

**FLUKE®**

# **368/368 FC** **369/369 FC**

AC Leakage Current Clamp

## **Users Manual**

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## ***Introduction***

The 368/368 FC and 369/369 FC AC Leakage Current Clamp (the Product) is a handheld tool for measurement of ac leakage current.

### **Principle of Leakage Current Measurement**

Based on the electromagnetic induction principle, the Product has a ring-shape current transformer comprised of a metal core and coil winding. The current transformer senses the magnetic field produced by the current or by the vector sum of the currents flowing in the conductor under test. The current transformer then produces a current proportional to the current flowing in the conductor.

See the *Product Functions* section near the end of this manual.

## **How to Contact Fluke**

To contact Fluke, call one of the following telephone numbers:

- Technical Support USA: 1-800-44-FLUKE (1-800-443-5853)
- Calibration/Repair USA: 1-888-99-FLUKE (1-888-993-5853)
- Canada: 1-800-36-FLUKE (1-800-363-5853)
- Europe: +31 402-675-200
- Japan: +81-3-6714-3114
- Singapore: +65-6799-5566
- China: +86-400-921-0835
- Brazil: +55-11-3530-8901
- Anywhere in the world: +1-425-446-5500

Or, visit Fluke's website at [www.fluke.com](http://www.fluke.com).

To register your product, visit <http://register.fluke.com>.

To view, print, or download the latest manual supplement, visit <http://us.fluke.com/user/support/manuals>.

## **Safety Information**

General Safety Information is in the printed Safety Information document that ships with the Product and at [www.fluke.com](http://www.fluke.com). More specific safety information is listed where applicable.

## Product Overview

Table 1 and Figure 1 explain the Product features.

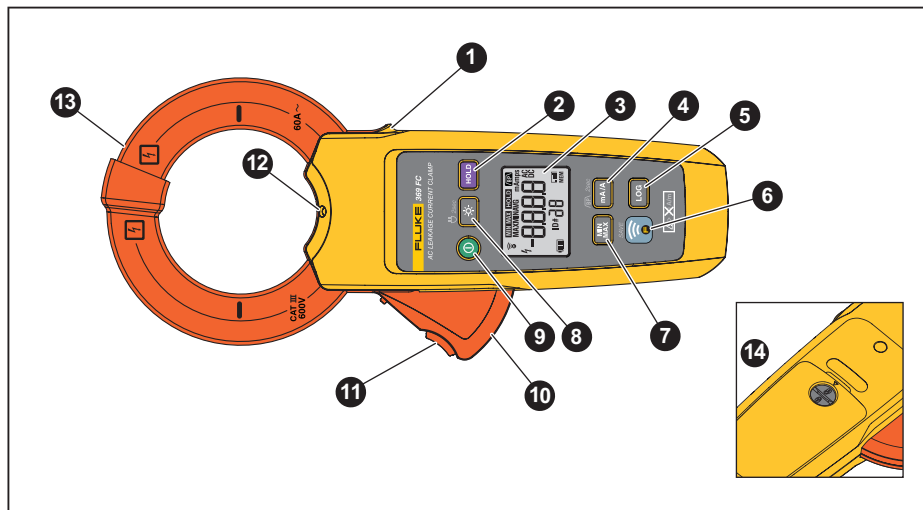
**Table 1. Features**

| Item | Definition                                                                                                                                                                       |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1    | Keep fingers below the <b>Tactile Barrier</b> .                                                                                                                                  |
| 2    | Push <b>HOLD</b> to retain the measured data on the display. When pushed, <b>HOLD</b> shows on the display. When pushed again, data hold is canceled and <b>HOLD</b> disappears. |
| 3    | The display shows the measured value (digital reading), unit, function, and low battery symbol.                                                                                  |
| 4    | Push <b>mA/A</b> to choose the range of ac current (either mA or A). Push and hold <b>mA/A</b> for 2 seconds to turn on the filter.                                              |
| 5    | 368 FC/369 FC: Log data and clear memory, see <i>Product Functions</i> .                                                                                                         |
| 6    | 368 FC/369 FC: Turn on/turn off the Fluke Connect™ wireless connectivity to a smartphone, see <i>Product Functions</i> .                                                         |

Table 1. Features (cont.)

