

CTC AppNotes

A series of technical documents written by members of the CTC community

Entity Parameters for Intrinsically Safe Probes
 Intrinsic safety prevents instruments and other low-voltage circuits in hazardous areas from releasing sufficient energy to ignite volatile gases. In order to limit the amount of energy in an instrument circuit specially designed components are required. All electrical components added up are what determine the overall energy in the system. The ISA 12.02-10-22002 standard defines and provides abbreviations for the electrical properties that must be determined.

"For intrinsically safe apparatus

	ISA mark	IEC Mark
Maximum input voltage	V_{max}	U_i
Maximum input current	I_{max}	I_i
Max. internal capacitance	C_i	C_i
Max. internal inductance	L_i	L_i
Maximum input power	P_i	P_i
Internal inductance-to-resistance ratio	L_i/R_i	L_i/R_i

For any Intrinsically safe sensor, these values are displayed on the instrument's "Control Drawing" and where possible, displayed on the instrument itself. (See figure 1)

The values are defined in the approval reports as well, for example, CTC's CSA approval for Class I Div 1 proximity probes follow:

Electrical Ratings when connected to an approved IIC barrier are:

Input (VT) $U_i = 30VDC$, $I_i = 140mA$, $P_i = 757mW$, $C_i = 50pF$, $L_i = 1 mH$

Output (OUT) $U_o = 30VDC$, $I_o = 35mA$, $P_o = 263mW$, $C_o = 50pF$, $L_o = 500uH$

Each type of product also has a control drawing for a completed assembly. See figure 2 below
 The control drawing defines how electrical connections are made to complete the circuit as well as showing the allowable temperatures for each circuit type. CTC offers intrinsically safe barriers for customer convenience, however any barrier can be used provided when the circuit is completed none of the entity parameters are exceeded by any component in the system.

If you have any questions please feel free to contact CTC directly. Call us toll free 1-800-999-5290 in the US and Canada or +1-585-924-5900 internationally, or email techsupport@ctconline.com.



Figure 1

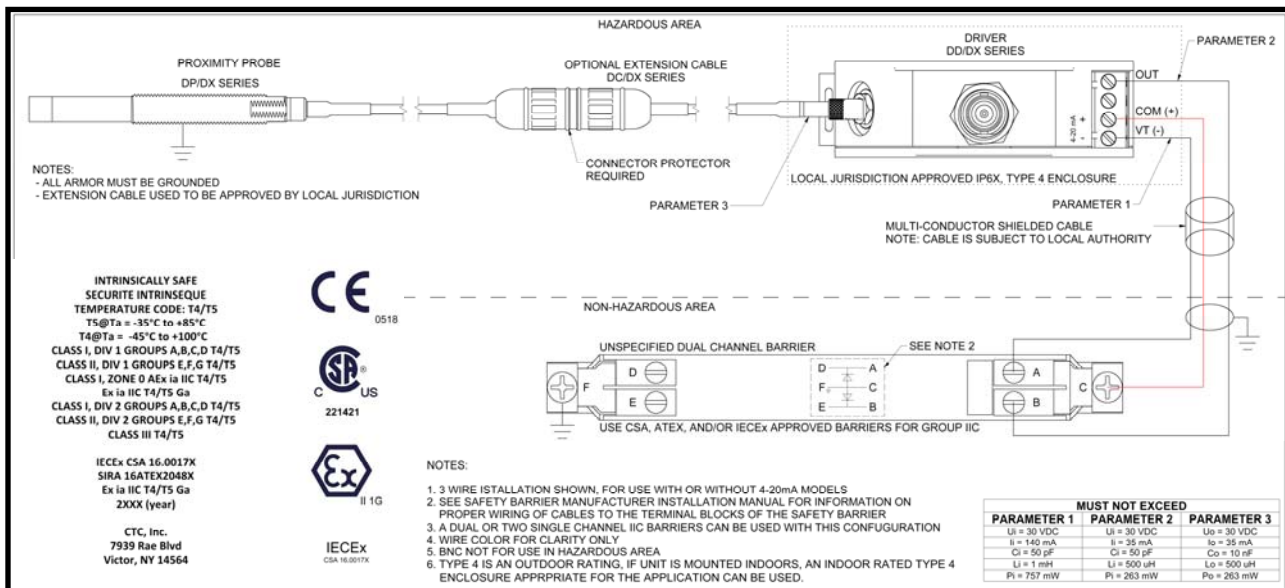


Figure 2. 3 wire control drawing for CTC PRO and Bently compatible proximity probe products

If any CTC vibration analysis hardware product should ever fail, we will repair or replace it at no charge.