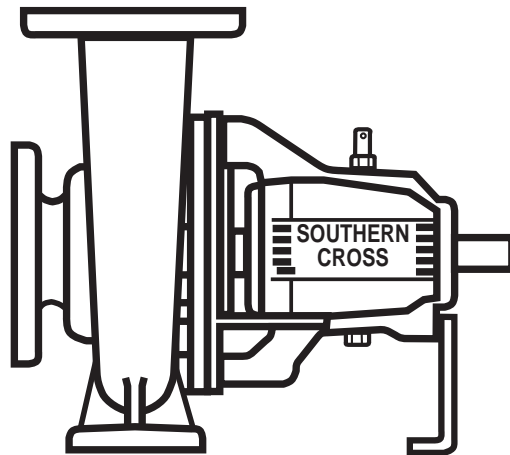


**INSTALLATION
AND
OPERATING INSTRUCTIONS
FOR
SOUTHERN CROSS**

SOUTHERN CROSS

ISO-PRO

PUMPS



Southern Cross

LOCATION

Select a site as near as possible to the source of the liquid to be pumped, involving the smallest suction lift and the shortest length of suction pipe. Reference should be made to the pump performance curve to determine the maximum permissible suction lift of the pump.

DIRECTION OF ROTATION

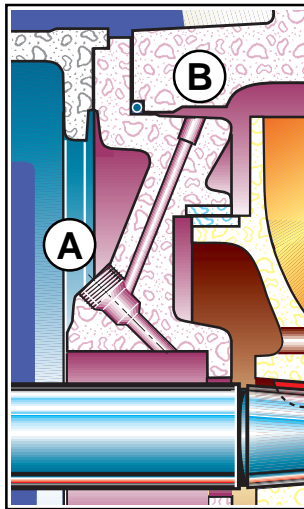
The pump is designed to run in an anti-clockwise direction, when viewed from the suction end of the pump. Before installing, check rotation of the driving machine to ensure that the pump will be driven in the correct direction.

FOUNDATION

Set the pump unit base plate on a firm foundation. The foundations should be sufficiently substantial to support the pump unit (eg. concrete), depending upon whether the pump is electric or diesel engine driven.

SHAFT SEAL

Southern Cross ISO-PRO pumps are supplied with an empty shaft seal cavity to allow the dealer/customer to fit a seal to suit a particular application. It is important that the shaft seal is fitted according to the manufacturer's instructions. In the case of a packed gland, the gland needs to be adjusted so a slow drip of water is evident when the pump is operating. A drain hole is provided in the bearing housing (below the seal cavity) for use with a packed gland. If the gland in the pump is to be lubricated with water from the pump body, ensure the plug (A) is fitted and the passage from the pump body to the seal cavity is clear. If the pump gland is to be lubricated from an external water supply, plug (B) must be fitted. Ensure passage from seal cavity to external water supply is clear before connecting water supply line.

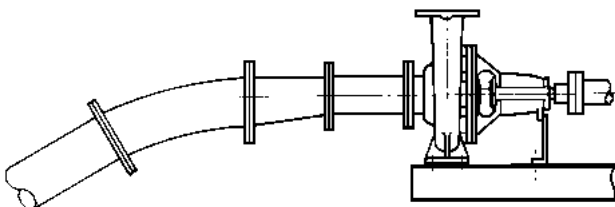


INSTALLATION

NOTE: All pipe work should be correctly aligned with the pump and firmly supported so that no external loads are imposed on the pump body. The pump shaft must be free to turn after the pump has been bolted in position and pipe work connected.

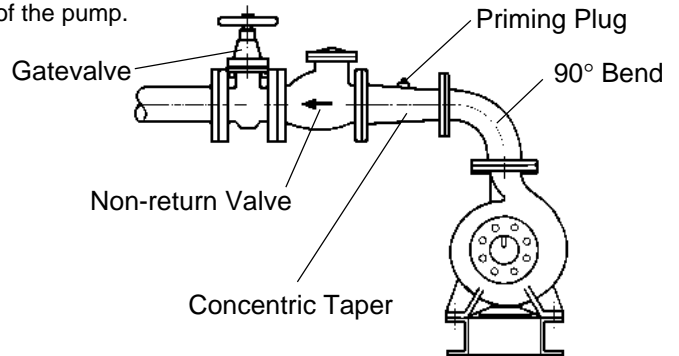
SUCTION PIPING

Suction piping must be free from air leaks. Suction piping should be the same size or larger than that of the pump flange. Tapered eccentric reducers should be used. A straight length of pipe should be fitted to the pump inlet. Suction piping should have a continual fall from pump to the liquid source. Avoid sharp turns, by using long radius bends and not elbows. Ensure that the end of the suction line is sufficiently below the low level of the liquid to prevent the formation of whirlpools, and the consequent entry of air into the suction pipe. Where there is a suction lift, a good type of footvalve, with a water opening of at least equal to that of the pipe, is essential.



