Isolated
Signal
Converters

FEMA ELECTRÓNICA

Series ISC

Isolated Signal Converters

Model ISC-TJ **for Thermocouple J**
Model ISC-TK **for Thermocouple K**
Model ISC-TE **for Thermocouple E**
Model ISC-TT **for Thermocouple T**
Model ISC-TR **for Thermocouple R**
Model ISC-TS **for Thermocouple S**

Isolated signal converters for thermocouple signals, types J, K, E, T, R and S. Output configurable for mA or Vdc. The instrument linearizes the curve of the thermocouple and automatically compensates for the thermocouple cold junction. Detection in case of broken probe. Instrument to be mounted on standard DIN rail. Power options in AC and DC. Strong three way isolation between input, output and power circuits.

USER'S MANUAL
(1196R02)

Converters ISC-Tx

Signal Converter for thermocouples J, K, E, T, R and S

Isolated signal converters for thermocouple J, K, T, E, R or S probes. The instrument linearizes the curve of the thermocouple and automatically compensate for the thermocouple cold junction. Detection in case of broken probe, with output switching to highest value available.

Output signal configurable in 0/10Vdc, 4/20mA and other ranges. Instrument readjustable through jumpers and span and offset potentiometers accessible at the rear of the front cover.

Power option in AC and DC. Instrument to be mounted on standard DIN rail. Connections with plug-in screw terminals. For industrial applications.

High isolation levels between the input, output and power circuits, the instruments can be used as isolators between circuits together with the signal converter functionality.

The isolation provided prevents the propagation of transient peaks and energy discharges between circuits, thus protecting the remote acquisition systems. It also minimizes loop grounds, which if acquired with the signal, are very difficult to isolate.

Order Reference

		Model		Power		Input		Output
ISC	-	**TJ**	-	**0**		**0/1200ºC**	=	**4/20mA**
		-TJ (Thermocouple J)		-0 (230 Vac 50/60 Hz)		-0/1200ºC		-4/20mA
		-TK (Thermocouple K)		-1 (115 Vac 50/60 Hz)		-0/1000ºC		-0/10Vdc
		-TE (Thermocouple E)		-6 (24 Vdc aislada)		-0/700ºC		-...
		-TT (Thermocouple T)				-0/400ºC		
		-TR (Thermocouple R)				...		
		-TS (Thermocouple S)						

Precautions on installation

Risk of electrical shock. Instrument terminals can be connected to dangerous voltage.

Instrument protected with double isolation. No earth connection required.

Instrument is in conformity with CE rules and regulations. See "CE Declaration of Conformity" further in this document.

This instrument has been designed and verified according to the 61010-1 CE security regulation, and is designed for applications on industrial environments. See the "CE Declaration of Conformity" further in this document for information on the category of measure and the degree of pollution levels that apply.

Installation of this instrument must be performed by qualified personnel only. This manual contains the appropriate information for the installation. Using the instrument in ways not specified by the manufacturer may lead to a reduction on the specified protection level. Disconnect the instrument from power before starting any maintenance and / or installation action.

The instrument does not have a general switch and will start operation as soon as power is connected. The instrument does not have protection fuse, the fuse must be added during installation.

The instrument is designed to be panel mounted. An appropriate ventilation of the instrument must be assured. Do not expose the instrument to excess of humidity. Maintain clean by using a humid rag and do NOT use abrasive products such as alcohols, solvents, etc.

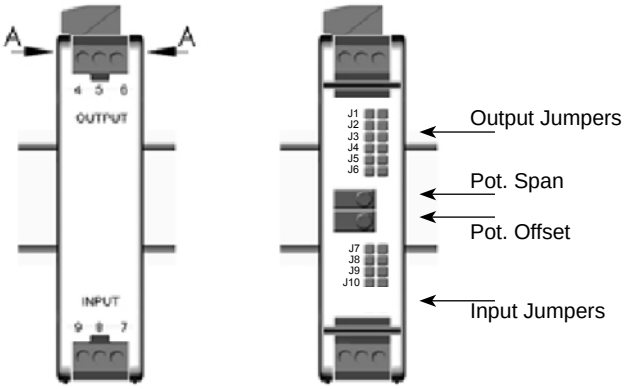
General recommendations for electrical installations apply, and for proper functionality we recommend : if possible, install the instrument far from electrical noise or magnetic field generators such as power relays, electrical motors, speed variators, ... If possible, do not install along the same conduits power cables (power, motor controllers, electrovalves, ...) together with signal and/or control cables.

