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Martindale Electric Company Limited  
Metrohm House, Penfold Trading Estate, Imperial Way, Watford WD24 4YY, UK  
Tel: +44(0)1923 441717 Fax: +44 (0)1923 446900  
E-mail: sales@martindale-electric.co.uk  
Website: www.martindale-electric.co.uk

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# RT80 OPTICAL TACHOMETER

## Instruction Manual



# **⚠ ALWAYS READ THESE INSTRUCTIONS BEFORE PROCEEDING**

Thank you for buying one of our products. For safety and a full understanding of its benefits please read this manual before use. Technical support is available from 01923 441717 and support@martindale-electric.co.uk.

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## Specification RT80 Optical Tachometer



All specified accuracies are at 23°C ± 5°C, <75% R.H. for 1 year.

Temperature coefficient: 0.1 x (specified accuracy) per °C, (0°C to 18°C, 28°C to 50°C).

Measuring range: 100 to 99999 rpm  
1.7 to 1666 rps

Resolution: 0.1 rpm (100.0 to 19999.9 rpm)  
0.1 rps (1.7 to 333.3 rps)  
1 rpm (20000 to 99999 rpm)  
1 rps (334 to 1666 rps)

Accuracy: ± (0.02% of reading + 1 digit)


### **GENERAL**

Display: liquid crystal display

Measurement rate: once per second

Power: 2 x 1.5V, AAA alkaline batteries (IEC LR03, NEDA 24A)

Continuous operating time: 30 hours typical.

Low battery indication: The  is displayed when the battery voltage drops below the operating level

Auto power off: after approx. 10 minutes

Dimensions: 132.9(L) x 50.9(W) x 24.7(D) mm

Weight: 110g approx. including batteries

Includes: protective cover, 2 x 1.5V AAA batteries, detachable carry strap and instructions

### **ENVIRONMENTAL**

Operating environment: 0°C to 50°C at <70% R.H.

Storage environment: -20°C to 60°C, <80% R.H. with batteries removed.

### **EMC**

Conforms to BS EN61326-1

## 5. WARRANTY AND LIMITATION OF LIABILITY

This Martindale product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is 2 years and begins on the date of receipt by the end user. This warranty extends only to the original buyer or end-user customer, and does not apply to fuses, disposable batteries, test leads or to any product which, in Martindale's opinion, has been misused, altered, neglected, contaminated, or damaged by accident or abnormal conditions of operation, handling or storage.

Martindale authorised resellers shall extend this warranty on new and unused products to end-user customers only but have no authority to extend a greater or different warranty on behalf of Martindale.

Martindale's warranty obligation is limited, at Martindale's option, to refund of the purchase price, free of charge repair, or replacement of a defective product which is returned to Martindale within the warranty period.

This warranty is the buyer's sole and exclusive remedy and is in lieu of all other warranties, expressed or implied, including but not limited to any implied warranty of merchantability or fitness for a particular purpose. Martindale shall not be liable for any special, indirect, incidental or consequential damages or losses, including loss of data, arising from any cause or theory.

Since some jurisdictions do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any part of any provision of this warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision or other part of that provision.

## 1 SAFETY INFORMATION

### REMEMBER: SAFETY IS NO ACCIDENT

These instructions contain both information and warnings that are necessary for the safe operation and maintenance of this product. It is recommended that you read the instructions carefully and ensure that the contents are fully understood. Failure to understand and to comply with the warnings and instructions can result in serious injury, damage or even death.

Particular attention should be paid to the Warnings, Precautions and Technical Specifications.

Please keep these instructions for future reference. Updated instructions and product information are available at:  
[www.martindale-electric.co.uk](http://www.martindale-electric.co.uk)

### 1.1 Meaning of Symbols and Markings



**Caution - risk of danger and refer to instructions**



**Equipment complies with relevant EU Directives**



**End of life disposal of this equipment should be in accordance with relevant EU Directives.**

## 1.2 Precautions

This product has been designed with your safety in mind, but please pay attention to the following warnings and cautions before use.

### Cautions

The RT80 must only be used by a skilled and competent person who is familiar with the relevant regulations, the safety risks involved and the consequent normal safe working practices, and under the conditions and for the purposes for which it has been constructed and specified.

Before use check the unit for cracks or any other damage. Make sure the unit is free from dust, grease and moisture. **Do not** use if damaged.

Avoid severe mechanical shock or vibration and extreme temperature.

To avoid possible corrosion from leaking batteries, remove the batteries if discharged, or when the unit is not in use for an extended period.

## 4.4 Repair & Service

There are no user serviceable parts in this unit other than those that may be described in section 4. Return to Martindale Electric if faulty. Our service department will provide a quotation to repair any fault that occurs outside the guarantee period.

Before the unit is returned, please ensure that you have checked the unit and batteries.

## 4.5 Storage Conditions

The instrument should be kept in warm dry conditions away from direct sources of heat or sunlight, and in such a manner as to preserve the working life of the unit. It is strongly advised that the unit is not kept in a tool box where other tools may damage it.

## 4. MAINTENANCE

### 4.1 Battery Replacement

Push the battery cover up towards the sensor and lift away from the back of the RT80.

Remove the old batteries from the battery compartment.

Replace with 2 x new AAA batteries (IEC LR03, NEDA 24A), observing correct polarity as indicated on the base of the battery compartment.

Replace the battery cover.

Note: Do not mix old and new batteries.

### 4.2 Calibration

To maintain the integrity of measurements made using your instrument, Martindale Electric recommends that it is returned at least once a year to an approved Calibration Laboratory for recalibration and certification.

Martindale Electric is pleased to offer you this service. Please contact our Service Department for details.

Email: [service@martindale-electric.co.uk](mailto:service@martindale-electric.co.uk)

Tel: 01923 650660

### 4.3 Cleaning

If contamination is found, clean with a damp soft cloth and if necessary a mild detergent. Do not use abrasives, abrasive solvents, or detergents which can cause damage to the unit. If a mild detergent is used, the unit should subsequently be thoroughly cleaned with a water dampened soft cloth. After cleaning, dry and allow to remain in a dry environment for 2 hours before use.

## 2. INTRODUCTION

### 2.1 Inspection

Examine the shipping carton for any sign of damage. Inspect the unit and any accessories for damage. If there is any damage then consult your distributor immediately.

### 2.2 Description

The Martindale RT80 has the following functions and features:

- ◆ 100 to 99999 rpm and 1.7 to 1666 rps ranges
- ◆ Hold, Max, Min, Max-Min and Average functions
- ◆ Auto power off
- ◆ Low battery indication
- ◆ LCD display with backlight
- ◆ Pocket-sized, compact body

### 2.3 Accessories

The RT80 comes with the following accessories:


- ◆ Protective cover for safe storage
- ◆ 2 x 1.5V AAA batteries
- ◆ Detachable carry strap
- ◆ Instructions

### 2.4 Battery Installation




Refer to Section 4.1 (Battery Replacement) for the battery installation instructions for the RT80.

### 3. OPERATION

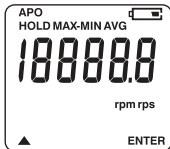
#### 3.1 Low Battery Indication





If the  is displayed, the battery needs replacing as measurement accuracy can no longer be guaranteed (see section 4.1 Battery Replacement).

#### 3.2 Description of Press Buttons

	Selects Set mode settings Activates measurement mode
	Turns on/off the RT80, turns on backlight
	Selects Set mode and Hold mode functions

#### 3.3 Description of LCD symbols



<b>APO</b>	Auto power off is active
	Indicates low batteries
<b>HOLD</b>	Hold mode is active
<b>MAX</b>	Maximum recorded reading is displayed
<b>MIN</b>	Minimum recorded reading is displayed
<b>MAX-MIN</b>	The difference between maximum and minimum recorded readings is displayed
<b>rpm rps</b>	Units of measurement being displayed
	Indicates press of  button required
<b>ENTER</b>	Indicates press of  button required

Successive presses of the  button will display the following in sequence:


**MAX** - maximum recorded reading;

**MIN** - minimum recorded reading;


**MAX-MIN** - difference between max and min recorded readings;

**AVG** - average of the recorded readings.

**NO.** and the current setting for the number of markers.

Press  to increment the digit from 1 to 9 as required. After 9 the digit will step back to 1.

The unit will return to the Measurement mode at the end of the above sequence.

To **clear the recorded readings**, press  for 2 seconds at any point in the above sequence. The unit will return to the Measurement mode.

Note: The Hold mode will not function until at least 3 measurements have been stored to memory.

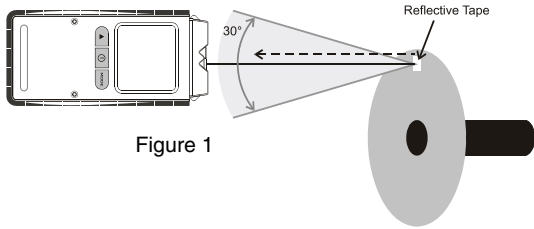
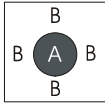


Figure 1

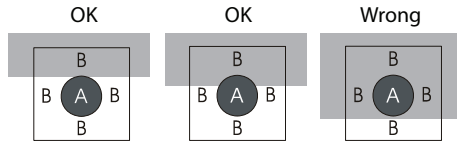
Figure 2

Light pattern



Reflective tape

A: non effective area of light pattern  
B: effective area




### 3.9 Hold Mode


The RT80 has the facility to display the maximum reading, the minimum reading, the difference between maximum and minimum readings and the average of the recorded readings.


To enter the Hold mode press **MODE**, while in Measurement mode.

The LCD will display **HOLD** and the last measured value will be held on the display.

### 3.4 Power On/Off

To power on in Measurement mode, press  for less than 1 second.

To power on in Set mode, press  for 2 seconds.


To power off the unit, press  for 2 seconds.

### 3.5 Auto Power Off (APO)

If the unit is inactive for a period of 10 minutes it will automatically power off.

To disable this function refer to section 3.7.

### 3.6 Backlight


Press  for less than 1 second to turn on the backlight.

It will automatically turn off after 15 seconds if there is no further operation of the unit.

### 3.7 Set Mode

This mode sets the following in the order shown:



- ◆ Unit of measurement;
- ◆ Auto power off (APO).

The Set mode is selected by pressing  for 2 seconds with the unit powered off.

If the unit is switched off while in the Set mode, any changed settings will not be saved, and the unit will revert to the previous settings.

### Unit of Measurement


The LCD will flash **rpm** or **rps** after entering the Set mode.

Press  to select **rpm** or **rps** as required.  
Press  to advance to the next function.


### APO

The LCD will display **APO**.

Press  to select **ON** or **OFF** as required.

Press  to save settings and return to the Measurement mode.

### 3.8 Measurement Mode

 **Never** try applying reflective tape to rotating objects if they are still moving.

Take all required safety precautions when applying reflective tape to stationary rotating objects and when taking measurements.

If the rotating object to be measured does not have a highly reflective surface, it is advisable to apply a reflective marker or multiple reflective markers to the object.

Avoid exposing the sensor to light sources or applying the reflective tape next to highly reflective surfaces, such as glass, as this can affect measurement accuracy.


The ideal measurement distance to the object is between 10cm to 40cm. Refer to table 1 for the recommended tape size and measuring distance.

Table 1

Tape size H x L (cm)	Measuring distance (cm)
1 x 2	10 to 20
2 x 3	20 to 30
2 x 5	30 to 40


If multiple markers have been used then enter the number of markers into the RT80 (see section 3.9).

The RT80 will flash **HOLD** on the LCD.

Press and hold  to commence measurement. **HOLD** will no longer be displayed.

Hold the RT80 perpendicular within 30° to the reflective tape or reflective surface as shown in figure 1.

Aim the RT80 so the light pattern from the LED is positioned on the reflective tape as shown in figure 2 for measuring distances greater than 30cm.

To stop the measurement process, release the  button and the RT80 will hold the last measured value on the display and flash **HOLD** again.

While in Measurement mode, all measured values are recorded at a rate of once per second for use by the Hold mode (see section 3.9).