



**MODEL  
3760  
DC VOLTAGE CONDITIONER**

**INSTRUCTION MANUAL**



**3700**  
**Instrument Series**

## **WARNING**

Death, serious injury, or fire hazard could result from improper connection of this instrument. Read and understand this manual before connecting this instrument. Follow all installation and operating instructions while using this instrument.

Connection of this instrument must be performed in compliance with the National Electrical Code (ANSI/NFPA 70-2014) of USA and any additional safety requirements applicable to your installation.

Installation, operation, and maintenance of this instrument must be performed by qualified personnel only. The National Electrical Code defines a qualified person as "one who has demonstrated the skills and knowledge related to the construction and operation of the electrical equipment and installations, and who has received safety training on the hazards involved."

Qualified personnel who work on or near exposed energized electrical conductors must follow applicable safety related work practices and procedures including appropriate personal protective equipment in compliance with the Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2012) of USA and any additional workplace safety requirements applicable to your installation.

## **ADVERTENCIA**

Una conexión incorrecta de este instrumento puede producir la muerte, lesiones graves y riesgo de incendio. Lea y entienda este manual antes de conectar. Observe todas las instrucciones de instalación y operación durante el uso de este instrumento.

La conexión de este instrumento a un sistema eléctrico se debe realizar en conformidad con el Código Eléctrico Nacional (ANSI/NFPA 70-2014) de los E.E.U.U., además de cualquier otra norma de seguridad correspondiente a su establecimiento.

La instalación, operación y mantenimiento de este instrumento debe ser realizada por personal calificado solamente. El Código Eléctrico Nacional define a una persona calificada como "una que esté familiarizada con la construcción y operación del equipo y con los riesgos involucrados."

El personal cualificado que trabaja encendido o cerca a los conductores eléctricos energizados expuestos debe seguir prácticas y procedimientos relacionados seguridad aplicable del trabajo incluyendo el equipo protector personal apropiado en conformidad con el estándar para los requisitos de seguridad eléctricos para los lugares de trabajo del empleado (ANSI/NFPA 70E-2012) de los E.E.U.U. y cualquier requisito de seguridad adicional del lugar de trabajo aplicable a su instalación.

## **AVERTISSEMENT**

Si l'instrument est mal connecté, la mort, des blessures graves, ou un danger d'incendie peuvent s'en suivre. Lisez attentivement ce manuel avant de connecter l'instrument. Lorsque vous utilisez l'instrument, suivez toutes les instructions d'installation et de service.

Cet instrument doit être connecté conformément au National Electrical Code (ANSI/NFPA 70-2014) des Etats-Unis et à toutes les exigences de sécurité applicables à votre installation.

Cet instrument doit être installé, utilisé et entretenu uniquement par un personnel qualifié. Selon le National Electrical Code, une personne est qualifiée si "elle connaît bien la construction et l'utilisation de l'équipement, ainsi que les dangers que cela implique".

Le personnel qualifié qui travaillent dessus ou s'approchent des conducteurs électriques activés exposés doit suivre des pratiques en matière et des procédures reliées par sûreté applicable de travail comprenant le matériel de protection personnel approprié conformément à la norme pour des conditions de sûreté électriques pour les lieux de travail des employés (ANSI/NFPA 70E-2012) des Etats-Unis et toutes les conditions de sûreté additionnelles de lieu de travail applicables à votre installation.

## **WARNUNG**

Der falsche Anschluß dieses Gerätes kann Tod, schwere Verletzungen oder Feuer verursachen. Bevor Sie dieses Instrument anschließen, müssen Sie die Anleitung lesen und verstanden haben. Bei der Verwendung dieses Instruments müssen alle Installation- und Betriebsanweisungen beachtet werden.

Der Anschluß dieses Instruments muß in Übereinstimmung mit den nationalen Bestimmungen für Elektrizität (ANSI/NFPA 70- 2014) der Vereinigten Staaten, sowie allen weiteren, in Ihrem Fall anwendbaren Sicherheitsbestimmungen, vorgenommen werden.

Installation, Betrieb und Wartung dieses Instruments dürfen nur von Fachpersonal durchgeführt werden. In dem nationalen Bestimmungen für Elektrizität wird ein Fachmann als eine Person bezeichnet, welche "mit der Bauweise und dem Betrieb des Gerätes sowie den dazugehörigen Gefahren vertraut ist."

Qualifiziertes Personal, das an bearbeiten oder herausgestellte angezogene elektrische Leiter sich nähern, muß anwendbare Sicherheit bezogener Arbeit Praxis und Verfahren einschließlich passende persönliche schützende Ausrüstung gemäß dem Standard für elektrische Sicherheitsauflagen für Angestellt-Arbeitsplätze (ANSI/NFPA 70E-2012) der Vereinigten Staaten und alle zusätzlichen Arbeitsplatzsicherheitsauflagen folgen, die auf Ihre Installation anwendbar sind.

## **Safety Precautions**

The following safety precautions must be followed whenever any type of voltage or current connection is being made to the instrument.

- Before connecting to electric circuits or pulse initiating equipment, open their related breakers or disconnects. It is recommended NOT TO install any connection of the instrument on live power lines. Only Qualified Service personnel that have demonstrated the abilities and received the proper safety training are capable of connecting to live circuits.
- Connections must be made to the instrument first, then connect to the circuit to be monitored.
- Wear proper personal protective equipment, including safety glasses and insulated gloves when making connections to power circuits.
- Hands, shoes and floor must be dry when making any connection to a power line.
- Before each use, inspect all cables for breaks or cracks in the insulation. Replace immediately if defective.
- If the equipment is used in a manner not specified in this user's guide, the protection provided by the equipment may be impaired.

## **Medidas de seguridad**

Las medidas de seguridad siguientes deberán observarse cuando se realice cualquier tipo de conexión al instrumento.

- o Cuando se haga conexiones a circuitos eléctricos o a equipo de activación por pulso, deberá abrirse sus respectivas cajas de seguridad. NO deberá hacerse ninguna conexión del instrumento en líneas eléctricas bajo tensión.
- o Las conexiones deberán hacerse primero al instrumento y, luego, al circuito a ser monitorizado.
- o Al hacer conexiones a circuitos eléctricos, deberá utilizar anteojos y guantes protectores.
- o Sus manos, zapatos y el piso deberán estar secos en todo momento en que se haga una conexión a un cable eléctrico.
- o Verifique que la unidad esté DESACTIVADA antes de conectar sondas en el panel posterior.
- o Previo a cada uso, deberá verificarse que los cables no estén rotos y que el material aislante no tenga rajaduras. Reemplace de inmediato cualquier parte defectuosa.

## **Mesures de Sécurité**

Les mesures de sécurité suivantes doivent être prises chaque fois qu'un type de connexion quelconque est effectué sur l'instrument.

- o Ouvrir les disjoncteurs correspondants lors d'une connexion à des circuits électriques ou à des équipement de génération d'impulsions. NE PAS effectuer de connexion d'instrument sur des lignes électriques sous tension.
- o Une fois toutes les connexions de l'instrument effectuées, connecter au circuit à contrôler.
- o Porter des lunettes de protection et des gants isolants pour effectuer des connexions aux circuits électriques.
- o S'assurer que les mains, les chaussures et le sol soient secs lors de connexions à une ligne électrique.
- o S'assurer que l'unité est ÉTEINTE avant de connecter les sondes au panneau arrière.
- o Inspecter tous les câbles, avant chaque utilisation, pour s'assurer que les isolants ne sont pas coupés ou fendus. Remplacer immédiatement tous les équipements défectueux.

## Sicherheitsvorkehrungen

Die folgenden Sicherheitsvorkehrungen sind immer dann zu befolgen, wenn eine Verbindung zum Instrument hergestellt wird.

- o Öffnen Sie beim Anschluß an elektrische Stromkreise oder Impulsauslösungseinrichtungen die entsprechenden Unterbrecher. Es dürfen KEINE Anschlüsse an das Instrument unter stromführenden Spannungsleitungen montiert werden.
- o Die Verbindungen müssen zuerst am Instrument und danach an der zu überwachenden Schaltung hergestellt werden.
- o Tragen Sie Schutzbrillen und Isolierhandschuhe, wenn Sie Anschlüsse an den Stromkreisen vornehmen.
- o Hände, Schuhe und Fußboden müssen trocken sein, wenn Sie Anschlüsse an den Stromkreisen durchführen.
- o Stellen Sie sicher, daß das Gerät AUSgeschaltet ist, bevor Sie an der rückwärtigen Konsole Meßfühler anschließen.
- o Prüfen Sie vor jedem Gebrauch alle Kabel auf Bruchstellen und Risse in der Isolierung. Wechseln Sie schadhafte Kabel sofort aus.

## Standard Accessories

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### Standard accessories

The following table lists the 3700 standard accessories.

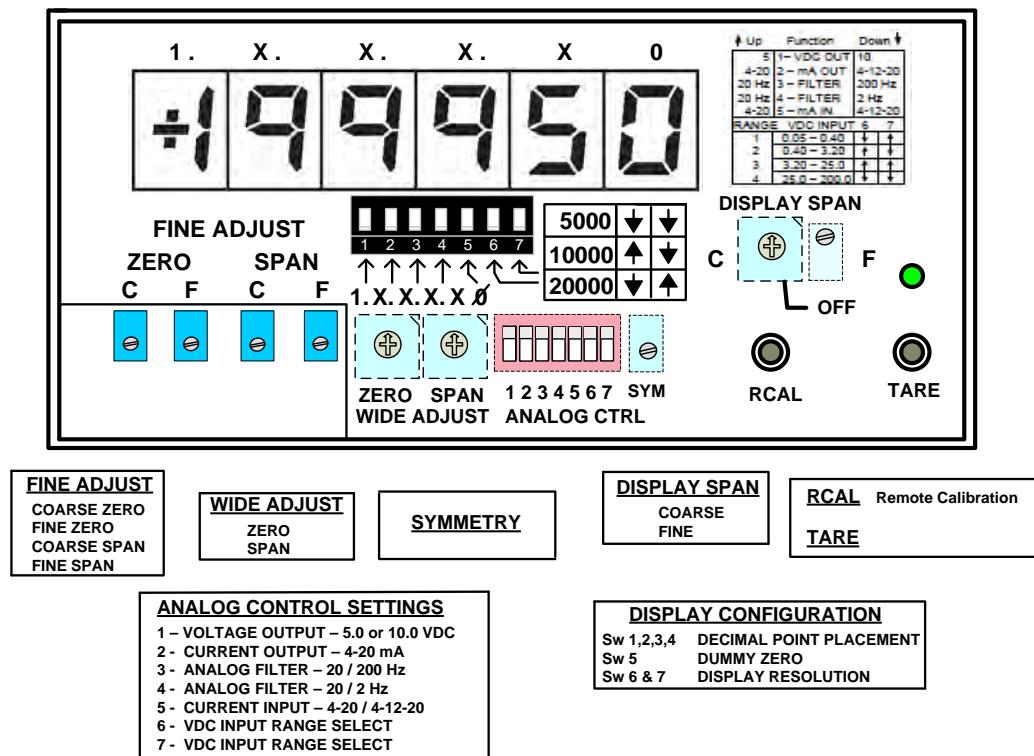
Description	Part Number
3760 Manual	92362.00
3760 Quick Reference Guide	92367.00
5 Pin connector, analog signals	25657-LF
8 Pin connector, transducer	25658-LF
10 Pin connector, logic	25606.00
*US Power Cord	USSTDCORD (900744)
*European Power Cord	EUROSTDCORD (115369-G1)
*United Kingdom Power Cord	UKSTDCORD (115368-G2)
*Australian Power Cord	AUSTDCORD (901347)
Desk top feet (4ea.)	35058.00
*User specified, one standard only.	

## 1 GENERAL DESCRIPTION AND SPECIFICATIONS

The Model 3760 is a single-channel panel instrument for DC Voltage and 4-20mA sensors; intended for applications involving single ended or differential DC Voltage signals with ratings between 50 mV to 200.0 Vdc input full scale or 4-20mA inputs. The 3760 will supply excitation, conditioning and provide a calibrated Engineering Unit's display and analog output signals for the measurement of pressure, displacement, speed, load and other parameters associated with DC based sensors. The 3760 is front panel configurable with user selectable wide gain, zero, symmetry, and selectable analog output of voltage and current signals. Display is user configured and independently adjustable for engineering unit scaling up to  $\pm 199950$  independent of the analog full scale signal.

The Model 3760 can be calibrated by the “two-point (dead-weight)” process involving known “zero” and “full scale” input parameters. A convenient “RCAL” front panel push button or rear panel connection is available for calibration verification.

