



Isolated, configurable Analog Trip Amplifier

DAT5024

FEATURES

- Voltage, Current, Resistance, Tc or RTD Analog Input
- Two independent Thresholds
- One High Alarm type threshold and one configurable High or Low Alarm type threshold
- Optional 3 digit display for set-point visualization (DAT5024/D)
- Opzional 'Low Profile' version (DAT5024/L)
- Set-point and Hysteresis adjustable by potentiometer
- Delay time adjustable up to 25 sec.
- Two SPDT 250Vac, 2A Relay outputs (DAT5024, DAT5024/D)
- (110Vac, 1A for DAT5024/L)
- EMC compliant - CE Mark
- Suitable for DIN rail mounting

APPLICATIONS

Control and monitoring of signals for:

- Process controls
- Automation systems
- Energy sources managements



GENERAL INFORMATION

The DAT 5024 analog trip amplifier is able to accept at its input a large range of voltage or current signals; it is also able to interface directly temperature sensors like thermocouples or RTDs.

The Threshold n°1 works as High Alarm, while the Threshold n°2 can be configured by DIP-switch as High Alarm or Low Alarm. The set-point is adjustable by means of the potentiometers located on the front of the enclosure. To simplify this operation, it is available a version with a 3-digit display that visualizes the set-point value, in the same measurement unit of the input analog signal. It is possible to set, by potentiometer adjustments, the value of Hysteresis and Delay time. Moreover it is available a 'low profile' version of the device suitable for use in those applications where the available space is reduced. The input circuit is isolated at 2000 Vac among the power supply and the relay contacts. The power supply circuit is isolated at 1500 Vac among the relay contacts.

An auxiliary power source (Vaux) is provided for the input sensor, allowing to connect both active and passive sensors or transmitters. The DAT 5024 unit, developed, manufactured and tested in strict accordance with the quality assurance standard UNI EN ISO9001:2000, is in compliance with the directive 89/336 EEC on Electromagnetic Compatibility. DAT 5024 models are housed into a strong plastic enclosure of thickness included between 12.5 to 27.5 mm, allowing an high density mounting on DIN rail.

TECHNICAL SPECIFICATIONS (Typical @25°C and in normal conditions)

INPUT

Input Signal
Auxiliary Supply
Input impedance

Voltage, Current, Resistance, TC or RTD (see "Input type and range" table)
18V min. @ 20mA
> 500 KOhm for Volt input ; > 1 MOhm for mV, Tc input
< 50 Ohm for Current input

OUTPUT

Relays
Max. load (resistive only)

N° 2 SPDT (Form C)
250 Vac, 2 A (DAT5024, DAT5024/D)
110 Vac, 1 A (DAT5024/L)
1000 Vac

Isolation between Contacts

POWER SUPPLY

Voltage supply
Current consumption
Polarity reversal protection

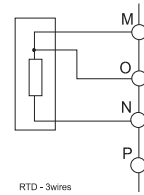
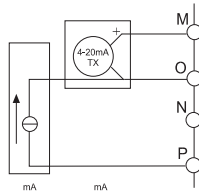
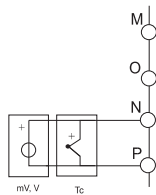
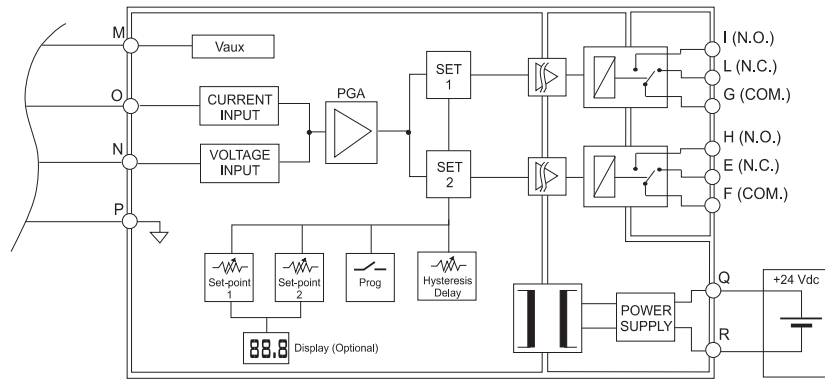
18 ÷ 32 Vdc
80 mA max with both active relays (110 mA max with display)
60 Vdc reversal max.

