

Low profile dip-switch programmable transmitter for Thermocouple

DAT 1112



FEATURES

- Input for thermocouple type J, K, N, R, S and T
- Input for thermocouple type B or E available on request
- Input range in °C or °F
- Span and Zero programmable by DIP-switches
- 4÷20 mA “ voltage linear ” output on current loop
- High accuracy
- EMC compliant – CE mark
- Suitable for DIN B in-head mounting
- Option for mounting on DIN rail in compliance with DIN 50022 (Option DIN RAIL)

GENERAL DESCRIPTION

The transmitter DAT 1112 is designed to provide a 4÷20 mA output on current loop linear and proportional with the value of voltage generated from the thermocouple connected to its input.

The DAT 1112 doesn't execute the linearisation of the input signal; this feature allows to use the transmitter with acquisition systems with an internal linearisation software.

It is possible to program the input range by the 4 way DIP-switches available removing the protection plastic cap located on the top of device (see the section "Input ranges table").

The regulation of the zero and full-scale value are made using the ZERO and SPAN potentiometers.

The DAT 1112 is in compliance with the Directive 2004/108/EC on the Electromagnetic Compatibility.

It is housed in a self extinguish plastic enclosure for in-head mounting.

Moreover it is possible to mount (by proper mounting kit) the device on DIN RAIL .

USER INSTRUCTIONS

The transmitter DAT 1112 must be powered by a direct voltage between 12 to 32 V and applied to the terminals +V and -V.

The 4÷20 mA output signal is measurable in the power loop as shown in the section "Output/Power supply connections"; Rload is the input impedance of instruments on the current loop; to obtain a correct measure, the value of Rload will be calculated as function of the power supply value (see section "Load characteristic").

The input sensor must be connected to the terminals 1(+TC) and 2 (-TC) as show in the section "Input connections"; in case of use of a shielded cable, connect the shield to the terminal 2 .

The configuration of the input range must be made by DIP-switches. To configure the device refer to the section "Input ranges table".

Regulate the output value by the ZERO and SPAN regulations.

To calibrate and install the transmitter refer to sections " DAT1112: configuration and calibration" and "Installation Instructions".

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

Input	
Sensor	Thermocouple type B, E, J, K, N, R, S and T
Zero programmability	Programmable from -50 up to 50 °C or from - 58 up to 122 °F
Span programmability	Thermocouple type K (Version 1): from 100 up to 1370 °C or from 210 up to 2500 °F Thermocouple type J (Version 1): from 100 up to 950 °C or from 210 up to 1740 °F Thermocouple type R (Version 2): from 650 up to 1760 °C or from 1200 up to 3200 °F Thermocouple type S (Version 2): from 700 up to 1760 °C or from 1290 up to 3200 °F Thermocouple type T (Version 3): from 100 up to 450 °C or from 210 up to 840 °F Thermocouple type N (Version 4): from 150 up to 1300 °C or from 300 up to 2370 °F Thermocouple type B (on request): from 900 up to 1820 °C or from 1652 up to 3308 °F Thermocouple type E (on request): from 100 up to 1050 °C or from 210 up to 1920 °F
Line resistance influence	0.2 uV / Ω

Output	
Signal	4 ÷ 20 mA on current loop
Burn -out signalling	Positive out of scale (> 20 mA)
Maximum output signal	35 mA
Load resistance (Rload)	see section " Load characteristic"
Response time (from 10 to 90 % of f.s.)	300 ms
Warm-up time	3 minutes

Performances	
Calibration error	the bigger than ± 0.1 % of f.s. or 0.2 °C
Linearity error (*)	± 0.1 % of f.s.
Cold Junction Compensation (CJC)	± 0.5 °C
Thermal drift	0,02 % of f.s./°C (per Span > 300 °C / 500 °F)
Supply voltage (**)	12 ÷ 32 Vdc
Electromagnetic Compatibility (EMC) (for industrial environments)	Immunity: EN 61000-6-2; Emission : EN 61000-6-4.
Operating temperature	-20 ÷ 70 °C
Storage temperature	-40 ÷ 85 °C
Relative humidity (not condensed)	0 ÷ 90%
Weight	about 35 g

(*) inclusive of hysteresis and variation of the power supply .

(**) internally protected against reverse polarity .

DAT 1112: VERSION LIST (use to order the device).

Version 1 : Thermocouple K and J;

Version 2 : Thermocouple R and S;

Version 3 : Thermocouple T;

Version 4 : Thermocouple N.

Note: thermocouples B and E available on request.

DAT 1112: CONFIGURATION AND CALIBRATION

- 1) Calculate the difference between the full-scale and the zero values (Span).
- 2) Refer to the "Input range table", find the thermocouple in use and determine in the column " PROG SPAN " where the calculated value is included. Determine in the column " PROG ZERO", the range of value where the zero scale value is included. In the side, is shown the relative DIP-switches configuration.
- 3) Remove the protection plastic cap
- 4) Set the switches as indicated.
- 5) Connect on input a simulator of thermocouple.
- 6) Set the simulator at the zero value.
- 7) Regulate the output value at 4 mA by the "ZERO" potentiometer .
- 8) Set the simulator at the full scale value.
- 9) Regulate the output value at 20 mA by the "SPAN" potentiometer .
- 10) Repeat the operation from the step 6 to the step 9 until the output values are accurate (typical 3 attempts required).

Example of configuration: TC " K " 0 ÷ 400 °C

Span => 400°C ;

Input switches configuration: On, Off, On, Off.

INPUT RANGE TABLE

THERMOCOUPLE K PROG. SPAN	SWITCH			THERMOCOUPLE K PROG. ZERO	SW 3
	1	2	4		
100÷150°C (210÷300 °F)	●		●	- 50 ÷ - 10°C (-58 ÷ 14 °F)	
150÷390°C (300÷730 °F)	●	●	●	-10 ÷ 50 °C (14 ÷ 122 °F)	●
390÷510°C (730÷950 °F)	●				
510÷1370°C (950÷2500 °F)	●	●			

THERMOCOUPLE J PROG. SPAN	SWITCH			THERMOCOUPLE J PROG. ZERO	SW 3
	1	2	4		
100÷115°C (210÷240 °F)			●	- 50 ÷ - 10°C (-58 ÷ 14 °F)	
115÷290°C (240÷550 °F)		●	●	-10 ÷ 50 °C (14 ÷ 122 °F)	●
290÷390°C (550÷730 °F)					
390÷950°C (730÷1740 °F)		●			

THERMOCOUPLE R PROG. SPAN	SWITCH			
	1	2	3	4
650÷940°C (1200÷1720 °F)				●
940÷1760°C (1720÷3200 °F)		●		●

The programming of the Zero is not necessary; it can be adjusted from -50 up to 50 °C by the Zero potentiometer.

THERMOCOUPLE S PROG. SPAN	SWITCH			
	1	2	3	4
700÷1010°C (1290÷1850 °F)				●
1010÷1760°C (1850÷3200 °F)		●		●

The programming of the Zero is not necessary; it can be adjusted from -50 up to 50 °C by the Zero potentiometer.

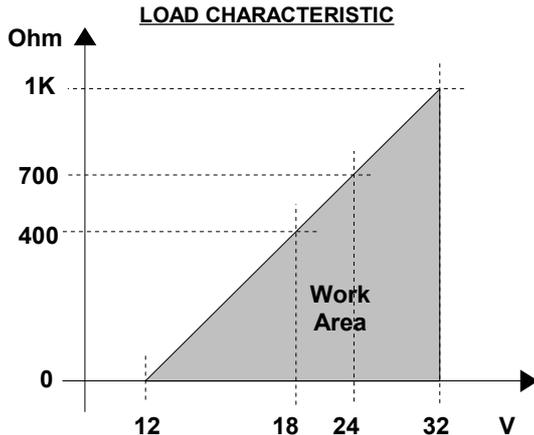
THERMOCOUPLE T PROG. SPAN	SWITCH			
	1	2	3	4
100÷145°C (210÷290 °F)				●
145÷450°C (290÷840 °F)		●		●

The programming of the Zero is not necessary; it can be adjusted from -50 up to 50 °C by the Zero potentiometer.

