**METRAHIT Iso and METRAHIT COIL**

**TRMS Multimeter with Insulation Measurement and Interturn Short-circuit Measurement (COIL only)**

- **Insulation resistance measurement up to 3.1 GΩ** with interference voltage detection, test voltages: 50 V, 100 V, 250 V, 500 V, 1000 V
- **Multimeter with diverse functions (V, Ω, F, Hz)**
- **TRMS measurements**: TRMS AC / AC+DC for current/voltage up to 10 kHz
- **Activatable low-pass filter**: 1 kHz/~3 dB in the V AC range
- **Direct current measurement**: 100 nA to 10 A
- **Current measurement with clip-on current sensors – CLIP**: A transformation ratio of 1 mV:1 mA to 1 mV:1 A can be selected and is taken into consideration at the display.
- **Precision temperature indicator**: °C or °F, for Pt100/Pt1000 sensors and type K thermocouples
- **Diode measurement** (I<sub>k</sub> = 1 mA, U<sub>flow</sub> to 5.1 V) and **continuity testing**
- **Duty cycle measurement**: 5 to 95% (METRAHIT COIL only)
- **Display**: 3¾ digits, 3100 steps, illumination can be activated
- **Acoustic signals**: for: continuity testing, dangerous contact voltages, exceeded overload limits
- **Min-Max value storage**
- **Data memory** and internal clock, power pack adapter socket
- **IP 54 Housing**: protection, dust and splash protected, protective cover
- **Bidirectional infrared interface** for exchanging data with a PC
- **Windows software** available as accessory for processing and graphic display of measured values via USB interface

**Application**

The METRAHIT ISO and METRAHIT COIL multimeters are rugged portable measuring instruments. They are suitable for servicing household appliances, machines (e.g. forklifts) and systems (e.g. photovoltaic). The instruments can be used in the field and are equipped with an internal, mains-independent power supply.

METRAHIT COIL allows for interturn short-circuit measurements in combination with the **COIL TEST ADAPTER**. By comparing the measurement results, asymmetries in motor coils can be detected, which, in turn, is an indication of possible short-circuits.

Interturn short-circuit measurement in the inductance range: 10 μH to 50 mH @ 100 Hz

The standard adapter **COIL** is suitable for the most common electric drives of different performance classes. Adapters for motors with different inductivity are available upon request.

**Features**

**RMS Value with Distorted Waveshape**

The utilized measuring method allows for waveshape independent TRMS measurement of periodic quantities (AC) and pulsating quantities (AC and DC) for voltage and current at up to 10 kHz.

**Activatable Filter for V AC Measurement**

A 1 kHz low-pass filter can be activated if required, e.g. for measurements at cables with parasitic external signals. The input signal is checked by a voltage comparator for dangerous voltages as long as the low-pass filter is activated, which are indicated at the display if present.

**Diode Testing with Constant Current I<sub>k</sub> = 1 mA**

This function can be used to test the polarity of diodes, and to test electrical circuits for short-circuiting and interruptions. The test voltage source makes it possible to measure LEDs and reference diodes up to 5.1 V, e.g. also white LEDs.

**Fast Acoustic Continuity Test I<sub>k</sub> = 1 mA**

Testing for short-circuiting and interruption is possible with the selector switch in the Metrahit COIL position. The threshold value for acoustic signaling can be set to 1, 10, 20, 30, 40 or 90 Ω.

**Insulation Resistance Measurement with Interference Voltage Detection**

Depending upon the utilized instrument variant, insulation resistance can be measured with an adjustable test voltage of 50 to 1000 V.

If the instrument detects interference voltage of greater than 15 V AC or 25 V DC during insulation testing, an error message is briefly displayed at the LCD panel. The instrument is then automatically switched to voltage measurement TRMS (AC + DC) with an input resistance of approximately 1 MΩ and the currently measured voltage value is displayed.

