

MAGNATEST[®] D Test System 3.623



Figure 1: MAGNATEST[®] D 3.623

The FOERSTER MAGNATEST D 3.623 is a test instrument for non-destructive testing of metallic materials for their different magnetic and/or electrical properties.

It is well-suited for testing both semi-finished products (bars, tubes, wires, etc., software version HZP) as well as mass-produced parts and components (bolts, screws, rings, valves, forged parts, etc., software version SGP) for quality differences such as

- alloy content
- heat treatment
- grain structure
- material strength
- hardness
- case depth

and other properties.

With the MAGNATEST D 3.623 a modern test instrument has been created which enables the operator an easy, fast, and secure solution of virtually any test task in the field of materials testing.

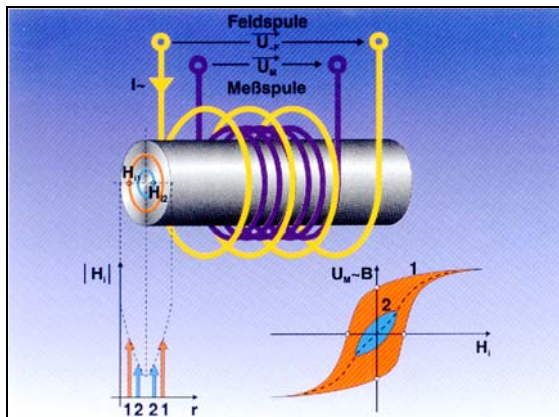
Characteristics

- Processor controlled test system for manual or automatic magneto-inductive non-destructive materials testing
- Single-coil absolute operating mode; therefore no compensation coil required; adapter for two-coil differential mode available
- Constant excitation current; therefore defined magnetic field over the whole test
- High output current amplitude; therefore stimulation of higher harmonics and particularly high sensitivity for the magnetic properties of the test sample
- Single frequency or multi-frequency testing, evaluation of higher harmonics
- Simple operators interface thanks to application specific function keys and high-resolution TFT color display
- Standard interfaces for peripheral devices (keyboard, mouse, printer, network, etc.)

Mode of operation

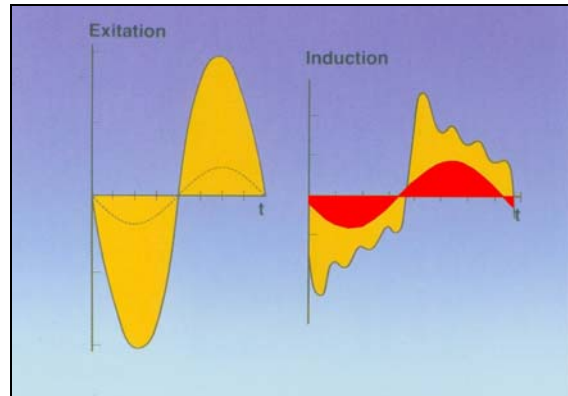
The part under test is exposed to the magnetic field created by the test coil. Eddy currents are induced within the electrically conductive material. Additionally the part is magnetized as far as ferromagnetic material is to be tested.

The voltage induced in the receiver winding depends on the electrical conductivity (electrical property) as well as on the shape and size of the hysteresis curve (magnetic property). It is analyzed and allows a sensitive test of ferromagnetic as well as non-ferromagnetic and austenitic materials.



Since the hysteresis curve itself is strongly influenced by technological parameters like hardness, alloy content and grain structure a determination of those parameters is particularly sensitive to the magnetic properties.

At higher excitation field strength a non-sinuosoidal signal is produced which consists of a ground wave and higher harmonics.



An analysis of the content of higher harmonics supplies information about the material condition. Alloy composition and mechanical or thermal treatment of ferromagnetic test pieces that influence different ranges of the hysteresis curve can be evaluated with high test reliability.

By variation of the excitation field strength it is possible to select that range of the hysteresis curve which gives the highest sensitivity to the magnetic properties of the material under test.

Choosing the appropriate excitation frequency allows selective observation of core and surface characteristics.

Construction

The MAGNATEST D in its standard configuration consists of the following components:

- MAGNATEST D 3.623 basic unit
- function module
- coil cable
- test coil

and can be adapted to the respective requirements by adding further components from the accessory program.



