



CIRCLE SEAL

CONTROLS

**HI-RESPONSE
SOLENOID
VALVES**

**2-way
Vacuum-3600 PSI**

OPERATING CHARACTERISTICS

HI-RESPONSE — Total opening or closing response times as short as 8 milliseconds. (See page 4.)

RELIABLE ACTUATION — Interlocked action assures positive actuation even with zero pressure.

LEAKPROOF SERVICE in vacuum or pressure — unique design of poppet provides virtually deadtight shutoff.

CONTROL FOR MOST FLUIDS — Available for use with many exotic gaseous and liquid media, including most propulsion fluids.

FULL FLOW—Orifice is larger than port size, permits full flow with very low pressure drop.

ELECTRICAL ADAPTABILITY — Standard valves furnished with 24v DC coils and pigtail connections. Coils are interchangeable to obtain other voltages, duty cycles, and connections.

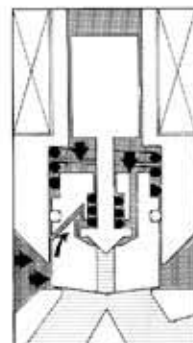
SHOCK- AND VIBRATION-PROOF — Poppet will remain in fully opened or closed position despite severe shock and vibration.

OPERATING TEMPERATURES — From -65°F to +160°F, ambient and fluid temperatures. Special units available for use at extreme temperatures.

HOW IT WORKS:

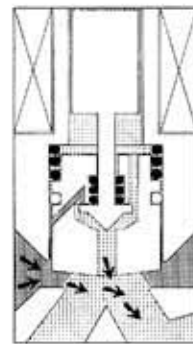
CLOSED

(Coil de-energized) Pressure reaches area above poppet through fill orifice. System pressure is applied above poppet. Added to pressure of spring, this holds poppet and pilot firmly closed.



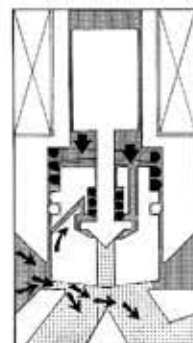
OPENING

(Coil energized) Energized coil pulls armature and interlocked poppet up. Upper area pressure is dumped through pilot slots and bleed orifice. Pressure above poppet drops to less than inlet pressure. Differential quickly opens poppet.



CLOSING

(Coil de-energized) Pull from coil is eliminated. Pilot spring and pressure close pilot. Pressure returns to area above poppet. High flow velocity reduces pressure below poppet and differential plus spring pressure closes poppet quickly.



 **CIRCLE SEAL CONTROLS, INC.**
A CIRCOR International company

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TECHNICAL DATA

*OPERATING PRESSURES:

V4075, V4076, V4077

Vacuum—1000 PSI

V4175, V4176, V4177

Zero — 3600 PSI

*To assure proper operation inlet pressure must be higher than outlet pressure.

PROOF PRESSURES:

V4075, V4076, V4077—1500 PSI

V4175, V4176, V4177—5400 PSI

BURST PRESSURES:

V4075, V4076, V4077—2500 PSI

V4175, V4176, V4177—7500 PSI

External leakage — none

Internal leakage:

Liquid — 1cc/hr. (max.)

Air — 5 cc/hr. (max.)

Operating speed — up to 1200 cycles/ min.

Solenoid rating — Class 220 (428° max. coil temperature) for continuous duty.

Response Time — See Response Time Charts, page 4.

Power Consumptions — See Part Number Tables, page 3.

Voltage — 24v DC.

(For other voltages, both AC & DC, consult factory)

C_v factors:

Size V in-line

VC cartridge

VR right angle

1/4 tube 0.40 0.50

3/8 tube 1.00 1.40

1/2 tube 1.40 2.70

SERVICE RECOMMENDATIONS

Standard Circle Seal Hi-Response Solenoid Valves are supplied with Kel-F poppet and Viton seals. With these seals the valves are suitable for many gaseous and liquid media including aircraft and jet fuels. For non-standard seals and special applications, consult factory.

HOW TO ORDER

PART NUMBER DESIGNATION

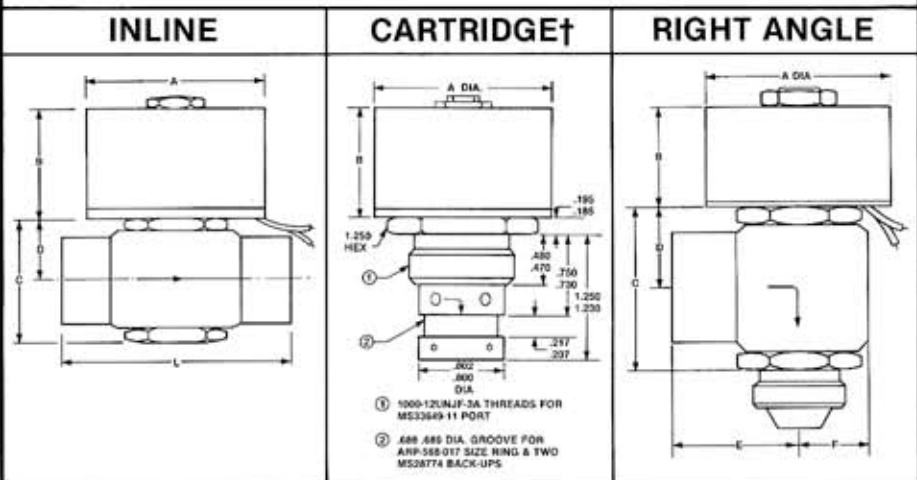
V 4 0 7 5 T — Z A G

BASIC VALVE NUMBER

MATERIAL

POPPET STYLE

CHARACTERISTICS



DIMENSIONS

MATERIAL

Standard—7075-T73 Aluminum body, valve cap and deflector cap. Balance electroless nickel plated steel.

T—303 S.S. body, valve cap and deflector cap. Balance 430F S.S. EXCEPT all V4176 & V4177 models, balance electroless nickel plated steel.

POPPET STYLE & SEALS

Z—Kel-F dynamic poppet seal and Viton static seals (standard)

Y—Viton dynamic seal for low pressure application and Viton static seals (300 psig)

Available in other materials—consult factory for details.

TUBE SIZE AND 10050	V4075, V4076, V4077					VR4075, VR4076, VR4077†					
	Solenoid		Valve			Solenoid		Valve			
	A	B	C	D	L	A	B	C	D	E	F
1/4	1.50	.75	1.49	.74	2.25	1.50	.75	1.19	.59	1.06	.61
3/8	1.75	1.00	1.52	.76	2.25	1.75	1.00	1.29	.64	1.06	.61
1/2	1.87*	1.25	1.56	.78	2.56	1.87*	1.25	1.44	.72	1.19	.62

*Exceptions: Part Numbers V, VR & VC4077-ZDH, A = 2.00

†Substitute C for R in prefix to Part No. to order cartridge type.

TUBE SIZE AND 10050	V4175, V4176, V4177					VR4175, VR4176, VR4177†					
	Solenoid		Valve			Solenoid		Valve			
	A	B	C	D	L	A	B	C	D	E	F
1/4	1.75	1.00	1.49	.74	2.25	1.75	1.00	1.19	.59	1.06	.61
3/8*	3.00	1.75	1.52	.76	2.25	3.00	1.75	1.29	.64	1.06	.61
1/2**	2.00	1.25	1.56	.78	2.56	2.00	1.25	1.44	.72	1.19	.62

Exceptions *V4176-ZDF, VR4176-ZDF — A = 2.00, B = 1.25

**V4177-ZGG, VR4177-ZGG — A = 3.00, B = 1.75

V4177-ZHH, VR4177-ZHH — A = 3.25, B = 2.00

†Substitute C for R in prefix to Part No. to order cartridge type.

STRAIGHT IN-LINE VALVES

PART NUMBERS

	TUBE SIZE AND 10050	ALUMINUM		303 STAINLESS STEEL		*Duty Cycle % 24v DC	Resistance Ohms @ 78°F
		Part No.	Wgt (lbs.)	Part No.	Wgt (lbs)		
VACUUM TO 1000 PSI	1/4	V4075-ZAG	.46	V4075T-ZAG	.80	50	19.0 ± 1.9
		V4075-ZAH	.46	V4075T-ZAH	.80	100	33.0 ± 3.3
	3/8	V4076-ZBF	.68	V4076T-ZBF	1.02	25	7.2 ± 0.7
		V4076-ZBG	.68	V4076T-ZBG	1.02	50	12.5 ± 1.3
		V4076-ZBH	.68	V4076T-ZBH	1.02	100	19.5 ± 2.0
	1/2	V4077-ZCF	.87	V4077T-ZCF	1.23	25	7.1 ± 0.7
V4077-ZCG		.87	V4077T-ZCG	1.23	50	11.0 ± 1.1	
V4077-ZDH		1.02	V4077T-ZDH	1.38	100	11.7 ± 1.2	
ZERO TO 3600 PSI	1/4	V4175-ZBF	.67	V4175T-ZBF	1.01	25	7.2 ± 0.7
		V4175-ZBG	.67	V4175T-ZBG	1.01	50**	12.5 ± 1.3
		V4175-ZBH	.67	V4175T-ZBH	1.01	100•	19.5 ± 2.0
	3/8	V4176-ZDF	1.01	V4176T-ZDF	1.35	25	5.7 ± 0.6
		V4176-ZGG	2.69	V4176T-ZGG	3.03	50	6.2 ± 0.6
		V4176-ZGH	2.69	V4176T-ZGH	3.03	100	10.7 ± 1.1
	1/2	V4177-ZDD	1.02	V4177T-ZDD	1.38	5	1.4 ± 0.1
		V4177-ZDF	1.02	V4177T-ZDF	1.38	25••	5.7 ± 0.6
		V4177-ZGG	2.70	V4177T-ZGG	3.06	50	6.2 ± 0.6
V4177-ZHH	3.50	V4177T-ZHH	3.86	100	8.5 ± 0.9		

*Duty Cycle % = on time divided by total time
 **300 PSI max. operating pressure

•2250 PSI max. operating pressure
 ••2000 PSI max. operating pressure

RIGHT ANGLE VALVES

PART NUMBERS

	TUBE SIZE AND 10050 & MS 33656	ALUMINUM		303 STAINLESS STEEL			*Duty Cycle % 24v DC	Resistance Ohms @ 78°F	
		Part No.†	Wgt (lbs)		Part No.†	Wgt (lbs)			
			①	②		①			②
VACUUM TO 1000 PSI	1/4	VR4075-ZAF	.41	.11	VR4075T-ZAF	.65	.34	25	9.6 ± 1.0
		VR4075-ZAG	.41	.11	VR4075T-ZAG	.65	.34	50	19.0 ± 1.9
		VR4075-ZAH	.41	.11	VR4075T-ZAH	.65	.34	100	33.0 ± 3.3
	3/8	VR4076-ZBF	.64	.13	VR4076T-ZBF	.91	.39	25	7.2 ± 0.7
		VR4076-ZBG	.64	.13	VR4076T-ZBG	.91	.39	50	12.5 ± 1.3
		VR4076-ZBH	.64	.13	VR4076T-ZBH	.91	.39	100	19.5 ± 2.0
	1/2	VR4077-ZCF	.84	.15	VR4077T-ZCF	1.15	.45	25	7.1 ± 0.7
		VR4077-ZCG	.84	.15	VR4077T-ZCG	1.15	.45	50	11.0 ± 1.1
		VR4077-ZDH	.99	.15	VR4077T-ZDH	1.30	.45	100	11.7 ± 1.2
ZERO TO 3600 PSI	1/4	VR4175-ZBF	.62	.11	VR4175T-ZBF	.86	.34	25	7.2 ± 0.7
		VR4175-ZBG	.62	.11	VR4175T-ZBG	.86	.34	50**	12.5 ± 1.3
		VR4175-ZBH	.62	.11	VR4175T-ZBH	.86	.34	100•	19.5 ± 2.0
	3/8	VR4176-ZDF	.97	.13	VR4176T-ZDF	1.24	.39	25	5.7 ± 0.6
		VR4176-ZGG	2.65	.13	VR4176T-ZGG	2.92	.39	50	6.2 ± 0.6
		VR4176-ZGH	2.65	.13	VR4176T-ZGH	2.92	.39	100	10.7 ± 1.1
	1/2	VR4177-ZDD	.99	.15	VR4177T-ZDD	1.30	.45	5	1.4 ± 0.1
		VR4177-ZDF	.99	.15	VR4177T-ZDF	1.30	.45	25••	5.7 ± 0.6
		VR4177-ZGG	2.67	.15	VR4177T-ZGG	2.98	.45	50	6.2 ± 0.6
VR4177-ZHH	3.47	.15	VR4177T-ZHH	3.78	.45	100	8.5 ± 0.9		

*Duty Cycle % = on time divided by total time
 **3000 PSI max. operating pressure

•2250 PSI max operating pressure
 ••2000 PSI max. operating pressure

†Substitute C for R in prefix to Part No. to order cartridge type Ex: VC4177-ZDF

①— with tube connections ②— cartridge type.



HI-RESPONSE
SOLENOID
VALVES

2-way
Vacuum-3600 PSI

Response Curves

*Response time in milliseconds
(With GN₂ at ambient temperatures)
Opening—Solid Lines
Closing—Broken Lines
(Identical closing times for same size valve)

