

**INSTALLATION & OPERATION MANUAL
PRESSURE REGULATOR VALVE
MODEL GA-302-8**



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1 – PRE-COMMISSIONING INSTRUCTIONS

It must be clearly understood that the information given in the Commissioning Instructions that follows do not intend to revoke or substitute the instructions set by any pertinent entity. References will be made to applicable Standards and/or existing recommendations on the subject.

Before commissioning starts the execution of applicable “Cleaning and Purification Procedures” are implied, which are applicable to all instructions on “Pressurization” and the “Standards for Labor Health and Safety”, which shall be strictly adhered to.

Valve suppliers’ advices, such as: “open slowly”, or “open very slowly”, shall be strictly observed.

2 – HEALTH AND SAFETY

Regulators, valves and other pressurized components containing poisonous or flammable gases, or other hazardous products, are potentially dangerous if not correctly operated and maintained. It is mandatory that all users of such equipment are properly trained and guided on potential dangers, and assurance is necessary that all personnel responsible for installation, testing, commissioning, operation, and maintenance of the plant are qualified to do their jobs. Instruction manuals are provided to guide operators, but it is supposed that the same already have a basic knowledge level. If any doubt remains, or if there is ambiguity on the correct procedures, ask **Gascat** on the correct proceeding. We will be pleased to explain the corresponding instructions or provide the corresponding service. **TAKE NO RISKS**. Our telephone, fax number and e-mail follows:

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The comments below, although abridged, provide guidance on possible hazards to health and safety.

2.1 – NOISE

Regulators, valve and other pressure reducers may generate high noise levels, which can be harmful to person exposed to them for long time periods. Users shall assure themselves that appropriate precautions are taken to provide safety to employees’ health and/or third parties, according to applicable standards and recommendations in force.

2.2 – INSTALLATION

All equipments, piping and vessels are designed to support mechanical stresses, as mechanical torque and bending moments, in addition to internal pressure. However, great care shall be taken during installation not to apply excessive strain that could cause cracks that may result in serious break down when the regulator is put into operation. Excessive stress can also be caused by unbearable length of piping, which should be appropriately supported.

All the regulators, shutoff valves, relief valves, etc., should be installed with 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 cause fatigue breaking. They should also be positioned in such manner that they cannot serve as support to feet or hands. Impulse lines shall have a slight slope for liquids and condensates drain towards the main piping.

Auxiliary systems should not be changed or modified without knowing the operation conditions and after permission of the responsible superior.

2.3 – OPERATION

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

All regulators, etc., shall operate with the regulating spring specified by the manufacturer. That is particularly important in relief or shutoff valves operation, since incorrect springs can hinder a relief valve to open, or a shutoff valve to close.

Precautions should be taken to avoid water from entering through venting and breathing apertures.

2.4 – MAINTENANCE

Regulators and valves restrain gases with pressures several times larger than the atmospheric pressure. Before trying to investigate any problem or performing maintenance service in the equipment, they should be safely depressurized. Furthermore, as most gases can be flammable, poisonous, corrosive, i.e. dangerous, it may be necessary to purge the installation with an inert gas, as nitrogen. Special precautions are necessary for operation with gases as oxygen or hydrochloric gas and the user shall be sure that appropriate procedures were implemented.

Eventually, it is not enough to isolate high-pressure device, since high pressures can be trapped downstream of the insulation valves. Do not try to remove covers, plugs, etc., before the item is properly freed. Even so, it is advisable to consider that high-pressure gas can be trapped when removing covers and plugs.

Most regulators use spiral springs as the loading device. It is important to reduce the load on these springs by moving their pressing device backward as much as possible. In some cases, a residual load may be left, even with the spring released to the end of its housing.

3 – INTRODUCTION

The pressure regulator model GA 302-8 is self-operated by a spring, designed for low pressure gas distribution, in commercial and industrial areas, and its main characteristic is ease of operation and maintenance.

4 – OPERATION PRINCIPLE

The GA 302-8 series pressure regulators operate by direct spring action on the outlet pressure sensing element (diaphragm) that, with consumption variation and the consequent pressure change on the sensor element, repositions the diaphragm and the articulated lever that actuates the shutter stem, increasing or decreasing the gas passage aperture through the valve, in order to keep constant the adjusted outlet pressure.

In case of flow absence, the consequent increase in outlet pressure is transmitted by the sensor tubing to the diaphragm base causing it to rise, making the articulated lever to move the stem, and, consequently, moving the valve shutter against the seat, closing the gas passage.

