

MANUAL

DUMP TRAILER POWER UNIT

MAGISTER
HYDRAULICS

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GENERAL DATA

A1. MANUFACTURER

MAGISTER HYDRAULICS



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A2. INTRODUCTION

This manual contains information about the dump trailer power unit. It contains the necessary information for assembling, starting up, maintaining, and safely operating the hydraulic power units. It's especially important to follow our safety instructions when using the machine.

Qualified and authorized specialists should handle any operations involving the disassembly and assembly of the Power Unit and its electrical components. Do not attempt any repairs or adjustments not covered in this manual.

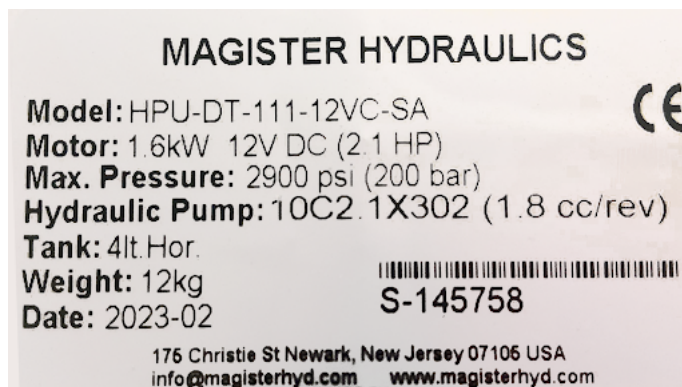
A3. PRODUCT CLAIMS

If you encounter any technical issues, do not hesitate to contact our technical department at info@magisterhyd.com. Please include the following information so we can assist you effectively.

- ▶ Power unit code (you can find this on the label located on the oil tank)
- ▶ Operating voltage and frequency
- ▶ Operating pressure
- ▶ Pump displacement
- ▶ Production date
- ▶ A detailed description of the issue
- ▶ The amount of time the power unit has been in operation
- ▶ Order Number
- ▶ Video of unit operating demonstrates the issue
- ▶ Photos of the equipment and connection

A4. LABEL

The unit's specifications, such as motor power, pump displacement, and tank size, can be found on the label located on the tank.



A5. APPLICATIONS

The hydraulic power unit is made to fit into hydraulic systems for dump trailers that use a double-acting cylinder. It's small and has a specially designed center part that includes a 4/2 solenoid valve. This valve works well for operations that require a two-way movement.

HERE ARE A FEW FEATURES HPU-DT-111-12VDC-SA OFFERS:

- ▶ Compact and unique designed central manifold, including 4/2 solenoid operated valve suitable for double acting systems.
- ▶ load-holding function for both working ports.
- ▶ Optional "B" port pressure relief valve 13
- ▶ SAE or BSPP outlet port options



A6. WORKING CONDITIONS AND REQUIREMENTS

The hydraulic power unit is designed for use indoors or outdoors, where the temperature is between -13°F to 122°F. It works well in places with up to 80% humidity in the air.

A7. TECHNICAL CHARACTERISTICS

POWER UNIT FOR DUMP TRAILER	HPU-DT-111-12VDC-SA
Action:	Double Acting
Max Flow:	1.25 GPM
Max Pressure:	2100 PSI
Pressure Relief Valve:	2500 PSI
Max RPM:	2500
Pump Displacement:	0.128 CI/REV
Reservoir Capacity:	4/6/8 qts
Tank Material:	Plastic
Voltage:	12 V
Current:	Direct
Motor power:	1.6 kW
Port Size:	SAE 6
Mounting:	Horizontal
Dimensions(LxWxH):	17x8x8 in
Weight:	32 lbs
Country of Origin	Bulgaria, European Union

A8. NOISE CHARACTERISTICS

The hydraulic power unit does not emit noise higher than 85 dB in accordance with EN 60034-9.

A9. WORKING FLUID

The oil tank has to be filled with new, clean mineral-based ISO 6743/4 fluid. We suggest using hydraulic oil that is mineral or synthetic and has a thickness between 59 and 154.4°F at a temperature of 104°F. The kind of hydraulic fluid you require might change depending on where you're working. Do not use fluids such as motor oil, diesel oil, or water in the system, this will damage the unit and potentially affect your hydraulic system and equipment. The filtration should be at least Class -9 NAS 1638.

We recommend changing the oil after the first 100 hours of use or after 6 months-1 year depending on how often the unit is used. After that, every 3000 hours is suggested. When changing the oil be sure to clean the suction filter as well. If the fluid level goes down, add more oil.

SAFETY

B1. RULES FOR TECHNICAL SAFETY

Only personnel who are familiar with the rules for the actuation of electrical equipment and equipment that works under pressure should be allowed to work with the power unit.

For the safe functioning of the hydraulic power unit, it is necessary to follow the following rules:

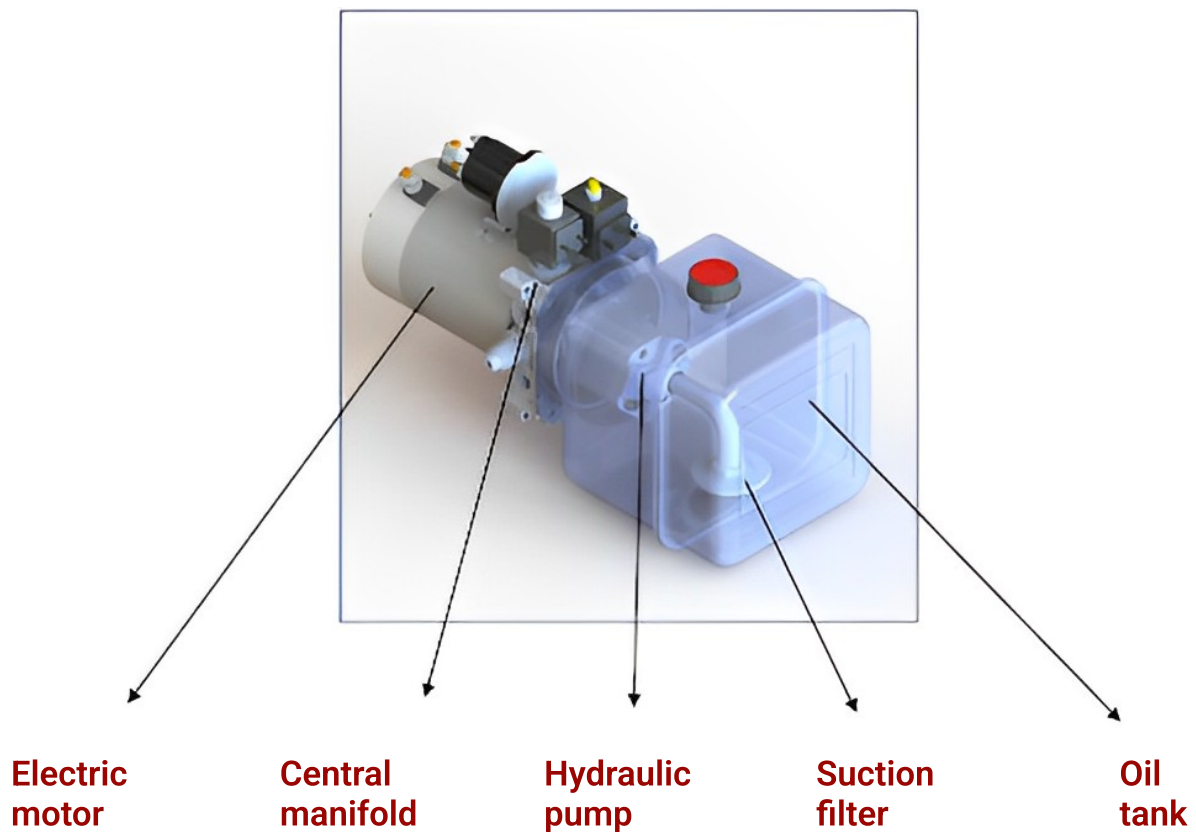
- ▶ The power unit must not be activated if the motor's terminal connecting box cap has been replaced or if connectors on the solenoid valve coils differ from the ones used in the unit's construction.
- ▶ Only a qualified electrician should perform the electrical connection. Make sure to pay attention to the electric motor's rotation direction, which should be counter-clockwise when viewed from the shaft.
- ▶ Carefully carry out the hydraulic connection. The manifold has two outlet ports that need to be properly connected to the actuator in the system.
- ▶ Choose pipelines that match the system's pressure and flow rate. Ensure tight and secure fitting of tube connectors, preventing any fluid leakage on outer surfaces. Utilize proper sealing elements.
- ▶ Do not replace the air breather with a plug.
- ▶ Adjusting the pressure relief valve to a higher pressure is not allowed.
- ▶ Securely mount the power unit on a stable base or frame.
- ▶ Avoid using the power unit in environments prone to explosions or combustible materials.
- ▶ Ensure the oil level is sufficient to prevent damage to the hydraulic pump.

- ▶ Use insulated cables for all connections.
- ▶ Keep the power unit assembly away from watery environments.
- ▶ Prevent contact between the positive and negative poles of the DC motor.
- ▶ Insulate the cable ends of the DC motor.
- ▶ Do not operate the DC motor without a properly assembled starter.
- ▶ On the oil tanks, there are breathers marked with a red color. Avoid using blind plugs on these breathers.
- ▶ Ensure hose diameters are adequate and not too small for the intended use.

DESCRIPTION OF THE HYDRAULIC POWER UNIT

C1. MAIN COMPONENTS

THE POWER UNIT IS COMPOSED OF THE FOLLOWING MAIN ELEMENTS:



- ▶ Electric motor
- ▶ Hydraulic gear pump
- ▶ Suction filter
- ▶ Central manifold
- ▶ Oil tank

When the electric motor is turned on, it drives the gear pump. The pump draws working liquid from the tank and directs it to the central manifold, where it is routed to the system's actuators. The outlet ports A and B must be connected to a double acting cylinder. (A port to cylinder inlet, B port to cylinder outlet)

C2. ELECTRICAL COMPONENTS

THE HYDRAULIC POWER UNIT IS ASSEMBLED WITH:

- ▶ Electric motor
- ▶ 2/2 normally closed cartridge valve
- ▶ 4/2 solenoid-operated cartridge valve

The electric motor can be selected as 1.6 kW (12 V) or 2.2 kW (24 V) DC.

The solenoid elements are of the cartridge variety. Their coils can operate at 12, 24, or 220 volts. The connectors are made under DIN 43650.

POWER UNIT ASSEMBLY

D1. REQUIREMENT OF THE WORKING AREA

The power unit's functioning is determined by the machine it's integrated with. When the power unit is in operation, there should be no leaks of working fluid on the external surfaces. The power unit turns on when the motor receives the required voltage. Proper control is achieved by correctly coordinating the motor and solenoid valves during activation.

If there's no mounting bracket, the power unit needs to be installed using M10 holes. The area around the power unit where it's placed must be clear, allowing access to the oil filler, valves, and unloading throttle. Make sure not to position the power units in enclosed spaces that could hinder proper cooling. Also, avoid any contact between the power unit and vibrating or noise-transmitting parts.

D2. TRANSPORTATION OF THE HYDRAULIC POWER UNIT

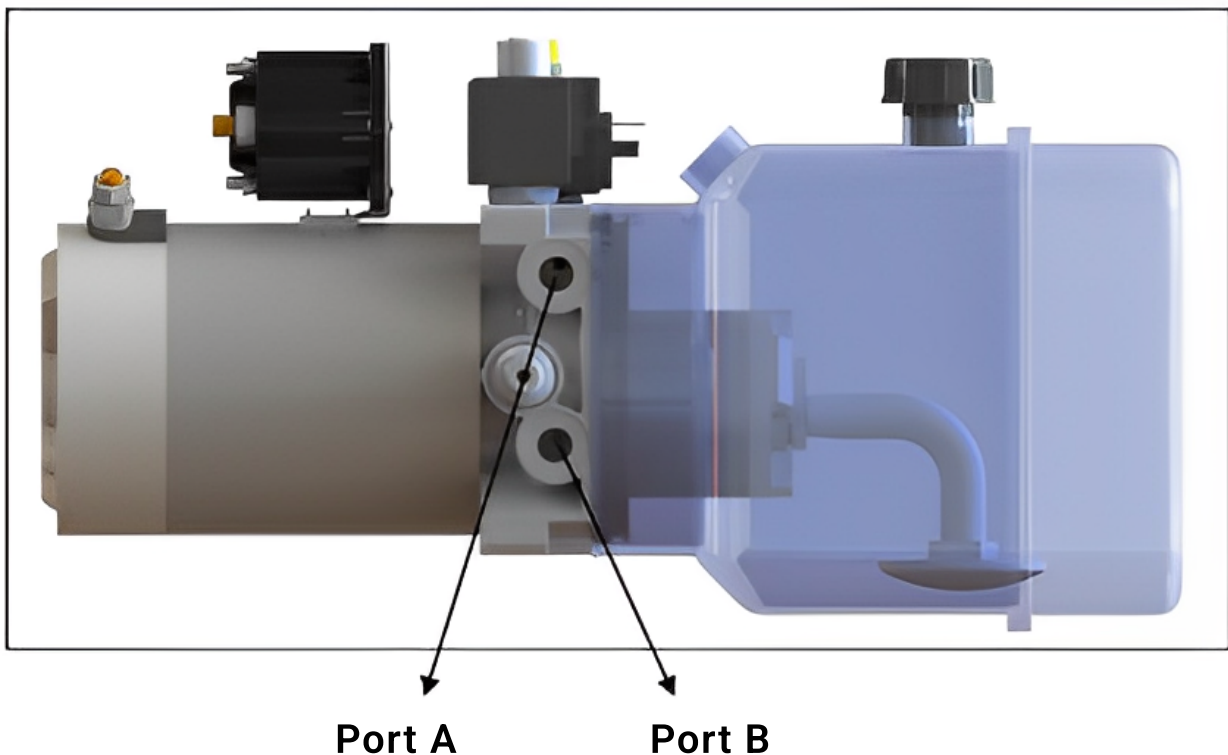
You can move the power unit using any covered transport. When you're transporting it, follow the guidelines on the packaging. If there's oil in the tank during transport, you should either replace the air breather with a blind plug or empty out the oil before moving it.

