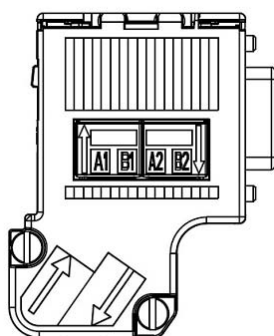


Intrinsic Safety Control Drawing

A5E00335525-03

Profibus connector RS 485-IS

6ES7972-0DA60-0XA0



Profibus connector RS 485-IS

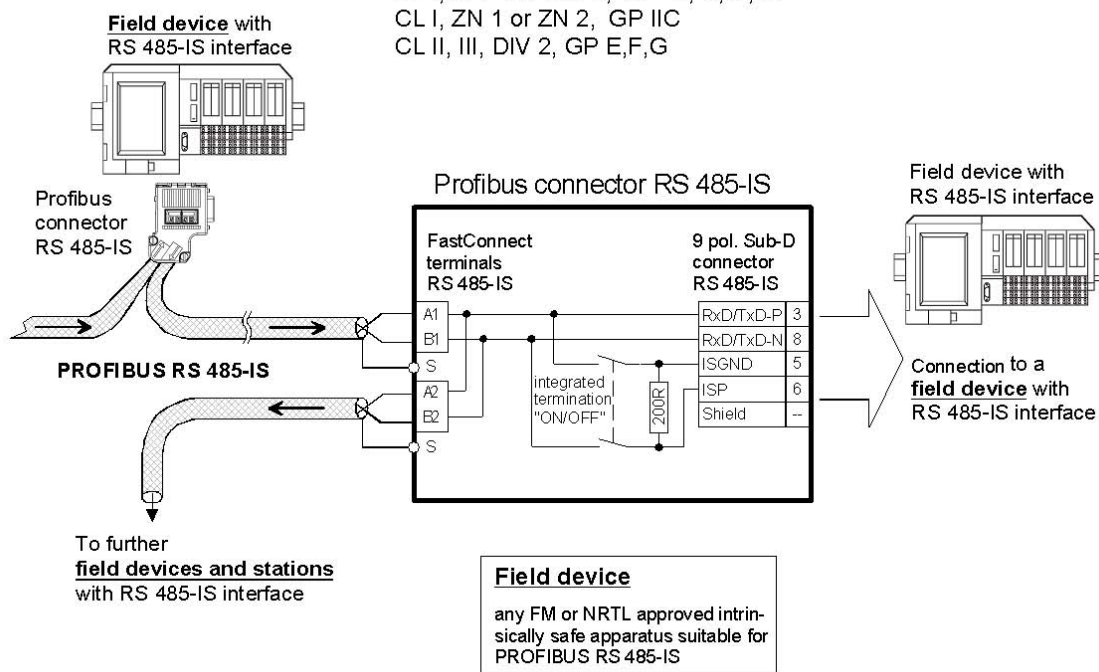
Type: 6ES7 972-0DA60-0XA0

	IS CL I, DIV 1, GP A,B,C,D T4
	IS CL I, ZN 1, AEx ib IIC T4
	NI CL I, DIV 2, GP A,B,C,D T4
	CL II, III, DIV 2, GP E,F,G
	PROC. CONT. EQ. for HAZ. LOC
	CL I, ZN1, AEx ib IIC T4; Ex ib IIC T4
	CL I, DIV 1, GP A,B,C,D T4

Maximum Values	
$U_i = V_{max} = 4.2V$	
$I_i = I_{max} = 4.8A$	
L_i, C_i - negligible small	
Ambient Temperature	
$-25^{\circ}C \leq T_{amb} \leq 70^{\circ}C$	

Hazardous (Classified) Location

CL I, DIV 1 or DIV 2, GP A, B, C, D
 CL I, ZN 1 or ZN 2, GP IIC
 CL II, III, DIV 2, GP E, F, G



Installation Notes

1. Approved intrinsically safe apparatus must be installed in accordance with manufacturer instructions.
2. The Intrinsically Safety Entity concept allows the interconnection of FM or NRTL approved intrinsically safe devices with entity parameters not specifically examined in combination as a system when:

$$\begin{aligned}U_o \text{ or } V_o \text{ or } V_t &\leq V_{\max} \\I_o \text{ or } I_{sc} \text{ or } I_t &\leq I_{\max} \\C_a \text{ or } C_o &\leq C_i + C_{\text{cable}} \\L_a \text{ or } L_o &\leq L_i + L_{\text{cable}} \\P_o &\leq P_i\end{aligned}$$

