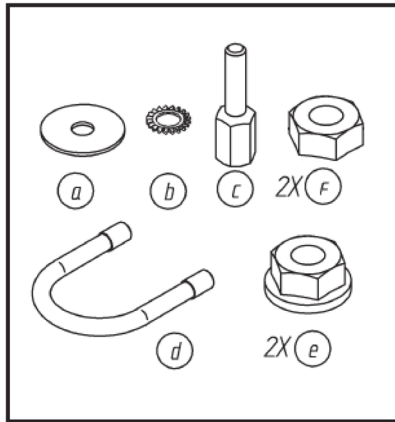


### MOUNTING INSTRUCTIONS

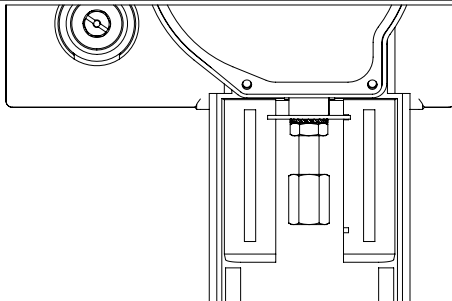


Hot media hazard. Before removing actuator from valve or opening the valve, ensure that the valve control medium is isolated and remove the pressure. Work must only be carried out by a competent engineer.



**Attention:** do not use the actuator disassembled from the valve.

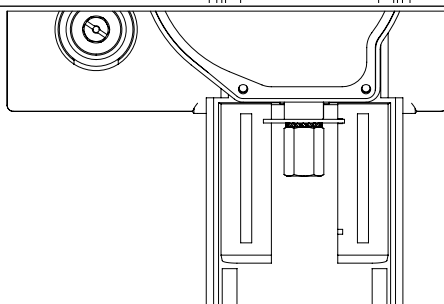
1



**For valve with 16 and 25mm stroke**

- Lower the valve stem
- lock the stem extension **c** on the rack completely retracted placing the indicator disk **a**, the jagged washer **b** and the nut **f** positioned half of the extension itself.

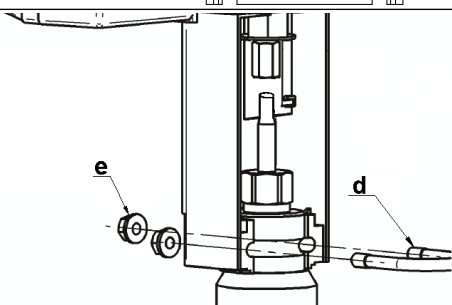
1a



**For valves with 45mm stroke**

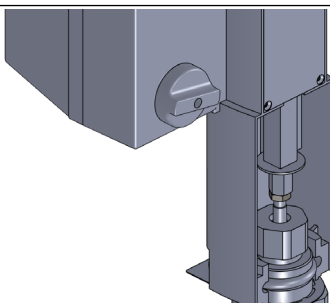
- Lower the valve stem;
- lock the stem extension **c** on the rack completely retracted placing the indicator disk **a** and the jagged washer **b**.