The basic unit includes all components which are required for performing an application:

- robust instrument housing 4HU with integrated fan, power supply, front pad keyboard, high-resolution TFT color screen, diskette drive behind tight closing front lid
- PC plug-in unit with processor module, mass storage device, peripheral interfaces (2 x serial, 1 x parallel, 2 x USB, 1 x PS/2, Ethernet, VGA)
- analog signal board
- signal evaluation board
- power amplifier
- opto-isolated I/O interface

It is adapted to the respective testing task by the appropriate function module.

Function modules

MAGNATEST D – SGP

The standard version for solving your test task. Includes the following features:

- single- or multi-frequency testing; maximum of 24 parameter sets
- sorting gates: circle, ellipses, rectangular (manual ranges), box regression
- manual, internal or external trigger modes
- test throughput depending on the test frequency (more than 10 parts/s at 1 kHz)

MAGNATEST D – HZP

The standard version for applications in semi-finished products testing.

In contrast to the SGP version measurements are continuously triggered as long as the test release input signal is active.

After deactivation of test release input signal all single measurements are combined to an overall-result (median calculation) and output to the opto I/O interface.

Accessories

Test coils

All test coils as well as the LF probes of the MAGNATEST S system can be used for the MAGNATEST D. A detailed description can be found in the leaflet "MAGNATEST S Transmitter Systems 3.625".

The HF probes of the MAGNATEST S system can only be used with the MAGNATEST D after a technical clarification.



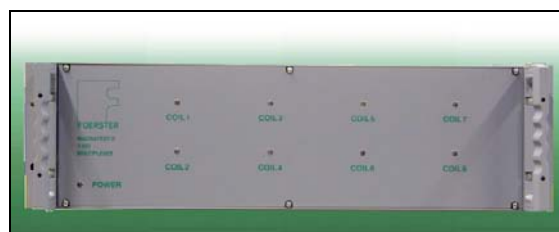
Coil cables

Coil cables of different lengths and with different connectors are available. The following table summarizes the available cables.

Coil cable	Order no.
Coil cable 3 m	3.625.11-9911 138 162 8
Coil cable 5 m	3.625.11-9911 M5 166 051 9
Coil cable 10 m	3.625.11-9911 M10 138 149 0
Coil cable 3 m, angled connector	3.625.01-9914 166 120 5
Coil cable 10 m, angled connector	3.625.01-9914 M10 136 611 4

Coil multiplexer

Multiplexer for operation of up to eight coils with one MAGNATEST D 3.623.



The coil multiplexer is described in detail in a separate leaflet "MAGNATEST D 3.623 Coil Multiplexer".

Mouse

Standard PC mouse with serial connector.

Keyboard

Compact keyboard with touch pad and USB interface.



Industrial keyboard

Robust keyboard in a drawer 1HU for integration into 19" cabinets. With touch pad.



External CD-ROM drive

External drive to be used for software update and other installation purposes.

Footswitch

The footswitch replaces the manual test release via keyboard or the external test release via test line control. It is connected directly to the opto-I/O interface of the MAGNATEST D.



Signal indicator

Low cost signal light for displaying test results, sorting outputs, error conditions, etc. There are two lamps (red/green) for displaying up to four operating modes. Connection to the opto-I/O interface of the MAGNATEST D by the 37-pin connecting cable. A second connector allows the simultaneous use of the foot switch. For more information see leaflet "Signal Light 3.623.01-2000".



Transfer component

Transfer component with 37-pin DSUB connector and screw terminals for connecting external peripherals to the MAGNATEST D. The transfer component will be connected via the connecting cable to the opto-I/O interface. The external input and/or output lines can be connected at the screw terminals.

The transfer component is useful especially when mounting the test instrument into a 19"-cabinet.

I/O-Adapter 3.623

Versatile extension module for easy integration of additional components. The base version allows the connection of external signals (e.g. from the PLC) by the 37-pin transfer component.



Several options enable the adaptation to most implementation situations. Please ask for separate leaflet "MAGNATEST D I/O-Adapter 3.623".

Opto-I/O-Tester

Test device for easy investigation of functionality of the MAGNATEST D opto-I/O interface. This device will be connected instead of other peripherals and allows the display of MAGNATEST D output signals by LED's as well as generating MAGNATEST D input signals by manual switches. For a detailed specification please ask for the separate leaflet "MAGNATEST D Opto-I/O-Tester".



Connecting cable

37-pin cable for connection of signal indicator, transfer component, IO-Adapter, or Opto-I/O-Tester to the MAGNATEST D.

