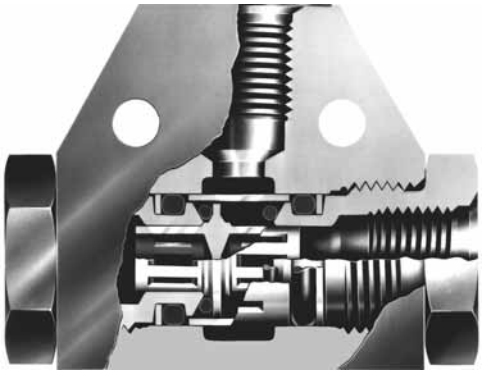
CIRCLE SEAL CONTROLS

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

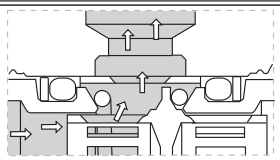
- Zero leak

Technical Data

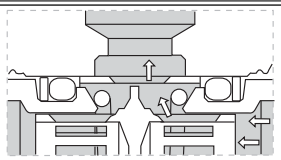
Body Construction Materials	Aluminum, brass or 303 stainless steel
O-ring Materials	Buna N, neoprene and Viton®
Operating Pressure	• 400 Series: 0 to 3000 psig (207 bar) • H400 Series: 0 to 6000 psig (414 bar)
Proof Pressure	• 400 Series: 4500 psig (310 bar) • H400 Series: 9000 psig (621 bar)
Rated Burst 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	⅛″ to ½″

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

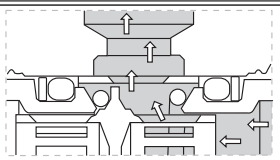
How it Works



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.

Circle Seal Controls
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400 Series/H400 Series

Leakage

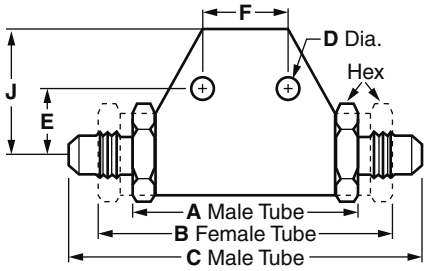
Body leakage:	Zero
Internal leakage:	
459, 432 Series:	Zero @ 2 psig up to proof
433, 449 Series:	Zero @ 5 psig up to proof
420T Series:	Zero @ 100 psig up to proof 10cc/min max. @ 10 to 100 psig 20cc/min max. @ 1 to 10 psig
420A Series:	1cc/min @ 100 psig up

Zero leakage is 3×10^{-4} cc/min

Flow Rates

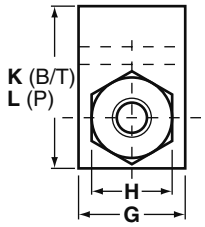
Valve size	Tube	–4BB	–6BB	–8BB
	Pipe	—	–1PP	–2PP
Cv (maximum)		0.46	1.34	2.26

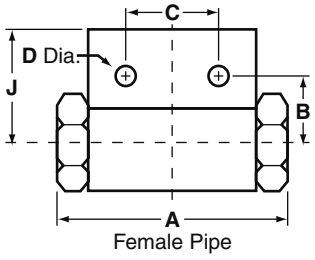
Dimensions (Inches)



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	¼″	2.02	2.02	3.12	0.193	0.56	0.875	1.00	0.75	1.50
–6BBB /–6TTB	⅜″	2.02	2.94	3.13	0.193	0.56	0.875	1.00	0.81	1.50
–8BBB / –8TTB	½″	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	⅛″	2.02	0.53	0.875	0.193	1.00	0.81	0.75	1.25
–2PPP	¼″	2.39	0.66	1.125	0.193	1.25	1.00	0.91	1.50
–3PPP	⅜″	2.66	0.79	1.375	0.193	1.25	1.12	1.10	1.75
–4PPP	½″	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 ⅛″ 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).

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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