4.3.1 Internal Scaling

Use internal scaling if you do not have an actual input signal to the meter. With internal scaling the input values are assumed to be the low and high signal input based on the selection input (e.g. if you selected 4-20 mA input, the "rd1" input value will be 0400 for 4 mA and "rd2" will be 2000 for 20 mA). All you need to do is change what the meter should read at these two points. For internal scaling, follow these steps:

Refer to Table B-2 for a summary list of menu configuration.

1. Press the **MENU** button until the meter flashes **"ScAL"**.
2. Press the **►/TARE** button until the meter shows **"int"**.
3. Press the **▲/MAX** button. The meter momentarily flashes **"rd1"** (read 1), then shows the low input value based on the selected input range (e.g. if the input range is 0 - 10 V, the meter shows **"0000"**, or if input range is 4-20 mA, the meter shows **"0400"**).
4. Enter the desired reading for this low input value using the **▲/MAX** and **►/TARE** buttons.
5. Press the **MENU** button for the meter to accept the new value. The meter then momentarily flashes **"rd2"** , then shows the high input value based on the selected input range (e.g. if the input range is 0 - 10 V, the meter shows **"9999"** or if the input range is 4-20 mA, the meter shows **"2000**").
6. Enter the desired reading for this high input value using the **▲/MAX** and **►/TARE** buttons.
7. Press the **MENU** button for the meter to accept the new value, save changes and return to the run mode. The meter shows **"Stor"** and calculates the new scale factor based on the new high and low values.
8. If the display is not zero with no load on your sensor, press the **►/TARE** button. Scaling is now complete.

4.3.2 Live Scaling

Use live scaling when a stable input source is available (e.g. 4-20 mA or voltage calibrator). Also use live scaling when the actual input from your sensor can be set to output values close to the low and high ends of your input. For live scaling, follow these steps:

Refer to Table B-2 for a summary list of menu configuration.

1. Press the **MENU** button until the meter flashes **"ScAL"** .
2. Press the **►/TARE** button until the meter shows **"LivE"**.
3. Press the **▲/MAX** button. The meter momentarily flashes **"rd1"** .
4. Apply the low input signal to the input. The meter then shows the live low input source.
5. Change the meter reading as required for the applied low input using the **▲/MAX** and **►/TARE** buttons.
6. Press the **MENU** button for the meter to accept the new value. The meter then momentarily flashes **"rd2"** .
7. Apply the high input signal to the input. The meter then shows the live high input source.
8. Change the meter reading as required for the applied high input using the **▲/MAX** and **►/TARE** buttons.
9. Press the **MENU** button to save changes and return to the run mode. The meter shows **"Stor"** and calculates the new scale factor based on the new high and low values.

4.4 CHANGING THE METER S CALIBRATION

CAUTION: It is not necessary to calibrate a brand new meter, it arrives completely calibrated. The following procedure modifies the calibration of the meter.

This procedure should only be performed by qualified personnel with accurate test equipment.

To change the meter's calibration, follow these steps:

Note ☞ *Disconnect the main power from the meter.*

1. Install jumper S4 to enable the calibration procedure (refer to Figure 3-3).
2. Slide the main board back into the case and replace the cover.
3. Power on the meter.
4. Select the input range you want to calibrate (refer to Section 4.1, Selecting Input Range)
5. Press the **MENU** button until the meter flashes "LINE". The meter will indicate the line frequency it is currently using. Line frequency default is 60H for 60 Hz and 50H for 50 Hz.
6. Press the **►/TARE** button until the correct line frequency shows.
7. Press the **MENU** button to store this line frequency selection. Once you store your selection, the meter flashes **"cAL"**.
8. Press the **►/TARE** button to initiate the calibration procedure. The meter momentarily flashes the selected input range that you are about to calibrate, then flashes **"rd1"** .
9. Apply 0 Vdc or 0 mA and change the display to **"0000"** . Use the **►/TARE** and **▲/MAX** buttons to change the digits.

4.4 CHANGING THE METER S CALIBRATION (Continued)

10. Press the **MENU** button for the meter to accept the new value. The meter then flashes **"rd2"** .

11. Apply the high input voltage or current for the selected input range (e.g. apply 9.900 V if you are calibrating 0-10 V range).

