

# AM-6

AM-6-4D R, AM-6-4D E

## 6A three-phase energy meter with built-in communication

- AM-6-4D R for RS485 Modbus RTU/ASCII communication
- AM-6-4D E for Ethernet (Modbus TCP) communication
- For 1 or 5A CT
- Programmable CT ratio
- Fully bi-directional 4-quadrant measurements for all energies and powers
- For 4 wire networks with balanced or unbalanced load
- Class B according to EN 50470-3 (MID)
- 8 MB for data recording and automatic/manual data transferring (only ETHERNET model)
- S0 output for energy pulse emission
- Available with MID certification



### General features

4 DIN modules energy meter for the energy measurement in industrial and civilian application, with the following built-in communication, according to the model: RS485 Modbus RTU/ASCII or Ethernet Modbus TCP. Available with MID certification suitable for billing.

Besides the energy, the meter can measure the main electrical parameters and makes them available on the built-in COM port. The LCD display shows the energies and the instantaneous powers. The COM port allows to manage the connected meter by a remote station. Data is transmitted on a RS485 or Ethernet line according to the device model. Moreover, a dedicated application for remote management is provided:

- *Modbus Master software* > for energy meter management by PC in RS485 Modbus or Ethernet network.
- *Web server* > built-in interface for energy meter management by PC in Ethernet network. Moreover, it allows to enable a data recording and a manual or automatic data transferring. In case of automatic transferring, data is sent to a remote server at the set time schedule.

The meter is built according to EN 50470-1 standard. The active energy is compliant to IEC/EN 62053-21 class 1, but for MID certified device it moreover fulfills class B requirements according to EN 50470-3. The accuracy of reactive energy is compliant to IEC/EN 62053-23 class 2.

Wide backlit LCD display with clear graphic symbols comprehensible at a glance. Metrological LED on front panel and sealable terminal covers. The analysis of the MTBF values, the accurate selection of components and the reduction of the internal working temperatures together with strict production and control standards guarantee a product with an excellent quality and a long lasting reliability.

### Application

- Totalisation of the electric energy in the industry for each single line or machine.
- Measurement of energy generated by renewable sources such as solar, eolic, etc.
- Accounting and billing of consumptions in camp sites, malls, residential areas, naval ports, etc.
- Totalization of the electric consumption in hotels, congress centers, exhibition fairs.
- Accounting of the consumptions in buildings with executive office services.
- Internal allocation of the consumptions in timeshare civilian and industrial buildings.
- Realization of energy monitoring systems.
- Remote survey of the consumptions and compute of the costs.

### Benefit

- Remote management through dedicated application/interface according to the device model (RS485 Modbus, Ethernet).
- Up to 30 instantaneous measurements, complete set of energy counters and partial counters. Moreover partial counters can be started, stopped or reset.
- Suitable for CT with 1 or 5A secondary. CT ratio is programmable (1 ... 10000).
- Phase sequence and diagnostic function for error signalling in case of wrong polarity connection.

### Related Products

- ARTEMES Server Software



## ■ Technical features

### Power Supply

- Power supplied from the voltage circuit
- Nominal measurement voltage  $\pm 20\%$
- Max consumption (for each phase):  
RS485 MODBUS / ETHERNET models: 3.5 VA - 1 W
- CT burden (for each phase): 0.04 V
- Nominal frequency: 50/60 Hz

### Voltage Range & Frequency

- 3x230/400 ... 3x240/415 V 50/60 Hz

### Current

- Starting current  $I_{st}$ : 2 mA
- Minimum current  $I_{min}$ : 10 mA
- Transitional current  $I_{tr}$ : 50 mA
- Reference current  $I_{ref}$  ( $I_n$ ): 1 A
- Maximum current  $I_{max}$ : 6 A

### RS485 Modbus Communication

- Port: RS485
- Protocol: Modbus RTU/ASCII
- Communication speed: 300 ... 57600 bps

### Ethernet Communication

- Port: 10/100 Base T
- Protocol: HTTP, NTP, DHCP, Modbus TCP
- Communication speed: 10/100 Mbps
- 8 MB for data recording
- Web server

