

**INSTALLATION & OPERATION MANUAL
PRESSURE REGULATOR VALVE
MODEL ARES N**



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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.

2 – 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 equipment 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, although not completely inclusive, provide guidance on possible sources of risk to safety and health.

2.1 – 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.

2.2 – 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.

When necessary (underground installations or internal area), it should be installed a vent piping from thread connection on spring cover or diaphragm chamber of regulator or pilot, which should be extended and positioned in a safety place, with the outlet vent protected to avoid rain water and little particles that can obstruct the venting.

For fuel gas applications with density greater than 1.0 (as Propane) it is recommended that the gas have breather to atmosphere where don't exist gas accumulation, as low places and distant of the flame, other devices etc.

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2.3 – 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 apertures.

2.4 – 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 depressurized. 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.

3 – INTRODUCTION

The pressure regulator series ARES N is self operated type, designed for gases distribution with low pressure, for commercial and industrial applications, with main characteristics easy operation and maintenance.

4 – PRINCÍPIO DE OPERAÇÃO

The pressure regulator series ARES N works by principle of direct spring action against sensor element of outlet pressure (diaphragm). The consumption variation and consequently change of pressure in the sensor element (diaphragm) will change diaphragm position and diaphragm lever that acts the obturator shaft, increasing or decreasing the valve passage in order to keep the outlet pressure constant.

In case of flow absence, the consequently outlet pressure increase is transmitted to the diaphragm resulting in this upward movement; it will change lever position and shaft that will decrease the gas passage.

With gas consumption the opposite will happen and will open the main valve.

5 – CHARACTERISTICS

- ✓ Connections: Thread 3/4" or 1" NPT according to ANSI B2.1 or BSP DIN ISO 228;
- ✓ ARES N: with internal relief and with or without slam shut valve incorporated.

6 – INSTALLATION

6.1 – Filter

We recommend the installation of a basket filter with 150mesh (minimum), as close as possible to the regulator input, without being joined flange to flange, because the filter 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.

6.2 – Cleaning

Check piping cleaning before the installation of the regulator. We recommend a complet purge of the line with nitrogen or compressed air.

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6.3 – Flow Direction and Assembly Options

Check the flow direction of the regulator before the installation.

There are two options of installation in the schemes below with different kind of slam shut-off valves.

In case of dirty gas, the pressure regulator can be supplied with an exclusive filter to the pilot.

The sensor piping (TS) installed in a point without turbulence or distant of changing in flow direction.

6.4 – Sensing Line

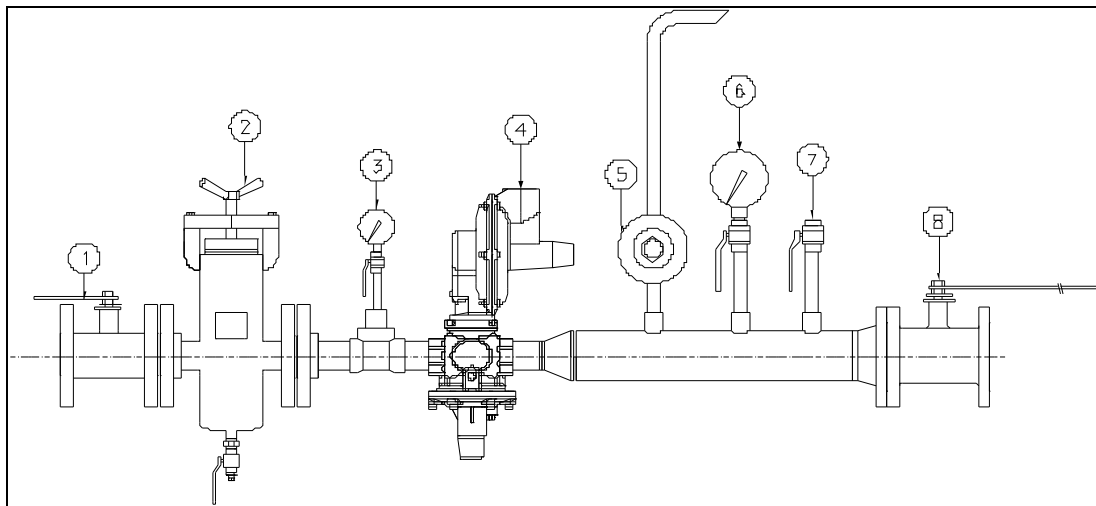
When necessary; connector for tube of 3/8”.

6.5 – Purge Valve

Install purge valve downstream of regulator.

