



EDPT-DI SERIES

Surface Waste Water And Process Centrifugal Pumps

Operation and Maintenance Guide



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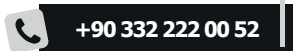
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1. GENERAL WARNINGS ABOUT THE USER GUIDE

The purpose of this user manual;

- It has been prepared to inform you about the installation, maintenance, repair and use of the pump and to make your operations easier.
- Persons responsible are required to read, examine, store and keep this manual in a safe place that is easily accessible.
- The operating instructions must be followed for efficient, correct and reliable operation of the pump.
- The responsible persons must have knowledge and experience on the subject, and must have a good command of safety-related standards.
- Contact **ERDURO** authorized service, if the pump needs to be operated outside the desired operating conditions (type of fluid, flow rate, speed, density, pressure, temperature and motor power.)
- **ERDURO** is not responsible for any damages that occur due to the operation of the **ERDURO** authorized service without the written consent of the specified working conditions.
- If the delivered pump will not be installed immediately, the environmental conditions (humidity, temperature, etc.) of the place to be stored must be suitable. Otherwise, excessively dry or humid, hot or cold ambient conditions may damage the pump.
- This user manual does not cover the safety rules applicable at the place of use.
- The service life of the pumps determined and announced by the Ministry is 10(ten) years.

1.1 - Meaning of Signs



General danger mark according to ISO 7000-0434.



General danger sign according to IEC 417-5036.



Priority, importance status.

2. SAFETY INSTRUCTIONS



ATTENTION!

The following safety instructions must be strictly followed.

- The pump should not be run in the reverse direction.
- Do not put any load on the pump and do not walk on the installation connected to the pump.
- Do not touch the pumps and pipes that will cause danger. Take precautions for the user.
- Do not forget to put up warning signs.
- The protection parts of rotating mechanisms (such as couplings) that will cause accidents should not be disassembled and should never be removed during operation.
- The pumped liquids are explosive, hot, chemical, etc. measures should be taken against leakage that may pose a danger in case of occurrence and the provisions of the environmental law should be applied.
- Before working on the pump, the electrical connection of the motor must be disconnected and it must be made sure that it is.
- Necessary precautions and warning markers should be placed and applied for electrical hazards.
- No work should be done on the pump system without stopping it.
- Before the pump body is serviced and repaired, the system must be stopped, cooled, depressurized and drained of liquid.
- After work is done on the pump, the cautions that were removed must be put back in their places.
- Do not insert your hand or finger into the gaps or holes in the pump system.
- Tension, contraction and weights in the plumbing system should not be transferred to the pump.

3. TECHNICAL SPECIFICATIONS

3.1 - Pump Description

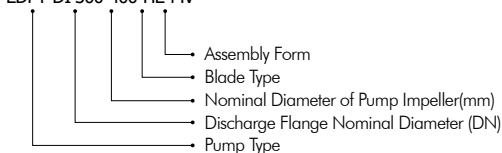
- EDPT Series are vertical shaft, large volute, single stage, submersible centrifugal pumps with closed, semi-open or vortex impeller.

3.2 - Application Areas

- Domestic and Industrial Raw Sewage Liquid Transfer
- Liquid with Mud and Solids Transfer
- Heating and Cooling Plants
- Sewage Treatment Plants
- Transfer of Viscous Liquids and Suspensions
- Factory Waste Water Discharge
- Power Stations
- Paper and Cellulose Industry
- Iron and Steel Industry

3.3 - Description of the Pump Code

EDPT-DI 300-400-HE-MV






3.4 - Technical Information

- Speed: up to 2900 rpm
- Capacity : 3000 m³/h
- Head : 100 m
- Discharge Flange: DN50-DN400
- Suction and Discharge Flanges: TS ISO 7500-2, DIN 2533 / PN10-PN16
- Operating Temperature: -10°C... 140°C cooled gland packing
- Ambient Temperature (Maximum): + 40°C
- Casing Pressure: 16 Bar (25 Bar)*
- Motor Insulation Class: F
- Motor Protection Class: IP55
- Motor Connection: Single-Phase 220V-50Hz, Three-Phase 380 V-50 Hz
- Motor Options (Optional): Special Voltage, Frequency

* Pump materials may vary depending on operating fluid, operating temperature and pressure.

3. TECHNICAL SPECIFICATIONS

3.5 - Pump Label Information

			
TP: _____			
Y: _____		No: _____	
Q: _____	m ³ /h	H: _____	m
P: _____	kW	Ø: _____	mm
n: _____	rpm	MEI ≥ _____	
MS: _____			
CE 		ERC	
MADE IN TURKEY		TS EN ISO 9905	

TP : Pump Type
Y : Production Year
No : Serial Number
Q : Capacity
H : Pump Head
Ø : Impeller Diameter
P : Motor Power
n : Rotation Speed
MEI : Energy Efficiency Index
MS : Montage Sealing

4. TRANSPORT PROCEDURES

- The pump unit must always remain horizontal during the transportation process.
- Pump unit should never be transported by lifting from pump shaft or motor shaft.
- Please inform ERDURO service department and the shipping company about the damaged product during transportation.
- Make sure that the products or parts listed

4.1 - Transport Procedures



General Warnings

- During the carriage process, the operator must take the necessary measures.
- Use appropriate cranes, forklifts and lifting mechanisms to disload and load wooden cases, packages, boxes and pallets, depending on their weight, structure and volume.
- Use protective equipment during carriage. (Eg. Gloves, Safety Helmet ... etc.)

4. TRANSPORT PROCEDURES

4.2 - Disloading / Loading Process Of Pump And Motor Group

- Determine the maximum weight and dimensions to be transported.
- Determine the lifting points.
- Acceleration and braking of the vehicle during lifting should not be dangerous and should be careful.
- Do not stand under or next to the lifted assembly parts.
- Assembly parts should be transported as shown below.

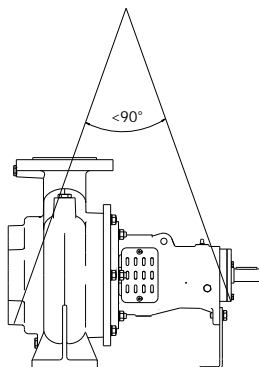


Figure 4.2.1. Transportation of the Pump

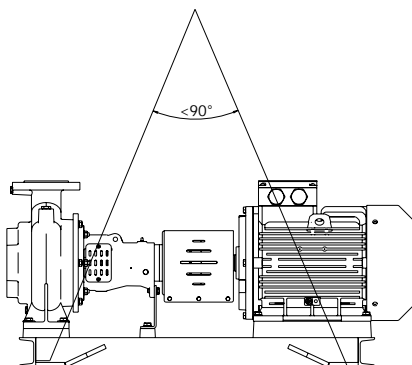


Figure 4.2.2. Transportation of the Pump Assembly

5. STORAGE AND PROTECTION



ATTENTION!

- If the pump group is not to be installed immediately, it should be stored in a low humidity, dry and frost-free place.
- If the pump bearings are of the grease-filled type, extra grease should be pressed to prevent moisture from entering the bearings around the shaft.
- Pump and / or assembly parts should be covered and small ventilation holes should be opened to protect from dust, moisture, dirt and foreign materials
- In order to avoid jamming in the shafts, they should be turned a few turns at certain time intervals

6. INSTALLATION

- Installation has to be carried out in accordance with EN 60204.
- Installation and connection settings of the pump to the place where it will be used should only be made by experts or within service. **ERDURO** is not responsible for malfunctions that may arise due to faulty installation or the condition of the pump ground. This situation is out of warranty.
- Concrete floor should be made to DIN 1045/1 or a similar standard to this standard, it should be ensured that the floor is suitable, horizontal and flat.
- If the pump is purchased without a base plate and motor, a suitable base plate should be provided for this pump. The base plate to be used must be of a size and robustness that will not allow vibration and deformations.
- If the pump is purchased without a motor, appropriate motor should be selected. The appropriate motor selection should be as follows.
 - Maximum power consumed by the pump (in all operating ranges)
 - Pump operating cycle
 - Required power supply
 - Motor type
 - Motor connection type (footed, flanged, horizontal, vertical etc.)
- Coupling (Clutching) setting must be coaxial with the pump and motor shafts. The vibration caused by the unbalanced coupling damages the parts of the pump.

6. INSTALLATION

6.1 - Before Start to Pump Installation

- The guards on the suction and discharge flanges should be removed and cleaned well.
- The pump should be assembled in a well ventilated place that does not have freezing and explosion risk.
- In order for the pump to be installed easily, there should be a comfortable working area. The assembling area should be high enough to lift the pump when needed.
- Pump suction pipe should be kept as short as possible.

6.2 - Installation of the Pump

- Mounting the pump group to the ground with an anchor bolt;
- The pump group is placed in the center of the anchor stud slots opened on the concrete floor. Anchor studs are inserted through the connection holes on the pump baseplate and placed in their housing.
- The pump group is placed on the foundation concrete. The horizontality of the pump is checked by placing a spirit level on the discharge flange of the pump. If there is a horizontal imbalance in the standing position of the pump, the pump is balanced by placing steel plates made of sheet under the baseplate.

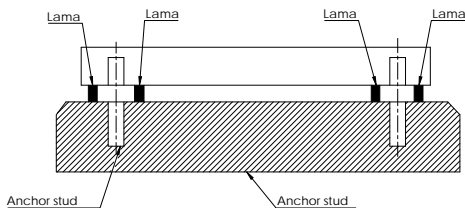


Figure 6.2.1. Foundation Concrete, lama and anchorage application

- Nuts of anchor studs are fastened.
- Anchor stud holes are filled with concrete or special epoxy mortar.
- Anchor studs are tightened slightly mutually.
- Coupling adjustment is checked again according to this position.
- Baseplates up to 400 mm wide are resistant to bending and do not need to be filled with cement. After connection, it should be filled with cement up to the top of the baseplate for baseplates larger than 400 mm..
- After making sure that the concrete is completely filled, the anchor bolts should be tightened well.
- Couplings are checked again with the coupling adjustment gauge. If there are misalignments, corrections should be made.
- Pump suction and discharge flange connections should be checked. If there an unnecessary stretch and tension, it should be eliminated.
- After the coupling adjustment, the coupling cover plate should be replaced.

7. CLUTCH ADJUSTMENT

- Coupling adjustment is of great importance for the proper operation of the pump system. Problems such as noise, vibration, heating of the bearing parts and overloading can be encountered in pump systems where the coupling adjustment is not made properly.
- After the baseplate assembly and the connection of the installation are made, the adjustment of the clutch should be done properly. This process is the buyer's responsibility. Even if the adjustments are made in the manufactured factory, the coupling adjustment may be broken in cases of shipping, transportation, assembly and installation.
- Motor axis and pump axis should be in the same line. After the axes are in the same line, they should be connected to the baseplate. Until the pump axis and the motor axis are the same, flat plates are placed under the motor feet.

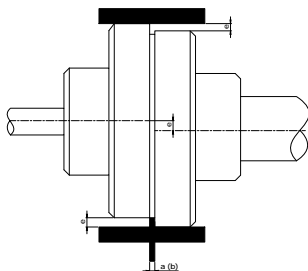


Figure 7.1.1. Elastic clutch adjustment

- Elastic coupling or rubber is not a factor in correcting a bad adjustment.
- It is used to normalize the expansion caused by temperature change, which is used to allow the movement of the shaft ends to prevent friction in the power transmission from the motor to the pump.
- A smooth edged tool such as a steel calliper and a precision calliper should be used to adjust the coupling.

