Gascat **–** Indústria e Comércio Ltda

JR – LP/A/B/HP/HPE/CH Series - Relief Valve

Installation, Maintenance and Operation Manual

CONTENTS

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 out by any relevant entity, and reference should be made to the relevant Standards and/or existent recommendations on the subject.

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

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

2 – HEALTH AND SAFETY

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, testing, commissioning, operation, and maintenance of the plant are properly skilled 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*** Indústria e Comércio Ltda., 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.

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 standards and recommendations in force.

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 breakdown. They should also be positioned so that they cannot serve as support to feet or hands. Impulse lines should have a slight slope 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.

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 opened 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.

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

2.4 – MAINTENANCE

Regulators and valves contain gases under pressure 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. Furthermore, 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

Partial relief self-operated valve 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.

This valve was developed with the purpose of facilitating its maintenance, or parts substitution, as much as possible. Therefore, because of its top entry characteristic, there is no need to remove the valve from the line for maintenance or just cleaning. The Junior Series relief valves are also known for their small weight, constructive simplicity and excellent accuracy of relief setpoint (± 2,5%).

With a design intended to protect against unwanted triggering of automatic blocking devices (shutoff valves) in gas pressure reducing or regulating and measurement stations, or in applications where a safety device is needed to deal with “temporary” pressure increases.

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.

4 – OPERATING PRINCIPLE

The pressure relief valve mode JR, operates when the line pressure increases above the adjusted setup pressure, gradually opening gas passage though the shutter / seat.

5 – CHARACTERISTICS

- ✓ FITTINGS:
  - o JR LP is available with NPT thread in ¾” x 1’’, 1’’ x 1”, and 2” x 2 ½” sizes;
  - o JR CH is available with NPT thread ¾’’ x ¾’’ and 1’’ x 1’’ sizes;
  - o Jr A, B, HP & HPE (all obsolete versions) are available with NPT thread in ½”, ¾”, ¾” x 1” and 1” NPT sizes and with ANSI B.16.5 flanges in ½”, ¾” and 1” 150# sizes.
- ✓ Self-operated
- ✓ Fail-safe in closed position
- ✓ Topy Entry

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 – Cleaning

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

6.3 – Flow Direction

Check the flow direction engraved in the valve body before installation. The Junior Relief regulator can be installed in any position.

7 – OPERATION AND PRESSURE ADJUSTMENT (START-UP)

- ✓ Turn the regulating screw close to the final extent of its travel.
- ✓ Adjust the inlet pressure in the valve line to the specified relief pressure (a minimum of 10% above the normal operating pressure).
- ✓ Check if the valve has any leak. In affirmative case, increase the setup pressure with the regulating screw.
- ✓ Slowly reduce the adjusted pressure, until the relief opening starts.
- ✓ Reduce the input pressure in the valve line to the normal operation pressure confirm the relief closure.
- ✓ Repeat at least twice the adjustment point check and the valve tightness, in order to evidence its perfect operation and the valve repeatability.

Note: We recommended that the adjusted relief pressure shall be, at least, 5% above the pressure of the regulator closing (SG), considering the accuracy group of the same.

8 – MAINTENANCE

Defect	Probable Cause	Solution
Gas passage / direct gas passage.	Particles between orifice and valve or worn valve gasket.	Open Cover and verify the Valve and Orifice, if any of them is damaged, proceed with its/their substitution.
Gas passage through the cover vent	Diaphragm rupture.	Open Cover. Remove the Diaphragm. If it's damaged, proceed with its substitution.

9 – 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.

10 – GENERAL RECOMMENDATIONS

- ✓ We test our regulators and valves at the requested operation conditions.
- ✓ 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 provide you proper guidance.
- ✓ Gascat supplies, on request, a complete replacement kit.

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.

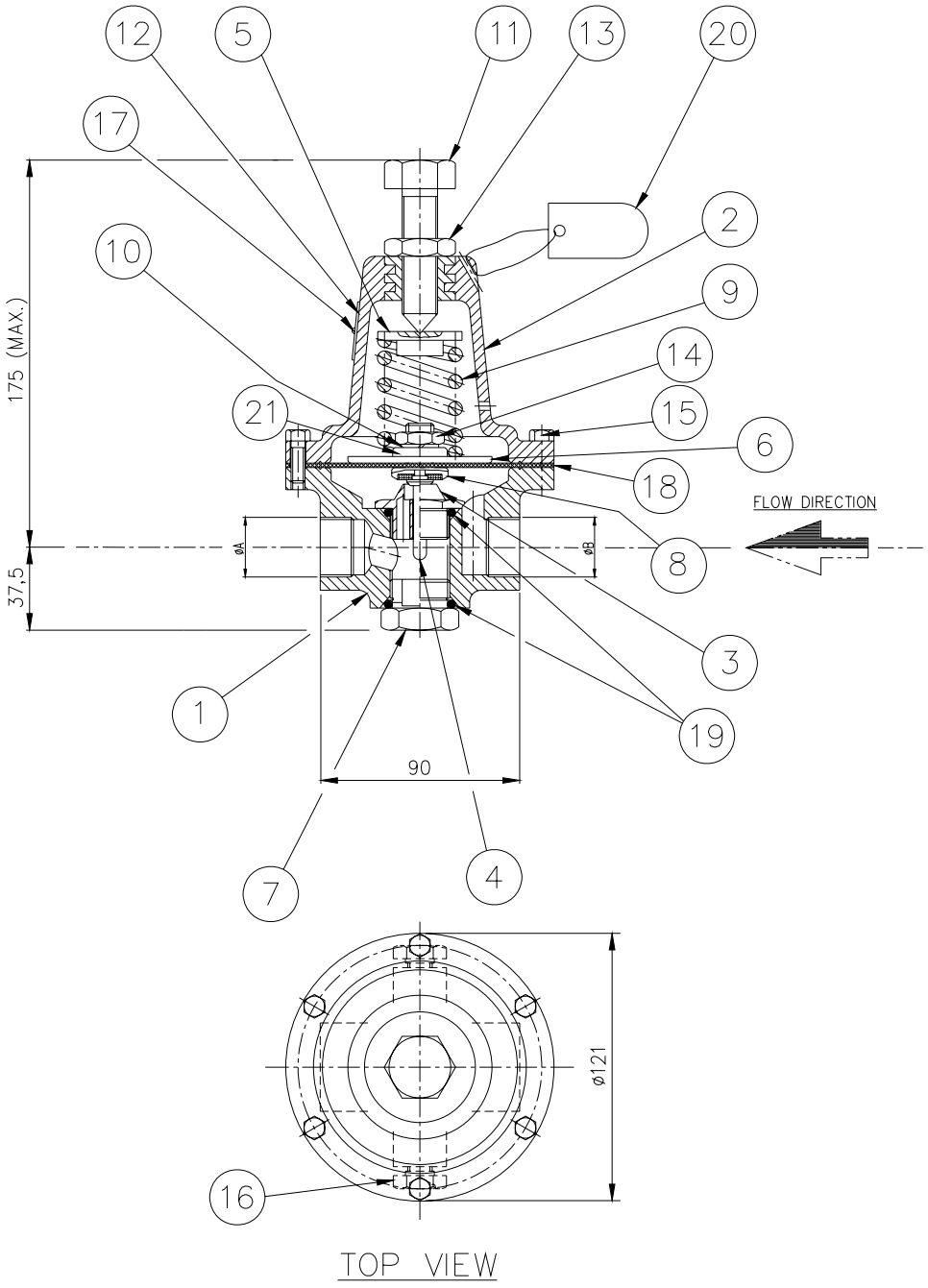
To present warranty is not valid if it is found that the defect or mishap was caused by accident, normal wear, inadequate installation, improper maneuvering or use, inadequate storage, assembly disregarding technical standards or if the buyer undertook repairs or changes in equipment by himself, without 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. and Com. Ltda. holds the right to make changes without notice, introducing improvements in the described products drawings or specifications.

JR-A/B/HP - RELIEF



TOP VIEW

JR-A/B/HP – RELIEF (COMPONENTS)

ITEM	QTY.	DESCRIPTION	DRAWING	MATERIAL	REMARKS
1	1	BODY	21.003.2	ALUMINUM	
2	1	COVER	21.005.3	SAE–323	
3	1	ORIFICE	21.013.4	AISI–316	
4	1	SHAFT	21.012.4	AISI–410	
5	1	SPRING FOLLOWER	21.010.4	CARBON STEEL	YELLOW DICHROMATE
6	1	DIAPHRAGM PLATE	21.009.4	BRASS	
7	1	PLUG	21.011.4	ALUMINUM	
8	1	VALVE	21.003.4	BRASS/BUNA	VULCANIZED
9	1	REGULATING SPRING	–	SAE–1070	SEE TABLE
10	1	WASHER	–	CARBON STEEL	YELLOW DICHROMATE
11	1	REGULATING SCREW	21.014.4	CARBON STEEL	YELLOW DICHROMATE
12	1	NAMEPLATE	–	ALUMINUM	
13	1	NUT 5/8"W	–	CARBON STEEL	YELLOW DICHROMATE
14	1	NUT 1/2"W	–	CARBON STEEL	YELLOW DICHROMATE
15	6	HEX. HEAD SCREW 1/4"Wx3/4"	–	CARBON STEEL	YELLOW DICHROMATE
16	2	PLUG	–	BRASS	
17	2	RIVET	–	CARBON STEEL	
18	1	DIAPHRAGM	04.001.4	BUNA–N	SEE TABLE
19	2	O'RING	–	BUNA–N	ø26,57 x ø3,53
20	1	TAG NAMEPLATE		STAINLESS STEEL	
21	1	SPRING GUIDE	21.030.4	NYLON	*

NOTE

SPARE PARTS

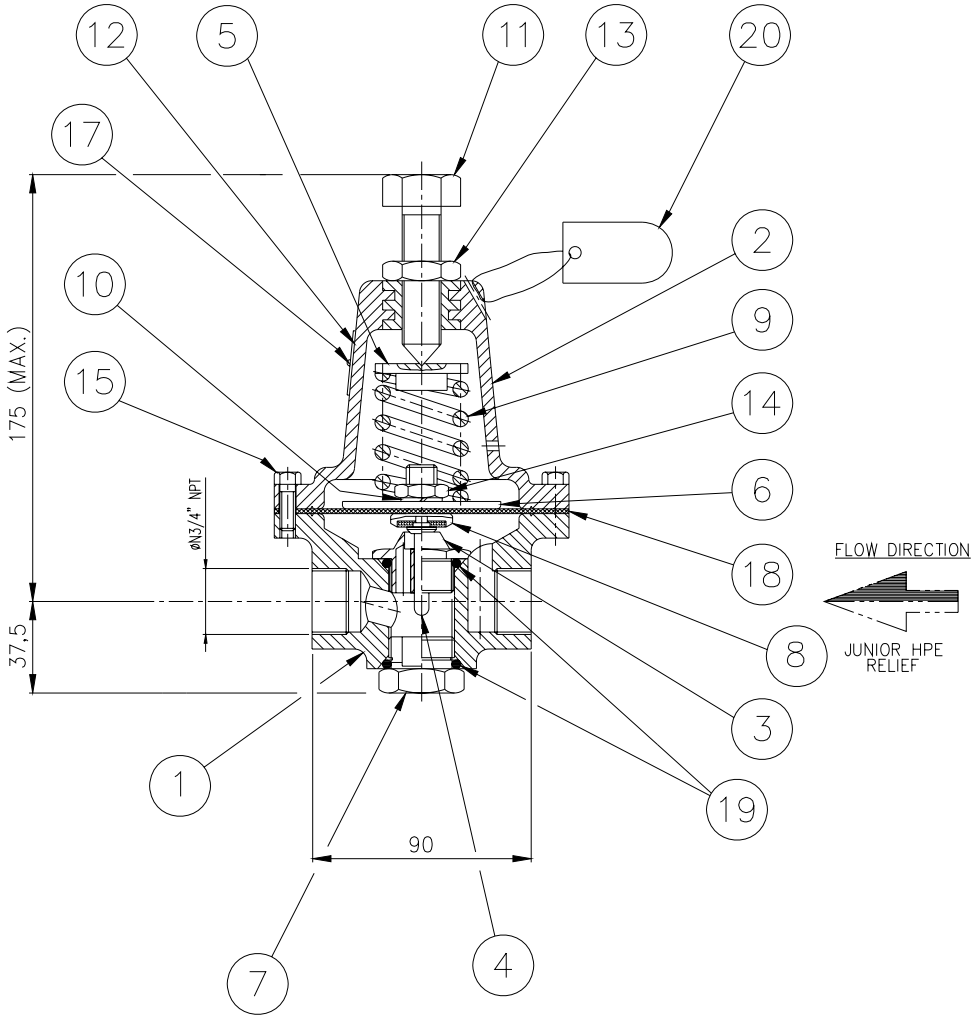
* ONLY FOR JR–B – RELIEF

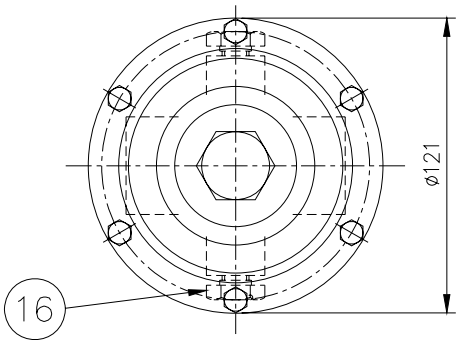
SPRING RANGE		CODE
JUNIOR A	0,9 – 7,0 bar	01.49.37
JUNIOR B	0,2 – 1,0 bar	01.49.38
JUNIOR HP	2,0 – 12,0 bar	01.49.28

DIAPHRAGM		CODE
JUNIOR A	THICKNESS 2,0 mm	04.49.36
JUNIOR B	THICKNESS 0,8 mm	04.49.37
JUNIOR HP	THICKNESS 2,0 mm	04.49.36

BODY				
REFERENCE	MATERIAL	ORIGIN	øA	øB
21.00.02	BRONZE	21.04.02	3/4"NPT	3/4"NPT
21.00.03	CARBON STEEL	21.04.03		
21.00.04	ALUMINUM	21.04.04		
21.00.09	CF8M	21.04.09		
21.00.01	CAST IRON	21.04.01		
21.00.26	BRONZE	21.04.02	1"NPT	1"NPT
21.00.08	CARBON STEEL	21.04.03		
21.00.30	ALUMINUM	21.04.04		
21.00.35	CF8M	21.04.09		
21.00.29	CAST IRON	21.04.01		
21.00.02E	BRONZE	21.04.02	1/2"NPT	1/2"NPT
21.00.03E	CARBON STEEL	21.04.03		
21.00.23	CAST IRON	21.04.01		
21.00.27	CF8M	21.04.09		
21.00.28	CAST IRON	21.04.01	1"NPT	3/4"NPT

JR-HPE – RELIEF





TOP VIEW

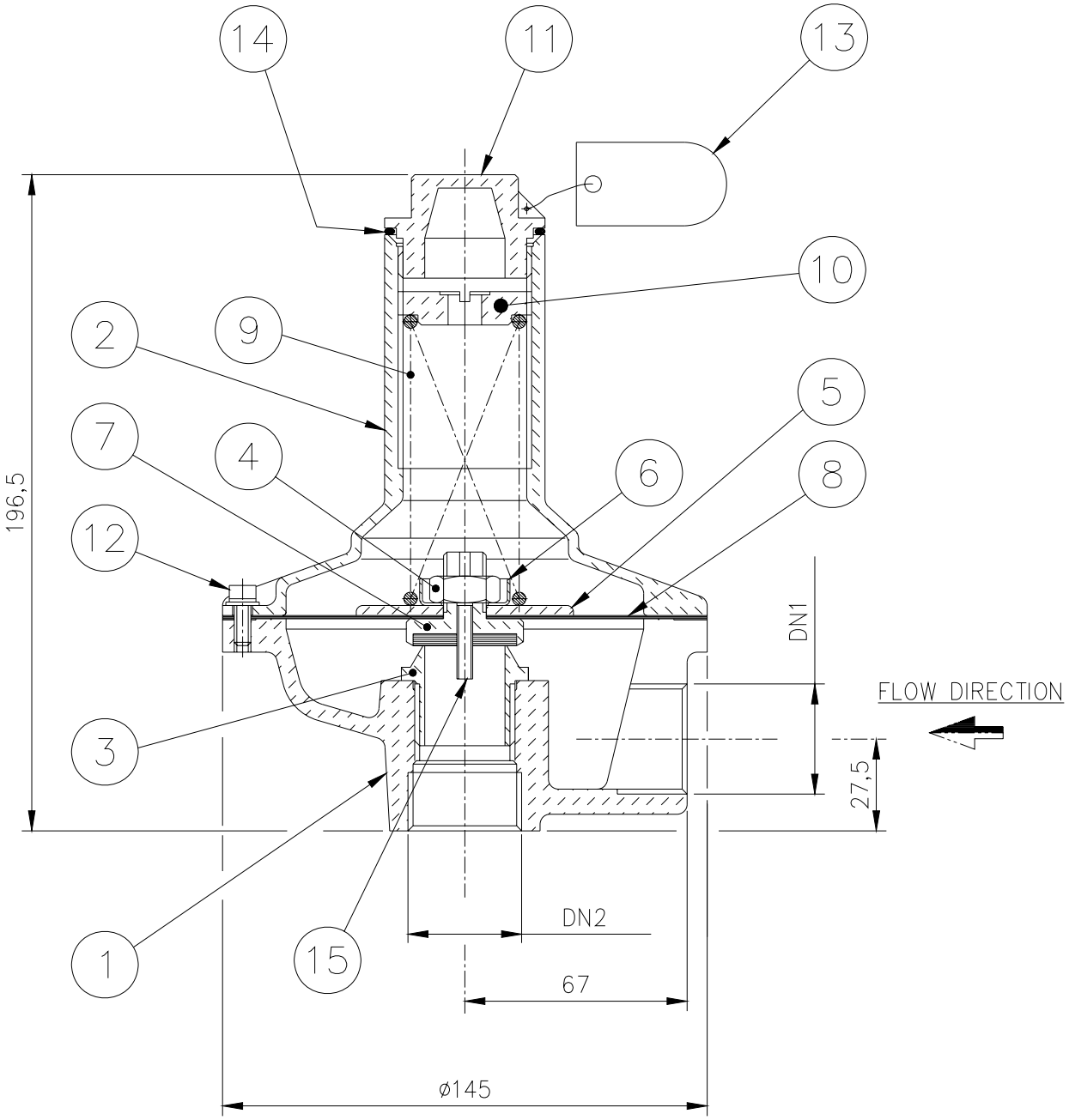
JR-HPE – RELIEF (COMPONENTS)

ITEM	QTY.	DESCRIPTION	DRAWING	MATERIAL	REMARKS
1	1	BODY	21.003.2	ALUMINUM	
2	1	COVER	21.005.3	SAE–323	
3	1	ORIFICE	21.013.4	AISI–316	
4	1	SHAFT	21.012.4	AISI–410	
5	1	SPRING FOLLOWER	21.010.4	CARBON STEEL	YELLOW DICHROMATE
6	1	DIAPHRAGM PLATE	21.009.4	BRASS	
7	1	PLUG	21.011.4	ALUMINUM	
8	1	VALVE	21.003.4	BRASS/BUNA	VULCANIZED
9	1	REGULATING SPRING	01.49.38	SAE–1070	
10	1	WASHER	–	CARBON STEEL	YELLOW DICHROMATE
11	1	REGULATING SCREW	21.014.4	CARBON STEEL	YELLOW DICHROMATE
12	1	NAMEPLATE	–	ALUMINUM	
13	1	NUT 5/8" W.	–	CARBON STEEL	YELLOW DICHROMATE
14	1	NUT 1/2" W.	–	CARBON STEEL	YELLOW DICHROMATE
15	6	HEX. HEAD SCREW 1/4"W. x 3/4"	–	CARBON STEEL	YELLOW DICHROMATE
16	2	PLUG	–	BRASS	
17	2	RIVET	–	CARBON STEEL	
18	1	DIAPHRAGM	04.49.36	BUNA–N	THICK. 2,0 mm
19	2	O'RING	–	BUNA–N	ø26,57 x ø3,53
20	1	TAG NAMEPLATE		STAINLESS STEEL	

NOTE

● SPARE PARTS

JR-LP – RELIEF


14
11
13
10
2
9
5
7
4
6
8
12
196,5
DN1
FLOW DIRECTION
3
27,5
DN2
1
15
67
ø145

JR-LP – RELIEF (COMPONENTS)

ITEM	QTY.	DESCRIPTION	DRAWING	MATERIAL	REMARKS
1	1	BODY	21.002.3		See table 1
2	1	COVER	21.011.2	SAE–323	
3	1	ORIFICE	21.019.4	BRASS	
4	1	NUT – 1/2"W	05.49.41	SAE–1020	YELLOW DICHROMATE
5	1	DIAPHRAGM PLATE	21.009.4	.	
6	1	SPRING GUIDE	21.002.4	BRASS	
7	1	VALVE	21.001.4	BRASS/BUNA	VULCANIZED
8	1	DIAPHRAGM (DRW. 04.001.4)	04.50.61	BUNA N	
9	1	REGULATING SPRING	SEE TABLE 2		PAINTED
10	1	SPRING FOLLOWER	21.022.4	BRASS	PAINTED
11	1	TOP COVER	21.023.4	SAE 323	
12	6	ROUND HEAD SOCKET SCREW	05.49.24	ABNT EB 168	YELLOW DICHROMATE
13	1	TAG NAMEPLATE	.	STAINLESS STEEL	
14	1	O'RING	06.49.72	BUNA N	
15	1	INSPIRATOR (TUBE)		COPPER	ø3/8"X22

TABLE 1					
ND1	ND2	MATERIAL	REFERENCE	SET REFERENCE	WEIGHT
1"NPT	1"NPT	GGG–40	21.00.38	21.23.30	
3/4"NPT	1"NPT	GGG–40	21.00.37	21.23.31	
1"NPT	1"NPT	ALUMINIO	21.00.40	21.23.32	
3/4"NPT	1"NPT	ALUMINIO	21.00.39	21.23.33	1.5 Kg

