



INSTALLATION INSTRUCTIONS

ISE 1-CHANNEL INTRINSICALLY SAFE RELAYS

March 2019

901-0000-329

DANGER!



Potentially hazardous voltages are present. Electrical shock can cause death or serious injury.

Installation should be done by qualified personnel following all National, State & Local Codes.



Présence de tensions potentiellement dangereuses. Une décharge électrique peut causer la mort ou des blessures graves.

L'installation devrait être effectuée par du personnel qualifié suivant tous les codes nationaux, provinciaux et locaux.

**BE SURE TO REMOVE ALL POWER SUPPLYING THIS EQUIPMENT BEFORE CONNECTING OR DISCONNECTING WIRING.
READ INSTRUCTIONS BEFORE INSTALLING OR OPERATING THIS DEVICE. KEEP FOR FUTURE REFERENCE.**

**S'ASSURER DE SUPPRIMER TOUTE ALIMENTATION ÉLECTRIQUE DE CET ÉQUIPEMENT AVANT DE BRANCHER OU DE DÉBRANCHER LES CÂBLAGES.
LIRE LES INSTRUCTIONS AVANT D'INSTALLER OU D'UTILISER CET APPAREIL ET LES CONSERVER POUR RÉFÉRENCE ULTÉRIEURE.**

Installation & Wiring

1. The ISE Series Intrinsically Safe relays are UL913 Listed as associated apparatus for interfacing between hazardous and safe areas. The ISE relay must be installed in a suitable enclosure in a safe area.
2. For DIN-rail mounting, snap the relay on 35mm DIN track. For panel mounting, using a thumb, gently extend the two black DIN-rail clips from under the relay until they snap into place and the mounting hole on each one is visible. Mount the relay to the panel using a #8 screw through the hole on each clip.
3. Connect all wires to the device per Macromatic Control Drawing ISD2A01 (on back). Use #14-24 solid or stranded copper wire with a terminal tightening torque of 7 in-lbs.

Standard Operation

Each ISE Series relay consists of an intrinsically safe input and a corresponding electromechanical relay output. There is one bi-color LED for status indication. With input voltage applied, the LED will be ON (GREEN) to indicate power is applied. When the input device from the hazardous area is closed, the output relay is energized and the LED is ON (ORANGE). When the input device opens, the output relay will de-energize and the LED will be ON (GREEN).

Inverted Operation (V-suffix)

Each ISE Series relay consists of an intrinsically safe input and a corresponding electromechanical relay output. There is one bi-color LED for status indication. With input voltage applied, the LED will be ON (GREEN) to indicate power is applied. When the input device from the hazardous area is **open**, the output relay is energized and the LED is ON (ORANGE). When the input device **closes**, the output relay will be de-energized and the LED will be ON (GREEN).

Troubleshooting: If the unit fails to operate properly, check that all connections are correct per Macromatic Control Drawing ISD2A01. If problems continue, contact Macromatic at 800-238-7474 or e-mail tech-support@macromatic.com for assistance.

Warranty: All catalog-listed ISE Series Intrinsically Safe Relays manufactured by Macromatic are warranted to be free from defects in workmanship or material under normal service and use for a period of five (5) years from date of manufacture.

CONTROL DRAWING ISD2A01

ASSOCIATED APPARATUS / APPAREILLAGE CONNEXE

Revision A

Notes:

1. The output current of this associated apparatus is limited by a resistor such that the output voltage-current plot is a straight line drawn between open-circuit voltage and short-circuit current.

2. This associated apparatus may be connected to simple apparatus as defined in Article 504.2 installed and temperature classified in accordance with Article 504.10(D) of the National Electrical Code (ANSI/NFPA 70), or other local codes as applicable.

3. Capacitance and inductance of the field wiring from the simple apparatus to the associated apparatus shall be calculated. Cable capacitance, C_{cable} , must be less than the marked capacitance, C_a (or C_o), shown on the associated apparatus used. The same applies for inductance (L_{cable} , L_i and L_a or L_o , respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: $C_{cable} = 60 \text{ pF/ft.}$, $L_{cable} = 0.2 \text{ } \mu\text{H/ft.}$

4. If connected to intrinsically safe equipment, the equipment must be third party listed as intrinsically safe for the application, and have intrinsically safe entity parameters conforming with the below.

<u>I.S. Equipment</u>	≥	<u>Associated Apparatus</u>
V max (or U_i)	≥	Voc (or U_o)
I max (or I_i)	≥	Isc (or I_o)
P max, P_i	≥	P_o
$C_i + C_{cable}$	≥	C_a (or C_o)
$L_i + L_{cable}$	≥	L_a (or L_o)

5. If connected to intrinsically safe equipment, capacitance and inductance of the field wiring from the intrinsically safe equipment to the associated apparatus shall be calculated and included in the system calculations as shown in Note 6.

6. Cable capacitance, C_{cable} , plus intrinsically safe equipment capacitance, C_i must be less than the marked capacitance, C_a (or C_o), shown on any associated apparatus used. The same applies for inductance (L_{cable} , L_a (or L_o), respectively). Where the cable capacitance and inductance per foot are not known, the following values shall be used: $C_{cable} = 60 \text{ pF/ft.}$, $L_{cable} = 0.2 \text{ } \mu\text{H/ft.}$

7. Associated apparatus must be installed in an enclosure suitable for the application in accordance with the National Electrical Code (ANSI/NFPA 70) for installation in the United States, the Canadian Electrical Code for installations in Canada, or other local codes, as applicable.

8. Intrinsically safe circuits must be wired and separated in accordance with Article 504.20 of the National Electrical Code (ANSI/NFPA 70) or other local codes, as applicable.

9. This associated apparatus has not been evaluated for use in combination with another associated apparatus.

10. If connected to intrinsically safe equipment, installations in which both the C_i and L_i of the intrinsically safe equipment exceed 1% of the C_a (or C_o) and L_a (or L_o) parameters of the associated apparatus (excluding the cable), then 50% of C_a (or C_o) and L_a (or L_o) parameters are applicable and shall not be exceeded. The reduced capacitance shall not be greater than $1 \text{ } \mu\text{F}$ for Groups C and/or D, and 600 nF for Groups A and B. The values of C_a (or C_o) and L_a (or L_o) determined by this method shall not be exceeded by the sum of all of C_i plus cable capacitances and the sum of all of the L_i plus cable inductances.

11. All channels comprise a single intrinsically safe circuit.

Approvals:



Class I; Division I; Groups A,B,C,D
Class II; Division I; Groups E,F,G
Class III



Zone 0; [Ex ia] IIC Ga
Zone 20; [Ex ia] IIIC Da

Ratings:

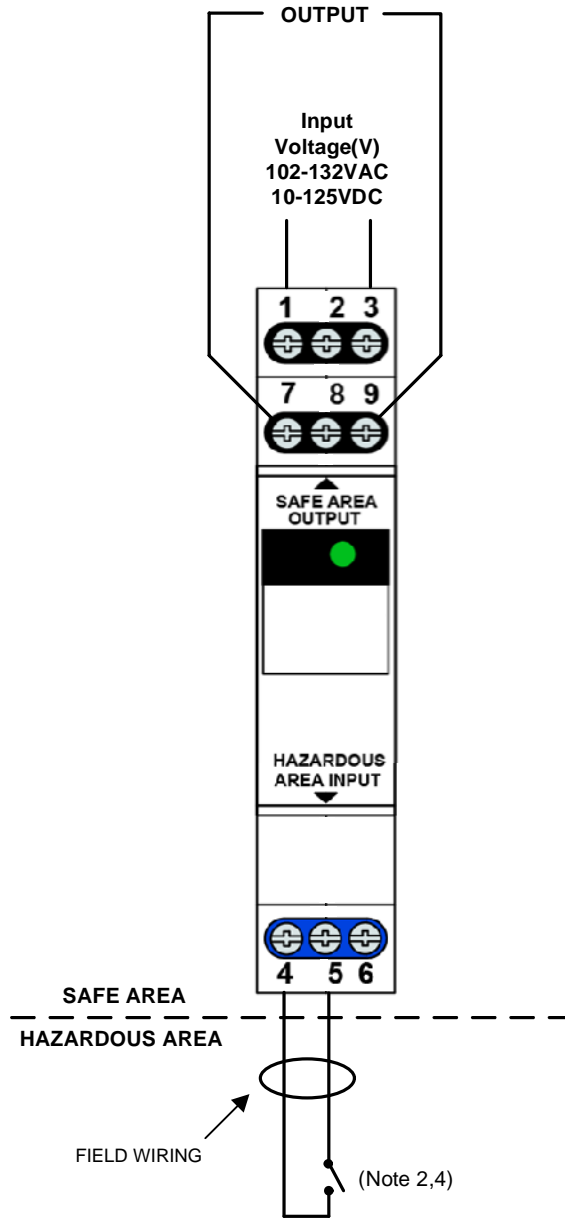
- Input Voltage(V): 102-132VAC 10-125VDC
- Temperature(T_a): $-28^\circ\text{C} \leq T_a \leq 60^\circ\text{C}$ (Max. 3 A)
 $-28^\circ\text{C} \leq T_a \leq 40^\circ\text{C}$ (Max. 5 A)
- Maximum Voltage(U_m): 132VAC
- Contacts Ratings (terminals 7,9):
- 5A 125VAC/30VDC (Max. T_a 40°C)
- 3A 125VAC/30VDC (Max. T_a 60°C)
- D300 Pilot Duty (Max. T_a 60°C)

WARNING!

SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.
AVERTISSEMENT!

LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSÈQUE.

ISE, MBE SERIES



Entity Parameters(terminals 4-5):

Voc(U_o)	10.29 V
Isc(I_o)	18.05 mA
P_o	46.44 mW
$C_a(C_o)$	2.63 μF
$L_a(L_o)$	109.10 mH