| Item | Definition                                                                                                                                                                                                                                                                              |
|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 7    | Push  to show the minimum, maximum, and average reading. When pushed, <b>MIN MAX</b> shows on the display.                                                                                             |
| 8    | Push  to turn on the display backlight. Push and hold  for 2 seconds to turn on the spotlight. See <i>Spotlight</i> . |
| 9    | Push  to turn on or turns off the Product.                                                                                                                                                             |
| 10   | Jaw trigger                                                                                                                                                                                                                                                                             |
| 11   | Push the jaw lock button and the trigger together to unlock the jaw.                                                                                                                                                                                                                    |
| 12   | Spotlight. See <i>Spotlight</i> .                                                                                                                                                                                                                                                       |
| 13   | Jaw                                                                                                                                                                                                                                                                                     |
| 14   | Battery Housing holds the batteries. See <i>Batteries</i> .                                                                                                                                                                                                                             |

**Figure 1. Product Features**



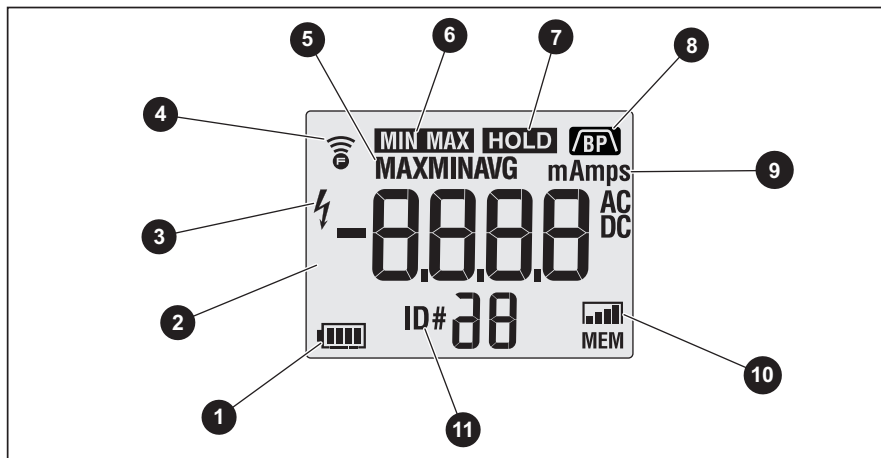
## **The Display**

Table 2 and Figure 2 explain the Product display.

**Table 2. Display**

| <b>Item</b> | <b>Definition</b>                                                               |
|-------------|---------------------------------------------------------------------------------|
| <b>1</b>    | Battery Symbol                                                                  |
| <b>2</b>    | Main display                                                                    |
| <b>3</b>    | The Product is searching for ranges.                                            |
| <b>4</b>    | Fluke Connect on (368 FC and 369 FC)                                            |
| <b>5</b>    | Min, Max, or Avg reading is showing.                                            |
| <b>6</b>    | MinMax mode is active.                                                          |
| <b>7</b>    | Hold mode is active.                                                            |
| <b>8</b>    | Filter is active and filters signals from 40 Hz – 70 Hz.                        |
| <b>9</b>    | mAAC or AAC                                                                     |
| <b>10</b>   | Remaining memory (368 FC and 369 FC)                                            |
| <b>11</b>   | Product identification number when used with Fluke Connect (368 FC and 369 FC). |

**Figure 2. Display**



## **Manual-Range Mode**

To enable manual-range mode:

1. With the Product off, simultaneously push  and .
2. Hold both buttons until the backlight illuminates (~2 s).  
The Product is now in manual-range mode.
3. Push  to select the range.

## **Clean the Product**

Periodically wipe the case with a damp cloth and mild detergent.

### **Caution**

**To avoid damaging the Product, do not use abrasives or solvents to clean the Product.**

1. Inspect the jaw mating surface for cleanliness. If any foreign material is present, the jaw will not close properly and measurement errors will result.
2. Open the jaws and clean the clamp metal ends with a lightly oiled cloth.

## **Maintenance**

If the Product does not work or perform properly, use these steps to help isolate the problem:

1. Inspect the jaw mating surface for cleanliness. If any foreign material is present, the jaw will not close properly and measurement errors will result.
2. Verify that the range on the Product is correct.

## **Replacement Parts**

Replacement parts are listed in Table 3. To order, see *How to Contact Fluke*.

**Table 3. Replacement Parts**

| Item                  | Description          | Fluke Part Number |
|-----------------------|----------------------|-------------------|
| Battery               | 2AA IEC LR6 Alkaline | 376756            |
| Battery door assembly | English              | 4700598           |
|                       | Chinese              | 4739829           |

## **Specifications**

### **General**

Measurement functions .....AC current

Display (LCD) .....Digital reading: 3300 counts, LCD refresh rate 4x/s

Range selection.....mA/A: manual selection  
3 mA/30 mA/300 mA: auto selection  
3 A/30 A/60 A: auto selection

### **Battery**

Type ..... 2 AA IEC LR6 alkaline

Life..... >150 hours without backlight and spotlight

Maximum conductor diameter .....368: 40 mm, 369: 61 mm

Automatic power off..... 15 minutes after the last switch operation

Dimensions

369/369 FC (W x H x D)..... 116 mm x 257 mm x 46 mm

368/368 FC (W x H x D)..... 101 mm x 234 mm x 46 mm

Weight

369/369 FC..... 600 g

368/368 FC..... 500 g

**Electrical Specifications**

Reference Conditions.....23 ±5 °C and 80 % RH maximum

A AC Range .....3 mA, 30 mA, 300 mA, 3 A, 30 A, 60 A

Frequency .....40 Hz to 1 kHz

Crest Factor.....3

**AC Current Measurement**

Accuracy is specified for 1 year after calibration. Accuracy is given as  $\pm$ (% reading + digit).

| Range               | Resolution | 368/368 FC              |                          | 369/369 FC              |                          | T.C./°C Outside<br>18 °C to 28 °C |
|---------------------|------------|-------------------------|--------------------------|-------------------------|--------------------------|-----------------------------------|
|                     |            | Filter On<br>(40-70 Hz) | Filter Off<br>(40-1 kHz) | Filter On<br>(40-70 Hz) | Filter Off<br>(40-1 kHz) |                                   |
| 3 mA <sup>[1]</sup> | 0.001 mA   | 1+5                     | 1+5                      | 1.5+5                   | 1.5+5                    | 0.002+1                           |
| 30 mA               | 0.01 mA    | 1+5                     | 1+5                      | 1.5+5                   | 1.5+5                    | 0.002+1                           |
| 300 mA              | 0.1 mA     | 1+5                     | 1+5                      | 1.5+5                   | 1.5+5                    | 0.002+1                           |
| 3 A                 | 0.001 A    | 1+5                     | 1+5                      | 1.5+5                   | 1.5+5                    | 0.002+1                           |
| 30 A                | 0.01 A     | 1+5                     | 1+5                      | 1.5+5                   | 1.5+5                    | 0.002+1                           |
| 60 A                | 0.1 A      | 2+5                     | 2+5                      | 2+5                     | 2+5                      | 0.002+1                           |

[1] The minimum value is 10  $\mu$ A rms.

**Environmental Specifications**

Operating temperature .....-10 °C to +50 °C

Storage temperature .....-40 °C to +60 °C

Operating humidity  
(without condensation) .....Non condensing (<10 °C)  
90 % RH (10 °C to 30 °C)  
75 % RH (30 °C to 40 °C)  
45 % RH (40 °C to 50 °C)

Ingress Protection .....IEC 60529: IP30 with jaw closed

Operating Altitude.....2000 m

Storage Altitude.....12 000 m

**Electromagnetic Compatibility (EMC)**

International..... IEC 61326-1: Industrial Electromagnetic Environment  
IEC 61326-2-2, CISPR 11: Group 1, Class B

*Group 1: Equipment has intentionally generated and/or uses conductively-coupled radio frequency energy that is necessary for the internal function of the equipment itself.*

*Class B: Equipment is suitable for use in domestic establishments and in establishments directly connected to a low voltage power supply network which supplies buildings used for domestic purposes.*

*Emissions that exceed the levels required by CISPR 11 can occur when the equipment is connected to a test object.*

Korea (KCC) ..... Class A equipment (Industrial Broadcast & Communications Equipment)

*Class A: Equipment meets requirements for industrial electromagnetic wave equipment and the seller or user should take notice of it. This equipment is intended for use in business environments and not to be used in homes.*

USA (FCC) ..... 47 CFR 15 subpart B. This product is considered an exempt device per clause 15.103.

### **Safety Specifications**

General ..... IEC61010-1: Pollution degree 2

Measurement ..... IEC61010-2-032: CAT III 600 V

Current Clamp for Leakage Current

Measurements ..... IEC 61557-13: Class 2,  $\leq 30$  A/m

## Wireless Radio

Radio Frequency Certification ..... FCC ID:T68-FBLE IC:6627A-FBLE

Frequency Range ..... 2405 MHz to 2480 MHz

Output Power ..... <100 mW

Radio Frequency Data ..... Go to [www.fluke.com](http://www.fluke.com) and search for “Radio Frequency Data for Class A” (PN 4333628)

## Operational Error for Current

Accuracy is specified for 1 year after calibration. Accuracy is given as  $\pm$ (% reading).

Accuracy guaranteed for 50 Hz and 60 Hz.

| Parameter             | Specification                       | Typical    |            | Max <sup>[1]</sup> |            |
|-----------------------|-------------------------------------|------------|------------|--------------------|------------|
|                       |                                     | 368/368 FC | 369/369 FC | 368/368 FC         | 369/369 FC |
| Intrinsic Uncertainty | IEC 61557-13 A Reference conditions | 0.08 %     | 0.06 %     | 0.15 %             | 0.13 %     |
| Conductor Position    | IEC 61557-13 E1 $\pm 30^\circ$      | 0.08 %     | 0.06 %     | 0.15 %             | 0.12 %     |
| Battery Voltage       | IEC 61557-13 E2 2.0 V to 3.3 V      | 0.08 %     | 0.05 %     | 0.15 %             | 0.12 %     |
| Temperature           | IEC 61557-13 E3 -10 °C to 50 °C     | 0.14 %     | 0.14 %     | 0.29 %             | 0.29 %     |
| Distortion            | IEC 61557-13 E9                     | 0.06 %     | 0.07 %     | 0.15 %             | 0.12 %     |

## 368/368 FC/369/369 FC

### Users Manual

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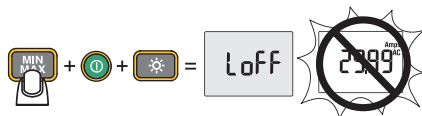
| Parameter                   | Specification                                                          | Typical          |                  | Max <sup>[1]</sup> |                   |
|-----------------------------|------------------------------------------------------------------------|------------------|------------------|--------------------|-------------------|
|                             |                                                                        | 368/368 FC       | 369/369 FC       | 368/368 FC         | 369/369 FC        |
| Magnetic Field              | IEC 61557-13 E11 (15 Hz to 400 Hz)<br>10 A/m Class 3<br>30 A/m Class 2 | 1.58 %<br>4.75 % | 2.07 %<br>6.21 % | 3.54 %<br>10.61 %  | 3.31 %<br>9.96 %  |
| Load Current                | IEC 61557-13 E12<br>60 A rms max (50 Hz and 60 Hz)                     | 3.60 %           | 5.17 %           | 7.67 %             | 10.83 %           |
| Touch Current               | IEC 61557-13 E13 CAT III 600 V/ 60 Hz                                  | 0.94 %           | 0.06 %           | 1.61 %             | 0.14 %            |
| Frequency                   | IEC 61557-13 E14 40 Hz to 1 kHz                                        | 0.15 %           | 0.15 %           | 0.30 %             | 0.32 %            |
| Repeatability               | IEC 61557-13 E15                                                       | 0.08 %           | 0.06 %           | 0.15 %             | 0.12 %            |
| Uncertainty                 | IEC 61557-13 B<br>10A/m Class 3<br>30A/m Class 2                       | 4.74 %<br>7.02 % | 6.47 %<br>9.36 % | 10.06 %<br>15.34 % | 13.16 %<br>17.05% |
| [1] Confidence level: 95 %. |                                                                        |                  |                  |                    |                   |

## Product Functions

### Auto Power Off



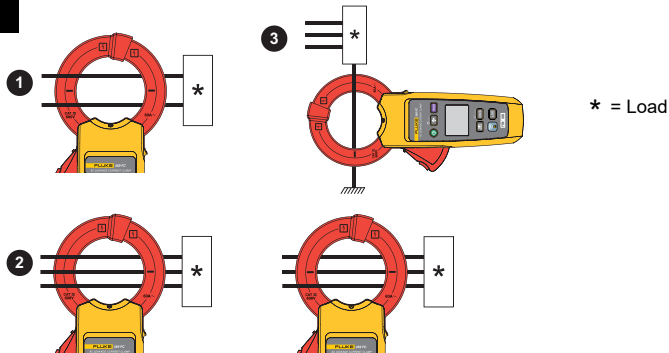
### Backlight



**A**



**Measure**



**1**

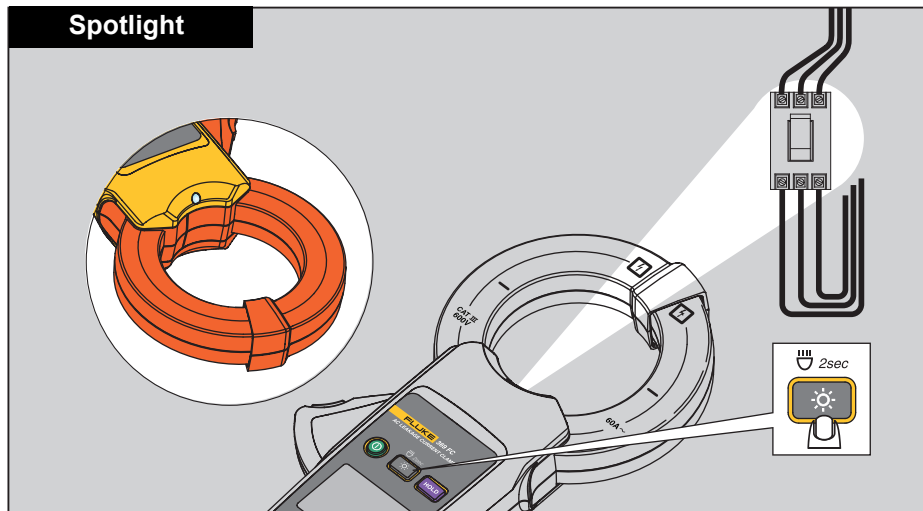
Single-Phase Two-Wire Circuit

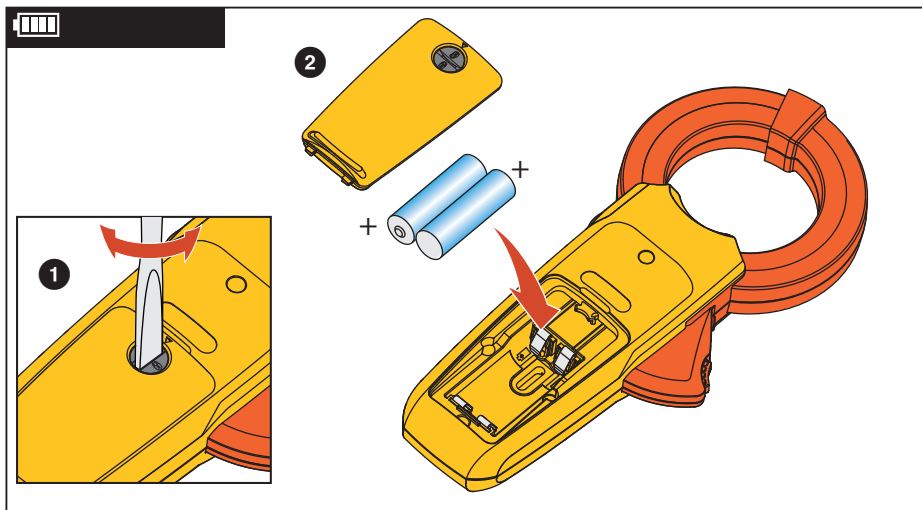
**2**

Single-Phase Three-Wire or Three-Phase Three-Wire Circuit

**3**

Load Current Measurement. Insert only one of the wires through the jaw.





**Fluke Connect™ Bluetooth Connection to FC Tools**

