

# CURRENT MEASUREMENT

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## Current sensors

### Ammeter clamps



MN88



#### The widest range of IEC 1010 clamps

Our innovation, technical mastery and desire to manufacture top-quality products that comply with norms have made Chauvin Arnoux the worldwide specialist in ammeter clamps.

On the next pages, you will find a table presenting the clamps for measuring AC/DC current, followed by a diagram giving clamp form with dimensions and then another table grouping a large number of models for AC current.

As a result of their specifications, certain clamps are specialized for specific applications.

- Clamps for oscilloscopes (BNC connectors): E3N, PAC12, PAC22, MN60, Y7N, C160, and D38N
- Clamps for leak currents: MN73 and C173
- Process current clamps: K1 and K2
- Clamp for measurement on the secondary winding of current transformers: MN71

**As well as these standard specialized and unspecialized models, "specific" versions can also be produced on request: please ask for details.**

K1



#### Choosing your ammeter clamp

There is a wide range of criteria for choosing an ammeter clamp. The approach below is designed to help define your requirements and guide you naturally towards the model which best suits your application.

The criteria selected are classified from 1 to 6.

To choose your clamp, we advise you to follow this logic:

- Measurement of direct or alternating current? (AC/DC clamps or AC clamps tables)
- High or low currents? (see the "Input" column to define the appropriate families of clamps)
- On small wires or large cables? (see the diagrams at the bottom of the next page and only choose families with the shapes and dimensions required)

- What instrument will it be connected to? (see "Input / Connection" column to choose a clamp with compatible signal and connection possibilities)
- What are your other criteria? (see "Specific features" column to check that the clamp chosen fulfils your requirements perfectly)






| MULTIMETERS         |        |          |          |          |          |          |           |           |           |           |          |          |
|---------------------|--------|----------|----------|----------|----------|----------|-----------|-----------|-----------|-----------|----------|----------|
| Clamps              | Output | C.A 5000 | C.A 5001 | C.A 5003 | C.A 5005 | C.A 5011 | C.A 5205G | C.A 5210G | C.A 5220G | C.A 5230G | C.A 5240 | C.A 5260 |
| <b>AC CLAMPS</b>    |        |          |          |          |          |          |           |           |           |           |          |          |
| MN09                | I      |          | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| MN11                | I      | ■        | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| MN13                | V      |          |          |          |          |          | ■         | ■         |           |           |          | ■        |
| MN39                | V      |          |          |          |          |          | ■         | ■         |           |           |          | ■        |
| MN89                | V DC   | ■        |          |          | ■        |          | ■         | ■         |           |           |          | ■        |
| Y1N                 | I      |          | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| C103                | I      |          | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| C122                | I      |          | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| C148                | I      |          | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| C173                | V      |          |          |          |          |          |           |           | ■         | ■         | ■        |          |
| D30CN               | I      | ■        | ■        | ■        |          |          |           |           | ■         | ■         | ■        |          |
| D36N                | I      | ■        | ■        | ■        |          | ■        |           |           | ■         | ■         | ■        |          |
| AmpFLEX             | V      |          |          |          |          | ■        | ■         | ■         | ■         | ■         | ■        |          |
| <b>AC/DC CLAMPS</b> |        |          |          |          |          |          |           |           |           |           |          |          |
| K1/K2               | V      |          |          |          |          | ■        |           | ■         | ■         | ■         | ■        |          |
| E1N                 | V      |          |          |          |          | ■        | ■         | ■         | ■         | ■         | ■        |          |
| E6N                 | V      |          |          |          |          | ■        |           | ■         | ■         | ■         | ■        |          |
| PAC10               | V      |          |          |          |          |          |           |           | ■         | ■         | ■        |          |
| PAC11               | V      |          |          |          |          |          |           |           | ■         | ■         | ■        |          |
| PAC20               | V      |          |          |          |          |          |           |           | ■         | ■         | ■        |          |








The ■ sign indicates the compatibility between a clamp and a multimeter  
The colored squares indicate the best choice for your multimeter

