

# HALL EFFECT SINGLE AXIS PADDLE

UP TO 5 MILLION CYCLE MECHANICAL LIFE, 14 OUTPUT OPTIONS



The HPW series, available with 14 output options, offers a self-centering single axis actuator that provides linear change in voltage output in either direction from center. Options include increasing or decreasing voltage output in either direction (from center position to the full travel position) with single or dual outputs in either direction. The HPW series without detent provides a five million cycle, full forward to full back life, and with detent (available with HPW-3) provides a two million cycle full forward to full back life. Electronics are sealed to IP68S, while offering outstanding EMI/RFI immunity.

## Features:

- Designed for grip, armrest & panel mounting
- Proven contactless analog output Hall effect technology
- 14 output options available
- Self-centering, single axis actuator
- Up to 5,000,000 mechanical life
- Electronics sealed to IP68S
- RoHS compliant
- Optional soft touch coating available

### Standard Characteristics/Ratings:

#### MECHANICAL:

|                                        |                                                                       |
|----------------------------------------|-----------------------------------------------------------------------|
| <b>Mechanical Life with Detent:</b>    | Up to 2,000,000 cycles full forward to full back                      |
| <b>Mechanical Life without Detent:</b> | Up to 5,000,000 cycles full forward to full back                      |
| <b>Travel:</b>                         | Full travel angle each direction from center to 25° typical           |
| <b>Operating Force:</b>                | HPW-1 is 4 oz typical @ 25°<br>HPW-2 and HPW-3 are 3 oz typical @ 25° |
| <b>Max Allowable Radial Load:</b>      | 30.0 lbs.                                                             |

#### ELECTRICAL RATINGS: Vcc = 5V @ 25°C Load = 1mA (4.7KΩ)

| Electrical                                                            | Units        | Min   | Typ | Max   |
|-----------------------------------------------------------------------|--------------|-------|-----|-------|
| Supply Voltage                                                        | VDC          | 4.5   | 5   | 5.5   |
| Output Voltage Tolerance at Center (A, B, C, D, E, F, G & H)          | VDC @ 5V Vcc | -0.25 | N/A | +0.25 |
| Output Voltage Tolerance at Center (J, K, L, M, N & P)                | VDC @ 5V Vcc | -0.15 | N/A | +0.15 |
| Output Voltage Tolerance at Full Travel (see graph for output values) | VDC @ 5V Vcc | -0.25 | N/A | +0.25 |
| Supply Current Options A & D (B = 0, Vcc = 5V, Iout = 0)              | mA           | N/A   | 8   | 10    |
| Supply Current All Other Options (B = 0, Vcc = 5V, Iout = 0)          | mA           | N/A   | 16  | 20    |

#### ENVIRONMENTAL:

|                              |                         |
|------------------------------|-------------------------|
| <b>Operating Temp Range:</b> | -40°C to +85°C          |
| <b>Electronic Enclosure:</b> | IP68S                   |
| <b>Mechanical Enclosure:</b> | Unsealed                |
| <b>RFI/EMI:</b>              | Withstand per SAE J1113 |

## HPW PART NUMBER CODE

| Button Style                        | Output 1*         | Output 2**        | Operating Force          | Termination                                           | Bezel Color | Button Color | Detent  |
|-------------------------------------|-------------------|-------------------|--------------------------|-------------------------------------------------------|-------------|--------------|---------|
| 1. Lever Style #1 (Paddle)          | A. 2.5 +/- 2.0VDC | NONE              | 1.4 oz (HPW-1)           | A. 22 AWG 18.3" Long, Stripped Ends                   | 1. Red      | 1. Red       | N. None |
| 2. Lever Style #2 (Standard Lever)  | B. 2.5 +/- 2.0VDC | 2.5 +/- 2.0VDC    | 3 oz (HPW-2 and HPW-3)   | B. 0.025" SQ. Pins, Phosphor Bronze Alloy, Tin Plated | 2. Black    | 2. Black     | A. ±18° |
| 3. Lever Style #3 (Ergonomic Lever) | C. 2.5 +/- 2.0VDC | 2.5 +/- 2.0VDC    | 2.5 oz (HPW-2 and HPW-3) |                                                       | 3. Orange   | 3. Orange    |         |
|                                     | D. 2.5 +/- 1.5VDC | NONE              |                          |                                                       | 4. Yellow   | 4. Yellow    |         |
|                                     | E. 2.5 +/- 1.5VDC | 2.5 +/- 1.5VDC    |                          |                                                       | 5. Green    | 5. Green     |         |
|                                     | F. 2.5 +/- 1.5VDC | 2.5 +/- 1.5VDC    |                          |                                                       | 6. Blue     | 6. Blue      |         |
|                                     | G. 1.0 - 4.0VDC   | 1.0 - 4.0VDC      |                          |                                                       | 7. Violet   | 7. Violet    |         |
|                                     | H. 0.5 - 4.5VDC   | 0.5 - 4.5VDC      |                          |                                                       | 8. Gray     | 8. Gray      |         |
|                                     | J. 2.5 +/- 2.0VDC | NONE***           |                          |                                                       | 9. White    | 9. White     |         |
|                                     | K. 2.5 +/- 2.0VDC | 2.5 +/- 2.0VDC*** |                          |                                                       |             |              |         |
|                                     | L. 2.5 +/- 2.0VDC | 2.5 +/- 2.0VDC*** |                          |                                                       |             |              |         |
|                                     | M. 2.5 +/- 1.5VDC | NONE***           |                          |                                                       |             |              |         |
|                                     | N. 2.5 +/- 1.5VDC | 2.5 +/- 1.5VDC*** |                          |                                                       |             |              |         |
|                                     | P. 2.5 +/- 1.5VDC | 2.5 +/- 1.5VDC*** |                          |                                                       |             |              |         |



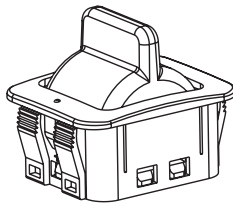
- \* Outputs are from the center position to the full travel position in each direction. Options A-F provide increasing voltage in Direction 1 and decreasing voltage in Direction 2 from a single output. Options G and H provide increasing voltages in both directions from two separate outputs.
- \*\* Options B and E provide redundant output 2 which duplicates output 1. Options C and F provide redundant output 2 which is inverse of output 1.
- \*\*\* Options J, K, L, M, N and P are identical to Options A, B, C, D, E and F respectively, except with a tighter center tolerance.

**STOP HERE** for HPW-1 and HPW-2 switches.

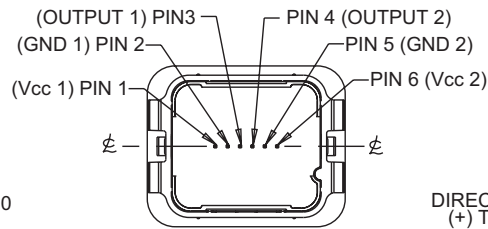
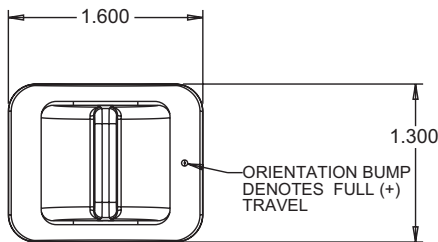
# HALL EFFECT SINGLE AXIS PADDLE

