

Multifunction instrument without communication gates and with inputs via CT

Codes: **MFD45A00**
 Model: **NEMO D4-e**



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1. USE

Multifunction instrument 4 DIN modules, without communication gate and pulse output with 3 CT inputs and programmable ratio, with diagnostics and phase sequence correction for low voltage networks.

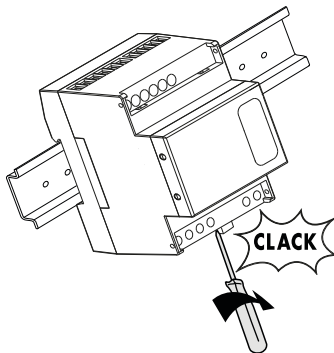
2. GAMMA

Code Art.	Model	Type connection	Weight
MFD45A00	No COM	SCREW	0,250Kg

3. INSTALLATION

Fixing:

On EN/IEC 60715 symmetrical rail or DIN 35 rail.



Tools required:

For fastening the device on the DIN rail: 5,5 mm flat screwdriver (from 4 to 6 mm).

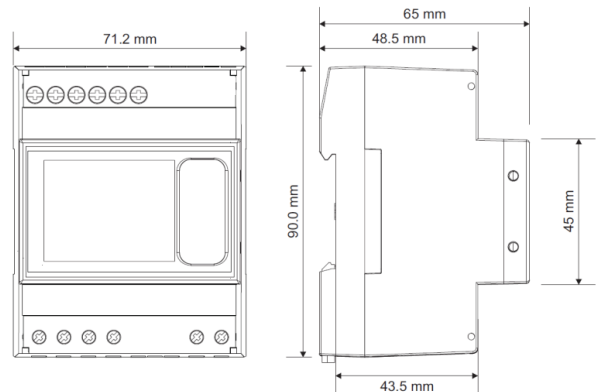
Operating position:

Vertical, Horizontal, Upside down, On the side



4. DIMENSIONS

Housing: 4 module DIN43880



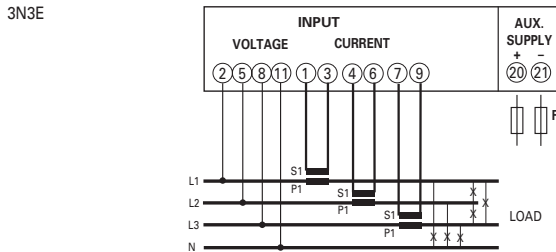
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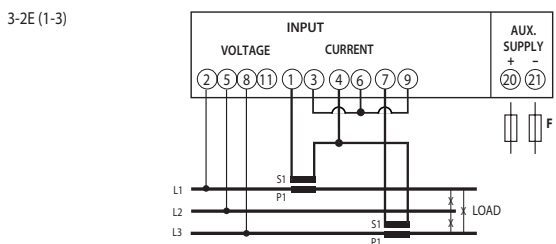
5. COMMISSIONING - CONNECTION

Wiring diagrams:

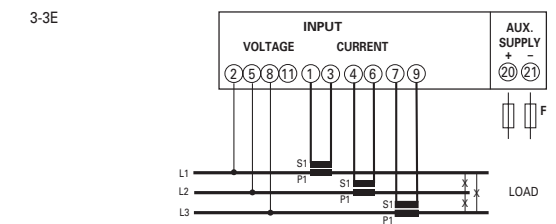
- 4 wires three-phase network, 3 CT (3N-3E):



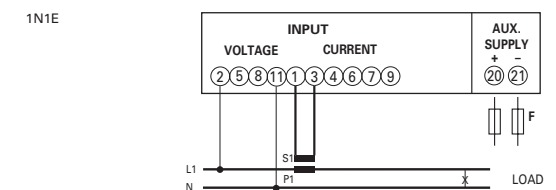
- 3 wires three-phase network, 2 CT (3-2E):



- 3 wires three-phase network, 3 CT (3-3E):



- Single-phase network (1N-1E):



Protection of the device:

- Recommended fuse 0,5 A type gG

6. OPERATING DATA

6.1 ELECTRIC

Rated currents:

- Rated currents, I_n : 5A
- Maximum current, I_{max} : 1,2 I_n
- Instantaneous overload: 20 I_n / 0,5s
- Current self consumption: $\leq 1VA$ (per phase at the maximum current 6A)

Rated voltages:

- Three-phase rated voltage U_n : 400V (phase-phase)
- Three-phase voltage: 50...500V
- Single phase voltage: 50 - 290V
- Voltage self consumption: $\leq 0,2VA$ (phase-neutral at the rated voltage)

External CT ratio: 1...9999 (max. primary current 50kA/5A)

Note: on modifying the kCT parameter in the device configuration menu, all the energy meters are reset.

THD: The THD is calculated taking account of a harmonic content up to and above the 25th harmonic.

Peak factor:

- Current 2
- Voltage 1,5

Rated frequency:

- F_n : 50...60Hz (automatic selection)
- Permitted variation: 45...65Hz

Starting time (energy counting): < 5s

Connectable section:

Amperometric inputs	Without bush	With bush
	Rigid wire	0,05 + 6 mm ²
Flexible wire	0,05 + 4mm ²	0,05 + 4mm ²
Other terminals		
	Without bush	With bush
Rigid wire	0,05 + 4 mm ²	-
Flexible wire	0,05 + 2,5 mm ²	0,05 + 2,5 mm ²

Necessary tools:

- CT terminals: 4 mm flat or Phillips PH1 screwdriver
- Other terminals: 2,5 mm flat or Phillips PH0 screwdriver

6.2 MECHANICAL

Depth of the terminals:

- Profondità dei morsetti: 8mm
- Lengths of the wire stripping: 8mm

Screw head:

- Phillips and countersunk screw

Recommended torque:

- CT terminals (I1, I2, I3): 1 Nm
- Voltage connection terminals (L1, L2, L3, N), auxiliary supply: 0,6 Nm

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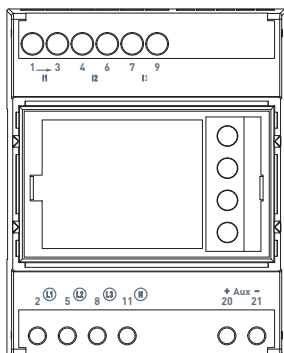
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7. GENERAL FEATURES (continued)

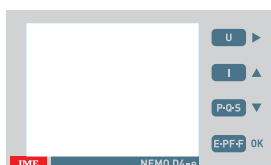
Cover marking:

Marking by indelible tampography



Front marking:

Adhesive film



Display:

- Type: backlit LCD
- Resolution: automatic adjustment of the display resolution for the decimal figures and the engineering units as a function of the transformation ratio of the external CT (kCT¹).
- kCT= external CTs ratio (e.g. 800A / 5A, kCT = 160).
- Update time: 1 sec.

Display of the value and programming:

- By means of the front keypad, 4 pushbuttons (please refer to the user manual).
- Access protected by identification code (**predefined code 1000**)

Auxiliary supply (terminals 20 and 21):

- Rated value U_{aux} ac: 230Vac +/-15%
- Frequency: 50...60Hz +/-10%
- Self consumption: ≤ 2,5VA @230 Vac

Operating room temperatures:

- Min. = - 5 °C Max. = + 55 °C.

Room storage temperatures:

- Min. = - 25 °C Max. = + 70 °C.

Maximum dissipated thermal power for the thermal dimensioning of the panels: ≤ 5W

7. GENERAL FEATURES

Measurements and precision in conformity with EN/IEC 61557-12

- Current: cl.0,5
- Voltage: cl.0,5
- Frequency: ± 0,1 Hz
- Instantaneous total active power, phase, average value and max. average value: cl.1
- Instantaneous total reactive power, phase, average value and max. average value: cl.2
- Instantaneous total apparent power, phase, average value and max. average value: cl.1
- Power Factor: cl.1
- Total active energy, positive and negative: cl.1
- Total reactive energy, positive and negative: cl.2
- THD cl.2

Average current - Average power:

- Measurement: current-apparent, reactive, active power
- Calculation: moving average, on the selected period
- Average time: 5/8/10/15/20/30/60min.
- Average time: same for all the magnitudes

Hour meter:

- Counting of operating hours and minutes (**resettable meter**)
- Start count: can be selected, presence of voltage or power

- Voltage: Phase voltage > 20V

- Three phase rated active power

- Programmable value: 0...50% P_n

P_n = three phase rated active power = Three-phase rated voltage

Unx Current In x √3

Un 400V

In 5A

P_n = 400V x 5A x √3 = 3464W

Diagnostic, Phase sequence correction:

In the software there is a diagnostic and correction algorithm of the voltmetric and amperometric connection sequence.

The function can be activated on request and password protected: it can display and modify the wiring sequence with the following limitations:

- 1) The neutral conductor (in the 4-wire connections) must be correctly positioned (terminal 11)
- 2) There are no conductor crossings between different CT (e.g. on phase 1 of the device there is a cable from CT 1 and on the other a cable from CT 2)
- 3) The power factor must be between 0.9cap and 0.7ind for each phase. See www.imeitaly.com "TECHNICAL SUPPORT".

Protection class:

- Terminal protection index against solid bodies and liquids: IP 20 (IEC/EN 60529).

- Housing protection index against solid bodies and liquids: IP 54 (IEC/EN 60529).

Room: Mechanical M1 – Electric E2

Housing material: Self-extinguishing polycarbonate

Packaged volume: 0,70 dm³.

8. CONFORMITY AND CERTIFICATIONS

Insulation:

- Measurement categories: III
- Level of pollution: 2
- Insulation voltage, U_i : 300V, Phase-Neutral

Dielectric rigidity:

- Power supplies / Outputs: 3kV / 50Hz / 1min
- Housing / Terminals: 4kV / 50Hz / 1min

Impulse:

- Power supplies: 6kV / 12 – 50 μ sec / 0,5J
- Power supplies / Outputs: 6kV / 12- 50 μ s / 0,5J

In compliance with the standards:

- Conformity with the Directive on electromagnetic compatibility (EMC) No. 2014/30/EU
- Conformity with the low-voltage Directive No. 2014/35/EU
- Electromagnetic compatibility: emission according to IEC / EN 61326-1, class B immunity according to IEC / EN 61326-1
- Active energy precision class: 1 (Ea, IEC / EN 61557-12)
- Reactive energy precision class: 2 (Erv, IEC / EN 61557-12)

Respecting the environment – Conformity with the CEE directives:

- Conformity with directive 2011/65/CE known as “RoHS 2” on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
- Conformity with the REACH regulation: at the date of publication of this document no substance in the list of candidates is found in these products.

Plastic materials:

- Plastic materials without Halogens.
- Part marking according to standards ISO 11469 and ISO 1043

Packagings:

- Packaging designed and produced in accordance with Decree 98-638 of 07.20.98 and directive 94/62/CE