

Proportional Relief Valves

RV, RL and RM Series



FITOK
Valves and Fittings

www.fitokgroup.com

Proportional Relief Valves

RV, RL and RM Series

Introduction

Relief valve opens when system pressure exceeds the set pressure, allowing the medium to flow out and closes when the system pressure decreases to the resealing pressure so as to protect the system.



Features

- ◎ Set pressure:
 - RV series: 7 color-coded springs available for a wide range of set pressure, 50 to 6000 psig @ 70°F (3.4 to 414 bar @ 20°C)
 - RL series: 10 to 225 psig @ 70°F (0.68 to 15.5 bar @ 20°C)
 - RM series: 3 color-coded springs available for a wide range of set pressure, 50 to 1500 psig @ 70°F (3.4 to 103 bar @ 20°C)
- ◎ Maximum outlet pressure:
 - RV series: 1500 psig (103 bar)
 - RL series: 225 psig (15.5 bar)
 - RM series: 1500 psig (103 bar)
- ◎ Orifice size:
 - RV series: 0.14" (3.6 mm)
 - RL series: 0.19" (4.8 mm) and 0.25" (6.4 mm)
 - RM series: 0.25" (6.4 mm)
- ◎ Back pressure
 - Back pressure is the pressure of the outlet of valves. It increases the set pressure of proportional relief valves.
 - RV and RM series: Balance stem design to eliminate the effect of system back pressure
 - RL series: Pre-set pressure = Desired pressure - 0.8 × Back pressure
- ◎ Working temperature: -10°F to 300°F (-23°C to 148°C)
- ◎ Variety of end connections
- ◎ Liquid or gas service
- ◎ Adjustable bonnet cap and adjustable set pressure
- ◎ Lock wired secure cap to maintain set pressure
- ◎ Variety of seal materials
- ◎ Label identifies the set pressure range
- ◎ Manual override handle available to open the valve without changing the set pressure when the set pressure is lower than 1500 psig

Temperature Range of Sealing Materials

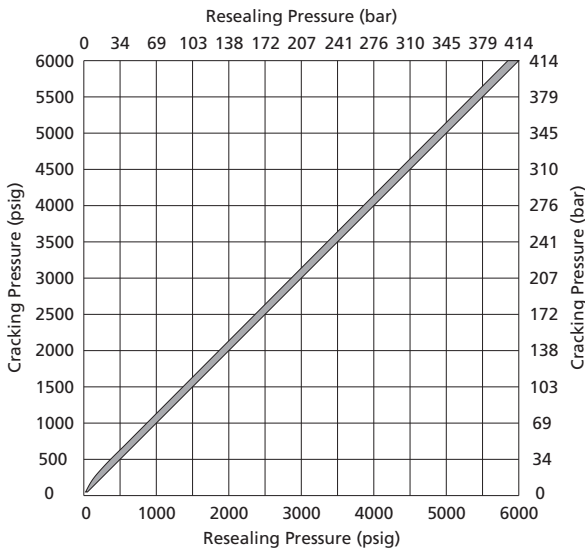
| O-ring Material | Temperature Ranges °F (°C) |
|---------------------------|----------------------------|
| Fluorocarbon Rubber | 25 to 250 (-4 to 121) |
| Buna-N Rubber | 0 to 250 (-17 to 121) |
| Neoprene Rubber | -10 to 300 (-23 to 148) |
| Ethylene Propylene Rubber | 30 to 250 (-1 to 121) |

Set Pressure and Resealing Pressure

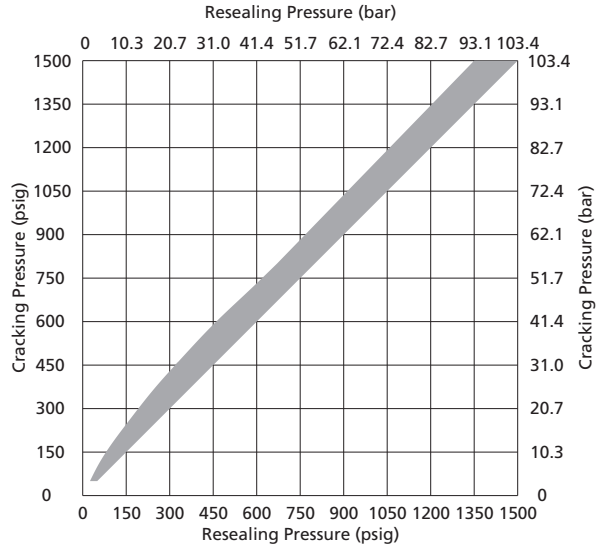
Set pressure: The set pressure is the upstream pressure at which the first indication of flow occurs. The repeatability of set pressure of each valve after initial relief is $\pm 5\%$ at room temperature.

Resealing pressure: The resealing pressure is the upstream pressure at which there is no indication of flow. Resealing pressure is always lower than set pressure.

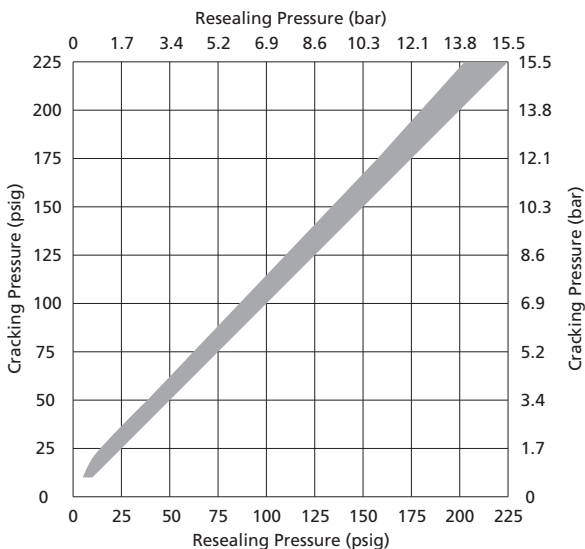
RV Series



RM Series



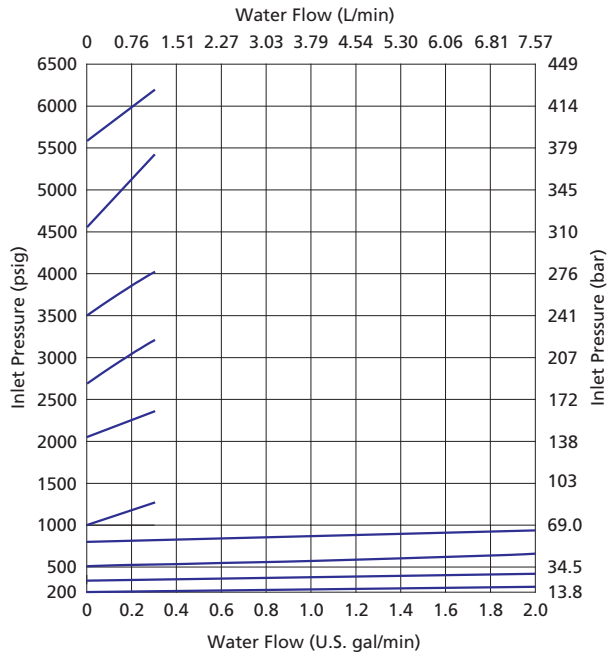
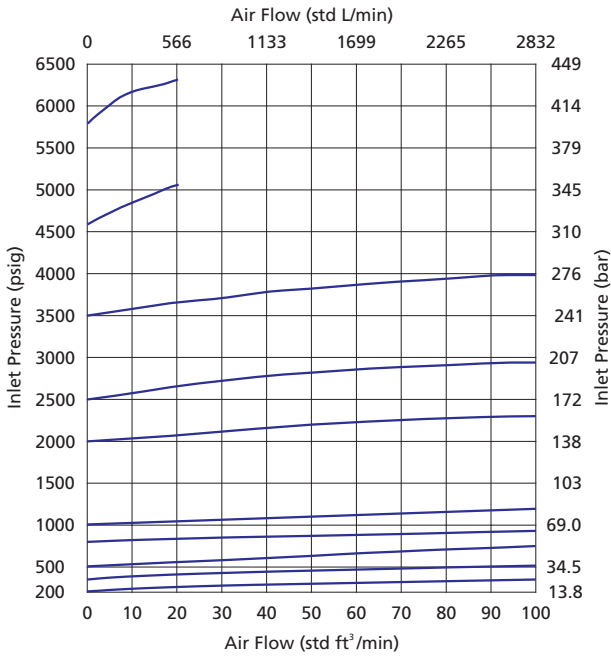
RL Series



