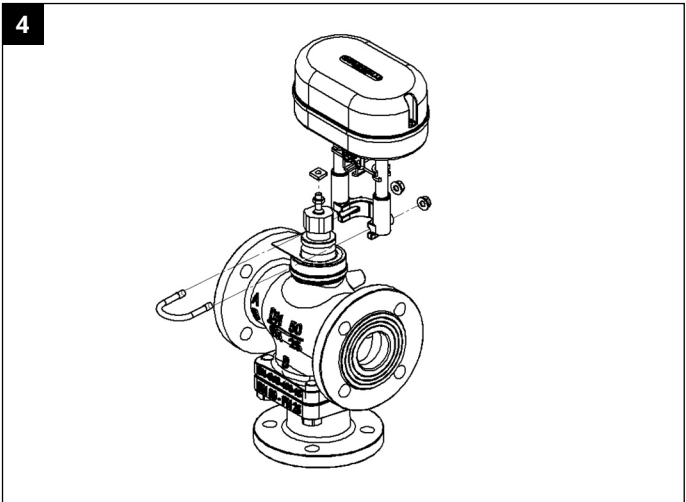
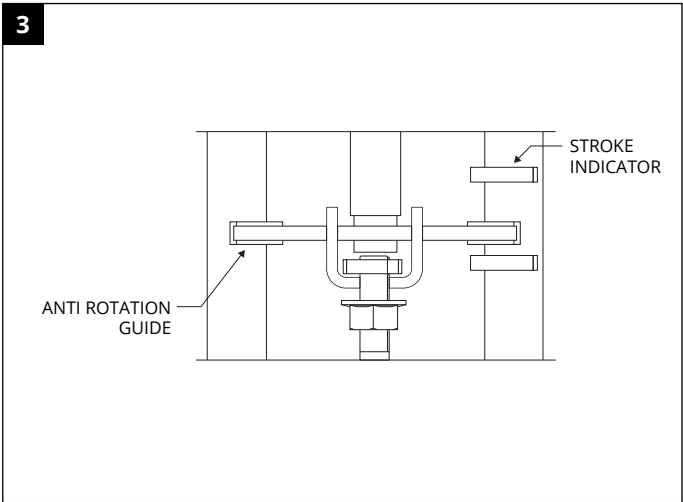
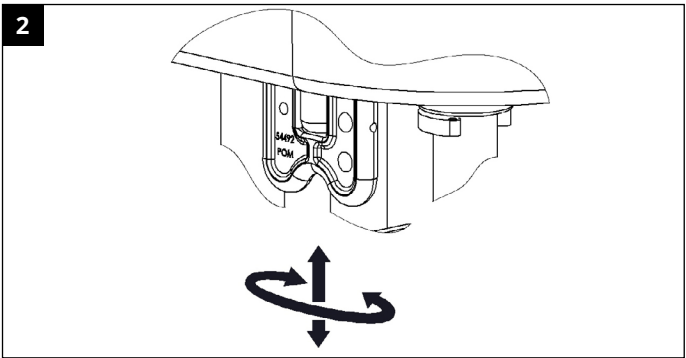
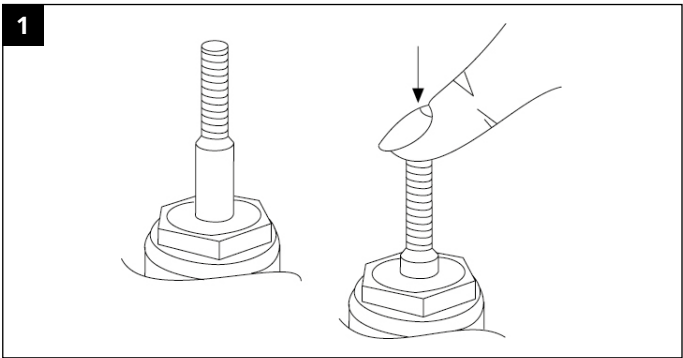
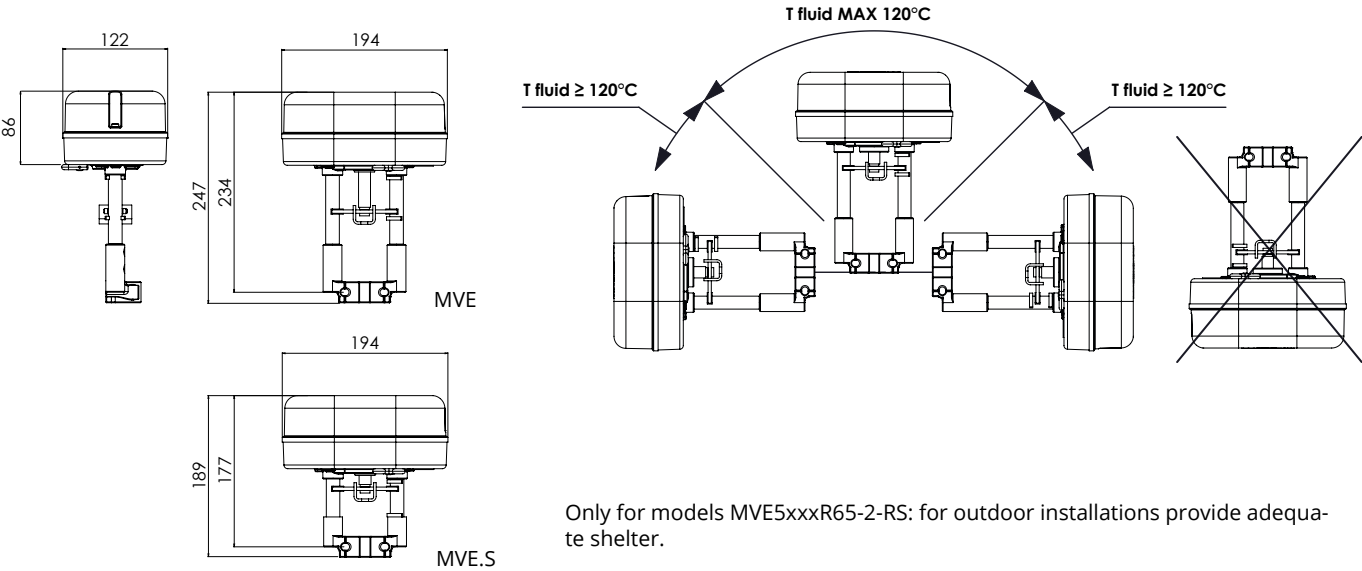


