



All J+J electric actuators are tested prior to shipping. Most issues are site related, we hope that you will find a solution to your problem in this guide. If not, please contact us for support.

Multi-colour LED Status Light - using it as a diagnostic tool:

The LED is provided as standard to give users a continuous visual feedback of the functional status of the actuator.

- If the LED is not lit then the actuator is not receiving, or seeing external power at the grey DIN (power) plug.
- If the LED is solidly lit, the actuator has power applied and is/ should be ready to respond to remote commands.
- If a problem exists and the actuator does not respond to remote commands, the sequence and colour of the blinking gives an indication of the possible cause.

| LED SEQUENCES | END OF TRAVEL | ACTUATOR RUNNING: LED FLASH COLOURS | | | | | | | | | | END OF TRAVEL | |
|--------------------------|-----------------|----------------------------------------|--------|-------|--------|-------|--------|-------|--------|-------|--------|---------------|-----------------------|
| NO POWER | | | | | | | | | | | | | |
| OPEN SIGNAL APPLIED | CLOSED | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | Yellow | Green | OPEN |
| CLOSE SIGNAL APPLIED | OPEN | Red | Yellow | Red | Yellow | Red | Yellow | Red | Yellow | Red | Yellow | Red | CLOSED |
| IN MANUAL | | | Yellow | | Yellow | | Yellow | | Yellow | | Yellow | | |
| TORQUE LIMITER ACTIVATED | CLOSED SIGNAL | Red | | Red | | Red | | Red | | Red | | Red | |
| | OPEN SIGNAL | Green | | Green | | Green | | Green | | Green | | Green | |
| BATTERY FAILSAFE ENGAGED | SET FAIL CLOSED | Red | | | | | | | | | | | STOPS AFTER 3 MINUTES |
| | SET FAIL OPEN | Green | | | | | | | | | | | |
| MODULATING FUNCTION | CLOSED | Green | Blue | Green | Blue | Green | Blue | Green | Blue | Green | Blue | Green | OPEN |
| | OPEN | Red | Blue | Red | Blue | Red | Blue | Red | Blue | Red | Blue | Red | CLOSED |



ISSUE: LED NOT LIT AND ACTUATOR NOT WORKING

| POSSIBLE REASON(S) | POSSIBLE SOLUTIONS/ ADVICE |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>No external power arriving at the actuator, or actuator damaged due to wiring error.</p> | <ul style="list-style-type: none"> • Check wiring AT THE ACTUATOR’S GREY DIN PLUG matches the wiring on the actuator’s wiring diagram (affixed to actuator). • Check for loose wires in the DIN plug, or bare wires/ strands shorting across 2 terminals. • Check for damaged or trapped cables. |
| | <ul style="list-style-type: none"> • The difference between the wiring connections of the power (grey plug) and end of travel (black plug) wiring has been missed resulting in a short circuit blowing the main PCB. • The plugs have been swapped so the grey power plug was fitted to the black base, creating an internal short circuit resulting in a catastrophic blow-out on the limit-switch sub-PCB. Thereafter plugging the grey power plug back into its correct base would not show a lit LED. |
| | <ul style="list-style-type: none"> • Is the correct voltage being applied? Check voltage being applied AT THE ACTUATOR DIN PLUG* is within the range shown on the actuator ID label; (a) when the DIN plug is not fitted to the actuator and (b) when it is connected to the actuator and driving actuator (checks for undersized power supply) * Checking AT THE ACTUATOR DIN PLUG eliminates any issues in the connection between the power source and the actuator – it is imperative that the voltage the actuator sees is being measured, not the output from a controller/ panel. |
| | <ul style="list-style-type: none"> • Insufficient power intensity available, this could be; a) undersized power supply and/ or transformer b) inrush not allowed for (power supply should be the maximum actuator consumption x 3) c) voltage drop due to length of cable, particularly in DC systems d) control panel issue e) actuators connected in parallel (prohibited) f) damaged cable(s) g) loose connections (may be but not necessarily in the Din plug – could be anywhere in the supply cable route/ system) h) Supply circuit fuse blown/ breaker out . . . or it could be a combination of these |
| | <ul style="list-style-type: none"> • Actuator PCB fault. If the customer confirms that all of the above checks have been carried out and that they are sure that the actuator is receiving the correct voltage when power is being applied and that all wiring and signalling is correct, there could be a PCB fault. However, this is very rare, and in most cases the cause is down to a wiring, or power supply issue. See ‘PCB’ later in this document. |



