

## FEATURES

- Input for Voltage and Current
- Two independent thresholds
- Type of alarm programmable by dip-switch as high or low
- Galvanic isolated among the ways
- Trip level and hysteresis adjustable by potentiometers
- Delay time adjustable by potentiometer from 1 up to 6 sec.
- Two relays SPDT (Form C)
- Good accuracy and linearity
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN-50035



## GENERAL DESCRIPTION

The economic trip amplifier DAT 5024E is able to accept on its input normalised voltage and current signals coming from both active and passive current loops. Both the trips can be configured as high or low alarm; it is possible to regulate the trip level values by the potentiometers THR1 and THR2 located on the front side of the device.

The isolation between input and power supply is 1500 Vac. The isolation between input and the contacts of relays is 1000 Vac.

The isolations eliminate the effects of all ground loops eventually existing and allows the use of the device in heavy environmental conditions found in industrial applications.

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.

## OPERATIVE INSTRUCTIONS

The device DAT 5024E must be powered by a direct voltage included in the 18 V to 30 V range. The power supply must be applied between the terminals Q (+Vdc) and R (GND). The green led PWR switched on shows the right state of supply of the device.

The input voltage signal must be applied between the terminals N (IN V) and P (GND1), while the input current signal must be applied between the terminals O (IN I) and P (GND1) for active loops (passive input), between the terminals M (+Vaux) and O (IN I) for the passive loops (active input).

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

The input range is programmable by the dip-switches SW2. To configure it, refer to the section "Configuration tables".

To configure, calibrate and install the device refer to the section "Configuration and calibration DAT5024E" and "Installation instructions".

The red led RL1 and RL2 switched on show the state of energizing of the relays relative to the trip 1 (RL1) and the trip 2 (RL2).

## THRESHOLDS OPERATION

For the high alarm the relay goes on when the input signal is higher than the trip level and after the delay time. The relay goes off only when the input signal is lower than the trip level minus the hysteresis value or when reaches the minimum value of the input scale and after the delay time.

For the low alarm the relay goes on when the input signal is lower than the trip level and after the delay time. The relay goes off only when the input signal is higher than the trip level plus the hysteresis value or when reaches the maximum value of the input scale and after the delay time.

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

<b>INPUT</b>	
Input signal	Voltage: 0÷10 V, 0÷5 V, 2÷10 V, 1÷5 V. Current: 0÷20 mA, 4÷20 mA.
Auxiliary supply (Vaux)	18 V min @ 20 mA
Input impedance	Voltage: ≥ 1 Mohm Current: ≤ 50 ohm
<b>OUTPUT</b>	
Relays	N° 2 SPDT (Form C)
Maximum operating voltage (on resistive load)	125 Vac, 30 Vdc
Maximum operating current (on resistive load)	0.5 A @ 125 Vac, 1 A @ 30 Vdc
Maximum switching capacity (on resistive load)	62.5 VA, 30 W
Isolation between coil and contacts	1000 Vac
Isolation between contacts	1000 Vac
<b>PERFORMANCE</b>	
Calibration error	± 0.1 % of f.s.
Thermal drift	0.02 % of full scale/°C
Warm-up time	3 minutes
Power supply voltage (*)	18÷30 Vdc
Current consumption	110 mA max. with both the relays energized
Trip value regulation	Configurable from 2 up to 96 % of f.s.
Delay time value regulation (Delay)	Configurable from 1 up to 6 sec.
Hysteresis value regulation	Configurable from 1 up to 9.5 % of f.s.
Electromagnetic Compatibility (EMC) ( for industrial environments )	Immunity: EN 61000-6-2; Emission : EN 61000-6-4.
Isolation between Input and Power supply	1500 Vac, 50 Hz, 1min.
Operating temperature	-20 ÷ 60 °C
Storage temperature	-40 ÷ 70 °C
Relative humidity (not condensed)	0 ÷ 90%
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2
Weight	approx. 90 g
<b>Mechanical Specifications</b>	
Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm <sup>2</sup> /AWG 14-18
Tightening Torque	0.8 N m
Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
(*) internally protected against reverse polarity.	

## CONFIGURATION AND CALIBRATION DAT 5024E

1) Referring to the tables below, set the input range by the dip-switches SW2.

2) Referring to the unit of measure of the input scale, calculate the voltage value corresponding to the trip level using the next formula:

**V1 & V2 = [(trip value - min) \* 2.5 V] / (max-min)** where:

trip value: trip level value expressed in the same unit measure of the input;

min: minimum value of the input range in use;

max: maximum value of the input range in use.

The two trip level values relative to the channels 1 and 2 are independent from each other.

The obtained value, proportional with the input scale, must be included between 0 and 2.5 V (\*).

3) Connect a multimeter, selected as Volt, between the test points TP1 (trip 1), TP2 (trip 2) and REF (negative reference). By the potentiometers "THR1" and "THR2", adjust the measures in order to obtain the calculated values in the step 2.

4) Set the type of alarm (high or low) by the dip-switches "SW1" (1 & 3).

5) Adjust the hysteresis and delay time values by the potentiometers TRH and TRD, measuring the voltage between the test-points TP3 (delay) and TP4 (hysteresis) referring to the test point REF.

Delay and hysteresis are the same for both the trips.

It is possible to double the delay selected by the dip-switches SW1 (2 & 4).

