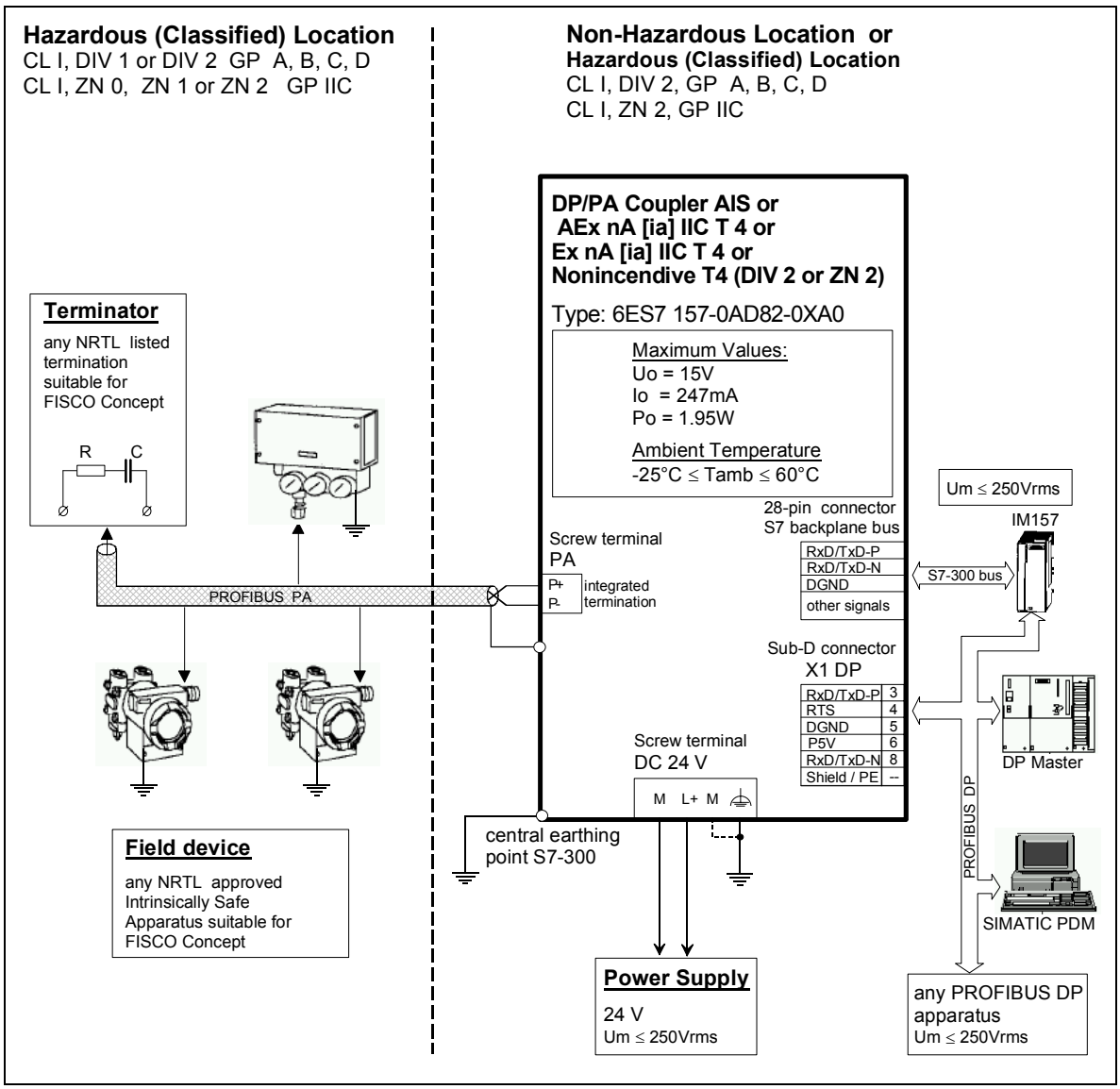
SIEMENS

Intrinsic Safety Control Drawing

A5E00237843-01

DP/PA Coupler

6ES7 157-0AD82-0XA0



Installation Notes

1. Approved associated apparatus must be installed in accordance with manufacturer instructions.
2. The maximum non-hazardous area voltage must not exceed 250Vrms.
3. The intrinsically safe apparatus (Div. 1 or Zone 0 or Zone 1) an non-incendive apparatus (Div. 2 or Zone 2) as well as the terminator must meet the following requirements:

   $U_i, V_{max} \geq U_o, V_{oc}$

   $I_i, I_{max} \geq I_o, I_{sc}$

   $P_i \geq P_o$
4. The installation must be in accordance with the NEC ANSI / NFPA 70 Article 504 or 505 and ANSI / ISA-RP 12.6.
5. The screen and the earth insertion of apparatuses must be connected to earth electrode in accordance with ANSI / ISA-RP 12.6.
6. The cable capacitance should be calculated according to FISCO-Concept related to the case of both lines are floating.
7. The terminator shall be NRTL approved (resistor R must be infallible).
8. One of two allowed terminators is already integrated in the associated apparatus.
9. WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR THE INTRINSIC SAFETY OR SUITABILITY FOR DIVISION 2 • DISCONNECT BEFORE SERVICING.
10. The ingress protection of DP/PA Coupler is IP30 (NEMA 2).
    When the environment requires a higher degree of ingress protection the apparatus must be installed in an enclosure compliant with the required ingress protection
11. WARNING FOR APPLICATIONS IN DIV. 2 OR ZONE 2 (CLASSIFIED) LOCATIONS: EXPLOSION HAZARD. EXCEPT FOR FIELD CIRCUITS, DO NOT DISCONNECT THE APPARATUS UNLESS THE AREA IS KNOWN TO BE NONHAZARDOUS.

FISCO rules (basic requirements)

The FISCO Concept allows the interconnection of intrinsically safe apparatus to associated apparatus not specifically examined in such combination. The criterion for such interconnection is that the voltage (U_i), the current (I_i) and the power (P_i) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o), the current (I_o) and the power (P_o) which can be provided by the associated apparatus (supply unit). In addition, the maximum unprotected residual capacitance (C_i) and inductance (L_i) of each apparatus (other than the terminators) connected to the fieldbus must be less than or equal to 5 nF and 10 µH respectively.

In each I.S. fieldbus segment only one active source, normally the associated apparatus, is allowed to provide the necessary power for the fieldbus system. The allowed voltage U_o of the associated apparatus used to supply the bus is limited to the range of 14V d.c. to 24V d.c. All other equipment connected to the bus cable has to be passive, meaning that the apparatus is not allowed to provide energy to the system, except to a leakage current of 50 µA for each connected device.

Separately powered field equipment needs galvanic isolation to assure that the intrinsically safe fieldbus circuit remains passive in any case.

The cable used to interconnect the devices needs to comply with the following parameters:

- 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
  - $C' = C'_{\text{line/line}} + 0.5\, C'_{\text{line/screen}}$, 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: max. 30 m
- length of trunk cable: max. 1 km.

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

- R = 90 ... 100 Ω
- C = 0 ... 2.2 µF.

One of the two allowed terminators might already be integrated in the associated apparatus (bus supply unit).

The number of passive devices like transmitters, actuators, hand held terminals connected to a single bus segment is not limited due to I.S. reasons. If the above rules are respected, the inductance and capacitance of the cable need not to be considered and will not impair the intrinsic safety of the installation.