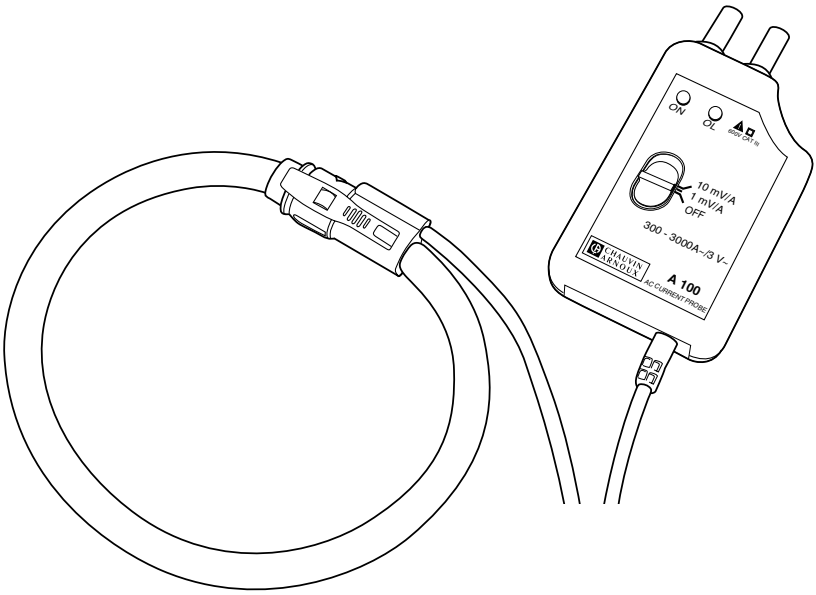
AmpFlex® A100



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Thank you for purchasing an **Amp*Flex*® A100** flexible current sensor.
For best results from your instrument:

- **read** these operating instructions carefully,
- **comply** with the precautions for use.


WARNING, risk of DANGER! The operator must refer to these instructions whenever this danger symbol appears.


WARNING, risk of electric shock. The voltage applied to parts marked with this symbol may be hazardous.


Application or withdrawal authorized on conductors carrying dangerous voltages. Type B current sensor as per IEC 61010-2-032.


Equipment protected by double insulation.


The CE marking indicates conformity with European directives, in particular LVD and EMC.


The rubbish bin with a line through it indicates that, in the European Union, the product must undergo selective disposal in compliance with Directive WEEE 2002/96/EC.

Definition of measurement categories:

- Measurement category IV corresponds to measurements taken at the source of low-voltage installations.
  Example: power feeders, counters and protection devices.
- Measurement category III corresponds to measurements on building installations.
  Example: distribution panel, circuit-breakers, machines or fixed industrial devices
- Measurement category II corresponds to measurements taken on circuits directly connected to low-voltage installations.
  Example: power supply to electro-domestic devices and portable tools.

PRECAUTIONS FOR USE

- Comply with the rated maximum voltage and current and the measurement category.
- Never exceed the protection limits stated in the specifications.
- Comply with the conditions of use, that is to say temperature, humidity, altitude, degree of pollution and location of use.
- Do not use the instrument if it is open, damaged, or incorrectly reassembled. Before each use, check the integrity of the insulation on the coil, the leads, and the electronic unit.
- The application or withdrawal of the sensor on uninsulated conductors at dangerous voltages requires the use of suitable safety equipment.
- If it is not possible to power down the installation, follow safe operating procedures and use suitable means of protection.
- All troubleshooting and metrological checks must be done by competent, accredited personnel.

CONTENTS

1. PRESENTATION

1.1. STANDARD MODELS IN A A100 SERIES

A100 Series AmpFlex® sensors make up a range of nine standard models which enable the measurement of alternating current from 0.5 A to 10 kA at industrial frequencies. Each probe is of a flexible air-core type (45 cm, 80 cm or 120 cm) attached by a shielded cable to a small box housing the integrator circuit and a standard 9 V battery.
Their flexibility means that they can be attached to any type of conductor for measurement (including cables, busbars and stranded conductors), regardless of its accessibility. Because of the latch-type design of the air-core's open/close mechanism, it is appropriate to use gloves when operating it.
The box is fitted with a two-position switch (single range) or a three-position switch (dual range) and two LED diodes. One indicates that the device is in use (green LED), and the other warns when the integrator circuit is overloaded (red LED).
Probes can be connected to any multimeter, tester, recorder, etc. fitted with an alternating voltage input with an impedance over 1 MW (AC mode without a DC component). They have reinforced insulation and comply with international standards, particularly IEC 61010-1.

9 standard models

Range		Lenght*
2 kA	single range	45 cm
2 kA	single range	80 cm
20 A / 200 A	dual range	45 cm
200 A / 2 kA	dual range	45 cm
200 A / 2 kA	dual range	80 cm
300 A / 3 kA	dual range	45 cm
300 A / 3 kA	dual range	80 cm
300 A / 3 kA	dual range	1.20 m
1 kA / 10 kA	dual range	1.20 m

* 45 cm air core are preshaped.

1.2. CUSTOM MODELS

Probes of different length or sensitivity (mV/A) are available upon request. Custom lengths can be supplied in 10 cm increments: contact us for more information.

2. DESCRIPTION

See illustration on p 50

a Air core

Lenght	45 cm	80 cm	120 cm
Weight	< 120 g	< 240 g	< 360 g

b Latch device
c Cable: 2 m lenght
d Box: dimensions 140 x 64 x 28 mm - weight 200 g
e Sliding switch with two positions (single range) or three positions (dual range)
f Green «ON» LED
- Continuous display when battery charge is sufficient
- Flashes when under eight hours of charge remain

g Red «OL» LED
- Displays when the measured current overloads the integrator circuit

h Output: two Ø 4 mm male safety plugs - 19 mm between centres

3. USE

Do not attach the probe to bare conductors carrying a dangerously high voltage unless wearing protective clothing suitable for high-voltage work and using appropriate equipment for personal protection.

The probe is not for use on cables or conductors with a potential of over 1000 V relative to earth.

Illumination of the red LED indicates an overload of the integrator circuit.

If the green LED fails to light, or flashes, the battery requires replacement. It begins to flash when around 8 hours of battery life remain.

- Open the flexible air-core, and attach it to the conductor to be measured.
- Close the air-core using the latching system.
- Centring the conductor and making the air-core as circular as possible will ensure optimum measurement accuracy.
- Connect the box to a multimeter with V AC or mV AC ranges and with an impedance of over 1 MΩ.
- Set the switch on the box to the desired range.
- Read off the measurement by applying the ratio indicated by the switch position on the box (see Chapter 4.4).

4. SPECIFICATIONS

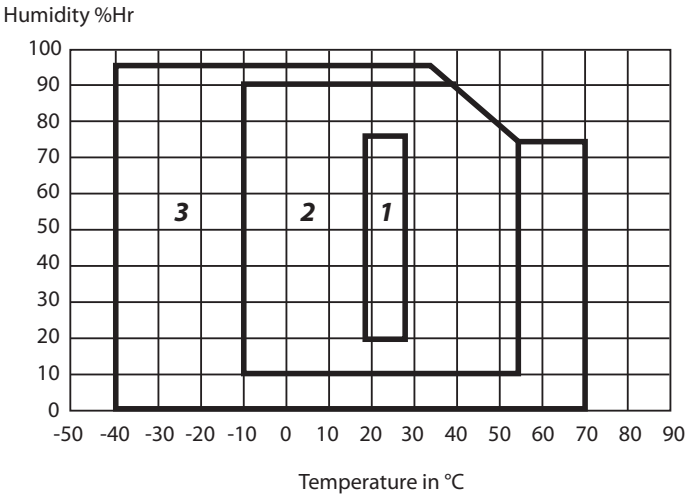
4.1. REFERENCE CONDITIONS

- Temperature: +18 ... +28°C
- Relative humidity: 20 ... 75 % HR
- Battery voltage: 9 V ± 0.5 V
- Measurement of sinusoidal alternating current: 10 Hz to 100 Hz
- Continuous magnetic field: Earth's magnetic field (< 40 A/m)
- Alternating external magnetic field: none present
- External electrical field: none present
- Position of conductor for measurement: centred within the air-core
- Shape of air-core: practically circular
- Impedance of multimeter connected: ≥ 1 MΩ

4.2. CONDITIONS OF USE

The box must be used within the following parameters to ensure user safety and measurement accuracy:

- Environmental conditions: see graph below



1 = Reference range 2 = Operational range 3 = Storage range

NB: the flexible air-core can withstand a maximum temperature of 90°C.
Performance in humidity: 90% RH at 50°C.

4.3. POWER SUPPLY

- 9V alkaline battery (of type 6LF22)
- Normal operational voltage: between 9 V and 7 V
- Battery life:
  - continuous operation: 150 hours
  - intermittent use: 10,000 1-minute measurements
- Battery low indicator: green “ON” LED flashes

4.4. MEASUREMENT PARAMETERS

9 standard models	20 - 200 A	2 kA		0,2 - 2 kA		0.3 - 3 kA			1 - 10 kA
Probe length (3)	45 cm	45 cm	80 cm	45 cm	80 cm	45 cm	80 cm	1.2 m	1.2 m
Single/dual range	20 A / 200 A	2 kA		200 A / 2 kA		300 A / 3 kA			1 kA / 10 kA
Output/input ratio (in mV-/A~)	100 mV/A / 10 mV/A	1 mV/A		10 mV/A / 1 mV/A		10 mV/A / 1 mV/A			1 mV/A / 0.1 mV/A
Operating use	0.5 A ... 200 A~	0.5 A ... 2 kA~		0.5 A ... 2 kA~		0.5 A ... 3 kA~			0.5 A ... 10 kA~
Specified measurement range (1)	5 A ... 200 A~	5 A ... 2 kA~		5 A ... 2 kA~		5 A ... 3 kA~			5 A ... 10 kA~
Typical accuracy (1)	1%								
Pass band (2)	10 Hz to 20 kHz								
Typical phase shift at 50 Hz	1°	0.5°							0.3°
Crest factor at nominal I	2.25					1.5			4.5
Residual current or noise (I=0)	0.2 A								0.5 A
Max. offset DC voltage at output	50 mV / 5 mV	2 mV		5 mV / 2 mV		4 mV / 2 mV			2 mV / 1 mV
Max. peak voltage at output	4.5 V								
Output impedance	1 kΩ								
Permissible overload at output	600 V eff (crest factor 1.5)								

(1) See APPENDIX for linear graphs from 0.5 A up to 100 A
(2) See APPENDIX for frequency response graphs.
(3) The minimum radius of curvature is 15 mm

4.5. COMPLIANCE WITH ELECTRICAL STANDARDS

4.5.1 ELECTRICAL SAFETY IN LINE WITH IEC 61010-1 (IEC 61010-031, IEC 61010-2-032)

- Double insulation ⧈
- Installation category III
- Operating voltage: 1000 V
- Pollution level 2

4.5.2 ELECTROMAGNETIC COMPATIBILITY

- Emissions and immunity in an industrial environment per IEC 61326-1.
  - Electrostatic discharge (meets EN 61000-4-2)

    8 kV in air - level 3 - class B

    4 kV on contact - level 2 - class B
  - 10V/m radiated electromagnetic field (in line with EN 61000-4-3)

    Class B
  - Rapid transients (in line with EN 61000-4-4)

    1 kV - level 2 - class B
  - Electric shocks (in line with EN 61000-4-5)

    6 kV - class B

4.5.3 MECHANICAL PROTECTION

- Waterproofing (in line with EN 60529)
  - Box - protection index IP40
  - Flexible probe : protection index IP40
- Shocks: 100g (in line with IEC 68-2-27)
- Drop test: 1m (in line with IEC 68-2-32)
- Vibrations (in line with IEC 68-2-6)

4.5.4 AUTO-EXTINGUISHABILITY RATING

- Flexible probe: V0 (in line with UL 94)

4.5.5 RESISTANCE TO CHEMICAL PRODUCTS

- Flexible probe: resistant to oils and aliphatic hydrocarbons

5. MAINTENANCE

When performing maintenance, use only the specified replacement parts. The manufacturer cannot be held responsible for any accident occurring subsequent to repair work carried out by parties other than its own after-sales service team or agreed repair personnel.

5.1. BATTERY REPLACEMENT

The battery must be replaced when the green LED flashes or fails to light up when the box is used.

- Remove the flexible probe from the circuit to be measured.
- Set the box switch to ‚OFF'
- Disconnect the box from the measurement device.
- Unscrew the two fastening screws on the box.
- Replace the used battery with a 9V alkaline battery (type 6LF22)
- Close the box again, refitting the two screws.

5.2. CLEANING

- The air-core and its latching system require no special care. Simply ensure that no foreign body is allowed to obstruct the latching mechanism.
- Clean the box with a cloth slightly dampened in soapy water. Clean off with a damp cloth. Dry immediately afterwards with a cloth or with blown air at 80°C maximum.

5.3. CALIBRATION CHECKING

Like all measuring or testing devices, the instrument must be checked regularly.

This instrument should be checked at least once a year. For checking and calibration, contact one of our accredited metrology laboratories (information and contact details available on request), at our Chauvin Arnoux subsidiary or the branch in your country.

5.4. REPAIR

For all repairs before or after expiry of warranty, please return the device to your distributor.