

■ FI324

1 channel – I.S. temperature converter. RTD or potentiometer input

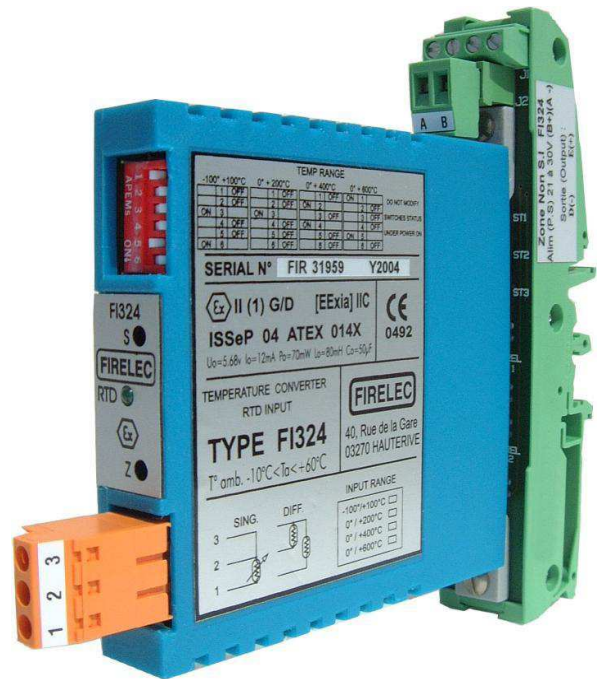
Description:

The FI324 converter is used as interface between apparatus located in the hazardous area and the control room. It must be installed in the non hazardous area.

The FI324 module converts a low level DC signal from RTD or a potentiometer into a 4-20mA isolated signal. The output signal is linearized regarding the temperature.

Four range of temperature can be selected using switches in front side. Offset and span adjustments are easy using two trimmers located in front side.

The module FI324 must be associated to a certified IS apparatus, and this combination must be compatible regarding the intrinsic safety parameters.



Product options:

- Option **ST**:FI324-ST: apparatus connected using Screw Terminals
- Option **CCT**:FI324-CCT: apparatus connected using Cage Clamp or spring Terminals

Main characteristics:

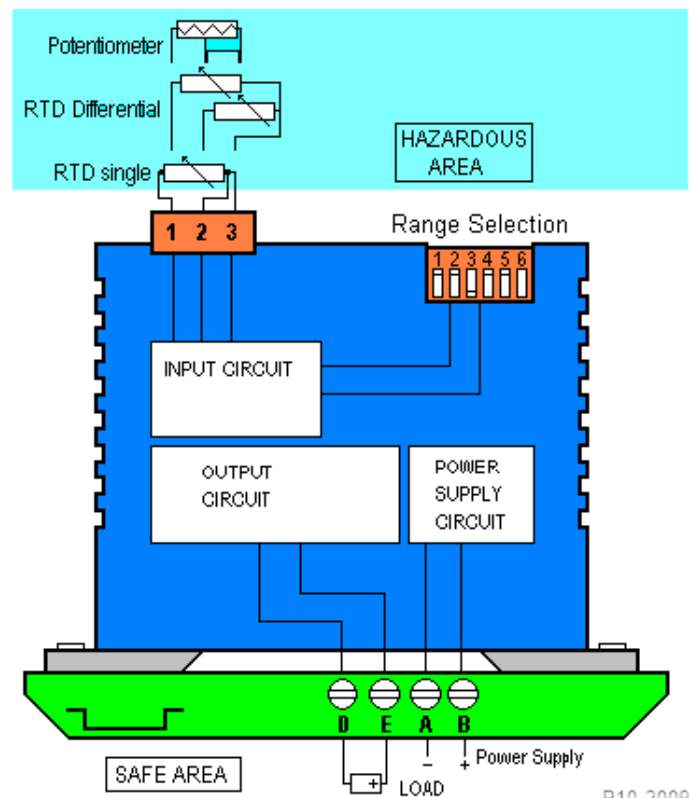
1 channel for RTD or potentiometer input

Linearized output signal

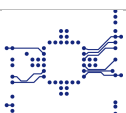
Isolation between input and output-power supply

EN50020 Classification [EEExia] IIC
ATEX certification ISSEp 04 ATEX014X

DIN rail mounting, individually or on termination panel modulo 8 or modulo 16



R10-2009



Technical specifications

Power Supply

Voltage range:	21Vdc to 30Vdc
Power ON indication:	By green Led on front plate
Consumption (25Vdc):	70mA at 20mA output
Replaceable fuse:	100 mA 250V quick action
Protection:	Reverse polarity and over voltage picks

Input specifications

RTD type:	Single or differential
Potentiometer:	Up to 1000 Ω
RTD selectable range:	-100°C to 100°C 0 to 200°C 0 to 400°C 0 to 600°C
Source current:	50 nA max
Zero trimmer adjustment (Z):	+/-15%
Span trimmer adjustment (S):	+/-15%

Output specifications

Current	4-20mA
Low limit	0.1mA (open input circuit)
Max Output Current	30mA (broken RTD)
Max load at 20mA output	500 Ω

Transfer characteristics

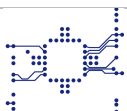
Accuracy at 20°C	+/- 0.2% (linearization included)
Response time	90% of the final value in 150ms.