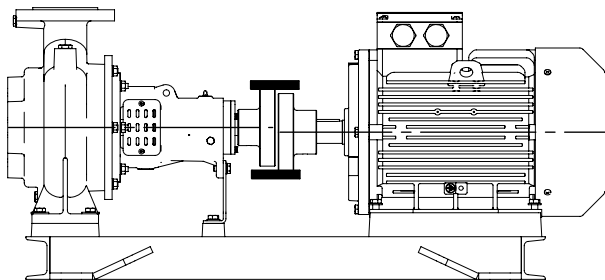


Figure 7.1.2 Non-Coaxial Clutches in Vertical Plane

7. CLUTCH ADJUSTMENT

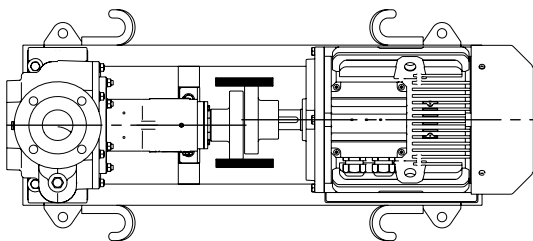


Figure 7.1.3. Non-Coaxial Clutches in the Horizontal Plane

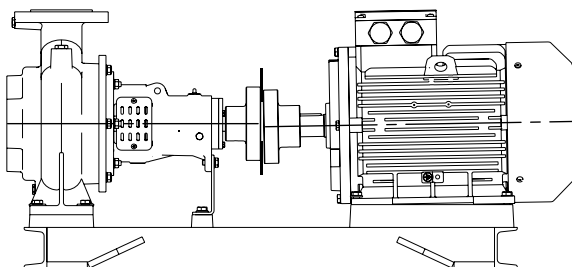


Figure 7.1.4. Angular Error in the Horizontal Plane

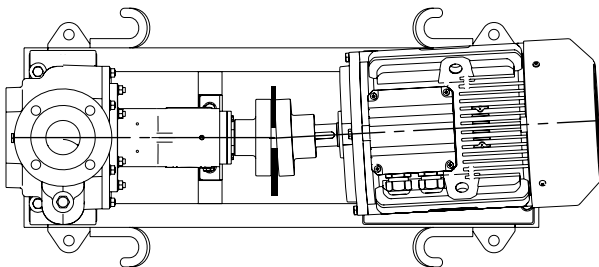


Figure 7.1.4. Angular Error in the Vertical Plane

7. CLUTCH ADJUSTMENT

- In order to correct the angular error, the distance between the couplings should be measured in vertical and horizontal planes and care should be taken to ensure that they are the same.
- In order to correct the non-coaxial situation, the axis with a straight edge gauge is pressed to the coupling parallel to that axis and the position of the gauge is observed and controlled according to the mutual coupling. This process should be applied separately in horizontal and vertical planes.
- In order to correct the abnormality in adjustment, thin sheet pieces are placed under the feet of the pump or motor for the vertical plane. For the horizontal plane, make the adjustment by sliding through the foot holes on the pump and motor.

ATTENTION! The coupling settings should be checked again after each change. Any adjustment made in the planes can distort the adjustment of the other plane.

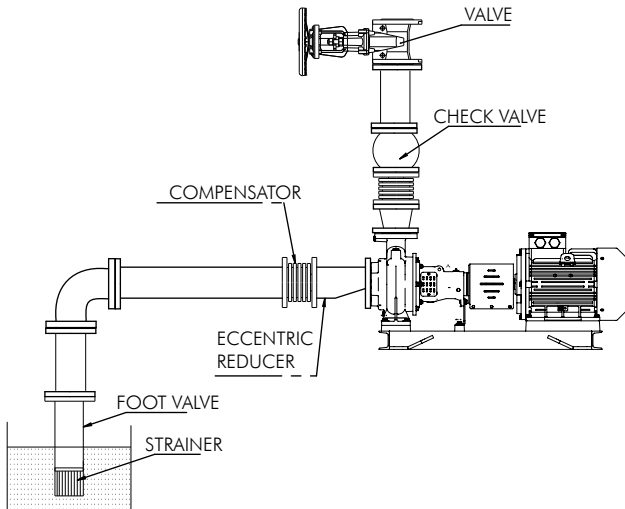
8. CONNECTION OF PIPE INSTALLATION



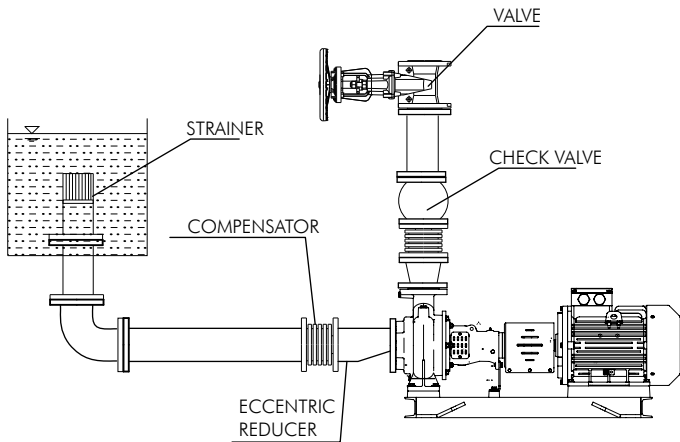
ATTENTION!

- Never use the pump itself as a support or carrier point. The pump should never bear the weight of the pipes.
- The piping support points should be chosen close to the pump and should be installed without any additional stress to the pump.
- Eccentric reduction should be used to avoid creating an air jacket in the pump suction line.
- It is recommended to choose the nominal diameters of the suction and discharge pipes 1-2 more bigger than the suction and discharge nominal diameters of the pump.
- Depending on the pump and operating conditions, a control element and a closing element must be placed.
- In order to prevent additional stress and contraction on the pump, elements that will compensate the mechanical and thermal expansion should be connected.
- The installation should be cleaned well before the pump is put into operation for any dirt, welding residues or slag that may come to the pump. Deep valves, filters and strainers should be used and generally larger ones should be preferred.
- Gaskets placed between pipe and pump flanges should be properly centered and should not block the flow.
- The velocity of the fluid should not exceed in the suction line 2 m / s and 3 m / s in the discharge line. Since high speeds will cause high pressure drop, it causes cavitation in the suction pipe and excessive friction losses in the discharge pipe.

8. CONNECTION OF PIPE INSTALLATION



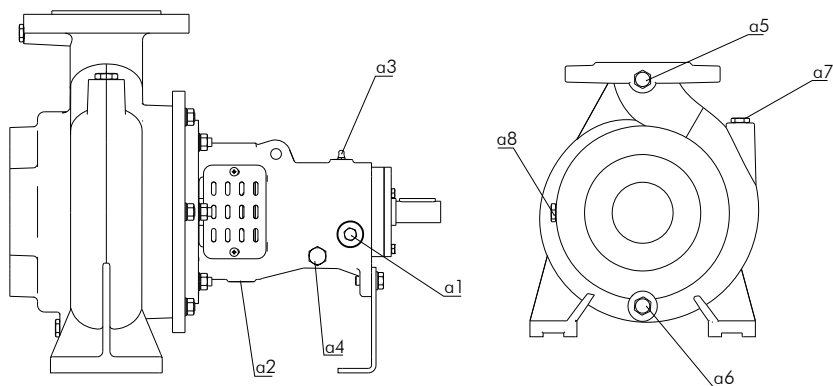
Şekil 8.1.2. Negative Suction



Şekil 8.1.3. Positive Suction

9. AUXILIARY ELEMENTS and ACCESSORIES

- Depending on applications, auxiliary elements should be used to check vacuum, pressure, temperature etc. values also auxiliary should be used for seal washing, cooling, watering etc.
- Vacuum or pressure measurements should be made from the point where is closest to the pump flange.
- Seal washing pipes should be installed properly and correctly.
- Each pump has drain holes in the body to drain water and to reduce water leakage from the seal box.



- a1: Oil Indicator
- a2: Seal Leakage Drain Hole
- a3: Grease Nipple
- a4: Oil Relief Plug
- a5: Discharge Nozzle Pressure Gauge Connection
- a6: Drain Plug
- a7: Water Filling Plug
- a8: Suction Mouth Pressure Gauge Connection

10. ELECTRICAL CONNECTION



ATTENTION!

- Electrical connections should be made by experts who have knowledge and experience in electricity. Operations must be carried out in accordance with international standards and regulations.
- Electric motors must be manufactured in accordance with the EN 60034-1 standard.
- Check the current main voltage according to the data on the motor nameplate and determine the proper starting method. It is recommended to use a motor protection unit.

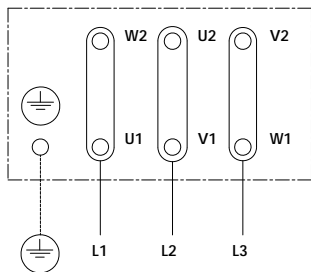


Figure 10.1.1 Delta Connection (Low Voltage)

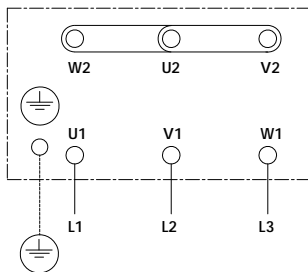


Figure 10.1.2 Star Connection (High Voltage)

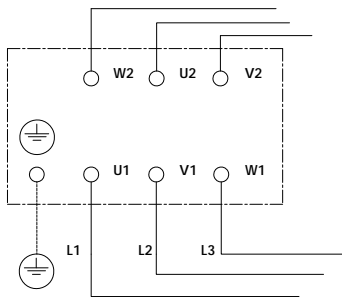


Figure 10.1.3 Y/Δ Connection

10. ELECTRICAL CONNECTION

- In three-phase motors, the motor rotation direction should be clockwise when viewed from the back of the motor in accordance with DIN VDE 0530. The rotation direction of the pump should be counterclockwise when viewed from the the pump side. It should be connected as above to make sure it is correct.
- It is recommended to use PTC sensor in motors. It is a case that is included according to customer demand. If it is to be used, a PTC sensor in accordance with DIN 44081/44082 must be installed. Its leads must be connected to the motor terminal box and from there to the thermistor controller in the motor control panel.
- Electric motors must be protected against overload by circuit breakers or fuses.
- In the start-up time setting, if 3-phase motors are connected as star / delta, it must be ensured that the transition from star to delta takes place at short intervals. Delayed transition interval causes damage to the pump.
- If the motor power is ≤ 30 kW, the Y time to be adjusted should be less than 3 seconds, if the motor power is > 30 kW, it should be less than 5 seconds.
- In cases where the motor rotation direction is reversed, the two phases should be replaced.

11. FINAL CONTROL OF THE PUMP

- Coupling alignment should be checked one more time.
- Warning signs should be hung and protective equipment should be worn.
- Make sure that the pump shaft and motor shaft rotate easily.
- The pump should be operated until it reaches the system temperature and the coupling settings should be made again.
- Make sure that the pump is filled with liquid.
- Make sure that the direction of rotation is correct
- Make sure that auxiliary equipment is working.
- Make sure that the lubricants (grease, oil) are filled enough for at least 1 year.
- Make sure that there is liquid in the liquid well or tank.
- If there is a foot valve in deep suction pumps, it is filled with water from the filling hole at the highest point and its air is taken.

CAUTION! Never operate the pump without liquid.

12. START-UP OF THE PUMP



ATTENTION!

