AT-1I Analogue Temperature Transducer

FandF AT-1I Analogue Temperature Transducer Instruction Manual

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FandF AT-1I Analogue Temperature Transducer

Purpose

Temperature transducer AT-1I is designed for temperature measurement employing an external temperature sensor and converting a measured value to ua unified analog output current signal in the range of 4÷20 mA.

Features

The AT-1I module continuously converts the resistance of an external temperature sensor to a DC output signal in the range 4÷20 mA. As a result of the transformation, a current proportional to the temperature of the environment in which the temperature sensor is located appears at the output.

- The module works with a resistance temperature sensor type KTY81-210 (or equivalent).
- Dedicated temperature probes manufactured by F&F: RT probe or RT2 probe. Probes are available separately.

The signal output of the module is protected by an interference filter, which eliminates mains interference affecting the accuracy of the transmitted signal. The protection allows the use of signal cables with a length of up to 300 m.

Auxiliary calculation formulas

Based on the linear function y= ax+b, we calculate from the formulas:

$$[1]\ Iw = [0{,}106667 \times Tm + 9{,}334] \pm 0{,}5\%, \text{ where:}$$

$$a = \frac{20 - 4}{100 - (-50)} = 0{,}106667$$

$$[2]\ Tm = [9{,}375 \times Iw - 87{,}5] \pm 0{,}5\%, \text{ where:}$$

$$a = \frac{100 - (-50)}{20 - 4} = 9{,}375$$

- Iw – output current [mA]
- Tm – sensor environment temperature [°C]

- 4÷20 mA – signal output current range
- -50÷100°C – temperature sensor measuring range
- ±0,5% – conversion error

