



Relief Valves (RL4 Series)

*Catalog 4131-RL
Revised, April 2005*



RL4 Series Relief Valve

Introduction

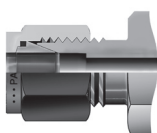
Parker RL4 Relief Valves are designed such that when the upstream pressure exceeds the closing force exerted by the spring, the lower stem opens, permitting flow through the valve. Flow through the valve increases proportionately to the increase in upstream pressure.

Features

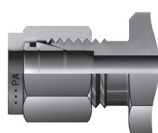
- ▶ Pressure settings are externally adjustable while the valve is in operation. Seven different spring ranges provide greater system sensitivity and enhanced performance.
- ▶ Manual override option with positive stem retraction is available for the full working pressures range. This option permits the 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



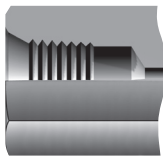
A - Two ferrule A-LOK® compression port



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



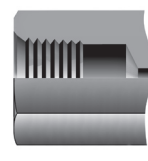
F - ANSI/ASME B1.20.1, Internal pipe threads



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:

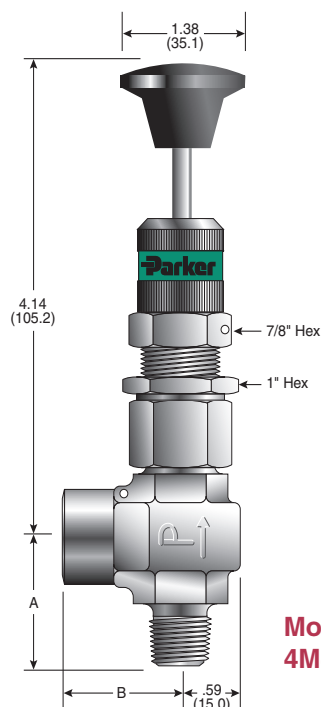
10-25 psig (0.7-1.7 bar)	25-50 psig (1.7-3.4 bar)	50-100 psig (3.4-6.9 bar)
100-150 psig (6.9-10.3 bar)	150-225 psig (10.3-15.5 bar)	225-400 psig (15.5-27.6 bar)
10-225 psig (0.7-15.5 bar)		

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)

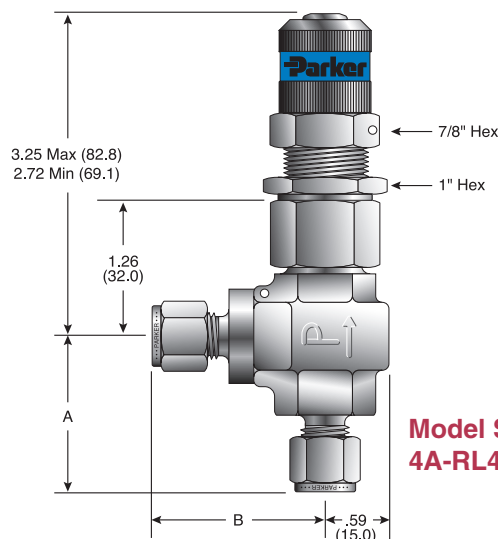
Flow Calculations

Inlet Pressure		Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
psig	bar	psig	bar	gpm	m³/hr	scfm	m³/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	0.203	5.2	0.75	0.70	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					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
4M Male NPT 4F Female NPT 4A A-LOK® Compression 4Z CPI™ Compression 4KF Female BSP/ISO 4KM Male BSP/ISO M6A A-LOK® Compression M6Z CPI™ Compression M8A A-LOK® Compression M8Z CPI™ Compression		RL4A	V Fluorocarbon Rubber EPR Ethylene Propylene Rubber BN Nitrile Rubber KZ Highly Fluorinated Fluorocarbon Rubber NE Neoprene Rubber	T PTFE	SS Stainless Steel	(blank) Standard MN Manual Overdrive	KA 10 - 25 psig (0.7 - 1.7 bar) KB 25 - 50 psig (1.7 - 3.4 bar) KC 50 - 100 psig (3.4 - 6.9 bar) KD 100 - 150 psig (6.9 - 10.3 bar) KE 150 - 225 psig (10.3 - 15.5 bar) K 10 - 225 psig (0.7 - 15.5 bar) KG 225-400 psig (15.5 - 27.6 bar)
Notes: 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:

4Z	*	RL4A	BN	T	SS		KD
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.

