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ACM-1P/M, ACM-1P4/M, ACM-1P3/M

Multifunctional transducers

ACM-1P/M – 1 system for 1-phase grid
ACM-1P3/M - 1 systém for 3-phase 3-wire balanced grid
ACM-1P4/M – 1 systém for 3-phase 4-wire balanced grid
with output RS485 Modbus RTU

- measuring the AC electrical quantities
 - active power
 - reactive power
 - phase current
 - phase voltage
 - frequency
 - phase angle
- direct measuring up to 6A and up to 600V
- communication bus RS485 with protocol Modbus RTU (2400-19200Bd)
- user configuration of transducer
- universal power supply 19 – 300V DC & 90 – 250V AC
- frequency range 40 ... 1000Hz
- isolation input-output-power supply: 4000Vef
- conversion accuracy 0,2%
- compact design
- designed for DIN 35 rail mounting



Four-quadrant transducer measures and digitally processes instantaneous values of measured quantities. The input of the transducer is a current transformer or voltage divider. From input signals calculates alternating quantity. Information on their sizes are available on the output bus 485. Inputs, supply and RS485 are galvanically separated. Both input and output circuit is protected against overload. The converter is suitable for processing heavily distorted waveform of the input signal. It can be used even if they are in measuring systems that contains frequency converters or other non-linear elements. Standard processes the signals with a crest factor less than 4.5. When measuring signals with a crest factor greater than 4.5 it is necessary to proportionally increase the value of measuring range. If you double the measuring range of the measured input is crest factor of processed signal also doubled. The measuring range can be changed via RS485 MODBUS RTU, respectively our program Rawet Studio.

Electrical specifications:

- operating temperature range: -25 ... +70°C
- storage temperature range: -40 ... +80°C
- supply voltage: universal 19 – 300V DC and 90 – 250V AC, to order 20 – 60V AC
- consumption: max. 1,2VA
- protection: resettable thermal cut-out in primary circuit
- input measured signal: 0...max. 6A AC
0...max. 600VAC
- maximum measuring range: 0 ... 120% of rated input
- nominal frequency: 50Hz (60Hz)
- impedance voltage input: 1,5MΩ
- consumption current input: 0,015VA
- input overload capacity: voltage 2 U_{jm} – 1s, current 2 I_{jm} – 1min., 20 I_{jm} – 1s
- standard input range In Un 0...5A (measuring range 0..6A)
0...500V (measuring range 0..600V)
- output: RS485 protocol Modbus RTU (2400 – 19200Bd)
- line termination: idle mode defined by 39kohm resistors, to add external termination
- addressing: by software
- maximum transmission error U, I: <0,2% with crest factor < 4,5
frequency: ± 0,011Hz
- temperature induced error: <0,01%/°C
- test voltage: 4000Vrms
- response time: 250ms
- weight: 100g
- protection housing: IP40
- protection terminal board: IP20
- working environment: pollution degree 2, installation category: III
- optional accessories: programming adapter AX-USB-485, AY-USB-485, (program for setting Rawet Studio)

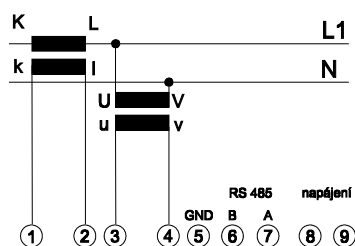
User configuration via RS485 protocol Modbus:

- input range: from 0..500mA to 0..5A
from 0..50V to 0..500V
- measuring range: 0..120% of input range
- nominal frequency: 50 or 60Hz (calibrating frequency) default is 50Hz
- measuring range of frequency: 40..65 Hz, input voltage between 0..120% of the set voltage range

Type test: Basic type test: in compliance with ČSN EN 60688
 EMC: in compliance with ČSN EN 61326-1
 Safety: in compliance with ČSN EN 61010-1

Variants of connections:

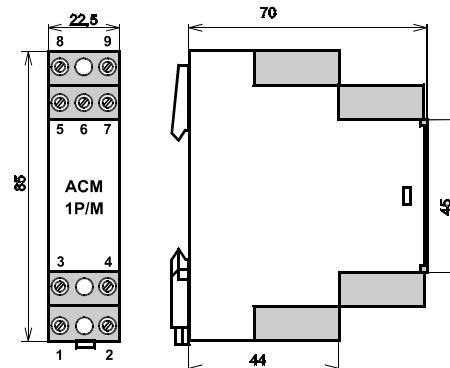
1-phase grid, transducer ACM-1P/M:



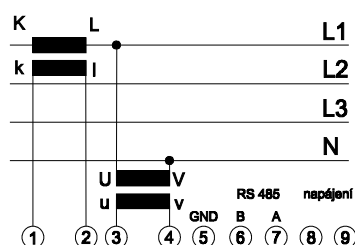
Measured power:
 $P = U \cdot I \cdot \cos \varphi$
 $Q = U \cdot I \cdot \sin \varphi$
 U, I – phase current and voltage

Terminals: 1,2 ... current input
 3,4 ... voltage input
 5,6,7 ... bus RS485 (5 is GND, 6 is B, 7 is A)
 8,9 ... power supply without polarity

Dimensional drawing:

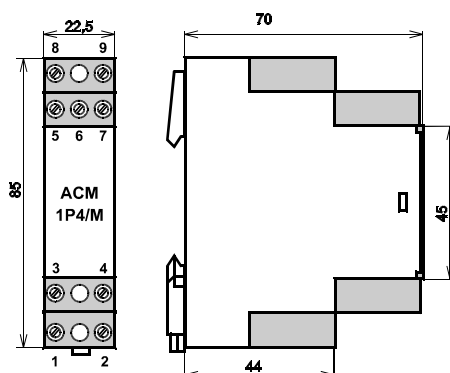


3-phase 4-wire balanced grid (alternative connection), transducer ACM-1P4/M

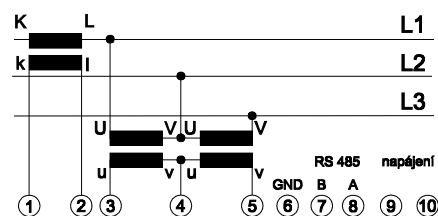


Measured power:
 $P = 3 \cdot U_f \cdot I_f \cdot \cos \varphi$
 $Q = 3 \cdot U_f \cdot I_f \cdot \sin \varphi$
 U_f, I_f – phase current and voltage

Terminals: 1,2 ... phase current input
 3,4 ... phase voltage input
 5,6,7 ... bus RS485 (5 is GND, 6 is B, 7 is A)
 8,9 ... power supply without polarity

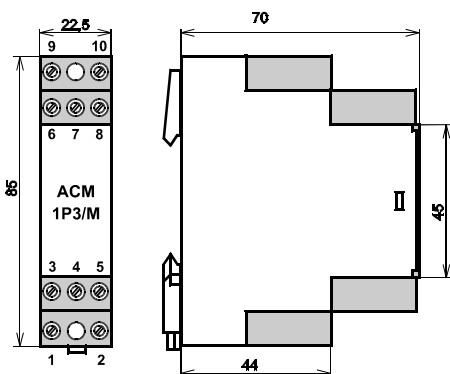


3-phase 3-wire balanced grid (alternative connection), transducer ACM-1P3/M



Measured power:
 $P = \sqrt{3} \cdot U_s \cdot I_f \cdot \cos \varphi$
 $Q = \sqrt{3} \cdot U_s \cdot I_f \cdot \sin \varphi$
 U_s – phase to phase voltage
 I_f – phase current

Terminals: 1,2 phase current input
 3,4,5 ... line voltage input
 6,7,8 ... bus RS485 (6 is GND, 7 is B, 8 is A)
 9,10 ... power supply without polarity



Default configuration (if not other request):

Input 5A, 500V, frequency 50Hz, adress 1, Baud rate 19200Bd, even parity

Ordering instructions:

- Your order should include:
- transducer type
 - request for configuratin (adress, baud rate, parity, stopbit, input parameters,)
 - other requirements (other power supply ...)
 - quantity (No. of pieces)

Connection terminals:

The terminals accept conductors up to 4mm². We recommend using a cable with a core cross section of 0.5 mm². In noisy environments, use shielded cable.

Ordering example:

1. ACM-1P/M 1ks (default 500V, 5A, adress-1, 19200Bd , even parity, 1 stopbit- 8E1)
2. ACM-U/M 250V, 1A adress- 15, 9600Bd, without parity, 1 stopbit (8N1)

Recommended optional accessories for configuration:

programming adapter AY-USB-485(Rawet)
 software Rawet studio (free rawet.cz)



Likvidaci po ukončení životnosti provést odděleným sběrem. Rawet s.r.o. je členem sdružení RETELA www.retela.cz