

## STATOGRAPH ECM 6.421



- \* Low-cost eddy-current module for non-destructive flaw testing
- \* Processor-controlled compact unit
- \* Simple operation
- \* Test pieces sorted into two groups: o.k. / n.o.k.
- \* One-dimensional display of measured value by LED bar graph
- \* Key-operated switch for locking operating functions

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## Features

- ✓ Test frequency selected by plug-in module (one fixed frequency) or user-selectable (up to eight frequencies)
- ✓ Frequency range 1 kHz to 3 MHz
- ✓ Vector evaluation
- ✓ Phase-selective component evaluation (optional)
- ✓ Dynamic operation
- ✓ Static operation (optional)
- ✓ Clearance compensation (optional)
- ✓ Can be combined with additional STATOGRAPH ECM, MAGNATEST<sup>®</sup> ECM and/or DEFECTOMAT<sup>®</sup> ECM
- ✓ PC interface to evaluation program eddyWin running with MS WINDOWS<sup>®</sup>
- ✓ Simple integration into existing control cabinets
- ✓ Physically separated interface for the most important control signals to the testing line
- ✓ Mains failure protection by battery backup of the parameter memory

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## Application

- Non-destructive testing for surface flaws using eddy-current method in accordance with DIN 51 140
- Testing of ferrous, austenitic and non-ferrous material
- Testing of components, structures, small parts and mass-produced parts
- Use of absolute and difference eddy-current probes
- Connection of stationary, rotating or linear-motion scanning probes, through-type or segment coils
- High defect resolution (as from 30  $\mu\text{m}$ , depending on the surface quality)

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## Mode of operation

Application rotating sensor system

The eddy-current scanning probe rotates at high speed just above the surface of the test piece, which is moved longitudinally, and scans the surface.

### Application stationary or moving probes

The eddy-current probe scans the surface or sub-areas of a test piece which is rotated. During this process, the eddy-current scanning probe with "punctiform" action (Figure 1) detects only a small section of the material surface at each instant, i.e. it concentrates on a very small part of the overall circumferential area when testing. Thus, even an extremely small material flaw represents a major disturbance percentage-wise with respect to this relatively small section of the material surface scanned by the probe. The eddy-current scanning probe indicates extremely small material flaws reliably with maximum resolution.

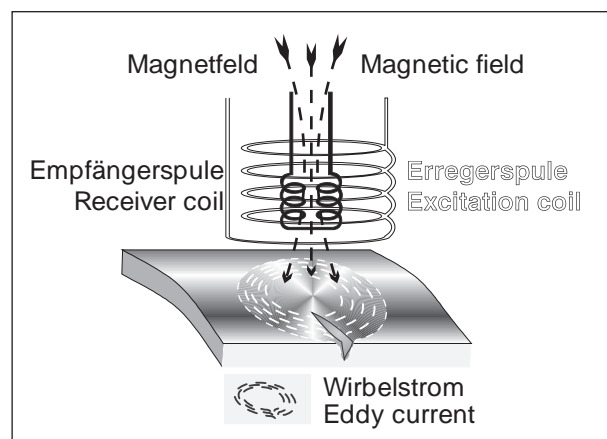


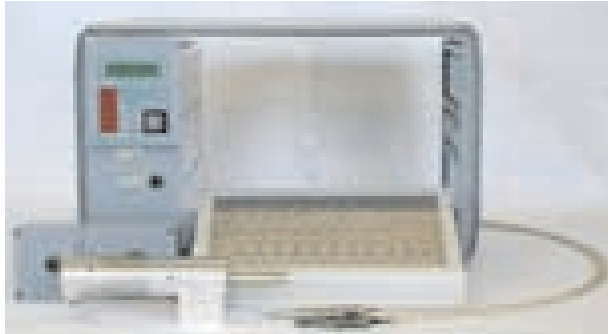
Fig. 1 Principle of the eddy-current probe

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## Construction

In its standard configuration, the STATOGRAPH ECM consists of the components

- STATOGRAPH ECM 6.421
- Frequency module for one fixed frequency
- Mains cable, sensor cable, connecting cable
- Sensor system



The system can be adapted in steps to the respective test situation by adding further components:

- Frequency module for up to eight selectable frequencies
- Phase adjuster for phase-selective component evaluation
- Static operation
- Clearance compensation
- Housing 6 HU
- Configuration adapter
- Combination with additional STATOGRAPH ECM, MAGNATEST ECM and/or DEFECTOMAT ECM

Remote control and extended display and evaluation by PC program eddyWin  
Please refer to separate leaflet „ECM-SYSTEM“, Order No. 107 593 4, for possible combination options.

