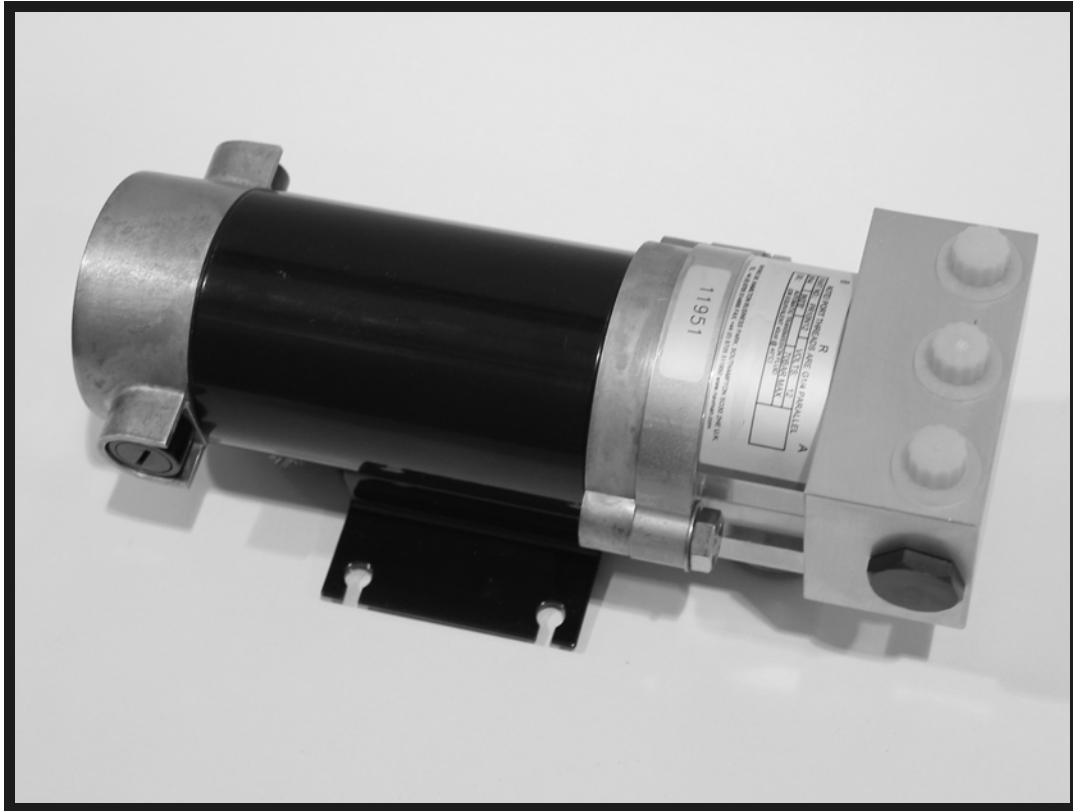


Hydraulic Projects Ltd



PR

Reversing Marine Autopilot Hydraulic Pump Installation and Service Instructions

Serial Number

“Engineering Excellence”

FORM_PR ISS.2

Released\11 Data Sheets & Manuals\Manuals\Customer Documentation\FORM_PR.PDF

The information in this manual was, to the best of our knowledge, correct when it went to press and Hydraulic Projects Ltd cannot be liable for any inaccuracies or omissions. There may also be differences between the specifications in the manual and the product as a result of ongoing development for which we accept no liability.

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IMPORTANT SAFETY INFORMATION

Failure to install and maintain this equipment in accordance with the instructions contained in this Manual could result in damage or injury.

This equipment must be installed and maintained by a person who is qualified to do so. This equipment is only for use with marine Auto pilots within the limitations stated in the following pages.

Auto pilot steering systems are navigational aids and the user must still maintain a permanent watch.

This equipment meets the latest EMC (Electromagnetic Compatibility) standards required for use in the recreational marine environment. In order to ensure conformance and to prevent interference with electronic systems the unit must be properly bonded to earth and the supply cables screened.

DO NOT FLASH TEST

Beware of hot motor and solenoid components and the risk of entrapment from moving parts.

DESCRIPTION

"PR" reversing type gear pumps are driven by 12 or 24 volt dc permanent magnet motors. Incorporated in the design are pilot operated check valves that prevent the pump being back driven by the manual steering system.

