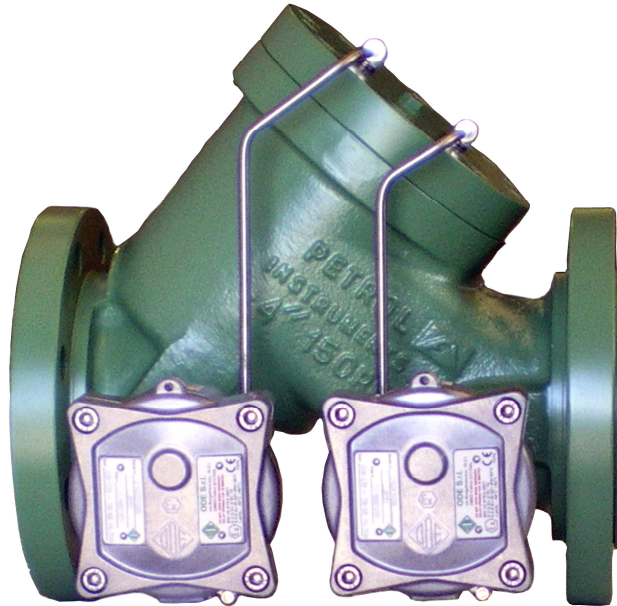




PETROL INSTRUMENTS CONTROL VALVE



MOD.

2,3,4,6

INSTALLATION, USE AND SERVICE MANUAL



INSTALLATION, USE AND SERVICE MANUAL

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P.O. No.	_____
Mod.	_____
Ser. No.	_____
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General Warnings

Read this manual carefully before carrying out any operations.

You should strictly follow all of the warnings and recommendations reported here when carrying out operations on the PETROL Instruments Control Valves.

This documentation must always be preserved and made available to operators and service engineers.

Consult the manufacturer in the event of any unforeseen circumstances for uses, which are not included in this manual



1 Introduction

PETROL Instruments S.r.l. is not responsible in cases in which:

- ✚ Operating procedures for use and maintenance of the Control Valve described in the manual are not respected
- ✚ Damage verified after repairs or modifications of the Control Valve undertaken by unauthorized personnel or after normal deterioration of the Control Valve

No parts of this Manual may be reproduced by any means, transferred, or copied for public and/or private purposes without prior authorization by PETROL Instruments S.r.l.

The information contained in this manual relates to data in the PETROL Instruments's possession at the time of publication.

PETROL Instruments reserves the right to make any changes to this document at any time without prior notice.

The equipment may not be used for purposes other than those for which it was designed.

PETROL Instrument does not accept any responsibility for accidents or damage caused by improper use of the equipment.



2 General Information

This manual is intended for specialized personnel and operators to allow correct use of the valve and is intended to prevent hazardous situations for the Control Valve users or environmental situations that could damage the equipment or its components.

This Manual is an integral part of the equipment.

For proper and safe use of the equipment, carefully read the instructions in this Manual before using or servicing the equipment and keep it where it is easily available for future reference.

This way, the operator will be informed of all equipment-related problems.

Inside the manual the operator will find instructions and information for:

- correct installation of the valve
- a practical description of the valve and all of its parts
- correct ordinary and programmed maintenance
- correct use.

Thus, the operator will have the opportunity to become aware of valve related problems.

For a better understanding of this manual, we should like to point out the following terms used:

· **DANGER AREA:**

area inside or near the valve, which constitutes a personal health and safety risk.

· **EXPOSED PERSON:**

anyone, who is completely or partially inside a danger area.

· **OPERATOR:**

person commissioned to install, set into operation, regulate and carry out ordinary valve maintenance.

· **QUALIFIED TECHNICIAN:**

specialized person, suitably trained and authorized to carry out interventions of special maintenance or repairs, which require a particular knowledge of the machine, its working, safety and methods of intervention.



2.1 Warnings

- ✚ Before carrying out any operations, follow the safety norms contained in this manual.
- ✚ If in doubt, consult the technical assistance service at our company on the following telephone number: +39 06 - 9201941
- ✚ Do not carry out repairs: contact qualified personnel for this.
- ✚ Failure to comply with the prescriptions of this manual implies forfeiture of the guarantee.

If the valve is sold or transferred to another user, ensure that this manual and all of the attached documents are included, so that the new user may be aware of the working of the valve and relative warnings.

