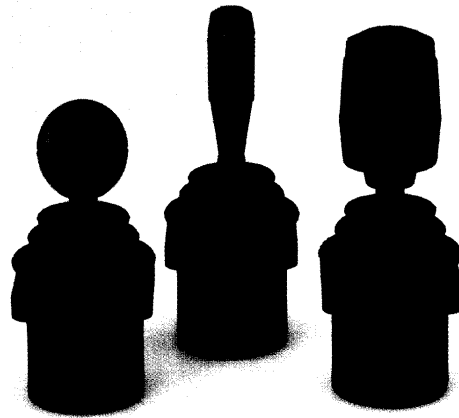


# HFX Series

## Panel Mount Magnetic Joysticks

### Compact, Reliable, Industrial Quality

Designed for applications requiring a rugged, durable joystick, the HFX incorporates automotive quality non-contacting Hall effect sensors and solid magnets in a small, compact housing. A durable rubber boot and secondary gasket provide for a watertight (IP65) seal when properly mounted. The precision-ground 0.25 inch (6.35mm) stainless steel shaft and stainless steel pivot pins offer impressive strength and corrosion resistance. Available in single, dual, and three-axis models with or without push buttons, the HFX joystick is ideal as a control for both stepping motors and servo motors.



The HFX joystick is truly the next generation of small magnetic joysticks and is meant as a replacement for older inductive coil joysticks, which have remained basically unchanged since their introduction in the late 1970s. The primary problem with the inductive coil joystick is that it is inherently susceptible to both radio frequency interference (RFI) and electromagnetic interference (EMI). By using industry proven Hall effect sensors and high grade solid magnets, the HFX line of products is practically impervious to RFI and EMI distortions. The HFX joystick is also form-fit-function compatible with most major brands of inductive coil joysticks. This means that it will easily fit into the same panel cutouts using the same mounting holes.

### Typical applications:

- Power wheelchair controls
- Automated conveyer systems
- Hydraulic controls
- Scissor lift platforms
- Construction and farm equipment
- Forklifts

### Electrical specifications:

Supply Voltage: Vdd=5V	Center Voltage: 2.5V ( $\pm 15\text{mV}$ )
Supply Current: 2-axis = 4.8mA min to 11.0mA max	Typical: 8mA
Supply Current: 3-axis = 7.2mA min to 16.5mA max	Typical: 12mA
Resolution: Infinite	Response: 40-80uSec
Output Current: $\pm 2\text{mA}$	Output Voltage Tolerance: $\pm 2\%$

Electrical MTBF (mean time between failure): 1,000,000 operational (power on) hours

Output Voltage Option 0: 0V min to 5V max (full range rail to rail)

Output Voltage Option 1: 0.5V min to 4.5V max (fault range =  $<0.5\text{V}$  or  $>4.5\text{V}$ )

Output Voltage Option 2: 0.25V min to 4.75V max (fault range =  $<0.25\text{V}$  or  $>4.75\text{V}$ )

Output Voltage Option 3: 2V min to 3V max

Note: The fault range is controlled by a clamping circuit in the Hall effect sensor which limits the output voltage to a pre-set range.

### Physical specifications:

Joystick Travel:  $40^\circ (\pm 18^\circ)$

Panel Thickness: 0.046 to 0.125in (1.17 to 3.17mm)

Housing: high impact glass-filled nylon

Handle: thermoset phenolic (model 1100)

Breakout Force: X/Y axes = 1.25N nominal

Weight: two-axis with ball handle = 0.2 lbs (0.091 kg)

Environmental: sealed to IP65 above panel

Operating Temperature:  $-40^\circ\text{C}$  to  $85^\circ\text{C}$

Mechanical MTBF: 15,000,000 cycles under normal use

Centering: single spring, omnidirectional

Return to Center Repeatability:  $\pm 0.5\%$

Shaft: 0.25in (6.35mm) diameter, stainless steel

Boot & Gasket: thermoplastic rubber

Operation Force: X/Y axes = 2.25N nominal

Weight: three-axis with 1 button = 0.215 lbs (0.098kg)

Flammability Rating: 94HB

Storage Temperature:  $-55^\circ\text{C}$  to  $165^\circ\text{C}$

**CH Products: 970 Park Center Drive, Vista CA 92083**

**Tel: 760.598.2518 or 800.240.7282 (USA only) Fax: 760.598.2524**

**E-mail: oemsales@chproducts.com**

**www.chproducts.com**

(V.2/10-99)



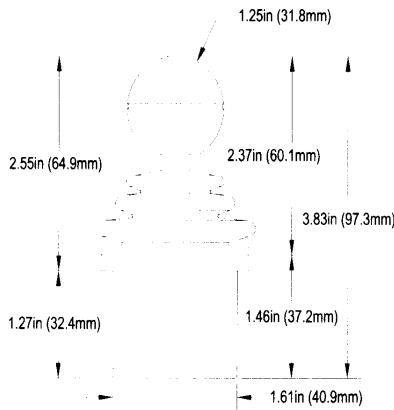
### Standard Features:

- Reliable non-contacting Hall effect sensors
- Corrosion resistant stainless steel pivot pins
- Durable rubber boot and sealing gasket

- Industrial quality solid magnets
- Precision ground stainless steel shaft
- Non-binding teflon coated wires

- Multiple mounting options
- Flexible configurations
- Compact low profile design

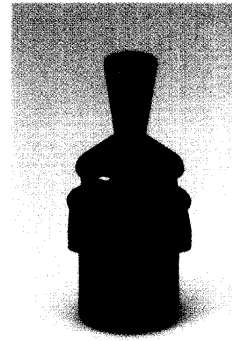
### Product Gallery:



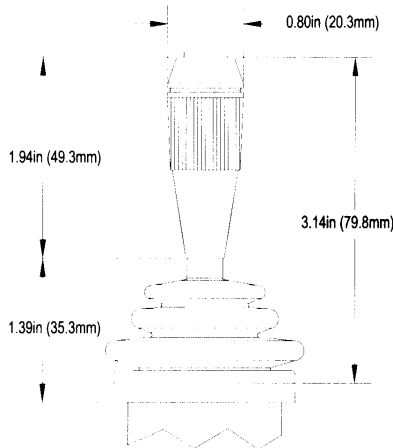
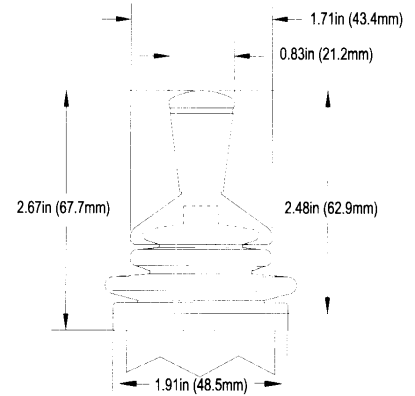
**Model 1100 (2 axis)**



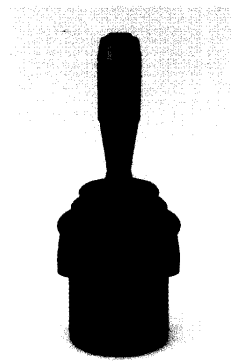
**Option 0**



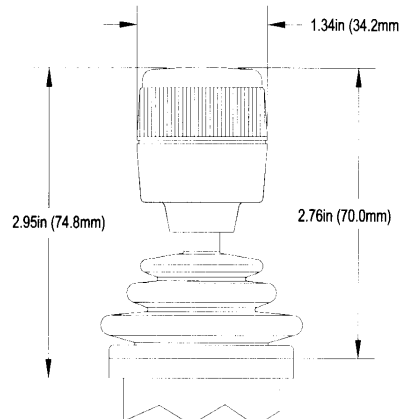
**Option 1**



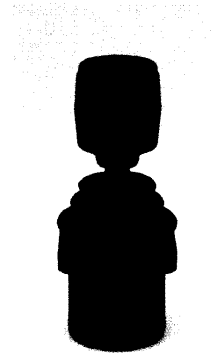
**Model 1200 (2 axis with button)**



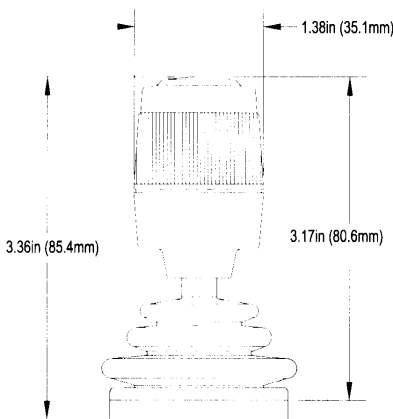
**Option 2**



**Model 1300 (3 axis)**



**Option 3**



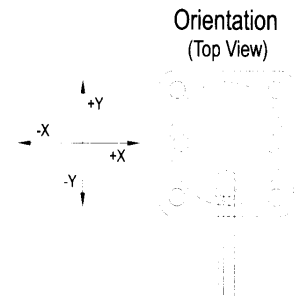
**Model 1400 (3 axis with button(s))**



**Option 4**



**Option 5**



**Notes:** 1) To provide consistency in output, the third axis (Z) twist handle also incorporates a Hall Effect sensor.

2) Above panel dimensions are the same for both the option 4 and option 5 handles.

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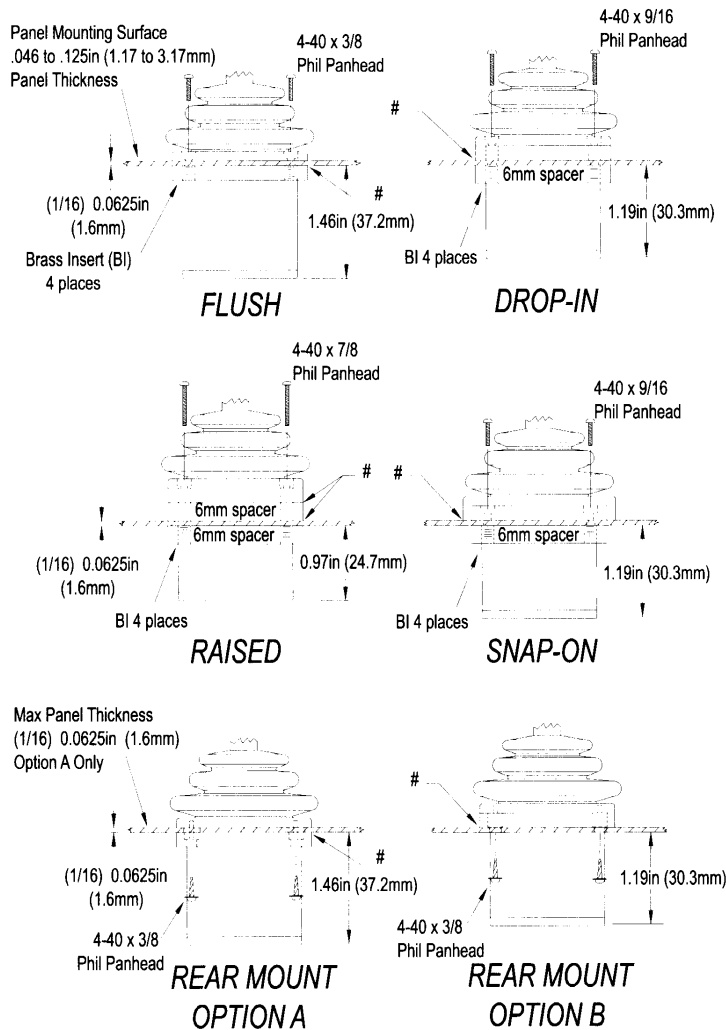
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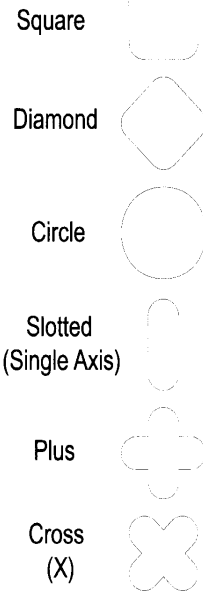
**Mounting Options:** In order to suit a variety of integration requirements, the HFX joystick offers six different mounting options from which to choose.



Notes: 1) # indicates suggested position for optional gasket  
 2) Mounting screws are included with each unit

**Limiter Plate Options:** The limiter plates are used to determine the deflection pattern of the HFX joystick.

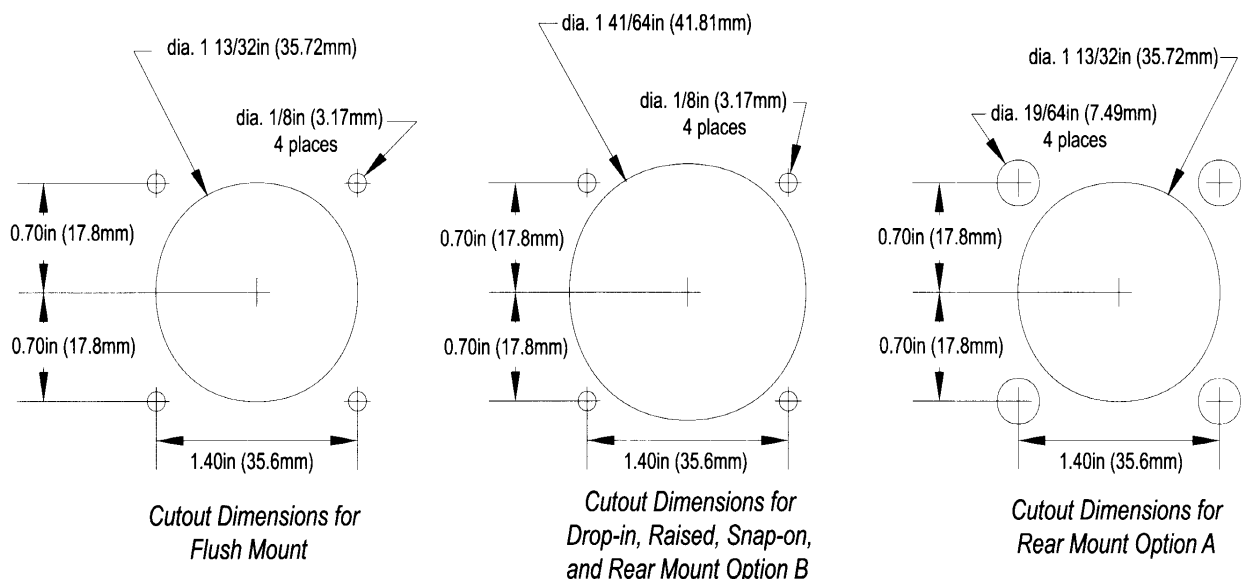
Max Deflection  
 40° (+/-20°)



**Wire Color Code**

Red = Vdd      Green = Z-axis\*  
 Black = Gnd    White = Switch Com\*  
 Blue = X-axis   Orange = Switch 1\*  
 Yellow = Y-axis   Violet = Switch 2\*  
 \* = optional

**Mounting Cutout Dimensions**

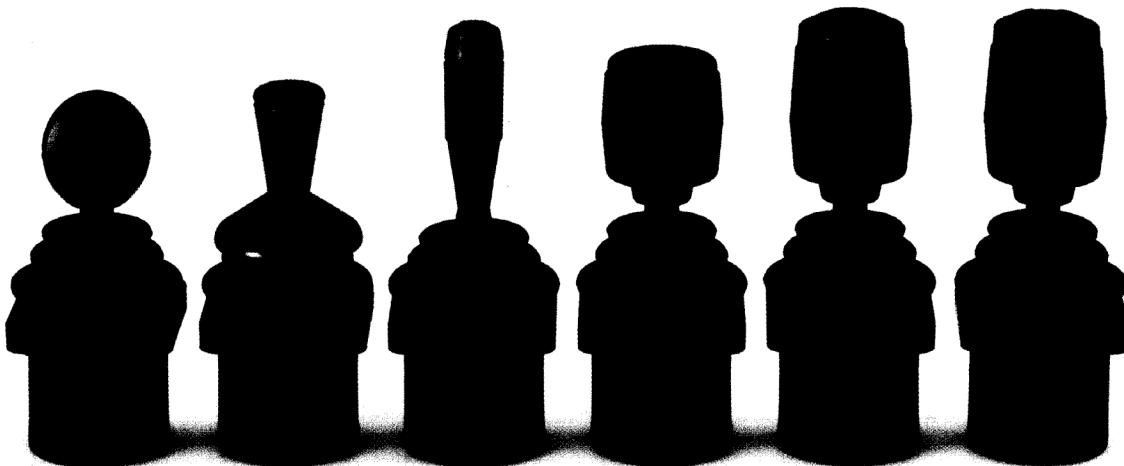


## HFX CONFIGURATION GUIDE

(select one key option from each description field)

Description Field	Key	Feature	Feature Availability			
Model	HFX-1 HFX-2 HFX-3 HFX-4	Mod. 1100, 2 axis Mod. 1200, 2 axis with pushbutton Mod. 1300, 3 axis Mod. 1400, 3 axis with pushbutton(s)	100	200	300	400
Joystick Handle	0 1 2 3 4 5*	Ball Tip Tapered (see Note 3) 2 axis with pushbutton 3 axis 3 axis with 1 pushbutton 3 axis with 2 pushbuttons	X X	X	X	X X
Limiter Plate	S D R M P X	Square Diamond Round Slotted "-" (Single Axis) Plus "+" Cross "x"	X X X X X X	X X X X X X	X X X X X X	X X X X X X
Mounting Option	0 1 2* 3 4	Flush Drop In Raised Snap On Rear Mount	X X X X X	X X X X X	X X X X X	X X X X X
Output Option	0 1 2 3	0V to +5V Rail to Rail +0.5V to +4.5V with Fault Detection +0.25V to +4.75V with Fault Detection +2V to +3V	X X X X	X X X X	X X X X	X X X X

- Notes: (1) X denotes availability of features  
 (2) \* denotes additional charge - see pricing information  
 (3) Tapered handle is not compatible with the Flush, Snap on, or Rear Mount Option A mounting options  
 (4) Customers desiring options not listed should contact factory representative. Options include friction clutch (non-return) positioning, multiple spring tensions, and a low profile three-axis handle.  
 (5) Example: Joystick Part Number HFX-11D11 is  
 HFX Model 100, 2 axis joystick with tapered handle, diamond limiter plate, drop-in mounting, and +0.5V to +4.5V output with fault detection



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