

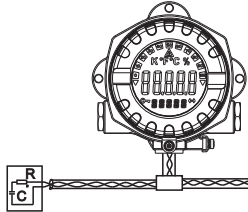
## Hazardous (Classified) Location

Class I / Division 1, 2 / Groups ABCD  
 Class I / Zone 0 / IIC  
 Class II / Division 1, 2 / Groups EFG  
 Class III

RID14 with electronic insert for Profibus PA/Foundation Fieldbus

Concept	FISCO	Entity
Ui (Vmax)	17.5 V	24 V
Ii (Imax)	500mA	250mA
Pi (Pmax)	5.5 W	1.2 W

Ci ≤ 5nF Li ≤ 10 μH  
 Leakage current ≤ 50 μA



Any FM Approved Termination with  
 $R=90...100\Omega$   
 $C=0...2.2\mu F$

## Nonhazardous Locations



### FISCO-Concept

The FISCO Concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination.

The criteria for interconnection is that the voltage (Ui or Vmax), the current (Ii or Imax) and the power (Pi or Pmax) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (Uo or Voc or Vt), the current (Io or Isc or It) and the power (Po or Pmax) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (Ci) and inductance (Li) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 μH respectively. In each segment only one active device, normally the associated apparatus is allowed to provide the necessary energy for the fieldbus system.

The voltage Uo (or Voc or Vt) of the associated apparatus has to be limited to the range of 14V to 24V d.c. All other equipment connected to the bus cable has to be passive, meaning that they are not allowed to provide energy to the system, except to a leakage current of 50 μA for each connected device.

Separately powered equipment needs a galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive.

The cable used to interconnect the devices has to meet the following values:

Loop resistance R': 15 ... 150 Ω/km, inductance L': 0.4 ... 1 mH/km capacitance C': 80 ... 200 nF/km

$C' = C' \text{ line/line} + 0.5 C' \text{ line/screen}$ , if both lines are floating or

$C' = C' \text{ line/line} + C' \text{ line/screen}$ , if the screen is connected to one line

Length of spur cable: 30 m length of trunk cable: 1 km length of splice: 1 m

At each end of the trunk cable an approved infallible line termination with the following parameters is suitable:

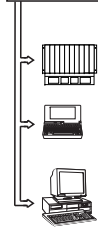
$R = 90 \dots 100 \Omega$   $C = 0 \dots 2.2 \mu F$ .

One of the allowed terminations might already be integrated in the associated apparatus.

The number of passive devices connected to the bus segment is not limited due to I.S. reasons. If the above rules are respected, up to a total length of 1000 m (sum of the length of trunk cable and all spur cables), the inductance and capacitance of the cable will not impair the intrinsic safety of the installation.

See also installation notes for using power supply

FM approved Associated apparatus suitable for FISCO concept or Associated Nonincendive Field Wiring



Any FM Approved Intrinsically Safe Apparatus suitable for Entity-concept or FISCO concept

### Installation Notes RID14

- FM Approved Apparatus must be installed in accordance with manufacturer instructions.
- Install per National Electrical Code (NFPA 70)
- Use supply wires suitable for 5°C above surroundings.
- Warning: Substitution of components may impair intrinsic safety or suitability for Class I, Division 2.

#### Temperature range

T4 -40°C ... +80°C T5 -40°C ... +70°C T6 -40°C ... +55°C

### DUST IGNITION PROOF DIP Class II, III / Div. 1 / Groups EFG

- A dust tight seal must be used for conduit entries when the field indicator is used in a Class II or Class III location.

### INTRINSICALLY SAFE IS Class I / Div. 1 / Groups ABCD

- FM approved associated apparatus must meet the following requirements:
- $U_o$  or  $V_{oc}$  or  $V_t \leq U_i$  (Vmax) and  $I_o$  or  $I_{sc}$  or  $I_t \leq I_i$  (Imax) and  $P_o$  or  $P_{max} \leq P_i$  (Pmax)
- The maximum non-hazardous area voltage must not exceed 250 V.
- The Installation should be in accordance with the National Electrical Code (ANSI/NFPA 70) and ANSI/ISA RP 12.6.01 (except chapter 5)
- Be aware of multiple earthing of screen. The screen must be connected in accordance with National Electrical Code.
- The polarity for connecting + and - is of no importance due to an internal rectifier.

RID14 is suitable for the connection to a Profibus PA/Foundation Fieldbus system according to Entity- or FISCO Concept

### NONINCENDIVE

### NI Class I / Div. 2 / Groups ABCD

- Depending on location install per National Electrical Code (NEC) using wiring methods described in article 500 through article 510.
  - Intrinsic safety barrier not required.  $V_{max} \leq 35 \text{ V DC}$ .
  - Warning: Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous.
  - Nonincendive field wiring installation
- The Nonincendive Field Wiring Circuit Concept allows interconnection of Nonincendive Field Wiring Apparatus with Associated Nonincendive Field Wiring Apparatus or Associated Intrinsically Safe Apparatus or Associated Apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when  $V_{oc} \leq V_{max}$ ,  $C_a \geq C_i + C_{cable}$ ,  $L_a \geq L_i + L_{cable}$ .
- Field indicator Nonincendive Field Wiring parameters are as follows:  
 $U_i$  or  $V_{max} \leq 35 \text{ V DC}$   $C_i \leq 5 \text{ nF}$   $L_i \leq 10 \mu F$
- For these current controlled circuits, the parameter Imax is not required and need not to be aligned with parameter Isc and It of the Associated Nonincendive Field Wiring Apparatus or Associated Apparatus.
- Warning: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be non-hazardous
  - The field indicator is suitable to be installed according the FNICO concept.

Approved	Date (yyyy-mm-dd)	Drawing No.	Dwg.rev.	Revision no.	Revision date (yyyy-mm-dd)	Name	Material	Endress+Hauser	
Pfanzelt	2009-07-06	12 08 00 111	-	-	-	-	71540273 XA02305R/09/EN/01.20		
Designed	Date (yyyy-mm-dd)	Unit	Scale	Title		Series			
Pfanzelt	2009-07-05	RID14	1:1	CONTROL DRAWING FM					
Refer to protection notice	Geometrical tolerancing	Part No.	Format			Objekt version	Sheet	Endress + Hauser Wetzer GmbH+Co. KG Nesselwang / Germany	
ISO 16016	ISO 2768-mH-E	-	A4				1 of 1		