

INSTRUCTION MANUAL AND PARTS LIST

No. 3190 - 9001 - 040

WESTFALIA

Quark - Separator

Model KDA 16 - 02 - 177

(equipped for CIP cleaning)



WESTFALIA SEPARATOR AG./4740 OELDE 1 (W.-GERMANY)

CABLES: WESTFALIA OELDE · PHONE: (02522) 771 · TELEX: 89474

IMPORTANT HINTS

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The WESTFALIA Separator is a high-speed centrifuge which works reliably provided that it is operated and looked after in accordance with our Operating Instructions. Please read carefully through the directions so that you will be able to operate and service your separator in such a manner as to extract from it the greatest possible efficiency.

We recommend in your own interest to have your separator inspected by WESTFALIA service engineers at regular intervals. Such inspections will keep your separator working reliably and prevent undesirable shut-downs.

- 1) Before each start-up check to be sure that
 - all nozzles are open,
 - hood, discharge and centripetal pump are tightened securely,
 - oil level is slightly below middle of sight glass.
- 2) Before the initial start-up and after a long-term shut-down let the separator run, without bowl on spindle, for one minute to make sure that the oil is evenly distributed in the bearings. This is the only time that the separator may be started without bowl on spindle (see sect. 2).
- 3) To avoid clogging of the nozzles, be sure to feed the coagulated skim milk to the separator via the WESTFALIA tubular strainer.
- 4) During the starting and braking period as well as in case of interrupted milk supply, feed the bowl with water.
- 5) Feed ice-water to hood and brake ring at a rate of about 500 l/h. The feed pressure ahead of connection piece 53 must not exceed 2 bar. If necessary, install a pressure-reducing valve.
- 6) Check oil level and oil circulation daily through sight glass 38c. If the oil flow is interrupted, stop the separator immediately and clean the lubricating system (see sect. 7.4).

Check regularly for water in oil. To do this, loosen oil drain screw and allow a small amount of oil to drain. Oil pan must be cleaned at least once a year.
- 7) Change the oil every 1000 operating hours (see sect. 2).
- 8) Replace ball bearings of spindle every 5000 operating hours. On this occasion, check holes in spindle and suction pipe to see if they need to be cleaned (see sect. 7.4).

- 9) If the separator is included in the CIP cycle of the plant, it need not be dismantled at the end of a processing run, unless clogged nozzles require dismantling of the machine.

NOTE: For reasons of safety the bowl should, however, be dismantled every four weeks for routine inspection of bowl threads and gaskets.

- 10) Do NOT loosen any part of the separator or of the feed and discharge connections before the bowl has stopped completely.
- 11) When dismantling the bowl be sure to place bowl parts on a rubber mat or wooden surface, never on the stone floor. Do NOT place bowl top into bowl lock ring.
- 12) After removing the bowl bottom, place splash cover 413 over spindle end to prevent wash liquid from seeping into the drive. Do NOT flush inside of upper section of frame with water hose; wash by hand.
- 13) Before installing bowl bottom, oil upper part of spindle (thread, cone and cylindrical guide surface for spindle cap). It must be possible to move the spindle cap easily up and down on the spindle. Then clean and wipe dry the conical part of the spindle with a smooth rag. Also clean the inside of the bowl hub to assure proper fitting.
- 14) Before assembling the bowl, thoroughly clean threads on bowl bottom and bowl lock ring as well as the contact surfaces and apply a thin film of lubricating paste furnished with the separator, to prevent seizing of the threads.
- 15) When assembling the bowl, strictly adhere to the instructions given in sect. 4 to avoid undue unbalance. Before starting the bowl be sure it is completely assembled.
- 16) When pressure in disc stack has slackened, add spare disc.
- 17) After re-installing the drive or after mounting a different bowl, check bowl height and re-adjust it, if necessary (see sect. 8.4).
- 18) Never use blow-torch on bowl or expose bowl to heat of open flame.

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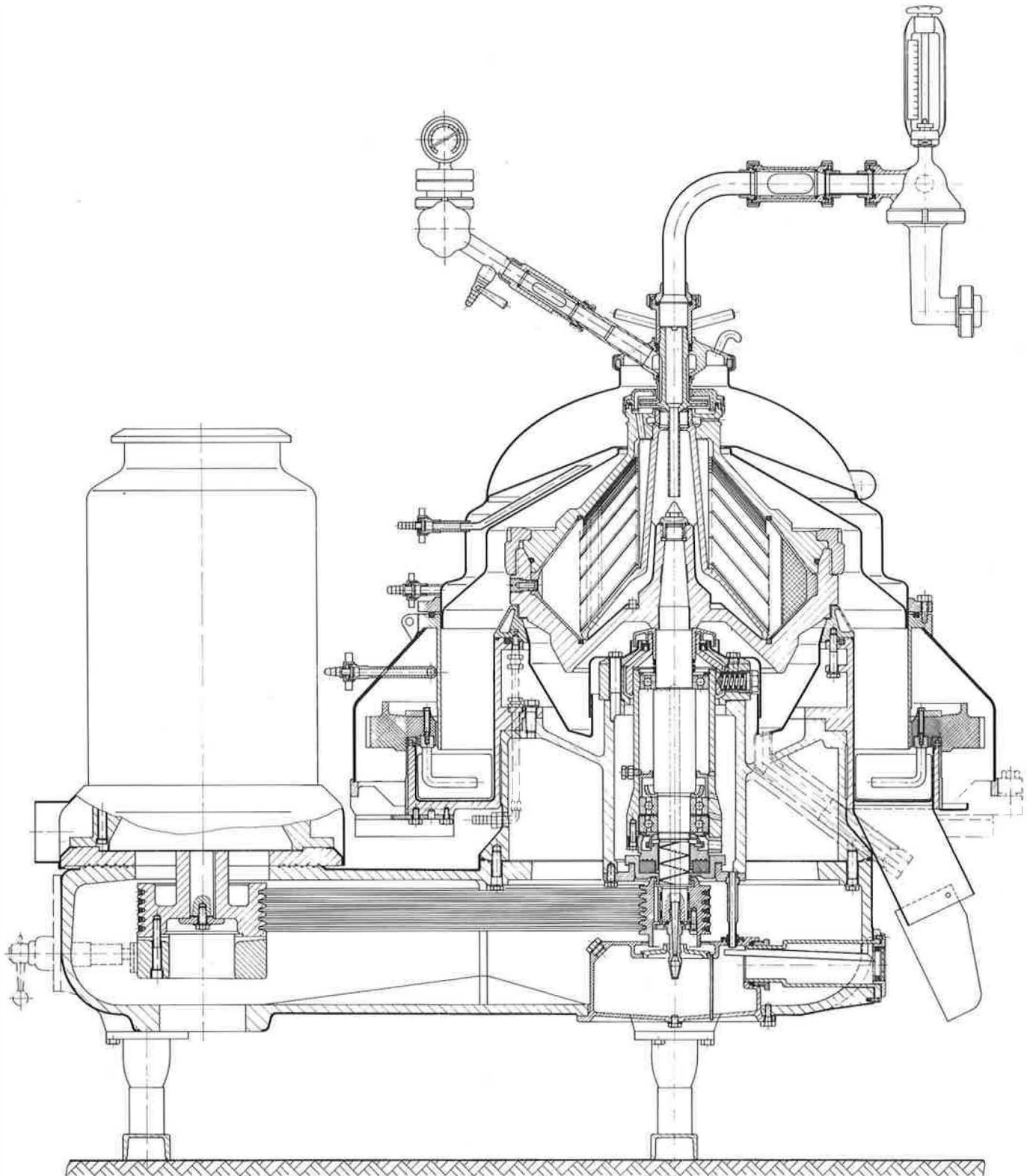
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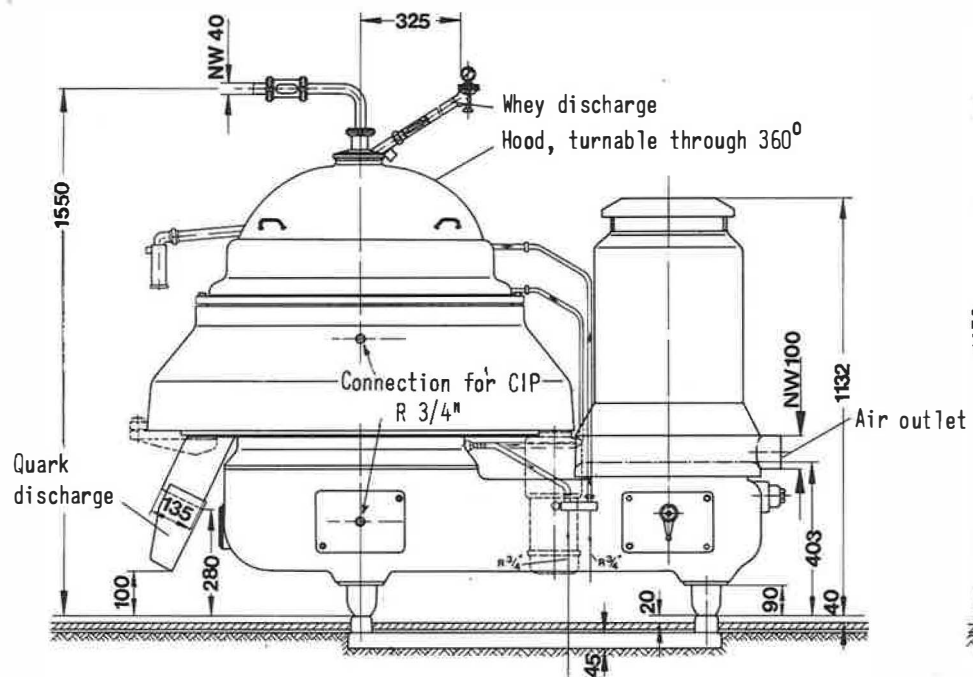
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Sectional View of the Separator

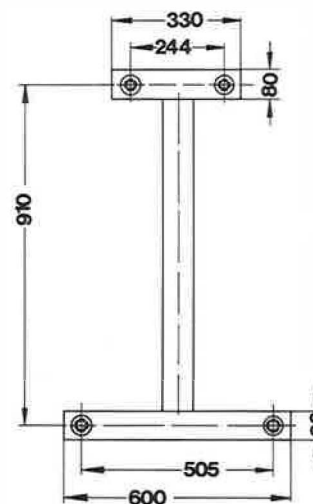
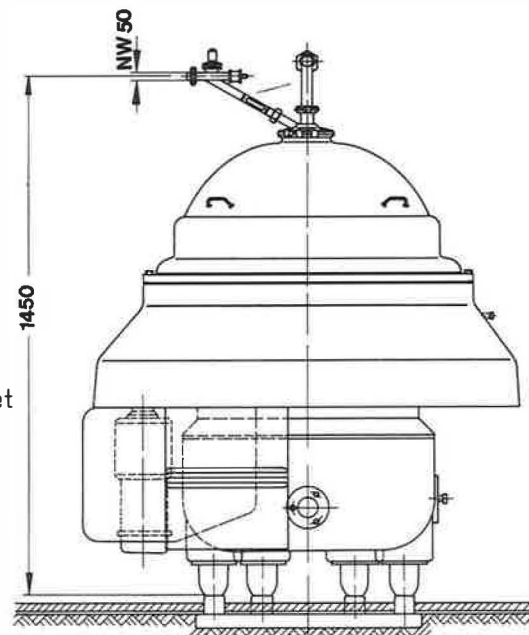
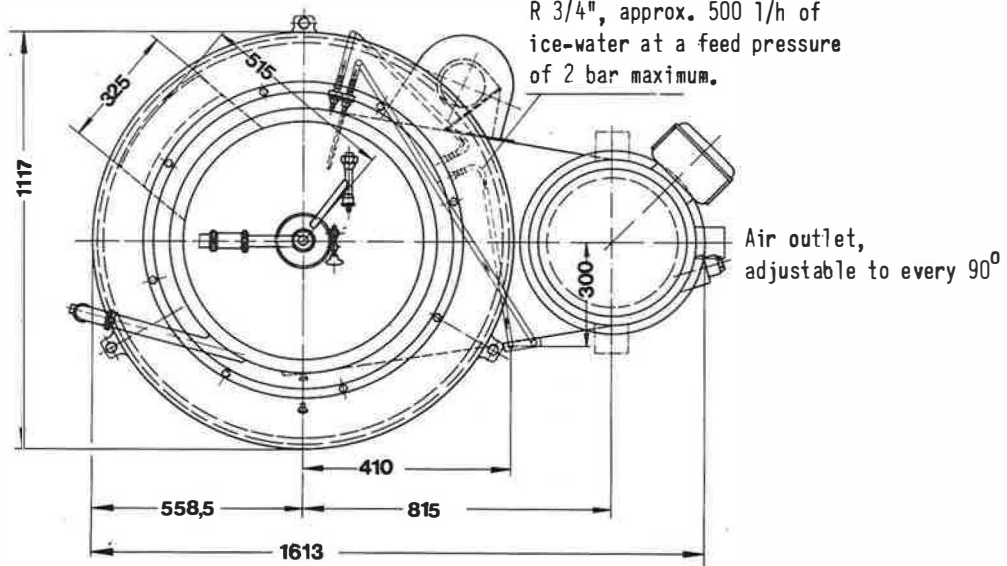
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Cooling-water connection
for brake ring and hood

R 3/4", approx. 500 l/h of
ice-water at a feed pressure
of 2 bar maximum.



Technical Data:

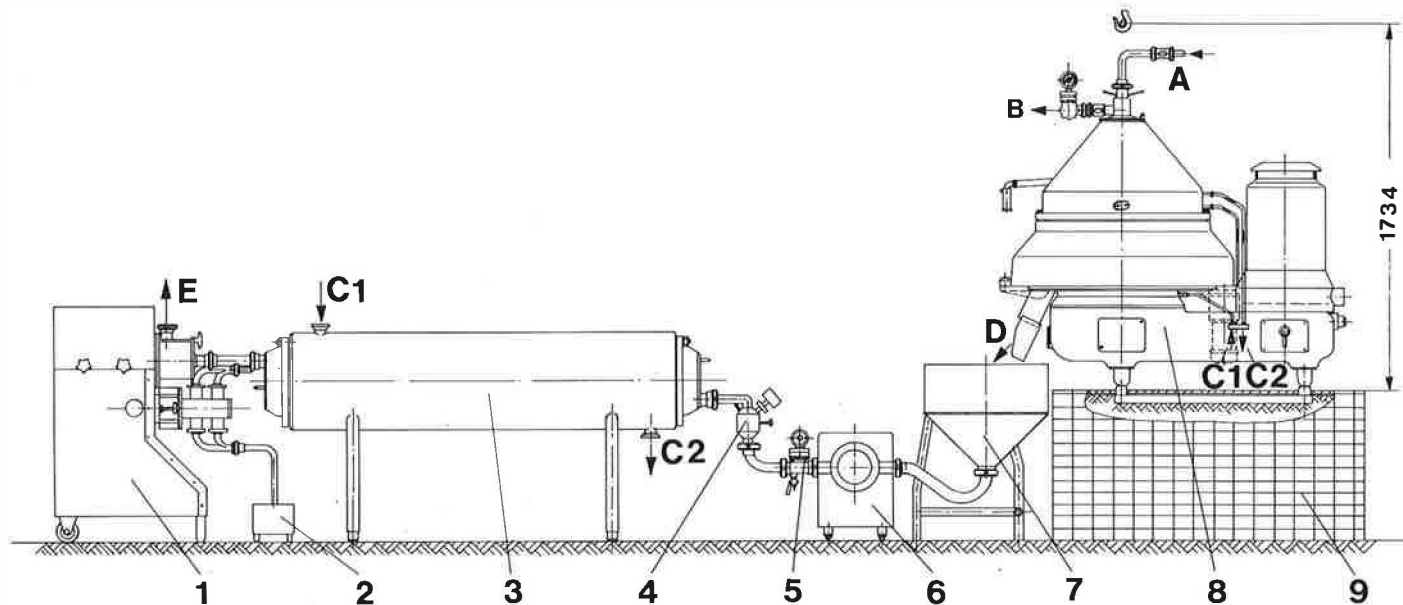
Motor power: 15 kW
Power consumption: 12 kW (for 5,000 l/h)
Motor speed: 3000 rpm (50 Hz)
Bowl speed: 5,500 rpm

Weight:

Complete machine: 1,530 kg
Bowl: 240 kg

Dimensioned Drawing

WESTFALIA Quark Line
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- 1 WESTFALIA Quark Mixer
- 2 Cream tank
- 3 WESTFALIA Quark Cooler
- 4 Moisture meter, Make: Brabender
- 5 Pressure gauge
- 6 Positive displacement pump
- 7 Quark funnel
- 8 WESTFALIA Quark Separator
- 9 Concrete foundation
(about 720 mm high)

- A Feed
- B Whey discharge
- C1 Inlet for ice-water
- C2 Outlet for ice-water
- D Quark outlet
- E to packing machine

WORKING INSTRUCTIONS

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1. Installation

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1.1. Transport

Suspend the separator as shown below: Remove two opposite hex head screws M10 from neck bearing bridge. Then screw eye bolts 409 into tap holes M16 and hook lifting device 425 into eye bolts.

To prevent the rope from slipping, wind it around the crane hook. When lowering the separator make sure it touches down gently.

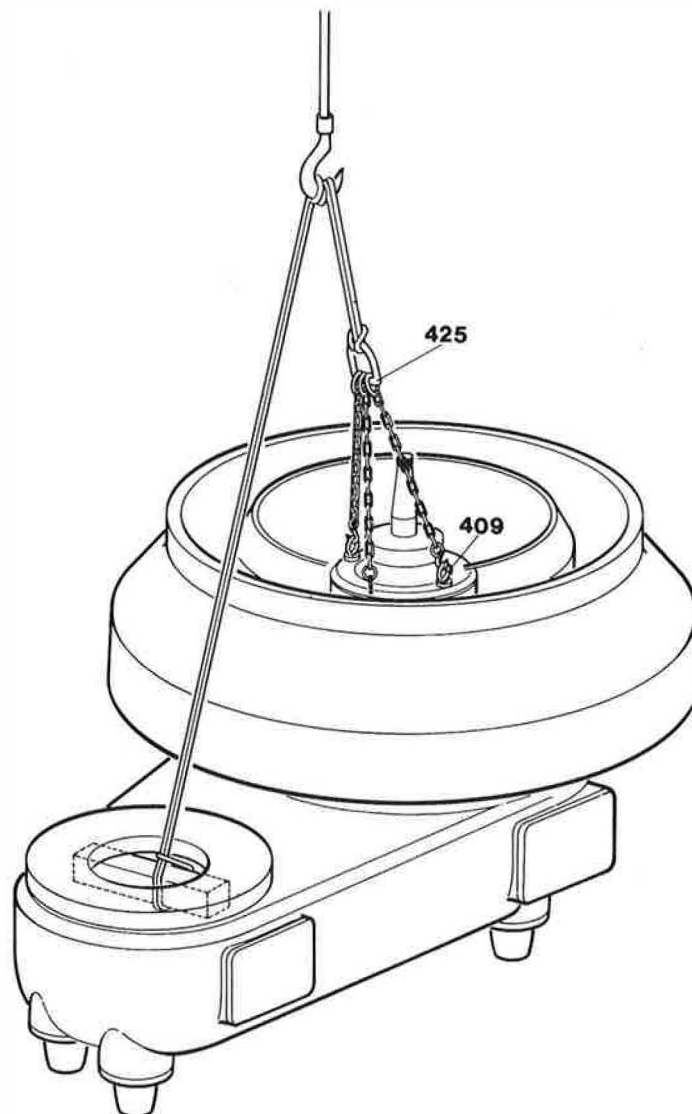
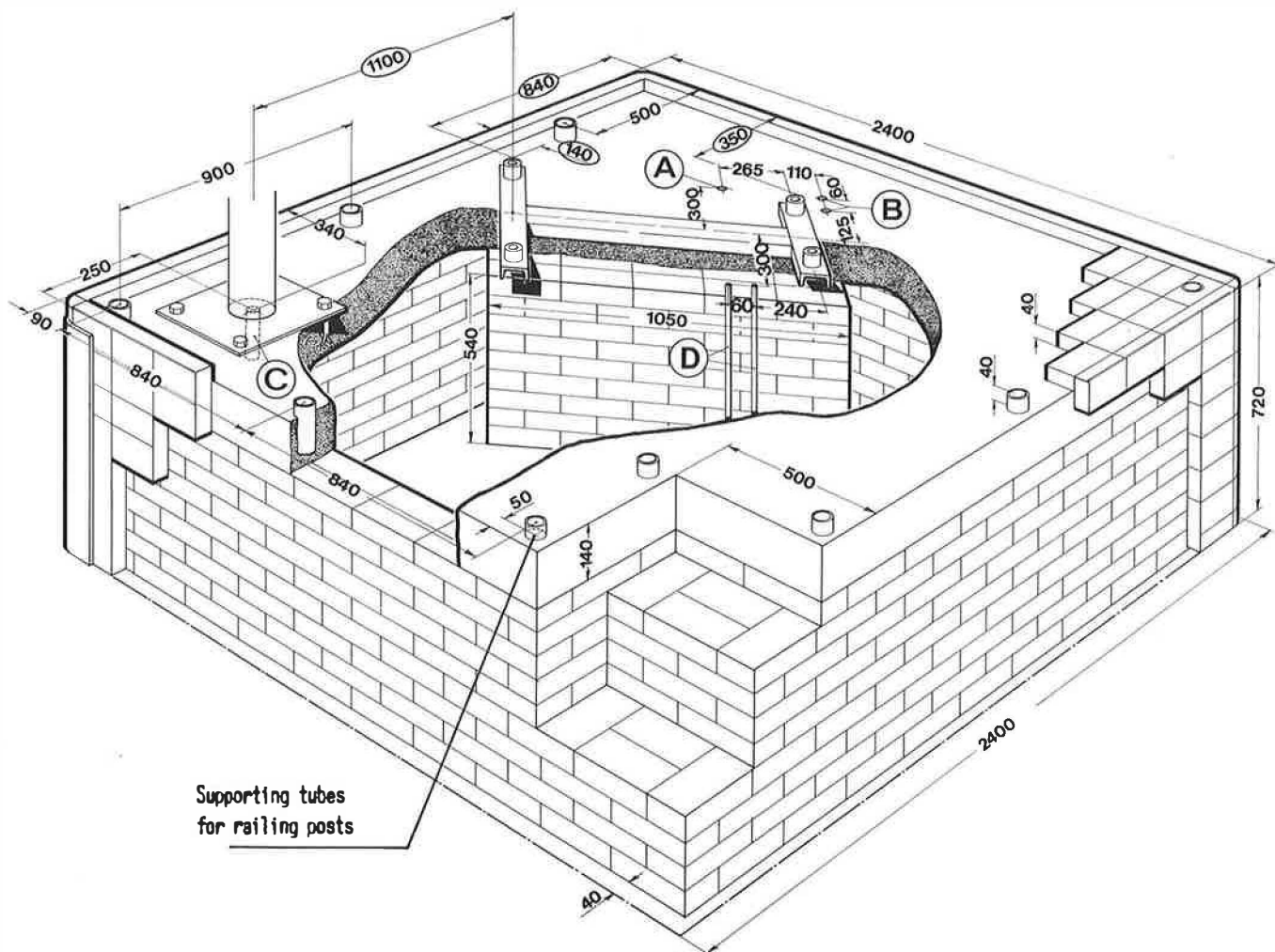


Fig. 1/1

Weight: 1000 kg

Foundation Plan



For cable passages "A" and "C"
use a 26/28 mm dia. pipe

For cable passage "B" use a
32/34 mm dia. pipe

For ice-water connection "D"
use two pipes R 1/4"

The stated dimensions, except for the encircled ones, are standard dimensions. When building the foundation for your separator refer to the foundation plan especially designed for your requirements.