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## STATOGRAPH ECM 6.421

The STATOGRAPH ECM contains the control elements, the test channel and the power supply.

- Input keys for user inputs
- Key-operated switch for locking operating functions
- LC display for plain-text messages
- LED bar graph for measured value and threshold display
- Individual LEDs to display certain conditions
- Sensor connection socket
- Serial interface to additional ECMs or PC
- Parallel interface to the testing line (inputs via optocouplers; outputs via relays)

- Analog output socket
- Mains connection socket
- Standard plug-in module for 19" cabinets
- Dimensions approx. 261 x 106 x 313 mm (H x W x D)

- Mass approx. 5 kg

The STATOGRAPH ECM is delivered as standard with a test frequency of 300 kHz. However, it may also be equipped with other test frequencies for certain applications. Instead of a fixed-frequency module the instrument can be equipped with a module for up to eight switchable frequencies. Please specify when ordering.

### Variable frequency option

In its standard configuration the STATOGRAPH ECM is equipped with a single-frequency module. As an option a multi-frequency module can be installed. With this option the user can select the test frequency from up to eight values.

### Phase adjuster option

The STATOGRAPH ECM can operate in „vector evaluation“ mode and optionally also in „phase-selective component evaluation“ mode. The plug-in module PHASE ADJUSTER must be installed in the ECM for this purpose. Please specify when ordering.

### Static operation option

The STATOGRAPH ECM operates in dynamic operation in the basic version. As an option, it can also be equipped with static operation for certain applications. The plug-in module STATIC OPERATION must be installed for this purpose. Please specify when ordering.

### Clearance compensation option

In certain applications it is necessary to correct the sensitivity of the test channel to suit the respective probe clearance. The STATOGRAPH ECM can be equipped with the option CLEARANCE COMPENSATION for this purpose. Please specify when ordering.

### Analog signal cable (Diode BNC)

Connecting cable to connect an oscilloscope to the analog output of the STATOGRAPH ECM.

### Sensor systems

Sensors designed for the STATOGRAPH S system can be connected to the STATOGRAPH ECM. Please refer to the corresponding data sheets for a detailed description.

### Adapter for sensor cable

For direct connection of a STATOGRAPH probe to the STATOGRAPH ECM. No additional coil cable required. The distance between the test instrument and the probe is limited by the length of the sensor cable (approx. 1 m).

### Cable adaptation for probe cable

Contains drivers for the sensor winding and preamplifiers for the receiver winding(s). This makes it possible to span larger distances between test instrument and sensor. Additional coil cable required.

### Coil cable 10 m

For connection of a STATOGRAPH sensor to the STATOGRAPH ECM. Other cable lengths available on request.

### Housing 6 HU

To accommodate one to four ECM modules.  
Dimension  
approx. 290 mm x 475 mm x 345 mm (H x W x D)

### Functional package with oscilloscope

For easy operation FOERSTER offers a complete package consisting of a STATOGRAPH ECM, a digital storage oscilloscope, the necessary connection cables and a desktop housing 6 HU. The oscilloscope includes a serial interface for communication and remote control as well as a parallel interface for documentation on a standard printer.



### Configuration adapter

Plug-on module for automatic configuration of the STATOGRAPH ECM. Stores the configuration data for one application.

### Determining the instrument setting

If required, FOERSTER can determine an application-specific instrument setting in its application laboratory and save it on the configuration adapter. Specimen test pieces must be submitted for this purpose.

