Eddy Current Technology

eddyguard® digital C

Digital eddy current test instrument for one channel nondestructive testing of metal components, including mass produced parts and semi-finished products for cracks, pores and grinder burn according to the Preventive Multi-Filter Technology (PMFT).

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The eddyguard digital C distinguishes itself with compact design and concentration on one channel crack and grinder burn detection with one probe and combines that with the well known ibg test reliability and ease of operation. Configuration is effected by means of a PC or a laptop supplied by customer via the USB-port. The ergonomic interface of the PC-software facilitates intuitive and simple operation. After configuration is finished the eddyguard may be disconnected from the PC/laptop. The eddyguard continues testing self-sufficiently.

Digital processing of the measuring signal with unique processors, immediately after the pre-amplifier guarantees the greatest possible stability of test results.

The eddyguard is based on the ibg system concept proven for decades. All probes and rotating heads of the ibg system family can be used. The eddyguard is therefore recommended not only for the solution of new tasks but also as an upgrade for existing production machines to be equipped with state-of-the-art eddy current technology.

Up to now, competitive instruments require sophisticated and time-consuming manual determination and setting of suitable filter band, phase angle and gain. We replace that by the ibg exclusive development of Preventive Multi-Filter Technology (PMFT) with automatic tolerance zone creation. This quantum leap in the eddy current technology, unique to ibg worldwide, establishes a new standard for quality in crack and grinder burn detection.

During material data recording (calibration) with a PC/laptop with PMFT, surface areas of several good parts are scanned, and the good surface eddy current “noise” is recorded simultaneously in each of 30 band pass filters. Tolerance zones, enveloping 360 degrees, are automatically created within each filter band, capturing the allowable eddy current “noise” from good parts. The eddy current signals of good parts are the result of surface roughness and material properties. Thus, the thirty tolerance zones store the part specific fingerprint of the good parts. Additionally, edge effect, hardness profile run out, eccentricity, etc. of the good parts are calibrated during material data recording. Pseudo rejects are, therefore, reduced considerably without losing visibility to real flaws. Real flaws are now automatically detected no matter their frequency content or phase angle content. Even unexpected flaws that can be detected by eddy current are reliably detected.

This unique “good-part-only-concept” enables setup within a few minutes. Simply record an adequate number of good parts with a connected PC/laptop. One keypress switches to Preventive Multi-Filter Test and testing can start. That’s all!

Product features

- **Probes**
  A variety of crack detection probes are available with different scan width, sensitivity and design. Customised models for special applications are designed and manufactured in house.
  Our compact and precision rotating heads eddyscan H and eddyscan F, operated with our eddyguard, can be the solution for cycle time optimised crack tests. Monitoring of probe cable break guarantees maximum reliability for continuous operation.

- **Lift-off compensation**
  Eccentricity of a workpiece can be offset electronically thanks to the optional lift-off compensation. This function requires special lift-off compensation probes.

- **Suspend**
  The suspend function enables areas on components such as holes not to be tested.

- **Part types**
  Maximum 20 part types with all settings and reference data can be stored at the same time in the device memory and switched manually via the PC/laptop or via PLC for automated processes.

- **Displays**
  (with connected PC/laptop only)
  Test results are shown as bargraph, xy-diagram with tolerance zones, x(t) and y(t) or three-dimensional C-scan, selectable. The C-scan (or cascade diagram) provides a plannar display of a cylindrical surface to enable visualisation of defect position and length.

- **Probe distance**
  ibg probes are standard designed for a large distance between probe and test part of 0.7 mm. This considerably widens the scope for the requirements concerning parts preciseness and test mechanic.

- **Frequency range**
  The carrier frequency is selectable within a range of 3 kHz and 10 MHz in 21 steps. The filter frequencies of the 30 band pass filters are spread in the range 6 Hz – 5 kHz.

- **Data storage**
  Part types and device settings are stored on the PC/laptop and can additionally be stored on an USB stick.

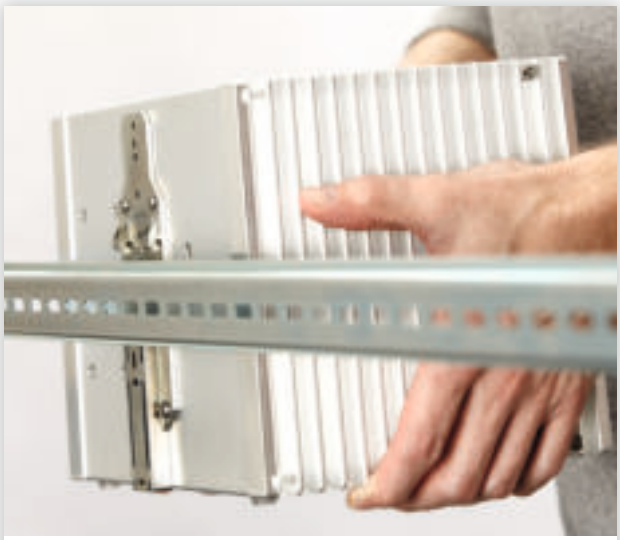
- **Activating test**
  Start of test manually on the PC/laptop, via PLC or an optional start button.

- **Automation without PLC**
  Direct control of sorting devices, paint marking systems or indicating lamps is possible with merely an external voltage source 24Vdc, providing a low cost solution for small automated systems without an additional PLC.

- **Operation / Configuration**
  by means of the delivered ibg operating software to be installed on a PC/laptop supplied by customer. System requirements: USB 2.0 and operating system MS Windows 7 (32 or 64 bit) or Windows XP (32 bit).

- **Help function**
  The software for the PC/laptop has a context sensitive help function which often renders a look into the manual unnecessary.

- **Languages**
  The software for the PC/laptop may be set to German, English, French, Spanish, Italian, Czech, Portuguese, Hungary, Polish, Chinese, Japanese, Korean and Russian. Other languages as option.



Installation on top hat rail

Connections

- **IO-Ports**
  optically insulated interface for PLC connection with 32 inputs and 32 outputs

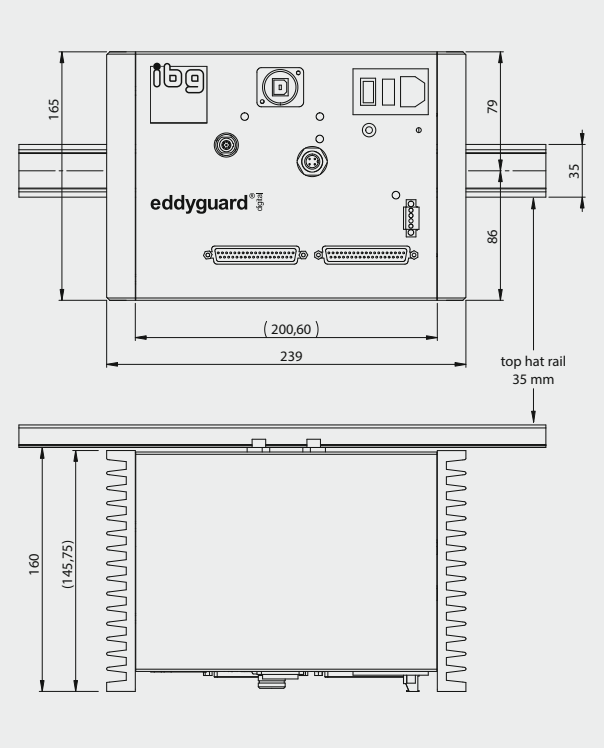
- **USB 2.0**
  for connection of a PC/laptop supplied by customer

Housing

- completely sealed and thus can be used in a dusty production environment
- for installation on top hat rail TH35 as per DIN EN 60715.

Technical Data

Mains: 100 – 240 V, 50/60 Hz
Protection class: IP 41
Ambient temperature: 0 – 45°C
Relative humidity: max. 85 %, non condensing
Dimensions (w x h x d): 239 x 165 x 169 mm
Weight: 4 kg

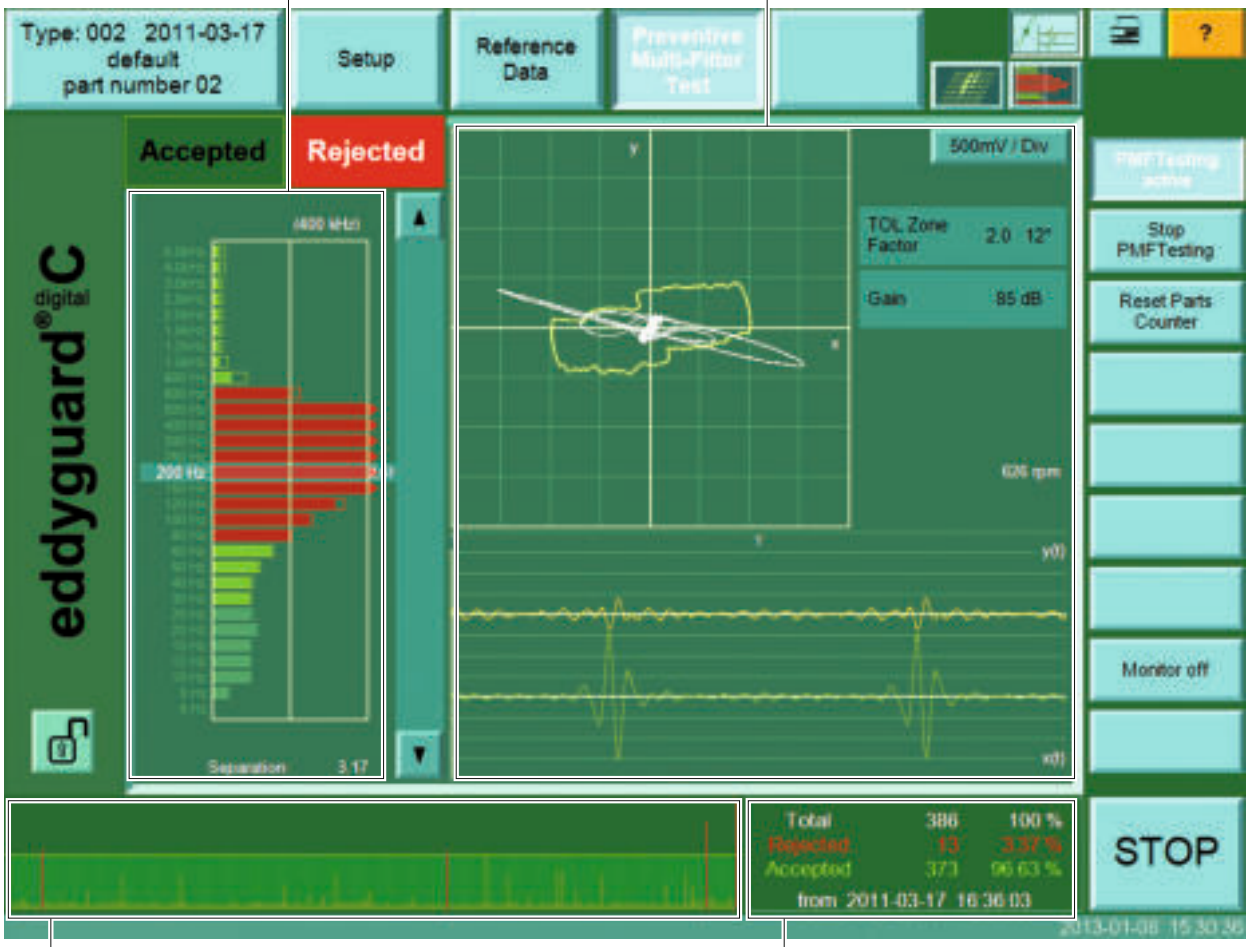


Dimensional drawing of the instrument

High testing accuracy, sensitivity and temperature stability - probes of different design for crack and grinder burn detection. Back-left an eddyscan H rotating head for testing parts in a line. Back-right an eddyscan F for testing boreholes and surfaces.

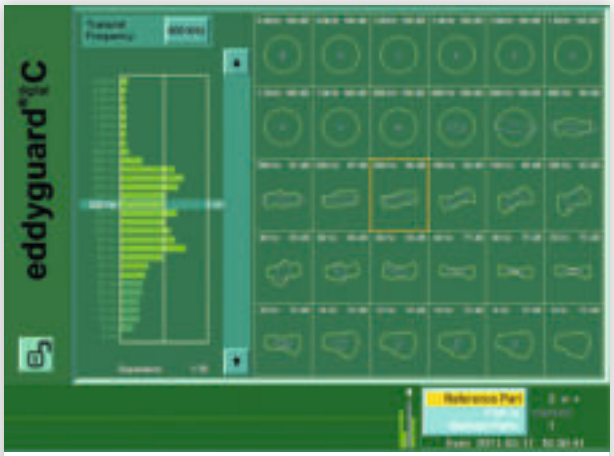
Bargraph display of the latest test results over all 30 band pass filters.

Classic signal curve display of a single band pass filter with relating good part tolerance zone.

