«F&F»®

ANALOG TRANSMITTERS OF MEASUREMENT VOLTAGE [4-20 mA]

AV-1I

5 9 0 8 3 1 2 5 9 5 3 3 5

CE

Purpose
AV-1I module is designed to measure volyage and converting the measured quantity to an unified analog output signal the current from range 4÷20 mA.

Functioning
The transmitter measures the value of input voltage (AC or DC voltage circuit). The value of the measured voltage is converted to a proportional output current Iout signal in the range 4÷20 mA, which corresponds to the measurement range 0÷400V.

The transducer allows to perform measurements of the real effective value (TrueRMS) of direct and alternating voltage with an amplitude not exceeding 400 V (which corresponds to approximately 285 V of the effective value of undisturbed sinusoidal voltage).

Signal output of module is secured noise filter, which eliminates interference network, affecting the accuracy of the transmitted signal. This allows the use of signal cables up to 300 m.

Installation
1. Take OFF the power.
2. Put the module on the rail.
3. power supply connect to joints 10(-)-12 (+)[Upow].
4. Measured voltage connect to joints 4(L/+)-6(N/-) [Uin].
5. The output signal 11 '(+) [Iout] connected to the current analog input (AI) of the receiving device.
   ATTENTION! Both devices must have a single point GND (-).
   ATTENTION! Maximum lenght of UTP cable - 300 m.
   Optionally, the joints 11 - 11 '[Iout] can be connected to an ammeter or other current measuring device.

ATTENTION!
Due to the differences between the inner resistance (RAI), analog current devices that can be used with AC-1I module is necessary power to the appropriate voltage V +. The minimum voltage can be calculated from the formula:

$$U_{V+} > [R_{AI}[\Omega]+400] / 50 [V]$$

R_{IA} - inner resistance of input of receiver device.

In the case of the module supply voltage lower than the required outcome measurements will be saddled with a mistake.

Wiring diagram
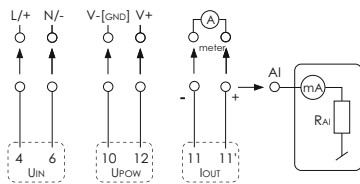
Auxiliary calculation formulas

Based on a linear function y=ax+b calculate formulas:

$$U_{in} = [25 \times I_{out} - 100] \pm 0.5\%$$

$$I_{out} = [(U_{we} + 100) / 25] \pm 0.5\%$$

U_{in} - AC or DC measured voltage [V]
I_{out} - outptu current [4÷20 mA]
±0,5% - processing error

Assembly

General assumptions
* recommended the use of filters and surge suppression (eg, OP-230)
* recommended is wiring to UTP (twisted pair) for connecting the module to another device
* In the case of shielded cables grounded screens performed only on one side and as close to the device
* not installed parallel signal wires in close proximity to the line and high voltage.
* do not install the module in close proximity to electrical devices, high-power electromagnetic measuring instruments, devices with phase power regulation, and other devices which can introduce distortions

Technical data

power supply	9÷30V DC
TrueRMS measure range DC	0÷400V
max. instantaneous voltage	320V AC / 450V DC
max. measurement mistake	±0.5V
output signal	4÷20mA
length of signal cable	300m
breakdown voltage IN->OUT	3kV
processing error	±0.5%
power consumption	0.8W
working temperature	-20÷50°C
relative humidity	85% for +30°C
terminal	2.5mm² screw terminals
dimensions	1 module (18 mm)
mounting	on TH-35 rail
ingress protection	IP20

Working with programming controller MAX [F&F]

Example of program instruction in ForthLogic Language, reading of input current and convert the value of the measured to voltage;
         1 AI? 25.0 F* 100.0 F−
More information in the user programming in ForthLogic language.

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