

508B



CURRENT LOOP INDICATOR

Operator's Manual



N® **NEWPORT Electronics, Inc.**

Additional products from
NEWPORT Electronics, Inc.

Counters	Rate Meters
Frequency Meters	Timers
PID Controllers	Totalizers
Clock/Timers	Strain Gauge Meters
Printers	Voltmeters
Process Meters	Multimeters
On/Off Controllers	Soldering Iron Testers
Recorders	pH pens
Relative Humidity	pH Controllers
Transmitters	pH Electrodes
Thermocouples	RTDs
Thermistors	Thermowells
Wire	Flow Sensors

For Immediate Assistance
In the U.S.A. and Canada: 1-800-NEWPORT®
In Mexico: (95) 800-NEWPORTSM
Or call your local NEWPORT Office.

NEWPORTnetSM On-Line Service
<http://www.newportUS.com>

Internet e-mail
info@newportUS.com

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.

TABLE OF CONTENTS

1.0	DESCRIPTION	1
1.1	Definition/Application	1
1.2	Features	1
2.0	SPECIFICATIONS	2
2.1	Input	2
2.2	Accuracy	3
2.3	Display	3
2.4	Conversion	3
2.5	Environmental	3
2.6	Mechanical	4
3.0	MECHANICAL ASSEMBLY AND INSTALLATION	4
3.1	Safety Considerations	4
3.2	Intrinsic Safety Parameters for FM (FACTORY MUTUAL)	4
3.4	Mechanical Installation	5
3.5	Standard Mounting	6
4.0	SIGNAL INPUT CONNECTIONS	10
4.1	508B-1	10
4.2	508B-2 and 508B-3	10
5.0	CONFIGURATION AND CALIBRATION	11
5.1	Glossary	11
5.2	Calculation	12
5.3	Alternate FS Calculation	13
5.4	FS Procedure Implementation	13
5.5	Component Access/Unit Calibration	14
5.6	Labels	16
6.0	INTRINSIC SAFETY CONSIDERATIONS	18

Figures

	Page
Figure 1-1 Model 508B	1
Figure 3-1 Basic Mounting Configurations	5
Figure 3-2 Surface and TR2/2TK Relay Track Mounting (Option MAT1)	7
Figure 3-3 DIN Track Mounting (Option MDT1)	7
Figure 3-4. External Explosion-Proof Housing Mounting (Option MXS1)	8
Figure 3-5. External Explosion-Proof Housing Mounting (Option MXS2)	9
Figure 3-6. External Explosion-Proof Housing Mounting (Option EPW2)	9
Figure 4-1 508B-1 Signal Connections	10
Figure 4-2 508B-2 & 508B-3 Signal Connections	10
Figure 5-1. 508B-2 and 508B-3 Case Access	14
Figure 5-2. Calibration Setup	15
Figure 5-3. Label Placement	16
Figure 5-4. Jumper Locations	17
Figure 6-1 Block Diagram for 508B Usage for Factory Mutual	19

Tables

Table 5-1. Configuration Chart	17
--------------------------------------	----

1.0 DESCRIPTION

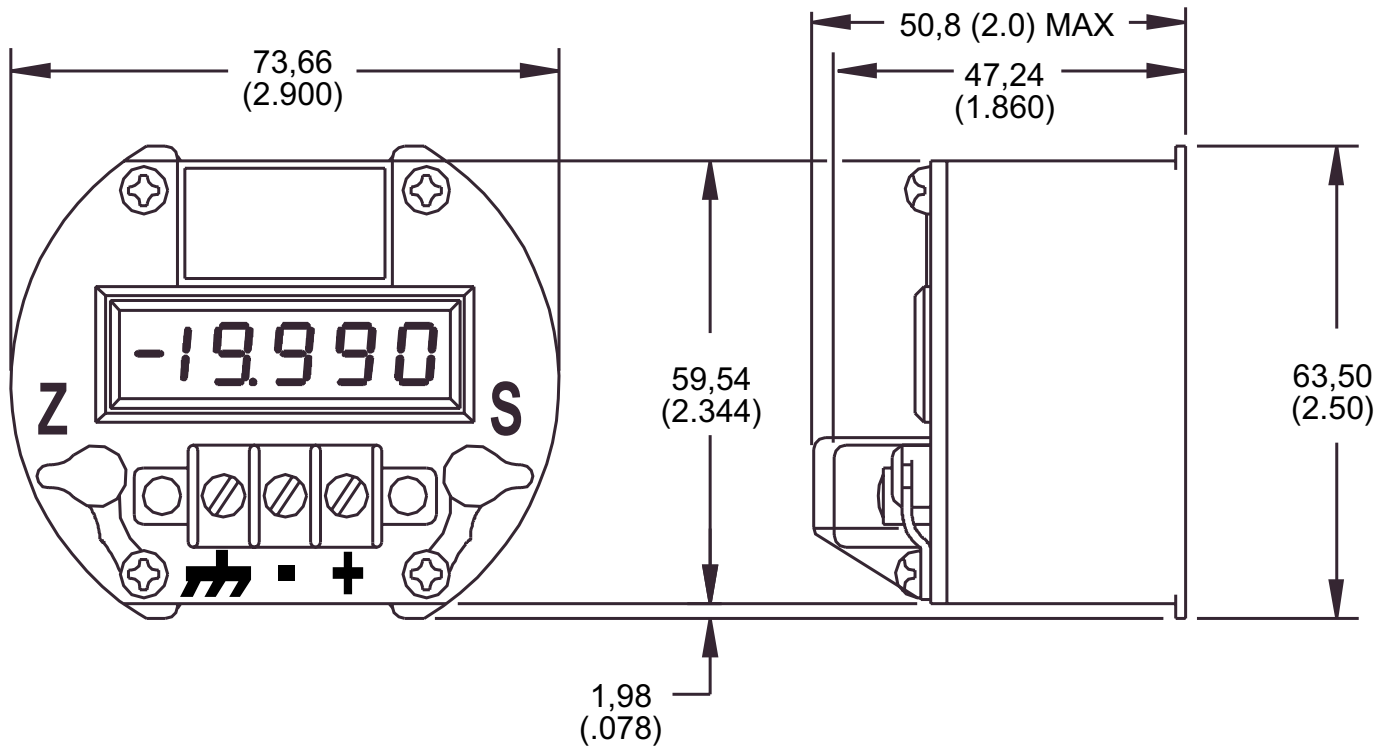


Figure 1-1. Model 508B

1.1 DEFINITION/APPLICATION

Model 508B is a signal powered, two-wire current-loop indicator that accepts 1-5 mA, 4–20 mA, or 10-50 mA process signals and digitally display (± 2000 active counts) the process variable in either percent or in engineering units for such parameters as pressure, flow, temperature, and level.

1.2 FEATURES

In-field Programmability

Input ranges (1-5 mA, 4-20 mA, or 10-50 mA) are selected by push-on jumpers. Three decimal points and a dummy right-hand zero may also be selected by push-on jumpers. Zero and span may be fine tuned with precision, 25-turn potentiometers. Positive slope response may be changed to negative slope response (e.g. , +6000 to -18000) by simply changing two other push-on jumpers.

Signal Powered

Model 508B obtains operating power directly from the current loop, requiring a drop of less than 2.5 V or 2.5 mW at 1 mA.

Electrical Isolation/Overrange Protection

The 508B is electrically isolated from its case and is immune to most sources of electrical noise encountered in process-control environments. In the event of input overrange currents, the 508B can tolerate 250 mA in the forward direction and 1000 mA reverse.