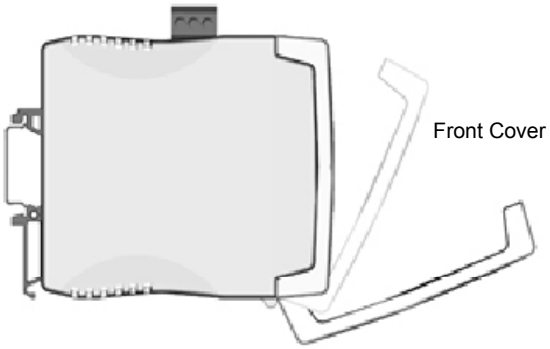
Before proceeding to the power connection, verify that the voltage level available matches the power levels indicated in the label on the instrument.

In case of fire, disconnect the instrument from the power line, fire alarm according to local rules, disconnect the air conditioning, attack fire with carbonic snow, never with water.

Instrument View

To access the jumpers for input and output range selection, and the span and offset adjust potentiometers, open the front cover by pressing on the A-A points indicated below.

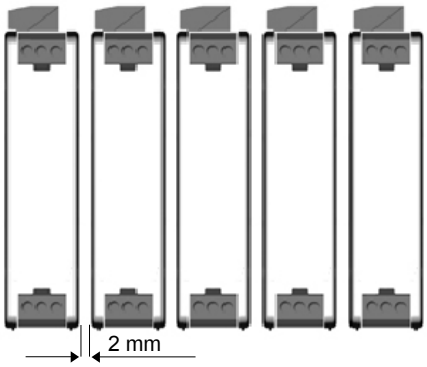




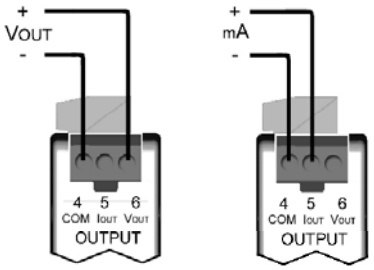
IMPORTANT - Opening the front cover may grant access to areas with dangerous voltages. Operation must be performed by qualified personnel only.

Mounting

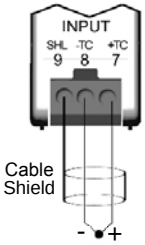
Install the instrument in vertical position, as indicated below. To help dissipate the heat, a free space of 2mm must be left available on both sides of the instrument.



Output Connections

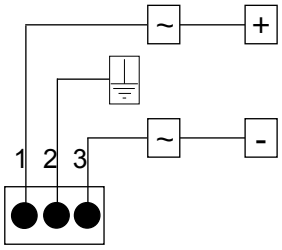


Input Connections



Thermocouple

Power Connections



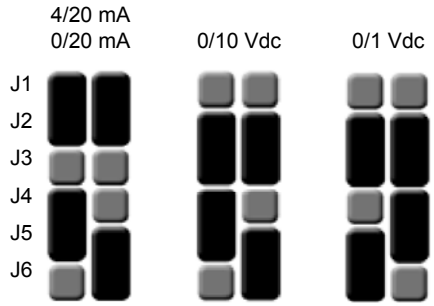
Earth connection - Although a terminal is offered for earth connection, the connection is optional. The instrument does not need this connection for correct functioning nor for compliance with the security regulations.

Fuse - To comply with security regulation 61010-1, add to the power line a protection fuse acting as disconnection element, easily accessible to the operator and identified as a protection device.

230 Vac	70mA time lag
115 Vac	100mA time lag
24 Vdc	250mA time lag

Output range selection Jumpers

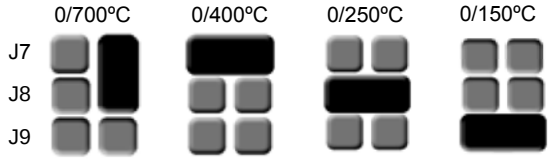
Place the jumpers in the appropriate position to select the desired output signal range.



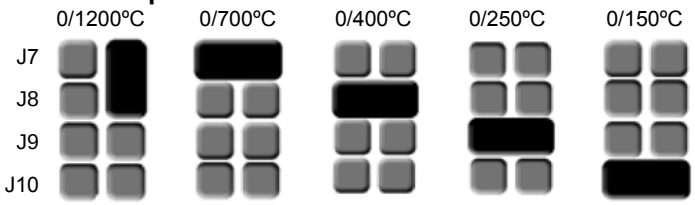
Input range selection Jumpers

Place the jumpers in the appropriate position to select the desired input signal range.

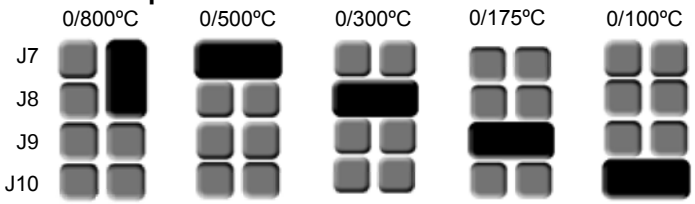
Thermocouple J



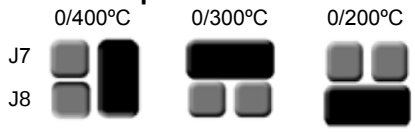
Thermocouple K



Thermocouple E



Thermocouple T



Thermocouple S
0/1600ºC
(Without jumpers)

Thermocouple R
850/1700ºC
(Without jumpers)

Readjustment procedure

To change the input/output relation of the instrument, select the appropriate jumper positions for input and output, and recalibrate the instrument as described below :

1- Open the front cover

2- Select the appropriate output range jumpers
(Section "Output range selection Jumpers" in page 4)

3- Select the appropriate input range jumpers
(Section "Input range selection Jumpers" in page 4)

4- Connect a thermocouple simulator to the input terminals
(Section "Input Connections" in page 3)

5- Connect a multimeter to the output terminals
(Terminals 4 and 5 for mA or terminals 4 and 6 for Vdc)

(Values in brackets are examples for an input/output adjustment of 0/800ºC=0/10Vdc)

6- Generate the lower input signal *(0ºC)*
Operate the Offset potentiometer, until the output is at the low output value desired *(0Vdc)*

7- Generate the higher input signal *(800ºC)*
Operate the Span potentiometer, until the output is at the high output value desired *(10Vdc)*

8- Repeat steps 6 and 7, until the desired accuracy is reached

9.- Close the front cover

Important - The thermocouple simulator should internally simulate the cold junction of the thermocouple. The connection between the thermocouple simulator and the ISC unit should be done with compensated cable for the thermocouple used.

IMPORTANT - Opening the front cover may grant access to areas with dangerous voltages. Operation must be performed by qualified personnel only.

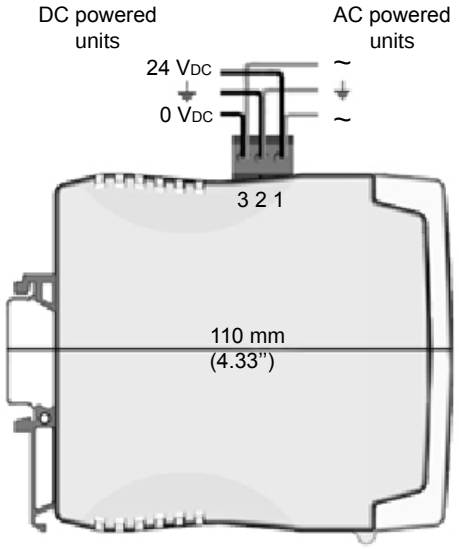
Technical Data

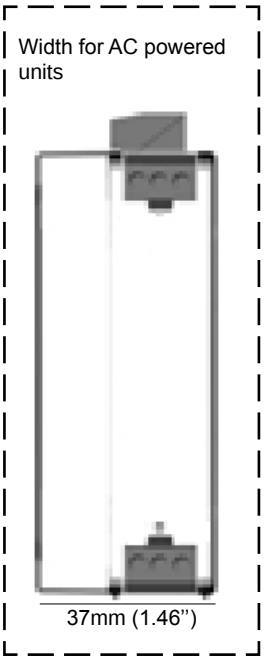
Input signals	Thermocouple J, K, E, T, R o S (different units)
Thermocouple J	0/700ºC, 0/400ºC, 0/250ºC, 0/150ºC
Thermocouple K	0/1200ºC, 0/700ºC, 0/400ºC, 0/250ºC, 0/150ºC
Thermocouple E	0/800ºC, 0/500ºC, 0/350ºC, 0/175ºC, 0/100ºC
Thermocouple T	0/400ºC, 0/300ºC, 0/200ºC
Thermocouple R	850/1700ºC
Thermocouple S	0/1600ºC
Broken probe	output switches to highest
Input Impedance	1MOhm
Overvoltage	max. 10Vdc
Cold junction	automatic compensation
Output signals	Vdc or mA
Selectable output ranges	4/20mA, 0/20mA 0/10Vdc, 0/1Vdc
Type	active
Maximum output	22mA in current ranges 11Vdc in voltage ranges
Minimum output	-1.5mA in current ranges -1Vdc in voltage ranges
Minimum load in Vdc	>1 KOhm
Maximum load in mA	<400 Ohms
Power	
in AC	230Vac 50/60 Hz 115Vac 50/60 Hz
in DC	24Vdc ±10% isolated
Consumption	<3.8VA
Configuration	input and output range selection jumpers, and span and offset potentiometers, accessible at the rear of the front cover
Accuracy	0.3% F.S. at 25ºC
Linearity	0.2% F.S.
Thermal stability	250ppm/ºC typ.
Response time	<250mSec. (90% of signal)
Bandwidth	20Hz (-3dB)
Isolation	3 way isolation
Input - Output	3500Veff (60 sec.), optical
Power - Input	3500Veff (60 sec.), galvanic
Power AC - Output	3500Veff (60 sec.), galvanic
Power DC - Output	1000Veff (60 sec.), galvanic

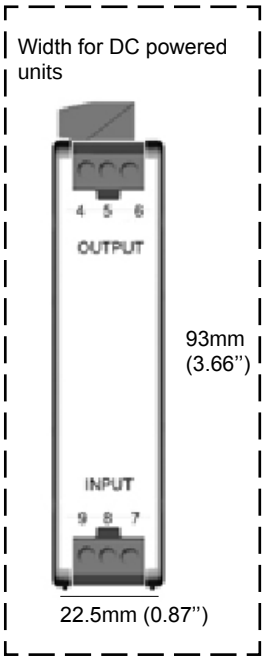
Technical Data (cont.)

Mechanical	
Mounting	standard DIN rail (35 x 7,5mm)
Connections	plug-in screw terminals
Weight	120 grams (DC power) 200 grams (AC power)
Housing material	Polyamide PA6 UL94 V-2 blue
Size	DC models 22.5 x 93 x 110 mm AC models 37.0 x 93 x 110 mm
Protection	IP30
Operating Temp.	0 to 60ºC
Storage Temp.	–20 to +70ºC
Warm-up	15 minutes

Mechanical Dimensions (mm)







CE Declaration of conformity

Manufacturer FEMA ELECTRÓNICA, S.A.
Pol. Ind. Santiga - Altimira 14
E08210 - Barberà del Vallès - BARCELONA
ESPAÑA - SPAIN
www.fema.es - info@fema.es

Series - Models ISC
P, PT100, TJ, TK, TE, TT, TR, TS, VAC, VDC, IAC, IDC, POT, RES, HZ, LC

The manufacturer declares that the instruments indicated comply with the directives and rules indicated below.

European directive for low voltage D73/23/CEE amended by D93/68/CEE.
European directive for product safety D92/59/CEE
Electrotechnical regulation for low voltage (RBT) ITC 21, ITC 29, ITC 35.

European directive for electromagnetic compatibility D89/336/CEE amended by D93/68 CEE

Security EN61010-1
Equipment "Fixed", "Permanently connected"
Degree of pollution 1 and 2 (without condensation)
Isolation Double
Category CAT-II

Immunity: EN 50082-2, IEC 1000-4-2, EN 61000-4-2, IEC 801-2, ENV 50140, EN 61000-4-4, IEC 801-4 (level 3), ENV 50204 (level 3)

Emission EN 50081-2, EN 55011, EN 55014, EN 55022,

UNE 21352-76: CEI 359-71 Operating quality expressions for electronic equipment. UNE 20652-80: CEI 284-68 Behavior rules inherent to the handling of electronic equipment and other similar technics.

Barberà del Vallès, 2002
Daniel Juncà - Quality Manager

Warranty

All instruments are warranted against all manufacturing defects for a period of 24 MONTHS from the shipment date. This warranty does not apply in case of misuse, accident or manipulation by non-authorized personnel. In case of malfunction get in contact with your local provider to arrange for repair. Within the warranty period and after examination by the manufacturer, the unit will be repaired or substituted when found to be defective. The scope of this warranty is limited to the repair cost of the instrument, not being the manufacturer eligible for responsibility on additional damages or costs. .

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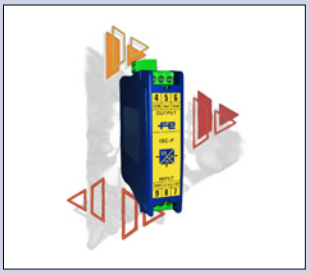
other products

Panel Meters
Standard 96x48 mm

Panel Meters
Small 72x36 mm

Panel Meters
Miniature 48x24 mm

Large Displays
60 & 100 mm digit



Signal Converters
& Isolators

Panel Meters
Standard 96x48 mm

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ELECTRONIC INSTRUMENTATION FOR INDUSTRY

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