DATEXEL

Configurable & linearized transmitter for thermocouples

DAT 2055

FEATURES

TC input for J or K type
Linearized output 4 - 20 mA
Input range configurable by means of DIPswitches
Good accuracy and performance stability
Conform to EMC standards - CE mark
12,5 mm only enclosure thickness
DIN rail mounting
Low cost

APPLICATIONS

Temperature monitoring and controlling in:
- Process controls
- Automation systems
- Energy sources management

GENERAL INFORMATION

The two wire DAT2055 transmitter has been designed to give an output current signal of 4÷20 mA perfectly linear and proportional to the temperature detected by the thermocouple sensor connected to its input. The output current signal is supplied on the same two wires used to power the device. It is possible to program the type of thermocouple and the input range by means of DIP switches accessible only after opening the door suitable for such purpose.The cold junction compensation is performed inside it by a highly accurate and stable semiconductor temperature sensor.
The maximum accuracy and reliability are ensured for all the functions (conditioning, cold junction compensation and current transmission) thanks to the use of high precision and high-quality components and to the use of the SMD technology.The type and the value of the input signal are configurable in a large range of combinations (see section INPUT CONFIGURATION). The DAT 2055 unit, developped, manufactured and tested in strict accordance with the quality assurance standard UNI EN ISO 9001 : 2000, is in compliance with the directive 89/336/CEE on the electromagnetic compatibility. It is housed into a strong plastic enclosure of only 12,5 mm thickness, allowing an high density mounting capability on DIN rail.

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

INPUT

Type of sensor	TC type K or J according to SIPT68
Minimum input range	15 mV
Zero regulation	± 50 °C min.
Span regulation	± 5% min. of f.s.
Input impedence	>/= 10 MΩ
Influence of line resistance	0.2 µV / Ω

OUTPUT

Output signal	4 - 20 mA
Sensor interruption signaling	High alarm : 30 mA max.
Load resistance	see the "Load characteristic"
Response time (from 10 % to 90% of f.s.)	0.5 s
Warm-up time	3 minutes
Reverse polarity protection	60 V reverse max.

PERFORMANCES

Linearity error for thermocouple type K	Range **- 50 / 560°C**: ± 1.5 °C ± 0.1% of f.s.selected
	Range **- 50 / 950°C**: ± 2 °C ± 0.1% of f.s.selected
	Range **- 50 / 1370°C**: ± 3 °C ± 0.1% of f.s.selected
Linearity error for thermocouple type J	Range **- 50 / 470°C**: ± 2 °C ± 0.1% of f.s.selected
	Range **- 50 / 700°C**: ± 2 °C ± 0.1% of f.s.selected
	Range **- 50 / 950°C**: ± 2 °C ± 0.1% of f.s.selected
Calibration error	The larger of : ± 0.1% of f. s. or ±0.2°C
(inclusive of hysteresis and supply voltage variations)	
Thermal drift	0.02% of f. s. /°C
Cold junction compensation error	± 0.5°C
Power supply voltage	10 ÷ 30 Vdc
Electromagnetic Compatibility (EMC)	According to EN50081-2 and EN50082-2
Operating temperature	- 20 ÷ 70 °C
Storage temperature	- 40 ÷ 100 °C
Relative humidity (non-condensing)	0 ÷ 90 %
Weight	90 grams

OPERATING INSTRUNCTIONS

The transmitter DAT 2055 must be powered with a voltage value, ranging from 10 Vdc to 30 Vdc, applied between the terminals Q or R (+Vdc & Out) and O or P (GND).The permissible Rload resistance, equivalent to that of the instruments applied in series to the voltage generator, must be determined as a function of the power supply voltage value and according to the load characteristic so that its value is covered by the working area. The connections must be executed in according to the "WIRING DIAGRAM" here at side. The termoucouple sensor must be connected between the terminals I (-TC) and L (+TC).

The output signal is available on the power loop.The configuration of the input is performed by the DIP-switches. The " INPUT CONFIGURATION " section show the list of the possible input measuring ranges, and the indication of how to set the DIP-switches to obtain the selected configuration.Once such operation is completed, it is necessary to proceed to the calibration of the transmitter by means of the ZERO and SPAN regulations placed on the top of the encousure.

The DAT 2055 is supplied with the calibration requested by the customer's order. In case such calibration is not indicated, the device is supplied with the standard configuration (see on the bottom). To calibrate the device it is necessary to proceed as described here after.

INPUT RANGES CONFIGURATION

1) Calculate the difference (Span) between the full scale value and the zero value.

