

HF series

Hall effect joysticks

Distinctive features and specifications



- 1, 2 & 3 axis configurations
- CANbus J1939 and CANopen options
- USB 1.1 HID interface option
- Dual sensors for redundancy
- Voltage regulator, 24V supply option
- Connectorized housing

| MECHANICAL (FOR X, Y AXIS) | ENVIRONMENTAL |
|---|---|
| <ul style="list-style-type: none"> Break Out Force: 1.3N (0.3lbf) Operating Force: 2.8N (0.63lbf) Maximum Applied Force: 200N (45.00lbf) Mechanical Angle of Movement: 36° (18° from center) Expected Life: 5 million Material: Glass filled nylon Package Size: 5.75" x 4.50" x 3.25" Lever Action: Single spring, omnidirectional | <ul style="list-style-type: none"> Operating Temperature: -40°C to 85°C (-40°F to 185°F) Storage Temperature: -40°C to 85°C (-40°F to 185°F) Sealing (IP): Up to IP68* EMC Immunity Level (V/M): EN61000-4-3 EMC Emissions Level: EN61000-6-3:2001 ESD: EN61000-4-2 Output linearity: ±200mV Dual output interlinearity (X/Y): ±400mV Dual output interlinearity (Z): ±600mV |
| MECHANICAL (FOR Z AXIS) | ELECTRICAL |
| <ul style="list-style-type: none"> Break Out Torque: 0.09N·m (0.80lbf·in) Operating Torque: 0.121N·m(1.07lbf·in) Maximum Allowable Torque: 2.50N·m(22.13lbf·in) Hand Mechanical Angle: 60° (30° from center) Handle Action: Spring centering, rotational Expected Life: 5 million | <ul style="list-style-type: none"> Sensor: Hall effect Supply Voltage Operating: 5VDC±0.01VDC Reverse Polarity Max: -10VDC Overshoot Max: 20VDC Output Voltage: See options Output Impedance: 2Ω |

NOTES:

- All values are nominal.
- Exact specifications may be subject to configuration. Contact Technical Support for the performance of your specific configuration.
- * Excludes some handle options.

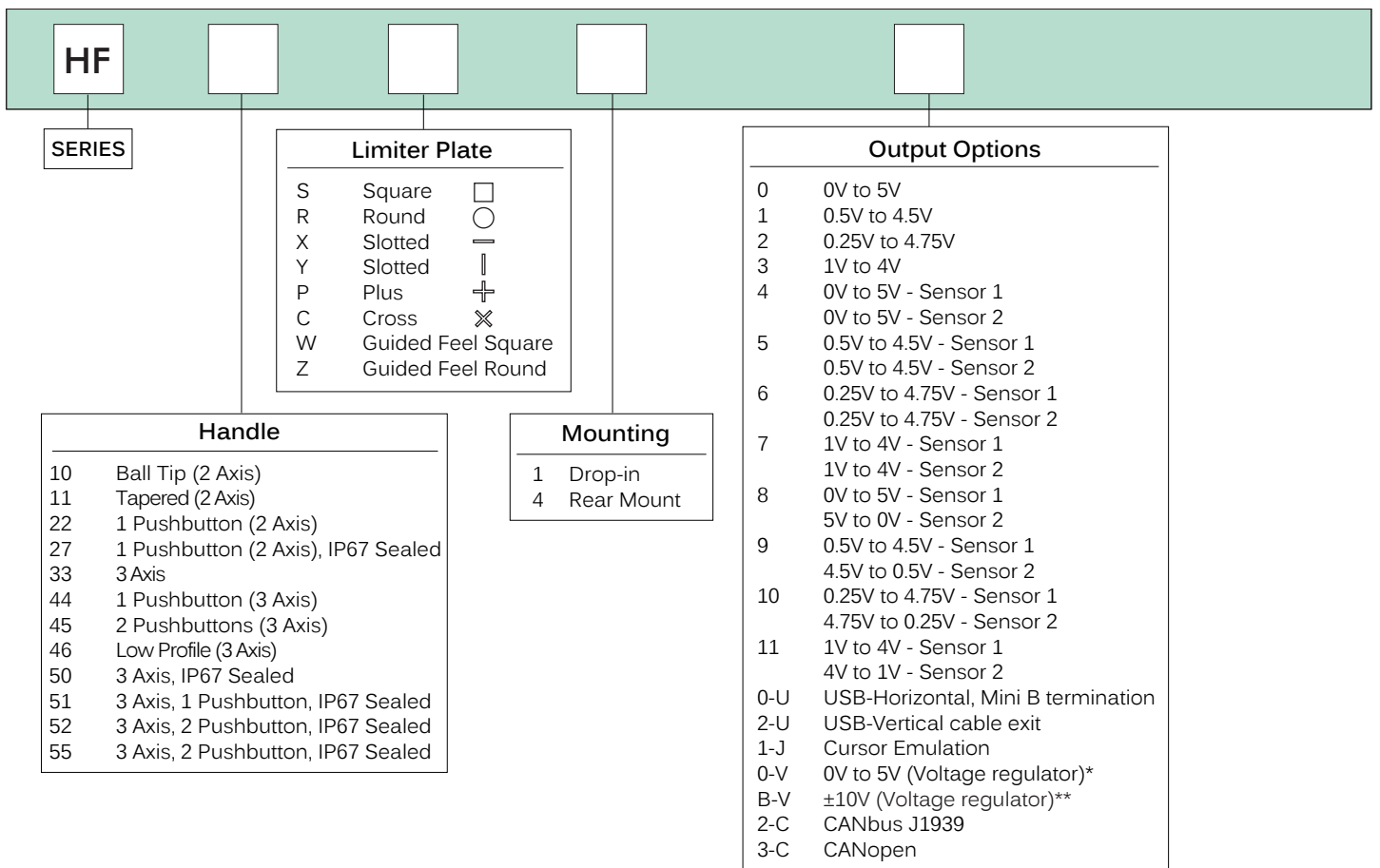


Note: The company reserves the right to change specifications without notice.

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Overview



NOTES

- The HF Series joysticks are supplied with a Hirose DF11-12DP-2DS9(24) connector (male receptacle). (Fig 1) Cable not included. Please request at order entry. Cable connector (female socket) is Hirose DF11-12DS-2C. (Fig 2) Connector specifications: 12 position 2mm pitch dual row (2x6) pin header.

| Wire Color | Description |
|--------------|----------------------|
| Black | Ground |
| Red | Power |
| Blue/White | X-Axis (Dual Output) |
| Blue | X-Axis |
| Yellow/Black | Y-Axis (Dual Output) |
| Yellow | Y-Axis |
| Green/Black | Z-Axis (Dual Output) |
| Green | Z-Axis |
| Orange | Button 1 |
| White | Button Common |
| Violet | Button 2 |

- * Requires operating voltage $6V \geq 35V$
- ** Requires operating voltage $11V \geq 35V$



Up to IP68 available.



Mounting accessories. Standard hardware includes: gasket, clamping ring, and four #4-40x3/4 Phil Ph MS SS screws.


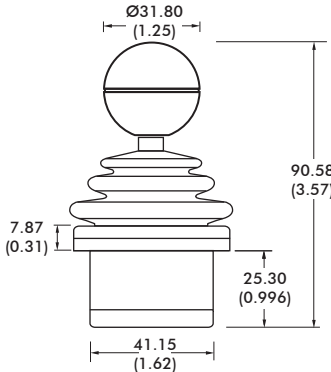
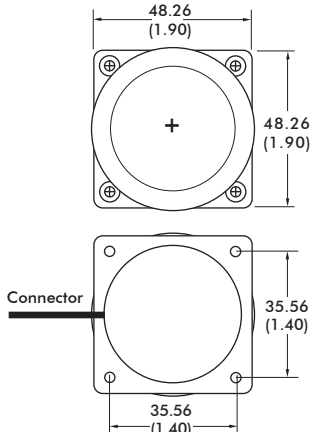

