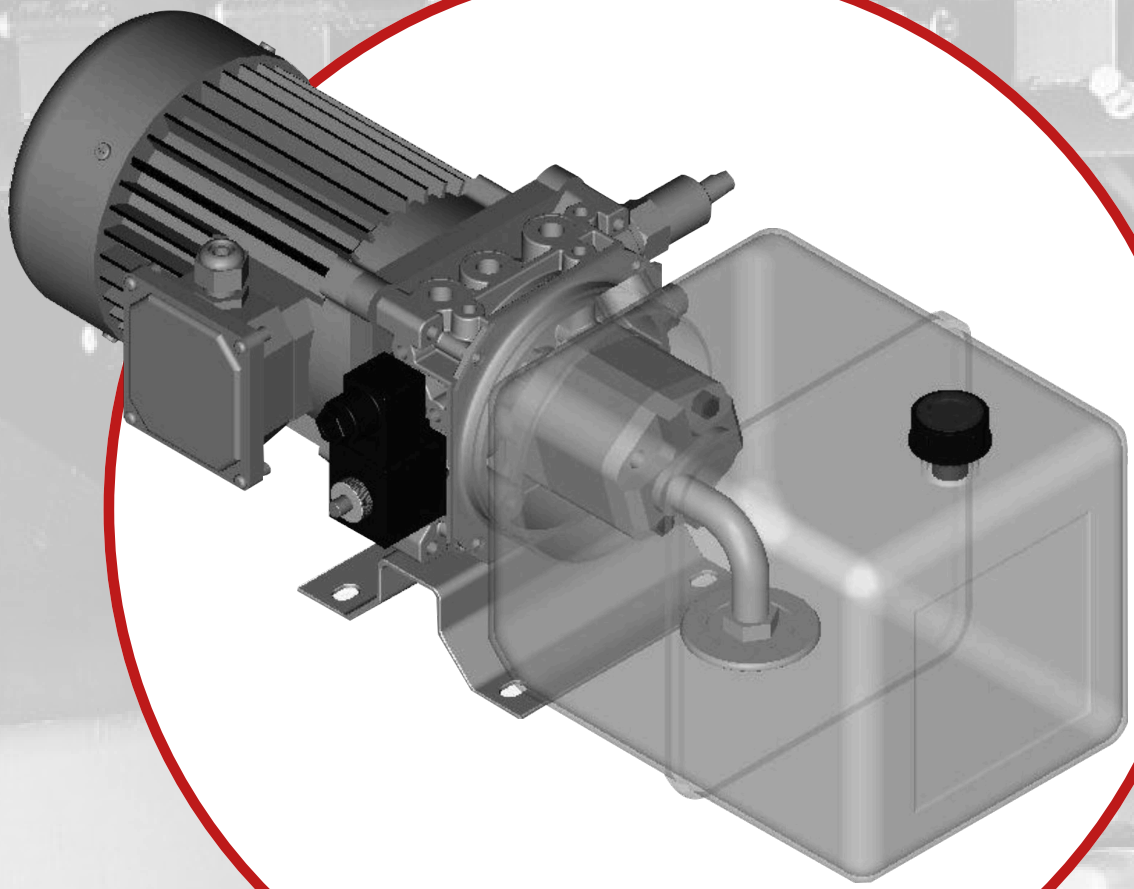
MAGISTER HYDRAULICS

DOCK LEVELER POWER UNIT

MANUAL



ATTENTION! Before operating the hydraulic power unit, it is essential to read and understand all the recommendations provided in this manual. The manufacturer is not responsible for any damage resulting from improper operation of the hydraulic power unit or from unauthorized modifications.

www.magisterhyd.com (973) 344-5313 NJ, USA

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A2 INTRODUCTION

This operation manual is intended for users of hydraulic dock leveler power units. It contains the necessary information for assembly, initial startup, operation, maintenance, and safe use of the hydraulic power units.

In preparing this manual, the experience of the manufacturing company and its specialists has been taken into consideration. It is strongly recommended to follow the safety instructions provided in the section on workplace safety when operating the machine.

Any operations involving disassembly or assembly of the power unit or electrical components must be performed only by qualified and authorized personnel. Repair work and adjustments not covered in this manual should not be carried out.