**Analog Scale for Quick Trend Display – Pointer**

The analog scale (with additional negative axis range for zero-frequency quantities) allows for faster recognition of measured value fluctuation than is possible with a digital display.

**Automatic/Manual Measuring Range Selection**

Measured quantities are selected with the rotary switch. The measuring range can be automatically matched to the measured value, or selected manually.
High Resolution Mode
Via mem function „Set Resol“, the multimeter (in V DC and Ohm-function) can be switched to a high-resolution operating mode with 30,000 digits and enhanced accuracy.

Automatic Storage of Measured Values
The DATA HOLD function automates the storage of measured values after they have settled in. A patented process assures that random values are not saved to memory in the case of rapidly changing measured quantities, but rather the actual measured value. The stored measured value appears at the digital display. The analog display continues to read out the current measured value.

Overload Protection
Overload protection safeguards the instrument in all measuring functions against voltage of up to 1000 V. Voltages of greater than 1000 V and currents of greater than 10 A are indicated acoustically. FUSE appears at the display if the fuse for the current measuring input blows.

Battery Charging Status – Power Saving Circuit
The battery charging status is indicated by means of four symbols. The device is switched off automatically if the measured value remains unchanged for a period of between 10 and 59 minutes (adjustable), and if none of the controls are activated during this time. Automatic shutdown can be deactivated by switching the instrument to continuous operation.

Three Connector Jacks with Automatic Blocking Sockets (ABS) *
All current ranges are implemented via a single connector jack which prevents any possibility of operator error. Beyond this, the automatic blocking sockets prevent incorrect connection of the measurement cables, as well as selection of the wrong measured quantity. Danger to the user, the instrument and the device under test resulting from operator error is thus ruled out.

Housing and Protective Cover for Harsh Conditions
• New housing design
• Separate battery and fuse compartments
• Intelligent key functions with SMD button
The instrument is protected against damage in the event of impacts or dropping by means of a soft rubber cover with tilt stand and test probe holder. The rubber material also assures that the instrument does not wander if it is set up on a vibrating surface.

Infrared Data Interface
The device can be remote configured, and momentary and saved measurement data can be read out via the bidirectional infrared interface. The USB X-TRA interface adapter and METRawin 10 software are required to this end (see accessories). Interface protocol and device driver software for LabVIEW® (National Instruments™) are available upon request.

Voluntary Manufacturer’s Guarantee
36 months for materials and workmanship
1 to 3 years for calibration (depending upon application)

Overview of Features Included

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<tr>
<th>Function</th>
<th>METRAHIT ISO</th>
<th>METRAHIT COIL</th>
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<td>V AC+DC TRMS (RI = 1 MΩ)</td>
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<td>•</td>
</tr>
<tr>
<td>V AC / Hz TRMS (RI ≥ 9 MΩ)</td>
<td>TRMS filter</td>
<td>TRMS filter</td>
</tr>
<tr>
<td>V AC+DC TRMS (RI ≥ 9 MΩ)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>V DC (RI ≥ 9 MΩ)</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Hz (V AC)</td>
<td>... 300 kHz</td>
<td>... 300 kHz</td>
</tr>
<tr>
<td>Bandwidth, V AC</td>
<td>15 Hz ... 10 kHz</td>
<td>15 Hz ... 10 kHz</td>
</tr>
<tr>
<td>A AC / Hz TRMS</td>
<td>300 µA  3/30/300 mA 3 A / 10 A</td>
<td>300 µA  3/30/300 mA 3 A / 10 A</td>
</tr>
<tr>
<td>A AC+DC TRMS</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>A DC</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Fuses</td>
<td>10 A / 1000 V</td>
<td>10 A/1000 V</td>
</tr>
<tr>
<td>Transformation Ratio ≥</td>
<td>mV/A, mA/V</td>
<td>mV/A, mA/V</td>
</tr>
<tr>
<td>Hz (A AC)</td>
<td>... 30 kHz</td>
<td>... 30 kHz</td>
</tr>
<tr>
<td>Insulation resistance MΩ&lt;ISO</td>
<td>test voltage selectable</td>
<td>test voltage selectable</td>
</tr>
<tr>
<td>Interturn short-circuit measurement MΩ&lt;ISO</td>
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<td>•</td>
</tr>
<tr>
<td>Duty cycle measurement %</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Resistance Ω</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Continuity µΩ</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Diode ... 5.1 V+</td>
<td>•</td>
<td>•</td>
</tr>
<tr>
<td>Temperature TC (K)</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Temperature RTD</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Capacitance µF</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Min-Max / data hold</td>
<td>•</td>
<td>•</td>
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<tr>
<td>4 MBit memory ¹</td>
<td>•</td>
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<tr>
<td>IR Interface</td>
<td>•</td>
<td>•</td>
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<tr>
<td>Power pack socket</td>
<td>•</td>
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<tr>
<td>Protection</td>
<td>IP 54</td>
<td>IP 54</td>
</tr>
</tbody>
</table>

Measuring category
1000 V CAT II, 600 V CAT III
1000 V CAT II, 600 V CAT III

¹ For 15,000 measured values, sampling rate adjustable from 0.1 seconds to 9 hours

Scope of Delivery
1 Insulation multimeter METRAHIT ISO or METRAHIT COIL
1 Protective rubber cover
1 Pair of safety measurement cables with 4 mm test probes, 1000 V CAT II, 600 V CAT III (KS17-2)
1 Condensed operating instructions, English/German
1 Operating instructions in English and German (CD ROM)
1 DAkkS calibration certificate
1 Batteries, 1.5 V, type AA, installed
1 COIL TEST ADAPTER for interturn short-circuit measurement (only in combination with METRAHIT COIL)

METRAHIT ISO and METRAHIT COIL
TRMS Multimeter with Insulation Measurement and Interturn Short-circuit Measurement (COIL only)
### Technical Data

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</tbody>
</table>

#### Measuring Range

- **V**
  - 300.0 mA
  - 100 µA
  - 9 MΩ (MΩ)
  - 30% to 100% of voltage measuring range

- **A**
  - 300.0 µA
  - 1 µA
  - 32 mV
  - 32 mV
  - 1 mA
  - 200 mV
  - 200 mV
  - 30 mA
  - 10 mA
  - 400 mV
  - 400 mV

- **Ω**
  - 300.0 Ω
  - 100 mΩ
  - 1 mΩ
  - 1.4 V
  - Approx. 300 µA
  - 0.5 + 15 (8 d)
  - 0.5 + 5 (8 d)

- **Hz (V)**
  - 300.0 Hz
  - 1 Hz
  - 1 Hz
  - 10 Hz
  - 10 Hz
  - 100 Hz

- **Hz (A)**
  - 300.0 Hz
  - 1 Hz
  - 1 Hz
  - 10 Hz
  - 10 Hz

- **Hz (Ω)**
  - 2.0...260
  - 10.0...260
  - 5.0...95.0
  - 10.0...95.0

<table>
<thead>
<tr>
<th>Hz (V)</th>
<th>Hz (A)</th>
<th>Hz (Ω)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0...260</td>
<td>10.0...260</td>
<td>30.0...95.0</td>
</tr>
<tr>
<td>3 V</td>
<td>1 Hz...1 kHz</td>
<td>15 Hz...1 kHz</td>
</tr>
<tr>
<td>1 kHz...4 kHz</td>
<td>4 kHz...8 kHz</td>
<td>4 kHz...8 kHz</td>
</tr>
<tr>
<td>1 kHz...4 kHz</td>
<td>4 kHz...8 kHz</td>
<td>4 kHz...8 kHz</td>
</tr>
</tbody>
</table>

