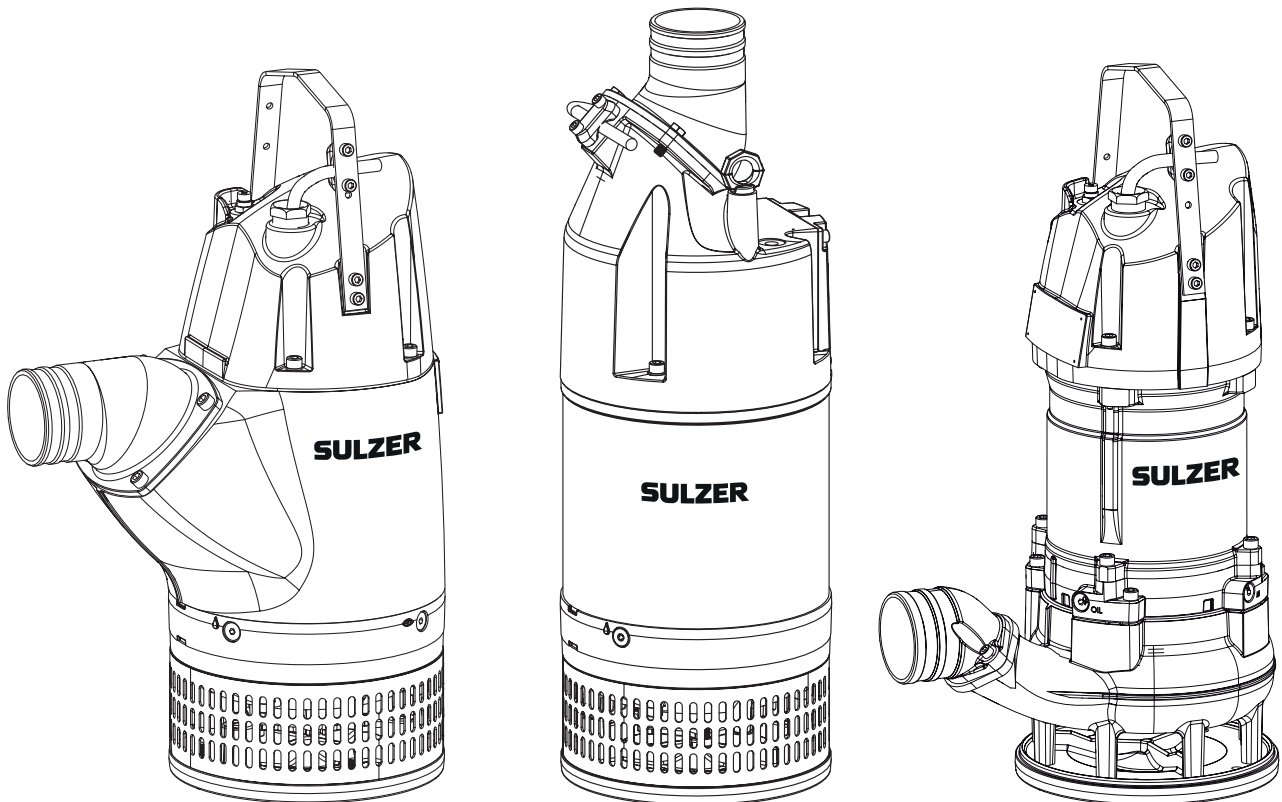

Submersible Drainage Pump XJ
Submersible Drainage Center-line Pump XJC
Submersible Sludge Pump XJS



Submersible drainage pump XJ

XJ 25 ND (50/60 Hz)	XJ 25 HD (50/60 Hz)		
XJ 40 ND (50/60 Hz)	XJ 40 HD (50/60 Hz)		
XJ 50 ND (50/60 Hz)	XJ 50 HD (50/60 Hz)	XJ 50 LD (50/60 Hz)	
XJ 80 ND (50/60 Hz)	XJ 80 HD (60 Hz)	XJ 80 LD (50/60 Hz)	XJ 80 SD (50/60 Hz)
XJ 110 ND (50/60 Hz)	XJ 110 HD (50/60Hz)		

XJ 25 ND AT (50/60 Hz)	XJ 25 HD AT (50/60 Hz)		
XJ 40 ND AT (50/60 Hz)	XJ 40 HD AT (50/60 Hz)		
XJ 50 ND AT (50/60 Hz)	XJ 50 HD AT (50/60 Hz)	XJ 50 LD AT (50/60 Hz)	
XJ 80 ND AT (50/60 Hz)	XJ 80 HD AT (60 Hz)	XJ 80 LD AT (50/60 Hz)	XJ 80 SD (50/60 Hz)
XJ 110 ND AT (50/60 Hz)	XJ 110 HD AT (50/60 Hz)		

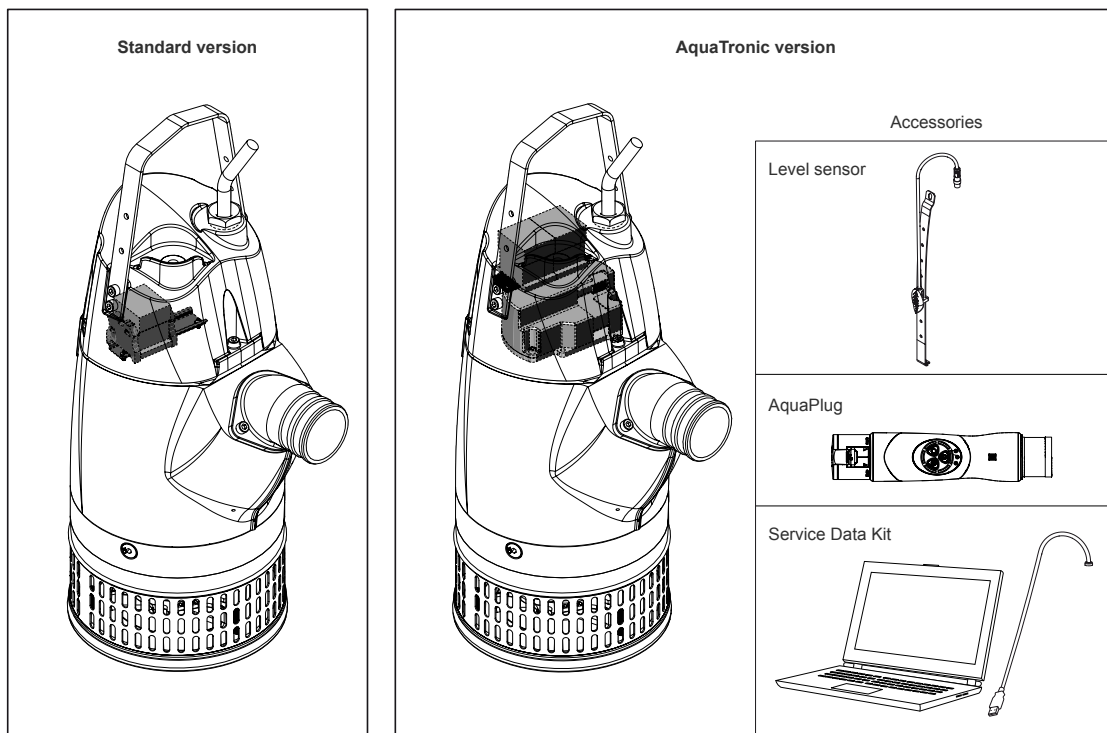
Submersible drainage center-line pump XJC

XJC 50 ND (50/60 Hz)	XJC 50 HD (50/60 Hz)	XJC 50 LD (50/60 Hz)	
XJC 80 ND (50/60 Hz)	XJC 80 HD (60 Hz)	XJC 80 LD (50/60 Hz)	XJC 80 SD (50/60 Hz)
XJC 110 ND (50/60 Hz)	XJC 110 HD (50/60 Hz)		

XJC 50 ND AT (50/60 Hz)	XJC 50 HD AT (50/60 Hz)	XJC 50 LD AT (50/60 Hz)	
XJC 80 ND AT (50/60 Hz)	XJC 80 HD AT (60 Hz)	XJC 80 LD AT (50/60 Hz)	XJC 80 SD (50/60 Hz)
XJC 110 ND AT (50/60 Hz)	XJC 110 HD AT (50/60 Hz)		

Submersible sludge pump XJS

XJS 25 (50/60 Hz)	XJS 25 AT (50/60 Hz)
XJS 40 (50/60 Hz)	XJS 40 AT (50/60 Hz)
XJS 50 (50/60 Hz)	XJS 50 AT (50/60 Hz)
XJS 80 (50/60 Hz)	XJS 80 AT (50/60 Hz)
XJS 110 (50/60 Hz)	XJS 110 AT (50/60 Hz)



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1. General

1.1 Service intervals

This workshop manual can be used for both regular inspection and complete overhaul on the pump. For assistance contact Sulzer workshop or by Sulzer authorized workshop.

- For regular inspection on the pump such as electrical check, oil/motor check and check of hydraulic parts, proceed and follow chapter 1 to 5 in this manual.
- For complete overhaul on the pump proceed and follow chapter 1 to 9 in this manual.
- For electrical information and wiring diagrams see chapter 10.

Submersible drainage pumps XJ 25-110, Submersible drainage center-line pumps XJC 50-110 and Submersible sludge pumps XJS 25-110 are built for long periods of trouble free operation. The pumps can “run on snore” without any risk for the mechanical seals. They get sufficient cooling from the pumped media and sufficient lubrication and cooling from the oil in the housing between the seals. All the ball bearings are sealed and prefilled with high performance bearing grease for life time duty.

Regular inspection and preventive maintenance will ensure more reliable operation. The pump should be inspected every six months and should have a complete overhaul once a year. If the operating condition of the pump is severe it may be required more frequently. A reason for inspection could be if a drop in capacity is being noticed.

1.2 AquaTronic version

Check the pump data in the Service Diagnose Program (see separate manual) before dismantling AquaTronic version.

1.3 Repair kits and o-ring kits

The repair kits include preselected spare parts which secure a fast and efficient maintenance and avoids unnecessary downtime for the pump. The o-ring kit is included in the repair kit and can be ordered separately. For contents of repair and o-ring kits see spare part lists, positions marked **1** and **2**.

Repair kits: XJ 25-40, XJS 25-40: 00863347

XJ 50-110, XJC 50-110, XJS 50-110: 00863348

O-ring kits: XJ 25-40, XJS 25-40: 00863349

XJ 50-110, XJC 50-110, XJS 50-110: 00863350

1.4 Tools

The submersible drainage pumps can be maintained with standard tools. Sulzer does not recommend the use of impact tools for removal and installation of screws and nuts.

Torque rating

Size	M4	M5	M8	M10
Nm	1.0	4.1	17	33
lb-ft	1.5	3.0	12.5	24.3

Cable gland: A specific torque value cannot be given for the cable gland. Tighten it until the rubber offers resistance, and thereafter, one more full rotation.

1.5 Complete pump overhaul

A complete overhaul of the pump should be carried out if there has been water or oil in the motor housing or if the pump has been in daily operation for more than a year. At low utilization of the pump the overhaul intervals can be extended. For complete overhaul follow the workshop manual and dismantle the pump completely, replace damaged and worn parts.

Use only Sulzer spare parts.

Spare part lists are available in the resources section of the Sulzer web site at www.sulzer.com.

1.6 Cleaning of pump before service

Before overhaul or maintenance is started the pump should be cleaned. High pressure water is recommended. If the pump has been operating in tough applications additional solvents can be used. To clean the pump from lime deposits it is recommended to lower the pump in a bath containing formic acid (15%) and 85% water for some hours. If needed leave the pump longer. Clean the pump again with high pressure water. Another example is to use Beto 2000 which is a solvent for concrete deposits.

1.7 Recycling in case of scrapping the pumps

Recycling of individual pump parts is beneficial to the environment. The pump can be fully dismantled for recycling. Aluminium, stainless steel, ductile iron and high chrome cast iron can be recycled when a pump is scrapped. Wear parts which consists of rubber/polyurethane/aluminium/steel and cables/stators with copper must be treated before recycling is possible. Environmental white oil should be left to designated areas.

2. Service inspection

2.1 Service Data Kit

Contact Sulzer.

2.2 Pump start and cable check

Check the cable for damage and that there is no water or corrosion in the connecting plug.

Test the insulation between cable end / plug and earth.

Check if the pump starts by connecting it to the power supply.

2.3 Dismantling cover

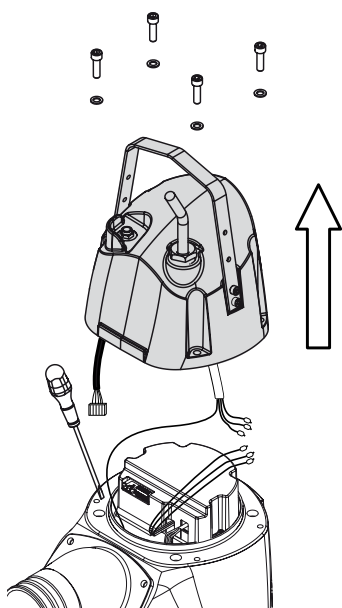
Unscrew and lift off the cover and disconnect the power cables from the contactor/terminal block.

If the water has penetrated through the cable gland and the cable seal, the cable gland and the cable seal should be replaced. Remove strain relief clamp prior to unscrewing cable gland body. Pull out cable, cable gland, washer and unscrew the cable seal.

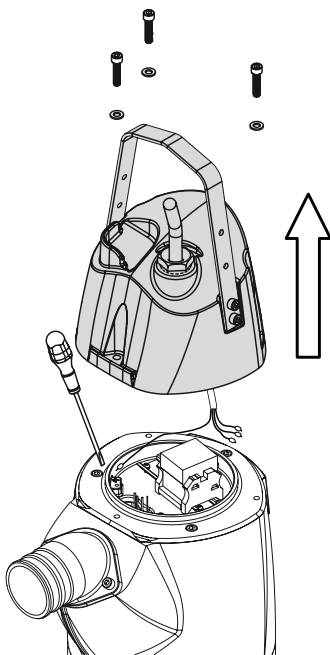


DANGER! Always check that the pump is disconnected from the electric power supply before opening any part of the pump.

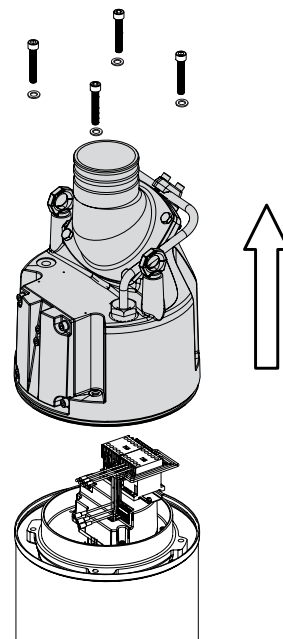
AquaTronic version



Standard version



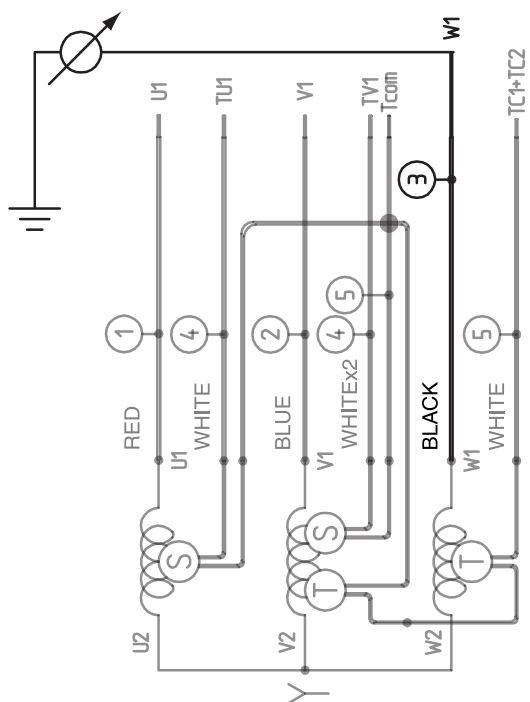
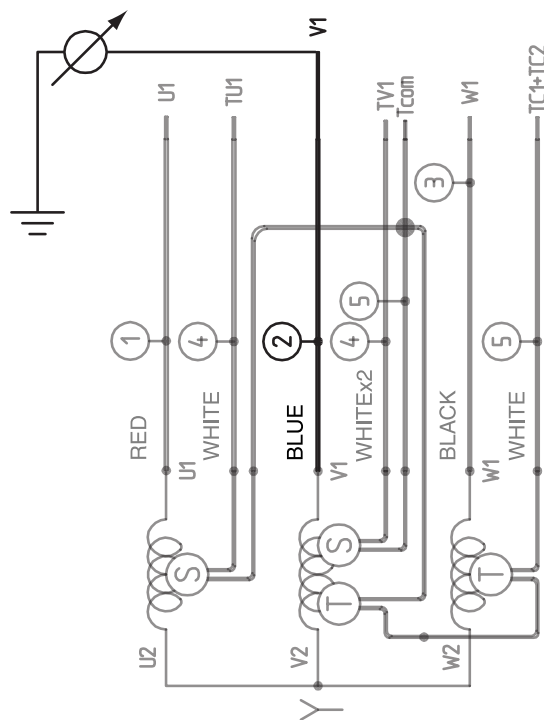
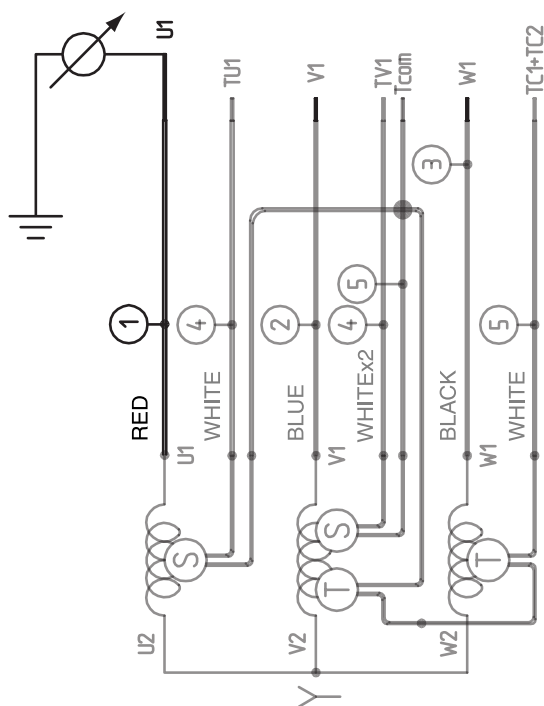
XJC



2.4 Insulation test

Disconnect stator leads. Check that the contact points are not burned. Measure insulation resistance between the different phase windings, between windings and earth and between windings and thermal sensor circuit.

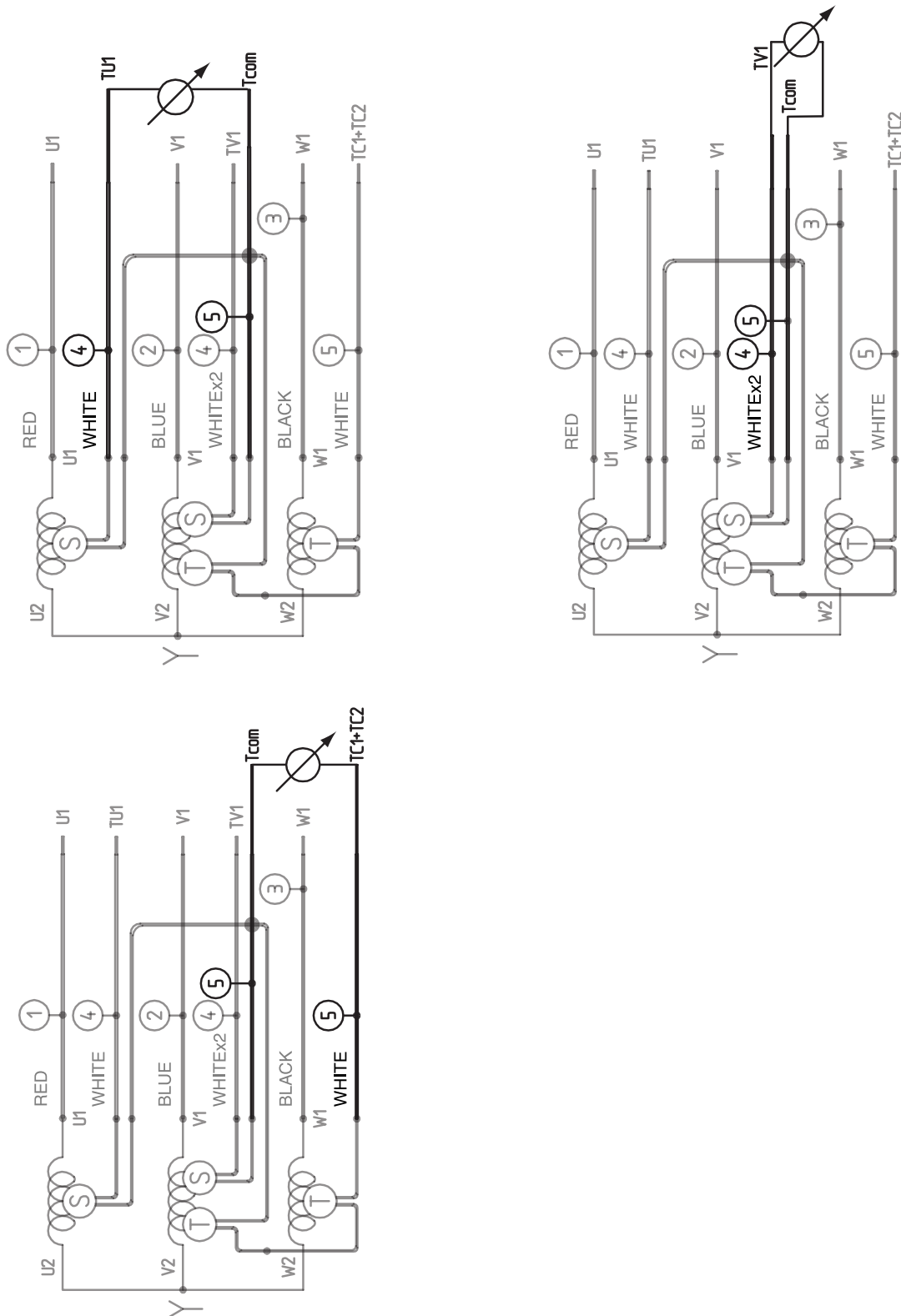
The insulation resistance should be measured with 500 V megohmmeter (megger) and the reading should be at least 1 MΩ. If the insulation resistance is lower, the stator unit should be dried in an oven. If the stator insulation reading after drying is still low, the stator unit should be replaced. See chapter 7.



The insulation between the separate turns in the winding should also be checked. This can be done by measuring the resistance of the phase windings, which should give the same reading for all three windings for 3-phase motors. For resistance values and wiring diagrams check chapter 9.

2.5 Thermal sensors

The circuit thermal sensors with the two built-in NTC thermistors (TU1+TV1) $\text{\textcircled{S}}$, used when pumps are equipped with AquaTronic, should be checked for continuity, using an ohmmeter. At 25°C = 47 kOhm. The circuit, used when pumps are equipped with DS contactor, with the two thermal contacts (TC1+TC2) $\text{\textcircled{T}}$ should be checked for continuity, using an ohmmeter or buzzer.



If one sensor has much too high or low resistance it should be removed from terminals at AquaTronic module.

3. Oil / Motor check

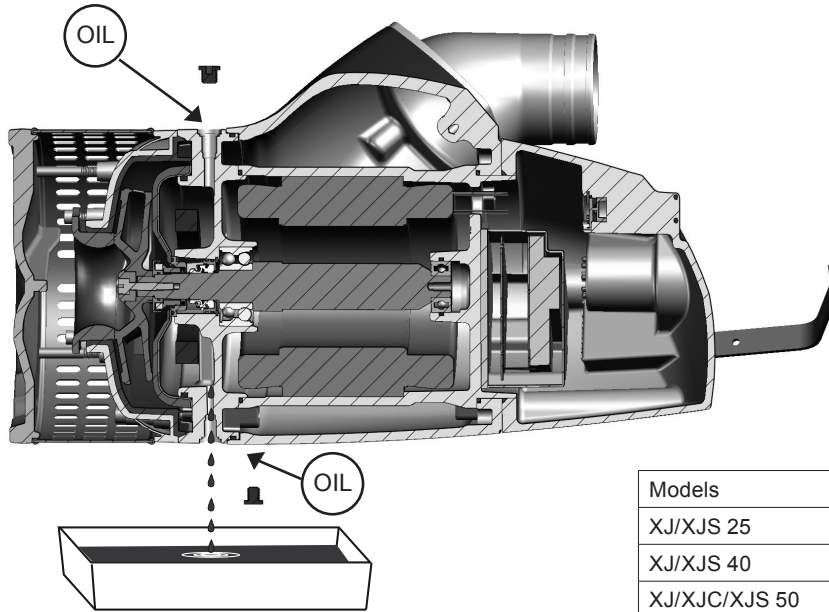
3.1 AquaTronic version

See separate manual for Service Diagnostic Program.

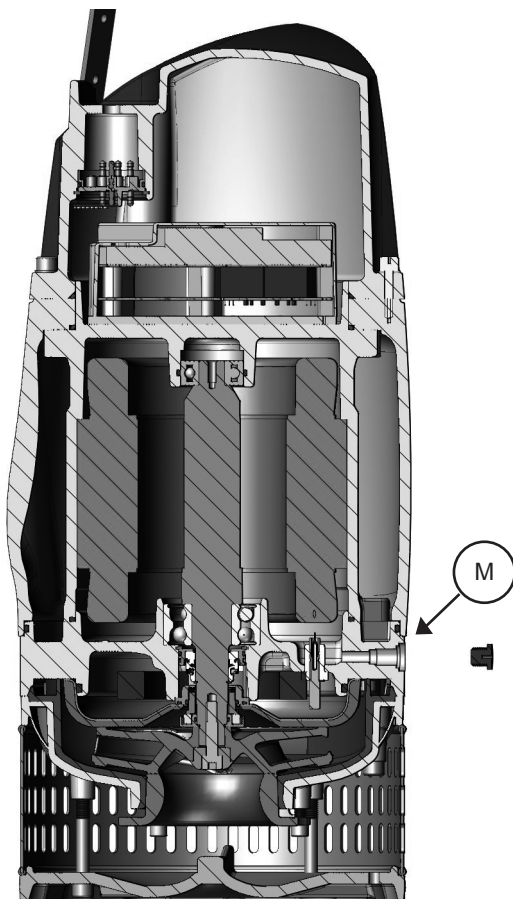
3.2 Standard version and AquaTronic version

Unscrew the two oil plugs and drain off the oil in a clean can and inspect it. Oil should be clear and without impurity.

For refilling of oil see chapter 8.9.



Models	litres	US gallon
XJ/XJS 25	0.4	0.11
XJ/XJS 40	0.4	0.11
XJ/XJC/XJS 50	0.9	0.24
XJ/XJC/XJS 80	0.9	0.24
XJ/XJC/XJS 110	0.9	0.24



The motor plug gives access to the motor housing.

Unscrew and check to make sure no oil or water has leaked into the motor housing.

4. Hydraulic check

If the test run against shut of head shows that the pump is not close to expected head a hydraulic check is needed.

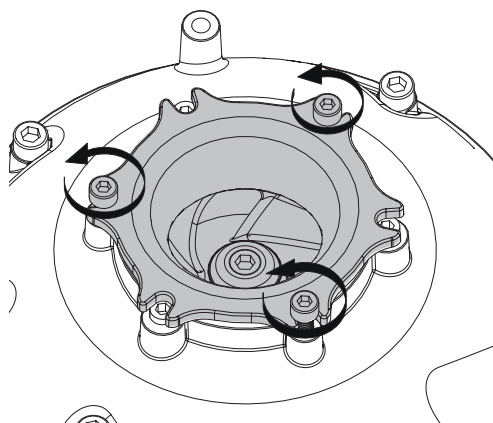
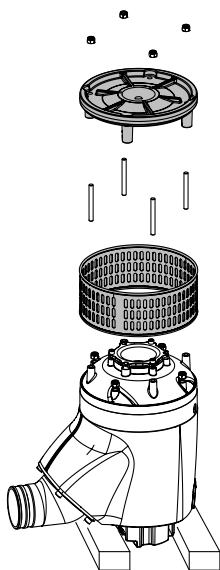
4.1 Wear ring ND, HD

4.1.1 Adjustment of wear ring



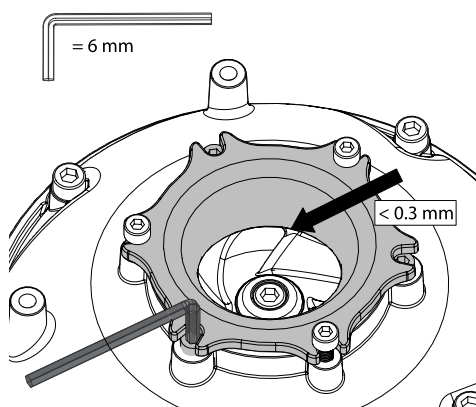
CAUTION!

Do not place the pump directly on the AquaTronic unit. It will break.

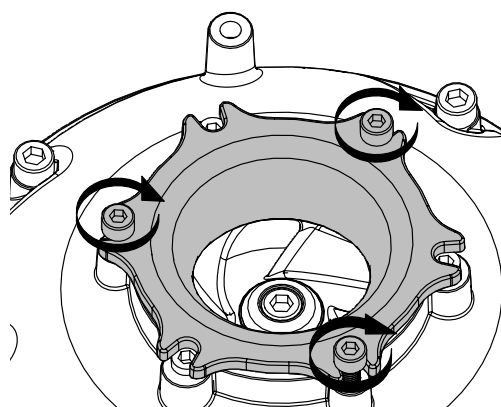


Turn the pump upside down and remove the base plate and strainer.

Check clearance between wear ring and impeller. Clearance should be less than 0.3 mm. Loosen the wear ring to make adjustments.



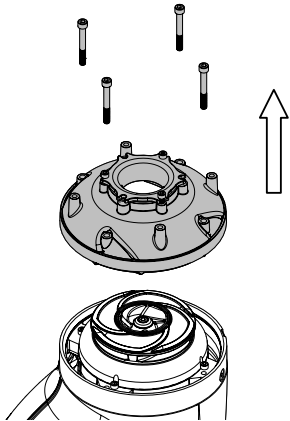
Adjust the clearance with the three screws that hold the wear ring.



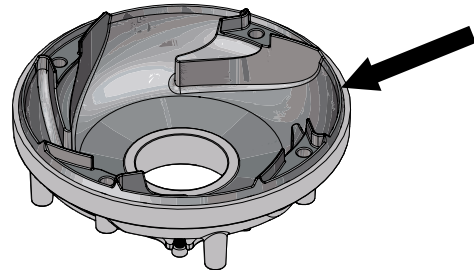
Fasten wear ring with remaining three screws.

4.2 Diffuser ND, HD, LD

4.2.1 Dismantling of diffuser

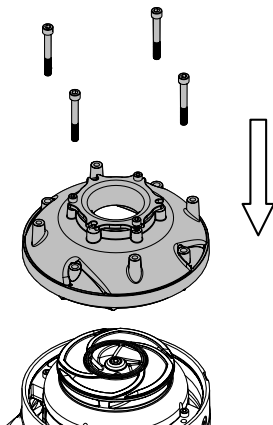


Remove the screws which hold the upper diffuser and bearing house together.



Check the diffuser for scratches. The rubber should have a smooth surface.

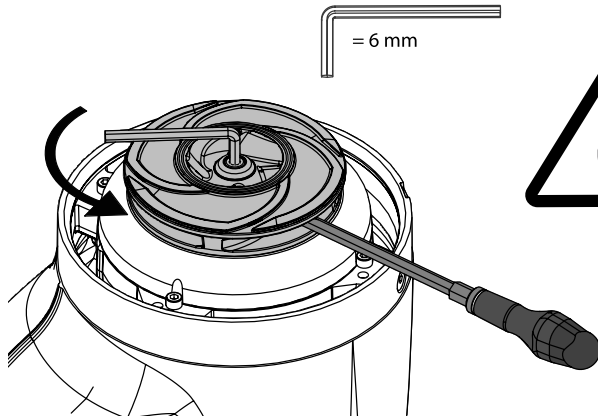
4.2.2 Assembly of diffuser.



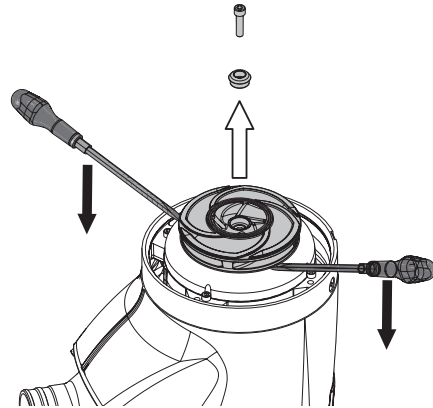
Fasten the upper diffuser on the bearing house.

4.3 Impeller ND, HD, LD

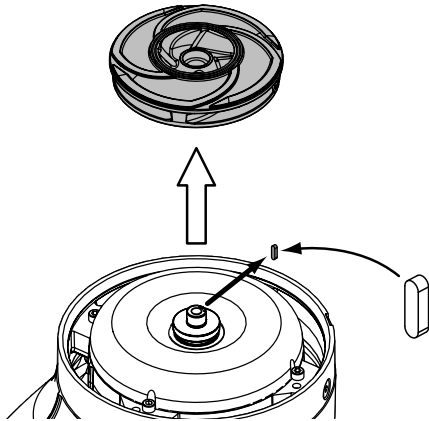
4.3.1 Dismantling of impeller



Hold the impeller with a large screwdriver or similar, between the vanes and unscrew the impeller washer.

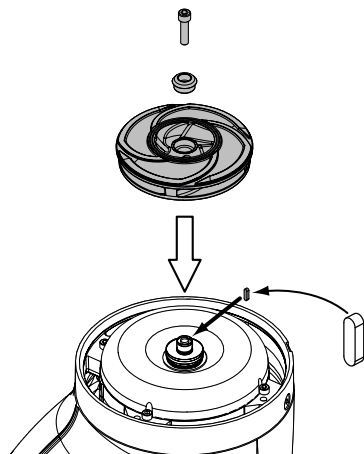


Pry the impeller loose with two screwdrivers under the impeller hub.

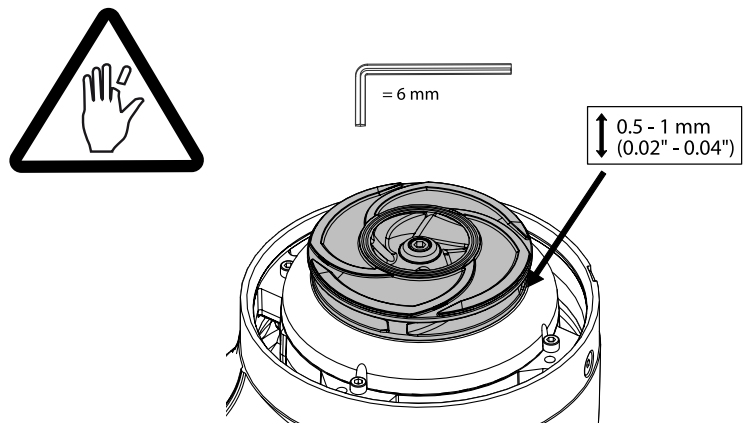


Remove the key from the shaft.

4.3.2 Assembly of impeller



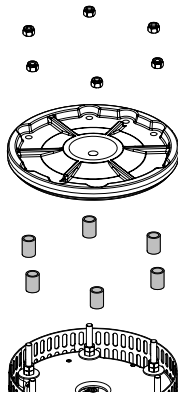
Mount the new impeller on the shaft, securing it with key, washer and screw.



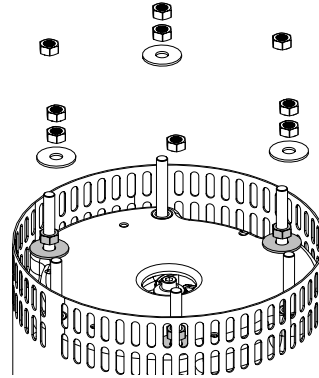
Check that the impeller runs free of upper diffuser with a clearance of 0.5 - 1 mm (0.02 - 0.04"). Adjust the clearance with shims between impeller and the shaft if necessary.

5. XJ 80 SD, change of diffusers, impellers and guide vane plate

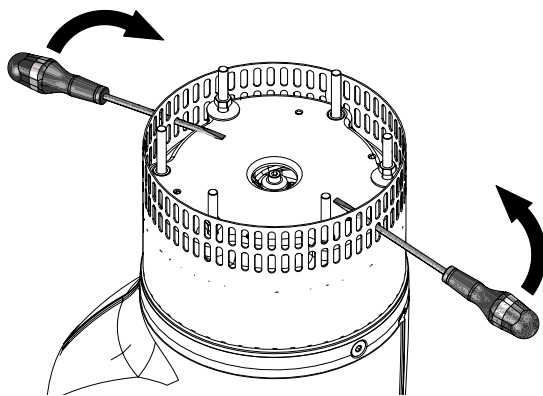
5.1 Dismantling



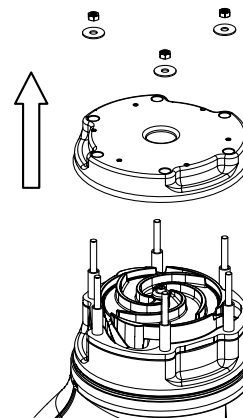
Turn the pump upside down. Loosen the bottom nuts and remove the base plate and the rubber sleeves.



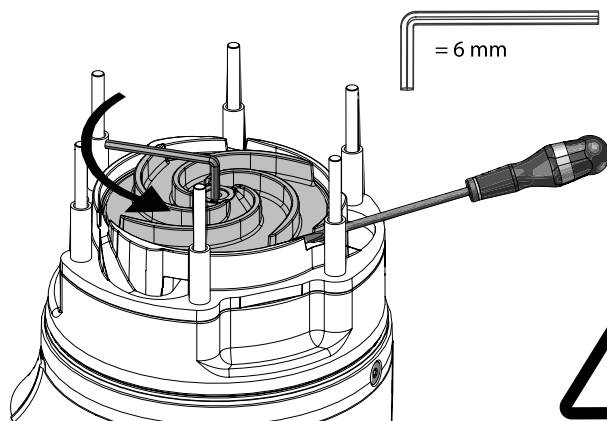
Loosen the dual nuts and washers that hold the lower diffuser but make sure to leave three nuts to keep the diffuser in place (loosen them a few turns only).



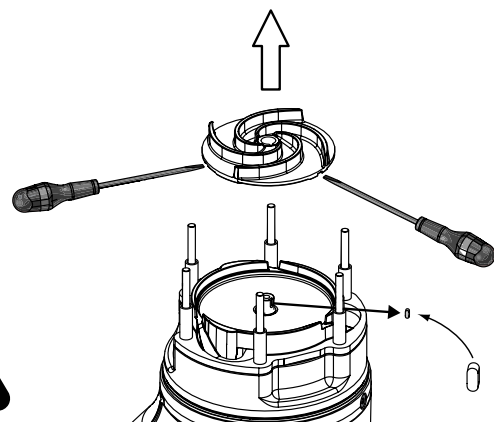
Then loosen the strainer by adding leverage from the diffuser by inserting two screwdrivers in the strainer and press against the diffuser.



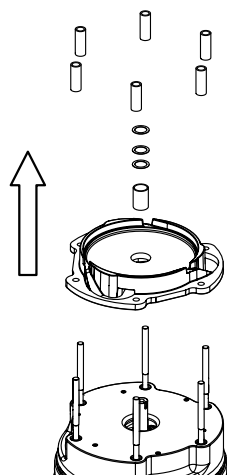
Remove the remaining three nuts and then the lower diffuser by pulling it gently straight out.



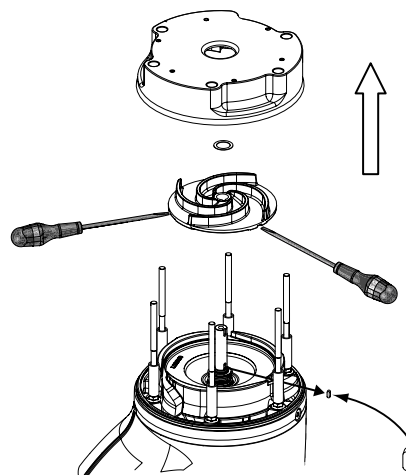
Hold the impeller with a large screwdriver or similar, between the vanes and unscrew the impeller screw with an 6 mm Allen key.



Turn the impeller so the three marks on the impeller side meet the channels of the guide vane plate. Pry the lower impeller loose with screwdrivers on the marks of the impeller sides. Remove the key from the shaft. If the impeller is stuck, hit it carefully in circles with a hammer and use a creeping lubricant if needed.

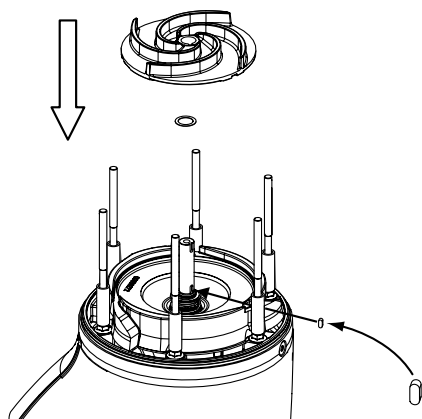


Remove the distance sleeve between the impellers and pull out the guide vane plate. Note the number of 0.5 shims on top of the distance sleeve before removing them, also check for shims under the distance sleeve and or top of the lower impeller.

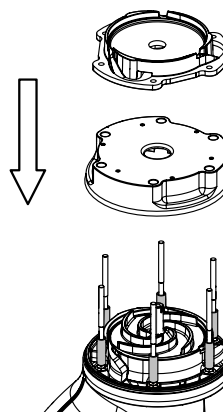


Pull out the upper diffuser. Turn the impeller so the three marks on the impeller side meet the channels of the wear plate. Pry the upper impeller loose with screwdrivers on the marks of the impeller sides. Remove the key from the shaft. If the impeller is stuck hit it carefully in circles with a hammer. Check if there are shims on top of the upper impeller, if so remove them too.

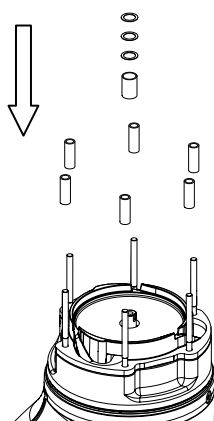
5.2 Assembly



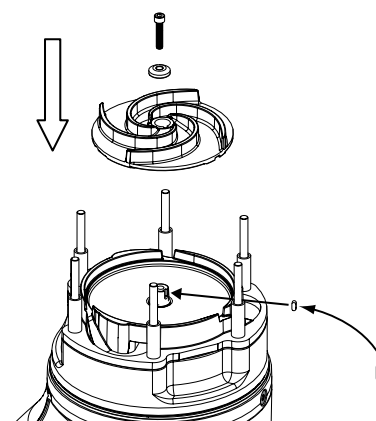
Put the shims on the shaft, then the upper key in place on the shaft and mount the new upper impeller. Check that the impeller runs free of wear plate. Adjust the clearance with shims between impeller and shaft if necessary.



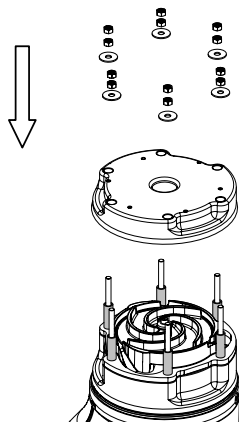
Put on the upper diffuser and then the guide vane plate on the stud bolts and push them in place. Check that the distances are in place in the diffuser.



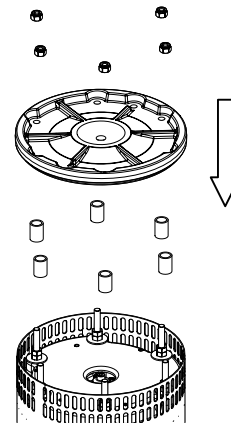
Place the shims and then the tube distance between the impellers on the shaft.



Mount the new lower impeller on the shaft securing it with the key, spring washer and screw. Check that the impeller runs free of guide vane plate. Adjust the clearance with shims between the tube distance and upper impeller if necessary.



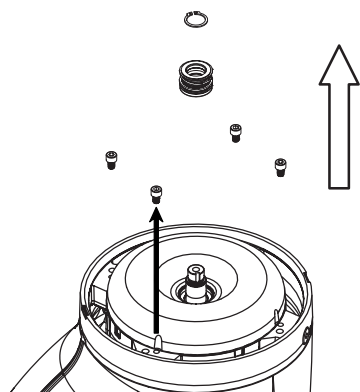
Mount the lower diffuser on the stud bolts and screw two screws onto each stud bolt. Check that the distances are in place in the diffuser.



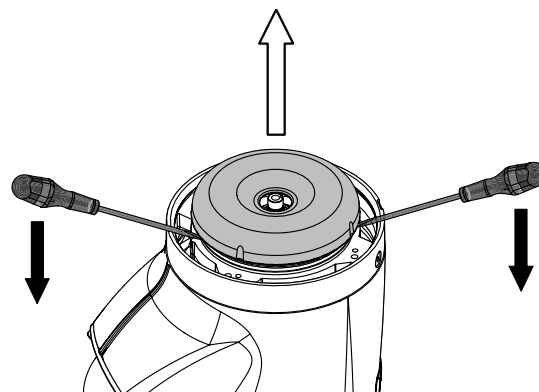
Grease and mount o-ring on the oil casing. Put the strainer in place and then the rubber sleeves and the base plate. Tighten it up with the bottom nuts.

6. Primary seal and upper diffuser

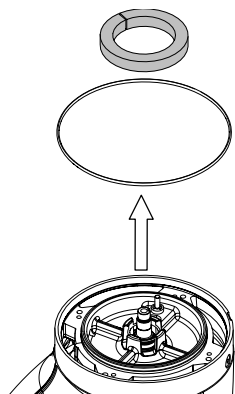
6.1 Dismantling of primary seal and upper diffuser



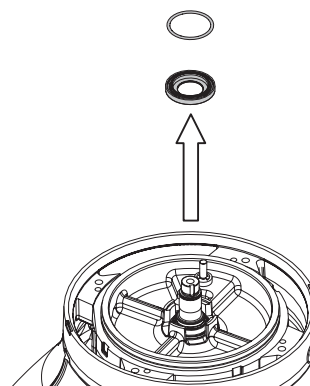
Remove the circlip and pull out the rotating part of the primary seal. Remove the screws which hold the diffuser and bearing house together.



Withdraw the upper diffuser by using two screwdrivers.

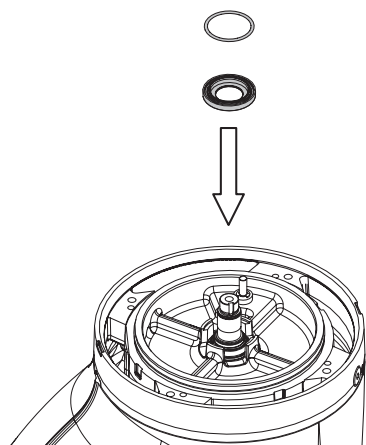


Remove the rubber foam and o-ring in the bearing house.




Remove the stationary ring with o-ring, of the primary seal.

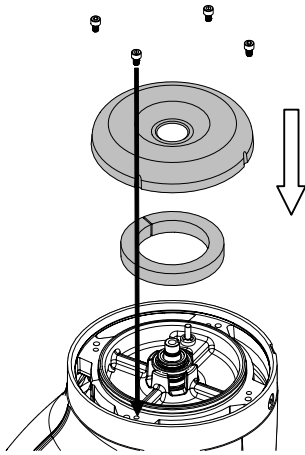
6.2 Assembly of primary seal and upper diffuser



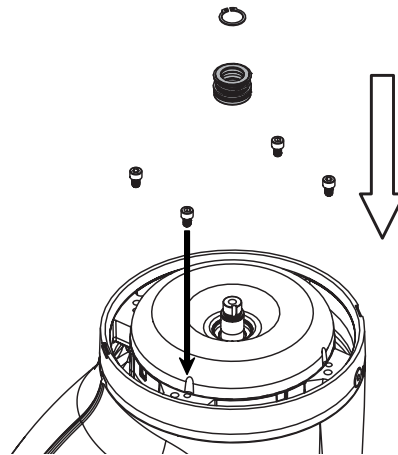
Mount stationary ring of primary seal with o-ring in its seat in the bearing house.

 **Always use new mechanical seals for assembly. For repair kit part nos see chapter 1.2.**

Before the outer o-ring is mounted on the bearing house, check that upper diffuser is compressing the o-ring in the stationary seal enough to give efficient sealing.



Place the rubber foam in the bearing house. Grease and mount o-ring on the bearing house, and mount upper diffuser with screws. Tighten gradually crosswise.



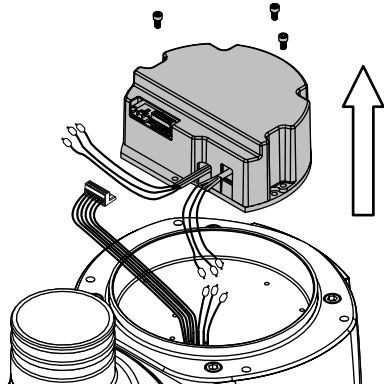
Grease and mount a new primary seal o-ring on the shaft. Oil the sealing surfaces of the mechanical seal and push the rotating ring onto the shaft

7. Complete pump overhaul / dismantling

Perform all dismantling operation in chapter 2 then continue with:

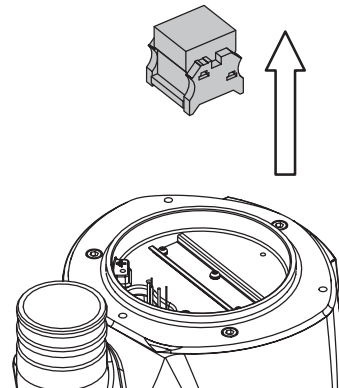
7.1 Electronics

7.1.1 AquaTronic version



Turn the pump and remove AquaTronic

7.1.2 Standard version



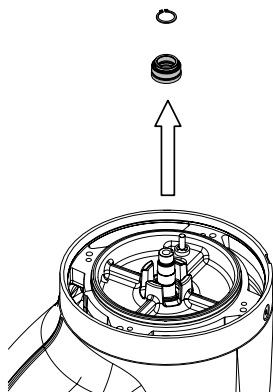
Turn the pump and remove the contactor from the omega rail.

7.2 Oil/motor, hydraulic, primary seal and upper diffuser

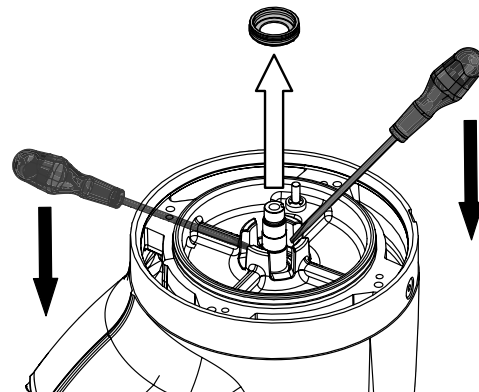
Perform all dismantling operation in chapter 3-5 then continue with:

7.3 Secondary seal

7.3.1 Dismantling of secondary seal



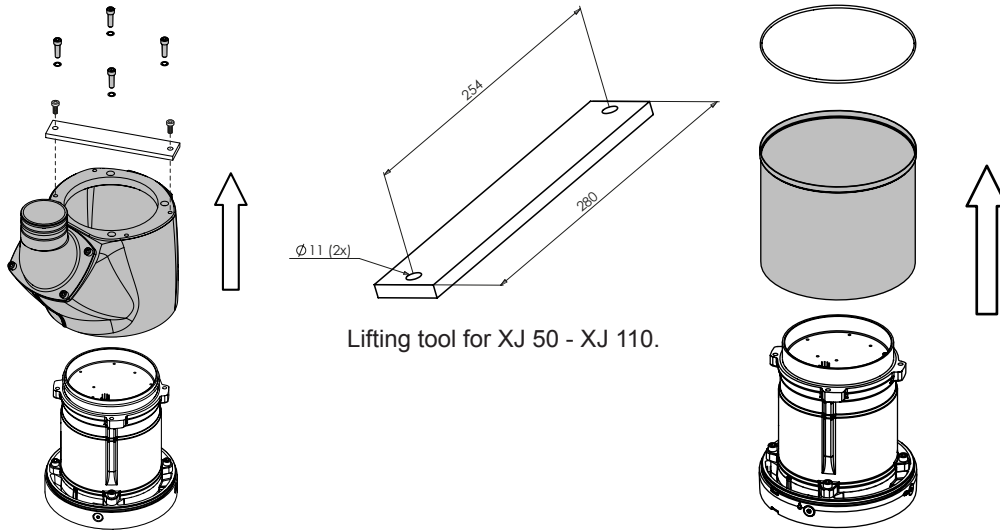
Remove circlip and rotating parts of secondary seal from the shaft.



Remove the stationary ring with two screwdrivers.

7.4 Rotor unit

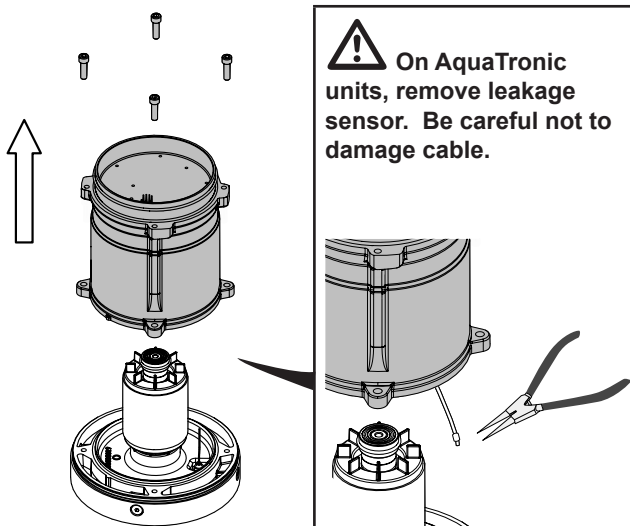
7.4.1 Dismantling of rotor unit.



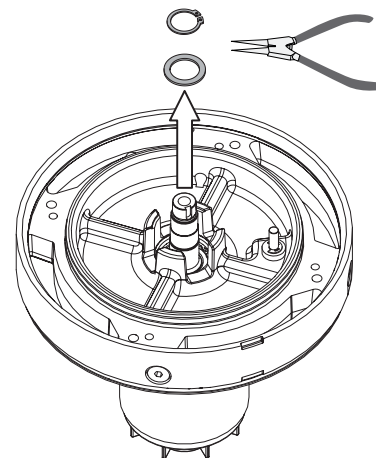
Lifting tool for XJ 50 - XJ 110.

Remove the jacket (for easy dismantling of jacket use lifting tool).

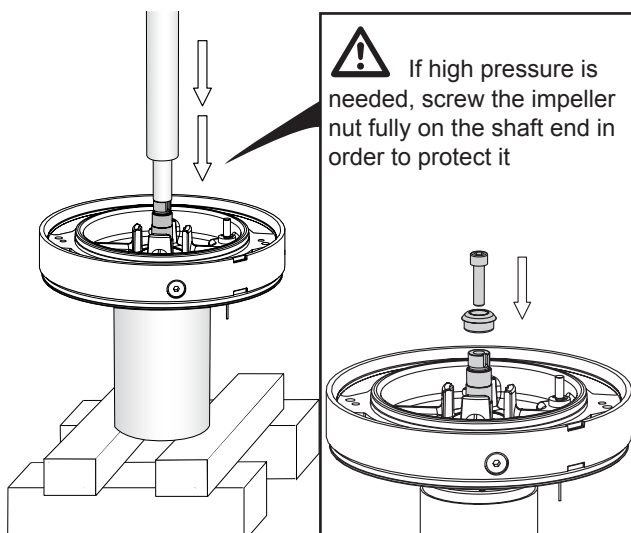
Remove the jacket on XJC.



Remove the stator and motor housing from the rotor unit.

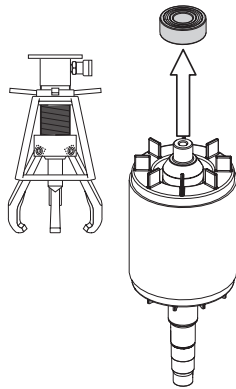


Remove the external circlip with a pair of circlip pliers (diameter 25 mm) and remove washer (holding the bearing).

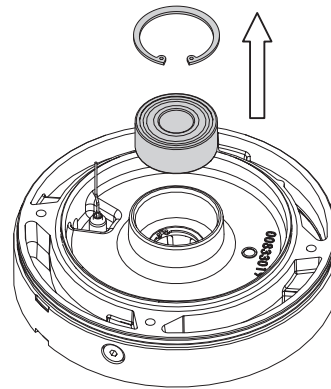


Place the rotor into a tube or similar of the same length as the rotor shaft and with an inner diameter slightly larger than the outer diameter of the bearing seat. Press against the end of the shaft until the rotor comes loose. The bearing seat can be heated quickly with LP-gas to facilitate the removal.

7.5 Dismantling of ball bearings



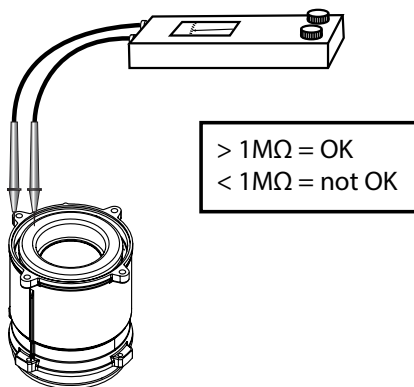
Remove upper bearing with a ball bearing puller tool.



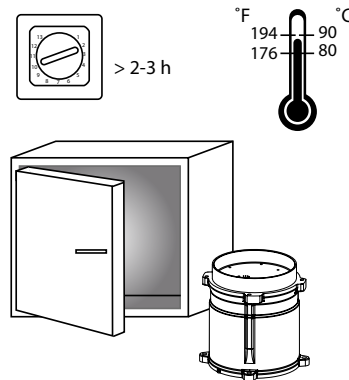
Remove the circlip and press out the bearing. Make sure to support the bearing house properly.

7.6 Stator

7.6.1 Insulation check

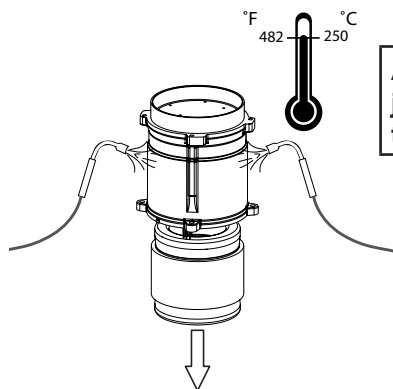


Measure the insulation resistance with a 500 V megohmmeter (megger). If the insulation resistance is lower than 1 MΩ the stator unit should be dried in an oven.



Dry the stator unit in oven in not more than 80-90 °C (176-194 °F) for at least 2-3 hours. If the insulation resistance still is too low the unit should be replaced.

7.6.2 Dismantling of stator



Arrange the motor cables so as to avoid jamming when the stator is falling out of the housing.

Heat the motor housing with two LP gas flames (large propane burner) at the stator laminations and downwards until the temperature of about 250 °C (482 °F) is reached or till the stator starts to fall out.

Clean the housing and check it for damages. Particularly on the sealing surfaces and in ball bearing seat. If damages cannot be corrected, the housing must be replaced.

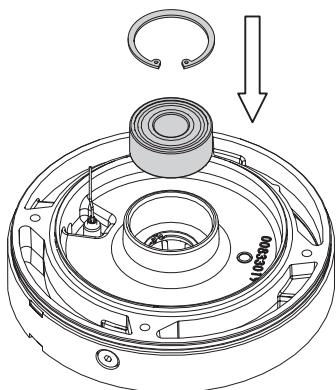
8. Complete pump overhaul / assembly

8.1 General

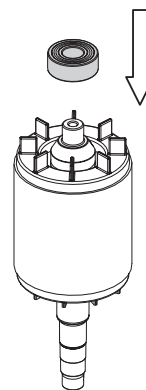
Clean all parts carefully, especially o-ring grooves and mating surfaces.

Grease or oil o-rings to eliminate damage during assembly. Grease or oil screw threads to simplify disassembly during future overhaul.

8.2 Assembly of ball bearings

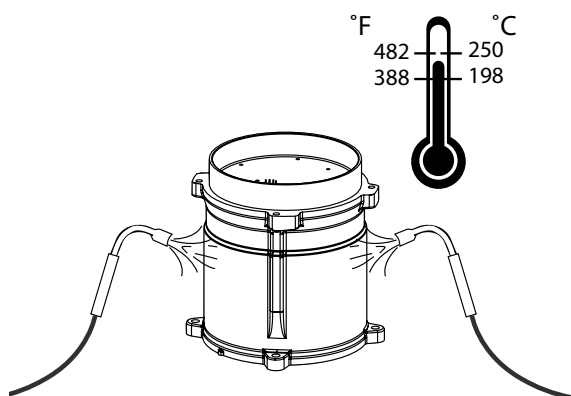


Clean the bearing house and all sealing surfaces thoroughly. Remove burrs and scratches. All ball bearings are sealed and pre-filled with grease for lifetime performance. Heat the bearing seat with LP-gas to about 150°C (302°F) and mount the bearing in the seat. Mount the circlip on top of the bearing.



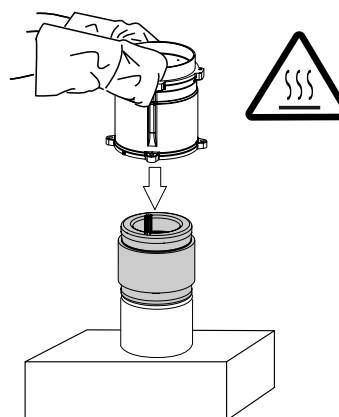
Press upper bearing into position against the shaft shoulders. Use properly sized press tool.

8.3 Assembly of stator



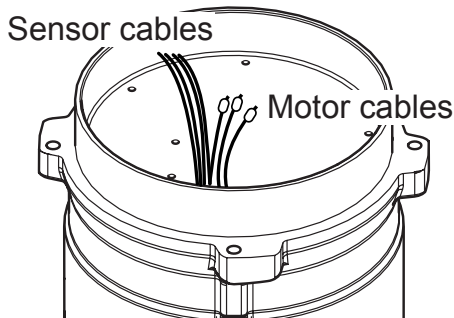
Heat the housing with two LP-gas flames to about 198 °C to 250 °C (388 °F to 482 °F).

Protect the stator insulation from damages and put down the thermal wires (free from insulation resin and smooth) into the stator to avoid contact with the hot housing during assembly.

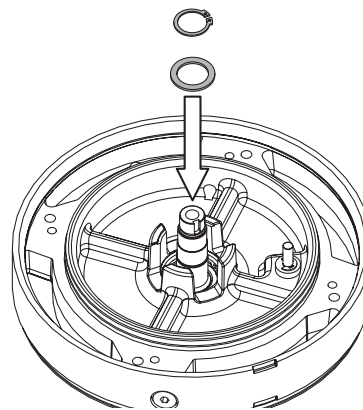


Take the hot housing with heat-resistant gloves and push it down till it stops over the stator, or the other way around, drop the stator into the housing.

Note! Locate the holes for the thermal cables in the housing about 10 mm from the exit of the cable groups on the winding head.



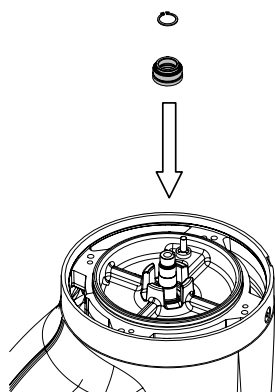
When the housing has been mounted it may be cooled by compressed air. When the housing has cooled down the terminal cables can be pulled up through the holes in the housing with a hook.



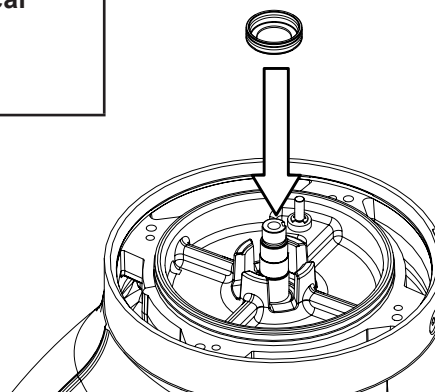
Press rotor with shaft in place in the bearing house (with the bearing assembled) assemble the washer and the circlip. Make sure to support bearing properly.

Turn the rotor by hand and check that it turns freely without seizing. Grease and mount o-ring on the casing. Slip the rotor unit into the stator unit and check that the o-ring is not jammed.

8.4 Secondary seal



**Always use new mechanical seals for assembly.
For repair kit part nos see chapter 1.2.**



Clean and grease the seal seat in the bearing house and mount the stationary ring with o-ring. Push it down to the bottom of the seat.

Push the rotating part of the secondary seal onto the shaft. Mount the circlip and push it down till it fits into the groove.

8.5 Primary seal and upper diffuser

For assembly of primary seal and upper diffuser see section 5.2.

8.6 Impeller

For assembly of impeller see section 4.3.2

8.7 Assembly of diffuser

For assembly of diffuser see section 4.2.2.

8.8 Base plate and strainer

8.8.1 With distances

Place the distances and the strainer in position before tightening the base plate bolts.

8.8.2 Without distances

Put strainer and baseplate in place and tighten bolts.

8.9 Refilling of oil

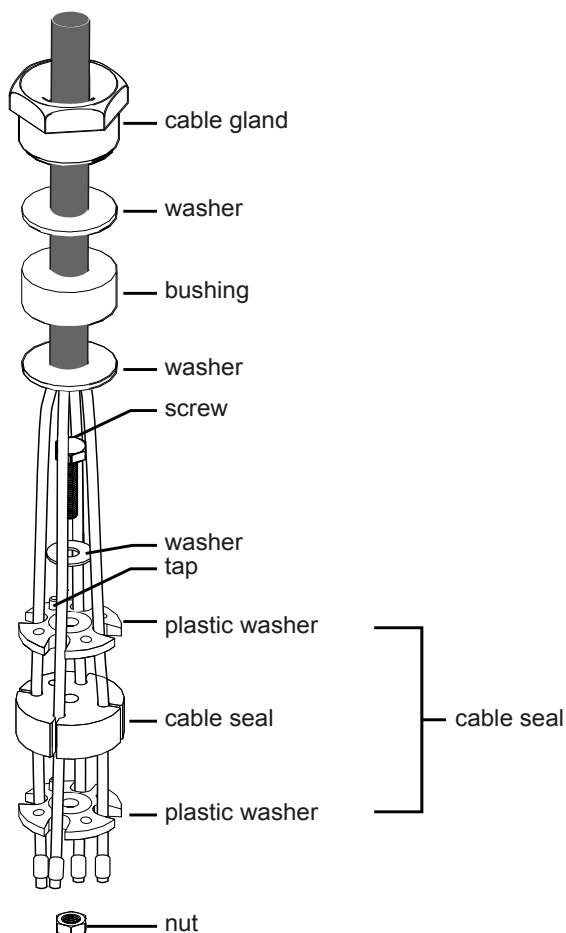
Fill all the way up to entrance of oil inspection hole. Make sure to fill in oil chamber marked with an oil drop. Tighten the oil plug with a new o-ring

Use Paraffin oil (white oil) with viscosity 10-15 cSt, e.g. BP Enerpar M 002 or equivalent.

For oil quantity see chap. 3.2.

8.10 Change of cable gland

8.10.1 Change of cable gland



Measure inner diameter of cable bushing to see that it corresponds to the cable diameter. Place cable bushing and washers (one on each side) on the cable.

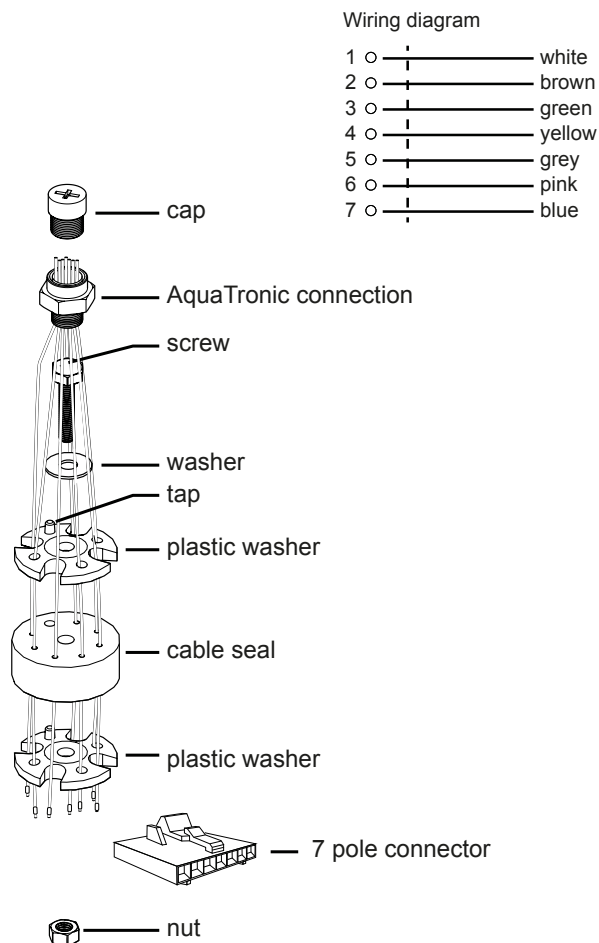
Pull cable through the cover, far enough to let the cable gland seat on a non-deformed portion of cable. Make sure that the non stripped cable is going all the way through the bushing.

Tighten the cable gland and strain relief clamp on the handle. Put the plastic washer (one on each side) and cable seal in place. Make sure that the plastic tap fits the hole in the cable seal.

Push the cable seal in place in the top cover and tighten the screw. Make sure that the washer is in place.

Connect the phases according the wiring diagram (chapter 9.1). Yellow/green earth screwed to cover.

8.10.2 Change of AquaTronic connection interface



Cut or disassemble the 7-pole connector from the cable terminals. Unscrew and remove all cable seal parts and connectors.

Replace connector and make sure that the o-ring seat is okay.

Put all cable seal parts together and fix the cable seal in the top cover by tightening the screw. Make sure that the washer is in place and the tap fits the hole in the cable seal.

Assemble the cable cores with the 7-pole connector. Note the wiring.

8.11 Assemble the top cover

Grease and mount the o-ring on the cover. Mount the cover on the jacket and arrange the leads so that they may not be jammed or block the functioning of the contactor. Tighten cover with the screws.

9. Testing

Connect motor cable to power supply and start the pump. If possible, operate the pump in water and measure the head against closed valve. Also make sure that the rotor is rotating in correct direction if the stator is changed/repaired or the AT is changed.

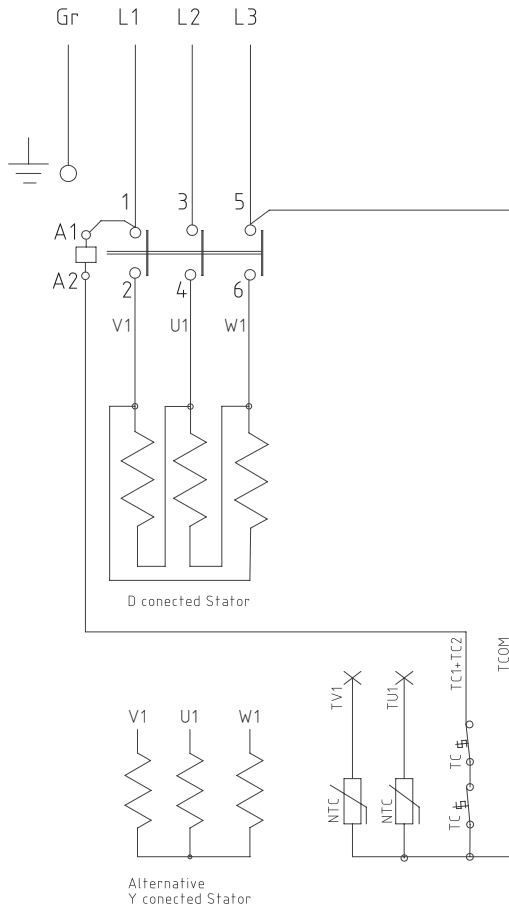
With AT connect the AquaTronic USB interface cable (00833329) and make sure that a correct connection is established by opening Aquatron.exe software from the AT directory.

10. Electrical information and wiring diagrams

10.1 Three phase Direct Start D.O.L. with contactor

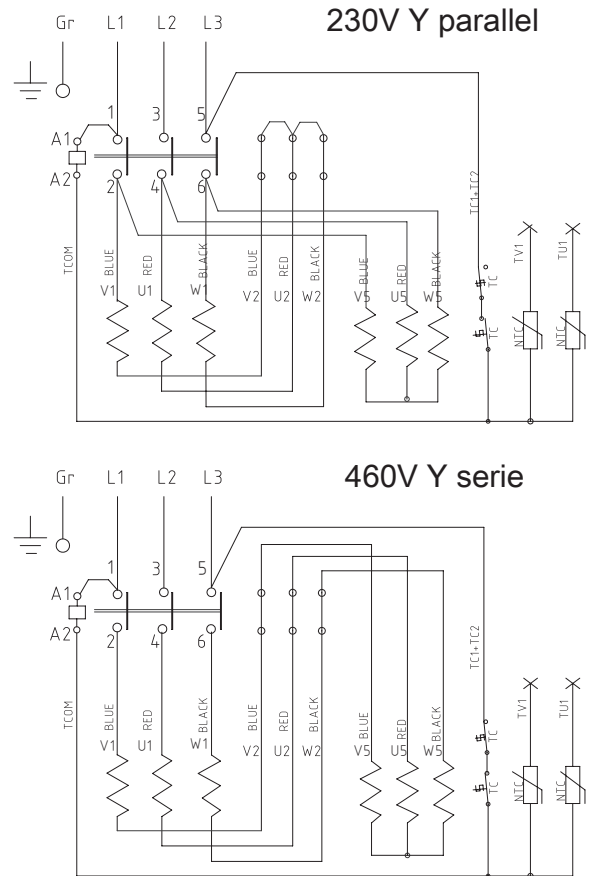
The stators are wound for different voltages and can be internally Delta- or Star-connected.

The contactor is activated by the same voltage as the supply voltage. Therefore, when changing from one voltage to another the contactor must also be changed.



00833286AA

Figure 1: Direct start with contactor.

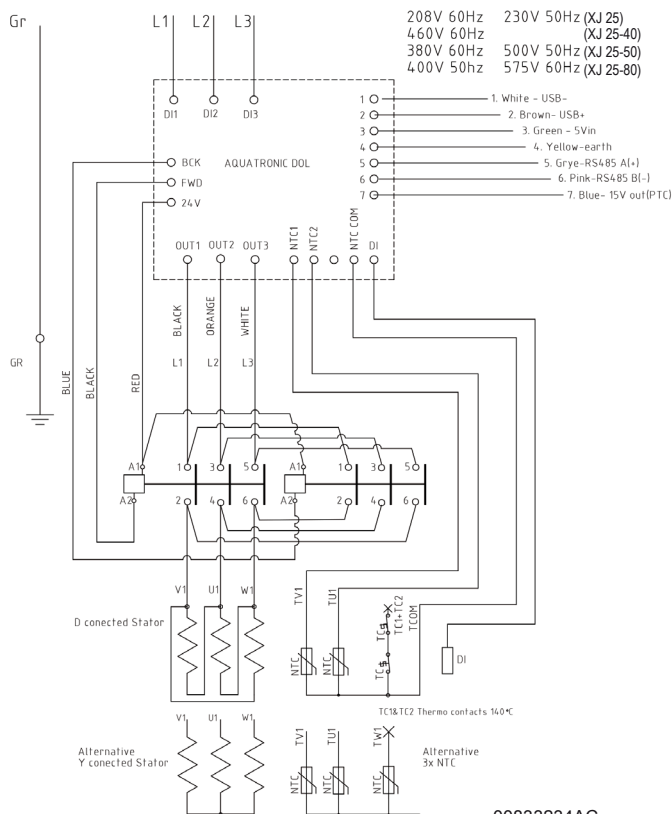


00833287AA

Figure 2: Direct start with contactor 230/460 V.

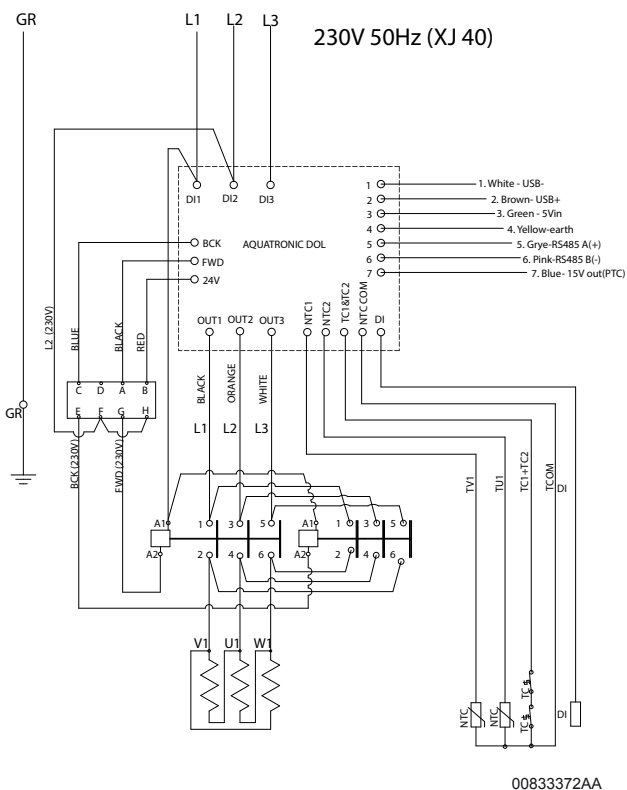
10.2 Three phase Direct Start D.O.L. with AquaTronic

The stators are wound for different voltages and can be internally Delta- or Star-connected.



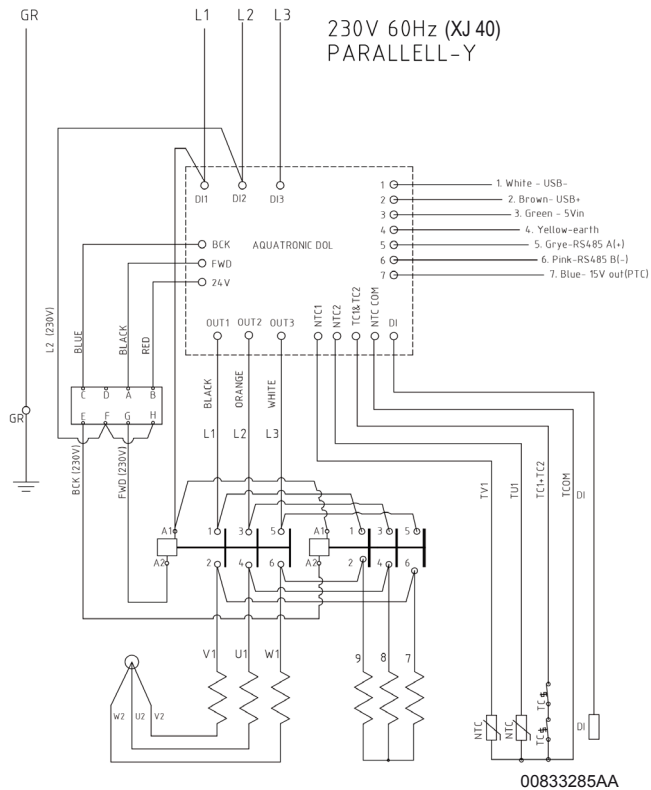
00833234AC

Figure 3: Direct start with AquaTronic.



00833372AA

Figure 4: Direct start with AquaTronic 230 V 50 Hz, XJ 40.

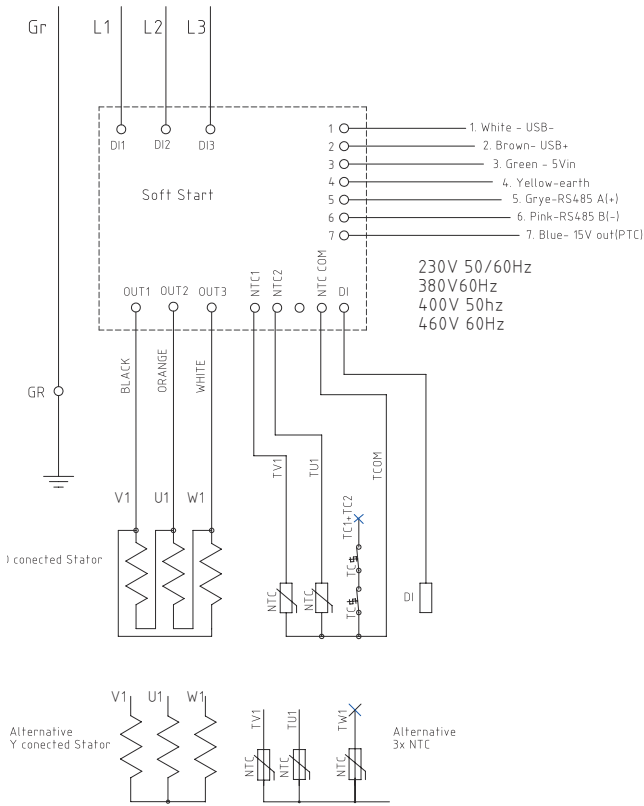


00833285AA

Figure 5: Direct start with AquaTronic 230 V 50/60 Hz, XJ 40.

10.3 Three phase Soft Start with AquaTronic.

The stators are wound for different voltages and can be internally Delta- or Star-connected.



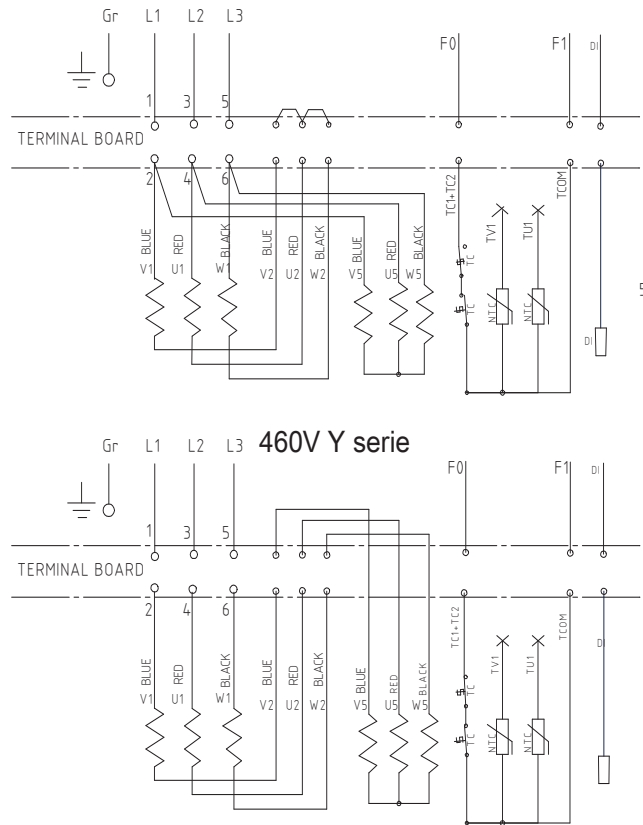
00833235AC

Figure 6: Soft Start with AquaTronic.

10.4 Three phase Direct Start D.O.L. with terminal block

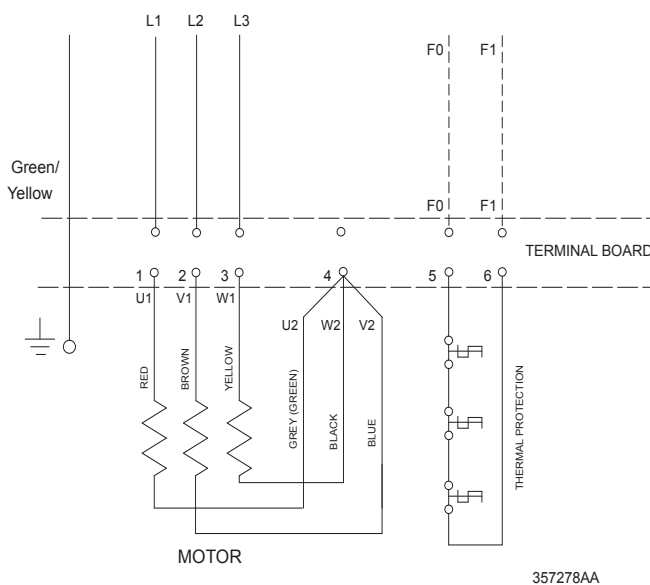
The stators are wound for 230 V or 460 V 50 Hz and connected Star. (Figure 7). The stators are wound for 1000 V 50 Hz and connected Star. (Figure 8). When ground check diode is used see figure 9.

230V Y parallel

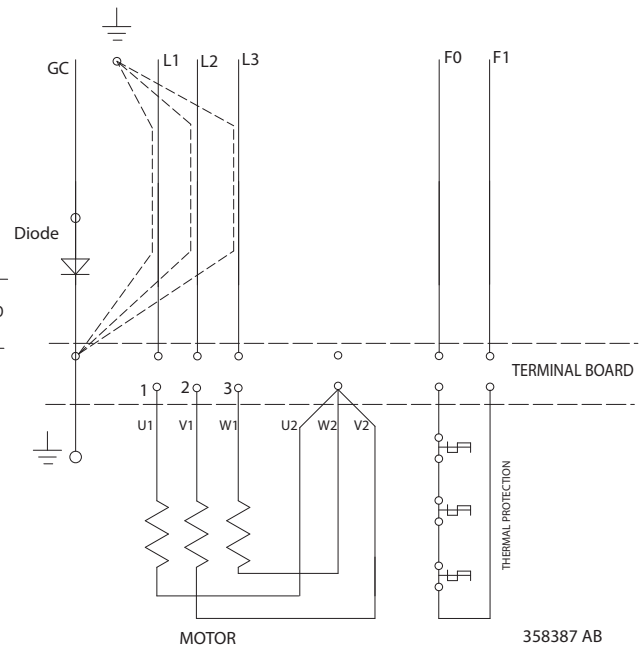


00833591AA

Figure 7: Standard connecting for Direct Start D.O.L. 230 V or 400 V 50 Hz.



357278AA



358387 AB

Figure 8: Standard connecting for Direct Start D.O.L. 1000 V 50 Hz.

Figure 9: Optional: Connecting for Direct Start D.O.L. 1000 V 50Hz with ground check diode.

10.5 Winding data

Pole		50Hz		60Hz		DOL = direct on line	P/n	P/n Spare part	NTC B57164K473J	Temp Thermik 50/6.140°C	Class	Star or Delta	Series or Parallel	Rotation	α	Turns per slot	Pitch	Copper wire	Power leads	Nos. of slots	Core height (mm)	Outer diameter (mm)	Inner diameter (mm)		
		V	I2 kW	V	I2 kW																				
SULZER																									
Dwg.-No 00863500 AC Sheet 1 Date 151007 Drawn NH Checked NH Approved TI-523																									
XJ1/XJS 25																									
2	2.5	230	2.9	230	DOL	00833118	00863118	x2	x2	F	A	Series	Clockwise	0.8	38		0.85+0.30	3							
	2.5	380	2.9	380	DOL	00833119	00863119	x2	x2	F	A	Series	Clockwise	1.15	46		2x0.80	3							
	2.5	400	2.9	460	DOL	00833120	00863120	x2	x2	F	A	Series	Clockwise	2.15	37/36		2x0.90	3							
	2.5	400	2.9	460	DOL	00833121	00863121	x2	x2	F	Y	Series	Clockwise	3.4	46	1-12,10	2x0.80	3							
	2.5	500	2.9	575	DOL	00833295	00863295	x2	x2	F	YY	Series	Clockwise	0.85/3,4	46		2x0.80	9							
	2.5	600	2.9	575	DOL	00833122	00863122	x2	x2	F	Y	Series	Clockwise	5.4	58/57		2x0.71	3							
2.5	690	2.5	690	DOL	00833507	00863507	-	x3	F	Y	Series	Clockwise	9.875	79		0.60+0.63	3								
2.5	1000	2.5	1000	DOL	00833123	00863123	-	x3	F	Y	Series	Clockwise	10.8	115		0.71	6								
XJ1/XJS 40																									
2	3.7	230	4.3	230	DOL	00833124	00863124	x2	x2	F	A	Series	Clockwise	0.65	33		0.75+2x0.80	3							
	3.7	380	4.3	380	DOL	00833125	00863125	x2	x2	F	A	Series	Clockwise	0.95	40		3x0.71	3							
	3.7	400	4.3	460	DOL	00833126	00863126	x2	x2	F	Y	Series	Clockwise	2.8	32		3x0.80	3							
	3.7	400	4.3	460	DOL	00833127	00863127	x2	x2	F	Y	Series	Clockwise	2.8	40	1-12,10	3x0.71	3							
	3.7	500	4.3	575	DOL	00833296	00863296	x2	x2	F	YY	Series	Clockwise	0.72/8	40		3x0.71	9							
	3.7	690	3.7	690	DOL	00833128	00863128	x2	x2	F	Y	Series	Clockwise	4.4	50		0.75+0.80	3							
3.7	1000	3.7	1000	DOL	00833508	00863508	-	x3	F	Y	Series	Clockwise	8.382	69		0.65+0.67	6								
3.7	1000	3.7	1000	DOL	00833129	00863129	-	x3	F	Y	Series	Clockwise	8.8	100		2x0.65	6								
XJ1/XJS 50																									
2	5.6	230	6.7	230	DOL	00833130	00863130	x2	x2	F	A	Parallel	Clockwise	0.3	34		3x0.75	3							
	5.6	380	6.7	380	DOL	00833131	00863131	x2	x2	F	A	Parallel	Clockwise	0.42	41		2x0.65	3							
	5.6	400	6.7	460	DOL	00833132	00863132	x2	x2	F	A	Parallel	Clockwise	0.65	57		2x0.71	3							
	5.6	400	6.7	460	DOL	00833133	00863133	x2	x2	F	A	Parallel	Clockwise	1.3	72	1/18-16-14	0.9	3							
	5.6	500	6.7	575	DOL	00833297	00863297	x2	x2	F	YY	Series	Clockwise	0.33/1,3	21		0.8+3x0.85	9							
	5.6	690	5.6	690	DOL	00833134	00863134	x2	x2	F	Y	Series	Clockwise	2.1	45		2x0.80	3							
5.6	1000	5.6	1000	DOL	00833509	00863509	-	x3	F	Y	Series	Clockwise	3.7	72		0.9	6								
5.6	1000	5.6	1000	DOL	00833135	00863135	-	x3	F	Y	Series	Clockwise	4.1	52		2x0.75	6								
XJ1/XJS 80																									
2	8.3	230	9.8	230	DOL	00833136	00863136	x2	x2	F	A	Parallel	Clockwise	0.21	28		0.80+2x0.85	3							
	8.3	380	9.8	380	DOL	00833137	00863137	x2	x2	F	A	Parallel	Clockwise	0.3	34		0.75+2x0.80	3							
	8.3	400	9.8	460	DOL	00833138	00863138	x2	x2	F	A	Parallel	Clockwise	0.57	47		2x0.80	3							
	8.3	400	9.8	460	DOL	00833139	00863139	x2	x2	F	A	Parallel	Clockwise	0.9	59	1/18-16-14	2x0.71	3							
	8.3	500	9.8	575	DOL	00833298	00863298	x2	x2	F	YY	Series	Clockwise	0.23/0,9	17		4x0.75+5x0.80	9							
	8.3	690	8.3	690	DOL	00833140	00863140	x2	x2	F	A	Parallel	Clockwise	1.45	74		2x0.63	3							
8.3	1000	8.3	1000	DOL	00833510	00863510	-	x3	F	Y	Series	Clockwise	2.6	59		2x0.71	6								
8.3	1000	8.3	1000	DOL	00833141	00863141	-	x3	F	Y	Series	Clockwise	2.72	85		0.85	6								
XJ1/XJS 110																									
2	11.8	230/400	13.5	380	DOL	310100000001	310100000001	-	x3	H	Δ/Y	Parallel	Clockwise	0.25	24		4x0.80	6							
	11.8	400	13.5	460	DOL	310100000006	310100000006	x2	x2	H	A	Parallel	Clockwise	0.17	20		3x0.85+0.90	3							
	11.8	400	13.5	460	DOL	310100000002	310100000002	x2	x2	H	A	Parallel	Clockwise	0.74	41		2x0.85	3							
	11.8	500	13.5	575	DOL	310100000007	310100000007	-	x3	H	YY	Series	Clockwise	0.255/1,02	24	1-18,16,14	4x0.80	9							
	11.8	400/690	11.8	400/690	DOL	310100000003	310100000003	x2	x2	H	Y	Parallel	Clockwise	1.14	51		2x0.75	3							
	11.8	578/1000	11.8	578/1000	DOL	310100000004	310100000004	-	x3	H	Y	Parallel	Clockwise	1.5	41		2x0.85	6							

10.6 Fuses

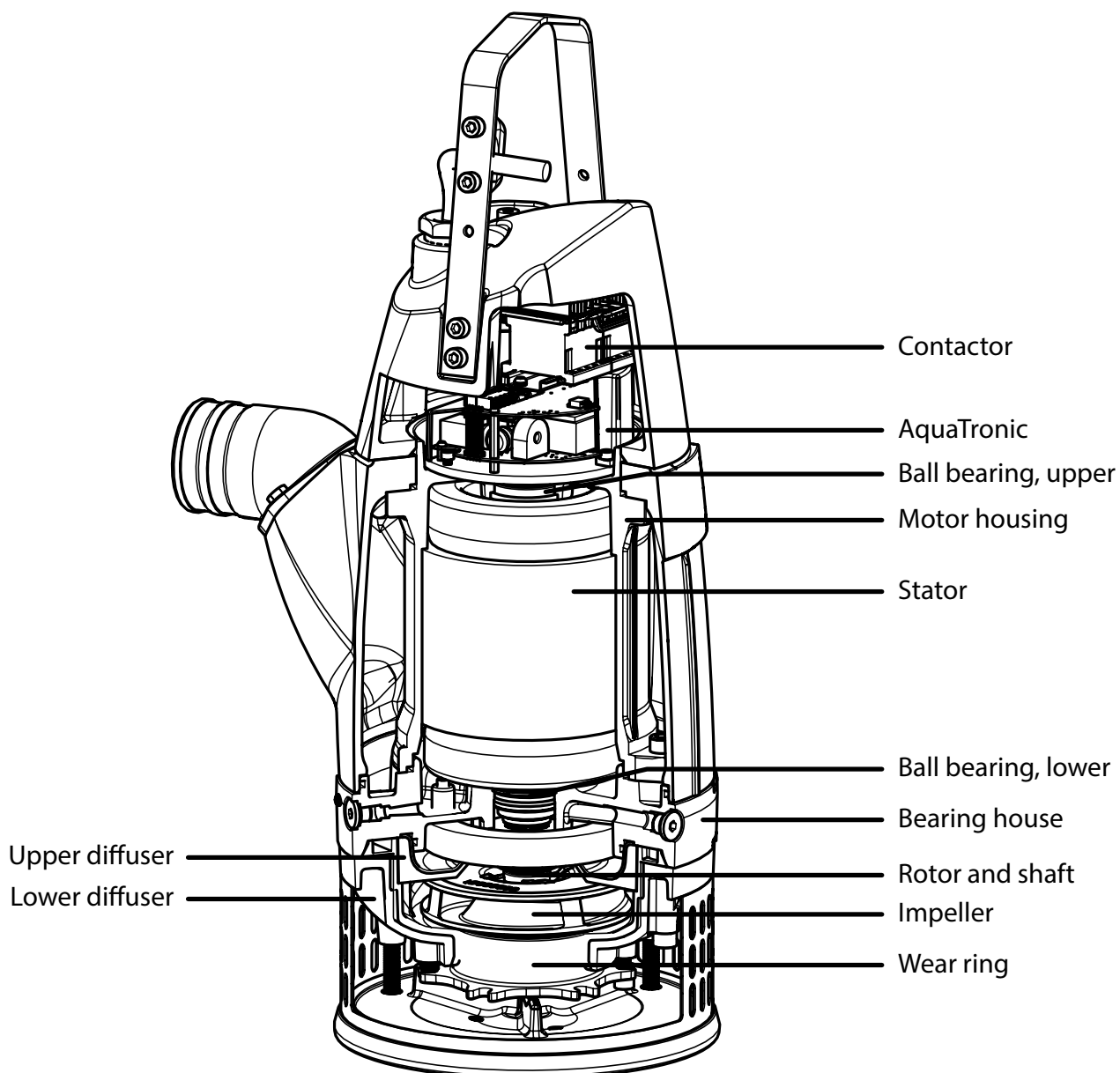
Fuses are to be installed in the power circuits as a short circuit protection. Fuses with a time lag are recommended. The table shows the nominal current and starting current factor. Multiply factor with nominal current to get the pumps starting current.

Three-phase 50Hz					Starting current factor	
Pump	230V	400V	500V	1000V	Direct Start	Soft Start
XJ 25	8.8 A	5.1 A	4.3 A	2.0 A	5.3	-
XJ 40	13.2 A	7.6 A	6.1 A	3.0 A	6.3	-
XJ/XJC 50	19.7 A	11.3 A	9.0-10.8 A	4.5 A	8.9	3.9
XJ/XJC 80	27.8 A	16.0 A	13.8 A	6.4 A	9.0	3.3
XJ/XJC 110	37.4 A	21.5 A	17.2 A	8.6 A	8.0	3.0
XJS 25	8.8 A	5.1 A	4.3 A	2.0 A	5.3	-
XJS 40	13.2 A	7.6 A	6.1 A	3.0 A	6.3	-
XJS 50	19.7 A	11.3 A	9.0-10.8 A	4.5 A	8.9	3.9
XJS 80	27.8 A	16.0 A	13.8 A	6.4 A	9.0	3.3
XJS 110	37.4 A	21.5 A	17.2 A	8.6 A	8.0	3.0

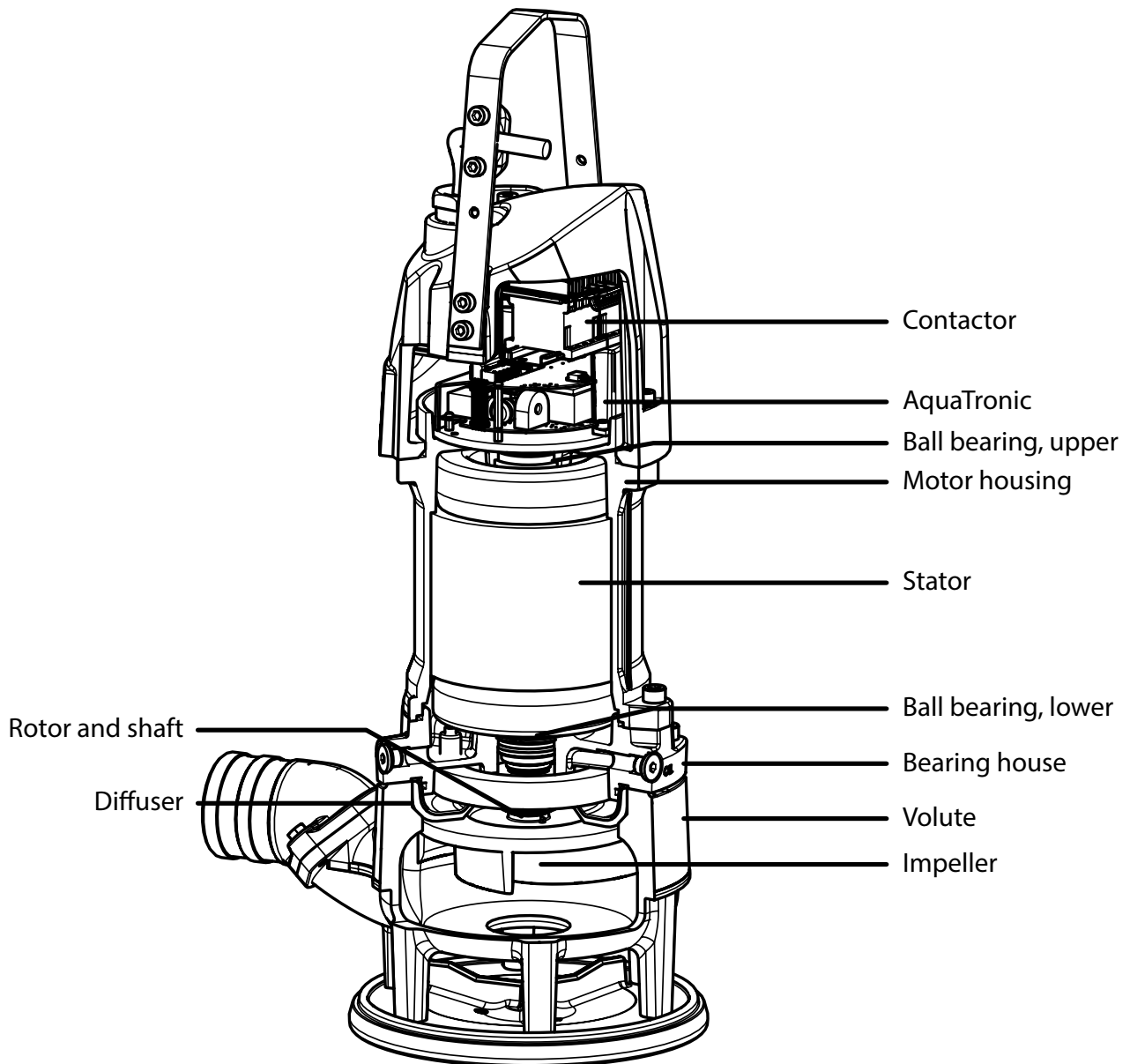
Three-phase 60Hz					Starting current factor	
Pump	230V	380 V	460V	575V	Direct Start	Soft Start
XJ 25	9.8 A	5.9 A	4.9 A	3.9 A	6.0	-
XJ 40	14.8 A	8.9 A	7.4 A	5.9 A	6.1	-
XJ/XJC 50	22.4 A	13.6 A	11.2 A	9.0 A	8.1	3.8
XJ/XJC 80	31.4 A	19.0 A	15.7 A	12.6 A	7.7	3.2
XJ/XJC 110	42.8 A	25.9 A	21.4 A	17.1 A	8.7	3.0
XJS 25	9.8 A	5.9 A	4.9 A	3.9 A	6.0	-
XJS 40	14.8 A	8.9 A	7.4 A	5.9 A	6.1	-
XJS 50	22.4 A	13.6 A	11.2 A	9.0 A	8.1	3.8
XJS 80	31.4 A	19.0 A	15.7 A	12.6 A	7.7	3.2
XJS 110	42.8 A	25.9 A	21.4 A	17.1 A	8.7	3.0

11. Sectional drawing

XJ



XJS



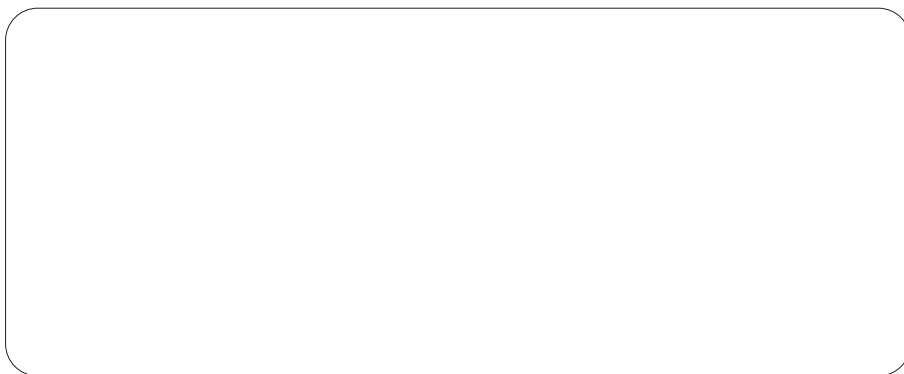
12. Troubleshooting

12.1 Troubleshooting in field

Error	Probable cause	Solution
The pump will not start.	Dead incoming power lines.	Check power lines.
	Blown fuses or breakers.	Check fuses and breakers.
	Phase failure.	Check phases.
	Blocked impeller.	Check for stones, pieces of wood etc.
	Loose cable.	Service inspection needed.
The motor trips out.	Wrong direction of rotation.	Shift phases.
	Excessive water temperature (max 40 °C).	Check water temperature.
	Blocked impeller.	Check for stones, pieces of wood etc.
	Low voltage due to long cables, or inadequate power supply (generator).	Check cables and power supply.
Pump operating at too low capacity.	Clogged strainer.	Clean strainer.
	Sharp bends, folds or restrictions of the discharge hose.	Adjust hose.
	Total delivery head (static head + frictions losses) too high.	Exchange for a pump with sufficient capacity for the task.
Residual Current Device trips out.	Moisture in stator.	Service inspection needed.

12.2 Troubleshooting/service inspection without service program

Error	Probable cause	Solution	Chapter
The pump will not start.	Defective cable.	Replace cable.	8.10
	Defective contactor unit.	Replace contactor.	8.2
	Burned motor.	Complete pump overhaul.	1-8
	Blocked impeller.	Check for stones, pieces of wood etc. Check diffuser for damages.	4.2 + 8.8
	Water intrusion.	See error "Water found inside top cover, and/or motor housing".	
	Loose wires between motor / contactor / power cable.	Fasten wires and check for water intrusion. Check cables in connection chamber.	8.10
The motor trips out.	Pump overloaded due to material build up.	Hydraulic check and cleaning.	4
	Blocked impeller.	Check for stones, pieces of wood etc. Replace damaged impeller.	4.3
	Blocked rotor.	Complete pump overhaul.	1-8
	Burned motor caused by water entering the pump through shaft seal or cable entry area.	Complete pump overhaul.	1-8
	Oil in motor housing.	Clean from oil. Replace secondary seal.	1-8
Water found inside top cover, and/or motor housing.	Pump cable damaged or cut.	Replace cable.	8.10
	Loose cable gland or faulty assembly of gland.	Replace cable gland and cable seal.	8.10
	Damaged o-ring, foreign material between motor housing and jacket, or cover.	Complete pump overhaul. Replace damaged parts.	1-8
	Wire(s) pinched between top cover and main cover.	Replace damaged wires and check contactor.	1-8
	Loose or missing screws that secure top cover to main cover.	Complete pump overhaul. Replace missing parts.	1-8
	Water entered through inspection hole.	Check motor inspection plug	3



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