

5 DIGIT OPTICAL HAND TACHOMETER



9801.001 - 5 DIGIT OPTICAL

DIGITAKER 9801.001 is a microcomputer based digital tachometer for rotational speed measurements, particularly suitable in application where a physical contact with the moving part cannot be obtained and braking force cannot be applied.

DIGITAKER has a measuring range of 2.0 to 100,000 r.p.m. with automatic decimal point selection in order to ensure a high degree of accuracy.

TOTALIZING function allows to count the incoming pulses.

DIGITAKER is provided with an auxiliary input for an optional external sensor.

By inserting the 8830.001 contact sensor, linear speed measurements can be made.

TECHNICAL FEATURES

Readout: 5 digit ultrabright LED displays
 Accuracy: $\pm 0,1$ r.p.m. up to 999.9 r.p.m.
 $\pm 0,005\%$ from 1000 to 100,000 r.p.m.
 Power supply: 4 batteries UM3 1,5V
 Operating temperature: from 0 to 45°C
 Dimensions: 180x60mm
 Weight: 0.4Kg

Measuring range: from 2.0 to 100,000 r.p.m.
 Measuring period:

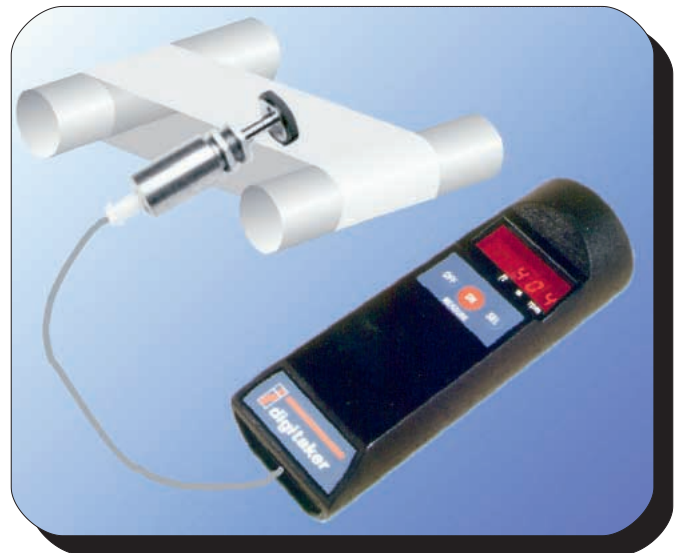
Each rotation from 2.0 to 60.0 r.p.m.
 1 second from 60,0 to 100,000 r.p.m.

Standard accessories:

Plastic case for tachometer and sensors
 Set of 5 self-adhesive reflective tabs

9801.001 5 digit optical hand tachometer

7817.006 Spare 5 self-adhesive reflecting tabs (25x90)



ROTATION SPEED MEASUREMENT

- Apply a reflective strip on the rotating part.
- Point optical head towards the strip.
- Press the MEASURE push-button.
- Releasing the push-button, the measured value is held in memory.

LINEAR SPEED MEASUREMENT

- Insert 8830.001 contact sensor (optional) connector into the external connector input of the tachometer.
- Select through the SEL push-button the desired measuring unit (m/min).

OPTIONAL SENSORS

- 8830.001** Contact sensor
8810.001 Optical sensor
8810.010 Proximity switch



5 DIGIT CONTACT HAND TACHOMETER

9802.001 5 DIGIT CONTACT

DIGITAKER 9802.001 is a microcomputer based digital tachometer for rotation and feed speed measurements by means of a hard rubber contactor placed on the outlet spindle of the device itself.

DIGITAKER has a measuring range from 0.2 to 30,000 r.p.m. with automatic decimal point selection in order to ensure a high degree of reading accuracy.

A calibrated rubber wheel is provided for linear speed measurements directly in m/min or feet/min.

TOTALIZING function allows to count the incoming pulses (10 pulses per revolution, 1 centimeter every pulse when the rubber wheel is inserted).

DIGITAKER is provided with an auxiliary input for optional external sensor fitting.



TECHNICAL FEATURES

Readout:	5 digit ultrabright LED displays
Accuracy:	$\pm 0,1$ r.p.m. up to 999.9 r.p.m. $\pm 0,005\%$ from 1000 to 100,000 r.p.m.
Power supply:	4 batteries UM3 1,5V
Operating temperature:	from 0 to 45°C
Dimensions:	180x60mm
Weight:	0.4Kg
Measuring range:	from 0,2 to 30,000 r.p.m. linear speed from 0,02 to 3,000m/min
Measuring period:	1 second
Standard accessories:	Plastic case for tachometer and sensors Set of 3 hard rubber tips. Rubber wheel to measure m/min and feet/min.

9802.001	5 digit contact hand tachometer
7608.009	Set of 7 spare rubber tips
7608.010	Spare surface wheel

ROTATION SPEED MEASUREMENT

- Contact the tachometer tip to the shaft center of the rotating part.
- Press the MEASURE push-button.
- Releasing the push-button, the measured value is held in memory.

LINEAR SPEED MEASUREMENT

- Apply the hard rubber wheel to the tachometer outlet spindle.
- Select through the SEL push-button the desired measuring unit (m/min).

OPTIONAL SENSORS

8830.001	Contact sensor
8810.001	Optical sensor
8810.010	Proximity switch



EXTERNAL SENSORS FOR 5 DIGIT HAND TACHOMETERS

8810.001 OPTICAL SENSOR

Modulated infrared ray system optical detector.

A strip of reflective paper on the rotating part is needed to get the r.p.m. measurement.

Measuring range: from 2.0 to 100,000 r.p.m.
 Reflection range: from 10 to 300mm
 Dimensions: Chromed brass casing M27x73mm
 Cable length: 3m (standard), optional up to 30m max.
 Standard accessories: set of 5 reflective adhesive strips

8810.001 Optical sensor - temp.range 0 to +45°C
8810.002 Optical sensor - temp.range -20 to +70°C
7817.006 Spare 5 self-adhesive reflecting tabs
9994.854 Optional cable (exceeding the 3m standard)

8830.001 CONTACT SENSOR

For rotation and linear speed measurement, connect to the rotating part for rotation measurement or apply the calibrated wheel for linear speed measurement.

Measuring range: from 0.2 to 30,000 r.p.m.
 from 0.02 to 3000 m/min
 Operating temperature: from 0 to +45°C
 Dimensions: Chromed brass casing M27x93mm
 Cable length: 3m (standard), optional up to 30m max.
 Standard accessories: Set of 3 hard rubber tips.
 Rubber wheel to measure m/min and feet/min.

8830.001 Contact sensor (3m cable)
9994.854 Optional cable (exceeding the 3m standard)
7608.009 Set of 7 spare rubber tips
7608.010 Spare surface wheel

8810.010 PROXIMITY

Proximity magnetical sensor for rotational speed measurements in dusty environments.

Needs only one reference per round.

Measuring range: from 2.0 to 100,000 r.p.m.
 Operating temperature: from 0 to +60°C
 Dimensions: Chromed brass casing M12x36mm
 Cable length: 3m (standard), optional up to 10m max.
 Sensitivity: 2mm (typical 1mm)

8810.010 Proximity sensor (3m cable)
9994.854 Optional cable (exceeding the 3m standard)



5 DIGIT MECHA-OPTO HAND TACHOMETER



9803.001 - 5 DIGIT MECHA-OPTO

DIGITAKER 9803.001 is a microprocessor based digital tachometer with quartz crystal oscillator to maintain high accuracy. It has a mechanical contact assembly at the top of the unit and an integrated infrared transmitter and receiver at the base of the unit.

The 5-digit LED automatically inverts when switched from contact to optical so that the display is always the right way up when viewed.

For optical reading, a reflective adhesive tab is applied on the rotating part.

DIGITAKER has a measuring range from 0.2 to 100,000 r.p.m. with automatic decimal point selection in order to ensure the better reading accuracy degree.

A calibrated rubber wheel is provided for linear speed measurement directly in m/min or feet/min.

TECHNICAL FEATURES

Readout: 5 digit ultrabright LED displays
 Accuracy: $\pm 0,1$ r.p.m. up to 999.9 r.p.m.
 $\pm 0.005\%$ from 1000 to 100,000 r.p.m.
 Power supply: 4 batteries UM3 1,5V
 Operating temperature: from 0 to 45°C
 Dimensions: 180x60mm
 Weight: 0.4Kg
 Measuring range: from 0.2 to 100,000 r.p.m.
 Measuring period: 1 second

Standard accessories:
 Plastic case for tachometer and sensors
 Set of 3 hard rubber tips.
 Rubber wheel for measuring m/min and feet/min.
 Set of 5 reflective adhesive strips

9803.001 5 digit mecha-opto hand tachometer
7608.009 Set of 7 spare rubber tips
7608.010 Spare surface wheel
7817.006 Spare 5 self-adhesive reflecting tabs

4 DIGIT OPTICAL HAND TACHOMETER



4 DIGIT CONTACT HAND TACHOMETER



9003.001 - 4 DIGIT OPTICAL

DIGITAKER 9003.001 is a microcomputer based digital tachometer for rotation speed measurements, particularly suitable in application where a physical contact with the moving part cannot be obtained and braking force cannot be applied.

DIGITAKER has a measuring range of 2.0 to 20,000 r.p.m. with automatic decimal point selection in order to ensure a higher degree of reading accuracy.

TECHNICAL FEATURES

Readout:	4 digit ultrabright LED displays
Accuracy:	$\pm 0,1$ r.p.m. up to 999.9 r.p.m. $\pm 0.005\%$ from 1000 to 20,000 r.p.m.
Power supply:	4 batteries UM3 1,5V
Operating temperature:	from 0 to 45°C
Dimensions:	180x60mm
Weight:	0.4Kg
Measuring range:	from 2.0 to 20,000 r.p.m.
Measuring period:	Each rotation from 2.0 to 60.0 r.p.m. 1 second from 60.0 to 20,000 r.p.m.

Standard accessories:
Plastic case for tachometer and sensors
Set of 5 reflective adhesive strips

9003.001 4 digit optical hand tachometer
7817.006 Spare 5 self-adhesive reflecting tabs(25x90)

9004.001 - 4 DIGIT CONTACT

DIGITAKER 9004.001 is a microcomputer based digital tachometer for rotation and feed speed measurements by means of hard rubber contactor placed on the outlet spindle of the device itself.

DIGITAKER has a measuring range from 0.2 to 20,000 r.p.m. with automatic decimal point selection in order to ensure the better reading accuracy degree. A calibrated rubber wheel is provided for linear speed measurement directly in m/min or feet/min.

TECHNICAL FEATURES

Readout:	4 digit ultrabright LED displays
Accuracy:	$\pm 0,1$ r.p.m. up to 999.9 r.p.m. $\pm 0.005\%$ from 1000 to 20,000 r.p.m.
Power supply:	4 batteries UM3 1,5V
Operating temperature:	from 0 to 45°C
Dimensions:	180x60mm
Weight:	0.4Kg
Measuring range:	from 0.2 to 20,000 r.p.m. linear speed from 0,02 to 2,000m/min
Measuring period:	1 second

Standard accessories:
Plastic case for tachometer and sensors
Set of 3 hard rubber tips.
Rubber wheel for measuring m/min and feet/min.

9004.001 4 digit contact hand tachometer
7608.009 Set of 7 spare rubber tips
7608.010 Spare surface wheel

9210 MULTIFUNCTION TACHOMETER



TACHOMETER

The instrument computes the speed value according to the input pulse frequency coming from the external detector (proximity, pick-up, optical detector, etc.).

FREQUENCY METER

The instrument computes the input pulse frequency value. This value can be converted into another unit format in order to correspond to the desired measuring unit.

TOTALIZER

Input pulses coming from an external sensor (proximity, pick-up, etc.) are totalized. This value can be converted into another unit format in order to correspond to the desired measuring unit.

TIMER

When the "SIGNAL" input is connected to GROUND the timer starts counting until the input returns to the open condition.

TECHNICAL FEATURES

Display 5 digit high efficiency LED 13mm height
 Accuracy $\pm 0.005\% \pm 1$ digit
 OVERFLOW indication
 HOLD function
 MAX and MIN value memory
 4 function decimal point (0-1-2-auto)
 Parameters are easily set on the front panel keyboard
 2 alarm relays fully programmable.

SENSORS Optical detector, Proximity, Pick-up,
 Contact sensor, encoder, etc.
 Sensor power supply : 12Vdc/30mA
 or 5Vdc/30mA

Input waveform :

Sinusoidal min 100mVpp (at 1KHz), max 50Vac
 Square or open-collector low=0-1.5V high=4-30V
 INPUT LOAD (pick-up): 18K Ω
 INPUT LOAD (open collector): 2K Ω

MINIMUM FREQUENCY RATE:

Tachometer 2 r.p.m. (1 pulse per rev.)
 Frequency-meter 0,034Hz

MAXIMUM FREQUENCY RATE:

Tachometer and frequency-meter 60KHz
 Totalizer 4KHz

ALARM RELAYS

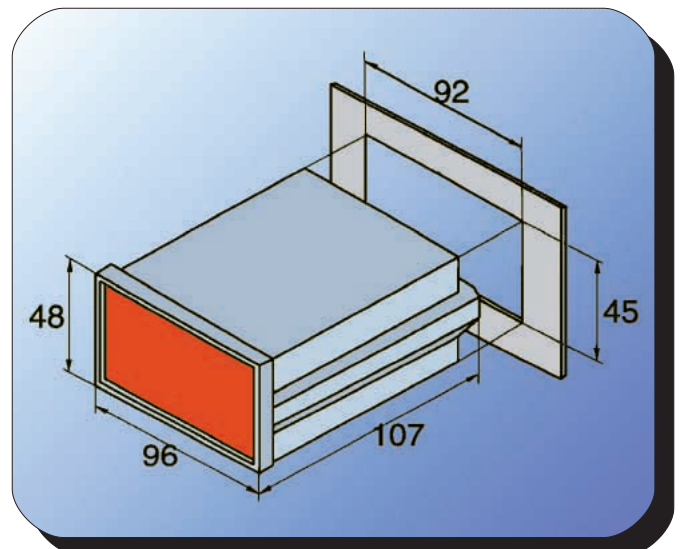
Max. allowed current: 1A at 125 Vac
 Max. commutating power: 50VA

Power supply

9210.001 Multifunction panel tachometer 220Vac
9210.002 Multifunction panel tachometer 110Vac
9210.003 Multifunction panel tachometer 12Vdc
9210.004 Multifunction panel tachometer 24Vdc
9210.005 Multifunction panel tachometer 24Vac
9210.006 Multifunction panel tachometer 12Vac

9010.100 Optional ANALOG OUTPUT
 0-10V and 4-20mA

9010.200 Optional RS232C optoinsulated
 for remote connection to host computer



9211 Elapsed Time Counter

9211 Elapsed Time Counter

INPUTS: enable time counting input
hardware RESET on the connector
range selector

Display 5 digit high efficiency LED 13mm height

RANGES:

A version 9h 59m 59s and 999h 59m

B version 9m 59s 99cents and 999h 59m

C version 999h 59m and 99999h

MODELS:

9211.001/A/B/C 220Vac

9211.002/A/B/C 110Vac

9211.003/A/B/C 12Vdc



9210 MULTIFUNCTION : applicable examples



LINEAR SPEED MEASURE

INPUT: pick-up pulses on gear wheel

MEASUREMENT UNIT CONVERSION:

The 9210 converts true measurement unit, transmitting relevant linear speed value on display.

For example 20.00 m/minute corresponds to 100 r.p.m. of gear wheel.

OPTIONAL OUTPUTS:

Analog output 0-10V and 4-20mA for remote linear speed control by PLC or digital acquisition system, or RS232 serial output to a PC.

TOTALIZER

INPUT: pulses from optical or capacitive sensors

OPTIONAL OUTPUTS:

RS232 serial output to a PC.
(Non-applicable analog output)

ALARM RELAYS:

2 alarm relays, fully programmable, for feed system control, relays are controlled by PC in remote mode.

Totalizer counts in both directions: either up or down.



EXTERNAL SENSORS FOR PANEL TACHOMETERS



8209.002 OPTICAL SENSOR

Modulated infrared ray system optical detector. A strip of reflective paper on the rotating part is needed to get the r.p.m. measurement.

8209.002 operating temperature from 0° to +45°C
8209.004 operating temperature from -20° to +70°C
 (See page 4 for technical specifications)

8830.002 CONTACT SENSOR

For rotation and linear speed measurement, connect to the rotating part for rotational measurement or apply the calibrated wheel for linear speed.
 (See page 4 for technical specifications)

8210.002 PROXIMITY

Proximity magnetical sensor for rotation speed measurements in dusty environments. Needs only one metal reference per round.
 (See page 4 for technical specifications)

8010.010 PICK-UP

Variable reluctance magnetic pick-up to be fitted with an iron toothed wheel (such as 8010.011), 8010.010 outputs a signal proportional to the speed.
 Measuring range from 10 to 20,000 r.p.m.
 Operating temperature: from -20 to +120°C
 Sensitivity: from 0 to 1mm
 Dimensions: M18x73mm

8010.010 Pick-up sensor (3m cable)
9994.854 Optional cable (exceeding the 3m standard)

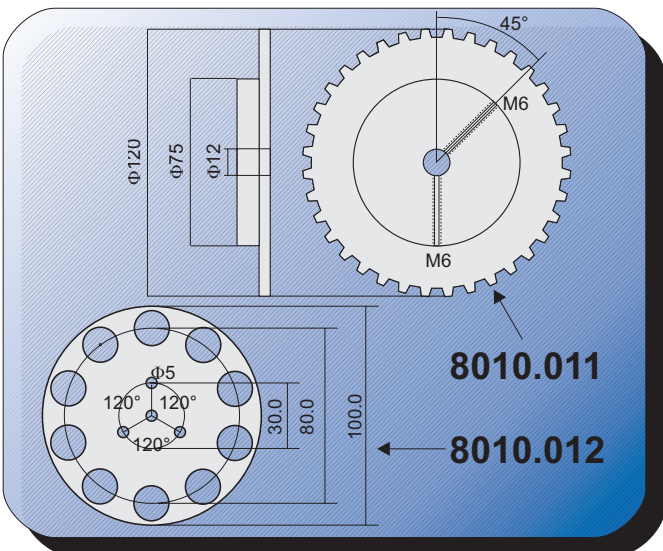


TOOTHED WHEEL FOR PICK-UP

Type: Iron toothed wheel, 60 teeth
 Dimensions: 120x15mm
 Fixing: two 6MA threaded holes
8010.011 TOOTHED WHEEL FOR PICK-UP

PUNCHED WHEEL FOR PROXIMITY

Type: Iron punched wheel, 1.2mm width
 Dimensions: 100mm
 Hole number : 10
 Fixing: 3 holes at 120° + 1 central hole
8010.012 PUNCHED WHEEL FOR PROXIMITY



8410 DIGITAL PANEL TACHOMETERS

8410 DIGITAL PANEL TACHOMETERS

The digital tachometers series 8410 are panel types and input can be provided through different kinds of transducers in order to meter the r.p.m. of a motor, or any other rotating part and also linear speed measurement ,

The main features are the low cost and the high accuracy, and make them suitable in applications where no special features other than accuracy are required.

The tachometers are grouped in two basic families:

8410.040/042 four digits

8410.050/052 five digits



TACHOMETER	DIGITS	Measuring range (r.p.m.)	TRANSDUCER	PULSE PER REVOLUTION
8410.040	4	50-9'999	Optical det. , proximity	1
8410.042	4	10-9'999	Contact detector Proximity + 8010.012	10
8410.050	5	50-50,000	Optical det., proximity	1
8410.052	5	10-30,000	Contact detector Proximity + 8010.012	10

TECHNICAL FEATURES

Display: 4 or 5 digits, 13mm height LED display

Measuring period: 1 second

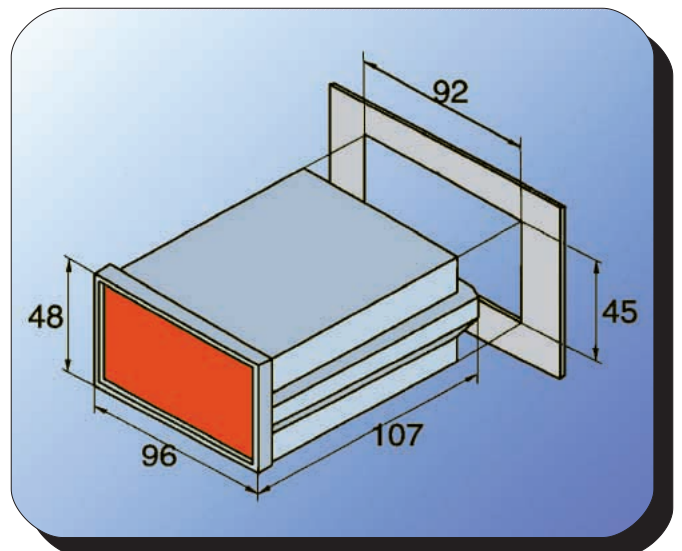
Accuracy: ± 1 r.p.m. up to 10,000 r.p.m.
 $\pm 0.005\%$ over 10,000 r.p.m.

Operative temperature: from 0° to 45°C

Power supply: AC 110/220Vac

DC from 8 to 16Vdc

Weight: 0.33Kg



AUTOMOTIVE TESTER 9350.001

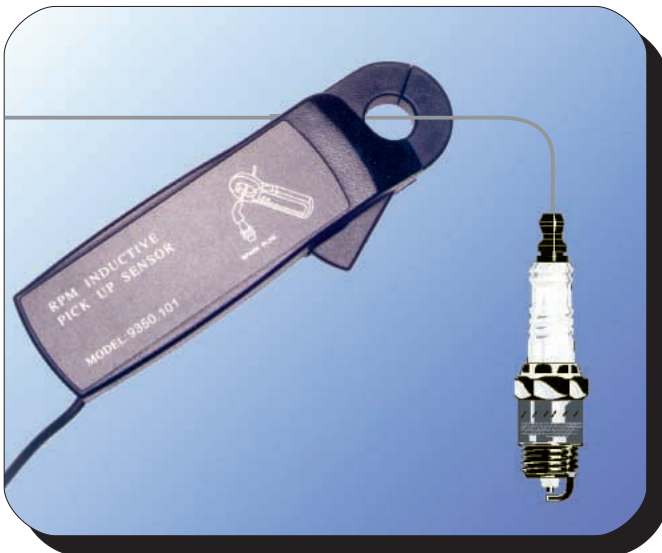
AUTOMOTIVE TESTER 9350.001

RPM (tachometer)

Engine speed measurement with inductive pick-up.
 Measuring range from 500 to 10,000 r.p.m.
 Resolution: 10 r.p.m.
 Accuracy $\pm 1.2\%$ ± 10 r.p.m.

DWELL ANGLE

"DWELL ANGLE" measurement
 Cylinder: 3,4,5,6,8
 Ranges: 0-120°(3 cyl.) 0-90.0°(4 cyl.) 0-72.0°(5 cyl.)
 0-60.0°(6cyl) 0-45.0°(8 cyl.)
 Resolution: 0.1°
 Accuracy: $\pm 1.2\%$ ± 1 digit



TEMP (temperature)

Temperature measurement.
 Ranges: from -20° to +750°C
 Resolution: 1°C
 Accuracy: $\pm 1\%$ ± 2 digits (from 0 to 300°C)
 $\pm 3\%$ ± 2 digits (over 300°C)

DC VOLTAGE

DC voltage measurement.
 Accuracy: $\pm 0.8\%$ ± 1 digits
 Range 200mV - 2V - 20V - 200V - 600V

AC VOLTAGE

AC voltage measurement.
 Accuracy: $\pm 1\%$ ± 2 digits
 Range 200mV - 2V - 20V - 200V - 600V

CC/CA

DC or AC current measurement.
 Range: 10A

RESISTANCE Resistance measurement
 Range: 200 Ω - 2K Ω - 20K Ω - 200K Ω - 2M Ω - 20M Ω

FREQUENCY Frequency measurement
 Range: 200Hz - 2KHz - 20KHz

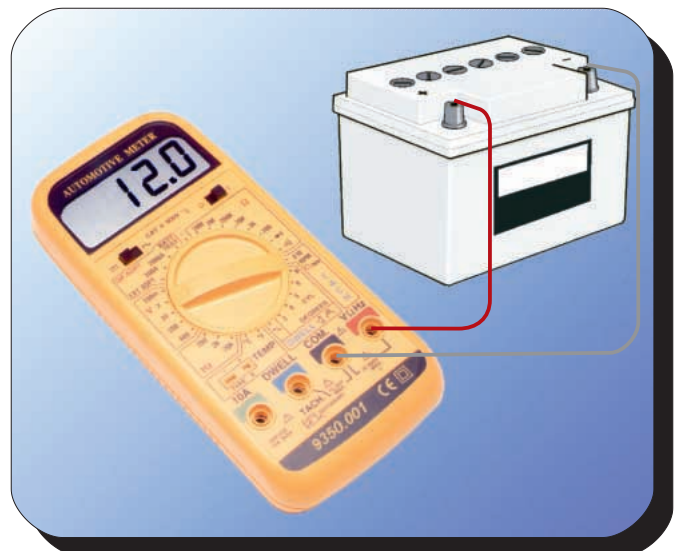
DIODE TEST

Measures the forward diode voltage drop.

AUDIBLE CONTINUITY

Continuity beeper keeps whenever probes touch a continuous circuit

9350.001 Automotive tester
 (Plastic carrying case included)
9350.101 RPM inductive pick-up sensor



9340.001 SOUND LEVEL METER



TECHNICAL FEATURES

- Large LCD display, easy to read.
- Frequency weighting networks are designed to meet IEC 651 type 2.
- A & C weighting networks are conformity to standard.
- Condenser microphone for high accuracy & long term stability.
- Time weighting (FAST and SLOW) dynamic characteristic modes.
- AC/DC output for system expansion.
- Built in calibration VR on front panel.
- Max. Hold function for storing the maximum value on display.
- Warning indicator for over and under load.
- Small, light weight design allows hand operation.

TECHNICAL FEATURES

Display: 18mm LCD, 3 ½ digits
 Function: dB(A & C frequency weighting)
 Time weighting (FAST e SLOW)
 MAX HOLD, AC and DC output

Measuring range: A - 3 ranges, from 30 to 130 dB
 C - 3 ranges, from 30 to 130 dB

Resolution: 0.1dB
 Accuracy: ± 1.5dB at 1kHz (after calibration)
 (23±5°C)* meet IEC 651 type 2,
 Calibrating input signal of 94dB

Frequency: from 31.5 Hz to 8 kHz
 from 31.5 a 8'000 Hz

Microphone: condenser microphone
 12.7mm diameter

Weighting network : A and C
 Range selector: 3 ranges
 (from 30 to 80dB, from 50 to 100dB,
 from 80 to 30dB)
 * 50 dB on each step with over & under range indicator

Time weighting: FAST t=200ms, SLOW t=500ms
 Fast simulates the human ear
 Slow gives the average value

Calibration: B&K (Bruel & Kjaer) MULTIFUNCTION
 ACOUSTIC CALIBRATOR 4226

Output signal:
 AC 0.5Vrms corresponding to each range step
 DC from 0.3 to 1.3 Vdc 10mV per dB (Rout=600Ω)

Operating temperature: from 0 to 50°C
 Power supply : Dc 9V battery,
 6mA of current consumption

Dimensions: 255x70x28mm
 Weight: 280g

CALIBRATOR (optional)

Acoustic pressure level: 94 ±0.8 dB
 Frequency: 1000Hz ±5%
 Microphone: 1 and ½ inch.

9340.001 SOUND LEVEL METER type 2
 (Plastic carrying case included)
9340.005 CALIBRATOR (94dB output)

