

Feature rich **J+J** multi-voltage smart electric actuator with LED status light and function conversion kits.

### J3C-S20



#### Overview

The J3C-S20 multi-voltage smart electric valve actuator from the European electric actuator manufacturer J+J offers an impressive list of standard features that include 24-240V multi-voltage capability, protection against damage from over-torque or condensation, safety features, the ability to have its standard on-off function changed with user friendly plug & play conversion kits, and a highly visible LED light to offer users continual actuator operational status feedback.

The innovation in the J3C S Type of 24-240V AC or DC multi-voltage capability with automatic voltage sensing has a patent pending.

The multi-colour LED light remains constantly lit if the actuator is functional and able to respond to remote commands - if it is unable to, the LED flashes. The sequence of the flashes indicates the possible reason. This user friendly continuous visual status feedback LED gives the user at-a-glance actuator status, and assists in fault diagnosis.

For 12V applications, a small adapter PCB can be installed which restricts the supply voltage to 12V AC or DC only.

#### J3C-S20DPS Electric Actuator Specifications

|  |                              |
|--|------------------------------|
| Voltage range - automatic sensing      | 24V - 220V AC (1ph) or DC    |
| Modulating control (DPS pre-installed) | 4-20mA or 0-10VDC I/O        |
| Operating time (0-90° no load)         | 10 seconds                   |
| Maximum break torque                   | 25 Nm (221 lb.ins)           |
| Maximum operating torque (run/ reseat) | 20 Nm (177 lb.ins)           |
| Duty rating                            | 75%                          |
| IP Rating (IEC 60529)                  | IP67                         |
| Working angle Standard (on request)    | 90° (180° or 270° options)   |
| Mounting ISO:5211 x DIN 3337           | F03, F04 & F05 x 14 (std)    |
| Motor switches                         | 2 x SPDT micro switches      |
| End of travel confirmation (volt free) | 2 x SPDT micro switches      |
| Heater                                 | 3.5 W                        |
| Ambient temperature range              | -20° to +70°C (-4 to +158°F) |
| Electrical connecting plugs            | EN175301-803                 |
| Weight                                 | 1.8 kg                       |

#### J3C-S20 Consumption

|         |                                |
|---------|--------------------------------|
| Figures | See page 5                     |
| Motor   | 24VDC 1ph, Class B, S4 service |

#### J3C-S Main features

IP67 Weatherproof, UV protected, corrosion resistant plastic housing.

LED light gives user continuous visual actuator status feedback - if the LED is flashing, there's a problem!

Many protective features as standard - such as over-torque and anti-condensation.

Multi-voltage capable, automatically sensed

Very user friendly and easy to install - all the electrical connections are external.

Digital Positioning System (DPS) pre-installed to give proportional control from typically 4-20mA or 0-10VDC I/O signal.

Failsafe modulating available (+BSR)

#### How this J3C-S modulating electric 1/4 turn valve actuator works

With power permanently connected, movement of the J3CS actuator is then proportional to an input control signal, typically 4-20mA or 0-10V, usually the output from a process controller. The DPS processor continually compares the physical position of the J3CS output shaft to the input signal, and if a difference exists, controls the motor to eliminate the difference. Output shaft position is very accurate using digital magnetic position sensing technology. An output signal is provided as standard.

### MAIN FEATURES J3C SERIES OF ELECTRIC ACTUATOR

IP67 Weatherproof, UV protected, corrosion resistant Polyamide housing.

IP67 allows the J3C electric actuator to be submerged, the international standard IEC60529 states: *Test duration is 30 minutes. Ingress of water in harmful quantity shall not be possible when the enclosure is immersed in water under defined conditions of pressure and time (up to 1 m of submersion). The lowest point of enclosures with a height less than 850 mm is located 1000 mm below the surface of the water, the highest point of enclosures with a height equal to or greater than 850 mm is located 150 mm below the surface of the water.*

The J3C is therefore fully weatherproof.

Multi-colour LED light gives user continuous visual actuator status feedback - if the LED is flashing, there's a problem!

The multi-colour LED light provides a continuous highly visible indication of the J3C-S Type electric actuator's operational status. If all is well, the LED is solidly lit. If it is blinking there is a problem and the J3C-S will not respond to remote commands - the sequence gives an indication of the likely cause.