6.6 – Other important devices for a safety installation

1. On-Off Valve (Ball valve)
2. Filter with drain
3. Upstream gauge manometer
4. Ares N pressure regulator
5. Partial pressure relief valve – JR LP
6. Downstream gauge manometer
7. Purge valve
8. On-Off Valve (Ball valve)



7 – OPERATION / START-UP

7.1 – Start Up procedure for Pressure Regulator WITHOUT Slam Shut Valve Incorporated

- ✓ Release totally the regulating spring of pressure regulator. The access is done through the respective cover in spring housing.
- ✓ Open slowly the Upstream On-Off valve up to 20%, with the purge valve opened around 20%.
- ✓ Reduce slowly the purge valve opening up to flow gas stabilization. Open totally the Upstream On-Off Valve.
- ✓ Close totally the purge valve to check tightness of regulator.
- ✓ Open the purge valve 20%, adjust the set pressure using the regulating screw.
- ✓ Close the purge valve, open slowly the downstream On-Off valve doing a thin adjustment in set pressure.

7.2 – Start Up procedure for Pressure Regulator WITH Slam Shut Valve Incorporated

- ✓ Release totally the regulating spring of pressure regulator. The access is done through the respective cover in spring housing.

- ✓ Tight the slam shut spring range around 70%.
- ✓ Reset the slam shut valve pulling up the shaft (regulating screw) inside of spring housing. It is done after a "light click" sound.
- ✓ Open slowly the Upstream On-Off valve with the purge valve opened around 20%.
- ✓ Reduce slowly the purge valve opening up to process flow stabilization; open slowly the upstream On-Off valve.
- ✓ Close totally the purge valve to verify the tightness of regulator.
- ✓ Open the purge valve around 20%; adjust slowly the regulator set pressure.
- ✓ 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.
In the next step the pressure regulator should be adjusted.
- ✓ Open the downstream On-Off valve and adjust the pressure regulator if necessary.

8 – TROUBLESHOOTING

<u>Defect</u>	<u>Cause</u>	<u>Correction</u>
Outlet pressure decreasing	Saturated filter element	Check the filter and clean the filter element.
	Insufficient flow	Check the valve sizing and change the orifice (seat) if necessary. Check the downstream pipe size.
Outlet pressure increasing Direct Gas passage through the valve	Presence of particles between seat and obturator	Release the screws of intermediary body and remove the regulator of the body valve. Check obturator and seat. Clean or change the parts.
Gas passage through the vent	Diaphragm rupture or presence of particles in the relief set	Release slowly the regulating screw and remove the spring. Release the cover screws, remove the diaphragm and clean or change it.
Slam shut valve blocking	Outlet pressure gradual increasing	Check the slam shut seat; change it. Fix the seat in the body, remove the excess of grease.
	Direct gas passage through the valve	Check shaft o'rings and change it if necessary.
		Check the slam shut valve obturator and change it if necessary.

9 – 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.

