6152A

PANEL REMOTE DISPLAY

Operator's Manual

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It is the policy of NEWPORT to comply with all worldwide safety and EMC/EMI regulations that apply. NEWPORT is constantly pursuing certification of its products to the European New Approach Directives. NEWPORT will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct but NEWPORT Electronics, Inc. accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, patient connected applications.

This device is marked with the international caution symbol. It is important to read the Setup Guide before installing or commissioning this device as it contains important information relating to safety and EMC.

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SAFETY CONSIDERATIONS

This device is marked with the international Caution symbol. It is important to read this manual before installing or commissioning this device as it contains important information relating to Safety and EMC (Electromagnetic Compatibility).

Unpacking & Inspection

Unpack the instrument and inspect for obvious shipping damage. Do not attempt to operate the unit if damage is found.

This instrument is a panel mount device protected in accordance with Class I of EN 61010 (115/230 AC power connections). Installation of this instrument should be done by Qualified personnel. In order to ensure safe operation, the following instructions should be followed.

This instrument has no power-on switch. An external switch or circuit-breaker shall be included in the building installation as a disconnecting device. It shall be marked to indicate this function, and it shall be in close proximity to the equipment within easy reach of the operator. The switch or circuit-breaker shall not interrupt the Protective Conductor (Earth wire), and it shall meet the relevant requirements of IEC 947–1 and IEC 947-3 (International Electrotechnical Commission). The switch shall not be incorporated in the mains supply cord.

Furthermore, to provide protection against excessive energy being drawn from the mains supply in case of a fault in the equipment, an overcurrent protection device shall be installed.

- The **Protective Conductor** must be connected for safety reasons. Check that the power cable has the proper Earth wire, and it is properly connected. It is not safe to operate this unit without the Protective Conductor Terminal connected.

- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.

EMC Considerations

- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

1.0 GENERAL INFORMATION

1.1 DESCRIPTION

The Model 6152A is a 115V AC or +5V DC powered remote display that accepts logic level data inputs and displays the corresponding numeric information on 14.2mm high 7 segment LED readouts. The input logic data code may be parallel BCD (0-9) or octal (0-7). All components are housed in a tough molded case.

Input data storage is provided and may be used by applying a signal to the strobe input while the desired input data is present. A steady true level on the strobe input allows the displayed data to follow the input data. Two strobe inputs are provided to allow several different strobing modes.

A blanking input allows the display to be blanked upon command. Stored data may be retained or new data stored during blanking.

Decimal points are available to the right of the four most significant digits and more than one may be lighted simultaneously. The decimal points are neither stored or blanked.

The standard instrument has a display capability of 99999 counts and can be converted to -19999 count capability by ordering the Left Annunciator Option. The Right Annunciator Option replaces the rightmost digit with three horizontal bars. All three bars can be independently lighted and can be used to denote selectable engineering units.

1.2 SPECIFICATIONS

Display Characteristics

Type	7 Segment LED
Size	14.2mm
Capacity	99999 Standard -19999 With LEFT ANNUNCIATOR OPTION 9999 $\equiv$ With RIGHT ANNUNCIATOR OPTION
Display Storage	Standard (may be disabled)
Decimal Points	To the right of the four most significant digits
Blanking	Display blanks on command

Data and Control Input Characteristics

Data Codes	BCD and Octal
DC Strobe	Selectable high or low level true, 2us minimum width
AC Strobe	Selectable rising or falling edge strobe. Maximum 1us transition time. Should be settled for 10us before transition.
Blanking	Low level blanks display
Decimal Points	Grounding decimal point input lights corresponding decimal point.

Input Signal Requirements

BCD Inputs	Low Level: -0.5V to +0.5V, sink 0.4ma
	High Level: +2.4V to +5.0V, source 40ua
POLARITY and STROBE Inputs	Low Level: -0.5V to +0.5V, sink 3.2ma
	High Level: +2.4V to +5.0V, source 80ua
$\overline{\text{BLANKING}}$ Input	Low Level: 0.5V to +0.5V, sink 8ma
	High Level: +2.4V to +5.0V, source 200ua
RIGHT ANNUNCIATOR Inputs	Top Bar: Same as POLARITY and STROBE inputs
	Middle Bar: Same as BCD Inputs
	Bottom Bar: Same as BCD Inputs

