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

RTD/RES   OUTPUT

DC SUPPLY

GENERAL DESCRIPTION
The isolated converter DAT 4531 B is able to measure and linearise the standard RTDs and resistances with 2 or 3 wires cable 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.
Moreover, by Personal Computer the user can program all of the device's parameters for his own necessity. For all the sensors it is possible to set the cable compensation with 2 or 3 wires.
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, output 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 4531 B 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

Input type	Min	Max	Min.Span
RTD (2, 3 wires)			
Pt100	-200°C	850°C	50°C
Pt1000	-85°C	185°C	30°C
Ni100	-60°C	180°C	50°C
Ni1000	-60°C	150°C	30°C
RES. (2, 3 wires)	0 Ω	500 Ω	50 Ω
	0 Ω	2000 Ω	50 Ω

Accuracy (1)
RTD   the higher of ±0.1% and ±0.2°C
Low Res.   the higher of ±0.1% and ±0.15 Ω
High Res.   the higher of ±0.2% and ± 1 Ω

Linearity (1)
RTD   ± 0.1 % f.s.

Sensor excitation current
RTD,Res   500 uA

Line resistance influence (1)
RTD 3 wires   0.05%/Ω (50 Ω max balanced)

Thermal drift (1)
Full scale   ± 0.01% / °C

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

OUTPUT

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

Output resolution
Current   7 uA
Voltage   4 mV

Burn-out values
Max. output value   22 mA or 10.6 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   26 mA max.

Response time (10÷ 90%)   about 500 ms

POWER SUPPLY
Power supply voltage   18 .. 30 Vdc
Reverse polarity protection 60 Vdc max
Current consumption
Current output   35 mA max.
Voltage output   20 mA max.

ISOLATION
Among all the ways   1500 Vac,
                            50 Hz, 1 min

ENVIRONMENTAL CONDITIONS
Operative Temperature   -20°C .. +60°C
UL Operative Temperature   -10°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 mm^2 /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 industrial environments)
Immunity   EN 61000-6-2
Emission   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

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 DATESOFT from version 2.7 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 DATESOFT
4) Select the COM port in use and click on "Open COM".
5) Click on the icon "Program".
6) Set the programming data.
7) Click on the icon "Write" to send the programming data to the device.
*For information about DATESOFT refer to the software's user guide.*

CVPROG cable
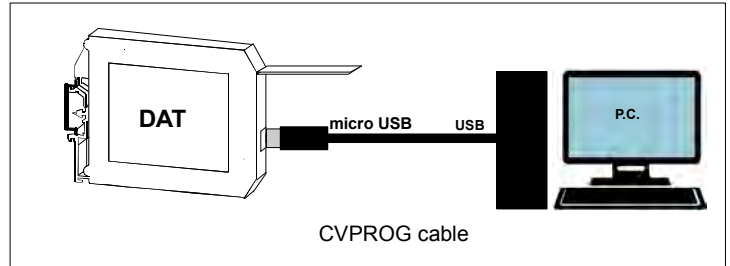
CONFIGURATION BY DIP-SWITCHES
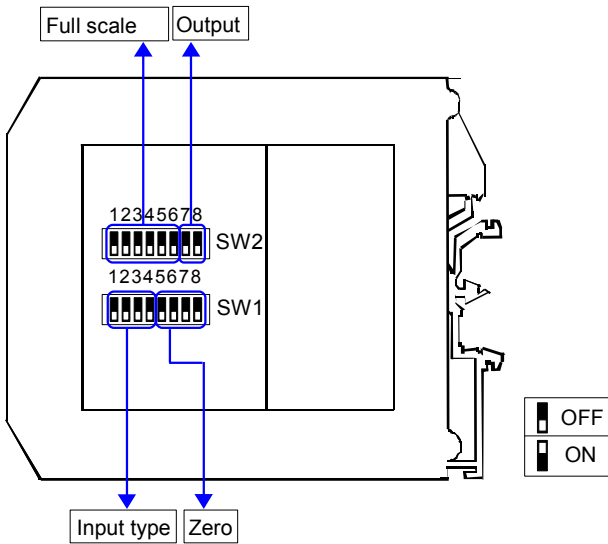
1) Open the suitable door on the side of the device.

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)

EX. of configuration:

- Input type   Pt100
- Zero value   -50 °C

- Full scale value 200 °C
- Output type   4-20 mA
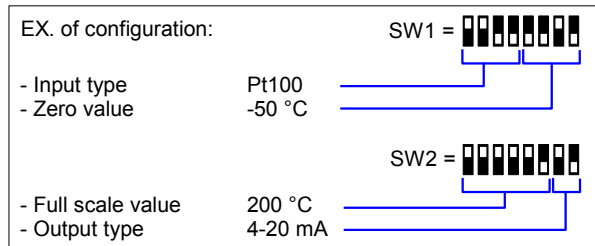
NOTE:
- It is also possible to set the dip-switches using the wizard of the configuration software following the procedure described in the section "Configuration by PC" until the step 6 and clicking on "Switch".

DIP-SWITCH CONFIGURATION TABLES

TAB.1
Input type settings

TAB.2
Output settings

NOTES:

* For all the input type selected by dip-switches, the compensation of wires is fixed at 3.

* To configure the range for the input type selected (TAB.1) refer to the section of the TAB.3 on next page relative to it (ex: for Pt100 use the table TAB.3c).

* 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).

* 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".

TAB.3a – Settings for Resistance < 2KOhm

Zero (SW1 5678) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω
Default	Default	800	1150	1600	
0	500	820	1175	1650	
150	520	840	1200	1700	
200	540	860	1225	1750	
250	560	880	1250	1800	
300	580	900	1275	1850	
350	600	920	1300	1900	
400	620	940	1325	1950	
450	640	960	1350	2000	
500	660	980	1375	2000	
550	680	1000	1400	2000	
600	700	1025	1425	2000	
650	720	1050	1450	2000	
700	740	1075	1475	2000	
750	760	1100	1500	2000	
800	780	1125	1550	2000	

TAB.3b – Settings for Resistance < 500 ohm

Zero (SW1 5678) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω	Full scale (SW2 123456) Ω
Default	Default	125	210	370	
0	50	130	220	380	
10	55	135	230	390	
20	60	140	240	400	
30	65	145	250	410	
40	70	150	260	420	
50	75	155	270	430	
75	80	160	280	440	
100	85	165	290	450	
125	90	170	300	460	
150	95	175	310	470	
175	100	180	320	480	
200	105	185	330	490	
225	110	190	340	500	
250	115	195	350	500	
300	120	200	360	500	

TAB.3c – Settings for Pt100, Pt1K, Ni100, Ni1K

Zero (SW1 5678) °C	Full scale (SW2 123456) °C	Full scale (SW2 123456) °C	Full scale (SW2 123456) °C	Full scale (SW2 123456) °C	Full scale (SW2 123456) °C
Default	Default	75	210	370	
-200	0	80	220	380	
-150	5	85	230	390	
-100	10	90	240	400	
-50	15	95	250	425	
-40	20	100	260	450	
-30	25	110	270	475	
-20	30	120	280	500	
-10	35	130	290	525	
0	40	140	300	550	
5	45	150	310	600	
10	50	160	320	650	
20	55	170	330	700	
30	60	180	340	750	
50	65	190	350	800	
100	70	200	360	850	

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.
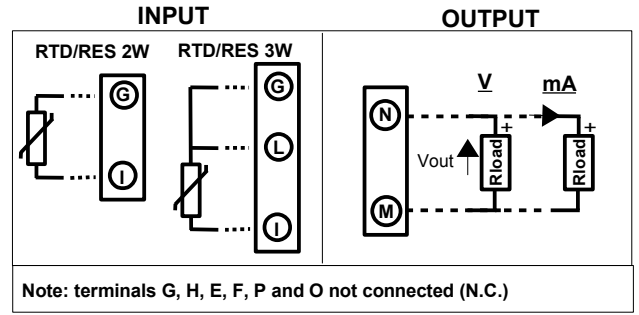Install the device in a place without vibrations.
Moreover it is suggested to avoid routing conductors near power signal cables (motors, induction ovens, inverters etc...) and to use shielded cable for connecting signals.
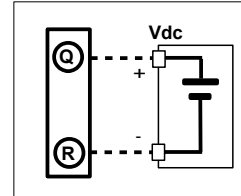
ISOLATION STRUCTURE

INPUT → OUTPUT

SUPPLY

CONNECTIONS

INPUT

RTD/RES 2W   RTD/RES 3W

OUTPUT

V   mA

Vout

Note: terminals G, H, E, F, P and O not connected (N.C.)
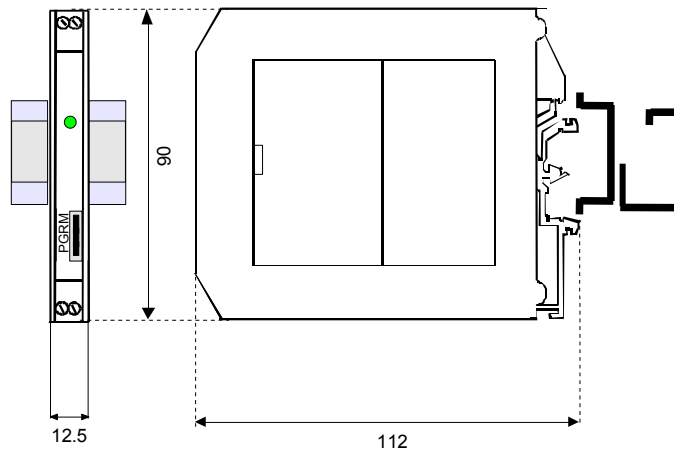
POWER SUPPLY(*)

Vdc

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

LIGHT SIGNALLING

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

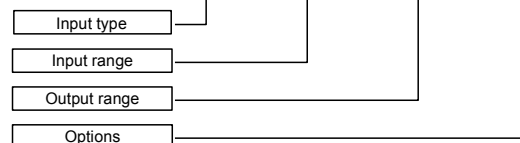## DIMENSIONS (mm)

90

12.5

112

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 4531B / Pt100 / 0 ÷ 200 °C / 4 ÷ 20 mA / 3 wires

Input type
Input range
Output range
Options