Other features include compatibility with balanced or unbalanced cylinders and they can also be used with pressurised reservoir systems (max 3.5 bar).

Relief valves can be fitted as an option.

PUMP SIZE

Maximum flow output at no load is indicated on the rating plate. Check the voltage shown is correct for the output of your auto pilot.

LOCATION

These pumps are designed for 'under deck' installations only.

Excessive temperature, vibration and fumes in the atmosphere can drastically reduce motor brush life.

Mounting the unit on a flimsy surface can transmit and amplify undesirable noise.

As in common with other electrical equipment, contact with water and excessive humidity must be avoided.

Keep the cable and pipe work runs as short as practically possible.

Any attitude of mounting may be used but 'motor up' is advantageous.

This unit should not be positioned in a confined area where there are inflammable gases.

HYDRAULIC CONNECTIONS

The 'A' and 'B' and 'R' ports are G1/4(BSP) parallel threaded.

Use only bonded rubber/metal washers to seal the fittings. Do not use tapered adapters, sealing compound or P.T.F.E tape.

Ports marked 'A' and 'B' are the service line connections to the ram, the pipe work and connections must be suitable for a 100 bar working pressure minimum rating.

The port marked 'R' is the reservoir or balance line and must be connected, through a continuous rise to the helm pump bottom connection.

Do not plug this port – damage and steering failure could result.

If used with pressurised reservoir type systems the pipe must be suitable for at least 7 bar.

Ensure that no dirt enters the system during the installation, be certain that all pipes and fittings are cleaned before connecting up.

HYDRAULIC FLUID

Good quality 10 to 40 cst hydraulic mineral oil is recommended, check the compatibility with the helm pump and ram manufacturers specifications and if it is suitable for use with nitrile rubber hydraulic seals. Refer 'Recommended Oils'.

COMMISSIONING

CAUTION! Be aware of the danger of moving linkages and the risk of entrapment during this procedure.

Bleed the system according to the Helm Pump Manufacturers instructions. To aid clearing air from the electric pump please note the orientation of the hydraulic/electrical connections -See installation data.

The pump must not be run without oil.

TROUBLE SHOOTING

1) Motor does not run

- : check electrical connections.
- : check auto pilot output.
- : check motor brushes.
- : check fuse / trip rating (Ref. page 10)

2) Motor runs, but no ram movement.

- : check for air in system.
- : check for incorrect hydraulic connections.
- : check there is sufficient fluid in the system.
- : check that the relief is set correctly if fitted.
- : check the drive coupling between pump and motor.
- : check if the pump has been dismantled and incorrectly assembled.

3) Excessive noise

- : check for air in system.
- : check the motor for damage.

SERVICE

With a minimum of moving parts and top quality precision engineering the pump will give many years of trouble free service. Should service replacement seals be required, a kit is available from your nearest dealer under the following part code: PR-sk

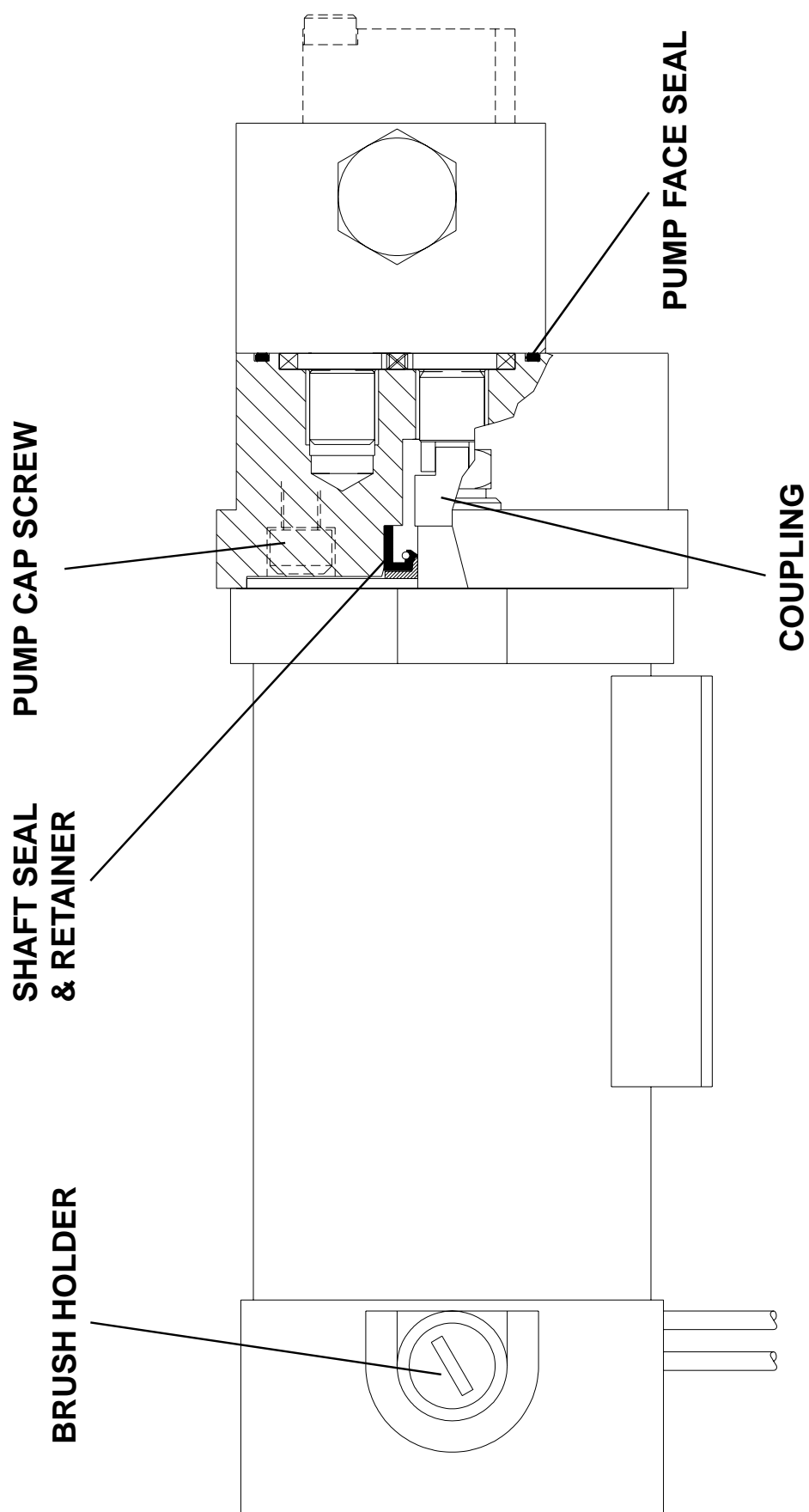
During disassembly carefully note the order of the components and keep everything scrupulously clean, especially the pump faces with the plastic shim gasket or o-ring. When re-assembling, lubricate the check valve piston and gears with hydraulic fluid and ensure that all parts move freely. A smear of grease on the o-rings will aid assembly without damage.

Evenly torque tighten the four M6 pump socket head cap screws to 10 lbs/ft (13.5 Nm). The gears must turn easily at this stage.

BRUSHES

Inspect the motor brushes every 500 hours, or annually, for wear. Replacement motor brushes are available from your dealer. State the serial number of your unit when ordering.

