Parker
Instrumentation

Relief Valves (RL4 Series)

Catalog 4131-RL
October 1999

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.
- Standard low friction synergistic coating of body bonnet improves crack and re-seal performance.
- 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.

Specifications

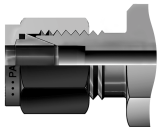
- **Working pressure:**
  Up to 400 psig CWP (28 bar).
  Up to 600 psig (41 bar) during relief with no internal seal damage.

- **Cracking pressure:**
  Seven springs with the following ranges: 0-25 psig, 25-50 psig, 50-100 psig, 100-150 psig, 150-225 psig, 225-400 psig and 0-225 psig (See table on page 3 for bar equivalents).

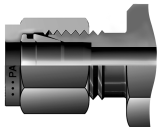
- **Temperature Rating:**
  Buna-N Rubber
  -30 °F to 225 °F (-34 °C to 107 °C)
  Highly Fluorinated Fluorocarbon Rubber
  -20 °F to 200 °F (-29 °C to 93 °C)
  Ethylene Propylene Rubber
  -70 °F to 275 °F (-57 °C to 135 °C)
  Fluorocarbon Rubber
  -10 °F to 400 °F (-23 °C to 204 °C)
  Neoprene Rubber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

Available End Connections

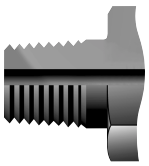
Z-Single ferrule CPI™ compression port



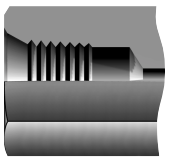
A-Two ferrule A-LOK® compression port



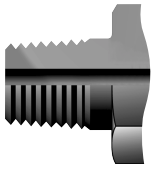
M-ANSI/ASME B1.20.1, External pipe threads



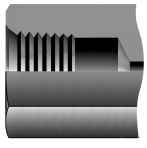
F-ANSI/ASME B1.20.1, Internal pipe threads



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



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

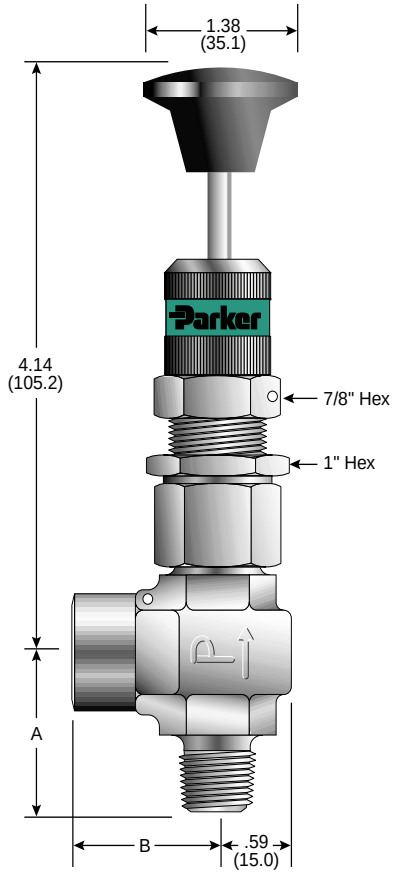


Flow Calculations

Inlet Pressure		Pressure Drop Δ P		Water @ 60 °F (16 °C)		Air @ 60 °F (16 °C)	
psig	bar	psig	bar	gpm	m³/hr	scfm	m³/hr
100	6.9	1 10 50	0.1 0.7 3.4	0.8 2.4 5.3	0.2 0.5 1.2	8.0 24.2 44.7	12.7 38.2 68.2
200	13.8	10 50 100	0.7 3.4 6.9	2.4 5.3 7.5	0.5 1.2 1.7	33.8 68.7 85.0	55.4 111.2 136.8
300	20.7	100 150 200	6.9 10.3 13.8	7.5 9.2 10.6	1.7 2.1 2.4	112.2 125.2 130.4	184.9 205.0 212.2
400	27.6	150 200 250	10.3 13.8 17.2	9.2 10.6 11.9	2.1 2.4 2.7	153.9 165.4 171.1	255.1 273.6 281.9

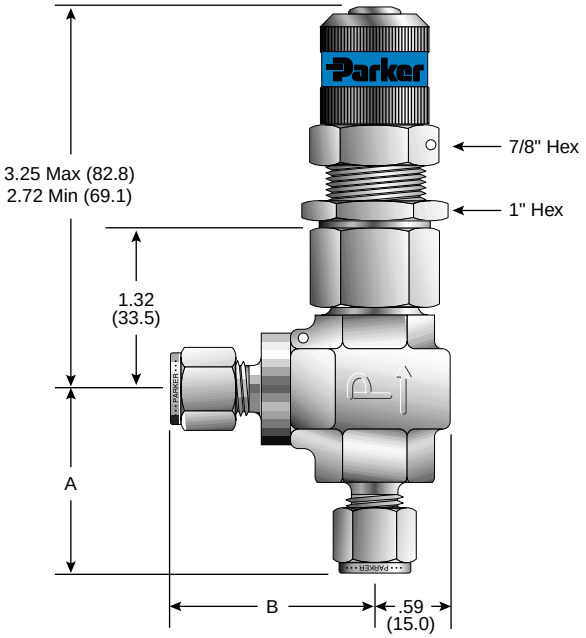
Parker Hannifin Corporation
Instrumentation Valve Division
Jacksonville, Alabama

RL4 Series Relief Valve



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

( ) Denotes dimensions in millimeters



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

Flow Data / Dimensions

Basic Part Number	End Connections		Flow Data				Dimensions †			
	(Inlet) Port 1	(Outlet) Port 2	Orifice		C_v	x_T‡	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-0-25	0-25	0.0-1.7	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-0-225	0-225	0.0-15.5	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.