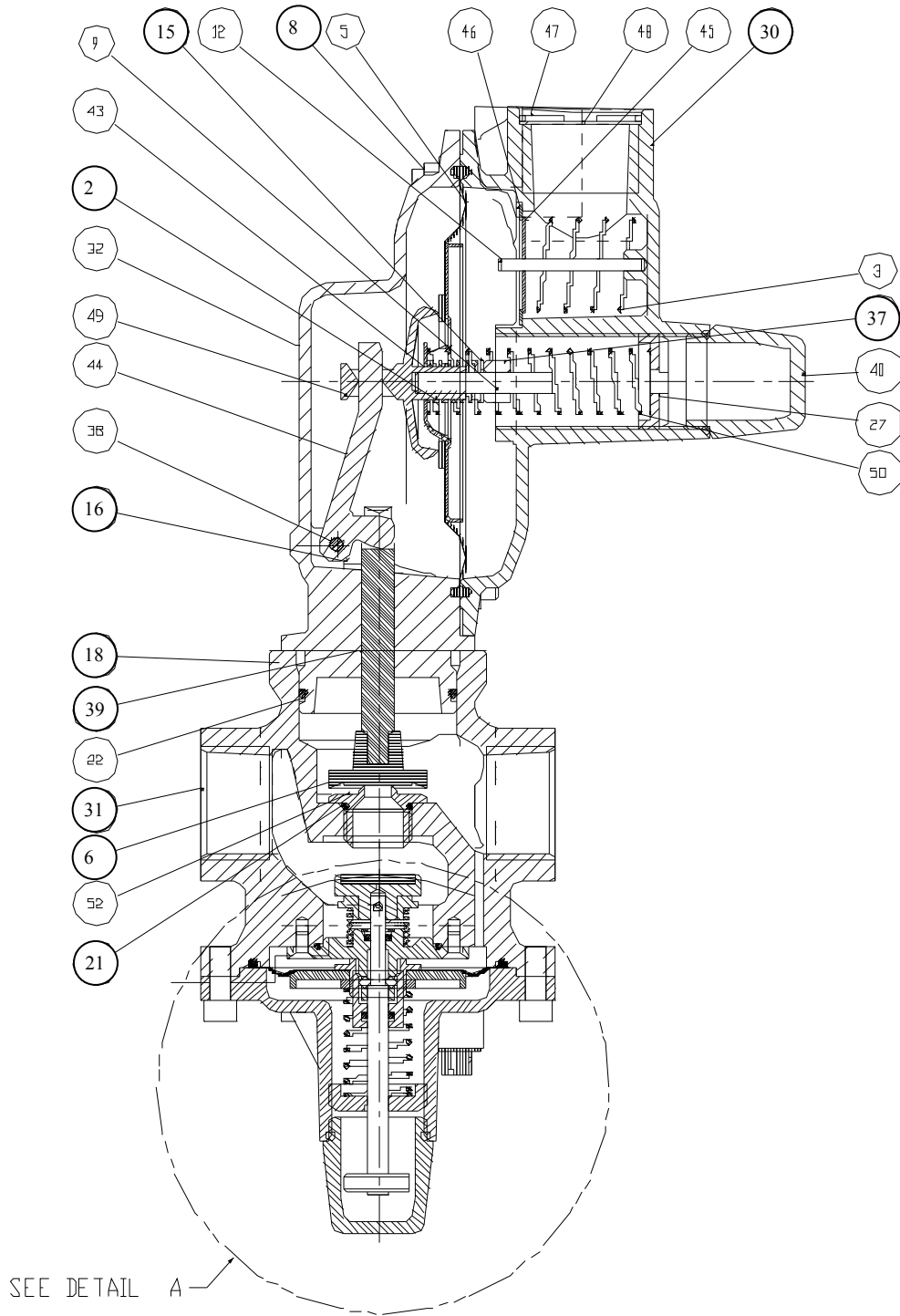
To present warranty is not valid if it is found that the defect or mishap was caused by accident, normal wear, inadequate installation, improper maneuvering or use, inadequate storage, assembly disregarding technical standards or if the buyer undertook repairs or changes in equipment by himself, without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

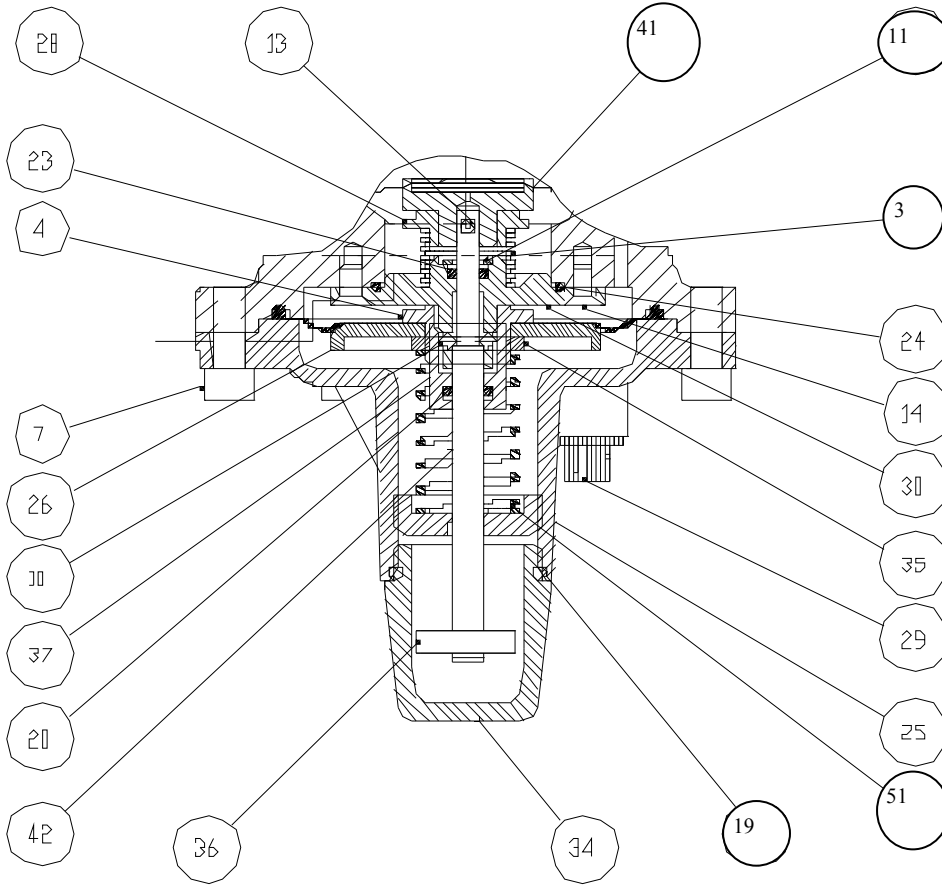
The information contained in this manual contains GASCAT's supply conditions, independently of the verified performance.

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. withholds the right to make changes without notice, introducing improvements in the described products drawings or specifications.

10 – DRAWING AND COMPONENTS





DETAIL A
 SCALE 1:1

ITEM	QTY.	DESCRIÇÃO / DESCRIPTION	MATERIAL	REFER.	OBSERVATION
1	1	MOLA DE REGULAGEM / ADJUSTMENT SPRING	DIN 17.223 CLASS C	01.51.87P	-
2	1	MOLA DE ALÍVIO / RELIEF SPRING	DIN 17.223 CLASS C	01.52.01	YELLOW DICHROMATE
3	1	MOLA DO VENT / VENT SPRING	DIN 17.223 CLASS C	01.52.05_50	YELLOW DICHROMATE
4	1	DIAFRAGMA / DIAPHRAGM	BUNA-N	04.51.47_50	
5	1	DIAFRAGMA / DIAPHRAGM	BUNA-N	04.51.82_50	
6	1	OBTURADOR / OBTURATOR	BUNA-N	04.51.83_50	
7	6	PARAFUSO / SCREW DIN912 - M6 x 1 x 16		05.50.18	CLASS 8.8 / BLACK OXIDATION
8	6	PORCA / NUT DIN934 - M5 x 0.8		05.52.62	CLASS 8.8 / YELLOW DICHROMATE
9	6	PARAFUSO / SCREW DIN912	CLASS 8.8 EN ISO 898-1 / PHOSPHAT COATING	05.53.97	M5 x 20
10	4	ESFERA 3mm / SPHERE 3mm	AISI 410	05.54.04	
11	1	ARRUELA / WASHER DIN125 M5 - 5.3 x 10 x 1	BRASS	05.54.20	
12	1	PINO / BOLT	BOLT DIN 7 FORM B	05.54.66_50	ZINC FINISH
13	1	PINO ELÁSTICO / SPRING PIN 2.15 x 10	REENO: 704.031	05.56.14P	SPRING STEEL / ZINC FINISH
14	6	PARAFUSO / SCREW DIN7991 M4 x 0.7 x 8		05.66.67	CLASS 8.8 / BLACK OXIDATION
15	1	ARRUELA / WASHER DIN125 M6 - 6.4 x 12.5 x 1.6		05.66.91	YELLOW DICHROMATE
16	2	PARAF. AUTO ATARR. / SELF TAPPING SCREW	MITTO COD. 33072	05.66.93	ALLOY STEEL / ZINC FINISH
17	1	PORCA PARLOCK / HEX. NUT PARLOCK DIN982			M6 x 1 - CLASS 8.8 / ZINC PLATED
18	4	PARAFUSO / SCREW DIN933	ISO 898-1 GR. 8.8 / PHOSPHAT PLATING	05.68.11	M5 x 16
19	2	O'RING 2.62 x 25.06	BUNA-N	06.49.55	PARKER 2-120
20	1	O'RING 1.78 x 6.07	BUNA-N	06.49.94	2-010
21	1	O'RING 1.78 x 17.17	BUNA-N	06.50.26	2-017
22	1	O'RING 2.62 x 40.94	BUNA-N	06.51.42	2-130
23	1	O'RING 1.78 x 4.47	BUNA-N	06.53.37	2-008
24	1	O'RING 1.78 x 33.05	BUNA-N	06.53.38	2-027
25	1	TAMPA / COVER	ALUMINUM SAE 306	10.00.01P_50	
26	1	PRATO / PLATE	POLYACETAL	10.00.03P_50	
27	2	PRESSIONADOR DA MOLA / SPRING ADJUSTER	POLYACETAL	10.00.04P_50	
28	1	SUPORTE DA MOLA / SPRING SUPPORT	POLYACETAL	10.00.05P_50	
29	1	PLUG / VENT PLUG	PLUG POLYETHYLENE	10.00.06P	ALLIANCE PFP-1/8
30	1	SUPORTE GUIA / GUIDE SUPPORT	BRASS HARDNESS 125-130HV	10.00.07P_50	
31	1	CORPO / BODY	GGG40	10.00.31	
32	1	TAMPA INFERIOR / UNDER COVER	A380 / ADC12	10.00.39	
33	1	TAMPA SUPERIOR / UPPER COVER	A380 / ADC12	10.00.40_50	
34	1	VISOR / VIEW FINDER	ACRYLIC / POLYCARBONATE	10.01.02P_50	
35	1	PORCA / NUT	ASTM B16 TM360	10.01.06P	
36	1	ARRUELA / WASHER	ASTM B16 TM360	10.01.08P	
37	1	GUIA DA HASTE / SHAFT GUIDE	ASTM B16 TM360 HARD / MIDDLE HARD	10.01.26P_50	
38	1	PINO / PIN	PIN DIN 7 FORM C	10.01.38P_50	
39	1	HASTE / STEM	POLYACETAL	10.01.39_50	
40	1	VISOR / VIEW FINDER	ACRYLIC / POLYCARBONATE	10.01.44_50	
41	1	OBTURADOR / OBTURATOR	ALUMINIO 6151T6 / BUNA-N 35-40 SHORE A	10.02.01P_50	
42	1	SHAFT / HASTE	AISI 410 ASTM A276 TYPE 410	10.02.05P_50	
43	1	PRATO / PLATE	SAE 1020	10.02.07P_50	
44	1	ALAVANCA / LEVER	SAE 1020	10.02.10_50	
45	1	DISCO / DISC	SAE 1020	10.02.11_50	
46	1	ARRUELA / WASHER	SAE 1020	10.02.12_50	
47	1	ANEL / RING	SAE 1020	10.02.13	
48	1	TELA / MESH	SAE 1020	10.02.14_50	
49	1	SUPORTE DO DIAFRAGMA / DIAPHRAGM SUPPORT	POLYACETAL / ASTM A29 GR 1020	10.20.03P_50	
50	1	MOLA REGULAGEM / ADJUSTMENT SPRING	SEE TABLE	SEE TABLE	
51	1	MOLA SHUT-OFF / SSV SPRING	SEE TABLE	SEE TABLE	
52	1	SEDE / SEAT	SEE TABLE	SEE TABLE	

SEDE / SEAT TABLE

ITEM	QTY.	DIAMETRO DA SEDE / SEAT DIAMETER	MATERIAL	REFER.	OBSERVATION
52	1	10 mm	ALUMINUM ASTM B26 A356	100132P 50	-
52	1	8 mm	ALUMINUM ASTM B26 A356	100132P 50	-
52	1	6 mm	ALUMINUM ASTM B26 A356	100132P 50	-
52	1	4 mm	ALUMINUM ASTM B26 A356	100132P 50	-

MOLA DA SHUT-OFF / SHUT-OFF SPRING TABLE

ITEM	QTY.	FAIXA DE REGULAGEM / SPRING RANGE	MATERIAL	REFER.	COR / COLOR
51	1	220 – 600 mbar	DIN 17223 CLASS C	01.51.90P	BRANCA / WHITE
51	1	80 – 280 mbar	DIN 17223 CLASS C	01.51.89P	AZUL / BLUE
51	1	50 – 120 mbar	DIN 17223 CLASS C	01.51.88P	MARROM / BROWN
51	1	25 – 70 mbar	DIN 17223 CLASS C	01.51.78P	AMARELA / YELLOW
51	1	10 – 40 mbar	DIN 17223 CLASS C	01.51.77P	CINZA / GRAY

MOLA DO REGULADOR / REGULATOR SPRING TABLE

ITEM	QTY.	FAIXA DE REGULAGEM / SPRING RANGE	MATERIAL	REFER.	COR / COLOR
50	1	105 – 540 mbar	SAE 1070	01.52.13	PRETA / BLACK
50	1	90 – 150 mbar	SAE 1070	01.52.12	MARROM / BROWN
50	1	70 – 100 mbar	SAE 1070	01.52.11	AMARELA / YELLOW
50	1	30 – 75 mbar	SAE 1070	01.52.10	LARANJA-CINZA / ORANGE-GRAY
50	1	22 – 35 mbar	SAE 1070	01.52.09	ZINCO / ZINC
50	1	5 – 15 mbar	SAE 1070	01.52.08	MARROM-LARANJA / BROWN-ORANGE
50	1	12 - 30 mbar	SAE 1070	01.52.07	CINZA / GRAY