

## HALL EFFECT JOYSTICK WITH GRIP



The HJLG3 medium Hall effect joystick with grip allows you to easily create a standard, catalog codable solution that handles loads up to 250 lbs., has a compact behind-panel size, and a long life. Choose from a variety of grips, faceplates, outputs and gating options to match your application.

G3-A, G3-B, G3-C, G3-CK and G3-M Universal Grips, as well as the G3-D Control Grip, altogether offer nearly 50 standard faceplate design options.

Analog and digital outputs, CANopen, CANbus J1939, PWM, USB, and redundant sensor output selections are available. Gating options are single axis, single axis with center detent, dual axis, and various omnidirectional selections that include square smooth feel, on-axis and off-axis guided feel, square on-axis guided feel and center detent.

The HJLG3 serves agriculture, construction, off-highway, material handling and industrial equipment markets.

### Features:

- Compact design made for armrest and panel mounting
- Contactless Hall effect technology
- Mechanical life up to 6 million cycles
- Handles loads up to 250 lbs.
- Multiple output options, both analog and digital
- Electronics sealed to IP68S
- Redundant sensors available
- Variety of gating options
- Modular design
- Left or right handed
- RoHS compliant
- CANbus J1939 and CANopen outputs with integral Deutsch connector option

# JOYSTICK WITH GRIP OPTIONS

**HJLG3**  
MEDIUM  
JOYSTICK  
WITH GRIP

## HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings:				
<b>ELECTRICAL:</b>				
<b>Joystick</b>				
Rated at Vcc = 5V @ 20°C Load = 1 ma (4.7 KΩ)	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	- .25	N/A	+ .25
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	- .25	N/A	+ .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 Impedance	kΩ	N/A	1.0	N/A
<b>Joystick CAN Open</b>				
Supply Voltage	VDC	9	N/A	32
Node Identifier	Dec.		10	
Baud Rate	B/S		125K	
<b>Joystick J1939</b>				
Supply Voltage	VDC	9	N/A	32
Source Address	Dec.		51	
Baud Rate	B/S		250K	
<b>Grip Touch Switch*</b>				
Supply Voltage	VDC	3.15	NA	5.5
Output Active (Low)	VDC	NA	NA	0.60
Output Current Sink	mA	N/A	NA	10
<b>Operator Presence</b>				
Electrical Rating	10mA Resistive Load @ 5VDC			
Logic Level Electrical Life	1,250,000 Cycles			
<b>Keypads</b>				
Circuit Configuration	SPST N.O.			
Voltage	1-32 VDC			
Current	10-100 mA Resistive			
<b>P9 Switches</b>				
Electrical Rating	10mA Resistive Load @ 5VDC			
Logic Level Electrical Life	1,250,000 Cycles			
<b>K1 Switches</b>				
Electrical Rating	10mA Resistive Load @ 5VDC			
Electrical Life	100,000 Cycles			
<b>HPL Switches</b>				
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage (Button Up)	VDC @ 5V Vcc	0.35	0.50	0.65
Output Voltage (Button Down)	VDC @ 5V Vcc	4.35	4.50	4.65
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	8.00	10
Continuous Output Current	mA	-1.2	N/A	1.2
<b>HTW &amp; HTWF Switches</b>				
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	- .15	NA	+ .15
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	- .25	N/A	- .25
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	N/A	10
<b>HTWM Switches</b>				
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	- .25	NA	+ .25
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	- .25	N/A	- .25
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	N/A	10

Standard Characteristics/Ratings (continued):				
<b>HTWS Switches</b>				
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	- .25	NA	+ .25
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	- .25	N/A	+ .25
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	N/A	20
<b>HTLT4 Switches</b>				
Supply Voltage	VDC	4.5	5.0	5.5
Output Voltage Tolerance at Center	VDC @ 5V Vcc	- .25	NA	+ .25
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	- .25	N/A	- .25
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	10	12
<b>TC-5 Switches</b>				
Electrical Rating @ 1-32 VDC	10-100mA			
Electrical Life	3,000,000 Cycles			
<b>MECHANICAL:</b>				
<b>Joystick</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Mechanical Life, Return to Center	6,000,000 cycles; 1,000,000 cycles (Detent) 250,000 cycles with Friction			
Travel Angle	Degrees	18	20	22
Op. Force (w/Bellows) Low Force @ GRP, Ret. to Ctr.	Lbs.	.25	.50	1.0
Op. Force (w/Bellows) Low Force @ GRP, Ret. to Ctr., Detent	Lbs.	.50	1.0	1.5
Op. Force (w/Bellows) Medium Force @ GRP, Ret. to Ctr.	Lbs.	.75	1.0	1.5
Op. Force (w/Bellows) Medium Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	2.5	3.0
Op. Force (w/Bellows) High Force @ GRP, Ret. to Ctr.	Lbs.	1.5	2.0	2.5
Op. Force (w/Bellows) High Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	4.0	6.0
Op. Force (w/Bellows) @ GRP, Friction Y-Axis	Lbs.	1.0	3.5	6.0
Maximum Allowable Load @ 5" GRP	Lbs.			250 Lbs.
<b>Keypads</b>				
Mechanical Life	3,000,000 Cycles			
<b>P9 Switches</b>				
Mechanical Life	1,250,000 Cycles			
<b>K1 Switches</b>				
Mechanical Life	1,000,000 Cycles			
<b>HPL Switches</b>				
Mechanical Life	100,000 Cycles			
Full Stroke Per Button				
Button Travel	IN	.135	.150	.160
Operating Force 25°C @ .150"	Lbs.	N/A	3.0	3.8
Reset Force @ 25°C	Oz.	5	N/A	N/A
<b>HTW &amp; HTWF Switches</b>				
Mechanical Life, Full Forward to Full Back, Ret. to Ctr.	3,000,000 Cycles			
Mechanical Life, Full Forward to Full Back, Friction	250,000 Cycles			
Operating Force (HTW) 25°C at Top of Roller, Return to Ctr.	Oz.	2.0	5.0	8.0
Operating Force (HTWF) 25°C at Top of Roller, Friction	Oz.	2.0	4.0	6.0
Maximum Allowable (HTW & HTWF) Radial Load	Lbs.	N/A	N/A	30
<b>HTWM Switches</b>				
Mechanical Life, Full Forward to Full Back, Ret. to Ctr.	3,000,000 Cycles			
Operating Force 25°C at Top of Roller	Oz.	2.0	5.0	8.0
Maximum Allowable Radial Load	Lbs.	N/A	N/A	30.0

## HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings (continued):				
<b>HTWS Switches</b>				
Mechanical Life, Full Forward to Full Back	3,000,000 Cycles			
Operating Force 25° C at Top of Roller	Oz.	2.0	5.0	8.0
Maximum Allowable Radial Load	Lbs.	N/A	N/A	15.0
<b>HTLT4 Switches</b>				
Mechanical Life,	3,000,000 Cycles			
Operating Force (w/Boot) Top of Roller @ 20°C	Oz.	5.0	8.0	16.0
Maximum Allowable Vertical Force on Button	Lbs.	N/A	N/A	25.0
Maximum Allowable Radial Force on Top of Knob	Lbs.	N/A	N/A	25.0
Maximum Allowable Torque on Button about Shaft Axis	In-Lbs	N/A	N/A	5.0
<b>TC-5 Switches</b>				
Mechanical Life	3,000,000 Cycles			
Operating Force	Oz.	8.0	16.0	24.0
<b>ENVIRONMENTAL:</b>				
<b>Joystick</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Humidity	96% RH, 70°C, 96 Hrs.			
Vibration	10g, 24 Hz – 2KHz Swept Sinusoidal			
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
EMI/RFI Withstand	Per SAE J1113 (Contact factory for details)			
<b>Keypads</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Faceplate and Side Keypad Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>P9 Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>K1 Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-30	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>HPL Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>HTW &amp; HTWF Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>HTWM Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>HTWS Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP5K8S – Dust-protected, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
<b>HTLT Switches</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b>	<b>Max</b>
Operating Temperature	°C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			

Standard Characteristics/Ratings (continued):			
<b>TC-5 Switches</b>			
Operating Temperature	°C	-40	20 85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)		
<b>Grip</b>	<b>Units</b>	<b>Min</b>	<b>Typ</b> <b>Max</b>
Operating Temperature	°C	-40	20 85
Electrical Enclosure Design	Unsealed		
<b>MATERIAL:</b>			
<b>Joystick</b>			
Plunger	Thermoplastic		
Housing	Thermoplastic, Black		
Bellows	Silicone, 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: 24 AWG (19 strands of 34 AWG TSC) PVC/Polyurethane Blend Outer Jacket		
Mounting Hardware	#10–24 x 3/4 Carriage Bolts Self Locking Nuts		
<b>Keypads</b>			
Keypads	Silicone Rubber, Black		
Keypads, Lighted	Silicone Rubber, Black with White Graphic		
<b>P9 Switches</b>			
Button	Thermoplastic		
Housing	Thermoplastic		
<b>K1 Switches</b>			
Button	Thermoplastic		
Housing	Thermoplastic		
<b>HTW &amp; HTWF Switches</b>			
Button Top	Thermoplastic		
Housing	Thermoplastic		
<b>HTWM Switches</b>			
Button Top	Thermoplastic		
Housing	Thermoplastic		
<b>HTWS Switches</b>			
Button Top	Thermoplastic		
Housing	Thermoplastic		
<b>HTLT4 Switches</b>			
Housing and Flange	Thermoplastic		
Bellows	Silicone, Black		
<b>TC-5 Switches</b>			
Housing	PBT		
Keypad	Silicone Rubber		
<b>Grip</b>			
Handle	Thermoplastic, Glass Reinforced, Black		
Faceplate	Thermoplastic, Glass Reinforced, Black		
Wires	22 AWG, UL Style 1569 (8.5 in. long from bottom of joystick)		
Side Keypad Wires	24 AWG, (26/.10TA) Insulation Diameter: .037 Insulation Type: PVC (40 in. from bottom of joystick)		

**\*WARNING ON PERSONAL INJURY AND ANY USE AS SAFETY RELATED:**

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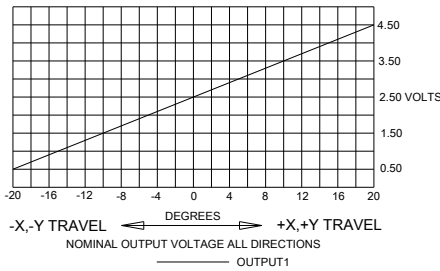
# JOYSTICK WITH GRIP OPTIONS

**HJLG3**  
MEDIUM  
JOYSTICK  
WITH GRIP

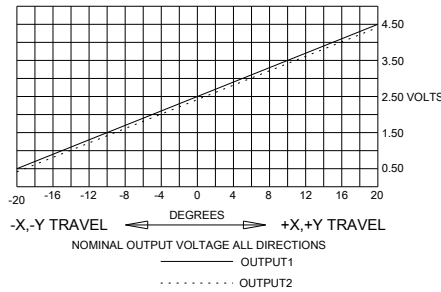
HALL EFFECT JOYSTICK WITH GRIP

## HJLG3 OUTPUT CONFIGURATIONS

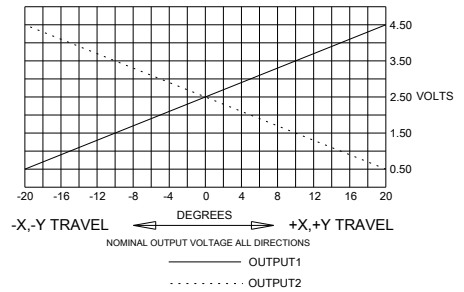
OPTION AA



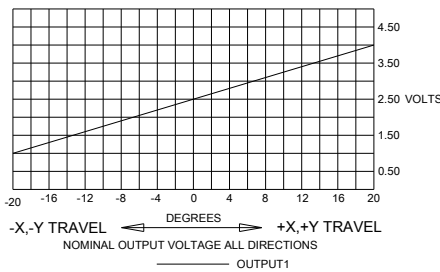
OPTION BB



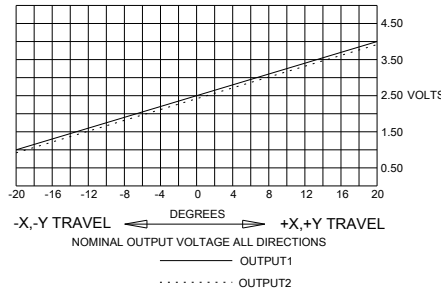
OPTION CC



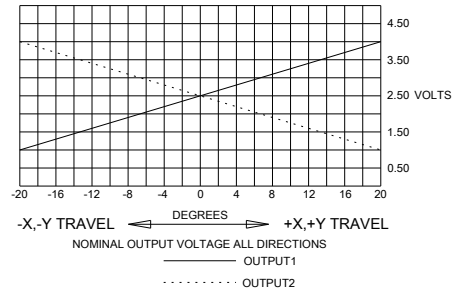
OPTION DD



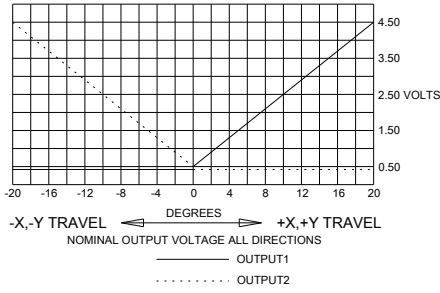
OPTION EE



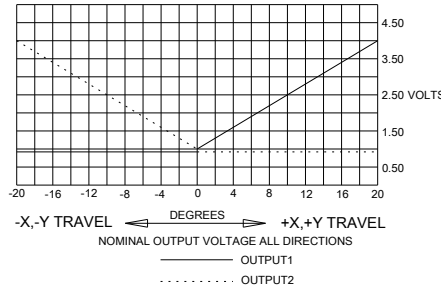
OPTION FF



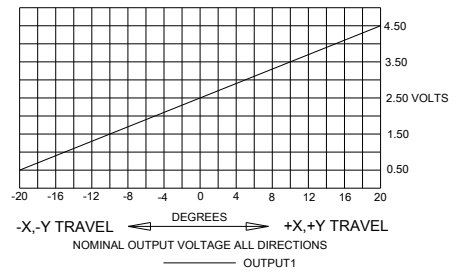
OPTION GG



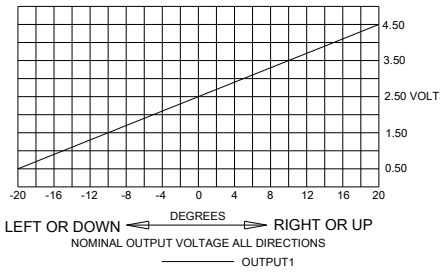
OPTION HH



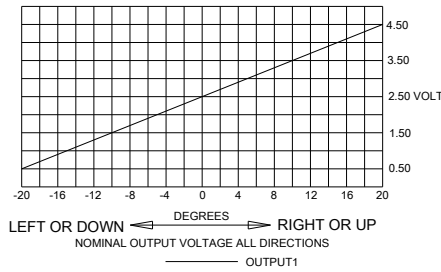
HJLT4 OUTPUT



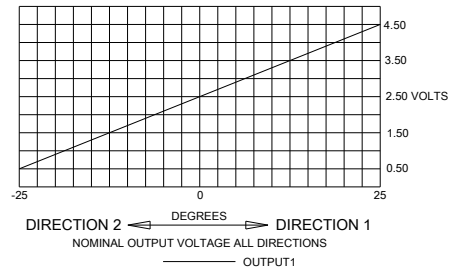
HTWM OUTPUT



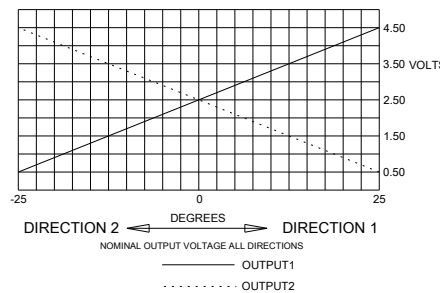
HTWS OUTPUT



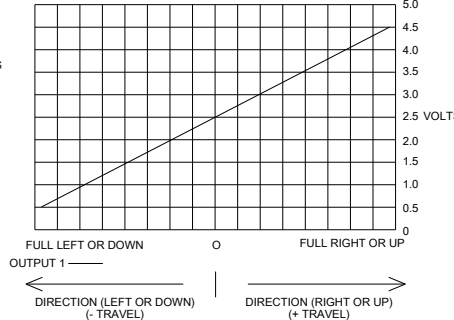
Z-AXIS SINGLE OUTPUT