With consumption start, the inverse effect of flow absence will cause the passage opening, by decreasing of the output pressure on the lower diaphragm chamber, making the articulated lever to move the stem increasing the passage aperture through the regulator valve.

5 – CHARACTERISTICS

- ✓ FITTINGS:
 - ✓ flanged body 2" class 150# according to ANSI B.16.5
 - ✓ threaded body 1½" NPT or BSP (under request)
- ✓ MODEL GA302-8: With internal relief. The internal relief system allows venting the pressure excess to the atmosphere in case of direct passage or increase of output pressure, avoiding damages to the regulator or diaphragm rupture. The relief pressure is adjusted at the factory.

- ✓ MODEL GA 302-8-3: With incorporated over-pressure shut-off valve. Model GA 302-8-3 has incorporated a shut-off valve with the function of blocking gas flow if output rises, working as a safety.
- ✓ MODEL GA 302-8-4: Regulator with over-pressure shut-off and relief valve incorporated. This model offers double safety.
- ✓ MODEL GA 302-12-BLI: Obsolete.

6 – INSTALLATION

6.1 – Filter

We recommended the installation of a basket type or “Y” filter of 150 mesh (minimum), as close as possible to the regulator inlet. A careful filter installation is essential to the perfect operation of the equipment, because eventual particles existing in the piping can lodge themselves between the seat and the shutter, damaging them and provoking direct flow passage.

6.2 – GA 302-8/12-BLI Recommendation (Obsolete)

For model GA 302-8/12-BLI, we recommend to install the regulator with the spring cover for low in the case of outlet pressure $\leq 180\text{mmca}$.

6.3 – Cleaning

Check pipeline cleaning before the regulator installation. We recommended a complete purge of the line with nitrogen or compressed air.

6.4 – Flow Direction

Check the regulator flow direction before installation.

6.5 – Impulse Intake

When necessary install the impulse intake downstream of the pressure regulator ($\varnothing 3/8"$ tube fitting) according to installation drawings.

6.6 – Purge valve

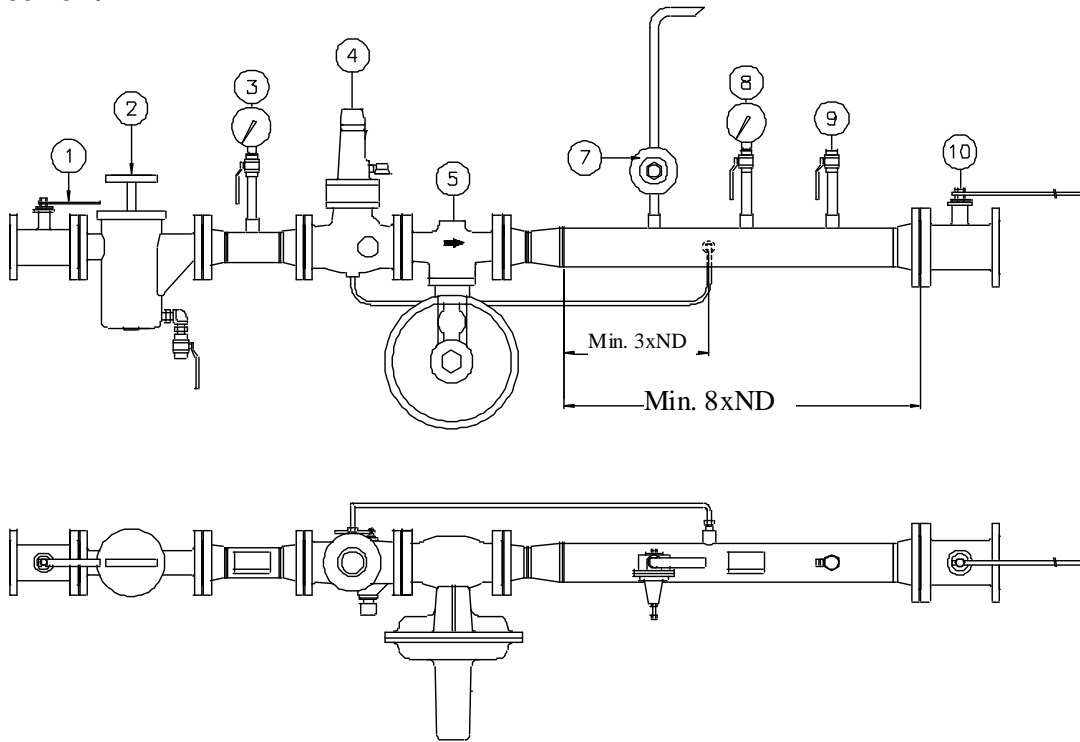
Install a purge valve downstream of the regulator (it can be provisory, only for adjustment).

6.7 – Other important devices for a safe installation (see ABNT NBR 12313)

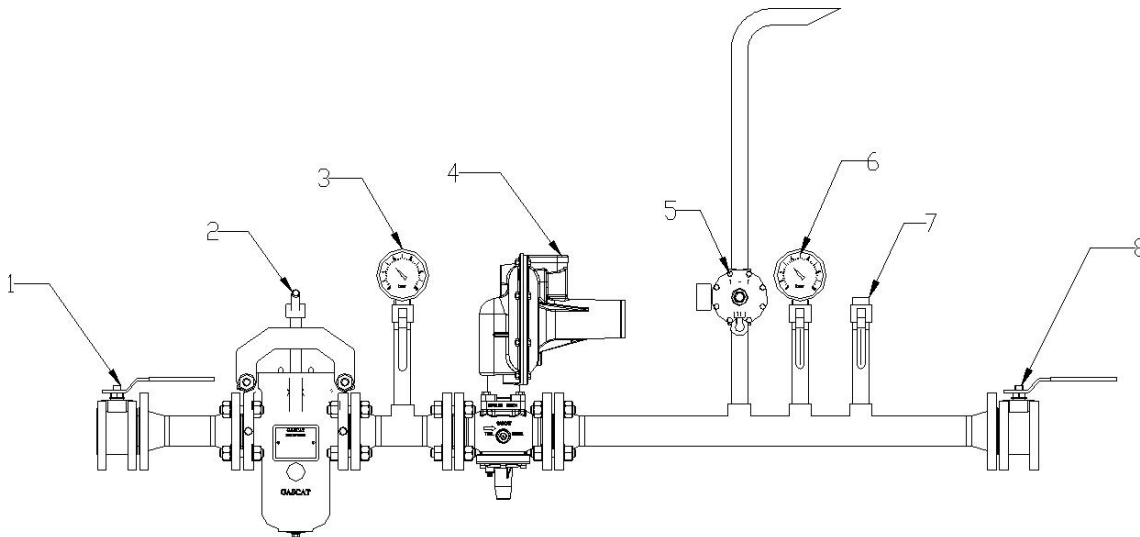
A safe installation shall contain, at least (see outline drawing proposed below):

1. Manual blocking valve (ball type, or similar).
2. Filter with drain.
3. Pressure gauge for input pressure reading.
4. Slam shut valve (GIPS-FC model).
5. Pressure regulator (GA-302-8).
6. Pressure regulator with incorporated shut-off (GA302-8 + G10).
7. Partial relief valve (Gascats Junior model).
8. Pressure gauge for output pressure reading.
9. Purge valve, $\varnothing 1/2"$.
10. Manual blocking valve (ball type, or similar).

**Recommended installation outline for regulator without incorporated slam shut valve.
 GA 302-8-1/2**



**Recommended installation outline for regulator with incorporated slam shut valve model G10.
 GA 302-8-1/2 + G10**



7 – OPERATION (START-UP)

7.1 – Start-Up Procedure of Regulators without Incorporated Shut-Off Valve

- ✓ Release completely the regulator pressure adjustment spring. Access to the spring in through the upper cap.
- ✓ Slowly open the gas inlet valve until 20% of total travel, with the purge valve opened about 20% of the total travel.
- ✓ Slowly reduce the purge valve opening until gas flow stabilizes. Open the gas input valve completely.
- ✓ 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.
- ✓ Open the purge valve by approximately 20% of the total travel; slowly adjust the required work pressure, by the regulating screw.
- ✓ Close the purge valve; slowly open the gas output closing valve, make pressure fine adjustment.

7.2 – Start-Up Procedure of Regulators with Incorporated Shut-Off Valve

- ✓ Release completely the regulator pressure adjustment spring.
- ✓ Press the shut-off 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 (for low pressure blocking valves IPS-L or JY-L obsolete versions) or by the regulating screw in the upper part of the cover (for high pressure blocking valves IPS-H, JY-H or **G10 → ACTUAL VERSION**).
- ✓ Reset the blocking valve (it usually leaves factory in the blocked position) by the reset lever in obsolete versions or with the internal shaft for G10 model.
- ✓ Slowly open the gas inlet valve until 20% of total travel, with the purge valve opened about 20% of the total travel.
- ✓ Slowly reduce the purge valve opening until gas flow stabilizes. Open the gas input valve completely.
- ✓ 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.
- ✓ Open the purge valve by approximately 20% of the total travel; slowly adjust the required work pressure, by the regulating screw.
- ✓ Adjust the shut-off valve.
- ✓ 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. This can be noticed by the reset lever rotation, for IPS model valves, or by the displacement, inside of the valve, of the reset stem for JY model valves.
- ✓ Close the gas input valve, open the purge valve, raise the reset lever, for IPS valve models or pull the stem for JY models, until the gas flows freely; release the pilot spring follower, reset the blocking valve as already described. Reset is noticed by a slight “click”.

8 – TROUBLESHOOTING

<u>Defect</u>	<u>Probable Cause</u>	<u>Solution</u>
Outlet Pressure decrease/insufficient flow	Dirt in filter	Verify the filter element. Provide cleaning or.
Outlet pressure increasing/direct passage	Presence of particles between shutter/seat	Release fixation screws of the regulator intermediate, remove the regulator from the body. Verify the shutter and seat state. Proceed cleaning or replacement, in case they have been damaged.
Gas passage through vent	Diaphragm rupture or presence of particles in the relief valve	Slowly unfasten the regulation screw, remove the spring. Release the screw from the top cover and remove the diaphragm. Proceed cleaning or replacement, in case they have been damaged.
Slam shut operation	Momentary increase of output pressure	Verify if cause is not in the equipment part after the regulator.
	Direct passage	Behave as described above.

9 – STORAGE

The regulators must not suffer mechanical impact, by risk of damage to internal components.
The regulators must be stored on a clean and dry place, protected from bad weather.

10 – GENERAL RECOMMENDATIONS

- ✓ We test all regulators and valves in the required operation conditions.
- ✓ The maintenance criteria and steps are contained in the manuals. Nevertheless, for any doubts relating to the use, operation or maintenance, contact Gascat Technical Department, which will give you proper advisement.
- ✓ Under request, Gascat may provide complete reposition kits.

11 – 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.

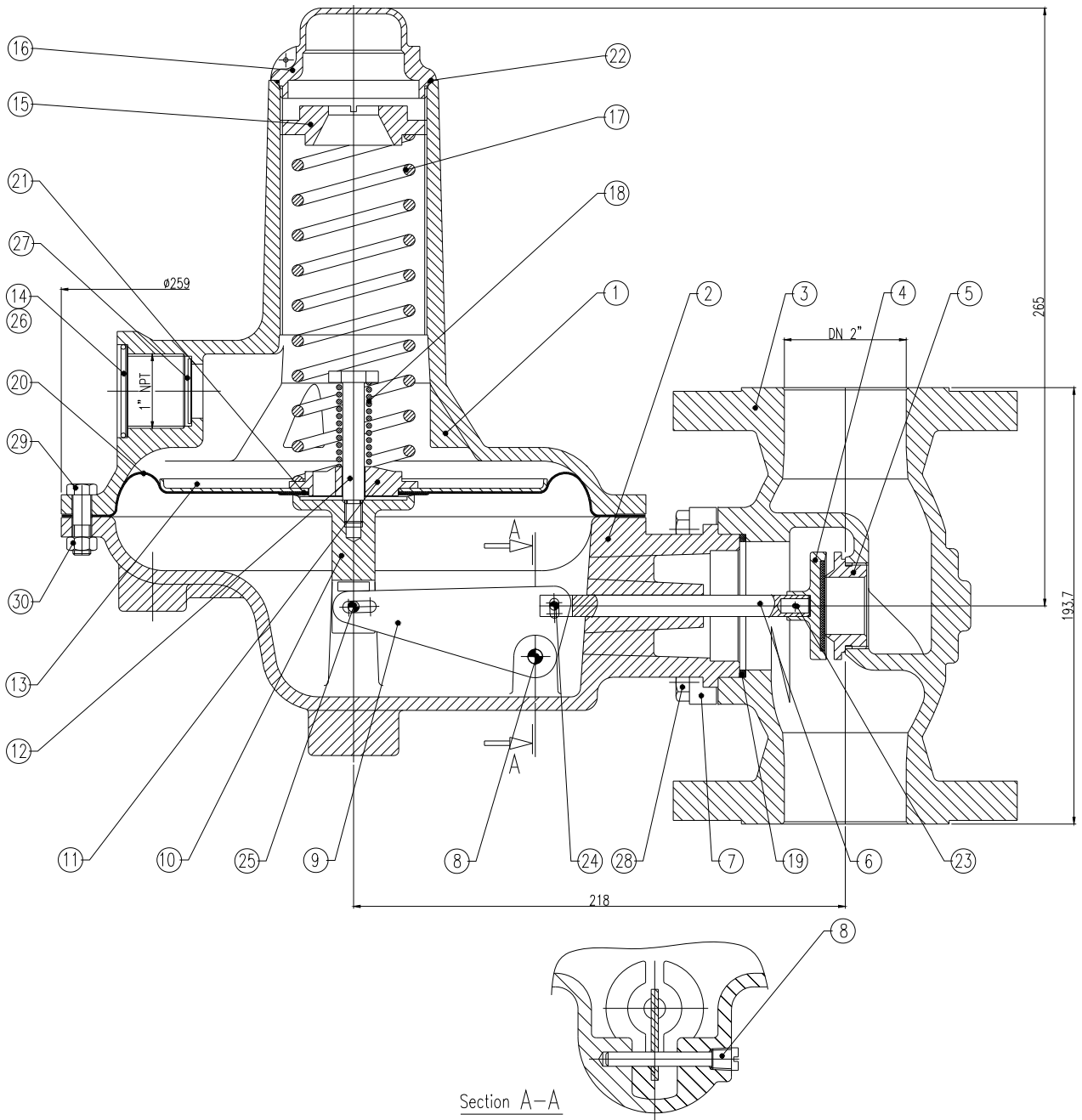
The information contained in this manual contains Gascat's supply conditions, independently of the verified performance.