**HPW**  
HALL EFFECT  
PADDLE

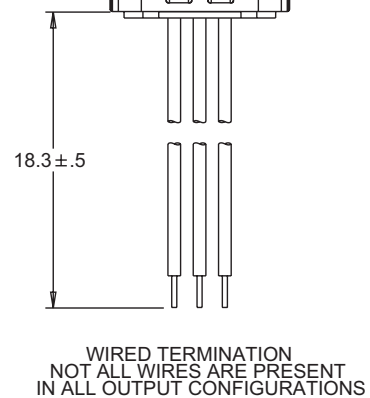
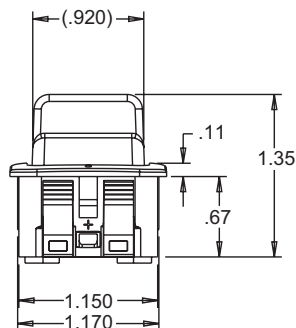
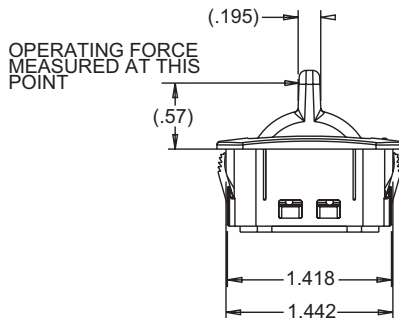
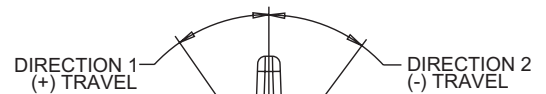
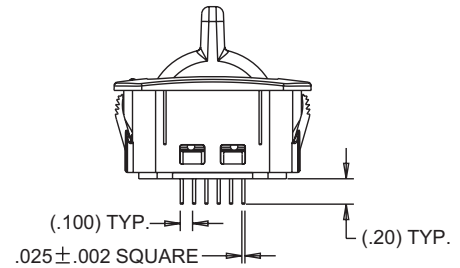
UP TO 5 MILLION CYCLE MECHANICAL LIFE, 14 OUTPUT OPTIONS



**LEVER STYLE #1  
(Paddle)**



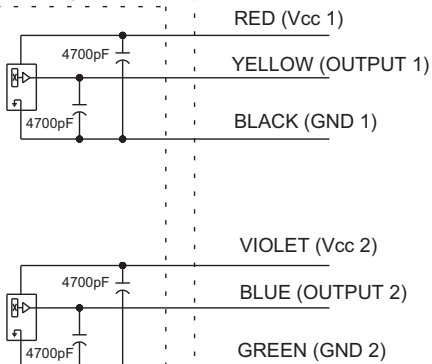
PINNED TERMINATION  
NOT ALL PINS ARE PRESENT  
IN ALL OUTPUT CONFIGURATIONS



WIRED TERMINATION  
NOT ALL WIRES ARE PRESENT  
IN ALL OUTPUT CONFIGURATIONS

## ROCKER SWITCH

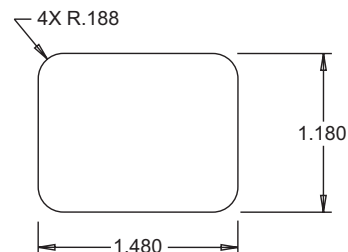
### PCB



OUTPUT 2 IS NOT PRESENT  
IN ALL CONFIGURATIONS

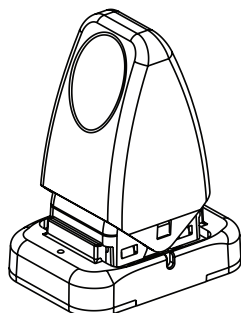
RECOMMENDED PANEL THICKNESS: 0.100 OPTIMUM THICKNESS  
(0.065 MIN. - 0.175 MAX.)

RECOMMENDED PANEL OPENING: 1.180 X 1.480 OPTIMUM  
(1.175/1.185 X 1.475/1.485)

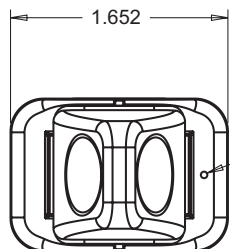
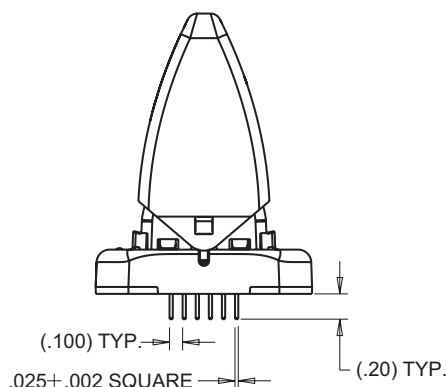


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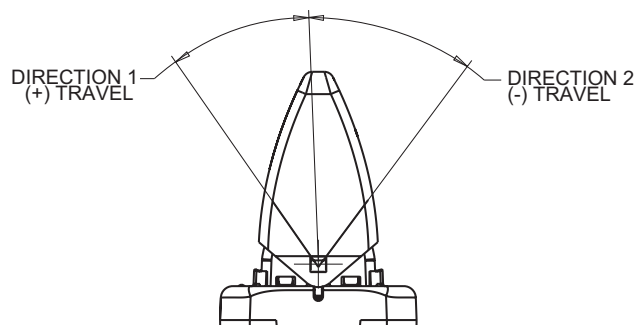
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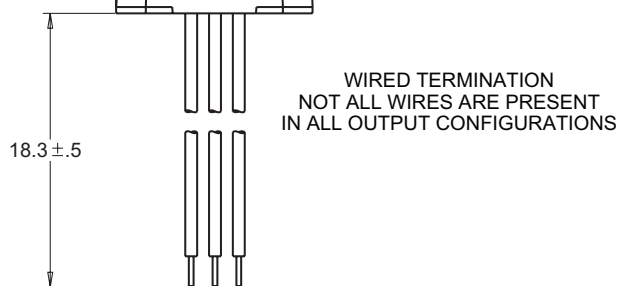
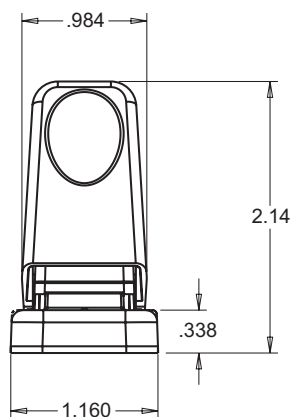
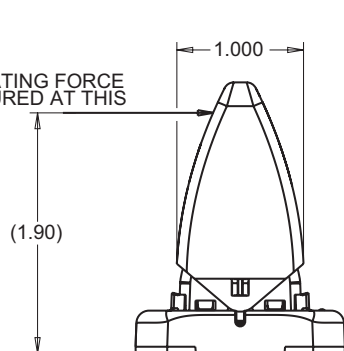
**LEVER STYLE #2**  
**(Standard Lever)**



ORIENTATION BUMP  
DENOTES FULL (+)  
TRAVEL

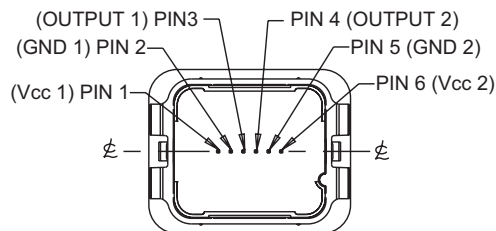
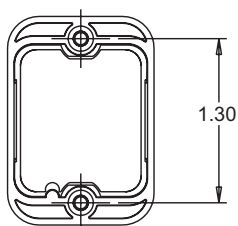
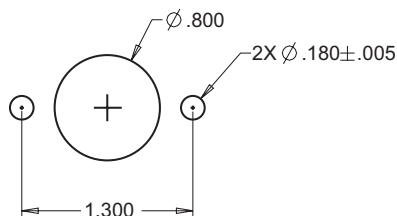


OPERATING FORCE  
MEASURED AT THIS  
POINT



RECOMMENDED PANEL THICKNESS: 0.130 OPTIMUM THICKNESS  
(0.125 MIN. - 0.135 MAX.)

RECOMMENDED PANEL OPENING:  $\varnothing 0.800$  OPTIMUM  
(0.750 MIN. - 0.850 MAX)

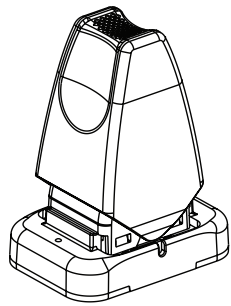


PINNED TERMINATION  
NOT ALL PINS ARE PRESENT  
IN ALL OUTPUT CONFIGURATIONS

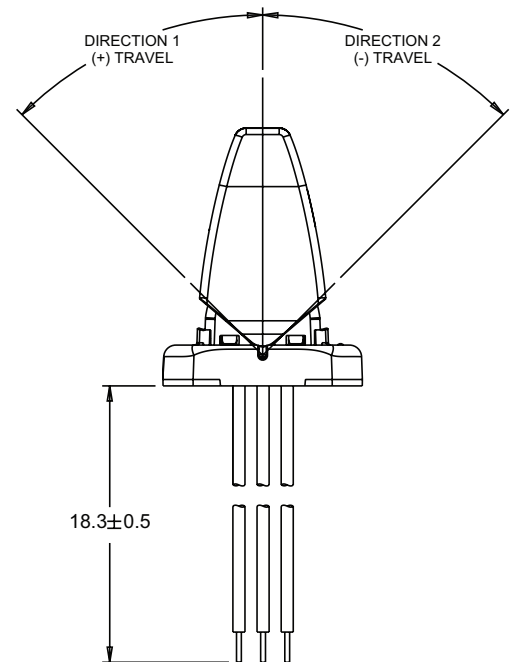
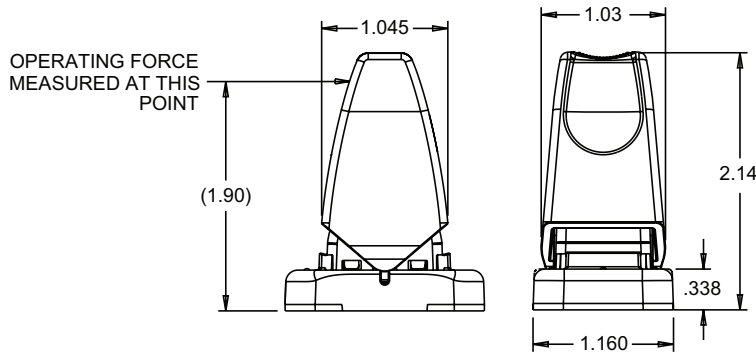
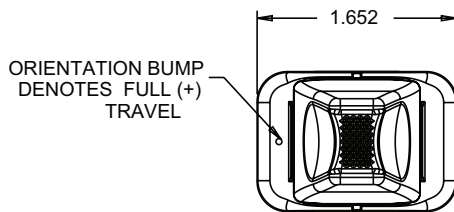
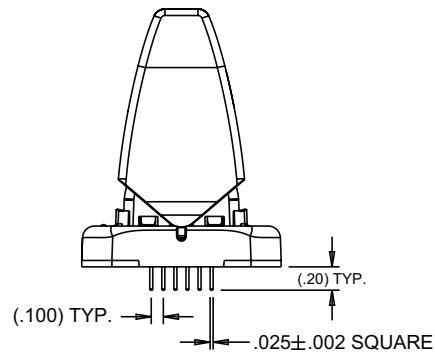
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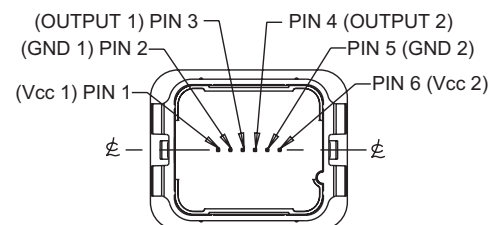
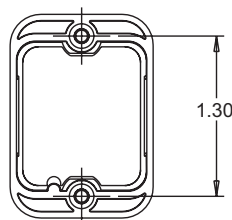
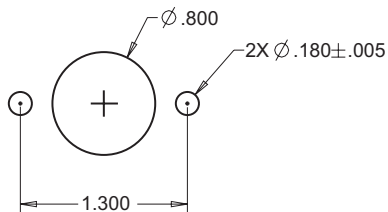
**LEVER STYLE #3**  
(Ergonomic Lever)



WIRED TERMINATION  
NOT ALL WIRES ARE PRESENT  
IN ALL OUTPUT CONFIGURATIONS

RECOMMENDED PANEL THICKNESS: 0.130 OPTIMUM THICKNESS  
(0.125 MIN. - 0.135 MAX.)

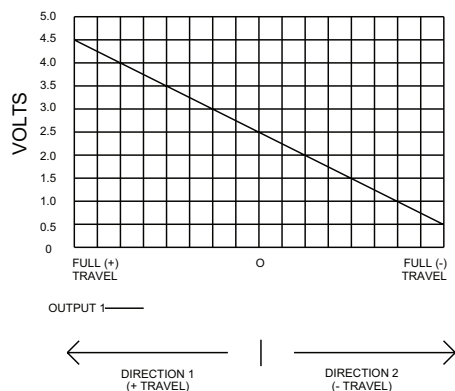
RECOMMENDED PANEL OPENING:  $\varnothing 0.800$  OPTIMUM  
(0.750 MIN. - 0.850 MAX.)