CHARACTERISTICS and PERFORMANCES

Calibration Error
Linearization error
Thermal Drift
Warm-up time
Cold Junction Compensation (TC)
Sensor excitation current (RTD)
Hysteresis
Delay time
Set-point Display (optional)
Electromagnetic Compatibility (EMC)
Isolation Supply / Input and Input / Contacts
Isolation Supply / Contacts
Operatin Temperature
Storage Temperature
Relative Humidity (non condensing)
Weight

± 0.1% of f. s.
± 0.05% of f.s. for mV, V, mA ; ± 0.1% of f.s. for Tc and RTD
± 0.02% of f.s./°C
3 min.
± 0.5 °C
0.6 mA typ.
Adjustable 0.5 to 10% F.S.
Adjustable up to 25 sec.
3 digit (0.4" height)
In compliance with EN50081-2 and EN50082-2
2000Vac, 50 Hz, 1 min.
1500Vac(DAT5024, DAT5024/D) ; 1000Vac (DAT5024/L)
- 20 ÷ 60 °C
- 40 ÷ 100 °C
0 ÷ 90 %
approx. 125 g.

BLOCK DIAGRAM



INPUT TYPE AND RANGE

TC		
Input	Min	Max
J	-210 °C	+1200°C
K	-210 °C	+1370°C
R	-50 °C	+1760°C
S	-50 °C	+1760°C
B	+400 °C	+1820°C
E	-210 °C	+1000°C
T	-210 °C	+400°C
N	-210 °C	+1300°C

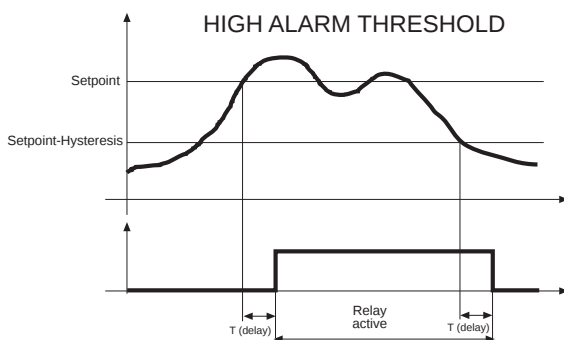
RTD		
Input	Min	Max
Pt100	-50 °C	+400°C
Pt1000	-200 °C	+200°C
Ni100	-60 °C	+180°C
Ni1000	-60 °C	+150°C

Resistance		
Input	Min	Max
250 Ohm	0 Ohm	250 Ohm
2 KOhm	0 Ohm	2000 Ohm

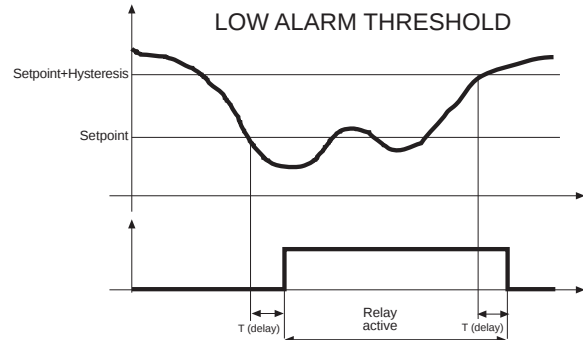
Voltage		
Input	Min	Max
50 mV	0 mV	+50 mV
100 mV	0 mV	+100 mV
500 mV	0 mV	+500 mV
1 V	0 V	+1 V
10 V	0 V	+10 V

Current		
Input	Min	Max
20 mA	0 mA	+20 mA

THRESHOLD OPERATION



On the High Alarm threshold, the relay goes ON when the input signal is higher than the set-point. The relay is released only when the input value is lower than the set-point minus the hysteresis value, or when the input value reaches the minimum value of the input scale.



On the Low Alarm threshold, the relay goes ON when the input signal is lower than the set-point. The relay is released only when the input value is higher than the set-point plus the hysteresis value, or when the input reaches the maximum value of the input scale.

The value of set-points and hysteresis can be set by adjusting the proper potentiometer: a 0-1Vdc voltage proportional to the input signal scale (0 volt corresponds to the minimum value and 1V corresponds to the full scale) is available on the test points located on the front panel "TP1" and "TP2", both the values must be referred to the "REF" test point.

NOTES:

- The maximum value of the set-point is limited to 98% of the input signal full scale, while the minimum value is limited to 2%.
- The minimum value of the hysteresis is limited to 0.5% of the full scale.
- The values "setpoint+hysteresis" and "setpoint-hysteresis" are limited to don't exceed the input scale limits.
- The Delay time works on both the relay connection and disconnection. The minimum time between connection and disconnection of a relay is about 1 second (due to measure stabilization)
- Hysteresis and delay time are the same for both the thresholds.

OPERATING INSTRUCTIONS

The device must be powered with a voltage, included in the 18..32 Vdc value range, which must be applied between the terminal Q(+) and R(-). The PWR led switched on indicates a correct power supply, while the RL1 and RL2 red led indicates the relays excitation status.