1.2. Installation

For dimensions of separator refer to page 0/7 and for dimensions of foundation refer to foundation plan on opposite page.

In accordance with the dimensions of the foundation plan, a frame of sand-lime brick has to be built on solid ground and, in addition, a supporting wall for the separator. The interior of the frame must be filled with ash or similar material. Then cover the frame with a concrete slab which has to be provided with recesses for subsequent installation of the foundation frame of the separator and the rotary crane.

The dimensions which determine the position of the foundation frame of the separator and of the rotary crane are encircled in the plan and have to be kept strictly. The cable passages in the concrete slab are marked with letters A, B and C, the connections for the ice-water are marked with the letter D.

Embedding the separator foundation frame in the concrete slab (fig. 1/3)

Screw bolts 1c all the way down into the four raised mounting blocks of foundation frame 1a. Embed the foundation frame into the concrete slab so that the mounting blocks of the frame protrude from the floor by about 40 mm. Make sure that the mounting blocks are absolutely level, then grout the frame with poured concrete.

NOTE: The foundation frame must be absolutely level, because the separator cannot be levelled during installation.

Fastening the separator on the foundation frame (fig. 1/3)

By means of flanges 3 and screws 2 fasten feet 4b with fitted-on rubber cushions 4c to separator frame. Then lift separator onto bolts of foundation frame and tighten threaded pins 4a with a wrench.

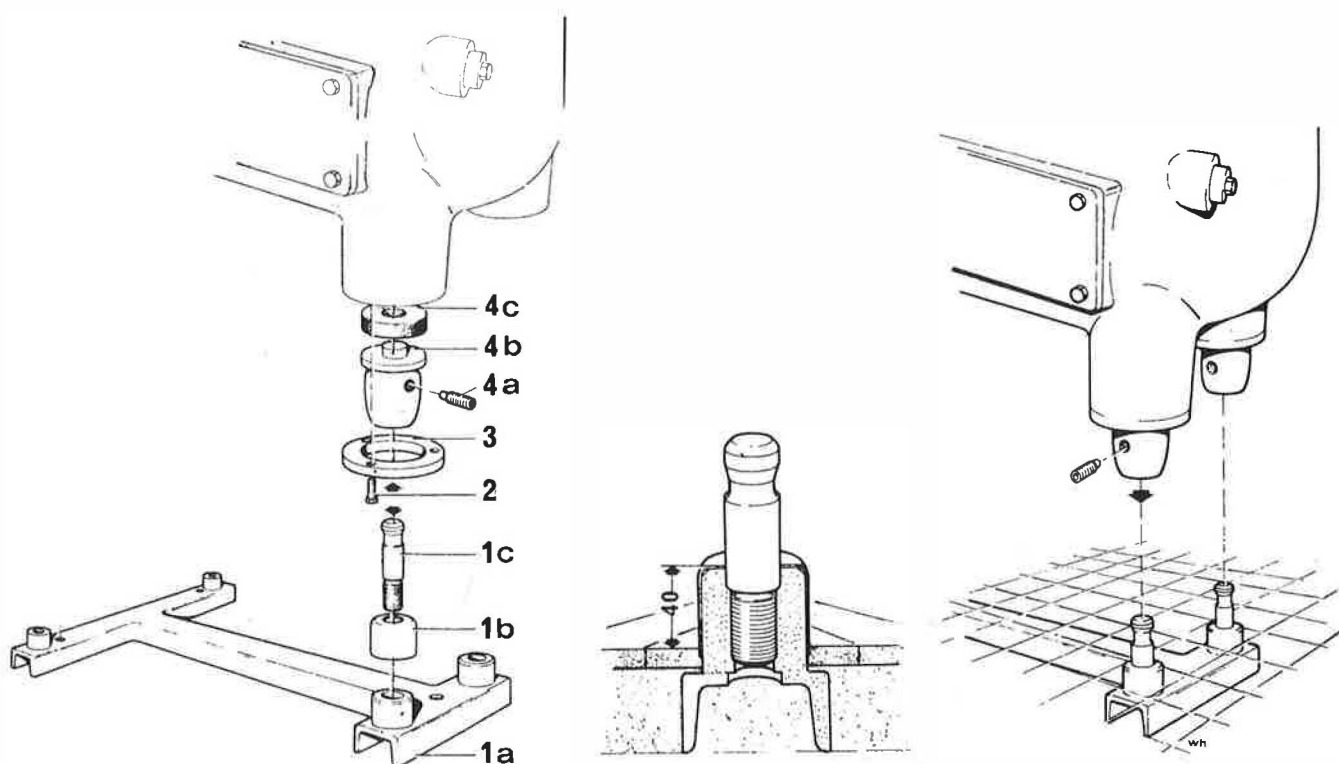


Fig. 1/3

2. Lubrication

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2.1. Lubrication of the separator bearings

All bearings, except those of the motor, are automatically lubricated from a central oil bath. The oil flow is illustrated in fig. 2/1. The oil is sucked in through the central hole in the drive spindle and directed to the upper and lower bearings. The return of oil can be seen through sight glass 38c.

Oil level

Before the initial start-up of the separator, remove screw 21 and use funnel 411 to fill oil pan with oil. Oil level must be slightly below middle of sight glass. About 5 litres of oil are required for one filling. In case of oil loss, refill immediately.

Before the first start and after an extended shut-down of the separator, let the separator run - without bowl on spindle - for one minute to make sure that the oil is evenly distributed in the bearings. Before starting the separator, remove spindle cap 151y and pressure spring 151x which would otherwise slip off the rotating spindle. Turn off the motor as soon as oil flows out of the return pipe (to be seen through the sight glass).

Note that this is the only time that the separator is allowed to run without bowl on spindle. When rotating without bowl, the spindle will be raised by the centrifugal force acting on the balls of the angular contact ball bearing which, in turn, might cause damage to the bearing.

Oil check

Check oil level and oil flow daily through sight glass. Also, check from time to time for water in oil. To do this, loosen oil drain screw 26 and allow a small amount of oil to drain.

An immediate oil change becomes necessary when the oil in the sight glass shows a milky colouring (emulsification).

As soon as the oil flow decreases, the drive parts have to be removed for cleaning (see 7.4). The holes in suction pipe 151a-b and in spindle 151q should be cleaned with special care.

Oil change

Make first oil change after about 250 operating hours, then change oil when conditions require, that is in general after 1000 operating hours. However, be sure not to wait longer than 6 months to change the oil.

After several oil changes or when an additional oil change becomes necessary because water or dirt has infiltrated into the oil, the oil pan must be cleaned (see 7.4).

Type of oil

For lubrication use only high-grade solvent-refined mineral oil with additives "L" (giving increased protection against corrosion and increased resistance to aging) and additives "P" (for decreasing wear and increasing the load-carrying capacity).

Designation: C-LP 36 (according to DIN 51502) or
ISO VG 46 (according to ISO/DIS 3448)
Viscosity: 36 ± 4 cSt/50°C (46 ± 5 cSt/40°C).

The lubricating oil must meet the requirements of the "FZG" gear rig test according to DIN 51 354, load grade > 12 .

Do NOT use motor vehicle lube oils, since they might develop disturbing odours.

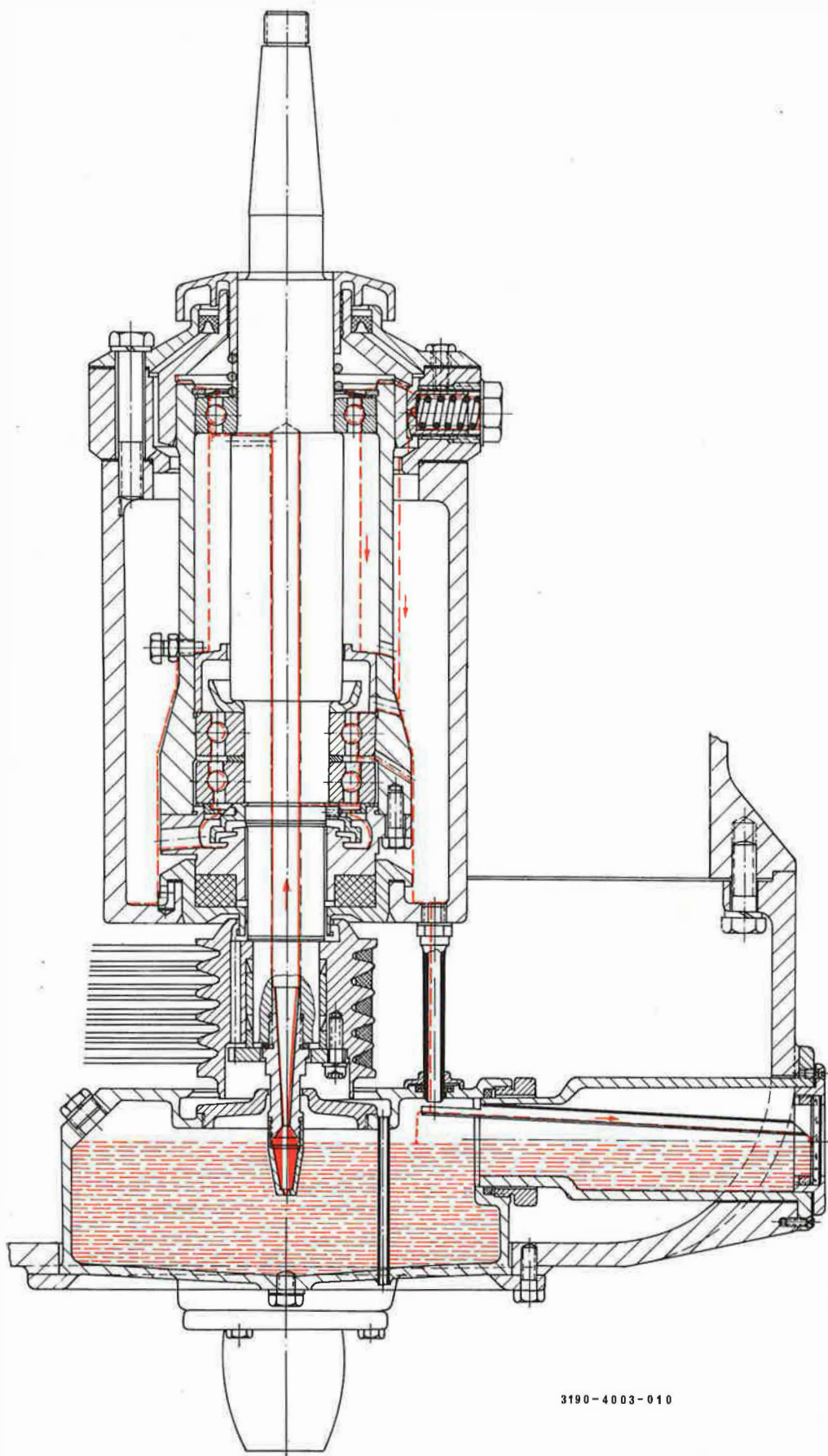


Fig. 2/1

2.2. Lubrication of threads and contact surfaces on the bowl parts

Before assembling the bowl, grease threads and contact surfaces of the bowl parts (bowl bottom, bowl top, lock rings, etc.) with the following lubricants.

For separators operating in the food industry we recommend to use the following lubricants:

Molykote D	(white paste; apply sparingly),
Molykote DX	(white paste; may be used in excess),
Klüber-Grease KSB 8	(may be used in excess).

Besides the above mentioned lubricants, other pastes or greases with the same characteristics may also be used.

2.3. Lubrication of the motor bearings

For lubrication of the motor bearings refer to the instructions of the motor manufacturer (see plate attached to the motor).

3. Motor Connection =====

3.1. Three-phase AC motor, 15 kW

The separator is driven by a totally enclosed special type three-phase AC motor designed for star-delta connection. The motor is rated to stand up to the conditions during starting and actual operation. The windings of the motor are insulated as per class of insulation "H" (silicon insulation).

The starting time in star connection is about 9 minutes. Only after this time may switching-over from star to delta connection be made. A second start may only be made after 30 minutes. The starting current amounts to about 2,2 times the value of the rated current. This value has to be considered when selecting the switches, the cross sections of the lead-in-wires, and the fuses.

The minimum cross sections of the lead-in-wires, valid for a maximum cable length of 100 m, are given below:

Line voltage	220	380	440	500	V
Cross section of lead-in-wires between mains and motor starter	16	6	6	4	mm ²
Cross section of lead-in-wires between motor starter and motor	10	6	6	4	mm ²

Motor protection during operation must be assured by a thermal release adjusted to the rated current of the motor. Because of the increased starting current, this release may, however, only be actuated upon termination of the starting time, i.e. simultaneously with switching over from star to delta connection. During the starting period, motor protection is assured by built-in temperature feelers and by an electronic protecting device of the type CALOMAT C21.

3.2. Direction of rotation of the bowl

IMPORTANT: The bowl must rotate clockwise, when looked at from above. If it turns counter-clockwise (incorrect), reverse direction of rotation by interchanging two lead-in wires.

3.3. Speed of the bowl

The bowl speed depends on the densities of the centrifugally dry solids and of the heavy liquid phase. It has been rated so as to ensure the operating safety of the separator.

The bowl speed is 5500 rpm. The maximum permissible densities for this bowl speed are given on the name-plate of the separator. If the densities exceed those specified on the name-plate, the bowl speed will have to be reduced by mounting a smaller motor V-belt pulley. In this case, be sure to check with the factory.

Before the initial start-up of the separator and after changing the V-belt pulleys, check the number of revolutions of the spindle (rpm of bowl) with a hand tachometer before installing the bowl. Variations in speed of up to 3% are permissible.

3.4. Three-phase AC motor for drive ring

The drive ring is driven by a 0,75 kW motor. This motor is started across-the-line.

Nozzle 252
with gaskets 252a

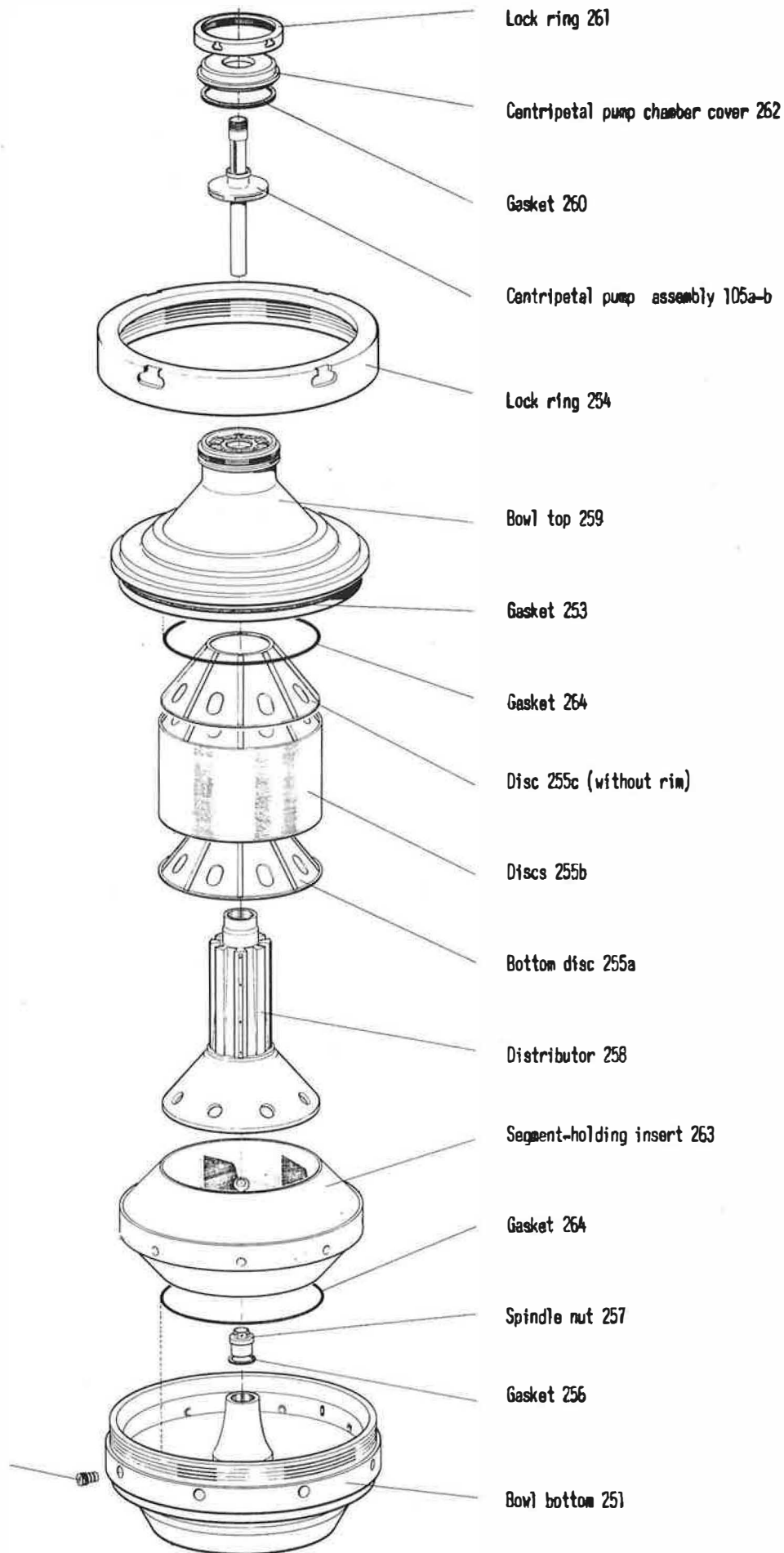


Fig. 4/1
Exploded view of the bowl

4. Bowl, Feed and Discharge Connections

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IMPORTANT HINTS

Before assembling the bowl, make sure that the contact surfaces and the threaded areas of the bowl parts are clean.

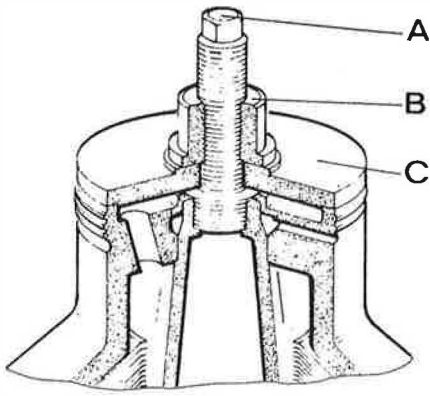
When installing the bowl parts, see that the "O" marks of all parts are aligned.

If the plant has several separators, be careful not to interchange parts of different bowls, since each bowl has been balanced with its component parts. The main parts of the bowl are marked with the last three digits of the serial-number of the separator.

Be sure to replace worn gaskets.

4.1. Assembly of the bowl

- 1) Oil the upper part of the spindle (thread, cone, and cylindrical guide surface for spindle cap). It must be possible to move the spindle cap easily up and down on the spindle. Then clean and wipe dry the conical part of the spindle with a smooth rag. Carefully clean the inside of the bowl hub as well to assure proper fitting.
- 2) Carefully wipe dry groove for gasket 264 in bowl bottom and insert gasket.
- 3) Use jack 422 to place bowl bottom 251 onto the spindle.
- 4) Place on gasket 256 and screw on spindle nut 257 tightly.
- 5) Use lifting device 431 to place segment-holding insert 263 into bowl bottom. Make sure that arresting piece 251a catches into recess of segment-holding insert.
- 6) Place bottom disc 255a on neck of distributor, then stack on discs 255b-c in numerical order, beginning with No. 1.
- 7) Use jack 426 to put distributor 258 together with stacked-on discs into bowl bottom. The arresting cams of the bowl bottom must catch into the grooves of distributor base.
- 8) Insert gaskets 253 and 264 into grooves of bowl top.
- 9) Use tool 423 to place bowl top 259 onto bowl bottom. Make sure arresting cam of bowl bottom fits into groove of bowl top. The "O" marks of both parts must be in line with each other.
- 10) Thoroughly clean and wipe dry threads of bowl bottom and bowl lock ring 254 as well as the contact surfaces. Then apply grease (see 2.2) to prevent galling of threads.
Screw bowl lock ring (left-hand thread) onto bowl bottom, by hand. Then tighten it lightly with annular wrench 428.



- 11) To facilitate final tightening of the bowl lock ring, compress disc stack with special device 424 in the following manner (see fig. 4/2):

Screw bolt A of compressing device into distributor as far as it will go. Place pressure piece C onto bowl top. Grease thread of bolt A. Then screw hexagon nut B onto bolt and tighten it with wrench 421. While tightening, block bowl with annular wrench 428.

Fig. 4/2.

- 12) Now tighten the lock ring with annular wrench 428 until "0" marks on bowl top and lock ring are close to each other. Final tightening for "0" mark alignment will have to be done by hitting the wrench handle with mallet 420. Only a few blows with the mallet on the wrench handle will be sufficient to align the parts.

If the disc pressure has slackened so that tightening of the lock ring with the annular wrench can be done by hand without using the mallet, then a spare disc or the compensating disc (with 2 mm spacers) has to be added.

- 13) Loosen hexagon nut B with wrench 421. Unscrew bolt A and remove it together with nut and pressure piece.
- 14) Place centripetal pump assembly 105a-b onto bowl top.
- 15) Insert gasket 260 in groove of centripetal pump chamber cover 262.
- 16) Place centripetal pump chamber cover onto bowl top. The "0" marks of both parts must be aligned.
- 17) Clean, wipe dry and grease (see sect. 2.2) threads of bowl top and lock ring 261. Tighten lock ring (left-hand thread) by lightly hitting handle of wrench 429 with mallet.
- 18) Check if bowl can be turned by hand.

4.2. Installation of nozzles 252

- 1) Before installing the nozzles, make sure that the bowl is perfectly clean. For this purpose let the separator run for 1 minute and feed clean water to bowl. Then brake bowl by turning handles 9g counter-clockwise. For flushing, the hood must be installed.
- 2) Check to see if nozzle bores are open and if nozzle gaskets are in good condition.
- 3) With the aid of wrench 402 screw nozzles into bowl bottom until front surface of nozzles is flush with outer wall of bowl bottom. The nozzles are installed correctly when the slots are in vertical position and the discharge openings directed backwards (related to the direction of rotation).