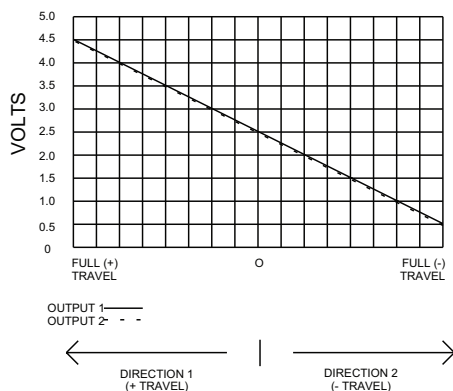
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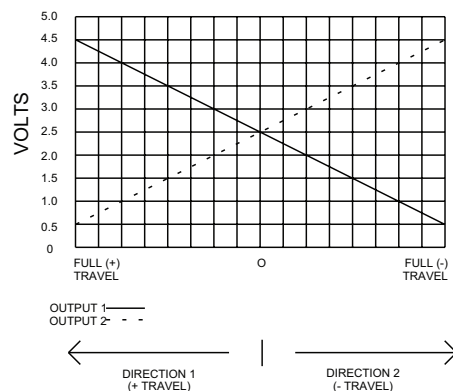
**OPTION A & J**



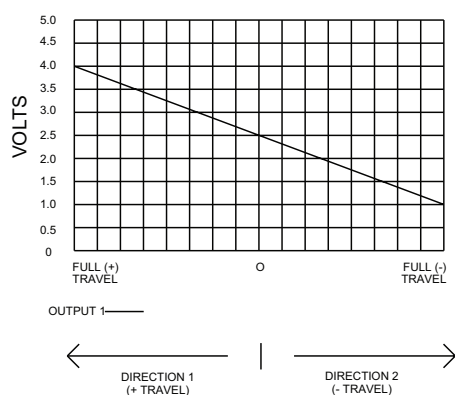
**OPTION B & K**



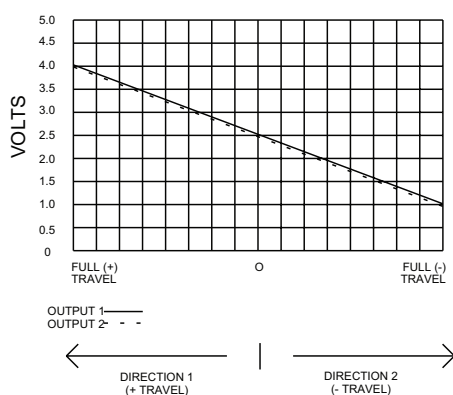
**OPTION C & L**



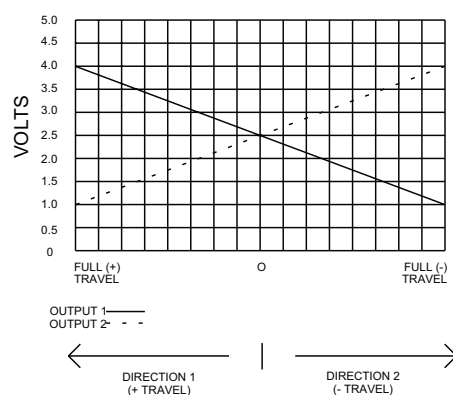
**OPTION D & M**



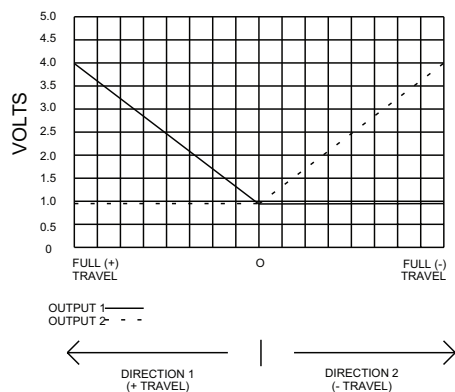
**OPTION E & N**



**OPTION F & P**



**OPTION G**



**OPTION H**