### Accuracy

- Active energy class 1 according to IEC/EN 62053-21 (NO MID)
- Active energy class B according to EN 50470-3 (MID)
- Reactive energy class 2 according to IEC/EN 62053-23

### S0 output

- Passive optoisolated
- Maximum values: 27 V<sub>DC</sub> - 27 mA
- Meter constant according to the set CT ratio:  
1000 imp/kWh with CT ratio in range 1...4  
200 imp/kWh with CT ratio in range 5...24  
40 imp/kWh with CT ratio in range 25...124  
8 imp/kWh with CT ratio in range 125...624  
1 imp/kWh with CT ratio in range 625...3124  
0.1 imp/kWh with CT ratio in range 3125...10000  
The measuring unit (imp/kWh, imp/kvarh, imp/kVAh) changes according to the assigned counter (kWh, kvarh, kVAh)
- Pulse length: 50  $\pm$  2ms

### Tariff Input (no ETHERNET model)

- Active optoisolated
- Voltage range for tariff 2: 80 ... 276 V<sub>AC-DC</sub>

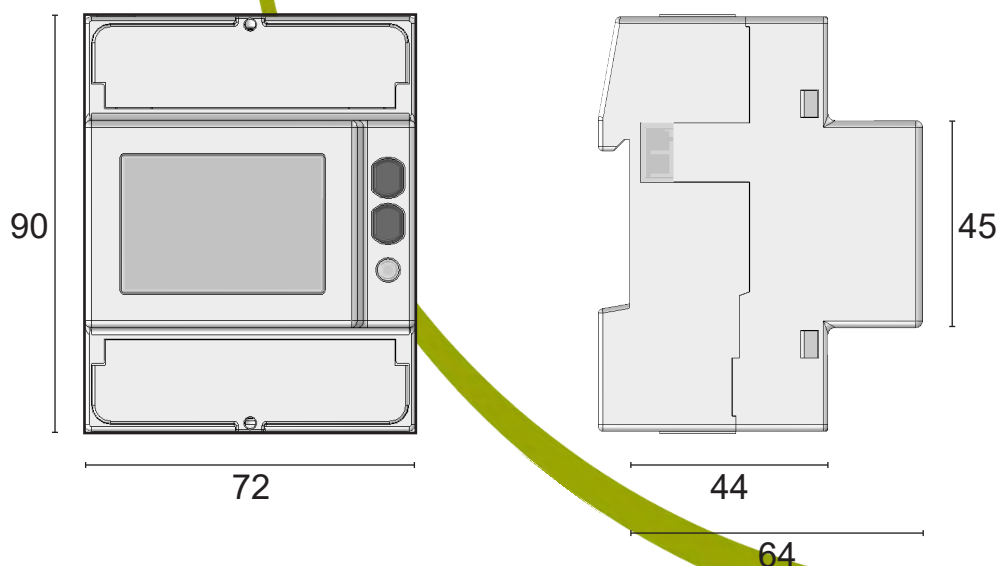
### Metrological LED

- Meter constant: 10000 imp/kWh
- Pulse length: 10  $\pm$  2ms

### Environmental Conditions

- Operating temperature: -25°C ... +55°C
- Storage temperature: -25°C ... +75°C
- Humidity: 80% max without condensation
- Protection degree: IP51 frontal part -IP20 terminals