## Current measurement



### Leak current measurement

| Series  | Model | Input  |             |                |            |      | Output / Connections |                    |         | Specific features            |                       |  |                                     |  | To order |                   |                                      |                             |
|---|-------|--|-------------|----------------|------------|------|----------------------|--------------------|---------|------------------------------|-----------------------|--|-------------------------------------|--|----------|-------------------|--------------------------------------|-----------------------------|
|   |       | Very low current   | Low current | Medium current | No current | ~ AC | ⋯ DC                 | Current            | Voltage | Lead + safety plug ø 4 mm(2) | Female sockets ø 4 mm | BNC connector (oscilloscopes)              | Transformation ratio (input/output) | Output, protected against overvoltages |          | Automatic DC zero | Power measurement (low phase shift)  | Bandwidth (frequency in Hz) |
|  | MN73  | 10 mA to 2.4 A<br>100 mA to 240 A                            |             |                |            | ●    |                      | 2 V AC<br>2 V AC   |         |                              |                       | 1 A/1000 mV<br>1 A/10 mV                   |                                     |  |          | 40 Hz to 10 kHz   | ≤ 1%<br>≤ 2%                         | > P01.1204.21               |
|  | C173  | 1 mA to 1.2 A<br>0.01 to 12 A<br>0.1 to 120 A<br>1 to 1200 A |             |                |            | ●    |                      | 1 V AC             |         |                              |                       | 1 A/1V<br>10 A/1V<br>100 A/1V<br>1000 A/1V |                                     |  |          | 10 Hz to 3 kHz    | ≤ 0.7%<br>≤ 0.5%<br>≤ 0.3%<br>≤ 0.2% | > P01.1203.09               |
|  | B102  | 500 µA to 4 A<br>0.5 to 400 A                                |             |                |            | ●    |                      | 4 V AC<br>0.4 V AC |         |                              |                       | 1 mA/1 mV<br>1 A/1 mV                      | ●                                   |  |          | 10 Hz to 1 kHz    | ≤ 0.5%<br>≤ 0.35%                    | > P01.1200.83               |

### Measurement on oscilloscope

|   |       |  |  |  |  |   |  |                                  |  |  |  |                                     |   |  |  |                  |                      |                |
|---|-------|--|--|--|--|---|--|----------------------------------|--|--|--|-------------------------------------|---|--|--|------------------|----------------------|----------------|
|  | MN60  | 0.1 to 60 A peak<br>0.5 to 600 A peak  |  |  |  | ● |  | 2 V AC<br>2 V AC                 |  |  |  | 1 A/100 mV<br>1 A/10 mV             |   |  |  | 40 Hz to 40 kHz  | ≤ 2%<br>≤ 1.5%       | > P01.1204.09  |
|  | Y7N   | 1 A to 1200 A peak   |  |  |  | ● |  | 1 V AC                           |  |  |  | 1 mA/1 mV                           |   |  |  | 5 Hz to 10 kHz   | ≤ 2%                 | > P01.1200.75  |
|  | C160  | 0.1 to 30 A peak<br>1 to 300 A peak<br>1 to 2000 A peak                        |  |  |  | ● |  | 3 V peak<br>3 V peak<br>2 V peak |  |  |  | 10 A/1 V<br>100 A/1 V<br>1000 A/1 V |   |  |  | 10 Hz to 100 kHz | ≤ 3%<br>≤ 2%<br>≤ 1% | > P01.1203.08  |
|  | D38N  | 1 to 90 A peak<br>1 to 900 A peak<br>1 to 9000 A peak                          |  |  |  | ● |  | 1 V AC                           |  |  |  | 1 A/10 V<br>1 A/1 mV<br>1 A/0.1 mV  |   |  |  | 30 Hz to 50 kHz  | ≤ 2%                 | > P01.1200.57A |
|  | E3N   | 0.05 to 10 A peak<br>1 to 100 A peak   |  |  |  | ● |  | 1 V peak                         |  |  |  | 1 A/100 mV<br>1 A/10 mV             |   |  |  | DC to 100 kHz    | ≤ 3%<br>≤ 4%         | > P01.1200.43A |
|  | PAC12 | 0.2 to 60 A peak<br>0.4 to 60 A DC<br>0.5 to 600 A peak<br>0.5 to 600 A DC     |  |  |  | ● |  | 600 mV AC/DC                     |  |  |  | 1 A/10 mV<br>1 A/1 mV               | ● |  |  | DC to 10 kHz     | ≤ 1.5%<br>≤ 2%       | > P01.1200.72  |
|  | PAC22 | 0.2 to 150 A peak<br>0.4 to 150 A DC<br>0.5 to 1400 A peak<br>0.5 to 1400 A DC |  |  |  | ● |  | 1.4 V AC/DC                      |  |  |  | 1 A/10 mV<br>1 A/1 mV               | ● |  |  | DC to 10 kHz     | ≤ 1.5%<br>≤ 2.5%     | > P01.1200.73  |

### Measurement of process current

|   |    |   |  |  |  |   |  |                                 |  |  |  |            |  |  |  |               |      |               |
|---|----|---|--|--|--|---|--|---------------------------------|--|--|--|------------|--|--|--|---------------|------|---------------|
|  | K1 | 1 to 14.5 A DC<br>1 to 3 A RMS<br>1 to 2 A peak             |  |  |  | ● |  | 4.5 V DC<br>3 V RMS<br>2 V peak |  |  |  | 1 mA/1 mV  |  |  |  | DC to 2 kHz   | ≤ 1% | > P01.1200.67 |
|  | K2 | 0.1 to 450 mA DC<br>0.1 to 300 mA RMS<br>0.1 to 450 mA peak |  |  |  | ● |  | 4.5 V DC<br>3 V RMS<br>2 V peak |  |  |  | 1 mA/10 mV |  |  |  | DC to 1.5 kHz | ≤ 1% | > P01.1200.74 |

### Measurement on secondary winding of current transformers

|   |      |               |  |  |  |   |  |        |  |  |  |            |  |  |  |                 |      |               |
|---|------|---------------|--|--|--|---|--|--------|--|--|--|------------|--|--|--|-----------------|------|---------------|
|  | MN71 | 10 mA to 12 A |  |  |  | ● |  | 1 V AC |  |  |  | 1 A/100 mV |  |  |  | 40 Hz to 10 kHz | ≤ 1% | > P01.1204.20 |
|---|------|---------------|--|--|--|---|--|--------|--|--|--|------------|--|--|--|-----------------|------|---------------|

(1) The upper value corresponds to 120% of the maximum nominal value.  
 (2) Lead + electronic unit with Ø 4 mm safety connectors, centre distance 19 mm, for K series







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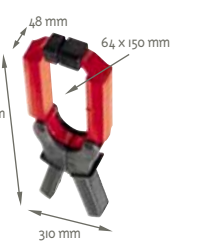
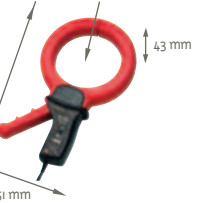
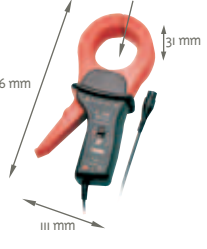
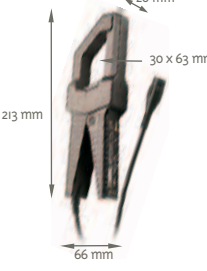
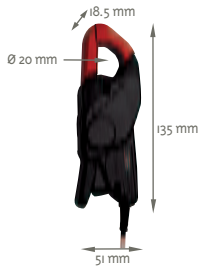
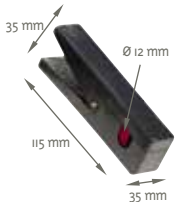
## AC current measurement

| Input | Output / Connections | Specific features |
|-------|----------------------|-------------------|
|-------|----------------------|-------------------|




| Measurement range (i) |             | Voltage | Leads + safety plug ø 4 mm (c) | Female sockets ø 4 mm | BNC connector (oscilloscope) | Transformation ratio (input/output) | Output protected against overvoltage | Automatic DC zero | Power measurement (low phase shift) | Bandwidth (frequency in Hz) | Typical accuracy |
|-----------------------|-------------|---------|--------------------------------|-----------------------|------------------------------|-------------------------------------|--------------------------------------|-------------------|-------------------------------------|-----------------------------|------------------|
| Very low current      | Low current |         |                                |                       |                              |                                     |                                      |                   |                                     |                             |                  |

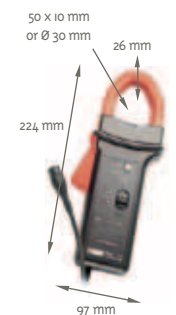
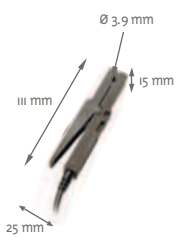
| Series  | Model   | Measurement range (i)  | Input         | Output / Connections             | Specific features | To Order                                       |  |                         |                |
|---|---|--|---------------|----------------------------------|-------------------|--|--|-------------------------|----------------|
|    | Miniclamp 1   | 1 mA to 10 A<br>1 A to 100 A                                 | •             | 10 V AC<br>0.1 V AC              | •                 | 1 mA/1 mV<br>1 A/1 mV                          | 45 Hz..500 Hz<br>≤ 3%<br>≤ 2%                        | > P01.1050.01           |                |
|   | Miniclamp 2   | 1 A to 150 A   | •             | 15 V DC (2)                      | •                 | 1 A/100 mV                                     | 50 Hz..400 Hz<br>≤ 3%                                | > P01.1050.02           |                |
|   | Miniclamp 3   | 0.5 to 150 A   | •             | 0.3 A AC                         | •                 | 500/1  | 45 Hz..450 Hz<br>≤ 4%                                | > P01.1050.03           |                |
|   | Miniclamp 4   | 2 to 150 A   | •             | 0.15 A AC                        | •                 | 1000/1   | 45 Hz..1 kHz<br>≤ 2,5%                               | > P01.1050.04           |                |
|   | Miniclamp 5   | 50 mA to 100 A   | •             | 0.1 A AC                         | •                 | 1000/1   | 45 Hz..10 kHz<br>≤ 1%                                | > P01.1050.05           |                |
|    | MNo8  | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.01           |                |
|   | MNo9  | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.02           |                |
|   | MNo10   | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 2%                                | > P01.1204.03           |                |
|   | MNo11   | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 2%                                | > P01.1204.04           |                |
|   | MNo12   | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.05           |                |
|   | MNo13   | 0.5 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.06           |                |
|   | MNo14   | 0.5 to 240 A   | •             | 0.2 V AC                         | •                 | 1 A/1 mV                                       | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.16           |                |
|   | MNo15   | 0.5 to 240 A   | •             | 0.2 V AC                         | •                 | 1 A/1 mV                                       | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.17           |                |
|   | MNo21   | 0.1 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 2%                                | > P01.1204.18           |                |
|   | MNo23   | 0.1 to 240 A   | •             | 0.2 A AC                         | •                 | 1000/1   | 40 Hz..10 kHz<br>≤ 1,5%                              | > P01.1204.19           |                |
|   | MNo38   | 0.1 to 24 A<br>0.5 to 240 A                                  | •             | 2 V AC<br>2 V AC                 | •                 | 1 A/100 mV<br>1 A/10 mV                        | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.07           |                |
|   | MNo39   | 0.1 to 24 A<br>0.5 to 240 A                                  | •             | 2 V AC<br>2 V AC                 | •                 | 1 A/100 mV<br>1 A/10 mV                        | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.08           |                |
|   | MNo60   | 0.1 to 180 A peak<br>0.5 to 600 A peak                       | •             | 2 V AC<br>2 V AC                 | •                 | 1 A/100 mV<br>1 A/10 mV                        | 40 Hz..40 kHz<br>≤ 2%<br>≤ 1,5%                      | > P01.1204.09           |                |
|   | MNo71   | 10 mA to 12 A  | •             | 1 V AC                           | •                 | 1 A/100 mV                                     | 40 Hz..10 kHz<br>≤ 1%                                | > P01.1204.20           |                |
|   | MNo73   | 10 mA to 2.4 A<br>100 mA to 240 A                            | •             | 2 V AC<br>2 V AC                 | •                 | 1 mA/1 mV<br>1 A/10 mV                         | 40 Hz..10 kHz<br>≤ 1%<br>≤ 2%                        | > P01.1204.21           |                |
| MNo88   | 0.5 to 240 A  | •  | 20 V DC (2)   | •                                | 1 A/100 mV        | 40 Hz..10 kHz<br>≤ 2%                          | > P01.1204.10  |                         |                |
| MNo89   | 0.5 to 240 A  | •  | 20 V DC (2)   | •                                | 1 A/100 mV        | 40 Hz..10 kHz<br>≤ 2%                          | > P01.1204.15  |                         |                |
|  | YiN   | 4 A to 600 A   | •             | 0.5 A AC                         | •                 | 1000/1   | 48 Hz..1 kHz<br>≤ 3%                                 | > P01.1200.01A          |                |
|   | Y2N   | 4 A to 600 A   | •             | 0.5 A AC                         | •                 | 1000/1   | 48 Hz..1 kHz<br>≤ 1%                                 | > P01.1200.28A          |                |
|   | Y3N   | 4 A to 600 A   | •             | 5 A AC                           | •                 | 100/1  | 48 Hz..1 kHz<br>≤ 3%                                 | > P01.1200.29A          |                |
|   | Y4N   | 4 A to 600 A   | •             | 0.5 V DC (2)                     | •                 | 500 A/ 0.5 V                                   | 48 Hz..1 kHz<br>≤ 1%                                 | > P01.1200.05A          |                |
|   | Y7N   | 1 A to 1200 A peak   | •             | 1 V AC                           | •                 | 1 A/1 mV                                       | 5 Hz..10 kHz<br>≤ 2%                                 | > P01.1200.75           |                |
|   |  | Ci00   | 0.1 to 1200 A | •                                | 1 A AC            | •  | 1000/1   | 30 Hz..10 kHz<br>≤ 0,5% | > P01.1203.01  |
|   |   | Ci02   | 0.1 to 1200 A | •                                | 1 A AC            | •  | 1000/1   | 30 Hz..10 kHz<br>≤ 0,5% | > P01.1203.02  |
| Ci03  |   | 0.1 to 1200 A  | •             | 1 A AC                           | •                 | 1000/1   | 30 Hz..10 kHz<br>≤ 0,5%                              | > P01.1203.03           |                |
| Ci06  |   | 0.1 to 1200 A  | •             | 1 V AC                           | •                 | 1 A/1 mV                                       | 30 Hz..10 kHz<br>≤ 0,5%                              | > P01.1203.04           |                |
| Ci07  |   | 0.1 to 1200 A  | •             | 1 V AC                           | •                 | 1 A/1 mV                                       | 30 Hz..10 kHz<br>≤ 0,5%                              | > P01.1203.05           |                |
| Ci12  |   | 1 mA to 1200 A   | •             | 1 A AC                           | •                 | 1000/1   | 30 Hz..10 kHz<br>≤ 0,3%                              | > P01.1203.14           |                |
| Ci13  |   | 1 mA to 1200 A   | •             | 1 A AC                           | •                 | 1000/1   | 30 Hz..10 kHz<br>≤ 0,3%                              | > P01.1203.15           |                |
| Ci16  |   | 1 mA to 1200 A   | •             | 1 V AC                           | •                 | 1 A/1 mV                                       | 30 Hz..10 kHz<br>≤ 0,3%                              | > P01.1203.16           |                |
| Ci17  |   | 1 mA to 1200 A   | •             | 1 V AC                           | •                 | 1 A/1 mV                                       | 30 Hz..10 kHz<br>≤ 0,3%                              | > P01.1203.17           |                |
| Ci22  |   | 1 to 1200 A  | •             | 5 A AC                           | •                 | 1000/5   | 30 Hz..10 kHz<br>≤ 1%                                | > P01.1203.06           |                |
| Ci48  |   | 1 to 300 A<br>1 to 600 A<br>1 to 1200 A                      | •             | 5 A AC                           | •                 | 250/5<br>500/5<br>1000/5                       | 48 Hz..1 kHz<br>≤ 2%<br>≤ 1%<br>≤ 1%                 | > P01.1203.07           |                |
| Ci60  |   | 0.1 to 30 A peak<br>0.1 to 300 A peak<br>1 to 2000 A peak    | •             | 3 V peak<br>3 V peak<br>2 V peak | •                 | 10 A/1 V<br>100 A/1 V<br>1000 A/1 V            | 10 Hz..100 kHz<br>≤ 2%<br>≤ 1%                       | > P01.1203.08           |                |
| Ci73  |   | 1 mA to 1.2 A<br>0.01 to 12 A<br>0.1 to 120 A<br>1 to 1200 A | •             | 1 V AC                           | •                 | 1 A/1 V<br>10 A/1 V<br>100 A/1 V<br>1000 A/1 V | 10 Hz..3 kHz<br>≤ 0,7%<br>≤ 0,5%<br>≤ 0,3%<br>≤ 0,2% | > P01.1203.09           |                |
|  | Bi02  | 500 µA to 4 A<br>0.5 to 400 A                                | •             | 4 V AC<br>0.4 V AC               | •                 | 1 mA/1 mV<br>1 A/1 mV                          | 10 Hz..1 kHz<br>≤ 0,5%<br>≤ 0,35%                    | > P01.1200.83           |                |
|   |  | D30N   | 1 A to 3600 A | •                                | 1 A AC            | •  | 3000/1   | 30 Hz..5 kHz<br>≤ 0,5%  | > P01.1200.49A |
| D30CN   |   | 1 A to 3600 A  | •             | 1 A AC                           | •                 | 3000/1   | 30 Hz..5 kHz<br>≤ 0,5%                               | > P01.1200.64           |                |
| D31N  |   | 1 to 600 A<br>1 to 1200 A<br>1 to 1800 A                     | •             | 1 A AC                           | •                 | 500/1<br>1000/1<br>1500/1                      | 30 Hz..1.5 kHz<br>≤ 3%<br>≤ 1%<br>≤ 0,5%             | > P01.1200.50A          |                |
| D32N  |   | 1 to 1200 A<br>1 to 2400 A<br>1 to 3600 A                    | •             | 1 A AC                           | •                 | 1000/1<br>2000/1<br>3000/1                     | 30 Hz..1 kHz<br>≤ 1%<br>≤ 0,5%<br>≤ 0,5%             | > P01.1200.51A          |                |
| D33N  |   | 1 to 3600 A  | •             | 5 A AC                           | •                 | 3000/5   | 30 Hz..5 kHz<br>≤ 1%                                 | > P01.1200.52A          |                |
| D34N  |   | 1 to 600 A<br>1 to 1200 A<br>1 to 1800 A                     | •             | 5 A AC                           | •                 | 500/5<br>1000/5<br>1500/5                      | 30 Hz..1.5 kHz<br>≤ 3%<br>≤ 1%<br>≤ 0,5%             | > P01.1200.53A          |                |
| D35N  |   | 1 to 1200 A<br>1 to 2400 A<br>1 to 3600 A                    | •             | 5 A AC                           | •                 | 1000/5<br>2000/5<br>3000/5                     | 30 Hz..1.5 kHz<br>≤ 1%<br>≤ 0,5%<br>≤ 0,5%           | > P01.1200.54A          |                |
| D36N  |   | 1 to 3600 A  | •             | 3 A AC                           | •                 | 3000/3   | 30 Hz..5 kHz<br>≤ 0,5%                               | > P01.1200.55A          |                |
| D37N  |   | 0.1 to 36 A RMS<br>1 to 360 A RMS<br>1 to 3600 A RMS         | •             | 3 V AC                           | •                 | 30 A/3 V<br>300 A/3 V<br>3000 A/3 V            | 30 Hz..5 kHz<br>≤ 2%                                 | > P01.1200.56A          |                |
| D38N  |   | 1 to 90 A peak<br>1 to 900 A peak<br>1 to 9000 A peak        | •             | 1 V AC                           | •                 | 1 A/10 mV<br>1 A/1 mV<br>1 A/0.1 mV            | 30 Hz..50 kHz<br>≤ 2%                                | > P01.1200.57A          |                |

(1) The higher value corresponds to 120% of the max. nominal value (2) Reshaping of AC signal by diodes.



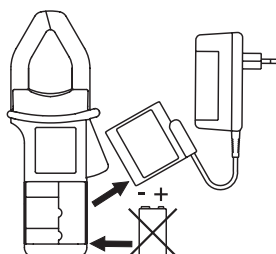
**AC / DC current measurement**

| Series  | Model        | Input  |             |      |        | Output / Connections               |                               |                       |                               | Specific features                   |                                      |                        |                                     | To Order       |
|---|--------------|--|-------------|------|--------|------------------------------------|-------------------------------|-----------------------|-------------------------------|-------------------------------------|--------------------------------------|------------------------|-------------------------------------|----------------|
|   |              | Measurement range (i)  |             |      |        | Voltage                            | Leads + safety plug Ø 4 mm(2) | Female sockets Ø 4 mm | BNC connector (oscilloscopes) | Transformation ratio (input/output) | Output protected against overvoltage | Automatic DC zero      | Power measurement (low phase shift) |                |
| Very low current  | Low current  | Medium current   | Hot current | ~ AC | ... DC |                                    |                               |                       |                               |                                     |                                      |                        |                                     | Current        |
|    | <b>K1</b>    | 1 mA to 4.5 A DC<br>1 mA to 3 A RMS<br>1 mA to 4.5 A peak                      | ●           | ●    |        | 4.5 V DC<br>3 V RMS<br>2 V peak    | ●                             |                       | 1 mA/1 mV                     |                                     |                                      | DC..2 kHz              | ≤ 1%                                | > P01.1200.67  |
|   | <b>K2</b>    | 100 µA to 450 mA DC<br>100 µA to 300 mA RMS<br>100 µA to 450 mA peak           | ●           | ●    |        | 4.5 V DC<br>3 V RMS<br>2 V peak    | ●                             |                       | 1 mA/10 mV                    |                                     |                                      | DC..1.5 kHz            | ≤ 1%                                | > P01.1200.74  |
|   | <b>E1N</b>   | 0.05 to 2 A DC<br>0.05 to 1.5 A AC<br>0.5 to 150 A AC/DC                       | ●           | ●    |        | 2 V DC<br>1.5 V AC<br>150 mV AC/DC | ●                             |                       | 1 A/1 V<br>1 A/1 mV           |                                     |                                      | DC..2 kHz<br>DC..8 kHz | ≤ 2%<br>≤ 1.5%                      | > P01.1200.30A |
|   | <b>E3N</b>   | 0.05 to 10 A peak<br>1 to 100 A peak   | ●           | ●    |        | 1 V peak                           | ●                             |                       | 1 A/100 mV<br>1 A/10 mV       |                                     |                                      | DC..100 kHz            | ≤ 3%<br>≤ 4%                        | > P01.1200.43A |
|   | <b>E6N</b>   | 5 mA to 2 A DC<br>5 mA to 1.5 A AC<br>20 mA to 80 A AC/D                       | ●           | ●    |        | 2 V DC<br>1.5 V AC<br>0.8 V AC/DC  | ●                             |                       | 1 A/1 V<br>1 A/10 mV          |                                     |                                      | DC..2 kHz<br>DC..8 kHz | ≤ 2%<br>≤ 4%                        | > P01.1200.40A |
|  | <b>PAC10</b> | 0.5 to 400 A AC<br>0.5 to 600 A DC   | ●           | ●    |        | 600 mV AC/DC                       | ●                             |                       | 1 A/1 mV                      |                                     |                                      | DC..5 kHz              | ≤ 2%                                | > P01.1200.70  |
|   | <b>PAC11</b> | 0.2 to 40 A AC<br>0.4 to 60 A DC<br>0.5 to 400 A AC<br>0.5 to 600 A DC         | ●           | ●    |        | 600 mV AC/DC                       | ●                             |                       | 1 A/10 mV<br>1 A/1 mV         | ●                                   |                                      | DC..10 kHz             | ≤ 1.5%<br>≤ 2%                      | > P01.1200.68  |
|   | <b>PAC12</b> | 0.2 to 60 A peak<br>0.4 to 60 A DC<br>0.5 to 600 A peak<br>0.5 to 600 A DC     | ●           | ●    |        | 600 mV AC/DC                       | ●                             |                       | 1 A/10 mV<br>1 A/1 mV         | ●                                   |                                      | DC..10 kHz             | ≤ 1.5%<br>≤ 2%                      | > P01.1200.72  |
|   | <b>PAC20</b> | 0.5 to 1000 A AC<br>0.5 to 1400 A DC   | ●           | ●    |        | 1.4 V AC/DC                        | ●                             |                       | 1 A/1 mV                      |                                     |                                      | DC..5 kHz              | ≤ 2%                                | > P01.1200.71  |
|   | <b>PAC21</b> | 0.2 to 100 A AC<br>0.4 to 150 A DC<br>0.5 to 1000 A AC<br>0.5 to 1400 A DC     | ●           | ●    |        | 1.4 V AC/DC                        | ●                             |                       | 1 A/10 mV<br>1 A/1 mV         | ●                                   |                                      | DC..10 kHz             | ≤ 1.5%<br>≤ 2.5%                    | > P01.1200.69  |
|   | <b>PAC22</b> | 0.2 to 150 A peak<br>0.4 to 150 A DC<br>0.5 to 1400 A peak<br>0.5 to 1400 A DC | ●           | ●    |        | 1.4 V AC/DC                        | ●                             |                       | 1 A/10 mV<br>1 A/1 mV         | ●                                   |                                      | DC..10 kHz             | ≤ 1.5%<br>≤ 2.5%                    | > P01.1200.73  |



(1) The higher value corresponds to 120% of the max. nominal value  
(2) Lead + electronic housing with Ø 4 mm safety plugs, centre distance 19 mm, for K series.

Bring an unlimited autonomy to your current clamps: replace the battery with the mains adapter plug



| Adapter for... | Reference     |
|----------------|---------------|
| E clamps       | > P01.1019.68 |
| K clamps       | > P01.1019.66 |
| PAC clamps     | > P01.1019.67 |

# CURRENT MEASUREMENT

More information at [www.chauvin-arnoux.com](http://www.chauvin-arnoux.com)

## Flexible current sensors

AmpFLEX™

Flexibility and easy handling for clamping any conductor

The range is composed of 9 standard models\* dedicated to the measurement of AC currents from 0.5 A to 10 kA, at industrial frequencies. Each flexible core (48, 80 or 120 cm long depending on the model) is connected by a shielded cable to a small box containing the

processing electronics and a standard 9 V battery. The distance between the sockets (19 mm) facilitates direct connection to any type of multimeter, tester or recorder equipped with an AC voltage input (impedance  $Z > 1 M\Omega$ ). The quick and simple system for opening/

closing the core makes it easy to handle even with safety gloves.

Other strong points: very lightweight (no magnetic circuit), no saturation effect, highly accurate and very little phase shift (for wattmeter measurements).

| 9 standard models                  | 20-200 A   | 2 kA             |         | 0.2 - 2 kA        |         | 0.3 - 3 kA        |         |         | 1-10 kA            |
|------------------------------------|--|------------------|---------|-------------------|---------|-------------------|---------|---------|--------------------|
| Sensor length                      | 45 cm  | 45 cm            | 80 cm   | 45 cm             | 80 cm   | 45 cm             | 80 cm   | 1.2 m   | 1.2 m              |
| Single or two-calibre              | 20 A<br>200 A  | 2000 A           |         | 200 A<br>2000 A   |         | 300 A<br>3000 A   |         |         | 1000 A<br>10000 A  |
| Input / output ratio (in mV~ / A~) | 100 mV/A<br>10 mV/A                                    | 1 m V/A          |         | 10 mV/A<br>1 mV/A |         | 10 mV/A<br>1 mV/A |         |         | 1 mV/A<br>0.1 mV/A |
| Measurement range                  | 0.5 A to 200 A ac                                      | 0.5 A to 2 kA ac |         | 0.5 A to 2 kA ac  |         | 0.5 A to 3 kA ac  |         |         | 0.5 A to 10 kA ac  |
| Typical accuracy                   | 1%   |                  |         |                   |         |                   |         |         |                    |
| Bandwidth                          | 10 Hz to 20 kHz  |                  |         |                   |         |                   |         |         |                    |
| Typical phase Shift at 50Hz        | ≤ 1.3°   |                  | ≤ 0.7°  |                   |         |                   |         | ≤ 0.5°  |                    |
| Dimensions / weight                | Housing: 140 x 64 x 28 mm - 200 g - Built-in lead: 2 m |                  |         |                   |         |                   |         |         |                    |
| Weight of flexible sensor          | < 120 g  | < 240 g          | < 120 g | < 240 g           | < 120 g | < 240 g           | < 240 g | < 360 g |                    |
| Electrical safety                  | IEC 61010-2-032 1000 V Cat III                         |                  |         |                   |         |                   |         |         |                    |

1 kA / 10 kA

AmpFLEX™



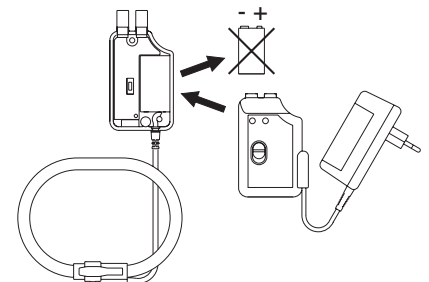
20 A / 200 A



Standard AmpFLEX™ model\*:

|                      |               |                                       |               |
|----------------------|---------------|---------------------------------------|---------------|
| 2 kA (45 cm)         | > P01.1205.01 | 300 A / 3 kA (45 cm)                  | > P01.1205.06 |
| 2 kA (80 cm)         | > P01.1205.02 | 300 A / 3 kA (80 cm)                  | > P01.1205.07 |
| 20 A / 200 A (45 cm) | > P01.1205.03 | 300 A / 3 kA (1.2 m)                  | > P01.1205.08 |
| 200 A / 2 kA (45 cm) | > P01.1205.04 | 1 kA / 10 kA (1.2 m)                  | > P01.1205.09 |
| 200 A / 2 kA (80 cm) | > P01.1205.05 | Adapter socket $\varnothing$ 4 mm/BNC | > P01.1018.46 |

Also see AmpFLEX™ Logger C.A 605 and C.A 607 page 49



\* Specific models on request: consult us concerning the possible sensitivities (mV/A) and lengths. We can also supply bare sensors for incorporation in assemblies including the signal processing electronics.

Bring unlimited autonomy to your AmpFLEX™: replace the battery with the mains adapted plug

■ Adapter for AmpFLEX™ > P01.1019.68

## Digital current clamps



> TRMS measurement for all sinusoidal or distorted AC currents

### FiN

- Intensity and frequency
- HOLD function

### F2N

- PEAK / SMOOTH / HOLD functions

### F3N

- Min/max/avg storage



### Pince FiN

> P01.1207.01A

### Pince F2N

> P01.1207.02A

### Pince F3N

> P01.1207.03A

|                       |   |                                 |                         |
|-----------------------|---|---------------------------------|-------------------------|
| Reference             | > P01.1207.01A                                | > P01.1207.02A                  | > P01.1207.03A          |
| Max clamping capacity |   | Ø 42 mm                         |                         |
| Display               | 10,000 counts and 40-segment bargraph         |                                 |                         |
| Intensity             | 2 cal.: 0.3 to 400 A - 700 A TRMS 1000 A peak |                                 |                         |
| Frequency             | stable  | 2 cal.: 0.5 Hz to 1kHz - 10 kHz |                         |
|                       | variable                                      | 2 cal.: 5 Hz to 1kHz - 2 kHz    |                         |
| Storage               |   |                                 | min, max and avg values |
| Peak                  |   | 1 ms in intensity               |                         |
| Smooth (3 s)          |   | 3 s in intensity and frequency  |                         |
| Hold                  |   | yes                             |                         |
| Electrical safety     |   | IEC 61010 600 V cat.III-2       |                         |
| Dimensions            |   | 232 x 98 x 44 mm                |                         |
| Weight                |   | 500 g                           |                         |
| State of delivery     |   | with carrying case              |                         |

Accessories



Carrying case

> P01.2980.43

## Digital RMS current recorders

### C.A 60i

- > Quick and easy load curve acquisition
- A single control button
- Instrument status signaling with LED
- Acquisition frequency automatically adjusted according to real acquisition time, without prior configuration (data automatic compression algorithm)



### C.A 60i

|                       |  |
|-----------------------|--|
| Reference             | > P01.1568.01  |
| Digital recording     | 0.5 to 600 A RMS                                     |
| Accuracy              | 2% R   |
| Resolution            | Automatic selection                                  |
| Acquisition frequency | 4096 sam/hour max                                    |
| Recording capacity    | 8192 values  |
| Instrument status     | signaling with LED                                   |
| Data transfer         | RS 232 output  |
| Clamping capacity     | Ø 42 mm cable max                                    |
| Electrical safety     | IEC 61010 600 V cat.III-2                            |
| Dimensions            | 235 x 76 x 38 mm                                     |
| Weight                | 600 g  |
| State of delivery     | with PC lead, battery and Windows™ analysis software |

Accessories



Shoulder bag  
> P01.2980.33