- Before starting the pump, make sure that the discharge line is closed. When the pump reaches full rotation speed, the valve should be opened slowly.
- Suction line pressure should not drop below atmospheric pressure.
- After opening the valve completely, make sure that the value read on the manometer is at the operating point. If the value read on the manometer is less than the operating value, make the adjustment by turning the valve down. If the value is large, check its installation and static height.

- If the following problems are observed in the pump, the pump should be stopped and the authorized service should be applied;
 - When the operating temperature rises or there is a leak.
 - Temperature increase in couplings and bearings.
 - Pressure increase or decrease
 - Pump does not pump the liquid.
 - Continuous reduction of flow.
 - Excessive vibration.
 - Excessive noisy situations.

13. SHUT-OFF THE PUMP

- The valve in the discharge line should be closed slowly.
- If there is a non-return check valve in the discharge line, it can be stopped without closing the valve.
- Make sure that the valve on the suction line is open when you stop the pump. Make sure it stops without jerking.
- If the system will not be operated for a long time, the valve on the suction should be closed, the auxiliary pipes and the liquid in the pump should be drained. These precautions should be taken against the possibility of frost in cold weather.

14. THE OBSERVATION THAT MUST BE MADE DURING OPERATION

- The pump should run smoothly, silently and without noise.
- The pump should not be operated with a closed valve after prolonged non-operation.
- Bearing temperature may exceed 50 °C. However, it should not exceed 85-90 °C.
- The pump should not be operated for a long time with a closed valve at a value where the flow rate is zero.
- If the system has a stand-by pump, it should be operated once a week.
- The amper value on the control panel must be checked. If excess amperage occurs, there may be friction or jamming. Necessary maintenance should be done.
- The pump should not be operated without water.
- If the pump has a mechanical seal, it does not require any maintenance. If it has a gland seal, it must be ensured that water comes out of the seal as leakage. If there is no water leak, the pump should be stopped and maintained. The soft seal must be tightened with the seal support at certain time intervals.
- Elastic coupling rubber should be checked periodically.

15. LUBRICATION AND OIL CHANGE

- DPT-DI Series pumps use liquid lubricated bearings.
- In liquid lubricated pumps, oil must be changed after the first 250 operating hours. In normal operating condition, it should be replaced once a year or after 3000 operating hours. The amount of oil according to the Pump Size type is as follows.
- Keep the oil level under constant observation. Provide control and complete when decrease.

16. DISASSEMBLY

- Before disassembling the pump, make sure that it will not start self-study automatically. Electrical connections must be removed.
- Make sure that the valves in the suction and discharge lines are closed.
- The pump body should be cooled to ambient temperature, the liquid inside should be drained and the pressure should be reduced.
- The oil in the bearing housing must be drained.
- Auxiliary equipment and auxiliary lines must be removed.
- The coupling cover plate should be removed. Suction and discharge lines are separated from the pump.
- The bolts on the engine feet are removed and the engine is separated from the base plate.
- The volute is disassembled and separated from the bearing body group of the pump. If this process is performed in large pumps, it should be placed with support.
- If fastening materials such as studs, bolts, nuts are not removed, rust solvent or solvent may be used.
- To disassemble the impeller, it will be sufficient to unscrew the impeller nut and remove the impeller key. The mechanical seal will also come off easily after the impeller is removed. If the bushing of the packing is scratched or worn, contact the authorized service and replace it with a new one.
- The sealing box is removed from the interconnection cage and separated from the bearing group.
- Clutch assembly couplings on the pump must be removed with the help of a puller.

17. ASSEMBLY

- Installation of the pump is the opposite of disassembly.
- Deformed, damaged, corroded main and auxiliary equipment should be changed.
- Flange gasket should definitely be changed.
- Check the surfaces of the packing shaft bushings before installing them. If the surfaces of the shaft bushings are worn, scratched or rough, replace the shaft bushings with new ones.
- The pump is placed on the baseplate. The system should be prepared by connecting the motor group and coupling kit. Coupling adjustment needs to be done again.
- Suction and discharge lines must be connected and auxiliary equipment-accessories are installed.
- Coupling should be adjusted one more time and the coupling cover plate should be attached. The electrical connection of the motor should be made and the pump group should be checked one more time.

18. SEALING

18.1 - Gland Packing

- The packing cavity and packing thrust in the seal box must be thoroughly cleaned before replacing the soft packing. If there is wear on the packing bush or shaft, it should be replaced with a spare part.
- Soft packings should be cut at 90°, reverse assembly should be made, with the cut point of the first seal on the top and the second on the bottom, and if there is an irrigation ring should be placed.
- After the packing is placed, the packing must be tightened with pressure and the pump must be started. In the first start-up, no intervention should be made for 5-10 minutes and then the compression nuts should be tightened in equal proportions. This process should be done every 5-10 minutes until the leakage reaches the desired value. Minimum desired leakage amount should be 10 cm³/min and maximum desired leakage amount should be 20 cm³/min.

18. SEALS

18.2 - Mechanical Seal

- Mechanical seals do not leak like soft seals, so if there is no leakage, the mechanical seal does not require maintenance.
- Information such as required dimensions and operating instructions for mechanical seals can be obtained from mechanical seal manufacturers.
- In the mechanical seal change, the surfaces should be cleaned well and foreign materials such as slag welding residue should not come into the seal.
- Water should be used instead of substances such as oil to aid assembly.

19. SPARE PARTS

- ERDURO is obliged to provide spare parts for all its pumps for 10 (ten) years after the production period. It will be sufficient to send the information on the label in your spare parts orders.
- The recommended 2 (two) year spare parts stock is as follows. (DIN 24296)

Part Number	Part Name	Total Pump Quantity						
		2	3	4	5	6 and 7	8 and 9	10 and 10+
010	Volute Casing	1	1	2	2	2	3	%20
210	Seal Support	1	1	2	2	2	3	%20
040	Shaft	1	1	2	2	2	3	%20
459	Shaft Sleeve	2	2	2	3	3	4	%50
165	Mechanical Seal	1	1	2	2	9	3	%25
166	Soft Packing	4	6	8	8	2	12	%150
160	Bearing Set	2	2	4	4	6	8	%100
030	Impeller	1	1	1	2	2	3	%20
080	Bearing Housing	-	-	-	-	-	1	2 qty
220-099	O-ringler-Seals	4	6	8	8	9	12	%150
451	Wear Ring	2	2	2	4	4	6	%50

20. TIGHTENING MOMENT

Metric Bolt	Tightening torques according to quality classes Nxm (Newton x Meter)					
	4,6	5,6	6,9	8,8	10,9	12,9
M 2	0,15	0,2	0,3	0,4	0,5	0,6
M 2,2	0,2	0,3	0,5	0,6	0,8	1
M 2,5	0,3	0,4	0,8	0,9	1,2	1,5
M 3	0,5	0,6	1,2	1,4	1,9	2,3
M 3,5	0,7	0,9	1,8	2,1	2,9	3,5
M 4	1	1,5	2,6	3	4,3	5,2
M 5	2	3	5	6	9	11
M 6	4	5	9	11	15	18
M 7	6	8	15	18	25	29
M 8	9	11	22	26	36	43
M 10	17	22	43	51	71	86
M 12	30	40	74	88	123	148
M 14	46	61	117	140	195	236
M 16	70	94	180	210	300	360
M 18	96	128	246	290	412	491
M 20	136	181	385	412	580	697
M 22	183	246	471	560	785	942
M 24	231	310	600	711	1000	1196
M 27	344	461	887	1049	1481	1775
M 30	466	623	1206	1422	2010	2403
M 33	633	850	1628	1932	2716	3266
M 36	814	1089	2099	2481	3491	4197
M 39	1059	1412	2716	3226	4531	5443
M 42	1304	1746	3364	3991	5609	6727
M 45	1638	2177	2177	4992	7012	8414
M 48	1981	2638	2638	6021	8473	10150

21. FAULTS AND FAILURE CAUSES

Reason For Failure	Fault	The pump does not suction	Pump does not deliver label flow rate	Pump does not deliver label pressure	Pump does suction after first run	Motor overlands	There is noise or vibration	Seal box overheats	The seal box overheat and deform	Irregularity and turmoil in the flow
Reverse direction		X		X						
Suction line not fully filled with water		X			X					
Air in suction pipe		X	X		X		X			X
Suction pipe not filled with enough water		X	X		X		X			X
NPSH (present) too small		X	X		X		X			X
Low speed		X	X	X						
System pressure is greater than pump label rating		X	X							
Suction pipe sucks air			X	X	X		X			X
Foot valve is too small			X							
Foot valve is blocked		X	X							
The viscosity of the liquid is higher than the design value			X	X		X	X			
Wear rings worn			X	X		X				
Impeller deformed			X	X		X				
Suction depth too high		X	X		X					
Excessive vapor, gas, or air in liquid				X	X		X			X

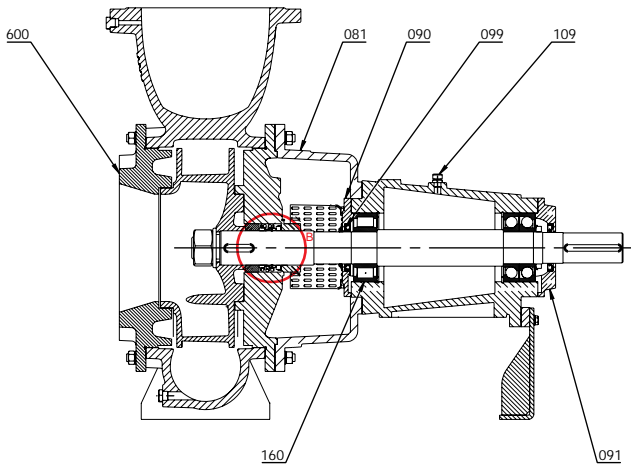
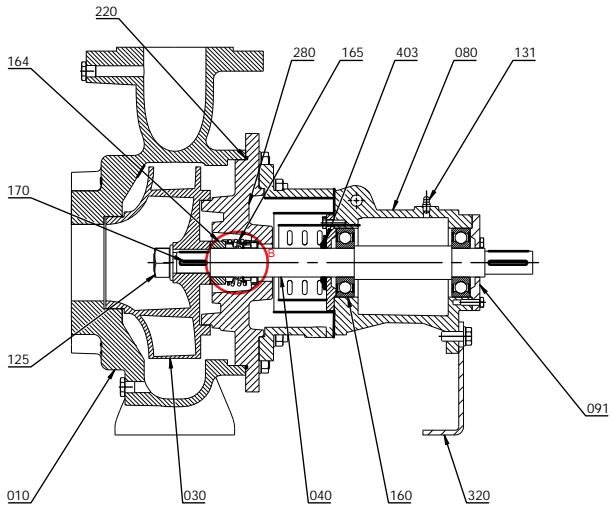
Reason For Failure	Fault	The pump does not suction	Pump does not deliver label flow rate	Pump does not deliver label pressure	Pump does suction after first run	Motor overlands	There is noise or vibration	Seal box overheats	The seal box overheat and deform	Irregularity and turmoil in the flow
Irrigation ring not placed correctly					X					
Quick turn										
Liquid density higher than design value						X				
Coupling unadjusted						X				
The seal box are deformed						X	X		X	
Impeller not balanced							X			
Impeller section blocked			X				X		X	
Curvature of the shaft						X	X		X	
Pump outlet valve position is not correct							X		X	
Chassis foundation is broken							X			
Seal tightly mounted						X		X		
No water comes into the packing or the air is sucking in the packing		X	X		X			X		
Packing selection wrong								X		
Cooling insufficient								X	X	
Low or high oil level									X	

