



PRS 400.3

Three-phase Portable Reference Standard Class 0.02



The PRS 400.3 is a high accuracy reference standard for the comprehensive investigation of all components of a modern metering installation. Characteristic features are its wide measuring range, the high accuracy and the small dependence of disturbing.

Advantages of the PRS 400.3

- Simultaneous testing of up to three meters or registers of a multi-functional meter
- Current- and voltage ranges:
1 mA ... 120 A / 5 V ... 520 V / 45 Hz ... 70 Hz
- Six current inputs allow simultaneous measurements of both primary and secondary currents in CT-connected metering systems
- Using several clip-on CT's at the range of 100 A up to 3000 A or hot sticks for measurement on high voltage potential
- Internal memory for measurement results and customer data
- Integrated RS 232 C interface for data transfer and programme control via external PC

- The Portable Control Module PCS 400.3 can be removed and the reference standard is controlled in this case via blue-tooth

Functions

- Active, reactive and apparent power measurement in three-wire or four-wire circuits with integrated error measurement and pulse output for energy
- Vector diagram, harmonics spectrum, wave form and rotary field display for analysis of the mains conditions
- Burden measurement and ratio test of current- and voltage transformers
- Measuring of current, voltage and power transducers

Options

- Software CAMCAL for Windows or CALSOFT
- Error compensated clip-on CT's up to 100 A
- Clip-on CT's up to 1000 A
- Flexible current transformers FLEX 3000 up to 3000 A
- Scanning head SH 2003 with clamp on device SCD 2003

Technical Data PRS 400.3 + PCS 400.3

Mains supply voltage: 88 ... 280 V, 45...66 Hz
 Power consumption: max. 20 VA
 Housing: Metal, rubber protection
 Dimensions: W 520 x H 195 x D 275 mm
 Weight: approx. 11.5 kg
 Influence of supply on the measuring results: $\leq 0.005\%$ at 10% variation
 Ambient temperature: -10 °C ... +50 °C (Operating range)
 +10 °C ... +40 °C (Specified range)

Temp. Coefficient: $\leq 0.0025\% / ^\circ\text{C}$ +10°C ... +40°C
 $\leq 0.0050\% / ^\circ\text{C}$ -10°C ... +50°C
 Frequency range of the measured quantities: 45 ... 70 Hz

Influence of external fields: $\leq 0.07\% / 0.5\text{ mT}$
 Time base: 1 (0.2 ... 9999) s

Current measurement (I)

Direct

Current range: 1 mA ... 12 A
 Internal range: 1 mA ... 4 mA $\alpha = 30000$
 4 mA ... 12 mA $\alpha = 10000$
 12 mA ... 40 mA $\alpha = 3000$
 40 mA ... 120 mA $\alpha = 1000$
 120 mA ... 400 mA $\alpha = 300$
 400 mA ... 1.2 A $\alpha = 100$
 1.2 A ... 4.0 A $\alpha = 30$
 4.0 A ... 12.0 A $\alpha = 10$

Display range: 1.0000 mA ... 12.0000 A
 Measurement error: $E \leq \pm 0.02\%$ 4 mA ... 12 A
 of the measured value
 $E \leq \pm 0.02\%$ 1 mA ... 4 mA
 of the measurement range final value

Current range: 10 mA ... 120 A
 Internal range: 10 mA ... 40 mA $\alpha = 3000$
 40 mA ... 120 mA $\alpha = 1000$
 120 mA ... 400 mA $\alpha = 300$
 400 mA ... 1.2 A $\alpha = 100$
 1.2 A ... 4 A $\alpha = 30$
 4 A ... 12 A $\alpha = 10$
 12 A ... 40 A $\alpha = 3$
 40 A ... 120 A $\alpha = 1$

Display range: 10.000 mA ... 120.000 A
 Measurement error: $E \leq \pm 0.02\%$ 40 mA ... 120 A
 of the measured value
 $E \leq \pm 0.02\%$ 10 mA ... 40 mA
 of the measurement range final value

Electronically compensated Clip-on CT's

Current range: 50 mA ... 100 A
 Range: 50 mA ... 800 mA $\alpha = 125$
 800 mA ... 4 A $\alpha = 25$
 4 A ... 20 A $\alpha = 5$
 20 A ... 100 A $\alpha = 1$

Display range: 10.00 mA ... 100.00 A
 Measurement error: $E \leq \pm 0.2\%$ 0.5 A ... 100 A
 $E \leq \pm 1.0\%$ 50 mA ... 499 mA

Clip-on CT's up to 1000 A

Measurement error: $E \leq \pm 0.5\%$ 2 A ... 1000 A
 of the measured value + error of the clip-on CT's

Current transformers FLEX 3000 30 / 300 / 3000 A

Measurement error: $E \leq \pm 0.5\%$ 10 ... 100% of range
 of the measured value + error of the clip-on CT's

Voltage measurement (U)

Voltage range: 5 V ... 520 V
 Internal ranges: 5 V ... 65 V $\beta = 8$
 65 V ... 130 V $\beta = 4$
 130 V ... 260 V $\beta = 2$
 260 V ... 520 V $\beta = 1$

Display range: 5.0000 ... 520.000 V
 Measurement error: $E \leq \pm 0.02\%$ 30 V ... 520 V
 of the measured value
 $E \leq \pm 0.02\%$ 5 V ... 30 V
 of the measurement range final value

Burden measurement

Voltage range: 0 V ... 5 V
 Display range: 0.000 mV ... 5.000 V
 Measurement error: $E \leq \pm 0.5\%$ 0.4 V ... 5 V
 of the measured value
 $E \leq \pm 1.0\%$ 0 V ... 0.4 V
 of the measurement range final value

DC measurement

	DC Current	DC Voltage
Measurement range:	0 ... ± 20 mA	0 ... ± 10 V
Measurement error:	$E \leq \pm 1.0\%$	$E \leq \pm 1.0\%$
Display range	0.00 ... 20.00 mA	0.000 V ... 10.000 V

Power measurement (P, Q, S)

Power measurement per phase on range 30 ... 520 V. The accuracy of the power is related to apparent power

Measurement error direct (1 mA ... 12 A):

Active, reactive, apparent power P, Q, S: $E \leq \pm 0.02\%$ 4 mA ... 12 A
 of the measured value
 $E \leq \pm 0.02\%$ 1 mA ... 4 mA
 of the measurement range final value

Measurement error direct (10 mA ... 120 A):

Active, reactive, apparent power P, Q, S: $E \leq \pm 0.02\%$ 40 mA ... 120 A
 of the measured value
 $E \leq \pm 0.02\%$ 10 mA ... 40 mA
 of the measurement range final value

Measurement error with electronically compensated clip-on CT's (50 mA ... 100 A):

Active, reactive, apparent power P, Q, S: $E \leq \pm 0.2\%$ 500 mA ... 100 A
 of the measured value
 $E \leq \pm 0.5\%$ 50 mA ... 500 mA
 of the measurement range final value

Measurement error with clip-on CT's up to 1000 A:

Active power P: $E \leq \pm 0.2\%$ 50 A ... 1000 A
 of the measured value
 $E \leq \pm 0.5\%$ 2 A ... 50 A
 of the measurement range final value

Measurement error with current transformers

FLEX 3000 30 / 300 / 3000 A:

Active power P: $E \leq \pm 2.0\%$ 10 ... 100% of range
 of the measured value
 $E \leq \pm 3.0\%$ 3.33 ... 10% of range
 of the measurement range final value
 6-digit for each measuring point

Display range:

Energy measurement (W)

Connections and errors as under power measurement

Power factor (PF)

$$PF = \frac{P}{S}$$

Measurement error direct:
 $E \leq \pm 0.0002$

Measurement error with electronically compensated clip-on CT's:
 $E \leq \pm 0.0002$

- 1.00000 ... + 1.00000

Display range:

Phase angle display

Resolution: 0.01°

Accuracy: $E \leq \pm 0.05^\circ$

Frequency inputs 1-3

Input level: 4 ... 12 V (24V)
 Input frequency: max. 200 kHz
 Auxiliary voltage: 11 ... 13 V ($I \leq 60$ mA)
 Min. impulse length: $\geq 1 \mu\text{s}$

Frequency outputs 1-3 (fo)

Output level: 5 V TTL short-circuit-proof
 Range 0.01 ... 100 A
 $\Sigma C_P = 1'125 \text{ Imp./Wh}$

$$f_o = \frac{\Sigma P \cdot \Sigma C_P \cdot \alpha \cdot \beta}{3600}$$

Output frequency: α, β The factors of the highest current and voltage range reached are to be substituted here.

max. 58'500 Hz

Output frequency:

Safety Requirements

- Isolation protection EN 61010-1
- CE-certified
- Degree of Protection: IP-40
- Storage Temp.: -20°C ... +55°C
- Relative humidity: $\leq 85\%$ at $T_a \leq 21^\circ\text{C}$
- Relative humidity: $\leq 95\%$ at $T_a \leq 25^\circ\text{C}$
 at 30 days/year: