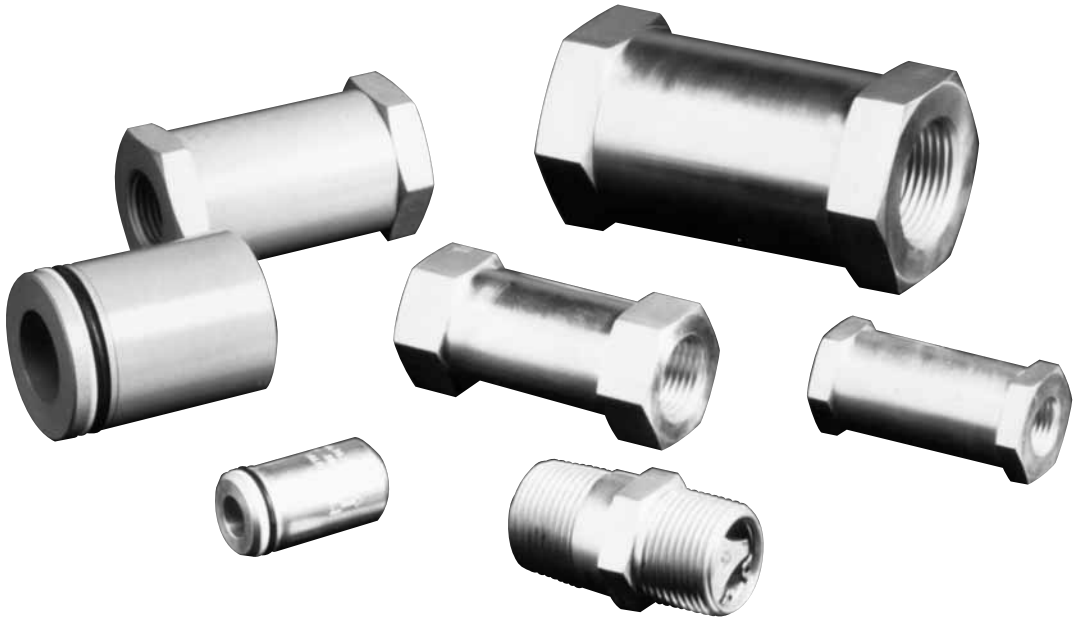
CIRCOR | Circle Seal Controls

Check Valves

Index

Safety Warning	Inside Front Cover
100 Series	1
200/H200 Series	3
2200 Series	9
2300 Series	12
C200 Series	16
C2900 Series	19
400/H400 Series	22
BIVCO Check Valves	26
Disclaimers	Inside Back Cover



check valves

Circle Seal Controls
2301 Wardlow Circle • Corona, CA 92880-3300
Phone (951) 270-6200
www.circlesealcontrols.com • www.circor.com/circle-seal-controls
circleseal@circor.com

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. When selecting products, the total system design must be considered to ensure safe, trouble-free performance. 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.

Contact your authorized Atkomatic sales and service representative for information about additional sizes and special alloys.

SAFETY WARNING:

Circle Seal products are designed for installation only by professional suitably qualified licensed system installers experienced in the applications and environments for which the products are intended. These products are intended for integration into a system. Where these products are to be used with flammable or hazardous media, precautions must be taken by the system designer and installer to ensure the safety of persons and property. Flammable or hazardous media pose risks associated with fire or explosion, as well as burning, poisoning or other injury or death to persons and/or destruction of property. The system designer and installer must provide for the capture and control of such substances from any vents in the product(s). The system installer must not permit any leakage or uncontrolled escape of hazardous or flammable substances. The system operator must be trained to follow appropriate precautions and must inspect and maintain the system and its components including the product(s) and at regular intervals in accordance with timescales recommended by the supplier to prevent unacceptable wear or failure.

100 Series

0 to 25 psig Check Valves

Features & Benefits

Low pressure

- Lightweight check valve for pressures to 25 psig.

Ultra-sensitive

- Unique design allows flow with minimum pressure differential. Cracking pressure is 4″ H2O maximum.

Positive sealing

- Unique knife-edge on the poppet positions snugly to provide zero sealing even with extremely low pressure.

Zero leakage

- Compact, easy installation. Efficient, inline design reduces size and weight. The valve can be mounted in any position.

Technical Data

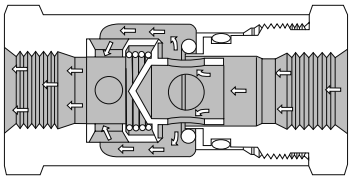
Body Construction Materials	Aluminum, brass, steel, 303 or 316 stainless steel
O-ring Materials	Buna N or Viton®
Operating Pressure	25 psig (1.7 bar)
Cracking Pressure	4″ H2O maximum
Temperature Range	–40° F to +400° F (–40° C to +204° C) *Based on o-ring & body material, see "How to Order"*
Connection Sizes	1/8″ to 3/4″

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

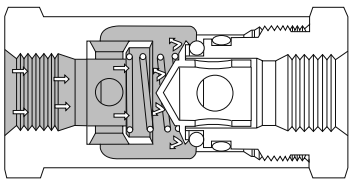
check valves

100 Series

How it Works

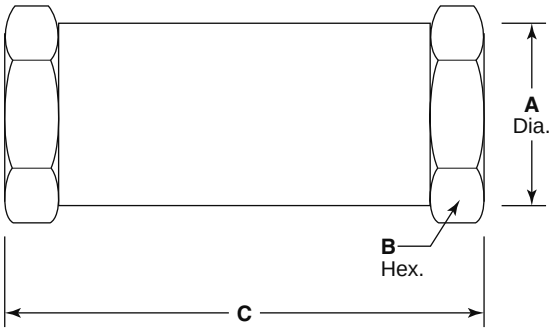


Open
Full flow passages offer minimum restriction to flow. Spring is completely removed from flow path



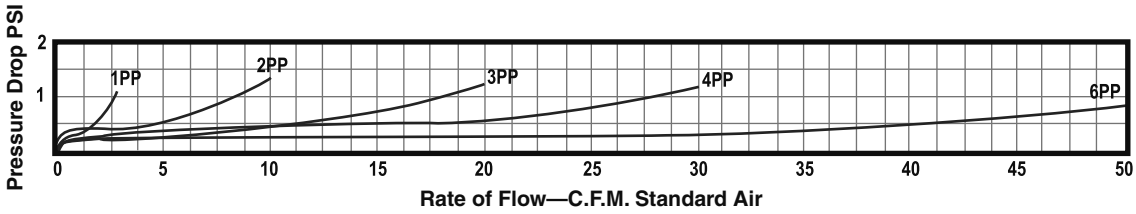
Closed
As the inlet supply pressure decreases, a light spring closes the poppet, positioning the knife-edge automatically in line of contact sealing against the o-ring. The impression of the knife edge is limited by a metal-to-metal seat, which carries the reverse pressure load and serves to prevent sticking of the o-ring.

Dimensions



Pipe, Female	Size	A Dia.	B Hex	C
–1PP	1/8″	0.81	0.81	1.70
–2PP	1/4″	1.00	1.00	2.25
–3PP	3/8″	1.12	1.12	2.43
–4PP	1/2″	1.50	1.50	2.93
–6PP	3/4″	1.75	1.75	3.37

Flow Curve



How to Order

1 19 B – 2 PP

O-RING MATERIAL & TEMPERATURE RANGE
- **19** Buna N, –40° F to +250° F
- **32** Viton®, –20° F to +400° F

MATERIAL
- **A** Aluminum
- **B** Brass
- **T** 303 stainless steel†
- **T1** 316 stainless steel

CONNECTIONS—INLET/OUTLET
- **P** Female pipe, NPT

VALVE SIZE
- **1** 1/8″
- **2** 1/4″
- **3** 3/8″
- **4** 1/2″
- **6** 3/4″

† *Not available for PED applications.*

Please consult Circle Seal Controls or your local distributor for information on special connections, o-rings, operating pressures, reseal 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/119B–2PP**).

Although we offer separate kits where o-ring replacement is considered necessary, factory repair is recommended. Because of the ultra-sensitive characteristics of this valve, extreme care is necessary to insure that the o-ring is properly fitted into the groove without being twisted or distorted.

Viton® is a registered trademark of DuPont Dow Elastomers.

200 Series 0 to 3000 psig Check Valves
H200 Series 0 to 6000 psig Check Valves

Features & Benefits

Quick opening/positive closing
- Provides a wide range of adaptability

Large flow capacity
- The patented sealing principle effects complete leakproof closing under all pressure conditions

Zero leakage
- Compact, easy installation. Efficient inline piston reduces size and weight

Floating o-ring
- The streamlined poppet and full ports offer minimum restriction to flow

Technical Data

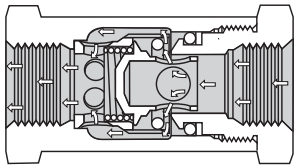
Body Construction Materials	Aluminum, brass, steel, 303 or 316 stainless steel
O-ring Materials	Buna N, ethylene propylene, fluorosilicone, Kalrez®, neoprene, PTFE, and Viton®
Operating Pressure	200 Series: to 3000 psig (207 bar) H200 Series: to 6000 psig (414 bar)
Proof Pressure	1.5 times operating pressure
Rated Burst Pressure	200 Series: 2.5 : 1 H200 Series: 4 : 1
Cracking Pressure	0.1 to 25 psig (0.007 to 1.72 bar)
Temperature Range	–320° F to +550° F (–196° C to +288° C) *Based on o-ring & body material, see "How to Order"*
Connection Sizes	1/8″ to 2″

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

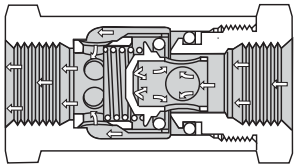
check valves

200 Series / H200 Series

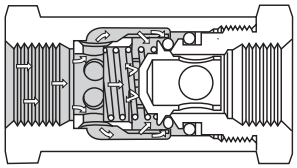
How it Works



Open
Full flow passages offer minimum restriction to flow. Spring is completely removed from flow path



Closing
Floating o-ring automatically establishes line contact with conical metal surfaces of poppet and seat to cushion closing and insure perfect sealing.



Closed
O-ring only seals. Full pressure load is carried by metal-to-metal seat. Increasing pressure increases sealing efficiency; metal seat prevents any possibility of deformation or extrusion of o-ring.

Cracking Pressure

Minimum cracking pressure available: 0.1 psig
Standard cracking pressure: see page 7
Maximum cracking pressure available: 25 psig

Note: Cracking pressure is defined at which flow is 5cc/min except for 220 Series for which flow is approximately 0.02 cfm. When ordering a cracking pressure within the standard range or below the standard range of the cracking pressure, the dash number is a "maximum". Example: ***259A–4TT–.3*** *(cracking pressure tolerance will be +0%, –50%). When ordering a cracking pressure equal to or greater than the upper limit of the standard cracking pressure shown above, cracking pressure tolerance will be ±10%. Example:* ***259A–4TT–5****. Cracking pressure over 8 psig should not be specified without consulting the factory. Where 200 Series valves are supplied with higher cracking pressures, a shroud ring may be used to confine the o-ring.*

Note: Reseat pressure is the back pressure required to seal a check valve. It varies with different springs and seals. Reseat pressure is not specified unless called out on the sales order.

Leakage

External: Zero
Internal:
Elastomeric seals: Zero
PTFE seals: 0–50 psig = 5cc/min max.
50+ psig = 0.5cc/min max.

Operating Pressure: 200 Series

Aluminum (A)	Tube	3/16″–1 1/2″	0–3000 psig to 200° F
	Pipe	1/8″–1 1/2″	0–3000 psig to 200° F
Brass	Tube	3/16″–1 1/2″	0–3000 psig to 300° F
	Pipe	1/8″–1 1/2″	0–3000 psig to 300° F
	Pipe	2″	0–1500 psig to 300° F
Steel	Tube	3/16″–1 1/2″	0–3000 psig to 300° F
	Pipe	1/8″–2″	0–3000 psig to 300° F
Stainless steel	Tube	3/16″–1 1/2″	0–3000 psig to 450° F
	Pipe	1/8″–2″	0–3000 psig to 450° F

Operating Pressure: H200 Series

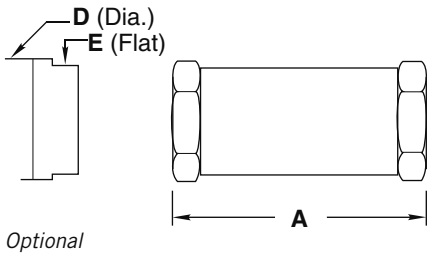
Aluminum (A)	Tube	3/16″–1 1/4″	0–6000 psig to 200° F
	Pipe	1/8″–1 1/2″	0–6000 psig to 200° F
Brass	Tube	3/16″–1 1/4″	0–5000 psig to 300° F
	Pipe	1/8″–1 1/2″	0–5000 psig to 300° F
Steel	Tube	3/16″–1 1/4″	0–5000 psig to 300° F
	Pipe	1/8″–2″	0–5000 psig to 300° F
Stainless steel	Tube	3/16″–2″	0–6000 psig to 450° F
	Pipe	1/8″–2″	0–6000 psig to 450° F

End Connections, Dimensions (Inches) & Weights

–RR, –BB: Female Tube

Dash No.	Tube Size	A ±0.050	C Hex & Rd.	Opt. Dimensions D	Opt. Dimensions E	Weights (Lbs) Alum.	Weights (Lbs) All Steel
–4BB	1/4″	1.98	0.75	—	—	0.06	0.16
–5BB	5/16″	2.07*	0.81	—	—	0.08	0.22
–6BB	3/8″	2.44	0.81	—	—	0.08	0.22
–8BB	1/2″	3.06	1.00	—	—	0.13	0.37
–10BB	5/8″	3.42	1.12	—	—	0.18	0.50
–12BB	3/4″	3.83	1.50	1.75	1.50	0.34	0.88
–16BB	1″	4.37	1.75	2.00	1.75	0.52	1.50
–20BB	1 1/4″	4.99	2.00	2.25	2.00	0.68	2.18
–24BB	1 1/2″	5.75	2.75	2.75	2.25	2.05	5.95

** Exception: **200T–5BB**, **'A'** dimension is 2.44*

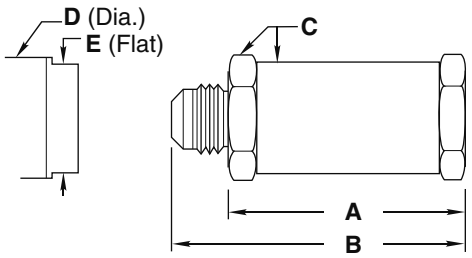


Optional
(Based on availability)

–BT: Female Tube to Male Tube
–TB: Male Tube to Female Tube

Dash No.	Tube Size	A ±0.050	B Ref.	C Hex & Rd.	Opt. Dimensions D	Opt. Dimensions E	Weights (Lbs) Alum.	Weights (Lbs) All Steel
–4BT	1/4″	1.53	2.08	0.75	—	—	0.06	0.15
–6BT	3/8″	1.98	2.54	0.81	—	—	0.08	0.21
–8BT	1/2″	2.37	3.03	1.00	—	—	0.12	0.34
–12BT	3/4″	3.00	3.86	1.50	1.75	1.50	0.32	0.96
–16BT	1″	3.50	4.41	1.75	2.00	1.75	0.50	1.46
–20BT	1 1/4″	3.97	4.93	2.00	2.25	2.00	0.68	1.90
–24BT	1 1/2″	4.73	5.81	2.75	2.75	2.25	1.82	5.31

Dash No.	Tube Size	A ±0.050	B Ref.	C Hex & Rd.	Opt. Dimensions D	Opt. Dimensions E	Weights (Lbs) Alum.	Weights (Lbs) All Steel
–4TB	1/4″	1.98	2.53	0.75	—	—	0.07	0.20
–5TB	5/16″	1.98	2.53	0.81	—	—	0.07	0.20
–6TB	3/8″	1.98	2.54	0.81	—	—	0.08	0.21
–8TB	1/2″	2.49	3.15	1.00	—	—	0.14	0.37
–10TB	5/8″	2.80	3.56	1.12	—	—	0.18	0.50
–12TB	3/4″	3.33	4.19	1.50	1.75	1.50	0.37	1.07
–16TB	1″	3.74	4.65	1.75	2.00	1.75	0.55	1.60
–20TB	1 1/4″	4.39	5.35	2.00	2.25	2.00	0.80	2.30
–24TB	1 1/2″	5.06	6.14	2.75	2.75	2.25	2.03	5.90

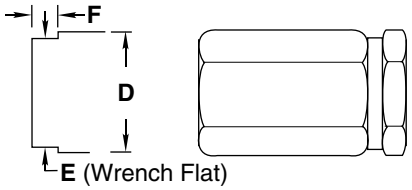


Optional
(Based on availability)

200 Series / H200 Series

H200 Series

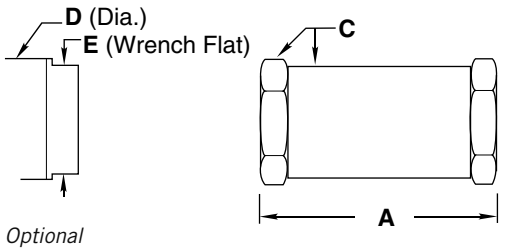
End Connection	Alum. (Stock Size Hex)	Brass (Stock Size Hex)	St. Steel (Stock Size Hex)	Steel D Dia.	Steel E	Steel F ± 0.015
–3T / –3C	0.625	0.625	0.625	0.650	0.560	0.220
–4T / –4B	0.875	0.875	0.812	0.875	0.750	0.280
–1P/–5T, –6T, –6B	0.937	0.937	0.875	0.960	0.813	0.280
–2P/–8T, –8B	1.125	1.250	1.125	1.250	1.000	0.300
–3P/–10T, –10B	1.375	1.375	1.250	1.375	1.125	0.350
–4P/–12T, –12B	1.750	1.875	1.750	1.875	1.625	0.450
–6P/–16T, –16B	2.000	2.250	2.000	2.125	1.875	0.500
–8P/–20T, –20B	2.250	2.500	2.250	2.50	2.125	0.620



Optional
(Based on availability)

–PP: Female Pipe

Dash No.	Tube Size	A ±0.050	B Ref.	C Hex & Rd.	Opt. Dimensions D	Opt. Dimensions E	Weights (Lbs) Alum.	Weights (Lbs) All Steel
–1PP	1/8″	1.70	0.81	—	—	0.05	0.15	0.14
–2PP	1/4″	2.25	1.00	—	—	0.12	0.36	0.34
–3PP	3/8″	2.43	1.12	—	—	0.15	0.46	0.43
–4PP	1/2″	2.93	1.50	1.50	1.25	0.32	0.98	0.92
–6PP	3/4″	3.37	1.75	1.75	1.50	0.49	1.50	1.41
–8PP	1″	3.99	2.00	2.00	1.75	0.73	2.25	2.11
–10PP	1 1/4″	4.50	2.75	2.75	2.25	1.60	5.00	4.80
–12PP	1 1/2″	5.35	2.75	2.75	2.25	1.73	5.34	4.97
–16PP	2″	6.10	—	3.50	2.75	2.60	8.00	7.50

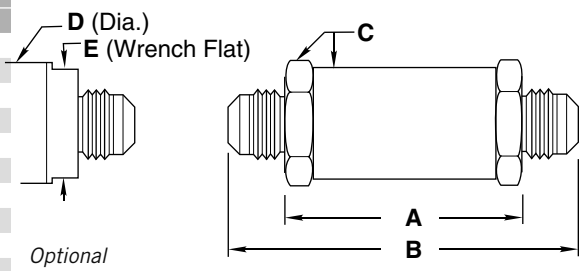


Optional
(Based on availability)

–TT: Female Tube

Dash No.	Tube Size	A ±0.050	B Ref.	C Hex & Rd.	Opt. Dimensions D	Opt. Dimensions E	Weights (Lbs) Alum.	Weights (Lbs) All Steel
–3TT	3/16″	0.97*	1.93*	0.56*	—	—	0.03	0.08
–4TT	1/4″	1.53	2.63	0.75	—	—	0.07	0.18
–5TT	5/16″	1.53	2.63	0.81	—	—	0.07	0.20
–6TT	3/8″	1.53	2.63	0.81	—	—	0.07	0.20
–8TT	1/2″	1.81	3.12	1.00	—	—	0.13	0.35
–10TT	5/8″	2.06	3.58	1.12	—	—	0.18	0.49
–12TT	3/4″	2.50	4.23	1.50	1.75	1.50	0.35	1.00
–16TT	1″	2.87	4.69	1.75	2.00	1.75	0.53	1.50
–20TT	1 1/4″	3.37	5.29	2.00	2.25	2.00	0.79	2.30
–24TT	1 1/2″	4.04	6.21	2.75	2.75	2.25	1.80	5.22

