SERIES 68B

Hall-Effect Rocker Switch

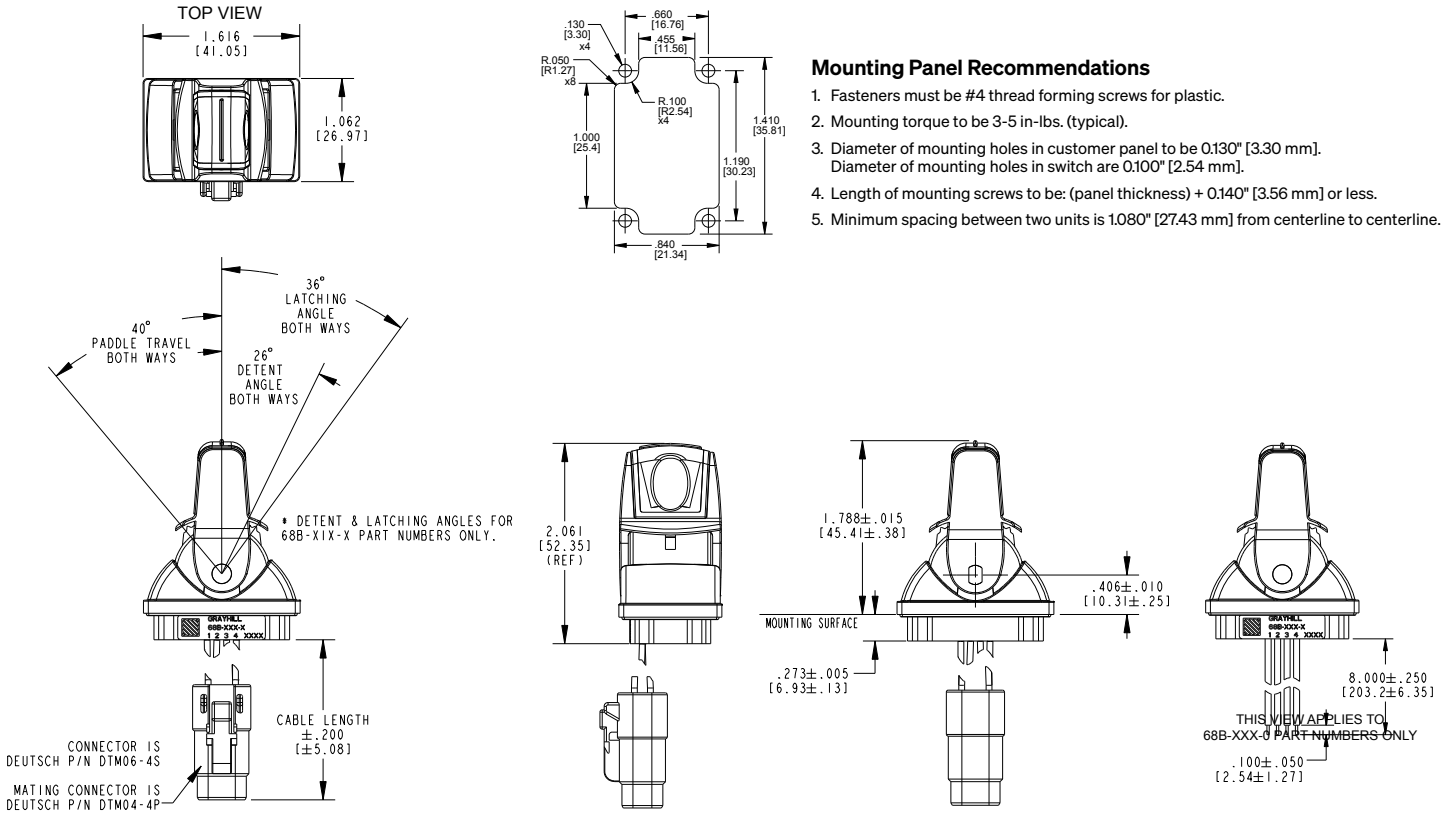
FEATURES

- Choice of ratiometric analog or PWM outputs
- 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 [and millimeters]

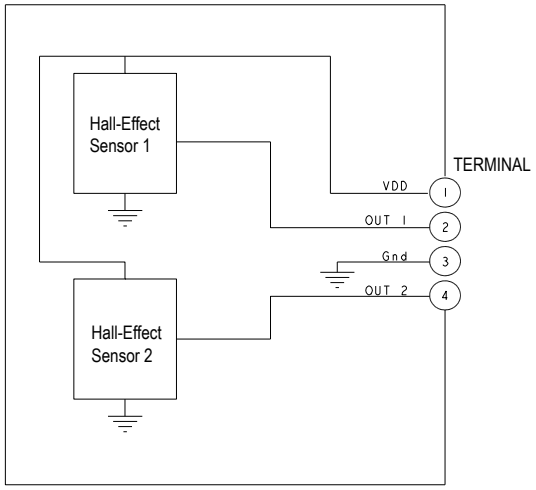


Mounting Panel Recommendations

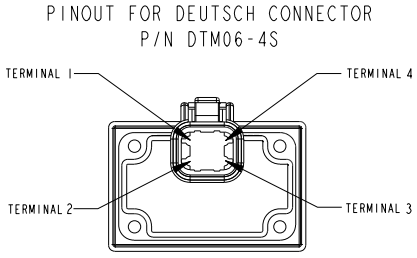
1. Fasteners must be #4 thread forming screws for plastic.
2. Mounting torque to be 3-5 in-lbs. (typical).
3. Diameter of mounting holes in customer panel to be 0.130" [3.30 mm]. Diameter of mounting holes in switch are 0.100" [2.54 mm].
4. Length of mounting screws to be: (panel thickness) + 0.140" [3.56 mm] or less.
5. Minimum spacing between two units is 1.080" [27.43 mm] from centerline to centerline.

Specifications are subject to change.

BLOCK DIAGRAM

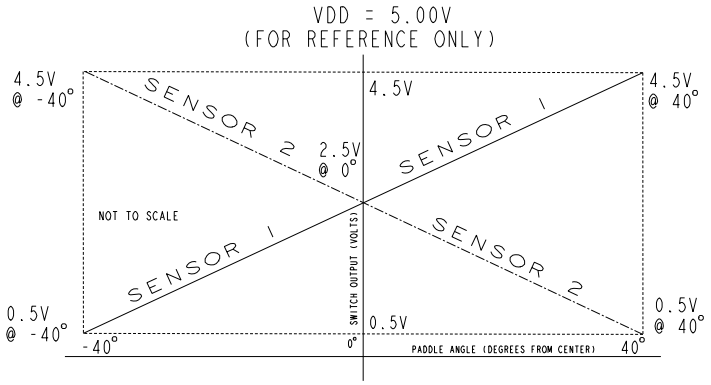


PINOUT AND WIRE COLOR CHART

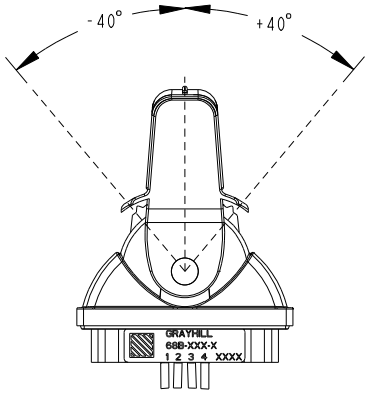


PINOUT		
TERMINAL #	FUNCTION	WIRE COLOR
1	VDD, +5V NOMINAL	RED
2	OUTPUT, SENSOR 1	WHITE
3	GROUND	BLACK
4	OUTPUT, SENSOR 2	GREEN

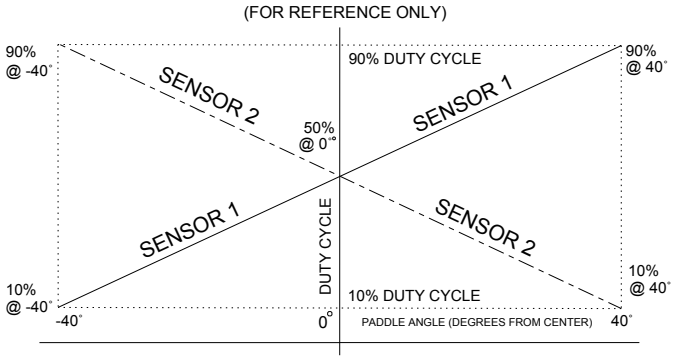
ANALOG OUTPUT WAVEFORM



POSITIVE/NEGATIVE DIRECTION REFERENCE

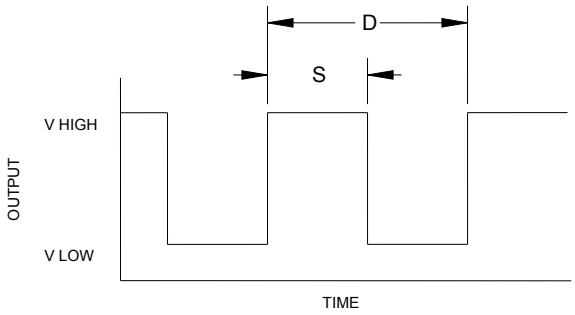


PWM OUTPUT WAVEFORM



FAILURE INDICATIONS*		
FAILURE MODE	PWM FREQUENCY	DUTY CYCLE
SENSOR ERROR	50% ± 37.5 Hz	85% OR 95%
OVERVOLTAGE	50% ± 37.5 Hz	75%
UNDERVOLTAGE	50% ± 37.5 Hz	100%

* IN CASE OF ERROR THE SENSOR CHANGES THE PWM FREQUENCY TO 50% OF THE NORMAL OPERATING FREQUENCY



DUTY CYCLE DEFINED AS THE RATIO BETWEEN THE HIGH TIME (S) AND THE PERIOD (D) OF THE PWM SIGNAL AS SHOWN IN FIGURE ABOVE.

SPECIFICATIONS

Analog

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, maximum
Recommended Load	10 K Ohm pull-down resistor
Sensor Error	When a sensor error occurs, the output goes to < 4% of operating voltage (VDD)

EMC Ratings

Radiated Immunity	At 3 orientations, meets ISO11452-5 (140 V/M, 10 KHz–2 MHz), ANSI/ASAE EP455 5.16 (100 V/M, 2–200 MHz), ISO 11452-2 (140 V/M, 200 MHz–1 GHz), and ISO 11452-2 (50 V/M, 1 GHz–2.7GHz)
Conducted Immunity	Bulk Current Injection Meets ISO11452-4, SAE J1113-4 (120 mA, 1MHz-400MHz)
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

PWM

Time from Power-up to Signal Out	8 mS maximum
PWM Frequency Tolerance	± 15%
Center Position Duty Cycle	50 ± 5%
End Position 1 Duty Cycle	10 ± 3%
End Position 2 Duty Cycle	90 ± 3%
VOL	0.5 V typ. at I < 5 mA; VDD= 5.00 V
VOH	4.9 V typ. at I < -1.2 mA; VDD= 5.00 V
Recommended Load	1.0 K Ohm pull-up resistor

Materials and Finishes

Paddle	Thermoplastic with elastomer finger grip
Cable Assembly	22 AWG stranded, tin-coated copper wires in PVC insulation
Connector Body	Thermoplastic
Terminals	Nickel
RoHS Compliant	

Electrical Specifications

Operating Voltage on Pin 1 (VDD)	5.0 V ± 0.5 V
Absolute Maximum Voltage* on Pin 1 (VDD)	-18 V minimum, +18 V maximum (t < 1 hr)
Operating Current	15 mA typ., 20 mA, maximum

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 Z/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
Insulation Resistance	Meets MIL-STD-202G, Method 302

Physical and 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 0.3 m
Paddle Side-Load	45 lbs. minimum
Mounting Torque	3-5 in-lbs (Typical)
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

* 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.

** One cycle is defined as full travel from the center to the +40° direction, then full travel to the -40° direction, then return to the center.

ORDERING INFORMATION

6 8 B - X X X - X

Series

Accent Color
1 = Black
2 = Blue
3 = Purple
4 = Yellow
5 = Green
6 = Red

Paddle Function
0 = No detent or latching
1 = 26° detent + 36° latching
2 = Friction hold
Custom options available, contact Grayhill

Output
5 = Analog, 5.0 V supply, dual inverse outputs*
A = PWM, 5.0 V supply, FREQ. = 500 Hz, dual inverse outputs
B = PWM, 5.0 V supply, FREQ. = 2 kHz, dual inverse outputs
*Output voltage is proportional to VDD

Termination
0 = No connector; 8” wires with stripped ends
4 = 4.00” cable with Deutsch connector
6 = 6.00” cable with Deutsch connector
8 = 8.00” cable with Deutsch connector

Specifications are subject to change.