

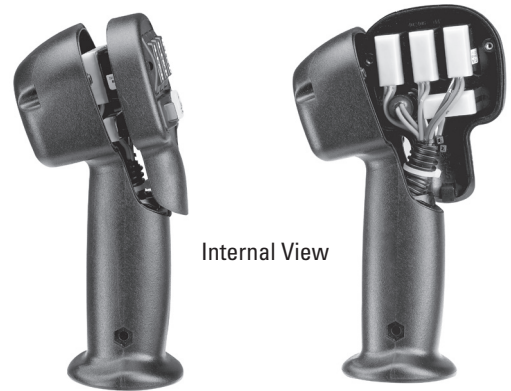
HEAVY EQUIPMENT & MATERIAL HANDLING GRIPS

The G3 Universal Grips can be customized for top-of-the-line machines requiring high switch content, or to provide only basic control functions on lower tier units. The grips are designed to be panel mounted as a fixed control grip or mounted on an OTTO JH, JHL or JHM joystick.

The OTTO G3 Universal Grips have a modular design and were developed for use with OTTO's standard pushbuttons, rockers, toggles, Hall effect switches and the JH, JHL and JHM series Hall effect joysticks. The G3 Grips are easily customized with multiple switch configurations, quickly and without tooling charges.

Features:

- **Compatible with the OTTO JH , JHL and JHM series Hall effect Joysticks**
- **Variety of sizes/shapes available**
- **Accommodates a full line of pushbutton, rocker, toggle, HP Hall effect & HPL proportional output series of switches**
- **Various mounting & termination options available**
- **Includes mounting adapter with boot ring (where applicable)**
- **Modular faceplate design reduces the need for tooling charges**

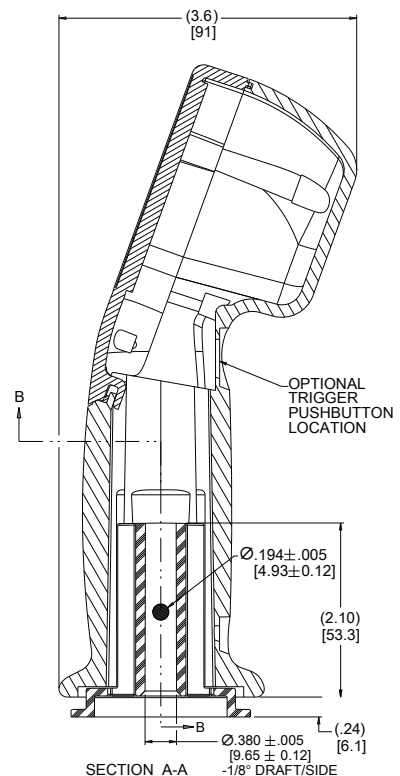
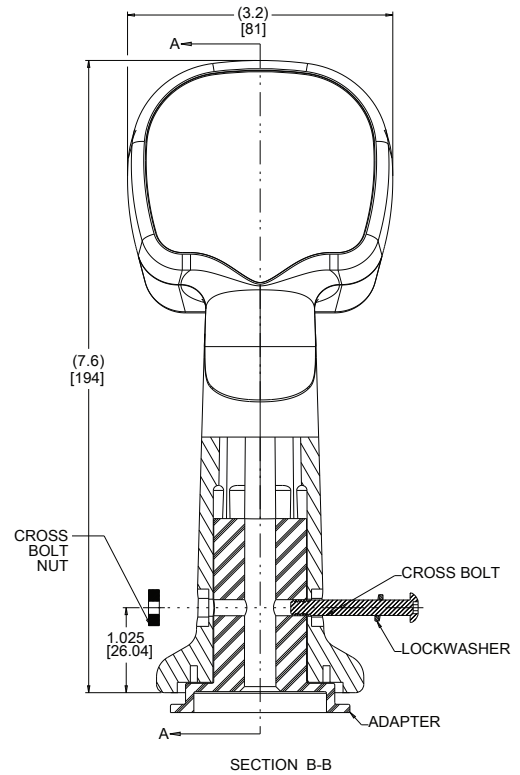


HEAVY EQUIPMENT AND MATERIAL HANDLING GRIPS

G3-B UNIVERSAL GRIP

Standard Characteristics/Ratings:				
ELECTRICAL RATINGS:	Full Load	Logic Level		
K1 Switches	@ 28VDC	@5VDC		
Electrical Rating @ 28 VDC	16 AMP Resistive Load 10 AMP Inductive Load	10mA Resistive Load		
Electrical Life	25,000 Cycles	100,000 Cycles		
P9 Switches	@ 28VDC	@5VDC		
Electrical Rating	5 AMP Resistive Load 3 AMP Inductive Load	10mA Resistive Load		
Electrical Life	25,000 Cycles	1,250,000 Cycles		
Thumbwheels				
Rated at $V_{cc}=5V@20^{\circ}C$; Load = 1ma (4-7K)				
	Units	M	In	Typ Max
Supply Voltage	VDC		4.50	5.00 5.50
Output Voltage – Return to Center Tolerance at Center	VDC @ 5V Vcc		-.10	N/A +.10
Output Voltage – Return to End Tolerance at Rest	VDC @ 5V Vcc		-.25	N/A +.25
Output Voltage Tolerance Full Travel	VDC @ 5V Vcc		-.25	N/A +.25
Supply Current B=0, Vcc=5V, Io=0	mA		N/A	N/A 10
MECHANICAL RATINGS				
K1 Switches				
Mechanical Life				100,000 Cycles
P9 Switches				
Mechanical Life				1,250,000 Cycles
Thumbwheels				
Mechanical Life (Full Forward to Full Back)				3,000,000 Cycles (Return to Center) 1,000,000 Cycles (Return to End) 250,000 Cycles (Friction)
	Units	Min	Typ	Max
Operating Force (25°C at the Top of Roller)	OZ	8	12	16
Initial Operating Force - Friction (25°C at the Top of Roller)	OZ	2	4	6
Max Allowable Radial Load	LBS	N/A	N/A	30.0
Travel		± 40 Degrees		
ENVIRONMENTAL:				
Operating Temperature:	Units	Min	Typ	Max
	° C	-40*	20	85
K1 Switches				
Switch Seal Integrity		Watertight per IP68S (1 meter) and IP69K		
P9 Switches				
Switch Seal Integrity		Watertight per IP68S (1 meter) and IP69K		
Thumbwheels				
Electronics Seal Integrity		Watertight per IP68S (1 meter)		
Mechanical Seal Integrity		Unsealed		
Grip				
Seal Integrity		Unsealed		
MATERIALS:				
Handle	Thermoplastic, Glass Reinforced, Black			
Faceplate	Thermoplastic, Glass Reinforced, Black			
Mounting Hardware	#10 Crossbolt with Nut and Lockwasher			
Wires	22 AWG, UL Style 1569, (20" Long)			

* Minimum operating temperature is -30°C when a K1 Switch is installed.

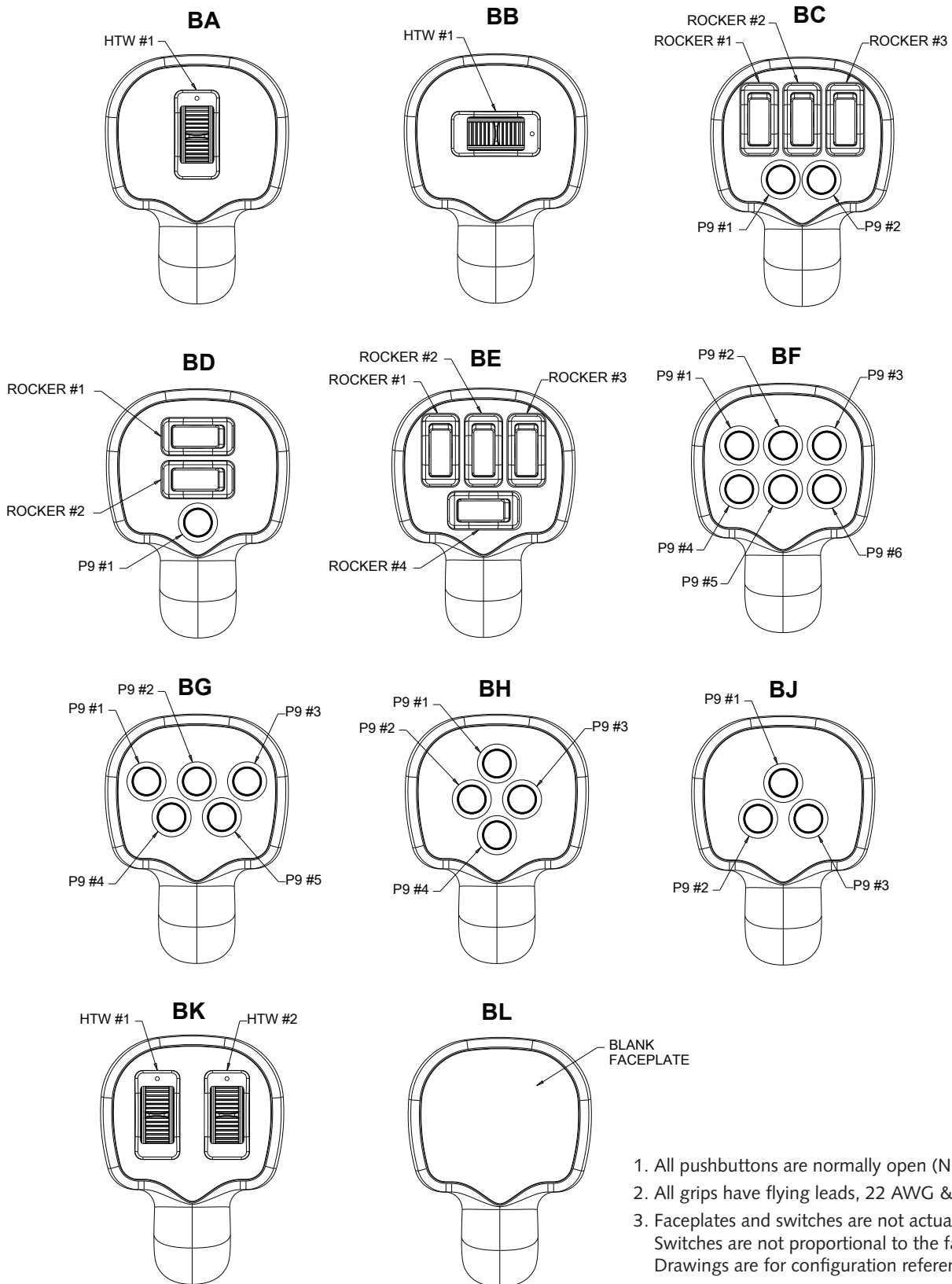


Note: All dimensions are for reference only.

Specifications Subject To Change Without Notice

STANDARD FACEPLATES

G3-B UNIVERSAL GRIP SWITCH CONFIGURATIONS



1. All pushbuttons are normally open (NO).
2. All grips have flying leads, 22 AWG & 20" long.
3. Faceplates and switches are not actual size. Switches are not proportional to the faceplates. Drawings are for configuration reference only.

HEAVY EQUIPMENT & MATERIAL HANDLING GRIPS

G3-B UNIVERSAL GRIP PART NUMBER CODE

	G3-B	X	XX	X	X	X	X	X	Part Number Code Continued Below
Configuration	Switches	Trigger Pushbutton in Handle	K1 Rocker #1 Style - Black *	K1 Rocker #2 Style - Black *	K1 Rocker #3 Style - Black *	K1 Rocker #4 Style - Black *			
1. Grip With Adapter	See Configuration Sheet on next page	1. None 2. Black	1. None 2. On-Off 3. (On)-Off 4. On-Off-On 5. (On)-Off-(On)	1. None 2. On-Off 3. (On)-Off 4. On-Off-On 5. (On)-Off-(On)	1. None 2. On-Off 3. (On)-Off 4. On-Off-On 5. (On)-Off-(On)	1. None 2. On-Off 3. (On)-Off 4. On-Off-On 5. (On)-Off-(On)	1. None 2. On-Off 3. (On)-Off 4. On-Off-On 5. (On)-Off-(On)		

* () denotes momentary. On position or momentary position is up or to the right. Contact factory for rocker legends and additional color options.

G3-B PART NUMBER CODE CONTINUED

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

1 = HTW-1J12X22***
2 = HTWF-1A12X22***
3 = HTWE-1A12X22***

** Positive travel is up or to the right. Contact factory for additional options.
***Contact factory for additional options.

HEAVY EQUIPMENT & MATERIAL HANDLING GRIPS

G3-B UNIVERSAL GRIP SCHEMATICS