## ■ Technical Drawing (mm)



## ■ Measurements

	SYMBOL	MEASURE UNIT Value or Status		4 WIRE SYSTEM	DISPLAY	COM PORT
<b>INSTANTANEOUS VALUES</b>						
Phase voltage	$V_{L1-N} - V_{L2-N} - V_{L3-N}$	V		●		●
Line voltage	$V_{L1-L2} - V_{L2-L3} - V_{L3-L1}$	V		●		●
System voltage	$V_{\Sigma}$	V		●		●
Phase current	$I_1 - I_2 - I_3$	A		●		■
Neutral current	$I_N$	A		●		■
System current	$I_{\Sigma}$	A		●		■
Phase power factor	$PF_{L1} - PF_{L2} - PF_{L3}$	-		●		●
System power factor	$PF_{\Sigma}$	-		●		●
Phase apparent power	$S_{L1} - S_{L2} - S_{L3}$	VA		●	■	■
System apparent power	$S_{\Sigma}$	VA		●	■	■
Phase active power	$P_{L1} - P_{L2} - P_{L3}$	W		●	■	■
System active power	$P_{\Sigma}$	W		●	■	■
Phase reactive power	$Q_{L1} - Q_{L2} - Q_{L3}$	var		●	■	■
System reactive power	$Q_{\Sigma}$	var		●	■	■
Frequency	f	Hz		●		●
Phase sequence	CW/CCW	-		●	●	●
Power direction	> <	-		●	●	●
<b>RECORDED DATA</b>						
Phase active energy	L1 - L2 - L3	Wh		●	■	■
System active energy	$\Sigma$	Wh		●	■	■
Phase inductive and capacitive reactive energy	L1 - L2 - L3	varh		●	■❖	■
System inductive and capacitive reactive energy	$\Sigma$	varh		●	■❖	■
Phase inductive and capacitive apparent energy	L1 - L2 - L3	VAh		●	■	■
System inductive and capacitive apparent energy	$\Sigma$	VAh		●	■	■
Tariff 1/2 phase active energy (no ETHERNET model)	L1 - L2 - L3	Wh		●	■	■
Tariff 1/2 system active energy (no ETHERNET model)	$\Sigma$	Wh		●	■	■
Tariff 1/2 phase ind. and cap. reactive energy (no ETHERNET model)	L1 - L2 - L3	varh		●	■❖	■
Tariff 1/2 system ind. and cap. reactive energy (no ETHERNET mod.)	$\Sigma$	varh		●	■❖	■
Tariff 1/2 phase ind. and cap. apparent energy (no ETHERNET mod.)	L1 - L2 - L3	VAh		●	■	■
Tariff 1/2 system ind. and cap. apparent energy (no ETHERNET mod.)	$\Sigma$	VAh		●	■	■
Resettable partial energy counters	$\Sigma$	Wh, varh, VAh		●	■❖	■
Energy balance	$\Sigma$	Wh, varh, VAh		●	■❖	■

In case of ETHERNET model, a recording at programmable rate (minimum 10 s) can be enabled with selectable parameters like instantaneous values and counters. Then, the recorded data can be transferred manually or automatically.

<b>OTHER INFORMATION</b>						
Present tariff (no ETHERNET model)	T	1/2				●
Secondary values	SEC	ON/OFF			●	●
CT ratio	CT	Set value			●	●
Undervoltage/overvoltage	VOL, VUL	ON/OFF				●
Undercurrent/overcurrent	IOL, IUL	ON/OFF				●
Frequency out of range	fOUT	ON/OFF				●
Partial counters	PAR	START/STOP			●	●
S0 output status	$\overline{1}$ L	Active			●	


**LEGEND:** ● = Available □ = Bidirectional value v = varh not available for MID S meter



▪ Order Details

model	order code	voltage and frequency input	communication port		option	user manual
		self-powered	RSA485 MODBUS	Ethernet	MID	DE/EN
AM-6-4D R	1101.0013.0001	3x230/400V ... 3x240/415V 50/60Hz	•		•	•
AM-6-4D E	1101.0021.0001	3x230/400V ... 3x240/415V 50/60Hz		•	•	•

LEGEND

- MID:** MID certified meter, with reset function only on partial counters.
- MID S:** MID certified meter, with reset function only on partial counters, without reactive energy counters on display (only SWITZERLAND .
- NONE:** Meter without MID certification, with reset function only on partial counters.
- RESET:** Meter without MID certification, with RESET function on ALL counters.
- Softwares for meter remote management (MODBUS Master, M-BUS Master) downloadable for free at [www.algodue.it](http://www.algodue.it), in the Client protected area.

NOTE: Subject to change without notice

