GASCAT

INSTALLATION & OPERATION MANUAL
SLAM SHUT VALVE
MODEL TWIN

GASCAT

INDEX

1 – INSTRUCTIONS PRIOR TO COMMISSIONING

It should be clearly understood that the information given under the Commissioning Instructions below do not intend to revoke or substitute instructions laid by any relevant entity and reference should be made to the relevant Standards and/or existent recommendations on this subject.

It is implied that before Commissioning the performance of the appropriate "Cleaning and Purification Procedures" will be observed and all the instructions contained in "Pressurization" and "Labor Safety and Health Standards" shall be strictly attended.

The recommendations of valves' suppliers, as for instance, "open slowly" or "open very slowly" should be strictly observed.

1.1 – SAFETY AND HEALTH

Regulators, valves, and other pressurized components that contain toxic or flammable gases, or other hazardous products, are potentially dangerous if not correctly operated and maintained. It is mandatory that all users of these equipments are properly instructed and warned on their potential danger, and certify yourself that the personnel responsible for installation, test, commissioning, operation, and maintenance of the plant are skilled enough to perform their duties. Instruction manuals are provided for orientation of the operators, but it is supposed that they have a basic knowledge level. If any doubts or ambiguities remain that could affect the proper procedures ask ***Gascat*****,** which will be pleased to instruct, or to provide the suitable service or instruction. **NOT TO TAKE ANY RISK**. Our telephone, fax numbers, and e-mail are the following:

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The comments below, while not completely inclusive, provide guidance on possible sources of risk to safety and health.

1.1.1 – NOISE

Regulators, valves, and other pressure reducers can produce high noise levels, which can be harmful to persons exposed to them for long periods of time. Users should assure themselves that appropriate provisions will be taken, in order to foresee health safety of employees and/or third parties, according to valid standards and recommendations.

1.1.2 – INSTALLATION

All equipment, piping, and vessels are designed to support mechanical efforts, as, for instance, torque and bending momentum, in addition to internal pressure. However, careful shall be exercised during installation not to develop excessive efforts, which can cause cracks that may result in serious breakage when the regulator is put into operation. Excessive tensions can also be caused if the equipment is overburden by piping, which should be otherwise appropriately supported.

All regulators, shutoff valves, relief valves, etc., shall be installed taking into account the correct flow sense.

Impulse lines are important components of any control system and it is essential for them to be correctly installed according to instructions.

Impulse lines should be appropriately supported to reduce excessive vibration, which can provoke fatigue breaks. They should also be positioned so that they cannot serve as feet or hands supports. Impulse lines should be slightly sloping so that liquids and condensates drain towards the main piping.

Auxiliary systems should not be changed, or modified, without knowledge of the operation conditions and permission of the responsible in charge.

1.1.3 – OPERATION

Depending on the regulator type, its valve can be positioned fully open. Consequently, when a regulator is put into operation, the shutoff valves should be open slowly so that the regulator valve can assume its regulating position. If the valves are quickly opened the upstream pressure can pass downstream through the regulator and over-pressurize downstream the main line.

All regulators, etc., should operate with the regulating spring specified by the manufacturer. This provision is particularly important when operating relief or shutoff valves, since incorrect springs can hinder a relief valve to open and a shutoff valve to close at the proper time.

Provisions should be taken to avoid water input through breathing and ventilation openings.

1.1.4 – MAINTENANCE

Regulators and valves contain gases at pressures that sometimes are higher than the atmospheric pressure. Before trying to investigate any problem or to perform service maintenance of the equipment, they should be safely de-pressurized. Besides, as most gases can be flammable, poisonous, corrosive, or somehow, dangerous, it may be necessary to purge the installation with an inert gas, as nitrogen. Special precautions are necessary for operation with oxygen or hydrochloric gas and the user should be reassured that appropriate procedures are implemented.

Eventually, it is not enough to isolate the high-pressure device, since high pressures can be retained downstream of isolation valves. Do not try to remove covers, plugs, etc., before these parts are properly freed-up. Even so, it is advisable to consider if high-pressure gas can be present at the time of removal of covers and plugs.

Most regulators use spiral springs as the loading device. It is important to reduce the load of these springs relieving their loaders as much as possible. In some cases, some residual load may last, even though the spring is relaxed to the limits of its housing.

There is not a recommendation about the frequency to change the repair kit due several different variables in the process that changes installation by installation as, for example, process gas quality, service conditions etc. The repair kit should be changed when the regulator has problems during operation, as leakage, increase in set pressure and also others that become the quality and regulator performance different.

However, ***Gascat*** recommends that after all regulators opening during maintenance service the repair kit must be changed. It is also indicated to change a complete repair kit and not only specific part (example o'ring, shutter), to have the all spare parts with same life time.

Gascat already inform to avoid all no original and genuine parts.

2 – INTRODUCTION

2.1 – SCOPE OF MANUAL

This Instruction manual has as objective supply information about operation, installation and maintenance about TWIN slam shut valve manufactured by GASCAT.

2.2 – DESCRIPTION

The slam shut valve model TWIN was designed by Gascat's Engineering to assist many different applications and service conditions according to valve configuration. It is equipped with two actuators to ensure more security in applications with high pressure.

2.3 – SPECIFICATIONS

2.3.1 – AVAILABLE CONFIGURATIONS

TWIN H: Configuration to set pressure 0,2 to 10,0 Bar.

