



Cooling Tower Systems, Inc.

OPERATING INSTRUCTIONS
&
SERVICE MANUAL



PC Series
CENTRIFUGAL

**Congratulations On Your Choice
In Purchasing This Pump**

Its Quality is unsurpassed in material and workmanship and has been factory tested.
If properly installed, it will give many years of trouble free service.

Cooling Tower Systems, Inc.

3170 Mercer University Dr., Macon, GA 31204

TF: 800.752.1905 F: 478.755.8304 www.coolingtowersystems.com info@coolingtowersystems.com

Note: Inlet pipe should be at least one size larger than suction inlet tapping. (1 1/2 NPT)

Figure1 - Connection to a water tank which provides a gravity flow, flooded suction.

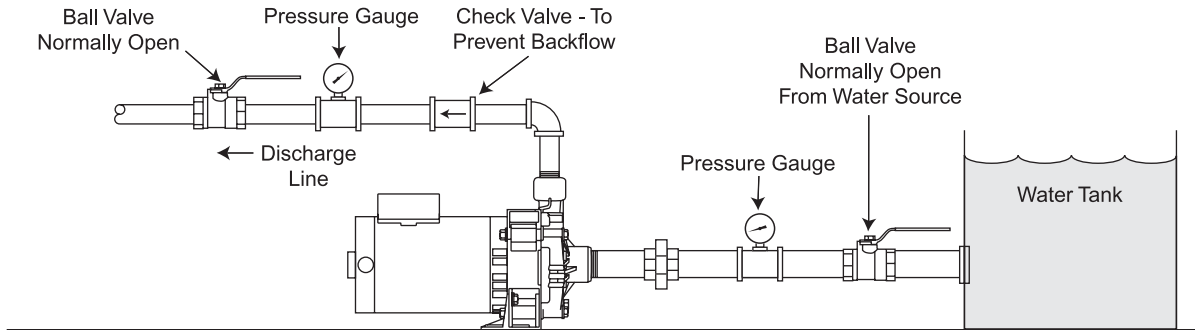


Figure 1

Figure 2 - Connection to a pressurized water system.

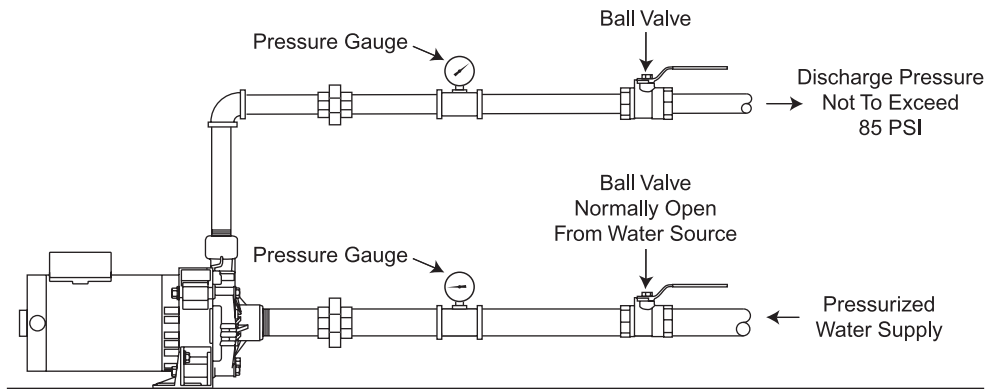


Figure 2

Figure 3 - The normal position of the discharge is top vertical.

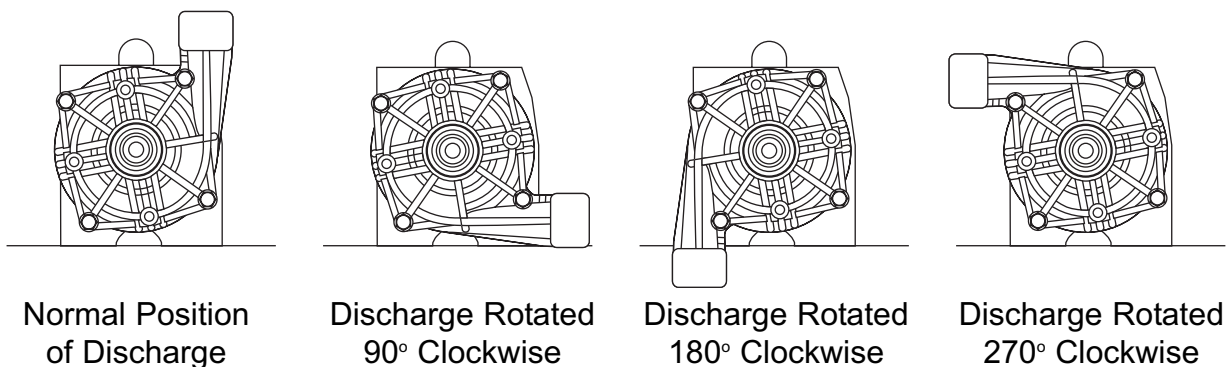


Figure 3

| Baldor 1 Phase ODP Motor | | |
|--------------------------|------------|-------|
| Catalog Number | See Figure | HP |
| JL1303A | 8 | 1/2 |
| JL1306A | 8 | 3/4 |
| JL1309A | 8 | 1 |
| JL1313A | 8 | 1 1/2 |

| Baldor 3 Phase ODP Motor | | |
|--------------------------|------------|-------|
| Catalog Number | See Figure | HP |
| JM3107 | 9 | 1/2 |
| JM3111 | 9 | 3/4 |
| JM3115 | 9 | 1 |
| JM3120 | 9 | 1 1/2 |

Baldor Motors Connection Diagrams

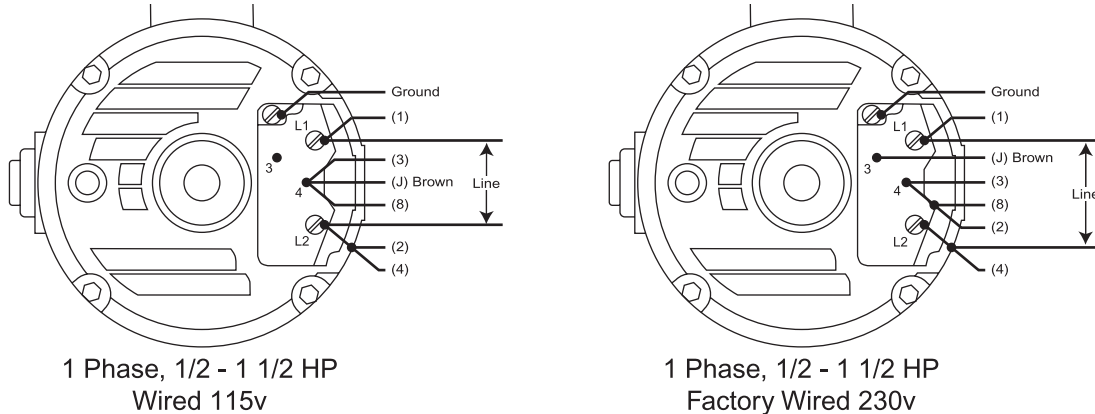


Figure 8

Baldor Motors Connection Diagrams

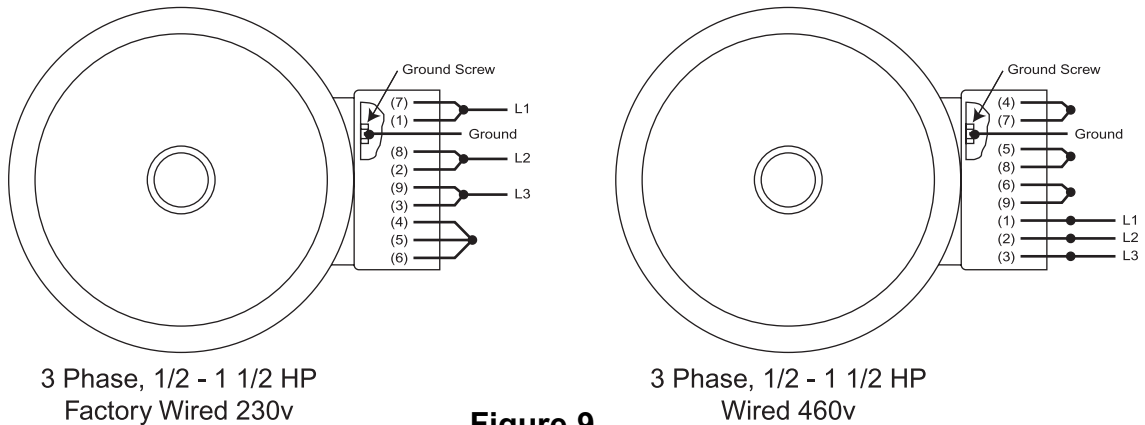


Figure 9

If the supply voltage is 460 volts, refer to the motor wiring connections shown in (Figure 9) to properly rewire the motor.

Start-Up Procedures

Shaft Rotation - To check for a free turning pump turn the power off and rotate the motor shaft. This can be done by removing the motor end cap located on the back of the motor. Rotate the motor shaft in a clockwise direction. Do not start the pump if the motor shaft cannot be turned.

Shaft Rotation (3 Phase Motors) - After the proceeding instructions have been completed, turn the motor on for **1 second**. If the connection is correct, the motor shaft will rotate clockwise when viewed from the end opposite the motor shaft extension. If the rotation is not correct, reverse any two leads to the starter. The rotation will now be correct.