Example:	4Z	*	-	RL4A	-	BN	T	-	SS	-	____	-	KD
	①	②		③		④	⑤		⑥		⑦		⑧
	Inlet Port	Outlet Port		Valve Series		Seals	Back-Up Ring		Body Material		Actuation		Spring Kit

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

Example:	4M	4F	-	RL4A	-	EPR	T	-	SS	-	MN	-	KF
	①	②		③		④	⑤		⑥		⑦		⑧
	Inlet Port	Outlet Port		Valve Series		Seals	Back-Up Ring		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 0 to 225 psig (0.0 to 15.5 bar) spring kit.

① Inlet Port / ② Outlet Port	③ Valve Series	④ Seals	⑤* Back-Up Rings	⑥ Body Material	⑦ Actuation	⑧* 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- Buna-N Rubber KZ- Highly Fluorinated Fluorocarbon Rubber NE- Neoprene Rubber	T- PTFE	SS- Stainless Steel	Blank - Standard MN- Manual Override	KA: 0 - 25 psig KB: 25 - 50 psig KC: 50 - 100 psig KD: 100 - 150 psig KE: 150 - 225 psig KF: 0 - 225 psig KG: 225-400 psig

* Note: To order valve with an elastomer back-up ring, eliminate circled number sequence 5. To order only the valve without a spring kit, eliminate circled number sequence 8.

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
Seal Assembly Mandrel
Maintenance Instructions

⚠ WARNING

FAILURE, IMPROPER SELECTION OR IMPROPER USE OF THE PRODUCTS AND/OR SYSTEMS DESCRIBED HEREIN OR RELATED ITEMS CAN CAUSE DEATH, PERSONAL INJURY AND PROPERTY DAMAGE.

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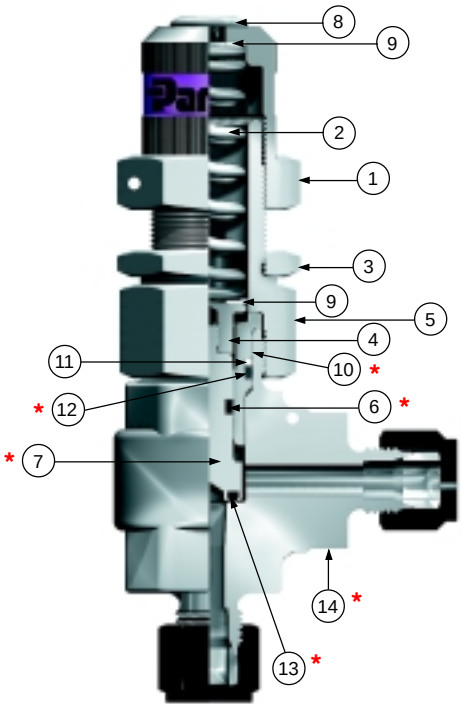
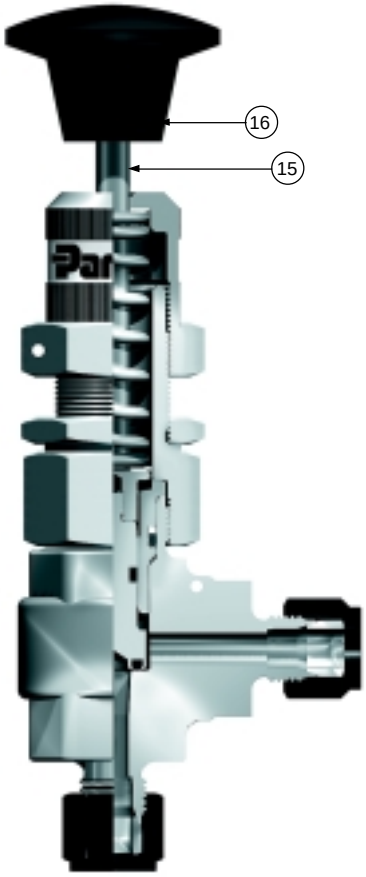


Model Shown: 4Z-RL4A-BNT-SS-KE



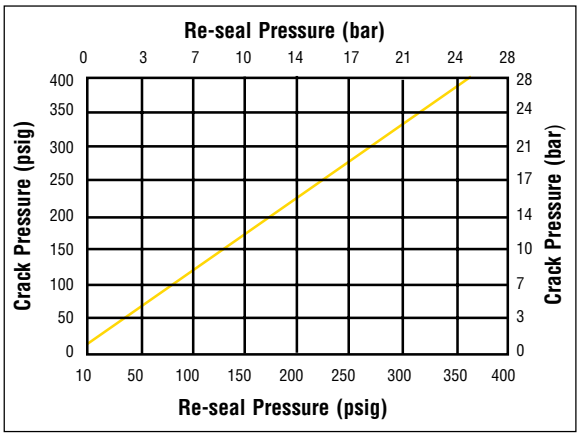
Model Shown: 4Z-RL4A-VT-SS-MN-KG

Materials of Construction

Part No.	Part Description	Material
1	Cap	ASTM A 479 Type 316
2	Spring	17Cr-7Ni Stainless Steel
3	Locknut	ASTM B16 Copper Alloy C36000
4	Upper Stem	ASTM A 479 Type 316
5	Bonnet	ASTM A 479 Type 316
*6	Stem Seal	*PTFE coated Fluorocarbon Rubber
*7	Lower Stem	ASTM A 479 Type 316
8	Plug	316 SS
9	Washer	PTFE
*10	Body Bonnet	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: Silicone and Graphite Hydrocarbon.

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

Parker Instrumentation

Catalog 4131-RL, 10M, 10/99

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