AUTOMETERS SYSTEMS

Three-phase Digital Energy meters

IIST049-01 Stand 31-08-2011

Direct connection 125 A

Operating instructions

three-phase digital active and reactive energy-meter with measurement of active and reactive instantaneous power, set up for communication

Code	Description
AD3-125C	three-phase digital with direct connection 0.25-5 (125) A **2 tariff** - 2 S0
AD3-125MC	three-phase digital with direct connection 0.25-5 (125) A **2 tariff** - 2 S0 **(MID calibrated)**

⚠ WARNING

Installation must be carried out and inspected by a specialist or under his supervision. When workingon the instrument, switch off the mains voltage!

1) Quantities displayed

1a) Energy

- They are displayed on the main 8 digits counter:

Ref.	Energy	Unit	Symbol	ΣL	L1	L2	L3	Tariff
E1	Active Absorbed	MWh/kWh	→	•	•	•	•	T1
E2	Active Supplied	MWh/kWh	←	•	•	•	•	T1
E3	Reactive Absorbed	Mvarh/kvarh	→	•	•	•	•	T1
E4	Reactive Supplied	Mvarh/kvarh	←	•	•	•	•	T1
E5	Active Absorbed	MWh/kWh	→	•	•	•	•	T2
E6	Active Supplied	MWh/kWh	←	•	•	•	•	T2
E7	Reactive Absorbed	Mvarh/kvarh	→	•	•	•	•	T2
E8	Reactive Supplied	Mvarh/kvarh	←	•	•	•	•	T2

1b) Power

- Powers are displayed on the bar indicator and also on the 3 digits secondary counter:

Ref.	Power	Unit	Symbol	ΣL	Tariff
P1	Active Absorbed	MW/kW/W	→	•	T1
P2	Active Supplied	MW/kW/W	←	•	T1
P3	Reactive Inductive	Mvar/kvar/var	ξ	•	T1
P4	Reactive Capacitive	Mvar/kvar/var	⫟	•	T1
P5	Active Absorbed	MW/kW/W	→	•	T2
P6	Active Supplied	MW/kW/W	←	•	T2
P7	Reactive Inductive	Mvar/kvar/Var	ξ	•	T2
P8	Reactive Capacitive	Mvar/kvar/Var	⫟	•	T2

2) Display View (see quantities displayed)

- A green backlighted LCD display.
- With the front push button all register will appear.

3) User informations

- A quantity of informations are available on the display. They are divided into 4 groups:

A	**Default Page (currently growing Active Energy)**
B	**System Energy Registers (ΣL)**
C	**Phases Energy Registers (L1, L2 and L3)**
D	**Diagnostic Page**

A) Default Page (currently growing Active Energy)

- The value of the currently growing Active 3-phase Energy is represented (or the last one that has grown).
  The Energy is always Active, and may be Active Consumed (right arrow), Active Generated (left arrow), with Tariff T1 or T2, depending on the current Energy flowing.
- The value of currently flowing Active Power is visible (3 digits field), together with a dedicated bar-graph representing the percentage of the flowing power (10% division of the bar graph)
- A short keypress of the "command button" switches the backlight ON.
  A further short keypress enable the visualisation of system energy registers.
- If the command button is not pushed for 40 seconds, the backlight is automatically switched off, and the display returns to the default page

B) System Energy Registers (ΣL) E1 to E8 see Table

- This group is dedicated to show the System (ΣL) Energy registers, E1 to E8, as described in the above table.
- A short keypress of the "command button" allows to see all 8 registers, one at a time
- If the current rate corresponds to that of energy represented on the display, also the power and the bar-graph are represented
- By keeping the command button pushed for at least 4 seconds, the L1 Phase Energy registers group representation on display is enabled. If the command button is not pushed for 40 seconds, the backlight is automatically switched off, and the display returns to the default page

C) Phases Energy Registers (L1, L2 and L3) E1 to E8 see Table

- This group is dedicated to show the Phase Registers (with the same criteria of the System Energy registers). Initially, L1 group registers are displayed. A short keypress of the "command button" allows to see all 8 registers, one at a time
- By keeping the command button pushed for at least 4 seconds (less than 10 seconds), the L2 Phase Energy registers group representation on display is enabled. In the same way, once selected L2 registers, one can push the button for 4 seconds and start to see the L3 registers group.
- If the command button is not pushed for 40 seconds, the backlight is automatically switched off, and the display returns to the default page
- By keeping the command button pushed for at least 10 seconds, the diagnostic page is enabled

D) Diagnostic Page

- All display segments are activated, thus allowing the operator to see if the display is correctly working. By keeping the command button furtherly pushed, it is possible to see the value of the Firmware Release and of the Flash Checksum
- If the command button is not pushed for 40 seconds, the backlight is automatically switched off, and the display returns to the default page

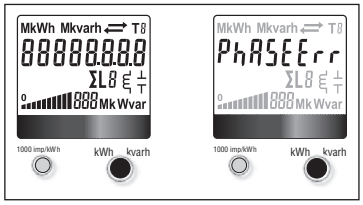
3.1) Zeroing all registers (only AD3-125C model)

- A pressure of 20 sec. of the "command button" allows to enter in the zeroing menu and on the display appears "rESEt".
- The button must be released. To do the reset press it again for 4 sec., afterwards it will go back to the default visualization with all registers reset.
- After 4 sec. from the button release if the "command reset" is not done, it will go back to the default visualization without the reset.
- Zero setting not available into products with MID certification

3.2) Error condition

- When the display shows the message "ErrOr 01" or "ErrOr 02", the meter has got a malfunction and must be replaced.

Display



- Connection errors and phase out
- Energy value
- Energy export (absorbed →)
- Energy import (supplied ←)
- Energy line (L1-2-3)
- Running active power display

kWh kvarh
MWh Mvarh
- MWh/kWh display
- Mvarh/kvarh display

T8 • Tarif Running tarif, called tarif (T1-T2)

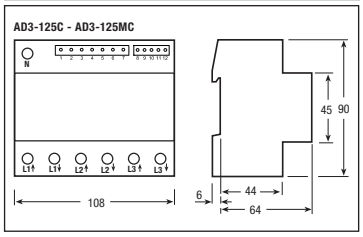
ΣL • Phase summary line energy

⫟ • Displays capacitative, reactive power

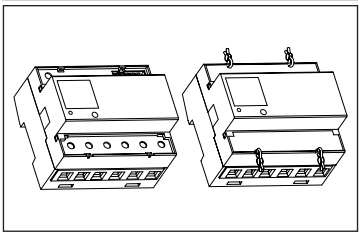
ξ • Displays inductive, reactive power

- Consumption Bar display (percentage of ***Pmax***)
- 1000 imp/kWh • Precision control LED
- kWh kvarh • Readout selection push button

Dimension



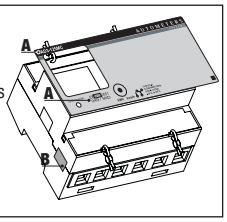
Sealable terminal covers



MID calibrated AD3-125MC

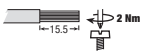
A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part

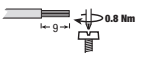


Cable stripping length and max. terminal screw torque

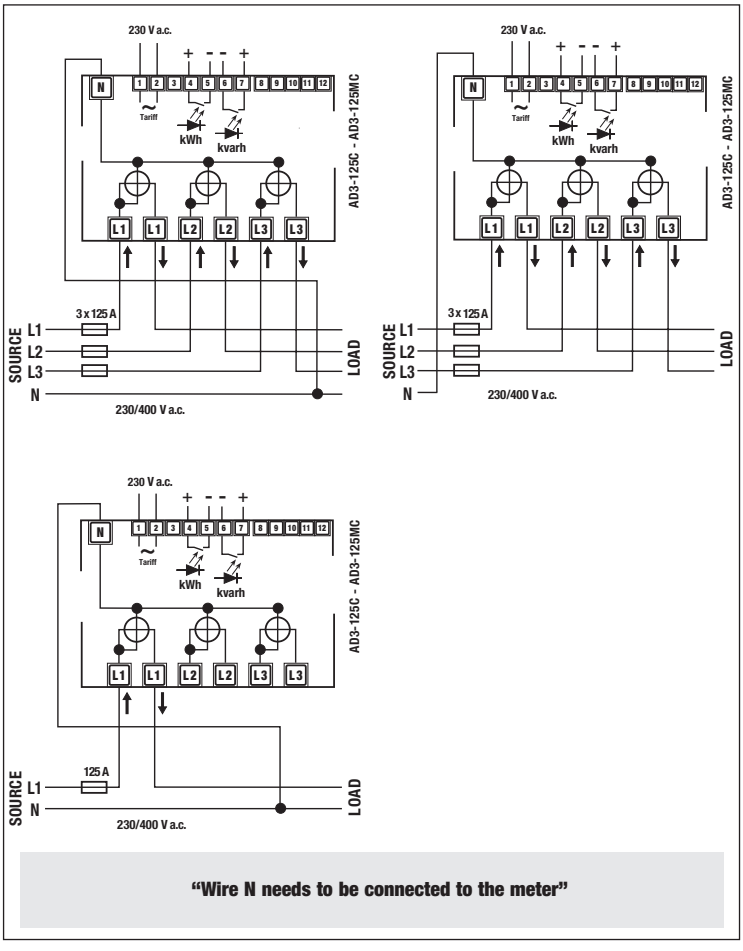
125 A direct connection main terminals Screw driver PZ2



Tariff and communication terminals - Screw driver blade 0.8x3.5 mm



Wiring diagram



"Wire N needs to be connected to the meter"

Technical data

Data in compliance with EN 50470-1, EN 50470-3, EN 62053-23, EN 62053-31			**AD3-125C** **AD3-125MC**
General characteristics			
• Housing	DIN 43880	DIN	6 modules
• Mounting	EN 60715	35 mm	DIN rail
• Depth		mm	70
Operating features			
• Connectivity	to single/three-phase network	n° wires	2-4
• Storage of energy values and configuration	digital display (EEPROM)	-	yes
• Display tariffs identifier	for active and reactive energy	n° 2	T1 and T2
Supply			
• Rated control supply voltage ***Un***		VAC	230
• Operating range voltage		V	184 ... 276
• Rated frequency ***fn***		Hz	50
• Rated power dissipation (max. for phase) ***Pv***		VA (W)	≤8 (0.6)
Overload capability			
• Voltage ***Un***	continuous; phase/phase	V	480
	1 second: phase/phase	V	800
	continuous; phase/N	V	276
	1 second: phase/N		V 300
• Current ***Imax***	continuous	A	125
	momentary (10 ms)	A	3750
Display (readouts)			
• Connection errors and phase out	discernible from phase-sequence indication	-	Phase Err
• Display type	LCD	n° digits	8 (2 decimal)
	digit dimensions	mm x mm	6.00 x 3
• Active energy: 1 display, 8 digit	tariffs 2	Wh	0.01
+ display import or export (arrow)	overflow	MWh	999999.99
• Reactive energy: 1 display, 8 digit	tariffs 2	varh	0.01
+ display import or export (arrow)	overflow	Mvarh	999999.99
• Instantaneous active power: 1 display, 3 digit		W, kW or MW	000 ... 999
• Instantaneous reactive power: 1 display, 3 digit		var, kvar or Mvar	000 ... 999
• Instantaneous tariff measurement		-	1
	1 display, 1-digit	-	T1 or T2
• Display period refresh		s	1
Measuring accuracy			
• Active energy and power	acc.to EN 50470-3	class 1	B
• Reactive energy and power	acc.to EN 62053-23	class 2	2
Measuring input			
• Type of connection		-	direct
• Voltage ***Un***	phase/phase	V	400
	phase/N	V	230
• Operating range voltage	phase/phase	V	319 ... 480
	phase/N	V	184 ... 276
• Current ***Iref***		A	5
• Current ***Imin***		A	0.25
• Operating range current ***(Ist ... Imax)***	direct connection	A	0.020 ... 125
• Frequency		Hz	50 ±2%
• Input waveform		-	sinusoidal
• Starting current for energy measurement ***(Ist)***		mA	20
Pulse output S0	acc.to EN 62053-31		
• Pulse output	for active and reactive energy T1 and T2	-	yes
• Quantity pulse output		Imp/kWh	500
• Pulse duration		ms	30 ±2 ms
• Required voltage	min. (max.)	VAC (DC)	5 ... 230 ±5% (5 ... 300)
• Permissible current	pulse ON (max. 230 V AC/DC)	mA	90
• Permissible current	pulse OFF (leakage cur. max. 230 V AC/DC)	µA	1
Optical interfaces			
• Front side ***(accuracy control)***	LED	imp/kWh	1000
Safety acc. to EN 50470-1			
• Indoor meter		-	yes
• Degree of pollution		-	2
• Operational voltage		V	300
• AC voltage test (EN 50470-3, 7.2)		kV	4
• Impulse voltage test		1.2/50 µs-kV	6
• Protection class (EN 50470)		class	II
• Housing material flame resistance	UL 94	class	V0
• Safety-sealing between upper and lower housing part **(mod. AD3-125MC)**	-	yes	
Lateral IR interfaces			
• For communication moduls connection **(LAN-TCP/IP / M-Bus / Modbus RTU / KNX-EIB / SD-Card Datalogger)**		-	yes
Connection terminals			
• Type cage main current paths	screw head Z +/-	POZIDRIV	PZ2
• Type cage pulse output	blade for slotted screw	mm	0.8 x 3.5
• Terminal capacity main current paths	solid wire min. (max.)	mm^2	1.5 (50)
	stranded wire with sleeve min. (max.)	mm^2	1.5 (50)
• Terminal capacity pulse output	solid wire min. (max.)	mm^2	1 (4)
	stranded wire with sleeve min. (max.)	mm^2	1 (2.5)
Environmental conditions			
• Mechanical environment		-	M1
• Electromagnetic environment		-	E2
• Operating temperature		°C	-10 ... +55
• Limit temperature of transportation and storage		°C	-25 ... +70
• Relative humidity (not condensation)		%	≤80
• Vibrations	50 Hz sinusoidal vibration amplitude	mm	±0.075
• Degree protection	housing when mounted in front (terminal)	-	IP51(*)/IP20

(*) **For the installation in a cabinet at least with IP51 protection.**