TWIN PH: Configuration to set pressure 10,0 to 60 Bar.

2.3.2 – AVAILABLE CONNECTIONS

ND	FLANGE ASME B16.5	ROSCA
1/2"; 3/4"	-	NPT-F
1"; 2"	600#RTJ; 900#RTJ; 1500#RTJ; 2500#RTJ	-

2.3.3 – TEMPERATURE LIMITS

Operating temperature: -20°C a 60°C

Ambient temperature: -20°C a 60°C

The temperature limits informed at this manual or in any applicable standard must not be exceeded under any circumstances, at risk of damage the equipment, safety of installation and safety of people involved in the operation.

2.3.5 – MAXIMUM WORKING PRESSURE

600#RTJ	900#RTJ	1500#RTJ NPT-F	2500#RTJ
102 bar	153 bar	255 bar	425 bar

The pressure limit informed at this manual or in any applicable standard must not be exceeded under any circumstances, at risk of damage the equipment, safety of installation and safety of people involved in the operation.

2.3.6 – OVER PRESSURE SPRING RANGE (SET-POINT)

SPRING COLOR	PART NUMBER	RANGE (BAR)
GREY	01.52.60	0,2 – 0,5
PURPLE	01.52.61	0,5 – 1,0
RED	01.52.62	1,0 – 5,0
YELLOW	01.52.54	5,0 – 10,0
BROWN	01.52.64	10,0 – 15,0
DICHROMATE	01.52.25	15,0 – 38,0
WHITE	01.52.36	28,0 – 60,0

2.3.7 – UNDER PRESSURE SPRING RANGE (SET-POINT)

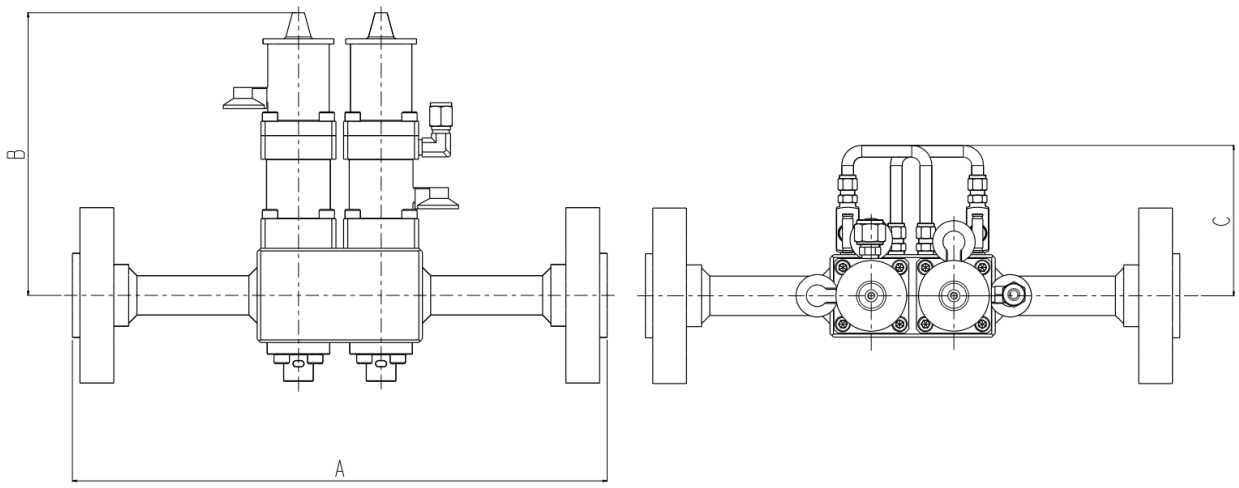
SPRING COLOR	PART NUMBER	RANGE (BAR)
GREY	01.52.70	0,120 – 0,220
PURPLE	01.52.71	0,2 – 0,8
ORANGE	01.52.72	0,6 – 1,0
BLACK	01.52.26	1,0 – 3,0
YELLOW	01.52.65	3,0 – 7,0
BLUE	01.52.55	7,0 – 10,0
RED	01.52.50	10,0 – 13,0