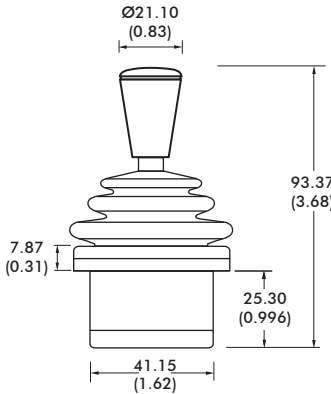
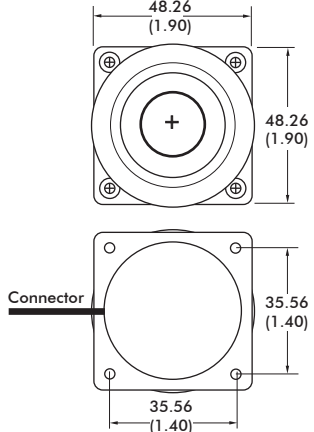

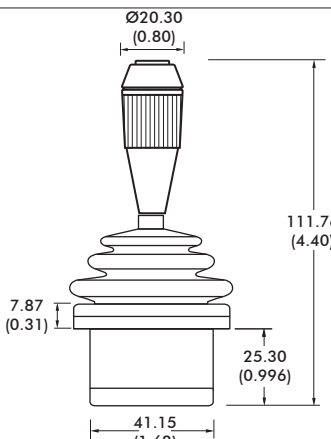
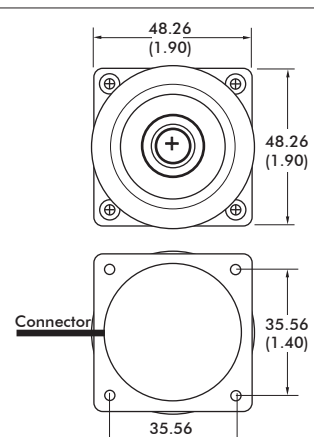

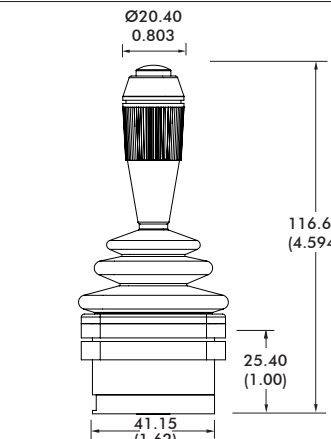
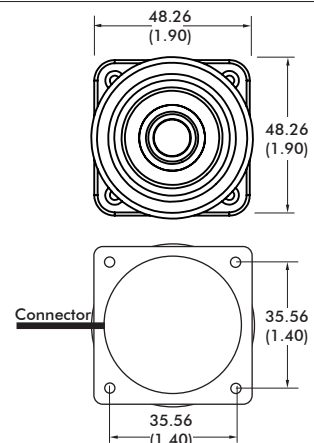


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| | | |
|--|---|---|
| <p style="text-align: center;">10</p>  |  |  |
| <p style="text-align: center;">11</p>  |  |  |
| <p style="text-align: center;">22</p>  |  |  |
| <p style="text-align: center;">27</p>  |  |  |

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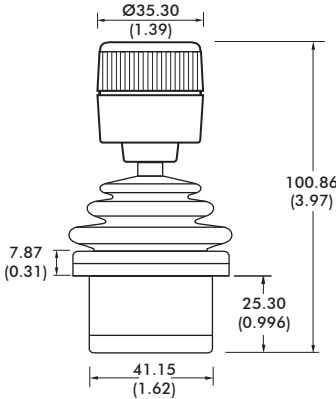
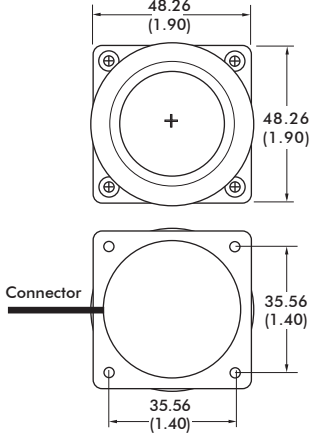

