PUBLICATION NUMBER 1067-597
REV. B 3/99

SC-1330

SQUARE ROOT EXTRACTOR

CAUTION
Read Carefully Before Installation

1. When installing Non-Isolated Instrumentation ensure that applicable signal and power commons are at equal potential.

2. When installing Isolated Instrumentation ensure that the potential between applicable signal and power commons do not exceed the specified voltage isolation rating.

Failure to adhere to the guidelines listed above may damage the instrument and/or other equipment.

SC1300 GENERAL SPECIFICATIONS

GENERAL SPECIFICATIONS

Linearity: ±0.1% of span, maximum error (except models 1300L, 1300U, 1330, 1352, 1354, 1380, 1382 and 1390); linearity referred to mV signal for thermocouple inputs.

SC1330 - ±0.1% of span from 2.5 to 100% of input maximum
±0.25% of span from 1 to 2.5% of input maximum

SC1352 - ±.2% of span from 2.5% to 100% of input maximum; ±0.1% typical

SC1354 - ±0.15% of span maximum

SC1380, 82, - ±0.25% of span maximum ±0.15% typical

SC1390 - ±0.25% maximum; ±0.1% typical

SC1300L, SC1300U - ±0.3% maximum ±0.1% typical for 5-100% span

Repeatability: ±0.1% of span, maximum error

Ambient Temperature Range: 0° to 140°F (-18° to 60°C)

Power Supply Effect: ±0.15% for a ±20% power variation maximum with 800 ohm load and 4-20 mA output (H3, H4, H5 ±10%)

Common Mode Rejection: -130 dB @ 60 Hz on isolated units

Operating Power Supplies:

a. 115 VAC ±20%, 50/60 Hz, 5 watts (standard)
b. 24 VDC ±20%, 3.5 watts (H suffix, non-isolated)
c. 230 VAC ±20%, 50/60 Hz, 5 watts (H2 suffix)
d. 115 VAC ±10%, 60 Hz, 5 watts (H3 suffix; P-11 or A-12 Option)
e. 115 VAC ±10%, 50/60 Hz, 5 watts (H4 suffix; P-11 or A-12 Option)
f. 230 VAC ±10%, 50/60 Hz, 5 watts (H5 suffix; P-11 or A-12 Option)
g. 24 VDC ±20%, 4.5 watts (I suffix; isolated)
h. 48 VDC ±20%, 5 watts (I1 suffix; isolated)

Net Weight (Approximate): 3.4 lbs. (1.54 kg)

Connections: barrier terminal strips

Mounting: Position insensitive

Enclosures:

a. Single unit surface mount (standard)
b. P-11, high-density, 19" rack mount (with rear access terminal blocks)
c. A-12, high-density, 19" rack and surface mount (with front access terminal blocks)
d. NEMA 4 and 12 (from one to 24 units)
e. Explosion-proof single unit (FM approved for Class 1, Division 1, Groups C and D)

Electrical Classification: General purpose

High Load Drive Option (HO):

mA	Output Drive Capability
10-50 mA	600 ohm
4-20 mA	1600 ohm
2-10 mA	3200 ohm
1-5 mA	6400 ohm
0.2-1 mA	32,000 ohm

Note: Any analog output may also be zero based

True Voltage Output Option (VO):

VDC	Minimum Drive Impedance
0-10 VDC	300 ohm
0-5 VDC	150 ohm

Specifications printed here are subject to change.

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Rev. B, DCO 6795, 12/87, GHA

ROCHESTER INSTRUMENT SYSTEMS
255 NORTH UNION STREET, ROCHESTER, NEW YORK 14605

Instrument Installation Guide
Square Root Transmitter SC-1330

Section 1 Unpacking and Inspection

1-1 **Functional Description** — This manual has been provided to aid in the installation and calibration of the SC-1330 Square Root Extractor. The SC-1330 is a field mountable process instrument which provides a linear output from a square function input.

All inputs and outputs may be "0 based", or "live zero", and used in any combination. No level shift occurs between input and output as the negative lead of each is common with power supply ground, making the SC-1330 completely compatible with most process control instrumentation.

1-2 **Unpacking** — Upon receipt of the equipment, perform the following unpacking procedures:

1) Ensure that the container is sealed. If any container is open, notify the carrier and record it on the freight bill.

2) Check the shipment against the packing list to ensure that the shipment received is correct. If the shipment is incorrect, notify the carrier and RiS Customer Service.

3) Check container for signs of external damage. Look for dents, protrusions, holes or smashed corners. Record any damage.

4) Open the container and check the contents against the packing list. Record any missing items.

5) If reshipment is contemplated, retain all packing materials.

1-3 **Inspection**

1) Inspect the outside of the equipment for damage such as scratches, dents, etc.

2) Record any damage, missing or incorrect items and immediately notify the carrier and RiS Customer Service.

CAUTION: DO NOT ATTEMPT TO INSTALL EQUIPMENT WITH OBVIOUS SIGNS OF PHYSICAL DAMAGE. CONTACT YOUR RiS CUSTOMER SERVICE REPRESENTATIVE.

Section 2 Mounting and Installation

2-1 **Mounting** — Mounting dimensions for the single unit enclosure are shown in Figure 2-1A. Multiple unit enclosures are shown in Attachment A. Multiple unit enclosures are designed for 19 inch rack or for surface mounting (See Attachment A). Single unit enclosures may be surface mounted into a wall or panel. Before mounting, make certain the mounting surface is secure. All units may be mounted with number 10 screws.

2-2 **Connections** — Refer to Figures 2-2A, 2-2B and 2-2C for the connection diagram applicable to your particular model. Signal wire size is dependent upon the distance between the unit and the source. Connections in 2-2A, 2-2B and 2-2C are made to number 6 screws on the terminal block and can accept a .296 dia. spade, ring lug or up to 14 AWG wire.

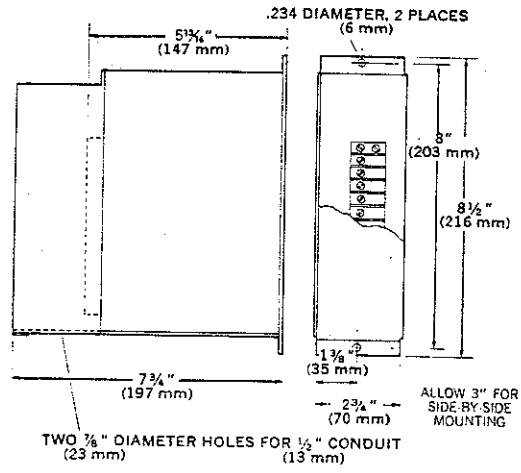


Figure 2-1A Mounting Dimensions Single Unit Enclosure

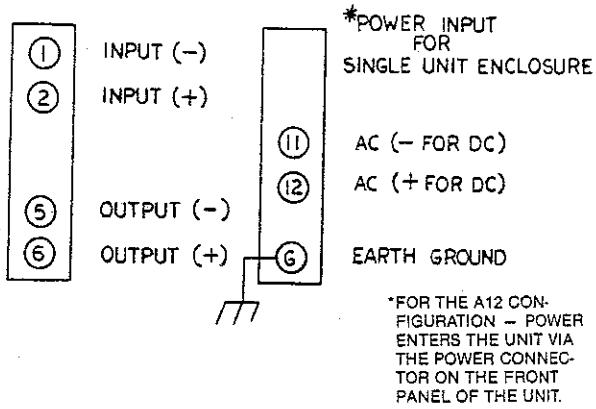


Figure 2-2A Input/Output Connections, SC-1330, A12 and Single Unit Enclosures

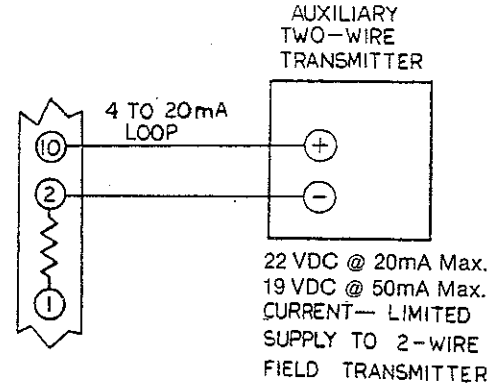


Figure 2-2B "E" Option

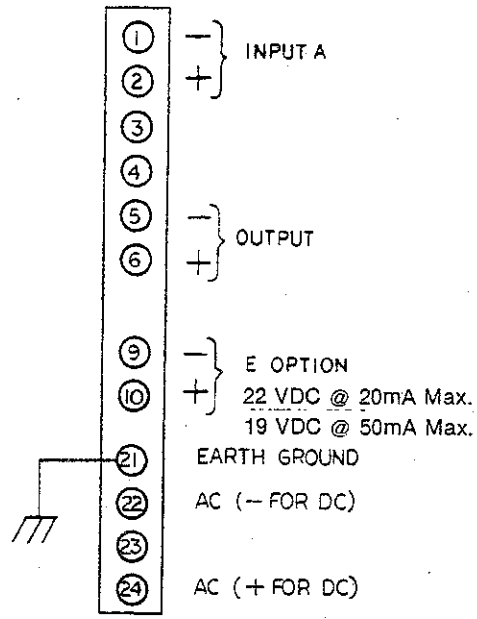


Figure 2-2C Input/Output Connections, SC-1330, P11 Configuration

Section 3 Calibration

3-1 **General** — Field wiring which may interfere with the field calibration equipment or cause false alarms or over scale conditions to occur should be removed during this field calibration procedure. The field wiring should not be reconnected until the field calibration is complete and all calibration equipment removed.

Detailed calibration instructions are contained in the following paragraphs. If the unit fails to operate within the prescribed parameters, it should be returned to the factory for further testing.

3-2 **Calibration Equipment** — The following test equipment items will be necessary to perform the calibration procedures:

1) Power Supply-AC or DC as required.
2) Input Voltage/Current Source.
3) Digital Voltmeter (3½ digit minimum, 4½ digit preferred).

3-3 **Calibration Connections** — Make certain that those connections necessary to calibrate the SC-1330 are made as shown in Figure 3-3A. RL is connected for current outputs *only*. RL values are shown in Table 3-3A.

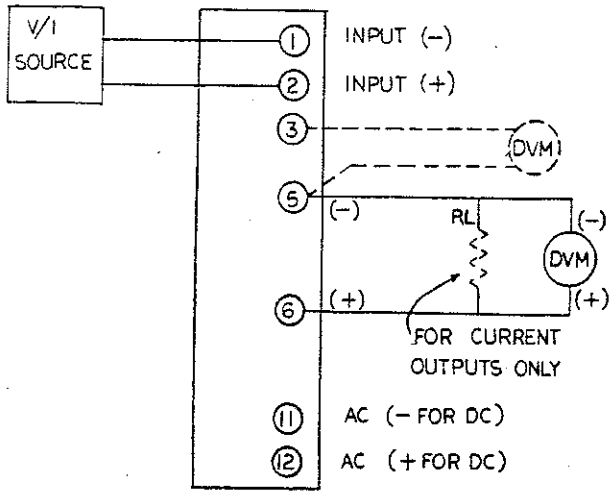


Figure 3-3A Calibration Connections

OUTPUT	RL
4-20 mA	250Ω .01%
1-5 mA	1000Ω .01%
10-50 mA	100Ω .01%
0-10 mA	500Ω .01%
0-1 mA	5KΩ .01%

Table 3-3A Shunting Resistance Values (Output Load Resistor)

Voltage from C1 to E11	23 to 32 VDC
Voltage across C2	11.4 to 12.6 VDC
Voltage across VR2	5.89 to 6.51 VDC
Voltage across C6	−9.0 TO −11 VDC

Table 3-4A SC-1330 Voltages — For Reference Purposes Only.

3-4 **Calibration Procedures** — The following steps contain those procedures necessary to properly calibrate the SC-1330.

1) Turn the Input Zero Potentiometer (R4), and the span potentiometer (R18) fully clockwise.

2) Turn the drop out potentiometer (R10) and the output zero potentiometer (R17) fully counterclockwise.

3) Connect the DVM to terminals 5(−) and 3(+).

4) Apply minimum input to terminals 2(−) and 3(+). *Slowly,* turn the input zero potentiometer (R4) counterclockwise until the DVM just reads 0.00V. The voltage may shift slightly negative. This is acceptable.

3-4.1 **Output Calibration** —

1) Connect the DVM positive lead to terminal 6.

2) With the fullscale input applied, adjust the span potentiometer (R18) for 5.000V (±.004V).

3) With minimum input applied, adjust the output zero potentiometer (R17) for minimum output. For zero based outputs adjust for ±0.003V.

4) Apply a 1% input signal (1.040V for 1 to 5 V) and adjust the input zero potentiometer (R4) for 10% output (1.400V for live zero output, .500V for zero based output).

Input →			%			%
1-5V	4-20mA	0-5V	Input	0-5V out	1-5V out	Output
1.000	4.000	0.000	0%	0.003	1.000	0%
1.040	4.160	0.050	1%	0.500	1.400	10%
1.100	4.400	0.125	2.5%	0.791	1.632	15.81%
2.000	8.000	1.250	25%	2.500	3.000	50%
3.000	12.000	2.500	50%	3.536	3.828	70.71%
4.000	16.000	3.750	75%	4.330	4.464	86.60%
5.000	20.000	5.000	100%	5.000	5.000	100%

Table 3-4B Linearity Table

5) Repeat steps 2 through 4 of this sub-paragraph until the above output conditions are met within ±.002V.

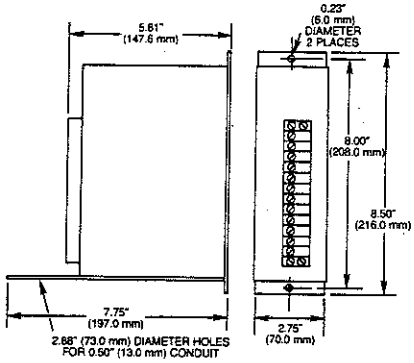
6) Apply the input voltages shown in Table 3-4B. Make certain the output at all points shown in Table 3-4B are within 1% of span, of the values shown.

3-4.2 **Drop Out Adjustment** – (Check Data Log)

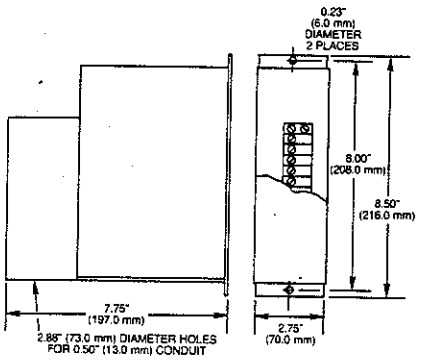
1) Apply the specified drop out input signal. The allowable range is from 0.25% to 10%. If the drop out value is not specified, apply a 1% input signal.

2) Gradually turn the drop out potentiometer (R10) clockwise until the output just switches from minimum output value.