Multiprotocol Network actuator for PICV and Globe Valves with energy and temperature control functions, BACnet and Modbus protocols

INSTALLATION

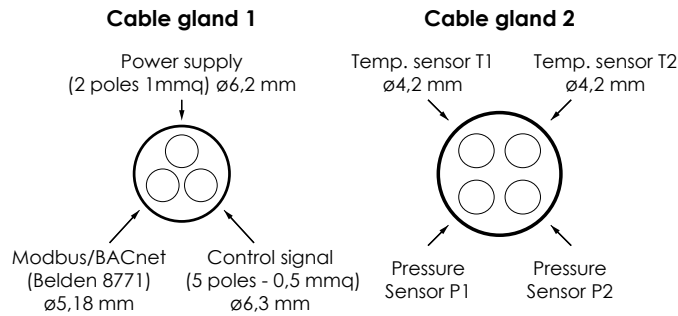


The performances stated in this sheet can be modified without any prior notice.

CABLE GLAND

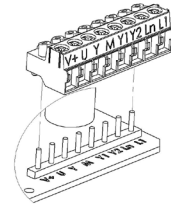
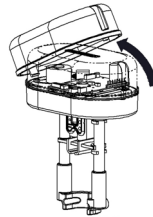
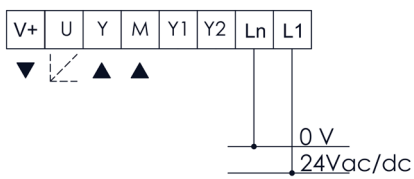
The actuator is supplied with 2 cable glands with punched membranes for safe and tidy wiring.

- Cable gland 1 for 3 cables: 2-wire cable for power supply; 5-wire cable for control and feedback signals and 3-wire cable for Modbus/BACnet;
- Cable gland 2 for 4 cables: 2 cables with 2 wires for temperature sensors (if present) and 2 cables with 3 wires for pressure transmitters.



IP65 MODEL suitable with PG13,5 cable gland for cables with Ø variable between 6 and 12 mm.

TERMINAL BLOCK T1



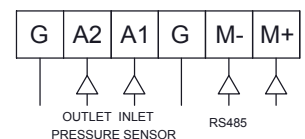
Connect the ground terminal to the proper screw labelled with the ground symbol as shown in the following picture

Note: To avoid damages to electronic components caused by the PCB bending, do not press too much while fixing the terminal block.

Label	Description	Function	Cable Type	Max. Wire Length
L1	24 V AC/DC	Power supply	AWG 16 (min. 1 mm ² - max 1.5 mm ²)	75 m
Ln	0 V			
Y	0-10 V DC	Modulating control input	AWG 20 (min. 0.5 mm ² - max 1.5 mm ²)	200 m
M	0 V (common)			
Y1	Not used			
Y2				
V+	16 V DC	Current output max 25mA	AWG 20 (min. 0.5 mm ² - max 1.5 mm ²)	200 m
M	0 V (common)			
U	2-10 V DC	Feedback output signal	AWG 20 (min. 0.5 mm ² - max 1.5 mm ²)	200 m
M	0 V (common)			

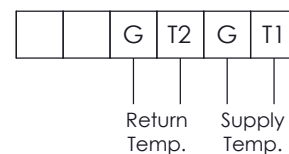
TERMINAL BLOCK T2

Label	Description	Function	Cable type	Max wire length
M+	Tx	Modbus RTU/BACnet MS/TP connection	Belden 8771	See chapter RS485 connection
M-	Rx			
G	Shield			
A1	0-10 V from pressure sensor (inlet pressure)	ΔP reading	Three-core cable supplied	75 cm
A2	0-10 V from pressure sensor (outlet pressure)			
G	0 V (Common)	Pressure sensor common		



TERMINAL BLOCK T3

Label	Description	Function	Max wire length
T1	Supply temp. sensor	Temperature control loop/ ΔT limit function, power control/limit function and energy function	10 m
G	Common		
T2	Return temp. sensor		
G	Common		

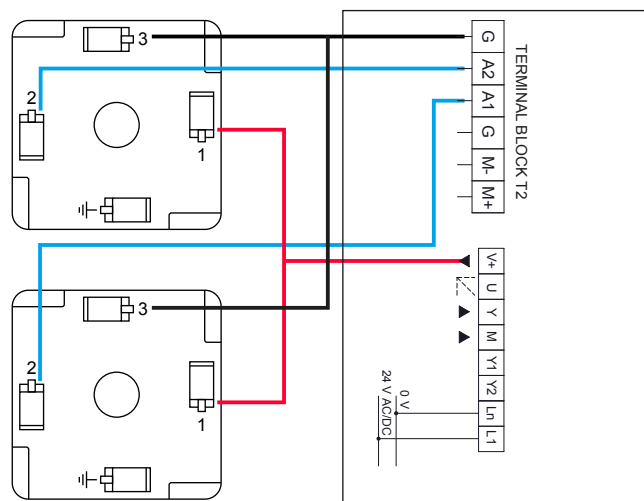


PRESSURE TRANSDUCERS CONNECTION (ACCESSORY)

DIN CONNECTOR EN175301-803-A	Label	Description	Function	Cable type	Max wire length
	1	Power supply	Differential Pressure Reading	Three poles wire (supplied)	75 cm
	2	0-10 V signal			
	3	Common			