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

Prepared by GCN	Verified by/Approved by VL	CSQ GN	Date 06/01/14	Rev. 07	Page 8 of 14
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12 – DRAWINGS AND COMPONENTS PARTS LIST



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Date
06/01/14

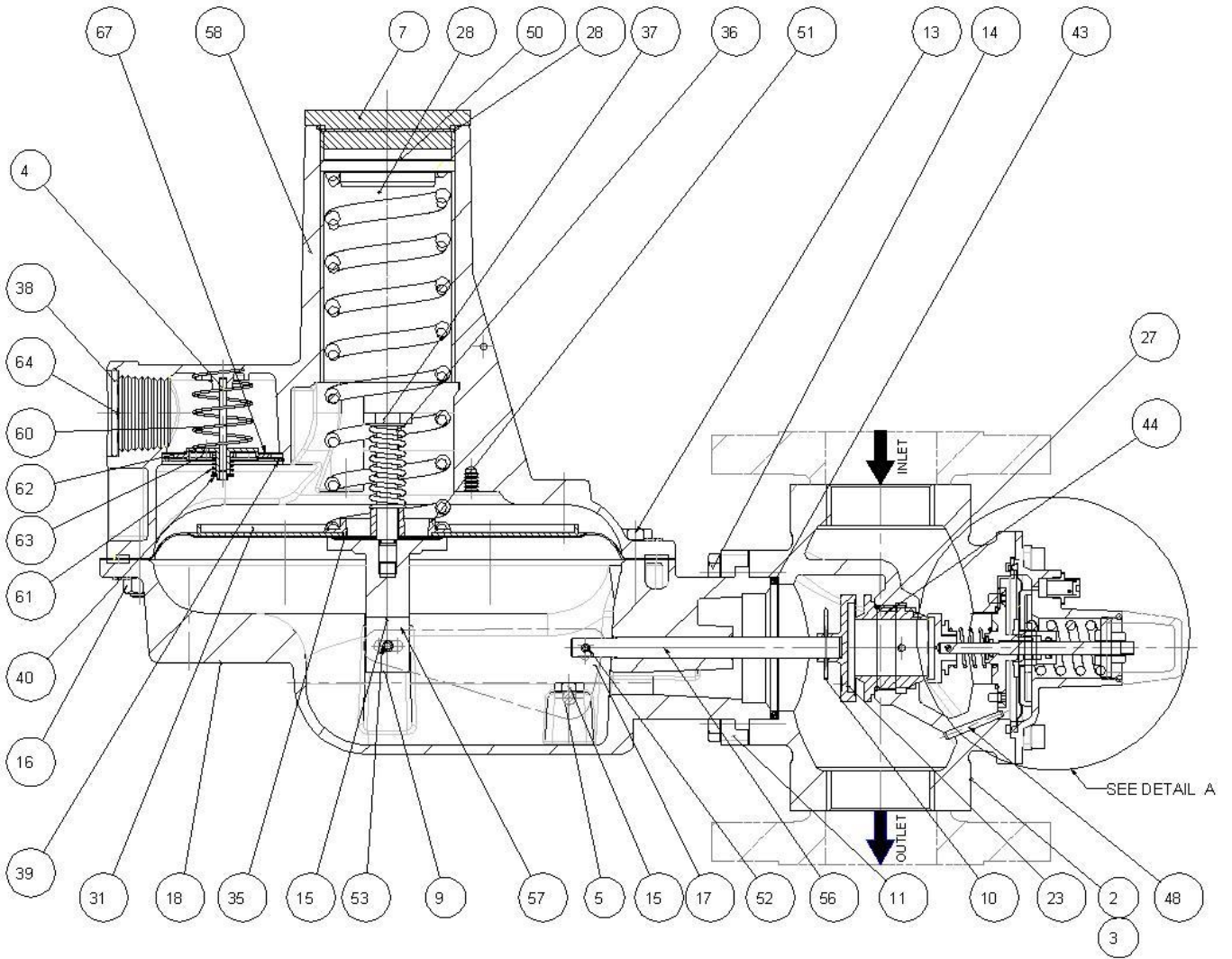
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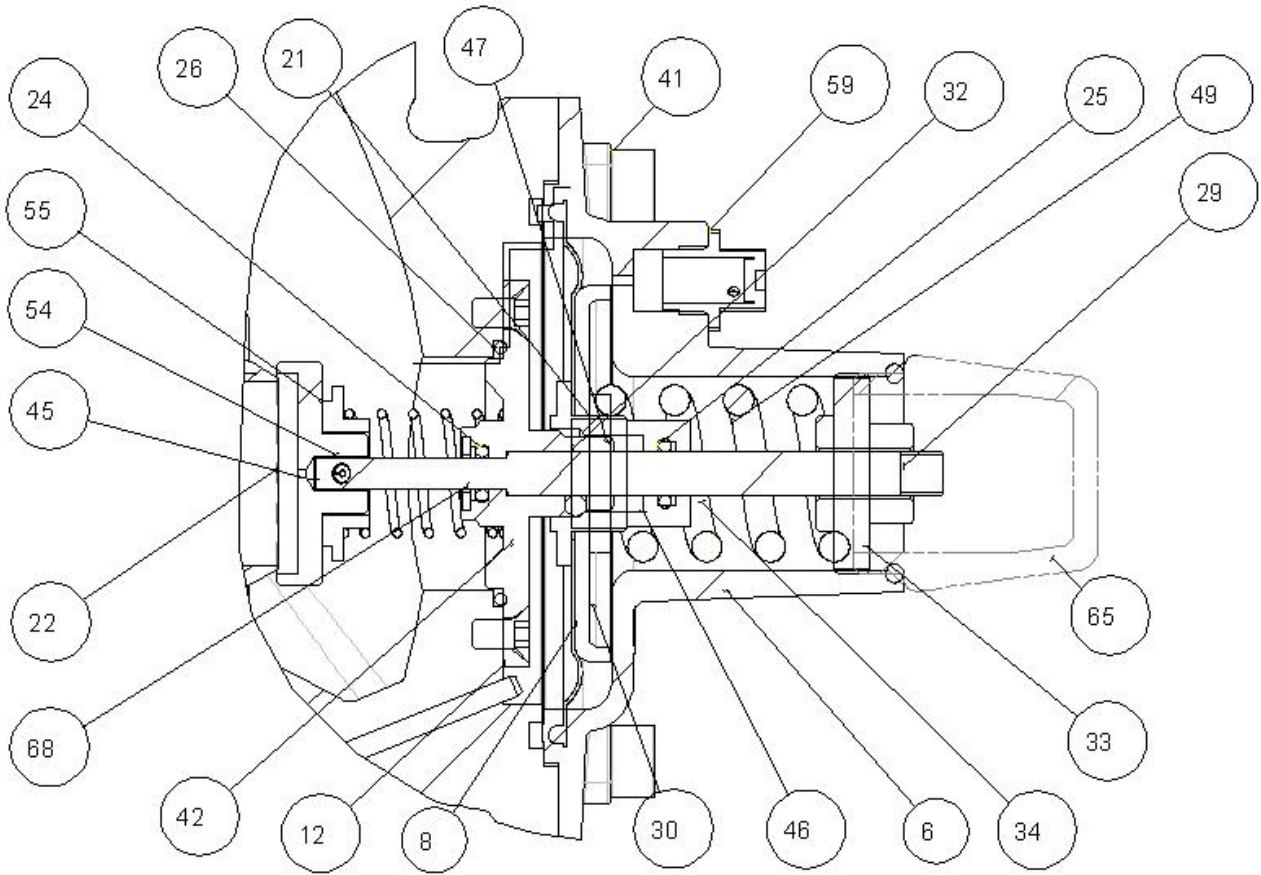
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MOD. GA 302-8-2 (with internal relief)

