

**CIRCLE SEAL CONTROLS, INC.**  
 A division of CIRCOR International, Inc.

## 500 Series Adjustable Popoff & Inline Relief Valves .5 to 150 PSIG

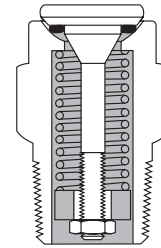
### Features

- Popoff or Inline Valves
- Adjustable Crack Pressure
- Zero Leakage
- Optional Factory Preset
- Accurate Set Pressure
- Wide Range of Cracking Pressure
- Tamper Proof Adjustment
- 100% Seat Leakage Tested

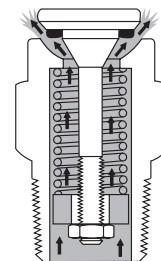
### Applications

- System Overpressure Protection
- Storage Tanks
- Freon Recovery Systems
- Medical Equipment
- Refrigeration & Heating Equipment
- Measuring & Dispensing Pumps
- Communications Equipment
- Process Control Instruments
- R & D Pilot Plants

### How it Works



**CLOSED**  
 Resilient seal design prevents leakage. Sealing efficiency increases with increased pressure up to cracking pressure. Metal-to-metal poppet stop supports spring load, prevents sticking.



**OPEN**  
 When system pressure overcomes spring force, poppet opens. As pressure continues to rise, variable orifice between poppet and body increases, allowing greater flow.

### Technical Data

Body Construction Materials:	• Aluminum, Brass, 303 or 316 Stainless Steel
O-ring Materials:	• Buna N, Ethylene Propylene, Neoprene, Silicone, Teflon® or Viton®
Spring Materials:	• 302 Stainless Steel or 17-7PH Stainless Steel
Operating Pressure:	• Vacuum to 200 PSIG (14 BAR)
Inline Valve Proof Pressure:	• 400 PSIG (28 BAR)
Inline Valve Burst Pressure:	• Above 500 PSIG (34 BAR)
Temperature Range:	• -320° F to +400° F (-196° C to +204° C) Based on o-ring material, see "How to Order"
Connection Sizes:	• 1/8 inch to 1-1/4 inch

### RESEALING

Resilient seal automatically establishes line of contact with spherical seat. Seal provides zero leakage at reseal.

NOTE: Proper filtration is recommended to prevent damage to sealing surfaces.

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# 500 Series

## .5-150 PSI

### FLOW AT CRACKING PRESSURE

Elastomeric seals 5cc/min  
 Teflon® .02 scfm

### CRACKING PRESSURE TOLERANCE ± 5 %

Cracking pressure on initial crack may be higher than cracking pressure tolerance due to inherent characteristics of seals. Cracking pressure tolerance will be greater than ±5% if set pressure is ≤ 10psi.

(Consult factory)

### LEAKAGE Ascending Pressure

Standard seals 0 to 95% of C.P.  
 Silicon (524) & EPR (562) 0 to 80% of C.P.  
 Teflon® (520)\*

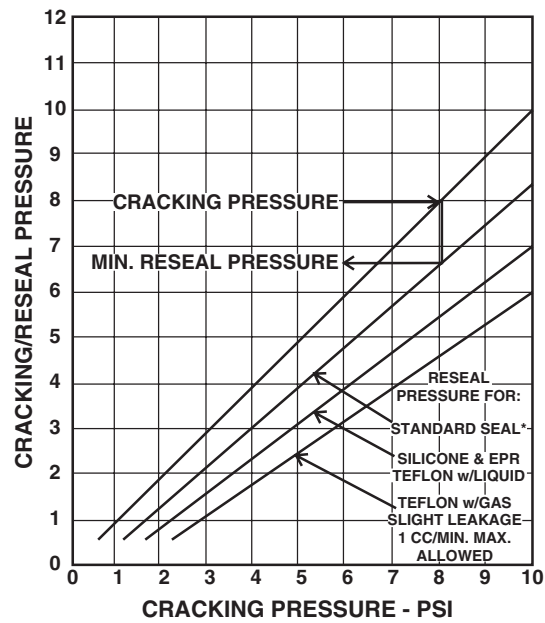
Cracking pressures up to 2.4 PSI – 4cc/min at 0 to 50% of cracking pressure

Cracking pressures 2.5 PSI and higher – 1cc/min at 0 to reseal pressure, 10cc/min from reseal to 90% of cracking pressures.

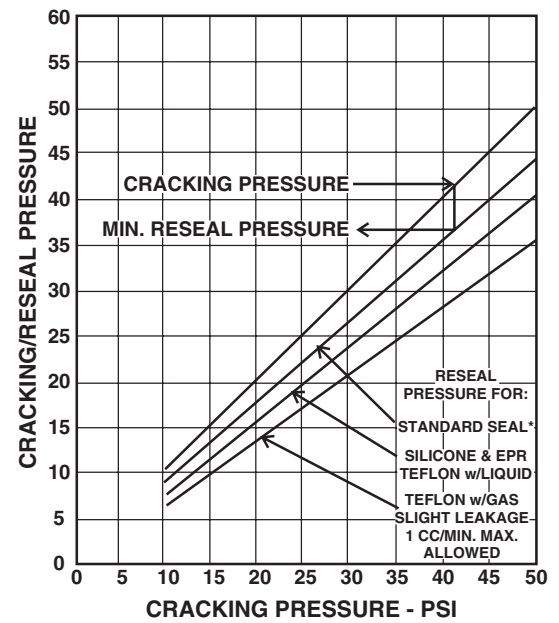
### LEAKAGE at Reseal Pressure

All Elastomeric seals - Zero  
 Teflon® - 1cc/min for cracking pressures 2.5 PSI & higher