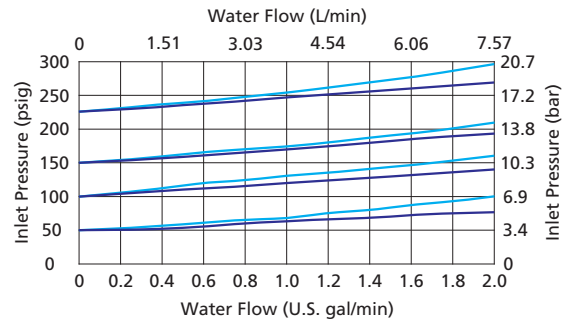
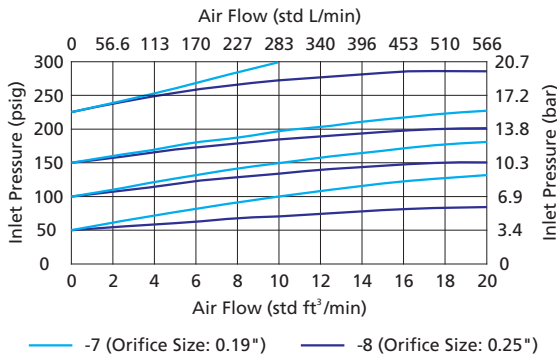
3 Proportional Relief Valves

Flow Data at 70°F (20°C)

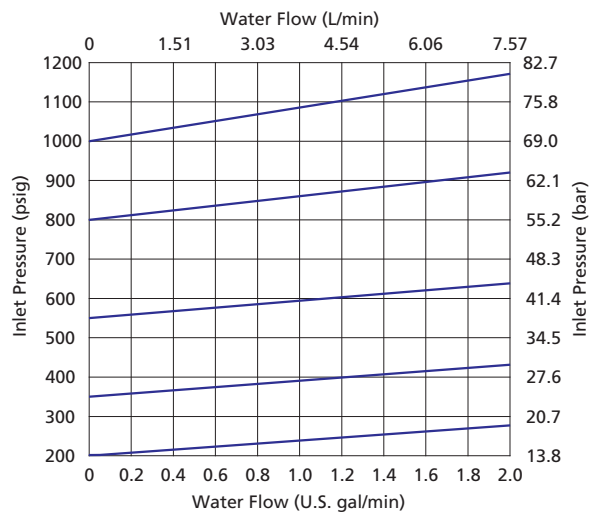
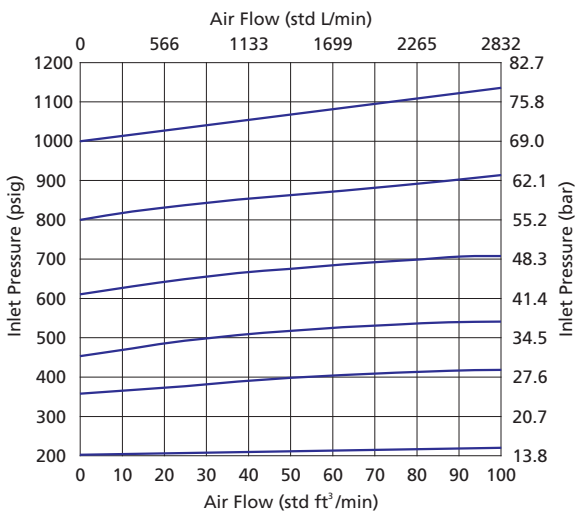
RV Series