2.3.8 – ACCURACY AND LOCK UP

Pressure regulator: AC up to 2,5 / SG up to 5

SSV: AG up to 5

2.3.9 – PRESSURE REGULATOR DIMENSIONS

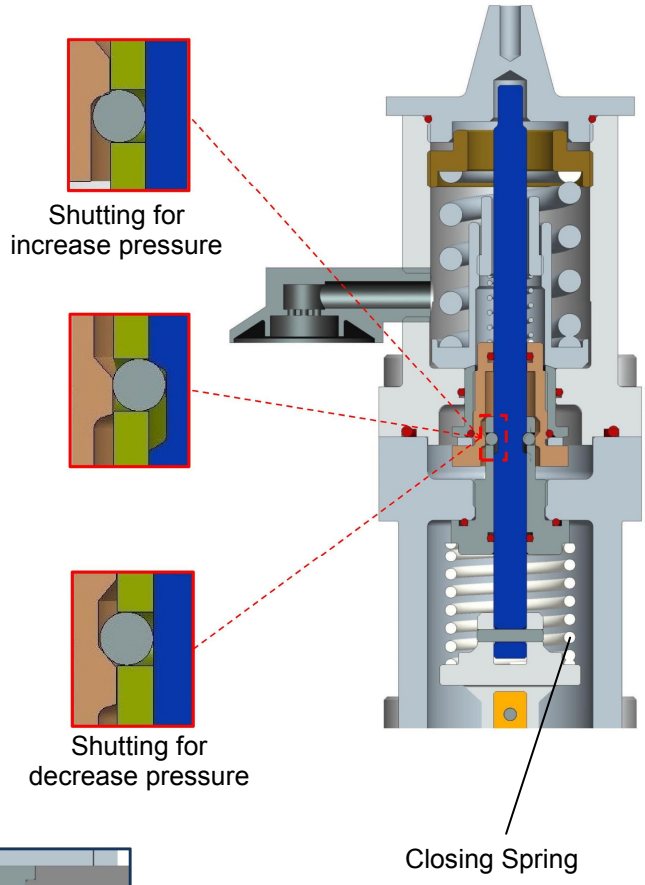


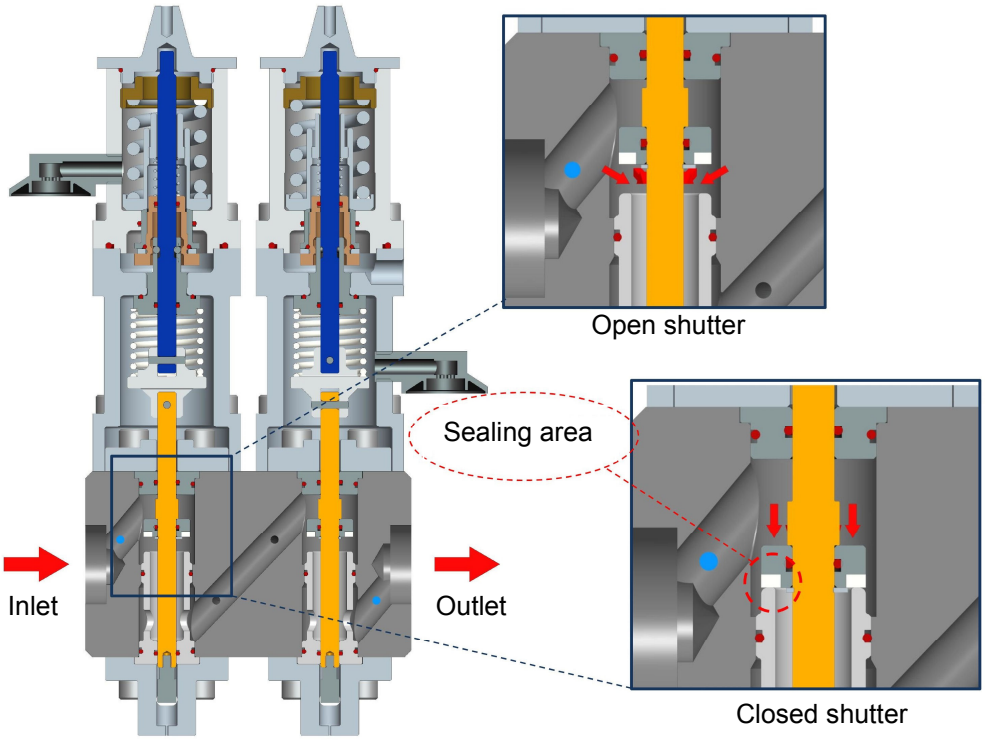
DIMENSIONS (mm)			
ND	A	B	C
½", ¾" e 1" NPT-F	140	240	128
1" FLANGE	453	240	128
2" FLANGE	512	240	128
General Tolerance +- 1,6			

3 – OPERATING PRINCIPLE

The slam shut valve model TWIN has two actuators with shaft (stem) and spheres collar monitoring the outlet pressure. In case of outlet pressure increase or decrease, the external bush will move up or move down, allowing the spheres running out of channel and the main shaft moves according to the force exerted by closing spring to close the valve against the seat, shutting downs the gas totally tight (see the picture with the two conditions).

After reestablishing to the normal service condition operation it is necessary to reset manually the slam shut valve.





3.1 – GENERAL RESET PROCEDURE

To reset the valve to the open position (ready to work), the sensing line should be connected in the actuator chamber .

3.1.1 – PROCEDURE TO RESET VALVE IN CASE OF OVER PRESSURE

1. Adjust the pressure of sensing line around 10-15% below under the set-point.
2. Open the by-pass valve to equalize the internal pressure of the valve.
3. Pull up the actuator stem until the upper position using the cap.

