

SPECIFICATION

DC/AC Voltage Ranges & 1 year Accuracy [ppm]

Range	DC	20 Hz – 10 kHz *	10 kHz – 50 kHz	50 kHz – 100 kHz
1 mV – 20 mV	50 + 6 μ V	2 000 + 30 μ V	2000 + 30 μ V	1.0 + 30 μ V
20 mV – 200 mV	15 + 8 μ V	1 000 + 80 μ V	1500 + 120 μ V	0.3 + 120 μ V
200 mV – 2 V	12 + 10 μ V	180 + 100 μ V	500 + 200 μ V	0.2 + 1 mV
2 V – 20 V	10 + 50 μ V	180 + 1 mV	500 + 6 mV	0.2 + 10 mV
20 V – 240 V	20 + 500 μ V	180 + 20 mV	–	–
240 V – 1000 V	50 + 20 mV	300 + 200 mV	–	–

* frequency in range 200 to 240 V is limited to 1 kHz

DC/AC Current Ranges & 1 year Accuracy [ppm]

Range	DC	20 Hz – 1 kHz	1 kHz – 5 kHz	5 kHz – 10 kHz
1 μ A – 200 μ A	500 + 20 nA	1500 + 20 nA	3000 + 220 nA	–
200 μ A – 2 mA	200 + 100 nA	700 + 200 nA	2000 + 1 μ A	5000 + 1400 nA
2 mA – 20 mA	100 + 600 nA	500 + 1 μ A	2000 + 10 μ A	5000 + 14 μ A
20 mA – 200 mA	100 + 6 μ A	500 + 10 μ A	2000 + 100 μ A	5000 + 140 μ A
200 mA – 2 A	150 + 100 μ A	500 + 100 μ A	–	–
10 A – 20 A *	200 + 2 mA	1000 + 6 mA	–	–
20 A – 30 A *	300 + 3 mA	20000 + 9 mA	–	–

* Output current time is limited above 10 A. Max. 60 sec at 20 A, 30 sec at 30 A.

TC Temperature Sensor Simulation

R	range [°C]	-50-0	0-400	400-1000	1000-1767	T	range [°C]	-200- -100	-100-0	0-100	100-400
	accuracy [°C]	1.8 - 1.4	1.4 - 0.7	0.7 - 0.6	0.6 - 0.5		accuracy [°C]	0.4 - 0.3	0.2	0.2	0.1
S	range [°C]	-50-0	0-250	250-1400	1400-1767	E	range [°C]	-250- -100	-100-280	280-600	600-1000
	accuracy [°C]	1.6 - 1.3	1.3 - 0.8	0.8 - 0.6	0.7 - 0.6		accuracy [°C]	0.7 - 0.2	0.2 - 0.1	0.1	0.1
B	range [°C]	400-800	800-1000	1000-1500	1500-1820	K	range [°C]	-200- -100	-100-480	480-1000	1000-1372
	accuracy [°C]	1.7 - 0.9	0.9 - 0.8	0.8 - 0.7	0.7 - 0.6		accuracy [°C]	0.5 - 0.2	0.2	0.3 - 0.2	0.3
J	range [°C]	-210- -100	-100-150	150-700	700-1200	N	range [°C]	-200- -100	-100-0	0-580	580-1300
	accuracy [°C]	0.3 - 0.2	0.2 - 0.1	0.2 - 0.1	0.2		accuracy [°C]	0.7 - 0.3	0.3	0.2	0.2

GENERAL DATA

Warm up time:	60 min
Storing temperature:	0 to 40 °C @ max. 80 % r.h.
Reference temperature:	23 °C \pm 2 °C
Dimensions & weight:	450 x 150 x 480 mm (W, H, D), 23 kg
Power supply:	115 V/230 V-50/60 Hz
Max. power consumption:	250 VA

ADDITIONAL FULL VERSION FUNCITONS

Function Shape

Range of voltage:	1 mV to 200 V
Range of current:	100 μ A to 2 A
Output waveform:	square, positive, negative, symmetrical, ramp A, ramp B, triangle, truncated sinus
Peak value accuracy:	0.3 %

AC/DC Power & Energy

Function	Range	Accuracy
DC Voltage	0.2 V – 240 V	40-150 ppm
DC Current	M142: 2 mA–20 A	500-1500 ppm
AC Voltage	0.2 V–240 V	300-1200 ppm
AC Current	M142: 2 mA–20 A	500-1500 ppm
Frequency	20–400 Hz	50 ppm
Power factor	-1 – +1	0.005-0.0005
Phase	0–360 °	0.15-0.25 °
Time in energy mode	10 s–1999 s	0.1 s

Accuracy of AC power depends on set value of voltage, current, phase. Best accuracy is 0.08 %.

Accuracy in energy mode depends on set value of voltage, current, phase and time. Best accuracy is 0.09 %.

Resistance and Capacitance

Range	ppm of value	Range	% of value
0–10 Ω	300 + 5 m Ω	700 pF – 1 nF	0.5 + 15 pF
10–33 Ω	150 + 5 m Ω	1 nF – 3.3 nF	0.5 + 5 pF
100–330 Ω	100 + 5 m Ω	3.3 nF – 100 nF	0.5
330 Ω – 1 M Ω	100	100 nF – 1 μ F	1
1–3.3 M Ω	200	1 μ F – 10 μ F	1.5
3.3–10 M Ω	500	10 μ F – 100 μ F	2.0
10–33 M Ω	1000		
33–100 M Ω	2000		
100 M Ω –1 G Ω	5000		

Maximum compliance voltage 10-20 Vpk in resistance mode, 5.5 Vpk in capacitance mode.

Multimeter

Quantity	Range	Accuracy
DC voltage – DCV	0 – +/-12 V	0.01 % +500 μ V
DC voltage – mVDC	0 – +/-2 V	0.02 % +7 μ V
DC current	0 – +/-25 mA	0.015 % +300 nA
Frequency	1 Hz – 15 kHz	0.005
Resistance	0 – 2 k Ω	0.02 % + 10 m Ω
RTD temperature	-150 – +600 °C	0.1 °C
TC temperature	-250 – +1820 °C	0.4 – 2.5 °C

RTD Temperature Sensor Simulation

Type:	Pt 1.385, Pt 1.392, Ni
Range of RO:	20 Ω to 2 k Ω
Range of temperature:	-200 to +850 °C
Temperature accuracy:	0.04 °C to 0.5 °C
Temperature scale:	ITS 90, PTS 68

Frequency

Type	Range	Frequency acc.	Amplitude	Amplitude acc. [%]	Ratio	Ratio acc.
PWM (POS, NEG, SYM)	0.1 Hz – 100 kHz	0.005 %	1 mV – 10 V	0.1 %	0.1 – 0.99	0.0005
HSO *7	0.1 Hz – 20 MHz	0.005 %	5 V _{pk-pk}	10 %	–	–

*7 Rise time of generated output waveform in HSO function < 5 ns