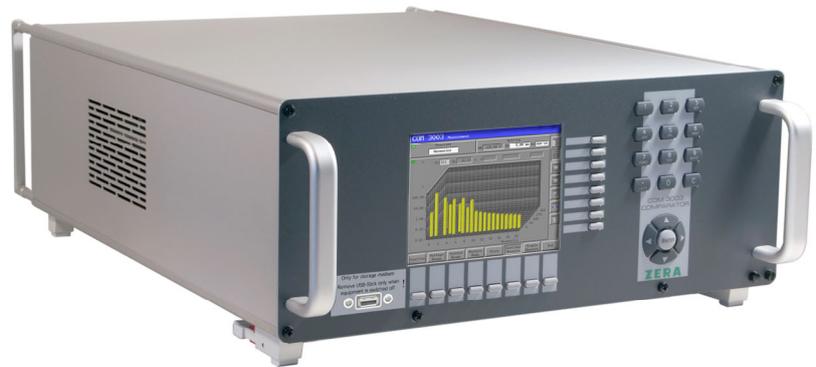


COM1003 | COM3003

Single Phase or Three Phase Comparator



Primary Standard with Accuracy Class 0.008

The System Concept

Comparator COM1003/COM3003 is part of the ZERA high precision measuring instrument series. To meet the requirements a single phase COM1003 or a three phase COM3003 is available.

As AC/DC transfer standard comparator serves for testing current and voltage meters as well as single phase or poly phase* power and energy meter testing systems in metrological institutes, official testing places and other testing fields of energy suppliers or manufacturers of electricity meters.

Via soft keys, 6.4" colour display and integrated user software MT3701 inputs, measurements and visualisations will be performed during the operation. An additional external control including evaluation and report generation is achieved via windows based user software SSM3000 and external Windows PC.

* only COM3003

Features

- High accuracy (class 0.008), independent of measuring mode
- Excellent long-term stability by using of DC-capable current transformers
- Recalibration period by PTB can possibly be set for > 2 years
- RS232 and IEEE 488 interface
- SCPI compatible IEEE488 interface commands
- Automatic measuring range selection
- Only one current input for the complete measuring range
- Direct traceability of measuring accuracy by connection of DC- and frequency standard devices

Functions

The following functions are available via softkeys:

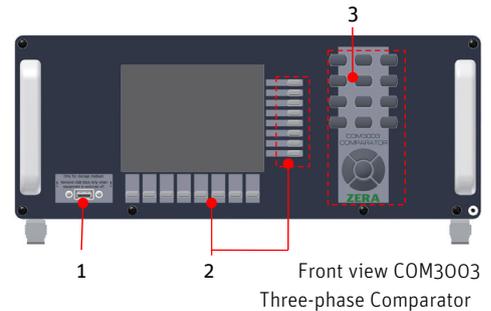
- Actual values
- Vectorial diagram
- Curve diagram
- Harmonic measurement
- Error measurement
- Reference measurement

User Software Data management

Individual functions of the integrated user software are described in the following.

Measurement data can be stored on an especially configured USB stick.

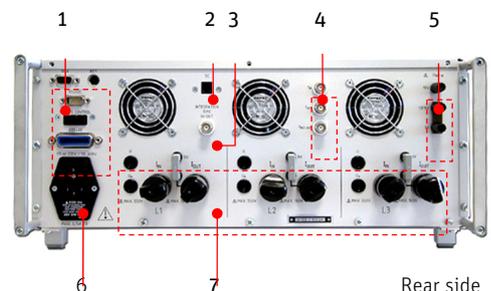
For evaluation and reporting of the measurement results data management software MTVIS can be used on external PC.



- 1 USB connection
- 2 Softkeys
- 3 Alphanumeric keypad, Enter and cursor keys



COM3003 with suitcase



- 1 Interface: RS232, Remote control, IEEE, VGA and external keypad
- 2 Scanning head input f. comparative P measurement
- 3 Quartz output for integration time
- 4 Power proportional pulse outputs (2x)
Pulse inputs for comparative P measurement (1x)
- 5 1 V and 10 V DC reference input
- 6 Mains supply 115/230 V
- 7 Current and voltage inputs

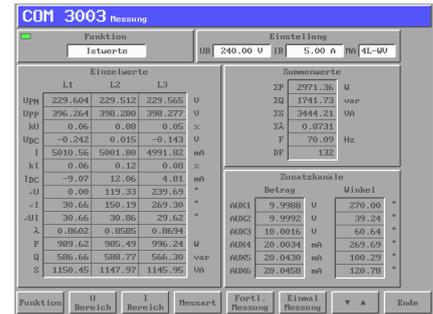


Display with softkeys

Actual Values Measurement

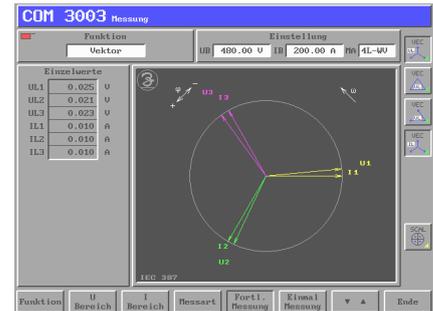
The following system parameters are displayed as averages values over an adjustment integration time:

- 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



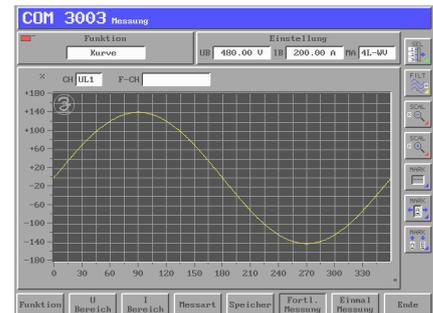
Vector Display

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



Waveform Display

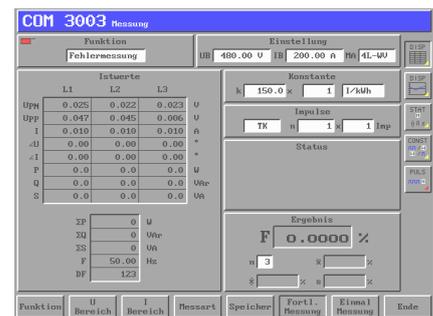
The waveforms of voltage and currents can be measured and displayed. The user can choose between display as curves with indication of individual values and harmonic displaying with individual distortion values.



Error Measurement

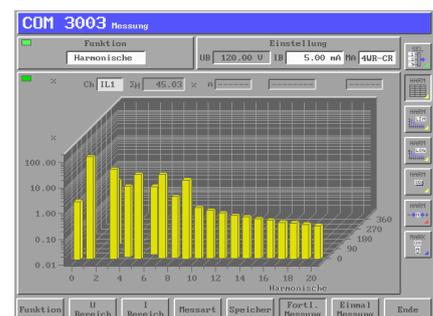
Static and electromechanical power meters as well as all kind of measuring instruments with power proportional frequency output can be tested in the menu "Error measurement".

The user can select between scanning head input or frequency input.



Harmonic Measurement

Harmonic spectrum measurement in voltage and current up to the 40th THD conforming to EN50160. The harmonic spectrum can be displayed in a chart or in a diagram. All measured harmonic values can be stored according to the customer information data on USB stick. The system has also the ability to scan the measured harmonic by using a cursor and to display the scanned values referring to the cursor position on the screen.



Technical Data

General	
Power supply	115 V / 230 V + 10 % -15 %, 50 ... 60 Hz
Power consumption	max. 220 VA
Fuse	5 mm Ø x 20 mm 4 A 250 V (T)
Temperature range, operation	+15 ... + 40 °C
Temperature range, storage	-15 ... + 65 °C
Dimensions (LxWxH)	172 x 465 x 460 mm
Weight	~ 25 kg
Safety	
IP class according to DIN EN 60529	IP40
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	I
Reference meter	
Measuring modes	Pure (AC) signals and mixed signals (AC + DC) 4-W active and apparent, reactive true, cross and Q60 3-W active and reactive true, cross connected A and B 2-W active and reactive Pure (DC) signals 10) 2-W DC 4-W DC
Fundamental frequency	15 ... 70 Hz
Sampling	24 bit 720 samples/period
Accuracy class for measuring of power/energy 4) 6) 11) 25)	0.008 %
Angle measurement accuracy 4)	< 0.005°
Frequency measurement deviation	± 0.001 Hz
Voltage Measurement	
Voltage measurement	30 V ... 500 V ≈
Voltage range(s)	480 V, 240 V, 120 V, 60 V
Voltage channels input impedance (@ range)	372 kΩ
Voltage measurement accuracy AC 5) 11) 25)	< 0.003 %
Voltage measurement temperature drift AC	< 0.5 x 10 E-6 / K
Voltage measurement long term stability 2)	< 0.0015 % / Year
Voltage measurement DC accuracy 5) 10)	< 0.005 %
Voltage measurement DC temperature drift 10)	< 0.001 % / K
Voltage measurement DC long term stability 2) 10)	< 0.005 % / Year
Current measurement	
Current measurement	1 mA ... 160 A ≈
Current range(s)	200 A, 100 A, 50 A, 20 A, 10 A, 5 A, 2 A, 1 A, 500 mA, 200 mA, 100 mA, 50 mA, 20 mA, 10 mA, 5 mA
Usage of ranges	10 ... 120 %
Current channels input impedance (@ range)	< 2 mΩ @ 200 A ... 50 A < 11 mΩ @ 20 A ... 5 A < 101 mΩ @ 2 A ... 500 mA < 1 Ω @ 200 mA ... 50 mA < 10 R @ 20 mA ... 5 mA
Current measurement accuracy 5) 11) 25)	< 0.005 % @ 50 mA ... 100 A < 0.007 @ 10 mA ... < 50 mA / > 100 A ... 160 A < 0.015 % + < 0.003 % @ 1 mA ... < 10 mA
Current measurement temperature drift 4)	< 0.5 x 10 E-6 / K
Current measurement long term stability 2)	< 0.0025 % / Year
Current measurement DC accuracy 4) 5) 10)	< 0.035 %
Current measurement DC temperature drift 10)	< 0.0025 % / K
Current measurement DC long term stability 2) 10)	< 0.01 % / Year
Power Measurement	
Power/energy measurement accuracy 5) 6) 11) 25)	< 0.008 % @ 50 mA ... 100 A < 0.01 % @ 10 mA ... < 50 mA / > 100 A ... 160 A < 0.018 % @ 1 mA ... < 10 mA
Power/energy measurement temperature drift 4)	< 1 x 10 E-6 / K
Power/energy measurement long term stability 2) 4)	< 0.004 % / Year
Power/energy measurement DC accuracy 4) 5) 10)	< 0.04 %
Power/energy measurement DC temperature drift 10)	< 0.0035 % / K
Power/energy measurement DC long term stability 2) 10)	< 0.015 %

2: Stability over 1 year (every month one measurement over one hour)

14.12.2021

4: From 50 mA ... 160 A

5: Related to the read value at optimum range selection

6: Related to the active power with power factors from 1 to 0.5 i and from 1 to 0.8

10: Option

11: From 45 Hz .. 65 Hz

22: Only at 50 Hz, compensated

25: Measurement uncertainties of the laboratory has to be considered separately

Subjects to alteration.