

## SAFETY CONSIDERATIONS

This device is marked with the international Caution, risk of danger 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**  
 Note: Unpack the instrument and inspect for obvious shipping damage. Do not attempt to operate the unit if damage is found.

This instrument is a DIN rail mount device. 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.

**Note:**

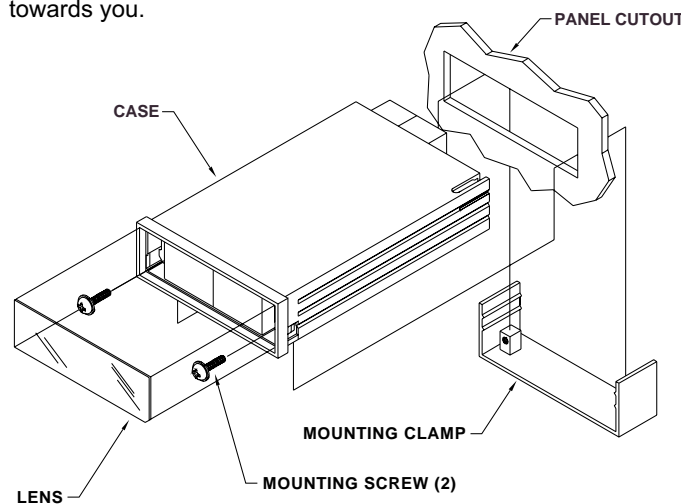
- Do not exceed voltage rating on the label located on the top of the instrument housing.
- Always disconnect power before changing signal and power connections.
- Do not use this instrument on a work bench without its case for safety reasons.
- Do not operate this instrument in flammable or explosive atmospheres.
- Do not expose this instrument to rain or moisture.
- Unit mounting should allow for adequate ventilation to ensure instrument does not exceed operating temperature rating.
- Use electrical wires with adequate size to handle mechanical strain and power requirements. Install without exposing bare wire outside the connector to minimize electrical shock hazards.

**EMC Considerations**

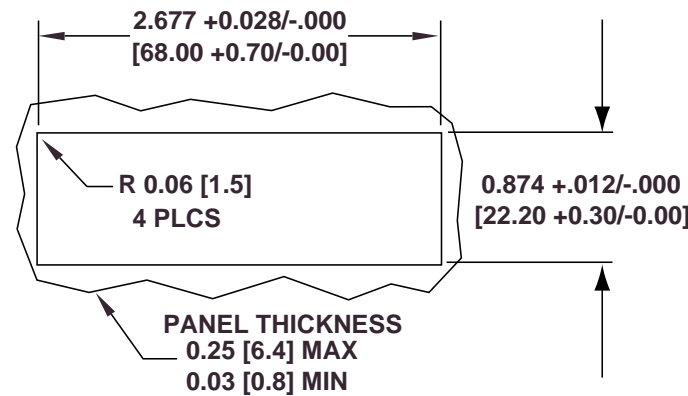
- Whenever EMC is an issue, always use shielded cables.
- Never run signal and power wires in the same conduit.
- Use signal wire connections with twisted-pair cables.
- Install Ferrite Bead(s) on signal wires close to the instrument if EMC problems persist.

## INSTALLATION

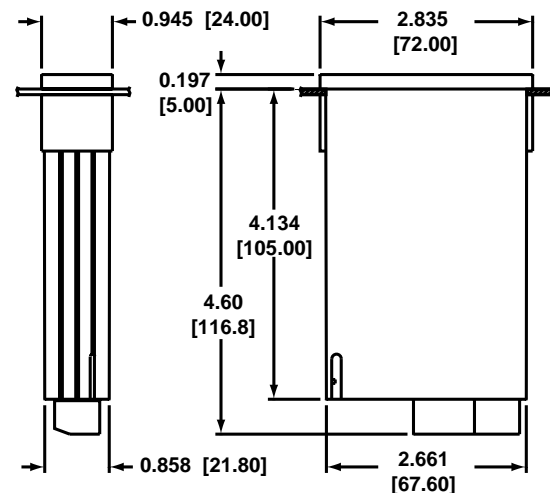
- Unpack and verify that all equipment has been received. If there are any questions about the shipment, contact the service department nearest you.
- Cut or punch a hole in the panel where you want the meter to go.
- Remove the lens by inserting a paper clip or small flat screwdriver into the rounded corner of the lens and lift out.
- Remove the two mounting screws from both sides of display. Pry both sides of the mounting clamp *out and down* to remove it from the case.
- Insert the meter into the panel cutout and reinstall the mounting clamp from the rear.
- Reinstall the mounting screws to secure the meter into the panel. Do not overtighten the screws.
- Pop the lens back in, making sure the dull side of the lens faces towards you.



