

MINIATURE Z-AXIS HALL EFFECT JOYSTICK

COMPACT DESIGN



JHT Z-Axis

With Pushbuttons

Without Pushbuttons

The JHT Z-Axis Miniature Series Hall Effect Joystick allows for a 60° rotational movement of the knob at the top of the joystick. Z-Axis options include detent, friction hold or spring return to center. Its compact design is the ideal solution where space is limited and precision control is required, while its robust construction is suited for demanding applications. The JHT joystick has been tested to five million cycles in all directions with no degradation of performance. The Z-Axis and/or pushbuttons have been tested to one million cycles. Various gating options are also available. The JHT Z-Axis electronics are sealed to IP68S and can withstand EMI/RFI per SAE J1113 specifications. The JHT Z-Axis has numerous applications and is ideal for construction equipment, unmanned vehicles, hydraulic controls, industrial vehicle controls, medical and surgery equipment and surveillance video cameras.

Features:

- 60° rotational movement of the knob
- Compact design
- Contactless analog output Hall effect technology
- 5 million operational cycles in all directions (Joystick)
- Joystick electronics sealed per IP68S
- Optional pushbutton switches available
- 3.3V and 5V SPI Output Options
- RoHS compliant

Environmental Ratings and Materials:	
ENVIRONMENTAL:	
Operating Temp Range:	-40°C to +85°C
Seal:	Joystick electronics without pushbutton sealed to IP68S Keypad electronics sealed to IP65S
EMI/RFI:	Withstand per SAE J1113
MATERIALS:	
Housing:	Thermoplastic, black
Bellows:	Silicone, black. Additional materials available, contact factory.

Standard Characteristics/Ratings:

GENERAL:

Sensor Type: Hall effect analog, factory programmed ground and supply line break detection; over voltage and reverse voltage protection

Design: Contactless sensing

ELECTRICAL RATINGS: Rated at Vcc = 5V @ 20°C Load = 1ma (4.7KΩ)

Electrical - Analog Joystick

	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	-25	N/A	+25
Output Voltage Tolerance Full Travel	VDC @ 5V Vcc	-25	N/A	+25
Supply Current* (B = 0, Vcc = 5V, Io = 0)	mA	N/A	10	12
Output Impedance	kΩ	N/A	1	N/A

*Single output per axis. Dual output per axis available. Supply current 20mA typical.

Electrical - Joystick Z-Axis Return to Center

	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output 1+2 Voltage, +Z, -Z 0° Deflection	VDC @ 5V Vcc	2.25	2.50	2.75
Output 1+2 at Full Travel +Z Direction	VDC @ 5V Vcc	4.25	4.50	4.55
Output 1+2 at Full Travel -Z Direction	VDC @ 5V Vcc	0.45	0.50	0.75
Supply current (per sensor) B = 0, Vcc = 5V, Io = 0	mA	N/A	N/A	10.0
Output - Source Current Limit B = -X, Vo = 0	mA	-1.0	N/A	1.0

Electrical - Joystick Z-Axis Friction

	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output 1+2 at Full Travel +Z Direction	VDC @ 5V Vcc	4.25	4.50	4.55
Output 1+2 at Full Travel -Z Direction	VDC @ 5V Vcc	0.45	0.50	0.75
Supply Current (per sensor) (B = 0, Vcc = 5V, Io = 0)	mA	N/A	N/A	10
Output - Source Current Limit B = -X, Vo = 0	mA	-1.0	N/A	1.0

Electrical - Joystick Z-Axis 3 Detent

	Units	Min	Typ	Max
Supply Voltage	VDC	4.5	5	5.5
Output 1+2 Voltage, +Z, -Z 0° Deflection	VDC @ 5V Vcc	2.25	2.50	2.75
Output 1+2 at Full Travel +Z Direction	VDC @ 5V Vcc	4.25	4.50	4.55
Output 1+2 at Full Travel -Z Direction	VDC @ 5V Vcc	0.45	0.50	0.75
Supply current (per sensor) B = 0, Vcc = 5V, Io = 0	mA	N/A	N/A	10.0
Output - Source Current Limit B = -X, Vo = 0	mA	-1.0	N/A	1.0

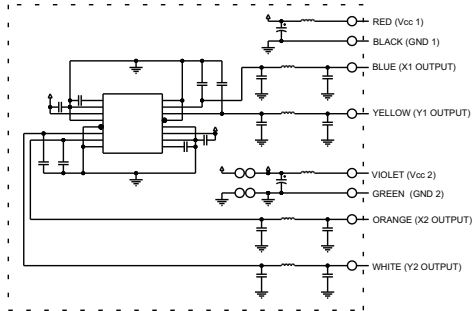
Joystick

Mechanical Life:	5,000,000 cycles in all directions			
Travel Angle	Units	Min	Typ	Max
Over Travel Angle	Degrees	18	20	22
Max Allowable Radial Force (Styles 11, 12 & 21) @ GRP	Degrees	0.5	1.0	1.5
Max Allowable Radial Force (All Other Styles) @ GRP	Lbs.	N/A	N/A	50
	Lbs.	N/A	N/A	15

Z-Axis

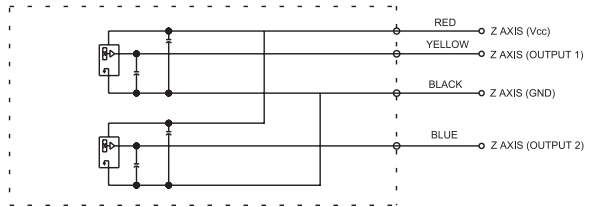
Mechanical Life:	1,000,000 cycles in all directions			
Travel Angle (Total)	Units	Min	Typ	Max
Operational Torque with Detent	Degrees	56	60	64
Operational Torque with Friction Hold	OZ	10	20	30
Operational Torque with Friction Hold	OZ	1.0	4.0	7.0
Operational Torque Return to Center	OZ	8.0	16	24

COMPACT DESIGN



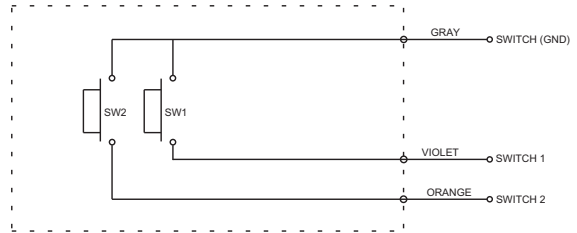
GENERAL SCHEMATIC

(WIRE BUNDLE 1)
ALL OUTPUTS ARE NOT PRESENT IN ALL CONFIGURATIONS

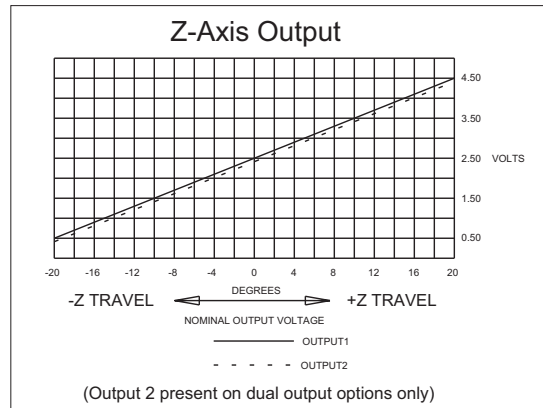
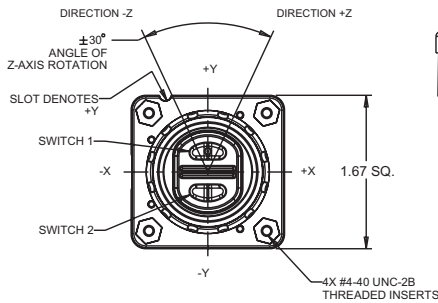
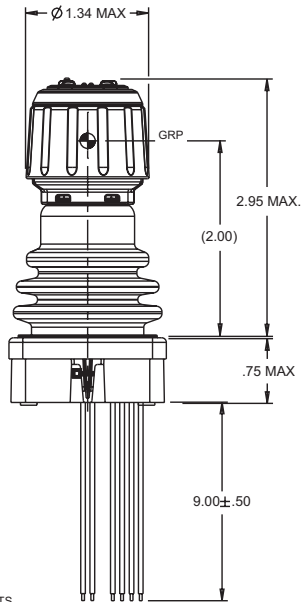
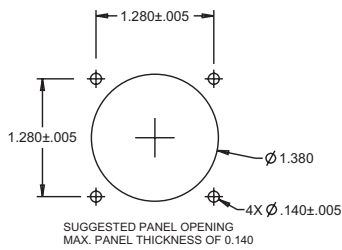


Z AXIS SCHEMATIC

(WIRE BUNDLE 2)
ALL WIRES ARE NOT PRESENT IN ALL CONFIGURATIONS



KEYPAD SCHEMATIC



JHT Z-AXIS PART NUMBER CODE

JHT	XX	X	X	XX	X	N
Switch/Boot Style (All Half Boot)	Gating*	Operating Force	Joystick Output 1	Joystick Output 2	Termination	
32. Z-Axis with Detent, Single Output 42. Z-Axis with Friction Hold, Single Output 52. Z-Axis Return to Center, Single Output 62. Z-Axis with Detent, Dual Output 72. Z-Axis with Friction Hold, Dual Output 82. Z-Axis Return to Center, Dual Output 92. Z-Axis with Detent, Single Output with Two Pushbuttons A2. Z-Axis with Friction, Single Output with Two Pushbuttons B2. Z-Axis Return to Center, Single Output with Two Pushbuttons C2. Z-Axis with Detent, Dual Output with Two Pushbuttons D2. Z-Axis with Friction, Dual Output with Two Pushbuttons E2. Z-Axis Return to Center, Dual Output with Two Pushbuttons	1. Gated; Single axis – Return to Center 2. Gated; Two axis – Return to Center 3. Omni-directional; Round Smooth Feel 4. Omni-directional; Round On-Axis and Off-Axis Guided Feel 5. Omni-directional; Round On-Axis Guided Feel	1.1 lb	AA. 2.5 +/- 2.0VDC BB. 2.5 +/- 2.0VDC CC. 2.5 +/- 2.0VDC DD. 2.5 +/- 1.5VDC EE. 2.5 +/- 1.5VDC FF. 2.5 +/- 1.5VDC GG. 0.5 - 4.5VDC HH. 1.0 - 4.0VDC JJ. SPI, 3.3V Supply** KK. SPI, 5V Supply**	NONE 2.5 +/- 2.0VDC 2.5 +/- 2.0VDC NONE 2.5 +/- 1.5VDC 2.5 +/- 1.5VDC 0.5 - 4.5VDC 1.0 - 4.0VDC NONE NONE	1.24 AWG Wire Leads	

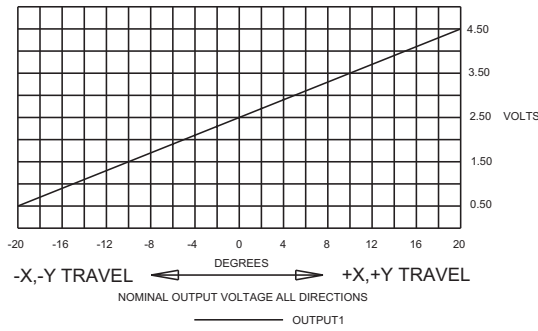
*Gated = Restricted movement in XY axis only. Gating Icons shown on page 111 in the JHT mini joystick section.
 **Z-Axis and Pushbuttons are not part of the SPI message.

NOTES (Applies to Joystick Output Only):

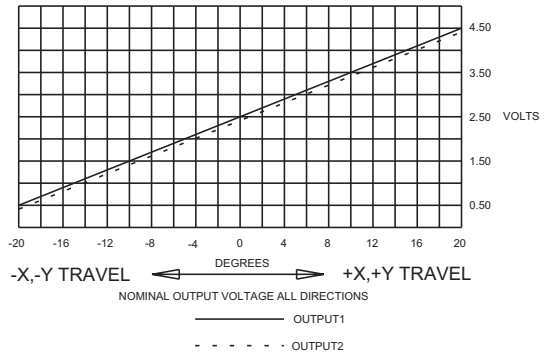
- Outputs are from the center to the full travel position in each direction.
- Options "AA", "BB", "CC", "DD", "EE" and "FF" provide increased voltage in +X, +Y; and decreasing voltage in -X, -Y direction from one output per axis.
- Options "GG" and "HH" provide increasing voltages in all directions (+X, +Y, -X, -Y) from 2 outputs per axis.
- Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

Joystick Output Configuration

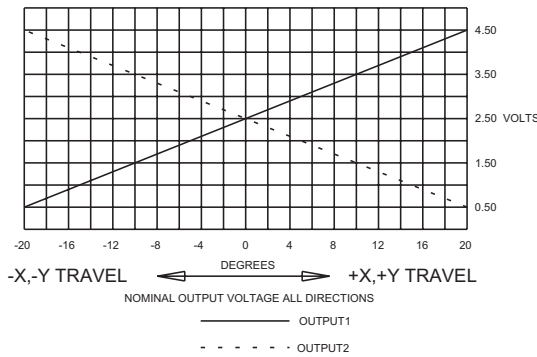
OPTION AA



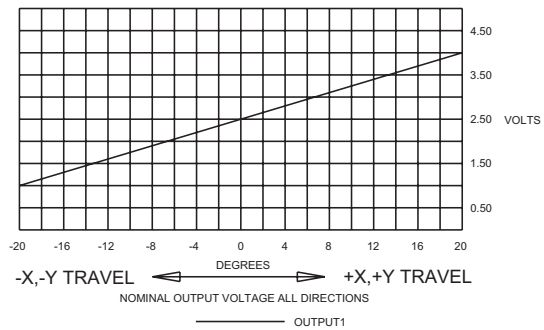
OPTION BB



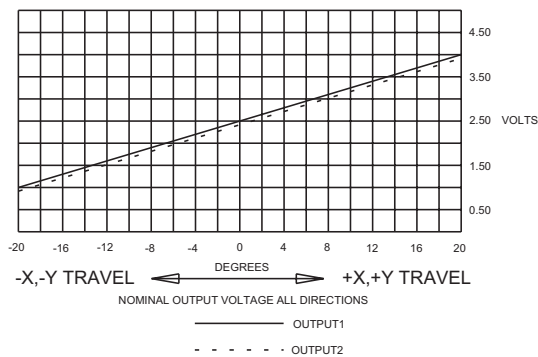
OPTION CC



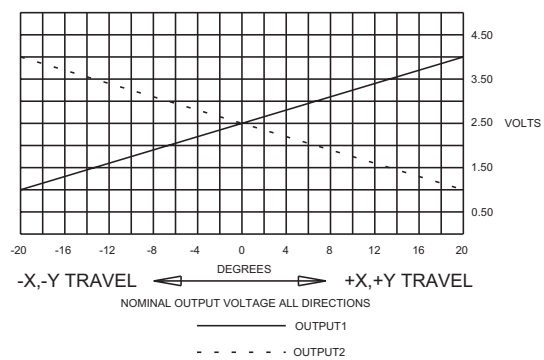
OPTION DD



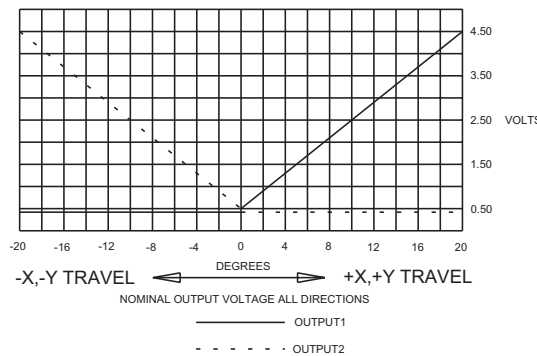
OPTION EE



OPTION FF



OPTION GG



OPTION HH