Many protective features as standard - such as over-torque and anti-condensation.

Over-torque protection is electronic, the J3C Series actuators constantly measures the current being drawn and compares it with pre-set parameters, if the current draw exceeds the parameter, the power is cut preventing mechanical damage to the actuator. An internal thermostatic heater, energised from the external power supplied to the power DIN connector, ensures the J3C's internal temperature remains above that at which condensation could form.

Multi-voltage capable, automatically sensed

The J3C S Type valve actuator automatically senses the external power being applied and can accept any external voltage between 24V and 220V AC or DC .  
**Note: Patent pending for the automatic sensing innovation.**

Very user friendly and easy to install - all electrical connections are external.

J3C Actuators have mounting options according to ISO5211 with a female star output drive. Electrical connections are made using external DIN plugs supplied with the J3C Series actuators which eliminate the need to remove the actuators cover to connect The J3C electrically.

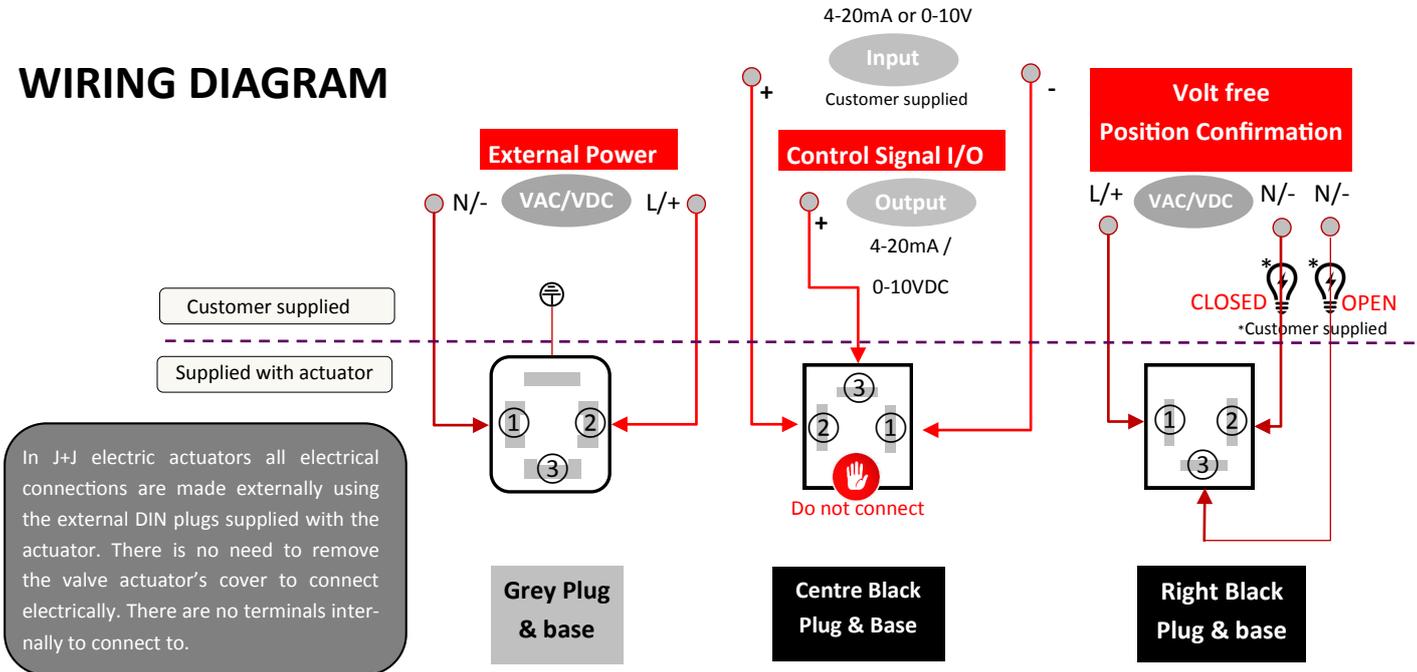
Unique plug & play function conversion kits create **FAILSAFE & MODULATING** function from a standard on-off electric actuator.

The J3C Series of electric actuators can have their standard on-off functionality changed by the installing of very user friendly plug and play conversion kits. See later in this document for more details

Manufactured in the EU by J+J

The J3C electric valve actuators are designed and manufactured by J+J in Spain. J+J have been innovating, designing and manufacturing electric actuators for over 25 years and the J+J valve actuators are sold in more than 70 countries.