NOTE: The nozzles must never be screwed in any further than described above or even as far as they will go, since that would cause damage to the nozzle seating in the bowl bottom. In addition, the misled stream would cause atomisation of the quark.

Before starting the separator, the bowl should be filled with water in order to check if all nozzles discharge solid jets. Uneven jets prove that nozzles are clogged or damaged and must, therefore, be cleaned or replaced.

4.3. Assembling the feed and discharge connections

- 1) Install hood and tighten fastening screws securely. Connect ice-water line.
- 2) Place on discharge 102d and fasten with clamp ring 95.
- 3) Grease threaded area on centripetal pump. Screw handle connection piece 101m onto centripetal pump and tighten securely. While doing so, block feed tube of centripetal pump with wrench 427.
- 4) Connect feed and discharge lines.

4.4. Removing the feed and discharge connections, - Dismantling the bowl

CAUTION! To avoid accidents, do NOT loosen any part of the separator or of the feed and discharge connections before the bowl has stopped completely.

Place the bowl parts on a rubber mat or wooden grating.

For dismantling the bowl, proceed in reverse order of assembly (see sect. 4.1) and according to the following instructions:

Before opening the bowl, release brakes by turning the two handles 9g (fig. 13) clockwise and remove nozzles from bowl bottom.

After removing the centripetal pump, compress disc stack with special device 424 as described in sect. 4.1, No. 11, in order to facilitate loosening of the lock ring. Only a few blows with the mallet against handle of wrench 428 will then be sufficient to loosen the lock ring (left-hand thread). Then remove disc stack compressing device.

To remove bowl top from bowl bottom, use jack 423.

After unscrewing the spindle nut, use jack 422 to remove bowl bottom from spindle cone.

4.5. Exchanging the nozzles while hood is closed

- 1) Loosen hex head screws 99 and take plugs 98 out of hood.
- 2) Unscrew nozzles 252 with the aid of wrench 402. By turning the wrench, the nozzle threads into the sleeve of the wrench and can thus be safely removed.

5. Technical Information

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5.1. Set-up of a Quark Line

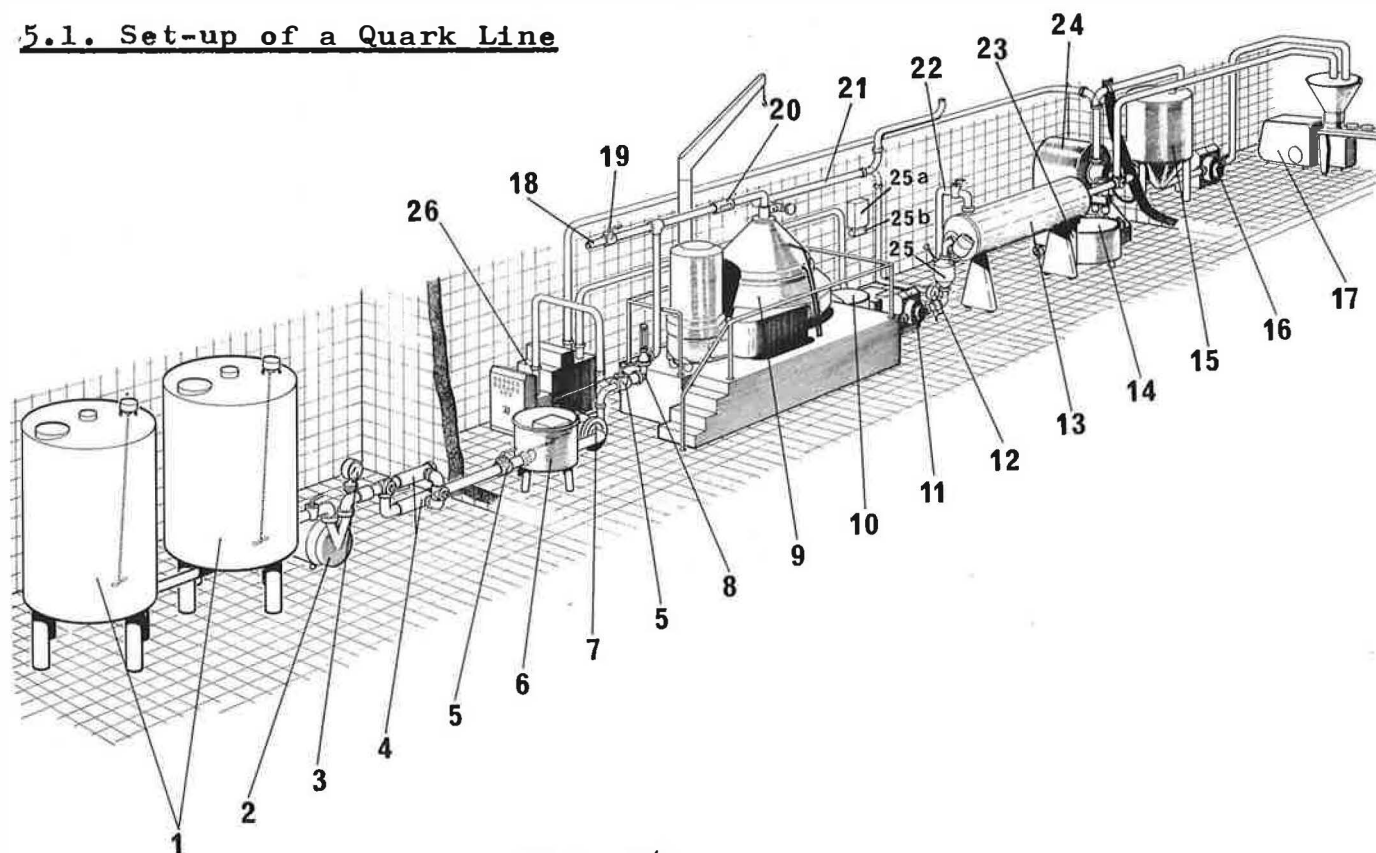


Fig. 5/1

Continuous production of normal quark and of cream-containing quark with WESTFALIA Quark Separator and WESTFALIA Quark Mixer

- | | |
|--|---|
| 1 Renneting tank with low-speed agitator, contents 10,000 litres | 15 Quark Silo, contents 2,500 kg |
| 2 *Centrifugal pump, self-priming 3 kW, 1400 rpm | 16 Positive displacement pump |
| 3 Pressure gauge | 17 Packing machine |
| 4 WESTFALIA tubular strainer | 18 Water supply |
| 5 Micrometer adjustment valve | 19 Shut-off valve |
| 6 Float-controlled balance tank | 20 Sight glass |
| 7 *Centrifugal pump, 1.5 kW, 2900 rpm | 21 Whey discharge with sight glass, micrometer adjustment valve, pressure gauge and sampling cock |
| 8 WESTFALIA Flowmeter | 22 Ice-water supply |
| 9 WESTFALIA Quark separator | 23 Ice-water discharge |
| 10 WESTFALIA Quark funnel | 24 WESTFALIA Quark mixer |
| 11 Positive displacement pump | 25 Moisture meter |
| 12 Pressure gauge with vent cock | 25a Recorder |
| 13 WESTFALIA Quark cooler | 25b Signalling box |
| 14 Cream vat | 26 CIP control unit |

*When the pipe lines between renneting tanks and separator are short, a positive displacement pump can be installed instead of the centrifugal pumps 2 and 7. In this case, the balance tank 6 need not be installed and the micrometer adjustment valve is to be installed in the suction line of the positive displacement pump.

5.2. Preparing the skim milk

The renneting tanks are to be filled with pasteurized milk. Make sure that during a short-time pasteurization (40 sec.) the temperature does not exceed 74°C since otherwise the whey discharging from the separator will contain albumin.

A good quality quark can only be obtained from a properly treated skim milk. For renneting, the skim milk should have a temperature of at least 30°C.

Normally 0.5 - 1% starter and 1 cm³ of liquid rennet (concentration 1 : 10,000) are added per 100 litres of skim milk

or

0.5 - 1% starter and 1 gramme of dry rennet dissolved in 0.25 litre of water (concentration 1 : 100,000) per 1,000 litres of skim milk.

After 16 to 18 hours, when the desired coagulation has taken place, the acidity of the whey will be 25-28° SH which corresponds to a pH-value of 4.5 - 4.4. As soon as this acidity is attained, the coagulated skim milk is efficiently stirred by means of an agitator and then fed to the separator by means of a pump. During separation, the agitators in the tanks must be kept working to ensure that the content of dry matter in the quark remains constant.

The separating temperature should be at least 28 - 30°C.

5.3. Production of cream-enriched or normal quark (fig. 5/1)

The coagulated skim milk, efficiently stirred by means of an agitator in renneting tanks 1, is pumped to quark separator 9. Tubular strainer 4 incorporated in the feed line, retains the coarse solids liable to clog the nozzles. If great amounts of skim milk are to be processed, it would be useful to install a double tubular strainer. The throughput capacity is indicated by flowmeter 8. Sight glass 20 allows inspection of the incoming liquid.

In the bowl of the separator the coagulated skim milk is separated into quark and whey.

The whey is discharged from the bowl foamless and under pressure by means of a built-in centripetal pump which is capable of overcoming a counter-pressure of 4 bar.

The specifically heavy quark flows towards the bowl periphery, from where it is discharged through the nozzles. The nozzles are interchangeable and are to be selected in accordance with the desired throughput capacity.

The horizontally ejected quark strikes the cooled hood wall and drops into a catch chamber which rings the separator frame. Scraper blades, fastened to a drive ring which is arranged around the catch chamber, push the quark into the discharge chute leading into funnel 10.

Positive displacement pump 11 sucks the quark from the funnel and conveys it via cooler 13 to quark mixer 24. Depending on the requirements, the quark can either be pumped directly to packing machine 17 or, for storage, to silo tanks 15.

It is recommended to install a moisture meter (see item 25 in fig. 5/1) in feed line to cooler.

5.4. Calculation of the quark yield

According to the well known formula which is used to determine the cream volume when separating milk, the percentage of quark with reference to the coagulated skim milk can be found out as follows:

$$Q = \frac{100 (T_{MM} - T_{MO})}{T_{MQ} - T_{MO}}$$

T_{MM} = dry matter of coagulated skim milk (%)

T_{MO} = dry matter in discharging whey (%)

T_{MQ} = dry matter in normal quark (%)

Example:

When $T_{MM} = 8.6\%$, $T_{MO} = 6.1\%$, $T_{MQ} = 18\%$, 100 litres of skim milk will yield the following amount of quark:

$$Q = 100 \frac{8.6 - 6.1}{18 - 6.1} = 20.95\%$$

If 100 litres of skim milk are required to obtain 20.95 kg of quark with 18% of dry matter, then $\frac{100}{20.95} = 4.77$ kg of skim milk are necessary to produce 1 kg of quark with 18% of dry matter.

The actual percentage of dry matter in the skim milk depends on the conditions prevailing in each dairy. Therefore, the above example cannot be set as a rule.

Amount of skim milk required to produce 1 kg of quark
based on the percentage of dry matter in the quark

=====

Percentage of dry substance in the quark	Amount of skim milk (kg) neces- sary to produce 1 kg of quark
18.0	4.77
18.5	4.85
19.0	5.05
19.5	5.23
20.0	5.43
20.5	5.62
21.0	5.80
21.5	6.02
22.0	6.20
22.5	6.38
23.0	6.57
23.5	6.76
24.0	6.98

The values in the above table show that the skim milk consumption per 1 kg of quark depends on the content of dry matter in the quark.

In addition to determining the yield theoretically, the actual amount of coagulated skim milk and the actual amount of the quark produced should be measured precisely. Approximation of theoretically and practically obtained values will only be achieved by high accuracy of measurement.

5.5. Determining the size and number of nozzles

The quark, having been concentrated in the bowl, is continuously discharged through 6 nozzles with a diameter of 0.6 - 0.7 mm. Make sure that the nozzles are screwed in equally distributed.

The diameter and number of nozzles to be fitted depend on the feed rate, on the percentage of dry matter in the coagulated skim milk and on the desired percentage of dry matter in the discharging quark. A homogeneous quark can only be obtained when the feed rate and the solids content in the feed liquid are kept constant.

If the concentrate is too thin, the feed rate must be increased. If necessary, screw in nozzles with a smaller diameter.

If the concentrate is too thick and the discharging whey looks turbid, the feed rate will have to be reduced. If the whey then still contains albumin, nozzles with a larger diameter will have to be installed.

The following table is based on quark with a solids content of 18% (dry substance).

Determination of Nozzles
based on feed rate and nozzle output
=====

Feed rate l/h	Nozzle output kg/h	Nozzle bore mm
4300	900	6 x 0.6 dia.
4770	1000	4 x 0.6 dia. 2 x 0.7 dia.
5250	1100	4 x 0.7 dia. 2 x 0.6 dia.
5700	1200	6 x 0.7 dia.

Depending on local conditions, slight deviations from the above mentioned values may occur, since the feed rate - quark output ratio depends on the solids content of the coagulated skim milk and on the desired solids content in the quark.

6. Operation

=====

6.1. General

To avoid nozzle clogging and uneven run of the bowl, make sure to feed water to bowl during starting and braking period and in case of interrupted milk supply.

When clogged nozzles have caused uneven accumulation of solids in the bowl, strong vibrations are likely to occur if the bowl is not completely filled with liquid. The vibrations will be attenuated by keeping the bowl filled with liquid during the braking period.

6.2. Starting the separator

- 1) Before starting the separator, make sure that
 - a) all nozzles are open (see sect. 4.2, No. 2),
 - b) oil level is slightly below middle of sight glass,
 - c) hex head screws (for fastening the scraper blades) are tightened securely,
 - d) hex head screws for fastening the upper and lower hood and clamp ring for fastening the discharge are tightened securely,
 - e) centripetal pump is tightened firmly by means of handle connection piece,
 - f) V-belts are in good condition and have the proper initial tension.
- 2) Place cover plate on quark funnel.
- 3) Open water valve.
- 4) Switch on the motor as soon as water discharges from the concentrate outlet.
- 5) Let more water come into the bowl so that water discharges also from the whey outlet.
- 6) Wait until bowl has reached its rated speed which is after 9 minutes.
- 7) Before feeding the coagulated skim milk, disinfect pipe lines between tank and separator and flush with water.
- 8) Feed approx. 500 l/h of ice-water to cooling jacket of hood and to brake ring. The feed pressure ahead of connection piece 53 must not exceed 2 bar. If necessary, install pressure reducing valve.
- 9) Switch on the motor for drive ring.
- 10) Switch on feed pump and close water valve simultaneously. As soon as quark discharges from the separator, remove cover plate from quark funnel.
- 11) Throttle valve in whey discharge line until slight overflow occurs at overflow pipe of hood. The pressure indicated by the pressure gauge in the moment when overflow occurs, is considered as maximum pressure. Then re-open whey valve to obtain a pressure which is 0.3 - 0.5 bar lower than the maximum pressure. This discharge pressure must be maintained during separation.

The discharging whey must be clear and rid of undissolved albumin. If it contains undissolved albumin, reduce the hourly capacity.

- 12) Check oil circulation through sight glass 38c. If 5 minutes after starting of the motor oil has not yet emerged from the return pipe, the lubricating system must be cleaned (see 7.4).
- 13) During operation, the discharging quark should be checked at intervals. If the concentrate is too thin, increase feed rate or install nozzles with a smaller diameter. If the concentrate is too thick and the discharging whey is turbid, reduce feed rate or install nozzles with a larger diameter.

Sudden increase in concentration indicates that one or several nozzles are clogged. In such a case, the separator must not be cleaned in place upon termination of separation. It must be stopped (see 6.4) and cleaned by hand (see 7.1).

6.3. CIP cleaning

- 1) After separation, open water supply line. (To avoid nozzle clogging, the bowl must be continuously fed with liquid).
- 2) Place cover plate on quark funnel.
- 3) When the quark has been evacuated from the funnel, change the separator over to CIP cleaning and start the CIP cycle (see Instruction Manual 8290-9000-000 for CIP control unit, type 150).

NOTE: Use only the detergents specified in the Instruction Manual. Never use agents containing chlorine since they will attack the stainless steel bowl parts, resulting in impaired operating safety.

6.4. Stopping the separator

IMPORTANT! Do NOT loosen any part of the separator or of the feed and discharge connections before the bowl has stopped completely.

- 1) Open water valve and stop feed pump simultaneously.
Place cover plate on quark funnel.
- 2) Switch off the motor of the separator. Adjust water supply so that water discharges from concentrate and whey outlets during slowing-down of the machine.
- 3) Apply brakes by turning handles 9g in counter-clockwise direction.
The brakes should always be applied. By braking, the slowing-down time of the bowl and, hence, the water consumption is reduced. Braking also reduces the period of time during which unbalance will occur while the bowl rotates at its critical speed.
- 4) To prevent clogging of nozzles and uneven run of the bowl, do NOT close water valve before the bowl has stopped completely.
- 5) Switch off motor of drive ring.

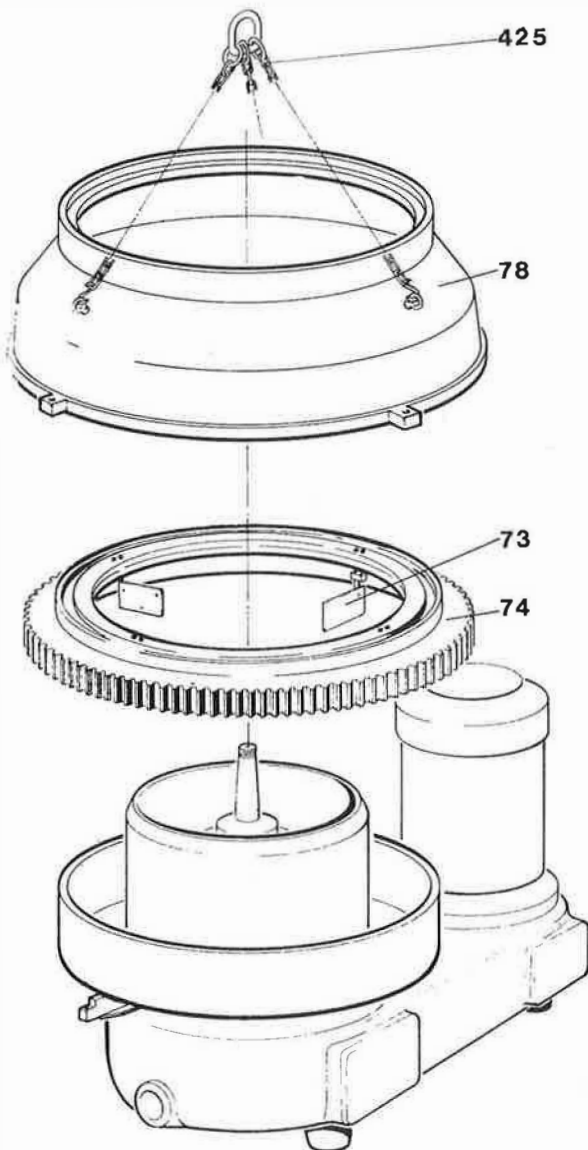
7. Cleaning

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7.1 Cleaning the bowl, the concentrate collector, and the drive ring

The bowl has to be dismantled for manual cleaning when nozzles have become clogged during separation, for instance as a result of insufficient pre-straining of the feed material.

For reasons of safety, the bowl should also be dismantled at least every four weeks for routine inspection of bowl threads and gaskets.



Before cleaning, remove all gaskets from the bowl parts and clean grooves and gaskets. Renew damaged or very swollen gaskets.

Keep swollen gaskets at a warm place where they can regain their original dimensions so that they can be used again.

Thoroughly clean the individual discs and bowl parts, using the scrapers and brushes furnished with the separator. Do NOT use metal scrapers or metal brushes.

Thoroughly clean and wipe dry threads on bowl bottom and bowl lock ring as well as the contact surfaces, and apply some grease (see 2.2).

To prevent clogging of nozzles when re-starting the separator, check to be sure that all nozzles are open and no solid particles are left in the bowl.

After having cleaned the bowl, clean concentrate collector and scraper blades 73. To do this, loosen fastening screws and remove lower hood 78 with the aid of lifting device 425, then remove drive ring 74 with the aid of device 425.

Fig. 7/1

7.2. Cleaning the motor cooling ribs

To assure good cooling of the motor, the cooling ribs have to be cleaned every six months. For this purpose remove motor cowling.

7.3. Cleaning the upper section of the frame

From time to time, the upper section of the frame should be cleaned in the area below the bowl. After removing the bowl, place splash cover 413 over spindle to prevent wash liquid from getting into the drive and rendering the lubricating oil unserviceable.

7.4. Cleaning the oil pan, the spindle, and the suction pipe

The oil pan must be cleaned after several oil changes, - in any case after 5000 working hours when changing the ball bearings. Besides that, cleaning of the oil pan becomes necessary when the oil has to be changed because water and dirt have seeped into the drive, or when there is a decrease in the oil circulation (to be seen through sight glass 38c). In the latter case, the drive has to be cleaned as well.

After removal of the bowl (see 4.4) and of the drive (see 8.2) undo screw 26 and let the oil drain.

Remove sight glass 38a-d and clean oil return housing 34.

Remove cover 5. Use wrench 408 to remove cover 19 from oil pan. Clean oil pan with kerosene or trichlorethylene. Do NOT use fluffy cloths or cotton waste! After cleaning, flush oil pan with thin oil.

Replace screw 26 with gasket and cover 19 with gasket, and tighten. Install sight glass 38a-d. Before re-installing the drive, check the holes in suction pipe 151a-b and spindle 151q for cleanness. If the holes need to be cleaned, use the brushes furnished with the separator.

Assemble the drive as per instructions given in sect. 8.3. and install it in the separator frame. Then fill in new lubricating oil (see sect. 2).

7.5. Cleaning before a long-term shut-down

Clean the separator thoroughly (see sect. 7.1). The clean bowl parts and all unvarnished machine parts should be wiped dry and greased to avoid corrosion. The clean bowl should be kept at a dry place.

The gaskets should be kept in a cool, dark and dry room to prevent them from getting brittle.

Slacken V-belts (see 8.1.2., no. 2-3).

Check water shut-off devices for leakage. If necessary, remove connecting piping between faulty shut-off device and separator to avoid damage which may be caused by drip water.

8. The Drive

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8.1. The V-belts

8.1.1. General

The V-belts are supplied as a bundled set. The V-belts of a set have exactly the same length. Therefore, when one of the V-belts needs replacement, be sure to replace always the whole set.

8.1.2. Removing the V-belts

- 1) Undo screws 7 and remove cover 5.
- 2) Slacken back screw 15 (fig. 8/1) until it is possible to push the motor towards separator frame.
- 3) Push back motor until it hits stop.
- 4) Remove V-belts from V-belt pulleys.
- 5) Remove spindle (see 8.2.1) and take the V-belts out of the frame. It is also possible to take out the V-belts without having to remove the spindle. However, in that case the oil pan has to be removed.

