INSTRUCTION MANUAL

Model 2110R2 Barrier Unit

Characteristics

General Desription:

The Model 2110R2 Barrier Unit is an intrinsically safe DIN Rail Mountable device that actively limits the current and voltage to protect intrinsically safe equipment from power spikes and to maintain the intrinsic safety. The barrier provides intrinsically safe power and intrinsically safe communication or I/O lines for devices located in Hazardous Area.

Functions:

The 2110R2 is capable of delivering safe levels of supply power and 4-wire/2-wire RS485 digital signals or any other digital I/O lines. The device conforms to UL 913 Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, Division 1 hazardous locations.

Technical data

Supply:

Voltage: 12VDC nom (10 to 15VDC max) with no reverse polarity protection
Maximum input current: 100 mA
Current consumption:

- No load
  @ 15VDC 11mA
  @ 12VDC 1.5mA
  @ 10VDC 0.2mA
- With short circuit on the output
  @ 15VDC 83 mA

Communication (I/O) lines input:

Voltage: 5 VDC nom / 7 VDC max
Maximum input current: 50 mA

Um = 250 Vrms.

Environmental Conditions:

Operating: -40 to 60 °C
Storage: -40 to 85 °C

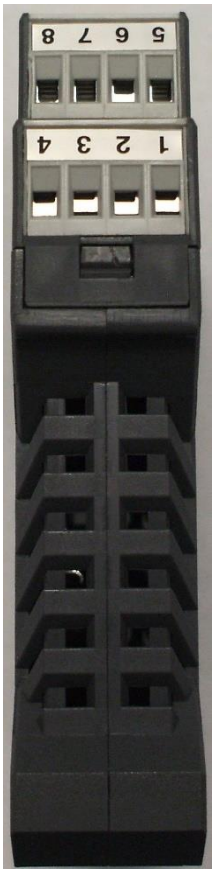
Approvals: UL 913, Standard for intrinsically Safe Apparatus and Associated Apparatus for Hazardous (Classified) Locations
UL 60079-11(Intrinsic Safety "i" Zones 0 and 1)
CAN/CSA C22.2 No. 157 Intrinsically safe and non-incendive equipment for use in hazardous locations

Mounting: T35 DIN Rail
Weight: about 130 g
Connection: by polarized plug-in disconnect screw terminal blocks to accomodate terminations up to 2.5mm^2
Location: Class I Div 1 Group D Temperature code T4
Protection class: IP20

INSTRUCTION MANUAL

Dimensions: width 22.5mm/0.9“,Depth 99mm/3.9“,Height 114.5mm/5.5“

Terminal Block connection



HAZARDOUS AREA	SAFE AREA
9 → NOT CONNECTED	1 → TX/RX+
10 → NOT CONNECTED	2 → TX/RX-
11 → DC GND	3 → RX-
12 → VDC	4 → RX+
13 → TX/RX+	5 → NOT CONNECTED
14 → TX/RX-	6 → EARTH GND
15 → RX-	7 → DC GND
16 → RX+	8 → +VIN

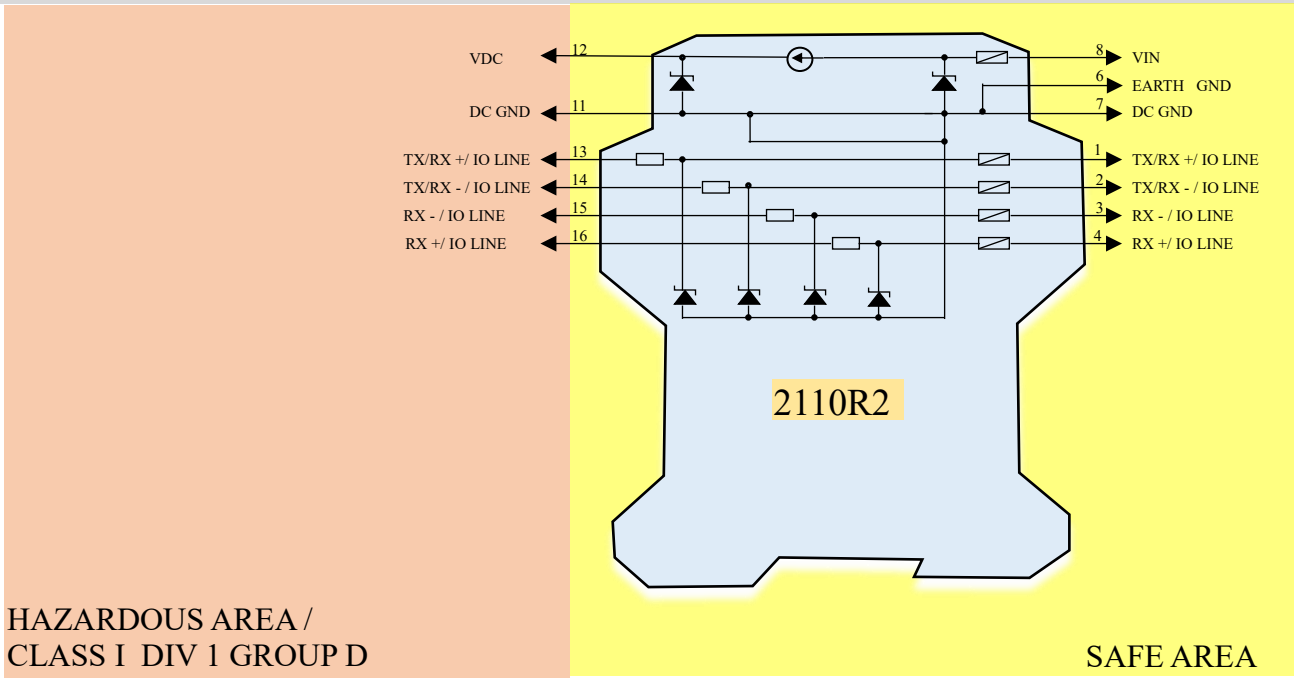
PARAMETERS TABLE

INSTRUCTION MANUAL

Terminals	2110R2 Associated Aparratus Parameter	Must be	Hazardous Area Device Parameters
12	U_o/V_{oc} = 12.81 V	≤	U_i/V_{max}
12+13+14+ 15 +16	I_o/I_{sc} = 217.4 mA	≤	I_i/I_{max}
12+13+14+ 15 +16	P_o = 1.32 W	≤	P_i / P_{max}
12+13+14+ 15 +16	C_o/C_a = 23.2 µF	≥	C_i/C_i device + C cable
12+13+14+ 15 +16	L_o/L_a = 5.9 mH	≥	L_i/L_i device + L cable

For installation in which both C_i and L_i of the Intrinsically Safe Apparatus exceed 1% of the C_o and L_o parameters of the Associated Apparatus (excluding cable), than 50% of C_o and L_o parameters are applicable and shall not be exceeded.
If cable parameters are unknown , the following values may be used: Capacitance 60pF per foot(180pF per meter), inductance 0.20uH per foot (0.60µH per meter).

FUNCTION DIAGRAM



INSTRUCTION MANUAL

WARNINGS

- Not to be connected to control equipment that uses or generates more than 250Vrms or VDC with respect to earth ground.
- The 2110R2 must be installed , operated and maintained only by qualified personnel, in accordance to relevant national/international installation standards(National Electric Code (NFPA, Article 504) and ANSI/ISA – RP12.6).
- Particular care shall be given to segregation and clear identification of IS conductors from non IS ones.
- De-energized power source (turn off power supply voltage) before plug or unplugging the terminal blocks when installed in Hazardous Area/ Hazardous Locations or unless area is known to be nonhazardous.
- **Warning: Substitution of components may impair Intrinsic Safety.**
- **Explosion Hazard: to prevent ignition of flamable or combustible atmospheres, disconect power before servicing unless area is known to be nonhazardous.**
- The unit cannot be repaired by the end user and must be returned to the manufacturer or his authorized representative. Any unauthorized modification must be avoided.

Note: All inputs are not reverse polarity protected. If reverse polarity occurs the unit will fail safe by blowing the fuses. To avoid this situation special care is required during installation.

MARKING

Labels:

The Model 2110R2 IS barrier board parameters and instructions will be clearly marked on the labels attached to the enclosure. There are three labels, one on each side and one on the front.
Side label drawing number is 2110R2-001D and front label document number is 2110R2-00A2.

Serial Number:

For each unit a unique serial number will be generated after factory testing and coating are completed. The serial number consist of five digits (e.g. SN: 00101) and will be clearly printed with black permanent marker on a white special rectangle located on the front side of the PCB.

Installation

The unit is suitable for installation on T35 DIN Rail.
The unit can be mounted with any orientation over the entire ambient temperature range.
Electrical connection of conductors up to 2.5 mm^2 are accomodated by polarized plug-in removable screw terminal blocks which can be plugged in/out .
Identify the function and location of each connection terminal using the wiring diagram.
Intrinsiccaly safe conductors must be identified and segregated from non IS and wired in accordance to relevant national/international standards(National Electric Code (NFPA, Article 504) and ANSI/ISA – RP12.6).
The enclosure provides an IP20 minimum degree of mechanical protection for indoor installation; Outdoor installation requires an aditional enclosure with higher degree of protection consistent with the effective operating environment of the specific installation. Unit must be protected against dirt, dust, extreme mechanical and thermal stress, and casual contacts
If enclosure needs to be cleaned use only a cloth lightly moistened by a mixture of detergent in

water.

Electrostatic Hazard: to avoid electrostatic hazard, enclosure must be cleaned only with a damp or antistatic cloth.

Any penetration of cleaning liquid must be avoided to prevent damage to the unit. Any unauthorized card modification must be avoided.

Fuses are not field replaceable and unit must be returned to Manufacturer for repair.

For more information contact Electrolab:

Electrolab, Inc.
159 Enterprise Parkway

Boerne, Texas 78006
P: (210) 824-5364
www.electrolabcontrols.com