Vibration/Shock/Water Resistance

Low mass and multi-point circuit board support give excellent vibration and shock resistance. Sturdy, die-cast construction, polyurethane paint, and full fluorosilicone gasketing ensure a virtually waterproof case. Circuit boards are conformally coated for added humidity protection.

Mounting Versatility

The 508B-1 may be mounted in a control room on either American or European relay tracks with snaptrack adaptors. The unit can be wall mounted using an available bulkhead adaptor or mounted in an explosion-proof enclosure for wiring compatibility with other equipment in hazardous environments. Both the 508B-2 and the 508B-3 may be connected directly to a conduit with a "T" junction box.

2.0 SPECIFICATIONS

2.1 INPUT

Current:	1-5 mA, 4-20 mA, or 10-50 mA (jumper selectable)
Voltage drop:	2.5 V max forward; up to 50 mA
Protection:	250 mA forward at 3 V or 6 V with IS option; 1000 mA reverse at 2.5 V
Zero range:	-2510 to +2000 counts; jumper selectable in 4 overlapping coarse ranges with a 25-turn potentiometer for continuous adjustment within the following selected ranges: -2510 to -1420; -1580 to -420; -470 to +850; and +760 to +2000.
Span range:	0 to 2000 counts, continuously adjustable with 25-turn potentiometer
Normal mode rejection:	46 dB min at 50/60 Hz
Common mode rejection:	120 db typical, dc to 60 Hz
Common mode voltage:	700 V peak from dc to 60 Hz (meter to case)
RFI susceptibility:	Less than $\pm 0.5\%$ of span at a distance of one meter from a 2-watt, hand-held transceiver (approximately equivalent to 10 V/m field strength) at frequencies of 27 MHz or 440 MHz

NOTE: Proper lead dress and shielding required.
--

2.2 ACCURACY

Accuracy:	Within $\pm 0.1\%$ Span ± 1 Count at $+25^{\circ}\text{C}$
Zero Tempco:	± 0.1 Count/K typ. , ± 0.2 Count/K max.
Span Tempco:	$\pm 0.005\%$ Span/K typ. , $\pm 0.015\%$ Span/K max.

2.3 DISPLAY

Type:	7-segment LCD, 8.9 mm (0.350 in) high
Color:	Black digits on white background
Symbols:	-1.8.8.80
Polarity:	Minus sign
Overrange:	Three least significant digits blanked
Extra digit:	Dummy right-hand zero is jumper selectable
Decimal points:	Three positions, jumper selectable
Lifetime:	More than 30,000 hours to 2:1 contrast ratio
Temperature derating:	2:1 lifetime reduction for each 10°C above 60°C
Humidity derating:	2:1 lifetime reduction for each 10%RH above 60%RH

2.4 CONVERSION

Technique:	Dual-slope, average-value with autozero correction
Polarity:	Determined automatically at the end of signal integration period
Signal integration period:	100 mS typ.
Reading rate:	2.5/sec

2.5 ENVIRONMENTAL

Temperature:	-40 TO $+85^{\circ}\text{C}$
Humidity:	To 95% at 40°C
Vibration:	1.52 mm (.06 in) double amplitude, 10-80 Hz cycled
Shock	55 g, half-sine, 9-13 msec duration
Water resistance	Watertight to a proof pressure of 35 kPa (5 psi)
Mounting position:	Any

2.6 MECHANICAL

Weight:	400 g (14 oz)
Diameter:	74 mm (2.9 in)
Height:	48 mm (1.9 in) including barrier
Electrical connections:	Standard: 3-position barrier strip with #6 screw wire clamps Optional: Two #18 stranded wires, 305 mm (12 in) long

3.0 MECHANICAL ASSEMBLY AND INSTALLATION

3.1 SAFETY CONSIDERATIONS

To ensure safe operation follow the guidelines below:

VISUAL INSPECTION: Do not attempt to operate the instrument if damage is found.

This instrument will meet the requirements of certain FM safety certifications for hazardous environments. In order to meet these requirements the appropriate intrinsic safety barrier must be included in the installation to limit the voltage and current that may be introduced in the hazardous environment.

EXERCISE CAUTION: Due to certain current loop installations, high common mode voltages may be present on the loop circuits. Become familiar with the possible hazards that your circuit may present before installing this meter or, to be safe, remove all sources of power to the circuit while installing.

RAIN OR MOISTURE: Do not expose the instrument to condensing moisture.

3.2 INTRINSIC SAFETY PARAMETERS FOR FM (FACTORY MUTUAL)

Certificate No. 5X2A0.AX

V max=12.5 V,

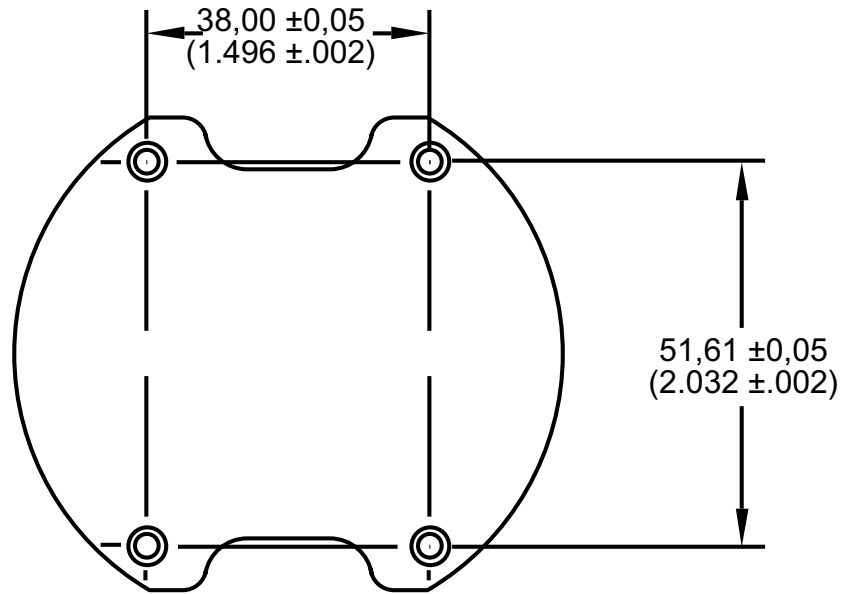
I max=250 mA

Intrinsically Safe for Class I, II and III, Division 1, Groups A,B,C,D,E,F and G hazardous locations.

