

Proportional Relief Valves

RV, RL, RM Series



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FITOK
Valves and Fittings

www.fitokgroup.com

Proportional Relief Valves

RV, RL and RM Series

Introduction

Relief Valve opens open when system pressure reaches the set pressure, allowing the medium to flow out and relieve the system pressure. The valve closes when the system pressure is down to the resealing pressure. The opening height and the system pressure are direct proportional. However, there's no limit for relieving capacity, so valves in this series in these series should be selected carefully according to system requirements.



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 and Pre-set Pressure**
 - 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 which pressure 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) |

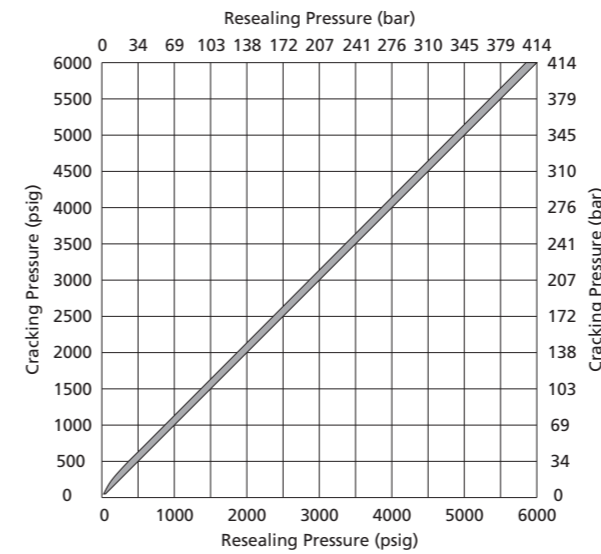
Cracking Pressure and Resealing Pressure

Cracking pressure: The pressure at which the first indication of flow occurs. The repeatability of the cracking pressure of each valve after initial relief is within ±5% at room temperature.

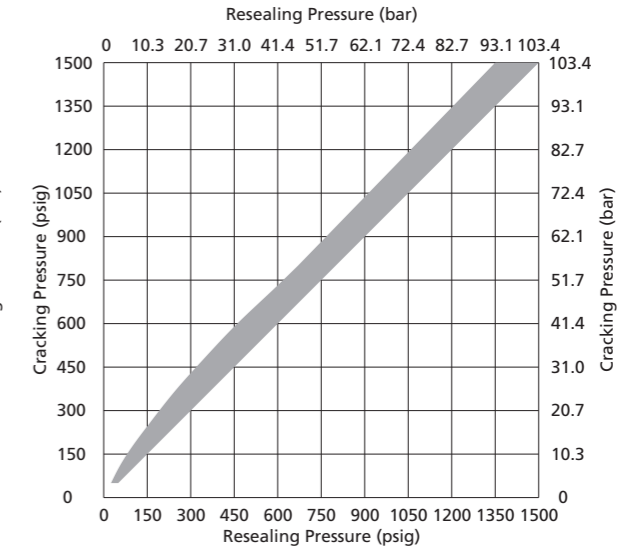
Resealing pressure: The pressure at which there is no indication of flow. Resealing pressure is always lower than the set pressure.

Back pressure: The pressure of the outlet of the valve. It increases the set pressure.