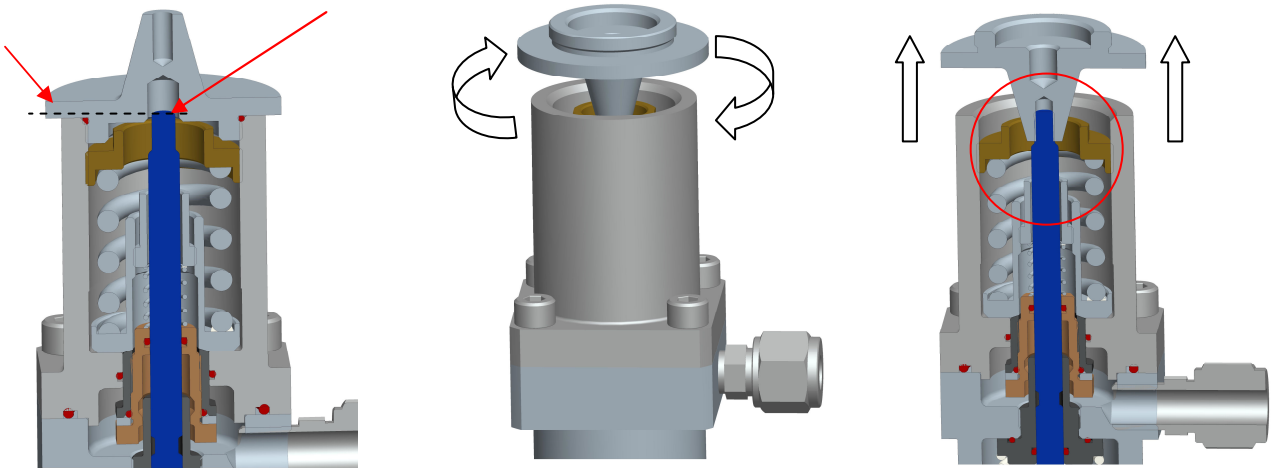
3.1.2 – PROCEDURE TO RESET VALVE IN CASE OF UNDER PRESSURE

1. Adjust the pressure of sensing line around 10-15% above the over set-point.
2. Open the by-pass valve to equalize the internal pressure of the valve.
3. Pull up the actuator stem until the upper position using the cover

3.2 – RESET PROCEDURE

When the Slam Shut Valve TWIN is blocked, is necessary to reset manually. See below how to proceed:

When there is a lock, the face of the shaft is approximately parallel to the upper cover. Then it is necessary to use the cap screwing it onto the shaft. After connecting the cover in the actuator stem, the user should pull up the cover in the direction indicated in the figure to reset the actuator of under pressure blocking.

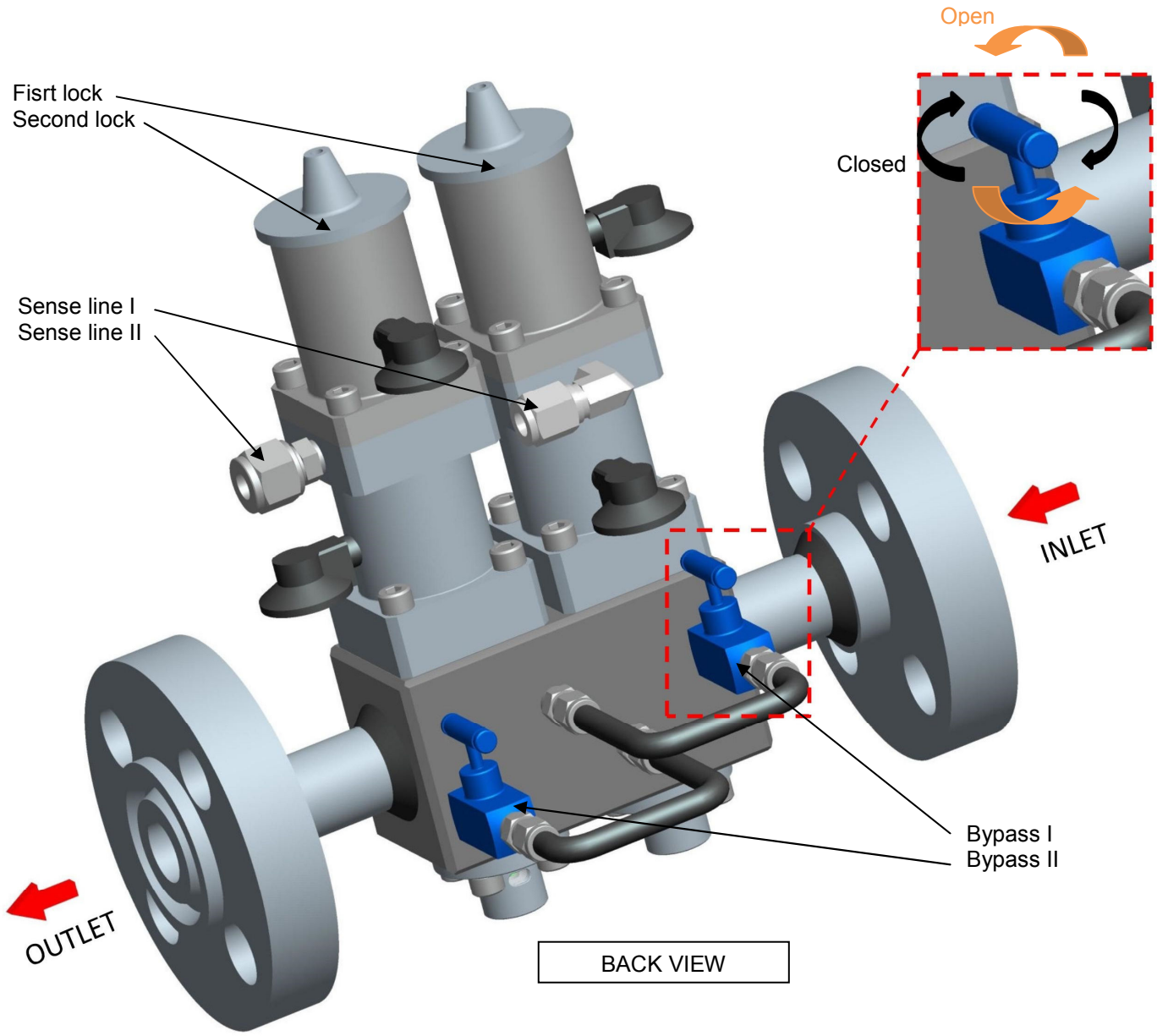


This procedure should only be done after item 3.3

3.3 – BYPASS PROCEDURE

To reset the Slam Shut Valve TWIN, is necessary to equalize the pressure before and after the shutter. Thus it is necessary to use the bypass.

How the TWIN VALVE has a double actuator, it is necessary two bypass (one for each actuator). The “bypass I” is responsible to equalize the upstream pressure and downstream pressure of first lock. Already the “bypass II” is responsible to equalize the upstream pressure and downstream pressure of second lock.



4.1 – CHECKING SYSTEM INTEGRITY

Before installing the slam shut valve pressure it's necessary to insure that:

1) The equipment are in perfect conditions or has evidences of damage during the transport, in case of perceptible damage in the equipment do not proceed with installations and get in contact with GASCAT.

2) The space provided for the acess and installation of equipment is appropriate, including future maintenance.

3) The installation was designed to support the load imposed by the equipment.

4) The inlet and outlet pipe connections are in the same level.

5) All connections for sense line and discharge line requested by the model of pressure regulator are arranged in the pipeline and respect the dimensions provided by manufacturer.

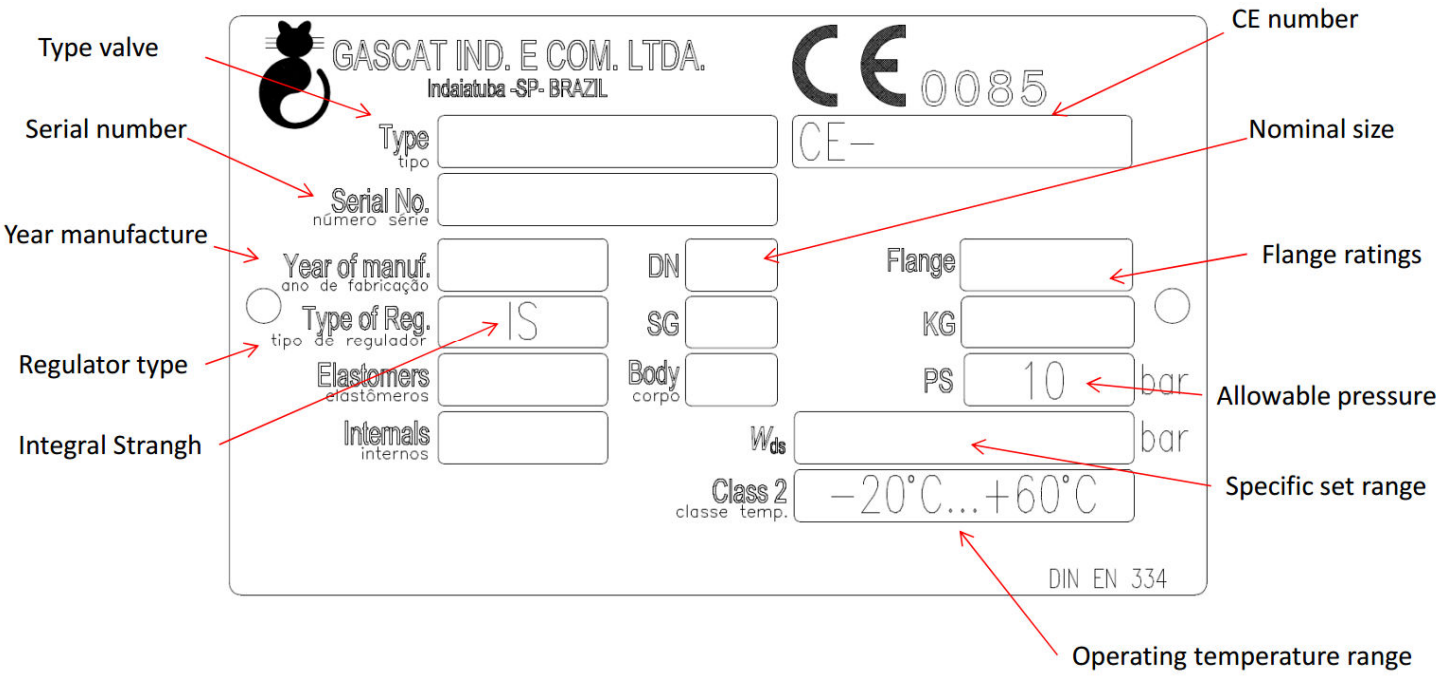
6) Was arranged pressure indicators at the inlet and outlet of the pressure regulator to insure the correct adjustment of set point during the commissioning.

7) Was arranged a vent line between the pressure regulator and the first block valve in the outlet of stream to help the operator during the start-up.

8) Check the flow direction in the valve body and pay attention in the installation to assure that the valve are in the correct position.

4.2 – PRESSURE REGULATOR NAMEPLATE

Before installation, checking is recommended to ascertain that the conditions of use are in conformity with the specifications of the equipment. These specifications are recalled with the symbols on the plate fitted on pressure regulator.