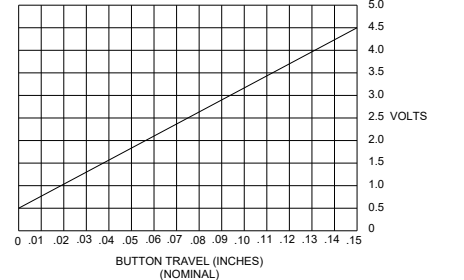
Z-AXIS DUAL OUTPUT



HTW OUTPUT



HPL OUTPUT

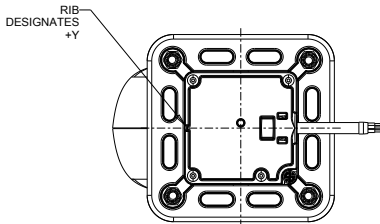
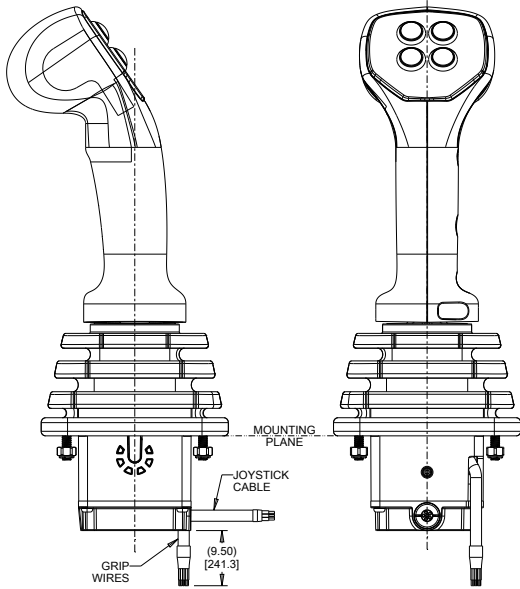
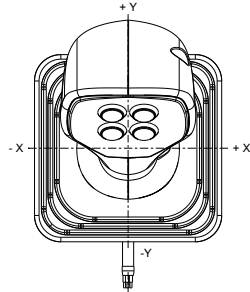


## HALL EFFECT JOYSTICK WITH GRIP

### OUTPUTS AND JOYSTICK SCHEMATICS

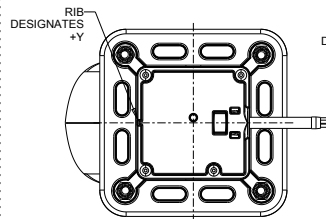
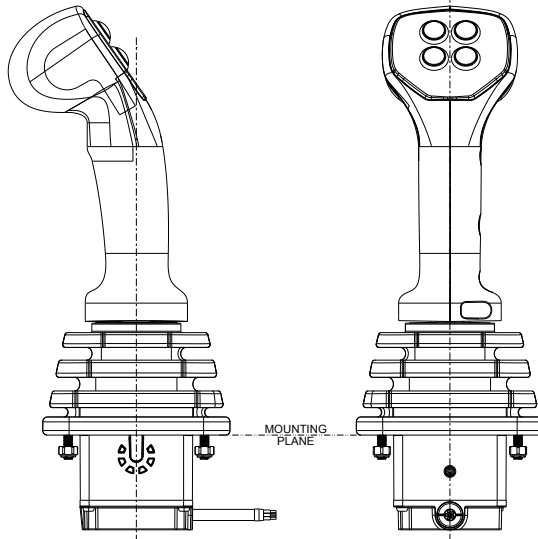
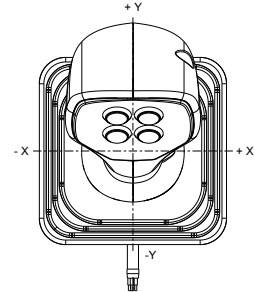
#### HJLG3-C with Faceplate shown

#### Analog Outputs



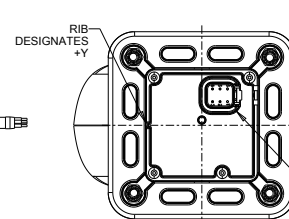
OUTPUTS  
AA-HH SHOWN

#### CAN Outputs



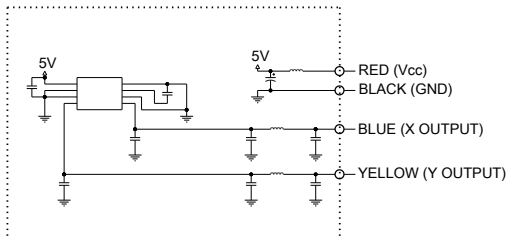
OUTPUTS JJ AND KK SHOWN

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

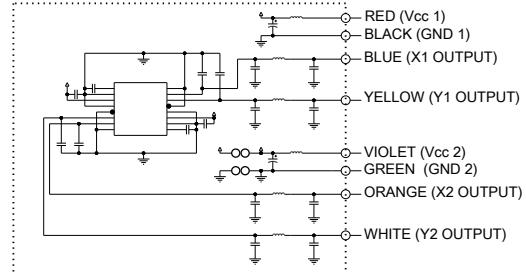


OUTPUTS LL AND MM SHOWN

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



JOYSTICK SCHEMATIC  
(AA AND DD OUTPUTS)



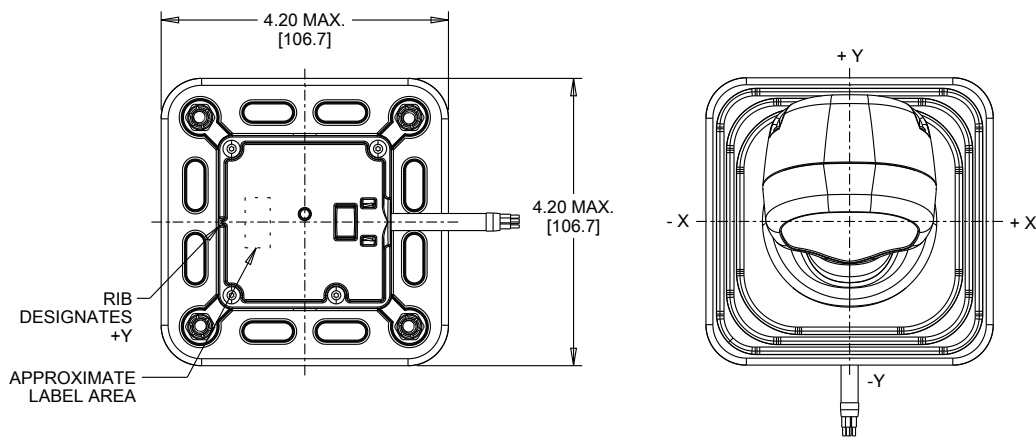
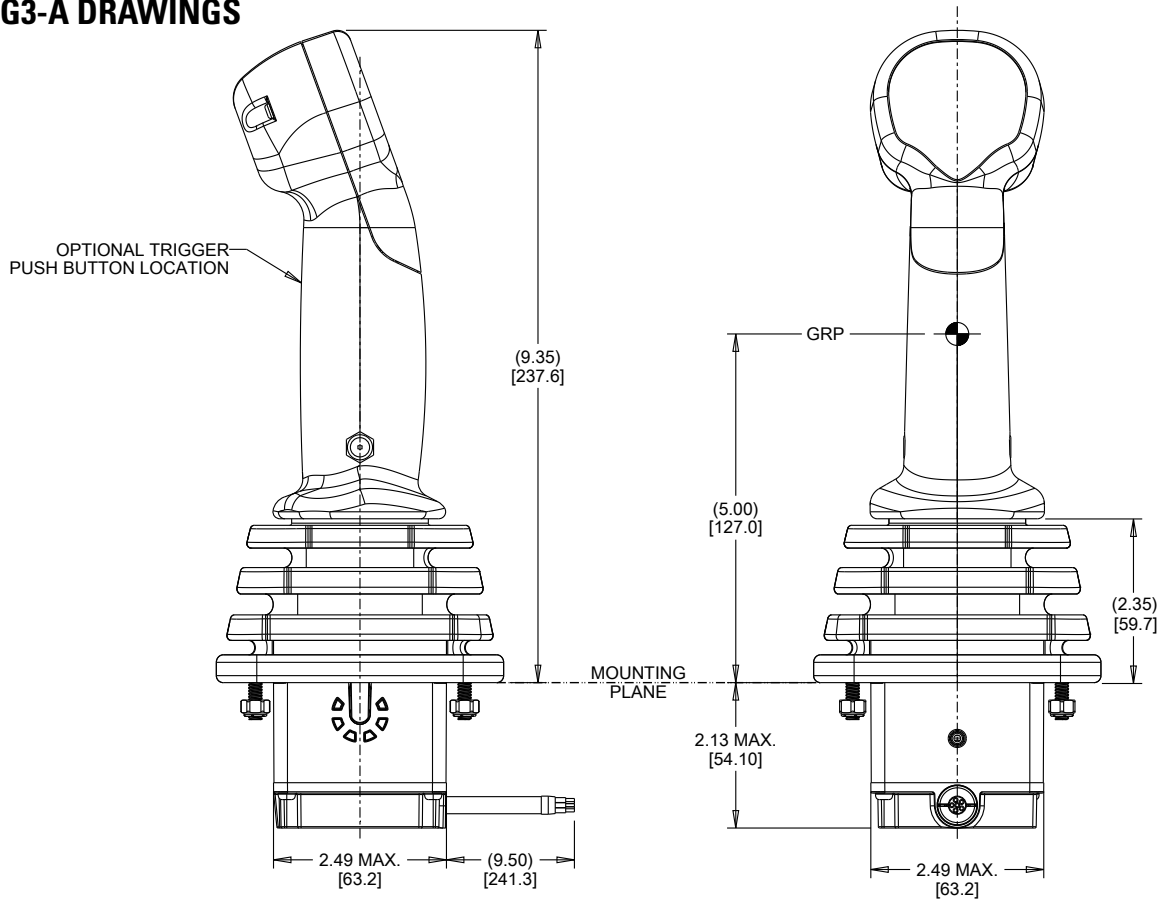
JOYSTICK SCHEMATIC  
(BB, CC, EE, FF, GG, & HH OUTPUTS)



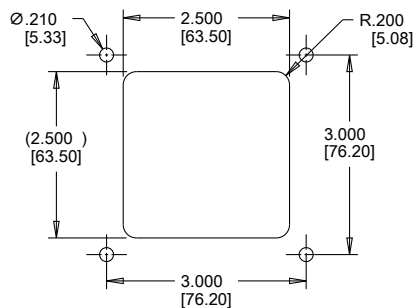
## JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

### HJLG3-A DRAWINGS



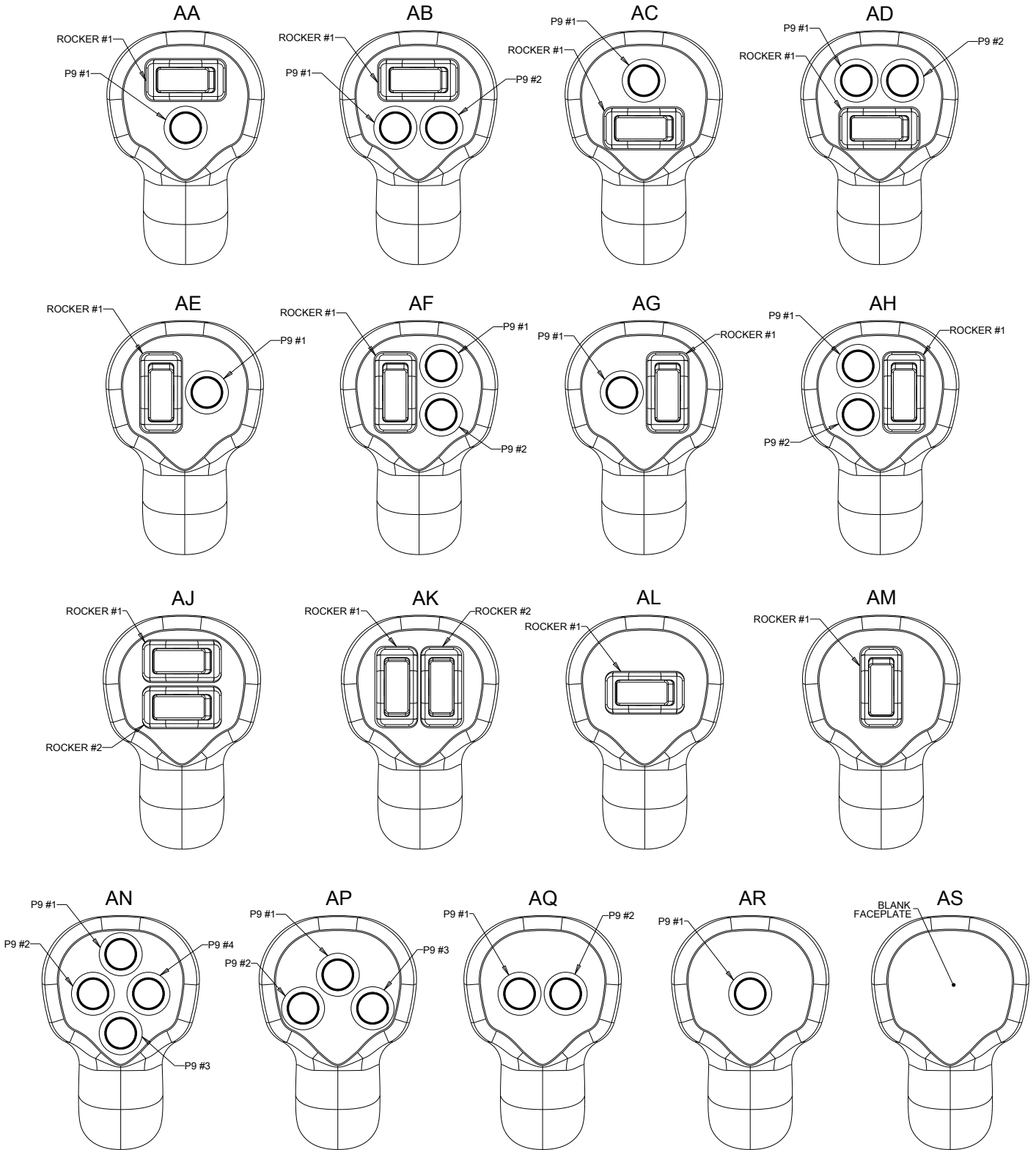
### HJLG3 SUGGESTED PANEL OPENING



SUGGESTED PANEL OPENING  
MAX. PANEL THICKNESS OF .250

HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

## HJLG3-A FACEPLATES



# JOYSTICK WITH GRIP OPTIONS

**HJLG3-A**  
MEDIUM  
JOYSTICK  
WITH GRIP

HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

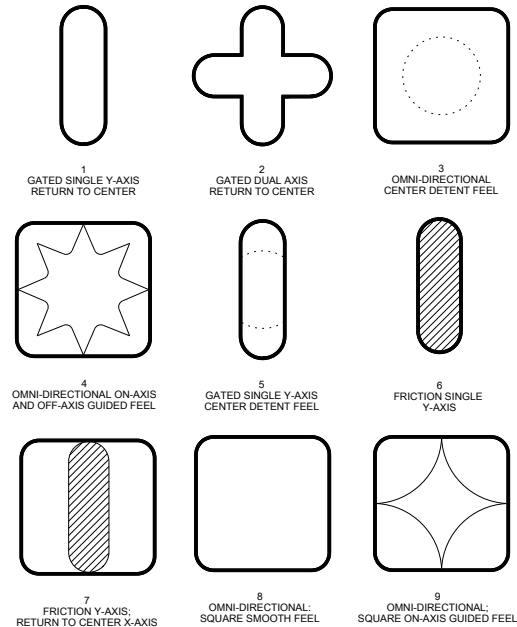
## HJLG3-A PART NUMBER CODE

HJLG3-A	X	XX	X	X	XX	X	X	Continued Below
Gating	Joystick Output 1*	Joystick Output 2**	Operate Force	Trigger Pushbutton	Faceplate	K1 Rocker #1 Style - Black***	K1 Rocker #2 Style - Black***	
1. Gated Single Y-Axis; Return to Center	AA. 2.5 +/- 2.0VDC ①	NONE	2. Medium	1. None	AA	1. None	1. None	
2. Gated Dual Axis; Return to Center	BB. 2.5 +/- 2.0VDC ②	2.5 +/- 2.0VDC	3. High	2. P9 - Black	AB	2. On-Off	2. On-Off	
3. Omni-directional; Center Detent Feel	CC. 2.5 +/- 2.0VDC ②	2.5 +/- 2.0VDC		3. P9 - Red	AC	3. (On)-Off	3. (On)-Off	
4. Omni-directional; On-Axis and Off-Axis Guided Feel	DD. 2.5 +/- 1.5VDC ①	NONE			AD	4. On-Off-On	4. On-Off-On	
5. Gated Single Y-Axis; Center Detent Feel	EE. 2.5 +/- 1.5VDC ②	2.5 +/- 1.5VDC			AE	5. (On)-Off-(On)	5. (On)-Off-(On)	
6. Friction - Single Axis	FF. 2.5 +/- 1.5VDC ②	2.5 +/- 1.5VDC			AF			
7. Friction Y-Axis; Return-to-Center X-Axis	GG. 0.5 - 4.5VDC ②	0.5 - 4.5VDC			AG			
8. Omni-directional; Square Smooth Feel	HH. 1.0 - 4.0VDC ②	1.0 - 4.0VDC			AH			
9. Omni-directional; Square On-Axis Guided Feel	JJ. CANbus J1939 ①	NONE			AJ			
	KK. CANopen ①	NONE			AK			
	LL. CANbus J1939 w/ Deutsch Connector	NONE			AL			
	MM. CANopen w/ Deutsch Connector	NONE			AM			
					AN			
					AP			
					AQ			
					AR			
					AS			

## HJLG3-A PART NUMBER CODE CONTINUED

Cont.	X	X	X	X
	P9 #1 Button Color	P9 #2 Button Color	P9 #3 Button Color	P9 #4 Button Color
	1. Red	1. Red	1. Red	1. Red
	2. Black	2. Black	2. Black	2. Black
	3. Orange	3. Orange	3. Orange	3. Orange
	4. Yellow	4. Yellow	4. Yellow	4. Yellow
	5. Green	5. Green	5. Green	5. Green
	6. Blue	6. Blue	6. Blue	6. Blue
	7. Violet	7. Violet	7. Violet	7. Violet
	8. Gray	8. Gray	8. Gray	8. Gray
	9. White	9. White	9. White	9. White
	N. None	N. None	N. None	N. None

## HJLG3 GATING ICONS



\*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.

\*\*\* K1 Rocker Switches: on position or momentary position is up or to the right and ( ) denotes momentary action. Contact factory for rocker legends and additional color options.

- ① 22 AWG Cable
- ② 24 AWG Cable