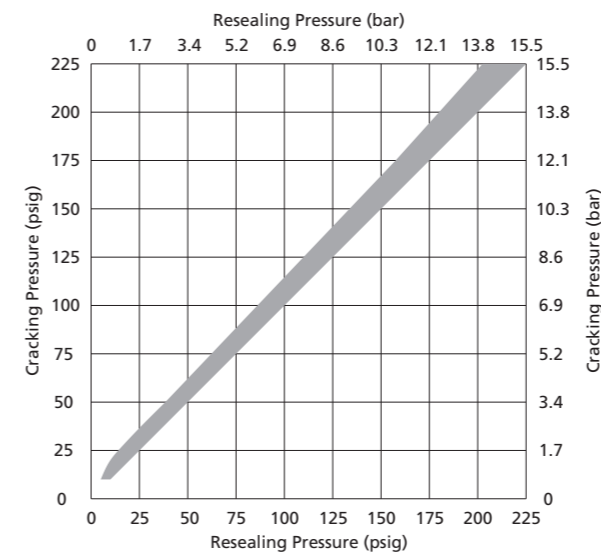
RV Series



RM Series

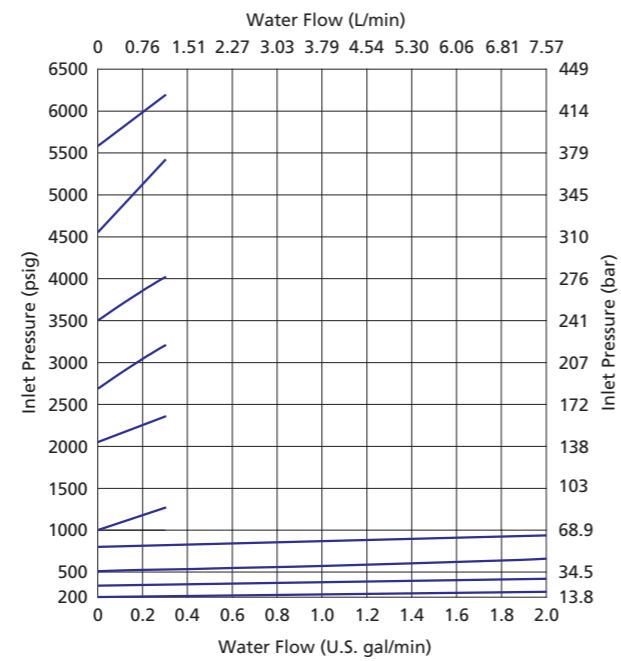
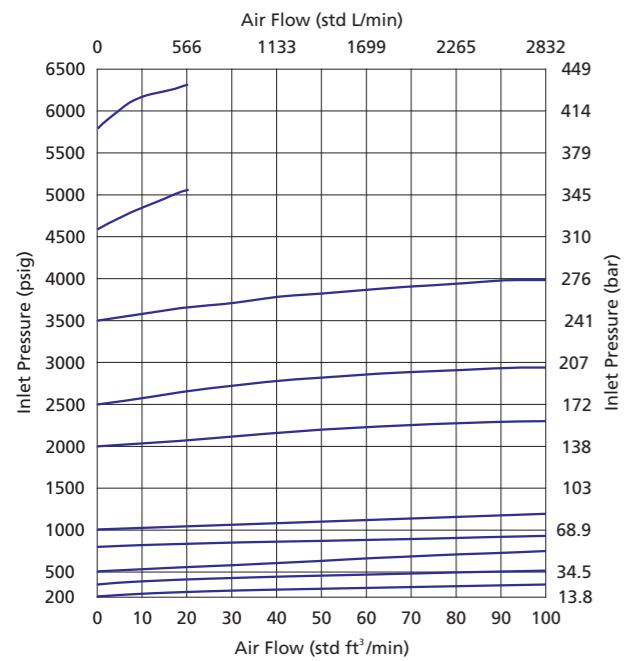


RL Series

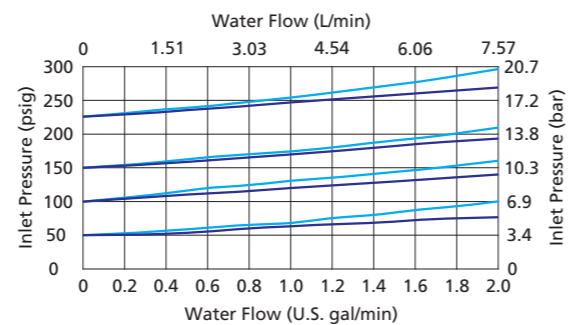
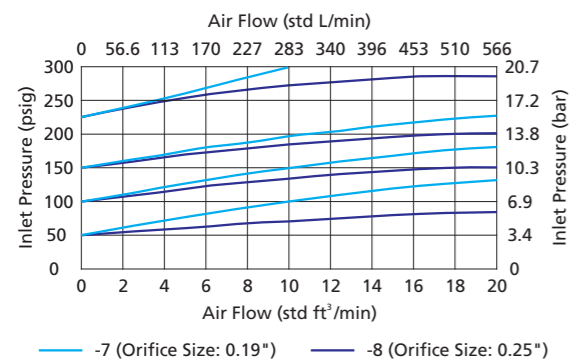


