Joysticks

Grayhill

# SERIES 68B Hall Effect Rocker Switch

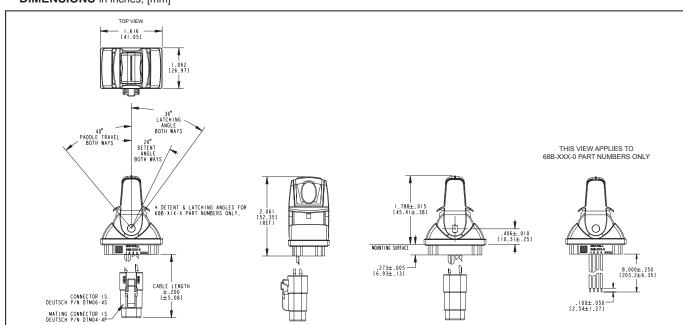
# FEATURES

- Ratiometric analog output
- Sealed to IP67 dynamic even during actuation
- · Rugged industrial design suited for outdoor use
- Provides positive tactile feedback in any environment
- Long operational life
- Redundant output for safety
- Available with 26° detent and 36° latching, friction hold, or spring return (no detent)
- · Choices of cable length
- · Choices of accent color

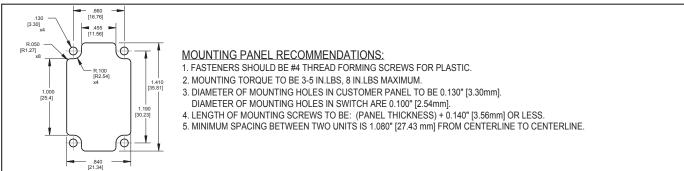
# **APPLICATIONS**

- · Dash-panel and armrest controls
- Hydraulic fluid flow control
- Engine speed control
- Heavy duty industrial equipment
- Remote control belly boxes

## DIMENSIONS in inches, [mm]

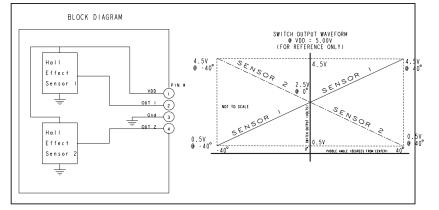


## **MOUNTING PANEL OPTIONS**



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## **BLOCK DIAGRAM & JOYSTICK OUTPUT WAVEFORM**



## **SPECIFICATIONS**

**Electrical Specifications** Operating Voltage on Pin 1 (VDD): 5.0V ± 0.5V

Absolute Maximum Voltage\* on Pin 1 (VDD): -18 V min, +18 V max (t < 1 h) Operating Current: 15 mA typ., 20 mA, max. Output Voltage is Analog (Ratiometric to Operating Voltage)

Output at Center Position: 50% VDD Output at Full Travel: 10% VDD or 90% VDD depending on configuration **Output Voltage Tolerance:** 

± 3% VDD at full travel

± 5% VDD at center position

Output Current: 1 mA, max.

Recommended Load: 10 K Ohm pull-down resistor

Sensor Error: When a sensor error occurs, the output goes to < 4% of operating voltage (VDD)

\*Exceeding the Absolute Maximum Voltage may result in permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operation listings of this specification is not implied.

#### **Physical & Mechanical Ratings**

Vibration: Random, meets MIL-STD-810G, Method 514.6. Procedure I Mechanical Shock: Meets MIL-STD 202, Method 213B Test Condition A Transit Drop: Meets MIL-STD-810G, Method 516.6, Procedure II Terminal Strength: 10 lbs. minimum, tested per MIL-STD-202, Method 211A Push-Out Force: 45 lbs. minimum Pull-Out Force: 45 lbs. minimum Paddle Impact: 0.5 lbs. weight dropped 3x

from height of 0.3m

Paddle Side-Load: 45 lbs. minimum Mounting Torque: 3-5 in-lbs recommended,

8 in-lbs maximum

Return to Center Life: 2 million cycles minimum\*\*

Detent Life: 200,000 cycles minimum

Latching Life: 200,000 cycles minimum

Friction Hold Life: 200,000 cycles minimum

\*\* One cycle is defined as full travel from the center to the +40  $^{\circ}$ direction, then full travel to the -40° direction, then return to the center

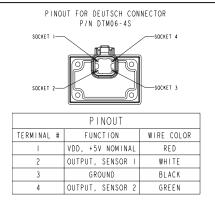
### **Environmental Ratings**

Seal: IP67 as mounted Altitude: Meets MIL-STD-810G, Method 500.4, Procedure I Thermal Shock: Meets MIL-STD-810G, Method 503.4, Procedure I Operating High Temperature: +85°C, Meets IEC 68-2-2, Test Aa **Operating Low Temperature:** -40°C, Meets IEC 68-2-1, Test Aa Storage High Temperature: +100°C, Meets IEC 68-2-2, Method Aa Storage Low Temperature: -55°C, Meets IEC 68-2-1, Method Aa Damp Heat Cycle: Meets IEC/EN 60068-2-38 7/AD Humidity, 85/85: Meets MIL-STD 202, Method 103B, 500 hours Solar Radiation: Meets ISO 4892-2, Method

A, Cycle 1, 1000 hours

Chemical Resistance: Meets IEC 60068-2-74

Salt Fog: Meets MIL STD 810G Dielectric: Meets MIL-STD-202G, Method 301 PINOUT AND WIRE COLOR CHART



Insulation Resistance: Meets MIL-STD-202G. Method 302

#### **Materials and Finishes**

Paddle: Thermoplastic with elastomer finger grip

Cable Assembly: 22AWG stranded, tincoated copper wires in PVC insulation Connector Body: Thermoplastic Terminals: Nickel **RoHS Compliant** 

#### **EMC Ratings**

Radiated Immunity: At 3 orientations, meets ISO11452-5 (140 V/M, 10KHz-2MHz), ANSI/ ASAE EP455 5.16 (100 V/M, 2-200MHz), ISO 11452-2 (140 V/M, 200MHz-1GHz), and ISO 11452-2 (50 V/M, 1GHz-2.7GHz).

Conducted Immunity: Bulk Current Injection Meets ISO11452-4, SAE J1113-4 (120 mA, 1MHz-400MHz)

Radiated Emissions: Meets CISPR25, Class 3 (150kHz - 54MHz), CISPR 16.2.3, Class B (30-1000 MHz) and ISO13766, level 6db (30MHz - 1GHz)

Conducted Emissions: Meets CISPR 25, Class 5

Electrostatic Discharge: Meets ANSI/ASAE EP455 5.12, Level 1

Power Frequency Magnetic Field: Meets IEC 61000-4-8, 30 A/m