RL Series



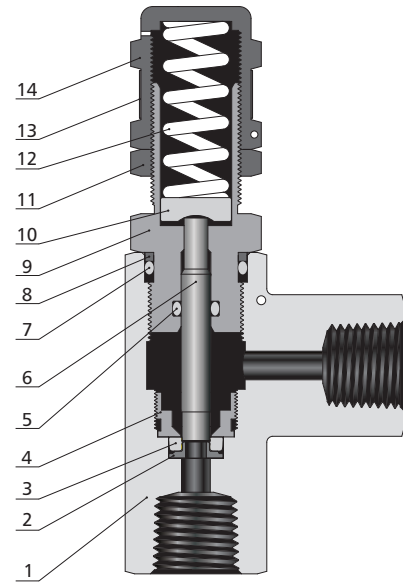
RM Series



Standard Materials of Construction

RV Series

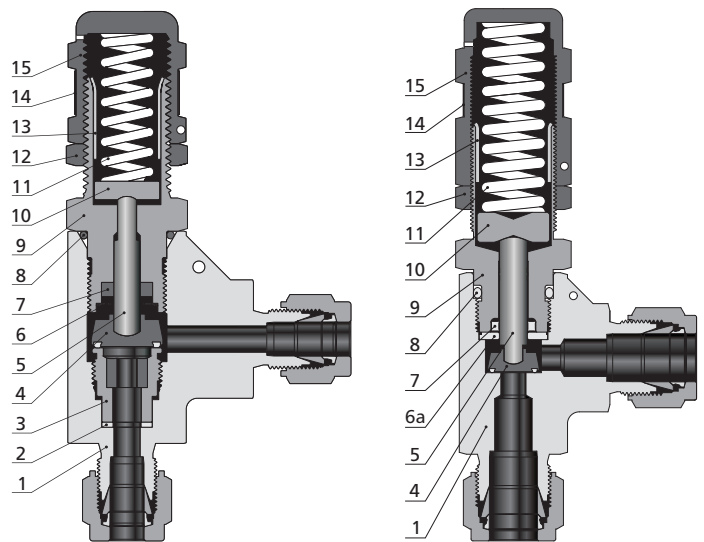
| Component | | Material Grade/ASTM Specification |
|-----------|----------------|-----------------------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Insert | 316 SS/A479 |
| 3 | O-ring | Fluorocarbon FKM |
| 4 | Seat Retainer | 316 SS/A479 |
| 5 | O-ring | Fluorocarbon FKM |
| 6 | Stem | 316 SS/A479 |
| 7 | O-ring | Fluorocarbon FKM |
| 8 | Seal Retainer | PTFE |
| 9 | Bonnet | 316 SS/A479 |
| 10 | Spring Support | 316 SS/A276 |
| 11 | Lock Nut | 17-4PH powdered metal |
| 12 | Spring | S17700 SS/AMS 5678 |
| 13 | Label | Polyester |
| 14 | Bonnet Cap | 316 SS/A479 |



1. Lubricant: Silicone-based
2. Contact the authorized representative or FITOK Group for other materials.

RL Series

| Component | | Material Grade/ASTM Specification |
|-----------|---------------------------|-----------------------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Gasket (Only 7 Orifice) | 316 SS/A479 |
| 3 | Seat (Only 7 Orifice) | 316 SS/A479 |
| 4 | Bonded disc | 316 SS/A479+Fluorocarbon FKM |
| 5 | Stem | 316 SS/A479 |
| 6 | Retainer (Only 7 Orifice) | 316 SS/A479 |
| 6a | Ring (Only 8 Orifice) | 316 SS/A479 |
| 7 | Quad Seal | Fluorocarbon FKM |
| 8 | O-ring | Fluorocarbon FKM |
| 9 | Bonnet | 316 SS/A479 |
| 10 | Spring Support | 316 SS/A276 |
| 11 | Spring | S17700 SS/AMS 5678 |
| 12 | Lock Nut | 17-4PH powdered metal |
| 13 | Sleeve | 304SS/A240 |
| 14 | Label | Polyester |
| 15 | Bonnet Cap | 316 SS/A479 |



Orifice 7 in. (mm)
0.19 (4.8)

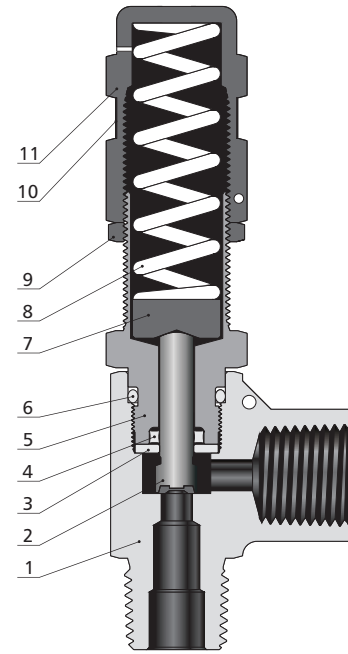
Orifice 8 in. (mm)
0.25 (6.4)