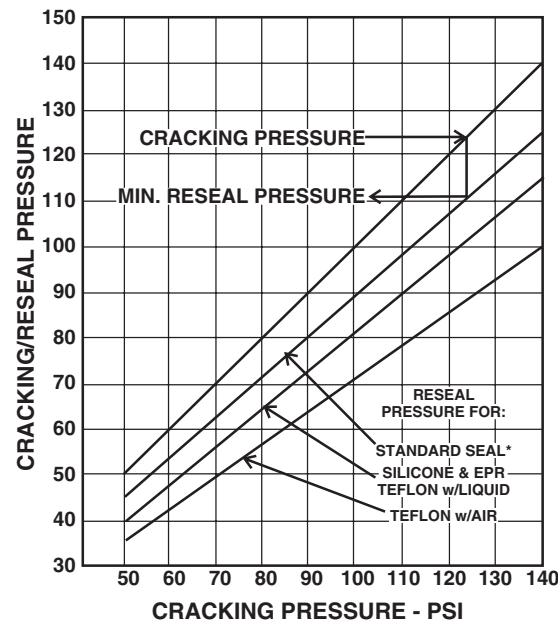
### 0 to 10 PSI



### 10 to 50 PSI



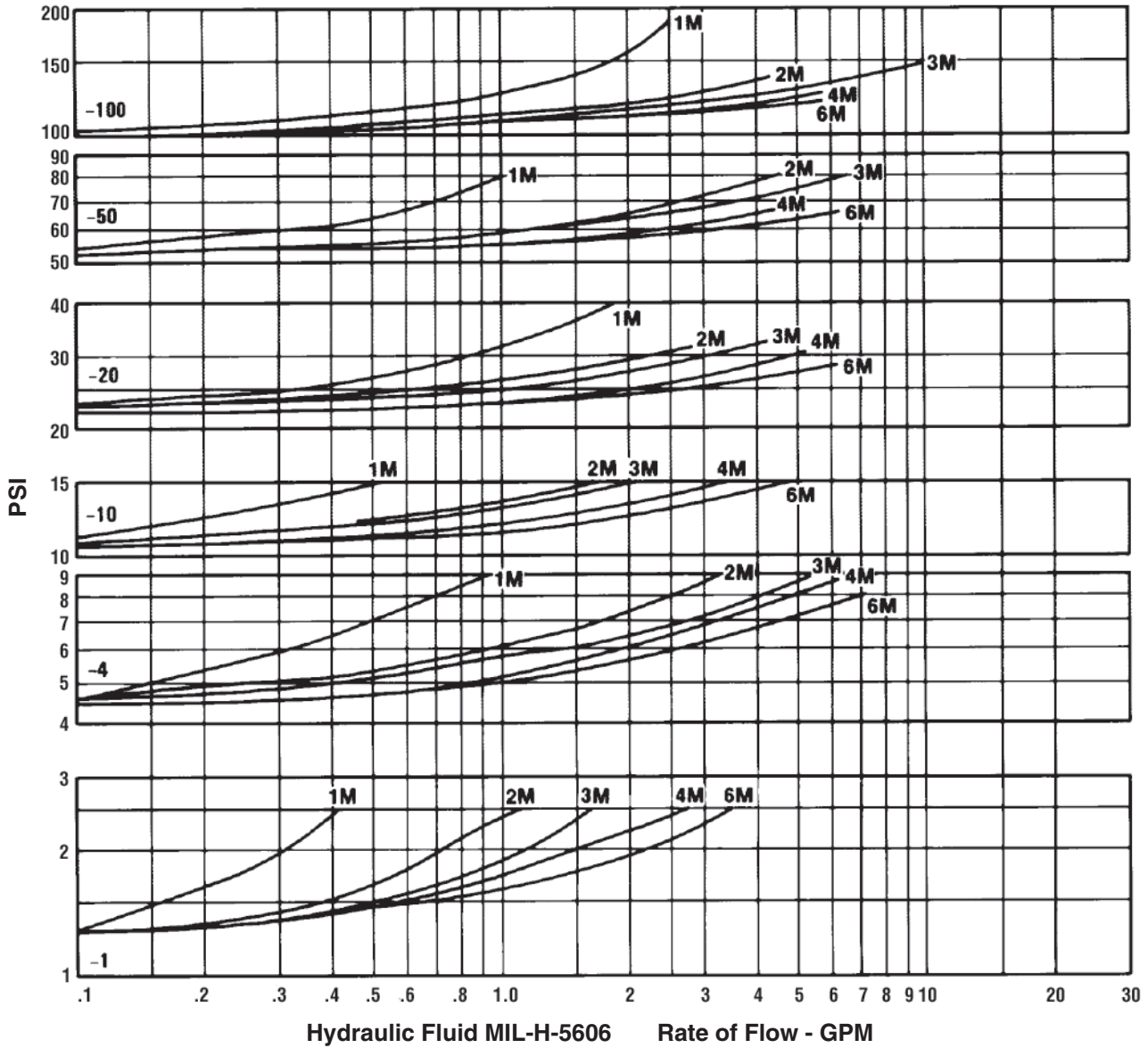
### 50 to 140 PSI



\* STANDARD SEALS:  
 Buna N (559)  
 Viton® (532)  
 Neoprene (533)