### WIRING DIAGRAM



In J+J electric actuators all electrical connections are made externally using the external DIN plugs supplied with the actuator. There is no need to remove the valve actuator's cover to connect electrically. There are no terminals internally to connect to.

### J3C-S MODULATING ELECTRIC ACTUATOR

The J3CS Modulating is used where the position of the actuator is required to be set by a control input signal. Unlike an on-off electric actuator, a modulating actuator will rarely travel from open to closed in one movement, it may only be required to alter its position by a few degrees. This is achieved by installing our DPS (Digital Positioning System) - installed by J+J when ordered as a modulating electric actuator.

#### How this electric 1/4 turn valve works (Modulating):

Power permanently connected, movement of the J3CS actuator is then proportional to an input signal, typically 4-20mA or 0-10V. The DPS processor continually compares the physical position of the J3CS output shaft to the input signal, and if a difference exists, controls the motor to eliminate the difference. An output signal is provided as standard. The reaction from the J3CS actuator to a loss of control signal can be set as below, but it will stay put on loss of external power.

Configuration options:

- 1) Closes on loss of control signal
- 2) Opens on loss of control signal
- 3) Stays put on loss of control signal (Fail Freeze)

The DPS in the J3CS uses the latest magnetic position sensing technology which, when combined with digital processing, produces very accurate modulating control. This is a very Smart Red Box.

#### Option:

It is possible to change the J3CS actuator's function by installing user friendly pug and play function conversion kits. This will provide the following alternative function:

#### Failsafe Modulating J3CS Actuator

Adding the BSR (Battery 'Spring Return') plug and play function conversion kit to the J3CS modulating actuator, it becomes a J3CS failsafe modulating electric actuator.

The advantage this gives is that the actuator will fail to either the open or closed position, depending on how the DPS positioner is configured, in the event of an external power failure.

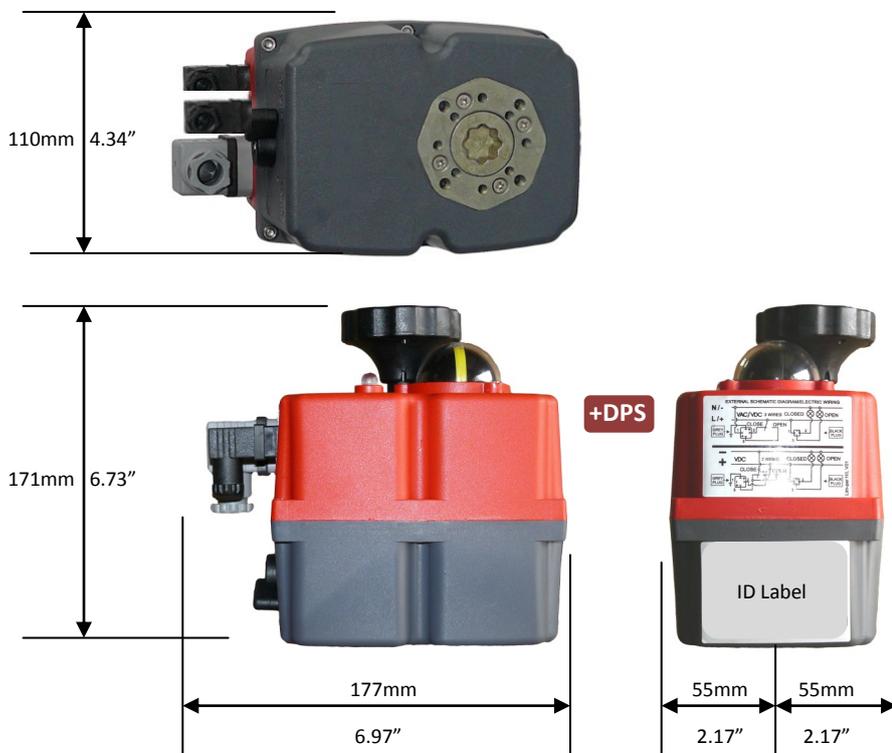
The BSR failsafe system comprises of an industrial rechargeable NiCad battery and a PCB containing a trickle charger and control circuitry. It can either be installed by J+J on original supply, or retro-fitted.



