



# Certificate of Compliance

**Certificate:** 2578463

**Master Contract:** 187869

**Project:** 2578463

**Date Issued:** March 6, 2014

**Issued to:** Crystal Engineering Corp.

708 Fiero Lane, Suite 9  
San Luis Obispo, CA 93401  
USA  
Attention: Janine White

*The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US' for Canada and US or with adjacent indicator 'US' for US only or without either indicator for Canada only.*



*John Yam*

Issued by: John Yam

## **PRODUCTS**

**CLASS 2258 03** - PROCESS CONTROL EQUIPMENT - Intrinsically Safe and Non - Incendive Systems - For Hazardous Locations

**CLASS 2258 83** - PROCESS CONTROL EQUIPMENT-Intrinsically Safe and Non-Incendive - Systems-For Hazardous Locations-Certified to U.S. Standards

### **Class I, Division 1, Groups C and D**

Reference Pressure Recorder Model nVision; Temperature Code T4/T3A/T3B/T3C; Maximum Working Pressure 15,000 PSI; Intrinsically Safe when powered by one of the following batteries (4-cells, AA, max 6.6V); IP67

Rayovac Maximum Plus, 815, - **T4**, Ta= +50 °C

Eveready (Energizer) EN91, - **T3A**, Ta= +50 °C

Eveready (Energizer) E91, - **T3B**, Ta= +50 °C

Duracell MN1500, - **T3C**, Ta= +50 °C

Duracell MN1500, - **T4**, Ta= +45 °C



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**Entity Parameters:**

RTD Module	MA20 Module
$U_i = 0$	$U_i = 28 \text{ V}$
$I_i = 0$	$I_i = 93.3 \text{ mA}$
$P_i = 0$	$P_i = 653.3 \text{ mW}$
$U_o = 9.73 \text{ V}$	$C_i = 0.36 \text{ uF}$
$I_o = 1.6642 \text{ A}$	$L_i = 39.1 \text{ uH}$
$P_o = 1.1 \text{ W}$	$U_o = 6.6 \text{ V}$
$C_o = 0.5 \text{ uF}$	$I_o = 4.45 \text{ mA}$
$L_o = 12 \text{ uH}^{**}$	$P_o = 7.34 \text{ mW}$
	$C_o = 0.5 \text{ uF}^*$
	$L_o = 12 \text{ uH}^{**}$

Note: \* - Dependant on the supply to the terminals but shall not be greater than 0.5 uF

\*\* - Total cable inductance between all modules

Notes:

- 1) The equipment shall not be installed in a location where the external conditions are conducive to the buildup of electrostatic charge.
- 2) The equipment shall be installed in such a way that, even in the event of rare incidents, ignition sources due to impact and friction sparks shall be avoided. Additionally, cleaning of the equipment should be done only with a damp cloth.
- 3) The USB connector shall not be used within the hazardous atmosphere. It shall be used in the non-hazardous atmosphere with either "Safety Extra Low Voltage Circuits" (SELV) or "Protective Extra Low Voltage Circuits" (PELV). The USB connector has an  $U_m$  of 6V.
- 4) Only one MA20 module may be used in any one nVision Reference Pressure Recorder.
- 5) The manufacturer shall ensure that the fuse F1 (Littelfuse 0466.125NR) (PCA PN: 4931) has a minimum resistance of  $2.78 \Omega$  when measured at an ambient temperature not exceeding  $25^\circ\text{C}$ . The minimum resistance at the lower certified ambient temperature ( $-20^\circ\text{C}$ ) which is relied upon for safety is  $2 \Omega$ .



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**APPLICABLE REQUIREMENTS**

CSA Standard C22.2 No. 0-10 - General Requirements - Canadian Electrical Code Part II

CSA Standard C22.2 No. 157-M1992 - Intrinsically Safe and Non-Incendive Equipment for Use in Hazardous Locations

UL Standard 913, Seventh Edition - Intrinsically Safe Apparatus and Associated Apparatus for use in Class I, II, III, Division 1, Hazardous (Classified) Locations