



Installation, care and maintenance

2201.590/690



Flygt



ITT Industries

GUARANTEE

Flygt undertakes to remedy faults in products sold by Flygt provided:

- that the fault is due to defects in design, materials or workmanship;
- that the fault is reported to Flygt or Flygt's representative during the guarantee period;
- that the product is used only under conditions described in the care and maintenance instructions and in applications for which it is intended;
- that the monitoring equipment incorporated in the product is correctly connected;
- that all service and repair work is done by a workshop authorized by Flygt;
- that genuine Flygt parts are used.

Hence, the guarantee does not cover faults caused by deficient maintenance, improper installation, incorrectly executed repair work or normal wear and tear.

Flygt assumes no liability for either bodily injuries, material damages or economic losses beyond what is stated above.

Official approval applies only providing:

- that the product is used under conditions described in the care and maintenance instructions and in applications for which it is intended;
- that the monitoring equipment incorporated in the product is correctly connected;
- that all service and repair work is done by a workshop authorized by Flygt;
- that genuine Flygt parts are used.

Flygt guarantees that a spare parts stock will be kept for 10 years after the manufacture of this product has been discontinued.

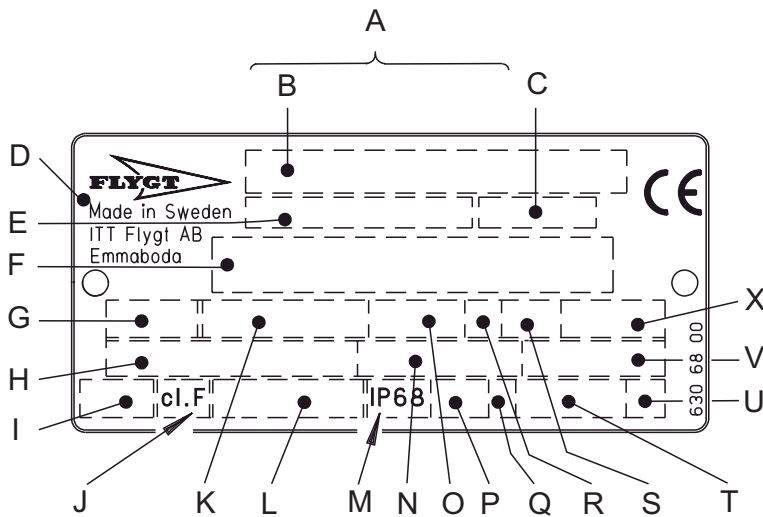
The manufacturer reserves the right to alter performance, specification or design without notice.

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DATA PLATES INTERPRETATION

GENERAL DATA PLATE

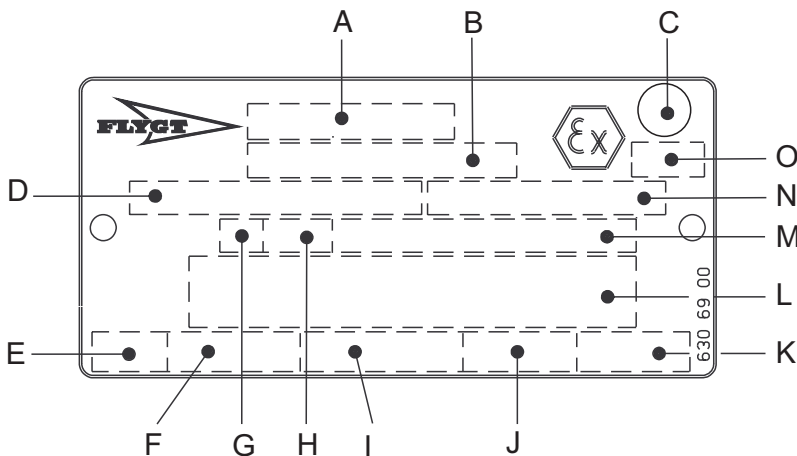


- A Serial number
- B Product code + Number
- C Curve code / Propeller code
- D Country of origin
- E Product number
- F Additional information
- G Phase; Type of current; Frequency
- H Rated voltage
- I Thermal protection
- J Thermal class
- K Rated shaft power
- L International standard
- M Degree of protection
- N Rated current
- O Rated speed
- P Max. submergence
- Q Direction of rotation: L=left, R=right
- R Duty class
- S Duty factor
- T Product weight
- U Locked rotor code letter
- V Power factor
- X Max. ambient temperature

APPROVAL PLATES

Always together with the general data plate

EN-data plate



- A Approval
- B Approval authority + Approval Number
- C Approval for Class I
- D Approved drive unit
- E Stall time
- F Starting current; Rated current
- G Duty class
- H Duty factor
- I Input power
- J Rated speed
- K Controller
- L Additional information
- M Max. ambient temperature
- N Serial number
- O ATEX marking

Explosion-proof

590: EEx de IIB T3

690: EEx de I

EEx de I (Sch)s

PRODUCT DESCRIPTION

These care and maintenance instructions apply to an explosion-proof (permissible), submersible Flygt pump.

Applications

2201.590.690 is intended to be used for:

pumping of water which may contain abrasive particles. The pump is designed for use in explosive environments in accordance with the following approval:

Européan Norm 590: EEx de IIB T3
690: EEx de I
EEx de I (Sch)s

Liquid temperature: max. 40° C (104°F)

Liquid density: Max. 1100 kg/m³ (9.2 lb per US gal.)

The pumped liquid may contain particles up to a size which corresponds to the openings in the strainer.

The pH of the pumped liquid: 6-11.

Depth of immersion: max. 20 m (66 ft).

Pumps with a swirl-type impeller may not be operated at a too low discharge head, since this causes overloading of the motor. This applies to ST pumps. See "Technical data".

Design

Cooling

ST version

The stator is cooled by the circulation of a portion of the pumped liquid in the space between the stator casing and the cooling jacket. The stator is cooled by the circulation of a portion of the pumped liquid in the space between the stator casing and the outer casing. The air between the outer casing and the stator casing is evacuated through a vent pipe that runs from the valve housing down to the suction side of the pump.

MT and HT versions

The stator is cooled by the pumped liquid passing through the space between the stator casing and the outer casing.

Air is evacuated through two valves on the top part of the pump.

Motor data

The table gives rated current and starting current. Fuse amperage and cable shall be selected in accordance with local rules and regulations. Note that with long cables, the voltage drop in the cable must be taken into consideration, since the motor's rated voltage is the voltage that is measured at the terminal board in the pump.

Motor 3 ~ 50 Hz, 2900 rpm, 37 kW		
Voltage V	Rated current A	Starting current A
380Δ	67	375
400Δ	64	310
415Δ	61	325
440Δ	58	350
500Δ	51	305
550Δ	46	285
1000Δ	25	132
1100Δ	23	145
Motor 3 ~ 60 Hz, 3400 rpm 42.7 kW (58 hp)		
440Δ	68	375
460Δ	65	395
575	52	305

The overload protection (motor protection breaker) shall be set to the motor's operating current, but no higher than the motor's rated current as given on the data plate.

Technical data

The pump curves show:

- input power at various operating points.
- flow rate versus total head.

Note: ST pumps may not be operated at a head lower than 50 m (164 ft).

The following abbreviations are used:

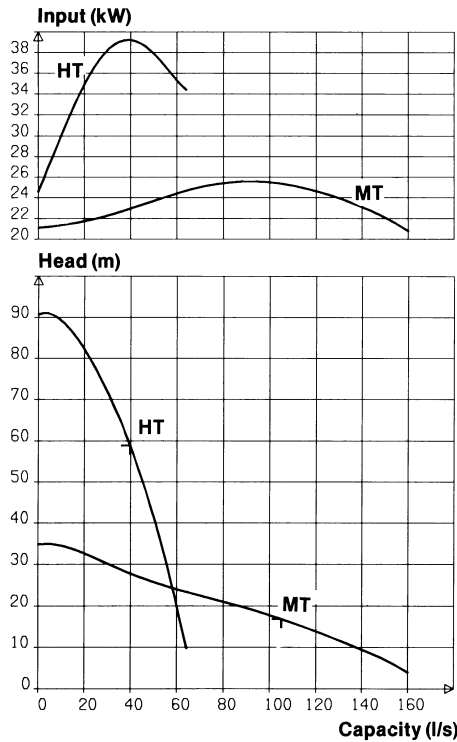
MT = medium-head version

HT = high-head version

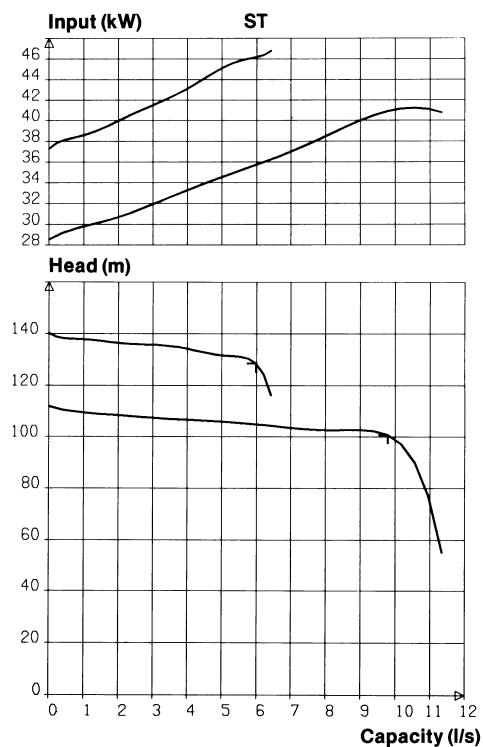
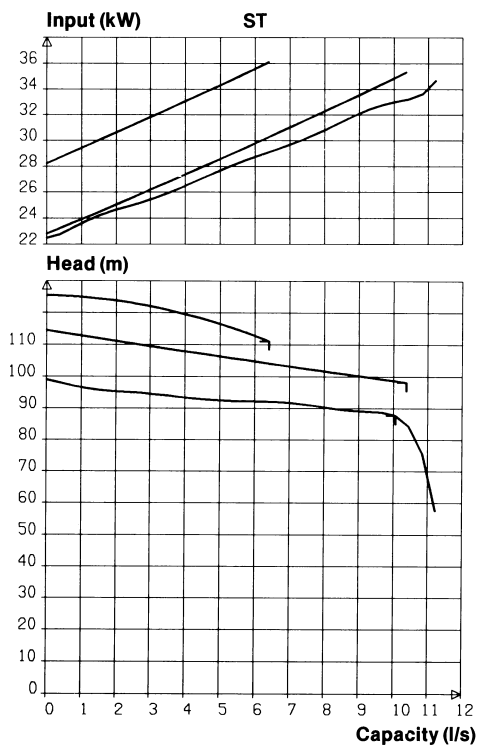
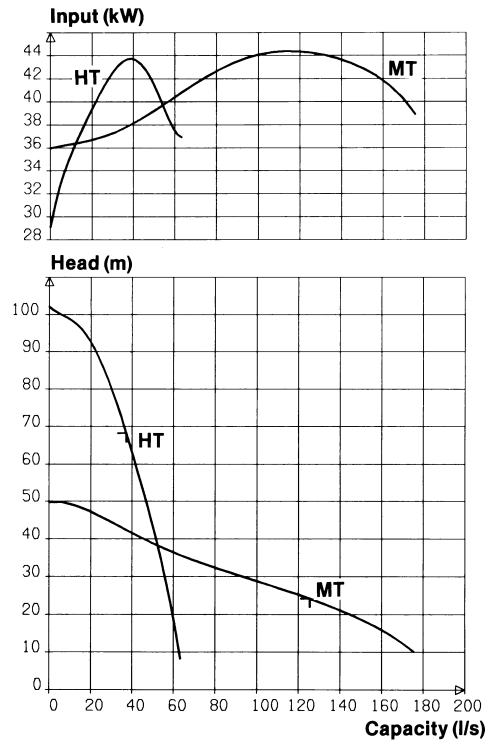
ST = super-head version

For further information, see "Parts list".

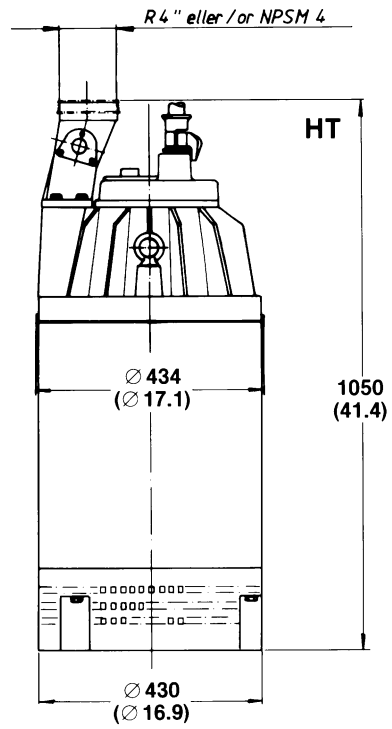
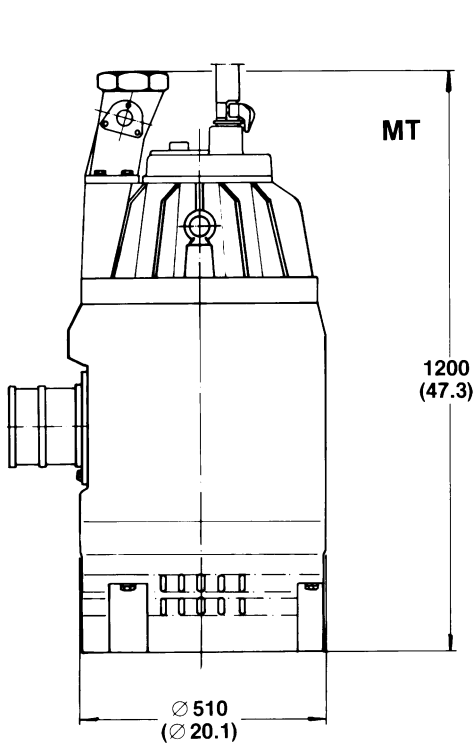
50 Hz, 37 kW



60 Hz, 42.7 kW (58 hp)



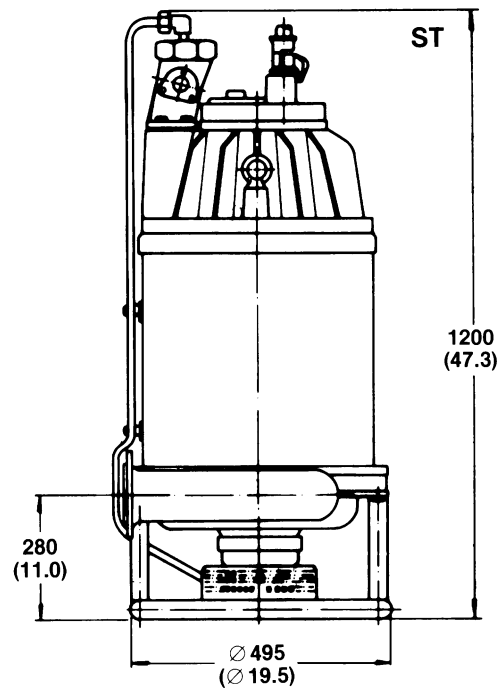
Dimensions and weights



All dimensions are in mm (in).

Weight in kg (lb) without motor cable and discharge connection:

MT	HT	ST
445 (980)	350 (770)	415 (915)



TRANSPORTATION AND STORAGE

The pump may be transported and stored in a vertical or horizontal position. Make sure that it cannot roll or fall over.



Always lift the pump by its lifting eyes, never by the motor cable or the hose.

The pump is frostproof as long as it is operating or is immersed in the liquid. If the pump is taken up when the temperature is below freezing, the impeller may freeze. The pump shall be operated for a short period after being taken up in order to expel all remaining water.

A frozen impeller can be thawed by allowing the pump to stand immersed in the liquid for a short period before it is started. Never use an open flame to thaw the pump.

For longer periods of storage, the pump must be protected against moisture and heat. The impeller should be rotated by hand occasionally (for example every other month) to prevent the seals from sticking together. If the pump is stored for more than 6 months, this rotation is mandatory.

After a long period of storage, the pump should be inspected before it is put into operation. Pay special attention to the seals and the cable entry.

Follow the instructions under the heading "Before starting".

INSTALLATION

Safety precautions

In order to minimize the risk of accidents in connection with the service and installation work, the following rules should be followed:

1. Make sure the lifting equipment is in good condition.
2. Be aware of the risk of electrical accidents.
3. Use a safety helmet, safety goggles and protective shoes.

Follow all other health and safety rules and local codes and ordinances.



At certain installations and operation points on the pump curve the noise level 70 dB, or for the actual pump specified noise level, can be exceeded.

Pump installation

Run the cables so that they do not have any sharp bends and are not pinched.

Connect the discharge connection and motor cable. See "Electrical connections".

Lower the pump into the sump.

Place the pump on a base which will prevent it from sinking into a soft sump bottom. Alternatively, the pump can be suspended by its lifting eyes just above the sump bottom.

For tandem connection of pumps, see "Accessories and tools".

Consult your nearest Flygt representative regarding:

- choice of peripheral equipment.
- other problems in connection with installation.

ELECTRICAL CONNECTIONS

All electrical work shall be carried out under the supervision of an authorized electrician.

Local codes and regulations shall be complied with.



NOTE for Ex-version
All work on the explosion-proof motor section must be performed by authorized Flygt personnel or personnel authorized by Flygt.

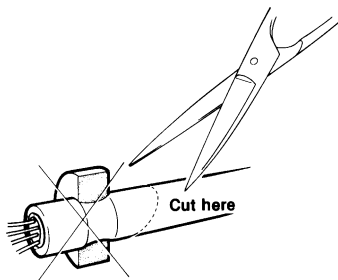
Check that the mains voltage and frequency agree with the specifications on the pump data plate.

The motor cannot be connected for different voltages.

Install the motor cable and the control cable as illustrated in the figure.

To avoid leakage into the pump, check:

- that the cable entry seal sleeve and washers conform to the outside diameter of the cable. See the parts list.
- that the outer jacket on the cable is not damaged. When refitting a cable which has been used before, **always** cut off a short piece of the cable so that the cable entry seal sleeve does not close around the cable at the same point again.



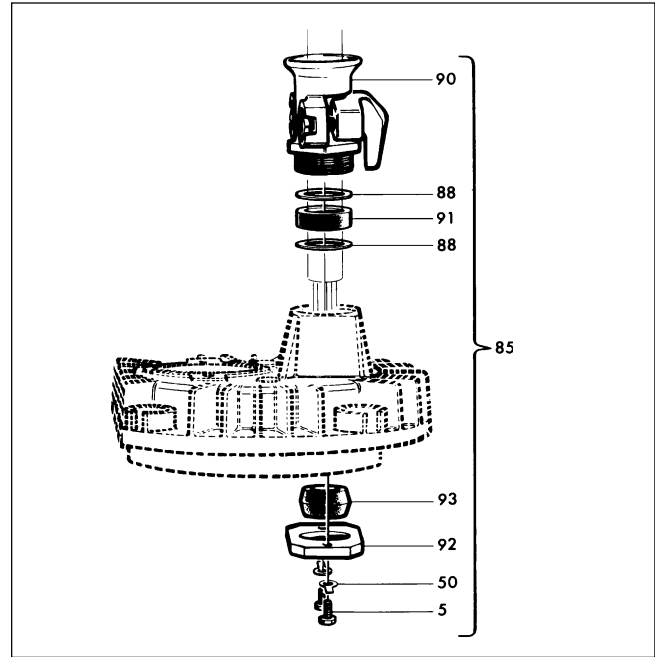
NOTE!
For safety reasons, the earth lead should be approx. 100 mm (3.94") longer than the phase leads. If the motor cable is jerked loose by mistake, the earth lead should be the last lead to come loose from its terminal. This applies to both ends of the cable.

Insert the motor cable so far that 25—30 mm (0,9"—1,2") of the jacket projects on the inside of the cover (120).

