

FEATURES

- Available analog inputs: RTD, TC, Voltage, Resistance and Current
- Two independent threshold programmable as both high alarm or one high and one low alarm
- Galvanic isolated among the three ways
- Trip level and hysteresis adjustable by potentiometer
- Delay time adjustable by potentiometer up to 25 sec.
- Two relays SPDT 250 Vac, 2A
- High accuracy
- 3 digits display for the visualisation of the trip level
- EMC compliant – CE mark
- Suitable for DIN rail mounting in compliance with EN-50022 and EN50035



GENERAL DESCRIPTION

The converter DAT 5024/D is able to accept on its input a wide range of normalised voltage signals, normalised current signals coming from both active and passive current loop, signals coming from RTDs, Thermocouples and resistance sensors.

The input type and the input range are fixed: refer to the section "Technical Specifications", table "Input type" to order the device.

The Threshold 1 is programmed as high alarm, while, by dip-switches, it is possible to set the Threshold 2 either as high or low alarm.

The trip level of each threshold can be adjusted by potentiometers. It is possible to check it by the test-points or the 3 digits display located on the front of the device; to simplify this operation, on the display the trip level appears in the same format of the input analog signal.

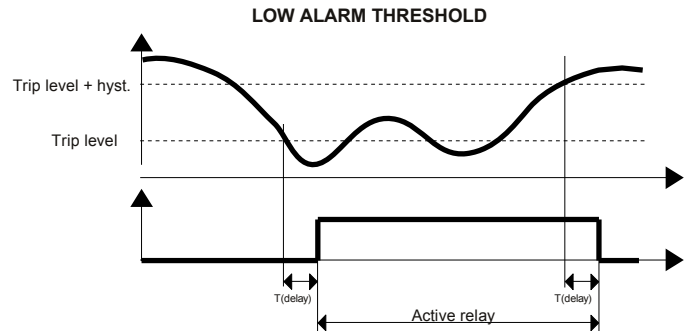
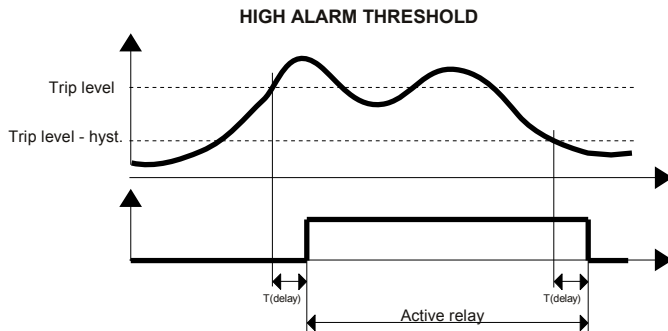
It is possible to adjust by potentiometers also the values of the hysteresis level and delay time.

The isolation between input and power supply is 2000 Vac. The isolation between input and contacts of relays is 2000 Vac. The isolation between power supply and contacts of relays is 1500 Vac.

The isolations eliminate 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 5024/D is in compliance with the Directive 2004/108/EC on the Electromagnetic Compatibility.

It is housed in a plastic enclosure of 27.5 mm thickness suitable for DIN rail mounting in compliance with EN-50022 and EN-50035 standards.

THRESHOLD 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)

Input type (*)	Min	Max	Input calibration (1)	Relays Output	N° 2 SPDT
Voltage			$\pm 0.1\% \text{ f.s.}$	Contact rating	2A , 250 Vac
50 mV	0 mV	+50 mV	Linearity (1)	2 A , 30 Vdc	
100 mV	0 mV	+100 mV	mV, V, mA	Minimum load	5 Vdc, 10mA
250 mV	0 mV	+250 mV	Tc, RTD	Max Voltage	250 Vac (50/60 Hz)
1000 mV	0 mV	+1000 mV	Input impedance	Isolation	110 Vdc
10 V	0 V	+10 V	mV, Tc		coil-to-contacts: 2000Vac
			V		between contacts: 1000Vac
			mA	Power supply	
Thermocouple			RTD excitation current	Power supply voltage	18 .. 32 Vdc
J	-210 °C	+1200 °C	Typ. 0.6 mA	Current consumption	110 mA max @ 24 Vdc
K	-210 °C	+1370 °C	Thermal drift (1)	Reverse polarity protection	60 Vdc max
R	-50 °C	+1760 °C	Full Scale		
S	-50 °C	+1760 °C	CJC comp.		
B	+400 °C	+1820 °C	$\pm 0.5\%$	Isolation voltage	
E	-210 °C	+1000 °C	CJC Thermal drift (1)	Input – power supply	2000 Vac 50 Hz, 1 min.
T	-210 °C	+400 °C	Full Scale	Input – contact of relays	2000 Vac 50 Hz, 1 min.
N	-210 °C	+1300 °C	$\pm 0.02\% / ^\circ\text{C}$	Power supply – contact of relay	1000 Vac 50 Hz, 1 min.
			Line resistance influence (1)		
RTD			mV, Tc	Temperature & humidity	
Pt100	-50 °C	+400 °C	$< 0.8 \text{ uV/Ohm}$	Operative temperature	-20°C .. +60°C
Pt1000	-200 °C	+200 °C	Auxiliary supply	Storage temperature	-40°C .. +85°C
Ni100	-60 °C	+180 °C	(only for mA input) $> 18 \text{ V @ } 20 \text{ mA}$	Humidity (not condensed)	0 .. 90 %
Ni1000	-60 °C	+150 °C	(1) referred to input Span (difference between max. and min. values)	Housing	
			Threshold	Material	Self-extinguish plastic
Resistance			Adjustable from 2 up to 98% f.s.	Mounting	DIN rail in compliance with
250 Ω	0 Ω	250 Ω	Hysteresis	Weight	EN-50022 and EN-50035
2 KΩ	0 Ω	1800 Ω	Adjustable from 0.5 up to 10 % f.s.	EMC (for industrial environments)	about 125 g.
			Delay	Immunity	EN 61000-6-2
Current			Adjustable up to 25 sec.	Emission	EN 61000-6-4
20 mA	0 mA	20 mA	Display		
			3 digits (h=10 mm)		

* Specify in phase of order

OPERATIVE INSTRUCTIONS

The converter DAT 5024/D must be powered by a direct voltage included in the 18 V to 32 V range. The power supply must be applied between the terminals Q (+V) and R (-). The leds RL1 and RL2 switched on show the state of energizing of the relays relative to the threshold 1 (RL1) and the threshold 2 (RL2). The input connections must be made as shown in the section " Analog input connections", in function of the device ordered; specify in phase of order the type of input and the input range.

The relays connections must be made as shown in the section " Contacts of relays"

To configure and calibrate the device refer to the section "Configuration".

To install the device refer to the section "Installation instructions".

CONFIGURATION

By the 3 digits display, it is possible to visualize the trip level in the same format of the input signal; the resolution of the measure depends from the input range; set the dip-switch on the front side to the position 1 or 2 to visualize the trip level relative to the threshold in use. The trip levels are adjusted by the potentiometers "THR1" and "THR2" located on the front of the device; the delay time and the hysteresis value are the same for both the thresholds. Follow next steps in order to set the correct trip level value.

1- Refer to the section " Technical Specification ", table "Input type" and find the input type in use.

2 – Refer to the unit of measure of the input scale and calculate the voltage value corresponding to the threshold value using the next formula:

$$V = (\text{trip value} - \text{min}) / (\text{max} - \text{min})$$

where:

min: minimum value of the input type in use;

max: maximum value of the input type in use;

trip value: threshold value expressed in the unit measure of input.

The obtained value, proportional with the input scale, must be included between 0 and 1 V (*).

3 – Connect a multimeter, selected as Volt, between the test points TP1 and REF. By the potentiometer "THR1", adjust the measure in order to obtain the calculated value in the step 2; with such operation the threshold 1 value has been adjusted. Repeat the same operation for the threshold 2 using the potentiometer "THR2" and the test point TP2 (referred to the test point REF).

4 – Open the door located on the side of device.

5 – Set the type of alarm (high or low) for the threshold 2 by the DIP-switch "SW1".

6 – Adjust the delay time value (**) by the dedicated potentiometer as indicated in the section "Dimensions and regulations".

7 – Adjust the hysteresis(***) level by the dedicated potentiometer as indicated in the section "Dimensions and regulations".

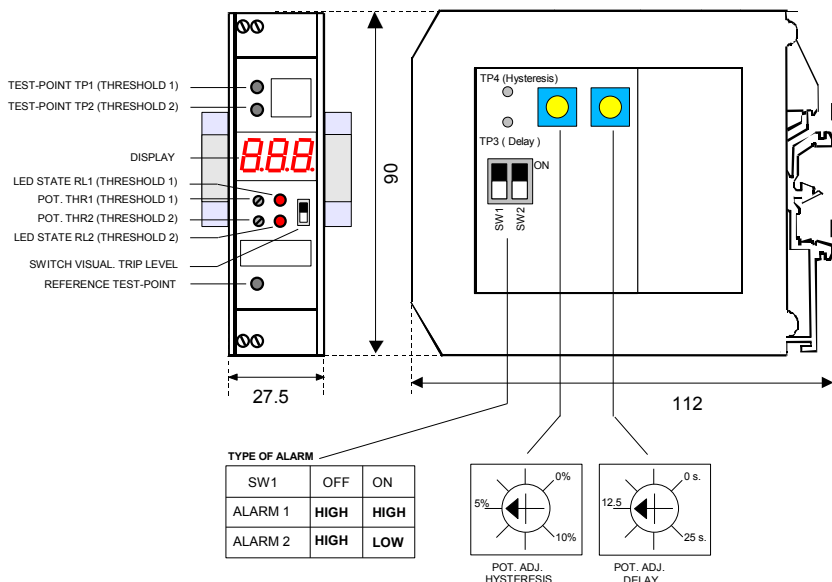
NOTES:

(*)The maximum threshold value is internally limited at 98 %, the minimum at 2 %; the values of de-energizing for the relays "Trip value + hysteresis" and "Trip value – hysteresis" are limited to not get over the limits of the scale of measure.

(**) The delay time value is the same for the energizing and de-energizing of the relay; the minimum time between these operation it's about 1 second (time to have a stable measure) .

(***)The minimum hysteresis level value is internally limited at 0.5 %.

DIMENSIONS (mm) & REGULATIONS



INSTALLATION INSTRUCTIONS

The DAT 5024/D 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).

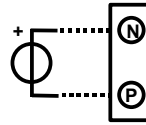
Make sure that sufficient air flow is provided for the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid that devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.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

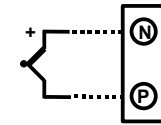
CONNECTIONS

ANALOG INPUT CONNECTIONS

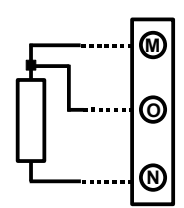
Voltage



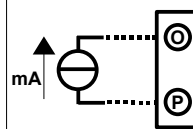
Thermocouple



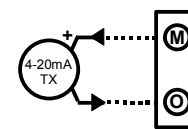
RTD / Res. 3 wires



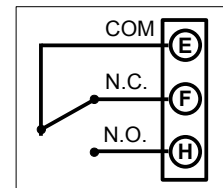
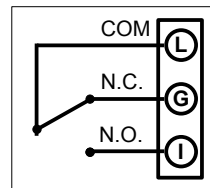
Current (active loop)



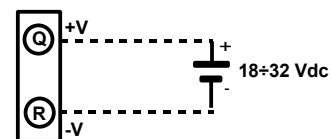
Current (passive loop)



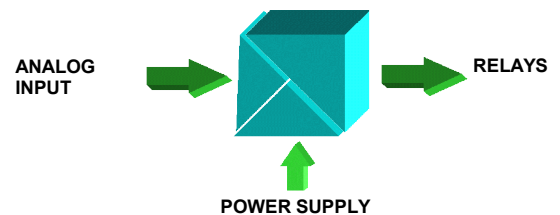
CONTACTS OF RELAYS



POWER SUPPLY CONNECTIONS



ISOLATION STRUCTURE

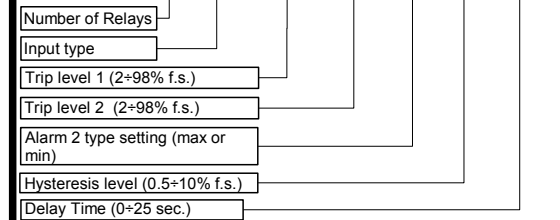


HOW TO ORDER

In phase of order it is necessary to specify the input type (refer to the " Technical Specifications " section) and the number of relays. The DAT 5024/D is provided as requested on the Customer's order.

ORDER CODE

DAT 5024/D - 2 - Pt100 - 100°C - 50°C - MIN - 5% - 2 sec.



■ = Requested □ = Optional