

## **Electric Multi-Voltage Actuators**

24-240 Volt AC/DC 3097 inch lbs (300Nm)

**5616** 

#### **Features**

- Quarter turn (90°) operation
- Long life brushless motor
- Multi-voltage capable with auto-voltage sensing
- External LED diagnostic light
- IP67 weatherproof enclosure, UV resistant
- ISO5211 multi-flange valve mounting pad
- · Thermostatically controlled anti-condensation heater
- Manual override
- Highly visual valve position dome style indicator
- Auxiliary limit switches to confirm valve open/closed position
- Digital positioner and battery failsafe options available
- Nominal life > 60,000 cycles
- 24V-240V AC/DC voltage range

### **Applications**

Multi-voltage electric actuators typically used to automate quarter turn ball valves, butterfly valves and dampers. The 5616 series actuator is quick and easy to install with standard ISO5211 multi-flange mounting and a double square output drive.

### Operation

Electric actuator uses power-to-open and power-to-close, stays in the last known position with power failure. On receipt of a continuous voltage signal, the motor runs and via a flat gear system rotates the output drive 90°. The motor is automatically stopped by internal cams striking limit switches. On receipt of a reversing continuous signal, the motor turns in the opposite direction reversing the output drive position.

#### Construction

Enclosure	Anti-corrosive polyamide, weatherproof IP67					
Electrical Connections	DIN 43650/ ISO4400 plug connectors, cable entry					
Output Drive	Zamac, female double square					
Valve Position Indicator	Clear polyamide					
Manual Override	Polyamide knob					
Gears	Steel and polyamide (low torque)					
Shaft	Stainless steel					
Fasteners	Stainless steel					



## **Description**

Feature packed electric actuators take the valve automation industry to the next level. Features include a LED status indicator, manual override for emergency hand operation, visual valve position indicator and electronic over-torque protection. Easy wiring via DIN plug connectors eliminate the need to remove the cover, saving time and money. Two auxiliary dry contact limit switches are supplied to confirm valve open and closed position. Standard anti-condensation heater will help protect against condensation build-up inside the actuator.

#### **Optional Functions**

BSR: Battery Spring Return - actuator fails to a safe position with loss of power

DPS: Digital Positioning System - valve position controlled by either a 4-20mA or 0-10V control signal

#### **Approvals**



- CE mark, conforming to:
- 2006/42/EC Machinery Directive
- 2006/95/EC Low Voltage Directive
- 2004/108/EC EMC Compatibility
- RoHS Compliance per 2011/65/EU
- ISO5211 Compliance
- IP67 weatherproof enclosure



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### **Construction Features**



## **Typical Applications**





## **Specifications**

Stock Number	561604C						
Voltage Range AC or DC	24~240v AC or DC						
1ph,50/60Hz, Auto-sensing							
Cycle Time - Seconds/0-90° (no load, ±10%)	58 sec						
Maximum Run Torque	2655 in lbs						
	300 Nm						
Maximum Break Torque	3097 in lbs						
	350 Nm						
Duty Cycle	75%						
Over-load Protection	Electronic over-torque with LED status light						
Enclosure	Anti-corrosive polyamide with UV protection						
Enclosure Rating	IP67 weatherproof						
Working Angle	90 degrees						
Temperature Range	-4~+158° F (-20~+70° C)						
Motor Switches	2 x SPST limit switches						
Position Confirmation Switches	2 x SPST limit switches, 3A @125/250VAC, 30VDC resistive load						
Anti-condensation Heater	4 watts						
Electrical Connections	Plug connectors per DIN 43650/ ISO4400, cable entry, screw terminals						
Current (full load) 24VDC	2.7A						
24VAC	3.3A						
110VAC	0.8A						
240V/1ph	0.5A						
Valve Mounting Interface per ISO5211	F07, F10						
Output Drive - Female Double Square	22mm						
Weight	11.5 lbs (5.2 kg)						



## **Optional DPS - Digital Positioner System**

The DPS Digital Positioner System is available as a factory installed option for Valworx 5616 series electric actuators. Installing the DPS kit will change a standard On-Off type electric actuator to modulating or proportional control. This will allow positioning of the actuator output drive anywhere between 0 and 90° using either a 4-20mA or 0-10vdc input command signal. When using an electric actuated valve with DPS option, the output flow can be adjusted anywhere between 0-100%.

The DPS kit contains a microprocessor based control board and mounting hardware. The control board continuously monitors the analog input and output signals and compares them to the actual physical position of the output drive. An electric motor/gear drive moves the actuator output drive as required to balance the signals and find the desired position. The digital microprocessor ensures highly sensitive and repeatable control. The DPS is installed inside the actuator, under the red cover.



Rotation	0-90°						
Input Signal	4-20mA or 0-10vdc 4-20mA or 0-10vdc						
Output Signal							
Accuracy	3% Full Scale						
Linearity	2% Full Scale						
Hysteresis	3% Full Scale						
Steps	4/20mA: Min. 150 steps, 0-10V/Min. 98 steps/90°						
Impedance 4-20mA	100 Ohms						
Impedance 0-10vdc	25K Ohms						

Note: Overall accuracy of a valve assembly will vary depending on the type of valve selected and how the valve is mounted to the actuator. Output signals will be in the same format as input signal (ex: 4-20mA input, 4-20mA output).

The DPS system provides an accurate valve positioning function whereby the movement of the actuator is controlled by either a 4-20mA or 0-10vdc control signal. Any change in the control input signal results in a corresponding and proportional change in the position of the actuator (valve).

The DPS positioner has auto-calibration, no need to adjust zero and span settings. An output monitoring signal, in the same format as the input signal is also provided to confirm the output drive position (ex: 4-20mA input, 4-20mA output).

The standard DPS actuator will fail closed with loss of the control signal. Actuator can also be setup reverse-acting (4ma or 0v = 0 open) and fail open with loss of the control signal. The 5616 series electric actuator will fail in place with loss of external power.

Kit Stock No.	Input Signal	For Actuators
561108C	4-20mA	5616C series
561109C	0-10VDC	5616C series

· DPS kits are a factory installed option



## **Optional BSR - Battery Spring Return**

The BSR- Battery Spring Return kit is available as a factory installed option fo Valworx 5616 series electric actuators. The BSR kit will work with both on-off models and actuators with DPS positioners. The battery failsafe system provides an alternative source of power to drive the actuator to a preset failsafe position in the event of an external power failure. The industrial quality battery is constantly trickle charged during normal operation to assure maximum charge when required. The battery kit is installed under the actuator cover. No separate modules or boxes are required.

In many applications, the BSR battery spring return function tends to be a very economical option when compared to the alternate true mechanical spring return actuator. Valworx actuators with the BSR option are much smaller, lighter and less expensive.



Valworx Actuator with BSR Option	561604C
Working operations without recharge, with 100% initial battery charge	4
Recharge time per working operation	50 min
Full Charge Time 100%	54 h
Battery capacity +/-5% (2 batteries)	4400mA

The installed BSR kit will provide enough power to move the actuator/valve to a failsafe position with loss of external power. The kit can be ordered as fail closed or fail open as required.

The actuator operates in the normal power open and power close mode while external power is available. Internal circuitry monitors the incoming main power and automatically switches within a few seconds to the battery backup with loss of external power. The battery will then provide enough power to move the actuator to a failsafe position. Under normal operation the external control power will trickle charge the battery and maintain a full charge.

In the normal mode of operation, an LED status light located on top of the actuator cover will be continuously lit. With a loss of power, the LED status light will blink slowly. On resumption of external power, conditional that the actuator control signal remained unchanged, the actuator will reset to the position it saw at the time of the main power failure.

	Stock mber	Description	For Actuators		
561	1106C	5610 BSR Battery Spring Return Kit, Fail Closed	5616C series		
561	1107C	5610 BSR Battery Spring Return Kit, Fail Open	5616C series		

• BSR kits are a factory installed option

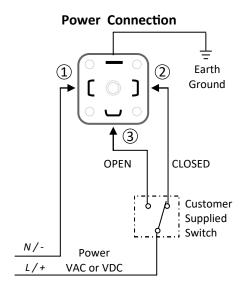


BSR kit installed under red cover

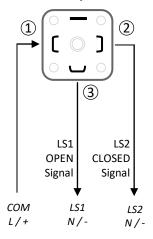


## Electrical Wiring for On/Off and BSR Battery Spring Return Versions

Voltage: 24-240 Volts AC or DC (auto-voltage sensing)



## Position Confirmation Limit Switches 250v/3A



#### Function: ON-OFF version

**Power Connections** 

Power to PIN 1 and 2 - actuator CLOSED

Power to PIN 1 and 3 - actuator OPEN

Stays in last known position with loss of power.

#### Function: ON-OFF version with BSR option

Wiring is the same as standard ON-OFF version.

Power to open, power to close - maintain power to trickle charges battery system in either open or closed position.

Actuator sent by battery power to failsafe position with power failure.

Actuator returns to pre-failure position on power resumption.

# Function: Position confirmation limit switches

Dry contact 3A @ 125/250 VAC, 30VDC resistive load

PIN 1 (COM) and 2 to confirm actuator is closed

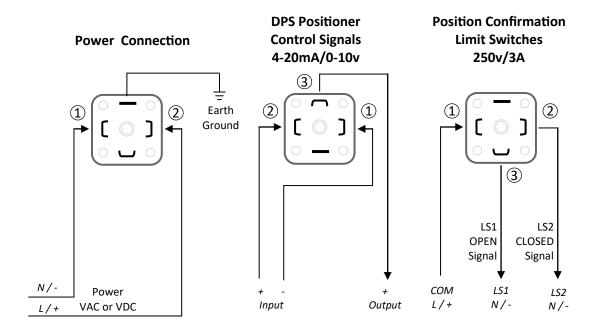
PIN 1 (COM) and 3 to confirm actuator is open



## **Electrical Wiring for Actuators with DPS Digital Positioner Option**

Voltage: 24-240 Volts AC or DC (auto-voltage sensing)

Control Signal: 4-20mA or 0-10 VDC



#### Function: Actuators with DPS-Digital Positioner Option

Power open, power close - actuator movement controlled by 4-20mA or 0-10VDC input signal. Standard operation: 4mA or 0V = actuator closed, 20mA or 10V = actuator open (can be set-up reverse acting).

Actuator closes with loss of control signal, stays in last known position with loss of main power.

Output monitoring signal (in same format as supply signal) provided as standard.

# Function: Position confirmation limit switches

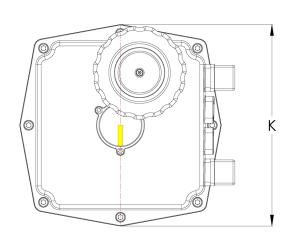
Dry contact 3A @ 125/250 VAC, 30VDC resistive load

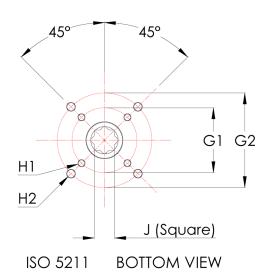
PIN 1 (COM) and 2 to confirm actuator is closed

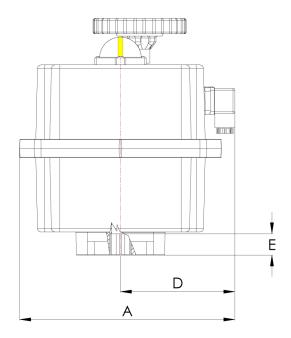
PIN 1 (COM) and 3 to confirm actuator is open

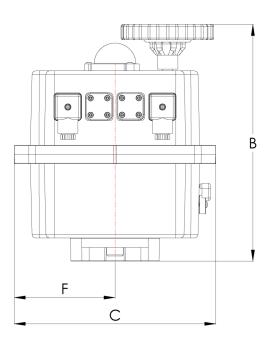


## **Dimensions:** mm/inches









Stock Number		A	В	C	D	E	F	J	K	Valve Mounting	G1	H1	Weight
										ISO 5211	G2	H2	
	inch	9.13	10	8.54	4.84	0.87	4.29	0.87	8.54	-	-	-	11.5 lbs
561604C			055	0.17	400		400			F07	70	M8 x 25 depth	<b>.</b>
	mm	232	255	217	123	22	109	22	217	F10	102	M10 x 25 depth	5.2 kg