IT SIMPLY WORKS.

BrainBee
WORKSHOP SOLUTIONS

EMISSION

// Emission control devices

MAHLE


BrainBee
BrainBee

MAXIMUM EFFICIENCY
FOR MINIMAL ENVIRONMENTAL IMPACT.

EXHAUST GAS ANALYSERS // OPACIMETERS // REV COUNTER

The wide range of products in our Emission Line includes gas analysers and opacimeters for monitoring the exhaust systems of petrol- and diesel-engined cars and motorcycles. These devices do far more than standard diagnostic tools and are ideal for PTI Stations and and tests on the composition of emissions. Our devices are fullfilling the national regulation.

Key features of our-Emission Line:

+ Modularity: you can configure your station by choosing BRAIN BEE instruments (or others), connecting them to the PC station
+ Open system: compatible with all common commercial software and hardware systems
+ Plug and play solution: we fully configure and test all our exhaust examination testers
+ Extreme mesaurement precision
+ Approved by several national regulations (in continuous development)

// OVERVIEW OF EMISSION CONTROL DEVICES

EXHAUST GAS ANALYSERS

AGS-688
OIML R 99
ISO 3930

AGS-690
OIML R 99
ISO 3930

AGS-200
OIML R 99
ISO 3930

OPACIMETERS FOR DIESEL ENGINES

OPA-300
Serial interface
(RS-232 or RS-485)

OPA-100
12-V power supply from
small portable device

REV COUNTER FOR PETROL AND DIESEL ENGINES

MGT-300 EVO
Bluetooth

// MODES OF OPERATION

Exhaust gas analysers:

Exhaust gas analysers from BRAIN BEE are designed for measuring the different exhaust gas concentrations in vehicles with controlled ignition. They can be used both for monitoring emissions in legally prescribed inspections, and for routine automotive servicing and repair.

Opacimeters

Our opacimeters for diesel engines are small and compact. With their 12-V power supply, these portable units with comfortable, ergonomic handle are ideal for use on the go.

Rev counter:

The universal rev counter for petrol and diesel engines transfers its recorded values to the receiver via Bluetooth or USB. On the one hand, it records the revolutions based on the harmonics of the car battery charging signal or via the magnetic vibration sensor. On the other hand, it measures the engine temperature using the standard temperature sensor. The optional EOBD-300 sensor is available for use with cars and lorries

BRAIN: Neural Network Technology

MGT-300 EVO rev counter is equipped with the special Neural Network Technology, the application of which allows the instrument, in the course of daily use, to identify and isolate the main noise signals that could (physiologically) affect the accuracy of measurement. Thanks to the application of this advanced technology, MGT-300 EVO can adapt its software parameters directly to the environment conditions in which it operates, refining and optimizing the accuracy of the values returned.

// AGS-688

The AGS-688 gas analyser can work both statically and dynamically, by sampling emissions at the exhaust pipe using the supplied probe designed for this purpose. With the intuitive operator panel, users have all the functions of the exhaust gas analyser at their fingertips, and can easily swap from independent measurements to the legally specified test. The AGS-688 features six backlit LCD units, which display the readings of ongoing tests. When analysis is complete, the user can print out the test result straight away or send it to a connected computer.

Pneumatic assembly:

The integrated condensate separator is drop-forged to prevent any hindrance to the gas flow and reduce maintenance times. Its special design facilitates the continuous drainage of condensate that forms in the separator. The separation filter has two parts: a net filter and a coalescing filter. In addition to the gas and air inlet for the autozero phase, the AGS-688 also features another special inlet for calibration using a gas sample cylinder. The rear side of the unit features connections for the supply, for measuring revolutions and temperature either wired or wirelessly, and a wired or wireless connection to a PC.

Advantages:

The AGS-688 was developed as our basic exhaust gas analyser model. However, thanks to our large range of connectible accessories, it can take on a lot of additional functions without problem:

+ The rev counter is incorporated, and an inductance clamp meter, capacitance clamp meter or MGT-300 EVO (via bluetooth) can also be bluetooth connected (wireless module optional)
+ Connection to a PC is achieved via the RS-232 cable, USB or the BT-100 Bluetooth module.
+ The AGS-688 enables connection to the opacimeter via the OMNIBUS port. In this case, the analyser converts into a smoke indicator for diesel engines.

Certification:

Certificazioni to MID (Measuring Instrument Directive) 2004/22/CE NMI 0122 B+D

CE marking:

Approved in the following countries:
Italy, Russia, Serbia

MEASURING FIELDS					
CO	0	÷	9.99	% vol	Res. 0.01
CO_2	0	÷	19.9	% vol	Res. 0.1
HC hexane	0	÷	9,999	ppm vol	Res. 1
O_2	0	÷	25	% vol	Res. 0.01
NO_x	0	÷	5,000	ppm vol	Res. 1
Lambda	0.5	÷	5		Res. 0.001
Revolutions Inductance/ capacitance	300	÷	9,990	rpm	Res. 10
Oil temperature	20	÷	150	°C	Res. 1

// AGS-690

The AGS-690 samples the exhaust gas from the exhaust pipe using the probe. Thanks to the interaction with the specified BRAIN BEE OMNIBUS-800 software, users benefit from all the features of the analyser. In addition, the user can easily switch from routine measurements to the legally specified test. The device functions by measuring the degree to which the gas in the sample absorbs infrared rays during analysis. Using its high-precision technology, the AGS-690 analyses the absorption of the different frequency bands of the constituents CO, CO_2 and HC, and thereby determines the concentrations. Oxygen and NO_x concentrations can be measured as an option via electrochemical sensors.

Pneumatic assembly:

The condensate separator assembly was precision-forged to minimise the gas travel and shorten maintenance times. The separation filter has two parts: a net filter and a coalescing filter. The design enables the continuous exit of condensate forming in the separator via a single-shaft, twin-head pump. In addition to the gas and air inlet for the autozero phase, the AGS-690 also features another special inlet for calibrating the gas sample cylinder.

Advantages:

The AGS-690 was developed as a basic exhaust gas analyser model. However, thanks to accessories that can be connected to it, it can perform a lot of additional functions without problem:

+ The rev counter is incorporated, and an inductance clamp meter, capacitance clamp meter or MGT-300 EVO (via bluetooth) can also be connected (wireless module optional)

+ Connection to a PC is possible via the RS-232 cable, USB or the BT-100 Bluetooth module.

Certification:

Certificazioni to MID (Measuring Instrument Directive) 2004/22/CE NMI 0122 B+D

CE marking:

Approved in the following country:
Italy

MEASURING FIELDS					
CO	0	÷	9.99	% vol	Res. 0.01
CO_2	0	÷	19.9	% vol	Res. 0.1
HC hexane	0	÷	9,999	ppm vol	Res. 1
0_2	0	÷	25	% vol	Res. 0.01
NO_X	0	÷	5,000	ppm vol	Res. 1
Lambda	0.5	÷	5		Res. 0.001
Revolutions Inductance/ capacitance	300	÷	9,990	rpm	Res. 10
Oil temperature	20	÷	150	°C	Res. 1

// AGS-200

The AGS-200 exhaust gas analyser can be connected to a PC via serial port. It is powered by PSI-050 power pack. However, with its minimal dimensions and 12-V power supply, this unit is ideal for mobile use.

Possible uses:

Gas curve:
The unit automatically saves the gas readings at different engine speeds and plots them on a gas curve. Especially recommended for road tests or test bench tests.

Automatic diagnostics:
The program analyses the gas values and creates a list of individual readings.

Catalytic converter efficiency:
The program guides the user through the test and calculates the efficiency of the catalytic converter for the different types of gas in percent – ahead of and behind the catalytic converter.

MEASURING FIELDS					
CO	0	÷	9.99	% vol	Res. 0.01
CO_2	0	÷	19.9	% vol	Res. 0.1
HC hexane	0	÷	9,999	ppm vol	Res. 1
0_2	0	÷	25	% vol	Res. 0.01
NO_x	0	÷	5,000	ppm vol	Res. 1
Lambda	0.5	÷	5		Res. 0.001
Revolutions Inductance/ capacitance	300	÷	9,990	rpm	Res. 10
Oil temperature	20	÷	150	°C	Res. 1

Certification:
Certificazioni to MID (Measuring Instrument Directive) 2004/22/CE NMI 0122 B+D

CE marking:
Approved in the following countries:
Austria, Bulgaria, Columbia, England, Germany, Hungary, India, Italy, Netherlands, Peru, Portugal, Russia

Double lambda sensor test:
With its oscilloscope feature, the unit analyses variations in the signal and calculates an operating efficiency value.

Cylinder head leak test:
The program guides the user through the test and, by analysing the gases in the coolant expansion tank, is able to determine whether the cylinder head gasket is leaking.

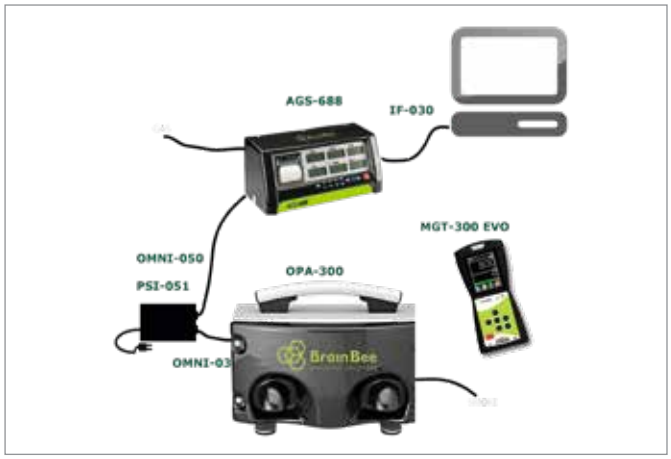
// OPA-300

The OPA-300 is designed for extreme flexibility and ease of use and can be connected to a PC via a normal serial interface (RS-232 or RS-485). Since it has its own OMNIBUS-800 software, it can guide even inexperienced users safely through the emissions testing process.

Guaranteed modularity:

Like many other devices in this series, the OPA-300 opacimeter can also be incorporated in various BRAIN BEE emission control configurations, enabling users to set the testing station up based entirely on their individual requirements.

It can also be integrated in existing stations (on a BRAIN BEE trolley), and therefore fits in harmoniously and stylistically in workshops that use BRAIN BEE equipment.



MEASURING FIELDS					
Light transmission	0	÷	99.9	%	Res. 0.1
Light transmission	0	÷	9.99	M-1	Res 0.01
Rev counter	300	÷	9,990	RPM heat.	Res. 10
Oil Temperature	20	÷	150	°C	Res. 1
Smoke temp.	20	÷	400	°C	Res. 1

CE marking:

Approved in the following countries:
Italy, Morocco, Netherlands, Russia, Serbia

// OPA-100

Small and compact: Thanks to its small size, 12-V power supply and comfortable, ergonomic handle, the OPA-100 is extremely easy to use on the go. The opacimeter can be connected to a PC via serial port. It is powered by PSI-050 power pack. However, with the OMNIBUS-800 software specially developed by BRAIN BEE, you can use the OPA-100 to work on all makes and models.

Guaranteed modularity:

Like many other devices in this series, the OPA-100 opacimeter can also be incorporated in various BRAIN BEE emission control configurations, enabling end users to set the testing station up entirely in line with their individual requirements.

It can also be integrated in existing stations (on a BRAIN BEE trolley), and therefore blends in harmoniously and stylistically in workshops that use BRAIN BEE equipment.

MEASURING FIELDS					
Light transmission	0	÷	99.9	%	Res. 0.1
Light transmission	0	÷	9.99	M-1	Res. 0.01
Rev counter	300	÷	9,990	RPM heat.	Res. 10
Oil Temperature	20	÷	150	°C	Res. 1
Smoke temp.	20	÷	400	°C	Res. 1

CE marking:

Approved in the following countries:
Austria, Brazil, Bulgaria, Columbia, Czech Republic, England, Germany, Hungary, India, Italy, Morocco, Netherlands, Peru, Portugal, Romania, Russia, Spain

// MGT-300 EVO

The MGT-300 EVO is BRAIN BEE's universal rev counter that transmits rev. and temperature to the receiver via Bluetooth.

Universal:

It records the revolutions based on the harmonics of the car battery charging signal or via the magnetic vibration sensor, and the engine temperature via the standard temperature sensor.

The built-in rechargeable battery dispenses with the old rev counter's need for cables to the car battery when using the magnetic vibration sensor.

The user-friendly software always provides comprehensive, clearly organised information on the signal quality, current readings, and transmission quality of the signals to the receiver.

Thanks to EOBD-300 (optional) the engine speed can also be recorded via OBD interface via Bluetooth.

Signal recording options:

1. Vibration sensor
2. Alternator harmonics
3. EOBD connector (EOBD-300) for speed and temperature

Two options for connecting to a PC:

The MGT-300 EVO can be connected to a PC via the USB cable included in delivery, or via Bluetooth.

MEASURING FIELDS					
RPM	300	÷	9,990	rpm	Res. 10
Temperature	20	÷	200	°C	Res. 1

BRAIN –
Neural Network Technology

Accessories:

+ SG-030 phono-metric probe (structure-borne sound microphone)
+ EOBD-300 interface

Certification:

DEKRA

// SG-030

The SG-030 probe (for motorcycle) records rpm differently, via phono-metric measurements. Highly precise, it can also be used in particularly difficult situations (ex: on trucks).

// TECHNICAL DATA



EXHAUST GAS ANALYSERS	AGS-688	AGS-690	AGS-200
Measuring chamber	AMB-2 sensor	AMB-2 sensor	AMB-2 sensor
Gas sampling	4 litres/minute	4 litres/minute	4 litres/minute
Condensate drain	Automatic and continuous	Automatic and continuous	Automatic and continuous
Leak test	Semi-automated	Semi-automated	Semi-automated
Minimum flow check	Automatic	Automatic	Automatic
Checks sensor for remaining O_2	Automatic (< 5 mV)	Automatic (< 5 mV)	Automatic (< 5 mV)
Protective filters of measurement heads for water/gas from pump	Attached externally to prevent the unit from opening and the seal from being lost	Attached externally to prevent the unit from opening and the seal from being lost	Internal
Automatic ambient pressure compensation	850 ÷ 1,060 kPa	850 ÷ 1,060 kPa	850 ÷ 1,060 kPa
Calibration	With gas sample cylinder	With gas sample cylinder	With gas sample cylinder
Zero position	Automatic	Automatic	Automatic
Time for heating to 20 °C	10 minutes	10 minutes	10 minutes
Response time for CO, CO_2 and HC	< 10 seconds	< 10 seconds	< 10 seconds
Response time for O_2	< 60 seconds	< 60 seconds	< 60 seconds
Printer	Integrated thermal printer with 24 columns	No	No
Display	6 LCD units	No	No
Connections	Rpm measurement via cable for inductance or capacitance clamp	Rpm measurement via cable for inductance or capacitance clamp	Rpm measurement via cable for inductance or capacitance clamp
	Oil inlet temperature from Pt100 sensor (DIN 43760)	Oil inlet temperature from Pt100 sensor (DIN 43760)	Oil inlet temperature from Pt100 sensor (DIN 43760)
	Rpm/oil temperature received via RS-232 cable, wireless frequency 433 MHz (optional)	Rpm/oil temperature received via RS-232 cable, wireless frequency 433 MHz (optional)	Rpm/oil temperature received via RS-232 cable, wireless frequency 433 MHz
	Serial ports: PC USB B (slave mode); PC RS-232 (9600,N,8,1); PC in RS-485 network (9600,8,N,1)	Serial ports: PC USB B (slave mode); PC RS-232 (9600,N,8,1); PC in RS-485 network (9600,8,N,1)	Serial ports: in RS-485 network
	Software programming/ updates via RS-232 cable	Software programming/ updates via RS-232 cable	Software programming/ updates via RS-232 cable
	User interface to OPA-100 opacimeter possible		
Power supply	12 V DC typical (11–15 V DC)	12 V DC typical (11–15 V DC)	12 V DC typical (11–15 V DC)
Consumption	1.5 A DC	1.5 A DC	1.5 A DC
Operating temperature	5 ÷ 40 °C	5 ÷ 40 °C	5 ÷ 40 °C
Dimensions	434 x 190 x 291 mm	360 x 280 x 288 mm	220 x 140 x 430 mm
Weight	5 kg	5 kg	5 kg

OPACIMETERS	OPA-300	OPA-100
Light source	With green LED diode	With green LED diode
Light receptor	Photodiode	Photodiode
Measuring chamber pressure monitoring	Automatic	Automatic
Stabilisation of measuring chamber temperature at 90 °C	Yes	Yes
Monitoring of glass cover cleaning system	Automatic	Automatic
Zero position	Automatic	Automatic
Time for heating to 20 °C	10 minutes	10 minutes
Receives rpm and temperature	Via cable or wireless device	Via cable or wireless device
Connections	Serial port RS-232 Serial port in RS-485 network	Serial port RS-232 Serial port in RS-485 network
Power supply	12 V DC typical (11–15 V DC)	12 V DC typical (11–15 V DC)
Consumption	1 A DC, 5 A DC with heater switched on	1 A DC, 5 A DC with heater switched on
Operating temperature	0 ÷ 40 °C	0 ÷ 40 °C
Dimensions	360 x 280 x 288 mm	200 x 140 x 430 mm
Weight	5 kg	5 kg

REV MEASUREMENT	MGT-300 EVO
Display	LCD 3.5", 320 x 240 mm, 700 Nit (cd/m^2)
Keypad	Soft touch keypad
Battery	Lithium-ion, rechargeable
Interfaces	USB 2.0 Bluetooth
Dimensions	200 x 100 x 30 mm
Weight	385 g

// ACCESSORIES

CODE	DESIGNATION	 AGS-688	 AGS-690
1010750038XX	TRO-060 Trolley	✓	✓
1010750081XX	TRO-220 Trolley		
1010750083XX	TRO-8250 Support – TRO-220		
1010750058XX	TRO-8790 Laptop Support – TRO-060		
1010100014XX	PSI-50 USB Power Supply 13.5 V @ 150 W RAL7042		
1010700025XX	OMNI-010 Cable Communication/Power Supply 0.4 M	✓	✓
1010700065XX	OMNI-011 Cable Communication/Power Supply 0.75 M	✓	✓
1010700028XX	OMNI-030 Cable Communication/Power Supply 6 M	✓	✓
1010500001XX	NO_x-010 Sensor for AGS	✓	✓
1030700029XX	EOBD-300 EVO		
1010700165XX	SG-030 RPM Motorcycle Probe		
1010601163XX	BT-100 USB Kit Bluetooth Module	✓	✓
1010601410XX	BT-100 Bluetooth Module	✓	✓

	 AGS-200	 OPA-300	 OPA-100	 MGT-300 EVO
		✓	✓	
	✓		✓	
	✓		✓	
	✓		✓	
	✓	✓	✓	
	✓	✓	✓	
	✓	✓	✓	
	✓			
				✓
				✓
	✓	✓	✓	
			✓	

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