

# TP40S

## 200mm Bar Graph Display Operation and Instruction Manual

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# 1 Introduction

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The TP40S series bar graph displays are designed for applications where good visibility is important. Large high intensity LED's provide a wide viewing angle of the display. The display has been designed to be wall mounted. Optional brackets are available which may be used to panel mount the display.

## **Standard Features:**

Pushbutton calibration.

High and low setpoint output relays.

18V unregulated transmitter supply standard (on AC powered models only).

Microprocessor based.

Weatherproof IP65 enclosure.

40 segment bar graph display.

200mm high intensity LED segments.

Automatic digital filter.

Selectable display brightness.

Selectable bar or dot display.

Input over current protection via PTC fuse.

## **Description:**

The instrument may be factory configured to accept inputs from 0-20mA, 4-20mA, 0-100mV, 0-1V, 0-10V or 0-100V. An optional input board is available for use with a 4 wire mV output type load cell or pressure transducer. A transmitter supply of 18VDC (20mA max.) unregulated is provided as standard on AC powered models. An optional +/-12V (24V) transducer excitation voltage is available to suit various sensors or transmitters.

## **Technical Description:**

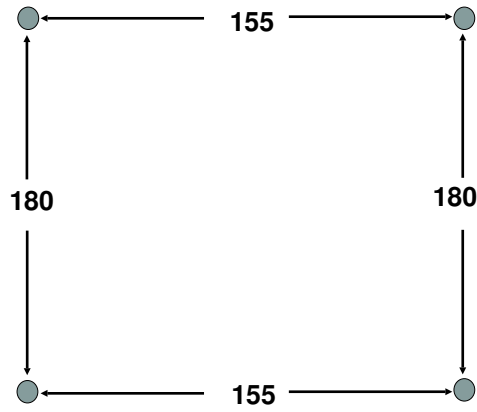
The instrument consists of an input board, a bar graph display board and a power transformer board (110VAC and 240VAC models). An optional input board may also be fitted if the input is from a 4 wire load cell/pressure transducer.

The main PCB uses a high performance A/D converter and a single chip microprocessor.

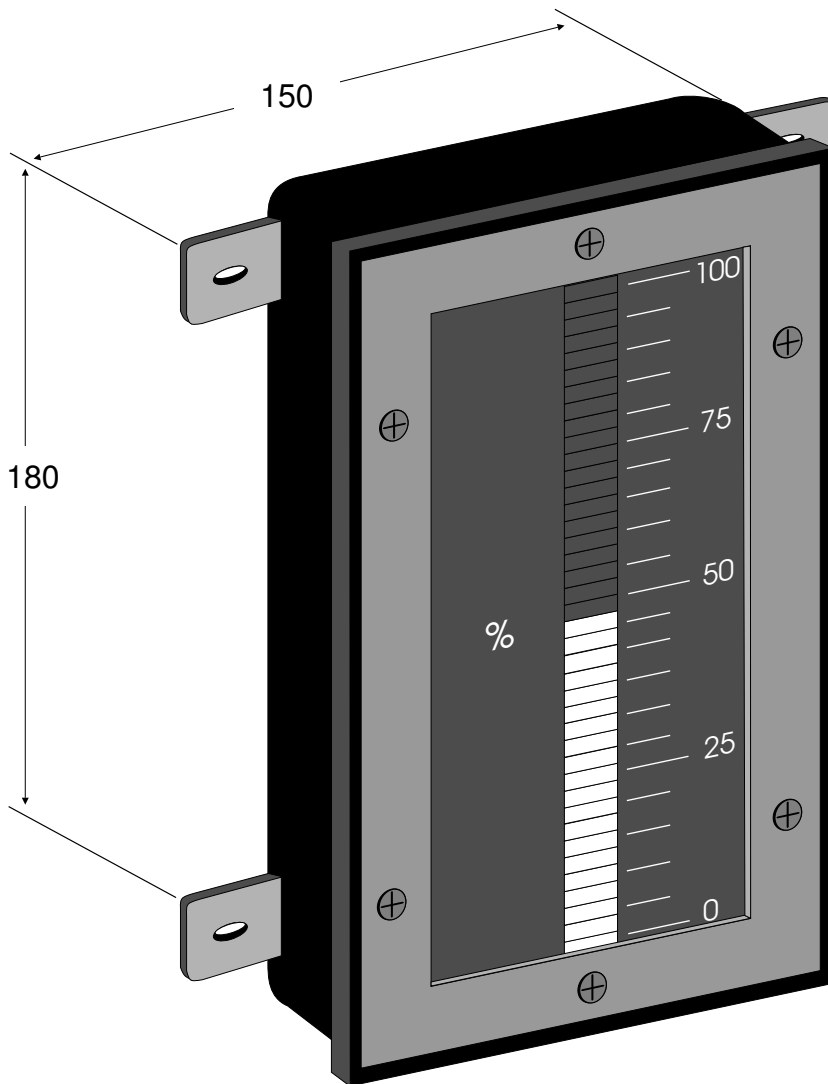
The 40 segment x 200mm bar graph display provides easy viewing of values from a wide range of viewing angles.

## 2 Mechanical Installation

The instrument is designed to be wall mounted using the four mounting brackets provided. Carefully measure and drill four holes as shown below. Measurements are in mm and the hole size is 6.5mm



Dimensions mm

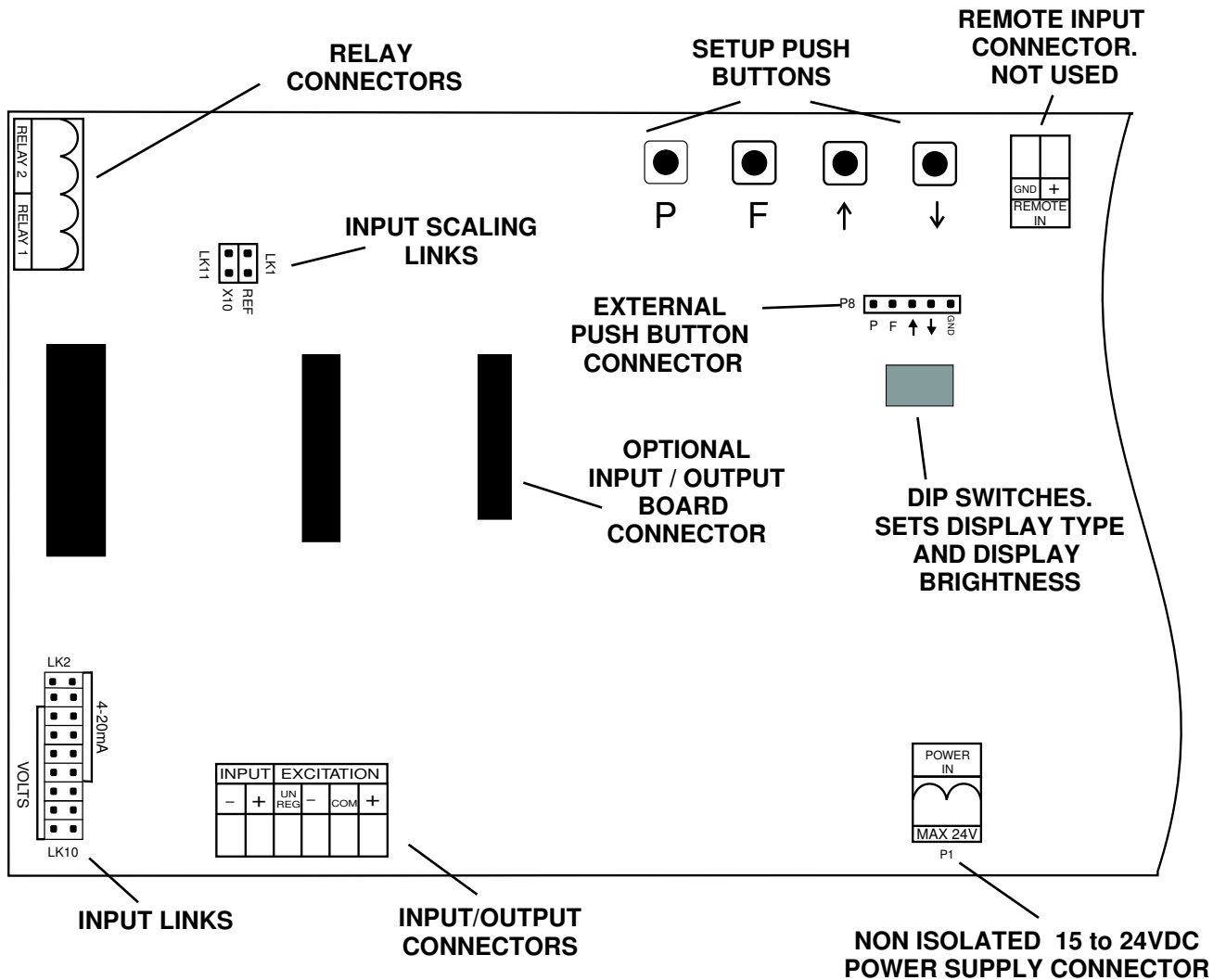


### 3 Electrical Installation

The TP40S instrument is designed for continuous operation and no power switch is fitted to the unit. It is recommended that an external switch and fuse be provided to allow the unit to be removed for servicing.

The terminal blocks, which are the plug in type for ease of installation, allow for wires of up to 1.5mm (2.5mm for relay and power connections) to be fitted. Connect the wires to the appropriate terminals as indicated below. Refer to other details provided in this manual to confirm proper selection of voltage, polarity and input type before applying power to the instrument. When power is applied the instrument will cycle through an LED display sequence.

#### MAIN CIRCUIT BOARD LAYOUT (PARTIAL VIEW)

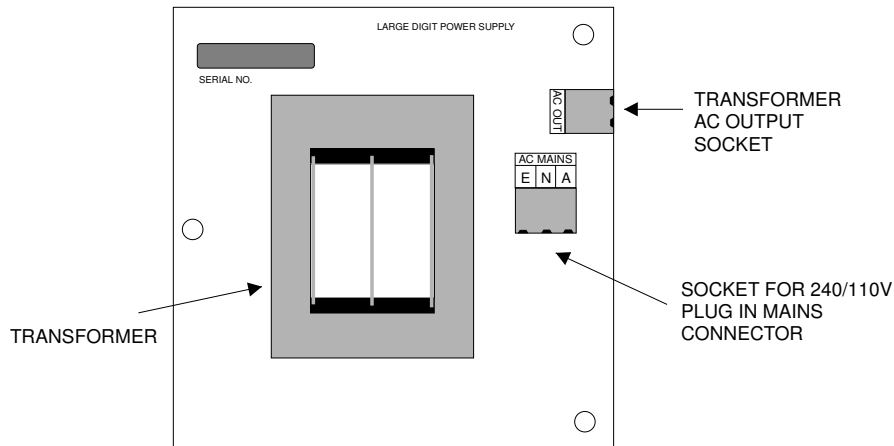


### 3.1 Power supply connections

Mains power connections (240VAC or 110VAC) are via a plug in terminal with screw connections. This connector will accept wires of up to 2.5mm diameter.

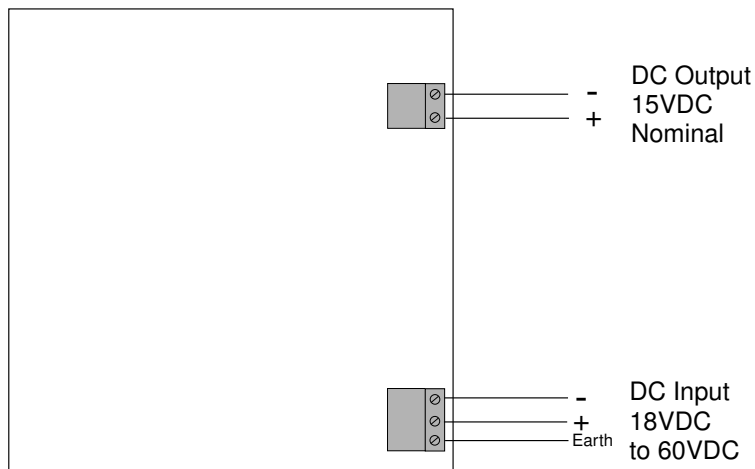
The transformer low voltage AC output goes to the power supply connector P1 on the main circuit board via the lead supplied.

Non isolated 15 to 24VDC supplies may be connected directly to the main circuit board power supply connector P1 via the plug in connector terminals. The positive and negative supplies may be connected either way around.



### 3.2 12 to 48VDC isolated supply

#### 18 to 60VDC Isolated Supply Board



### 3.3 Relay connections

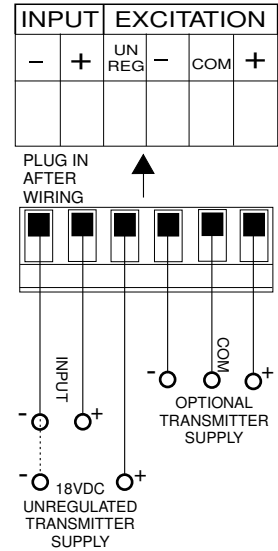
The TP40S is supplied with two alarm relays as standard with connections on P6. The relays are single pole, single throw types and are rated at 5A, 240VAC into a resistive load. The relay contact is voltage free. Relay 1 can be used as a low alarm and relay 2 can be used as a high alarm.

### 3.4 Input/output Connectors

The diagram shows the input/output connectors for the TP40S. The input signal connection is between INPUT + and INPUT -.

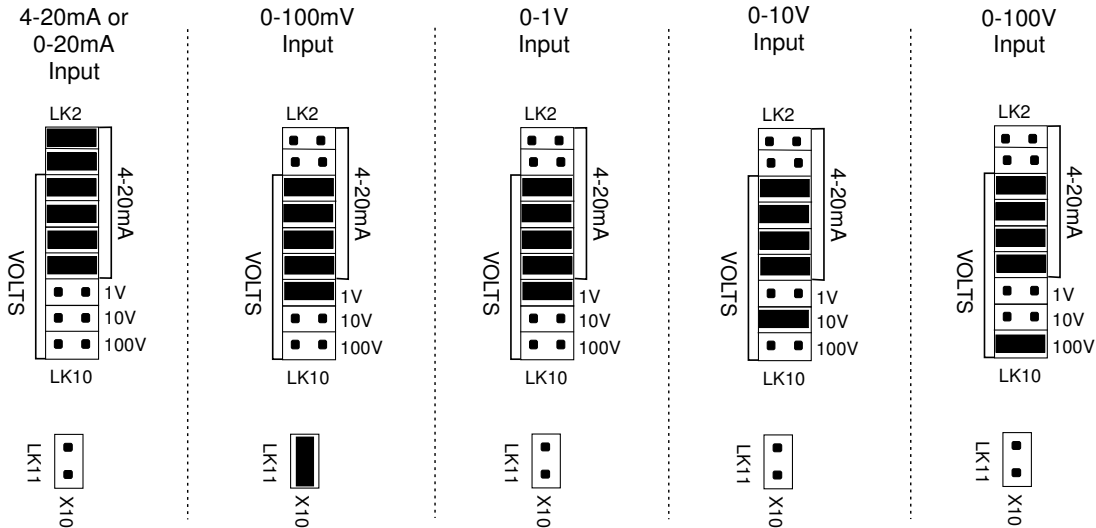
The standard 18VDC unregulated transmitter supply output (20mA max.) is between INPUT - and EXCITATION UN REG.

The optional +/-12V transmitter supply output (20mA max.) is between COM , EXCITATION + and EXCITATION -. Wires of up to 1.5mm diameter can be accepted. The connectors are of the plug in type for ease of installation.



### 3.5 Input type selector links

The input type selector links must be set to suit the input type required. Input links allow selection of 0-20mA, 4-20mA, 0-100mV, 0-1VDC, 0-10VDC or 0-100VDC input. Note that the x10 link (LK11) is used for the 0-100mVDC input range. The 4-20mA input will allow both 4-20mA and 0-20mA input ranges. Note: Input link LK1 must always be in unless an optional input board is fitted.



### 3.6 DIP Switch settings

SW9 is a DIP switch package with 4 switches. These switches are used to set choices of: Dot or bar display, number of dots in a dot display or display brightness. Settings are as follows:

Switch 1

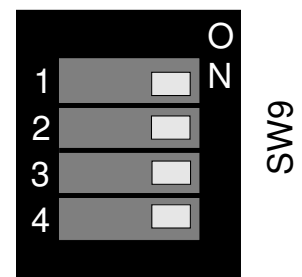
- OFF - 1 dot in a dot display
- ON - 2 dots in a dot display

Switch 2

- OFF - dot display type
- ON - bar display type

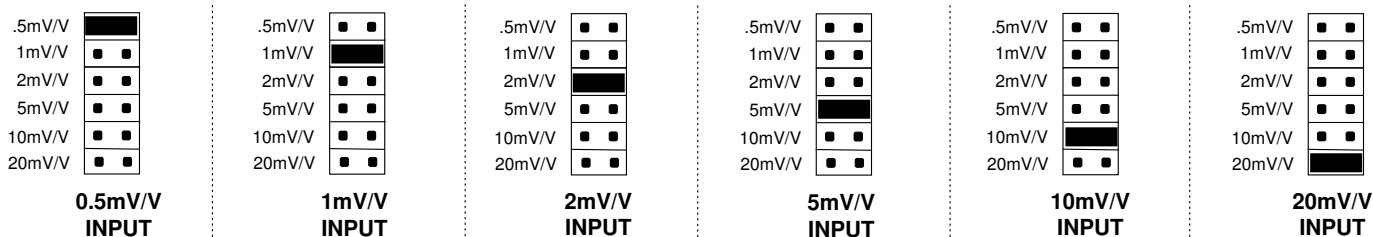
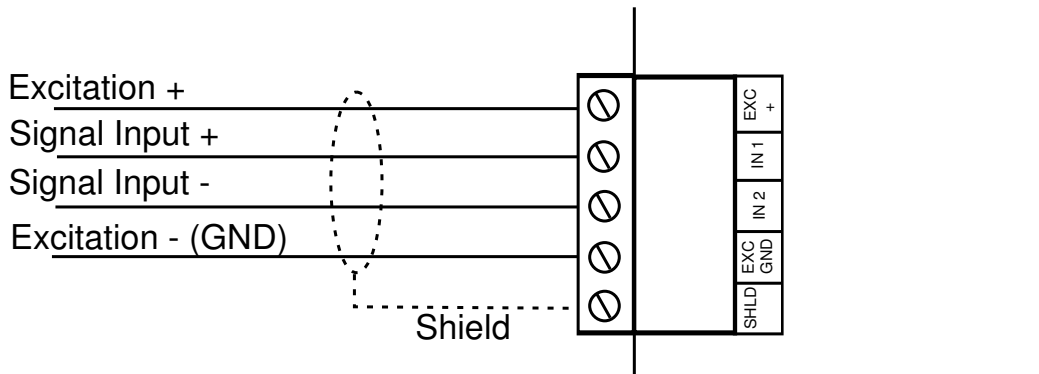
Switches 3 and 4

- |     |     |                       |
|-----|-----|-----------------------|
| 3   | 4   |                       |
| OFF | OFF | low brightness        |
| ON  | OFF | medium brightness     |
| OFF | ON  | high brightness       |
| ON  | ON  | ultra high brightness |



### 3.7 Optional load cell input

The diagram shows the input connector for the optional load cell input. Ensure that the input type selector links are also set correctly (see below). Wires of up to 2.5mm<sup>2</sup> can be accepted. The connector is of the plug in type for ease of installation. Your load cell/pressure transducer connects directly to this input. Remember to set the mV/V input links to suit your sensor.





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## 4 Calibration and alarm settings

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To enter the calibration mode a special “power up procedure” must be followed. This procedure prevents accidental alteration of calibration and provides a degree of calibration security.

### Initialising the calibration mode

Turn off instrument Power.

Press and hold the **F** button whilst applying power to the instrument, leave the **F** button pressed for at least 10 seconds after applying power. The instrument calibration mode is now activated. Note that if you power up in this mode you will not see the normal “wake up” LED test display.

#### 4.1 Setting the bar display low value

Using a suitable input simulator or with the input value at 0% press the **F** and **▼** buttons simultaneously. The lower display segment only will be displayed indicating that the 0% (low value) is entered into the instrument memory.

#### 4.2 Setting the bar display high value

Using a suitable input simulator or with the input value at 100% press the **F** and **▲** buttons simultaneously. The full bar will be displayed indicating that the 100% (high value) is entered into the instrument memory.

#### 4.3 Setting the low alarm

Relay 1 can be used as a low alarm relay. Use a suitable input or simulator, when the input level equals the required low alarm level press the **P** and **▼** buttons simultaneously. This will now be the low alarm level. A hysteresis (deadband) of 1% of full scale is applied to this alarm value.

#### 4.4 Setting the high alarm

Relay 2 can be used as a high alarm relay. Use a suitable input or simulator and, when the input level equals the required high alarm level press the **P** and **▲** buttons simultaneously. This will now be the high alarm level. A hysteresis (deadband) of 1% of full scale is applied to this alarm value.

#### 4.5 Resetting the low & high alarm

Once a high or low setting has been made the alarm relay cannot be turned off. If the alarm relay is not required and one or more levels have been set then for 4-20mA inputs open circuit the input signal or reverse the input signal and set the high and/or low alarms at this point. For DC Volts or load cell (optionally fitted) inputs reverse the input and set the high and/or low alarms at this point. In this way the alarms will not function under normal operating conditions.

### Returning to the normal measure mode

Turn off power to the instrument (to exit the calibration access mode), wait a few seconds and then restore power. This procedure inhibits further alteration to the instrument calibration (without re-initialising the calibration mode).

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## 5 Specifications

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### Technical Specifications

Input Types, also see  
Individual specifications

Standard Input Types:	0-20mA, 4-20mA, 0-100mV, 0-1V, 0-10V & 0-100V link selectable
Optional Input Types:	4 wire mV output type Strain Gauge/ Load Cell/Pressure Transducer
Resolution:	1 in 40
Accuracy:	0.5% plus 1 bar segment
Sample Rate:	4 per sec
Conversion Method:	Dual Slope ADC
Microprocessor:	MC68HC11F1FN CMOS
Ambient Temperature:	-10 to 60°C
Humidity:	5 to 95% non condensing
Display:	40 segment red LED
Power Supply:	AC 240V or 110V 45/65Hz DC 15 to 24V non isolated DC 12 to 48V isolated
Power Consumption:	AC supply 15VA max, Non isolated DC supply, typical 500mA (2A peak)
Unregulated DC Output:	Non isolated nominal 18V (20mA max), AC supply models only.

### Optional DC Output

DC Voltage Output:	Isolated $\pm 12V(24V)$ standard, $\pm 15V(30V)$ and $\pm 5V(10V)$ available (20mA max).
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### Physical Characteristics

Case Size:	255mm(H) x 145mm(W) x 85mm(D)
Weight:	1.3 kgs

### Individual Specification

#### TP40S-IV DC Current & Voltage Input

Input types:	Link selectable 0-20mA or 4-20mA current sinking & sourcing or DC volts 0-100mV, 0-1V, 0-10V or 0-100V
Impedance:	80 $\Omega$ (4-20mA) & 1M $\Omega$ on DC voltage

#### TP40S-SG Strain Gauge/Load Cell Input

Input:	Ratiometric 4 arm strain gauge
Measuring range:	FS 5, 10, 20, 50, 100 & 200mV link selectable
Bridge compatibility:	80 $\Omega$ to 2000 $\Omega$
Excitation:	5V or 10V link selectable

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## 6 Guarantee and Service

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The product supplied with this manual is guaranteed against faulty workmanship for a period of 2 years from the date of dispatch.

Our obligation assumed under this guarantee is limited to the replacement of parts which, by our examination, are proved to be defective and have not been misused, carelessly handled, defaced or damaged due to incorrect installation. This guarantee is VOID where the unit has been opened, tampered with or if repairs have been made or attempted by anyone except an authorised representative of the manufacturing company.

Products for attention under guarantee (unless otherwise agreed) **must be returned to the manufacturer freight paid** and, if accepted for free repair, will be returned to the customers address in Australia free of charge.

When returning the product for service or repair a full description of the fault and the mode of operation used when the product failed must be given.

In any event the manufacturer has no other obligation or liability beyond replacement or repair of this product.

Modifications may be made to any existing or future models of the unit as it may deem necessary without incurring any obligation to incorporate such modifications in units previously sold or to which this guarantee may relate.

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the instrument manufacturer  
and may not be reproduced in whole or part without the  
written consent of the manufacturer.**

**This product is designed and manufactured in Australia.**