

# Proportional Relief Valves

RV, RL and RM Series

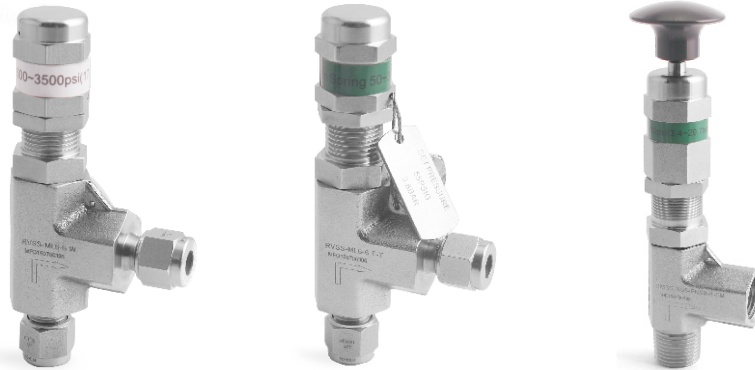


# Proportional Relief Valves

## RV, RL and RM Series

### Introduction

FITOK relief valves OPEN when system pressure reaches the set pressure and CLOSE when system pressure falls below the set pressure.



### 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: Balanced 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
- ⦿ Lead seal through lock wire holes to lock proportional relief valve so as to secure a set pressure effectively
- ⦿ Variety of seal materials
- ⦿ Label identifies the set pressure range

### Applications

Relief valves are proportional relief valves that open gradually as the pressure increases. Consequently, they do not have a capacity rating at a given pressure rise (accumulation), and they are not certified to ASME or any other codes.

- ⚠ **Some system applications require relief valves to meet specific safety codes. The system designer and user must determine when such codes apply and whether these relief valves conform to them.**
- ⚠ **FITOK proportional relief valves should never be used as ASME Boiler and Pressure Vessel Code safety relief devices.**
- ⚠ **FITOK proportional relief valves are not "Safety Accessories" as defined in the Pressure Equipment Directive 2014/68/EU.**

## 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)
EPDM	30 to 250 (-1 to 121)

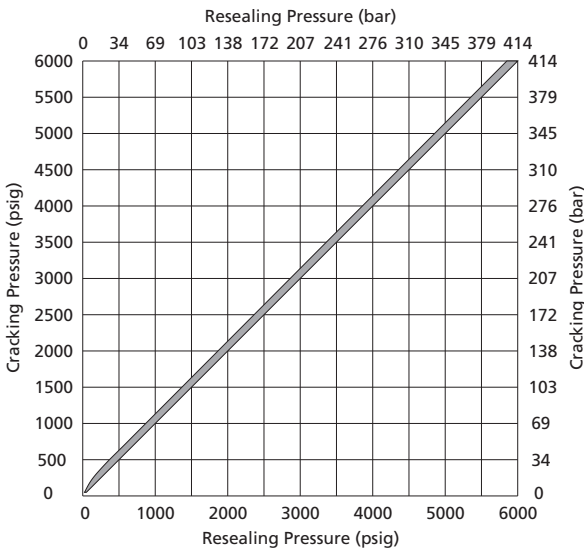
## Set Pressure and Resealing Pressure

**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.

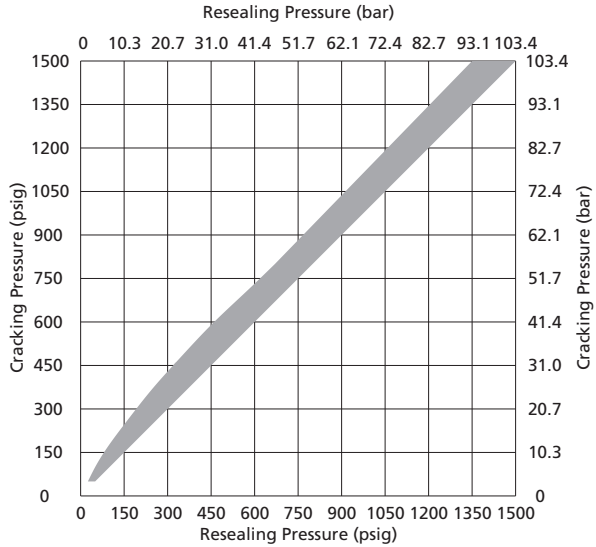
**Resealing pressure:** The resealing pressure is the upstream pressure at which there is no indication of flow. Resealing pressure is always lower than set pressure.

*Note: For valves not acutated for a period of time, the initial relief pressure may be higher than the set pressure.*

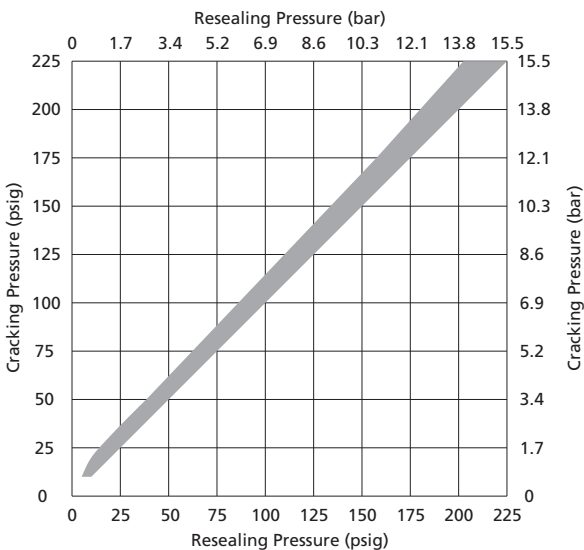
### RV Series



### RM Series



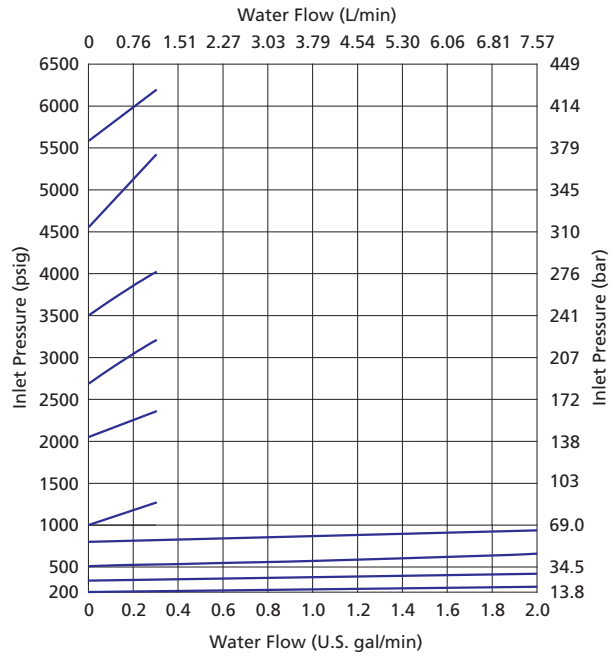
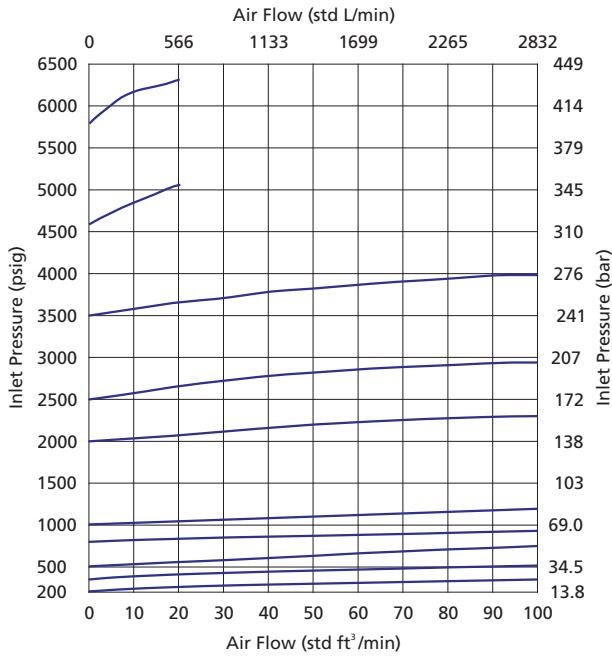
### RL Series



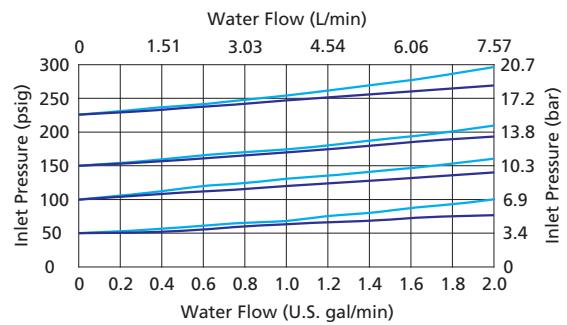
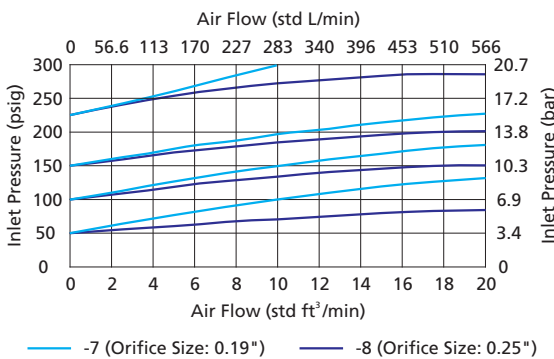
Check Valves  
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## Flow Data at 70°F (20°C)

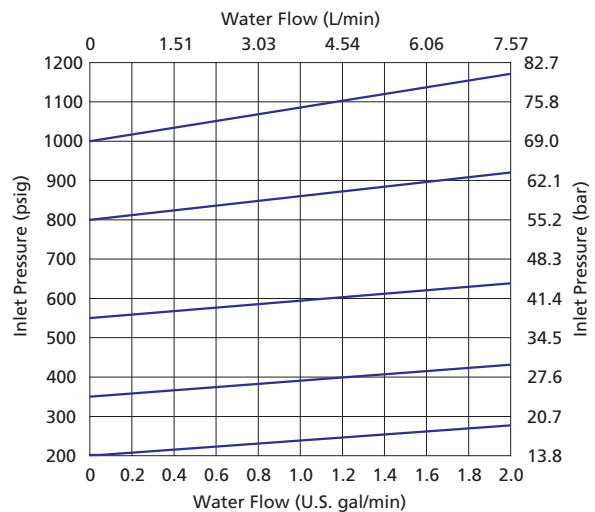
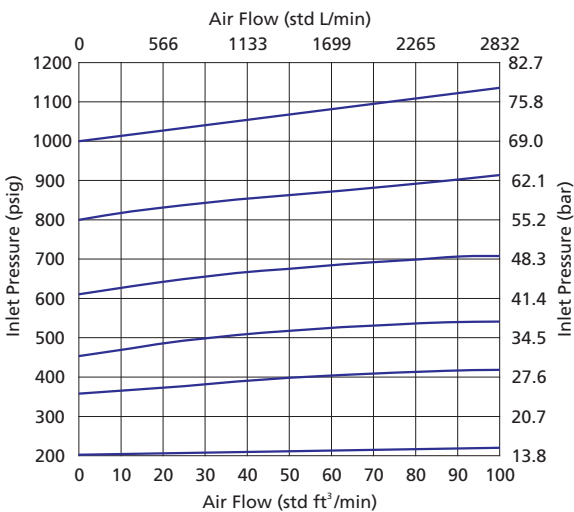
### RV Series



### RL Series



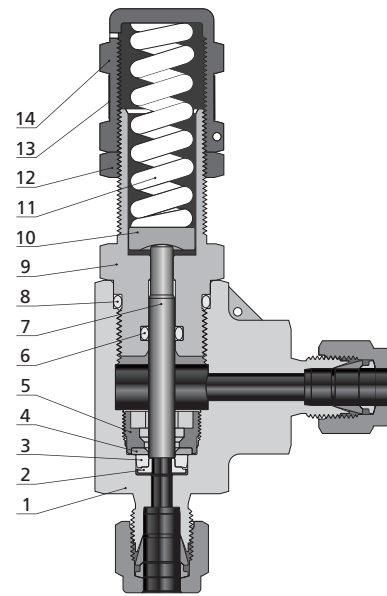
### RM Series



## Standard Materials of Construction

### RV Series

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



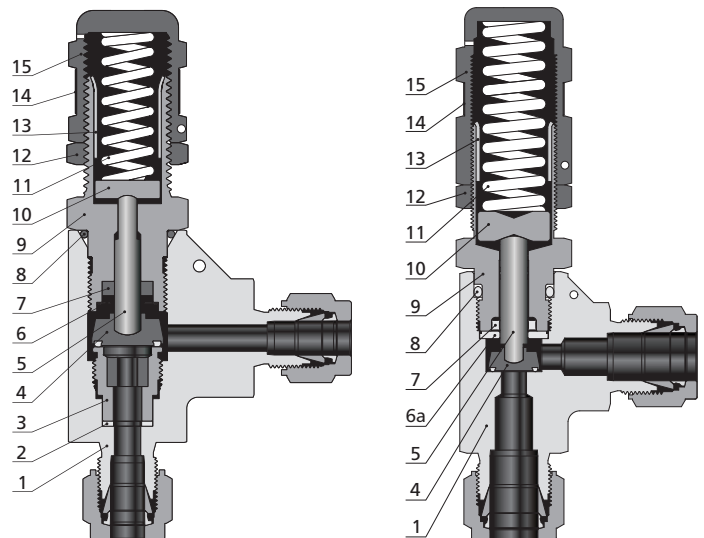
Note: Wetted components are listed in italics.

1. Lubricant: Silicone-based

2. Contact FITOK Group or our authorized distributors for other materials

### RL Series

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



Orifice 7  
0.19 in. (4.8 mm)

Orifice 8  
0.25 in. (6.4 mm)

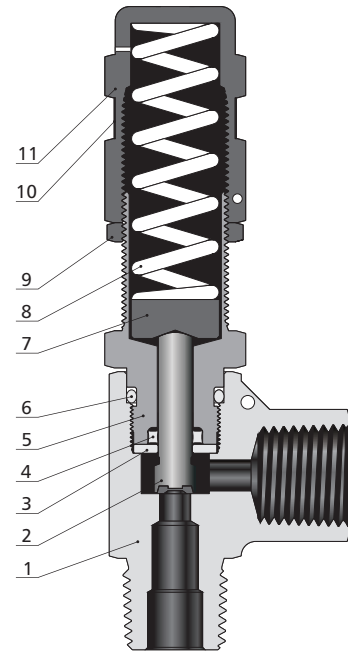
Note: Wetted components are listed in italics.

1. Lubricant: Silicone-based

2. Contact FITOK Group or our authorized distributors 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/A479
8	Spring	S17700 SS/AMS 5678
9	Lock Nut	17-4PH powdered metal
10	Label	Polyester
11	Bonnet Cap	316 SS/A479



Note: Wetted components are listed in italics.

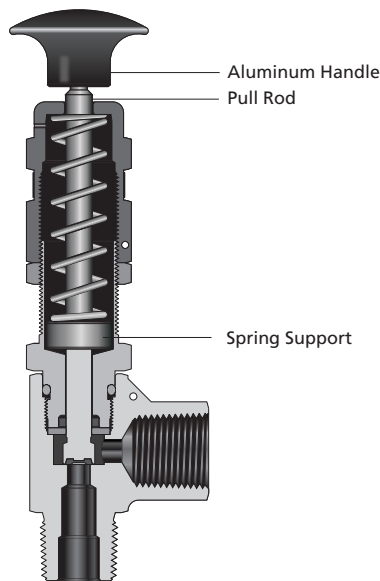
1. Lubricant: Silicone-based

2. Contact FITOK Group or our authorized distributors for other materials

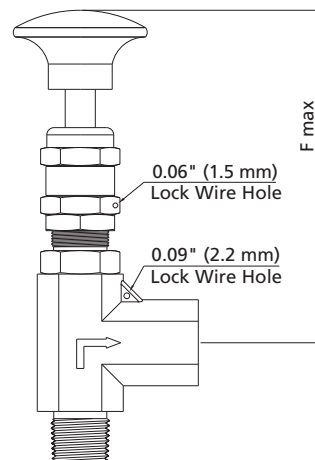
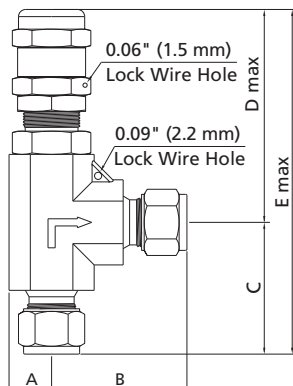
**Manual Override Handles**

Lift the aluminum handle with hand to open the proportional relief valve without changing the set pressure. For use with following valves :

- RV Series — set pressure range 50~1500 psig
- RL Series — set pressure range 10~225 psig
- RM Series— set pressure range 50~300 psig



**Dimensions**



Check Valves  
Relief Valves

**RV Series**

Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Dimensions, in. (mm)					
	Inlet	Outlet		A	B	C	Dmax	Emax	Fmax
RV□□-FL4-6-□	1/4" FITOK	1/4" FITOK	0.14 (3.6)	0.46 (11.9)	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							
RV□□-FL8-6-□	1/2" FITOK	1/2" FITOK							
RV□□-ML6-6-□	6 mm FITOK	6 mm FITOK		0.46 (11.9)	1.60 (40.6)	1.44 (36.6)	2.70 (68.6)	4.14 (105.2)	4.09 (104.9)
RV□□-ML8-6-□	8 mm FITOK	8 mm FITOK							
RV□□-ML12-6-□	12 mm FITOK	12 mm FITOK							
RV□□-FNS4-6-□	1/4 Female NPT	1/4 Female NPT		0.46 (11.9)	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							
RV□□-FRT4-6-□	1/4 Female BSPT	1/4 Female BSPT							

**RL Series**

Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Dimensions, 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)	0.46 (11.9)	1.60 (40.6)	1.44 (36.6)		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							
RL□□-RT4-7	1/4 Male BSPT	1/4 Male BSPT			1.17 (29.7)	1.38 (34.9)		4.08 (103.5)	
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)	0.54 (13.7)	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							
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							

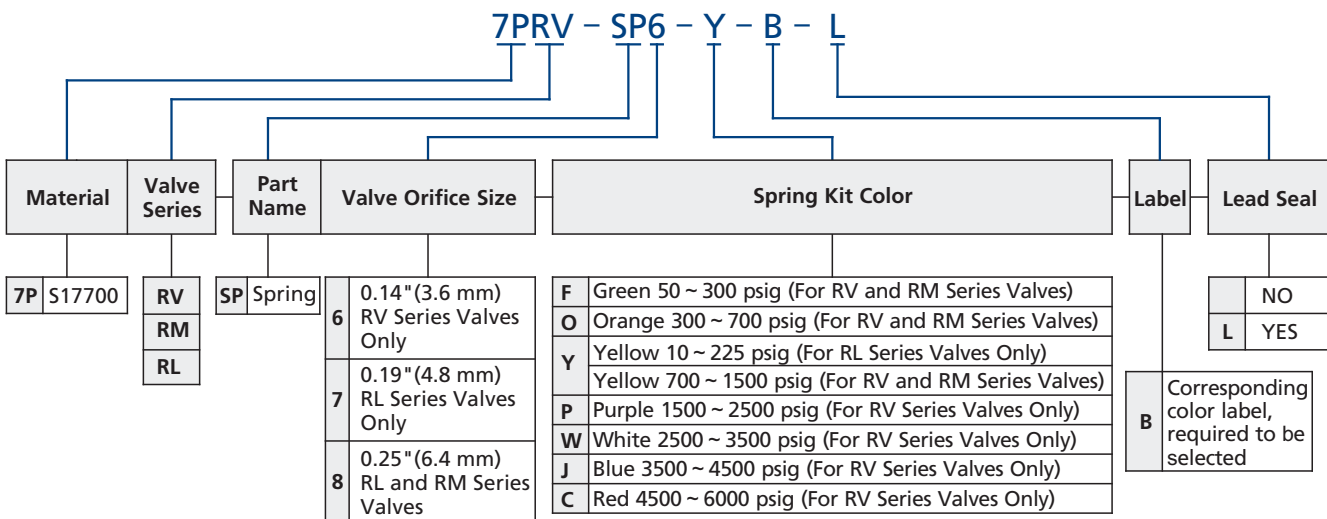
Check Valves  
Relief Valves

RM Series

Basic Ordering Number	Connection Type and Size		Orifice in. (mm)	Dimensions, 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)	0.54 (13.7)	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							
RM□□-NS8-8-□	1/2 Male NPT	1/2 Male NPT			1.44 (36.6)	1.44 (36.6)	5.52 (140.0)		
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.
3. Sizes and types listed are standard. For other connection types and sizes, please contact FITOK Group or our authorized distributors.

Spring Kit Ordering Number Description



Note: "Ordering Number Description" is a reference to understand the combination rules of FITOK product part number. Not all combinations are available.

© Every spring kit includes a spring, a label and a lead seal (optional).

Check Valves  
Relief Valves

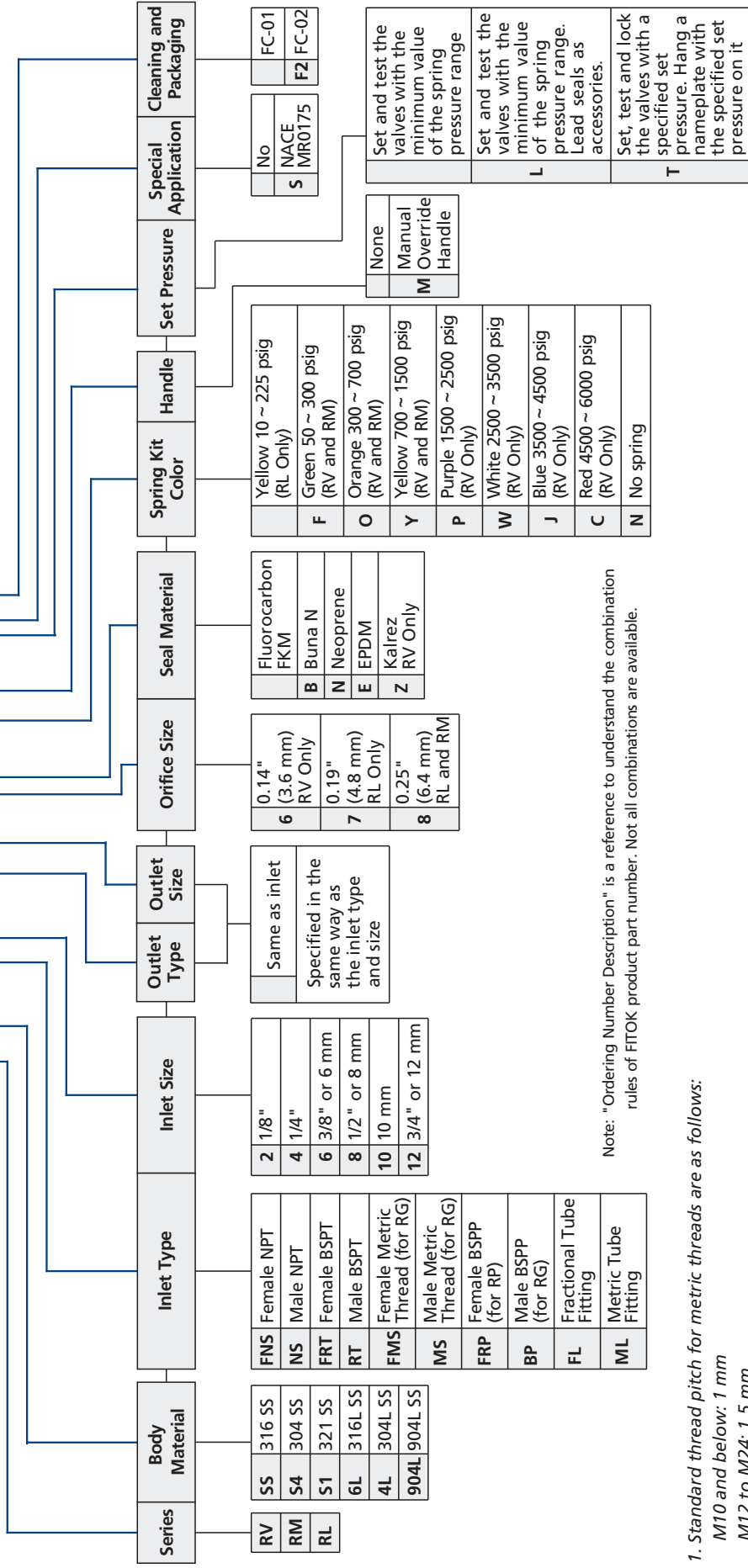


# Ordering Number Description

## Valves

RVSS – FL6 – ML8 – 6Z – WM – TSF2

Check Valves  
Relief Valves



- 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.
- 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 FITOK Group or our authorized distributors.  
 4. For Proportional Relief Valves with specified set pressure on the nameplate, add the set pressure value (unit: psig) as a suffix to the ordering number.  
 Example: RVSS-ML6-6-F-T-116PSIG.

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