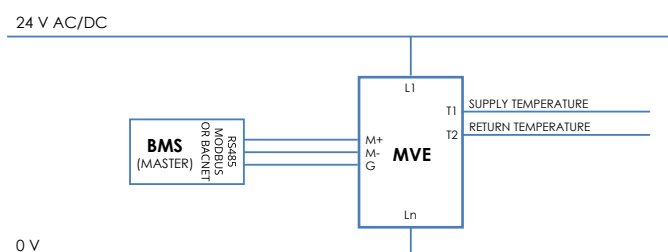
P2 PRESSURE SENSOR (OUTLET)
CONNECT TO PORT A OF THE VALVE

P1 PRESSURE SENSOR (INLET)
CONNECT TO PORT AB OF THE VALVE

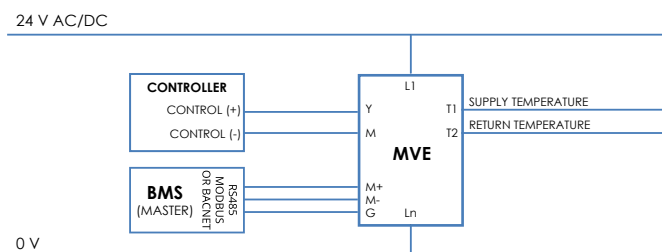


WIRING DIAGRAMS

RS485 control



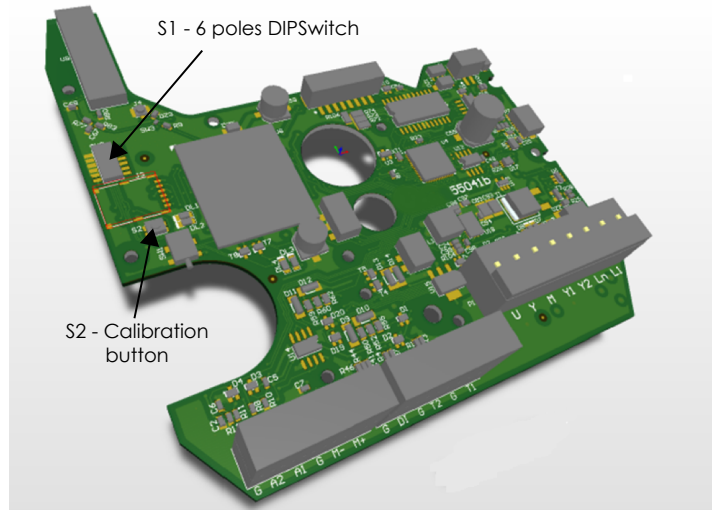
Modulating Control & Modbus RTU or BACnet MS/TP Supervisory



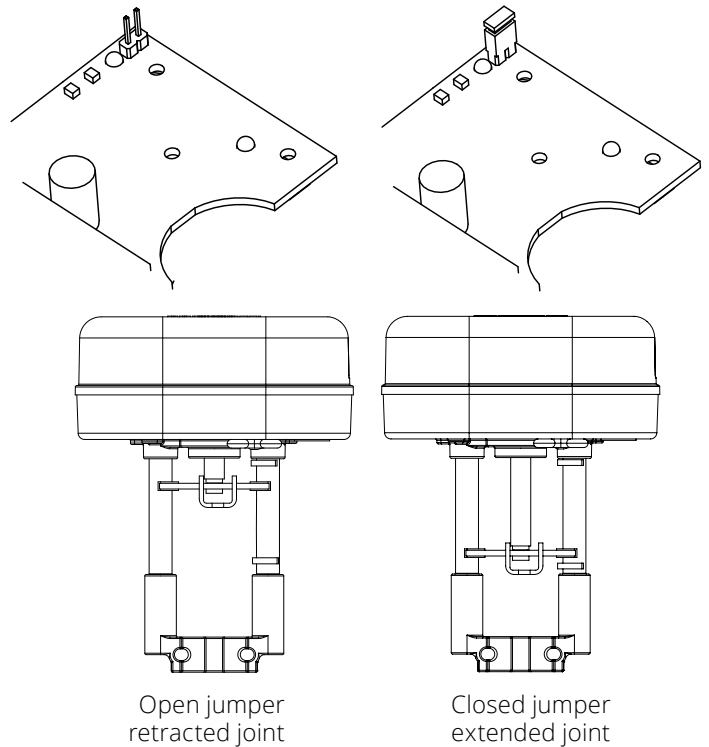
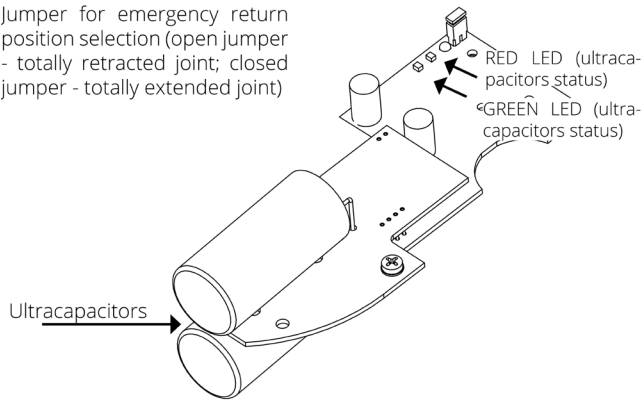
Note: To avoid damages to electronic components caused by the PCB bending, do not press too much while fixing the terminal block. Each pole of the terminal blocks is clearly marked and the same label is on the electronic board. Before turning on the actuator make sure that the terminal blocks are correctly connected to the board and that the labels on the terminals and board match.

DEFAULT SETTINGS

ON	REV	BUS	DEFAULT SETTING	BACNET	EBV	4-20 mA
OFF	1	2	3	4	5	6
	DIR	0-10	NORM	MODBUS	MVE-2-RS	VOLTAGE



Jumper for emergency return position selection (open jumper - totally retracted joint; closed jumper - totally extended joint)



DIP switch	OFF	ON
1	Direct action U= feedback U = 2V U = 10V	Reverse action U= feedback U = 10V U = 2V
2	0-10 V (Input between Y[+] and M [-])	Input signal Bus via Modbus RTU or BACnet MS/TP
3	Normal	Default setting*
4	Modbus RTU	BACnet MS/TP

DIP switch	OFF	ON
5	MVE-2-RS	EBV**
6	Voltage Input Signal (input between Y [+] and M [-])	Current Input Signal 4-20mA (input between Y [+] and M [-])

* To restore the device to factory settings:

1. Switch DIP3 to ON;
2. Disconnect the actuator and in case of model with emergency return wait until the supercapacitors are completely discharged (all the LEDs are OFF);
3. Power up the actuator and in case of model with emergency return wait until the supercapacitors are completely charged (Green LED on emergency return module ON);
4. Switch DIP3 to OFF;
5. Calibration restarts automatically.

** (available only for MVE515R-2-RS)

It is possible to configure another EBV model by following these steps:

1. Set the DIP switch to ON;
2. Reset the actuator via the configurator or enabling/disabling manual override;
3. Select "set as an EBV" in the iC Actuator Configurator software;
4. Choose the configuration file of the model to be configured;
5. Reset the actuator.

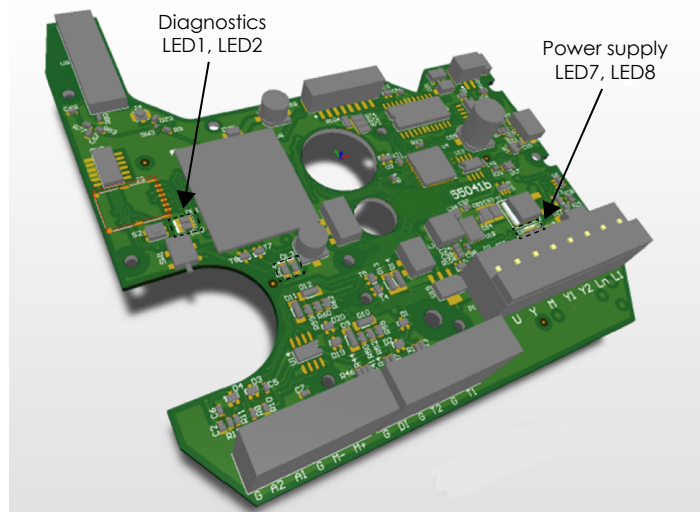
Attention: after changing the DIP Switch configuration it is necessary to restart the actuator (by power Off/On, or reset or engaging/disengaging manual override).

