product and the viscosity (temperature) of the liquid. The supply of the liquid to the nozzle rods has to be carried out from below so that no liquid can drop into the mixer after completion of the injection. The lines are to be insulated against heat loss.

Especially in the case of fat it is important that the temperature in the flexible tubes between nozzle rod and mixer does not fall below the solidification point. It has to be pointed out that the liquids are better added in the homogenizer than in the batch mixer.

Disadvantages of liquid addition in the batch mixer:

- prolongated mixing time
- increasing power requirement of the mixer drive of 10 - 20 %
- danger of contamination and formation of lumps
- no partial batches.

Fig. 5.1

5. Maintenance / Lubrication

Switch off and lock the main switch when performing any maintenance and inspection work.

5.1 Lubricating the Pedestal Bearings (Fig. 5.1)

The fixed bearing is placed at the pinion end. The movable bearing is at the opposite end.

Lubricate both pedestal bearings (1) half-yearly.

Remove old grease.

Starting from DFMF-66 lubricate via lubricating nipple.

Grease recommendation see UAB-18020, code T.

Fig. 5.2

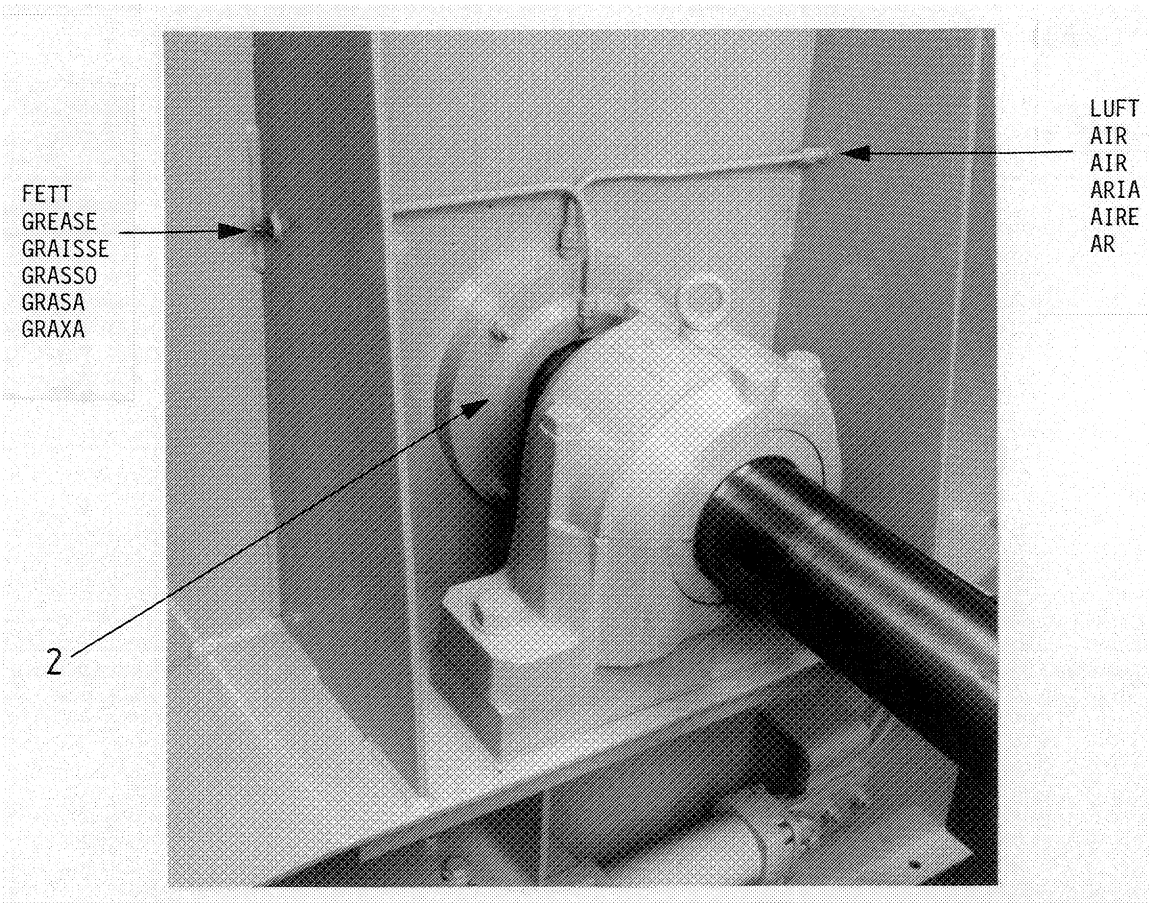
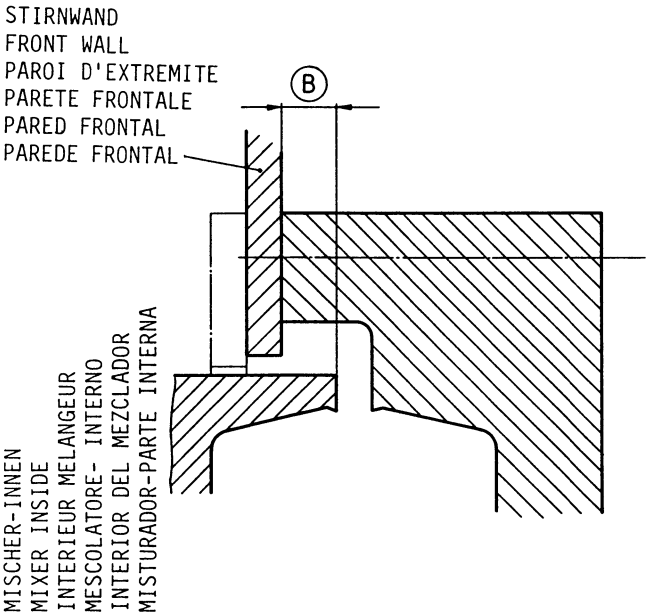
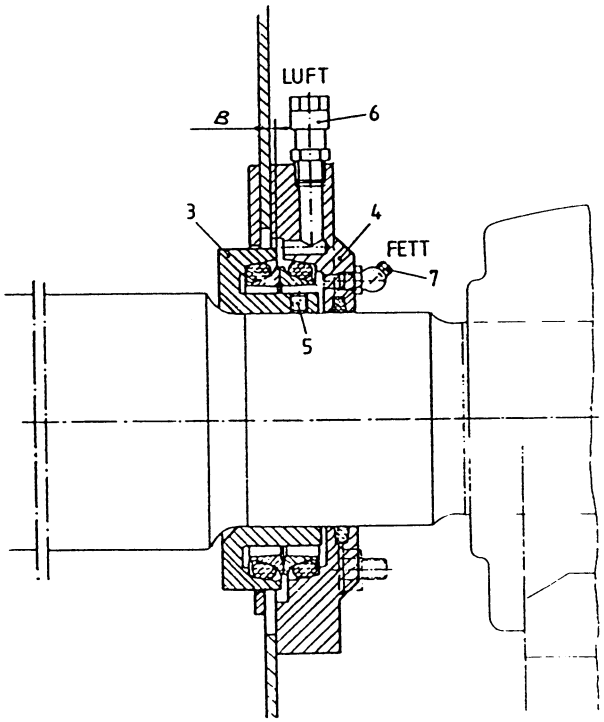

FETT
GREASE
GRAISSE
GRASSO
GRASA
GRAXA
LUFT
AIR
AIR
ARIA
AIRE
AR
2

Fig. 5.3


STIRNWAND
FRONT WALL
PAROI D'EXTREMITE
PARETE FRONTALE
PARED FRONTAL
PAREDE FRONTAL
B
MISCHER-INNEN
MIXER INSIDE
INTERIEUR MELANGEUR
MESCOLATORE- INTERNO
INTERIOR DEL MEZCLADOR
MISTURADOR-PARTE INTERNA


LUFT
B
6
3
4
FETT
7
5

5.2 Lubricating the Axial Face Seal (Fig. 5.2)

Regrease both seals (2) if necessary, this means if dust escapes to the outside (see chapter 5.4).

Grease recommendation see UAB-18020, code T.

If used in foodstuff industry, lubricate according to UAB-18020, code Y.

5.3 Adjusting the Axial Face Seal (Fig. 5.3)

Readjustment after assembling/disassembling the rotor. When mounting take care that the clearance "B" between the sealing parts (3, 4) is kept.
After the clearance has been adjusted, lock the sealing part (4) with the setscrew (5).

For blowing out the seal while the bottom flap is closing, an air pressure of approx. 2 bar is required at nipple (6). In special cases a connection to scouring water is also possible for washing the seals.

Fill the seal with grease via lubricating nipple (7) (do not generate an overpressure in the grease space as otherwise grease may penetrate into the mixer).

DFMF	B
2	3 mm
10	6.5 mm
20	3 mm
33	3 mm
44	3 mm
66	13 mm
88	12 mm
110	6.5 mm

Fig. 5.4

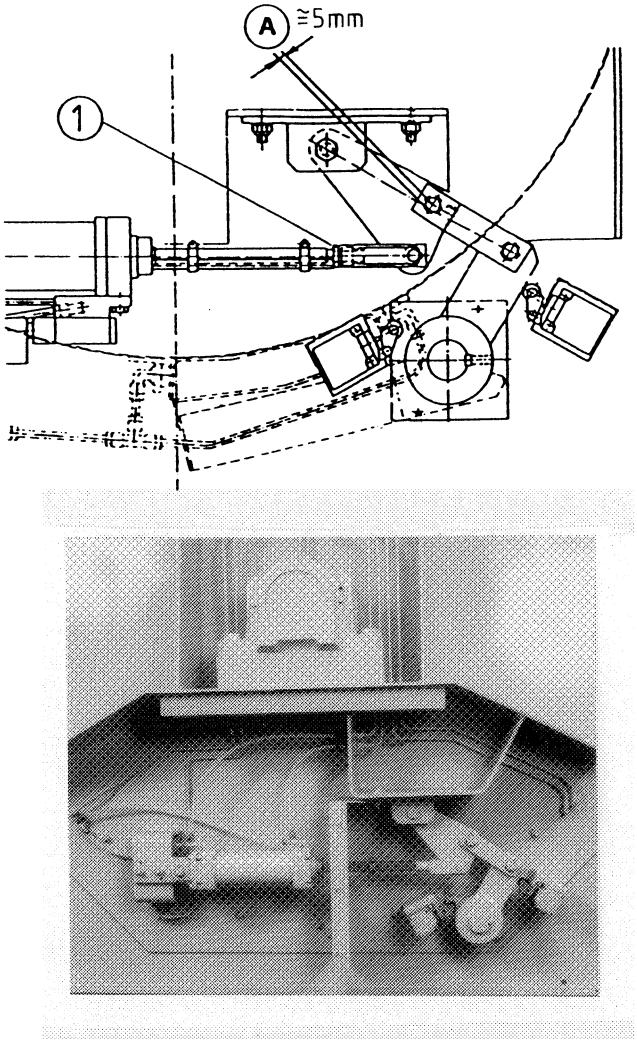
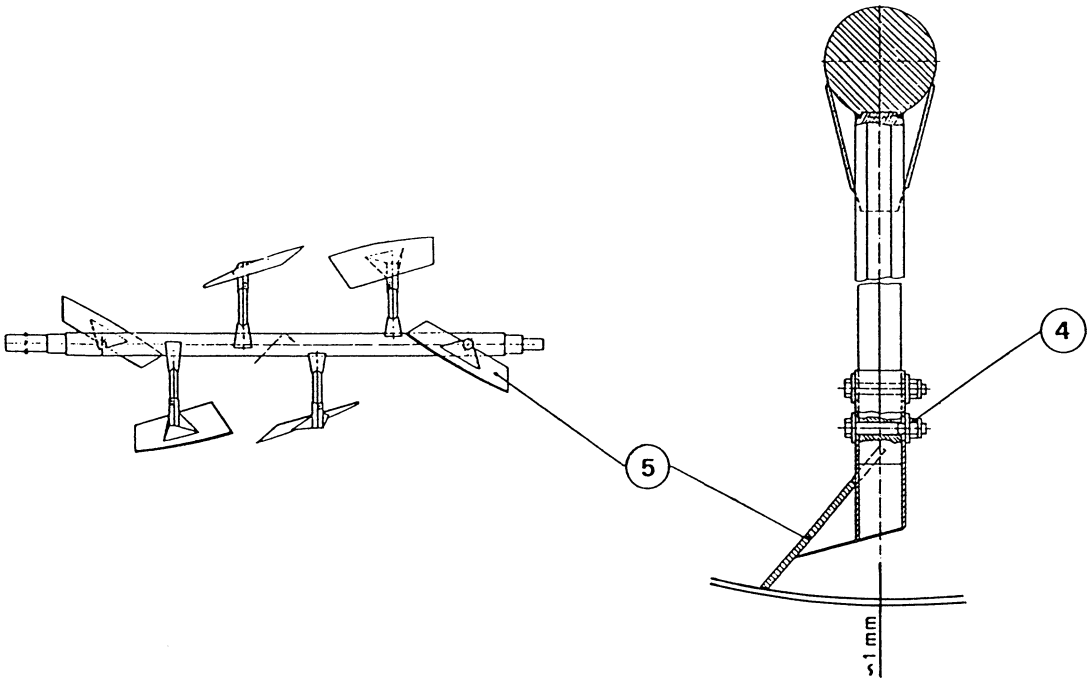


Fig. 5.5



5.4 Adjusting the Discharge Flap (Fig. 5.4)

The toggle link is adjusted correctly if the measure "A" is approx. 5 mm when the discharge flap is closed.
Adjustable via counternut (1).

The required air pressure for actuating the flap is 6 bar.

When working on the outlet flap, the compressed air must be shut off, and the pneumatic elements must be vented in any case.

5.5 Adjusting the Paddles (Fig. 5.5)

If there are too many residues in the mixer after emptying, it is possible that the paddles are worn out and that therefore the clearance between rotor and trough is too big.

The paddles have to be readjusted that the clearance at the bottom is approx. 1 mm.

The openings for the fastening screws of the paddles are designed as elongated holes so that there is an adjustment range of 10 ... 20 mm.

In the case of continued wear the paddles have to be exchanged.

This has to be done as follows :

- loosen srews (4)
- move the paddles (5)
- fasten screws (4) again

After adjusting or exchanging the paddles the rotor has to be turned by hand to make sure that the paddles do not touch the trough.

Instructions for lubricating

BÜHLER

We suggest that you have a lubricating routine set up by your lubricant supplier. Lubricating points on BUHLER equipment are marked with orange paint (RAL-2004), or with black paint (RAL-9005) if the equipment itself is orange. If a lubricating point is hidden, an arrow of the same color draws attention to it. Check the oil fillings of hydraulic units, splash lubrication and circulation oiling systems, etc. at the intervals prescribed by the routine, checking the oil levels as well as contamination. Top up or renew, as required. Clean all lubricating points thoroughly before lubrication. To prevent lubricating errors, mark every lubricant container, lubricating tool such as oil can, grease gun, etc. and the lubrication symbol at the lubricating point with the same color, e.g. according to DIN-51502. Only use non-fading and abrasion- and solvent-resistant paints.

Approximate value of grease quantity:
Excessive lubrication of the bearings may lead to unpermissible temperature increase. Therefore, do not exceed the grease quantities which can be calculated as follows:

Initial lubrication: $m = d$

Relubrication: $m = \frac{D \times B}{200}$

m = grease volume in grams
d = bore of bearing in mm
D = outside diameter of bearing in mm
B = width of bearing in mm

1) In the food-processing industries, never use lubricants containing lead additives!

2) If the lubricants may occasionally come into contact with food, use food-compatible lubricants only!

3) Use the lubricant suiting the prevailing ambient temperature.

4) Never fill lubricant containers, lubricating tools such as oil can, grease gun, etc. or lubricating points with a lubricant having a different color code in order to prevent premature wear of machine components.

5) The additives of oils and greases and the stiffeners of greases may be incompatible!
Greases with identical thickeners and similar basic oils can as a rule be intermixed without detrimental effects.

Compatibility of stiffeners + compatible - incompatible B borderline compatibility	Aluminium Complex	Barium	Calcium	Calcium 12 Hydroxide	Calcium Complex	Alumina	Lithium	Lithium 12 Hydroxide	Lithium Complex	Polycarbamide
Aluminium Complex		-	-	+	-	-	-	-	+	-
Barium	-		-	+	-	-	-	-	-	-
Calcium	-	-		+	-	+	+	B	+	-
Calcium 12 Hydroxide	+	+	+		B	+	+	+	+	-
Calcium Complex	-	-	-	B		-	-	-	+	+
Alumina	-	-	+	+	-		-	-	-	-
Lithium	-	-	+	+	-	-		+	+	-
Lithium 12 Hydroxide	-	-	B	+	-	-	+		+	-
Lithium Complex	+	-	+	+	+	-	+	+		-
Polycarbamide	-	-	-	-	+	-	-	-	-	

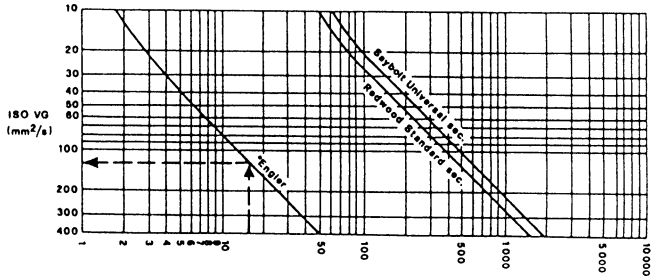
In case of doubt, consult lubricant supplier.

Schmier - Oele für Normalfälle — Lubricating oils for ordinary cases — Huiles de graissage pour cas ordinaires — Olii lubrificanti per casi normali — Aceites lubricantes para casos normales

Schmierstellen Lubricating points Points à lubrifier Punti di lubrificazione Puntos de engrase	BÖHLER Code	1) DIN	1) ISO 3498	ISO VG mm²/s (cSt)	Umgebungstemperatur Ambient temperature Température ambiente Temperatura ambiente Temperatura ambiente	Agip	ARAL	ASEOL	BP	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell	TEXACO	TOTAL	VALVOLINE
Ring- und Tauchschmierung Ring- and splash- lubrication Graissage à bague et par immersion Lubrificazione ad anello e a sbattimento Lubricación por anillo y por inmersión	A	H-LP DIN 51524/2	L-HM	46	-10°...+5°C	OSO 46	Vitam GF 46	PLUS 16 - 115	Energol HLP 46	NUTO H 46	RENOLIN MR 15	LAMORA 46	DTE 25	Tellus Oil 46	Rando Oil HD B - 46	AZOLLA 46	Ultramax AW 46
				68	+5°...+26°C	OSO 68	Vitam GF 68	PLUS 16 - 120	Energol HLP 68	NUTO H 68	RENOLIN MR 20	LAMORA 68	DTE 26	Tellus Oil 68	Rando Oil HD C - 68	AZOLLA 68	Ultramax AW 68
				100	+26°...+40°C	OSO 100	Vitam GF 100	PLUS 16 - 130	Energol HLP 100	NUTO H 100	RENOLIN MR 30	LAMORA 100	DTE 27	Tellus Oil 100	Rando Oil HD E - 100	AZOLLA 100	Ultramax AW 100
Schneckengetriebe Worm gear drives Entraînement par vis sans fin Ingranaggio a vite senza fine Engranaje de tornillo sin fin	B	C-LP DIN 51517/3	L-CC	100	-10°...+5°C	BLASIA 100	Degol BG 100	MIPRESS 11 - 308	Energol GR-XP 100	SPARTAN EP 150	RENEP COMP. 103	LAMORA 100	Mobilgear 629	Omala Oil 100	Meropa 100	CARTER EP 100	EPG 100
				220	+5°...+26°C	BLASIA 220	Degol BG 220	MIPRESS 11 - 318	Energol GR-XP 220	SPARTAN EP 220	RENEP COMP. 106	LAMORA 220	Mobilgear 630	Omala Oil 220	Meropa 220	CARTER EP 220	EPG 220
				320	+26°...+40°C	BLASIA 320	Degol BG 320	MIPRESS 11 - 323	Energol GR-XP 320	SPARTAN EP 320	RENEP COMP. 108	LAMORA 320	Mobilgear 632	Omala Oil 320	Meropa 320	CARTER EP 320	EPG 320
Hydraulik Oele mit H-LP Zusätzen für hydr. Steuerung, hydr. Motor oder hydr. Schmierung Hydraulic oils with H-LP additives for hydr. control, hydr. drive or hydr. lubrication Huiles hydr. avec additifs H-LP pour commande hydr., moteur hydr. ou lubrification hydr. Olii idraulici con additivi H-LP per comando idr., motore idr. o lubrificazione forzata Aceites hidr. con adiciones H-LP para mando hidr., motor hidr. o lubricación hidráulica	C D od. or ou o N	H-LP DIN 51524/2	L-HM	32	-10°...+5°C	OSO 32	Vitam GF 32	PLUS 16 - 110	Energol HLP 32	NUTO H 32	RENOLIN MR 10	LAMORA HLP 32	DTE 24	Tellus Oil 32	Rando Oil HD A - 32	AZOLLA 32	Ultramax AW 32
				46	+5°...+26°C	OSO 46	Vitam GF 46	PLUS 16 - 115	Energol HLP 46	NUTO H 46	RENOLIN MR 15	LAMORA HLP 46	DTE 25	Tellus Oil 46	Rando Oil HD B - 46	AZOLLA 46	Ultramax AW 46
				68	+26°...+40°C	OSO 68	Vitam GF 68	PLUS 16 - 120	Energol HLP 68	NUTO H 68	RENOLIN MR 20	LAMORA HLP 68	DTE 26	Tellus Oil 68	Rando Oil HD C - 68	AZOLLA 68	Ultramax AW 68
Oele für Motoren ohne Aufladung Oils for engines without turbo-charging Huiles pour moteurs sans suralimentateur Olii per motori senza sovralimentazione Aceites para motores no sobrealimentados Spezifikation: MIL-L-46152 od. or ou o API-Service: CC	O			SAE 20W ... 20	-10°...+5°C	DIESEL GAMMA 20W/20	Super Elastic 15W/40	MILOR 15 - 87	Vanellus C 3 15W-40	ESSOLUBE HDX 20W	INGRALUB HD SAE 20W-20	———	Delvac 1220	Rotella X Oil 20W/20	URSATEX SAE 20	RUBIA H SAE 20W/20	HDS SAE 20W-20
				SAE 30	+5°...+26°C	DIESEL GAMMA 30	Super Elastic 15W/40	MILOR 15 - 88	Vanellus C 3 15W-40	ESSOLUBE HDX 30	INGRALUB HD SAE 30	———	Delvac 1230	Rotella X Oil 30	URSATEX SAE 30	RUBIA H SAE 30	HDS SAE 30
				SAE 40	+26°...+40°C	DIESEL GAMMA 40	Super Elastic 15W/40	MILOR 15 - 89	Vanellus C 3 15W-40	ESSOLUBE HDX 40	RENOPUR HD SAE 15W-40	———	Delvac 1240	Rotella X Oil 40	URSATEX SAE 40	RUBIA H SAE 40	HDS SAE 40
Getriebeöle für Fahrzeuge Gear lubricant oil for vehicles Huiles pour les engrenages des véhicules Olii per cambi di veicoli Aceites para cambios de vehículos Spezifikation: MIL-L-2105	P			SAE 80W	-10°...+5°C	ROTRA HY/DB 80W	Getriebeöl EP 80	GEPRESS 11 - 508	Hypogear EP SAE 80	ESSO GEAR OIL GP 80W	RENOGEAR MP SAE 80	———	Mobilube GX 80 - A	Spirax Heavy Duty 80	UNIVERSAL GEAR OIL SAE 80	TRANSMISSION TM SAE 80W/90	X - 18 SAE 80
				SAE 85W ... 90	+5°...+26°C	ROTRA HY 80W/90	Getriebeöl EP 90	GEPRESS 11 - 518	Hypogear EP SAE 90	ESSO GEAR OIL GP 80W-90	RENOGEAR MP SAE 90	———	Mobilube GX 85W - 90A	Spirax Heavy Duty 90	UNIVERSAL GEAR OIL SAE 85W/90	TRANSMISSION TM SAE 80W/90	X - 18 SAE 90
				SAE 85W ... 140	+26°...+40°C	ROTRA HY 85W/140	Getriebeöl Hyp. 140	GEPRESS 11 - 533	Hypogear EP SAE 140	ESSO GEAR OIL GP 85W-140	RENOGEAR MP SAE 140	———	Mobilube GX 140 - A	Spirax Heavy Duty 140	UNIVERSAL GEAR OIL SAE 140	TRANSMISSION TM SAE 85W/140	X - 18 SAE 85W-140

1) Mindestanforderungen nach ISO/DIN
1) Minimum requirements according to ISO/DIN
1) Exigences minimums selon ISO/DIN
1) Esigenze minime secondo ISO/DIN
1) Exigencias mínimas según ISO/DIN

Viscositätsindex (VI)			Motorenöl (VI 100)				Getriebeöl (VI 0)			
Viscosität SAE			20	30	40	50	80	90	140	
+ 40°C +104°F 293 K	mm²/s	min.	29	58	93	150	48	135	360	
		max.	58	93	150	240	135	360	820	



Schmier - Oele für Normalfälle | Lubricating oils for ordinary cases | Huiles de graissage pour cas ordinaires | Olii lubrificanti per casi normali | Aceites lubricantes para casos normales

Schmierstellen Lubricating points Points à lubrifier Punti di lubrificazione Puntos de engrase	BÖHLER Code	1) DIN	1) ISO 3498	ISO VG mm²/s (cSt)	Umgebungstemperatur Ambient temperature Température ambiente Temperatura ambiente Temperatura ambiente	Agip	ARAL	ASEOL	BP	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell	TEXACO	TOTAL	VALVOLINE
Gleitlager; Zahnrad- und Kettengetriebe (laufen im Oel) Slide bearings; toothed wheels- and chain drives (running in oil bath) Paliers de glissement; engrenages et transm. à chaine (marchant dans l'huile) Cuscinetti lisci; ingranaggi e trasm. a catena (girano in olio) Cojinetes de fricción; engranajes y transm. de cadena (marchan en aceite)	E F od. or ou o J	C-LP DIN 51517/3	L-CC	68	-10°...+5°C	BLASIA 68	Degol TU 68	MIPRESS 11 - 305	Energol GR-XP 68	SPARTAN EP 68	RENEP COMP. 102	LAMORA 68	Mobilgear 626	Omala Oil 68	MEROPA 68	CARTER EP 68	EPG 68
				100	+5°...+26°C	BLASIA 100	Degol TU 100	MIPRESS 11 - 308	Energol GR-XP 100	SPARTAN EP 150	RENEP COMP. 103	LAMORA 100	Mobilgear 629	Omala Oil 100	MEROPA 100	CARTER EP 150	EPG 100
				220	+26°...+40°C	BLASIA 220	Degol TU 150	MIPRESS 11 - 318	Energol GR-XP 220	SPARTAN EP 220	RENEP COMP. 106	LAMORA 220	Mobilgear 630	Omala Oil 220	MEROPA 220	CARTER EP 150	EPG 220
Gleitbahnen und Führungen (mittlere Belastung) Sliding planes and guides (medium load) Guides et guidages glissants (charge moyenne) Piani di scorrimento e guide (carico medio) Planos de deslizam. y guías (carga media)	G	CG DIN 51502	L-G	68	-10°...+5°C	EXIDIA 68	Deganit B 68	SLIDE 16 - 22	Energol HP-C 68	FEBIS K 68	RENEP 2	LAMORA Super POLADD 68	Vactra Oil No.2	Tonna Oil T 68	Way Lubricant 68	DROSERA 68	WAYOIL 68
				68	+5°...+26°C	EXIDIA 68	Deganit B 68	SLIDE 16 - 22	Energol HP-C 68	FEBIS K 68	RENEP 2	LAMORA Super POLADD 68	Vactra Oil No.2	Tonna Oil T 68	Way Lubricant 68	DROSERA 68	WAYOIL 68
				220	+26°...+40°C	EXIDIA 220	Deganit B 220	SLIDE 16 - 24	Energol HP-C 220	FEBIS K 220	RENEP 5	LAMORA Super POLADD 220	Vactra Oil No.4	Tonna Oil T 220	Way Lubricant 220	DROSERA 220	WAYOIL 220
Zahnrad- und Kettengetriebe (laufen nicht im Oel) Toothed wheels- and chain drives (do not run in oil) Engrenages et transm. à chaine (glissage hors de l'huile) Ingranaggi e trasm. a catena (non girano in olio) Engranajes y transm. de cadena (no marchan en aceite)	H	C-LP DIN 51517/3	L-CC	68	-10°...+5°C	EXIDIA 68	Degol BG 68	MIPRESS 11 - 305	Energol GR-XP 68	NUTO H 68	RENEP COMP. 102	LAMORA 68	Vactra Oil No.2	Tonna Oil T 68	MEROPA 68	DROSERA 68	EPG 68
				150	+5°...+26°C	EXIDIA 220	Degol BG 150	MIPRESS 11 - 311	Energol GP-XP 150	NUTO H 100	RENEP COMP. 104	LAMORA 150	Vactra Oil No.4	Tonna Oil T 220	MEROPA 150	DROSERA 150	EPG 150
				150	+26°...+40°C	EXIDIA 220	Degol BG 150	MIPRESS 11 - 311	Energol GR-XP 150	NUTO H 100	RENEP COMP. 104	LAMORA 150	Vactra Oil No.4	Tonna Oil T 220	MEROPA 150	DROSERA 150	EPG 150
Reibungsgetriebe Friction drive Engrenage à friction Meccanismi a ruote di frizione Engranajes de ruedas de fricción	K	H-LP DIN 51524/2	L-HM	10	-10°...+5°C	OSO 10	Vitam GF 10	PLUS 16 - 106	Energol LPT 15	SPINESSO 10	RENOLIN MR 3	FORMINOL DS 23 K	Velocite Oil No.6	Tellus Oil C 10	Spintex Oil 10	AZOLLA 10	ETC 10
				10	+5°...+26°C												
				10	+26°...+40°C												
Physiologisch unbedenkliche Schmieröle für geschlossene Gleit- und Wälzlager - mit niederer Druckbelastung Lubricating oils not hazardous to health; for enclosed friction and anti-friction bearings - with low pressure loadings. Huiles lubrifiantes physiologiquement inoffensives, pour paliers lisses et paliers à roulement étanches - avec basse charge de pression Olii lubrificanti fisiologicamente non pericolosi per supporti lisci e cuscinetti volventi chiusi - a basso carico di compressione Aceites lubricantes, fisiológicamente no peligrosos, para cojinetes de deslizamientos y rodamientos cerrados - de bajo esfuerzo de compresión.	L	Paraffinöle pharm. Qual.		15	-10°...+5°C	OBI 12	Autin PL	203 - 17	Energol MW 2	MARCOL 52	INGRAPAL W 505	PARALIQ P 12	——	Ondina Oil 15	White Oil Pharm. 30	LOBELIA TB 10	WHITEOIL DAB 15
				68	+5°...+26°C	OBI 10	Autin SL	203 - 2	Energol MW 6	MARCOL 82	INGRAPAL W 530	PARALIQ P 68	——	Ondina Oil 68	White Oil Pharm. 190	LOBELIA TB 68	WHITEOIL DAB 68
				68	+26°...+40°C	OBI 10	Autin SL	203 - 2	Energol MW 6	MARCOL 82	INGRAPAL W 530	PARALIQ P 68	——	Ondina Oil 68	White Oil Pharm. 190	LOBELIA TB 68	WHITEOIL DAB 68
Mehrzweck-Schmieröle mit Notlaufeigenschaften. Zusätze: MoS_2 oder Graphit Multi-purpose lubricating oils with emergency running properties. Additives: MoS_2 or graphite. Huiles lubrifiantes à fonction multiple, avec propriétés de fonctionnement exceptionnel en cas d'urgence. Additifs: MoS_2 ou graphite Olii lubrificanti per più impieghi con proprietà di emergenza. Additivi: MoS_2 o grafite Aceites lubricantes de usos múltiples con propiedades de emergencia. Adiciones: MoS_2 o grafito	M	C-LP-F DIN 51502		68	-10°...+5°C	——	Degol BMB 100	PLUS 16-120.1	——	——	RENEP SUPER 4	LAMORA 68	——	——	——	——	EPG 68
				100	+5°...+26°C	——	Degol BMB 100	PLUS 16-130.1	——	——	RENEP SUPER 4	LAMORA 100	——	——	——	——	EPG 100
				150	+26°...+40°C	——	Degol BMB 220	PLUS 16-140.1	——	——	RENEP SUPER 6	LAMORA 150	——	——	——	——	EPG 150

1) Mindestanforderungen nach ISO/DIN | 1) Minimum requirements according to ISO/DIN | 1) Exigences minimums selon ISO/DIN | 1) Esigenze minime secondo ISO/DIN | 1) Exigencias mínimas según ISO/DIN

Schmierfette für Normalfälle — Lubricating greases for ordinary cases — Graisses consistantes pour cas ordinaires — Grassi lubrificanti per casi normali — Grasas lubricantes para casos normales

Schmierstellen Lubricating points Points à lubrifier Punti di lubrificazione Puntos de engrase	BÖHLER Code	1) DIN 51502	1) ISO 3498	Penetr. NLGI	Umgebungstemperatur Ambient temperature Température ambiente Temperatura ambiente Temperatura ambiente	Agip	ARAL	ASEOL	BP	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell	TEXACO	TOTAL	VALVOLINE
Hochdruckfett für: Gleit- und Wälzlager High pressure grease for: Friction and antifriction bearings Graisse pour pressions élevées pour: Paliers lisses et paliers à roulement Grasso per elevate pressioni per: Supporti lisci e cuscinetti volventi Grasa para alta presión para: Cojinetes de deslizamiento y rodamientos	Hp	KP 2K		2	-10°...+40°C	GR MU/EP 2	Aralub HLP 2	LITEA EP 6 - 077	Energrease LS - EP 2	BEACON EP 2	RENOLIT FWA 160	STABURAGS NBU 8 EP	Mobilplex 47	Calithia EP Grease T2	Multifak EP 2	MULTIS EP 2	EP - LB Grease No. 2
Hochtemperaturfett für: Gleit- und Wälzlager **High temperature grease for: Friction and antifriction bearings** **Graisse pour températures élevées pour: Paliers lisses et paliers à roulement** **Grasso per elevate temperature per: Supporti lisci e cuscinetti volventi** **Grasa para altas temperaturas para: Cojinetes de deslizamiento y rodamientos**	Q	KH 2R		2	-10°...+40°C	GR MF 2 ev. GREASE 33/FD	Aralub HTR 2	SILEA 7 - 206	Energrease HTB 2	———	RENOPLEX EP 2	STABURAGS N 12 MF	Mobiltemp 1	Darina Grease 2	Thermatex EP 2	CALORIS 3	AR - 1
Fliessfette für: Getriebemotoren, Getriebe, Zentralschmiersysteme Flowing greases for: Gearbox-motors, gearboxes, centralized lubrication systems Graisse à faible viscosité pour: Moteur-réducteurs, système de lubrification central Grassi fluidi per: Motoriduttori, riduttori, lubrificazione centrale Grasas fluidas para: Motores-reductores, reductores, engrase central	S	G 00 E		00	-10°...+40°C	GR SLL ev. GR MU/EP 0	Aralub FDP 00	LITEA 6 - 109	Energrease HT - EP 00	FIBRAX EP 370	RENOSOD GFB	STRUCTOVIS P 00 ev. NATOSBIN B 1600 EP	Mobilplex 44	Grease S - 3655	GLISSANDO FL 283 - 00	MULTIS EP 200	T+D Grease
Schmierfett in Dispersion mit Lösungsmittel für: Ketten, Gleit- und FUhrungsschienen **Grease in dispersion with solvent for: Chains, slide- and guide-rails** **Graisse lubrifiante en dispersion avec dissolvent pour: Chaines, rails de guidage et glissières** **Dispersione di grasso lubrificante con solvente per: Catene, pattini e guide** **Dispersión de grasa con solvente para: Cadenas, rieles de deslizamiento y de guía**	Sp	OG-V			-10°...+40°C	RUSTIA 80/F	Sinit FZL 3	LUCA 20 - 5.1	Penetrating Oil	MILLCOT K 68	ANTICORIT SG 3	POLYLUB HVT 50A	———	Tonna Oil E ev. Ossagol V	———	EMS/EP 700	———
Gleit- und Wälzlager (Normale Belastung) Friction and antifriction bearings (Normal load) Paliers lisses et paliers à roulement (Charge normale) Supporti lisci e cuscinetti volventi (Carico normale) Cojinetes de deslizamiento y rodamientos (Carga normal)	T od. or ou o V	K 2K	L-XM 2	2	-10°...+40°C	GR MU 2	Aralub HL 2	LITEA 806 + 12	Energrease LS - EP 2	BEACON 2	RENOLIT FWA 160	CENTOPLEX 2	Mobilplex 47	Alvania Grease R 2	Marfak MP 2	MULTIS 2	EP - LB Grease 2
Gleit- und Wälzlager (Hohe Belastung) Friction and antifriction bearings (High load) Paliers lisses et paliers à roulement (Charge importante) Supporti lisci e cuscinetti volventi (Carico forte) Cojinetes de deslizamiento y rodamientos (Carga alta)	U od. or ou o W	KP 2K		2	-10°...+40°C	GR MU/EP 2	Aralub HLP 2	LITEA EP 6 - 077	Energrease LS EP 2	BEACON EP 2	RENOLIT FWA 160	CENTOPLEX 2 EP	Mobilplex 47	Alvania EP Grease 2	Multifak EP 2	MULTIS EP 2	EP - LB Grease 2

1) Mindestanforderungen nach ISO/DIN — 1) Minimum requirements according to ISO/DIN — 1) Exigences minimums selon ISO/DIN — 1) Esigenze minime secondo ISO/DIN — 1) Exigencias mínimas según ISO/DIN

Schmierfette fur Normalfälle Lubricating greases for ordinary cases Graisses consistantes pour cas ordinaires Grassi lubrificanti per casi normali Grasas lubricantes para casos normales

Schmierstellen Lubricating points Points à lubrifier Punti di lubrificazione Puntos de engrase	BÖHLER Code	1) DIN 51502	1) ISO	Penetr. NLGI	Umgebungstemperatur Ambient temperature Température ambiente Temperatura ambiente Temperatura ambiente	Agip	ARAL	ASEOL	BP	Esso	FUCHS	KLÜBER LUBRICATION	Mobil	Shell	TEXACO	TOTAL	VALVOLINE
Physiologisch unbedenkliche Fliessfette für: Getriebe oder Zentralschmiersysteme Flowing greases not hazardous to health, for: gearings or central lubricating systems Graisses coulantes physiologiquement inoffensives, pour: engrenages ou systèmes de lubrification centraux Grassi lubrificanti fluidi, fisiologicamente non pericolosi, per: ingranaggi o sistemi di lubrificazione centrale Grasas fluidas, fisiológicamente no peligrosas, para: engranajes o sistemas de engrase central	X	Spezialschmierfett		00	-10°...+40°C	———	———	FOOD 4 - 23	———	———	———	Nontrop PLB EL	———	———	———	SPECIS A	GERALYN 00
Physiologisch unbedenkliche Schmierfette für: Gleit- und Wälzlager Greases not hazardous to health, for: friction and antifriction bearings Graisses de lubrification physiologiquement inoffensives, pour: paliers lisses et paliers à roulement Grassi lubrificanti fisiologicamente non pericolosi per: supporti lisci e cuscinetti volventi Grasas lubricantes, fisiológicamente no peligrosas, para: cojinetes de deslizamiento y rodamientos	Y	Spezialschmierfett		2	-10°...+40°C	———	———	FOOD 4 - 22	———	———	RENOGEL 7	Nontrop PLB	———	Alima Grease 2	———	SPECIS FM	GERALYN 2
Mehrzweck-Schmierfette mit Notlaufeigenschaften. Zusätze: MoS_2 oder Graphit Multi-purpose greases with emergency running properties. Additives: MoS_2 or graphite Graisses de lubrification à fonction multiple, avec propriétés de fonctionnement exceptionnel en cas d'urgence. Additifs: MoS_2 ou graphite Grassi lubrificanti per più impieghi con proprietà di emergenza. Additivi: MoS_2 o grafite Grasas lubricantes de usos múltiples con propiedades de emergencia. Adiciones: MoS_2 o grafito	Z	K-F 2K		2	-10°...+40°C	GR SM	Mehrzweck-Fett F	MOLITEA 5 - 077	Energrease L 21 M	MULTI-PURPOSE GREASE MOLY	RENOLIT FLM 2	Unimoly GL 82	Mobiltac 81	Retinax AM	Molytex Grease EP 2	MULTIS MS - 2	SPEZIAL MOLY GREASE No. 2
Mehrzweck-Schmierpaste farblos/weiss für Montagearbeiten und offene Schmierstellen Multi-purpose lubricating paste, colorless/white, for: erection work and open lubricating points Pâte lubrifiante à fonction multiple incolore /blanche, pour: travaux de montage et points de lubrification ouverts Pasta lubrificante per più impieghi, incolore/bianca, per: lavori di montaggio e punti di lubrificazione aperti Pasta lubricante de usos múltiples, incolora/blanca, para: trabajos de montaje y puntos de engrase abiertos	Za	Spezialschmierfett		2	-10°...+40°C	GR PV 2	———	AQUARES EP 810 - 60	———	———	———	———	———	———	———	———	———
Schmierfette für Kunststofflager, zur Vermeidung von Laufgeräuschen Greases for plastic bearings, for preventing running noises Graisses lubrifiantes pour paliers plastiques, afin d'empêcher des bruits de roulement Grassi lubrificanti per supporti di materie sintetiche per evitare rumori di marcia Grasas lubricantes para cojinetes de plástico para evitar ruidos de marcha	Zb	Spezialschmierfett		2	-10°...+40°C	———	———	AQUARES EP 810 - 60	———	———	———	———	———	———	———	———	———

1) Mindestanforderungen nach ISO/DIN 1) Minimum requirements according to ISO/DIN 1) Exigences minimums selon ISO/DIN 1) Esigenze minime secondo ISO/DIN 1) Exigencias mínimas según ISO/DIN

Special lubricants with approval USDA H1

BÜHLER

Greases / oils H1 Klüber Lubrication AG for application with occasional, technically unavoidable food contact, fully synthetic, free from mineral oil, bacteriostatic.
Technically equivalent or superior to industrial lubricants.

Alternative suppliers without guarantee on the part of Buhler Ltd, especially with regard to compatibility with elastomers and bacteriostatic properties.

Polyalphaolefines will attack seals !
White oils are not considered fully safe for food applications!

Mobil Oil [1]	Bel Ray	Shell [2] Aseol [3]
White oils [2]		
Grease FM 102	No Tox Grease HD2	Cassida Grease 3
Grease FM 101	No Tox Grease 2 TC	Cassida Grease 2
	No Tox Grease EP2	Cassida Grease 1
	No Tox Hylo Grease	Cassida Grease 00
Polyalphaolefins [3]		
Oil DTE FM 32	No Tox Hydraulic Oil 32	Cassida Fluid HF 32
Oil DTE FM 68	No Tox Hydraulic Oil 68	Cassida Fluid HF 68
Oil DTE FM 220	No Tox EP Gear Oil 90	Cassida Fluid GL 220
Oil DTE FM 460	No Tox EP Gear Oil 90/140	Cassida Fluid GL 460
Oil DTE FM 680	No Tox EP Gear Oil 140	Cassida Fluid GL 680
	Chain Lubricant Type 2500	

FM means : 'Food Machine'

[1] Inconsistent with regard to the use of polyalphaolefins

[2] White oils have a low loading capacity

[3] PAO = polyalphaolefin = synthetically produced hydrocarbon

Seals, fittings, stuffing box packings
- Anti-friction bearings, sliding bearings, joints, central lubrication systems (NLGI 1) *
- Grease-lubricated gear trains, central lubrication systems (NLGI 00/000) *
- Sealing media, hydraulic & pneumatic systems
- Anti-friction bearings
- Installation
- Gear trains
- Chains

	BUZ part No.	Greases	Application							
☒	UXB-18000-...	Klübersynth UH1 84-201 Seal and installation grease	●				●			
☒	UXB-18000-043	Klübersynth UH1 14-151 Anti-friction bearing and sliding bearing grease		●						
		Klübersynth UH1 14-31 Anti-friction bearing and sliding bearing grease for low temperature and high speed						●		
		Klübersynth UH1 14-1600 Fluid grease			●					

	BUZ part No.	Oils	Application							
		Klüberoil 4 UH1 32			●					
BWA1	UXB-18001-048	Klüberoil 4 UH1 68			●					
		Klüberoil 4 UH1 220						●		
BWA1	UXB-18001-052	Klüberoil 4 UH1 460						●	●	
		Klüberoil 4 UH1 680						●		
		Klüberoil 4 UH1 1500							●	
		Paraliq P 68			●					

☒ on stock at BUZ

* Consistency class table, greases of NLGI class

Special lubricants with approval USDA H2

BÜHLER

Greases / oils H2 Klüber Lubrication AG for application without direct contact with foods

Seals, fittings, stuffing box packings
Anti-friction bearings, sliding bearings, joints
Grease-lubricated gear trains,
central lubrication (NLGI 00/000)
Sealing media,
hydraulic & pneumatic systems
Installation
Geare trains
Chains

	Greases	Application						
	Klüberplex BE 31 - 102 Long-term anti-friction bearing grease		●					
	Klüberplex BE 31 - 222 Long-term anti-friction and sliding bearing grease		●					
	Klüberplex BE 31 - 502 Consistent, highly adhesive	●	●			●		●
	Centoplex GLP 500 Fluid grease			●				
	Klüberalfa BHR 53 - 402 ✸ High-temperature grease - 40 ... + 260°C	●	●					

	Oils	Application						
	Klüberoil GEM1 - 46				●			
	Klüberoil GEM1 - 100						●	
	Klüberoil GEM1 - 220						●	
	Klüberoil GEM1 - 460						●	
	Klüberoil GEM1 - 680						●	
	Hotemp 2000		●					●
	Structovis EHD							●
	Lamora Variogearoil TRF 33						●	

☒ on stock at BUZ

✸ **not** miscible with other greases

6. Function / Service

6.1 Process of Mixing

During the rotation of the paddle rotor each of the six paddles throws the mixed material lying in its area to an empty space in the mixing trough.

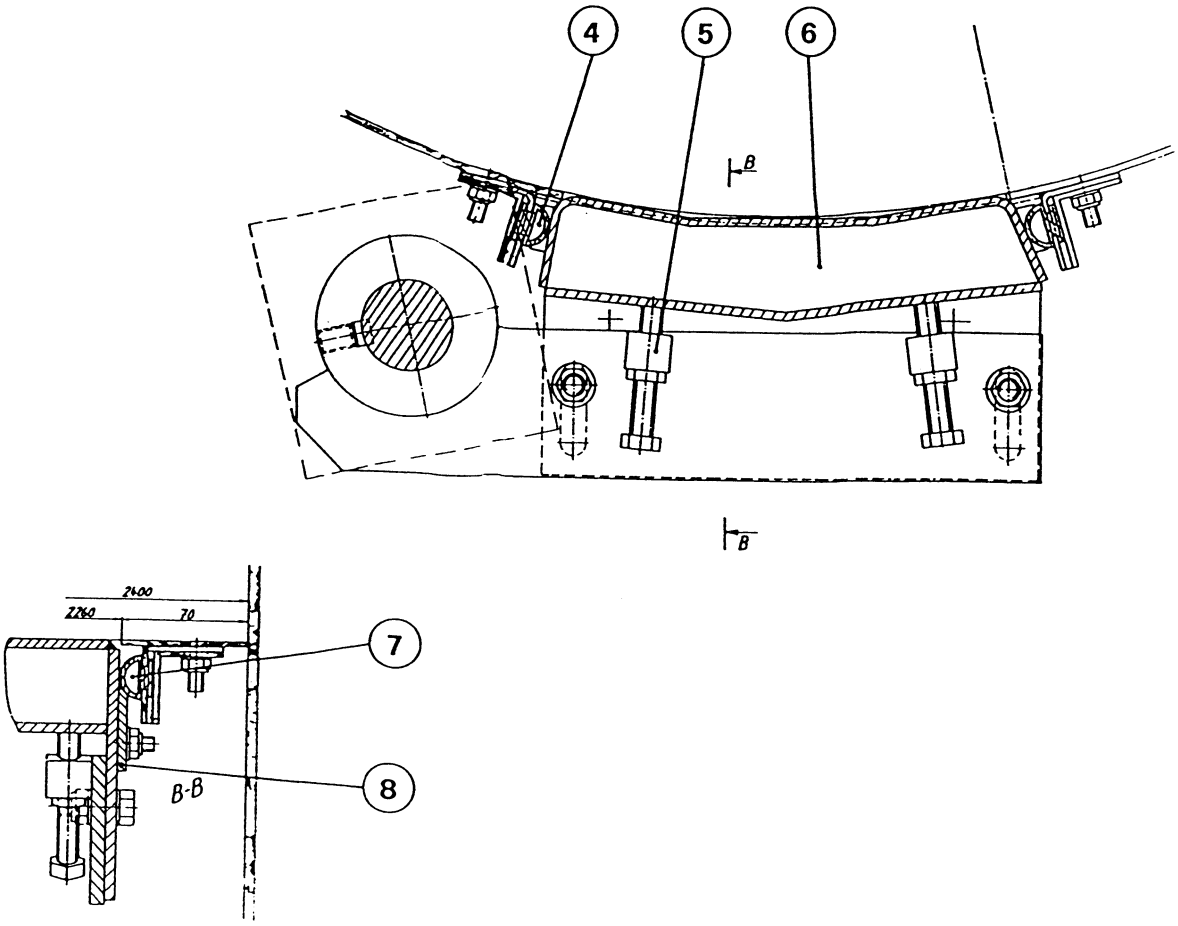
As the paddles convey in direction against the center part of the batch mixer it is necessary to provide the feeding of the batch mixer in the central third (see chapter 3).

If a batch mixer is equipped with a spiral rotor, the feeding can be arranged anywhere.

As both helixes are left-handed and right-handed also the product is conveyed in opposite directions.

In the case of both rotor types an intensive mixing of the individual components is achieved.
The mixing only gets homogeneous, however, if there is no great difference in granulation and relative density of the individual components.

Fig. 6.2



6.2 Discharge Flap (Fig. 6.2)

When working on the outlet flap, the compressed air must be shut off, and the pneumatic elements must be vented in any case.

The discharge flap is operated by a pneumatic cylinder via a system of toggle levers.

If closed, the flap has to flush with the trough on the inside.
This adjustment is carried out with the screws (5).
In this position the center of the toggle lever has to be moved by the measure "A" (see chapter 5) above the dead point.

The two positions OPEN and CLOSED are determined by limit switches (5) and (6) and are indicated by control lamps.

The sealing of the discharge flap is a pneumatic one, this means the side walls are sealed with a special hollow section rubber which is filled with compressed air of max. 0.8 bar.
The expansion causes an exact fitting to the flap.
The same hollow section rubber, which seals by means of a stop plate (without compressed air) is used at the front sides.

The sheets (8) for the hollow section rubbers at the sides which are not filled with compressed air are to be placed in such a way that they press slightly against the hollow section rubber when the flap is closed.

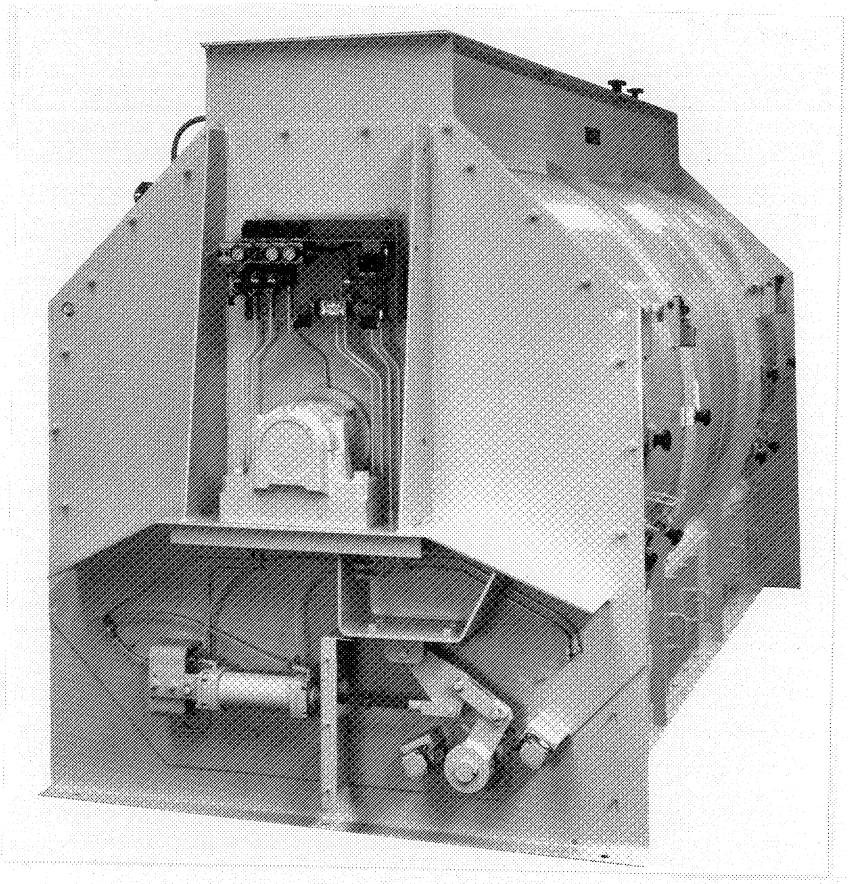
Check sealing regularly.

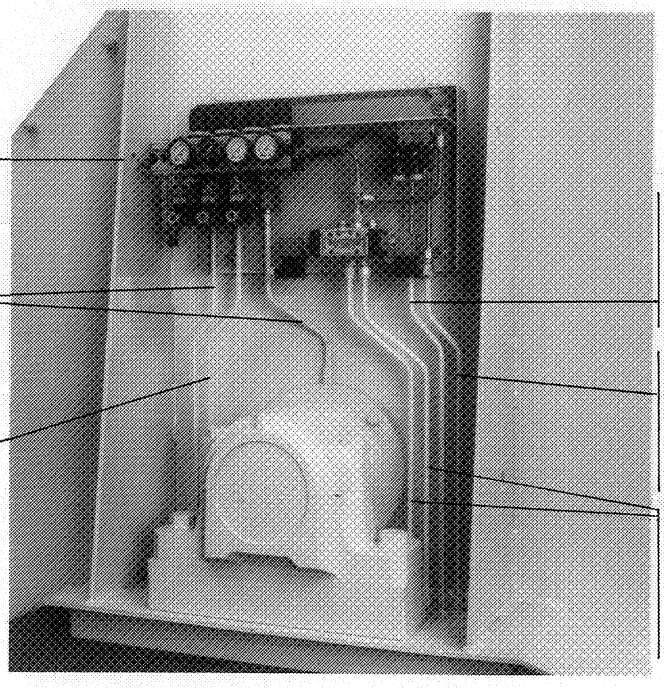
It is important
that the following regulations are exactly observed as otherwise the rubber seals may be damaged and the mixer gets untight.

Closing the flap: Blow up the flap sealing only when the flap is completely closed !

Opening the flap: First deaerate the sealing and then open the flap (see connection diagram).

Fig. 6.3



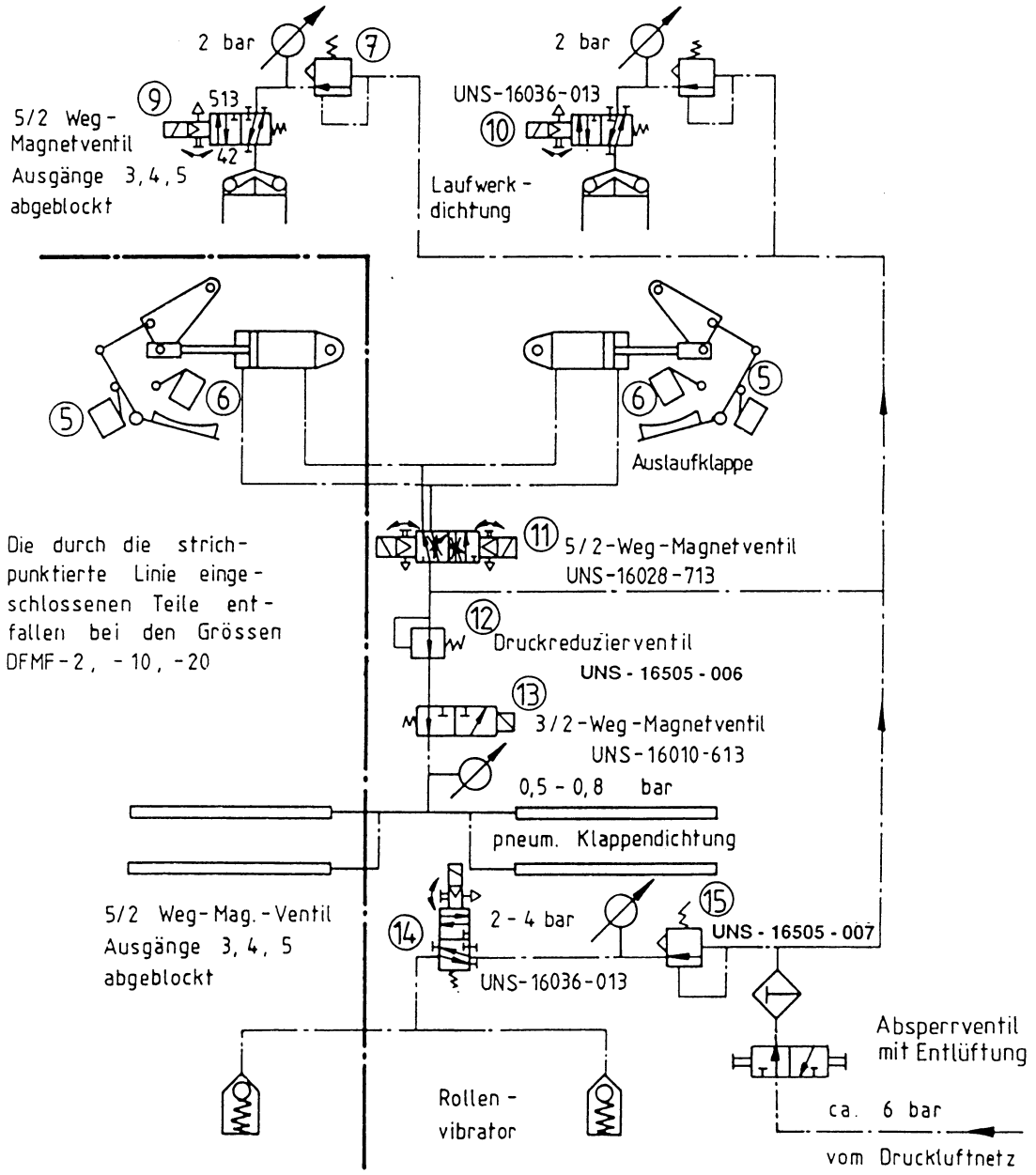

DRUCKLUFTANSCHLUSS
COMPRESSED-AIR SUPPLY
ALIMENTATION AIR COMPRIME
COLLEGAMENTO ARIA COMPRESSA
CONEXION AIRE COMPRIMIDO
CONEXAO DE AR COMPRIMIDO
LAUFWERKDICHTUNG
RUNNING GEAR SEAL
GARNITURE MECANISME DE ROULEMENT
TENUTA MECCANISMO DI SCORRIMENTO
JUNTA DEL MECANISMO DE ENGRANAJES
VEDACAO DO MECANISMO DE DESLOCACAO
ROLLENVIBRATOR
ROLLER VIBRATOR
VIBRATEUR A ROULEAUX
VIBRATORE A RULLI
VIBRADOR DE RODILLOS
VIBRADOR DE ROLOS
KLAPPENDICHTUNG
FLAP SEAL
GARNITURE TRAPPE
TENUTA DEL PORTELLO
JUNTA DE LA CHAPALETA
VEDACAO DA BASCULA
TUERSICHERUNG
DOOR SECURING DEVICE
DISPOSITIF DE SECURITE PORTE
SICUREZZA DELLA PORTA
SEGURO DE LA PUERTA
SEGURANCA DA PORTA
KLAPPENBETAETIGUNG
ACTUATION OF FLAPS
ACTIONNEMENT TRAPPES
AZIONAMENTO PORTELLO
ACCIONAMIENTO DE LA CHAPALETA
ACIONAMENTO DA BASCULA

6.3 Compressed-Air Control (Diagram 6.4)

The connections of the pneumatic elements of the batch mixer DFMF are led to a central set of valves (fig. 6.3) so that only one connection has to be made to the compressed-air ductwork system (6 bar) . See diagram (6.4).

The discharge flaps and the safety lockings of the doors are operated with the full pressure of the system of approx. 6 bar while the flap seal is pressurized with max. 0.8 bar, the sweeping of the running gear seals and the roller vibrators with approx. 2 bar.

The pressure for sweeping the running gear seal, blowing-up of the flap sealing and actuating the roller vibrator can be adjusted individually at the set of valves.



Produkt-Benennung	Druckluftschema DFMF mit Ventilbatterie 24V DC (SPS)	Dénomination du prodit	
Name of Product		Typ / Type / Type	DFMF
BÜHLER	Mass Stab / Echelle: %	Ersatzt durch Nr / Replaced by No / Remplacé par n°	Chiffre Cipher: DMSK
FF-3.1 / 9605		Ersatz für Nr / Replaces No / Remplace n°	Nummer / Number / Numero: 51129-

6.4 Electric Control (see Diagram)

The electric control has to be designed in such a way that the process of the mixing cycle and the functions concerning safety are performed.

Functional Description (see Diagram)

Checking the cleaning door safety

- **Safety switch** (manual activation)
  - OPEN -> The machine must stop
  - CLOSE -> The machine must not start
- **Safety switch**
  - OPEN -> The machine must stop
- **Opening the door**
  - The hinged safety switch is activated -> The machine must not start
- **When the door is open**
  - Close the safety switch -> The machine must not be started
- **Closing the door**
  - The hinged safety switch closes (with door)
  - Close the safety switch -> The machine can be started

Result

The machine cannot be started until the two switches have been activated.

If the mixing time is started now, K2 is connected to voltage and the time set at the time lag relay K3T is running.

After completion of the mixing time the contact K3T is closed and the relay K4 is connected to voltage and deaerates the flap seal for the time set at K5T (approx. 2 sec) if the vessel behind the mixer announces "empty".

After this time is over the 5/2-port distributing valve (11) is activated, the discharge flap is opened and actuates the limit switches (6) which connect the relay K9 and therefore also the time lag relay K6T to voltage.

After the set time is over K2 and therefore also K4 are disconnected, the 2nd coil of the 5/2-port distributing valve (11) is activated and the discharge flap is closed.

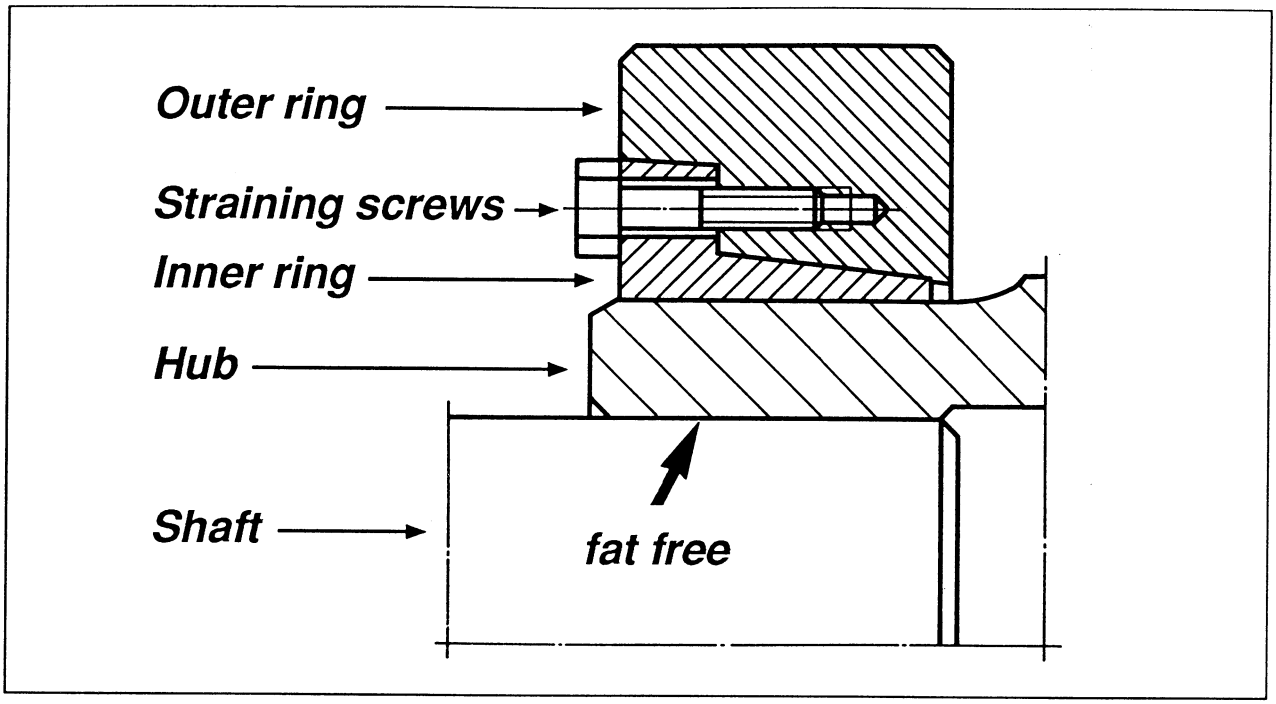
During the closing travel until the limit switches (5) (mixer closed) are pressed, the valves (9) and (10) are also active and the running gear seal is swept.

As soon as the discharge flap is closed and the limit switches (5) are actuated, relay K10 is connected to voltage and opens the contact K10 so that the valve (13) gets currentless and the flap seal is blown up.

The roller vibrators are active as long as the limit switches "flap open" (6) are pressed.

The adding of liquid is not included in this control and has to be defined from case to case depending on the kinds and numbers of liquids.

7. Mounting and Dismounting Instructions for Shrink Disks Type HSD



Mounting

The shrink disks are supplied ready for installation. Therefore they must not be dismantled prior to the first straining.

1. Degrease the hub bore and the shaft!
2. Slip the shrink disk onto the hub. The outside of the hub can be greased in the area of the shrink disk seat.

Attention:
Never fasten the straining srews before the shaft is built in!

3. Install the shaft or slip the hub onto the shaft.
4. Fasten all straining screws evenly.
   All straining screws have to be screwed so long until the front sides of the outer and inner ring flush.
5. The correct state of straining can be determined visually.

Dismounting

The unscrewing process is similar to the one of straining.

1. Unscrew the straining screws evenly and one after the other.
2. If the outer ring does not get loose from the inner ring by it self, some straining srews can be removed and can be screwed into the neighbouring forcing screw threads.

   Now it can be restrained easily.
3. Remove the shaft or pull the hub from the shaft.

   Slight rust deposits which may appear on the shaft in front of the hub have to be removed.
4. Pull the shrink disk from the hub.

Cleaning and Lubrication

Dismounted shrink disks do not have to be dismantled or greased before straining them again.

Only if the shrink disk is dirty, it has to be cleaned and to be re-greased.

A solid lubricant with a coefficient of friction of $\mu = 0.04$ has to be used.

Examples:

Lubrificant	Form of Product Manufacturer
Molykote 321 R (friction laquer)	spray Dow Corning
Molykote Spray (powder spray)	spray Dow Corning
MolykoteG Rapid	spray or paste Dow Corning
Aemasol MO19R	spray or paste A.C. Matthes
Molykombin UMFT 1	spray Klüber Lubric.
Unimoly P5	powder Klüber Lubric.

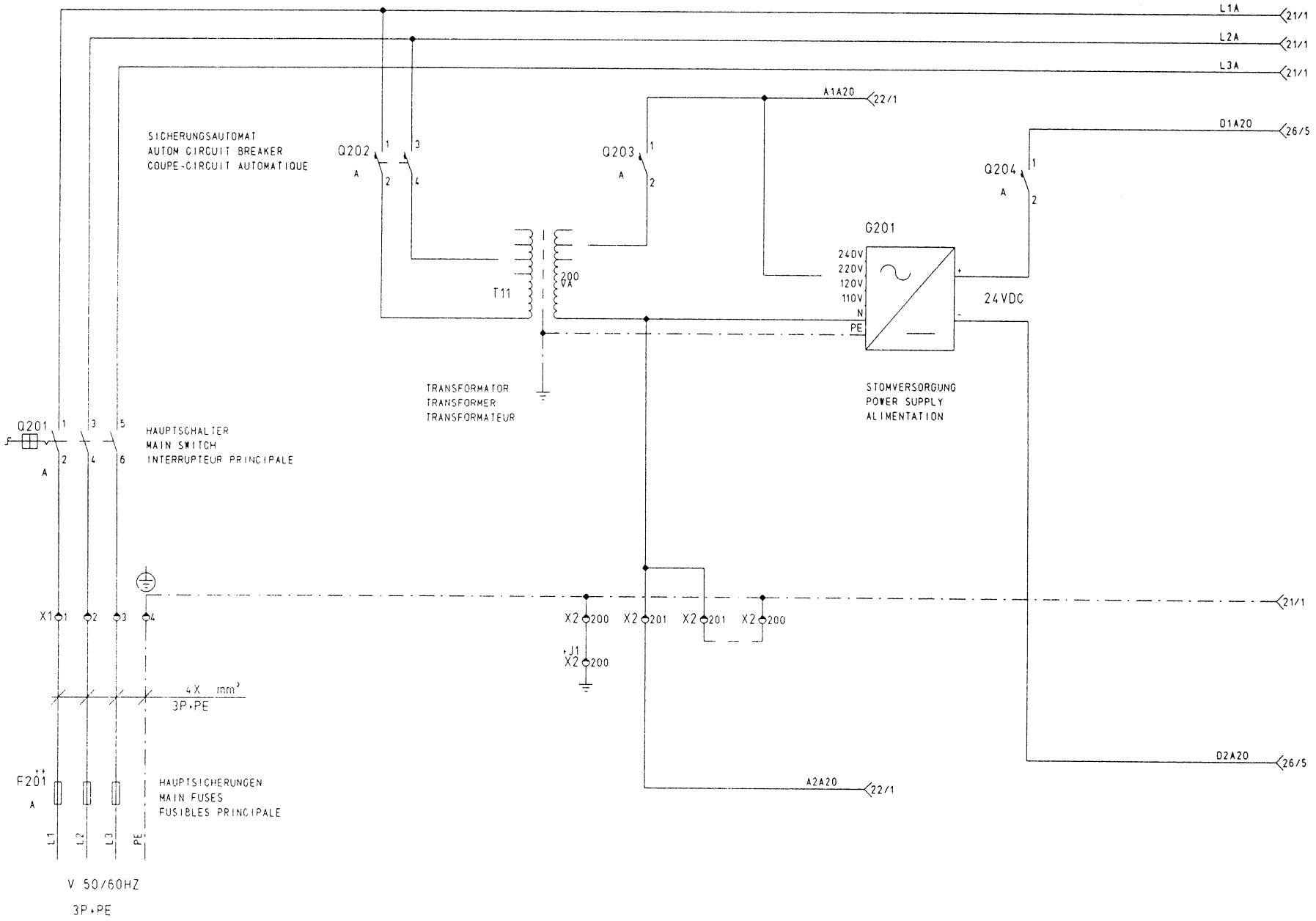
8. Safety Concept Electric Control

The electric control is an integrated part of the safety concept for preventing accidents in the workshop.

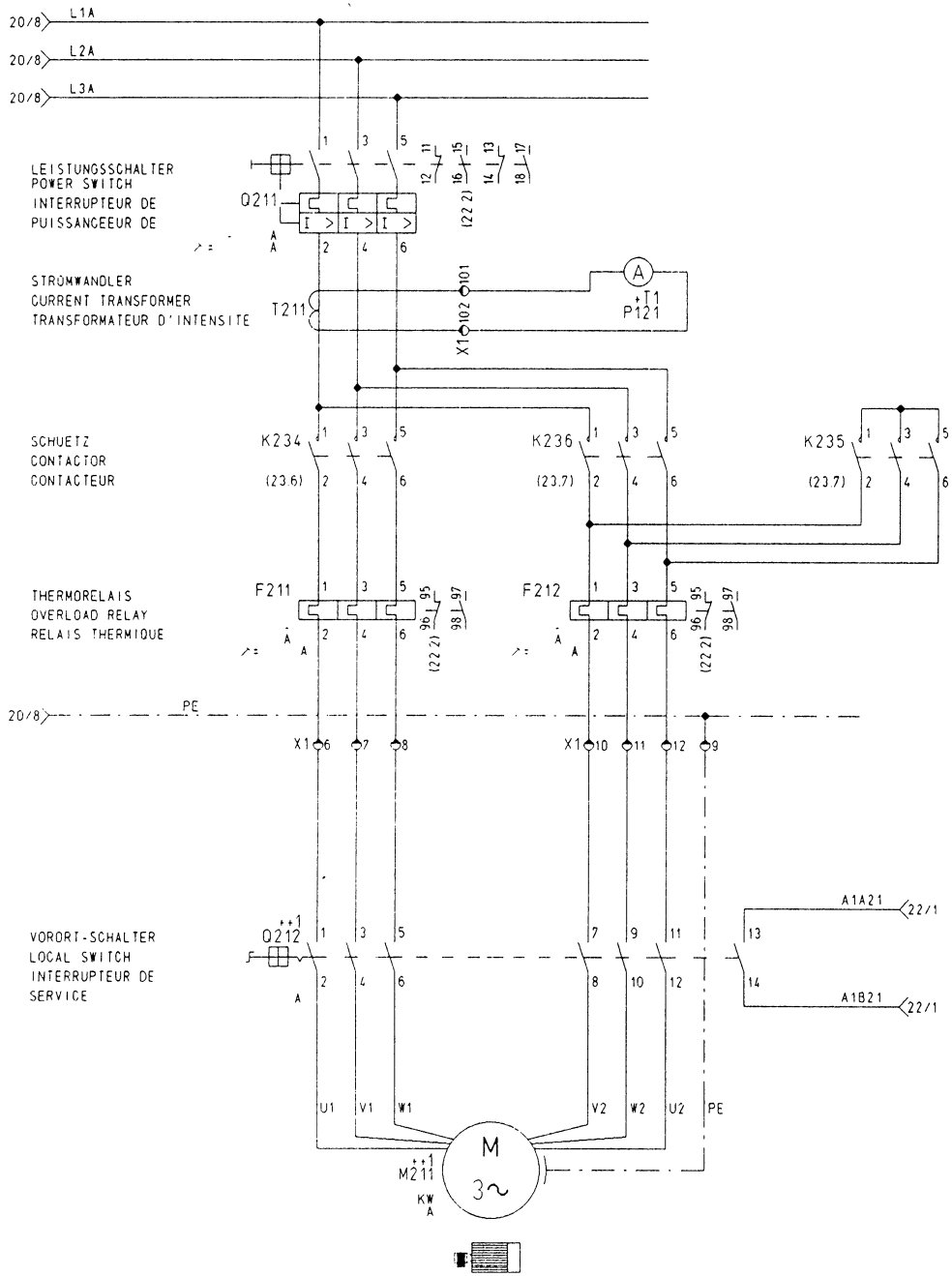
Therefore the control has to be built according to Buhler specifications and has to be inspected by a Buhler specialist before starting the machine according to a check list and has to be released with a certificate.

If the control is started without the abovementioned prerequisites, Buhler refuses the liability for any damages caused thereby.

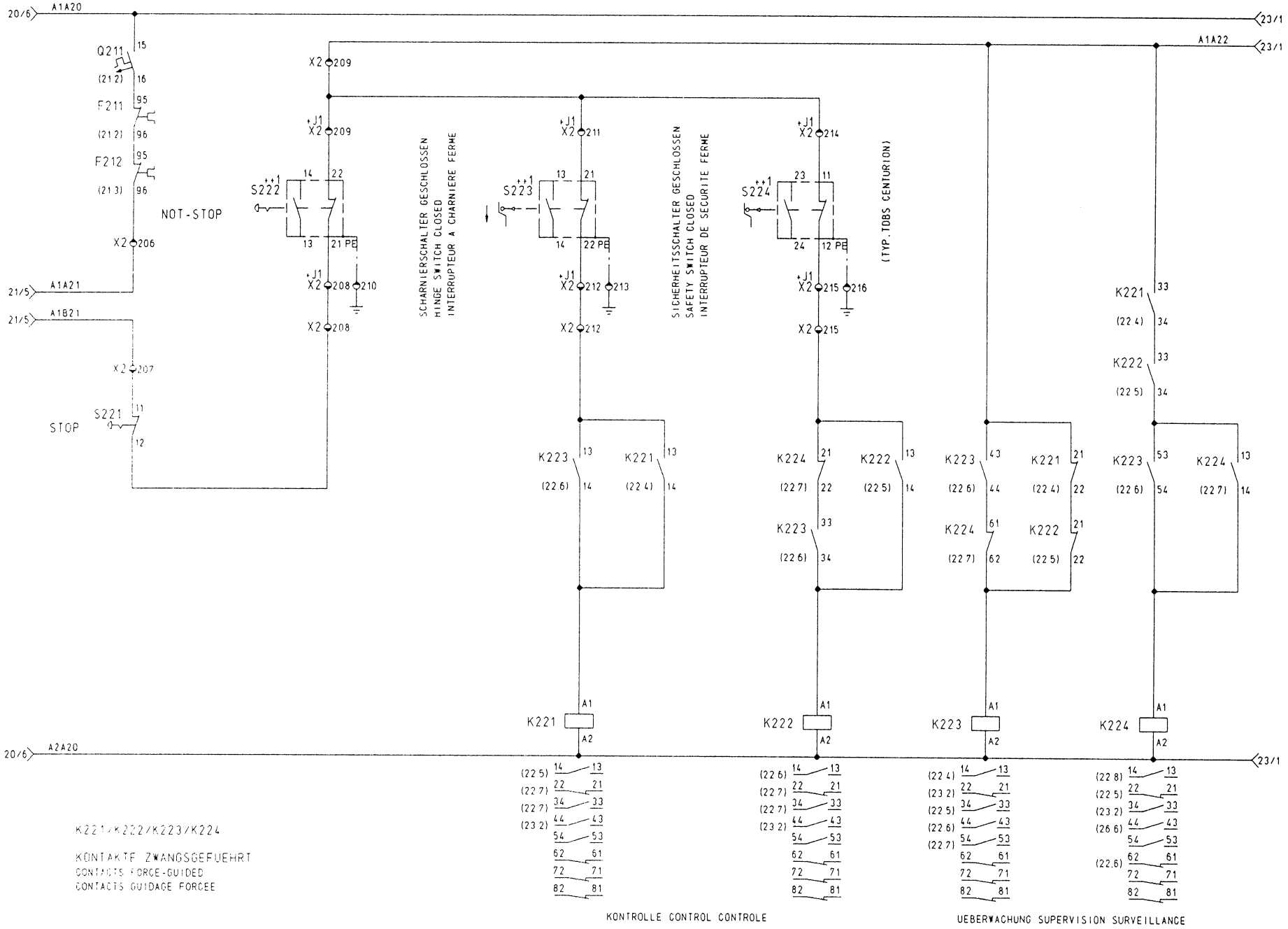
If Buhler is held liable, Buhler reserves the right to have recourse against the operator.

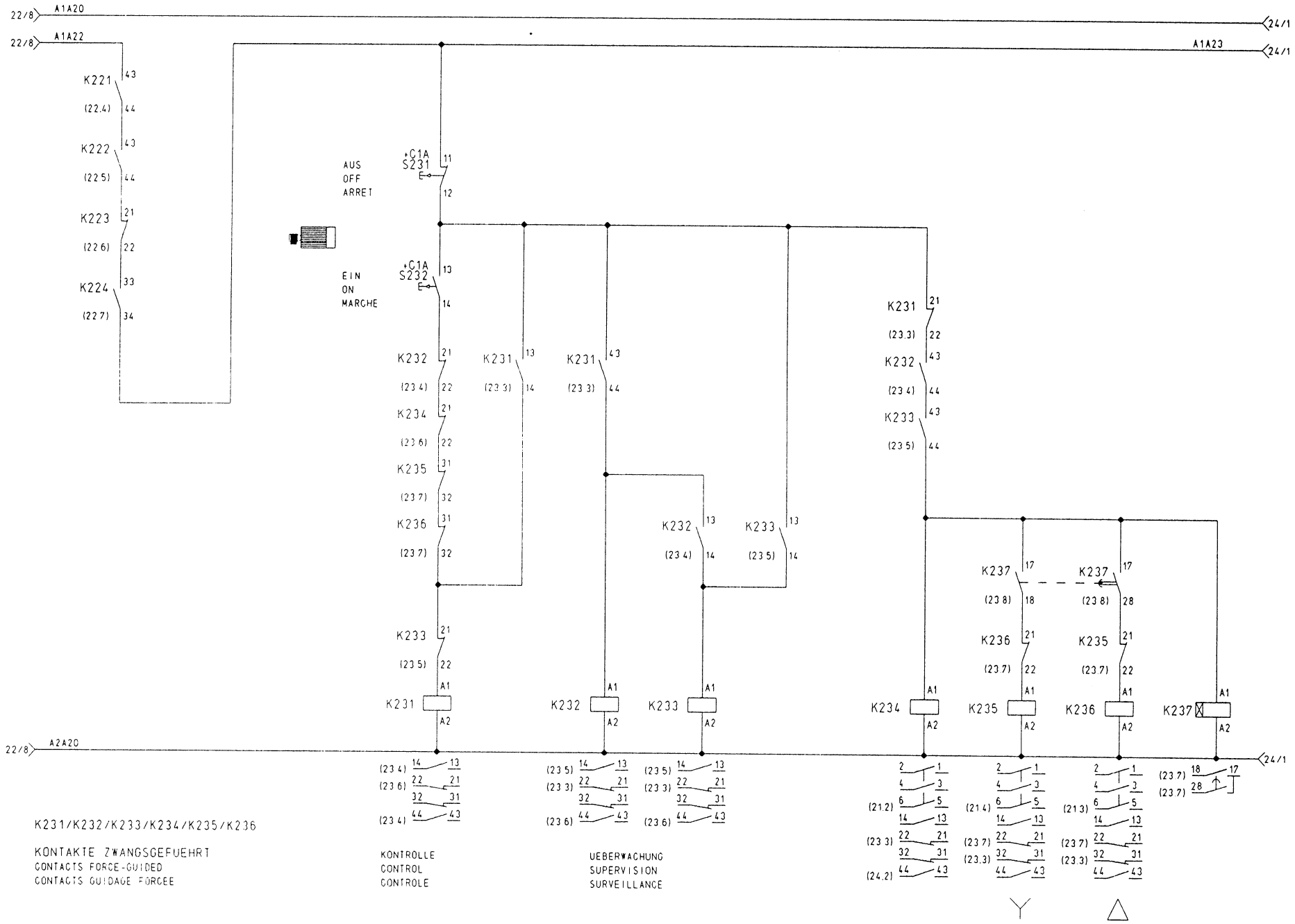


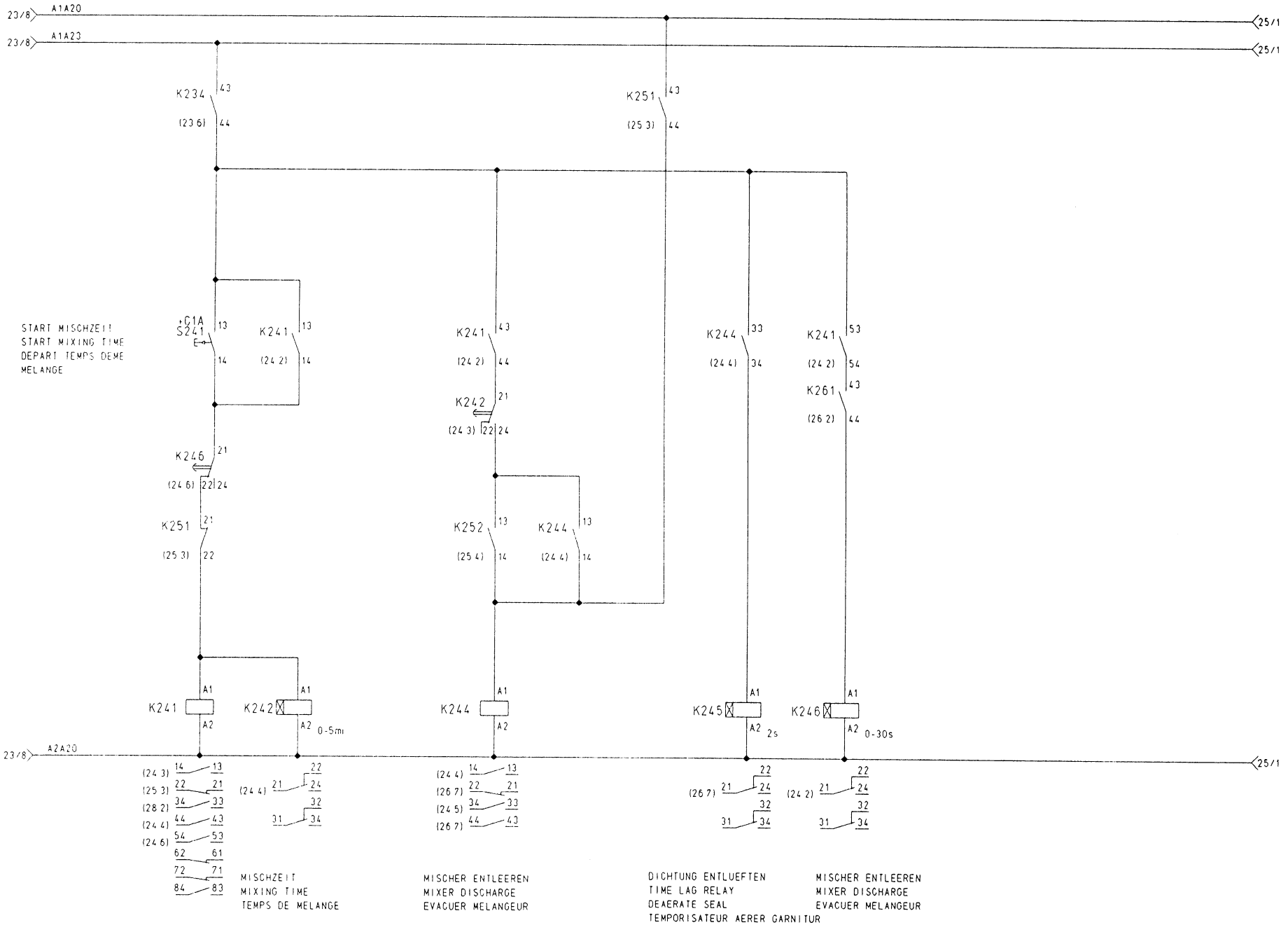
BÜHLER

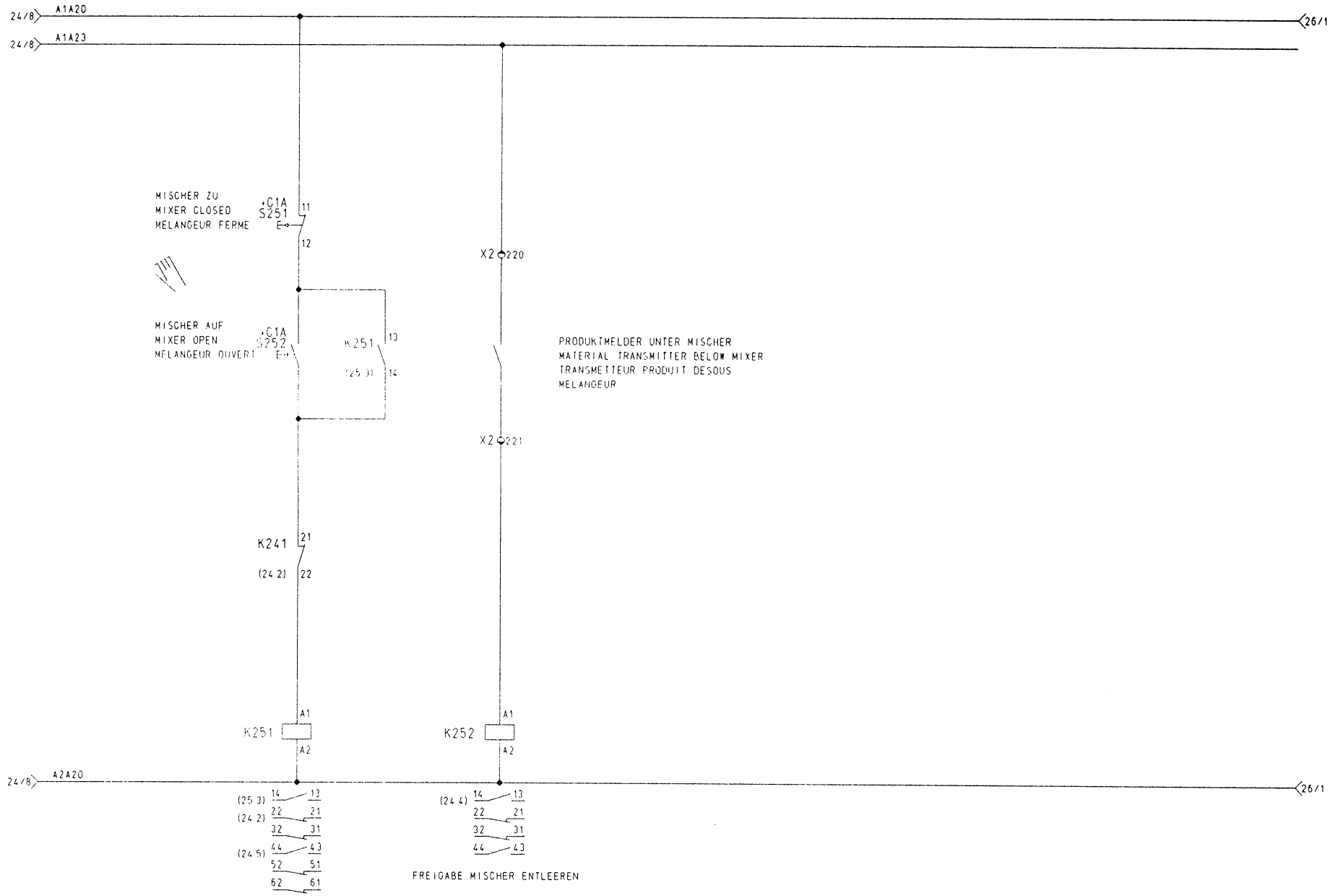


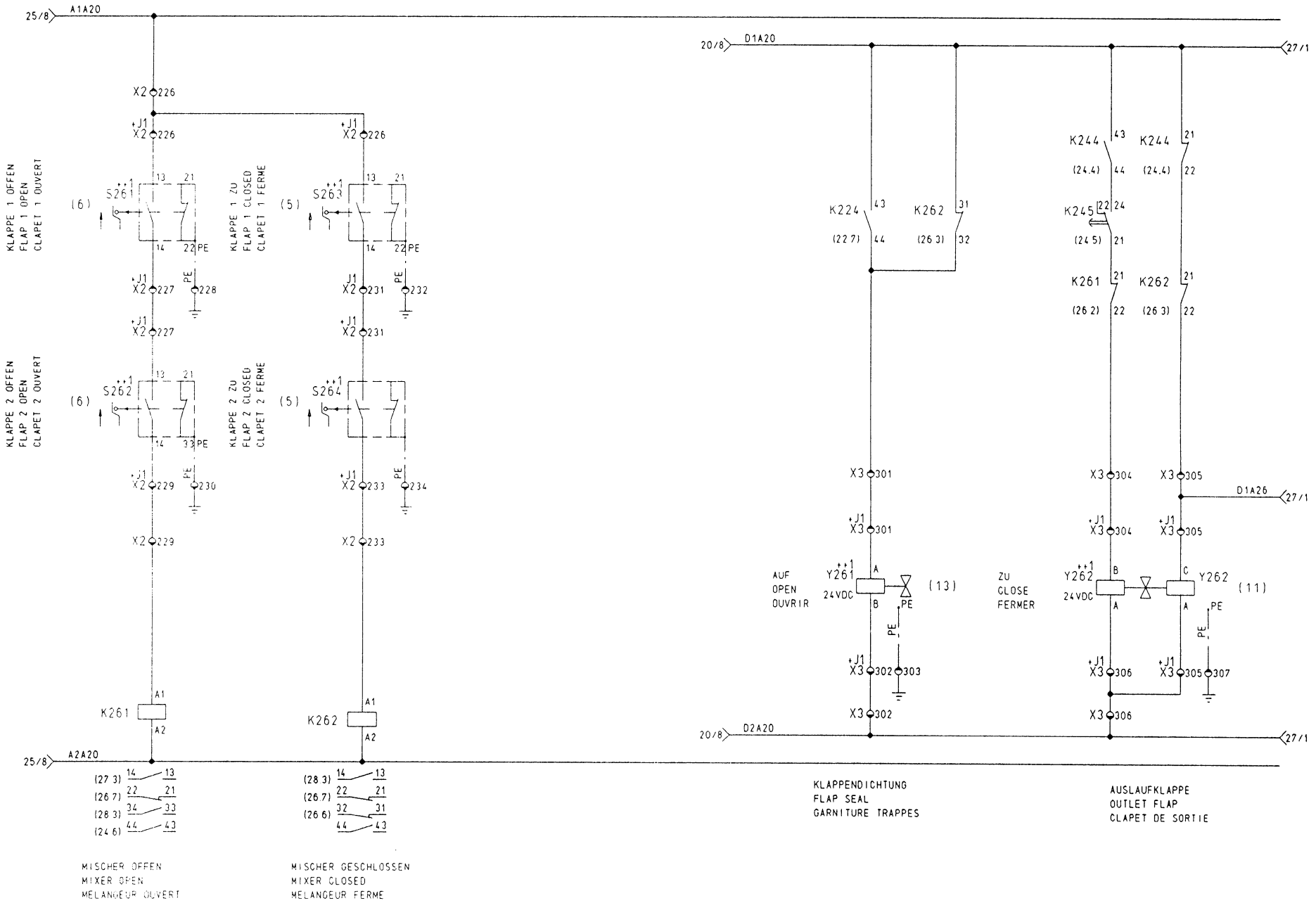
BÜHLER

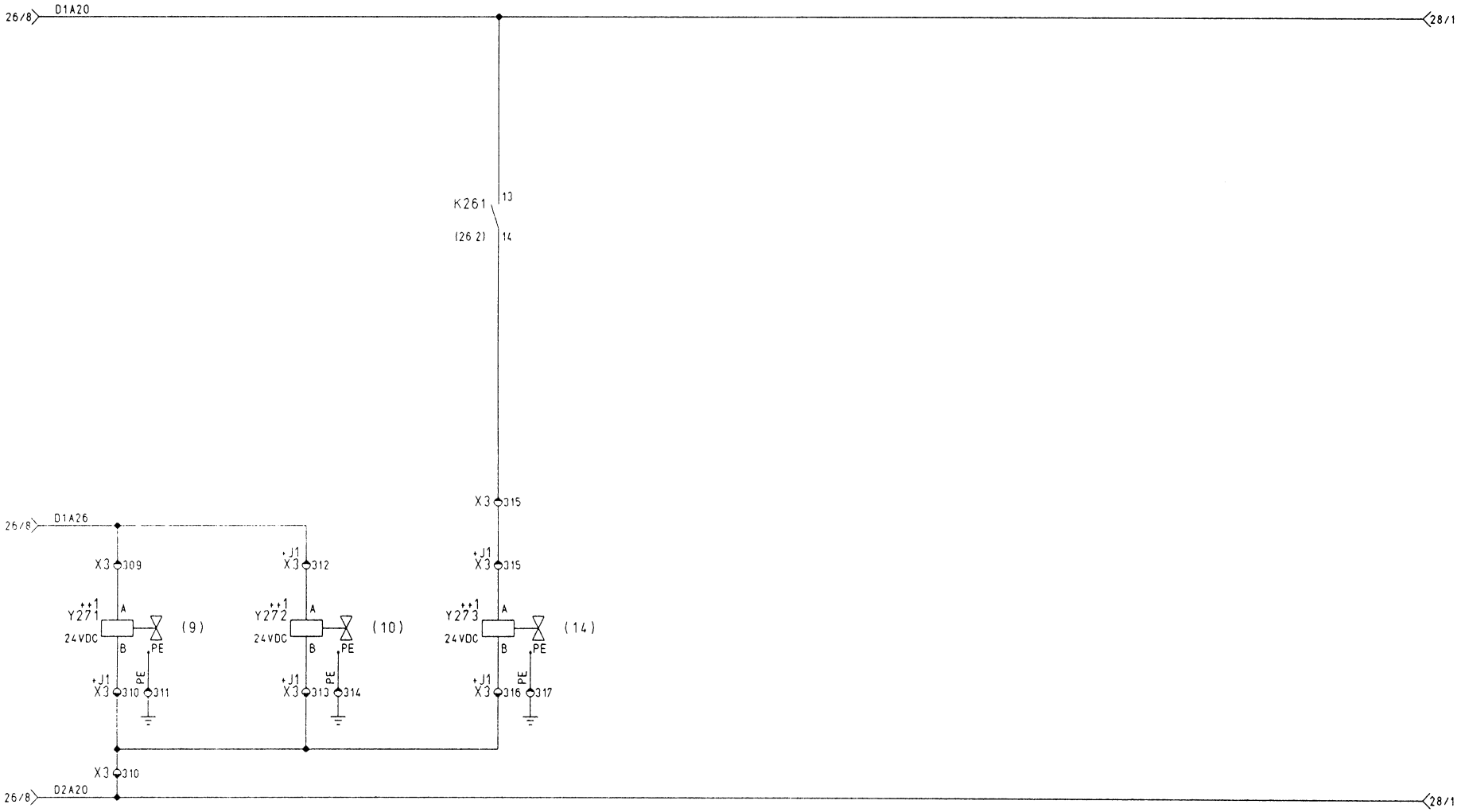








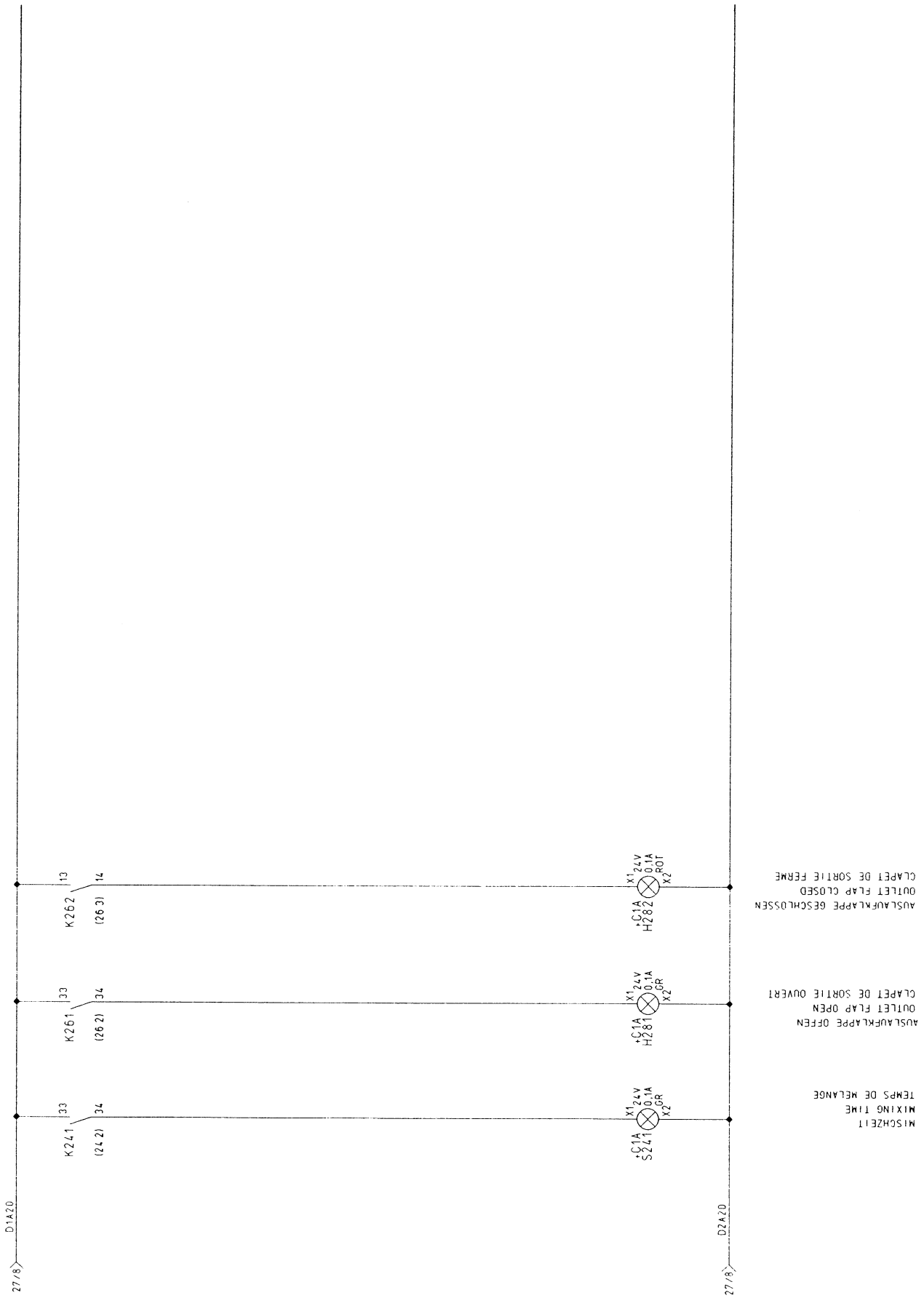


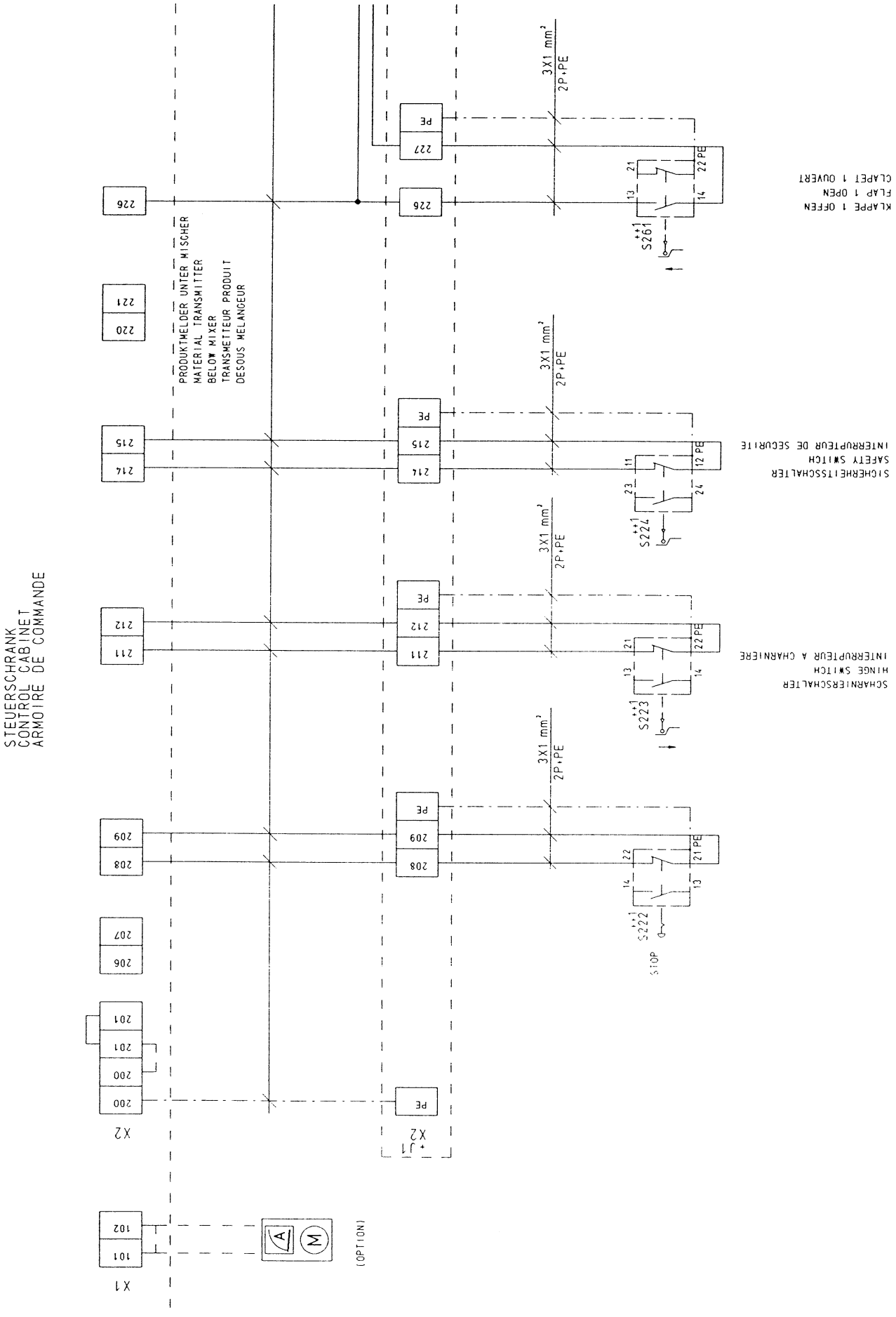


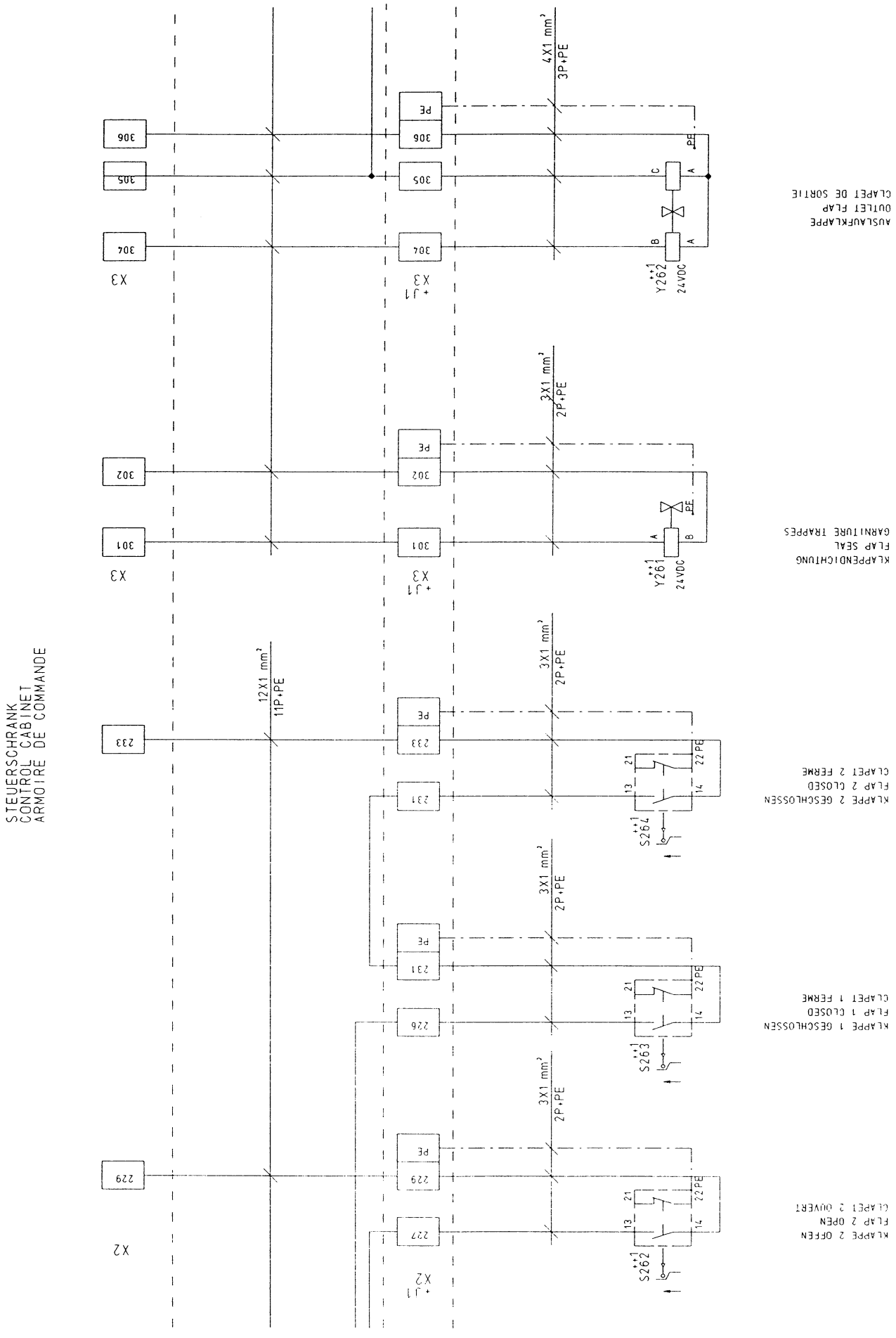
LAUFWERKDICHTUNG 1
RUNNING GEAR SEAL 1
GARNITURE MECHANISME
DE ROULEMENT 1

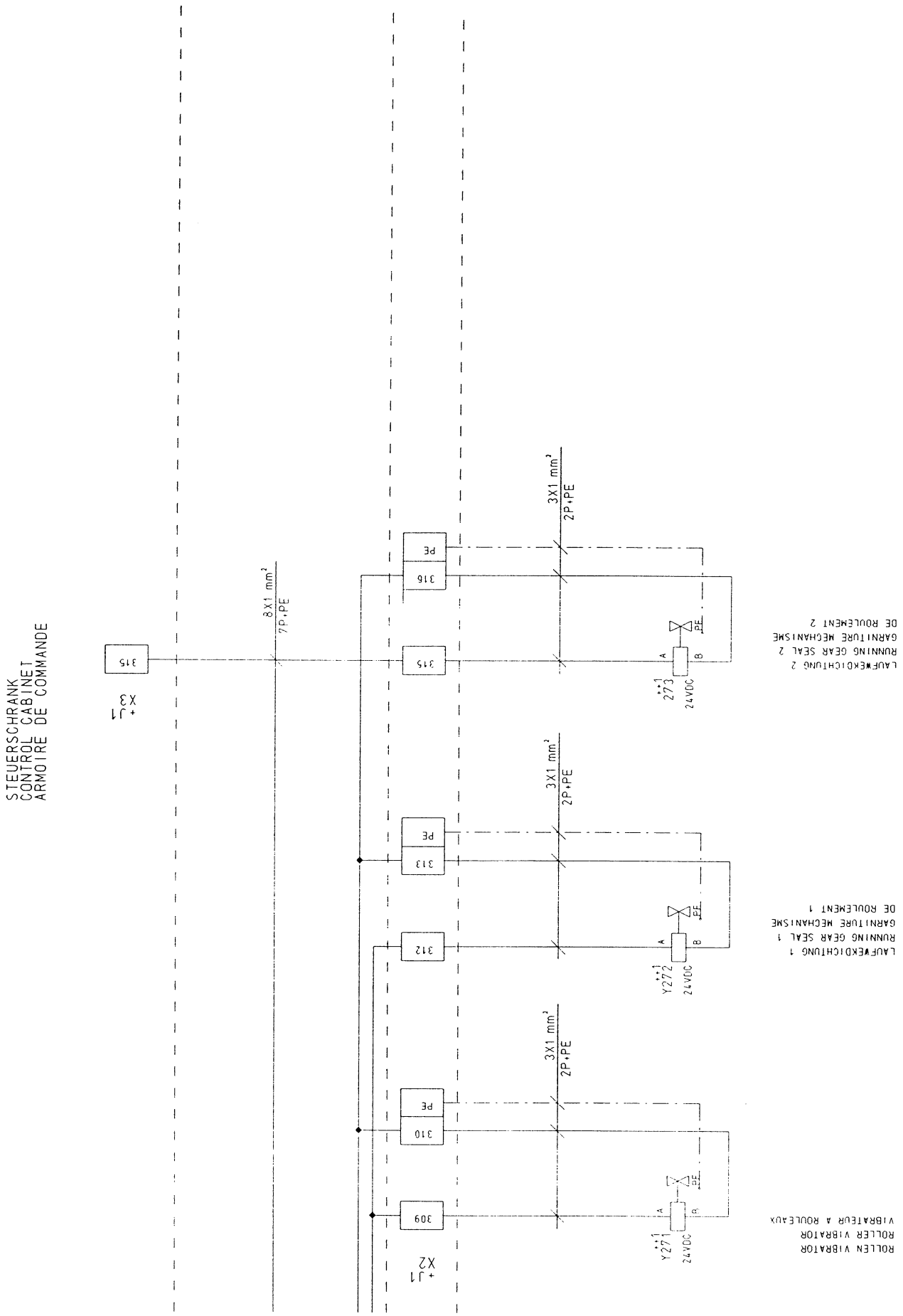
LAUFWERKDICHTUNG 2
RUNNING GEAR SEAL 2
GARNITURE MECHANISME
DE ROULEMENT 2

ROLLEN-VIBRATOR
ROLLER VIBRATOR
VIBRATEUR A ROULEAUX


D1A20
27/8
D2A20
27/8
K262
13
14
(26 3)
+C1A
H282
X1
24V
0.1A
ROT
X2
AUSLAUFKLAPPE GESCHLOSSEN
OUTLET FLAP CLOSED
CLAPET DE SORTIE FERME
K261
33
34
(26 2)
+C1A
H281
X1
24V
0.1A
GR
X2
AUSLAUFKLAPPE OFFEN
OUTLET FLAP OPEN
CLAPET DE SORTIE OUVERT
K241
33
34
(24 2)
+C1A
S241
X1
24V
0.1A
GR
X2
MISCHZEIT
MIXING TIME
TEMPS DE MELANGE


STEUERSCHRANK
CONTROL CABINET
ARMOIRE DE COMMANDE
PRODUKTMELDER UNTER MISCHER
MATERIAL TRANSMITTER
BELOW MIXER
TRANSMETTEUR PRODUIT
DESSOUS MELANGEUR
KLAPPE 1 OFFEN
FLAP 1 OPEN
CLAPET 1 OUVERT
SICHERHEITSSCHALTER
SAFETY SWITCH
INTERRUPTEUR DE SECURITE
SCHARNIERSCHALTER
HINGE SWITCH
INTERRUPTEUR A CHARNIERE
3X1 mm²
2P+PE
S261
S224
S223
S222
STOP
(OPTION)
X1
X2
X2
+J1


STEUERSCHRANK
CONTROL CABINET
ARMOIRE DE COMMANDE
AUSLAUFKLAPPE
OUTLET FLAP
CLAPET DE SORTIE
KLAPPENDICHTUNG
FLAP SEAL
GARNITURE TRAPPES
KLAPPE 2 GESCHLOSSEN
FLAP 2 CLOSED
CLAPET 2 FERME
KLAPPE 1 GESCHLOSSEN
FLAP 1 CLOSED
CLAPET 1 FERME
KLAPPE 2 OFFEN
FLAP 2 OPEN
CLAPET 2 OUVERT
4X1 mm²
3P+PE
3X1 mm²
2P+PE
12X1 mm²
11P+PE
24VDC
Y262
Y261
S264
S263
S262
X3
X2
+J1
PE
306
305
304
302
301
233
231
226
229
227
22PE
21
13
14
A
B
C


STEUERSCHRANK
CONTROL CABINET
ARMOIRE DE COMMANDE
X3
+J1
315
8X1 mm²
7P+PE
3X1 mm²
2P+PE
PE
316
315
Y273
24VDC
LAUFWERKDICHTUNG 2
RUNNING GEAR SEAL 2
GARNITURE MECHANISME
DE ROULEMENT 2
3X1 mm²
2P+PE
PE
313
312
Y272
24VDC
LAUFWERKDICHTUNG 1
RUNNING GEAR SEAL 1
GARNITURE MECHANISME
DE ROULEMENT 1
3X1 mm²
2P+PE
PE
310
309
Y271
24VDC
ROLLEN VIBRATOR
ROLLER VIBRATOR
VIBRATEUR A ROULEAUX
X2
+J1

BÜHLER

Notizen	Notes	Notice	Nota	Notas	Заметки