ZERA

Transformer Measuring Equipment

WM3000U | WM3000I

Measuring Bridges for Voltage Transformers and Current Transformers

Testing of Conventional, Electronical and Non-conventional, Digital Measuring Transformers

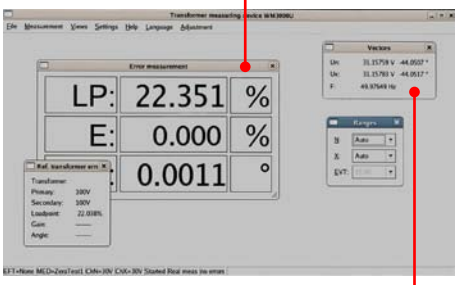
Multifunctional Measuring Bridge WM3000U WM3000I

The current/voltage measuring bridges WM3000U and WM3000I are high-precision comparator units for comparing secondary signal from transformer under test (or digital information of non-conventional transformers) with a reference signal supplied by a standard device.
The resulting error value will be displayed as ratio error and phase displacement on the screen.
In general the operation of the measuring bridges will be performed via integrated 8.9“ touch screen. Optionally control and read-out of the measuring values can be performed via integrated interfaces and PC.

Measuring bridge WM3000U

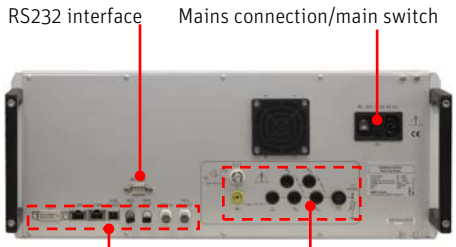
PTs WM3000U

- Conventional voltage transformers (PT) according to IEC60044-2
- Electronical voltage transformers (EVT) according to IEC60044-7
- Non-conventional, digital voltage transformers according to IEC61850-9-2



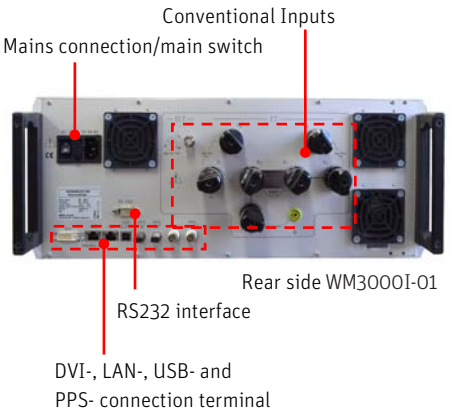
CTs WM3000I

- Conventional current transformers (CT) according to IEC60044-1
- Electronical current transformers (ECT) according to IEC60044-8
- Non-conventional, digital current transformers according to IEC61850-9-2



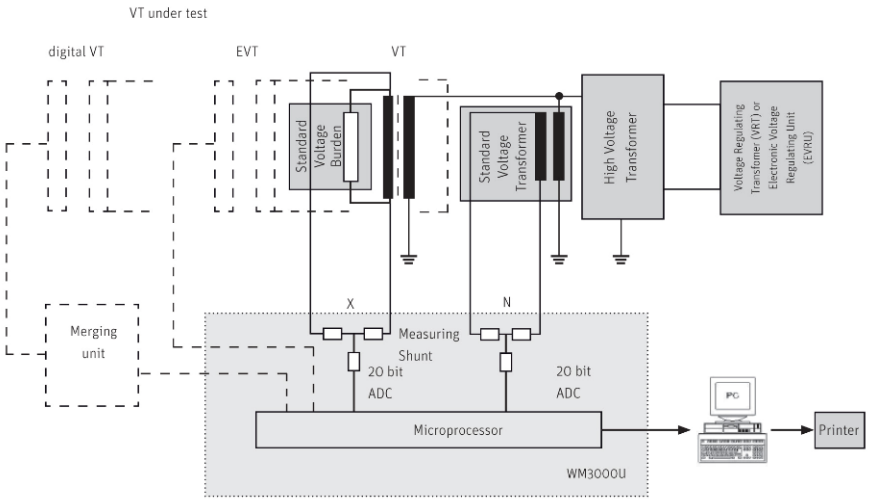
Features

- Voltage inputs for PT and EVT with high impedance direct input (WM3000U)
- Current inputs for CT and ECT with high impedance direct input (WM3000I)
- Inputs for non-conventional, digital transformer (100Base-Tx full duplex RJ45)
- User friendly operation via touch screen with integrated graphical user interface
- A/D conversion of measuring value by 24 Bit converter
- Measurement of different currents and voltages via absolute control of all ranges PC interface via Ethernet



Principle Diagramm Accuracy Test

Voltage transformer testing



Technical Data

WM3000U

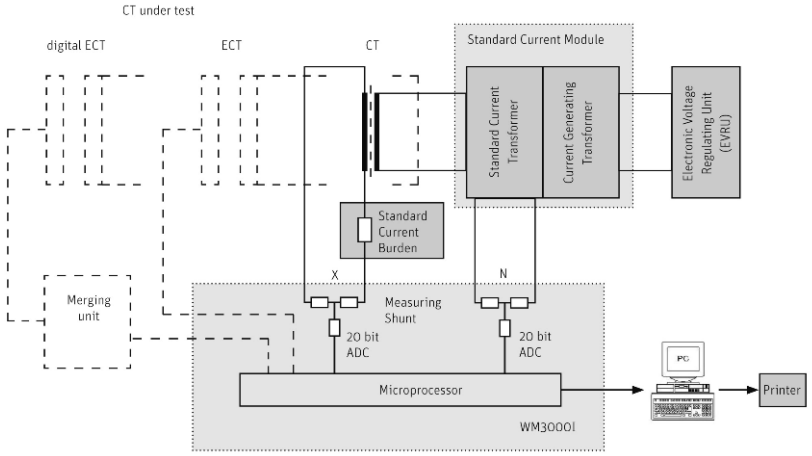
Voltage Transformer Measuring Bridge WM3000U

General	
Power supply	85 … 265 V, 47 … 63 Hz
Power consumption	55 VA
Temperature range, operation	5° … + 40° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	17 x 450 x 450 mm
Weight	ca. 8.5 Kg
Fundamental frequency	15 … 65 Hz
Safety	
IP class according to DIN EN 60529	IP30
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	I
Voltage transformer measurement	
Voltage input N-channel	
Voltage measurement	2 V … 500 V
Voltage channels input impedance (@ range)	380 KΩ / 500 pF @ 3.75 V … 480 V
Voltage measurement accuracy	< 100 x 10 E-6 @ 10 V … 500 V < 200 x 10 E-6 @ 2 V … < 10 V
Maximum of voltage	500 V
Voltage input X-channel	
Voltage measurement	2 V … 500 V
Voltage channels input impedance (@ range)	380 KΩ / 500 pF @ 3.75 V … 480 V
Voltage measurement accuracy	< 100 x 10 E-6 @ 10 V … 500 V < 200 x 10 E-6 @ 2 V … < 10 V
Maximum of voltage	500 V
Voltage input EVT-channel	
Voltage measurement	2.5 mV … 18 V
Voltage channels input impedance (@ range)	20 MΩ / 240 pF @ 25 mV .. 15 V
Voltage measurement accuracy	< 300 x 10 E-6 @ 200 mV … 15 V < 500 x 10 E-6 @ 20 mV … < 200 mV
Maximum of voltage	20 V
Conventional voltage transformers	
Ratio error indication 1)	TV 0.9 … 1: < 50 x 10 E-6 @ 10 V … 500 V < 100 x 10 E-6 @ 2 V … < 10 V TV 0.5 … < 0.9 : < 100 x 10 E-6 @ 10 V … 500 V < 150 x 10 E-6 @ 2 V … < 10 V TV < 0.5 : < 200 x 10 E-6 @ 10 V … 500 V < 250 x 10 E-6 @ 2 V … < 10 V
Phase displacement indication 1)	TV 0.9 … 1: < 0.2 min @ 10 V … 500 V < 0.5 min @ 2 V … < 10 V TV 0.5 … < 0.9 : < 0.4 min @ 10 V … 500 V < 0.7 min @ 2 V … < 10 V TV < 0.5 : < 0.6 min @ 10 V … 500 V < 0.9 min @ 2 V … < 10 V
Non-conventional, digital voltage transformers acc. to EN61850	
Ratio error indication	< 100 x 10 E-6 @ 10 V … 500 V < 200 x 10 E-6 @ 2 V … < 10 V
Phase displacement indication	< 1.1 min @ 10 V … 500 V < 1.5 min @ 2 V … < 10 V
Electronical voltage transformers	
Ratio error indication 2)	< 400 x 10 E-6 @ 200 mV … 15 V < 600 x 10 E-6 @ 20 mV … < 200 mV
Phase displacement indication 2)	< 0.6 min @ 200 mV … 15 V < 1.1 min @ 20 mV … < 200 mV

1: with TV = divider ratio
(input voltage X / input voltage N) or
(input voltage N / input voltage X)
2: in N-channel @ 10 V … 500 V

15.01.2013

Principle Diagramm
Accuracy Test
Current transformer testing



Technical Data
WM3000I

Current Transformer Measuring Bridge WM3000I

General	
Power supply	85 … 265 V, 47 … 63 Hz
Power consumption	typ. 150 VA, max. 280 VA
Temperature range, operation	5° … + 40° C
Temperature range, storage	-15° … + 65° C
Relative humidity (not condensing)	max. 95 %
Dimensions (DxWxH)	17 x 450 x 450 mm
Weight	ca 11 Kg
Max. height above sea level	2000 m
Fundamental frequency	15 … 65 Hz
Safety	
IP class according to DIN EN 60529	IP30
Declaration of conformity	CE conform
Protection class according to DIN EN 61140	I
Current transformer measurement	
Current input N-channel	
Current measurement	1 mA … 15 A
Current channels input impedance (@ range)	< 5 mΩ
Current measurement accuracy	< 100 x 10 E-6 @ 15A .. 50 mA < 200 x 10 E-6 @ < 50 mA … 5 mA
Maximum current	15 A
Current input N-channel	
Current measurement	1 mA … 15 A
Current channels input impedance (@ range)	< 5 mΩ @5 mA … 15 A
Current measurement accuracy	< 100 x 10 E-6 @ 15A .. 50 mA < 200 x 10 E-6 @ < 50 mA … 5 mA
Maximum current	15 A
Voltage input ECT-channel	
Voltage measurement	2.5 mV … 18 V
Voltage range(s)	15 V, 10 V, 5 V, 2.5 V, 1 V, 500 mV, 250 mV, 100 mV, 50 mV, 25 mV
Voltage channels input impedance (@ range)	20 MΩ / 240 pF @ 25 mV .. 15 V
Voltage measurement accuracy	< 300 x 10 E-6 @ 200 mV … 15 V < 500 x 10 E-6 @ 20 mV … < 200 mV
Voltage measurement linearity	< 150 x 10 E-6 @ 200 mV … 15 V
Maximum of voltage	20 V
Conventional current transformers	
Ratio error indication 1)	TV 0.9 … 1: < 50 x 10 E-6 @ 50 mA … 15 A < 150 x 10 E-6 @ 5 mA … < 50 mA TV 0.5 … < 0.9 : < 100 x 10 E-6 @ 50 mA … 15 A < 200 x 10 E-6 @ 5 mA … < 50 mA TV < 0.5 : < 200 x 10 E-6 @ 50 mA … 15 A < 300 x 10 E-6 @ 5 mA … < 50 mA 0
Phase displacement indication 1)	TV 0.9 … 1: < 0.2 min @ 50 mA … 15 A < 0.5 min @ 5 mA … < 50 mA TV 0.5 … < 0.9 : < 0.4 min @ 50 mA … 15 A < 0.7 min @ 5 mA … < 50 mA TV < 0.5 : < 0.6 min @ 50 mA … 15 A < 0.9 min @ 5 mA … < 50 mA 0
Non-conventional, digital current transformers acc. to EN61850-9-2	
Ratio error indication	< 200 x 10 E-6 @ 15A .. 50 mA < 400 x 10 E-6 @ < 50 mA … 5 mA 0
Phase displacement indication	< 1.1 min @ 15A .. 50 mA < 1.5 min @ < 50 mA … 5 mA 0
Electronical current transformers	
Ratio error indication 2)	< 400 x 10 E-6 @ 200 mV … 15 V < 600 x 10 E-6 @ 20 mV … < 200 mV 0
Phase displacement indication 2)	< 0.6 min @ 200 mV … 15 V < 1.1 min @ 20 mV … < 200 mV 0

1: with TV = divider ratio
(input voltage X / input voltage N) or
(input voltage N / input voltage X)
2: in N-channel @ 50 mA … 15 A

18.02.2013

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