

ISC-POT ISC-RES

ISOLATED SIGNAL CONVERTER 3 WAY ISOLATION



MODEL : RES
MODEL : POT

USER'S MANUAL

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GENERAL INFORMATION

The ISC series of Isolated Signal Converters, allow to convert process signals, temperatures, electrical signals, etc, to current loops or voltage signals for further retransmission, while introducing into the system galvanic isolation barriers between the input, the output and the power supply circuits.

The ISC series of Isolated Signal Converters, offer an excellent relation between signal conversion speed and measure accuracy. Offering a 0.2% accuracy and a 70ms response time (depends on the model), these units can process information coming from probes or transducers, in such a way that can be quickly retransmitted in a fast and accurate form to remote data acquisition systems or PLC's. The isolated signal converters of the ISC series are ideal to integrate into 12 bit data acquisition systems.

Its powerful galvanic isolation of 3.500 V introduces high security to the measuring systems, preventing the propagation of those phenomenon which usually cause damage, such as transient peaks or energy shocks in any of the circuits of the system. The galvanic isolation also acts as a strong CE barrier. The decoupling created between the circuits avoids pernicious effects on the output, such as ground loops or signal leaks, which distort the acquired data and are extremely difficult to isolate once introduced into the signal.

The isolation offered by the ISC series of Isolated Signal Converters is a 3 way isolation. Thus, all the benefits exposed above are applicable to any of the three circuits composing the instrument : input, output and power.

Recalibration of the instruments is realized in a fast and easy way. Opening the frontal cover grants access to the configuration jumpers. Additional Span and Offset potentiometers are directly accessible from the frontal part. These potentiometers are highly decoupled, minimizing the iterations needed to obtain a correct adjustment.

In order to obtain a higher and quickest benefit of the ISC units, we recommend you to read carefully the information provided in this manual before proceeding to the installation of the instrument. In this manual you will find all technical data, both electrical and mechanical, needed for a correct instalation and utilization.

Note : The units of the ISC Isolated Signal Converters have attached a characteristics label on the side of the instrument. Check that this information matches with your requirements for this specific application, and very specially check the value and type of the Power Supply.

QUICK GUIDE

The ISC units have a frontal cover which can be opened down. This cover gives access to the Span and Offset potentiometers, and to the selection jumpers for input and output signal ranges.

To open the frontal cover, press slightly the sides of the cover at the upper side, close to the OUTPUT terminals, as indicated on Figure1.

The cover is free to open down, as shown on Figure2.

POWER SUPPLY CONNECTIONS

ISC units are powered through the plug-in terminal positioned on the upper side of the instrument. This terminal is placed in a transverse axis, different from the other terminals. Close to the power supply terminal there is a small yellow label with indications on the connections for AC and DC

IMPORTANT !! Check that the power supply indicated on the white label attached to the side of the instrument, matches with the power supply you want to connect.

For more accurate information on the power supply connections, please see page 6 of this manual.

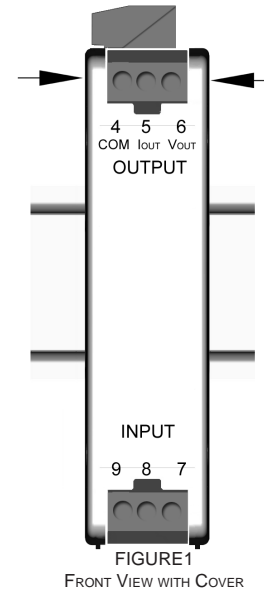
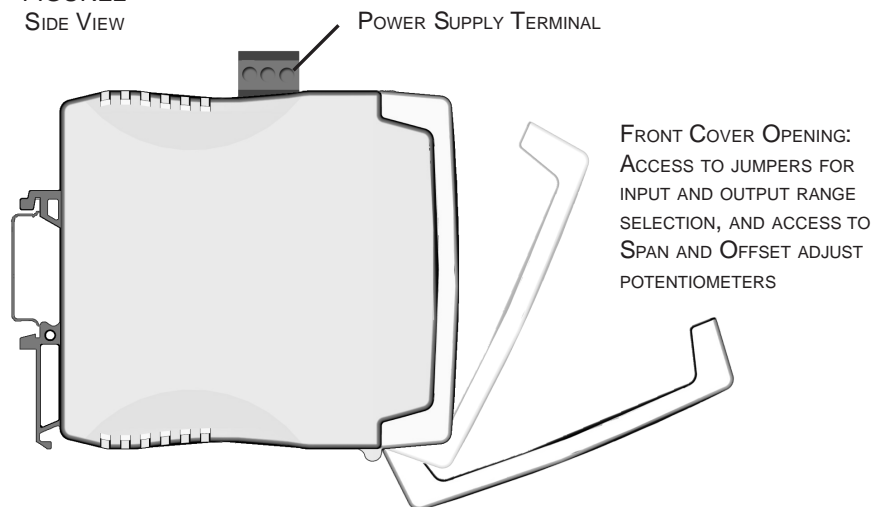
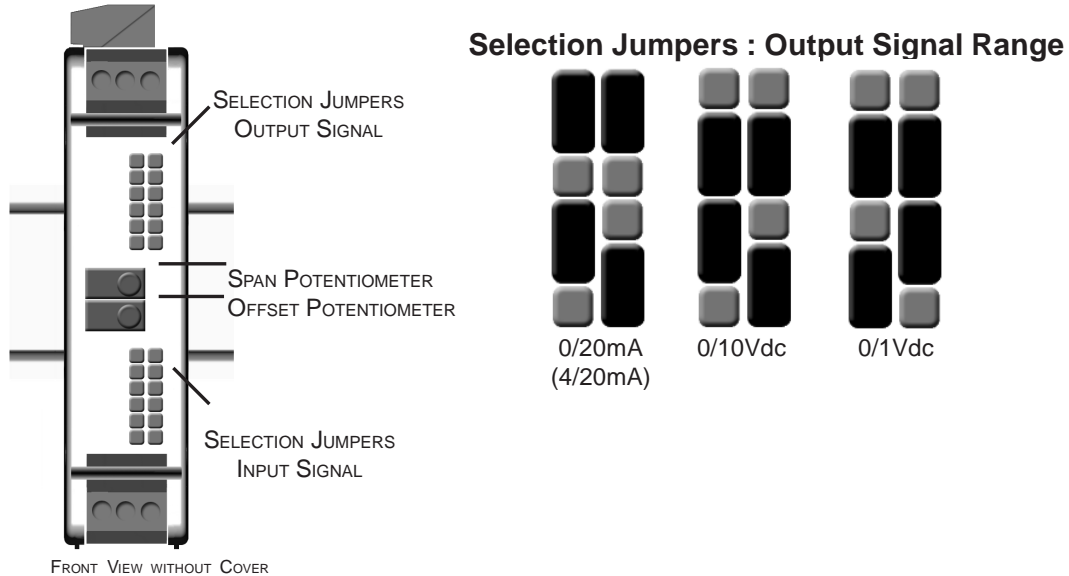


FIGURE2
SIDE VIEW



SIGNAL ADJUSTMENT

To proceed to adjust a range of input and output signals, first select with the appropriate jumpers, the signal ranges which include your desired adjustment. Then proceed to the adjustment.



Example of Adjustment : 0/100% = 0/10Vdc

- 1.- Connect a potentiometer to the input terminals (8 connector + and 9 connector -. Terminal 7 connects to the Sense of the potentiometer).
- 2.- Connect a multimeter to the output signal terminals (4 and 5 for mA or 4 and 6 for Vdc).
- 3.- Select the jumpers for Signal Output Range (see pag. 5) and Input Signal Range (see pag. 6) so that we have a 0/10 Vdc output and a 0/100% input.


