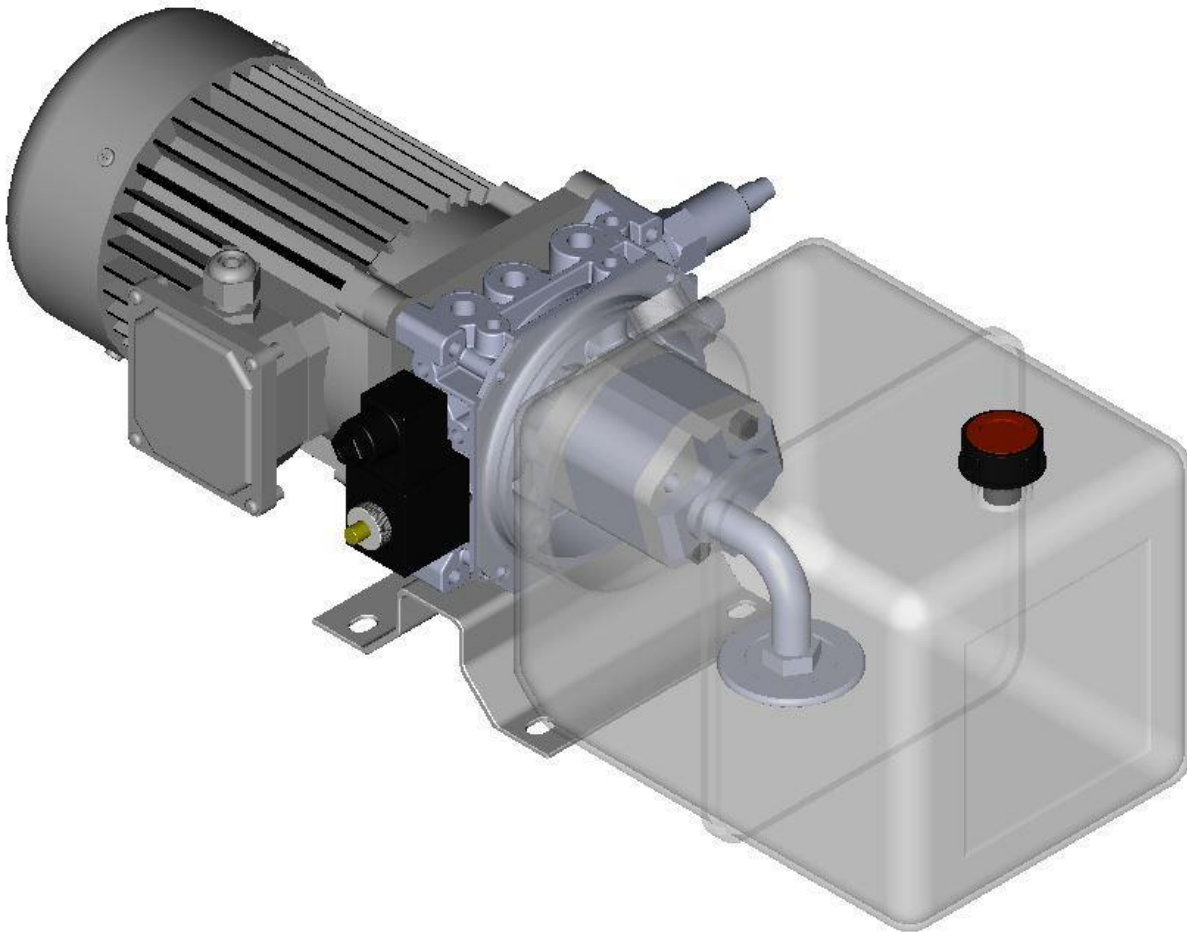


MINI POWER PACKS

DD.036 ENG R(1) DOCK LEVELER POWER PACK MANUAL



Attention! Before starting the hydraulic power pack operation, it is necessary to get acquainted with all the recommendations included in this manual. The producer does not bear any responsibility for damages occurred because of improper operation of hydraulic power pack or constructive changes.

