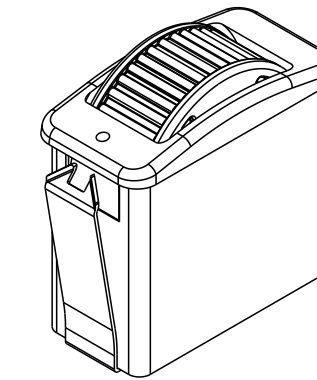


NOTES: (D)

- DRAWING TO BE INTERPRETED IN ACCORDANCE WITH THE CURRENT REVISION OF ASME Y14.5
- 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 "A" "B" "C" "D" "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
- DETTENTED SWITCH FULL TRAVEL IS $\pm 30^\circ$ MAX.
DETTENTED SWITCHES REACH FULL OUTPUT BEFORE ENGAGING DETENTS.

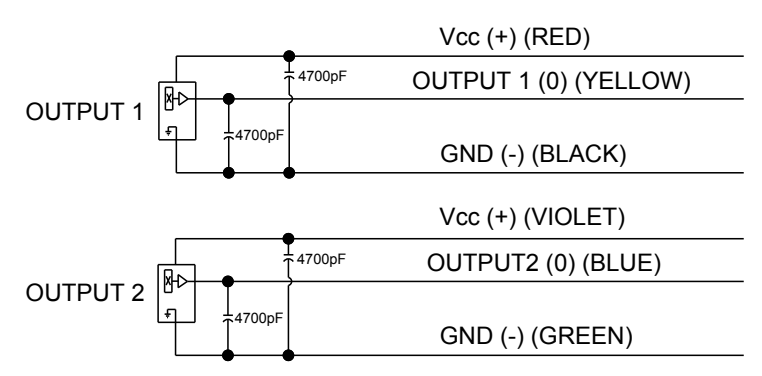
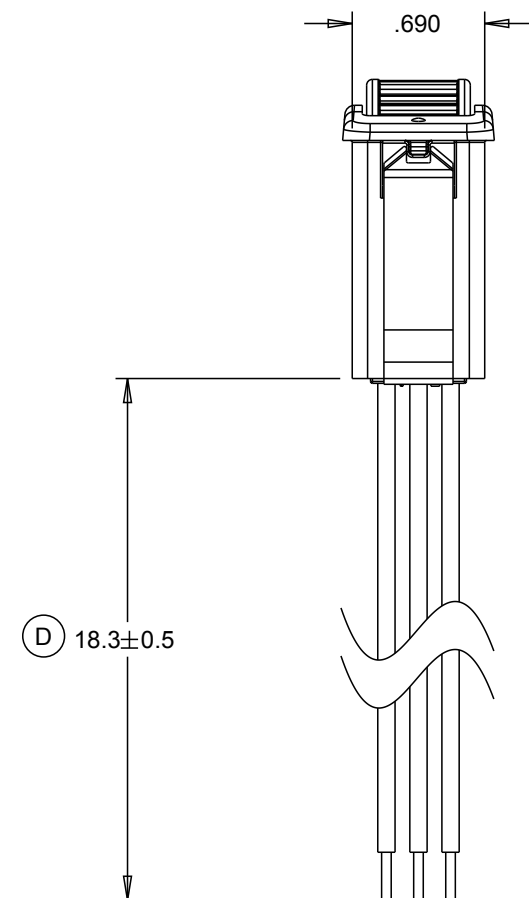
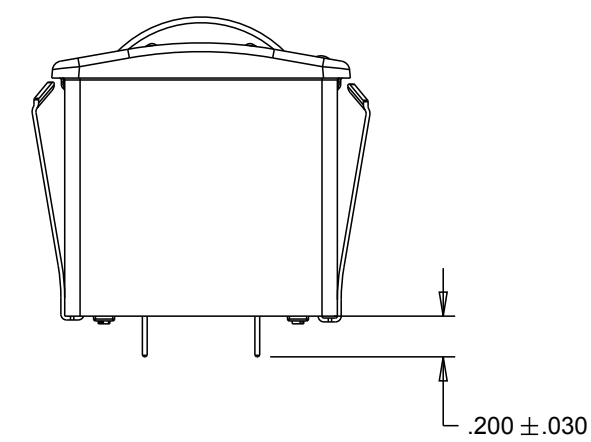
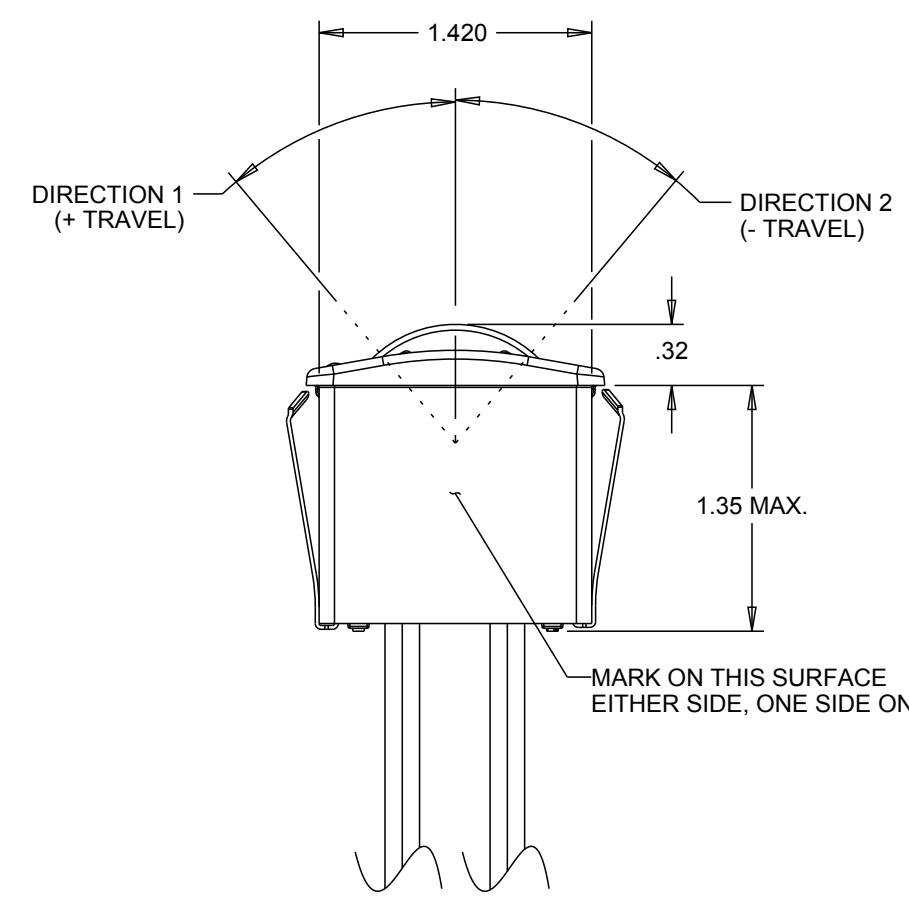
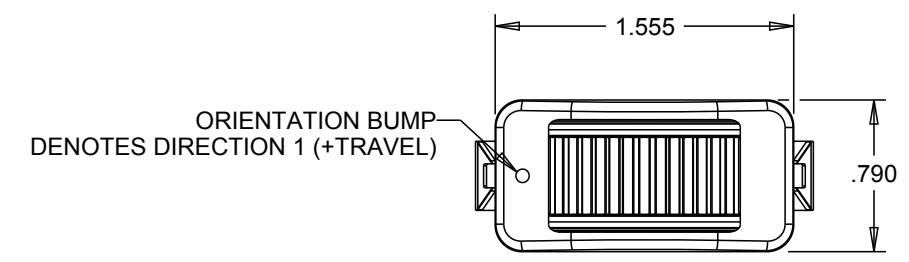
SWITCH CHARACTERISTICS				
ELECTRICAL				
RATED AT $V_{CC} = 5V @ 25^\circ C$ LOAD = 1ma (4.7K Ω)	UNITS	MIN	TYP	MAX
SUPPLY VOLTAGE	VDC	4.50	5.00	5.50
OUTPUT VOLTAGE, TOLERANCE AT CENTER (SEE APPROPRIATE GRAPH FOR OUTPUT VALUES)	VDC AT 5V V_{CC}	-.15	NA	+.15
OUTPUT VOLTAGE, TOLERANCE AT CENTER (FOR DETENT VERSION A ONLY)	VDC AT 5V V_{CC}	-.25	NA	+.25
OUTPUT VOLTAGE, TOLERANCE FULL TRAVEL (SEE APPROPRIATE GRAPH FOR OUTPUT VALUES)	VDC AT 5V V_{CC}	-.25	NA	+.25
SUPPLY CURRENT OPTIONS A & D B=0, $V_{CC}=5V$, $I_{out}=0$	mA	NA	NA	10
SUPPLY CURRENT FOR ALL OTHER OPTIONS B=0, $V_{CC}=5V$, $I_{out}=0$	mA	NA	NA	20
MECHANICAL				
MECHANICAL LIFE FULL FORWARD TO FULL BACK		3,000,000		
MECHANICAL DETENT CYCLE LIFE PER DETENT (6)		100,000		
MAXIMUM ALLOWABLE RADIAL LOAD	LBS	NA	NA	30
ENVIRONMENTAL				
OPERATING TEMPERATURE	$^\circ C$	-40	20	85
HUMIDITY		96% RH, 70 $^\circ C$, 96 HRS		
VIBRATION		PER MIL-810F MINIMUM INTEGRITY (D)		
ELECTRONICS SEAL INTEGRITY		WATERTIGHT PER IP68S. 1 METER (D)		
MECHANICAL SEAL INTEGRITY		UNSEALED (D)		
EMI/RFI WITHSTAND		PER SAE J1113 CONTACT FACTORY FOR DETAILS (D)		
MATERIAL				
BUTTON TOP		THERMOPLASTIC		
BEZEL		THERMOPLASTIC		
SNAP ARMS		STAINLESS STEEL		

HTW- 1								
TRAVEL	OUTPUT(S) OUTPUT 1	OUTPUT 2	OPERATE FORCE	BUTTON STYLE	TERMINATION	BEZEL COLOR	BUTTON COLOR	DETENT
1 = +/-40 DEG 2 = +/-30 DEG	A = 2.5+/-2.0Vdc NONE B = 2.5+/-2.0Vdc 2.5+/-2.0Vdc C = 2.5+/-2.0Vdc 2.5+/-2.0Vdc D = 2.5+/-1.5Vdc NONE E = 2.5+/-1.5Vdc 2.5+/-1.5Vdc F = 2.5+/-1.5Vdc 2.5+/-1.5Vdc G = 1.0-4.0Vdc 1.0-4.0Vdc H = 0.5-4.5Vdc 0.5-4.5Vdc		1 = 5.0 OZ		A = 18AWG WIRES 18.3" LONG, STRIPPED ENDS B = 0.025" SQ. PINS	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	NONE = NO DETENT A = SPRING RETURN CENTER ± 21 DEGREES, 12 OZ DETENT AT END OF TRAVEL, BOTH DIRECTIONS

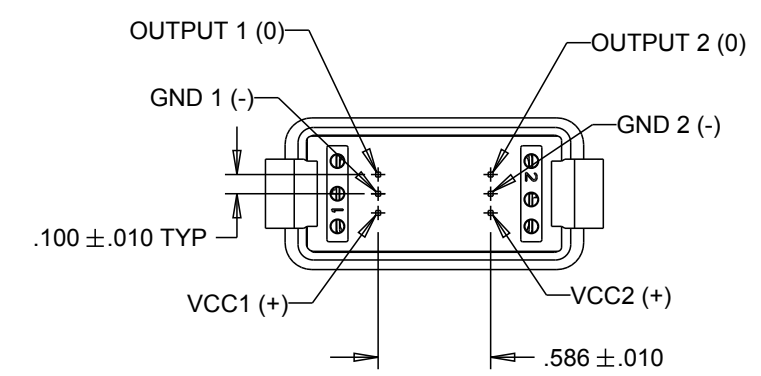
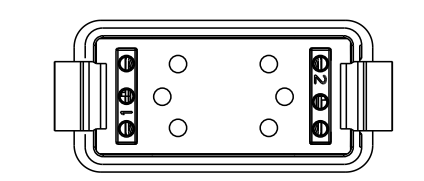
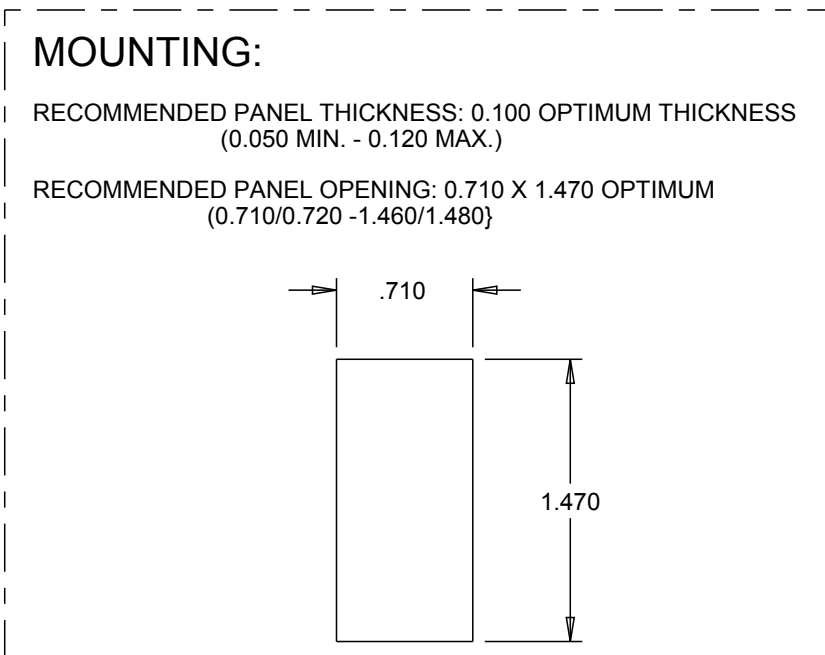


SCALE 1:1

REV	OCN #	DATE	APR
A	047995	24 MAR 09	LBG
B	061319	19 MAY 11	DCF
C	066712	27 JUL 12	DCF
D	070633	24 MAY 13	DCF



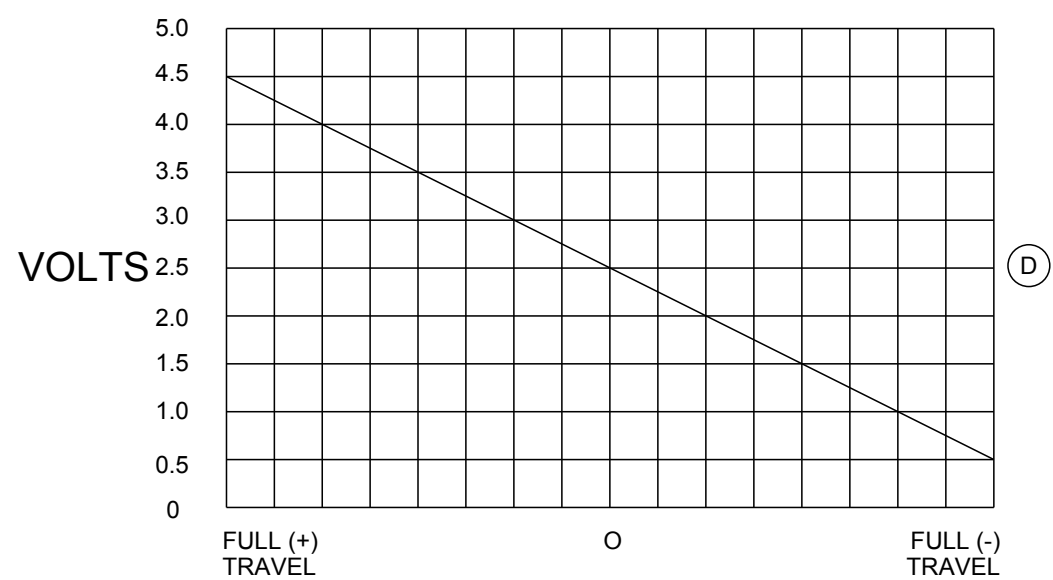
OUTPUT 2 IS NOT PRESENT IN ALL CONFIGURATIONS



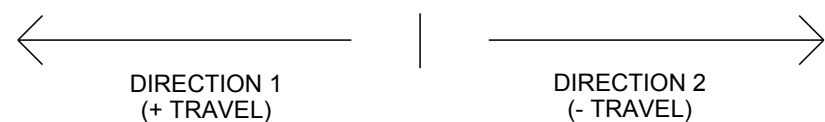
PINNED TERMINATION
NOT ALL PINS ARE PRESENT IN ALL OUTPUT CONFIGURATIONS

UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES. TOLERANCES: .XX $\pm .03$.XXX $\pm .010$ ANGLES $\pm 2^\circ$ DO NOT SCALE	CARPENTERSVILLE, ILLINOIS USA	DESCRIPTION			
		HTW, PROPORTIONAL THUMBWHEEL, KNURLED WHEEL, SPRING RETURN			
		DRWN. TH	SIZE	FSCM NO	DRAWING NO.
CHKD. DCF	C	21649	HTW- 1	D	
APPD. AH					
THIRD ANGLE PROJECTION		Scale 1:1		Sheet 1 OF 2	

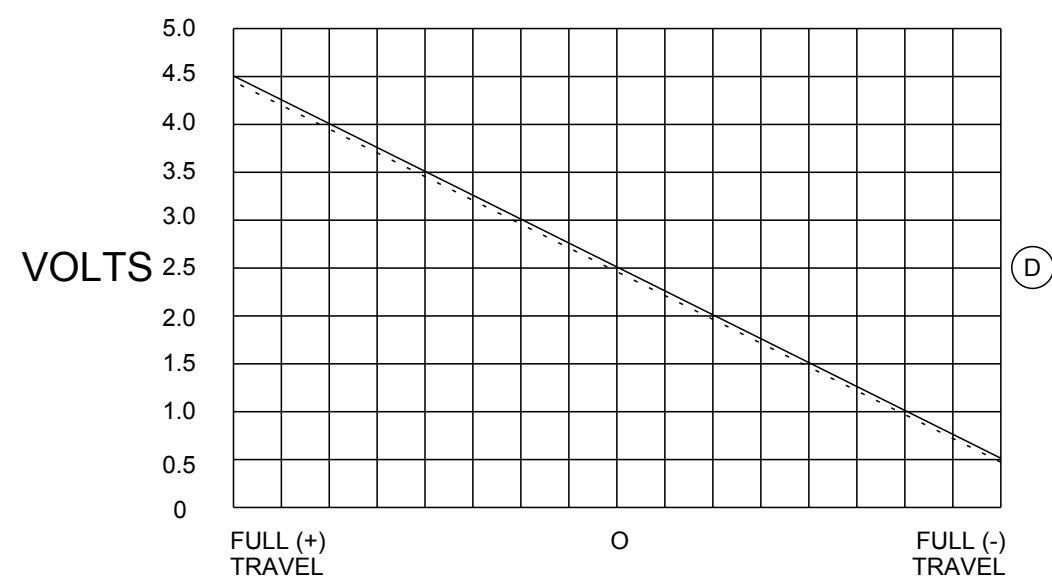
OPTION A



OUTPUT 1 ———
OUTPUT 2 ·····



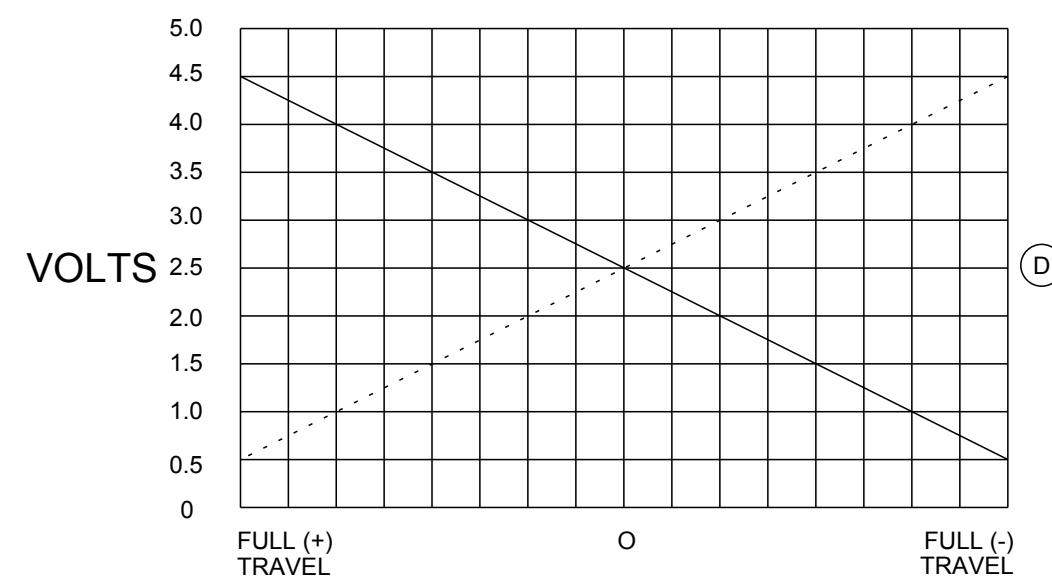
OPTION B



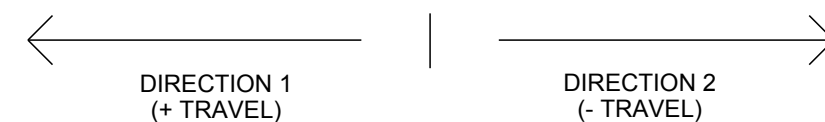
OUTPUT 1 ———
OUTPUT 2 ·····



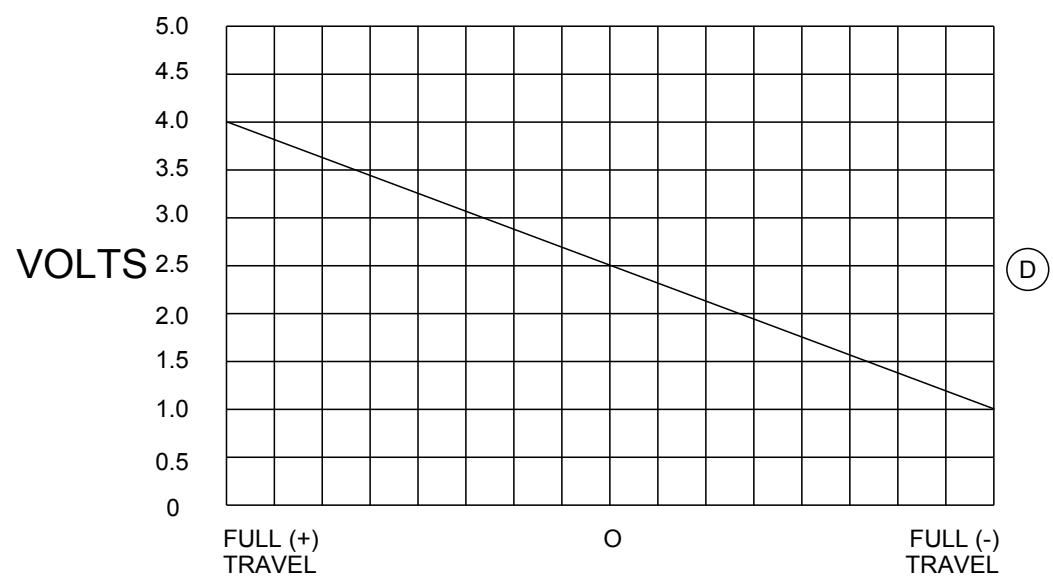
OPTION C



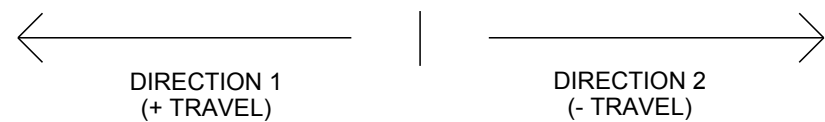
OUTPUT 1 ———
OUTPUT 2 ·····



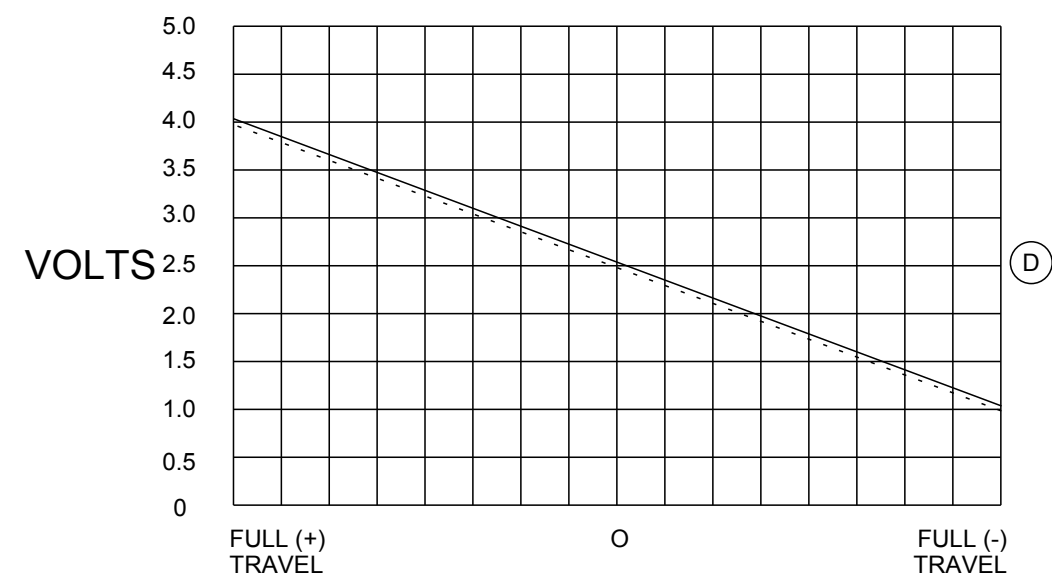
OPTION D



OUTPUT 1 ———
OUTPUT 2 ·····



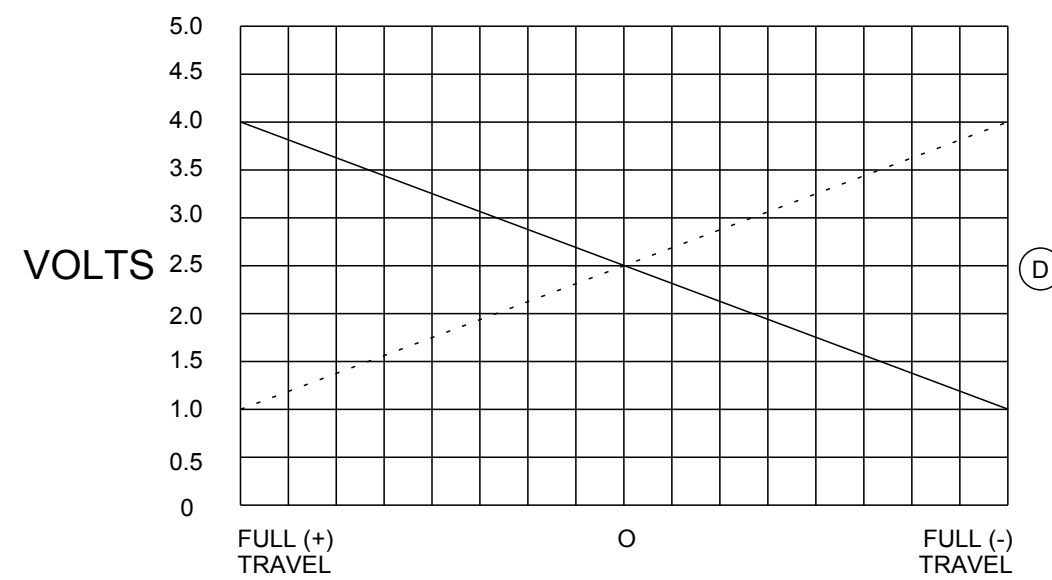
OPTION E



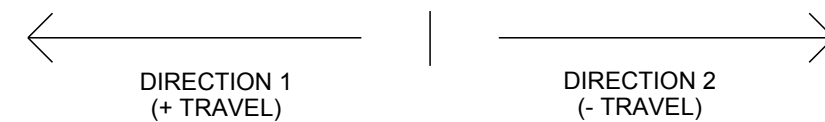
OUTPUT 1 ———
OUTPUT 2 ·····



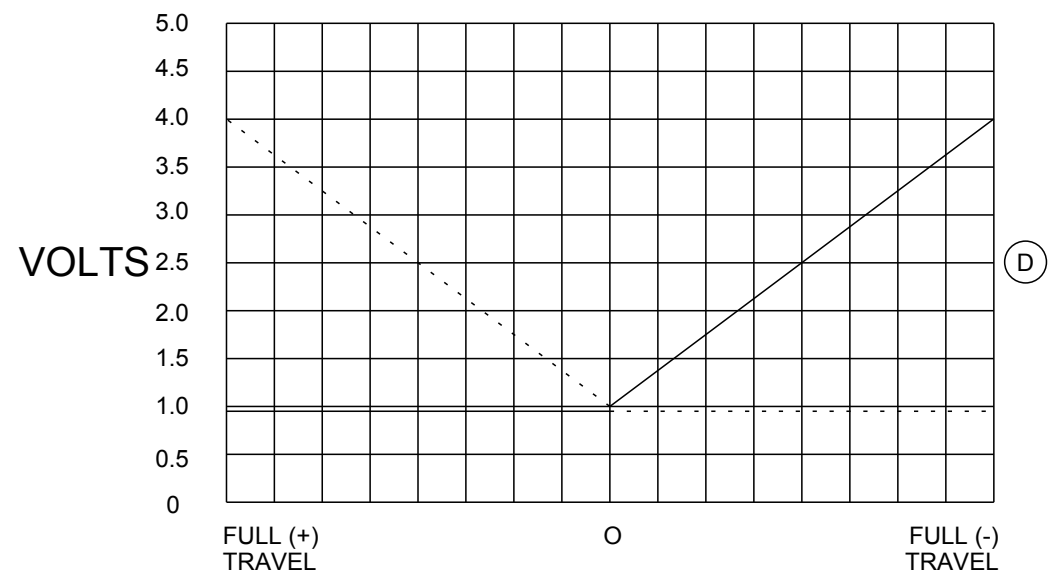
OPTION F



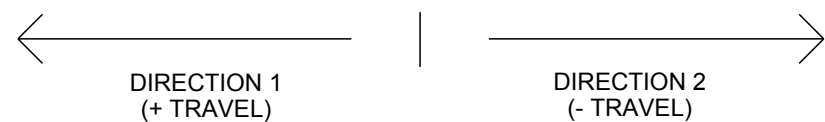
OUTPUT 1 ———
OUTPUT 2 ·····



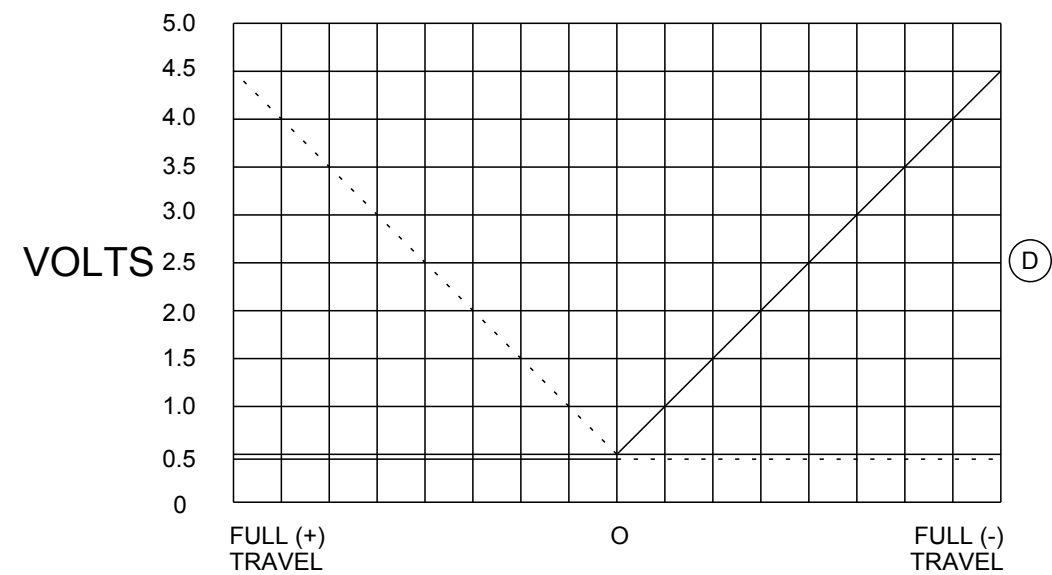
OPTION G



OUTPUT 1 ———
OUTPUT 2 ·····



OPTION H



OUTPUT 1 ———
OUTPUT 2 ·····



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

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. TH	SIZE
CHKD. DCF	C
APPD. AH	
WT.	

FSCM NO
21649

DRAWING NO.
HTW-1

REV.
D

Scale 1:1

Sheet 2 OF 2