Operating Environment

Temperature	0°C to +50°C
Humidity	0 to 95% at < 40°C

Input Power

AC	4.2W maximum
DC	3.8W maximum

Weight 425g

Dimensions (See Figure 5-1)

Bezel (WxHxT)	96 x 48 x 112,2 mm
Depth Behind Bezel with Connector	104,2 mm
Panel Cutout (WxH)	92 x 45 mm

Connector (Furnished with D1 Option)

Types	SAE	SAC 18D/1-2
Key	SAE	007900
Key Position	Between pin 3 and pin 4	

1.3 OPTION CODES

MODEL/OPTION	DESCRIPTION
6152A	Basic Model 6152A Remote Display Module, 99999 counts, 115V AC, 50-60 Hz operation
C3	+5V DC operation
C1	230V AC, 50-60 Hz operation
C5	100V AC, 50-60 Hz operation
AR	Right Annunciator (≡)
ALP	Left Annunciator (-1) with Positive Polarity Input
ALN	Left Annunciator (-1) with Negative Polarity Input
D1	One P.C. edge connector with solder terminals
BL	Blank lens

2.0 RECEIVING AND INSTALLATION

2.1 UNPACKING AND INSPECTION

Your Model 6152A Remote Display has been carefully inspected and tested before shipment. Unpack the instrument and perform a visual inspection to verify that no damage has occurred during shipment or handling. These instruments are factory sealed units. Because extensive damage could result from attempts to measure circuit parameters or to troubleshoot the instrument by non-factory personnel, the warranty is automatically voided if the unit has been removed from its case.

2.2 MECHANICAL INSTALLATION

See Section 4, Outline Mounting DIN 2A Case, for installation and mounting. The unit is inserted in the front of the panel with the slide retainers removed. Slide retainers are then installed from the rear and held in place by the clamp rings as shown in the diagram.

3.0 OPERATING INSTRUCTIONS

3.1 INTRODUCTION

The Model 6152A is a compact self-contained panel mounted Remote Display that accepts parallel BCD or Octal data, retains it in storage, and displays it on 7 segment LED readouts. All components including the AC power supply are housed in a tough molded case and all connections to the instrument are made to the printed circuit connector at the rear of the case.

The standard instrument has 99999 count capability with two options extending this capability to include a left-hand overrange 1 and minus sign and a right-hand engineering units annunciator. 5V power input is available as an option with AC power input standard.

Input data should be of a positive true, parallel BCD or Octal format and should have TTL compatible logic levels.

Input data is connected to internal data latches which can be strobed to store and display data indefinitely or can be commanded to follow and display the data as it appears. The latches can be wired to strobe the data into storage on either a positive or negative pulse (or level) or on a positive or negative transition.

3.2 POWER

The standard Model 6152A Remote Display operates from a 115V AC power source. The optional AC power supply allows the display to be operated on a 100V AC, or 230V AC ±10%, 50-60 Hz power source. A maximum of 4.2 watts are dissipated in AC operation. The DC powered option operates from a +5V ±5% power source. It dissipates 3.8 watts maximum.

3.2.1 DC OPERATION

In DC operation the Remote Display should be connected to a +5V ±5% power source capable of supplying a steady state current of 800ma or more. Care must be taken when connecting the input, control, and power supply ground lines to insure that a ground loop is not formed. It is suggested that all ground connections be made at the same node, preferably at the ground terminal of the Remote Display.

Wiring Detail, 5VDC Power Operation

a. Connect the positive lead of the 5V power source to Pin 15.

b. Connect the negative lead (ground reference) of the 5V power source to Pin T.

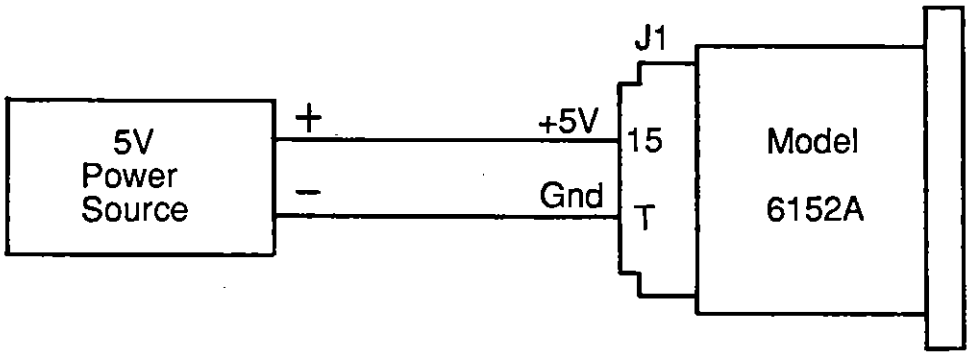


Figure 3-1 Wiring Detail, 5VDC Power Operation

Input Voltage at J1 (Static or Instantaneous)	4.75V minimum 5.25V maximum
Ripple (50 Hz to 120 Hz)	20mV rms
Noise (above 120 Hz)	10mV rms
Output Impedance (Including Interconnect Wiring)	0.5 Ohm maximum

3.2.2 AC OPERATION

Model 6152A Remote Displays can be ordered with an AC power supply wired for either a standard 115VAC or an optional 100VAC, or 230VAC 50-60 Hz power source. The power source is connected to J1 per Figure 2. Before wiring to 230VAC, confirm that the instrument is wired for 230VAC power, as overvoltage could cause electrical damage.

Wiring Detail, AC Power Operation

a. Connect the high or "hot" side of the AC power line to Pin A.

b. Connect the low or "cold" side of the AC power line to Pin 2.

c. Connect the earth ground or "third wire" to Pin C.

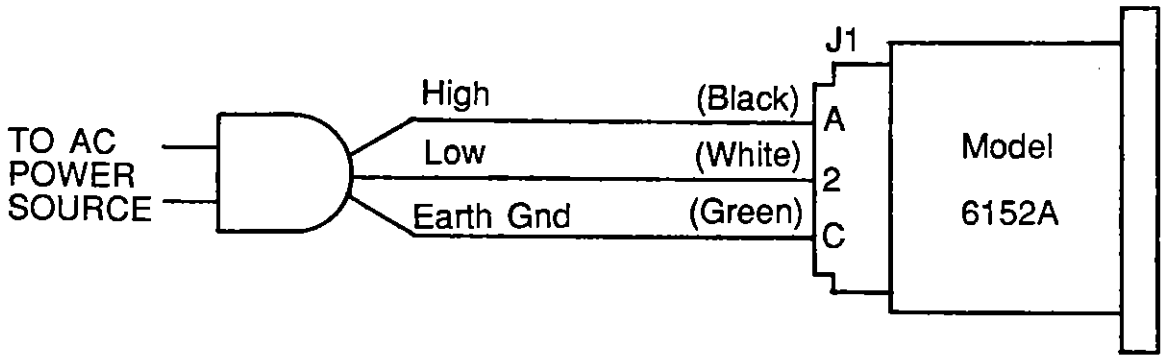


Figure 3-2 Wiring Detail, AC Power Operation

CAUTION

1. Improper power connection or incorrect line voltage may result in catastrophic failure.

2. Proper insulation of power line connections is mandatory to insure safety against shock hazard.

3.3 DATA INPUTS

The BCD data inputs are connected to J1 as shown in TABLE 4-1 PIN ASSIGNMENTS. Octal data (3 wire, 0-7) may be accommodated by grounding the "8" bit of each decade. The data inputs should be positive true, TTL compatible and must be stable before being strobed into storage. The truth table for these inputs appears in Figure 3-3.

LOGIC INPUT 8 4 2 1	VISUAL DISPLAY
0 0 0 0	0
0 0 0 1	1
0 0 1 0	2
0 0 1 1	3
0 1 0 0	4
0 1 0 1	5
0 1 1 0	6
0 1 1 1	7
1 0 0 0	8
1 0 0 1	9
1 0 1 0	-
1 0 1 1	E
1 1 0 0	H
1 1 0 1	L
1 1 1 0	P
1 1 1 1	Blank

Figure 3-3 Truth Table for Data Inputs

3.4 EXTERNAL CONTROL SIGNALS

3.4.1 STROBE

The Model 6152A contains data latches which store input BCD data which is entered into storage by a strobe signal applied to either the AC or DC strobe inputs. Data can be strobed into storage on either a positive or negative pulse or at a positive or negative transition. The storage feature may be disabled to allow the display to follow the data inputs on a continuous basis. All elements of the display are strobed into storage except the decimal points and the top element of the optional right annunciator display.

AC Strobe (J1-17)

An AC strobe input is provided to strobe data into storage at either the positive or negative edge of a strobe signal. The strobe signal should be 2us minimum in width, settled for 10us or more before the strobing transition, and have rise and fall times of 1us or less. If data is to be strobed into storage at the negative transition of the strobe signal, connect the AC strobe input to the strobe signal and connect the DC strobe and strobe polarity inputs to logic levels per line 1 of Figure 3-4. Line 2 of Figure 3-4 indicates the connections to be made when data is to be strobed into storage on the positive transition of the strobe signal.

DC Strobe (J1-14)

If data is to be strobed into storage continuously for the duration of the strobe signal, the DC strobe input should be connected to the strobe signal. If the storage is to be continuously updated whenever the strobe signal is low, connect the DC strobe input to the strobe signal and connect the AC strobe and strobe polarity inputs to logic levels per line 3 of Figure 3-4. Line 4 of Figure 3-4 indicates the connections to be made when data is to be continuously strobed into storage whenever the strobe signal is high. The minimum strobe width is 2us in either condition. The storage feature can be disabled by hardwiring a continuous strobe signal into the DC strobe input.

3.4.2 STROBE POLARITY (J1-16)

The strobe polarity input is used in conjunction with the unused strobe input to select the polarity of the used strobe input. Refer to Figure 3-4 for connection information.

LINE	INPUT TO PRODUCE STROBE	AC STROBE (J1-17)	DC STROBE (J1-14)	STROBE POLARITY (J1-16)
1.	Negative Transition	Strobe Signal Input	High	Low
2.	Positive Transition	Strobe Signal Input	Low	High
3.	Low Pulse (or Level)	High	Strobe Signal Input	Low
4.	High Pulse (or Level)	Low	Strobe Signal Input	High

Figure 3-4 Strobe Polarity Inputs

3.4.3 $\overline{\text{BLANKING}}$ (J1-V)

A low logic level on the $\overline{\text{Blanking}}$ input blanks all the display elements except the decimal points and the top bar of the optional annunciator display. The storage function remains functional during blanking.

3.4.4 DP1-DP4 (J1-S,P,U,13)

The DP1-DP4 inputs control the right-hand decimal points with DP1 to the right of the most significant digit. Grounding a DP input causes the corresponding decimal point to light. The decimal points are not stored. If the decimal point is grounded by a transistor or passive-pull-up I.C., it must be capable of sinking 15ma.

3.4.5 +5V (J1-15)

The +5V output provides a pull-up voltage source where needed for control and data inputs. No external load current should be drawn from the +5V output. Additionally it is the +5V power input for 5VDC powered instruments. All open inputs should be pulled up to +5V by connecting them to the +5V output.

3.4.6 GROUND (J1-T)

All inputs and outputs are referenced to circuit ground. This pin may be used to connect a constant low logic level to an input.

3.5 ANNUNCIATOR OPTIONS

The Model 6152A Remote Display is normally supplied with five all numeric digits; however, the leftmost digit is replaced with an annunciator having the capability to display the symbols (-) and (1) independently or together in the Left Annunciator Option. The (1) symbol input is positive true whereas the (-) polarity symbol input may be ordered either positive or negative true.

The Right Annunciator Option replaces the rightmost digit with an annunciator capable of displaying three horizontal bars which may be used as an indicator of engineering units by applying the appropriate designations to the front panel.

3.5.1 LEFT ANNUNCIATOR OPTION, + POLARITY (J1-12 & N)

This option replaces the leftmost digit with an annunciator having the capability to display the symbols (-) and (1). The minus symbol is lit by applying a low logic level to the + Polarity Input (J1-N). A high logic level applied to this input extinguishes the minus sign indicating a positive data input. The one symbol is lit by applying a high logic level to the 10K input (J1-12). Both the minus sign and the one symbol are stored and are strobed into storage along with the BCD data.

3.5.2 LEFT ANNUNCIATOR OPTION, - POLARITY (J1-12 & 18)

The Left Annunciator Option, - Polarity is identical to the Left Annunciator Option, + Polarity with the exception of the polarity signal input which becomes negative true and is located at J1-18. This option makes the instrument compatible with data sources that have a Polarity Output that is high for negative polarity data.

3.5.3 RIGHT ANNUNCIATOR OPTION (J1-4,5,7)

The Right Annunciator Option replaces the rightmost digit with an annunciator capable of displaying three horizontal bars which may be controlled independently. The top bar is controlled by J1-5, the middle bar by J1-4, and the bottom bar by J1-7. A high level on any of these pins will cause the corresponding horizontal bar to light. The middle bar and the bottom bar are strobed into storage along with the input data, whereas the top bar is directly controlled.

FUNCTION	PIN
AC Power Hi (1)	A
No Connection	B
AC Power Gnd (1)	C
10 Bit	D
20 Bit	E
40 Bit	F
80 Bit	H
1K Bit	J
2K Bit	K
4K Bit	L
8K Bit	M
10K Bit (1)	N
XX.XXX DP2	P
80K Bit (1)	R
X.XXXX DP1	S
Digital Gnd	T
XXX.XX DP3	U
BLANKING	V

FUNCTION	PIN
No Connection	1
AC Power Lo (1)	2
No Connection	3
8 Bit (1)	4
4 Bit (1)	5
2 Bit (1)	6
1 Bit (1)	7
800 Bit	8
400 Bit	9
200 Bit	10
100 Bit	11
20K Bit (1)	12
XXXX.X DP4	13
DC Strobe	14
+5VDC Power	15
Polarity Select	16
AC Strobe	17
40K Bit (1)	18

OPTION AR, RIGHT ANNUNCIATOR

FUNCTION	PIN
Top Bar	5
Middle Bar	4
Bottom Bar	7
Internal Connection (2)	6

OPTION ALP, LEFT ANNUNCIATOR, + POLARITY

FUNCTION	PIN
+ Polarity	N
10K Bit	12
Internal Connection (2)	R
Internal Connection (2)	18

OPTION ALR, LEFT ANNUNCIATOR, - POLARITY

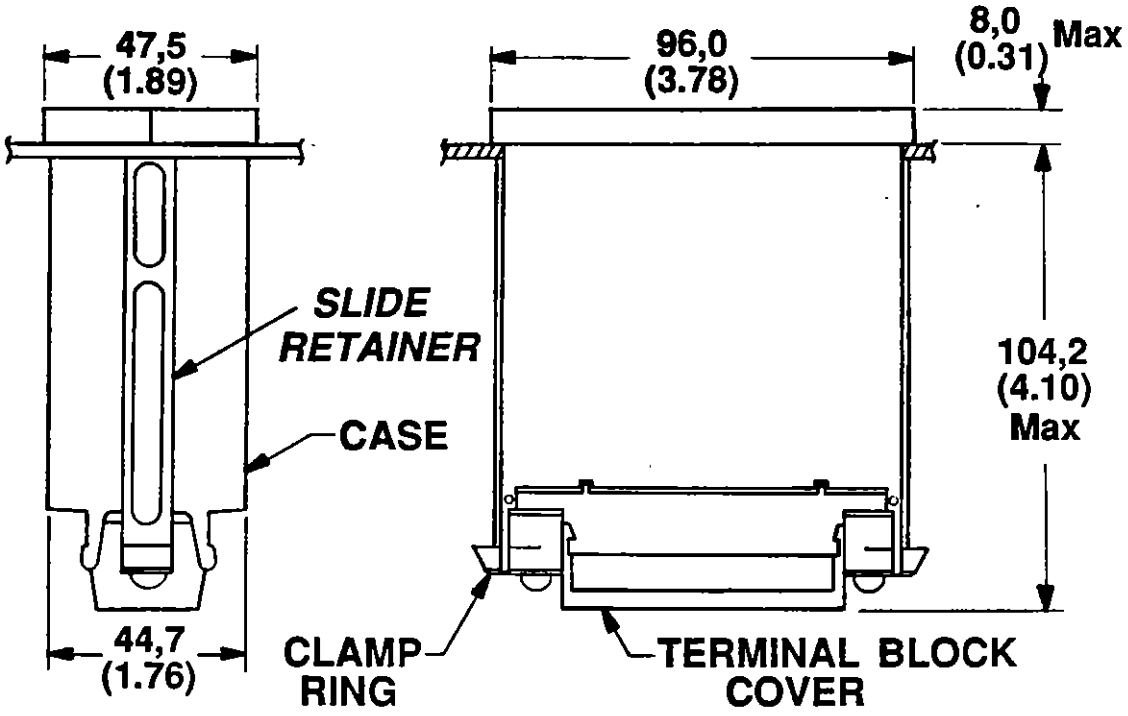
FUNCTION	PIN
Internal Connection (2)	N
10K Bit	12
- Polarity	18
Internal Connection (2)	R