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SECTION A: GENERAL DATA

A1 LEVERANCIER

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A2 INTRODUCTION

The present manual of operation is intended for users of hydraulic dock leveler power packs. It contains the necessary information for assembly, initial starting into actuation, maintenance, correct and safety work with the hydraulic power packs.

During the compiling of this manual the experience of the producing company and its specialists are taken into consideration. With special responsibility it is recommended that our indications to be followed up in the part treating the safety precautions at work with the machine.

The operations that request disassembly and assembly of the power pack and electric elements have to be implemented by only qualified and authorized specialists. The repair works and adjustments that are not included in this manual should not be carried out.

A3 PRODUCT CLAIMS

At occurrence of technical problem, please contact technical department of Hydropack. (support@hidros.com.tr) Please send us an e-mail or call with us regarding your claim. Please also provide us the following information so that we can help you better:

- Code of power pack which is on label (Label is located on oil tank.)
- Working voltage and frequency
- Working pressure
- Displacement of the pump
- Date of production
- Detailed description of the claim
- Working time of the power unit

A4 LABEL

Technical information of power pack (Such as motor power, pump displacement, oil tank size, etc.) can be seen on label. Label is located on oil tank.

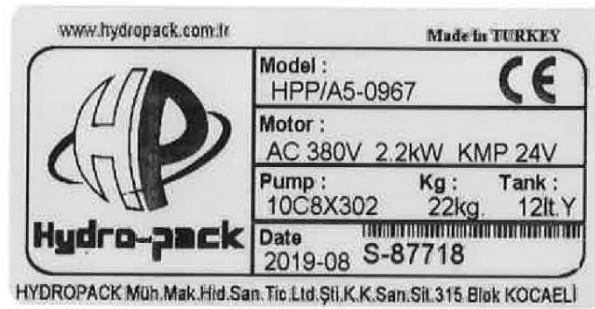


Photo 1. Label of power unit

A5 APPLICATIONS

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

2/2 cartridge valve has two options, normally closed or normally open. This choice is made according to customer request. This valve is used for emergency stop. In addition, the system that doesn't need an emergency stop, this valve can be eliminated.

A6 WORKING CONDITIONS AND REQUIREMENTS

The hydraulic power pack is intended to be used in covered premises as well as at open area at ambient temperature of - 25 to +50°C. Air humidity up to 80 %.

A7 TECHNICAL CHARACTERISTIC

The power packs are designed and accomplished so that they provide flow from 0,75 L/min to 27 L/min depending on selected electric motor (0.37 kW up to 4 kW) and hydraulic pump (0,5 cc/rev up to 9 cc/rev) Working pressure is from 40 to 220 bar depends on the size of the selected components.

A8 NOISE CHARACTERISTIC

The hydraulic power pack does not emit noise higher than 85 dB in accordance to EN 60034–9.

A9 WORKING LIQUID

The oil tank must be filled with new, filtered mineral based ISO 6743/4 fluid. Hydraulic oils at mineral or synthetic base with viscosity rate from 15 to 68 cST at temperature of 40 °C. Hydraulic fluid may change regarding working climate. Please do not use motor oil, diesel oil or water as fluid in the system. Class of filtration -9 NAS 1638.

Hydraulic fluid should be changed after 6 months or 1 year depends on usage in application. (After initial 100 operation hours, afterwards once every 3000 hours is recommended.) Suction filter needs to be cleaned as well. If there is decrease on fluid level, additional oil should be put in.

SECTION B: SAFETY TECHNICS

B1 RULES FOR TECHNICAL SAFETY

To work with the power pack it could be allowed only personel who is acknowledged with the rules for actuation of electrical equipments and equipments working under pressure.

