



## INSTALLATION AND MAINTENANCE INSTRUCTIONS PNEUMATIC CONTROL VALVE ADCATROL V403 (3 way valve)

### GENERAL

- These instructions must be carefully read before any work involving products supplied by VALSTEAM ADCA ENGINEERING S.A. is undertaken.
- The installation procedure is a critical stage in a life of a valve and care should be taken to avoid damage to the valve or equipment.
- Control valves are designed to give accurate control. They give their maximum performance only when the equipment and piping associated with them is correctly sized and installed in accordance with our recommendations.
- Referring to the name-plate located on pneumatic actuator yoke, check that the product is suitable for the intended use/application as follows:
  - the body material must be compatible with the process fluid
  - compatibility with the pressure and temperature and their maximum and minimum values
- 4. Adcatrol control valves are not intended to withstand external stresses that may be induced by any system to which they are fitted. It is the responsibility of the installer to consider these stresses and take adequate precautions to minimise them.

### **Warning!**

- At start up, the presence of small particles in the fluid (dirt, scale, weld splatters, etc) may cause an imperfect closure of the seat. If this occurs, proceed to an accurate cleaning.
- Do not touch the equipment without appropriate protection during working operation because it may conduct heat if the used fluid is at high temperature.
- Before starting maintenance be sure that the equipment is not pressurized or hot. Even if upstream and downstream isolating valves have been closed care should be taken since fluid under pressure may be trapped between them. Disconnect air and/or electricity supply, before working on the valve.
- The equipments must be used within the working temperature and pressure limits laid down for them, otherwise they may fail (refer to nameplate and/or IS- Information Sheet).
- All work must be carried out or be supervised by competent person.
- Manual handling of products may present a risk of injury. You are advised to assess the risks taking into account the task, the individual, the load and the working environment.
- Before starting work ensure that you have suitable tools and/or consumables available. Use only genuine ADCA replacement parts.
- Do not remove the nameplate attached to the equipment. Serial number and other useful information is stamped on it.

## INSTALLATION



### ATTENTION

- Before to installation remove plastic covers placed on flanges or connection ends. The equipment has an arrow, Inlet/Outlet designations or letters A, B, AB. Be sure that it will be installed on the appropriate direction.
- Take care with jointing material to ensure that none may be permitted to block or enter the valve.
- Control valves are recommended to be fitted with the centre line of the valve in a vertical position to ensure that the best results are obtained.
- An ADCA pipeline strainer should be installed upstream of the valve to protect from dirt which could damage the valve or cause malfunctioning.
- The control valve pipework should be properly supported and free from strain and it should not be subjected to undue surges of pressure.
- For steam installations we strongly recommend that the control valve is positioned where condensation is unable to collect or, alternatively, separators and steam traps should be fitted to make sure pipework drains correctly. The start up condition should be considered.
- If the system cannot be stopped for maintenance it is recommended that isolating valves are installed upstream and downstream of the control valve together with a by-pass manual regulating valve. The process can be then controlled manually during the control valve maintenance.
- A safety device should be included in the system to prevent dangerous overpressure or over temperature occurrence, if applicable.
- The pneumatic actuator is provided of two 1/4"NPT connections, one of these has a silencer. Connect the air to the free 1/4" connection. The inlet air must be dry, oil and water free and it's pressure would not exceed 3,5 bar (50 psi). The suitable control signal is displayed on the name-plate fixed on the valve yoke. If the valve is provided with positioner see also the Installation and Maintenance Instruction IMI PE986.10 and IMI PP981.10.
- Control valves can be supplied with different kind of actuators, positioners, converters, etc. All these components have different limiting conditions which are specified on the nameplates and catalogues and they must be respected. Positioners, electric actuators and other equipment have their own installation instructions.
- In case of valves supplied with EL series electric actuators, please consult IMI EL20.00.

## PERIODICAL CHECKING

24 hours after the start up, it is recommended to check pipe connections and verify the tightening of flanges locknuts. Graphite packing should be compressed by tightening the threaded bushing (6) (see fig.4) about a ¼ of a turn (care should be taken since overtighten may lock-up the valve stem).