### Key:
- d: digit(s)
- MR: measuring range
- rdg.: reading

---

1. 15...260 Hz...10 (5) kHz sine. See page 6 regarding influence.
2. At 0°C...+40°C.
3. Display of up to max. 5.1 V. “OL” in excess of 5.1 V.
4. Applies to measurements at film capacitors and battery operated.
5. Lowest measurable frequency for sinusoidal measuring signals symmetrical to the zero point.
6. Overload capacity of the voltage measurement input;
7. Power limiting: frequency x voltage max. 3 x 10^6 V x Hz at > 100 V
8. Overload capacity of the current measurement input;
9. See current measuring ranges for maximum values.
10. Input sensitivity, sinusoidal signal, 10% to 100% of voltage or current measuring range;
11. Limitation: up to 10 kHz in the mV measuring range, 30% of the range in the A measuring range.
12. The voltage measuring ranges with max. 30 kHz apply in the A measuring range.

Key: d = digit(s), MR = measuring range, rdg. = reading
METRAHIT Iso and METRAHIT COIL
TRMS Multimeter with Insulation Measurement and Interturn Short-circuit Measurement (COIL only)

Insulation Resistance Measurement

<table>
<thead>
<tr>
<th>Measuring Range</th>
<th>Resolution</th>
<th>Nominal Voltage ( U_{iso} )</th>
<th>Intrinsic Uncertainty under Reference Conditions (( % ) rdg. + d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 V ... 1000 V</td>
<td>( R_i = 1 \Omega )</td>
<td>3 + 30 &gt; 100 digits</td>
<td></td>
</tr>
<tr>
<td>5 ... 3100 kΩ</td>
<td>( R_i = 1 \Omega )</td>
<td>5 + 5</td>
<td></td>
</tr>
<tr>
<td>0.280 ... 3.100 MΩ</td>
<td>( R_i = 1 \Omega )</td>
<td>5 + 5</td>
<td></td>
</tr>
<tr>
<td>0.280 ... 3.100 MΩ</td>
<td>( R_i = 1 \Omega )</td>
<td>5 + 5</td>
<td></td>
</tr>
<tr>
<td>0.280 ... 3.100 MΩ</td>
<td>( R_i = 1 \Omega )</td>
<td>5 + 5</td>
<td></td>
</tr>
</tbody>
</table>

1) During insulation resistance measurement (MT2Iso): If ERROR is displayed >> limits: \( U_{interference} > 10 \ldots 20 \text{ V} \) and \( U_{interference} < U_{iso} \). \( R_i < 50 \text{kΩ} @ U_{iso} 50 \text{ V} \), \( R_i < 100 \text{kΩ} @ U_{iso} 100 \text{ V} \), \( R_i < 250 \text{kΩ} @ U_{iso} 250 \text{ V} \), \( R_i < 500 \text{kΩ} @ U_{iso} 500 \text{ V} \), \( R_i < 1000 \text{kΩ} @ U_{iso} 1000 \text{ V} \).

2) Interference voltage measurement TRMS (V AC + DC) with 1 MΩ input resistance, Bandwidth 15 Hz ... 500 Hz, measuring error 3% + 30 Digits

<table>
<thead>
<tr>
<th>Measuring Function</th>
<th>Nom. No. in Circuit</th>
<th>Measuring Voltage ( U_{iso} )</th>
<th>Short-Circuit Current ( I_{iso} )</th>
<th>Short-Circuit Current ( I_{i} )</th>
<th>Overload Capacity</th>
<th>Time Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>( U_{interference} )</td>
<td>( U_{iso} )</td>
<td>( U_{i} ) &gt; 1000 V</td>
<td>1000 V&gt; Cont.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT2Iso 50, 100, 250, 500 V</td>
<td>Max. 1.1x ( U_{iso} )</td>
<td>1.0 mA</td>
<td>( U_{i} ) &gt; 1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MT2Iso 1000 V</td>
<td>Max. 1.1x ( U_{iso} )</td>
<td>0.5 mA</td>
<td>( U_{i} ) &gt; 1000 V</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Interturn Short-circuit Measurement (METRAHIT COIL only)

<table>
<thead>
<tr>
<th>Measuring Range</th>
<th>Resolution</th>
<th>Nominal Voltage ( U_{iso} )</th>
<th>Intrinsic Uncertainty at Reference Conditions (( % ) rdg. + d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.3 V ... 1000 V</td>
<td>( R_i = 1 \Omega )</td>
<td>3 + 30 &gt; 100 digits</td>
<td></td>
</tr>
<tr>
<td>10.0 ... 320 µs</td>
<td>0.1 [µs]</td>
<td>1000 V</td>
<td>10 + 5 digits</td>
</tr>
<tr>
<td>31 ... 200 µs</td>
<td>1 [µs]</td>
<td>1000 V</td>
<td>10 + 5 digits</td>
</tr>
</tbody>
</table>

2) Interference voltage measurement TRMS (V AC + DC) with 1 MΩ input resistance, frequency response width 15 Hz ... 500 Hz, accuracy 3% + 30 Digits

Internal Clock

<table>
<thead>
<tr>
<th>Time format</th>
<th>Resolution</th>
<th>Accuracy</th>
<th>Temp. Influence</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD.MM.YYYY hh:mm:ss</td>
<td>0.1 s</td>
<td>±1 min./month</td>
<td>50 ppm/K</td>
</tr>
</tbody>
</table>

Reference Conditions

- Ambient temperature: \(+23 \pm 2 \text{ °C}\)
- Relative humidity: 40% ... 75%
- Measured qty. frequency: 45 Hz ... 65 Hz
- Measured qty. waveshape: Sine
- Battery voltage: 3 V ±0.1 V

Influencing Quantities and Influence Error

<table>
<thead>
<tr>
<th>Measured Qty. / Measuring Range</th>
<th>Sphere of Influence</th>
<th>Measured Qty. / Measuring Range</th>
<th>Intrinsic uncertainty (( % ) rdg. + d)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interference</td>
<td>( V_{interference} )</td>
<td>( V_{interference} )</td>
<td>0.4 + 5</td>
</tr>
<tr>
<td>Series Mode</td>
<td>( V_{series} )</td>
<td>( V_{series} )</td>
<td>0.5 + 5</td>
</tr>
</tbody>
</table>

With zero balancing

1.8 to 3.6 V ditto Included in intrinsic uncertainty

Intrinsic Uncertainty at Reference Conditions

- Temperature: \(+25 \pm 1 \text{ °C}\)
- Humidity: \(+75 \% \text{ rh.}\) \( \pm 5 \% \text{ rh.}\)
- Interference quantity: \( V_{interference} \) \( \pm 20 \text{ V}\)

AC and DC ranges.

- Measuring range for both measuring modes with the TRMS converter in the A and COIL ranges.

Influence Measurement

- 1.1x \( U_{iso} \) Max.

Series Mode Interference Voltage

- Measuring range for both measuring modes with the TRMS converter in the A and COIL ranges.

Internal Clock

- Time format: DD.MM.YYYY hh:mm:ss
- Resolution: 0.1 s
- Accuracy: ±1 min./month
- Temp. Influence: 50 ppm/K

Batttery voltage: 1.8 to 3.6 V

Intrinsic Uncertainty

- Relative Humidity: 75%, 3 days, instrument off
- Battery voltage: 1.8 to 3.6 V

Influence Error

- Crest factor F: \( 1 < 3 \ldots 5 \)...
- Series Mode Interference Voltage: \( V_{series} \)...

Damping

- Common Mode Interference Voltage: \( V_{max} \)...
- Series Mode Interference Voltage: \( V_{max} \)...

Influence Error

- Common Mode Interference Voltage: \( V_{max} \)...
- Series Mode Interference Voltage: \( V_{max} \)...

- Battery voltage: 1.8 to 3.6 V

Intrinsic Uncertainty

- Relative Humidity: 75%, 3 days, instrument off
- Battery voltage: 1.8 to 3.6 V

Influence Error

- Common Mode Interference Voltage: \( V_{max} \)...
- Series Mode Interference Voltage: \( V_{max} \)...

Except for sinusoidal waveforms
TRMS Multimeter with Insulation Measurement and Interturn Short-circuit Measurement (Coil only)

**Response Time (after manual range selection)**

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<th>Jump Function of the Measured Quantity</th>
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<tr>
<td>V, mV, V~ A, mA, A~</td>
<td>1.5 s</td>
<td>From 0 to 80% of upper range limit value</td>
</tr>
<tr>
<td>300 Ω ... 3 MΩ</td>
<td>2 s</td>
<td></td>
</tr>
<tr>
<td>30 MΩ, MΩ&lt;ISO</td>
<td>Max. 5 s</td>
<td>From 0 to 50% of upper range limit value</td>
</tr>
<tr>
<td>Continuity</td>
<td>&lt; 50 ms</td>
<td></td>
</tr>
<tr>
<td>°C (Pt 100)</td>
<td>Max. 3 s</td>
<td></td>
</tr>
<tr>
<td>±</td>
<td>1.5 s</td>
<td></td>
</tr>
<tr>
<td>30 nF ... 300 μF</td>
<td>Max. 5 s</td>
<td>From 0 to 50% of upper range limit value</td>
</tr>
<tr>
<td>&gt;10 Hz</td>
<td>1.5 s</td>
<td></td>
</tr>
</tbody>
</table>

**Fuses**

- **Fuse link**: FF 10 A / 1000 V AC/DC; 10 x 38 mm; Switching capacity: 30 kA at 1000 V AC/DC, protects the current measurement input in the 300 μA through 10 A ranges.

**Display**

- LCD panel (65 mm x 36 mm) with analog and digital display including unit of measure, type of current and various special functions.

**Background Illumination**

- Background illumination is switched off approximately 1 minute after it has been activated.

**Analog**

- **Display**: LCD scale with pointer
- **Scaling**: Linear: ± 0 ... ±30 with 35 scale divisions for ± 0 ... ±30 with 30 scale divisions in all other ranges
- **Polarity display**: with automatic switching
- **Overflow display**: with the symbol
- **Measuring rate**: 40 measurements per second and display refresh

**Digital**

- **Display / char. height**: 7-segment characters / 15 mm
- **Number of places**: 3½ digits ± 3100 steps, the changeover function to 4½ digits in measuring function VDC and Ω depends on parameter selection
- **Overflow display**: “OL” is displayed for ≥3 0000 digits, or ≥3 100 digits, respectively
- **Polarity display**: “−−” (minus sign) is displayed if plus pole is connected to “−”
- **Measuring rate**: 10 and 40 measurements per second with the Min-Max function except for the capacitance, frequency and duty cycle measuring functions
- **Refresh rate**: 2 times per second, every 500 ms

**Electrical Safety**

- **Safety class**: II per EN 61010-1:2010/VDE 0411-1:2011
- **Measuring category**: CAT II CAT III
- **Nominal voltage**: 1000 V 600 V
- **Pollution degree**: 2
- **Test voltage**: 5.2 kV – per EN 61010-1:2010/VDE 0411-1:2011

**Power Supply**

- **Battery**: 2 ea. 1.5 V mignon cell (2 ea. size AA), alkaline manganese per IEC LR6
- **Service life**: With alkaline manganese batteries: approx. 200 hours (without MΩ<ISO measurement)
- **Battery test**: Battery capacity display with battery symbol in 4 segments: „ “. Querying of momentary battery voltage via menu function.
- **Power OFF function**: The multimeter is switched off automatically:
  - If battery voltage drops to below approx. 1.8 V
  - If none of the keys or the rotary switch are activated for an adjustable duration (10 to 59 min.) and the multimeter is not in the continuous operation mode

**Fuses**

- **Fuse link**: FF 10 A / 1000 V AC/DC; 10 x 38 mm; Switching capacity: 30 kA at 1000 V AC/DC, protects the current measurement input in the 300 μA through 10 A ranges.

