Intrinsically safe isolated universal smart transmitter

DAT 1065 IS
DAT 1065 IS/HT

FEATURES
PROTECTION MODE : EEX ia IIC T4,T5,T6 approvals
Certified according to ATEX 94/9/EC:
CESI 02ATEX 115
Production Notification Certificate:
CESI 02 ATEX 116Q
Applicable in zones with explosion risk (ZONE 0)
RTD, TC, mV, Resistor and Potentiometer input
With galvanic isolation
Configurable by Personal Computer
High accuracy and performance's stability
In compliance with EMC standards - CE Mark
DIN B head type mounting
Available as configured device on user specifications

APPLICATIONS
Temperature Monitoring and Control for:
- Process Controls
- Automation Systems
- Energy Sources Management

ATEX

GENERAL INFORMATION

Introduction
The DAT 1065 IS is an intelligent in-head transmitter capable to perform many functions such as: Linearized temperature measurement with thermocouple or RTD sensors; conversion of a linear resistance variation to a standard analog current of 4-20 mA; conversion of a voltage signal, even coming from a potentiometer connected to its input, to a 4-20 mA signal. Its small mechanical dimensions allows the mounting of a "smart" transmitter with galvanic isolation even in a little space like that available in a DIN B head.

General
The device is built around a microprocessor core which controls any device function in a continuos and reliable mode by an efficient program developped by DATEXEL. The unit can be configured to accept input from a wide range of sensors and electrical parameters. Thanks to its versatility of use, it greatly reduces the warehouse stock satisfying a wide variety of needs; thus it offers immediate and evident economical advantages. By means of its continuos self calibrating operation, controlled by the microprocessor, the device guarantees an excellent accuracy and very stable measurement, both in time and in the operating temperature. Further, with this operating mode, the device is not longer subject to the usual variations of the circuit parameters. The 2000 Vac galvanic isolation, removing all ground loop effects as the input is electrically and physically isolated from the loop power supply, allows the use of the transmitter even in the heavy environmental conditions found in the industrial applications.
The units are manufactured by using high quality and high precision electronic components which are assembled by the SMT technology; both of these elements are the indispensable tools to realize a very reliable device. The DAT 1065 IS, 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 and the CE mark confirms the compliance of the product. The device is housed in a rough self estinguish plastic case suitable for mounting on DIN B head. A version of this device for mounting on DIN rails is also available.

Input types
The DAT 1065 IS is configurable for any of the following input types:
- **RTD** input for PT100, PT1000, Ni100 and Ni1000. The cable compensation is possible by 3 or 4 wire connection.
- **Thermocouple** input for 8 different types. The Cold Junction Compensation is selectable as internal or external.
- **Voltage** input up to -100/+700 mV.
- **Resistance** input for linear resistance measurement from 20 Ohm to 2 KOhm with 3 or 4 wire compensation.
- **Potentiometer** input from 20 Ohm to 2 KOhm.

Output
Programmable or standard 4 - 20 mA current output. Programmable Sensor Burnout as "Upscale" or "Downscale". Protection against polarity reversal is provided.

Set-Up
All the configurable functions and parameters are easily programmed by means of a PC with a software package, named PROSOFT, developped by DATEXEL. This "guide lines menu" type program operates under "Windows9x/NT™" on a PC which communicates, via an interface adapter, with the DAT 1065 IS. The adapter is connected through a cable to an apposite connector situated on the transmitter (for more detailed information, see the figure in the next page). IMPORTANT: On request the transmitter can be supplied configured for the desired sensor type and calibrated for the specific range as defined in the order (see "HOW TO ORDER ").

Application advices
1)The power supply voltage (intrinsically safe) applied between -V e +V terminals must be included between 11 V and 30 V values .
2)The maximum power supplied by the safety barrier must be not higher then 0.75 W.
Moreover transmitter must be mounted so as to have environmental protection of IP54 grade in external and IP4x grade or better for the application in closed or protected area.

Configuration options for DAT 1065 IS Transmitter (use this checklist when ordering configured units):

ORD. CODE	INPUT				
A	**RTD type:** O Pt100 O Ni100 O Pt1000 O Ni1000 Range:	**TC type:** O type J O type K O type S O type R O type B O type E O type T O type N Range:	**Resistance range:** 20 Ohm to 2000 Ohm Range:	**Potentiometer range:** O 20 Ohm to 200 Ohm O 200 Ohm to 500 Ohm O 0.5 Kohm to 2 Kohm ZERO: SPAN:	**Voltage input range:** -100 mV to 700 mV Range:
B	**Linearization:** O Standard linearization RTD, TC		**Linearization:** O No linearization O Customer linearization (specify):		
C	**RTD options:** O 2-wire O 3-wire O 4-wire	**TC options:** O Intern. CJC O Extern. CJC	**Res. Options:** O 2-wire O 3-wire O 4-wire		

OUTPUT	
D	**Output current range:** O 4 - 20 mA O 20 - 4 mA O Special (specify):
E	**Sensor Burnout:** O Upscale O Downscale
F	**Temperature Range:** O T6, T5 O T6, T5, T4 ('HT')

HOW TO ORDER:

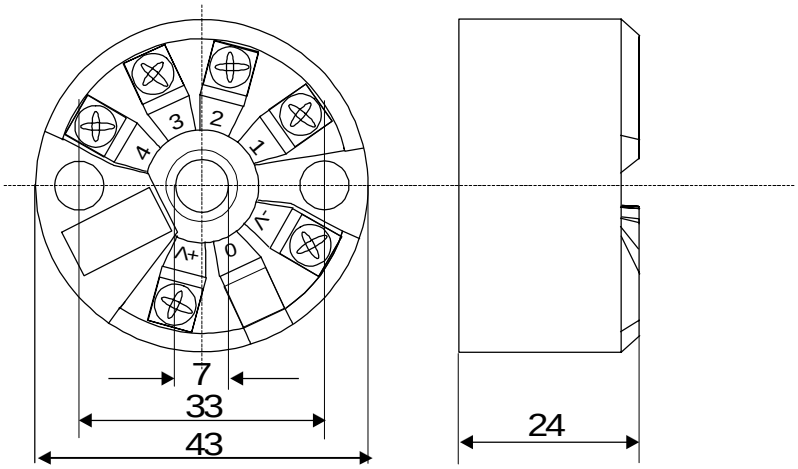
A-Not configured device: **DAT 1065 IS**

Code: A B C D E F

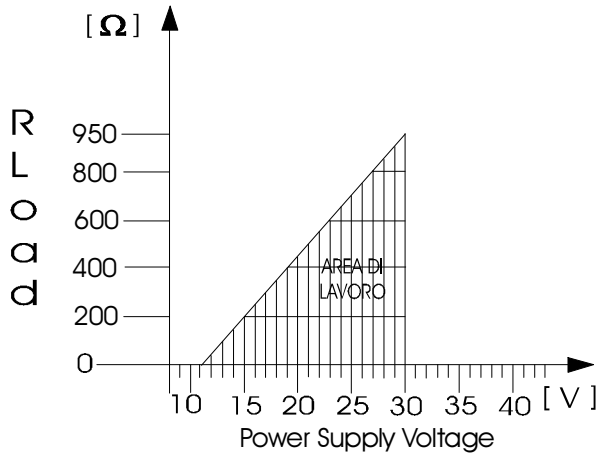
B-Configured device: **DAT 1065 IS / Ni1000-0..250°C / S.L. / 3-wire / 20..4 / Downscale / HT**

(*)The above is an example of how to order a transmitter for Ni1000 sensor, operating in the 0 to 250°C range, with standard linearization, connected to input in the 3-wire connection, with an output of 20 to 4 mA and with downscale sensor burnout. The 'HT' option indicates the model which can be used whit an operating temperature of 85 °C (T4).

MECHANICAL DIMENSIONS (mm.)

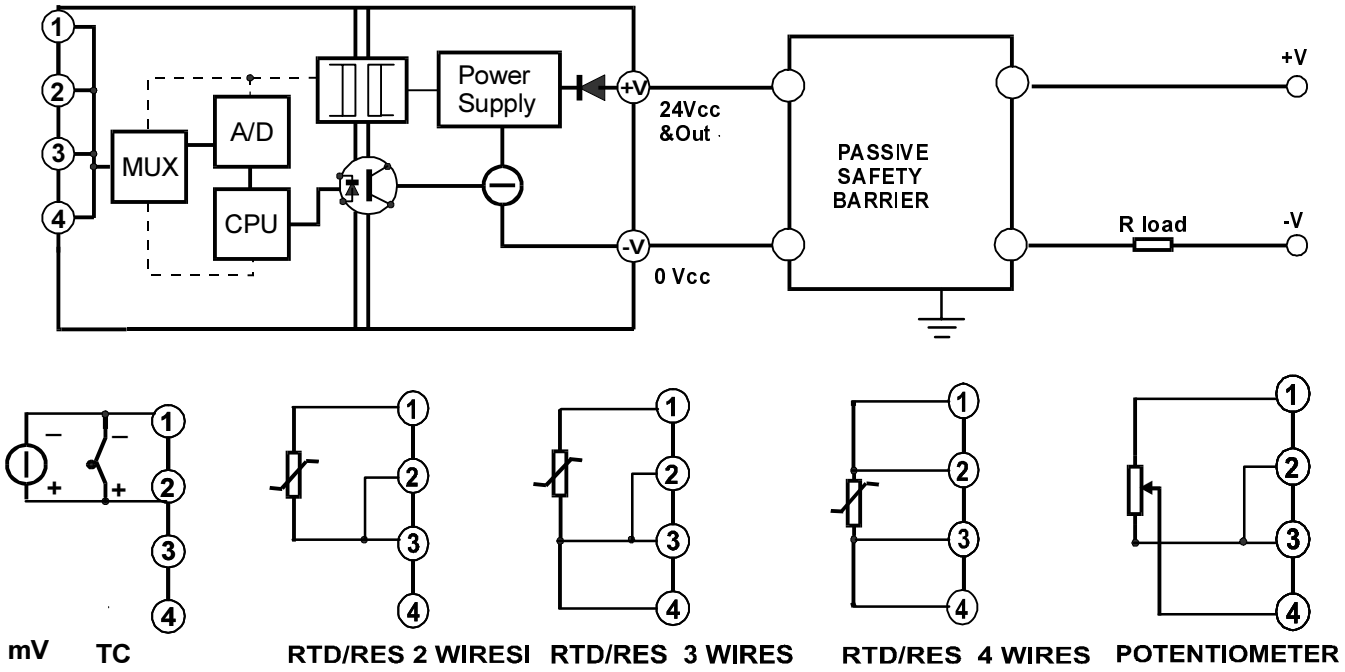


LOAD CHARACTERISTIC



DAT 1065 IS

DAT 1065 IS: BLOCK AND WIRING DIAGRAM



CONFIGURATION

This operation is carried out, using a Personal Computer with "Windows9x/NT™" operating system, by the software PROSOFT, specifically developped by DATEXEL, and by the interfacing adatpter PRODAT-03 and protection cable CVPR-03.
The software includes a window-type program by which the operator is guided through the operations to be executed. Once the data are inputed, a few seconds is the time necessary to complete a configuration cycle.
The parameters which is possible to configure are illustrated in the "Configuration options" in the page here at side. Furthermore it is possible, in the same phase, to program the "zero" and the "full scale" values. The calibration of the device is made automatically, with the maximum accuracy, without the need of any mechanical regulation. The configuration is normally made at the factory in conformity of the customer' s order or, alternatively, in one of the most used configuration:
DAT 1065 IS / Pt100-0..200°C / S.L. / 3-wire / 4..20mA / Upscale.
The device can be reconfigured for any number of times. This operation is possible also when the device is operating in the plant or in the field because it is possible, by software, to interrupt momentarily the normal operation which restarts automatically after the configuration. .
The complete configuration system (which includes: interface module PRODAT-03, protection cable CVPR-03 and software) is supplied from DATEXEL at convenient price.
ATTENTION!The connection between device and interface adapter PRODAT-03 must be made ONLY IN SAFE ZONE and using the protection cable CVPR-03.

