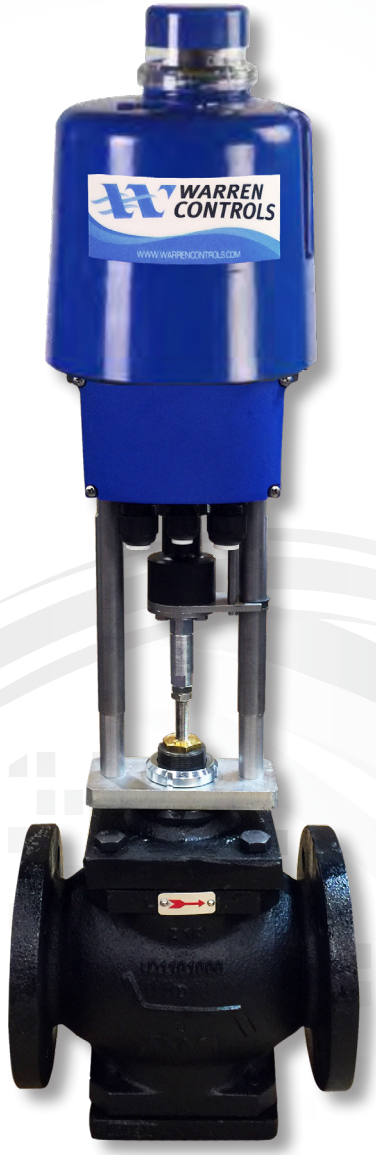
INDUSTRIAL LINEAR ELECTRICALLY ACTUATED

HIGH CAPACITY, GENERAL PURPOSE, GLOBE CONTROL VALVES

PRODUCT SPECIFICATION



SERIES **2900**

ILEA

SIZES: 2-1/2 TO 10 INCHES

Two-Way & Three Way, Linear Cast Iron Body
Control Valves for Process & Utility Applications.

2900E_PS_RevN_1121

2900 E PRODUCT SPEC

WARREN CONTROLS

2600 EMRICK BLVD • BETHLEHEM, PA 18020 • USA •800-922-0085 • WWW.WARRENCONTROLS.COM

DEPENDABLE, RUGGED, PRECISION CONTROL VALVES AND ACCESSORIES

Actuator: ILEA_F

Actuator: ILEA_A

WARREN CONTROLS INC.
A VETERAN OWNED, PRIVATELY HELD, SMALL BUSINESS
WARREN CONTROLS INC.

THE ILEA SERIES OF INDUSTRIAL, LINEAR, ELECTRIC ACTUATORS OFFER CONFIDENCE AND RELIABILITY WITH BEST IN CLASS PERFORMANCE SPECIFICATIONS IN TWO FRAME SIZES.

ILEA F-Series 450 LBF
ILEA A-Series 1011 LBF

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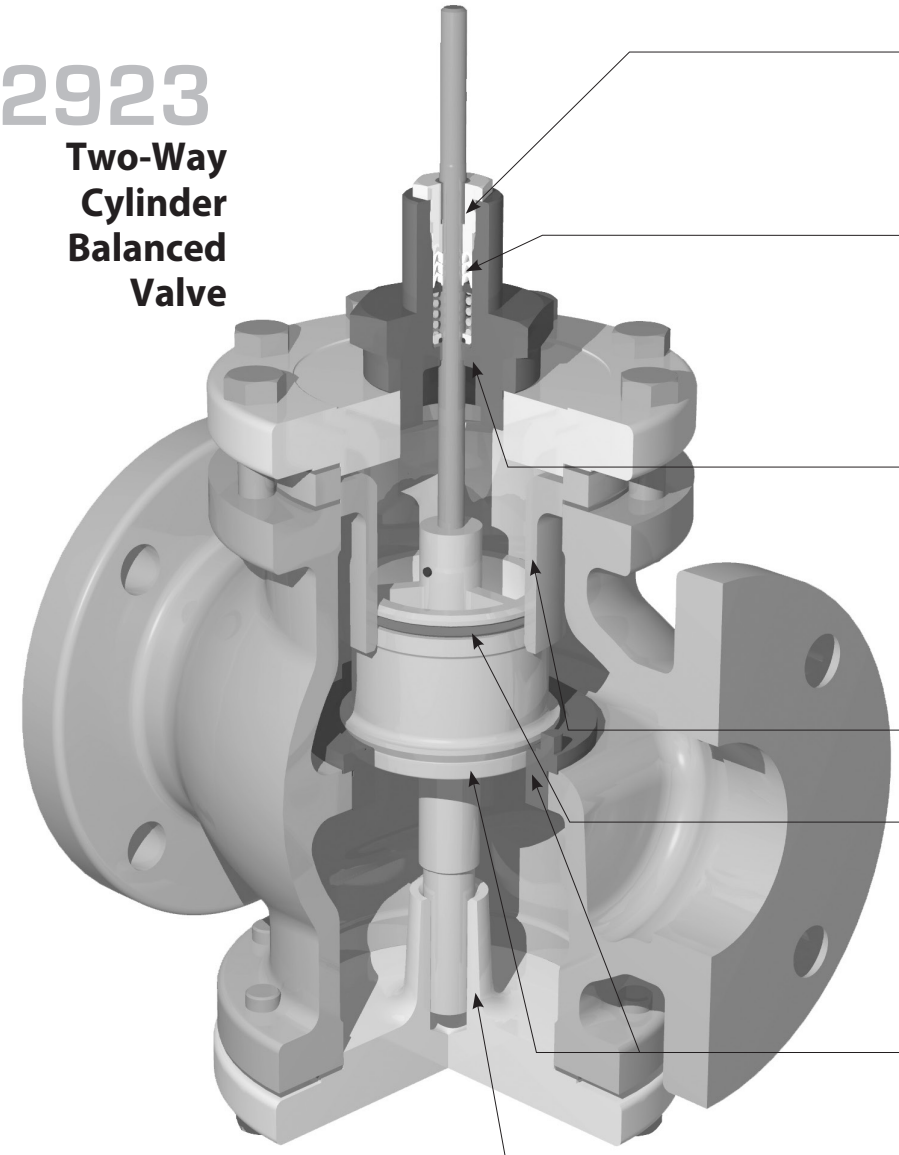
2923
Two-Way Cylinder Balanced Valve



Peek Bearing
for low friction provides stem guiding and protects packing box from external debris.

Robust Spring-Loaded PTFE V-Ring Packing
has low friction and is self adjusting for zero maintenance.

Peek Bearing in Lower Bonnet Assembly
provides stem guiding and protects packing box from entrained solids for longer packing life.

Thick Balancing Chamber
in bronze, 300 SS, or 17-4pH.

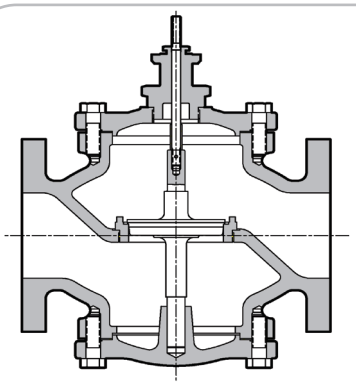
EPDM O-Ring or Fluoraz O-Ring
(for higher temperatures) maintains pressure balance seal.

Plug and Seat
in choice of Bronze, 300 SS, 17-4pH, or Alloy 6 provide Class IV leakage rating.

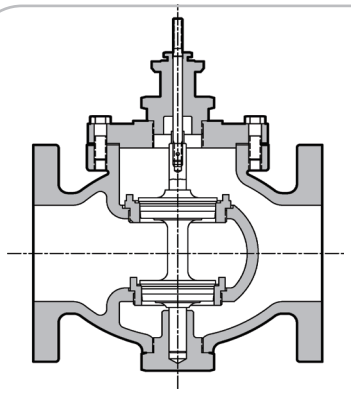
Bottom Post Guide
for additional stability, allowing higher pressure drop.

SERIES: 2900

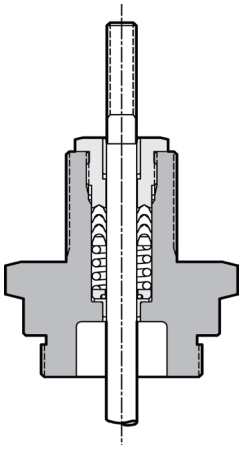
High Capacity
General Purpose Globe Control Valves



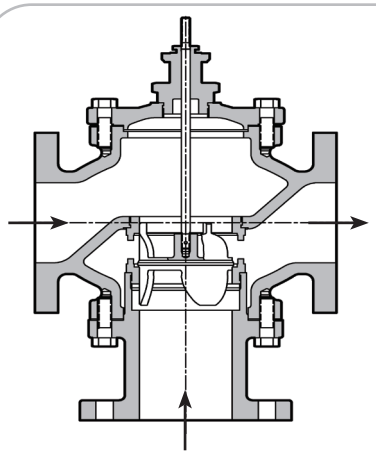
2920
Two-Way Single Seat Unbalanced Valve



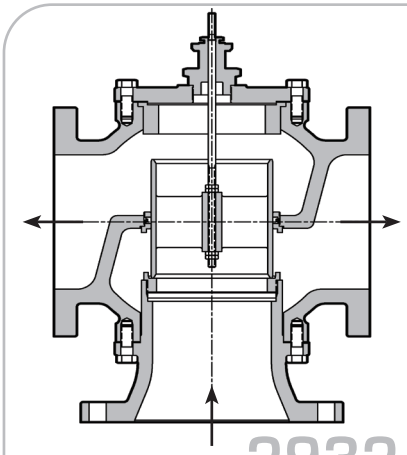
2922
Two-Way Double Seat Balanced Valve



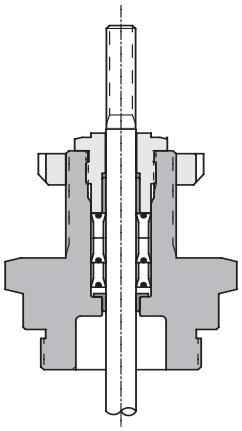
Guided Low-Friction TFE V-Ring Packing Spring Loaded



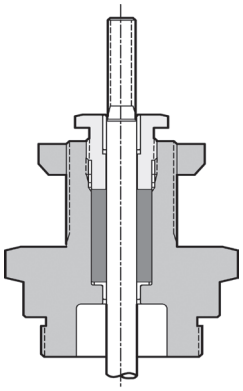
2930
Three-Way Mixing Valve



2932
Three-Way Diverting/Mixing Valve



Long-Life Multi-Stack EPDM Lip Packing



Adjustable Graphite Packing

AGENCY APPROVALS

CRN REGISTERED	SEE TABLE ON PAGE 24

ISO 9001:2015 REGISTERED FIRM

Description: Warren Controls Series 2900 High Capacity General Purpose Globe Control Valves feature rugged iron bodies with a variety of trim materials. The equal percentage plugs in the 2-way valves and linear plugs in the 3-way valves provide excellent modulating control of a wide variety of fluids. The Series 2900 is ideally suited where value and long life are important objectives for applications including but not limited to: Food & Beverage, Packaged Water Heaters, Pharmaceutical, General Service, and Waste Water having moderate pressure drops and temperatures from -20° to 400°F.

