UNICON

Rev Ver. 01
Manual No. M-10

Installation and Instruction Manual

V520 Series

PRV - Back Pressure Valve

Table of Contents

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.

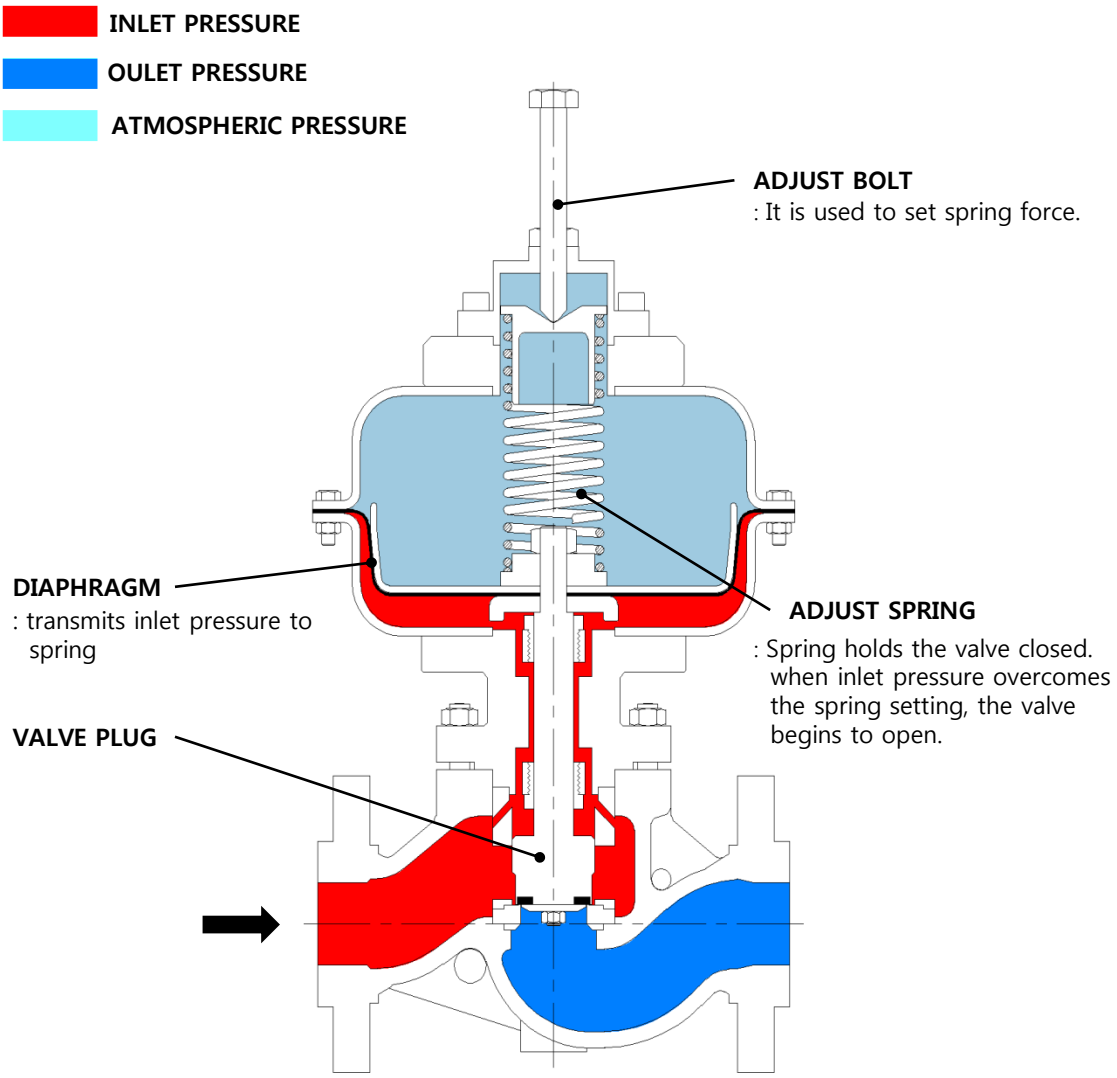

Figure 1. Operational Schematic (Valve Close) - Type 1

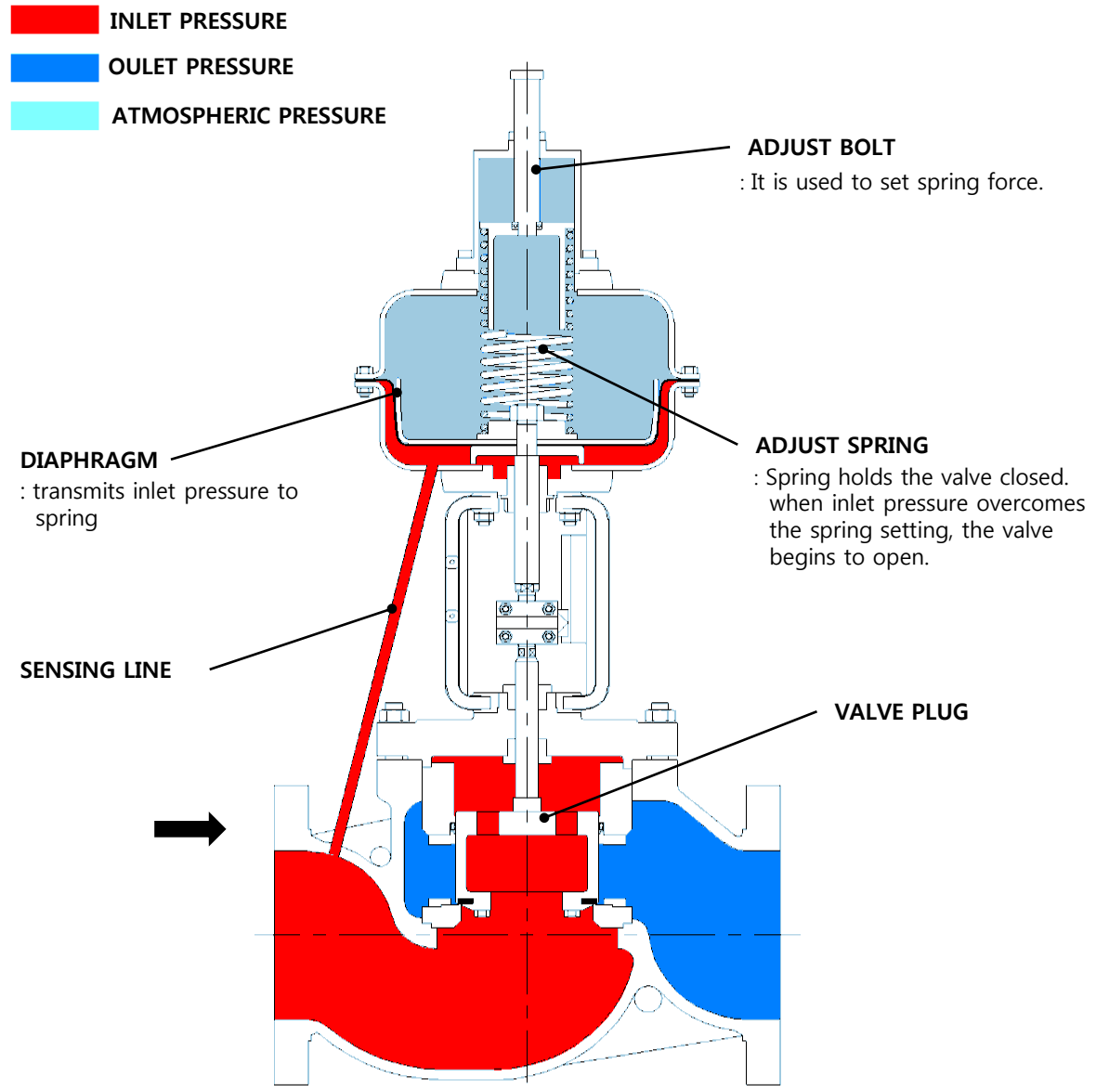

Figure 2. Operational Schematic (Valve Close) - Type 2

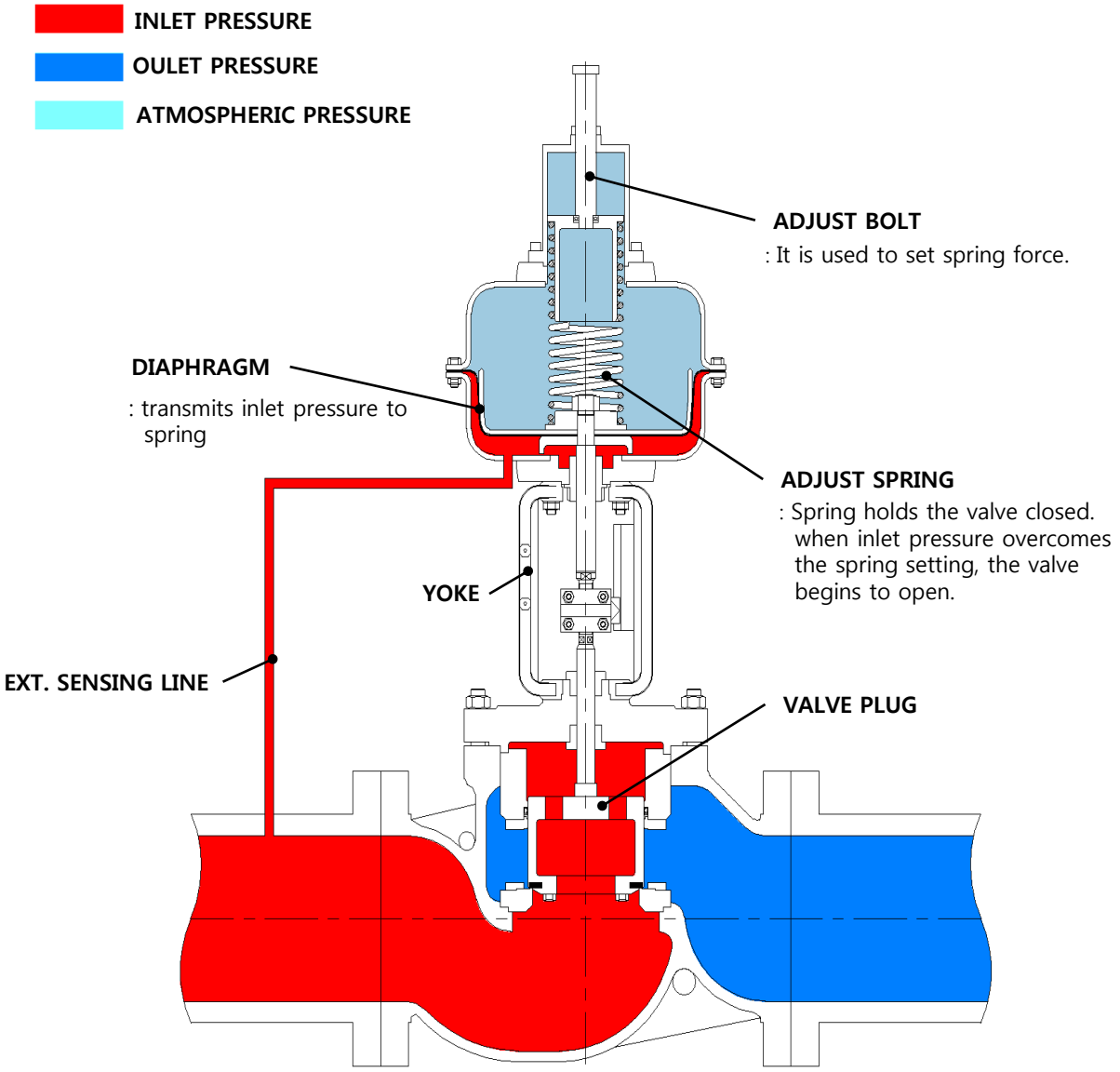

Figure 3. Operational Schematic (Valve Close) - Type 2

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 in 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 5 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, diaphragm, 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 4, 5 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 diaphragm may be ruptured or the seating surfaces nicked or scratched. Proceed as follows to replace or repair the diaphragm, seat and valve plug.

Disassembly to Replace Diaphragm and seat (type1)

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

2. Remove bolt/nut(key 33) and lift off the upper diaphragm case, spring, upper spring seat.

3. Unscrew the diaphragm lock nut from the stem in order to separate the parts of the diaphragm. lift off the diaphragm plate, diaphragm holder, diaphragm.

4. Remove the diaphragm and examine for damage. Replace if damage is verified.

5. Unscrew the Lower Cap Screw from the lower diaphragm case in order to separate the parts of the bonnet. lift off the lower diaphragm case.

6. Remove stud/nut(key 15) and lift off the bonnet.

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.

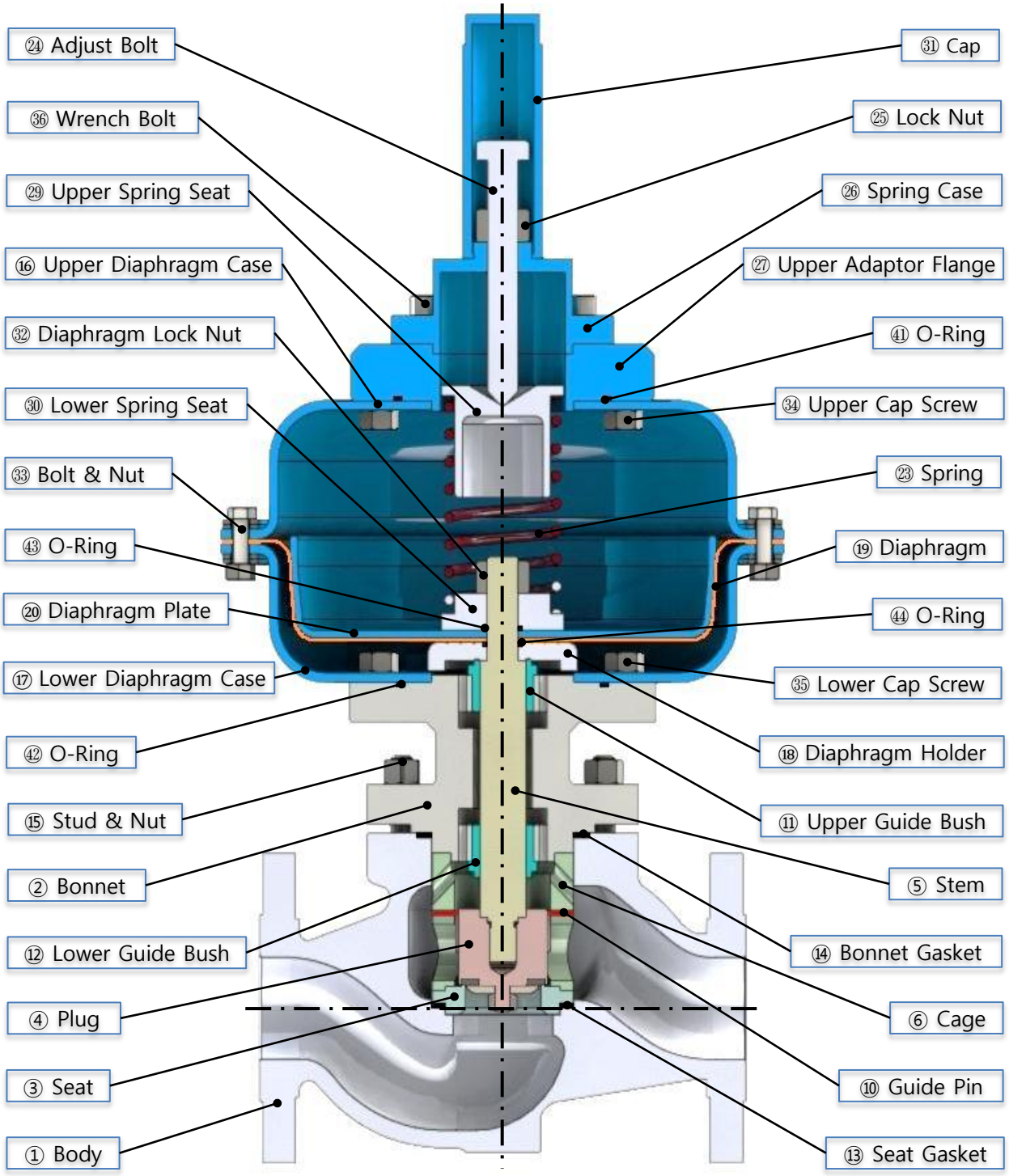

Figure 4. Assembly Drawing (Sectional)

Disassembly to Replace Diaphragm (Type2)

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

2. loosen Bolt & Nut(key 33) then lift off the upper diaphragm case, spring, upper spring seat.

3. Unscrew the diaphragm lock nut from the stem in order to separate the parts of the diaphragm. lift off the diaphragm plate, diaphragm holder, diaphragm.

4. Remove the diaphragm and examine for damage. Replace if damage is verified.

5. Unscrew the Lower Cap Screw from the lower diaphragm case in order to separate the parts of the bonnet. lift off the lower diaphragm case.

Disassembly to Replace Seat (Type2)

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

2. Disassembly yoke clamp and loosen stud & nut(key 40) of yoke.

3. Seperate actuator set from the body.

4. loosen stud & nut(key 15) then separate bonnet from the body.

5. 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.

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

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

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

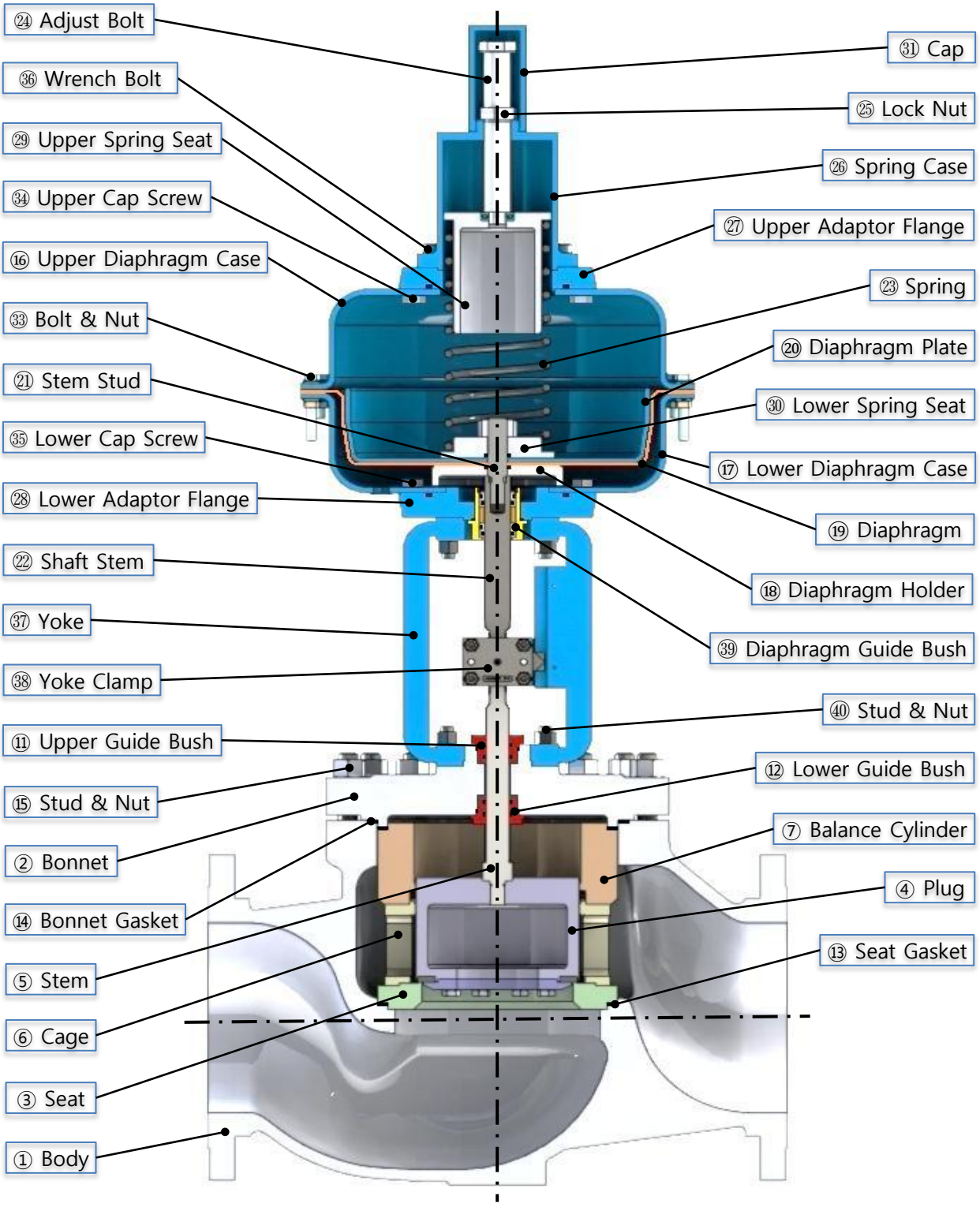

Figure 5. Assembly Drawing (Sectional)

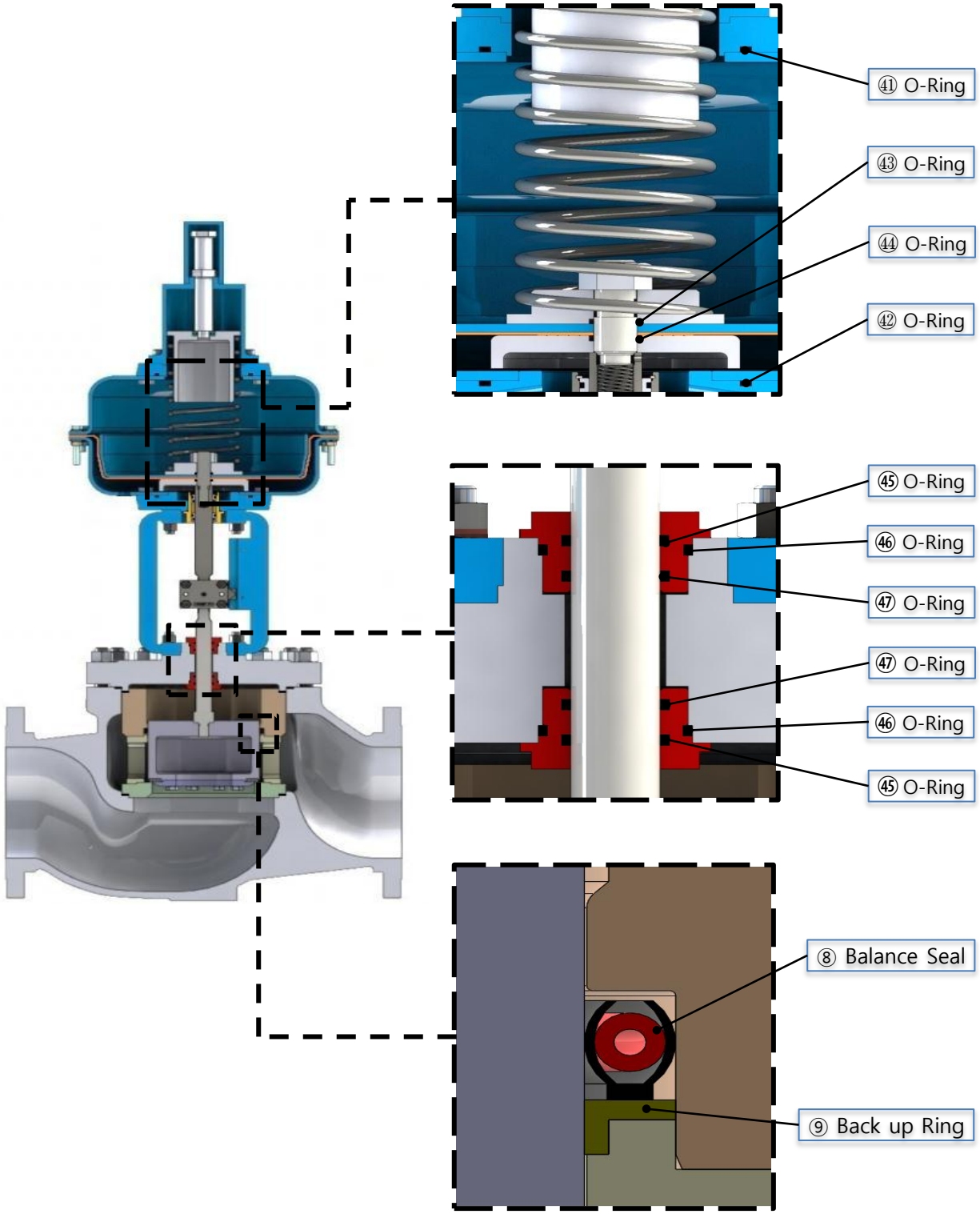

Figure 5-1. Assembly Drawing (Sectional)