2.2 Guarantee And Responsibilities

PETROL Instruments S.r.l. guarantees that this product is free of defects in materials and workmanship for a period of 12 (twelve) months beginning from the date of shipment from the PETROL Instruments factory.

The guarantee covers any parts and components, which may prove to be faulty due to manufacturing flaws or assembly errors, the guarantee does not cover faults deriving from errors of installation or wiring carried out by third parties or related to improper use of this equipment.

PETROL INSTRUMENTS S.r.l. DISAVOWS ANY OTHER GUARANTEE BEYOND THE LIMITATION, UNLESS EXPRESSLY AGREED.

Solenoid Valves are excluded from the guarantee.

In the eventuality that this product is defective within the guarantee period, PETROL Instruments reserves the right to repair and/or replace any parts that are, in its unquestionable judgment, faulty.

The guarantee for components and labor is understood as ex factory PETROL Instruments of Aprilia (LT) - Italy, any intervention at the customer's premises must be explicitly requested and will be debited for transfer and holding.

Keep this manual and all of the attached documents in a place, which is accessible and known to all users (operators and personnel in charge of maintenance).

You are advised to make a copy of this manual and keep it in a safe place. Except as expressly prohibited by law, PETROL Instruments S.r.l. denies any responsibility for loss or damage arising from use of this product, whether direct, indirect, accidental, or deriving from improper use of the product.



2.3 Mode of transport

PETROL Instruments will use packaging that is suitable for guaranteeing the integrity and conservation of the control valve during transport until it is delivered to the customer; in case it is not immediately used by the client, it is necessary to store packaging in a dry area sheltered from weather. The Control Valve is supplied with packaging in wooden boxes.

Use a lifting device for handling that is suitable for the weight of the valve.

Do not dispose of the packaging in the environment, but in accordance with the conditions permitted by the existing regulations.

Transport must be carried out using suitable means with a minimum capacity that is at least equal to the weight of the valve.

The valve must be protected from humidity and atmospheric agents during transport, and within the limits of possibility, it must not suffer knocks and/or excessive vibrations.



2.4 Receipt of Shipment

When you receive your equipment, inspect the outside of the packing case for damage which may have incurred during shipping.

Damage incurred during shipment is the responsibility of the carrier and is not part of the factory warranty.

If the package is in good condition remove the envelope containing the packing list and carefully remove the equipment and all components included in the shipment from the packing case. Inspect for damaged or missing parts, referring to the packing list, prior to discarding the packing material.

If Items are missing from your shipment, contact your sales representative or PETROL Instruments. Your sales order number will be required. If the packing case is damaged, notify the local carrier immediately. If the equipment must be returned to the factory for repair or replacement, just inform PETROL Instruments (or your sales representative) before returning back.

If the equipment is removed from service it must be thoroughly drained and neutralized before it is packed for shipment. Care must be taken to ensure that product removed from the equipment is disposed of in accordance with all applicable local, state and federal regulations.

Note: Place the equipment on the inlet flange to completely drain the equipment of fluid. The flanges should be sealed to keep residual fluid from leaking out of the equipment during transport. The type of flange seal required will vary with the form of transportation used.

Contact the carrier for specific instructions. The equipment should be securely fixed to its packing.

When packing the equipment or components for return to the factory, place a copy of the packing list that was delivered with the equipment inside an envelope. Place the envelope inside the shipping container with the Item being returned.

Equipment returned to the factory without the proper documentation will be returned to sender at their expense.

Ship the equipment to:
PETROL Instruments S.r.l.
Via della Tecnica, 5
04011 Aprilia (LT) - Italy



2.5 Handling

Handling (loading and unloading) of the valve must be carried out using an elevator truck or other means with a capacity suited to the characteristics of the equipment to be handled.

The machine must not be lifted with ropes or slings without the appropriate certificates

2.6 Storage

Control Valves are precision instruments and should be handled with care. They should not be subjected to rough or improper handling, or stored in an environment where moisture, extreme temperatures, or foreign material can cause damage to the equipment. Inlet and outlet covers must remain on the valve until it is ready for installation. If extended storage under harsh field conditions is anticipated, the valves should be stored in waterproof, lined, wooden boxes. Desiccant packs should be taped to the inside of the valve flanges to reduce the effects of humidity on the element. Caution must be used to insure the desiccant packs are removed prior to installation.

If the valve is removed from service for an extended period of time it should be flushed with a light lubricating oil before being placed into storage. The inlet and outlet openings should be securely covered.

2.7 Forbidden Use

Given the specificity of use of the PETROL Instruments Control Valve, other uses beyond those described in the point above are not considered.

In the case of other identified uses, it is necessary to contact PETROL Instruments S.r.l. to have confirmation of the appropriateness of the PETROL Instruments Control Valve for different uses than those provided for.



CAUTION!

INSTALLATION AND MAINTENANCE OF THE EQUIPMENT MUST BE PERFORMED BY QUALIFIED AND AUTHORIZED PERSONNEL.



2.8 Safety Information

To be certain of correctly using the PETROL Instruments Control Valve, immediately read this information on safety and the user's manual closely.

After having read the information on safety, always keep it on hand for later consultation.

In order to prevent any danger of accident, the following precautions are essential:

- Read and follow the instruction manual for installation, use and maintenance, furnished with the PETROL Instruments Control Valve and respect all the instructions and warnings.
- Start the PETROL Instruments Control Valve only after having verified the adequacy of installation and conformity to the notes contained in this manual. Installation must be performed by qualified personnel.
- Verify that the labels containing information on safety are always very visible and in good condition.
- Power supply the Solenoid Valves with the proper power supply indicated on the name plate. In case of doubt regarding the type of power supply needed, consult the technical assistance service.
- It is necessary to establish a regular program of inspections and maintenance.

Additionally:



Obligatory safety shoe

Obligatory protective gloves

Wear uniforms appropriate for the type of work and in perfect condition



3 Valve Description

The PETROL Instruments Control Valve is a solenoid operated equipment used when an high precision flowrate and batch control is needed. The valve is installed in conjunction with an electronic preset counter for start and stop and flowrate control function. The valve permit to start-stop operation (two stage or one stage closure), maintain a constant flowrate during batching function varying line pressure necessary for a maximum flowmeter accuracy. The external control is composed by a normally closed solenoid valve and a normally open solenoid valves.

The basic components of the valve are:

-  Body
-  Cylinder
-  Piston
-  Body Cover
-  Spring
-  Solenoid Valves
-  Tubing and Fittings
-  Gaskets

If you have questions or need information not contained in this manual, please contact your sales representative or the PETROL Instruments service.

3.1 Operating Principle

The valve operates on a balanced piston principle, normally closed through a spring. An equal pressure on both valve sides, permit to the spring (located on the top of the piston) to maintain the valve closed.

When the differential pressure overcome the spring forces, and the pressure at the bottom of the piston becomes higher than the pressure against the top of the piston plus the spring force, the valve opens.

Two digitally controlled solenoid valves permit to determine the valve piston position required for flow control. Fluctuation of valve opening and closing is used to maintain a constant flowrate.



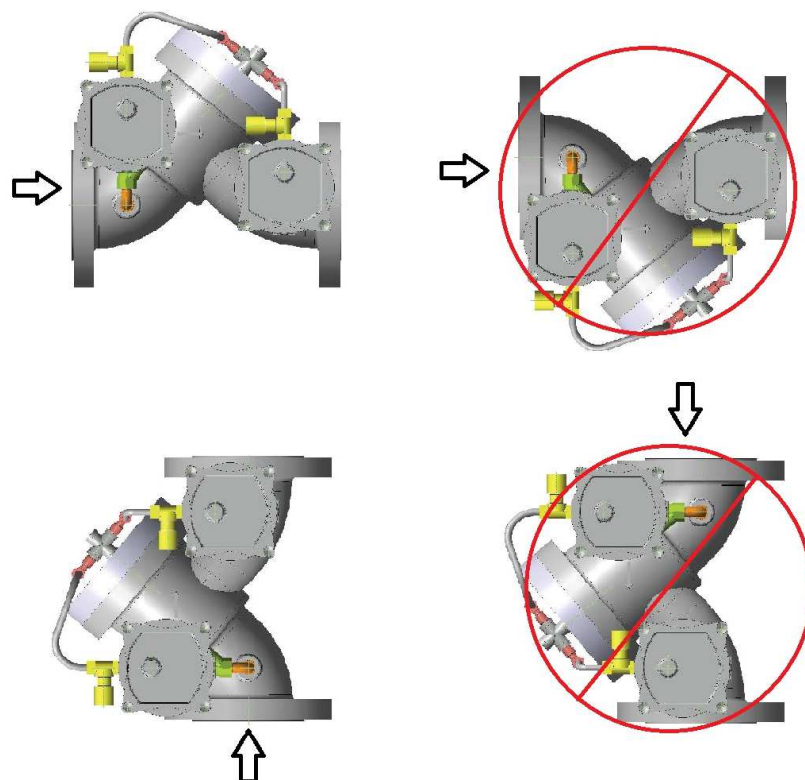
4 Installation

As with all control valves, it is most important that proper installation be accomplished if the valve is to operate as designed.

Preliminary setup should include the following steps:

1. Evaluate the metering system in the process line to determine that criteria pertinent to digital valve control is met.
2. Reference engineering drawings for proper in-line sequence of all components.
3. Check valve position. The inlet flange has been marked and is to be in the upstream position.
4. Verify all electrical connections against wiring diagrams and unit specifications.
5. Flush the line of any and all contaminants.
6. Bleed as much air as possible from the system before start up.

The valve can be installed in one of the following way as per below picture





5 Digital Valve Control Set-up

The following information is provided as a guideline for proper set-up and operation of the PETROL Instruments Control Valve when used with an electronic preset.

1. Activate or verify that the digital valve control function is properly programmed.
2. Control Parameters such as high and low flow error, valve response time, flow rates, and final stop quantities are functions of system hydraulics and should be set based on customer requirements with consideration given to system performance.
3. Purge the air inside the valve using the screw indicated in the exploded view drawing at the end of this manual (PN21) to be sure that the piston shall be completely full of liquid

6 Disassembly of Control Valve

For a proper disassembling of the valve, you have to follow below procedure:

1. Remove the inlet pipe (PN18) and the outlet pipe (PN19) unscrewing the coupling under PN15
 2. Unscrew the cover screws (PN12)
 3. Use n.2 M12 screws to pull out the piston
 4. Unscrews the piston support screws (PN11) (PAY ATTENTION - THESE SCREWS ARE USED TO BLOCK THE COMPRESSED SPRING!)
 5. After the disassembly of the valve check all the O-rings and replace the same if needed
 6. To reassembly the valve you can follow the same procedure from point 5 to 1
-



7 Troubleshooting

The most frequent problem encountered with any control valve is the accumulation of sediment, rouge, scale and other foreign material in the pilot or its supply system. It is therefore good practice to periodically remove the piston from the valve and inspect it for accumulation of these materials.

Periodic examination of all Seals and O-rings for nicks, cuts and wear is recommended (see paragraph 6 for details)

Symptom	Possible Cause(s)	Test / Check	Corrective Action
Does not open or open too slow	No inlet pressure	Is pump running?	Turn pump on
	Isolation valves closed	Upstream block valve closed?	Open valve
		Downstream block valve closed?	Open valve
	Insufficient inlet pressure	Clogged strainer?	Clean Strainer
	Bypass valve	Are bypass valve(s) closed?	Close bypass valves
	Pilot Malfunction (Electrical)	Correct voltage at solenoid?	Correct voltage supply source and wiring
		Signal logic from control device incorrectly programmed?	Correct programming logic at Control device to include pump delay timer and low flow start settings
		Defective solenoid?	Replace solenoid
		Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
	Pilot malfunction (hydraulic)	Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
Swollen O-rings due to fluid incompatibility?		Inspect O-rings, confirm correct elastomer compound, replace as necessary	
Does not close or closes too slow	Main valve piston	Seat O-ring cut or damaged?	Inspect and replace as necessary
	Valve seat O-ring	Incorrect wiring?	Check wiring with schematic and correct as necessary



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	Pilot Malfunction (Electrical)	Signal logic from control device incorrectly programmed?	Correct programming logic at Control device to include Zero shut off control
		Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
		Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
	Pilot malfunction (hydraulic)	Swollen O-rings due to fluid incompatibility?	Inspect O-rings,
Does not control	Main valve piston	Signal logic from control device incorrectly programmed?	Correct programming logic at Control device
	Pilot Malfunction (Electrical)	Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
	Pilot malfunction (hydraulic)	Defective/worn O-rings / Seals?	Inspect / Replace O-rings / Seals as necessary
Leaks	O-rings or Seals	Damaged or worn O-rings/ Seals?	Replace as required