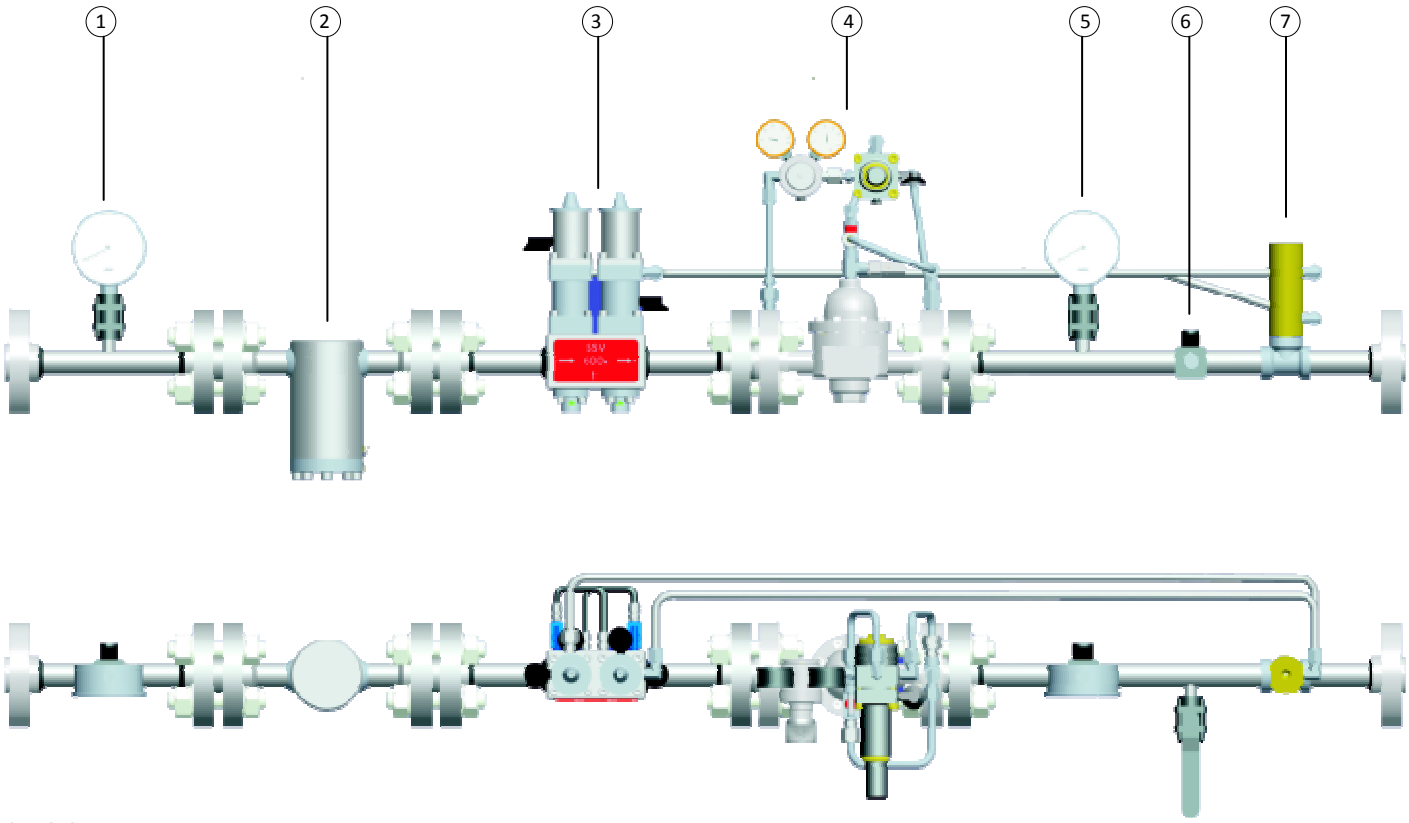
4.3 – FILTER

We recommended the installation of a cartridge type filter, with minimum 10 micra, as close as possible to the regulator input, without being joined flange to flange, because, if the filter is installed immediately upstream of the regulator, it can produce turbulence that will cause disturbances in the pressure control of the regulator. Care with the filter installation is essential to the perfect operation of the apparatus, because, particles eventually found in the piping can lodge themselves the seat and the shutter, damaging them and producing direct flow.

4.4 – CLEANING

Check piping cleaning before the installation of the slam shut valve. We recommended a complete purge of the line with nitrogen or compressed air.

4.7 – RECOMMENDED INSTALLATION SCHEME



1 – Inlet pressure gauge
2 – Cartridge filter - 10 micra
3 – Slam shut valve model twin
4 – Pressure regulator valve model Domus.
5 – Outlet pressure gauge

6 – Vent
7 – Colector 5 ways (or similar device)

5.1 – PRESSURE REGULATOR ADJUSTMENT

In this procedure it is supposed the there is a pressure regulator installed downstream of slam shut valve.

1) Release totally the regulating spring of pressure regulator.
2) Tight the slam shut spring range around 70%.
3) Reset the slam shut valve pulling up the shaft (regulating screw) inside of spring housing. It is done after a "light click" sound.
4) Open slowly the Upstream On-Off valve with the purge valve opened around 20%.
5) Reduce slowly the purge valve opening up to process flow stabilization; open slowly the upstream On-Off valve.
6) Close totally the purge valve to verify the tightness of regulator.
7) Open the purge valve around 20%; adjust slowly the regulator set pressure.
8) To adjust the slam shut valve set point, firstly, the purge valve must be closed. Adjust the regulator set point until achieve the slam shut valve set point. Then, release the slam shut valve spring until the valve blocks and then reset the slam shut valve.
9) In the next step the pressure regulator should be adjusted.
10) Open the downstream On-Off valve and adjust the pressure regulator if necessary.

