

**INSTRUCTION MANUAL  
FOR**

***Southern Cross***



**CBI-Series**  
**AUTOMATIC WATER PRESSURE SYSTEMS**

***Southern Cross***

Form 2822 April 2008

**Telephone 131 PUMP**  
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A division of **tyco** Flow Control Pacific Pty Ltd  
A.B.N. 83 000 922 690

As Tyco policy is one of constant improvement, we reserve the right to make specification changes without notice and without incurring liability.

**These instructions act as a guide only and do not cover every aspect. Owners not familiar with pumping equipment should seek advice from their pump dealer or Southern Cross.**

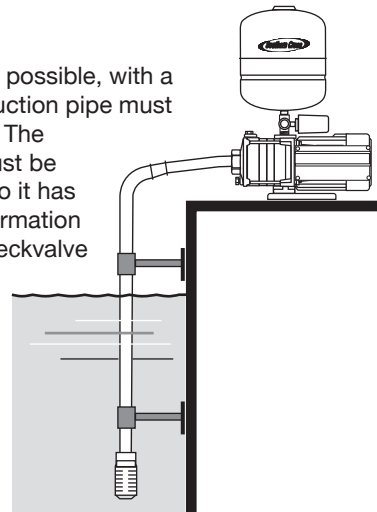
Southern Cross CBI Series Pressure Systems are designed for pumping non-aggressive water, and water not containing solid particles. Never install the pump in areas where the ambient temperature exceeds 40° C. The temperature of the pumped liquid should be within the range of +4° C to +60° C. Before installing the pump ensure the rotating parts turn freely.

**Installation**

The pump should be installed as close as possible to the liquid source, and covered by a weather-proof housing, well ventilated to allow motor heat to escape. The pump foundation should be rigid enough to absorb any vibration from the motor, and the pump should be securely bolted to the foundation. It is also recommended that the plumber/installer provides an adequate draining system to avoid damage in case of leakage, particularly when installed indoors.

**Piping**

The suction line should be as short and straight as possible, with a minimum of bends. The internal diameter of the suction pipe must be equal to, or greater than the ports of the pump. The connection between the suction line and pump must be airtight, and the suction pipe must be positioned so it has an upward slope to the pump (thus avoiding the formation of air pockets) and **must** be fitted with a reliable checkvalve (supplied with unit) for correct operation. When used on a suction lift a footvalve should be fitted on the suction line, below the liquid level. For long suction pipes or high suction lifts over four metres, the suction pipe should be of greater diameter than the suction port. On all installations where water is drawn from wells, dams and creeks, an additional strainer must be fitted to the inlet to the suction line, to ensure any solids in the water do not enter the pump. If hose is used as the suction line, it must be non-collapsible.



To minimise pressure drop the discharge pipe should be at least the same size as the discharge port of the pump. All piping should be independently supported and in no way apply any strain to the pump casing with all pipe joints securely tightened and sealed using a jointing compound.

**WARNING: All wiring should be carried out by a fully qualified electrician.**

Ensure the mains voltage is the same as the value shown on the motor plate and that the pump is safely connected to ground/earth. All single phase (240 V) motors are supplied with a 3 pin plug and lead and can be connected directly to the mains supply. All single phase pumps/motors are fitted with a thermal overload protection which will automatically reset when the temperature returns to normal. Do not start the pump until it has been primed.

**Pressure Tank Unit Fault Finding**

Fault	Possible Cause
Pump starts and stops rapidly	<ul style="list-style-type: none"> <li>- Incorrect pressure switch setting.</li> <li>- Incorrect pressure tank pre-charge.</li> <li>- Punctured diaphragm in pressure tank.</li> <li>- Faulty footvalve or checkvalve.</li> <li>- Leaking pipework.</li> </ul>
Water emitted from air valve	- Punctured diaphragm
Tank will not hold air pressure	- Faulty air valve.

**Presscontrol Unit Fault Finding**

Fault	Possible Cause
Pump does not start	- Electronic card is faulty
Pump does not stop	<ul style="list-style-type: none"> <li>- Electronic card is faulty</li> <li>- Flow detector is blocked in the upper position</li> <li>- Reset button is stuck</li> <li>- System has leaks present which are greater than the minimum flow of 0.6 L/min</li> </ul>
Pump continually starts and stops	<ul style="list-style-type: none"> <li>- Electronic card is faulty</li> <li>- System has leaks present which are less than the minimum flow of 0.6 L/min</li> <li>- Float valve in a watering trough in the system</li> </ul>
Pump does not pump liquid	<ul style="list-style-type: none"> <li>- Electronic card is broken</li> <li>- Column of water between the highest tap and the Presscontrol unit exceeds 15 metres</li> <li>- Unit diaphragm is broken</li> </ul>
<p>Presscontrol will allow the pump to automatically perform all its normal functions, however if there is an operational breakdown (ie. lack of water, blockage in suction pipe, etc) the unit will recognise the breakdown, send a stop signal to the pump and subsequently light the red "Failure" LED. Once the problem has been rectified, the unit can be restarted by pressing the "Reset" button.</p>	