For safety functioning of the hydraulic power pack it is necessary to be kept the following rules:

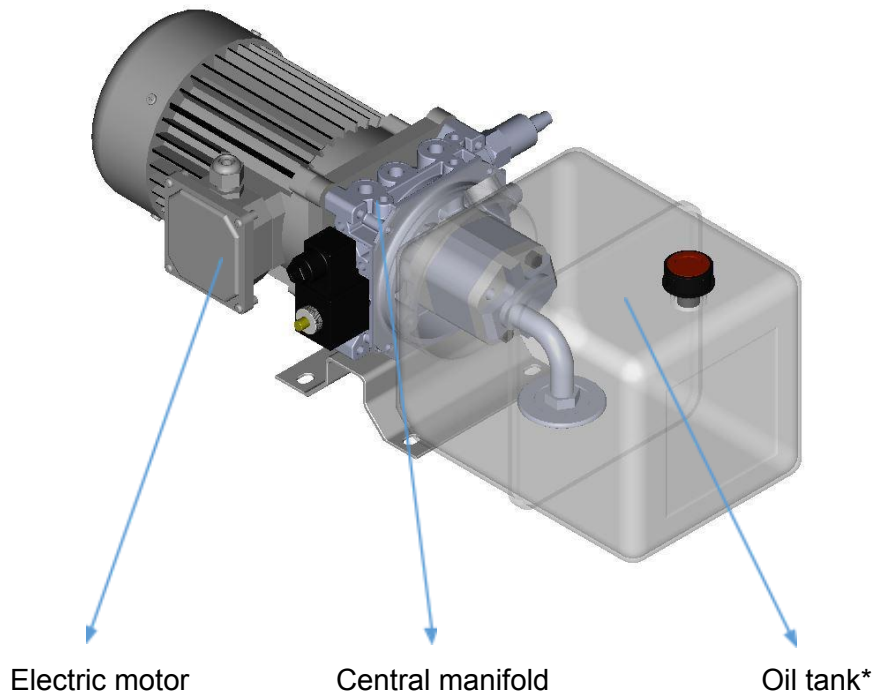
- It is not allowed an actuation of the power pack with replaced cap of the terminal connecting box of the motor or using connectors on the coils of the solenoid valves that are not of the same type like these with which the power pack is accomplished.
- The connection has to be done from a qualified electrician. During the connection it should be observed the direction of rotation of the electric motor (the arrow at the cover of the electric motor indicates the correct direction of rotation)
- Hydraulic connection must be carried out carefully. There are letters on top of the main manifold. "A" refers to ramp cylinder port and "B" refers to lip cylinder port. ("C" port is blind plugged if both cylinders are single acting.)
- The selection of the pipelines must be complied with the system pressure and flow rate.
- The tube connectors must be fixed tightly. It should not be allowed any fluid leakage at the outer surfaces. Proper sealing elements should be used.
- It is not permitted the replacement of the air breather with plug.
- It is not permitted pressure relief valve readjustment to a higher pressure.
- The power pack must be fixed to a basement or to a stable frame.
- It is not allowed the power pack use in explosion – hazardous and combustable environment.
- Lack of oil may cause damage to hydraulic pump.
- Mono phase and three phase AC motor terminal box covers should be closed.
- Rotation of the AC motor from fan side view must be left (CCW) rotation.
- Insulated cables must be used in connection.
- Power pack assembly should not be carried out in watery environment.
- There are breathers with red color on oil tanks. Blind plugs should not assemble on these breathers.
- Hose diameters should not be too small.

SECTION C: DESCRIPTION OF THE HYDRAULIC POWER PACK

C1 MAIN PARTS

The power pack is consisted on the following main elements:

- Electric motor
- Central manifold
- Hydraulic gear pump
- Oil tank
- Filter



** Hydraulic gear pump and filter are inside oil tank.*

Photo 2. Main components of dock leveler power pack

At switching on the power of the electric motor, it drives the gear pump. The pump sucks the working liquid from the tank and directs it to central manifold and from there to the actuators of the system. A port must be connected to ramp cylinder and B port must be connected to lip cylinder. When the motor starts, the oil goes to ramp cylinder, when the pressure in the circuit reached setted value, sequence valve changes the position and lip cylinder opens. When the motor stops, first ramp cylinder retracts and then lip cylinder retracts.

C2 ELECTRICAL PARTS

The hydraulic power pack is assembled with:

- Electric motor
- 2/2 cartridge solenoid valve (Optional)

The electric motor is three phase type or mono-phase for AC.

The solenoid elements are cartridge type. Their coils can operate under voltages of 12, 24 or 220 V. The connectors are made under DIN 43650.

SECTION D: WORKING WITH HYDRAULIC POWER PACK

The power pack work is determined by the machine at which it is integrated. During operation of power pack it is not allowed the presence of leakage of working fluid on the outside surfaces. The power pack is switched when the motor is supplied with the necessary voltage. The control is effected by proper combination of switching on the motor and the solenoid valves.

SECTION E: POWER PACK ASSEMBLY

E1 REQUIREMENT OF THE WORKING AREA

The power pack must be mounted using M10 holes if there is no mounting bracket. The working area around the power pack must be free and an access to the oil filler, to the valves and the unloading throttle has to be ensured. The power packs must not be placed in closed areas that may prevent its cooling. The power pack should not contact with any parts that may vibrate and transmit noise.

E2 TRANSPORT OF THE HYDRAULIC POWER PACK

The power pack can be transported with any kind of covered transport. At its transporting it should be observed the recommendations on the carton. If there is oil inside the tank during transportation, air breather should be replaced with blind plug or oil should be pour out before transport.

E3 POWER PACK PROTECTION

The hydraulic power pack is taken out of the carton. The polyethylene packing is removed of it. The safety plugs are replaced of the supply ports.

E4 CONNECTING PORTS

There are three letters on main manifold which refer to ramp port (A) lip port (B) where both cylinders are single acting. In this case, (C) port is blind plugged.

If lip cylinder is double acting, (B) port is connected to inlet (to extend) and (C) port is connected to outlet (to retract) of lip cylinder. (A) port is connected to ramp cylinder. All ports are G 1/4" as standard. Max. tightening torque for fittings is 50 Nm.

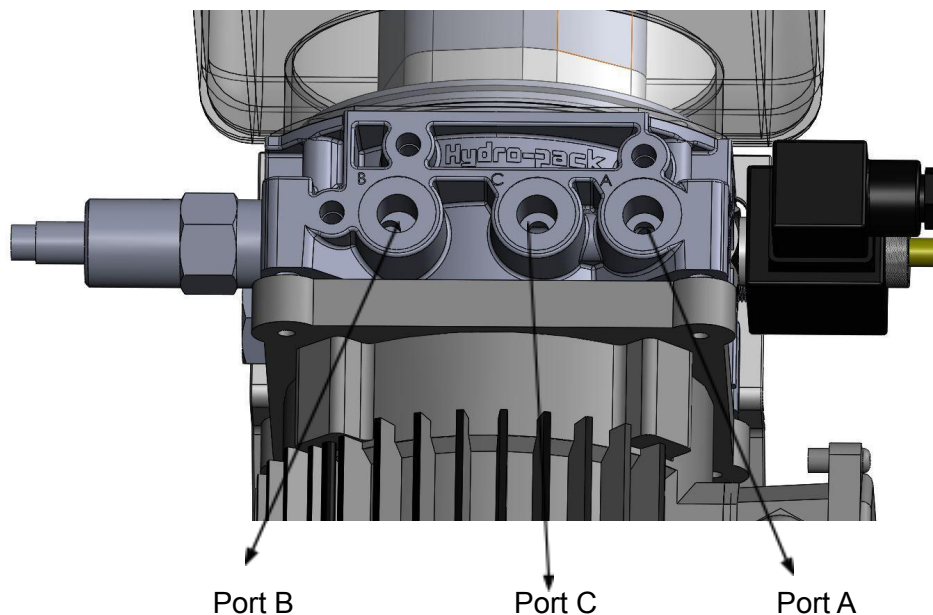


Photo 3. Connection ports on central manifold

E5 CONNECTION TO HYDRAULIC SYSTEM

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

E6 CONNECTION TO ELECTRICAL SYSTEM

The cap of the motor terminal connecting box is removed. The nuts of the terminals are unscrewed. The cable shoes are connected to the terminals. Then the nuts are screwed and reliably tightened. The motor is nullified. The cap is placed at the terminal connecting box. The coils of the solenoid valves are connected in the analogical manner. Motor rotation must be checked carefully. Electric motor rotation from fan side must be left. (CCW)

The connecting of the power pack to the electrical system should be done by a certified electrician as the rules for safety work with electrical equipments should be observed. Please refer to producer for electrical schema. After electrical connection has been made, please check the motor rotation by executing short pulses of correct rotation – max. 1 second each.