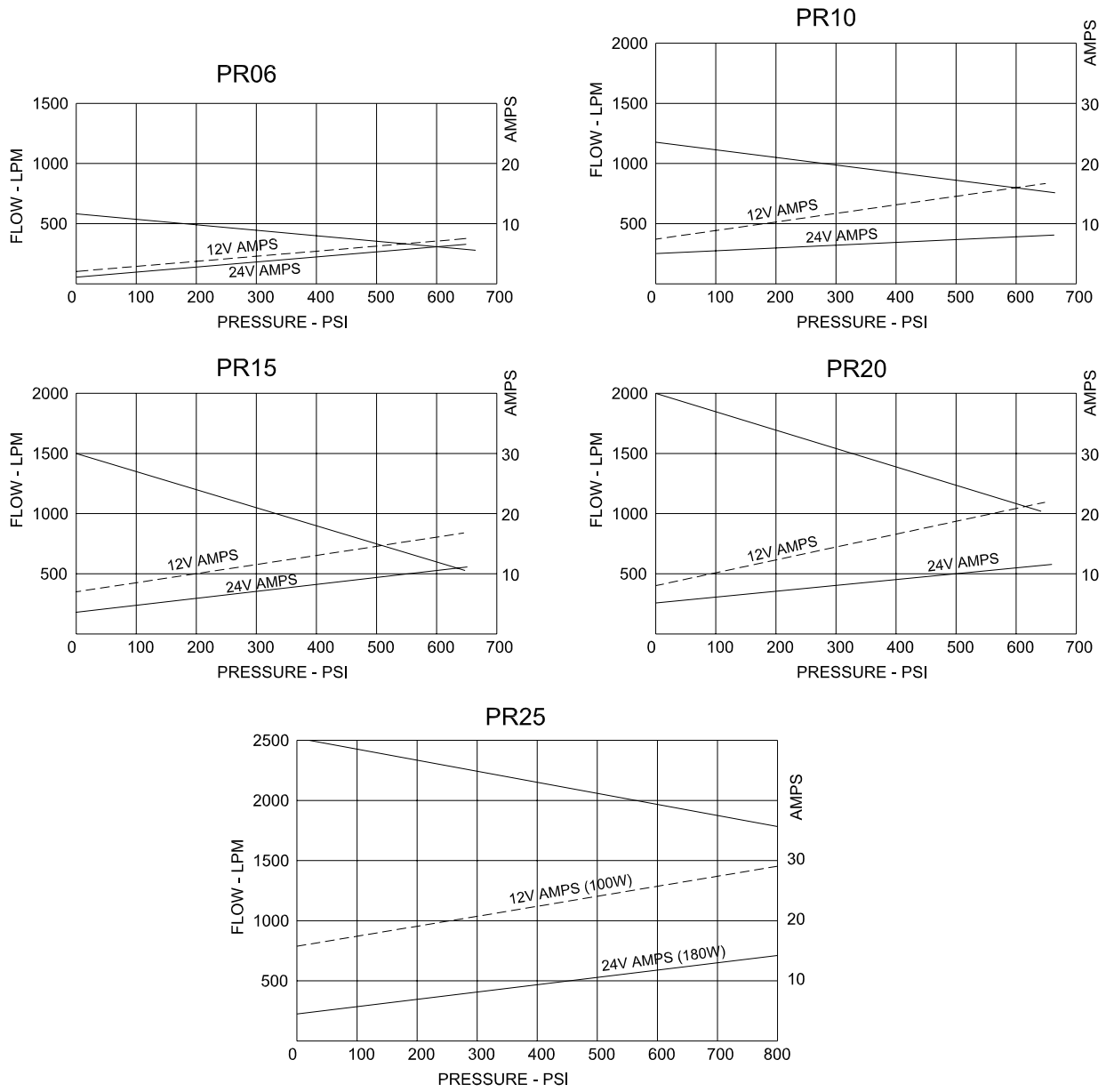
Be sure to clean out all loose carbon before fitting new brushes. If fluid has entered the motor, degrease the brush gear and commutator before running the unit, otherwise arcing will reduce brush life.



TECHNICAL DATA

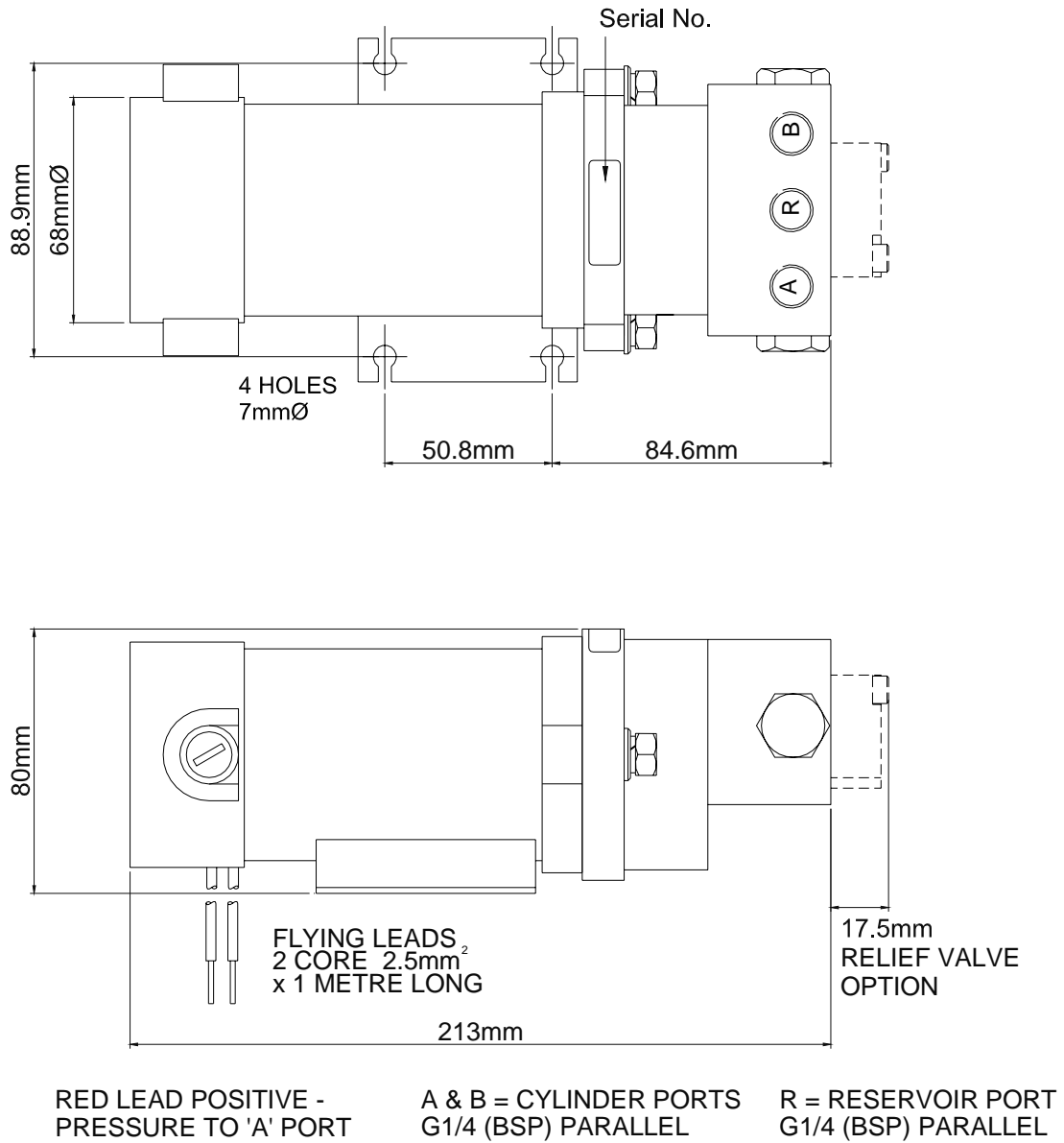
Max Pressure:	55 Bar
Amb. Temp:	-20 to +55 deg C
Supply Voltage:	12 / 24 VDC
Pipework:	Suitable for 35 Bar working pressure (100 max)
Rec. Oils:	From -20 to +10 deg C use ISO VG10. From +10 to +55 deg C use ISO VG40
Motor Rating: 12V 100W	25% Duty Cycle: 22.5 A 50% Duty Cycle: 17.5 A 100% Duty Cycle: 12.5A
24V 100W	25% Duty Cycle: 11.5 A 50% Duty Cycle: 8.5 A 100% Duty Cycle: 6.5A
24V 180W	25% Duty Cycle: 19.6 A 50% Duty Cycle: 14.5 A 100% Duty Cycle: 10.0A
Relief Valve (Optional):	Acting on each port A – B Adjustable between 0 and 41 bar max
Reservoir Port 'R':	G1/4 (BSP) Parallel BS2779' 1973 NOTE – This port must be connected. Max pressure 3.4 Bar on this port
Cylinder Ports 'A' & 'B': Orientation:	G1/4 (BSP) Parallel BS2779' 1973 Red lead positive – pressure to 'A'
EMC Protection:	BS EN 60945:2002 (DC)
Ignition protection:	BS EN 28846:1993
Weight:	100W – 2.9 kg 180W – 3.5 kg

