

Hydraulic inverter

User and maintenance manual

Original instructions

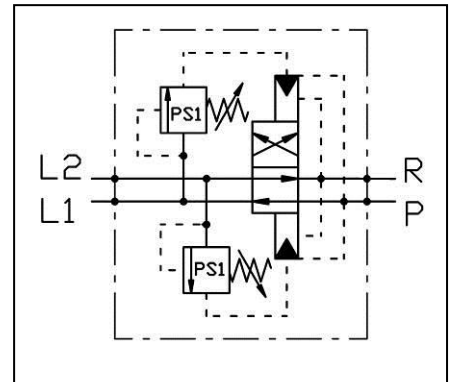


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1. INTRODUCTION

This User and Maintenance Manual refer to Dropsa's "hydraulic inverter with three pistons".

You can find additional copies and newer revisions of this document from our website <http://www.dropsa.com>.

Alternatively contact one of our Sales Offices.

This manual contains important information on health and safety issues the personnel. It is recommended to attentively read this manual and carefully keep it in good condition so that it is always available to personnel requiring to consult it.

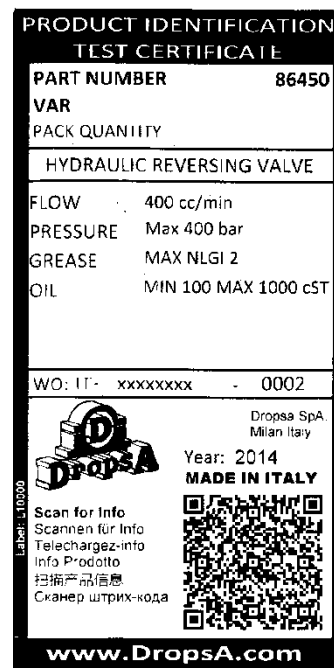
2. GENERAL DESCRIPTION

Hydraulic inverter has been designed to control the dual line system supply (02 System), it is able to work both with oil and grease at 5880 psi (400 bar) max pressure.

The function of this Hydraulic inverter is that both main lines have to be alternately pressurized and be relieved of pressure.

3. PRODUCT IDENTIFICATION

Machine identification label is located on the front side of the reservoir and contains product serial number, input voltage and details of the operating parameters.



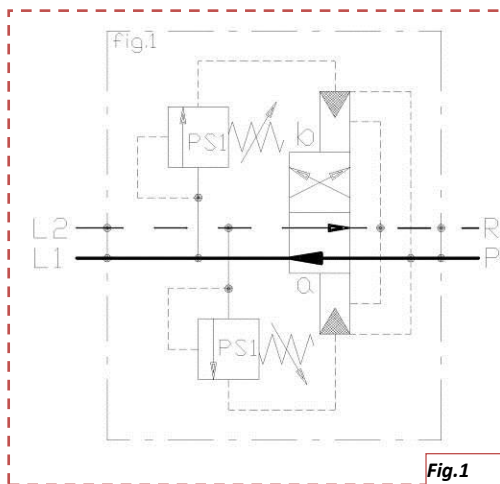
4. TECHNICAL CHARACTERISTICS

GENERAL CHARACTERISTICS	
Weight	4.5 Kg
HYDRAULIC CHARACTERISTICS	
Max flow rate	400 cc/min
Max working pressure	300 bar
Outlet and inlet connection	G3/8" BSP
Adjustment range	60÷300 bar
Temperature of use	- 5 ÷ + 50 °C (23° ÷ +122° F)
Humidity	90 % Rel. humidity
Lubricants	Max greaseNLGI2 Min oil 100 cSt
Storage temperature	-20 ÷ +65 °C

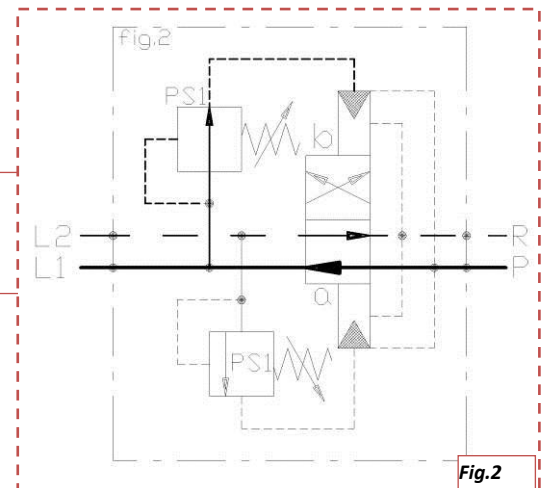
N.b. The specifications refer to the temperature of use of +20°C (+68°F)