Valves - The suction inlet valve should be fully open and the discharge valve should be partially open. This will allow the pump to develop back pressure when it is started.

Priming - The pump will automatically fill with water when the pump is connected to a city main, hydrant or water tank. To relieve the air trapped inside the pump, allow the water supply to run a minimum of 1 minute before starting the pump. Then, turn the motor on and off several times to free the air trapped inside the pump. Repeat this priming sequence several times to be sure all the air has been removed from the pump. Start and run the pump for 1 minute. The pump should be pumping water and rapidly build pressure. If not repeat the priming procedure.

Warning: The pressure gauge installed in the inlet line should never read less than 2 PSI. This insures that an ample supply of water is flowing into the pump.

Starting - When the pump is up to operating speed, open the discharge valve to obtain the desired capacity or pressure. Do not allow the pump to run with the discharge valve closed because the liquid in the pump can get extremely hot.

Warning: The discharge pressure should never be allowed to exceed 85 PSI, otherwise, leakage between the motor bracket and pump casing will occur.

Final Inspection - Once the proceeding instructions have been completed the pump can be started. During the first few hours of operation, inspect the pump, piping and auxiliary equipment used in conjunction with the pump. Check for leaks, vibration or noises.

If a problem arises, consult a Webtrol representative or call Webtrol at (314) 631-9200 for assistance.

Maintenance

The pump does not require special maintenance. If the pump is not going to be used for a long period, the pump should be drained of water and flushed with clean water. Where the pump is exposed to freezing temperatures, it should always be left drained when not in use.

System Trouble Shooting

Motor Fails To Start Or Run At Full Speed

| Possible Cause Of Trouble | Corrective Action |
|--|---|
| Start capacitor failed - 1 phase motor (motor hums) | Replace start capacitor |
| Power Loss | Replace bad fuse or reset circuit breaker (check for correct fuse/breaker size) |
| Incorrect voltage - voltage must be within $\pm 10\%$ of motor rated voltage. Example: Rated voltage 230 volts Range: 207 - 253 volts | 1. Check incoming voltage, contact power company 2. Verify that the voltage of the motor matches the power supply voltage 3. Check wire size from main switch to motor. |
| Defective wire or connections | Replace defective wires, tighten and clean connections. |
| Grounded motor | Have motor rewound with new winding or replace motor. |
| Wired for incorrect voltage | Check motor wiring diagram for proper voltage |

Pump Leaks

| Possible Cause Of Trouble | Corrective Action |
|---|---|
| Worn mechanical seal due to abrasive liquid/corrosion | 1. Replace seal with materials compatible with liquid pumped. 2. Install filter on inlet line. |
| Lack of water - carbon seal on mechanical seal face overheats and cracks or wears rapidly | 1. Replace seal 2. Verify inlet pressure, minimum pressure on inlet gauge is 2 PSIG |
| Inlet pressure to high | 1. Discharge pressure not to exceed 85 PSI 2. Reduce inlet pressure |
| Misalignment of mechanical seal | Check for a bent motor shaft |
| Worn or pinched O-ring seal | Replace O-ring seal |

Pump Operates, But Delivers Little Or No Water

| Possible Cause Of Trouble | Corrective Action |
|--|--|
| Incorrect rotation on 3 phase motor | Interchange any two incoming power leads to the motor. |
| Low line voltage | (See motor trouble shooting section above) |
| Air Locked Pump | Fill pump & inlet pipe with water - jog motor on and off several times. Refill with water. Repeat procedure several times to remove all air |
| Worn or plugged impeller | 1. Replace impeller 2. Clean clogged impeller, install filter on Inlet |
| Inadequate inlet pressure | Minimum pressure on the inlet side of pump is 2 PSIG |
| Diameter of suction/discharge pipe is to small | 1. Size of inlet pipe should be at least equal to the threaded inlet size in the pipe inlet housing 2. Calculate friction losses for the discharge pipe. Replace undersized piping. For assistance call Webtrol (314) 631-9200 |
| Broken Shaft | If motor shaft is broken replace motor |
| Wired for incorrect voltage | Check motor wiring diagram for proper voltage |

Excessive Noise While Pump Is Operating

| Possible Cause Of Trouble | Corrective Action |
|--|---|
| Cavitation (noise like gravel in pump) | 1. Increase size of inlet line 2. Reduce flow rate - GPM 3. Too viscous (liquid is too thick) maximum viscosity is 80 centipoise (CPS) |
| Pump not secured to firm foundation | Bolt down to secure and rigid base |
| Noisy motor | 1. Ensure that motor fan is clear 2. Remove motor from pump. If noise persists check for smooth bearing operation. Replace bad bearings/or motor |
| Wired for incorrect voltage | Check motor wiring diagram for proper voltage |