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RM Series

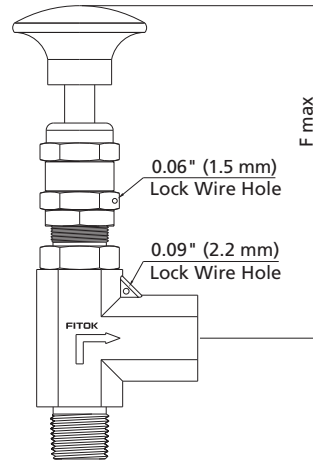
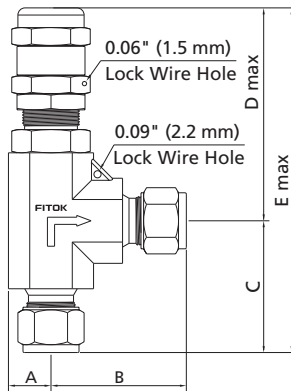
| Component | | Material Grade/ASTM Specification |
|-----------|----------------|-----------------------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Stem | 316 SS/A479+Fluorocarbon FKM |
| 3 | Retainer | 316 SS/A479 |
| 4 | Seal | Fluorocarbon FKM |
| 5 | Bonnet | 316 SS/A479 |
| 6 | O-ring | Fluorocarbon FKM |
| 7 | Spring Support | 316 SS/A276 |
| 8 | Spring | S17700 SS/AMS 5678 |
| 9 | Lock Nut | 17-4PH powdered metal |
| 10 | Label | Polyester |
| 11 | Bonnet Cap | 316 SS/A479 |



1. Lubricant: Silicone-based
2. Contact the authorized representative or FITOK Group for other materials.

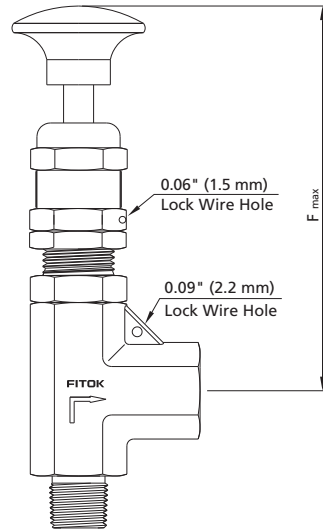
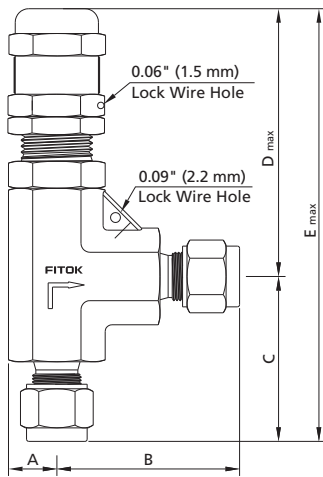
Dimensions

RV Series



| Basic Ordering Number | Connection Type and Size | | Orifice in. (mm) | Dimension in. (mm) | | | | | |
|-----------------------|--------------------------|-----------------|------------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|
| | Inlet | Outlet | | A | B | C | Dmax | E max | Fmax |
| RV□□-FL4-6 | 1/4" FITOK | 1/4" FITOK | 0.14 (3.6) | 0.43 (10.9) | 1.60 (40.6) | 1.44 (36.6) | 2.70 (68.6) | 4.14 (105.2) | 4.09 (103.9) |
| RV□□-FL6-6 | 3/8" FITOK | 3/8" FITOK | | 0.50 (12.7) | 1.72 (43.7) | 1.72 (43.7) | 4.09 (103.9) | 5.81 (147.6) | 5.37 (136.4) |
| RV□□-FL8-6 | 1/2" FITOK | 1/2" FITOK | | 0.43 (10.9) | 1.60 (40.6) | 1.44 (36.6) | 2.70 (68.6) | 4.14 (105.2) | 4.09 (104.9) |
| RV□□-ML6-6 | 6 mm FITOK | 6 mm FITOK | | 0.50 (12.7) | 1.83 (46.5) | 1.83 (46.5) | 4.09 (103.9) | 5.92 (150.4) | 5.37 (136.4) |
| RV□□-ML8-6 | 8 mm FITOK | 8 mm FITOK | | 0.43 (10.9) | 1.17 (29.7) | 1.38 (34.9) | 2.70 (68.6) | 4.08 (103.5) | 4.28 (108.7) |
| RV□□-ML12-6 | 12 mm FITOK | 12 mm FITOK | | 0.43 (10.9) | 1.17 (29.7) | 1.19 (30.2) | 2.70 (68.6) | 3.89 (98.8) | 4.09 (103.9) |
| RV□□-FNS4-6 | 1/4 Female NPT | 1/4 Female NPT | | 0.43 (10.9) | 1.17 (29.7) | 1.38 (34.9) | 2.70 (68.6) | 4.08 (103.5) | 4.28 (108.7) |
| RV□□-NS4-6 | 1/4 Male NPT | 1/4 Male NPT | | 0.43 (10.9) | 1.17 (29.7) | 1.38 (34.9) | 2.70 (68.6) | 4.08 (103.5) | 4.28 (108.7) |
| RV□□-FRT4-6 | 1/4 Female BSPT | 1/4 Female BSPT | | 0.43 (10.9) | 1.17 (29.7) | 1.38 (34.9) | 2.70 (68.6) | 4.08 (103.5) | 4.28 (108.7) |

