

# User's manual

## Clamp-on-ammeter

### MiniFLEX



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## 2. Foreword

Dear customer,

thank you for purchasing our product. Please read the installation and operating instructions carefully, before performing the installation and commissioning. Only if the described regulations and notices are precisely observed, can the flawless function and safe operation of the product be guaranteed.



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### 3. Safety instructions



Please check to see if these instructions correspond to the device type.

Observe all the instructions stated in this manual. It contains fundamental information, which must be observed during installation, operation and maintenance. Therefore, this manual must absolutely be read carefully by the installer and the responsible operator/personnel before the installation, commissioning and maintenance.

The operating instructions must always be accessible at the operation location of the product.

In addition to these instructions, local and national regulations must be observed if necessary.

In case of doubt or questions about this manual or the device, you should contact CS Instruments GmbH.

#### Further safety instructions:

1. Trouble-free operation and reliability of the device can only be guaranteed if the device is not subjected to any other climatic conditions than those stated under 'Specification'.
2. General instructions and safety regulations for electric, light and heavy current plants, including domestic safety regulations (e.g. VDE), have to be observed.
3. If device is to be connected to other devices (e.g. via PC) the circuitry has to be designed most carefully. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.
4. If there is a risk whatsoever involved in running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting.  
Operator safety may be a risk if:
  - there is visible damage to the device.
  - the device is not working as specified.
  - the device has been stored under unsuitable conditions for a longer time.

In case of doubt, please return device to manufacturer for repair or maintenance.

5. Do not use this product as safety or emergency stop devices, or in any other application where failure of the product could result in personal injury or material damage.

## 4. Description

MiniFLEX.ACDC-400-040 is an AC RMS current sensor composed of a flexible active part (Rogowski coil model MiniFLEX MA101) connected to a compact digital converter, capable of measuring the current carried on a power conductor up to a value of 400 Aac. The digital converter supplies an output of 4-20 mAdc in linear proportion to the measured current.

## 5. Technical characteristics

- Measurement range: from 5 Aac to 400 Aac
- Fundamental frequency: from 45 Hz to 65 Hz
- Output signal: from 4 mAdc to 20 mAdc
  - 4 mAdc = 0 Aac
  - 20 mAdc = 400 Aac
- Maximum output: 21.6 mA
- Load impedance:  $\leq 300 \Omega$
- Precision:  $\leq 1 \%$  Full scale in the measurement range 5...400 Aac <sup>(1)</sup>
- Power supply: from 10 Vdc to 30 Vdc
- Power consumption:  $\leq 50 \text{ mA}$
- Output lead with 3 wires (brown – blue – black)

(1) Reference conditions 23°C  $\pm$  5°C, R.H. 20...75%, continuous external magnetic field < 40A/m, absence of magnetic and electrical fields, measured signal frequency 50 Hz  $\pm$  1 Hz sine wave, sensor mounting as per Fig. 3, cable diameter clamped 14...24mm