Ci=8.6 μ F

Li=0 mH

3.3 MECHANICAL INSTALLATION



Rear view: Standard, integral mounting plate

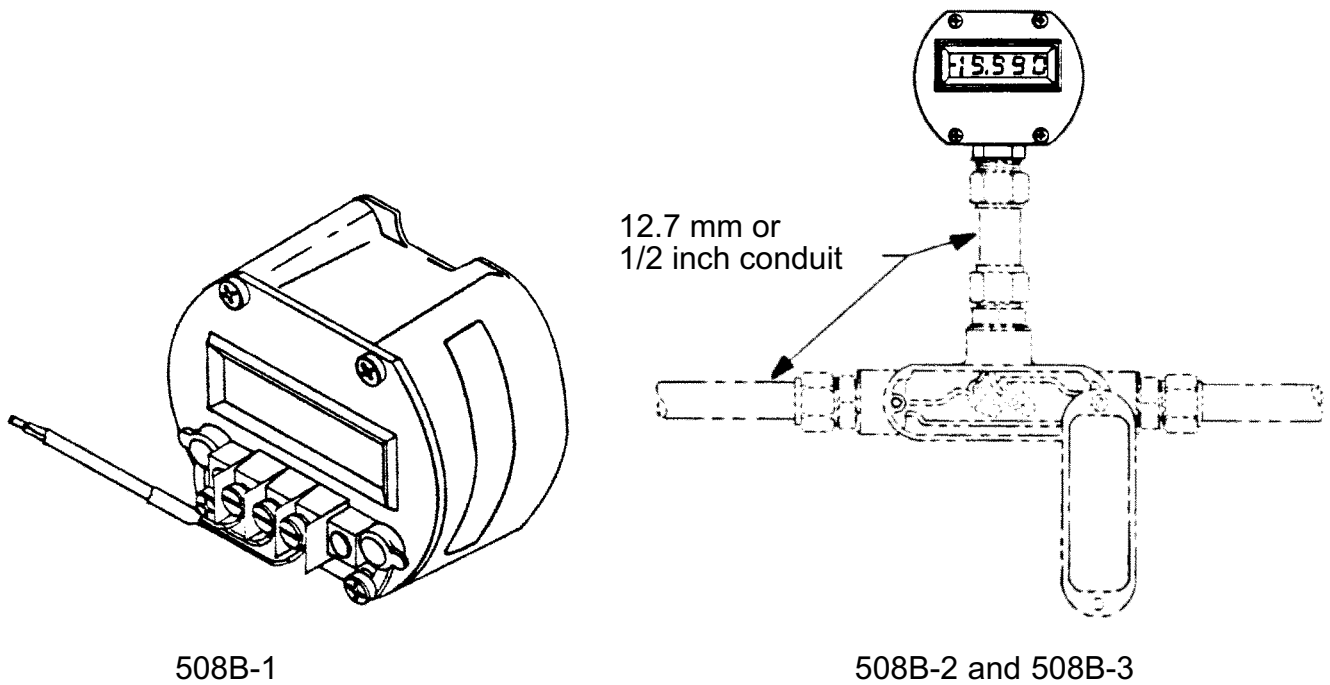


Figure 3-1 Basic Mounting Configurations

The 508B is packaged in a small, rugged, die-cast, zinc-alloy case designed to fit 3" I.D. or larger housings, requiring less than 2" of height.

Three basic 508B configurations (508B-1, 508B-2, and 508B-3) provide mounting versatility.

The 508B-1 provides for surface, track, or explosion-proof housing mounting and is connected with a 3-terminal, #6 screw barrier strip (beneath the display window).

The 508B-2 is equipped with a 1/2" EMT conduit fitting on the case side beneath the display. The fitting has two 0.3 millimeter long, #18 stranded insulated wires passing through a neoprene moisture plug for hookup to junction boxes with standard wire nuts.

The 508B-3 is equipped with a 1/2" NPT conduit fitting on the case side beneath the display. The fitting has two 0.3 mm long, #18 stranded insulated wires passing through a neoprene moisture plug for hookup to junction boxes with standard wire nuts.

3.4 STANDARD MOUNTING

Tapped holes on the back of the 508B case provide for custom mounting to a flat surface; integral flanges on the back of the case provide for standard 8TK2 relay track mounting. For flat surface mounting, use #6 hardware. For 8TK2 relay track mounting, simply push onto track.

The following optional adaptors provide additional mounting options:

1. Adapter plate for surface mount with two #8 front-entry screws through keyhole slots or for push-mount into TR2/2TK relay track. (Option MAT1)
2. Rail clamp for push mount onto DIN EN 50 022 relay track. (Option MDT1)
3. Spring retainers for mounting in 76.4 to 88.9 mm (3 to 3.5 in) inside diameter explosion-proof housings. (Option MXS1)
4. Wire brackets for mounting the 508B above a transmitter in a single housing. (Option MXS2)

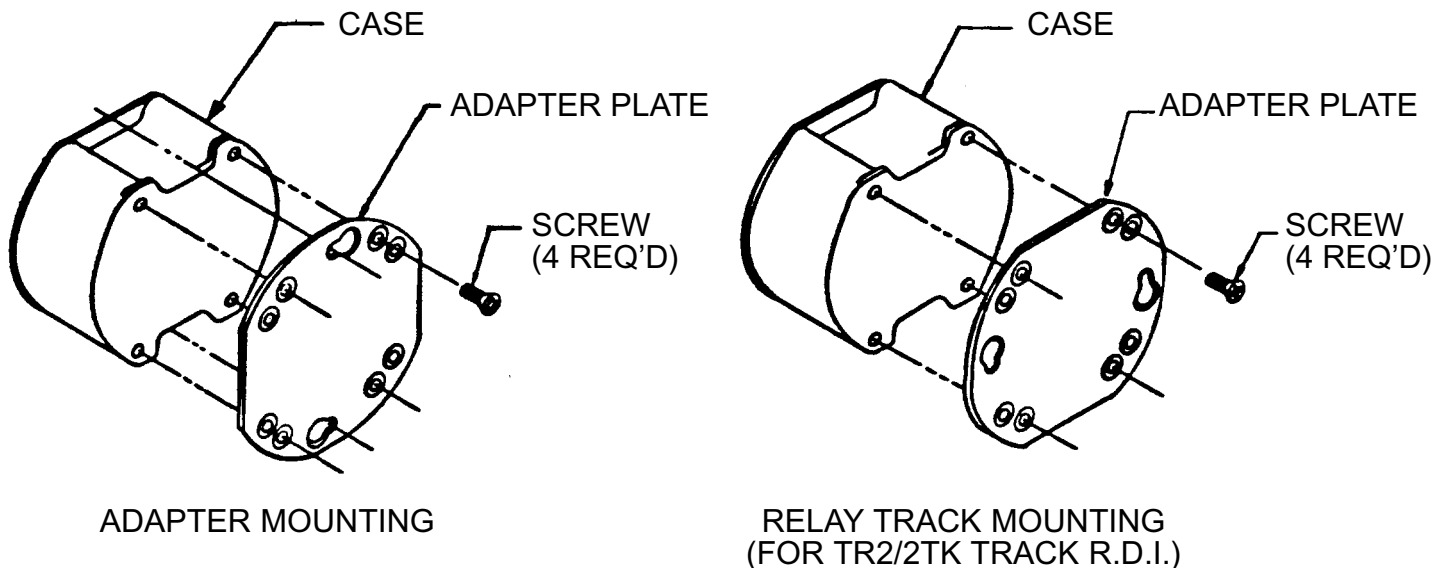


Figure 3-2 Surface and TR2/2TK Relay Track Mounting (Option MAT1)

1. Position plate for desired application.
2. Use #6 hardware to mount plate to the back of the case.

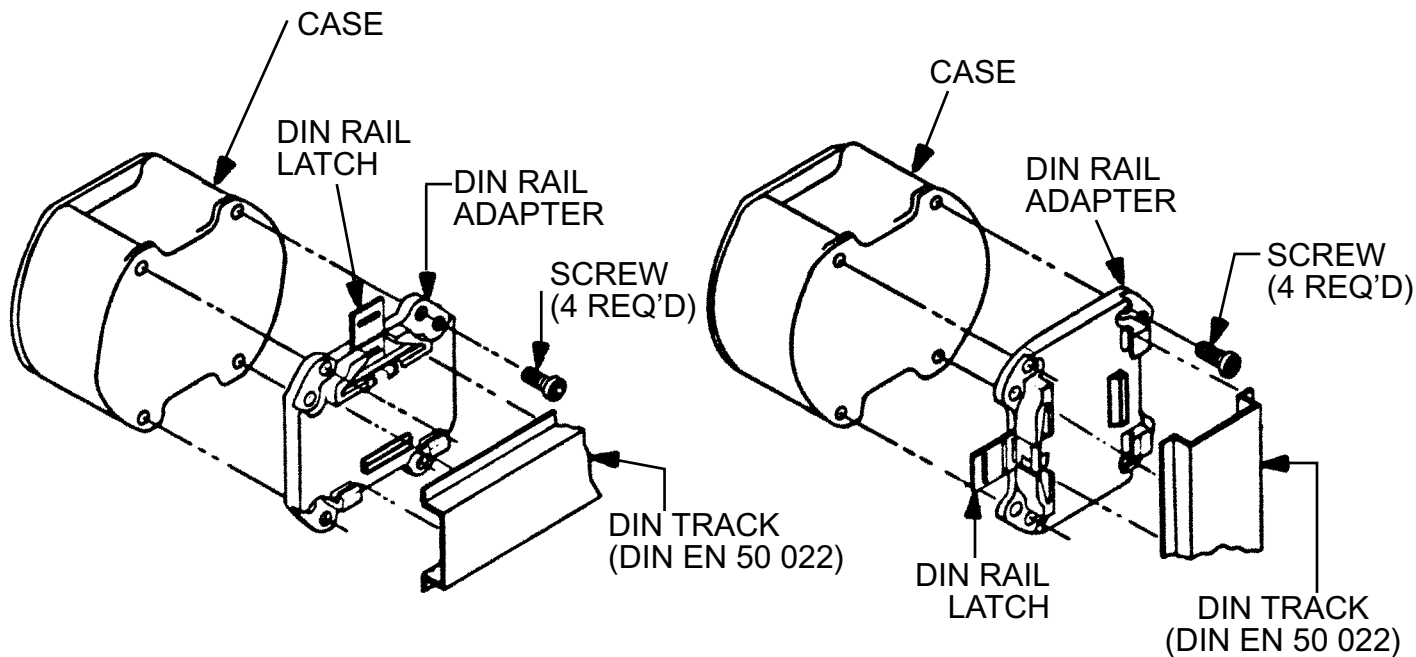
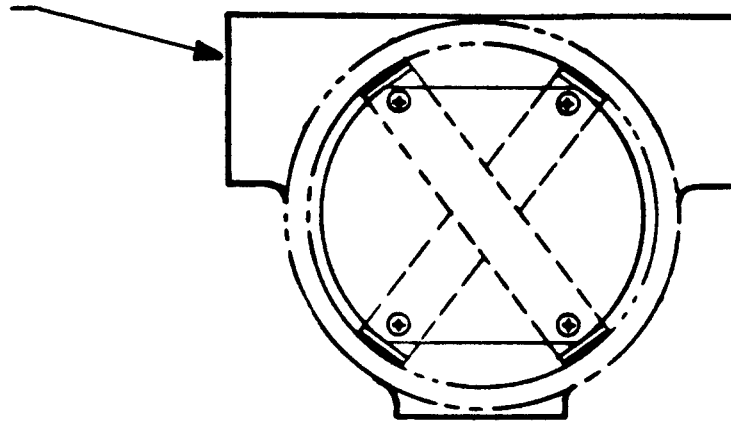


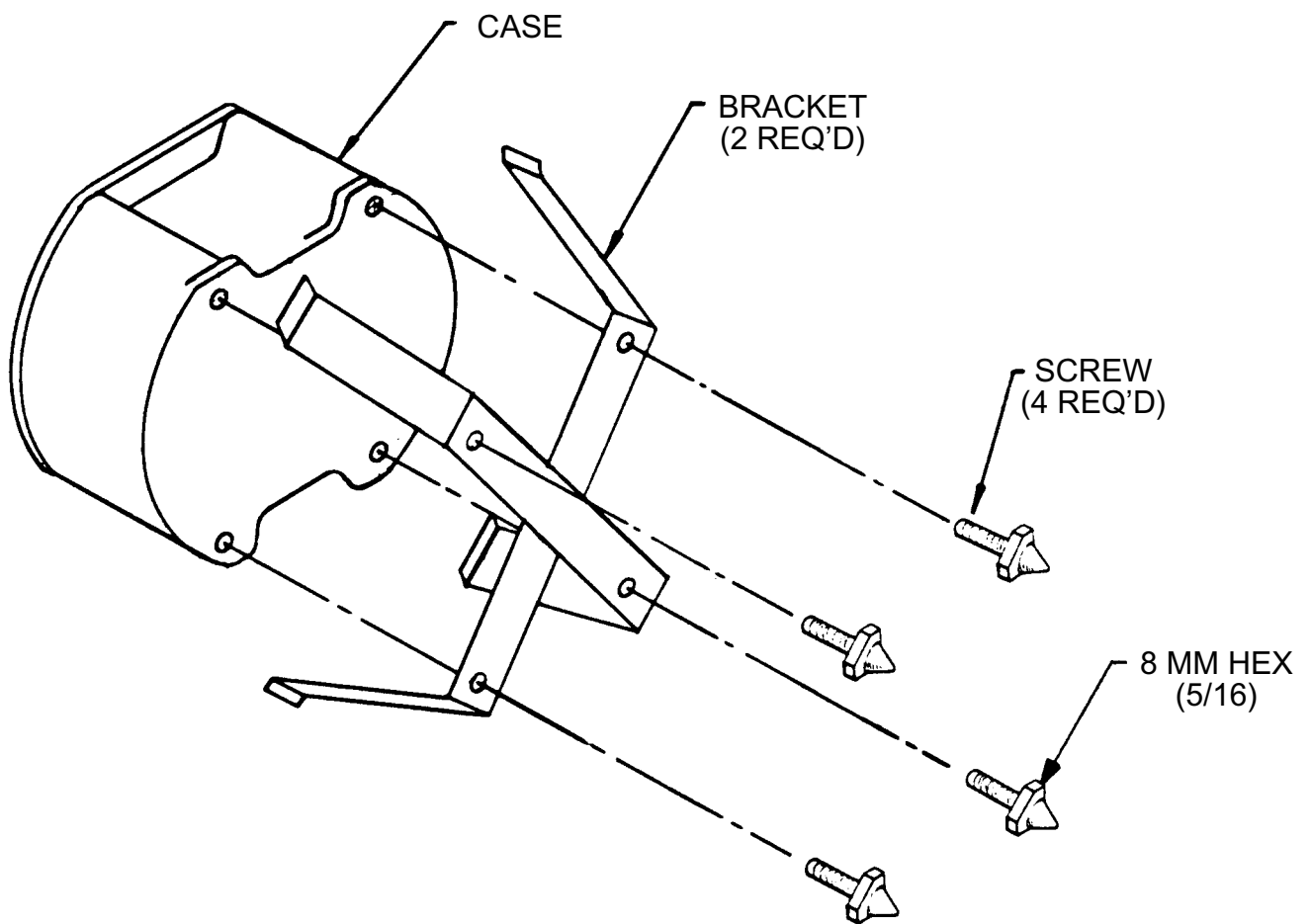
Figure 3-3 DIN Track Mounting (Option MDT1)

1. Position plate for desired track direction.
2. Use #6 flathead screws to mount plate to the back of the case.
3. Snap case assembly onto DIN rail.

1/2" N.P.T.
BOTH ENDS



TOP VIEW OF EXPLOSION-PROOF HOUSING.
UNIT AND HOUSING SHOWN FOR REFERENCE ONLY.



Spring Retainer for Explosion-Proof Housing

Figure 3-4. External Explosion-Proof Housing Mounting (Option MXS1)

1. Position spring retainers across the back of the case.
2. Use wire protector feet (4 provided with Option MXS1) to hold spring retainers in place.
3. Press case assembly into explosion-proof housing.

