

# AVL DITEST MDS 650 – MODULAR DIAGNOSTIC SYSTEM



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## AVL DiTEST Gas 2301



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. ≥ 10.0 % vol: ± 5 % o.M.
CO2	0 ... 20% vol.	0,01 % vol.	< 16.0 % vol.: ± 0,3 % vol., ± 3 % o.M. ≥ 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. ≥ 5000 ppm vol.: ±5% o. M. ≥10000 ppm vol.: ±10% o. M
O2	0 ... 25% vol.	0,01 % vol.	± 0,02 % vol. ± 1 % o. M.
NO (optional)	0 ... 5.000 ppm vol.	1 ppm vol.	± 5 ppm vol. ± 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% - Auflösung: 0,1 %
Absorption (k-Value)	- Messbereich: 0 ... 9,99% - Auflösung: 0,011/m

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## AVL DITEST AUX 2000



Measurement Parameters (optional) 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 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 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 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 AC DC
Trigger	Internal or external (source channel 1 2 3 4) Positive, negative, auto, autolevel, norm
Counter function	0.1Hz to 100kHz 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: Cable length:	Up to 600VDC 2.9 m
Temperature Probe	Temperature range: Technology: Cable length:	-20°C...+200°C Thermocouple 2.9 m
Ignition kV clip	Range: Cable length:	Up to 50 KV AC 2.9m
Pressure probe	Maximum range: Cable length:	Up to 100 bar 2.9m
AC/DC 100A Current probe	Current range: Overload capability: Resolution:	100A DC or AC pk 500A DC (1 min) ±1mA
AC/DC 1800A Current probe	Current range: Overload capability: Resolution:	1800A DC or AC pk 500A DC (< 10 ms) ±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 ± 0,5 K for 0 °C to +40 °C ± 1 K for +40 °C to +100 °C ± 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 20kV: ±15 % ± 400V 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% 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) over 5 hour cycle	±2mA typ per °C / 18mA typ
Zero Drift with time (after 3 mins, 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	