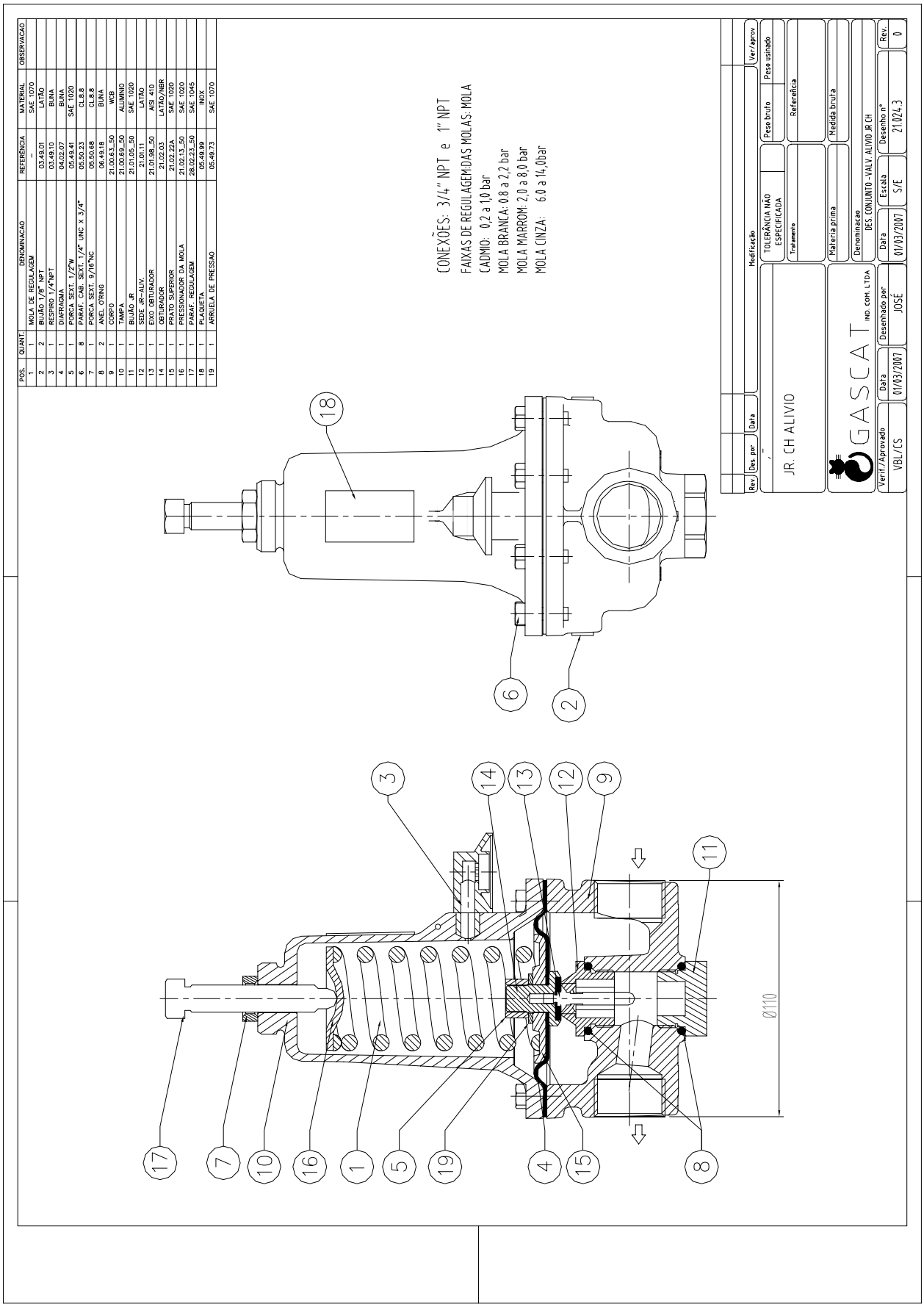
NOTES:

1– SPARE PARTS

2– APPROX. TOTAL WEIGHT = 1.5Kg

TABLE 2		
RANGE	SPRING COLOR	REFERENCE
100–230 mmWC	BLUE	01.49.75
205–510 mmWC	GREY	01.49.77
485–1015 mmWC	GREEN	01.49.78
915–2500 mmWC	BLACK	01.49.85

JR-CH – RELIEF



POS.	QUANT.	DENOMINAÇÃO	REFERÊNCIA	MATERIAL	OBSERVAÇÃO
1	1	MOLA DE REGULAGEM	–	SAE 1070	
2	2	BUJÃO 1/8" NPT	03.49.01	LATÃO	
3	1	RESPIRO 1/4"NPT	03.49.10	BUNA	
4	1	DIAFRAGMA	04.02.07	BUNA	
5	1	PORCA SEXT. 1/2"W	05.49.41	SAE 1020	
6	8	PARAF. CAB. SEXT. 1/4" UNC X 3/4"	05.50.23	CL.8.8	
7	1	PORCA SEXT. 9/16"NC	05.50.68	CL.8.8	
8	2	ANEL O'RING	06.49.18	BUNA	
9	1	CORPO	21.00.63_50	WCB	
10	1	TAMPA	21.00.69_50	ALUMINIO	
11	1	BUJÃO JR	21.01.05_50	SAE 1020	
12	1	SEDE JR-ALIV.	21.01.11	LATÃO	
13	1	EIXO OBTURADOR	21.01.98_50	AISI 410	
14	1	OBTURADOR	21.02.03	LATÃO/NBR	
15	1	PRATO SUPERIOR	21.02.22A	SAE 1020	
16	1	PRESSIONADOR DA MOLA	21.02.13_50	SAE 1020	
17	1	PARAF. REGULAGEM	28.02.23_50	SAE 1045	
18	1	PLAQUETA	05.49.99	INOX	
19	1	ARRUELA DE PRESSÃO	05.49.73	SAE 1070	