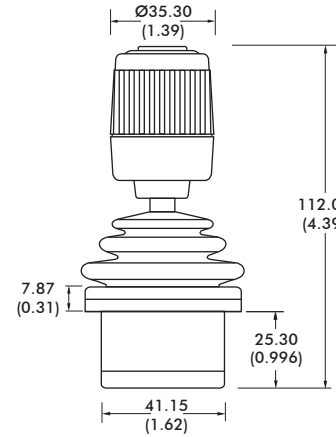
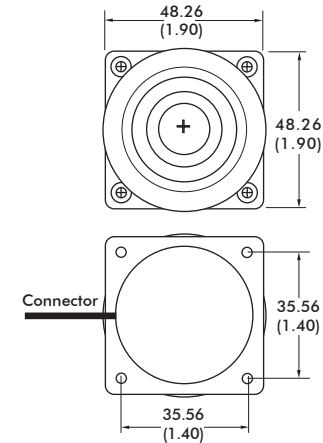

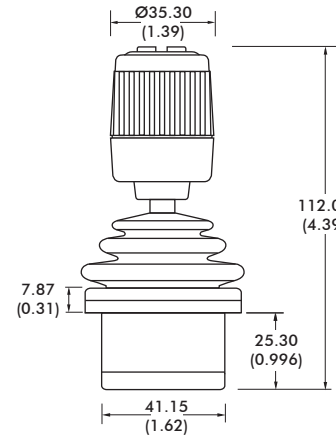
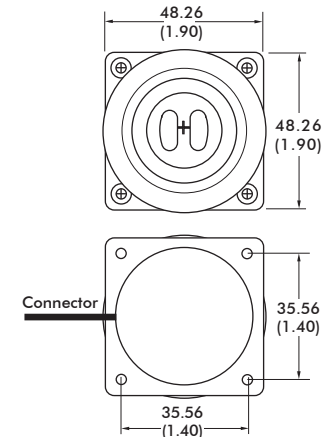

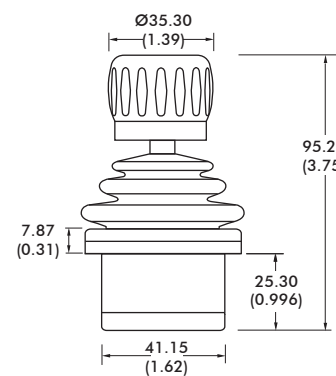
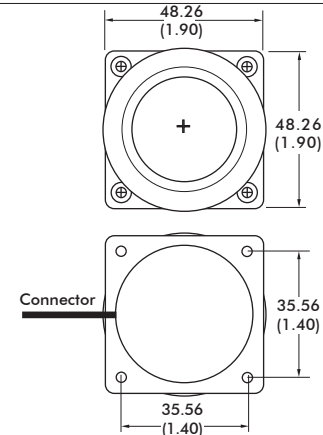
APEM

www.apem.com

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Overview

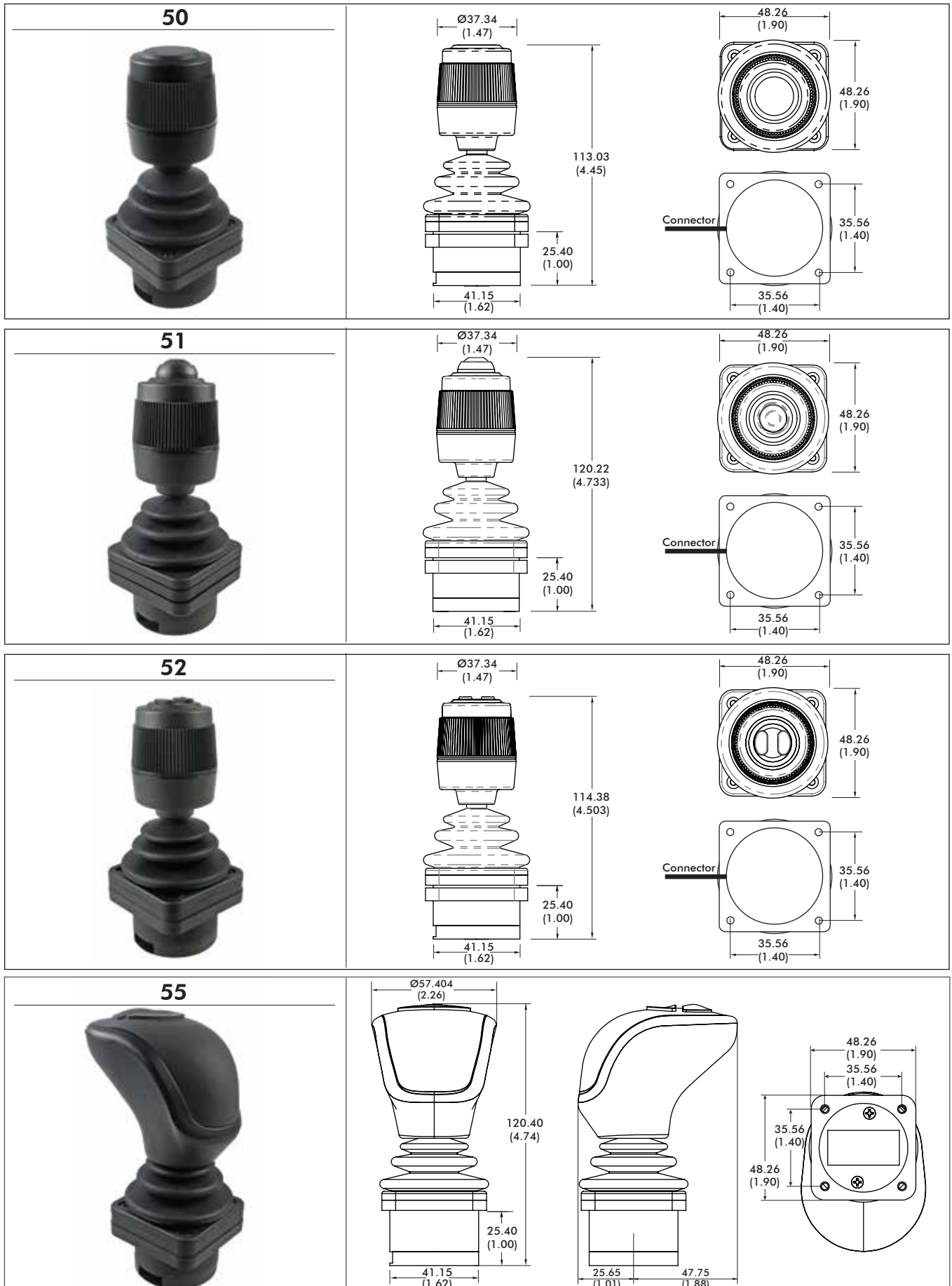
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|--|---|---|
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| <p style="text-align: center;">44</p>  |  |  |
| <p style="text-align: center;">45</p>  |  |  |
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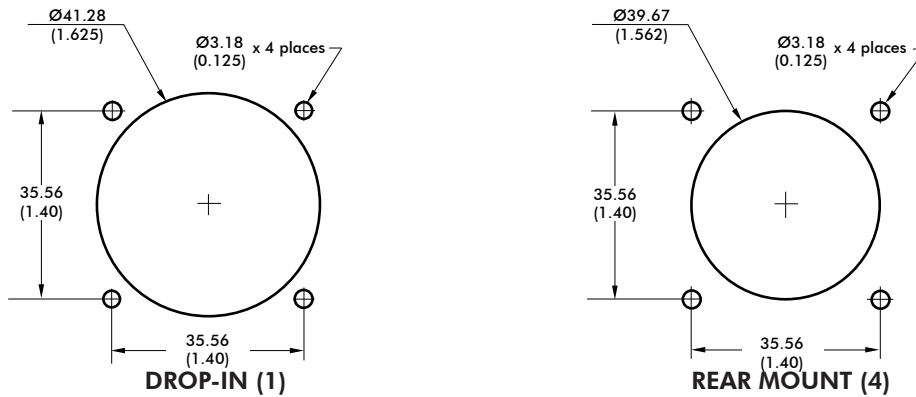
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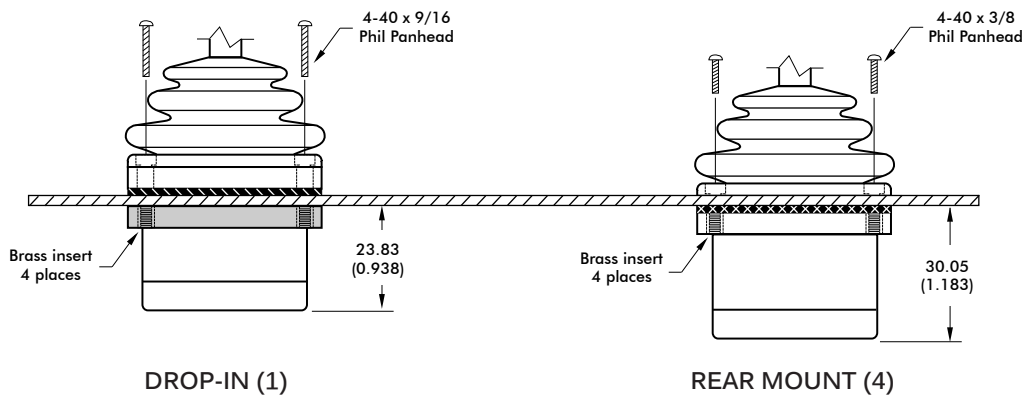
Overview

PANEL CUT-OUT DIMENSIONS

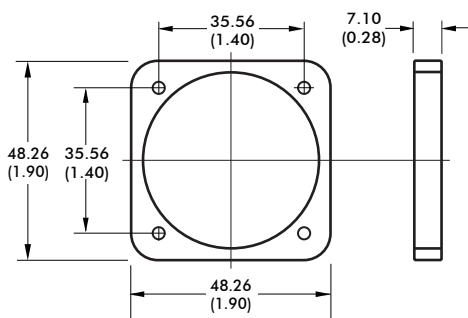


* Not available for Option 11 and 55 Handles

MOUNTING OPTIONS



CLAMPING RING



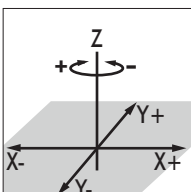
NOTES:

- For DROP-IN mounting, the panel thickness can be 1.17mm to 3.17mm (0.046in to 0.125in).
- For REAR MOUNT the maximum panel thickness is 1.6mm (0.063in).
- A panel thickness of 1/16" (1.6mm/0.063in) was considered for all the below-panel depth values.
- The below-panel depth is extended by 7.11mm (0.28in) with the USB, Cursor Emulation, Voltage Regulator options.

-  - Panel
-  - Gasket
-  - Rear Mount Gasket

NOTES:

1. Dimensions are in mm/(inch).
2. Axis orientation:



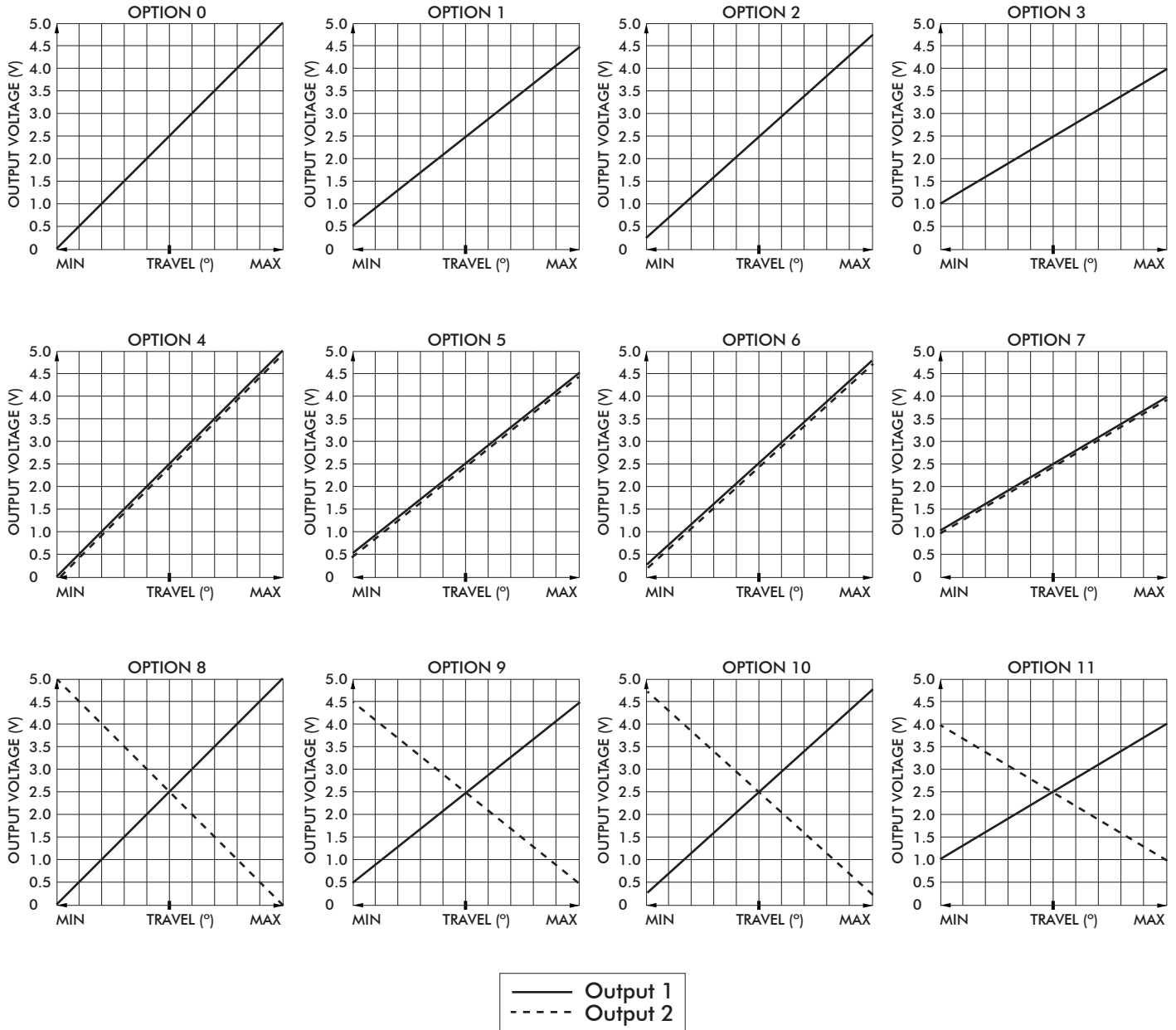
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VOLTAGE OUTPUT OPTIONS



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USB

USB

Featuring USB 1.1 HID compliant interface, APEM's USB joysticks are recognized as standard HID "game controller" devices. Adhering to the HID specification, APEM's USB joysticks are plug-and-play with most versions of Windows and Linux. Joystick button and axis assignments are dependent upon the controlled application.

FEATURES

- USB 1.1 HID compliant "game controller" device
- Easy to install and operate
- Functions determined by controlled application
- Standard Male Type A Connector

CURSOR EMULATION

The Cursor Emulation option converts multi-axis joystick output into a mouse, trackball, or cursor control device. The joystick's internal microprocessor converts absolute axis position into a cursor velocity, which is translated as a relative trackball or mouse position.

APPLICATIONS

The Cursor Emulation option is ideal for vehicle applications subjected to dirt and high vibration which makes operating a traditional cursor control device difficult. The Cursor Emulation option is widely used in marine and military applications.

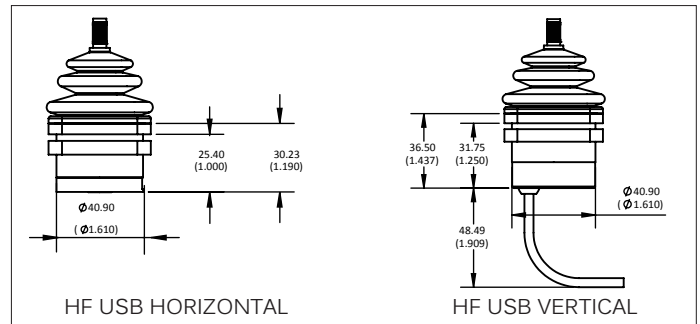
FEATURES

- HID compliant "pointing device"
- Plug-and-play with USB option
- Ideal for marine GPS and navigation

TERMINATION OPTIONS

- 0-U USB Male Type A to mini B
- 2-U USB Male Type A to verticle cable termination

I/O COMPLEMENT/ USER SPECIFIED PARAMETERS:



ADDITIONAL OUTPUT OPTIONS

VOLTAGE REGULATOR

The Voltage Regulator option may be used when the operating supply voltage is 11V to 35V..

User Specified Output Voltage:

- 0-5VDC
- ±10VDC

| ELECTRICAL SPECIFICATIONS | |
|---------------------------|------------|
| • Supply Voltage: | 11V to 35V |
| • Supply Current: | 90mA max |

| WIRING SPECIFICATION | |
|--|------------------------|
| • Red wire: | Supply (+35V max.) |
| • Black wire: | Ground |
| • Blue wire: | X axis output |
| • Yellow wire: | Y axis output |
| • Green wire: | Z axis output |
| • White wire: | Pushbutton common wire |
| • Orange, violet, grey, brown, pink, bl/wt/y/bk, gn/bk, gy/w wire: | Pushbutton outputs |

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CANbus

CANbus ELECTRICAL SPECIFICATIONS

- Operating voltage: 6V to 35V
- Current consumption: TBD
(typical: 35mA @ 12V, 18mA @ 24V, 15mA @ 30V)
- Output signal: CANbus
- Reverse connection protected: Yes
- Short-circuit protected against + UB max: Yes
- Short-circuit protected against GND: Yes
- CAN: ISO 11898, CAN specification 2.0A/ 2.0B
- Protocol: CANJ1939, CANJ1939-71, CANopen
- Baud rate: 125kbit/s, 250kbit/s, 500kbit/s, 1Mbit/s
- CAN ID: 11/29 bit/s as requested
- BJM/EJM cycle time: 50ms (standard)/15ms (optional)
- Terminating resistor: Optional
- Operating temperature: -40° to +85°C (-40°F to 185°F)
- Storage temperature: -40° to +85°C (-40°F to 185°F)
- Wiring specifications: 22AWG, PTFE, 22" ±.125"
 - Red: Supply power
 - Black: Ground
 - Green: CAN High data
 - White: CAN Low data
 - Blue: Identifier Select LSB
 - Orange: Identifier Select MSB

MOUNTING

Below panel dimensions for CANbus configurations