A3 PRODUCT CLAIMS

If you experience a technical issue, please contact the Magister Hydraulics technical department at **info@magisterhyd.com.**

When reaching out via email or phone regarding your claim, please provide the following details to help us assist you more effectively:

- Power unit code (found on the label located on the oil tank)
- Working voltage and frequency
- Working pressure
- Pump displacement
- Production date
- Detailed description of the issue
- Operating time of the power unit

A4 LABELING

Technical information about the power unit (such as motor power, pump displacement, oil tank size, etc.) can be found on the label. The label is located on the oil tank.

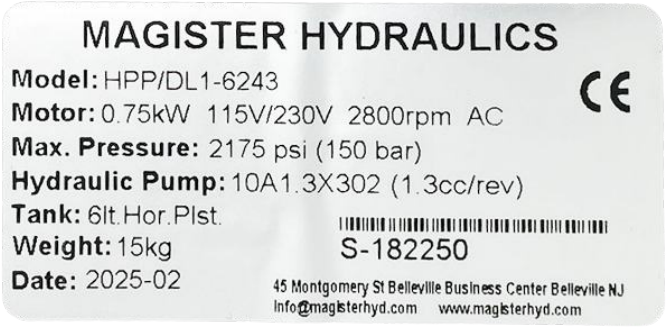


Photo 1. Power Unit Label

A5 APPLICATIONS

The hydraulic power unit is designed for integration into the hydraulic system of dock levelers. HP DL WP models can be used in applications where both the ramp and lip cylinders are single-acting, or where the ramp cylinder is single-acting and the lip cylinder is double-acting.



A 2/2 cartridge valve is available in two configurations: normally closed or normally open. The selection is made based on the customer's request. This valve is used for emergency stop functionality. If the system does not require an emergency stop, the valve can be omitted.

A6 PRODUCTION CONDITIONS AND REQUIREMENTS

The hydraulic power pack is intended for use in covered areas as well as in open areas at an ambient temperature range of -13°F to +122°F. Relative air humidity may be up to 80%.

A7 TECHNICAL SPECIFICATION

The power units are designed and manufactured to provide flow rates from **0.2 GPM to 7.1 GPM**, depending on the selected electric motor (0.37 kW up to 4 kW) and hydraulic pump (**from 0.03 ci/rev to 0.55 ci/rev**). The working pressure ranges from **580 to 3,190 PSI**, depending on the size of the selected components.

A8 NOISE SPECIFICATIONS

The hydraulic power unit does not emit noise levels exceeding 85 dB in accordance with EN 60034–9.

A9 OPERATING FLUID

The oil tank must be filled with new, filtered, mineral-based ISO 6743/4 fluid. Use hydraulic oils with a mineral or synthetic base and a viscosity range of 15 to 68 cST at a temperature of 104°F. The hydraulic fluid may vary depending on the working environment.
Do not use motor oil, diesel oil, or water as fluid in the system. The required filtration class is NAS 1638 - 9.

Hydraulic fluid should be changed every 6 months to 1 year, depending on application usage. (After the initial 100 operating hours, it is recommended to change the fluid every 3,000 hours.) The suction filter should also be cleaned. If the fluid level decreases, additional oil should be added.



B1 SAFETY GUIDELINES

Only personnel familiar with the operation of electrical equipment and equipment operating under pressure are allowed to work with the power unit.

For the safe operation of the hydraulic power unit, the following rules must be observed:

- Operation of the power unit is not permitted if the terminal box cover of the motor is missing or if non-original connectors are used on the solenoid valve coils. Only connectors of the same type as those originally supplied with the power unit may be used.
- Electrical connections must be performed by a qualified electrician. During connection, the rotation direction of the electric motor must be checked. The correct direction is indicated by an arrow on the motor housing.
- Hydraulic connections must be made carefully. Ports on top of the main manifold are labeled: “A” refers to the ramp cylinder port, and “B” refers to the lip cylinder port. The “C” port is factory-plugged if both cylinders are single-acting.
- Piping selection must match the system’s pressure and flow rate specifications.
- Tube connectors must be tightened securely. Fluid leakage on external surfaces is not acceptable. Proper sealing elements must be used.
- The air breather must not be replaced with a plug.
- The pressure relief valve must not be readjusted to a higher pressure setting.
- The power unit must be securely mounted on a base or stable frame.
- The power unit must not be used in explosive or flammable environments.
- Operation without oil may result in damage to the hydraulic pump.
- Terminal box covers of both single-phase and three-phase AC motors must remain closed.
- The AC motor must rotate counterclockwise (CCW) when viewed from the fan side.
- Only insulated cables must be used for electrical connections.
- The power unit must not be assembled or operated in a wet or watery environment.
- Oil tanks are equipped with red-colored breathers. Do not replace these breathers with blind plugs.
- Hose diameters must be appropriately sized; undersized hoses are not allowed.

C1 MAIN PARTS

The power unit consists of the following main components:

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

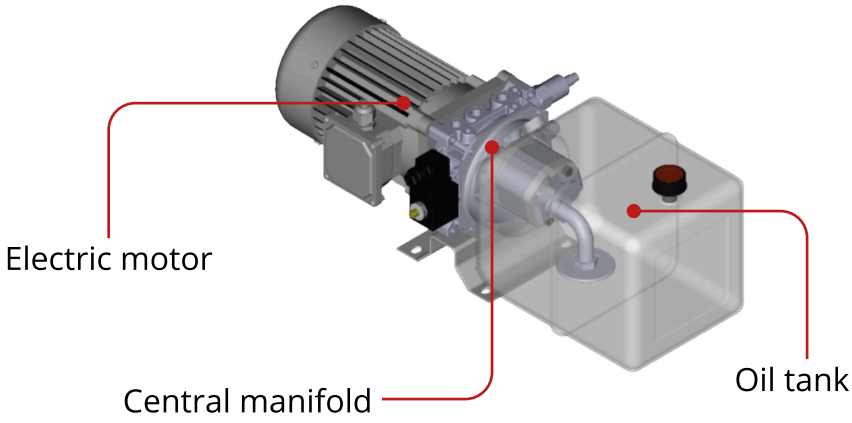


Photo 2. Main components of a dock leveler power unit
*The hydraulic gear pump and filter are located inside the oil tank.

When the electric motor is powered on, it drives the gear pump. The pump draws working fluid from the tank and directs it to the central manifold, and from there to the system's actuators. Port A must be connected to the ramp cylinder, and port B must be connected to the lip cylinder.

When the motor starts, oil flows to the ramp cylinder. When the pressure in the circuit reaches the set value, the sequence valve shifts position, allowing the lip cylinder to extend.
When the motor stops, the ramp cylinder retracts first, followed by the lip cylinder.

C2 ELECTRICAL PARTS

The hydraulic power unit is equipped with:
- Electric motor
- 2/2 cartridge solenoid valve (optional)

The electric motor is either a three-phase or single-phase AC type.
The solenoid elements are cartridge type. Their coils can operate at voltages of 12 V, 24 V, or 220 V. The connectors conform to DIN 43650.

The operation of the power unit is determined by the machine into which it is integrated. During the operation of the power unit, the presence of working fluid leakage on external surfaces is not permitted. The power unit is activated when the motor is supplied with the required voltage. Control is achieved by the proper combination of switching the motor and the solenoid valves on.

SECTION E: ASSEMBLY OF THE POWER UNIT

E1 WORK AREA REQUIREMENTS

The power unit must be mounted using M10 holes if a mounting bracket is not available. The working area around the power unit must be kept clear, and access to the oil filler, valves, and unloading throttle must be ensured. The power unit must not be placed in enclosed areas that could prevent proper cooling. The power unit should not be in contact with any parts that may vibrate or transmit noise.

E2 TRANSPORTING OF THE HYDRAULIC POWER UNIT

The power unit can be transported using any type of covered transport. During transportation, the recommendations indicated on the carton must be followed. If there is oil inside the tank during transport, the air breather should be replaced with a blind plug, or the oil should be drained before transport.

E3 POWER UNIT PROTECTION

The hydraulic power unit is taken out of the carton. The polyethylene packing is removed from it. The safety plugs are installed in the supply ports.

E4 CONNECTION PORTS

There are three ports on the main manifold: ramp port (A), lip port (B), where both cylinders are single-acting. In this case, port (C) is blind plugged.If the lip cylinder is double-acting, port (B) is connected to the inlet (to extend), and port (C) is connected to the outlet (to retract) of the lip cylinder. Port (A) is connected to the ramp cylinder.All ports are G 1/4” as standard. The maximum tightening torque for fittings is 50 Nm.

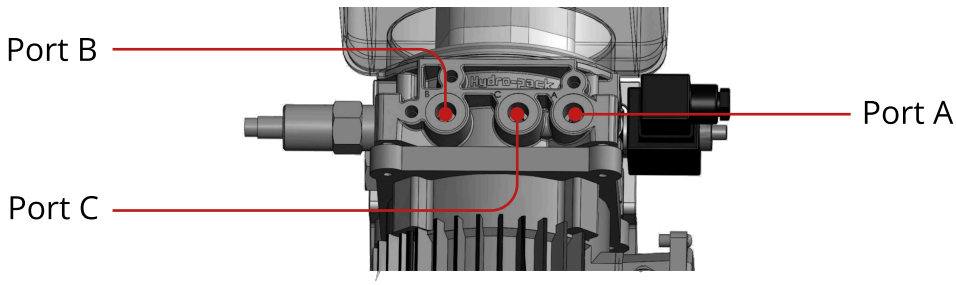


Photo 3. Connection ports on central manifold

E5 HYDRAULIC SYSTEM CONNECTION

The pipelines from the power pack are connected to the actuators in the system. Hydraulic circuit and technical information can be found in the technical drawing. After the final installation of the power unit, clean working fluid is poured into the tank to the indicated level. Please clean all hydraulic parts involved before mounting. Please check the oil level in the tank after initial operation.

E6 HYDRAULIC SYSTEM CONNECTION

The cap of the motor terminal junction box is removed. The terminal nuts are unscrewed. The cable lugs are connected to the terminals. Then the nuts are screwed back on and securely tightened. The motor is grounded. The cap is replaced on the terminal junction box. The coils of the solenoid valves are connected in a similar manner. The motor rotation must be checked carefully. The electric motor rotation, viewed from the fan side, must be counterclockwise (CCW).

The connection of the power unit to the electrical system should be performed by a certified electrician, and all safety regulations for working with electrical equipment must be observed. Please refer to the manufacturer for the electrical schematic. After the electrical connection is made, check the motor rotation by applying short pulses of correct rotation — maximum 1 second each.

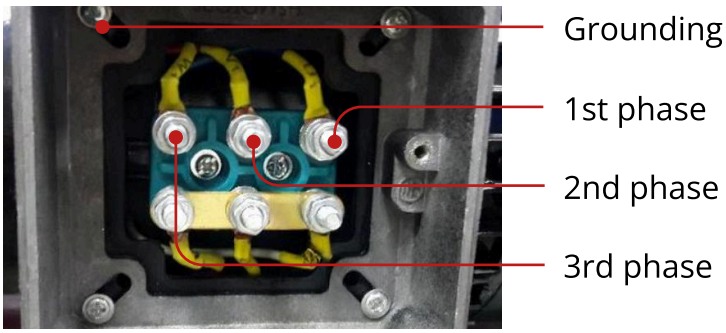


Photo 4. Connection on 380 V AC three phase motors

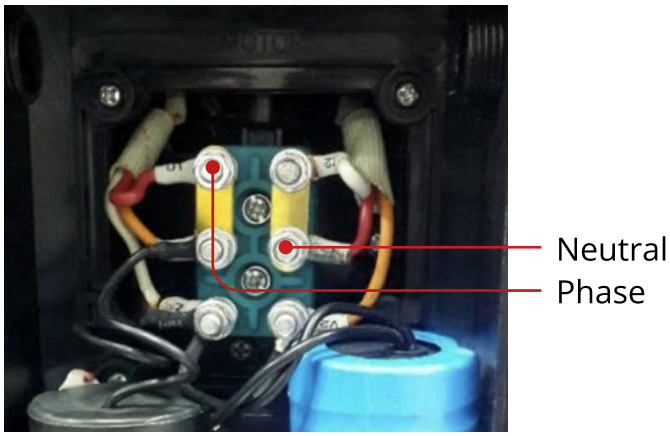
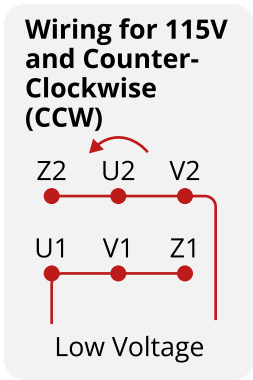
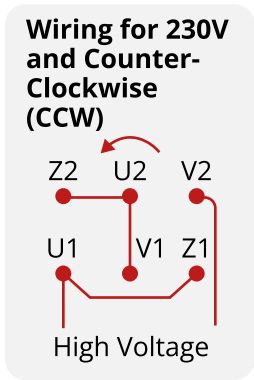
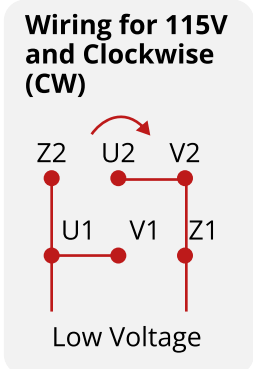


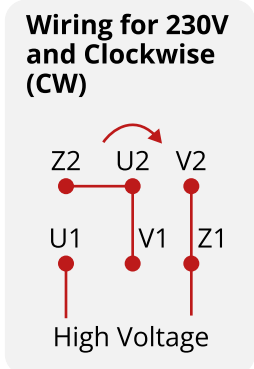
Photo 5. Connection on 220 V AC mono phase motors*

*If the single-phase motor operates in the wrong direction, please refer to the instructions located on the terminal box cover to correct the rotation.









F1 POWER UNIT CLEANING

The power unit is cleaned using a textile cloth without any cleaning agents or solvents. The cloth should not leave any fibers on the cleaned surfaces.
Oil and the tank flushing must be performed once a year. The oil change procedure is as follows:

- Release the pressure in the system.
- Disconnect the power unit from the electrical supply.
- Disassemble the pipelines. Unscrew the bolts securing the power unit to the base.
- Place the power unit vertically on the tank and remove the fixing screws. Remove the electric motor along with the central manifold and the pump. Drain the old oil and clean the internal surface of the tank. Clean the suction filter as well.

After cleaning, reinstall the electric motor and central manifold on the tank. Secure them with the fixing screws and bracket. Install the assembled power unit back in its operating position. Fill the working fluid to the specified level. Ensure the air breather is tightly closed. Reassemble the pipelines and reconnect the power unit to the electrical system according to the application requirements.

Contaminated oil significantly reduces the lifespan of the power unit.



F2 PRESSURE ADJUSTMENT

The pressure adjustment in the hydraulic power unit is made by means of a pressure relief valve, which is built into the main manifold.

- The pressure relief valve is set to 2,176 PSI.
- The pressure sequence valve is set to 1,305 PSI.

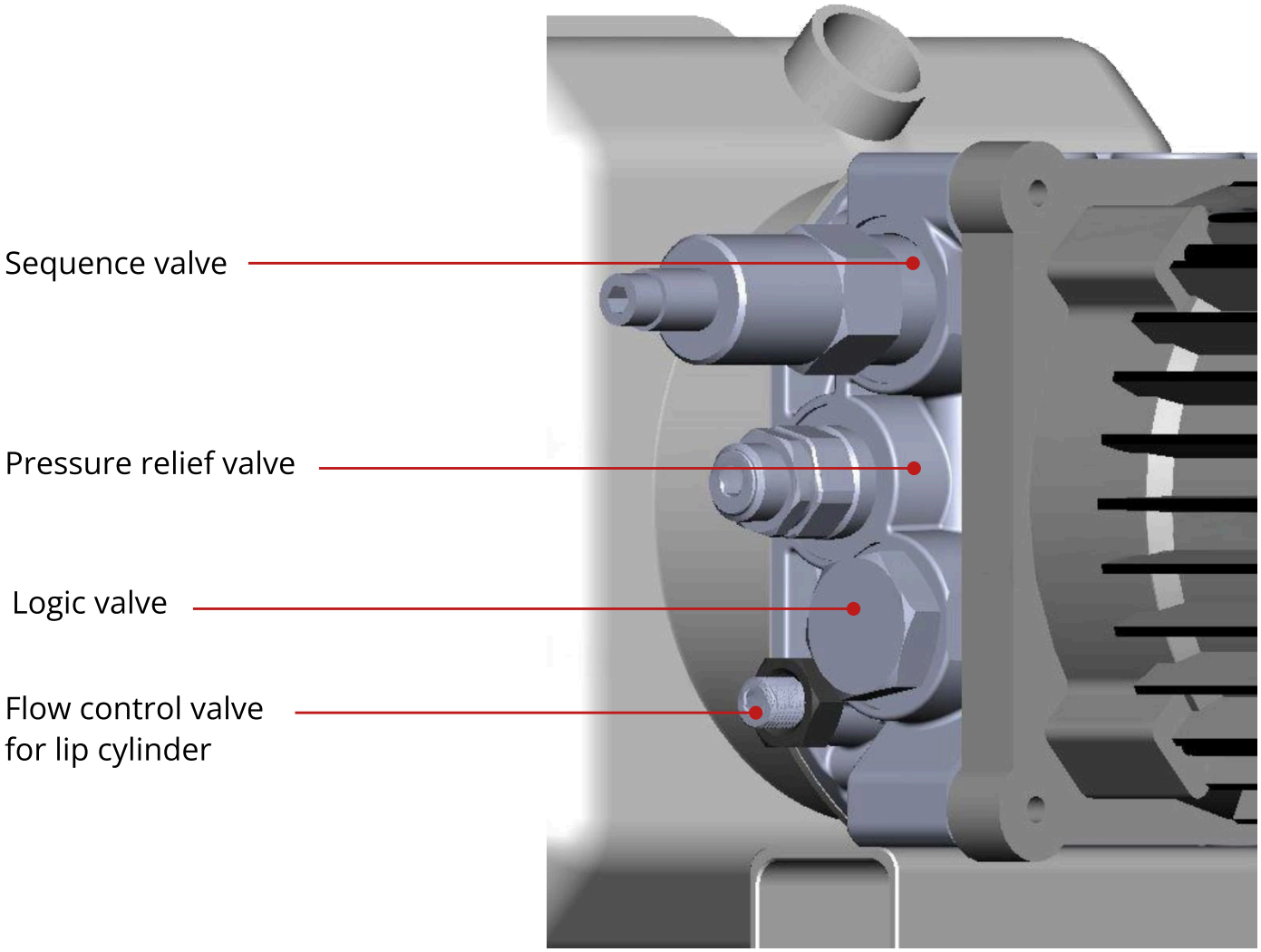


Photo 6. Pressure relief valve, sequence valve, logic valve and flow control valve for lip cylinder retract

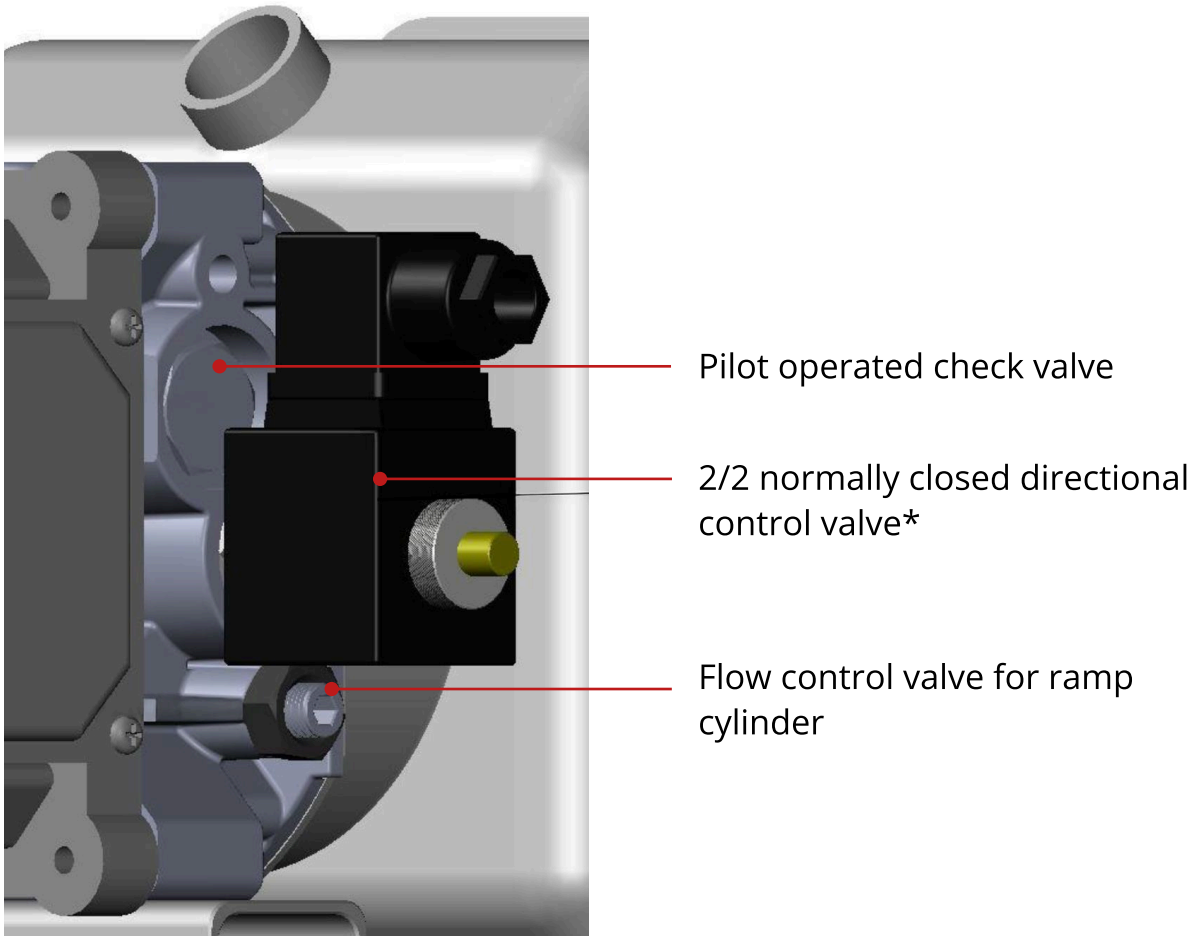


Photo 7. Pilot-operated check valve, normally closed cartridge valve, and flow control valve for ramp cylinder retraction

* This cartridge valve can be normally open upon customer request.

Factory settings of the power units usually meet the requirements of most field applications. Users must exercise caution when resetting the settings on the manifold.

The lock nut of the pressure relief valve may become loose. Turn the adjusting screw clockwise to increase the pressure setting or counterclockwise to decrease it. The sequence valve pressure can be set in a similar manner.

The lowering speed of the platform and lip can be increased or decreased by turning the corresponding flow control valve counterclockwise (CCW) or clockwise (CW). Turn the needle valve 15° each time.

Attention! Do not exceed the maximum working pressure indicated on the technical drawing.

F3 TROUBLESHOOTING

PROBLEM	REASONS	METHOD OF ELIMINATION
The motor doesn't run.	Wrong motor wiring	Check and correct wiring
Motor runs, cylinders don't move.	• Wrong motor wiring • Pilot operated check valve has contaminants	• Check and correct wiring • Clean the valve
Cylinders don't retract	• Solenoid valve is being energised • Flow control valve is closed	• Check and correct the wiring • Adjust the flow control valve
Not sufficient pressure	• Lack of oil inside the tank • Damaged pressure relief valve • Damaged solenoid operated valve • Damaged Hydraulic pump • Filter is blocked • Air on suction line	• The oil is filled up • Readjustment of the relief valve • Replacement • Replacement • Replacement • Elimination of the air
Non-performance of the function	• Damaged solenoid operated valve • Damaged shuttle valve • Damaged pressure relief valve • Damaged sequence valve • Damaged pilot operated control valve	• Replacement
Gear pump does not operate properly	• Air inside the system • Lack of oil inside the tank	• Elimination of the air • The oil is filled up
Ramp cylinder is too slow	Flow control adjustment is not correct	• Re-adjustment of flow control valve
Lip cylinder doesn't close properly	• Pilot operated check valve problem • Flow control valve adjustment is not correct • Lip cylinder problem	• Replacement • Re-adjustment of flow control valve – it shouldn't be totally closed • Inspection of lip cylinder
Lip does not rise	• Relief valve pressure is too low. • Sequence valve pressure is too high • Logic valves have contaminants inside.	• Increase the relief pressure. • Decrease the sequence valve pressure. • Clean the valve
Platform and lip rise simultaneously when motor runs	Sequence valve pressure is too low	• Increase sequence valve pressure

The manufacturer guarantees that the product complies with the applicable standards and technical documentation, and that its functionality during operation is in accordance with the current 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.

The manufacturer will be responsible for addressing any defects caused by its fault.
The warranty will be void if the user performs unauthorized repairs or fails to follow the instructions outlined in this manual.

Warranty services will be provided at the manufacturer's facility or through an authorized service provider.

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