**Hazardous (Classified) Location**
Class I, Division 1 / Groups ABCD
Class 1, Zone 0 (EPL Ga), IIC

**Nonhazardous Locations**

**2-WISE**

- The 2-WISE concept allows interconnection of intrinsically safe apparatus and associated apparatus not specially assessed for such a combination. For the acceptance of the interconnection of the different intrinsically safe circuits of these apparatus, the comparison of the voltage $U_{i}(V_{\text{max}})$ with $U_{o}(V_{o})$, the current $I_{i}(I_{\text{max}})$ with $I_{o}(I_{\text{sc}})$, and the power $P_{i}(P_{\text{max}})$ with $P_{o}(P_{\text{max}})$ of the interconnected circuits must demonstrate that $U_{i}(V_{\text{max}})$, $I_{i}(I_{\text{max}})$ and $P_{i}(P_{\text{max}})$ are equal to or greater than $U_{o}(V_{o})$, $I_{o}(I_{\text{sc}})$ and $P_{o}(P_{\text{max}})$ of the connected circuits.

- In addition, the maximum internal capacitance ($C_{i}$) and maximum internal inductance ($L_{i}$) of each apparatus (other than those from auxiliary devices) connected to a 2-WISE system must not exceed 5 nF and 10 μH respectively.

- In a powered 2-WISE system only 2 ports (power source and power load) are allowed to be connected at the opposite ends of a cable, with a maximum of two auxiliary devices connected in between. The power source port supplies DC power to the system, and the power load port consumes DC power from the system. Auxiliary device ports may also consume DC power from the system.

- The voltage $U_{o}(V_{o})$ of a power source port must be in the range of 14 to 17.5 V. Any other device connected to the cable shall be passive, meaning that it is not allowed to provide energy to the system, with the exception of a leakage current of 1 mA for a power load port and a leakage current of 50 μA for each auxiliary device port.

- The intrinsically safe circuit of a 2-WISE port shall be galvanically isolated from non-intrinsically safe circuits.

- The parameters of cable used to interconnect 2-WISE ports must be as follows:

  - **Cable Resistance** $R_{c}$: 15 to 150 Ohm/km
  - **Cable Inductance** $L_{c}$: 0.4 to 1 mH/km
  - **Cable Capacitance** $C_{c}$: 45 to 200 nF/km
  - **Length of Cable (not including cable stubs)**: ≤ 200 m
  - **Length of Cable Stubs**: ≤ 1 m

- If the above rules are respected, the inductance and the capacitance of the cable will not impair the intrinsic safety of the installation.

**Applicable requirements see CSA certificate 70187832**

**Installation Notes TMT86**

- CSA approved apparatus must be installed in accordance with manufacturer’s instructions.
- Install per Canadian Electrical Code or National Electrical Code (NFPA 70).
- Use supply wires suitable for 5°C above surroundings.
- Stating that only simple apparatus should be terminated to the sensor connection.
- Simple apparatus is defined as a device that will neither generate nor store more than 1.2V, 0.1A, 0.25mW or 20μJ. Examples are Thermocouples or RTDs.
- **WARNING:** POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS.

**AVERTISSEMENT: RISQUE POTENTIEL DE DÉCHARGES ELECTROSTATIQUES – VOIR CONSIGNES.**
INTRINSICALLY SAFE  
Class I / Div. 1 / Groups ABCD  
Ex ia IIC/Ex ia IIC

- CSA Approved Associated Apparatus must meet the following parameters:
  \[ U_0 \leq U_i \quad I_0 \leq I_i \quad P_0 \leq P_i \quad C_a \geq C_i + C_{cable} \quad L_a \geq L_i + L_{cable} \]

Transmitter entity parameters are as follows:
- \( U_i \text{ or } V_{\text{max}} \leq 17.5 \text{ V DC} \quad C_i = 0 \)
- \( I_i \text{ or } I_{\text{max}} \leq 380 \text{ mA} \quad L_i = 0 \)

- \( V_{o} + V_{o} \text{ of Handheld device} < V_{\text{max}}, I_{sc} + I_{sc} \text{ of Handheld device} < I_{\text{max}}, \)
  \( P_o + P_o \text{ of Handheld device} < P_i, C_a > C_i + C_{cable} + C_i \text{ of Handheld device}, \)
  \( L_a > L_i + L_{cable} + L_i \text{ of Handheld device}, \) when Programming Handheld device is used.

- WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

AVERTISSEMENT: LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA SÉCURITÉ INTRINSEQUE

CONDITIONS OF ACCEPTABILITY
- Due to the risk of discharge the non-metallic parts of the equipment and of all non-metallic accessories have to be protected from electrostatic charging during installation and operation (e.g. only wipe with damp cloth and do not expose to high voltage fields).
- The equipment is for use under atmospheric conditions only, the permissible pressure range is to 1.1 bar (80 to 110 kPa) and the permissible normal oxygen content is typically 21 % v/v.
- The end user shall ensure appropriate earthing of the metallic field housing (optional) and all metallic accessories if used (wall or pipe mounting accessories for the field housing and the DIN rail clip for the head transmitter) upon installation.
- For the use as an intrinsically safe equipment, and for Zone 0 (EPL Ga), Zone 1 (EPL Gb) and Class I, Division 1 applications, the head transmitter TMT86 shall be installed completely inside an additional enclosure, providing a degree of protection of not less than IP20 according to CSA/UL 60079-0 and CSA/UL 60079-11. The ambient temperature within the end use enclosure shall not exceed the limits of the permissible ambient temperature range. Clearances, creepage distances and separations as defined in CSA/UL 60079-11 must be considered for the installation.
- If the head transmitter TMT86 was used in a Zone 1 (EPL Gb), Zone 2 (EPL Gc) or Class I, Division 2 application it is not allowed to use it in Zone 0 (EPL Ga) or Class I, Division 1 applications in the future.
- When connecting the head transmitter TMT86 with a certified circuit of category "ib" into an IIC or IIB hazardous area the ignition class changes to: Ex ib IIC or Ex ib IIB.
- The use of the display type TID10 with the head transmitter TMT86 by connecting display to the CDI interface of the head transmitter is only permitted for Zone 1 (EPL Gb), Zone 2 (EPL Gc) and Class I, Division 2 applications.
- The CDI interface is only allowed to be used for connecting the display type TID10. Irrespective of inside or outside the hazardous area, no other circuits/equipment is allowed to be connected to the CDI Interface.
- The use of the additional field housing (optional) with the head transmitter TMT86 is only permitted for Zone 1 (EPL Gb), Zone 2 (EPL Gc) and Class I, Division 2 applications.
- Final acceptance of this equipment when installed is subject to the jurisdiction of the local inspection authority.
Temperature range for option field housing
AA, AB and AC (head transmitter as component only):
without display, TID10
T4 -50°C ... +85°C  T5 -50°C ... +70°C  T6 -50°C ... +55°C
with display, TID10
T4 -40°C ... +85°C  T5 -40°C ... +70°C  T6 -40°C ... +55°C

Temperature range for option field housing
A1, A3, D1, D2, H1, H3, H5, H7:  A2, A4, H2, H4, H6, H8:
T4 -50°C ... +85°C  T5 -50°C ... +80°C  T6 -50°C ... +70°C

Applicable requirements see CSA certificate 70187832

Installation Notes TMT86
- CSA approved apparatus must be installed in accordance with manufacturer’s instructions.
- Install per Canadian Electrical Code or National Electrical Code (NFPA 70).
- Use supply wires suitable for 5°C above surroundings.
- Terminal specification:

<table>
<thead>
<tr>
<th>Screw terminals</th>
<th>Cable version</th>
<th>Cable cross-section</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5Nm</td>
<td>Solid or flexible</td>
<td>≥ 2.5 mm² (14 AWG)</td>
</tr>
<tr>
<td>Push-in terminals (cable version, stripping length ≤ 0.39 in)</td>
<td>Solid or flexible</td>
<td>0.2 to 1.5 mm² (24 to 16 AWG)</td>
</tr>
</tbody>
</table>

- WARNING: POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS.
- AVERTISSEMENT: RISQUE POTENTIEL DE DÉCHARGES ELECTROSTATIQUES – VOIR CONSIGNES.

INCREASED SAFETY
Applicable for option field housing
AA, AB and AC (Component):

<table>
<thead>
<tr>
<th>Option field housing</th>
<th>Ex ec IEC Gc</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class I, Zone 2, AEx ec IIC</td>
<td>Class I, Division 2, Groups A, B, C</td>
</tr>
</tbody>
</table>

- Functional ratings
- These ratings do not supersede Hazardous Location values
- Use max ≤ 30 V DC
- P ≤ 0.7 W

CONDITIONS OF ACCEPTABILITY
- Due to the risk of discharge the non-metallic parts of the equipment and all non-metallic accessories have to be protected from electronic charging during installation and operation (e.g. only wipe with damp cloth and do not expose to high voltage fields).
- For the use as an equipment in type of protection increased safety, and for Zone 2 (EPL Gc), and Class I, Division 2 applications, the head transmitter TMT86 shall be installed completely inside an additional enclosure, providing a degree of protection of not less than IP65 according to CSA/UL 60079-0 and CSA/UL 60079-7. The ambient temperature within the end use enclosure shall not exceed the limits of the permissible ambient temperature range. Clearances, creepage distances and separations as defined in CSA/UL 60079-7 must be considered for the installation.
- For the use as an equipment in type of protection increased safety, and for Zone 2 (EPL Gc), and Class I, Division 2 applications, the head transmitter TMT86 can not be connected or disconnected unless the area is known to be non-hazardous. The same applies for the connection and disconnection of the display type TID10.
- The use of the additional field housing (optional) with the head transmitter TMT86 was used in a Zone 2 (EPL Gc) or Class I, Division 2 application it is not allowed to use it in Zone 1 (EPL Gb), Zone 0 (EPL Ga) or Class I, Division 1 applications in the future.
- The use of the display type TID10 with the head transmitter TMT86 by connecting display to the CDI Interface of the field housing is only permitted for Zone 2 (EPL Gc) and Class I, Division 2 applications. The CDI interface is only allowed to be used for connecting the display type TID10. Irrespective of inside or outside the hazardous area, no other circuits/equipment is allowed to be connected to the CDI Interface.
- The use of the additional field housing (optional) with the head transmitter TMT86 is only permitted for Zone 2 (EPL Gc) and Class I, Division 2 applications.
- The CDI interface is only allowed to be used for connecting the display type TID0. Irrespective of inside or outside the hazardous area, no other circuits/equipment is allowed to be connected to the CDI Interface.
- The use of the display type TID10 with the head transmitter TMT86 by connecting display to the CDI Interface of the field housing is only permitted for Zone 2 (EPL Gc) and Class I, Division 2 applications.

Applicable for option field housing A1, A2, A3, A4, D1, D2, H1, H2, H3, H4, H5, H6, H7 and H8:
- Final acceptance of this equipment when installed is subject to the jurisdiction of the local inspection authority.
- The end user shall ensure appropriate earthing of the field housing.

Applicable for option field housing AA, AB and AC (head transmitter as component only):
- The end user shall ensure appropriate earthing of the metallic field housing (optional) and all metallic accessories if used (e.g. pipe mounting accessories for the field housing and the DIN rail clip for the head transmitter) upon installation.
- These components do not have any surface that achieves a temperature greater than 135°C/100°C/85°C with a 5K safety factor when operated under full load conditions at an ambient of range of 85°C/70°C/55°C respectively.