

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 2.0 HID interface options
- CAN bus J1939 and CANopen options

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: 0.09Nm (0.80lbf in)
- Operating Torque: 0.121Nm(1.07lbf in)
- Maximum Allowable Torque: 2.50Nm(22.13lbf in)
- Hand Mechanical Angle: 60° (30° from center)
- Handle Action: Spring centering, rotational
- Expected Life: 5 million

ELECTRICAL

- Sensor: Hall effect, single or dual
- Supply Voltage Range: 5VDC ±0.01VDC
- Reverse Polarity Max: -10VDC
- Transient Overvoltage Max: 16VDC
- Ratiometric 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.

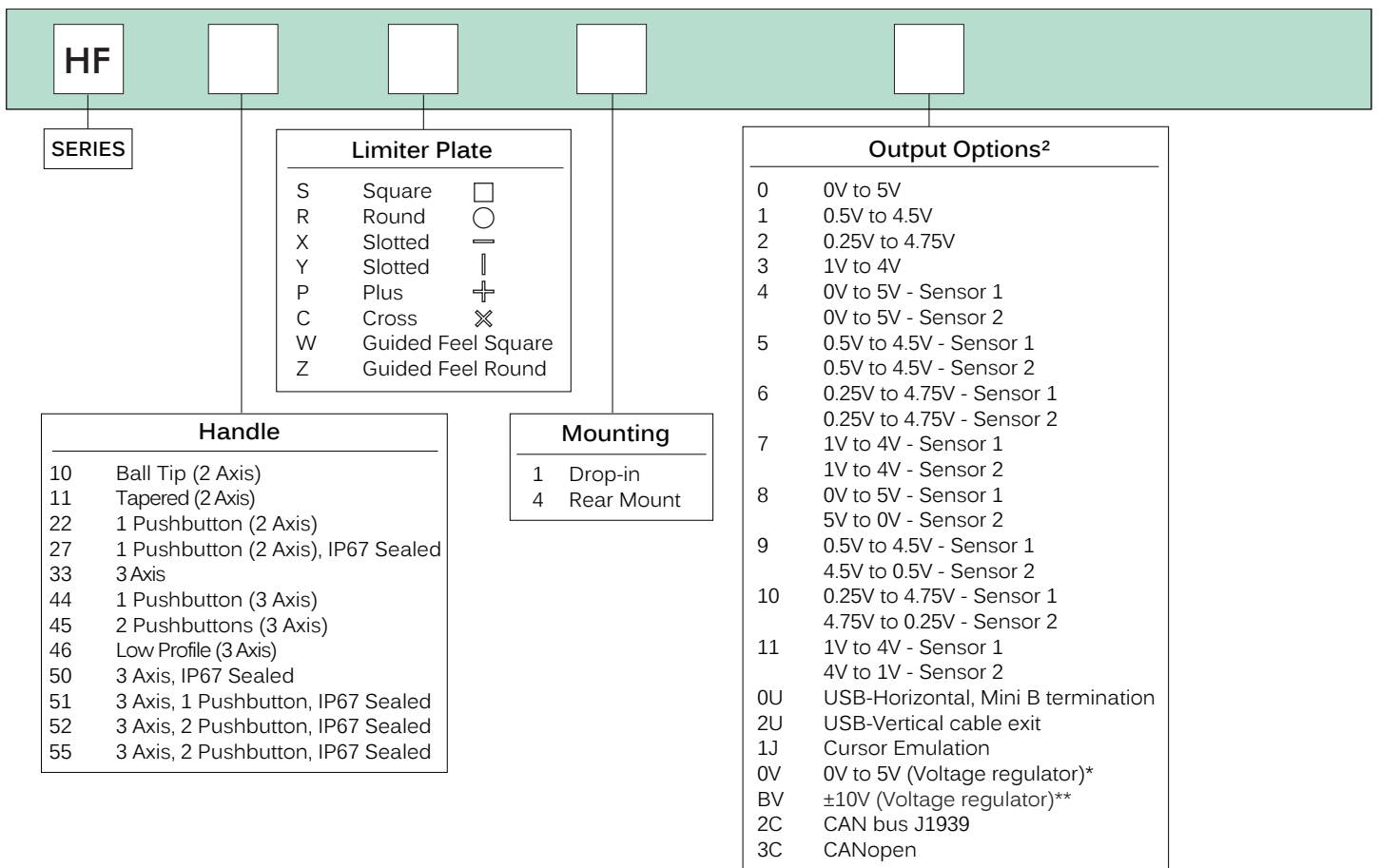


Note: The company reserves the right to change specifications without notice.

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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 IP67 available.



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


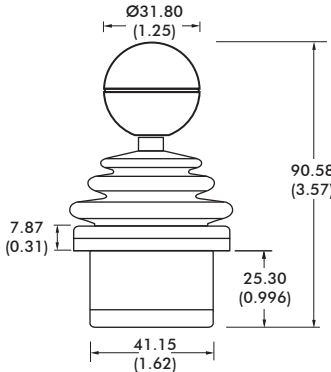
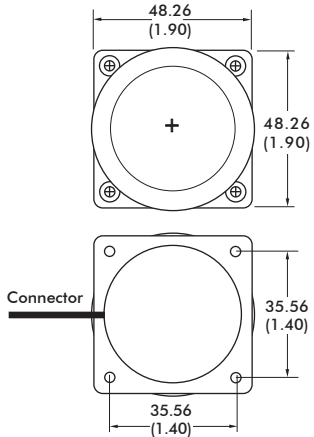

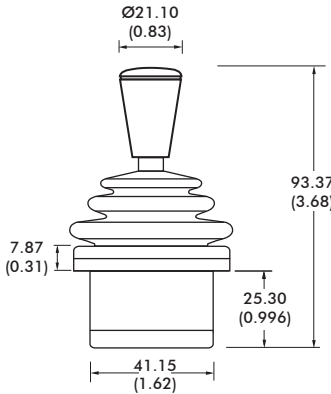
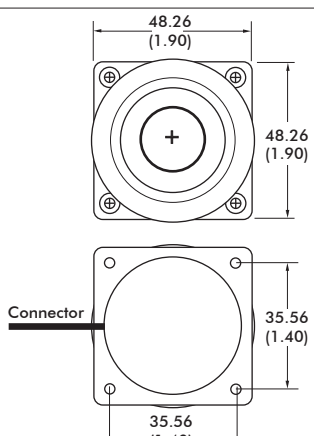

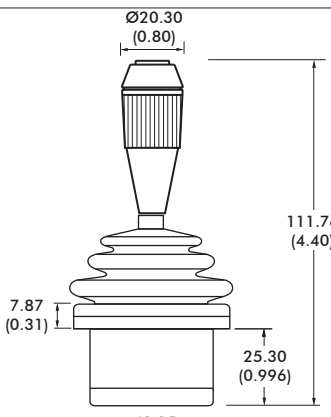
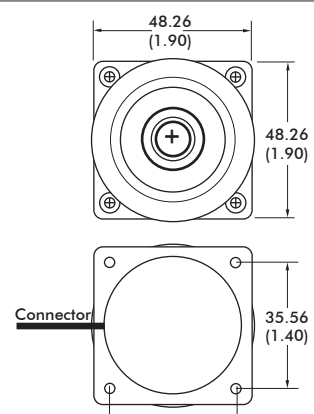

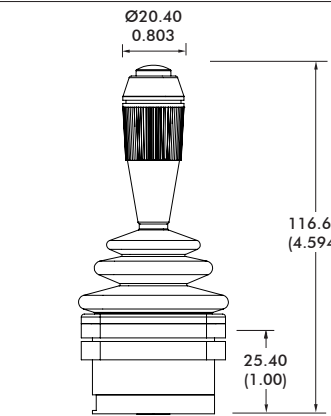
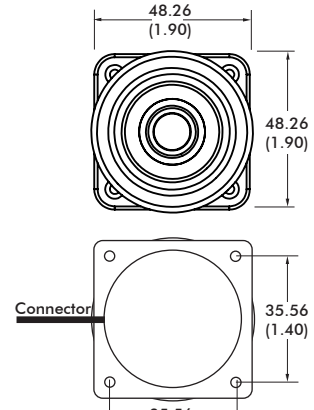
² Output voltage is ratiometric to supply voltage.



HF series

Hall effect joysticks

Overview

<p>10</p> 	 <p> $\text{Ø}31.80$ (1.25) 90.58 (3.57) 7.87 (0.31) 25.30 (0.996) 41.15 (1.62) </p>	 <p> 48.26 (1.90) 48.26 (1.90) Connector 35.56 (1.40) 35.56 (1.40) </p>
<p>11</p> 	 <p> $\text{Ø}21.10$ (0.83) 93.37 (3.68) 7.87 (0.31) 25.30 (0.996) 41.15 (1.62) </p>	 <p> 48.26 (1.90) 48.26 (1.90) Connector 35.56 (1.40) 35.56 (1.40) </p>
<p>22</p> 	 <p> $\text{Ø}20.30$ (0.80) 111.76 (4.40) 7.87 (0.31) 25.30 (0.996) 41.15 (1.62) </p>	 <p> 48.26 (1.90) 48.26 (1.90) Connector 35.56 (1.40) 35.56 (1.40) </p>
<p>27</p> 	 <p> $\text{Ø}20.40$ 0.803 116.69 (4.594) 25.40 (1.00) 41.15 (1.62) </p>	 <p> 48.26 (1.90) 48.26 (1.90) Connector 35.56 (1.40) 35.56 (1.40) </p>

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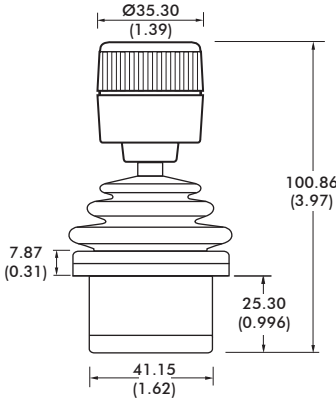
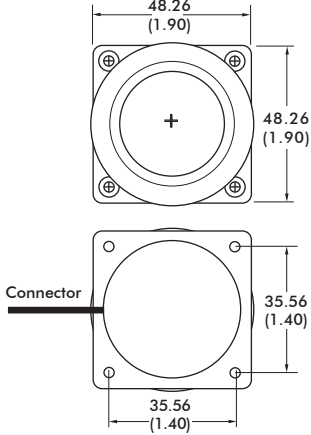

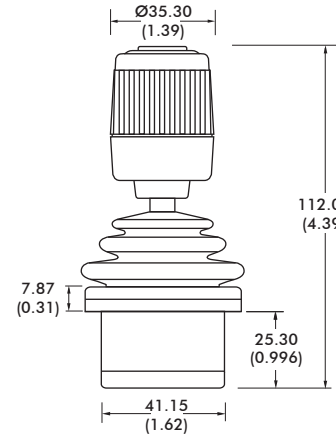
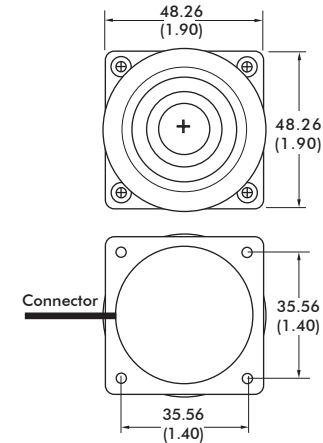

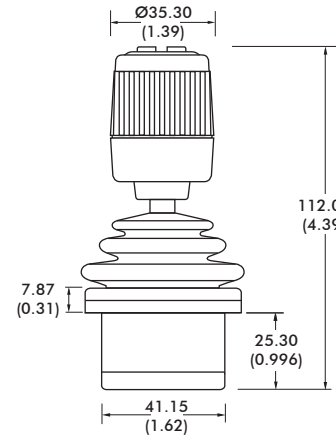
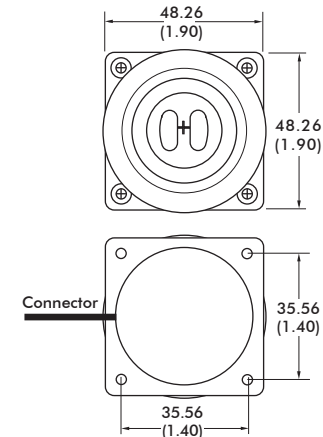

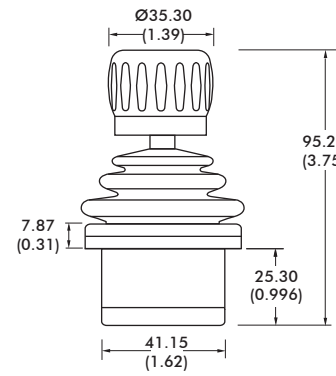
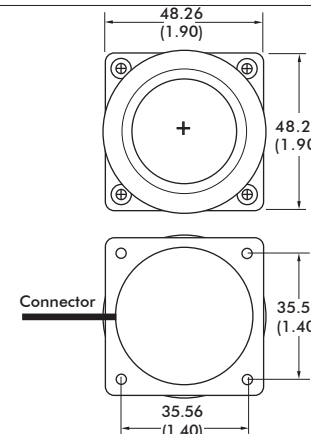
APEM

www.apem.com

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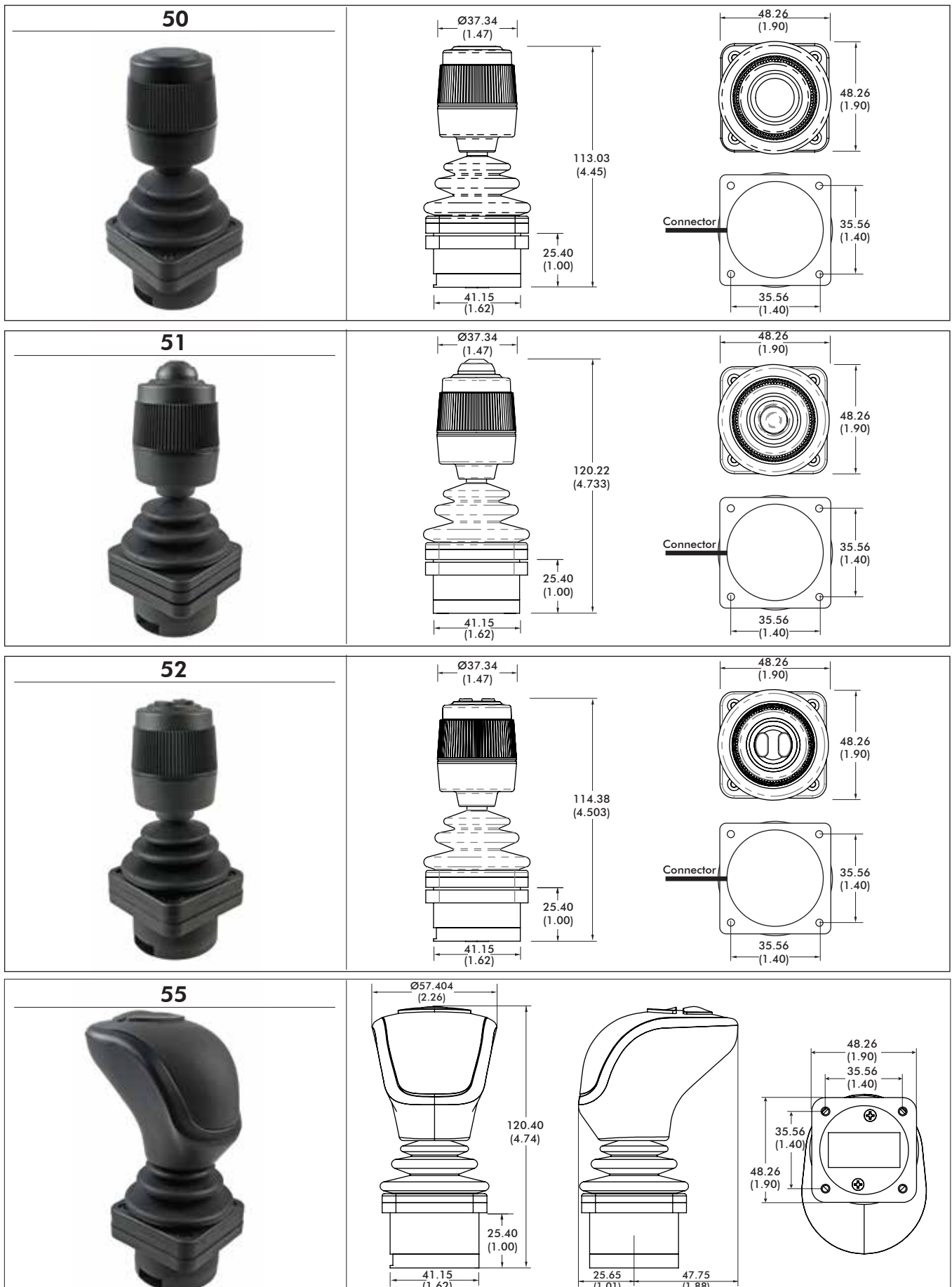
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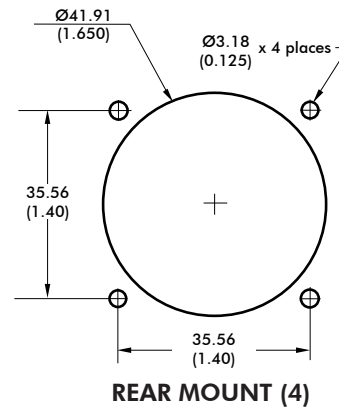
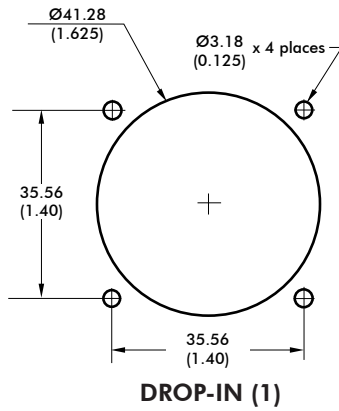
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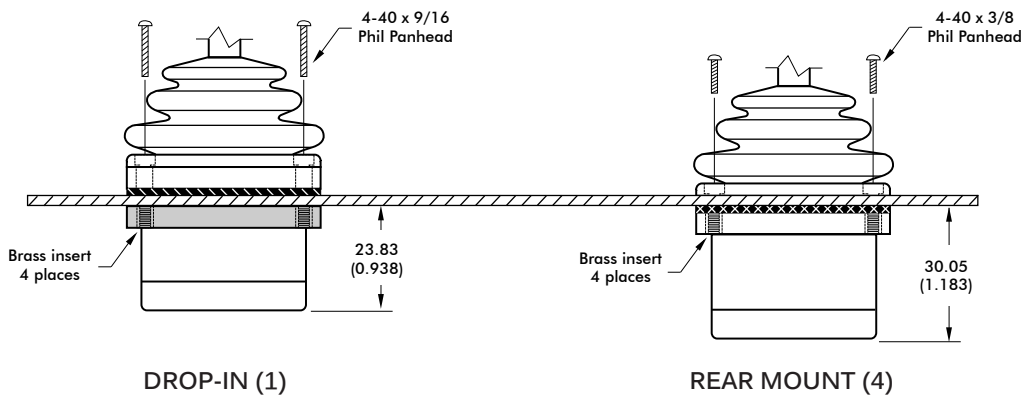
Overview

PANEL CUT-OUT DIMENSIONS

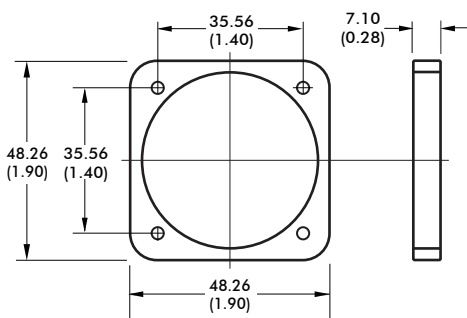


* Not available for Option 11 and 55 Handles

MOUNTING OPTIONS



CLAMPING RING



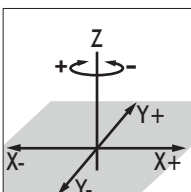
NOTES:

- 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:

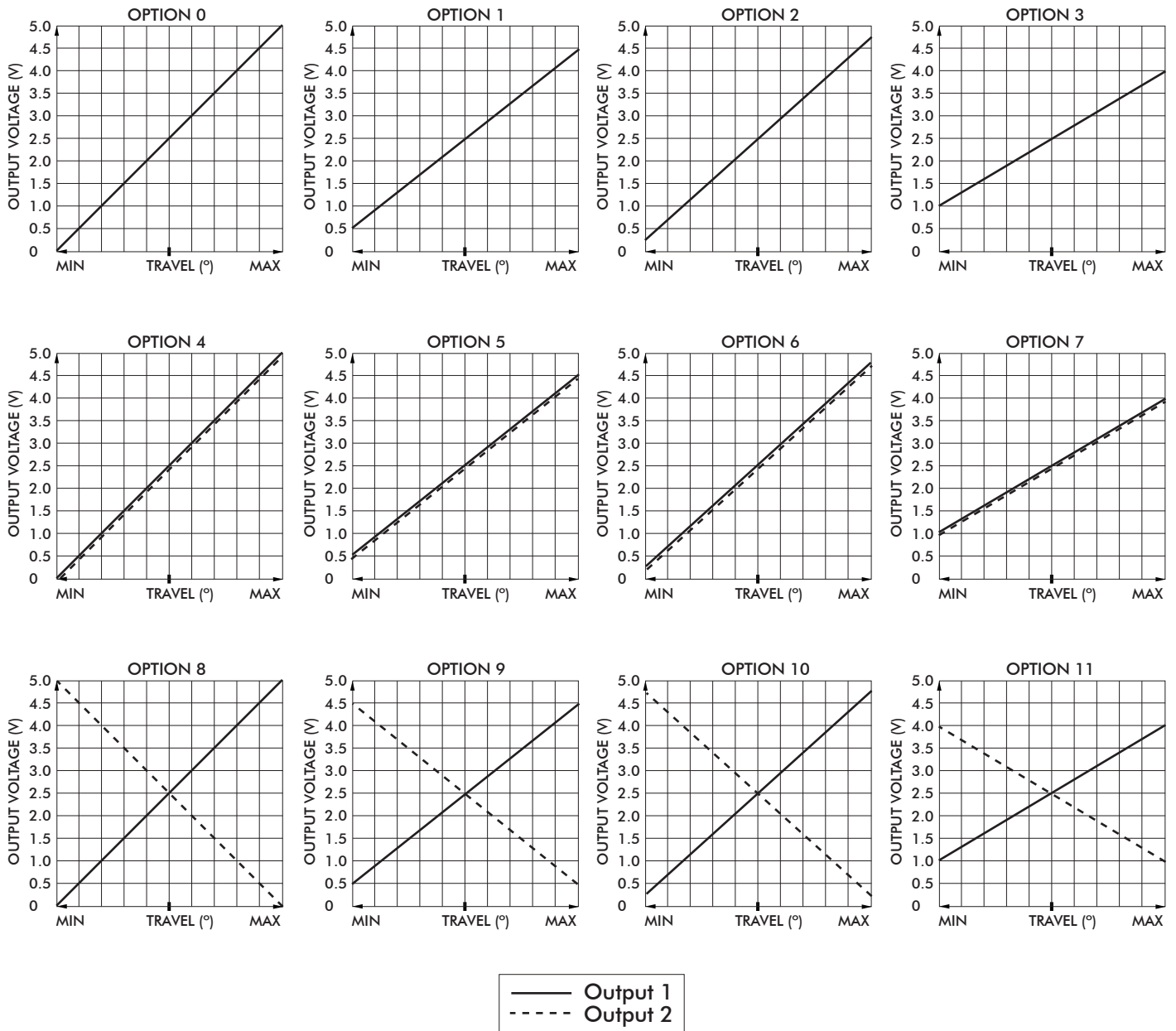


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Overview

VOLTAGE OUTPUT OPTIONS¹



¹ Voltage outputs are ratiometric to supply voltage

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Overview

USB

USB

Featuring USB 2.0 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. Joystick button and axis assignments are dependent upon the controlled application.

FEATURES

- USB 2.0 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 a multi-axis joystick into a mouse, trackball, or cursor control device.

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

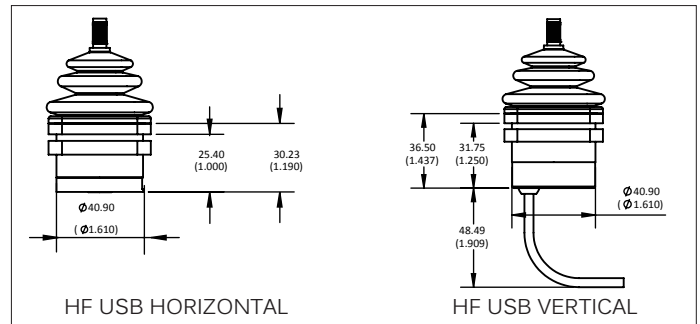
- HID compliant "pointing device"
- Plug-and-play with USB option
- Ideal for marine GPS and navigation

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:

- USB 2 pushbuttons 2 or 3 axes (X, Y, and Z "scroll")



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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CAN bus

CAN bus ELECTRICAL SPECIFICATIONS

- Operating voltage: 6V to 35V
- Current consumption: TBD
(typical: 35mA @ 12V, 18mA @ 24V, 15mA @ 30V)
- Output signal: CAN bus
- 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 CAN bus configurations