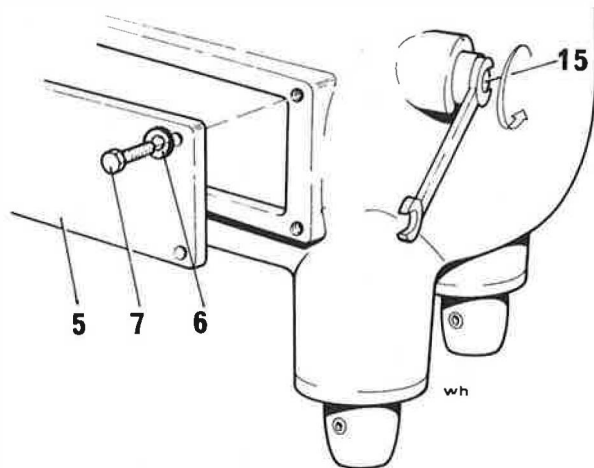


Fig. 8/1

To do this proceed as follows:

- a) Undo screw 26 and let oil drain.
- b) Undo screws 36 and remove sight glass assembly 38a-d.
- c) Undo countersunk screws 35.
- d) Use wrench 407 to loosen threaded ring 29. Then pull out oil return housing 34.
- e) Undo screws 23 and remove oil pan 24.

8.1.3. Re-fitting the V-belts

To re-fit the V-belts, proceed in reverse order of removal.

To prevent the V-belts from slipping, tighten them by turning screw 15 in clockwise direction until you can push the belts inwards with your thumb by approx. 25 mm. Slight expansion of the belts is compensated by a spring. Nevertheless, new belts have to be re-tightened on the first day of operation.

8.2. Dismantling the drive parts

8.2.1. Removing the drive spindle

- 1) Remove the bowl (see sect. 4.4).
- 2) Remove V-belts from V-belt pulleys (see 8.1.2).
- 3) Remove spindle cap 151y from the spindle.
- 4) Unscrew hex head screws 171 and 169 on neck bearing. Remove casing 175 and neck bearing protection cap 166.

- 5) Screw lifter 406 onto the spindle. Check to see if all V-belts are removed from the V-belt pulley of the spindle. Then hoist the complete drive together with neck bearing assembly carefully out of the frame.

Should the neck bearing bridge be stuck in the upper section of the frame, press it out of the frame by alternately threading screws 169 into the neck bearing bridge. When doing this, be sure not to fit washers 167.

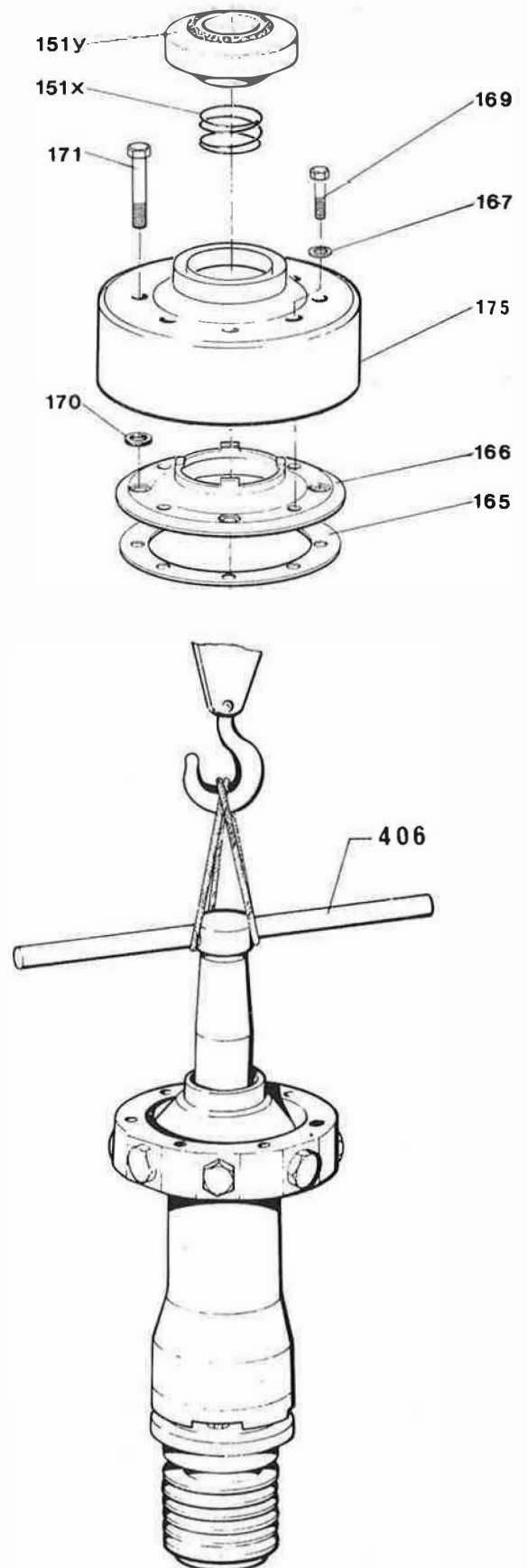


Fig. 8/2

8.2.2. Removing the V-belt pulley from the spindle.

- 1) Remove the spindle (8.2.1).
- 2) Use Allen wrench to loosen Allen screws 152. Then slacken clamp disc 154.
- 3) Rap with a rubber hammer against V-belt pulley until conical clamp rings 156 come loose from the spindle.

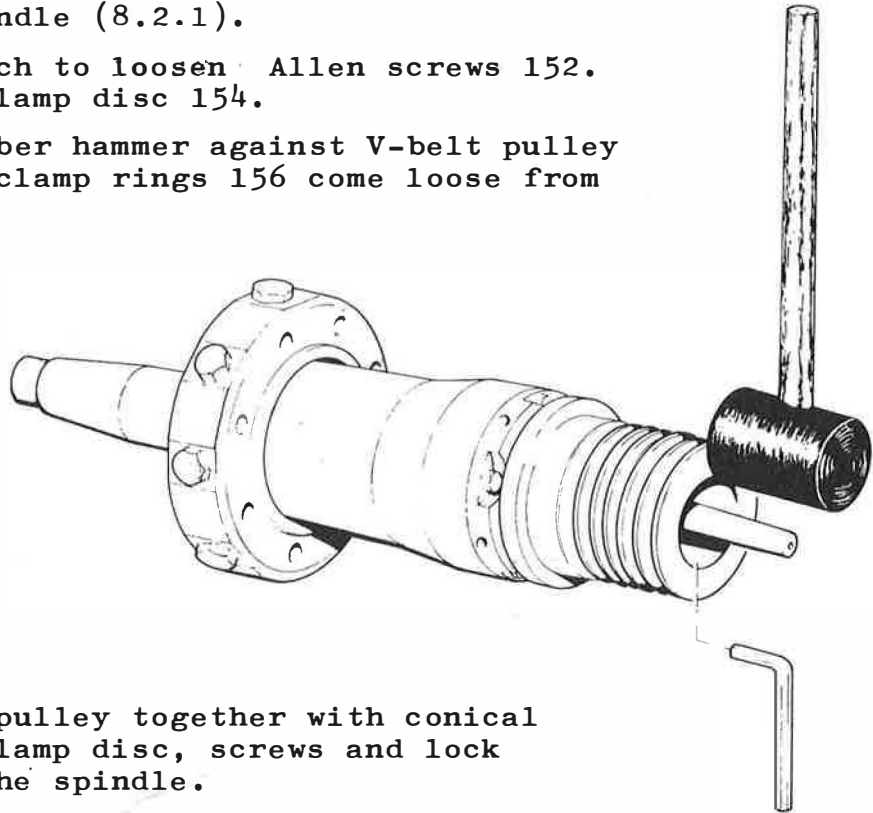


Fig. 8/3

- 4) Remove V-belt pulley together with conical clamp rings, clamp disc, screws and lock washers from the spindle.

IMPORTANT: Do NOT use a pulling device, since it will cause the conical clamp rings to jam, which, in turn can result in damage to the V-belt pulley while it is being removed.

8.2.3. Dismantling the drive spindle

- 1) Remove the spindle and take the V-belt pulley off the spindle (8.2.1. and 8.2.2).
- 2) Screw suction pipe 151a out of the spindle and remove gasket 151b.
- 3) Use screwdrivers to press off pressure ring 160. Then remove pressure ring and rubber cushion 161 from the spindle.

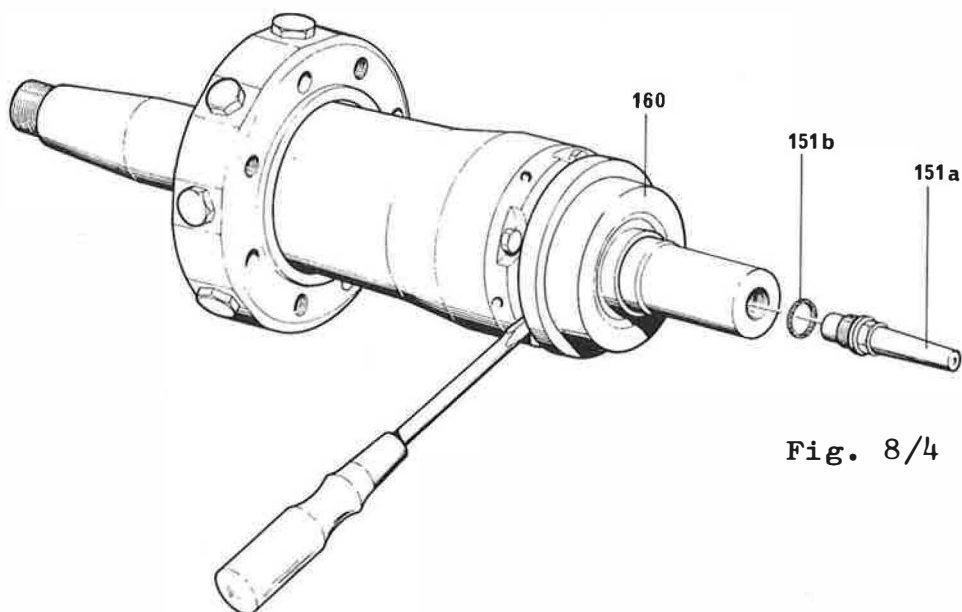


Fig. 8/4

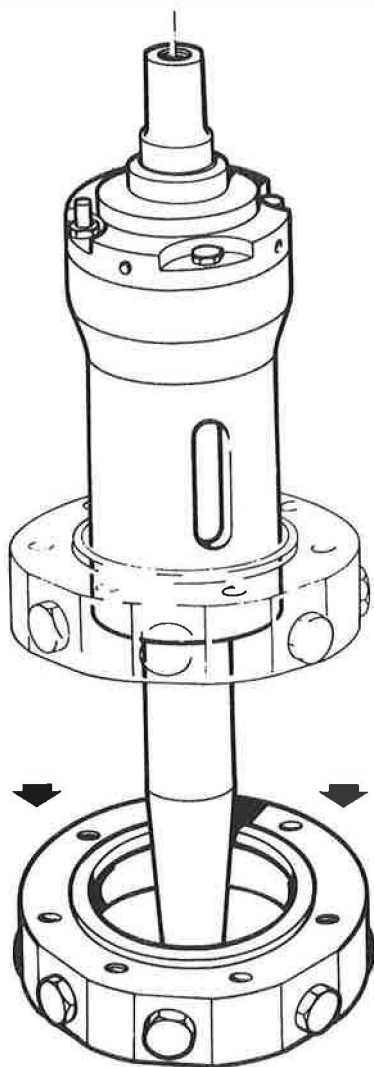


Fig. 8/5

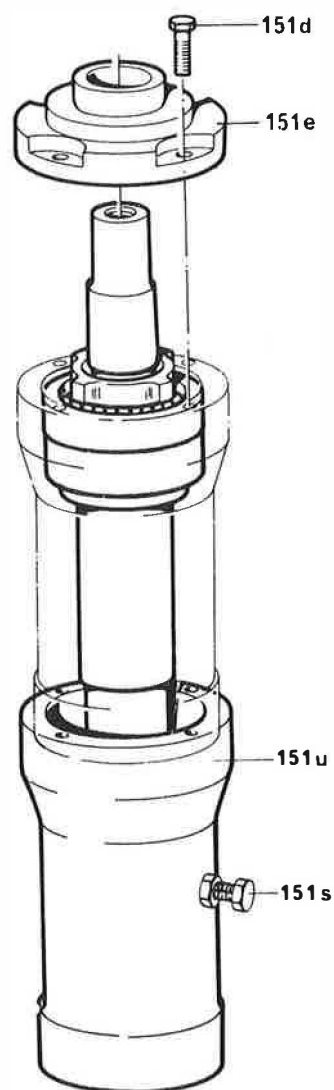


Fig. 8/6

- 4) Fig. 8/5: To remove neck bearing bridge, hold spindle in inverted position, upper end down, and tap spindle lightly against a wooden surface. Removal can be facilitated by alternately rapping with a rubber hammer on two opposite sides of the rim of the neck bearing bridge.
- 5) Fig. 8/6: Undo screws 151d from the bearing housing and remove bearing cover 151e. Unscrew hex head screw 151s. Then hold spindle in inverted position, upper end down, and tap it lightly against a wooden surface. The bearing housing 151u will then come loose. Remove the spindle, with the remaining parts attached to it, from the bearing housing.
- 6) Loosen threaded pin 151g and screw threaded ring 151f (fig. 17) off the spindle. Then remove bearing from the spindle.

8.3. Assembly of the drive parts

8.3.1. General

For assembly of the drive proceed in reverse order of disassembly (see 8.2) and bear in mind the following:

- 1) Make sure holes in spindle 151q and in suction pipe 151a are clean.
- 2) Check condition of bearings before re-installation. If they show the slightest damage, they must be replaced. In any case, they have to be replaced every 5000 working hours.

IMPORTANT: Use only bearings which are precision tested for high speed as those in our List of Parts.

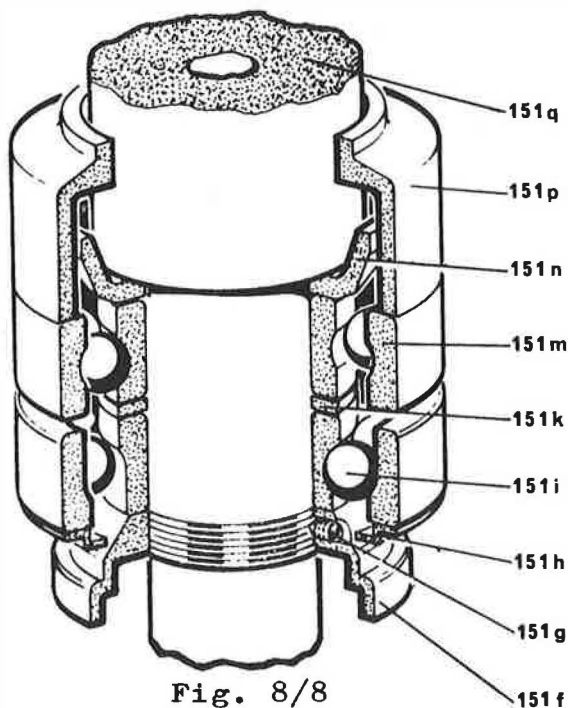


Fig. 8/8
Installation of angular contact ball bearing

- 3) Before mounting, warm up grooved ball bearings 151r and 151m as well as angular contact ball bearing 151i in 80°C oil.
- 4) For installing the lower group of bearings refer to fig. 8/8. Be sure not to interchange the two bearings 151m and 151i. The upper bearing is a grooved ball bearing, whereas the lower bearing is an angular contact ball bearing. The angular contact ball bearing 151i may be loaded axially in one direction only. It must be mounted in such a manner that the large rim of the inner ring faces ring 151k. Faulty mounting will inevitably result in damage to the angular contact ball bearing.
- 5) The conical clamp rings 156 that hold the V-belt pulley 158 on the spindle must be installed in the following order (see fig. 8/9): The inner ring of each set must be fitted in first, then the outer ring. Wrong installation of the inner and outer rings will lead to damage when removing the V-belt pulley.

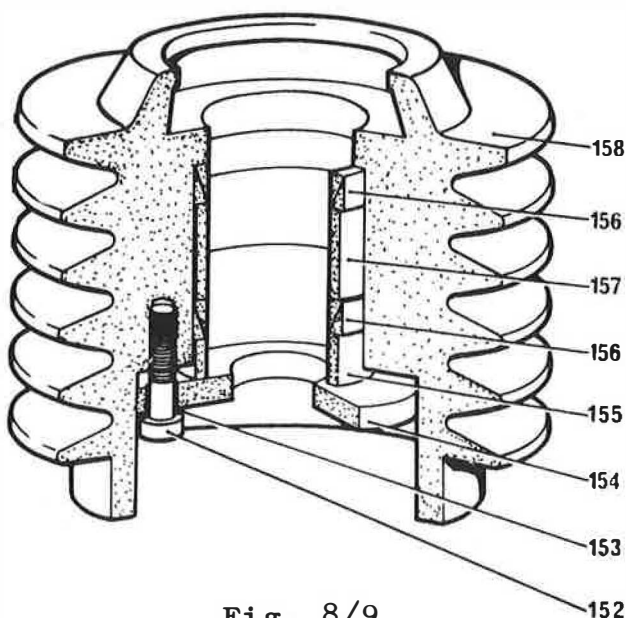


Fig. 8/9
Installation of conical clamp rings

- 6) The V-belt pulley must rest against shoulder of spindle and it must be firmly tightened to the spindle. This is accomplished by tightening screws 152 in clamp disc 154 alternately and evenly.
- 7) Be sure to screw in suction pipe 151a-b with inserted gasket.

- 8) Use a micrometer clock-gauge to check V-belt pulley 158 for centric run (fig. 8/10).

Tolerance of deviation: 3/100 mm.

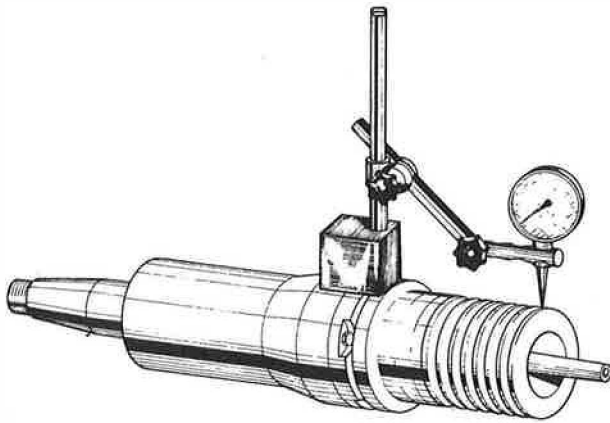


Fig. 8/10

Checking the V-belt pulley with a micrometer clock gauge

- 9) When installing the neck bearing bridge assembly 163a-f, check to be sure that gaskets 162 and 165 are in perfect condition.
- Install neck bearing bridge into upper section of frame by slipping it over the bearing housing. Be sure arresting pin of upper section of frame catches hold of corresponding hole in neck bearing bridge. For assembly of neck bearing bridge refer to sect. 8.3.2.
- 10) Check to be sure that the V-belts are under proper tension (see 8.1.3).
- 11) **IMPORTANT:** After re-installation of the drive parts, the bowl height has to be checked for possible re-adjustment (see 8.4).

8.3.2. Assembly of the neck bearing bridge

The top of the bearing housing is contained in neck bearing pressure ring 163a which is held by eight radially arranged, equally distributed springs 163d.

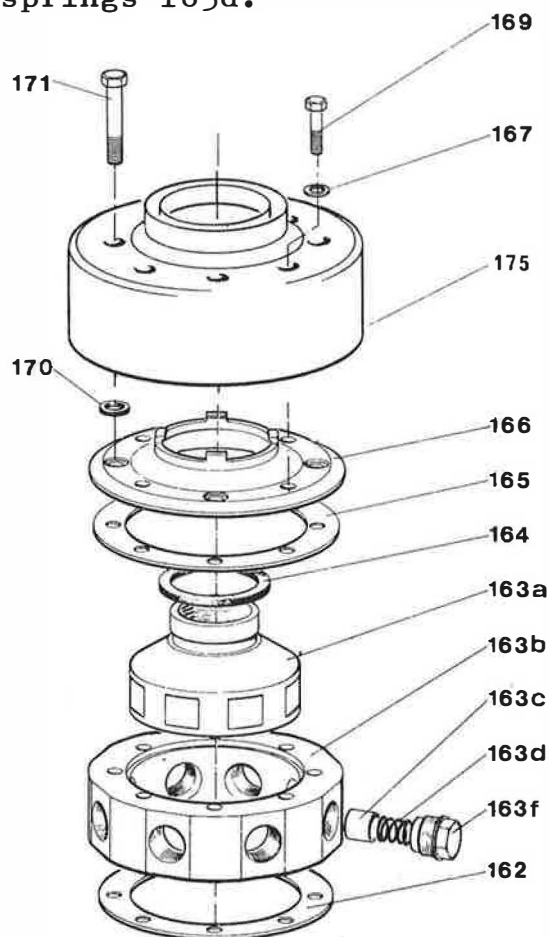


Fig. 8/11

- 1) Insert neck bearing pressure ring 163a in neck bearing bridge 163b in such a manner that the recesses of the pressure ring face the tapholes of the neck bearing bridge.
- 2) Grease spring pistons 163c thoroughly. Insert neck bearing springs 163d in the spring pistons and put spring pistons into threaded plugs 163f.
- 3) Screw threaded plugs with neck bearing springs and spring pistons into the eight tapholes of the neck bearing bridge. Then tighten threaded plugs.
- 4) Slip neck bearing bridge over bearing housing and fit it into upper section of frame. Make sure that gaskets 162 and 165 are in good condition.
- 5) Fit sealing ring 164 on neck bearing pressure ring with sealing lips pointing downwards.
- 6) Place on neck bearing protection cap 166 (with inserted gaskets 170) and casing 175; then screw in screws 171 and 169. Be sure to fit washers 167.

8.4. Re-adjustment of bowl height

The bowl height is adjusted at the factory before the separator is shipped. It must be checked for re-adjustment after re-installing the drive parts and after exchanging the bowl.

After installing the bowl, the distance between lower edge of bowl bottom and upper edge of brake ring 69 must be 1.5 - 2.0 mm at the narrowest point while the V-belts are tight (see fig. 8/12).

Measure the distance with a feeler gauge.

If the distance is less than 1.5 mm, place a shim of the proper size under the surface "a" of pressure ring 160 (see fig. 8/12) in order to adjust bowl to correct height. For this purpose, the following shims can be supplied with the separator:

Shim 157/139 \emptyset x 0.6, Part-Number 0026-0646-000

Shim 157/139 \emptyset x 1.0, Part-Number 0026-0647-000

If the distance is more than 2 mm, the surface "a" of pressure ring 160 has to be machined to proper dimension.

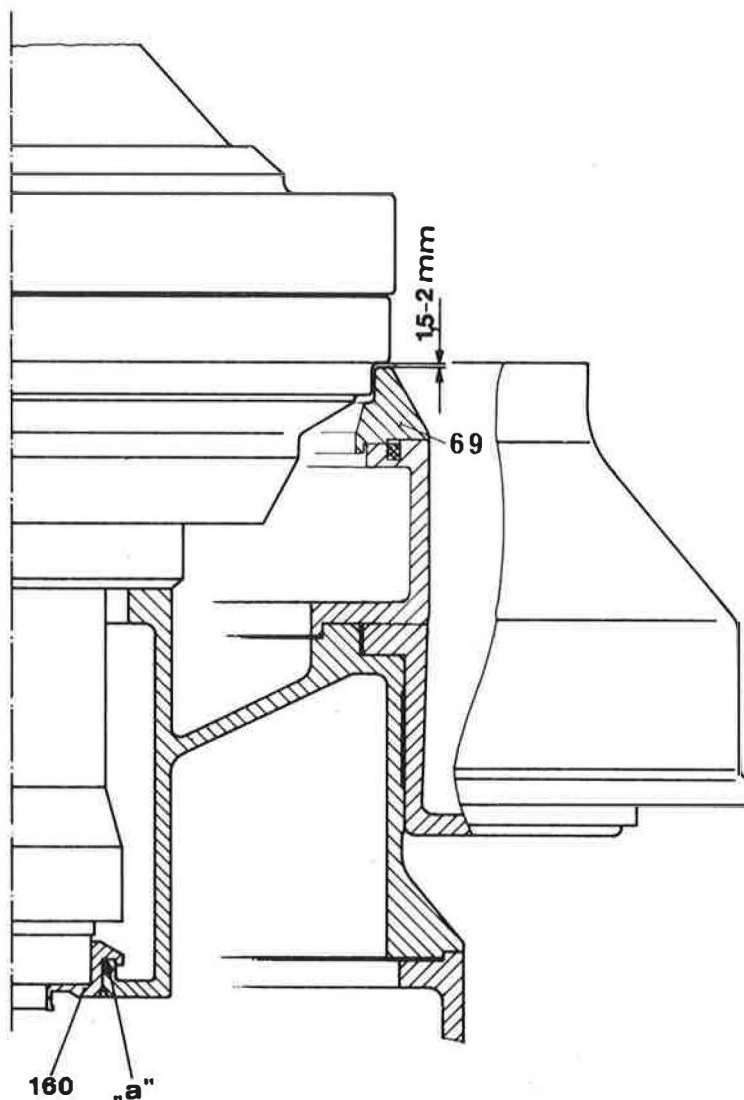


Fig. 8/12

9. Trouble Shooting

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Troubles	Causes	Remedies
9.1. The bowl does not come up to rated speed or takes too long to do so (see sect. 3).	1) Motor is incorrectly connected.	See wiring diagram.
	2) Bowl is placed too low and rubs against brake ring 69.	Adjust bowl to proper height (see 8.4).
	3) Bowl is placed too high. Quark has passed through the large gap between bowl bottom and concentrate collector and has accumulated in the upper section of the frame, resulting in slowing-down of the bowl.	Adjust bowl to proper height. Clean upper section of frame (see 7.3).
	4) Frame drain is clogged. Liquid or quark has collected in the upper section of frame, resulting in slowing-down of the bowl.	Clean frame drain and upper section of frame.
	5) Clamp disc 154 is not tight enough; V-belt pulley slips on spindle.	Remove spindle (see 8.2.1) and tighten screws in clamp disc evenly and <u>firmly</u> (see 8.3.1, no. 6).
	6) V-belts slip because they are oily or have lengthened.	Replace or tighten V-belts (see 8.1).
9.2. The bowl speed drops during operation.	1) Speed of motor drops during operation.	Check line voltage and motor.
	2) Nozzle bores are worn or nozzles are untight because of damaged gaskets.	Insert new nozzles. Replace gaskets.

Troubles	Causes	Remedies
9.3. Uneven run of the separator.	1) One or several nozzles are clogged. Quark has deposited unevenly in the bowl.	Stop feed liquid supply and at the same time open up water feed valve all the way in order to attenuate vibrations which occur during slowing-down of the bowl. Switch off the motor and apply brakes. Then clean bowl thoroughly.
	2) Bowl is not properly assembled or, if plant has several separators, parts of the bowls may have been interchanged.	Assemble bowl properly (see 4.1).
	3) Tension of disc stack has slackened.	Check if bowl lock ring is screwed on tightly (see 4.1., no. 12). Check disc count. If necessary, add spare disc or spare compensating disc.
	4) Bowl is damaged and, therefore, out of balance.	Send bowl to factory or authorized factory repair shop. Do NOT attempt to make your own repairs. Never weld or solder. Bowl is made of heat-treated steels.
	5) Neck bearing springs are weak or broken.	Replace all <u>8</u> neck bearing springs.
	6) V-belt pulley does not run centrally.	Check V-belt pulley with micrometer clock gauge (see 8.3.1., no. 8).
	7) Angular contact ball bearings or grooved ball bearings are worn.	Replace worn bearings. <u>IMPORTANT:</u> When replacing the bearings, be sure to use only high precision ball bearings (see List of Parts).

Troubles	Causes	Remedies
9.3. Uneven run of the separator (cont'd.)	<p>8) Angular contact ball bearings or grooved ball bearings have become damaged due to insufficient lubrication which may be caused by:</p> <p>a) Clogging of the frame drain, which resulted in liquid collecting in upper section of frame and seeping through neck bearing into lubrication system.</p> <p>b) Clogging of suction pipe 151a.</p>	<p>Replace damaged bearings (see 9.3 no. 7).</p> <p>Clean lubricating system.</p> <p>Change the oil.</p> <p>Clean frame, drain.</p>
	<p>9) Guide surface of bearing cover 151e has become rough. Cover jams in pressure ring 160.</p>	<p>Smooth surfaces and apply a thin film of molybdenum disulfide paste.</p> <p>If necessary, replace bearing cover and pressure ring.</p>

9.4. Possible causes for inefficient separation

Troubles	Causes
Insufficient concentration	<ol style="list-style-type: none">1) Temperature of coagulated skim milk is too low.2) Acidity degree is too low.3) Skim milk has not been renneted.4) Feed rate is too low.5) Nozzle diameter is too large.6) Nozzle gaskets are damaged.7) Gaskets 264 in segment-holding insert 263 are damaged.
Whey is not pure.	<ol style="list-style-type: none">1) Feed rate is too high.2) Nozzles are clogged: solids content of quark increases.3) Rising channels in disc stack are clogged.4) Vat milk:<ol style="list-style-type: none">a) separating temperature too low,b) rennet concentration too low,c) acidity degree too low,d) pasteurization temperature too high.

L I S T O F P A R T S
=====

IMPORTANT!

When ordering parts, please state the following:

- | | |
|--------------------|---|
| 1) Model | of the Separator: |
| 2) Serial-No. | Both designations are shown on the name-plate of the separator. The Serial-No. also appears on the rim of the sludge collector. |
| 3) Description | of the part to be replaced: |
| 4) Part-No. | For details, see List of Parts. The Part-No. is also shown on all major parts. |
| 5) Bowl Serial-No. | (only required when ordering bowl parts):
The Bowl Serial-No. appears, in large figures, on bowl lock ring and on bowl bottom. |

Part-Nos. ending with letter "L" (e.g. 3158-1021-L) designate parts which are available in different designs for the separator concerned. To ensure correct delivery of these parts, Model and Serial-No. of the Separator MUST be stated.

Lower Frame Parts

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No. in Fig.	Part - No.	Qty.	Part Description
-	3157-1020-000	1	Foundation frame assembly (1a-c)
1a	3157-1003-000	1	Foundation frame
1b	0026-2034-300	4	Cap
1c	3157-1033-000	4	Bolt
2	0019-6937-400	12	Hex head screw M 10x30 DIN 933
3	0001-0516-300	4	Flange
-	2315-1015-010	4	Foot assembly (4a-c)
4a	0019-6387-400	4	Threaded pin AM 12x28 DIN 915
4b	2315-1011-000	4	Foot, stainless steel coated
4c	0021-3018-750	4	Rubber cushion
5	1079-1004-000	1	Cover
-	1079-1004-010	1	Cover
6	0026-1348-400	8	Washer 10.5 DIN 125
7	0019-6937-400	8	Hex head screw M 10x30 DIN 933
8	0019-1088-300	2	Threaded bush
-	1079-1043-000	2	Brake assembly (9a-h)
-	1079-1031-000	2	Brake bolt assembly (9a-c)
9a	1079-1032-000	2	Brake shoe
9b	0026-5700-090	2	Cylindrical pin
9c	1079-1039-000	2	Brake bolt
-	0021-4110-880	2	Brake lining
-	0026-1262-550	4	Countersunk rivet 4x13 DIN 661
9d	0006-4354-160	2	Cylindrical pressure spring
9f	0021-3538-640	2	Brake housing
9g	0021-3514-690	2	Handle
9h	0019-8974-150	2	Threaded pin AM 8x15 DIN 914
10	1182-1061-000	1	Cover (for lye connection)
-	1079-1004-020	1	Cover
-	0007-2184-750	1	Gasket 15/22x3
-	0013-2818-400	1	Hexagon coupling nut R 3/4"
-	0018-1843-400	1	Hose outlet 10
11	2315-1309-010	1	Guide bolt
12	0006-4363-160	1	Cylindrical pressure spring
13	2315-1355-000	1	Guide bush
14	2315-3466-030	1	Washer
15	0019-1110-400	1	Hex head screw M 16x255
-	1079-1021-000	1	Flange assembly (16a-h)
16a	2315-1209-010	1	Bolt
16b	0026-1105-030	2	Cylindrical pin
16c	2315-1104-010	1	Bolt
16d	1079-1028-000	1	Flange
16f	0019-7725-090	8	Stud M 16x35 DIN 939 - 5.6
16g	0026-1330-190	8	Lock washer
16h	0013-0282-030	8	Hexagon nut M 16 DIN 934 - 4.6
17	0026-1985-030	1	Washer
18	0019-6970-150	1	Hex head screw M 12x30 DIN 933 - 8.8
19	2315-1125-010	1	Cover
20	0004-5074-700	1	Gasket 110.6/124.2x1
21	0019-1442-030	1	Threaded plug
22	0004-5276-710	1	Gasket 22/26x1
23	0019-6937-150	4	Hex head screw M 10x30 DIN 933
24	2315-1041-000	1	Oil pan
25	0004-1872-720	1	Gasket 13/25x2
26	0019-0133-000	1	Hex head screw M 12x15

continued on page 13/3

Lower Frame Parts

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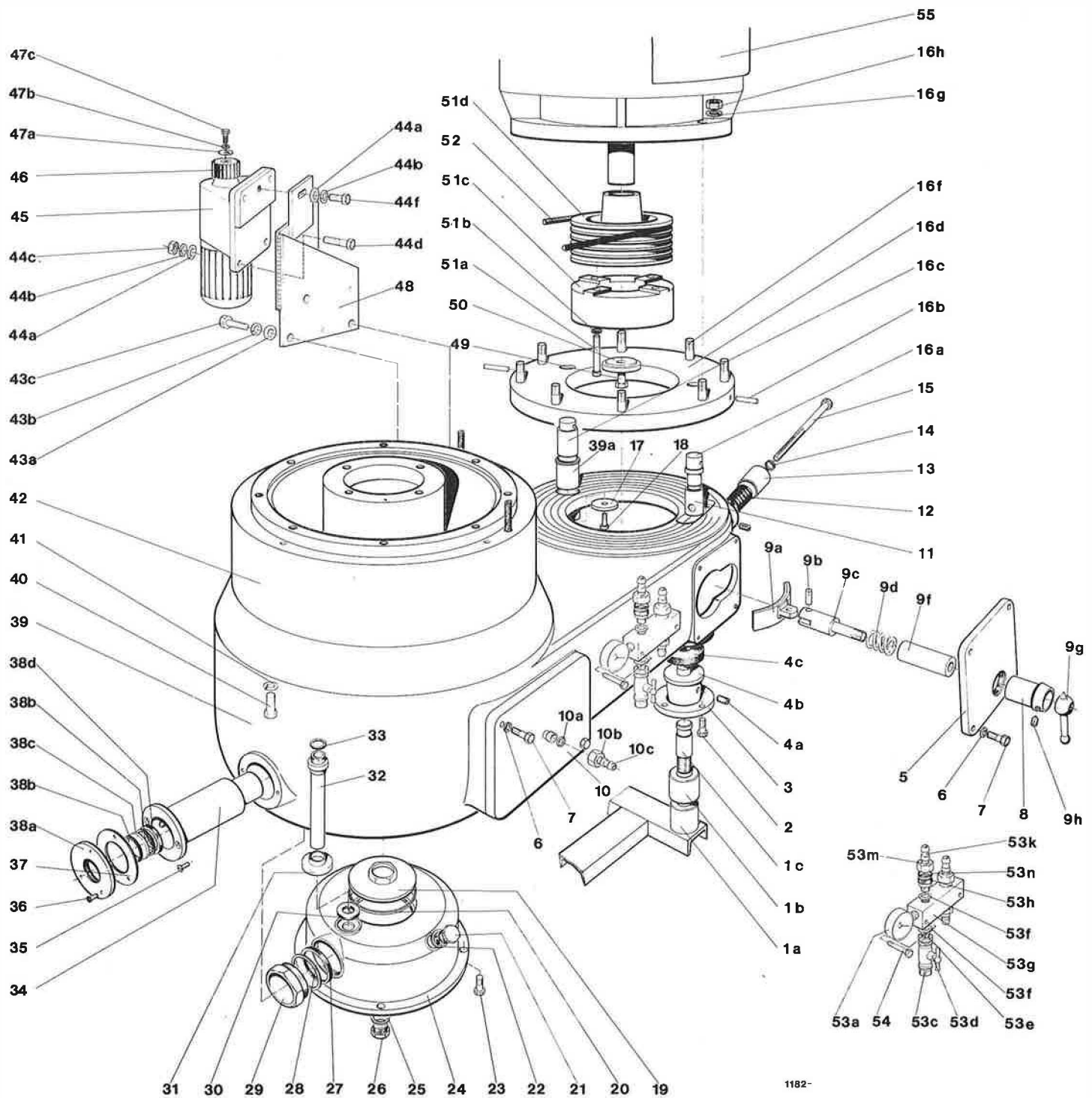


Fig. 13

No. in Fig.	Part - No.	Qty.	Part Description
27	0007-2163-750	1	Gasket 63/75x6
28	0026-5800-500	1	Washer
29	0019-1180-500	1	Threaded bush
30	0004-5716-840	1	Grooved ring 13/24x6
31	2315-3347-000	1	Cap
32	2315-1122-000	1	Return pipe
33	0007-2502-750	1	Gasket 12/3
34	2315-1348-000	1	Oil return housing
35	0019-2112-300	2	Countersunk screw AM 8x15 DIN 631
36	0019-3250-300	3	Lens head screw M 6x15 DIN 88
37	0004-5346-770	1	Gasket 70/110x0.3
-	0001-0007-640	1	Sight glass assembly (38a-d)
38a	0001-0021-690	1	Sight glass frame
38b	0004-5041-740	2	Gasket 48/57x1
38c	0001-0046-820	1	Sight glass
38d	0019-1620-600	1	Threaded ring
39	3190-1006-000	1	Lower section of frame, complete
39a	2315-1377-000	1	* Bearing bush
40	0019-6610-150	8	Hex head screw M 16x70 DIN 931 - 8.8
41	0026-1330-190	8	Lock washer A 16 DIN 127
42	1182-1005-000	1	Upper section of frame
-	1182-1124-000	1	Flange
-	0004-2449-770	1	Gasket 198/246x0.3
-	0019-6970-150	8	Hex head screw M 12x30 DIN 933
-	0019-1329-000	1	Threaded pin M 10x24
43a	0026-1348-400	3	Washer 10.5 DIN 125
43b	0026-1337-300	3	Lock washer A10 DIN 127
43c	0019-6937-400	3	Hex head screw M 10x30 DIN 933
44a	0026-1371-030	5	Washer 13 DIN 125
44b	0026-1328-190	3	Lock washer A 12 DIN 127
44c	0013-0280-150	2	Hexagon nut M12 DIN 934
44d	0019-6536-150	2	Hex head screw M 12x50 DIN 931 - 8.8
44f	0019-6966-150	1	Hex head screw M 12x50 DIN 933 - 8.8
45	5970-4010-000	1	Geared motor
46	1182-3498-000	1	Toothed wheel
47a	0026-1894-300	1	Washer
47b	0026-1325-300	1	Lock washer A 8 DIN 127
47c	0019-6900-150	1	Hex head screw M 8x12 DIN 933 - 8.8
48	1182-1029-010	1	Bracket
49	0019-7102-150	1	Hex head screw M20x30 DIN 933 - 8.8
50	0026-1667-030	1	Centering disc
-	1079-3355-000	1	V-belt pulley assembly (51a-d)
51a	0019-6175-150	4	Allen screw M 12x80 DIN 912 - 8.8
51b	0026-1328-170	4	Lock washer
51c	1079-3371-000	1	Brake pulley
51d	1079-3354-000	1	V-belt pulley
52	0021-4492-800	1	Set of 5 V-belts SPA 2150 DIN 7753
-	1182-1204-000	1	Connection piece, complete (53a-n)
53a	0001-0292-400	1	Pressure gauge
53c	0018-4646-300	1	Threaded connection R 3/4" / R 1/2"
53d	0018-1312-640	1	Straight-way diaphragm valve 1/2" DIN 3512
53e	0018-1783-300	1	Reducing nipple 1/2" / 3/8"
53f	0007-2024-750	4	Gasket 17/24x2
53g	1182-1203-000	1	Connection piece
53h	0018-4645-300	3	Threaded connection R 3/4" / R 3/8"
53k	0018-1843-400	3	Hose connection 10
53m	0013-2818-400	3	Hexagon coupling nut R 3/4"
53n	0007-2184-750	3	Gasket 15/22x3
54	0019-2272-400	2	Fillister head screw AM 8x45 DIN 84
55	1182-1159-000	1	Cowling

* This part is included in the preceding "complete" part, but it is also available as separate item.

Lower Frame Parts

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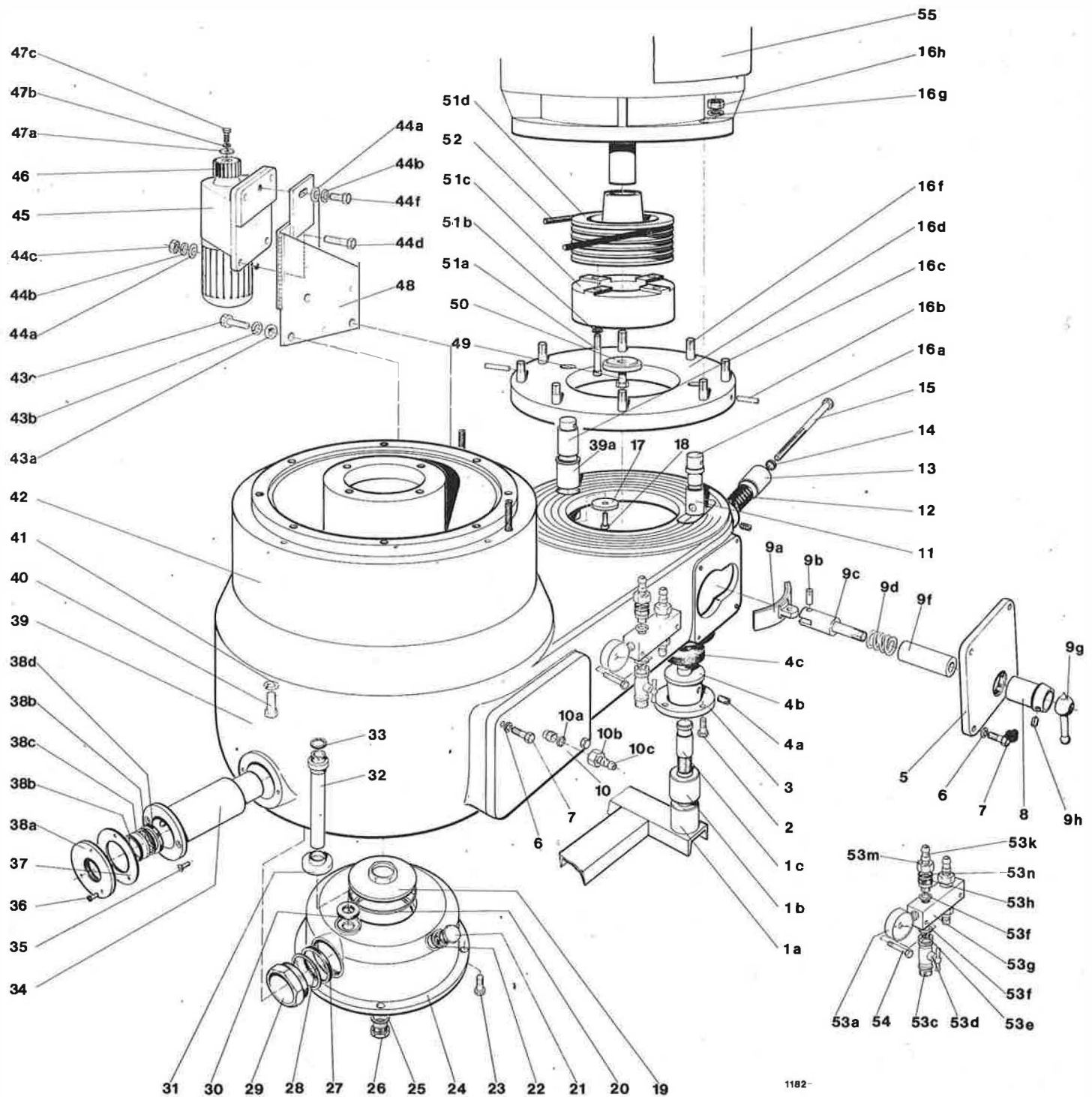


