

Modular Directional Valve (4/2)

User and Maintenance Manual

Original text translation

TABLE OF CONTENTS

1. INTRODUCTION
2. GENERAL DESCRIPTION
3. PRODUCT-MACHINE IDENTIFICATION
4. TECHNICAL SPECIFICATIONS
5. MACHINE COMPONENTS
6. UNPACKING AND INSTALLING THE MACHINE
7. INSTRUCTIONS FOR USE
8. TROUBLESHOOTING
9. MAINTENANCE PROCEDURE
10. DISPOSAL
11. ORDERING INFORMATION
12. DIMENSIONS
13. HANDLING AND TRANSPORTATION
14. OPERATING HAZARDS
15. PRECAUTIONS



Manual drawn up in accordance with
EC Directive 06/42

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<http://www.dropsa.com>
Via Benedetto Croce, 1
Vimodrone, MILANO (IT)
t. +39 02 250791

Dropsa products can be purchased from Dropsa branches and authorized distributors, visit
www.dropsa.com/contact or contact us sales@dropsa.com

1. INTRODUCTION

This user's and maintenance manual refers **Modular Directional Valve (4/2) for oil and grease in Dual Line System**.

It is recommended that this manual is carefully kept in good condition and is always available to persons requiring to consult it.

To request further copies, updates or clarifications with respect to this manual contact the Engineering Department at Dropsa SpA.

The use of the Modular Directional Valve referred to in this manual must be entrusted to qualified personnel with a knowledge of hydraulics and electrical systems.

The manufacturer reserves the right to update the product and/or the user's manual without the obligation to revise previous versions. It is however, possible to contact the Engineering Department for the latest revision in use.

The *Modular Directional Valve*, and any accessories mounted on it, should be carefully checked immediately on receipt and in the event of any discrepancy or complaint the Dropsa SpA Sales Department should be contacted without delay.

DROPSA S.p.A. declines to accept any responsibility for injuries to persons or damage to property in the event of the non-observance of the information presented in this manual.

Any modification to component parts of the system or the different destination of use of this system or its parts without prior written authorisation from DROPSA S.p.A. will absolve the latter from any responsibility for injury or damage to persons and/or property and will release them from all obligations arising from the guarantee.

2. GENERAL DESCRIPTION

These Modular Directional Valves have been designed to control Dual Line Systems (Systems 02). They can operate with Oil or Grease at a max pressure of 400 bar (5880psi).

The main function of the Modular Directional Valves is to put in communication alternatively the pump with one of the two lines, allowing at the same time, the release of the pressure in the other line.

3. PRODUCT IDENTIFICATION

Product identification yellow label contains product serial number, input voltage and details of the operating parameters.

4. TECHNICAL SPECIFICATIONS

TECHNICAL CHARACTERISTICS	
Max. delivery (Oil 100 cSt)	40L/min. (10.56 gpm)
Manual override force requirement	14 kg@400 bar
Max. operating pressure	400 bar (5880 psi)
Lubricant	Oil min. 32 cSt max. 1000 cSt Grease max. NLGI 2
Port (R – P – 1 – 2)	3/8" BSP or NPT
Protection Grade	IP-55
Voltage	110V AC, 230V AC,- 50/60 Hz (Other voltages available on request)
Power absorption for electromagnet coil	See Spare parts
Working temperature (*)	-30° C ÷ + 50° C (-22° ÷ +122° F)
Humidity	90°
Weight	8 Kg (17,63 lb)

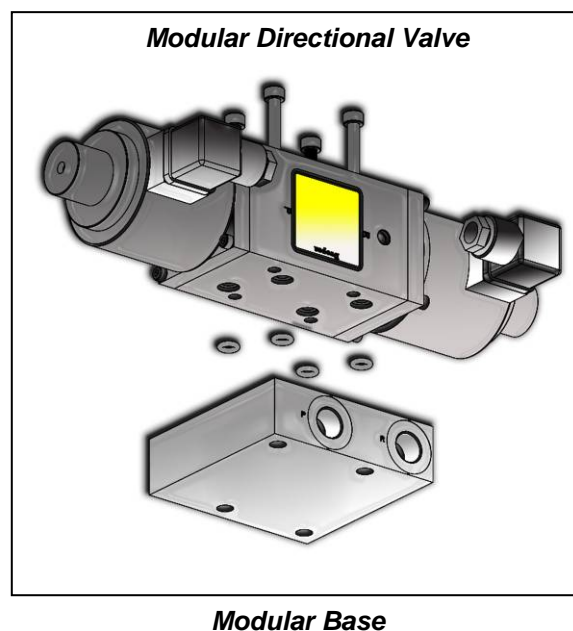


Note: At low temperature the electromagnets operate properly. During operating period electromagnets are hot. After a downtime of the system during the cooling off period the inside the electrical winder there may be some atmospheric moisture. At low temperature the moisture becomes ice and it block the electromagnet. When you restart the system you must activate the electromagnet for few minutes in order to thaw the ice. Doing this the electromagnet can work properly.

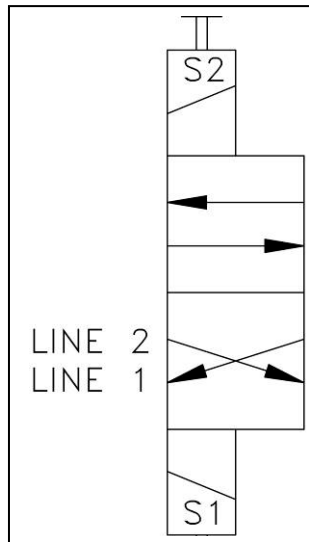
5. MACHINE COMPONENTS

The modular valve is composed of:

- ❑ a grinding **piston** with roughness grade of 0,2 μ and double coupling head. Each coupling has 3 grooves to improve the seal at high pressure;
- ❑ an **modular valve body** with a lapping central hole which allows the sealing coupling with the modular valve's piston. All piping are disposed on the same surface and have 4 holes G 3/8 UNI ISO 228-1. The inversion phase is made easier by a balancing system, holes and grooves that allow to regulate the pressure;
- ❑ close **flanges**;
- ❑ **spacers**;
- ❑ **sealing gaskets** designed to tolerate high pressures. These basket allow to have a high pressure chamber which maximise the functioning of the modular valve.



5.1 Circuit Diagram



By exciting S1 solenoid, Line 1 is switched to Line 2. By exciting S2 solenoid Line 2 is switched to Line 1.

6. UNPACKING AND INSTALLING

6.1 Unpacking

Once a suitable location has been found to install the unit remove the Modular directional valve from the packaging. Check the Modular directional valve has not been damaged during transportation or storage. No particular disposal procedures are necessary, however packing should be disposed of in accordance with regulations that may be in force in your area or state.

6.2 Installing the Modular directional valve

1. Assembly the valve on the modular base. Please pay attention where you position the OR-rings.
2. Fix the modular valve in the desired position using the four holes \varnothing 8.5 mm placed on the upper side of the modular valve.
3. Connect the inlet pipe of the lubricant to the INLET hole on the modular valve.
4. Connect the two outlet pipes to the holes marked as LINE 1 and LINE 2 on the modular valve.
5. Connect the lubricant return line with the hole marked as OUTLET on modular valve body.
6. Connect the electromagnet assembly connectors. (See pin out in fig. 6.3)

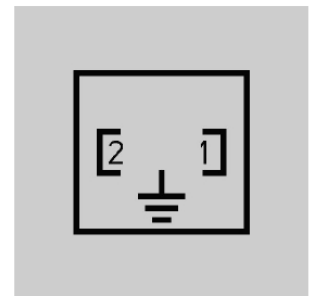


Fig.6.3

7. INSTRUCTIONS FOR USE

7.1 Modular directional valve Start-up

Steps to be taken before starting up the device:

- Check Modular directional valve integrity;
- Check that the Modular directional valve is at running temperature and that the pipes are free of air bubbles
- Check that the electrical connection has been carried out correctly (CEI 64/8, IEC 364);
- Check the correct inversion of the Modular directional valve both in pression and without pression;
- Check that there aren't lubricant leakage or air pressure loss;
- Check that the lock screws are properly screwed up;
- For correct fastening, check the dimensions of the axle bases (see chapter 12);
- 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.
- Do not ignore dangers to the health and maintain the regular hygiene standard.

7.2 Precaution during installation process

In order to avoid the danger of fulguration due to direct or indirect contacts with the live parts, it is necessary that the electric power supply line be adequately protected by a special magnetothermal differential switch with a cut-off threshold of 0.03 Ampere and a maximum cut-off time of 1 second.

8. TROUBLESHOOTING

DIAGNOSTIC TABLE		
PROBLEMS	PROBABLE CAUSE	SOLUTION
The modular valve doesn't invert	<ul style="list-style-type: none"> there isn't electric power supply seizure piston the modular valve has reached the maximum pressure level important lubricant leakage from one of the four connection pipes gasket broken 	<ul style="list-style-type: none"> check the power supply line verify if the piston creeps properly replace the modular valve regulate the installation pressure to max 400 bar (5880 psi) check if the connection fittings are properly fastened replace

9. MAINTENANCE PROCEDURE

To make easier the maintenance, position the modular valve in such a way that it can be checked easily. Check periodically coupling and pipes to identify possible leakages. Keep always clean the modular valve in order to identify quickly possible leakage or defects.

INSPECTION / MAINTENANCE OPERATION	WORK CYCLES
Gasket wear	50.000
Bush wear (pneumatic version)	50.000



WARNING: Prior to any maintenance, be sure that the power and the hydraulic supplies are off and there is no residual pressure in the main/branch pipe.

In the case of persistent problems and/or doubts, do not disassemble parts of the machine to trace the origin, instead contact the technical office of DROPSA S.p.A.

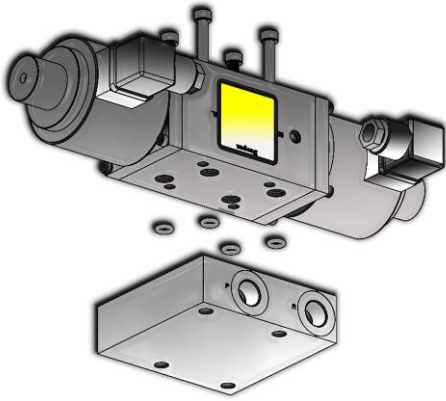
10. DISPOSAL

During maintenance or disposal of the modular valve 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 Modular directional valve



STEP 1. MODULAR DIRECTIONAL VALVE (BASE NOT INCLUDED)

Valve & Coil Part No.	Description
083421	110V AC 50/60 Hz
083422	230V AC 50/60 Hz

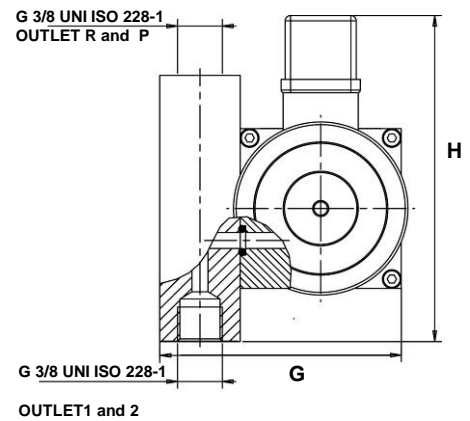
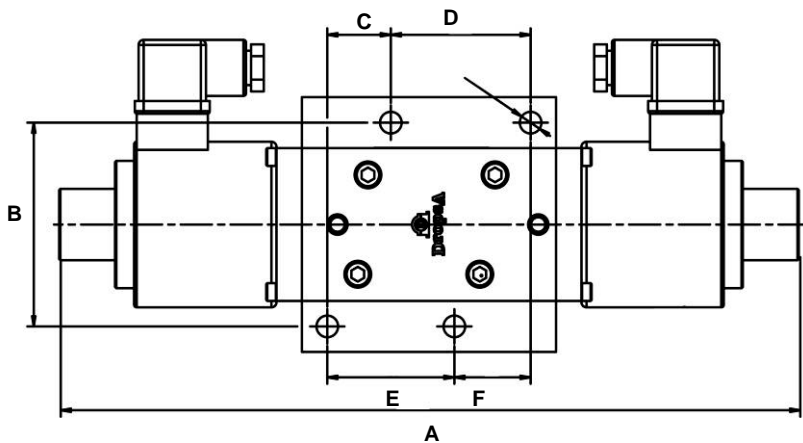
STEP 2. MODULAR BASE

Modular Base Part No.	Description
3072599	3/8" BSP porting
3072606	3/8" NPT porting

11.2 Spare parts

Part No.	Description	Current (A)	Power Absorption (W)
3150012	Solenoid 110V AC 50/60 Hz	2	206
3150013	Solenoid 230V AC 50/60 Hz	1	176
3133262	Seal Kit		
3234316	Solenoid cap		
3190553	OR fixing cap		
3230152	Solenoid connector screw		

12. DIMENSIONS



Position mm (in.)			
A	291 (11.45)	E	50 (1.96)
B	60 (2.36)	F	30 (1.18)
C	25 (0.98)	G	90 (3.54)
D	55 (2.16)	H	122,5 (4.29)



Note: for correct operation of valve with modular bases you must comply with the following operating limitations:

- "R" return tube with NLGI 2 grease must be an internal diameter ≥ 12 [mm].
- "R" return tube with oil and grease not very dense (max NLGI 00) must have an internal diameter ≥ 8 [mm].

13. HANDLING AND TRANSPORTATION

Prior to shipping, the equipment is carefully packed in cardboard package. During transportation and storage, always maintain the right way up as indicated on the box. On receipt check that package has not been damaged. Then, storage the package in a dry location.

No particular precautions are required except as noted on the package itself.

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.*

Power supply

Any type of intervention must not be carried out before unplugging the machine from power supply. Make sure that no one can start it up again during the intervention.

All the installed electric and electronic equipment, reservoirs and basic components must be grounded.

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

Prior to any intervention, check the absence of residual pressure in any branch of the lubricant circuit as it may cause oil sprays when disassembling components or fittings.

Noise

Modular Directional Valve does not produce excessive noise, less than 70 dB(A) .

15. PRECAUTIONS

The verification of conformity with the essential safety requirements and regulations of the Machine Directive is effected by means of the compilation of a check list which has been pre-prepared and is contained in the *technical file*.

The lists which are utilised are of three types:

- list of dangers (as in EN 414 referring to EN 292)
- application of essential safety requirements (Machine Dir.)
- electrical safety requirements (EN 60204-1).

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

- in modular valve it is possible to encounter squirts of oil (for this reason appropriate protective clothing must be worn)
- contact with oil -> see the requirements for the use of suitable personal protective clothing
- use of unsuitable lubricant -> the characteristics of the fluid are shown on the modular directional valve and in the manual (**in case of doubt contact the Eng. Dept of Dropsa Spa**)
- protection against direct and indirect contact must be provided by the user
- never work at pressures above 400 bar (5880 psi.).
- check the correctness of power supply .

Fluids	Dangers
Lubricants containing abrasive components	Premature wear of modular valve
Lubricants containing silicon	Modular valve failure
Petrol – solvents – inflammable liquids	Fire – explosion – seal damage
Corrosive products	Modular valve damage - danger to persons
Water	Modular valve oxidization
Food Products	Contamination of the product