



## RAYLEIGH INSTRUMENTS LIMITED

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# 3 way galvanically isolated configurable signal converter

E&OE

## DAT 5020

### FEATURES

- Input isolated from output and power supply
- More than 50 Input & Output configurations
- Configurable by means of DIP switches
- 2000Vac galvanic isolation on the 3 ways
- Potentiometric input
- Isolated power supply source for external transmitter
- Independent zero and full scale regulations
- EMC compliant - CE mark
- 12,5mm only thickness enclosure
- DIN rail mounting

### APPLICATIONS

- Control and monitoring of the temperature for:
  - Process controls
  - Automation systems
  - Energy sources management



### GENERAL INFORMATION

The DAT 5020 signal converter is able to accept at its input a large selection of analog normalized signals. The input signal is processed and converted into the corresponding output analog normalized signal previously programmed. Moreover it operates at 2000Vac full isolation among input, output and power supply. This allows to eliminate the problems coming from the reciprocal influence of the various circuits, and also originated from the induced noise through the ground loops. The type and the value of the input signal, and the type and the value of the output signal are configurable in a wide range of combinations (see table "Configurability"). They are selected by means of suitable DIP switches. It is also available a potentiometer input, to measure position, level etc., besides a power supply source (Vaux) for an eventual transmitter. Vaux is isolated from both the power supply and the output circuit. The DAT 5020 unit, developed, manufactured and tested in strict accordance with the quality assurance standard ISO 9001 / EN 29001, is in compliance with the directive 89/336/CEE on the electromagnetic compatibility. It is packaged into a strong plastic enclosure of only 12,5mm thickness, allowing an high density mounting capability on DIN rail.

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

#### INPUT

Input Signal	configurable in mV, V, +/- V, mA (see table "Configurability")
Input Potentiometer	from 1 kOhm to 5 KOhm
Zero regulation	± 5% min.
Span regulation	± 5% min.
Max input signal	30Vdc or 50mAdc
Input impedance	> 1MOhm for voltage input, < 50 Ohm for current input

#### OUTPUT

Output signal	configurable: V, +/- V, mA (see table "Configurability")
Max output signal	15Vdc or 30mAdc
Load resistance	> /= 5 KOhm or < /= 500 Ohm
Reverse polarity protection	60 V reverse max
Response time (from 10 % to 90% e.s.)	0.5 s.
Warm up time	3 min.

#### CHARACTERISTIC PERFORMANCES

Calibration error	± 0.1% of f. s.
Transmission error	± 0.15% of f.s.
(inclusive of hysteresys, linearization error and power supply voltage variations)	
Electro Magnetic Compatibility (EMC)	In compliance with EN50081-2 and EN50082-2
Thermal drift	0.02% of f.s./°C
Power Supply Voltage (Vps)	18 ÷ 32 Vdc
Auxiliary Power Supply Voltage (Vaux)	20 Vdc min. @ 25 mA with Vps > /= 24 Vdc
Current consumption	< /= 80 mA or < /= 110 mA max. with Vaux operating
Isolation among the 3 ways	2000Vac, 50 Hz, 1 min.
Operating temperature	- 20 ÷ 70 °C
Storage temperature	- 40 ÷ 100 °C
Relative humidity (non condensing)	0 ÷ 90 %
Weight	approx. 90 g.

CONFIGURABILITY									
INPUT SELECTION					OUTPUT SELECTION				
IN	DSI	1	2	3	4	5	6	7	8
0-20 mA		●			●			●	
4-20 mA		●		●	●				
0-10 V		●		●				●	
+/-5 V		●		●					●
+/-10 V		●					●		●
0-1 V				●				●	
0-100mV			●						●
POT				●					●

● : DIP SWITCHES ON

### OPERATING INSTRUCTIONS

The converter must be powered with a Power Supply Voltage comprised in the 18V to 32V range which must be connected to the terminal R (+24Vdc) and Q(GND3). The green LED switched on indicates the situation of a correct power supply. The input signal, voltage or current, must be connected to terminal L(IN V/I) and indifferently to E, G, I. For the potentiometric measure, the potentiometer must be connected between terminal H(POT HI) and to E, G, I.

The auxiliary 24Vdc output is available between the terminals F(+24Vdc) and indifferently E, G, I. The output signal, voltage or current, is available between terminal N(OUT V/I) and M, O, P. The input and output configuration is possible by means of the two DIP switches DSI and DSO. They are accessible only after the opening of the apposite door on the housing. The table of "Configurability" shows the lists of the possible input and output signals and the positioning of the switches to obtain their combinations.

The DAT 5020 unit is supplied with the requested configuration at the moment of the order. In case of order without this specification, the unit is supplied with a standard setting: IN= 0-10V and OUT= 0-10V. In the case it is necessary a calibration of the device, it can be done in a very simple manner thanks to the complete independence of the zero and span regulations.

### INSTALLATION INSTRUCTIONS

The DAT 5020 device is suitable for fitting to DIN rails in the vertical position. For optimum operation and long life, 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.

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

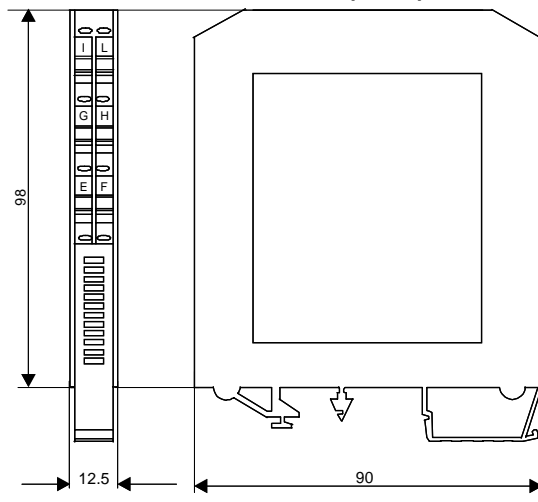
- If panel temperature exceeds 45°C and at least one of the overload condition exists.
- If panel temperature exceeds 35°C and at least two of the overload condition exists.

The overload conditions are the following:

- High power supply voltage: >27Vdc
- Use of the auxiliary power supply Vaux.

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.)

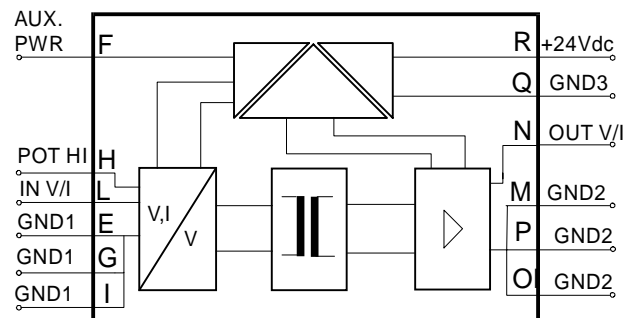


### HOW TO ORDER:

DAT 5020 0/10V - 4/20mA



### BLOCK DIAGRAM



### TERMINAL ASSIGNMENT

E	GND1	M	GND2
F	AUX. PWR.	N	OUT V/I
G	GND1	O	GND2
H	POT. IN	P	GND2
I	GND1	Q	GND3
L	IN V/I	R	+24Vdc

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