The input sensor must be connected as shown in the wiring diagram; in the order phase, indicate the input type and range. It is possible to adjust the threshold level by means of potentiometers and test-points located on the front of the enclosure and the value of Hysteresis and Delay, by means of the potentiometers, test points and disp-switches available by opening the suitable window located on the side of the enclosure.

CONFIGURATION

The threshold's set-point can be adjusted by means of potentiometers located on the front of the enclosure. To configure the thresholds, follow these steps:

1- Calculate the value of the threshold, referred to the input scale, as:

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

The values "max" and "min" are referred to the "Input type and range" table; "setpoint" is the desired value expressed in the same unit value of the input signal.

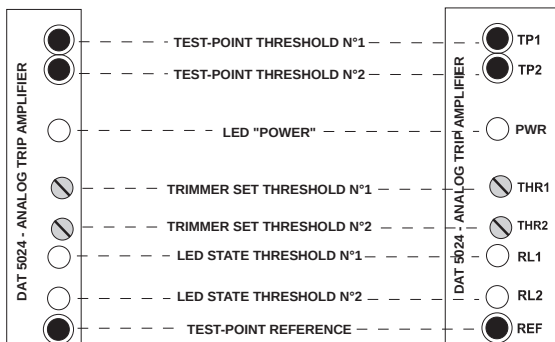
2 -The "V" value, that will be included between 0 and 1, indicates the voltage to which the potentiometer will be adjusted ("THR1" for the N°1 threshold and "THR2" for the N°2 threshold). The value can be controlled by means of a voltmeter, measuring the voltage on test-point "TP1" for the N°1 threshold and "TP2" for the N°2 threshold, both the values must be referred to "REF" test point. Potentiometer regulations and test-points for the thresholds adjustment are located on the front of the enclosure. To simplify this operation, it is available a version with a 3 digit display that visualize the setpoint value, in the same format of the input analog signal.

3 - Set the alarm type (High or Low) for the N°2 threshold by means the "SW1" DIP-switch available by opening the window located on the side of the enclosure.

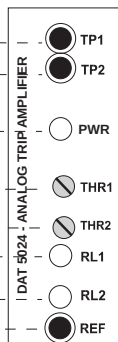
4 - Adjust the value of Hysteresis and Delay, by means of the potentiometers availables by opening the window, and measuring the voltage on "TP3" test-point for Delay and "TP4" for Hysteresis, both referred to the "REF" test point.

FRONT PANEL

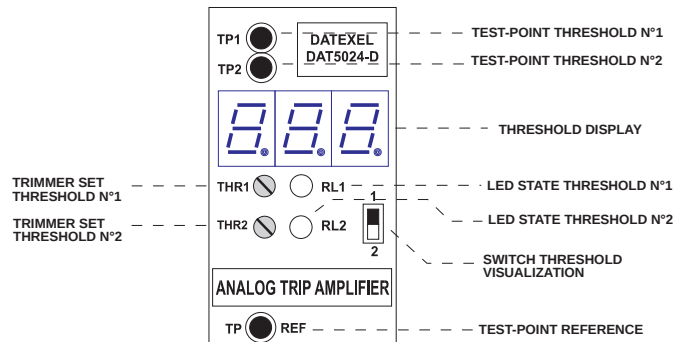
DAT 5024 /L



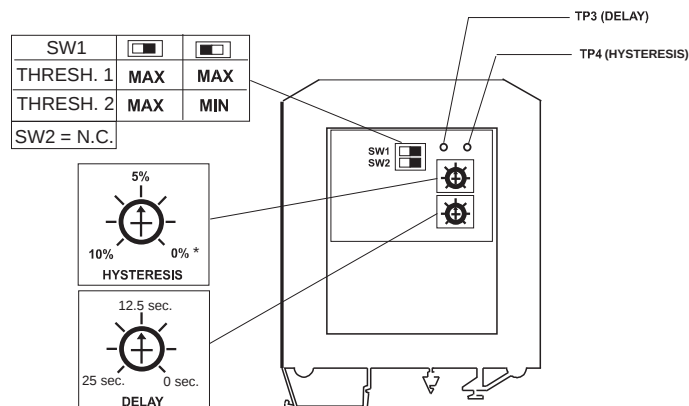
DAT 5024



DAT 5024 /D



VIEW WITH OPENED WINDOW



* NOTE: the minimum value of the hysteresis is internally limited to 0.5%F.S.

INSTALLATION INSTRUCTIONS

The DAT 5024 device is suitable for fitting to DIN rails in vertical position. For optimum operation and long life, make sure that sufficient air flow is provided or the device avoiding to place raceways or other objects which could obstruct the ventilation slits. Moreover it is suggested to avoid the devices are mounted above appliances generating heat; their ideal place should be in the lower part of the panel.

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

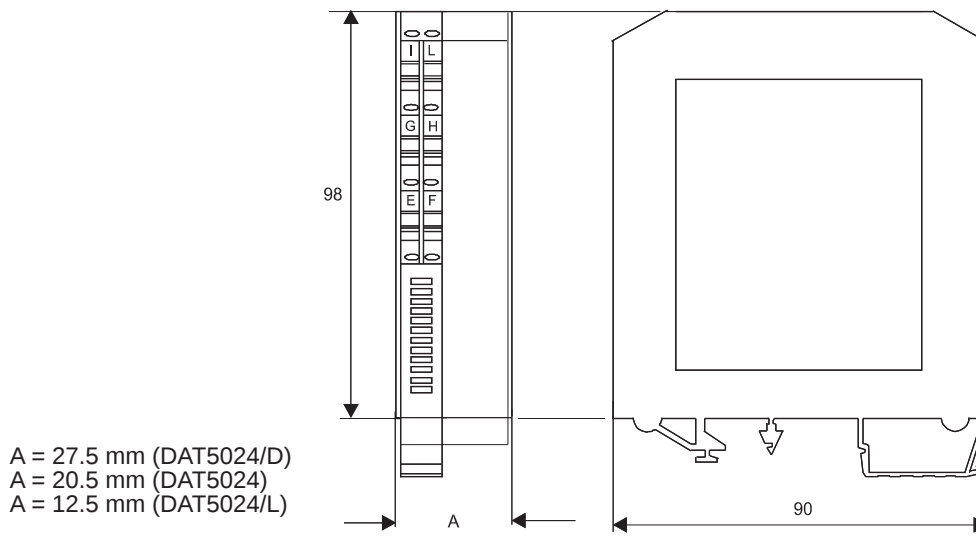
- If panel temperature exceeds 45°C and at least one of the overload conditions exist.
- If panel temperature exceeds 35°C and both the overload conditions exist.

The overload conditions are the following:

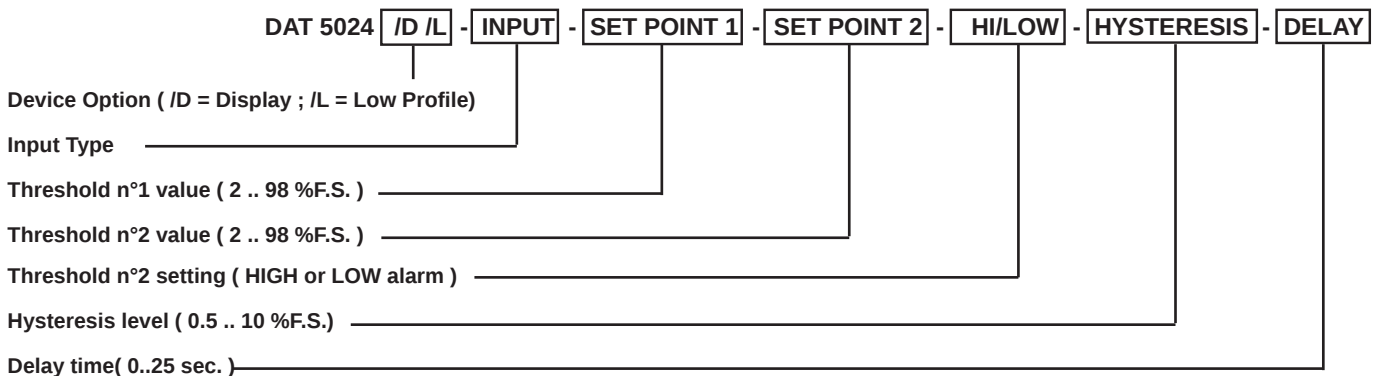
- High supply voltage: >27Vdc
- Use of the Input Auxiliary power supply for current input (terminal M)

It is recommended to use shielded cable for connecting signals. The shield must be connected to an earth wire provided for this purpose. Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...).

DIMENSIONS (mm.)



HOW TO ORDER:



Ordination example: DAT5024 with display, Tc J input, threshold N°1 = 600°C, threshold N°2 (low alarm) = 0°C, hysteresis = 5%f.s., delay = 1s.

" DAT5024 - D - Tc J - 600 °C - 0 °C - LOW - 5 % - 1sec. "

EDIT.01.05-REV.04

DATEXEL S.r.l. - Via Oslavia, 21- 21049 TRADATE (VA) ITALY - Tel 0331 - 841070 - Telefax 0331 - 841950

La società Datexel si riserva il diritto di modificare in tutto o in parte le caratteristiche dei propri prodotti senza alcun preavviso
Datexel reserves its right to modify the characteristics of its products totally or in part without warning at any time.