**Power pack socket**

- If the power pack has been plugged into the instrument, the installed batteries are disconnected automatically.
- Rechargeable batteries can only be recharged externally.

**Electromagnetic Compatibility (EMC)**

- **Interference emission**: EN 61326-1:2006, class B
- **Interference immunity**: EN 61326-2-1:2006 EN 61326-2-1:2006

**Ambient Conditions**

- **Accuracy range**: 0 °C ... +40 °C
- **Operating temp. range**: −10 °C ... +50 °C
- **Storage temp. range**: −25 °C ... +70 °C (without batteries)
- **Relative humidity**: 40 to 75%, no condensation allowed
- **Elevation**: to 2000 m
- **Deployment**: Indoors, except within specified ambient conditions
METRAHIT Iso and METRAHIT Coil
TRMS Multimeter with Insulation Measurement
and Interturn Short-circuit Measurement (Coil only)

Data Interface
Type: Optical via infrared light through the housing
Data transmission: Serial, bidirectional (not IrDa compatible)
Protocol: Device-specific
Baud rate: 38,400 baud
Functions:
- Select/query measuring functions and parameters
- Query momentary measurement data

The USB | X-TRA plug-in interface adapter (see accessories) is used for adaptation to the PC's USB port.

Internal Measured Value Storage
Memory capacity: 4 MBit / 540 kB for approx. 15,000 measured values with indication of date and time

Mechanical Design
Housing: Impact resistant plastic (ABS)
Dimensions: 200 x 87 x 45 mm (without protective rubber cover)
Weight: Approx. 0.35 kg with batteries
Protection: Housing: IP 54 (pressure equalization by means of the housing)

Table Excerpt Regarding Significance of IP Codes

<table>
<thead>
<tr>
<th>IP XY (1st char. X)</th>
<th>Protection against penetration by solid particles</th>
<th>IP XY (2nd char. Y)</th>
<th>Protection against penetration by water</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Not protected</td>
<td>0</td>
<td>Not protected</td>
</tr>
<tr>
<td>1</td>
<td>≥ 50.0 mm dia.</td>
<td>1</td>
<td>Vertical dripping</td>
</tr>
<tr>
<td>2</td>
<td>≥ 12.5 mm dia.</td>
<td>2</td>
<td>Dripping (15° inclination)</td>
</tr>
<tr>
<td>3</td>
<td>≥ 2.5 mm dia.</td>
<td>3</td>
<td>Spray water</td>
</tr>
<tr>
<td>4</td>
<td>≥ 1.0 mm dia.</td>
<td>4</td>
<td>Splashing water</td>
</tr>
<tr>
<td>5</td>
<td>Dust protected</td>
<td>5</td>
<td>Jet-water</td>
</tr>
</tbody>
</table>

Applicable Regulations and Standards

- DIN EN 61010, part 1:2001/VDE 0411-1:2002: Safety requirements for electrical equipment for measurement, control and laboratory use
- DIN EN 61326-1 VDE 0843-20-1: Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements
- EN 60529 VDE 0470, part 1: Test instruments and test procedures – degrees of protection provided by enclosures (IP code)

Accessories for operation at a PC
Interface Adapter for USB Connection
The USB | X-TRA bidirectional interface adapter includes the following functions:
- Configure the METRAHIT ISO from a PC.
- Transmit live measurement data to the PC.
- Read data out of memory from the METRAHIT ISO.

