PRODUCT SPECIFICATION

March 2005

PNEUMATIC ACTUATED INDUSTRIAL VALVES

SERIES: 2800 SIZES 1/2 to 2 INCHES

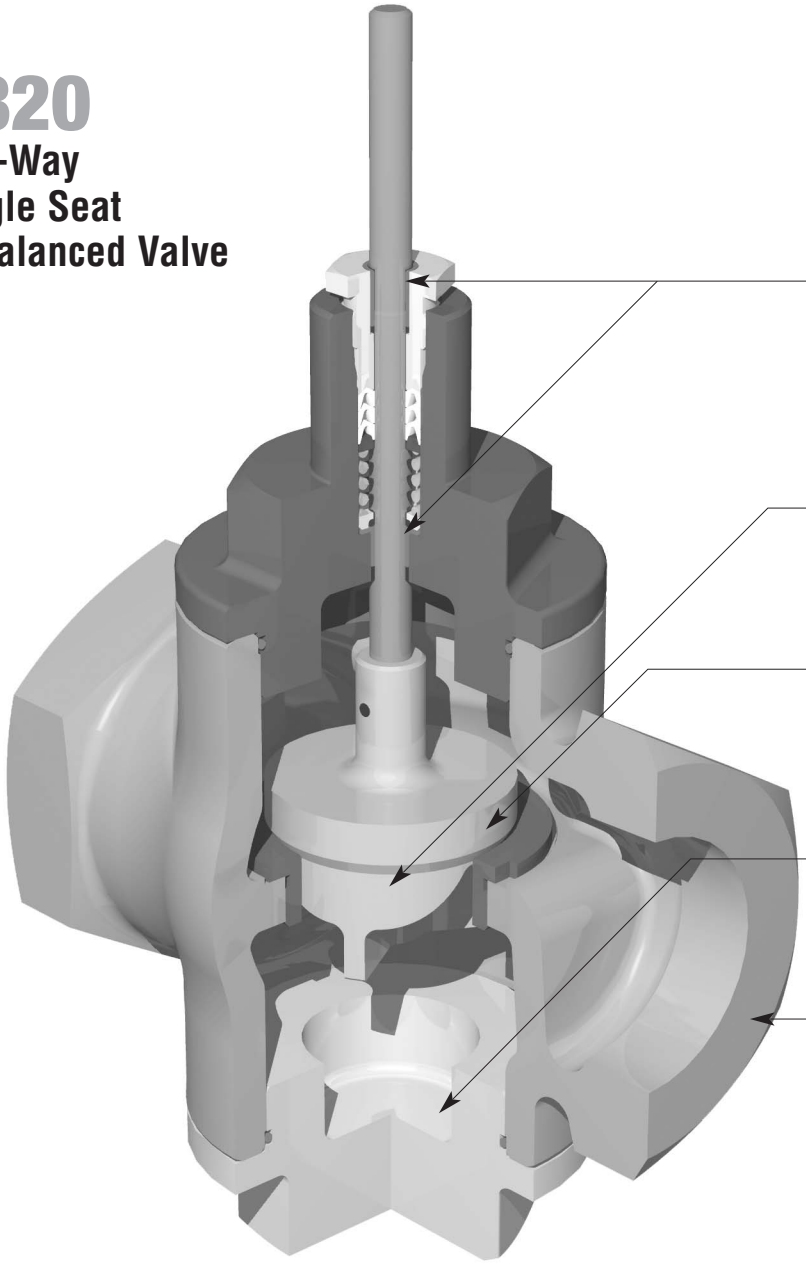
Precision Globe Control Valves

WARREN CONTROLS

Two-Way and Three-Way, Reciprocating,
Bronze or Stainless Steel Body Valves
for Process and Utility Applications

Table of Contents

2820
Two-Way Single Seat Unbalanced Valve



Flexible Design Options
provide optimum performance and extended reliability in a cost effective, application specific package.

Dual Point PEEK Bearing Stem Guiding
provides both stability and low friction, yielding reduced hysterisis and optimum control.

Trim
available in 316SS, 17-4 pH, Alloy 6, PEEK, and PTFE.

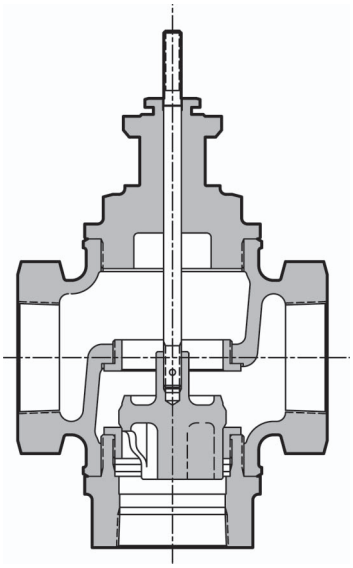
Port Guided Plug Assembly
provides stability and desired equal percentage flow characteristic.

Lower Plug
offers easy access for inspection and clean out.

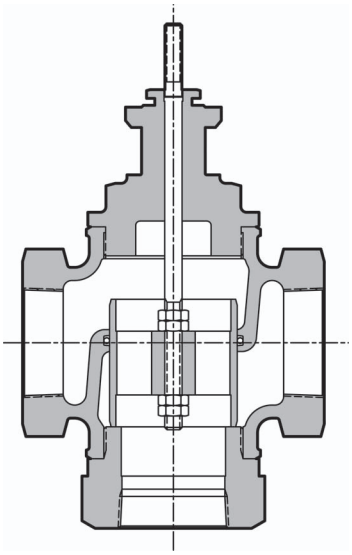
Rugged Body
with a selection of port reductions.

SERIES: 2800

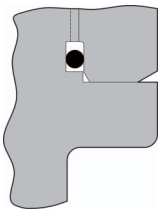
Precision Globe Control Valves



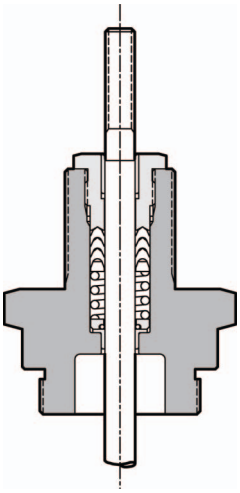
2830
Three-Way Mixing Valve Bronze Body



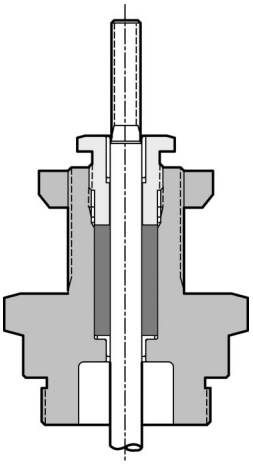
2832
Three-Way Diverting/Mixing Valve Bronze Body



Fluoraz O-Ring Upper and Lower Body Seals in Stainless Steel Body Valves



Guided Low-Friction TFE V-Ring Packing Spring Loaded



Adjustable Graphite Packing

Description

Warren Controls Series 2800 Precision Globe Control Valves feature rugged bronze or stainless steel bodies with a variety of trim materials and port sizes. The equal percentage and linear plugs in the 2-way valves and linear plugs in the 3-way valves provide excellent modulating control of a wide variety of fluids for pressure, temperature, level, and flow applications from –20 to 500ºF. The Series 2800 is ideally suited where value and long life are important objectives for applications including but not limited to the Chemical, Food & Beverage, General Service, Refining, and Pharmaceutical Industries.

Body Style Versus Application

2-Way Valves (Control of Liquids, Gases, and Steam)

2820 Two-Way Single Seat Unbalanced Valve

The most commonly applied solution with ANSI Class IV and VI shut-off.

Sizes:	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT) or 316 Stainless Steel 300LB Threaded (NPT)
Trim:	EQ% or Linear, 316 Stainless Steel, Alloy 6, TFE, PEEK, or 17-4 PH Hardened Stainless Steel
Shut-off:	ANSI Class IV (Stainless Steel and Alloy 6 Trim), ANSI Class VI (TFE and PEEK Trim)
Packing:	Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
Temperature:	+32 to 400°F (Bronze 250LB Threaded Body) +32 to 450°F (316 Stainless Steel 300LB Threaded Body w/ TFE or PEEK Trim) +32 to 500°F (316 Stainless Steel 300LB Threaded Body w/ Stainless Steel or Alloy 6 Trim)
Rangeability:	50:1

The valve closes — The valve opens

Body Pressure-Temperature Ratings:		
Temperature (F)	250 THD Bronze	300 THD SS
+32° To 150°F	400	720
150°	400	670
175°	392	645
200°	385	620
225°	375	605
250°	365	590
275°	350	575
300°	335	560
325°	317	548
350°	300	537
375°	275	526
400°	250	515
450°	-	497
500°	-	480

Trim Materials	Flowing Differential Pressure Limit
Bronze	50 PSID
316 Stainless Steel	100 PSID
TFE	100 PSID
PEEK	100 PSID
17-4 pH Hardened Steel	200 PSID
Alloy 6	300 PSID

Pressure ratings are PSIG

For applications below 32° consult factory.

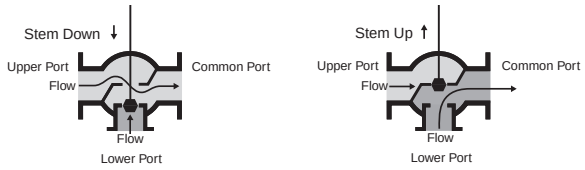
For applications above 375°, 300 THD Stainless Steel Body is recommended.

3-Way Valves (Control of Liquids)

2830 Three-Way Mixing Valve

This valve has two inlets and one outlet, and is the simplest solution for mixing or bypass applications with ANSI Class IV shut-off. In normal applications the inlet pressures are near equal and control is possible from 5% to 95% of travel with inlet pressures up to 100 PSI.

Sizes:	1/2, 3/4, 1, 1-1/4, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT) or 316 Stainless Steel 300LB Threaded (NPT)
Trim:	Linear, 316 Stainless Steel
Packing:	Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
Temperature:	+32 to 400°F (Bronze 250LB Threaded) +32 to 500°F (316 Stainless Steel 300LB Threaded)
Rangeability:	50:1

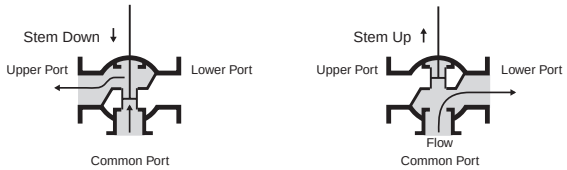


The upper port opens and the lower port closes — The upper port closes and the lower port opens

2832 Three-Way Diverting/Mixing Valve

Designed as a diverting valve with one inlet and two outlets with ANSI Class III shut-off. However, flow can be reversed for mixing if this port configuration is desirable. The difference between the upper port and lower port pressure must not exceed 50 PSID.

Sizes:	1, 1-1/2, 2 inch
Body:	ANSI B16.15 Bronze 250LB Threaded (NPT) or 316 Stainless Steel 300LB Threaded (NPT)
Trim:	Linear, Bronze (Bronze 250LB Threaded), or 316 Stainless Steel (316 Stainless Steel 300LB Threaded)
Packing:	Guided Low-Friction TFE V-Ring, Spring Loaded (+32 to 450°F), Adjustable Graphite Packing (+32 to 500°F)
O-Ring:	EPR (Bronze 250LB Threaded), Fluoraz 797 (316 Stainless Steel 300LB Threaded)
Temperature:	+32 to 300°F (Bronze 250LB Threaded) +32 to 500°F (316 Stainless Steel 300LB Threaded)
Rangeability:	50:1



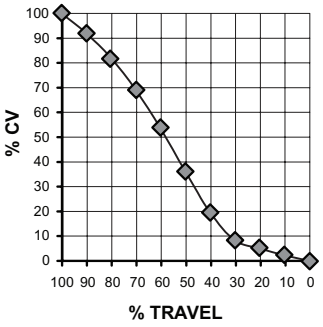
The upper port opens and the lower port closes — The upper port closes and the lower port opens

2-Way Valves (Control of Liquids, Gases, and Steam)

Valve — 2820 Flow Coefficients (Cv)
Two-Way Single Seat Unbalanced Valve

Valve Size(IN)	Trim Style	Trim Size(IN)	Port Size	%Travel 100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
1/2	EQ%	0.876	FULL	4.90	4.78	3.53	2.57	1.92	1.92	0.95	0.69	0.43	0.17
		0.626	1SR	3.20	3.16	2.29	1.61	1.19	0.75	0.51	0.39	0.26	0.13
		0.626	2SR	1.50	1.44	0.96	0.72	0.52	0.42	0.31	0.21	0.10	0.06
	LINEAR	0.876	FULL	6.00	5.40	4.80	4.20	3.60	3.00	2.40	1.80	1.20	0.60
3/4	EQ%	0.876	FULL	7.20	7.09	5.53	3.51	2.53	1.73	1.24	0.88	0.52	0.27
		0.876	1SR	5.50	5.31	3.73	2.64	1.95	1.21	0.96	0.70	0.43	0.17
		0.626	2SR	3.30	3.30	2.34	1.63	1.20	0.75	0.51	0.39	0.26	0.13
		0.626	3SR	1.50	1.45	0.96	0.73	0.52	0.42	0.31	0.21	0.10	0.06
	LINEAR	0.876	FULL	7.20	6.48	5.76	5.04	4.32	3.60	2.88	2.16	1.44	0.72
1	EQ%	1.126	FULL	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	1SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
		0.876	2SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
		0.626	3SR	3.40	3.41	2.38	1.64	1.20	0.75	0.51	0.39	0.26	0.13
		0.626	4SR	1.50	1.46	0.97	0.73	0.53	0.42	0.31	0.21	0.10	0.06
	LINEAR	1.126	FULL	10.0	9.00	8.00	7.00	6.00	5.00	4.00	3.00	2.00	1.00
1-1/4	EQ%	1.438	FULL	16.0	15.5	10.4	7.04	4.51	3.26	2.18	1.30	0.88	0.48
		1.126	1SR	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	2SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
		0.876	3SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
		0.626	4SR	3.40	3.41	2.38	1.64	1.20	0.75	0.51	0.39	0.26	0.13
	LINEAR	1.676	FULL	17.2	15.5	13.8	12.0	10.3	8.60	6.88	5.16	3.44	1.72
1-1/2	EQ%	1.676	FULL	24.0	22.5	19.7	15.1	10.3	7.30	4.90	3.20	1.90	0.90
		1.438	1SR	16.0	15.5	10.4	7.04	4.51	3.26	2.18	1.30	0.88	0.48
		1.126	2SR	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	3SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
		0.876	4SR	6.00	5.79	3.88	2.70	1.97	1.22	0.96	0.70	0.43	0.17
	LINEAR	1.676	FULL	18.0	16.2	14.4	12.6	10.8	9.00	7.20	5.40	3.60	1.80
2	EQ%	2.126	FULL	40.0	37.1	33.1	27.3	19.8	13.2	8.50	5.30	2.80	1.10
		1.676	1SR	24.0	22.5	19.7	15.1	10.3	7.30	4.90	3.20	1.90	0.90
		1.438	2SR	16.0	15.5	10.4	7.04	4.51	3.26	2.18	1.30	0.88	0.48
		1.126	3SR	10.0	9.70	6.52	4.40	2.82	2.04	1.36	0.81	0.55	0.30
		0.876	4SR	8.60	8.38	6.09	3.64	2.58	1.74	1.25	0.89	0.52	0.27
	LINEAR	2.126	FULL	37.0	33.3	29.6	25.9	22.2	18.5	14.8	11.1	7.40	3.70