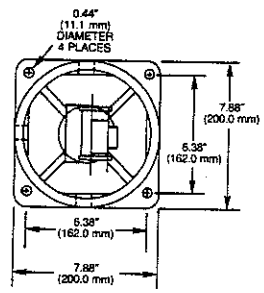
STANDARD ENCLOSURE WITH SUFFIX "B" CONDUIT MOUNTING PLATE

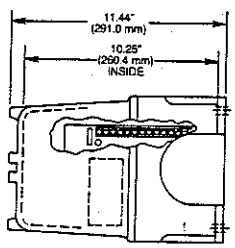


STANDARD ENCLOSURE WITH SUFFIX "C" CONDUIT MOUNTING PLATE AND COVER

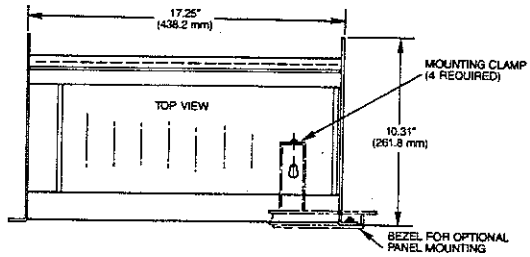


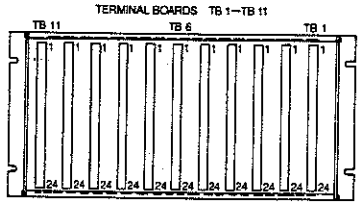
EXPLOSION-PROOF HOUSING



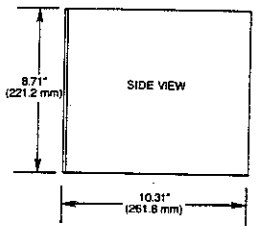


P-11 RACK OR PANEL MOUNT

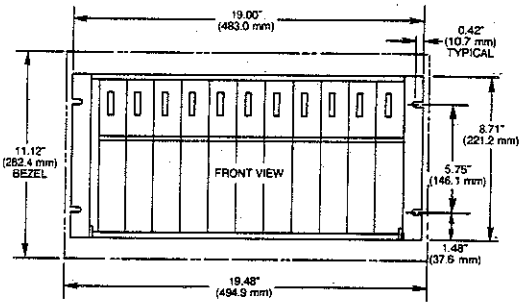




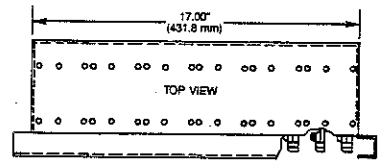
REAR VIEW
CUSTOMER WIRING

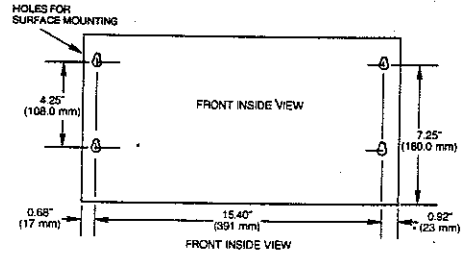


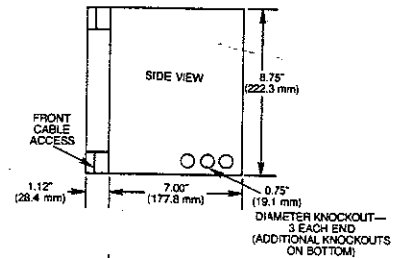
PANEL CUTOUT—
17.62" ±0.12 (447.5 mm) wide x 9.00" ±0.12 (228.6 mm) high

