



**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 / 1year    |
|--------|----------------|------------|---------------------|
| 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:<br>- Via keyboard<br>- Via digital interface<br>- 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<br>Battery life: 2 to 3.5 hours<br>Charging time: 12 to 14 hours |
| Communication ports | RS 232<br>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<br>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



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## Packing information:

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