



Electric Actuated 3-Way Ball Valves-

EPS Positioner

SERIES
5864
5865

L-Port, Lead Free Brass, Full Port
1/4" to 2" NPT – Explosion Proof

Features

- Full Port Lead Free Brass Diverter/ Selector Valve
- Valve certified NSF372 & NSF/ANSI/CAN 61-2020 for potable/drinking water
- EPS – Electronic Positioning System with 4-20mA input
- UL C1/ D1 Explosion Proof rated
- High strength glass lens valve position indicator
- Rugged aluminum Type 4X weatherproof enclosure
- Heavy duty motor with overload protection
- Manual override with end of travel mechanical stops
- Actuators CSA Listed per UL429 and CSA C22.2 and Explosion ratings per Approvals section
- Electrical interface: Two 1/2" NPT threaded ports with temporary plugs. Remove and replace with corresponding explosion proof cable connectors, pipe or plugs (Not Included)

Applications

Electric actuated flow diverter or selector valves are typically used to control the flow of water, air, oil and other media compatible with the materials of construction. Ideal where lead free and NSF approved construction are required for potable drinking water as well as general industrial applications in hazardous environments. Suitable vacuum service to 29" Hg. Actuator designed for 70% duty cycle.

Flow pattern is highly non-linear. Refer to page 3 for flow vs position.

Operation

Explosion proof electric actuated valves with EPS- Electronic Positioning System provide an accurate valve positioning function whereby the movement of the actuator is controlled by 4-20mA input control signal. Any change in the control input signal results in a corresponding and proportional change in the position of the actuator. Flow is adjustable anywhere between 0-100%. Unique electronic positioning module is fully potted to help protect the electronics from vibration/moisture resistance.

Construction

Valve Body	Lead free brass C69300
Ball/Stem	316 stainless steel
Ball Seats	(4) PTFE (Teflon) energized with FKM (Viton)
Stem Seals	PTFE (Teflon) with (2) additional FKM (Viton) seals
Gear Drive	Heavy duty alloy steel /aluminium bronze, self locking
Actuator Enclosure	Anti-corrosive durable painted aluminum alloy, Type 4X/ IP67
Visual Valve Position Indicator	High strength glass lens
Fasteners	Stainless Steel



Description

Explosion proof electrically operated Full Port 3-way L-port flow pattern ball valve has four energized PTFE ball seats allowing for full pressure at any port. Leak free triple PTFE/FKM stem seal design. Rugged Type 4X explosion proof electric actuator includes a manual override, 4-20mA servo controller, thermostatically controlled anti-condensation heater, and over-torque protection.

Approvals

Actuators



ANTI EXPLOSION GRADE

The anti-explosion grade of these actuators is

- ♦ Class 1, Division 1, Groups C & D T5
- ♦ Ex db IIC T5 Gb Class 1 Zone 1
- ♦ AEx db IIC T5 Gb

Where:

Class I – Hazard Class

Division 1/ Zone 1 – Area Classification

db – Explosion Proof Type

II – Electrical Equipment design for explosive atmospheres (except colliery)

C – Magnitude of the explosion

T5 - Highest allowed surface temperature of the actuator (+55C)

Gb – Protection Grade

The grades of combustible gas, steam and temperature group are listed in CSA 22.2 No 60079-0-2019, CSA 22.2 No 60079-1-2016, CSA 22.2 No 30-M1986(R2016), CSA 22.2 No 145-11(R2015), ANSI/UL 60079-2:2020, ANSI/UL 1203-2013, ANSI/UL 674 Fifth Edition. It is the user's responsibility to ensure compatibility with the applicable regulations.

- CE Conformance- EN 60204-1:2006

Valves

- IAPMO RT certified to:
 - NSF/ANSI 372 - 2011 Drinking Water
 - NSF/ANSI/CAN 61-2020
 - Weighted average lead content < = 0.25%
- Meets design MSS-SP-110



Construction Features



Pressure-Temperature*

Pressure Rating: 400 PSI CWP (27 Bar) non-shock

29" Hg vacuum, 25 PSI steam with high temp. kit

Ball Valve Temperature Rating: 0 to 344° F (-18 to 173° C)

Actuator Temperature Rating: -13 to 131° F (-25 to 55° C)

* See P/T chart

Installation Requires-Two 1/2" NPT threaded explosion-proof connectors or pipe for electrical interface

(**Not included**)



Visual Valve
Position Indicator

Pressure/Temperature Chart (PSI/°F)

P/T Chart						
PSI	400	400	400	400	375	275
°F	0	50	100	176	200	266

Pressure/Temperature Chart (Bar/°C)