2) See the "INPUT CONFIGURATION " section and find the table regarding the thermocouple in use. Determine in the column " Span " the position where the calculated value (*) is included. In the line corresponding to such position the configuration of the input switches is shown.

3) Set the switches as indicated.

4) Set the simulator at the minimum temperature.

5) Adjust the 4 mA value by the zero potentiometer .

6) Set the simulator at the maximum temperature.

7) Adjust the 20 mA value by the SPAN potentiometer.

8) Repeat the operations number 4-5-6-7 sequentially until the values are sufficiently accurate.

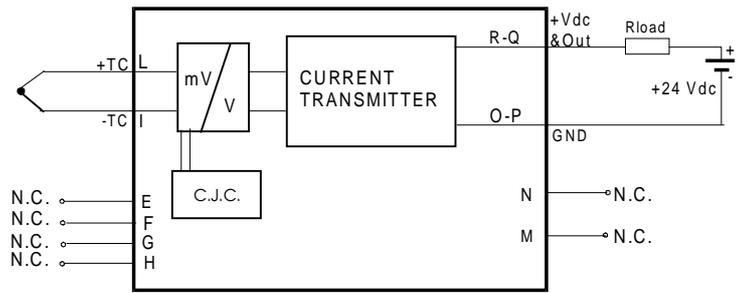(*) **Note**: if the value is a limit of the input range (700 °C for example) select the next one.

TERMINAL ASSIGNEMENT			
E	N.C.	M	N.C.
F	N.C.	N	N.C.
G	N.C.	O	GND
H	N.C.	P	GND
I	-TC.	Q	Out & +24Vdc
L	+TC.	R	Out & +24Vdc

DIMENSIONS (mm.)
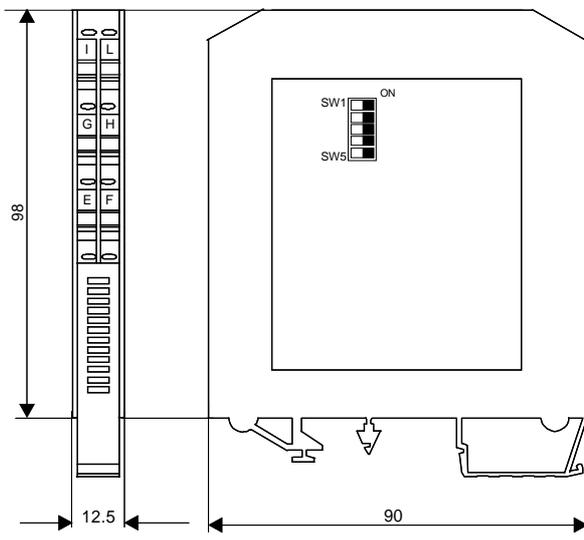
WIRING DIAGRAM

LOAD CHARACTERISTIC

Power supply voltage
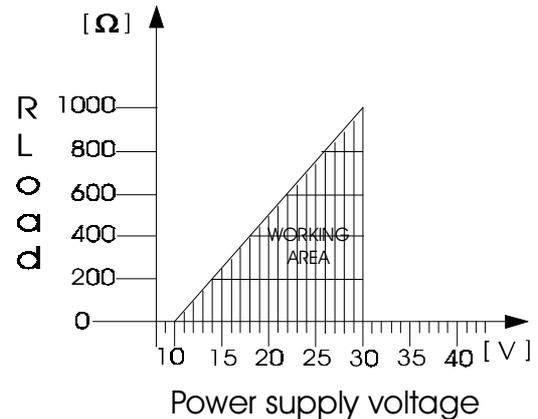
INPUT CONFIGURATION

THERMOUCOUPLE "J"

PROG. SPAN					
	SW 1	SW 2	SW 3	SW 4	SW 5
100° - 470°C		●		●	
470° - 700°C				●	●
700° - 950°C				●	

THERMOUCOUPLE "K"

● = DIP SWITCH " ON "

PROG. SPAN					
	SW 1	SW 2	SW 3	SW 4	SW 5
100° - 560°C	●	●	●		
560° - 850°C	●		●		●
850° - 1370°C	●		●		

The Zero programming is not necessary; the output is adjustable for input values from -50 °C to + 50 °C.

HOW TO ORDER:
DAT 2055   0/1200 °C TC "K"
                                                         J

Input range   TC type

STANDARD CONFIGURATION :
Thermocouple K, Range : 0 / 1200°C

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