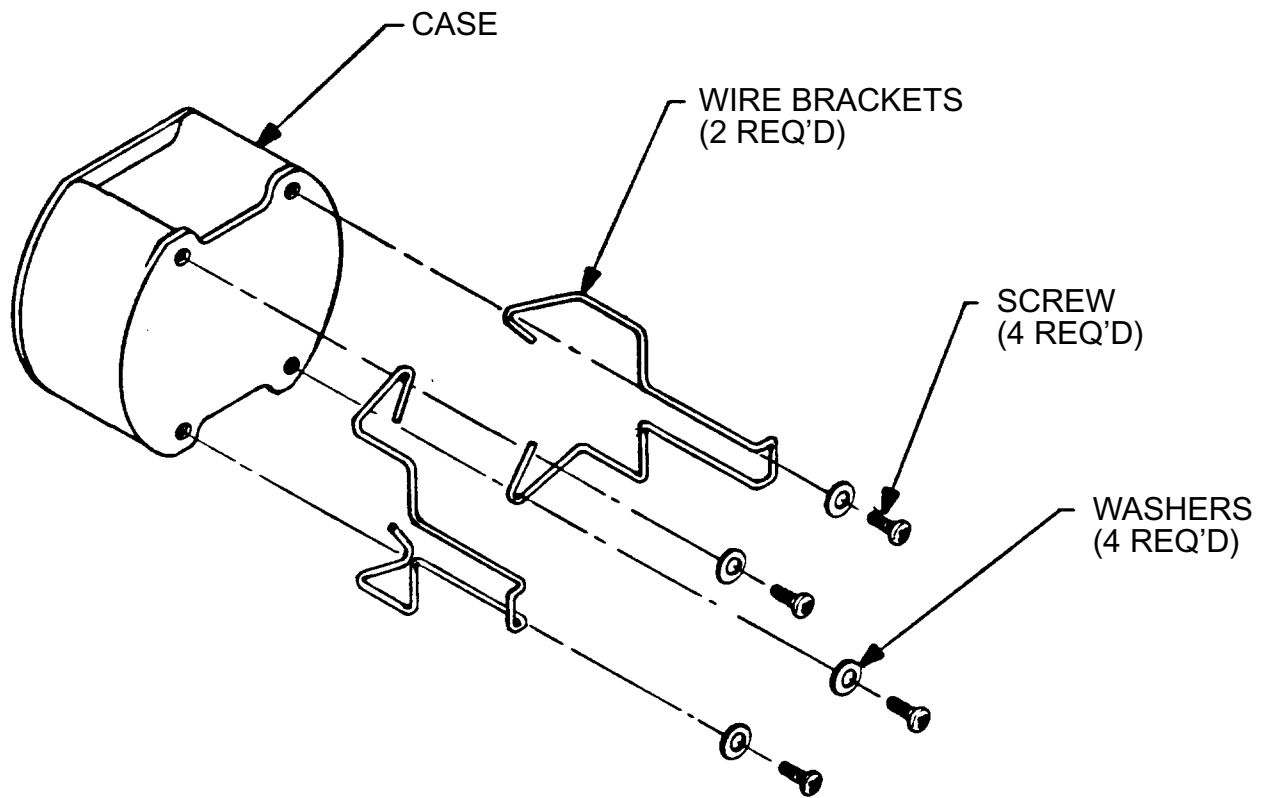


Figure 3-5. External Explosion-Proof Housing Mounting (Option MXS2)

1. Install brackets using #6 screws and flat washers.
2. Mount 508B above transmitter as shown in Figure 3-6.
3. Press wires to pass into housing.

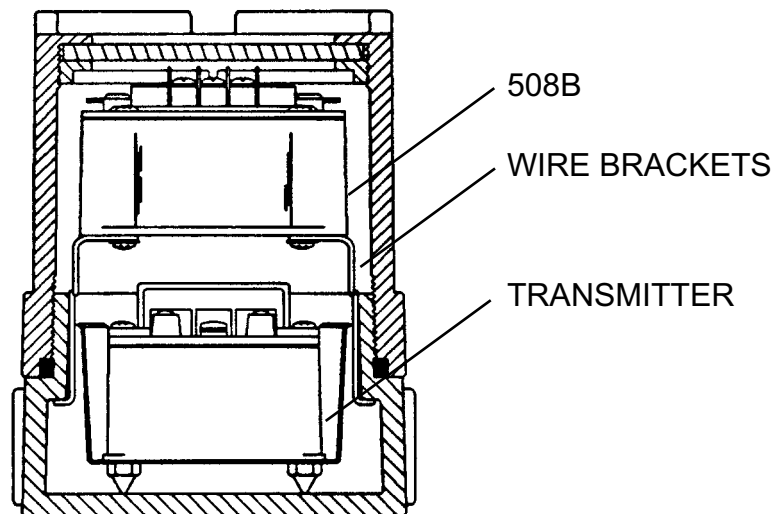


Figure 3-6. External Explosion-Proof Housing Mounting (Option EPW2)

4.0 SIGNAL INPUT CONNECTIONS

WARNING: Input currents in excess of protective limits can damage your meter

4.1 508B-1

The 508B-1 has a 3-terminal barrier strip on the front of the case below the display window. The signal inputs are marked with a "+" or a "-" symbol. The third terminal (case ground) is marked with a "///" symbol. Use of a shielded cable, properly dressed, is recommended.

4.2 508B-2 and 508B-3

Both the 508B-2 and 508B-3 come equipped with a male conduit fitting on the side of the case. The 508B-2 fitting is 1/2" EMT; the 508B-3 fitting is 1/2" NPT. Each conduit fitting is plugged with a rubber stopper. Two 0.3 millimeter long, #18 stranded insulated wires are passed through each stopper. The two wires are white and black. The black wire is the "+" signal input; the white wire is the "-" signal input. Either unit can be hooked up using standard wire nuts.

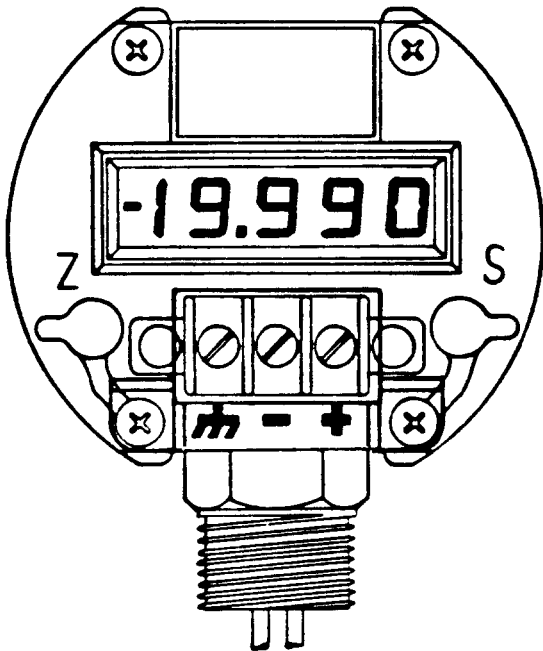


Figure 4-1 508B-1 Signal Connections

Screw-Terminal Pin Assignment	
1	+ SIGNAL INPUT
2	- SIGNAL INPUT
3	GROUND

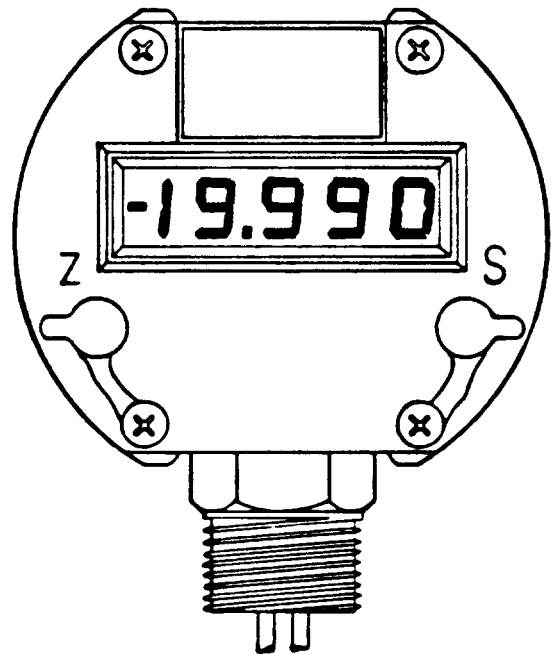


Figure 4-2 508B-2 & 508B-3 Signal Connections

Terminal Wire Assignment	
BLACK WIRE	+ SIGNAL INPUT
WHITE WIRE	- SIGNAL INPUT

5.0 CONFIGURATION AND CALIBRATION

The factory setup (FS) option procedure is to configure the 508B for a specific application. Customers may specify any two current inputs and their corresponding digital readings. For optional configuration procedures, see **Section 5.3**.