* If a different product is used, please contact Dropsa S.p.A. to ensure it is suitable for use

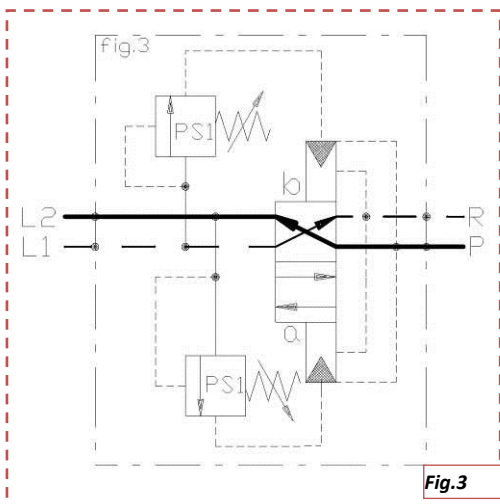
4.1 Hydraulic system



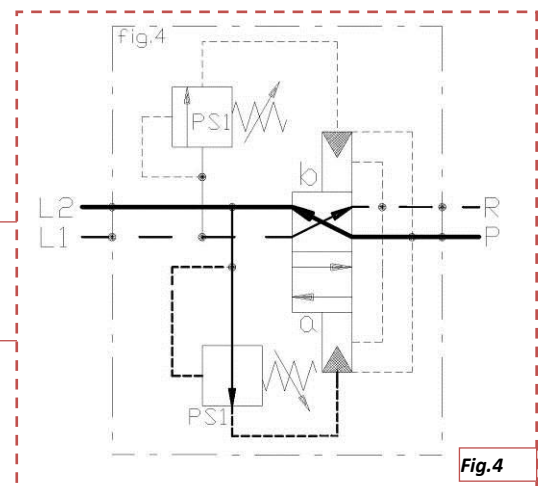
Activation line 1 (fig.1) - with valve in position "a" the pump pushes lubricant to line 1. Line 2 is discharge phase.



Exchange line 1->2 (fig.2) - when fluid reaches the adjusting spring pressure calibration "PS1", the pilot conduit opens causing the displacement of the chamber from the position "b" to the position "a"

