

PRODUCT INFORMATION



# MAGNETOSCOPE® 1.070

Portable Magnetometer



proof.

## Features

- Portable, microprocessor controlled magnetometer system
- Probes for the measurement of the magnetic flux density as absolute or gradient value
- Probes for determination of the relative magnetic permeability  $\mu_r$  in accordance with IEC 60404-15 und ASTM A342/A342M
- USB interface for data transfer
- SD card for storage of measurement data and parameters
- Peak value detection and storage
- Adjustable limits for threshold values
- Visual and acoustic alarm
- Single or batch measurement
- Editable measuring- and test procedures including graphical operator assistance
- Battery or mains operated
- PC software for data analysis and report generation

## Measurement method

- Fluxgates probes (absolute or gradient)
- Hall-probes (absolute)

## Applications

- Long term monitoring of magnetic environmental conditions, e.g. prior to installation of magnetic sensitive devices e.g. MRI systems
- Testing of feebly magnetic materials and machined components for magnetic remanence
- Determine the demagnetization status of steel bars and components
- Detection of ferrous inclusions in austenitic steels and nonferrous alloys
- Surface inspection to detect inclusions in wear sensitive components like bearing rings
- Determination of relative magnetic permeability as part of the quality inspection for austenitic steels and feebly magnetic / nonmagnetic alloys
- Verify material changes caused by carburization, corrosion, coating reduction or micro structural alteration by permeability comparative measurement

## Components

The measuring instrument as well as the probes are calibrated. They are delivered with a calibration certificate. The device and calibration parameters are electronically stored in the respective component. The measuring instrument automatically recognizes the probes, when it is connected.

### Measuring instrument MAGNETOSCOPE 1.070



- Compact, lightweight measuring instrument
- 3,5" color display
- Clear menu structure for operator guidance
- Data logging function
- Connection of 1-axis-magnetic field sensor, 3-axis-magnetic field sensors as an option
- Connection of permeability probes
- Trigger input
- Temperature measuring channel
- USB, mini USB and SD card interfaces
- Power supply by batteries, battery pack or mains adapter

### Probe PD-100-100



- Differential probe with 100 mm sensor distance
- 1 nT to 100 µT measuring range
- For detection of larger local magnetic field anomalies
- Compensation of the earth magnetic field or large disturbances caused by anomalies at bigger distance
- Orientation dependency when moving in the earth magnetic field: < 50 nT

### Probe PD-100-20



- Differential probe with 20 mm sensor distance
- 10 nT to 100 µT measuring range
- For detection of smaller local magnetic field anomalies
- Detection of locally limited remanences
- Compensation of the earth magnetic field or large disturbances caused by anomalies at bigger distance
- Orientation dependency when moving in the earth magnetic field: < 100 nT

## Probe PFD-100



- Probe pair for the optional arrangement as an absolute or differential probe- with variable sensor element distance
- 1 nT to 100  $\mu$ T / 200 $\mu$ T measuring range by absolute or differential arrangement
- Determination of magnetic remanence of single components, whereby the probe has to be in a fixed position and compensated to zero
- When using differential arrangement with parallel arranged sensor elements: compensation of the earth magnetic field or bigger disturbances from the distant field
- Nonmagnetic probe mount – as an option

## Probe PF-1000



- Probe for determination of absolute magnetic field
- 10 nT to 1 mT measuring range
- Sensor elements are installed parallel in axial direction of the probe housing
- Determination of magnetic fields (orientation + value))
- Determination of magnetic remanence of single components, whereby the probe has to be in a fixed position and compensated to zero

## Probe PH-50-TR



- Probe for determination of absolute magnetic field
- 1  $\mu$ T to 50 mT measuring range
- Sensor element is installed perpendicular to the longitudinal axis of the probe
- Determination of magnetic fields (orientation + value)
- Determination of magnetic remanence of single components with high spatial resolution

## Probe PH-50-AX



- Probe for determination of absolute magnetic field
- 1  $\mu$ T to 50 mT measuring range
- Sensor element is installed parallel to the longitudinal axis of the probe
- Determination of magnetic fields (orientation + value)
- Determination of magnetic remanence of single components with high spatial resolution

