

AC CURRENT & VOLTAGE TRUE R.M.S. VALUE CONVERTER

AC24 - powered via the 4 to 20mA output loop
ACN24 - auxiliary power supply 24V DC
ACN230 - auxiliary power supply 230V AC



- true R.M.S. value
- handling inputs with a crest factor of up to 5
- frequency range from 40 to 1000Hz
- input-to-output-to-power supply isolation: 4000Vr.m.s.
- measuring range 0 to 120% of rated input
- conversion accuracy < 0.5%
- compact design
- designed for DIN 35 rail mounting

The converter has been designed to convert the true R.M.S. value of an AC signal into a unified-range DC voltage/current. The converter input includes a measuring transformer. It isolates the input circuit from the converter itself and converts the input signal into a voltage, which is suited for further processing. After full-wave rectification, R.M.S. value calculation and subsequent smoothing out, a DC voltage is created at the output. An optocoupler is used to isolate the voltage input. The R.M.S. value is calculated in a monolithic converter made by Analog Devices. Both the input and the output circuit are overload-protected.

This converter is also suited for handling the inputs whose waveforms are heavily distorted. It can even be applied in control systems including frequency converters or other non-linear control elements. Mean value converters may generate errors amounting to several tens of percent when distorted waveform signals are measured. The table below shows a comparison between the mean and true R.M.S. value measurements for waveforms showing various distortion factors.

Signal waveform	Distortion factor (V _{max} / V R.M.S.)	True R.M.S. value	Mean value calibrated in corresponding sine wave r.m.s. value	Error of mean value based measurements
Sine wave	1.414	0.707	0.707	0%
Symmetrical square wave	1.00	1.00	1.11	+11.0%
Triangular	1.73	0.577	0.555	-3.8%
Gaussian noise	3	0.333	0.295	-11.4%
Various mark-to-space ratio square waves	2	0.5	0.278	-44%
	10	0.1	0.011	-89%

Electrical specifications:

- operating temperature range: -25...+80°C
- storage temperature range: -40...+80°C
- supply voltage: 24V DC, ±30%
230V ± 15%, 50 - 60Hz, max.2VA
other options (80..300V DC, 60..250V AC) by arrangement
- protection: resettable thermal cut-out in primary circuit
- rated inputs: 1A, 2.5A, 5A AC
57.7V, 100V, 110V, 220V, 230V
380V, 400V, 500V AC
- voltage input current load: 0.5mA
- input overload capacity voltage: 2 Unom – 1s
current: 2 Inom - 1min, 20 Inom - 1s
- standard measuring range: 0...1.2 Inom (Unom)
other options available per order
- output: 4-20mA, 0-20mA, 0-10V
- output current limit: typically 28mA (electronic cut-out)
- current output maximum load: 15 / Iout (ohm)
- voltage output maximum load: 10mA
- transfer function: linear
- transfer function maximum error: < 0.5%
- error for a crest factor of 5: 2.5%
- temperature induced error: < 0.02%/°C
- test voltage: 4000Vr.m.s.
- output signal settling time: 300ms
- weight: 120g
- enclosure: casing: IP40
terminal board: IP10

Terminal designation:

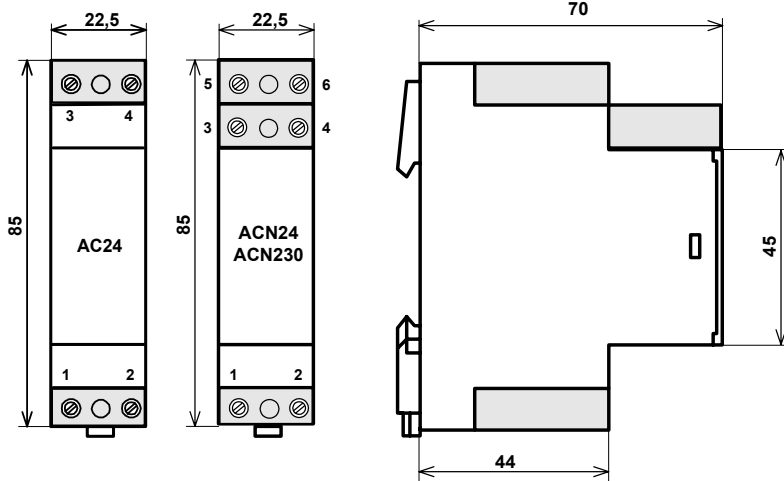
Dimension sketch:

AC24

1,2 ... input to be measured
3,4...output 4-20mA (power supply of the output loop: 4 is +)

ACN24, ACN230

1,2 ... input voltage to be measured
3, 4 .. output terminals (4 is +)
5,6... power supply terminals,
polarity insensitive



Ordering instructions:

Your order should include:

- converter type
- rated input
- rated output
- non-standard options (different power supply, measuring range, frequency setting, etc.)
- quantity (No. of pieces)

Type tests:

Standard type test: to ČSN EN 60688
EMC: to ČSN EN 61326-1
Safety: assessed acc. to ČSN EN 61010-1