Flow Data at 70°F (20°C)

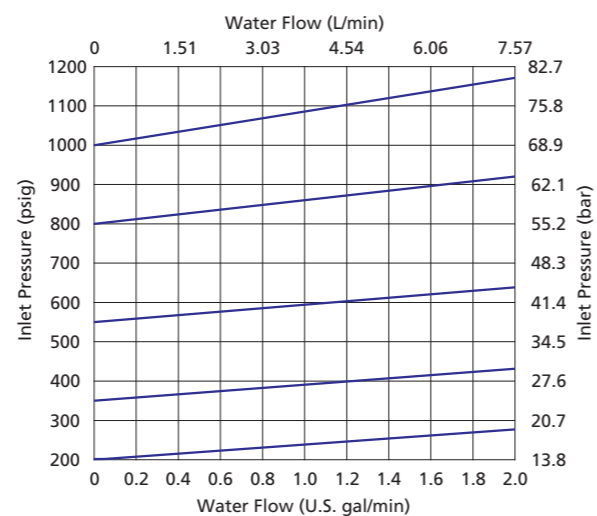
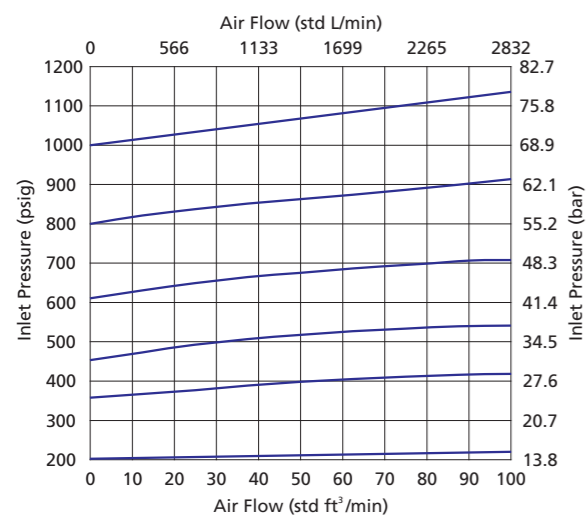
RV Series



RL Series



RM Series



Standard Materials of Construction

RV Series

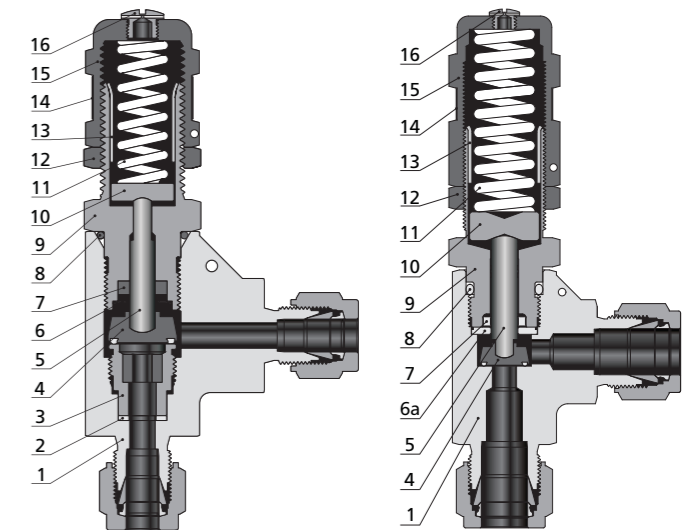
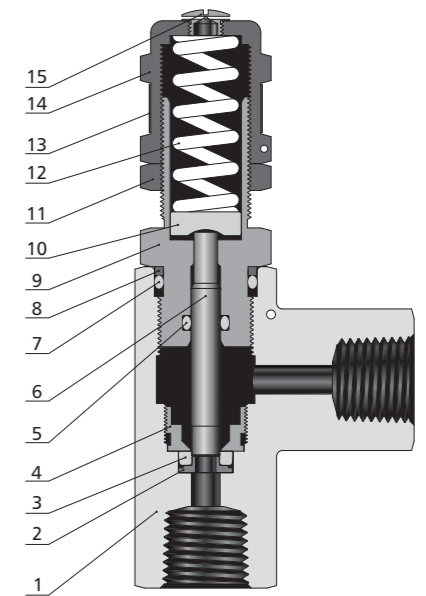
| Component | Material Grade/ASTM Specification | |
|-----------|-----------------------------------|-----------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Insert | 316 SS/A479 |
| 3 | O-ring | Fluorocarbon FKM |
| 4 | Seat Retainer | 316 SS/A479 |
| 5 | O-ring | Fluorocarbon FKM |
| 6 | Stem | 316 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 |
| 15 | Plug | 316 SS/A276 |

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

RL Series

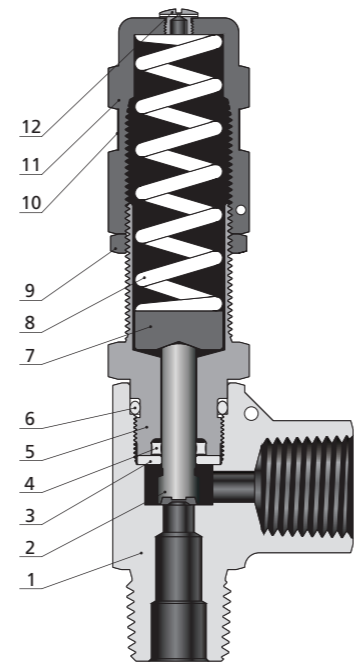
| Component | Material Grade/ASTM Specification | |
|-----------|-----------------------------------|------------------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Gasket (Only 7 Orifice) | 316 SS/A479 |
| 3 | Seat (Only 7 Orifice) | 316 SS/A479 |
| 4 | Bonded disc | 316 SS/A479+Fluorocarbon FKM |
| 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 |
| 16 | Plug | 316 SS/A276 |

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



RM Series

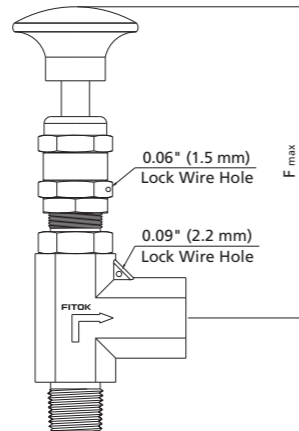
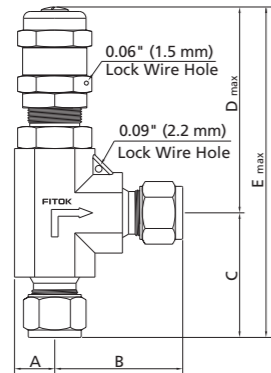
| Component | Material Grade/ASTM Specification | |
|-----------|-----------------------------------|------------------------------|
| 1 | Body | 316 SS/A182 |
| 2 | Stem | 316 SS/A479+Fluorocarbon FKM |
| 3 | Retainer | 316 SS/A479 |
| 4 | Seal | Fluorocarbon FKM |
| 5 | Bonnet | 316 SS/A479 |
| 6 | 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 |
| 12 | Plug | 316 SS/A276 |



