

SWS 1.3

Three phase, electronic stationary Working Standard class 0.1



The SWS 1.3 (Stationary Working Standard) is an electronic, three phase stationary working standard meter and can be use with meter test systems.

The SWS 1.3 electronic working standard is a precision measurement unit for all AC values that are used in the measurement of energy. It impressive trough its small dimensions and light weight. The wide measurement range, high precision and excellent immunity to interference are the outstanding features of this instrument.

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

Key points of the SWS 1.3

- Three-phase working standard
- Precision measurement unit for AC values in the frequency range of 45 to 66 Hz
- Measurement of active, reactive and apparent power in 3 and 4 wire networks
- Impulse output for energy
- Current, voltage and Frequency measurement
- Control of output relays to control the energy dosage of register tests
- Error measurement

Technical Data SWS 1.3

Auxiliary supply:	86 ... 264 VAC
Power consumption:	max. 12 VA
Housing:	Hard plastic
Dimensions:	W157 x H310 x D110 mm
Weight:	approx. 2.4 kg
Operation temperature:	-10 ... +50 °C

Accuracy class:	[%]	
	0.1*	* related to the apparent power S

Temperature coefficient:	[% / K]	Range
	0.01	+15 ... +30 °C
	0.02	-10 ... +50 °C

Frequency range:	45 ... 66 Hz
Influence of ex. fields:	≤ 0.5 % / 0.5 mT

Current measurements (I)

Current range	10 mA ... 120 A
Display range:	0.01000 A ... 129.999 A
Error:	

	[%]	Range
	≤ ± 0.1	120 mA ... 120 A
	≤ ± 0.5	10 mA ... 120 mA

Internal ranges:

10 mA ... 120 mA	α=1000
120 mA ... 1.2 A	α=100
1.2 A ... 12 A	α=10
12 A ... 120 A	α=1

Time base Tm: 1 (1 ... 9999) s

Voltage measurements (U)

Voltage range:	46 V ... 300 V
Display range:	46.0000 V ... 309.999 V
Error:	

	[%]	Range
	≤ ± 0.1	46 V ... 300 V

Time base Tm: 1 (1 ... 9999) s

Power measurements (P, S, Q)

Power measurement per phase and as sum of all phases, in 3 and 4 wire networks

The accuracy of the power is related to apparent power.

Error:	[%]	Range
Active and apparent power P, S	≤ ± 0.1	120 mA ... 120 A
	≤ ± 0.5	10 mA ... 120 mA
Reactive power Q	≤ ± 0.2	120 mA ... 120 A
	≤ ± 1.0	10 mA ... 120 mA

Display range: 0.000 W (var, VA) ...
115.00 kW (kvar, kVA)

Energy measurements (W)

Sum of all phases

Connection and error as under power measurements

Display range: 0.01 Wh ... 9'999.99 kWh
(kvarh, kVAh)

Frequency measurements (f)

Measurement range:	45 ... 66 Hz
Error:	E ≤ ± 0.01 Hz
Display range	45.00 ... 66.00 Hz

Power factor (PF)

	[%]	
$PF = \frac{P}{S}$	≤ ± 0.2*	* related to the end of scale value

Display range: -0.999 ... 1.000

Meter constant

Active, reactive and apparent consumption

C_{p0} = 0.2777777 Imp./Ws = 1000 Imp./Wh

Pulse output (f_o)

$$f_o = P_{\Sigma} \times C_p$$

$$f_{max} = P_{\Sigma Max} \times C_{p0} \times \alpha$$

$$= 3 \times 300 \text{ V} \times 120 \text{ A} \times 0.2777777 \text{ Imp./Ws}$$

$$= 30000 \text{ Imp./s}$$

Output level: 5 V (Galvanic isolation)

Pulse length: > 10 μs.

Pulse input (TK)

Suitable for scanning head SH 2003

Input level: 5 ... 15 V (Galvanic isolation)

Input frequency: max. 50 Hz

Input supply: 11 ... 15 V (I < 60 mA)

Safety requirements

- Isolation protection EN 61010-1
- Degree of protection IP-40
- Storage temperature: -20 °C ... +55 °C
- Relative humidity: ≤ 85% at Ta ≤ 21 °C
- Relative humidity for ≤ 95% at Ta ≤ 25 °C
30 days / year spread: