

# AVL DITEST MDS 650 – MODULAR DIAGNOSTIC SYSTEM



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## AVL DITEST GAS 1000



| Miscellaneous         |   |
|-----------------------|---|
| Warm-up Time          | Approx. 2 min                                 |
| Operating Temperature | 5 ... 40 °C                                   |
| Storage Temperature   | 0 ... 50°C                                    |
| Humidity              | 10 ... 90 % non condensing                    |
| Dimensions            | 344 x 252 x 85 (W x H x D)                    |
| Weight                | 2.2 kg  |
| Interfaces            | USB, Bluetooth Class 1, RS 232 (AK Protokoll) |
| Certification         | 2004/22/EC (MID); OIML R99 Class 0            |

| Versorgung        |  |
|-------------------|--|
| Voltage Supply    | Via AVL DITEST CDS Basic Unit: 11..25 V DC |
| Power Consumption | Approx. 20 VA                              |

| Measurand     | Measuring             | Resolution          | Accuracy  |
|---------------|-----------------------|---------------------|---|
| CO            | 0 ... 15% vol         | 0,01 % vol.         | < 10.0 % vol.: ± 0,02% vol., ± 3% o.M.<br>≥ 10.0 % vol: ± 5 % o.M.                                  |
| CO2           | 0 ... 20% vol.        | 0,01 % vol.         | < 16.0 % vol.: ± 0,3 % vol., ± 3 % o.M.<br>≥ 16.0 % vol: ± 5 % o.M.                                 |
| HC            | 0 ... 30.000 ppm vol. | ≤ 2.000: 1 ppm vol. | < 2000 ppm vol.: ±4 ppm vol., ±3% o. M.<br>≥ 5000 ppm vol.: ±5% o. M.<br>≥10000 ppm vol.: ±10% o. M |
| O2            | 0 ... 25% vol.        | 0,01 % vol.         | ± 0,02 % vol.<br>± 1 % o. M.  |
| NO (optional) | 0 ... 5.000 ppm vol.  | 1 ppm vol.          | ± 5 ppm vol.<br>± 1 % o. M.   |
| Lambda        | 0 ... 9.999           | 0,001               | Calculated from CO, CO2, HC, O2   |

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## AVL DISMOKE 480 BT



| Technical Data        |                               |
|-----------------------|-------------------------------|
| Measuring Principle   | Extinction Measurement        |
| Operating Temperature | +5 ... +40 °C                 |
| Storage Temperature   | -20 ... +60 °C                |
| Humidity              | max. < 90 %, non condensing   |
| Nominal Voltage       | 230 VAC                       |
| Voltage Range         | 85 - 264 VAC                  |
| Frequency             | 47 ... 63 Hz                  |
| Power Consumption     | approx. 78 VA (incl. heating) |
| Dimensions            | 395 x 285 x 136 (W x H x D)   |
| Weight                | 3,5 kg                        |
| Interfaces            | RS232; Bluetooth Class1       |

| Opacity Chamber           |  |
|---------------------------|--|
| Chamber Heating           | 100 °C   |
| Measurement Length        | 215 mm ± 2 mm                                      |
| Max. Emission Temperature | 200 °C   |
| Opacity                   | - Messbereich: 0 ... 99,9%<br>- Auflösung: 0,1 %   |
| Absorption (k-Value)      | - Messbereich: 0 ... 9,99%<br>- Auflösung: 0,011/m |

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## AVL DITEST AUX 2000



| Measurement Parameters (optional)<br>RPM and oil temperature | Measuring Range  |
|--|--|
| Engine   | 4-Stroke-Diesel- and Gasoline Engines                              |
| RPM Diesel Engines   | 400 ... 6.000 min-1  |
| Drehzahl Gasoline Engines                                    | 400 ... 8.000 min-1  |
| RPM Ranges   | Idle Speed 400 ... 1.200 min-1<br>High RPM I 1.700 ... 6.000 min-1 |
| Signal Input   | AVL DITEST magnetic sensor   |
| Oil Temperature  | -10 ... 145 °C   |
| Signal Input   | AVL DITEST oil temperature Probe                                   |

| Climatic conditions   |                           |
|-----------------------|---------------------------|
| Operating Temperature | +4 ... +40 °C             |
| Storage Temperature   | -20 ... +50 °C            |
| Humidity              | 10 ... 90% non condensing |

| Schnittstellen            |   |
|---------------------------|---|
| AVL DiSPEED 492 connector | - Connection for external DISPEED 490/492         |
| AVL Dual sensor connector | - Connection for magnetic sensor (Art.Nr.:        |
| Oil temperature probe     | - Connection for oil temperature probe (Art.Nr.:) |
| connection                | USB, Bluetooth Class 1                            |

| Dimension/Weight    |                            |
|---------------------|----------------------------|
| Dimensions          | 235 x 162 x 60 (W x H x D) |
| Storage Temperature | 0,8 kg                     |

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## AVL DITEST VCI 1000 OR OBD 100



| Power Supply    |                         |
|-----------------|-------------------------|
| Nominal Voltage | +12 V (DC)              |
| Voltage Range   | +6 ... +36 V (DC)/0,4 A |

| Power Supply    |                            |
|-----------------|----------------------------|
| Nominal Voltage | +12 V (DC)                 |
| Voltage Range   | +8 ... +34 V (DC), max. 3W |

| Temperature           |                                |
|-----------------------|--------------------------------|
| Operation temperature | 0°C ... +40°C                  |
| Transport temperature | -20°C ... +60°C                |
| Humidity              | 10% ... 90% (not condensating) |

| Temperature           |                                |
|-----------------------|--------------------------------|
| Operation temperature | 0°C ... +40°C                  |
| Transport temperature | -20°C ... +60°C                |
| Humidity              | 10% ... 90% (not condensating) |

| Housing                |                   |
|------------------------|-------------------|
| Weight                 | 120g              |
| Dimensions (T x B x H) | 121,5 x 50 x 25mm |

| Housing                |                 |
|------------------------|-----------------|
| Weight                 | 95g             |
| Dimensions (T x B x H) | 118 x 48 x 25mm |

| Interfaces                   |   |
|------------------------------|---|
| Personal Computer (PC):      | Mini USB 2.0 Type B-Buchse (USB1.1)   |
| Vehicle:                     | OBD-plug (16-pin)   |
| supported vehicle-Protocols: | (AU)/(E)OBD/OBDII conform protocols<br>All vehicle manufacturers specific protocols (e.g. K-line, CAN, PWM/VPW, SCP, GMLAN, UDS, KWP2000, TP2.0, ...) |

| Interfaces                   |   |
|------------------------------|---|
| Personal Computer (PC):      | Mini USB 2.0 Type B-plug (USB1.1)           |
| Vehicle:                     | OBD-plug (16-pin)                           |
| supported vehicle-Protocols: | (AU)/(E)OBD/OBDII/WWH/OBD conform protocols |

# AVL DITEST MDS 650 – MODULAR DIAGNOSTIC SYSTEM

## AVL DITEST SCOPE 1400



### Technical specifications SCOPE 1400

#### DSO channel

| Measuring Unit/Part                            | Specification  |
|--|--|
| Measurement Resolution                         | 14 Bit DSO Operation<br>16 Bit DMM Operation with oversampling                             |
| Bandwidth                                      | 10 MHz (-3dB)  |
| Maximum sampling rate                          | 40 Msps per channel, no multiplexing   |
| DSO Samples Memory                             | 1Gbit (64MSamples) buffer  |
| Channels                                       | 4 independent channels   |
| Galvanic Isolation                             | Yes, no common grounds   |
| Measurement input                              | Full Differential  |
| Maximum voltage                                | 350V AC, 500V DC (+20% overvoltage)  |
| DSO Scale factors Volt/Div (Software)          | 2–200V   |
| DSO Scale factors Time/Div (Software)          | 50ns–5h  |
| Programmable hardware Filter (one per channel) | 0–450 KHz  |
| Coupling modes                                 | GND<br>AC<br>DC  |
| Trigger  | Internal or external (source channel 1 2 3 4)<br>Positive, negative, auto, autolevel, norm |
| Counter function                               | 0.1Hz to 100kHz<br>Channel source 1 2 3 4  |

#### Ohmmeter and diode tester (Channel 1)

#### Ohmmeter and Diode Tester Specification

| Part                       | Specification                        |
|----------------------------|--------------------------------------|
| Resistor measurement range | 0.1 $\Omega$ to 15 M $\Omega$        |
| Diode measurement          | 0V to 1.7V with constant current 1mA |

#### Ohmmeter Accuracy

| Range | 0–15 M $\Omega$ | 0,4%–2.0% measurement depending range |
|-------|-----------------|---------------------------------------|
|-------|-----------------|---------------------------------------|

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## AVL DITEST SCOPE 1400

| SPI Channel Specification |                            |
|---------------------------|----------------------------|
| Part                      | Specification              |
| Communication format      | SPI, 4 wires bidirectional |
| SPI clock frequency       | 1MHz max.                  |
| Probe Power supply        | 5V, 200mA max.             |

| Stimuli Generator   |   |
|---------------------|---|
| Measuring Unit/Part | Specification   |
| Output voltage      | 0 to +18V programmable with 10mV steps and +/-2% accuracy |
| Output current      | 0 to 600mA  |
| Waveforms           | DC to 10KHz   |

| Main Power Supply Unit     |  |
|----------------------------|--|
| Part                       | Specification                                |
| Power supply input voltage | 8VDC to 19VDC nominal                        |
| Input power                | 30W max.                                     |
| Main power supply sources  | External AC/DC adapter, 100V-240VAC to 19VDC |

| General specifications |   |
|------------------------|---|
| Part                   | Specification   |
| Operating system       | 32-bit edition of Windows XP (SP3), 32- or 64-bit edition of Windows Vista or Windows 7 |
| Communication port     | High Speed USB 2.0 (480Mbit/s)  |

| Physical Properties         | Description                          |
|-----------------------------|--------------------------------------|
| Dimensions                  | 240mm x 200mm x 60mm (W x D x H)     |
| Case                        | Magnesium housing without ventilator |
| Weight                      | 600g                                 |
| Operating temperature range | 0°C to +50°C                         |
| Protection class            | IP-54                                |
| Air humidity                | 30% bis 95%                          |
| Operating height            | max. 3048m ü. NN.                    |
| Storage temperature         | -20°C bis +60°C                      |

# AVL DITEST MDS 650 – MODULAR DIAGNOSTIC SYSTEM

## AVL DITEST SCOPE 1400

### Probes, cables and adapters

#### Probes and adapters list

| Probes                    | Description   |  |
|---------------------------|---|--|
| Universal Voltage probe   | Range:<br>Cable length:                               | Up to 600VDC<br>2.9 m                          |
| Temperature Probe         | Temperature range:<br>Technology:<br>Cable length:    | -20°C...+200°C<br>Thermocouple<br>2.9 m        |
| Ignition kV clip          | Range:<br>Cable length:                               | Up to 50 KV AC<br>2.9m                         |
| Pressure probe            | Maximum range:<br>Cable length:                       | Up to 100 bar<br>2.9m                          |
| AC/DC 100A Current probe  | Current range:<br>Overload capability:<br>Resolution: | 100A DC or AC pk<br>500A DC (1 min)<br>±1mA    |
| AC/DC 1800A Current probe | Current range:<br>Overload capability:<br>Resolution: | 1800A DC or AC pk<br>500A DC (< 10 ms)<br>±1mA |
| Trigger probe             | Type:   | Inductive                                      |

#### Temperature Probe Specification

| Property                | Specification  |
|-------------------------|--|
| Temperature range       | -20 to +200 °C   |
| Technology              | Thermocouple   |
| Resolution and Accuracy | ± 1 K for < 0 °C<br>± 0,5 K for 0 °C to +40 °C<br>± 1 K for +40 °C to +100 °C<br>± 2 K for > +100 °C |
| T 99%                   | 2 Sec @ Air 1/Sec  |

#### Ignition kV clip Specification:

| Property      | Specification   |
|---------------|---|
| Type          | kV Clamp  |
| Voltage Range | + -50 kV  |
| Accuracy      | 50kV: ±15 % ± 1000V<br>20kV: ±15 % ± 400V<br>10kV: ±15 % ± 200V |



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## AVL DITEST SCOPE 1400

### 100 bar Pressure Probe Specification:

| Property             | Specification  |
|----------------------|--|
| Pressure range       | Up to 100 bar  |
| Proof pressure       | 200 bar  |
| Burst pressure       | 1000 bar   |
| Fatigue life         | 100 million cycles min                                   |
| Accuracy             | Up to 24bar = 0.25%<br>Between 30bar and 100bar = 1% Max |
| Operable temperature | -40 to 120°C   |

### AC/DC Current 100A Probe Specification:

| Property  | Specification                |
|---|------------------------------|
| Current Range   | 100A DC or AC pk             |
| Overload Capability without Damage                        | 500A DC (for 1 min)          |
| Output sensitivity  | 50mV/A (w.r.t. 0V)           |
| Accuracy (@ +23 °C, I < 10A)                              | ±1% of reading ± 2mA         |
| Resolution  | ±1mA                         |
| Error due to Earth's Magnetic Field                       | ±0.5mV (±10mA) max           |
| Warm up zero Drift  | 3 minutes max from switch ON |
| Zero Drift (+10 °C to +28 °C)<br>over 5 hour cycle        | ±2mA typ per °C / 18mA typ   |
| Zero Drift with time (after 3 mins,<br>over 1 hour cycle) | ±10mA max, ±8mA typ          |
| Zero Drift with time (over 12 hour cycle)                 | ±12mA max, ±10mA typ         |
| Zero Drift with time (over 24 hour cycle)                 | ±20mA max, ±15mA typ         |
| Frequency Range   | DC to 20kHz (- 0.5dB)        |
| Remanence (0A →100A → 0A)                                 | 12mA max                     |
| Operating Temperature Range                               | 0 to +60°C                   |

### AC/DC Current 1800A Probe Specification:

| Property                                 | Specification            |
|--|--------------------------|
| Current range                            | 1800A AC peak or DC      |
| Overload Capability                      | 2000A                    |
| Overload Capability without damage       | 3000A < 10 ms            |
| Output Sensitivity                       | 2.778 mV/A (w.r.t. 0 V)  |
| DC Accuracy (0–1000A)                    | ± 0.8% of reading ± 0.5A |
| DC Accuracy (1000–1500A)                 | ± 1.8% of reading ± 0.5A |
| Overall Accuracy (1500–1800A)            | ± 5.0% of reading        |
| Conductor Position Sensitivity (0–1000A) | ± 1.7% of reading        |
| Resolution                               | ± 100 mA                 |
| Zero Offset (at +25°C)                   | ± 10 mV max              |
| Zero Drift (0°C to +50°C)                | ± 100 mA/°C              |
| Maximum Conductor Size                   | 32 mm diameter           |
| Eternal zero correction                  |                          |