ISSUE: LED LIT SOLIDLY BUT ACTUATOR NOT WORKING

| POSSIBLE REASON(S) | POSSIBLE SOLUTIONS/ ADVICE |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wiring issue | <ul style="list-style-type: none"> • Check wiring as above. • Ensure that in on-off versions, a signal is not being sent to both 'live' pins (2 & 3) at the same time |
| Signalling issue | <ul style="list-style-type: none"> • Ensure the command signal is continuous and not a pulse signal, the actuator will not respond well to any pulsed input command signal. • Relay or switch is not compatible with the actuator. Typically residual voltage from solid state relays may cause this issue. |
| Power supply issue | <ul style="list-style-type: none"> • Borderline power supply, sufficient to light LED but not to drive actuator |

ISSUE: LED FLASHING AND ACTUATOR NOT WORKING

| POSSIBLE REASON(S) | POSSIBLE SOLUTIONS/ ADVICE |
|---------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Depends on sequence and colour of flashes/ blinks | <p>By far the 2 most common are:</p> <ul style="list-style-type: none"> • Actuator's internal electronic torque limiter has activated (see below for causes) • Actuator is in 'MANUAL' mode (see later in document for details) |

ISSUE: TORQUE LIMITER ACTIVATED

| POSSIBLE REASON(S) | POSSIBLE SOLUTIONS/ ADVICE |
|-----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Electronic torque limiter (ETL) has activated | <ul style="list-style-type: none"> • Electronic Torque Limiter (ETL) activated. <p>ETL function: An internal micro-processor monitors the current draw and is programmed to cut the motor power if the upper current set point is reached and that the rate of increase exceeds a maximum allowable rate. Once the power to the motor is cut, the LED blinks (see Page 2) and the gearbox is relaxed by a 5 degree movement in the opposite direction to that which activated the ETL.</p> <ul style="list-style-type: none"> • The ETL activation could be caused by either (or sometimes both) the valve, or the actuator: <p>The torque in the valve exceeds the trigger point of the ETL. This could be due to;</p> <ul style="list-style-type: none"> • Actuator undersized for the torque in the valve, or • Actuator undersized for the application – dry duty, air, steam solids, long periods of no operations etc • A blockage in the valve • A valve internal issue that has caused the torque to rise (eg: seat failure) <p>Whilst the ETL protects the gearbox from mechanical damage caused by a valve blockage, if the blockage is not investigated and the actuator's ETL is activated excessively (this can be identified from the electronic counters that can be read by J+J service centres, comparing torque limiter activations to number of operations), it is possible that eventually the gearbox will fail mechanically.</p> |



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| | <p>This is not a warranty issue because it is customer generated by not resolving the excessive torque issue.</p> <p>Quick check 1:</p> <ul style="list-style-type: none"> Put the actuator in 'MANUAL' and try to operate the valve using the actuator's hand wheel. DON'T FORCE IT if it is stiff – this is a strong indicator the issue is with the valve. If the gearbox is blocked in mid travel – this is a sure sign the gearbox has failed. <p>Be aware that the gearing system in the manual override system would allow destructive force to be transmitted if there was a blockage and the hand-wheel was forced – this would physically damage either the manual override hand wheel drive shaft (plastic) or gears in the gearbox and the actuator would be irreparable. This damage is not covered under warranty.</p> <p>Quick check 2:</p> <ul style="list-style-type: none"> Remove the actuator from the valve, re-apply power, first apply an open signal, then a closed signal. <p>2a) If the LED lights continuously, <i>the issue is valve related</i>, and the valve should be removed from the line, stripped and re-assembled with new seats and seals and/or any other parts required, or replaced.</p> <p>If the LED still blinks (see chart on page 2) there is either;</p> <ul style="list-style-type: none"> a motor issue that the electronics interpret as a torque issue as it is current related [see 'MOTORS' later in this document for further details], or a mechanical gear failure in the actuator has occurred. If the actuator has suffered a mechanical failure in the gearbox, the failed gears will cause a blockage and prevent the output shaft rotating (either at all, or partially), and this may trigger the ETL. Normally you can hear a crunching sound if this is the case. |
| | <p>2) There is an issue with the actuator where it 'thinks' it is seeing excessive torque and activates the ETL;</p> <p>Models J3C-S20-S85 use a brushed DC motor. Brushed motors are susceptible to carbon brush wear which can result in a build-up of carbon brush dust. In older J+J actuators where the motor is not fitted with a dust cap, this dust covers all internals in high cycling actuators, and/ or actuators continually working at maximum load, which can cause electronic issues that can prevent an actuator from working, but more likely causes increased motor current draw if the dust builds up in the cavity between the motor rotor and windings.</p> <p>New in 2016 – Motor Cap</p> <p>In 2016 manufactured models, J+J electric actuators had a modified motor installed that has a plastic cap fitted over the top of the motor that will 'collect' the dust internally. This design change is a preventive measure from the manufacturer to try and prevent the effect of carbon dust triggering the ETL.</p> |



LED FLASHING WHEN ACTUATOR NOT FITTED TO VALVE

| POSSIBLE REASON(S) | POSSIBLE SOLUTIONS/ ADVICE |
|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Motor issue</p> | <p>This generally indicates a motor issue.</p> <ul style="list-style-type: none"> • Motor issues generally cause increased or erratic current draw which can activate the ETL as it mimics the effect of a jammed valve – the actuator can therefore activate the ETL (and causing the LED to flash) even if it is not fitted to a valve. |
| | <p>POSSIBLE SOLUTIONS/ ADVICE are;</p> <ul style="list-style-type: none"> • Motor has been in service for many years and is simply worn out |
| | <ul style="list-style-type: none"> • High ambient temperatures seem to wear out the motors more quickly than cooler ambient conditions. The commutator brushes wear faster and the resulting dust damages the motor. Consider turning off the anti-condensation heater – but check with a manufacturers’ service centre first. |
| | <ul style="list-style-type: none"> • Chattering relay causing the motor to rapidly change direction. Often this is invisible and difficult to detect because the only rotation is in the motor, it is not a large enough rotation to translate to the output shaft, but sufficient to wear the brushes, and this dust usually fills the cavity between the rotor and windings as described above. |
| | <ul style="list-style-type: none"> • User has applied 110 or 240VAC across the motor terminals to try to prove the motor works, in an actuator that has stopped working. All the motors are 24VDC, therefore this ‘test’ will cause irreparable damage to the motor and is not covered by the warranty. • Also, should this ‘test’ be done whilst the motor cables are still connected to the actuator’s main PCB, the PCB will be irreparably damaged too, again not covered under warranty. |
| | <p>Warranty note: Number of cycles and frequency of operation:</p> <ul style="list-style-type: none"> • The actuator conforms to the minimum requirements stated in EN 157412-2 (2009) for Part Turn Electric Actuators. The standard requires that a part turn actuator is capable of 10,000 cycles (1 cycle = close to open and back to closed). The manufacturer warrants the actuator for 1 year from date of despatch, so the warranty covers 1.14 cycles per hour during the warranty period. More commonly this is expressed as 10,000 cycles or 1 year from date of despatch, whichever arrives first. • If an actuator is being cycled more than 1.14 times per hour, the warranty will expire before the 1 year time period expires As an example: 1 cycle every 6 minutes = 10 per hour, 240 per day. The warranty would therefore expire in 41.7 days/ 5.95 weeks. |