DISCHARGE PIPING

Discharge piping should be selected of a size suitable to carry the required capacity, such that the friction head created is not excessive. To avoid the formation of air pockets in the discharge piping (ie. at the high points), vent cocks must be placed to expel any accumulation of air which may affect the discharge capacity of the pump.



DIRECT COUPLED PUMPS

Flexible couplings should be fitted and aligned in accordance with the coupling manufacturers instructions. Failure to align the coupling may result in early bearing failure. Coupling alignment should be checked after the pump unit has been bolted to the foundations.

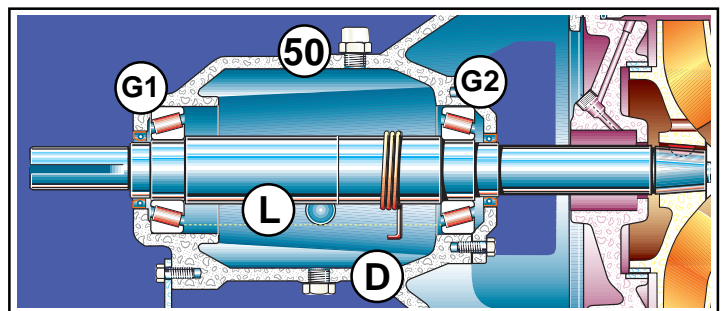
BELT DRIVEN UNITS

A bearing housing bracket must be fitted when the pump is belt driven. **NOTE:** Pump pulley and speed must be to Southern Cross specification.

LUBRICATION

OIL LUBRICATED PUMPS:

Warning: Do not operate pump before adding oil. Lubrication of bearings in the pump is from an oil reservoir in the bearing housing. Check oil level daily for the first three days running, and thereafter each week. To fill reservoir, unscrew oil breather (50) and oil level plug (L) located in the bearing housing side. Using SAE20 lubricating oil, pour oil in through hole in top of bearing housing until oil appears at oil level hole. Replace the oil after 1000 hours running, by removal of drain plug (D) in the bottom of the bearing housing.



PUMPS FITTED WITH REGREASABLE BEARINGS:

Bearings are pre-greased during pump assembly and do not require further lubrication before start-up. Grease lubricated ISO-PRO Pumps must not be operated over 1500rpm. Recommended grease type is Shell Alvania R3 or an equivalent high quality Lithium-based grease. Apply grease to both drive end bearing (G1) and pump end bearing (G2).

<i>Grease replenishment intervals (running hours) at 70°C operating temperature and 1450rpm.</i>		
Bearing Housing	Hours	Grease Qty (g)
Group 1	6000	10g
Group 2	4500	14g
Group 3	3700	19g
Group 4	3000	26g

STARTING

NOTE: Do not run the pump dry as the shaft seal will be severely damaged.

1. Ensure the discharge gate valve is closed. Do not run the pump for very long with the discharge valve closed.
2. Prime the pump. The pump casing and suction line must be filled with the liquid to be pumped, either by direct filling or evacuation of air (diaphragm pump). The pump shaft should be turned slowly to expel air trapped in the impeller. It should not be necessary to re-prime the pump before subsequent starts if the footvalve has remained sealed.
3. Ensure the drive shaft rotation conforms to the direction arrow on the pump.
4. The unit may now be started. When the pump reaches full speed, open the gatevalve on the discharge pipe gradually until the desired quantity of liquid is being delivered. If no liquid is being delivered, shut down the unit immediately.
5. Check for exceptional noise or operating temperature and check pump mechanical seal for leaks.

TROUBLES AND THEIR CAUSES

FAILURE TO DELIVER WATER/ OPERATING BELOW RATED CAPACITY

1. Long suction and short delivery. A minimum discharge head of approximately 1.5m will help to eliminate this trouble.
2. Obstruction in suction/discharge line:
 - a. Valve closed.
 - b. Suction strainer clogged.
 - c. Suction footvalve stuck in closed position or partially closed.
 - d. Footvalve too small.
 - e. Suction and/or discharge pipes of insufficient diameter causing excessive friction loss.
3. Slight air leaks in suction piping or joints or a badly worn or damaged shaft seal.
4. Pump not properly primed.
5. Speed too low.
6. Discharge head beyond pump's rating. Check both suction and discharge heads with gauges.
7. Excessive suction lift.
8. Incorrect direction of rotation.
9. Impeller partially or fully clogged.
10. Air or gases in liquid handled.

HOT BEARINGS

1. Incorrectly aligned coupling.
2. Belt drive too tight or out of line.
3. Unsupported pipes straining the pump.

NOTE: A temperature uncomfortably hot to the hand is not necessarily injurious to the pump - however any sudden rise in temperature should be investigated.

POWER CONSUMPTION TOO HIGH

1. Total head is lower than estimated causing too much water to be pumped. Throttle capacity by means of gate valve on delivery side or turndown impeller.
2. Pump speed too high.
3. Density of liquid greater than water.
4. Bent shaft.
5. Foreign body jammed in pump.
6. Misalignment.

EXCESSIVE VIBRATION

1. Misalignment.
2. Foundation not sufficiently rigid.
3. Impeller partially clogged, causing imbalance.
4. Worn bearings.
5. Unbalanced coupling or pulley.

EXCESSIVE INTERNAL WEAR OF PUMP

1. Cavitation from air gases in liquid.
2. Abrasion caused by solid particles.
3. Corrosive action of liquid pumped.

NOISY OPERATION

1. Foreign body jammed in impeller or body.
2. Impeller binding in body.
3. Worn or faulty bearings.
4. Pump not properly primed.
5. Cavitation noise.

DISMANTLING PROCEDURE

NOTE: If spacer type coupling has been fitted between the pump and driver, the pump casing can remain bolted to the suction and discharge pipes.

1. Remove the backplate to casing bolts. Jacking screw holes are provided in the backplate, to facilitate removal of the bearing housing shaft element.
2. Unscrew the impeller nut about two turns and drive a pair of wooden or metal wedges gently between the impeller and backplate, being careful not to distort the impeller. Give the impeller nut a sharp blow, using a hammer and piece of hardwood, to spring the impeller from the taper. Remove the impeller nut and sealing washer and lift off impeller. Lift out impeller key.
3. Remove the bearing housing to backplate bolts and remove the backplate. **NOTE: Some pumps do not have separate bearing housing to backplate bolts and these would have been removed in step (1).**
4. Remove the bearing cover to bearing housing bolts. By tapping on the end of the shaft with a piece of wood the shaft, bearing assembly and bearing cover can be removed.

A pump which has become worn in the body or impeller may be repaired by fitting bronze wear rings. These rings, with full instructions for machining the pump parts and fitting rings are obtainable from the nearest Southern Cross Dealer.

RE-ASSEMBLY PROCEDURE

Re-assemble the pump by reversing the dismantling procedure, paying particular attention to the following:

1. Ensure gasket surfaces are clean.
2. Ensure shaft seal is fitted according to manufacturer's instructions.

SPANNER SIZES AND RECOMMENDED TORQUES

NO. 1 SHAFT MODULE

Pump Driven End Shaft Diameter - 24mm.
13mm, 16mm, 18mm AF Spanners and a 19mm Socket for the Impeller Nut.
Impeller Nut Torque 35 Nm (25 ft.lbs)

NO. 2 SHAFT MODULE

Pump Driven End Shaft Diameter - 32mm.
13mm, 16mm, 18mm, 24mm AF Spanners and a 24mm Socket for the Impeller Nut.
Impeller Nut Torque 80 Nm (60 ft.lbs)

NO. 3 SHAFT MODULE

Pump Driven End Shaft Diameter - 42mm.
16mm, 18mm, 24mm, 30mm AF Spanners and a 30mm Socket for the Impeller Nut.
Impeller Nut Torque 340 Nm (250 ft.lbs)

NO. 4 SHAFT MODULE

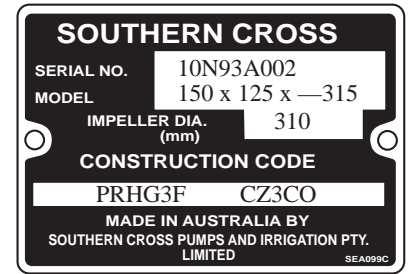
Pump Driven End Shaft Diameter - 48mm.
18mm, 24mm, 30mm, 36mm AF Spanners and a 57mm AF Socket for the Impeller Nut.
Impeller Nut Torque 750 Nm (550 ft.lbs)

ORDERING PARTS

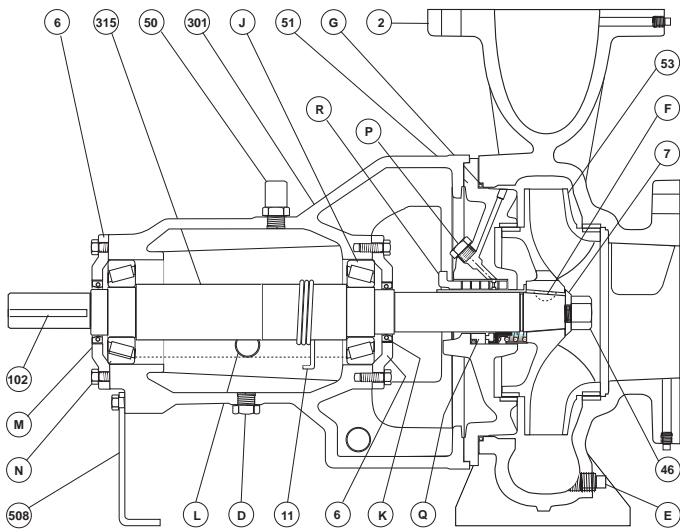
Quote the serial no., model and construction code from the pump nameplate, followed by the part description. The impeller diameter box will be blank, if the pump was a supplied with a full diameter impeller. If ordering a replacement impeller specify full diameter if the box is blank or specify the turndown diameter stamped in the box.

WARRANTY

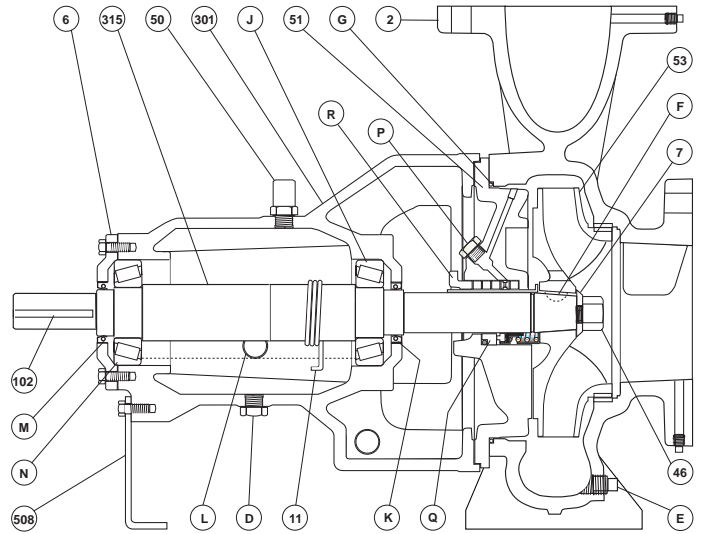
Every Southern Cross ISO-PRO pump is covered by a two year warranty against defective material and workmanship and is backed by an Australia wide and overseas network of service agents.



Nos. 1, 2 and 3 SHAFT PUMP



No. 4 SHAFT PUMP



ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
2	Pump Body	102	Shaft Key	J	Bearing - Impeller End
6	Bearing Cover	301	Bearing Housing	K	Dust Seal - Impeller End
7	Impeller Washer	315	Shaft	L	Oil Level Plug
11	Oil Thrower	508	Support Foot	M	Dust Seal - Pulley End
46	Impeller Nut	D	Oil Drain Plug	N	Bearing - Pulley End
50	Oil Breather	E	Casing Plug	P	Gland Flushing Plug
51	Backplate	F	Impeller Key	Q	Mechanical Seal
53	Impeller	G	O-Ring	R	Packed Gland

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

Distributed by...

Form 2594A Aug '07



e-mail: southerncross@typac.com.au
Ph: 131 786

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