### FRONT PANEL VIEW OF 3760 CONTROLS (Front Display Cover Removed)



**3760 SPECIFICATIONS**

**Measurement Range:** Adjustable; 0.050 mV to 200 VDC; or 4-20 / 4-12-20 mA nominal full-scale.

**Transducer Types:** DC Voltage or mA Current out (potentiometer, DC to DC LVDT)

**Excitation:**  $\pm 12.0$  Vdc (24 Vdc), up to 50 mA.

**Power Supply:** Voltage 90 - 250 VAC, 47 - 63 Hz  
Consumption 10 Watts

**Physical Parameters:** 5.68" W x 2.84" H x 7.06" D; weight - 3.25 Lbs.

**Analog Output:** selectable;  $\pm 5$ ,  $\pm 1$  0 VDC, 4 -20 mA or 4 -12 -20 mA (20 % over -range on voltage outputs only)

**Operating Temperature:** 0 to +55 Degrees C, 5 to 95% relative humidity, non-condensing

**Altitude:** 2000m (6560 ft) maximum

**Installation Category:** Installation Category II, Pollution Degree 2

**Amplifier**

**Normal - Mode Range:**  $\pm 5$  V RMS operating;  $\pm 28$  V without instrument damage

**Input Impedance:** Differential 200 k $\Omega$

**Offset:** vs. Temperature:  $\pm 30$  ppm  $\mu$ V/ $^{\circ}$ C; vs. Time:  $\pm 10$  ppm/month

**Gain Accuracy:** Limited only by calibration accuracy

**Gain Stability:** vs. Temperature:  $\pm 30$  ppm/ $^{\circ}$ C; vs. Time:  $\pm 10$  ppm/month

**Linearity:** better than  $\pm 0.03\%$  of full scale

**Filter:** 3-pole modified Butterworth; 3 dB down at 2 Hz, 20 Hz or 200 Hz; selectable.

Fast output always enabled, 5 KHz response (J3 Pin 3).

**Common Mode:**

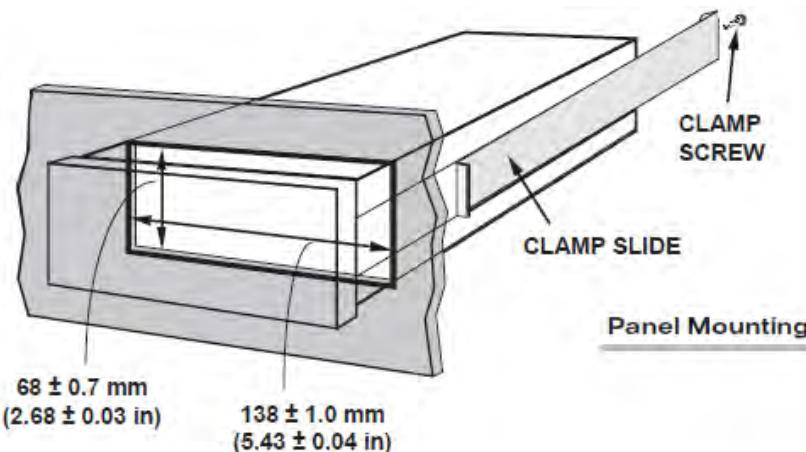
<u>Range</u>	<u>C-M Range</u> (V f.s.) (+/- V)
0.050 - 0.400	5
0.400 - 3.200	40
3.200 - 25.00	200
25.00 - 200.0	200

**Step-Response Settling Times for the 3760 (in milliseconds)**

	<u>3db Frequency</u>	<u>To within 1%</u>	<u>within .1%</u>	<u>within .02%</u>
Fast Output	5000 Hz	0.14	0.10	0.08
Selectable Output	200 Hz	3.7	5.0	5.6
	20 Hz	37	50	56
	2 Hz	370	500	560

**1.a PANEL MOUNTING**

You can easily mount the instrument in your own precut panel. Cutout dimensions for a *panel-mounted* unit are standard **DIN**; panel thickness should not exceed 6 mm (0.24 in). Simply unscrew the two rear-panel CLAMP SCREWS and slide the CLAMP SLIDES rearwards out of their grooves (THE FRONT BEZEL NEED NOT BE REMOVED). Insert the unit through the panel cutout, *from the front of the panel* (if the unit has rubber feet, these will have to be removed). Then reinstall the CLAMP SLIDES, and tighten the CLAMP SCREWS until the instrument is securely mounted.

**Panel Mounting**

## 2 CONNECTIONS

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The **Model 3760 I/O CONNECTIONS** are via removable screw terminals which will accept wire sizes from AWG 12 to 26. NOTE: The recommended transducer cabling would be twisted pair, individually shielded - wired as indicated (Fig. 6). Table 1 denotes screw terminal assignments

### Rear Panel Connections

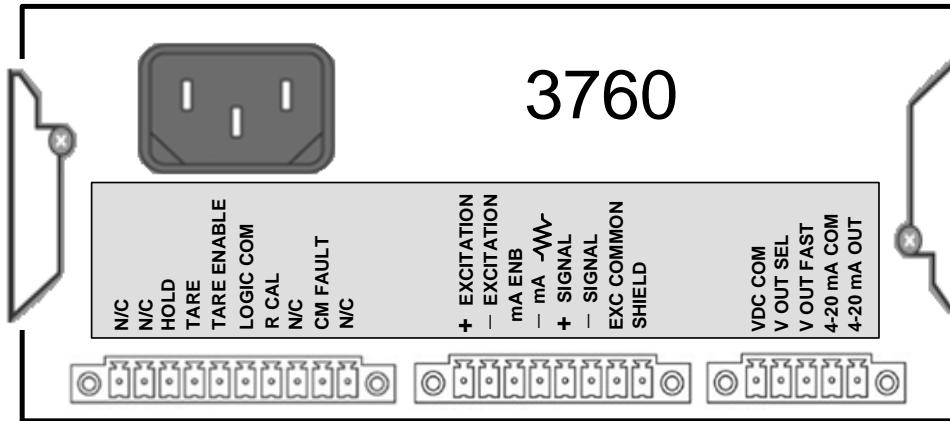
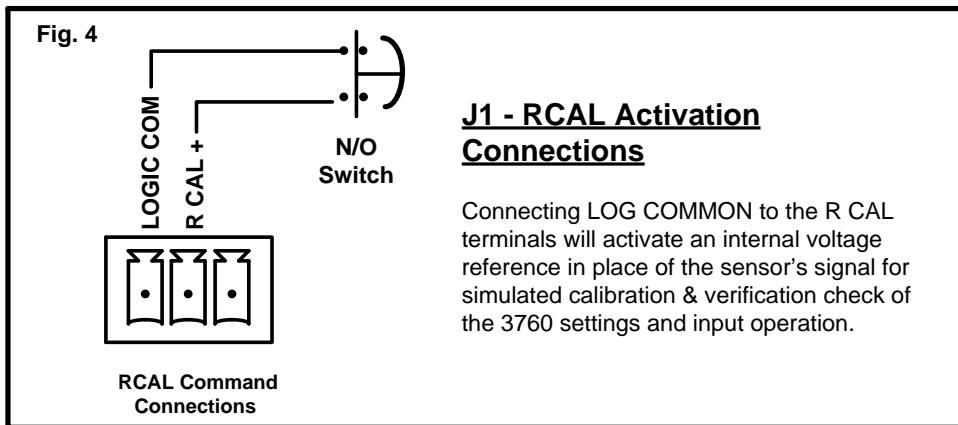


