

HF series

Hall effect joysticks

Distinctive features and specifications



- Connectorized housing
- Shallow mounting depth <1.00"
- 1, 2 and 3 axis configurations
- Voltage regulator, 24V supply option
- USB 1.1 HID interface option
- CANbus J1939 and CANopen option

MECHANICAL (FOR X, Y AXIS)

- 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

ENVIRONMENTAL

- 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)

- 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

ELECTRICAL

- Sensor: Hall effect
- Supply Voltage Operating: 5VDC±0.01VDC
- Reverse Polarity Max: -10VDC
- Overvoltage 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.

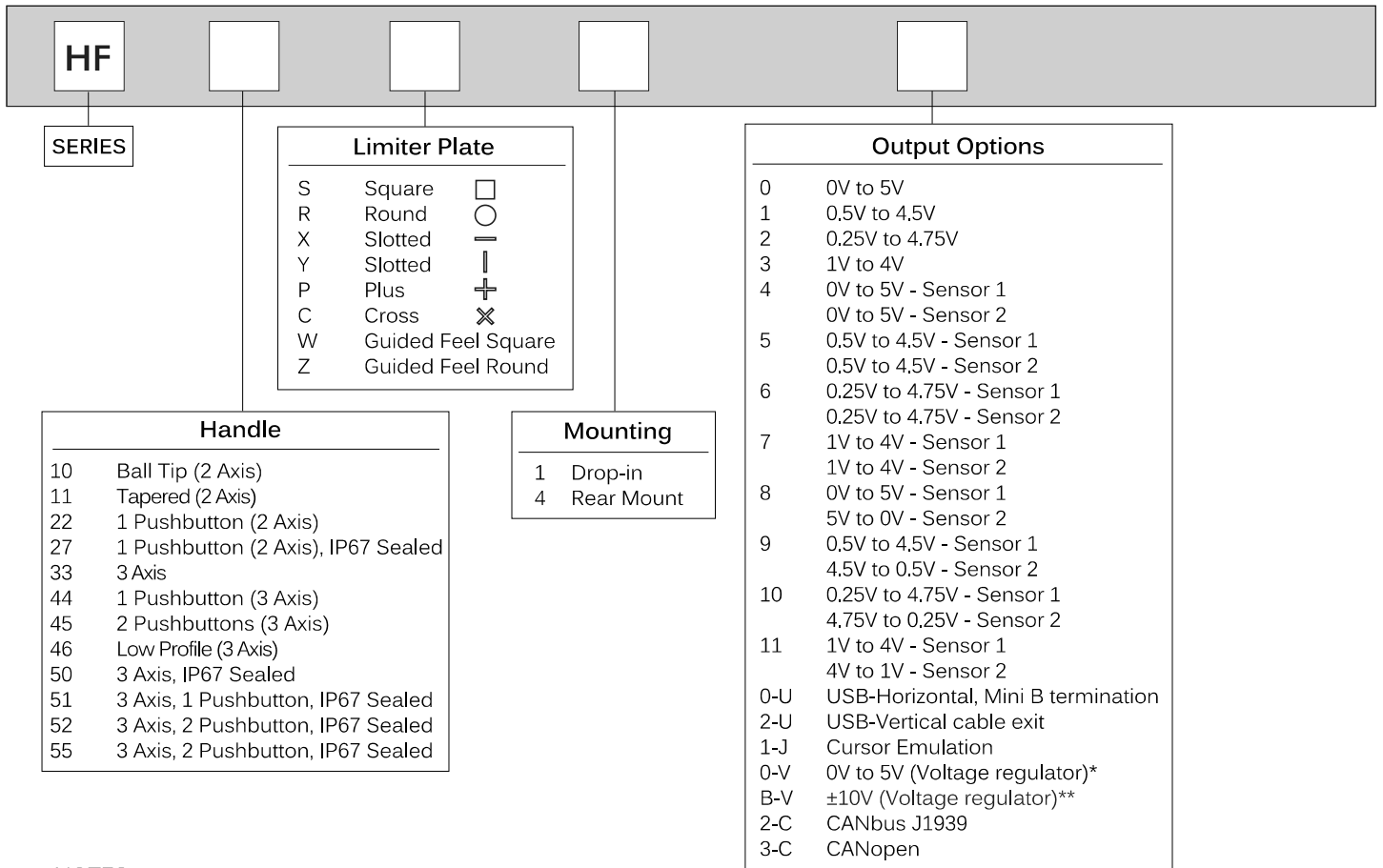
APEM

www.apem.com

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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 $11V \geq 35V$



Fig 1



Fig 2



Up to IP68 available.



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


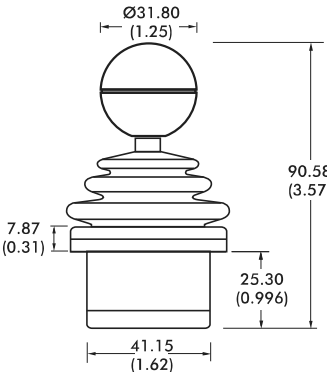
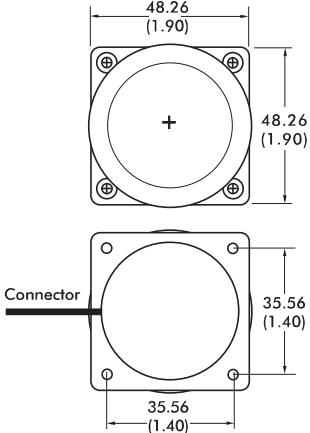

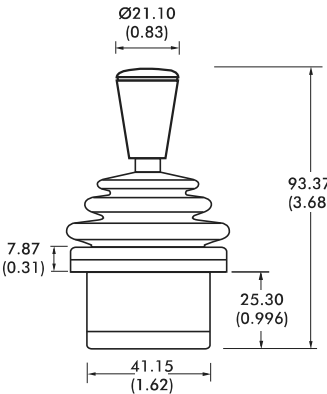
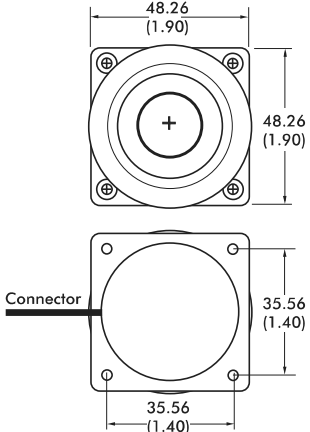

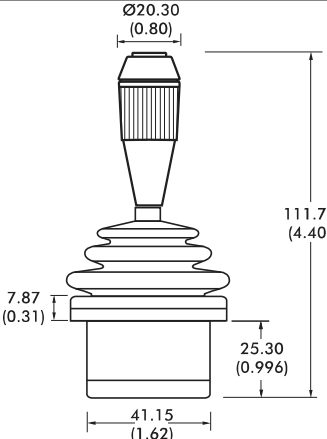
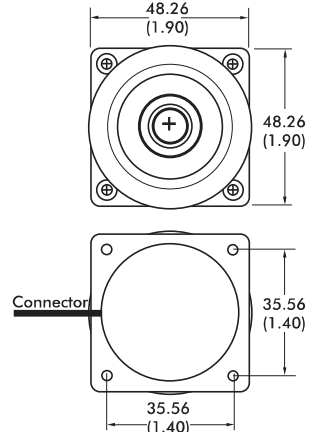

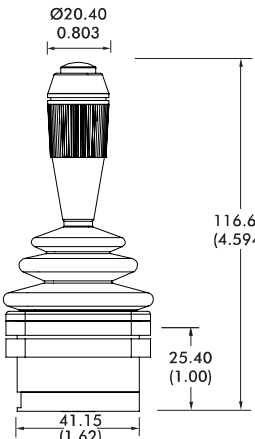
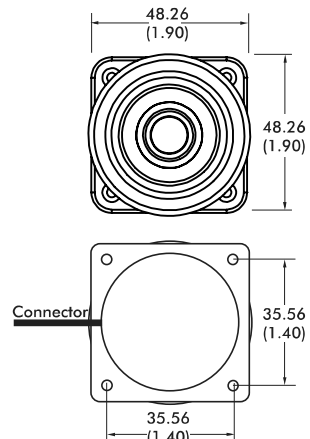


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<p style="text-align: center;">11</p> 		
<p style="text-align: center;">22</p> 		
<p style="text-align: center;">27</p> 		

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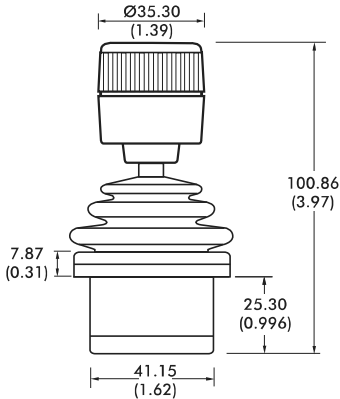
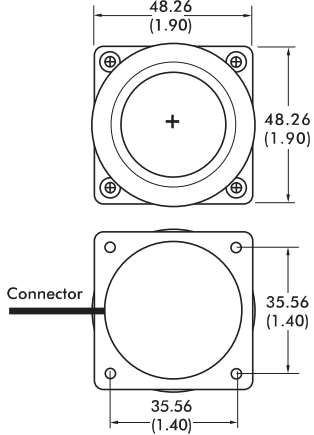

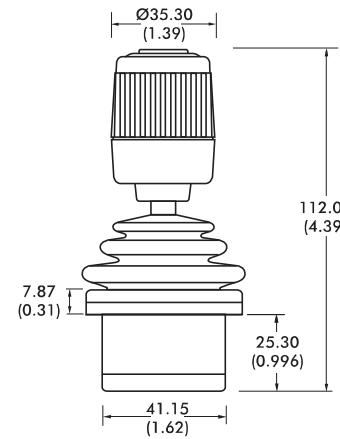
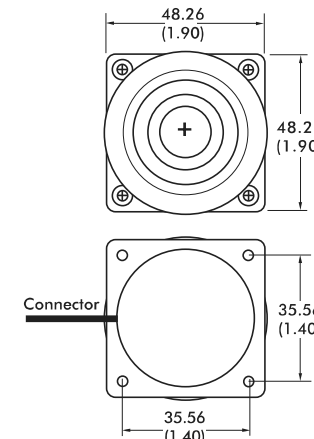

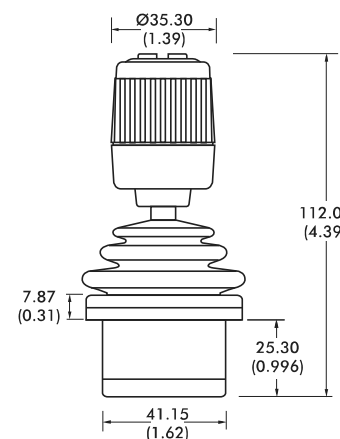
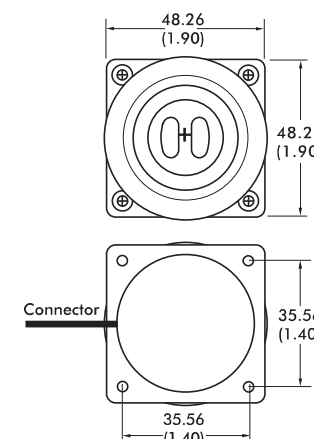

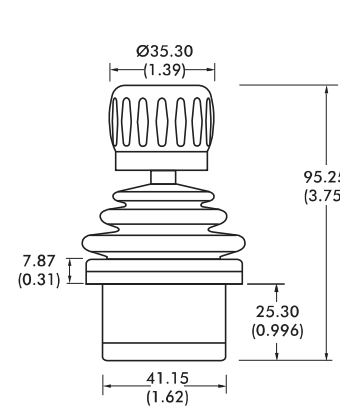
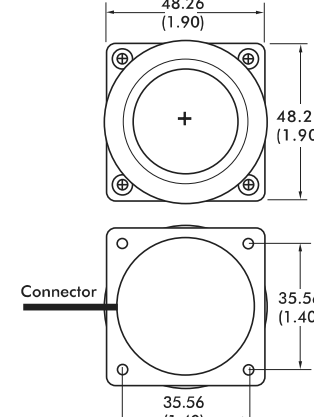
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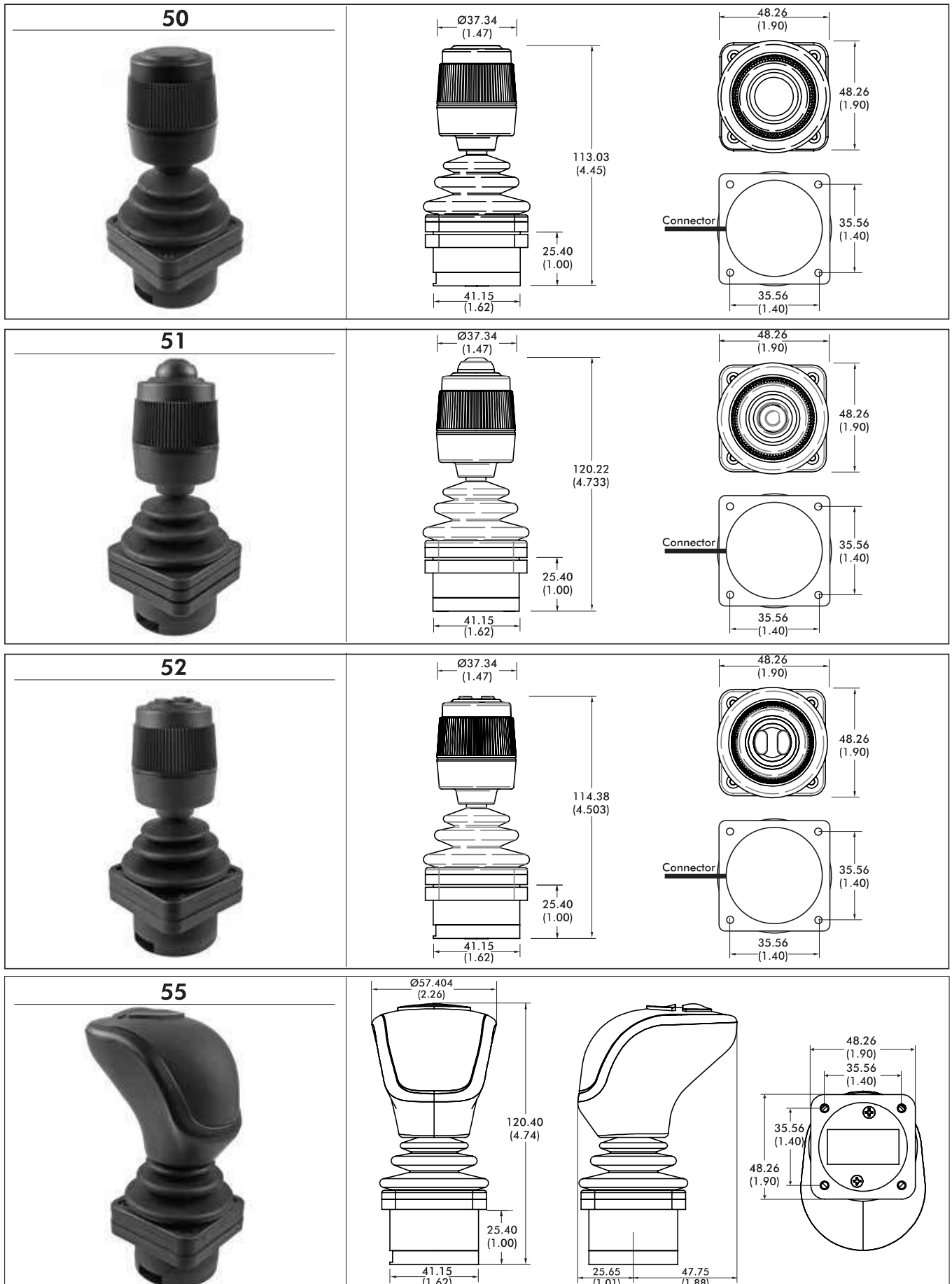
<p style="text-align: center;">33</p> 	 <p>Technical drawing showing side view of joystick model 33. Dimensions: Top diameter $\varnothing 35.30$ (1.39), total height 100.86 (3.97), base diameter 41.15 (1.62), base thickness 7.87 (0.31), and a lower section height of 25.30 (0.996).</p>	 <p>Technical drawings showing top and bottom views of joystick model 33. Top view: square body with side length 48.26 (1.90) and a central cross symbol. Bottom view: square body with side length 35.56 (1.40) and a circular connector port labeled "Connector".</p>
<p style="text-align: center;">44</p> 	 <p>Technical drawing showing side view of joystick model 44. Dimensions: Top diameter $\varnothing 35.30$ (1.39), total height 112.00 (4.39), base diameter 41.15 (1.62), base thickness 7.87 (0.31), and a lower section height of 25.30 (0.996).</p>	 <p>Technical drawings showing top and bottom views of joystick model 44. Top view: square body with side length 48.26 (1.90) and a central cross symbol. Bottom view: square body with side length 35.56 (1.40) and a circular connector port labeled "Connector".</p>
<p style="text-align: center;">45</p> 	 <p>Technical drawing showing side view of joystick model 45. Dimensions: Top diameter $\varnothing 35.30$ (1.39), total height 112.00 (4.39), base diameter 41.15 (1.62), base thickness 7.87 (0.31), and a lower section height of 25.30 (0.996).</p>	 <p>Technical drawings showing top and bottom views of joystick model 45. Top view: square body with side length 48.26 (1.90) and a central figure-eight symbol. Bottom view: square body with side length 35.56 (1.40) and a circular connector port labeled "Connector".</p>
<p style="text-align: center;">46</p> 	 <p>Technical drawing showing side view of joystick model 46. Dimensions: Top diameter $\varnothing 35.30$ (1.39), total height 95.25 (3.75), base diameter 41.15 (1.62), base thickness 7.87 (0.31), and a lower section height of 25.30 (0.996).</p>	 <p>Technical drawings showing top and bottom views of joystick model 46. Top view: square body with side length 48.26 (1.90) and a central cross symbol. Bottom view: square body with side length 35.56 (1.40) and a circular connector port labeled "Connector".</p>

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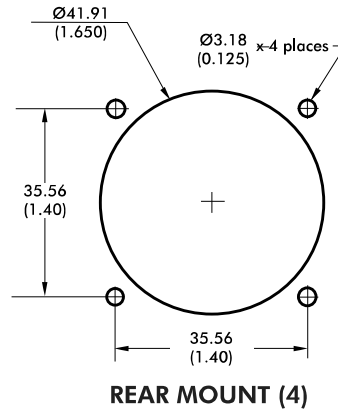
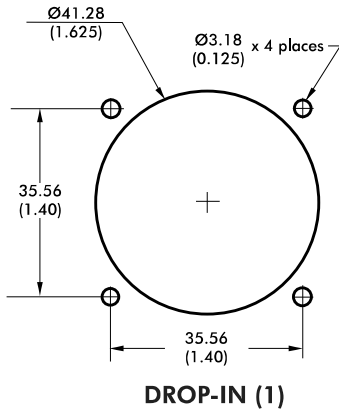
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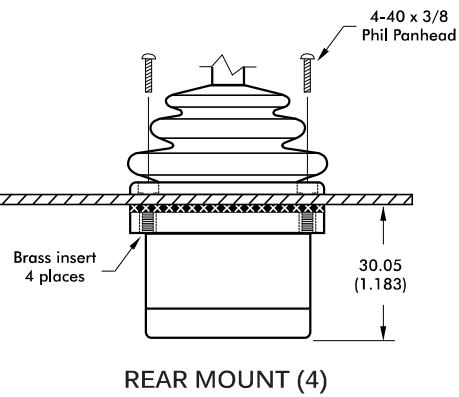
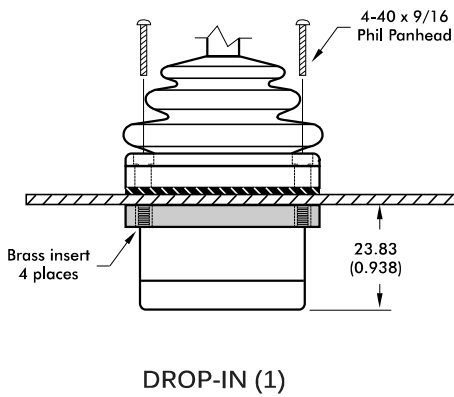
Overview

PANEL CUT-OUT DIMENSIONS

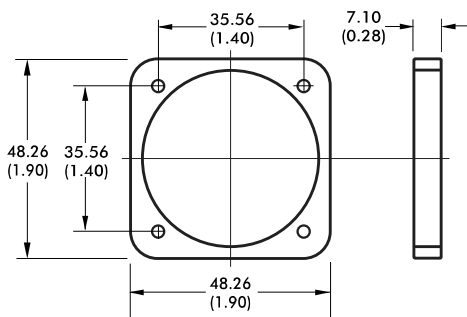


* Not available for Option 11 and 55 Handles

MOUNTING OPTIONS



CLAMPING RING



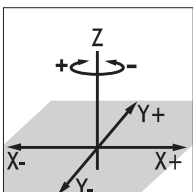
NOTES:

- 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:



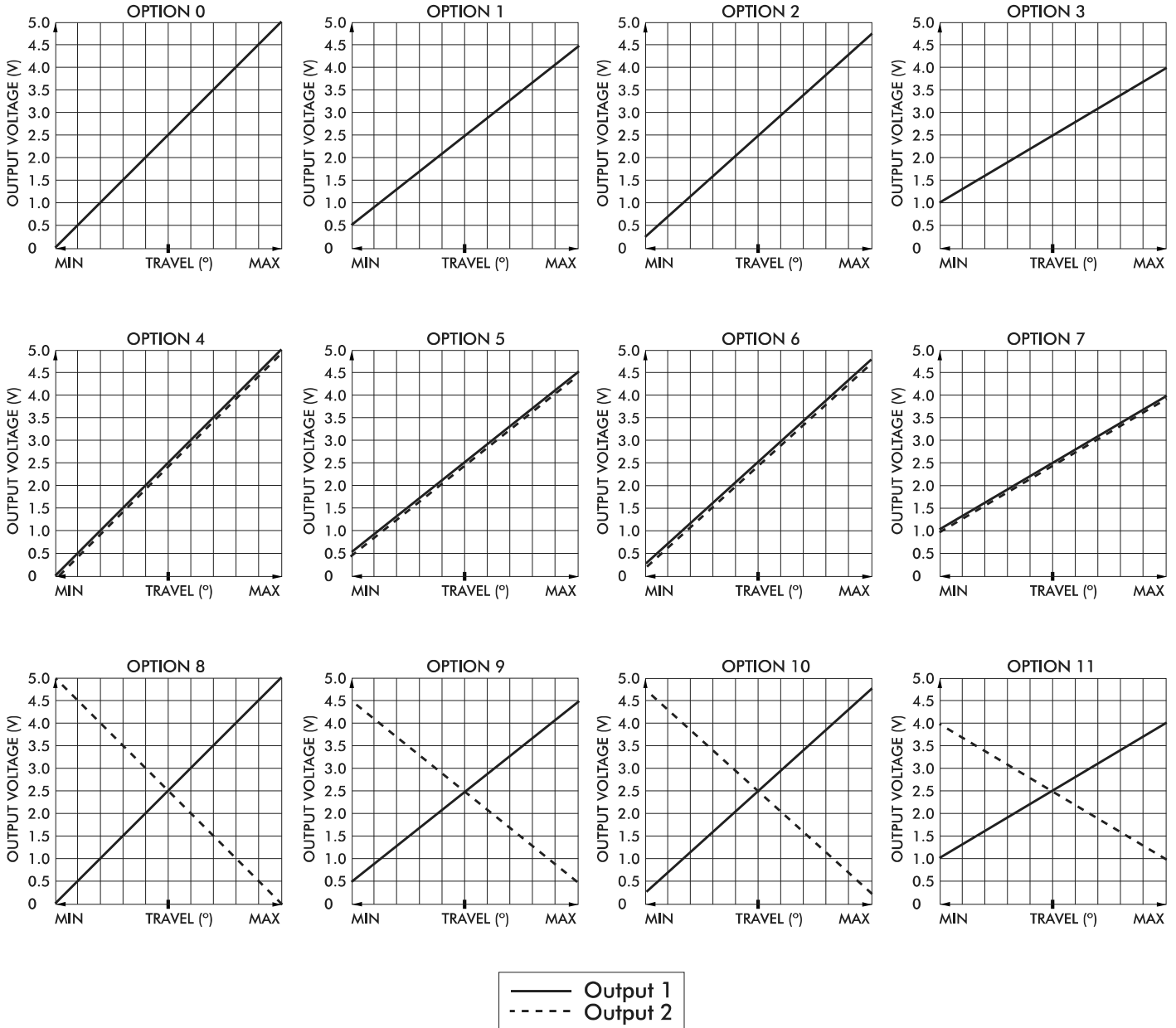
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VOLTAGE OUTPUT OPTIONS



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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.

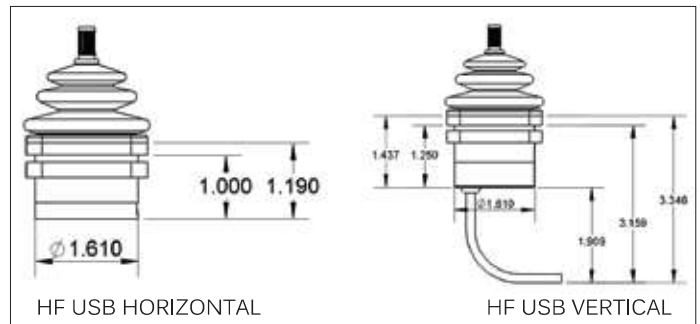
FEATURES

- 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 vertical 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: 9V 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

FUNCTIONAL SAFETY

- 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, 12" ±.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