## MAINTENANCE

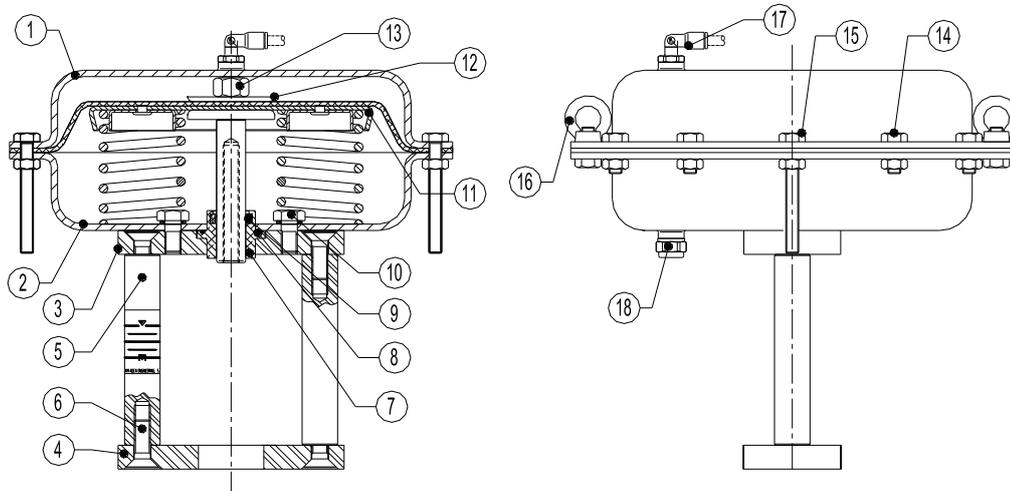
- We recommend to service these control valves when necessary. Control valves should be checked periodically (at least yearly), to verify that they are operating correctly.
- When reassembling, make sure that all gasket faces are clean and always use a new gasket. Tighten cover bolts uniformly in a diagonal sequence.
- For further information refer to the relevant IS brochure or consult the factory or distributor.

## REPLACEMENT OF ACTUATOR DIAPHRAGM

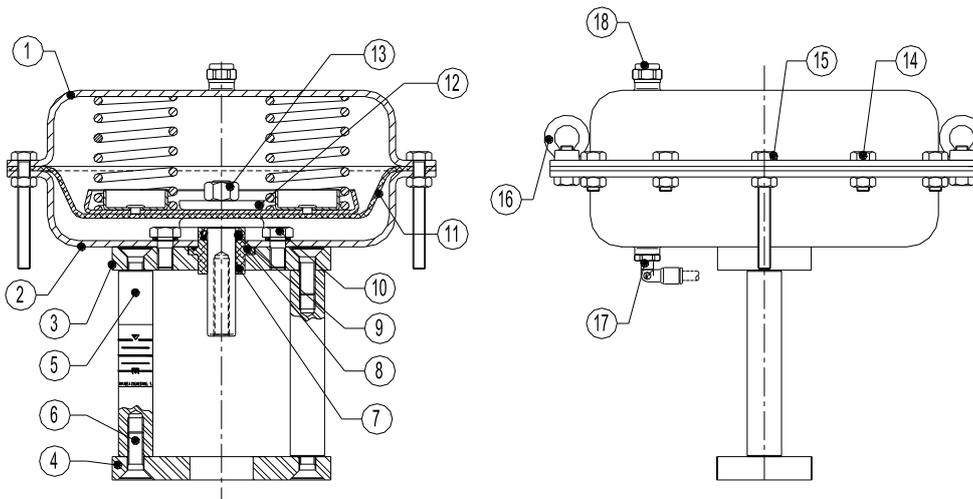
In reference to the fig.1 and 2 proceed as follow:

- Remove the housing screws (14) except the long ones (15) which must be gradually loosen only when the other bolts have been already removed.
- Remove the housing lid (1) by loosening the plate locknut (13) and removing the disc plate (12) then replace the diaphragm (11).

- Refit all the items in reverse order.



**Fig.1 – Direct action actuator**



**Fig.2 – Reverse action actuator**

### REMOVING ACTUATOR FROM VALVE

In reference to the fig.3 proceed as follow:

- Loosen the lock bolts (4).
- Release air supply to the actuator and drive it into approximately mid-travel position.
- Loosen the mounting nuts (2) completely.
- Reduce air supply pressure until housing is pressure free.
- Check and measure the shifting between parts (1) and (3) and take note.
- Hold to the actuator pillars and remove it from valve body. Nut (4) can be used to fix the valve spindle in order to avoid its rotation and consequently valve plug damage against the seat. Valve spindles are burnished and if this super finishing is destroyed due to the use of wrong tools packing will be consequently damage in a short period of time.
- Re-assemble all the items in reverse order ensuring the alignment of spindles and plug-seat consequently.