5.2 – RECOMMENDED TOOLS FOR START-UP

✓ Socket Tool size: 1/2" and 1" or similar;

6 – TROUBLESHOOTING

To maintain the slam shut valve in the correct conditions of operation, the slam shut valve model TWIN must be submitted to preventive maintenance, the periodicity depends of the flow, quantity/type of contaminants and the operation conditions.

Defect	Cause	Correction
Direct passage (increase in pressure even with valve blocked)	Gas passage through the bypass valve	If the valve has na internal bypass maybe the o'rings shold be changed new ones
	Gas passage through seal o'ring - Seat o'ring - Shutter stem o'ring	Change the o'rings
	Gas passage between seat and shutter	Clean the seat and shutter. Verify if thes is any damage or deformation in these pieces. If comfirmed, then chage the damaged pieces
Gas passage through the actuator vent	Presence of particles between seata and shutter	Change the respective o'rings or diaphragm.
Gas passage through the valve	Piston o'rings or diaphragm damaged	Check the shutter and the seat. Clean or change the part

7 – WARRANTY

We warrant our products, for a 12 months period from the date of invoicing, if the products are in operation, extending the warrant up to 18 months, in case they are in stock. Such warranty only covers those cases for which the occurrence of production defects are evidenced, which remained unnoticed at the time the product delivery.

To present warranty is not valid if it is found that the defect or mishap was caused by accident, normal wear, inadequate installation, improper maneuvering or use, inadequate storage, assembly disregarding technical standards or if the buyer undertook repairs or changes in equipment by himself, without the manufacturer's previous authorization.

The information contained in this manual contains Gascat's supply conditions, independently of the verified performance.

The information herein contained shall not be interpreted or suggest performance warranty in relation to the final products, or the system usage purpose, nor should they serve as usage recommendation for any product or process mentioned in the specifications. This system should only be operated by qualified technician trained for this purpose; and no changes that may affects the system safety can be executed without our previous authorization.

GASCAT Ind and Com. Ltda. withhold the right to make changes without notice, introducing improvements in the described products drawings or specifications.

8 – STORAGE

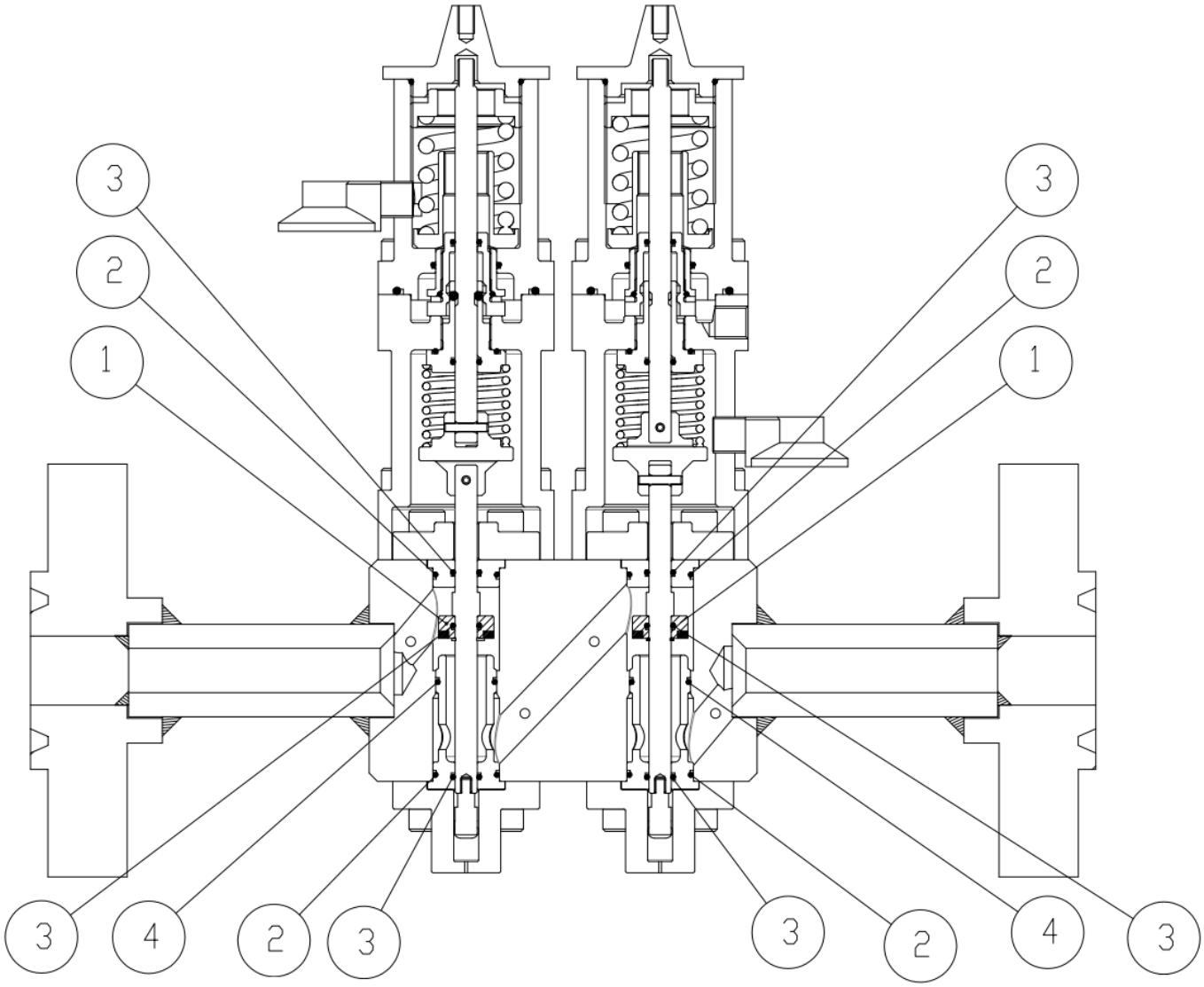
The shut-off valve should not suffer mechanical shock, not to risk internal components' damages.

