



**thermo - electra**

temperature sensor solutions



**SN 8310**

Benchtop DC voltage and current  
source standard with high accuracy  
of 0.002%

SN 8310 is a standard DC voltage and current source. It supplies voltages from 100 nV to 110 V and currents from 1 nA to 110 mA with an accuracy of better than 0.002% (20 ppm).

## Description

SN 8310 is a standard DC voltage and current source. It supplies voltages from 100 nV to 110 V and currents from 1 nA to 110 mA with an accuracy of better than 0.002% (20 ppm).

It is fully programmable via RS 232 and IEEE 488 (option) interfaces, which makes it the perfect instrument for test benches and automatic test equipment applications. SN 8310 is also available with a battery in option.

SN 8310 is offered into a compact benchtop housing for on-site use as well as benchtop or panel mounted use. It is widely used in metrological departments, quality-control departments, research and development laboratories and also by maintenance and approval companies.

SN 8310 needs 30 seconds to warm-up and generate an output within 0.002% of final value, 5 minutes to get an output within 0.0002% of final value.

The exceptional precision, stability and extended range of the SN 8310 enable the instrument to address a wide variety of applications, which can be grouped into 3 types:

- DC voltage and current standard for calibrating or testing voltmeters or ammeters (bench or panel mounted), but also electronic systems, such as dividers, amplifiers, converters, oscillators and other components whether linear or not.
- Sensor simulation such as  $\mu\text{V}$ , mV or mA sources to calibrate controllers, transmitters, recorders and other instruments used in process control.
- Ultra-stable, programmable, high precision power supply

# Specifications

Specifications and performances in process @23°C ±1°C

## DC current: Emission

Range	Emission range	Resolution	Accuracy / 1 year
100 mA	-11 to 110 mA	100 nA	0.01% RDG + 800 nA
10 mA	-1.1 to 11 mA	10 nA	0.01% RDG + 80 nA
1 mA	-0.11 to 1.1 mA	1 nA	0.01% RDG + 8 nA

Compliance, output impedance, stability, noise data

Range	Compliance with positive output	Compliance with negative output	Output impedance	Stability 24 h 0.1 Hz	Noise 0.1 10 Hz	Noise ≥10 Hz 10 kHz
100 mA	(1) (2)	-5 V	> 10 MΩ	0.0003% RDG + 300 nA	500 nA	1 μA
10 mA	110 V (2)	-10 V	> 10 MΩ	0.0003% RDG + 03 nA	50 nA	100 nA
1 mA	110 V (2)	-10 V	> 10 MΩ	0.0003% RDG + 3 nA	5 nA	10 nA

(1) Power delivered by instrument is limited to 1.4 W approximately.

(2) Maximum output voltage can be limited to 25 V.

Temperature Coefficient < 10% accuracy /°C

Warm-up time:

- 30 s to generate an output within 0.002% of final value

- 5 min to get an output within 0.0002% of final value

Linearity: < 0.0003% of range

Max output voltage: 30 V

Possible external supply: ≤ 30 V

Overshoot: < 5%

## DC voltage: Emission

Range	Emission range	Resolution	Accuracy / 1 year
100 V	-5 to 110 V	100 μV	0.004% RDG + 300 μV
10 V	-1.1 to 11 V	10 μV	0.004% RDG + 30 μV
1 V	-0.11 to 1.1 V	1 μV	0.005% RDG + 6 μV
100 mV	-11 to 110 mV	100 nV	0.007% RDG + 20 μV

Compliance, output impedance, stability, noise data

Range	Compliance with positive output	Compliance with negative output	Output impedance	Stability 24 h 0.1 Hz	Noise 0.1 10 Hz	Noise 10 Hz 10 kHz
100 V	(1)	-11 mA	< 0.5 mΩ	0.0001% RDG + 100 μV	500 μV	600 μV
10 V	110 mA	-11 mA	< 0.5 mΩ	0.0001% RDG + 10 μV	5 μV	60 μV
1 V	110 mA	-11 mA	< 0.5 mΩ	0.0001% RDG + 2 μV	5 μV	60 μV
100 mV	-	-	99 Ω	0.0001% RDG + 500 nV	500 nV	10 μV

(1) Power delivered by instrument is limited to 1.4 W approximately.

Temperature Coefficient < 10% accuracy /°C

Warm-up time:

- 30 s to generate an output within 0.002% of final value

- 5 min to get an output within 0.0002% of final value

Linearity: < 0.0003% of range

Max output voltage: 30 V

Possible external supply: ≤ 30 V

Overshoot: < 5%

## Further features

Step simulation	Manual or automatic generation of user programmable steps
Generation of programmed values	Emission of 200 calibration values recalled: - Via keyboard - Via digital interface - In automatic sequencing with programmable time interval between every value

## General specifications

Size	225 x 88 x 310 mm
Weight	2 to 3 kg according to the configuration
Display	LCD display, 1,100,000 counts, height: 11.5 mm
Power supply	115 / 230 V ±10% (50/400 Hz)
Battery (option)	Type: 12 V Battery life: 2 to 3.5 hours Charging time: 12 to 14 hours
Communication ports	RS 232 IEEE488 in option
Storage capacity	200 emission values

## Environmental specifications

Reference range	23°C ±1°C (RH: 45 to 75% w/o condensing)
Operating reference range	0 to +45°C (RH: 20 to 80% w/o condensing)
Limit operating range	0 to +50°C (RH: 10 to 80% w/o condensing)
Storage temperature limits	-30°C to +55°C (-15 to +50°C for model with battery charged)
IP protection	IP40 according to EN60529

## Safety specifications

Class	In accordance with EN 61010-1 Category III, pollution 2
Rated voltage	60 V
Chocks and vibrations	EN 61010-1
EMC conformity	

# Models and accessories

## Instrument:

SN8310-1                      DC voltage and current standard generator  
Delivered in standard with:

- Carrying case
- Factory test report
- RS 232 interface

SN8310-2                      DC voltage and current standard generator  
Delivered in standard with:

- Carrying case
- Factory test report
- RS 232 interface
- Battery + charger

SN83101-3                      DC voltage and current standard generator  
Delivered in standard with:

- Carrying case
- Factory test report
- RS 232 and IEEE 488 interface

SN8310-4                      DC voltage and current standard generator  
Delivered in standard with:

- Carrying case
- Factory test report
- RS 232 and IEEE 488 interface
- Battery + charger

## Accessories:

AN6901	Soft case for benchtop instruments
AN5836	IEEE 488 cable
Length: 2 m	
AN5875	RS232 9p F cable
AN5883	Bracket mounting for panel installation (T2 box type)
AN5884	Rack mounting kit for rack installation (T2 box type)

## Software:

LC104                      Data management software for SN 8310

## Certification:

QMA11EN                      COFRAC certificate of calibration  
With all relevant data points where the device has been tested



SN 8310  
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## Packing information:

Size 255 x 88 x 310 mm  
Weight (gross) 2 to 3 kg according to the configuration chosen



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temperature sensor solutions

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