Defining Reliability through form and function.

(Each unit is completely tested after assembly)

Dedicated to quality high-performance hydraulic control of steering systems for yachts and commercial vessels.

Instruction Manual

HPU 100
# HYDRAULIC POWER UNIT

## HPU 100

### TABLE OF CONTENTS

1. GENERAL INFORMATION ............................................. p. 01
2. TECHNICAL SPECIFICATIONS .................................... p. 01
3. PUMP UNIT .................................................................... p. 01
   3.1 Construction
   3.2 Pump
   3.3 Electric Motor
   3.4 Electric Box
4. INSTALLATION ................................................................ p. 02
   4.1 Mechanical
   4.2 Hydraulic
   4.3 Electrical
5. OPERATION and ADJUSTMENTS ................................. p. 03
   5.1 Initial Adjustments
6. NOTES ............................................................................. p. 04
7. DRAWINGS ..................................................................... p. 05
   7.1 HPU 100 — Side View
   7.2 HPU 100 — Top View
   7.3 HPU 100 — System Connection Schematic
   7.4 HPU 100 — Electric Junction Box Schematic
   7.5 HPU 100 — Electrical DC Motor Schematic
1. GENERAL INFORMATION

The Accu-Steer HPU100 pumpset is a continuous running pumpset designed to interface hydraulic steering systems with electric or autopilot control. As described the motor runs continuously when started and the output oil is directed to the port or starboard line by operating the four way solenoid valve mounted on the pumpset. Its compact and rugged construction provides ease of installation along with long life operation. This unit is available in both 12 VDC and 24 VDC.

This pumpset is suitable for vessels with steering actuators up to 40 cu in (820 c.c.) or vessels up to 50 ft (15 meters) in length. Proper pump selection and application is very important to optimize steering performance and pump longevity. This particular pump is not designed for larger or commercial style vessels.

2. TECHNICAL SPECIFICATIONS

<table>
<thead>
<tr>
<th>Model Number</th>
<th>HPU100-12</th>
<th>HPU100-24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Output</td>
<td>222 cu in/min 3.70 lpm</td>
<td>222 cu in/min 3.70 lpm</td>
</tr>
<tr>
<td>Pressure Relief</td>
<td>500 psi/34 bar</td>
<td>500 psi/34 bar</td>
</tr>
<tr>
<td>Full Load Amperage</td>
<td>14 (Average)</td>
<td>7 (Average)</td>
</tr>
<tr>
<td>Weight</td>
<td>22 lbs (10 kgs)</td>
<td>22 lbs (10 kgs)</td>
</tr>
</tbody>
</table>

3. PUMP UNIT

3.1 CONSTRUCTION

The Accu-Steer HPU100 is a complete pump assembly consisting of a gerotor style pump, adjustable flow control, adjustable pressure release valve and an electric permanent magnet motor with a connection/relay start box. As the pumpset is self-contained, installation involves connecting the pump to the steering lines and the electric control and adjusting the unit to the requirements of the steering system.

3.2 PUMP

The pump is a gerotor style gear unit with extremely quiet operation. Hydraulic flow control and pressure relief are adjustable. The pressure relief valves are factory set for 500 psi
and should not be altered in the field as it will change the electric motor current draw.

### 3.3 ELECTRIC MOTOR

The electric motor is a permanent magnet style D.C. motor featuring ball bearing supports and replaceable brush gear. The motor is directly coupled to the pump unit by a machined face. The electric motor is available in both 12 VDC and 24 VDC voltages.

### 3.4 ELECTRIC BOX

The electric box features a remote start relay and thermal overload along with oversized terminals for easy connection. The thermal overload is sized for proper motor protection. Refer to the drawings for the layout and wiring schematics.

### 4. INSTALLATION

#### 4.1 MECHANICAL

The pumpset should be placed on a horizontal shelf or bracket with a solid foundation. Ensure the foundation is level to prevent any twisting action when securing the pump. The pump can be bolted or screwed down using the provided foot mounts. The pumpset should be close to and below the steering lines for ease of connections and bleeding.

#### 4.2 HYDRAULIC

Before connecting the hydraulic lines to the pumpset ensure all the hydraulic lines in the steering system have been flushed and that the hydraulic oil is free of any contamination, which may enter the pumpset and cause it to fail.

Most steering manufacturers have recommended hydraulic oils to be used in their systems. The **HPU100** is compatible with these oils. Most manufacturers use an ISO #32 or ISO #10 oil.

Three hydraulic connections are required to the pumpset. Two lines connect the main steering lines. The third line, which is the interconnect/fill line, connects the pumpset to the header tank or helm pump. This third line is critical as it provides makeup oil and allows the pumpset to vent any air, which may enter the pumpset from the steering lines. It is recommended that flex hose be used for all three lines to prevent any pump
noise from being transmitted to the steering system. The two steering lines should have pressure rating of 1000 psi, where the third interconnection line is a non-pressure line. Shut off or isolation valves for all three lines are recommended. If the pumpset failed, the isolation valves can be shut and manual steering regained.

The three hydraulic connections are 1/4” NPT (National Pipe Thread). When installing the hydraulic fittings a pipe thread sealant such as Teflon paste or tape must be used. If a horizontal port/starboard line connection is desired, the elbow fittings can be removed.

4.3 ELECTRICAL
The pumpset units are manufactured for operation from either 12 VDC or 24 VDC. The electrical connection box contains a remote start relay, thermal overload and terminal strip. The remote relay can be activated with a positive or negative switched signal. Most autopilots have a switched output or clutch/relay output that is used to operate the start relay. Refer to the schematics for connections to many common autopilots.

5. OPERATION and ADJUSTMENTS

5.1 INITIAL ADJUSTMENTS
After the hydraulic and the electrical connections have been made, open all valves and allow sufficient time for the pump and lines to fill with oil. Operate the pumpset and note the hard over to hard over (HOH) time. This time varies with the type of autopilot or electric control used. Adjust the HOH time to suit the autopilot manufacturers recommendation (generally 8 to 16 seconds).

To adjust the output flow of the pumpset, loosen the securing nut on the flow control mounted on the same side as the electrical box. Now adjust to the desired speed and re-tighten the lock nut.

The pressure relief setting is factory set at 500 psi. This adjustment should not be altered. Decreasing the pressure relief may result in the pump bypassing oil internally and therefore no rudder movement. Increasing the pressure may cause internal damage to the pumpset and will void the warranty.
7. DRAWINGS

7.1 HPU100 SIDE VIEW SCHEMATIC

Shipping weight: 28 lbs • Dimensions: 14” x 12” x 12”
7.2 **HPU100** TOP VIEW SCHEMATIC

- **ELECTRICAL BOX**
- **12 / 24 VDC MOTOR**
7.3  **HPU100 SYSTEM CONNECTION SCHEMATIC**

- **HELM PUMP**
- **STARBOARD LINE**
- **PORT LINE**
- **ELECTRICAL BOX**
- **HM190 STEERING MANIFOLD**
DC Electrical Start Box Only
7.5 **HPU 100 ELECTRICAL DC MOTOR SCHEMATIC**

![Diagram of an electrical DC motor schematic with components labeled as follows:
- DC MOTOR
- THERMAL BREAKER
- COIL
- POWER
- POS.
- NEG.
- START POS.
- START NEG.
- COIL COMM.
- COIL PORT
- COIL STBD
- MOTOR START
- SOLENOID CONTROL

The diagram shows the connections and labels for the electrical components of a DC motor system.]