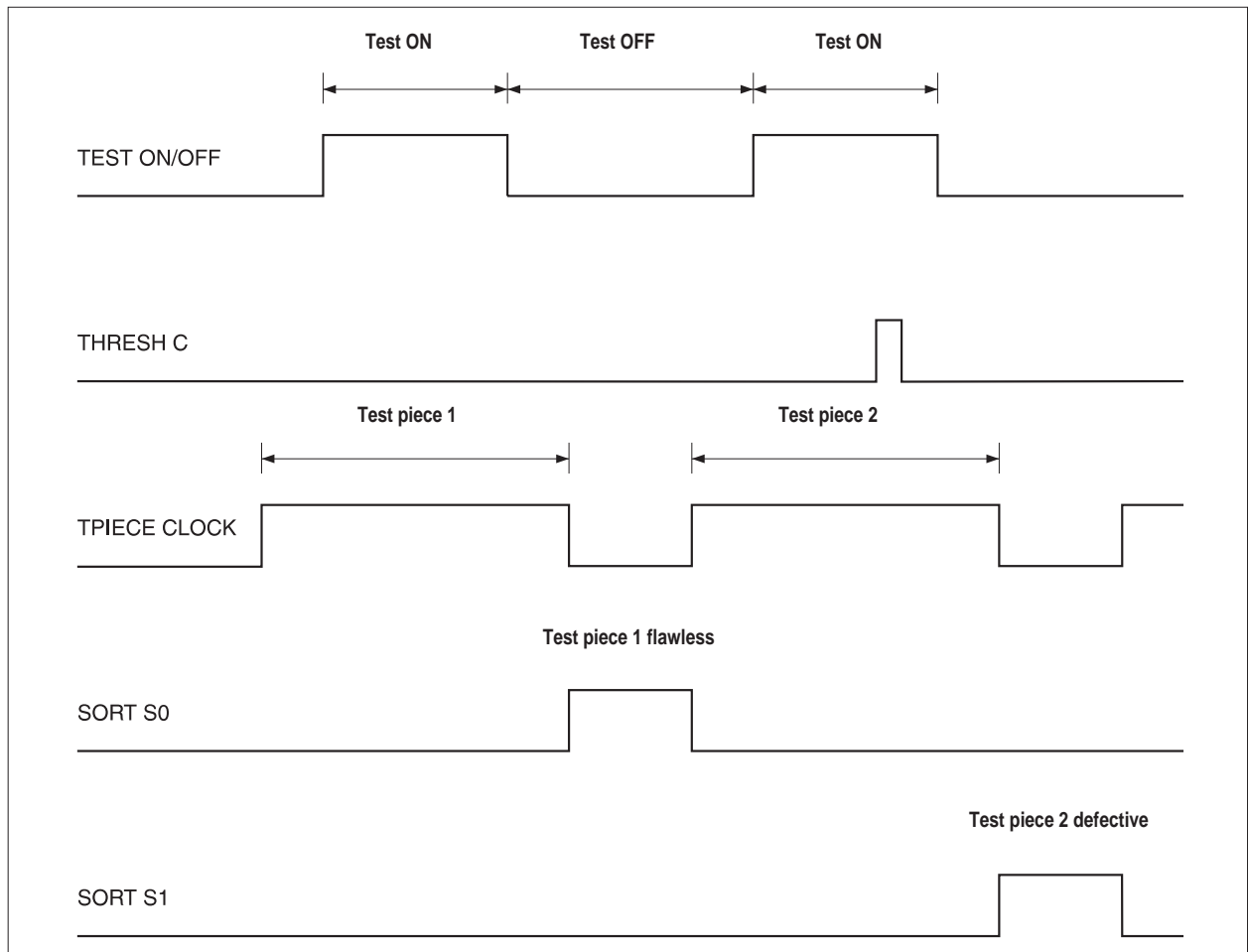
## Test sequence

The ECM's test sequence is controlled by two external signals: TEST ON/OFF and TPIECE CLOCK. TEST ON/OFF controls test release. TPIECE CLOCK controls the evaluation sequence (assignment of flaw signals to test pieces).

The test result is signaled by the ECM to the control by instantaneous signals (threshold transgression THRESH A, THRESH B and THRESH C) on the one hand and by static signals (SORT S0 = flawless test

piece, SORT S1 = defective test piece) on the other. A test piece is evaluated as defective if flaw threshold C was exceeded at least once.

Threshold transgressions THRESH A, THRESH B and THRESH C are signaled immediately they occur and for the duration of the threshold transgression by LEDs and by output signals at socket IN/OUT. The sorting signals SORT S0 and SORT S1 are output at socket IN/OUT only when the tail of the test piece is reached. The criterion for this is the trailing edge of the input signal TPIECE CLOCK.



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**Technical data**

Test frequency	1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz, 300 kHz, 1 MHz, 3 MHz selectable by plug-in module
Sensor	Difference or absolute sensor
High-pass filter, low-pass filter	1 Hz to 16 KHz, 25 steps
Testing	Dynamic operation  Static operation with zero compensation (optional)
Evaluation mode	Vector evaluation  Phase-selective component evaluation (optional)  Clearance compensation (optional)
Microprocessor	For sequence control, operator prompting self-test, etc.
Permissible supply voltage	115/230 V +10% -15%, 50-60 Hz
Operating temperature	+5 °C to +40 °C
Type of protection (DIN 40 050)	IP 30 (ECM without housing) IP 54 (ECM in housing 6 HU)