Fig. 13

Upper Frame Parts
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No. in Fig.	Part - No.	Qty.	Part Description
60	1182-1019-010	1	Concentrate collector
61	0018-3726-600	4	Hose coupling R 1/4"
62	0018-0839-300	2	Reducing coupling R 3/8" - R 1/2"
63	0018-1805-400	2	Hose connection R 3/8"
64	0019-6517-400	6	Hex head screw M10x65 DIN 931
65	0026-1337-300	6	Lock washer A 10 DIN 127
66	0018-0380-848	1	Pipe 8x1x0.4 m long
67	0018-0793-300	1	Reducing coupling 1/4" / M 12x1.5
68	0018-1779-300	2	Reducing nipple M12x1.5 /M10x1
69	1182-1068-010	1	Brake ring
70	3118-6710-070	1	Nozzle
-	0004-5262-830	1	Gasket 6/10x2
71a } 71b }	1182-1496-000	1	Casing
72	0019-6837-400	8	Hex head screw M6x8 DIN 933
73	1182-1245-000	4	Scraper blade
74	1182-1237-010	1	Drive ring
75	1182-1157-020	1	Ring
76	0019-6497-400	8	Hex head screw M8x55 DIN 931
77	0019-7039-400	3	Hex head screw M16x50 DIN 933
78	1182-8808-020	1	Lower hood
79	0019-6938-400	8	Hex head screw M10x35 DIN 933
80	0004-2365-758	1	Packing cord 10x10x2620
81	0019-6935-400	12	Hex head screw M10x25 DIN 933
82	1182-1145-000	3	Holder
83	0004-2365-758	1	Packing cord 10x10x1850
84	0026-1330-190	4	Lock washer A16 DIN 127
85	0019-7038-150	4	Hex head screw M16x45 DIN 933
86	0018-0585-848	1	Pipe 6x1x600
87	0018-3724-880	2	Hose coupling R 1/8" / 4x6
88	1182-1191-010	1	Protecting cover
-	0019-6841-400	4	Hex head screw M 6x16 DIN 933 (for item 88)
89	1182-2776-000	1	Siphon
90	1182-1448-010	1	Pipe

Upper Frame Parts =====

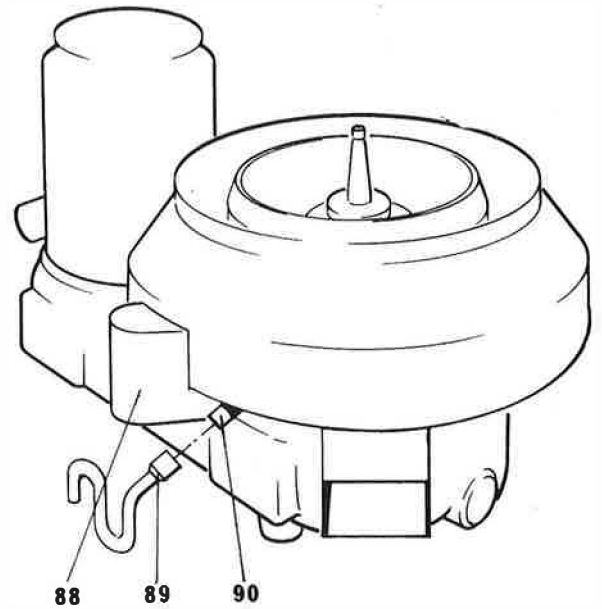
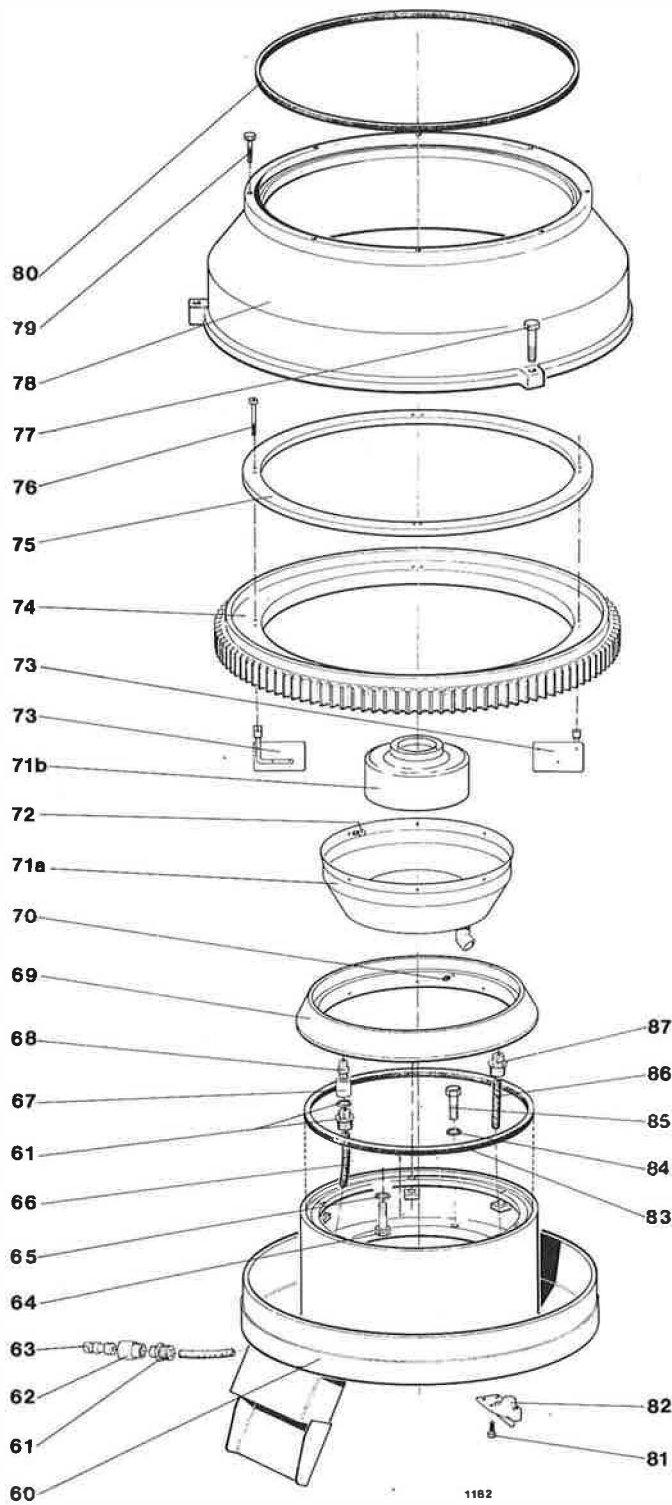


Fig. 14/1

Hood (with clamp ring)

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No. in Fig.	Part - No.	Qty.	Part Description
-	3190-7759-040	1	Hood, complete (91-99)
91	0013-2818-400	2	Hexagon coupling nut R 3/4"
92	0018-1843-400	2	Hose connection
93	0007-2184-750	2	Gasket 15/22x3
94	3190-7765-040	1	Hood
95	1033-7719-020	1	Clamp ring assembly (95a-k)
95a	0026-1075-400	1	Cylindrical pin
95b	0021-3122-300	1	Handle
95c	1033-7717-000	1	Threaded piece
95d	1033-1129-000	1	Threaded bolt
95f	1033-7717-010	1	Threaded piece
95g	1033-7718-010	1	Clamp ring
95h	0026-1343-300	2	Washer
95k	0019-2507-300	2	Cylindrical lens head screw AM 6x10 DIN 85
96	3190-2775-000	1	Siphon, complete
96a	0013-2570-300	1	* Blind nut
96b	0004-5300-740	1	* Gasket 48/67x2
97	0007-2220-750	1	Gasket 50/58x4
98	3190-7213-000	1	Cover
99	0019-6935-400	2	Hex head screw M 10x25 DIN 933

* This part is included in the preceding "complete" part, but it is also available as separate item.

Hood

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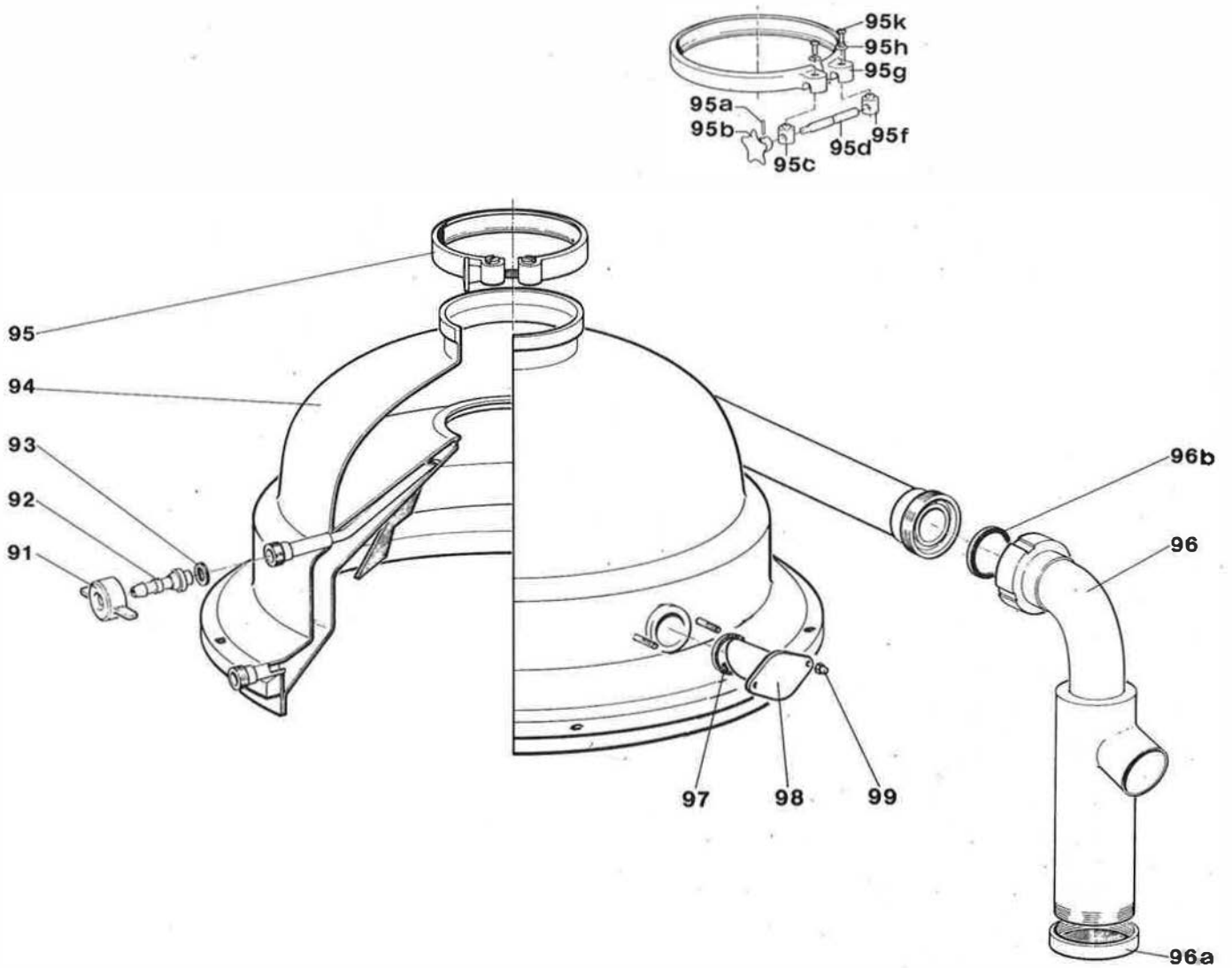


Fig. 14/2

Feed and Discharge Connections and Centripetal Pump

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No. in Fig.	Part - No.	Qty.	Part Description
-	3190-2296-000	1	Feed line assembly (101a-m)
101a	8021-2100-090	1	Flowmeter (for component parts refer to page 15/3)
101b	1033-2166-030	1	Connecting pipe
101c	0007-2210-750	1	Gasket G 40 DIN 11851
101d	1033-2196-000	1	Cylindrical sight glass housing
101f	0007-2245-750	2	Gasket 40/50x5
101g	0001-0097-820	1	Cylindrical sight glass
101h	3190-2197-000	1	Bend
101k	0007-2211-750	1	Gasket G 50 DIN 11851
101m	1328-2190-010	1	Handle connection piece
-	0018-3949-300	1	Cone connection
-	0013-2844-300	1	Grooved coupling nut
-	3190-2299-000	1	Whey discharge line, complete (102a-104)
-	3190-2295-000	1	Discharge line assembly (102a-103f)
102a	0026-5556-300	1	Snap ring
102b	0026-5659-300	1	Washer
102c	0007-2247-750	1	Gasket 50/62x6
102d	3190-2285-000	1	Discharge
102f	0007-2124-750	1	Gasket 53/61x5
102g	0007-2299-750	2	Gasket 25.5/33.5x4
102h	0001-0090-820	1	Cylindrical sight glass
102k	3190-2291-000	1	Valve housing
102m	0018-1526-400	1	Hose cock 1/2"
102n	0004-5277-850	1	Gasket 19/26x1
102p	0007-2211-750	1	Gasket G 50 DIN 11851
102r	0018-3955-300	1	Cone connection
102s	0013-2845-300	1	Grooved coupling nut
102t	0026-5538-300	1	Washer
102u	0007-2210-750	1	Gasket G 40 DIN 11851
-	1073-2272-030	1	Valve cone assembly (103a-f)
103a	0013-2852-640	1	Cap nut
103b	1033-2276-000	1	Adjusting screw
103c	0026-5998-840	1	Distance sleeve
103d	0004-5718-840	1	Grooved ring 18/30 x 6
103f	1073-2278-000	1	Valve cone
104	8918-2000-290	1	Pressure gauge
-	3190-2213-020	1	Centripetal pump assembly (105a-b)
105a	3190-2243-010	1	Lower part of centripetal pump
105b	3190-2253-000	1	Upper part of centripetal pump

Feed and Discharge Connections and Centripetal Pump

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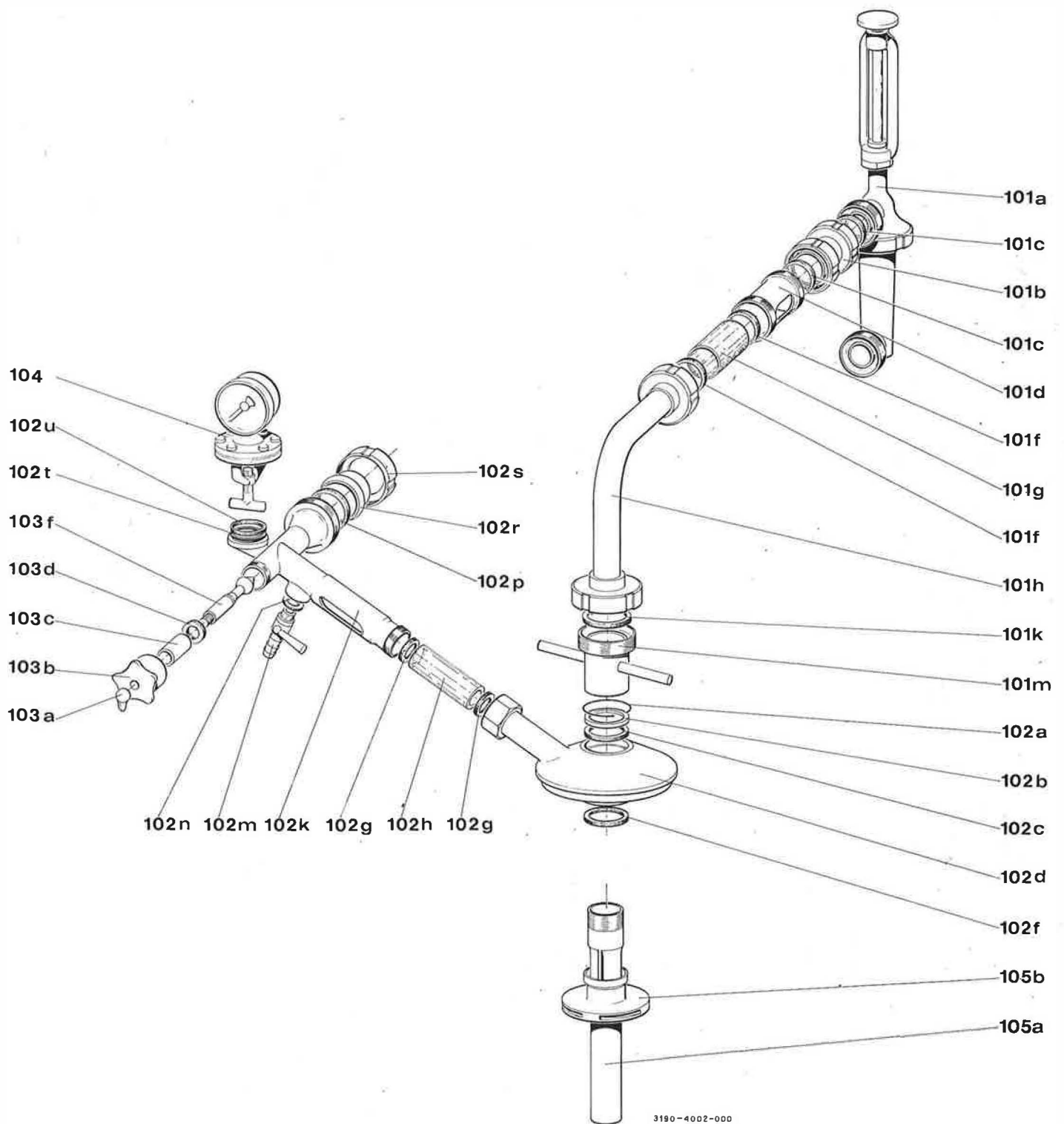


Fig. 15/1

Flowmeter (for discharge line)

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Measuring range: 2000 - 10000 litres/h

No. in Fig.	Part - No.	Qty.	Part Description
-	8021-2100-090	1	Flowmeter, complete (110-126)
110	0007-2210-750	2	Gasket 42/52x5
111	0013-2846-300	1	Grooved coupling nut
112	8021-2001-150	1	Inlet cup
113	8021-2112-010	1	Flow indicating cone
114	0007-2279-750	1	Gasket 56/68x6
115	8021-2003-120	1	Outlet pipe
116			
117	0007-2298-750	2	Gasket 13,5/22x10
118	0026-1375-300	1	Washer
119	0013-3010-300	1	Nut M 35x1,5
120	0019-1380-300	1	Threaded bush
121	8020-2002-000	1	Intermediate piece
122	0001-0083-820	1	Cylindrical sight glass
123	0019-1731-300	1	Handle screw
124	0019-2478-300	2	Lens head screw AM 4x8 DIN 85
125	0004-5261-720	2	Gasket 4,5/8,5x1
126	8021-2117-000	1	Scale 2000 - 10000 l/h

Flowmeter

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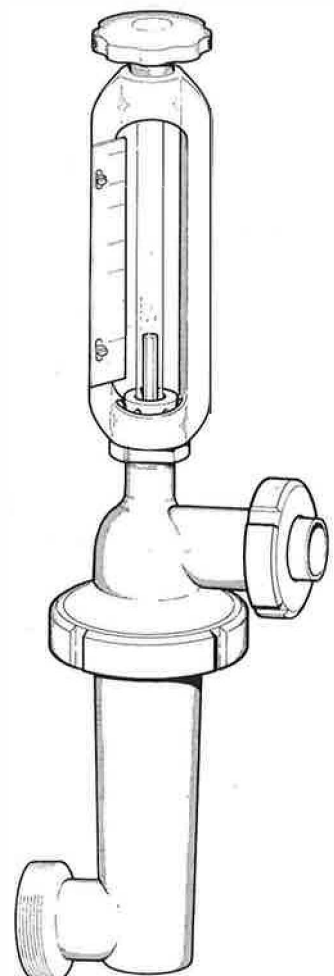
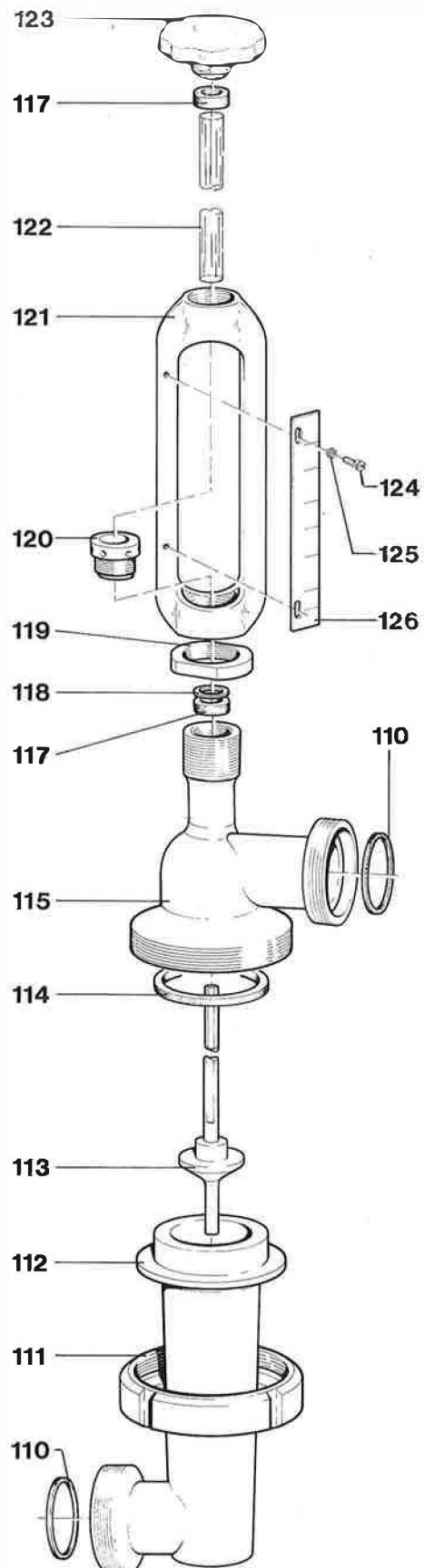


Fig. 15/2

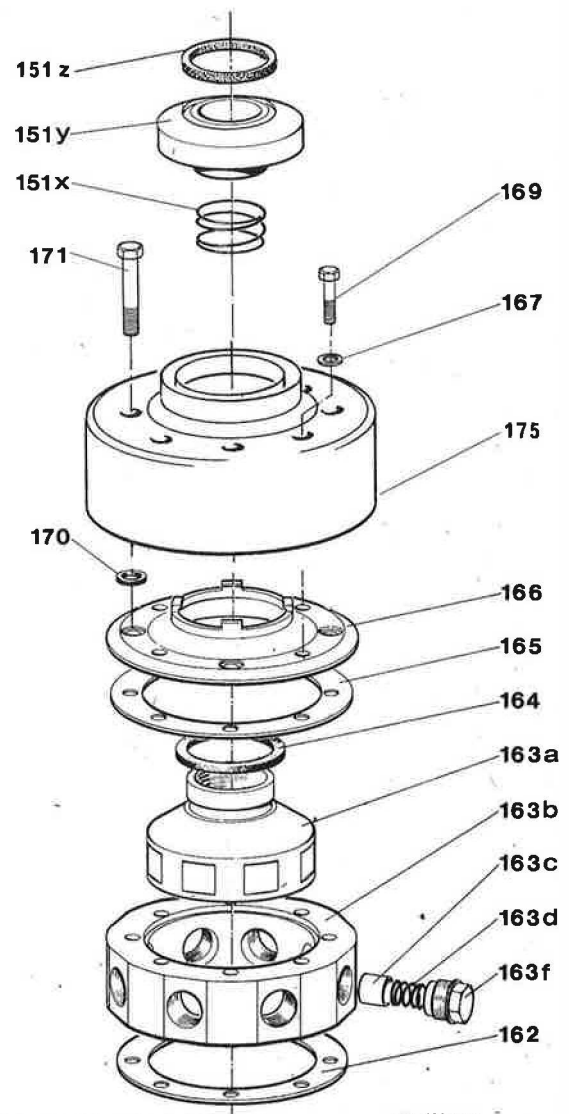
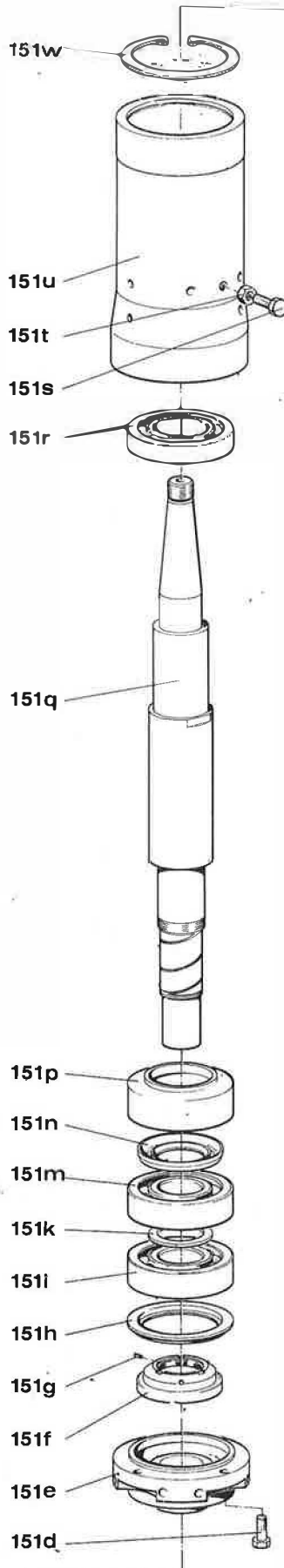
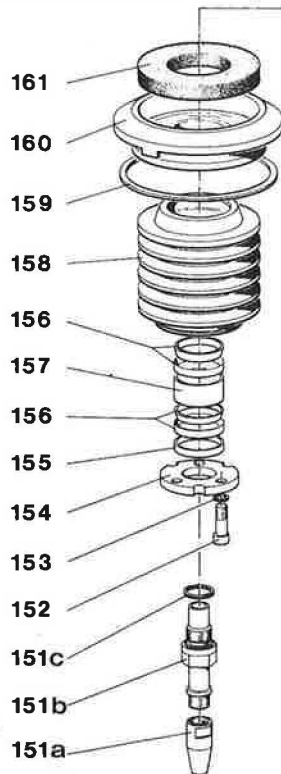
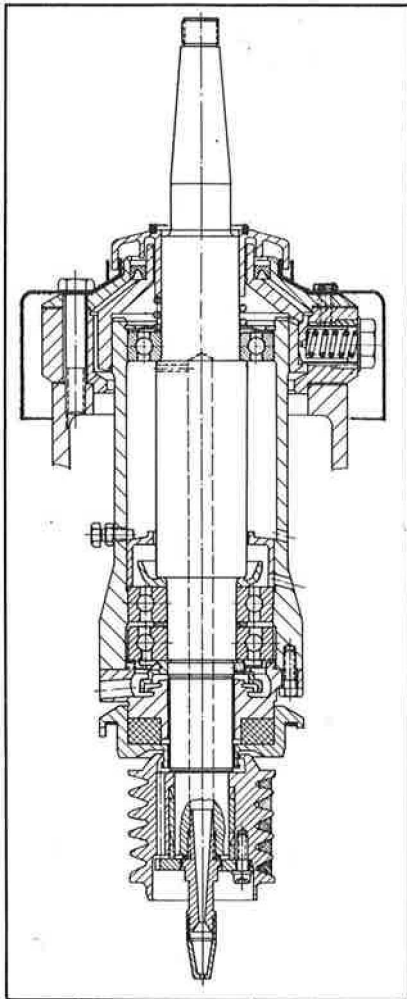
Drive Parts

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No. in Fig.	Part - No.	Qty.	Part Description
-	3190-3300-000	1	Drive assembly
-	3190-3429-000	1	Spindle assembly (151a-z)
151a	3157-3427-010	1	Lower part of suction pipe
151b	3157-3422-000	1	Upper part of suction pipe
151c	0004-1877-750	1	Gasket 22/29x3
151d	0019-6937-150	4	Hex head screw M 10x30 DIN 933 - 8.8
151e	3157-3375-000	1	Bearing cover
151f	3157-3308-000	1	Threaded ring
151g	0019-8967-150	1	Threaded pin AM 6x15 DIN 914 - 10.9
151h	3157-3419-000	1	Oil control ring
151i	0011-7311-100	1	Angular contact ball bearing 7311/BM/P6 DIN 628
151k	0026-5801-000	1	Washer
151m	0011-6311-180	1	Grooved ball bearing M/P63 DIN 625
151n	0008-6511-040	1	Oil slinger ring
151p	3157-3419-020	1	Ring
151q	3190-3411-000	1	Spindle
151r	0011-6213-180	1	Grooved ball bearing 6213 MA/P63 DIN 625
151s	0019-5196-150	1	Hex head screw AM 10x30 DIN 561 - 8.8
151t	0013-0279-150	1	Hexagon nut M 10 DIN 934 - 8
151u	3190-3131-000	1	Bearing housing
151w	0026-5845-170	1	Securing ring
151x	0006-4309-160	1	Spindle spring
151y	0008-6501-750	1	Spindle cap
151z	0007-2451-750	1	Gasket 68/74x3.5
152	0019-6147-150	3	Allen screw M 10x40 DIN 912 - 8.8
153	0026-1337-170	3	Lock washer A10 DIN 127
154	0026-2062-060	1	Clamp disc
155	0026-5971-060	1	Distance sleeve
156	0026-5983-060	2	Set of conical clamp rings
157	0026-5972-060	1	Distance sleeve
158	2315-3352-060	1	V-belt pulley
159	0004-5100-710	1	Gasket 138/157x1
160	1182-3435-000	1	Pressure ring
161	0021-3020-750	1	Rubber cushion
-	0008-6520-000	1	Neck bearing bridge assembly with covering (162-171)
162	0004-5478-770	1	Gasket 175/240x0.3
-	0008-6510-000	1	Neck bearing bridge assembly (163a-f)
163a	0008-6507-050	1	Neck bearing pressure ring
163b	0008-6506-050	1	Neck bearing bridge
163c	0026-5724-110	8	Spring piston
163d	0006-4240-080	1	Set of neck bearing springs
163f	0019-1426-150	8	Threaded plug
164	0004-2522-830	1	Sealing ring A90x115x12
165	0004-5479-770	1	Gasket 185/260x0.3
166	0008-6502-050	1	Neck bearing protection cap
167	0026-5723-030	4	Washer
169	0019-6520-150	4	Hex head screw M 10x80 DIN 931 - 8.8
170	0004-5925-800	4	Gasket M16
171	0019-6616-150	4	Hex head screw M 16x100 DIN 931 - 8.8
175	see item 71b, page 14/1	1	Casing

Drive Parts

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3190-4003-000

Fig. 17

Bowl (with segment-holding insert for CIP)

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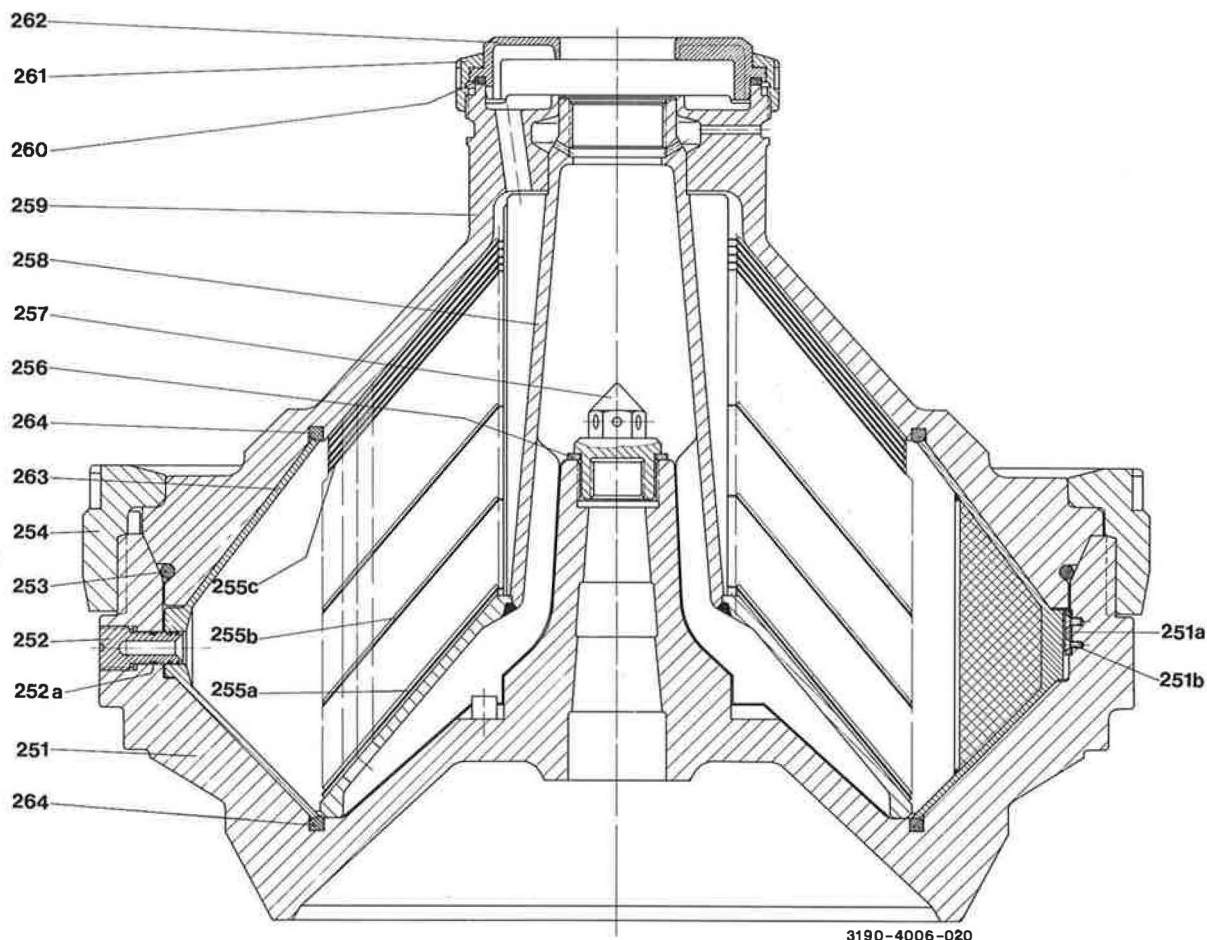


Fig. 19

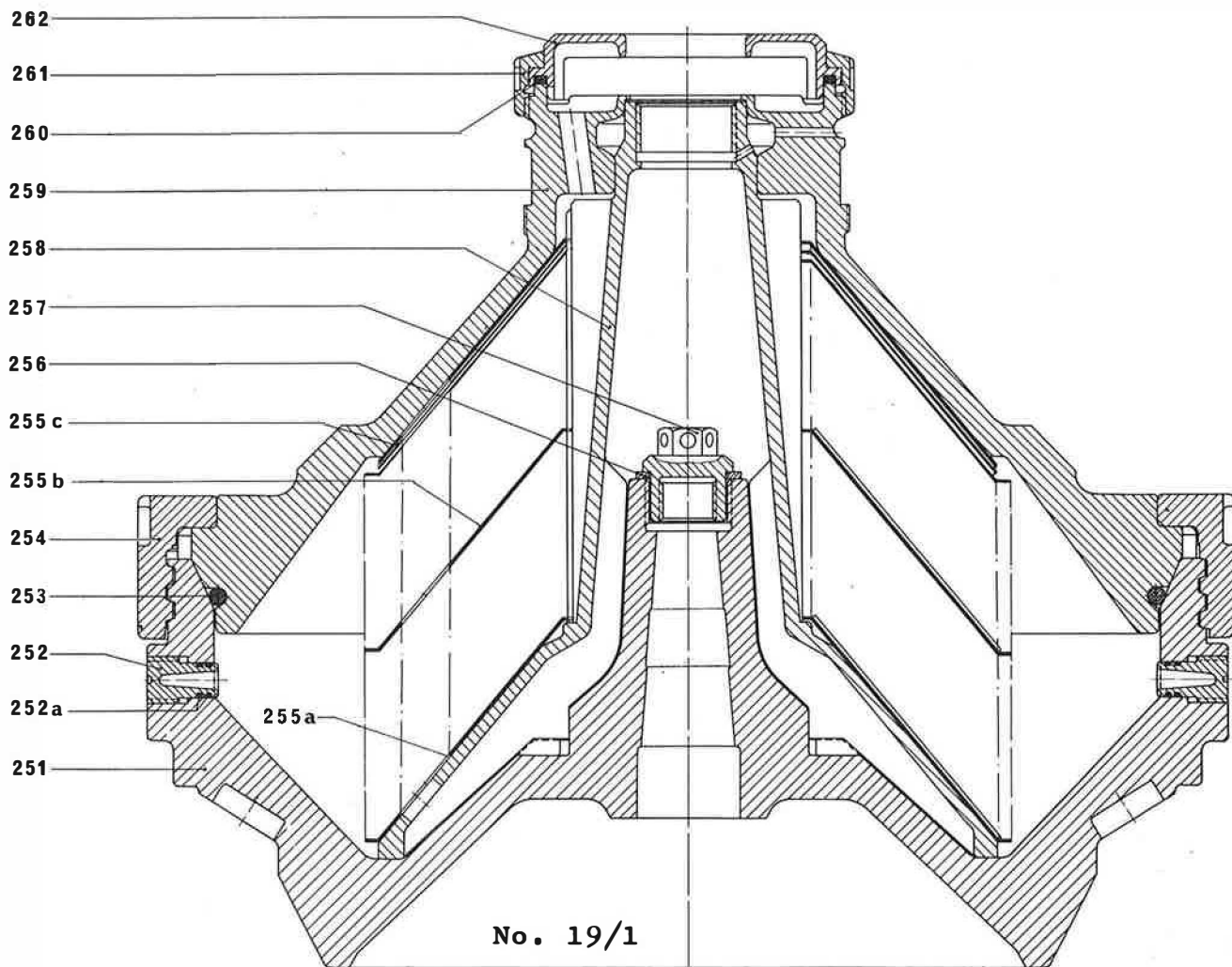
No. in Fig.	Part - No.	Qty.	Part Description
-	3190-6600-050	1	Bowl, complete (251-264)
251	3190-6604-010	1 *	Bowl bottom, complete
251a	0028-7366-400	1 +)	Arresting piece
251b	0019-0347-400	2 +)	Countersunk screw M 4.5x8
252	1182-6710-L	6	Nozzle, complete (state diameter)
252a	0007-2505-750	3 +)	Gasket 13.3/2.4
253	0007-2194-750	1	Gasket 465/9
254	3122-6631-020	1 *	Lock ring Tr 545x18
-	3190-6660-040	1	Set of discs (255a-c)
255a	3190-6662-030	1	Bottom disc
255b	3190-6663-020	45	Disc
-	1182-6663-010	2	Compensating disc (with 2mm spacers)
255c	1182-6663-000	5	Disc
256	0004-2180-850	1	Gasket 41/53x2
257	0013-3150-400	1	Spindle nut
258	3190-6620-010	1 *	Distributor
259	3190-6610-020	1 *	Bowl top
260	0007-2133-750	1	Gasket 140
261	1072-6631-070	1	Lock ring Tr 166x6
262	0947-6642-080	1	Centripetal pump chamber cover
263	3190-6715-010	1 *	Segment-holding insert
264	0007-2846-700	2	Gasket 312/328x8

* This part can only be replaced by a WESTFALIA service engineer or by a special repair shop authorized by WESTFALIA because of special re-fitting to machine and possible re-balancing of bowl.

+) This part is included in the preceding "complete" part, but it is also available as separate item.

B o w l

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No. in Fig.	Part - No.	Qty.	Part Description
-	3190-6600-060	1	Bowl, complete (251-262)
251	3190-6601-010	1	* Bowl bottom
252	0983-6710-L	6	Nozzle (state diameter)
-	0983-6706-000	4	Plug, complete
252a	0007-2505-750	16	+) Gasket 13.3/2.4
253	0007-2194-750	1	Gasket 465/9
254	3110-6631-000	1	* Lock ring
-	3190-6660-L	1	Set of discs (255a-c)
255a	3190-6662-000	1	Bottom disc
255b	3122-6663-030	45	Disc
255c	1182-6663-000	5	Disc
256	0004-2180-850	1	Gasket 41/53x2
257	0013-3150-400	1	Spindle nut
258	3190-6620-010	1	* Distributor
259	3190-6610-010	1	* Bowl top
260	0007-2133-750	1	Gasket 140/152x4
261	1072-6631-070	1	Lock ring
262	0947-6642-080	1	Centripetal pump chamber cover

* This part can only be replaced by a WESTFALIA service engineer or by a special repair shop authorized by WESTFALIA because of special re-fitting to machine and possible re-balancing of bowl.

+) This part is included in the preceding "complete" part, but it is also available as separate item.

Tools and Accessories

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No. in Fig.	Part - No.	Qty.	Part Description
401	0003-4202-320	1	Double-ended wrench 12x13 DIN 3110
-	0003-4205-320	1	Double-ended wrench 17x19 DIN 3110
-	0003-4208-320	1	Double-ended wrench 22x27
-	0003-4209-320	1	Double-ended wrench 24x30
402	0003-4189-000	1	Nozzle wrench
403	0003-3776-320	1	Allen wrench 6 DIN 911
-	0003-3778-320	1	Allen wrench 10 DIN 911
404	0003-0420-000	1	Needle holder (1 package of needles for nozzles, 3157-9818-000)
406	3157-9862-000	1	Spindle lifter
407	0003-4225-110	1	Single-ended wrench 75 DIN 894
408	0003-4296-110	1	Wrench 41
409	0019-5384-000	4	Eye bolt M 16 DIN 580 (for transport)
411	0003-0161-010	1	Oil funnel
412	0003-0274-000	1	Oil cup
413	0003-0296-000	1	Splash cover
414	0003-0210-950	1	Scraper 25
415	0003-0211-950	1	Scraper 70
416	0003-4636-050	1	Screwdriver 4.5x125
-	0003-4637-050	1	Screwdriver 8x150
417	0003-4544-960	1	Cylindrical brush 150 x 85 x 285
-	0003-4551-800	1	Cylindrical brush 200 x 100 x 800
-	0003-4681-960	1	Cylindrical brush 400 x 120 x 500
-	0003-4552-960	1	Cylindrical brush 450 x 110 x 270
418	0003-4690-960	1	Brush 50x125x285
419	0003-4695-960	1	Brush 70x100x500
420	0003-0200-000	1	Mallet
421	0003-4297-110	1	Wrench 60
422	3190-9930-010	1	Jack (for bowl bottom)
423	3190-9930-000	1	Jack
424	3190-9820-000	1	Disc stack compressing device
425	3230-9985-010	1	Lifting device (for lower hood)
426	3121-9970-000	1	Jack (for distributor)
427	0003-0133-000	1	Wrench (for centripetal pump)
428	0003-4064-030	1	Annular wrench (for large lock ring)
429	0003-3992-000	1	Annular wrench (for small lock ring)
430	3190-9840-000	1	Lifting device (for hood)
431	3190-9985-000	1	Lifting device (for segment-holding insert)
-	0015-0001-090	2	5-litre can of lubricating oil C-LP 36 Viscosity at 50°C: 36±4 cSt
-	0015-0113-000	1	100-gram tube of special lubricating paste (for threaded areas of bowl)

7F



Fig. 20

A D D I T I O N A L E Q U I P M E N T
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Valve
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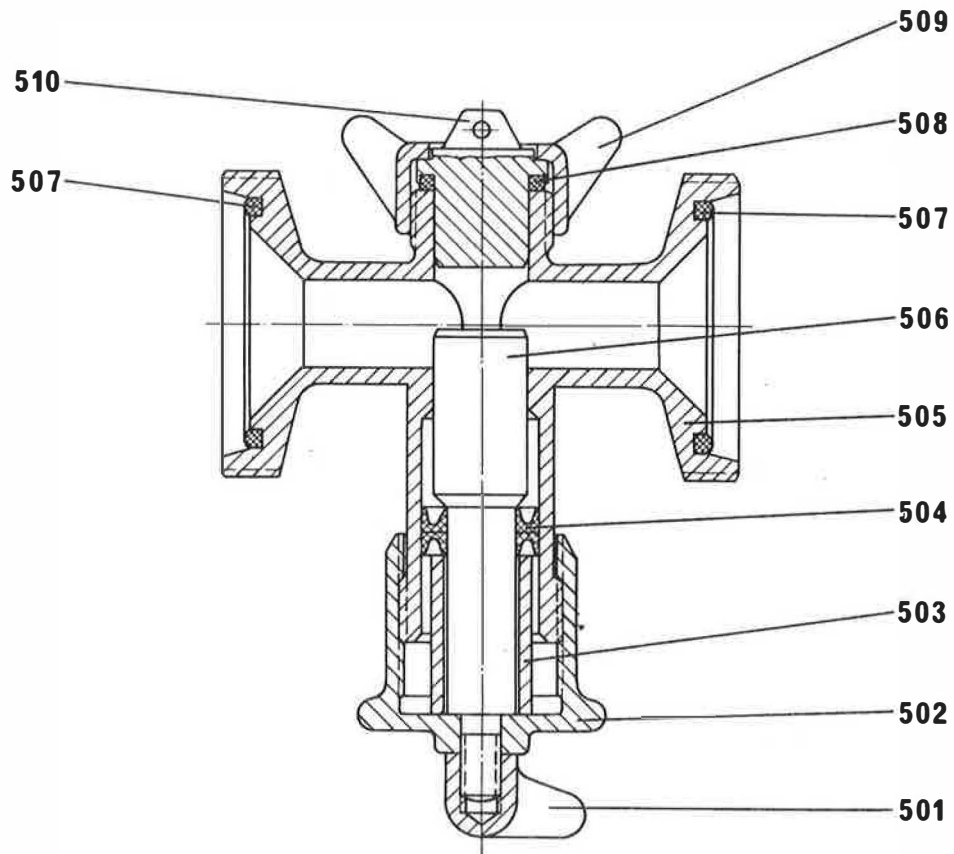


Fig. 21

No. in Fig.	Part - No.	Qty.	Part Description
-	8121-2225-030	1	Valve assembly (501-510)
501	0013-2852-640	1	Cap nut
502	1033-2276-000	1	Adjusting screw
503	0026-0517-840	1	Distance sleeve
504	0004-5718-840	2	Grooved ring 18/30 \varnothing x 6
505	8121-2226-010	1	Valve housing
506	8121-2229-020	1	Slide
507	0007-2211-750	2	Gasket G 50 DIN 11851
508	0007-2218-750	1	Gasket 23/31 \varnothing x 4
509	0013-2834-690	1	Winged nut
510	1033-2223-000	1	Plug

