HAZARDOUS (CLASSIFIED) LOCATION
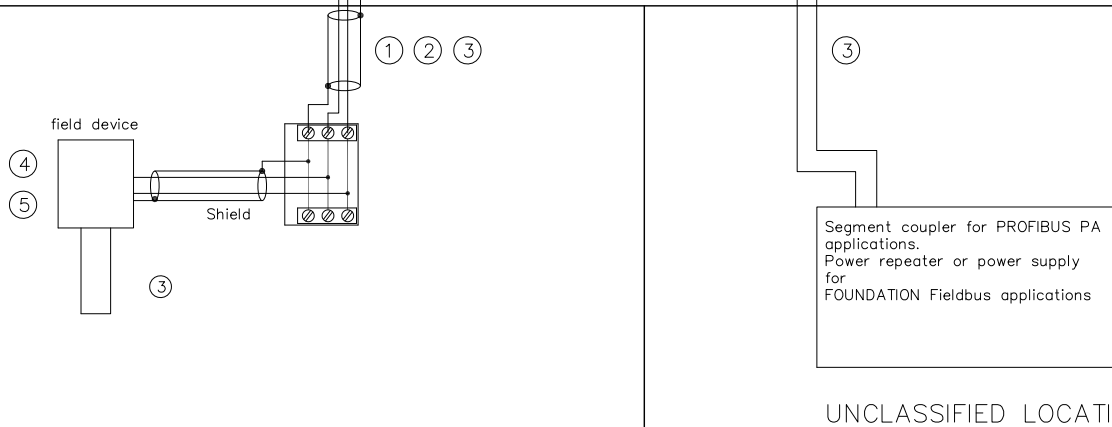
CLASS I, ZONE 2, GROUPS IIC, IIB, IIA or
CLASS I, DIVISION 2, GROUPS A,B,C,D

I.S. Ground

Segment coupler for PROFIBUS PA
applications.
Power repeater or power supply for
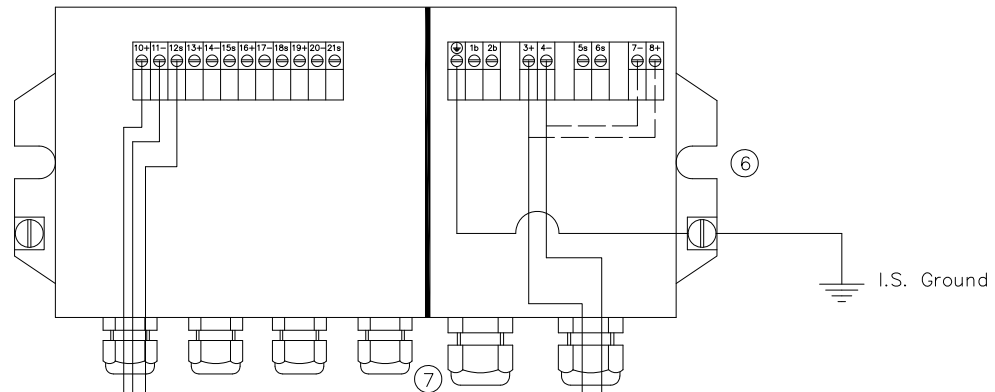FOUNDATION Fieldbus applications

UNCLASSIFIED LOCATION

field device

Shield

HAZARDOUS (CLASSIFIED) LOCATION

CLASS I, ZONE 0, GROUPS IIC, IIB, IIA or
CLASS I, DIVISION 1, GROUPS A,B,C,D or
CLASS II, DIVISION 1, GROUPS E, F, G or
CLASS III, DIVISION 1

TABLE 1: FISCO PARAMETERS ①

MODEL NUMBER	TERMINALS	Uo (V) (Voc)	Io (mA) (Isc)	Po (mW) (Pmax)
F2D0–FB–Ex4.*, RD0–FB–EX4.* ⑧ where * is CG, CGB, CGS, C, COM, M12B, M12S, 7/8B, or 7/8S	10+, 11–; 13+, 14–; 16+, 17–; 19+, 20–	15.75	247.7	975.24