Screw down the flange (90) so that the seal sleeve (91) is compressed and seals between the motor cable and the cover (120).

Twist together the earth leads located concentrically around each phase lead into a bundle and slip an insulating tube over the intertwined earth lead.

The holder (92) shall be fitted with the largest diameter of the hole facing the inside of the cover (120). The screws (5) shall be tightened just enough to leave 1 mm (0,4") of clearance between the cover and the holder (92). Lock the screws (5) with the tab washers (50).



Check the phase sequence in the mains using a phase sequence indicator. The impeller will rotate in the right direction when the motor cable is connected to the mains as follows:

Alt. 1		Alt. 2	
Clockwise phase sequence		Anticlockwise phase sequence	
Mains Lead (line)		Mains Lead (line)	
L1	Brown (Red)	L1	Brown (Red)
L2	Blue (White)	L3	Black (Black)
L3	Black (Black)	L2	Blue (White)

Connect the control cable between the terminal board (H1, H2) and the starter's control circuit.

Fit and tighten the cover (120). Check through the inspection hole that no leads are pinched. Fit and tighten the inspection cover (107).

NOTE! The pump shall be connected to earth (ground) with an external earth lead on the top of the cover (120).

Check the direction of rotation, see "Inspection". If the impeller rotates in the wrong direction, transpose two phase leads.

Make sure that the pump is correctly earthed (grounded).

Remember that the starting surge with the direct-on line start can be up to six times higher than the rated current. Make sure that the fuses or circuit breakers are of the proper amperage.

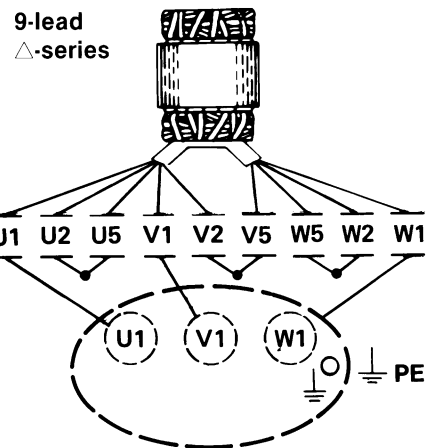
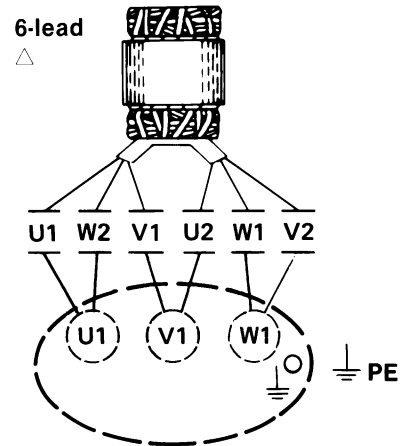
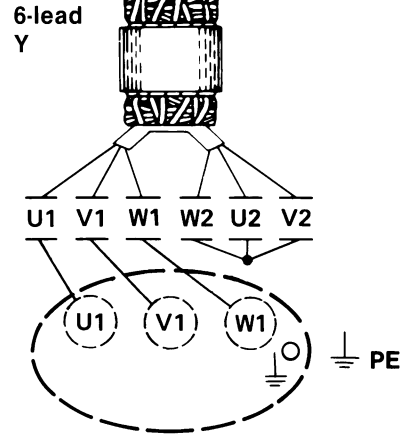
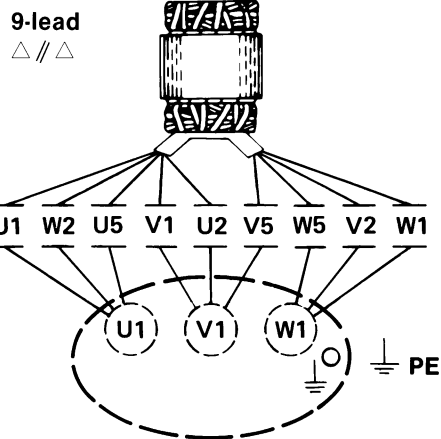


NOTE!
Make sure that the monitoring equipment incorporated in the product is correctly connected.

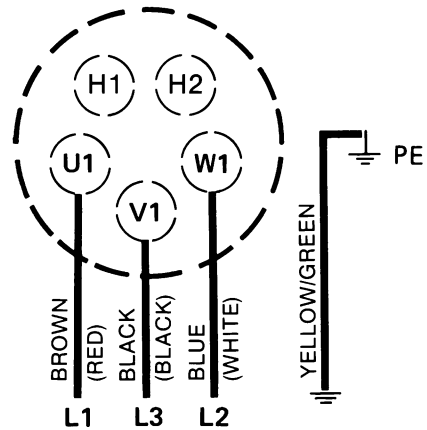
The stator leads are colour-coded as follows:

9-lead	}	U1 = Red	6-lead
		V1 = Brown	
		W1 = Yellow	
		U2 = Green	
		V2 = Blue	
		W2 = Black	
		U5 = Red	
		V5 = Brown	
		W5 = Yellow	

The stator leads are connected to the underside of the terminal board as follows:



Connect the motor cable to the terminal board connections U1, V1, W1 and earth as illustrated in the picture.



OPERATION

Before starting

Check the oil level in the oil casing.

Remove the fuses or open the circuit breaker and check that the impeller can be rotated by hand.

Check that the monitoring equipment (if any) works.

Check the direction of rotation. See the figure. When started, the pump will jerk in the opposite direction to the direction in which the impeller rotates.



Beware!
The starting jerk on large pumps can be powerful!

The above measures are described under "Inspection".



In order to avoid sedimentation when the pumped medium contains solid particles, the velocity of the medium in the discharge line should be:

Mixture	Min. velocity in discharge line
1. Water + coarse gravel	4 m/s (13.1 ft/s)
2. Water + gravel	3.5 m/s (11.5 ft/s)
3. Water + sand	
3a. Sand particles <0.1 mm (<0.004")	1.5 m/s (4.9 ft/s)
3b. Sand particles <0.6 mm (<0.024")	2.5 m/s (8.2 ft/s)

The pump can be provided with level regulation in order to prevent unnecessary wear on the hydraulic components.

Cleaning

If the pump has been running in very dirty water, let it run for a while in clean water, or flush it through the discharge connection. If clay, cement or other similar dirt is left in the pump it may clog the impeller sealings preventing the pump from working.

CARE AND MAINTENANCE

The figures in parentheses are item numbers and refer to the cutaway figure.

Safety precautions

Before starting work on the pump, make sure that the pump is isolated from the power supply and cannot be energized.

NOTE! This applies to the control circuit as well.

The following points are important in connection with work on the pump:

- make sure that the pump has been thoroughly cleaned.
- observe good personal hygiene.
- beware the risk of infection.
- follow local safety regulations.



NOTE for Ex-version
All work on the explosion-proof motor section must be performed by authorized Flygt personnel or personnel authorized by Flygt.

Flygt renounces all responsibility for work done by untrained, unauthorized personnel.

Inspection

Regular inspection and preventive maintenance ensure more reliable operation.


The pump should be inspected at least every sixth month, more frequently under severe operating conditions.

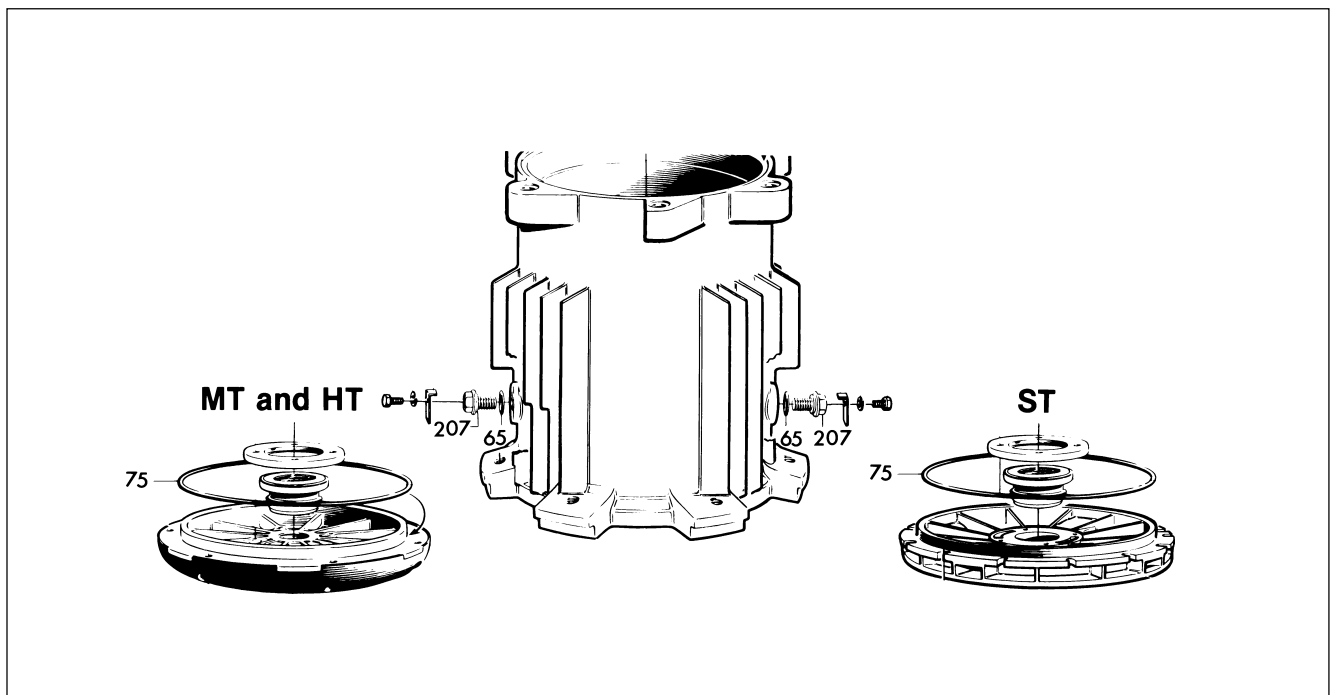
Under normal operating conditions, the pump should have a major overhaul in a service shop once a year.

This requires special tools and should be done by an authorized service shop.

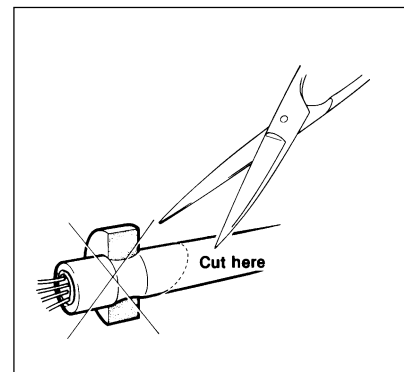
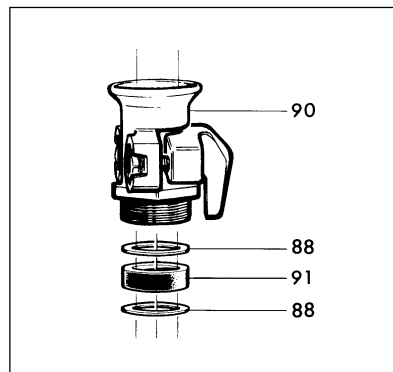
When the pump is new or when the seals have been replaced, inspection is recommended after one week of operation.

Recommended inspections:

Inspection of	Action
Visible parts on pump and installation	Replace or fix worn and damaged parts. Make sure that all screws, bolts and nuts are tight. Check the condition of lifting eyes.
Pump casing and impeller	Replace worn parts if they impair function. Wear on the impeller and the parts around it necessitates fine adjustment of the impeller or replacement of worn parts. See “Replacing the impeller” and “Replacing the diffuser”.
Oil quantity	<div data-bbox="453 521 1442 678" style="border: 1px solid black; padding: 5px;">  <p data-bbox="655 539 1385 663">WARNING. If the seal leaks, the oil casing may be under pressure. Hold a rag over the oil casing screw in order to prevent splatter. See “Safety precautions” for additional information.</p> </div> <p data-bbox="453 701 1425 761">Check that the oil reaches up to the oil hole when the pump is lying down with the oil hole “OIL FILLING” up.</p> <p data-bbox="453 772 943 801">Add oil as needed. See “Changing the oil”.</p>
Condition of the oil	<p data-bbox="453 831 1422 891">A check of the condition of the oil can show whether there has been any leakage. Note! Air/oil mixture can be confused with water/oil mixture.</p> <p data-bbox="453 902 1442 963">Insert a tube (or hose) into the oil hole. Cover the top end of the tube and take up a little oil from the bottom.</p> <p data-bbox="453 974 1433 1068">Change the oil if it contains too much water, i.e., is heavily emulsified (cream-like), or if the water has settled out. See “Changing the oil”. Check again one week after changing the oil.</p> <p data-bbox="453 1079 1134 1108">If the oil contains too much water again, the fault may be:</p> <ul data-bbox="453 1120 1283 1232" style="list-style-type: none"> — that an oil screw (207) is not sufficiently tight. — that an O-ring (65), (75) or its sealing surface is damaged. — that the lower seal (190) is damaged. Contact a Flygt service shop.



Inspection of	Action
Cable entry	<p>Make sure that the cable clamps are tight.</p> <p>If the cable entry leaks:</p> <ul style="list-style-type: none"> — check that the entry is tightened so it bottoms out. — cut a piece of the cable off so that the seal sleeve (90) closes around a new position on the cable. — replace the seal sleeve (91). — check that the seal sleeve (91) and the washers (88) conform to the outside diameter of the cables.
Cables	<p>Replace the cable if the outer jacket is damaged. Make sure that the cables do not have any sharp bends and are not pinched.</p>
Level sensors or other level equipment	<p>Check function. Clean, adjust, replace or repair damaged level sensing equipment. Follow the instructions for the level sensing equipment in question.</p> <p>NOTE! The level sensor contains a mercury switch. Damaged sensors should therefore be disposed of in a proper manner.</p>
Starter equipment	<p>If faulty, contact an electrician.</p>
Rotation direction of pump (requires voltage)	<p>Transpose two phase leads if the impeller does not rotate clockwise as viewed from above. Rotation in the wrong direction reduces the capacity of the pump and the motor may be overloaded. Check the direction of rotation, during non-load every time the pump is reconnected.</p>
Pipes, valves and other peripheral equipment	<p>Repair faults and notify supervisor of any faults or defects.</p>
Insulation resistance in the stator	<p>Use insulation tester. With a 1000 V-DC megger the insulation between the phases and between any phase and earth (ground) should be > 1 MΩ.</p>



Changing the oil



WARNING. If the seal leaks, the oil casing may be under pressure. Hold a rag over the oil plug to prevent splatter.

Lay the pump on its side on a bench or over two supports.

Remove the plug (57) marked "OIL DRAINING" and washer (58) from one of the oil holes.

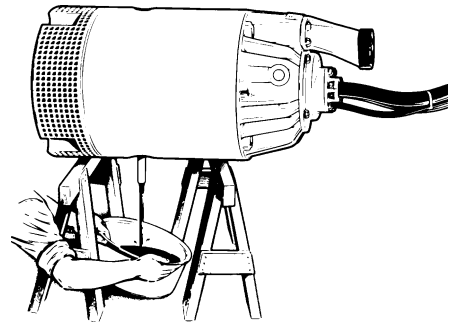
Unscrew the locking screw (3), spring washer (42), lock washer (208), oil casing screw (207) and O-ring (65).

Screw in the oil drainage tube (the tube is included with the pump at delivery).

Turn the pump so that the oil hole faces downwards. It is easier to drain the oil if the other oil hole screw is also removed.

Fill with 5 litres (5.3 quarts) of new oil. A paraffin oil with viscosity close to ISO VG 15 is recommended (e.g. Mobil Whiterex 307-309). The pump is delivered from factory with this type of oil. The hole is marked "OIL FILLING". Always replace the O-rings under the oil casing screws. Place the screws back in. Tightening torque 10—20 Nm (7—14 ft lb). Don't forget O-rings and washers.

Oil draining



Replacing the wear ring (ST pumps only)

Remove the screws (98) and the washers (46).

Lift off the base stand (173) and the strainer (135).

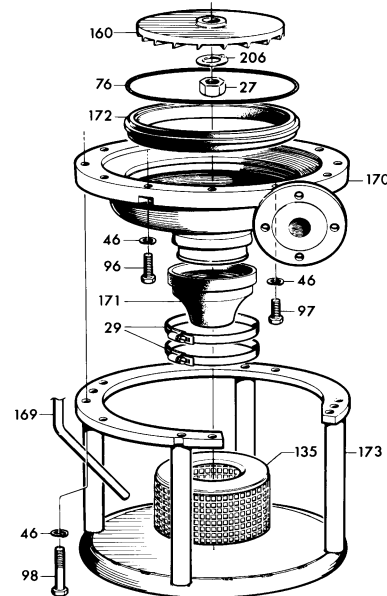
Remove the screws (96) and the washers (46).

Remove the screw (97) and the washers (46).

Lift off the pump casing (170).

Remove the O-ring (76). Carefully prize and lift up the wear ring (172).

The new wear ring shall be mounted in the pump casing so that the arrow stamped on the top side of the ring points towards the arrow cast into the casing, which is located next to the bolt hole nearest the discharge flange. See figure.



Replacing the impeller

(ST pumps)

See "Replacing the wear ring".

Then continue by bending down the tab washer (206) and unscrewing the impeller nut (27).

Pull off the impeller (160).

Use impeller puller 84 13 60 or pry off carefully with two strong screwdrivers or bars.



Replacing the impeller

Removing the impeller (MT and HT)



WARNING!
Worn impellers often have very sharp edges.

Lay the pump on its side.

Remove screws (10) and pull off the strainer (135).

Bend down the tabs on the tab washers (54) and (53).

Remove nuts (25).

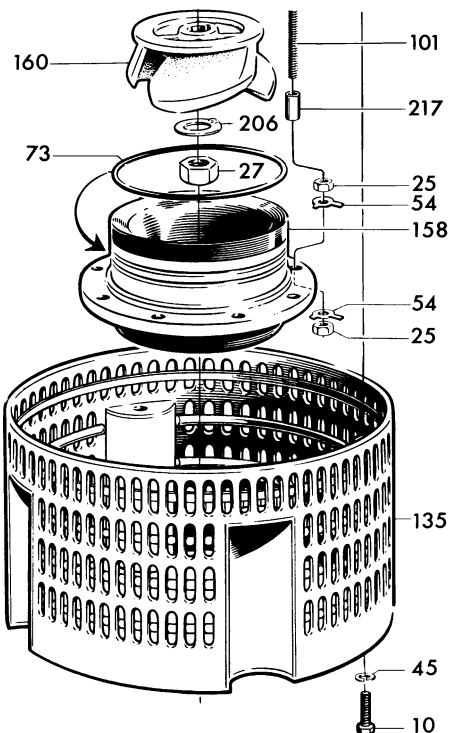
Remove lower diffuser (158), O-ring (73) and (74).

Remove impeller nut (27).

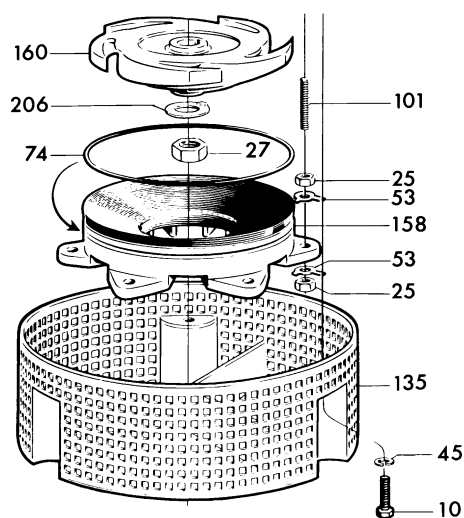
Remove the tab washer (206).

Pull off the impeller.

Use impeller puller 84 13 60 or pry off carefully with two strong screwdrivers or bars.



