LITTLE CHAMP

Task master for light industrial and domestic applications

Operation & Maintenance Manual
DC Series Pumps

OPERATION & MAINTENANCE MANUAL

DC Pump Model Number	DC Bare Shaft Pump	DC Close Coupled Pump
DC-01ςΤπςς	DCAC-012/022	DCCC-012/022
DC-03ς	DCAC-032	DCCC-032
DC-041	DCAA-041	DCCA-041
DC-051	DCAA-51	DCCA-051

Applicable for pump modal : - ……
Pump Serial Number : - ……

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  a) Dismantling Instructions
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Introduction

Roto DC Series pumps are designed for long, trouble-free service in many fields such as light industrial, domestic and agriculture. Their application include wine and beverage, filling machines, weak acid and alkali transfer, sump duties, septic and sullage disposal, brine injection, spear point, domestic water supply, garden reticulation and the like.
The discharge port of the pump is nearest to the driving (motor) end on all models. The maximum temperature allowable is 80oC and should never be exceeded.
For fluids other than water consult your dealer or Roto Pumps Ltd. (Australia) to ensure the correct stator and mechanical seal materials are used.

Installation

Location of Unit: - The pump should be bolted to a firm, flat base in a dry, well ventilated area. If mounted outside it is recommended that the motor be protected from the elements with a well ventilated cover. The pump should be accessible for inspection and repair.

Pipe Connection: -

When connecting pipe work to the pump it is preferable to use thread tape. Care should be taken not to over-tighten connections to the pump, in particular when tapered thread fittings are used. Plastic fittings are preferable.
Both the suction and discharge lines should be independently supported near the pump so that no strain is placed on the pump. The suction line should contain a minimum number of bends. Any bends necessary should have large radii.
The suction line diameter shall be at least equal to the diameter of the suction port. For pumps operating with a suction lift, no valves should be placed in the suction line. For long suction lines a foot valve should be fitted. It is very important to have the suction line airtight. Arrange the suction pipework so that the pump has minimal time before it is primed.
Foot valves, when used, should have an open area of at least 1 1/2 times the area of the suction pipe. An efficient strainer should be provided to prevent foreign matter from being drawn into the pump and choking the foot valve. It is recommended that no foot valve or strainer be fitted for septic effluent duties
The discharge line will preferably be the same or one size larger than the pumps discharge port. The discharge line should be short and direct with the least number of bends and fittings, thus minimising the head lost by friction
A non-return valve should be fitted on the discharge side for high head, long discharge lines and auto pressure system applications. The non-return valve is to protect the pump from excessive back pressure. Where the pump is operating on long suction line suitable valves should be fitted to ensure the pump does not run dry.

Electrical Connection: - Single -phase pump units are supplied complete with a plug and lead. This can be plugged into any single-phase power outlet. Single-phase pump units are supplied fitted with a thermal overload. In the event of the motor overheating, the overload will activate and the motor will stop. Once the cause of the overheating has been identified and removed, the red button on the back of the capacitor box will reset the overload and the motor can be restarted.

All three-phase motor connections must be conducted by a registered electrical contractor.

Three-phase motors should be connected to the electrical supply as shown on the label in the terminal box.

In three phase pumps, it is important to check the direction of rotation of the pump prior to running the pump. Running the pump in reverse could result in the rotor unscrewing from the motor shaft and damaging the pump. Remove the pump from the motor before checking the direction of the pump. Care must be taken while checking direction to ensure that nothing entangles in the pump.

Three-phase motors should be protected through the installation of a thermal cut out of the non-self resetting type.

When a three-phase power supply is available, the motor should be connected in star configuration.

When a single-phase frequency controller is being used, the motor should be connected in delta to the three-phase power that is being created by the frequency controller. Three-phase frequency controllers should not be used.

If a frequency controller is to be used, the motor speed for continuous applications should fall within the range 800rpm to 1500 rpm. Outside this speed range the motor is likely to overheat due to higher currents or reduced cooling effects from the fan.

All three-phase motors on Mono pumps should be wired for direct on line starting. Do not use star-delta starting.

OPERATION

FILL THE PUMP WITH LIQUID BEFORE STARTING - NEVER RUN THE PUMP DRY

Starting:- The plug on the end cover immediately adjacent to the suction port, as shown below, should be removed before starting the pump for the first time and filled with liquid.

This is not to prime the pump, but provides lubrication to prevent damage to the stator on starting. The pump should be mounted with the suction port horizontal on the CP11 & CP25 and vertical on the CP800 & CP1600.

When the pump is stopped, sufficient liquid will be retained to provide start-up lubrication. If the pump has been standing for some time or has been drained by removal of the end cover the pump must again be filled with liquid to lubricate the stator.

Servicing the Pump

All Builds

Assemble the pump following the instructions for the relevant build on the following pages. Inspect the stator for signs of damage to the rubber surface and replace if necessary. Inspect the Rotor for signs of wear and replace if damaged, If it is necessary to replace the rotor it is recommended that the stator be replaced at the same time.

Assembly Notes:

WARNING: Do not use grease, soap, hand cream etc. to lubricate the Stator. These products will damage a natural rubber stator and result in seizure of the pump. When assembling the rotor into the stator it is only necessary to wet the rotor and stator with water and slide the stator assembly over the rotor assembly. Some resistance will be felt as the rotor is pushed into the stator.

a) Dismantling Instructions:-

Before dismantling, isolate all electrical circuits. Close all isolation valves on the suction and discharge lines to the pumps for prevention of liquid escaping from the pipe work system. The persons carrying out the work should be adequately trained in general workshop practice, relevant to the class of work involved & taking care of safety measures.

* Unplug Hex. Taper Plug (07). Its removal in not necessary for pump dismantling.
* Unscrew (Eight) Flanged Hex. Head Screw (26) & Nut (25) from Stator Housing (6310), Remove stator housing from Pump.
* Remove O- Ring (4230) & Stator Support Ring (6220).
* Now Fix Rotor (2500) and rotate Stator (2210) in anticlockwise direction and Try to pull out stator slowly.
* Fix Motor (8800) Shaft and Remove Rotor (2500) with a spanner by rotating it in opposite direction. Remove abutment Ring (8570).
* Remove Mechanical seal (40).
* Unscrew (Four) Hex. Nut (25) from Studs (12).
* Remove Pump Housing (5010) from assembly.
* Unscrew (Four) Socket Head Set Screws (27) for Stub Shaft (4400) to dismantle it.
* Remove Stub Shaft (4400) from Motor.
* Remove (Four) Studs (12).

NOTE: -

1. Clean all the parts and check them for wear / damage .The damaged parts should be replaced with original ROTO spares.

2. In order to store dismantled parts apply suitable antirust compound on metallic surfaces of components.

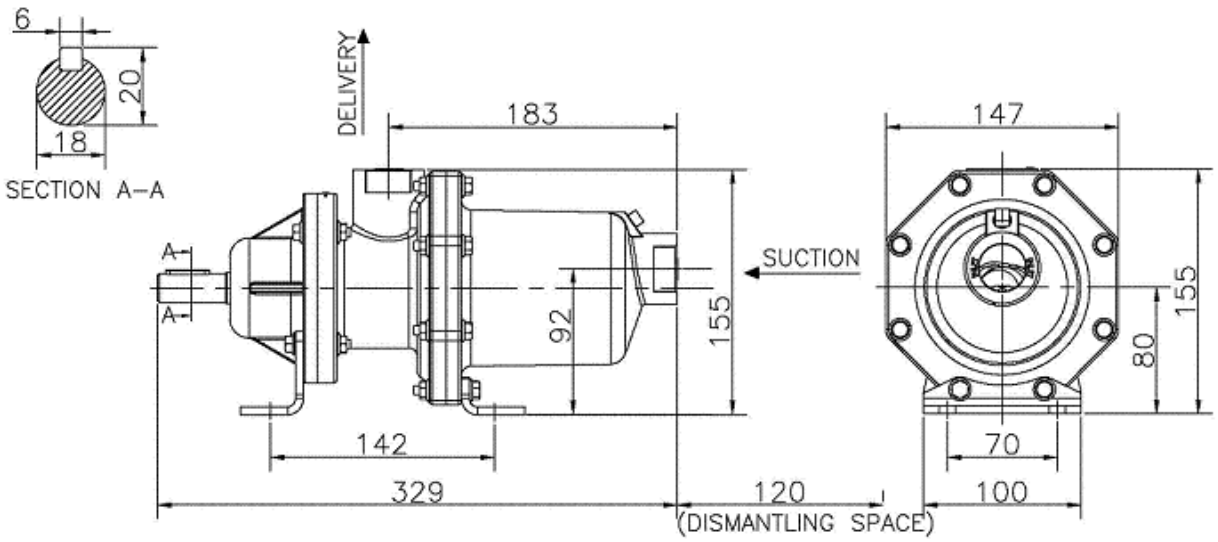
b) Assembly Instructions

* Position the Motor (8800) upright at flat bed / work table.
* In case of re-assembly, make sure that the motor shaft is properly cleaned and burrs are removed for easy insertion in Stub shaft (4400).
* Place Stub shaft (4400) on Motor shaft in a manner so that threaded hole on Stub shaft for Grub screw and Motor key way are at 120 degree apart.
* Ensure correct dimension given in Dimensional drawing from Stub Shaft (4400) to Motor (8800) Flange Face.
* Tight (Four) Socket head set screws (27) in shaft. Ensure no slip between Motor shaft & Stub Shaft (4400).
* Tight (Four) Studs (12) at Motor (8800) Flange Face.
* Place Mechanical Seal's stationery piece (40) in groove of Pump Housing (5010). Check its proper squareness and sitting.
* Put Pump housing (5010) on Motor Flange Face, keeping Delivery End facing motor terminal box. Screw (Four) Studs (12) & tight nuts.
* Place Mechanical Seal (40) in groove of Pump Housing (5010).
* Place Abutment Ring (8570) on Stub shaft (4400).
* Apply anti-seize grease on external threads of Stub shaft (4400).
* Now fix Motor shaft & tight Rotor (2500) on Stub Shaft (4400) with spanner.
* Lubricate internal side of Stator (2210) with Soapy water & place it on Rotor (2500). Rotate it & make it touched with Pump housing's ribbed face.
* Put Stator Support Ring (6220) & O-Ring (4230)
* Now place Stator Housing (6310) by tightening of (Eight) Flanged Hex. Head Screws (26) and Nuts (25).
* Plug Hex Taper Plug (07). Use Teflon tape
* Ensure that all the fasteners are tightened properly.
* This is important that Rotor (2500) should be protected them any undue scratch / harm during Assembly.