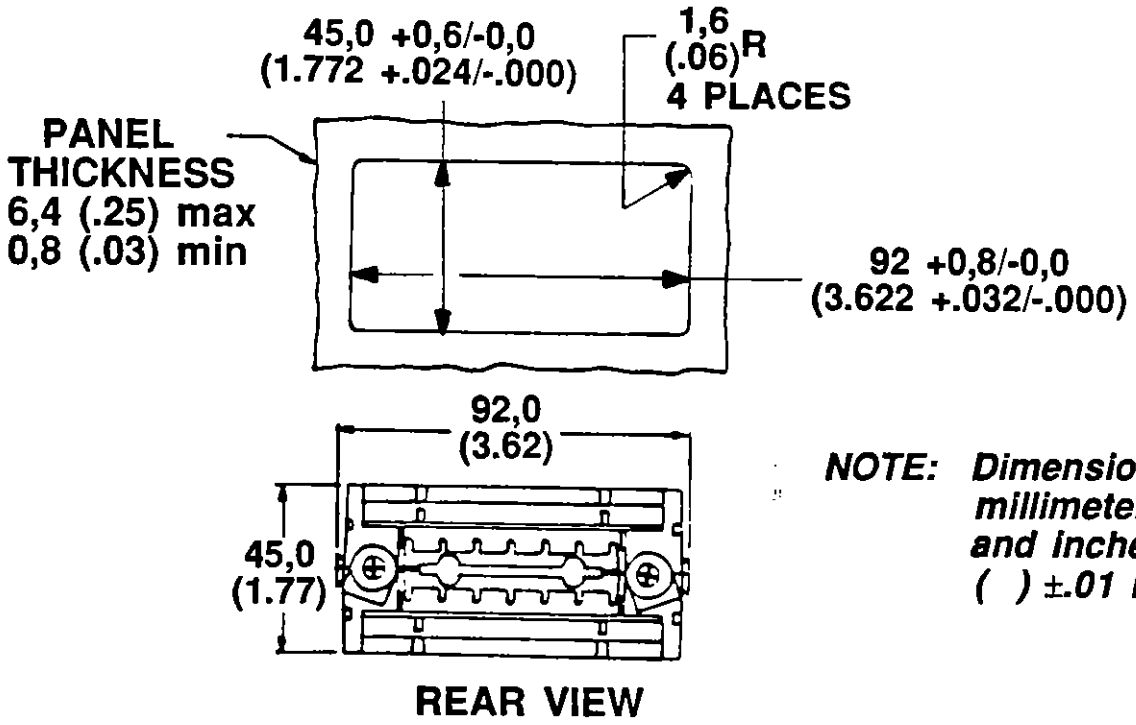
Table 3-1 Model 6152A Pin Assignments

NOTES

(1) These pins may change function with options. (See Option Pin Assignments above.)

(2) Pins marked "Internal Connection" must be left unconnected.





NOTE: Dimensions are in millimeters ±,25 mm and inches are in ( ) ±.01 in

Terminal block cover and bezel not shown for clarity.

Slide clamps rotated and slide retainers removed as shown for installation.