## Probe PP-2-5



- Probe for the determination of the relative magnetic permeability  $\mu_r$  on semi-finished products and components
- Measuring range  $\mu_r$  1,00000 to 2,00000
- „Permeability Meter“ method according to IEC 60404-15 or „Flux Distortion Method“ according to ASTM A342/A342M, method 4
- Calibrated traceable to national standards (PTB-Braunschweig), measured in accordance with IEC 60404-15“Solenoid / magnetic moment“ Method, ASTM A342/A342M Method 1, H=30 kA/m

## Probe PP-2-2



- Miniaturized probe for measurement of effects correlated to magnetic permeability, e.g. coating thickness, carburization layer thickness, corrosion effects
- The probe size is optimized for measurement of small components and complex shaped design.
- The probe is not designed for the determination of the relative magnetic permeability  $\mu_r$  traceable to national standards.

## Probe PP-2-2-R

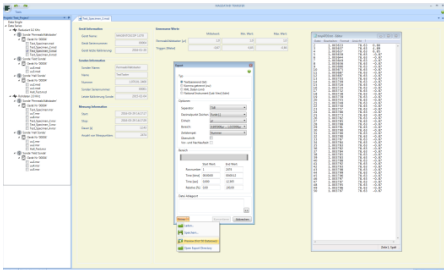


- PP-2-2 –R with 90° angled sensor head.

## Software

### MAGDATA® Transfer-Software

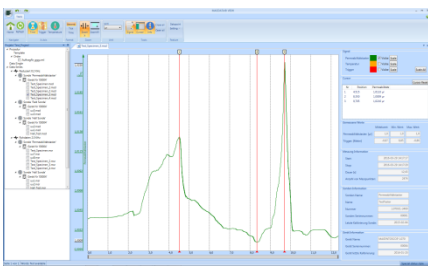
Software for the communication between PC and MAGNETOSCOP.



- Loading of measuring data from the MAGNETOSCOP
- Converting of measurement data set in different formats (.txt, .csv, .xml, .tdm (LabVIEW™)....)
- Loading of software-updates on the MAGNETOSCOP

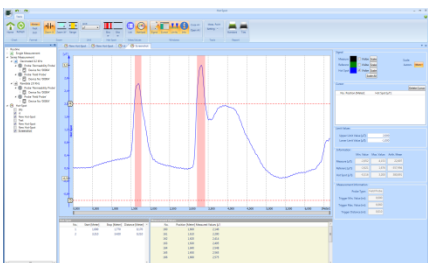
### MAGDATA® VIEW-Software

Comprehensive software for visualization of measuring data – up to 16 channels per chart.



- Data selection and reduction
- Visualization of measuring data (oscilloscope, list of values...)
- Processing of dynamic measurement methods including trigger information (time, distance)
- Statistical evaluation of measurement series
- Report generation and printing
- Creation of templates for measuring and testing procedures and transfer to the MAGNETOSCOP

### MAGDATA® HOTSPOT-Software



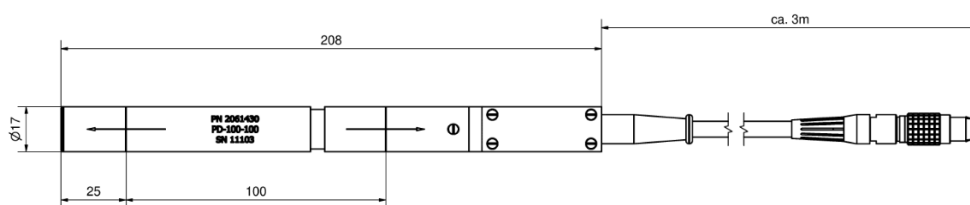
- Data selection and reduction
- Visualization of measuring data (oscilloscope, list of values...)
- Processing of dynamic measurement methods including trigger information (time, distance)
- Processing of reference measurements for Offset-compensation
- Definition and display of treshold values, highlighting of magnetic anomalies
- Report generation according to API Spec 7

## Technical Specification

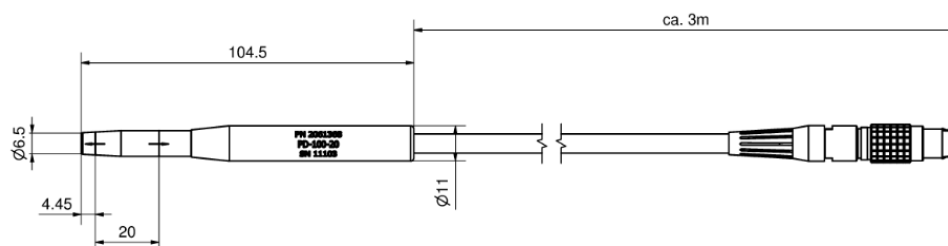
Measuring range	0,1 nT to 1 mT (Fluxgate Probe) 1 $\mu$ T to 50 mT (Hall Probe) $\mu_r$ 1,00000 to 2,00000
Resolution	24 Bit ADC
Measurement uncertainty, field measurement	1,5% of the measured value Hall Probes: 1 $\mu$ T to 40 mT – 2 % of the measured value 40 mT to 50 mT – 4% of the measured value
Measurement uncertainty, permeability measurement	5% of the measured value
Ambient temperature	0 to +40 °C
Protection grade	IP 54
Dimensions measuring instrument	212 x 102 x 41 mm (L x W x H)
Display size	3,5"
Weight - measuring instrument incl. batteries	0,62 kg
Battery type	4 pcs. Mignon, AA, LR6 Alkaline or NiMH

## Probe dimensions and position of the sensors

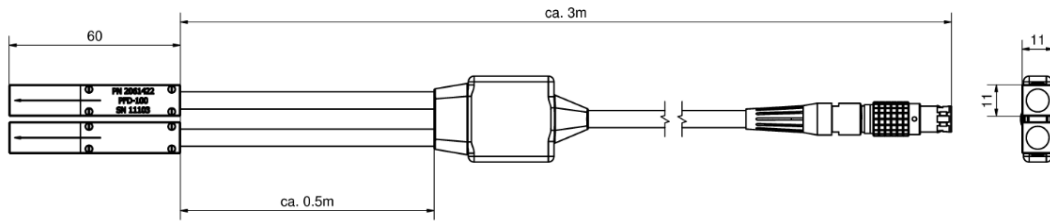
### PD-100-100



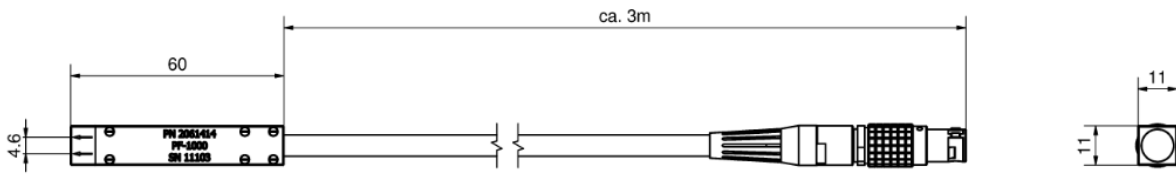
### PD-100-20



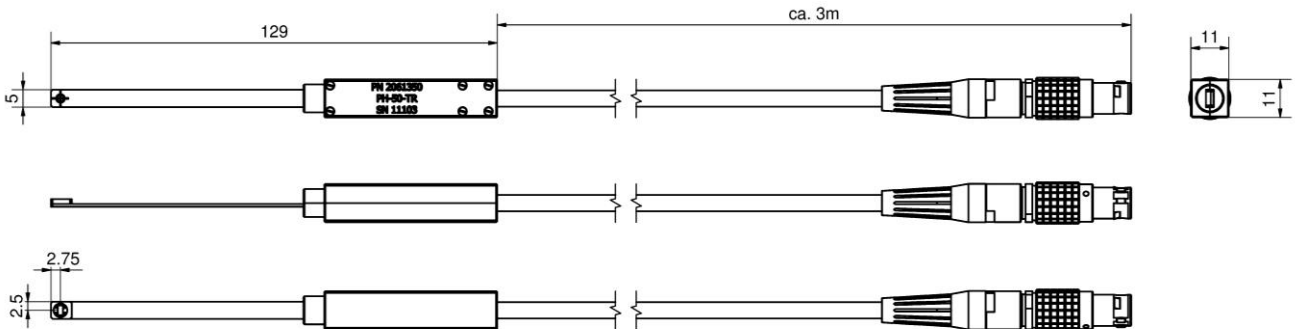
### PFD-100



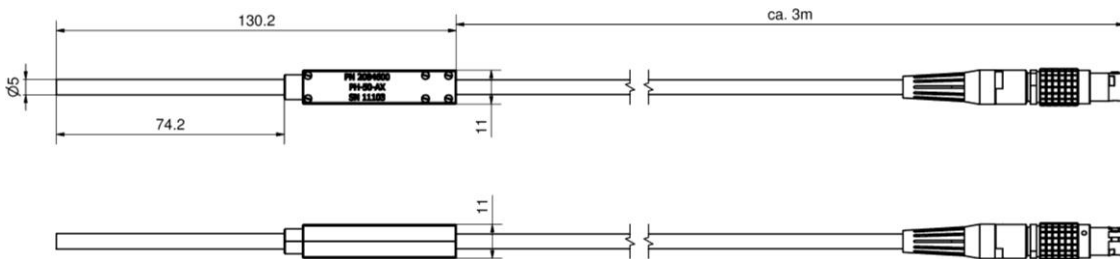
### PF-1000



### PH-50-TR

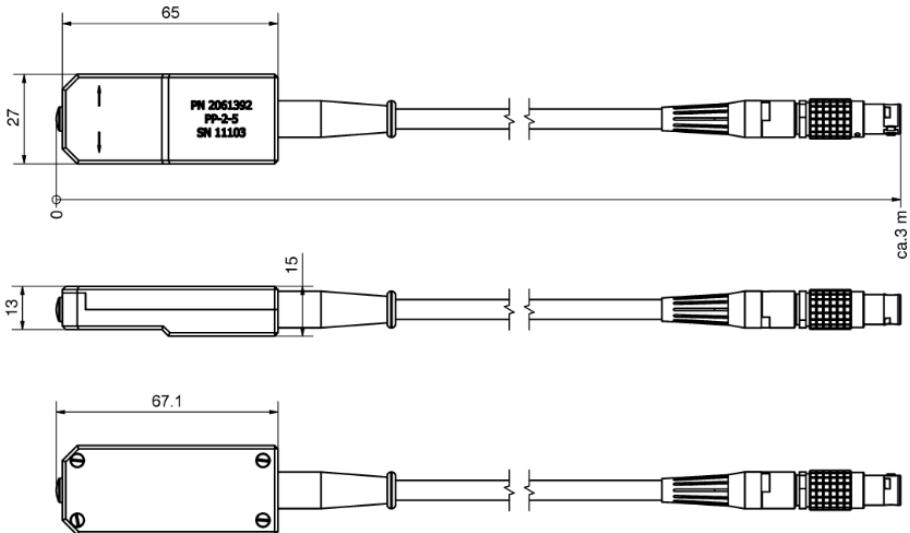


### PH-50-AX

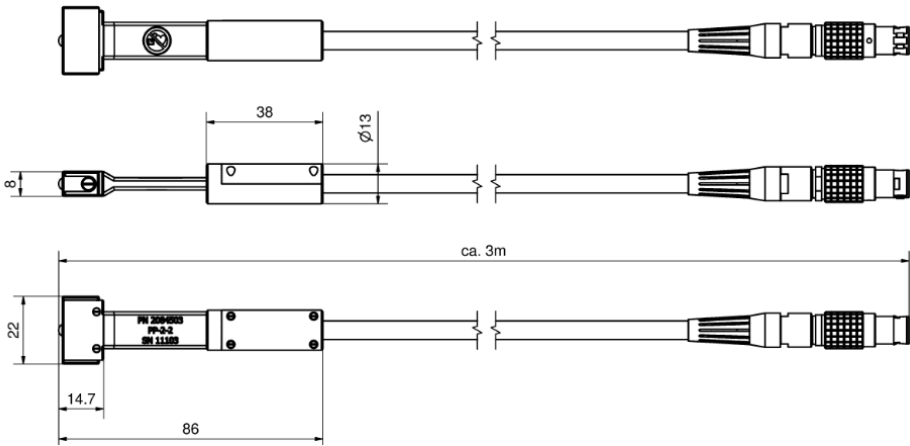




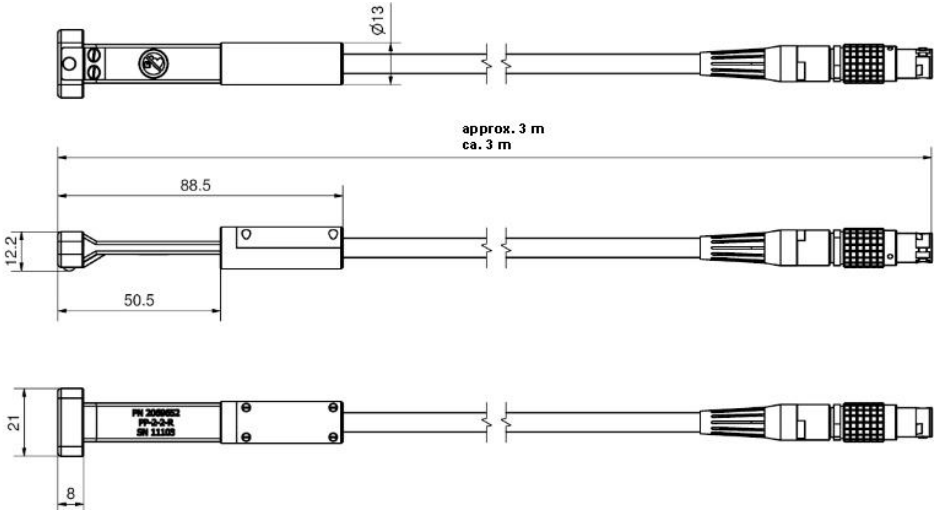
PP-2-5



PP-2-2



PP-2-2-R



## Standard kits

### **MAGNETOSCOP 1.070 – Field and differential measurement**

Basic equipment

- Measuring instrument MAGNETOSCOP 1.070
- Transport case
- Mains adapter
- MAGDATA TRANSFER software
- USB cable
- 4 batteries

Probe PFD-100

Probe mount

### **MAGNETOSCOP 1.070 – Field measurement**

Basic equipment

Probe PF-1000

### **MAGNETOSCOP 1.070 – Field measurement Hall-transversal**

Basic equipment

Probe PH-50-TR

Zero-Gauss Chamber

### **MAGNETOSCOP 1.070 – Field measurement Hall-axial**

Basic equipment

Probe PH-50-AX

Zero-Gauss Chamber

### **MAGNETOSCOP 1.070 – Differential measurement – 20 mm**

Basic equipment

Probe PD-100-20

### **MAGNETOSCOP 1.070 – Differential measurement – 100 mm**

Basic equipment

Probe PD-100-100

### **MAGNETOSCOP 1.070 – Permeability measurement**

Basic equipment

Probe PP-2-5

Reference standard  $\mu_r$  1.05

Adapter

## Accessories

### Power supply

Mains adapter	5 VDC, 2.4 A, 100 – 240 VAC
Battery	NiMH 1.2 V, Mignon, AA, HR6, 2.850 mAh
Battery charger for NiMH batteries	100 – 240 VAC, 50/60 Hz
Battery pack (external)	5 VDC, 2.4 A, 10.000 mAh
Battery charger for external battery pack	5 VDC, 2.2 A, 100 – 240 VAC, 50/60 Hz

### Cables

Trigger cable	5 m long
Extension cables – probes	5 / 15 m

### Reference standards

Reference standard	$\mu_r$ 1.005/ 1.025/ 1.05/ 1.2 for probe PP-2-5, calibrated traceable to national standards (PTB-Braunschweig), measured in accordance with IEC 60404-15 "Solenoid / magnetic moment" Method, ASTM A342/A342M Method 1, H=30 kA/m
Reference standard	For probes PP-2-2 and PP-2-2-R
Adapter for precise probe centering on the reference standard	3 types, for probes PP-2-5 / PP-2-2 / PP-2-2-R
Zero-Gauss Chamber	For zero-compensation of PH-50 probes

### Software

MAGDATA® Transfer	System requirements: 32 / 64 bit OS Windows 7 or higher
MAGDATA® View	
MAGDATA® Hotspot	

### Miscellaneous

Carrying bag	For measuring instrument and external battery pack
Belt pouch	For external battery pack

## Imprint



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