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REVISIONS

LTR	ECN NUMBER	DATE	APPROVED
A	ECN-3380	5-18-79	D.P.F.
B	ECN-9963	4-8-88	MFH
C	ECN-10401	12-22-88	H. J. J.

1. SCOPE

- 1.1 Scope This specification covers the detail requirements for a precision potentiometer, New England Instrument Co. (hereinafter called NEI) type number 78FL1-224 equivalent to Clifton Precision # 78Z12003-01
REV. E

2. APPLICABLE DOCUMENTS

- 2.1 The following documents, of the issue in effect on the date of issue of the applicable NEI sales order forms part of this specification to the extent specified herein:

SPECIFICATIONS

NEW ENGLAND INSTRUMENT COMPANY

1222-0000

3. REQUIREMENTS

- 3.1 General specifications The potentiometers shall be as specified in NEI specification 1222-0000 except as modified or elaborated on herein. In the event of any conflict between this specification and the general specification, this specification shall govern.

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES

TOLERANCES:

FRACTIONS $\pm 1/64$
DECIMALS $\pm .005$
ANGLES $\pm 2'$

DRAWN S. Profit DATE 10-25-78

CHECKED C. Daly DATE 11/7/78

MFG APPROVED DATE

APPROVED DATE

Q.C. APPROVED DATE

APPROVED FOR NEI DATE D. Frimmer 11-10-78

SALES APPROVED DATE

APPROVED FOR DATE



NEW ENGLAND INSTRUMENT COMPANY

NATICK, MASSACHUSETTS

PRODUCT DEFINITION SPECIFICATION
PRECISION POTENTIOMETER

TYPE NO. 78FL1-224

SIZE A

CODE IDENT NO. 08815

DRAWING NUMBER

1222-0224-00

SCALE:

SHEET 1 OF 6

3.2 GENERAL CHARACTERISTICS				AQL	
			QA CLASS		
			Requirement Source		
	CHARACTERISTICS	REQUIREMENT			
1.	NO. OF CUPS	1	0	A	
2.	NO OF SECTIONS	1	0	A	
3.	ELEMENT TYPE	"Resistofilm" Conductive Plastic	N/O	Q	
4.	BEARING TYPE	Ball	0	Q	
5.	MATERIAL - MOUNTING PLATE	Anodized Aluminum	N	Q	
6.	MATERIAL-HOUSING	Anodized Aluminum	N	Q	
7.	MATERIAL-SHAFT	Stainless Steel	0	Q	
8.	WEIGHT	N/R	-	-	

3.3 MECHANICAL PARAMETERS				AQL	
			QA CLASS		
			Requirement Source		
	PARAMETER	REQUIREMENT			
1.	LATERAL RUNOUT	.001 TIR max	0	A	
2.	PILOT SURFACE RUNOUT	.001 TIR max	0	A	
3.	SHAFT RUNOUT	.001 TIR max	0	A	
4.	END PLAY	.005 TIR max	0	A	
5.	RADIAL PLAY	.001 TIR max	0	A	
6.	STARTING TORQUE	.2 in-oz MAX.	0	A	
7.	RUNNING TORQUE	.2 in-oz MAX.	0	A	
8.	MOMENT OF INERTIA	N/R	-	-	
9.	STATIC STOP STRENGTH	N/A	-	-	
10.	DYNAMIC STOP STRENGTH	N/A	-	-	
11.	MECHANICAL TRAVEL	360° Continuous	0	A	

LEGEND:

Requirement Source — N = NEI; O = OEM
 Q.A. Class — A = Acceptance Test;
 P = Preproduction Test; Q = Qualification Test

SIZE

A

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3.4 ELECTRICAL AND ELECTROMECHANICAL PARAMETERS				QA CLASS		AQL
PARAMETER		REQUIREMENT	Requirement Source			
1.	DIELECTRIC WITHSTANDING VOLTAGE	500 VRMS	0	A		
2.	INSULATION RESISTANCE	1000 Megohms	0	A		
3.	RESISTANCE - TEMPERATURE CHARACTERISTIC	-150 to +300 PPM/°C	0	Q		
4.	POWER RATING	1 watt @ 50°C derated to 0 watts @ 105°C	0	Q		
5.	EXCITATION FREQ. FOR AC CHARACTERISTICS	N/R	-	-		
6.	QUADRATURE VOLTAGE	N/A	-	-		
7.	PHASE SHIFT	N/A	-	-		
8.	CONFORMITY OF IN-PHASE COMPONENT	N/A	-	-		
9.	TOTAL INPUT IMPEDANCE	N/A	-	-		
10.	OUTPUT SMOOTHNESS	.01875% max. for $220 \leq \theta \leq 302.5^\circ$.045% max. for $0 \leq \theta < 220^\circ$ and $302.5 < \theta \leq 330^\circ$	0	A		
11.	THEORETICAL ELECTRICAL TRAVEL	330°	0	A		
12.	ELECTRICAL OVERTRAVEL	10° min, each end	0	A		
13.	MECHANICAL OVERTRAVEL	N/A	-	-		
14.	CONTINUITY TRAVEL	359° max	N	A		
15.	INDEX POINT	Per para. 3.5.4	0	A		
16.	CONFORMITY DEFINITION	Absolute	0	A		
17.	SHAFT ALIGNMENT	THE SHAFT ALIGNMENT SHALL BE PER FIG. 1 $\pm 15^\circ$ @ $\theta = 0^\circ$	N	A		
18.	TAP LOCATION	TERMINAL 4 @ $\theta = 0^\circ$ REF	0	A		
19.	EFFECTIVE TAP WIDTH	Zero width	0	A		
20.	BACKLASH	.083° max.	0	A		
21.	RESOLUTION	Virtually Infinite	N/O	A		
22.	MINIMUM VOLTAGE	0.066% CW END (OMITTING EXTERNAL RESISTOR) (E APPL. BET. TERMS. #1 & 3, TERM. #4 OPEN)	0	A		
23.	END VOLTAGE	N/R	-	-		

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3.5 REQUIREMENTS OF INDIVIDUAL SECTIONS

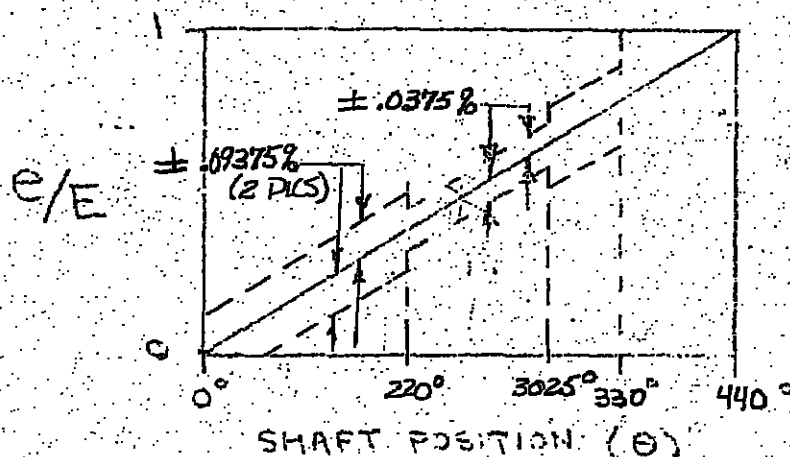
3.5.1 Total Resistance

3681.9-4500.1 ohms terminal 1 to 3

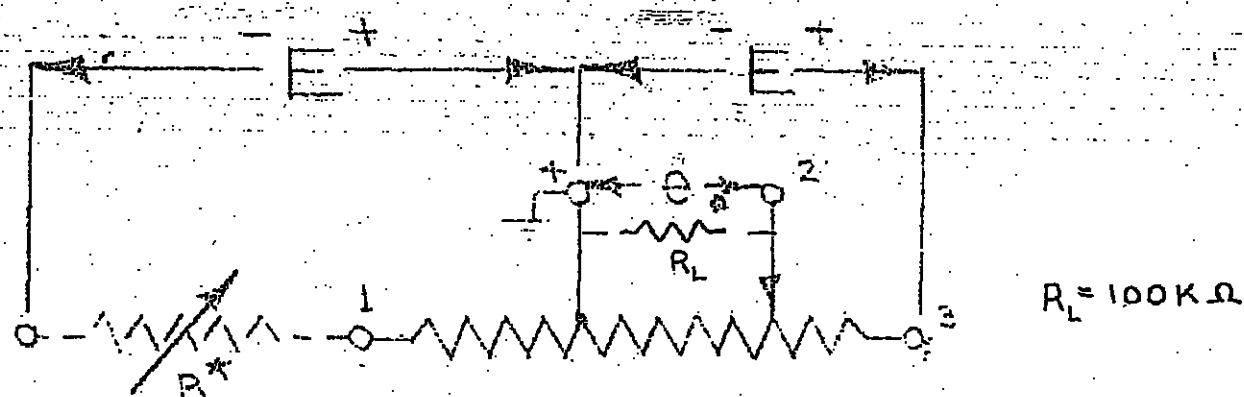
3.5.2 Function Characteristic

When measured in accordance with the schematic diagram, the output ratio (e/E) shall conform to the following function characteristic.

θ increases in a CCW direction.



Note: Absolute Index at 275° of 0.62500



* R SHALL BE CHOSEN SUCH THAT ZERO CURRENT FLOWS THROUGH THE TAP, TERMINAL 7. (NOMINAL VALUE: 3909Ω) (REF.)

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3.5.3 The output ratio shall be increasing for increasing θ everywhere in the regions $-10^\circ \leq \theta \leq 0^\circ$ and $330^\circ \leq \theta \leq 340^\circ$.

3.5.4 Index point
The output @ $\theta = 275^\circ$ shall be marked per para 3.6.3, indicated as follows:

3.5.4.1 Output ratio form, EXACTLY 0.62500 O.R. @ $\theta = 275^\circ$ MEASURED PER PARA. 3.5.2.

3.5.4.2 Customer's proprietary percentage, derived as follows: $[133.3333 \times (\text{NEI O.R. value})]\%$. I.e. 0.62500 O.R. yields 83.333%

3.6.0 Marking: The potentiometer shall be permanently and legibly marked as follows.

3.6.1 The size and color of the marking shall be as follows:

- (a) Size (height) - 1/16
- (b) Color - white

3.6.2 The marking on the cylindrical surface shall consist of the following:

- (a) NEI logotype and MFR 08815
- (b) NEI type number: 78FL1-224
- (c) Clifton Code Ident. and Part number: 8619750CN 78212003-01
- (d) Electronic Industries Association date code
- (e) Terminal identification (PER FIGURE 1)
- (f) Serial NUMBER

3.6.3 The index point (per para 3.5.4) shall be marked on the cylindrical surface as follows: @ $\theta = 275^\circ$, NEI O.R. = 0.62500
CPPA = 83.333%

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SHAFT ALIGNMENT PER PRRA 3.4.17 (REF.)

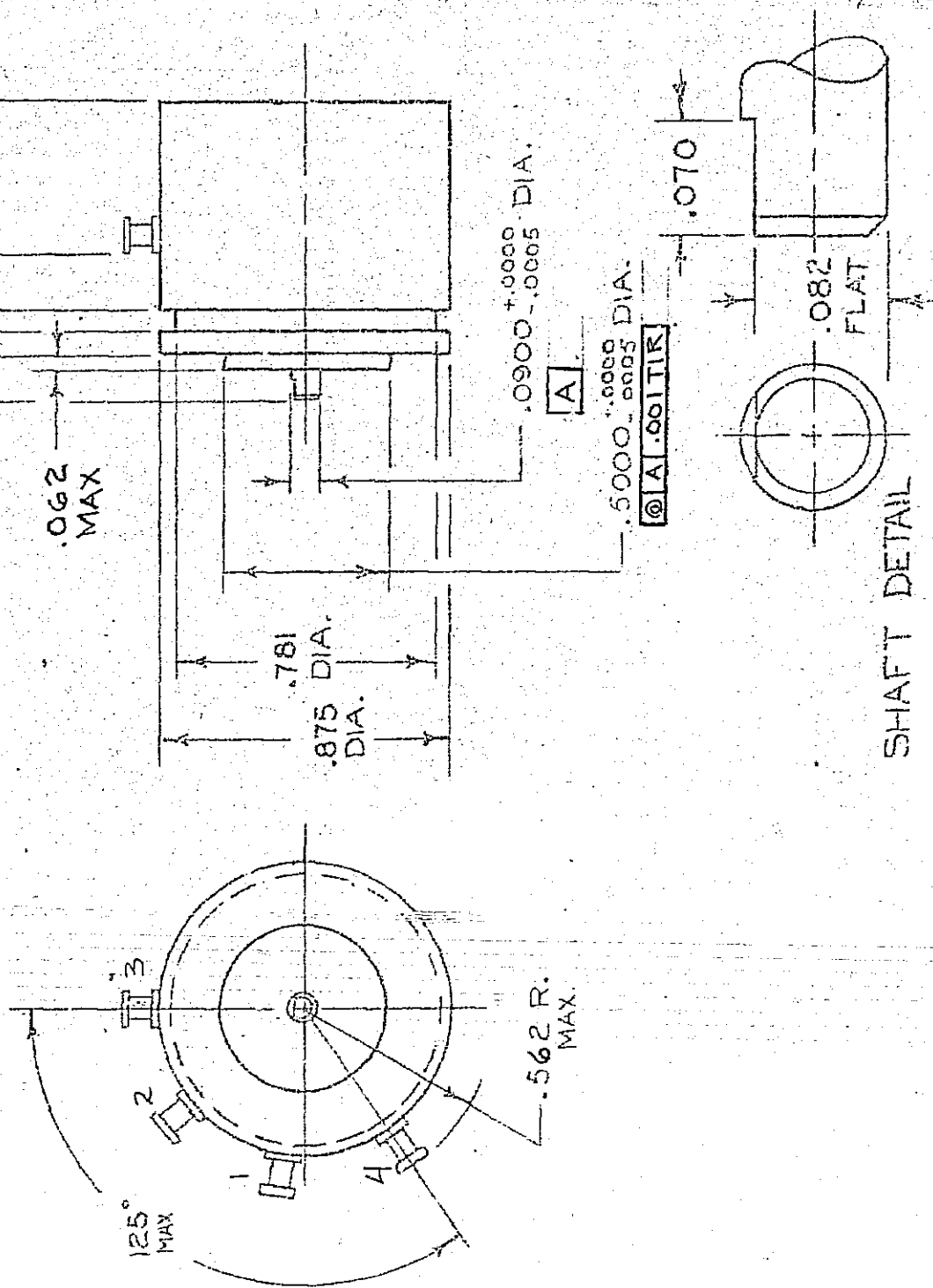


FIGURE 1

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