Figure 4-1 Outline and Mounting DIN 2A Case

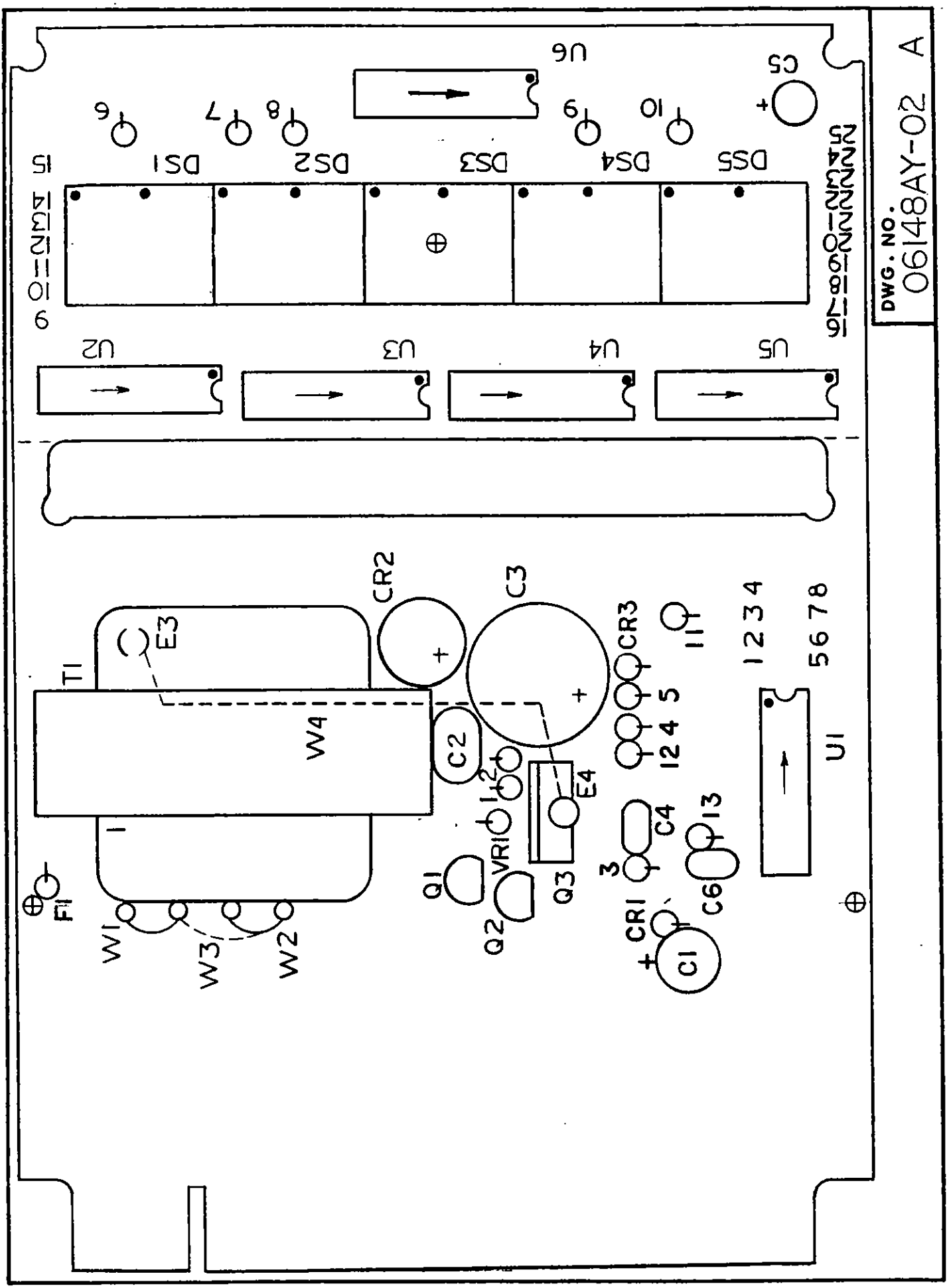


Figure 4-2 Assembly Diagram, Remote Display

Warranty/Disclaimer

NEWPORT ELECTRONICS, INC. warrants this unit to be free of defects in materials and workmanship for a period of one (1) year from date of purchase. In addition to NEWPORT's standard warranty period, NEWPORT ELECTRONICS will extend the warranty period for one (1) additional year if the warranty card enclosed with each instrument is returned to NEWPORT.

If the unit should malfunction, it must be returned to the factory for evaluation. NEWPORT's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by NEWPORT, if the unit is found to be defective it will be repaired or replaced at no charge. NEWPORT's WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of NEWPORT's control. Components which wear are not warranted, including but not limited to contact points, fuses, and triacs.

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Direct all warranty and repair requests/inquiries to the NEWPORT Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO NEWPORT, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM NEWPORT'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting NEWPORT:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS, consult NEWPORT for current repair charges. Have the following information available BEFORE contacting NEWPORT:

1. P.O. number to cover the COST of the repair,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems relative to the product.

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