



# Relief Valves (RL4 Series)

Catalog 4131-RL  
Revised, April 2005



## RL4 Series Relief Valve

### Introduction

Parker RL4 Relief Valves are designed such that when the upstream pressure exceeds the closing force exerted by the spring, the lower stem opens, permitting flow through the valve. Flow through the valve increases proportionately to the increase in upstream pressure.

### Features

- ▶ Pressure settings are externally adjustable while the valve is in operation. Seven different spring ranges provide greater system sensitivity and enhanced performance.
- ▶ Manual override option with positive stem retraction is available for the full working pressures range. This option permits the user to relieve upstream pressure while maintaining the predetermined cracking pressure.
- ▶ Color coded springs and labels indicate spring cracking range.
- ▶ Back pressure has minimum effect on cracking pressure.
- ▶ Lock wire feature secures a given pressure setting.

### Available End Connections

**Z** - Single ferrule CPITM compression port



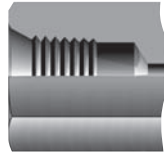
**A** - Two ferrule A-LOK® compression port



**M** - ANSI/ASME B1.20.1, External pipe threads



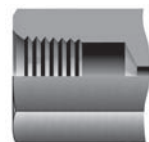
**F** - ANSI/ASME B1.20.1, Internal pipe threads



**KM** - British Standard BS21 (ISO 7-1), External pipe threads



**KF** - British Standard BS21 (ISO 7-1), Internal pipe threads



### Specifications

#### Working pressure:

Up to 400 psig (28 bar) CWP

Up to 600 psig (41 bar) during relief with no internal seal damage.

#### Cracking pressure:

Seven springs with the following ranges:

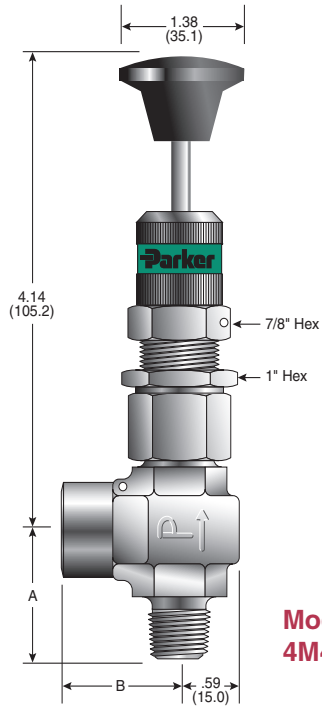
10-25 psig (0.7-1.7 bar)	25-50 psig (1.7-3.4 bar)	50-100 psig (3.4-6.9 bar)
100-150 psig (6.9-10.3 bar)	150-225 psig (10.3-15.5 bar)	225-400 psig (15.5-27.6 bar)
10-225 psig (0.7-15.5 bar)		

#### Temperature Rating:

Nitrile Rubber	-30°F to 225°F (-34°C to 107°C)
Highly Fluorinated Fluorocarbon Rubber	-20°F to 200°F (-29°C to 93°C)
Ethylene Propylene Rubber	-70°F to 275°F (-57°C to 135°C)
Fluorocarbon Rubber	-10°F to 400°F (-23°C to 204°C)
Neoprene Rubber	-45°F to 250°F (-43°C to 121°C)

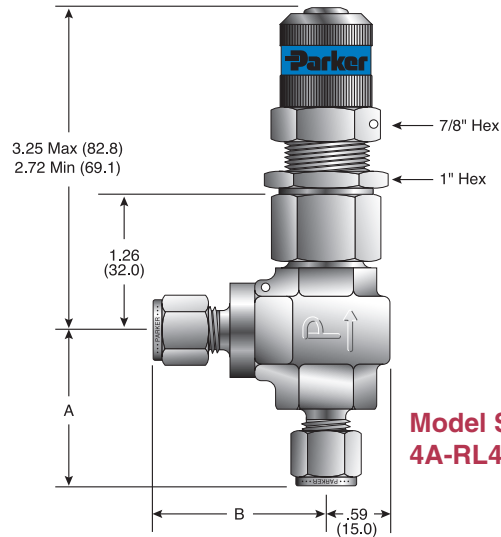
### Flow Calculations

Inlet Pressure		Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
psig	bar	psig	bar	gpm	m <sup>3</sup> /hr	scfm	m <sup>3</sup> /hr
100	6.9	1	0.1	0.8	0.2	8.0	12.7
		10	0.7	2.4	0.5	24.2	38.2
		50	3.4	5.3	1.2	44.7	68.2
200	13.8	10	0.7	2.4	0.5	33.8	55.4
		50	3.4	5.3	1.2	68.7	111.2
		100	6.9	7.5	1.7	85.0	136.8
300	20.7	100	6.9	7.5	1.7	112.2	184.9
		150	10.3	9.2	2.1	125.2	205.0
		200	13.8	10.6	2.4	130.4	212.2
400	27.6	150	10.3	9.2	2.1	153.9	255.1
		200	13.8	10.6	2.4	165.4	273.6
		250	17.2	11.9	2.7	171.1	281.9



**Model Shown:  
4M4F-RL4A-VT-SS-MN-KD**

( ) Denotes dimensions in millimeters



**Model Shown:  
4A-RL4A-BNT-SS-KC**

## Flow Data and Dimensions

Basic Part Number	End Connections		Flow Data				Dimensions †			
	(Inlet) Port 1	(Outlet) Port 2	Orifice		$C_v$	$x_T^{\ddagger}$	A		B	
			inch	mm			inch	mm	inch	mm
4A-RL4A	1/4" A-LOK® Compression	1/4" A-LOK® Compression					1.44	36.6	1.60	40.6
4Z-RL4A	1/4" CPI™ Compression	1/4" CPI™ Compression					1.44	36.6	1.60	40.6
4M4A-RL4A	1/4" Male NPT	1/4" A-LOK® Compression					1.19	30.2	1.60	40.6
4M4Z-RL4A	1/4" Male NPT	1/4" CPI™ Compression					1.19	30.2	1.60	40.6
4M4F-RL4A	1/4" Male NPT	1/4" Female NPT					1.19	30.2	1.17	29.7
4KF-RL4A	1/4" Female BSP/ISO Tapered	1/4" Female BSP/ISO Tapered	0.203	5.2	0.75	0.70	1.19	30.2	1.17	29.7
4KM-RL4A	1/4" Male BSP/ISO Tapered	1/4" Male BSP/ISO Tapered					1.19	30.2	1.17	29.7
M6A-RL4A	6mm A-LOK® Compression	6mm A-LOK® Compression					1.44	36.6	1.60	40.6
M6Z-RL4A	6mm CPI™ Compression	6mm CPI™ Compression					1.44	36.6	1.60	40.6
M8A-RL4A	8mm A-LOK® Compression	8mm A-LOK® Compression					1.44	36.6	1.60	40.6
M8Z-RL4A	8mm CPI™ Compression	8mm CPI™ Compression					1.44	36.6	1.60	40.6

† For CPI™ and A-LOK®, dimensions are measured with nuts in the finger tight position.

‡ Tested in accordance with ISA S75.02. Gas flow will be choked when  $P_1 - P_2 / P_1 = x_T$ .

## Spring Kits

Kit Part Number	Cracking Pressure Range (psig)	Cracking Pressure Range (bar)	Color Code
KIT-RL4SP-10-25	10-25	0.7-1.7	Magenta
KIT-RL4SP-25-50	25-50	1.7-3.4	Brown
KIT-RL4SP-50-100	50-100	3.4-6.9	Purple
KIT-RL4SP-100-150	100-150	6.9-10.3	Dark Green
KIT-RL4SP-150-225	150-225	10.3-15.5	Dark Blue
KIT-RL4SP-225-400	225-400	15.5-27.6	White
KIT-RL4SP-10-225	10-225	0.7-15.5	None



### Spring Kit Contains:

- Spring
- Coded label
- PTFE washers
- Locking wire/lead seal
- Installation Instructions

## How to Order

The correct part number is easily derived from the following number sequence. The eight product characteristics required are coded as shown below.

**\*Note:** If the inlet and outlet ports are the same, eliminate the outlet port designator.

Inlet Port	Outlet Port	Valve Series	Seals	Back-Up Rings	Body Material	Actuation	Spring Kit
<b>4M</b> Male NPT <b>4F</b> Female NPT <b>4A</b> A-LOK® Compression <b>4Z</b> CPI™ Compression <b>4KF</b> Female BSP/ISO <b>4KM</b> Male BSP/ISO <b>M6A</b> A-LOK® Compression <b>M6Z</b> CPI™ Compression <b>M8A</b> A-LOK® Compression <b>M8Z</b> CPI™ Compression		<b>RL4A</b>	<b>V</b> Fluorocarbon Rubber <b>EPR</b> Ethylene Propylene Rubber <b>BN</b> Nitrile Rubber <b>KZ</b> Highly Fluorinated Fluorocarbon Rubber <b>NE</b> Neoprene Rubber	<b>T</b> PTFE	<b>SS</b> Stainless Steel (blank) Standard <b>MN</b> Manual Overdrive	<b>KA</b> 10 - 25 psig (0.7 - 1.7 bar) <b>KB</b> 25 - 50 psig (1.7 - 3.4 bar) <b>KC</b> 50 - 100 psig (3.4 - 6.9 bar) <b>KD</b> 100 - 150 psig (6.9 - 10.3 bar) <b>KE</b> 150 - 225 psig (10.3 - 15.5 bar) <b>K</b> 10 - 225 psig (0.7 - 15.5 bar) <b>KG</b> 225-400 psig (15.5 - 27.6 bar)	
<b>Notes:</b> To order valve with an elastomer back-up ring, eliminate Back-Up Rings code. To order only the valve without a spring kit, eliminate Spring Kit code.							

### Examples:

<b>4Z</b>	*	<b>RL4A</b>	<b>BN</b>	<b>T</b>	<b>SS</b>		<b>KD</b>
Inlet Port	Outlet Port	Valve Series	Seals	Back-Up Rings	Body Material	Actuation	Spring Kit

Describes a RL4A Series externally adjustable relief valve equipped with 1/4" CPI™ compression inlet and outlet ports, Nitrile seals, PTFE back-up ring, stainless steel construction, and a 100 to 150 psig (6.9 to 10.3 bar) spring kit.

<b>4M</b>	<b>4F</b>	<b>RL4A</b>	<b>EPR</b>	<b>T</b>	<b>SS</b>	<b>MN</b>	<b>KF</b>
Inlet Port	Outlet Port	Valve Series	Seals	Back-Up Rings	Body Material	Actuation	Spring Kit

Describes a RL4A Series externally adjustable relief valve equipped with 1/4" male NPT inlet port, 1/4" female NPT outlet port, ethylene propylene seals, PTFE back-up ring, stainless steel construction, manual override option, and a 10 to 225 psig (0.7 to 15.5 bar) spring kit.

## Seal Kits

Seal Kit Order Number	Seat / Seal Material
KIT-RL4-VT	Fluorocarbon Rubber
KIT-RL4-BNT	Buna-N Rubber
KIT-RL4-EPRT	Ethylene Propylene Rubber
KIT-RL4-NET	Neoprene Rubber
KIT-RL4-KZT	Highly Fluorinated Fluorocarbon Rubber

**Seal Kit Contains:**  
 Stem Seal  
 Bonnet Seal  
 PTFE Back-Up Ring  
 Lower Stem Assembly  
 Maintenance Instructions