3. The installation of PROFIBUS RS 485-IS must be in accordance with “Profibus RS 485-IS User and Installation Guideline”, PNO Guideline, Order-No. 2.262.
4. The Profibus connector RS 485-IS shall only be used for the connection of an apparatus to the PROFIBUS RS 485-IS.
5. Any apparatus connected through Profibus connector RS 485-IS to PROFIBUS RS 485-IS must be approved for use on PROFIBUS RS 485-IS and meet the requirements of PNO Guideline.
6. The cable used to interconnect the devices shall be cable type A in accordance with IEC 61158-2 / IEC 61784 (see also RS 485-IS intrinsically safe concept).
7. Installation should be in accordance with ANSI/ISA RP12.06.01 “Installation of Intrinsically Safe Systems for Hazardous (Classified) Locations” and the National Electrical Code® (ANSI/NFPA 70) Sections 504 and 505.
8. The screen and the earth insertion of apparatuses must be connected to equipotential bonding electrode in accordance with ANSI/ISA RP 12.06.01.
9. The nonincendive field wiring circuit concept allows interconnection of nonincendive field wiring apparatus with associated nonincendive field wiring apparatus using any of the wiring methods permitted for unclassified locations.
10. **WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR THE INTRINSIC SAFETY OR SUITABILITY FOR DIVISION 2.**

The ingress protection of the Profibus connector RS 485-IS is IP20 (NEMA 2). Make sure that a protection class of IP 20 is ensured even when the RS 485-IS bus connector has been disconnected. 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.**
12. When installing according to FM requirements, all intrinsically safe apparatus must be FM approved.
13. No revision to drawing without prior Approval by FM Approvals.

RS 485-IS intrinsically safe concept (basic requirements)

(for details see "Profibus RS 485-IS User and Installation Guideline", Version 1.1, June 2003, PNO)

The RS485-IS intrinsically safe concept provides a fieldbus system with limited maximum voltage, current and cable L/R ratio. The concept allows the interconnection of intrinsically safe apparatus and associated intrinsically safe apparatus (communication devices) not specifically examined in such combination.

In set-up at least one fieldbus isolating repeater is (usually) located in the "non-hazardous area" for the safe separation of the intrinsically-safe bus segment from the non-intrinsically-safe bus segment. Other connected communications devices (field devices) are located in the "hazardous area". The bus cable is terminated at both ends by means of an external active bus termination or a bus termination integrated in a communication device as well as in a bus connector. All communications devices are supplied by external voltage sources and possess the means of safely limiting the current and voltage on the bus.

The maximum safety values of RS 485-IS are defined as follows.

Maximum input voltage between the signal wires	$U_i = V_{MAX} = 4.2 \text{ V}$
Maximum input current in the signal wires	$I_i = I_{MAX} = 4.8 \text{ A}$
The characteristic of the circuit is linear.	
Maximum L/R ratio of the cable	$L'/R' = 15 \mu\text{H}/\text{Ohm}$

With this values is the RS 485-IS fieldbus system intrinsically safe

Up to 32 communication devices and 2 external active bus terminators may be interconnected. For such interconnection the all devices shall meet the following requirements.

Communication device:

Maximum output voltage	$U_o = V_{OC} = 4.2 \text{ V}$
Maximum output current	$I_o = I_{SC} = 149 \text{ mA}$
Maximum input voltage	$U_i = V_{MAX} \geq 4.2 \text{ V}$
Maximum internal inductance	$L_i \approx 0 \mu\text{H}$
Maximum internal capacitance	$C_i = \text{Negligibly small}$

External active bus termination

Maximum output voltage	$U_o = V_{OC} = 4.2 \text{ V}$
Maximum output current	$I_o = I_{SC} = 16 \text{ mA}$
Maximum input voltage	$U_i = V_{MAX} \geq 4.2 \text{ V}$
Maximum internal inductance	$L_i \approx 0 \mu\text{H}$
Maximum internal capacitance	$C_i = \text{Negligibly small}$

The output characteristic of all devices must be linear.

The cable used to interconnect the devices shall be cable type A in accordance with IEC 61158-2 / IEC 61784:

- impedance R: 135 to 165 Ω
- capacitance per unit length C': $\leq 30 \text{ pF/m}$
- resistance per unit length R': $\leq 110 \Omega/\text{km}$
- ratio L'/R' : $\leq 15 \mu\text{H}/\Omega$ (safety required)

efesotomasyon.com
