

SCALE 1:1

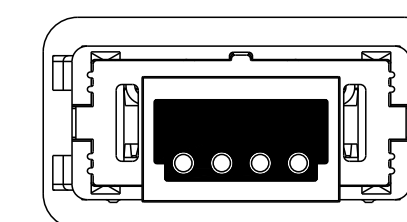
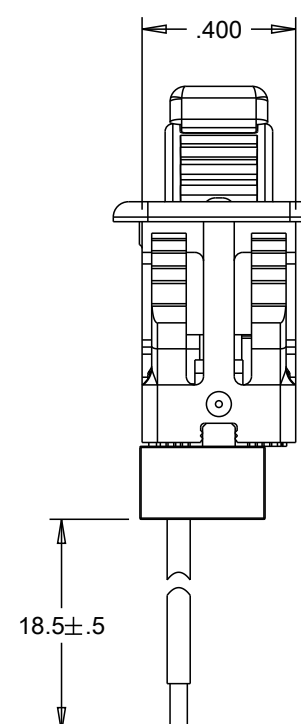
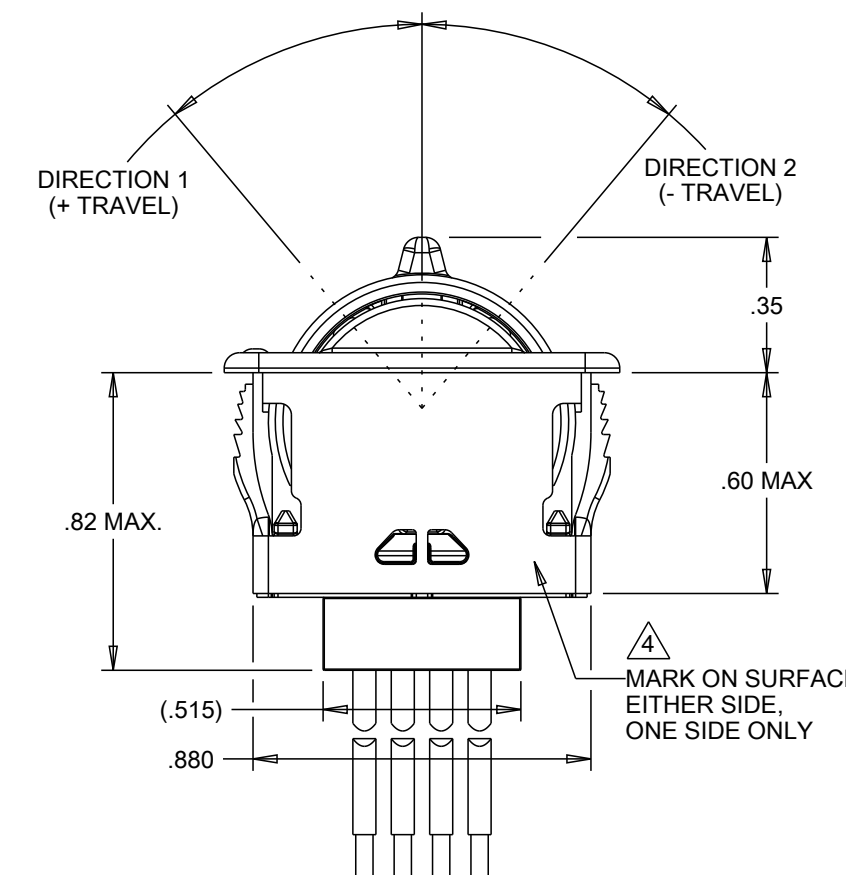
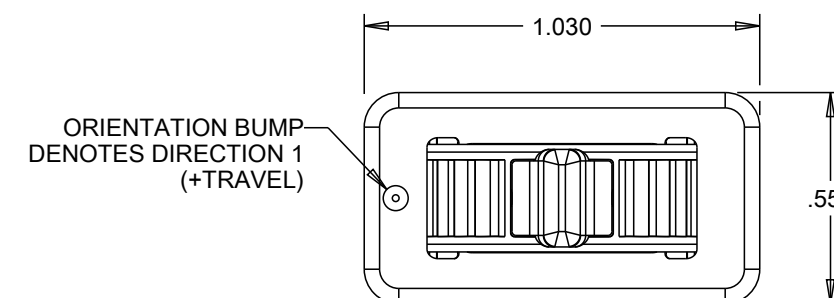
NOTES:

- DRAWING TO BE INTERPRETED IN ACCORDANCE WITH THE CURRENT REVISION OF ASME Y14.5
  - TSI TO BE INTERPRETED AS THEORETICAL SHARP INTERSECTION.
  - THIS PART/PRODUCT IS TO BE MANUFACTURED WITH THE LATEST APPLICABLE REGULATIONS OF EC DIRECTIVES FOR THE RESTRICTION OF THE USE OF HAZARDOUS SUBSTANCES IN ELECTRICAL AND ELECTRONIC EQUIPMENT (ROHS), WASTE ELECTRICAL AND ELECTRONIC EQUIPMENT (WEEE) AND REGISTRATION, EVALUATION, AUTHORIZATION AND RESTRICTION OF CHEMICALS (REACH).
- MARKING TO INCLUDE:  
 "OTTO" P/N & DATE CODE "YYWW"  
 OUTPUTS ARE FROM THE CENTER POSITION TO THE FULL TRAVEL POSITION IN EACH DIRECTION.  
 OPTIONS "B" "C" "E" "F" PROVIDE INCREASING VOLTAGE IN DIRECTION 1 AND DECREASING VOLTAGE IN DIRECTION 2 FROM A SINGLE OUTPUT.  
 OPTION "G" AND "H" PROVIDE INCREASING VOLTAGES IN BOTH DIRECTIONS FROM TWO SEPARATE OUTPUTS.  
 OPTION "B" AND "E" PROVIDE REDUNDANT OUTPUT 2 WHICH DUPLICATES OUTPUT 1  
 OPTION "C" AND "F" PROVIDE REDUNDANT OUTPUT 2 WHICH IS INVERSE OF OUTPUT 1

# HTWS - 2

TRAVEL OPTIONS	OUTPUT OPTIONS		OPERATE FORCE	BUTTON STYLE	TERMINATION OPTIONS	BEZEL COLOR	BUTTON COLOR
1 = ±30 DEG	OUTPUT 1	OUTPUT 2	3 = 12.0 OZS.		B = WIRE LEADS, 22 AWG UL1569, COMMON POWERS AND GROUNDS	1 = RED 2 = BLACK 3 = ORANGE 4 = YELLOW 5 = GREEN 6 = BLUE 7 = VIOLET 8 = GRAY 9 = WHITE	1 = RED 2 = BLACK 3 = ORANGE 4 = YELLOW 5 = GREEN 6 = BLUE 7 = VIOLET 8 = GRAY 9 = WHITE
	B = 2.5± 2.0 Vdc	2.5± 2.0 Vdc					
	C = 2.5± 2.0 Vdc	2.5± 2.0 Vdc					
	E = 2.5± 1.5 Vdc	2.5± 1.5 Vdc					
	F = 2.5± 1.5 Vdc	2.5± 1.5 Vdc					
	G = 1.0-4.0 Vdc	1.0-4.0 Vdc					
	H = 0.5-4.5 Vdc	0.5-4.5 Vdc					

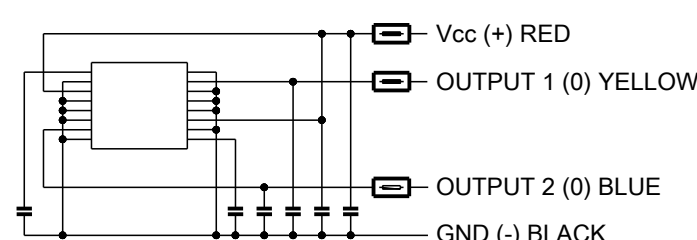
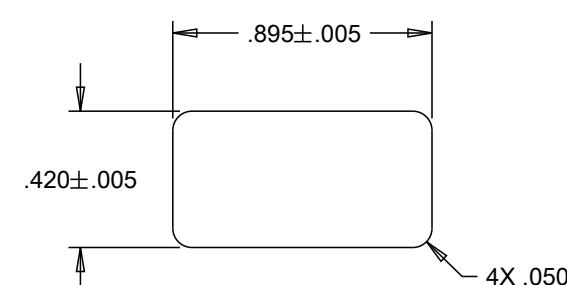
SWITCH CHARACTERISTICS				
ELECTRICAL				
RATED AT V <sub>cc</sub> = 5V @ 25° C LOAD = 1ma (4.7KΩ)	UNITS	MIN	TYP	MAX
SUPPLY VOLTAGE	VDC	4.50	5.00	5.50
OUTPUT VOLTAGE, TOLERANCE AT CENTER (A, B, C, D, E, F, G AND H) (SEE APPROPRIATE GRAPH FOR OUTPUT VALUES)	VDC AT 5V V <sub>cc</sub>	-25	NA	+25
OUTPUT VOLTAGE, TOLERANCE FULL TRAVEL (SEE APPROPRIATE GRAPH FOR OUTPUT VALUES)	VDC AT 5V V <sub>cc</sub>	-25	NA	+25
SUPPLY CURRENT PER SENSOR B=0, V <sub>cc</sub> =5V, I <sub>out</sub> =0	mA	NA	NA	20
MECHANICAL				
MECHANICAL LIFE FULL FORWARD TO FULL BACK		3,000,000		
MAXIMUM ALLOWABLE RADIAL LOAD	LBS	NA	NA	15
ENVIRONMENTAL				
OPERATING TEMPERATURE	°C	-40	20	85
HUMIDITY		96% RH, 70° C, 96 HRS		
VIBRATION		PER MIL-810F MINIMUM INTEGRITY		
MECHANICAL ENCLOSURE DESIGN		UNSEALED		
ELECTRONICS ENCLOSURE DESIGN		ISO 20653, IP6K8S DUST TIGHT, CONTINUOUS IMMERSION, 1 METER FOR 31 MINUTES, STATIONARY DURING TEST(S)		
RFI		ISO 11452-2/SAE J1113-21 & ISO 11452-4/SAE J1113-4		
EMI		ISO 11452-8/SAE J1113-22		
ESD (POWERED & UN-POWERED)		SAE J1113-13		
MATERIAL				
BUTTON TOP		THERMOPLASTIC		
BEZEL		THERMOPLASTIC		



NOT ALL WIRES ARE PRESENT IN ALL OUTPUT CONFIGURATIONS

MOUNTING:

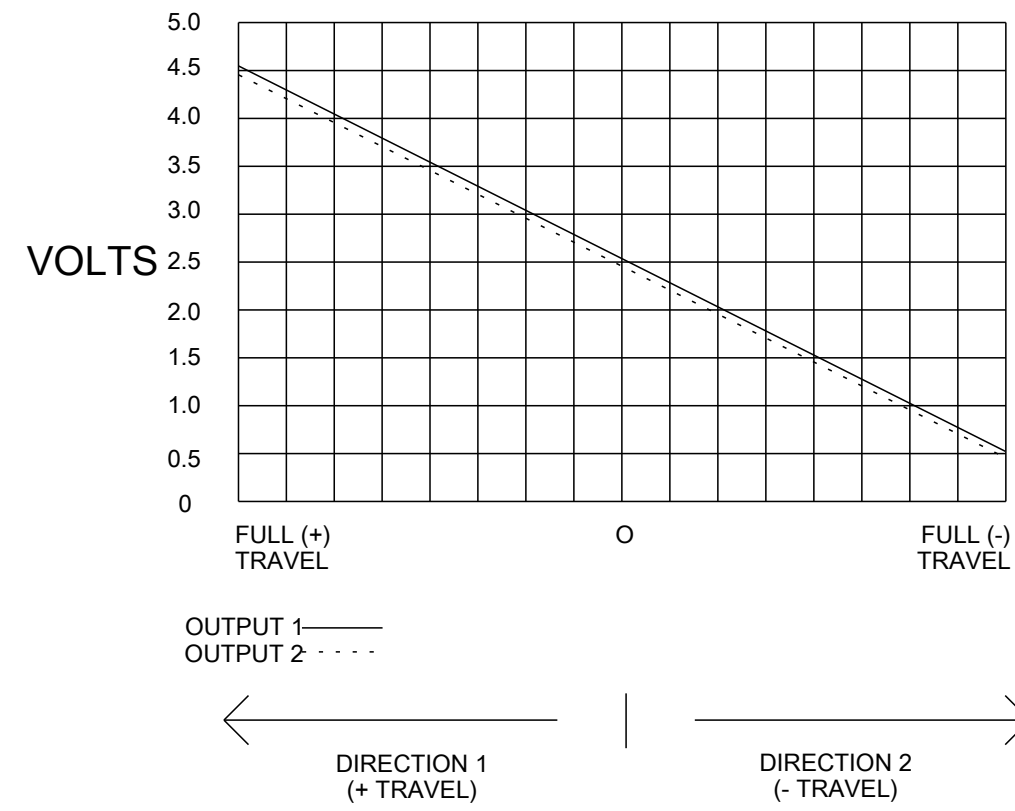
RECOMMENDED PANEL THICKNESS: 0.150 OPTIMUM THICKNESS



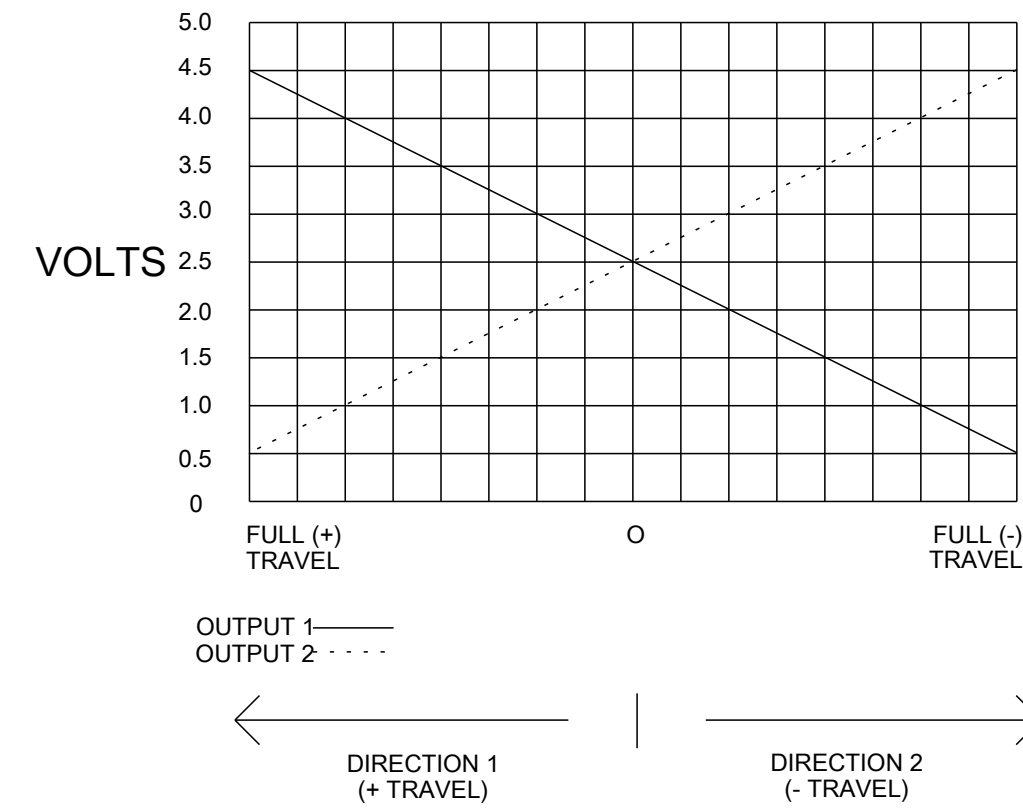
DUAL OUTPUT  
COMMON POWER & GROUND  
SCHEMATIC

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES. TOLERANCES: .XX ±.03 .XXX ±.010 ANGLES ±2° DO NOT SCALE	CARPENTERSVILLE, ILLINOIS USA	DESCRIPTION				
		HTWS, PROPORTIONAL THUMBWHEEL PADDLE WHEEL, SPRING RETURN				
KEY CHARACTERISTICS SPECIAL REQUIREMENT	THIS DOCUMENT IS THE CONFIDENTIAL PROPERTY OF OTTO ENGINEERING, INC. IT IS NOT TO BE USED IN ANY WAY DETRIMENTAL TO THE INTERESTS OF OTTO ENGINEERING, INC.	DRWN. RDN CHKD. VEB APPD. AH	SIZE <b>C</b>	FSCM NO <b>21649</b>	DRAWING NO. HTWS- 2	REV. <b>A</b>
		THIRD ANGLE PROJECTION		Scale 2:1	Sheet 1 OF 2	

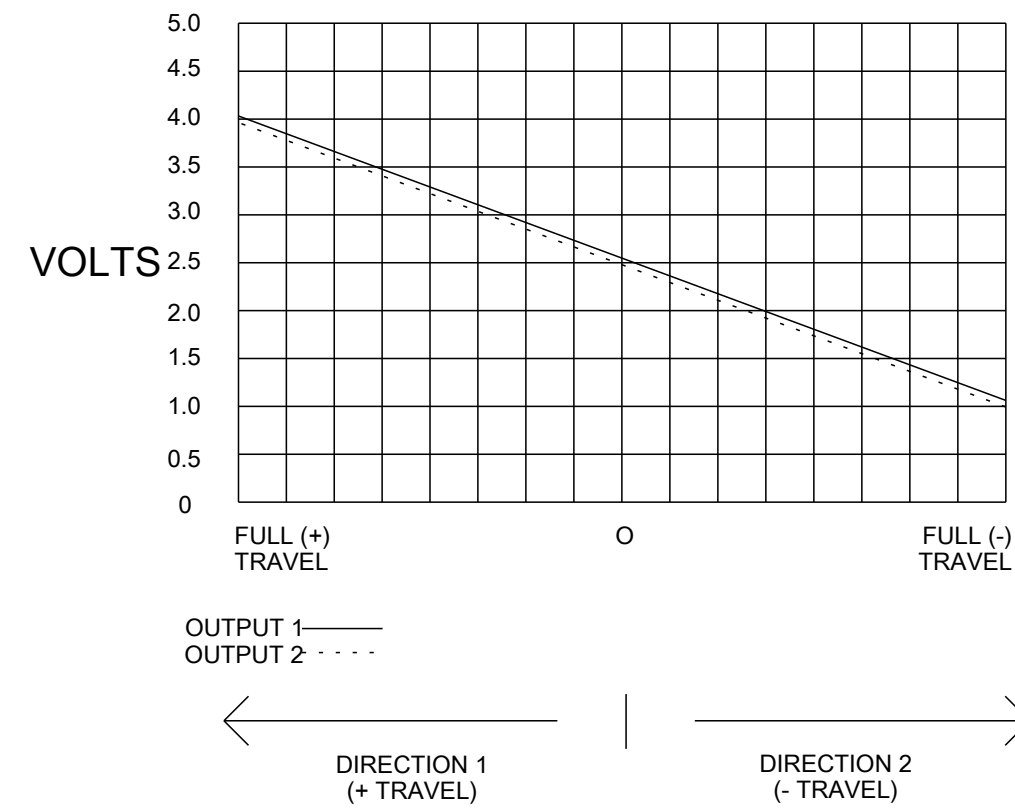
### OPTION B



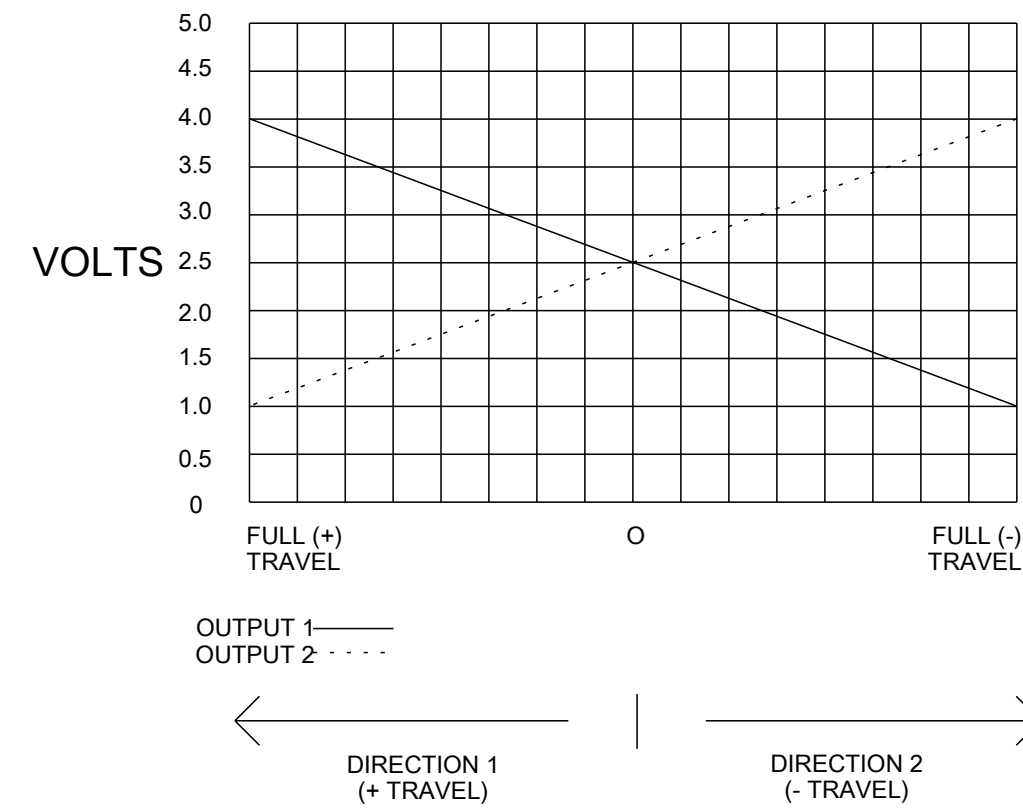
### OPTION C



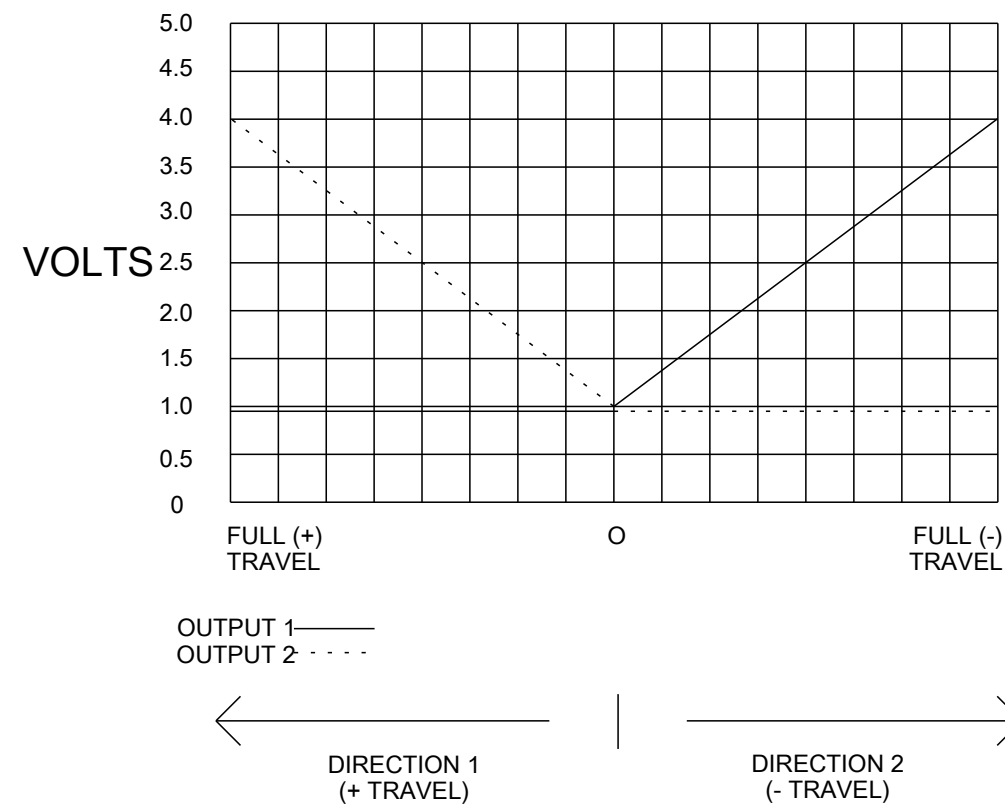
### OPTION E



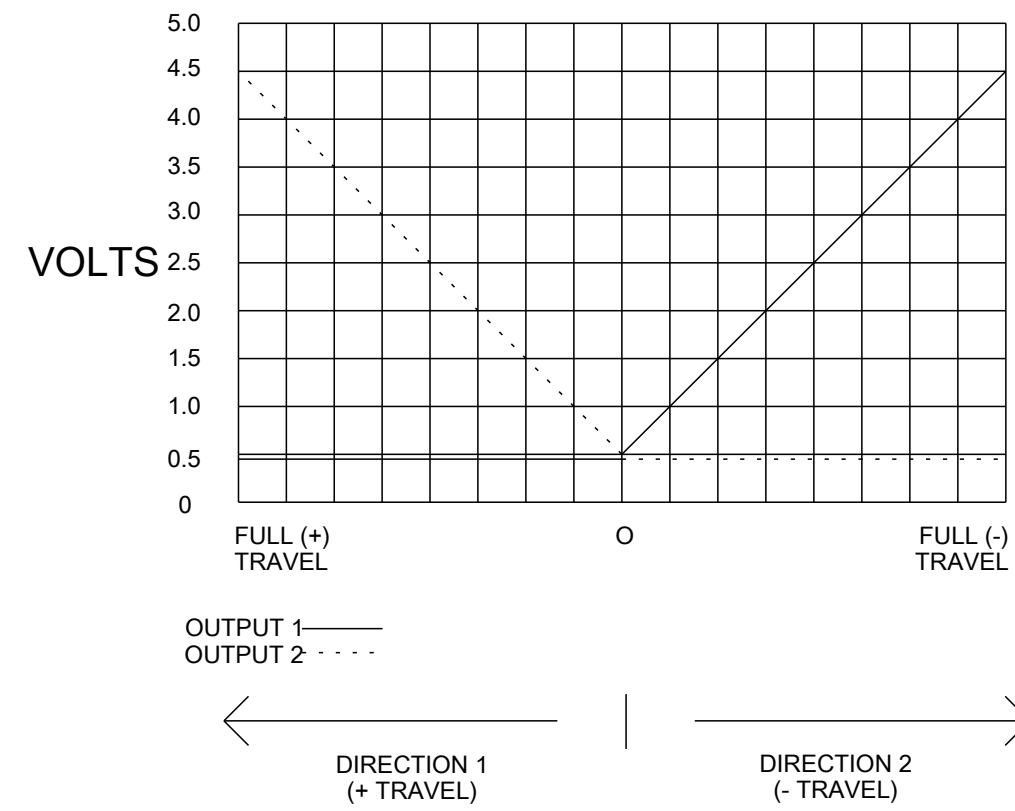
### OPTION F



### OPTION G



### OPTION H



UNLESS OTHERWISE SPECIFIED  
DIMENSIONS ARE IN INCHES.  
TOLERANCES ARE AS LISTED.  
MUST BE FREE FROM BURRS  
AND SHARP EDGES

TOLERANCES  
.XX ±.03  
.XXX ±.010  
ANGLES ±2°  
DO NOT SCALE DRAWING

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DRWN. RDN	SIZE	FSCM NO	DRAWING NO.
CHKD. VEB	<b>C</b>	<b>21649</b>	HTWS-__2__
APPD. AH			
WT.	THIRD ANGLE PROJECTION	Scale 1:1	Sheet 2 OF 2

REV.  
**A**