# 500 Series .5-150 PSI

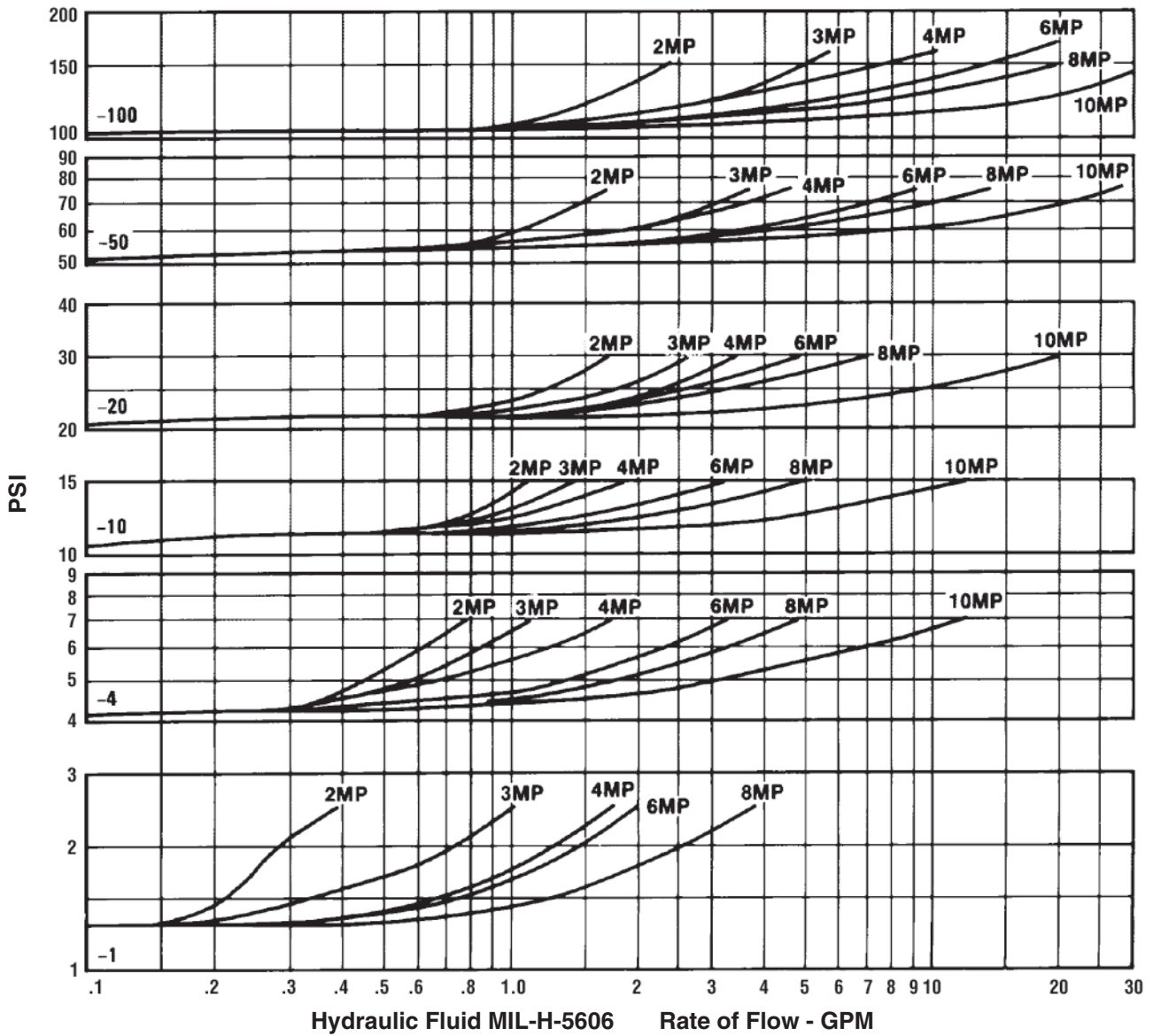
## Hydraulic Flow Curves (500-M) Popoff Relief Valves



# 500 Series

.5-150 PSI

## Hydraulic Flow Curves (500-MP) Inline Relief Valves



# 500 Series

.5–150 PSI

## Air Flow Rates (500-M & -MP)

M—Popoff valves 1/8"–3/8"

MP—Inline valves 1/4"–1/2"

Crack Pressure PSIG	Percent Over Pressure Beyond Cracking (SCFM air at room temperature)								
	10%			25%			50%		
	1M/2MP	2M/3MP	3M/4MP	1M/2MP	2M/3MP	3M/4MP	1M/2MP	2M/3MP	3M/4MP
0.5	.08	.08	.80	.12	.17	.45	.14	.60	1.1
1	.10	.10	.10	.17	.35	.65	.20	.80	1.6
1.5	.12	.12	.15	.25	.46	.90	.40	1.0	2.0
2	.15	.14	.20	.34	.62	1.2	.63	1.4	2.5
2.5	.17	.17	.30	.42	.75	1.5	.80	1.8	3.1
3	.20	.21	.40	.50	.85	1.7	1.1	2.2	3.6
4	.23	.24	.50	.70	1.05	2.0	1.5	3.0	5.4
5	.28	.30	.50	.86	1.3	2.2	1.7	3.7	6.0
10	.60	.70	.80	1.65	3.2	3.8	3.2	7.0	11
15	.80	1.2	1.6	2.3	4.2	8.5	4.2	8.5	20
20	1.1	1.5	2.5	2.9	5.0	11.5	5.2	10	28
25	1.2	2.0	3.0	3.4	7.9	15	6.0	14	33
30	1.6	2.4	4.0	4.0	10.1	19.5	7.0	18	36
40	1.9	3.5	7.0	5.1	13	24.5	8.8	26	53
50	2.3	4.4	9.0	6.0	15	29	10.6	32	60
60	2.5	5.4	9.8	6.7	18	33	11.6	39	69
70	2.9	6.6	10.9	7.5	22.5	38	12.7	47	79
80	3.2	7.6	12	8.2	26	43	13.8	56	91
90	3.6	8.7	13.5	9.0	30.5	47	14.9	66	101
100	4.0	9.5	15	9.8	34	52	15.8	75	108
110	4.4	11.3	17.5	10.2	38	53.5	17.0	77.5	114
120	4.8	13.2	20.8	10.6	42.5	56.5	18.3	80	122
130	5.2	14.9	24	11	47	58.5	19.6	83	131
140	5.6	16.5	27.5	11.5	51	61.5	20.9	87	138
150	6.0	18	30	12	56	63	22.0	90	145

# 500 Series

.5–150 PSI

## Air Flow Rates (500-M & -MP)

M—Popoff valves 1/2"–1"

MP—Inline valves 3/8"–1-1/4"

Crack Pressure PSIG	Percent Over Pressure Beyond Cracking (SCFM air at room temperature)								
	10%			25%			50%		
	4M/6MP	6M/8MP	8M/10MP	4M/6MP	6M/8MP	8M/10MP	4M/6MP	6M/8MP	8M/10MP
.5	.07	.07	—	.50	.50	—	.80	2.2	—
1	.10	.10	—	.70	.70	—	1.7	3.2	—
1.5	.30	.30	—	1.0	1.4	—	2.2	5.5	—
2	.50	.50	—	1.2	1.7	—	3.0	7.0	—
2.5	.60	.60	—	1.8	3.0	—	4.2	10.5	—
3	.80	.80	—	2.2	4.0	—	5.0	13	—
4	1.0	1.0	1.5	3.0	5.0	30	7.5	17	56
5	1.0	1.2	2.5	3.5	6.0	34	9.0	20	64
10	1.0	2.4	7.0	6.0	12	60	19	40	115
15	1.6	3.0	7.0	8.5	22	60	27	80	160
20	2.0	5.0	7.0	10	30	60	34	110	190
25	3.0	5.5	9.0	13.5	34	72	43	116	—
30	3.5	6.0	11.5	16	37	80	50	121	—
40	5.5	8.5	18	24	48	115	72	136	—
50	7.0	10	23	30	56	140	90	150	—
60	11	13	35	38	64	160	100	165	—
70	15	17	59	47	72	185	111	182	—
80	20	21	77	56	81	215	123	204	—
90	26	26	88	68	94	235	138	225	—
100	30	30	100	75	105	250	150	240	—
110	33	38	115	80	112	258	166	—	—
120	37	47	132	86	125	270	183	—	—
130	41	57	150	93	150	282	201	—	—
140	46	71	175	102	163	290	222	—	—
150	50	80	190	110	175	300	240	—	—

# 500 Series

## .5–150 PSI

### Air Flow Rates (D500-M)

Popoff valves with deflector cap 1/8"–3/8"

Crack Pressure PSIG	Percent Over Pressure Beyond Cracking (SCFM air at room temperature)								
	10%			25%			50%		
	1M	2M	3M	1M	2M	3M	1M	2M	3M
.5	.12	.20	.15	.24	.50	.50	.44	1.2	1.1
1	.21	.30	.30	.40	.85	.85	.73	2.0	1.9
1.5	.21	.30	.30	.42	1.0	1.0	.80	2.7	3.1
2	.21	.30	.30	.45	1.2	1.2	.95	3.5	5.0
2.5	.22	.30	.30	.49	1.3	1.3	1.1	4.3	6.2
3	.23	.30	.30	.52	1.6	1.6	1.25	5.4	8.0
4	.23	.30	.30	.58	2.1	2.1	1.5	7.5	12
5	.32	.30	.30	.60	2.2	4.5	1.7	8.3	14
10	.70	.34	.40	1.6	2.5	14	3.2	12.6	23
15	1.4	1.3	1.5	2.0	6.0	18	3.9	16.5	29
20	1.8	2.2	3.0	2.7	10	23	5.4	21	36
25	1.9	3.0	8.0	2.8	11.5	27	6.0	23	40
30	2.0	4.0	14	3.0	14	32	7.0	27	47
40	2.3	5.9	26	3.5	18	42	9.0	33	59
50	2.4	8.0	39	3.8	25	54	10.5	40	74
60	3.2	17	43	4.6	33	62	11.4	46	—
70	4.0	26	47	5.5	41	70	12.4	52	—
80	4.9	36	52	6.4	50	79	13.7	59	—
90	5.9	46	58	7.5	61	89	15	67	—
100	7.0	56	65	8.5	72	100	16	76	—
110	7.3	56	65	9.5	73	113	24	80	—
120	7.7	57	66	12.8	74	127	33	84	—
130	8.1	58	67	16.2	76	142	43	89	—
140	8.6	59	68	20	78	158	53	96	—
150	9.0	61	70	25	80	176	60	104	—