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

2920 2-Way Single Seat Unbalanced Valve

The most commonly applied solution for sizes 3" and under with ANSI Class IV leakage rating. ***See Table on page 26 for Fluid Temperature Limits.***

Sizes:	2-1/2, 3, 4, 5, 6 inch
Body:	ANSI B16.1 Iron 125LB Flange or 250LB Flange
Trim:	Linear: 300 Series Stainless Steel (2-1/2 thru 4 only) EQ%: Bronze, 300 Series Stainless Steel, or 17-4 pH Hardened Stainless Steel
Packing:	Long-Life Multi-Stack, EPDM Lip Packing (EPDM Lip Packing is not suitable for use with oils, hydrocarbons, or acids.) Guided Low-Friction TFE V-Ring, Spring Loaded Packing, Adjustable Graphite Packing,
Rangeability:	50:1

2922 2-Way Double Seat Balanced Valve

A balanced valve that is an effective solution for sizes over 3" and for higher pressures. Its double seat design allows for dirtier fluids and requires less force to operate than unbalanced valves so smaller actuators can be used. It is limited to ANSI Class III leakage rating. ***See Table on page 26 for Fluid Temperature Limits***

Sizes:	2-1/2, 3, 4, 5, 6, 8, 10 inch
Body:	ANSI B16.1 Iron 125LB Flange or 250LB Flange
Trim:	EQ%: Bronze or 300 Series Stainless Steel
Packing:	Long-Life Multi-Stack, EPDM Lip Packing (EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids) Guided Low-Friction TFE V-Ring, Spring Loaded Packing, Adjustable Graphite Packing
Rangeability:	50:1

2923 2-Way Cylinder Balanced Valve

A balanced valve that is an effective solution for sizes over 3" and for higher pressures. It requires less force to operate than unbalanced valves so smaller actuators can be used. Its single seat o-ring seal design facilitates ANSI Class IV leakage rating. It is limited to cleaner fluids. ***See Table on page 26 for Fluid Temperature Limits.***

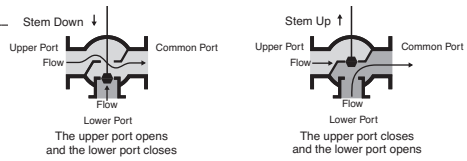
Sizes:	2-1/2, 3, 4, 5, 6, 8 inch
Body:	ANSI B16.1 Iron 125LB Flange or 250LB Flange
Trim:	Linear: 300 Stainless Steel only EQ%: 300 Stainless Steel, 17-4 pH Hardened Stainless Steel, or Alloy 6
Packing:	Long-Life Multi-Stack, EPDM Lip Packing (EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids.) Guided Low-Friction TFE V-Ring, Spring Loaded Packing, Adjustable Graphite Packing
O-Ring:	EPDM (BRZ) *Fluoraz 797 (300 SS Trim, 17-4 pH or Alloy 6 Trim)
Rangeability:	50:1

3-Way Valves (Control of Liquids)

2930 3-Way Mixing Valve

This valve has two inlets and one outlet, and is the simplest solution for mixing or bypass applications with an ANSI Class IV leakage rating. 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. ***See Table on page 26 for Fluid Temperature Limits.***

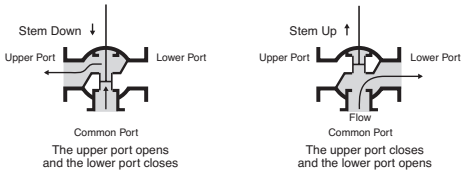
Sizes:	2-1/2, 3, 4, 5, 6, 8 inch
Body:	ANSI B16.1 Iron 125LB Flange or 250LB Flange
Trim:	Linear: Bronze (2-1/2 thru 6) or 300 Series Stainless Steel (2-1/2 thru 8)
Packing:	Long-Life Multi-Stack, EPDM Lip Packing, (EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids.) Guided Low-Friction TFE V-Ring, Spring Loaded Packing, Adjustable Graphite Packing
Rangeability:	50:1



2932 3-Way Diverting/Mixing Valve

Designed as a diverting valve with one inlet and two outlets with ANSI Class II leakage rating. 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 50PSID. ***See Table on page 26 for Fluid Temperature Limits.*** (See piping note on page 11.)

Sizes:	2-1/2, 3, 4, 5, 6, 8 inch
Body:	ANSI B16.1 Iron 125LB Flange or 250LB Flange
Trim:	Linear: Bronze or 300 Series Stainless Steel
Packing:	Long-Life Multi-Stack, EPDM Lip Packing, (EPDM lip packing is not suitable for use with oils, hydrocarbons, or acids.) Guided Low-Friction TFE V-Ring, Spring Loaded Packing, Adjustable Graphite Packing
O-Ring:	EPR
Rangeability:	50:1



Body Pressure-Temperature Ratings (PSIG):		
Temp. (°F)	**125 FLG**	**250 FLG**
-20° To 150	175	400
175	170	385
200	165	370
225	157	355
250	150	340
275	145	325
300	140	310
350	125	280
375	-	265
400	-	250

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

Pressure ratings are PSIG • For applications below 32° consult factory

Note: Fluoraz o-ring in Type 2923 is not compatible with the following solvents: acetates, acetone, benzene, carbon tetrachloride, ethers, Freons, ketones, lacquers, methyl ethyl ketone, and toluene - Consult Factory with service conditions for alternate o-ring selection.

FLOW COEFFICIENTS (Cv) VERSUS TRAVEL

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

VALVE — 2920 FLOW COEFFICIENTS (Cv) 2-WAY SINGLE SEAT UNBALANCED VALVE

Valve Size (IN)	Trim Style	%Travel									
		100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
2-1/2	EQ%	65.0	55.6	43.8	29.8	15.4	8.07	5.67	4.11	2.81	1.49
	Linear	65.0	58.5	52.0	45.5	39.0	32.5	26.0	19.5	13.0	6.50
3	EQ%	90.0	83.6	75.1	63.8	49.2	31.6	12.9	4.75	3.37	1.99
	Linear	90.0	81.0	72.0	63.0	54.0	45.0	36.0	27.0	18.0	9.00
4	EQ%	170	159	143	122	95.1	62.9	31.3	15.6	9.89	4.11
	Linear	170	153	136	119	102	85	68.0	51.0	34.0	17.0
5	EQ%	280	258	230	194	150	102	54.7	23.1	14.0	6.40
6	EQ%	360	333	298	255	203	144	83.6	34.1	14.6	7.10

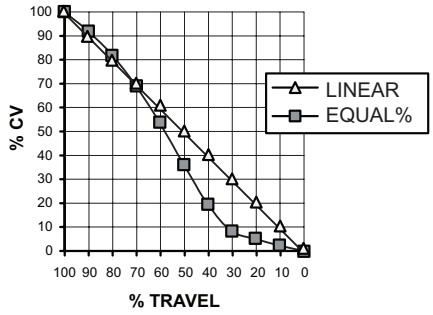
VALVE — 2922 FLOW COEFFICIENTS (Cv) 2-WAY DOUBLE SEAT BALANCED VALVE

Valve Size (IN)	Trim Style	%Travel									
		100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
2-1/2	EQ%	70.0	59.5	45.9	30.2	15.7	8.60	6.36	4.12	3.44	2.75
3	EQ%	100	87.6	71.2	50.8	28.7	12.2	8.54	6.58	4.60	3.27
4	EQ%	200	180	155	126	91.0	53.3	17.8	8.36	6.07	4.54
5	EQ%	260	239	212	178	138	100	74.3	53.8	32.2	9.86
6	EQ%	350	323	286	238	178	113	63.2	44.8	27.5	9.83
8	EQ%	680	619	557	475	370	246	118	43.9	29.0	14.2
10	EQ%	960	859	737	593	431	263	127	86	57	27.6

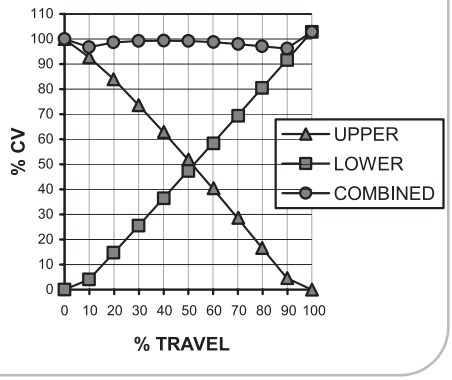
VALVE — 2923 FLOW COEFFICIENTS (Cv) 2-WAY CYLINDER BALANCED VALVE

Valve Size (IN)	Trim Style	%Travel									
		100%	90%	80%	70%	60%	50%	40%	30%	20%	10%
2-1/2	EQ%	65.0	55.6	43.8	29.8	15.4	8.07	5.67	4.11	2.81	1.49
	Linear	65.0	58.5	52.0	45.5	39.0	32.5	26.0	19.5	13.0	6.50
3	EQ%	90.0	83.6	75.1	63.8	49.2	31.6	12.9	4.75	3.37	1.99
	Linear	90.0	81.0	72.0	63.0	54.0	45.0	36.0	27.0	18.0	9.00
4	EQ%	170	159	143	122	95.1	62.9	31.3	15.6	9.89	4.11
	Linear	170	153	136	119	102	85	68.0	51.0	34.0	17.0
5	EQ%	280	258	230	194	150	102	54.7	23.1	14.0	6.40
	Linear	280	252	224	196	168	140	112	84.0	56.0	28.0
6	EQ%	360	333	298	255	203	144	83.6	34.1	14.6	7.10
	Linear	360	324	288	252	216	180	144	108	72.0	36.0
8	EQ%	680	643	590	513	407	267	115	50.3	31.1	17.1
	Linear	680	612	544	476	408	340	272	204	136	68.0

TWO-WAY
TYPICAL FLOW CURVES



2930
TYPICAL FLOW CURVE



3-Way Valves (Control of Liquids)

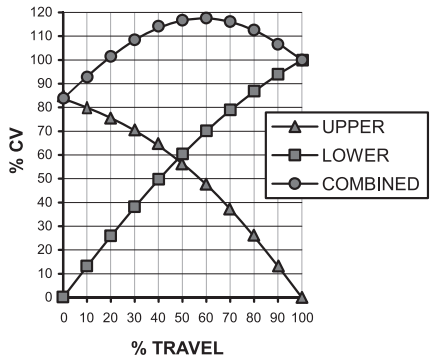
VALVE — 2930 FLOW COEFFICIENTS (Cv) 3-WAY MIXING VALVE

Valve Size (IN)	Trim Style	Travel
		100%
2-1/2	LINEAR	69
3	LINEAR	86
4	LINEAR	156
5	LINEAR	270
6	LINEAR	347
8	LINEAR	590

VALVE — 2932 FLOW COEFFICIENTS (Cv) 3-WAY DIVERTING/MIXING VALVE

Valve Size (IN)	Trim Style	Travel 100%	
		Upper Port	Lower Port
2-1/2	LINEAR	68	75
3	LINEAR	85	95
4	LINEAR	160	180
5	LINEAR	195	220
6	LINEAR	270	300
8	LINEAR	425	510

2932
TYPICAL FLOW CURVE



ILEA-F SERIES: small frame actuators

High Quality, Modulating, Linear, Industrial Electric Valve Actuator

For smaller sized control valves, this compact design packs a nice set of features at an economical price point. The Brushless DC motor ensures long life.