D3. POWER UNIT PROTECTION

Remove the hydraulic power unit from the carton and take off the polyethylene wrapping. Replace the safety plugs on the supply ports.

D4. CONNECTING PORTS

The central manifold has two working ports that link up with the double-acting cylinder on the dump trailer. The port threads are 9/16" – 18 UNF(SAE 6). For fittings, tighten them to a torque of 25 Nm.



D5. CONNECTION TO HYDRAULIC SYSTEM

Connect the pipelines from the power unit to the actuators in the system. You can find the hydraulic circuit #and technical details on the technical drawing. Once you've completed the power unit installation, add clean working fluid to the tank up to the indicated level. Before mounting, make sure to clean all relevant hydraulic components. After the first operation, remember to inspect the oil level in the tank.

D6. CONNECTION TO ELECTRICAL SYSTEM

To link the power unit with the electrical system, it's crucial to have a certified electrician carry out the task, adhering to safety guidelines for working with electrical equipment. For detailed instructions, consult the manufacturer's provided electrical diagram.

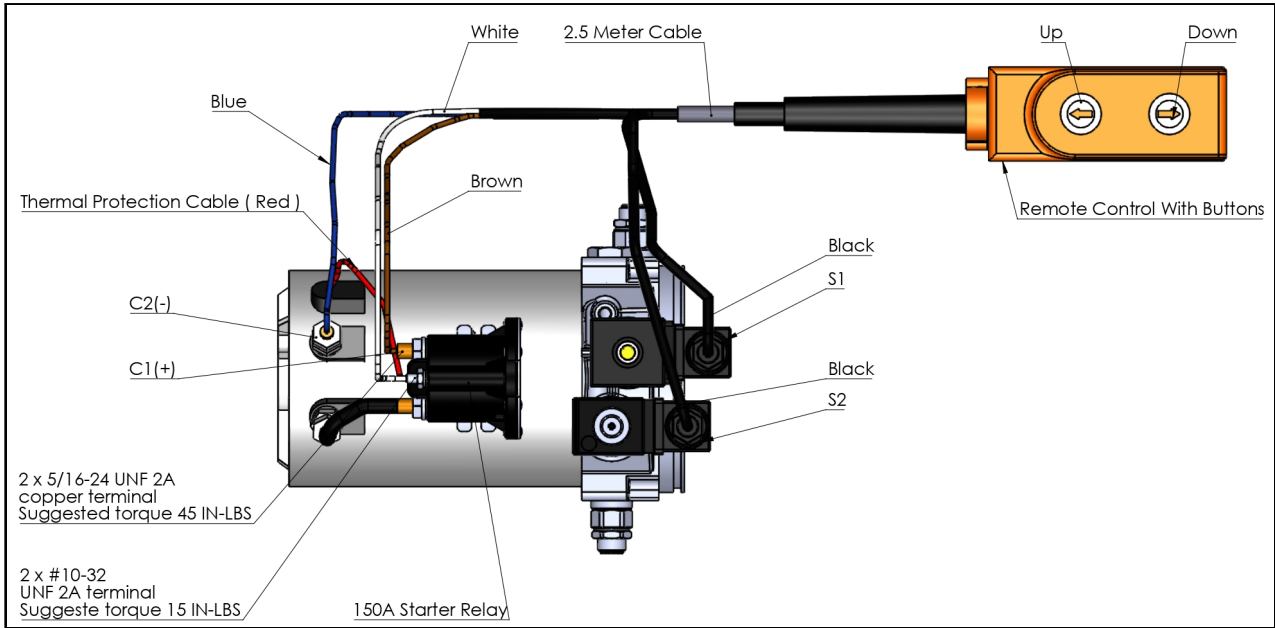
HERE'S HOW THE BATTERY CONNECTION IS MADE:

- ▶ Connect the (+) pole of the battery to C1 on the starter relay.
- ▶ Connect the (-) pole of the battery to C2 on the DC electric motor.