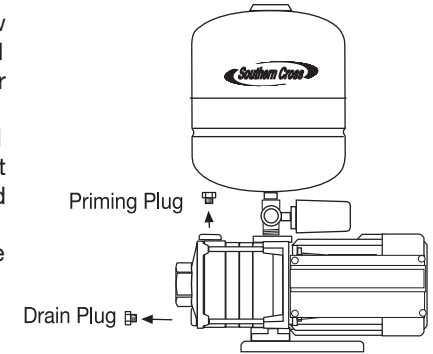
**General Fault Finding**

Fault	Possible Cause
<i>Pump won't prime/ no liquid delivered</i>	<ul style="list-style-type: none"> <li>- Footvalve may be leaking.</li> <li>- Suction lift too high.</li> <li>- Air leak or blockage in suction line.</li> <li>- Footvalve not installed below lowest water level.</li> <li>- Footvalve/checkvalve installed in the wrong direction.</li> <li>- Voltage or wiring of motor incorrect.</li> <li>- Strainer blocked.</li> <li>- Pump speed too low.</li> <li>- Pump impeller blocked.</li> </ul>
<i>Pump runs at reduced capacity</i>	<ul style="list-style-type: none"> <li>- Suction lift too high.</li> <li>- Suction or discharge line blocked.</li> <li>- Pump impeller partly blocked by impurities.</li> <li>- Footvalve/checkvalve or strainer partly blocked.</li> <li>- Air leak in suction line.</li> <li>- Pump speed too low - check voltage.</li> <li>- Damaged impeller or casing.</li> <li>- Discharge pressure too high.</li> </ul>
<i>Pump does not start</i>	<ul style="list-style-type: none"> <li>- Power supply failure.</li> <li>- Defective motor.</li> <li>- Impeller jammed.</li> <li>- Incorrect voltage.</li> <li>- Thermal overload tripped.</li> </ul>
<i>Pump switching on and off when no water is being used</i>	<ul style="list-style-type: none"> <li>- Pressure tank pre-charge incorrect.</li> <li>- Footvalve/checkvalve leaking.</li> <li>- Discharge or suction line leaking.</li> </ul>
<i>Pump stops during operation</i>	<ul style="list-style-type: none"> <li>- Motor thermal overload tripping.</li> <li>- Voltage too low.</li> <li>- Blocked/damaged impeller causing it to rub.</li> <li>- Motor continually starting/stopping resulting in thermal overload tripping.</li> </ul>
<i>Pump not switching off or taking too long to switch off</i>	<ul style="list-style-type: none"> <li>- Voltage too low.</li> <li>- Drop in suction water level.</li> <li>- Leak in discharge line.</li> <li>- Pump impeller blocked.</li> </ul>
<i>Pump loses suction</i>	<ul style="list-style-type: none"> <li>- Suction line leaking.</li> <li>- Air in the pumped liquid.</li> <li>- Air leaks in suction line.</li> <li>- Suction lift too high.</li> </ul>

**Starting**

Before starting, the pump must be primed. This is done by removing the priming plug and completely filling the pump with clean water. On pumps with suction lift the suction line should also be filled. Ensure the priming plug is tightened in place once pump has been primed.

For Installations where the pump inlet is below the water supply remove the priming plug and allow the water to flow into the priming chamber until all air is expelled. The priming procedure should be repeated until all air is expelled and the pump delivers a full stream of water without air bubbles. The pump must always be checked for prime if not used for a prolonged period. It is imperative to fill the pump with liquid before operation as dry running causes irreparable damage to the mechanical seal.



**Precautions**

The pump should be shut down and the trouble corrected if the pump is running at speed and found to have any of the following problems:

- No liquid delivered
- Not enough liquid delivered
- Excessive vibration
- Motor runs hot

Do not allow the pump unit to continually start and stop (short-cycle) as this will reduce the motor life. Short-cycling can occur on pressure units when the pressure tank pre-charge drops, or where there is a leak in the discharge plumbing.

**Adjustments and Reset Procedures**

For most applications Southern Cross Pressure Systems need no adjustments to operate under normal conditions. If problems are experienced, or if the unit is to operate outside the factory settings range, adjustments should be made by **qualified pump service technicians only**.

**Operation and Maintenance**

Under normal operating conditions, the pump does not require any maintenance as long as the following points are observed:

- if the pump is to remain inactive at temperatures of less than 0° C, the pump body must be completely emptied (priming must be carried out before the next start).
- periodically check the condition of the footvalve and strainer (if used).
- if the pump is to be inactive for long periods, the pump should be rinsed thoroughly with clean water, then drained and stored in a dry place.
- if the pump sticks after long periods of inactivity the unit may need dismantling.
- pressure tank air charge should be checked at regular intervals of between 1 to 3 months and after the pump has not been used for a prolonged period.

**Units fitted with Pressure Tanks**

The Southern Cross range of pressure tanks is designed to be used in a water supply system to provide draw-off prior to a pump unit starting.

**WARNING: Always use an accurate pressure gauge to check pre-charge as over-inflating may cause tank to explode, resulting in serious injury.**

**Never exceed the maximum tank pressure of 1000 kPa (145 psi).**

**Removal of Air Valve from pressurised tank may result in serious injury.**

**Installation:** Ensure no sharp objects are placed in the discharge of the tank as this may puncture the diaphragm. A suitable sealant should be used on all pipe connections. All tanks should be installed in a vertical position, under a weather-proof housing. Pressure tanks should never be placed between a pump and a flow switch as the discharge from the tank will activate the flow switch and start the pump.

**Checking and Adjusting Precharge:** (Minimum recommended Personal Protection Equipment (PPE) – Safety Glasses and Steel Capped, Enclosed Footwear)

Before installation, the tank should be precharged and then checked approximately every three months. To adjust the precharge, firstly turn off the power to the pump. Open a tap on the discharge line and allow all water to escape, leaving the tap open when finished. Remove the dust cap from the valve and check the precharge using a tyre pressure gauge. The precharge should be 10% below the cut-in pressure of your pump pressure switch (pre-charge figures are shown below). If necessary, adjust the air charge using a hand or foot pump. Replace valve cap, close tap on discharge line and turn pump on. Ensure the pump builds up pressure in the tank, then shuts off (this may take longer than usual as the tank and discharge line will both need refilling).

**Operating Pressures for Southern Cross Pressure Pumps**

Model	Cut-in Pressure kPa (psi)	Tank Precharge kPa (psi)	Cut-out Pressure kPa (psi)
CBI 2-30PT8	140 (20)	125 (18)	250 (36)
CBI 2-40PT18	175 (25)	150 (22)	310 (45)
CBI 2-50PT18	200 (30)	180 (25)	380 (55)
CBI 2-60PT18	300 (43)	270 (39)	485 (70)
CBI 4-40PT18	175 (25)	150 (22)	310 (45)
CBI 4-50PT18	200 (30)	180 (25)	380 (55)
CBI 4-60PT18	250 (35)	220 (32)	450 (65)

**Units fitted with Presscontrol**

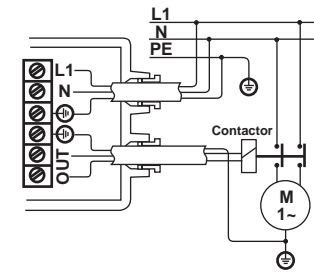
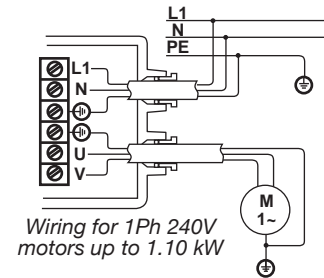
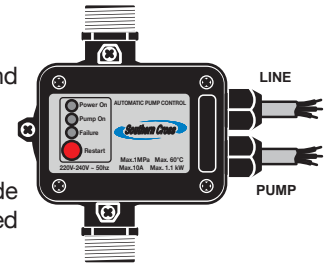
Note: The use of a Presscontrol unit is not recommended for systems incorporating float valves in stock-watering troughs, as flows below the minimum of 0.6 l/min can be encountered for long periods prior to complete valve closure. Should the features of a Presscontrol unit be required, it is recommended that an air pressure tank also be incorporated in the system.

**Installation** The Presscontrol unit is equipped with an in-built check valve to prevent the pipeline from losing pressure. The units have a preset restart pressure of either 150 kPa (23 psi) PC15 or 220 kPa (32 psi) PC22. The pressure produced by the pump must be at least 50 kpa (8 psi) higher than the preset pressure of the unit. It is IMPERATIVE that the unit is installed with the arrows in the upward position, and protected by a weather-proof housing. Presscontrol can be installed either directly on the pump, or between the pump and the first tap. NEVER install a tap between the Presscontrol unit and the pump.

If the vertical distance between the highest tap and the Presscontrol unit is greater than 15 metres (49 feet), the Presscontrol unit will have to be raised until these conditions are fulfilled. Presscontrol must be connected to the discharge pipe via a flexible hose to ensure there is no pipe loading on the unit. Presscontrol is rated to handle liquids up to 60° C.

**WARNING: All wiring should be performed by a fully qualified electrician.**

When the Presscontrol unit is installed correctly, the top gland is for the mains power lead in, the bottom gland is for the power lead from the unit to the pump. The basic wiring diagram is shown on the inside of the terminal box cover. Cable used must be within the range of 6mm to 9mm outside diameter, and the terminal box cover screws securely tightened to ensure the terminal box remains watertight.



**Starting:** Before connecting the unit to the electrical mains check the suction line and ensure the pump is primed. When the power is switched on for the first time the green “Power On” LED and yellow “On” (pump in operation) LED light up. The pump will continue to operate for a short period until the discharge pipes are filled and required pressure reached. When reached the pump will cut out and yellow LED will turn off. If the pump fails to fill the pipes/reach the set pressure the red “Failure” LED will light up. In this event, open a tap on the discharge line and hold the “Reset” button in until the red LED goes off. Release the “Reset” button and close the tap, making sure the pump stops once it reaches maximum pressure.