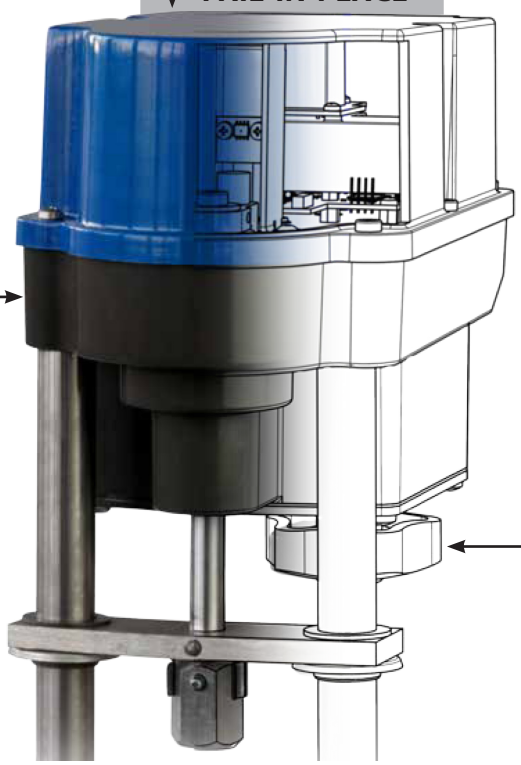
Robust industrial design with polycarbonate cover, enclosure IP65

Compact design with low installation height, durable aluminium gearbox

Integrated power spring for fail safe function in case of loss of power supply, either extending or retracting actuator stem

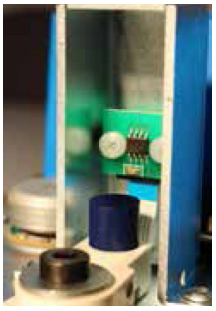
SPRING FAIL

FAIL-IN-PLACE



Manual operation with handwheel or push buttons. Parameter setting via DIP switches

FOR SPRING FAIL & FAIL-IN-PLACE



Contactless, non-wearing travel detection with Hall sensor for exact positioning

Brushless DC motor (BLDC). Controller with integrated positioner function. Status display and automatic commissioning

Manual operation with push buttons or handwheel. Parameter setting via DIP switches

	UNITS	SPRING-FAIL	FAIL-IN-PLACE	
		ILEA-F18-U/D	ILEA-F1A-M	
Thrust / Force	(Lbf)	450	450	
MAX Stroke	(Inches)	1.57	1.57	
Pillar distance, C to C	(Inches)	4	4	
Weight, approx. kg 5.6	(Lbs.)	12.3	11	
Stroke Speed	(Secs / Inch)	28	21	
Approximate Height	(Inches)	11	11	
Approx.clearance above to remove cover	(Inches)	3.25	3.25	
Manual Override		Electrically via 2 push buttons	Electrically via 2 push buttons or Handwheel	
What happens under the condition of Overvoltage/ Undervoltage on the power supply or loss of power.		Actuator engages Spring Fail, to Open or Closed, Depending on model.	Actuator Stops in Position when event occurs.	
What happens under the condition of Loss of Control Signal.		Actuator engages Spring Fail, to Open or Closed, Depending on model.	**4-20mA or 2-10 VDC**	**0-20mA or 0-10 VDC**
			Actuator Stops in Position when event occurs.	Actuator Assumes Lower Control Signal when event occurs.

GLOBAL SPECIFCATIONS for ILEA-F18-U/D and ILEA-F1A-M

Power Supply:	24 VAC/DC, optionally wide range PS (100-240 VAC)
Motor protection:	Electronic motor current monitoring with safety cut-off
Duty cycle as per IEC 60034-1,8:	S2 30 min/ S4 1200c/h-50% ED
Permitted ambient temperature:	-4°F to 140°F (-20°C to +60°C)
Internal fault monitoring:	Thrust, Control Signal, Temperature, Power Supply
Binary control:	24-230- VAC for ON/OFF service
Control Signal and Feedback:	0-20 mA, 4-20 mA, 0-10 V, 2-10 V selectable
Mounting Position:	Any position, except cover pointing downwards
Conduit entries:	2 pcs. M 20 x 1.5 /1 pc. M 16 x15 / Optional 1/2"Female NPT, NEMA4X (as an accessory)
Cover material:	Polycarbonate
Gear case material:	High quality aluminium die casting, powder-coated (60 µm thickness)
Enclosure Rating. to EN 60529:	IP65: Standard, IP67: Optional
Fuse - HV Power Supply:	1 AMP, 5 x 20 mm, 250 VAC, Slow Blow

ENERGY CONSUMPTION

ELECTRIC PARAMETER	UNITS	POWER SUPPLY VOLTAGE			
		115 VAC	*230 VAC*	*24 VAC*	*24 VDC*
Nominal Current	(Amps)	0.12	0.24	1.2	0.6
Max Current	(Amps)	0.12	0.24	1.2	0.6
Power Consumption	(Watts)	16.5	16.5	16.5	14.5

ILEA-A/B SERIES: medium frame actuators
ILEA-G SERIES: large frame actuators

High Quality, Modulating, Linear, Industrial Electric Valve Actuator

FEATURE RICH AND PROVEN DESIGN WITH ROBUST CONSTRUCTION PROVIDES RELIABLE, TROUBLE FREE SERVICE.

No switching-over to manual operation needed. The hand wheel serves as an operation indicator and is always ready for operation

Vibration-proof potentiometer suspension

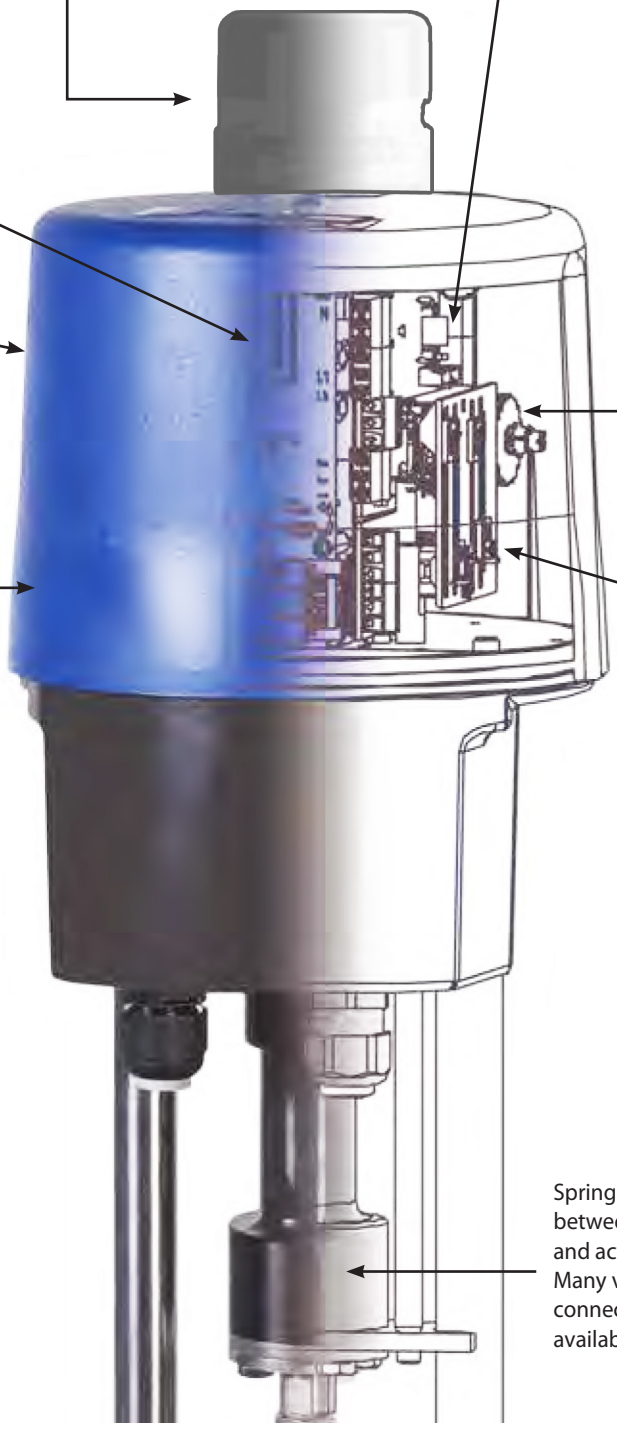
All common power supplies: single phase, and d.c. voltage. Suitable for control operations. Protection class IP67 is standard.

Efficient motor for precise positioning and controlling with a long duty cycle.

Friction clutch prevents damage

Compact, corrision resistant, sturdy and light-weight due to high-quality aluminum alloys

IP67 ENCLOSURE METAL COVER



IP67 ENCLOSURE POWDER COAT ALUMINUM

Precise valve setting:
- with fine adjustment of cams
- with stroke scale

Spring clutch between valve and actuator. Many valve connections are available.