*Exception: **200T–3TT**: **'A'** dimension is 1.00, 'B' dimension is1.96, 'C' dimension is 0.625*

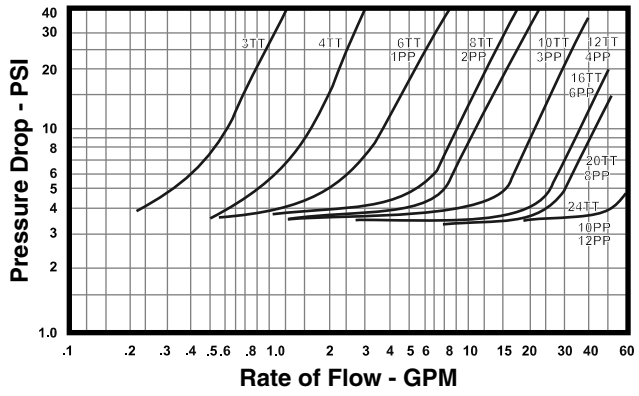


Optional
(Based on availability)

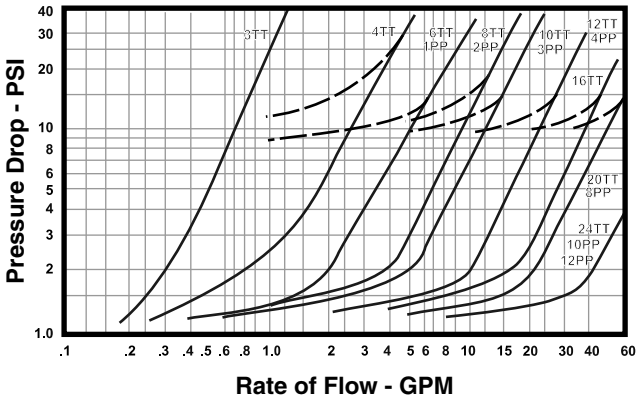
200 Series / H200 Series

Flow Curves

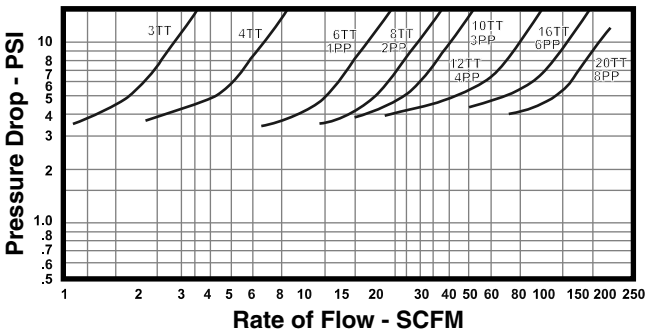
Models 223, 233, 249, 299
Hydraulic Fluid (MIL-H-5606)



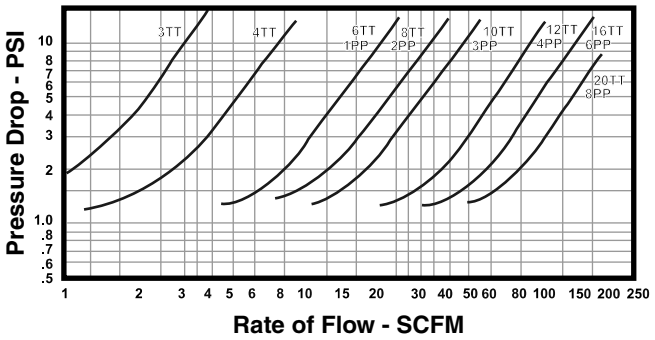
Models 220*, 259, 279
Hydraulic Fluid (MIL-H-5606)



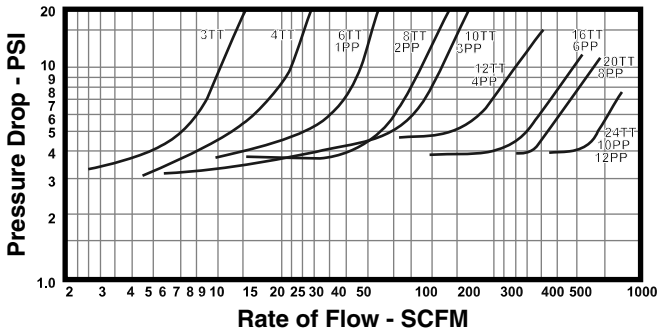
Models 223, 233, 249, 299
Air (Discharge to Atmosphere)



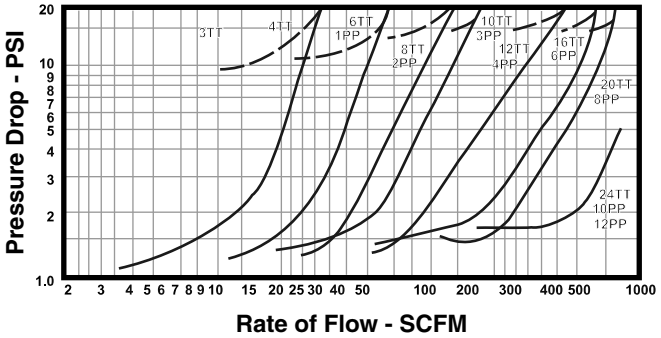
Models 220*, 259, 279
Air (Discharge to Atmosphere)



Models 223, 233, 249, 299
Air (100 PSI Inlet Pressure)



Models 220*, 259, 279
Air (100 PSI Inlet Pressure)



Flow Rates

Valve size	Tube	3	4	6	8	10	12	16	20	24	32
	Pipe	—	—	1	2	3	4	6	8	10–12	16
Cv (nominal)		0.30	0.7	1.6	2.7	3.5	6.6	10.3	12.5	23.2	51

200 Series / H200 Series

How to Order

H 2 49 T1 – 4TT (L) – 1

VARIATION
- **H** Modified construction for 6000 psig service (1/4″ to 1 1/2″ tube, 1/8″ to 1 1/4″ pipe and larger)
- **K** Cryogenic service, special cleaning and testing (stainless steel valves only)

O-RING MATERIAL, TEMPERATURE & CRACKING PRESSURE RANGE
- **49** Buna N, –65° F to +250° F, 2–4 psig
- **59** Buna N, –65° F to +275° F, 0.5–1 psig
- **69** Buna N (fuels), –65° F to +180° F, 0.5–1 psig
- **62** Ethylene propylene, –65° F to +300° F, 2–4 psig
- **64** Fluorosilicone, –80° F to +350° F, 0.5–1 psig
- **65** Kalrez®, –40° F to +550° F, 0.5–1 psig
- **33** Neoprene, –40° F to +300° F, 2–4 psig
- **53** Neoprene, –40° F to +250° F, 0.5–1 psig
- **24** Silicone, –70° F to +450° F, 0.5–1 psig
- **32** Viton®, –20° F to +400° F, 0.5–1 psig
- **20*** PTFE, –100° F to +400° F, 8 psig maximum
- **20*** PTFE (K220T), –320° F to +165° F, 8 psig maximum
- **80*** PTFE (no cyrogenic testing), –320° F to +165° F, 8 psig

MATERIAL
- **A** 2024–T4/T351 aluminum††
- **B** Brass††
- **A1** 6061–T6/T651 aluminum††
- **S** Steel†
- **T** 303 stainless steel†
- **T1** 316 stainless steel

SIZE & END CONNECTIONS (INLET/OUTLET)

Pipe sizes in 1/8″ increments
Tube sizes in 1/16″ increments
- **P** Female pipe, NPT
- **T** Male tube, **AS4395 (MS33656)**
- **B** Female tube, **AND10050**
- **C** GYROLOK® tube fittings
- **D** Male straight thread, **AS4395 (MS33656)** w/ cone point removed
- **E** Flareless male tube, **MS33514** (SAE)
- **F** Male tube, SAE flare 45°
- **H** Hose, **MS33658**
- **J** Female tube, **MS33649**
- **K** British parallel pipe (male)
- **L** British parallel pipe (female)
- **R** Female tube, SAE straight thread, **MS16142**
- **S** British taper pipe (male)
- **X** British taper pipe (female)
- **U** Bulkhead tube, **AS4396** (MS33657)

SPECIAL CHARACTERISTICS
- **030** Hole in poppet head, thousandth of an inch
- **L** Lock wire

CRACKING PRESSURE

Call out dash number if not standard
- **1** 1 psig

** For PTFE, specify stainless steel body material. The stainless steel valve design provides a PTFE static seal for use in systems with low or high temperatures or with liquids or gases which would cause excessive swell or shrinkage of elastomeric compounds.*

† Not available for PED applications.

†† For PED applications, brass bodies are limited to a maximum temperature of +100° F (+38° C), aluminum bodies are limited to a maximum temperature of +200° F (+93° C)

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/H249T1–4TT(L)–1**).

GYROLOK® is a registered trademark of HOKE®.
Kalrez® and Viton® are registered trademarks of DuPont Dow Elastomers.

2200 Series

0 to 800 psig Check Valves

Features

- Medium flow
- Single piece design
- Resilient o-ring

Benefits

- Maintenance free
- Dependable
- Economical

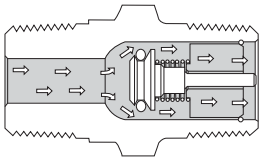
Technical Data

Body Construction Materials	Brass, 316 stainless steel
O-ring Materials	Buna N, ethylene propylene, neoprene, silicone, or Viton®
Operating Pressure	0 to 800 psig (55 bar)
Proof Pressure	1,200 psig (83 bar)
Cracking Pressure	1 to 3 psig (0.07 to 0.21 bar)
Temperature Range	–70° F to +450° F (–57° C to +232° C) *Based on o-ring & body material, see "How to Order"*
Connection Sizes	⅛″ to 1″

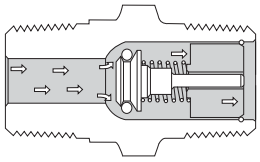
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

2200 Series

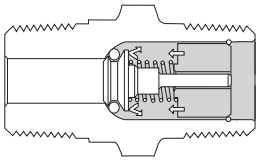
How it Works



Open
Flow passes smoothly over poppet head with minimum turbulence and through the fluted guide without restriction.

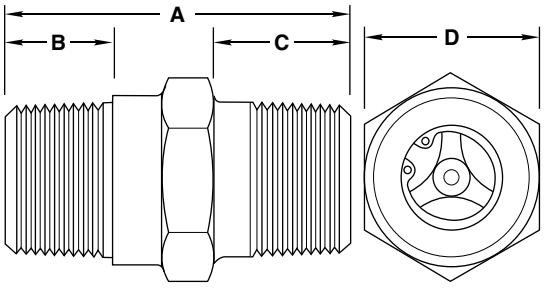


Closing
O-ring automatically establishes line of contact with spherical seat to cushion closing and insure perfect sealing.



Closed
O-ring only seals. Full pressure is carried by metal-to-metal seat.

Dimensions, Pressure Drop & Flow Rates



2200 Series Dimensions (inches), Male Pipe

		A		B & C		D	
Part Number	Size	–MM	–SS	–MM	–SS	–MM	–SS
–1MM / –1SS	1/8″	1.30	1.32	0.39	0.40	0.50	0.50
–2MM / –2SS	1/4″	1.59	1.70	0.54	0.60	0.63	0.63
–3MM / –3SS	3/8″	1.59	1.73	0.54	0.61	0.75	0.75
–4MM / –4SS	1/2″	2.13	2.20	0.78	0.81	0.88	0.88
–6MM / –6SS	3/4″	2.15	2.33	0.78	0.86	1.13	1.13
–8MM / –8SS	1″	2.57	2.68	0.97	1.02	1.38	1.38

Maximum Allowable Pressure Drop

		2249 & 2262 Series		2224, 2232, 2233 & 2259 Series	
Part Number	Size	Air	Oil	Air	Oil
–1MM / –1SS	1/8″	10 psid	15 psid	5 psid	10 psid
–2MM / –2SS	1/4″	10 psid	15 psid	5 psid	10 psid
–3MM / –3SS	3/8″	10 psid	15 psid	5 psid	10 psid
–4MM / –4SS	1/2″	10 psid	15 psid	5 psid	10 psid
–6MM / –6SS	3/4″	10 psid	15 psid	5 psid	10 psid
–8MM / –8SS	1″	10 psid	15 psid	5 psid	10 psid

Flow Rates

Valve size	–1MM	–2MM	–3MM	–4MM	–6MM	–8MM
Cv (nominal)	0.26	0.74	1.1	2.1	4.7	6.6

Viton® is a registered trademark of DuPont Dow Elastomers.

2200 Series

How to Order

22 59 B – 2 MM – 1

O-RING MATERIAL, TEMPERATURE & STANDARD CRACKING RANGE

- **49** Buna N, –65° F to +250° F, 4.0 psig
- **59** Buna N, –65° F to +275° F, 2.0 psig
- **62** EPR, –65° F to +300° F, 4.0 psig
- **33** Neoprene, –40° F to +300° F, 4.0 psig
- **24** Silicone, –70° F to +450° F, 2.0 psig
- **32** Viton®, –20° F to +400° F, 2.0 psig
- **20** PTFE, –100° F to +400° F, 4.0 psig

BODY MATERIAL

- **B** Brass†
- **T1** 316 stainless steel

CRACKING PRESSURE

Call out dash number if not standard

- **1** 1 psig

CONNECTIONS—INLET/OUTLET

- **M** Male pipe, NPT
- **S** Male British taper pipe

VALVE SIZE

- **1** 1/8″
- **2** 1/4″
- **3** 3/8″
- **4** 1/2″
- **6** 3/4″
- **8** 1″

† For PED applications, brass bodies are limited to a maximum temperature of +100° F (+38° C).

Please consult Circle Seal Controls or your local distributor for information on special connections, o-rings, operating pressures, reseal pressures and temperature ranges.

Leakage

2249, 2262 Series	zero @ 3 psig to 800 psig
2259, 2232, 2233 & 2224 Series	zero @ 1 psig to 800 psig
2220 Series	10cc/min maximum from zero to 75 psig; zero from 75 psig to 800 psig

Cracking Pressure

Minimum cracking pressure available: 0.1 psig

Maximum cracking pressure available: 7.0 psig

*Note: Cracking pressure is defined as pressure at which flow is 5cc/min, except the 2220 Series, for which flow is approximately 0.02 cfm. For standard cracking pressures and less (example: **2259–2MM–.3**), the tolerance is +0%, –100%. For cracking pressure greater than standard (example: **2259B–2MM–5**), the tolerance is ±20%.*

2300 Series

0 to 10000 psig Check Valve

Features

- Designed for high pressure service
- Resilient o-ring
- Single piece design

Benefits

- Less susceptible to contamination damage
- Zero leakage at normal back pressure
- Automatic compensation for wear
- Cushioned, quiet closing

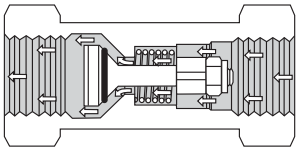
Technical Data

Body Construction Materials	Aluminum, brass, 303 stainless steel, or 17-4 PH stainless steel
O-ring Materials	Buna N, ethylene propylene, neoprene, PTFE and Viton®
Operating Pressure	• Aluminum: 0 to 5000 psig (345 bar) (for temperatures under 250° F) • Brass: 0 to 5000 psig (345 bar) • 303 stainless steel: 0 to 7500 psig (517 bar) • 17-4 PH stainless steel: 0 to 10000 psig (690 bar)
Proof Pressure	• Aluminum: 7500 psig (517 bar) • Brass: 7500 psig (517 bar) • 303 stainless steel: 11,250 psig (776 bar) • 17-4 PH stainless steel: 15000 psig (1,034 bar)
Rated Burst Pressure	• Aluminum: 12500 psig (862 bar) • Brass: 12500 psig (862 bar) • 303 stainless steel: 18,750 psig (1,293 bar) • 17-4 PH stainless steel: 25000 psig (1,724 bar)
Temperature Range	–100° F to +400° F (–73° C to +204° C) *Based on o-ring & body material, see "How to Order"*
Connection Sizes	1/8" to 1"

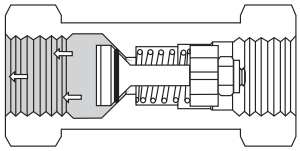
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

2300 Series

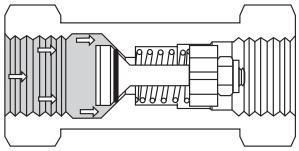
How it Works



Open
Flow passes smoothly over poppet head with minimum turbulence.



Closing
O-ring automatically establishes line of contact with conical seat to cushion closing and insure perfect sealing.

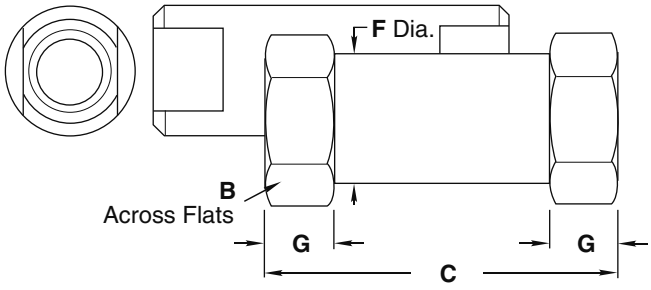


Closed
O-ring only seals. Full pressure is carried by metal-to-metal seat. Increasing pressure increases sealing efficiency.

End Connection & Dimensions (Inches)

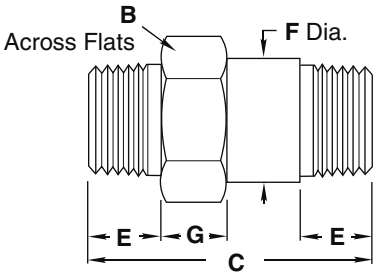
–PP: Female / Female Pipe

Dash No.	Pipe Size	B Hex	C	F	G
–1PP	1/8″	0.625	1.50	0.59	0.31
–2PP	1/4″	0.813	2.00	0.77	0.41
–3PP	3/8″	1.000	2.35	0.95	0.50
–4PP	1/2″	1.250	2.89	1.19	0.56
–6PP	3/4″	1.500	3.30	1.43	0.69



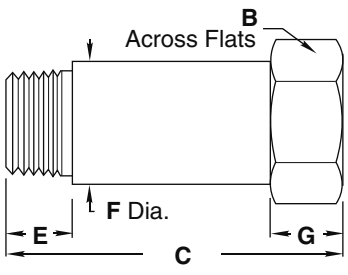
–MM: Male / Male Pipe

Dash No.	Pipe Size	B Hex	C	E	F Dia.	G
–2MM	1/4″	0.625	1.82	0.60	0.59	0.31
–3MM	3/8″	0.813	2.21	0.61	0.77	0.41
–4MM	1/2″	1.000	2.75	0.79	0.95	0.50
–6MM	3/4″	1.250	3.03	0.80	1.19	0.56
–8MM	1″	1.500	3.67	0.99	1.43	0.69

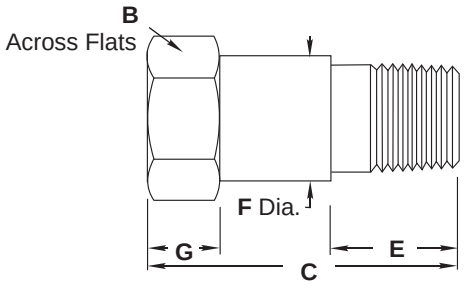


–MP: Male / Female Pipe

Dash No.	Pipe Size	B Hex	C	E	F Dia.	G
–1MP	1/8″	0.625	1.46	0.40	0.59	0.31
–2MP	1/4″	0.813	1.67	0.60	0.77	0.41
–3MP	3/8″	1.000	2.07	0.61	0.95	0.50
–4MP	1/2″	1.250	2.56	0.79	1.19	0.56
–6MP	3/4″	1.500	2.88	0.80	1.43	0.69

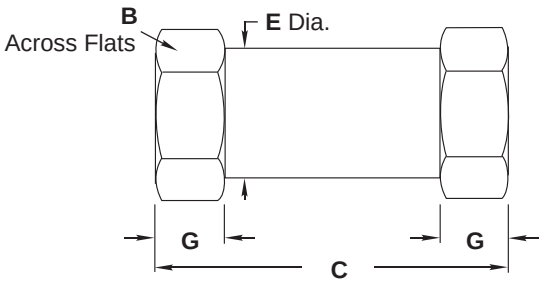


End Connection & Dimensions (Inches)



–PM: Female / Male Pipe

Dash No.	Pipe Size	B Hex	C	E	F Dia.	G
–2PM	1/4″	0.813	1.93	0.60	0.77	0.41
–3PM	3/8″	1.000	2.26	0.61	0.95	0.50
–4PM	1/2″	1.250	2.89	0.79	1.19	0.56



