

# METRAPHASE 1

## Phase Sequence Indicator

3-348-992-03  
5/12.09

- **Displays phase sequence**  
by means of 6 optically rotating LEDs with different colors  
(clockwise: green, counterclockwise: red)
- **Displays nominal line voltage**  
with 3 LEDs
- **Displays nominal line frequency**  
with 6 LEDs
- **Phase search**  
with 3 LEDs for L1, L2 and L3
- **Indication of errors for:**
  - Asymmetries
  - Missing phases

### Useful accessories

- Protective rubber cover for rugged operation conditions



### Applications

Phase sequence, line frequency and phase voltage are tested and displayed simultaneously after the METRAPHASE 1 test instrument has been connected to the system under test at all phases with the included, contact-protected connector cables. The instrument is suited for initial testing, as well as for testing after repairs and modifications.

### Features

#### Convenient Testing with Only 2 Cables (2-pole measurement)

In addition to normal testing with 3 measurement cables, phase sequence can also be tested with only 2 cables. After connection to L1 has been established, phases L2 and L3 are scanned separately, one after the other. This operating mode is indicated by means of intelligent software which rules out the possibility of erroneous measurements.

#### Automatic Activation

The instrument is activated automatically as soon as a voltage of at least 100 V is applied to any 2 measurement sockets.

#### Battery Saving Circuit

The instrument is shut down automatically when zero voltage is applied in order to extend battery service life.

### Applicable Regulations and Standards

IEC 61010-1/EN 61010-1/ VDE 0411-1	Safety requirements for electrical equipment for measurement, control and laboratory use
IEC 61557 Part 7/ EN 61557-7/ VDE 0413 Part 7	Phase sequence indicators
EN 60529 VDE 0470 Part 1	Test instruments and test procedures – Protection provided by enclosures (IP code)
DIN EN 61326-1 VDE 0843-20-1	Electrical equipment for measurement, control and laboratory use – EMC requirements – Part 1: General requirements

### Characteristic Values

Phase Direction	Phase Sequence	Phase Sequence LED Display	Phase Direction LED Display
Clockwise	L1 – L2 – L3	L1 L2 L3 light up	green LED rotates in clockwise direction
Counterclockwise	L3 – L2 – L1	L1 L2 L3 light up	red LED rotates in counterclockwise direction
Asymmetrical	Lx – N/PE – Lx	connection with N/PE not indicated	green or red LED rotates clockwise or counterclockwise depending upon connection
Phase Missing	Lx – X – Lx	missing phase does not light up, the other 2 do light up	—

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## Phase Sequence Indicator

**Nominal 3 phase ~ line voltage indicated with one LED each for**  
120/208 V, 230/400 V, 400/690 V  
Total line voltage range: 100 ... 690 V

**Line frequency indicated with one LED each for**  
50 Hz, 60 Hz, 100 Hz, 200 Hz, 300 Hz, 400 Hz  
Total frequency range: 15 ... 410 Hz

### Reference Conditions

Ambient Temperature	+23 °C ±2 K
Relative Humidity	40 ... 60%
Battery Voltage	4.5 V ±0.25 V
Line Voltage	230/400 V ±0.5%
Line Frequency	50 Hz ±0.1 Hz
Line Voltage Waveshape	sine, deviation between effective and rectified values < 1%

### Ambient Conditions

Storage Temperature	-25 °C ... +75 °C
Operating Temp.	-10 °C ... +50 °C
Relative Humidity	max. 75%, no condensation
Elevation	to 2000 m

### Power Supply

Batteries	4 cells, alkaline-manganese per IEC LR6 (4 x AA-size)
Battery Voltage	4 V ... 6 V
Battery Service Life	with alkaline-manganese cells: approx. 100 hrs.

### Electrical Safety

Protection Class	II per IEC 61010-1
Measuring Category	IV
Operating Voltage	600 V
Contamination Level	2
Test Voltage	5.55 kV

### Mechanical Design

Protection IP40 per DIN VDE 0470 Part 1/EN 60529  
Extract from table on the meaning of IP codes

IP XY (1 <sup>st</sup> digit X)	Protection against foreign object entry	IP XY (2 <sup>nd</sup> digit Y)	Protection against the penetration of water
4	≥ 1.0 mm dia.	0	not protected

Dimensions 84 mm x 195 mm x 35 mm  
Weight approx. 0.3 kg with batteries

### Standard Equipment

- 1 phase sequence indicator
- 3 plug-on measurement cables with contact-protected plugs
- 3 test probes for attachment to contact-protected plugs
- 1 alligator clip for attachment to contact-protected plugs
- 4 batteries
- 1 operating instructions
- 1 carrying case

### Order Information

Description	Type	Article Number
Phase sequence indicator in HC20 carrying case	METRAPHASE 1	M620A
<b>Accessories</b>		
Variable plug adapter set 3.5 ... 12 mm	Z500A	Z500A
Protective rubber cover with prop-up flap and carrying strap	GH18	GTZ3212000R0001

See *Measuring Instruments and Testers Catalog* for additional information concerning accessories.

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