

# APEM

## M series

Miniature resistive joysticks



The M Series miniature joystick is a low profile potentiometric controller providing precision multi-axes finger-positioning control. Available with up to three axes and two pushbuttons, the M Series joystick is ideal for applications requiring a compact low operating force controller. Featuring 17 ergonomically designed handles, typical applications include CCTV, robotics, electric wheelchairs, and measurement systems. The M Series is the de facto standard industrial joystick for the CCTV professional.



### KEY FEATURES

- ☐ World's #1 selling joystick for CCTV applications
- ☐ Potentiometric sensing
- ☐ One, two or three axes
- ☐ Low profile design with 17 handle options



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### OPTION SELECTION

|   |  |   |  |  |  |   |  |
|---|--|---|--|--|--|---|--|
| M |  | 1 |  |  |  | 1 |  |
|---|--|---|--|--|--|---|--|

**SERIES**

#### MOUNTING BEZEL

- C Split Bezel
- F Square Bezel
- L Rubber Boot Kit

#### MODEL

- 1 2 Axes
- 2 2 Axes with Pushbuttons
- 3 3 Axes
- 4 3 Axes with Pushbuttons

#### CENTERING

- 0 Spring Centering
- 6 Torque Set (Friction)

#### HANDLE

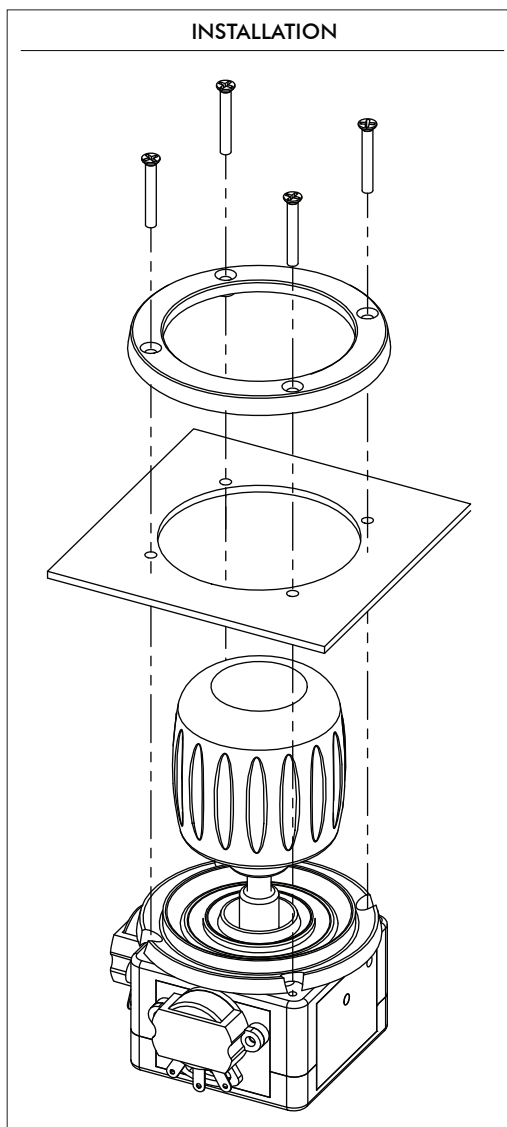
- 0 Tapered Convex
- 1 Concave Tip
- 2 Flat Tipped
- 3 Concave Tip - Long
- 5 Pushbutton
- 6 Straight Tip - Short
- 8 3 Axes
- 9 3 Axes with Pushbutton
- A Straight Tip - Mid
- B Straight Tip - Long
- C Ball Tip
- E Pushbutton
- G Pushbutton
- H Pushbutton
- M 3 Axes No Button
- N 3 Axes with 1 Button
- Q 3 Axes with 2 Buttons

#### OUTPUT OPTIONS

Potentiometers<sup>3</sup> :

- P 5K $\Omega$ , 220°
- M 5K $\Omega$ , 56°
- R 5K $\Omega$ , 50°

#### INSTALLATION



#### NOTES

##### 1. Front Mounting Bezels (FM)



C = Split Bezel  
Cutout dimensions = 39.70mm(1.562in)



L = Rubber Boot  
Cutout dimensions = 39.70mm(1.1.562in)

##### 2. Rear mounting bezels (RM)



F = Square Bezel  
Cutout dimensions = 30.15mm(1.187in)

##### 3. Potentiometer specifications are located on the next page.



Mounting accessories. Standard hardware includes:

- C = Ring, cup, and 4 black screws 2-56x1/2in
- L = Ring and 4 black screws 2-56x1/2in
- F = Square bezel, 4 screws 2-56x1/2in, and 4 screws 2-56x1/4in

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### SPECIFICATIONS

#### MECHANICAL (FOR X AND Y AXES)

|                                            |   |                           |
|--------------------------------------------|---|---------------------------|
| Break Out Force                            | – | 0.7N (0.16lbf)            |
| Operating Force                            | – | 1.3N (0.29lbf)            |
| Maximum Applied Force                      | – | 100N (22.48lbf)           |
| Mechanical Angle of Movement               | – | 56°                       |
| Expected Life                              | – | See potentiometer options |
| Mass/weight                                | – | Varies                    |
| Package Size (mm) (L x W x H) or (Dia x H) | – | Varies                    |
| Lever Action (Centering)                   | – | Spring or Friction        |

#### MECHANICAL (FOR Z AXIS)

|                          |   |                       |
|--------------------------|---|-----------------------|
| Break Out Torque         | – | 0.022N·m (0.19lbf·in) |
| Operating Torque         | – | 0.040N·m (0.35lbf·in) |
| Maximum Allowable Torque | – | 0.049N·m (0.43lbf·in) |
| Mechanical Angle         | – | 90°                   |
| Handle Action            | – | Spring                |

#### ENVIRONMENTAL

|                       |   |                                |
|-----------------------|---|--------------------------------|
| Operating Temperature | – | -25°C to 70°C (-13°F to 158°F) |
| Storage Temperature   | – | -40°C to 70°C (-40°F to 158°F) |

#### POTENTIOMETER OPTIONS

| Potentiometer         | P                  | M                  | R                  |
|-----------------------|--------------------|--------------------|--------------------|
| Electrical Element    | Conductive Plastic | Conductive Plastic | Conductive Plastic |
| Track Resistance      | 5K                 | 5K                 | 5K                 |
| Linearity             | ±1.0%              | ±5.0%              | ±1.0%              |
| Track Operating Angle | 220°               | 56°                | 50°                |
| CRV                   | ±1.5%              | ±1.5%              | ±1.0%              |
| Power Dissipation     | 0.25W @ 40°C       | 0.5W @ 70°C        | 1W                 |
| Rotational Life       | 1,000,000          | 1,000,000          | 10,000,000         |

#### CENTERING OPTIONS

- **SPRING CENTERING**

The joystick returns to center when the handle is released.

- **TORQUE SET**

Torque set provides absolute positioning with uniform friction applied to “X” and “Y” axes.

#### NOTES:

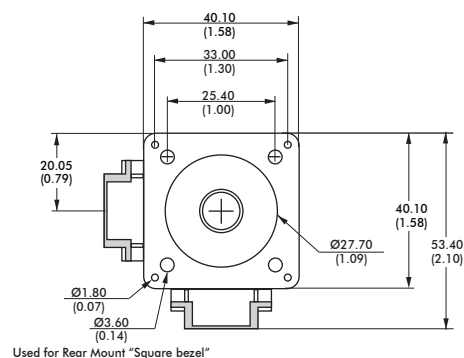
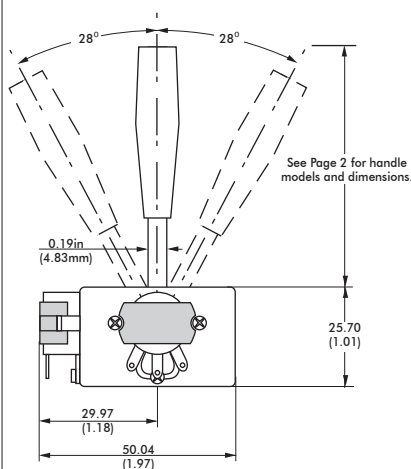
- All values are nominal
- Specifications are subject to the joystick configuration. Contact Technical Support for the performance of your specific configuration
- The M Series is intended for internal applications

# M series

## Miniature resistive joysticks

### DIMENSIONAL DRAWINGS

#### 2 AXES WITH OPTION A HANDLE



#### NOTES:

1. Mechanical dimensions represent a joystick with the largest potentiometer option.
2. Potentiometer size will vary according to selected option.

#### HANDLES

##### 2 AXES

0

1

2

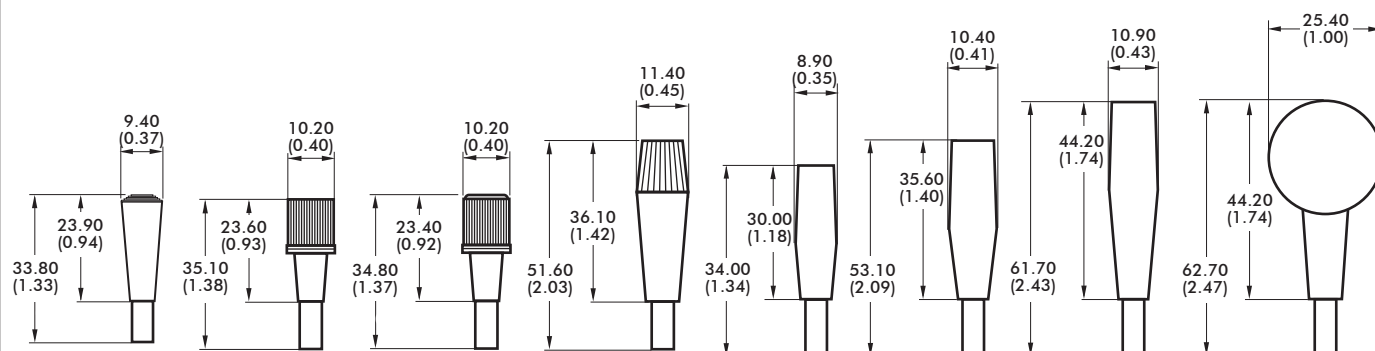
3

6

A

B

C



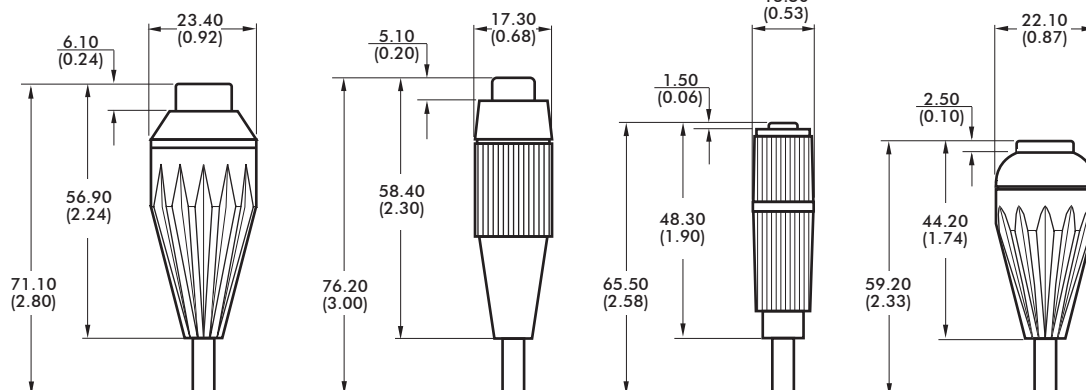
##### 2 AXES WITH PUSHBUTTON<sup>1</sup>

5

E

G

H



#### NOTES:

1. Pushbuttons are not sealed. Joysticks are intended for internal applications only.

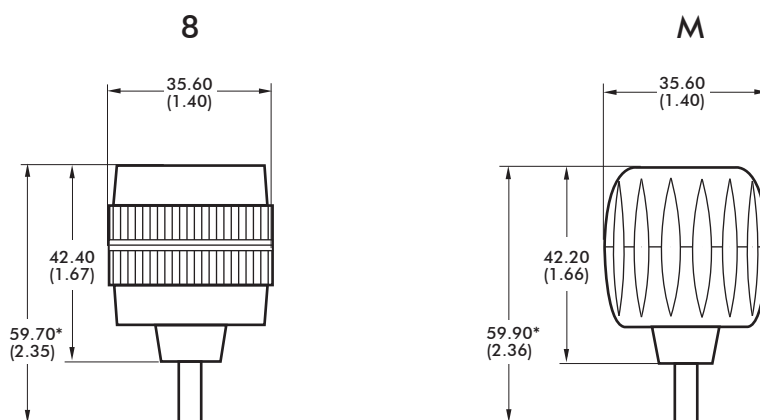
Note: The company reserves the right to change specifications without notice.

# M series

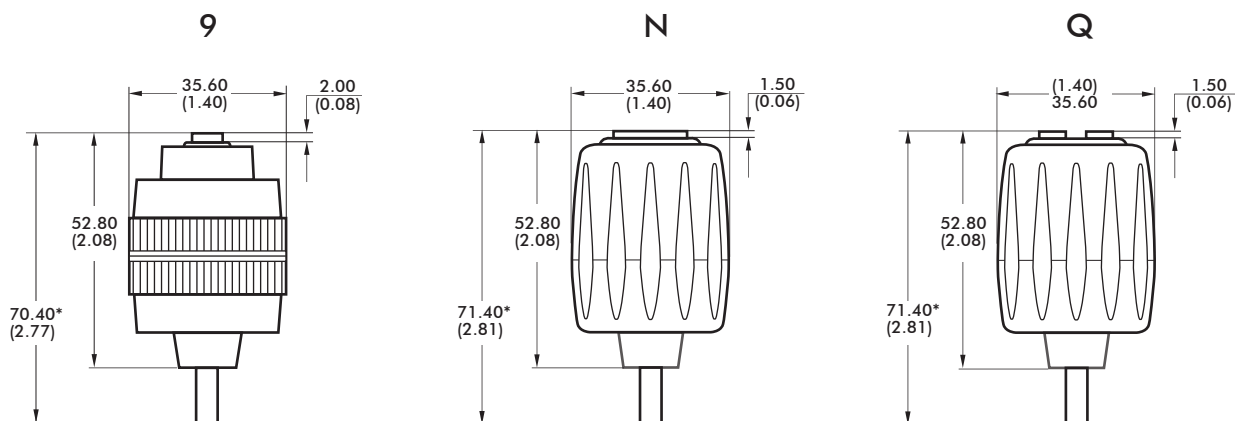
## Miniature resistive joysticks

### DIMENSIONAL DRAWINGS - continued

#### 3 AXES



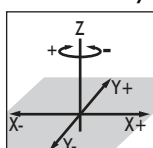
#### 3 AXES WITH PUSHBUTTONS



#### NOTES:

1. Dimensions are in mm/(inch)
2. Pushbuttons are not sealed. Joysticks are intended for internal applications only.

3. Axes orientation:



4. Wiring information: -Cables are provided for pushbuttons and the Z axis.  
-Cables are not supplied for the potentiometers (axes X and Y).

#### DEFAULT WIRE COLOR CODE\*

| DEFAULT WIRE COLOR CODE*                                     |               |     |
|--------------------------------------------------------------|---------------|-----|
| COLOR                                                        | FUNCTION      | AWG |
| 2 OR 3 AXES JOYSTICK WITH 1 PUSHBUTTON - OPTIONS 5,E,G,H,9,N |               |     |
| ORANGE                                                       | Switch 1      | 28  |
| ORANGE                                                       | Switch Common |     |
| 3 AXES JOYSTICK WITH 2 PUSHBUTTONS - Option Q**              |               |     |
| ORANGE                                                       | Switch 1      | 28  |
| BROWN                                                        | Switch 2      |     |
| GREEN                                                        | Switch Common |     |
| Z AXIS IN A 3 AXES JOYSTICK - OPTIONS 8,9,M,N,Q              |               |     |
| RED                                                          | Supply        | 28  |
| WHITE                                                        | Signal        |     |
| BLUE                                                         | Return        |     |

#### NOTES:

\* Wires for the Z axis and for the pushbuttons are 292mm (11.5in) and stripped.

\*\* Handle "Q" pushbuttons are shown in the following drawing:

