



INSTRUCTIONS FOR: DIGITAL AUTOMOTIVE ANALYSER 14 FUNCTION WITH IC MODEL No: TA202

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.



IMPORTANT: PLEASE READ THESE INSTRUCTIONS CAREFULLY. NOTE THE SAFE OPERATIONAL REQUIREMENTS, WARNINGS & CAUTIONS. USE THE PRODUCT CORRECTLY AND WITH CARE FOR THE PURPOSE FOR WHICH IT IS INTENDED. FAILURE TO DO SO MAY CAUSE DAMAGE AND/OR PERSONAL INJURY AND WILL INVALIDATE THE WARRANTY. KEEP THESE INSTRUCTIONS SAFE FOR FUTURE USE.

1. SAFETY

1.1. PERSONAL PRECAUTIONS

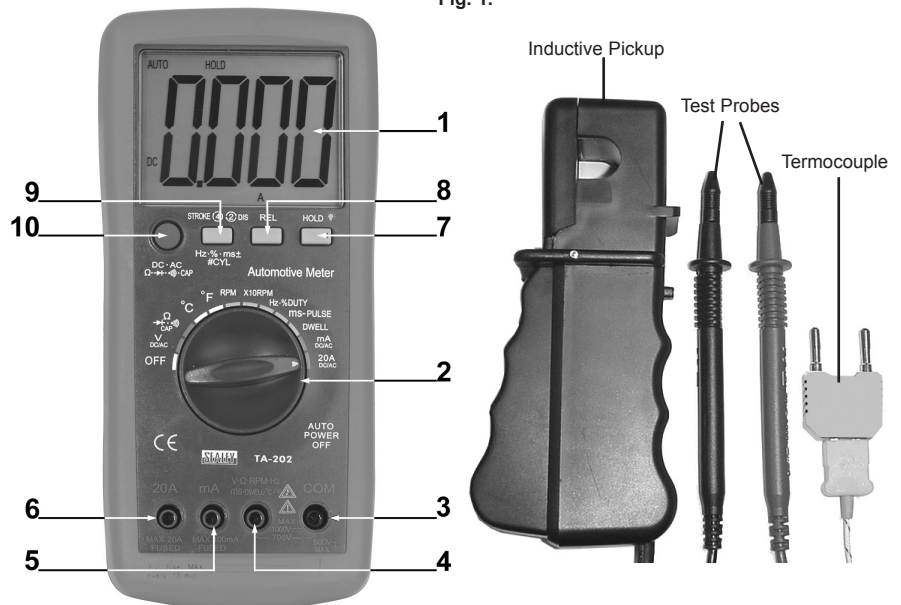
- ✓ When using this meter, please observe all normal safety rules concerning:
 - Protection against the dangers of electric current.
 - Protection of the meter against misuse.
- ✓ Full compliance with safety standards can only be guaranteed if used with the test leads supplied. If necessary, they must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

1.2. GENERAL SAFETY INSTRUCTIONS

- ✓ Familiarise yourself with the applications, limitations and hazards of the meter. *IF IN ANY DOUBT CONSULT A QUALIFIED ELECTRICIAN.*
- ✓ When the meter is linked to a measurement circuit, do not touch unused meter terminals.
- ✓ When the scale of the value to be measured is unknown set the selector to the highest range available.
- ✓ Before rotating the range selector to change functions, disconnect test leads from the circuit under test.
- ☐ **WARNING!** Never perform resistance measurements on live circuits.
- ✓ Always be careful when working with voltages above 60Vdc or 30Vac rms. Keep your fingers behind the probe guards while measuring.
- ✓ When not in use, store the meter carefully in a safe, dry, childproof location. Storage temperature range -10°C to 50°C.
- ✓ Never apply voltage or current to the meter that exceeds the specified maximum.
- ✓ The user shall ensure that test probes are correctly selected in order to prevent danger. Probes shall be selected to ensure that adequate barriers guard against inadvertent hand contact with live conductors under test and that probes have minimal exposed probe tips. Where there is a risk of the probe tip short circuiting with other live conductors under test, it is recommended that the exposed tip length shall not exceed 4mm.

Fig. 1.

Input Limits	
Function	Maximum Input
V AC or V DC	700V AC, 1000V DC
mA AC/DC	400mA AC/DC
A AC/DC	20A AC/DC (30 secs max every 15 minutes)
Frequency Resistance Duty Cycle Diode Test Continuity Temperature RPM DWELL Pulse Width	250V AC/DC



2. FEATURES

Extra large, hi-contrast LCD display with 36mm high digital read-out and backlight. Durable bi-composite case and integral stand suitable for the toughest workshop conditions. Features millisecond pulse-width function for accurate measurement of fuel injection systems. Includes auto-ranging, data hold and auto-power off. Supplied with tough nylon carry case and shoulder strap, inductive coupler, for fast reading of engine rpm, test probes and thermocouple.

Symbols & Description	
	Continuity
	Low Battery
	Diode
	Data Hold
	Auto Ranging
	Alternating Current
	Direct Current or Voltage

Layout: (Refer to fig. 1.)	
1.	Large LCD display
2.	Rotary switch
3.	COM, negative input jack
4.	Positive (+) input for AC/DC Voltage, Current, Hz, %duty, Cycle, Ohms, Diode, Continuity, Capacitance, Temperature (°C or °F), RPM, Dwell and Pulse Width.
5.	Positive (+) input jack for AC/DC μ A/mA.
6.	Positive (+) 20A input jack for 20A AC/DC measurements.
7.	Data Hold and backlight push button.
8.	Relative push button.
9.	RPM, DWELL, Hz%, CYL, mS \pm button.
10.	Mode push button.

3. SPECIFICATION

DC Voltage (Auto Ranging)

Range	Resolution	Accuracy
400.0mV	0.1mV	± 0.5% of reading ± 2 digits
4.000V	1mV	± 1.5% of reading ± 2 digits
40.00V	10mV	
400.0V	100mV	
1000V	1V	± 1.8% of reading ± 2 digits

Input Impedance: 10MΩ.
Maximum Input 700Vac rms or 1000Vdc.

AC Voltage (Auto Ranging except 400mV)

Range	Resolution	Accuracy
400.0mV	0.1mV	± 1.5% of reading ± 30 dig
4.000V	1mV	± 1.0% of reading ± 3 digits
40.00V	10mV	± 1.5% of reading ± 3 digits
400.0V	100mV	
700V	1V	± 2.0% of reading ± 2 digits

Input Impedance: 10MΩ.
Frequency Range: 50 to 400Hz.
Maximum Input: 700Vac rms or 100Vdc.

Capacitance (Auto Ranging)

Range	Resolution	Accuracy
40.00nF	10pF	± 5.0% of reading ± 7 digits
400.0nF	0.1nF	± 3.0% of reading ± 5 digits
4.000uF	1nF	
40.00uF	10nF	
100.0uF	0.1uF	± 5.0% of reading ± 5 digits

Input Protection: 250Vac rms or 250Vdc.

Resistance (Auto Ranging)

Range	Resolution	Accuracy
400.0Ω	0.1Ω	± 1.2% of reading ± 4 digits
4.000kΩ	1Ω	± 1.0% of reading ± 2 digits
40.00kΩ	10Ω	± 1.2% of reading ± 2 digits
400.0kΩ	100Ω	
4.000MΩ	1kΩ	± 2.0% of reading ± 3 digits
40.00MΩ	10kΩ	

Input Protection: 250Vac rms or 250Vdc.

Diode test

Range	Resolution	Accuracy
0.3mA typical	1mV	± 10% of reading ± 5 digits

Open Circuit Voltage: 1.5Vdc typical
Overload Protection: 250Vac rms or dc.

Temperature

Range	Resolution	Accuracy
-20°C~+760°C	1°C	± 3.0% of reading ± 3 digits (Meter only, probe accuracy not included).
-4°F~+1400°F	1°F	

Sensor: Type K Thermocouple

RPM (Tach)

Range	Resolution	Accuracy
RPM 4	600~4000RPM	1RPM
	600~1200RPM (X 10PM)	10RPM
		±2% of rdg ± 4 digits
RPM 2	300~4000 RPM	1RPM
	300~600RPM (x 10RPM)	10RPM

Effect Reading: >600RPM

Overvoltage Category: CAT11 1000V.
Display: 4000 counts LCD display with function indication.
Polarity: Automatic, (-) negative polarity indication.
Overrange: "OL" mark indication.
Low Battery Indication: The "BAT" is displayed when the battery voltage drops below the operating level.
Measurement Rate: 2 times per second nominal
Auto Power Off: Meter automatically shuts down after approx 30 minutes of inactivity.
Operating environment: 0°C to 50°C (32° to 122°F) at < 70%relative humidity.
Storage Temperature: -20° to 60°C (-4°F to 140°F) at <80% relative humidity.
For Inside Use:
Max Working Height: 2000mtr.
Power: One 9V battery PP3.
Dimensions: 195 (H) x 92 (W) x36 (D) mm
Approx Weight: 360g

Accuracy is given at 18°C to 28°C (65°F to 83°F) less than 70% relative humidity.

Duty Cycle (Auto Ranging)

Range	Resolution	Accuracy
0.1%~99.9%	0.1%	± 1.2% of reading ± 2 digits

Pulse Width: >100us, <100ms
Frequency Width: 5Hz - 150kHz
Overload Protection: 250Vac rms or dc.

Pulse Width

Range	Resolution	Accuracy
1.0~10.0ms	0.1ms	± 3% of reading ± 10 digits

Overload Protection: 250Vac rms or dc.

Dwell Angle

Cylinder	Range	Resolution	Accuracy
4CYL	0~90.0°	0.1°	± 2.0% of reading ± 4 digits
5CYL	0~72.0°		
6CYL	0~60.0°		
8CYL	0~45.0°		

Overload Protection: 250Vac rms or dc.

Frequency (Auto Ranging)

Range	Resolution	Accuracy
5Hz	0.001Hz	± 1.5% of reading ± 5 digits
50Hz	0.01Hz	
500Hz	0.1Hz	
5kHz	1Hz	± 1.2% of reading ± 3 digits
50kHz	10Hz	
500kHz	100Hz	
10MHz	1kHz	± 1.5% of reading ± 4 digits

Sensitivity: <0.5V RMS while <1MHz
Sensitivity: >3V rms while >1MHz
Overload Protection: 250Vac rms or dc.

DC Current (Auto Ranging for uA and mA)

Range	Resolution	Accuracy
400.0uA	0.1uA	± 1.0% of reading ± 3 digits
4000uA	1uA	± 1.5% of reading ± 3 digits
40.00mA	10uA	
400.0mA	100uA	
4A	1mA	± 2.5% of reading ± 5 digits
20A	10mA	

Overload Protection: 0.5A/250V and 20A/250V

Fuse:
Maximum Input:400mAac rms or 400mAac on uA/mA ranges
20A ac or dc rms on 10A range.

AC Current (Auto Ranging for uA and mA)

Range	Resolution	Accuracy
400.0uA	0.1uA	± 1.5% of reading ± 5 digits
4000uA	1uA	± 3.0% of reading ± 7 digits
40.00mA	10uA	
400.0mA	100uA	
4A	1mA	± 3.0% of reading ± 7 digits
20A	10mA	

Overload Protection: 0.5A/250V and 20A/250V

Fuse:
Frequency Range:50 to 400Hz
Maximum Input: 40mA ac rms or 400mA dc on uA/mA ranges,
20A ac or dc rms on 20A range.

Audible Continuity	
Audible threshold:	Less than 150Ω
Test Current:	<0.3mA

Overload Protection: 250Vac rms or dc.

4. OPERATION

- **WARNING!** Ensure that you read, understand and apply the safety and operational instructions before connecting the meter. 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 on meter before use and to turn it off when measurement is completed.
- Note:** IF "OL" appears in the display during a measurement, the value exceeds the range you have selected. Change to a higher range.
- Note:** On some low AC and DC ranges, with the test leads not connected to a device, the reading may show a random fluctuating reading. This is normal and is caused by the high input sensitivity. The reading will stabilise and give a proper measurement when connected to a circuit.
- 4.1. Mode Button** (fig.1.10)
- 4.1.1. To select AC/DC voltages, AC/DC current, Resistance, Diode, Continuity and Capacitance check.
- 4.2. **Stroke Button** 4/2 (DIS) Hz, %, ms CYL range button. (fig.1.9.)
- 4.2.1. To select stroke 4/2 (DIS) Hz, %, ms CYL range.
- 4.3. Data Hold, Backlight Button** (fig.1.7.)
- 4.3.1. The data hold function allows the meter to freeze a measurement for later reference.
- 4.3.2. Press the data hold button to freeze the reading in the display. The indicator "hold" will appear in the display.
- 4.3.3. Press the data hold button to return to normal operation.
- 4.3.4. Press and hold the data button for two seconds to switch on the display backlight.
- 4.3.5. Press and hold the data button again for two seconds to turn off the backlight.
- 4.4. Relative Button** (fig.1.8.)
- 4.4.1. The relative measurement feature allows you to make measurements relative to a stored reference value. A reference voltage, current etc can be stored and measurements made in comparison to that value. The displayed value is the difference between the reference value and the measured value.
- 4.4.2. Perform any measurement as described in the operating instructions.
- 4.4.3. Press the relative button to store the reading in the display and the "REL" indicator will appear in the display.
- 4.4.4. The display will now indicate the difference between the stored value and the measured value.
- 4.4.5. Press the relative button to return to normal operation.
- 4.5. AC or DC Voltage Measurements**
- 4.5.1. Insert the black test lead into the negative "COM" jack and the red test lead into the positive "V" jack.
- 4.5.2. Turn the rotary switch to the VDC/AC position.
- 4.5.3. Press the "MODE" button to select ac or dc voltage.
- 4.5.4. Touch the test probes to the circuit under test and read the voltage display.
- Note:** Pressing the Hz button (fig.1.9.) while in the voltage function will switch the display to frequency or duty cycle.
- 4.6. AC or DC Current Measurements**
- **WARNING! Do Not make current measurements on the 20A scale for longer than 30 seconds in every 15 minutes. Exceeding 30 seconds may cause damage to the meter and test leads.**
- 4.6.1. Insert the black test lead into the negative "COM" jack and the red test lead into the:
a) **Positive uA/mA jack** for currents to 400mA (fig.1.5.)
b) **Positive 20A jack** for currents to 20A (fig.1.6.)
- 4.6.2. Turn the rotary switch to the uA, mA or A position.
- 4.6.3. Press the mode button to select AC or DC current.
- 4.6.4. Touch the test probes in series with the circuit under test and read the current on the display.
- 4.7. Resistance, Diode, Continuity or Capacitance Measurements**
- **WARNING! To avoid electric shock, disconnect power to unit under test and discharge all capacitors before taking any resistance or capacitance measurements.**
- 4.7.1. Insert the black test lead into the negative "COM" jack and the red test lead into the positive Ω \rightarrow \rightarrow CAP jack.
- 4.7.2. Turn the rotary switch to the Ω \rightarrow \rightarrow CAP position.
- 4.7.3. Press the Mode button (fig. 1.1.) to select Ω or \rightarrow or \rightarrow or CAP.
- 4.7.4. Connect the test probes to the two ends of the Resistance, Diode, Continuity, Capacitance or circuit to be measured.
- 4.7.5. Read the measured value from the display.
- 4.7.6. When on continuity range a beeping will be heard if the resistance is lower than 150 Ω .
- 4.7.7. When measuring the forward voltage across a good Diode will indicate 0.4V or 0.7V will be indicated and the reverse voltage will indicate "OL" (same as on open condition). For a short circuit diode, a value of 0mV will be displayed.- **WARNING! When checking in-circuit capacitance, be sure to disconnect the power supply from the circuit and that the capacitors are fully discharged. The range control mode in capacitance measurement is auto-ranging.**

4.8. Frequency or Duty Cycle measurements

4.8.1. Insert the black test lead into the negative "COM" jack and the red test lead into the positive "Hz" jack.

4.8.2. Turn the rotary switch to the "Hz %DUTY" position.

4.8.3. Press the Hz % button (fig.1.9.) to select Hz or %.

4.8.4. Touch the test probes to the circuit under test and read the frequency or duty cycle on the display.

4.9. Temperature Measurements

4.9.1. Insert the type K thermocouple plug into the negative "COM" jack and the positive jack ensuring the + symbol on the plug is inserted into the positive + jack and the negative symbol on the plug is inserted into the negative "COM" jack.

4.9.2. Turn the rotary switch to the select °C or °F.

4.9.3. Read the temperature on the display.

4.10. Pulse Width Measurements

4.10.1. Insert the black test lead into the negative "COM" jack and the red test lead into the positive + jack.

4.10.2. Turn the rotary switch to the PULSE WIDTH position.

4.10.3. Connect the black test probe to ground and the red test probe to the signal wire that connects to the component to be measured.

Note: The applied time for most fuel injector is displayed on the negative (-) slope.

4.11. RPM (TACH) Measurements

4.11.1. Select the RPM range with the rotary switch.

4.11.2. Select the X10 RPM range with the rotary switch. Multiply the displayed reading times by 10 to get the actual RPM.

4.11.3. Press STROKE button (fig.1.9.) to select through RPM 4 for 4-stroke or RPM 2 for 2-stroke

4.11.4. Insert the inductive pickup leads into the meter. Black lead into the negative "COM" jack and the red lead into the positive RPM jack (fig.1.4.).

4.11.5. Connect the inductive pickup to a spark plug HT lead. If no reading is received, unhook the clamp, turn it over and connect again.

Note: Connect the pickup as far away from the distributor and exhaust manifold as possible.
Position the pickup to within six inches of the spark plug or move it to another plug HT lead if no reading or an erratic reading is obtained.

Note: RPM4: For RPM of 4-stroke engines which have 1 ignition on every 4 engine strokes.
RPM2: For RPM of DIS (Distributor-less Ignition System) and 2-stroke engines which have 1 ignition on every two strokes.

4.12. Dwell Angle Measurement

Dwell angle is the number of degrees through which the distributor cam rotates while the breaker points are closed.

4.12.1. Insert the black test lead into the negative "COM" jack and the red test lead into the positive + jack.

4.12.2. Turn the rotary switch to the corresponding position of 4CYL, 5CYL, 6CYL, 8CYL on the dwell range.

4.12.3. Set number of cylinders with the CYL button (fig.1.9.).

4.12.4. Connect the black test lead to the Ground terminal (-) on the car battery and the red test lead to the contact breaker points or the negative (-) terminal of the ignition coil.

4.12.5. When the engine is started the Dwell will be displayed.
Note: To reduce the dwell angle reading the points gap must be increased, to increase the dwell angle the points gap must be reduced.
Refer to your owners handbook for detailed procedures for dwell settings and adjustments.

4.13. Other Functions

4.13.1. Your meter is also capable of testing the following automotive sensors.

- Oxygen Sensors
- Fuel Injectors
- Temp Sensors
- Position Sensors
- absolute pressure (MAP) and Baro Sensors
- Mass Air Flow (MAF) Sensors

4.13.2. For a detailed description and testing procedure for these sensors, please refer to the vehicles hand book.

4.14. Replacing The Battery

WARNING! To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery door.

4.14.1. When the battery become exhausted or drops below the operating voltage, "BAT" will be appear in the right hand side of the display. Replace the battery.

4.14.2. Disconnect the leads from the meter.

4.14.3. Open the battery door by loosening the screw using a Philips head screw driver.

4.14.4. Remove the old battery and insert the new one, observing the correct polarity.

4.14.5. Replace the battery cover and secure with the two screws.

WARNING! To avoid electric shock, DO NOT operate the meter until the battery cover is secured in place.

4.15. Replacing The Fuses

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

4.15.1. Disconnect the test leads from any item under test and disconnect them from the meter.

4.15.2. Remove the 5 screws on the rear of the meter and gently pull the two halves of the meter apart.

4.15.3. Remove the old fuse from its holder by gently pulling it out.

4.15.4. Install the new fuse into its holder.

Note: Always use a fuse of the correct size and value.

0.5A/250V fast blow for the 400mA range.

20A/250V fast blow for the 10A range.

4.15.5. Put the two halves of the meter back together and secure with the 5 screws.

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

5. MAINTENANCE

WARNING! DO NOT attempt to repair or service your meter unless you are qualified to do so and have the relevant calibration, performance test, and service information. To avoid electrical shock or damage to the meter 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 meter off when not in use and remove the battery if stored for a long period of time.

5.3. Do not store the meter in a place of high humidity or high temperature

6. PARTS

Item	Description	Parts
1	TA202.01	TEMPERATURE PROBE
2	TA202.02	TEST LEADS

ISSUE	1
ISSUE DATE	220404



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.



WEEE Regulations

Dispose of this product at the end of its working life in compliance with the EU Directive on Waste Electrical and Electronic Equipment (WEEE). 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.

Battery Removal: See Section 4.14.

ONLY dispose of or recycle according to local authority regulations. Under the Waste Batteries and Accumulators Regulations 2009, Jack Sealey Ltd are required to inform potential purchasers of products containing batteries (as defined within these regulations), that they are registered with Valpak's registered compliance scheme. Jack Sealey Ltd's Batteries Producer Registration Number (BPRN) is BPRN00705.

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 product.

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.



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