P/T Chart						
Bar	27	27	27	27	26	19
°C	-18	10	38	80	93	130

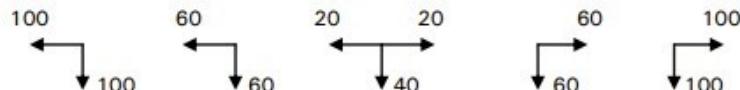
Flow Path Features

L-Port Diverter

Position 1 (0°) Position 2 (90°)



Orifice Size %



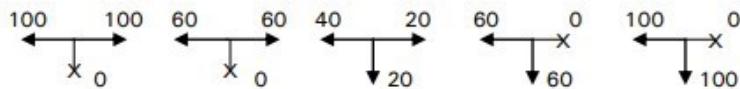
Manual Operation	0°	22.5°	45°	67.5°	90°
4-20 mA Input	4mA	8mA	12mA	16mA	20mA
0-10 volt Input	0V	2.5V	5V	7.5V	10V

T-Port Diverter

Position 1 (0°) Position 2 (90°)



Orifice Size %



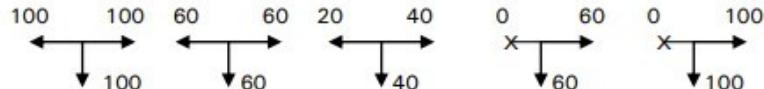
Manual Operation	0°	22.5°	45°	67.5°	90°
4-20 mA Input	4mA	8mA	12mA	16mA	20mA
0-10 volt Input	0V	2.5V	5V	7.5V	10V

T-Port Mixing

Position 1 (0°) Position 2 (90°)



Orifice Size %



Manual Operation	0°	22.5°	45°	67.5°	90°
4-20 mA Input	4mA	8mA	12mA	16mA	20mA
0-10 volt Input	0V	2.5V	5V	7.5V	10V

Note: A) Orifice Size % is the approximate orifice size of each port shown as a percent of full open. B) Examples shown are 3-way quarter turn (90°) ball valves with full port design. Actuator at 0° is considered position 1 and 90° position 2.

Specifications (English units)

Stock Number	Pipe Size (NPT)	Orifice Size (inch)	Cv Flow Factor	Pressure Max.(PSI)*	Cycle Time/90°	Voltage	Current (amps)	Duty Cycle	Electrical Dwg.
120 VAC ELECTRIC ACTUATED 3-WAY LF BRASS BALL VALVE: L-PORT with EPS POSITIONER 4-20mA input									
586402	1/4	0.4	3.2	400	20	110 VAC, 50/60Hz	0.27	70%	E
586403	3/8	0.4	3.5	400	20	110 VAC, 50/60Hz	0.27	70%	E
586404	1/2	0.6	4.5	400	20	110 VAC, 50/60Hz	0.27	70%	E
586406	3/4	0.8	10.0	400	20	110 VAC, 50/60Hz	0.27	70%	E
586408	1	1.0	16.0	400	20	110 VAC, 50/60Hz	0.27	70%	E
586410	1-1/4	1.2	31.0	400	20	110 VAC, 50/60Hz	0.27	70%	E
586412	1-1/2	1.5	49.0	400	20	110 VAC, 50/60Hz	0.27	70%	E
586416	2	2.0	82.0	400	30	110 VAC, 50/60Hz	0.63	70%	E
24 VDC ELECTRIC ACTUATED 3-WAY LF BRASS BALL VALVE: L-PORT with EPS POSITIONER 4-20mA input									
586502	1/4	0.4	3.2	400	20	DC24	1.8	70%	GEY
586503	3/8	0.4	3.5	400	20	DC24	1.8	70%	GEY
586504	1/2	0.6	4.5	400	20	DC24	1.8	70%	GEY
586506	3/4	0.8	10.0	400	20	DC24	1.8	70%	GEY
586508	1	1.0	16.0	400	20	DC24	1.8	70%	GEY
586510	1-1/4	1.2	31.0	400	20	DC24	1.8	70%	GEY
586512	1-1/2	1.5	49.0	400	20	DC24	1.8	70%	GEY
586516	2	2.0	82.0	400	30	DC24	2.4	70%	GEY

* Pressure at 176° F (reduce pressure for higher temperatures, see P/T chart)

Electric Actuated 3-Way L-port Valves
Valve positioning and how it works?

Valworx electric actuators with EPS- Electronic Positioning System provide an accurate valve positioning function whereby the movement of the actuator is controlled by a 4-20mA input control signal. Any change in the control input signal results in a corresponding and proportional change in the position of the actuator (valve).