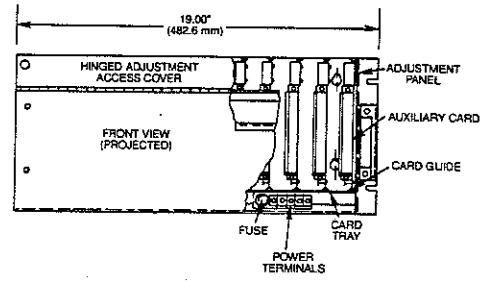


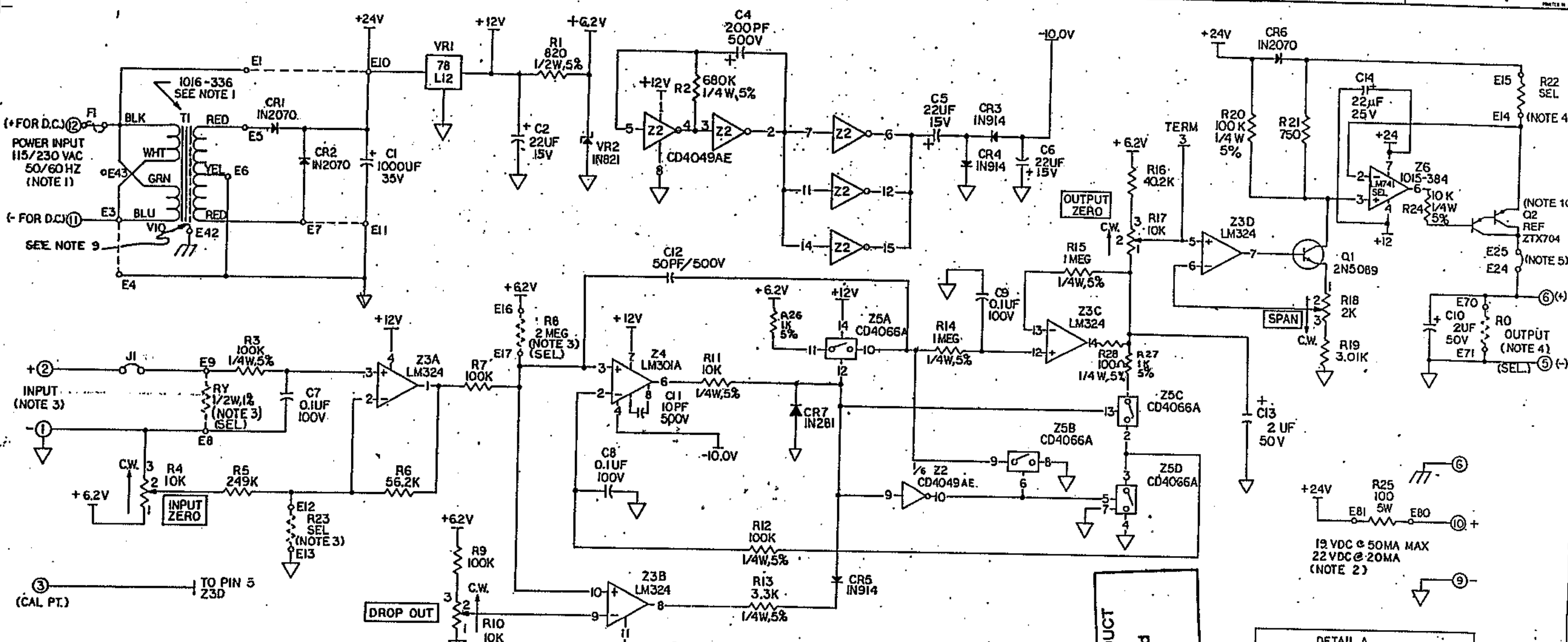
A-12 RACK MOUNT









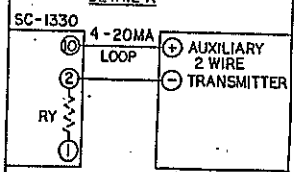

+24V
+12V
+6.2V
VR1 78 L12
R1 820 1/2W,5%
C2 22UF 15V
VR2 1N821
C4 200PF 500V
+12V R2 680K 1/4W,5%
Z2 CD4049AE
C5 22UF 15V
CR3 1N914
CR4 1N914
C6 22UF 15V
-10.0V
1016-336 SEE NOTE 1
T1
BLK
RED
WHT
GRN
YEL
BLU
VIO
CR1 1N2070
CR2 1N2070
C1 1000UF 35V
E1
E3
E4
E5
E6
E7
E10
E11
E42
E43
(+FOR D.C.) 12
F1
POWER INPUT 115/230 VAC 50/60HZ (NOTE 1)
(- FOR D.C.) 11
SEE NOTE 9
+24V
CR6 1N2070
TERM 3
R20 100K 1/4W 5%
R21 750
C14 22µF 25V
Z6 1015-384
LM741 SEL
R24 10K 1/4W 5%
Q2 REF ZTX704 (NOTE 10)
E15
E14
R22 SEL (NOTE 4)
E25 (NOTE 5)
E24
+6.2V
R16 40.2K
OUTPUT ZERO
R17 10K
C.W.
Z3D LM324
Q1 2N5089
R18 2K
SPAN
R19 3.01K
E70
C10 2UF 50V
R0 OUTPUT (NOTE 4) (SEL.)
E71
6 (+)
5 (-)
C12 50PF/500V
+6.2V
E16
R8 2 MEG (NOTE 3) (SEL)
E17
+12V
Z3A LM324
R7 100K
Z4 LM301A
C11 10PF 500V
R11 10K 1/4W,5%
A26 1K 5%
Z5A CD4066A
CR7 1N281
R14 1MEG 1/4W,5%
C9 0.1UF 100V
R15 1MEG 1/4W,5%
Z3C LM324
R28 100Ω 1/4W,5%
R27 1K 5%
Z5C CD4066A
Z5B CD4066A
Z5D CD4066A
1/6 Z2 CD4049AE
C13 2 UF 50V
+2
INPUT (NOTE 3)
-1
J1
E9
R3 100K 1/4W,5%
RY 1/2W,1% (NOTE 3) (SEL)
E8
C7 0.1UF 100V
R4 10K
INPUT ZERO
R5 249K
R6 56.2K
E12
R23 SEL (NOTE 3)
E13
C8 0.1UF 100V
-10.0V
R12 100K 1/4W,5%
CR5 1N914
R9 100K
DROP OUT
R10 10K
Z3B LM324
R13 3.3K 1/4W,5%
3 (CAL. PT.)
TO PIN 5 Z3D
+24V
R25 100 5W
E81
E80
10 +
9 -
19 VDC @ 50MA MAX
22 VDC @ 20MA
(NOTE 2)

NOTES:

1. POWER & FUSE OPTIONS
   A. FOR 115 VAC OPERATION, WIRING LIST 'A'. [FUSE NO. 0620-354 (.15A SLO BLO)]
   B. (SUFFIX 'H2) FOR 230 VAC OPERATION WIRING LIST 'B' [FUSE NO 0620-354 (.15A SLO BLO)]
   C. (SUFFIX 'H') FOR 24VDC OPERATION, NON-ISOLATED, WIRING LIST 'C' [FUSE NO. 6006-204 (1/4AMP. SLO BLO)]
   D. (SUFFIX 'I') FOR 24VDC OPERATION, ISOLATED WIRING LIST 'D' [FUSE NO. 6006-204 (1/4AMP. SLO BLO)]
   E. (SUFFIX I1) FOR 48VDC OPERATION, ISOLATED WIRING LIST 'E' [FUSE NO. 6006-204 (1/4AMP. SLO BLO)]
   A12 OR P11 HOUSE OPTION
   F. (H3) 115VAC ±10% 60HZ ONLY, WIRING LIST 'F' [FUSE NO. 0620-354 (.15A SLO BLO)]
   G. (H4) 115VAC ±10% 50/60HZ WIRING LIST 'A' [FUSE NO. 0620-354 (.15A SLO BLO)]
   H. (H5) 230VAC ±10% 50/60HZ WIRING LIST 'B' [FUSE NO. 0620-354 (.15A SLO BLO)]
2. AUXILIARY POWER OUTPUT, 50MA @ 19 VDC
   POWER OUTPUT IS AVAILABLE AT A MAXIMUM OF 50MA. FOR TYPICAL APPLICATION REFER TO DETAIL A.
3. INPUT SIGNAL OPTION
   WHEN CURRENT INPUT SIGNALS ARE TO BE USED, THE PROPER SCALING RESISTOR (SEE INPUT CHART) IS TO BE EMPLOYED BETWEEN INTERNAL TERMINALS E8 AND E9. THIS SCALING RESISTOR CONVERTS THE CURRENT INPUT TO A 5 VOLT SIGNAL AS REQUIRED BY THE TRANSMITTER FOR SELECTION OF RY, R23, R8, SEE INPUT CHART.
4. OUTPUT OPTION
   SEE OUTPUT CHART DETAILING THIS INFORMATION
5. HIGH LOOP DRIVE OPTION 'HO'.
   A. ADD MODULE A-1030-643.
   B. WIRE PER WIRING LIST 'G'.
6. TRUE VOLTAGE OUTPUT OPTION 'VO' 5VDC FULLSCALE OUTPUT
   A. ADD MODULE A-1030-639.
   B. REMOVE LUG FROM TERM 6 ON MAIN PCB.
   C. REMOVE 'RO' FROM MAIN PCB IF INSTALLED.
   D. WIRE PER WIRING LIST 'H'.
   E. FOR 10VDC FULL SCALE OUTPUT JUMPER E109 TO E110 ON MODULE A-1030-639.
7. 'P' OPTION
   REMOVE TERMINAL BLOCK LUG (MAIN-PCB) FROM TERM. 6. SCREW IS TO BE RETAINED AFTER RING LUG IS ADDED. SEE WIRING LIST 'I'.
8. UNLESS OTHERWISE SPECIFIED ALL RESISTORS ARE: 1/4W, 1%
9. SOME TRANSFORMERS, 1016-336, MAY BE CONSTRUCTED WITH A SPLIT BOBBIN. IN SUCH CASES THE FARADAY SHIELD AND ASSOCIATED VIOLET WIRE WILL BE ABSENT. IF THE VIOLET WIRE IS NOT PRESENT, ITS DESIGNATED TIE POINT WILL REMAIN UNTERMINATED.
10. FOR 50mA OUTPUT OPTION, A HIGHER WATTAGE OUTPUT TRANSISTOR IS REQUIRED. CONSULT WITH ENGINEERING FOR PART REPLACEMENT.