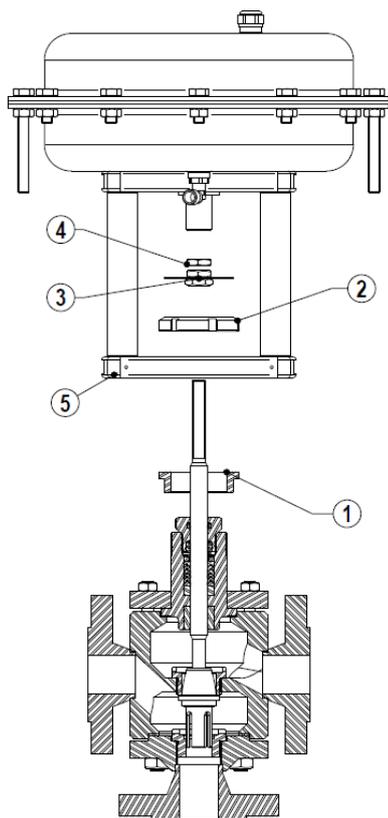


Fig.3 – Removing actuator

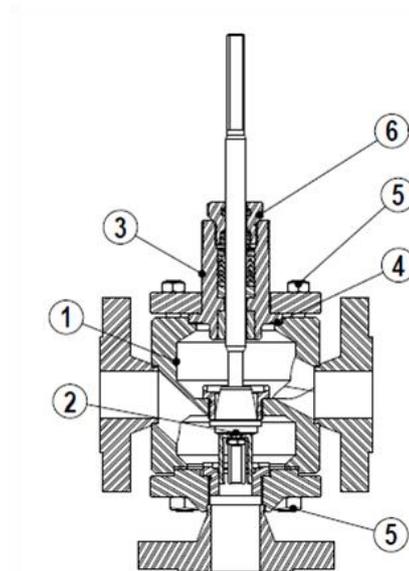


Fig.4 – Replacing the plug

### REPLACING STANDARD PLUG

Separate the actuator from the valve body as described before. In reference to fig.4 proceed as follow:

- Loosen the threaded bushing (6) and screw off the lock nuts (5).
- Remove the bonnet (3) from the valve body (1)
- Take off the complete plug stem (2) from the bonnet (3).
- Apply silicon oil on the new complete plug stem and introduce it into the bonnet (3).
- Replace the body gasket (4) after cleaning its housing face carefully.
- Re-assemble all the items in reverse order ensuring the alignment of spindles and plug-seat consequently.

**Caution:** always change the old packing gland when the plug stem replacing is made.



ATTENTION

- Always change the old packing gland when the plug stem replacing is made.

### Replacing packings:

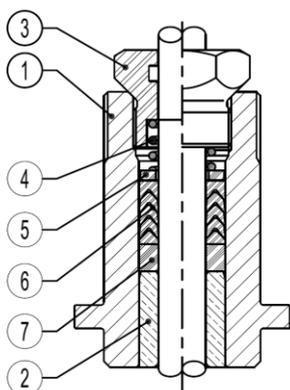
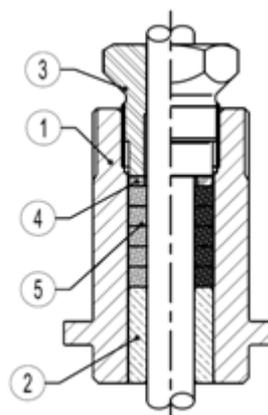
Take off the complete plug stem as described on paragraph “REPLACING STANDARD PLUG”, then, in reference to the Fig.5 and 6 proceed as follow:

1. Screw off the threaded bushing (3).
2. Remove spring (4) and packing (graphite type G packing do not have spring).

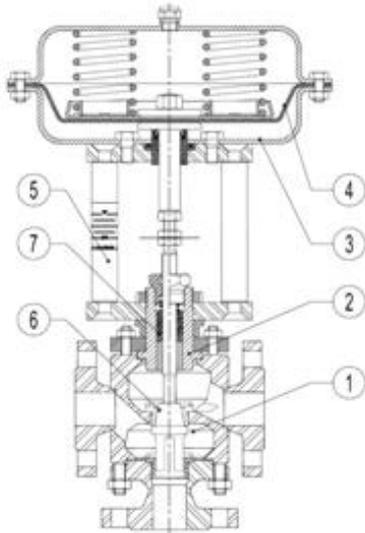
3. Clean the packing chamber carefully and apply silicon oil to the individual parts of the new packing and the plug stem.
4. Insert the plug stem in the valve bonnet (see note).
5. Lodge the new packing and its spring following the right sequence.
6. Replace the body gasket (4) (see fig. 4) after cleaning its housing face carefully.
7. Re-assemble all the items ensuring the alignment of spindles and plug-seat consequently.