(Values in brackets show an example for conertion 0/100% =0/10Vdc)


- 4.- Place the potentiometer to measure at position 0% at the input.
Operate on the potentiometer OFFSET, until getting a zero output (0Vdc)
- 5.- Place the potentiometer to measure at position 100% at the input
Operate on the potentiometer SPAN, until getting the difference between high and low output levels (10-0=10Vdc)
- 6.- Place the potentiometer to measure at position 0% at the input
Operate on the potentiometer OFFSET, until getting the low level output signal (0Vdc)
- 7.- Place the potentiometer to measure at position 100% at the input
Check that the output is the desired high level output (10Vdc)


If higher accuracy is needed, it is possible to operate on the SPAN potentiometer during step 6. In this case, repeat also steps 5 and 6.


Most of the input/output combinations required are reached after these three steps. Close front cover once the adjustment is finished.


SELECTION JUMPERS : INPUT SIGNAL RANGE


 MODEL : POT
Range : 100% FS


 MODEL : RES
Range : 10 KOhms
Range Min : 5 KOhms


 MODEL : POT
Range : 50% FS

 MODEL : RES
Range : 5 KOhms
Range Min : 3 KOhms

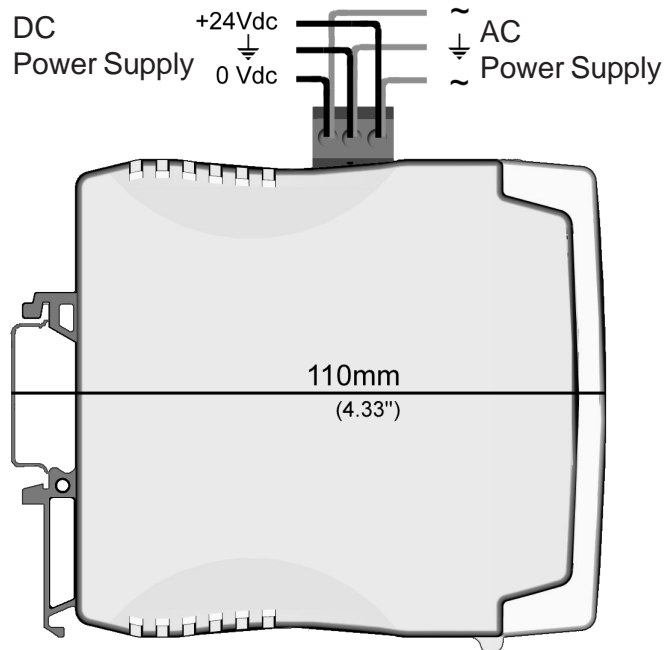
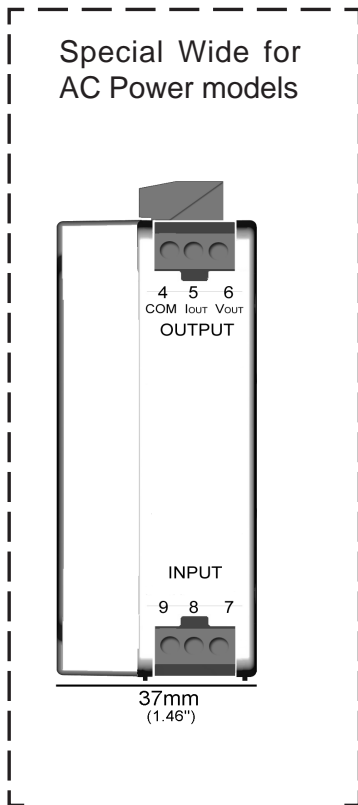
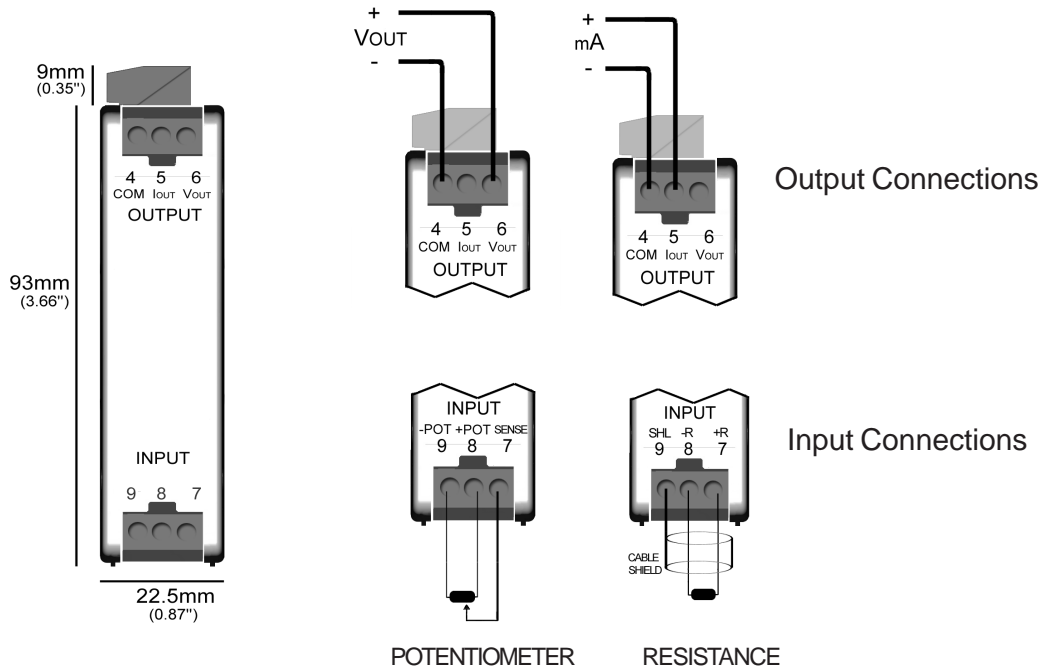
 MODEL : POT
Range : 25% FS