AGENCY CERTIFIED PRODUCT
No modifications permitted without approval of the Standards Engineer

DETAIL A



INTERCONNECTION WIRING DIAGRAM NOTE 2

REV.	DESCRIPTION	CHK.	APPR.
M	ECO 10856 DRH 12-11-92	7/4/4	
L	DCO 7085 AW 4/26/88		RPM
K	DCO 7053 RJH 4-4-88		RPM

B/M A-1030-141

DRAWN AHK

TITLE SCHEMATIC & ASSEMBLY SQ. ROOT TRANSMITTER SC-1330

RIS ROCHESTER INSTRUMENT SYSTEMS

DWG. NO. D-1030-140 M

WIRING LIST 'A' 115 VAC, H4	
FROM	TO
TI BLK	E1
GRN	E1
BLU	E3
WHT	E3
RED	E5
YEL	E6
RED	E7
TI VIO	E42

SUFFIX H2, H5 230 VAC WIRING LIST 'B'	
FROM	TO
TI BLK	E1
BLU	E3
WHT	E43
GRN	
VIO	E42
RED	E5
YEL	E6
TI RED	E7

SUFFIX 'H' WIRING LIST 'C' 24 VDC		
FROM	TO	AWG
E1	E10	#22
E3	E4	#22
E7	E11	#22

TI SUFFIX WIRING LIST 'E' 48 VDC (ISOLATED)			
FROM A-1042-567	TO	AWG	COLOR
E17	E1	22	RED
E18	E3		BLK
E8	E10		ORN
E9	E11	22	BRN

SUFFIX 'I' 24 VDC WIRING LIST 'D' (ISOLATED)	
FROM A-1024-613	TO
E17	E1
E18	E3
E8	E10
E9	E11

115 VAC H3 WIRING LIST 'F'	
FROM	TO
TI BLK	E1
BLK	E3
RED	E5
YEL	E6
TI RED	E7

HIGH LOOP DRIVE OPTION 'HO' (NOTE 5) WIRING LIST 'G'			
FROM A-1030-643	TO	AWG	COLOR
E101	E10	22	RED
E102	E11	22	BLK
E103	E24	22	ORN
E104	E25	22	BRN

NOTE: DELETE EXISTING JUMPERS FROM PCB BETWEEN E24-E25

TRUE VOLTAGE OUTPUT OPTION 'VO' (NOTE 6) WIRING LIST 'H'			
FROM A-1030-639	TO	AWG	COLOR
E105	E10	22	RED
E106	E11		BLK
E107	E70		ORN
E108	E71	22	BRN
E111	TERM 6	22 WITH RING LUG	YEL
E112	TERM 5	22 WITH RING LUG	GRN

NOTE 7

'P' OPTION WIRE LIST 'I'			
FROM MAIN PCB	TO AUX MODULE	AWG	COLOR
E10	E105	22	RED
E11	E114	22	BLK
TERM 8	E108	22 WITH RING LUG	BRN
TERM 7	E109	22 WITH RING LUG	ORN
E70	E115	22	YEL
E71	E116	22	GRN

AGENCY CERTIFIED PRODUCT

No modifications permitted without approval of the Standards Engineer

INPUT CHART NOTE 3				
INPUT	RY	RIS / P/N	R23	RIS P/N
0,1-5 VDC	—	—	—	—
0,.2-1 MA	5000 Ω, 0.1%	1011-767	—	—
0,1-5MA	1K, 0.1%	1015-553	—	—
0,2-10MA	500Ω, 0.1%	1011-766	—	—
0,4-20MA	250 Ω, 0.1%	1015-552	—	—
0,10-50MA	100 Ω, 0.1%	1015-551	—	—
0,25-125VDC	—	—	15K, 1%	4709-400
0-1VDC	—	—	15K, 1%	4709-400

