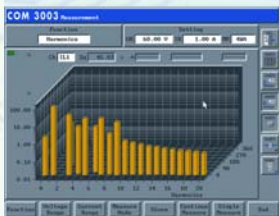


Comparator

single phase or three phase



ZERA

COM 1003 / 3003

Front View



Concept

By continuation of previous developments the new COM 1003 / COM 3003 comparator is the new member of the ZERA high precision measuring instrument series.

According to the measuring requirements 2 versions are available: Single phase instrument COM 1003 or three phase instrument COM 3003. These comparators are common used in metrological institutes. To perform their traceability to national standards also test laboratories, power utilities and meter manufacturer use this kind of high accurate instruments.

Features

- DC capable measuring modes (optional)
- High accuracy, independent of measuring mode
- Excellent long-term stability by using of DC-capable current transformers
- Recalibration period by PTB set for 2 years
- RS232 and IEEE488 interfaces
- SCPI compatible IEEE488 interface commands
- Automatic measuring range selection
- Only one current input for the whole measuring range
- Direct traceability of measuring accuracy by connection of DC- and frequency standard devices

The COM 1003 / COM 3003 comparator can be controlled by:

- Menu-related function keys and 6.4" colour TFT display, located on the front panel
- Windows (application software SSM 3000)

The following functions are selectable by softkeys:

Functions

Indication of:

- Actual values
- Vectorial diagram
- Curves
- Harmonics
- Error measurements

User Software

The SSM 3000 control program contained in the scope of supply is an MS Windows application which extends the possible applications of the COM 1003 / COM 3003 with numbers of additional features.



Display with menu-related function keys



Rear view

The following system parameters are displayed as averages values over an adjustment integration time (1s ... 99s):

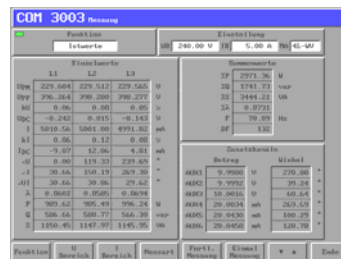
- RMS values of phase voltages and currents and their DC component
- All angles between currents and voltages calculated from the fundamental components
- Active, reactive and apparent power, per phase or total
- Frequency and direction of rotating field

Actual values can be displayed in table form or as vectorial graphic.

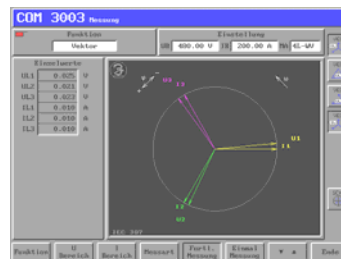
The waveforms of voltage and currents can be measured and displayed. The user can choose between display as curves with indication of individual values and harmonic displaying with individual distortion values.

Static and electromechanical power meters as well as all kind of measuring instruments with power proportional frequency output (e.a.reference standards, working standards) can be tested in the menu "Accuracy measurement". The user can select between scanning head input or frequency input.

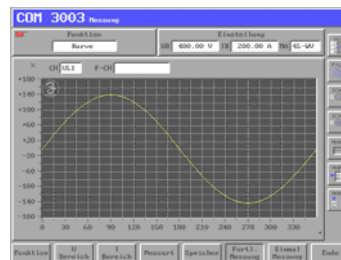
All measuring results can be stored at incorporated Compact-Flash cards afterwards. The stored data can be transferred to an external PC. The device to read out the Compact-Flash cards is contained in the scope of supply.



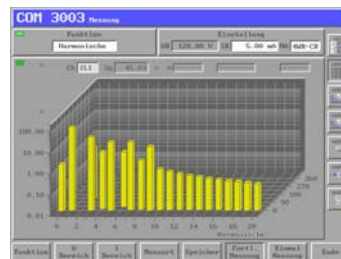
Actual Value Measurement



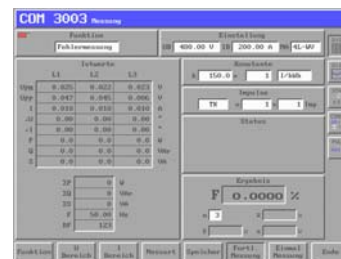
Vectorial Measurement



Curve Measurement



Harmonics Measurement



Accuracy Measurement

Unless otherwise indicated, all measurement errors are related to sine-wave test parameters in the nominal frequency range and appropriate range selection.

ZERA

COM 1003 / 3003

Technical Data

Comparator	COM 1003	
Power supply	230 V + 10 % -15 %, 50 Hz ... 60 Hz approx. 80 VA	230 V + 10 % -15 %, 50 Hz ... 60 Hz
Temperature range	15° ... 40° C	15° ... 40° C
Weight	172 x 465 x 460 mm 16 kg	25 kg
Voltage measurement	30 V ... 500 V 60 - 120 - 240 - 480 V	30 V ... 500 V
Current measurement	1 mA ... 160 A 5-10-20-50-100-200-500 mA 1-2-5-10-20-50-100-200 A	1 mA ... 160 A 1-2-5-10-20-50-100-200 A
Reference voltage ranges	1 V and 10 V DC 15 ... 70 Hz	1 V and 10 V DC
Bandwidth	DC ... 3500 Hz	DC ... 3500 Hz
	2 wire Active 2 wire Reactive 2 wire DC ³ mixed signals (AC+DC) in all active measuring modes (optional)	4 wire Reactive true 4 wire Reactive cross 4 wire Reactive Q60 4 wire Apparent 4 wire DC ³ 3 wire Active 3 wire Reactive true 3 wire Reactive cross connected A 3 wire Reactive cross connected B 2 wire Active 2 wire Reactive 2 wire DC ³ mixed signals (AC+DC) in all active measuring modes (optional)
Accuracy class rating according to PTB for measuring power and energy ¹ <i>Independent of measuring mode</i>	< 100 x 10 ⁻⁶	< 100 x 10 ⁻⁶
	2 years	
Voltage measurement accuracy	< 30 x 10 ⁻⁶	< 30 x 10 ⁻⁶
Voltage measurement accuracy DC ³	< 50 x 10 ⁻⁶ (30 V ... 500 V)	< 50 x 10 ⁻⁶ (30 V ... 500 V)
	< 15 x 10 ⁻⁶ / year	
Current measurement accuracy	< 50 x 10 ⁻⁶ (50 mA ... 160 A) < 150 x 10 ⁻⁶ (10 mA ... 50 A) < 250 x 10 ⁻⁶ (1 mA ... 10 mA)	< 50 x 10 ⁻⁶ (50 mA ... 160 A) < 150 x 10 ⁻⁶ (10 mA ... 50 A) < 250 x 10 ⁻⁶ (1 mA ... 10 mA)
Current measurement accuracy DC ³	< 350 x 10 ⁻⁶ (50 mA ... 160 A)	< 350 x 10 ⁻⁶ (50 mA ... 160 A)
	< 25 x 10 ⁻⁶ / year	
Power/energy measurement long term stability ² <i>Independent of measuring mode</i>	< 80 x 10 ⁻⁶ (50 mA ... 160 A) < 180 x 10 ⁻⁶ (10 mA ... 50 mA) < 280 x 10 ⁻⁶ (1 mA ... 10 mA)	< 80 x 10 ⁻⁶ (50 mA ... 160 A) < 180 x 10 ⁻⁶ (10 mA ... 50 mA) < 280 x 10 ⁻⁶ (1 mA ... 10 mA)
Power/energy measurement accuracy DC ³	< 400 x 10 ⁻⁶ (50 mA ... 160 A)	< 400 x 10 ⁻⁶ (50 mA ... 160 A)
stability	< 30 x 10 ⁻⁶ / year	
Angle measurement error	< 0.005°	< 0.005°
	< 20 x 10 ⁻⁶	
DC reference voltage measurement long term stability	< 5 x 10 ⁻⁶ / year	< 5 x 10 ⁻⁶ / year
	U < 0.5 x 10 ⁻⁶ / K I < 0.5 x 10 ⁻⁶ / K P < 1 x 10 ⁻⁶ / K DC reference input < 1 x 10 ⁻⁶ / K Quartz time base < 0.1 x 10 ⁻⁶ / K	I < 0.5 x 10 ⁻⁶ / K P < 1 x 10 ⁻⁶ / K DC reference input < 1 x 10 ⁻⁶ / K Quartz time base < 0.1 x 10 ⁻⁶ / K
Inputs / Outputs	1 x current 1 x voltage 1 x 1 V and 10 V DC reference input 2 x power proportional pulse output 1 x pulse input for energy comparison measurement 1 x Scanning head input for meter testing 1 x Quartz output for internal time base 1 x RS232 interface 1 x IEEE488 interface 1 x ZERA fibre optics interface 1 x Compact-Flash interface 1 x Keyboard interface 1 x VGA interface	1 x current 1 x voltage 1 x 1 V and 10 V DC reference input 2 x power proportional pulse output 1 x pulse input for energy comparison measurement 1 x Scanning head input for meter testing 1 x Quartz output for internal time base 1 x RS232 interface 1 x IEEE488 interface 1 x ZERA fibre optics interface 1 x Compact-Flash interface 1 x Keyboard interface 1 x VGA interface

Version: 27. August 2007

¹ Within the range of 30 V ... 500 V and 50 mA ... 160 A

³ only with option DC-measurement

² related to the apparent power each with 30 V ... 500 V

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