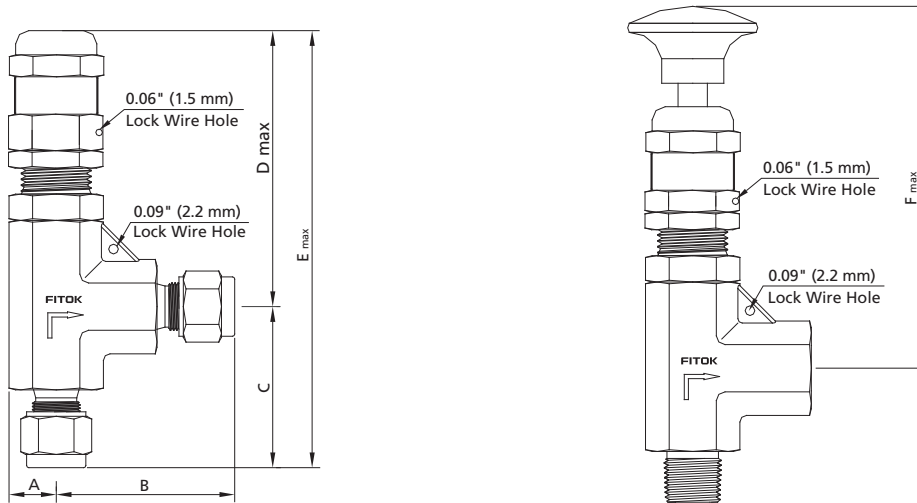
RL Series



| Basic Ordering Number | Connection Type and Size | | Orifice in. (mm) | Dimension in. (mm) | | | | | |
|-----------------------|--------------------------|-----------------|------------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|
| | Inlet Size | Outlet Size | | A | B | C | D | E | F |
| RL□□-FL4-7 | 1/4" FITOK | 1/4" FITOK | 0.19 (4.8) | 0.43 (10.9) | 1.60 (40.6) | 1.44 (36.6) | 2.70 (68.8) | 4.14 (105.0) | 4.09 (104.0) |
| RL□□-ML6-7 | 6 mm FITOK | 6 mm FITOK | | | 1.44 (36.6) | 1.19 (30.2) | | | |
| RL□□-NS4-7 | 1/4 Male NPT | 1/4 Male NPT | | | 1.17 (29.7) | 1.38 (34.9) | | 4.08 (103.5) | |
| RL□□-RT4-7 | 1/4 Female BSPT | 1/4 Female BSPT | | | | | | | |
| RL□□-FNS4-7 | 1/4 Female NPT | 1/4 Female NPT | | | | | | | |
| RL□□-FRT4-7 | 1/4 Female BSPT | 1/4 Female BSPT | | | | | | | |
| RL□□-FL8-8 | 1/2" FITOK | 1/2" FITOK | 0.25 (6.4) | 0.50 (12.7) | 1.83 (46.5) | 1.83 (46.5) | 4.09 (104.0) | 5.92 (150.0) | 5.37 (136.0) |
| RL□□-ML12-8 | 12 mm FITOK | 12 mm FITOK | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140.0) | |
| RL□□-NS8-8 | 1/2 Male NPT | 1/2 Male NPT | | | | | | | |
| RL□□-RT8-8 | 1/2 Male BSPT | 1/2 Male BSPT | | | | | | | |
| RL□□-FNS8-8 | 1/2 Female NPT | 1/2 Female NPT | | | | | | | |
| RL□□-FRT8-8 | 1/2 Female BSPT | 1/2 Female BSPT | | | | | | | |

