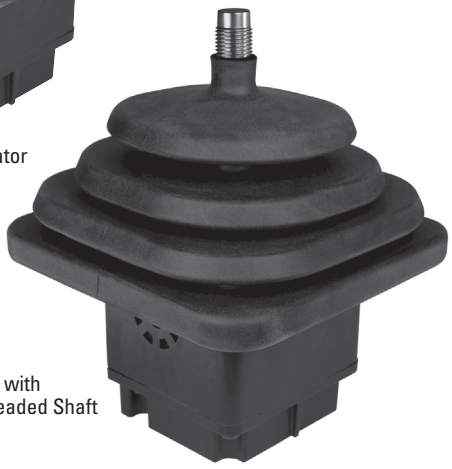
LARGE HALL EFFECT JOYSTICK

HIGH PERFORMANCE, COST-EFFECTIVE, SEALED

JHL with Ball Actuator



JHL with
Threaded Shaft

Offering high performance in a cost-effective, sealed Hall effect joystick, the JHL series boasts a cycle life of up to 6 million cycles and can handle up to 250 lbs. static load strength. Electronics are sealed to IP68S and it offers excellent immunity to RFI and EMI per SAE J1113.

The standard JHL is a top mount joystick. Available as a joystick only or with a ball handle, it has multiple gating options and various output configurations including single analog output, dual analog output, CANopen, CANbus J1939, and redundant sensors.

The JHL can also be paired with an OTTO G3 series universal grip or a G3-D control grip for a more complete solution. See the HJLG3 series.

Features:

- **Contactless analog output Hall effect technology**
- **Electronics sealed to IP68S**
- **Up to 250 lbs. static load strength at grip reference point (GRP)**
- **Top mount is standard**
- **Excellent EFI/RFI immunity**
- **Up to 6 million cycle mechanical life (1 million cycle life with detent)**
- **Multiple output configurations available**
- **Available with grips in the HJLG3 series**
- **CANbus J1939 with Deutsch connector and CANopen with Deutsch connector output options**

Standard Characteristics/Ratings:

ELECTRICAL RATINGS

Joystick				
Rated at 5V @ 20°C, Load = 1ma (4.7kΩ)	**Units**	**Min**	**Typ**	**Max**
Supply Voltage, Vcc	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center (See Appropriate Graph)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output Voltage Tolerance at Full Travel (See Appropriate Graph)	VDC @ 5V Vcc	-0.25	N/A	+0.25
Output at Full Travel +X, +Y Direction	VDC @ 5V Vcc	4.25	4.50	4.75
Supply Current Per Die B=0, Vcc=5V, Iout=0	mA	N/A	10	12
Output Impedence	kΩ	N/A	1.00	N/A
Joystick CANopen				
Supply Voltage	VDC	9	N/A	32
Node Identifier (configurable)	Dec.		10	
Baud Rate (configurable)	B/S		125K	
Joystick J1939				
Supply Voltage	VDC	9	N/A	32
Source Address (configurable)	Dec.		51	
Baud Rate	B/S		250K	

MECHANICAL

Joystick				
Mechanical Life	6,000,000 Cycles (1,000,000 cycles, with detent)			
Mech. (Operating Force w/Bellows)	**Units**	**Min**	**Typ**	**Max**
Travel Angle	Degrees	18	20	22
Low Force @ GRP, Ret. to Ctr.	Lbs.	0.25	0.5	1.0
Low Force @ GRP, Ret. to Ctr., Detent	Lbs.	0.5	1.0	1.5
Medium Force @ GRP, Ret. to Ctr.	Lbs.	0.75	1.0	1.5
Medium Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	2.5	3.0
High Force @ GRP, Ret. to Ctr.	Lbs.	1.5	2.0	2.5
High Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	4.0	6.0
Maximum Allowable Load @ GRP	Lbs.		250 Lbs	

ENVIRONMENTAL

Joystick				
Operating Temperature	˚C	-40	20	85
Humidity	96% RH, 70˚C, 96 HRS.			
Vibration	10g, 24Hz - 2Khz, Swept Sinusoidal			
Electrical Enclosure Design	IP68S			
EMI/RFI Withstand	Per SAE J1113, Contact Factory for Details			

MATERIAL

Joystick	
Plunger	Thermoplastic
Housing	Thermoplastic, Black
Bellows	Silicone, Black
Ball Knob	Thermoset, Black
Cable	Output Option AA, DD, JJ & KK: 22 AWG (19 strands of 34 AWG TSC) PVC/Polyurethane Blend Outer Jacket Output Option BB, CC, EE, FF, GG & HH: 22 AWG (19 strands of 34 AWG TSC) PVC/Polyurethane Blend Outer Jacket
Mounting Hardware	#10-24 x 3/4 Carriage Bolts Self Locking Nuts

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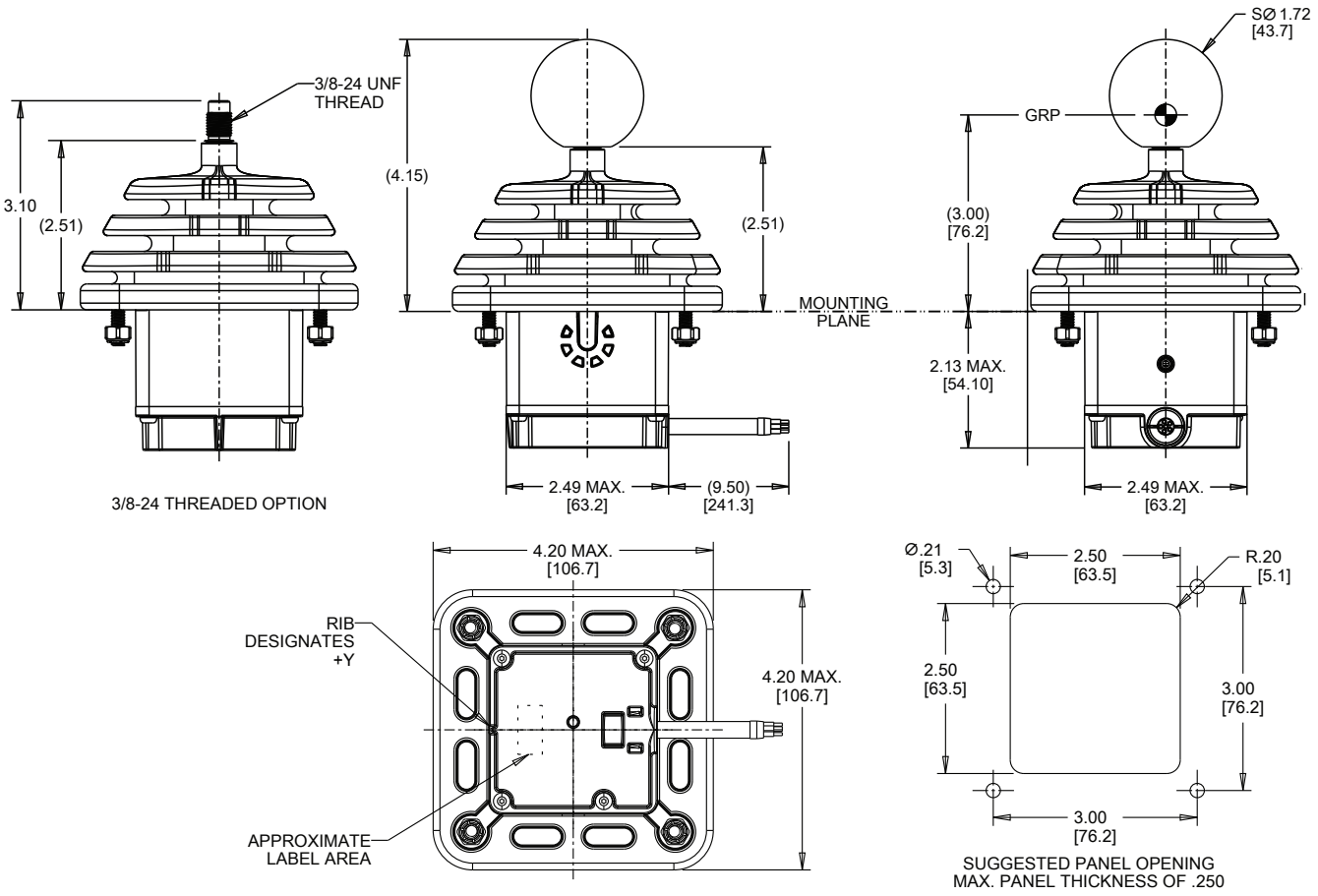
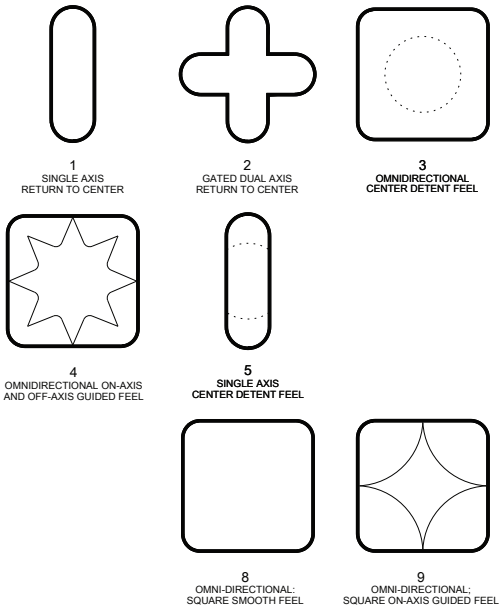
JHL DRAWINGS



JHL GATING ICONS



JHL PART NUMBER CODE

JHL – X X XX X

Actuator Options	Gating Options	Joystick Output 1*	Joystick Output 2**	Force
1. 3/8-24 Threaded	**1.** Gated Single Y-Axis: Return to Center	**AA.** 2.5 +/- 2.0VDC	NONE	**1.** Low
2. 1.72 Ball Knob	**2.** Gated; Dual Axis – Return to Center	**BB.** 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	**2.** Medium
	3. Omni-directional; Center Detent Feel	**CC.** 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC	**3.** High
	4. Omni-directional: On-Axis and Off-Axis Guided Feel	**DD.** 2.5 +/- 1.5VDC	NONE	
	5. Gated Single Y-Axis: Center Detent Feel	**EE.** 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC	
	8. Omni-directional: Square Smooth Feel	**FF.** 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC	
	9. Omni-directional: Square On-axis Guided Feel	**GG.** 0.5 - 4.5VDC	0.5 - 4.5VDC	
		HH. 1.0 - 4.0VDC	1.0 - 4.0VDC	
		JJ. CANbus J1939	NONE	
		KK. CANopen	NONE	
		LL. CANbus J1939 w/ Deutsch Connector	NONE	
		MM. CANopen w/ Deutsch Connector	NONE	

*Outputs are from the center to the full travel position in each direction. Options "AA", "BB", "CC", "DD", "EE", "FF" provide increased voltage in +x, +y; and decreasing voltage in -x, -y direction from 1 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.

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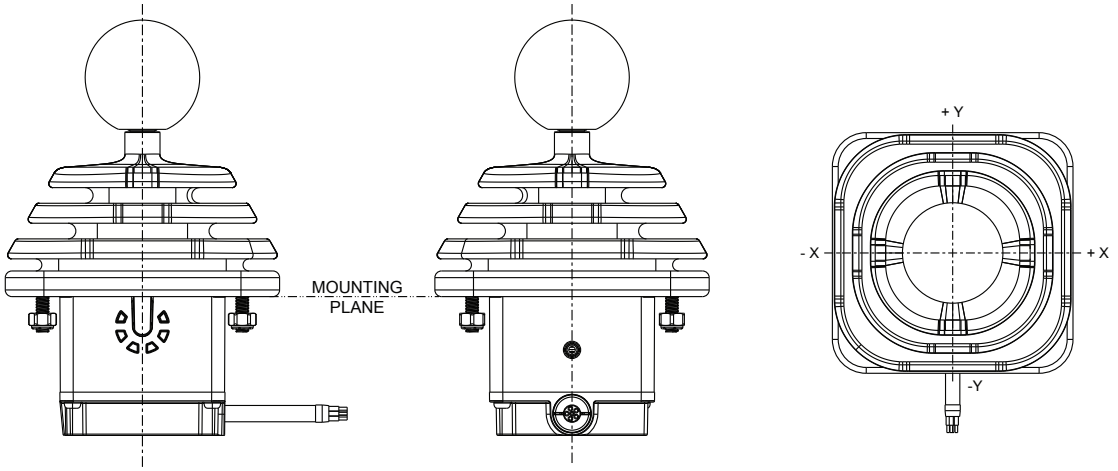
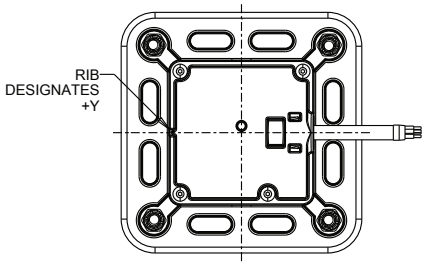
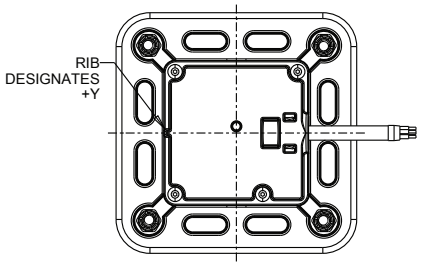
JHL OUTPUT DRAWINGS



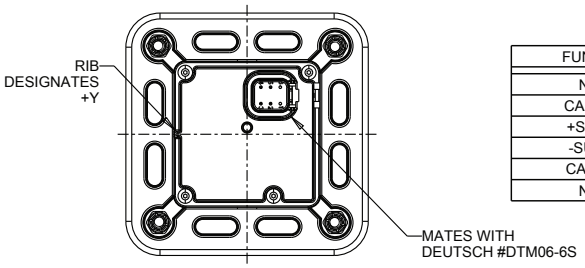


OUTPUTS AA-HH SHOWN



OUTPUTS JJ AND KK SHOWN

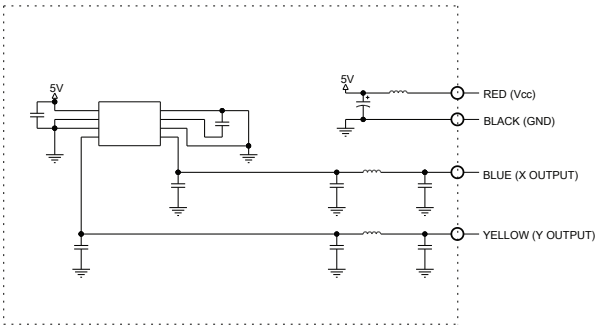
FUNCTION	COLOR
CAN HIGH	YELLOW
+SUPPLY	RED
-SUPPLY	BLACK
CAN LOW	GREEN



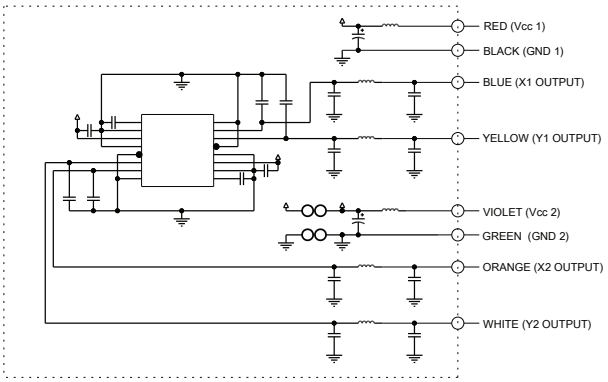
FUNCTION	COLOR
NONE	PIN 1
CAN HIGH	PIN 2
+SUPPLY	PIN 3
-SUPPLY	PIN 4
CAN LOW	PIN 5
NONE	PIN 6

OUTPUTS LL AND MM SHOWN

JHL SCHEMATICS



JOYSTICK SCHEMATIC
(AA AND DD OUTPUTS)

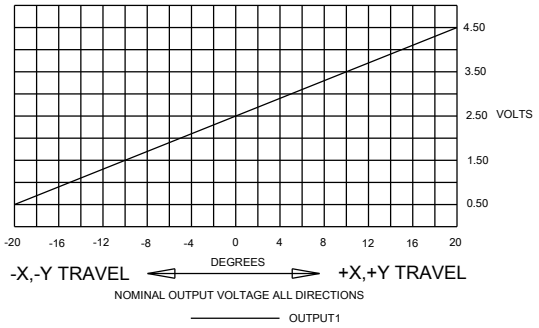


JOYSTICK SCHEMATIC
(BB, CC, EE, FF, GG, & HH OUTPUTS)

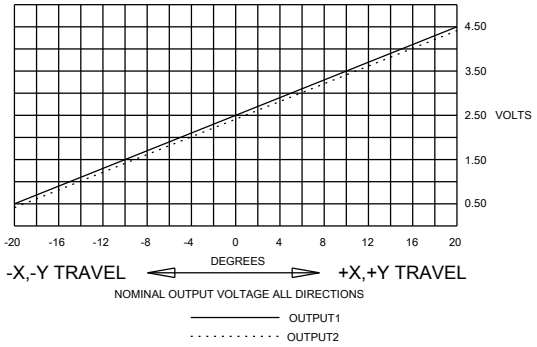
HIGH PERFORMANCE, COST-EFFECTIVE, SEALED

JHL OUTPUTS

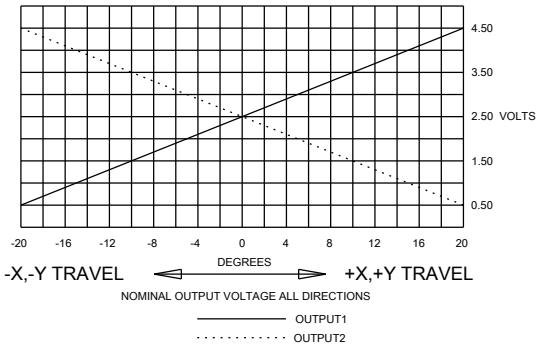
OPTION AA



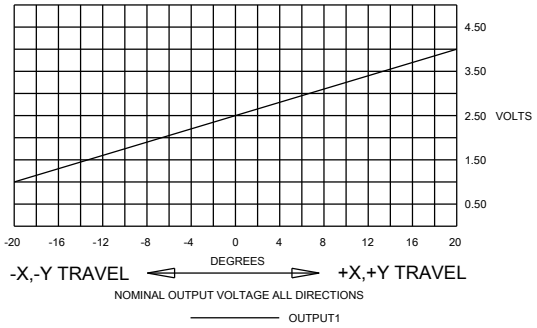
OPTION BB



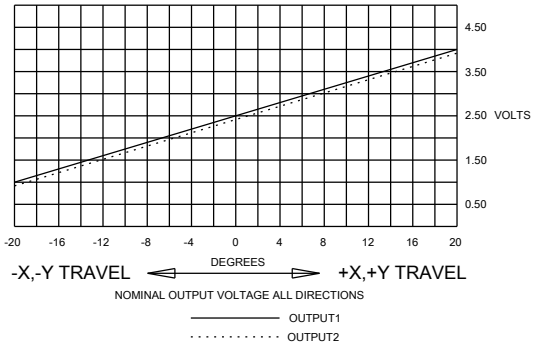
OPTION CC



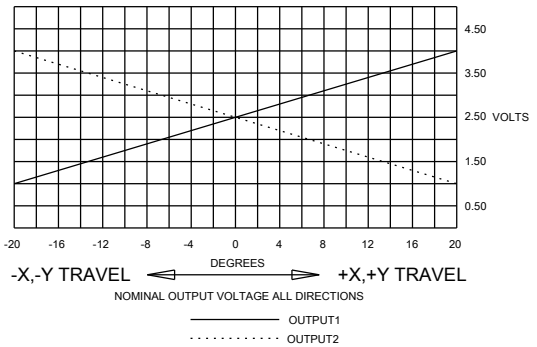
OPTION DD



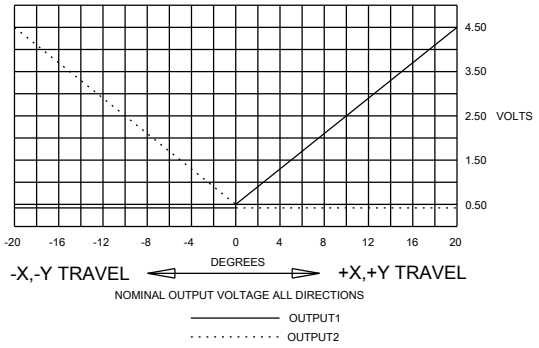
OPTION EE



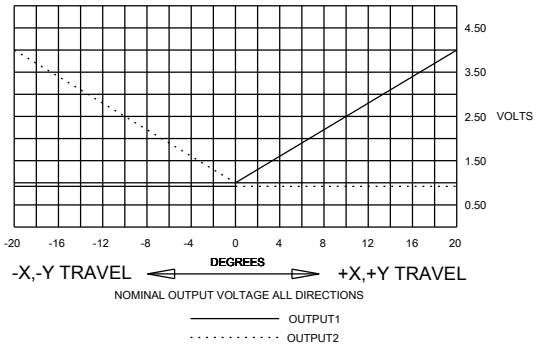
OPTION FF



OPTION GG



OPTION HH



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