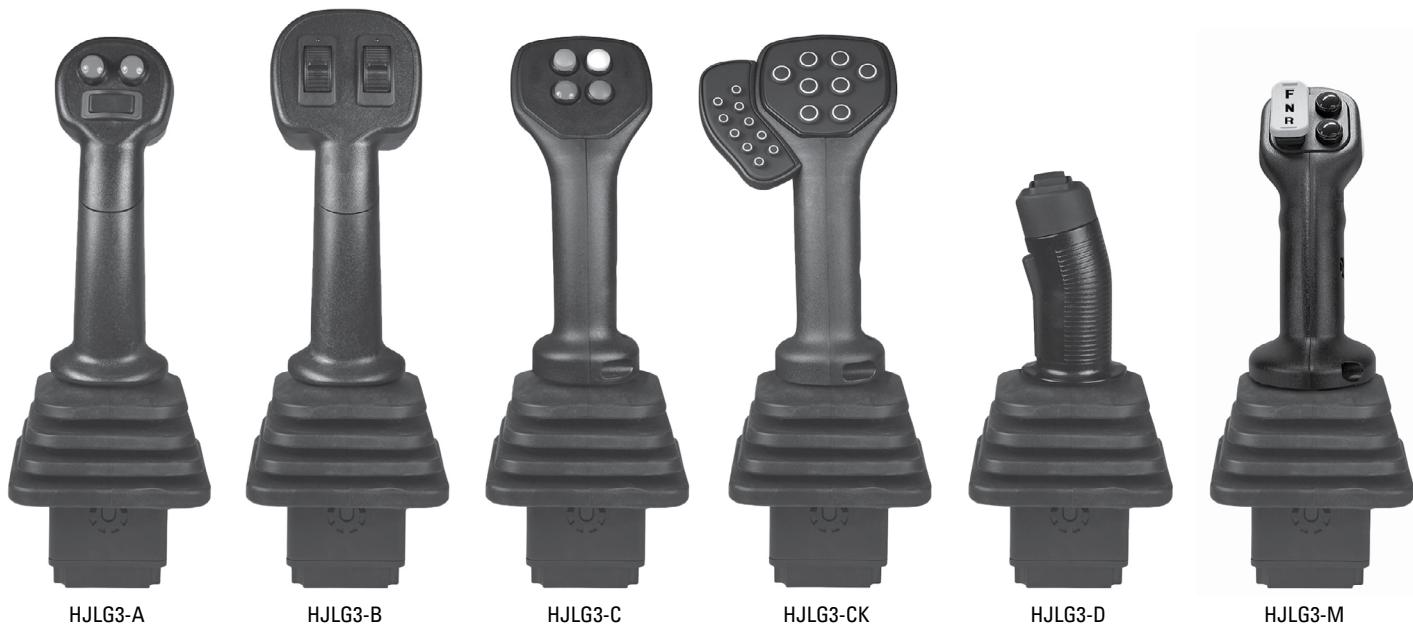


HALL EFFECT JOYSTICK WITH GRIP



HJLG3-A

HJLG3-B

HJLG3-C

HJLG3-CK

HJLG3-D

HJLG3-M

The HJLG3 series combines a medium JHL Hall effect joystick base with a grip. The long-lasting, fully integrated assembly handles loads up to 225 lbs. and is well suited for machinery and vehicles in agriculture, construction, material handling and industrial markets. Choose from a variety of grips, faceplates, outputs, gating and Z-axis options.

Joystick and grip assemblies:

HJLG3-A comes with a smaller G3-A Universal Grip

HJLG3-B comes with a larger G3-B Universal Grip

HJLG3-C comes with a medium G3-C Universal Grip

HJLG3-CK comes with a medium G3-CK Universal Grip

HJLG3-D comes with a G3-D Control Grip

HJLG3-M comes with a medium G3-M Universal Grip

Altogether, these models offer nearly 50 standard grip faceplates with the flexibility to create custom faceplates with hundreds of switch configurations.

Output configurations include single analog, redundant analog, CANopen and J1939. The JHL joystick has a PLd option for functional safety applications: It has been designed in accordance with Safety Standard ISO 13849-1, performance level D, Category 3 to enable communications on two separate channels.

Select HJLG3 models offer optional field replaceability, which allows either grips or faceplates to be quickly replaced without costly machine downtime. Field-replaceable grips are available on the HJLG3-C and HJLG3-M models. Field-replaceable faceplates are an option for the HJLG3-A and HJLG3-B models.

Features:

- Compact, behind-panel design for armrest and panel mounting
- Contactless Hall effect technology
- Several grip types with standard and custom faceplates that can accommodate pushbuttons, rockers, thumbwheels and other switches
- Field-replaceable grip or faceplate option on select models*
- Mechanical life up to 6 million cycles
- Analog, PWM, USB, CANopen, J1939 and PLd outputs; CANopen and J1939 available with integral Deutsch® connector
- Electronics sealed to IP68S
- Redundant sensors available
- Gating options: single axis, single axis with center detent, dual axis and omnidirectional selections, including square smooth feel, on-axis and off-axis guided feel, square on axis guided feel and center detent.
- Modular design
- Left- and right-handed operation
- RoHS compliant

**Contact factory for field-replaceable option information.*

The Z-axis feature is not available on field-replaceable models.



JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings:					Standard Characteristics/Ratings (continued):				
ELECTRICAL:									
Joystick					HTWS Switches				
Rated at Vcc = 5V @ 20°C	Units	Min	Typ	Max	Supply Voltage	VDC	4.5	5.0	5.5
Load = 1 ma (4.7 kΩ)					Output Voltage	VDC	-.25	NA	+.25
Supply Voltage	VDC	4.5	5.0	5.5	Tolerance at Center	@ 5V Vcc			
Output Voltage Tolerance at Center	VDC @ 5V Vcc	-.25	N/A	+.25	Output Voltage	VDC	-.25	N/A	+.25
Output Voltage Tolerance at Full Travel	VDC @ 5V Vcc	-.25	N/A	+.25	Tolerance at Full Travel	@ 5V Vcc			
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	N/A	20
Supply Current Per Die B=0, Vcc=5V, Iout=0	mA	N/A	10	12					
Output Impedance	kΩ	N/A	1.0	N/A					
Joystick CAN Open					HTLT4 Switches				
Supply Voltage	VDC	9	N/A	32	Supply Voltage	VDC	4.5	5.0	5.5
Node Identifier	Dec.		10		Output Voltage	VDC	-.25	NA	+.25
Baud Rate	B/S		125K		Tolerance at Center	@ 5V Vcc			
Joystick J1939					Output Voltage	VDC	-.25	N/A	-.25
Supply Voltage	VDC	9	N/A	32	Tolerance at Full Travel	@ 5V Vcc			
Source Address	Dec.		51		Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	10	12
Baud Rate	B/S		250K						
Joystick PLd					TC-5 Switches				
Supply Voltage	VDC	9	N/A	32	Electrical Rating @ 1-32 VDC	10-100mA			
Inputs or Measure PWM		24 analog and digital inputs; six inputs can decode J2716 SENT protocol signals or measure PWM			Electrical Life	3,000,000 Cycles			
Outputs		Two PWM outputs			MECHANICAL:				
Grip Touch Switch* (see usage message)					Joystick				
Supply Voltage	VDC	3.15	NA	5.5	Mechanical Life, Return to Center	6,000,000 cycles; 1,000,000 cycles (Detent) 250,000 cycles with Friction			
Output Active (Low)	VDC	NA	NA	0.60	Travel Angle	Degrees	18	20	22
Output Current Sink	mA	N/A	NA	10	Op. Force (w/Bellows) Low Force @ GRP, Ret. to Ctr.	Lbs.	.25	.50	1.0
Operator Presence					Op. Force (w/Bellows) Low Force @ GRP, Ret. to Ctr., Detent	Lbs.	.50	1.0	1.5
Electrical Rating		10mA Resistive Load @ 5VDC			Op. Force (w/Bellows) Medium Force @ GRP, Ret. to Ctr.	Lbs.	.75	1.0	1.5
Logic Level Electrical Life		1,250,000 Cycles			Op. Force (w/Bellows) Medium Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	2.5	3.0
Keypads					Op. Force (w/Bellows) High Force @ GRP, Ret. to Ctr.	Lbs.	1.5	2.0	2.5
Circuit Configuration		SPST N.O.			Op. Force (w/Bellows) High Force @ GRP, Ret. to Ctr., Detent	Lbs.	2.0	4.0	6.0
Voltage		1-32 VDC			Op. Force (w/Bellows) @ GRP, Friction Y-Axis	Lbs.	1.0	3.5	6.0
Current		10-100 mA Resistive			Maximum Allowable Load @ 5" GRP	Lbs.			225 Lbs.
P9 Switches					Keypads				
Electrical Rating		10mA Resistive Load @ 5VDC			Mechanical Life	3,000,000 Cycles			
Logic Level Electrical Life		1,250,000 Cycles			P9 Switches				
K1 Switches					Mechanical Life	1,250,000 Cycles			
Electrical Rating		10mA Resistive Load @ 5VDC			K1 Switches				
Electrical Life		100,000 Cycles			Mechanical Life	1,000,000 Cycles			
HPL Switches					HPL Switches				
Supply Voltage	VDC	4.5	5.0	5.5	Mechanical Life	100,000 Cycles			
Output Voltage (Button Up)	VDC @ 5V Vcc	0.35	0.50	0.65	Full Stroke Per Button				
Output Voltage (Button Down)	VDC @ 5V Vcc	4.35	4.50	4.65	Button Travel	IN	.135	.150	.160
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	8.00	10	Operating Force 25°C @ .150"	Lbs.	N/A	3.0	3.8
Continuous Output Current	mA	-1.2	N/A	1.2	Reset Force @ 25°C	Oz.	5	N/A	N/A
HTW & HTWF Switches					HTW & HTWF Switches				
Supply Voltage	VDC	4.5	5.0	5.5	Mechanical Life, Full Forward to Full Back, Ret. to Ctr.	3,000,000 Cycles			
Output Voltage	VDC @ 5V Vcc	-.15	NA	+.15	Mechanical Life, Full Forward to Full Back, Friction	250,000 Cycles			
Tolerance at Center					Operating Force (HTW) 25°C at Top of Roller, Return to Ctr.	Oz.	2.0	5.0	8.0
Output Voltage	VDC @ 5V Vcc	-.25	N/A	-.25	Operating Force (HTWF) 25°C at Top of Roller, Friction	Oz.	2.0	4.0	6.0
Tolerance at Full Travel					Maximum Allowable (HTW & HTWF) Radial Load	Lbs.	N/A	N/A	30
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	N/A	10					
HTWM Switches					HTWM Switches				
Supply Voltage	VDC	4.5	5.0	5.5	Mechanical Life, Full Forward to Full Back, Ret. to Ctr.	3,000,000 Cycles			
Output Voltage	VDC @ 5V Vcc	-.25	NA	+.25	Operating Force 25°C at Top of Roller	Oz.	2.0	5.0	8.0
Tolerance at Center					Maximum Allowable (HTWM) Radial Load	Lbs.	N/A	N/A	30.0
Output Voltage	VDC @ 5V Vcc	-.25	N/A	-.25					
Tolerance at Full Travel									
Supply Current per Die B=0, Vcc=5V, Iout=0	mA	N/A	N/A	10					

HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings (continued):								
HTWS Switches								
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				
HTLT4 Switches								
Mechanical Life, Operating Force (w/Boot) Top of Roller @ 20°C	3,000,000 Cycles							
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				
TC-5 Switches								
Mechanical Life	3,000,000 Cycles							
Operating Force	Oz.	8.0	16.0	24.0				
ENVIRONMENTAL:								
Joystick	Units	Min	Typ	Max				
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)							
Keypads	Units	Min	Typ	Max				
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)							
P9 Switches	Units	Min	Typ	Max				
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
K1 Switches	Units	Min	Typ	Max				
Operating Temperature	°C	-30	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
HPL Switches	Units	Min	Typ	Max				
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
HTW & HTWF Switches	Units	Min	Typ	Max				
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
HTWM Switches	Units	Min	Typ	Max				
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
HTWS Switches	Units	Min	Typ	Max				
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)							
HTLT Switches	Units	Min	Typ	Max				
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):								
TC-5 Switches								
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)							
Grip	Units	Min	Typ	Max				
Operating Temperature	°C	-40	20	85				
Electrical Enclosure Design	Unsealed							
MATERIAL:								
Joystick								
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							
Keypads								
Keypads	Silicone Rubber, Black							
Keypads, Lighted	Silicone Rubber, Black with White Graphic							
P9 Switches								
Button	Thermoplastic							
Housing	Thermoplastic							
K1 Switches								
Button	Thermoplastic							
Housing	Thermoplastic							
HTW & HTWF Switches								
Button Top	Thermoplastic							
Housing	Thermoplastic							
HTWM Switches								
Button Top	Thermoplastic							
Housing	Thermoplastic							
HTWS Switches								
Button Top	Thermoplastic							
Housing	Thermoplastic							
HTLT4 Switches								
Housing and Flange	Thermoplastic							
Bellows	Silicone, Black							
TC-5 Switches								
Housing	PBT							
Keypad	Silicone Rubber							
Grip								
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)							

*GRIP TOUCH SWITCH—WARNING ON PERSONAL INJURY AND ANY USE AS SAFETY RELATED:

Do not use these products as safety or emergency stop devices or in any application where failure of the product could result in personal injury. Failure to comply with these instructions could result in death or serious injury. OTTO Engineering Inc. makes no warranty, representation, or guarantee regarding the information contained herein or the suitability of its products and services for any particular purpose, nor does OTTO Engineering Inc. assume any liability whatsoever arising out of the application or use of any product. The product sold hereunder by OTTO has been subject to limited testing and should not be used in conjunction with detection of the presence of an operator on or with any equipment that is in any way safety related. OTTO does not accept any liability for incidental, consequential damages, personal injury or loss of life for any claims against the use of this product.