Mounting set 19"

When installing the MAGNATEST D into a 19"-cabinet the mounting set 19" is required. Please note that a later installation of the mounting set requires some extra work; therefore, please state already with your order if the mounting set 19" is necessary.

Mounting set 19" for DS 6.430 cabinet

Complete mounting set for installing the MAGNATEST D into the 19"-cabinet of the FOERSTER DS 6.430 system. Includes the mechanical components (sliding bars, assembly material, strain relief), as well as the components for connecting the opto-I/O interface (transfer component, connecting cable).

Please pay attention to additionally ordering the mounting set 19" (3.623.01-0491) together with the MAGNATEST D.

Technical Data

MAGNATEST D

Test frequency	2 Hz to 12 kHz in 14 steps	Evaluation	Ground wave; spectral analysis up to the 11 th harmonic for test frequencies up to 2 kHz
Test throughput	depending on test frequency; more than 10 parts/s at 1 kHz	Interfaces	serial, USB, printer (parallel), mouse (serial), external keyboard(PS/2), external monitor (VGA)
Test release	manual, external, internal	Inputs	8 (galvanically isolated)
Sorting gates	Circle, ellipse, rectangle (manual ranges), box regression	Outputs	8 (galvanically isolated)
Test mode	Group analysis	Permitted supply voltage	115 V/230 V \pm 10%, 50 Hz or 60 Hz (please state the mains frequency when ordering)
Number of sorting groups	6	Dimensions	ca. 177 x 450 x 425 mm ³ (HxWxD)
Excitation	single-frequency, multi-frequency	Mass	approx. 18 kg
Output amplifier	Current-driven max. 2,0 A _P , max. 36 V _P	Operating temperature	+5°C to +40°C
Test	Single-coil absolute mode; two-coil differential mode optional	Relative humidity	8% to 80%, non-condensing
		Enclosure	IP65, front side

Product information

Leaflets

Signal Light 3.623.01-2000	150 865 2
Foot Switch 3.623.01-9704	151 120 3
I/O-Adapter 3.623	188 011 0
Opto-I/O-Tester	188 009 8
MAGNATEST S Test System 3.625	137 375 7
MAGNATEST S Transmitter Systems 3.625	137 992 5
MAGNATEST D 3.623 Coil Multiplexer	188 159 0

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Product information

Standard Functional Sets

Designation	Part No.	Order No.
MAGNATEST D 50 HZ PIECE TESTING	3.623.81	167 631 8
MAGNATEST D 60 HZ PIECE TESTING	3.623.91	169 715 3
MAGNATEST D 50 HZ SEMI-FINISHED PROD TESTING	3.623.84	169 695 4
MAGNATEST D 60 HZ SEMI-FINISHED PROD TESTING	3.623.94	169 717 0

These items are the standard versions (desktop housing). For mounting into a 19" industrial cabinet please make sure to add the mounting set 19" to your p.o.

Standard Components

Designation	Part No.	Order No.
COIL CABLE	see page 3	
COIL MULTIPLEXER	see separate leaflet	
KOMPACT INDUSTRIAL KEYBOARD WITH TOUCHPAD USB GER-LAYOUT	KS9509	038 204 3
KOMPACT INDUSTRIAL KEYBOARD WITH TOUCHPAD USB US-LAYOUT	KS9510	038 203 5
19 INCH 1HU INDUSTRIAL KEYBOARD USB TOUCHPAD GER-LAYOUT	KS9529	038 046 6
19 INCH 1HU INDUSTRIAL KEYBOARD USB TOUCHPAD US-LAYOUT	KS9530	038 045 8
FOOT SWITCH	see separate leaflet	
SIGNAL INDICATOR RED/GREEN	3.623.01-2000	150 873 3
TRANSFER COMPONENT 37-PIN SUB-MIN-D	289-558	030 999 0
I/O-ADAPTER 3.623	see separate leaflet	
OPTO-I/O-TESTER	see separate leaflet	
CONNECTION CABLE 37-PIN ST-ST 1M		038 590 5
CONNECTION CABLE 37-PIN ST-ST 2M		038 573 5
MOUNTING SET 19" FOR MAGNATEST D	3.623.01-0491	167 628 8
MOUNTING SET 19" FOR CABINET DS (6.430)	3.623.01-0493	169 767 6