 MODEL : RES
Range : 3 KOhms
Range Min : 1.5 KOhms

 MODEL : POT
Range : 12.5% FS

 MODEL : RES
Range : 1.5 KOhms
Range Min : 750 Ohms

DIMENSIONS AND CONNECTIONS



TECHNICAL DATA : Models ISC-POT and ISC-RES

INPUT SIGNAL FOR MODEL ISC-POT

Input Signal Potentiometer 3 Wire
 Range from 0 to 100% of potentiometer
 Potentiometer Value between 100 Ohms and 1 MegaOhm
 Excitation Voltage 1 Vdc
 Resistance Ranges selectable 0 / 100 %
 0 / 50 %
 0 / 25 %
 0 / 12.5 %
 (Last range allows down to 8%)

INPUT SIGNAL FOR MODEL ISC-RES

Input Signal Resistance 2 Wire
 Range from 1 KOhm to 10KOhm
 Excitation Voltage Resistance x 0.2 mA
 Resistance Ranges selectable 0 / 10 KOhm
 0 / 5 KOhm
 0 / 3 KOhm
 0 / 1.5 KOhm
 (Last range allows down to 750 Ohms)

(*For more information on ranges, please see page 5)

OUTPUT SIGNAL

Output Signal Ranges in Voltage 0/10Vdc
 0/1Vdc
 Maximum Voltage Output 11Vdc approx.
 Minimum Voltage Output -1Vdc approx.
 Minimum Load Resistance ≥1KOhm

 Output Signal Ranges in Current 0/20mA (4/20mA)
 Maximum Output in Current 22mA approx.
 Minimum Output in Current -1.5mA approx.
 Maximum Load Resistance ≤400 Ohms

POWER SUPPLY

DC Power Supply 24Vdc ±10%
 AC Power Supply 230Vac ±10% 50/60 Hz
 115Vac ±10% 50/60 Hz
 Consumption <3.8VA

GENERAL CHARACTERISTICS

Accuracy <0.2% F.S.
Optimized for 12 bit systems
Linearity <0.1% F.S.
Thermal Drift <250 ppm/°C Typical
Response Time <70mS (90% of signal)
Bandwith 20Hz (-3dB)
Electrical Connections Plug-In Screw Terminals
Maximum Wire Section .. 2.5 mm²
Protection IP-30
Operating Temperature .. from 0 to 60°C
Storage Temperature from -20 to +70°C