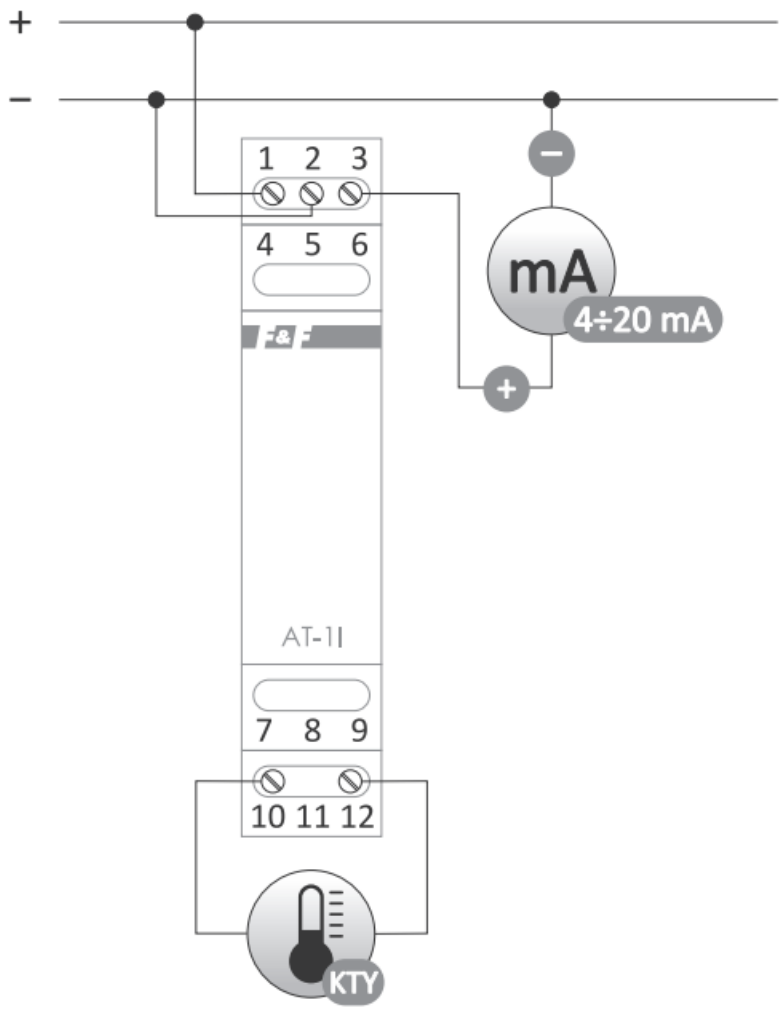
Mounting

- Recommended use of interference and surge filters (e.g. OP-230) from the F&F range.
- Recommended use of UTP (twisted pair) signal cables to connect the module to another device.
- If shielded cables are used, ground the screens on one side only, as close to the device as possible.
- Do not lay signal cables in parallel close to high and medium voltage lines.
- Do not install the module close to high-po-wer electrical consumers, electromagnetic measuring instruments, phase-controlled power devices or other devices that may introduce interference.
    - Switch off the power supply to the switchboard.
    - Mount the module on the DIN rail in the distribution box.
    - Connect the probe to terminals 10-12 (polarity optional).
    - Connect signal output 1-3 to the power supply and the analog current input (AI) of the consumer unit (polarity inde-pendent).
- The maximum length of the UTP cable must not exceed 300 m.
- Due to the differences between the internal resistances (RAI) of the analog current inputs of the devices that can be used with the AT-1I module, it is necessary to supply the module with an appropriate V+ voltage. The minimum voltage value can be calculated from the formula

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

- Switch on the power supply to the switchboard

Wiring diagram



- 1-3 – power supply
- 3 – 4÷20 mA current output
- 10-12 – KTY temperature sensor – power supply

Technical data

- power supply 9÷30 V DC
- output current 4÷20 mA
- measurement range -50÷130°C
- maximum measurement error ±1.5°C
- conversion error ±0.5°C
- signal wire 300 m
- temperature sensor KTY
- temeprature probe RT/RT2
- power consumption ≤0.8 W
- working temperature -20÷50°C
- terminal 2.5 mm² screw terminals
- tightening torque 0.4 Nm
- dimensions 1 module (18 mm)
- mounting on TH-35 rail

- ingress protection IP20

Dedicated temperature probes

- probe identification RT
- measurement range -50÷130°C
- temperature sensor KTY81-210
- sensor dimensions ø5; H= 20 mm
- sensor insulation shrink sleeve
- wire length OMY 2×0.34 mm², L= 2.5 m
- working temperature -50÷65°C
- probe identification RT2
- measurement range -50÷130°C
- temperature sensor KTY81-210
- sensor dimensions ø8; H= 40 mm
- sensor insulation metal sleeve
- wire length heat-resistant SIHF 2×0.5 mm², L= 2.5 m
- working temperature -50÷130°C

Operation with MAX [F&F] programmable controller

An example of a programmatic instruction in ForthLogic to read an input current value and convert it to a measured temperature value:

- 1 AI? 9.375 F* 87,5 F For

more information, see the Forthlogic programming guide.

Warranty

The F&F products are covered by a warranty of 24 months from the date of purchase. Effective only with proof of purchase. Contact your dealer or directly with us.

CE declaration

F&F Filipowski L.P. declares that the device conforms with the essential requirements of The Low Voltage Directive (LVD) 2014/35/EU and the Electromagnetic Compatibility (EMC) Directive 2014/30/UE. The CE Declaration of Conformity, along with the references to\ the standards to which conformity is declared, can be\ found at **www.fif.com.pl** on the product page.

Do not dispose of this device in the trash along with other waste!
According to the Law on Waste, electro coming from households free of charge and can give any amount to up to that endpoint of collecti on, as well as to store the occasion of the purchase of new equipment (in accordance with the principle of old-for-new, regardless of brand). Electro thrown in the trash or abandoned in nature, pose a threat to the environment and human health.

AT-1I Analogue temperature transducer (4÷20 mA)

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Documents / Resources

	**FandF AT-1I Analogue Temperature Transducer** [pdf] Instruction Manual AT-1I, AT-1I Analogue Temperature Transducer, Analogue Temperature Transducer, Temperature Transducer, Transducer

References

- **User Manual**