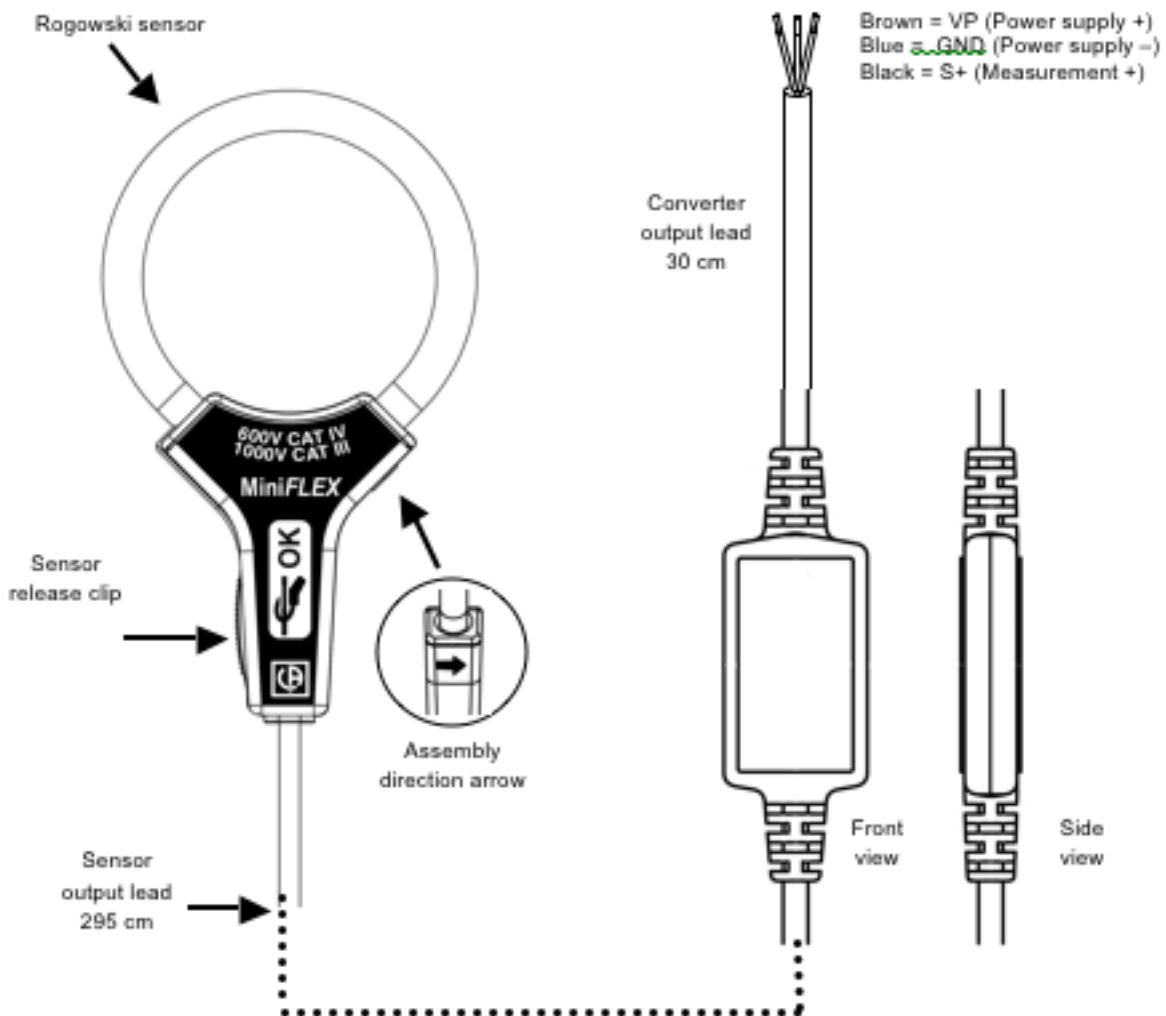
## 6. MiniFLEX MA101 sensor characteristics

- Sensor length: 140 mm  $\pm$  5mm
- Maximum clamp capacity: 40 mm  $\pm$  2mm
- Length of cable for connection to digital converter: 290 cm  $\pm$  5 cm
- $\varnothing$  of sensor: approx. 5.5 mm
- $\varnothing$  of output lead: approx. 3 mm
- Maximum temperature of clamped cable:  $\leq 80^\circ\text{C}$
- Protection rating: IP50
- Self-extinguishing: UL94-V0
- Service voltage  $\leq 600 \text{ Vrms}$  (CAT IV) / 1000 Vrms (CAT III)
- Material class II, dual insulation, in compliance with EN61010-1 EN61010-2-032

## 7. Digital converter

- Dimensions: 55 x 30 x 12.5 mm (excluding cable coupling)
- Output lead length: 30 cm  $\pm$  2 cm
- Output lead: three core cable, wires with straight terminal lugs
- $\varnothing$  of output lead: approx. 4 mm
- Protection rating: IP54
- Self-extinguishing: UL94-V0

## 8. Product view



View not in scale

**Abb. 1:** View of MiniFLEX MA101 sensor

**Abb. 2:** View of converter

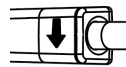
## 9. Installing the MiniFLEX MA101 sensor

To ensure compliance with the stated measurement tolerance, the sensor must be positioned as shown in **fig. 3**.

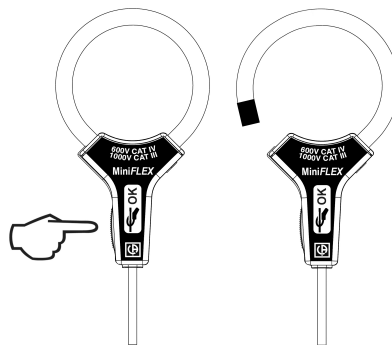
- 1) The sensor must be installed in an inclined position and inverted, with the "OK" label visible to the operator.



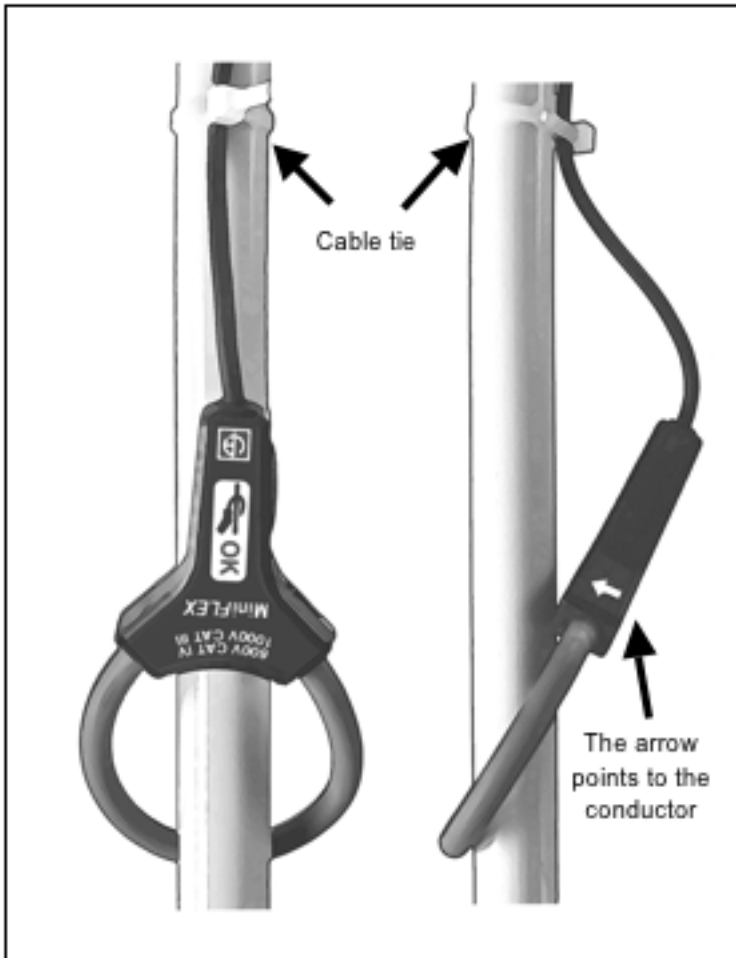
- 2) There is a black arrow on the right-hand side of the sensor. The arrow must be pointing towards the clamped conductor.



- 3) Press the yellow clip to release the sensor



- 4) Circle the cable with the sensor and lock the clamp, ensuring the yellow clip clicks into place. Make sure the red sensor is correctly locked in its location.
- 5) Incline the sensor until the black fastening clip is in contact with the clamped conductor (**Fig. 3**). Do not bend the sensor (**Fig. 4**).
- 6) To prevent the sensor from sliding along the conductor, fix the output lead to the clamped conductor, e.g. using a cable tie.
- 7) Allow the sensor to lie in a natural position, without causing any distortion during the fastening stage (**Fig. 4**).
- 8) The sensor should be positioned at a distance greater than 5 cm from other external conductors



**Fig. 3: correct mounting position**

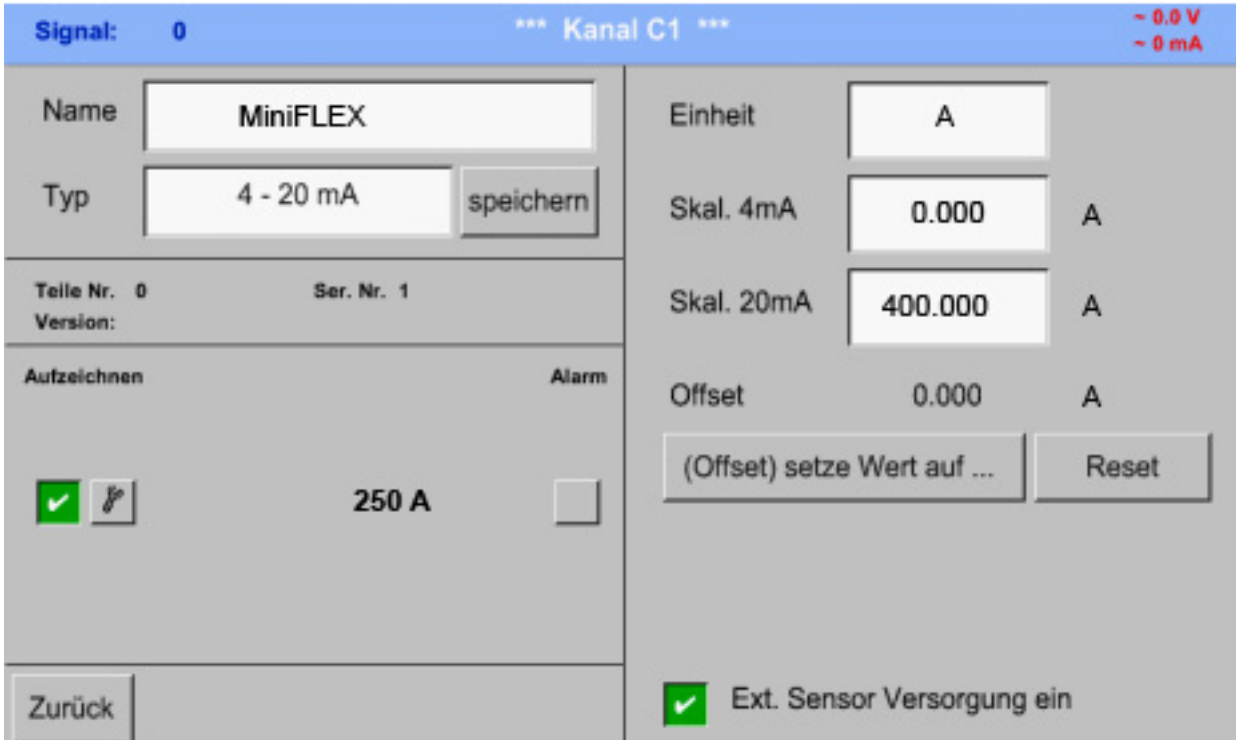


**Fig. 4: take care to avoid mechanical distortion**



## 10. Connection to DS 500 (mobile)

Use the following settings to connect your MiniFLEX clamp-on-ammeter to the mobile datalogger DS 500:



The screenshot shows the settings for 'Kanal C1'. The top status bar indicates 'Signal: 0', '\*\*\* Kanal C1 \*\*\*', and voltage/current levels '- 0.0 V' and '- 0 mA'. The settings are as follows:

Name	MiniFLEX	Einheit	A
Typ	4 - 20 mA	Skal. 4mA	0.000 A
Telle Nr. 0	Ser. Nr. 1	Skal. 20mA	400.000 A
Version:		Offset	0.000 A
Aufzeichnen	Alarm	(Offset) setze Wert auf ...	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	Reset	
Zurück		<input checked="" type="checkbox"/> Ext. Sensor Versorgung ein	

1) Open the settings menu and choose the preferred channel:

Main menu > Settings > Sensor settings > choose channel (e.g. C1)

2) Use the following settings:

Type:	4 - 20 mA
Unit:	A
Scale 4 mA:	0
Scale 20 mA:	400
Sensor Supply Voltage On:	activated

## 11. Connection to devices

**MiniFLEX.ACDC-0400-040** can be connected to 4-20 mA signal reading systems.

Observe the following polarities:

- Output lead with 3 wires:
  - Brown = VP (Power supply +)
  - Blue = GND (Power supply -)
  - Black = S+ (Measurement +)

## 12. Disposal instructions

The device must not be disposed in the regular domestic waste. Send the device directly to us (sufficiently stamped), if it should be disposed. We will dispose the device appropriate and environmentally sound.