GALVANIC ISOLATION LEVELS

DC Models	Input - Output	3500 V	(60 seconds)
	Power-Input	3500 V	(60 seconds)
	Power- Output	1000 V	(60 seconds)
AC Models	Input - Output	3500 V	(60 seconds)
	Power- Input	3500 V	(60 seconds)
	Power - Output	3500 V	(60 seconds)

All isolation levels are tested during 60 seconds time, in Vac TrueRMS mode, with current leaks <1mA.

Note : Indicated isolation levels are also indicated sometimes as STRENGTHENED ISOLATION levels, for systems with Pollution Level 2

MECHANICAL DIMENSIONS

DC Models 22.5 x 93 x 110 mm
AC Models 37.0 x 93 x 110 mm
DC Weight 120 gr.
AC Weight 200 gr.

Standard DIN rail mounting, as specified on DIN46277 and DIN EN 50022
37.5 x 7.5 mm (1.38 x 0.3 ``)

MATERIALS

Box and Cover in Poliamide PA6 UL94 V-2 blue color
Terminals in Poliamide UL94 V-0

CAUTIONS, WARNINGS AND NOTES

INSTALLATION

PRECAUTIONS.- The installation and the future use of this unit must be done by qualified personnel. The unit has not AC (mains) switch, neither internal protection fuse. It will be in operation as soon as power is connected. The installation must incorporate an external mains switch with a protection fuse and also the necessary devices to protect the operator and the process when using the unit to a control machine or process where injury to personnel or damage to equipment or process may occur as a result of failure of the unit.



RECOMMENDED FUSES

Units with Power Supply 24 Vdc	250mA Time Lag Fuse
Units with Power Supply 230 Vac	70mA Time Lag Fuse
Units with Power Supply 115 Vac	100mA Time Lag Fuse

SAFETY PRESCRIPTIONS.- The unit has been designed and tested under EN-61010-1 rules and is delivered in good conditions. This User's



Manual contains useful information the user has to respect in order to warrant a proper function of the unit, and good security conditions.

The unit is designed for internal applications, with good ventilation to avoid excessive heating. It can **occasionally** be applied to temperatures down to 10°C or up to 70°C without security degradation. Do all connections before applying power to the unit. Do not make wiring changes until power is disconnected from the unit.

Install the unit far from elements generating electric noise, or magnetic fields, such as power relays, electrical engines, speed regulators, etc. Do not use until installation is completed.

POWER SUPPLY.- The power supply must be connected to the adequate terminals 1, 2 and 3. The characteristics of the power supply are shown on the side label. Please make sure that the unit is correctly connected to a power supply of the correct voltage and frequency. Do not connect the unit to lines which are overloaded or which provide power to systems working on ON-OFF cycles or inductive loads.

ATTENTION : If the power supply is DC voltage, be careful with the polarity indicated for each terminal.

SIGNAL WIRING .- Certain considerations must be given when installing the signal input wires. If the wires are long, they can act as an antenna introducing electrical noise into the unit. Therefore :

Do not install the signal input wires in the same conduit with power lines, heaters, solenoids, SCR controls, etc ... and always far from these elements.

When shielded wires are used, leave unconnected the shield on the transmitter side and connect the other end of the shield to the ground terminal of the machine.

EXCITATION VOLTAGE.- Model ISC-P incorporates an internal power supply for transducers. The output of this power supply is connected to terminals 7 and 9. Do not connect these terminals to an external power supply, because both units will be permanently damaged.

SAFETY CONSIDERATIONS

PRESCRIPTION.- Before starting any operation of adjustment, replacement, maintenance or repair, the unit must be disconnected from any kind of power supply. Keep the unit clean, to assure good functioning and performance. To prevent electrical or fire hazard, do not expose the unit to excessive moisture. Do not operate the unit in the presence of flammable gases or fumes, such an environment definitely constitutes a safety hazard. The unit is designed to be mounted on a metal panel.