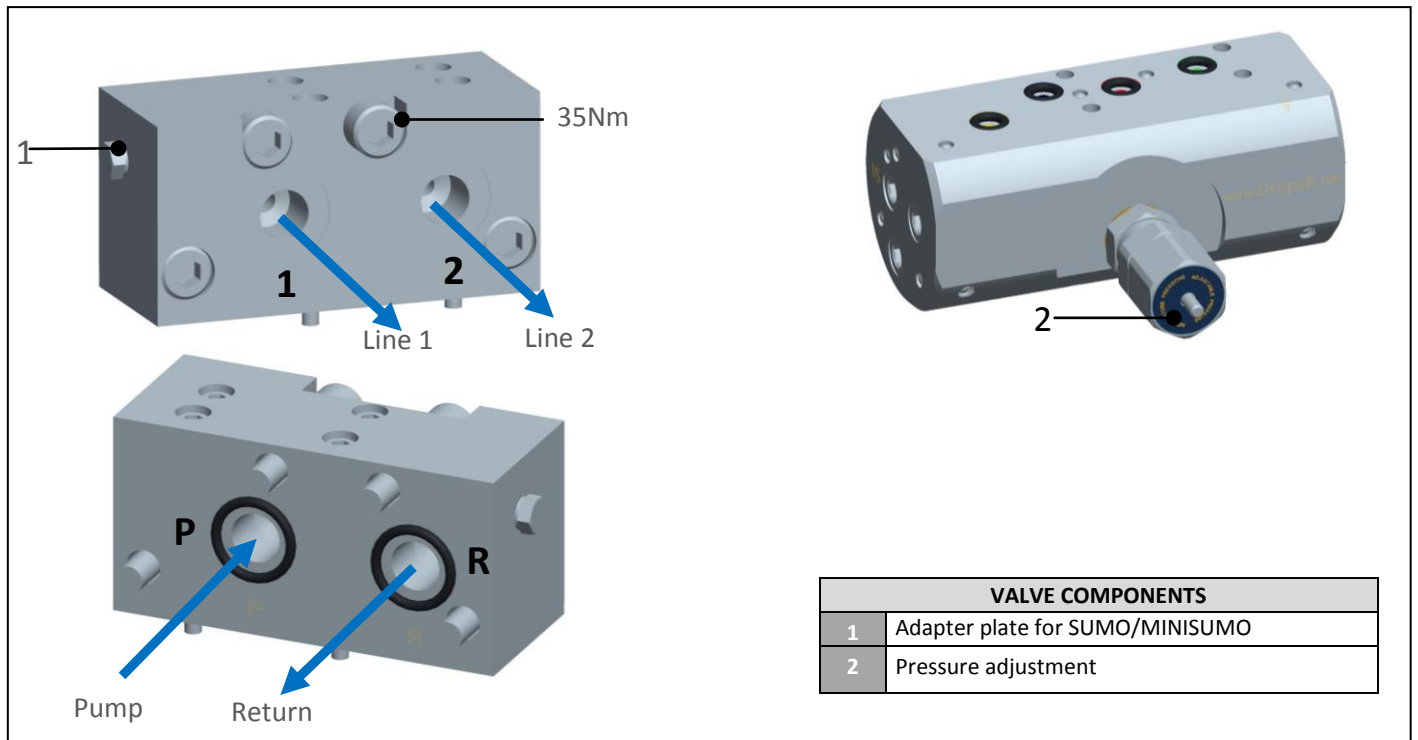


Activation line 2 (fig.3) - with valve in position "b" the pump pushes lubricant to line 2. Line 1 is discharge phase.



Exchange line 2->1 (fig.4) - when fluid attains the adjusting spring pressure calibration "PS1", the pilot conduit opens causing the displacement of the chamber from the position "a" to the position "b"

5. COMPONENTS



6. UNPACKING AND INSTALLATION

6.1 UNPACKING

Once a suitable installation position has been identified, unpack the product and prepare for installation. It is important to inspect the product to ensure that there has been no damage during transportation. The packaging material used does not require any special disposal procedures. You should refer to your regional requirements.

6.2 Installing

1. Fixing the valve on the pump using four M10 screws supplied, tightening with a torque of 35 Nm. Pay attention at the correct positioning of ORings.
2. Connect two outlet pipes to G3 /8" holes marked 1 and 2 on the adapter plate.

7. OPERATING INSTRUCTIONS

7.1 Start-up

Before using the product, a few preliminary checks must be performed:

- Check Modular directional valve integrity;
- Check that the valve is at running temperature and that the pipes are free of air pockets
- Check that the electrical connection has been carried out correctly;
- Check that there aren't lubricant leakage or air pressure loss;
- Check that the lock screws are properly screwed up;
- Use gloves and safety goggles, as stipulated in the safety chart for the lubricating oil;
- DO NOT use lubricants that may irritate the NBR gaskets; if in doubt, contact the Dropsa SpA technical office, which can provide you with a detailed chart of recommended oils;
- Not ignore dangers to the health and maintain the regular hygiene standard.

8. PROBLEMS AND SOLUTIONS

TROUBLESHOOTING TABLE		
PROBLEM	POSSIBLE CAUSE	REMEDIAL ACTION
The modular valve doesn't invert	Piston jammed	Verify correct sliding of piston ⚠ Possible replacement valve
	The modular valve has reached the maximum pressure level	Adjust the pressure to a maximum of 400 bar (5880 psi)
	Important lubricant leakage from one of the four connection pipes	Verify piping status and the connections to fittings. Replace worn out pipelines
	Gasket broken	Replace ⚠
Valve leaks lubricant	Breaking of internal gaskets	Replace ⚠

⚠ : Operations by specialized Dropsa personnel (ship the product to Dropsa headquarters)

9. MAINTENANCE PROCEDURE

The product does not necessitate any special tool for operation and maintenance. When working with the pump it is nonetheless recommended that personal health and safety equipment is used as is normal for any operation in an industrial or similar workplace.

The pump has been designed and built as to require minimal maintenance and operate in different and challenging operating environment. It is recommend that the unit is inspected and kept clean to ensure long life and trouble free operation. It is important to check all tubing on the system to ensure that it is always tight and leak free.

ITEM	FREQUENCY	OPERATION
Integrity of tubing and system	After initial 500 hours. Every 1500 hours.	Check fittings and tubing secured. Verify components are correctly fixed to machine.



WARNING: Before carrying out any maintenance operation, ensure that power and hydraulic system are disconnected.

In any doubts and/or problematic not solved, do not proceed to search by removing machine parts but contact our technical office

10. DISPOSAL

During maintenance or disposal of the machine care should be taken to properly dispose of environmentally sensitive items such as oils or other lubricants. Refer to local regulations in force in your area. When disposing of this unit, it is important to ensure that the identification label and all the other relative documents are also destroyed.

11. ORDERING INFORMATION

11.1. 4/3 Direction valve

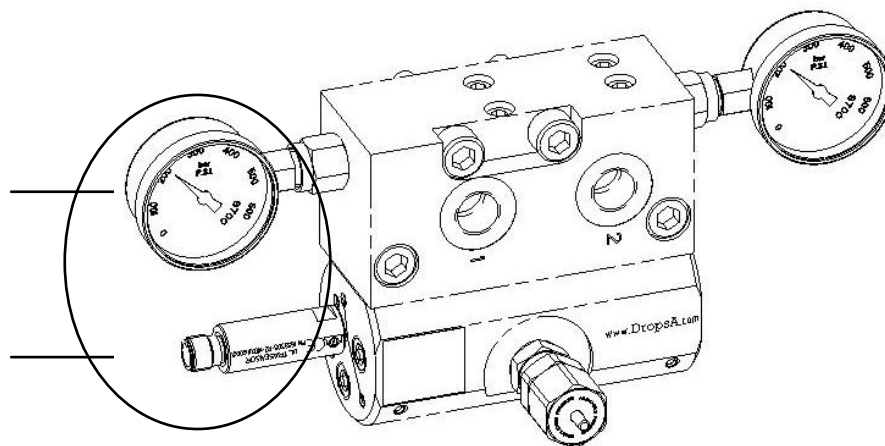
Description	Part Number
Hydraulic inverter	0086450

Description	Part Number
Pressure gauge Kit	3133910
Ultrasensor	1655305
M12 female connector	0039999
M12 female connector +cable L 5 mt	0039815

11.2. Optional

Positioning pressure gauge
(optional)

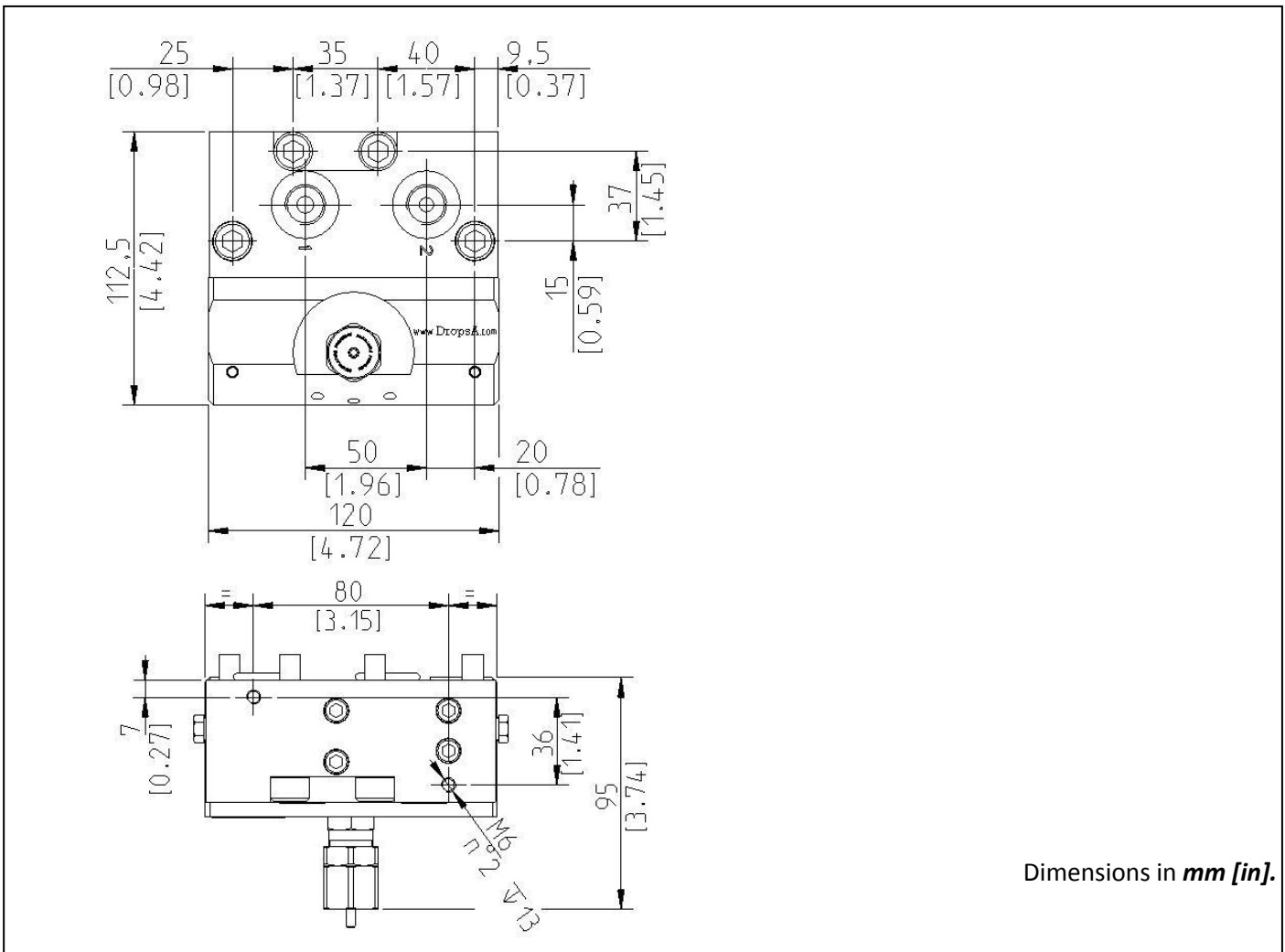
Positioning Ultrasensor
(optional)



11.2. Spare parts

Description	Part Number
OR gasket valve/pump	3190500
Right pressure gauge	3292172
Left pressure gauge	3292171

12. DIMENSIONS



13. HANDLING AND TRANSPORT

Before shipping, the units are carefully packed inside cardboard boxes. When transporting and storing the equipment, pay attention to the direction indicated on the boxes themselves.

Upon receipt, check that the package has not been damaged and store the equipment in a dry location.

14. OPERATING HAZARDS



WARNING: It is necessary to carefully read about the instructions and the risks involved in the use of lubrication machines. The operator must know the machine functioning through the User and Maintenance Manual.

Flammability

The lubricant generally used in lubrication systems is not normally flammable. However, it is advised to avoid contact with extremely hot substances or naked flames.

Pressure

Before each operation, make sure there is no residual pressure in every branch of the lubrication circuit that could cause oil to spray when disassembling fittings or components.

Noise

Under normal operating conditions, noise emission does not exceed 70 dB "A".

14.1 LUBRICANTS



**NOTE: The pump is designed to operate with maximum NLGI 2 grade lubricants.
Use lubricants compatible with NBR gasket
The residual lubricant used for assembly and testing is NLGI 2 grade.**

A comparison table is provided between the classification of NLGI lubricants (National Lubricating Grease Institute) and the ASTM classification (American Society for Testing and Materials) for greases for the values that concern the product.

GREASES	
NLGI	ASTM
00	400 – 430
0	355 – 385
1	310 – 340
2	265 – 295

For further information about the technical specifications and the safety measures to adopt, refer to the product safety sheet (Directive 93/112/EEC) relative to the type of lubricant selected and supplied by the manufacturer.

15. PRECAUTION

Compliance with the essential safety requirements and the provisions specified in the machine directive was checked by filling out prepared check lists that are contained in the *technical file*.

Three types of lists were used:

- Risk assessment (UNI EN ISO 14121-1).
- Compliance with the essential safety requirements Machine Directive –EC 06/42).
- Electrical safety requirements (EN 60204-1).

The following is a list of dangers which have not been fully eliminated but which are considered acceptable:

- During installation there may be small low pressure oil seepage from the pump. Always use appropriate protective clothing, gloves and take all necessary safety precautions.
- Contact with lubricant during maintenance or filling of the reservoir. → As per previous point, correct precautions must be taken to protect from contact with lubricant.
- Electric shock. → All electrical connections must be carried out by a qualified electrician who has studied the connection to ensure no electrical danger
- Unsuitable Lubricant. →Lubricant characteristics are indicated on the pump and in this user manual. In any case contact a Dropsa Sales and Support engineer (if in any doubts, contact the Technical Department Dropsa SpA).
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FLUIDS EXPLICITLY NOT ALLOWED	
Fluid	Dangers
Lubricants with abrasive additives	Wear of the components inside the pump
Lubricants with silicone based additives	Pump seizure
Petrol – solvents – inflammable liquids	Fire – explosion – damage to the gaskets
Corrosive products	Pump corrosion - damage to people
Water	Pump oxidation
Food substances	They would be contaminated