**NEW!**

**BEA 850 with BDM 300**


# A tidy affair:
## Emissions Analysis

BOSCH
Invented for life

Bosch Diagnostics

ESI[tronic] Software | Test Equipment | Service Training | Technical Hotline

# Effective **emission analysis** of today's vehicles

- **BEA 850** – **Emission Analysis (PC-based)**
- **BEA 150/250/350** – **Emission Analysis (embedded)**
- **BEA 460** – **Emission Analysis (modular)**
- **BDM 298/ BDM 300** – **Speed Measurement Modules**

# **Clean work** in a very short space of time with the Bosch emission analysis

Emission analysis with BEA 850

Testing and minimizing pollutant emissions with modular measurement technology – in accordance with the latest legislation and with highest measurement accuracy. The workshop requires robust, future-proof technology to achieve this, with clear operator guidance and simple handling. The new emission analysis instruments from Bosch test equipment excel through their easy and timesaving handling. Other particularly important aspects in the daily handling of exhaust-gas analysers are the short run-up times and brief measuring times.

**The triumphant progress of the diesel engine**

The increasing acceptance of the diesel engine is accompanied by expanded legal requirements for exhaust gas restriction and analysis. Technical innovations helped to significantly reduce the exhaust-gas values of today's diesel engines. The exact emissions measurement and adjustment by the workshop is increasingly becoming more significant to observe the new legal standards in practice.

**Emission analysis for gasoline engines**

The future engine for the average consumer will continue to be the gasoline-powered engine. With constantly optimized cleanliness values that can be measured quickly and conveniently using the Bosch emission analysis.

**Much more than only an exhaust-gas test**

Bosch provides the workshop with the complete spectrum from simple exhaust gas examination up to the complete emission system analysis:

- The exhaust-gas analyser for exhaust-gas examination
- The exhaust-gas diagnostics system for error diagnosis
- The modular expandable exhaust gas maintenance system for the efficient workshop

All devices are highly efficient with customer-conforming documentation of the measurement and diagnostic results. They are all easy to operate. With their modular design, high quality standard and innovative measurement technology, they always offer a future-proof investment.

# The exhaust-gas and diagnostics station **of the future** BEA 850[1]


**The BEA 850 at a glance:**

1. **TFT monitor 19":** Glare-free, high resolution and with a wide viewing angle
2. **Remote control:** Practical and handy
3. **Printer:** With dustproof cover
4. **Engine measurement technology module:** With clearly arranged mounting for all sensors and cables
5. **Smoke-opacity testing module:** Immediately ready to measure, reference device for registration authorities in various European countries
6. **Keyboard:** Ergonomic position and can be folded away
7. **Computer module (PC):** High-performance and robust
8. **Exhaust measurement module:** Low maintenance thanks to long-term stability
9. **Trolley:** Stable and easy to move
10. **OBD and ECU Diagnostics** choose from KTS 570/540/515 wireless or 530

[1] Not available in Switzerland

**A variable system for gasoline and diesel vehicles**

Testing and minimizing pollutant emissions with modular measurement technology – in accordance with the latest legislation and with high measurement accuracy.

- Optimized for current and future requirements of exhaust tests
- Integrated on-board diagnostics (OBD) with ECU diagnostics testers of the KTS series (KTS 570/540/530 wireless or 515)
- Integrated on a workshop-compatible trolley
- 4-gas module with optional NO
- Very rapid response time
- Gas detectors with high measurement accuracy and long-term stability
- Simple equipment maintenance by workshop staff
- User-oriented documentation of the measurement and diagnostics results
- Software-controlled integration of older Bosch exhaust-gas analyzers
- Network-compatible (integration in asanetwork)

**Exhaust-gas test and diagnostics on a gasoline-engine vehicle**

- On-board diagnostics OBD
- Gas values CO, $CO_2$, $O_2$, HC, lambda, NO (option)
- Lambda sensor voltage (graphical display)
- Moment of ignition and dwell angle, advance angle
- Speed measurement
- Oil temperature measurement
- Multiple curves: Up to 6 measured variables can be shown simultaneously as a curve: CO, $CO_2$, $O_2$, HC, lambda, NO (option), speed, moment of ignition, dwell angle, oil temperature and battery voltage

**Exhaust-gas test and diagnostics on a diesel-engine vehicle**

- Smoke-opacity testing during free acceleration
- On-board diagnostics OBD
- Continuous smoke-opacity testing
- Start-of-delivery measurement including determination of advance angle, reference angle and reference speed
- Speed measurement
- Oil temperature measurement
- Multiple curves: Up to 5 measured variables can be shown simultaneously as a curve: Smoke opacity, speed, start of delivery, advance angle and oil temperature

# **New!** BEA 850 now with engine speed measurement module **BDM 300**


Effective emission analysis of vehicles



KTS 540 wireless for ECU diagnostics

**Special accessories**

Protection hood, ignition stroboscope, temperature sensor, infrared temperature sensor, clamp-on pulse generator (4.5/5.0/6.0/7.0/10.0/12.7 mm), exhaust-gas probe for cars/trucks, heating hose, clamping device, connecting cable RTM (12 m), adapter cable with change part OBD, adapter cable and connecting cables for clamp-on pulse generator

**Equipment supply**

Trolley, PC, keyboard, mouse, TFT monitor 19", inkjet printer, MTM extended, BEA 050, RTM 430, sensors (trigger clamp, passenger car temperature sensor, multipurpose test cable, term. 1/term 15 cable), emission test data and, as an option, KTS 570/KTS 540 wireless or KTS 515 and BDM 300, remote control

**Specifications and standards**

International: OIML - R99 Class 0 (Edition 1998)
Measurement technology complies with ECE R24
EU: CE Conformity Authorizations for statutory exhaust-gas testing in various European countries

**Order number**

| | |
|---|---|
| BEA 850 with KTS 570 and BDM 300 | 0 684 120 090 |
| BEA 850 with KTS 540 and BDM 300 | 0 684 120 089 |
| BEA 850 with KTS 515 and BDM 300 | 0 684 120 099 |
| BEA 850 without KTS with BDM 300 | 0 684 120 088 |

| Technical data | |
|---|---|
| Dimensions (W x H x D) | 680 x 1785 x 670 mm |
| Weight | approx. 125 kg |
| Power supply | 90 – 264 VAC/47 – 63 Hz |
| Operating temperature range | 5 °C to 40 °C |

| Designation | Measuring range | Resolution |
|---|---|---|
| **Exhaust measurement module** | | |
| CO | 0 – 10 % vol. | 0.001 % vol |
| $CO_2$ | 0 – 18 % vol | 0.01 % vol |
| HC | 0 – 9999 ppm | 1.0 ppm |
| $O_2$ | 0 – 22 % vol | 0.01 % vol |
| NO | 0 – 5000 ppm | 1.0 ppm |
| Lambda | 0.5 – 1.8 | 0.001 |
| $CO_{vrai}$ | 0 – 10 % | 0.01 % |
| Accuracy according to OIML class 0 | | |
| **Smoke-opacity measurement module** | | |
| Degree of opacity | 0 – 100 % | 1 % |
| Absorption coefficient | 0 – 10 $m^{-1}$ | 0.01 $m^{-1}$ |
| Maximum exhaust-gas temperature at: | – exhaust-sample probe: 250 °C<br>– input RTM 430: 200 °C | |
| **Engine measurement technology** | | |
| Battery voltage | 0 – 72 V | 0.1 V |
| Moment of ignition | 0 – 60° kW | 0.1° kW |
| Dwell angle | 0 – 100 % | 0.1 % |
| Oil temperature | -20 – +150 °C | 0.16 °C |
| Start of delivery/ injection timing | 0 – 60° kW | 0.1° kW |
| **Speed, gasoline engine** | | |
| BDM (B+/B-) | 450 – 6000 rpm | 20 rpm |
| Terminal 1/TD/TN/EST | 100 – 12000 rpm | 10 rpm |
| Trigger clamp | 100 – 12000 rpm | 10 rpm |
| **Speed, diesel engine** | | |
| BDM (B+/B-) | 450 – 6000 rpm | 20 rpm |
| Clamp-on sensor | 250 – 7200 rpm | 10 rpm |
| Terminal 1/TD/TN/EST | 100 – 12000 rpm | 10 rpm |
| Trigger clamp | 100 – 12000 rpm | 10 rpm |

# Bosch emission analysis for a **clean** environment – BEA 150/250/350


BEA 350

With the Bosch Emission Analysis BEA, the workshop is perfectly prepared for all present and future exhaust-gas analysis requirements. The modular layout of the BEA series permits expansion completely in line with individual workshop requirements: For reliable and fast emission measurement of gasoline, diesel and gas engines.

**For statutory exhaust test and diagnostics on gasoline and/or diesel vehicles**

- OBD function[1]
- Vehicle database[1]
- Additional measurement functions: Lambda sensor voltage, start of delivery, moment of ignition
- Measurement accuracy according to OIML R99, class 0
- Individual devices – gasoline or diesel can be upgraded to complete exhaust test station BEA 350
- Can be networked via asanetwork[1]
- AU-Plus

**BEA 150 – for emissions testing on diesel engine vehicles (car, van)**

- Portable smoke opacity measurement module RTM
- Very fast measurement (response time)
- Long service life of measuring chamber
- Fast, simple maintenance due to magnetic fasteners
- Optimum flow technology of smoke opacity module

**BEA 250 – for emissions testing on petrol engine vehicles**

- Calibration only once a year
- Fast maintenance: filter is easily accessible (back)
- Long-term stability due to infrared measurement method with gas detectors as receivers
- Quick measurement readiness on activation

**BEA 350 – for emissions testing on diesel and petrol engine vehicles**

- Complete exhaust test station
- Optimized price composed of BEA 150 and 250

[1] Dependent on country-specific software

| Equipment supplied | BEA 150 | BEA 250 | BEA 350 |
|---|---|---|---|
| **Suitable for exhaust test on** | **diesel engines** | **gasoline engines** | **diesel- and gas. engines** |
| **Bosch Emissions Analysis** | | | |
| Operating and display unit | ✔ | ✔ | ✔ |
| PC keyboard | ✔ | ✔ | ✔ |
| Trolley | ✔ | ✔ | ✔ |
| Software process (country-specific) | ✔ | ✔ | ✔ |
| Vehicle database | ✔ | ✔ | ✔ |
| Connection cable B+/B– | ✔ | ✔ | ✔ |
| Oil temperature sensor, cars[2] | ✔ | ✔ | ✔ |
| Smoke opacity measuring module RTM 430, with car hose and sensor | ✔ | --- | ✔ |
| Exhaust measurement module BEA 050, including hose and sensor | --- | ✔ | ✔ |
| IR remote control | ✔ | --- | ✔ |

[2] German scope of supply

### Special accessories

Vehicle emissions data, sensor holder, NO retrofit kit, printer paper for installed printer, DIN A4 printer, tool tray, remote control, sampling probes and sampling hoses, diesel clamp-on sensor, adapter and connection cables, trigger clamp, ignition stroboscope, oil temperature sensor, upgrade from BEA 150/250 to BEA 350 and OBD upgrade, KTS 115 OBD module

### Specifications and standards

International: OIML-R99 Class 0
EC: CE Conformity
National (D): EGE guideline dated 23 June 1994 PTB appendix 18.9 for diesel, 18.10 for gasoline

### Order number

| | |
|---|---|
| BEA 150 (Germany/Austria) | 0 684 105 169 |
| BEA 250 (Germany/Austria) | 0 684 105 269 |
| BEA 350 (Germany/Austria) | 0 684 105 369 |
| BEA 150 (Switzerland) | 0 684 105 153 |
| BEA 250 (Switzerland) | 0 684 105 253 |
| BEA 350 (Switzerland) | 0 684 105 353 |

| Technical data | |
|---|---|
| Dimensions (W x H x D) | For all BEA variants with trolley 750 x 1370 x 700 mm<br>operating and display unit 470 x 260 x 480 mm |
| Weight | BEA 350 (incl. trolley) app. 67 kg<br>BEA 250 (incl. trolley) app. 60 kg<br>BEA 150 (incl. trolley) app. 63 kg<br>RTM 430 app. 7 kg |
| Protection classes | Operating and display unit IP 30<br>Smoke-opacity measurement module RTM 430 IP 33 |
| Range of accuracy | +5 °C – +40 °C |
| Functional range | +5 °C – +45 °C |
| Storage temperature | -25 °C – +60 °C |
| Power supply | 230 V, 50 Hz |

| Component | Measurement range | Resolution |
|---|---|---|
| **Exhaust measurement module** | | |
| CO | 0,000 – 10,00 % vol | 0,001 % vol |
| $CO_2$ | 0,00 – 18.00 % vol | 0,01 % vol |
| HC | 0 – 9999 ppm | 1 ppm |
| $O_2$ | 0,00 – 22.00 % vol | 0,01 % vol |
| Lambda | 0,500 – 9,999 | 0,001 |
| NO | 0 – 5000 ppm | < = 1 ppm |

| Measured quantity | Measurement range | Resolution |
|---|---|---|
| **Smoke-opacity measurement module** | | |
| Degree of opacity | 0 – 100 % | 1 % |
| **Oil temperature** | | |
| Temperature | -20 – +150 °C | 0,16 °C |
| **Speed, gasoline engine** | | |
| BDM (B+/B–) | 600 – 6000 rpm | 10 rpm |
| Terminal 1/TD/TN/EST | 100 – 15000 rpm | 10 rpm |
| Trigger clamp | 100 – 15000 rpm | 10 rpm |
| **Speed, diesel engine** | | |
| BDM (B+/B–) | 600 – 6000 rpm | 10 rpm |
| Clamp-on sensor | 250 – 7200 rpm | 10 rpm |
| Terminal 1/TD/TN/EST | 100 – 15000 rpm | 10 rpm |
| Trigger clamp | 100 – 15000 rpm | 10 rpm |
| **Multi-measurements** | | |
| Lambda-sensor voltage | ± 5 V | 10 mV |
| **Moment/adjustment of ignition** | | |
| OT Reference mark sensor against trigger clamp | -179 – 180° kW at 100 – 8000 rpm | 0,1° kW |
| **Dwell angle** | | |
| Terminal 1 | 0 – 100 %<br>0 – 360° VW | 0,1%<br>0,1% |
| **Start of delivery/ injection timing** | | |
| Clamp-on sensor against OT or strobe | -179 – 180° kW | 0,1° kW |

# **New!** BEA 460[1] – the **modular** solution for the exhaust-gas test


The BEA 460 is the ideal introductory tool for the statutory exhaust-gas test. The device was developed in cooperation with an automotive inspection agency and prepares the workshop for all current and future exhaust-gas analysis requirements. The modular concept can be extended to a complete ECU diagnostics system. Operation is either wireless or by means of a cable connection to a PC or notebook[2].

**BEA 460 – the new efficient solution for the exhaust-gas test**

- Impact-protection and robust - for daily use in the workshop
- Manageable and portable device (weight < 15 kg)
- Available with on-board diagnostics (OBD)
- Fast measurement thanks to optimized software
- 4-gas measurement with optional NO
- Simple operation thanks to Help function in the software
- Gas detectors with high measurement accuracy and long-term stability
- Semiannual maintenance sufficient
- With portable smoke opacity measurement module RTM 430
- Quick measurement readiness on activation
- Bluetooth connection between BEA 460 and notebook (alternatively, a cable connection is also possible)
- Bluetooth connection between notebook and KTS (alternatively, a cable connection is also possible)

[1] Not available in Switzerland
[2] PC/notebook not included in equipment supply

**Equipment supply**

Smoke opacity measurement module RTM 430 incl. exhaust-gas hose and sensor, 4-gas measuring instrument (without OBD) including exhaust-gas hose and sensor, connecting cable for vehicle socket, temperature probe for pass. car, connecting cable KI1/TN/TD/EST and B+/B-, trigger clamp, 2 Bluetooth sticks (for 4-gas device and PC), engine measuring technology (temperature and speed), serial cable (PC/notebook and 4-gas device), serial / USB converter, USB remote control[3]

Additionally available for the version with KTS:
Adaption cable OBD 5 m

[3] Not included in the gas model


**Specifications and standards**

International: OIML-R99 Class 0
EU: CE Conformity
MID certification for the 4-gas device
Certification dependent on country-specific software

**Accessories**

Remote control[1], NO retrofit kit, retrofit kit for motorcycle exhaust-gas test, sampling hose set for 2-stroke engines, sample probe for trucks, clamping device with telescopic rod, various connecting cables for clamp-on sensor, connecting cable for lambda sensor voltage

[1] already included in delivery with the station wagon models

**Order number**

| | |
|---|---|
| BEA 460 combination without OBD | 0 684 105 461 |
| BEA 460 combination with int. OBD | 0 684 105 462 |
| BEA 460 gasoline without OBD | 0 684 105 465 |
| BEA 460 diesel without OBD | 0 684 105 467 |

| Technical data | |
|---|---|
| Dimensions (W x H x D) | 470 x 250 x 400 mm |
| Weight incl. sensors and engine measuring technology | < 15 kg |
| Operation | via workshop PC or notebook |
| Supply voltage Power unit | 90 – 264 VAC/47 – 63 Hz |
| Service temperature range | 5 °C to 40 °C |

| Component | Measurement range | Resolution |
|---|---|---|
| **Exhaust measurement module** | | |
| CO | 0 – 10% vol. | 0,001% vol. |
| $CO_2$ | 0 – 18% vol. | 0,010% vol. |
| HC | 0 – 9999 ppm | 1,0 ppm |
| $O_2$ | 0 – 22% vol. | 0,010% vol. |
| NO | 0 – 5000 ppm | 1,0 ppm |
| Lambda | 0,5 – 1,8 | 0,001 |
| $CO_{vrai}$ | 0 – 10% vol. | 0,010% |

| Sensor | Measurement range | Resolution |
|---|---|---|
| Temperature | -20 – +150 °C | 0,16 °C |
| **Speed, gasoline engine** | | |
| BDM (B+/B-) | 450 – 6000 rpm | 20 rpm |
| Terminal 1/TD/TN/EST | 100 – 12000 rpm | 10 rpm |
| Trigger clamp | 100 – 12000 rpm | 10 rpm |
| **Speed, diesel engine** | | |
| BDM (B+/B-) | 450 – 6000 rpm | 20 rpm |
| Clamp-on sensor | 250 – 7200 rpm | 10 rpm |
| **Moment/adjustment of ignition** | | |
| Stroboscope with trigger clamp | 0 – 60° kW | 0.1° kW |
| **Dwell angle** | | |
| Terminal 1 | 0 – 100%<br>0 – 360° VW<br>0,0 – 50,0 ms<br>50,0 – 99,9 ms | 0,1%<br>0,1 °<br>0,01 ms<br>0,1 ms |
| **Start of delivery/ injection timing** | | |
| Clamp-on sensor or stroboscope | 0 – 60° kW | 0,1° kW |

# The **practical** speed measuring modules BDM 298 and BDM 300


BDM 298


BDM 300

**The engine speed measurement modules BDM 298 and BDM 300 enable speed indication on a wide variety of diagnosis devices from Bosch**

- Speed sensing on diesel and gasoline engines
- No lowering of driver cab for commercial vehicles
- Time saved on passenger car / commercial vehicle motors due to simple adaptation

**BDM 298**

Quick and easy speed sensing via the electrical system. Adaptation and speed detection via battery-cable terminals or cigarette lighter.

