UNICON

Rev Ver. 01
Manual No. M-11

Installation and Instruction Manual

V520 Series

PRV - Back Pressure Valve (Piston Type)

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Safety Information

Important – Please Read Before Installation

UNICON V520 Series Valve instructions contain **Danger**, **Warning** and **Caution** labels, where necessary, to alert you to safety related or other important information. Read the instructions carefully before installing and maintaining your control valve. **Danger** and **Warning** hazards are related to personal injury. **Caution** hazards involve equipment or property damage. Operation of damaged equipment can, under certain operational conditions, result in degraded process system performance that can read to injury or death. Total compliance with all **Danger**, **Warning** and **Caution** notices is required for safe operation.

The safety terms **Danger, Warning**, **Caution** and **Note** have used in these instructions to highlight particular dangers and/or to provide additional information on aspects that may not be readily apparent.

Danger : indicates that death , severe personal injury and/or substantial property damage will occur if proper precaution is not taken.

Warning : indicates that death, severe personal injury and/or substantial property damage can occur if proper precaution is not taken.

Caution : indicates that minor personal injury and/or property damage can occur if proper precaution is not taken.

Note : indicates and provides additional technical information which may not be obvious, even to qualified personnel.

1. Introduction

1-1 General

This instruction manual provides installation, startup, and maintenance procedures for the V520 Series Type valves.

1-2 Personnel qualification

Transport, installation, commissioning, maintenance or repair must only be performed by trained or instructed personnel.

⚠ Warning

In order to ensure successful and safe operation of our valves the entire operation manual must have been read through and understood prior to installation and commissioning. Under certain operating conditions, the use of damaged equipment could cause a degradation of the performance of the system which may lead to personal injury or death. If you have any questions about problems arise, contact UNICON office.

2. Operation

V520 Series Back Pressure Valve Type relieves excessive pressures upstream of the main valve. If the upstream pressure rises above the setting of the valve, pressure on the underside of the diaphragm overcomes the spring compression. The valve plug moves away from the seat and allows the excess pressure to escape. When the upstream pressure returns to normal, the valve plug resumes a closed position.

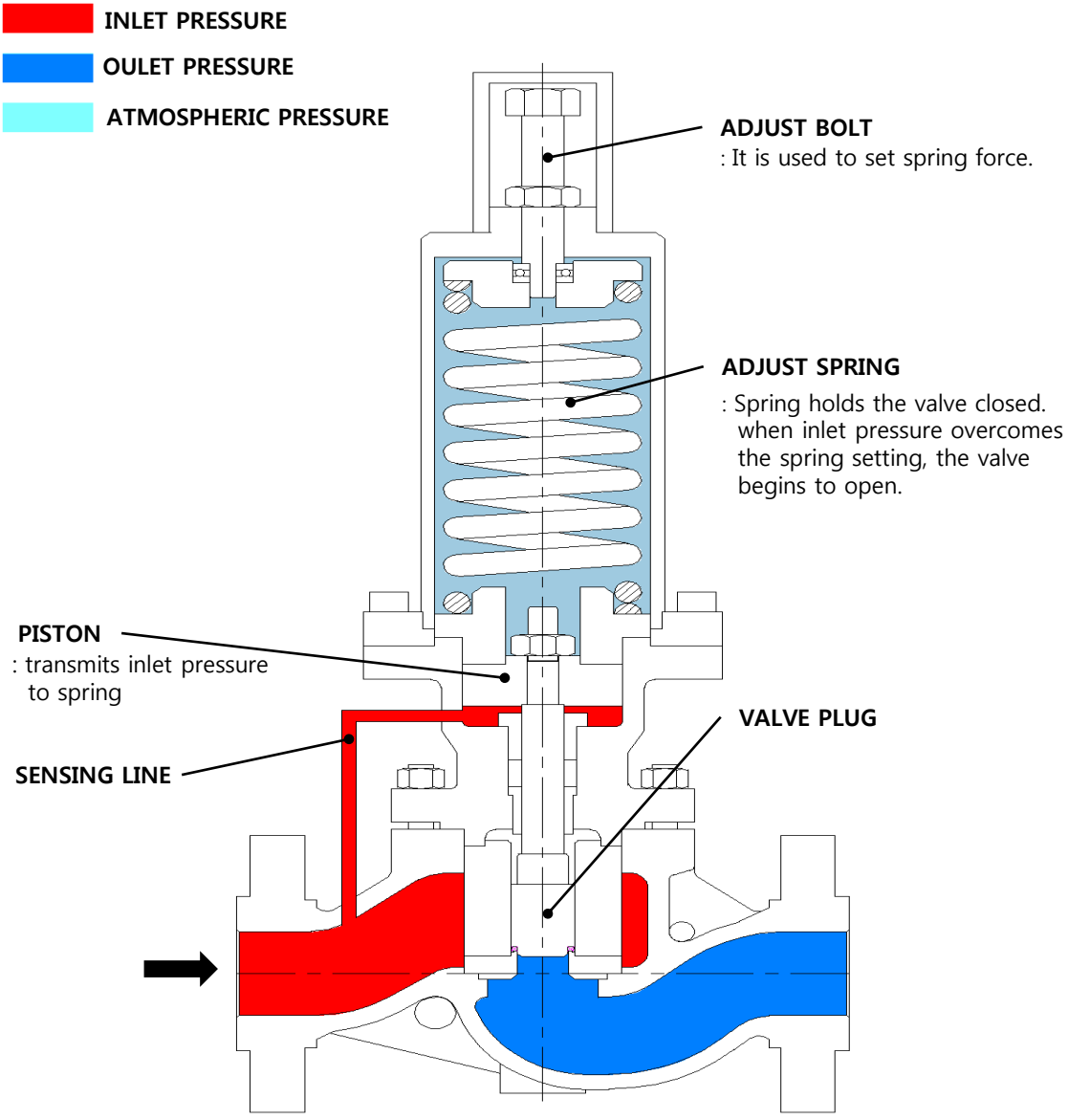

Figure 1. Operational Schematic (Valve Close) - Liquid Type

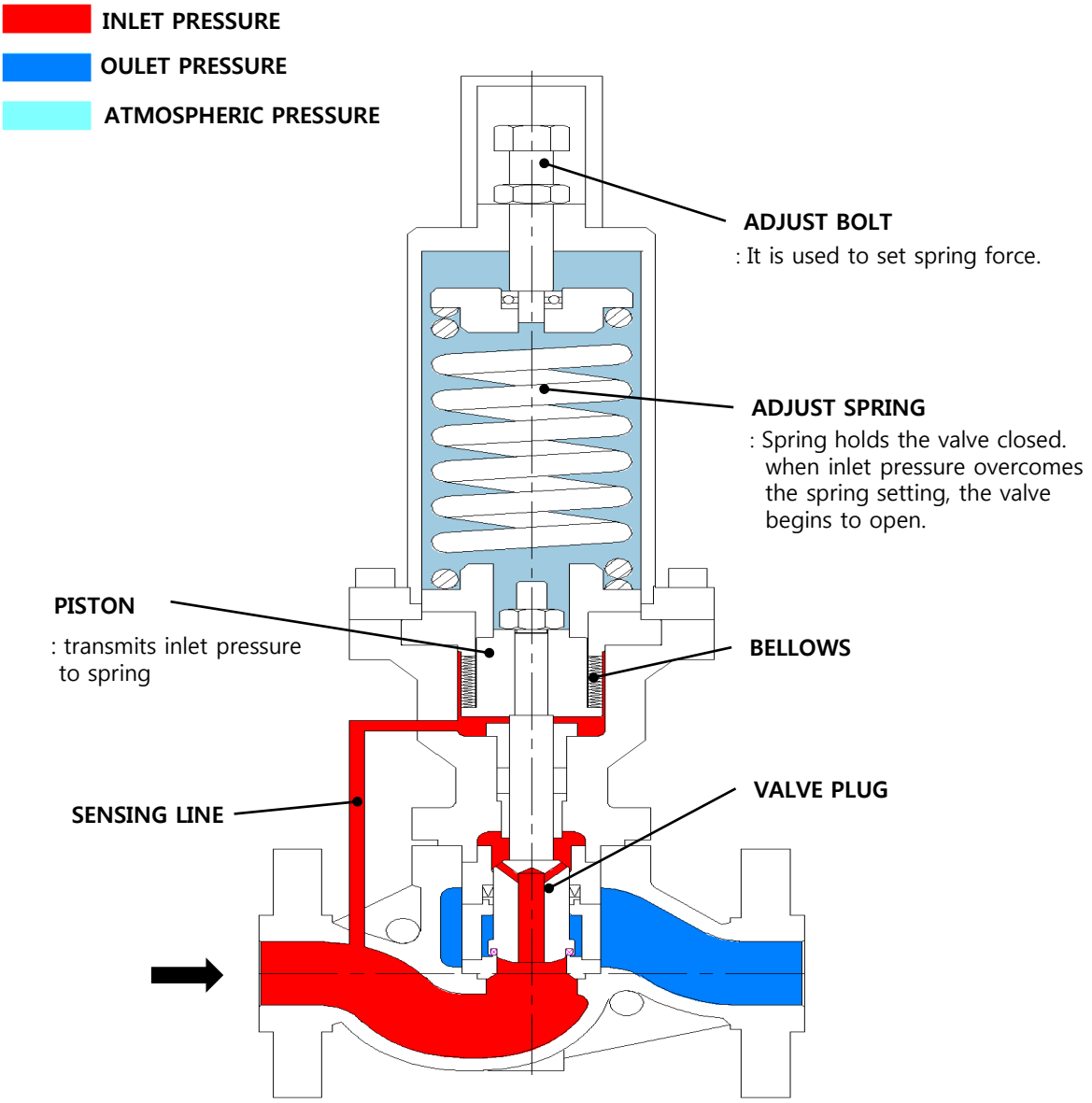

Figure 2. Operational Schematic (Valve Close) – Gas Type

3. Installation

Unbox and inspect the valve. Remove pipe scale and other foreign material from the connecting pipeline. Apply a suitable pipe compound to the external threads. The valve can be installed in any position as long as the flow is in the direction indicated by the arrow cast on the body.

> **⚠ Warning**
> *Personal injury or system damage may result if this back pressure valve is installed where service conditions could exceed the limits given on the Specifications section. Installations should be adequately protected from physical damage. Over pressuring any portion of this equipment may cause equipment damage, leaks in the back pressure valve, or personal injury due to bursting of pressure containing parts. System operation within the limits shown in the Specifications section does not eliminate the possibility of damage from external sources or debris in the pipeline. The back pressure valve should be inspected for damage regularly and after any over pressure condition.*

4. Overpressure Protection

> **⚠ Warning**
> *Over pressuring any portion of this equipment may result in equipment damage, leaks in the back pressure valve or personal injury due to bursting of pressure-containing parts. The system should be inspected after any over pressure condition.*

Back pressure valve maximum operating inlet pressure is 20 bar. The individual set pressure of your valve is stamped on the nameplate. The valve should be inspected for damage after any over pressure condition.

5. Start up

With proper installation completed and system equipment properly adjusted, slowly open the upstream shutoff valve while using pressure gauges to monitor pressure. If set pressure adjustment is necessary, monitor the inlet pressure with a gauge during the adjustment procedure.

6. Adjustment

Each unit is factory set for the pressure setting specified on the order. If adjustment is necessary, use a pressure gauge to monitor the pressure. Turn the adjusting bolt clockwise to increase the pressure or differential pressure setting. To decrease the setting, turn the adjusting bolt counterclockwise.

7. Shutdown

Close the upstream shutoff valve and release all pressure from the valve.

8. Maintenance

Due to normal wear and damage that may occur from internal sources, valve parts such as the O-rings, gaskets, piston, seat and valve plug should be inspected periodically and replaced as necessary.

The frequency of inspection and replacement depends upon the severity of service conditions or the requirements of state. Instructions are given below for disassembly of the backpressure valves. Refer to Figures 3, 4 while servicing the valve

⚠ Warning
To avoid personal injury and equipment damage, isolate the valve from all pressure. Cautiously release pressure from the valve before attempting disassembly.

If the valve is leaking, the piston may be ruptured or the seating surfaces nicked or scratched. Proceed as follows to replace or repair the piston, seat and valve plug.

Disassembly (Liquid Type)

1. Release adjust spring compression by turning the adjusting bolt counterclockwise until it turns freely without resistance from the adjust spring.
2. Remove wrench bolt and lift off the spring case, spring, upper spring seat and lower spring seat .
3. Unscrew the piston lock nut from the stem in order to separate the parts of the piston.
4. Remove the piston and examine for damage. Replace if damage is verified.
5. Remove stud/nut and lift off the bonnet.
6. Disassembly O-ring box, stem guide and anti spin guide from bonnet and check the damage of material surface and O-ring.
7. After separating the valve plug, cage and seat, inspect the seating surface of the valve plug, make sure that the elastomer or polished metal surface of the valve plug is not damaged. Replace if damage is verified.
8. Inspect the seating edge of the seat. If damage is verified. remove the seat and replace it with a new part.
9. If no further maintenance is required, reassemble the valve in the reverse of the above steps.

Caution
≫ *Please note as guide pin is not broken at the time of assembly of the cage and the plug.*

≫ *New gasket must be applied when trim parts an changed. (maintenance purpose)*

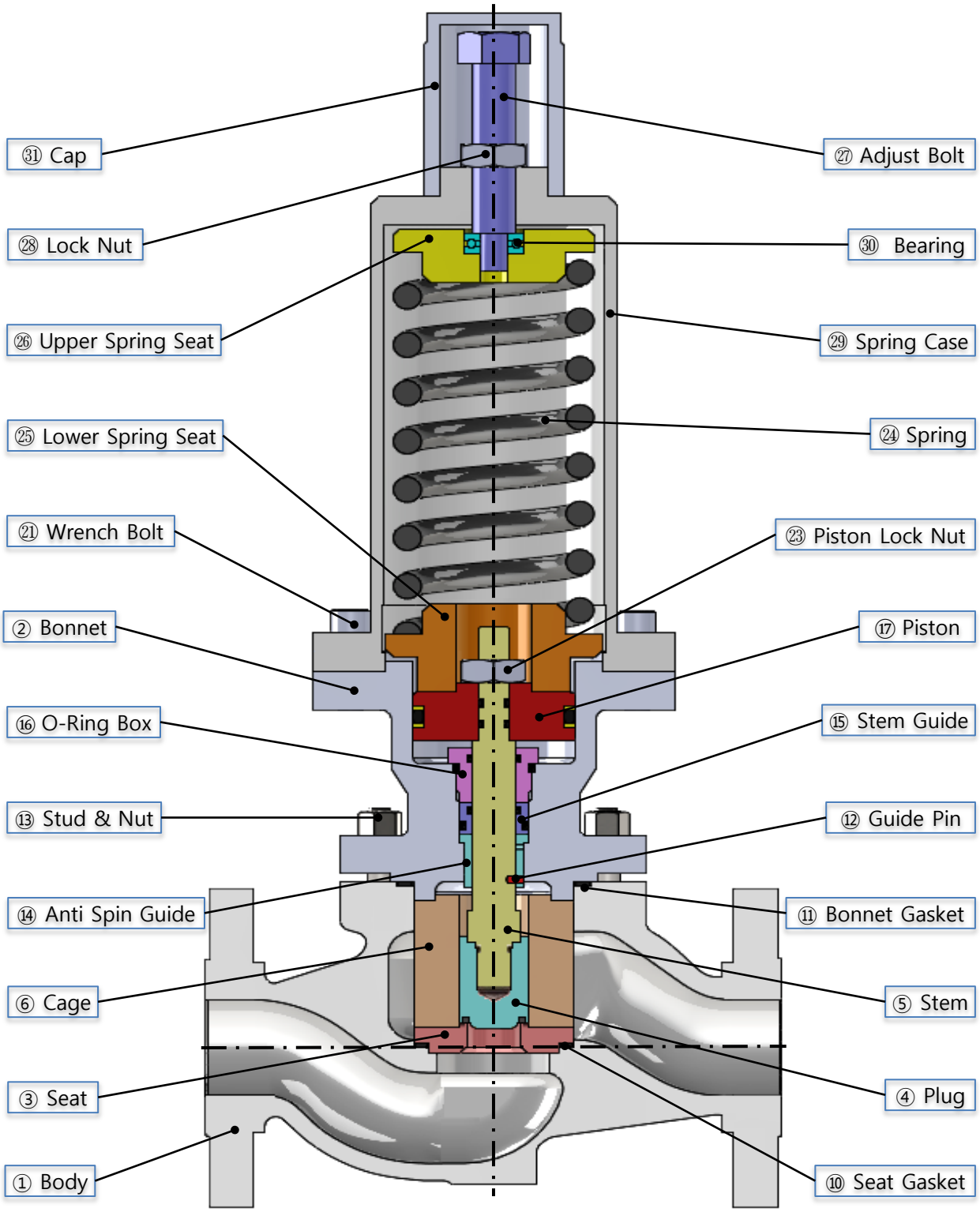

Figure 3. Assembly Sectional Drawing (liquid Type)

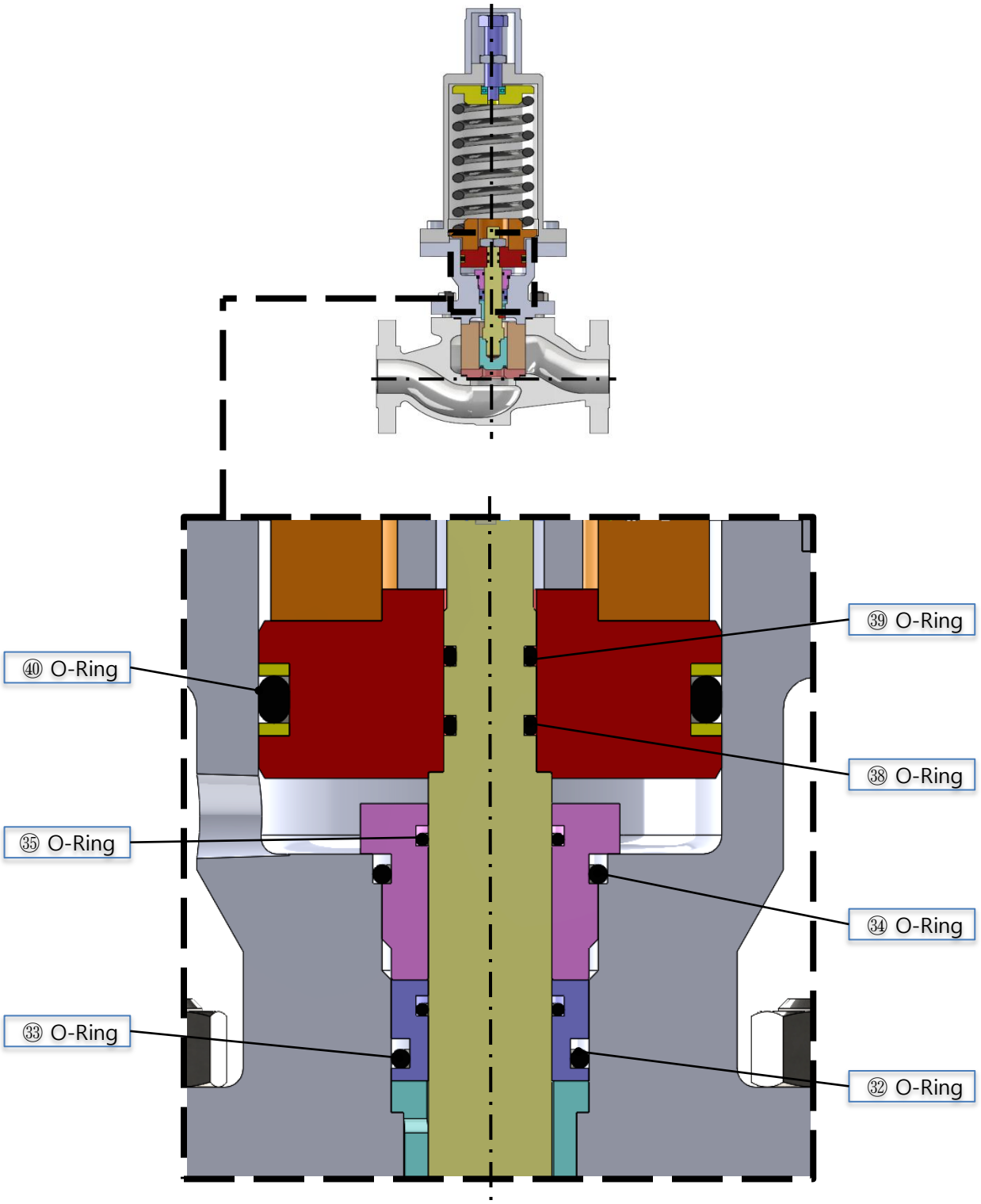

Figure 3-1. Assembly Sectional Drawing (liquid Type)

Disassembly (Gas Type)

1. Release adjust spring compression by turning the adjusting bolt counterclockwise until it turns freely without resistance from the adjust spring.

2. Remove wrench bolt(key 21) and lift off the spring case, spring, upper spring seat and lower spring seat .

3. Unscrew the piston lock nut from the stem in order to separate the parts of the piston bundle(piston, bellows, bellows piston). Remove wrench bolt.

4. Remove wrench bolt(key 20) and piston bundle(piston, bellows, bellows plate) and examine for damage. Replace if damage is verified.

5. Remove stud/nut and lift off the bonnet.

6. Disassembly O-ring box, stem guide and anti spin guide from bonnet and check the damage of material surface and O-ring.

7. After separating the valve plug, cage and seat, inspect the seating surface of the valve plug, make sure that the elastomer or polished metal surface of the valve plug is not damaged. Replace if damage is verified.

8. Inspect the balance seal. Replace if damage is verified.

9. Inspect the seating edge of the seat. If damage is verified. remove the seat and replace it with a new part.

10. If no further maintenance is required, reassemble the valve in the reverse of the above steps.

Caution

≫ *Please note as guide pin is not broken at the time of assembly of the cage and the plug.*

≫ *New gasket must be applied when trim parts an changed. (maintenance purpose)*

Note!

≫ Groove direction of the Anti-spin Guide and the Groove Pin has to be assembled to match.

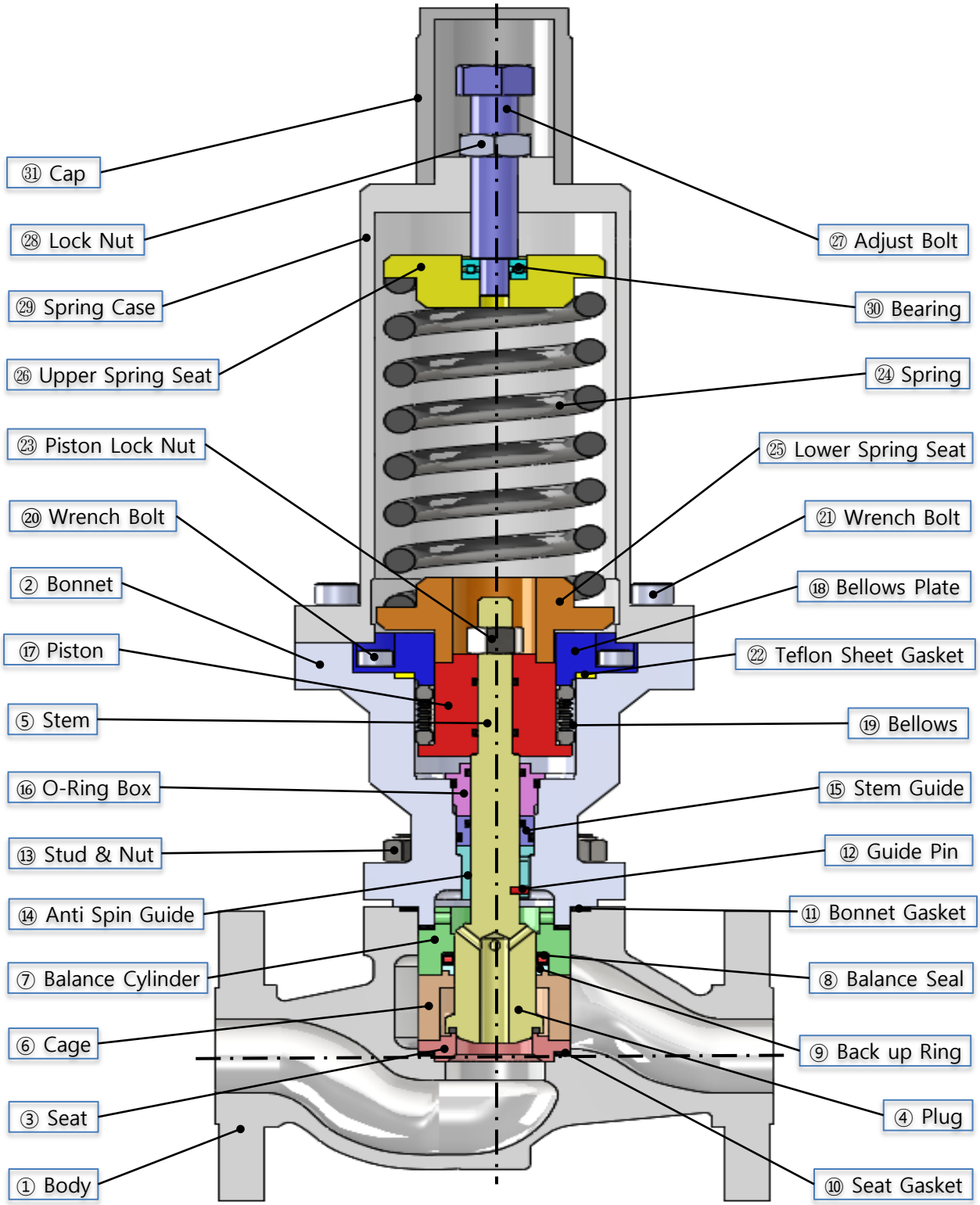

Figure 4. Assembly Sectional Drawing (Gas Type)

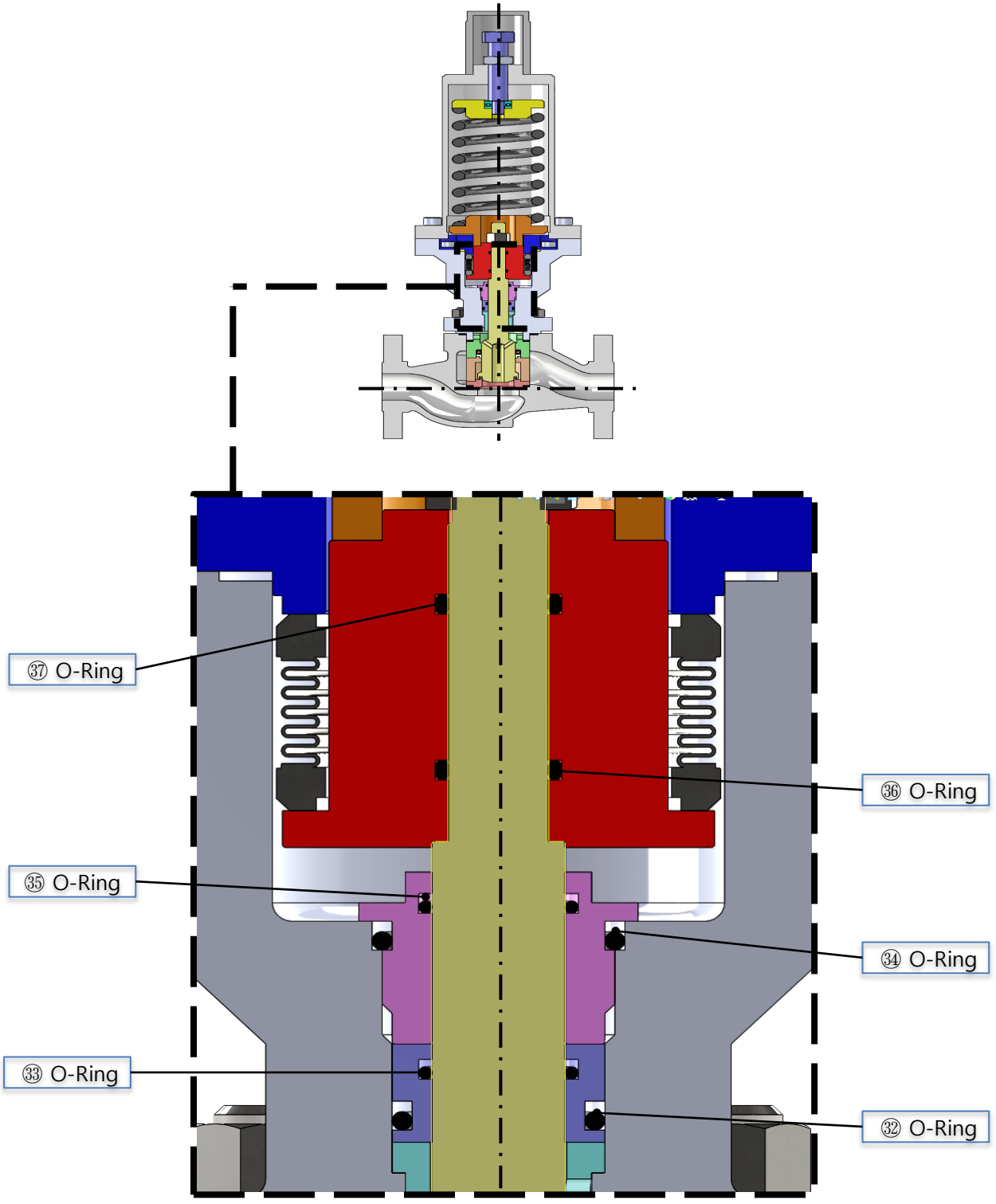

Figure 4-1. Assembly Sectional Drawing (Gas Type)

9. Specification

Maximum Operating Inlet Pressure
20BarG

Operating Temperature Range
-50 ℃ ~ 100 ℃

Main Valve Flow Characteristic
Linear

Pressure Registration
Internal

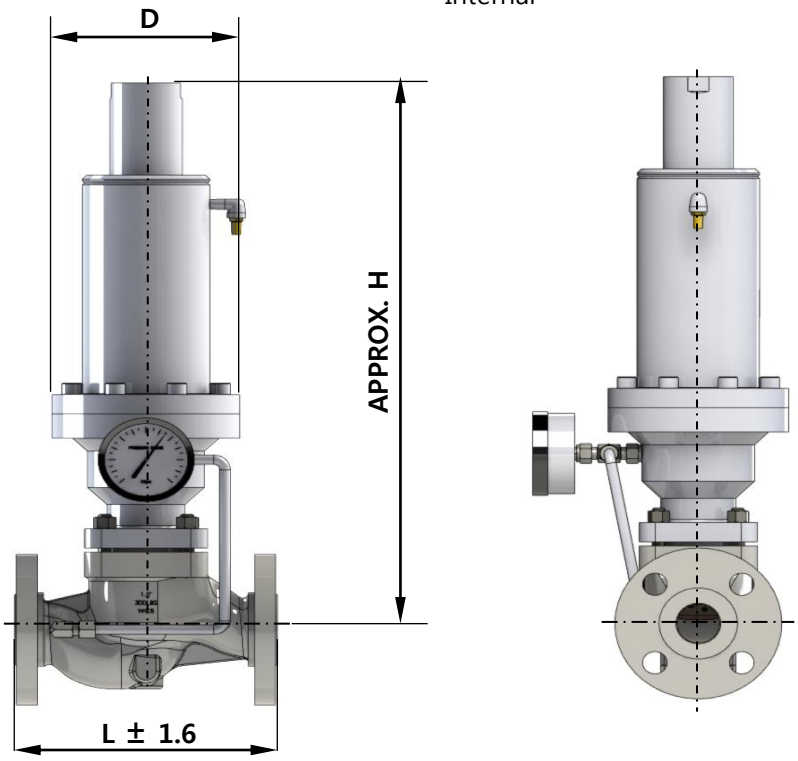

Figure 5. Dimensional Diagrams)

Valve Tag No.	1301-PCV-0006	1301-PCV-0007	1451-PCV-0006
Valve Size (300lbs)	2″ (50A)	2″ (50A)	1.5″ (40A)
Set Pressure (Bar)	12	11	15
Control Pressure Range (Bar)	8 ~ 15	8 ~ 12	11 ~ 17.5
Adjustable Spring Wire Diameter, mm (inch)	13 (0.55)	13 (0.55)	13 (0.55)
Adjustable Spring Free Length, mm (inch)	245 (9.65)	245 (9.65)	245 (9.65)
L (mm)	267	267	235
H (mm)	540	540	560
D (mm)	168	168	168
Weight	APPROX. 55Kg	APPROX. 55Kg	APPROX. 45Kg

Table 1. V520Series Back Pressure Valve Specification

Part Ordering

Key	Description	Material
1	Body	A216 WCB, A352 LCC
2	Bonnet	304 SS
3	Seat	316L SS
4	Plug	316L SS + TFE, EPDM
5	Stem	316L SS
6	Cage	316L SS
7	Balance Cylinder	316L SS
8	Balance Seal	316 + TFE
9	Back up Ring	TEFLON
10	Seat Gasket	316 SS+GRAP. SPIRAL WOUND
11	Bonnet Gasket	316 SS+GRAP. SPIRAL WOUND
12	Guide Pin	STAINLESS STEEL
13	Stud & Nut	A193 B7 / A194 2H, A193 B7M / A194 2HM
14	Anti Spin Guide	CARBON STEEL
15	Stem Guide	CARBON STEEL
16	O-Ring Box	CARBON STEEL
17	Piston	316L SS
18	Bellows Plate	316L SS
19	Bellows	316L SS
20	Wrench Bolt	A193 B7 / A194 2H, A193 B7M / A194 2HM
21	Wrench Bolt	A193 B7 / A194 2H, A193 B7M / A194 2HM
22	Teflon Sheet Gasket	TEFLON
23	Piston Lock Nut	CARBON STEEL
24	Spring	SPRING STEEL
25	Lower Spring Seat	CARBON STEEL
26	Upper Spring Seat	CARBON STEEL
27	Adjust Bolt	CARBON STEEL
28	Lock Nut	CARBON STEEL
29	Spring Case	CARBON STEEL
30	Bearing	CARBON STEEL
31	Cap	CARBON STEEL
32	O-Ring	NBR, EPDM/FDA, KFM, FFKM
33	O-Ring	NBR, EPDM/FDA, KFM, FFKM
34	O-Ring	NBR, EPDM/FDA, KFM, FFKM
35	O-Ring	NBR, EPDM/FDA, KFM, FFKM
36	O-Ring	NBR, EPDM/FDA, KFM, FFKM
37	O-Ring	NBR, EPDM/FDA, KFM, FFKM
38	O-Ring	NBR, EPDM/FDA, KFM, FFKM
39	O-Ring	NBR, EPDM/FDA, KFM, FFKM
40	O-Ring	NBR, EPDM/FDA, KFM, FFKM