

# Proportional Relief Valves

RV, RL and RM Series



**FITOK**  
Valves and Fittings

[www.fitokgroup.com](http://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

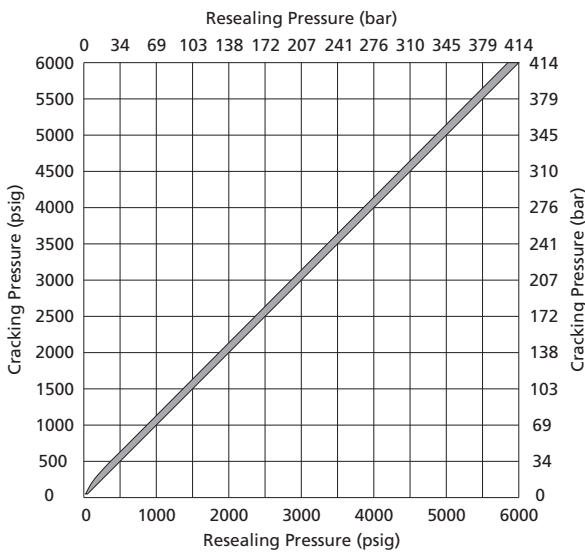
O-ring Material	Temperature Ranges °F (°C)
Fluorocarbon Rubber	25 to 250 (-4 to 121)
Buna-N Rubber	0 to 250 (-17 to 121)
Neoprene Rubber	-10 to 300 (-23 to 148)
Ethylene Propylene Rubber	30 to 250 (-1 to 121)

## Set Pressure and Resealing Pressure

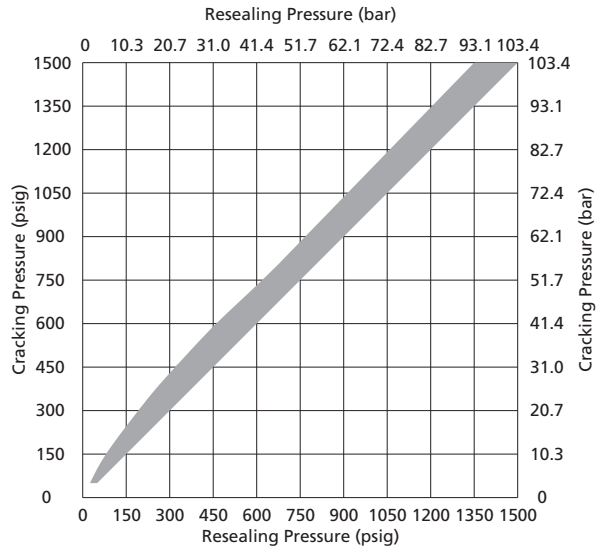
**Set pressure:** The set pressure is the upstream pressure at which the first indication of flow occurs. The repeatability of set pressure of each valve after initial relief is  $\pm 5\%$  at room temperature.

**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.

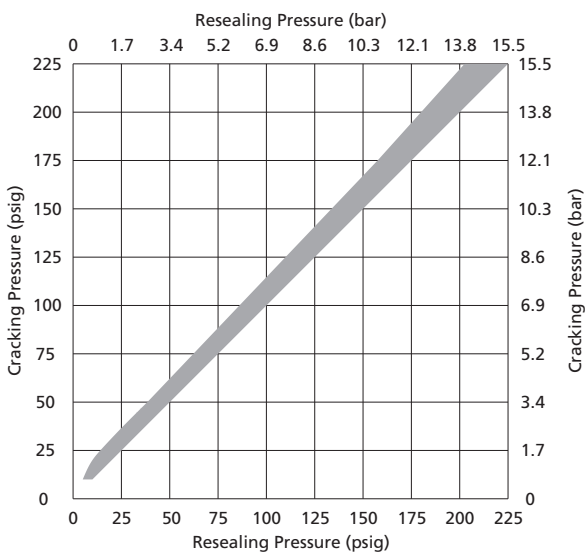
### RV Series



### RM Series



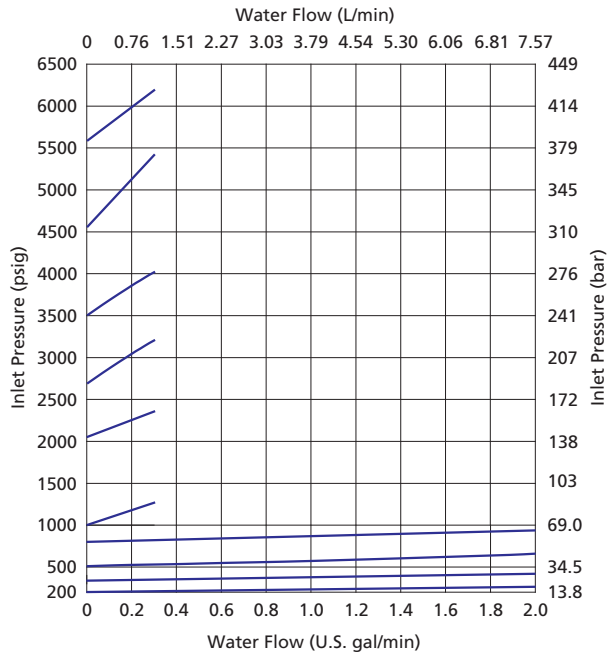
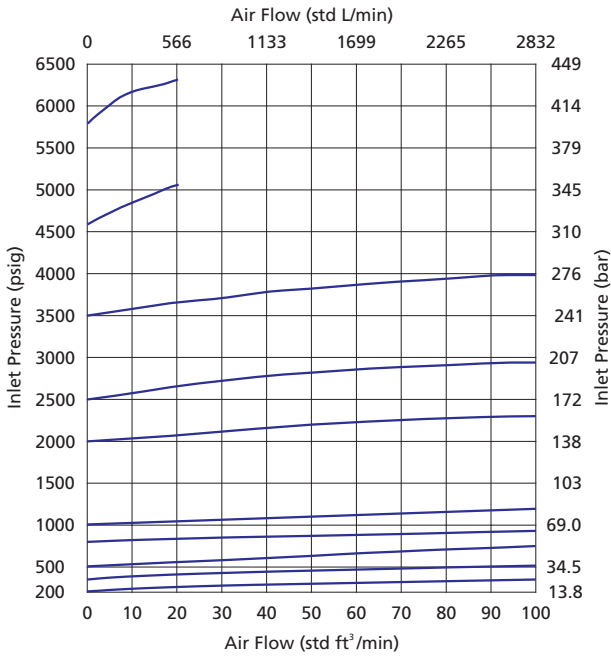
### RL Series



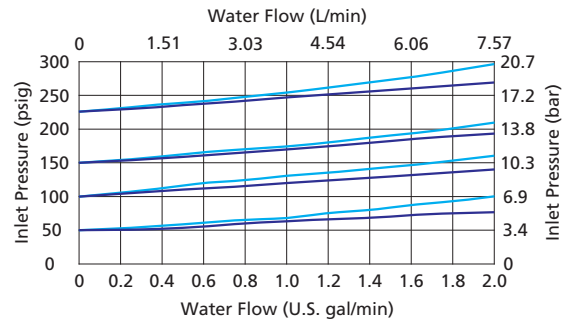
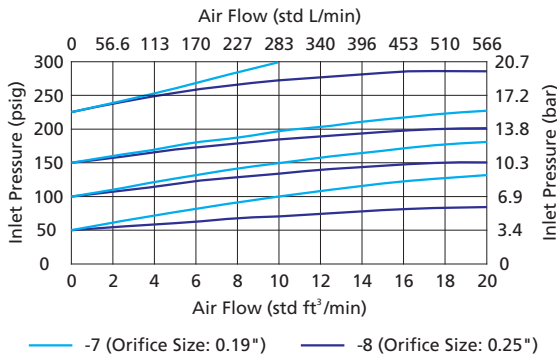
### 3 Proportional Relief Valves

## Flow Data at 70°F (20°C)

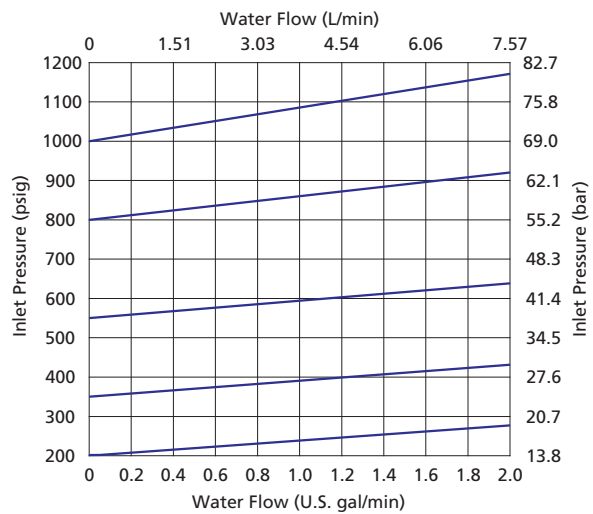
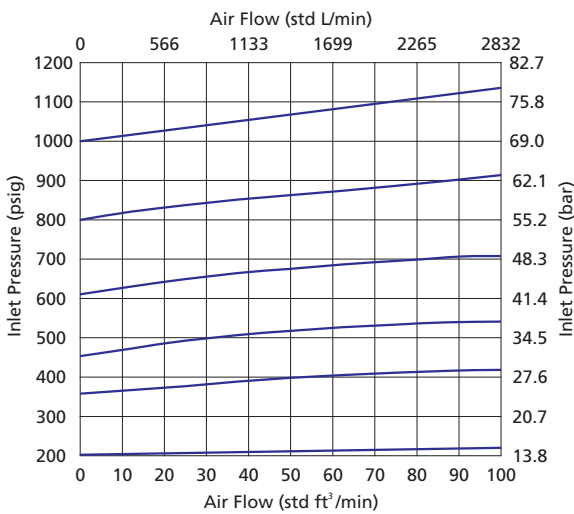
### RV Series



### RL Series



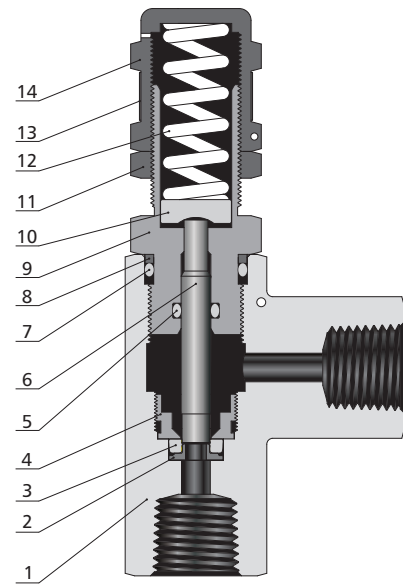
### RM Series



## Standard Materials of Construction

### RV Series

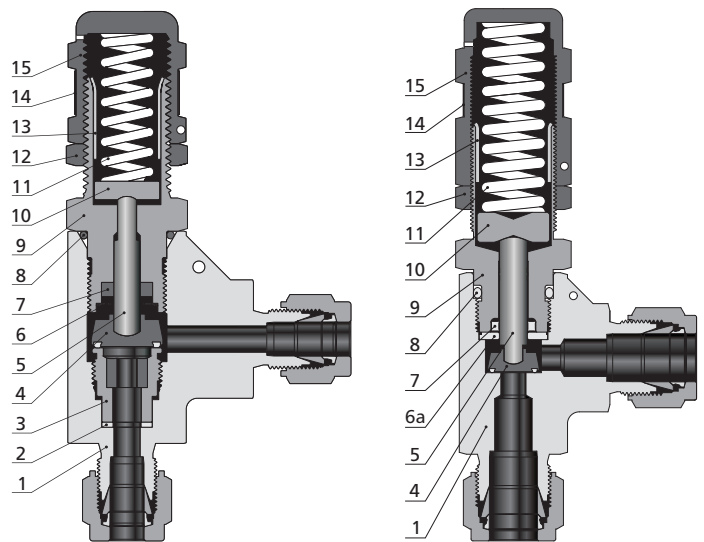
Component		Material Grade/ASTM Specification
1	Body	316 SS/A182
2	Insert	316 SS/A479
3	O-ring	Fluorocarbon FKM
4	Seat Retainer	316 SS/A479
5	O-ring	Fluorocarbon FKM
6	Stem	316 SS/A479
7	O-ring	Fluorocarbon FKM
8	Seal Retainer	PTFE
9	Bonnet	316 SS/A479
10	Spring Support	316 SS/A276
11	Lock Nut	17-4PH 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)

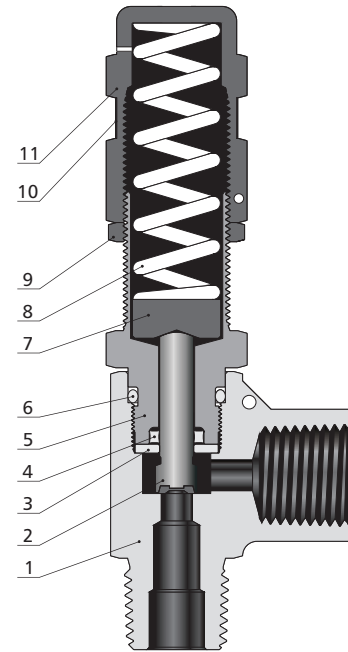
Orifice 8 in. (mm)  
0.25 (6.4)

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## 5 Proportional Relief Valves

### RM Series

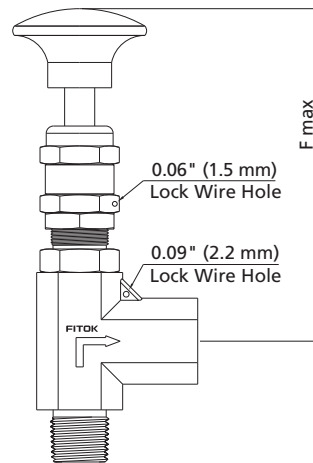
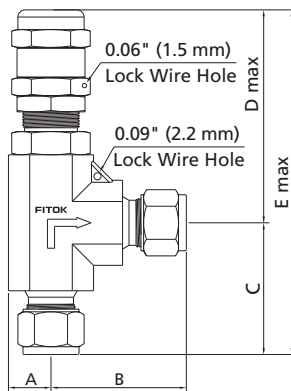
Component		Material Grade/ASTM Specification
1	Body	316 SS/A182
2	Stem	316 SS/A479+Fluorocarbon FKM
3	Retainer	316 SS/A479
4	Seal	Fluorocarbon FKM
5	Bonnet	316 SS/A479
6	O-ring	Fluorocarbon FKM
7	Spring Support	316 SS/A276
8	Spring	S17700 SS/AMS 5678
9	Lock Nut	17-4PH powdered metal
10	Label	Polyester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



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

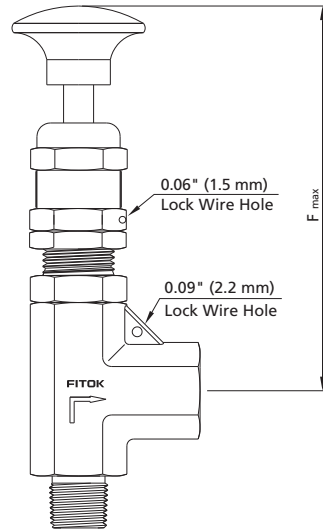
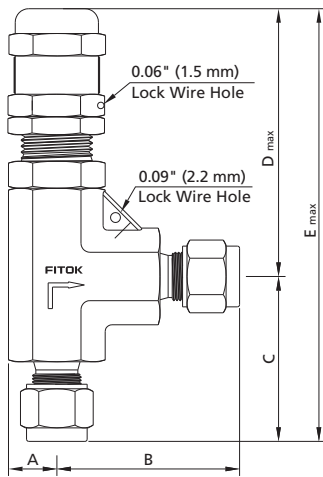
## Dimensions

### 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)

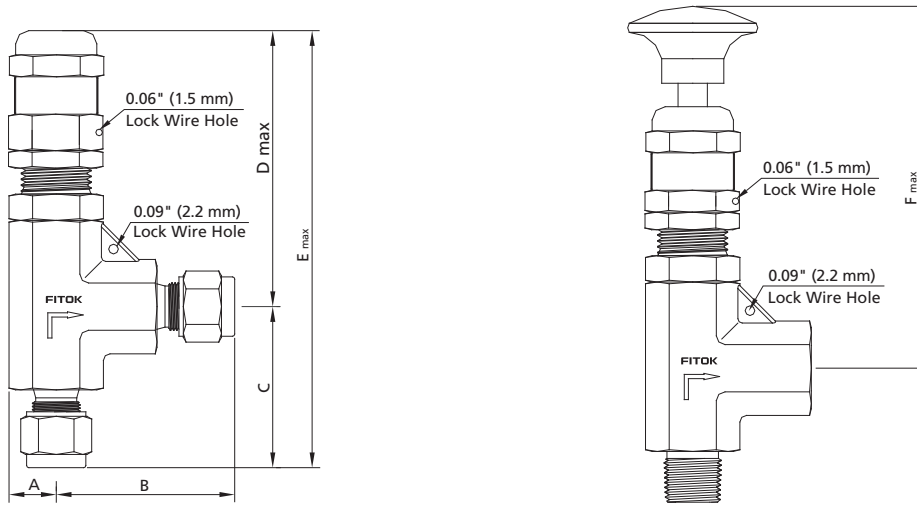
RL Series



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							
RL□□-NS4-7	1/4 Male NPT	1/4 Male NPT			1.44 (36.6)	1.19 (30.2)		3.89 (98.8)	
RL□□-RT4-7	1/4 Female BSPT	1/4 Female BSPT							
RL□□-FNS4-7	1/4 Female NPT	1/4 Female NPT			1.17 (29.7)	1.38 (34.9)		4.08 (103.5)	
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							
RL□□-NS8-8	1/2 Male NPT	1/2 Male NPT			1.44 (36.6)	1.44 (36.6)		5.52 (140.0)	
RL□□-RT8-8	1/2 Male BSPT	1/2 Male BSPT							
RL□□-FNS8-8	1/2 Female NPT	1/2 Female NPT			1.44 (36.6)	1.44 (36.6)		5.52 (140.0)	
RL□□-FRT8-8	1/2 Female BSPT	1/2 Female BSPT							

# 7 Proportional Relief Valves

## RM Series

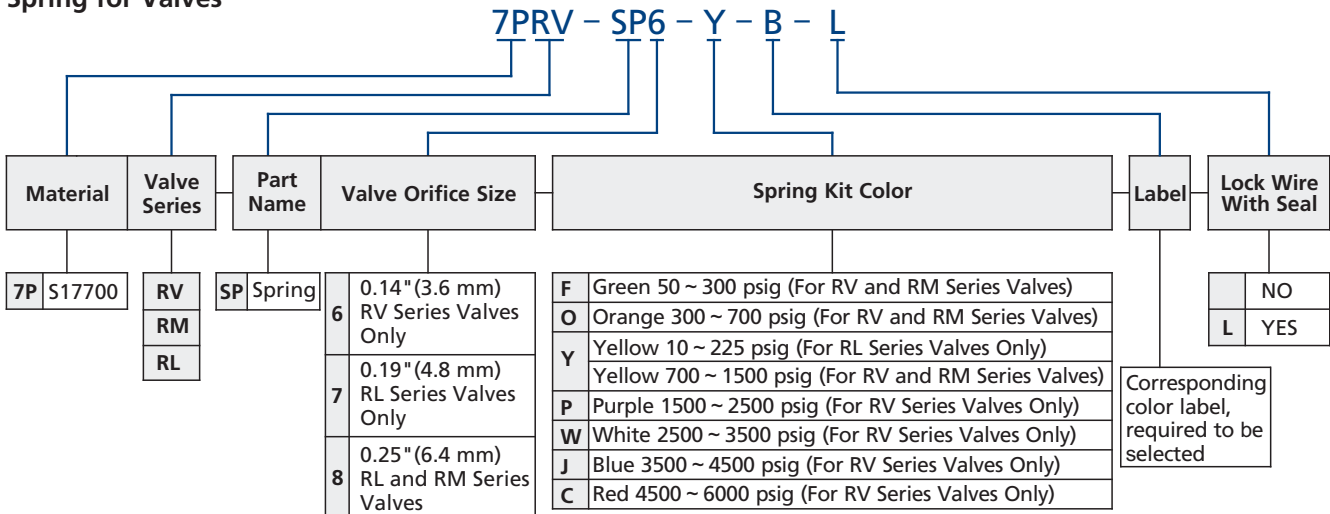


Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Dimension in. (mm)					
	Inlet Size	Outlet Size		A	B	C	D	E	F
RM□□-FL8-8	1/2" FITOK	1/2" FITOK	0.25 (6.4)	0.50 (12.7)	1.83 (46.5)	1.83 (46.5)	4.09 (104.0)	5.92 (150.0)	5.37 (136.0)
RM□□-ML12-8	12 mm FITOK	12 mm FITOK			1.44 (36.6)	1.44 (36.6)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

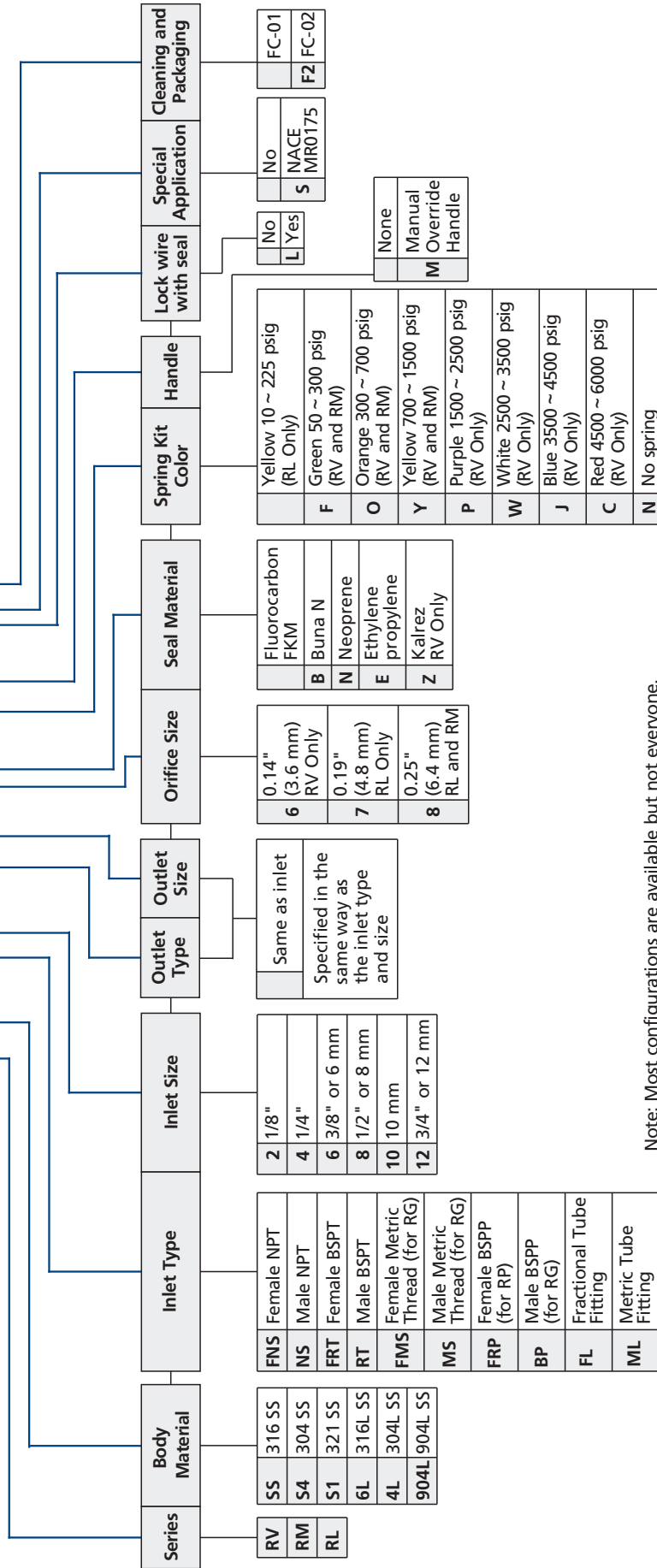
© Every spring kit includes a corresponding color label.



# 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.

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