

SERIES EBVG & TEBVG MULTI-VOLTAGE ELECTRIC ACTUATORS

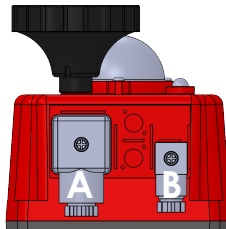
Installation, Operation & Maintenance Instructions

Damage caused by non-compliance to these instructions will not be covered by our warranty. Read these instructions **BEFORE** installing or connecting the actuator.

WARNING
VALVE MUST BE INSTALLED
IN CLOSED POSITION

SAFETY INSTRUCTIONS: Electric actuators operate with the use of live electricity. It is recommended that only qualified electricians or people instructed in accordance with electrical engineering, and familiar with local electrical, health and safety directives, be involved in the connection of these actuators. It is strongly recommended that each actuator has its own independent fused system to protect it against the influence of other electrical devices connected to the system.

ELECTRICAL CONNECTORS (DIN Plugs)



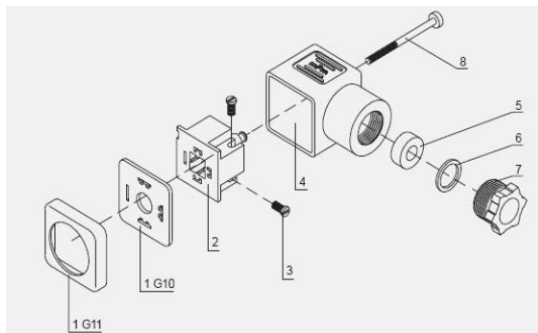
Connectors
A - Power Supply
B - Position Confirmation



Warning! BEFORE connecting, ensure the voltage to be applied is within the range shown on the ID label. Do NOT connect a voltage in excess of the intended design or irreparable damage will be caused and will NOT be covered by our warranty.

EBVGs are multi-voltage capable with automatic voltage sensing. All connections are made using the supplied external DIN plugs. The rotation is factory set so under normal circumstances there is no need to remove the cover to connect electrically - in fact removing the cover may invalidate the warranty.

The EBVG has 1 voltage range: EBVG-1,-3 and TEBVG-5-7 Series: Accepts voltages from 24-240V AC(1ph) or DC



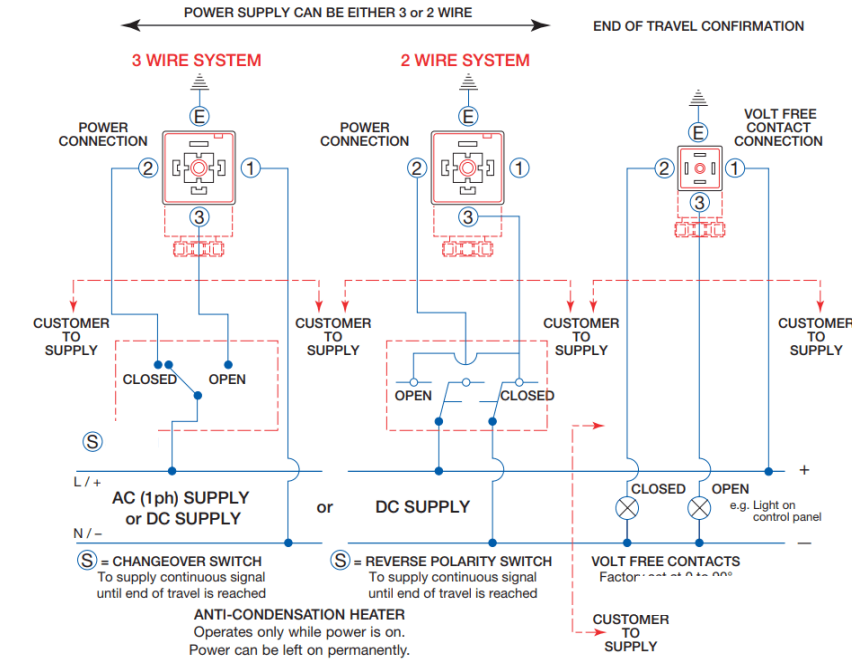
1. Gasket/seal. We use G11
2. Terminal strip
3. Cable securing screws
4. Housing
5. Grommet
6. Washer
7. Gland nut
8. Securing Screw

CABLE SIZE	SMALL CONNECTOR		LARGE CONNECTOR	
	Minimum Diameter	Maximum Diameter	Minimum Diameter	Maximum Diameter
EBVG	5 mm	6 mm	8 mm	10.5 mm

WARNING — Water-tightness: Ensure that the rubber gasket (part 1 above) is correctly installed when securing a DIN plug to the actuator. Failure to do so could allow water ingress - damage caused by this installation error will invalidate any warranty. Do not over-tighten the securing screw (part 8) when assembling. Note that the lip on the rubber gasket covers the edges of the female DIN connector that you are wiring, and not the male DIN connector on the actuator.

WIRING DIAGRAM

AC (1ph) or DC SUPPLY – WIRING ON/OFF OR FAIL SAFE ACTUATORS



On receipt of a continuous power signal, the motor runs and via a planetary gearbox system, rotates the output shaft. The motor is stopped by internal cams, fitted to the output shaft, striking micro-switches which cuts power to the motor. When a subsequent continuous signal is received, the motor will turn in the opposite direction, reversing the direction of rotation of the output shaft.

⚠ Actuator power supply must be on a dedicated circuit and must be grounded.

⚠ Volt free switches are set approximately 5° ahead of the final motor stop position. Do not use the signal from the volt free switches to cut the power to the motor, otherwise the actuator will not reach the full open or full closed position. The actuator is designed to have continuously energized power.

STATUS LIGHT FUNCTIONS

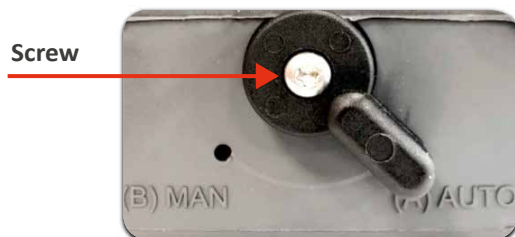
ON/OFF ACTUATOR	ACTUATOR OPERATIONAL STATUS (200 msec/block)
No power detected	Grey
In position open	Green
In position close	Red
Opening	Yellow
Closing	Red
Torque limiter engaged, moving from close to open	Green
Torque limiter engaged, moving from open to close	Red
Actuator in MANUAL mode	Yellow
Multiple concurrent signals	Purple

Emergency Manual Override

All EBVG electric actuators are provided with a declutchable manual override to allow manual operation should power not be available. There are 2 marked, selectable positions:

MAN for manual operation and AUTO for automatic operation.

- **Do NOT attempt to operate the manual override operator without first selecting MAN** using the manual override selector lever otherwise irreparable damage will be caused to the actuator gearbox. Damage so caused is NOT covered by our warranty.
- **Do NOT remove the manual override selector lever retaining screw** as this will allow the internal parts to become loose and will cause irreparable damage to the actuator gearbox. Damage so caused is NOT covered by our warranty.



Operating procedure for manual override:

If the actuator is rotated beyond the open and closed logos taking it outside the working areas (0-180°), and left outside the working area when returned to AUTO, malfunction may occur - see following pages for detailed information.



Operating the manual override will cause the LED status light to flash -- see following pages for details.

Selecting emergency manual operation: Using the manual override selector lever, select MAN. Do not force the lever the actuator will be damaged; this is not covered by our warranty. There are different situations from which MAN can be selected that each receive different responses from the EBVG actuator, which are outlined at the bottom of page 2.

IMPORTANT INSTRUCTIONS

ANTI-CONDENSATION HEATER: The EBVG actuator has a thermostatically controlled anti-condensation heater that maintains the internal housing at approx. 30°C. The heater is activated whenever mains power is connected to the actuator. We strongly recommend that power remains ON at all times to protect the actuator from the damaging effects of condensation. Damage caused by condensation is not covered by our warranty.

ELECTRONIC TORQUE LIMITER: All EBVG electric actuators are protected against the possible mechanical drive train damage caused by a valve blockage or jam. This protection is provided by an electronic torque limiter (ETL) in an internal micro-chip that is programmed to constantly measure and compare the motor load against a factory set maximum.

As torque is directly proportional to motor load, as the torque increases the motor load increases. The ETL closely monitors the rate of increase in motor load as the valve starts to come to rest at the jam, and as this occurs the motor load exceeds the factory set maximum and the ETL is activated, instantly cutting the power supply to the motor.

As the valve nears the jam point, the planetary gears are being driven hard in the direction of the jam, and at the jam point, they too are physically jammed. This would make selecting MAN to put the actuator in manual mode to assist in clearing the jam impossible - to eliminate this difficulty, the ETL, a few seconds after cutting the power to the motor, moves the actuator a few degrees in the opposite direction of the jam, to relax the gears.



Activating the electronic torque limiter triggers a change in the LED status light (see previous page) sequence. The EBVG allows the user to apply a reversing command signal to the actuator (in the opposite direction to the jam eg: if the actuator was closing, an open signal will be accepted) to power the actuator away from the jam. In many cases, this allows the flowing media to help clear the jam as this can be done several times, and prevent the user from having to shut the system down to dismantle the valve to clear the jam.



Sending a reversing signal will change the LED display (see previous page). When the actuator is subsequently sent back in the direction of the original jam, if it has not cleared the electronic torque limiter will be activated again and the LED will change accordingly.

Simple diagnostics: If the actuator will not respond to a command signal and the LED is flashing on-off, the electronic torque limiter has activated indicating that the torque required to turn the valve has exceeded the maximum output of the actuator. The user instantly knows that there is a problem with the valve, not the actuator.

WIRING THE ACTUATOR (With no failsafe or modulating kit, i.e. a simple on/off actuator)

Note: Wiring must be done by a qualified electrician, in accordance with all national and local codes.

1. Follow the wiring diagram on the actuator label. Note that the actuator labeled 24-240 AC or DC volts will accept any voltage between those limits in either AC or DC form.
2. The main actuating voltage is wired into the large grey DIN connector. The small black connector can be used to power external position indication per the wiring diagram

MAINTENANCE INSTRUCTIONS: The EBVG actuators are generally maintenance free. There are no internal parts that require maintenance. The gearbox is lubricated for life when built at the factory. The housing may be cleaned with a cloth covered in warm soapy water to keep it clean. Do not use solvents.



DO NOT PRESSURE WASH. Pressure washing will invalidate any warranty.

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EBVG-0322-I-4