If the unit shows signs of damage, is not able to show the expected measures, has been stored in a bad conditions or a protection failure happened, then do not attempt to operate, keep the unit out of service and send for repair.

IN CASE OF FIRE



- 1.- Disconnect the unit from the power supply
- 2.- Give the alarm according to the local rules
- 3.- Switch off all air conditioning devices
- 4.- Attack the fire with carbonic snow, do not use water in any case

WARNING: In closed areas do not use systems with vaporized liquids.

CE DECLARATION OF CONFORMITY

Manufactured by : FEMA ELECTRÓNICA, S.A.
Address : Centro Industrial Santiga
Altimira 14 (Talleres 14, Nave 2)
E 08210-Barberà del Vallès (Spain)

We hereby declare under our responsibility, that the equipments identified below comply with the following specifications :

Series: ISC Series of Isolated Signal Converters
Model: ISC-POT and ISC-RES

DIRECTIVES

EUROPEAN DIRECTIVE FOR LOW VOLTAGE D73/23/CEE AMENDED BY D93/68/CEE. Equipments powered from 50 to 1000 Vac and/or from 75 to 1500 Vdc.

EUROPEAN DIRECTIVE FOR PRODUCT SAFETY D92/59/CEE ELECTROTECHNICAL REGULATION FOR LOW VOLTAGE (RBT) ITC21, ITC 29, ITC 35. For equipments with power supply lower than 50Vac and/or 75Vdc.

EUROPEAN DIRECTIVE FOR ELECTROMAGNETIC COMPATIBILITY D89/336/CEE AMENDED BY D93/68CEE, ACCORDING TO RD1950/1995 (01/12)

REGULATIONS

ELECTRICAL SECURITY: EN61010-1
SUSCEPTIBILITY: 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

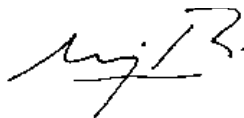
UNE 21352-76: CEI 359-71

Operating quality expressions for electronic equipments.

UNE 20652-80: CEI 284-68

Behaviour rules inherent to the handling of electronic equipments and other similar technics.

Signed : Alex Pina
Quality Manager
Barberà del Vallès, 2002



WARRANTY

FEMA ELECTRÓNICA, S.A. warrants this unit to be free of manufacturing defects for a period of 24 MONTHS from shipment date. This warranty covers both materials and manufacturing processes.

This warranty is VOID if the unit shows evidence of damages as a result of misapplication, accident, misuse or if the product had been tampered or repaired by personnel or companies without the official authorization of **FEMA ELECTRÓNICA, S.A.** This warranty is also VOID for damages caused by defective or inappropriate applications.

In case of malfunction, the unit should be sent to the manufacturer for its evaluation. Within the warranty period, and always previous examination from **FEMA ELECTRÓNICA, S.A.**, the unit will be repaired or replaced to the discretion of the manufacturer.

Limitation of liability : **FEMA ELECTRÓNICA, S.A.** shall not be responsible for any damage or loss to other equipment however caused, which may be experienced as a result of the installation or use of this product. **FEMA ELECTRÓNICA, S.A.** liability shall not exceed the purchase price paid of the product upon which liability is based. In no event shall **FEMA ELECTRÓNICA, S.A.** be liable for consequential, incidental or special damages

RETURN FOR REPAIR

Ship free of charges and properly packed to the address indicated below, including :

Defective product
Description of the defect
Warranty Data properly filled

FEMA ELECTRÓNICA, S.A.
REPAIRS
Pol.Ind.Santiga (Altimira 14, Talleres 14, Nave 2)
E-08210 BARBERÀ DEL VALLÈS (SPAIN)

WARRANTY DATA

Serial Number : _____
Series - Model : _____
Input Signal : _____
Output Signal : _____
Power Supply : _____

Supplied by :

Date and Stamp