–BB: Female / Female Tube

Dash No.	Tube Size	B Hex	C	E Dia.	G
–4BB	1/4″	0.688	2.00	0.66	0.24
–6BB	3/8″	0.813	2.40	0.77	0.41
–8BB	1/2″	1.250	3.34	1.19	0.56
–10BB	5/8″	1.250	3.53	1.19	0.56
–12BB	3/4″	1.500	4.15	1.43	0.69

2300 Series

How to Order

23 49 R – 2 PP – 7

O-RING MATERIAL, TEMPERATURE & STANDARD CRACKING RANGE

- **62** EPR, –65° F to +300° F, 0.5–1.5 psig
- **49** Buna N, –65° F to +250° F, 2–5 psig
- **59** Buna N, –65° F to +275° F, 0.5–1.5 psig
- **33** Neoprene, –40° F to +240° F, 2–5 psig
- **20** PTFE, –100° F to +400° F, 5 psig
- **32** Viton®, –20° F to +400° F, 0.5–1.5 psig

BODY MATERIAL

- **A** 2024–T4/T351 aluminum†
- **B** Brass†
- **R** 17-4 PH stainless steel
- **T** 303 stainless steel

CONNECTION SIZE

Pipe sizes in 1/8″ increments
Tube sizes in 1/16″ increments

CONNECTIONS

- **P** Female pipe, NPT
- **M** Male pipe, NPT
- **B** Female tube, **AND10050**
- **S** British taper, male pipe
- **X** British taper, female pipe

CRACKING PRESSURE

Call out dash number if not standard*
7 7 psig

* *Standard based on seal material*
† *For PED applications, brass bodies are limited to a maximum temperature of +100° F (+38° C), aluminum bodies are limited to a maximum temperature of +200° F (+93° C)*
Note: Vacuum service may require special lubricants.
AND10050 connections not normally recommended for 10000 psi service unless special fitting seals are used.

Please consult Circle Seal Controls or your local distributor for information on special connections, o-rings, operating pressures and temperature ranges.

Leakage

2362, 2332, 2359 Series	zero @ 1 psig to proof
2333, 2349 Series	zero @ 3 psig to proof
2320 Series	zero @ 75 psig to proof

For cracking pressures less than standard, consult factory for leakage rates

Special Cracking Pressures

Valves with special springs can be furnished to order
- Minimum cracking pressure available: 0.5 psig
- Maximum cracking pressure available: 30 psig

When ordering a cracking pressure less than the maximum indicated for a specific o-ring, indicate the exact maximum cracking pressure in the part number (i.e. **2349R–2PP–3**). If higher cracking pressure than the maximum shown is desired, cracking pressure tolerance is ±20%.

Flow Rates

Valve size	Tube	–4BB	–6BB	—	–8BB, –10BB	–12BB
	Pipe	–1PP	–2PP	–3PP	–4PP	–6PP
Cv (Maximum)		0.31	0.76	1.78	2.82	5.11

Viton® is a registered trademark of DuPont Dow Elastomers.

C200 Series

0 to 5000 psig Cartridge Check Valve

Features

- Large flow capacity
- Compact design
- Floating o-ring

Benefits

- Maintenance free flow
- Easy installation
- Zero leak
- Quiet closing
- Automatic compensation for wear

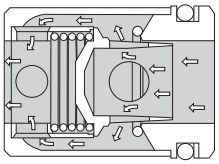
Technical Data

Body Construction Materials	Aluminum, 303 or 316 stainless steel, steel
Finish Materials	Aluminum-anodized, steel black oxide
O-ring Materials	Buna N, PTFE and Viton®
Spring Material	302 stainless steel
Operating Pressure	0 to 5000 psig (345 bar)
Proof Pressure	0 to 7500 psig (517 bar)
Rated Burst Pressure	Over 15000 psig (1,034 bar)
Temperature Range	–100° F to +400° F (–73° C to +204° C) *Based on o-ring & body material, see "How to Order"*

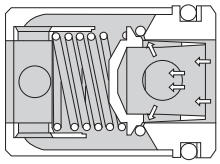
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

C200 Series

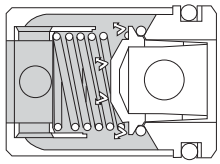
How it Works



Open
Full flow passages offer minimum restriction to flow. Spring is completely removed from flow path.



Closing
Floating o-ring automatically establishes line contact with conical metal surfaces of poppet and seat to cushion closing and insure perfect sealing.

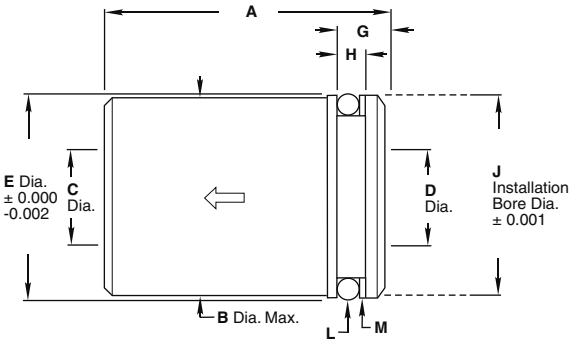


Closed
O-ring only seals. Full pressure load is carried by metal-to-metal seat. Increasing pressure increases sealing efficiency—metal seat prevents any possibility of deformation or extrusion of o-ring.

Specifications, Dimensions, Weights & Typical Flow Rates

Part Number	A	B	C	D	E	G	H	J	L* (O-ring) AS568	M* (Backup ring) MS28774	Weight (lbs) Aluminum	Weight (lbs) St. Steel
–1Q	1.13	0.746	0.34	0.34	0.748	0.245	0.170	0.750	**–113**	**–113**	0.05	0.14
–2Q	1.38	0.996	0.43	0.45	0.998	0.298	0.208	1.000	**–210**	**–210**	0.09	0.26
–4Q	1.90	1.432	0.72	0.73	1.435	0.306	0.208	1.437	**–217**	**–217**	0.24	0.69
–6Q	2.16	1.621	0.92	0.91	1.623	0.380	0.208	1.625	**–220**	**–220**	0.37	1.06

** Valves are furnished complete with o-ring and backup ring.*



Flow Rates**

Valve size	–1Q	–2Q	–4Q	–6Q
Cv (nominal)	1.6	2.7	6.6	10.3

*** For typical flow rates, see the 200/H200 Series catalog sheet.*
(–1Q = –1PP, –2Q = –2PP, –4Q = –4PP, –6Q = –6PP)

C200 Series

How to Order

C2 20 S – 1Q – 5

O-RING MATERIAL, TEMPERATURE & CRACKING PRESSURE RANGES

- **49** Buna N, –65° F to +250° F, 2.0–4.0 psig
- **59** Buna N, –65° F to +275° F, 0.5–1.0 psig
- **20** PTFE, –100° F to +400° F, 8 psig maximum
- **32** Viton®, –20° F to +400° F, 0.5–1.0 psig

BODY MATERIAL

- **A** 2024–T4/T351 aluminum††
- **A1** 6061–T6/T651 aluminum††
- **S** Steel†
- **T** 303 stainless steel
- **T1** 316 stainless steel

CRACKING PRESSURE

Call out dash number if not standard

- **5** 5 psig

CONNECTION SIZE

- **1Q**
- **2Q**
- **4Q**
- **6Q**

† Not available for PED applications

†† For PED applications, aluminum bodies are limited to a maximum temperature of +200° F (+93° C)

Note: Vacuum service may require special lubricants.

Please consult Circle Seal Controls or your local distributor for information on operating pressures, temperature ranges and reseal pressures.

Leakage

External: Zero

Internal:

Elastomeric seals: Zero

PTFE seals: 0–50 psig = 5cc/min max.
50+ psig = 0.5cc/min max.

Cracking Pressure

Minimum cracking pressure available: 0.1 psig

Maximum cracking pressure available: 25 psig

*Note: Cracking pressure is defined as pressure at which flow is 5cc/min, except for C220 Series, for which flow is approximately 0.02 cfm. When ordering a cracking pressure within the standard range or below the standard range of cracking pressure, the dash number is a "maximum". Example: **C259–1Q–.3** (cracking pressure tolerance will be +0%, –50%). When ordering a cracking pressure equal to or greater than the upper limit of the standard cracking pressure shown above, cracking pressure tolerance will be ±10%. Example: **C259S–1Q–5**. Cracking pressure over 8 psig should not be specified without consulting the factory. Where C200 Series valves are supplied with higher cracking pressures, a shroud ring may be used to confine the o-ring.*

For cracking pressures less than standard, consult factory for leakage rates.

Viton® is a registered trademark of DuPont Dow Elastomers.

C2900 Series

0 to 3000 psig Cartridge Check Valve

Features

- Compact & easily installed
- Curved poppet face
- Zero leakage—"bubble-tight" in check direction

Benefits

- Quick opening, positive closing
- Full flow—curved poppet face diverts flow smoothly with minimum pressure drop
- In addition to being used in new equipment, they are interchangeable with and can be used to replace many cartridge valves

Technical Data

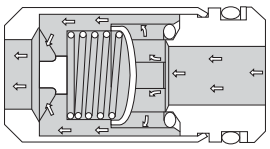
Body Construction Materials	Brass, carbon steel, 303 or 316 stainless steel
O-ring Materials	Buna N, ethylene propylene and Viton®
Operating Pressure	0 to 3000 psig (207 bar)
Cracking Pressure	0.15 to 15 psig (0.01 to 1 bar)
Temperature Range	–65° F to +300° F (–54° C to +149° C) *Based on o-ring & body material, see "How to Order"*

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

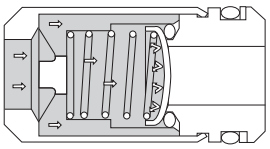
C2900 Series

How it Works

The proven sealing principle of Circle Seal Check Valves is employed in the C2900 Series cartridge-type valves—instant, bubble-tight sealing with an o-ring. Increasing pressure makes the seal tighter until metal-to-metal contact is made, which withstands full system pressures or pressure surges.

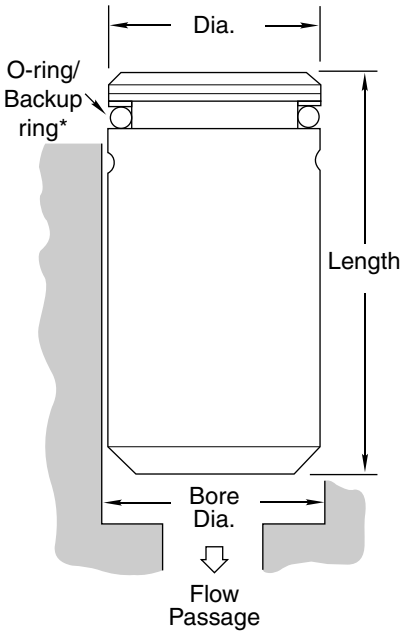


Open
In the flow position, the convex curved surface of the spring-loaded poppet permits full flow. The required cracking pressure is governed by the spring.



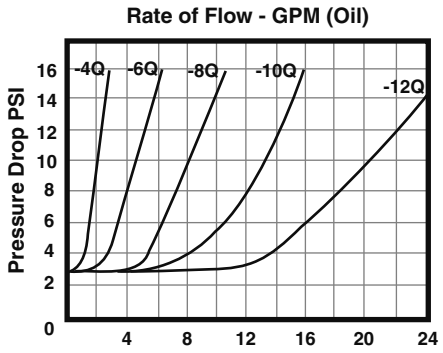
Closed
Closing to check position at the slightest back pressure, the dynamic o-ring seals instantly between the poppet and seat.

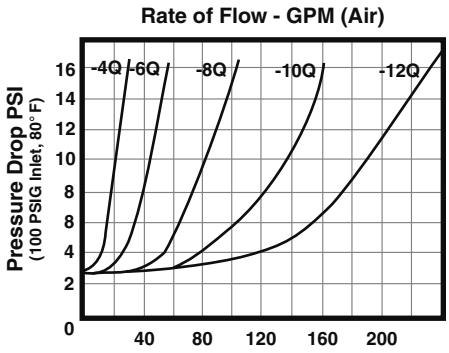
Specifications, Dimensions, Weights & Typical Flow Curves



Part Number	Bore Dia. +0.002, –0.000	Flow Passage	Dia. +0.005, –0.000	Length	O-ring* AS568	Backup Ring* MS28774	Cv
–4Q	0.501	0.200	0.494	0.830	**–012**	**–012**	0.55
–6Q	0.657	0.300	0.650	1.215	**–014**	**–014**	1.36
–8Q	0.813	0.385	0.806	1.490	**–017**	**–017**	2.35
–10Q	1.001	0.485	0.994	1.545	**–020**	**–020**	3.51
–12Q	1.219	0.850	1.212	1.930	**–023**	**–023**	5.66

** Valves are furnished complete with o-ring and backup ring.*





C2900 Series

How to Order

C29 49 S – 8Q – 15

O-RING MATERIAL & TEMPERATURE RANGES

- **49** Buna N, –65° F to +250° F
- **52** Viton®, –20° F to +300° F
- **62** EPR, –65° F to +300° F

BODY MATERIAL

- **B** Brass
- **S** Steel†
- **T** 303 stainless steel
- **T1** 316 stainless steel

CONNECTION SIZE

- **4Q**
- **6Q**
- **8Q**
- **10Q**
- **12Q**

CRACKING PRESSURE

Call out dash number if not standard (2–4 psig is standard)

- **15** 15 psig

† *Not available for PED applications.*

Please consult Circle Seal Controls or your local distributor for information on special connections, o-rings, operating pressures, reseal pressures and temperature ranges.

Leakage (internal): Zero from 0 to 3000 psig

Cracking Pressure

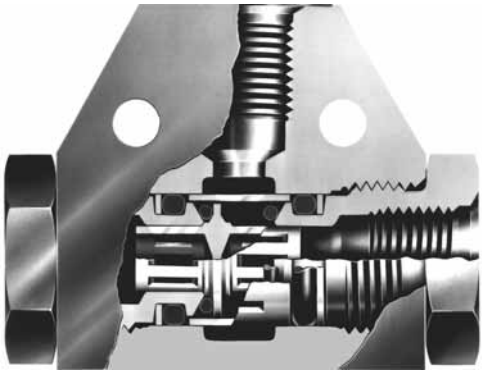
Minimum cracking pressure available: 0.15 psig

Maximum cracking pressure available: 15 psig

Note: Cracking pressure is defined as pressure at which flow is 5cc/min. When ordering a cracking pressure within the standard range and below, the dash number is a "maximum". For cracking pressure equal to or greater than the upper limit, the tolerance will be ±20%.

Viton® is a registered trademark of DuPont Dow Elastomers.

400 Series 0 to 3000 psig Shuttle Valves
H400 Series 0 to 6000 psig Shuttle Valves



Features & Benefits

Quick, positive operation
- Minimum interflow
- No breakaway friction

Double poppet
- The shuttle actuates immediately on overriding pressure

Positive sealing
- Zero leak

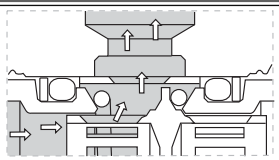
Technical Data

Body Construction Materials	Aluminum, brass or 303 stainless steel
O-ring Materials	Buna N, neoprene and Viton®
Operating Pressure	• 400 Series: 0 to 3000 psig (207 bar) • H400 Series: 0 to 6000 psig (414 bar)
Proof Pressure	• 400 Series: 4500 psig (310 bar) • H400 Series: 9000 psig (621 bar)
Rated Burst Pressure	• 400 Series: 7500 psig (517 bar) minimum • H400 Series: over 15000 psig (1,034 bar)
Temperature Range	–320° F to +400° F (–196° C to +204° C) *Based on o-ring & body material, see "How to Order"*
Connection Sizes	1/8″ to 1/2″

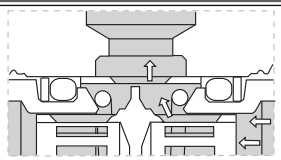
Note: Proper filtration is recommended to prevent damage to sealing surfaces.

400 Series/H400 Series

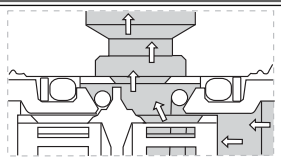
How it Works



One Inlet to Common Outlet
The flow passes easily through the shuttle ports to the common outlet. The o-ring is completely contained by the inner sleeve.



Shuttling
The shuttle actuates immediately on overriding pressure from the alternate inlet with no breakaway friction and minimum interflow.



Alternate Inlet to Common Outlet
The flow passes from the alternate port to the common outlet. The floating o-ring seals block the port and prevent leakage with pressure differential of less than 1 psig to 3000 psig.

Leakage

Body leakage: Zero

Internal leakage:

459, 432 Series: Zero @ 2 psig up to proof

433, 449 Series: Zero @ 5 psig up to proof

420T Series: Zero @ 100 psig up to proof
10cc/min max. @ 10 to 100 psig
20cc/min max. @ 1 to 10 psig

420A Series: 1cc/min @ 100 psig up

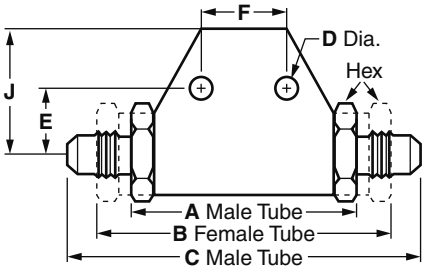
Zero leakage is 3 × 10-4 cc/min

Flow Rates

Valve size	Tube	–4BB	–6BB	–8BB
	Pipe	—	–1PP	–2PP
Cv (maximum)		0.46	1.34	2.26

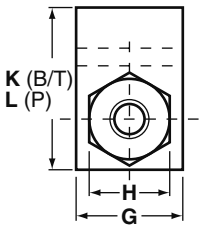
400 Series/H400 Series

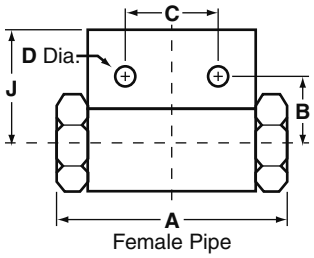
Dimensions (Inches)



Female Tube / Male Tube

Dash No.	Size	A ±0.050	B ±0.050	C Ref.	D ±0.050	E 0.015	F ±0.005	G/J	H	K
–4BBB / –4TTB	1/4″	2.02	2.02	3.12	0.193	0.56	0.875	1.00	0.75	1.50
–6BBB /–6TTB	3/8″	2.02	2.94	3.13	0.193	0.56	0.875	1.00	0.81	1.50
–8BBB / –8TTB	1/2″	2.38	3.53	3.70	0.193	0.81	1.125	1.25	1.00	1.87





Female Pipe

Dash No.	Size	A ±0.050	B ±0.015	C ±0.005	D ±0.050	G	H	J	L
–1PPP	1/8″	2.02	0.53	0.875	0.193	1.00	0.81	0.75	1.25
–2PPP	1/4″	2.39	0.66	1.125	0.193	1.25	1.00	0.91	1.50
–3PPP	3/8″	2.66	0.79	1.375	0.193	1.25	1.12	1.10	1.75
–4PPP	1/2″	3.20	1.02	1.625	0.193	1.75	1.50	1.37	2.25

400 Series/H400 Series

How to Order

H 4 59 T – 4 BBB – 6

VARIATION
- **H*** Modified construction for 6000 psig service (stainless steel valve only)
- **K** Cryogenic service, special cleaning and testing (stainless steel valve only)

O-RING MATERIAL & TEMPERATURE RANGE
- **49** Buna N, –65° F to +250° F
- **59** Buna N, –65° F to +275° F
- **33** Neoprene, –40° F to +240° F
- **32** Viton®, –20° F to +400° F
- **20**** PTFE, –100° F to +400° F
- **20**** PTFE (K420T Series), –320° F to +165° F
- **80**** PTFE (no cryogenic testing), –320° F to +165° F, 8 psig max.

BODY MATERIALS
- **A** 2024–T4/T351 aluminum (to 250° F)††
- **A1** 6061–T6/T651 aluminum††
- **B** Brass††
- **T** 303 stainless steel (to 400° F)†
- **T1** 316 stainless steel

CONNECTION SIZE
Pipe sizes in 1/8″ increments
Tube sizes in 1/16″ increments

END CONNECTIONS—INLET/INLET/OUTLET
- **B** Female tube, AND10050
- **P** Female pipe, NPT
- **T** Male tube, AS4395 (MS33656)

CRACKING PRESSURE
Shown only if normally open port is required

* *Up to and including ½″ tube and ¼″ pipe.*
** *For PTFE, specify stainless steel body material. The stainless steel valve design provides a PTFE static seal for use in systems with low or high temperatures or with liquids or gases which would cause excessive swell or shrinkage of elastomeric compounds.*
† *Not available for PED applications.*
†† *For PED applications, brass bodies are limited to a maximum temperature of +100° F (+38° C), aluminum bodies are limited to a maximum temperature of +200° F (+93° C).*

Please consult Circle Seal Controls or your local distributor for information on special connections, materials, larger sizes, o-rings, operating pressures and temperature ranges.

