

# The National Telephone Supply Company

## Instruction No. 50A – ½ HP Electric Hydraulic Pump Unit

### 1.0 IMPORTANT RECEIVING INSTRUCTIONS

Visually inspect all components for shipping damage. Shipping damage is **not** covered by warranty.

### ***SAFETY FIRST***

### 2.0 SAFETY ISSUES

Read all instructions, warnings and cautions carefully. Follow all safety precautions to avoid personal injury or property damage during system operation.

Failure to comply with the following cautions and warnings could cause equipment damage and personal injury.

A **CAUTION** is used to indicate correct operating or maintenance procedures and practices to prevent damage to, or destruction of equipment or other property.

A **WARNING** indicates a potential danger that requires correct procedures or practices to avoid personal injury.

A **DANGER** is only used when your action or lack of action may cause serious injury or even death.

❖ **WARNING:** Wear proper personal protective gear when operating hydraulic equipment.



- ❖ **DANGER:** To avoid personal injury keep hands and feet away from cylinder during operation.
- ❖ **WARNING:** Do not exceed equipment ratings. Overloading causes equipment failure and possible personal injury. The 635A Tool is designed for a max. pressure of 9200 psi.
- ❖ **Never** set the relief valve to a higher pressure than the maximum rated pressure of 9200 psi. Higher settings may result in equipment damage and/or personal injury. Install pressure gauges in the system to monitor operating pressure. It is your window to what is happening in the system.
- ❖ **CAUTION:** Avoid damaging hydraulic hose. Avoid sharp bends and kinks when routing hydraulic hoses. Using a bent or kinked hose will cause severe back-pressure. Sharp bends and kinks will internally damage the hose leading to premature hose failure.
- ❖ **Do not** drop heavy objects on hose. A sharp impact may cause internal damage to hose wire strands. Applying pressure to a damaged hose may cause it to rupture.
- ❖ **IMPORTANT:** Do not lift hydraulic equipment by the hoses or swivel couplers. Use the carrying handle or other means of safe transport.
- ❖ **CAUTION: Keep hydraulic equipment away from flames and heat.** Excessive heat will soften packings and seals, resulting in fluid leaks. Heat also weakens hose materials and packings. For optimum performance do not expose equipment to temperatures of 65°C [150°F] or higher. Protect hoses and cylinders from weld spatter.
- ❖ **DANGER: Do not handle pressurized hoses.** Escaping oil under pressure can penetrate the skin, causing serious injury. If oil is injected under the skin, see a doctor immediately.
- ❖ **IMPORTANT:** Hydraulic equipment must only be serviced by a qualified hydraulic technician.
- ❖ **CAUTION:** Check specifications and motor plate data. Use of an incorrect power source will damage the motor.

### 3.0 Specifications

	"B" Models	"E" Models
<b>Operating Pressure</b>	0-10,000 psi [700 bar] {70 mPa}	
<b>Electric Power Source</b>	15 Amp 120 V. grounded 1Ph. 50/60 Hz	10 Amp 220 V. 1Ph. 50/60 Hz
<b>Motor Rating</b>	Motor Rating 1/2 HP Universal, 9 Amps at 10,000 psi [700 bar] & 12,000 RPM operates at 60-125 Volts 85-89 dBA	.37 kW Universal, 4 Amps at 10,000 psi [700 bar] {70 mPa} & 12,000 RPM 85-89 dBA
<b>Flow Rate</b>	200 in. <sup>3</sup> /min. [3,3 l/min] at 0-200 psi [0-14 bar] {0-1,4 mPa} 20 in. <sup>3</sup> /min. [0,33 l/min] at 10,000 psi [700 bar] {70 mPa}	
<b>Max. Operating Temperature</b>	150°F [65°C]	

Model No.	Used with Cylinder	Valve Type	Usable Oil Capacity	Weight
PUD-1100B/E	Single-Acting	Dump Valve	122 in. <sup>3</sup>	31 lbs.

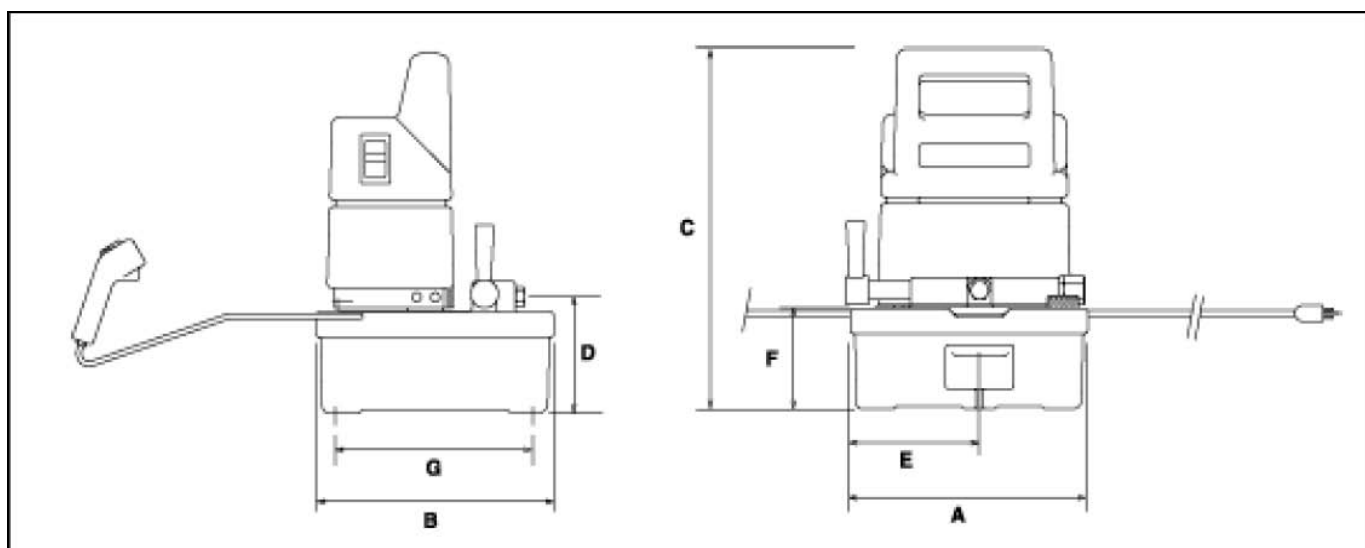


Figure 1

Dimensions in. [cm]								
Model	A	B	C	D	E	F	G	H
PUD-1100B/E	9.62 [24,43]	9.62 [24,43]	14.25 [36,20]	4.72 [11,99]	5.25 [13,34]	4.00 [10,16]	8.12 [20,62]	.75 [1,90]

## 4.0 INSTALLATION

### 4.1 Hydraulic Connections

Use 1 1/2 wraps of teflon tape (or suitable thread sealant) on all threads, leaving the first complete thread free of tape to ensure that the tape does not shed into the hydraulic system, causing damage. Trim loose ends.

❖ **WARNING:** To ensure proper operation, avoid kinking or tightly bending hoses. If a hose becomes kinked or otherwise damaged, it must be replaced. Damaged hoses may rupture at high pressure, causing personal injury.

### PUD1100B/E Model

1. The pump-to-cylinder hose attaches directly to the outlet port of the control valve.
2. The electric valve is controlled automatically with the electric motor. The cylinder advances when the pump is activated and retracts when the pump switch is released.
3. If a gauge is desired to monitor system pressure, a gauge adaptor must be installed into the outlet port. Install a 0-10,000 psi (700 Bar) pressure gauge into the gauge port of the gauge adaptor.

### 4.2 Valve Mounting (Figure 4)

1. Remove the plate (No. 1, D43918098).
2. Verify that the connector (2) is installed in the pump. If it is not, install the connector, taking care to avoid shearing the seals.
3. Mount the valve (3), taking care to avoid shearing the seals.

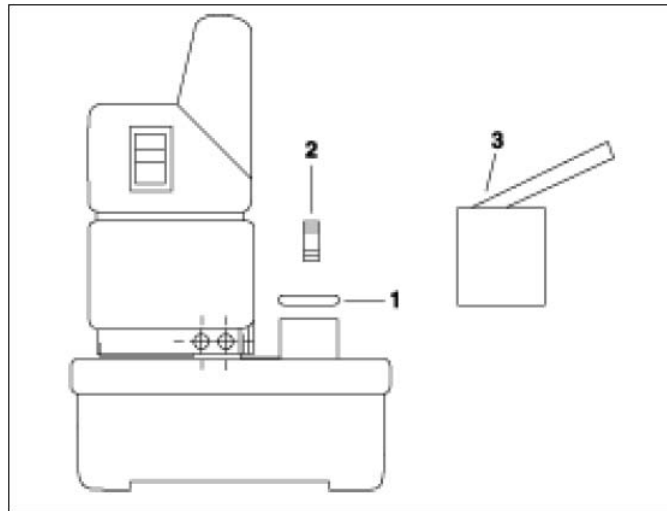


Figure 4

### 4.3 Adding Oil (Figure 5)

Check the oil level by unscrewing and removing the vent/fill plug (F). Add Enerpac HF-101 hydraulic oil until the oil level is 1/2 inch (1 cm) below the vent/fill opening.

**IMPORTANT:** Add oil only when all system components are fully retracted, or the system will contain more oil than the reservoir can hold.

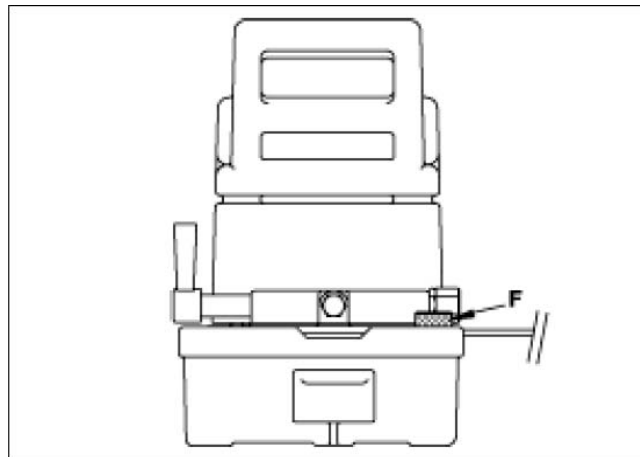


Figure 5

## 5.0 OPERATION

**NOTE:** To avoid power losses between the electrical outlet and pump motor, use the shortest possible extension cord. The pump motor will function at low voltage, but motor speed and oil flow will be reduced.

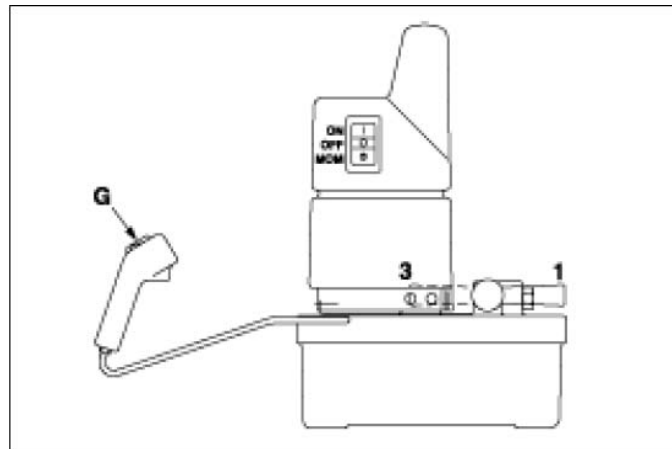
1. Check all system fittings and connections to be sure they are tight and leak free.
2. Check the fluid level and add fluid, if necessary.
3. Open the pump vent plug (**F**) located on the front right corner of the reservoir by turning it 1 or 2 complete turns.

❖ **CAUTION:** The vent plug must be open whenever the pump is running.

### 5.1 Switch Operation (Figure 6)

The "B" version requires a 15 amp, 120 V. grounded 1 Ph. circuit. The "E" version requires 220 V. 1 Ph. The pump power cord is 5 ft. (1 1/2 meters) long.

1. The pump switch is located on the side of the shroud. It is a three position switch, top detent is "ON", middle is "OFF", bottom is momentary on "MOM". Pressing the top "ON" position activates the electrical circuit, but does not turn the pump motor on. The pump motor is activated by the pendant switch (**G**).
2. Pressing the lower portion of the switch will activate the pump motor as long as the switch is held down. Releasing the switch stops the pump. This momentary position is used as an alternate to the pendant control.



**Figure 6**

### PUD-1100B/E Model

The PUD-1100B/E operates single-acting cylinders where the hold function is not necessary. Pressing the pendant switch starts the motor and advances the cylinder. When the switch is released, the cylinder will retract.

### 5.3 Thermal Relay

To protect the pump from damage, an internal relay switch shuts off the motor when the oil temperature reaches 150°F (65°C). When the temperature drops to 130°F (54°C) the relay will automatically reset.

### 5.4 Air Removal

When the hydraulic system is connected for the first time, air will be trapped in the components. To ensure smooth, safe operation, remove the air by running the system through several complete cycles without a load on the cylinders. When cylinders advance and retract without hesitation, the air is vented from the system.

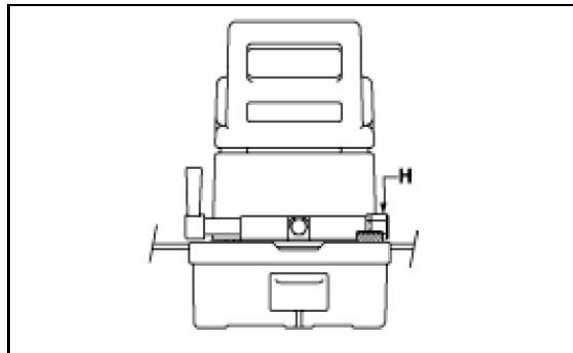
❖ **WARNING:** To avoid injury and equipment damage, do not continue pressurizing cylinders after they reach maximum travel or maximum operating pressure.

## 6.0 RELIEF VALVE ADJUSTMENT (Figure 8)

The main pump relief valve is internal and non-adjustable, factory set for 10,000 psi (700 bar) maximum operating pressure. An additional external relief valve is located under a hex cap on the right side of the pump. The external relief valve is adjustable from 10,000 psi (700 bar) down to 2000 psi (140 bar). The operating pressure is set to 9200 psi at the factory.

1. Install a gauge as directed in the installation instructions on page 3.
2. Install a plug in the valve outlet port.
3. Remove the hex cap (**H**) covering the relief valve adjustment screw.
4. Using an allen wrench, turn the adjustment screw counterclockwise one full turn.
5. Turn the pump "ON" and run the pump motor, watching the gauge reading for the maximum pressure. Stop the pump.
6. Continue to adjust the setting until the desired pressure is attained.
7. Check the setting by running the pump several times. If the gauge reading is the same each time, the valve setting is stable.
8. Replace the hex cap to cover the adjusting screw.

**NOTE:** To get the most accurate relief valve setting, start at a lower pressure and adjust up to the desired relief valve setting.



**Figure 8**

❖ **WARNING** To avoid equipment damage and personal injury, do not attempt to exceed 9200 psi maximum operating pressure.

## 7.0 MAINTENANCE

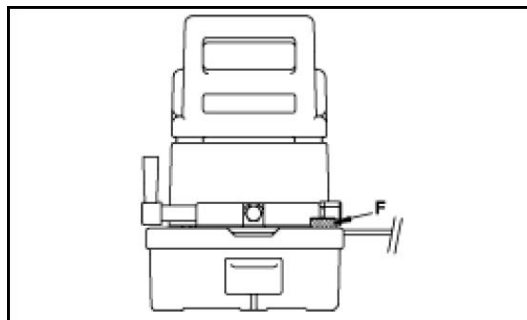
### 7.1 Checking the Oil Level

Check reservoir hydraulic oil level every 40 hours of operation. Add oil when necessary to bring the level to 1/2" (1 cm) below the fill opening. Use only Enerpac HF-101 hydraulic oil.

### 7.2 Changing the Oil (Figure 9)

Completely drain the reservoir after every 100 hours of operation. Refill with new hydraulic oil. If pump is operated in very dusty areas or at high temperatures, drain and refill more frequently.

1. To drain the reservoir, remove the vent/fill plug (**F**) from the top right hand corner of the reservoir.
2. Tip the pump until all old oil is drained.
3. Refill with new oil through the same opening. Reservoir capacity is .75 gal. (2,8 l) or 1.5 gal. (5,7 l) depending on model.
4. Replace fill plug (**F**).



**Figure 9**

### 7.3 Cleaning the Reservoir

The pump reservoir can be removed for cleaning. If the pump is constantly used in an extremely dusty environment, the reservoir should be cleaned once a year.

1. Drain the reservoir as described in steps 1 and 2 in "Changing the Oil".
2. Remove the six screws securing the shroud to the reservoir. Lift the shroud off the reservoir. A foam cushion wraps around the motor to keep electrical wires away from the motor. Use caution to avoid damaging or pulling wire connections off the terminals.
3. Remove the eight screws holding the pump to the reservoir. Lift the pump off the reservoir and remove the gasket.
4. Thoroughly clean the reservoir with a suitable solvent.
5. Re-assemble the pump and reservoir, installing a new gasket. Position the shroud over the motor with the shroud handle facing the valve side of the pump. Install the six mounting screws and internal/external lock washers.

### 8.0 TROUBLESHOOTING

Only qualified hydraulic technicians should service the power unit. The following information is intended as a guide in determining if a problem exists.

Problem	Possible Cause	Solution
Pump will not start.	No power. Wrong voltage.	Check electrical power source. Check voltage specifications on page 2.
Cylinder will not advance or retract.	Fluid level low. Intake screen clogged. Valve in wrong position. Valve failure.	Fill reservoir to proper level. Clean or replace intake screen. Shift valve to the pressure position. Have pump repaired by a qualified hydraulic technician.
Cylinder advances and retracts erratically.	Air in the system.  External leak in system. Internal hydraulic leak.	Remove air from the system by opening and closing the tool until operation is smooth.  Tighten leaky connections. Replace any damaged hoses and fittings. Have pump repaired by a qualified hydraulic technician.
Pump fails to maintain pressure.	External hydraulic leak.  Internal hydraulic leak.	Tighten leaky connections. Replace any damaged hoses or fittings. Have pump repaired by a qualified hydraulic technician.
Low Fluid output.	Fluid level low. Pump component parts are leaking. By-pass valve malfunction.  Fluid intake screens on piston blocks may be clogged with debris.	Fill reservoir to the proper level. Test to isolate leaks. Have pump repaired by a qualified hydraulic technician. Inspect intake screens. Flush all components of contamination. Replace any damaged components.

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