



The HF joystick is a contactless, multi-axis controller providing long life finger positioning control. Featuring non-contact Hall effect technology while utilizing minimal mounting depth, the HF joystick is designed for applications requiring enduring accuracy and precision. Available with several ergonomic handles and in single, dual or triple axes configurations, ideal applications include CCTV control, robotics, medical devices, and audio video production consoles.



KEY FEATURES







- Connectorized housing
- High voltage, 24V supply option
- Shallow mounting depth < 1.00"
- USB 1.1 HID interface option
- 1, 2 and 3 axis configurations



HF series

Hall effect joysticks

OPTION SELECTION

HF					
SERIES		LIMITER PLATE		OUTPUT OPTIONS	
		<p>S Square </p> <p>R Round </p> <p>X Slotted </p> <p>Y Slotted </p> <p>P Plus </p> <p>C Cross </p>		<p>0 0V to 5V (Rail to Rail)</p> <p>1 0.5V to 4.5V</p> <p>2 0.25V to 4.75V</p> <p>3 1V to 4V</p> <p>4 0V to 5V - Sensor 1 0V to 5V - Sensor 2</p> <p>5 0.5V to 4.5V - Sensor 1 0.5V to 4.5V - Sensor 2</p> <p>6 0.25V to 4.75V - Sensor 1 0.25V to 4.75V - Sensor 2</p> <p>7 1V to 4V - Sensor 1 1V to 4V - Sensor 2</p> <p>8 0V to 5V - Sensor 1 5V to 0V - Sensor 2</p> <p>9 0.5V to 4.5V - Sensor 1 4.5V to 0.5V - Sensor 2</p> <p>10 0.25V to 4.75V - Sensor 1 4.75V to 0.25V - Sensor 2</p> <p>11 1V to 4V - Sensor 1 4V to 1V - Sensor 2</p> <p>0-U USB</p> <p>1-J Cursor Emulation</p>	
	HANDLE		MOUNTING		ADDITIONAL OPTIONS
	<p>10 Ball Tip (2 Axis)</p> <p>11 Tapered (2 Axis)</p> <p>22 1 Pushbutton (2 Axes)</p> <p>27 2 Axis, 1 Pushbutton, IP67 Sealed</p> <p>33 3 Axis</p> <p>44 1 Pushbutton (3 Axis)</p> <p>45 2 Pushbuttons (3 Axis)</p> <p>46 Low Profile (3 Axis)</p>		<p>1 Drop-in</p> <p>4 Rear Mount</p>		<p>V Voltage Regulator</p>

NOTES

- The HF Series joysticks are supplied with a Hirose DF11-12DP-2DS9(24) connector (male receptacle). (Fig 1) Standard cable available. 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



Fig 1



Fig 2

- Dual Decode cannot be used with USB or Voltage Regulator.



Up to IP68 available.



Mounting accessories. Standard hardware includes: gasket, clamping ring, and four 40-3/4Phil Ph MS SS screws.

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SPECIFICATIONS

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

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

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)
Sealing (IP)	-	Up to IP68*
EMC Immunity Level (V/M)	-	EN61000-4-3
EMC Emissions Level	-	EN61000-6-3:2001
ESD	-	EN61000-4-2

ELECTRICAL

Sensor	-	Hall effect
Resolution	-	1.22mV
Supply Voltage Operating	-	5VDC±0.01VDC
Reverse Polarity Max	-	-10VDC
Overvoltage Max	-	20VDC
Output Voltage	-	See options
Output Impedance	-	2Ω
Return to Center Voltage (No Load)	-	±200mV
Error signal	-	1.0%

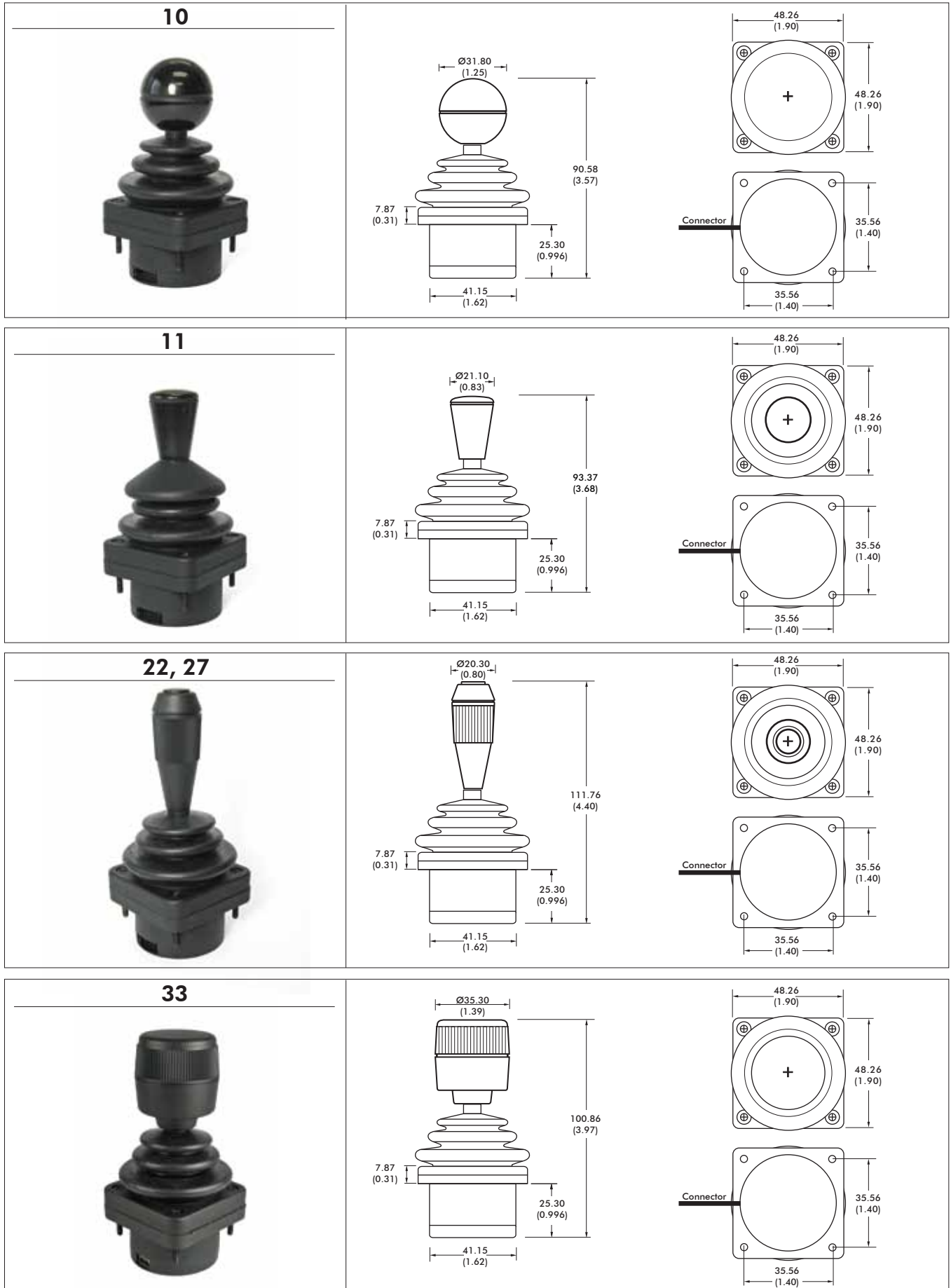
NOTES:

- 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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Hall effect joysticks

DIMENSIONAL DRAWINGS

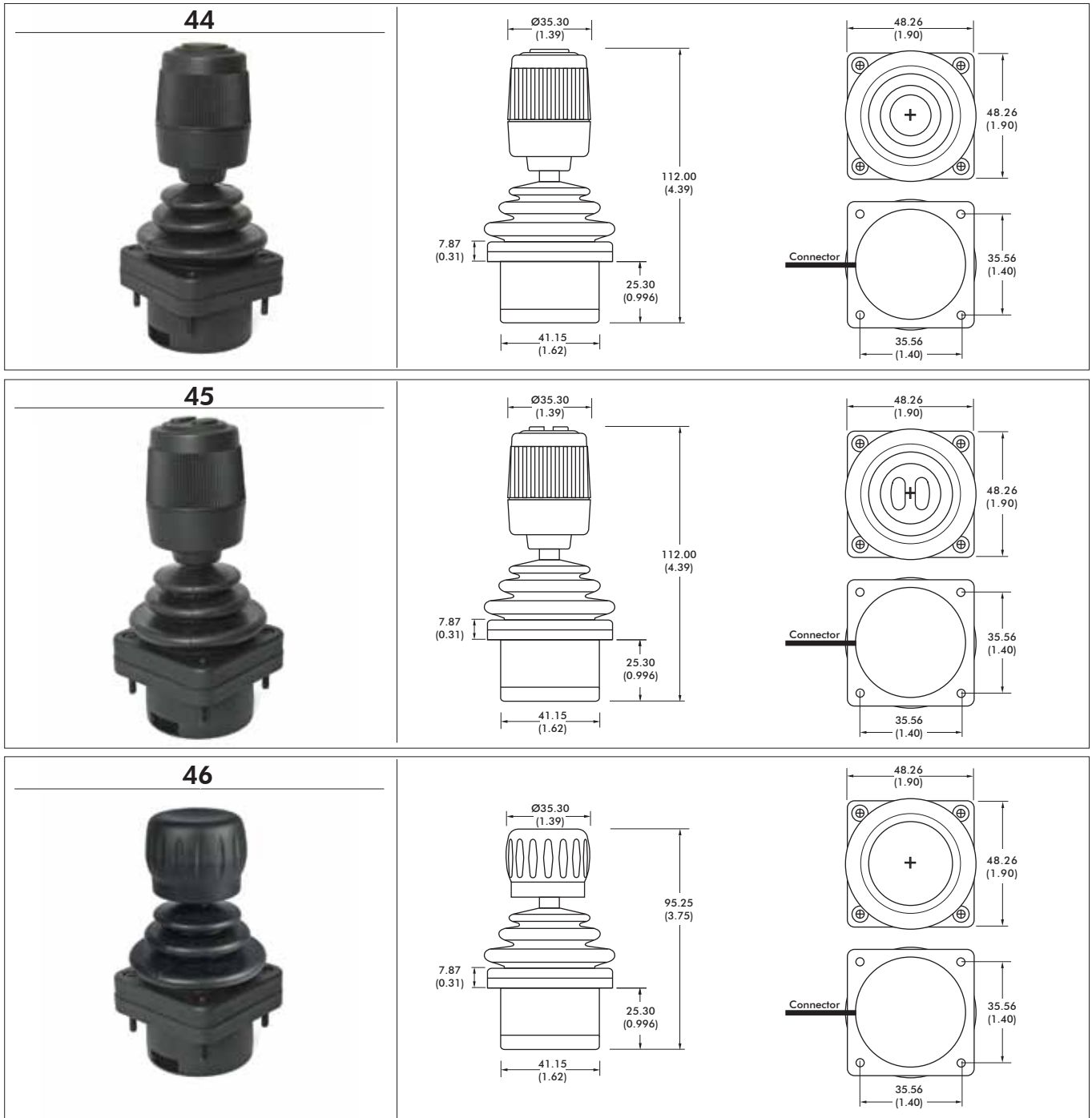


Note: The company reserves the right to change specifications without notice.

HF series

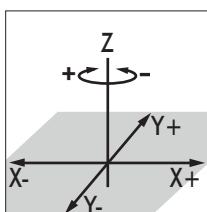
Hall effect joysticks

DIMENSIONAL DRAWINGS - continued



NOTES:

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

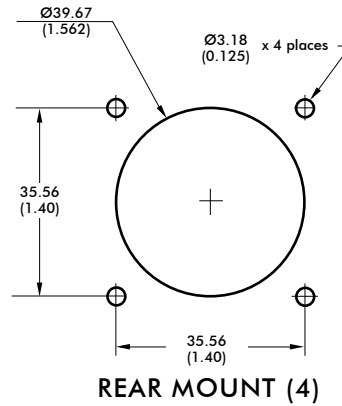
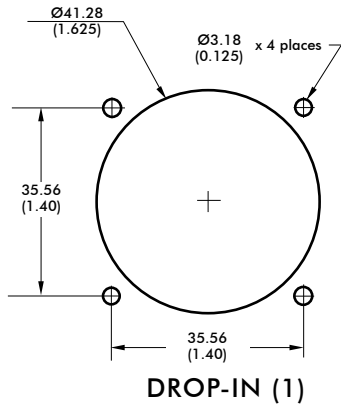


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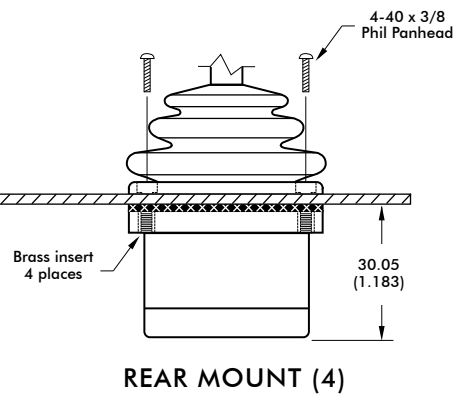
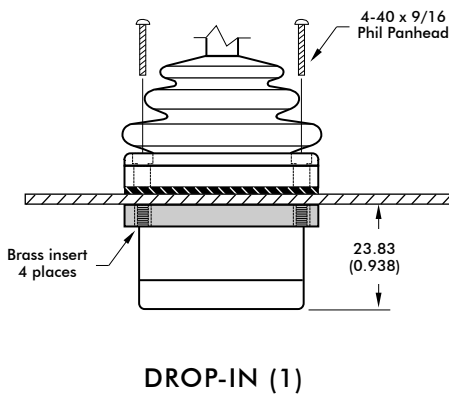
DIMENSIONAL DRAWINGS - continued

PANEL CUT-OUT DIMENSIONS

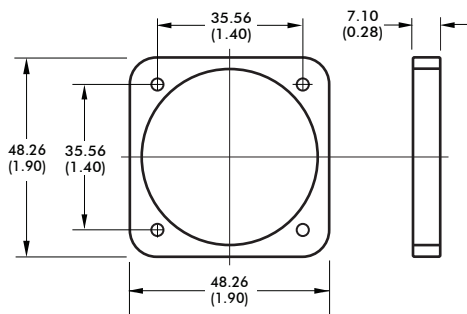


* Not available for Option 11 Handle

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 7.11 mm (0.28in) with the Joyball, USB, CANbus, Voltage Regulator, dual Decode, Center Detect, Discrete Board, Analog Deadband, and Dual Sensor options.

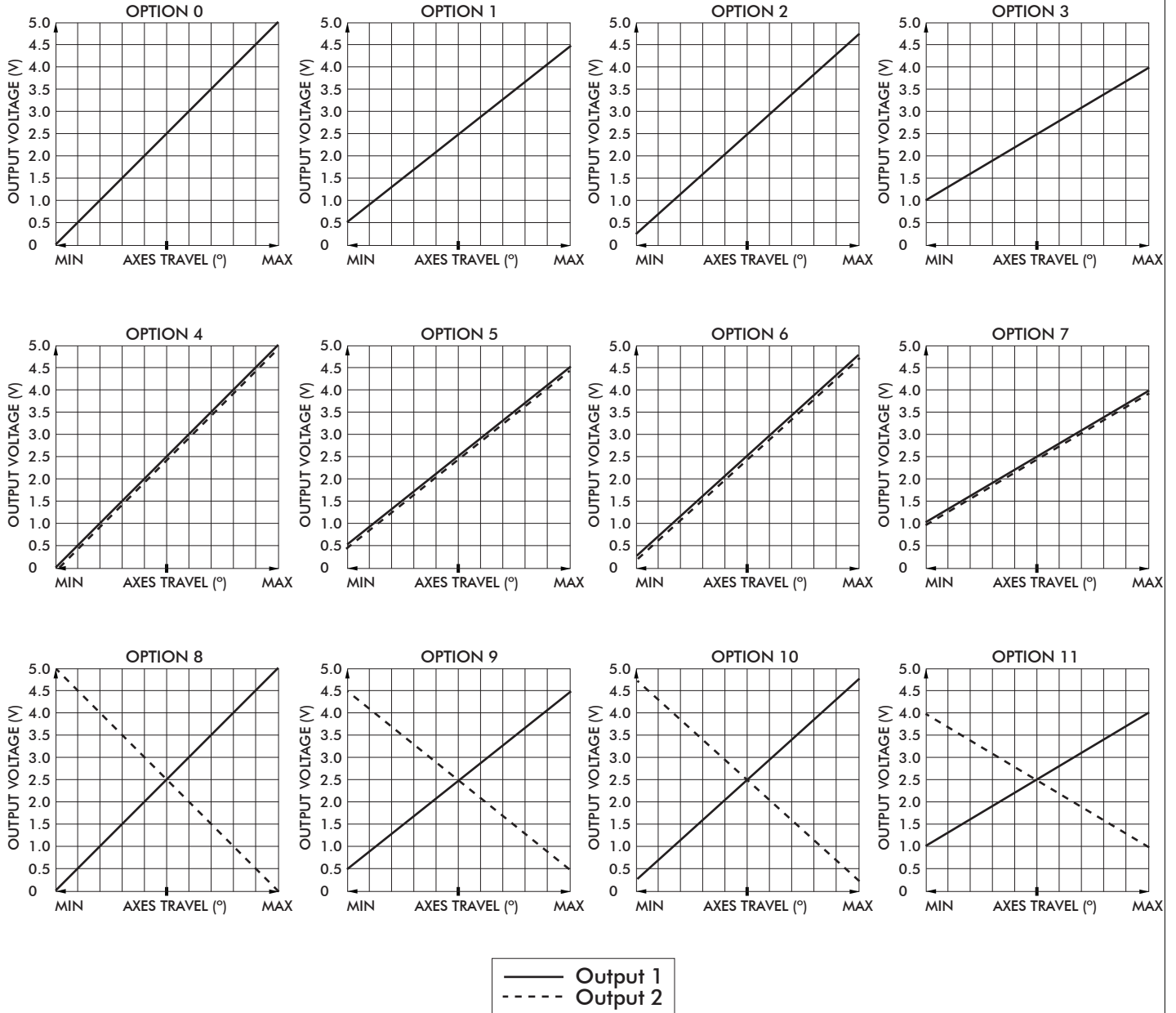
- Panel
- Gasket
- Rear Mount Gasket

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CONFIGURATION OPTIONS

LINEAR OUTPUT OPTIONS



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

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CONFIGURATION OPTIONS - continued

ADDITIONAL OUTPUT OPTIONS

PLUG-AND-PLAY SOLUTIONS:

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

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable
(Optional ruggedized military connectors are available.)



USB Male Type A Connector

JOYBALL (CURSOR EMULATION)

The Joyball 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. Supported protocols include Sun Microsystems (mouse systems 5VDC serial) and USB.

APPLICATIONS

The Joyball option is ideal for vehicle applications subjected to dirt and high vibration which makes operating a traditional cursor control device difficult. The Joyball 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
- Environmental sealing up to IP68

SUPPLIED WIRING

USB: USB Male Type A Connector with overmolded cable
SUN: SUN mini-DIN plug with overmolded cable and strain relief

I/O COMPLEMENT/ USER SPECIFIED PARAMETERS:

- USB 4 pushbuttons 2 or 3 axes (X, Y, and Z "scroll")
- SUN 2 pushbuttons and 2 axes (X, Y)

ADDITIONAL OUTPUT OPTIONS

VOLTAGE REGULATOR

The Voltage Regulator is a multi-wired analog option used to mate to a variety of industrial control voltages. The Voltage Regulator may be used when the supply or output voltage is greater than 5V or when bipolar output is required.

User Specified Output Voltage:

- 0-5 VDC
- 0-10 VDC
- +/-5 VDC
- +/-10 VDC

ELECTRICAL SPECIFICATIONS

Supply Voltage	-	(Output Voltage + 1V) to 35V
Supply Current	-	90mA max

WIRING SPECIFICATION

Red wire	-	Supply (+30V 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