USE THE APPROPRIATE INSULATED RING TERMINALS FOR THE CABLES:

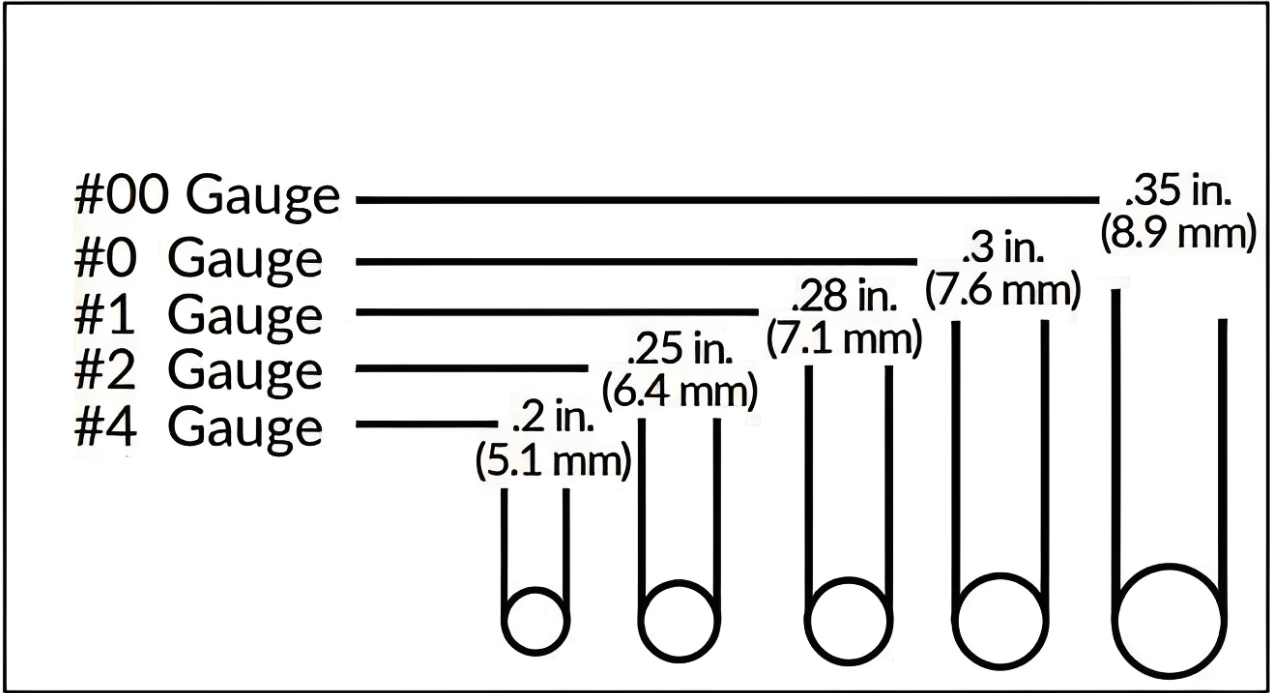
- ▶ Brown and blue cables come with 8.5 mm insulated ring terminals.
- ▶ The white cable comes with a 5 mm insulated ring terminal.

SECTION D: POWER UNIT ASSEMBLY



It is important to choose the proper cable size during the connection of the battery to the hydraulic power unit. The wrong selection may cause problems in the electrical circuit. The table below can be used for proper cable selection.

18-21 meter	#1	#00			
15-18 meter	#2	#0	#0		
12-15 meter	#2	#1	#0	#00	
9-12 meter	#4	#1	#0	#00	#00
6-9 meter	#4	#2	#1	#0	#00
3-6 meter	#4	#2	#1	#0	#00
0-3 meter	#4	#2	#1	#0	#00
	0-100 amp	100-150 amp	150-200 amp	200-250 amp	250-300 amp



Note: Insulation is not included.

MAINTENANCE OF THE HYDRAULIC POWER UNIT

E1. CLEANING OF THE POWER UNIT

You can clean the power unit with a cloth. No liquids or cleaning products are used. The cloth shouldn't leave threads on the surfaces. Once a year, you need to change the oil and clean the tank. To change the oil, follow these steps:

- ▶ The pressure is let out from the system.
- ▶ The power unit is turned off from the electrical setup.
- ▶ The pipes are taken apart. The screws holding the power unit to the base are unscrewed.
- ▶ The power unit is put upright on the tank, and the holding screws are loosened. The electric motor, central manifold, and pump are moved outside.
- ▶ The old oil is poured out, and the inside of the tank is cleaned. The suction filter is cleaned too.

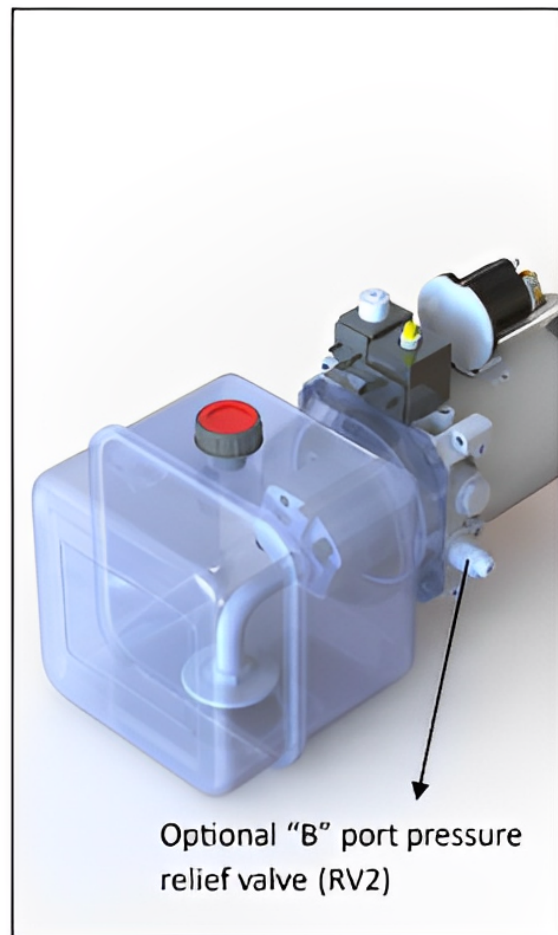
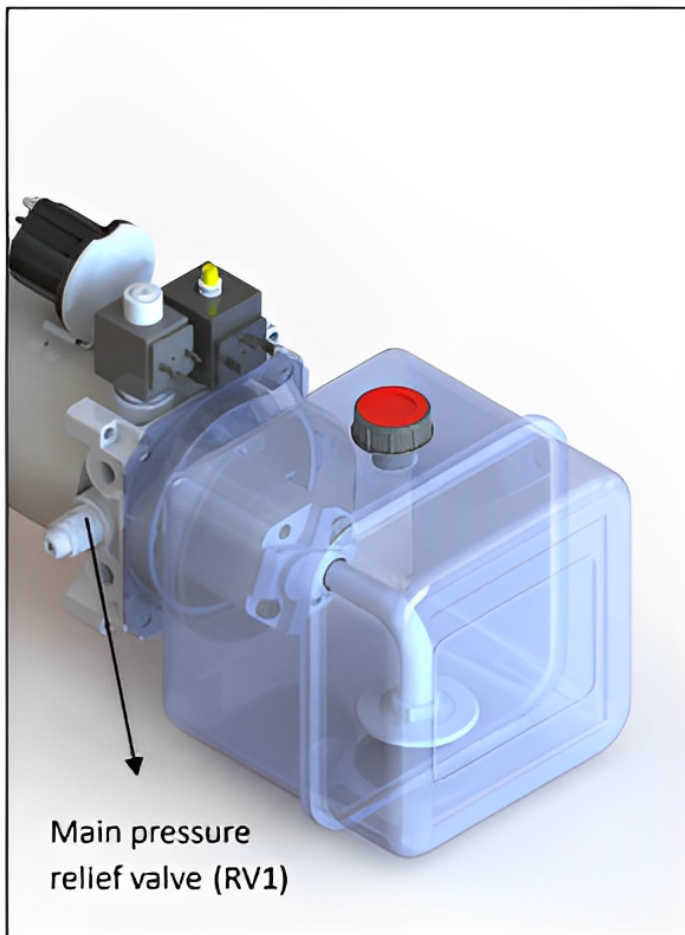
Once cleaning is done, put the electric motor and central manifold on the tank. Tighten the fixing screws and bracket. Put the assembled power unit back in its working spot. Pour in the working liquid up to the marked level. Close the air breather securely. Put the pipes back together and connect the power unit to the electrical system as needed.

Remember, using dirty oil will shorten the life expectancy of the unit.

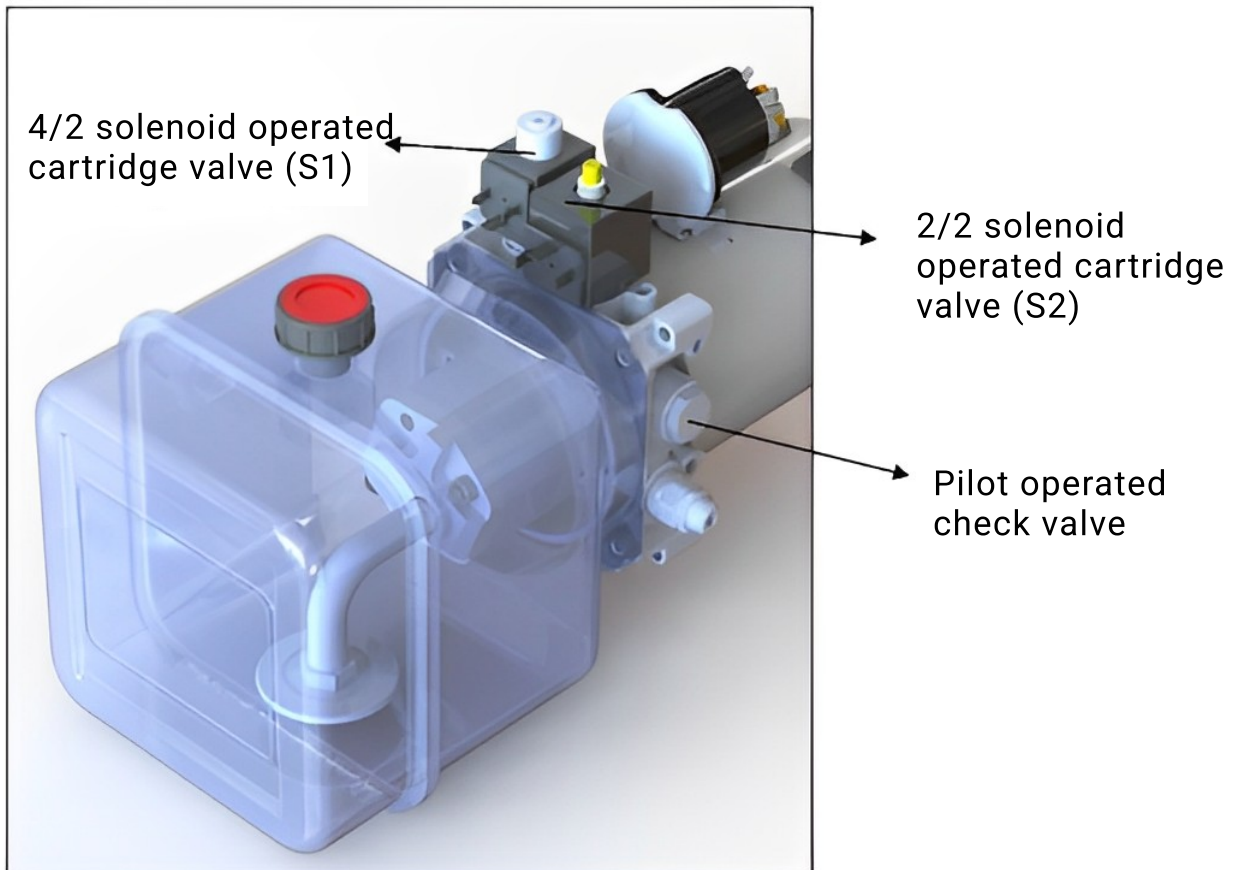
E2. PRESSURE ADJUSTMENT

Pressure relief valves built into the main manifold adjust the pressure in the hydraulic power unit.

- ▶ Main pressure relief valve for system
- ▶ Optional pressure relief valve on “B” port



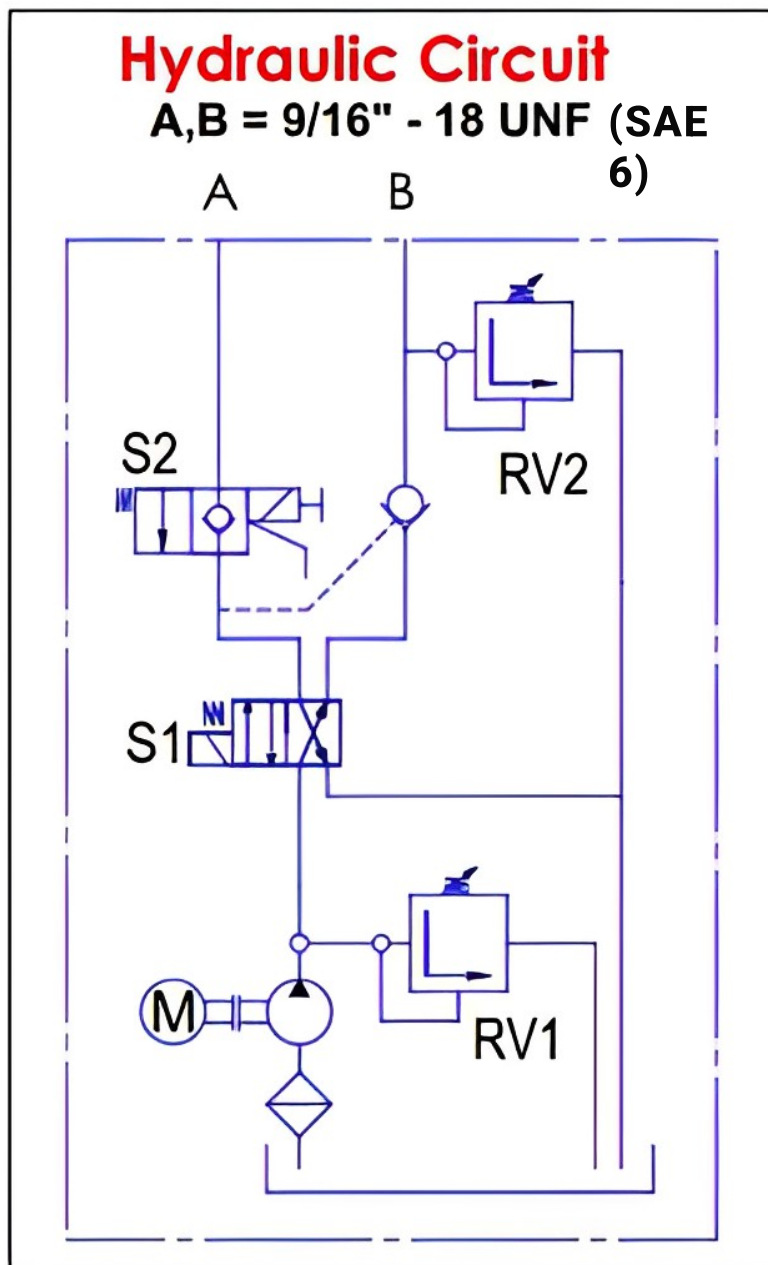
Main pressure relief valve and optional “B” port pressure relief valve on manifold