8 Parts List

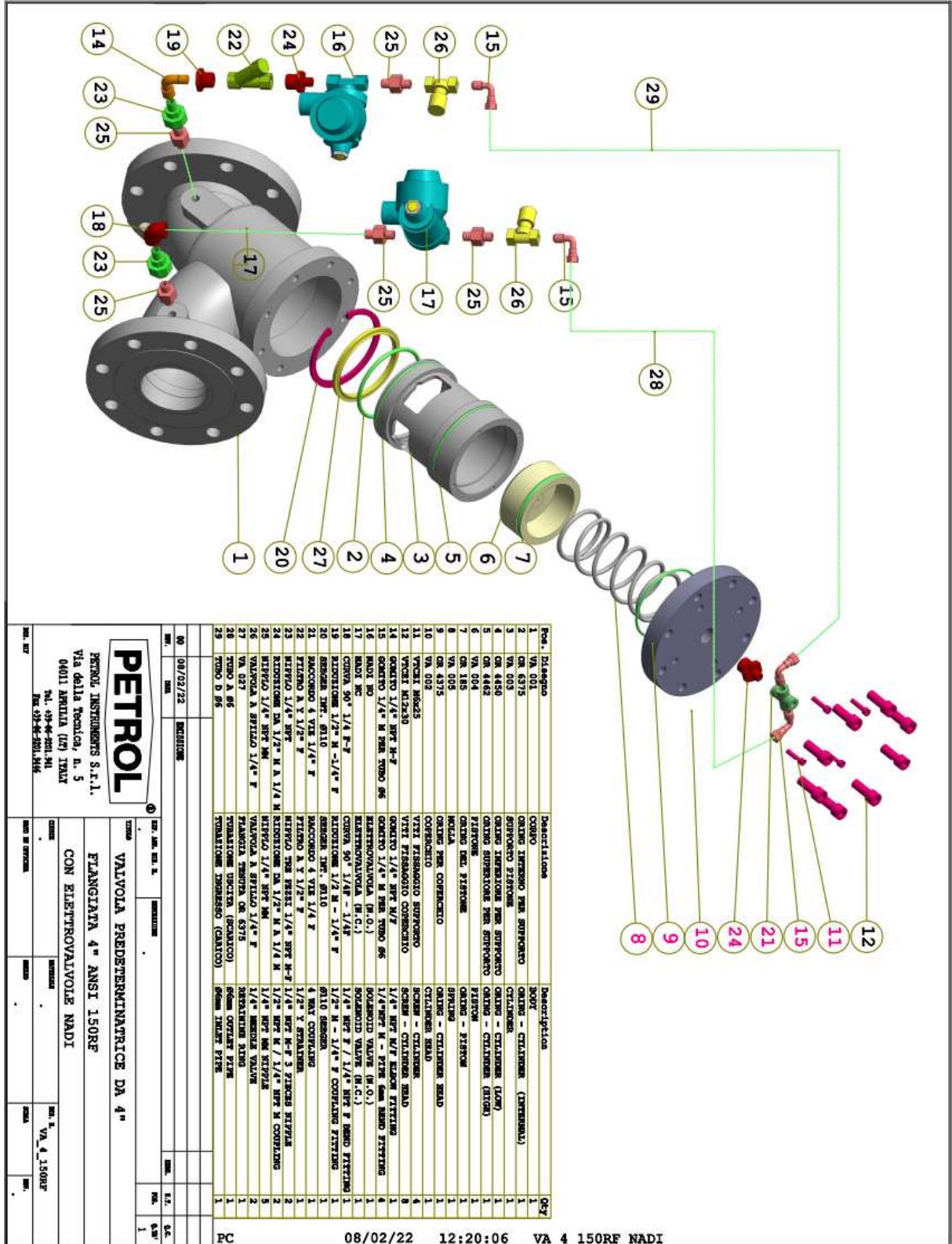
This section contains the necessary parts required for routine maintenance and service of the PETROL Instruments Control Valve. Each parts list also contains the recommended spare and replacement parts denoted by a Part Number.

For Items not listed, or additional information, consult factory. When ordering, the following information must be furnished:

1. Part Number
2. Model Number of the Control Valve
3. Serial Number
4. Quantity required.

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Picture 2 Exploded view drawing



9. Versions

PETROL Instruments Control Valve

V	A	4	-	C	4	Description
V						PETROL Instruments Control Valve
	A					Max pressure 10bar
	L					Max pressure 18 bar (ANSI 150 Rating)
	M					Max pressure 47 bar (ANSI 300 Rating)
		2				Valve size :2" / DN50
		3				Valve size :3" / DN80
		4				Valve size :4" / DN100
		6				Valve size :6" / DN150
				C		Carbon Steel Body
				F		St. St. Body
					4	St.St. Cylinder/ Brass Piston
					8	St.St. Cylinder/ St.St. Piston