7 Proportional Relief Valves

RM Series

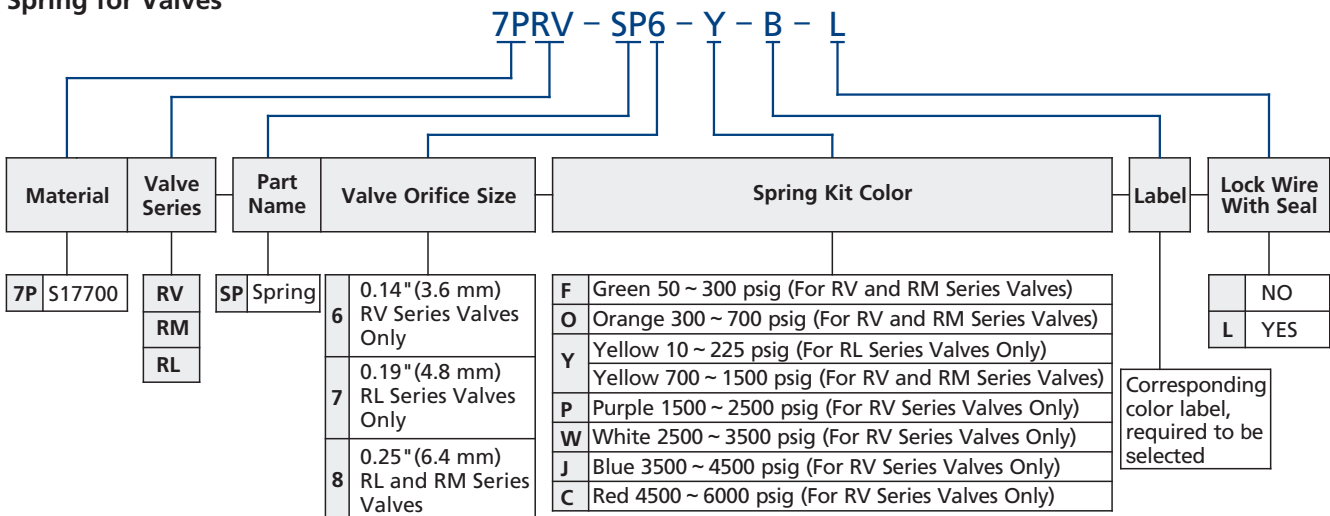


| Basic Ordering Number | Connection Type and Size | | Orifice in. (mm) | Dimension in. (mm) | | | | | |
|-----------------------|--------------------------|-----------------|------------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|
| | Inlet Size | Outlet Size | | A | B | C | D | E | F |
| RM□□-FL8-8 | 1/2" FITOK | 1/2" FITOK | 0.25 (6.4) | 0.50 (12.7) | 1.83 (46.5) | 1.83 (46.5) | 4.09 (104.0) | 5.92 (150.0) | 5.37 (136.0) |
| RM□□-ML12-8 | 12 mm FITOK | 12 mm FITOK | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140.0) | |
| RM□□-NS8-8 | 1/2 Male NPT | 1/2 Male NPT | | | | | | | |
| RM□□-RT8-8 | 1/2 Male BSPT | 1/2 Male BSPT | | | | | | | |
| RM□□-FNS8-8 | 1/2 Female NPT | 1/2 Female NPT | | | | | | | |
| RM□□-FRT8-8 | 1/2 Female BSPT | 1/2 Female BSPT | | | | | | | |

1. FITOK means FITOK double ferrule tube fittings.
2. Dimensions are shown with FITOK nuts finger-tightened. All dimensions are for reference only and are subject to change. For dimensions not shown above, please contact the authorized representative or FITOK Group.
3. Sizes and types listed are standard. Other sizes and types are available upon request. Refer to ordering information.