The unit may be configured using the push-on jumpers already positioned on the pin-forest. Pin-forest designations are illustrated in **Figure 5-4**.

5.1 GLOSSARY

The following terms and their definitions appear throughout the following procedures:

DP1	Decimal point 1.999
DP2	Decimal point 19.99
DP3	Decimal point 199.9
DRHZ	Dummy right-hand zero
G	Gain expressed in counts per mA
I1	Lowest input current in mA
I2	Highest input current in mA
N1	Reading in displayed counts at input current I1
N2	Reading in displayed counts at input current I2
RN	Required range number for zero range selection
RSS	Reverse span slope
ZR1	Zero range (-2510 to -1420)
ZR2	Zero range (-1580 to -420)
ZR3	Zero range (-470 to +850)
ZR4	Zero range (+760 to +2000)

5.2 CALCULATION

NOTE: An alternate FS calculation procedure is given in **Section 5.3**

1. Base all calculations on one of three ranges: 1 mA to 5 mA, 4 mA to 20 mA, or 10 mA to 50 mA. Write results of calculations in blanks provided below each procedural step.

2. Determine the lowest input current, I1, specified by the customer:

$$I1 = \text{_____ mA}$$

3. Determine the highest input current, I2, specified by the customer:

$$I2 = \text{_____ mA}$$

4. Determine the reading, N1, at input current, I1, specified by the customer:

$$N1 = \text{_____ counts}$$

5. Determine the reading, N2, at input current, I2, specified by the customer:

$$N2 = \text{_____ counts}$$

6. Calculate the gain (G1):

$$G = \frac{(N2 - N1)}{(I2 - I1)} = \left(\frac{\text{_____} - \text{_____}}{\text{_____} - \text{_____}} \right) \text{ counts per mA}$$

7. Calculate the required range number:

$$RN = N1 - (I1 \times G) = \text{_____}$$

NOTE: If G is greater than 500, it is out of the operating range for the standard unit.

8. Select the zero range, ZR, that includes the required range number, RN, from the following ranges:

$$ZR1 = -2510 \text{ to } -1420$$

$$ZR2 = -1580 \text{ to } -420$$

$$ZR3 = -470 \text{ to } +850$$

$$ZR4 = +760 \text{ to } +2000$$

9. Proceed to FS Procedure Implementation, **Section 5.4**.

5.3 ALTERNATE FS CALCULATION

1. (Line 1) Low signal input (mA) = _____
2. (Line 2) High signal input (mA) = _____
3. (Line 3) Low signal input reading (counts) _____
4. (Line 4) High signal input reading (counts) = _____
5. (Line 5) Line 2 - Line 1 = _____
6. (Line 6) Line 4 - Line 3 = _____
7. (Line 7) Line 6 divided by Line 5 = _____
8. (Line 8) Line 7 x Line 1 = _____
9. (Line 9) Line 3 - Line 8 = _____

10. Select a zero range from one of the following, where the number on Line 9 falls between the high and low numbers of that ZR range:

ZR1 = -2510 to -1420
ZR2 = -1580 to -420
ZR3 = -470 to +850
ZR4 = +760 to +2000

11. Proceed to FS Procedure Implementation, **Section 5.4**.

5.4 FS PROCEDURE IMPLEMENTATION

Pin-forest designations are illustrated in **Figure 5-4** Jumper Locations. Range and display selection are listed in **Table 5-1** Configuration Chart.

1. If the current range chosen in either **Section 5.2** Step 1 or **Section 5.3** Steps 1 and 2 equals either 4 mA to 20 mA or 10 mA to 50 mA, install a push-on jumper as indicated in **Table 5-1**.
2. If N1 (**5.2** Step 3 or **5.3** Step 3) is more positive than N2 (**5.2** Step 5 or **5.3** Step 4), reverse the span slope (RSS) by installing two push-on jumpers as indicated in **Table 5-1**.
3. Select the zero range required (ZR1, ZR2, ZR3, or ZR4), and install a push-on jumper as indicated in **Table 5-1**.
4. If a dummy right-hand zero (DRHZ) is required, install a push-on jumper as indicated in **Table 5-1**.
5. If a decimal point is required (DP1, DP2, DP3), install a push-on jumper as indicated in **Table 5-1**.