MT



HT

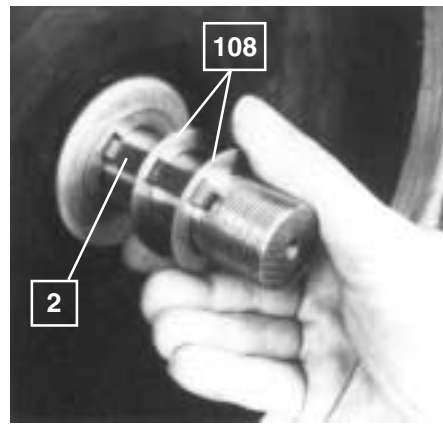
Installing the impeller

Make sure that the end of the shaft is clean and free of burrs. Polish off any flaws. Clean and oil all sealing surfaces and O-rings.

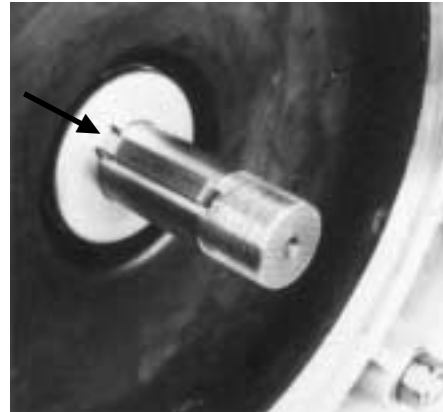
Check:

- that the key (2) is seated in the keyway on the shaft.
- that an appropriate number of adjusting washers (108) are on the shaft. (Does not apply to ST).

Grease end of shaft and impeller hub.



Check that the outer seal's driving pin is aligned with the key (1). Push the impeller carefully without turning the shaft in relation to the driving ring so that the pin fits into the impeller keyway.

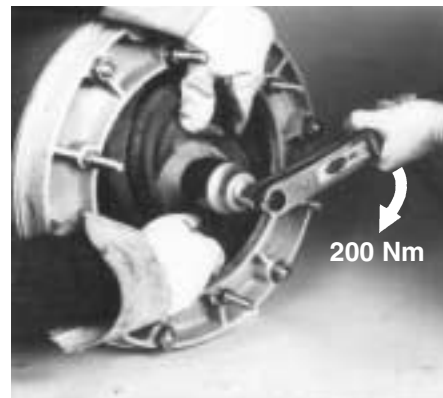


Fit washer (206), nut (27).

Tighten the impeller nut.

Tightening torque 200 Nm (150 ft lb).

Secure with washer (206).



Adjusting the impeller (MT and HT pumps only).

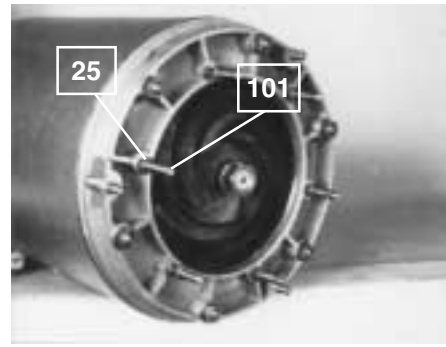
The clearance between the impeller and the oil casing bottom should be minimal when the impeller is tightened. The clearance can be adjusted with the adjusting washers (108).

Check that the impeller can easily be rotated by hand.



Screw the adjusting nuts (25) down toward the bottom on the studs (101).

Check that the spacers (217) (MT only) are seated on the studs (101).



Fit O-ring (73), (74) and washers (54), (53).

Press the lower diffuser (158) against the impeller.

Screw the adjusting nuts (25) so that they lie flush against the lower diffuser.

Back off all adjusting nuts another half-turn (counter-clockwise).

Place washers (53), (54) and nuts (25) on the studs.

Tighten the nuts evenly all around.

The clearance between the impeller and the lower diffuser shall be as little as possible.

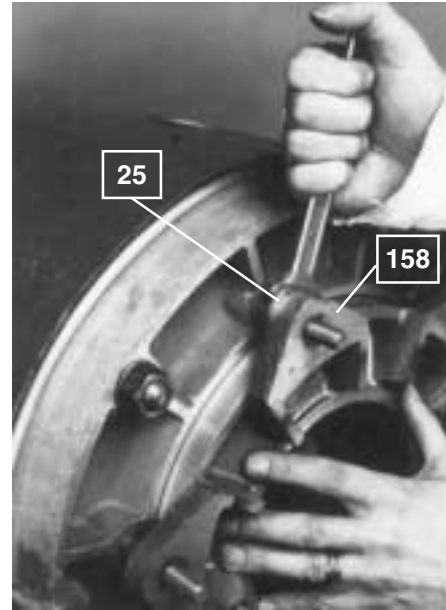
Check that the impeller can easily be rotated by hand.

Lock nuts (25) with tab washers (53) and (54).

Install: Strainer (135).

In order for the pump to perform at maximum capacity, the impeller must be adjusted regularly.

It is particularly important that the clearance between the lower diffuser and the impeller is kept to a minimum.



Replacing the diffuser (MT and HT pumps only)

Removing the diffuser

Remove the impeller, see "Removing the impeller".

Unscrew screws (99), washers (54) and remove the diffuser (121).

Installing the diffuser

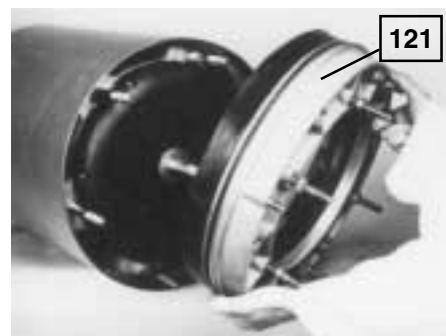
Screw the diffuser in place with the screws (99).

Tightening torque 200 Nm (150 ft lb).

Do not forget to put back washers (54).

For further instructions, see "Fitting the impeller".

More extensive repairs require special tools and should be carried out by an authorized service technician.



ACCESSORIES AND TOOLS

Tandem operation

The delivery head can be increased by connecting two or three pumps in tandem.

Max. permissible operating pressure is 1.2 MPa (174 psi) for MT and HT. 1.7 MPa (246 psi) for ST.

The vertical distances between the pumps should be approximately equal.

See special brochure that describes the procedure for tandem connection.

The following complete connection units are available for tandem connection:

Order No.	Intended for	Pump
415 12 00	R2	ST
337 06 08	R4	HT
337 06 09	4—8 NPSM	HT
337 06 10	R8	MT
337 06 11	NPT 8-8	MT

Installing the connection unit for tandem operation

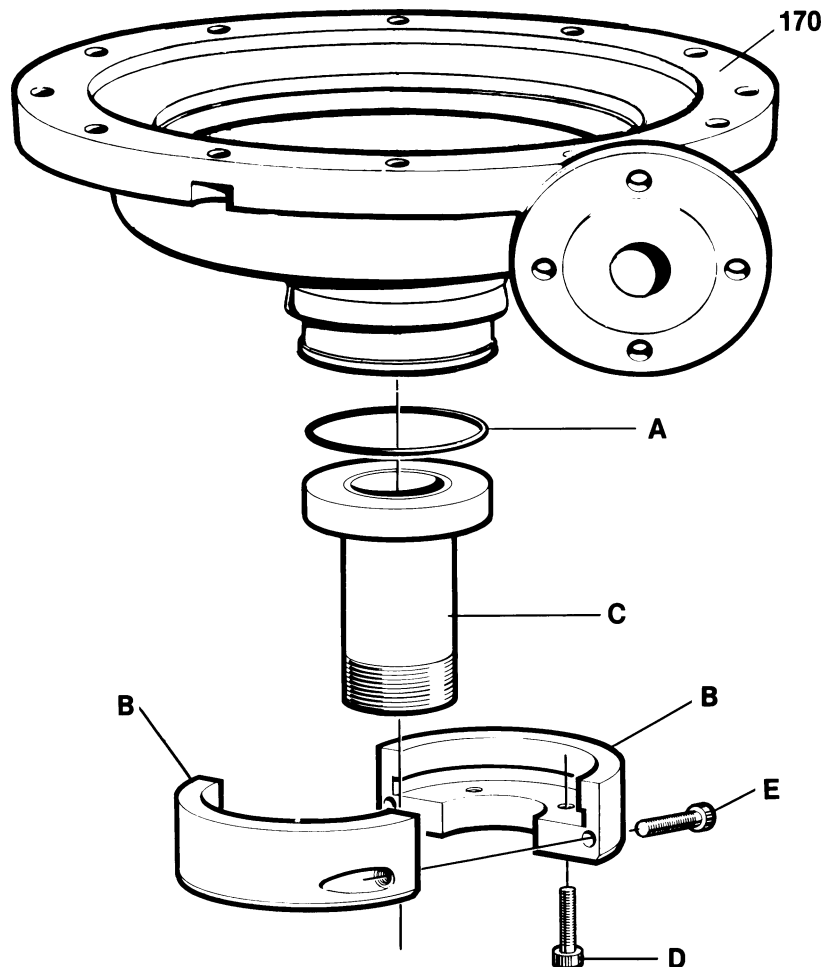
ST pumps (415 12 00).

Remove the base stand (173), the strainer (135) and the inlet bell (171).

Install connection unit 415 12 00 for tandem connection on the pump casing (170) as shown in the figure. The connection unit consists of the following parts:

Parts nr	Denomination	
82 79 02	O-ring 90.0 × 7.0	A
425 59 00	Connection	B
425 59 01	flange	
425 60 00	Pipe, compl.	C
82 00 53	Screw, 4 pcs	D
82 00 32	Screw, 2 pcs	E

Set of parts for tandem coupling ST



MT pumps 337 06 10 (8" BSP)
or 337 06 11 (NPT 8-8).

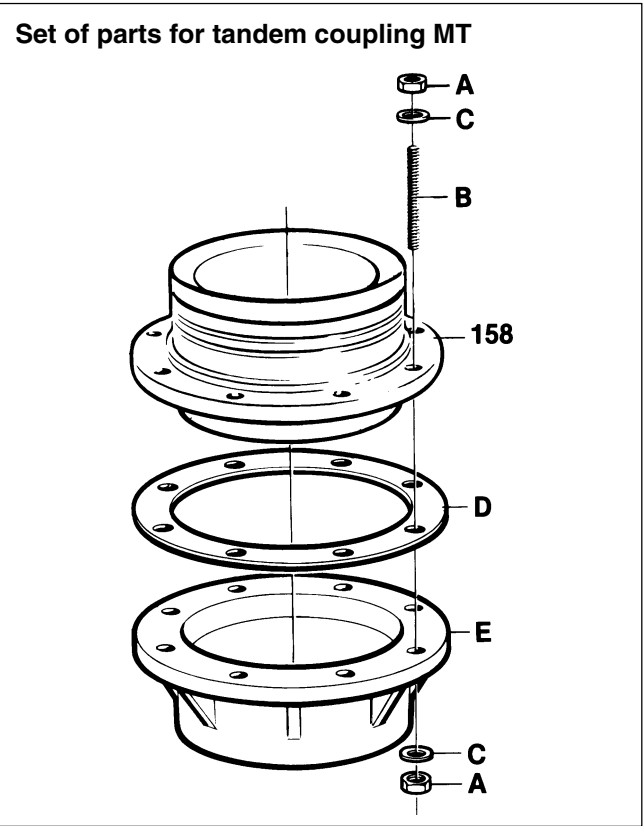
Remove the suction strainer (135) and the lower diffuser (158), screw the studs (84 46 92) into the empty threaded holes (4 holes) in the diffuser (121), screw a nut (82 23 61) onto every empty stud. Press the lower diffuser (158) against the impeller and set all eight adjusting nuts as instructed under the heading "Adjusting the impeller". Fit the gasket (214 27 01) and the tandem connection flange as shown in the figure.

Fit the lock washers (54), the washers (82 35 23) and the nuts (82 23 61).

Tighten the nuts evenly all around.

The connection unit consists of the following parts:

Parts nr	Denomination	
82 23 61	Nut, 8 pcs	A
84 46 92	Stud, 4 pcs	B
82 35 23	Washer, 4 pcs	C
214 27 01	Packing	D
385 20 02	Flange (R8")	} alt. E
385 20 03	Flange (NPT 8-8)	



HT pumps 337 06 08 (4" BSP)
or 337 06 09 (NPSM 4-8)

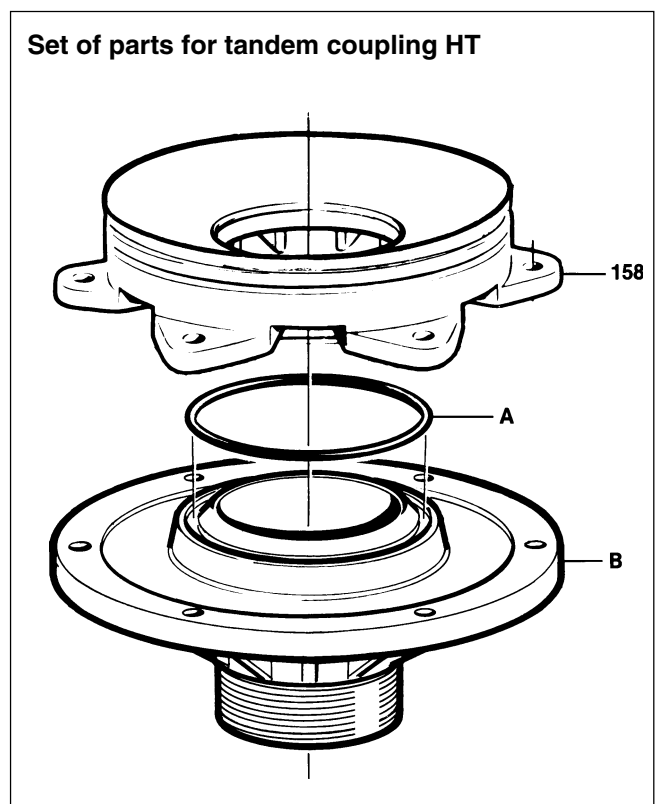
Remove the suction strainer (135). Remove the nuts (25) and the lock washers (53) on the underside of the lower diffuser (158). Fit the O-ring (82 74 81) and the tandem connection flange as shown in the figure.

Fit the lock washers (53) and the nuts (25) on the studs (101).

Tighten the nuts evenly all around.

The connection unit consists of the following parts:

Parts nr	Denomination	
82 74 21	O-ring (144.3x5.7)	A
337 05 02	Flange (R4")	} alt. B
337 05 03	Flange (NPSM 4-8)	



Zinc anode set

In order to reduce corrosion on the pump, it can be fitted with zinc anodes.

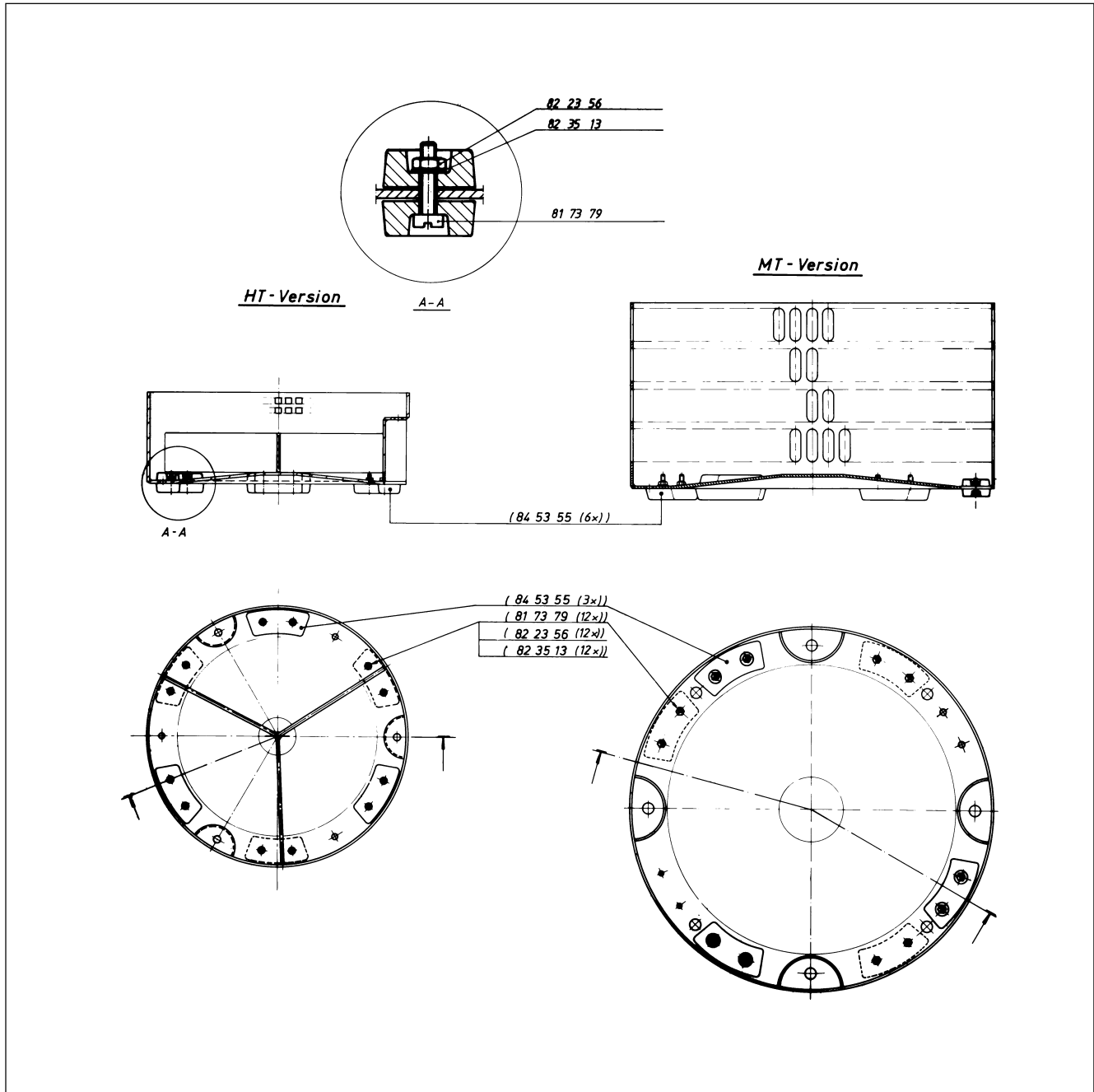
Order No. 290 15 00

Installing zinc anodes

The anodes are installed as shown in the figure.
Six anodes are fitted on the outside and three on the inside of the strainer bottom.

Important!

Brush or grind off paint, grease and dirt or any other coating that might interfere with the electrical contact between the anodes and the strainer.



Start and control equipment

Flygt has suitable start and control equipment for the pump. Contact Flygt for further information.

Tools

The following tools are required in order to perform the necessary care and maintenance of the pump:

Order No.	Description
84 12 27	Triangular box wrench, M6
84 12 29	Triangular box wrench, M10
84 12 30	Triangular box wrench, M12
84 13 84	Socket, n = 10
84 13 87	Socket, n = 13
84 13 92	Socket, n = 19
84 13 96	Socket, n = 24
84 15 55	Extension bar, 125 mm
84 15 61	Swivel handle
84 11 41	Combination wrench, n = 19
84 11 43	Combination wrench, n = 24
84 14 31	Adjustable wrench, 18"
84 13 60	Puller
84 15 64	Torque wrench, max. 225 Nm

For further information on tools, see Flygt's Tool Catalogue.

FAULT TRACING (Troubleshooting)

A universal instrument (VOM), a test lamp (continuity tester) and a wiring diagram are required in order to carry out fault tracing on the electrical equipment.

Fault tracing shall be done with the power supply disconnected and locked off, except for those checks which cannot be performed without voltage.

Always make sure that there is no one near the pump when the power supply is turned on.

Use the following checklist as an aid to fault tracing. It is assumed that the pump and installation have formerly functioned satisfactorily.

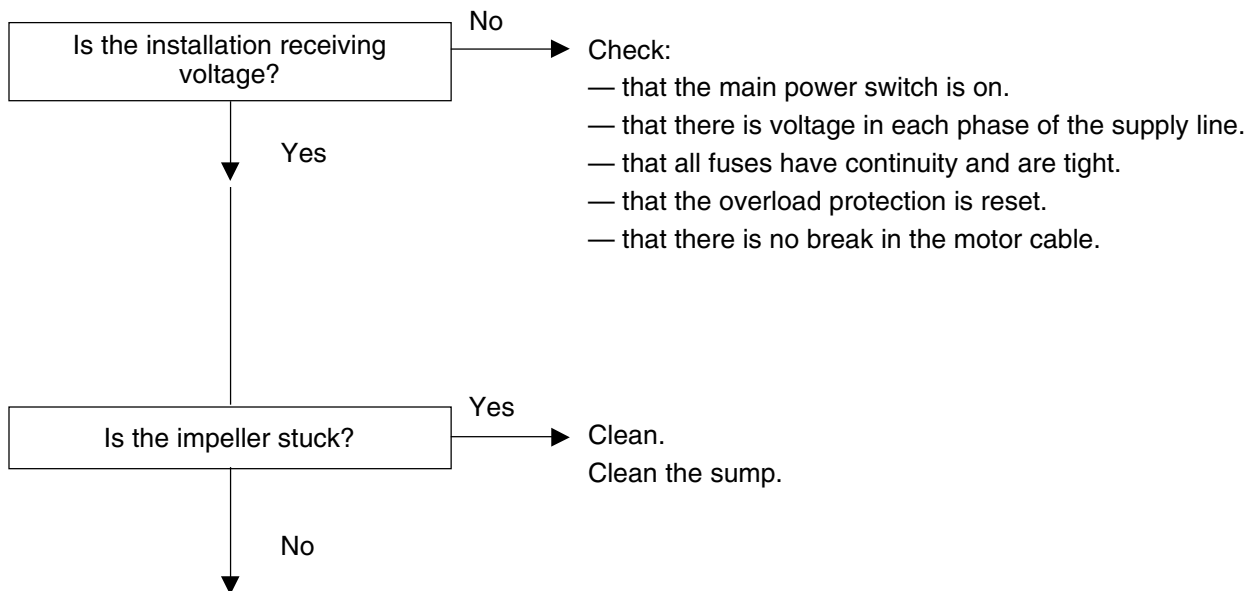
Electrical work should be performed by an authorized electrician.

Follow local safety regulations and observe recommended safety precautions.



NOTE for Ex version
All work on the explosion-proof motor section must be performed by authorized Flygt personnel or personnel authorized by Flygt.

1. Pump fails to start

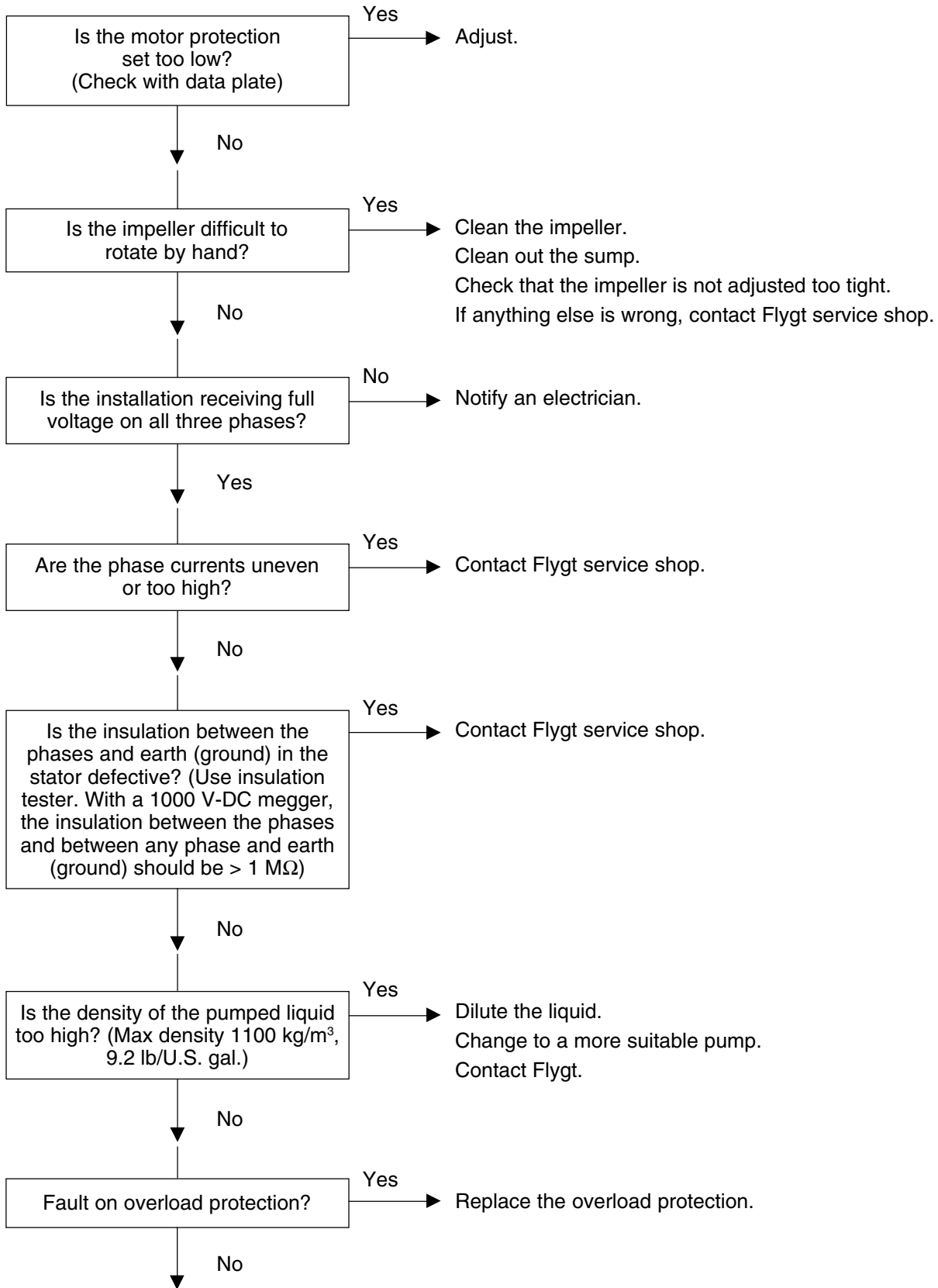


Contact Flygt service shop.

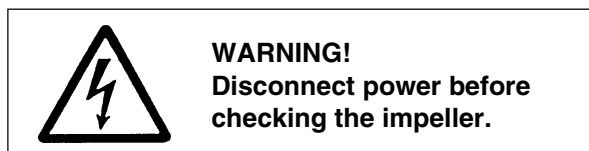


WARNING!
Disconnect power before checking the impeller.

2. Pump starts but motor protection trips



Contact Flygt service shop.



3. Pump runs but delivers too little or no water

Check:

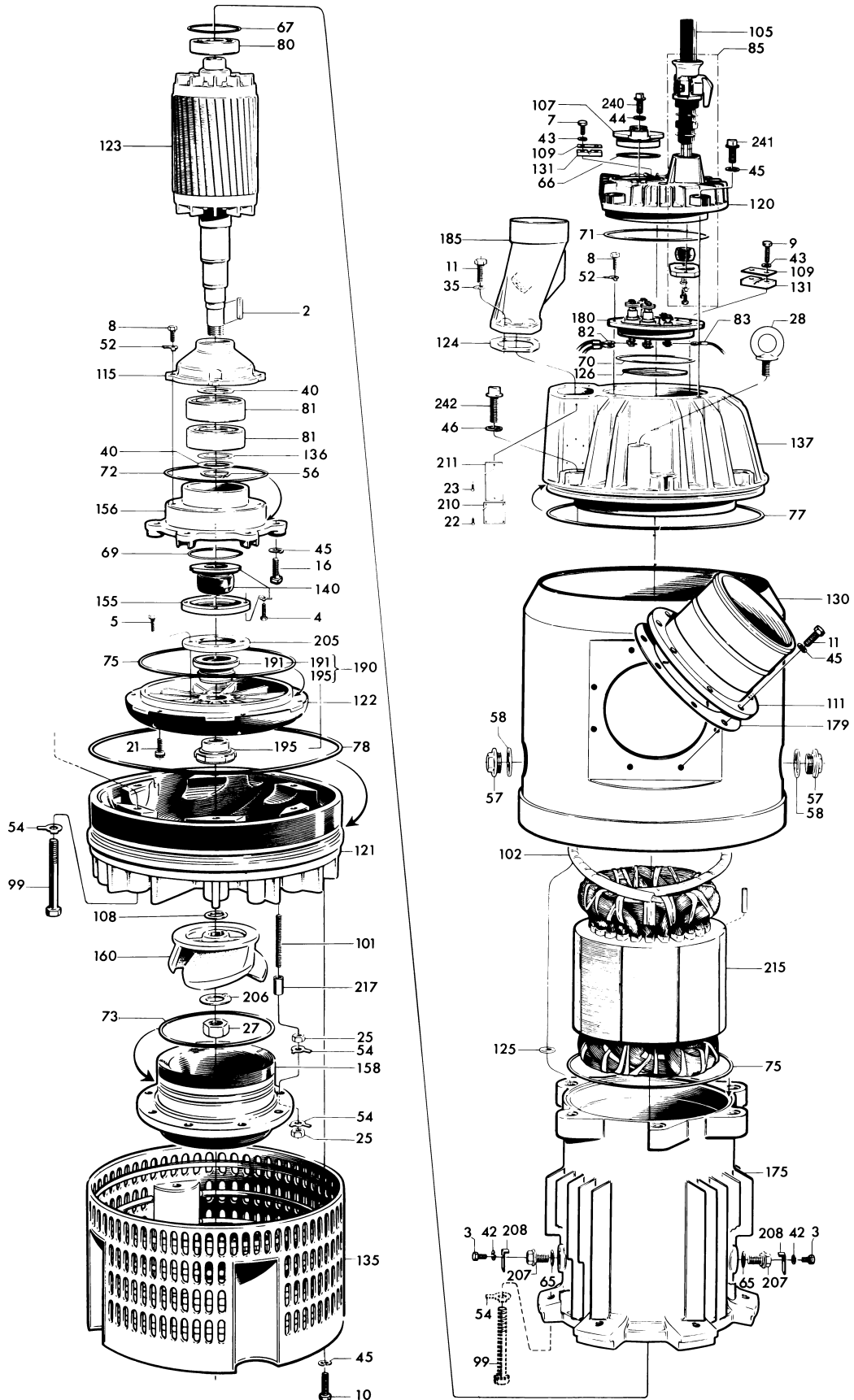
- direction of rotation of the pump, see “Before starting”.
- that valves are open and intact.
- that pipes, impeller and strainer are not clogged.
- that the impeller rotates easily.
- that the suction lift has not been altered.
- for leakage in the pump installation.
- for wear on wear ring, impeller, pump casing, suction bottom, diffuser.