Mechanical and environment characteristics

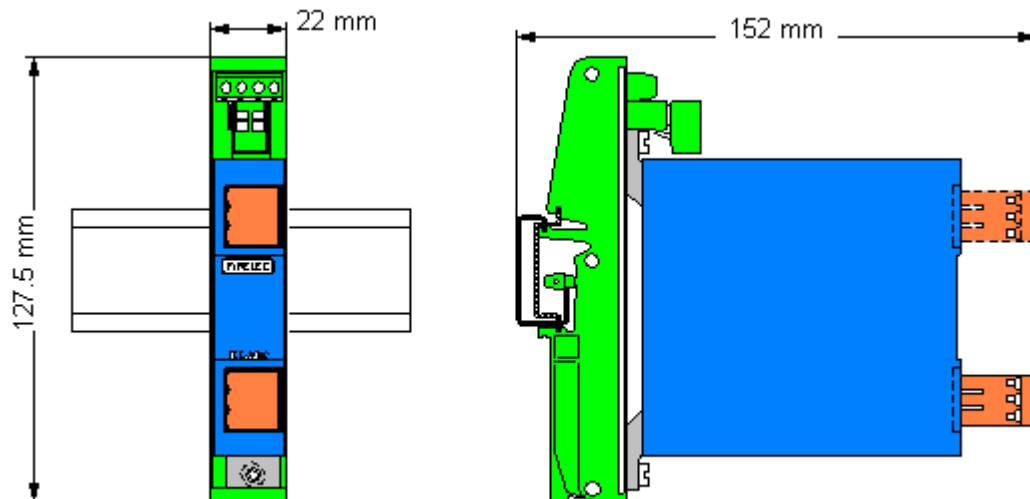
Isolation Voltage (input1 / output-P.S):	1500Vdc
Drift:	0.01%/°C typical
Common mode rejection:	DC: without measurable effect. AC(50Hz): 120dB
Serial mode rejection:	40 dB
Protection:	IP20
Wiring conductor section:	Option ST: 24 to 12 AWG (0.2 to 2.5 mm ²) Option CCT: 24 to 12 AWG (0.2 to 2.5 mm ²)
Weight:	100g
Size:	H=130mm W=22mm D=145mm with front connector
Operating temperature:	-10°C to 60°C
Storage temperature:	-20°C to 60°C
Relative humidity:	10 to 90% (no condensation)
Mounting:	<u>DIN rail</u> : panel modulo 8 type FI308 or modulo 16 type FI316-1, or individually

Intrinsic safety parameters

ATEX certificate:	ISSeP 04ATEX014X
U max:	5.68Vdc
I max:	12mA
Co max:	50 μ F
Lo max:	80mH



Individual mounting on DIN rail



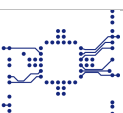
Individual mounting connection

Power Supply connection:

Screw Terminal B (+) and A (-) AWG 14 to 26 or
0.14 to 1.5mm²

Output connection:

Screw terminals E (+) and D (-) AWG 14 to 26 or
0.14 to 1.5mm²



Instruction note

Intrinsic safety specifications:

The FI324 intrinsic safety module complies with the European standards EN50014 and EN50020. Its classification is [Eexia]IIC. It must be mounted in the safety area and connected only to a RTD or a potentiometer.

The Intrinsic safety electric parameters are as follow

Module	Terminals	U _o (V)	I _o (mA)	C _o (μF)	L _o (mH)	P _o mW
FI324	1-2/3	5.68V	12mA	50	80	70

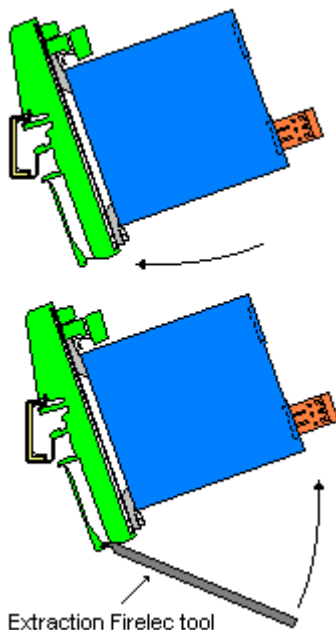
The output of the module must be connected to equipment powered on no more than 250Vac.

Mounting:

The module can be mounted on a symmetric or asymmetric. DIN rail. To keep an efficient and natural ventilation, it is better to install the module on horizontal rail.

To ensure good reliable operation, the module must be installed in a dry and clean place, with an ambient temperature constantly kept between 10 and 30°C. The ambient temperature limits for continuous working are -10°C to 60°C.

The module is protected by an IP20 polyamide enclosure.

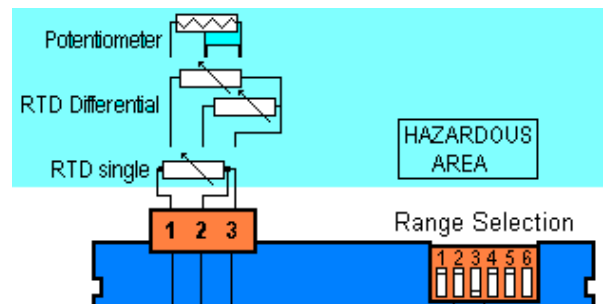


Asymmetric or symmetric DIN rail mounting. Push down following the arrow.

Asymmetric or symmetric DIN rail dismounting using the FIRELEC tool. Insert the tool at the bottom, and push up following the arrow.

Input signal connexion:

The RTD or the potentiometer located in the hazardous area is connected, between terminals 1, 2 and 3 of a removal connector plugged on the front side of the module. The available capacity of the terminals is 0,2 to 2.5 mm².

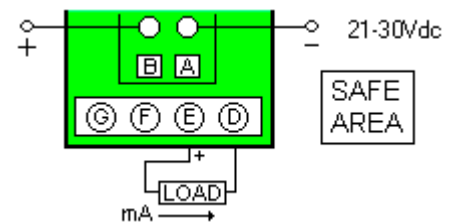


Output signal connexion :

The output load located in the safe area is connected between terminals E (+) et D (-), at the bottom side of the module. The available capacity of the terminals is 0,14 to 1.5 mm².

Power Supply connexion :

The 24Vdc power supply (21V to 30V) is connected between terminals A (-) and B (+) of a removal connector, plugged at the bottom side of the module. The available capacity of the terminals is 14 to 26 AWG (0,14 to 1.5 mm²).



Cables routed to the hazardous area must be properly SEGREGATED from other cables by routing through separate cable tray. See I.S electric parameters for max Co and Lo.

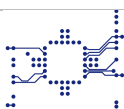
Start-up :

Never plug-in the module which is not protected by its enclosure.

The module is protected against reverse polarity. A green LED in the front side of the module indicate Power ON, when the module is under power. If the LED stay OFF, extract the module, remove the orange connector and the enclosure. Check the fuses F1 (100mA) et F2 (100mA) and replace them if necessary.

Be careful the fuses must have a breaking capacity of 1500A min.

If the failure remains, send back the module to FIRELEC which is the only one entitled to repair it



Temperature range modification:

The module FI324 can be calibrated in four different temperature ranges : -100 to +100°C, 0 to 200°C, 0 to 400°C, and 0 to 600°C. It is calibrated at the factory in one of this four ranges, depending on the customer requirements.

Range	Switches = ON	Switches =OFF
-100°C/ 100°C	3 et 6	1,2,4 et 5
0°C / 200°C	3	1,2,4,5 et 6
0°C / 400°C	2 et 4	1,3,5 et 6
0°C / 600°C	1 et 5	2,3,4 et 6

However, it is easy to change the temperature range, processing as follow.
Before handling switches in front side, disconnect the power supply from the module.

1. Select "switches" according to the suited temperature range (see table here above).
2. Connect on the input connector, the RTD simulator or the precision resistor box.
3. Connect a 100 ohms 0.1% precision resistor between terminals E (+) and D (-) of the bottom terminals, and connect a voltmeter.
4. Connect the 24Vdc Power Supply to the module .
5. On the RTD simulator, or with the resistor box set the input signal to the minimum range value (0%), and adjust the potentiometer Zero in front side to read 0.400V between terminals E (+) and D(-).
6. Set the input signal to the maximum range value (100%), and adjust the potentiometer Span in front side to read 2.000V between terminals E (+) and D(-).
7. Repeat operation 5 and 6 to get a fine adjustment.

Table here-below shows correspondance °C/ohm value for PT100.

Value°C	-100	0	100	200	400	600
Value Ω	60.26	100	138.51	175.86	247.09	313.71

Signals connexions are shown below

