Turn the motor to required position. Replace and tighten the bolts. Replace the coupling guards.

The electrical connection should be carried out as shown in the diagram inside the terminal box cover.

Do not start the pump until it has been filled with liquid.

6. Start-Up

Do not start the pump until it has been primed and vented.

- Priming

Closed or open systems where the liquid level is above the pump inlet :

Close the discharge isolating value and loosen the vent screw in the pump head

Pay attention to the direction of the vent hole and take care to ensure that the escaping water does not cause injury to persons or damage to the motor or other components. In hot water installations, special attention should be paid to the risk of injury caused by scalding hot water.

Slowly open the isolating valve in the suction pipe until a steady stream of liquid runs out the vent hole. Tighten the vent screw and completely open the isolating valve(s).

Open systems where the liquid level is below the pump inlet:

The suction pipe and the pump must be filled with liquid and vented before the pump is started.

- Checking Direction of Rotation

Do not start the pump to check direction of rotation until it has been filled with liquid

The direction or rotation should not be checked with the motor alone, as an adjustment of the shaft position is required when the coupling has been removed.

The correct direction of rotation is shown by arrows on the pump head and/or on the motor fan cover.

- Starting

Before starting the pump, completely open the isolating valve on the suction side of the pump and leave the discharge isolating valve almost closed. Start the pump.

Vent the pump during starting by loosening the vent screw in the pump head until a steady stream of liquid runs out the vent hole,

Pay attention to the direction of the vent hole and take care too ensure that the.

escaping water does not cause injury to persons or damage to the motor or other components. In hot water installations, special attention should be paid to the risk of injury caused by scalding hot water.

When the piping system has been filled with liquid, slowly open the discharge isolating valve.

While pumping liquid containing air, it is advisable to vent the pump regularly. To vent the pump, loosen the vent screw in the pump head during operation.

- Frequency of starts and stops

Motors smaller than 4KW should not start more than 100 times per hour.

Other motors should not start more than 20 times per hour.

7. Maintenance

Before starting work on the pump, make sure that no power is supplied to the pump and that it cannot be accidentally switched on.

Pump bearings and shaft seal are maintenance-free. If the pump is to be drained for a long period of inactivity, remove one of the coupling guards to inject a few drops of silicone oil on the shaft between the shaft seal faces from sticking.

Motor Bearings :

Motors which are not fitted with grease nipples are maintenance-free.

Motors fitted which grease nipples should be lubricated with a high-temperature lithium-based grease.

In the case of seasonal operation (motor is idle for more than 3 months of the year), it recommended to grease the motor when the pump is taken out of operation.

8. Frost Protection

Pumps which are not being used during periods of frost should be drained to avoid damage.

Drain the pump by loosening the vent screw in the pump head and by removing the drain plug from the base

Care must be taken to ensure that the escaping water does not cause injury to persons or damage to the motor or other components. In hot water installations, special attention should be paid to the risk of injury caused by scalding hot water.

Do not tighten the vent screw and replace the drain plug until the pump is to be used again.
Before replacing the drain plug in the base, screw the bypass valve out against the stop.
Fit the drain plug by tightening the large union nut followed by the bypass valve

9. Fault finding Chart

Before removing the terminal box cover and before any removal /dismantling of the pump, make sure that the electricity supply has been switched off.

Fault	Cause
1. Motor does not run when electric supply is started.	a) Supply failure. b) Fuses blown. c) Motor Starter overload has tripped out. d) Main contacts in motor starter are not making contact or the coil is faulty. e) Control circuit fuses are defective. f) Motor is defective.
2. Motor starter overload trips out immediately when supply is switched on.	a) One fuse is blown. b) Contacts in motor starter overload are faulty. c) Cable connection is loose or faulty. d) Motor winding is defective. e) Pump is mechanically blocked. f) Overload setting too low.
3. Motor starter overload tripped out occasionally.	a) Overload setting too low. b) Low voltage at peak times.
4. Mortor starter has not tripped out but the pump does not run,	a) Check 1 a), b), d) and e).
5. Pump capacity not consistant.	a) Pump inlet pressure is too low. b) Suction pipe / pump partly blocked by impurities. c) Pump draws in air.
6. Pump runs but gives no water.	a) Suction pipe / pump blocked by impurities. b) Foot or non-return valve blocked in closed position. c) Leakage in suction pipe. d) Air in suction pipe or pump. e) Motor rotates in the wrong direction.
7. Pump runs backwards when switched off.	a) Leakage in suction pipe. b) Foot or non-return valve defective, c) Foot valve blocked in open or partly open position. d) Non- return valve leaks or is blocked in partly open position.
8. Leakage in shaft seal.	a) Pump shaft position is incorrect. b) Shaft seal is defective.
9. Noise	a) Cavitation has occurred in the pump. b) Pump does not rotate freely (frictional resistance) because of incorrect pump shaft position.

10. Maintenance

Under normal operating conditions, the pump does not require any maintenance.

If the pump has been used for pumping liquids that may leave impurities in the pump, it should be flushed through with clean water immediately after use.

11. Calculation of Minimum Inlet Pressure

The Minimum inlet pressure "H" in meters head required to avoid cavitation in the pump is calculated as follows:

$H=p_b$ X 10.2 - NPSH - H_f - H_v - H_s

P_b =Barometric pressure in bar.
(Barometric pressure can be set to 1 bar).
In closed systems P_b indicates the system Pressure in bar.

NPSH =Net positive Suction Head in metres head
(to be read from the NPSH curve in the catalogue the highest flow the pump will be delivering).

H_f =Friction loss in suction pipe in meters head

H_s =Safety margin=0.5 meters head.

If the calculated H is negative, an inlet pressure of minimum "H" meters head is required. There must be a Pressure equal to the calculated H during operation.

Example:

P_b=1bar

Pump type : CDL 16, 50HZ.

Flow rate : 16m³/h

NPSH :1.5 metres head.

H_f = 3.0 metres head.

Liquid temperature : +90°C

H_v = 7.2 metres head.

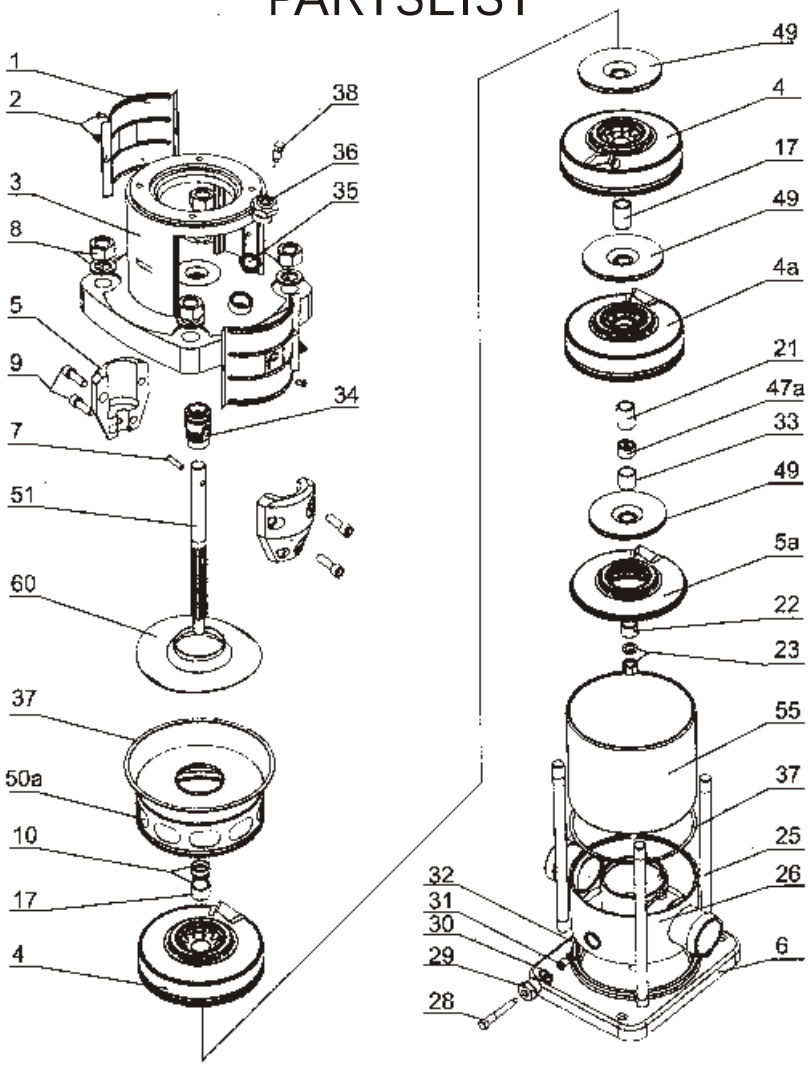
$H=P_b$ X 10.2 - NPSH - H_f - H_v - H_s [m head]

H=1 X 10.2 -1.5 - 3.0 - 7.2 - 0.5 = -2.0 metres head. This means that an inlet pressure of 2.0 metres head is required during operation.

The pressure calculated in bar : 2.0X 0.0981 = 0.20 bar.

The pressure calculated in kPa : 2.0 X 9.81 = 19.7kPa.

PARTSLIST



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