

# CS3

## ULTRA COMPACT – EXTREMELY RUGGED JOYSTICK CONTROLLER

**CS3** Hall-effect joystick  
**CS3HD** Heavy duty Hall-effect joystick  
**CS3B/B** Bang / bang

### Construction:

The **CS3** is an extremely rugged Joystick in an ultra-compact and versatile design. The durable housing and center pivot design make this device resistant to abuse and ideally suited for high duty cycle applications.

1, 2 and 3 axis control is available as well as a variety of standard and custom handles and grips with push-buttons and levers. Both separate and simultaneous operation of each axis is achieved with standard gate patterns.

### Application:

For use on industrial vehicles, both off and on highway including excavators, fork-lifts, bucket trucks, truck mounted cranes, construction, agricultural, mining, forestry, airport ground support equipment, scissor lifts, boom lifts and aerial work platforms.

### Features:

- Compact and rugged construction design
- Proprietary blend, ultra-tough boot
- Environmentally sealed mounting and corrosion resistant components
- Smooth high-life non-biasing compression style spring return
- Single and dual axis operation
- Long life Hall-effect technology
- Hall-effect meets or exceeds CE EMC requirements
- Conformal coated electronics to resist moisture

### Options:

- Drop-in or panel mount options
- Variety of handle options including sealed push-button and lever actuated deadman
- Cross gate
- 7-30 VDC Supply
- Redundant output
- CANopen, J1939 or basic CAN protocols
- Bang / bang design – 2 or 4 11A micro-switches per axis
- HD design – Robust internal mechanism including 10mm diameter operating shaft, heavy duty shaft retainer and heavy duty anti-rotation pin



**CS3 with BH Handle and  
Hall-effect sensors.**

# CS3 ORDERING INFORMATION

<b>Drive Arrangement:</b>	Single axis and double axis
<b>Basic Assembly:</b>	2.4" [61mm] shaft length x 0.32 [8mm] shaft diameter and boot supplied standard
<b>HD Assembly:</b>	2.4" [61mm] shaft length x 0.40 [10mm] shaft diameter and boot supplied standard
<b>Handle:</b>	1.25" [32mm] dia. Round ball
<b>Handle Action:</b>	Spring Return
<b>Output:</b>	Proportional – Hall-effect
<b>Optional:</b>	Bang / bang
<b>Immunity:</b>	Hall-effect meets or exceeds CE EMC requirements

## CS3 Technical Data

### Mechanical:

- **Mechanical Life:** 20 million cycles
- **Handle Deflection:** ±20 degrees
- **Gear Ratio:** Direct drive
- **Mounting Footprint:**
  - **Standard Panel Mounting:** 3.5" [90mm] x 3.5" [90mm]
  - **Optional Drop-in Mounting:** 2.7" [69mm] x 2.7" [69mm]

### Environmental:

- **Operating Temperature:** -25° to +70°C
- **Storage temperature:** -40° to +70°C
- **Degree of protection above panel:** IP54
- **EMC Emissions:**  
Complies with **EN61000-6-4:2007**  
Class A Group 1, 80 – 1000 MHz
- **EMC Immunity:**  
Complies with or exceeds **EN61000-6-2:2005**  
expanded to include:  
RFI Immunity of 100 V/M @ 80 – 1000 MHz  
ESD Immunity of 15 Kv air, 8 Kv contact

### Electrical:

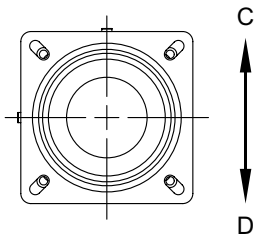
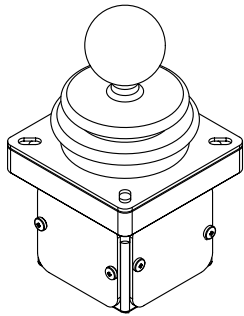
- **Hall-Effect:**
  - **Supply Voltage:** 4.5 to 5.5VDC
  - **Output Voltage:** Ratiometric 0.5 – 2.5 – 4.5V ±0.15V @ 5.0V supply
  - **Output Current:** 10 mA
  - **Power Consumption:** 20 mA @ full load
  - **Connections:**  
1 Axis: 20 AWG, UL1430 wire with AMP Mate-N-Lock connector (1-480707-0), 4" lead length  
2 Axis: 20 AWG, UL1430 wire with Molex mini-fit connector (39-01-2100), 14" lead length

### Options:

- **Handle:** See CS3 Mtg Dimensions & Handle Options
- **Gates:** Cross gate
- **Hall-Effect:**
  - Option 1:**  
Supply Voltage: 7 to 30VDC  
Output Voltage: 0.5 – 2.5 – 4.5V ±0.15V
  - Option 2:**  
Supply Voltage: 4.5 to 5.5VDC  
Output Voltage: Redundant - Ratiometric 0.5 – 2.5 – 4.5V ±0.15V complementary @ 5.0V supply
- **CAN bus:** CANopen or J1939 protocols
  - 4 Analog inputs, 8 digital inputs, 2 digital outputs
  - **Connections:** See ESS408 CAN based interface module board literature.
- **Pushbutton:** Sealed pushbutton, momentary, 1 N.O., 2 A @ 24VDC
- **Bang / bang:**
  - **Contacts:** 11A 125, 250VAC form C V series snap-action switch with .187" quick connect tab (4 max. per axis)

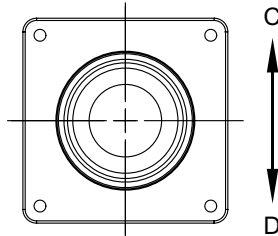
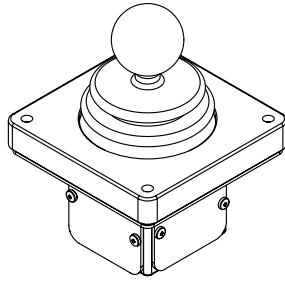
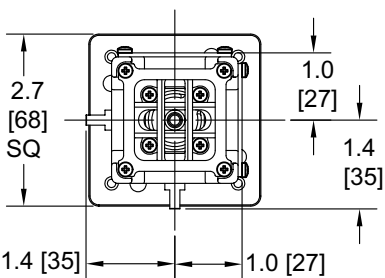
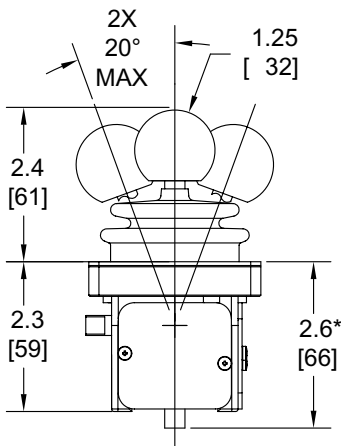
Please consult factory for other available options.

# CS3 & CS3HD HALL-EFFECT DIMENSIONS



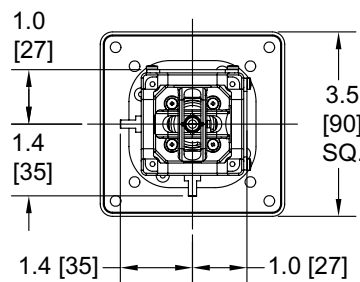
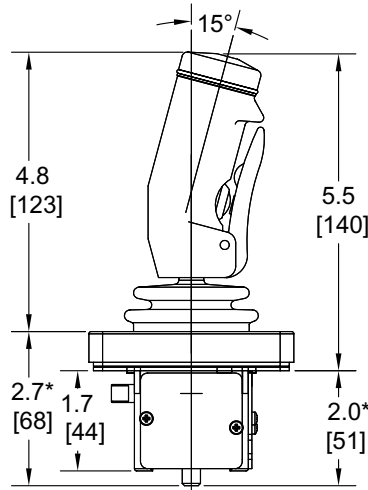
B ← A

**ROUND BALL HANDLE**

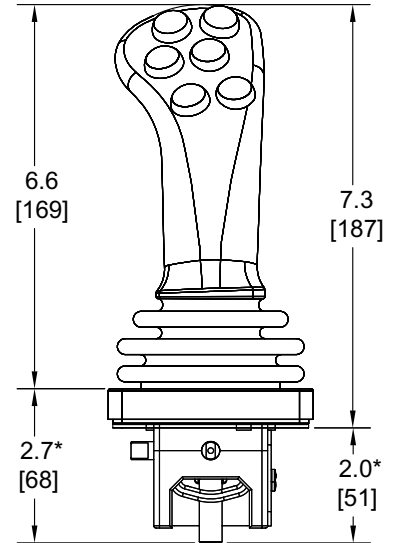


B ← A

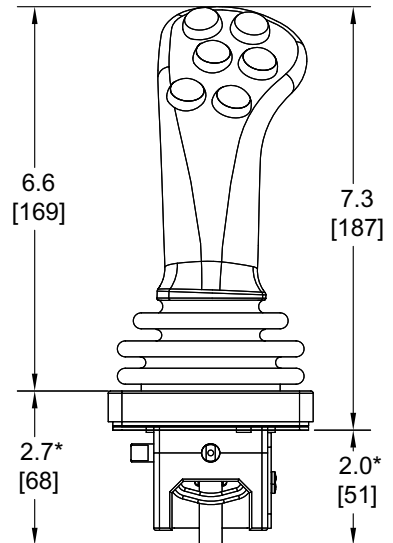
**BH HANDLE**



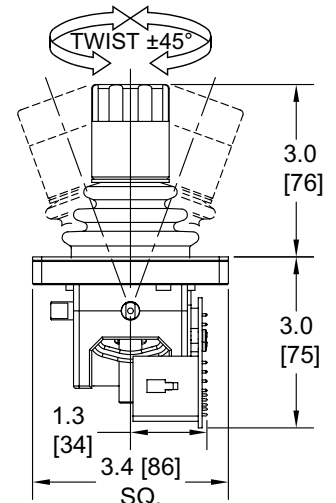
**FG6R HANDLE RIGHT**



**FG6L HANDLE LEFT**



**TH20 HANDLE WITH ESS408 CAN INTERFACE MODULE BOARD**

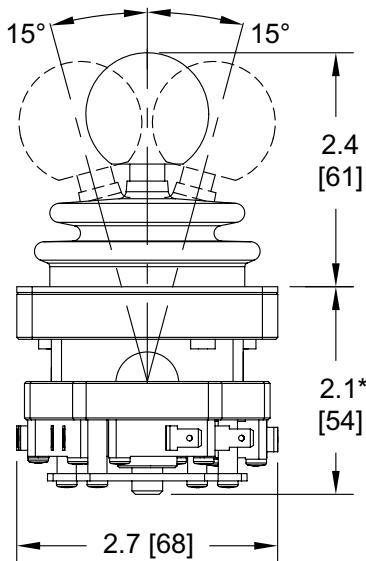
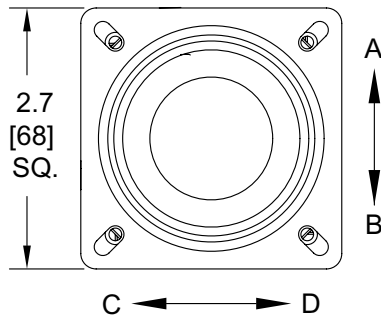
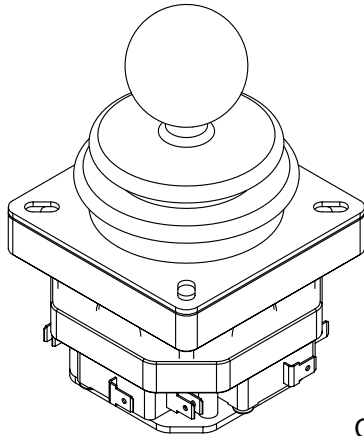


**\*NOTE:**

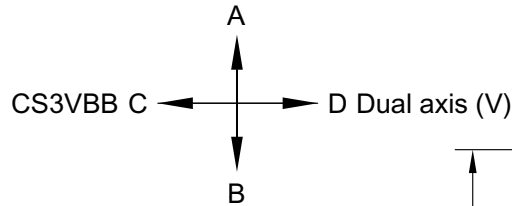
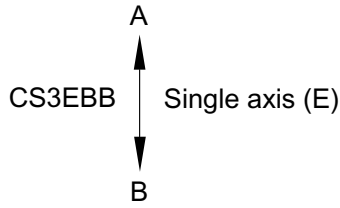
If your controller configuration includes a wired handle option add 1" [25.4mm] to the depth to insure the wire service loop has panel clearance at base of shaft and that the wire service loop can operate unobstructed in all directions.

# CS3B/B DIMENSIONS

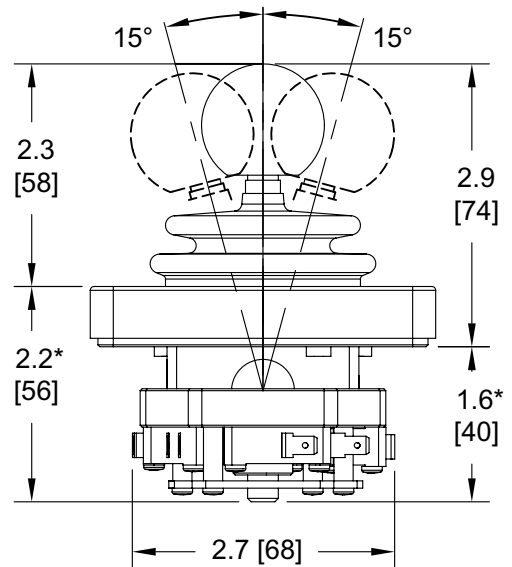
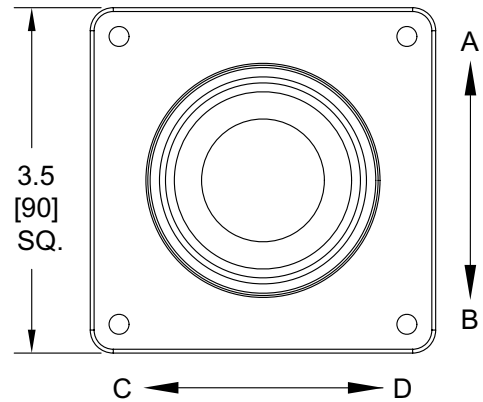
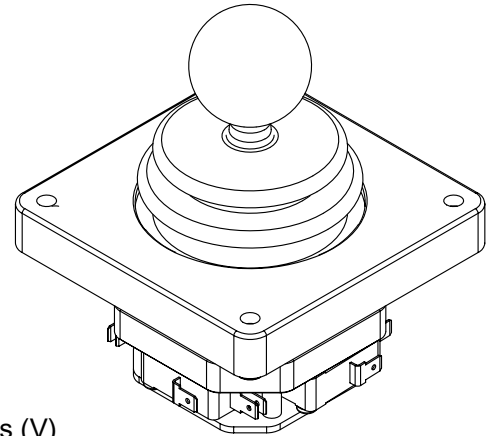
## CS3 BANG / BANG PANEL MOUNTING



## ARRANGEMENT



## CS3 BANG / BANG DROP-IN MOUNTING

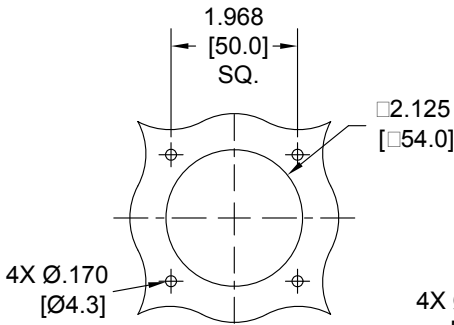


**\*NOTE:**

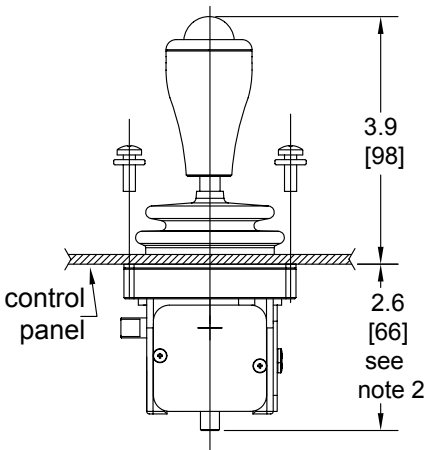
If your controller configuration includes a wired handle option add 1" [25.4mm] to the depth to insure the wire service loop has panel clearance at base of shaft and that the wire service loop can operate unobstructed in all directions.

# CS3 & CS3HD MOUNTING DIMENSIONS AND HANDLE OPTIONS

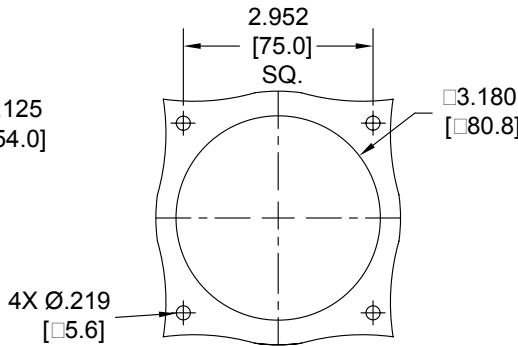
**MOUNTING STYLE 1:  
PANEL MOUNTING**



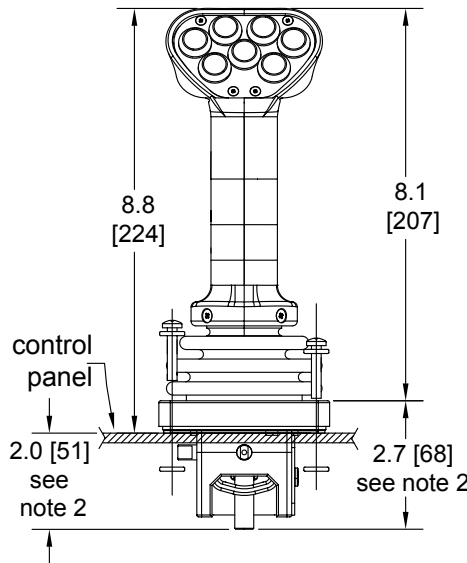
**MG27 HANDLE**



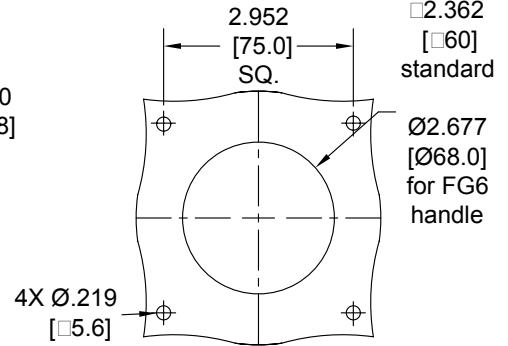
**MOUNTING STYLE 2:  
DROP-IN MOUNTING**



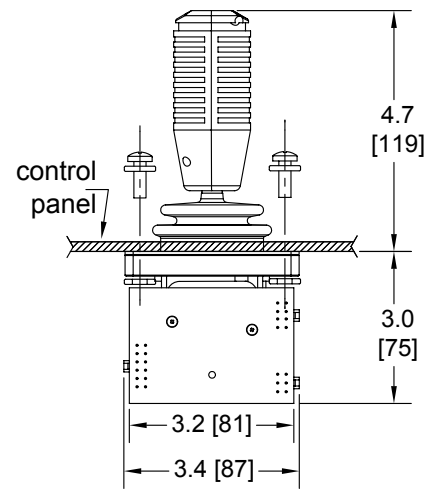
**FG5 HANDLE**



**MOUNTING STYLE 3:  
PANEL MOUNTING**



**RHS HANDLE WITH ESS408 CAN  
INTERFACE MODULE BOARD**



## HANDLE OPTIONS

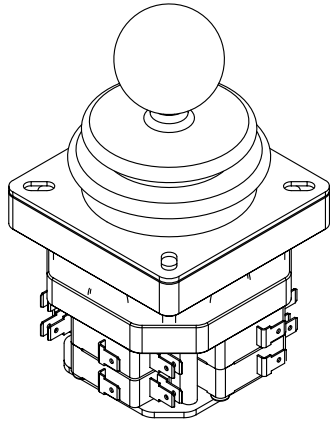
MOUNTING STYLE	CS3 & CS3HD								CS3HD ONLY	
	Ball Ø1.25 [32]	TH20	MG27 MG27V	BH	RHS	RHNC 1.8[46] Base Ø	RHN 2.25[57] Base Ø	MG13	FG6L FG6R	FG5
<b>STYLE 1:</b> standard 5 hole panel mounting with 2.125Ø [54.0Ø] center hole	X	X	X	X	X	X				
<b>STYLE 2:</b> 5 hole mounting with 3.180Ø [80.8Ø] center hole for drop-in mounting	X	X	X	X	X	X	X	X		
<b>STYLE 3:</b> 5 hole mounting with 2.362Ø [60.0Ø] center hole for panel mounting	X	X	X	X	X	X	X	X	2.677Ø [68.0Ø]	See note 1.

**NOTES:**

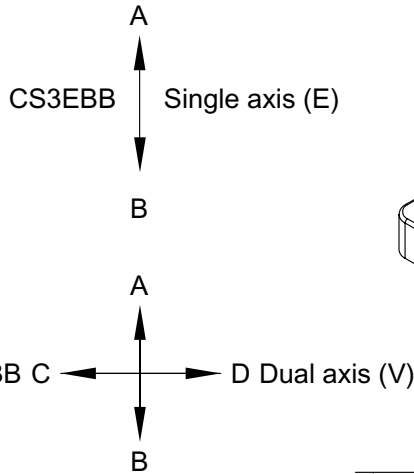
1. ESS408 CAN interface module board must be remote mounted when used with FG5 handle.
2. If your controller configuration includes a wired handle option add 1" [25.4mm] to the depth to insure the wire service loop has panel clearance at base of shaft and that the wire service loop can operate unobstructed in all directions.
3. Consult factory for other handle options.

# CS3B/B DIMENSIONS WITH DOUBLE SWITCHES

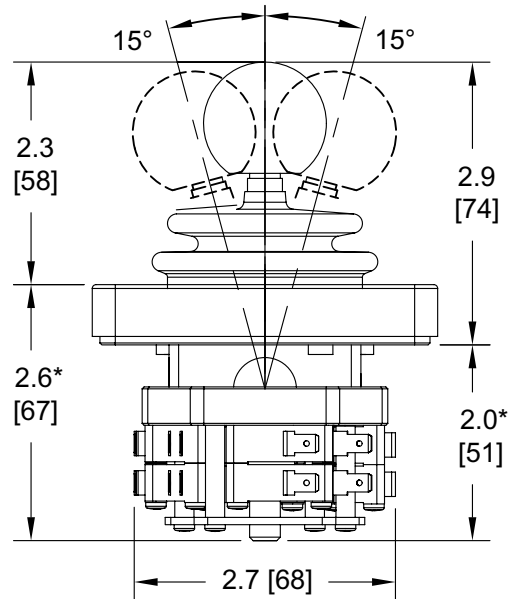
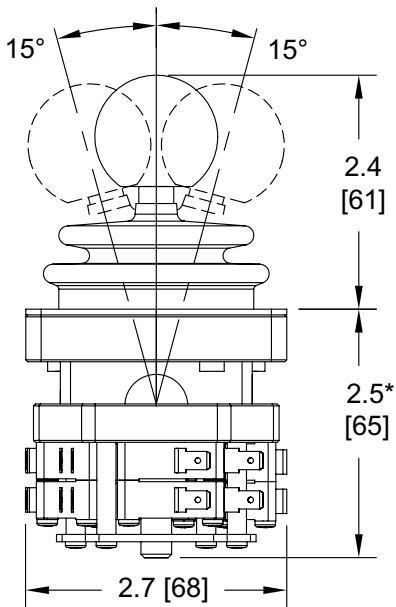
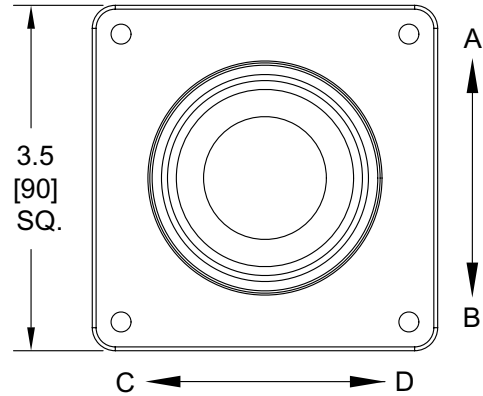
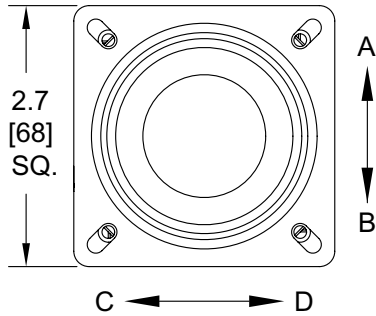
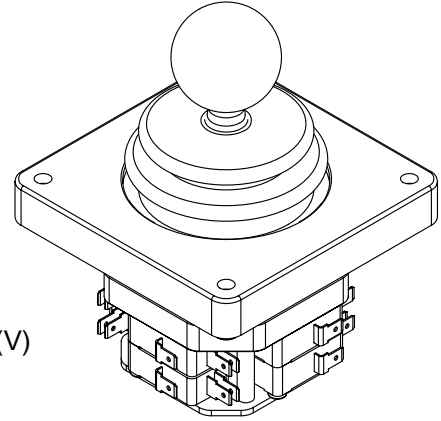
**CS3 BANG / BANG WITH  
DOUBLE MICRO-SWITCHES  
PANEL MOUNTING**



**ARRANGEMENT**



**CS3 BANG / BANG  
WITH DOUBLE MICRO-SWITCHES  
DROP-IN MOUNTING**



**\*NOTE:**

If your controller configuration includes a wired handle option add 1" [25.4mm] to the depth to insure the wire service loop has panel clearance at base of shaft and that the wire service loop can operate unobstructed in all directions.