Electronic board

ILEA-A SERIES ACTUATORS SPECIFICATIONS

	UNITS	ILEA-A3D-S			ILEA-A3D-M
Thrust / Force	(Lbf)	1,010			1,010
MAX Stroke	(Inches)	2			2
POWER SUPPLY	***VOLTAGE***	***24 VDC***	***24 VAC***	***115 VAC***	***24 VAC***
Nominal Current	(Amps)	2	3.15	0.66	3.15
MAX Current	(Amps)	2.6	4.1	0.86	4.1
Power Consumption	(Watts)	48	53	57	53
Fail Mode, Loss of Power		Fail-Safe, Capacitive, Selectable			Fail-In-Place
Pillar distance, C to C	(Inches)	4			
Weight, approx. kg 5.6	(Lbs.)	17.6			
Stroke Speed	(Secs / Inch)	6 to 11 (Default is 11)			
Approximate Height	(Inches)	19			
Approx.clearance above to remove cover	(Inches)	4			

GLOBAL SPECIFCATIONS for ILEA-A/B/G	
Manual override	Handwheel (For use when unpowered)
Duty Cycle & Motor Protection: (Per IEC 60034-1,8)	The motor has electronic current monitoring and temperature monitoring with a safety cutoff. Per IEC, the actuator is rated for S2 30 Min / S4 1200 Cycles/Hr. – 50% ED. In lab testing, duty cycle is potentially 100% and a function of motor load. At no inlet pressure to the valve it can run 100% moving for months w/o problem. Even with mild differential pressure on the valve plug it can run near continuously. At some point though, the motor will begin to heat up. The motor has a built in temperature sensor and when motor temperature exceeds 65°C, the motor's speed is reduced by 50%, in theory it should allow the motor temperature to then drop below 65°C, at which time the motor would go back to normal speed. Should the motor keep rising to exceed 70°C. then the motor would stop and the fail-safe circuit would take the valve to the designated FAIL-SAFE position.
Permitted ambient temperature	-4°F to 140°F (-20 to +60°C)
Binary Control	24 V for ON/OFF control (min. duration of pulse 1s)
Internal Fault Monitoring	Torque, set value, temperature, power supply, positioning deviation etc., adjustable
Duty cycle as per IEC 60034-1,8	S2 30 min S4 50% ED @ 25°C
Permitted ambient temperature	-4°F to 140°F (-20 to +60°C)
Automatic Startup	Recognizing the end position(s) and auto-scaling control and feedback values
Internal fault monitoring	Thrust, control signal, temperature, power supply
Diagnostics Function	Stores cumulated operation data (motor and total running time, number of motor starts) and data sets of current values (set value, feedback value, torque, temperature and error messages)
Communication Interface	Optional umbilical cable with USB Connection and software that allows for data reading and parameterization
Control Signal and Feedback	0 (4)..20 mA or 0 (2)..10 V selectable, split range operation
Valve Positioner Function	Integrated, deadband adjustable from 0.5 .. 5%, shut-off MIN
Mounting Position	Any position, except below horizontal
Conduit entries	2 pcs. M 20 x 1.5 / 1 pc. M 16 x 1.5 / Optional 1/2"Female NPT, NEMA4X (as an accessory)
Enclosure Rating	IP 67, according to EN 60529
Cover material	Powder Coated Aluminum
Optional Local Controls	Illuminated display to show the actuator status and lockable selector to switch between modes: automatic, manual process ON/OFF, STOP and parameter menu. Control buttons for manual movement, menu operation
Optional User Limit Switches	Potential-free additional position switches with silver contacts (0.1 A - 5 A switching current)
Fault Indication Relay	Standard, potential-free opening contact provides a freely definable (programmable) collective fault signal and doubles for indication for when optional Local Controls is NOT in remote mode.
Heating Resistor	Optional, primarily to prevent condensation
Additional Special Order Options	Profibus, Foundation Fieldbus

ILEA ACTUATORS SPECIFICATIONS

The Industrial Linear Electric Actuators (ILEA Series) is a best-in-class, robust and proven design with features and options not available elsewhere and now available at an attractive price point.

Depending on model with the ILEA Series, here is a listing of the possible features, attributes and options
(not all available on every model)

- 24Vac/Vdc, 115 Vac, 230 Vac, 320 - 575 Vac / 3-Phase / 60 Hz
- Spring Fail Safe, Capacitive Fail Safe and Fail-In-Place
- Handwheel Override
- Fast or Slow, Fixed or Adjustable speed ranges
- Profibus, Foundation Fieldbus, others
- IP65 or IP67 Enclosures
- Heaters
- Limit & Fault Switches
- Integral Local Control Station
- Multiple forces from 450 Lbf to 5620 Lbf.
- Modulating Control or ON/OFF
- Control & Feedback signals mA or Vdc
- Tested for EMC conducted and radiated emissions to EN55014-1, EN55022 and EN61000 specifications
- Software programmable settings with umbilical cord to fine tune operating parameters

ILEA ACTUATOR STOCKED MODELS

Warren Controls has ready stock on 11 popular models and a handful of the most popular configurable options, with dozens of other models available with only a 4-week delay on the order cycle.

Small Frame Size ILEA-F Model

- 450 Lbf with Spring Fail (up or down), speed range up to 85 seconds/inch of travel
- 450 Lbf with Fail-In-Place, speed range up to 21 seconds/inch of travel & handwheel
- IP65 Enclosure Only, 24Vac/Vdc or Universal 115 – 230 Vac Supply

Warren Controls factory stocked options include:
Limit Switches, Heater and High Voltage Power Supply

Model #'s

ILEA-F18-D400-5000
ILEA-F18-D500-5000
ILEA-F18-U400-5000
ILEA-F18-U500-5000
ILEA-F1A-M400-5000
ILEA-F1A-M500-5000

The optional High Voltage (100-240 Vac) Power Supply is Available and stocked.

Medium Frame Size ILEA-A Model

- 1,011 Lbf with Capacitive Fail-Safe, Speed range up to 6 seconds per inch of travel (Factory default: 11 seconds/inch) 24 Vac, IP67
- 1,011 Lbf with Fail-In-Place, Speed range up to 6 seconds per inch of travel (Factory default: 11 seconds/inch) 24 Vac, IP67
- 1,011 Lbf with Capacitive Fail-Safe, Speed range up to 6 seconds per inch of travel (Factory default: 11 seconds/inch) 115 Vac, IP67

Warren Controls factory stocked options include:Limit Switches, Heater, Local Control Station and Software / Programming umbilical cord.

Model #'s

ILEA-A3D-S100-7000
ILEA-A3D-S400-7000
ILEA-A3D-S500-7000
ILEA-A3D-M400-7000
ILEA-A3D-M500-7000

ILEA FACTORY AVAILABLE ACCESSORIES OVERVIEW

For ILEA-A/B models

Local Control Station **-** Switch between the remote analog control signal and a locally generated control signal via Up and Down push buttons. Includes a display indicating stroke percentage and a STOP function. If the local control station is in STOP or LOCAL, the Fault Indication Relay will energize for positive indication back to the central control system.

1 Local control PSC.2 with connection cable.

For ILEA-A/B models

IP67 Rated Metal Enclosure – With the IP67 rated enclosure the actuator can be subject to strong and sustained water jets with no water ingress into the enclosure. The epoxied aluminum enclosure offers high strength and integrity while the sealed cap over the manual override offers additional protection. (Now Standard)

Additional Items:

- User Limit switches rated for min. 0,1A / max. 10A @230VAC/DC
- Resistance Heater in outdoor applications to guard against condensation
- Software and USB Umbilical programming and data retrieval cable.
- 1/2" NPT / NEMA 4X conduit fittings.

For ILEA-F models:

- Wide Range, Universal Power Supply for 100 – 240 VAC, 50/60 Hz
- User Limit switches rated for min. 0,1A / max. 10A @230 VAC/DC
- Resistance Heater in outdoor applications to guard against condensation

For ILEA-G models

- Case Heater
- Limit Switches
- IP67 Enclosure
- Capacitive Fail-Safe
- Local Control Station
- Multiple Power Options

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

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

Heating or Cooling Water

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

Heating Oil with Steam

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

Heating Air with Water

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

Heating Liquids with Steam

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

Heating Liquids in Steam Jacketed Kettles

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

General Liquid Heating

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

Heating Air with Steam

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

SHUT-OFF ΔP AND Cv RATINGS

VALVE			ILEA ACTUATOR	2920 SHUT-OFF ΔP (PSIG) 2-WAY SINGLE SEAT UNBALANCED
Valve Size (IN)	Cv Rating	Plug Travel (IN)	Model Code Prefix	Fail Open, Closed or In Place
2 1/2	65	3/4	F1x	43
			A2x	56
			A3x, P3x	136
			A4x, P4x	318
			*A5x, P5x	400
			*B6x, P6x	400
3	90	3/4	F1x	25
			A2x	35
			A3x, P3x	90
			A4x, P4x	216
			*A5x, P5x	273
			*B6x, P6x	400
4	170	1 1/4	A3x, P3x	46
			A4x, P4x	117
			*A5x, P5x	149
			*B6x, P6x	220
5	280	1 1/2	A3x, P3x	26
			A4x, P4x	71
			*A5x, P5x	92
			*B6x, P6x	138
6	360	1 1/2	A3x, P3x	16
			A4x, P4x	47
			*A5x, P5x	62
			*B6x, P6x	93

Shut-off values are for valves with TFE or EPDM packing. For valves with graphite packing contact factory for shut-offs.

NOTES:

1) 2920 leakage rating is ANSI Class IV.

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

*Requires 29S Stem Interface

VALVE			ILEA ACTUATOR	2922 SHUT-OFF ΔP (PSIG) 2-WAY DOUBLE SEAT BALANCED
Valve Size (IN)	Cv Rating	Plug Travel (IN)	Model Code Prefix	Fail Open, Closed or In Place
2 1/2	70	3/4	F1x	400
			A2x	400
			A3x, P3x	400
3	100	3/4	F1x	400
			A2x	400
			A3x, P3x	400
4	200	3/4	F1x	400
			A2x	400
			A3x, P3x	400
5	260	1 1/4	F1x	354
			A2x	400
			A3x, P3x	400
6	350	1 1/4	F1x	278
			A2x	355
			A3x, P3x	400
8	680	1 1/2	A2x	211
			A3x, P3x	400
10	960	1 1/2	A2x	146
			A3x, P3x	400

NOTES:

1) 2922 leakage rating is ANSI Class III.

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

VALVE			ILEA ACTUATOR	2923 SHUT-OFF ΔP (PSIG) 2-WAY CYLINDER BALANCED
Valve Size (IN)	Cv Rating	Plug Travel (IN)	Model Code Prefix	Fail Open, Closed or In Place
2 1/2	65	3/4	F1x	378
			A2x	400
			A3x, P3x	400
3	90	3/4	F1x	272
			A2x	361
			A3x, P3x	400
4	170	1 1/8	F1x	127
			A2x	194
			A3x, P3x	400
5	280	1 1/8	F1x	41
			A2x	96
			A3x, P3x	400
6	360	1 1/8	A3x, P3x	301
8	680	2 1/2	B4x, Q4x	400

Shut-off values are for valves with TFE or EPDM packing. For valves with graphite packing contact factory for shut-offs.

NOTES:

1) 2923 leakage rating is ANSI Class IV.

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

SHUT-OFF ΔP AND Cv RATINGS

NOTES:

1) 2930 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.

2) 2930 leakage rating is ANSI Class IV.

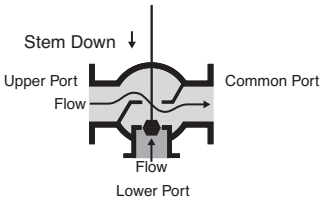
3) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

*Requires 29S Stem Interface

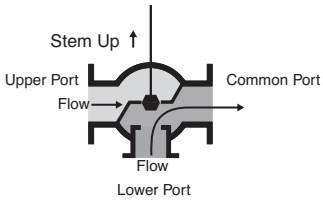
Shut-off values are for valves with TFE or EPDM packing. For valves with graphite packing contact factory for shut-offs.

VALVE			ILEA ACTUATOR	2930 SHUT-OFF ΔP (PSIG) 3-WAY MIXING	
				Fail Open, Closed or In Place	
Valve Size (IN)	Cv Rating	Plug Travel (IN)	Model Code Prefix	*LOWER SEAT*	*UPPER SEAT*
2 1/2	69	3/4	F1x	43	52
			A2x	56	65
			A3x, P3x	136	145
			A4x, P4x	318	327
			*A5x, P5x	400	400
3	86	3/4	F1x	25	32
			A2x	35	41
			A3x, P3x	90	96
			A4x, P4x	216	222
			*A5x, P5x	273	284
			*B6x, P6x	400	400
4	156	1 3/8	A3x, P3x	46	49
			A4x, P4x	117	120
			*A5x, P5x	149	155
			*B6x, P6x	220	227
5	270	1 3/8	A3x, P3x	26	28
			A4x, P4x	71	74
			*A5x, P5x	92	96
			*B6x, P6x	138	142
6	347	1 3/8	A3x, P3x	16	17
			A4x, P4x	47	49
			*A5x, P5x	62	64
			*B6x, P6x	93	96
8	590	2 1/2	*G72	45	45
			*G72	45	45
			*G72	45	45

2930 Three-Way Mixing Valve



The upper port opens and the lower port closes



The upper port closes and the lower port opens

NOTES:

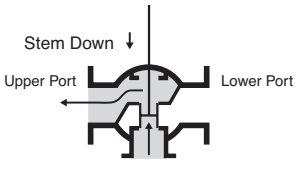
1) Published shut-off values are for diverting applications. The values are worst case and based on the pressure difference between the inlet and the outlet that is closed. Consult the factory if the required shut-off exceeds the published value and the pressure at the inlet and both outlets is known. 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 2932 mixing applications.

2) 2932 leakage rating is ANSI Class II.

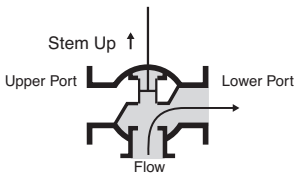
3) Inlet pressure **cannot** exceed Body Pressure-Temperature Rating.

VALVE			ILEA ACTUATOR	2932 SHUT-OFF ΔP (PSIG) 3-WAY DIVERTING/MIXING	
				Fail Open, Closed or In Place	
Valve Size (IN)	Cv Rating	Plug Travel (IN)	Model Code Prefix	*LOWER SEAT*	*UPPER SEAT*
2 1/2	68/75	3/4	F1x	100	100
			A2x	100	100
			A3x, P3x	100	100
3	85/95	3/4	F1x	100	100
			A2x	100	100
			A3x, P3x	100	100
4	160/180	3/4	F1x	100	100
			A2x	100	100
			A3x, P3x	100	100
5	195/220	1 1/4	F1x	100	100
			A2x	100	100
			A3x, P3x	100	100
6	270/300	1 3/8	A2x	100	100
			A3x, P3x	100	100
8	425/510	1 1/2	A2x	100	100
			A3x, P3x	100	100

2932 Three-Way Diverting Valve



The upper port opens and the lower port closes



The upper port closes and the lower port opens

Fluid Temperature Limit Thresholds

The engineering data within our product specification will share information about MAX fluid temperature limits as if it is an absolute for any configurable valve assembly. It is not. The MAX fluid temperatures listed, sometimes as high as 800 Deg. F depending on the valve is only an absolute one for the valve body itself. It does not take into consideration the actuation or accessories. Actuators and accessories each have their own MAX ambient temperature limits that may be anywhere from 122 °F to 250°F depending on the items for the electronics or soft goods these items contain. ***It is nearly impossible to correlate JUST fluid temperature to determine when any of these actuators or accessories will have their ambient exceeded.***

Predicting Safe Fluid Temperatures for Actuators & Accessories

THERE ARE SEVERAL FACTORS THAT DETERMINE FLUID TEMPERATURE LIMIT THRESHOLDS WHICH INCLUDE BUT ARE NOT LIMITED TO:

- valve size
- actuator orientation
- room ambient temperature
- distance from the valve body to the components of interest
- bonnet style/size
- conducted heat versus radiated heat
- ventilation

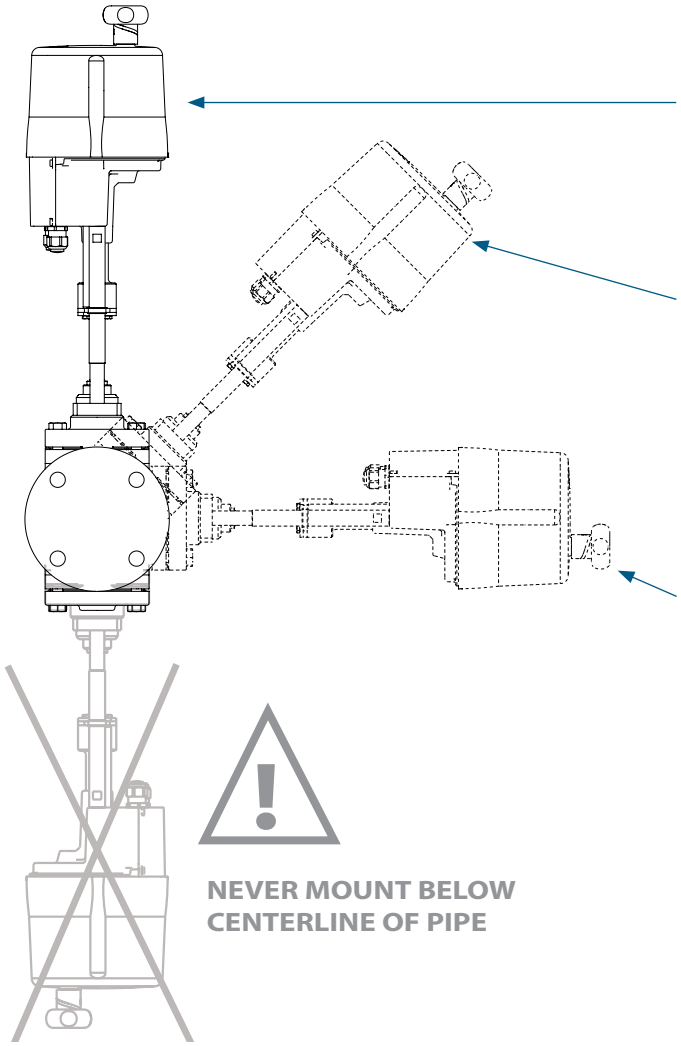
With all of these variables it is a challenge to come up with some guidelines.

However, we have attempted to do that in the tables that follow on page 19. Realize these are only guidelines.

Actuator Mounting VS *Insulating Blankets*

When working with higher fluid temperatures, thermal insulating blankets can ***dramatically reduce surface temperatures on pipes, valves and other fixtures*** in a fluid control system such that the ambient room temperatures in these environments are dramatically reduced as well. This is often required for valve actuators and accessories to reliably survive when fluid temperatures rise well above the safe ambient temperatures of the devices. Radiant heat and convected heat are the major sources for damage to these actuators and accessories. When a valve actuator is mounted to the side of a valve there is still radiant heat but convected heat is mostly eliminated. ***For globe control valves, having the actuator mounted vertically above the valve is best for optimum valve packing life but will then suffer the most with both radiant and convected heat to deal with.*** Alternatives to blankets and the mounting orientation listed include longer yoke actuators and extension bonnets on valves. These put distance between the heat sources and the components you are trying to protect from heat.

Actuator Mounting Orientations



VERTICAL ABOVE PIPING

This is the recommended position for mounting as it is the best position to ensure the service life of the equipment; however this is where it will encounter the most heat and sound vibrations.

45º FROM VERTICAL ABOVE PIPING ON EITHER SIDE

You may mount in this position to try to reduce the heat in high temperature applications; however this will reduce the life of the packing.

Actuators mounted in any position other than vertical MUST be supported independent of the valve.

90º TO PIPING HORIZONTAL ON EITHER SIDE

This is the worst possible position and creates great strain and limits the life of the internal components of the valve.

Actuators mounted in any position other than vertical MUST be supported independent of the valve.

NEVER MOUNT BELOW CENTERLINE OF PIPE

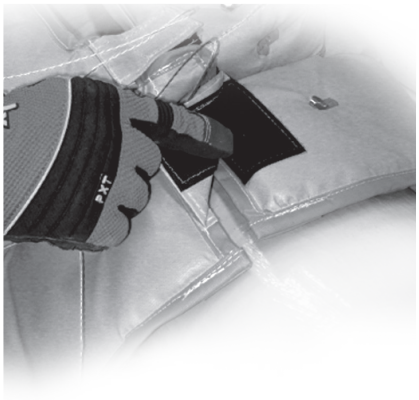
The tables that follow on page 20 will identify temperature ranges, valve size ranges, actuator orientation and use of thermal blankets to determine what is required to get longevity out of your actuators and accessories.

Choose the right blanket

ACOUSTIGUARD™ VS THERMIGUARD™

At Warren Controls our ***AcoustiGuard™ & ThermiGuard™*** blankets are nearly identical. In fact they have identical thermal properties. The ***AcoustiGuard™*** has an additional layer of high density barium sulfate vinyl reflector for sound reflection. Each blanket is specifically designed in a one or two piece design that is made to be easily removable for valve servicing. When used in conjunction with high temperature fluids, significant energy savings, lower surface & ambient temperatures and a ***safer environment for employees are just some of the benefits***.

Whether you need to lower your mechanical room temperature, avoid getting burned, reduce harmful noise or save energy our blanket wraps are your solution!