Pos.	Qty.	Description	Material	Drawing N°	Remarks
01	01	Top Cover	SAE 323	20.016.2	
02	01	Bottom Cap	SAE 323	20.015.2	
03	01	Body Ø 2"FLG 150#RF	NODULAR IRON	20.018.2	
● 04	01	10" Shutter	Aluminum /BUNA-N	20.056.4	
● 05	01	Seat	TM-360	20.053.4	
06	01	Lever Stem	TM-360	20.057.4	
07	04	CLAMPING PLATE	SAE 1020	20.058.4	
08	01	Lever Pin	Brass	05.002.4	
09	01	LEVER	SAE 1020	20.055.4	
10	01	Diaphragm Screw	SAE 323	20.060.4	
11	01	Spring Guide	SAE 323	05.059.4	
12	01	Guide Screw of Relief Spring	SAE 1020 BA	20.003.4	
13	01	Diaphragm Plate	SAE 1020 BA	20.054.4	
14	01	SCREEN	SAE 1020	07.001.4	
15	01	Spring Follower	SAE 323	20.019.4	
16	01	SEAL CAP	SAE 323	20.018.4	
17	01	REGULATING SPRING	SAE 1070	See Table	
18	01	RELIEF SPRING	SAE 1070	01.134.4	
● 19	01	TETRA SEAL	BUNA-N	04.007.4	
● 20	01	DIAPHRAGM	BUNA-N	04.006.3	
● 21	01	Rubber Ring	BUNA-N	04.037.4	
● 22	01	O'RING 2-038	BUNA-N	06.49.49	
23	01	Elastic Pin – Renno 701.019	Phosphatized Spring Steel	05.50.41	
24	01	Elastic Pin – Renno 701.074	Spring Steel	05.50.62	
25	01	Elastic Pin – Renno 701.119	Spring Steel	05.50.63	
26	01	SPRING RING	Spring Steel	05.50.71	
27	01	VENT FLAP	NYLON	04.038.4	
28	04	HEX HD SCREW 3/8"NC X 1"	Class 8.8	05.50.72	
29	08	HEX HD SCREW 5/16"NC X 1"	Class 8.8	05.50.70	
30	08	HEX NUT 5/16"NC	Class 8.8	05.50.67	

NOTE: (●) Denotes items of the spare parts kit





DETAIL A

●	44	1	SEAT SET	SEE TABLE	SEE TABLE	
●	43	1	SEAL RING		04.50.75	BUNA N 70±5 SH. A
	42	6	SCREW DIN 7991 M4X0,7X8	CLASS 8.8/ BLACK OXIDATION	05.66.67	
	41	6	SCREW DIN 912 M6X1X16	CLASS 8.8/BLACK OXIDATION	05.50.18	
	40	1	RETAINING RING	REENO 527.018.07/YELLOW DICHRMATE	05.66.86	SPRING STEEL
	39	1	RETAINING RING	REENO 508.050.07/YELLOW DICHRMATE	05.66.84	SPRING STEEL
	38	1	RETAINING RING	REENO 592.032.07/YELLOW DICHRMATE	05.66.83	SPRING STEEL
	37	1	RELIEF VALV SCREW	YELLOW DICHRMATE	05.50.65	SAE 1020
	36	1	RELIEF SPRING	YELLOW DICHRMATE	01.50.84	SAE 1070
	35	1	REGULATION SPRING 70-140 MBAR	ORANGE	01.50.61	SAE 1070
	34	1	REGULATION SPRING 50-120 MBAR	PAINTED BROWN	01.51.88P	DIN 17223 CLASS C
	33	1	PRESSIONADOR DA MOLA/ SPRING ADJUSTER		10.01.48	ALUMINUM
	32	3	POLISHED SPHERE	50 HRC	05.54.04	AINI 304
	31	1	PLATE	YELLOW DICHRMATE	20.02.34	SAE 1020
	30	1	PLATE		10.00.03P_50	POLYACETAL
●	29	1	O'RING PARKER 2-120	Ø2,62XØ25,06	06.49.55	BUNA N
●	28	1	O'RING 1,78XØ0,05	2-036	06.53.48	BUNA N
●	27	1	O'RING 1,78XØ4,65	2-028	06.49.06	BUNA N
●	26	1	O'RING 1,78XØ3,05	2-027	06.53.38	BUNA N
●	25	1	ORING 2-010	1,78XØ,07	06.49.94	BUNA N
●	24	1	ORING 2-008	1,78X4,47	06.53.37	BUNA N
●	23	1	OBTURATOR		20.11.69	ALUM. SAE306/BUNA N
●	22	1	OBTURATOR		10.02.01P_50	6151T6/BUNA N 35-40 SHORE A
	21	1	NUT		10.01.06P	ASTM B16 TM 360
	20	1	MOLA REG		01.50.89	
	19	1	MOLA REG		01.50.62	
	18	1	LOWER COVER		20.11.75	ALUMINUM DIN 60-ALSI 12
	17	1	LEVER	YELLOW DICHRMATE	20.02.36	SAE 1020
	16	8	HEX. NUT	5/16" UNC/YELLOW DICHRMATE	05.60.67	CLASS 8.8
	15	4	HEX. HEAD SCREW	1/4" UNC X 1/2" YELLOW DICHRMATE	05.66.82	ANSI B18 CLASS 8.8
	14	4	HEX. HEAD SCREW	3/8" UNC X 1" YELLOW DICHRMATE	05.60.72	ANSI B18 CLASS 8.8
	13	8	HEX. HEAD SCREW	5/16" UNC X 1" YELLOW DICHRMATE	05.60.70	ANSI B18 CLASS 8.8
	12	1	GUIDE SUPPORT		10.00.07P_50	BRASS HARDNESS 125-130HV
	11	4	FIXTURE		20.00.31	SAE 1020
	10	1	FIXTURE	YELLOW DICHRMATE	20.11.77	ASTMA29 GR. 1020
●	9	1	DIAPHRAGM STEM		20.11.73	ZAMAK
●	8	1	DIAPHRAGM		04.51.47_50	BUNA N
	7	1	COVER	ALLIANCE MO-10406	20.11.79	POLYETHYLENE
	6	1	COVER		10.00.01p_50	ALUMINUM SAE 306
	5	1	BOLT	ZINC FINISH	05.54.72	BOLT DIN 7 FORM B
	4	1	BOLT	ZINC FINISH	05.54.66	BOLT DIN 7 FORM B
	3	1	BODY ND 2" 150# RF	GGG40	20.11.85	GGG40
	2	1	BODY ND 1 1/2" NPT		10.00.13P_50	GGG40
	1	1	SEE TABLE			DIN 17 223- C
	Item	Qty.	Denomination	Dimensions/Observation	Code	Material

