FINGER JOYSTICK WITH PUSHBUTTON OPTION

3 MILLION CYCLE MECHANICAL LIFE, PUSHBUTTON OPTION

HTLT4 with
Center Pushbutton

OTTO's HTLT Series miniature Hall effect joystick is a proportional linear output finger joystick with a pushbutton option. With a lower base price than the HTL, the HTLT features 8 different button styles, multiple output configurations and 3 mounting options including top mount with threaded housing.

Gating options include omnidirectional square on axis guided feel, gated single axis return to center, gated dual axis return to center and omnidirectional round smooth feel. The HTLT offers excellent tactile feedback and is available with a mechanical seal of either dusttight or watertight per IP68S. All electronics are sealed to IP68S.

Featuring contactless Hall effect technology, the HTLT is designed to withstand harsh environments and works well in the industrial, medical, unmanned vehicle and off-highway industries for applications such as remote controls, armrest integration, control panels and belly boxes.

Features:

- **One/two axis gated or 360º**
- **Pushbutton option**
- **Electronics sealed to IP68S**
- **Dusttight or Watertight per IP68S option**
- **3.3V SPI output option**
- **Single or redundant analog output options**
- **PWM output option**
- **3 million cycle mechanical life**
- **Tested for harsh environments**
- **Great for industrial, medical, unmanned vehicle and off-highway industries**

Standard Characteristics/Ratings:

ELECTRICAL RATINGS:

Analog Joystick: Rated at Vcc = 5V @ 20°C Load = 1mA (4.7KΩ)

Electrical	**Units**	**Min**	**Typ**	**Max**
Supply Voltage	VDC	4.50	5.00	5.50
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
Supply Current Outputs "AA" & "DD" B=0, Vcc=5V, Io=0	mA	N/A	10.00	12.00
Supply Current Outputs "BB", "CC", "EE", "FF", "GG" & "HH" B=0, Vcc=5V, Io=0	mA	N/A	20.00	24.00

SPI Joystick

Electrical	**Units**	**Min**	**Typ**	**Max**
Supply Voltage - Output JJ	VDC	3.15	3.3	3.45
Supply Voltage - Output KK	VDC	4.50	5.00	5.50

Pushbutton Circuit:	Normally Open Tact Switch

MECHANICAL RATINGS

Joystick: Mechanical Life All Directions	3,000,000 Cycles
Joystick: Mechanical Life All Directions (Friction Held)	1,000,000 Cycles

Mechanical	**Units**	**Min**	**Typ**	**Max**
Travel Angle	Degrees	19.0	20.0	21.0
Over Travel Angle	Degrees	0.5	1.0	1.5
Operating Force (w/ Boot) at 0.8" from Flange, @ 20° C*	OZ	5.0	8.0	16.0
Max Allowable Vertical Force on Button	LBS	N/A	N/A	25.0
Max Allowable Radial Force on Top of Knob*	LBS	N/A	N/A	25.0
Max Allowable Torque on Button About Shaft Axis*	IN-LBS	N/A	N/A	5.5

* Button style "A" has a max allowable radial force of 10 lbs and max allowable torque of 3 in-lbs

Pushbutton:

Mechanical Life	3,000,000 Cycles			
Button Style 8 Operating Force @ 20° C	OZ	6.0	8.0	10.0
Button Style 9 Operating Force @ 20° C	OZ	8.0	14.0	16.0

ENVIRONMENTAL:

Operating Temperature:	° C	-40	20	85

Joystick:	
Mechanical Seal	ISO 20653, Dusttight or watertight per IP68S (Button styles 2,5,6,8 and 9)
Drop	1 meter max to concrete
EMI/RFI Withstand	Per SAE J1113, Contact Factory for Details
Pushbutton:	
Mechanical Seal	ISO 20653, Watertight per IP68S Panel Seal (Button styles 8 and 9)

ELECTRONICS

Seal Integrity:	Electronics IP68S

MATERIALS:

Housing + Flange:	Thermoplastic
Button:	Thermoplastic
Bellows:	Silicone, black
Pushbutton Wires:	24 AWG
Mounting Hardware:	1-27 Hex nut (.09 Thick) included (with threaded base) Recommended max torque = 7 IN-LBS. or 4x #4-40 x .38 screws with square mounting flange

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HTLT2 PART NUMBER CODE

HTLT2 – X X X X X X XX X X

Button Style	Case Style	Seal*	Travel	Gating	Operating Force	Output 1 ①	Output 2 ②	Termination	Button Color
1. Castle	**1.** 1-27 Thread	**1.** Dusttight	**1.** 20°	**1.** Single Axis Return to Center	**1.** 16 oz	**AA.** 2.5 +/- 2.0VDC	NONE	**1.** Wire Leads 22 AWG UL 1569***	**2.** Black
2. External Castle Boot	**2.** 1" Smooth	**2.** Watertight Panel Seal**		**2.** Single Axis - Friction Held		**BB.** 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	**2.** Wire Leads 24 AWG SAE AS22759***	
3. Short Double Stadium						**CC.** 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC		
4. Tall Concave Stadium						**DD.** 2.5 +/- 1.5VDC	NONE		
5. External Bat Handle Boot						**EE.** 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC		
6. External Smooth Boot						**FF.** 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC		
8. External Castle Boot with Pushbutton						**GG.** 0.5 - 4.5VDC	0.5 - 4.5VDC		
9. External Castle Boot with High Force Pushbutton						**HH.** 1.0 - 4.0VDC	1.0 - 4.0VDC		
A. Tall Metal Bat Handle****						**JJ.** SPI, 3.3V Supply	NONE		
						KK. SPI, 5V Supply	NONE		

***** Electronics sealed to IP68S.

****** Watertight panel sealed option available with button styles 2, 5, 6, 8 and 9.

******* Pushbutton wire leads are 24 AWG, SAE AS22759.

******** Button style "A" has a max. allowable radial force of 10 lbs and max allowable torque of 3 in-lbs.

① Outputs are from the center to the full travel position in each direction. Options "AA", "BB", "CC", "DD", "EE" and "FF" provide increased voltage in +Y and decreasing voltage in -Y. Direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+Y -Y) from 2 outputs per axis

② 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.

HTLT4 PART NUMBER CODE

HTLT4 – X X X X X X XX X X

Button Style	Case Style	Seal*	Travel	Gating	Operating Force	Output 1 ①	Output 2 ②	Termination	Button Color
1. Castle	**1.** 1-27 thread	**1.** Dusttight	**1.** 20°	**1.** Omnidirectional; Square; on Axis Guided Feel	**1.** 8 oz	**AA.** 2.5 +/- 2.0VDC	NONE	**1.** Wire Leads 22 AWG UL 1569***	**2.** Black
2. External Castle Boot	**2.** 1" smooth	**2.** Watertight Panel Seal**		**2.** Gated; Two Axis - Return to Center		**BB.** 2.5 +/- 2.0VDC	2.5 +/- 2.0VDC	**2.** Wire Leads 24 AWG SAE AS22759***	
3. Short Double Stadium				**3.** Omnidirectional; Square; Smooth Feel		**CC.** 2.5 +/- 2.0VDC	2.5 -/+ 2.0VDC		
4. Tall Concave Stadium				**4.** Gated; Two Axis - Friction Held		**DD.** 2.5 +/- 1.5VDC	NONE		
5. External Bat Handle Boot						**EE.** 2.5 +/- 1.5VDC	2.5 +/- 1.5VDC		
6. External Smooth Boot						**FF.** 2.5 +/- 1.5VDC	2.5 -/+ 1.5VDC		
8. External Castle Boot with Pushbutton						**GG.** 0.5 - 4.5VDC	0.5 - 4.5VDC		
9. External Castle Boot with High Force Pushbutton						**HH.** 1.0 - 4.0VDC	1.0 - 4.0VDC		
A. Tall Metal Bat Handle****						**JJ.** SPI, 3.3V Supply	NONE		
						KK. SPI, 5V Supply	NONE		

***** Electronics sealed to IP68S.

****** Watertight panel sealed option available with button styles 2, 5, 6, 8 and 9.

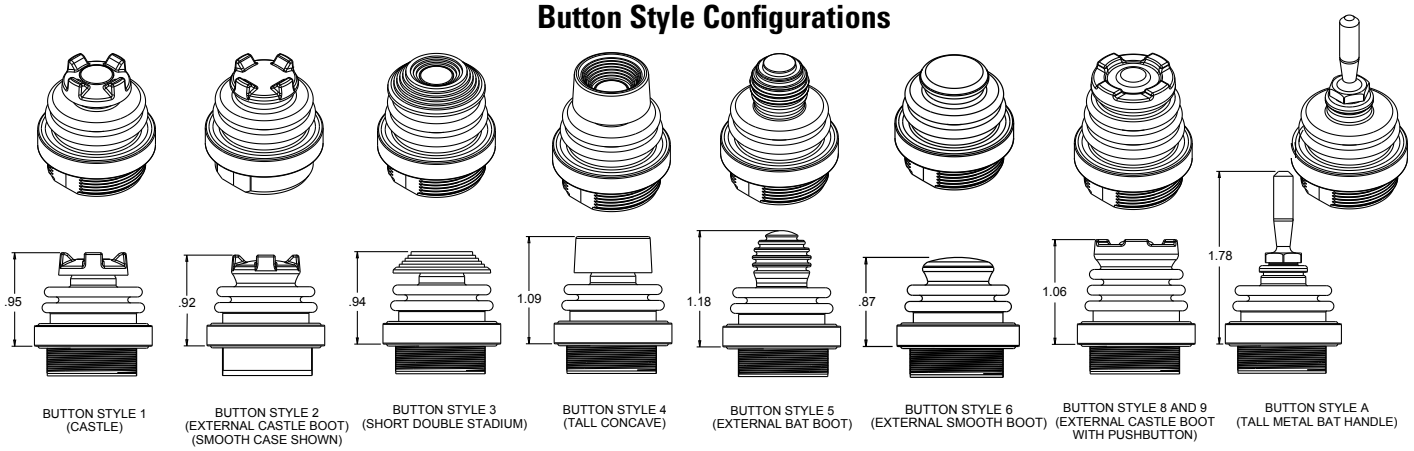
******* Pushbutton wire leads are 24 AWG, SAE AS22759.

******** Button style "A" has a max. allowable radial force of 10 lbs and max allowable torque of 3 in-lbs.

① Outputs are from the center to the full travel position in each direction. Options "AA", "BB", "CC", "DD", "EE" and "FF" provide increased voltage in +X, +Y and decreasing voltage in -X, -Y. Direction from one output per axis. Options "GG" and "HH" provide increasing voltages in all directions (+X, +Y, -X, -Y) from 2 outputs per axis.

② 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.

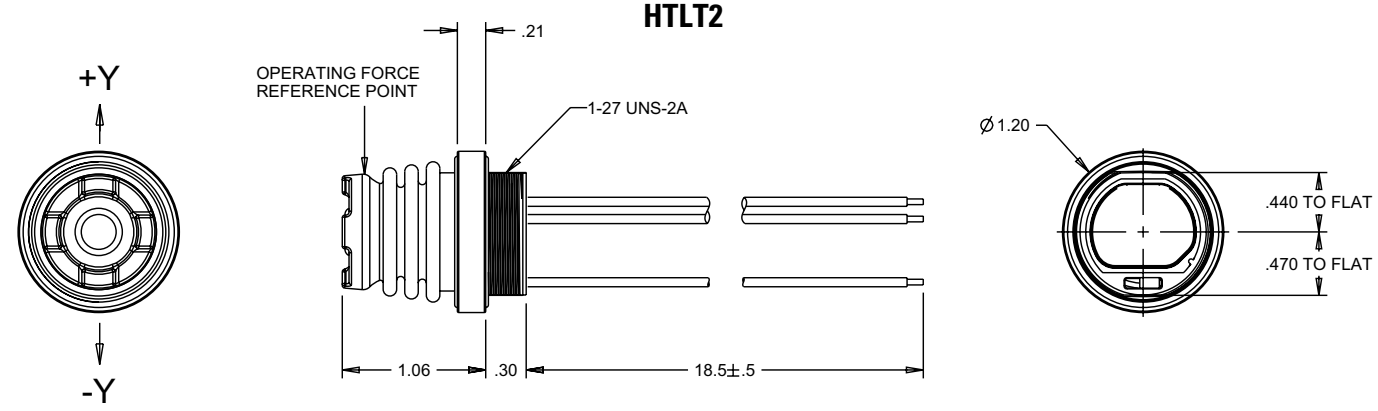
Button Style Configurations



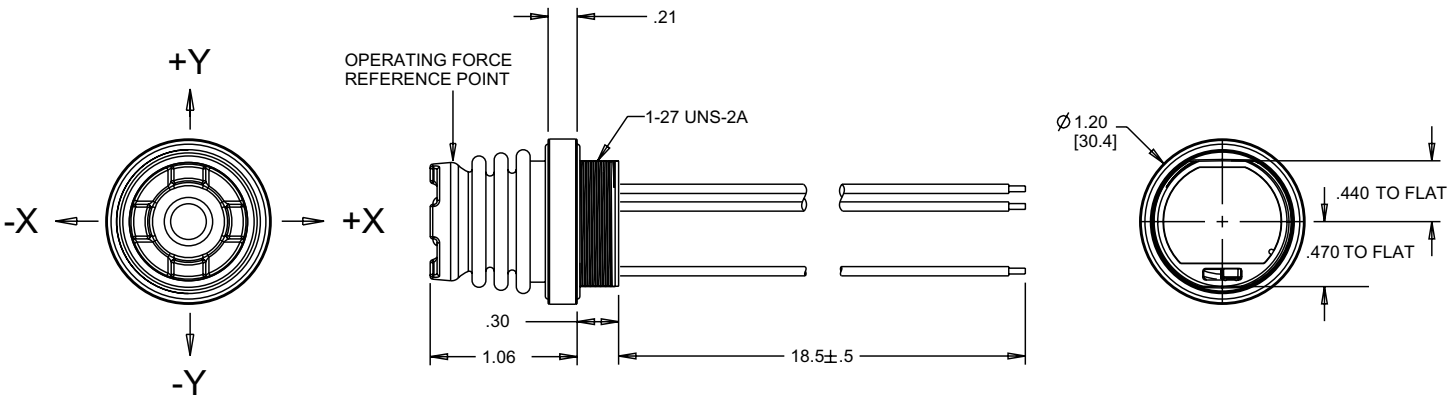
FINGER JOYSTICK WITH PUSHBUTTON OPTION

3 MILLION CYCLE MECHANICAL LIFE, PUSHBUTTON OPTION

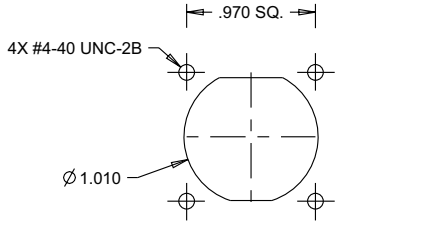
HTLT2



HTLT4



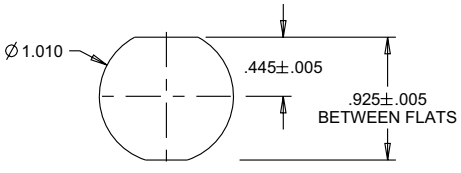
HTLT2 and HTLT4 Panel Footprint



SUGGESTED PANEL OPENING
WHEN USING FLANGE AND SCREWS.

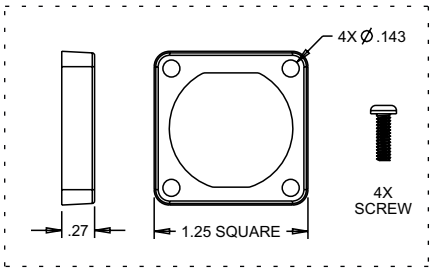
MAX. PANEL THICKNESS OF 0.125
FOR BOTTOM MOUNT

MIN. PANEL THICKNESS OF .100
FOR TOP MOUNT



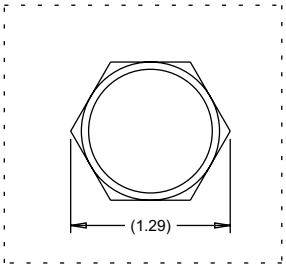
SUGGESTED PANEL OPENING
WHEN USING 1-27 NUT.

MAX. PANEL THICKNESS OF 0.125



1" SMOOTH CASE STYLE HARDWARE
SHIPPED UNASSEMBLED

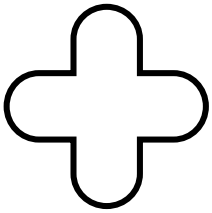
OR



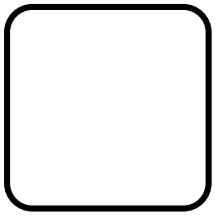
1-27 THREAD CASE STYLE HARDWARE
SHIPPED UNASSEMBLED

HTLT4 Gating Icons

Omnidirectional;
Square On-Axis
Guided Feel
(defined by shading)



Gated;
Two Axis
Return to Center



Omnidirectional;
Square;
Smooth Feel

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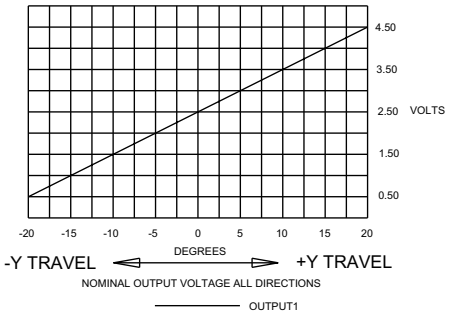
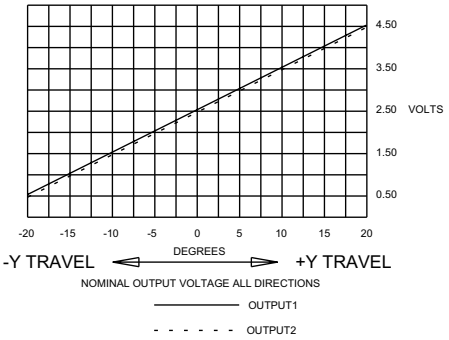
HTLT2

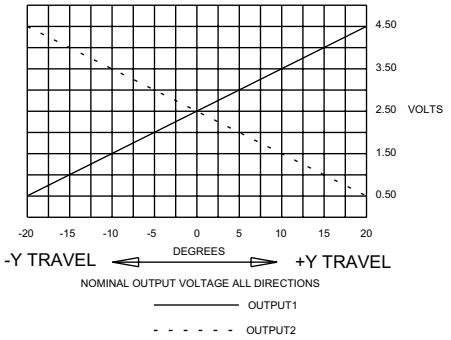
OPTION AA



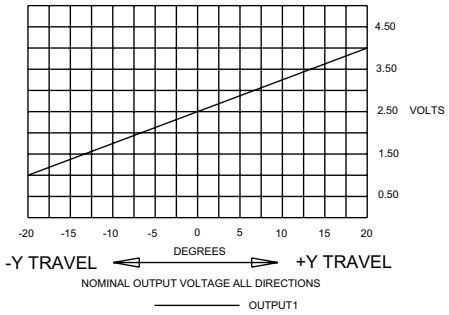
OPTION BB



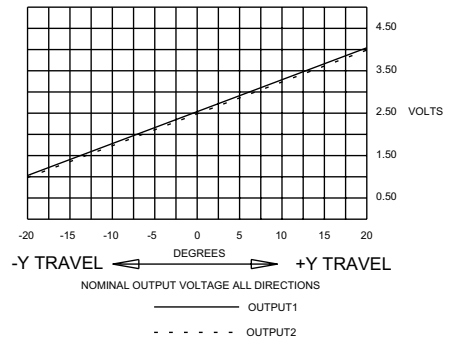
OPTION CC



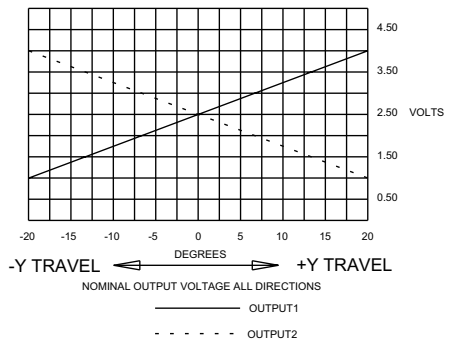
OPTION DD



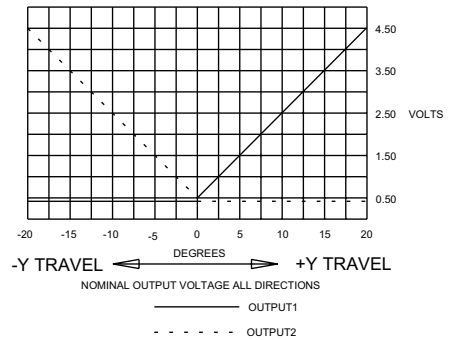
OPTION EE



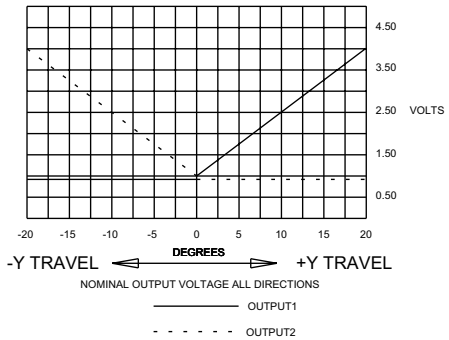
OPTION FF



OPTION GG



OPTION HH

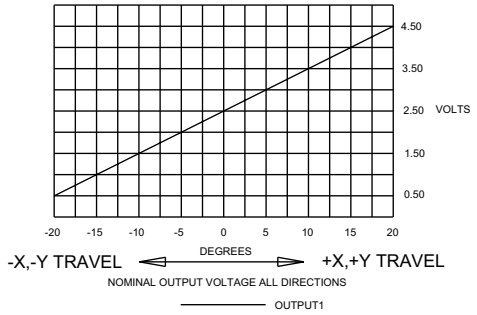


FINGER JOYSTICK WITH PUSHBUTTON OPTION

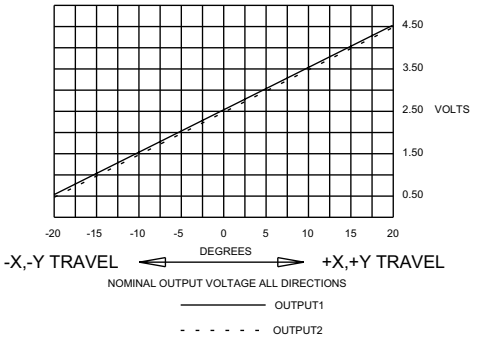
3 MILLION CYCLE MECHANICAL LIFE, PUSHBUTTON OPTION

HTLT4

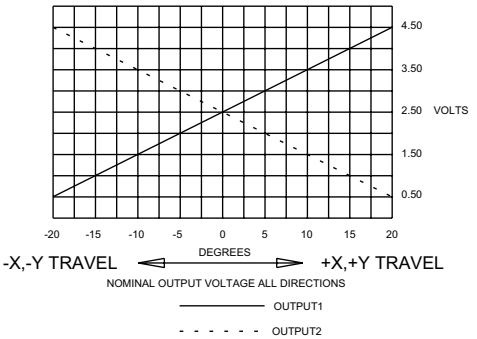
OPTION AA



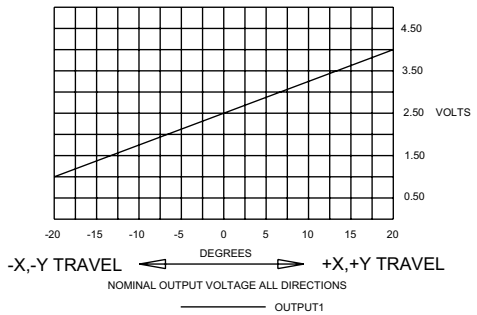
OPTION BB



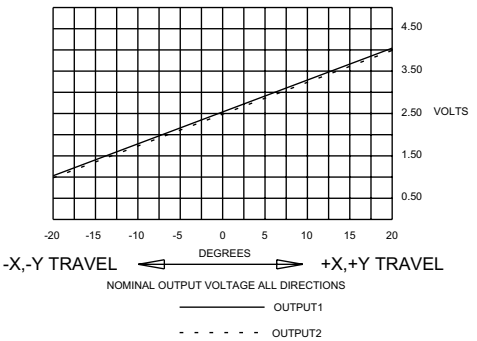
OPTION CC



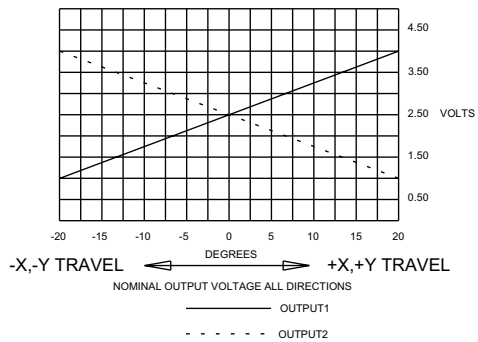
OPTION DD



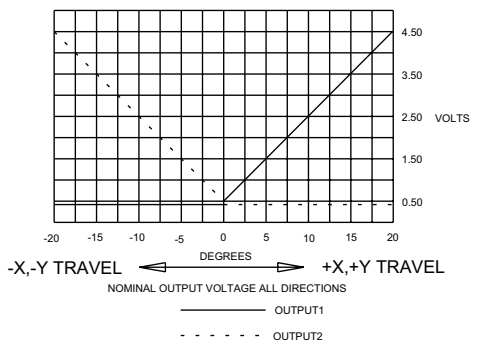
OPTION EE



OPTION FF



OPTION GG



OPTION HH