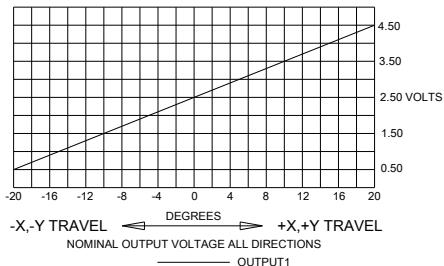
JOYSTICK WITH GRIP OPTIONS

HJLG3
JOYSTICK
WITH GRIP

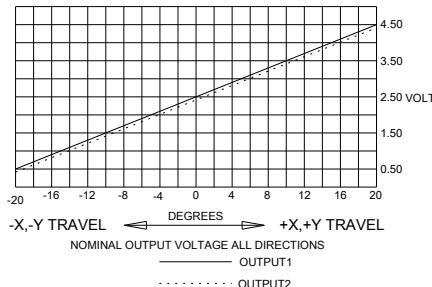
HALL EFFECT JOYSTICK WITH GRIP

HJLG3 OUTPUT CONFIGURATIONS

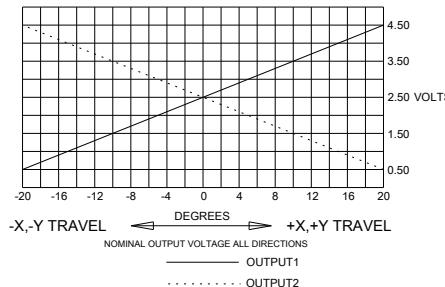
OPTION AA



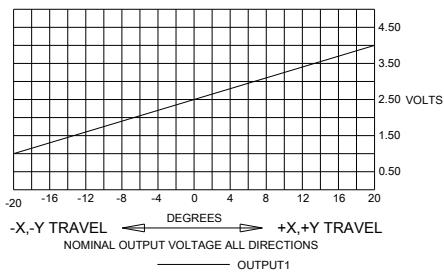
OPTION BB



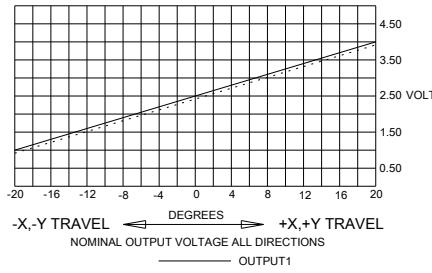
OPTION CC



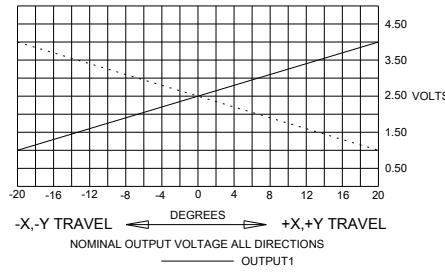
OPTION DD



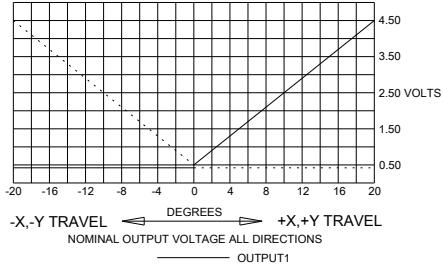
OPTION EE



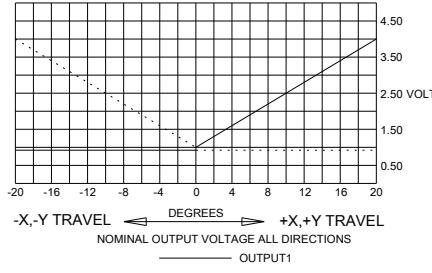
OPTION FF



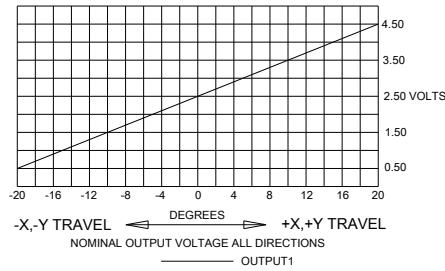
OPTION GG



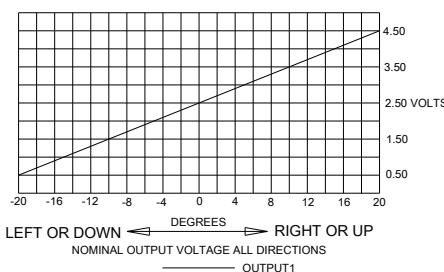
OPTION HH



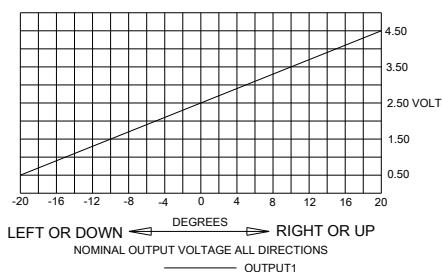
HTLT4 OUTPUT



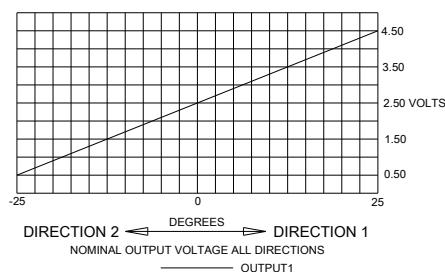
HTWM OUTPUT



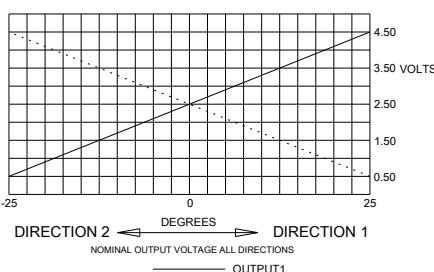
HTWS OUTPUT



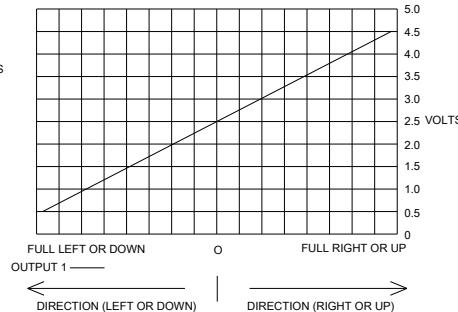
Z-AXIS SINGLE OUTPUT



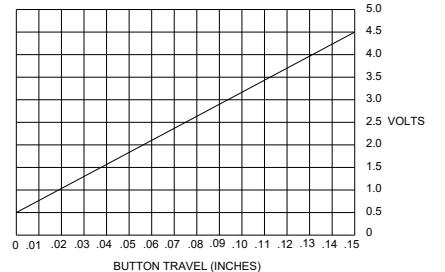
Z-AXIS DUAL OUTPUT



HTW OUTPUT



HPL OUTPUT



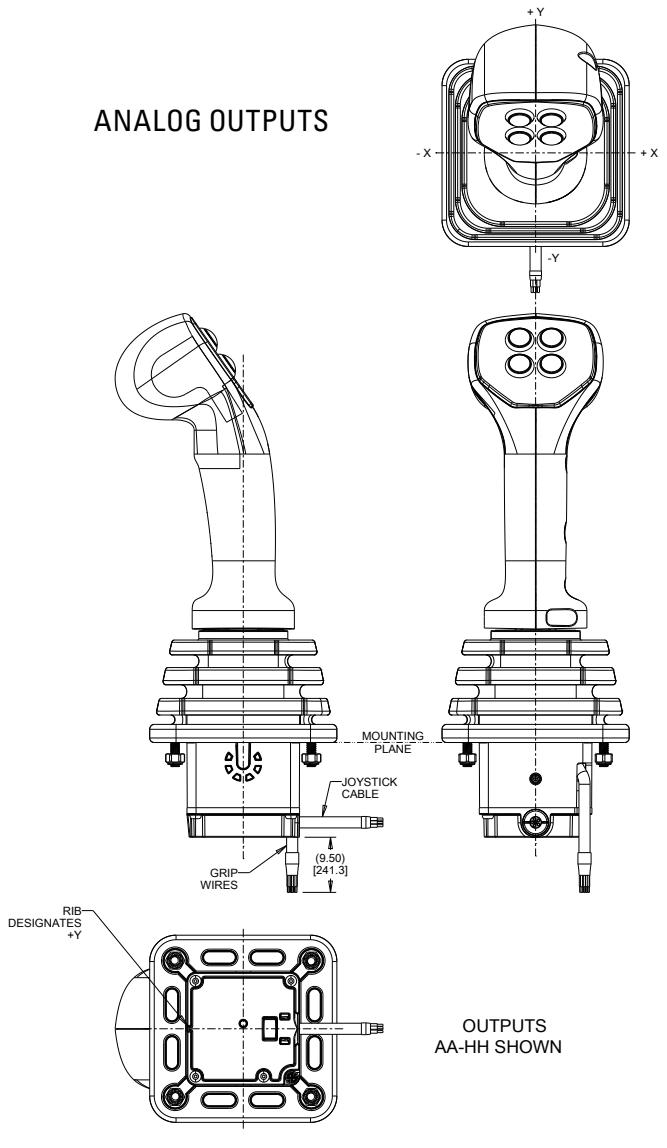
HALL EFFECT CONTROLS

HALL EFFECT JOYSTICK WITH GRIP

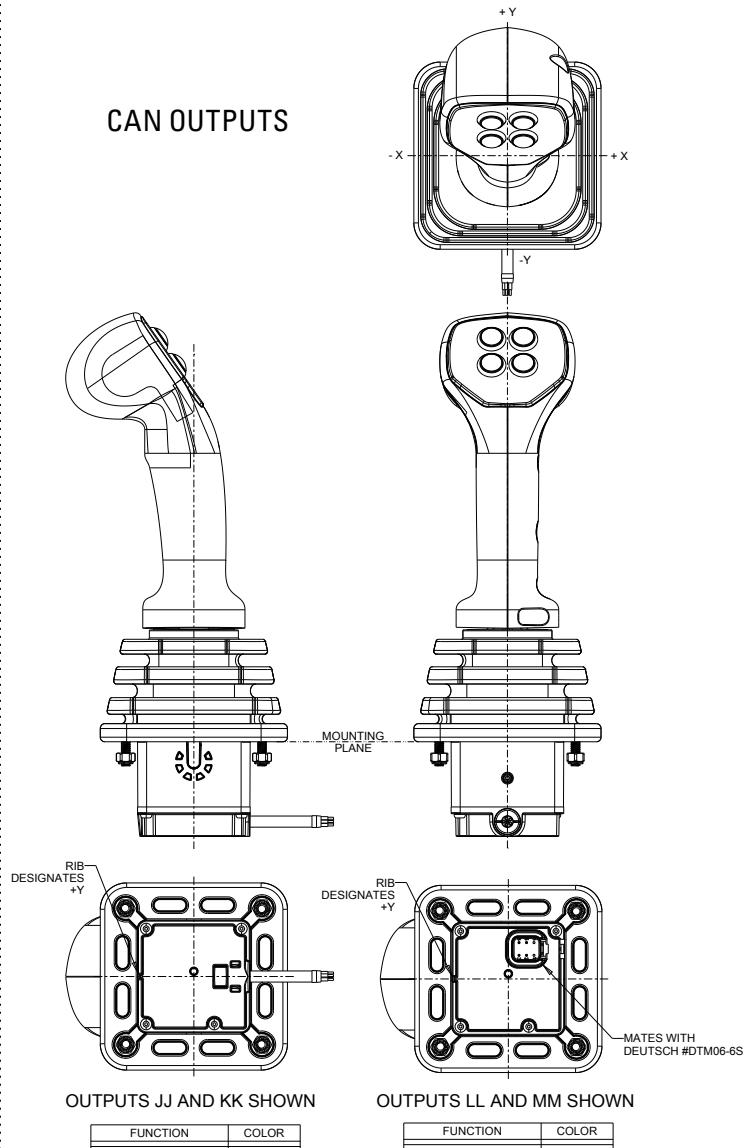
OUTPUTS AND JOYSTICK SCHEMATICS

For All Models in the HJLG3 Series

ANALOG OUTPUTS



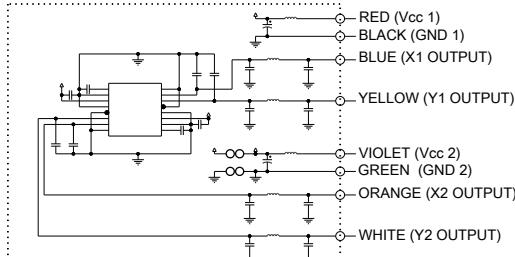
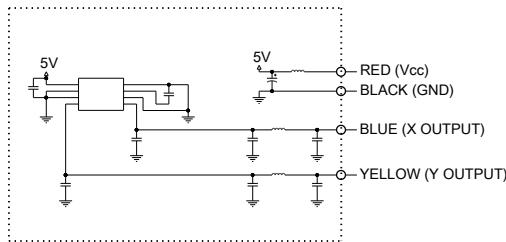
CAN OUTPUTS



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 WITH GRIP OPTIONS

HJLG3-A

JOYSTICK
WITH GRIP

HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

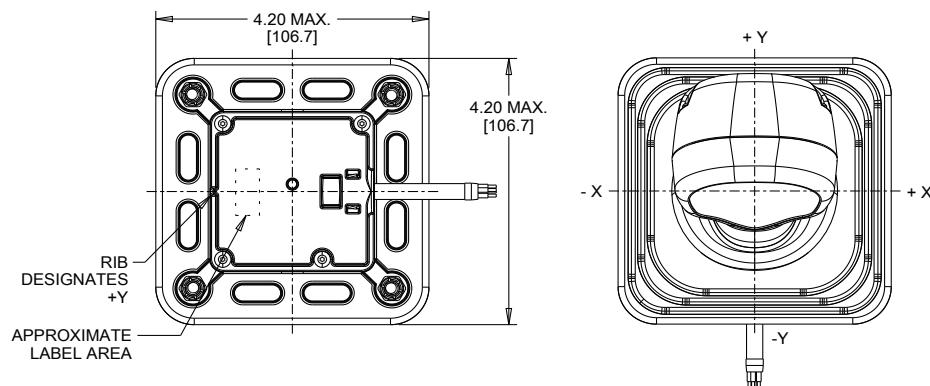
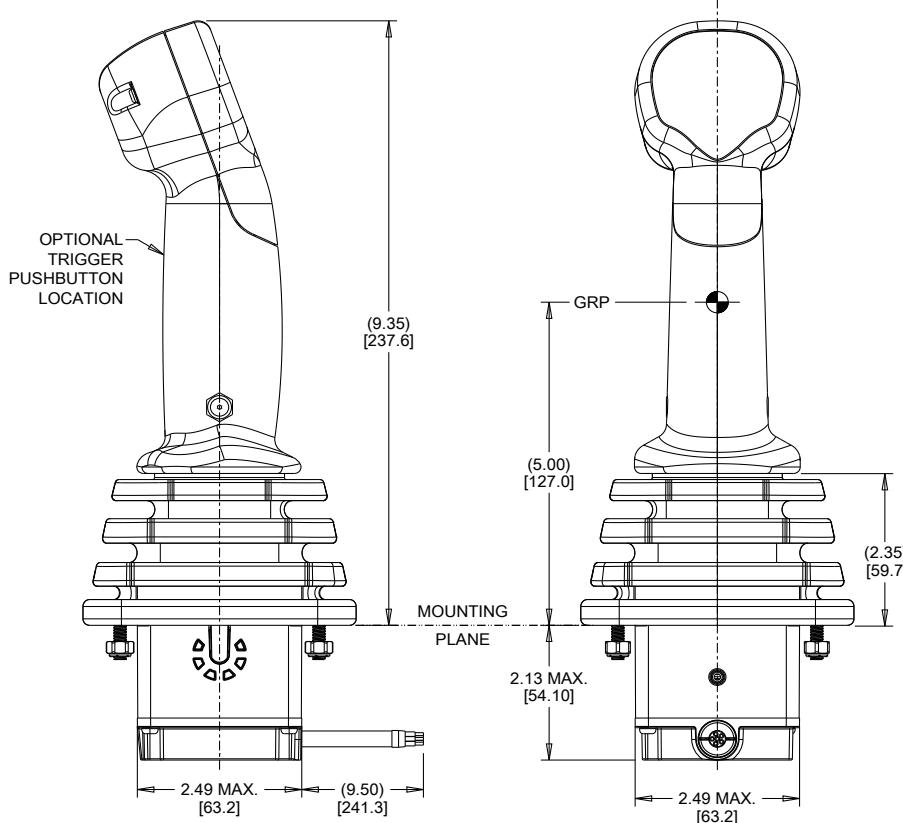
The HJLG3-A combines a small G3-A Universal Grip with a JHL Hall effect joystick base. The grip offers a choice of 17 standard faceplates with a combination of rockers and pushbuttons. A trigger pushbutton on the back of the grip handle is optional.

Visit the G3-A product page for more information about the grip, which is customizable to customer specifications.

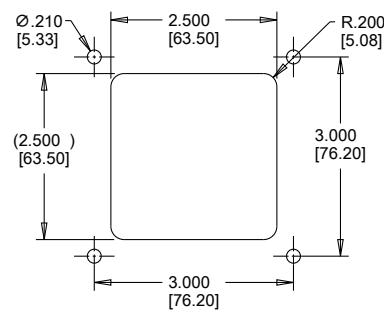


HJLG3-A with
AD Faceplate

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 PART NUMBER CODE

HJLG3-A	XX	X	X	XX	X	XX	X	X
Gating	Joystick Output 1*	Joystick Output 2**	Operate Force	Trigger Pushbutton	Faceplate	K1 Rocker #1 Style - Black***	K1 Rocker #2 Style - Black***	Continued Below
1. Gated Single Y-Axis; Return to Center	AA. 2.5 +/- 2.0VDC ①	NONE	2. Medium	1. None	AA	1. None	1. None	
BB. 2.5 +/- 2.0VDC ②	2.5 +/- 2.0VDC		3. High	2. P9 - Black	AB	2. On-Off	2. On-Off	
CC. 2.5 +/- 2.0VDC ②	2.5 +/- 2.0VDC			3. P9 - Red	AC	3. (On)-Off	3. (On)-Off	
DD. 2.5 +/- 1.5VDC ①	NONE				AD	4. On-Off-On	4. On-Off-On	
EE. 2.5 +/- 1.5VDC ②	2.5 +/- 1.5VDC				AE	5. (On)-Off-(On)	5. (On)-Off-(On)	
FF. 2.5 +/- 1.5VDC ②	2.5 +/- 1.5VDC				AF			
GG. 0.5 - 4.5VDC ②	0.5 - 4.5VDC				AG			
HH. 1.0 - 4.0VDC ②	1.0 - 4.0VDC				AH			
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			
NN. PLd	NONE				AN			
					AP			
					AQ			
					AR			
					AS			

HJLG3-A Part Number Code Continued

Cont. X	X	X	X
P9 #1	P9 #2	P9 #3	P9 #4
Button Color	Button Color	Button Color	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

*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.

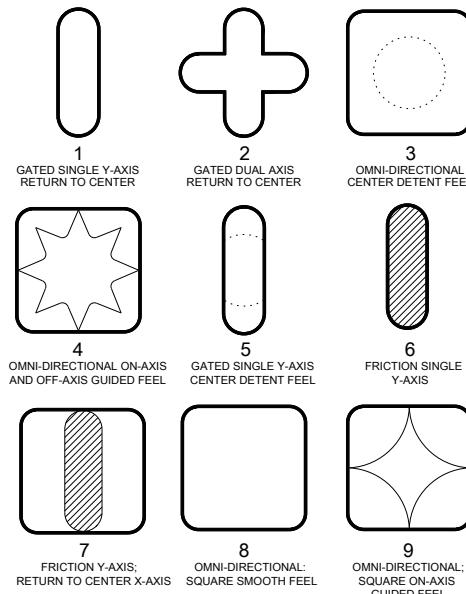
*** K1 Rocker Switches: on position or momentary position is up or to the right and () denotes momentary action.

Contact factory for rocker legends and additional color options.