### WARNING

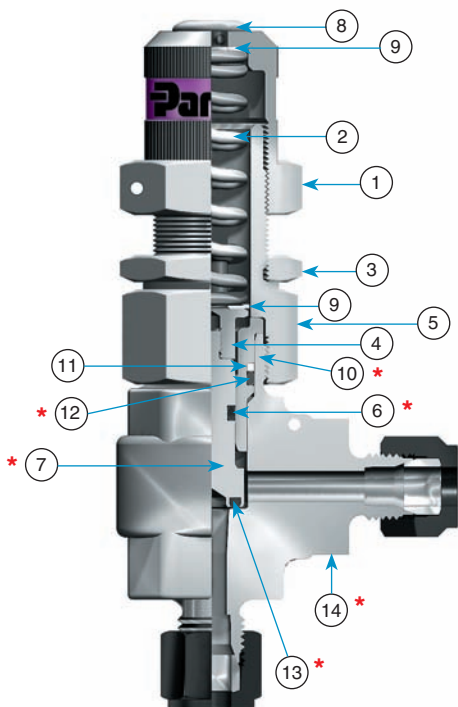
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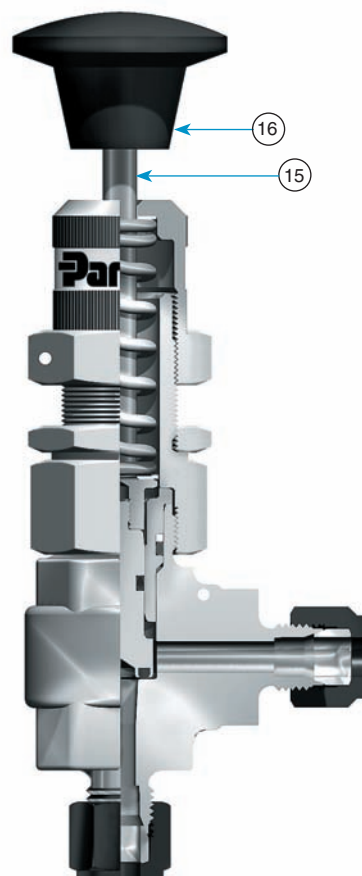
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Model Shown: 4Z-RL4A-BNT-SS-KE



Model Shown: 4Z-RL4A-VT-SS-MN-KG

## Materials of Construction

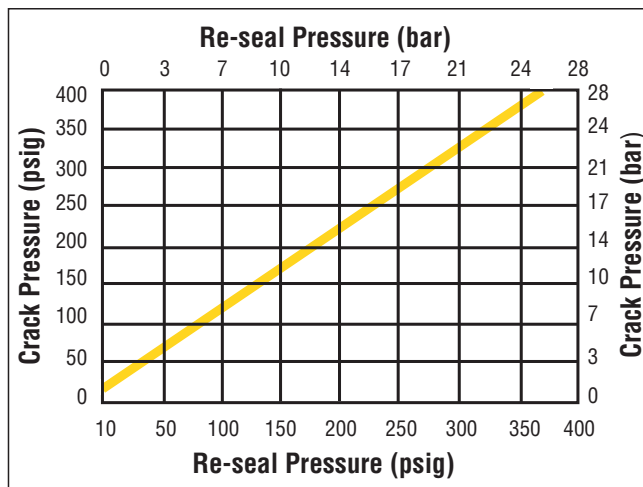
Part No.	Part Description	Material
1	Cap	ASTM A 479 Type 316
2	Spring	17Cr-7Ni Stainless Steel
3	Locknut	316 Stainless Steel
4	Upper Stem	ASTM A 479 Type 316
5	Bonnet	ASTM A 479 Type 316
*6	Stem Seal	*Fluorocarbon Rubber
*7	Lower Stem	ASTM A 479 Type 316
8	Plug	316 SS
9	Washer	PTFE
*10	Stem Guide	ASTM A 479 Type 316
11	Back-up Ring	PTFE
*12	Bonnet Seal	*Fluorocarbon Rubber
*13	Seat	*Fluorocarbon Rubber
*14	Valve Body	ASTM A 182 Type F316
15	Handle Stem	ASTM A 479 Type 316
16	Handle	Phenolic

\* Wetted Parts

\* Optional seat and seal materials are located in [How to Order](#) section.

Lubrication: Perfluorinated polyether.

## Crack Pressure vs. Re-seal Pressure



**Note:** Valves which are not actuated for a period of time may initially crack at higher than set crack pressures.

**Note:** To determine MPa, multiply bar by 0.1



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