

# Wattmeters

Analogue indicator to measure active power



## Description

- Does not need an auxiliary power supply
- DIN box with dimensions 96 and 144. Class 1.5
- Built-in electronic converter
- Balanced and unbalanced single and three-phase circuits.

## Application

Measurement of active power in balanced or unbalanced single and three-phase circuits.

## Features

|                              | WMC  | WTC |
|------------------------------|--|-----|
| <b>Voltage circuit</b>       |  |     |
| Voltage                      | 400 V  |     |
| Consumption                  | 1 ... 4 V·A  |     |
| Frequency                    | 45 ... 65 Hz   |     |
| Overloads                    | 1.25 $U_n$ permanent<br>2 $U_n$ during 5 s   |     |
| <b>Current circuit</b>       |  |     |
| Nominal current              | ... 5 A  |     |
| Consumption                  | 0.3 ... 1.5 V·A  |     |
| Frequency                    | 45 ... 65 Hz   |     |
| Overloads                    | 1.2 $I_n$ permanent<br>5 $I_n$ during 30 s<br>10 $I_n$ during 5 s<br>40 $I_n$ during 1 s |     |
| Accuracy                     | ± 1.5 % FS   |     |
| <b>Ambient conditions</b>    |  |     |
| Operating temperature        | +10 ... +30 °C   |     |
| Limit temperature            | - 25 ... +40 °C  |     |
| Altitude                     | 2000 m   |     |
| <b>Build features</b>        |  |     |
| Dimensions                   | See the following table  |     |
| Weight                       | See the following table  |     |
| Type of box                  | panel  |     |
| <b>Degree of protection:</b> |  |     |
| Front panel                  | IP 52  |     |
| Terminals                    | IP 00  |     |
| Insulation voltage           | 2 kV, during 1 min, between the mechanism and the box                                    |     |
| Standards                    | BS 89, EN 60051, IEC 144, UL 94, DIN 43780, IEC 51, UNE 21318                            |     |

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## References

### WMC: Single-phase wattmeters



| Single-phase  |                         |         |
|---|-------------------------|---------|
| Type  | WMC 96                  | WMC 144 |
| Class   | 1,5                     |         |
| Scale   | 90° P1 (Simple profile) |         |
| Dimensions (mm)   |                         |         |
|  | a<br>96                 | 144     |
|   | b<br>96                 | 144     |
|   | c<br>49,2               | 71,8    |
| Weight (g)  | 290                     | 490     |
| $U_{\text{phase-phase}}$  | 400 V                   |         |
|   | (*) M13031              | M13041  |


\*Scale is NOT included for **WMC 96**. For exchangeable scales, see Tables.

\*Scale included for **WMC 144**. Indicate the transformer ratio, power and voltage scale base.

\*Other voltage values, on demand.

### WTC: Three-phase wattmeters



| Type  | Balanced three-phase    |          | Three-phase 3 wires (ARON) |          | Three-phase (4 wires) |           |
|---|-------------------------|----------|----------------------------|----------|-----------------------|-----------|
|   | WTC 96E                 | WTC 144E | WTC 96A                    | WTC 144A | WTC 96AN              | WTC 144AN |
| Class   | 1,5                     |          |                            |          |                       |           |
| Scale   | 90° P1 (Simple profile) |          |                            |          |                       |           |
| Dimensions (mm)   |                         |          |                            |          |                       |           |
|  | a<br>96                 | 144      | 96                         | 144      | 96                    | 144       |
|   | b<br>96                 | 144      | 96                         | 144      | 96                    | 144       |
|   | c<br>49,2               | 71,8     | 62,9                       | 71,8     | 62,9                  | 71,8      |
| Weight (g)  | 290                     | 490      | 430                        | 640      | 430                   | 640       |
| $U_{\text{phase-phase}}$  | 400 V                   |          | 110 V                      |          | 400 V                 |           |
|   | (*)M13032               | M13032   | M13034                     | M13044   | (*)M13033             | M13043    |

\*Scale is NOT included for **WTC 96E** and **WTC 96AN**.

For exchangeable scales, see Tables.

\*Scale included for **WTC 144E**, **WTC 96A**, **WTC144A** and **WTC 144AN**.

Indicate the transformer ratio, power and voltage scale base.

\*Other voltage values, on demand.

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## References

Exchangeable scales

### Single-phase wattmeters

| Exchangeable scales |            |        |
|---------------------|------------|--------|
| Single-phase        |            |        |
| Type                | SWM 96     |        |
| Equipment           | WMC 96     |        |
| A                   | Scale Base | Code   |
| 50/5                | 20 kW      | M130J9 |
| 75/5                | -          | -      |
| 100/5               | 40 kW      | M130JC |
| 150/5               | 60 kW      | M130JE |
| 200/5               | 80 kW      | M130JF |
| 300/5               | 120 kW     | M130JH |
| 400/5               | 160 kW     | M130JJ |
| 500/5               | 200 kW     | M130JK |
| 600/5               | 240 kW     | M130JL |
| 1 000/5             | 400 kW     | M130JP |
| 1 500/5             | 600 kW     | M130JR |
| 2 000/5             | 800 kW     | M130JS |
| 3 000/5             | 1.2 MW     | M130JU |
| 4 000/5             | 1.6 MW     | M130JV |
| 5 000/5             | 2.0 MW     | M130JW |

### Three-phase wattmeters

| Exchangeable scales |            |         |          |
|---------------------|------------|---------|----------|
| Three-phase         |            |         |          |
| Type                | SWT 96E    |         | SWT 96AN |
| Equipment           |            | WTC 96E | WTC 96AN |
| A                   | Scale Base | Code    | Code     |
| 50/5                | 30 kW      | M130K9  | M130L9   |
| 75/5                | 50 kW      | M130KB  | M130LB   |
| 100/5               | 60 kW      | M130KC  | M130LC   |
| 150/5               | 90 kW      | M130KE  | M130LE   |
| 200/5               | 120 kW     | M130KF  | M130LF   |
| 300/5               | 180 kW     | M130KH  | M130LH   |
| 400/5               | 240 kW     | M130KJ  | M130LJ   |
| 500/5               | 300 kW     | M130KK  | M130LK   |
| 600/5               | 360 kW     | M130KL  | M130LL   |
| 1 000/5             | 600 kW     | M130KP  | M130LP   |
| 1 500/5             | 900 kW     | M130KR  | M130LR   |
| 2 000/5             | 1.2 MW     | M130KS  | M130LS   |
| 3 000/5             | 1.8 MW     | M130KU  | M130LU   |
| 4 000/5             | 2.4 MW     | M130KV  | M130LV   |
| 5 000/5             | 3 MW       | M130KW  | M130LW   |

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## Coding table

|                             |               |                                  |   |   |   |   |   |               |   |   |   |   |
|-----------------------------|---------------|----------------------------------|---|---|---|---|---|---------------|---|---|---|---|
| Wattmeters                  | M             | 1                                | X | X | X | X | 0 | 0             | X | X | X |   |
|                             | Code          |                                  |   |   |   |   |   | Internal Code |   | ↑ | ↑ | ↑ |
|                             | Current input | Standard ... / 5 A               |   |   |   |   |   | 0             |   | ↑ | ↑ | ↑ |
|                             |               | ... / 1 A                        |   |   |   |   |   | 1             |   |   |   |   |
|                             | Voltage       | Standard (400 V <sub>p-p</sub> ) |   |   |   |   |   | 0             |   | ↑ | ↑ | ↑ |
|                             |               | 110 V <sub>p-p</sub> (a)         |   |   |   |   |   | 1             |   |   |   |   |
|                             |               | 230 V <sub>p-p</sub>             |   |   |   |   |   | 2             |   |   |   |   |
|                             |               | 440 V <sub>p-p</sub>             |   |   |   |   |   | 5             |   |   |   |   |
|                             |               | 460 V <sub>p-p</sub>             |   |   |   |   |   | 6             |   |   |   |   |
|                             | Scale range   | 50                               |   |   |   |   |   |               |   | ↑ | ↑ | ↑ |
|                             |               | 75                               |   |   |   |   |   |               |   |   |   |   |
|                             |               | 100                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 150                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 200                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 300                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 400                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 500                              |   |   |   |   |   |               |   |   |   |   |
|                             |               | 600                              |   |   |   |   |   |               |   |   |   |   |
| 1000                        |               |                                  |   |   |   |   |   |               |   |   |   |   |
| Primary current transformer | 1500          |                                  |   |   |   |   |   |               | ↑ | ↑ | ↑ |   |
|                             | 2000          |                                  |   |   |   |   |   |               |   |   |   |   |
|                             | 3000          |                                  |   |   |   |   |   |               |   |   |   |   |
|                             | 4000          |                                  |   |   |   |   |   |               |   |   |   |   |
|                             | 5000          |                                  |   |   |   |   |   |               |   |   |   |   |

(a) For unbalanced ARON (3 wire) three-phase units, 100 V is considered the standard voltage

|                  |               |                    |   |   |   |   |   |               |   |   |   |
|------------------|---------------|--------------------|---|---|---|---|---|---------------|---|---|---|
| Wattmeter scales | M             | 1                  | X | X | X | X | 0 | 0             | X | X |   |
|                  | Code          |                    |   |   |   |   |   | Internal Code |   | ↑ | ↑ |
|                  | Current input | Standard ... / 5 A |   |   |   |   |   | 0             |   | ↑ | ↑ |
|                  |               | ... / 1 A          |   |   |   |   |   | 1             |   |   |   |
|                  | Voltage       | Standard (400 V)   |   |   |   |   |   | 0             |   | ↑ | ↑ |
|                  |               | 110 V (a)          |   |   |   |   |   | 1             |   |   |   |
|                  |               | 230 V              |   |   |   |   |   | 2             |   |   |   |
| 440 V            |               |                    |   |   |   | 5 |   |               |   |   |   |
| 460 V            |               |                    |   |   |   | 6 |   |               |   |   |   |

(a) For unbalanced ARON (3 wire) three-phase units, 100 V is considered the standard voltage

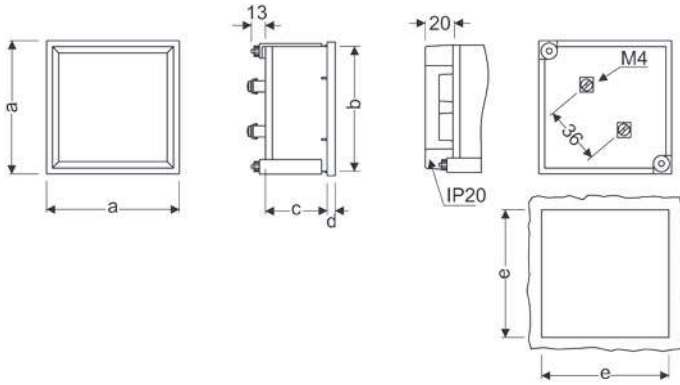
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## Dimensions

WMC / WTC

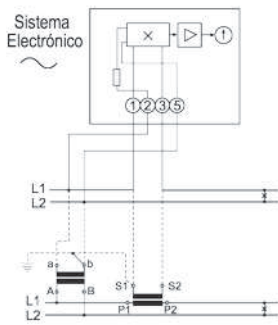


| Type      | a   | b   | c    | d   | e                  |
|-----------|-----|-----|------|-----|--------------------|
| 96 E      | 96  | 91  | 43,5 | 5,7 | 92 <sup>+0,8</sup> |
| 96 A / AN | 96  | 91  | 57,2 | 5,7 | 92 <sup>+0,8</sup> |
| 144       | 144 | 137 | 94,7 | 7,3 | 138 <sup>+1</sup>  |

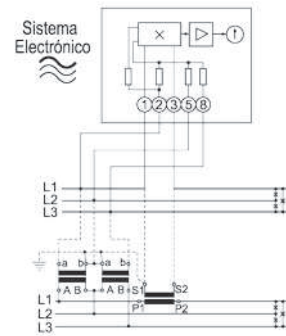
Dimensions (mm)

## Connections

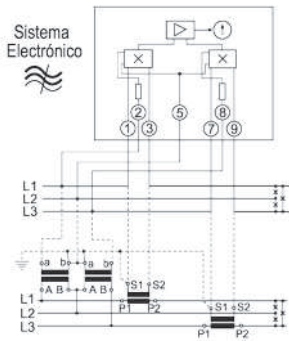
WMC



WTCE



WTCA



WTCAN