The adapter does not require a separate power supply. Its baud rate is 38,400 baud.
A CD ROM is included which contains current drivers for Windows operating systems.
**Order Information**

<table>
<thead>
<tr>
<th>Designation</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insulation multimeter</td>
<td>METRAHIT ISO</td>
<td>M246B</td>
</tr>
<tr>
<td>Insulation multimeter with interturn short-circuit measurement</td>
<td>METRAHIT COIL</td>
<td>M246C</td>
</tr>
<tr>
<td>Power pack: 90 ... 250 V AC / 5 V DC, 600 V CAT IV</td>
<td>NA</td>
<td>X-TRA</td>
</tr>
</tbody>
</table>

### Accessory Cables and Adapters

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cable set (1 pair of measurement cables), 1.2 m, with VDE-GS mark</td>
<td>KS17-2</td>
<td>GTY3620034P0002</td>
</tr>
<tr>
<td>Cable set with 2 mm ² steel tips with cable length 120 cm, 1000 V CAT II</td>
<td>KS17-S</td>
<td>Z110H</td>
</tr>
<tr>
<td>Cable set incl. test probes, clips and USA test probes, (1000 V CAT II / III 20 A)</td>
<td>KS-NTS</td>
<td>Z110W</td>
</tr>
<tr>
<td>Cable set for telecommunication application (a-b-e) 1000 V CAT III 1 A</td>
<td>KS21-T</td>
<td>Z110U</td>
</tr>
<tr>
<td>Alligator clips (1 pair) for KS17-2 1000 V CAT III 16 A</td>
<td>KY95-3</td>
<td>Z110J</td>
</tr>
<tr>
<td>Clip-on current sensor, 10 mA ... 100 A, 1 mV / 10 mA, clip opening: 15 mm dia.</td>
<td>WZ12B</td>
<td>Z218B</td>
</tr>
</tbody>
</table>

### Accessories for Operation at a PC

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bidirectional interface adapter, IR-USB</td>
<td>USB</td>
<td>X-TRA</td>
</tr>
<tr>
<td>METRAwin 10 software</td>
<td>METRAwin 10</td>
<td>GTZ3240000R0001</td>
</tr>
</tbody>
</table>

### Accessories for Temperature Measurement with Resistance Thermometer

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pt100 temperature sensor for surface and emersion measurements, -40 ... +600 °C</td>
<td>Z3409</td>
<td>GTZ3409000R0001</td>
</tr>
<tr>
<td>Pt1000 temperature sensor for measurement in gases and liquids, -50 ... +220° C (for servicing household appliances)</td>
<td>TF220</td>
<td>Z102A</td>
</tr>
<tr>
<td>Pt100 oven sensor, -50 ... +550 °C</td>
<td>TF550</td>
<td>GTZ3508000R0001</td>
</tr>
<tr>
<td>Ten adhesive Pt100 temperature sensors, -50 ... +550 °C</td>
<td>TS Chipset</td>
<td>GTZ3406000R0001</td>
</tr>
</tbody>
</table>

### Protection and Transport Accessories

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imitation leather carrying pouch</td>
<td>F829</td>
<td>GTZ3301000R0003</td>
</tr>
<tr>
<td>Cordura belt pouch</td>
<td>HitBag</td>
<td>Z115A</td>
</tr>
<tr>
<td>Ever-ready case for 2 instruments and accessories</td>
<td>F840</td>
<td>GTZ3302001R0001</td>
</tr>
<tr>
<td>Hard case for one instrument and accessories</td>
<td>HC20</td>
<td>Z113A</td>
</tr>
<tr>
<td>Hard case for two instruments and accessories</td>
<td>HC30</td>
<td>Z113A</td>
</tr>
</tbody>
</table>

### Replacement Fuses

<table>
<thead>
<tr>
<th>Description</th>
<th>Type</th>
<th>Article Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuses (pack of 10)</td>
<td>FF 10 A/1000 V AC/DC</td>
<td>Z109L</td>
</tr>
</tbody>
</table>

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1) with safety cap applied
2) without safety cap applied

For additional information regarding accessories please refer to
- Measuring Instruments and Testers catalog
- www.gossenmetrawatt.com
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TRMS Multimeter with Insulation Measurement and Interturn Short-circuit Measurement (COIL only)