To calibrate the entire meter, you only need to calibrate the following three ranges: 0-10 V, 0-5 V and 4-20 mA.

Table 4-1. Meter Calibration Table

Range	Low Input	rd1*	Input High	rd2*
0-10V	0 Vdc	0000	9.9 Vdc	9900
0-5, 1-5V	0 Vdc	0000	5.0 Vdc	5000
4-20, 20-4 mA	0 mA	0000	20.0 mA	2000

* Disregard decimal point

12. Change the display to equal the input source (e.g. if you apply 9.900 V for the high input voltage, change the meter reading to "9900"). Press the **▲/MAX** button to change the flashing digit's value (increments by one) and press the **►/TARE** button to move from one digit to the next.

13. Press the **MENU** button once more to save changes. The meter shows **"Stor"** and is now calibrated for the selected range.

14. Power off the meter. Remove the S4 jumper (to ensure no accidental changes). Slide main board back into the case.

15. Power on the meter.

APPENDIX A

CHECKING AND CHANGING MAIN BOARD POWER JUMPERS

IMPORTANT: If you want to change the Factory preset jumpers, do the following steps:

Note Disconnect the power from the unit before proceeding.

1. Remove the main board from the case. Refer to Section 2.6.
2. Locate the jumpers W1, W2, W3 and W4 (located near the edge of the main board alongside the transformer).
3. If your power requirement is 115 Vac, install jumpers W1 and W2. If your power requirement is 230 Vac, install jumpers W4 and W3. Refer to Figures A-1 and A-2.

Note *Refer to Section 2.5, Back of the Meter, for more information on dc-power connections.*

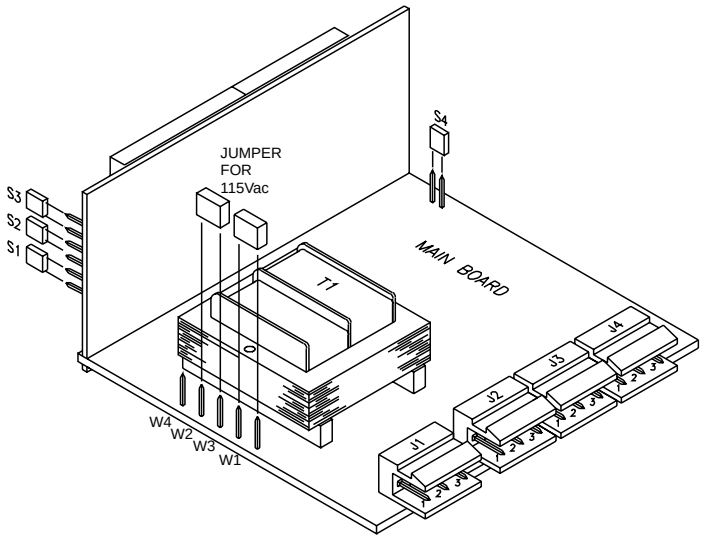

Figure A-1. 115Vac Jumper Wiring (Default)

APPENDIX A -
CHECKING AND CHANGING MAIN BOARD POWER JUMPERS
(Continued)

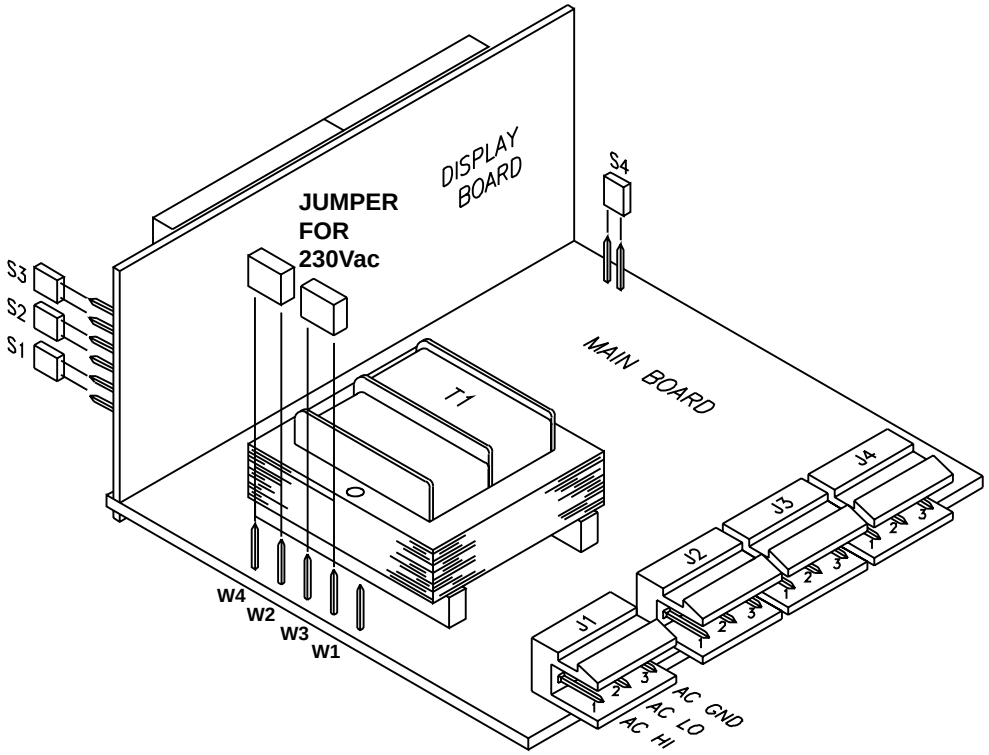

Figure A-2. 230 Vac Jumper Wiring

APPENDIX B

REFERENCE TABLES

Table B-1. Display Messages

MESSAGE	DESCRIPTION
∩∩∩∩	Peak value to follow
∪∪∪∪	Valley value to follow
∩ 123*	Peak value reached overload
∪ 123*	Valley value reached overload
ER 1	Scaling format error
PrSt	Peak reset
VrST	Valley reset
T-RST	Tare reset. Clears tare value.

* Represents any value

Table B-2. Menu Configuration Displays

MENU	►/TARE	▲/MAX
InP	0-10	
	4-20	
	20-4	
	0-5	
	1-5	
DEC.P	FFF.F	
	FFFF.	
	FFFF	
	F.FFF	
	FF.FF	
ScAL	int	
	LivE	rd 1*
		XXXX
		rd 2*
		XXXX

* Not displayed unless you press the ▲/MAX key.

APPENDIX B - REFERENCE TABLES (Continued)

Table B-3. Run Mode Displays

Display	▶/TARE	▲/MAX	RESET	T-RST	Jumpers
PrST Peak Reset			Press to activate		S3 installed
VrST Valley Reset			Press to activate		S3 removed
⌐⌐⌐⌐ Peak Value to follow		Press to activate*			S3 installed
⌐⌐⌐⌐ Valley value to follow		Press to activate*			S3 removed
T-RST Clears tare value				Press to activate	
Tare Display	Press to activate				

* Press ▶/MAX again to remove peak or valley reading and display process value.

Table B-4. Factory Preset Values

Menu Item	Description
INPT	Input Range: 4-20 mA = 0 - 100.0
DEC.P	Decimal Point Position: FFF.F
Sensor Excitation: 24 Vdc	
Line Frequency: 60 Hz	

APPENDIX C

SPECIFICATIONS

Analog Input Ranges:		4-20 mA, 0-5 Vdc, 1-5 Vdc, 0-10 Vdc
Input Impedance:		Voltage: 1.0 Meg Current: 100 Ω
Isolation:		Dielectric strength to 2500V transient per 3mm spacing base on EN61010 for 260Vrms or dc working voltage
Accuracy:		0.05%R +/- LSB
Tempco:		+/- 50 PPM/°C
Excitation Voltage:		24 Vdc @ 25mA 10 Vdc @ 25mA
Display:		LED 7-segment, 14.2 mm (0.56”) Range: +9999 to -1999 Decimal Point: 4 positions
Input Power Information:		
Voltage	ac:	115/230 Vrms ±10%
	dc:	9-32Vdc (Isolated up to 300 Vp)
Power:		1.5 watt Excitation Unloaded 2.5 Watts Maximum (with 20mA excitation load)
Frequency:		50/60 Hz
External Fuse Protection Recommended:		
	ac 115V	UL slow blow, 40mA, 250V
	ac 230V	UL slow blow, 20mA, 250V
Environment:		
Operating Temperature:		0° to 60°C (32° to 140° F)
Storage Temperature:		-40° to 85°C (-40° to 185° F)
Relative Humidity:		95% at 40°C (non-condensing)
Mechanical		
Panel Cutout:		DIN 4896-100 / 1.77 x 3.66” (45 x 92 mm)
Depth Behind Bezel:		3.94 in (100 mm)
Weight:		11 oz (312 g)
Case Material:		Polycarbonate, 94 V-O UL rated
External Features:		Tare, Display Hold, Tare Reset

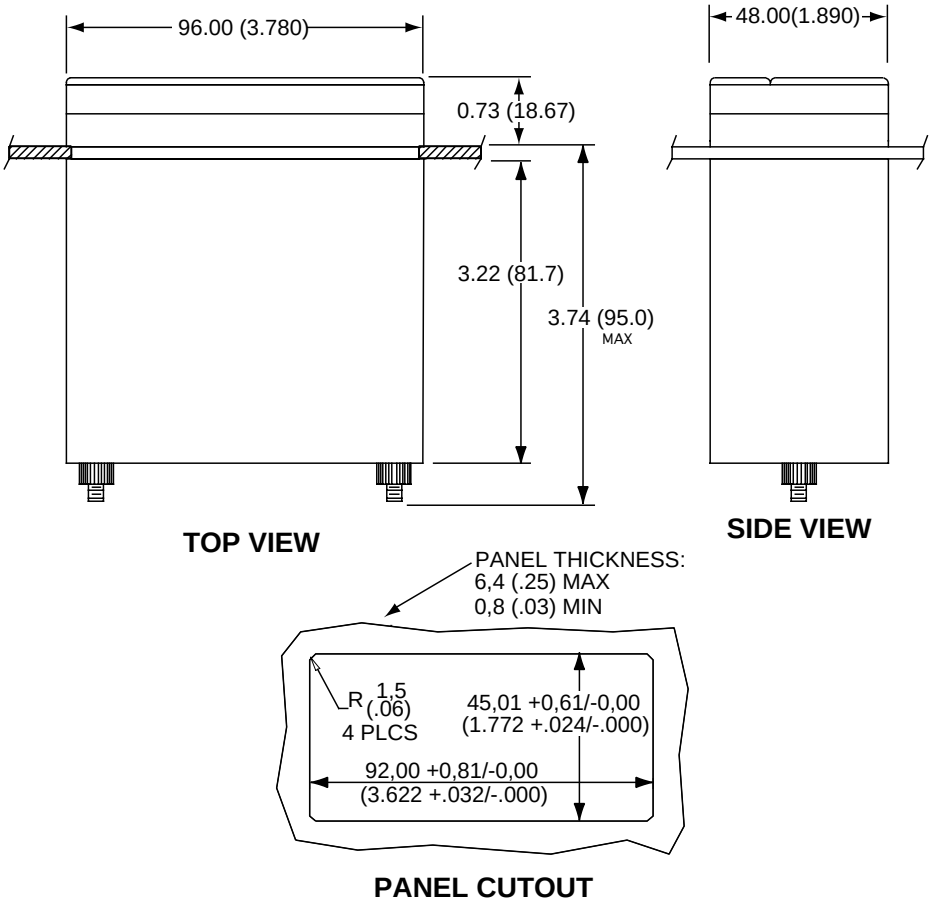

Figure C-1. Meter Dimensions

APPENDIX D - CE INFORMATION

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Note 1: **Measurements performed on circuits not directly connected to the Mains Supply (power). Maximum Line-to-Neutral working voltage 50Vac/dc.*

Note 2: *This unit should not be used in Measurement Categories II, III, IV.*

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