Solenoid operated cartridge valves and pilot operated check valve on manifold

The way the power units are set up at the factory is usually good for most uses. But if you want to change the settings on the manifold, be careful. First, loosen the lock nut on the pressure relief valve. To increase the pressure, turn the adjusting screw clockwise. To decrease it, turn it counterclockwise.

Important: Don't go above the maximum working pressure shown on the technical drawing.



	M: Electric Motor	X: Energized		
	M	S1	S2	
Cylinder extend	X	X		
Cylinder retract	X		X	

Operating the power unit

FEATURES:

- ▶ Compact and unique designed central manifold, including 4/2 solenoid operated valve suitable for double acting systems
- ▶ load-holding function for both working ports
- ▶ Optional “B” port pressure relief valve
- ▶ Easy to use: two-button remote control with 6 meter cable and magnets

E3. PROBLEM SOLVING

PROBLEM	REASONS	METHOD OF ELIMINATION
Motor doesn't run	<ul style="list-style-type: none"> ▶ Wrong motor wiring 	<ul style="list-style-type: none"> ▶ Check and correct wiring
Motor runs, cylinder doesn't extend	<ul style="list-style-type: none"> ▶ Wrong motor wiring Pilot ▶ Operated check valve has contaminants inside ▶ S1 valve is not energized ▶ The main pressure relief valve setting is too low 	<ul style="list-style-type: none"> ▶ Check and correct wiring ▶ Check and correct wiring ▶ Check and correct wiring
Non-performance of the function	<ul style="list-style-type: none"> ▶ Damaged solenoid operated valves ▶ Damaged pressure relief valves ▶ Damaged pilot operated check valve 	<ul style="list-style-type: none"> ▶ Replacement ▶ Replacement ▶ Replacement

PROBLEM	REASONS	METHOD OF ELIMINATION
Cylinder doesn't retract	<ul style="list-style-type: none"> ▶ Wrong motor wiring ▶ S2 valve isn't energized ▶ S1 valve is energised ▶ Pilot operated check valve has contaminants inside ▶ The main pressure relief valve setting is too low 	<ul style="list-style-type: none"> ▶ Check and correct the wiring ▶ Change the valve ▶ Change the valve ▶ Change the valve ▶ Adjust pressure setting to a higher value
Not sufficient pressure	<ul style="list-style-type: none"> ▶ Lack of oil inside the tank ▶ Damaged pressure relief valve ▶ Damaged solenoid operated valves ▶ Damaged Hydraulic pump ▶ Filter is blocked ▶ Air on suction line 	<ul style="list-style-type: none"> ▶ The oil is filled up ▶ Readjustment of the relief valve ▶ Replacement ▶ Replacement ▶ Replacement ▶ Elimination of the air

PROBLEM	REASONS	METHOD OF ELIMINATION
Gear pump does not operate properly	<ul style="list-style-type: none">▶ Air inside the system▶ Lack of oil inside the tank	<ul style="list-style-type: none">▶ Elimination of the air▶ The oil is filled up

**All power units are tested 100% before delivery to the customer.
Please kindly contact us with any questions.**

WARRANTY

F. WARRANTY

The manufacturer ensures that the product meets the standard and technical specifications. It should work properly when operated as explained in this manual.

Please don't remove the product label from the oil tank while the warranty is valid.

The warranty lasts for 12 months from the Order date.