**ATTENTION**

- The valve stem should be correctly fitted within the bonnet before replacing the packing in order to avoid v-rings damage.
- Care should be taken when handling the gaskets. Some gaskets are stainless steel reinforced and can easily cut.

**Fig.5 – Packing type V****Fig.6 – Packing type G**

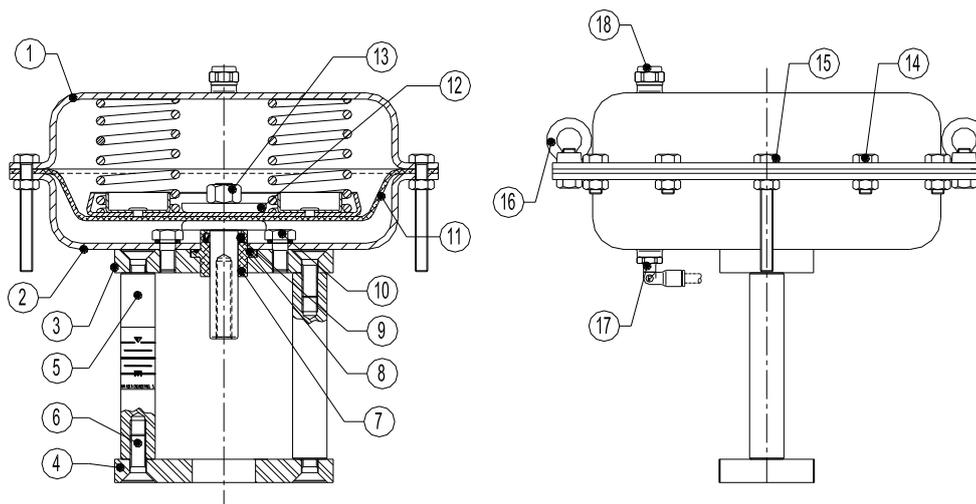
**PARTS LIST FOR V403 CONTROL VALVES:**



**Fig.7 – Control Valve V403**

MATERIALS			
POS.	DESIGNATION	PV403S - EV403S	PV403I - EV403I
1	Valve Body	S355 J2 G3 / 1.0570	AISI 316 / 1.4401
2	Bonnet	CF8 / 1.4308	CF8 / 1.4308
3	Actuator (Steel)	S235JRG2 / 1.0038	S235JRG2 / 1.0038
	Actuator (St. steel)	AISI304 / 1.4301	AISI304 / 1.4301
4	Diaphragm	NBR70	NBR70
5	Yoke (steel)	C45E / 1.1191	C45E / 1.1191
	Yoke (st. steel)	AISI304 / 1.4301	AISI304 / 1.4301
6	Valve plug	St.Steel - PTFE/GR	St.Steel - PTFE/GR
7	Standard packing	PTFE/GR	PTFE/GR

**PARTS LIST FOR PA SERIES ACTUATORS:**



**Fig.8 – PA series actuator**



## STEAM EQUIPMENT

CODE	DESIGNATION	ACTUATOR TYPE	POS.NR.	QTY.
9.PA205.10	Actuator Diaphragm PA-205	PA205DA and RA	11	1
9.PA280.10	Actuator Diaphragm PA-280	PA280DA and RA	11	1
9.PA340.10	Actuator Diaphragm PA-340	PA340DA and RA	11	1
9.PA435.10	Actuator Diaphragm PA-435	PA435DA and RA	11	1
9.PA205.11	Set of diaphragm seals	PA205-PA435	8,9	1 set

### USEFUL NOTES ON VALVE AND PIPE SIZING

Never size the valve according to the pipe diameter in which it has to be fitted but according to the required actual flow of steam or water. Refer to valve calculation data sheet or consult factory.

### TYPICAL INSTALLATION

Please consult the available standard assembling drawings or consult the factory for a specific installation drawing.



**ATTENTION**

- **LOSS OF WARRANTY:** Total or partial disregard of above instructions involves loss of any right to warranty.