# EMM

## Electrical Multimeters

- ***Measure and display more than 30 parameters of a three phase line with or without neutral. True RMS values.***
- ***All values can be read without making program changes.***
- ***Reduced size 96x96 mm. Flush mounted in panel.***
- ***EMM 5 and EMM 7 with ModBus communication.***
- Displays with red LED's of 3 digits with 7 segments for easy reading.
- Membrane push-buttons.
- Automatic scale of units.
- With active, reactive and apparent energy counter.
- Calculates the current demand and the active, reactive and apparent power demand.
- Models with ModBus communication.
- Suitable for all electrical switchboards used in the industrial field for instruments, motors, generators, etc.
- The multimeter **EMM 3** has the functions of Ampermeter, Voltmeter and Frequencymeter.
- The multimeter **EMM 5** has pulses output and optional communication facility.
- The multimeter **EMM 7** has the following options:
  - X: Power supply of 20~60 Vac/dc.
  - Y: Power supply of 90~250 Vac/dc.
  - A: Analogue output.
  - D: Digital input for doble tariff of energy.
  - F: Profibus protocol.
  - N: Direct neutral measure.
  - T: Galvanic insulation on current inputs.
- **NRG Communication Software.**
  Available for models with communication.

CE

EMM 3


EMM 5


EMM 7



| PARAMETERS | |
|---|---|
| **V** | Voltage |
| **A** | Current |
| **Cos φ** | Power factor (PF) |
| **W** | Active power (P) |
| **VAr** | Reactive power (Q) |
| **VA** | Apparent power (S) |
| **kWh** | Active energy counter |
| **kVArh** | Reactive energy counter |
| **kVAh** | Apparent energy counter |
| **Hz** | Frequency |
| **°C** | Temperature |
| **Max** | Maximum values |
| **Avg** | Average values |
| **MaxD** | Maximum average values |
| **h** | Hour counter |
| | Alarm |

| MODELS | | | | EMM 3 | EMM 5-P / EMM 5-C | EMM 7 |
|---|---|---|---|---|---|---|
| Code | according to the auxiliary supply of the electrical multimeter (±15%) 50/60 Hz | 3-Phase Power Supply L2-L3 | 110 Vac | **41250** | **41265/41280** | **41295** |
| | | | 230 Vac | **41255** | **41270/41285** | |
| | | | 400 Vac | **41260** | **41275/41290** | |

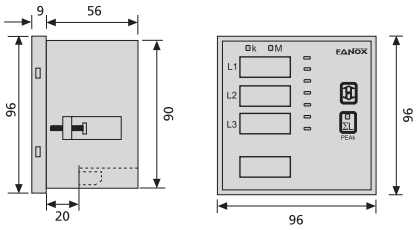
For 1-phase power supply please consult.

| CHARACTERISTICS | | | |
|---|---|---|---|
| Supply | Self-powered | Self-powered | V.Aux. |
| Voltage input | 4 wire input for 3 phase with or without neutral (in this case don't connect N) | | |
| • Input impedance | 1 MΩ | 1 MΩ | 1 MΩ |
| • Continuous overload | + 20 % | + 20 % | + 20 % |
| Current input | From 0,02 to 5 A. Use always 3 CT.../5. Multimeters self-consumption < 0,5 VA | | |
| • CT primary $I_N$ current | Range between 5 and 10.000 A. This value has to be programmed by the user in the multimeter | | |
| • Continuous overload | + 30 % | + 30 % | + 30 % |
| Communication RS485 ModBus | No | **EMM 5-P**: No / **EMM 5-C**: Yes | Yes |
| Digital output | No | **EMM 5-P**: Yes / **EMM 5-C**: No | Yes |
| Analogue output | No | No | Optional |
| Maximum terminal section | 2,5 mm² | | |
| Front protection degree / weight | IP52 / 0,5 kg | | |
| Storage / operation temperature; humidity | -25 ºC to 70 ºC / -10 ºC to 60 ºC ; < 90 % | | |
| Standards | IEC EN 50081-2, IEC EN 50082-1, IEC EN 61010-1 | | |

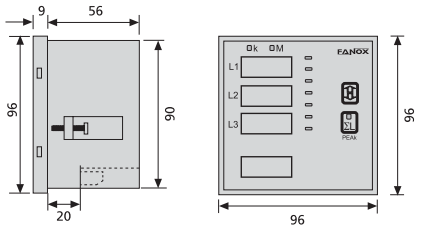
## MEASURED PARAMETERS

| EMM 3 | EMM 5 | EMM 7 | Parameters | Measured parameters | | | | Range | Accuracy % ± digits |
|---|---|---|---|---|---|---|---|---|---|
| • | • | • | **$V_{L-N}$** Voltage | $V_{L1-N}$ | $V_{L2-N}$ | $V_{L3-N}$ | $\sum V_{L-N}$ | 20~290 $V_{rms}$ | ±0,5 ± 1 |
| • | • | • | **$V_{L-L}$** Voltage | $V_{L1-2}$ | $V_{L2-3}$ | $V_{L3-1}$ | $\sum V_{L-L}$ | 20~500 $V_{rms}$ | ±0,5 ± 1 |
| • | • | • | **A** Current | $I_{L1}$ | $I_{L2}$ | $I_{L3}$ | $\sum I_L$ | 0,02~5 $A_{rms}$ | ±0,5 ± 1 |
| | | • | **N** Neutral Current | $I_n$ | | | | 0,02~5 $A_{rms}$ | ±0,5 ± 1 |
| | • | • | **PF** Power factor cos φ | $PF_{L1}$ | $PF_{L2}$ | $PF_{L3}$ | $\sum PF_L$ | 0,1~1 (+ind ; -cap) | ±1 ± 1 |
| | • | • | **W** Active power | $P_{L1}$ | $P_{L2}$ | $P_{L3}$ | $\sum P_L$ | 0,01~9990 kW | ±1 ± 1 |
| | • | • | **VAr** Reactive power | $Q_{L1}$ | $Q_{L2}$ | $Q_{L3}$ | $\sum Q_L$ | 0,01~9990 kVAr | ±1 ± 1 |
| | • | • | **VA** Apparent power | $S_{L1}$ | $S_{L2}$ | $S_{L3}$ | $\sum S_L$ | 0,01~9990 kVA | ±1 ± 1 |
| | • | • | **kWh** Active energy counter | ∑kWh | | | | 0~$10^8$ kWh | Class 2 |
| | • | • | **kVArh** Reactive energy count. | ∑kVArh | | | | 0~$10^8$ kVArh | Class 2 |
| | • | • | **kVAh** Apparent energy count. | ∑kVAh | | | | 0~$10^8$ kVAh | Class 2 |
| • | • | • | **Hz** Frequency | $F_{L1}$ | | | | 40~500 Hz | ±0,5 ± 1 |
| | • | • | **ºC** Temperature | T | Measured with internal sensor | | | 0~70 ºC | ±2 ºC |
| | • | • | ◴ Hour counter | H | Resolution in 1/10 of hour | | | | ±1 % |
| • | • | • | **Max** Maximum values | $V_{L1-N\ max}$ | $V_{L2-N\ max}$ | $V_{L3-N\ max}$ | | Values every second | |
| • | | | | $V_{L1-L2\ max}$ | $V_{L2-L3\ max}$ | $V_{L3-L1\ max}$ | | | |
| • | • | • | | $I_{L1\ max}$ | $I_{L2\ max}$ | $I_{L3\ max}$ | | | |
| | | • | | $I_{N\ max}$ | | | | | |
| | • | • | | $\sum W_{\ max}$ | $\sum VAr_{\ max}$ | $\sum VA_{\ max}$ | | | |
| • | | | **Min** Minimum values | $V_{L1-N\ min}$ | $V_{L2-N\ min}$ | $V_{L3-N\ min}$ | | | |
| | • | • | **Avg** Average values | $I_{L1\ avg}$ | $I_{L2\ avg}$ | $I_{L3\ avg}$ | | Values over last 15 minutes | |
| | | • | | $I_{N\ avg}$ | | | | | |
| | • | • | | $\sum W_{\ avg}$ | $\sum VAr_{\ avg}$ | $\sum VA_{\ avg}$ | | | |
| • | • | • | **MaxD** Maximun average val. | $I_{L1\ max\ (avg)}$ | $I_{L2\ max\ (avg)}$ | $I_{L3\ max\ (avg)}$ | | Values over last 15 minutes | |
| | | • | $I_{N\ max\ (avg)}$ | | | | | | |
| | • | • | | $\sum W_{max\ (avg)}$ | $\sum VAr_{max\ (avg)}$ | $\sum VA_{max\ (avg)}$ | | | |

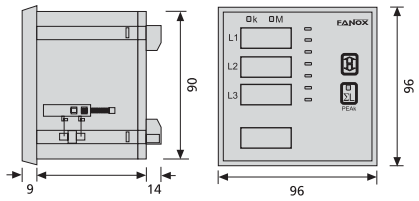
### DIMENSIONS EMM 3 RELAY (mm)



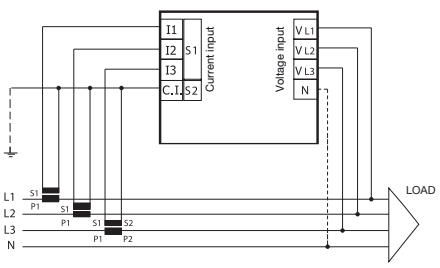

### DIMENSIONS EMM 5 RELAY (mm)



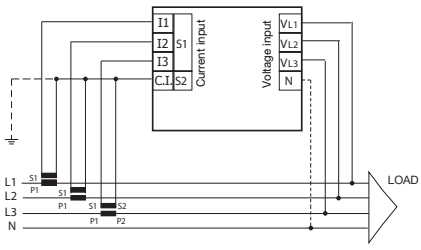

### DIMENSIONS EMM 7 RELAY (mm)




### WIRING DIAGRAM EMM 3




### WIRING DIAGRAM EMM 5




### WIRING DIAGRAM EMM 7