# 500 Series

.5–150 PSI

## Air Flow Rates (D500-M)

Popoff valves with deflector cap 1/2"–1"

Crack Pressure PSIG	Percent Over Pressure Beyond Cracking (SCFM air at room temperature)								
	10%			25%			50%		
	4M	6M	8M	4M	6M	8M	4M	6M	8M
.5	.15	.15	—	.30	.30	—	1.0	1.0	—
1	.30	.30	—	.50	.50	—	1.7	1.7	—
1.5	.40	.40	—	.60	1.5	—	3.2	7.5	—
2	.50	.60	—	.90	3.0	—	5.0	14.5	—
2.5	.60	.70	—	1.1	4.0	—	6.5	21	—
3	.70	1.0	—	1.4	5.5	—	9.0	29	—
4	1.0	1.5	—	3.0	9.0	—	13	45	—
5	1.0	1.8	—	4.0	13	—	15.5	49	—
10	1.5	4.0	92	10	36	115	28	75	145
15	9.0	26	127	22	66	—	42	101	—
20	18	50	170	36	100	—	58	131	—
25	21	60	173	43	112	—	65	—	—
30	25	74	177	51	128	—	74	—	—
40	33	100	188	67	158	—	91	—	—
50	42	130	200	85	195	—	110	—	—
60	49	148	225	95	220	—	—	—	—
70	56	167	251	106	247	—	—	—	—
80	64	188	278	117	275	—	—	—	—
90	73	212	308	130	305	—	—	—	—
100	85	240	340	145	340	—	—	—	—
110	89	246	355	152	347	—	—	—	—
120	93	253	372	159	355	—	—	—	—
130	98	261	390	167	363	—	—	—	—
140	103	270	415	176	375	—	—	—	—
150	110	280	440	185	390	—	—	—	—

# 500 Series

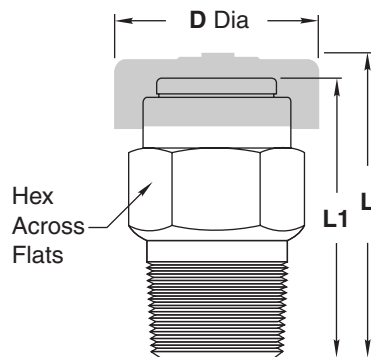
.5-150 PSI

Dimensions (Inches)

## Valve Size & Codes

Size	Pipe Thread Male	Pipe Thread Male/Female	British Pipe Thread Male/Female	British Taper Pipe Male
1/8"	1M			1S
1/4"	2M	2MP	2SX	2S
3/8"	3M	3MP	3SX	3S
1/2"	4M	4MP	4SX	4S
3/4"	6M	6MP	6SX	6S
1"	8M	8MP		8S
1-1/4"		10MP		

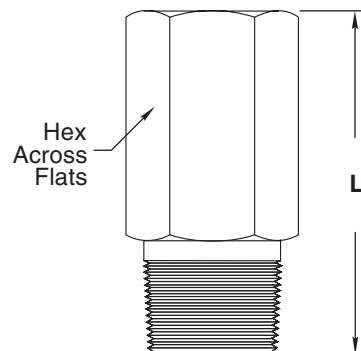
### Popoff



### Popoff Valve Dimensions

Pipe Size Male	L	L1	Hex	D dia Max
1/8"	1.14	.98	1/2	0.63
1/4"	1.38	1.20	5/8	0.90
3/8"	1.43	1.25	3/4	1.21
1/2"	1.98	1.74	1	1.45
3/4"	2.31	2.07	1-1/8	1.45
1"	3.16	2.85	1-1/2	1.89

### Inline



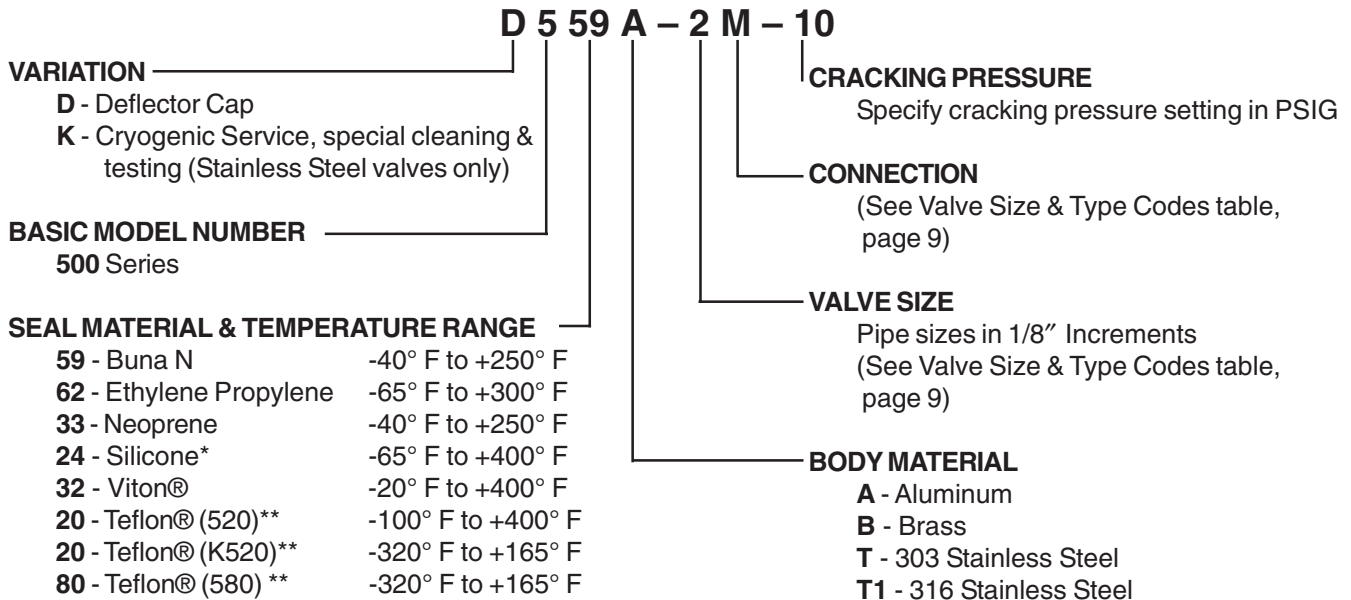
### Inline Valve Dimensions

Pipe Size Male & Female	L	Hex
1/4"	1.62	3/4
3/8"	2.08	7/8
1/2"	2.34	1-1/8
3/4"	2.72	1-1/4
1"	3.62	1-1/2
1-1/4"	4.67	1-7/8

# 500 Series

.5-150 PSI

## How to Order



### Notes:

D – Prefixed Part Number is supplied with a cap which diverts high pressure blasts from personnel and instruments, and serves as a rain and dust shield (NOT AVAILABLE FOR CRACKING PRESSURES BELOW 2 PSI).

\* Not available over 74.9 psi.

\*\* 520 - Teflon® or o-ring

\*\* K520 - Polished Teflon® o-ring, cryogenic testing and serialization

\*\* 580 - Polished Teflon® o-ring

ASME valves are covered on a separate catalog sheet.

Teflon® is a registered trademark of DuPont. Viton® is a registered trademark of DuPont Dow Elastomers.

Please consult your Circle Seal Controls Distributor or our factory for information on special connections, operating pressures and temperature ranges.

### Repair Kits

In normal service the only part(s) which may require replacement is(are) the seal(s). A repair kit may be ordered by placing a K/ in front of the complete part number, (i.e. K/559A-2M-10).

### **For Your Safety**

*It is the sole 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 here in can cause personal injury or property damage.*