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

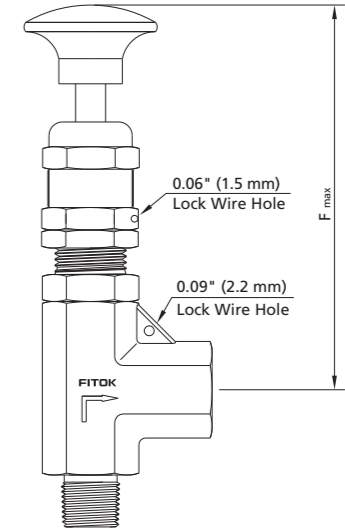
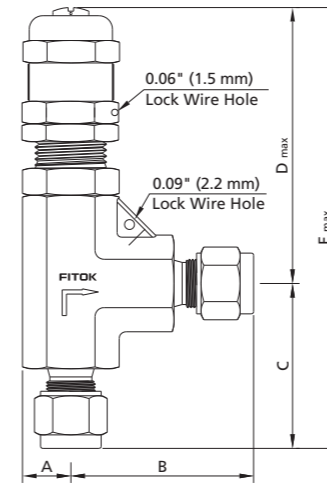
Dimensions

RV Series



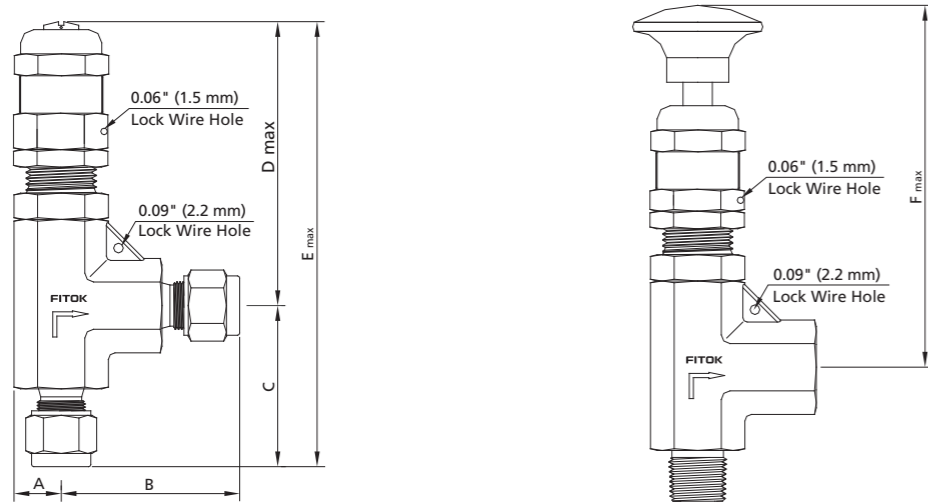
| Basic Ordering Number | Connection Type and Size | | Orifice in. (mm) | Dimension in. (mm) | | | | | |
|-----------------------|--------------------------|-----------------|------------------|--------------------|----------------|----------------|-----------------|-----------------|-----------------|
| | Inlet | Outlet | | A | B | C | Dmax | Emax | 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) | 1.19 (30.2) | 2.70 (68.6) | 3.89 (98.8) | 4.09 (103.9) |
| RV□□-ML12-6 | 12 mm FITOK | 12 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□□-FNS4-6 | 1/4 Female NPT | 1/4 Female NPT | | 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□□-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 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) | 2.7 (68.8) | 4.14 (105) | 4.09 (104) | |
| RL□□-ML6-7 | 6 mm FITOK | 6 mm FITOK | | | 1.44 (36.6) | 1.19 (30.2) | | 3.89 (98.8) | | |
| 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 | | | 1.83 (46.5) | 1.83 (46.5) | | 5.92 (150) | | |
| RL□□-FNS4-7 | 1/4 Female NPT | 1/4 Female NPT | | | 1.44 (36.6) | 1.44 (36.6) | | 4.09 (104) | | 5.52 (140) |
| RL□□-FRT4-7 | 1/4 Female BSPT | 1/4 Female BSPT | | | 0.25 (6.4) | 0.5 (12.7) | | 1.44 (36.6) | | 1.44 (36.6) |
| RL□□-FL8-8 | 1/2" FITOK | 1/2" FITOK | 0.25 (6.4) | 0.5 (12.7) | 1.83 (46.5) | 1.83 (46.5) | 4.09 (104) | 5.92 (150) | 5.37 (136) | |
| RL□□-ML12-8 | 12 mm FITOK | 12 mm FITOK | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140) | | |
| RL□□-NS8-8 | 1/2 Male NPT | 1/2 Male NPT | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140) | | |
| RL□□-RT8-8 | 1/2 Male BSPT | 1/2 Male BSPT | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140) | | |
| RL□□-FNS8-8 | 1/2 Female NPT | 1/2 Female NPT | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140) | | |
| RL□□-FRT8-8 | 1/2 Female BSPT | 1/2 Female BSPT | | | 1.44 (36.6) | 1.44 (36.6) | | 5.52 (140) | | |

RM Series

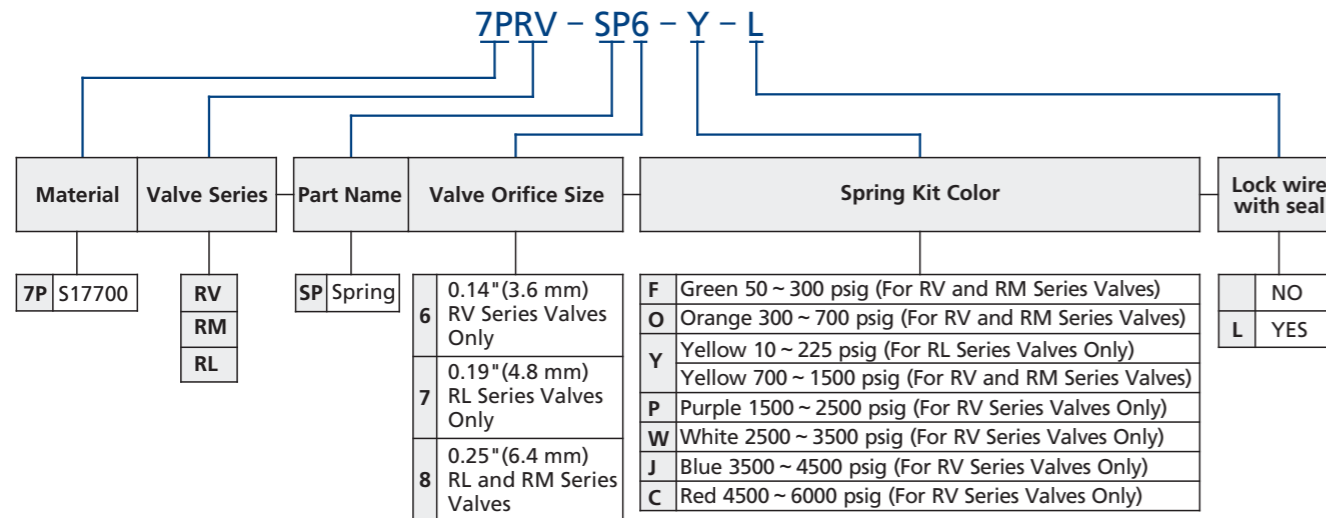


| Basic Ordering Number | Connection and Size | | Orifice in. (mm) | Dimension in. (mm) | | | | | |
|-----------------------|---------------------|-----------------|------------------|--------------------|----------------|----------------|----------------|------------|------------|
| | Inlet Size | Outlet Size | | A | B | C | D | E | F |
| RM□□-FL8-8 | 1/2" FITOK | 1/2" FITOK | 0.25 (6.4) | 0.5 (12.7) | 1.83 (46.5) | 1.83 (46.5) | 4.09 (104) | 5.92 (150) | 5.37 (136) |
| RM□□-ML12-8 | 12 mm FITOK | 12 mm FITOK | | | | | | | |
| RM□□-NS8-8 | 1/2 Male NPT | 1/2 Male NPT | | | 1.44 (36.6) | 1.44 (36.6) | 5.52 (140) | | |
| RM□□-RT8-8 | 1/2 Male BSPT | 1/2 Male BSPT | | | | | | | |
| RM□□-FNS8-8 | 1/2 Female NPT | 1/2 Female NPT | | | 0.25" (6.4 mm) | 0.19" (4.8 mm) | 0.25" (6.4 mm) | | |
| 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.

Ordering Information

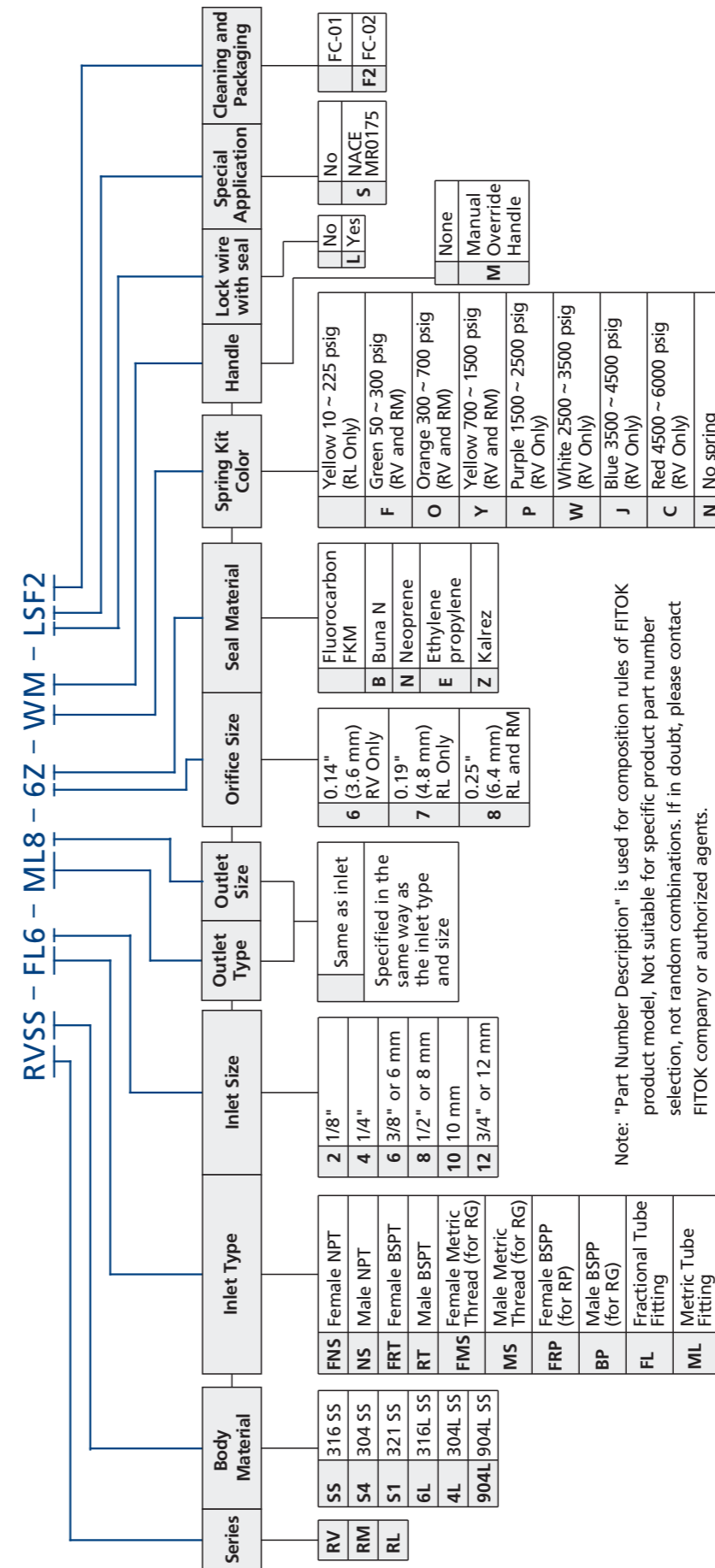
Spring For Valves



Every spring kit includes a corresponding color label.



Part Number Description
Valves



Note: "Part Number Description" is used for composition rules of FITOK product model. Not suitable for specific product part number selection, not random combinations. If in doubt, please contact FITOK company or authorized agents.

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 as stated in 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.