THERMOCOUPLE N PROG. SPAN	SWITCH	
	2	4
150÷200°C (300÷390 °F)		●
200÷480°C (390÷890 °F)	●	●
480÷580°C (890÷1070 °F)		
580÷1300°C (1070÷2370 °F)	●	

THERMOCOUPLE N PROG. ZERO	SWITCH	
	1	3
- 50 ÷ - 15 °C (- 58 ÷ 5 °F)		
- 15 ÷ 50 °C (5 ÷ 122 °F)		●

● = DIP SWITCHES " ON "



INSTALLATION INSTRUCTIONS

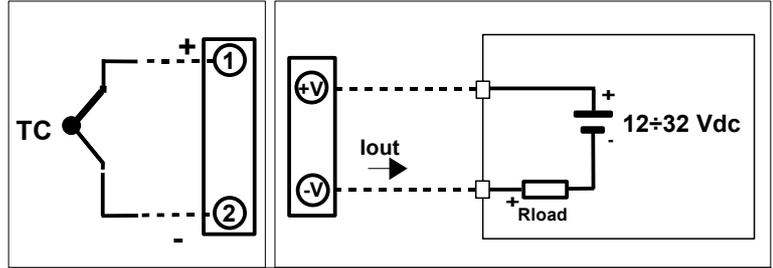
The device DAT 1112 is suitable for direct DIN B in-head mounting.

The transmitter must be fixed inside the probe by the proper kit.

By apposite stirrup, provided on request, it is possible to mount the device on DIN rail in compliance with EN-50022. It is necessary to install the device in a place without vibrations; avoid to routing conductors near power signal cables .

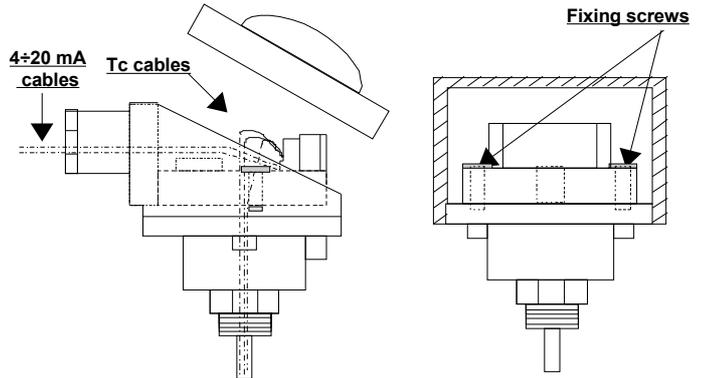
DAT 1112: CONNECTIONS

INPUT CONNECTION OUTPUT/POWER SUPPLY CONNECTIONS

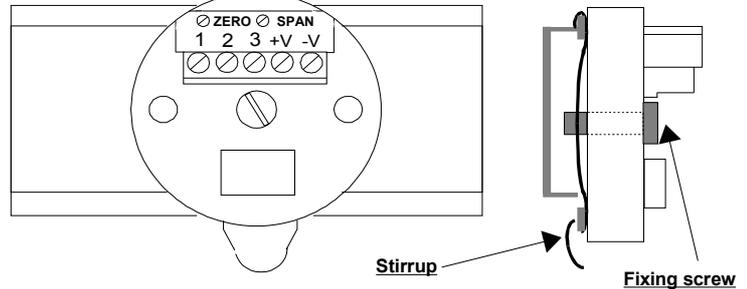


Note: terminal 3 not connected (NC).

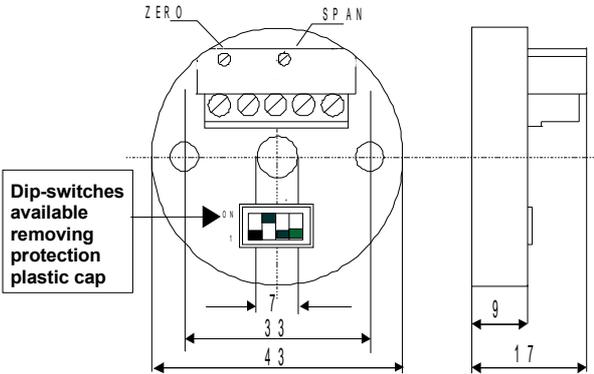
DIN B in-head mounting



DIN rail mounting (Option DIN RAIL)



DIMENSIONS (mm) & REGULATIONS



HOW TO ORDER

The DAT 1112 is supplied as request from the Customer in phase of order. In case of programmable device specify the version (i.e.: version 1 for Tc K & J) using the code shown in the "DAT 1112Version list".

ORDER CODE EXAMPLE:

DAT 1112- 1 - J - 0÷500 - °C/°F - DIN RAIL Option