Pressure gauge (with connecting pipe)

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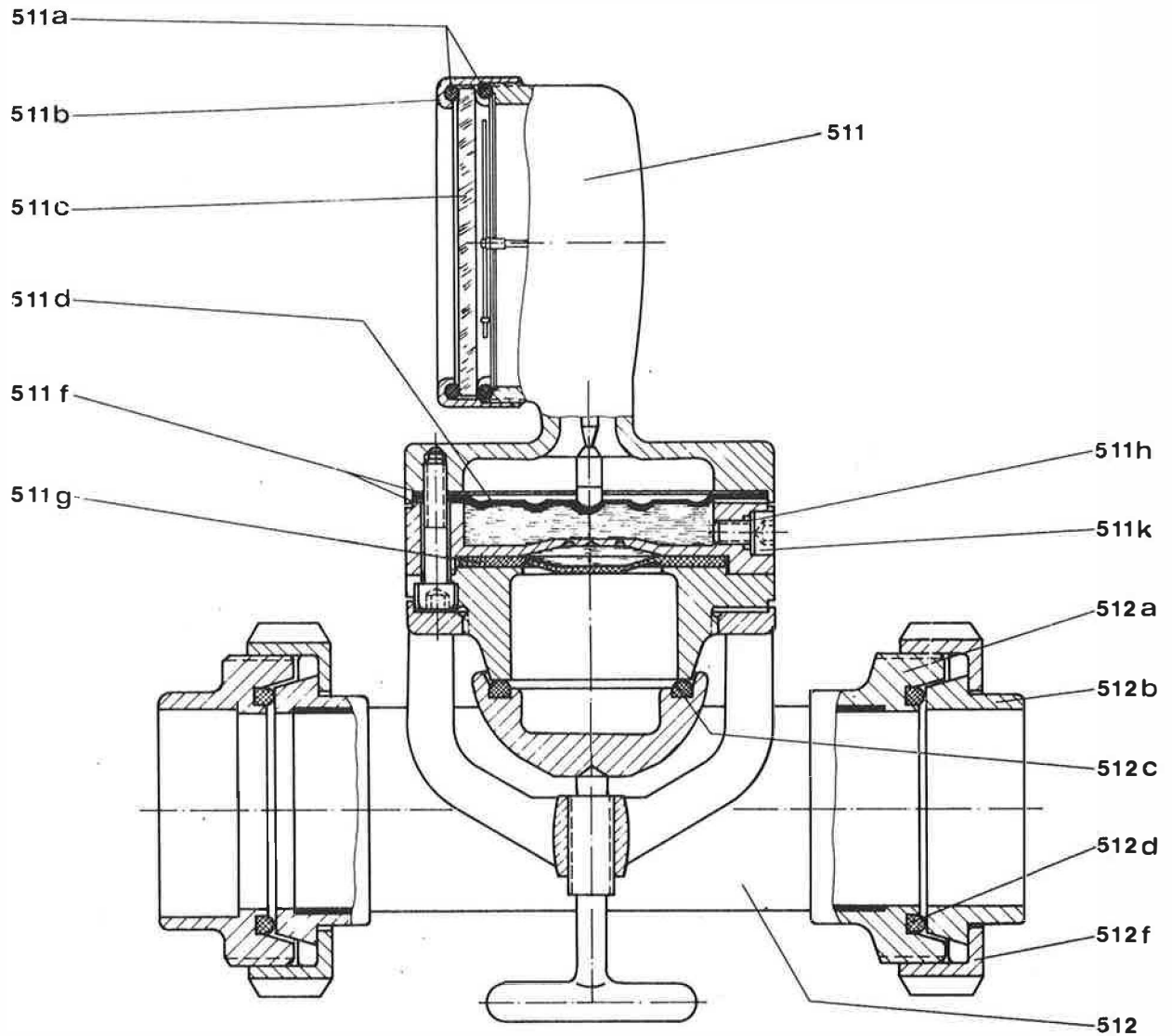


Fig. 22

No. in Fig.	Part - No.	Qty.	Part Description
511	8918-2000-290	1	Pressure gauge, complete (100 psi)
511a	0007-2057-750	2	* Gasket 71x4,5
511b	8470-3315-010	1	* Lock ring
511c	0001-0050-820	1	* Sight glass
511d	8915-2790-060	1	* Diaphragm
511f	0004-2745-850	2	* Gasket 64/89x0,3
511g	0004-2310-750	1	* Diaphragm 68
511h	0004-1921-720	1	* Gasket 6,5/10x1
511k	0019-6105-400	1	* Allen screw M 6x12 DIN 912
512	8918-2166-010	1	Connecting pipe, complete
512a	0018-4119-400	1	* Threaded connection
512b	0018-3955-400	1	* Cone connection
512c	0007-2210-750	1	* Gasket G 40 DIN 11851
512d	0007-2211-750	1	* Gasket G 50 DIN 11851
512f	0013-2845-300	1	* Grooved coupling nut

* This part is included in the previous "complete" part, but it is also available as separate item.

Tubular Strainer =====

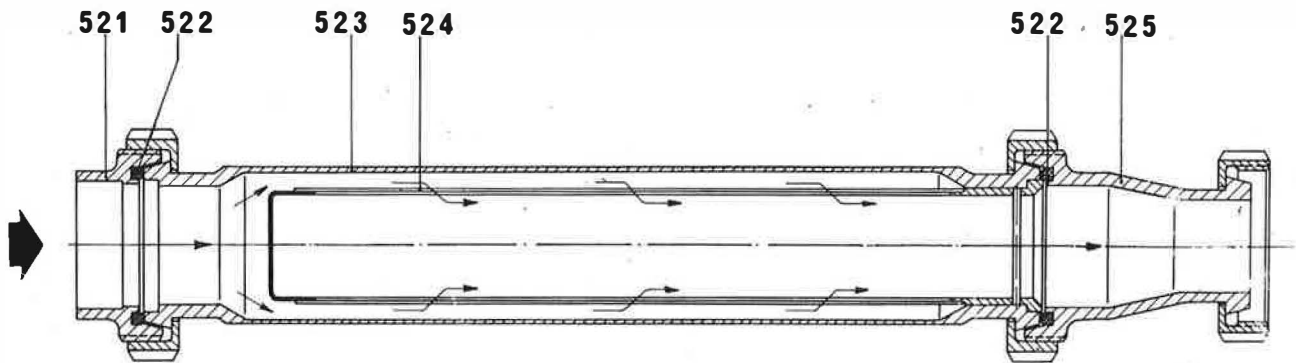


Fig. 23

No. in Fig.	Part - No.		Qty.	Part Description
	<u>30 meshes/1"</u>	<u>50 meshes/1"</u>		
-	3157-2330-000	3157-2330-010	1	Tubular strainer, complete (521-525)
521	0018-4119-300	0018-4119-300	1	Threaded connection C 50 DIN 11851
522	0007-2211-700	0007-2211-700	2	Gasket G 50 DIN 11851
523	3157-2331-000	3157-2331-000	1	Housing
524	3157-2332-010	3157-2332-020	1	Strainer
525	0018-0515-300	0018-0515-300	1	Reducing socket A 50x40 DIN 11890

Quark Cooler

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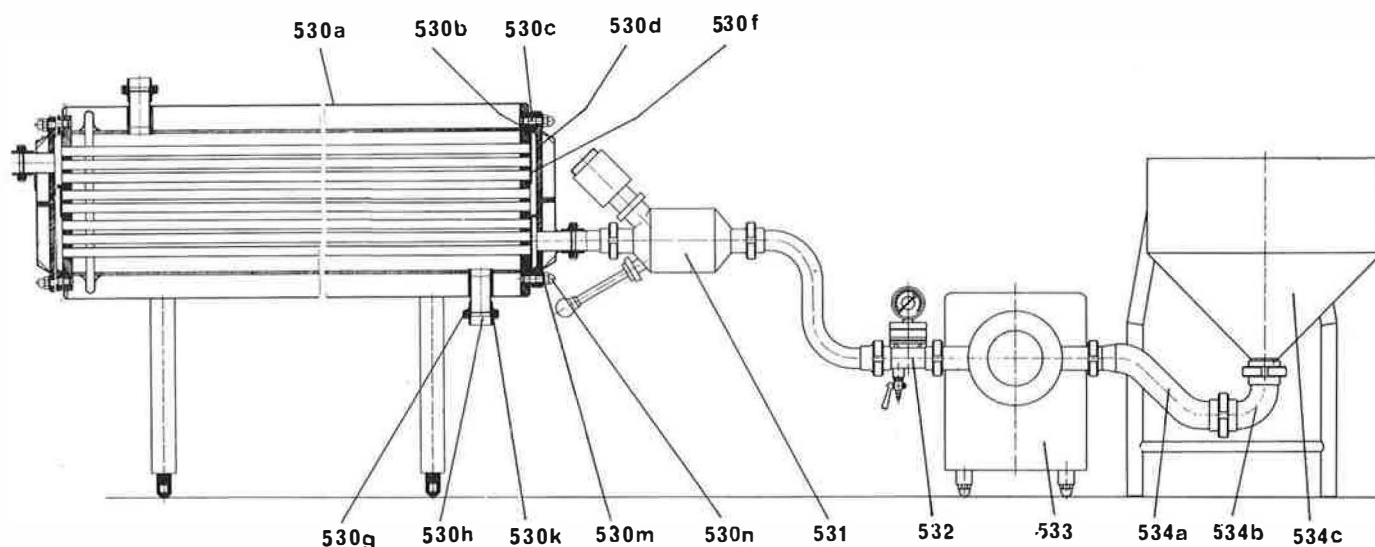


Fig. 24

No. in Fig.	Part - No.	Qty.	Part Description
-	8243-2100-010	1	Quark cooler, complete (530a-n)
530a	8243-2110-000	1	Quark cooler
530b	0004-5170-840	2	Gasket 342/366x6
530c	0019-7727-400	28	Stud M16x45
530d	8244-2354-000	2	Cover
530f	8244-2504-L	1	Perforated plate
530g	0013-2845-300	4	Grooved coupling nut
530h	0018-3955-300	4	Cone connection
530k	0007-2211-750	4	Gasket
530m	0026-2382-400	28	Washer 16.5x29.5x4
530n	0013-0408-400	28	Cap nut M6 DIN 1587
-	0019-4936-400	8	Threaded pin M6x20 DIN 551
-	0013-0276-400	8	Hexagon nut
531	8230-2100-L	1	Moisture meter
532	see page 25	1	Feed line
533		1	* Positive displacement pump (depending on order)
	8235-7500-010	1	Funnel, complete (534a-c)
534a	8235-2196-030	1	Bend
534b	8235-2196-020	1	Bend
534c	8235-7505-010	1	Funnel
-	0007-2212-700	1	Gasket 71/81x5

IMPORTANT: The pipe connections to the suction side of the positive displacement pump must be free of stress and the unions must be absolutely tight, otherwise air might be sucked-in, resulting in improper conveying of the quark (see also instruction manual for positive displacement pump).

Feed line for Quark Cooler C 1000

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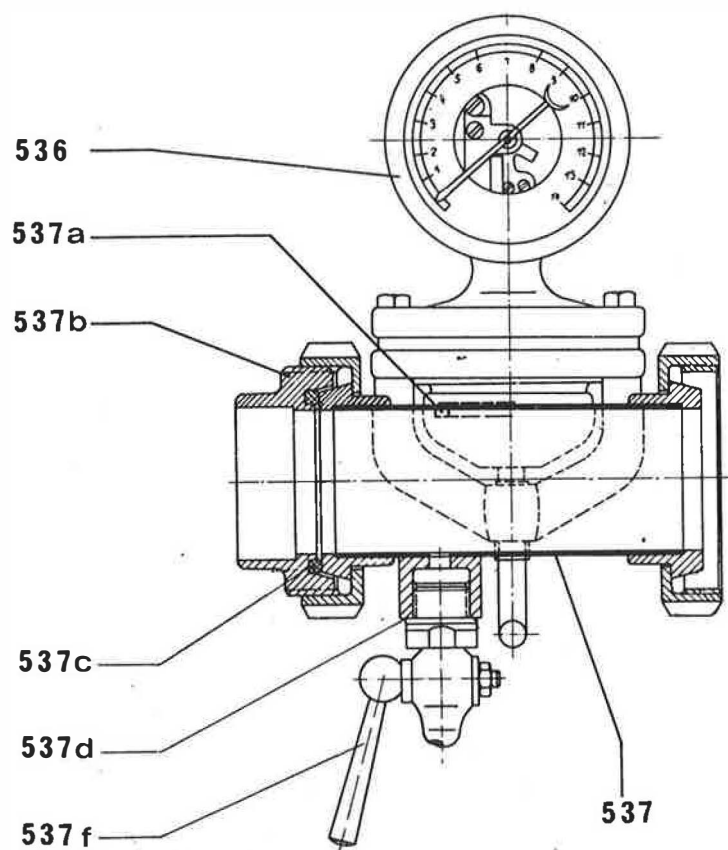


Fig. 25

No. in Fig.	Part - No.	Qty.	Part Description
-	8235-2215-010	1	Feed line assembly (536-537f) (see also fig. 24, no. 543)
536	8918-2000-300	1	Pressure gauge
537	8235-2166-010	1	Connecting pipe
537a	0007-2210-750	1	* Gasket G 40 DIN 11851
537b	0018-4119-300	1	* Threaded connection
537c	0007-2211-750	1	* Gasket G 50 DIN 11851
537d	0004-5277-850	1	* Gasket 19/26 x 1
537f	0018-1526-400	1	* Hose cock

* This part is included in connecting pipe 537, but it is also available as separate item.

Air Gun and Deflector Cover
for cleaning the Quark Cooler
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Maximum pressure of de-oiled compressed air: 114 psi

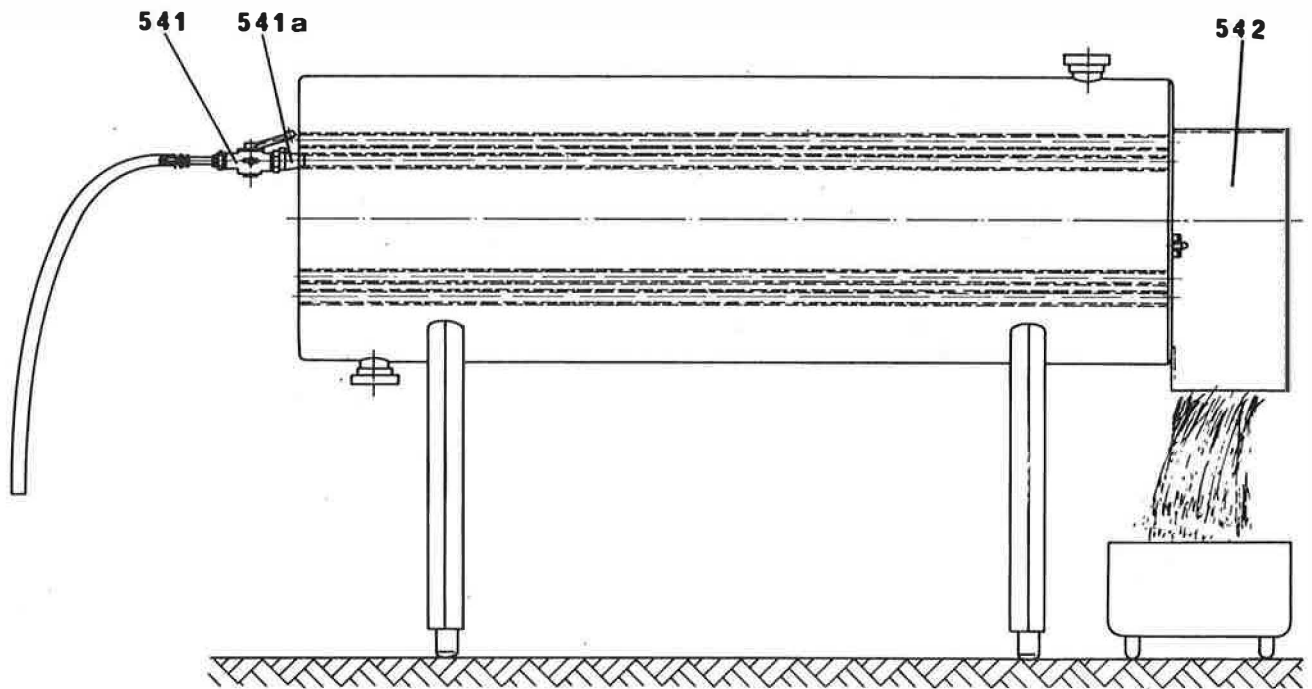
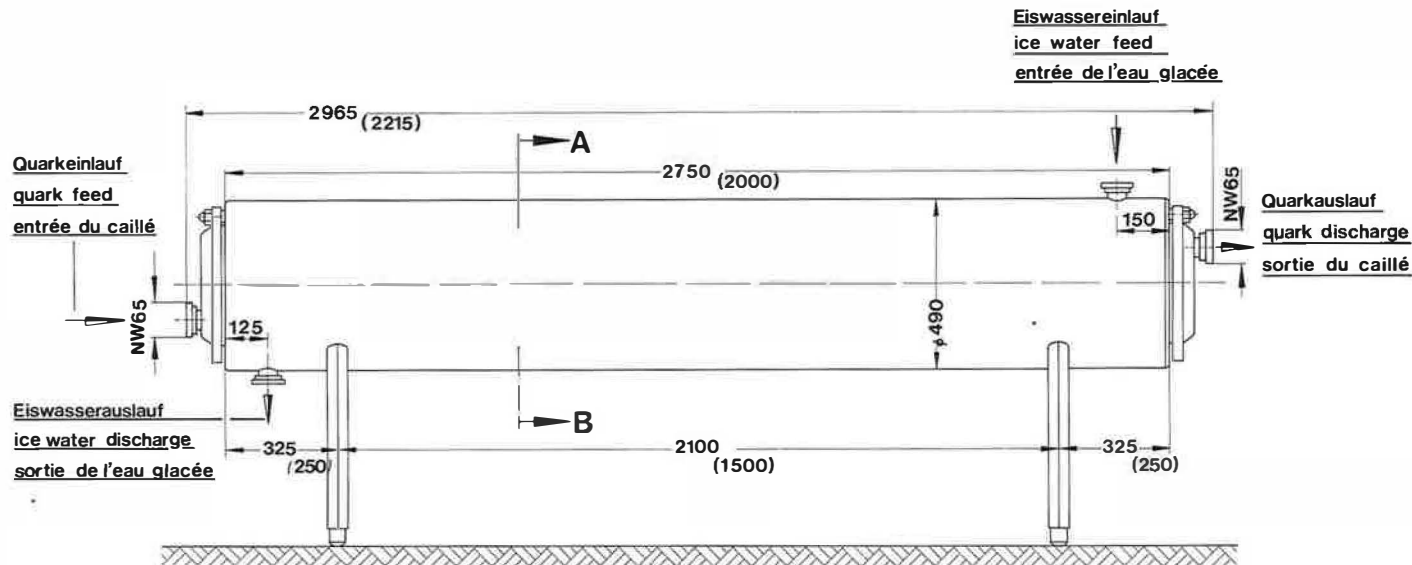


Fig. 26

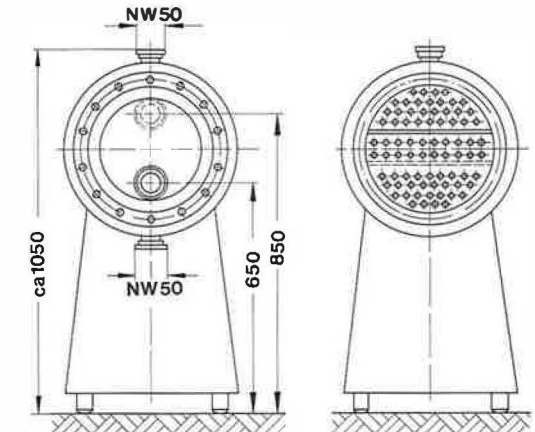
No. in Fig.	Part - No.	Qty.	Part Description
541	8239-2200-000	1	Air gun, complete
541a	0003-3654-750	1	* Rubber cone 24/20x45
542	8239-7765-000	1	Deflector cover (for C1000-3 with 14 cap nuts)

* This part is included in air gun No. 541, but it is also available as separate item.

WESTFALIA Quark Kühler**C 1000-3-S / C 2000-3****WESTFALIA Quark Cooler****C 1000-3-S / C 2000-3****WESTFALIA Refroidisseur de caillé****C 1000-3-S / C 2000-3**

Eingeklammerte Masse für C 1000-3-S
 measurements given in brackets C 1000-3-S
 dimensions entre parenthèses C 1000-3-S

- 14 Stiftschrauben M 16x45
 14 Stud M 16x45
 14 Goujon M 16x45



Schnitt A-B
 Section A-B
 Section A-B

Kühler für CIP Reinigung	côoler for CIP	refroidisseur pour système NEP	C 1000-3-S	C 2000-3
Kühlmittel: Eiswasser	cooling agent: ice water	moyen de refroidissement: eau glacée		
Eiswasserdurchlauf	capacity of ice water	débit de l'eau glacée	20000 l/h	30000 l/h
Eiswassertemperatur	temperature of ice water	température de l'eau glacée	+0,5 bis +1° C	+0,5 bis +1° C
Quarkleistung	quark capacity	rendement en caillé	1000 kg/h	2000 kg/h
Durchflußwiderstand	flow resistance	contre -pression	6 bar	8 bar
Quarkfassungsvermögen	quark holding capacity	capacité en caillé	ca 70 kg	ca 85 kg
Kühlrohrlänge	length of the cooling pipe	longueur du tuyau de refroidissement	2000 mm	2750 mm
Anzahl der Rohre	number of pipes	nombre des tuyaux	76 Stück	76 Stück
Durchmesser der Rohre	diameter of the pipes	diamètre des tuyaux	23/25 mm	23/25 mm
Isolierschicht: Polyurethan	insulating cover: polyurethan	isolement: polyuréthane	60/70 mm	60/70 mm
Nettogewicht des Kühlers	net weight of the flow cooler	poids net du refroidisseur	500 kg	558 kg
Reinigungsmitteldurchlauf	throughput of cleaning agent	débit du produit de nettoyage	mind. 11000 l/h	mind. 11000 l/h

Der Durchflußwiderstand erhöht sich pro Meter Rohrleitung (NW 50) um 0,5 bar und pro Rohrbogen ebenfalls um 0,5 bar
The flow resistance increases per meter of pipeline (pipe diameter 2") by 7 psig and per bend by 7 psig.
La résistance à la circulation augmente de 0,5 kg / cm ² par mètre de tuyauterie /diamètre du tube 50/52 et de 0,5 kg/cm ² par coude

WESTFALIA KÜHLGERÄTE 4100-4100-000	8244-4100-000
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