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Control drawing (IS)
960373-1024 A
Deltapilot S + FEB 26
(Foundation Fieldbus)

Endress+Hauser

The Deltapilot S with electronic insert FEB 26 is suitable for the connection to a Foundation Fieldbus (FF) system according to both the Entity-Concept or the FISCO-Concept (as described below).

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 needs to have the parameters in the following range:

loop resistance R':	15 ... 150 Ω/km
inductance per unit length L':	0.4 ... 1 mH/km
capacitance per unit length C':	80 ... 200 nF/km
C' = C' line/line + 0.5 C' 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 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 ... 100 Ω
C = 0 ... 2.2 µF.
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.

Notes:

INTRINSICALLY SAFE CLASS I, DIV.1, GROUPS A, B, C, D
1. FM Approved apparatus must be installed in accordance with manufacturer instructions
2. FM Approved associated apparatus must meet the following requirements:
   Uo or Voc or Vt ≤ Ui (Vmax) and Io or Isc or It ≤ Ii (Imax) and Po or Pmax ≤ Pi (Pmax)
3. The maximum non-hazardous area voltage must not exceed 250 V.
4. The installation must be in accordance with the National Electrical Code NFPA 70 and ANSI/ISA- Rp 12.6 (except chapter 5).
5. Multiple earthing of screen is allowed only, if high integrity equipotential system is realised between the points of bonding (see drawing No. 960373-1022 A).
6. Caution: Use only supply wires suitable for 5°C above surrounding temperature
7. Warning: Substitution of components may impair intrinsic safety.
8. The polarity for connecting FF+ (2) and FF– (1) is of no importance due to an internal rectifier.

NONINCENDIVE, CLASS 1, DIV.2, GROUP A,B,C,D AND DIP for CLASS II AND III, DIV.1, GROUP E, F, G HAZARDOUS LOCATION INSTALLATION.
1. INSTALL PER NATIONAL ELECTRICAL CODE (NEC) USING THREADED METAL CONDUIT. Intrinsic safety barrier not required. Max. supply voltage 30V. For T-code see table.
2. A Dust tight seal must be used at the conduit entry when the transmitter is used in a CLASS II & III Location.
3. WARNING: Explosion Hazard - do not disconnect equipment unless power has been switched off or the area is known to be Non-Hazardous.
   WARNING: Substitution of components may impair suitability for CLASS I, Division 2.