The shut-off valve should be stored at a clean and dry place, protected from bad weather

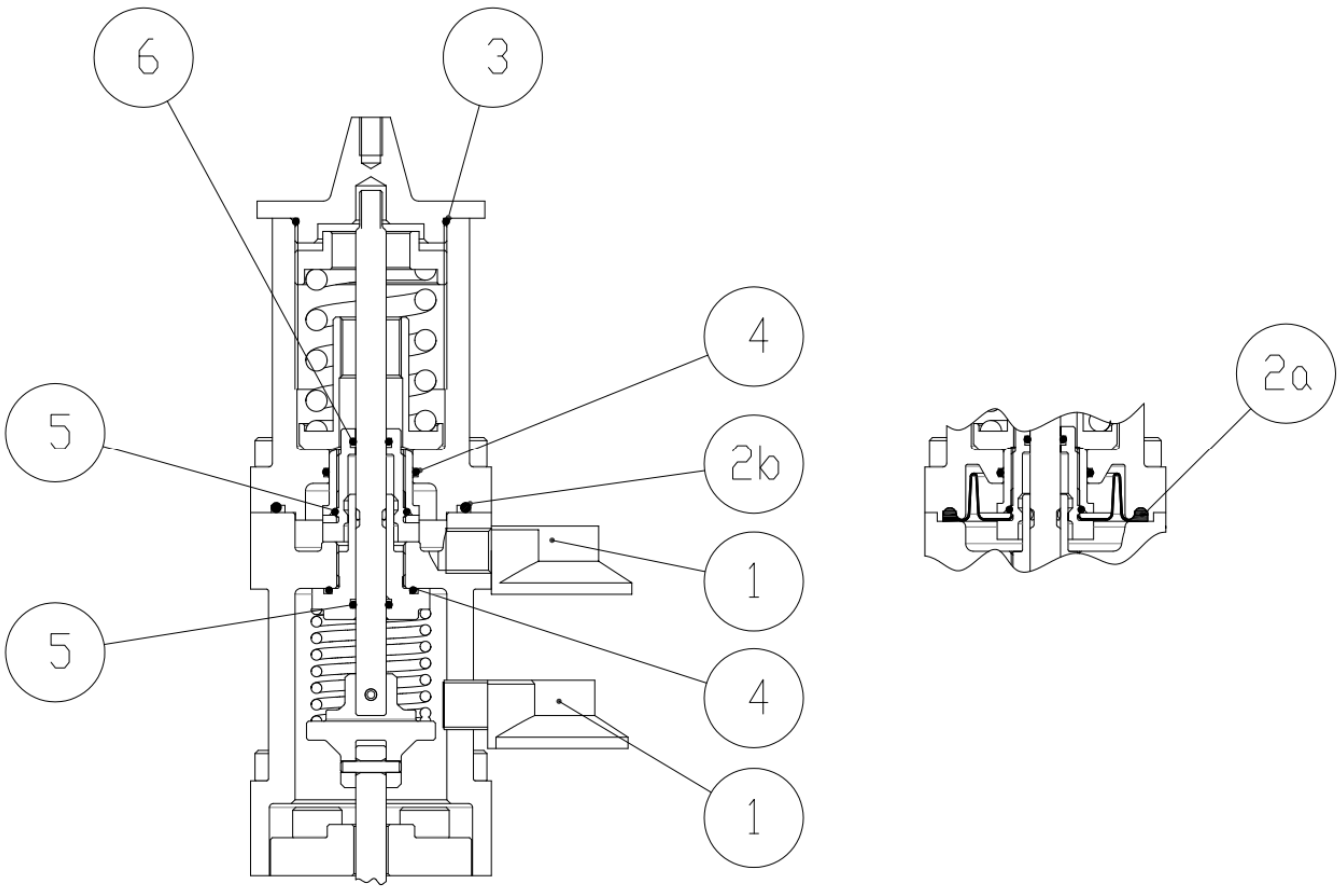
9 – GENERAL RECOMMENDATION

1) We test our regulators and valves at the requested operation conditions.
2) Criteria and maintenance steps are contained in manuals, however, for any doubt on the use, operation, or maintenance, contact Gascat's technical department that will give you proper guidance.
3) ***Gascat*** supplies, on request, a complete replacement kit.

10 – COMPONENTS & SPARE PARTS



POS.	DESCRIPTION	QTY
1	SHUTTER	2
2	O'RING	4
3	O'RING	4
4	O'RING	2



POS.	DESCRIPTION	QTY
1	RELIEF	4
2a	DIAPHRAGM	2
2b	O'RING	2
3	O'RING	2
4	O'RING	4
5	O'RING	4
6	O'RING	2