DESCRIPTION

The MTL Instruments MTL7000, MTL7700 and MTL5000 Series of ultra-slim intrinsic safety barriers are the worldwide standard in protection and accuracy for intrinsically safe sensing and controlling devices in hazardous locations. The electronic design limits the amount of electrical energy that can be transmitted into the hazardous area to a level below the ignition energy of even the worst-case explosive mixture of fuel and air. This level of protection remains intact even in the event of two simultaneous faults, thus providing the highest possible safety rating for this type of system.

All MTL7000, MTL7700 and MTL5000 Series barriers are FM approved for use in intrinsically safe systems under the entity concept and can thus be applied with the widest possible array of intrinsically safe devices. Designed for ease of installation, these barriers provide a positive intrinsic safety ground through the DIN rail. Isolating spacers are available for applications in which the intrinsic safety ground must be separate from the mounting panel's earth ground (ANSI / ISA RP-12.6 specifies grounding requirements).

FEATURES

- **FM entity approval** Class I, II, and III, Division 1, Groups A, B, C, D, E, F, G
- **BASEEFA approval** EEx [ia], IIC
- **DIN rail mounting with integral intrinsic safety ground**
- **Compact size**

APPLICATION

According to the entity concept, barriers must be selected to limit the available hazardous area voltage (V) and current (I) to levels below the rating of the intrinsically safe device (Vmax, Imax). Also, the combined capacitance (C) and inductance (L) of the intrinsically safe device and cabling must be less than the maximum ratings for the barrier (La, Ca). The great majority of applications can be satisfied with one of the six key barrier types stocked by Kele. Other types are available to suit most every application, contact Kele for assistance. Refer to the Hazardous Location Application Guide in the Technical Reference section for more detailed barrier selection procedures.
## SAFETY SPECIFICATIONS

<table>
<thead>
<tr>
<th>Application</th>
<th>Model</th>
<th>Entity Safety Parameters</th>
<th>Max Voltage</th>
<th>End to End Resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20 mA Two-wire transmitter</td>
<td>MTL7706+</td>
<td>V: 28 I: 93 U: 300</td>
<td>0.083</td>
<td>4.2</td>
</tr>
<tr>
<td>3 Wire RTD's</td>
<td>MTL7765ac</td>
<td>V: 15 I: 150 U: 100</td>
<td>0.58</td>
<td>1.45</td>
</tr>
<tr>
<td>Controller output</td>
<td>MTL7728+</td>
<td>V: 28 I: 93 U: 300</td>
<td>0.12</td>
<td>4.2</td>
</tr>
<tr>
<td>Dry contact/Dry contact</td>
<td>MTL5011B</td>
<td>V: 10.5 I: 14 U: 800</td>
<td>2.4</td>
<td>165</td>
</tr>
<tr>
<td>Digital output</td>
<td>MTL7728+</td>
<td>V: 28 I: 93 U: 300</td>
<td>0.083</td>
<td>4.2</td>
</tr>
</tbody>
</table>

* The MTL5011B is isolated end to end.

## ADDITIONAL SPECIFICATIONS

### MTL7706+ (for loop-powered 4-20 mA transmitters)
- Supply Voltage: 20-35 VDC
- Current: 45 mA typical @ 20 mA with 24 VDC supply
- Transmitter voltage: 16 VDC min @ 20 mA with 250 Ω load
- Safe area load: 500 max
- Accuracy: ±2 μA over 4-20 mA range
- Max safe area voltage: 250 VAC/VDC
- Area Class: I, II, III, Div 1, Groups A, B, C, D, E, F, G
- Weight: 0.3 lb (0.14 Kg)
- Agency approvals: FM BASEEFA EEx [ia] IIC

### MTL7765ac (3 Wire RTD's)
- Working voltage: 12.0 VDC @ 10 μA leakage current
- Max safe area voltage: 250 VAC/VDC
- Area: Class I, II, III, Div 1, Groups A, B, C, D, E, F, G
- Weight: 0.3 lb (0.14 Kg)
- Agency approvals: FM BASEEFA EEx [ia] IIC

### MTL5011B (dry contact to dry contact isolator)
- Supply voltage: 20-35 VDC, 40 mA max
- Contacts: 2A @ 250 VAC, 40 VDC
- Max safe area voltage: 250 VAC/VDC
- Area: Class I, II, III, Div 1, Groups A, B, C, D, E, F, G
- Weight: 0.3 lb (0.14 Kg)
- Agency approvals: FM/UL BASEEFA EEx [ia] IIC

### MTL 7728+ (for switched digital outputs)
- Supply voltage: 10-35 VDC (regulated)
- Supply current: 1.5 mA plus load current, actively limited to 50 mA total to protect safety fusing (50 mA)
- Output current: (Iout) Up to 50 mA
- Max safe area voltage: 250 VAC/VDC
- Area: Class I, II, III, Div 1, Groups A, B, C, D, E, F, G
- Weight: 0.3 lb (0.14 Kg)
- Agency approvals: FM BASEEFA EEx ia IIC

**Warning:** Check compatibility of the electrical safety parameters of the field equipment with those of the barriers to make sure that the combination is safe. If an intrinsically safe device does not have entity approval, it must be paired with a barrier specifically listed in its intrinsic safety drawing (control drawing).
HAZARDOUS LOCATIONS

INTRINSIC SAFETY BARRIERS
MTL5000, MTL7000, MTL7700 SERIES

WIRING

MTL5011B
Dry Contact to Dry Contact
Digital Input

MTL7728+
4-20 mA Output to Hazardous Area

MTL7706+
4-20 mA Input from Hazardous Area

Resistors only required for line fault detection
HAZARDOUS LOCATIONS

INTRINSIC SAFETY BARRIERS
MTL5000, MTL7000, MTL7700 SERIES

WIRING (CONTINUED)

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MTL5011B</td>
<td>Isolator for digital (dry contact) inputs, SPDT</td>
</tr>
<tr>
<td>MTL7706+</td>
<td>Intrinsic safety barrier, 4-20 mA two-wire transmitters</td>
</tr>
<tr>
<td>MTL7728+</td>
<td>Active barrier for 4-20 mA output or digital output</td>
</tr>
<tr>
<td>MTL7765AC</td>
<td>Intrinsic safety barrier for 3 wire RTDs</td>
</tr>
<tr>
<td>ETL7000</td>
<td>Din Rail earth terminal (1 per Din Rail required)</td>
</tr>
<tr>
<td>ISP7000</td>
<td>Insulating Din Rail spacer (2-Required per Din Rail)</td>
</tr>
</tbody>
</table>

ORDERING INFORMATION

<table>
<thead>
<tr>
<th>MODEL</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>250R-3-1</td>
<td>250 OHM 3 WATT 1% resistor long leads</td>
</tr>
<tr>
<td>DCP-1.5-W</td>
<td>Power supply, 24 VAC IN to 24 VDC OUT</td>
</tr>
<tr>
<td>DCPA-1.2</td>
<td>Power supply, 120 VAC IN to 24 VAC/24 VDC OUT</td>
</tr>
<tr>
<td>DIN-3F</td>
<td>35 mm DIN rail, steel, 39.4&quot; (1m), RoHS compliant</td>
</tr>
</tbody>
</table>

MTL7765ac
3 Wire RTD's

Ground Here Only
ETL7000 (Required) 1/Per Rail

FREE TECH SUPPORT FOR THE LIFE OF YOUR PROJECT

September 2016