AcoustiGuard™ & ThermiGuard™ are custom fit high quality insulation blanket systems pre-engineered to either reduce harmful noise, or save energy by retaining radiant heat. Both are designed to improve the surrounding work environment. While ***AcoustiGuard™*** is designed to act as a "sound attenuation" and thermal barrier, ***ThermiGuard™*** is capable of withstanding weather conditions and chemical environments. Both are capable of withstanding maximum service temperatures of 450°F (***AcoustiGuard™ & ThermiGuard™***) or up to 800°F with the High Temperature option. Any piece will not exceed 40 pounds. ***AcoustiGuard™*** comes with 2 fastening options: Lacing Pins & Metal "D" Ring Strap with Velcro Tab. In addition to these fastening options, ***ThermiGuard™*** comes with 2 additional fastening options: Velcro Flaps & Side Release Buckles. The ***AcoustiGuard™ & ThermiGuard™*** products are designed to be flexible and easier to install, easy to remove and reinstall, allowing quick access and easy equipment serviceability.

- ***EASY TO INSTALL & REINSTALL***
- ***CAN WITHSTAND UP TO 450°F OR 800°F***
- ***MULTIPLE FASTENING OPTIONS***

AcoustiGuard Insertion Loss Sound Pressure Levels

107 dBA Source	A-Weighted Measurements	Linear Weighted Measurements
Test Frequency (In Hz)	Noise Reduction (In dBA)	Insertion Loss (In dBA)
100	13	13
125	14	13
160	13	13
200	13	13
250	13	12
315	15	15
400	19	19
500	25	25
630	26	33
800	39	39
1000	38	39
1250	42	42
1600	43	43
2000	43	43
2500	44	44
3150	45	44
4000	44	45
5000	46	45

Fluid Temperature Limit Guidelines

2900 ILEA F SERIES ACUTATOR

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET

	Valves: 2 1/2" - 6"
ACTUATOR ORIENTATION	***FLUID TEMPERATURE LIMIT***
Above the Valve	300°F
35° - 45° To the Side of the Valve	325°F
With either above actuator orientation and Thermiguard*	400°F

**Thermiguard are custom fit blanket wraps & assumes that pipes are insulated as well.*

2900 ILEA A/B SERIES ACUTATOR

Ensures reliable, long-term performance of diaphragm, seals and any included instrumentation.

STANDARD BONNET

	Valves: 2 1/2" - 10"
ACTUATOR ORIENTATION	***FLUID TEMPERATURE LIMIT***
Above the Valve	300°F
35° - 45° To the Side of the Valve	350°F
With either above actuator orientation and Thermiguard*	400°F

**Thermiguard are custom fit blanket wraps & assumes that pipes are insulated as well.*

These are simply rough guidelines and not absolute thresholds.

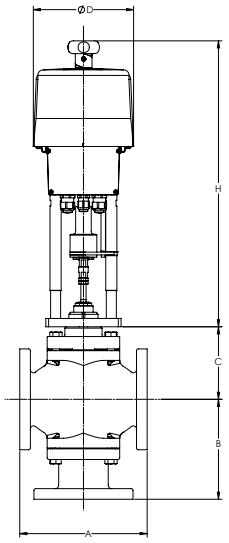
FACTORY DEFAULT SOFTWARE SETTINGS & ALTERNATE SOFTWARE SETTINGS

Control Signal:	4-20 mA (2-10 Vdc, wiring dependent) <FACTORY DEFAULT> 0-20 mA (0-10 Vdc, wiring dependent)
Control Action:	Decreasing Signal closes valve (2-way) closes Lower Port (3-Way) <FACTORY DEFAULT> Increasing Signal closes valve (2-way) closes Lower Port (3-Way)
Feedback Signal:	4-20 mA (2-10 Vdc, wiring dependent) <FACTORY DEFAULT> 0-20 mA (0-10 Vdc, wiring dependent)
Feedback Action:	Decreasing Signal valve closing (2-way) or closing Lower Port (3-Way) <FACTORY DEFAULT> Increasing Signal valve closing (2-way) or closing Lower Port (3-Way)
Control Signal Fails:	Generally follows power failure mode. Check the IOM or call factory for exceptions & details.
Digital Filtering*:	8 Samples <FACTORY DEFAULT> Range: 1 to 32 Samples
Dead Band*:	0.5% <FACTORY DEFAULT> Range: 0.5% to 5%
Power Failure:	Actuators that are Fail-In-Place actuators will have this as only choice <FACTORY DEFAULT> Actuators with Spring Fail will either close Stem Fail up or Stem fail down by model selection. Actuators with Capacitive Fail-Safe are preselected for Fail-Closed or Fail-Open at time of order, but with a programming umbilical cord and software can reverse this action in the field.
Critical Temperature*:	For ILEA-A/B models, when the ambient temperature is at 140°F (60°C) the following action can occur: 50% Speed <FACTORY DEFAULT>, Actuator Stop, Valve Open, Valve Close, Go to Specific Position.
MAX Temperature*:	For ILEA-A/B models, when the ambient temperature is at 158°F (70°C) the following action can occur: Valve Close on 2-Way Valves, Lower Port Closed on 3-Way Valves <FACTORY DEFAULT>, Actuator Stop, Valve Open, 50% Speed, Specific Position.
MAX Speed:	For ILEA-A3D model the Factory default is 50% of the Speed Range. For all other models the factory default is 100% of the Speed Range.

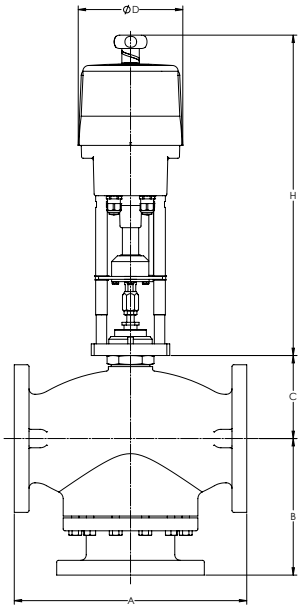
* Does not apply to ILEA-F Models

ILEA-A/B models allow for an optional Umbilical USB port cord and software to program various parameters and set ups.

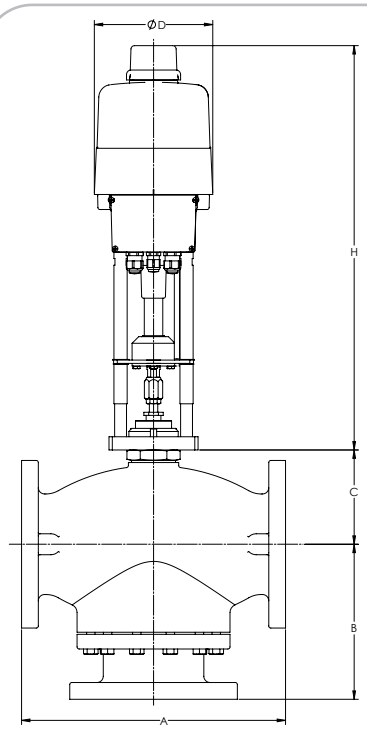
DIMENSIONS & WEIGHTS



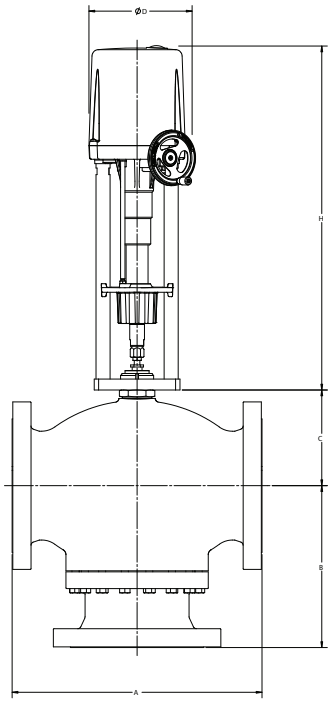
3-WAY
A2,A3,P3



3-WAY
A4,A5,B4, B5

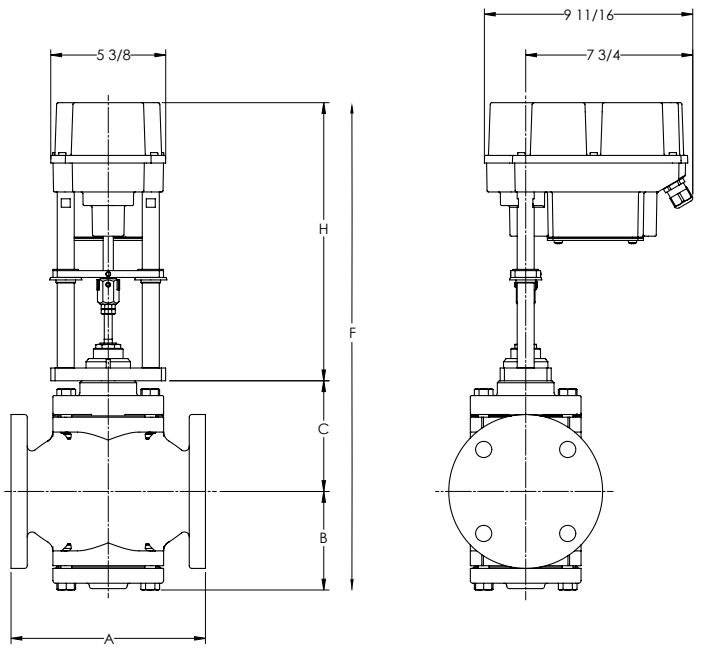


3-WAY
A6,P6,B4,B5



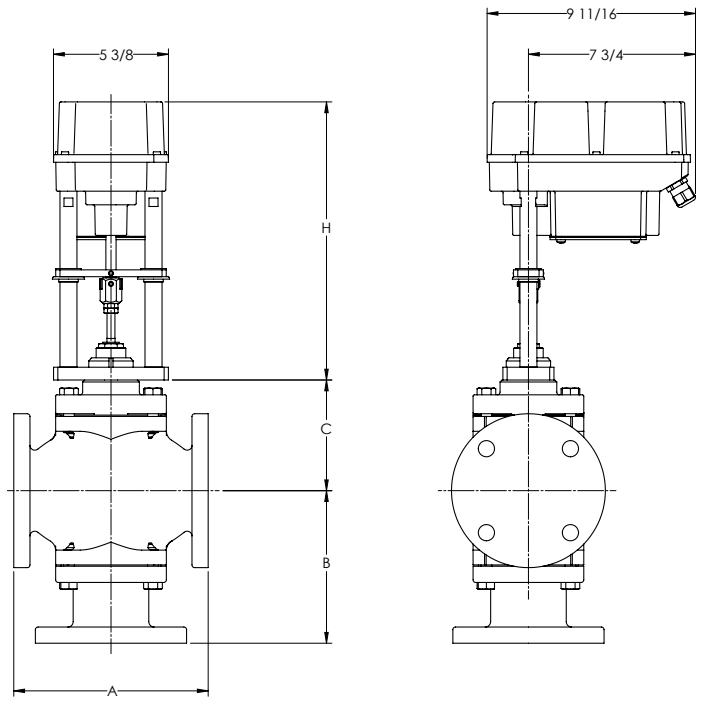
3-WAY
H7, H8, G7, G8

MEASUREMENT IN INCHES



2-WAY
F1

MEASUREMENT IN INCHES



3-WAY
F1

DIMENSION (IN) 2920		VALVE SIZE (IN)				
		2-1/2	3	4	5	6
A	125FLG	9	10	13	15-3/4	17-3/4
	250FLG	9-5/8	10-3/4	13-5/8	16-5/8	18-5/8
B		4-3/4	5-3/8	6-3/8	5-3/4	6-1/2
C		5-1/2	6-1/8	7-1/8	7-3/4	8-3/8
Weight (LB)	125FLG	55	72	119	134	175
	250FLG	64	77	131	166	233