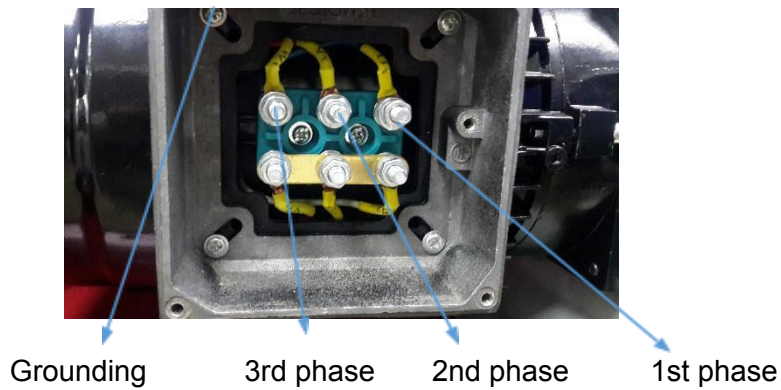


Photo 4. Connection on 380 V AC three phase motors



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

* If mono phase motor operates in wrong direction, please kindly check instructions located on terminal box cover to make it correct rotation.

SECTION F MAINTENANCE OF THE HYDRAULIC POWER PACK

F1 CLEANING OF THE POWER PACK

The cleaning of the power pack is made by textile cloth without using any cleaning substances or solvents. The cloth should not left any filaments on the treated surfaces. Once yearly it is necessary changing oil and flushing tank. Oil change is done in the following way:

- The pressure is unloaded in the system.
- The power pack is switched off from the electric installation.
- The pipelines are disassembled. The screws by which the power pack is fixed to the basement are unscrewed.
- The power pack is placed vertically on the tank and the fixing screws are unscrewed.
- The electric motor is placed outside together with the central manifold and the pump. The old oil is poured out and the internal surface of the tank is cleaned. The suction filter is cleaned also.

After cleaning, the electric motor with the central manifold are placed on the tank. The fixing screws and the bracket are screwed. The assembled power pack is installed on its working position. The working liquid is poured up to the indicated level. The air breather must be closed firmly. The pipelines are assembled and the power pack is connected to electrical system in accordance to the way of application.

Dirty oil sharply decreases the life time of power pack.

F2 PRESSURE ADJUSTMENT

The pressure adjustment in the hydraulic power pack is made by means of pressure relief valve which is built in on main manifold.

- Setting of pressure relief valve is 150 bar
- Setting of pressure sequence valve is 90 bar

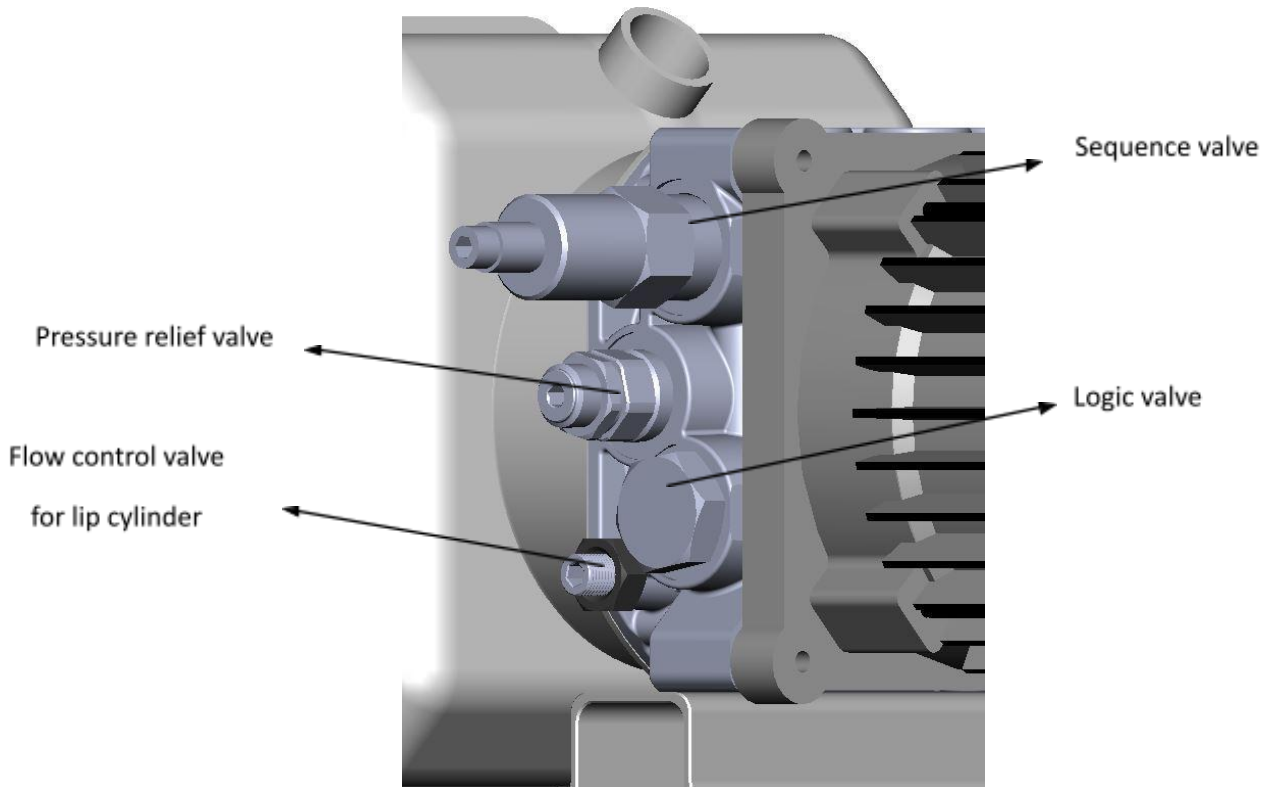
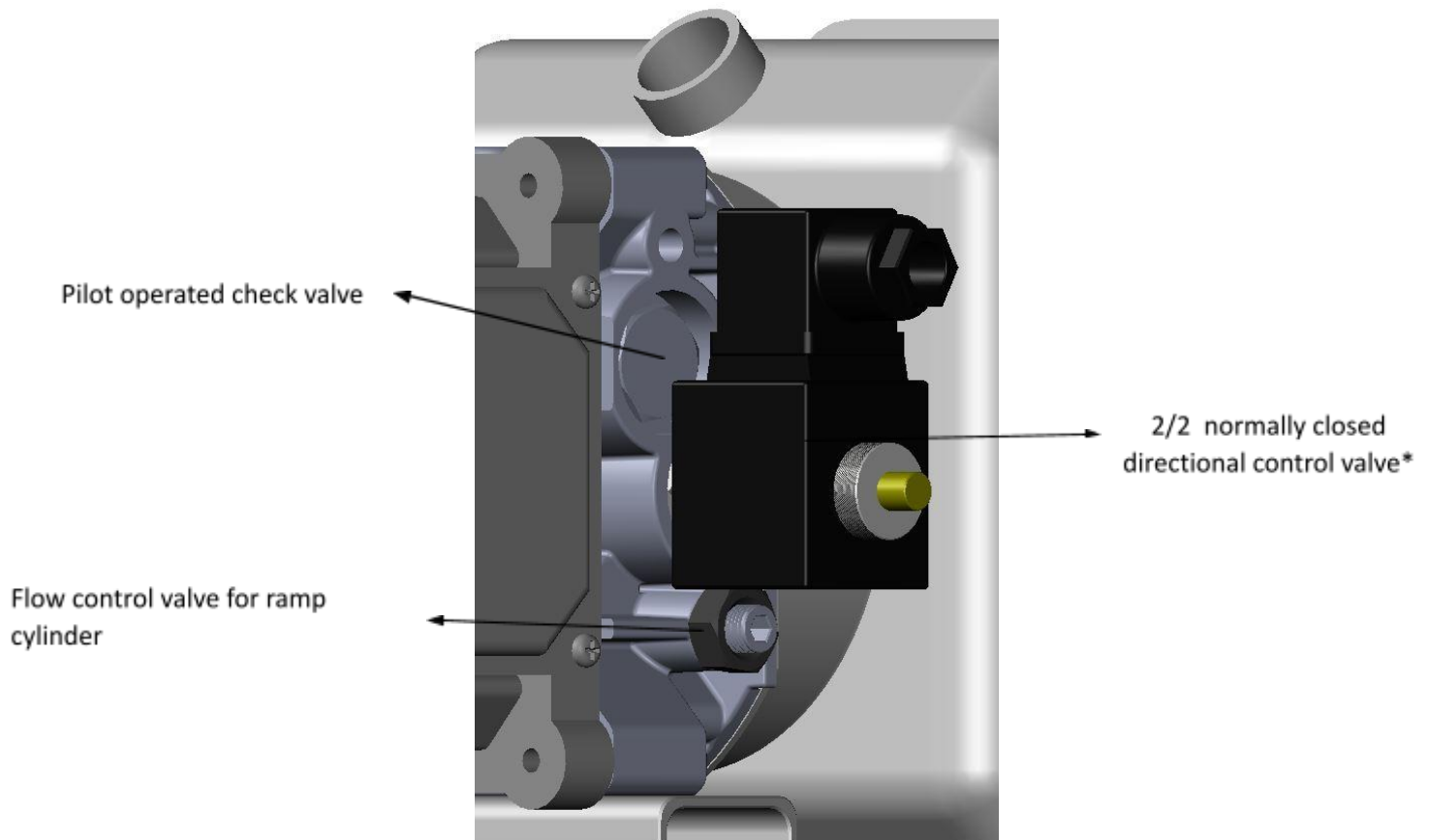


Photo 6. Pressure relief valve, sequence valve, logic valve and flow control valve for lip cylinder retract



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

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

Factory setting of the power packs can usually meet the requirements of most field applications. Users must be cautious when resetting the settings on the manifold. Loose lock nut of pressure relief valve. Adjusting screw is turned clockwise to increase pressure setting or anti-clockwise to decrease pressure setting. Sequence valve pressure can be set in similar manner.

Lowering speed of the platform and lip can be increased/decreased by turning the corresponding flow control valve in CCW/CW direction. Turn the needle 15° each time.

Attention! Please do not pass max. working pressure indicated on technical drawing.

F3 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, cylinders don't move.	<ul style="list-style-type: none"> ● Wrong motor wiring ● Pilot operated check valve has contaminant inside. 	<ul style="list-style-type: none"> ● Check and correct wiring ● Clean the valve
Cylinders don't retract	<ul style="list-style-type: none"> ● Solenoid valve is being energised ● Flow control valve is closed 	<ul style="list-style-type: none"> ● Check and correct the wiring ● Adjust the flow control valve
Not sufficient pressure	<ul style="list-style-type: none"> ● Lack of oil inside the tank ● Damaged pressure relief valve ● Damaged solenoid operated valve ● 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
Non-performance of the function	<ul style="list-style-type: none"> ● Damaged solenoid operated valve ● Damaged shuttle valve ● Damaged pressure relief valve ● Damaged sequence valve ● Damaged pilot operated control valve 	<ul style="list-style-type: none"> ● Replacement
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
Ramp cylinder is too slow	<ul style="list-style-type: none"> ● Flow control adjustment is not correct 	<ul style="list-style-type: none"> ● Re-adjustment of flow control valve
Lip cylinder doesn't close properly	<ul style="list-style-type: none"> ● Pilot operated check valve problem ● Flow control valve adjustment is not correct ● Lip cylinder problem 	<ul style="list-style-type: none"> ● Replacement ● Re-adjustment of flow control valve – it shouldn't be totally closed ● Inspection of lip cylinder
Lip does not rise	<ul style="list-style-type: none"> ● Relief valve pressure is too low. ● Sequence valve pressure is too high ● Logic valve has contaminant inside. 	<ul style="list-style-type: none"> ● Increase the relief pressure. ● Decrease the sequence valve pressure. ● Clean the valve
Platform and lip rise simultaneously when motor runs	<ul style="list-style-type: none"> ● Sequence valve pressure is too low 	<ul style="list-style-type: none"> ● Increase sequence valve pressure

