



# 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.

## 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)

## Flow Calculations

Inlet Pressure		Pressure Drop Δ P		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	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

## Available End Connections

**Z** - Single ferrule CPI™ compression port



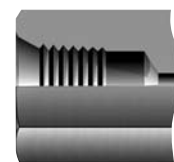
**A** - Two ferrule A-LOK® compression port



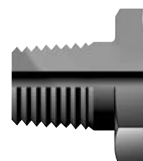
**M** - ANSI/ASME B1.20.1, External pipe threads



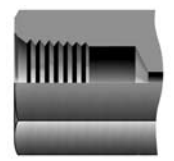
**F** - ANSI/ASME B1.20.1, Internal pipe threads

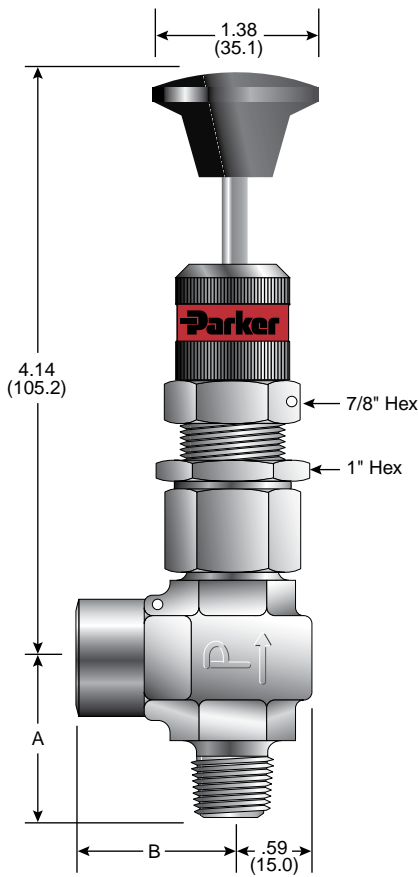


**KM** - British Standard BS 21 (ISO 7-1), External pipe threads



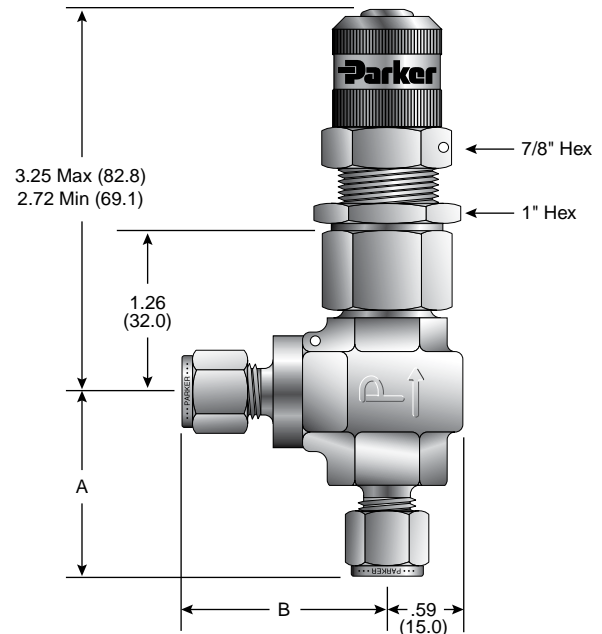
**KF** - British Standard BS 21 (ISO 7-1), Internal pipe threads





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

**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:

<b>4Z</b>	*	<b>RH4A</b>	<b>BN</b>	<b>T</b>	<b>SS</b>		<b>K6</b>
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.

<b>4M</b>	<b>4F</b>	<b>RH4A</b>	<b>EPR</b>	<b>T</b>	<b>SS</b>	<b>MN</b>	<b>K1</b>
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

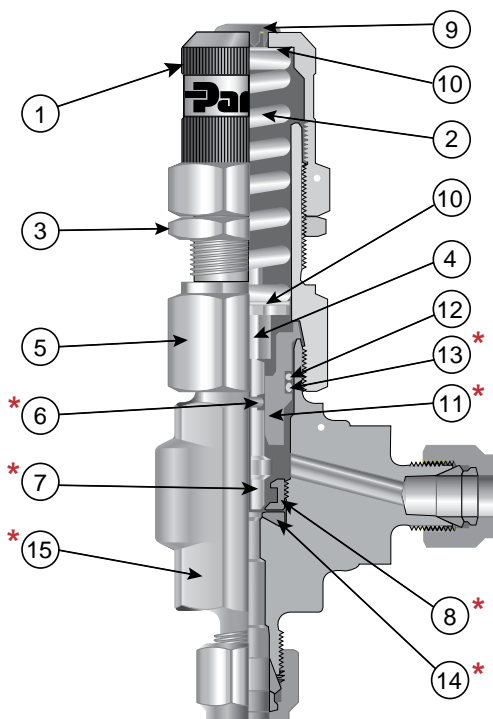
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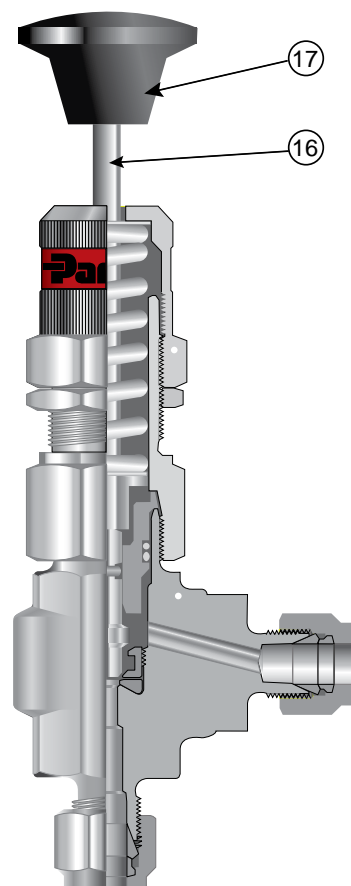
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Model Shown: 4A-RH4A-BNT-SS-K1



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

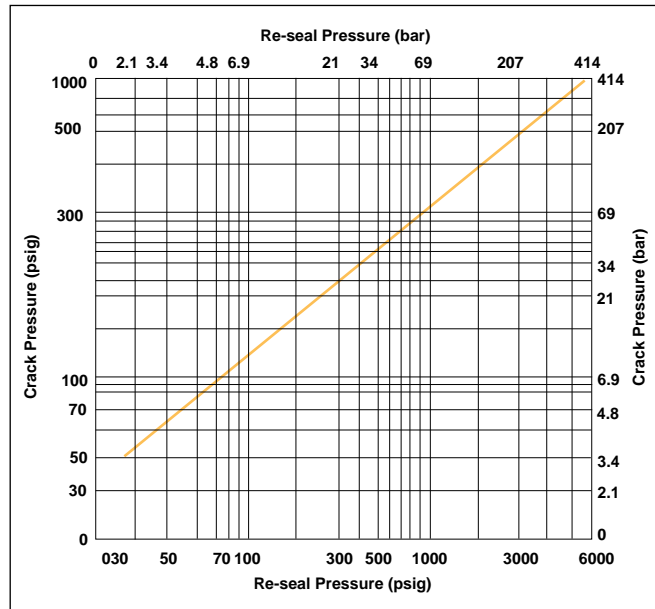
## Materials of Construction

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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**Parker Hannifin Corporation**  
Instrumentation Products Division  
2651 Alabama Highway 21 North  
Jacksonville, AL 36265-9681  
USA  
Phone: (256) 435-2130  
Fax: (256) 435-7718  
[www.parker.com/ipdus](http://www.parker.com/ipdus)

**Parker Hannifin plc**  
Instrumentation Products Division  
Riverside Road  
Pottington Business Park  
Barnstaple, Devon EX31 1NP  
England  
Phone: +44 (0) 1271 313131  
Fax: +44 (0) 1271 373636  
Email: [ipd@parker.com](mailto:ipd@parker.com)  
[www.parker.com/ipd](http://www.parker.com/ipd)

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