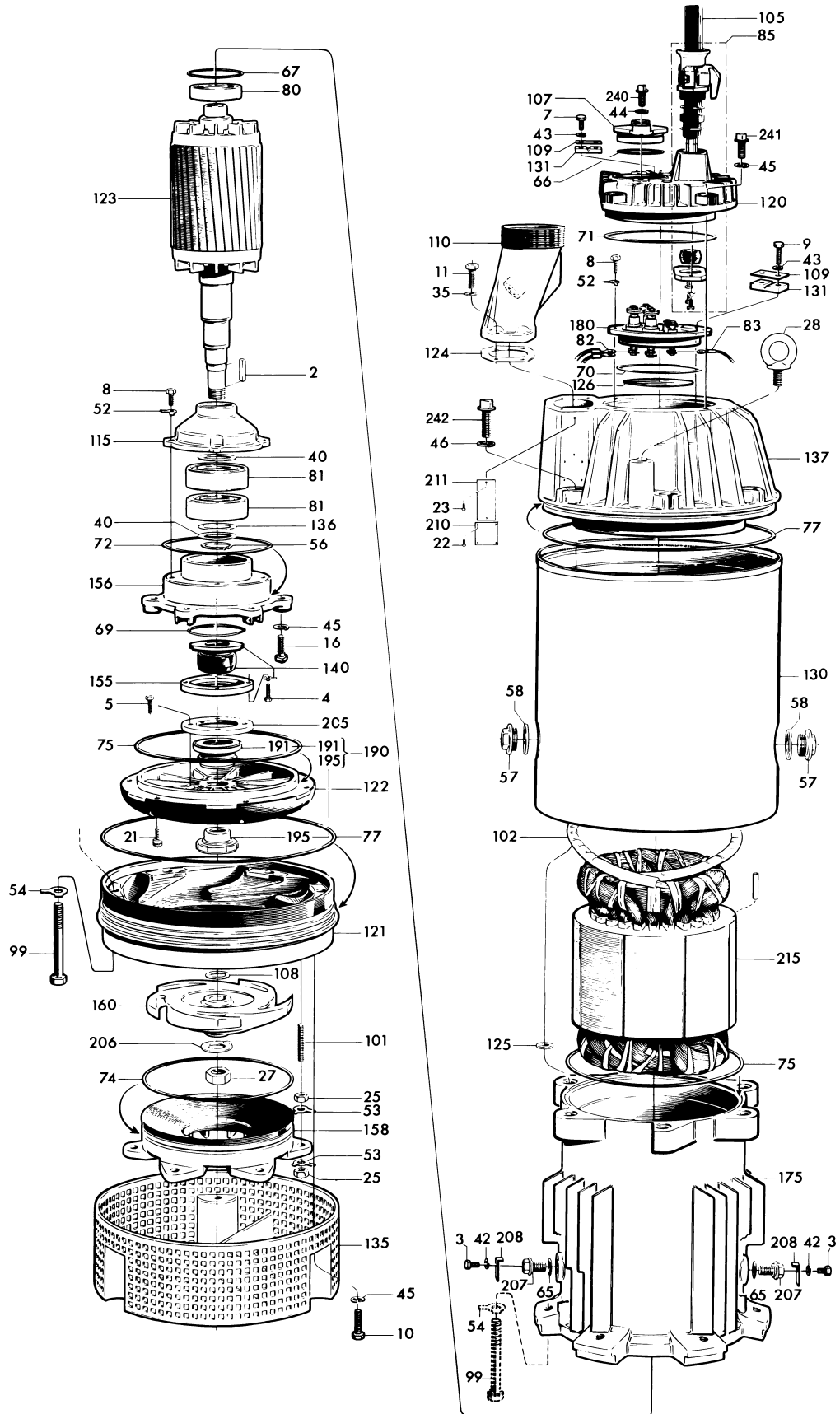
See also under “Inspection”.

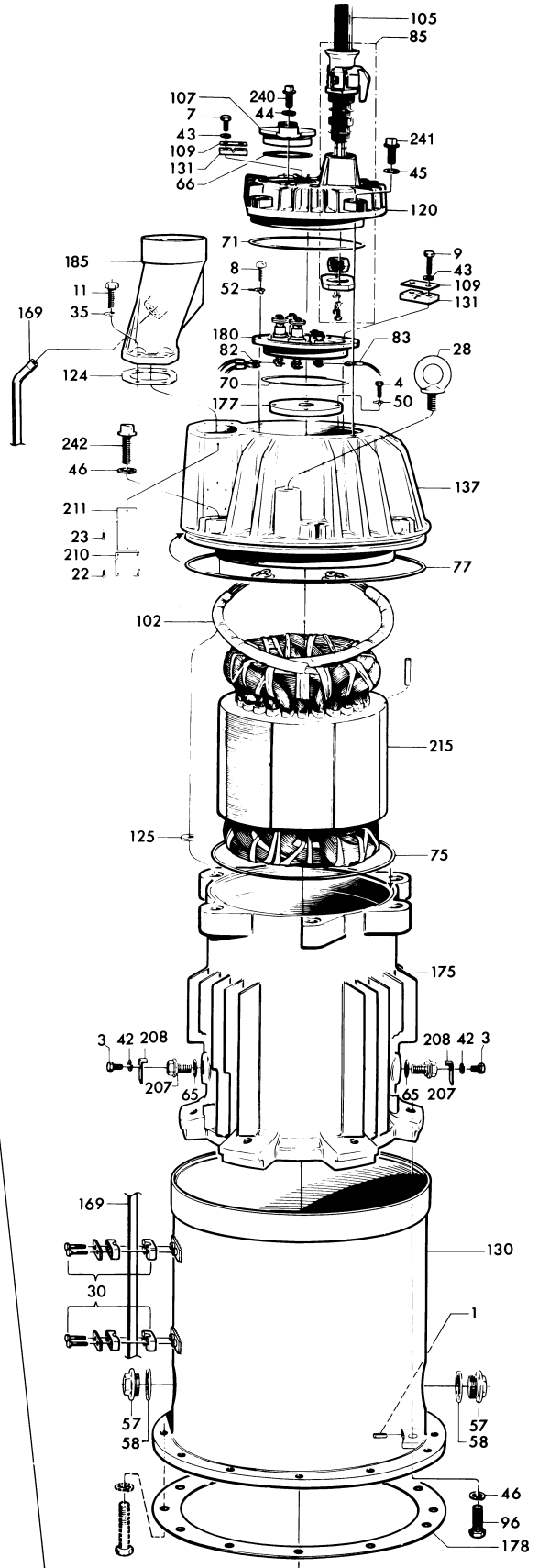
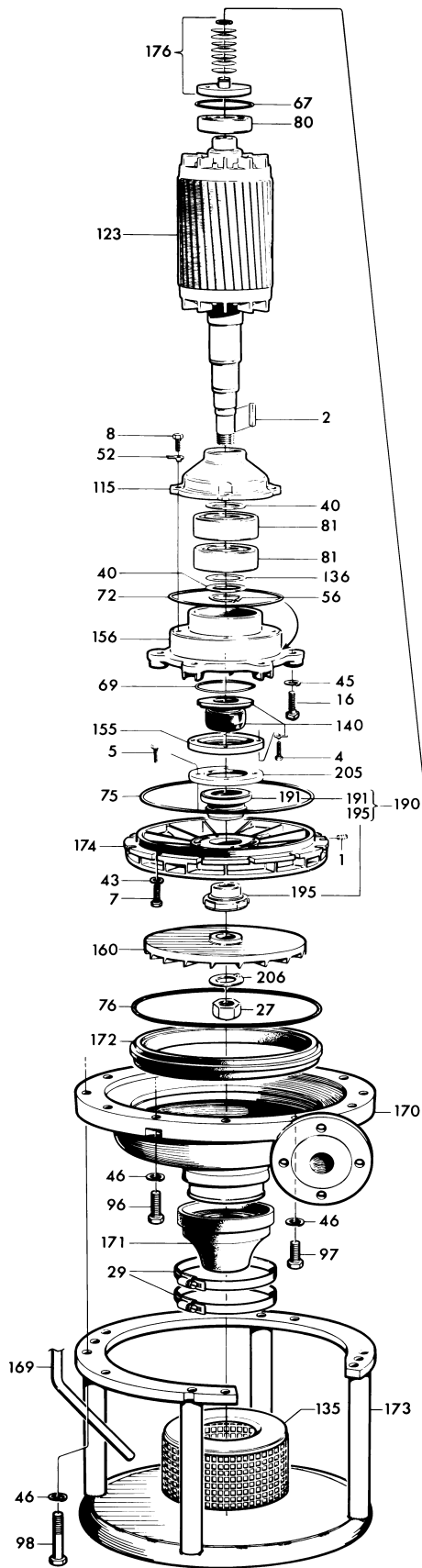
Do not override the motor protection repeatedly if it has tripped.

SERVICE LOG

Most recent service date	Pump No.	Hours of operation	Remarks	Sign.









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