

# C | FLEX CF3x45

## Flexible Current Sensor – 3-Phase Set

3-349-364-03  
1/8.06

- Measurement of alternating current up to 20 kA~ in 3 ranges (10 Hz ... 3.2 kHz)
- Circumference of flexible measuring loops 45 cm
- No separation of electrical circuits
- Connection to measuring and logging devices with AC voltage input
- Measurement on narrow measuring points with restricted access
- No saturation effect thanks to iron-free Rogowski current sensors and therefore no risk of overloading



### Application

The C | FLEX CF3x45 set is designed for measuring alternating current in 3-phase electrical systems. It is used in combination with the MAVOWATT | 50 or other devices with a 2 V AC measuring input. The flexible current transformer is capable of enclosing one or more conductors of various types (insulated cables, conductor bars, pipes). The measuring amplifier is supplied by internal batteries for independent operation. During the performance of long-term measurements, power is supplied either by the MAVOWATT | 50 via the adapter cable, or by the mains power pack which is part of the standard equipment.

### Features

- Simultaneous measurement of all three phases
- Broad range of applications thanks to selectable measuring ranges: 200 A, 2 kA and 20 kA
- Voltage output: 10 mV/A, 1 mV/A or 0.1 mV/A depending upon measuring range
- Large bandwidth for frequencies in industrial applications, and for harmonic analysis
- Minimal phase shifting for accurate power measurement
- Highly accurate
- Direct current components are suppressed
- User-friendly, tamper-proof lock on the current sensor; can be locked and sealed while wearing gloves
- High levels of safety for the operator during industrial use and service calls

### Applicable Standards and Regulations

|                                      |   |
|--------------------------------------|---|
| <b>DIN EN 61 010-2-32</b>            | Safety requirements for electrical equipment for measurement, control and laboratory use – Particular requirements for hand-held and hand-operated current probes |
| <b>EN 60 529<br/>VDE 0470 Part 1</b> | Test instruments and test procedures<br>Degrees of protection provided by enclosures (IP code)  |
| <b>DIN EN 61 000-6-2/-3</b>          | Electromagnetic compatibility   |

### Characteristic Values

| Feature                 | Specification                                |                            |                             |
|-------------------------|--|----------------------------|-----------------------------|
|                         | Measuring range                              | 200 A                      | 2 kA                        |
| Overloading range       | 250 A  | 2.5 kA                     | 25 kA                       |
| Output signal (AC)      | 10 mV/A                                      | 1 mV/A                     | 0.1 mV/A                    |
| Residual current        | < 4 mV = 0.4 A                               | < 1 mV = 1 A <sup>2)</sup> | < 1 mV = 10 A <sup>2)</sup> |
| Overload capacity       | unlimited                                    |                            |                             |
| Measuring uncertainty   | ±1 % <sup>2), 3)</sup>                       |                            |                             |
| Linearity (10% to 100%) | ±0.25 % <sup>2), 3)</sup>                    |                            |                             |
| Bandwidth               | 10 Hz to 3.2 kHz <sup>1)</sup>               |                            |                             |
| Output voltage          | 2 V at upper range limit (crest factor 1.5)  |                            |                             |
| Minimal load impedance  | 10 kΩ (output impedance 150 Ω) <sup>2)</sup> |                            |                             |

<sup>1)</sup> Bandwidth limits dependent upon relative amplification of –3 dB

<sup>2)</sup> under reference conditions

<sup>3)</sup> Error relative to upper range limit under reference conditions

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### Reference Conditions

|                                  |  |
|----------------------------------|--|
| Ambient temperature              | +15 °C ... +25 °C                                      |
| Relative humidity                | 20% ... 75%  |
| Operating voltage                | 3 V ±0,5 V   |
| Frequency of measuring quantity  | 45 Hz ... 65 Hz  |
| Waveshape of measuring quantity  | sine   |
| Magnetic field at line frequency | < 30 A/m   |
| Conductor position               | Conductor vertical to sensor level at geometric centre |
| Measuring loop shape             | circular   |
| Load impedance                   | 10 kΩ  |

### Display Functions

|                           |  |
|---------------------------|--|
| Measuring range selection | LED „200A, 2kA or 20kA“ lights up  |
| Battery monitoring        | LED „low battery“ lights up if:<br>– battery voltage too low,<br>– power supplied via mains power pack<br>or<br>– power supplied via MAVOWATT   50 |

### Power Supply

|                       |  |
|-----------------------|--|
| Internal power supply | 2 batteries 1.5 V alkaline-manganese IEC LR6 (AA), battery service life: 120 hours, battery monitoring by illuminated LED signal „Low Battery“ |
| External power supply | Mains power pack 230 V AC / 12 V DC, max. current consumption: 30 mA, alternative power supply via adapter cable from MAVOWATT   50            |

### Electrical Safety

|                      |                       |
|----------------------|-----------------------|
| Safety class         | II, double insulation |
| Measuring category   | 600 V CAT III         |
| Contamination degree | 2                     |

### Electromagnetic Compatibility EMC

|                       |                   |
|-----------------------|-------------------|
| Interference immunity | DIN EN 61 000-6-2 |
| Interference emission | DIN EN 61 000-6-3 |

### Ambient Conditions

|   |                                       |
|---|---------------------------------------|
| Operating temperatures/<br>storage temperatures | –20 °C ... +85 °C (without batteries) |
| Relative humidity                               | 15% ... 85%, no condensation allowed  |

### Mechanical Design

Protection *Flexible current sensor:* IP 65  
Extract from table on the meaning of IP codes

| IP XY<br>(1 <sup>st</sup> digit X) | Protection against<br>foreign object entry | IP XY<br>(2 <sup>nd</sup> digit Y) | Protection against the<br>penetration of water |
|------------------------------------|--|------------------------------------|--|
| 6                                  | dust-tight                                 | 5                                  | water jets                                     |

Dimensions  
and weight

*Flexible Current sensor:*  
Loop circumference 45 cm,  
Connector cable 250 cm, weight 130 g,  
*Measuring amplifier:*  
120 x 65 x 22 mm, 220 g  
*Total weight:* 1200 g

### Standard Equipment

- 3 flexible Rogowski current sensors, 45 cm loop circumference, 250 cm connector cable
- 1 C | FLEX CF3x45 measuring amplifier, permanently connected to the current sensor
- 1 adapter cable, 9-pin subminiature to six 4 mm safety sockets
- 1 adapter cable, 3.5 mm low-voltage plug to two 2 mm safety plugs
- 1 mains power pack, 230 V / 12 V
- 1 set operating instructions

### Order Information

| Designation   | Type   | Article Number |
|---|--------|----------------|
| C   FLEX 3-phase set<br>flexible Rogowski current transformer | CF3x45 | Z824A          |

For additional information on accessories please refer to

- *the associated product datasheet, our Measuring Instruments and Testers catalog or our Industrial Measuring and Control Technology catalog*
- *our website [www.gossenmetrawatt.com](http://www.gossenmetrawatt.com)*

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