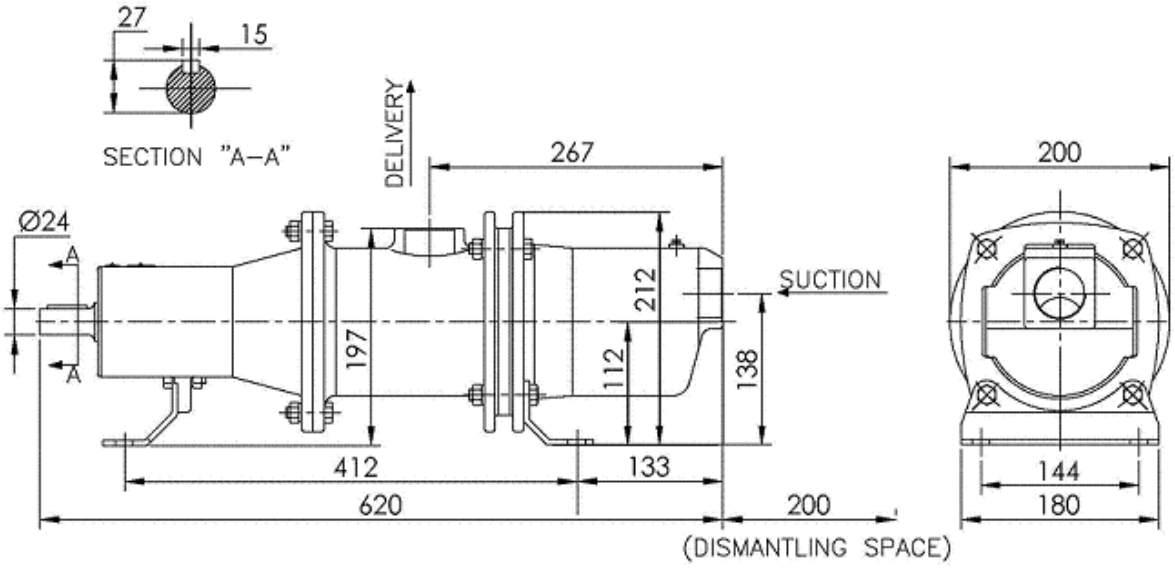
Reference Documents: -

- Cross-sectional drawing of DCCC-011/031 Pump.
- Tightening Torque for M6 8.8 Grade Screw: 9 Nm.

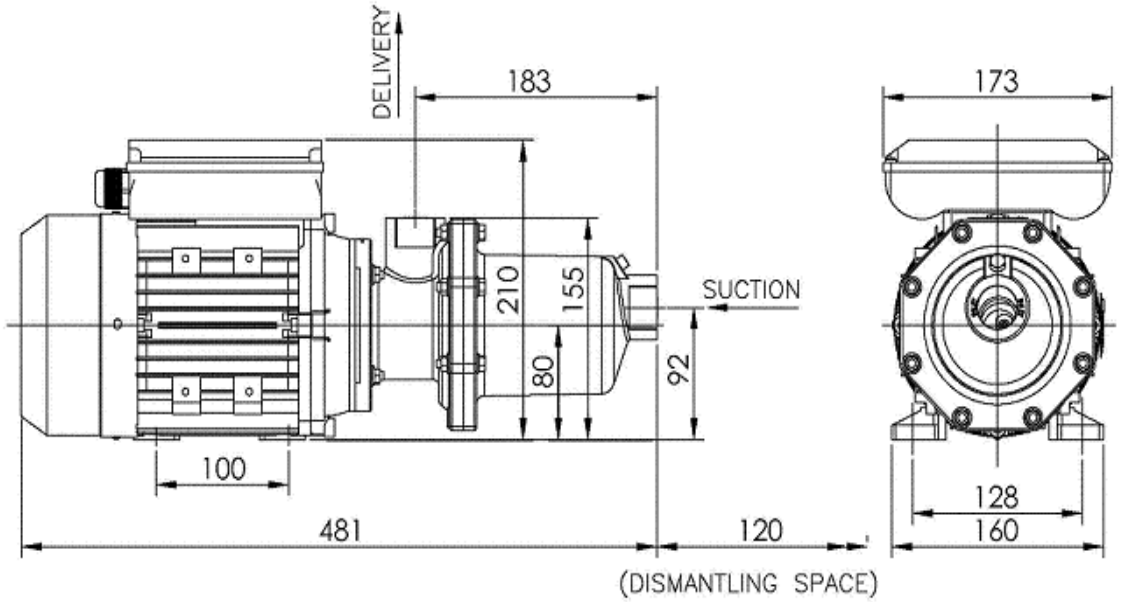
Bare Shaft Pump - DCAC-012/022/032:-



Bare Shaft Pump - DCAA-041/051:-



Closed Coupled – DCCC-012/022/032:-



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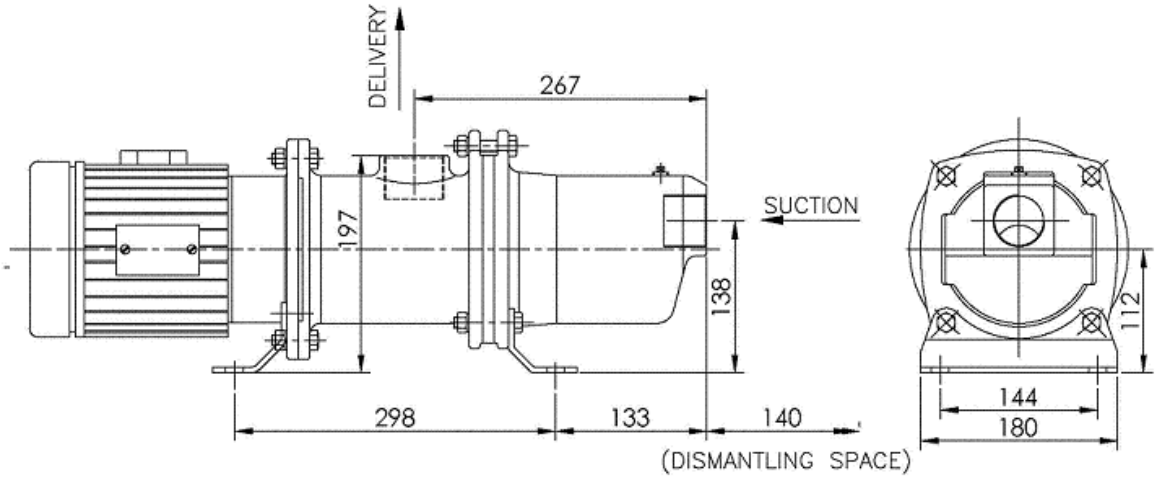
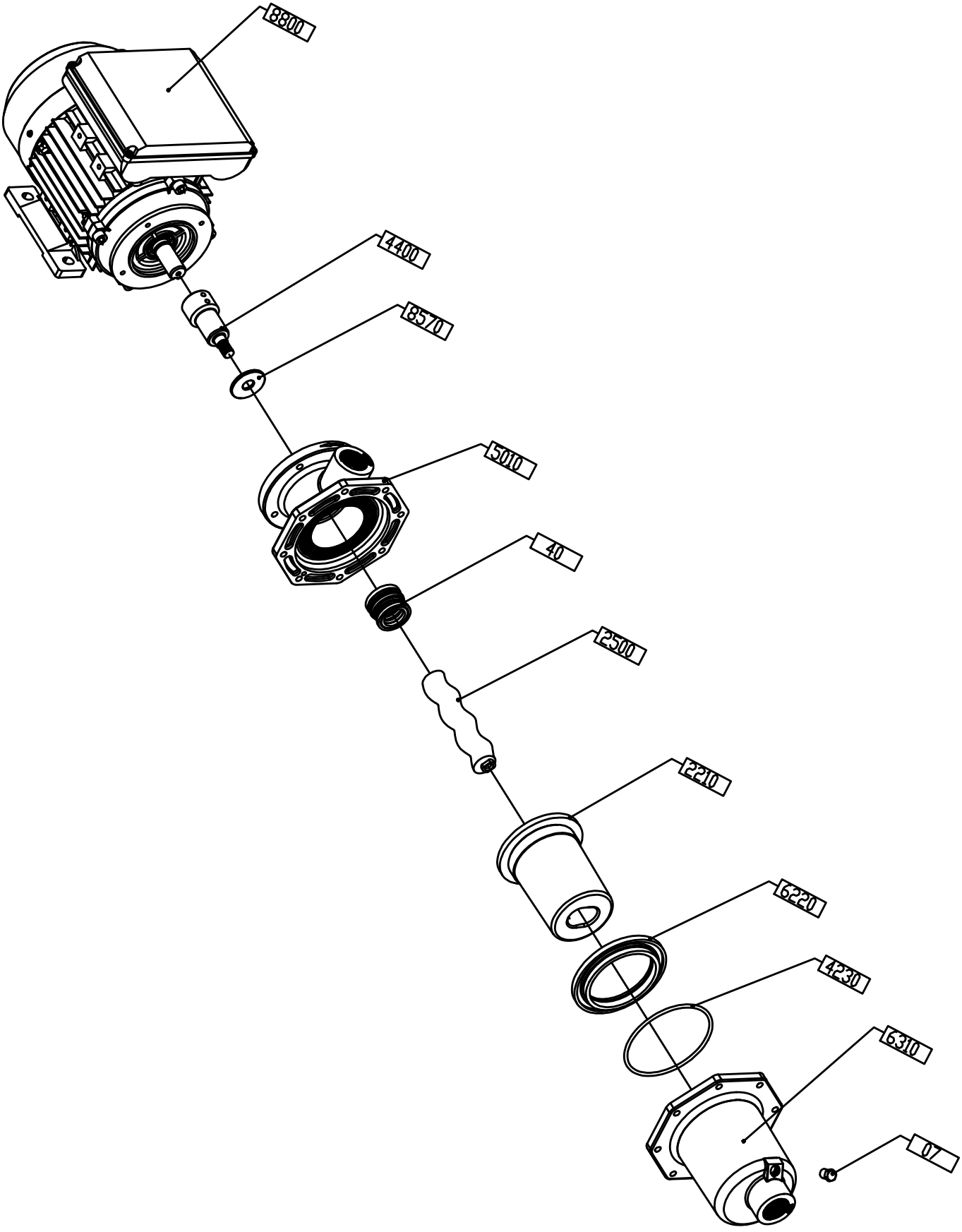
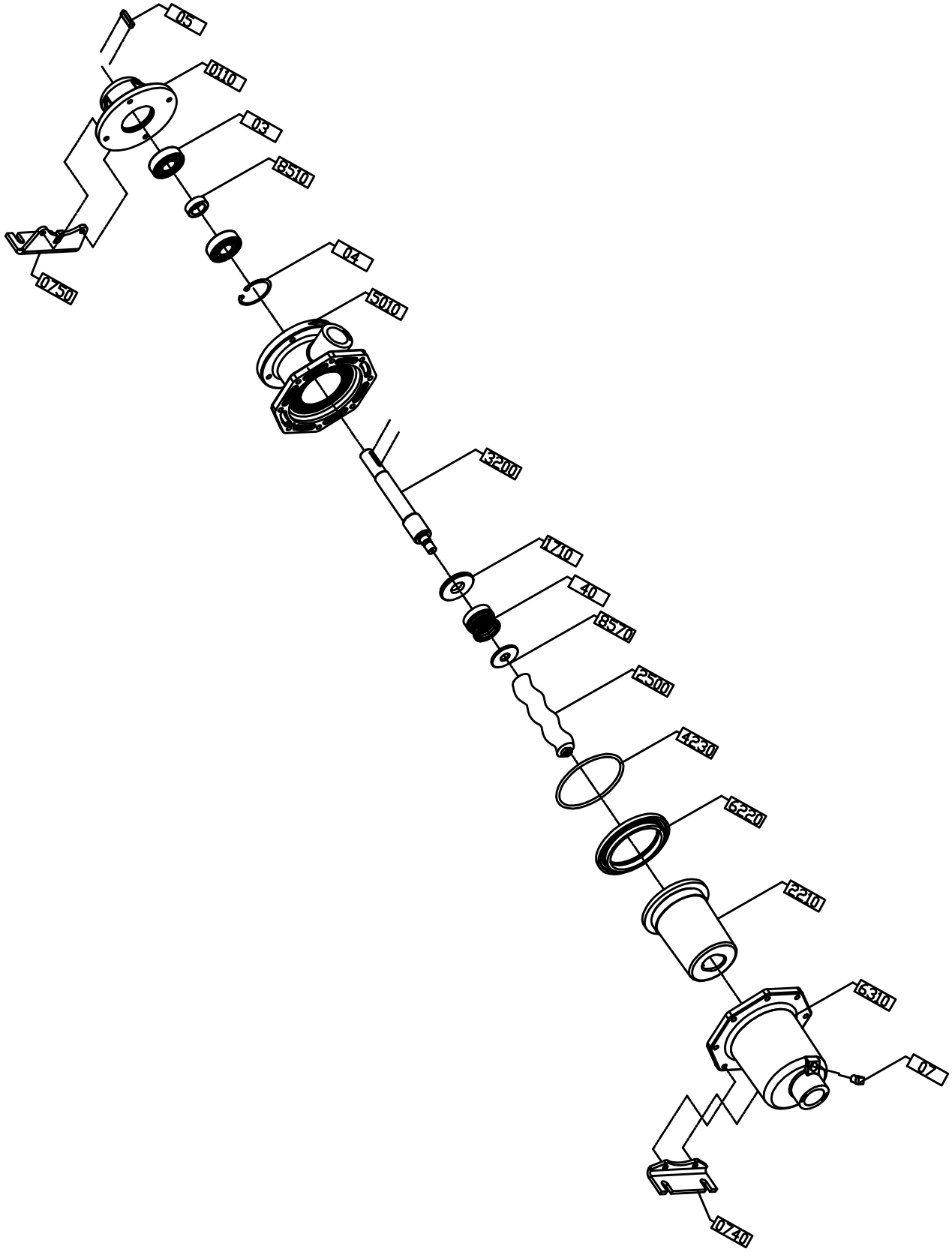


EXPLODED VIEW DCCC-012-022-032



EXPLODED VIEW DCAC-012-022-032



PART LIST

PART NO.	DESCRIPTION	DC-1ς7ςς		DC-3ς	
		DCCC-0ρς	DCAC -01ς	DCCC-31	DCAC-031
		Close coupled	Bare shaft	Close coupled	Bare shaft
1210	PUMP LANTERN	-	-	-	-
820	CLAMP	-	-	-	-
740	STATOR HOUSING FOOT	-	-	-	-
750	FOOT FOR MOTOR	-	-	-	-
750	BEARING HOUSING FOOT	-	DCAC-031-0750	-	DCAC-031-0750
8520	BEARING SPACER	-	DCAC-031-8510	-	DCAC-031-8510
110	BEARING HOUSING	-	DCAC-031-0110	-	DCAC-031-0110
410	BEARING COVER	-	-	-	-
5010	PUMP HOUSING	DCCC-031-5010	DCCC-031-5010	DCCC-031-5010	DCCC-031-5010
6310	STATOR HOUSING	DCCC-031-6310	DCCC-031-6310	DCCC-031-6310	DCCC-031-6310
740	FOOT FOR PUMP HOUSING	-	DCAC-031-0740	-	DCAC-031-0740
6220	STATOR SUPPORT RING	DCCC-031-6220	DCCC-031-6220	DCCC-031-6220	DCCC-031-6220
2500	ROTOR	DC-011-13	DC-011-13	DC-031-13	DC-031-13
2830	MECH.SEAL RETAINER	-	-	-	-
4410	STUB SHAFT	DCCB-011-4400	-	DCCB-031-4400	-
3200	DRIVE SHAFT	-	DCCC-031-3200	-	DCCC-031-3200
1	MECH SEAL	MG1-G60 Face DIN-24960			
1710	WATER THROWER	-	DCCC-031-1710	-	DCAC-031-1710
8570	ABUTMENT RING	DCCC-031-8570	DCCC-031-8570	DCCC-031-8570	DCCC-031-8570
2211	STATOR	DC-10-12	DC-10-12	DC-30-12	DC-30-12
4230	O-RING	DCCC-031-4230	DCCC-031-4230	DCCC-031-4230	DCCC-031-4230
5680	BONDED BUSH	-	-	-	-
20	MOTOR (T.E.F.C.)	-	-	-	-
7911	NAME PLATE	-	-	-	-
7961	ROTATIONAL PLATE	-	-	-	-

