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)

- Break Out Force: 1.3N (0.3lbf)
- Operating Force: 2.8N (0.63lbf)
- Maximum Applied Force: 200N (45.00lbf)
- Mechanical Angle of Movement: 36º (18º 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: -40ºC to 85ºC (-40ºF to 185ºF)
- Storage Temperature: -40ºC to 85ºC (-40ºF to 185ºF)
- 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: 60º (30º 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.

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Overview

HF | | | | |

SERIES

Limiter Plate

S	Square	□
R	Round	○
X	Slotted	⚌
Y	Slotted	‖
P	Plus	✛
C	Cross	✕
W	Guided Feel Square	
Z	Guided Feel Round	

Handle

10	Ball Tip (2 Axis)
11	Tapered (2 Axis)
22	1 Pushbutton (2 Axis)
27	1 Pushbutton (2 Axis), IP67 Sealed
33	3 Axis
44	1 Pushbutton (3 Axis)
45	2 Pushbuttons (3 Axis)
46	Low Profile (3 Axis)
50	3 Axis, IP67 Sealed
51	3 Axis, 1 Pushbutton, IP67 Sealed
52	3 Axis, 2 Pushbutton, IP67 Sealed
55	3 Axis, 2 Pushbutton, IP67 Sealed

Mounting

1	Drop-in
4	Rear Mount

Output Options

0	0V to 5V
1	0.5V to 4.5V
2	0.25V to 4.75V
3	1V to 4V
4	0V to 5V - Sensor 1 0V to 5V - Sensor 2
5	0.5V to 4.5V - Sensor 1 0.5V to 4.5V - Sensor 2
6	0.25V to 4.75V - Sensor 1 0.25V to 4.75V - Sensor 2
7	1V to 4V - Sensor 1 1V to 4V - Sensor 2
8	0V to 5V - Sensor 1 5V to 0V - Sensor 2
9	0.5V to 4.5V - Sensor 1 4.5V to 0.5V - Sensor 2
10	0.25V to 4.75V - Sensor 1 4.75V to 0.25V - Sensor 2
11	1V to 4V - Sensor 1 4V to 1V - Sensor 2
0-U	USB-Horizontal, Mini B termination
2-U	USB-Vertical cable exit
1-J	Cursor Emulation
0-V	0V to 5V (Voltage regulator)*
B-V	±10V (Voltage regulator)**
2-C	CANbus J1939
3-C	CANopen

NOTES

1. 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 ≥ 35V
** Requires operating voltage 11V ≥ 35V


Fig 1

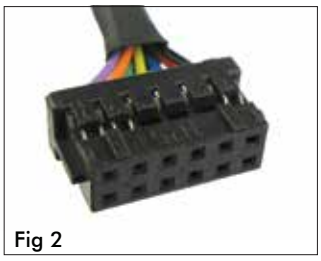
Fig 2

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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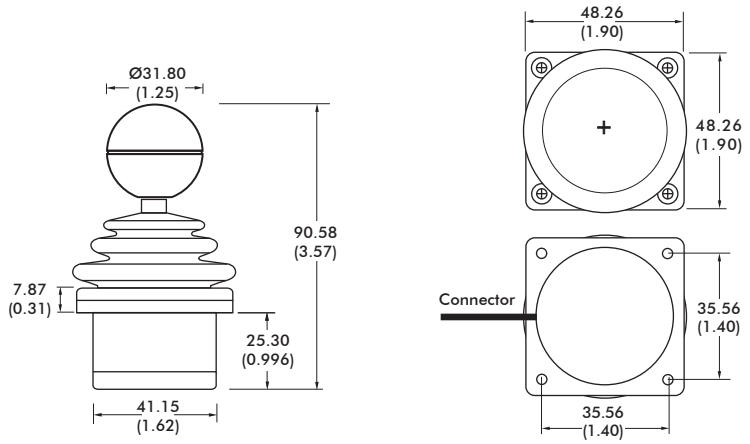

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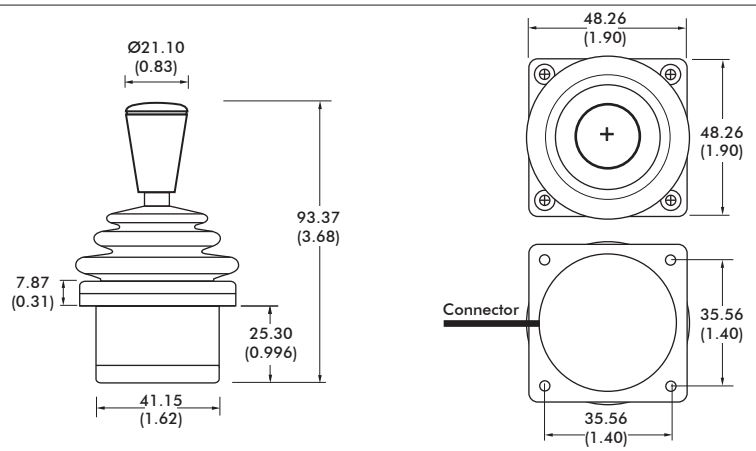

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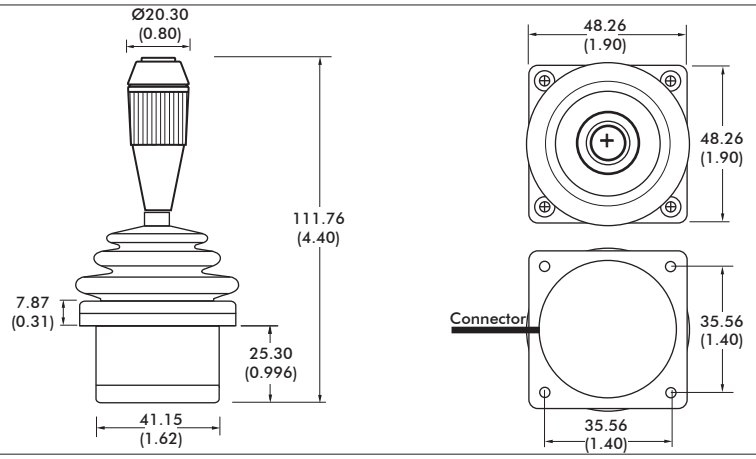

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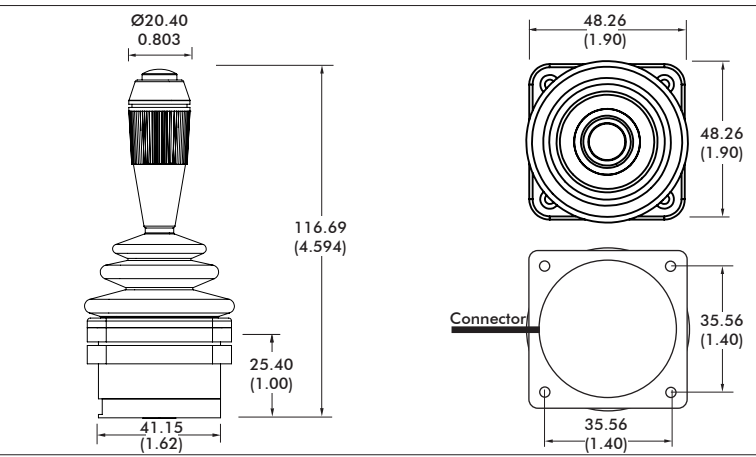
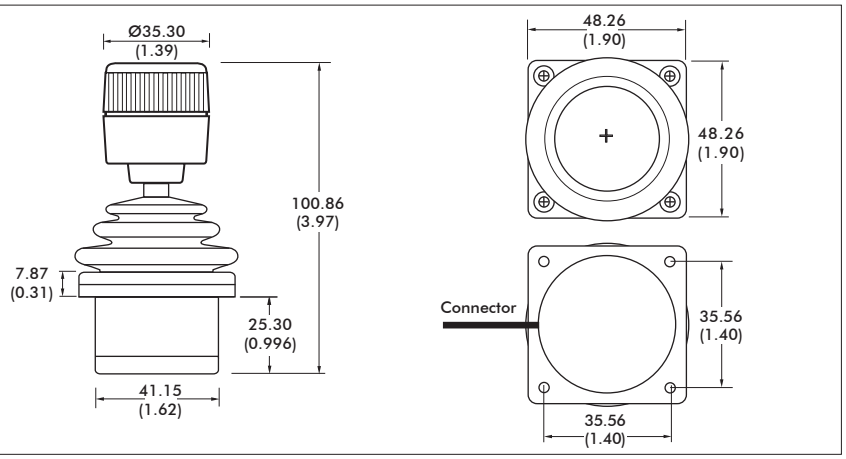


Note: The company reserves the right to change specifications without notice.

HF series
Hall effect joysticks

Overview

33



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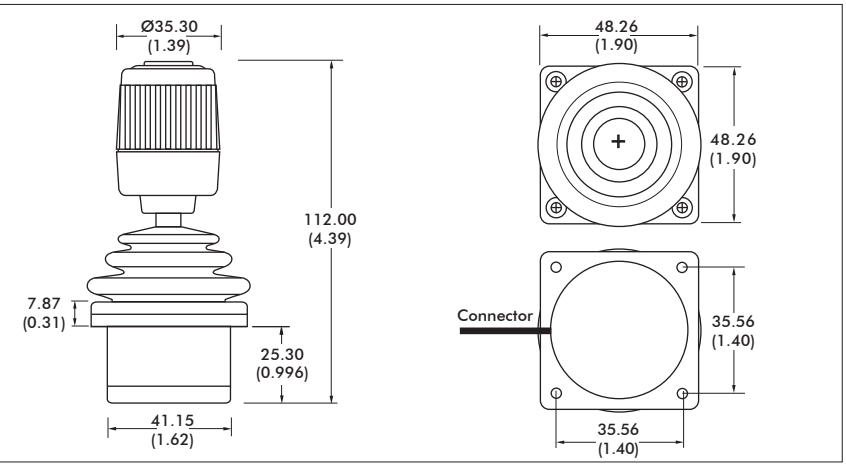

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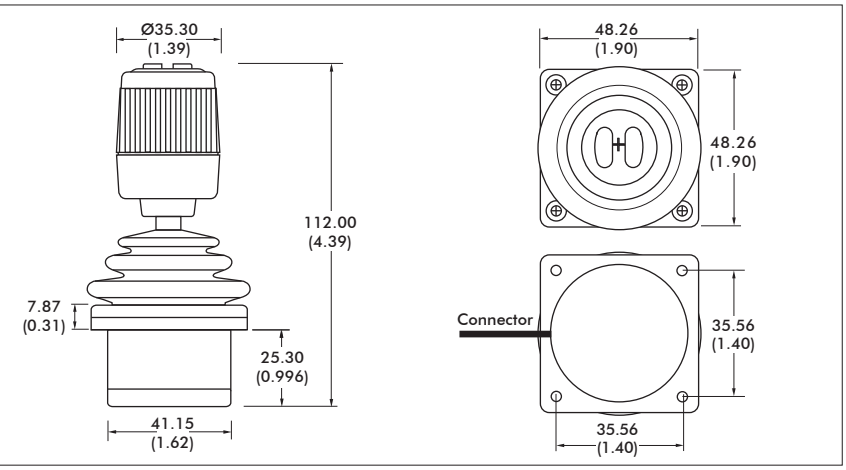

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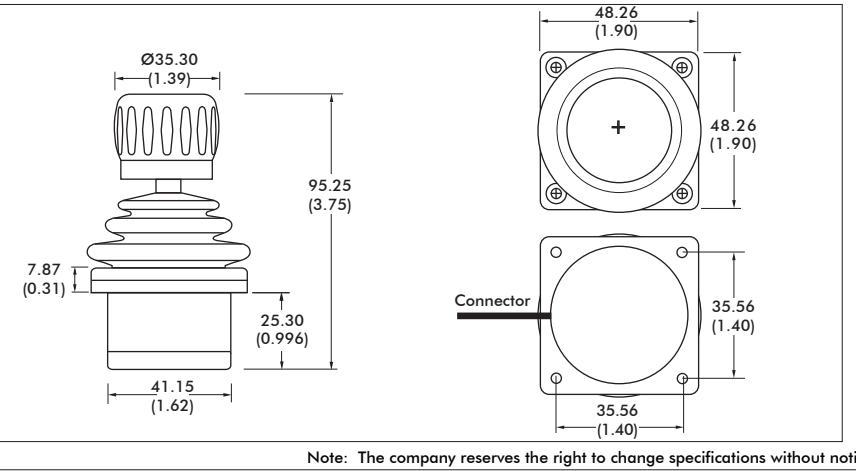

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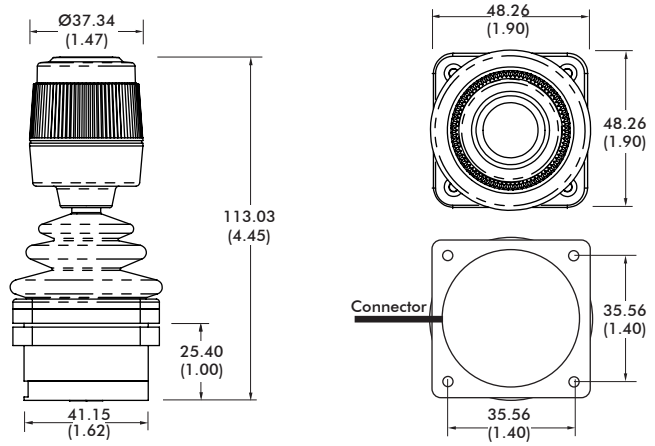

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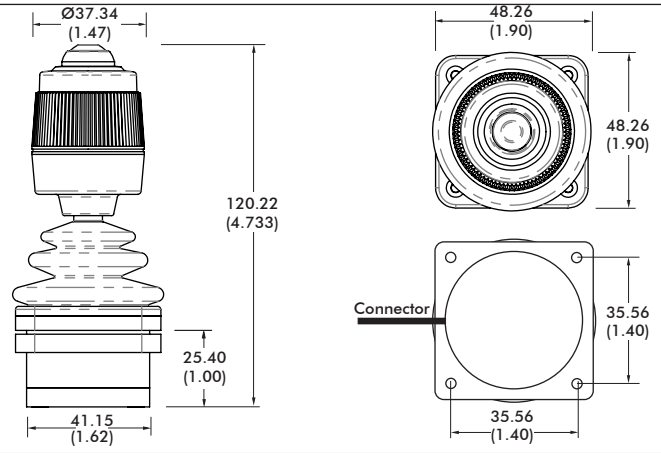

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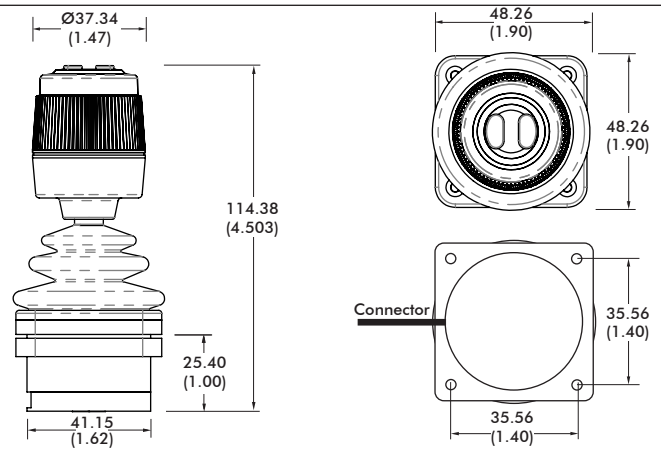

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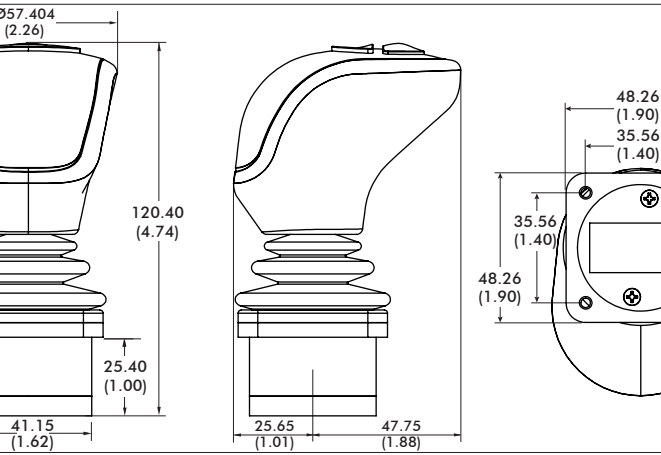

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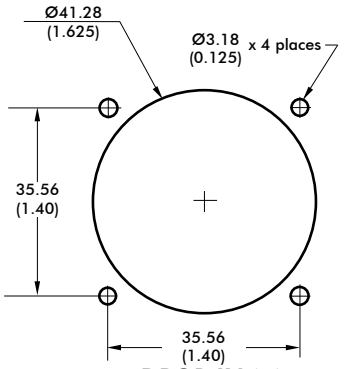
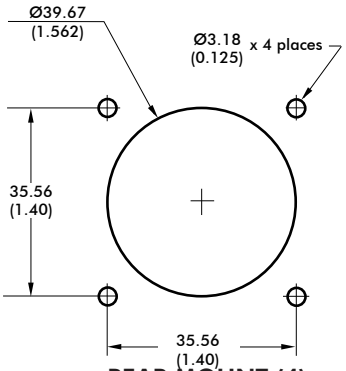
Overview

PANEL CUT-OUT DIMENSIONS



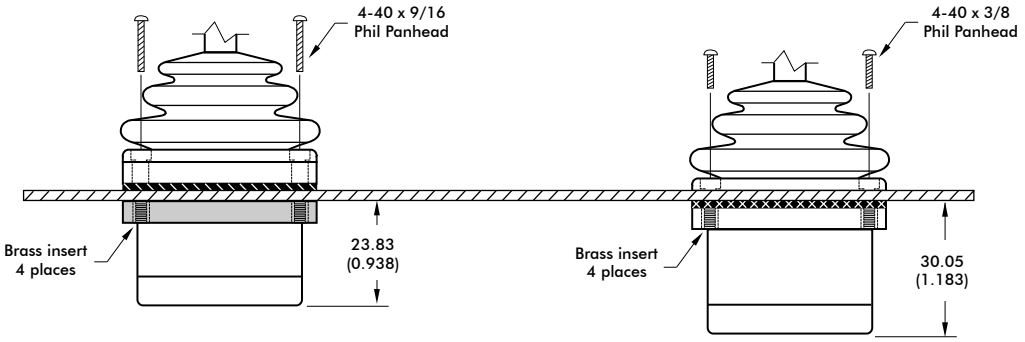
DROP-IN (1)



REAR MOUNT (4)

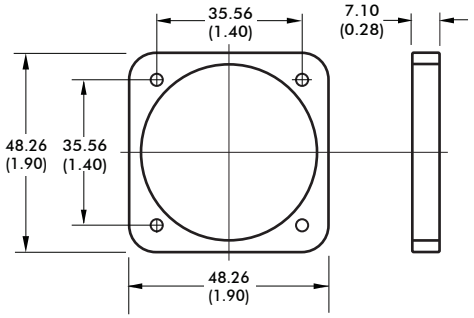
* Not available for Option 11 and 55 Handles

MOUNTING OPTIONS

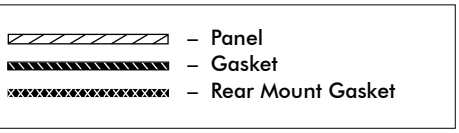


DROP-IN (1) REAR MOUNT (4)

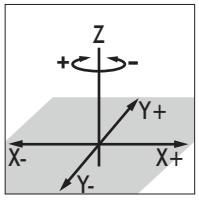
CLAMPING RING



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.



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



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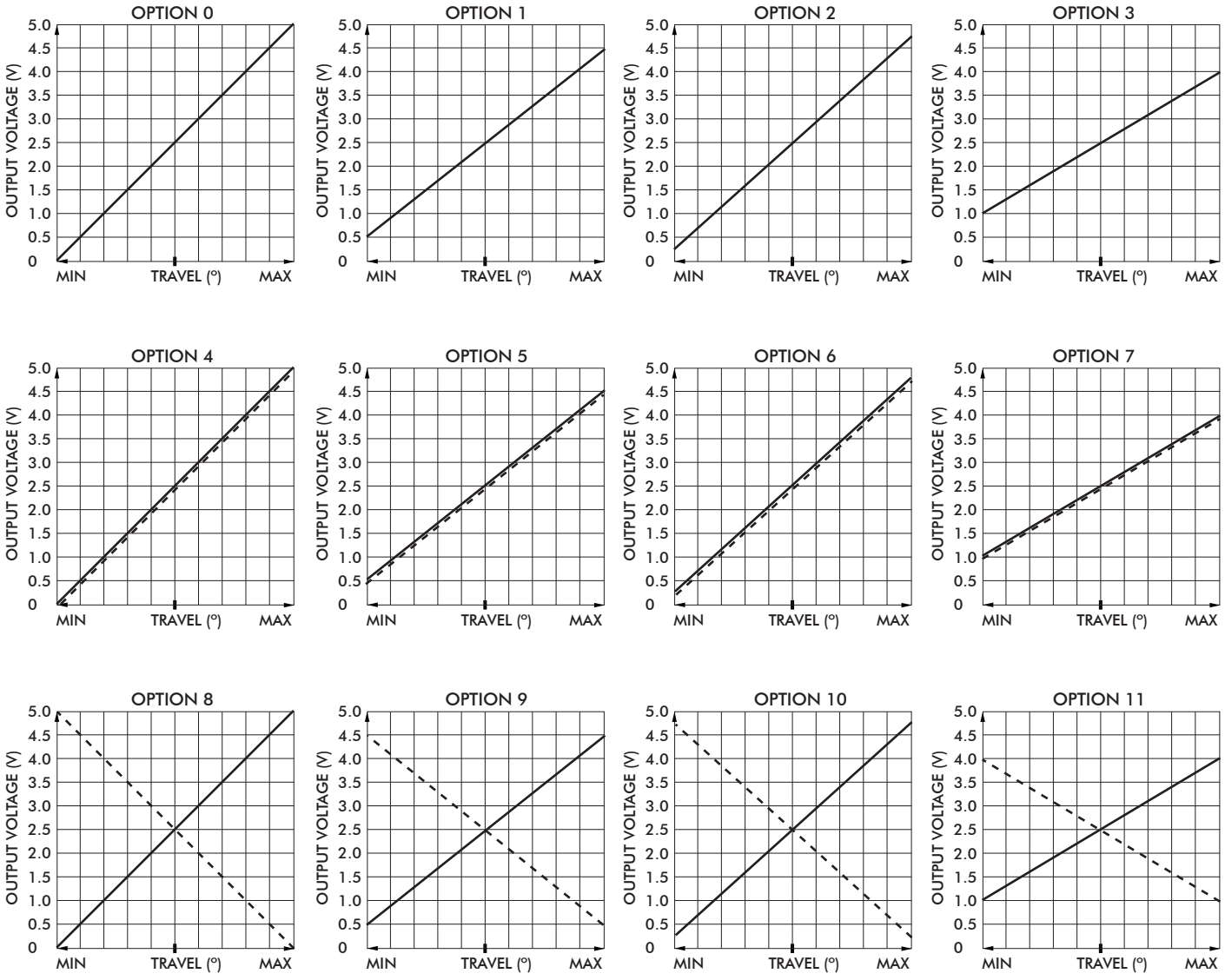
VOLTAGE OUTPUT OPTIONS



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Hall effect joysticks

Overview

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

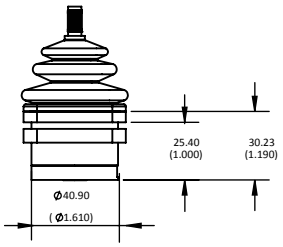
CURSOR EMULATION
The Cursor Emulation option converts multi-axis joystick output into a mouse, trackball, or cursor control device. The joystick's internal microprocessor converts absolute axis position into a cursor velocity, which is translated as a relative trackball or mouse position.

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.

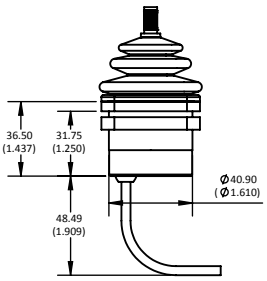
FEATURES
- HID compliant "pointing device"
- Plug-and-play with USB option
- Ideal for marine GPS and navigation

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:



HF USB HORIZONTAL



HF USB VERTICAL

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

CANbus

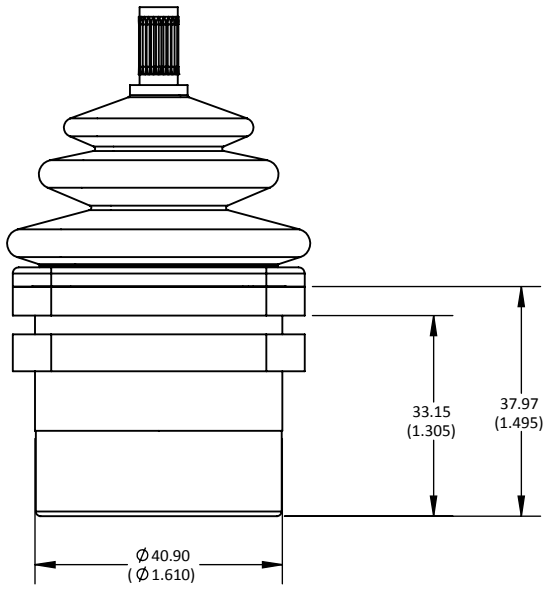
CANbus ELECTRICAL SPECIFICATIONS

- 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: -40^0 to +85^{0}C (-40°F to 185°F)
- Storage temperature: -40^0 to +85^{0}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



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Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

Apem:

HF-33S10 HF-45S10 HF-44S10-U HF-11S10 HF-27S10 HF10R11 HF44S10 HF45S10U HF45R10 HF10S11 HF45S12 HF22Y12 HF10S10 HF10P10 HF22Y10 HF33Y10 HF45R11J HF11P13 HF45S11 HF10Y41 HF33S12 HF11S19 HF45R12 HF27Y11 HF11P111 HF22R10 HF11S10U HF46Y10 HF11R40 HF11P10 HF44Y10 HF33P10 HF27R11 HF22R10U HF22S10U HF36R10U HF44S410 HF11Y10 HF27S10U HF44S10MJBLK HF27P10 HF44R10 HF27P111 HF45S10UMJ4SBLK HF45S10UMJ4CBLK HF11S11 HF45S1075 HF33S00UMJ4C HF46S10 HF11X10 HF45Y10 HF44S12 HF45S40U HF11S00U HF44R01 HF46S411 HF44S10UMJ0 HF45S40 HF11R11 HF11R10 HF33S40 HF45R41 HF27R10 HF27Y10 HF45P12 HF22Y10U HF46S41 HF45S41J HF22S00U HF10Y40 HF22S10 HF22X10U HF22P111 HF11R10U HF27Y12 HF33R10 HF33S11J HF22P11 HF45R10U HF22X10 HF11P11 HF45P10 HF44P10 HF10Y10 HF44R11 HF44S11 HF11R15 HF44R12 HF46S10U HF33R00U HF44R10MJ0BLK HF22P10 HF33R10U HF44R10U HF33S11 HF22P13 HF10S10U HF45S11J HF45R41J HF46P10