① 22 AWG Cable

② 24 AWG Cable

HJLG3 Gating Icons

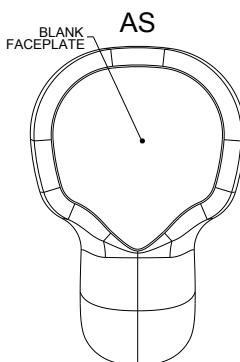
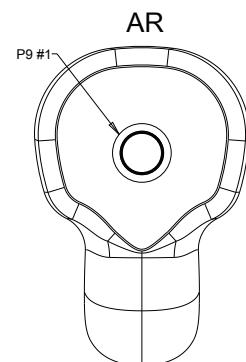
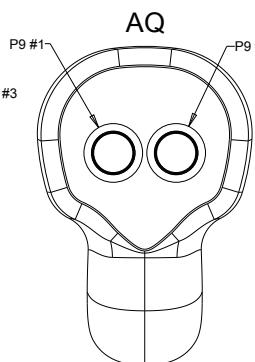
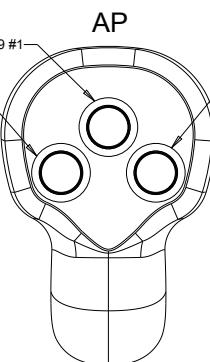
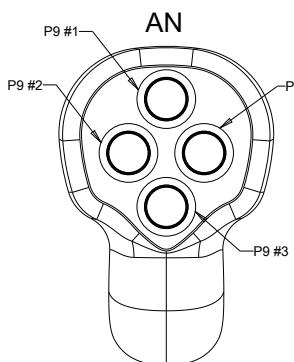
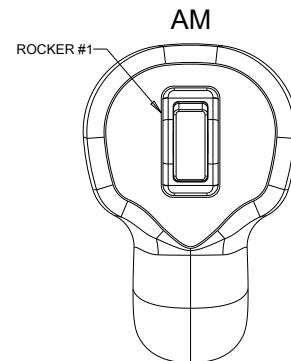
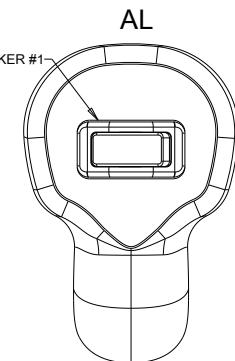
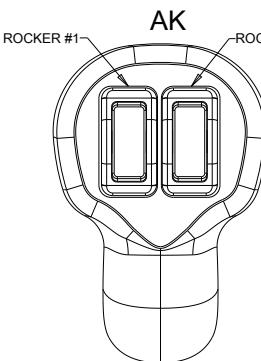
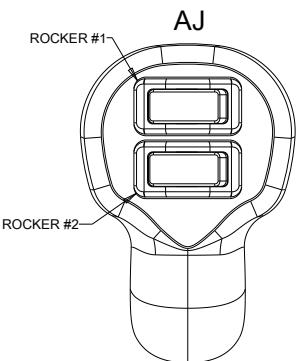
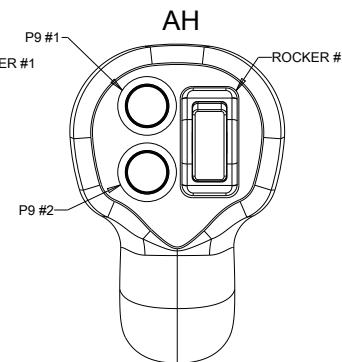
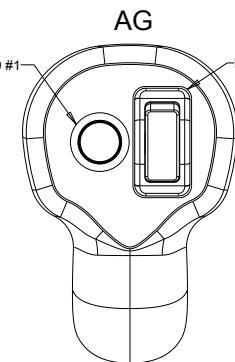
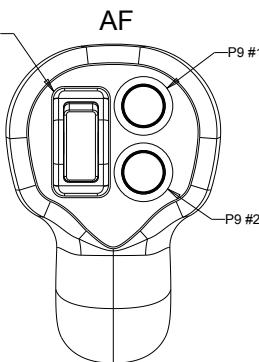
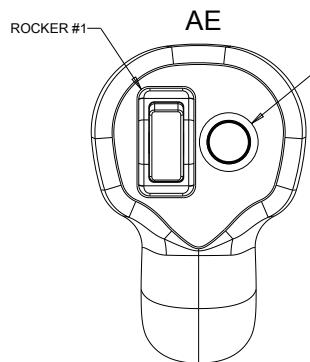
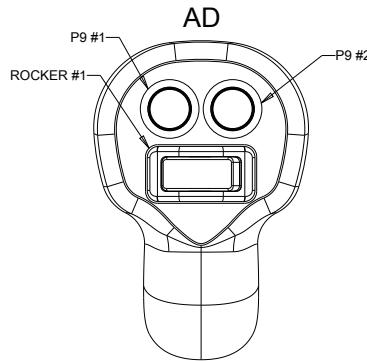
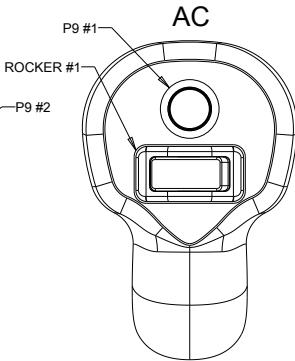
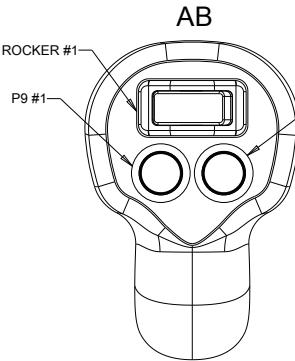
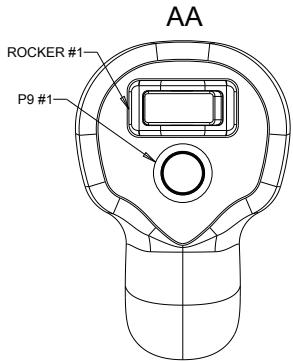


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