5.5 COMPONENT ACCESS/UNIT CALIBRATION

Tools and Equipment

#2 Phillips screwdriver

Jewelers' slotted screwdriver

Precision milliampere power source

or

10 V power supply, 4 1/2 digit DMM with milliampere range and 10 kOhm rheostat

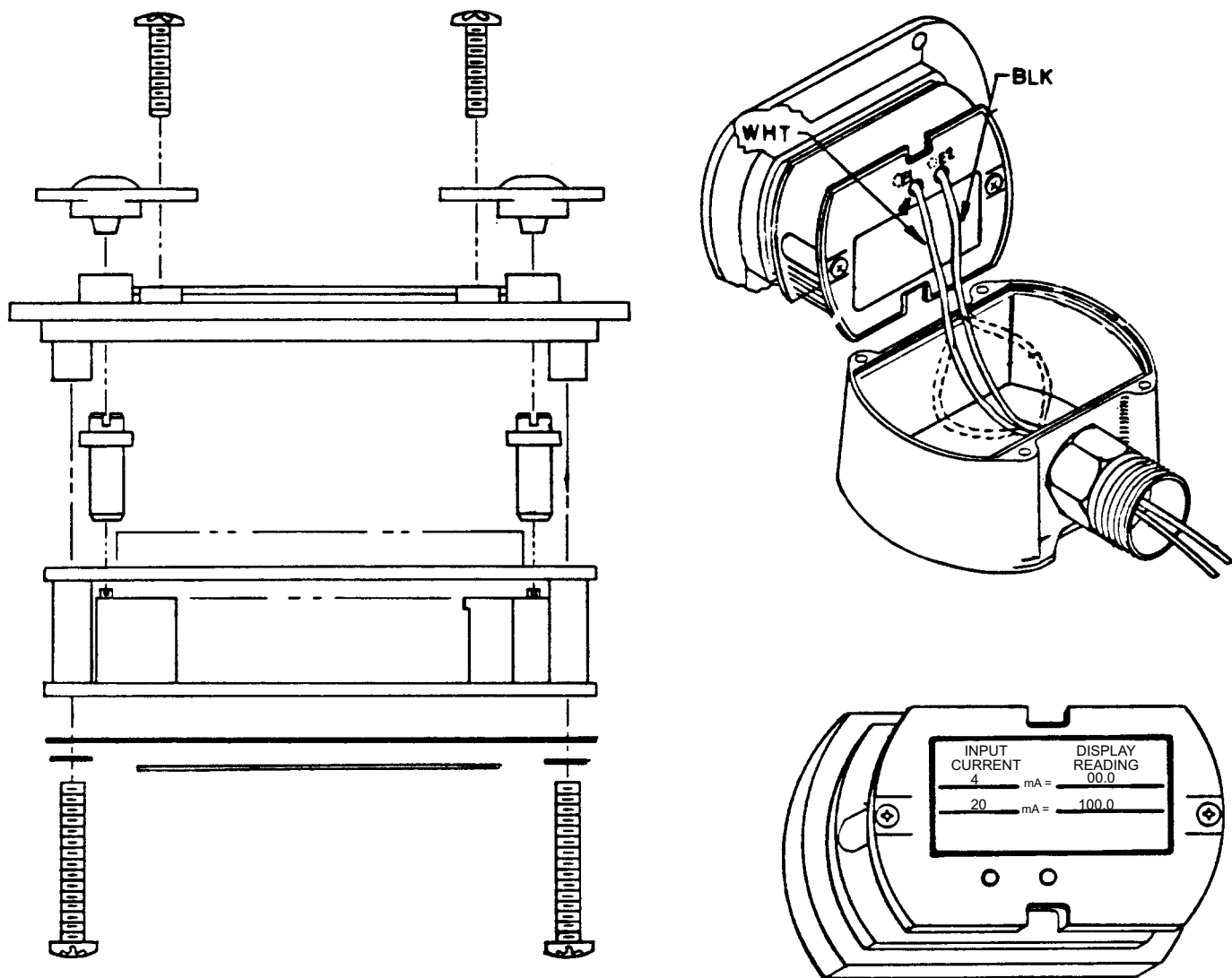


Figure 5-1. 508B-2 and 508B-3 Case Access

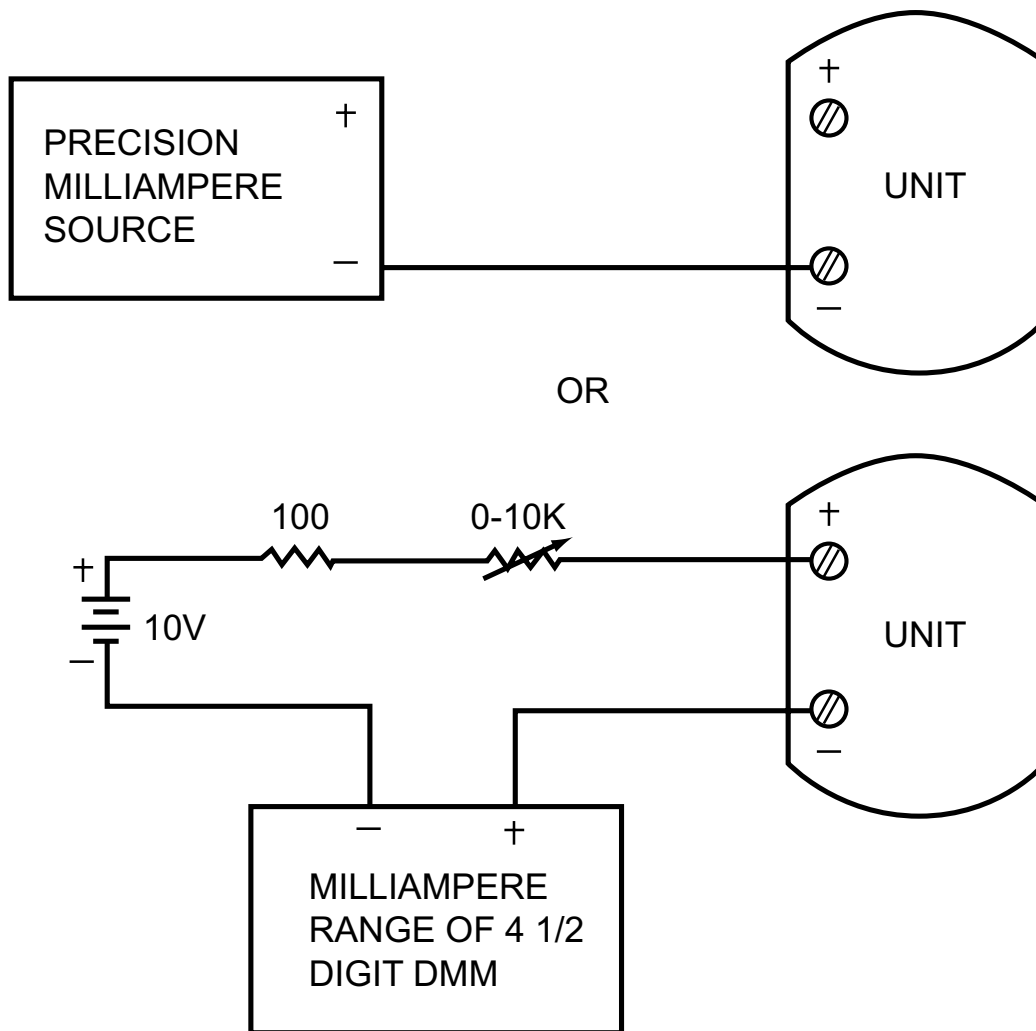


Figure 5-2. Calibration Setup

1. Remove 4 Phillips-head screws from the top of the 508B case, and lift main unit from case. (See **Figure 5-1**)
2. Select the desired jumper configuration and install push-on jumpers in locations indicated in the **Table 5-1** Configuration Chart. (See **Figure 5-4**)

NOTE: Store unused jumpers in a vertical position on unused upper pins closest to the display board.

3. Pull off two sealing plugs that cover 508B span and zero potentiometer screw heads.
4. Set up 508B in calibration configuration. (See **Figure 5-2**)

5. Calibrate unit as follows:
 - A. Alternately apply input currents I1 and I2, and adjust span pot (S) until span reading equals $N_2 - N_1$ counts.
 - B. Apply input current, I1, and adjust the zero pot (Z) until a reading equal to N1 is displayed.
6. Remove 508B from calibration setup.
7. Replace two sealing plugs over 508B span and zero potentiometer screw heads.
8. Apply labels as described in **Section 5.6**. (See **Figure 5-3**).
9. Replace 508B main unit in case.
10. Replace 4 Phillips-head screws that hold the 508B unit to the case.

5.6 LABELS

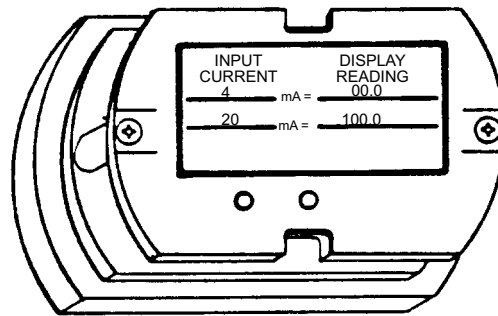


Figure 5-3. Label Placement

1. Add new label directly over existing label. Add correct values of I1, I2, N1, and N2.
2. Install one label on the outside of the housing as shown above.
3. Install one label on the wire shield as shown above.

