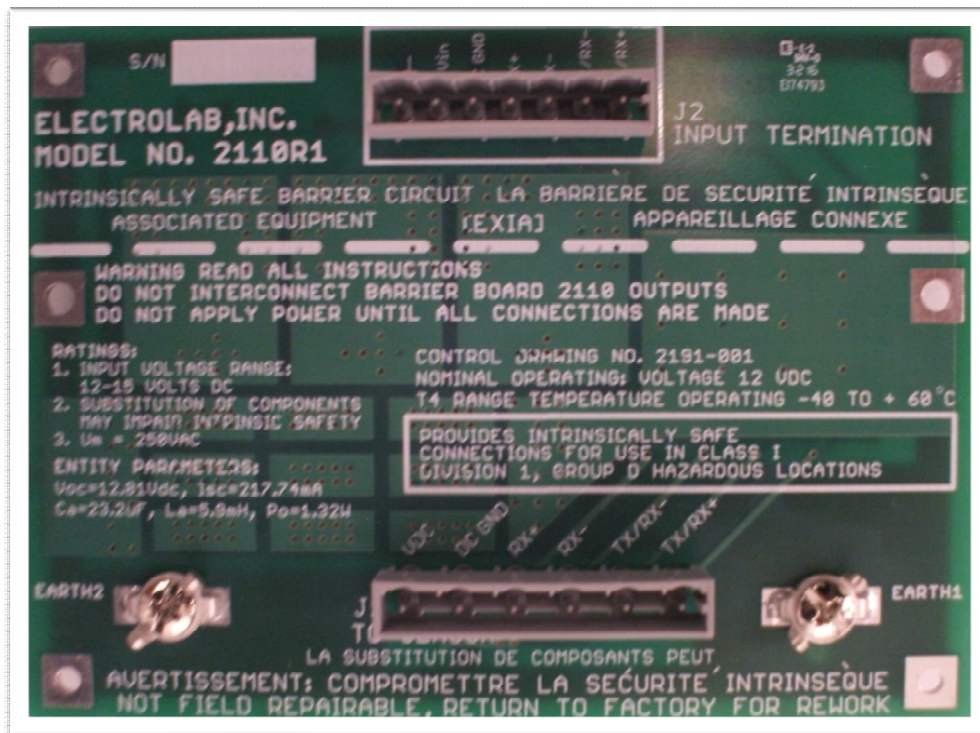


Model 2110R1 Barrier Device

Instruction Manual EI# 29084



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GENERAL DESCRIPTION

The Model 2110R1 Barrier Unit is an intrinsically safe device that actively limits 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 areas.

The 2110R1 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: May be mounted in Applied Molded Products AM664L enclosure

Weight: ~130 grams

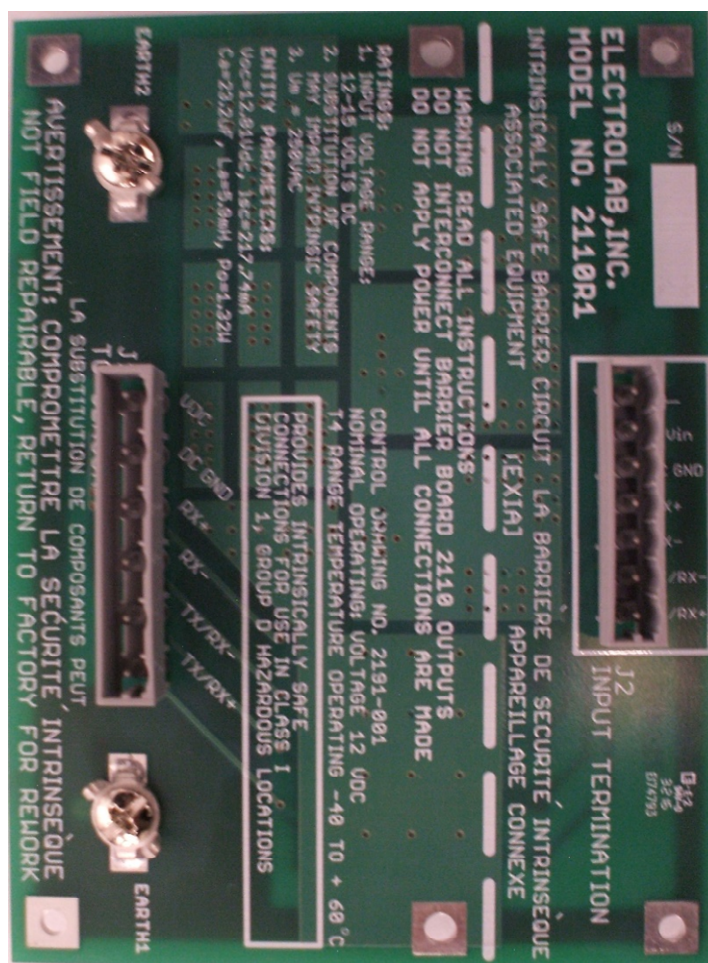
Connection: WAGO polarized plug-in disconnect/connect cage clamp connection terminal blocks to accommodate terminations up to 2.5mm²

Location: Class I Div 1 Group D Temperature code T4

Protection class: IP68 in Applied Molded Products AM664L enclosure

Dimensions: PCB: 5.5" x 4"; Enclosure: 6"x6"x 4"

TERMINAL CONNECTIONS



HAZARDOUS AREA	SAFE AREA
J1-1 → TX/RX+	J2-1 → Tx/Rx +
J1-2 → TX/RX-	J2-2 → Tx/Rx -
J1-3 → RX-	J2-3 → Rx -
J1-4 → RX+	J2-4 → Rx +
J1-5 → DC GND	J2-5 → DC GND
J1-6 → VDC	J2-6 → Vin
	J2-7 → Earth GND

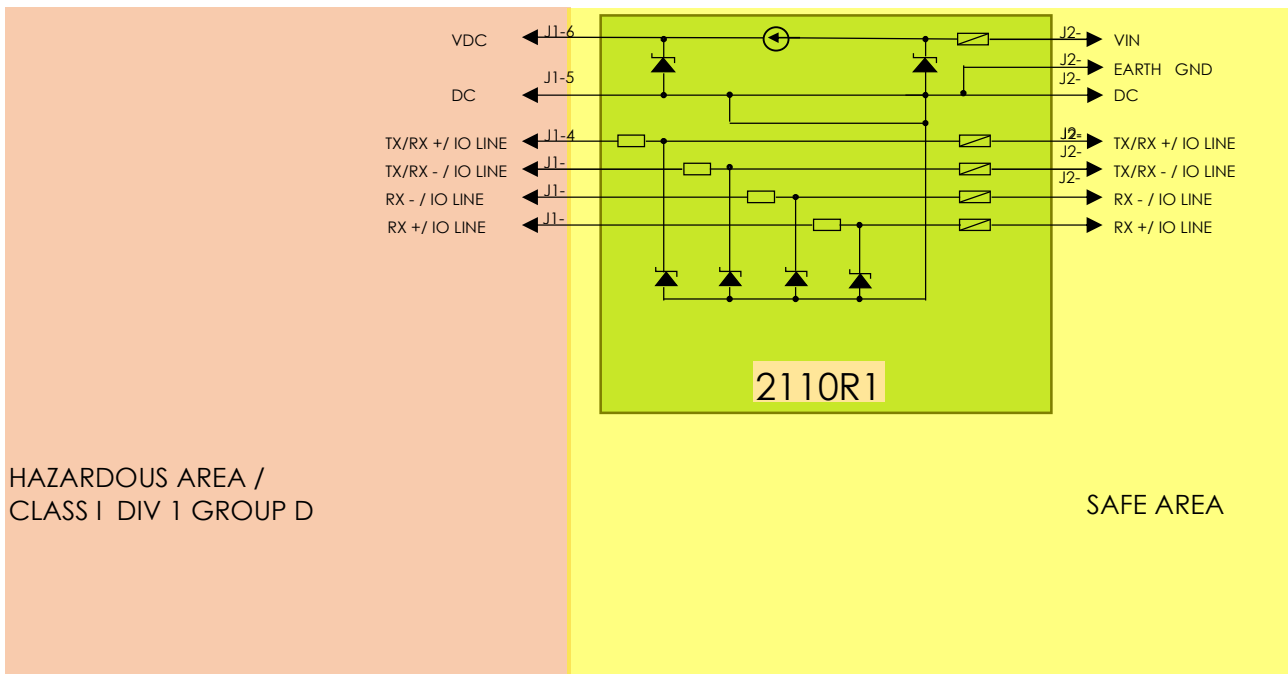
PARAMETERS TABLE

Terminals	2110R1 Associated Aparatus Parameter	Must be	Hazardous Area Device Parameters
J1-6	$U_o/V_{oc} = 12.81 \text{ V}$	\leq	U_i / V_{max}
J1-1 thru J1-4; J1-6	$I_o/I_{sc} = 217.4 \text{ mA}$	\leq	I_i / I_{max}
J1-1 thru J1-4; J1-6	$P_o = 1.32 \text{ W}$	\leq	P_i / P_{max}
J1-1 thru J1-4; J1-6	$C_o/C_a = 23.2 \mu\text{F}$	\geq	$C_i/C_i \text{ device} + C \text{ cable}$
J1-1 thru J1-4; J1-6	$L_o/L_a = 5.9 \text{ mH}$	\geq	$L_i/L_i \text{ device} + L \text{ cable}$

For installations 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), then 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 (0.60uH per meter).

FUNCTION DIAGRAM



WARNINGS

- Not to be connected to control equipment that uses or generates more than 250Vrms or VDC with respect to earth ground.
- The 2110R1 must be installed, operated and maintained only by qualified personnel, in accordance with 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 conductors.
- **Warning: Substitution of components may impair Intrinsic Safety.**
- **Explosion Hazard: to prevent ignition of flammable or combustible atmospheres, disconnect power before servicing.**
- The unit cannot be repaired by the end user and must be returned to the manufacturer for repair. 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 2110R1 IS barrier board parameters and instructions will be clearly marked on the label attached to the enclosure and printed on the silk screen layer of PCB.

Serial Number:

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

INSTALLATION

- The unit may be mounted in Applied Molded Products AM664L enclosure.
- The unit can be mounted with any orientation over the entire ambient temperature range.
- Electrical connection of conductors up to 2.5 mm² are accommodated by polarized plug-in, removable WAGO disconnect/connect cage clamps.
- Identify the function and location of each connection terminal using the wiring diagram.
- Intrinsically safe conductors must be identified and segregated from non IS conductors and wired in accordance with relevant national/international standards (National Electric Code (NFPA, Article 504) and ANSI/ISA – RP12.6).
- The enclosure (if used) provides an IP68 minimum degree of mechanical protection for indoor and outdoor installation. The 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 the unit must be returned to the Manufacturer for repair.

TECHNICAL SUPPORT

For more information or technical support:

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