## PANEL CUTOUT

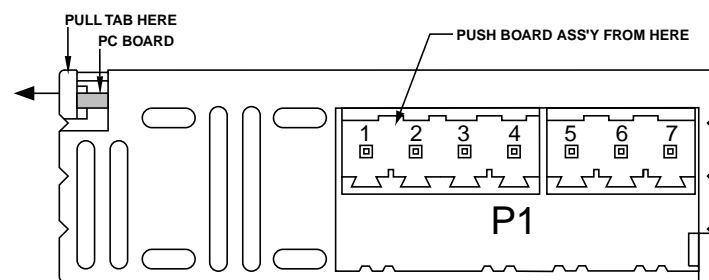


## DIMENSIONS



**Side View** **Top View**  
 All dimensions are in inches [millimeters].

## REMOVING BOARD FROM CASE



**REAR OF CASE**

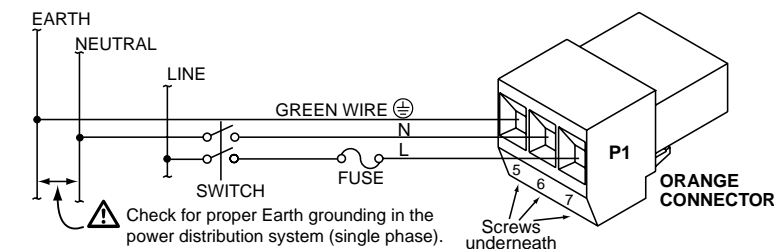
## ELECTRICAL CONNECTIONS

POWER AND SIGNAL INPUT			
P1	~ AC POWER		= DC POWER
	205-E	205-P & 205-A	205-P & 205-A
1	SIG HI (+S)	SIG HI (+S)	SIG HI (+S)
2	SIG LO (-S)	SIG LO (-S)	SIG LO (-S)
3	+ Exc	Hold	Hold
4	- Exc	Digital Return	Digital Return
5	AC Earth GND (⊕)	AC Earth GND ( )	-DC (-)
6	AC Neutral (N)	AC Neutral (N)	+ DC (+)
7	AC Line (L)	AC Line (L)	No Connection (N/C)

## WIRING

### AC POWER WIRING

Connect the ac main power connections as shown below.



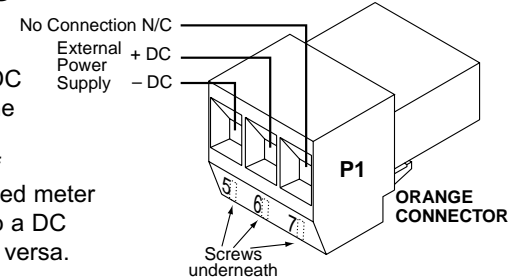
**CAUTION:** Do not connect ac power to your meter until you have completed all input and output connections. Failure to do so may result in injury! This device must only be installed electrically by specially trained electrician with corresponding qualifications. The main power input to the unit as well as the AC input signal to be measured must agree with the wiring instruction.

The meter is factory set to the power specified by the customer at the time of ordering. The voltage is printed on the label under Input power.

To connect power to the unit, attach wires, as shown from the ~AC power cord to the orange 3-pin female connector that is supplied with the meter. Plug the female connector into the orange P1 (male) connector at the rear of the meter.

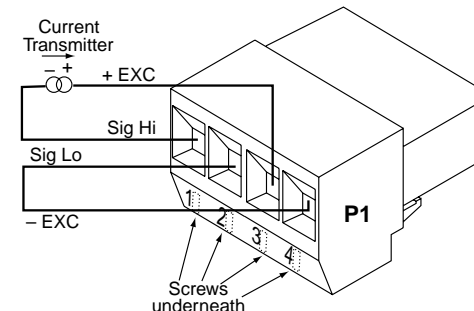
### DC POWER WIRING

The meter can be configured at the factory to operate on DC non-isolated power. The DC voltage option is specified at the time of ordering. An AC powered meter cannot be converted to a DC powered meter or vice versa.

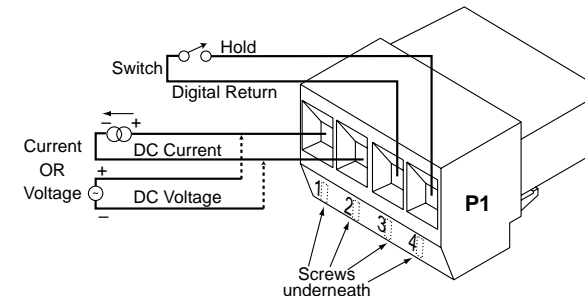


To connect power to the unit, attach wires, as shown, to the orange 3-pin female connector that is supplied with the meter. Plug the female connector into the orange P1 (male) connector at the rear of the meter.

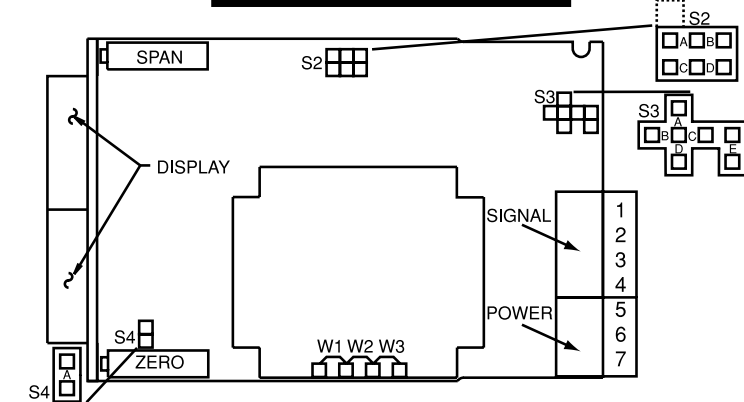
### SIGNAL INPUT WIRING 205-E



### SIGNAL INPUT WIRING 205-P & 205-A



## RANGE SELECTION



CURRENT / VOLTAGE INPUT 205-P & -E	S3	
4-20 mA	D, E	
0-0.2 V dc	E	
1-5 V dc	A	
0-10 V dc	B	
0-100 V dc	C	
VOLTAGE INPUT RANGE 205-A	S3	
±199.9 mV dc	-	
±1.999 V dc	A	
±19.99 V dc	B	
±100.0 V dc	C	
EXCITATION VOLTAGE 205-E ONLY	S2	S4
10 V, (standard internal reference)	B, D	A
24 V, (standard internal reference)	B, D	-
10 V, (reference based on excitation voltage)	A, C	A

Voltage operation was configured per customer order. 115 and 230 Vac operation use the same transformer and may be reversed with simple wiring installation.

**CAUTION:** Disconnect power before attempting to convert or remove the unit.

You must remove the printed circuit board from the case in order to change from 115 Vac to 230 Vac (and vice versa). These changes must be performed by a qualified technician in order to avoid damage.

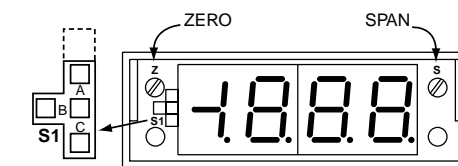
TRANSFORMER #	AC VOLTAGE	INSTALL	REMOVE
48131	115 Vac	W1, W3	W2
48131	230 Vac	W2	W1, W3

## CALIBRATION / 205-P & 205-E

- Apply the minimum current or voltage to the signal input. Adjust the zero pot for the minimum display reading ±1 count.
- Apply the maximum current or voltage to the signal input. Adjust the span pot for the maximum display reading ±1 count.
- Repeat steps 1 and 2 until ±1 count desired reading. Reinstall the lens.

## CALIBRATION / 205-A

- Apply a voltage equivalent to 95% of the range selected to the signal input.
- Adjust the span pot for a reading of 1900 ±1 count.
- Reinstall the lens.



Decimal Point	S1
1.999	A
19.99	B
199.9	C
1999	Store jumper above A



## MODEL 205-P, 205-E and 205-A

**3 1/2 DIGIT MINI-SIZE PROCESS METER (205-P)  
PROCESS WITH ISOLATED EXCITATION (205-E)  
DC VOLTAGE INPUT (205-A)**

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.  
Fryštatska 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

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### AVAILABLE MODELS

DESCRIPTION	PART #
Field selectable/scalable for 4-20 mA, 0-199.9 mV dc, 1-5 V dc, 0-10 V dc, 0-100 V dc input	205-P
205-P with sensor excitation output	205-E
Field selectable for ranges ±1999.9 mV, ±1.999 V, ±19.999 V, ±199.9 V	205-A
ADD-ON OPTIONS	PART #
230 V ac Input Power	Add suffix "-C1"
100 V ac Input Power	Add suffix "-C5"
24 V ac Input Power	Add suffix "-C8"
5 V dc (for 205-A and 205-P only)	Add suffix "-C3"
7-32 V dc (for 205-A and 205-P only)	Add suffix "-C2"
Green LED display (instead of Red)	Add suffix "-G"
25 x 75 mm bezel adaptor	Add suffix "TP2"
3/64 DIN to 1/8 DIN bezel adaptor	Add suffix "TP3"
<i>Ordering Example: 205-P-C1 (205-P unit w/ 230 Vac)</i>	

### 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.

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### 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 the 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, or 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.

### SPECIFICATIONS

#### ANALOG INPUT / 205-E & 205-P

Range	4-20 mA	0-0.2 V	1-5 V	0-10 V	0-100 V
Input resistance	13 Ω	1 MΩ	1 MΩ	1 MΩ	1 MΩ
Bias current	50 pA	50 pA	10 pA	5 pA	1 pA
Maximum input	55 mA	250 Vp	250 Vp	250 Vp	250 Vp

#### ANALOG INPUT / 205-A

Range	±199.9 mV	±1.999 V	±19.99 V	±100.0 V
Input resistance	1 GΩ	1.1 MΩ	1.0 MΩ	1.0 MΩ
Bias current	50 pA	5 pA	1 pA	1 pA
Maximum input	100 Vp	100 Vp	100 Vp	100 Vp

#### NOISE REJECTION

NMR, sig hi to sig lo	56 dB, 50/60 Hz
CMR, sig lo to pwr gnd	120 dB, DC to 60 Hz
CMV, sig lo to pwr gnd	Dielectric strength to 1500V transient per 260 Volt RMS or DC working voltage.
CMV, sig lo to dig return (205-A)	0 volts

#### ACCURACY AT 25°C / DISPLAY

Maximum error	±0.05% of reading ±1 count
Display range	±1999
Span adjustment (205-P & -E)	0-2000 counts
Span tempco	±0.02% of reading/°C
Zero adjustment (205-P & -E)	-1500 to +500 counts with zero input
Zero tempco (205-P & -E)	±0.01% of offset ±0.2 counts/°C
Full-scale step response	1 second
Warmup	30 minutes
Reading rate	2.5 / second
Overrange indication	Three least-significant digits blank

#### POWER OPTIONS / 205-E

Voltage	115/230 Vac ±15%
Frequency	50-60Hz
Power	3.5W max.
"Voltage options" with same power and frequency.	
	"-C5" 100Vac ±15% (36mA max.)
	"-C8" 24Vac ±10% (145mA max.)

#### POWER OPTIONS / 205-P & 205-A

Voltage	115/230 Vac ±15%
Frequency	50-60Hz
Power	2.5W max.
"Voltage options" with same power and frequency.	
<b>AC</b>	"-C5" 100Vac ±15% (36mA max.)
	"-C8" 24Vac ±10% (133mA max.)
<b>DC*</b>	"-C2" 7-32 Vdc (100mA max.)*
	"-C3" 5 Vdc (75mA max.)*

\* External Supply must meet safety Agency Approval for safety DC output. (Equipment CLASS I/II, CAT I min., Double Insulation)

### SPECIFICATIONS (continued)

#### REQUIRED EXTERNAL FUSE PROTECTION

24Vac	160mA, UL Slow-Blow or IEC 127-2/111 Time-lag
100/115Vac	40mA, UL Slow-Blow or IEC 127-2/111 Time-lag
230Vac	20mA, UL Slow-Blow or IEC 127-2/111 Time-lag

#### ELECTRICAL SAFETY CLASSIFICATION

Installation Category	CAT I	per EN61010-1
Pollution Degree	2	per EN61010-1
Class of Equipment	I	per EN61010-1

#### TRANSMITTER EXCITATION SUPPLY / 205-E

Output voltage	Selected for 10 or 24 V dc
Output current, max	30 mA @ 10 V, 20 mA @ 24 V
Line regulation	±0.01% / V of ac power
Load regulation	±0.5%
Tempco	±0.02% / °C
Ripple at 50/60 Hz	±0.01%

#### DISPLAY

Type	3 1/2 digit, 7-segment, red or green LED
Height	14.2 mm (0.56 in.)
Symbols	-1.8.8.8
Overrange Indication	Three least-significant digits blank

#### ENVIRONMENTAL

Operating temperature 205-E	0°C to 50°C (32°F to 122°F)
Operating temperature 205-P & 205-A	0°C to 60°C (32°F to 140°F)
Storage temperature	-40°C to +85°C (-40°F to 185°F)
Relative humidity	95% at 40°C (104°F) (non-condensing)

#### MECHANICAL

Case type	3/64 DIN (2472-100)
Bezel	24 x 72 mm (0.94 x 2.83 in)
Panel cutout 3/64 DIN	22.2 x 68 mm (0.87 x 2.68 in)
Panel Thickness	0.8 mm (0.03 in) min. 6.4 mm (0.25 in) max.
Depth behind bezel, with connector	120 mm (4.72 in)
Weight	200 g (7 oz)
Case material	94V-1 UL-rated thermoplastic

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.

Caution, risk of danger. 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.