This is achieved with a unique built in electronic positioning module. The module is fully potted to help protect the electronics from vibration and moisture resistance.

An internal microprocessor on the EPS circuit board continuously monitors the analog input and output signals and compares them to the physical position via a precision potentiometer feedback system, moving the actuator as required to balance the signals.

The EPS system is self-calibrating which virtually eliminates "hunting". The following functions are standard:

- Position monitoring output signal in same format as input. Ex: 4-20mA input, 4-20mA output
- Adjustable forward or reversing action.
- Deadband adjustment
- Selectable fail mode: fail closed, fail open or stop in place (for loss of input command signal).
- Electric manual control with onboard switches
- Fault LED lights indicate valve jam or signal loss
- Electronic brake function
- Refer to page 3 for signal vs flow characteristics



SERIES
5864
5865

Specifications (Metric units)

Stock Number	Pipe Size (NPT)	Orifice Size (mm)	Kv Flow Factor	Pressure Max.(Bar)*	Cycle Time/90° (seconds)	Voltage	Current (amps)	Duty Cycle	Electrical Dwg.
120 VAC ELECTRIC ACTUATED 3-WAY LF BRASS BALL VALVE: L-PORT with EPS POSITIONER 4-20mA input									
586402	1/4	10.0	2.8	27	20	110 VAC,50/60Hz	0.27	70%	E
586403	3/8	10.0	3.0	27	20	110 VAC,50/60Hz	0.27	70%	E
586404	1/2	15.0	3.9	27	20	110 VAC,50/60Hz	0.27	70%	E
586406	3/4	19.0	8.6	27	20	110 VAC,50/60Hz	0.27	70%	E
586408	1	25.0	14.0	27	20	110 VAC,50/60Hz	0.27	70%	E
586410	1-1/4	31.0	27.0	27	20	110 VAC,50/60Hz	0.27	70%	E
586412	1-1/2	38.0	42.0	27	20	110 VAC,50/60Hz	0.27	70%	E
586416	2	50.0	70.0	27	30	110 VAC,50/60Hz	0.63	70%	E
24 VDC ELECTRIC ACTUATED 3-WAY LF BRASS BALL VALVE: L-PORT with EPS POSITIONER 4-20mA input									
586502	1/4	10.0	2.8	27	20	DC24	1.8	70%	GEY
586503	3/8	10.0	3.0	27	20	DC24	1.8	70%	GEY
586504	1/2	15.0	3.9	27	20	DC24	1.8	70%	GEY
586506	3/4	19.0	8.6	27	20	DC24	1.8	70%	GEY
586508	1	25.0	14.0	27	20	DC24	1.8	70%	GEY
586510	1-1/4	31.0	27.0	27	20	DC24	1.8	70%	GEY
586512	1-1/2	38.0	42.0	27	20	DC24	1.8	70%	GEY
586516	2	50.0	70.0	27	30	DC24	2.4	70%	GEY

* Pressure at 80° C (reduce pressure for higher temperatures, see P/T chart)

Electrical Wiring Diagram

ELECTRICAL WIRING

Confirm the actuator VOLTAGE is correct, then remove the terminal box cover and connect wiring to terminal strip according to appropriate wiring diagram.

Wiring diagrams for each actuator are attached to the inside of the terminal box cover.

Input control signal type is 4-20mA. Actuator should have its own fused and isolated circuit. Do not connect actuators in parallel. Power to actuator should be maintained to activate the internal heater. This heater will help prevent condensation build-up inside the actuator.

