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Frequency Converter Trip Amplifier with Relay Output DAT4540R

DAT 4540

FEATURES

- **Measure of the frequency for digital contacts from Namur, TTL, NPN, PNP, Tachometer, Volt sensors**
- **Configurable output as current or voltage**
- **Double optional trip alarm**
- **Fault alarm condition for Namur sensor**
- **Configurable by Dip-switch or PC**
- **High accuracy**
- **On-field reconfigurable**
- **Galvanic insulation among all ways**
- **CE / UKCA mark**
- **Suitable for DIN rail mounting in according to EN-50022 and EN-50035 standards**

GENERAL DESCRIPTION

The isolated frequency converter DAT 4540 is able to measure, up to 20 KHz, the frequency of TTL, Namur, NPN, PNP and Tachometer digital signals. In function of programming, the measured values are converted in a current or voltage signal. Moreover two relays are available in order to be programmed as trip alarm (version "-R"). For the Namur input is continuously checked the integrity of the sensor; in case of fault (short circuit or interruption), on the transistor output is generated an alarm.
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 PC, the user can program all the parameters of the devices for his own necessities.
The 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.
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 input ,output and power supply 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

Input type	
Namur (DIN 19234)	
Low level Trig.	< 1.2 mA
High level Trig.	> 2.1 mA
Aux. Voltage	8.2 V – 8 mA
Impedance	~ 1000 Ohm
Interruption Alarm	< 0.2 mA
Short Circuit Alarm	> 7.0 mA
TTL	
Low level Trig.	< 0.8 V
High level Trig.	> 2.0 V
Impedance	> 20 KOhm
PNP	
Low level Trig.	< 4.0 V
High level Trig.	> 7.0 V
Aux. Voltage	17 V – 20 mA
Impedance	~ 2.2 KOhm
Tacho	
Max. Voltage	30 Vpp
Low level Trig.	< -50 mV
High level Trig.	> +50 mV
Impedance	> 100 KOhm
Voltage (programmable)	
Trigger Level	0.05 V ÷ 7.0 V
Aux. Voltage	5 ÷ 17 V @ 20 mA
Impedance	> 20 Kohm
Frequency	0.1 Hz ÷ 20 KHz
Sample Time	< 50ms + period

OUTPUT

Output type	**Min**	**Max**	**Span min**
Current	0 mA	20 mA	4 mA
Voltage	0 V	10 V	1 V

Output calibration	
Current	± 7 uA
Voltage	± 5 mV
Aux. Voltage	>12V @ 20 mA
Burn-out values	
Max. output value	22 mA or 11 V
Min. output value	0 mA or -0.6 V
Output load Resistance - Rload	
Current output	< 500 Ω
Voltage output	> 10 KΩ
Short circuit current	30 mA max.
Transistor Output	
Max. load (Resistive only)	30 Vdc, 100mA
Relay Outputs (Only for version "-R")	
	N° 2 SPDT
Max. Load (Resistive)	250 Vac, 2A
Isolation between terminals	1000 Vac max

GENERAL SPECIFICATIONS

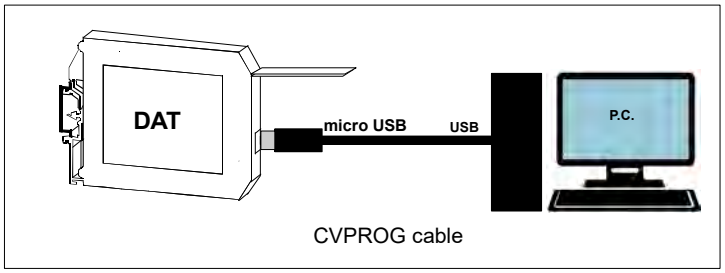
Power supply voltage	20 .. 30 Vdc
Reverse polarity protection	60 Vdc max
Current consumption	
Current output	90 mA max.
Voltage output	30 mA max.
(+ 10mA for each Relay output active)	
ISOLATION	
Among all ways	1500 Vac, 50 Hz, 1 min
ENVIRONMENTAL CONDITIONS	
Operative Temperature	-20°C .. +60°C
Storage Temperature	-40°C.. +85°C
Humidity (not condensed)	0 .. 90 %
Maximum Altitude	2000 m
Installation	Indoor
Category of installation	II
Pollution Degree	2
MECHANICAL SPECIFICATIONS	
Material	Self-extinguish plastic
IP Code	IP20
Wiring	wires with diameter 0.8÷2.1 mm² /AWG 14-18
Tightening Torque	0.8 N m
Mounting	in compliance with DIN rail standard EN-50022 and EN-50035
Weight	about 90 g
CERTIFICATIONS	
EMC (for the Industrial Environments)	
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

PROGRAMMING

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.

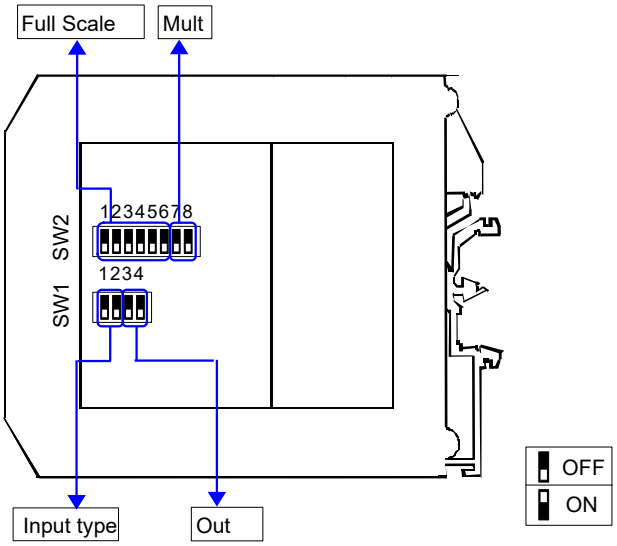


CVPROG cable

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.

CONFIGURATION BY DIP-SWITCH



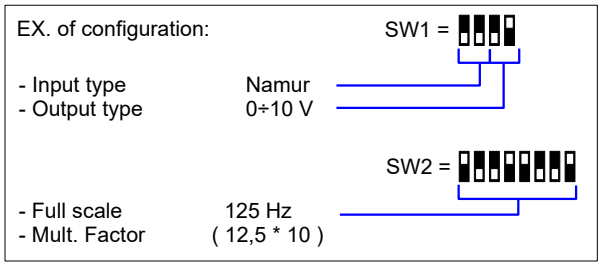
1) Open the suitable door on the side of the device.

2) Set the input type by the dip-switch SW1 [1..2] (see TAB.1)

3) Set the output type by the dip-switch SW1 [3..4] (see TAB.2)

4) Set the input Full Scale value by the dip-switch SW2 [1..6] (see TAB.3)

5) Set the multiplication factor by the dip-switch SW2 [7..8] (see TAB.3)



NOTE:
- It is also possible to see how to set the dip-switches using the wizard of the configuration software (connect the device to the PC following the procedure described in the section “Configuration by PC”)

DIP-SWITCH CONFIGURATION TABLES

TAB.1
Input type

SW1 1 2	
	Namur
	Tacho
	NPN/TTL
	PNP

Tab.2
Output type

SW1 3 4	
	0-20 mA
	4-20 mA
	0-10 V
	0-5 V

TAB.3 – Full Scale settings

Mult. Factor		Full Scale											
SW2 7 8	Mult	SW2 1 2 3 4 5 6	Hz	SW2 1 2 3 4 5 6	Hz	SW2 1 2 3 4 5 6	Hz	SW2 1 2 3 4 5 6	Hz
	1000		Default		8		16		24
	100		0.5		8.5		16.5		24.5
	10		1		9		17		25
	1		1.5		9.5		17.5		25.5
			2		10		18		26
			2.5		10.5		18.5		26.5
			3		11		19		27
			3.5		11.5		19.5		27.5
			4		12		20		28
			4.5		12.5		20.5		28.5
			5		13		21		29
			5.5		13.5		21.5		29.5
			6		14		22		30
			6.5		14.5		22.5		30.5
			7		15		23		31
			7.5		15.5		23.5		31.5

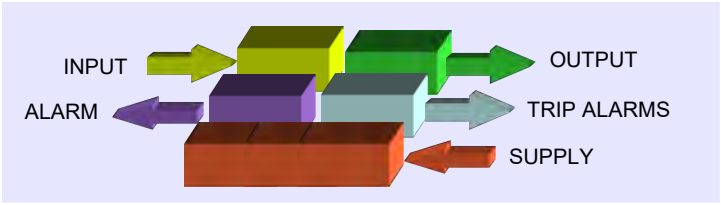
INSTALLATION INSTRUCTIONS

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

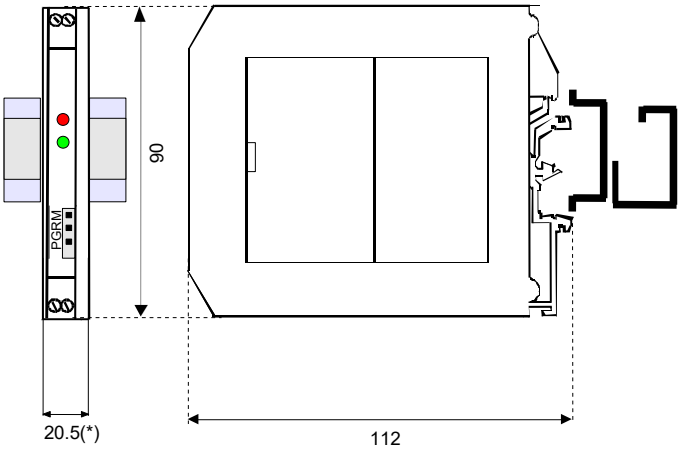
When the devices are installed side by side it may be necessary to separate them by at least 5 mm in the following cases:
- If panel temperature exceeds 45°C and the device is powered with high power supply value (> 27 Vdc).
- Use of output active current.
- Use of the input auxiliary supply .

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

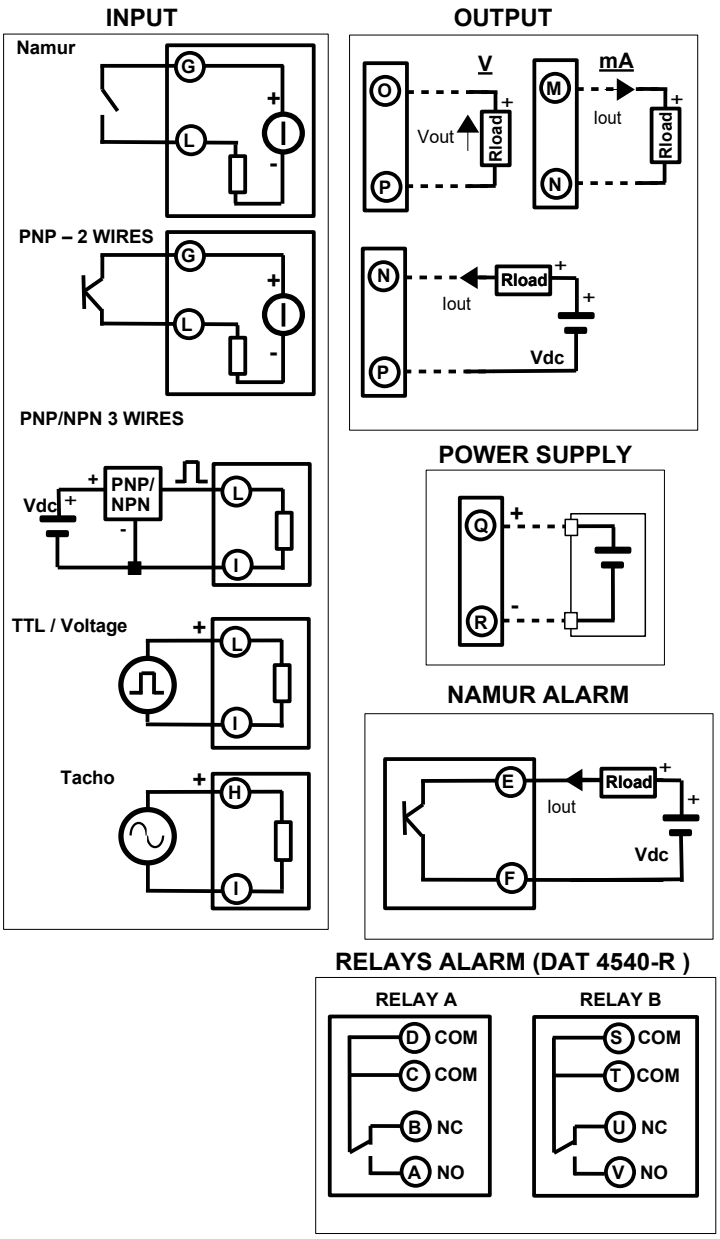


DIMENSIONS (mm)



(*) **NOTE**:
"-R" Version: 20.5 mm thickness
Standard Version: 12.5 mm thickness

CONNECTIONS



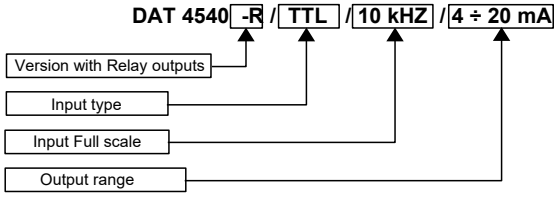
LIGHT SIGNALLING

LED	COLOUR	STATE	DESCRIPTION
PWR	GREEN	ON	Device powered
		OFF	Device not powered
		BLINKING	Wrong dip-switch setting
ALARM	RED	ON	Trip Alarm or Fault Alarm active
		OFF	Trip Alarm or Fault Alarm not active

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:



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.