MTE Meter Test Equipment

SRS 400.3

Three-Phase Electronic System Reference Standard, Class 0.02
Version 200 A



The SRS 400.3 three-phase electronic system reference standard has been especially developed for use with meter test systems.

The SRS 400.3 electronic system reference standard is a precision measurement unit for all AC values that are used in the measurement of energy. Its wide measurement range, high precision and excellent immunity to interference are the outstanding features of this instrument. It is the ideal measurement unit for verification of electricity meters in the test area.

This reference standard is operated completely via the RS 232C serial line interface.

Key features of the SRS 400.3

- Three-phase reference standard
- Precision measurement unit for AC values in the frequency range of 45 to 70 Hz
- Simultaneous availability of the measured values over the RS 232 C serial line interface
- Test of two, three and four-wire meters
- Integrated measurement connection mode switching
- Easy operation due to the use of processor technology
- Operation verification with error indication
- Integrated RS 232C serial line interface for data transmission and programmed operation using an external computer
- Current and voltage ranges:
  30 V to 520 V, 1 mA to 200 A

Other characteristics

Measurements are carried out in the four quadrants. They are valid for all AC operational modes, including the measurement of the power factor and the phase angle. Reactive power measurements may be made either in the natural or artificial connection mode. The measurement system uses the analogue/digital converter principle.

The operation and processing of the measured values is carried out using special operation commands from a personal computer. The internal, automatic, range selection may be switched off, and in this case the load point range is directly selected by the PC.

Technical Data SRS 400.3

Mains supply voltage:	88 ... 280 V, 45...66 Hz
Power consumption:	max. 50 VA
Housing:	19” plug-in unit, 6 HE
Dimensions:	W 483 x H 266 x D 342 mm
Weight:	approx. 9 kg
Influence of supply on the measuring results:	≤ 0.005% at 10% variation
Ambient temperature:	-10 °C ... +50 °C (Operating range) +10 °C ... +40 °C (Specified range)
Temp. Coefficient:	≤ 0.0025 % / °C +10°C ... +40°C ≤ 0.0050 % / °C -10°C ... +50°C
Frequency range of the measured quantities:	45 ... 70 Hz
Influence of external fields:	≤ 0.07 % / 0.5 mT
Time base:	1 (0.2 ... 9999) s

Current measurement (I)

Current range:	1 mA	...	12.5 A		
Internal ranges:	1 mA	...	20 mA	α =	10000
	20 mA	...	50 mA	α =	4000
	50 mA	...	125 mA	α =	1600
	125 mA	...	312.5 mA	α =	640
	312.5 mA	...	781.25 mA	α =	256
	781.25 mA	...	2 A	α =	100
	2 A	...	5 A	α =	40
	5 A	...	12.5 A	α =	16

Display range: 1.0000 mA ... 12.5000 A

Measurement error: E ≤ ± 0.02 % of the measured value (20 mA ... 12.5 A)
E ≤ ± 0.02 % of the measurement range final value (1 mA ... 20 mA)

Current range:	100 mA	...	200 A		
Internal ranges:	100 mA	...	320 mA	α =	625
	320 mA	...	800 mA	α =	250
	800 mA	...	2 A	α =	100
	2 A	...	5 A	α =	40
	5 A	...	12.5 A	α =	16
	12.5 A	...	32 A	α =	6.25
	32 A	...	80 A	α =	2.5
	80 A	...	200 A	α =	1

Display range: 30.000 mA ... 200.000 A

Measurement error: E ≤ ± 0.02 % of the measured value (320 mA ... 200 A)
E ≤ ± 0.02 % of the measurement range final value (100 mA ... 320 mA)

Voltage measurement (U)

Voltage range:	30 V	...	520 V		
Internal ranges:	30 V	...	65 V	β =	8
	65 V	...	130 V	β =	4
	130 V	...	260 V	β =	2
	260 V	...	520 V	β =	1

Display range: 5.0000 ... 520.000 V

Measurement error: E ≤ ± 0.02 % of the measured value (30 V ... 520 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 (1 mA … 12.5 A):

Active, reactive, apparent power P, Q, S: E ≤ ± 0.02 % of the measured value (20 mA ... 12.5 A)
E ≤ ± 0.02 % of the measurement range final value (1 mA ... 20 mA)

Measurement error (100 mA … 200 A):

Active, reactive, apparent power P, Q, S: E ≤ ± 0.02 % of the measured value (320 mA ... 200 A)
E ≤ ± 0.02 % of the measurement range final value (100 mA ... 320 mA)

Display range: 6-digit for each measuring point

Energy measurement (W)

Connections and errors as under power measurement

Power factor (PF)

$$PF = \frac{P}{S}$$ E ≤ ± 0.0002

Display range: - 1.00000 ... + 1.00000

Phase angle display

Resolution: 0.01°

Accuracy: E ≤ ± 0.01°

Frequency inputs 1-3

Input level: 4 ... 12 V (24V)

Input frequency: max. 200 kHz

Auxiliary voltage: 11 ... 13 V (I ≤ 60 mA)

Min. impulse length: ≥ 1 µs

Frequency output 1-3 (fo)

Output level: 5 V TTL short-circuit-proof

Range: ΣC_P = 675 Imp./Wh
12.5 A: 1 mA ... 12.5 A
200 A: 320 mA … 200 A

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

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

Output frequency: max. 58500 Hz

Safety Requirements

- Isolation protection EN 61010-1
- CE
- Degree of Protection: IP-20
- Storage Temp.: -20°C ... +55°C
- Relative humidity: ≤ 85% at Ta ≤ 21°C
- Relative humidity at 30 days/year: ≤ 95% at Ta ≤ 25°C