Table 1

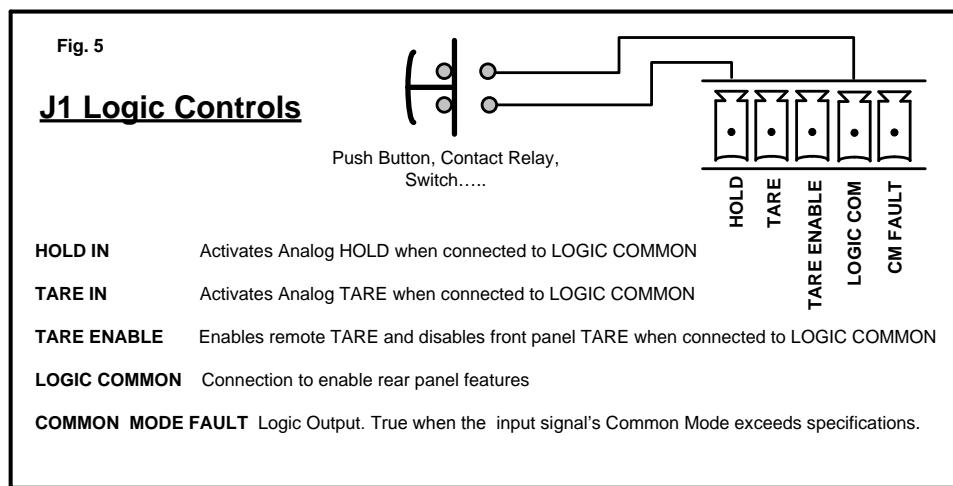
Connector Number	Screw Terminal	Terminal Label	Line Function
J1	1	N/C	No connection
J1	2	N/C	No connection
J1	3	HOLD	Input Analog Hold command
J1	4	TARE	Input Analog TARE command
J1	5	TARE ENABLE	External TARE enable input
J1	6	LOGIC COM	Logic Common
J1	7	R CAL	Remote Calibration Command
J1	8	N/C	No connection
J1	9	CM FAULT	Common Mode Fault output
J1	10	N/C	No connection
J2	1	+ EXCITATION	+ Excitation Power
J2	2	- EXCITATION	- Excitation Power
J2	3	mA ENABLE	Jumper Connection to Enable mA input
J2	4	- mA	- Negative 4-20 mA Input Signal from sensor
J2	5	+ SIGNAL	+ Signal Input (VDC or mA)from sensor
J2	6	- SIGNAL	- Signal Input from sensor
J2	7	EXC COMMON	Excitation common
J2	8	SHIELD	Case Shield for cable termination
J3	1	V OUT COM	- Signal Output Voltage Common
J3	2	V OUT SEL	+ Signal Output Voltage – Filter Select
J3	3	V OUT FAST	+ Signal Output Voltage – 5 kHz Filter
J3	4	4-20 mA COM	Current Output Common
J3	5	4-20 mA OUT	Current Output Signal

## 2 CONNECTIONS

**J1 – RCAL Command Connections.** Connection is used to remotely activate the positive calibration command from the rear panel. When the RCAL terminal is connected to LOGIC COM via a switch or relay, the 3760 meter will generate 80% of the full scale value as configured.



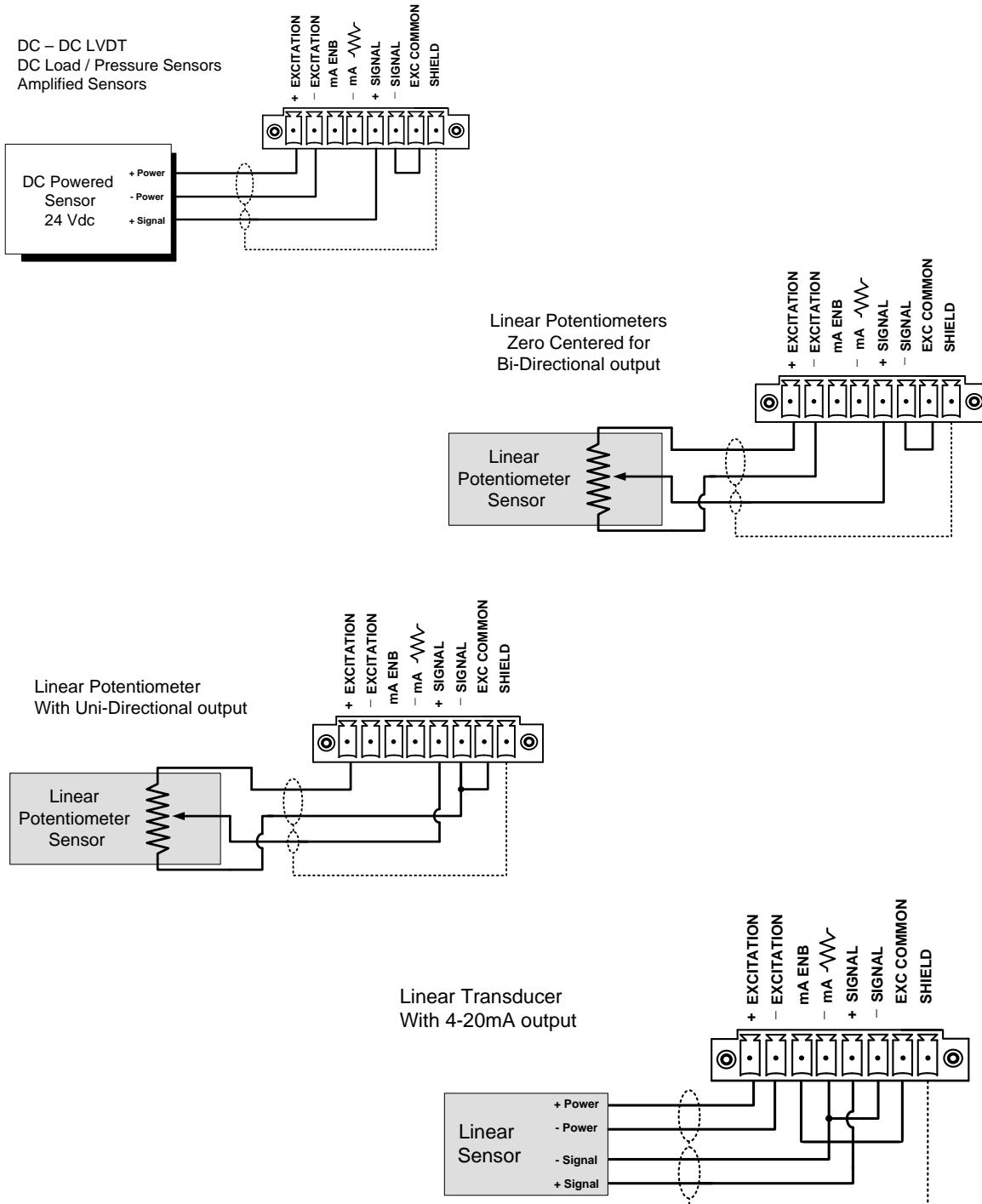
**J2 - HOLD & TARE Connections.** Connection is used when external control of the "HOLD" and "TARE" features of the unit are enabled and are controlled by an external switch, PLC or relay. The LOG COM signal is used to activate the analog HOLD or Analog TARE (offset) to the meter's display and analog output signals present on J13.



**Common Mode:** Is the voltage level at which the input signal can be "floating" from earth common which the 3760 can function properly. If this level is exceeded, the "CMF" (terminal 9, J1) will go true (to ground), giving the user a remote status of the Common-Mode condition of the 3760 unit. Static condition of terminal 9 is TTL (+ 5 Vdc).

## 2 CONNECTIONS

**Fig. 6 - Transducer Cabling – DC Voltage Input- J2 Connector**

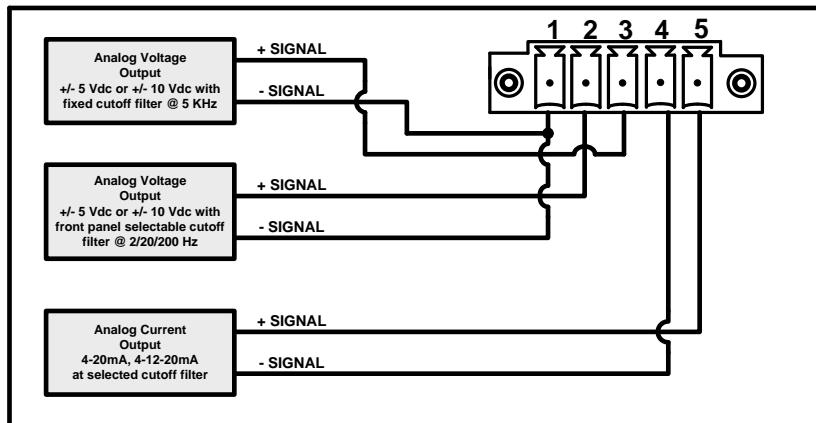


### WARNING

Qualified personnel who work on or near exposed energized electrical conductors must follow applicable safety related work practices and procedures including appropriate personal protective equipment in compliance with the Standard for Electrical Safety Requirements for Employee Workplaces (ANSI/NFPA 70E-2012) of USA and any additional workplace safety requirements applicable to your installation.

## **2 CONNECTIONS**

**J3 - Analog Connections** Provides analog outputs from the meter's signal conditioning area in the form of  $\pm 5$  Vdc or  $\pm 10$  Vdc (selectable via the front panel controls) and 4-20 mA (or selectable 4-12-20 mA). Full scale output is referenced to the display "range" selected (5000, 10000, or 20000). I.e. If range 10000 is selected, the analog output will be 5 Vdc or 10 Vdc, as determined by the front panel controls (or 20 mA FS) when in the default – UP position.



## **J3 - Analog Output Connections**

- Pin 1** V Out Common (- Signal out) reference for Pin 2 and Pin 3 + Signal Voltage Output.

**Pin 2** Voltage Output Selected (+Signal out) reference to Pin 1. The Full Scale Voltage is determined by the position of switch **1-VDC** on the Conditioner Controls. Output response is determined by the position of switch **3-FIL** and **4-FIL** on the Analog Controls.

**Pin 3** Voltage Output Fixed. (+ Signal out) reference to Pin 1. Full Scale Voltage is determined by the position of switch **1-VDC** of the Conditioner Controls. Filter response is fixed at the highest analog signal response of 5 KHz.

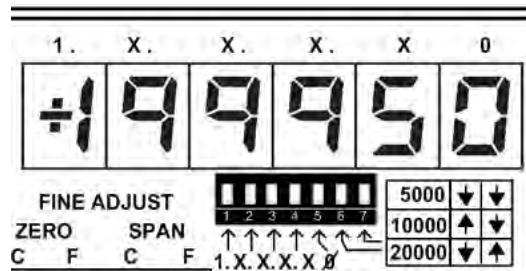
**Pin 4** 4-20 mA Current Output Common (- Signal) reference for Pin 5 Current Output.

**Pin 5** 4-20 mA Current Output (+Signal) reference to Pin 4 Current Output Common. The Current Output is selectable for 4 - 20 mA or 4-12-20 mA as determined by the position of switch **2-mA** of the Conditioner Control switch(s) on the front panel.

### 3 CONTROLS

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#### Display Range and Decimal Point Selection



**Switch 1** - selects decimal point for position **X.XXXXX**

**Switch 2** - selects decimal point for position **XX.XXXX**

**Switch 3** - selects decimal point for position **XXX.XXX**

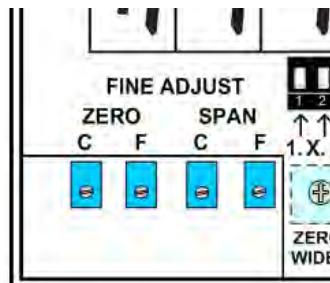
**Switch 4** - selects decimal point for position **XXXX.XX**

**Switch 5** - enables dummy zero display digit **XXXXX0**

**Switch 6 & 7** - selects Display Full Scale Range

Range will equate to an analog output value of  $\pm 5$  Vdc or  $\pm 10$  Vdc per Analog Control switch placement. Selection is set for 1 count in 5000, 2 counts in 10000 and 5 counts in 20000.

#### Analog Zero and Span Adjustments



**Coarse Zero** - 22 Turn potentiometer adjustment for balance control of analog offset signal

**Fine Zero** - 25 Turn potentiometer for fine balance control of analog offset signal

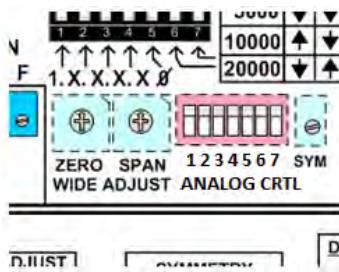
**Coarse Span** - 22 Turn potentiometer adjustment for analog control of gain (approx.  $+\text{-} 11\%$  authority)

**Fine Span** - 25 Turn potentiometer adjustment for analog control of fine gain

### 3 CONTROLS

#### Analog Wide Span and Zero Controls

16 Position switch for wide control adjustment of the analog output signal from the 3760 meter, this in turn affects the digital readout for engineering units adjustments as determined by the display settings.

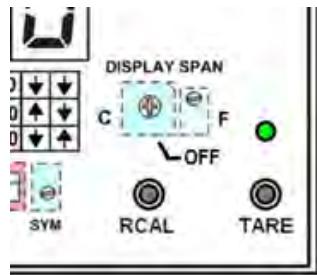


**Wide Zero** - 16 position switch to adjust wide zero-balance authority, approx. 13% /position

**Wide Span** - 16 position switch to adjust wide range gain for 0.050 mV to 200 Vdc sensors

#### Display Span Adjustments

The Display Span Adjustment is used to adjust the digital readout of the 3760 meter; the user calibrates the analog output for a specific span value and then adjusts the readout for proper engineering units display. "OFF" position indicator defines the default position. i.e. 5.000 Vdc for the analog outputs equals to 5000 counts on the display.



**Display Coarse Span** - 16 position switch to adjust wide span / gain authority for the display

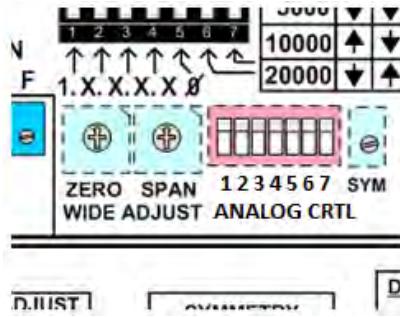
**Display Fine Span** - 25 Turn potentiometer for fine span / gain control of display reading

**Display "OFF"** – switch position "F" which disables the Adjustable Span feature of the display

### 3 Controls

#### Analog Control Settings

Front panel controls configure the main parameters of the Signal conditioner for input type, mode of the analog output signal, low pass filter characteristics and full scale voltage input range.



- 1 – **5 Vdc Output** - UP sets the analog output FS to 5 Vdc, DOWN is 10 Vdc
- 2 – **4 - 20 mA Output** - UP sets the analog current output for 4-20 mA , DOWN is 4-12-20ma
- 3 – **20/200 Hz** - UP selects 20 Hz filter. DOWN selects 200 Hz filter
- 4 – **20/2 Hz** - UP selects 20 Hz filter. DOWN selects 2 Hz filter
- 5 – **4-20 mA Input** – UP selects 4-20 ma Input. DOWN selects 4-12-20 mA Input
- 6 – **VDC Input** – Full Scale Range Select switch, 50 mV to 200 Vdc
- 7 – **VDC Input** – Full Scale Range Select switch, 50 mV to 200 Vdc

With all switches in the UP position, the unit will have the following settings:

- 5 Vdc Analog voltage output full scale
- 4-20 mA Analog current output full scale
- The Analog low pass filter will be set for 20 Hz
- 4-20 mA input is selected – requires proper input wiring. Refer to page 5 for diagram
- VDC Input Range set for 3.20 to 25.0 Vdc input

#### Analog Control Settings for Conditioner Configuration

Up	Function	Down
5	1–VDC OUT	10
4-20	2 – mA OUT	4-12-20
20 Hz	3 – FILTER	200 Hz
20 Hz	4 – FILTER	2 Hz
4-20	5 – mA IN	4-12-20
RANGE	VDC INPUT	6 7
1	0.05 – 0.40	↓ ↑
2	0.40 – 3.20	↑ ↓
3	3.20 – 25.0	↑ ↑
4	25.0 – 200.0	↓ ↓

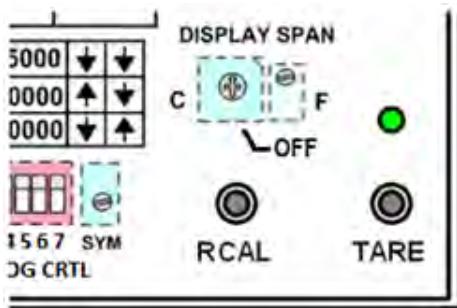
#### Analog Control Settings

Switch 6 and 7 are used to select one of the four expected DC Voltage Input Ranges of the meter. The adjustability within the selected range will be accomplished via the Wide Span, Coarse Span and Fine Span controls.

**When the input is 4-20mA, the correct input Range is auto-selected**

### 3 Controls

#### Analog Symmetry, RCAL, TARE

**SYM**

**Symmetry** - Adjust the negative gain slope for symmetrical analog adjustment and display reading with reference to the positive span value. 20 Turn potentiometer, with approx. +/- 2% full scale authority

**RCAL**

**Remote Calibration** – Activates the Positive voltage calibration reference. Value is determined by the rear rotary switch located behind the rear panel. See details after Section 4 - calibration.

**TARE**

Push / Push switch. When enabled, offsets the present sensor signal input to "Zero". When activated, a green LED light will illuminate. During activation process, LED will light Yellow. If disabled, or out of range, LED will be RED. TARE maybe remotely activated via rear J1 connections. Front panel TARE can be disabled via J1 Pin 5 connected to Logic Common, Pin 6. Maximum TARE capability is approx. 60% of full scale reading.

#### 4. CALIBRATION

This section contains the instructions for calibrating the 3760. Included is a functional description of the instrument front-panel (see Page 1). To perform calibration, proceed as follows.

- (a) Connect Sensor and Analog terminals as required. Connect and apply power to the unit. The front-panel digital display should light indicating the application of the AC input power. Allow 10 minutes of warm up for stabilization of transducer characteristics. Remove the front cover of the 3760 unit by removing the two small Phillips screws on the front panel. TARE button should not be activated.
- (b) Center the Zero and Fine Span potentiometers by rotating the potentiometers CW until you feel the "end stop" or by the number of turns accomplished (Coarse is 22 turns, Fine is 25 turns). Rotate the potentiometer back to the middle of their range (Coarse 11 turns, Fine 12-13 turns). This will establish the mid-authority adjustment of the potentiometers.
- (c) Position the front panel switches to the desired settings for the application. Refer to Section 3 for details.
- (d) Relax the sensor or voltage input to "zero" and adjust the Wide Zero and Fine Zero controls until the meter reading is achieved at the point which will be the "zero" value reference.
- (e) Once the Zero position has been established, apply a known input to the meter. With the input active and stable, adjust the Wide Span, Coarse Span and Fine Span controls until the display reading required is achieved.
- (f) Return the sensor to the "Zero" position and re-adjust the Coarse Zero and Fine Zero controls for the desired reading or analog output of the unit. Repeat the Span (step e) adjustment as necessary to achieve the proper reading or analog output. Note that changes in Span (Gain) will affect Zero. Span and Zero re-adjustments may need to be repeated to obtain the desired reading. (Note that the 3760 meter also has independent display adjustment capability to where the digital display can be adjusted independently to the analog output signal of the unit so as to achieve maximum analog output levels from the meter.)
- (g) Once the Zero and the Gain (SPAN) adjustments have been accomplished, if needed -the user can adjust for Negative non-symmetrical value (as referenced by the positive SPAN value) by utilizing the front panel Symmetry control when the input to the meter is Negative - adjust the symmetry control for the correct readout or analog output signal required. Note the Symmetry control has approx.  $\pm 2\%$  full scale authority.
- (h) Once completed, record the position of the "Wide Span" control setting (0 thru F). This setting position will be used to set the internal RCAL switch as described below under "Front Panel Calibration (RCAL) setting" instructions.
- (i) Replace the front display lens cover to the original position and ensure proper shielding and grounding have been done to the meter.

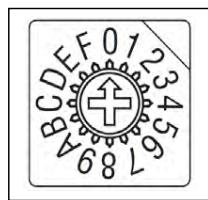
**Display Calibration** The 3760 instrument display has separate adjustment controls that are independent of the analog output controls - allowing the user to alter the display reading to a value that is suited for the display while maintaining the flexibility to adjust the analog signal as needed for external devices. In the standard – default switch position (as marked on the Coarse Span control area), the display has a fixed full scale reading set by the display range switches of 5000, 10000 or 20000 counts. At these settings the full scale analog output signal will be 5 Vdc or 10 Vdc, as selected. To accomplish the display adjustment change, the user would first set the desired display range and decimal location using the display dip switches, adjust the analog output to the desired level and then adjust the Display Coarse and Fine span controls for the required digital readout.

**Tech Tip on use of wide range settings for the DC Voltage Conditioner**

Due to multiple amplifier stages within the 3760 instrument, attention to the proper gain setting and understanding of the sensor inputs should be reviewed to produce a linear- amplified analog output signal and display reading.

The wide span – gain control (as shown in the front panel diagram) has 16 positions to amplify the incoming signal by incremental steps. Each step is positioned so the Coarse and Fine Span potentiometer controls overlaps each step to provide a continuous linear gain of the signal from 50 mVdc to 200Vdc full scale. Below is a table of each wide gain steps, indicating the nominal low and high input signal range per position – full scale in millivolts DC to the meter.

Wide Span Control table for Low and High Input DC Voltage adjustment per Front panel Range selection



Wide Span  
Control

		0.05 - 0.400		0.40 - 3.20		3.20 - 25.0		25.0 - 200.0	
		Range 1		Range 2		Range 3		Range 4	
F	0.045	0.056	0.355	0.440	2.84	3.52	22.75	28.10	
E	0.052	0.064	0.412	0.513	3.30	4.10	26.40	32.80	
D	0.060	0.074	0.480	0.592	3.84	4.75	30.70	38.00	
C	0.068	0.085	0.544	0.678	4.35	5.42	34.80	43.35	
B	0.078	0.096	0.624	0.768	5.00	6.15	40.00	49.20	
A	0.089	0.110	0.714	0.880	5.72	7.00	45.75	56.00	
9	0.103	0.128	0.824	1.024	6.60	8.20	52.80	65.60	
8	0.118	0.147	0.944	1.176	7.55	9.40	60.40	75.20	
7	0.135	0.168	1.080	1.344	8.65	10.75	69.20	86.00	
6	0.155	0.190	1.240	1.520	9.92	12.15	79.35	97.20	
5	0.178	0.220	1.424	1.760	11.40	14.05	91.20	112.4	
4	0.202	0.250	1.616	2.000	12.95	16.00	103.6	128.0	
3	0.232	0.285	1.856	2.280	14.85	18.25	119.0	146.0	
2	0.266	0.330	2.128	2.640	17.00	21.10	136.0	169.0	
1	0.310	0.385	2.480	3.080	19.85	24.65	159.0	197.0	
0	0.355	0.440	2.840	3.520	22.75	28.10	182.0	225.0	

Up	Function	Down
5	1– VDC OUT	10
4-20	2 – mA OUT	4-12-20
20 Hz	3 – FILTER	200 Hz
20 Hz	4 – FILTER	2 Hz
4-20	5 – mA IN	4-12-20
RANGE	VDC INPUT	6 7
1	0.05 – 0.40	↓ ↑
2	0.40 – 3.20	↑ ↓
3	3.20 – 25.0	↑ ↑
4	25.0 – 200.0	↓ ↓

Front Panel Range Switch Settings (refer to page 9)

**FRONT CALIBRATION (RCAL) setting**

The 3760 contains a "calibration switch" which is accessed by removing the rear panel of the instrument. This switch is used to set the range of the front panel pushbutton (and rear remote control) of the CAL / Remote CAL function of the 3760 instrument. The "calibration" switch is recommended to be set at the same value (0 thru F) as the front panel's "Wide Span" control. At this setting, the internal voltage reference will produce approx. 80% of the full scale value of the calibrated unit. This allows the user to produce a reference check of the instrument's calibration integrity.

Procedure should be done once the instrument has been calibrated per the instructions above.

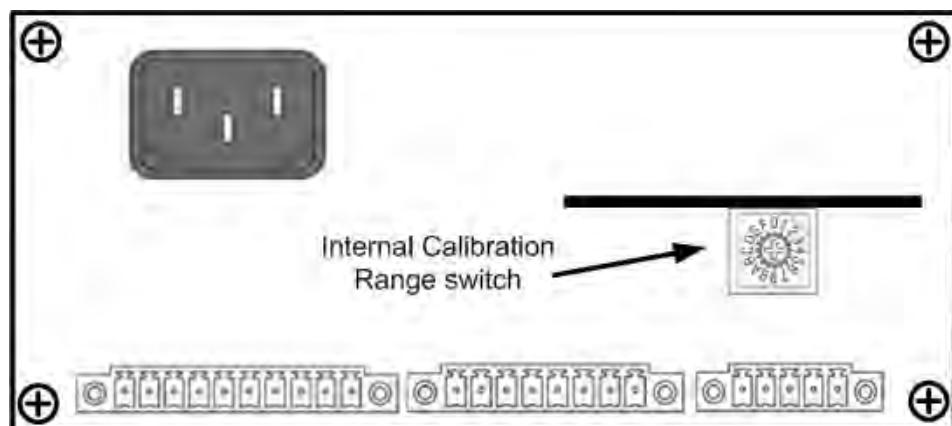
To access the "calibration switch":

- 1) Remove power from the instrument.
- 2) Record the position of the front panel "Wide Span" control..... 0 thru F position.
- 3) Remove the 4 phillips head screws retaining the back panel of the instrument
- 4) Remove the rear panel (with slides) and rotated away from the instrument. Locate the blue rotary switch to the bottom right of the instrument and set the switch to the "Wide Span" control position as noted in Step 2.

When complete, re-assemble the back panel and slides.

Re-energize the instrument.

With your "zero" input active, depress the front "CAL" button, or the rear panel "Remote CAL" logic and record the value on the display. This will be your calibration reference number. If any changes are made to the front panel controls, this reference number will change reflecting a "calibration" change has occurred to the 3760 unit.



**Rear Panel 3760**

## 5. FUSE REPLACEMENT

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Should you suspect a blown fuse proceed as follows.

### **WARNING**

**Installation, operation and maintenance of this instrument must be performed by qualified personnel only. The National Electrical Code defines a qualified person as “one who has the skills and knowledge related to the construction and operation of the electrical equipment and installations, and who has received safety training on the hazards involved.”**

- a) Disconnect all power sources and cables connected to the instrument before servicing the instrument.
- b) On the rear panel remove the (2) clamp slide retaining screws and remove the clamp slides from both sides of the instrument. Next remove the (4) corner screws that retain the rear panel to gain access to the instrument.
- c) Open the rear panel and replace the fuse(s) as required , replace only with same type T Slow Blow, 1A, 250V (Littelfuse 218001.HXP, 1 A). The fuseholder wire conductors are appropriately labeled “L” for Line and “N” for Neutral on both halves of each of the fuseholder wires. When reassembling the fuseholder(s) make sure “L” and “L” are connected together and “N” and “N” labeled wires are connected together properly.
- d) Mate the rear panel to the enclosure and replace the clamp slides back in position and secure the clamp slides with the (2) screws previously removed from the instrument. Next, replace the (4) corner screws to secure the rear panel and ensure that all screws have been adequately tightened.
- e) Power ON the instrument with the appropriate power cord and verify the instrument is functioning properly before reconnecting the instrument to your installation.

### **WARNING**

**For continued protection against risk of fire or shock replace only with the same type and rating of fuse.**

### **ADVERTENCIA**

**Para la protección continua contra el peligro de incendio o descarga, cambie sólo por fusibles del mismo tipo y capacidad nominal.**

### **AVERTISSEMENT**

**Pour assurer une protection continue contre les risques d'incendie ou de choc, ne remplacez que par un fusible du même type et de la même valeur nominale.**

### **WARNUNG**

**Zum anhaltenden Schutz gegen Brand oder einen elektrischen Schlag nur gegen eine Sicherung desselben Typs und mit demselben Nennwert austauschen.**

**WARNING**

**Do not replace fuse again if failure is repeated. Repeated failure indicates a defective condition that will not clear with replacement of the fuse. Refer condition to a qualified technician.**

**ADVERTENCIA**

**No reemplace el fusible nuevamente si se repite la falla. La repetición de las fallas indica una condición defectuosa que no se subsanará con el cambio del fusible. Acuda a un técnico calificado para evaluar la condición.**

**AVERTISSEMENT**

**Ne remplacez pas le fusible une nouvelle fois si la défaillance se répète. Une défaillance répétée indique une condition défectueuse qui ne disparaîtra pas avec le remplacement du fusible. Consultez un technicien qualifié.**

**WARNUNG**

**Die Sicherung nicht erneut austauschen, wenn der Fehler noch einmal auftritt. Ein wiederholtes Auftreten des Fehlers weist auf einen Defekt hin, der sich nicht durch Austauschen der Sicherung beheben lässt. Den Defekt einem qualifizierten Techniker mitteilen.**

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**DC Voltage Panel Meter 3760**

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**Product Warranty and Repair**

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*Daytronic Corporation warrants its products to be free from defects in material and workmanship, under normal and proper use in accordance with our instructions, for the period of time specified below. Our liability under such warranty or in connection with any other claim relating to the products shall be limited to, at our option, the repair or replacement of any products or parts or components thereof which are returned to us freight prepaid and which are defective in material or workmanship or the refund of the purchase price to the Buyer.*

ANY PRODUCT FOUND TO BE DAMAGED THROUGH CUSTOMER NEGLIGENCE OR MISUSE MAY BE EXCLUDED FROM ANY AND ALL POLICIES CONTAINED IN THIS DOCUMENT.

**ALL EQUIPMENT TO BE REPAIRED OR REPLACED UNDER WARRANTY MUST BE RETURNED TO THE FACTORY.** Before returning a product or products for any reason, the customer must call **Daytronic Customer Support Services at (937) 866-3300** to request a *RETURN MATERIAL AUTHORIZATION (RMA)*. Once the customer has provided the necessary information and has been assigned a specific RMA, the product(s) in question may be returned to Daytronic by shipping it

**Daytronic Corp., 1000 New Durham Road, Edison, New Jersey 08818**  
**Daytronic Customer Service: 1-800-668-4745** [service@daytronic.com](mailto:service@daytronic.com)

