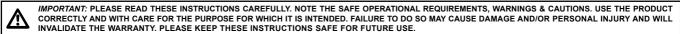


INSTRUCTIONS FOR: 11 FUNCTION DIGITAL AUTOMOTIVE ANALYSER MODEL:TA102

AUTOMOTIVE METER

Thank you for purchasing a Sealey product. Manufactured to a high standard this product will, if used according to these instructions and properly maintained, give you years of trouble free performance.



1. SAFETY INSTRUCTIONS

1.1. PERSONAL PRECAUTIONS

1

- When using the analyser, please observe all normal safety rules concerning:
- Protection against the dangers of electric current.
- Protection of the analyser against misuse.
- ✓ Full compliance with safety standards can only be guaranteed if used with the test leads supplied. If necessary, these must be replaced with genuine Sealey leads with the same electronic ratings. Failure to do so will invalidate the warranty.
- **X DO NOT** use leads if damaged or if the wire is bared in any way.

1.2. GENERAL SAFETY INSTRUCTIONS

- ✓ Familiarise yourself with the application and limitations of the analyser as well as the potential hazards. IF IN ANY DOUBT CONSULT A QUALIFIED ELECTRICIAN.
- ✓ When the analyser is linked to a measurement circuit, do not touch unused analyser terminals.
- ✓ When the scale of the value to be measured is unknown set the selector to the highest range available.
- ✓ Before rotating the function dial to change functions, disconnect test leads from the circuit under test.
- **WARNING!** Never perform resistance measurements on live circuits. Only measure on disconnected circuits.
- ✓ Use caution when working with voltages above 60V DC or 30V AC. Keep fingers behind the probe barriers whilst measuring.
- ✓ When not in use, store the analyser carefully in a safe, dry, childproof location. Storage temperature range -10°C to 50°C.
- When not in use, side the analyse carefully in a safe, any, amprovince and its of a safe, any, and province an
- WARNING! Do not make current measurements on the 10A scale for longer than 15 seconds in every 15 minutes Exceeding 15 seconds may cause damage to the analyser and test leads.

2. INTRODUCTION

Large, hi-contrast LCD display with 34mm high digital read-out. Durable bi-composite case and integral stand, suitable for the toughest workshop conditions. Test Lead Connection feature indicates correct hook-up. Includes over-ranging, auto-zeroing, data hold, auto power-off and low battery display functions. Supplied with capped test probes and K-type thermocouple.

	Functions	Connections	POWER	POWER Hz 210 22 20k Ω HOLD
Function	Test Range 200V - 750V	Connections	BUTTON	TEMP • 6 20M V
AC Voltage DC Voltage	200v - 730v 200mV - 1000V			ATT: 20m 200m 200m 200m
Resistance	200Ω – 20ΜΩ		FUNCTION/	10 20 +
Diode Test	Typically 1mA	RANGE ー VΩHzΩ <i>4</i> •+COM DIAL		8CYL 0 0 000 0 000 0 000 0 000 0 000 0 000 0
Continuity Test	<30 Ohms		DIAL	5CYL 750 - 200 V~ TEMP
Frequency	20kHz			DWELL 3CYL 4CYL 5CYL 6CYL 8CYL PNP
Dwell Angle	3cyl 120°- 8cyl 45°			∩ TACH xtérpm EBCE
Tachometer	180 - 10000rpm			
DC Current	20mA - 10A	mA or 10A + COM		
Temperature	-20°C to 750°C -4°F to 1382°F	Temp. sockets & thermocouple	SOCKETSL	
Transistor Test (hFE)	Vce=3V, Ib=10µA	Transistor socket		

Maximum Display: 1999 counts - (3 1/2 digits) LCD display with automatic polarity indication. Measurement Rate: 2-3 times per second. **Measuring Method:** Dual-slope integration A/D converter system. Over Range Indication: Figure "1" displayed on the LCD. Low Battery Indication: Auto-Power-Off: The symbol is displayed when the battery voltage drops below the operating level Meter automatically shuts down after approx. 15 minutes of inactivity. Operating Environment: 0°C to 40°C (32°F to 104°F) at <75% relative humidity. -10°C to 50°C (14°F to 122°F) at <75% relative humidity. Storage Environment: Single standard 9 Volt battery (PP9). Power: 250mA/250V. Fuse: Dimensions: 200 x 97 x 48 mm. Weight Approx: 495g including battery and holster.

Function Guide (Fig.2)

- 1. DC Voltage
- 2. AC Voltage
- 3. Transistor Check
- 4. Tachometer
- 5. Dwell Angle
- 6. DC Current

- Temperature
 Frequency
- 9. Audible Continuity Check
- 10. Resistance
- 11. Diode check





Fig.2

Fig.1

LCD

DISPLAY



3. SPECIFICATION

DC Voltage

Range	Resolution	Accuracy
200mV	100µV	$\pm (0.5\% + 5)$
2V	1mV	
20V	10mV	± (0.8% + 5)
200V	100mV	
1000V	1V	± (1.0% + 5)

Input Impedance: $1M\Omega$ for all ranges. Overload protection: 1000V DC/AC rms

(for 200mV range: 250V AC rms

AC Voltage

Range	Resolution	Accuracy	
200V	100mV	± (1.0% + 5)	
750V	1V	± (1.2% + 5)	
han the second second to the second			

Input Impedance: About $450k\Omega$ for all ranges. Frequency Range: 40Hz~400Hz

Indication: Average (RMS of sine wave).

Overload protection: 1000V DC/AC rms

DC Current

Range	Resolution	Accuracy
20mA	10µA	± (1.8% + 3)
200mA	100µA	$\pm (1.0\% \pm 3)$
10A	10mA	± (3.0% + 7)

Overload Protection: F 250mA L 250V (Range 10A unfused). Maximum Input Current: 10A (less than 15 seconds). Maximum Voltage Drop: 200mV.

Indication: Average (RMS of sine wave).

Resistance

Range	Resolution	Accuracy	
200Ω	0.1Ω	± (1.0% + 5)	
2kΩ	1Ω		
20kΩ	10Ω	. (0.8%	
200kΩ	100Ω	± (0.8% + 5)	
2MΩ	1kΩ	7	
20MΩ	10kΩ	± (2.0% + 7)	
Open circuit	t voltage: less than 2	.8V	

Overload protection: 250V DC/AC rms

Transistor hFE test

Range	hFE	Test Current	Test Voltage
PNP and NPN	0~1000	Ib=10μA	Vce = 3V

4. OPERATION

- J WARNING! Ensure that you read, understand and apply the safety and operational instructions before connecting the analyser. Only when you are sure that you understand the procedures is it safe to proceed with testing.
- **WARNING!** Risk of electrocution. High voltage circuits, both AC and DC are very dangerous and should be measured with great care.

Operating temperature range 0°C to 40°C. **Remember** to turn off analyser when measurement is completed.

NOTE: If "1" appears in the display during a measurement, the value exceeds the range you have selected. Select a higher range.

NOTE: On some low AC and DC ranges, with the test leads not connected to a device, the display may show a random fluctuating reading. This is normal and is caused by the high input sensitivity. The reading will stabilise and give a correct measurement when connected to a circuit.

4.1. Data Hold Button

- 4.1.1. The data hold function allows the analyser to freeze a measurement reading for later reference.
- 4.1.2. Press the data hold button once to freeze the reading in the display. The indicator "H" will appear in the display.
- 4.1.3. Press the data hold button again to return to normal operation.

4.2. AC Voltage Measurement

- 4.2.1. Insert the black test lead into the negative COM socket and the red test lead into the positive VΩHzQ4° socket.
- 4.2.2. Turn the function dial to the appropriate AC voltage setting as required and switch the analyser on (see ranges above). If the voltage range to be measured is not known, set to the highest range setting, and then select to the correct range when first reading is taken, until a satisfactory resolution is obtained.
- 4.2.3. Connect the test leads to the circuit under test and read the voltage on the display.

4.3. DC Voltage Measurement

- 4.3.1. Insert the black test lead into the negative COM socket and the red test lead into the positive VΩHzQ4° socket.
- 4.3.2. Turn the function dial to the appropriate DC voltage setting as required and switch the analyser on (see ranges above). If the voltage range to be measured is not known, set to the highest range setting, and then select to the correct range when first reading is taken, until a satisfactory resolution is obtained.
- 4.3.3. Connect the test leads to the circuit under test and read the voltage on the display.

4.4. DC Current Measurement

- WARNING! Do not make current measurements at 10A for longer than 15 seconds in every 15 minutes. Exceeding this may cause damage to the analyser and test leads.
- 4.4.1. Insert the black test lead into the negative COM socket, and the red test lead into the positive mA socket (or the positive 10A socket for currents from 200mA to 10A).
- 4.4.2. Turn the function dial to the appropriate setting as required (see ranges above). If the current range to be measured is not known, set to the highest range setting, and then select to the correct range when the first reading is taken, until satisfactory resolution is obtained.
- 4.4.3. Connect the test leads in series with the circuit under test and read the current on the display.

Dwell Angle

Cylinder	Range	Resolution	Accuracy
3CYL	0~120.0°		
4CYL	0~90.0°		
5CYL	0~72.0°	0.1°	± (2.5% + 5)
6CYL	0~60.0°		
8CYL	0~45.0°		

Frequency

Range	Resolution	Accuracy
20kHz	10Hz	± (1.5% + 5)

Tachometer

Range	Scope (RPM)	Resolution	Accuracy
RPM	180~10000	1*10RPM	± (2.5% + 5)

Temperature

Range	Resolution	Accuracy
-20°C~750°C	1°C	-20~0°C(-4°F~32°F) ±(6.0% +6)
-4°F~1382°F	1°F	0~400°C(32°F~752°F) ±(1.0% +7) 400~750°C(752°F~1400°F) ±(2.0%+7)

Audible Continuity Test

Description	Test condition
If the resistance of the circuit	Open circuit voltage is
under test is lower than 30Ω ,	approximately 3V
the audible warning will sound	

Diode test

Description	Test condition
The approximate forward voltage of the diode under test will be displayed on the LCD	The forward DC current is approximately 1mA, the reversed DC voltage is
	approximately 3V

4.5. Diode Measurement

- 451 Insert the black test lead into the negative COM socket and the red test lead into the positive VΩHzQ4° socket.
- 452 Turn the function dial to the 🚆 position and switch the analyser on.
- 4.5.3. Connect the red test lead to the anode of the diode, and the black test lead to the cathode of the diode.
- 4.5.4. The approximate forward voltage drop of the diode will be displayed. If the connection is reversed, a fig "1" will be displayed.

4.6. **Transistor Measurement**

- Determine whether the transistor to be tested is NPN or PNP and locate the E, B and C leads. Insert the leads into the respective slots in the testing 461 socket located on the front of the analyser.
- 4.6.2. Turn the function dial to the hFE position and switch the analyser on.
- The approximate hFE value of the transistor will be shown on the display, at the test condition of base current 10uA and Vce 3V. 4.6.3.

4.7. Resistance Measurement

- 4.7.1. Insert the black test lead into the negative COM socket and the red test lead into the positive VOHzQ40 socket.
- Turn the function dial to the desired Ω position and switch the analyser on. 4.7.2.
- Connect the test leads to the resistor to be tested and read the value on the display. 4.7.3.

4.8. Audible Continuity Test

- 481 Insert the black test lead into the negative COM socket and the red test lead into the positive VΩHzQ40 socket.
- Turn the function dial to the 🚆 position and switch the analyser on. 482
- 483 Connect the test leads to the two terminals of the circuit to be tested.
- 4.8.4. If the resistance is less than 30Ω , then an audible warning will be given.

4.9. **Frequency Measurement**

- 4.9.1. Insert the black test lead into the negative COM socket and the red test lead into the positive $V\Omega Hz \Omega \dot{z}^{o}$ socket.
- Turn the function dial to the Hz 20k position and switch the analyser on. 4.9.2.
- 4.9.3. Connect the test leads to the source or load to be measured and read the value on the display.

4.10. Temperature Measurement

- 4.10.1. Insert the type K thermocouple plug into the temperature socket on the front of the analyser, ensuring the positive '+' pin on the plug is inserted into the positive slot, and the negative '-' pin on the plug is inserted into the negative slot.
- 4.10.2. Turn the function dial to the °C or °F position and switch the analyser on.
- Place the thermocouple on the item to be measured and read the temperature on the display 4.10.3.

RPM (Tachometer) Measurement 4.11.

- Insert the black test lead into the negative COM socket and the red test lead into the positive VOHzO4• socket. 4.11.1.
- Turn the function dial to the desired O TACH position, according to the number of cylinders of the engine being tested, and switch the analyser on. 4.11.2. If the vehicle uses a DIS ignition system with no distributor, connect the red test lead to the TACH (tachometer) signal line (which is connected to the 4.11.3.
- computer DIS module of the engine). If the vehicle uses an ignition system with a distributor, connect the red test lead to the primary negative end of the ignition coil. Connect the black test lead to an earthing point, or the negative terminal of the vehicle battery. Note: Refer to the vehicle manufacturer's manual for the specific location and more details.
- 4.11.4. Start the engine and the RPM will be shown on the display.

4.12. **Dwell Angle Measurement**

- 4.12.1.
- Insert the black test lead into the negative COM socket and the red test lead into the positive $V\Omega Hz \Omega A^\circ$ socket. Turn the function dial to the A° position that corresponds with the correct number of cylinders for the engine being tested and switch the analyser on. 4 1 2 2 4.12.3. If the vehicle uses a DIS ignition system with no distributor, connect the red test lead to the TACH (tachometer) signal line (which is connected to the computer DIS module of the engine). If the vehicle uses an ignition system with a distributor, connect the red test lead to the primary negative end of the ignition coil. Connect the black test lead to an earthing point, or the negative terminal of the vehicle battery. Note: Refer to the vehicle manufacturer's manual for the specific location and more details
- 4.12.4. Start the engine and the dwell angle will be shown on the display.
- Note: Refer to vehicle manufacturer's manual for detailed procedures for dwell angle settings and adjustments.

Replacing The Batterv 4.13.

- WARNING! To avoid electric shock, disconnect the test leads from any source of voltage and from the analyser before removing the rear cover.
- When the battery drops below the operating voltage, the 💼 symbol will appear in the display. Replace the battery. 4.13.1.
- 4.13.2. Remove the analyser from its protective case.
- Loosen and remove the two screws using a Phillips screwdriver, and remove the rear cover from the analyser. 4.13.3.
- Remove the old battery (PP9) and insert a new one, observing the correct polarity. 4 13 4
- 4.13.5. Replace the rear cover and secure with the two screws.

WARNING! To avoid electric shock, DO NOT operate the meter until the it has been fully re-assembled.

4.14. Replacing the fuse

WARNING! To avoid electric shock, disconnect the test leads from any source of voltage and from the analyser before removing the fuses.

- 4.14.1. Remove the analyser from its protective case.
- Loosen and remove the two screws using a Phillips screwdriver, and remove the rear cover from the analyser. 4.14.2.
- 4.14.3. Loosen and remove the six small screws from the upper circuit board and remove the board to gain access to the fuse holder.
- 4.14.4. Remove the old fuse from its holder by gently pulling it out.
- Install the new fuse into its holder. 4.14.5.
- Note: Always use a fuse of the correct size and value, 250mA/250V.
- 4 14 6 Replace the rear cover and secure with the screws.

WARNING! To avoid electric shock, DO NOT operate the meter until it has been fully re-assembled.

5. MAINTENANCE

- WARNING! DO NOT attempt to repair or service the analyser unless qualified to do so and have the relevant calibration, performance test, and service information to hand. To avoid electrical shock or damage to the analyser do not get water inside the case.
- 5.1. Periodically wipe the case with a damp cloth and mild detergent. Do not use solvents.
- 5.2. Turn the analyser off when not in use and remove the battery if stored for a long period of time.
- 5.3. Do not store the analyser in a place of high humidity or high temperature.

6. PARTS LIST

ltem	Description	Parts
1	TA101.01	TEST LEADS
2	TA101.02	9V BATTERY
3	TA101.03	THERMOCOUPLE 'K' TYPE

Environmental Protection.



Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycle centre and disposed of in a manner which is compatible with the environment.

When the product is no longer required, it must be disposed of in an environmentally protective way. Contact your local solid waste authority for

recycling information. WARNING: Do not di

WARNING: Do not dispose of by fire. This could result in an explosion. Before disposing of battery, cover exposed terminals with heavy duty electrical tape to prevent shorting.

DO NOT expose battery to intense heat or fire as this could cause an explosion.

7. DECLARATION OF CONFORMITY

Declaration of Conformity We, the sole UK importer, declare that the product listed below is in conformity with the following standards and directives.

11 Function Digital Automotive Analyser

Model: TA102 89/336/EEC EMC Directive 79/23/EEC Low Voltage Directive 2002/95/EC RoHS Directive 2002/96/EC WEEE Directive

2002/96/EC WEEE Directive 93/68/EEC CE Marking Directive



The construction file for this product is held by the Manufacturer and may be inspected, by a national authority, upon request to Jack Sealey Ltd.

Signed by Tim Thompson TWTW 1st March 2007

For Jack Sealey Ltd. Sole UK importer of Sealey Professional Tools.

NOTE: It is our policy to continually improve products and as such we reserve the right to alter data, specifications and component parts without prior notice. **IMPORTANT:** No liability is accepted for incorrect use of this equipment.

WARRANTY: Guarantee is 12 months from purchase date, proof of which will be required for any claim.

INFORMATION: For a copy of our latest catalogue and promotions call us on 01284 757525 and leave your full name and address, including postcode.

