PENTAIR

INSTALLATION
AND
OPERATING INSTRUCTIONS
FOR
SOUTHERN CROSS

ISO-2858

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 pump 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

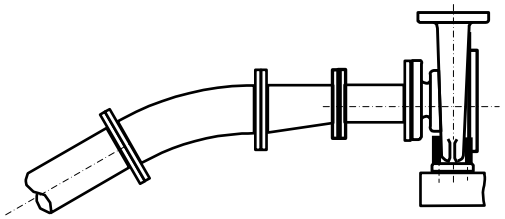
Southern Cross ISO pumps are supplied with a mechanical shaft seal unless specified otherwise. Pumps should not be run dry.

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.

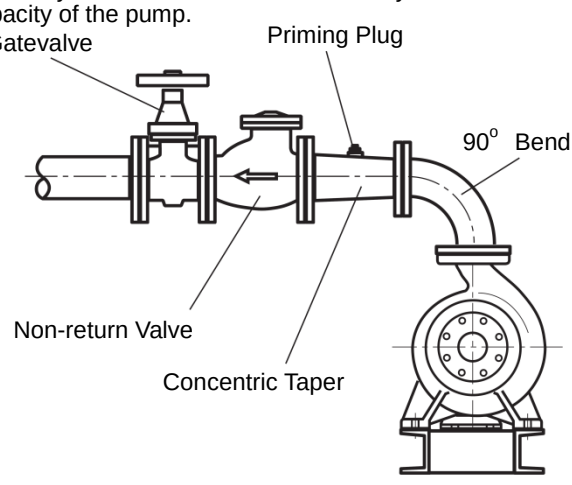
SUCTION PIPING

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 manufacturer's instructions. Failure to align the coupling may result in early bearing failure. **Coupling alignment must be checked after the pump unit has been bolted to the foundations.**

BELT DRIVEN UNITS

Refer to Southern Cross for belt drive applications.

NOTE: Pump pulley and speed must be to Southern Cross specification.

LUBRICATION

Unless specified otherwise, pumps are with sealed for life grease lubrication bearings which do not require further lubrication. Refer to the pump construction code on the nameplate for details.

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 and slide the moving section of the mechanical seal from the shaft.

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 stationary face of mechanical seal by tapping out gently with a piece of wood.

5. 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. Mechanical seal: It is advisable to fit a new mechanical seal whenever the seal in the pump has been dismantled during an overhaul. If a used seal is refitted, leakage from the seal may occur. When fitting the mechanical seal, the following points should be observed:-

NOTE: The mechanical seal seat and carbon rotating face must be handled with care, ensuring the rubbing faces are kept clean and free from scratches, otherwise they are unfit for use.

(a) Fit 'O'-ring to groove in mechanical seal seat and oil outside of 'O'-ring and recess in backplate. Push seat completely into recess, using a soft, clean cloth. After fitting backplate to bearing housing, check to see if seal seat is seated in recess.

(b) Smear a small quantity of waterproof grease on to the shaft where the moving section of the seal operates.

(c) Place the running face (carbon) on to the shaft.

(d) Oil 'O'-ring and push into position in the mechanical seal,using the mechanical seal washer and spring.

(e) Fit spring cap.

(f) Fit impeller key and impeller to shaft.

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 50 Nm (60 ft.lbs)

No. 2 SHAFT MODULE

Pump Driven End Shaft Diameter - 32mm. 13mm, 16mm, 18mm, 24mm AF Spanners and 24mm Socket for the Impeller Nut. Impeller Nut Torque 100 Nm (75 ft.lbs)