2



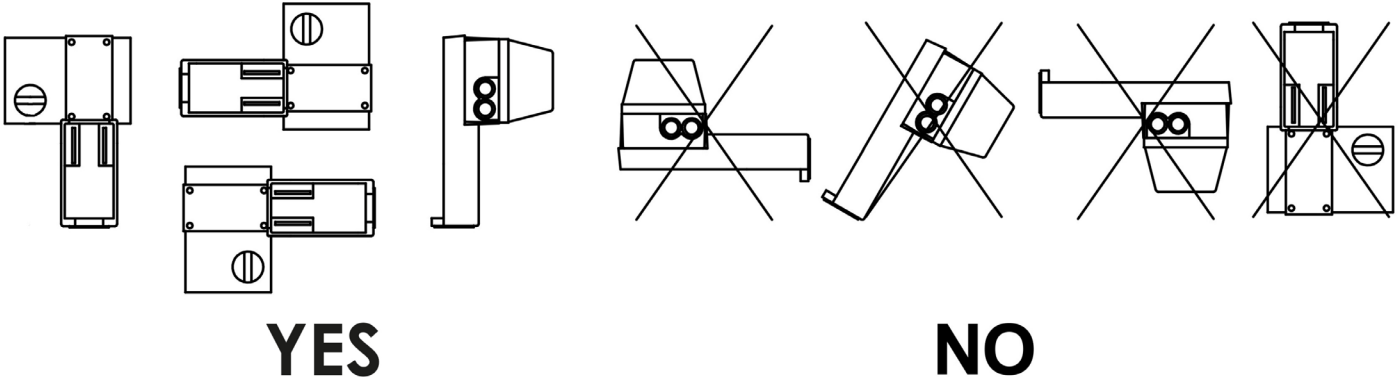
Assemble the actuator to the valve by U-bolt (**d**) and the two nuts (**e**) without locking the nuts.

3



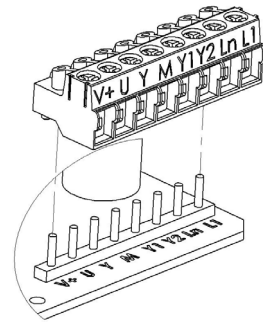
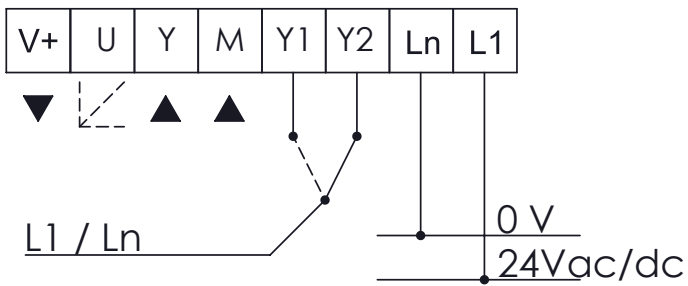
By rotating the manual override knob, lower the stem extension until it reaches the valve stem, then rotate the actuator to screw the stem into the extension. Tighten the locknut on the stem and lock the two nuts on the U-bolt.

## MOUNTING POSITIONS



## WIRING DIAGRAM

### Terminal Block

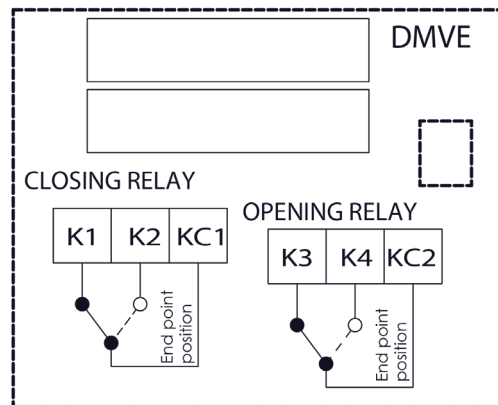


**Note:** To avoid damages to electronic components caused by the PCB bending, do not press too much while fixing the terminal block.

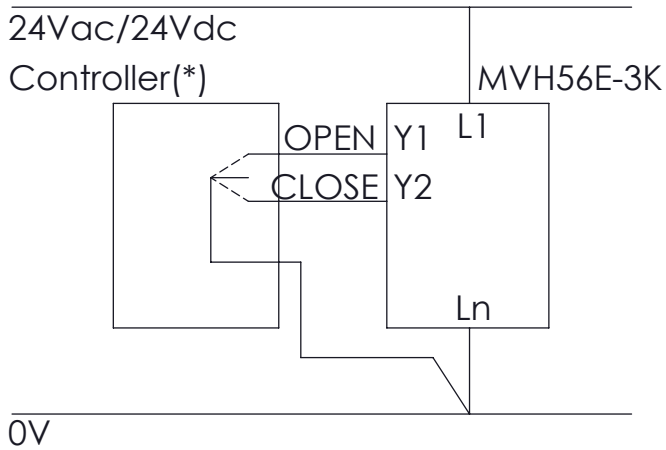
| Label | Description  | Function                    | Min Wire Size (# AWG)       | Max wire Length |
|-------|--------------|-----------------------------|-----------------------------|-----------------|
| L1    | 24 V AC/DC   | Power supply                | 1.5 mm <sup>2</sup> (AWG16) | 75 m            |
| Ln    | 0 V          |                             |                             |                 |
| Y     | 0..10 V DC   | Modulating control input    | 0.5 mm <sup>2</sup> (AWG20) | 200 m           |
| M     | 0 V (Common) |                             |                             |                 |
| Y1    | Open         | Floating control input      | 0.5 mm <sup>2</sup> (AWG20) | 200 m           |
| Y2    | Close        |                             |                             |                 |
| V+    | 16 V DC      | Voltage output (max. 25 mA) | 0.5 mm <sup>2</sup> (AWG20) | 200 m           |
| M     | 0 V (Common) |                             |                             |                 |
| U     | 2÷10 V DC    | Feedback output signal      | 0.5 mm <sup>2</sup> (AWG20) | 200 m           |
| M     | 0 V (Common) |                             |                             |                 |

Terminals correspondence with respect to other iSMA CONTROLLI actuators models.

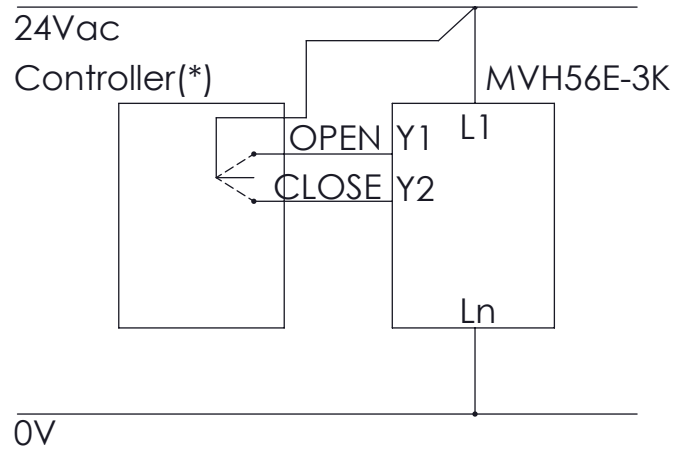
|    |    |    |    |    |    |    |   |               |
|----|----|----|----|----|----|----|---|---------------|
| G  | G0 | MX | G1 | X1 | VH | VC | Y | MVH56F        |
| G  | G0 | MX | G1 | X1 | VH | VC | Y | MVH3K         |
| L1 | LN | M  | V+ | Y  | Y1 | Y2 | U | MVH56E/MVHE3K |



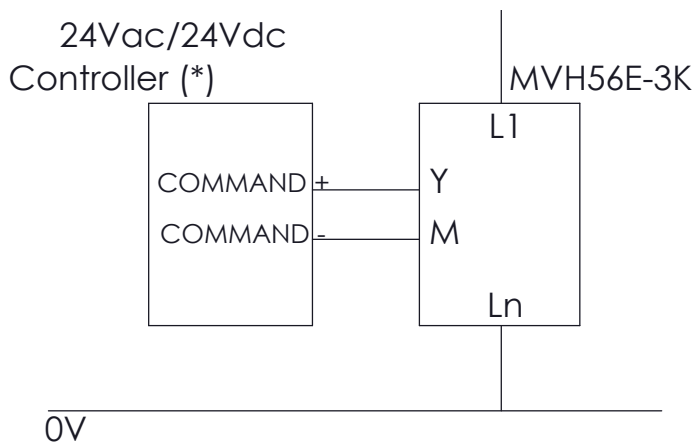
### 3-point Floating Control (Sink Connection)



### 3-point Floating Control (Source Connection)



### Modulating Control (0-10 Vcc)

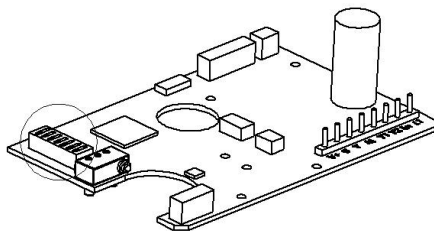


N.B. Signals M and Ln are internally connected.

(\*) MVH56E-3K actuators contain a half-wave rectifier power supply. They must not be powered with transformers that are used to power other devices using not isolated full-wave rectifier power supply.

## DIP SWITCHES SETTINGS

Set the DIP switches according to the tables here below. In order to be sure that any modification has been accepted by the actuator, power down and power up it again or act on the manual operation handle to be sure that settings will be recognized.



|              |  |                |
|--------------|--|----------------|
| DIR          |  | REV            |
| MOD          |  | INC            |
| ---          |  | SEQ            |
| 0 - 10       |  | 2 - 10         |
| 0 - 5, 2 - 6 |  | 5 - 10, 6 - 10 |
| ---          |  | 4 - 20 mA      |
| AUTO         |  | MAN            |

**OFF      ON**

**Factory settings**

| DIP Switch | OFF                                                                                                                                | ON                                                                                                                                                                                                                      |
|------------|------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1          | <p>Direct Action</p> <p>U= feedback   U = 2V<br/>U = 10V</p>                                                                       | <p>Reverse Action</p> <p>U= feedback   U = 10V<br/>U = 2V</p>                                                                                                                                                           |
| 2          | <p>Modulating Control (MOD) (Input between Y [+] and M [-])</p>                                                                    | <p>3 point floating (INC) ( Y1 open-extend , Y2 close-retract connected L1 or Ln if powered in V<sub>acd</sub>; if powered in V<sub>dc</sub> connected necessarily to Ln )</p> <p> </p>                                 |
| 3          | -                                                                                                                                  | Selection of sequence mode, control range defined by SW 5                                                                                                                                                               |
| 4          | Modulating Control 0-10Vdc<br>(DIP n. 2 OFF only)                                                                                  | Modulating Control 2-10Vdc<br>(DIP n. 2 OFF only)                                                                                                                                                                       |
| 5          | Sequence Control 0-5Vdc with DIP n. 4 OFF only<br>Sequence Control 2-6Vdc with DIP n. 4 ON only<br>(DIP n. 3 ON only)              | Sequence Control 5-10Vdc with DIP n. 4 OFF only<br>Sequence Control 6-10Vdc with DIP n. 4 ON only<br>(DIP n. 3 ON only)                                                                                                 |
| 6          | Voltage Input Signal<br>(input between Y [+] and M [-])                                                                            | Current Input Signal 4-20mA (input between Y [+] and M [-]).<br>In this case DIP n. 4 must be set to ON.                                                                                                                |
| 7          | Automatic Calibration: the actuator updates the stroke range every time an unexpected mechanical stop is detected for at least 10s | Manual Calibration: the actuator calibration is started moving the DIP from OFF to ON; if the DIP is left in ON the actuator will never update the calibrated stroke value even when an unexpected endpoint is detected |

| DIAGNOSTIC - ALARM FUNCTIONS (VIA LED) |                               |                                                     |                                    |                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                 |                                                |                                 |
|----------------------------------------|-------------------------------|-----------------------------------------------------|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------|
| N°                                     | LED BEHAVIOUR                 | ERROR                                               | ACTUATOR USE                       | ACTUATOR BEHAVIOUR                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                 | TYPICAL TROUBLESHOOTING CONDITION              | RESET PROCEDURE                 |
|                                        |                               |                                                     |                                    | AUTOMATIC CALIBRATION<br>DIP N. 7 OFF                                                                                                                                                                                                                                                                                                           | MANUAL CALIBRATION<br>DIP N. 7 ON                                                                                                                                                                                                                                                                                                               |                                                |                                 |
| 1                                      | RED ON                        | Valve stroke less than 5 mm                         | Calibration/<br>first installation | The actuator pushes/pulls 2 times (unexpected stall) trying to remove the possible obstacle. After 2 tries an alarm is signalled and the actuator moves to initial position and does not respond to control signal. Stroke value is not updated because out of range                                                                            | The actuator pushes/pulls 2 times against endpoint during calibration and the actuator moves to the initial position and then it does not respond to the control signal. The actuator keeps the previous stroke                                                                                                                                 | Valve with a stroke length lower than 5mm      | Remove power and power up again |
| 2                                      | RED quick blinking + GREEN ON | Stroke longer than 50 mm                            | Calibration/<br>first installation | The actuator exits the 50mm stroke range and it moves toward the new stroke limit signalling an anomaly. The actuator pushes/pulls 2 times against the new stroke limit, then it goes back to the initial position still signalling the anomaly until it is not within 50mm. The actuator does not calibrate the stroke after 10s (wrong range) | The actuator exits the 50mm stroke range and it moves toward the new stroke limit signalling an anomaly. The actuator pushes/pulls 2 times against the new stroke limit, then it goes back to the initial position still signalling the anomaly until it is not within 50mm. The actuator does not calibrate the stroke after 10s (wrong range) | Valve with a stroke length longer than 50mm    | Remove power and power up again |
| 3                                      | RED quick blinking            | Unexpected stall within the calibrated stroke range | Normal operation                   | The actuator tries 5 times against the new stall condition and then after 10s the actuator updates the new stroke length                                                                                                                                                                                                                        | The actuator tries 5 times against the new stall condition. At the end of the attempts the fault will be signalled. The actuator does not update the new stroke length, but after 60s makes other attempts to verify the stall condition                                                                                                        | Valve stuck                                    | Inverted control signal         |
| 4                                      | RED quick blinking            | Stroke longer than expected                         | Normal operation                   | The actuator moves toward the new stall condition with a lower speed; after 10s the actuator updates the new stroke value                                                                                                                                                                                                                       | The actuator moves toward the new stall condition with a lower speed; after 10s the actuator does not update the new stroke value                                                                                                                                                                                                               | Stem connection loose or valve damaged         | Inverted control signal         |
| 5                                      | RED slow blinking             | Low power voltage                                   | Normal operation                   | The actuator is still working but performance cannot be guaranteed                                                                                                                                                                                                                                                                              | The actuator is still working but performance cannot be guaranteed                                                                                                                                                                                                                                                                              | 1. Wrong transformer size<br>2. Unstable power | Correct Voltage Power           |
| 6                                      | RED slow blinking             | High power voltage                                  | Normal operation                   | The actuator is still working but performance cannot be guaranteed                                                                                                                                                                                                                                                                              | The actuator is still working but performance cannot be guaranteed                                                                                                                                                                                                                                                                              | 1. Wrong transformer size<br>2. Unstable power | Correct Voltage Power           |

#### STANDARD LEDs

##### Electronic Control Board

| N° | LEDs BEHAVIOUR                  | ACTUATOR STATUS                                                                                                               |
|----|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------|
| 1  | GREEN ON                        | The actuator arrived at the extreme point of the stroke                                                                       |
| 2  | GREEN BLINKING                  | The actuator is moving or arrived at the intermediate point of the stroke                                                     |
| 3  | RED GREEN BLINKING ALTERNATING  | Calibration or initialization phase                                                                                           |
| 4  | RED GREEN ON                    | Manual control enabled, the actuators ignores the control signal.<br>ATTENTION! The electronic board is electrically supplied |
| 5  | RED GREEN BLINKING SIMULTANEOUS | The actuator is in emergency return phase                                                                                     |