21. FAULTS AND FAILURE CAUSES

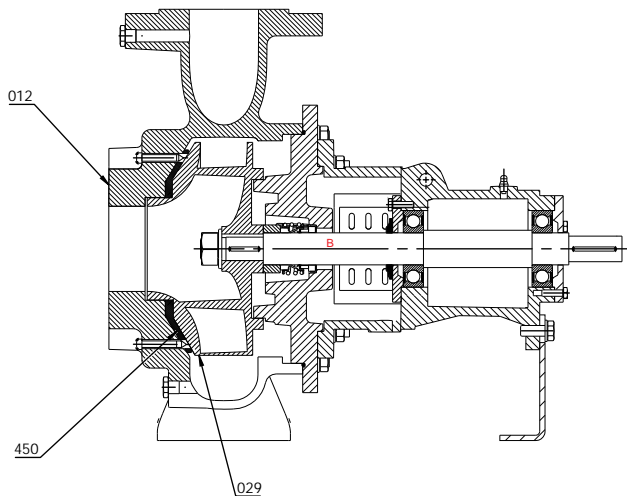
Reason For Failure	Fault	The pump does not suction	Pump does not deliver label flow rate	Pump does not deliver label pressure	Pump loses suction after first run	Motor overloads	There is noise or vibration	Seal box overheats	The seal box overheat and deform	Irregularity and turmoil in the flow
Wrong oil selection									X	
Water or dirt in the housings									X	
Lubrication system does not work									X	
The housings are very tightly mounted									X	
There is excessive axial load									X	
Insufficient lubrication									X	
Bearing assembly incorrect									X	
Excessive housings cooling									X	
Excessive grease in the bearings									X	
Plumbing puts an excessive load on the pump						X	X	X	X	
Foreign matter in the pump	X	X				X	X			
Impeller installed upside down	X									
Suction valve fully closed	X									
Suction valve partially closed			X							
The flange gaskets are installed without cutting the middle	X									

Reason For Failure	Fault	The pump does not suction	Pump does not deliver label flow rate	Pump does not deliver label pressure	Pump loses suction after first run	Motor overloads	There is noise or vibration	Seal box overheats	The seal box overheat and deform	Irregularity and turmoil in the flow
Impeller completely clogged		X								
Mechanical fault						X	X			
Impeller rubbing against the body						X				
Wrong pump selection			X	X						
Impeller diameter small				X						
Coupling is deformed							X			
Impeller balancing holes clogged									X	
Pump body seals worn			X	X	X					
Balancing disc does not work							X		X	

22. PUMP SECTIONAL VIEW



22. PUMP SECTIONAL VIEW

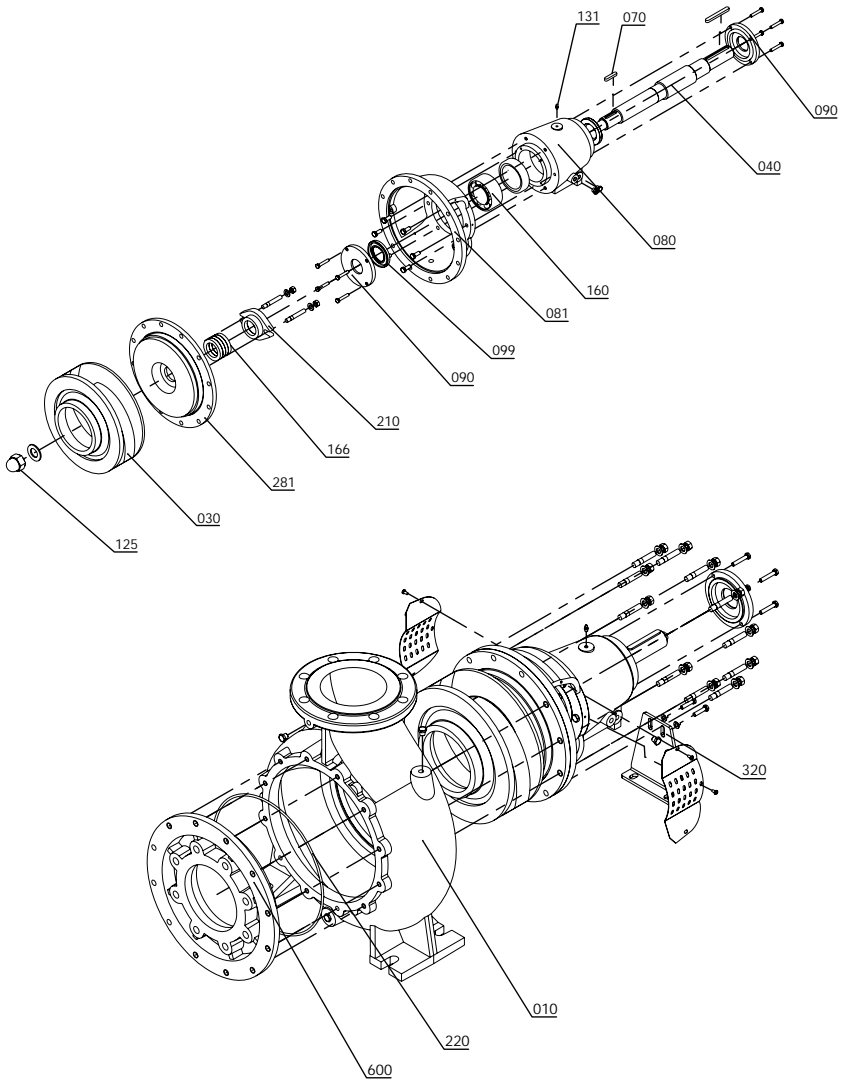


23. PART NUMBER AND PART NAME LIST

Part No	Part Name
010	Volute Casing
080	Volute Casing(semi-open impeller)
030	Impeller
040	Shaft
090	Bearing Cover-Inside
091	Bearing Cover-Outside
081	Interconnection Cage
459	Shaft Sleeve
390	Flat Washer
164	Mech. Seal Setting Sleeve
165	Mechanical Seal
160	Bearing
181	Piston Ring
128	Safety Cover

Part No	Part Name
130	Puller Nut
099	Oil seal
403	Throw Protection
170	Key
125	Nut
395	Spring washer
127	Nut
150	Stud
409	Drain Plug
109	Air Ventilation Plug
320	Supporting Feet
406	Full-Pass Bolt-Key head
220	O-ring
280	Seal Box

24. PUMP DISASSEMBLY VIEW



25. NOISE LEVEL

Motor Power PN (kW)	Noise Pressure Level (DbA)	
	Pump-Motor Group	
	1450 rpm	2900 rpm
<0,55	61	65
0,75	61	66
1,1	63	66
1,5	64	68
2,2	65	70
3	66	71
4	68	72
5,5	68	75
7,5	69	75
11	70	76
15	72	77
18,5	72	78
22	74	78
30	74	81
37	75	82
45	76	82
55	76	84
75	77	85
90	79	85
110	80	86
132	80	86
160	80	86

- It is the value measured in the free field of the reflecting surface, at a distance of 1 m without a sound protection curtain.

26. WARRANTY CONDITIONS

- 1- The warranty period starts from the delivery date of the product and the period is for 2 (two) years.
- 2- All parts of the delivered product are under warranty of our company.
- 3- If the product fails during the warranty period due to material and workmanship or assembly faults, it will be repaired without any charge under the name of labor cost, replacement part price, or any other name.
- 4- Damages and malfunctions resulting from usage errors and using contrary to the usage and maintenance instructions in the product's user manual are not covered by the warranty.
 - Regarding the product; If people other than the authorized service intervene in product promotion, assembly operations, technical controls, etc., the entire product is out of warranty. Malfunctions caused by parts not purchased from authorized services are not covered by the warranty.
 - Malfunctions that may occur due to voltage drop or increase or faulty electrical installation are not covered by the warranty.
 - The parts that wear out due to usage and consumables, that are worn out, that become calcified, that have lost their function due to contamination and the damage and malfunctions caused by the loss of these parts are not covered by the warranty.
- 5- In case of the product malfunctions within the scope of the warranty period, the time passed for repair is added to the warranty period. Repair cannot exceed 30 working days. This period starts from the date of acceptance of the notification to the service station (in case the service station is not available, to the seller, dealer, agency, representative office, importer or manufacturer) of the malfunction related to the product. Consumer's fault notification; It is possible to do by phone, fax, e-mail, registered mail or similar. However, in case of dispute, the burden of proof belongs to the consumer.
- 6- Repair cannot exceed 30 working days. If the fault of the product is not corrected within 10 working days, the manufacturer-producer or importer must allocate another industrial product with similar characteristics to the use of the consumer until the repair of the good is completed. If another good with similar features is not requested by the consumer, the manufacturer or importer is relieved of this obligation.
*Work day; working days other than national, official and religious holidays and New Year, May 1 and Sunday
- 7- Although the consumers use their right to repair;
 - The product fails at least four times within a year within the warranty period from the date of delivery to the Consumer, and more than six times within the specified warranty period, as well as these failures make it permanent not to benefit from the product,
 - Exceeding the maximum time required to repair the problem,
 - In cases where it is determined that the repair of the defect is not possible, the service station of the company (if the service station is not available, respectively, the seller, dealer, agency, representative, importer or manufacturer), with a report, the consumer can demand free replacement of the product, a refund or a discount in proportion to the defect.
- 8- If it is found that the good is defective, the consumer can use one of the limited optional rights listed below:
 - Canceling the contract by declaring that it is ready to return the sold product,
 - Retaining the sold and asking for a discount from the sales price at the rate of defects,
 - Requesting the seller to replace it with a similar one without any defects.
- 9- If the replacement of the product with a similar product without defects will bring disproportionate difficulties for the seller, the consumer can use one of the rights to withdraw from the contract and to discount the defect rate from the price.
- 10- The warranty period of the product replaced during the warranty application is limited to the remaining warranty period of the purchased product.
- 11- Invoices issued for sold goods do not replace warranty.
- 12- For problems that may arise regarding the warranty certificate, the Ministry of Customs and Trade, General Directorate of Consumer Protection and Market Surveillance can be applied.
- 13- Consumers can submit their complaints and appeals to consumer arbitration committees and consumer courts.



27. WARRANTY CERTIFICATE



This warranty, given by Erduro, is beyond the normal

It does not include the elimination of malfunctions arising from the use of not valid in the following situations

- Repairs and changes made outside the authorized service
- Using the product contrary to the points in the user manual.

damage and malfunctions

- Damages and failures caused by errors in the pump suction and discharge

line

- Damages and failures caused by not selecting the appropriate pump
- Damages and failures caused by chemical abrasives in the pumped water.
- Damages and malfunctions caused by the pumped liquid being different

from the liquid properties specified in the user manual.

• After delivery of the product to the customer; Damages and malfunctions caused by loading, unloading, transportation, transportation and storage conditions.

• Damages and malfunctions due to low or high voltage, incorrect electrical installation and control panel, incorrect connection of cable ends , use at different voltage than the voltage printed on the pump label.

• Damages and malfunctions caused by the use of cables in a section suitable for the pump power.

• Damages and malfunctions caused by the use of cables in a section suitable for the pump power.

- Damages and failures that occur after events such as fire, lightning, freezing.
- Elimination of the malfunctions that will occur due to the reasons

mentioned above is done for a fee.

• The responsibility of filling out the Warranty Certificate and giving it to the consumer belongs to the seller, dealer, agency or its representatives, where the consumer purchases the product.

This warranty is void if the Warranty Certificate is tampered with, the original serial number on the product is removed or tampered with.