TABLE 2: ENTITY PARAMETERS ②

MODEL NUMBER	TERMINALS	Uo (V) (Voc)	Io (mA) (Isc)	V_t (V)	I_t (mA)	Po (mW) (Pmax)	GROUPS C_o (uF) (Ca) IIC (A,B)	IIB (C,E)	IIA (D,F,G)	GROUPS L_o (mH) (La) IIC (A,B)	IIB (C,E)	IIA (D,F,G)
F2D0–FB–Ex4.*, RD0–FB–EX4.* ⑧ where * is CG, CGB, CGS, C, COM, M12B, M12S, 7/8B, or 7/8S	10+, 11–; 13+, 14–; 16+, 17–; 19+, 20–	15.75	247.7	–	–	975.34	.478	2.88	11.6	0.4	2.5	4.4

Dieses Dokument enthält sicherheitstechnische Angaben. Es darf nicht ohne Absprache mit dem Normenfachmann geändert werden!

This document contains safety-relevant information. It must not be altered without the authorization of the norm expert!

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Control drawing
FieldBarrier for PROFIBUS PA and
FOUNDATION Fieldbus

116-0266D

sheet 1 of 2

NOTES:

① The FISCO concept allows interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criteria for the interconnection is that the voltage (Ui or Vmax), (Ii or Imax) and (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 5nF and 10uH 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 for a leakage current of 50uA 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 connect the devices needs to have the parameters in the following range:

Loop resistance R':   15 ... 150Ω/km
Inductance per unit length L: 0.4 ... 1mH/km
Capacitance per unit length C':   45 ... 200nF/km
C' = C' line/line + 0.5' line/screen, if both lines are floating or
C' = C' line/line + C' line/screen, if the screen is connected to one line.
Length of splice: ≤ 1m (T—box must only contain terminal connections with no energy storage capability)
Length of spur cable: ≤ 60m
Length of trunk cable: ≤ 1km

At each end of the trunk cable an approved infallible termination with the following parameters is suitable:
R = 90 ... 100 Ω and C = 0 ... 2.2uF

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

② The Entity Concept allows interconnection of intrinsically safe apparatus with associated apparatus not specifically examined in combination as a system when the approved values of (Uo or Voc or Vt), (Io or Isc or It) and (Po) for the associated apparatus are less than or equal to (Ui or Vmax), (Ii or Imax) and (Pmax) for the intrinsically safe apparatus and the approved values of (Co or Ca) and (Lo or La) for the associated apparatus are greater than Ci + Ccable and Li + Lcable respectively, for the intrinsically safe apparatus.

For a system that has a single—channel associated apparatus connected to more than one intrinsically safe apparatus, the interconnection is intrinsically safe if:

Vmax (or Ui)   ≥ Voc (or Uo) for each intrinsically safe apparatus
Imax (or Ii)   ≥ Isc (or Io) for each intrinsically safe apparatus
Pi   ≥ Isc Po
Ca (or Co)   ≥ (Citot + Ccable) where Citot = sum of individual Ci values
La (or Lo)   ≥ (Litot + Lcable) where Litot = sum of individual Li values

③ Wiring methods must be in accordance with the National Electrical Code, ANSI/NFPA 70 and ANSI/ISA — RP 12.6.

④ FM approved Intrinsically safe apparatus with Entity Concept parameters shall only be connected to FM approved Associated Apparatus with Entity Concept parameters. FM approved intrinsically safe apparatus with FISCO Concept parameters shall only be connected to FM approved Associated Apparatus with FISCO concept parameters.

⑤ Simple Apparatus is defined as an electrical component or combination of components of simple construction with well defined electrical parameters that does not generate more than 1.5 volts, 100 milliamps, and 25 milliwatts, or a passive component that does not dissipate more than 1.3 watts and is compatible with the intrinsic safety of the circuit in which it is used.

⑥ Enclosure is conductive and must be grounded in accordance with the National Electrical Code, ANSI/NFPA 70.

⑦ Refer to National Electrical Code, ANSI/NFPA 70, Article 504.30 for conductor separation requirements.

⑧ RD0—FB—EX4.* must be installed in an enclosure meeting the requirements of ANSI/ISA S82.

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sheet 2 of 2