No. 3 SHAFT MODULE

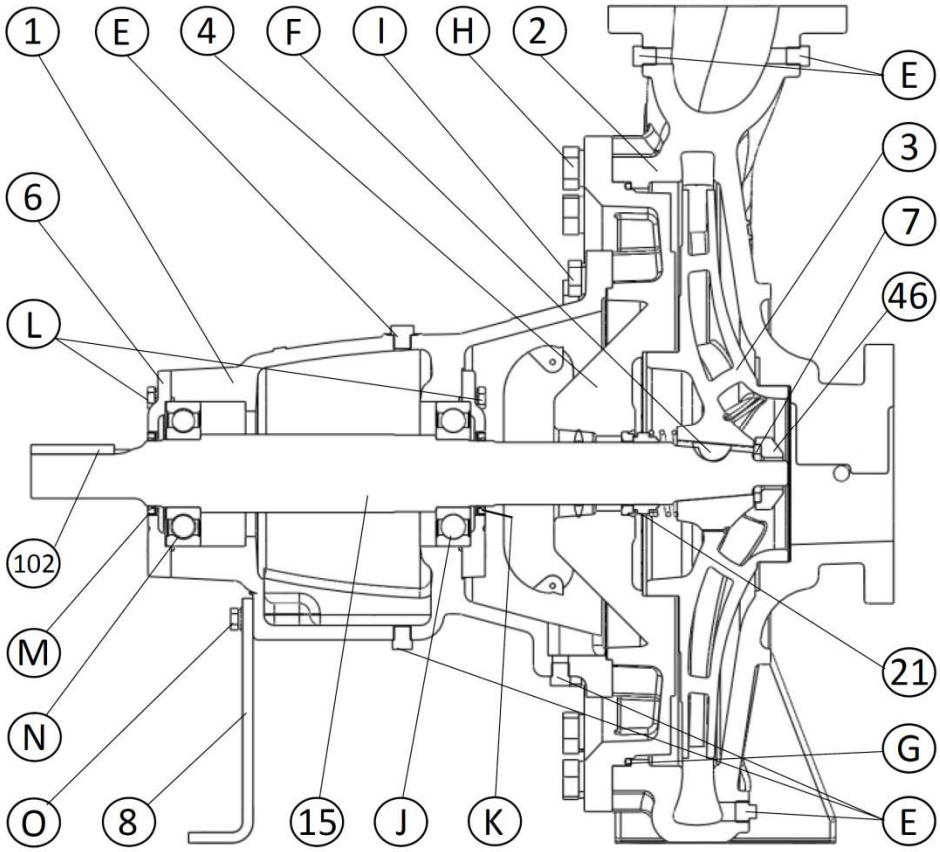
Pump Driven End Shaft Diameter - 42mm. 16mm, 18mm, 24mm, 30mm AF Spanners and a 30mm Socket for the Impeller Nut. Impeller Nut Torque 170 Nm (125 ft.lbs)

No. 4 SHAFT MODULE

Pump Driven End Shaft Diameter - 48mm. 18mm, 24mm, 30mm, 36mm AF Spanners and a 36mm Socket for the Impeller Nut. Impeller Nut Torque 320 Nm (235 ft.lbs)

ITEM NO.	DESCRIPTION
1	Bearing Housing
2	Casing
3	Impeller
4	Backplate
6	Bearing Cover
7	Impeller Washer
8	Support Foot
15	Shaft
21	Mechanical Seal
46	Impeller Nut
102	Shaft Key
A	Wear Ring - Back Plate
B	Wear Ring - Impeller Rear
D	Wear Ring - Casing
E	Casing Plug
F	Impeller Key
G	O-Ring
H	Backplate to Casing Bolt
I	Bearing Housing to Backplate Bolt
J	Bearing - Impeller End
K	Dust Seal - Impeller End
L	Bearing Cover to Bearing Housing Bolt
M	Dust Seal - Pulley End
N	Bearing - Pulley End
O	Support Foot to Bearing Housing Bolt and Nut
P	Bearing Housing to Casing Bolt

Items A, B, C & D are not shown. Item P is for an alternative configuration



Construction Code

This code defines construction material of various components in the pump. eg:- CZ5CMW

C Z 5 C M W X

Casing/Backplate
C - Cast Iron
S - 316 Stainless
Z - Zinc Free Bronze
N - Ni Resist
A - ADI
M - SGI (Malleable)
P - Alum Bronze
R - 2RK65
X - Exotic Material

Impeller Material
C - Cast Iron
S - 316 Stainless
Z - Zinc Free Bronze
N- Ni Resist
A - ADI
M - SGI (Malleable)
P - Alum Bronze
R - 2RK65
X - Exotic Material

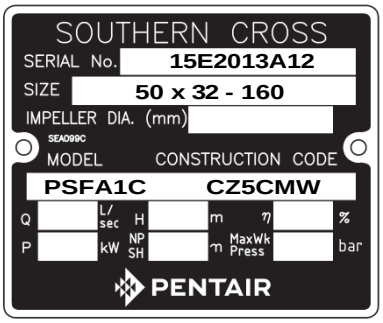
Shaft Material
2 - 420 Stainless
3 - 316 Stainless
4 - 431 Stainless
5 - 316 Cast Stainless
6 - SAF2205
X - Exotic Material

Seal Type
C - Nitrile Mech. Seal
V - Viton Mech Seal
E - Empty Pack Gland
P - Packed Gland
H - Hard Faced Seal
S - Single Cartridge Seal
D - Double Cartridge Seal
X - Special

Bearing Type
G - Grease Lubed
M - Motor Pump
O - Oil Lubed
P - Prepacked

Wear Rings
W - Wear Rings fitted
(Left blank if none fitted)

Bearing Housing
X - Denotes Mk2 bearing Housing of 2013
(left blank for older housing)



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

Refer to the separate document for Pentair Southern Cross warranty policy detailing terms and conditions of warranty. Every Southern Cross pump is backed by an Australia wide and overseas network of service agents. Refer to Southern Cross for long term storage instructions.

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

PENTAIR

Southern Cross

Ph: 131 786
e-mail: pacifictpssales@pentair.com
web: www.southerncross.pentair.com

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A.B.N. 83 000 922 690

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