BSR Failsafe plug & play kit can be added to create failsafe modulating function.

Available with actuator function: **POWER OPEN - POWER CLOSE** **FAILSAFE** **MODULATING** **FAILSAFE MODULATING**

### J3C-S20 Dimensions



| ISO5211 Mounting      | F03         | F04 | F05 |
|-----------------------|-------------|-----|-----|
| Mounting PCD (mm)     | 36          | 42  | 50  |
| Star Drive (Standard) | 14mm        |     |     |
| Star Drive (Optional) | 9mm or 11mm |     |     |

| J3C S20 Materials of construction: |   |
|------------------------------------|---|
| Housing                            | Anti-corrosive Polyamide                          |
| Fasteners                          | Stainless steel                                   |
| Gears                              | Polyamide (speed reducing) & steel (load bearing) |
| Shaft                              | Stainless steel                                   |
| Output drive                       | Zamac   |
| Position indicator                 | Clear Polyamide                                   |

### J3C Plug & Play Failsafe & Modulating Function Conversion Kits:

Failsafe and/or modulating function is quick and easy to achieve in the J3C smart electric actuator by the fitting of the user friendly failsafe and/or modulating plug & play function conversion kits to the standard on-off J3C smart valve actuator.

The J3C S Series **failsafe electric actuator** is created by installing easy to fit user friendly **Battery 'Spring Return' (BSR)** failsafe function conversion kit. The J3C BSR failsafe actuator can be set to fail open or fail closed.

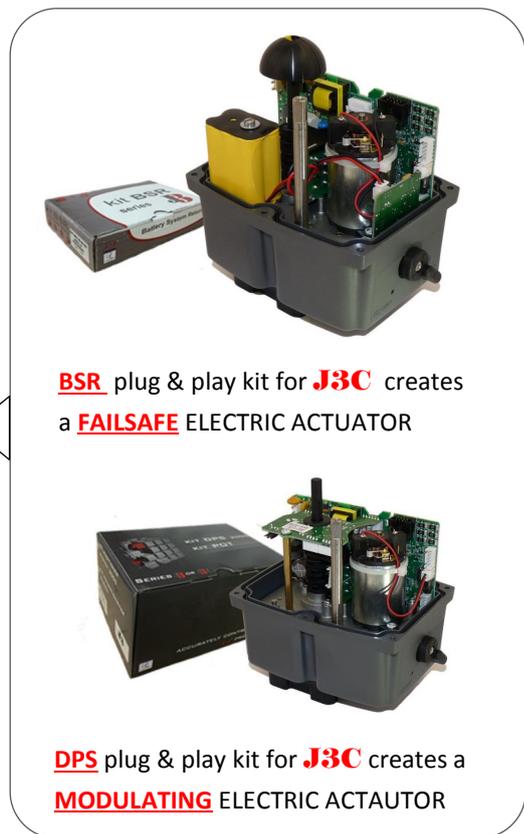
The BSR uses an internal trickle charged industrial rechargeable battery to provide an alternate power source to drive the J3CS failsafe actuator to its pre-set 'safe' position if external power is lost.

The J3C S Series **modulating electric actuator** is created by installing the plug and play **Digital Positioning System (DPS)** modulating function conversion kit. The J3C DPS modulating actuator can be controlled by either a 4-20mA or 0-10V control signal and provides feedback as standard.

The DPS provides accurate proportional control utilizing the latest digital magnetic position sensing technology and covers the popular I/O control signals of 4-20mA and 0-10VDC. The DPS is self-calibrating.

When actuated valves are ordered with failsafe, modulating or failsafe modulating function, J+J pre-install and test the plug and play function conversion kits. They can however easily be retro-fitted to J3C smart electric actuators should the on-off function requirement, supplied as standard, change.

Fitting both plug and plug function conversion kits quickly and easily creates failsafe modulating functionality to J3CS electric actuators.



**BSR** plug & play kit for **J3C** creates a **FAILSAFE** ELECTRIC ACTUATOR

**DPS** plug & play kit for **J3C** creates a **MODULATING** ELECTRIC ACTUATOR

Available with actuator function: **POWER OPEN - POWER CLOSE FAILSAFE MODULATING FAILSAFE MODULATING**
**J3CS Consumption**

| Supply Voltage | No load |       | At maximum operational torque 20Nm |       | At maximum break torque 25Nm |       |
|----------------|---------|-------|------------------------------------|-------|------------------------------|-------|
|                | Amps    | Watts | Amps                               | Watts | Amps                         | Watts |
| 24V DC         | 0.40    | 10.3  | 0.80                               | 19.30 | 0.80                         | 20.30 |
| 48V DC         | 0.20    | 10.20 | 0.40                               | 18.00 | 0.40                         | 18.50 |
| 110V DC        | 0.10    | 7.50  | 0.10                               | 13.30 | 0.10                         | 14.30 |
| 24V AC         | 0.60    | 14.20 | 1.10                               | 25.80 | 1.20                         | 27.60 |
| 48V AC         | 0.40    | 18.40 | 0.70                               | 31.30 | 0.70                         | 32.20 |
| 110V AC        | 0.20    | 16.50 | 0.30                               | 27.60 | 0.30                         | 27.60 |
| 240V AC        | 0.10    | 22.20 | 0.20                               | 37.50 | 0.20                         | 39.60 |

Note: To allow for inrush, and motor wear, MULTIPLY maximum consumption by 3 for sizing power supplies.

**J3CS Multi-colour LED status light:**

| Actuator operational status                    | LED Colour   |
|--|--|
| No power being supplied                        | Off ✨  |
| Power being supplied to actuator               | Fully OPEN = Solid <span style="color: green;">●</span> Fully CLOSED = Solid <span style="color: red;">●</span>  |
| Actuator moving between open and closed        | Open to close = flash <span style="color: yellow;">✨</span> <span style="color: red;">✨</span> <span style="color: yellow;">✨</span> <span style="color: red;">✨</span> Close to open = flash <span style="color: yellow;">✨</span> <span style="color: green;">✨</span> <span style="color: yellow;">✨</span> <span style="color: green;">✨</span>                              |
| Actuator in MANUAL mode                        | Flash ✨ <span style="color: yellow;">✨</span> ✨ <span style="color: yellow;">✨</span> ✨ <span style="color: yellow;">✨</span>  |
| Torque limiter activated                       | If closing when activated = flash <span style="color: red;">✨</span> ✨ <span style="color: red;">✨</span> ✨ if opening = flash <span style="color: green;">✨</span> ✨ <span style="color: green;">✨</span> ✨   |
| BSR failsafe system activated (for max 3 mins) | If configured Fail Close = flash ✨ ✨ ✨ <span style="color: red;">✨</span> if Fail Open = flash ✨ ✨ ✨ <span style="color: green;">✨</span>  |
| BSR Battery needs charging warning             | Flash <span style="color: yellow;">✨</span> <span style="color: yellow;">✨</span> <span style="color: yellow;">✨</span> ✨ ✨ <span style="color: yellow;">✨</span> <span style="color: yellow;">✨</span> <span style="color: yellow;">✨</span> ✨  |
| Actuator with DPS(2015) positioner             | Opening = flash <span style="color: green;">✨</span> <span style="color: blue;">✨</span> <span style="color: green;">✨</span> <span style="color: blue;">✨</span> Closing = flash <span style="color: red;">✨</span> <span style="color: blue;">✨</span> <span style="color: red;">✨</span> <span style="color: blue;">✨</span> Stationary = <span style="color: blue;">●</span> |

**J3CS BSR Failsafe System Specifications:**

| Detail   | J3C-S20         |
|--|-----------------|
| Initial charge time BEFORE being placed into operational service | <b>28 Hours</b> |
| Maximum movements with fully charged battery                     | 5               |
| Minimum recharge time after each movement                        | <b>8 mins</b>   |
| Battery consumption when power drawn from battery                | 6.2W            |
| Nominal battery capacity   | 1000mA          |
| Current drawn when operating by battery                          | 2.4mA           |
| Charge consumption   | 36mA/h          |
| System to change between fail close & fail open                  | PCB jumper      |

**J3CS DPS:2015 Digital Positioner Specifications:**

| Detail   | J3C-S Series                 |
|--|------------------------------|
| Input/ Output options                          | 0-10V, 1-10V, 0-20mA, 4-20mA |
| Output shaft feedback system                   | Magnetic, digital            |
| Accuracy, linearity, hysteresis, repeatability | Better than 2%               |