S. No	PROBLEM	PROBABLE CAUSES
1.	Motor will not run	o Overload tripped out o Blown fuse/power failure o Defects in motor o Faulty pressure switch (pressure system)
2.	No liquid delivered (Pump will not prime)	o Pump not filled before starting o Air leak on suction o Discharge head too high (above rating) o Suction lift too high o Inlet pipe not submerged enough o Non return valve too close to pump o Insufficient net inlet head o Damaged/worn stator/rotor
3.	Not enough liquid delivered	o Air leak on suction o Discharge head too high (above rating) o Suction lift too high o Inlet pipe not submerged enough o Viscosity of liquid greater than rating
4.	Loss of liquid after starting	o Air or gas in liquid o Air leak on suction o Suction lift too high o Inlet pipe not submerged enough o Insufficient net inlet head o Blocked inlet
5.	Motor runs hot	o Viscosity of liquid greater than rating o Voltage/frequency differ to rating o Overloads set too low (three phase) o Defects in motor o Pump overloaded (current too high) NOTE: Motor normally runs too hot to hold.

6.	Pump is noisy (cavitations)	o Air or gas in liquid o Blocked foot valve/strainer o Restriction in line o Too great total suction lift
7.	Pump will not give rated pressure	o Worn Stator/rotor or both rotor and stator
8.	Pump vibrates	o As for No. 5 above o Pump not bolted down firmly
9.	Overload tripped out	o Low voltage o Too frequent starting (single phase) o Overload set too low (three phase) o Pump overloaded (current too high) o Motor not protected from sun
10.	Pump starts too often (pressure system)	o Incorrect pressure switch setting o Leaking non return valve o Lead in system pipework o Pressure/diaphragm tank too small o Pressure diaphragm tank air pre-charge too low o Air bag in pressure tank damaged.
11.	Pump runs continuously	o Pressure switch set incorrectly

INTERCHANGEBILITY CHART

S. NO.	COMPONENT	PUMP MODEL							
1	PUMP SIZE	DCCC-01ç	DCCC-03ç	DCAC-01ç	DCAC-03ç	DCCB 01ç	DCCB 03ç	DCAB 01ç	DCAB 03ç
2	PUMP LANTERN	-				DCCB-011 1210	DCCB-031 1210	-	
3	BEARING HOUSING	-				-		DCAB031 0110	
4	BRG. SPACER	-				-		DCAB031 8520	
5	CLAMP	-				DCAB031 0820			
6	PUMP HOUSING	DCCC031 5010				DCCB031 5010			
7	STATOR HOUSING	DCCC031 6310				DCCB031 6310			
8	STATOR SUPPORT RING	DCCC031 6220				-			
9	ROTOR	DC011-13	DC031-13	DC011-13	DC031-13	DC011-13	DC031-13	DC011-13	DC031-13
10	STUB SHAFT	DCCC-011 4400	DCCC-031-4400	-		DCCB-011 4410	DCCB-031-4410	-	
11	DRIVE SHAFT	-		DCAC0313200				DCAB0313200	
12	WATER THROWER	-				DCAB0311710			
13	ABUTMENT RING	DCCC0318570				DCAB0118570			
14	STATOR	DC1012	DC3012	DC1012	DC3012	DC1012	DC3012	DC10-12	DC30-12
15	ORING	DCCC0314230				-			
16	NAME PLATE STICKER	DCCC-011-7964	DCCC-031-7964	DCAC-011-7964	DCAC-031-7964	-			
17	MOTOR	DCCC031 8800		-		DCCB-03120	DCCB-031-20	-	
18	MECHANICAL SEAL	Ø20, MG1 G60 FACE DIN 24960				Ø16, MG1 G60 FACE DIN 24960			