

Isolated Doubler/Converter for Tc and mV configurable by Dip-Switch or PC

DAT 4631 A

FEATURES

- Configurable input for TC and mV
- Double output configurable in current or voltage
- Configurable by dip-switch or PC
- High accuracy
- On-field reconfigurable
- Galvanic isolation among the ways
- UL / CE / UKCA mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



GENERAL DESCRIPTION

The isolated doubler/converter DAT 4631 A is able to measure and linearise the standard thermocouples with internal or external cold junction compensation. In function of programming, the measured values are converted in a current or voltage signal. The device guarantees high accuracy and performances stability both versus time and temperature.

The programming is made by the dip-switch located in the window on the side of the enclosure. By means of dip-switches it is possible to select the input type and range and the output type without recalibrate the device.

By Personal Computer the user can program all of the device's parameters for his own necessity; the configuration by PC allows to program the two outputs with two independent settings. For Thermocouple sensors it is possible to set the Cold Junction Compensation (CJC) as internal or external.

Moreover it is available the option of alarm for signal interruption (burn-out) that allows to set the output value as high or low out of scale.

The 1500 Vac galvanic isolation on all ways (input, outputs and power supply) eliminates the effects of all ground loops eventually existing and allows the use of the converter in heavy environmental conditions found in industrial applications.

The DAT 4631 A is in compliance with the Directive UL 61010-1 for US market and with the Directive CSA C22.2 No 61010-1 for the Canadian market.

It is housed in a plastic enclosure of 12.5 mm thickness suitable for DIN rail mounting in compliance with EN-50022 and EN-50035 standards.

USER INSTRUCTIONS

The connections must be made as shown in the section "Connections".

It is possible to configure the converter on field by dip-switch or Personal Computer as shown in the section " Programming ". The configuration by dip-switches can be made also if the device is powered (note: after the configuration the device takes some seconds to provide the right output measure).

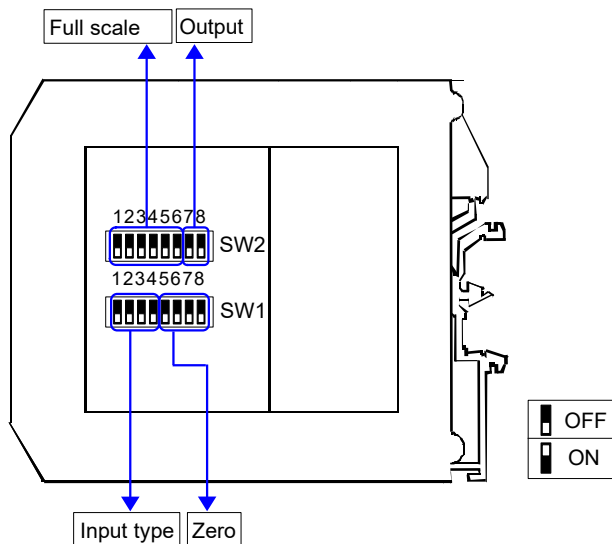
TECHNICAL SPECIFICATIONS (Typical at 25 °C and in nominal conditions)

| INPUT | | | | OUTPUT (2 CHANNELS) | | | | GENERAL SPECIFICATIONS | |
|---|---------|---------|----------|---------------------------------------|------|-----------------|----------|--|--|
| Input type | Min | Max | Span min | Output type | Min | Max | Span min | | |
| TC (CJC int./ext.) | | | | Current | 0 mA | 20 mA | 4 mA | Power supply voltage | 18 .. 30 Vdc |
| J | -200°C | 1200°C | 100°C | Voltage | 0 V | 10 V | 1 V | Reverse polarity protection | 60 Vdc max |
| K | -200°C | 1300°C | 100°C | | | | | Current consumption | |
| S | 0°C | 1750°C | 400°C | | | | | Current output | 55 mA max. |
| R | 0°C | 1750°C | 400°C | Output resolution | | | | Voltage output | 25 mA max. |
| B | 0°C | 1820°C | 400°C | Current | | ± 7 uA | | ISOLATION | |
| E | -200°C | 1000°C | 100°C | Voltage | | ± 4 mV | | Among all the ways | 1500 Vac, 50 Hz, 1 min |
| T | -200°C | 400°C | 100°C | Burn-out values | | | | ENVIRONMENTAL CONDITIONS | |
| N | -200°C | 1300°C | 100°C | Max. output value | | 22 mA or 10.6 V | | Operative Temperature | -20°C .. +60°C |
| Voltage | | | | Min. output value | | 0 mA or -0.6 V | | UL Operative Temperature | -10°C .. +60°C |
| mV | -100 mV | +90 mV | 5 mV | Output load Resistance - Rload | | | | Storage Temperature | -40°C .. +85°C |
| mV | -100 mV | +200 mV | 10 mV | Current output | | < 500 Ω | | Humidity (not condensed) | 0 .. 90 % |
| mV | -100 mV | +800 mV | 20 mV | Voltage output | | > 10 KΩ | | Maximum Altitude | 2000 m |
| Accuracy (1) | | | | Short circuit current | | 26 mA max. | | Installation | Indoor |
| mV, TC the higher of ± 0.1% f.s. and ±12 uV | | | | Response time (10÷ 90%) | | about 500 ms | | Category of installation | II |
| Linearity (1) | | | | | | | | Pollution Degree | 2 |
| TC ± 0,2 % f.s. | | | | | | | | MECHANICAL SPECIFICATIONS | |
| mV ± 0,1 % f.s. | | | | | | | | Material | Self-extinguish plastic |
| Input impedance | | | | | | | | IP Code | IP20 |
| TC, mV ≥= 10 MΩ | | | | | | | | Wiring | wires with diameter 0.8±2.1 mm ² /AWG 14-18 |
| Line resistance influence (1) | | | | | | | | Tightening Torque | 0.8 N m |
| TC, mV ≤=0.8 uV/Ohm | | | | | | | | Mounting | in compliance with DIN rail standard EN-50022 and EN-50035 |
| Thermal drift (1) | | | | | | | | Weight | about 90 g. |
| Full scale ± 0.01% / °C | | | | | | | | CERTIFICATIONS | |
| CJC ± 0.01% / °C | | | | | | | | EMC (for the Industrial Environments) | |
| CJC comp. ± 1 °C | | | | | | | | Immunity | EN 61000-6-2 |
| | | | | | | | | Emission | EN 61000-6-4 |
| | | | | | | | | UKCA (ref S.I. 2016 N°1091) | |
| | | | | | | | | Immunity | BS EN 61000-6-2 |
| | | | | | | | | Emission | BS EN 61000-6-4 |
| | | | | | | | | UL | |
| | | | | | | | | US Standard | UL 61010-1 |
| | | | | | | | | Canadian Standard | CSA C22.2 No 61010-1 |
| | | | | | | | | CCN | NRAQ/NRAQ7 |
| | | | | | | | | Typology | Open Type device |
| | | | | | | | | Classification | Industrial Control Equipment |
| | | | | | | | | File Number | E352854 |

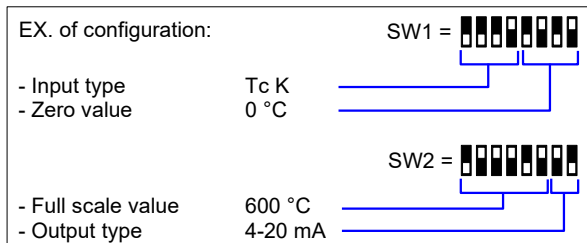
(1)referred to the input Span (difference between max. and min.)

PROGRAMMING

CONFIGURATION BY DIP-SWITCHES



- 1) Open the suitable door on the side of the device.
- 2) Set the input type by the dip-switch SW1 [1..4] (see TAB.1)
- 3) Set the minimum input scale value (Zero) by the dip-switch SW1 [5..8] (see TAB.3)
- 4) Set the maximum input value (Full scale) by the dip-switch SW2 [1..6] (see TAB.3)
- 5) Set the output type by the dip-switch SW2 [7..8] (see TAB.2)



NOTE:
- It is also possible to set the dip-switches using the wizard of the configuration software following the procedure described in the section "Configuration by PC" until the step 6 and clicking on "Switch".

DIP-SWITCH CONFIGURATION TABLES

TAB.1
Input type setting

| SW1 1 2 3 4 | SW1 1 2 3 4 | SW1 5 6 7 8 |
|----------------|----------------|----------------|
| | EPROM * | Tc K |
| | 90 mV | Tc R |
| | 200 mV | Tc S |
| | 800 mV | Tc T |
| | --- | Tc B |
| | --- | Tc E |
| | --- | Tc N |
| | Tc J | --- |

TAB.2
Output setting

| SW2 7 8 | |
|------------|---------|
| | 0-20 mA |
| | 4-20 mA |
| | 0-10 V |
| | 0-5 V |

TAB.3 – Input scale setting

| Zero | | Full Scale | |
|----------------|--------------------|--------------------|--------------------|
| SW1 5 6 7 8 | SW2 1 2 3 4 5 6 | SW2 1 2 3 4 5 6 | SW2 1 2 3 4 5 6 |
| | Default | | Default |
| | -200 | | 75 |
| | -100 | | 80 |
| | -80 | | 85 |
| | -60 | | 90 |
| | -50 | | 95 |
| | -40 | | 100 |
| | -30 | | 110 |
| | -20 | | 120 |
| | -10 | | 130 |
| | 0 | | 140 |
| | 10 | | 150 |
| | 20 | | 160 |
| | 50 | | 170 |
| | 100 | | 180 |
| | 150 | | 190 |
| | | | 200 |
| | | | 225 |
| | | | 250 |
| | | | 275 |
| | | | 300 |
| | | | 325 |
| | | | 350 |
| | | | 375 |
| | | | 400 |
| | | | 425 |
| | | | 450 |
| | | | 475 |
| | | | 500 |
| | | | 550 |
| | | | 600 |
| | | | 650 |
| | | | 700 |
| | | | 750 |
| | | | 800 |
| | | | 850 |
| | | | 900 |
| | | | 950 |
| | | | 1000 |
| | | | 1100 |
| | | | 1200 |
| | | | 1300 |
| | | | 1400 |
| | | | 1500 |
| | | | 1600 |
| | | | 1750 |
| | | | 1800 |
| | | | 1850 |

NOTES:

- * If the dip-switches SW1 [1..4] are all set in the position 0 ("EPROM"), the device will follow the configuration programmed by PC (input type and range, output type and range and options).
- * For all the "Tc" type selected by dip-switches, the cold junction compensation is internal.
- * If the dip-switches SW1 [5..8] are all set in the position 0 ("Default"), the device will follow the input scale programmed by PC for the input type selected by the dip-switches SW1 [1..4]
- * Eventual wrong dip-switches settings will be signalled by the blinking of the led "PWR".

CONFIGURATION BY PC

Notice: before to execute the next operations, check that the drivers of the cable CVPROG in use have been previously installed in the Personal Computer.

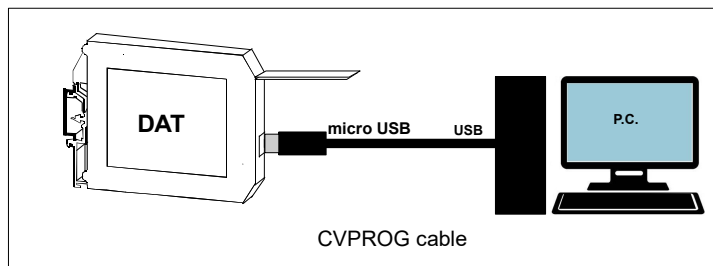
By software DATAPRO it is possible to:

- set the default programming of the device;
- program the options not available with the dip-switch; (burn-out level, CJC offset, trip alarm settings, delay on output, etc...);
- read, in real time, the input and output measures;
- follow the dip-switches configuration wizard.

To configure the device follow the next steps:

- 1) Open the protection plastic label on the front of the device.
- 2) Connect the two plugs of cable CVPROG to the Personal Computer (USB plug) and to the device (uUSB plug).
- 3) Run the software
- 4) Select the COM port in use and click on "Open COM".
- 5) Select the device and connect to it.
- 6) Set the programming data.
- 7) Click "Write" to send the programming data to the device.

For information about the software refer to its user guide.



INSTALLATION INSTRUCTIONS

The device is suitable for fitting to DIN rails in the vertical position. For optimum operation and long life follow these instructions:

When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following cases:

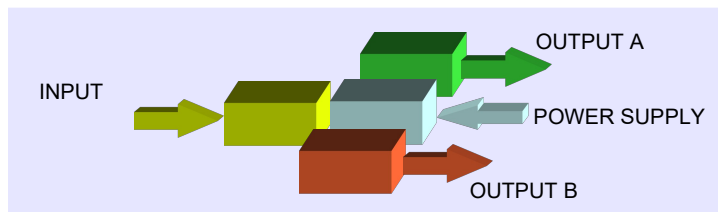
- If panel temperature exceeds 45°C.
- Use of high power supply value (> 27 Vdc).
- Use of output current.

Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.

Install the device in a place without vibrations.

Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...) and to use shielded cable for connecting signals.

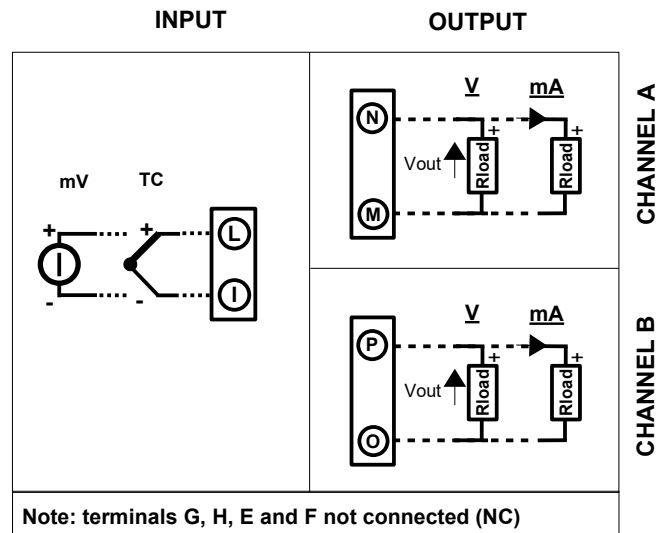
ISOLATION STRUCTURE



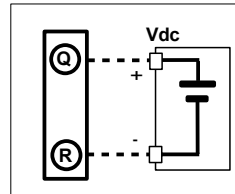
LIGHT SIGNALLING

| LED | COLOUR | STATE | DESCRIPTION |
|-----|--------|----------|----------------------------|
| PWR | GREEN | ON | Device powered |
| | | OFF | Device not powered |
| | | BLINKING | Wrong dip-switches setting |

CONNECTIONS

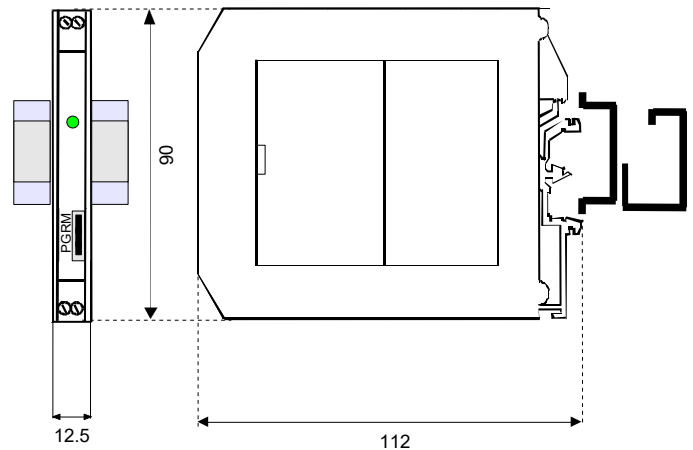


POWER SUPPLY(*)



(*) Note: for UL installation the device must be powered using a power supply unit classified NEC class 2 or SELV

DIMENSIONS (mm)

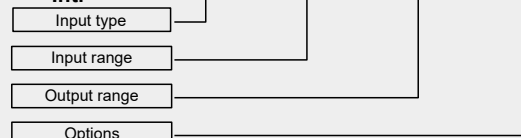


HOW TO ORDER

The device is provided as requested on the Customer's order. Refer to the section "Programming" to determine the input and output ranges. In case of the configuration is not specified, the parameters must be set by the user.

ORDER CODE EXAMPLE:

DAT 4631A / Tc K / 0÷1200 °C / 4 ÷ 20 mA / CJC Int.



The symbol reported on the product indicates that the product itself must not be considered as a domestic waste. It must be brought to the authorized recycle plant for the recycling of electrical and electronic waste. For more information contact the proper office in the user's city, the service for the waste treatment or the supplier from which the product has been purchased.