TYPICAL PERFORMANCE - OIL: ISO VG40 25°C



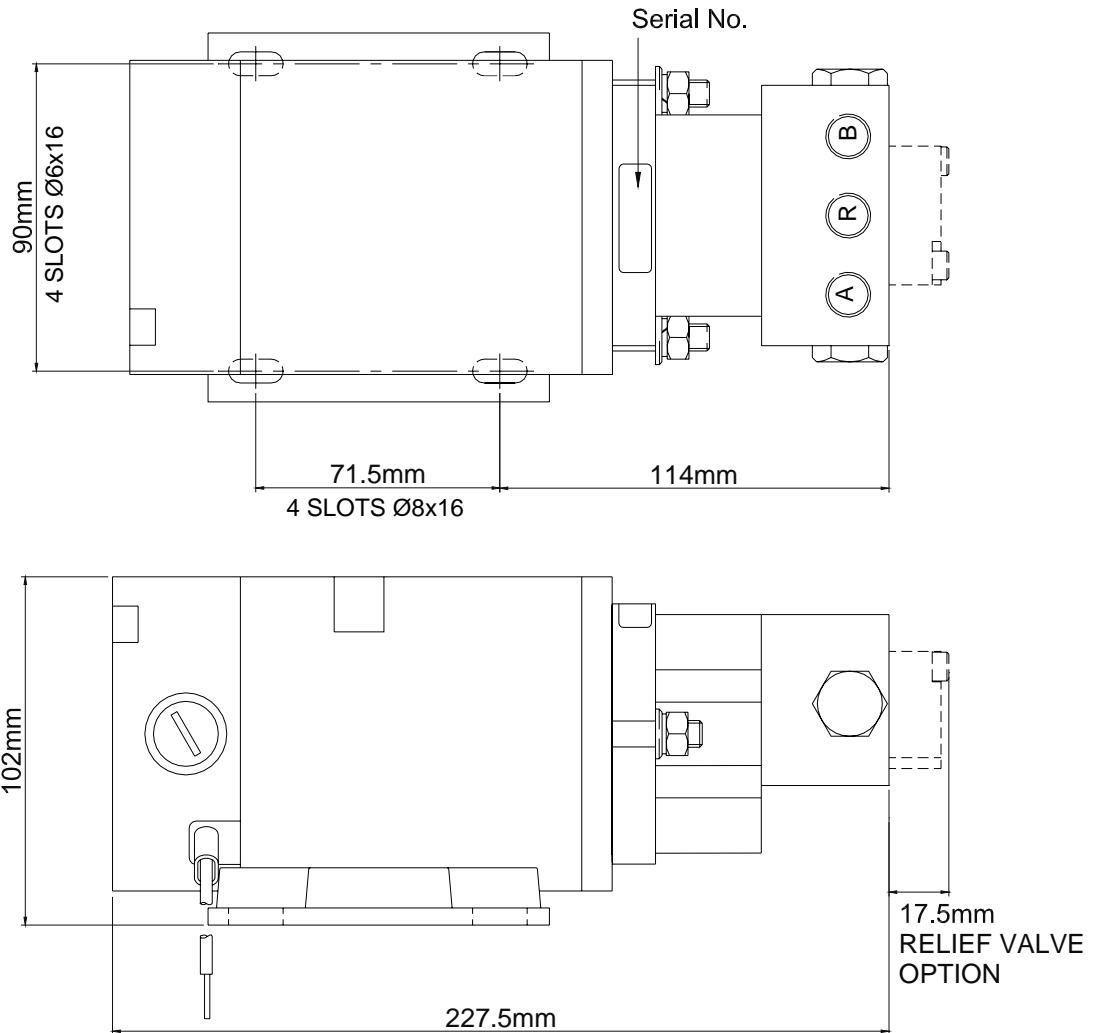
INSTALLATION DETAILS

PR06 PR10 PR15 & PR20 (100W)



INSTALLATION DETAILS

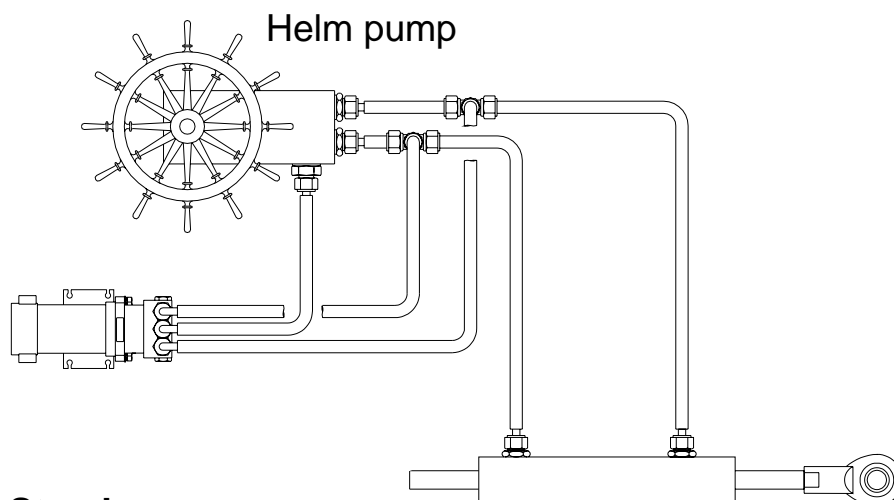
PR25 (180W)



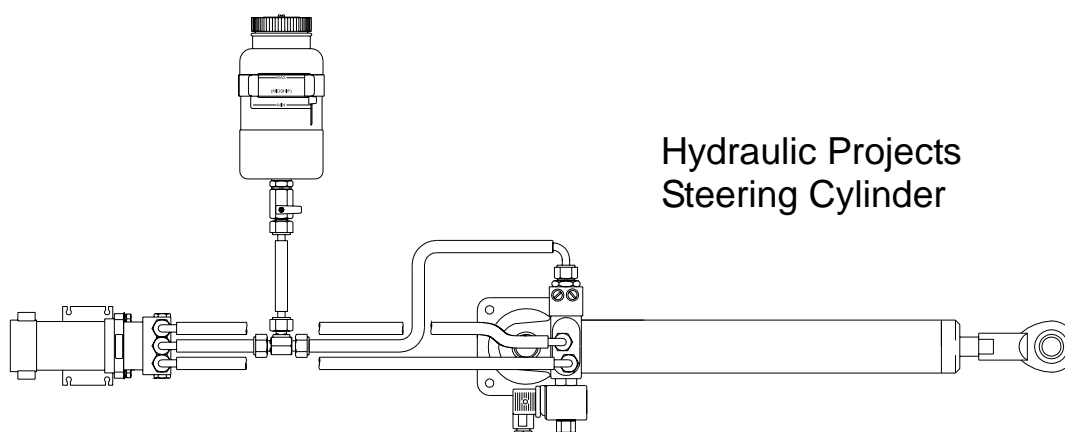
WARNING!
1) EMC PROTECTED - DO NOT FLASH TEST
2) HOT MOTOR COMPONENTS

TYPICAL ARRANGEMENTS

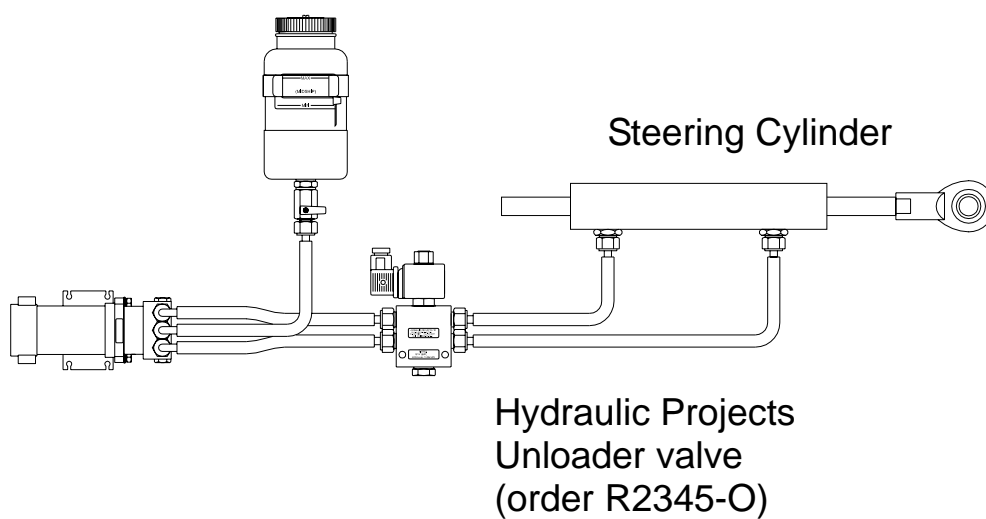
Primary Steering



Secondary Steering



Secondary Steering



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