Notes:
The common port is female tube or female pipe. Inlet ports may be female or male tube, or a combination of the two, or female pipe.

The 400 Series Shuttle Valves are manufactured with three-piece bodies, which are sealed with two synthetic o-rings or PTFE gaskets to prevent external leakage.

Where a normally open port is required, the shuttle is spring-loaded (except with female pipe and tube connections). The cracking pressure is the nominal pressure (tolerance ±15%) against which the shuttle will start to move to allow flow from the normally open port. Shuttling pressure, to close normally open port, is 2 to 5 times this pressure.

Repair Kits

In normal service, the only part(s) which may require replacement is(are) the seals. A repair kit may be ordered by placing a **'K/'** in front of the complete part number (i.e. **K/H459T–4BBB–6**).

Viton® is a registered trademark of DuPont Dow Elastomers.

BIVCO Check Valves

BIVCO valves are considered all-purpose valves because they can be tailored in the right combination of materials for the job at hand…for liquids, including acids, alkalais, formaldehyde, solvents, oils, gasoline, water, sea water, deionized water, pharmaceutical liquids, steam condensates, refrigerants…for gases including air, oxygen, argon, helium, nitrogen, dry chlorine, sulphur dioxide…for vapors including saturated steam, wet chlorine, and various others.

Operating Characteristics

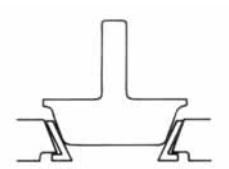
- **Versatility** BIVCO valves may be used in either liquid or gas systems.
- **No Leakage** Bubble-tight sealing is provided even at very low-pressure differentials.
- **Fast Response** The poppet design, which is light in weight and functions as "sail", is acted upon by fluid in the system to cause rapid and full opening of the valve regardless of installed position.
- **Dependability** The use of PTFE or other high performance plastic materials provides resiliency to shock and long life under various conditions.
- **Low Pressure Drop** Large passageways provide flow characteristics with lower pressure drop than competing valves.
- **Non-sticking** The free-floating seat and poppet design prevents sticking due to canting of the disk member. PTFE used in seats and poppets is self-lubricating and resistant to corrosion.
- **Noise Free** Chatter due to pulsation in the fluid system is absorbed by the resilient materials and unique design of the seat and poppet.
- **Adaptable to Most Fluids** Standard bronze,brass, steel, and stainless steel valves with PTFE seats and poppets are suitable for a wide range of fluids. Valves with bodies of PTFE are BIVCO specialties for corrosive fluids.

BIVCO Check Valves

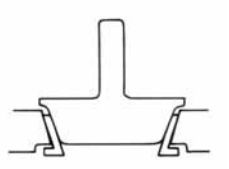
How it Works

The BIVCO Floating Seat and Poppet

The operating principles of BIVCO valves are unique. The conical seat of PTFE or other high performance plastic fits loosely when snapped in place and then becomes free floating, permitting horizontal, vertical and radial movement. In the closed position, the wedge-like action of the conical poppet seals the seat against the body, assuring positive, bubble-tight sealing. In the open position, the seat again becomes free floating.



Poppet making contact with seat



Poppet in closed position

Lift Type: 1000 Series

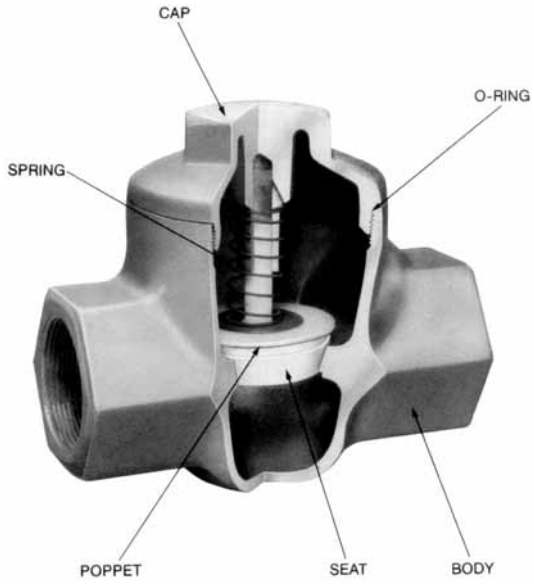
Bodies of Cast Bronze or Stainless Steel

Description

BIVCO 1000 Series are highly reliable lift type models which provide positive, zero leakage sealing and low-pressure drop. The standard model has NPT Female end connections. Other models are available including configurations with socket ends for welding or soldering to pipe, and with flanged ends. All models are normally supplied with light springs for nominal 0.5 psig cracking pressure. Valves may be ordered with no spring or with springs in a range of cracking pressures.

Special Features

Large seating areas provide very sensitive opening pressures and fast response. Seats, poppets and o-rings are easily replaced. Poppet is backstopped by a guide to prevent overstressing spring. Operation is chatter-free.



BIVCO Check Valves

In-line Type: 3000 / 4000 Series

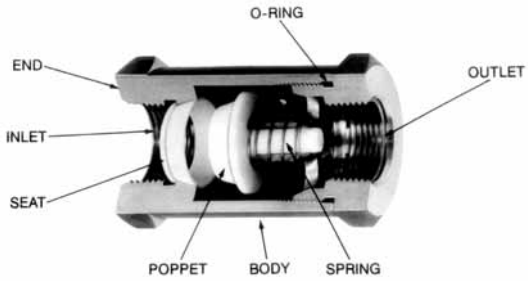
Bodies of Machined Bar Stock

Description

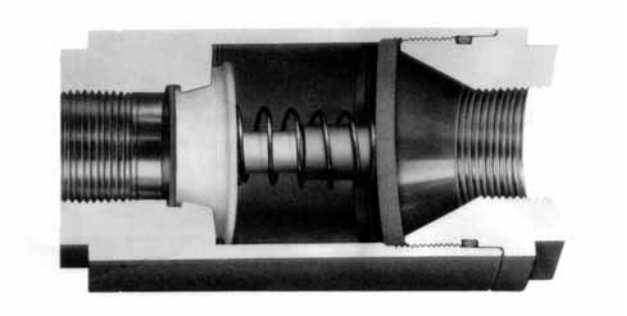
BIVCO 3000 / 4000 Series of check valve models are designed to work with the same floating seats and poppets as the 1000 Series. The standard model has NPT Female end connections. Other models are available, including configurations with socket ends for welding or soldering to pipe, and with flanged ends. All models are normally supplied with light springs for nominal 0.5 psig cracking pressures. Valves may be ordered with no spring or with springs in a range of cracking pressure. Standard body materials are brass, stainless steel, and carbon steel. See "How to Order" chart.

Special Features

Large seating areas provide sensitivity and fast response. In-line models exhibit extremely low-pressure drop and can be truly called full flow valves. Poppet is backstopped by a guide to prevent overstressing the spring. Operation is chatter-free.



3000 Series



4000 Series

BIVCO Check Valves

BIVCO Valve Applications

Besides check and valve functions, all purpose BIVCO valves are designed for pressurizing, vacuum breaking or holding, positive shutoff, antisiphoning, back flow protection and foot-valve operations. Successful applications of BIVCO valves include the following industrial processes:

Chemical processing
Metallurgical processing
Photographic filmmaking
Nuclear power
Water purification
Steam heating systems
Pharmaceutical processing
Research laboratories
Gas compression
Food processing
Plastics manufacturing
Naval ships instrumentation
Oil / water separation
Paper making
Chlorine battery development
Beverage bottling equipment
Plating processed
Missile systems
Fuel handling
Distillation processes
Refrigerant handling
Original equipment manufacturing

Applications by Valve Type and Series

BIVCO valves are considered all-purpose valves because they can be tailored in the right combination of materials for the job at hand…for liquids, including acids, alkalais, formaldehyde, solvents, oils, gasoline, water, sea water, deionized water, pharmaceutical liquids, steam condensates, refrigerants…for gases including air, oxygen, argon, helium, nitrogen, dry chlorine, sulphur dioxide…for vapors including saturated steam, wet chlorine, and various others.

BIVCO Lift Type 1000 Series

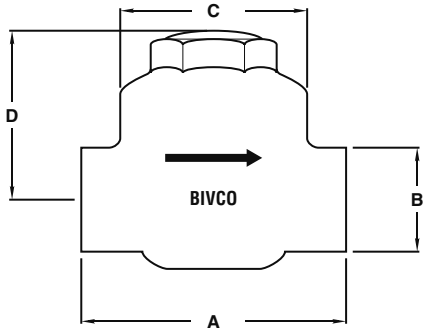
- Check valve in oxygen and air line downstream of control valve
- Check valve for process gas
- Check valves in nitrogen lines, subject to radiation
- Vacuum breakers in vapor system of water desalinization equipment
- Check valves for steam condensate, temperature 180°–200° F
- Air vent and liquid flow control valves in oil-water separation

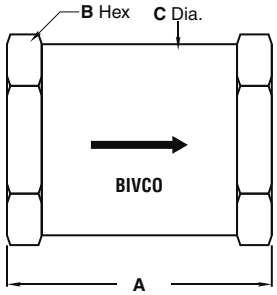
BIVCO In-line Type 3000 / 4000 Series

- Check valve in hydrofluoric acid feed line.
- Check valve for steam to prevent back flow of caustic materials
- Check valve for use in dry chlorine service
- Check valve for service in formic acid and formaldehyde
- Check valve in chlorine purge rotometer line
- Check valve in packaging equipment for precise metering of pharmaceutical liquids
- Check valve between stages of rotary air compressor
- Check valve in caustic soda and water system for cleaning pipes in milk plant
- Check valve for hot caustic liquor
- Check valve in air line to prevent back flow of carbonated beverage
- Check valves in steam system for return condensation, chlorine present

BIVCO Check Valves

Dimensions (inches), Technical Data & Cv Ratings





Model 1000 Series Lift Check: Bronze

Part No.	Size	A Length	B Hex	C Dia.	D	Cv* (Nominal)
1006	3/8	25/16	1	1 5/8	1 5/8	2.75
1008	½	2¾	1 1/8	1 15/16	1 13/16	4.37
1012	¾	3½	1 3/8	2 11/16	2 5/16	8.40
1016	1	4 5/8	1¾	3 1/16	2 13/16	12.76
1020	1¼	5¾	2¼	3 9/16	3 5/8	16.70
1024	1½	6¼	2½	4 1/16	3 5/8	21.77
1032	2	7½	3	4 9/16	4½	32.02

Model 1000 Series Lift Check: CRES 316

Part No.	Size	A Length	B Hex	C Dia.	D	Cv* (Nominal)
1008	½	4	1 3/8	2¾	2 3/8	4.37
1012	¾	4	1 3/8	2¾	2 3/8	8.40
1016	1	4 5/8	1¾	3 1/16	2 13/16	12.76
1020	1¼	5¾	2¼	3 9/16	3 5/8	16.70
1024	1½	6¼	2½	4 1/16	3 3/8	21.77
1032	2	7½	3	4 9/16	4 9/16	32.02

3000 Series In-line

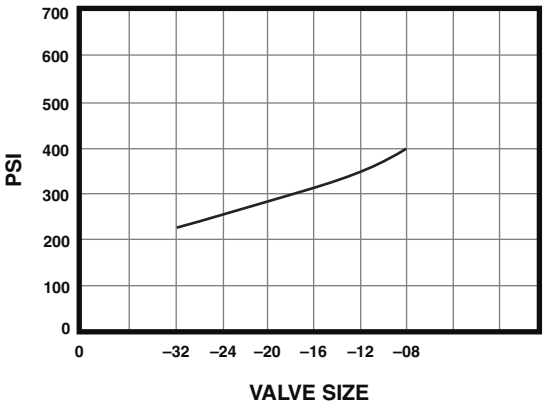
Part No.	Size	A Length	B Hex	C Dia.	Cv* (Nominal)
3004	¼	2¼	1 1/8	1 1/8	2.96
3006	3/8	2 7/16	1 3/8	1 3/8	6.18
3008	½	2 7/8	1½	1½	10.88
3012	¾	3 3/8	2	2	18.25
3016	1	3¾	2¼	2¼	24.81

4000 Series In-line

Part No.	Size	A Length	B Hex	C Dia.	Cv* (Nominal)
4020	1¼	6	3	3½	35.00
4024	1½	6	3	3½	36.50
4032	2	6 9/16	3½	4	51.15
4048	3	10 3/16	5¼	6½	70.05

** Flow coefficient (Cv) with standard 0.5 psig spring*

Operating Pressure Range
1000, 3000, And 4000 Series @ 70° F
(See Temperature Derating Table)



Note: Pressure in reverse direction limited to 120 psig.

Temperature derating factor 'K' for maximum allowable reverse pressure at given ambient and/or media temperature

°F	73	150	212	250
'K' PTFE	1.0	0.65	0.47	0.34

BIVCO Check Valves

How to Order: 1000 Series

10 08 B 0 0 V – 0.5 S

MODEL
- **10** NPT female
- **13** Socket weld end for pipe[1],[3] (stainless valve only)
- **14** Socket for soldering to pipe[1],[3]
- **15** Raised face flange 150lb ANSI, B16.5[2],[3]

Consult factory for models with other end connections.

SIZE
- **06** 3/8″
- **08** ½″
- **12** ¾″
- **20** 1¼″
- **24** 1½″
- **32** 2″

MATERIAL OF BODY
- **B** Bronze, B-62 cast
- **S** Stainless steel, 316 cast

MATERIAL OF SEAT
- **0** PTFE

MATERIAL OF POPPET
- **0** PTFE

MATERIAL OF O-RING IN BODY
- **T** PTFE
- **V** Viton®

CRACKING PRESSURE

Lbs/in² rating (always 3 spaces) (Example: 0.5 = ½ psig, 010 = 10 psig). See cracking pressure options, this page, for available ranges.

SPRING MATERIAL
- **S** 316 stainless steel

Notes

[1] *Dimensions of socket ends are available on request.*

[2] *Model with raised face 150lbs. Flange is available to special order in sizes ¾″ through 2″ in bronze or stainless steel. Dimensions supplied on request.*

[3] *A minimum order of 10 pieces is required.*

Repair Kit

In normal service the only parts which may require replacement are the seat, poppet and o-ring. A complete repair kit may be ordered, specify kit followed by the complete valve part number.

PSIG Cracking Pressure Options/Ranges for 1000 Series

Part No.	Nominal	–0.5	–002	–004	–006	–008	–010
1000 Series	Maximum	1.0	2.6	5.2	7.7	10.3	13.0
	Minimum	0.2	1.6	3.2	4.8	6.4	7.8

Leakage

1 cc/min at 0–5 psig
Zero at 5 psig to proof

BIVCO Check Valves

How to Order: 3000 & 4000 Series

30 12 C 0 0 T – 008 C

MODEL
- **30** NPT female (sizes ¼″ to 1″)
- **33** Socket weld end for pipe[1],[3] (sizes ¼″ to 1″)
- **40** NPT female (sizes 1¼″ to 3″)
- **43** Socket weld end for pipe[1],[3]
- **45** Raised face flange 150lbs ANSI B16.5[2],[3] Consult factory for models with other end connections.

SIZE

Pipe size in $^{1}/_{16}$″ (also used for tubing size in $^{1}/_{16}$″ when applicable for speical ends)

MATERIAL OF BODY
- **B** Brass, 360
- **C** Steel, 1018/1020†
- **S** 316 stainless steel

MATERIAL OF SEAT
- **0** PTFE

MATERIAL OF POPPET
- **0** PTFE
- **1** Reinforced TFE

MATERIAL OF O-RING IN BODY
- **T** PTFE
- **V** Viton®

CRACKING PRESSURE

Lbs/in² rating (always 3 spaces) (Example: 0.5 = ½ psig, 010 = 10 psig). See cracking pressure options, this page, for available ranges.

SPRING MATERIAL
- **S** 316 stainless steel
- **C** 316 stainless steel, coated

Notes

[1] *Dimensions of socket ends are available on request.*

[2] *Model with raised face flange is available to special order. Flange is slip-on type welded to nipple in socket weld end of valve. Dimensions supplied on request.*

[3] *A minimum order of 10 pieces is required. 1″ and above*

4 *For 4048 Series, consult the factor.*

† *For 3000 Series, not available for PED applications.*

Repair Kit

In normal service the only parts which may require replacement are the seat, poppet and o-ring. A complete repair kit may be ordered, specify kit followed by the complete valve part number.

PSIG Cracking Pressure Options/Ranges for 3000 & 4000 Series

Part No.	Nominal	–0.5	–002	–004	–006	–008	–010
3000 Series 4000 Series	Maximum	1.0	2.7	5.3	7.9	10.5	13.2
	Minimum	0.2	1.6	3.1	4.8	6.4	8.0

Leakage

1 cc/min at 0–5 psig
Zero at 5 psig to proof

Viton® is a registered trademark of DuPont Dow Elastomers.

Check Valve Specification Check Sheet

Customer Information

Customer Name	
Company Name	
Address	
Telephone	Fax
E-mail	

Application Information

Application				
Maximum Operating Pressure			PSIG / BAR (circle one)	
Operating Temperature	Max:	°F / ° C (circle one)	Min:	°F / °C (circle one)
System Fluid(s)				
Cracking Pressure (Set)	psig / BAR (circle one)			
Note: Standard cracking pressure is defined as a flow of 5cc/min for elastomers, 0.02 scfm (600cc) for PTFE				
Allowable Leakage				
Flow Rate (Min)	SCFM / GPM at Maximum Pressure Drop			

Valve Information

Materials

Body	Trim	Seal

Line Connections

Inlet Size	Type
Outlet Size	Type

Envelope Requirements

L	W	H
Maximum Weight		
Units Must Meet the Following Specifications		
Number of Units Required:	Now	Yearly
Target Price		

Check Valve Specification Check Sheet

Customer Information

Customer Name

Company Name

Address

Telephone | Fax

E-mail

Application Information

Application

Maximum Operating Pressure | PSIG / BAR (circle one)

Operating Temperature Max: | °F / ° C (circle one) | Min: | °F / °C (circle one)

System Fluid(s)

Cracking Pressure (Set) | psig / BAR (circle one)

Note: Standard cracking pressure is defined as a flow of 5cc/min for elastomers, 0.02 scfm (600cc) for PTFE

Allowable Leakage

Flow Rate (Min) | SCFM / GPM at Maximum Pressure Drop

Valve Information

Materials

Body | Trim | Seal

Line Connections

Inlet Size | Type

Outlet Size | Type

Envelope Requirements

L | W | H

Maximum Weight

Units Must Meet the Following Specifications

Number of Units Required: | Now | Yearly

Target Price

Notes

Notes

Circle Seal Literature and Published Information - Disclaimer:

Catalog, literature and other published information such as drawings, charts and website content is for informational purposes only. Dimensions are for reference only and are subject to change. Each reader of the information should consult with his or her own qualified engineer prior to using the whole or any part of the information.

CIRCOR International makes every effort to maintain the accuracy and quality of the information provided in our Catalogs, literature, digital resources and other published information such as drawings, charts, and website content. However, CIRCOR International cannot guarantee and assumes no legal liability nor responsibility for the accuracy or completeness of the information provided. The information contained in printed or published literature or digital resources is for general guidance only. You should neither act, nor refrain from action, on the basis of any such information. You should take appropriate professional advice on your particular circumstances because the application of our equipment may vary depending on particular circumstances.

Copyright Disclaimer:

In case of any questions or remarks, feel free to contact us.

CIRCOR | Circle Seal Controls

The Small Bore Instrumentation Specialists

The Circle Seal Controls Brand is just one product offering manufactured and supplied by CIRCOR International (NYSE:CIR).

CIRCOR is a global manufacturer that specializes in developing highly engineered, technically superior small bore instrumentation solutions that consistently deliver benchmark performance, quality & safety for general-to-severe service liquid & gas flow applications.

We specialize in small bore instrumentation products up to 2" that deliver benchmark performance quality & safety; provide the broadest array of superior alloy offerings in the market; decades of proven success in a wide range of industries; a roster of "who's who" customers & projects globally; original "Best Solution" engineering & designs; and are focused on continuous improvement in all aspects of our business.

2301 Wardlow Circle
Corona, CA 92880
+1-951-270-6200
+1-951-270-6201 (Fax)

Our headquarters and manufacturing facilities are located at:
405 Centura CT
Spartanburg, SC 29303-6603 USA

www.circlesealcontrols.com • www.circor.com/circle-seal-controls
circleseal@circor.com

Proudly Distributed By: