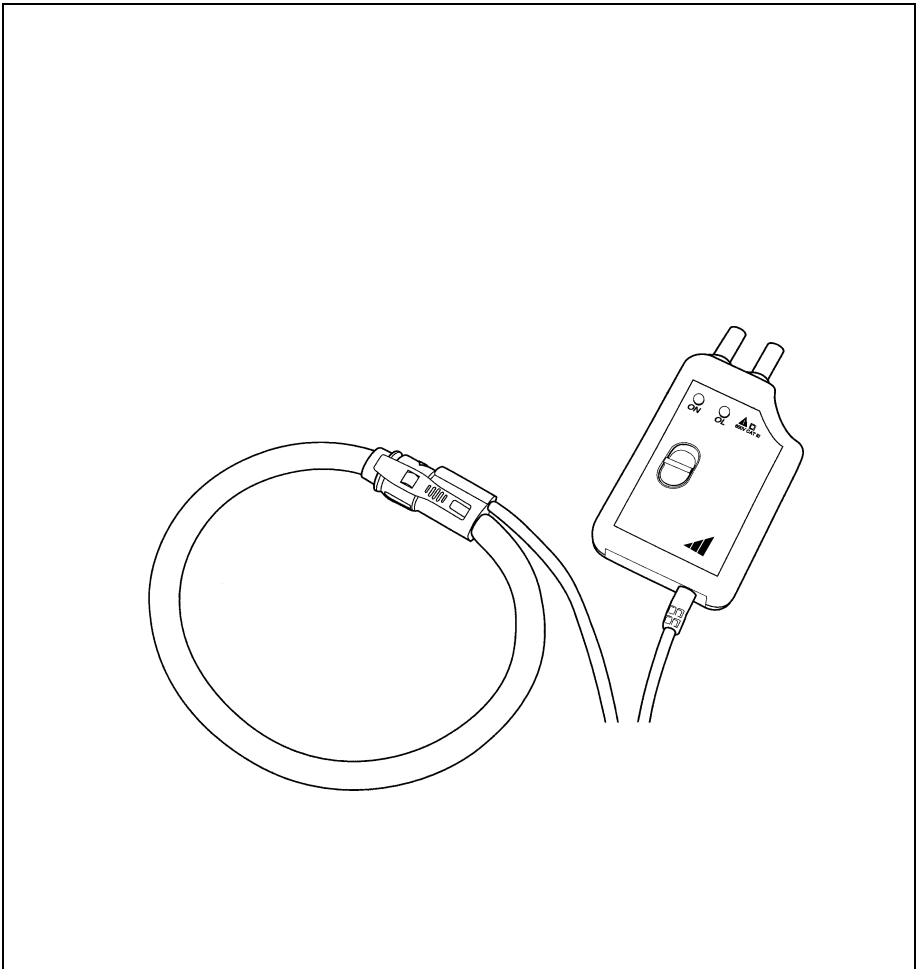
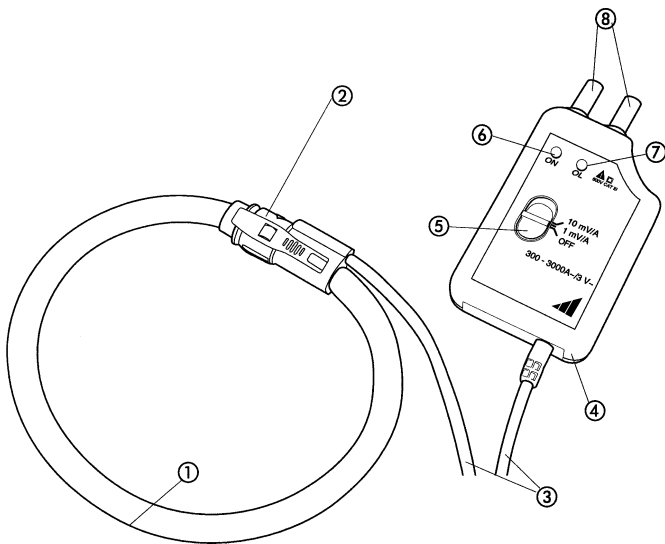


AmpFLEX[®]

Flexible Current Transformer

3-348-847-37
2/11.97





- 1 Measuring loop
- 2 Snap-in locking mechanism
- 3 Connector cable
- 4 Housing
- 5 Sliding switch: 3 position, ON/OFF and range selection
- 6 Green LED: "ON",
 - continuously lit if battery voltage is sufficient
 - blinks, when less than 8 hours service life remain
- 7 Red LED: "OL" (overload) lights up if measurement electronics are overloaded by measured current
- 8 Connection via two 4 mm diameter safety plugs with a clearance of 19 mm

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1 Description

Flexible "AmpFLEX" current transformers are suited for the measurement of alternating current conducting cables with currents of 0.5 A to 10 kA. Their function is based on the Rogowski coil principle. The high level of isolation between the measuring coil and the output circuit assures safe handling in low-voltage systems of up to 1000 V~.

The measurement output circuit has been especially designed for use with digital multimeters. However, it is also suitable for the measurement of current with analog multimeters, as well as for long-term monitoring with recorders, data loggers and power meters or power analyzers, for which the wide frequency range (10 Hz ... 20 kHz) is especially advantageous.

Thanks to the optimum flexibility of the pliable, removable measuring loop, the transformer can also be used in difficult to access locations. The snap-in locking mechanism can even be opened when wearing gloves. The length of the coil can be adapted for each of the nominal current ranges. Universal use is provided for with a variety of measuring loops for various measuring ranges, as well as varying loop lengths.

2 Safety Precautions

The flexible current transformer is manufactured and tested in accordance with safety regulations IEC 1010-1 / DIN EN 61010-1 / VDE 0411-1. If used for its intended purpose, safety is assured for the user, the device and the DUT.

Read the operating instructions carefully and thoroughly before placing the device into operation. Observe and follow all points included therein.

Make the operating instructions accessible to all users.

Please observe the following safety precautions:

- Never insert a bare conductor with dangerous high-voltage into the measuring loop if you are not in possession of an appropriate authorization for work involving high-voltage hazards, and without making use of the necessary personal protection equipment.
- Never use the current transformer on conductors which have an earth potential of greater than 1000 V.
- Be absolutely certain that the measuring loop and the connector cable between the measuring loop and the housing are not damaged, e.g. broken insulation, bends, interruptions etc.
- Protect the device from splashing water.

Repair, Parts Replacement and Balancing

When the device is opened voltage conducting parts may be exposed. The measuring loop must be disconnected from current conducting lines prior to repair, replacement of parts or balancing. If repair or balancing of a live, open device cannot be avoided, this may only be carried out by trained personnel who are familiar with the dangers involved.

Errors and Extraordinary Strains

If it may be assumed that the device can no longer be safely operated, it must be removed from service and secured against unintentional use. Safe operation can no longer be relied upon,

- if the signal lamps are defective,
- if the housing demonstrates visible damage,
- if the measuring loop or the connector cable between the measuring loop and the housing are damaged, e.g. broken insulation, bends or interruptions,
- if the device no longer functions,
- after a lengthy period of storage under unfavorable conditions.

3 Initial Start-Up

If the green "ON" LED does not light up or blink after the device has been switched on, the battery must be replaced. A blinking LED indicates that only about 8 hours of battery service life remain. For battery replacement see chapter 5.1, page 9.



Attention!

Never insert a bare conductor with dangerous high-voltage into the measuring loop if you are not in possession of an appropriate authorization for work involving high-voltage hazards, and without making use of the necessary personal protection equipment.

- ⇨ Open the snap connector and slip the measuring loop over the conductor carrying the current to be measured.
- ⇨ Close the snap connector such that it is visibly and audibly snaps into place.
- ⇨ An accurate measurement is assured under the following conditions:
 - The conductor is centered within the measuring loop.
 - The measuring loop forms a perfect circle.
- ⇨ Insert the safety plug from the electronics housing into a multimeter with an input impedance of greater than 1 M Ω , and select the range "V AC" or "mV AC" at the multimeter.
- ⇨ Set the sliding switch to the desired transducing range.
- ⇨ Read the measurement results, taking the selected transducing ratio and the multimeter measuring range into consideration (see Technical Data).



Note

If the red "OL" LED lights up, the measuring range has been exceeded. Select a higher measuring range with the sliding switch. Be certain to use the current transformer in combination with the appropriate measuring range.

4 Technical Data

Type	Measuring Range	Nominal Current, Primary ¹⁾	Output Signal	Crest Factor ²⁾	Inherent Deviation
AF033A	30 A	0.5 A ... <u>5 A</u> ... <u>30 A</u>	... 3 V	1.5	±(1% of V _A + 50 mV)
	300 A	0.5 A ... <u>5 A</u> ... <u>300 A</u>	... 3 V		±(1% of V _A + 5 mV)
AF11A	1000 A	0.5 A ... <u>5 A</u> ... <u>1000 A</u> (... 2000 A)	... 1 V (... 2 V)	4.5 (2.2)	±(1% of V _A + 2 mV)
AF33A	300 A	0.5 A ... <u>5 A</u> ... <u>300 A</u>	... 3 V	1.5	±(1% of V _A + 5 mV)
	3000 A	0.5 A ... <u>5 A</u> ... <u>3000 A</u>	... 3 V		±(1% of V _A + 2 mV)
AF101A	1 kA	0.5 A ... <u>5 A</u> ... <u>1 kA</u>	... 1 V	4.5	±(1% of V _A + 2 mV)
	10 kA	0.5 A ... <u>50 A</u> ... <u>10 kA</u>	... 1 V		±(1% of V _A + 1 mV)

¹⁾ Indicated inherent deviation is assured for the underlined range

V_A = Output voltage

²⁾ At measuring range upper limit

Frequency Range

10 Hz ... 100 Hz ... 20 kHz

Frequency Influence

Amplitude Error: none up to 1 kHz,
> 1 kHz, see amplitude error diagram on page 8
Phase Error: 2° for 20 Hz < f < 1 kHz

Output Magnitudes

Maximum Peak Voltage 4.5 V

Output Impedance 10 Ω

Display Functions

Exceeded

Red "OL" LED lights up:

Measuring Range

primary current in excess of range limit

Stand-By,

Green "ON" LED lights up:

Battery Monitoring

stand-by

Green "ON" LED blinks:

voltage less than 7 V

Ambient Conditions

Operating

Temperature Range -10 °C ... +55 °C

Storage

Temperature Range -40 °C ... +70 °C (without batteries)

Relative Humidity

max. 90% at +50 °C

Reference Conditions

Ambient Temperature	+18 °C ... +28 °C
Relative Humidity	20% ... 75%
Operating Voltage	9 V ±0.5 V
Measurement Magnitude Frequency	10 Hz ... 100 Hz
Measurement Magnitude Waveform	sine
External Magnetic Field	constant field / geomagnetic field (< 40 A/m)
Conductor Position	centered within the measuring loop
Measuring Loop Shape	circle
Impedance of Connected Measuring Instrument	≥ 10 kΩ

Electrical Safety

Protection Class	II per IEC 1010-1/EN 61010-1
Overvoltage Category	III
Operating Voltage	1000 V
Contamination Level	2

Electromagnetic Compatibility, EMC

Interference Immunity	EN 50082-1: 1992 EN 61000-4-2: 8 kV atmospheric discharge EN 61000-4-2: 4 kV contact discharge EN 61000-4-3: 10 V/m EN 61000-4-4: 1 kV
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Power Supply

Battery	9 V flat cell battery; zinc carbon battery per IEC 6 F 22, alkali manganese cell per IEC 6 LR 61
Nominal Operating Voltage	7 ... 9 V
Service Life	with zinc carbon battery: approx. 150 hr. continuous operation, intermittent operation: approx. 10,000 measurements of 1 min. each

Mechanical Design

Protection

Housing: IP 40, *Flexible Measuring Loop:* IP 65

Shock Resistance

100 g (IEC 68-2-27)

Free Fall

from a height of 1 m (IEC 68-2-32)

Vibration Resistance

per IEC 68-2-6

Material

Measuring Loop:

V0, self-extinguishing material (per UL 94), resistant to oils and aliphatic hydrocarbons

Dimensions and Weight

Housing:

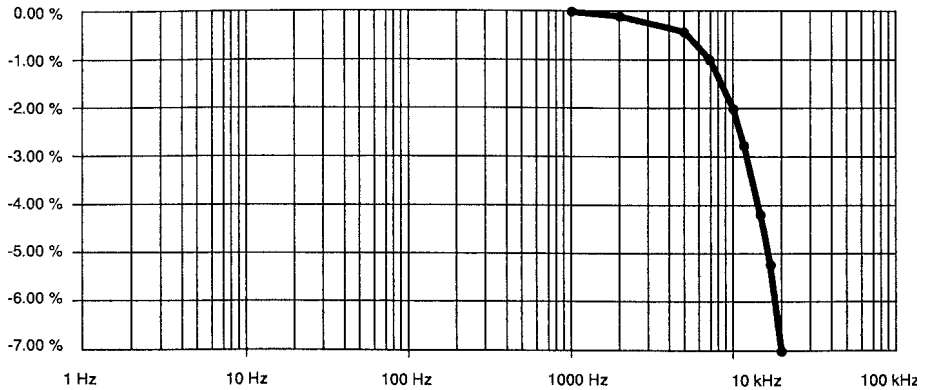
140 mm x 64 mm x 28 mm

Cable length: 2 m

Loop:

Type	Loop Length	Weight
AF11A	45 cm	300 gr.
AF033A	60 cm	340 gr.
AF33A	90 cm	420 gr.
AF101A	120 cm	460 gr.

Amplitude Error Dependent upon Frequency at 100 A (200 A)



5 Maintenance

Opening of the device or repairs may only be carried out by manufacturer customer service personnel or authorized repair services.

In the event of unauthorized opening of the device or unauthorized repair, the manufacturer or the dealer assumes no liability which may result from malfunctions or accidents.

5.1 Battery

The battery must be replaced as soon as the green "ON" LED blinks or does not light up when the current transformer is switched on.



Attention!

Before opening the housing, remove the measuring loop from the conductor under test.

- ⇨ Switch the current transformer off (sliding switch to "OFF" position).
- ⇨ Remove the electronics housing from the measuring instrument.
- ⇨ Loosen both of the screws on the housing.
- ⇨ Open the housing and replace the depleted battery with a new 9 V alkali manganese cell (type IEC6 LR61).
- ⇨ Close the housing and retighten the two screws.

5.2 Measuring Loop

The measuring loop and the snap connector do not require any special maintenance. Make certain that no foreign particles accumulate in the snap connector.

5.3 Housing

Keep the outside surfaces clean and dry. Clean the housing with a cloth dampened in soapy water, and then wipe the housing with a damp cloth. Dry the housing immediately thereafter with a cloth or warm air blower at max. 80 °C. Avoid the use of solvents, cleansers and abrasives.

5.4 Calibration

As is the case with all measuring instruments and testers, regular monitoring of measurement accuracy is recommended. For devices which are operated for up to 4 hours per day, we recommend inspection at least once a year. For more frequent use, this interval should be shortened accordingly.

6 Repair and Replacement Part Service

When you need service, please contact:

GOSEN-METRAWATT GMBH
Service
Thomas-Mann-Strasse 16 – 20
D – 90471 Nuremberg

Telephone +49 911 8602 410 / 411
Telefax +49 9118602 253

This address is for Germany only.

Abroad, our representatives or establishments are at your disposal.

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