DAT 1065 IS

PRODAT-03

DAT 1065 IS Technical Specifications

(typical @ 25°C and in the nominal conditions)

Input

RTD			
Input	Min	Max	Span Min
PT100	-200°C	850°C	50°C
PT1000	-200°C	200°C	50°C
NI100	-60°C	180°C	50°C
NI1000	-60°C	150°C	50°C

TC			
Input	Min	Max	Span Min
J	-200°C	1200°C	2 mV
K	-200°C	1370°C	2 mV
S	-50°C	1760°C	2 mV
R	-50°C	1760°C	2 mV
B	400°C	1820°C	2 mV
E	-200°C	1000°C	2 mV
T	-200°C	400°C	2 mV
N	-200°C	1300°C	2 mV

Voltage			
Input	Min	Max	Span Min
mV	-100mV	+700mV	2 mV

Potentiometer			
Input	Min	Max	Span Min
Ohm	0÷20	0÷200	10%
Ohm	0÷200	0÷500	10%
KOhm	0÷0.50	0÷2.00	10%

Resistance			
Input	Min	Max	Span Min
Low	20 Ohm	300 Ohm	10 Ohm
High	300 Ohm	2000 Ohm	200 Ohm

Input impedence

TC, mV >/=10 MOhm

Lead wire resistance influence

TC, mV </=0.8 uV/Ohm
RTD 3-wire 0.05%/Ohm (50 Ohm max.)(2)
RTD 4-wire 0.005%/Ohm (100 Ohm max.)

RTD excitation current

Typical 0.350 mA

Ex data :

Output /Supply	Input
Ui = 30V Ii = 100mA Pi = 0,75W Li = 0,1mH Ci = 10nF	Uo = 6,2V Io = 100mA Po = 500mW Lo = 3,6mH Co = 5uF

Output

Current Output

Signal range (4 - 20 mA) or (20 - 4 mA)
Load Resistance (see Load Characteristic)

Accuracy

Linearity TC ±0.2 % (1)
RTD ±0.1 % (1)

Calibration

RTD The larger of ±0.1%(1) and ±0,2 °C
Res. Low The larger of ±0.1%(1) and ±0,15 Ohm
Res. High The larger of ±0.2%(1) and ±1 Ohm
mV, TC The larger of ±0.1%(1) and ±10 uV
Cold junction comp. ±0.5 °C
Output current ±7 uA

Thermal Drift

Full Scale ±0.01%/°C
Cold junction Compensation ±0.01%/°C

Common data

Supply

Supply Voltage 11 - 30 Vdc
Pmax =0.75 W
Imax=100mA
Isolation Voltage 1500 Vac for 60 sec
Polarity protected 60 Vdc

Temperature & Humidity

Operating Temperature T4: -20 °C to +85 °C ('HT' vers. only)
T5: -20 °C to +70 °C
T6: -20 °C to +55 °C
Storage temperature -40 °C to +100 °C
Humidity (non-condensig) 0 to 90%

EMC

Emission EN50081-2
Immunity EN50082-2
RF Immunity tested for 10V/m up to 1000MHz

Response time

Rise time(10 - 90 %) 0,4 sec. approx.

Housing

Material Selfestinguish plastic
Mounting DIN B head or bigger
Weight Approx. 50 g

Note:(1) of input span
(2) Balancing required

EDIT.06.03-REV.02

DATEXEL S.r.l. - Via Oslavia, 21- 21049 TRADATE (VA) ITALY - Tel 0331 - 841070 - Telefax 0331 - 841950