Ex of configuration: input 4+20 mA, trip 1 as max at 16 mA, trip 2 as min at 8 mA.

$$V1 = [(16\text{mA} - 4\text{mA}) * 2.5\text{V}] / (20\text{mA} - 4\text{mA}) = 1.875\text{V};$$

$$V2 = [(8\text{mA} - 4\text{mA}) * 2.5\text{V}] / (20\text{mA} - 4\text{mA}) = 0.625\text{V};$$

Dip-switch SW1 settings : Off, Off, On, Off

Dip-switch SW2 settings : Off, On, Off, On

## CONFIGURATION TABLES

### TRIP SETTINGS

OUT	SW1	1
THR1 (MIN)	●	
THR1 (MAX)		

### DELAY SETTINGS

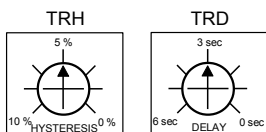
OUT	SW1	2	4
DELAY x 1			
DELAY x 2	●	●	

### INPUT SIGNAL

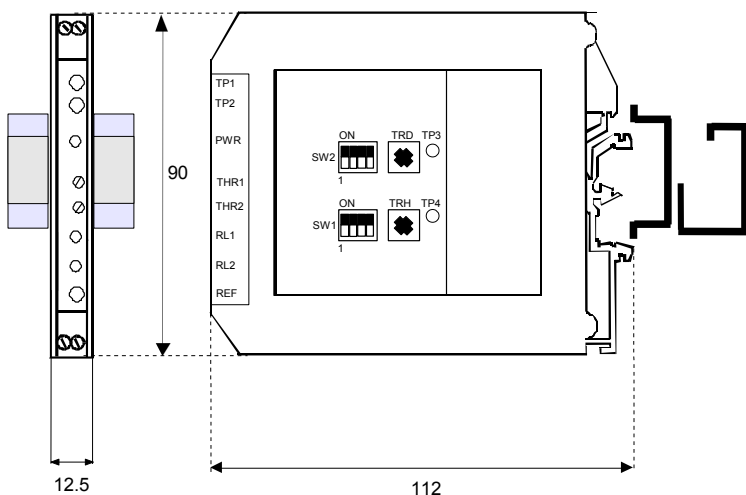
INPUT	SW2	1	2	3	4
0 ÷ 10 V				●	
2 ÷ 10 V					●
0 ÷ 5 V		●		●	
1 ÷ 5 V		●			●
0 ÷ 20 mA			●	●	
4 ÷ 20 mA			●		●

● =DIP-SWITCH: " ON"

## HYSTERESIS AND DELAY REGULATIONS



## DIMENSIONS (mm) & REGULATIONS



## INSTALLATION INSTRUCTIONS

The DAT 5024E 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 case:**

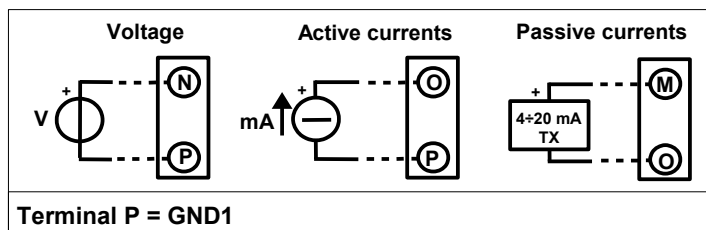
- If panel temperature exceeds 45°C and high power supply voltage (>27Vdc)
- Use of the input auxiliary supply for current input (terminal M).

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.

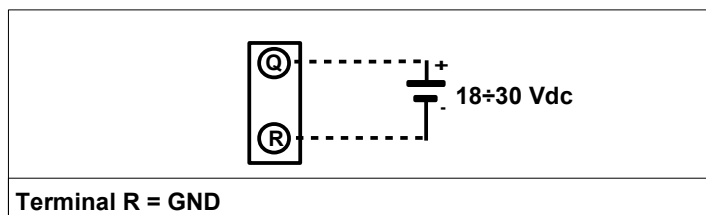
Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters, etc...) and to use shielded cable for connecting signals.

## CONNECTIONS

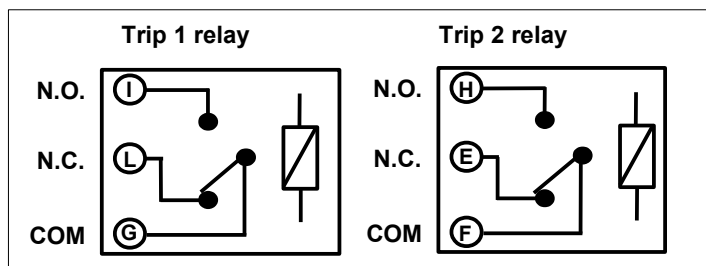
### INPUT



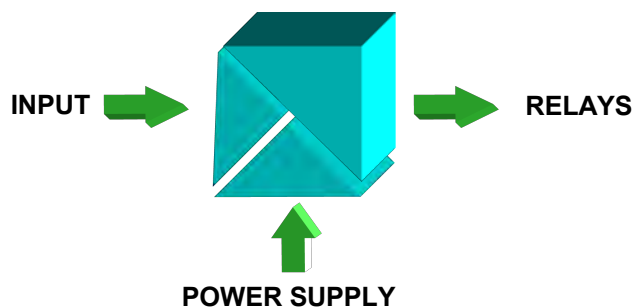
### POWER SUPPLY



### RELAYS



### ISOLATIONS STRUCTURE



### HOW TO ORDER

The DAT5024E is provided as requested on the Customer's order.

### ORDER CODE:

**DAT5024E 0÷10 V - 5 V - 7 V - MAX - MIN - 5 % - 1 sec.**

