

# WZ11 and WZ12

## Clip-On Transformers and Sensors for Alternating Current

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### Features

- Pointed clip jaws for easier access with dense cable arrays
- Safety in accordance with IEC 61010-1 and IEC 61010-2-032
- Minimal transformation error
- Suitable for use with power meters thanks to minimal phase angle error (exception: WZ12A)
- Compact, handy design
- Permanently connected safety cables
- Current or voltage output

### Applications

WZ11 and WZ12 clip-on current transformers and sensors have been developed as accessories for multimeters, power meters, power analyzers, recorders and data loggers. They are used for electrically isolated measurement of alternating current within a broad range, without interrupting the current conducting cable.



### Description

The basic model WZ12A includes a soft-iron core and is used for general current measurement starting at 15 A. It demonstrates traditional, cost-effective current transformer design with a transformation ratio of 1000:1.

All other WZ12 series clip-on current sensors are equipped with a top quality metal core which reduces eddy-current loss, and allows for accurate measuring results even with low primary current.

Damping diodes integrated into the measurement output of the current transformers (with current output) protect the secondary side against overvoltages which occur if the measuring circuit is interrupted, or if the measuring instrument has not been connected.

This function is performed by internal load resistors for the current sensor models (with voltage output).

Thanks to their compact design, these current clips easily fit into any service case or accessory compartment. Depending on type, they are suitable for the measurement of motor current, for measurements at distributor terminals (WZ12A) or for the measurement of minimal to intermediate current (WZ12B) at machinery and current consumption at electronic devices, or for the measurement of residual current as of 1 mA (WZ12C, Clip 0100S with selectable measuring ranges), right on up to measurements in systems with up to 240 A.

Rugged mechanical construction and all requirements set forth by the latest international safety standards are taken into consideration in the design concept of the clip-on current transformers.

WZ11 current clips are physically somewhat larger than WZ12

### Applicable Regulations and Standards

|                                               |                                                                                          |
|-----------------------------------------------|------------------------------------------------------------------------------------------|
| <b>IEC 61010-1/EN 61010-1/<br/>VDE 0411-1</b> | Safety requirements for electrical equipment for measurement, control and laboratory use |
| <b>EN 60529<br/>VDE 0470, Part 1</b>          | Test instruments and test procedures, protection provided by enclosures (IP code)        |
| <b>DIN EN 61326<br/>VDE 0843 Part 20</b>      | Electrical equipment for measurement, control and laboratory use – EMC requirements      |

### Characteristic Values

| Type                                               | WZ11A             | WZ11B                   |                   |
|----------------------------------------------------|-------------------|-------------------------|-------------------|
| Measuring Range                                    | 1 ... 200 A~      | 0.5 ... 20 A~           | 5 ... 200 A~      |
| Allowable Overload                                 | 240 A~ *          | 240 A~ *                |                   |
| Frequency Range (Hz)                               | 48...65...400     | 30 ... 48... 65 ... 500 |                   |
| Output Load $R_b$                                  | < 1 $\Omega$      | > 1 M $\Omega$          |                   |
| Intrinsic Error<br>$\pm$ (% reading + 0.5 A)       | 0.5...10 A: 3%    | 0.1 A...20 A: 1%+50 mV  | 0.5...10 A: 3%    |
|                                                    | 10...40 A: 2.5%   |                         | 10...40 A: 2.5%   |
|                                                    | 40...100 A: 2%    | —                       | 40...100 A: 2%    |
|                                                    | 100...240 A: 1%   | —                       | 100...240 A: 1%   |
| Phase Angle Error<br>under Reference<br>Conditions | 0.5...10 A: —     | 0.5...10 A: —           | 0.5...10 A: —     |
|                                                    | 10...40 A: 5°     | 10...20 A: 5°           | 10...40 A: 5°     |
|                                                    | 40...100 A: 3°    | —                       | 40...100 A: 3°    |
|                                                    | 100...240 A: 2.5° | —                       | 100...240 A: 2.5° |
| Transformation Ratio                               | 1000:1            | 1 mV/mA                 | 1 mV/A            |

\* Max. 10 min followed by 30 min pause

# WZ11 and WZ12

## Clip-On Transformers and Sensors for Alternating Current

| Type                                                 | WZ12A                                   | WZ12B             | WZ12C                                | WZ12D                   | WZ12E                 | WZ12F                 | Clip 0100S                           |
|------------------------------------------------------|-----------------------------------------|-------------------|--------------------------------------|-------------------------|-----------------------|-----------------------|--------------------------------------|
| Article Number                                       | Z219A                                   | Z219B             | Z219C                                | Z219D                   | Z823D                 | Z823E                 | Z501E                                |
| Measuring Range                                      | 15...180 A~                             | 10 mA...100 A~    | 1 mA...15 A~<br>1 A...150 A~         | 30 mA...150 A~          | 0.2...150 A~          | 20 mA...15 A~         | 1 mA...15 A~<br>1 A...150 A~         |
| Frequency Range                                      | 45...65...400 Hz                        | 45...65... 500 Hz | 45...65... 400 Hz                    | 45...65... 500 Hz       | 30...45...65...500 Hz | 30...45...65...500 Hz | 45...65...500 Hz                     |
| Transformation Ratio                                 | 1000 : 1                                | 100 mV/mA         | 1 mV/mA<br>1 mV/A                    | 1000 : 1                | 10 mV/A               | 100 mV/A              | 1 mV/mA<br>1mV/A                     |
| Output Load                                          | < 5 Ω                                   | > 1 MΩ            | > 1 MΩ<br>> 10 kΩ                    | < 50 Ω                  | > 10 kΩ               | 11...13 kΩ            | > 1 MΩ<br>> 10 kΩ                    |
| Intrinsic Error under Reference Conditions           | ±3% of reading                          | ±1.5% rdg. ±1 mA  | ±3% rdg. ±0.15 mA<br>±2% rdg. ±0.1 A | ±2.5% rdg. ±1 mA        | ±2% rdg. ±10 mA       | ±2% rdg. ±1 mA        | ±3% rdg. ±0.15 mA<br>±2% rdg. ±0.1 A |
| Influence Error: Frequency $f_{\min} \dots f_{\max}$ | ±3% of reading                          | ±1.5% rdg. ±1 mA  | ±3% rdg. ±0.15 mA<br>±2% rdg. ±0.1 A | ±2.5% rdg. ±1 mA        | ±2% rdg. ±10 mA       | ±2% rdg. ±1 mA        | ±3% rdg. ±0.15 mA<br>±2% rdg. ±0.1 A |
| Influence Error: Temp. $\Delta/10\text{ K (typ.)}$   | ±3% of reading                          | ±1.5% of reading  | ±3% of reading                       | ±2.5% of reading        | ±2% of reading        | ±2% of reading        | ±3% of reading                       |
| Typical Phase Angle Error                            | 45...65 Hz<br>$f_{\min} \dots f_{\max}$ | undefined         | 3°<br>10°                            | 3°<br>10°               | 2°<br>10°             | 2°<br>15°             | undefined<br>3°<br>10°               |
| Max. Overload                                        | continuous<br>int. < 1s                 | 360 A<br>900 A    | 200 A<br>500 A                       | 300 A<br>750 A          | 300 A<br>750 A        | 300 A<br>75 A         | 300 A<br>750 A                       |
| Open-Circuit Voltage                                 | max. 15 V <sup>1)</sup>                 | max. 15 V         | max. 27 V                            | max. 27 V <sup>1)</sup> | max. 27 V             | max. 27 V             | max. 27 V                            |

<sup>1)</sup> Clip not operated continuously at idle

Key: rdg. = of reading

### Reference Conditions

|                   |                 |
|-------------------|-----------------|
| Frequency         | 45 ... 65 Hz    |
| Waveshape         | sine            |
| Reference Temp.   | 21 ... 25 °C    |
| Relative Humidity | 40 ... 60%      |
| Output Load       | specified range |

### Electrical Safety

| Type                 | WZ11               |       | WZ12/Clip 0100S |       |
|----------------------|--------------------|-------|-----------------|-------|
| Safety Class         | II per IEC 61010-1 |       |                 |       |
| Overvoltage Category | II                 | III   | II              | III   |
| Operating Voltage    | 1000 V             | 600 V | 600 V           | 300 V |
| Contamination Level  | 2                  |       |                 |       |
| Test Voltage         | 5.55 kV 1 min      |       | 3.7 kV 1 min    |       |

### Ambient Conditions

|                     |                   |
|---------------------|-------------------|
| Operating Temp.     | -10 °C ... +40 °C |
| Storage Temperature | -20 °C ... +70 °C |

### Mechanical Design

| Type                   | WZ11                  | WZ12            | Clip 0100S          |
|------------------------|-----------------------|-----------------|---------------------|
| Dimensions (mm)        | 50 x 30 x 135         | 40 x 26 x 120   |                     |
| Clip Jaw Opening       | 20 mm diameter        | 15 mm diameter  |                     |
| Weight                 | approx. 180 gr.       | approx. 170 gr. |                     |
| Connector Cable        | 600 V, Cat. II        | 600 V, Cat. II  |                     |
| Length                 | approx. 150 cm        | approx. 120 cm  |                     |
| Plug                   | 2 banana safety plugs |                 | 1 jack plug, 3.5 mm |
| Protection per IEC 529 | IP 40                 |                 |                     |

Extract from Table on the Meaning of IP Codes

| IP XY<br>(1 <sup>st</sup> digit X) | Protection against foreign<br>object entry | IP XY<br>(2 <sup>nd</sup> digit Y) | Protection against the<br>penetration of water |
|------------------------------------|--------------------------------------------|------------------------------------|------------------------------------------------|
| 4                                  | ≥ 1.0 mm Ø                                 | 0                                  | not protected                                  |

### Standard Equipment

- 1 current transformer / sensor
- 1 permanently connected safety cable with connector plug
- 1 operating instructions

# WZ11 and WZ12

## Clip-On Transformers and Sensors for Alternating Current

### Order Information

| Description                                                                            | Type       | Article Number |
|----------------------------------------------------------------------------------------|------------|----------------|
| Clip-on current transformer, 1 ... 200 A, 1 mA/A                                       | WZ11A      | Z208A          |
| Clip-on current sensor, adjustable<br>0.5 ... 20 A / ... 200 A, 1 mV/mA / 1 mV/A       | WZ11B      | Z208B          |
| Clip-on current transformer, 15 A ... 180 A, 1 mA/A                                    | WZ12A      | Z219A          |
| Clip-on current sensor, 10 mA ... 100 A, 100 mV/A                                      | WZ12B      | Z219B          |
| Clip-on current sensor, adjustable<br>1 mA ... 15 A, 1 mV/mA and 1 A ... 150 A, 1 mV/A | WZ12C      | Z219C          |
| Clip-on current transformer, 30 mA ... 150 A, 1 mA/A                                   | WZ12D      | Z219D          |
| Clip-on current sensor, 0.2 ... 150 A~, 10 mV/A                                        | WZ12E      | Z823D          |
| Clip-on current sensor, 20 mA ... 15 A~, 100 mV/A                                      | WZ12F      | Z823E          |
| Clip-on current sensor, adjustable<br>1 mA ... 15 A, 1 mV/mA and 1 A ... 150 A, 1 mV/A | Clip 0100S | Z501E          |

#### Notes concerning the selection of transformers and sensors:

All of the transformers and sensors listed above can be utilized universally for the measurement of alternating current, as long as the interconnected measuring instrument or recorder is equipped with suitable input measuring ranges and input impedance.