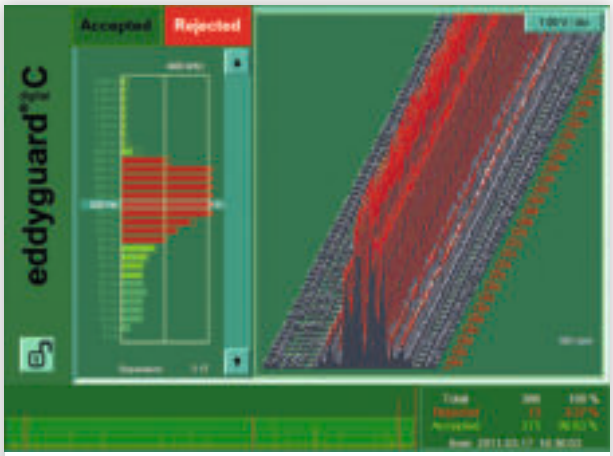


Test part history

Parts counter



Display of all 30 tolerance zones in material data recording



C-scan display of test result

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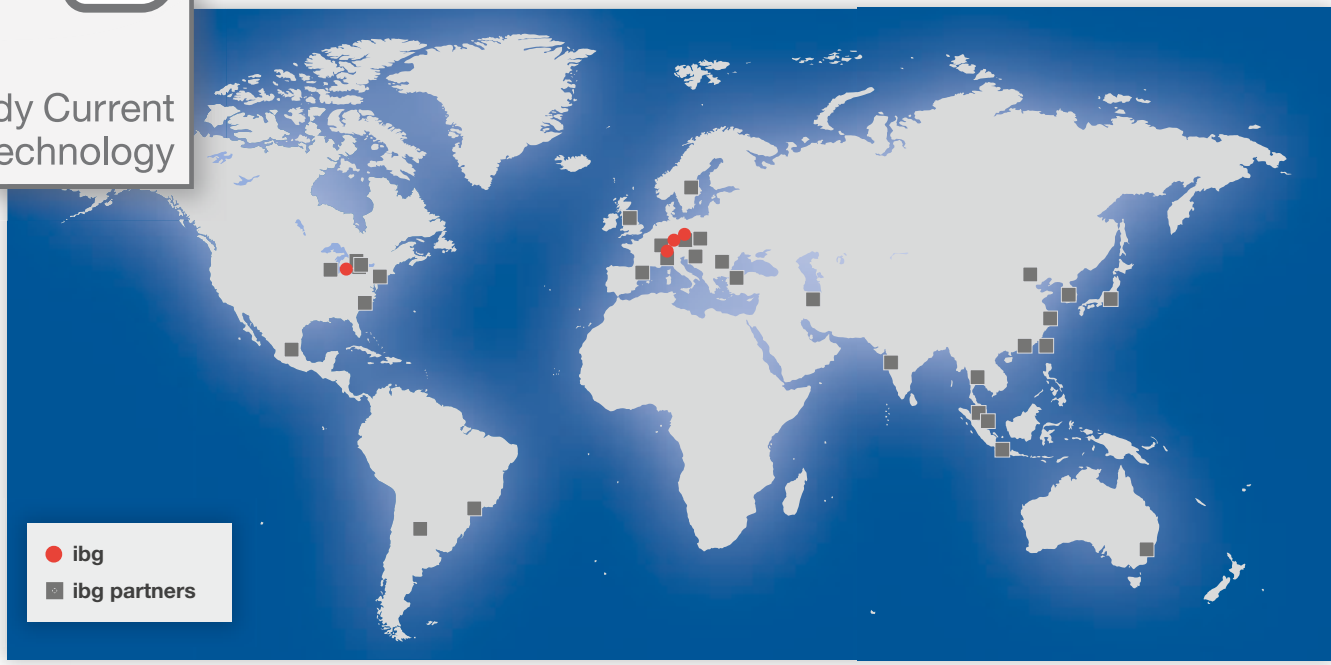

Instruments

Coils and Probes

Automation

For more than 30 years, the ibg group has been a market leader manufacturing eddy current test instruments and setting technology standards. Whether for multi-frequency structure verification, automatic tolerance zone generation or multi-filter crack and grinder burn detection – again and again innovations and inventions of the ibg developers shape the market and provide advanced testing solution.

The headquarters is situated in Ebermannstadt, Upper Franconia, and together with subsidiaries in the US, Switzerland and the Czech Republic as well as a competent worldwide partner network, we service our customers in industry and automotive engineering.

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