DIMENSION (IN) 2922		VALVE SIZE (IN)						
		2-1/2	3	4	5	6	8	10
A	125FLG	7-3/4	9	11-3/8	12	14-1/8	16-1/4	20
	250FLG	8-3/8	9-3/4	12	12-7/8	14-1/2	16-1/4	21-3/8
B		4-1/8	4-3/8	5	6-7/8	7-5/8	8-7/8	10-7/8
C		4-7/8	5-3/8	6-5/8	7-5/8	8-1/2	9-5/8	11-1/4
Weight (LB)	125FLG	32	42	77	124	169	290	CF
	250FLG	42	54	96	162	220	380	CF

DIMENSION (IN) 2923		VALVE SIZE (IN)					
		2-1/2	3	4	5	6	8
A	125FLG	9	10	13	15-3/4	17-3/4	21-3/8
	250FLG	9-5/8	10-3/4	13-5/8	16-5/8	18-5/8	22-3/8
B		4-3/4	5-3/8	6-3/8	5-3/4	6-1/2	9
C		6	6-5/8	7-3/4	8-1/4	8-7/8	11-1/2
Weight (LB)	125FLG	57	75	127	149	197	CF
	25FLG	66	80	139	181	256	CF

DIMENSION (IN) 2930		VALVE SIZE (IN)					
		2-1/2	3	4	5	6	8
A	125FLG	9	10	13	15-3/4	17-3/4	21-3/8
	250FLG	9-5/8	10-3/4	13-5/8	16-5/8	18-5/8	22-3/8
B	125FLG	7-1/16	7-15/16	9-7/8	9-1/4	9-7/8	14-1/2
	250FLG	7-3/8	8-5/16	10-3/16	10-3/8	11	14-1/2
C		5-1/2	6-1/8	7-1/8	6	6-3/4	8-3/4
Weight (LB)	125FLG	64	83	139	157	202	343
	250FLG	73	94	157	211	283	CF

ACTUATOR	DIMENSIONS		WEIGHT
	D (in)	H (in)	
F1 (Fail-In-Place)	**NOTE 1	13	11
F1 (Fail-Safe)	**NOTE 1	13	12.3
P3	7.125	20.25	10
A2, A3	7.125	20.25	17.6
P4, P5	7.125	21.75	16
A4, A5	7.125	21.75	22
P6	7.125	24.75	17.6
A6, B4, B5	7.125	24.75	26.5
H7, H8	9.875	30.75	50.7
G7, G8	9.875	30.75	50.7

**NOTE 1: Please see the diagrams on the bottom of page 22 for dimensions.

DIMENSION (IN) 2932		VALVE SIZE (IN)					
		2-1/2	3	4	5	6	8
A	125FLG	9	10	13	12	14-1/8	16-1/4
	250FLG	9-5/8	10-3/4	13-5/8	12-7/8	14-1/2	16-1/4
B	125FLG	7-1/16	7-15/16	9-7/8	10-1/2	11-1/16	11-13/16
	250FLG	7-3/8	8-5/16	10-3/16	10-15/16	11-1/2	12-5/16
C		5-1/2	6-1/8	6-7/8	7-1/2	8-1/8	9-1/4
Weight (LB)	125FLG	59	78	140	154	203	316
	250FLG	73	94	166	215	284	407

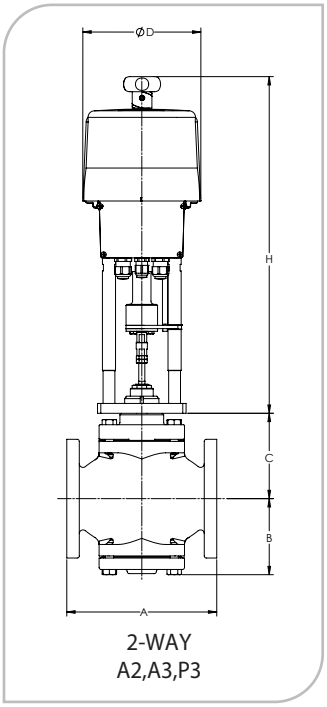
NOTES:

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

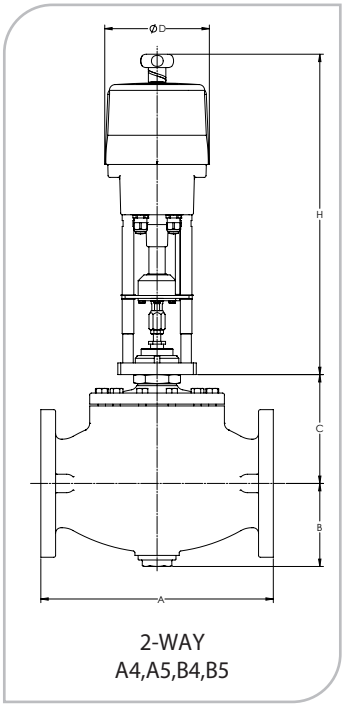
Actual shipping weights may vary.

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

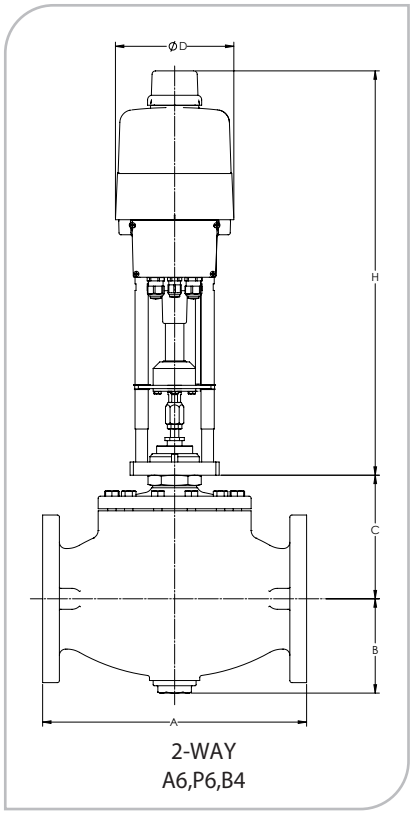
CF = Consult Factory



2-WAY
A2,A3,P3



2-WAY
A4,A5,B4,B5



2-WAY
A6,P6,B4

1. SELECTIONS

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

29□ - □□ □□□ R □ □ □ □ □

VALVE BODY

Model	Valve Type	Size	Body Material	End Conn.	Trim Style	Trim Material	Trim Cv	Packing Type
E Standard Valve Stem	**20** 2-Way, Single Seat	**250** 2-1/2 inch	**R** Cast Iron	**F** 125 lb. Flanged	**E** Equal % Types 20/22/23	**B** Bronze	**F** Full Port	**T** Teflon
S Heavy Valve Stem	**22** 2-Way Double Seated	**300** 3 inch		**G** 250 lb. Flanged	**L** Linear Types 20 Stainless Steel 2.5"-4" only, 23/30/32 Full Product Line*	**S** 300 SS		**G** Graphite
See Product Specifications	**23** 2-Way Cylinder Bal.	**400** 4 inch			**Type 23 is not available in Bronze Trim*	**H** 17-4 pH		**V** Vacuum Service
	30 3-Way Mixing	**500** 5 inch				**6** Alloy 6 Wrapped 300 SS		**L** EPDM
	32 3-Way Diverting	**600** 6 inch						
		800 8 inch						
		010 10 inch						

VALVE TYPE/ACTUATOR COMPATIBILITY:

MODEL	VALVE STYLE	VALVE SIZES	ILEA ACTUATORS
29E, 29S	TYPE 20	2 1/2" - 3"	ILEA- F
29E, 29S	TYPE 20	2 1/2" - 6"	ILEA -A
29E	TYPE 22	2 1/2" - 6"	ILEA- F
29E	TYPE 22	2 1/2" - 10"	ILEA -A
29E	TYPE 23	2 1/2" - 5"	ILEA-F
29E	TYPE 23	2 1/2" - 6"	ILEA -A
29E	TYPE 23	8"	ILEA-B
29E, 29S	TYPE 30	2 1/2" & 3"	ILEA-F
29E, 29S	TYPE 30	2 1/2" - 6"	ILEA-A
29S	TYPE 30	8"	ILEA-G
29E	Type 32	2 1/2" - 5"	ILEA- F
29E	Type 32	2 1/2" - 8"	ILEA -A

CRN REGISTERED

CRN (Canadian Registration Number)

Valve	FLG	Size (inch) 2-1/2	3	4	5	6	8	10
2920	125	Y	Y	Y	Y	Y	Y	---
	250	Y	Y	Y	Y	Y	Y	---
2922	125	Y	Y	Y	Y	Y	Y	Y
	250	N	N	N	N	N	N	N
2923	125	Y	Y	Y	Y	Y	Y	---
	250	Y	Y	Y	Y	Y	Y	---
2930	125	Y	Y	Y	Y	Y	Y	---
	250	Y	Y	Y	Y	Y	Y	---
2932	125	Y	Y	Y	Y	Y	Y	---
	250	N	N	N	N	N	N	---

Y = Yes, currently registered - CRN # CSA - OC20496
N = No, not currently registered

1. SELECTIONS

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

- ILEA- □ □ □ - □ □ □ □ - □ □ □ □

ACTUATOR

ILEA-	Model	Max Force (lbf)	Max Speed *(seconds/inch valve travel @60Hz or DC)*	Failure Mode	Voltage Supply	Binary Input	Comm.	Enclosure Rating	Local Control Station	Heater	Switches
	F Small Frame	**1** 450	**0** 85 Seconds	**M** Fail in Place	**1** 115 Vac	**0** 24V	**0** None	**5** IP65	**0** None	**0** None	**0** None
	A Medium Frame Modulating	**2** 515	**1** 73 Seconds	**U** Spring Fail Up	**2** 230 Vac	**2** 115/230V	**P** Profibus	**7** IP67	**L** Local	**H** Heater	**S** Silver Switch
	B Medium Frame Modulating (2.5" Stroke)	**3** 1010	**2** 64 Seconds	**D** Spring Fail Down	**4** 24 Vac		**C** CANopen				
	P Medium Frame ON - OFF	**4** 1800	**3** 56 Seconds	**S** Capacitive Fail Safe	**5** 24 Vdc		**F** Foundation				
	Q Medium Frame ON - OFF (2.5" Stroke)	**5** 2250	**4** 47 Seconds								
	G Large Frame Modulating (4" Stroke)	**6** 2900	**5** 42 Seconds								
		7 2900	**6** 36 Seconds								
			7 33 Seconds								
			8 28 Seconds								
			9 25 Seconds								
			A 21 Seconds								
			B 20 Seconds								
			C 15 Seconds								
			D 6 Seconds								

(NOTE: FOR D ONLY unless there is a special request this will be shipped at 50%-12 seconds)

NOTE:
All attributes combinations are not possible. Stocked Models are listed below. For other available models, refer to the product specification or check with the Warren Controls Factory.

1/2" Female NPT, NEMA 4X Conduit Adapter kits (As Accessory)		
QTY	**Description**	**Part Number**
1 EA	Male M20 to 1/2" FNPT	KCONDUITADAPTER00
1 EA	Male M16 to 1/2" FNPT	KCONDUITADAPTER01

STOCKED MODELS:

ORDERCODE	VOLTAGE	DESCRIPTION	IN STOCK AVAILABLE OPTIONS	SPECIAL ORDER AVAILABLE OPTIONS
ILEA-F18-D400-5000	24 Vac	Small Frame, 450 Lbf, 28 Seconds / Inch, Spring Fail Down, IP65 Enclosure	- 100 - 240 Vac Power Supply - Limit Switches - Case Heater	N/A
ILEA-F18-D500-5000	24 Vdc			
ILEA-F18-U400-5000	24 Vac	Small Frame, 450 Lbf, 28 Seconds / Inch, Spring Fail UP, IP65 Enclosure		
ILEA-F18-U500-5000	24 Vdc			
ILEA-F1A-M400-5000	24 Vac	Small Frame, 450 Lbf, 21 Seconds / Inch, Fail-In-Place w/ manual Override, IP65 Enclosure		
ILEA-F1A-M500-5000	24 Vdc			
ILEA-A3D-S100-7000	115 Vac	Medium Frame, 1012 Lbf, up to 6 Seconds / Inch (factory default 11 seconds), Capacitive Fail-Safe, IP 67 Enclosure	- Case Heater - Local Control Station - Limit Switches - Programming Umbilical Cord	- Alternate Actuator Forces - Alternate Speed Ranges - Alternate Voltage Supply - Alternate Binary Input Voltage - Various Communications Protocols
ILEA-A3D-S400-7000	24 Vac	Medium Frame, 1012 Lbf, up to 6 Seconds / Inch (factory default 11 seconds), Capacitive Fail-Safe, IP 67 Enclosure		
ILEA-A3D-S500-7000	24 Vdc			
ILEA-A3D-M400-7000	24 Vac	Medium Frame, 1012 Lbf, up to 6 Seconds / Inch (factory default 11 seconds), Fail-In-Place, IP 67 Enclosure		
ILEA-A3D-M500-7000	24 Vdc			

MATERIAL CHOICES & FLUID TEMPERATURE LIMITS

FLUID TEMPERATURE LIMITS						
Valve Type	**Body Material & Code**	**End Conn. & Code**	**Trim Material & Code**	**Packing Type & Code**	**T MAX**	**T MIN**
20 2-Way Single Seat	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**, 17-4 pH **H**	Teflon **T**, Vacuum Service **V**	350°F	60°F
	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**, 17-4 pH **H**	Graphite **G**, EPDM **L**	350°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**, 17-4 pH **H**	EPDM **L**	400°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**, 17-4 pH **H**	Teflon **T**, Vacuum Service **V**	400°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**, 17-4 pH **H**	Graphite **G**	400°F	-20°F
22 2-Way Double Seat	Cast Iron ***R***	125 lb **F**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	350°F	60°F
	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**	Graphite **G**, EPDM **L**	350°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	EPDM **L**	400°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	400°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Graphite **G**	400°F	-20°F
23 2-Way Cylinder Balanced	Cast Iron **R**	125 lb **F**	Bronze **B**	Teflon **T**, Vacuum Service **V**	300°F	60°F
	Cast Iron **R**	125 lb **F**	Bronze **B**	Graphite **G**, EPDM **L**	300°F	-20°F
	Cast Iron **R**	125 lb **F**	300 SS **S**, 17-4 pH **H**, Alloy 6 Wrapped **6**	Teflon **T**, Vacuum Service **V**	350°F	60°F
	Cast Iron **R**	125 lb **F**	300 SS **S**, 17-4 pH **H**, Alloy 6 Wrapped **6**	Graphite **G**, EPDM **L**	350°F	23°F
	Cast Iron **R**	250 lb **G**	Bronze **B**	Teflon **T**, Vacuum Service **V**	300°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**	Graphite **G**, EPDM **L**	300°F	-20°F
	Cast Iron **R**	250 lb **G**	300 SS **S**, 17-4 pH **H**, Alloy 6 Wrapped **6**	EPDM **L**	400°F	23°F
	Cast Iron **R**	250 lb **G**	300 SS **S**, 17-4 PH **H**, Alloy 6 Wrapped **6**	Teflon **T**, Vacuum Service **V**	400°F	60°F
	Cast Iron **R**	250 lb **G**	300 SS **S**, 17-4 pH **H**, Alloy 6 Wrapped **6**	Graphite **G**	400°F	23°F
30 3-Way Mixing	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	350°F	60°F
	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**	Graphite **G**, EPDM **L**	350°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	EPDM **L**	400°F	-20°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	400°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Graphite **G**	400°F	-20°F
32 3-Way Diverting (2-1/2 thru 5)	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	300°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Graphite **G**, EPDM **L**	300°F	-20°F
32 3-Way Diverting (6 & 8)	Cast Iron **R**	125 lb **F**	Bronze **B**, 300 SS **S**	Teflon **T**, Vacuum Service **V**	150°F	60°F
	Cast Iron **R**	250 lb **G**	Bronze **B**, 300 SS **S**	Graphite **G**, EPDM **L**	150°F	-20°F

Note: -20°F T MIN temperature limit is for indoor applications with low humidity where ice will not form on the valve stem.

VALVE TYPE/TRIM MATERIAL COMBINATIONS:

TRIM MATERIAL				
SIZE	**B** Bronze	**S** 300SS	**H** 17-4 PH	**6** Alloy Wrapped
250 2-1/2 in.	20, 22, 23, 30, 32	20, 22, 23, 30, 32	20, 23	23
300 3 inch	20, 22, 23, 30, 32	20, 22, 23, 30, 32	20, 23	23
400 4 inch	20, 22, 23, 30, 32	20, 22, 23, 30, 32	20, 23	23
500 5 inch	20, 22, 23, 30, 32	20, 22, 23, 30, 32	20, 23	23
600 6 inch	20, 22, 23, 30, 32	20, 22, 23, 30, 32	20, 23	23
800 8 inch	22, 32	22, 23, 30, 32	23	23
010 10 inch	22	22	N/A	N/A

WARREN CONTROLS
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DEPENDABLE, RUGGED, PRECISION CONTROL VALVES AND ACCESSORIES

VALVE SIZING DATA SHEET

DATE:

Customer Information

Highlight Preferred Contact Method

Company		Phone	
Contact		Fax	
Address		Email	
City, State, Zip		Project	

Application Data (*Indicates "Valuable" Information) (* * Indicates Required Information)

System Information			
Valve Tag (Name)			
System	* *		
Fluid	*		
Specific Gravity			
Pipe Size	*		
Pipe Material	* *		
Process Information			
	Maximum	Normal	Minimum
Flow Rate (GPM)/(Lbs./Hr.)	* *		*
…or, Required Cv	* *		*
P_1 = Inlet Pressure (PSIG)	* *		*
DP = Pressure Drop (PSIG)	* *		*
…or, P_2 = Outlet Pressure (PSIG)	* *		*
Temperature (Degrees F)	* *		*

Valve Information			
Type (Globe, Rotary, Any 2-way, 3-way Mix, 3-way Divert)		Operation (on-off, mix, divert, modulating)	
Size		End Connections	
Pressure Class		Trim Cv (FP, 1R, 2R, etc.)	
Body Material		Flow Direction (FTO,FTC)	
Trim Materials		Shaft Design	
Packing & Seals		Shut-Off Requirement	

Actuator & Control Information	
	Pneumatic / Electric / Model / Ratings
Type	
Supply Available / Air - (PSIG) Power – (VAC/Hz)	
Positioner Type / Increasing Signal (opens/closes)	
Control Signal (3-15psi, 4-20mA, etc.)	
Solenoid and/or Limit Switches	
Air Filter/Regulator (If Applicable / Range)	
Manual Override w/ Handwheel	
Failure Mode (open / close / As Is) Spring / Electric / None	
Tubing Material (copper, SS)	
Special Set ups or Misc. Accessories	

Notes • Specifications • Further Information

2900E PRODUCT SPECIFICATION

1800 SERIES

Heavy Globe Control Valves

styles:

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

sizes	1/2 to 12 in.
class	250 & 300
ends	125 FF, 150, 250, 300 RF flg
body	Cast Iron, WCB,CF8M, Bronze (ASTM B61)
trim	316 SST, Alloy 6
Cv	up to 1649
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class III, IV, 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
- 2-way low flow
- 3-way mixing
- 3-way diverting

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

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

2900

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	125 FF, 250 RF flg
body	Cast Iron
trim	Bronze, 300 SS, 17-4pH, Alloy 6
Cv	up to 960
temp.	-20° to 400°F
body limit	to 400 psi
leakage rates	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

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, Custom Alloys
trim	316 SST, Alloy 6, Ceramic, TFE, PEEK
Cv	up to 1420
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class IV, 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 unbalanced cage retained seat
- 2-way low flow unbalanced cage retained seat
- 2-way cage balanced cage retained seat

sizes	1/2 to 4 in.
class	300
ends	150,300 RF flg, Socketweld, NPT
body	WCB, CF8M, Bronze (ASTM B61)
trim	316 SST, 400 SST, Alloy 6, TFE, PEEK
Cv	up to 170
temp.	-20° to 800°F
body limit	to 740 psi
leakage rates	class IV, IV+, VI
rangeability	50:1

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