R6000 Series®

Right Angle Relief Valve

Available in low, medium, high and extra high pressure models, R6000 right angle relief valves provide users with high accuracy and consistency of cracking and reseat pressures. Furthermore, narrow pressure ranges (cracking pressures) for each model can be factory pre-set according to customer specifications. PED certification and CE marking are standard for all models. All R6000 relief valves are offered with multiple end connections to ensure application versatility.



Features & Benefits

Low Pressure (5 – 550 psig)*

Zero friction poppets

- Increases accuracy of cracking pressure and reseat pressure.
- Improves consistency of cracking pressure and reseat pressure.

Encapsulated Seat Seal

- Maintains small contact surface area.
- Protects seat from erosion due to flow.

Raised seal lip on poppet minimizes contact with seat, eliminating friction and preventing overstressing of the O-ring

6 pressure spring ranges improve accuracy

Caps and bonnets are pre-drilled for lockwire

Multiple end connections available

- Special High Tolerance NPT Thread

High Pressure (150–6000 psig)

3 models available:

- Medium (150–2500 psig)—6 spring ranges improve accuracy
- High (150–5000 psig)—7 spring ranges improve accuracy
- Extra High (5000–6000 psig)—one spring

Delta stem seal design prevents friction which increases accuracy of cracking pressure and reseat pressure.

Balanced poppet design allows cracking pressure to stay the same regardless of backup pressure.

Orifice sizes: 0.082", 0.094", 0.188"

Multiple end connections available.

Optional manual override handle

** Back pressure affects cracking pressure on low pressure version*

Typical Applications

- Beverage dispensing equipment
- Gas pilot plants
- Petrochemical test labs
- Offshore oil platform heating lines
- Pharmaceutical sterilization and packaging systems

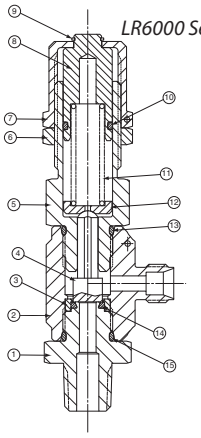
relief valves

HOKE Incorporated
405 Centura Court • PO Box 4866 (29305) • Spartanburg, SC 29303
Phone (864) 574-7966 Fax (864) 587-5608
www.hoke.com • sales@hoke.com

R6000 Series

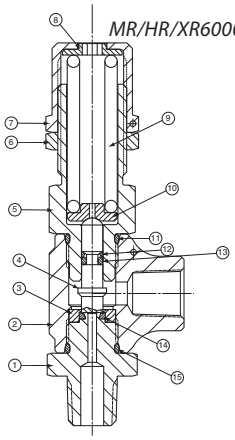
Materials of Construction

	LR
1	End
2	Body
3	Shroud ring
4	Poppet
5	Bonnet
6	Jam nut
7	Cap
8	Spring holder
9	Retaining ring
10	O-ring
11	Spring
12	Spring equalizer
13	O-ring
14	Seat o-ring
15	O-ring



LR6000 Series

	MR/HR/XR
1	End
2	Body
3	Shroud ring
4	Poppet
5	Bonnet
6	Jam nut
7	Cap
8	Spring holder
9	Spring
10	Spring equalizer
11	O-ring
12	Delta ring
13	O-ring
14	Seat o-ring
15	O-ring