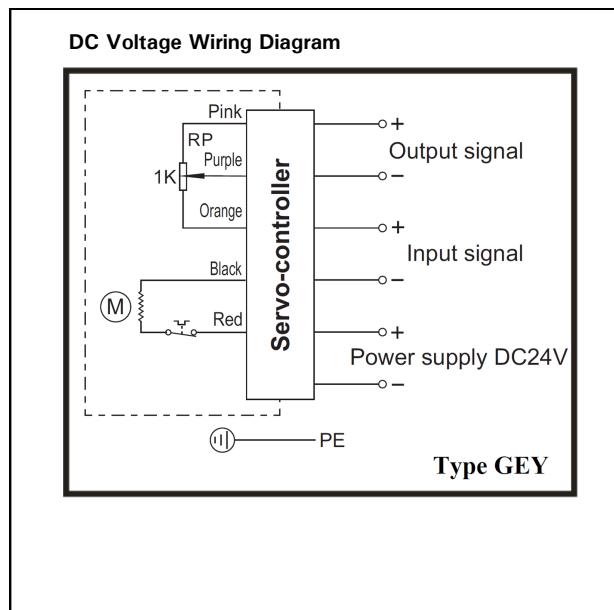
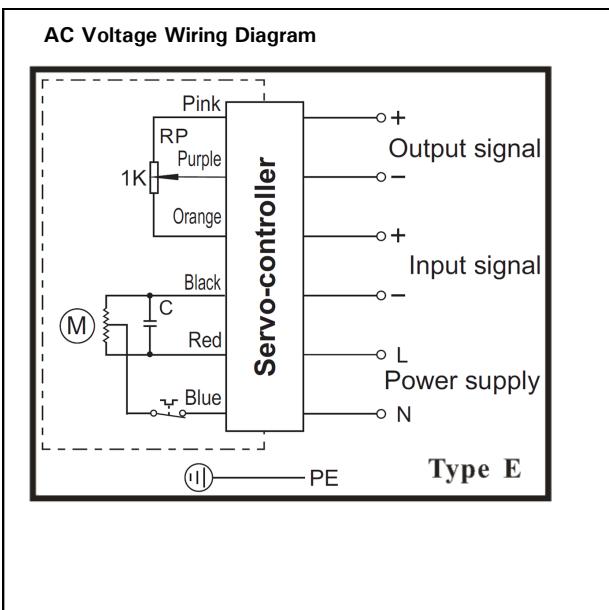
⚠ Before connecting power, confirm correct VOLTAGE is being applied. Incorrect voltage may damage actuator and void the warranty.

OPERATION (EPS ONLY)

Valworx 5818 series electric actuators with EPS- Electronic Positioning System provide an accurate valve positioning function whereby the movement of the actuator is controlled by a 4-20mA input control signal. Any change in the control input signal results in a corresponding and proportional change in the position of the actuator drive output.

This is achieved with a unique built in electronic positioning module. The module is fully potted to help protect the electronics from vibration and moisture.

An internal microprocessor on the EPS circuit board continuously monitors the analog input and output signals and compares them to the physical position via a precision potentiometer feedback system, moving the drive output as required to balance the signals



AC Voltage Wiring:

1. AC power - Neutral
2. AC power - Line/Hot
3. Input control signal - Negative (-)
4. Input control signal - Positive (+)
5. Output monitoring signal - Negative (-)
6. Output monitoring signal - Positive (+)

DC Voltage Wiring:

1. DC power - Negative (-)
2. DC power - Positive (+)
3. Input control signal - Negative (-)
4. Input control signal - Positive (+)
5. Output monitoring signal - Negative (-)
6. Output monitoring signal - Positive (+)

EPS POSITIONER TECHNICAL DATA

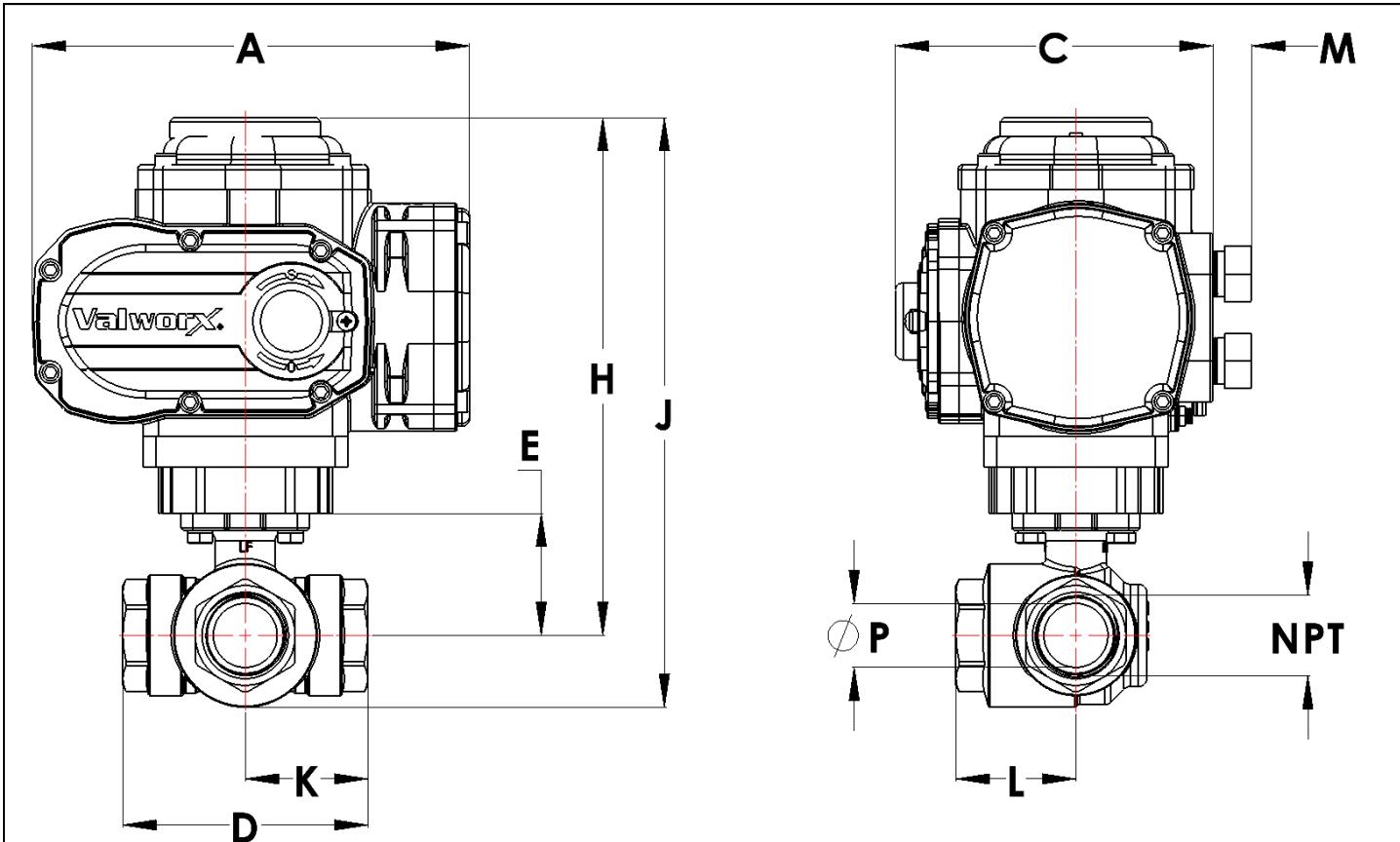
Input Signal: 4-20mA

Output Signal: 4-20mA

Deadband: 0.5% to 5.0%

NOTES: 1. Actuator should have its own fused and isolated circuit. 2. Do not wire actuators in parallel. 3. Output signal is 4-20mA. Use of the output is optional.

Dimensions:



Pipe Size (NPT)		A	C	D	E	H	J	K	L	M	P	Weight
1/4	inch	6.7	4.7	2.2	1.0	7.1	7.7	1.1	1.1	0.6	0.4	8.1 lb
	mm	170.5	118.5	55.6	26.5	179.8	195.0	27.8	27.5	15.0	10.0	3.7 kg
3/8	inch	6.7	4.7	2.2	1.0	7.1	7.7	1.1	1.1	0.6	0.4	8.1 lb
	mm	170.5	118.5	55.6	26.5	179.8	195.0	27.8	27.5	15.0	10.0	3.7 kg
1/2	inch	6.7	4.7	2.9	1.3	7.4	8.2	1.4	1.4	0.6	0.6	8.7 lb
	mm	170.5	118.5	73.0	33.5	187.4	207.7	36.5	36.5	15.0	15.0	3.9 kg
3/4	inch	6.7	4.7	3.3	1.7	7.7	8.6	1.6	1.6	0.6	0.8	9.4 lb
	mm	170.5	118.5	83.0	43.0	194.6	217.4	41.5	41.5	15.0	19.0	4.3 kg
1	inch	6.7	4.7	3.8	1.9	7.9	9.0	1.9	1.8	0.6	1.0	10.1 lb
	mm	170.5	118.5	95.6	47.6	199.6	227.6	47.8	46.8	15.0	25.0	4.6 kg
1-1/4	inch	6.7	4.7	4.2	2.2	8.2	9.5	2.1	2.0	0.6	1.2	11.1 lb
	mm	170.5	118.5	107.0	55.0	207.3	240.3	53.5	51.0	15.0	31.0	5.0 kg
1-1/2	inch	6.7	4.7	5.0	2.6	8.6	10.2	2.9	2.4	0.6	1.5	13.7 lb
	mm	170.5	118.5	126.0	65.5	217.4	258.1	63.0	60.0	15.0	38.0	6.2 kg
2	inch	8.6	5.5	5.9	3.0	10.2	12.2	2.9	2.7	0.6	2.0	22.5 lb
	mm	217.5	139.7	149.0	77.0	258.1	308.9	74.5	69.0	15.0	50	10.2 kg