Note: Items marked with (●) are part of the maintenance kit.



Installation and Operation Manual
GA 302-8 Series – Pressure Regulating Valve

MI-05

67	2	WASHER	YELLOWDICHROMATE	20.02.35	SAE 1020
66	1	WASHER		10.01.49	ASTM B16 TM 360
65	1	VIEWFINDER		10.01.02P_50	ACRYLIC/POLYCARBONATE
64	1	VENT SYSTEM WIRE CLOTCH		20.11.76	BRASS WIRE CLOTCH
63	1	VENT SYSTEM SUPPORT		10.01.36P	POLIACETAL
62	1	VENT SYSTEM PISTON		10.01.34p	POLIACETAL
61	1	VENT SPRING	YELLOWDICHROMATE	01.52.06	DIN 17.223 CLASS C
60	1	VENT SPRING	YELLOWDICHROMATE	01.52.05	DIN 17.223 CLASS C
59	1	VENT PLUG	ALLIANCE PFP-1/8	10.00.06P	PLUG POLYETHYLENE
58	1	UPPER COVER		20.11.74	ALUMINUM DIN GD-ALSI 12
57	2	STOP	YELLOWDICHROMATE	05.51.50	SAE 1020
56	1	STEM		20.11.78	ASTM B-16 TM 360
55	1	SPRING SUPPORT		10.00.05P_50	POLYACETAL
54	1	SPRING PIN 2.15X10	SPRING STEEL/ZINC FINISH	05.56.14P	REENO: 704.031
53	1	SPRING PIN Ø4,9 X 28	REENO 701.119.07/YELLOWDICHROMATE	05.50.63	SPRING STEEL
52	1	SPRING PIN Ø3,8 X 12	REENO 701.074.07/YELLOWDICHROMATE	05.50.62	SPRING STEEL
51	1	SPRING GUIDE		20.11.71	ZAMAK
50	1	SPRING ADJUSTER		20.11.72	ZAMAK
49	1	SPRING ADJUSTER		10.00.04p_50	POLYACETAL
48	1	SPIRAL PIN 3X28	REENO 704.059.07/YELLOWDICHROMATE	05.66.85	SPRING STEEL
47	1	SHUTOFF REGULATION SPRING SET	SEE TABLE		
46	1	SHAFT GUIDE		10.01.26P_50	
45	1	SHAFT		10.02.05P_50	AISI 410/ASTM A276 TYPE 410
Item	Qty.	Denomination	Dimensions/Observation	Code	Material

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