CHAUVIN ARNOUX

MN93, MN93A
PAC93, C193
MiniFlex® MA193, MA194, MA196
AmpFlex® A193, A196A

Current sensors

Measure up

ENGLISH

Thank you for purchasing a **MN93, MN93A, C193 or PAC93 AC current clamp or a MiniFlex® MA193, MA194 or MA196, AmpFlex® A193 or A196A flexible current sensor.** This current sensor should only be used only with C.A 82XX, C.A 83XX, C.A 84XX and PEL 1XX analysers.

For best service from your current sensor:
- **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.


Current sensor protected by double insulation.


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


Must not be applied to or removed from bare conductors at dangerous voltages. Type B current sensor as per IEC 61010-2-032.


The arrow indicates the phase of the current.


Battery.


The CE marking indicates compliance with the European Low Voltage Directive (2014/35/EU), Electromagnetic Compatibility Directive (2014/30/EU), and Restriction of Hazardous Substances Directive (RoHS, 2011/65/EU and 2015/863/EU).


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 2012/19/EU. This equipment must not be treated as household waste.

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

The protection assured by the current sensor can be compromised if it is used in a way that is not recommended by the manufacturer.

- Comply with the rated maximum voltage and current and the measurement category. Do not use your current sensor on networks where the voltage or category exceeds those stipulated.
- Comply with the conditions of use, that is to say temperature, humidity, altitude, degree of pollution and location of use.
- Do not use the current sensor if its housing is open, deteriorated, or incorrectly reassembled. Before each use, check the integrity of the insulation of the core or of the arms of the clamps, of the housing, and of the leads.
- Do not subject the current sensor to sprayed or falling water or other liquids.
- Keep the gap of the clamp absolutely clean.
- Use suitable personal protective equipment when parts at hazardous voltages may be accessible in the installation where the measurement is made.
- Any repairs must be carried out by accredited skilled personnel.

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1. PRESENTATION

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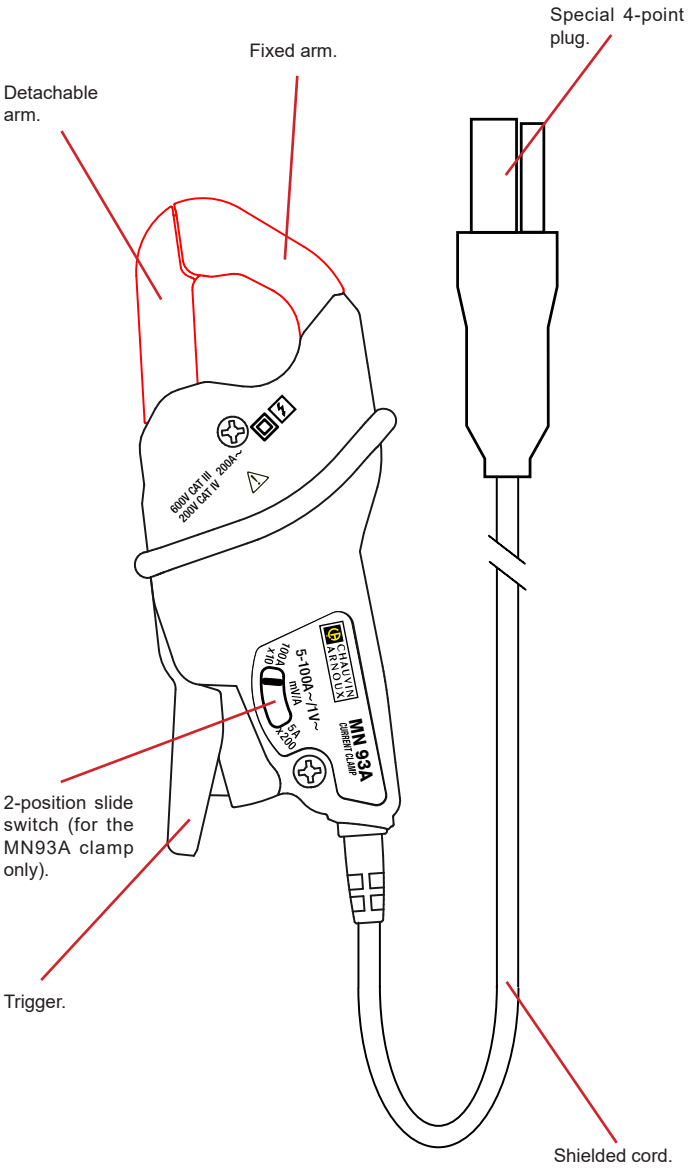
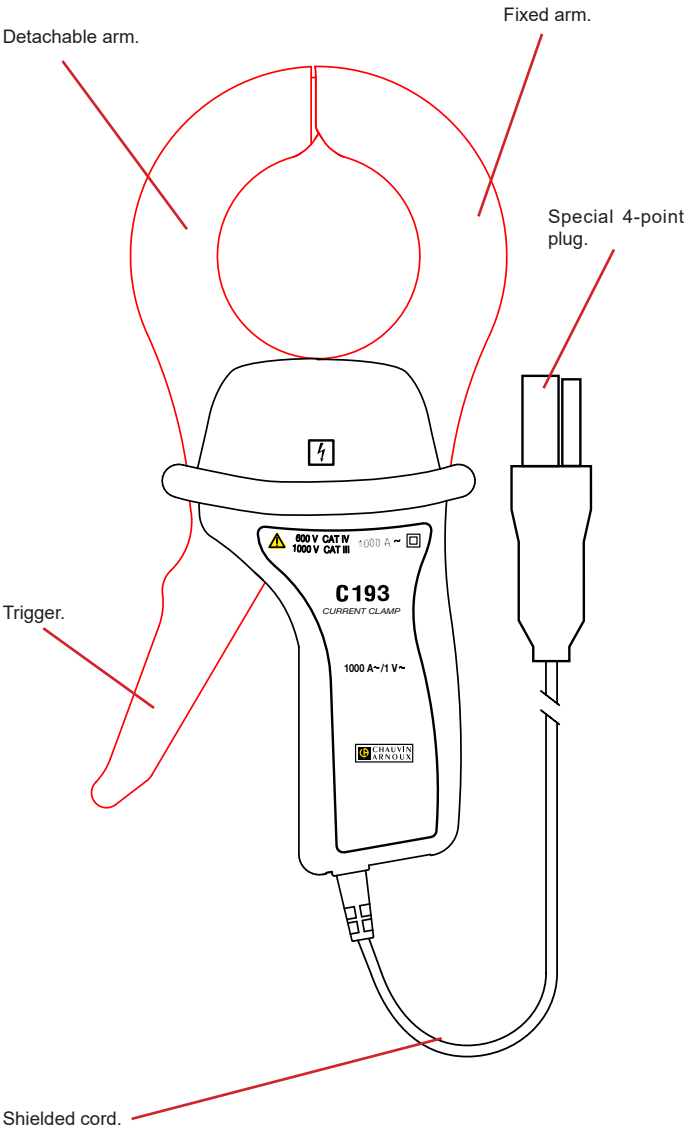
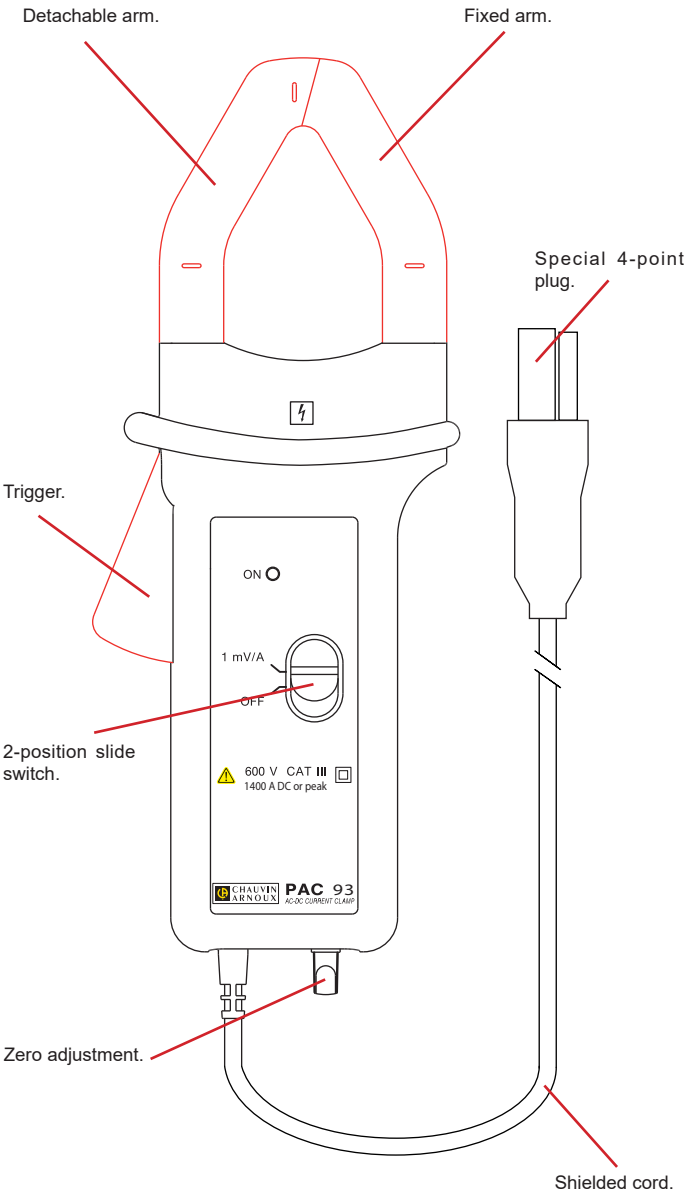


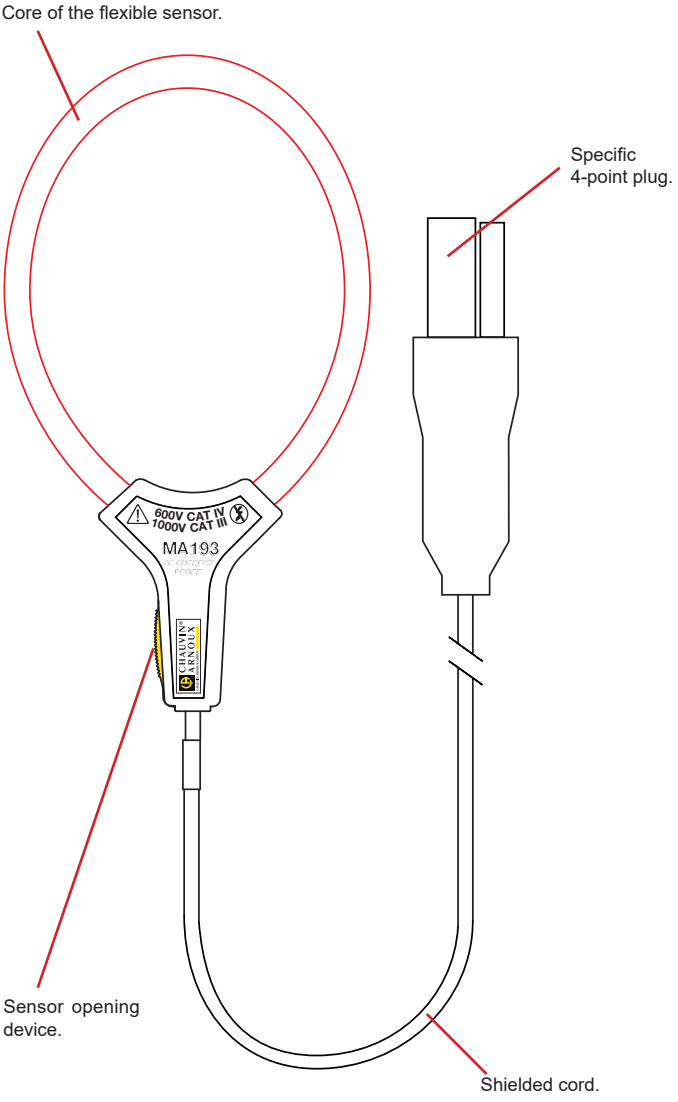
1.2. CLAMP C193



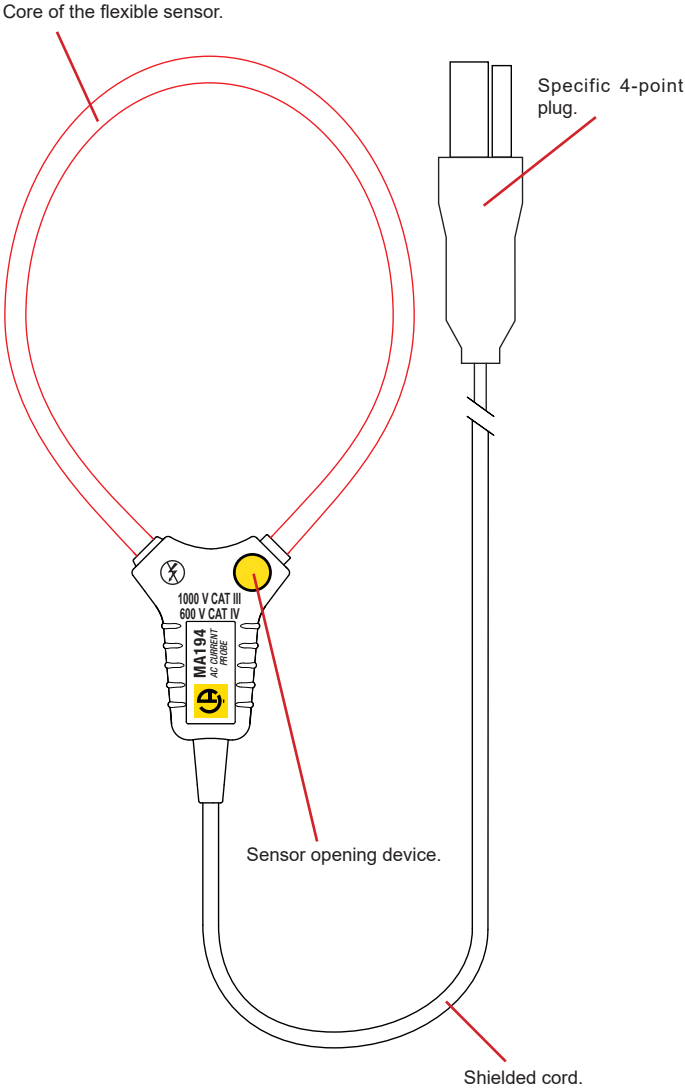
1.3. CLAMP PAC93



1.4. MINIFLEX® MA193

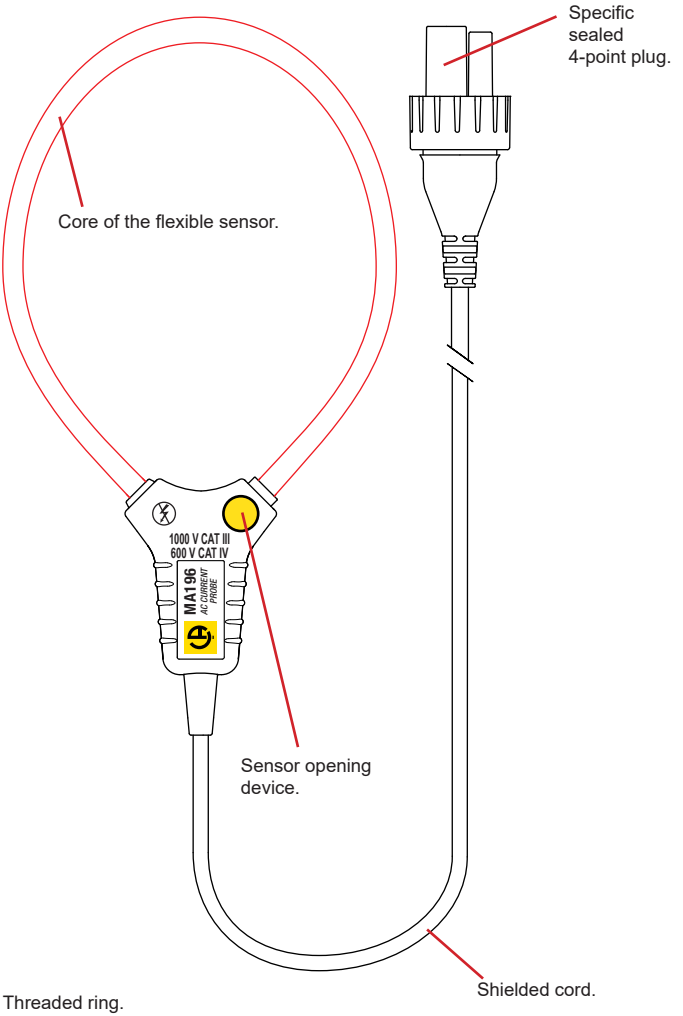


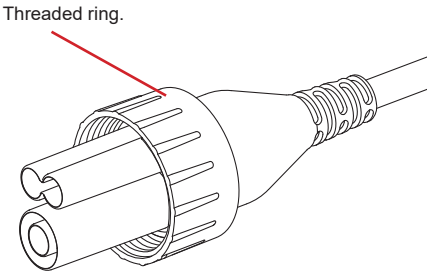
1.5. MINIFLEX® MA194



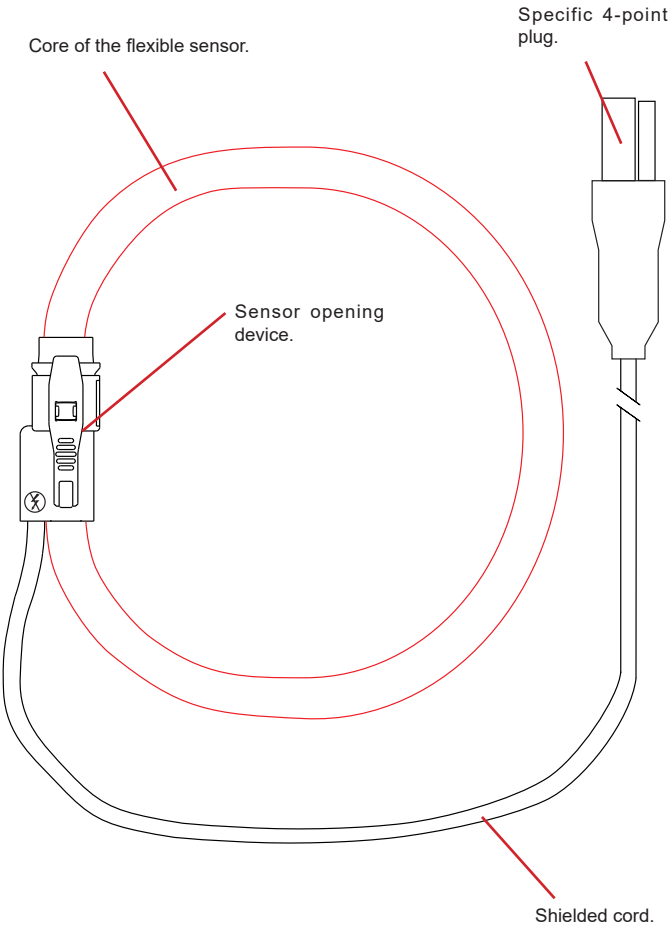
1.6. MINIFLEX® MA196

The connector on this sensor can be used to form a seal with the terminal to which it is connected, if the instrument has a threaded receptacle. Simply screw the ring on the connector onto the receptacle.



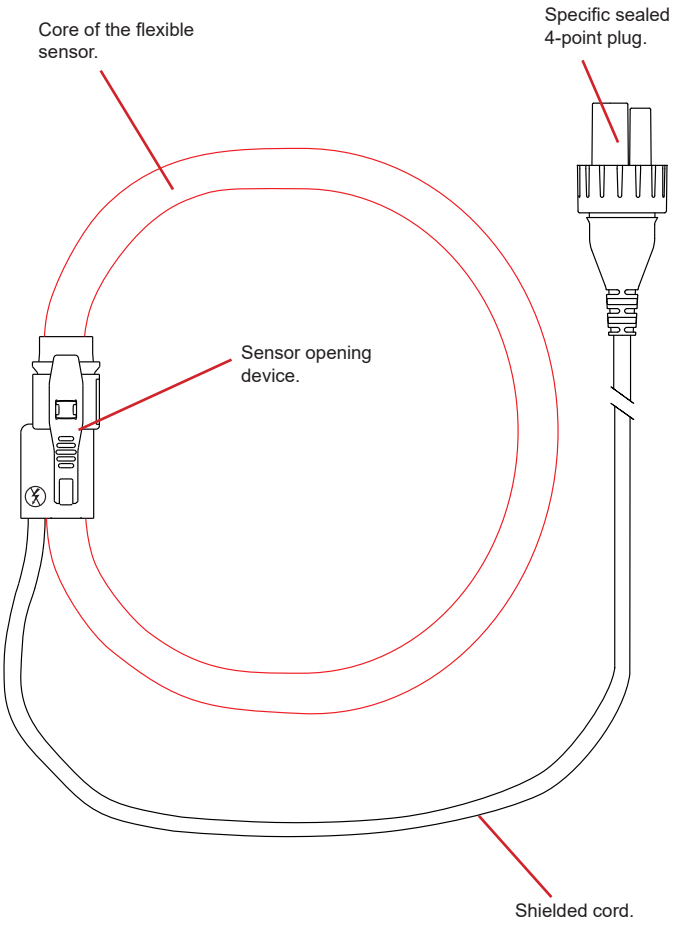


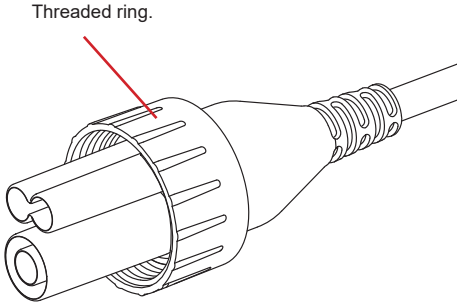
1.7. AMPFLEX® A193



1.8. AMPFLEX® A196A

The connector on this sensor can be used to form a seal with the terminal to which it is connected, if the instrument has a threaded receptacle. Simply screw the ring on the connector onto the receptacle.





1.9. DELIVERY CONDITION

Clamp MN93
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

Clamp MN93A
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

Clamp PAC93
Supplied in a cardboard box with:
- a 9V battery,
- a user manual in 5 languages,
- a verification certificate.

Clamp C193
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA193 250 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA193 350 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA194 250 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA194 350 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA194 1000 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

MiniFlex® MA196 350 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

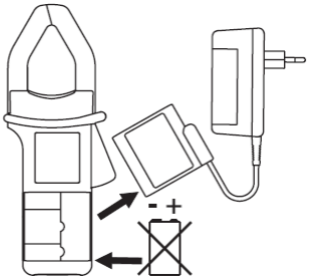
AmpFlex® A193 450 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

AmpFlex® A193 800 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

AmpFlex® A196A 610 mm sensor
Supplied in a cardboard box with:
- a user manual in 5 languages,
- a verification certificate.

1.10. DELIVERY CONDITION

- A main adapter for the PAC93.



For the accessories and spares, consult our web site:
www.chauvin-arnoux.com

2. USE

Current clamps, MiniFlex® and AmpFlex® flexible current sensors are used to measure the current flowing in a cable without opening the circuit. They also insulate the user from dangerous voltages in the circuit.

The choice of current sensor to be used depends on the current to be measured and the diameter of the cables.

	MN93	**MN93A 5 A**	**MN93A 100 A**
Measurement range *	0.05 - 240 A	0.005 - 6 A	0.1 - 120 A
Clamping diameter	20 mm	20 mm	20 mm

	C193	**PAC93**
Measurement range *	1 - 1.200 A	1 - 1.200 A
Clamping diameter	52 mm	39 mm

	MiniFlex® MA193 250 mm	**MiniFlex® MA193 350 mm**	**MiniFlex® MA196 350 mm**
Measurement range *	100 mA - 10 000 A	100 mA - 10 000 A	100 mA - 10 000 A
Clamping diameter	70 mm	100 mm	100 mm

	MiniFlex® MA194 250 mm	**MiniFlex® MA194 350 mm**	**MiniFlex® MA194 1000 mm**
Measurement range *	100 mA - 10 000 A	100 mA - 10 000 A	100 mA - 10 000 A
Clamping diameter	70 mm	100 mm	320 mm

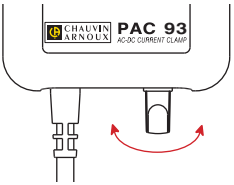
	AmpFlex® A193 450 mm	**AmpFlex® A196A 610 mm**	**AmpFlex® A193 800 mm**
Measurement range *	100 mA - 10 000 A	100 mA - 10 000 A	100 mA - 10 000 A
Clamping diameter	140 mm	190 mm	250 mm

* : The measurement ranges are those of the sensors. In some cases, they may differ from the ranges that can be measured by the analyser with which they are associated.

- For three-phase measurements, start by marking the accessories using the coloured rings supplied with the device: a different colour for each current terminal.
- Connect the current sensors to the current terminals of the device.

For the PAC93:

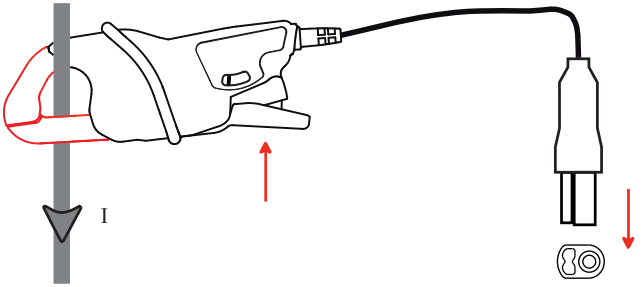
- Set the switch to “1 mV/A”; the “ON” indicator lights.
- Once the PAC93 is connected to the device, adjust the zero by turning the potentiometer with no conductor in the jaws of the clamp.



- At the end of the measurement, remember to switch off the PAC93.

For the clamps:

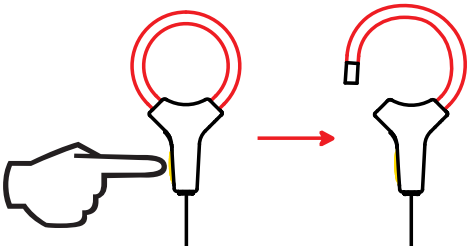
- Press the trigger on the clamp to open the jaws.
- Then clamp the cable that is to be measured. Where possible, the cable should be centred in the jaws of the clamp.



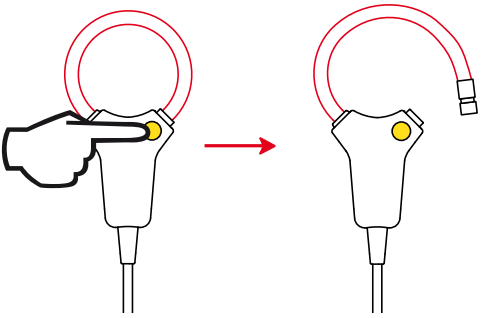
- Release the trigger.

For the MiniFlex® models:

- Press on the yellow opening device to open the flexible coil.
- Open it and place it around the conductor carrying the current to be measured (only one conductor in the sensor). Where possible, the cable should be centred in the sensor.



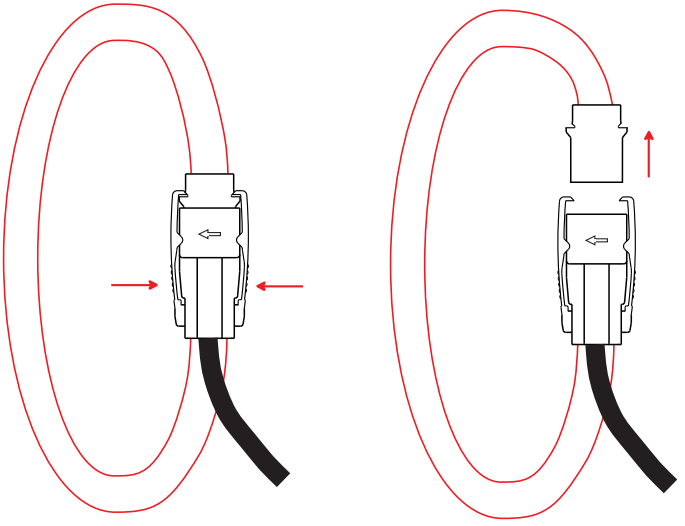
or



- Close the coil. You must hear the click.

For the AmpFlex® models:

- Press simultaneously on both sides of the opening device.
- Then clamp the cable that is to be measured. Where possible, the cable should be centred in the sensor.



- Close the sensor by forcing the moving part into the connector until you hear a click.

For details of the measurement configuration and technical characteristics, refer to the user manual of the analyser with which you are using the current sensor.

3. CHARACTERISTICS

3.1. ENVIRONMENTAL CONDITIONS

Indoor use.

Operating range	-10 °C to +55 °C and 10 % to 85% RH
Storage range	-40 °C to +70 °C and 10 % to 90% RH
Degree of pollution	2
Altitude	< 2000 m

3.2. CONSTRUCTION SPECIFICATIONS

MN93 and MN93A

- Dimensions (L x W x H) 135 x 51 x 30 mm
- Cord 3.50 metres long
- Weight approx. 290 g

C193

- Dimensions (L x W x H) 216 x 111 x 45 mm
- Cord 3.50 metres long
- Weight approx. 690 g

PAC93

- Dimensions (L x W x H) 236.5 x 97 x 44 mm
- Cord 3.50 metres long
- Weight approx. 540 g
- Battery life 120 hours with an alkaline battery

MiniFlex® MA193 250 mm

- Dimensions (L x W x H) approx. 130 x 80 x 12 mm
- Cord 3 metres long
- Weight approx. 110 g

MiniFlex® MA194 250 mm

- Dimensions (L x W x H) approx. 130 x 80 x 18 mm
- Cord 3 metres long
- Weight approx. 110 g

MiniFlex® MA193 350 mm

- Dimensions (L x W x H) approx. 170 x 110 x 12 mm
- Cord 3 metres long
- Weight approx. 120 g

MiniFlex® MA194 and MA196 350 mm

- Dimensions (L x W x H) approx. 170 x 110 x 18 mm
- Cord 3 metres long
- Weight approx. 120 g

MiniFlex® MA194 1000 mm

- Dimensions (L x W x H) approx. 370 x 320 x 18 mm
- Cord 3 metres long
- Weight approx. 160 g

AmpFlex® A193 450 mm

- Dimensions (L x W x H) approx. 170 x 158 x 25 mm
- Cord 3 metres long
- Weight approx. 220 g

AmpFlex® A193 800 mm

- Dimensions (L x W x H) approx. 280 x 265 x 25 mm
- Cord 3 metres long
- Weight approx. 270 g

AmpFlex® A196A 610 mm

- Dimensions (L x W x H) approx. 215 x 200 x 25 mm
- Cord 3 metres long
- Weight approx. 250 g

Protection index

- IP 40 for the clamps and IP 30 jaws open, according to IEC 60529
- IP 50 for the MiniFlex® MA193 and for the AmpFlex® A193 according to IEC 60529 in operation
- IP 67 for the MiniFlex® MA196 and MA194, and the AmpFlex® A196A according to IEC 60529 when the ring is screwed on

- IK 04 according to IEC 50102

Drop test: according to IEC 61010-1

3.3. CONFORMITY TO INTERNATIONAL STANDARDS

Electrical safety according to IEC 61010-2-032.

Maximum appliable voltage:

- MN93 and MN93A: 600 V Cat III or 300 V Cat IV
- C193: 1000 V Cat III or 600 V Cat IV
- PAC93: 600 V Cat III or 300 V Cat IV
- MiniFlex® : 1000 V Cat III ou 600 V Cat IV
- AmpFlex®: 1000 V Cat III or 600 V Cat IV

Type of current sensor as per IEC 61010-2-032:

- MN93 et MN93A : type A
- C193 : type A
- PAC93 : type A
- MiniFlex® : type B
- AmpFlex® : type B

4. MAINTENANCE

⚠ **Except for the batteries, the instrument contains no parts that can be replaced by personnel who have not been specially trained and accredited. Any unauthorized repair or replacement of a part by an "equivalent" may gravely impair safety.**

4.1. CLEANING

Disconnect the current sensor completely.

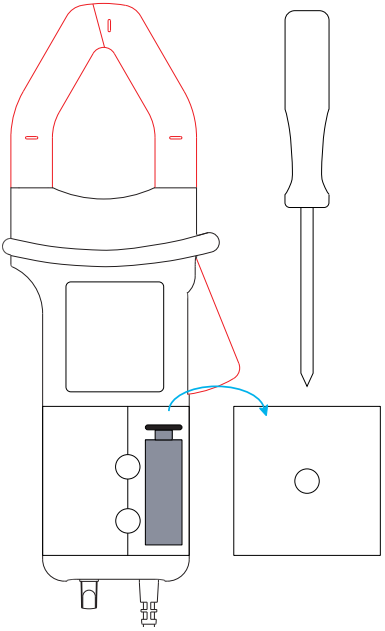
Use a soft cloth, dampened with soapy water. Rinse with a damp cloth and dry rapidly with a dry cloth or forced air. Do not use alcohol, solvents, or hydrocarbons.

Keep the air gaps of the clamps perfectly clean.

See to it that no foreign body interferes with the operation of the snap lock device of the sensor.

4.2. REPLACING THE BATTERY OF THE PAC93

- Disconnect the PAC93 completely and turn the rotary switch to OFF.
- Turn the PAC93 over.
- Use a screwdriver to unscrew the screws and remove the battery compartment cover.



- Withdraw the battery from its compartment without pulling on the wires.

- Disconnect the old battery without pulling on the wires and connect the new one in its place, observing the polarity.

Spent batteries must not be treated as ordinary household waste. Take them to the appropriate recycling collection point.

- Put the battery into its compartment.
- Put the cover back in place and screw the screws back in.

5. WARRANTY

Except as otherwise stated, our warranty is valid for **24 months** starting from the date on which the equipment was sold. Extract from our General Conditions of Sale provided on request.

The warranty does not apply in the following cases:

- Inappropriate use of the equipment or use with incompatible equipment;
- Modifications made to the equipment without the explicit permission of the manufacturer's technical staff;
- Work done on the device by a person not approved by the manufacturer;
- Adaptation to a particular application not anticipated in the definition of the equipment or not indicated in the user's manual;
- Damage caused by shocks, falls, or floods.

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