DIAGNOSTIC - ALARM FUNCTIONS

N°	Error type	Actuator status	Actuator behavior	Notification type LEDs	Possible anomaly	Restore procedure
1	Stroke less than 5 mm	Calibration / first installation	The actuator returns to its initial position and does not respond to the command. The actuator keeps the previous stroke or the default stroke	RED ON	Valve with stroke less than 5 mm	Remove power and re-power On
2	Stroke greater than 60 mm	Calibration / first installation	The actuator leaves the maximum range of 60mm and moves to the new extreme. Once the new stroke limit is reached, it returns to the initial position signaling an anomaly. The actuator does not learn the new stroke.	RED fast blinking + GREEN ON	Valve with stroke greater than 60 mm or incorrect coupling	Remove power and re-power On
3	Unexpected collision within the stroke	Normal operation	The actuator checks the stall condition 5 times. At the end of the attempts it signals an anomaly. The actuator does NOT learn the new stroke, but after 60s repeats the attempts to check the blocking conditions	RED fast blinking	Valve blocked	Reverse the control signal and remove the obstacle
4	Stroke greater than expected	Normal operation	The actuator moves to the new stall position signaling an anomaly. The actuator does NOT learn the new stroke	RED fast blinking	Damaged valve or incorrect coupling	Reverse the control signal and check valve coupling
5	Low supply voltage	Normal operation	The actuator continues to operate but performance is not guaranteed.	RED slow blinking	1. Wrong sizing of transformer 2. Unstable power supply	Check and restore power
6	High supply voltage	Normal operation	The actuator continues to operate but performance is not guaranteed.	RED slow blinking	1. Wrong sizing of transformer 2. Unstable power supply	Check and restore power

N°	Error type	Actuator status	Actuator behavior	Notification type LEDs	Possible anomaly	Restore procedure
7	Temperature sensors error	Normal operation	Temperature or ΔT control loops not working	RED blinking alternately fast (5sec) and slow (5sec)	1. Incorrect temperature probe connection	Check the connection and the condition of the temperature sensor
					2. Temperature probes damaged	
					3. Temperature detected outside the range of use	
8	Pressure sensors error	Normal operation	Pressure or ΔP regulation Loops not working		1. Pressure detected outside the range of use	Check the connection and the condition of the pressure sensor
					2. Probes damaged	

STANDARD LEDs BEHAVIOUR



N°	LED 1 and 2	Actuator status
1	FIXED GREEN	Actuator at end extreme end of the calibration stroke
2	GREEN SLOW BLINKING	Actuator has arrived or is moving towards an intermediate point of the calibrated stroke
3	RED and GREEN SLOW BLINKING ALTERNATIVELY	Actuator is calibrating the stroke or performing the initial positioning
4	RED and GREEN FIXED	Manual control activated, the actuator ignores the control signal. WARNING! The board is powered
5	RED and GREEN FAST BLINKING ALTERNATIVELY	Actuator is in bootloader mode

N°	LED 7 (RED) and 8 (RED)	Actuator status
1	LED 7 RED ON; LED 8 RED ON	Stable power supply of the actuator
2	LED 7 RED ON; LED 8 OFF	Unstable actuator power supply; possible hardware problem

Upper electronic board

LED	ULTRACAPACITORS STATUS
GREEN	Ultracapacitor charged
RED	Ultracapacitor discharging
OFF	Ultracapacitor totally discharged