4M	4F	RL4A	EPR	T	SS	MN	KF
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

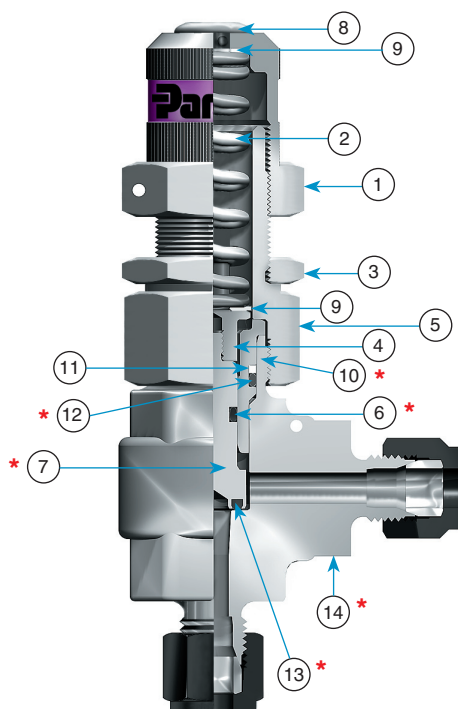
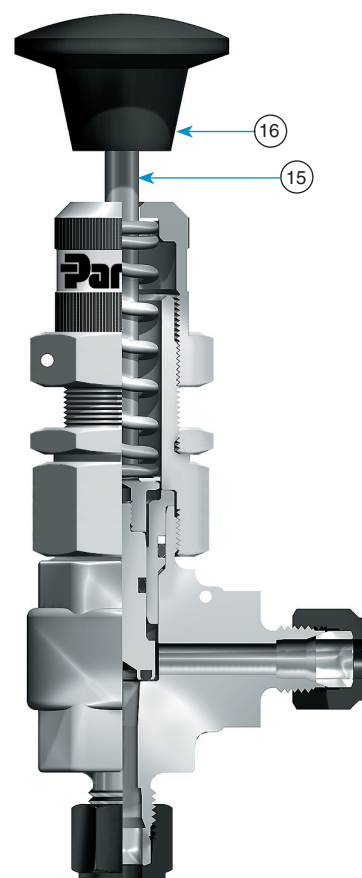
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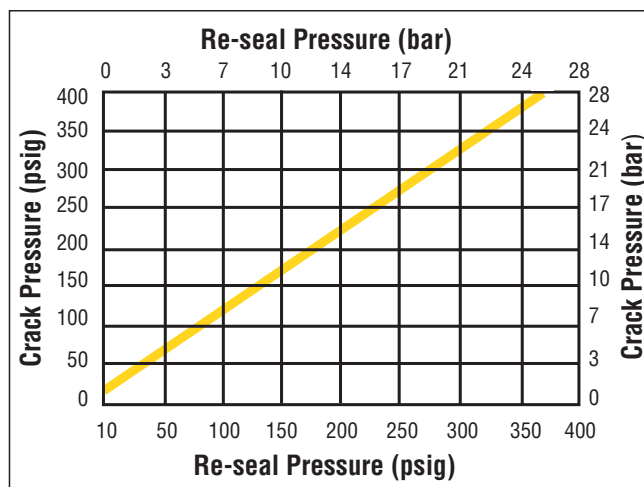
**Model Shown: 4Z-RL4A-BNT-SS-KE****Model Shown: 4Z-RL4A-VT-SS-MN-KG****Materials of Construction**

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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Relief Valves (RH4 Series)

*Catalog 4131-RH
August 2005*



Introduction

Parker RH4 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. Eight different spring ranges provide greater system sensitivity and enhanced performance.
- ▶ Captured molded seat design is blow-out and chip resistant.
- ▶ Manual Override option with positive stem retraction is available for pressures up to 1500 psig (103 bar). This option permits the user to relieve upstream pressure while maintaining the predetermined cracking pressure.
- ▶ Color coded springs and labels indicate spring cracking range.
- ▶ Lock wire feature secures a given pressure setting.

Flow Calculations

Inlet Pressure		Pressure Drop ΔP		Water @ 60°F (16°C)		Air @ 60°F (16°C)	
psig	bar	psig	bar	gpm	m ³ /hr	scfm	m ³ /hr
100	7	1	0.1	0.4	0.1	4.3	7.0
		10	0.7	1.3	0.3	13.2	21.0
		50	3.5	2.9	0.7	24.2	37.3
1000	69	10	0.7	1.3	0.3	40.9	69.0
		100	6.9	4.1	0.9	123.5	208.4
		500	34.5	9.2	2.1	219.1	368.6
3000	207	100	6.9	4.1	0.9	220.1	373.5
		1000	69.0	13.0	2.9	590.8	1002.4
		1500	103.4	15.9	3.6	652.1	1105.7
6000	413	1000	69.0	13.0	2.9	916.8	1556.2
		2000	137.9	18.3	4.2	1179.7	2001.3
		3000	206.8	22.5	5.1	1301.6	2207.0

Specifications

Working Pressure

Up to 6000 psig (414 bar) CWP.

Up to 8000 psig (552 bar) during relief with no internal seal damage.

Cracking Pressure

Eight springs, from 50 psig to 6000 psig in the following ranges: 50-350 psig, 350-750 psig, 750-1500 psig, 1500-2250 psig, 2250-3000 psig, 3000-4000 psig, 4000-5000 psig, 5000-6000 psig (See table on page 3 for bar equivalents).

Temperature Rating

Buna-N 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)

Available End Connections

Z - Single ferrule CPI™ compression port



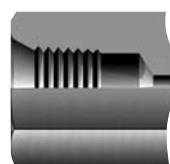
A - Two ferrule A-LOK® compression port



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



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

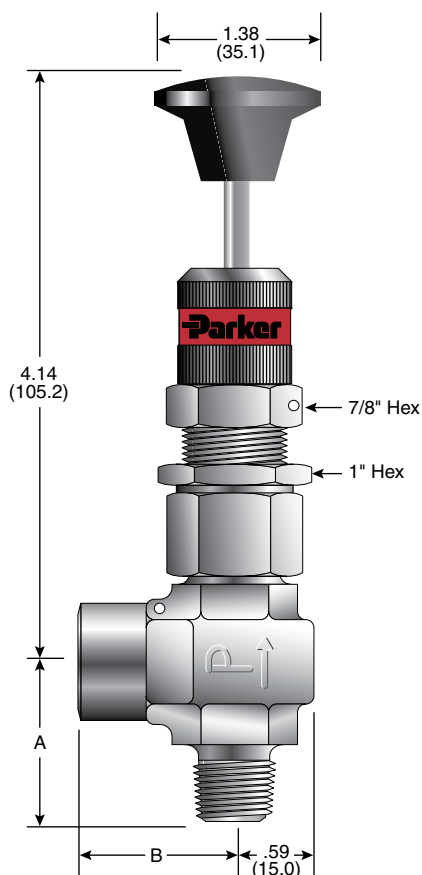


KM - British Standard BS 21 (ISO 7-1), External pipe threads



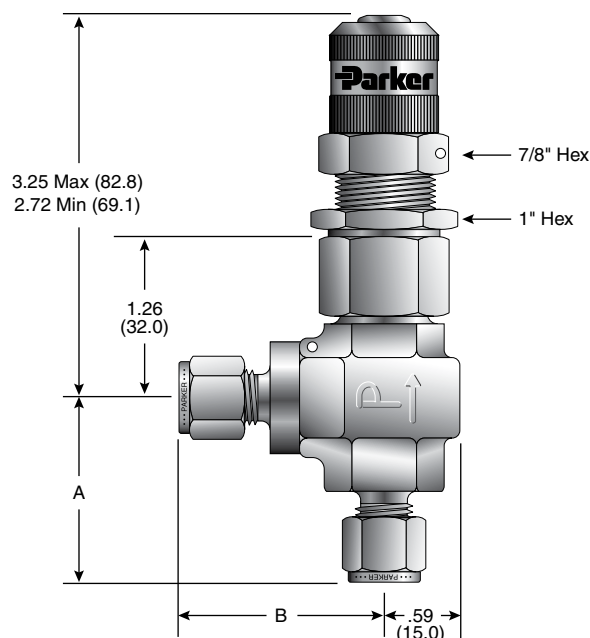
KF - British Standard BS 21(ISO 7-1), Internal pipe threads





Model Shown: 4M4F-RH4A-VT-SS-MN-K2

() Denotes dimensions in millimeters



Model Shown: 4A-RH4A-BNT-SS-K1

Flow Data / 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-RH4A	1/4" A-LOK® Compression	1/4" A-LOK® Compression	0.14	3.6	0.41	0.67	1.44	36.6	1.60	40.6
4Z-RH4A	1/4" CPI™ Compression	1/4" CPI™ Compression					1.44	36.6	1.60	40.6
4M4A-RH4A	1/4" Male NPT	1/4" A-LOK® Compression					1.19	30.2	1.60	40.6
4M4Z-RH4A	1/4" Male NPT	1/4" CPI™ Compression					1.19	30.2	1.60	40.6
4M4F-RH4A	1/4" Male NPT	1/4" Female NPT					1.19	30.2	1.17	29.7
4KF-RH4A	1/4" Female BSP/ISO Tapered	1/4" Female BSP/ISO Tapered					1.19	30.2	1.17	29.7
4KM-RH4A	1/4" Male BSP/ISO Tapered	1/4" Male BSP/ISO Tapered					1.19	30.2	1.17	29.7
M6A-RH4A	6mm A-LOK® Compression	6mm A-LOK® Compression					1.44	36.6	1.60	40.6
M6Z-RH4A	6mm CPI™ Compression	6mm CPI™ Compression					1.44	36.6	1.60	40.6
M8A-RH4A	8mm A-LOK® Compression	8mm A-LOK® Compression					1.44	36.6	1.60	40.6
M8Z-RH4A	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-RH4SP-50-350	50-350	3.4-24.1	Gray
KIT-RH4SP-350-750	350-750	24.1-51.7	Red
KIT-RH4SP-750-1500	750-1500	51.7-103.4	Orange
KIT-RH4SP-1500-2250	1500-2250	103.4-155.1	Yellow
KIT-RH4SP-2250-3000	2250-3000	155.1-206.8	Light Green
KIT-RH4SP-3000-4000	3000-4000	206.8-275.8	Light Blue
KIT-RH4SP-4000-5000	4000-5000	275.8-344.7	Violet
KIT-RH4SP-5000-6000	5000-6000	344.7-413.7	Lemon Yellow



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
4M Male NPT 4F Female NPT 4A A-LOK® Compression 4Z CPI™ Compression 4KF Female BSP/ISO 4KM Male BSP/ISO M6A A-LOK® Compression M6Z CPI™ Compression M8A A-LOK® Compression M8Z CPI™ Compression		RH4A	V Fluorocarbon Rubber EPR Ethylene Propylene Rubber BN Nitrile Rubber KZ Highly Fluorinated Fluorocarbon Rubber NE Neoprene Rubber	T PTFE	SS Stainless Steel	(blank) Standard MN Manual Override	K1 50 - 350 psig K2 350 - 750 psig K3 750 - 1500 psig K4 1500 - 2250 psig K5 2250 - 3000 psig K6 3000 - 4000 psig K7 4000 - 5000 psig K8 5000 - 6000 psig
Notes: 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:

4Z	*	RH4A	BN	T	SS		K6
Inlet Port	Outlet Port	Valve Series	Seals	Back-Up Rings	Body Material	Actuation	Spring Kit

Describes an RH4A 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 3000 to 4000 psig (206.8 to 275.8 bar) spring kit.

4M	4F	RH4A	EPR	T	SS	MN	K1
Inlet Port	Outlet Port	Valve Series	Seals	Back-Up Rings	Body Material	Actuation	Spring Kit

Describes an RH4A 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 50 to 350 psig (3.4 to 24.1 bar) spring kit.