NOTE: FOR ZERO BASE INPUTS ADD R8, 2 MEG, 1/4W, 1% P/N 4709-655

OUTPUT CHART NOTE 4				
OUTPUT	RO E70 TO E71	RIS P/N	R22	RIS P/N
0,4-20 MA	—	—	49.9 Ω	4709-090
0,2-10 V	499 Ω 1%	4709-206	—	—
0,1-5 V	249 Ω 1%	4709-169	—	—
0-1 V	49.9Ω 1%	4709-090	—	—
0-100MV	5.1 Ω 3%	4711-050	—	—
0-10MV	0.5 Ω 3%	4711-136	49.9	4709-090
0,1-5MA	—	—	200	4709-160
0,10-50MA	—	—	20.5	4711-113
0,2-10MA	—	—	100 Ω	4709-125
0-,2-1MA	—	—	1000Ω	4709-248

NOTE 10

REV.	DESCRIPTION	CHK.	APPR.	REV.	DESCRIPTION	CHK.	APPR.

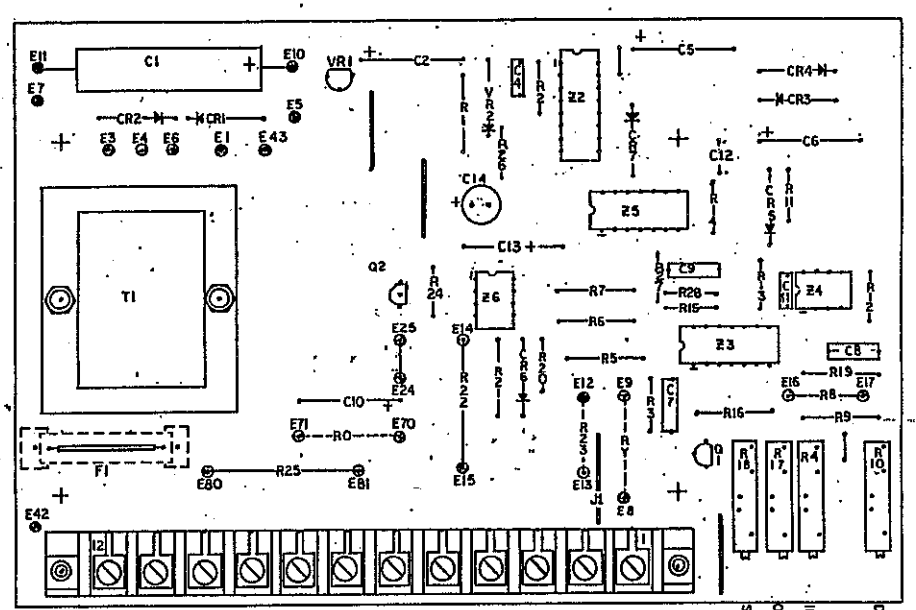
DRAWN AHK

TITLE SCHEMATIC & ASSEMBLY SQ. ROOT TRANSMITTER SC-1330

ROCHESTER INSTRUMENT SYSTEMS

SCALE — SHT 2 OF 3

DWG. NO. D-1030-140 M



AGENCY CERTIFIED PRODUCT

No modifications permitted without approval of the Standards Engineer

REV.	DESCRIPTION	CHK.	APPR.	REV.	DESCRIPTION	CHK.	APPR.

CUSTOMER
CUSTOMER P.O.
MFG'S ASST.
MATL.
FINISH
DRAWN AHK
CHKD.
ENGR.
APPD.
MFG. DATE
APPROVED
A-81

TITLE SCHEMATIC & ASSEMBLY
SQ. ROOT TRANSMITTER
SC-1330

ROCHESTER INSTRUMENT SYSTEMS

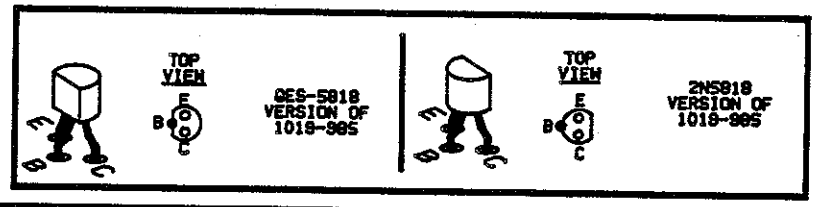
SCALE
SHT 2 OF 3
DWG. NO. D-1030-140
REV M

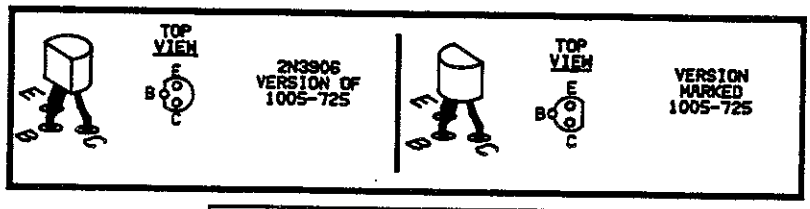
1 3 2 1

EQUIVALENT COMPONENT REFERENCE GUIDE

DUE TO CONDITIONS BEYOND OUR CONTROL, IT MAY BE NECESSARY TO SUBSTITUTE A DIFFERENT PART FOR ONE CALLED OUT ON DOCUMENTATION. THE USE OF SUCH AN ALTERNATE, WHICH MAY OR MAY NOT SHOW UP ON YOUR PRODUCT, IS COVERED IN THE FOLLOWING TABLE. UNLESS A SPECIFIC MANUFACTURER IS NAMED, THE PART NUMBER IS UNDERSTOOD TO BE AN INDUSTRY STANDARD (GENERIC) IDENTIFICATION.