2-WAY VALVE TYPICAL FLOW CURVE

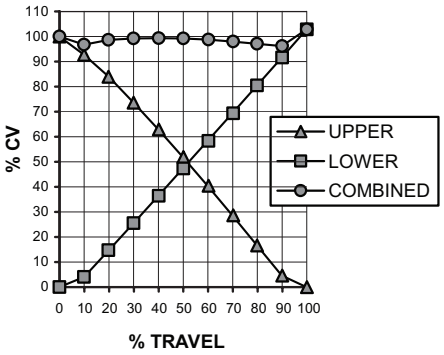


3-Way Valves (Control of Liquids)

Valve — 2830 Flow Coefficients (Cv)
Three-Way Mixing Valve

Valve Size(IN)	Trim Style	Trim Size(IN)	Port Size	Travel 100%	Valve Size(IN)	Trim Style	Trim Size(IN)	Port Size	Travel 100%
1/2	LINEAR	1.126	FULL	6.30	1-1/4	LINEAR	1.676	FULL	18.5
		0.876	1SR	4.00			1.126	1SR	10.0
		0.626	2SR	2.00	1-1/2	LINEAR	1.676	FULL	20.0
		0.626	3SR	1.00			1.126	1SR	10.0
3/4	LINEAR	1.126	FULL	8.20	2	LINEAR	2.126	FULL	40.0
		0.876	1SR	4.00			1.676	1SR	20.0
		0.626	2SR	2.00					
		0.626	3SR	1.00					
1	LINEAR	1.126	FULL	10.0					
		0.876	1SR	4.00					
		0.626	2SR	2.00					
		0.626	3SR	1.00					

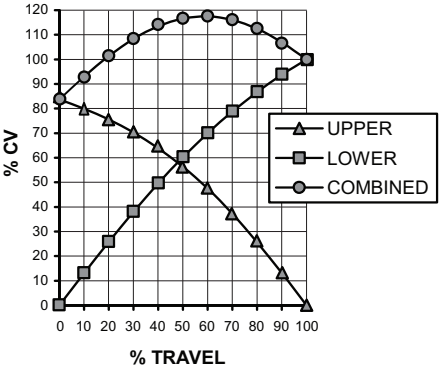
2830 TYPICAL FLOW CURVE



Valve — 2832 Flow Coefficients (Cv)
Three-Way Diverting/Mixing Valve

Valve Size(IN)	Trim Style	Travel 100% Upper	Lower
1	LINEAR	12	15
1-1/2	LINEAR	22	26
2	LINEAR	40	47

2832 TYPICAL FLOW CURVE



Steam Table

Steam Pressure PSIG	Temp. °F	Temp. °C	Sensible Heat BTU/Lb.	Latent Heat BTU/Lb.	Total Heat BTU/Lb.
0	212	100	180	971	1151
10	239	115	207	952	1159
25	266	130	236	934	1170
50	297	147	267	912	1179
75	320	160	290	896	1186
100	338	170	309	881	1190
125	353	178	325	868	1193
150	365	185	339	858	1197
200	387	197	362	838	1200
250	406	208	381	821	1202
300	422	217	399	805	1204
400	448	231	438	778	1216
500	470	243	453	752	1205
600	489	254	475	729	1204

Rectangular Tank Capacity in Gallons

$$\text{Gallons} = \frac{\text{Height x Width x Length (inches)}}{230}$$

or

Gallons = H x W x L (Ft.) x 7.5

Circular Tank Storage Capacity in Gallons

Storage = $6D^2$ x L (Gallons)

Where:
D = Tank Diameter in Feet
L = Length in Feet

Load Sizing Calculations

Glossary of Terms

t = Time in Hours
Cp = Specific Heat of Liquid
S = Specific Gravity of Fluid
W = Weight in Lbs.
ΔT = Temperature Rise or Fall in °F
h_{fg} = Latent Heat of Steam

Conversion Factors

1 Lb. Steam / Hr. =	1000 BTU / Hr.
1 Cubic Meter =	264 U.S. Gallons
1 Cubic Foot Water =	62.4 Lbs.
1 PSI =	2.04 Inches of Mercury
1 PSI =	2.3 Feet of Water
1 PSI =	27.7 Inches of Water
1 U.S. Gallon Water =	231 Cubic Inches
1 U.S. Gallon Water =	8.33 Lbs.

Heating Water with Steam

Quick Method

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{2} \times \Delta T$$

Accurate Method

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 500 \times \Delta T}{h_{fg}}$$

Heating or Cooling Water with Water

$$GPM_1 = GPM_2 \times \frac{\text{°F water}_2 \text{ temp. rise or drop}}{\text{°F water}_1 \text{ temp. rise or drop}}$$

Heating or Cooling Water

$$\text{GPM} = \frac{\text{BTU / Hr.}}{\text{(°F water temp. rise or drop)} \times 500}$$

Heating Oil with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM}}{4} \times \text{(°F oil temp. rise)}$$

Heating Air with Water

$$\text{GPM} = 2.16 \times \frac{\text{CFM x (°F air temp. rise)}}{\text{1000 x (°F water temp. drop)}}$$

Heating Liquids with Steam

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times 60 \times Cp \times W}{h_{fg}} \times \Delta T$$

Heating Liquids in Steam Jacketed Kettles

$$\text{Lbs./Hr.} = \frac{\text{GPM} \times Cp \times S \times 8.33}{h_{fg} \times t} \times \Delta T$$

General Liquid Heating

$$\text{Lbs./Hr.} = \frac{W \times Cp}{h_{fg} \times t} \times \Delta T$$

Heating Air with Steam

$$\text{Lbs./Hr.} = \frac{\text{CFM}}{900} \times \Delta T$$

Valve			Actuator		Shut-Off ΔP Two-Way, Single Seat Unbalanced 2820							
					Maximum Shut-off ΔP in PSI							
					Fail Closed Reverse Acting				Fail Open Direct Acting			
					Air Signal to Actuator				Air Signal to Actuator			
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI
0.626	1/2	3/4	DL49	Low	N/A	226	386	N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure	704	720	720	N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure
	thru			Full	67	386	545		67	386	720	
	1-1/4			High	720	720	720		226	545	720	
0.876	1/2	3/4	DL49	Low	N/A	90	171		333	496	720	
	thru			Full	8	171	252		8	171	720	
	2			High	415	577	659		90	252	720	
1.126	1	3/4	DL49	Low	N/A	38	88		186	284	720	
	thru			Full	N/A	88	137		N/A	88	720	
	2			High	235	334	383		38	137	720	
			DL84	Low	N/A	60	144		397	566	720	
				Full	N/A	60	144		N/A	60	720	
				High	397	566	650		N/A	60	720	
1.438	1-1/4	3/4	DL49	Low	N/A	11	42		102	162	555	
	thru			Full	N/A	42	72		N/A	42	434	
	2			High	132	193	223		11	72	464	
			DL84	Low	N/A	24	76		231	335	720	
				Full	N/A	24	76		N/A	24	697	
				High	231	335	386		N/A	24	697	
			DL84XR	Xtra-High	386	490	542		N/A	N/A	N/A	
1.676	1-1/4	3/4	DL49	Low	N/A	N/A	24		68	113	401	
	thru			Full	N/A	24	46		N/A	24	313	
	2			High	91	135	157		N/A	46	335	
			DL84	Low	N/A	11	49		163	240	720	
				Full	N/A	11	49		N/A	11	506	
				High	163	240	278		N/A	11	506	
			DL84XR	Xtra-High	278	354	392		N/A	N/A	N/A	
2.126	2	3/4	DL49	Low	N/A	N/A	7		34	62	242	
				Full	N/A	7	21		N/A	7	186	
				High	48	76	90		N/A	21	200	
			DL84	Low	N/A	N/A	23		94	141	449	
				Full	N/A	N/A	23		N/A	N/A	307	
				High	94	141	165		N/A	N/A	307	
			DL84XR	Xtra-High	165	212	236		N/A	N/A	N/A	

NOTES:

1) 2820 Seat closure ANSI Class IV (Stainless Steel and Alloy 6 Trim), ANSI Class VI (TFE and PEEK Trim).

2) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

3) The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.

4) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL49…30 PSIG
   DL84 & 84XR…30 PSIG

5) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

Shut-Off ΔP Ratings

NOTES:

1) 2830 Mixing Valves have two inlets and one outlet. Published shut-off values are with respect to worst case conditions with zero downstream pressure on the outlet port and zero upstream pressure on the opposing inlet port. Pneumatic Actuators used with the 2930 are direct acting. The upper port fails closed on loss of air pressure to the actuator.

2) 2830 Seat closure ANSI Class IV.

3) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

4) The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.

5) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL49…30PSIG
   DL84 & 84XR…30PSIG

Shut-Off ΔP Three-Way Mixing 2830

Valve			Actuator		Maximum Shut-off ΔP in PSI							
					Upper Port Closed Direct Acting				Lower Port Closed Direct Acting			
					Air Signal to Actuator				Air Signal to Actuator			
Trim Size (IN)	Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI
0.626	1/2	9/16	DL49	Low	N/A	67	226	N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure	560	720	720	N/A Exceeds DL49 and DL84 Actuator's Maximum Air Pressure
	thru			Full	N/A	226	386		N/A	242	720	
	1			High	545	720	720		83	401	720	
0.876	1/2	9/16	DL49	Low	N/A	8	90		260	423	720	
	thru			Full	N/A	90	171		N/A	98	720	
	1			High	252	415	496		16	179	720	
1.126	1/2	9/16	DL49	Low	N/A	N/A	38		142	240	720	
	thru			Full	N/A	38	88		N/A	43	683	
	2			High	137	235	284		N/A	92	720	
1.676	1-1/4	3/4	DL49	Low	N/A	N/A	2		48	93	381	
	thru			Full	N/A	2	24		N/A	4	293	
	2			High	46	91	113		N/A	26	315	
			DL84	Low	N/A	11	49		140	223	715	
				Full	N/A	11	49		N/A	N/A	486	
				High	163	240	278		N/A	N/A	486	
2.126	2	3/4	DL49	Low	N/A	N/A	N/A		22	50	229	
				Full	N/A	N/A	N/A		N/A	N/A	174	
				High	21	48	62		N/A	8	188	
			DL84	Low	N/A	N/A	23		81	129	436	
				Full	N/A	N/A	23		N/A	N/A	58	
				High	94	141	165		N/A	N/A	294	
			DL84XR	Xtra-High	165	212	236		N/A	N/A	294	

6) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

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1) Published shut-off values are for diverting applications. The values are worst case and based on the pressure difference between the inlet and the outlet that is closed. Consult the factory if the required shut-off exceeds the published value and the pressure at the inlet and both outlets is known. For proper operation in diverting applications, the pressure difference between both outlets must not exceed 50 PSI. Consult the factory for shut-off values for 2832 mixing applications. Pneumatic Actuators used with the 2832 are direct acting. The upper port fails closed on loss of air pressure to the actuator.

2) 2832 Seat closure ANSI Class III.

3) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

Shut-Off ΔP Three-Way Diverting/Mixing 2832

Valve		Actuator		Maximum Shut-off ΔP in PSI							
				Upper Port Closed Direct Acting				Lower Port Closed Direct Acting			
				Air Signal to Actuator				Air Signal to Actuator			
Valve Size (IN)	Plug Travel (IN)	Pneumatic Actuator	Spring Range	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI	3-15 PSI	1-17 PSI	0-30 PSI	0-40 PSI
1	3/4	DL49	High	110	113	115	N/A Exceeds Actuator Rating	N/A	N/A	115	N/A Exceeds Actuator Rating
		DL84	High	113	115	118		N/A	N/A	120	
1-1/2	3/4	DL49	High	N/A	110	113		N/A	N/A	113	
		DL84	High	110	113	115		N/A	N/A	118	
2	3/4	DL49	High	N/A	N/A	110		N/A	N/A	111	
		DL84	High	108	110	113		N/A	N/A	115	

4) The 3-15 and 1-17 columns of the table apply to valves with control signals coming directly from I/P transducers with matching ranges. The 0-30 and 0-40 columns apply to valves with a positioner or an I/P transducer of suitable range.

5) N/A indicates that the air signal is not capable of providing any shut-off or it exceeds the actuator's maximum air pressure.

   Maximum air pressure
   DL49…30 PSIG
   DL84…30 PSIG

6) See Actuators, Positioners, and Accessories section for explanation of spring ranges.

Component 2820		Dimension (IN) by Valve Size (IN)		
Variable		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
B	250THD	2-3/4	3-1/4	3-5/8
	300THD	3	3-1/2	3-7/8
C	DL49 Direct*	15-1/4	15-7/8	16-1/8
	DL49 Reverse	14-5/8	15-1/4	15-1/2
	DL84 Direct*	19-1/4	19-7/8	20-1/8
	DL84 or 84XR Reverse	18-5/8	19-1/4	19-1/2
H	DL49	1-3/4	2-3/8	2-3/4
(W/760)	DL84 or 84XR	3-5/8	4-1/4	4-1/2
Item		**Weight (LB) by Valve Size (IN)**		
Variable		1/2, 3/4, 1	1-1/4 & 1-1/2	2
	250THD	8-1/2	14-1/2	18-1/2
	300THD	8	15-1/2	19

Component 2830		Dimension (IN) by Valve Size (IN)		
Variable		1/2, 3/4, 1	1-1/4 & 1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
B	250THD	2-3/4	3-3/4	4
	300THD	2-3/4	3-3/8	3-3/4
C	DL49 Direct*	15-1/4	15-7/8	16-1/8
	DL84 or 84XR Direct*	N/A	19-7/8	20-1/8
H	DL49	1-3/4	2-3/8	2-3/4
(W/760)	DL84 or 84XR	N/A	4-1/4	4-1/2
Item		**Weight (LB) by Valve Size (IN)**		
Variable		1/2, 3/4, 1	1-1/4 & 1-1/2	2
	250THD	9	15-1/2	20
	300THD	8	15	18-1/2

Component 2832		Dimension (IN) by Valve Size (IN)		
Variable		1	1-1/2	2
A	250THD	4-7/8	5-3/4	6-1/2
	300THD	5	6-1/8	6-1/2
B	250THD	3-1/2	3-3/4	4
	300THD	2-3/4	3-3/8	3-3/4
C	DL49 Direct*	15-1/4	15-7/8	16-1/8
	DL84 Direct*	19-1/4	19-7/8	20-1/8
H	DL49	1-3/4	2-3/8	2-3/4
(W/760)	DL84	3-5/8	4-1/4	4-1/2
Item		**Weight (LB) by Valve Size (IN)**		
Variable		1	1-1/2	2
	250THD	9	16-1/2	21
	300THD	8	15	18-1/2

* Includes 1-3/8 inch for air fitting
H = Centerline of pipe to bottom of positioner
CF = Consult factory
N/A = Not Available

Allow 4-7/8 inch clearance above actuator for removal.

Actual shipping weights may vary.

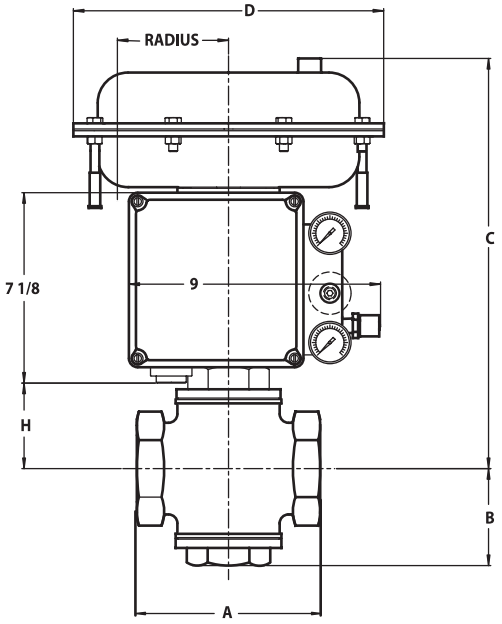
Consult factory for drawings, weights, and dimensions of configurations not shown.

Face to face dimensions conform to historical Warren Controls standard and are **NOT** ANSI/ISA compatible.

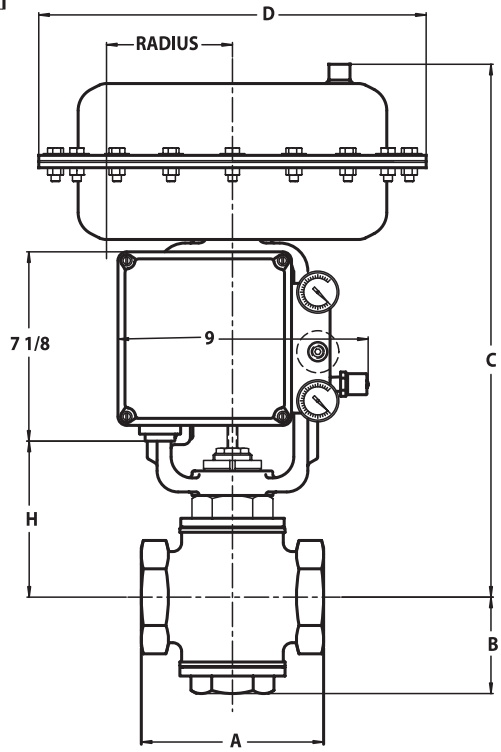
Actuator	Weight (LB)
DL49	24-1/2
DL84 84XR	48-1/2

Positioner	Weight (LB)
760	10

Dimension (IN)		
D	DL49	11
	DL84 or 84XR	13-7/8
Radius	DL49	7-7/8
(W/760)	DL84 or 84XR	8-1/8



2-WAY or 3-Way
w/DL49 & 760 Positioner



2-WAY or 3-Way
w/DL84 or 84XR & 760 Positioner

RADIUS is from centerline of actuator to outside edge of positioner.

Positioner Removal Clearance
Allow 3-1/4 Inch beyond 760 for cover removal/service.

Actuators

Actuator		Spring Range (PSI)			
Size	Action	Low	Full	High	Xtra-High
DL49	Direct	3-9	4-13	8-12	N/A
DL49	Reverse	4-10	5-14	10-14	N/A
DL84	Direct	3-9	3-15	9-15	N/A
DL84	Reverse	3-9	3-15	9-15	N/A
DL84XR	Direct	N/A	N/A	N/A	See Note
DL84XR	Reverse	N/A	N/A	N/A	See Note
Note: The spring range of XR (eXtended Range) actuators varies with travel. These actuators require positioners or I/P's for modulating control					

Effective Area: DL49 (49 Sq In), DL84 & 84XR (84 Sq In)
Springs: Multiple
Max Air Supply: 30PSIG
Air Connections: 1/4 NPT
Diaphragm: Buna-N Fabric Reinforced
Diaphragm Chambers: Steel
Yoke: Ductile Iron
Stem: 300 Series Stainless Steel
Finish: DL49 Epoxy-Coated
DL84, 84XR Acrylic Enamel
Ambient Temperature: DL49 -20 to 160°F
DL84, 84XR -40 to 180°F
Mounting: Vertical Above or Below Valve
Handwheel: Available on DL84 & 84XR
Not available on DL49

Positioners

Split Ranging with Positioners

Positioners are sometimes used to "Split-Range" two control valves in a parallel configuration within a piping scheme. This technique is used to obtain higher rangeability than could otherwise be achieved with a single control valve. Typically one smaller valve supplying 15% to 35% of total flow is mated with a larger valve supplying 65% to 85% of total flow.

The best-matched pair will each be providing similar rangeability for each respective flow contribution to the manifold. Calculated as maximum flow /minimum controllable flow, the smaller valve should not be attempting to control flow below 5% of stroke. Estimate Cv from Cv tables vs. stroke to calculate this.

The chosen positioners would then have a Low Range signal for the smaller valve and a High Range Signal for the larger valve. With this, a single control signal can be sequentially applied to each valve. At mid-signal range, the little valve is completely open while the larger valve is just starting to open. Controllability for wide process set point ranges is dramatically improved.

BLX Models:

BLX Pneumatic

Models: BFP_: Full Range Signal (3-15 PSIG)
BLP_: Low Range Signal (3-9 PSIG)
BHP_: High Range Signal (9-15 PSIG)
Options 2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection: NEMA 4X, IP66
Supply Pressure: Pneumatic 145 PSIG Max **Not to exceed actuator rating**
Air Consumption: 0.19 SCFM at 30 PSIG

BLX Electro-Pneumatic

Models: BFE_: Full Range Signal (4-20 mA)
BLE_: Low Range Signal (4-12 mA)
BHE_: High Range Signal (12-20 mA)
Options 2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection: NEMA 4X, IP66
Supply Pressure: 21.8 to 145 PSIG **Not to exceed actuator rating**
Air Consumption: 0.21 SCFM at 30 PSIG

BLX Electro-Pneumatic Intrinsically Safe

Models: BFI_: Full Range Signal (4-20 mA)
BLI_: Low Range Signal (4-12 mA)
BHI_: High Range Signal (12-20 mA)
Options 2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection: NEMA 4X, IP66
Approvals & Ratings:
FM Intrinsically Safe: Class I II III, Div 1, Groups A,B,C,D,E,F,G.
CSA Intrinsically Safe: Class I, Div 1, Groups A, B, C, D.
Class II, Div 1, Groups E, F, G.
Class III.
Class I, Div 2, Groups A, B, C, D.
Class II, Div 2, Groups E, F, G.
Supply Pressure: 30 to 145 PSIG **Not to exceed actuator rating**
Air Consumption: 0.21 SCFM at 30 PSIG

Positioners (Continued)

BLX Electro-Pneumatic Explosion Proof

Models: BFX_: Full Range Signal (4-20 mA)
BLX_: Low Range Signal (4-12 mA)
BHX_: High Range Signal (12-20 mA)
Options 2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection: NEMA 4X, IP66
Approvals & Ratings:
FM Intrinsically Safe: Class I II III, Div 1, Groups A,B,C,D,E,F,G.
Non-Incendive: Class I, Div 2, Groups A,B,C.
Explosion Proof: Class I, Div 1, Groups B,C,D.
Class I II III, Div 1, Groups E,F,G.
CSA Intrinsically Safe: Class I, Div 1, Groups A,B,C,D.
Class II, Div 1, Groups E,F,G.
Class III.
Class I, Div 2, Groups A,B,C,D.
Class II, Div 2, Groups E,F,G.
Explosion Proof: Class I, Div 1, Groups B,C,D.
Class II, Div 1, Groups E,F,G.
Supply Pressure: 30 to 145 PSIG **Not to exceed actuator rating**
Air Consumption: 0.21 SCFM at 30 PSIG

BLX Electro-Pneumatic Fail Freeze

Models: BFF_: Full Range Signal (4-20 mA)
BLF_: Low Range Signal (4-12 mA)
BHF_: High Range Signal (12-20 mA)
Options 2SPDT Limit Switches, 4-20 mA Feedback
Ingress & Corrosion Protection: NEMA 4X, IP66
Supply Pressure: 20 to 100 PSIG Max **Not to exceed actuator rating**
Air Consumption: 0.21 SCFM at 30 PSIG

All Models:

Construction: Aluminum Housing with Polyester Powder Coat
Action: Direct or Reverse
Media: Clean Dry Oil Free Air Filtered to 5 micron
Air Connections: 1/4 NPT
Flow Capacity: 9.8 SCFM at 30 PSIG
Electrical Connection: 1/2 NPT
Gauges: Input 0-30 PSIG, Output 0-60 PSIG, Supply 0-60 PSIG, Housing Black Steel Case with Chrome Ring
Ambient Temperature: -40 to 185°F (Except Fail Freeze –4 to 158°F)
Mounting: Yoke Mounted
Limit Switches and Feedback Options are NEMA 4X, IP66 only, and are not suitable for hazardous locations.

Moore 760 Models:

760P Pneumatic

Models: 76P_: Full Range Signal (3-15 PSIG)
Options Limit Switches, 4-20 mA Feedback *(Reduced feedback span for valves with less than 1 inch travel – Call factory for details)*

760E Electro-Pneumatic

Models: 76E_: Full Range Signal (4-20 mA)
Options Limit Switches, 4-20 mA Feedback *(Reduced feedback span for valves with less than 1 inch travel – Call factory for details)*
Approvals & Ratings:
FM Intrinsically Safe: Class I, Div 1, Groups A,B,C,D.
Class II, Div 1, Groups E,F,G.
Class III, Div 1.
Non-Incendive: Class I, Div 2, Groups A,B,C,D.
Suitable for: Class II, Div 2, Groups F,G.
Class III, Div 2.

760E Electro-Pneumatic (Continued)

CSA Intrinsically Safe: Class I, Div 1, Groups A,B,C,D.
Class II, Div 1, Groups E,F,G.
Class III, Div 1.
Suitable for: Class I, Div 2, Groups A,B,C,D.
Class II, Div 2, Groups E,F,G.
Class III, Div 2.

All Models:

Construction: Aluminum Housing with Epoxy/Polyester Powder Coat
Ingress & Corrosion Protection: NEMA 4, 4X, IP65
Action: Direct or Reverse
Supply Pressure: 150 PSIG Max **Not to exceed actuator rating**
Media: Clean Dry Oil Free Air Filtered to 3 micron
Flow Capacity: 9.0 SCFM
Air Consumption: 0.5 SCFM Typical
Air Connections: 1/4 NPT
Electrical Connection: 3/4 NPT
Gauges: Input 0-30 PSIG, Output 0-60 PSIG, Housing Black Steel Case with Chrome Ring
Ambient Temperature: 760P -40 to 180°F, 760E –40 to 167°F
Mounting: Yoke Mounted

Westlock ICoT Models:

Electro-Pneumatic

Models: 510_: Full Range Signal (4-20 mA)
Options 2SPDT Limit Switches

Intelligent with Keypad

Models: 520_: Full Range Signal (4-20 mA)
Calibration 3 Button Keypad
Options 2SPDT Limit Switches, 4-20 mA Feedback

Intelligent with HART

Models: 530_: Full Range Signal (4-20 mA)
Calibration 3 Button Keypad & HART
Options 2SPDT Limit Switches, 4-20 mA Feedback

Intelligent with Foundation Fieldbus

Models: 540_: Full Range Signal (4-20 mA)
Calibration 3 Button Keypad & Foundation Fieldbus
Options 2SPDT Limit Switches, 4-20 mA Feedback

All Models:

Construction: Engineered Resin Housing
Ingress & Corrosion Protection: NEMA 4, 4X
Approvals & Ratings: Non-Incendive Groups A-G, Div 2
Action: Direct or Reverse
Supply Pressure: 15 to 45 PSIG **Not to exceed actuator rating**
Media: Clean Dry Oil Free Air Filtered to 40 micron
Flow Capacity: 8.0 SCFM at 25 PSIG
Air Consumption: 0.003 SCFM at 20 PSIG
Air Connections: 1/4 NPT
Electrical Connection: 1/2 NPT
Gauges: Supply 0-60 PSIG, Output1 0-60 PSIG, Housing Black Steel Case with Chrome Ring
Ambient Temperature: -40 to 180°F
Mounting: Yoke Mounted

Position Indication Switches

Proximity Mark 1

Models:	2 SPDT Switches
	4 SPDT Switches
	6 SPDT Switches
	2 SPDT Switches w/ 2K Potentiometer
	2 SPDT Switches w/ 4-20 mA Feedback
Construction:	Aluminum Housing, Hard Anodized
Locations:	NEMA 1, 2, 3, 3R, 3S
Ambient Temperature:	-40 to 180°F
Electrical Connection:	3/4 NPT, Terminal Strip
Mounting:	Yoke Mounted

I/P's

Type 500X

Locations:	NEMA 3
Construction:	Zinc Alloy Base with Aluminum Bonnet, Epoxy Painted
Ranges:	3-9, 9-15, 3-15, 1-17, or 6-30 PSI
Supply Pressure:	Minimum 3 PSIG Above Maximum Output
	Maximum 100 PSIG **Not to Exceed Actuator Rating**
Flow Capacity:	4.5 SCFM at 25 PSIG
Air Consumption:	0.05 SCFM Midrange Typical
Ambient Temperature:	-20 to 140°F

Type 550X

Locations:	NEMA 4X (IP65)
Construction:	Chromate-treated Aluminum with Epoxy Paint
Ranges:	0-30 PSI
Supply Pressure:	Minimum 5 PSIG Above Maximum Output
	Maximum 100 PSIG **Not to Exceed Actuator Rating**
Flow Capacity:	12 SCFM at 100 PSIG
Air Consumption:	6.0 SCFH Midrange Typical
Ambient Temperature:	-20 to 150°F

Type 950X

Locations:	NEMA 4X (IP65), Explosion proof
Construction:	Chromate-treated Aluminum with Epoxy Paint
Ranges:	3-15 PSI
Supply Pressure:	Minimum 5 PSIG Above Maximum Output
	Maximum 100 PSIG **Not to Exceed Actuator Rating**
Flow Capacity:	4.5 SCFM at 25 PSIG
Air Consumption:	3.0 SCFH Midrange Typical.
Ambient Temperature:	-40 to 160°F

I/P's (Continued)

All Models:

Input:	4-20 mA
	Field Reversible
Air Connections:	1/4 NPT
Electrical Connection:	1/2 NPT, Pigtail Leads
Media:	Clean Dry Oil Free Air Filtered to 40 micron
Mounting:	Yoke Mounted

Air Filter Regulators

Models:	Type 300, Type 350SS
Output Ranges:	Type 300, 0-30, 0-60 PSIG
	Type 350SS, 0-100 PSIG
Supply Pressure:	Type 300, 250 PSIG Maximum
	Type 350SS, 290 PSIG Maximum
Construction:	Type 300, Die-Cast Aluminum with Irridite and Baked Epoxy Paint
	Type 350SS, 316 Stainless Steel
Gauge:	Type 300, Output, Housing Steel Painted
	Type 350SS,Output, Housing Stainless Steel
Air Connections:	1/4 NPT
Filter:	Type 300, 40 micron. Type 350SS, 25 micron
Mounting:	Chamber Mounted

Solenoids

Models:	8320G184, EF8320G184, 8320G202, EF8320G202
Construction:	(EF)8320G184, 3-Way Brass
	(EF)8320G202, 3-Way Stainless Steel
Locations:	83206G184 & 8320G202, Watertight, Types 1, 2, 3, 3S, 4 & 4X
	EF8320G184 & EF8320G202, Explosion proof and Watertight, Types 3, 3S, 4, 4X 6, 6P, 7 & 9
Supply:	120VAC
Ambient Temperature:	+32 to 125°F
Air Connections:	1/4 NPT
Electrical Connection:	1/2 NPT, Pigtail Leads
Approvals:	CSA, UL, CE
Mounting:	Chamber Mounted

Air Tubing

Standard:	Copper
Optional:	Stainless Steel

Positioners

Valve Type	Actuator Action	Input Signal			Failure Modes	
		Pneumatic	Electro-Pneumatic	Increasing Signal	Loss of Signal[1] Valve Fails…	Loss of Supply Valve Fails…
2820	Direct	3-15 PSI	4-20 mA	Closes Valve	Open	Open
	Reverse	3-15 PSI	4-20 mA	Opens Valve	Closed	Closed
2830 & 32	Direct	3-15 PSI	4-20 mA	Closes Lower Port/ Opens Upper Port	Upper Port Closed/ Lower Port Open	Upper Port Closed/ Lower Port Open

[1] Valves with Fail Freeze Positioners Fail in Last Position on Loss of Signal.

Positioner Feedback

Valve Type	Actuator Action	Feedback Signal[2]	Signal Increases as
2820	Direct	4-20 mA	Valve Closes
	Reverse	4-20 mA	Valve Opens
2830 & 32	Direct	4-20 mA	Lower Port Closes/ Upper Port Opens

[2] Reduced feedback span for valves with 760 and less than 1 inch travel.

Positioner Limit Switches

Valve Type	Position	Settings	
		Switch 1	Switch 2
2820	Valve Closed	Closed	Open
	Valve Open	Open	Closed
2830 & 32	Upper Port Closed	Closed	Open
	Lower Port Closed	Open	Closed

I/P's

Valve Type	Actuator Action	Input Signal	Increasing Signal	Failure Modes	
				Loss of Signal Valve Fails…	Loss of Air Supply Valve Fails…
2820	Direct	As Required For Shut-off	Closes Valve	Open	Open
	Reverse	As Required For Shut-off	Opens Valve	Closed	Closed
2830 & 32	Direct	As Required For Shut-off	Closes Lower Port/ Opens Upper Port	Upper Port Closed/ Lower Port Open	Upper Port Closed/ Lower Port Open

SOLENOIDS (without Positioners or I/P's)

Valve Type	Actuator Action	Solenoid Energized	Failure Modes		
			Loss of Signal Valve Fails…	Loss of Air Supply Valve Fails…	Solenoid De-energized Valve Fails…
2820	Direct	Closes Valve	Open	Open	Open
	Reverse	Opens Valve	Closed	Closed	Closed
2830 & 32	Direct	Closes Lower Port/ Opens Upper Port	Upper Port Closed/ Lower Port Open	Upper Port Closed/ Lower Port Open	Upper Port Closed/ Lower Port Open

If the Solenoid is used with a Positioner or an I/P, refer to the Positioner or I/P listings for factory default settings and failure modes with the solenoid not failed.

Proximity MARK 1 Position Indication Switches Feedback

Valve Type	Actuator Action	Feedback Signal		Feedback Signal Increases as
		Potentiometer[3]	mA	
2820	Direct	0-350 ohm	4-20 mA	Valve Closes
	Reverse	0-350 ohm	4-20 mA	Valve Opens
2830 & 32	Direct	0-350 ohm	4-20 mA	Lower Port Closes/ Upper Port Opens

[3] Span varies from approx 155 to 350 ohm depending on actuator and travel.

Limit Switches

Valve Type	Position	Settings	
		Switch 1, 3, 5	Switch 2, 4, 6
2820	Valve Closed	Closed	Open
	Valve Open	Open	Closed
2830 & 32	Upper Port Closed	Closed	Open
	Lower Port Closed	Open	Closed

Air Filter Regulators

Actuator	Output Pressure
DL49, 84 & 84XR	30 PSIG

1. SELECTIONS Please make a selection from each table of OPTIONS below to make a complete model number string.

28N – ☐☐ ☐☐☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

2. OPTIONS

VALVE BODY

Model	Valve Type	Size	Body Material	End Connection	Trim Style	Trim Material	Trim Cv	Packing Type
	20 2-Way Single Seat **30** 3-Way Mixing **32** 3-Way Diverting	**050** 1/2 inch **075** 3/4 inch **100** 1 inch **125** 1-1/4 inch **150** 1-1/2 inch **200** 2 inch	**B** Bronze **F** CF8M	**S** Screwed *NOTE : Additional end connections are available–check with the factory.*	**E** Equal % **L** Linear *Types 30/32, Linear Only*	**S** 316SS **B** Bronze **6** Alloy 6 **H** 17-4 PH **T** Teflon **P** PEEK	**F** Full Port **1** 1st Port Reduction **2** 2nd Port Reduction **3** 3rd Port Reduction **4** 4th Port Reduction *NOTE : Port reductions only available on Type 20/30. Check factory for availability.*	**T** Teflon **G** Graphite *Stainless Steel, Type 20 Bodies come standard w/PEEK bearings. Used for Temp. up to 500° F.*

VALVE TYPE/TRIM MATERIAL COMBINATIONS:

SIZE	TRIM MATERIAL					
	S 316 SS	**B** Bronze	**6** Alloy 6	**H** 17-4 PH	**T** Teflon	**P** PEEK
050 1/2 inch	20, 30	N/A	20	20	20	20
075 3/4 inch	20, 30	N/A	20	20	20	20
100 1 inch	20, 30, 32SS	32 BRZ	20	20	20	20
125 1-1/4 inch	20, 30	N/A	20	20	20	20
150 1-1/2 inch	20, 30, 32SS	32 BRZ	20	20	20	20
200 2 inch	20, 30, 32SS	32 BRZ	20	20	20	20

VALVE TYPE/ACTUATOR COMPATIBILITY:

VALVE STYLE	VALVE SIZES	ACTUATORS
Type 20	1/2"- 2"	DL49
Type 20	1" - 2"	DL84
Type 20	1-1/4" - 2"	DL84XR
Type 30	1/2"- 2"	DL49
Type 30	1-1/4" - 2"	DL84
Type 30	2"	DL84XR
Type 32	1/2"- 2"	DL49 & DL84

See Shut-Off ΔP Ratings for details.

ACTUATOR

Actuator Series

00 None

DIAPHRAGMS:

49 DL49 (49 Sq.In.)

84 DL84 (84 Sq.In.)

8X DL84XR (84 Ext. Rng.)

NOTE : 8X Only in Xtra-High Spring Range

Action

0 None

R Reverse Stem Fail Down

D Direct Stem Fail Up

Spring Range

0 None

L Low 4-10 PSI 49R ; 3-9 PSI 49D, 84R/D

F Full 5-14 PSI 49R ; 4-13 PSI 49D; 3-15 PSI 84R/D

H High 9-15 PSI 84 10-14 PSI 49R 8-12 PSI 49D

X Xtra-High DL84XR

Handwheel

0 None

R Reverse

D Direct

NOTE : DL84 or DL84XR only - Must match action.

ACCESSORIES

Positioners, I/P's & Limit Switches

0000 None

POSITIONERS:

B*x*P_ BLX Pneumatic

B*x*E_ BLX ElectroPneumatic

B*x*I_ BLX ElectroPneu. Intrn. Safe

B*x*X_ BLX ElectroPneu. Exp. Proof

B*x*F_ BLX ElectroPneu. Fail Freeze

76P_ Moore 760 Pneumatic

76E_ Moore 760 Electro-Pneumatic

510_ Westlock ICoT Electro-Pneumatic

520_ Westlock ICoT Intelligent-Keypad

530_ Westlock ICoT Intelligent-Hart

540_ Westlock ICoT Found.Fieldbus

x digit spec.

F Full Range Signal, 3-15 PSI or 4-20mA

L Low of Split Range, 3-9 PSI or 4-12mA

H High of Split Range, 9-15 PSI or 12-20mA

4th digit spec.

0 No Additions

L w/Mech. Lmt Swtch's

F w/4-20 Feedback

B w/Swtch's & Feedbck

PROXIMITY SWITCHES:

PX11 Mark 1 Series - 2 ea. SPDT

PX12 Mark 1 Series - 2 ea. SPDT w/2k Pot.

PX13 Mark 1 Series - 2 ea. SPDT w/4-20 Feedback

PX14 Mark 1 Series - 4 ea. SPDT

PX15 Mark 1 Series - 6 ea. SPDT

I/P's *Use with Diaphragm Only*

MAP1 Type 500X I/P, 3-9 PSI

MAP2 Type 500X I/P, 9-15 PSI

MAP3 Type 500X I/P, 3-15 PSI

MAP4 Type 500X I/P, 1-17 PSI

MAP5 Type 500X I/P, 6-30 PSI

MAP6 Type 550X I/P, 0-30 PSI

MAP9 Type 950X I/P, 3-15 EXP

Air Filter Regulators

0 None

A Type 300, 0-30 PSI

B Type 300, 0-60 PSI

D Type 350SS, 0-100 PSI

ASCO Solenoids

0 None

A 8320G184 3-Way Brass

B 8320G202 3-Way SS

L EF8320G184 3-Way EXP Br.

M EF8320G202 3-Way EXP SS

120 VAC Coils

Special Options

0 None

S Special Opts or Set-up

T SS Tubing

G SS Tagging

B SS Tubing and Tagging

Note: Standard pneumatic tubing is copper. SS tubing "**T**" is optional.
SS tagging "**G**" (Two lines, 24 characters/line) is optional.
SS tubing and tagging together "**B**" is optional.

FAILURE MODES:

MODE	VALVE TYPE	ACTUATOR ACTION
Closed	20	Reverse
Open	20	Direct
Upper Closed*	30/32	Direct
Upper Open	30/32	Reverse

*Standard

ACTUATOR/BODY COMPATIBILITY:

DIAPHRAGMS	BODY
49 49 Sq.In. (DL49)	For 28N Bodies
84 84 Sq.In. (DL84)	For 28N Bodies
8X (DL84XR)	For 28N Bodies

WARREN CONTROLS

ACTUATED INDUSTIRAL VALVES

1800 SERIES
Heavy Globe Control Valves

styles:
- 2-way balanced
- 2-way unbalanced
- 3-way mixing
- 3-way diverting

sizes 2-1/2 to 12 in.
class 300
ends 150,300 RF flg
body Cast Iron, WCB,CF8M
trim 316 SST, Alloy 6
Cv up to 1649
temp. -20° to 800°F
body limit to 740 psi
shutoff class III, IV
rangeability 50:1

- Heavy Duty
- Severe Service
- High Pressure Differentials
- Corrosive Materials, Liquids, Gases & Steam
- Modulating or On/Off Control

2800 SERIES
Precision Globe Control Valves

styles:
- 2-way unbalanced
- 3-way mixing
- 3-way diverting

sizes 1/2 to 2 in.
class 250 & 300
ends Buttweld, NPT
body Bronze, CF8M
trim Bronze, 316SST 17-4pH, Alloy 6, TFE, PEEK
Cv up to 40
temp. -20° to 500°F
body limit to 720 psi
shutoff class III, IV, VI
rangeability 50:1

- Economical
- Precision Control
- Suited for Gases, Steam, or Liquids that are Not Viscous or Solids Bearing

2900 SERIES
High Capacity General Purpose Globe Control Valves

styles:
- 2-way balanced
- 2-way unbalanced
- 3-way mixing
- 3-way diverting

sizes 2-1/2 to 10 in.
class 125 & 250
ends Flange
body Cast Iron
trim Bronze, 300SS, 17-4pH, Alloy 6
Cv up to 960
temp. -20° to 400°F
body limit to 400 psi
shutoff class II, III, IV
rangeability 50:1

- High Capacity
- General Purpose
- Moderate Pressure Drops
- Compatible Liquids and Gas, Steam & Water
- Modulating or On/Off Control

3800 SERIES
E-Ball Rotary Control Valves

styles:
- 2-way rotary
  - flow to open
  - flow to close

sizes 1 to 8 in.
class 300
ends 150,300 RF flg
body WCB, CF8M
trim 316 SST, Alloy 6, Ceramic, TFE, PEEK
Cv up to 1420
temp. -20° to 800°F
body limit to 740 psi
shutoff class IV, VI
rangeability 100:1

- Eccentric, Segmented Ball
- Well Suited for Erosive Service
- Various Trim Options Include Ceramic for Slurries or Gritty Materials & Teflon® for Class VI Shutoff

5800 SERIES
Compact Globe Control Valves

styles:
- 2-way cage-retained seat

sizes 1 to 4 in.
class 300
ends 150,300 RF flg
body WCB, CF8M
trim 316 SST, Alloy 6, TFE, PEEK
Cv up to 170
temp. -20° to 800°F
body limit to 740 psi
shutoff class IV, VI
rangeability 50:1

- Highly Efficient, Compact Design
- High Pressure Drops
- Typically Suited for High Force Piston Actuators for Steam, Chemicals & Dirty Fluids
- Minimizes Cavitation or Flashing Effects

WARREN CONTROLS
2600 Emrick Blvd., Bethlehem, PA 18020-8010 www.WarrenControls.com
Tel: 800-922-0085 or 610-317-0800 Fax: 610-317-2989