Seal Kits

Seal Kit Order Number	Seat / Seal Material
KIT-RH4-VT	Fluorocarbon Rubber
KIT-RH4-BNT	Nitrile Rubber
KIT-RH4-EPRT	Ethylene Propylene Rubber
KIT-RH4-NET	Neoprene Rubber
KIT-RH4-KZT	Highly Fluorinated Fluorocarbon Rubber

Seal Kit Contains:

Stem Seal
 Bonnet Seal
 PTFE Back-Up Ring
 Lower Stem Assembly
 Maintenance Instructions



WARNING

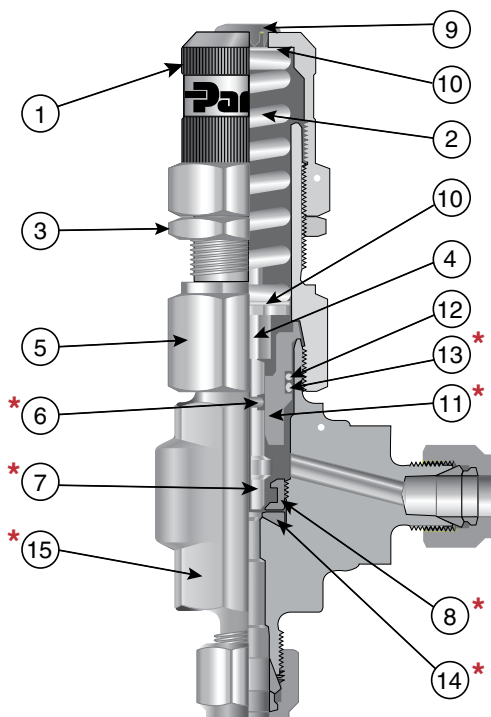
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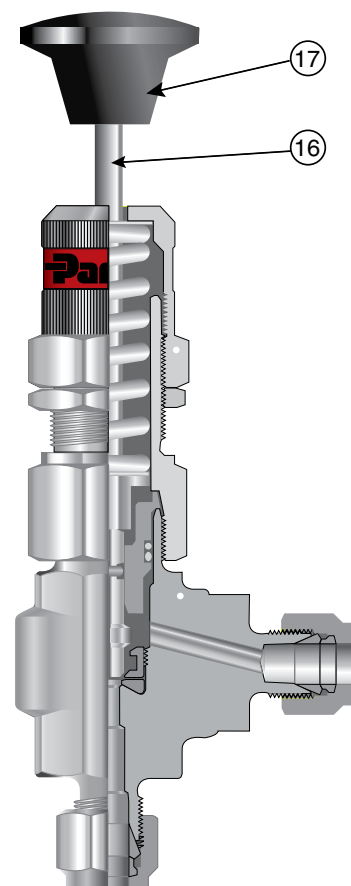
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Model Shown: 4A-RH4A-BNT-SS-K1



Model Shown: 4A-RH4A-VT-SS-MN-K2

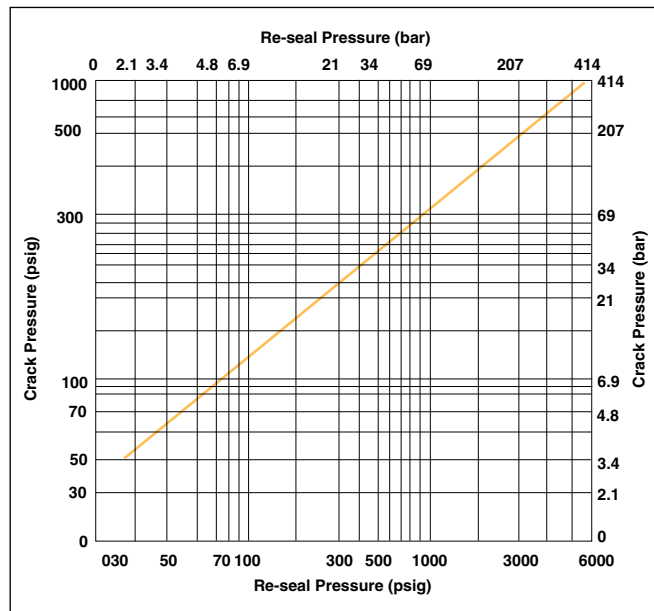
Materials of Construction

Part No.	Part Description	Material
1	Cap	ASTM A 479 Type 316
2	Spring	17-7 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	Seat Retainer	ASTM A 479 Type 316
9	Plug	Zinc Coated Steel
10	Washer	PTFE
*11	Stem Guide	ASTM A 479 Type 316
12	Back-up Ring	PTFE
*13	Body Seal	*Fluorocarbon Rubber
*14	Seat	*Fluorocarbon Rubber
*15	Valve Body	ASTM A 182 Type F316
16	Handle Stem	ASTM A 479 Type 316
17	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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