ORIGINAL PART NUMBER	COMPONENT DESCRIPTION	ALTERNATE #1	ALTERNATE #2	COMMMENTS
1N2070	DIODE 400V, 1A	1N4004		
1N914	DIODE 75V, 0.2A	1N4148		
20F40	DIODE 400V, 20A	MR-2004S		
D40D11	TRANSISTOR (NPN)	D40E7		
D41D11	TRANSISTOR (PNP)	D41E7		
IVN5000ANF	FET	2N6661		REQUIRES CONFIGURATION CHANGE
1014-270	OPTICAL COUPLER (NPN SILICON TRANSISTOR)	4N36		
2N5818	TRANSISTOR (NPN)	GES5818		
1005-725	TRANSISTOR (PNP)	2N3906		





G	DCO 8653 LPS 5/15/91 *Auto-trol*	LH 5/91	TITLE EQUIVALENT COMPONENT REFERENCE GUIDE	
F	DCO 8344 K.A.8/16/90 *Auto-trol*	LH	DWG. NO. A-1052-675	REV. G
REV	LAST REVISION	CHK	APPROVED	SHEET 1 OF 2

EQUIVALENT COMPONENT REFERENCE GUIDE

ORIGINAL PART NUMBER	COMPONENT DESCRIPTION	ALTERNATE #1	ALTERNATE #2	COMMMENTS
1011-765	RESISTOR 10Ω, 1/4W	MILITARY SERIES RS2B - 10.0Ω - 0.1%		
1032-502	RESISTOR 25Ω, 1/4W	MILITARY SERIES RS2B - 25.0Ω - 0.1%		
1032-501	RESISTOR 62.5Ω, 1/4W	MILITARY SERIES RS2B - 62.5Ω - 0.1%		
1015-551	RESISTOR 100.0Ω, 1/4W	MILITARY SERIES RS2B - 100.0Ω - 0.1%		
1032-503	RESISTOR 125.0Ω, 1/4W	MILITARY SERIES RS2B - 125.0Ω - 0.1%		
1015-552	RESISTOR 250.0Ω, 1/4W	MILITARY SERIES RS2B - 250.0Ω - 0.1%		
1011-768	RESISTOR 400.0Ω, 1/4W	MILITARY SERIES RS2B - 400.0Ω - 0.1%		
1011-766	RESISTOR 500.0Ω, 1/4W	MILITARY SERIES RS2B - 500.0Ω - 0.1%		
1015-553	RESISTOR 1.00KΩ, 1/4W	MILITARY SERIES RS2B - 1.00KΩ - 0.1%		
1011-769	RESISTOR 2.20KΩ, 1/2W	MILITARY SERIES RS2B - 2.20KΩ - 0.1%		
1019-538	RESISTOR 2.43KΩ, 1/2W	MILITARY SERIES RS2B - 2.43KΩ - 0.1%		
1011-767	RESISTOR 5.00KΩ, 1/4W	MILITARY SERIES RS2B - 5.00KΩ - 0.1%		

TITLE EQUIVALENT COMPONENT REFERENCE GUIDE		
DWG. NO.	A-1052-675	REV. G
APPROVED	SHEET 2 OF 2	

PROCEDURES FOR FACTORY REPAIR AND RETURN

A. Obtain a Returned Material Authorization (RMA) number by calling the AMETEK Repair Department and giving the following information:

1. ***Model*** and ***Serial Number*** of the equipment.
2. Failure Symptom - **Be Specific**
3. Approximate date of installation.
4. The site name and address of the failed equipment.
5. Complete shipping information for the return of the equipment if other than the operating site.
6. Name and telephone number of person to contact if questions arise.

B. Enclose the information with the equipment and pack in a commercially accepted shipping container with sufficient packing material to insure that no shipping damage will occur. Mark the outside of the container with the RMA number.
Ship to the appropriate location:

Attention: Repair Department

AMETEK Power Instruments
255 North Union Street
Rochester, New York 14605 USA
Telephone: (888) 222-6282
Fax: (716) 238-4097

C. Your equipment will be tested, repaired, and inspected at the factory. Normal factory turn-around is ten working days or less (excluding shipping time).

D. For emergency service or repair status information, please contact the AMETEK Repair Department at (800) 881-4156.

WARRANTY — AMETEK warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service. AMETEK will replace any component found to be defective, upon its return, transportation charges prepaid, within one year of its original purchase. AMETEK will extend the same warranty protection on accessories which is extended to AMETEK by the original manufacturer. AMETEK assumes no responsibility, expressed or implied, beyond its obligation to replace any component involved. Such warranty is in lieu of all other warranties expressed or implied.

TELEPHONE / FAX NUMBER LIST

This errata sheet provides an easy-to-use reference for all major departments. Use these numbers for ordering equipment, application assistance, technical support, and scheduling field service.
Please Note: Your instruction manual may contain other phone and fax numbers; this list will take precedence.

MAIN OFFICE

AMETEK Power Instruments - Rochester
255 N. Union St. Rochester, NY 14605

DEPARTMENT / PRODUCT LINE	TELEPHONE	FAX
MAIN PHONE	585-263-7700	585-262-4777
FIELD SERVICE	800-374-4835	585-238-4945
REPAIRS/RETURNS	888-222-6282	585-238-4945
SALES SUPPORT	800-950-6676	585-454-7805

Far East Office

AMETEK Power Instruments
271 Bukit Timah Road, #03-09
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Tel: 65-732-8675
Fax: 65-732-8676