

Single-phase Digital Energy meters
Direct connection 80 A

IST050-02 Stand 10-06-2012

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

Code	Description
AD1-80C	single-phase direct connection 0.75-15 (80) A - 2 tariffs - 2 S0
AD1-80MC	single-phase direct connection 0.75-15 (80) A - 2 tariffs - 2 S0 (MID calibrated)



WARNING

The Autometers range of DIN rail mounted meters should only be installed by a competent and qualified electrician who is fully aware of the latest electricity regulations concerning the installation of Electricity meters. The AD1-80 must be installed in a suitable enclosure.

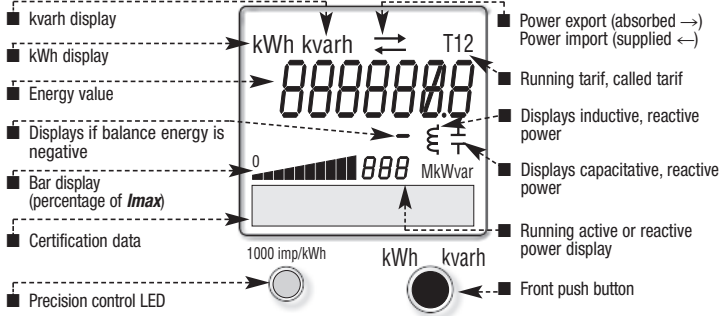
1) Quantities displayed

- They are displayed on the main 7.1 digits counter:
- For energies: AD1-80C - AD1-80MC: E1-E2-E3-E4-E5-E6-E7-E8**
- Power are displayed on the bar indicator and also on the 3 digits:
- For power: AD1-80C - AD1-80MC: P1-P2-P3-P4-P5-P6-P7-P8**

Energy	Power				
Ref.	Unit	Ref.	Unit	Description	Tariff
E1	kWh	P1	MW/kW/W	Active Absorbed	T1
E2	kWh	P2	MW/kW/W	Active Supplied	T1
E3	kvarh	P3	Mvar/kvar/var	Reactive Absorbed (ind.)	T1
E4	kvarh	P4	Mvar/kvar/var	Reactive Supplied (cap.)	T1
E5	kWh	P5	MW/kW/W	Active Absorbed	T2
E6	kWh	P6	MW/kW/W	Active Supplied	T2
E7	kvarh	P7	Mvar/kvar/Var	Reactive Absorbed (ind.)	T2
E8	kvarh	P8	Mvar/kvar/Var	Reactive Supplied (cap.)	T2

2) Display View

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



3) The user information

- The wide range of measurement available needs the adoption of groups. All the data are currently displayed using 2 different groups:

A	default group
B	all energy counters

A) The default group

- The default group lists the balances for active and reactive energy:
 - **Active energy balance** (E1-E2+E5-E6 for code **AD1-80C - AD1-80MC**)
 - **Reactive energy balance** (E3-E4+E7-E8 for code **AD1-80C - AD1-80MC**)
 - **Software version**
 - **Checksum n°**
- A short pressure of the command button allow to go through the measurements (active/reactive).
- One 3 digit counter shows the instant power. Beside this counter, a bar indicator shows the current percentage, in step of 10%, respect to the full scale (*I_{max}*). The bar indicator is updated every 1 sec.
- Note: in this group the symbol indicator refers to the instant power and not to the energy balance**

B) All energy counters

- This group is dedicated to store the energy values E1-E8 as described in the previous table.
- Press the "command button" for 4 seconds. After this time, the red led on the front panel lights on. The power indicators disappear and the display is completely dedicated to show the energy values E1-E8.
- A short pressure of the "command button" allow a loop vision of these values.
- To come back to the default group, press the "command button" for 4 seconds.
- The backlight of the display returns automatically switched off (after 40 sec. of inactivity).**

3.1) Display test

- Pressure of the "command button" for more then 10 sec. causes the test of all the display segments.
- The test will last for a fixed time of 30 sec. then it will go back to the default visualization.

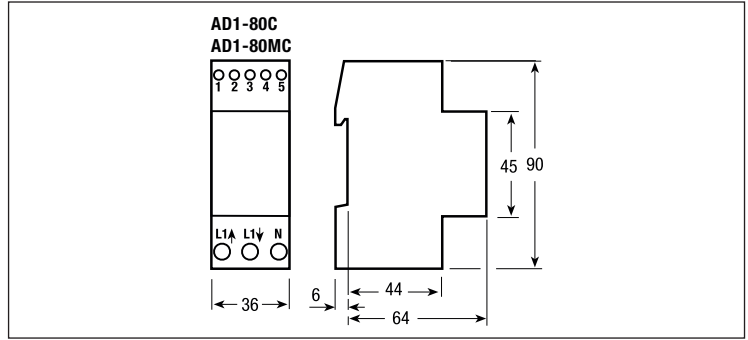
3.2) Zeroing all registers (only AD1-80C model)

- A pressure of 20 sec. of the "command button" allows to enter in the zeroing menu and on the display appears "**-ESEt**".
- 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.

3.3) Error condition

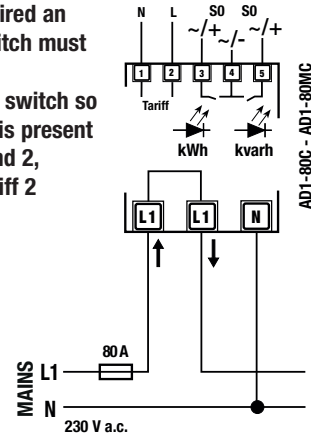
- When the display shows the message "**Err-Or 01**" the meter has got a malfunction and must be replaced.

Dimension



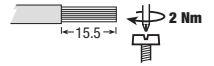
Wiring diagram

If tariffs are required an external time switch must be provided. Connect the time switch so that when 230 V is present on terminals 1 and 2, it switches to tariff 2

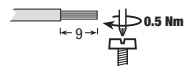


Cable stripping length and max terminal screw torque

80 A direct connection main terminals - Screw driver PZ2



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

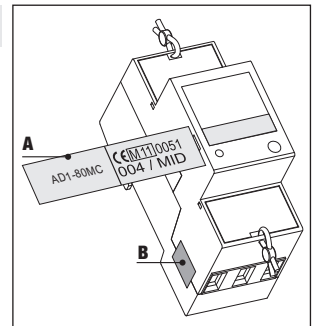


MID calibrated

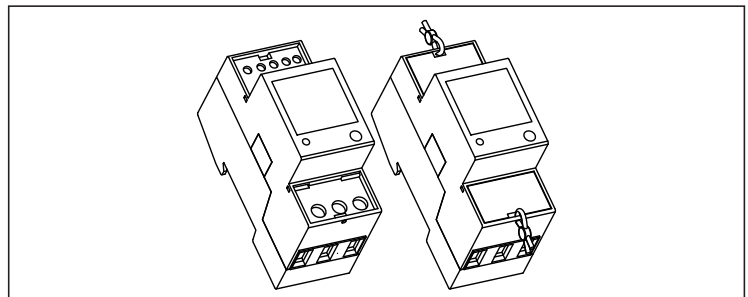
AD1-80MC

A) Device code and certification data indications

B) Safety-sealing between upper and lower housing part



Sealable terminal covers



Technical data

Data in compliance with EN 50470-1, EN 50470-3, EN 62053-23 and EN 62053-31

			AD1-80C AD1-80MC
General characteristics			
• Housing	DIN 43880	DIN	2 modules
• Mounting	EN 60715	35 mm	DIN rail
• Depth		mm	70
Operating features			
• Connectivity	to single-phase network	n° wires	2
• 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 <i>Un</i>		VAC	230
• Operating range voltage		VAC	184 ... 276
• Rated frequency <i>fn</i>		Hz	50
• Rated power dissipation (max.) <i>Pv</i>		VA (W)	≤8 (0.6)
Overload capability			
• Voltage <i>Un</i>	continuous	VAC	276
	momentary (1 s)	VAC	300
• Current <i>I_{max}</i>	continuous	A	80
	momentary (10 ms)	A	2400
Display (readouts)			
• Display type	LCD	n° digits	7 (1 decimal)
	digit dimensions	mm x mm	6.00 x 3
• Active energy: 1 display, 7-digit + display import or export (arrow)	tariffs 1-2	kWh	000000.0 ... 999999.9
	overflow	kWh	999999.9 ... 000000.0
• Reactive energy: 1 display, 7-digit + display import or export (arrow)	tariffs 1-2	kvarh	000000.0 ... 999999.9
	overflow	kvarh	999999.9 ... 000000.0
• 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			
	at 23 ±1 °C, referred to nominal values		
• Active energy and power	acc.to EN 50470-3	class	B
• Reactive energy and power	acc.to EN 62053-23	class	2
Measuring input			
• Type of connection	phase/N	-	direct
• Operating range voltage	phase/N	Vac	184 ... 276
• Current <i>I_{ref}</i>		A	15
• Current <i>I_{min}</i>		A	0.75
• Operating range current (<i>I_{st} ... I_{max}</i>)	direct connection	A	0.025 ... 80
• Frequency		Hz	50
• Input waveform		-	sinusoidal
• Starting current for energy measurement (<i>I_{st}</i>)		mA	25
Pulse output S0			
	acc.to EN 62053-31		
• Pulse output	for active and reactive energy T1 and T2		-
• Pulse quantity		imp/kWh	1000
• 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	Impuls OFF (leakage cur. max. 230 V AC/DC)	µA	1
Optical interfaces			
• Front side (<i>accuracy control</i>)	LED	imp/kWh	1000
Lateral IR interfaces			
• For communication moduls connection (LAN-TCP/IP / M-Bus / Modbus RTU / KNX / SD-Card Datalogger)		-	yes
Safety acc. to EN 50470-1			
• Indoor meter		-	yes
• Degree of pollution		-	2
• Operational voltage		VAC	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. AD1-80MC)		-	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 (35)
	stranded wire with sleeve min. (max.)	mm ²	1.5 (35)
	solid wire min. (max.)	mm ²	0.14 (2.5)
	stranded wire with sleeve min. (max.)	mm ²	0.14 (1.5)
• Terminal capacity pulse output			
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.