9. Specification

Maximum Operating Inlet Pressure
5BarG

Operating Temperature Range
0℃ ~ 100 ℃

Main Valve Flow Characteristic
Linear

Pressure Registration
Internal

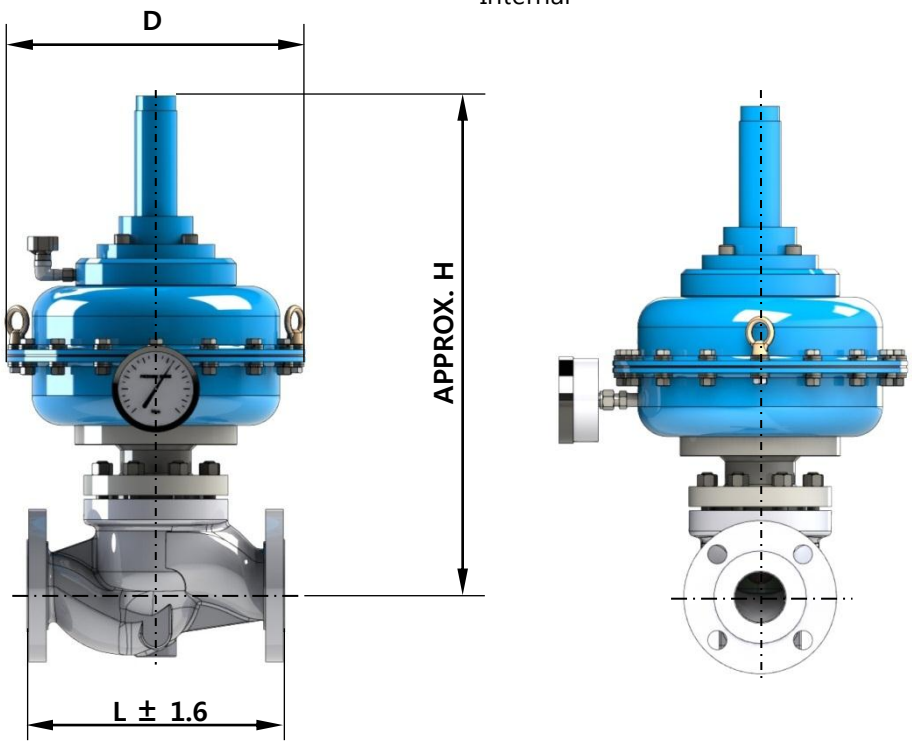

Figure 6. Dimensional Diagrams Type 1

Valve Tag No.	1211-PCV-0062	1021-PCV-0107 1085-PCV-0269 1086-PCV-0269	1461-PCV-0003 1461-PCV-0013 1461-PCV-0023 1461-PCV-0033	1021-PCV-0132	1021-PCV-0135A 1021-PCV-0135B
Valve Size (300lbs)	1.5″ (40A)	2″ (50A)	2″ (50A)	3″ (80A)	3″ (80A)
Set Pressure (Bar)	0.1	0.05 ~ 0.06	0.015	0.06	0.5
Control Pressure Range (Bar)	0.03 ~ 0.12	0.03 ~ 0.1	0.01 ~ 0.04	0.03 ~ 0.1	0.3 ~0.7
Adjustable Spring Wire Diameter, mm (inch)	5 (0.2)	5 (0.2)	4 (0.16)	5 (0.2)	10 (0.39)
Adjustable Spring Free Length, mm (inch)	190 (7.48)	190 (7.48)	200 (7.87)	190 (7.48)	270 (10.63)
L (mm)	235	267	267	318	318
H (mm)	485	490	490	536	650
D (mm)	292	292	292	292	292
Weight	APPROX. 45Kg	APPROX. 60Kg	APPROX. 60Kg	APPROX. 90Kg	APPROX. 90Kg

Table 1. V520Series Back Pressure Valve Specification Type1

Maximum Operating Inlet Pressure
5BarG

Operating Temperature Range
0℃ ~ 100 ℃

Main Valve Flow Characteristic
Linear

Pressure Registration
External

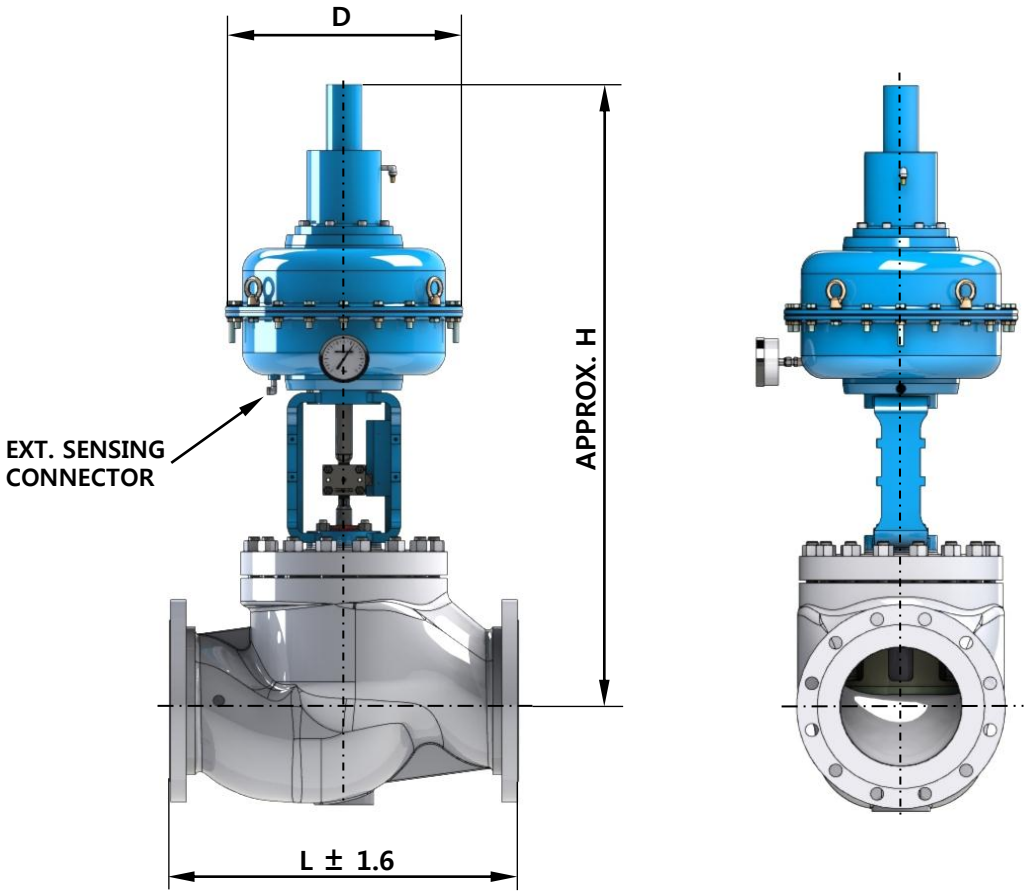

Figure 7. Dimensional Diagrams Type 2

Valve Tag No.	Valve Size (300lbs)	Set Pressure (Bar)	Control Pressure Range (Bar)	Adjustable Spring Wire Diameter, mm (inch)	Adjustable Spring Free Length, mm (inch)	L (mm)	H (mm)	D (mm)	Weight
1431-PCV-0012	10" (250A)	0.1	0.6~0.14	10 (0.39)	450	708	1310	482	APPROX. 530Kg

Table 2. V520Series Back Pressure Valve Specification Type 2

Part Ordering

Key	Description	Material
1	Body	A216 WCB
2	Bonnet	A105
3	Seat	316L SS
4	Plug	316L SS + 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	Guide Pin	304 SS
11	Upper Guide Bush	316L SS
12	Lower Guide Bush	316L SS
13	Seat Gasket	316 SS+GRAP. SPIRAL WOUND
14	Bonnet Gasket	316 SS+GRAP. SPIRAL WOUND
15	Stud & Nut	A193 B7 / A194 2H
16	Upper Diaphragm Case	CARBON STEEL
17	Lower Diaphragm Case	CARBON STEEL
18	Diaphragm Holder	CARBON STEEL
19	Diaphragm	EPDM
20	Diaphragm Plate	CARBON STEEL
21	Stem Stud	CARBON STEEL
22	Shaft Stem	CARBON STEEL
23	Spring	SPRING STEEL
24	Adjust Bolt	CARBON STEEL
25	Lock Nut	CARBON STEEL
26	Spring Case	CARBON STEEL
27	Upper Adaptor Flange	CARBON STEEL
28	Lower Adaptor Flange	CARBON STEEL
29	Upper Spring Seat	CARBON STEEL
30	Lower Spring Seat	CARBON STEEL
31	Cap	CARBON STEEL
32	Diaphragm Lock Nut	CARBON STEEL
33	Bolt & Nut	A193 B7 / A194 2H, A193 B8 / A194 8
34	Upper Cap Screw	CARBON STEEL
35	Lower Cap Screw	CARBON STEEL
36	Wrench Bolt	CARBON STEEL
37	Yoke	CARBON STEEL
38	Yoke Clamp	CARBON STEEL
39	Diaphragm Guide Bush	CARBON STEEL
40	Stud & Nut	CARBON STEEL
41	O-Ring	NBR, EPDM/FDA, KFM, FFKM
42	O-Ring	NBR, EPDM/FDA, KFM, FFKM
43	O-Ring	NBR, EPDM/FDA, KFM, FFKM
44	O-Ring	NBR, EPDM/FDA, KFM, FFKM
45	O-Ring	NBR, EPDM/FDA, KFM, FFKM
46	O-Ring	NBR, EPDM/FDA, KFM, FFKM
47	O-Ring	NBR, EPDM/FDA, KFM, FFKM