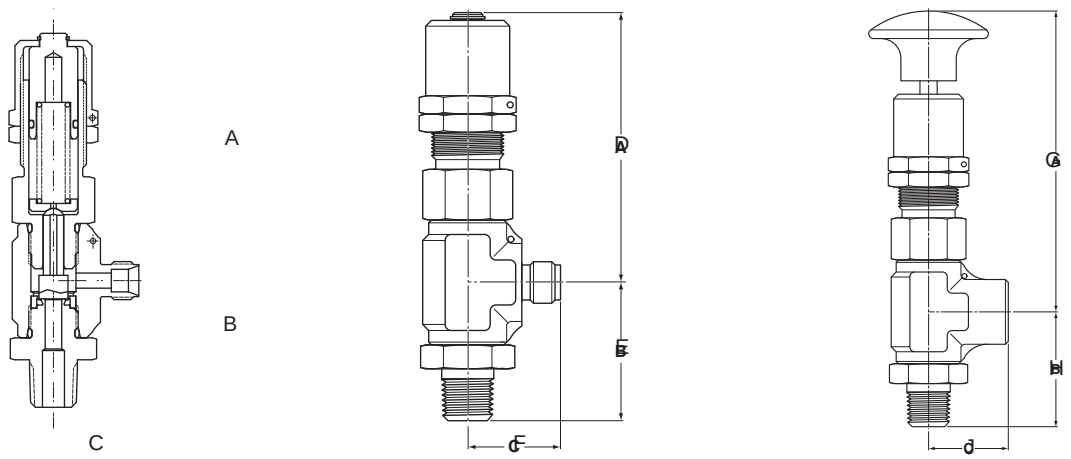
MR/HR/XR6000 Series

	Specifications
BODY CONSTRUCTION	316 stainless steel
SPRING MATERIAL	17-7PH CRES
SEAL MATERIAL	Neoprene • Viton® • Buna N • EPR • Kalrez® • Silicone (not available for the XR Series)
CONNECTION SIZES	¼″
ORIFICE SIZE	LR6000, MR6000: 0.188″ HR6000: 0.094″ XR6000: 0.082″

Dimensions

	¼″ Gyrolok x ¼″ Gyrolok			¼″ Male NPT x ¼″ Gyrolok			¼″ Male NPT x ¼″ Female NPT		
Model No.	A	B	C	D	E	F	G*	H	J
LR	3.10″ max	1.34″	0.97″	3.10″ max	1.44″	0.97″	n/a	1.44″	1.00″
	(7.87cm)	(3.40cm)	(2.39cm)	(7.87cm)	(3.66cm)	(2.39cm)		(3.66cm)	(2.54cm)
MR	2.94″ max.	1.34″	0.97″	2.94″ max.	1.44″	0.97″	2.94″ max.	1.44″	1.00″
	(7.47cm)	(3.40cm)	(2.39cm)	(7.47cm)	(3.66cm)	(2.39cm)	(7.47cm)	(3.66cm)	(2.54cm)
HR	2.94″ max.	1.34″	0.97″	2.94″ max.	1.44″	0.97″	2.94″ max.	1.44″	1.00″
	(7.47cm)	(3.40cm)	(2.39cm)	(7.47cm)	(3.66cm)	(2.39cm)	(7.47cm)	(3.66cm)	(2.54cm)
XR	2.94″ max.	1.34″	0.97″	2.94″ max.	1.44″	0.97″	n/a	1.44″	1.00″
	(7.47cm)	(3.40cm)	(2.39cm)	(7.47cm)	(3.66cm)	(2.39cm)		(3.66cm)	(2.54cm)

** Manual override not available for LR and XR Series*



Operating Pressures

Pressures	LR6000	MR6000	HR6000	XR6000
Cracking Pressure	5–550 psig (0–38 bar)	150–2500 psig (10–172 bar)	150–5000 psig (10–345 bar)	5000–6000 psig (345–414 bar)
Maximum Operating Pressure	5–700 psig (0–48 bar)	150–6000 psig (10–414 bar)	150–7000 psig (10–482 bar)	5000–7000 psig (345–482 bar)
Proof	1050 psig (72 bar)	9000 psig (620 bar)	9000 psig (620 bar)	9000 psig (620 bar)
Burst	Over 2800 psig (193 bar)	Over 24,000 psig (1652 bar)	Over 24,000 psig (1652 bar)	Over 24,000 psig (1652 bar)
Reseat Pressure	85% min. of CP > 10 psig 70% of CP < 10 psig	85% min. of CP	85% min. of CP	85% min. of CP

C_v Ratings

Cracking Pressure	C_v LR6000 0.188″		C_v MR6000 0.188″		C_v HR6000 0.094″		C_v XR6000 0.082″	
PSIG	Air	Water	Air	Water	Air	Water	Air	Water
5	0.63	0.47	—	—	—	—	—	—
25	0.63	0.47	—	—	—	—	—	—
26	0.64	0.43	—	—	—	—	—	—
80	0.64	0.43	—	—	—	—	—	—
81	0.4	0.31	—	—	—	—	—	—
150	0.4	0.31	—	—	—	—	—	—
151	0.42	0.26	0.79	0.59	0.25	0.16	—	—
250	0.42	0.26	0.79	0.59	0.25	0.16	—	—
251	0.3	0.19	0.79	0.59	0.25	0.16	—	—
350	0.3	0.19	0.79	0.59	0.25	0.16	—	—
351	0.35	0.18	0.61	0.59	0.27	0.16	—	—
550	0.35	0.18	0.61	0.59	0.27	0.16	—	—
650	—	—	0.61	0.59	0.27	0.16	—	—
651	—	—	0.38	0.29	0.27	0.16	—	—
700	—	—	0.38	0.29	0.27	0.16	—	—
701	—	—	0.38	0.29	0.2	0.16	—	—
1001	—	—	0.37	0.20	0.2	0.14	—	—
1300	—	—	0.37	0.20	0.2	0.14	—	—
1301	—	—	0.37	0.20	0.21	0.14	—	—
1500	—	—	0.37	0.20	0.21	0.13	—	—
1501	—	—	0.28	0.14	0.21	0.13	—	—
2000	—	—	0.28	0.14	0.21	0.13	—	—
2001	—	—	0.24	0.10	0.19	0.13	—	—
2500	—	—	0.24	0.10	0.19	0.13	—	—
3000	—	—	—	—	0.19	0.13	—	—
3001	—	—	—	—	0.15	0.07	—	—
4000	—	—	—	—	0.15	0.07	—	—
5000	—	—	—	—	—	—	0.15	0.009
6000	—	—	—	—	—	—	0.12	0.006

Pressure/Temperature Ratings

Low Pressure

Valve No.	Seal Material	Temperature °F (°C)	Pressure Range psig (bar)
LR6033	Neoprene	-40° to +300° (-40° to +149°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)
LR6032	Viton®	-20° to +400° (-29° to +204°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)
LR6077	Buna-N	-65° to +275° (-54° to +135°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)
LR6062	Ethylene Propylene	-65° to +300° (-54° to +149°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)
LR6065	Kalrez®	-40° to +550° (-40° to +288°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)
LR6024	Silicone	-70° to +450° (-57° to +232°)	Up to 25 (Up to 1.7) 26–350 (1.8–24.1) 351–550 (24.2–37.9)

Medium Pressure

Valve No.	Seal Material	Temperature °F (°C)	Pressure Range psig (bar)
MR6033	Neoprene	-40° to +300° (-40° to +149°)	150–350 (10.3–24.1) 351–2500 (24.2–172.4)
MR6032	Viton®	-20° to +400° (-29° to +204°)	150–350 (10.3–24.1) 351–2500 (24.2–172.4)
MR6077	Buna-N	-65° to +275° (-54° to +135°)	150–350 (10.3–24.1) 351–2500 (24.2–172.4)
MR6062	Ethylene Propylene	-65° to +300° (-54° to +149°)	150–350 (10.3–24.1) 351–2500 (24.2–172.4)
MR6065	Kalrez®	-40° to +550° (-40° to +288°)	150–350 (10.3–24.1) 351–2500 (24.2–172.4)
MR6024	Silicone	-70° to +450° (-57° to +232°)	150–350 (10.3–24.1)

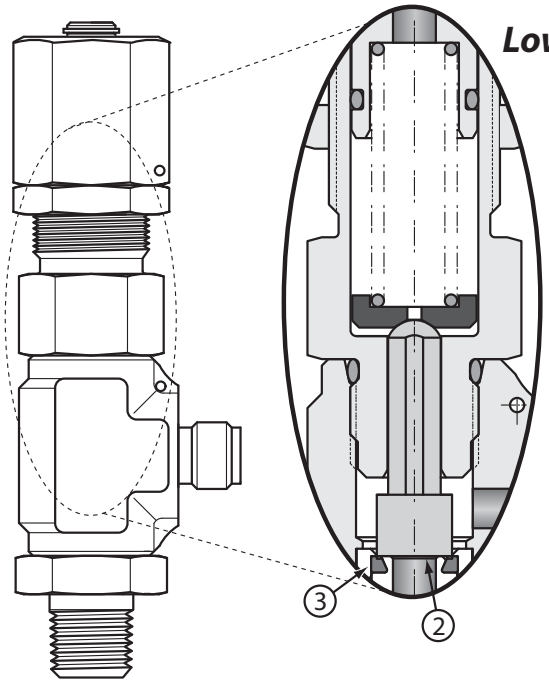
High Pressure

Valve No.	Seal Material	Temperature °F (°C)	Pressure Range psig (bar)
HR6033	Neoprene	-40° to +300° (-40° to +149°)	150–300 (10.3 to 20.7) 301–5000 (20.8 to 344.8)
HR6032	Viton®	-20° to +400° (-29° to +204°)	150–300 (10.3 to 20.7) 301–5000 (20.8 to 344.8)
HR6077	Buna-N	-65° to +275° (-54° to +135°)	150–300 (10.3 to 20.7) 301–5000 (20.8 to 344.8)
HR6062	Ethylene Propylene	-65° to +300° (-54° to +149°)	150–300 (10.3 to 20.7) 301–5000 (20.8 to 344.8)
HR6065	Kalrez®	-40° to +550° (-40° to +288°)	150–300 (10.3 to 20.7) 301–5000 (20.8 to 344.8)
HR6024	Silicone	-70° to +450° (-57° to +232°)	150–300 (10.3 to 20.7)

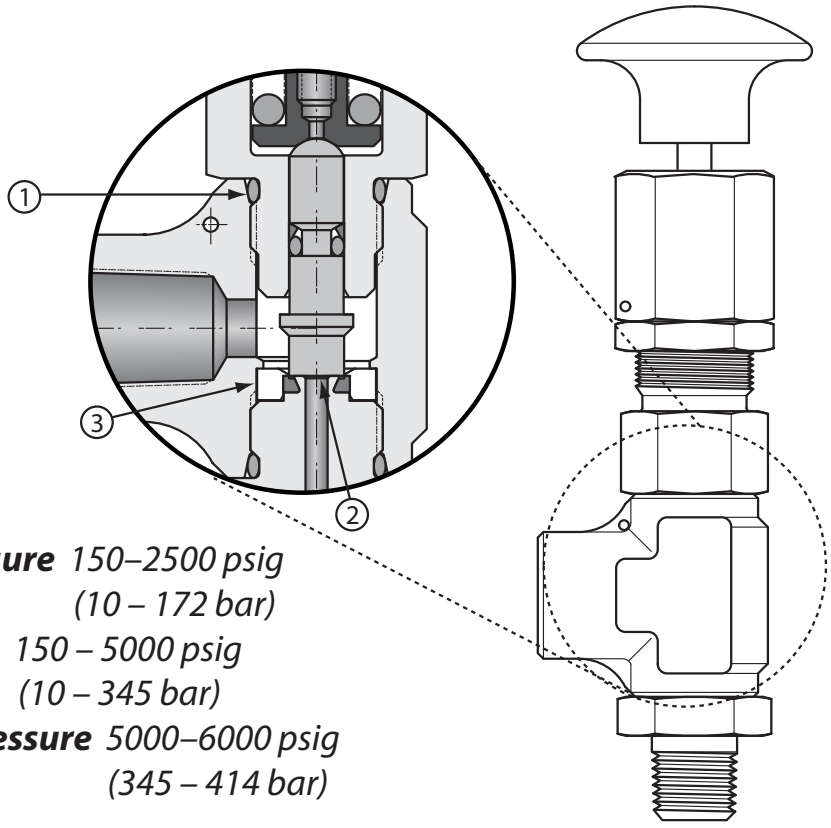
Extra High Pressure

Valve No.	Seal Material	Temperature °F (°C)	Pressure Range psig (bar)
XR6033	Neoprene	-40° to +300° (-40° to +149°)	5000–6000 (344.8–413.8)
XR6032	Viton®	-20° to +400° (-29° to +204°)	5000–6000 (344.8–413.8)
XR6077	Buna-N	-65° to +275° (-54° to +135°)	5000–6000 (344.8–413.8)
XR6062	Ethylene Propylene	-65° to +300° (-54° to +149°)	5000–6000 (344.8–413.8)
XR6065	Kalrez®	-40° to +550° (-40° to +288°)	5000–6000 (344.8–413.8)

R6000 Series



Low Pressure *5–550 psig (0-38 bar)*



Medium Pressure *150–2500 psig (10 – 172 bar)*

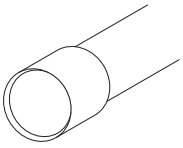
High Pressure *150 – 5000 psig (10 – 345 bar)*

Extra High Pressure *5000–6000 psig (345 – 414 bar)*

Features

① **O-ring & Delta backup ring**

② **Raised seal lip**



③ **Fully encapsulated seat seal**

R6000 Series

Crack Pressure Range

Select appropriate spring code

LR6000 Low Pressure		MR6000 Medium Pressure		HR6000 High Pressure		XR6000 Extra High Pressure	
Spring Code	Range in PSIG (BAR)	Spring Code	Range in PSIG (BAR)	Spring Code	Range in PSIG (BAR)	Spring Code	Range in PSIG (BAR)
A	5–25 (0–2)	B	150–350 (10–24)	A	150–300 (10–21)	A	5000–6000 (345–414)
B	26–80 (2–6)	C	351–650 (24–45)	B	301–700 (21–48)		
C	81–150 (6–10)	D	651–1000 (45–69)	C	701–1300 (48–90)		
D	151–250 (10–17)	E	1001–1500 (69–103)	D	1301–2000 (90–138)		
E	251–350 (17–24)	F	1501–2000 (104–138)	E	2001–3000 (138–207)		
F	351–550 (24–38)	G	2001–2500 (138–172)	F	3001–4000 (207–276)		
				G	4001–5000 (276–345)		

How to Order

LR60 24 – 2MP – A H M – * * * *

MANUAL OVERRIDE

(optional, not available for LR or XR series)
MR series only available up to 350 psig (24 bar).
HR series only available up to 700 psig (48 bar) .

SPRING CODE

See *Crack Pressure* table above

PORT SIZE

	Inlet	Outlet
2MP	¼″ male NPT	¼″ female NPT
2M4G	¼″ male NPT	¼″ Gyrolok®
4G	¼″ Gyrolok®	¼″ Gyrolok®
2RT	¼″ BSPT male	¼″ BSPT female
6Z	6mm Gyrolok®	6mm Gyrolok®
8Z	8mm Gyrolok®	8mm Gyrolok®
12Z	12mm Gyrolok®	12mm Gyrolok®

BASIC MODEL NUMBER

- **LR60** Low pressure *5–550 psig (0-38 bar)*
- **MR60** Medium pressure *150–2500 psig (10-172 bar)*
- **HR60** High pressure *150–5000 psig (10-276 bar)*
- **XR60** Extra high pressure *5000–6000 psig (345-414 bar)*

SEAL MATERIAL

- **24** Silicone*
- **32** Viton®
- **33** Neoprene
- **62** Ethylene propylene
- **65** Kalrez®
- **77** Buna-N

R6000 valves are CE 0035 / PED approved

* Silicone seals are not available for XR series.
* Silicone seals for MR series only available up to 350 psig (spring code B)
* Silicone seals for HR series only available up to 300 psig (spring code A)

**** Customer can request a specific cracking pressure when ordering. To specify, add the cracking pressure as -PSIG (not BAR) after the M for Manual Override (if no override, add value after "H"). Otherwise, the factory sets the valve at the nominal midpoint of the cracking pressure range selected. Valves with specific cracking pressure include standard factory installed lockwire.

R6000 Service Kits

LR Kit includes: end seat-to-body O-ring, bonnet-to-body O-ring, and bonnet seal O-ring.

MR/HR/XR Kit includes: end seat-to-body O-ring, bonnet-to-body O-ring, seat O-ring, and Delta seal. Replacement of Delta seal requires use of installation tool and resizing tool. Consult factory for details.

To Order, add K to front of valve part number (example: KLR6024-2MP-AH).

For Your Safety

It is solely the responsibility of the system designer and user to select products suitable for their specific application requirements and to ensure proper installation, operation, and maintenance of these products. Material compatibility, product ratings and application details should be considered in the selection. Improper selection or use of products described herein can cause personal injury or property damage.

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