

INSTALLATION & OPERATION MANUAL PRESSURE REGULATOR VALVE

**MODEL
BRISE N**

**GASCAT**

INDEX

1 – INSTRUCTIONS PRIOR TO COMMISSIONING	3
1.1 – SAFETY AND HEALTH	3
1.1.1 – NOISE	3
1.1.2 – INSTALLATION	3
1.1.3 – OPERATION	4
1.1.4 – MAINTENANCE	4
2 – INTRODUCTION	5
2.1 – SCOPE OF MANUAL	5
2.2 – DESCRIPTION	5
2.3 – SPECIFICATIONS	5
2.3.1 – AVAILABLE CONFIGURATIONS	5
2.3.2 – AVAILABLE CONNECTIONS	5
2.3.3 – TEMPERATURE LIMITS	6
2.3.4 – FLOW TABLES	6
2.3.5 – VALVE WEIGHT	7
2.3.6 – MAXIMUM WORKING PRESSURE	7
2.3.7 – PRESSURE REGULATOR SPRING RANGE (SET-POINT)	8
2.3.8 – SLAM SHUT VALVE SPRING RANGE (SET-POINT)	8
2.3.9 – ACCURACY AND LOCK UP	8
2.3.10 – PRESSURE REGULATOR DIMENSIONS	9
3 – OPERATING PRINCIPLE	10
4 – INSTALLATION	11
4.1 – CHECKING SYSTEM INTEGRITY	11
4.2 – PRESSURE REGULATOR PLATE	11
4.3 – FILTER	12
4.4 – CLEANING	12
4.4 – FLOW DIRECTION AND ASSEMBLY OPTIONS	12
4.5 – SENSE LINE	12
4.6 – RECOMMENDED INSTALLATION LAYOUT	14
4.6.1 – SINGLE REGULATOR	14
4.6.2 – ACTIVE MONITOR SYSTEM	14
5 – OPERATION (START UP)	16
5.1 – START-UP PROCEDURE OF REGULATORS WITHOUT INCORPORATED SHUT-OFF VALVE	16
5.2 – START-UP PROCEDURE OF REGULATORS WITH INCORPORATED SHUT-OFF VALVE	16
5.3 – REGULATOR ADJUSTMENT	16
5.4 – RECOMMENDED TOOLS FOR START-UP	17
6 – TROUBLESHOOTING	18
7 – WARRANTY	18
8 – STORAGE	19
9 – GENERAL RECOMMENDATION	19
10 – COMPONENTS & SPARE PARTS	19
11 – RECOMMENDATIONS FOR SPARE PARTS MAINTENANCE	19
11.1 – RECOMMENDATIONS FOR SHUTTER MAINTENANCE	16

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:

Gascat Indústria e Comércio Ltda.
Rodovia SP 73, 1141 – Indaiatuba / São Paulo.
CEP 13347-390 – Brazil
Phone: 55 19 3936-9300
E-mail sales@gascat.com.br

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

Elaborado
JJ

Verificado / Aprovado
JM

CSQ
GN

Data
24/05/21

Revisão
04

Página
3 de 28

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, obturator), to have the all spare parts with same life time.

Gascat already inform to avoid all non 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 BRISE N pressure regulator manufactured by GASCAT.

2.2 – DESCRIPTION

The Brise Series regulators are single stage, self-operated regulators for heavy duty work under high, medium, and low pressure applications, for all types of non-corrosive gases and for corrosive gases, when built in special versions.

It is also possible to supply the pressure regulator Brise with slam shut valve incorporated.

These regulators were developed with the purpose of facilitating their maintenance, or parts substitution, as much as possible. Therefore, because of their top entry characteristic, there is no need to remove them from the line for maintenance or cleaning. Brise Series regulators are also known for their small weight, constructive simplicity and soundness.

For valves intended for use with oxygen, all necessary precautions shall be taken for operation with this gas, avoiding oil or grease presence in tools, and use of lubricants that are not compatible with oxygen. Always use building materials for the valve that are compatible with the type of used gas.

2.3 – SPECIFICATIONS

2.3.1 – AVAILABLE CONFIGURATIONS

BRISE N (SO): Self operated pressure regulator fail open (spring to open)

BRISE N (SO) with SSV: Self operated pressure regulator fail open (spring to open) with slam shut valve

BRISE pressure regulators are classified as SO in accordance with standard DIN EN 334 directives, for fail condition.

2.3.2 – AVAILABLE CONNECTIONS

Elaborado
JJ

Verificado / Aprovado
JM

CSQ
GN

Data
24/05/21

Revisão
04

Página
5 de 28

ND	FLANGE ASME B16.5	FLANGE DIN 2633	THREAD
1"	150#RF	PN 16	NPT-F
2"	150#RF	PN 16	NPT-F
3"	150#RF	PN 16	-

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.

2.3.4 – FLOW TABLES

BRISE – DN 1"								
OUTLET PRESSURE – bar(g)								
	0,02	0,05	0,075	0,10	0,25	0,50	0,75	1,00
0,25	120,0	142,0	170,0	180,0				
0,50	178,0	200,0	230,0	260,0	260,0			
0,75	215,0	240,0	290,0	325,0	360,0	280,0		
1,0	260,0	285,0	340,0	370,0	420,0	395,0	300,0	
1,5	280,0	315,0	360,0	370,0	420,0	450,0	415,0	275,0
2,0	300,0	355,0	360,0	370,0	420,0	503,0	525,0	375,0
3,0	300,0	355,0	360,0	370,0	420,0	503,0	587,0	545,0
4,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	590,0
5,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0
6,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0
7,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0
8,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0
9,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0
10,0	342,0	355,0	360,0	370,0	420,0	503,0	587,0	670,0

BRISE – DN 2"								
OUTLET PRESSURE – bar(g)								
	0,02	0,05	0,075	0,10	0,25	0,50	0,75	1,00
0,25	488,0	560,0	700,0	770,0				

0,50	710,0	784,0	930,0	1060,0	1067,0			
0,75	860,0	950,0	1176,0	1320,0	1450,0	1153,0		
1,0	1050,0	1125,0	1385,0	1500,0	1700,0	1616,0	1200,0	
1,5	1125,0	1240,0	1450,0	1500,0	1700,0	1850,0	1660,0	
2,0	1200,0	1400,0	1450,0	1500,0	1700,0	2050,0	2100,0	1230,0
3,0	1200,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	2130,0
4,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	2750,0
5,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3100,0
6,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3350,0
7,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3350,0
8,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3350,0
9,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3350,0
10,0	1360,0	1400,0	1450,0	1500,0	1700,0	2050,0	2350,0	3350,0

BRISE – DN 3" OUTLET PRESSURE – bar(g)								
	0,02	0,05	0,075	0,10	0,25	0,50	0,75	1,00
0,25	730,0	835,0	1050,0	1150,0				
0,50	1055,0	1175,0	1400,0	1590,0	1600,0			
0,75	1250,0	1415,0	1650,0	1960,0	2200,0	1625,0		
1,0	1580,0	1705,0	1870,0	2285,0	2550,0	2100,0	1820,0	
1,5	1580,0	1705,0	1870,0	2285,0	2550,0	2980,0	1820,0	
2,0	1790,0	2075,0	2325,0	2780,0	2935,0	3515,0	3175,0	3200,0
3,0	2160,0	2330,0	2565,0	3100,0	3350,0	3600,0	3580,0	3610,0
4,0	2160,0	2500,0	2670,0	3455,0	3500,0	3800,0	3900,0	4200,0
5,0	2160,0	2500,0	2820,0	3650,0	3700,0	4400,0	3900,0	4775,0
6,0	2160,0	2500,0	2820,0	3650,0	3850,0	4400,0	4530,0	4775,0
7,0	2160,0	2500,0	2820,0	3650,0	3850,0	4400,0	4800,0	5970,0
8,0	2160,0	2500,0	2820,0	3650,0	3850,0	4400,0	4800,0	5970,0
9,0	2160,0	2500,0	2820,0	3650,0	3850,0	4400,0	4800,0	5970,0
10,0	2160,0	2500,0	2820,0	3650,0	3850,0	4400,0	4800,0	5970,0

2.3.5 – VALVE WEIGHT

DN	150# / PN16 / NPT-F
1"	18 Kg
2"	22 Kg
3"	40 Kg

2.3.6 – MAXIMUM WORKING PRESSURE

Elaborado
JJ

Verificado / Aprovado
JM

CSQ
GN

Data
24/05/21

Revisão
04

Página
7 de 28

150# / PN 16 / NPT-F

10 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.

2.3.7 – PRESSURE REGULATOR SPRING RANGE (SET-POINT)

BRISE		
SPRING COLOR	PART NUMBER	RANGE
GREY	01.51.23	20 – 50 mbar
YELLOW	01.51.24	45 – 100 mbar
BROWN	01.51.25	90 – 200 mbar
BLUE	01.51.26	150 – 300 mbar
WHITE	01.51.27	250 – 400 mbar
RED	01.51.21	350 – 500 mbar
PURPLE	01.51.28	450 – 600 mbar
GREEN	01.51.29	550 – 800 mbar
BLACK	01.51.30	650 – 1000 mbar

2.3.8 – SLAM SHUT VALVE SPRING RANGE (SET-POINT)

SSV – ACTUADOR L		
SPRING COLOR	PART NUMBER	RANGE
GREEN	01.53.46	25 – 70 mbar
BLACK	01.53.47	50 – 150 mbar
SSV – ACTUATOR H		
SPRING COLOR	PART NUMBER	RANGE
BLACK	01.51.98A	80 – 280 mbar
BLUE	01.53.35	200 – 340 mbar
WHITE	01.53.36	300 – 680 mbar
RED	01.53.37	650 – 1070 mbar
PURPLE	01.53.38	780 – 1200 mbar

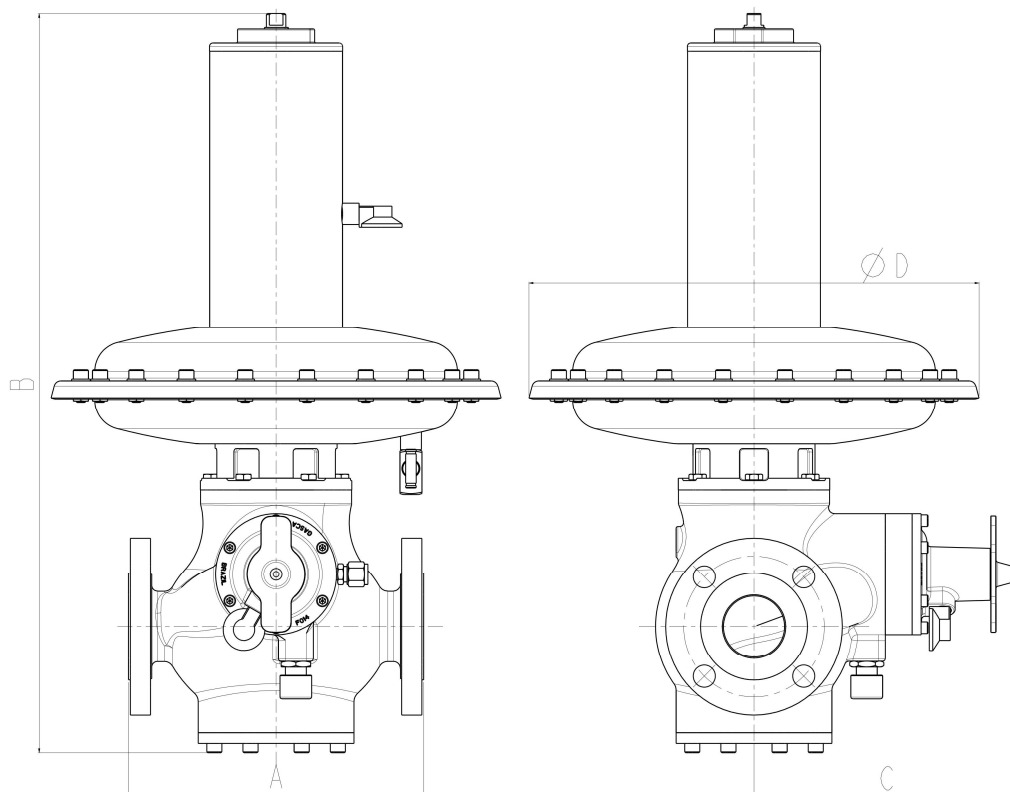
ORANGE	01.53.51	1000 – 2100 mbar
GRAY	01.53.38H	2000 – 3600 mbar

2.3.9 – ACCURACY AND LOCK UP

Pressure regulator: AC up to 5 / SG up to 10

SSV: AG up to 10

2.3.10 – PRESSURE REGULATOR DIMENSIONS



DIMENSIONS (mm)				
	A	B	C*	D
ND	150#	150#	150#	150#
1"	184	485	217	315
2"	254	635	230	380
3"	298	670	265	380
General Tolerance ± 2				

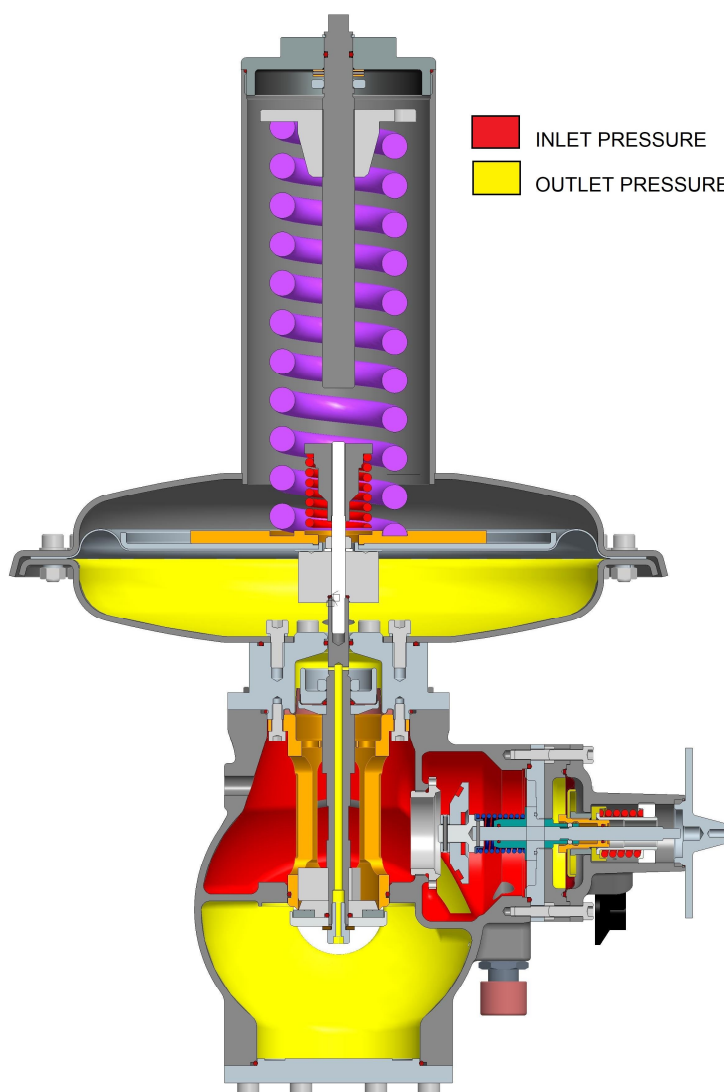
*Note: To L- Actuator it should be considered the dimension C how $\rightarrow C+23\text{mm}$.

3 – OPERATING PRINCIPLE

Pressure regulators of the Brise Series (with and/or without slam shut valve incorporated) operate by direct spring action on the output pressure sensor element (diaphragm) that, with consumption variation and consequent pressure change on the sensor element, will re-position the shutter stem increasing or reducing the valve aperture, in order to keep the adjusted output pressure constant.

The slam shut valve monitors the outlet pressure. In case of increase in pressure above slam shut set point the SSV diaphragm will senses it and release the obturator to close the SSV and interrupt the gas passage.

After outlet pressure stabilization it is necessary to reset manually the slam shut valve.



4 – INSTALLATION

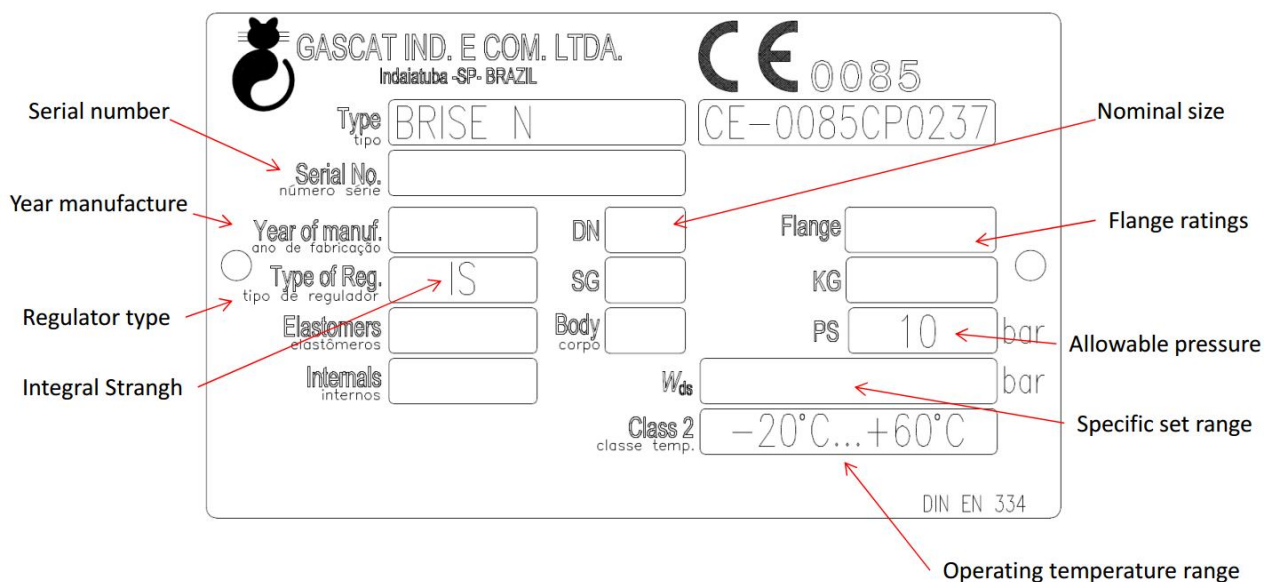
4.1 – CHECKING SYSTEM INTEGRITY

Before installing the pressure regulator it's necessary to insure:

- 1) The equipment is in perfect conditions or has not 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 for 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 gauges 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 is in the correct position.

4.2 – PRESSURE REGULATOR PLATE

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.



The diagram shows a pressure regulator plate with various fields and labels. Red arrows point from labels to specific fields:

- Serial number** points to the **Serial No.** field.
- Year manufacture** points to the **Year of manuf.** field.
- Regulator type** points to the **Type of Reg.** field.
- Integral Strangh** points to the **Internals** field.
- Nominal size** points to the **DN** field.
- Flange ratings** points to the **Flange** field.
- Allowable pressure** points to the **PS** field.
- Specific set range** points to the **Class 2** field.
- Operating temperature range** points to the **Operating temperature range** field.

The plate itself contains the following information:

- GASCAT IND. E COM. LTDA.** (with logo)
- Indaiatuba - SP - BRAZIL**
- CE 0085** (with CE mark)
- CE-0085CP0237**
- Type** **BRISE N**
- Serial No.** (empty field)
- Year of manuf.** (empty field)
- Type of Reg.** **IS**
- DN** (empty field)
- Flange** (empty field)
- KG** (empty field)
- PS** **10**
- Bar** (empty field)
- Class 2** **-20°C...+60°C**
- Operating temperature range** (empty field)
- DIN EN 334**
- Internals** (empty field)
- Body** (empty field)
- SG** (empty field)
- W_{ds}** (empty field)
- Elastomers** (empty field)

4.3 – FILTER

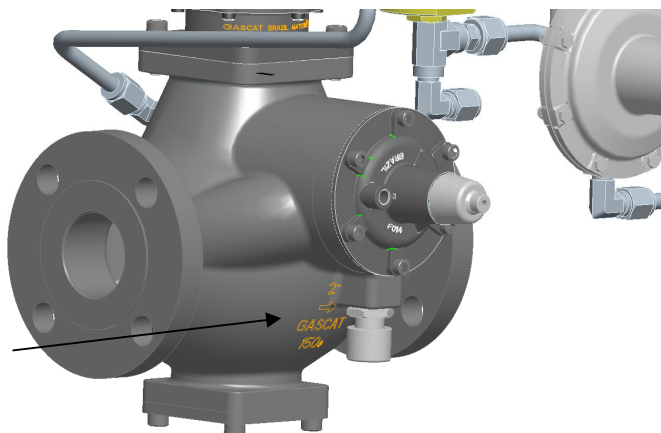
We recommended the installation of a basket type filter, with minimum 150 mesh, as close as possible to the regulator input, without being joined flange to flange, because, if the filter is installed immediately upstream of the regulator, it can produce turbulence that will cause disturbances in the 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 regulator. We recommended a complete purge of the line with nitrogen or compressed air.

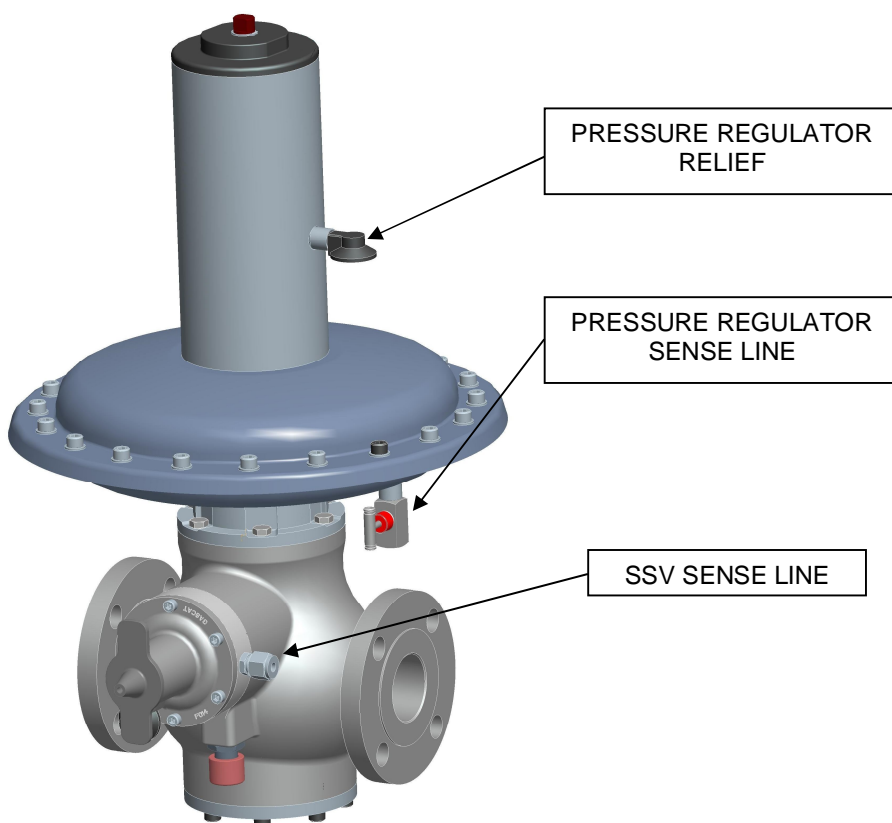
4.4 – FLOW DIRECTION AND ASSEMBLY OPTIONS

It is necessary to verify the flow direction before installing the regulator; this information could be found into marks in the equipment body.



4.5 – SENSE LINE

After install the pressure regulator model BRISE PLUS in the stream, you must connect the sensing lines and discharge line as showed as follow:



The correct positioning of pressure regulators sense line in the pipeline is essential for the proper functioning of the pressure regulator, for this reason it's important to install the impulse take at a distance of 5 times the nominal pipe diameter from the outlet of pressure regulator at a pipe stretch free from obstruction, with a pipe diameter sized to a velocity not higher than 25 m/s (considering the minimum pressure and the maximum flow)



We do not recommend installations of any type of block valve in the sensing lines.

The connections of BRISE N sense and discharge line are normally supplied for 10 mm OD pipe, however other connections could be arranged under consult.

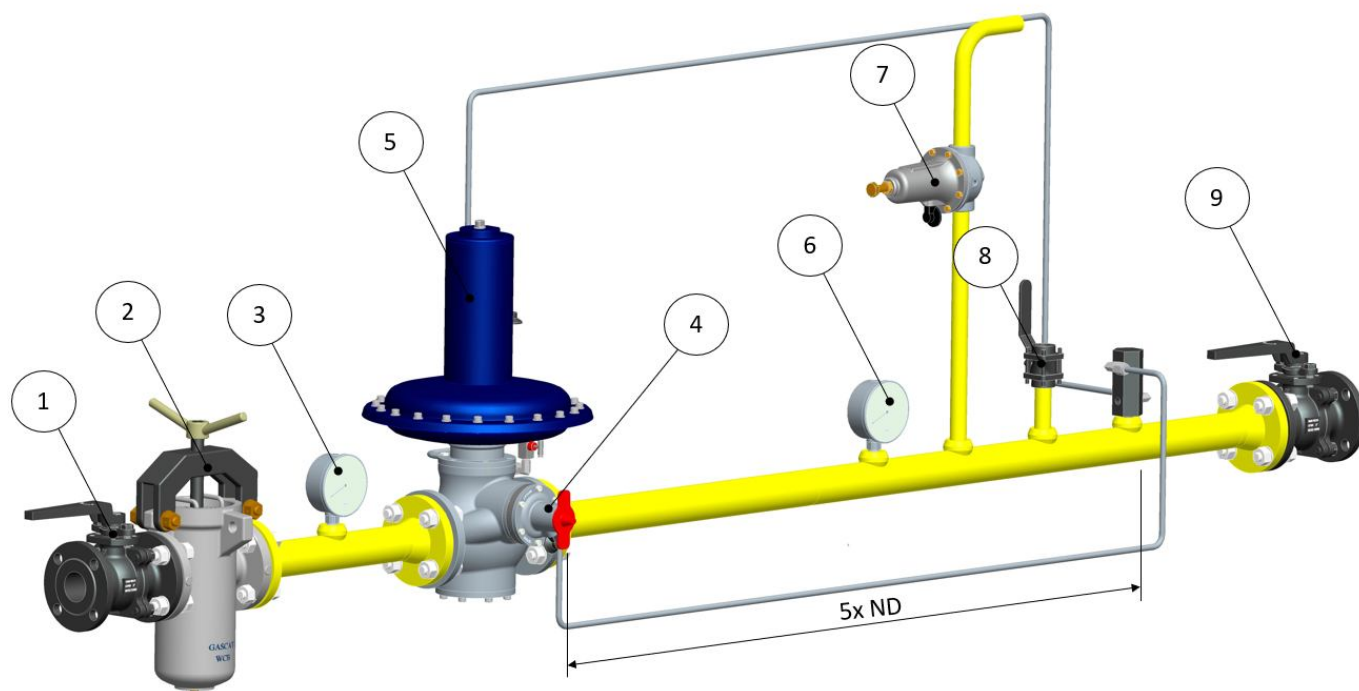
We recommend to not use pulse pick-up downstream of regulator with orifices with nominal diameter less than 3/8".

4.6 – RECOMMENDED INSTALLATION LAYOUT

4.6.1 – SINGLE REGULATOR

it is recommended for a safety installation:

1. Manual blocking valve (ball type, or similar).
2. Filter (GASCAT Metrius).
3. Inlet pressure gauge.
4. Slam shut valve (Incorporated in the BRISE N Regulator).
5. BRISE N (Pressure Regulator)
6. Outlet pressure gauge.
7. Partial pressure relief valve (GASCAT CH RELIEF)
8. Purge valve, $\varnothing \frac{1}{2}$ ".
9. Manual blocking valve (ball type, or similar).

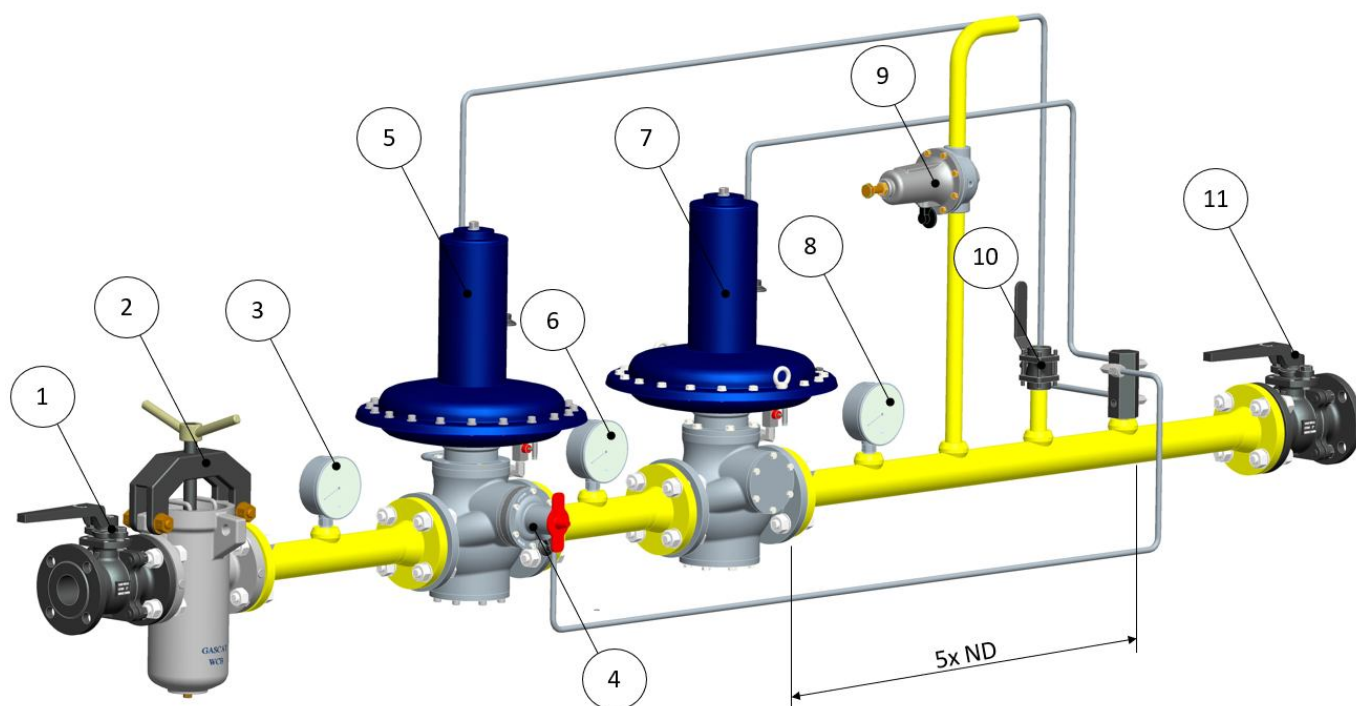


Note: The downstream regulator sensing line may be less than 5 xND from the installation of the project to be reviewed and approved by GASCAT Engineering Department.

4.6.2 – ACTIVE MONITOR SYSTEM

it is recommended for a safety installation:

1. Manual blocking valve (ball type, or similar).
2. Filter (GASCAT Metrius).
3. Inlet pressure gauge.
4. Slam shut valve (Incorporated in the BRISE N Regulator).
5. BRISE N (Monitor Pressure Regulator).
6. Pressure gauge.
7. BRISE N (Active Pressure Regulator).
8. Outlet Pressure Gauge.
9. Partial pressure relief valve (GASCAT CH RELIEF).
10. Purge valve, Ø ½".
11. Manual blocking valve (ball type, or similar).



Note: The downstream regulator sensing line may be less than 5xND from the installation of the project to be reviewed and approved by GASCAT Engineering Department

5 – OPERATION (START UP)**5.1 – START-UP PROCEDURE OF REGULATORS WITHOUT INCORPORATED SHUT-OFF VALVE**

- 1) Close slowly the outlet manual ball valve downstream of the regulator.
- 2) Close slowly the inlet shutoff valve upstream of the regulator.
- 3) Assure yourself that the pressure regulating spring is completely loose (it usually leaves the factory already loose).
- 4) Certify that bleed (discharge valve / needle valve) is open in 1/8" of turn.
- 5) Open the purge valve fitted downstream of the regulator to something like 20%.
- 6) Slowly open manual ball valve found upstream of the regulator, verifying the gas pressure with the pressure gauge located downstream of the regulator.
- 7) Slowly close the purge valve until the gas flow stabilizes. Completely open the gas input valve.

5.2 – START-UP PROCEDURE OF REGULATORS WITH INCORPORATED SHUT-OFF VALVE

- 1) Release completely the regulator pressure adjustment spring.
- 2) Press the slam shut valve spring, by approximately 70% of the spring total travel, by the spring follower, which access is by the cap in the upper part of the cover and regulating screw.
- 3) Reset the blocking valve (it usually leaves factory in the blocked position) by internal shaft.
- 4) Slowly open the gas inlet valve until 20% of total travel, with the purge valve opened about 20% of the total travel.
- 5) Slowly reduce the purge valve opening until gas flow stabilizes. Open the gas input valve completely.
- 6) Close the purge valve completely to check for tightness of the valve shutter/seat set, without gas consumption. The output pressure gauge shall present a slight increase in output pressure, which shall stabilize in a few seconds.
- 7) Open the purge valve by approximately 20% of the total travel; slowly adjust the required work pressure, by the regulating screw.
- 8) Adjust the shut-off valve.
- 9) With the purge valve closed, adjust the regulator output pressure to some 30% above the work pressure; release the blocking valve spring follower until blocking is reached.

5.3 – REGULATOR ADJUSTMENT

- 1) Open the purge valve located downstream of the regulator to, approximately, 20% of the passage.

- 2) Adjust the regulator pressure with the regulating screw located in its top cap to the requested operation pressure (turn it clockwise to increase pressure and counter clockwise to reduce pressure).
- 3) Close the purge valve.
- 4) Check for regulator tightness with the pressure gauge located downstream of the same; a stable pressure indication for, approximately, 2 minutes after closing attends this requisite.
- 5) Slowly open the gas outlet-blocking valve.
- 6) Make fine pressure adjustments.

5.4 – RECOMMENDED TOOLS FOR START-UP

- ✓ Combination spanner size: 12 mm
- ✓ Adjustable spanner 1"

6 – TROUBLESHOOTING

To maintain the pressure regulator in the correct conditions of operation, the pressure regulators model BRISE must be submitted to preventive maintenance, the periodicity depends of the flow, quantity/type of contaminants and the operation conditions.

<u>Defect</u>	<u>Cause</u>	<u>Correction</u>
Vibration	Problems in the installation	Verify if the pipe is correctly supported, if the vibration doesn't come from other devices or if it is inadequate sizing of some equipment.
	Damaged diaphragm or stem assembly of main valve damaged	Change the damaged pieces.
Outlet Pressure Variation	Low flow (less than 5% of maximum flow)	Verify the regulator sizing (check if is available a reduced orifice).
	Sensing line installed wrongly	Verify if the sensing line is too close of main valve or near of an equipment that may cause flow turbulence
	Bleed valve wrongly adjusted	Proceed the adjustment of bleed valve with the regulator operating (working) to find the best position of work.
Direct passage through the regulator or main valve totally opened	Main regulator stem locked	Verify the respective stem and change it if necessary.
	Sensing line damaged	Verify the sensing line and change it if necessary.
Outlet drop pressure / non-enough flow	Filter element dirty	Clean or change the filter element.
No Flow and No Outlet Pressure	Main diaphragm damaged	Change the main diaphragm.
Outlet pressure increase / Direct passage	Particles between obturator / seat or these parts damaged	Remove the inspection cover and obturator and clean the components (obturator e seat). Verify all other components and change if necessary.
	Particles between obturator / seat or these parts damaged	Remove the pilot balancing, clean it or change if necessary.

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 regulators should not suffer mechanical shock, not to risk internal components' damages.

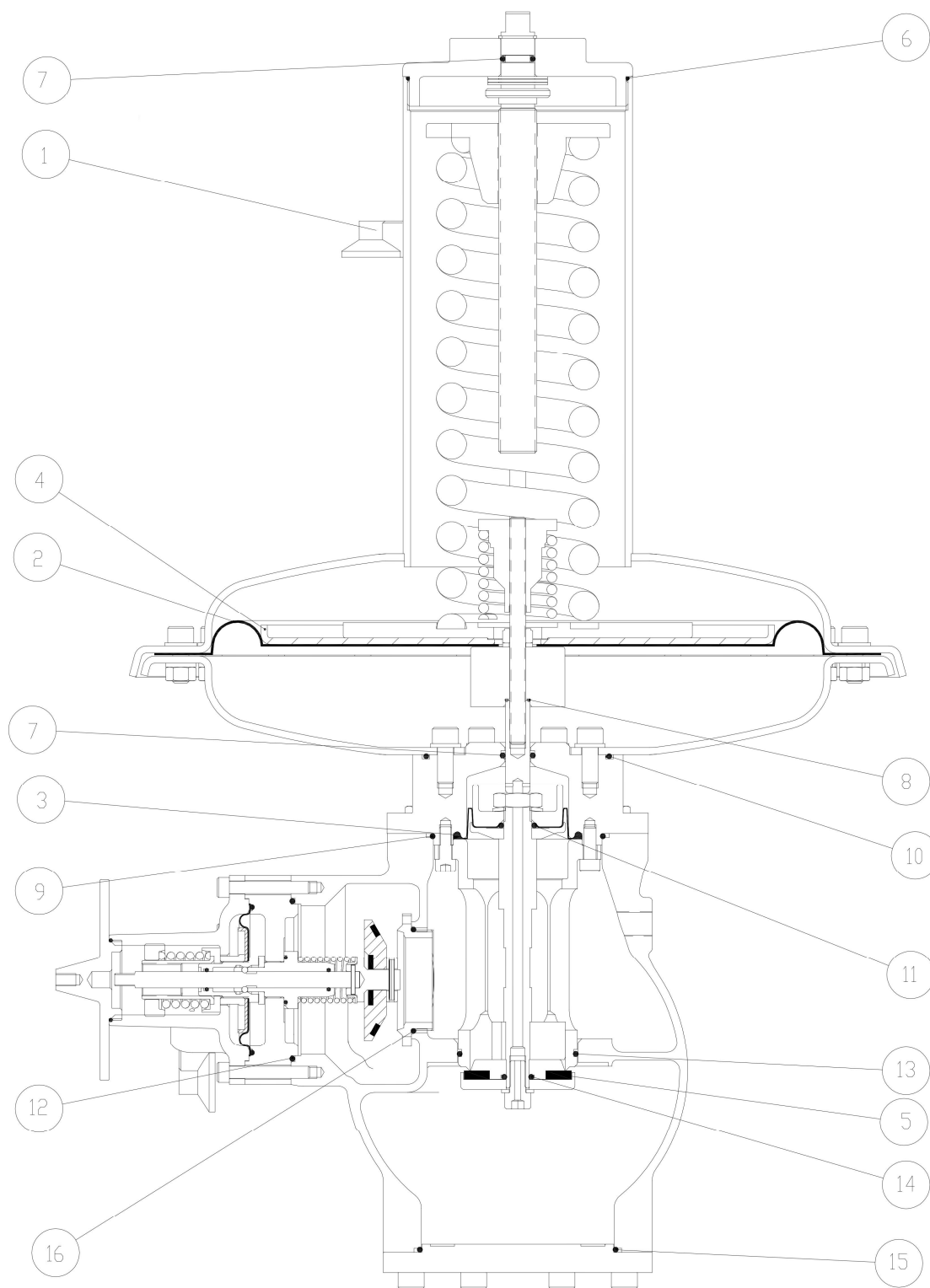
The regulators should be stored at a clean and dry place, protected from bad weather

9 – GENERAL RECOMMENDATION

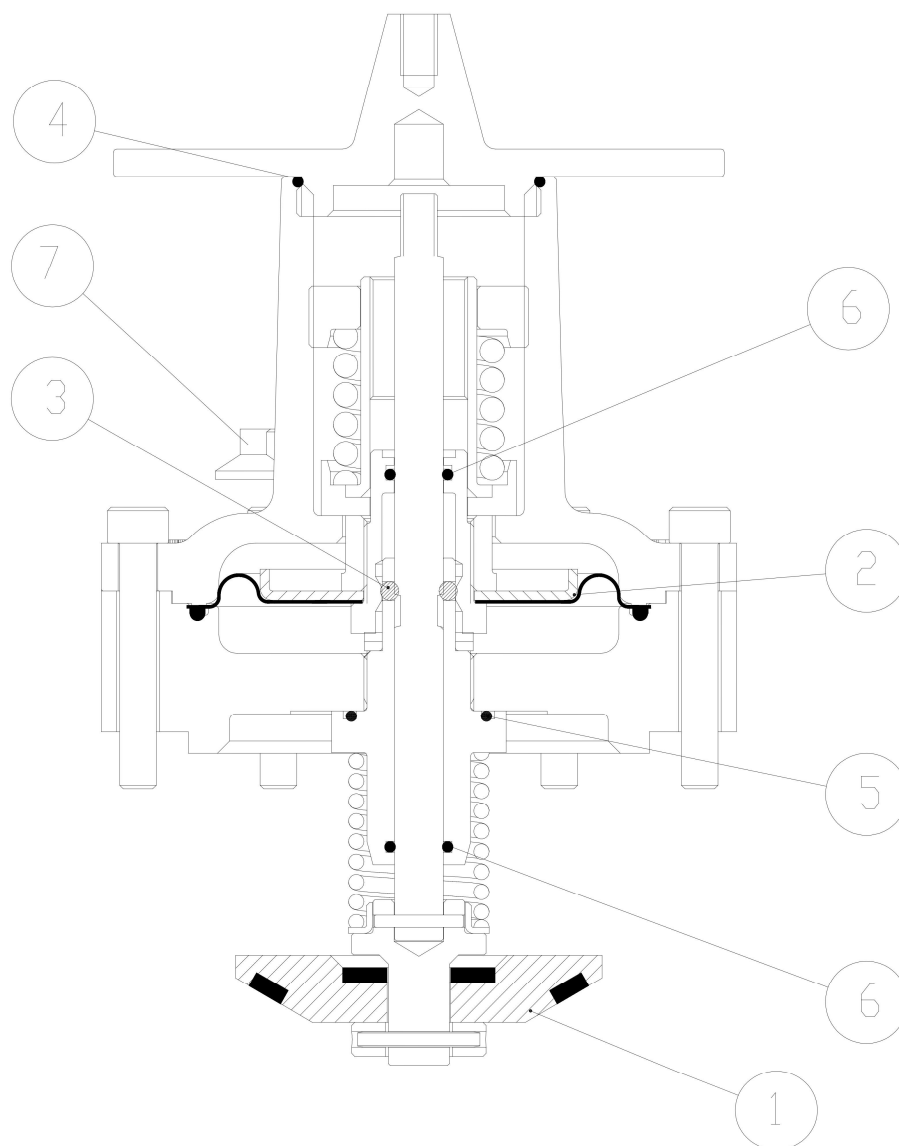
- 1) We test our regulators and valves at the requested operation conditions.
- 2) Criteria and maintenance steps are contained in manuals, however, for any doubt on the use, operation, or maintenance, contact Gascat's technical department that will give you proper guidance.
- 3) **Gascat** supplies,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

10 – COMPONENTS & SPARE PARTS

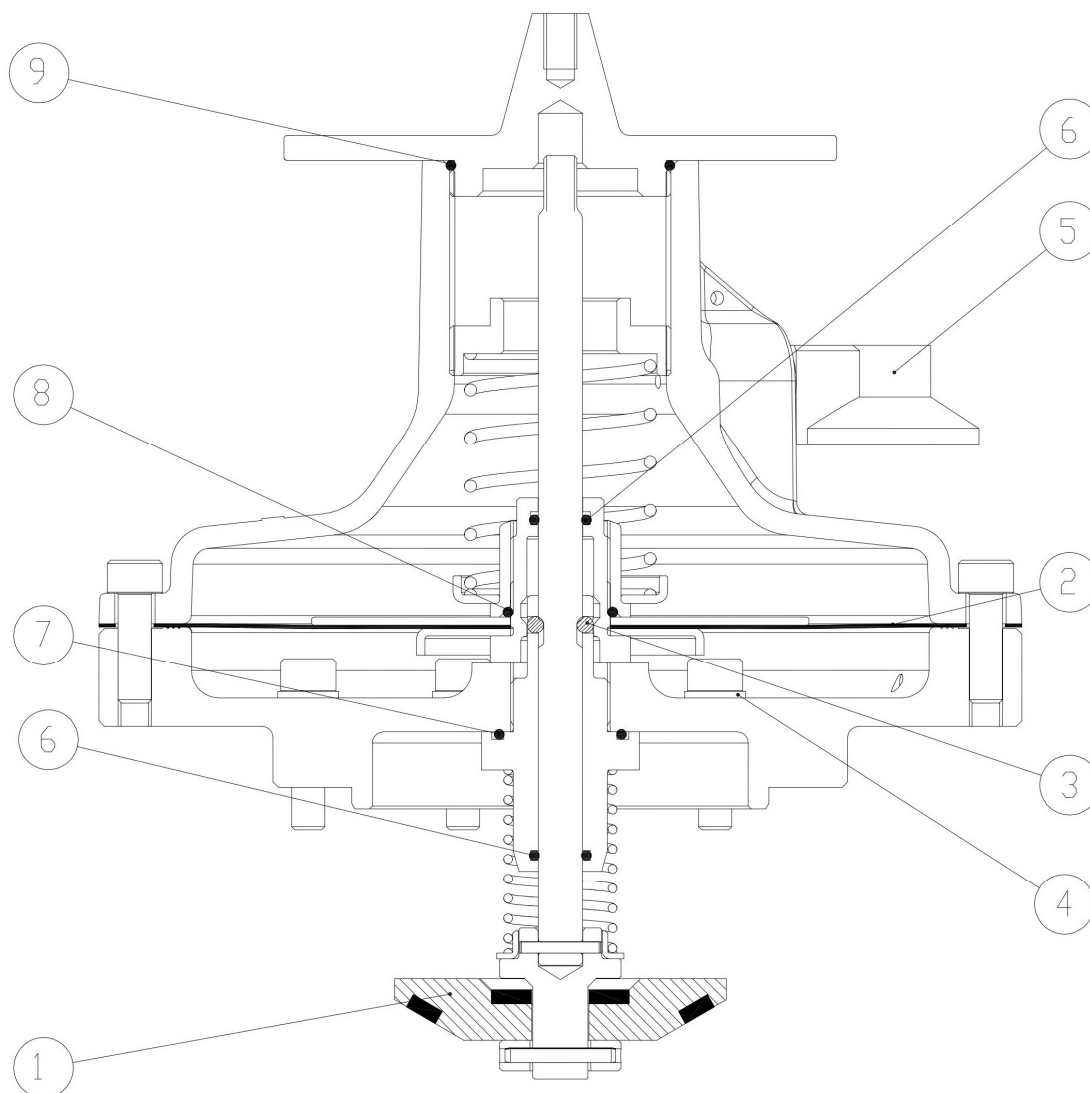
Find below the components positions and spare parts components of BRISE N:



POS.	DESCRIPTION	QTY
1	RELIEF	1
2	DIAPHRAGM	1
3	DIAPHRAGM	1
4	PLATE	1
5	O'RING	1
6	O'RING	1
7	O'RING	2
8	O'RING	1
9	O'RING	1
10	O'RING	1
11	O'RING	1
12	O'RING	1
13	O'RING	1
14	O'RING	1
15	O'RING	1
15	O'RING	1



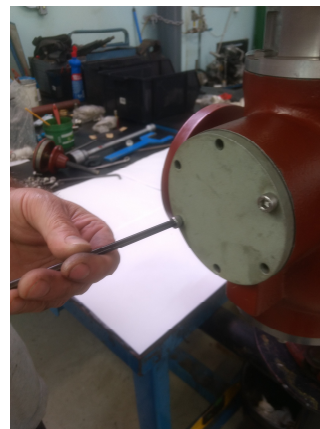
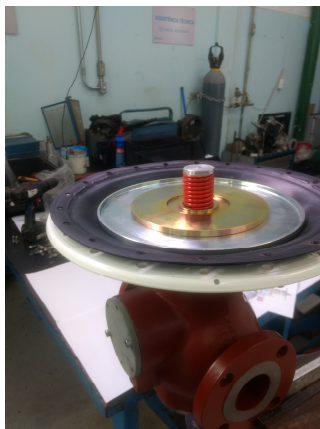
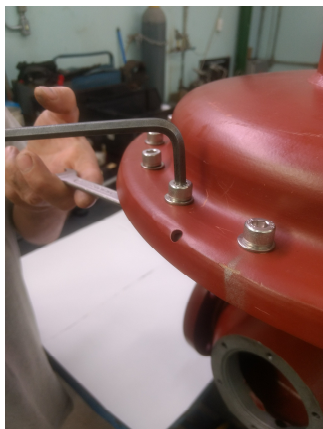
SHUT-OFF H		
POS.	DESCRIPTION	QTY
1	SHUTTER	1
2	DIAPHRAGM	1
3	SPHERE	4
4	O-RING	1
5	O-RING	1
6	O-RING	2
7	RELIEF	1



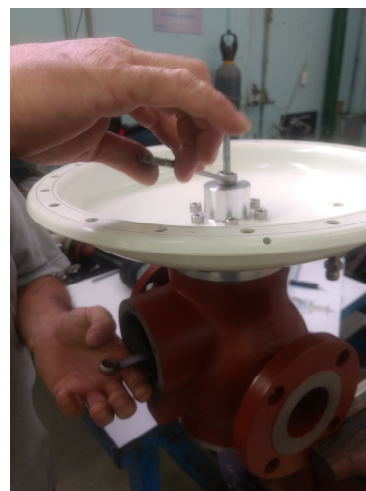
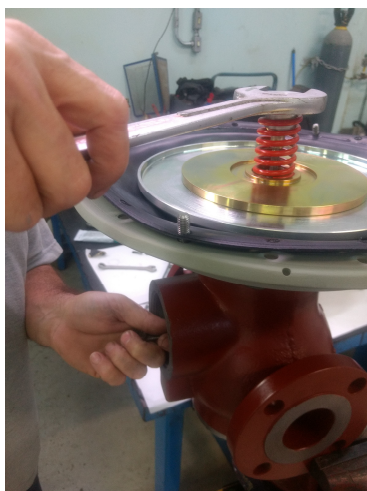
SHUT-OFF L		
POS.	DESCRIPTION	QTY
1	SHUTTER	1
2	DIAPHRAGM	1
3	SPHERE	4
4	GASKET	6
5	RELIEF	1
6	O-RING	2
7	O-RING	1
8	O-RING	1
9	O-RING	1

11 RECOMMENDATIONS FOR SPARE PARTS MAINTENANCE

- 1) Under no circumstances start the equipment disassembly if it is pressurized.
- 2) Proceed by removing all screws along the mains covers and the front cover (or SSV Actuator).



- 3) With a tool, hold the shaft to prevent it from rotating and through the bottom access remove the shutter screw and remove the internal relief and the support plate



- 4) Remove the lower cover and the intermediate screws to will be possible to remove the intermediate.



- 5) Remove the nut and now it will be possible to change the rollout diaphragm.



- 6) To assembly again, just follow the steps of the disassembly procedure in inverse order, but we shall make some observations on specific points that must be examined closely during the reassembly:

6.1) It is recommendable to utilize a PTFE paste and to apply in the bottom of the rollout plate (like the first picture). The rollout diaphragm should be housing in the center of the assembly.



6.2) Note the intermediate, the seat cage and the shaft position according the picture below. The assembly must be this way to facilitate a future maintenance, allowing the tool access



TOOL ACCESS

TOOLS	DIMENSIONS
ALLEN HEX TOOL	5mm, 8mm
SCREW WRENCH	12 mm, 13mm, 7/8" and 1.1/2" or 15/16" (to model without internal relief)

11.1 – RECOMMENDATIONS FOR SHUTTER MAINTENANCE

This chapter is applicable just any cases, when is necessary only the change of shutter gasket. In this case, there is not necessary to open the main covers.

- 1) Under no circumstances start the equipment disassembly if it is pressurized.
- 2) Proceed by removing the screws and remove the inspection cover and the front cover (or SSV Actuator).



- 3) With a tool, hold the shaft to prevent it from rotating and through the bottom access remove the shutter screw.



- 4) Remove the shutter assembly and change the gasket like pictures below.



To assembly, just follow the steps of the disassembly procedure in inverse order.

TOOLS	DIMENSIONS
ALLEN HEX TOOL	5mm, 8mm
SCREW WRENCH	12 mm