Part Number Description

Spring for Valves



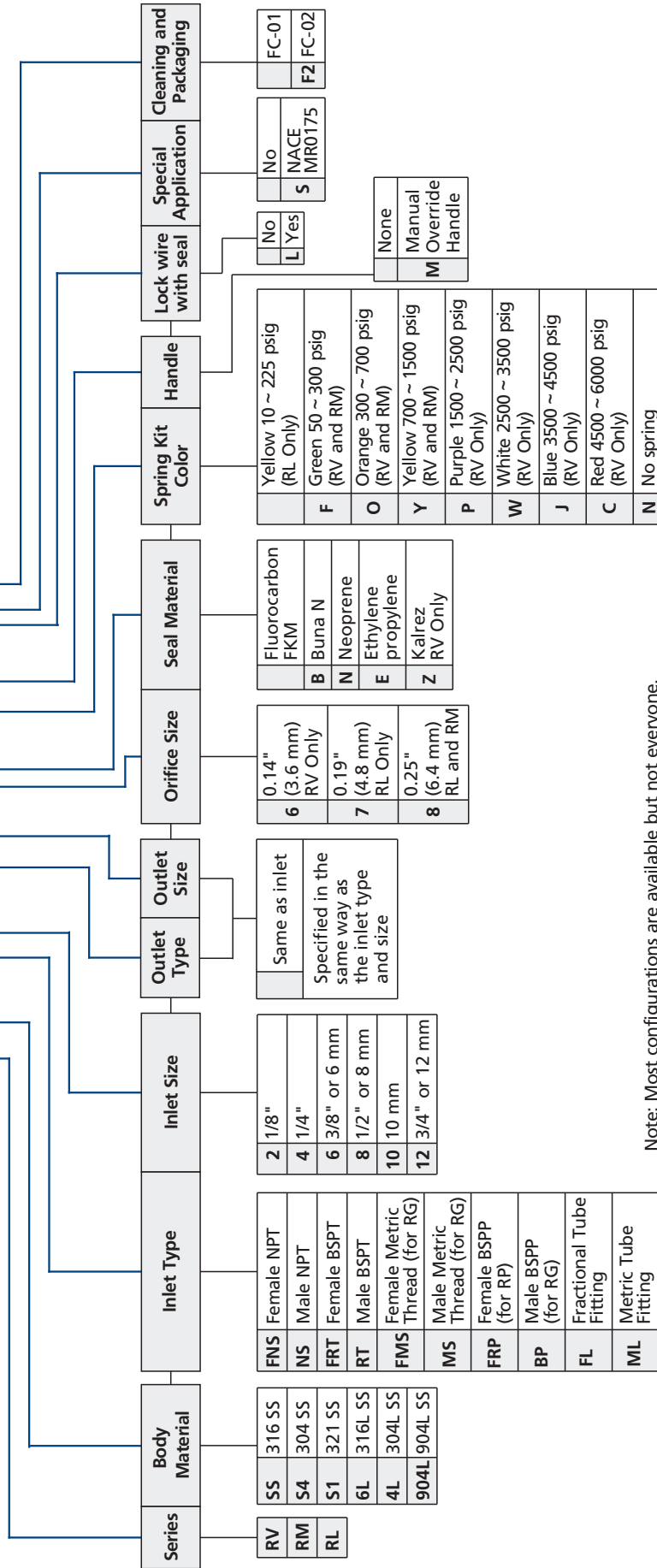
Note: Most configurations are available but not everyone.

© Every spring kit includes a corresponding color label.

Part Number Description

Valves

RVSS – FL6 – ML8 – 6Z – WM – LSF2



Note: Most configurations are available but not everyone.

1. Standard thread pitch for metric threads are as follows:

M10 and below: 1 mm

M12 to M24: 1.5 mm

M27 and above: 2 mm

Standard thread pitch should be ignored in the ordering number, others should be specified.

2. Cleaning and Packaging:

FC-01: Standard cleaning and packaging for general industrial procedures.

FC-02: Special cleaning and packaging for wetted system components to ensure compliance with product cleaning requirement of ASTM G93 Level C.

3. The color of the manual override handle is black. For other colors, please contact the authorized representative or FITOK Group.

FITOK Group

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