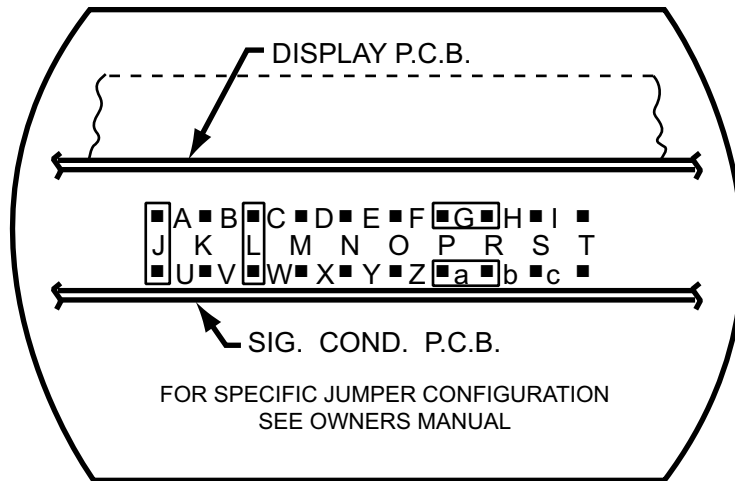


Figure 5-4. Jumper Locations

Table 5-1. Configuration Chart

Configuration	Push-On Jumpers
1-5 mA	NONE
4-20 mA	J*
10-50 mA	A
Normal span slope	G,a*
Reverse span slope	F,Z
Zero range -2510 to -1420 (ZR1)	I
Zero range -1580 to -420 (ZR2)	T
Zero range -470 to +850 (ZR3)	NONE
Zero range +760 to +2000 (ZR4)	c
Dummy right-hand zero (DRHZ)	D
Decimal Point 1.999 (DP1)	W
Decimal Point 19.99 (DP2)	V
Decimal Point 199.9 (DP3)	L*

* Default Setting

NOTE: The factory-calibrated configuration shows 00.0 to 100.0 for a 4 to 20 mA input.

6.0 INTRINSIC SAFETY CONSIDERATIONS

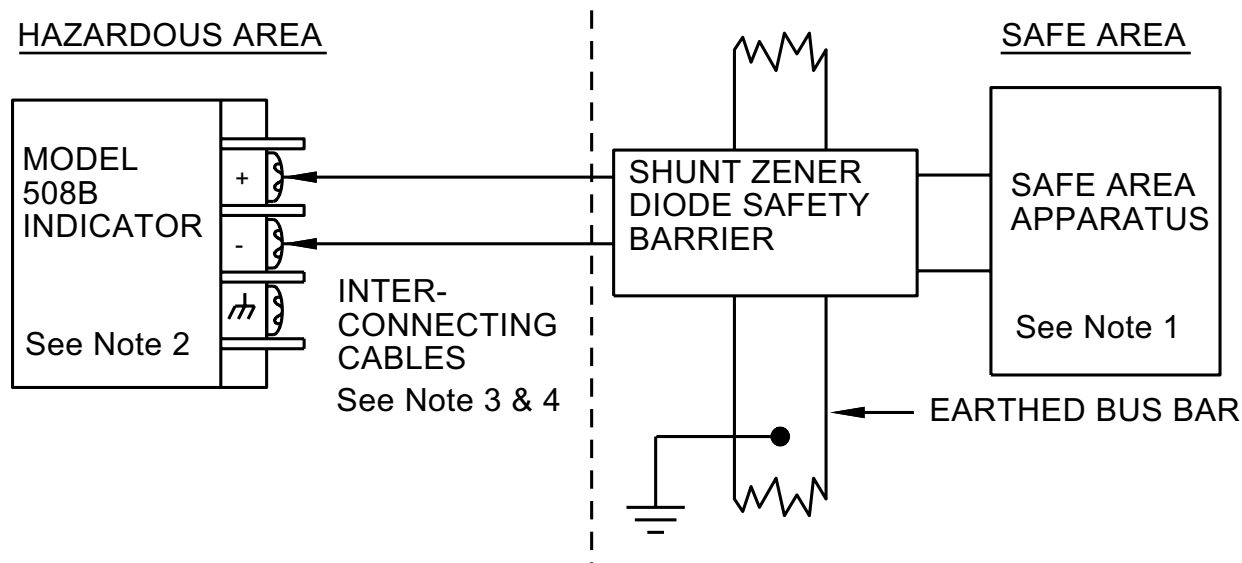


Figure 6-1 Block Diagram for 508B Usage for Factory Mutual

NOTES:

1. Apparatus which is unspecified except that it must not be supplied from nor contain under normal or abnormal conditions a source of potential with respect to Earth in excess of 250V R.M.S. or 250V D.C.
2. The following output parameters apply; $V_{max}=12.5V$, $I_{max}=250mA$, $C_i=6.2\mu F$, $L_i=0$.
3. The Interconnecting Cable may be a twin pair, or a pair contained in a Type A or Type B multicore cable (as defined in EN50 039 clause 5.3) provided that the peak voltage of any circuit contained within the multicore does not exceed 60 Volts.
4. The capacitance or inductance or inductance to resistance ($4R$) ratio of the Interconnecting Cable must not exceed the values specified for the barrier in use.
5. The electrical circuit in the Hazardous Area must be capable of withstanding without breakdown an A.C. test voltage of 500V R.M.S. to Earth or frame for one minute.

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.

NEWPORT is pleased to offer suggestions on the use of its various products. However, NEWPORT neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by NEWPORT, either verbal or written. NEWPORT warrants only that the parts manufactured by it will be as specified and free of defects. NEWPORT MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive and the total liability of NEWPORT with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall NEWPORT be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by NEWPORT is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, NEWPORT assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and additionally, purchaser will indemnify NEWPORT and hold NEWPORT harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

Return Requests/Inquiries

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.

NEWPORT's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

NEWPORT is a registered trademark of NEWPORT ELECTRONICS, INC.

© Copyright 2003 NEWPORT ELECTRONICS, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without prior written consent of NEWPORT ELECTRONICS, INC.

For immediate technical or application assistance please call:

1-800-6397678®
1-800-NEWPORT

Newport Electronics, Inc.
2229 South Yale Street • Santa Ana, CA • 92704 • U.S.A.
TEL: (714) 540-4914 • FAX: (203) 968-7311
Toll Free: 1-800-639-7678 • www.newportUS.com • e-mail: info@newportUS.com
ISO 9001 Certified

Newport Technologies, Inc.
976 Bergar • Laval (Quebec) • H7L 5A1 • Canada
TEL: (514) 335-3183 • FAX: (514) 856-6886
Toll Free: 1-800-639-7678 • www.newport.ca • e-mail: info@newport.ca

Newport Electronics, Ltd.
One Omega Drive • River Bend Technology Centre
Northbank, Irlam • Manchester M44 5BD • United Kingdom
Tel: +44 161 777 6611 • FAX: +44 161 777 6622
Toll Free: 0800 488 488 • www.newportuk.co.uk • e-mail: sales@newportuk.co.uk

Newport Electronics B.V.
Postbus 8034 • 1180 LA Amstelveen • The Netherlands
TEL: +31 20 3472121 • FAX: +31 20 6434643
Toll Free: 0800 0993344 • www.newport.nl • e-mail: info@newport.nl

Newport Electronics spol s.r.o.
Frystatska 184, 733 01 Karviná • Czech Republic
TEL: +420 59 6311899 • FAX: +420 59 6311114
Toll Free: 0800-1-66342 • www.newport.cz • e-mail: info@newport.cz

Newport Electronics GmbH
Daimlerstrasse 26 • D-75392 Deckenpfronn • Germany
TEL: 49 7056 9398-0 • FAX: 49 7056 9398-29
Toll Free: 0800 / 6397678 • www.newport.de • e-mail: sales@newport.de

Newport Electronique S.A.R.L.
11, rue Jacques Cartier • 78280 Guyancourt • France
TEL: +33 1 61 37 29 00 • FAX: +33 1 30 57 54 27
Toll Free: 0800 466 342 • www.newport.fr • e-mail: sales@newport.fr

Mexico and Latin America
FAX: 001 (203) 359-7807
En Español: 001 (203) 359-7803

NEWPORTnetSM On-Line Service www.newportUS.com
--

Internet e-mail info@newportUS.com
--

 **NEWPORT** Electronics, Inc.