JOYSTICK WITH GRIP OPTIONS

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 that match your application.

Grip choices include G3-A, G3-B, G3-C, and G3-CK Universal Grips as well as the G3-D Control Grip that altogether include nearly 50 standard faceplate design options to choose from.

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**

JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings:

ELECTRICAL:

Joystick	Units	Min	Typ	Max
Rated at Vcc = 5V @ 20˚C				
Load = 1 ma (4.7 KΩ)				
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

Joystick CAN Open				
Supply Voltage	VDC	9	N/A	32
Node Identifier	Dec.		10	
Baud Rate	B/S		125K	

Joystick J1939				
Supply Voltage	VDC	9	N/A	32
Source Address	Dec.		51	
Baud Rate	B/S		250K	

Grip Touch Switch*				
Supply Voltage	VDC	3.15	NA	5.5
Output Active (Low)	VDC	NA	NA	0.60
Output Current Sink	mA	N/A	NA	10

Operator Presence	
Electrical Rating	10mA Resistive Load @ 5VDC
Logic Level Electrical Life	1,250,000 Cycles

Keypads	
Circuit Configuration	SPST N.O.
Voltage	1–32 VDC
Current	10–100 mA Resistive

P9 Switches	
Electrical Rating	10mA Resistive Load @ 5VDC
Logic Level Electrical Life	1,250,000 Cycles

K1 Switches	
Electrical Rating	10mA Resistive Load @ 5VDC
Electrical Life	100,000 Cycles

HTW Switches				
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

HTWM Switches				
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

HTWS Switches				
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

Standard Characteristics/Ratings (continued):

HTLT4 Switches				
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

TC-5 Switches	
Electrical Rating @ 1-32 VDC	10-100mA
Electrical Life	3,000,000 Cycles

MECHANICAL:

Joystick	Units	Min	Typ	Max
Mechanical Life, Return to Center	6,000,000 cycles; 1,000,000 cycles (Detent)			
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
Maximum Allowable Load @ 5" GRP	Lbs.		250 Lbs.	

Keypads	
Mechanical Life	3 ,000,000 Cycles

P9 Switches	
Mechanical Life	1,250,000 Cycles

K1 Switches	
Mechanical Life	100,000 Cycles

HTW Switches	
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
Mechanical Life, Full Forward to Full Back, Ret. to End	1,000,000 Cycles

HTWM Switches				
Mechanical Life, Full Forward to Full Back, Ret. to Ctr.	3,000,000 Cycles			
Mechanical Life, Full Forward to Full Back, Ret. to End	1,000,000 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

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

HALL EFFECT JOYSTICK WITH GRIP

Standard Characteristics/Ratings (continued):

HTLT4 Switches				
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
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 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)			
HTW 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				
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				
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				
Operating Temperature	˚C	-40	20	85
Electrical Enclosure Design	ISO 20653, IP6K8S – Dusttight, Continuous Immersion, 1 meter for 31 minutes, Stationary during test(s)			
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			

Standard Characteristics/Ratings (continued):

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: 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
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 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)

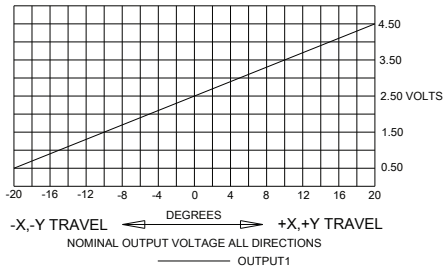
*WARNING ON PERSONAL INJURY AND ANY USE AS SAFETY RELATED:
Do not use these products as safety or emergency stop devices or in any application where failure of the product could result in personal injury. Failure to comply with these instructions could result in death or serious injury. OTTO Engineering 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

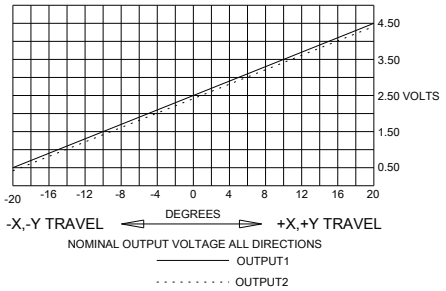
HALL EFFECT JOYSTICK WITH GRIP

HJLG3 OUTPUT CONFIGURATIONS

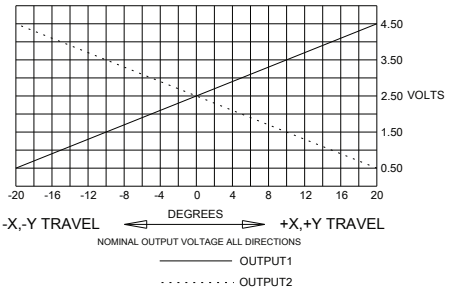
OPTION AA



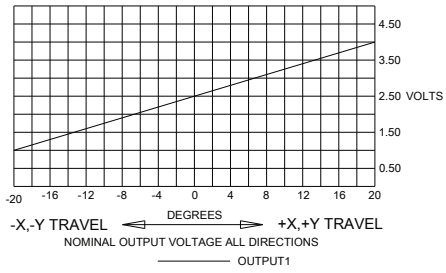
OPTION BB



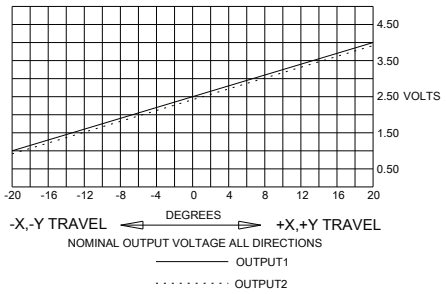
OPTION CC



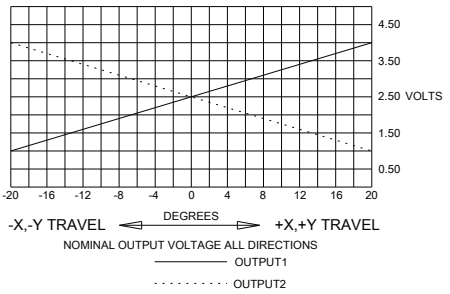
OPTION DD



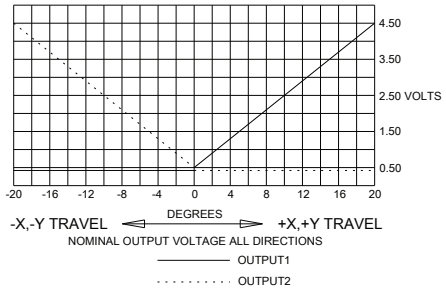
OPTION EE



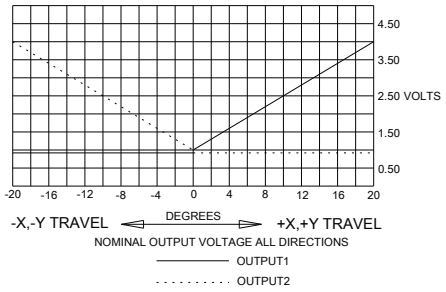
OPTION FF



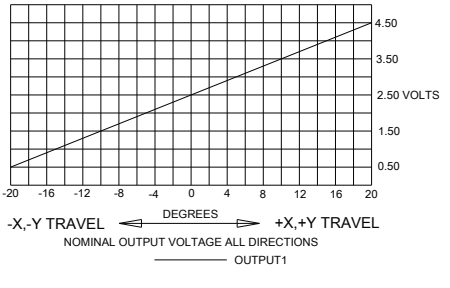
OPTION GG



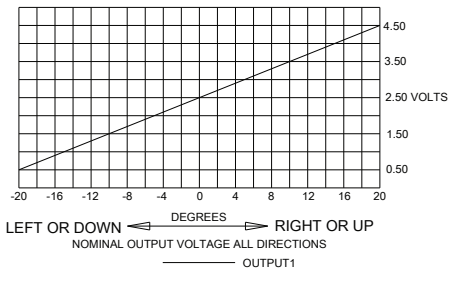
OPTION HH



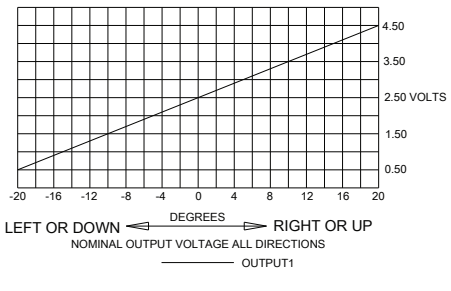
HTLT4 OUTPUT



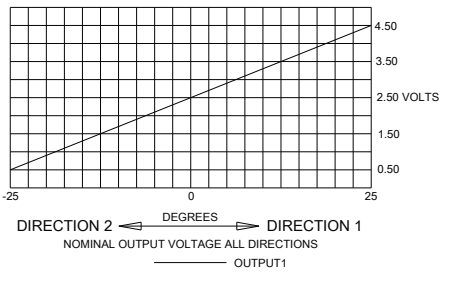
HTWM OUTPUT



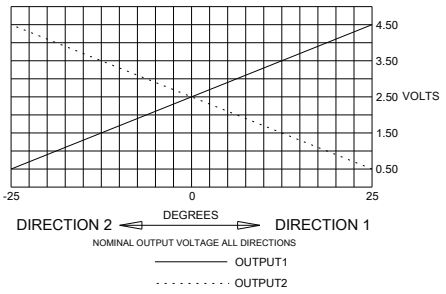
HTWS OUTPUT



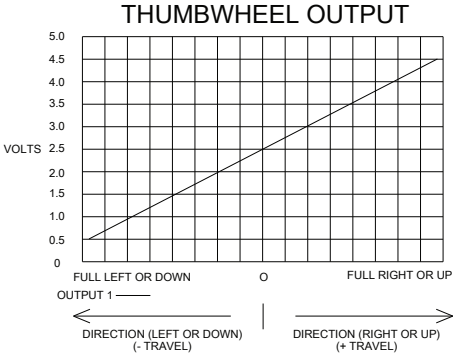
Z-AXIS SINGLE OUTPUT



Z-AXIS DUAL OUTPUT

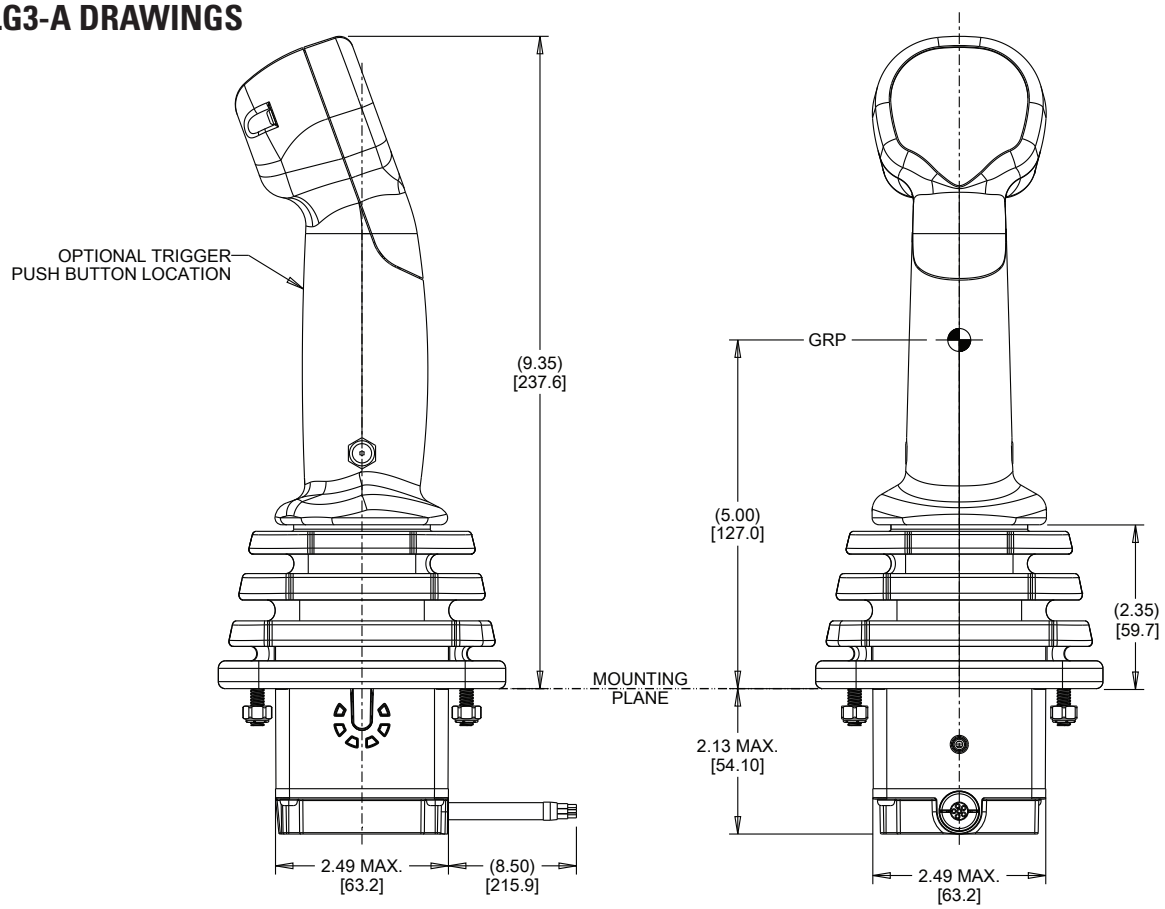


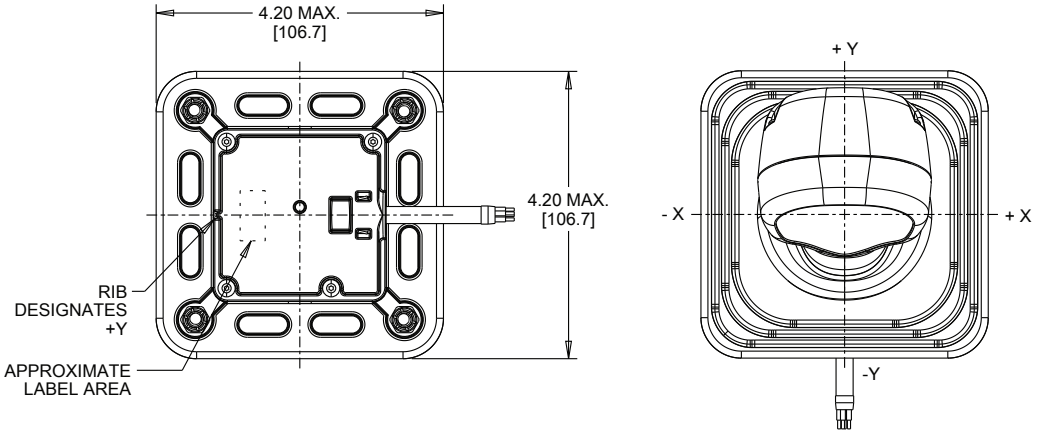
THUMBWHEEL OUTPUT



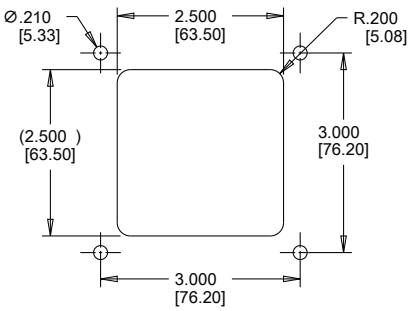
HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

HJLG3-A DRAWINGS





HJLG3 SUGGESTED PANEL OPENING

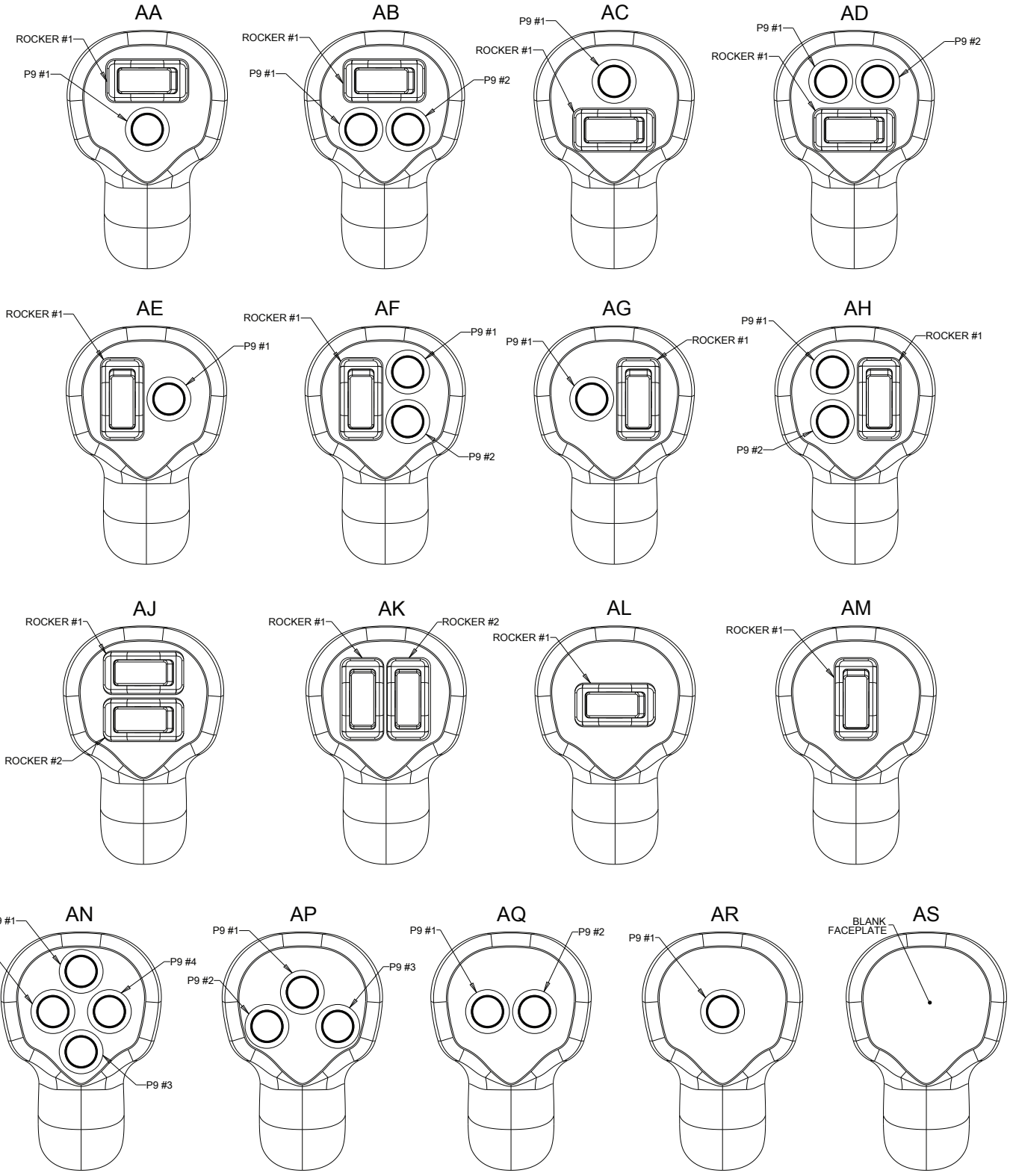


SUGGESTED PANEL OPENING
MAX. PANEL THICKNESS OF .250

JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-A UNIVERSAL GRIP

HJLG3-A FACEPLATES



JOYSTICK WITH GRIP OPTIONS

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

1. Gated Single Y-Axis; Return to Center
2. Gated Dual Axis; Return to Center
3. Omni-directional; Center Detent Feel
4. Omni-directional; On-Axis and Off-Axis Guided Feel
5. Gated Single Y-Axis; Center Detent Feel
8. Omni-directional; Square Smooth Feel
9. Omni-directional; Square On-Axis Guided Feel

Joystick Output 1*	Joystick Output 2**
AA. 2.5 +/- 2.0VDC	NONE
BB. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC
CC. 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC
DD. 2.5 +/- 1.5VDC	NONE
EE. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC
FF. 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC
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

Operate Force

2. Medium
3. High

Trigger Pushbutton

1. None
2. P9 - Black
3. P9 - Red

Faceplate

AA **AB** **AC** **AD** **AE** **AF** **AG** **AH** **AJ** **AK** **AL** **AM** **AN** **AP** **AQ** **AR** **AS**

K1 Rocker #1 Style - Black***

1. None
2. On-Off
3. (On)-Off
4. On-Off-On
5. (On)-Off-(On)

K1 Rocker #2 Style - Black***

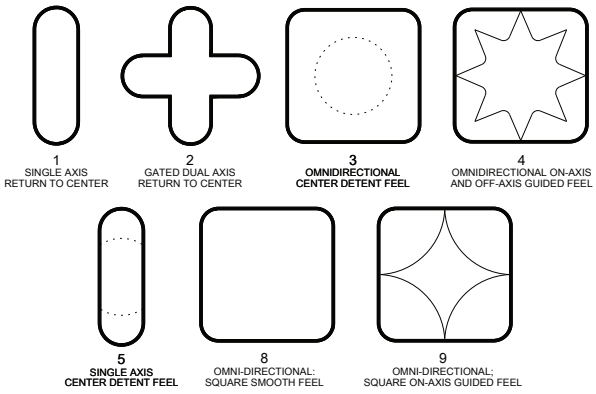
1. None
2. On-Off
3. (On)-Off
4. On-Off-On
5. (On)-Off-(On)

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.

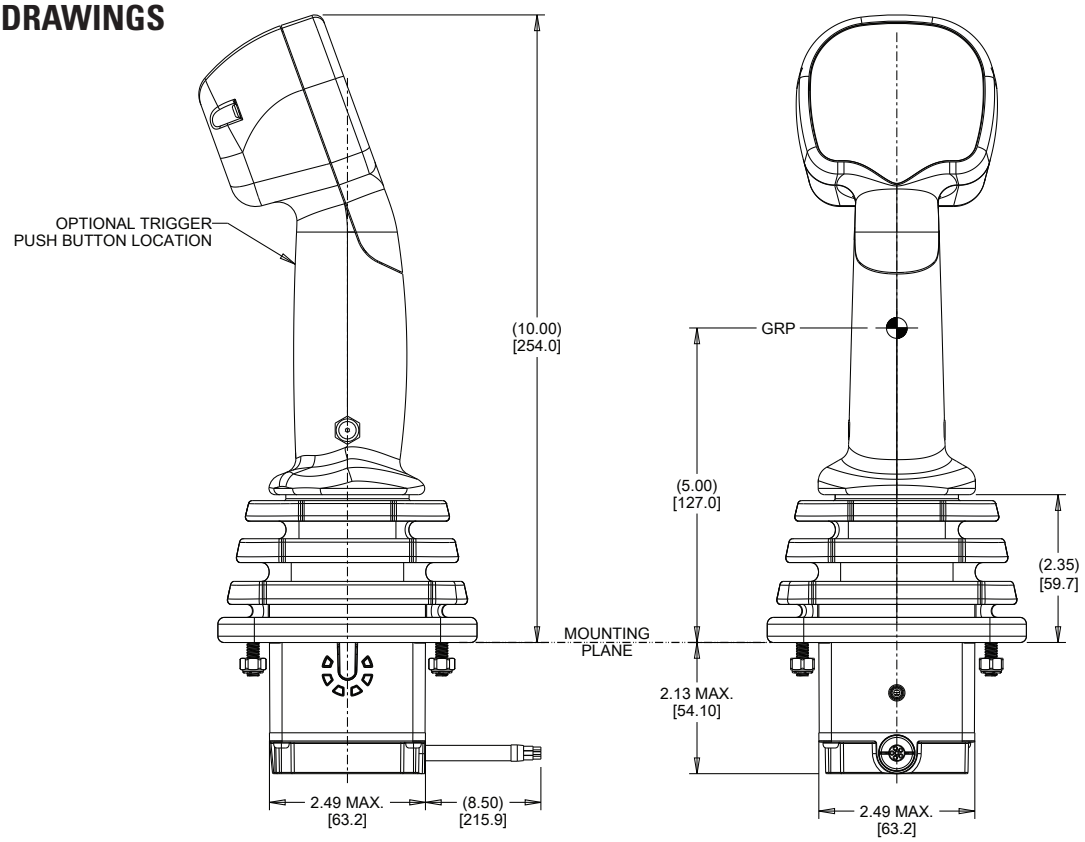
**Options "BB" and "EE" provide redundant output 2 which duplicates output 1. Options "CC" and "FF" provide redundant output 2 which is inverse of output 1.

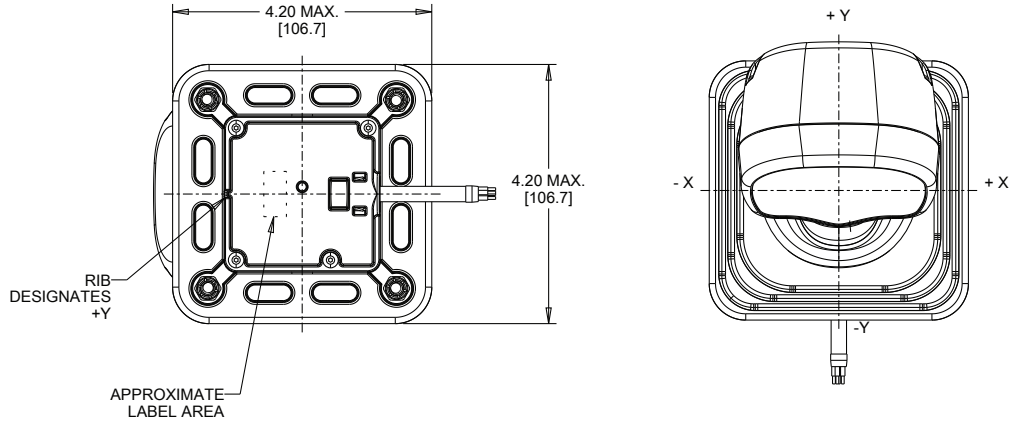
*** K1 Rocker Switches: on position or momentary position is up or to the right and ( ) denotes momentary action.
Contact factory for rocker legends and additional color options.

JOYSTICK WITH GRIP OPTIONS

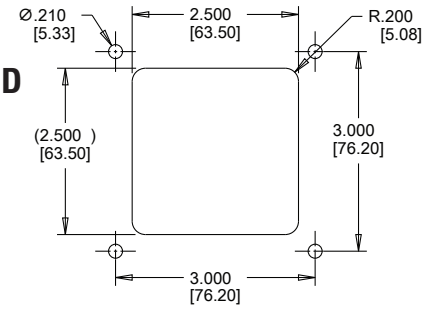
HALL EFFECT JOYSTICK WITH G3-B UNIVERSAL GRIP

HJLG3-B DRAWINGS





HJLG3 SUGGESTED PANEL OPENING

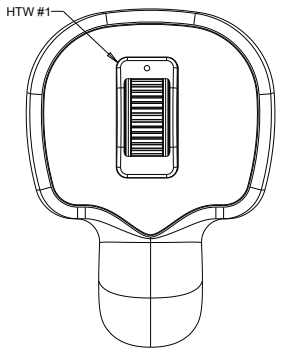


SUGGESTED PANEL OPENING
MAX. PANEL THICKNESS OF .250

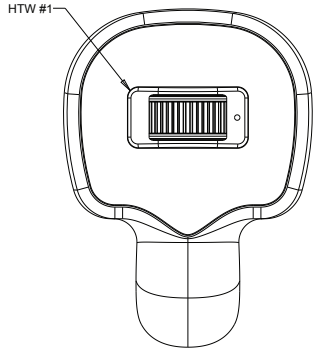
HALL EFFECT JOYSTICK WITH G3-B UNIVERSAL GRIP

HJLG3-B FACEPLATES

BA



BB



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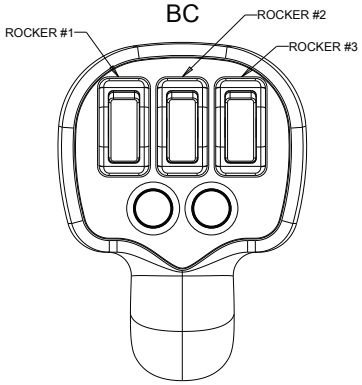

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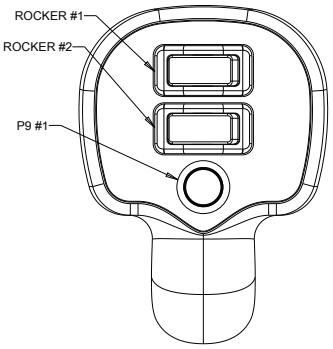

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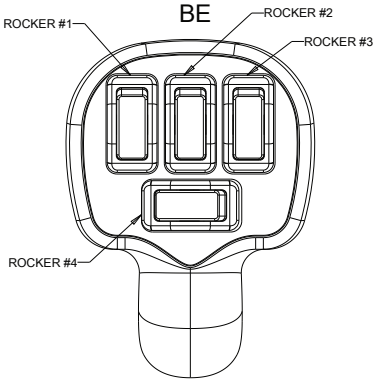

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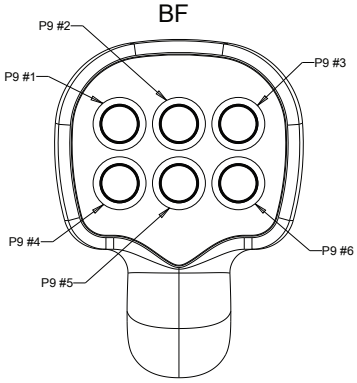

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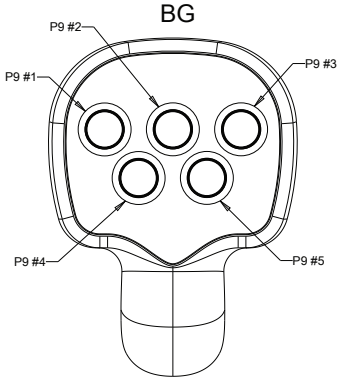

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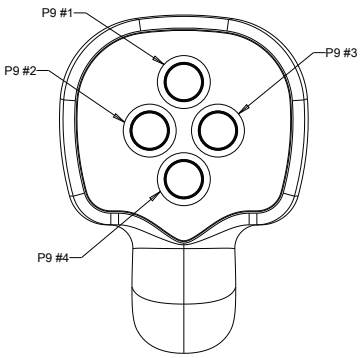

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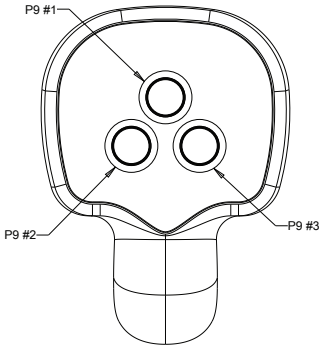

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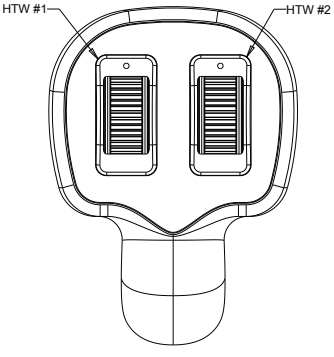

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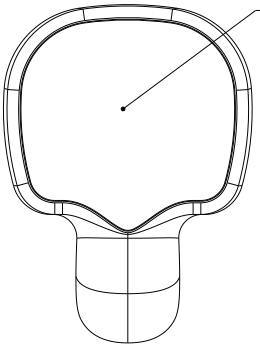


JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-B UNIVERSAL GRIP

HJLG3-B PART NUMBER CODE

HJLG3-B – X XX X X XX X X X X Continued Below

Gating	Joystick Output 1*	Joystick Output 2**	Force	Trigger Pushbutton	Faceplate	K1 Rocker #1 Style - Black***	K1 Rocker #2 Style - Black***	K1 Rocker #3 Style - Black***	K1 Rocker #4 Style - Black***
1. Gated Single Y-Axis; Return to Center	**AA.** 2.5 +/- 2.0VDC	NONE	**2.** Medium	**1.** None	**BA**	**1.** None	**1.** None	**1.** None	**1.** None
2. Gated Dual Axis; Return to Center	**BB.** 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	**3.** High	**2.** P9 - Black	**BB**	**2.** On-Off	**2.** On-Off	**2.** On-Off	**2.** On-Off
3. Omni-directional; Center Detent Feel	**CC.** 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC		**3.** P9 - Red	**BC**	**3.** (On)-Off	**3.** (On)-Off	**3.** (On)-Off	**3.** (On)-Off
4. Omni-directional; On-Axis and Off-Axis Guided Feel	**DD.** 2.5 +/- 1.5VDC	NONE			**BD**	**4.** On-Off-On	**4.** On-Off-On	**4.** On-Off-On	**4.** On-Off-On
5. Gated Single Y-Axis; Center Detent Feel	**EE.** 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC			**BE**	**5.** (On)-Off-(On)	**5.** (On)-Off-(On)	**5.** (On)-Off-(On)	**5.** (On)-Off-(On)
8. Omni-directional; Square Smooth Feel	**FF.** 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC			**BF**				
9. Omni-directional; Square On-Axis Guided Feel	**GG.** 0.5 - 4.5VDC	0.5 - 4.5VDC			**BG**				
	HH. 1.0 - 4.0VDC	1.0 - 4.0VDC			**BH**				
	JJ. CANbus J1939	NONE			**BJ**				
	KK. CANopen	NONE			**BK**				
					BL				

HJLG3-B PART NUMBER CODE CONTINUED

Cont. X X X X X X X X

HTW #1 Roller - Black****	HTW #2 Roller - Black****	P9 #1 Button Color	P9 #2 Button Color	P9 #3 Button Color	P9 #4 Button Color	P9 #5 Button Color	P9 #6 Button Color
1. None	**1.** None	**1.** Red	**1.** Red	**1.** Red	**1.** Red	**1.** Red	**1.** Red
2. Return to Center①	**2.** Return to Center	**2.** Black	**2.** Black	**2.** Black	**2.** Black	**2.** Black	**2.** Black
3. Friction②	**3.** Friction	**3.** Orange	**3.** Orange	**3.** Orange	**3.** Orange	**3.** Orange	**3.** Orange
4. Return to End③	**4.** Return to End	**4.** Yellow	**4.** Yellow	**4.** Yellow	**4.** Yellow	**4.** Yellow	**4.** Yellow
① = HTW-1J12X22		**5.** Green	**5.** Green	**5.** Green	**5.** Green	**5.** Green	**5.** Green
② = HTWF-1A12X22		**6.** Blue	**6.** Blue	**6.** Blue	**6.** Blue	**6.** Blue	**6.** Blue
③ = HTWE-1A12X22		**7.** Violet	**7.** Violet	**7.** Violet	**7.** Violet	**7.** Violet	**7.** Violet
Contact factory for additional options.		**8.** Gray	**8.** Gray	**8.** Gray	**8.** Gray	**8.** Gray	**8.** Gray
		9. White	**9.** White	**9.** White	**9.** White	**9.** White	**9.** White
		N. None	**N.** None	**N.** None	**N.** None	**N.** None	**N.** None

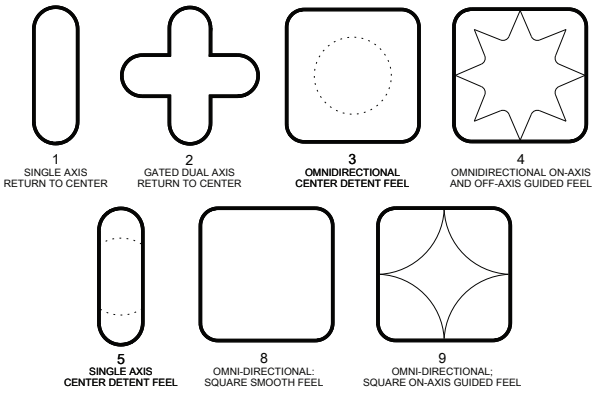
*Outputs are from the center to the full travel position in each direction. Options "AA", "BB", "CC", "DD", "EE", "FF" provide increased voltage in +x, +y; and decreasing voltage in -x, -y from 1 output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+x, +y, -x, -y) from 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.

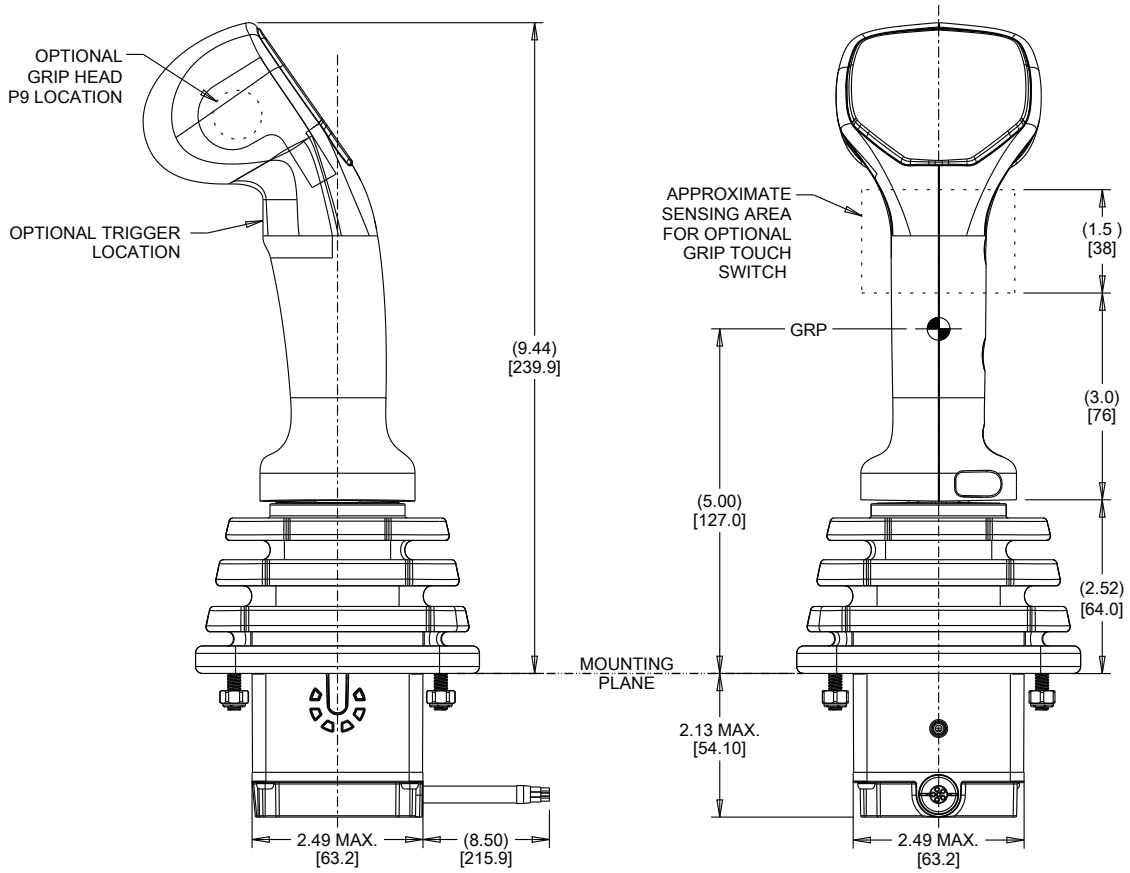
**** HTW Roller Switches: positive travel is up or to the right. Contact factory for additional options.

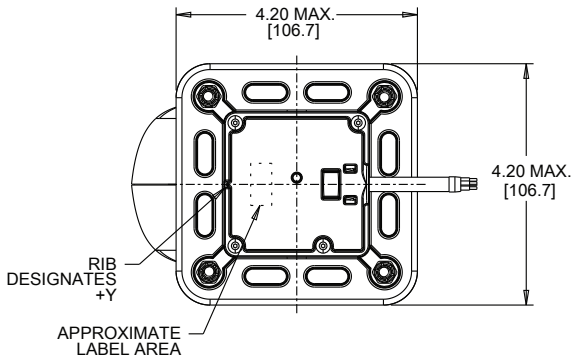
HJLG3 GATING ICONS

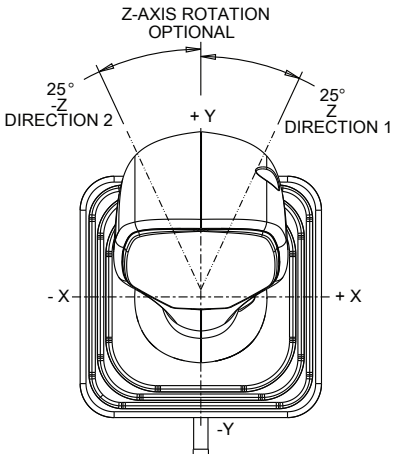


HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

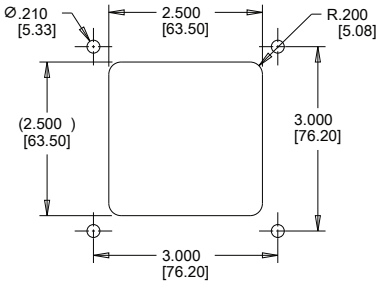
HJLG3-C DRAWINGS







HJLG3 SUGGESTED PANEL OPENING

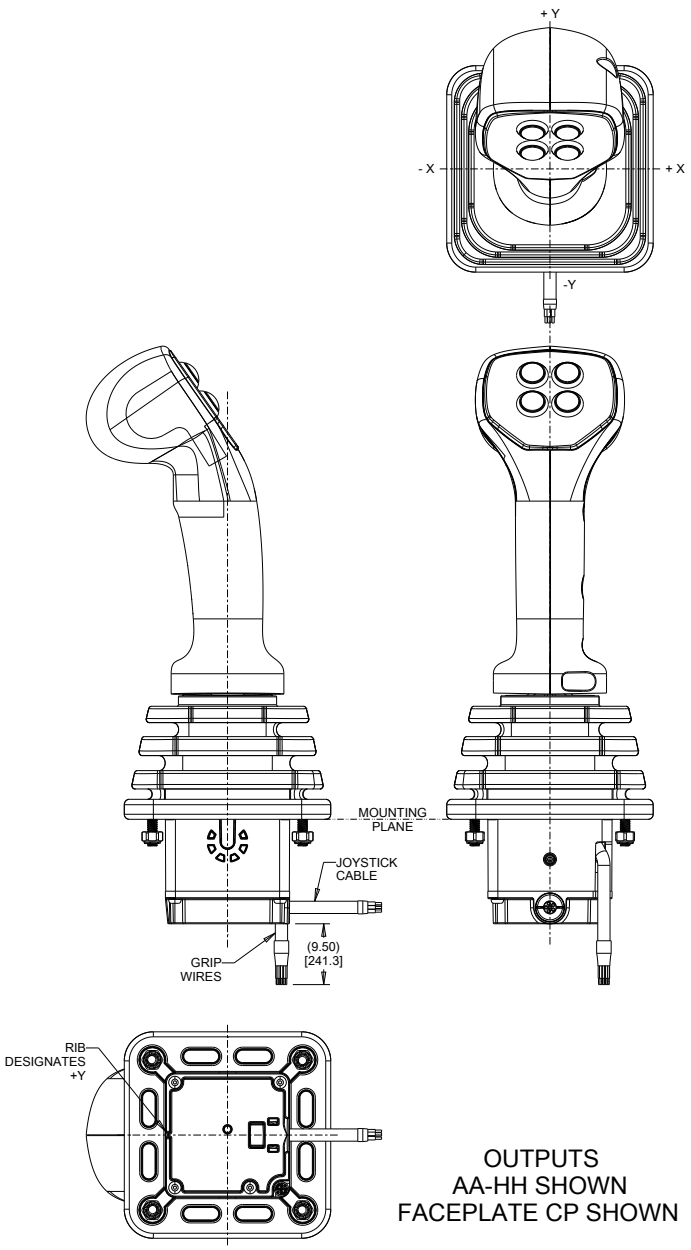


SUGGESTED PANEL OPENING
MAX. PANEL THICKNESS OF .250

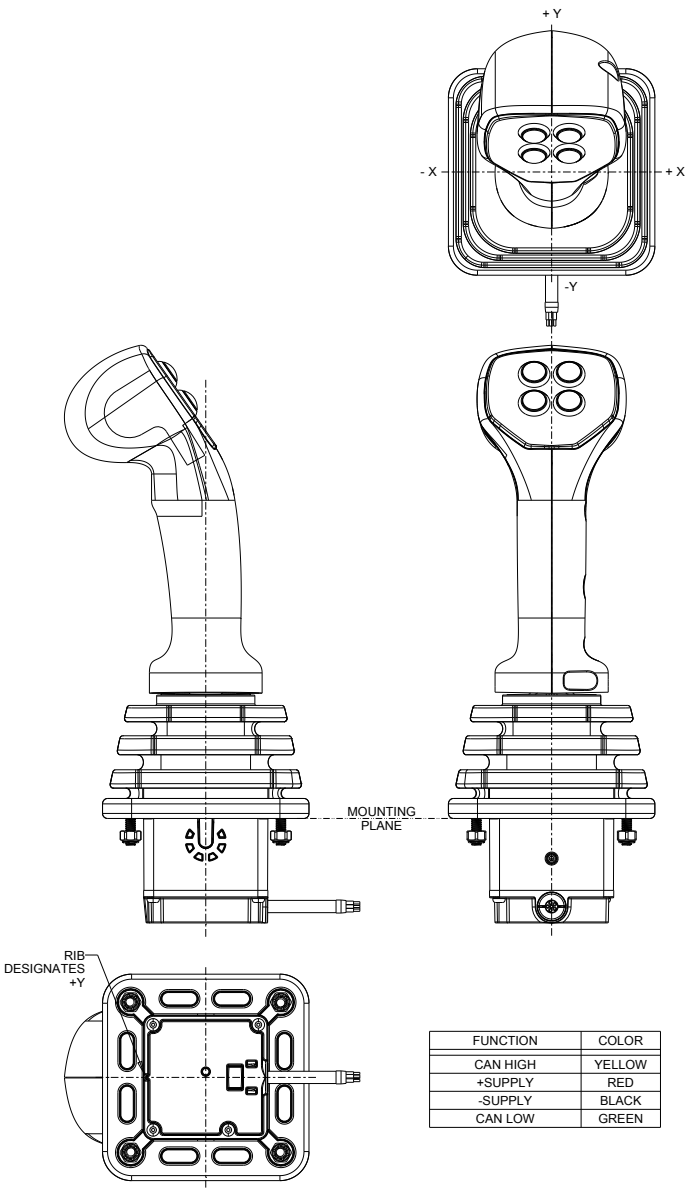
JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

HJLG3-C OUTPUTS AND JOYSTICK SCHEMATICS

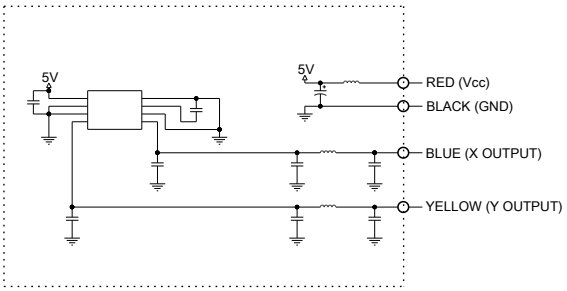


OUTPUTS
AA-HH SHOWN
FACEPLATE CP SHOWN

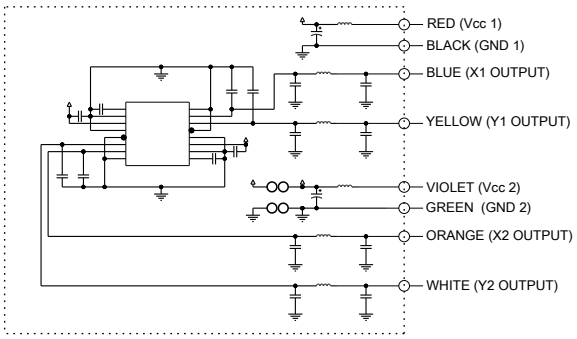


OUTPUTS JJ AND KK SHOWN

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



JOYSTICK SCHEMATIC
(AA AND DD OUTPUTS)



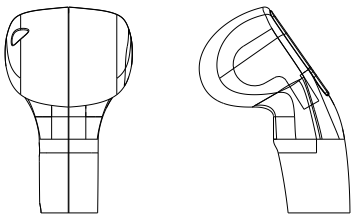
JOYSTICK SCHEMATIC
(BB, CC, EE, FF, GG, & HH OUTPUTS)

JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

HJLG3-C TRIGGER OPTIONS

1



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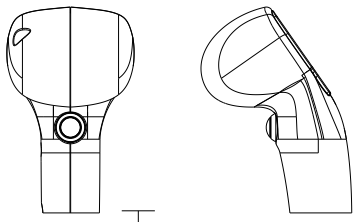

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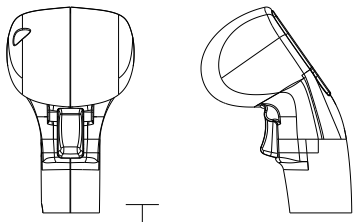

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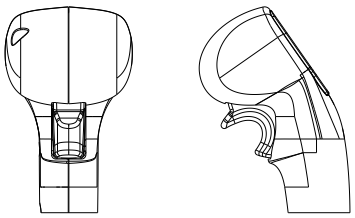
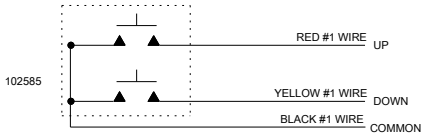
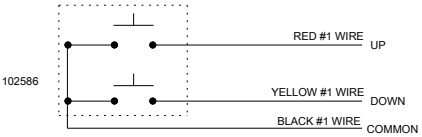


DUAL TRIGGER MOMENTARY



DUAL TRIGGER MAINTAINED



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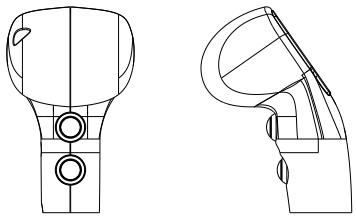

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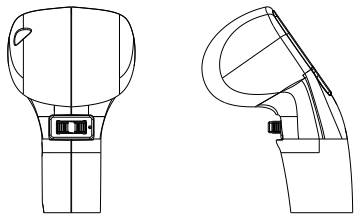
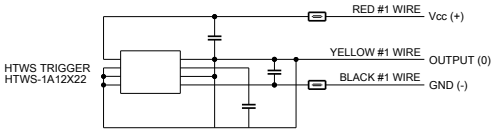
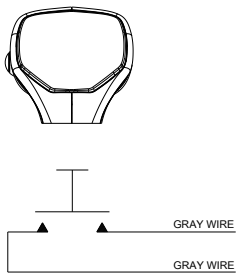




HJLG3-C HEAD PUSHBUTTON OPTIONS

1

2, 3



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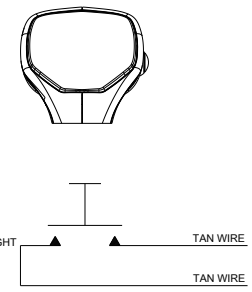

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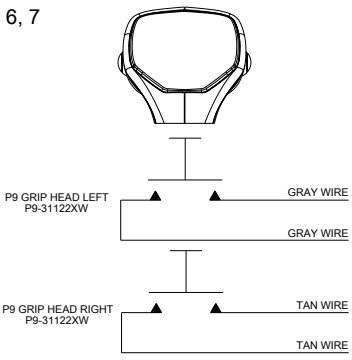
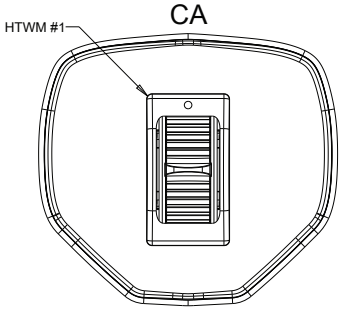


JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

HJLG3-C FACEPLATES

CA



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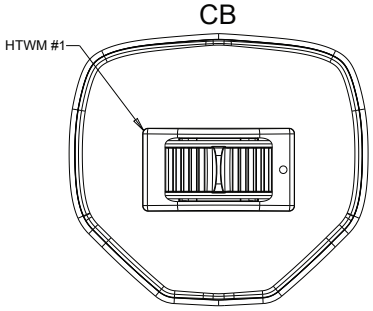

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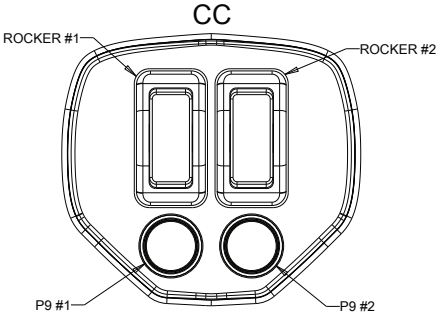

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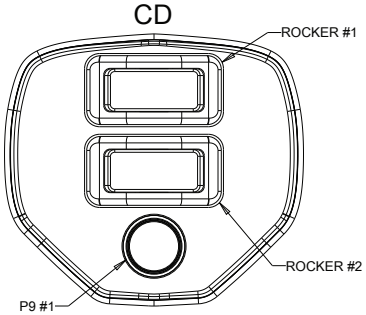

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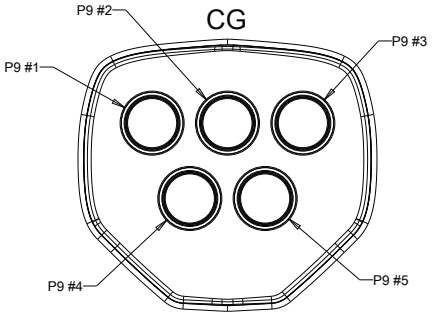

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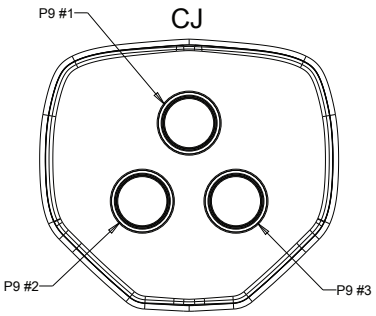

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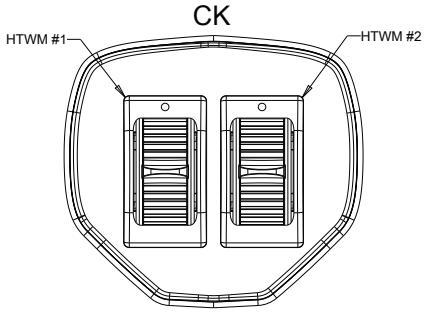

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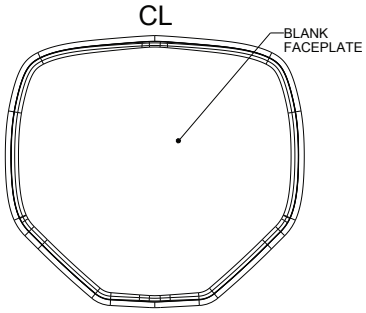

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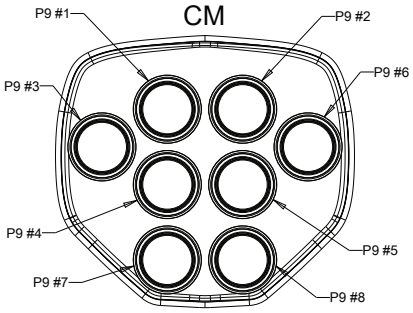

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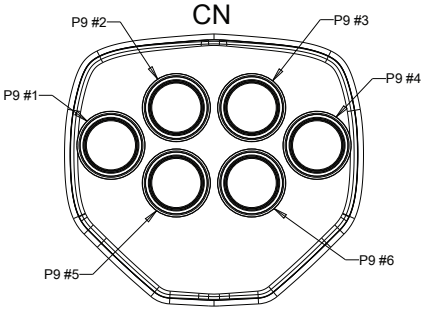

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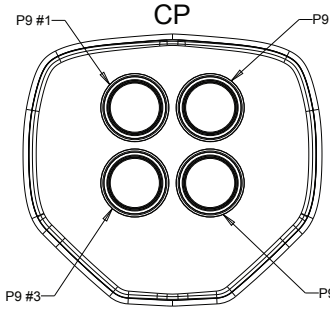

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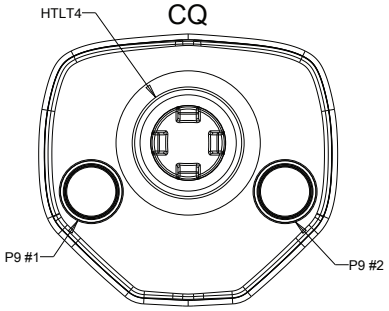

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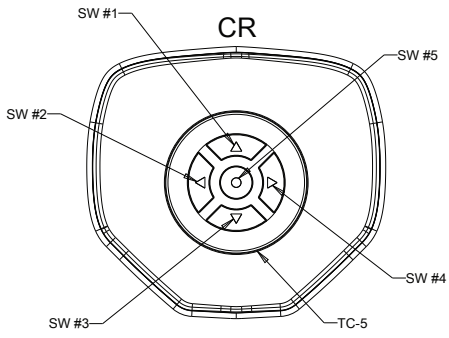
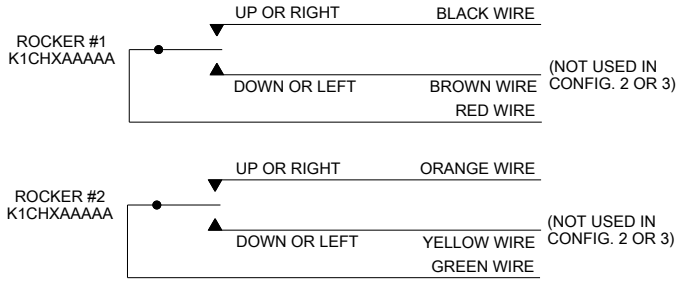
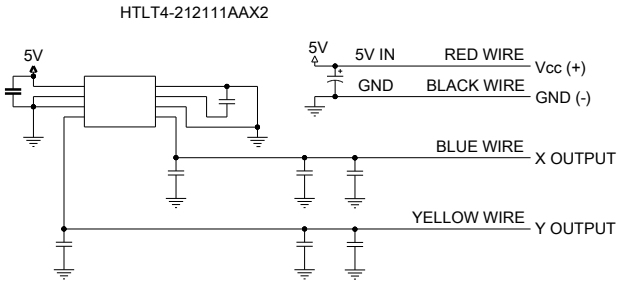
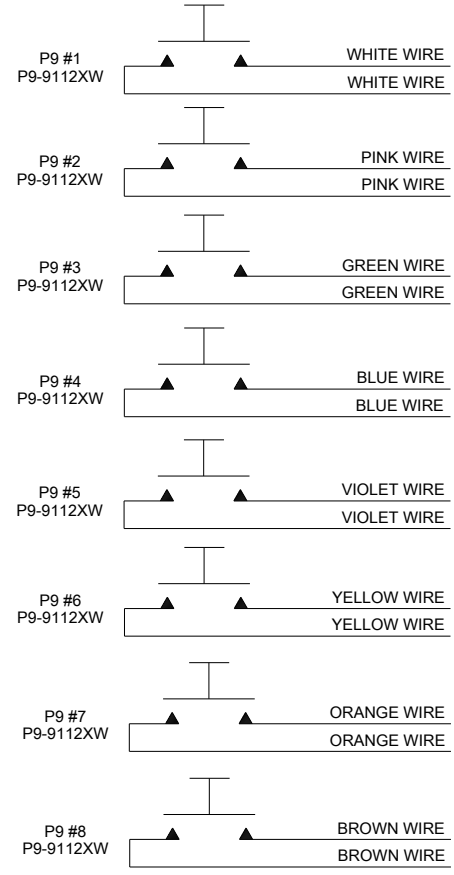


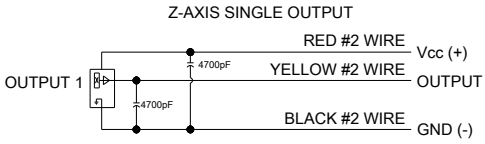
HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

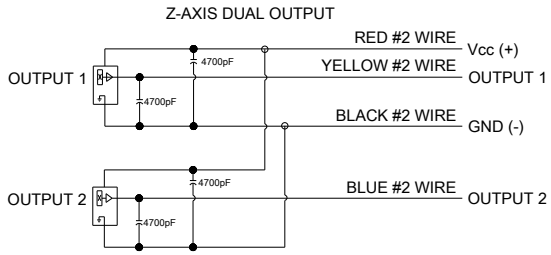
HJLG3-C FACEPLATE SCHEMATICS

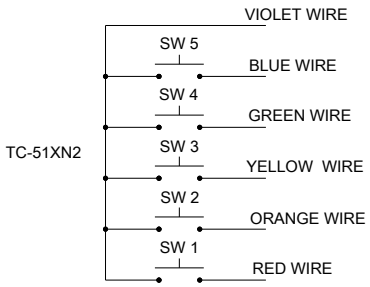


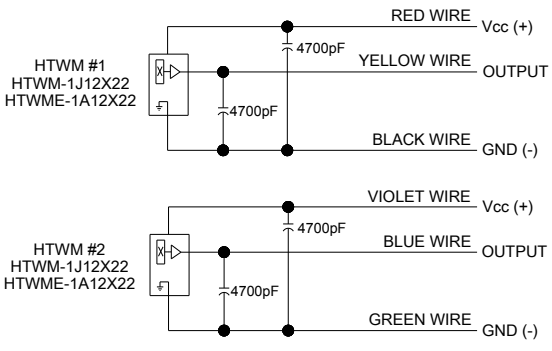


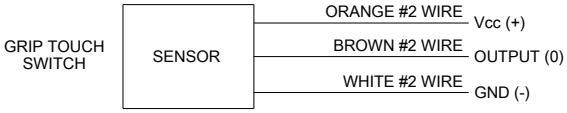












JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-C UNIVERSAL GRIP

HJLG3-C PART NUMBER CODE

HJLG3-C – X X XX X X X XX Continued Below

Z-Axis/Grip Touch Switch

1. No Z-Axis with No Grip Touch Switch
2. No Z-Axis with Grip Touch Switch* ① ②
3. Z-Axis (Single Output) with No Grip Touch Switch
4. Z-Axis (Dual Output) with No Grip Touch Switch
5. Z-Axis (Single Output) with Grip Touch Switch* ① ②
6. Z-Axis (Dual Output) with Grip Touch Switch* ① ②

Gating

1. Gated Single Y-Axis; Return to Center
2. Gated Dual Axis; Return to Center
3. Omni-directional; Center Detent Feel
4. Omni-directional; On-Axis and Off-Axis Guided Feel
5. Gated Single Y-Axis; Center Detent Feel
8. Omni-directional; Square Smooth Feel
9. Omni-directional; Square On-Axis Guided Feel

Joystick Output 1** / Joystick Output 2***

	Output 1**	Output 2***
AA.	2.5 +/- 2.0VDC	NONE
BB.	2.5 +/- 2.0VDC	2.5 +/- 2.0VDC
CC.	2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC
DD.	2.5 +/- 1.5VDC	NONE
EE.	2.5 +/- 1.5VDC	2.5 +/- 1.5VDC
FF.	2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC
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

Operate Force

2. Medium
3. High

Trigger in Handle

1. None
2. P9 - Black
3. P9 - Red
4. Single
5. Dual Momentary*
6. Dual Maintained*
7. 2 P9s - Black
8. 2 P9s - Red
9. HTWS - Black③

Grip Head Pushbutton

1. None
2. Left (Black)
3. Left (Red)
4. Right (Black)
5. Right (Red)
6. Left and Right (Black)
7. Left and Right (Red)

Faceplate

CA
CB
CC
CD
CG
CJ
CK
CL
CM
CN
CP
CQ
CR

HJLG3-C PART NUMBER CODE CONTINUED

Cont. X X X X X

K1 Rocker #1 Style - Black④

1. None
2. On-Off
3. (On)-Off
4. On-Off-On
5. (On)-Off-(On)

K1 Rocker #2 Style - Black④

1. None
2. On-Off
3. (On)-Off
4. On-Off-On
5. (On)-Off-(On)

HTWM #1 Roller - Black⑤

1. None
2. Return to Center[1]
3. Return to End[2]

1= HTWM-1J12X22
2= HTWME-1A12X22

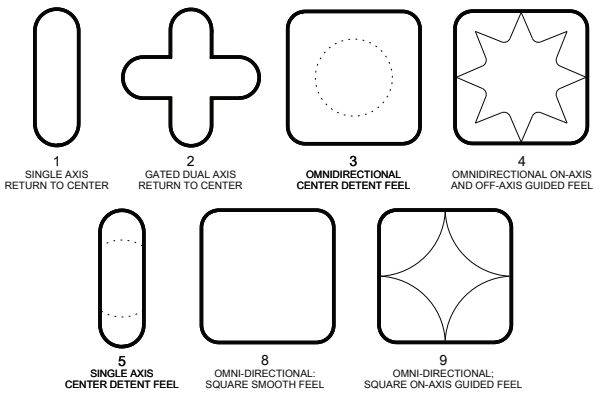
HTWM #2 Roller - Black⑤

1. None
2. Return to Center
3. Return to End

P9 Faceplate Button Color

1. Red
2. Black
3. Orange
4. Yellow
5. Green
6. Blue
7. Violet
8. Gray
9. White
N. None

HJLG3 GATING ICONS



*Grip Touch is not available with trigger option 5 or 6.

**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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② User Caution: To guarantee the intended operating characteristics of the capacitive switches, the zone around the switch must be free from materials which can affect switch performance. Those materials include but are not limited to water, cleaning solutions, and other conductive materials. Failure to maintain this contaminant free zone may result in unintended actuation of the capacitive switch.

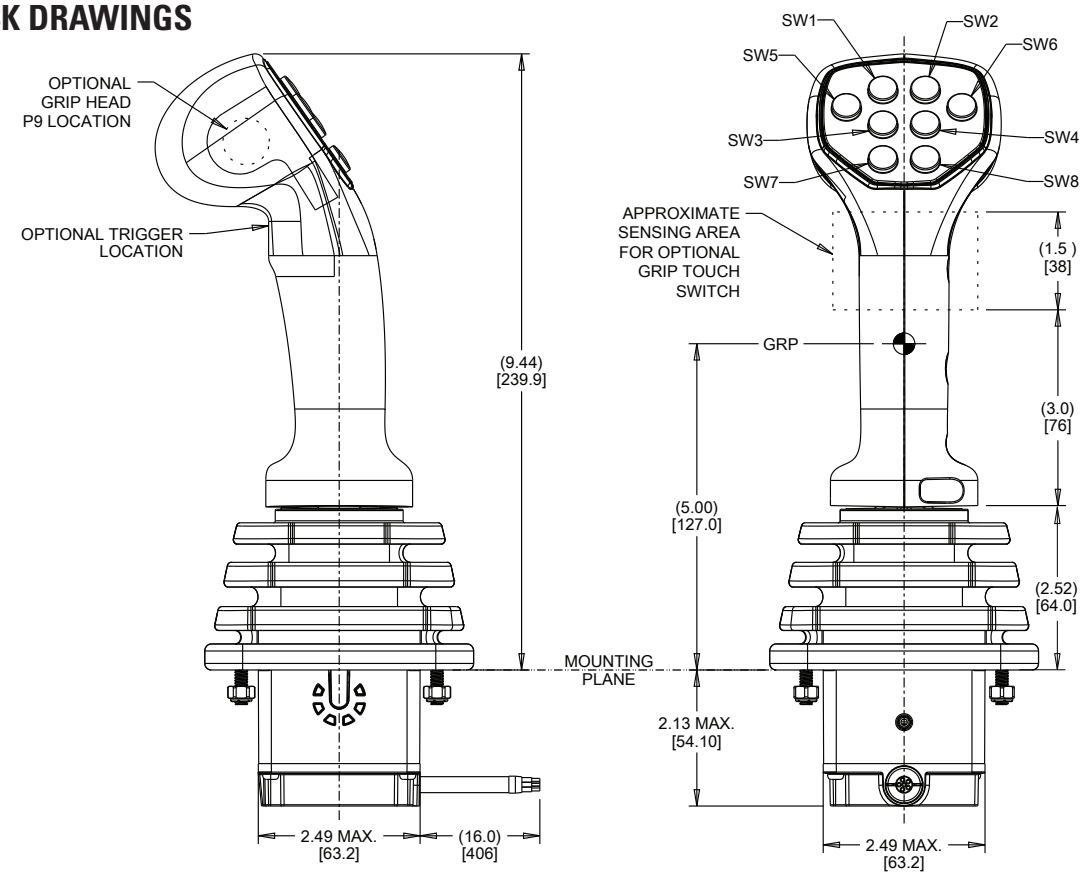
③ HTWS Trigger Switches: positive travel is to the right. Contact factory for additional options.

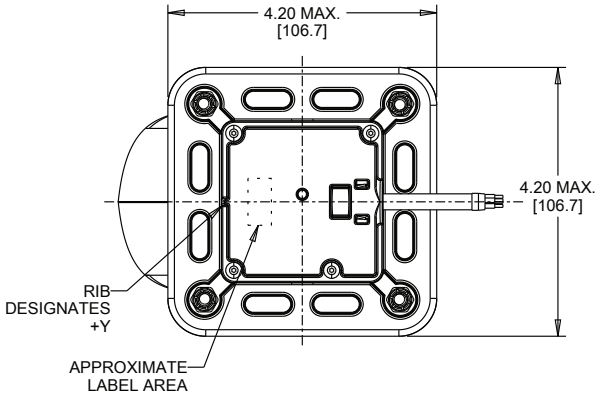
④ K1 Rocker Switches: on position or momentary position is up or to the right and ( ) denotes momentary action. Contact factory for rocker legends and additional color options.

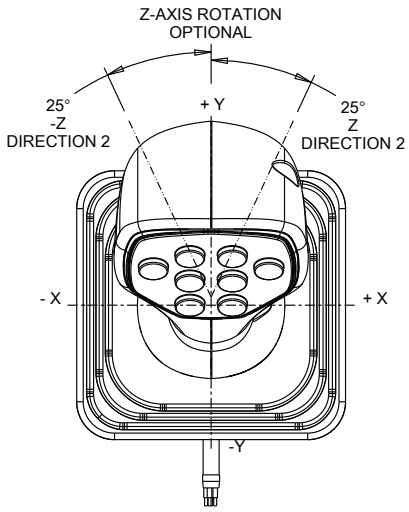
⑤ HTWM Roller Switches: positive travel is up or to the right. Contact factory for additional options.

HALL EFFECT JOYSTICK WITH G3-CK UNIVERSAL GRIP

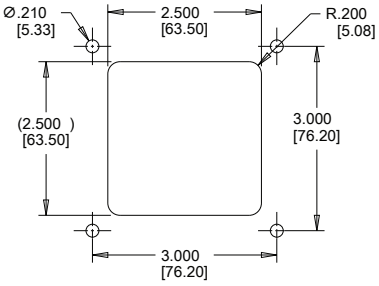
HJLG3-CK DRAWINGS







HJLG3 SUGGESTED PANEL OPENING

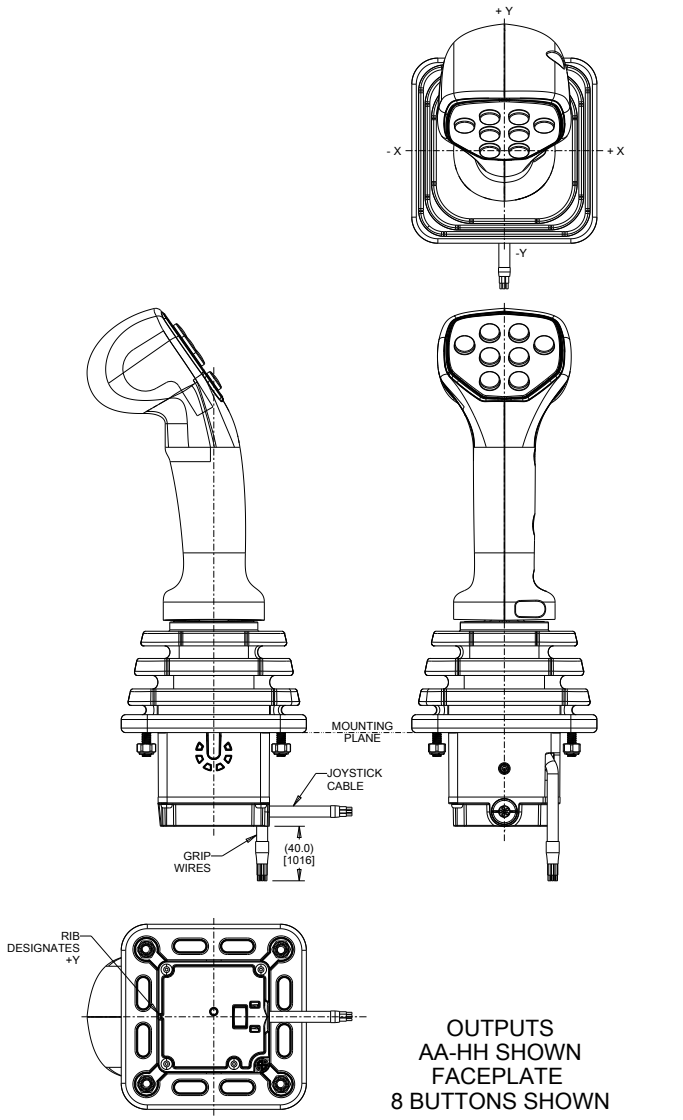


SUGGESTED PANEL OPENING
MAX. PANEL THICKNESS OF .250

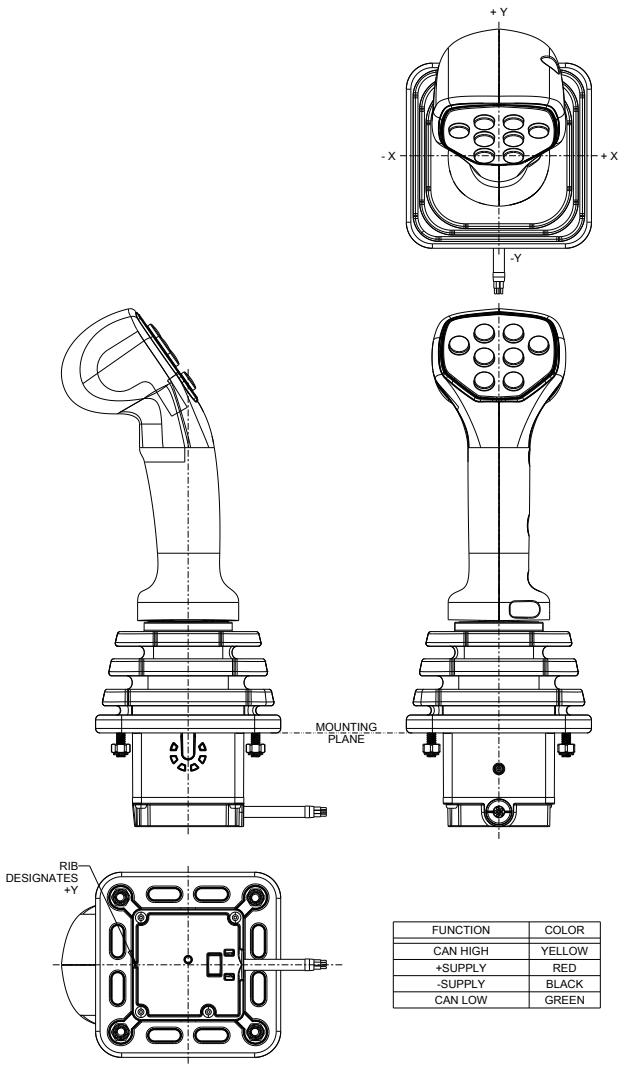
JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-CK UNIVERSAL GRIP

HJLG3-CK OUTPUTS AND JOYSTICK SCHEMATICS

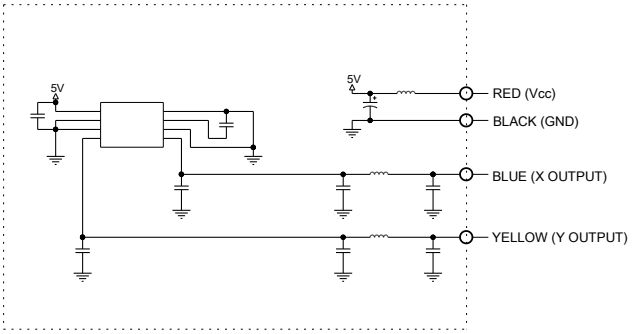


OUTPUTS
AA-HH SHOWN
FACEPLATE
8 BUTTONS SHOWN

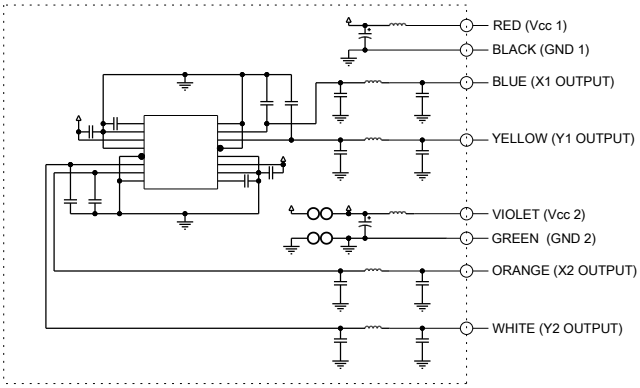


FUNCTION	COLOR
CAN HIGH	YELLOW
+SUPPLY	RED
-SUPPLY	BLACK
CAN LOW	GREEN

OUTPUTS JJ AND KK SHOWN



JOYSTICK SCHEMATIC
(AA AND DD OUTPUTS)

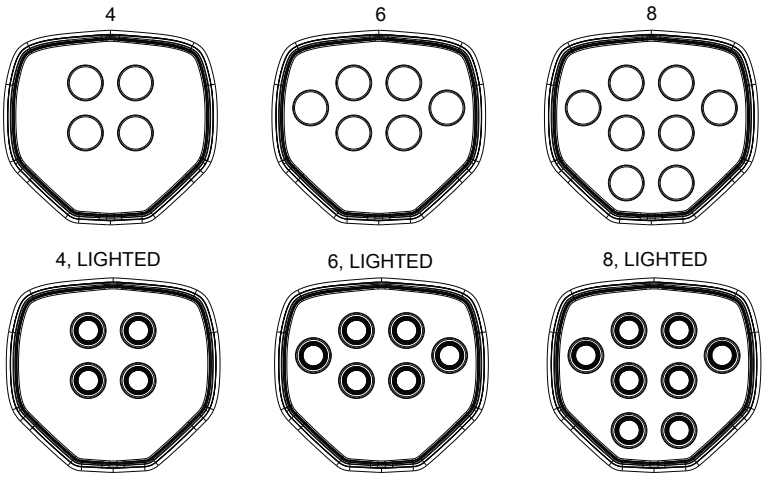


JOYSTICK SCHEMATIC
(BB, CC, EE, FF, GG, & HH OUTPUTS)

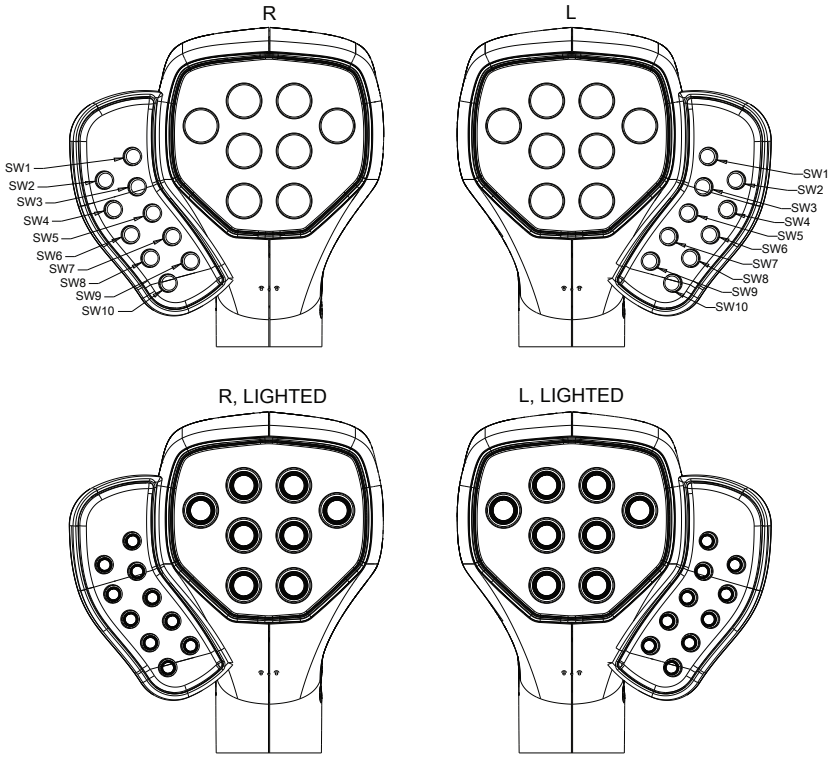
HALL EFFECT JOYSTICK WITH G3-CK UNIVERSAL GRIP

HJLG3-CK KEYPAD CONFIGURATIONS AND SCHEMATICS

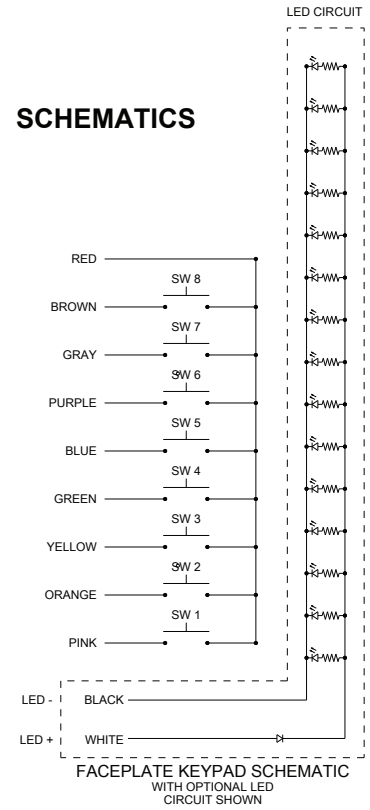
CENTER KEYPAD CONFIGURATIONS



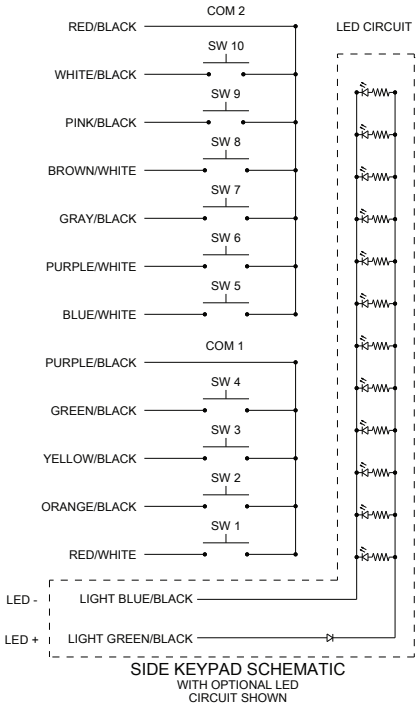
SIDE KEYPAD CONFIGURATIONS



SCHEMATICS

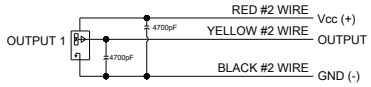


FACEPLATE KEYPAD SCHEMATIC
WITH OPTIONAL LED CIRCUIT SHOWN

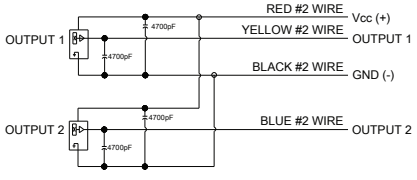


SIDE KEYPAD SCHEMATIC
WITH OPTIONAL LED CIRCUIT SHOWN

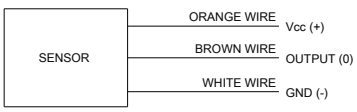
Z-AXIS SINGLE OUTPUT



Z-AXIS DUAL OUTPUT



GRIP TOUCH SWITCH

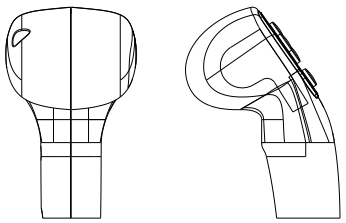


JOYSTICK WITH GRIP OPTIONS

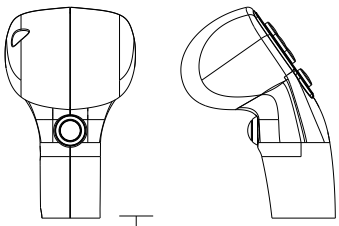
HALL EFFECT JOYSTICK WITH G3-CK UNIVERSAL GRIP

HJLG3-CK TRIGGER OPTIONS

1



2, 3



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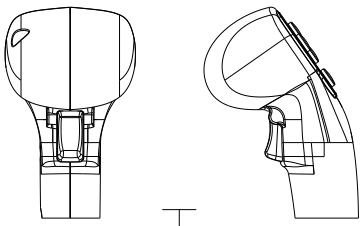

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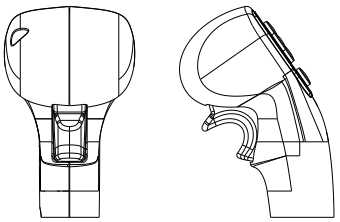
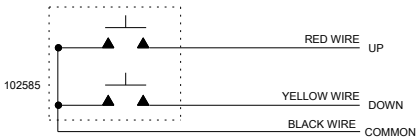
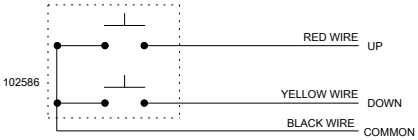


DUAL TRIGGER MOMENTARY



DUAL TRIGGER MAINTAINED



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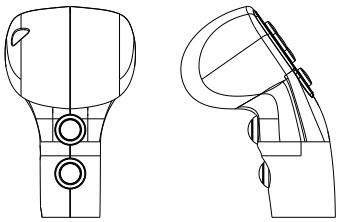

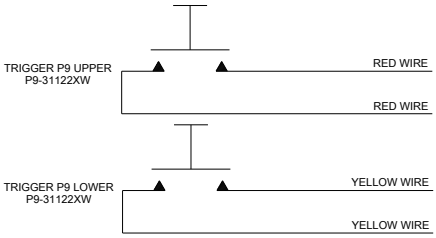

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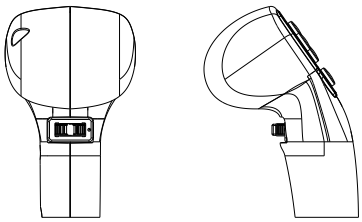
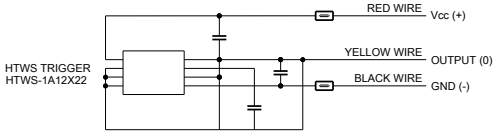
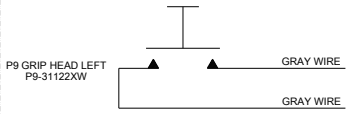




HJLG3-CK HEAD PUSHBUTTON OPTIONS

1

2, 3



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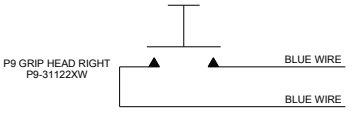

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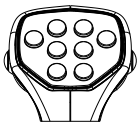
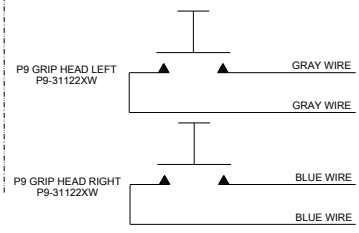




JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-CK UNIVERSAL GRIP

HJLG3-CK PART NUMBER CODE

HJLG3-CK – X X XX X X X Continued Below

Z-Axis/Grip Touch Switch*

- **1.** No Z-Axis with No Grip Touch Switch
- **2.** No Z-Axis with Grip Touch Switch** ① ②
- **3.** Z-Axis (Single Output) with No Grip Touch Switch
- **4.** Z-Axis (Dual Output) with No Grip Touch Switch
- **5.** Z-Axis (Single Output) with Grip Touch Switch** ① ②
- **6.** Z-Axis (Dual Output) with Grip Touch Switch** ① ②

Gating

- **1.** Gated Single Y-Axis; Return to Center
- **2.** Gated Dual Axis; Return to Center
- **3.** Omni-directional; Center Detent Feel
- **4.** Omni-directional; On-Axis and Off-Axis Guided Feel
- **5.** Gated Single Y-Axis; Center Detent Feel
- **8.** Omni-directional; Square Smooth Feel
- **9.** Omni-directional; Square On-Axis Guided Feel

Joystick Output 1*** / Joystick Output 2****

	Output 1***	Output 2****
AA.	2.5 +/- 2.0VDC	NONE
BB.	2.5 +/- 2.0VDC	2.5 +/- 2.0VDC
CC.	2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC
DD.	2.5 +/- 1.5VDC	NONE
EE.	2.5 +/- 1.5VDC	2.5 +/- 1.5VDC
FF.	2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC
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

Operate Force

- **2.** Medium
- **3.** High

Trigger in Handle*

- **1.** None
- **2.** P9 - Black
- **3.** P9 - Red
- **4.** Single
- **5.** Dual Momentary
- **6.** Dual Maintained
- **7.** 2 P9s - Black
- **8.** 2 P9s - Red
- **9.** HTWS - Black③

Grip Head Pushbutton*

- **1.** None
- **2.** Left (Black)
- **3.** Right (Black)
- **4.** Left and Right (Black)
- **5.** Left (Red)
- **6.** Right (Red)
- **7.** Left and Right (Red)

HJLG3-CK PART NUMBER CODE CONTINUED

Cont. X X X

Faceplate Keypad Configuration

- **4.** 4 Buttons
- **6.** 6 Buttons
- **8.** 8 Buttons

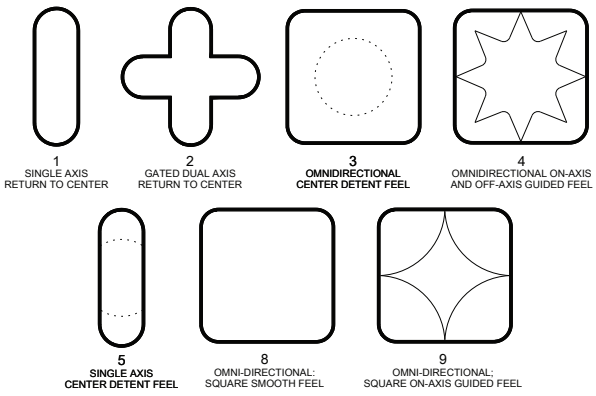
Side Keypad Configuration

- **1.** None
- **L.** Left Hand
- **R.** Right Hand

Back Lighting ④

- **N.** None
- **L.** Lighted Faceplate Keypad & Side Keypad
- **F.** Lighted Faceplate Keypad Only
- **S.** Lighted Side Keypad Only

HJLG3 GATING ICONS



*Wires from Z-Axis, Trigger, Head Position and Grip Touch Switch will be bundled in a shrink tube.

**Grip Touch Switch is not available with trigger option 5 or 6.

***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.

① 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.

② User Caution: To guarantee the intended operating characteristics of the capacitive switches, the zone around the switch must be free from materials which can affect switch performance. Those materials include but are not limited to water, cleaning solutions, and other conductive materials. Failure to maintain this contaminant free zone may result in unintended actuation of the capacitive switch.

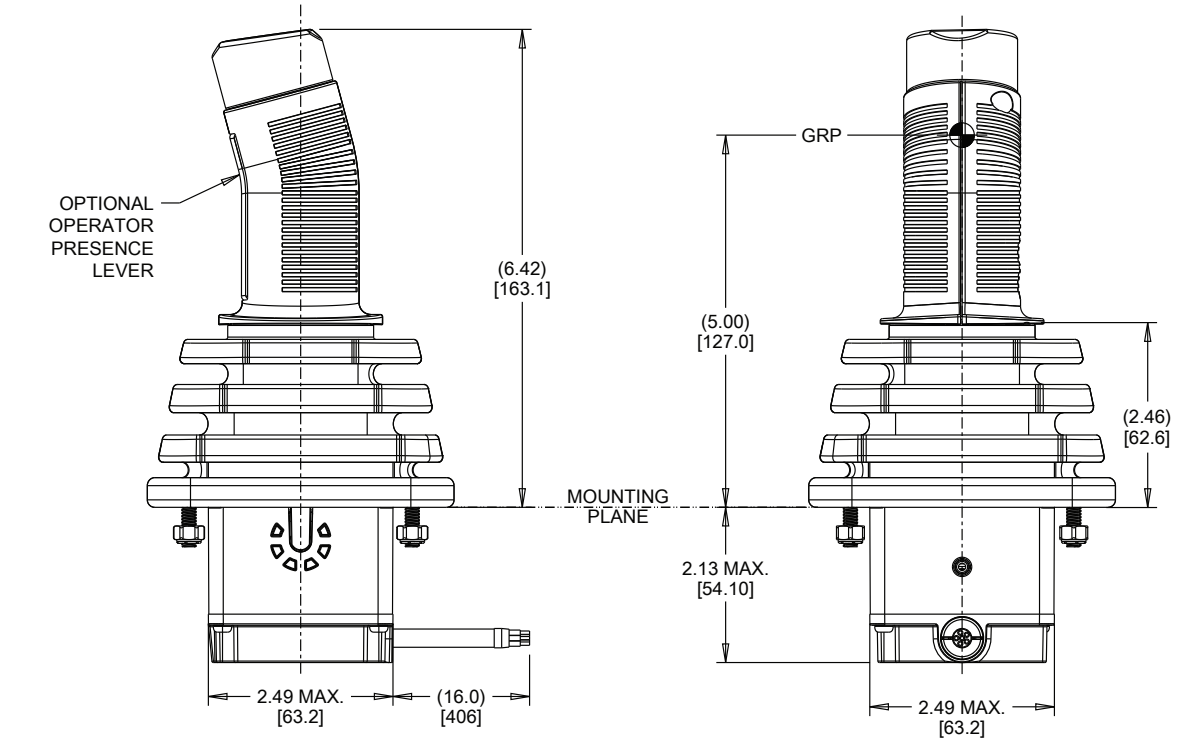
③ HTWS Trigger Switches: positive travel is to the right. Contact factory for additional options.

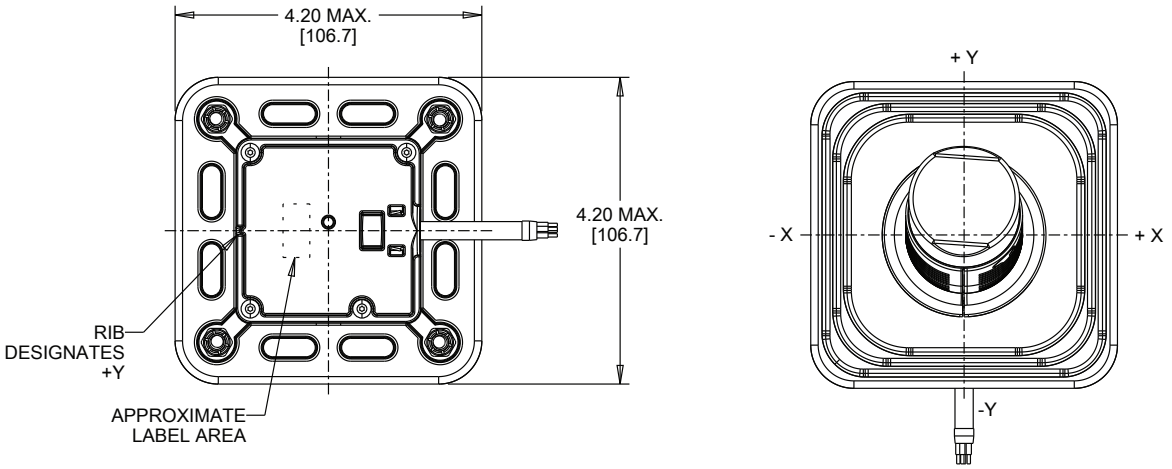
④ White LED's

JOYSTICK WITH GRIP OPTIONS

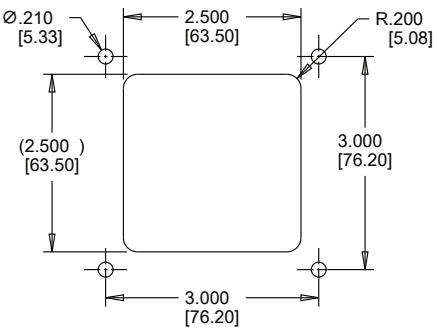
HALL EFFECT JOYSTICK WITH G3-D CONTROL GRIP

HJLG3-D DRAWINGS





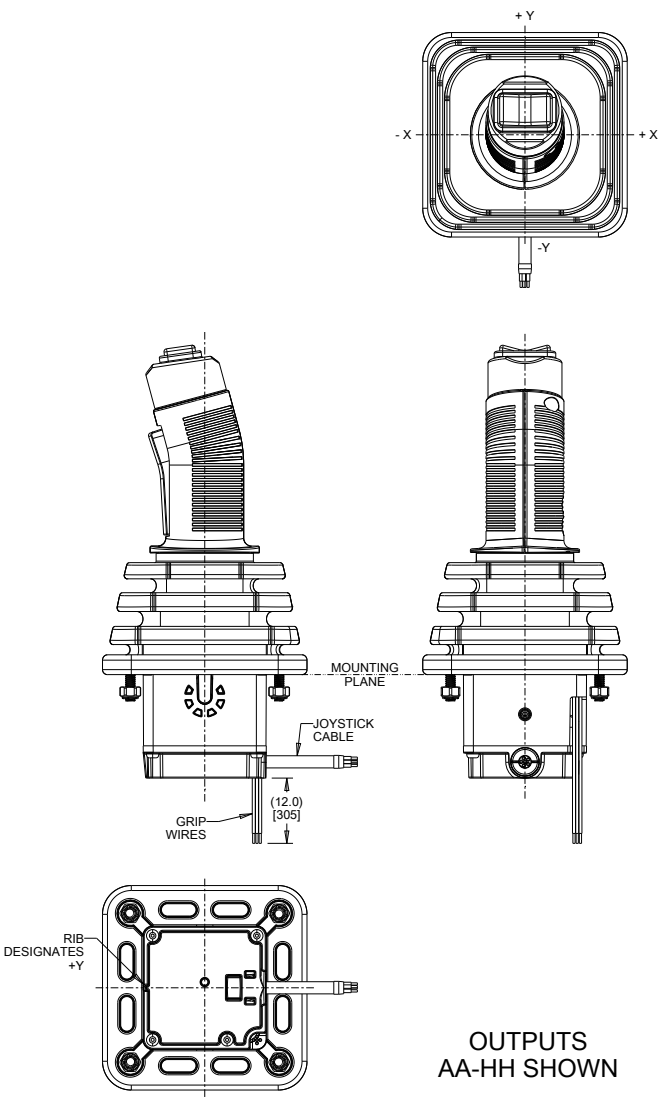
HJLG3 SUGGESTED PANEL OPENING



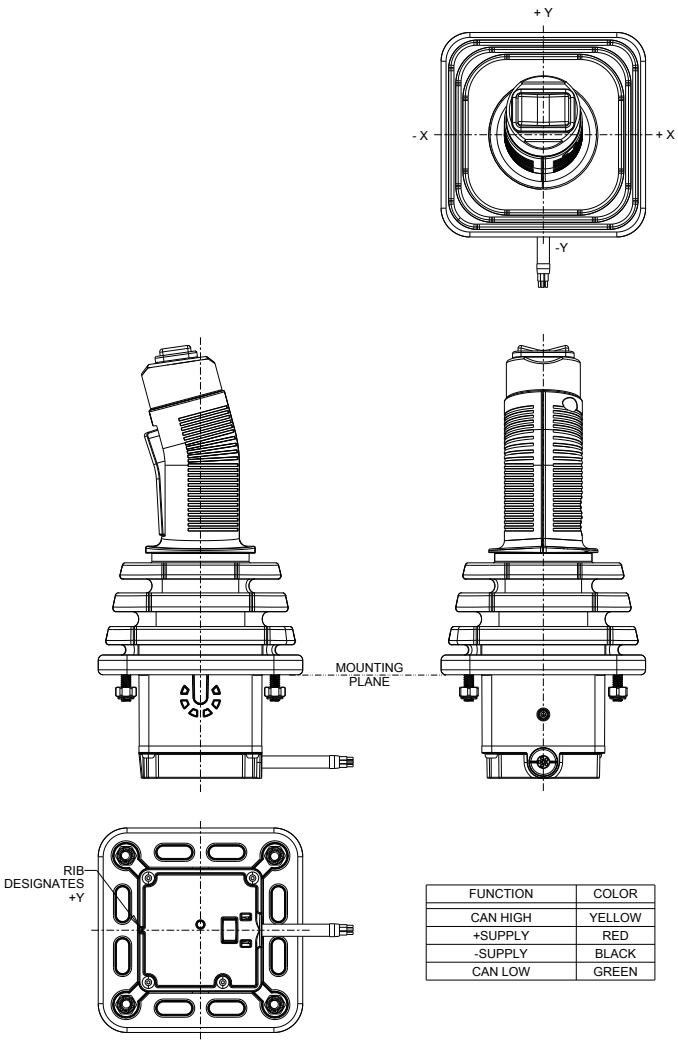
SUGGESTED PANEL OPENING
MAX. PANEL THICKNESS OF .250

HALL EFFECT JOYSTICK WITH G3-D CONTROL GRIP

HJLG3-D OUTPUTS AND JOYSTICK SCHEMATICS

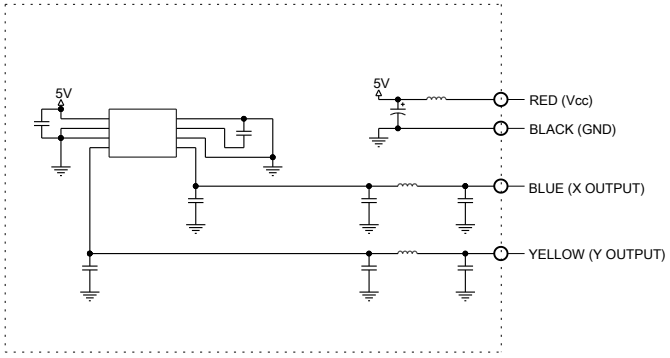


OUTPUTS
AA-HH SHOWN

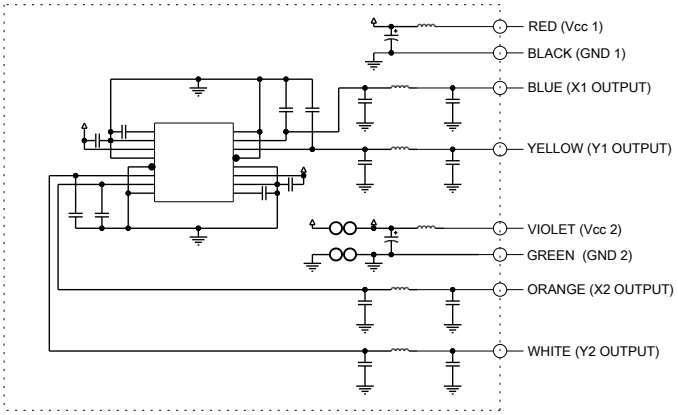


FUNCTION	COLOR
CAN HIGH	YELLOW
+SUPPLY	RED
-SUPPLY	BLACK
CAN LOW	GREEN

OUTPUTS JJ AND KK SHOWN



JOYSTICK SCHEMATIC
(AA AND DD OUTPUTS)



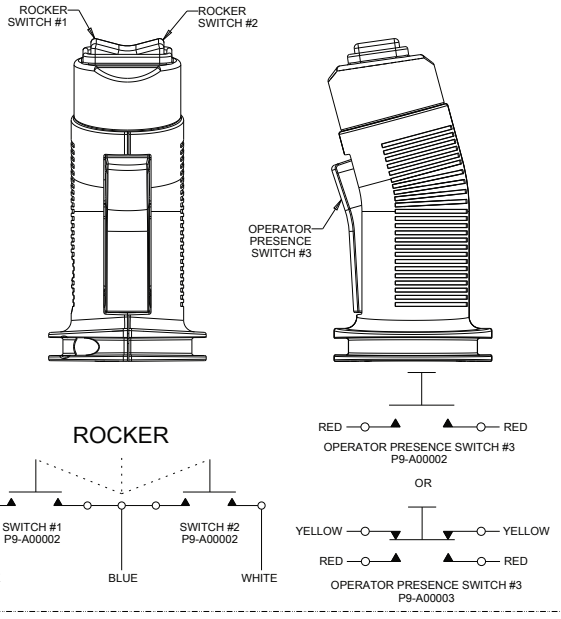
JOYSTICK SCHEMATIC
(BB, CC, EE, FF, GG, & HH OUTPUTS)

JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-D CONTROL GRIP

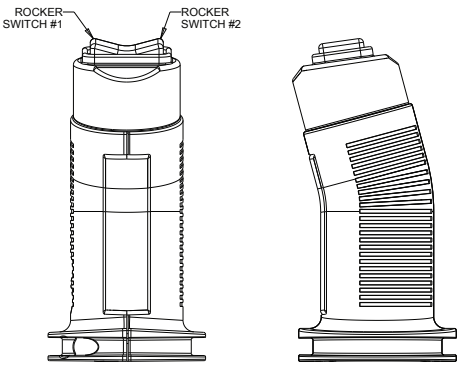
HJLG3-D FACEPLATE OPTIONS

ROCKER AND OPERATOR PRESENCE

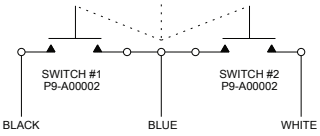


ROCKER

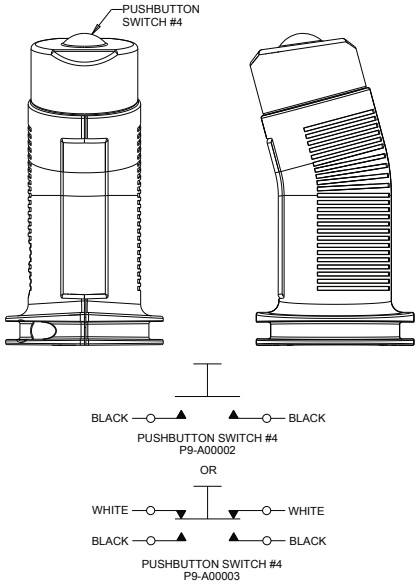
ROCKER



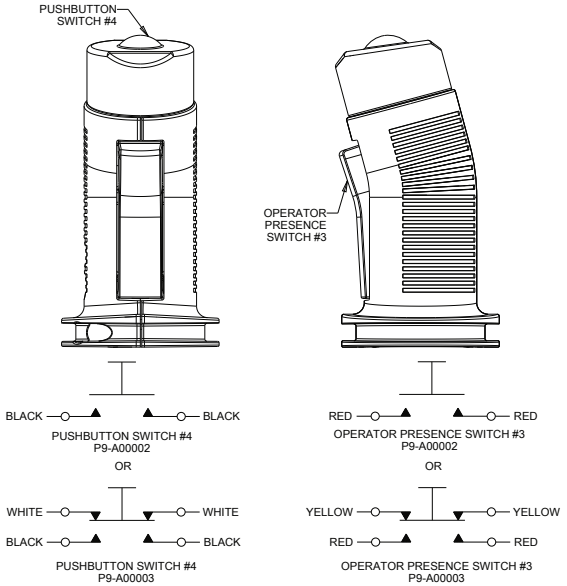
ROCKER



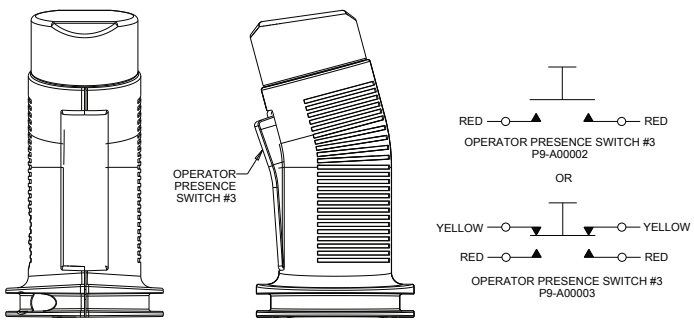
ONE PUSHBUTTON



ONE PUSHBUTTON AND OPERATOR PRESENCE



NO PUSHBUTTON AND OPERATOR PRESENCE



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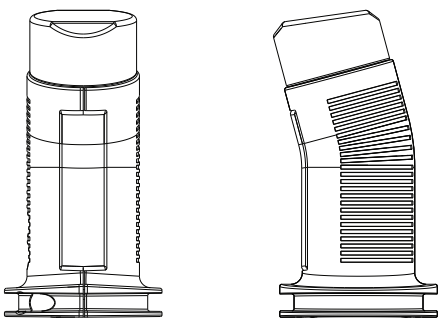

JOYSTICK WITH GRIP OPTIONS

HALL EFFECT JOYSTICK WITH G3-D CONTROL GRIP

HJLG3-D PART NUMBER CODE

HJLG3-D – X XX X XX X

Gating

- **1.** Gated Single Y-Axis; Return to Center
- **2.** Gated Dual Axis; Return to Center
- **3.** Omni-directional; Center Detent Feel
- **4.** Omni-directional; On-Axis and Off-Axis Guided Feel
- **5.** Gated Single Y-Axis; Center Detent Feel
- **8.** Omni-directional; Square Smooth Feel
- **9.** Omni-directional; Square On-Axis Guided Feel

Joystick Output 1*	**Joystick Output 2****
AA. 2.5 +/- 2.0VDC	NONE
BB. 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC
CC. 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC
DD. 2.5 +/- 1.5VDC	NONE
EE. 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC
FF. 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC
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

Operate Force

- **1.** Low
- **2.** Medium
- **3.** High

Faceplate Options

- **11.** Rocker (On)-Off-(On) and Operator Presence
- **22.** Rocker (On)-Off-(On) and No Operator Presence
- **33.** One Pushbutton and Operator Presence
- **44.** One Pushbutton and No Operator Presence
- **55.** No Pushbutton, No Rocker and Operator Presence
- **66.** No Pushbutton, No Rocker and No Operator Presence

OP & PB Configuration

- **1.** None①
- **2.** Normally Open (NO)
- **3.** 2 Circuit (NO/NC)②
- **4.** 2 Circuit (NO/NC)③

① Can only be used with configurations 22 and 66.

② For options 11 (Operator Presence), 44, 55.

③ For option 33.

*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.

HJLG3 GATING ICONS