

# URNS RATIO METER PWR3A- (CVT)

Full automated high precision transformers turns ratiometer  
Can be expanded for Capacitive Voltage Transformers Tests.

Transformer measuring  
devices

Turns Ratio Meter

The great advantage of the PWR3A compared to many of the other instruments on the market is its simple set-up.

In most cases the required parameters must be looked up in tables on the basis of the vector group and the code number of the transformer to be measured, and set up at the instrument by means of rotary switches or keys. This often results in a wrong set-up or uncertainty regarding the set-up since some of the tables are confusing.

Such a manual set-up is not necessary with the PWR3A transformation ratio measuring instrument. You simply type in the vector group with the keys.

The only thing you have to do is to connect the transformer being off-line to the device and release the measurement; all three phases are measured consecutively, all connecting and short circuited procedures at the primary and secondary voltage sides are performed automatically before each measurement. Of course it is also possible to measure just one phase, e.g. H<sub>2</sub>.

An adjustable set value permits the display of an error or deviation of the measured transformation ratio. Further, an automatic control of the tap changer is provided. In this case all phases and taps are measured consecutively, and all the results are stored inside the instrument (using the transformer specific memory), printed (if a printer is connected), and transferred to the PC (if connected).

Using the internal memory all results for all taps are written to a transformer specific area.

Furthermore, the transformer specific set point values, the vector group and additional information describing the transformer (e.g. serial number, location ...) are read from the memory when selected and displayed on the LCD. If set point values are present, an OK / NOT OK message with the corresponding information is displayed.

The transformer specific data can be easily programmed via a connected personal computer but it is also possible to input the transformer specific data via the internal keyboard.

The PWR3A transformation ratio measuring instrument is connected to the H.V. and L.V. sides via four connections each. It also powers the test object at selected voltage, supplied by an internal isolating transformer. However, an external excitation using different voltages and frequencies is also possible.

A special feature is the possibility to use three phase measuring voltage. Transformers have phase angles of  $n \cdot 30^\circ$  where  $n$  is the vector number 0 to 11. Because all measurements are single phase all results will be  $0^\circ$  or  $180^\circ$  too together with eventually phase errors.

But there are some special transformers with phase angles of  $n \cdot 30^\circ \pm (0^\circ..15^\circ)$ , e.g.  $127.5^\circ$ . To get this value (and not  $0/180^\circ$ ) one need a three phase source to feed the trans-



former. A 3-phase line voltage is used for this purpose.

The PWR3A is supplied in a robust carrying case. All connections are provided at the front of the instrument and are locked in order to avoid unplugging during a measurement. An alarm set (a red lamp is on during the measurement) can also be supplied.

The connecting cables and clamps are 4-pole (Kelvin) on the HV-winding to avoid errors due to cable resistance.

## Features

- Ratio range from 0.75 to 20,000 (higher ratios with **CVT-Ext.**)
- Fully automated measurement
- Features market unique Vector Group Detection
- Measuring voltage from 8 V to 230 V
- Measuring voltage up to 5 kV by CVT-Extension: **PWR3A-CVT**
- Using 3-phase voltage for phase angles other than  $0^\circ/180^\circ$
- Easy to handle tap changer automatic
- Internal memory stores all dates (Reading with PWR3A-XFER)
- LC display (256 x 128 pixel) with backlight
- Easy input of vectorgroup and measuring conditions
- USB/RS232C port to get full instrument control
- Centronics printer port or build in printer (optional)
- Robust mobile case for field use
- Factory Certificate

Questions?

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Here you will get technical assistance as well as complete information regarding features, prices, shipment and reselling.



[www.ohmmeter.de](http://www.ohmmeter.de)

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# URNS RATIO METER PWR 3A- (CVT)

Technical Data, Enhancements and Accessories

## Ratio measurement

Total Range	0.75 – 20,000 : 1
Max. errors (0.75 .. 2,500)	± 0.10 % ± 1d @ 8 V .. 230 V
Max. errors (2,501 .. 5,000)	± 0.10 % ± 1d @ 40 V .. 230 V ± 0.15 % ± 1d @ 8 V
Max. errors (5,001 .. 10,000)	± 0.10 % ± 1d @ 80 V .. 230 V ± 0.20 % ± 1d @ 8 V .. 40 V
Max. errors (10,001 .. 15,000)	± 0.15 % ± 1d @ 80 V .. 230 V ± 0.30 % ± 1d @ 8 V .. 40 V
Max. errors (15,001 .. 20,000)	± 0.30 % ± 2d @ 160 V .. 230 V ± 1.00 % ± 2d @ 40 V .. 80 V
Measuring voltage	8 V, 40 V, 80 V, 160 V, 230 V or by external source (8V .. 240 V)
Measuring frequency	45 Hz – 65 Hz
Range selection	full automatic

## Phase angle measurement

Range (one phase)	- 9.9 ° to + 9.9 °
Range (three phase)	- 179.9 ° to + 180 °
Max. error	± 0.1 ° ± 2 digit
Mag.current measurement	1 mA – 2000 mA ± 1 mA

## Multiplexer

Connections HV	1U, 1V, 1W, 1N / $H_{0,1,2,3}$ Amphenol
Connections LV	2U, 2V, 2W, 2N / $X_{0,1,2,3}$ Amphenol
Connections ext. excitation	8 V – 240 V (1/3-phase) AC, STASEI 5

## Error detection

Contact- and stability errors  
displays: HV / LV too low; bad line stability  
using front panel, via RS232 or chipcard  
shown on display, via RS232

## Set point input

Deviences  
Start of measurement using front panel, via RS232 or IEEE - 488

## Display

Result format  
vectorgroup, actual phase, actual tap-position,  
ratio and deviation, phase angle and deviation,  
exiting current, deviation ref. to setpoints

## Measuring Time

5 ... 20 s depending on line noise/distortion

## Measurement Storage

ca. 2000 sets of data on internal memory

## Data Transfer

direct or later on with PWR3A-XFER - Program

## Correct Connections

tested before each measurement

## Ports

USB, RS232C (full device control)  
printer (parallel, ANSI standard, *optional*)

## Temperature

Operating: -10° .. 50°C  
Storage: -20° ... 65°C

## Humidity

0 ... 90% (Storage 95%) non condensing

## EMC, Safety, Vibration

CE, IEC61010-1, ASTM D 999.75

## Dimensions, Weight

490 x 400 x 190 mm (WxDxH, mobile ABS  
rugged case), approx. 10 kg without cables

## Power Supply

230VAC +10% -15% (196 - 250VAC) / 48..62Hz

## Transformer measuring devices

Turns ratio meter



## Available Enhancements (Options)

### • CVT Test Adapter

The CVT Test Adapter increases the ratio by a factor of max. 50 using high voltage up to 5kV. The adapter will be connected with the HV- and LV-winding terminals on the PWR3A and two highvoltage terminals to the Capacitive Voltage Transformer. The PWR3A must have the -CVT-Option installed:

### • Warning light:

The warning light flashes if voltage appears on the test object during measurement.

### • Software PWR3A-XFER

The program PWR3A-XFER supports the transfer of stored measuring-data from the PWR3A-parameter card to a text editor or a spreadsheet program.



## Available Accessories

- Cable HVK(AV) 4x4-pole, various length, amphenol jack and clamps ( $H_{0,1,2,3}$ )
- Cable LV(BV) 4x2-pole, various length, amphenol jack and clamps ( $X_{0,1,2,3}$ )

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