

# HE2 Series

Ruggedized Hall effect fingertip joystick

## MAIN FEATURES

- Up to three axis
- IP67 above panel sealing
- Rugged design with metal mechanism
- 5 million lifecycles
- Precise center tolerances: +/-50mV
- Full voltage outputs at corner positions
- USB protocol output options



The HE2 Series is a ruggedized, multi-axis Hall effect joystick. Constructed with a metal mechanism and providing IP67 above panel sealing, the HE2 Series is designed for strenuous applications that require precision fingertip joystick positioning. Ideal applications include wireless remote controls and marine propulsion systems.

## SPECIFICATIONS\*

| MECHANICAL SINGLE AXIS          |  |
|---------------------------------|--|
| <b>Angular travel:</b>          | 40° total (20° each direction from center) |
| <b>Expected life:</b>           | 5 million operations                       |
| <b>Centering:</b>               | Spring return                              |
| <b>Mass/weight:</b>             | 120 grams**                                |
| <b>Maximum horizontal load:</b> | 150 lbF                                    |

\* Specifications subject to change without notice

\*\* Approximate weight. Actual weight dependent on configuration

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## SPECIFICATIONS

| MECHANICAL (Z AXIS)             |  |
|---------------------------------|--|
| <b>Rotational travel:</b>       | 90° total (45° each direction from center) |
| <b>Centering:</b>               | Spring return                              |
| <b>Maximum horizontal load:</b> | 14 lbFin                                   |

| ELECTRICAL                                 |  |
|--|--|
| <b>Technology:</b>                         | Hall effect sensor, single                   |
| <b>Resolution:</b>                         | 12 bit                                       |
| <b>Supply voltage:</b>                     | 5.00VDC +/- 0.01VDC regulated transient free |
| <b>Supply voltage tolerance:</b>           | 5.00VDC +/- 0.25VDC                          |
| <b>Supply current:</b>                     | 20mA max / 30mA max (3 axis)                 |
| <b>Ratiometric output voltage:</b>         | See output options                           |
| <b>Return to center voltage tolerance:</b> | +/-50mV*                                     |
| <b>Transient overvoltage max:</b>          | 20VDC  |
| <b>Reverse polarity max:</b>               | -10VDC                                       |
| <b>Output current:</b>                     | 8mA  |
| <b>Output impedance:</b>                   | 2Ω   |
| <b>Start up time:</b>                      | 15ms max                                     |

\* Based on supply voltage 5.00VDC +/- .01VDC. Outputs are ratiometric and dependent upon supply voltage.

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## SPECIFICATIONS

| ENVIRONMENTAL                 |   |
|-------------------------------|---|
| <b>Operating temperature:</b> | -40°C +85°C                                   |
| <b>Storage temperature:</b>   | -40°C +85°C                                   |
| <b>Above panel sealing:</b>   | IP67*   |
| <b>EMC immunity level:</b>    | EN61000-4-3** Compliance to 30A/m             |
| <b>EMC emissions level:</b>   | EN61000-6-3                                   |
| <b>ESD immunity level:</b>    | EN61000-4-2** Compliance to +/-15kV/+/-8kV    |
| <b>Vibration:</b>             | Per SAE J1455 Section 4.9 & MIL-STD810G 514.6 |
| <b>Mechanical shock:</b>      | Per SAE J1455 Section 4.10 & MIL-STD-202G     |

\* Above panel sealing. All configurations. Product is idle and not in use

\*\* Extended testing levels

| MATERIALS                           |  |
|-------------------------------------|--|
| <b>Plastic housing and handles:</b> | Mineral & glass filled nylon                                 |
| <b>Boots &amp; Actuators</b>        | Silicone (with tear resistant additive) & glass filled nylon |

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## CONNECTIONS: ANALOG OUTPUTS/OUTPUT OPTIONS 1-4

The HE2 Series joystick (Output options 1-4) features a Hirose DF11-12DP-2DS(24) header (male receptacle). The joystick is supplied with a mating wire harness featuring Hirose DF11-12DS-2C(05) connector (female socket).



**Joystick body:** Hirose DF11-12DP-2DS(24)

**Mating wire harness:** Hirose DF11-12DS-2C(05) to stripped & tinned wire leads 10", 11 x PTFE 28AWG, heat shrink cable jacket

| PIN # | WIRE COLOR | DESCRIPTION   |
|-------|------------|---------------|
| 1     | BLACK      | GROUND        |
| 2     | RED        | POWER (+5V)   |
| 3     | PINK       | N/A           |
| 4     | BLUE       | X AXIS SENSOR |
| 5     | GREY       | N/A           |
| 6     | YELLOW     | Y AXIS SENSOR |
| 7     | BROWN      | N/A           |
| 8     | GREEN      | Z AXIS SENSOR |
| 9     | ORANGE     | BUTTON 1      |
| 10    | WHITE      | BUTTON COMMON |
| 11    | VIOLET     | BUTTON 2      |
| 12    | N/A        | N/A           |

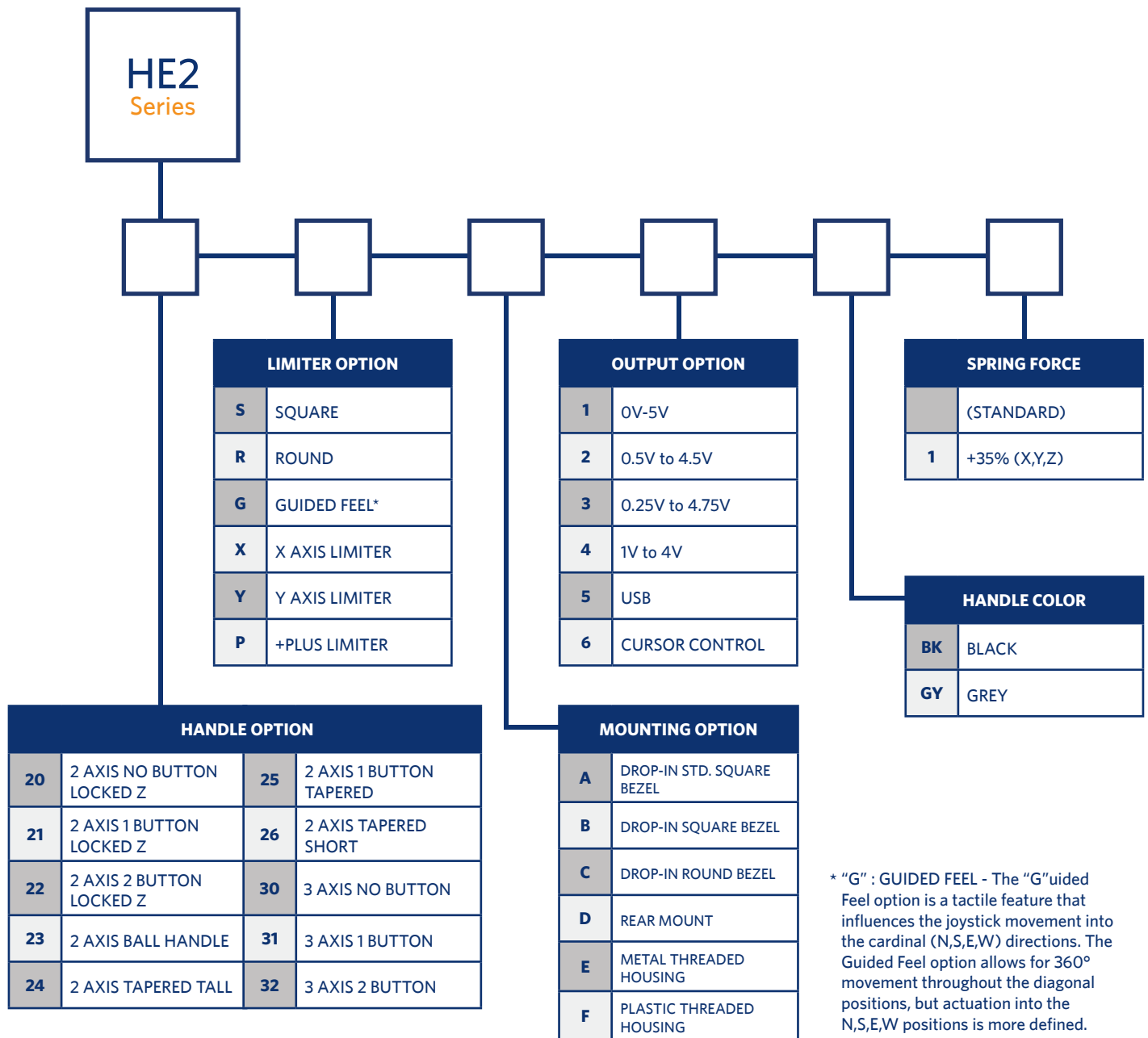
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## HE2 SERIES PRODUCT CONFIGURATION



\* "G" : GUIDED FEEL - The "G"uided Feel option is a tactile feature that influences the joystick movement into the cardinal (N,S,E,W) directions. The Guided Feel option allows for 360° movement throughout the diagonal positions, but actuation into the N,S,E,W positions is more defined.

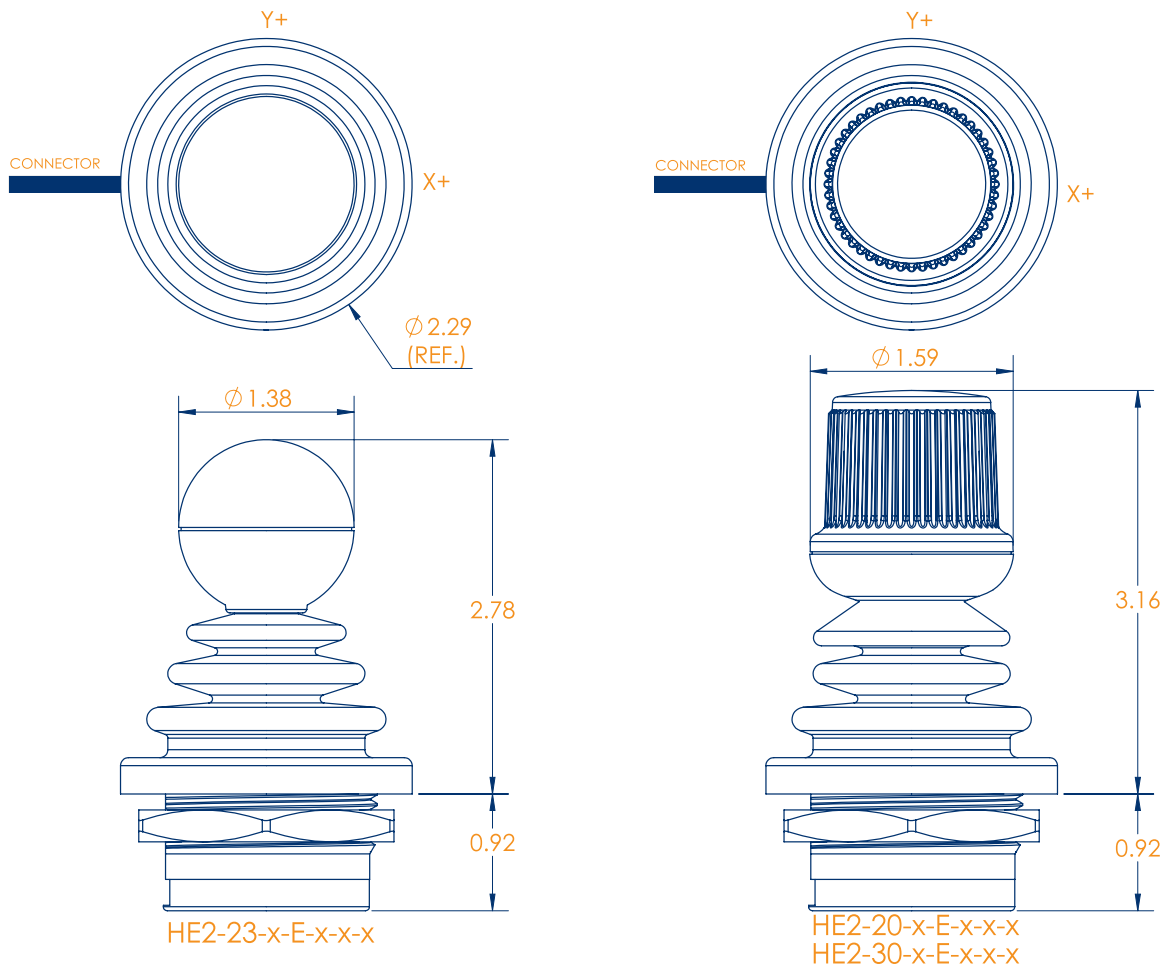
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## HANDLE OPTION



ALL HANDLE OPTIONS SHOWN WITH METAL THREADED HOUSING MOUNTING OPTION "E"

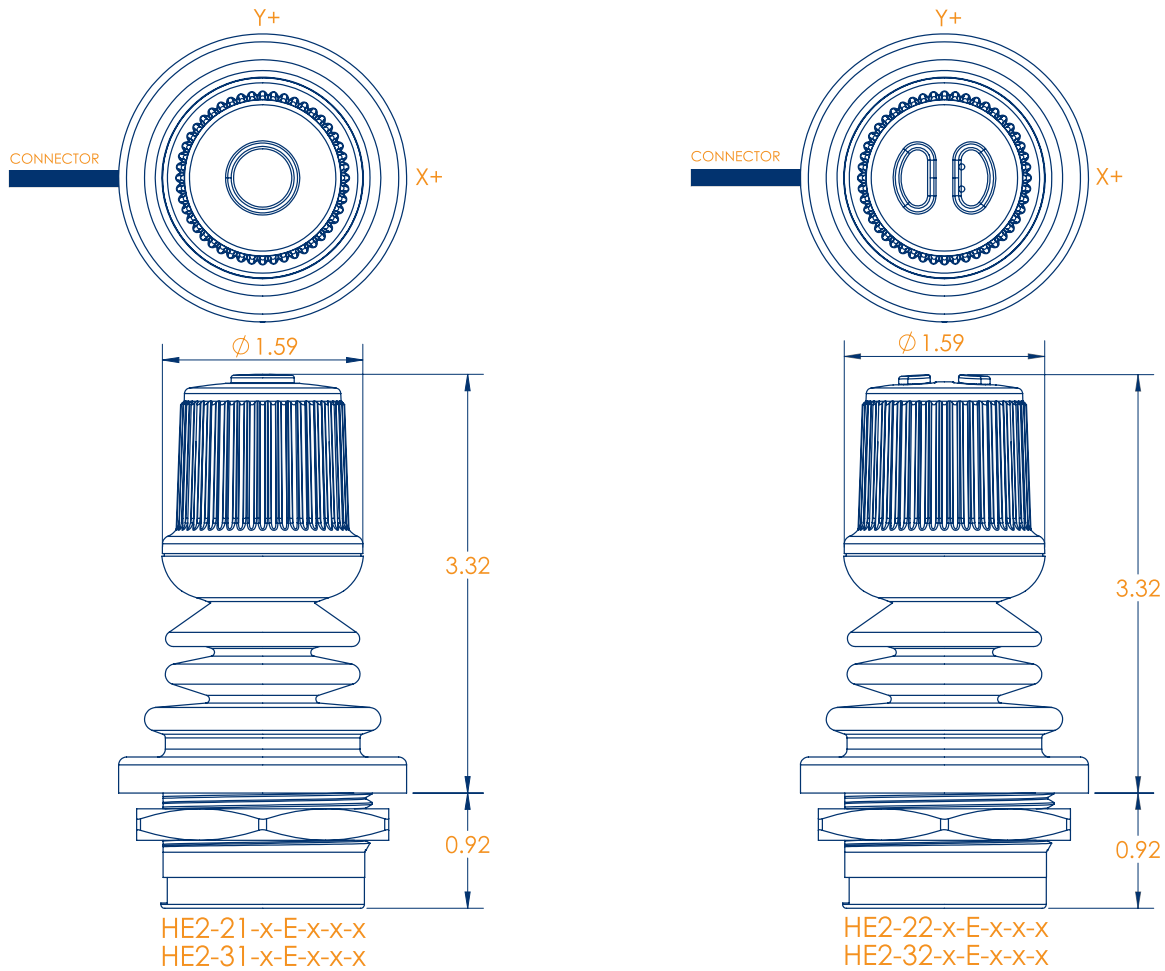
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## HANDLE OPTION



ALL HANDLE OPTIONS SHOWN WITH METAL THREADED HOUSING MOUNTING OPTION "E"

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**Ruffy Controls, Inc.**  
3258 Grey Hawk Ct., Carlsbad, CA 92010  
ruffycontrols.com

For more information: sales@ruffycontrols.com

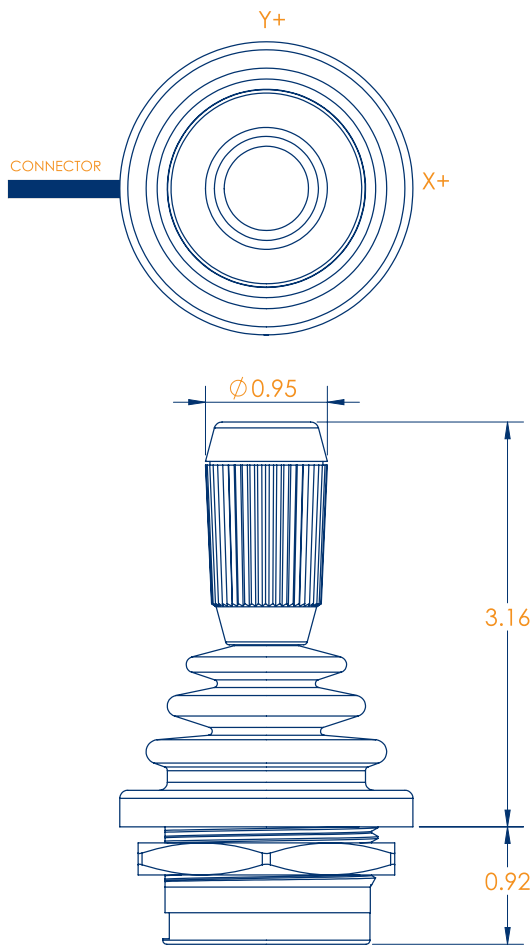
SCAN TO  
ORDER TODAY



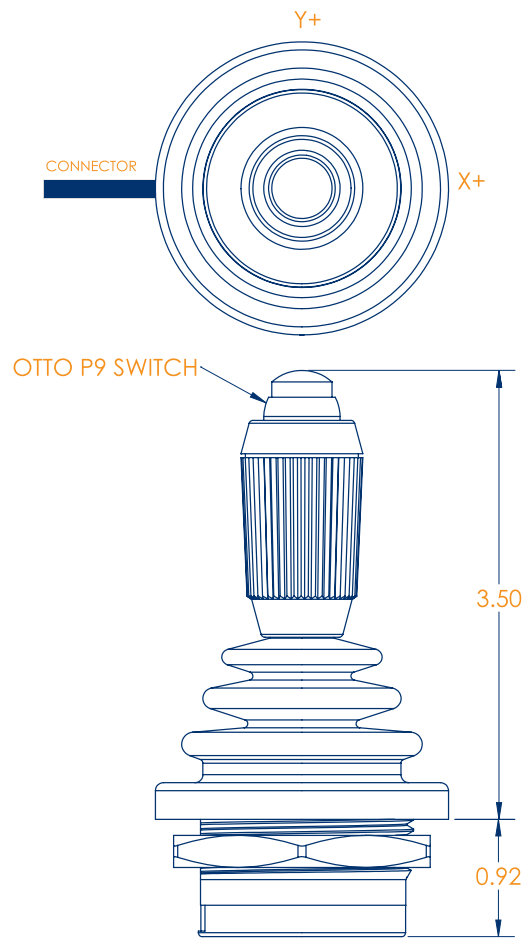
# HE2 Series

Ruggedized Hall effect fingertip joystick

## HANDLE OPTION



HE2-24-x-E-x-x-x



HE2-25-x-E-x-x-x

ALL HANDLE OPTIONS SHOWN WITH METAL THREADED HOUSING MOUNTING OPTION "E"

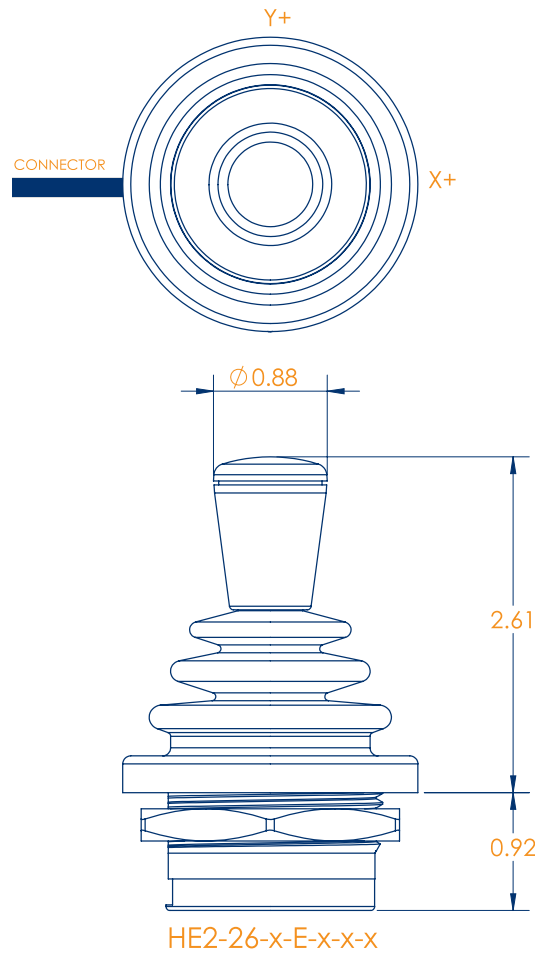
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## HANDLE OPTION



ALL HANDLE OPTIONS SHOWN WITH METAL THREADED HOUSING MOUNTING OPTION "E"

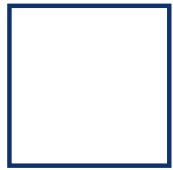
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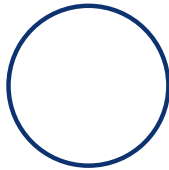
# HE2 Series

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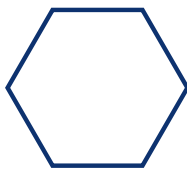
## HANDLE OPTION



S: SQUARE



R: ROUND



G: GUIDED FEEL



X: X AXIS



Y: Y AXIS



P: PLUS

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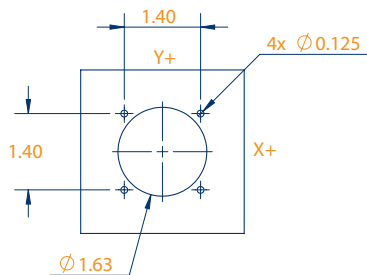


# HE2 Series

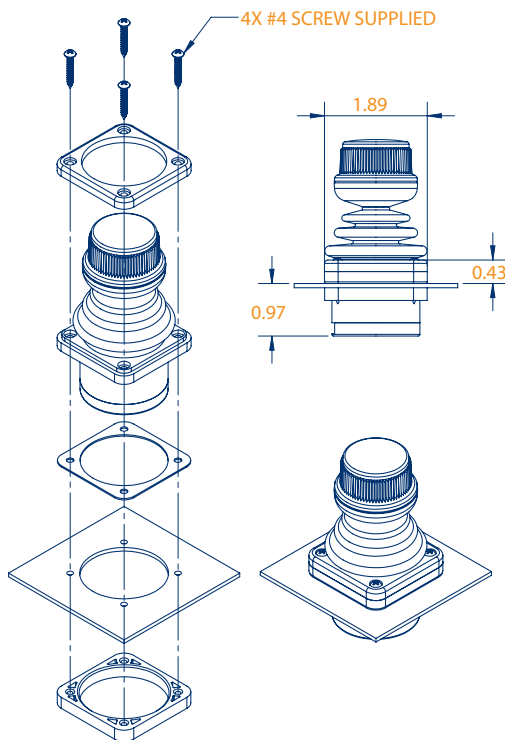
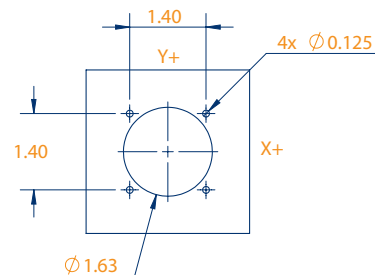
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## MOUNTING PANEL DIMENSIONS

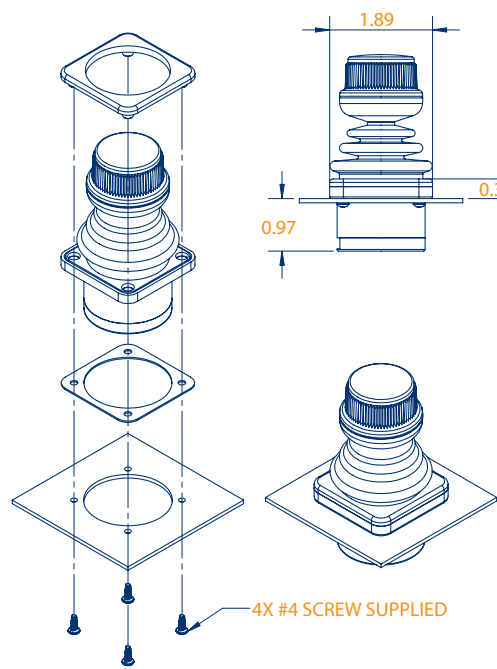
DROP-IN SQUARE PANEL DIMENSIONS



DROP-IN SQUARE PANEL DIMENSIONS  
(UNDER PANEL SCREWS)



OP-IN STANDARD SQUARE BEZEL



DROP-IN SQUARE BEZEL, UNDER PANEL SCREWS

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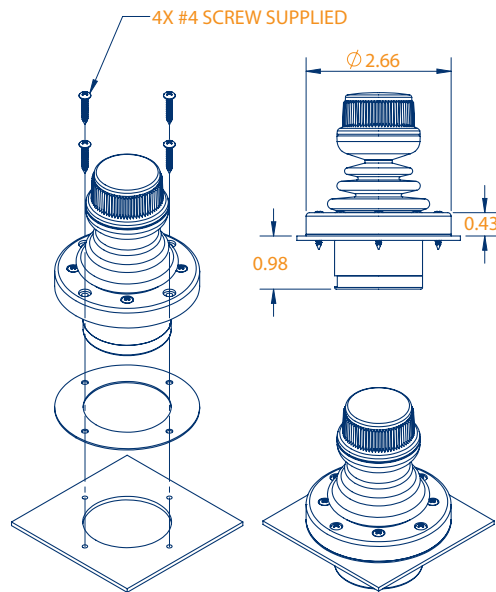
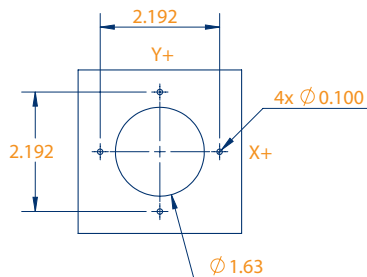


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## MOUNTING PANEL DIMENSIONS

### DROP-IN ROUND PANEL DIMENSIONS



### DROP-IN ROUND BEZEL

\*HANDLE SHOWN FOR REFERENCE ONLY

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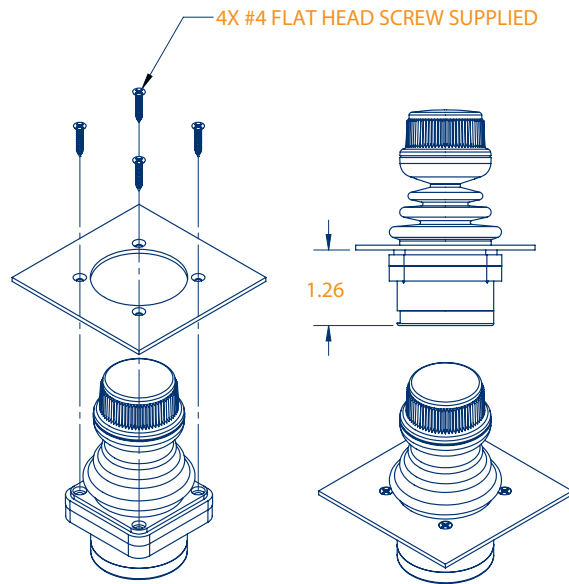
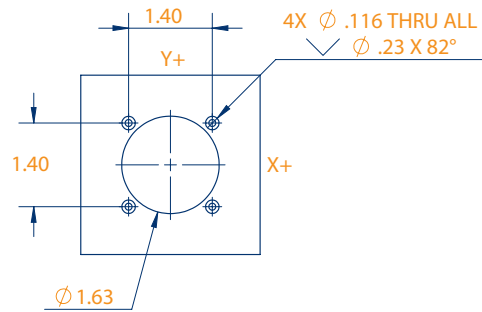


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## MOUNTING PANEL DIMENSIONS

### REAR MOUNT PANEL DIMENSIONS



REAR MOUNT

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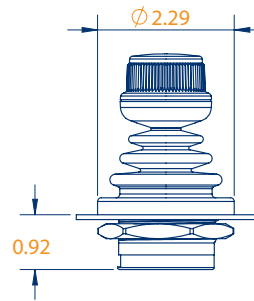
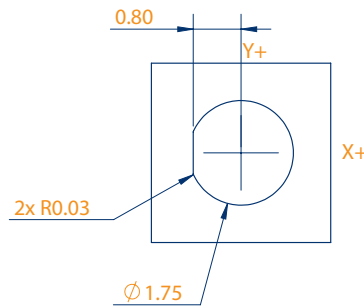


# HE2 Series

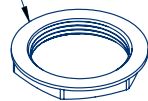
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## MOUNTING PANEL DIMENSIONS

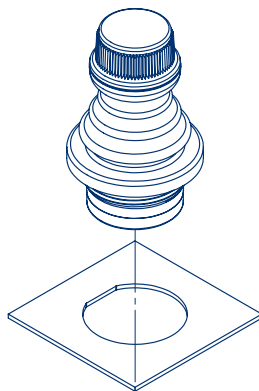
METAL OR PLASTIC THREADED HOUSING PANEL DIMENSIONS



PLASTIC NUT SUPPLIED

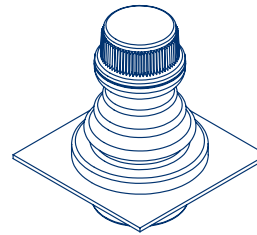


PLASTIC  
THREADED  
HOUSING



METAL  
THREADED  
HOUSING

ALUMINUM NUT SUPPLIED



\*HANDLE SHOWN FOR REFERENCE C

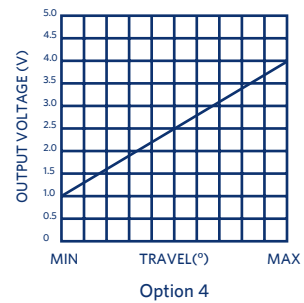
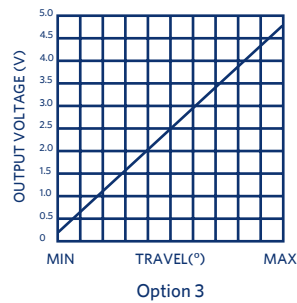
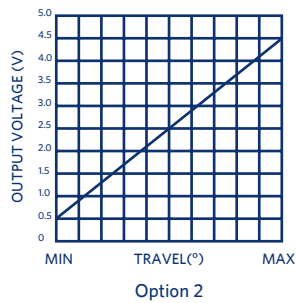
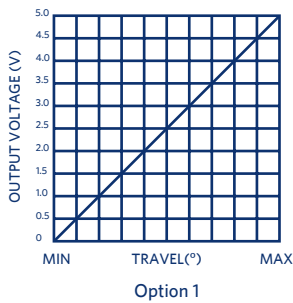
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## VOLTAGE OUTPUT OPTIONS



## USB OUTPUT OPTIONS

### USB OUTPUT OPTION (OPTION 5)

Featuring USB 1.1 HID compliant interface, USB Output Option 5 provides HID compliant "Game Controller" interface. Ruffy USB joysticks are plug-and-play with most versions of WINDOWS. Joystick button and axis assignment are dependent upon the controlled application.

|                             |   |
|-----------------------------|---|
| <b>Features:</b>            | USB 1.1 HID compliant Game Controller device<br>Easy to install and operate<br>Functions determined by controlled application |
| <b>Resolution:</b>          | 10 Bit  |
| <b>Supply voltage:</b>      | 5VDC via USB cable  |
| <b>Supply voltage:</b>      | WINDOWS (ALL), OSX, Linux   |
| <b>Supported protocols:</b> | USB HID 1.1 Game Controller<br>Standard DirectX HID drivers<br>Joystick: Up to 3 HID axis<br>Pushbuttons: Up to 2 buttons     |
| <b>Cable:</b>               | Overmolded USB Male Type A to Right Angle Mini B (60") length   |

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## USB OUTPUT OPTIONS

| CURSOR CONTROL OUTPUT OPTION (OUTPUT OPTION 6)  |   |
|---|---|
| The Cursor Control Output Option converts mutli-axis joystick output into USB HID compliant mouse / cursor control / pointing device interface. |   |
| <b>Features:</b>  | HID Compliant "mouse" device  |
| <b>Resolution:</b>  | 10 Bit  |
| <b>Supply voltage:</b>  | 5VDC via USB cable  |
| <b>Supply voltage:</b>  | WINDOWS (ALL), OSX, Linux   |
| <b>Supported protocols:</b>   | USB HID 1.1 Game Controller<br>Standard DirectX HID drivers<br>Joystick: Up to 3 HID axis<br>Pushbuttons: Up to 2 buttons |
| <b>Cable:</b>   | Overmolded USB Male Type A to Right Angle Mini B (60") length   |

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