**Equipment supply**

Speed measurement module BDM 298, connecting cable for cigarette lighter, adapter cable with battery-cable terminal

**Accessories**

Various connection cables available on request

**Order number**

BDM 298 1 687 023 298

| Technical data | BDM 298 |
|---|---|
| Speed range | 300 – 6000 rpm |
| Number of cylinders | 1 – 12 |
| Engine types | Four-stroke engines |
| Operating voltage | 9 – 32 V |
| Connection options | Cigarette lighter or battery |
| Starts measuring | Automatically |

**New! BDM 300**

Rapid speed sensing from the structure-borne sound and airborne sound signal of the engine.

**Equipment supply**

Engine speed measurement module BDM 300, mains adapter, combined sensor, connecting cable for terminal encoder signal (diesel), operating instructions

**Accessories**

2-stroke/4-stroke changeover switch 1 687 200 711

**Order number**

BDM 300 1 687 023 489

| Technical data | BDM 300 |
|---|---|
| Speed, diesel engines | 400 rpm – 6000 rpm |
| Speed, gasoline engines | 400 rpm – 8000 rpm |

| Measurement function | Vehicle type | Speed search range |
|---|---|---|
| Idle speed | Pass. car / Comm. vehicle | 400 rpm – 1200 rpm |
| Increased speed | | 1700 rpm – 6000 rpm |
| Idle speed | Motorcycle 4 stroke | 600 rpm – 1800 rpm |
| Increased speed | | 2200 rpm – 8000 rpm |
| Idle speed | Motorcycle 2 stroke | 900 rpm – 2200 rpm |
| Increased speed | | 1800 rpm – 8000 rpm |

# Our **knowledge,** your **success:** Bosch Diagnostics

**Diagnostics – the key to the automotive workshop of the future**
Motor vehicle systems are becoming increasingly complex; the demands placed on qualified diagnosis in workshops are rising. For professional service on modern vehicles, Bosch provides everything at one stop, perfectly coordinated: test technology, software, technical training and hotline, supplemented by parts in initial equipment quality.

**ESI[tronic]: Software for diagnostics and service**
- Simple operation
- Rapid access
- Modular structure
- Comprehensive market coverage
- Continually updated
- Universal operation regardless of manufacturer

**Test Equipment: Matched to each workshop type**
- Optimized combination of hardware and software for rapid troubleshooting, qualified repair and high time savings
- PC-based test technology of the latest generation with extendable module

**Service Training: Knowledge as a factor of success**
- Comprehensive training programs for automotive workshops
- Practical training courses
- Highly qualified trainers with a great deal of practical experience

**Technical Hotline: Support from the system developer**
- Support in difficult technical situations
- Skills covering all brands and manufacturers

# Bosch: **Skilled partner** for workshop business

**Developments from Bosch stand for innovative progress in automobile manufacturing**

Geared to the growing proportion of electronics in the vehicle, Bosch offers workshops the suitable test technology for all sizes of company and service concepts. Sturdy, innovative, state-of-the-art automobile technology: Computer-assisted diagnosis systems help in finding any fault more quickly and more reliably. The modular layout – using future-oriented technologies – enables broad networking and efficient use of comprehensive information from the ESI[tronic] software. Mobility and user-friendly user guidance support the workshop in reliable and time-saving diagnostics.




Where to find original Bosch Quality:

Robert Bosch GmbH
Automotive Aftermarket
Business Unit Diagnostics
73201 Plochingen
Germany

**www.bosch-diagnostics.com**


ECU Diagnostics KTS


Engine System Testing FSA


Emission Analysis BEA


Diesel Componenet Testing EPS

Battery Service BAT


Air Conditioning Service ACS


Wheel Alignment FWA


Tyre Service Equipment TSE


Brake Testing BSA

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