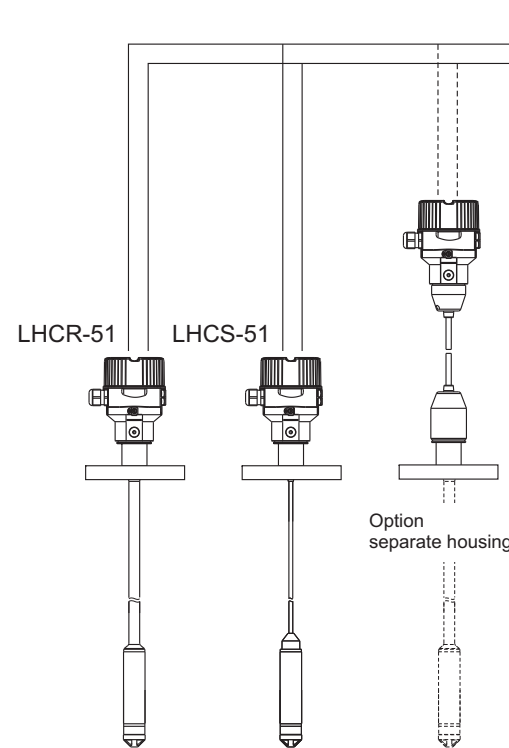


HAZARDOUS (CLASSIFIED) LOCATION

Class I, Zone 0, IIC
 Class I, Division 1, 2, Groups A,B,C,D
 Class II, Division 1, 2, Groups E,F,G
 Class III

NONHAZARDOUS LOCATION

Any
 FM Approved
 Associated
 Apparatus
 Suitable for
 Entity-concept
 or
 FISCO-concept



LHCR-51, LHCS-51 is suitable for the connection to a Profibus PA system according to the Entity- or 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 (U_i or V_{max}), the current (I_i or I_{max}) and the power (P_i or P_{max}) which intrinsically safe apparatus can receive and remain intrinsically safe, considering faults, must be equal or greater than the voltage (U_o or V_{oc} or V_t), the current (I_o or I_{sc} or I_t) and the power (P_o or P_{max}) levels which can be delivered by the associated apparatus, considering faults and applicable factors. In addition, the maximum unprotected capacitance (C_i) and inductance (L_i) of each apparatus (other than the termination) connected to the fieldbus must be less than or equal to 5 nF and 10 μ H 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 U_o (or V_{oc} or V_t) 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 μ A 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 Ohm /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:

$R = 90 \dots 100 \text{ Ohm}$ $C = 0 \dots 2.2 \text{ }\mu\text{F}$

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

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

LHCR-51, LHCS-51 with electronic insert for Profibus PA/ (Entity-Concept)		
$U_i (V_{max}) = 24 \text{ V}$		
$I_i (I_{max}) = 250 \text{ mA}$		
$P_i (P_{max}) = 1.2 \text{ W}$		
$C_i \leq 5 \text{ nF}$ $L_i \leq 10 \text{ }\mu\text{H}$		
Leakage current $\leq 50 \text{ }\mu\text{A}$		
Temperature classification	T6	T4
Max. ambient temperature	40°C 104 °F	70°C 158 °F

Min. ambient temp: -40°C (optional -50°C)

LHCR-51, LHCS-51 with electronic insert for Profibus PA/ (FISCO-Concept)		
$U_i (V_{max}) = 17.5 \text{ V}$		
$I_i (I_{max}) = 500 \text{ mA}$		
$P_i (P_{max}) = 5.5 \text{ W}$		
$C_i \leq 5 \text{ nF}$ $L_i \leq 10 \text{ }\mu\text{H}$		
Leakage current $\leq 50 \text{ }\mu\text{A}$		
Temperature classification	T6	T4
Max. ambient temperature	40°C 104 °F	70°C 158 °F

Min. ambient temp: -40°C (optional -50°C)

Any FM Approved
 Termination with
 $R = 90 \dots 100 \text{ }\Omega$
 $C = 0 \dots 2.2 \text{ }\mu\text{F}$

Intrinsically safe installations intrinsically safe for Cl. I,II,III Div.1, Gp. ABCDEFG; AEx ia IIC T6

1. FM Approved apparatus must be installed in accordance with manufacturer instructions
2. FM Approved associated apparatus must meet the following requirements:
 U_o or V_{oc} or $V_t \leq U_i (V_{max})$ and I_o or I_{sc} or $I_t \leq I_i (I_{max})$ and P_o or $P_{max} \leq P_i (P_{max})$
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 (NEC) and ANSI/ISA - RP 12.06.01 (except chapter 5).
5. Be aware of multiple earthing of screen. The screen must be connected in accordance with National Electrical Code.
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 PA+ (1) and PA- (2) is of no importance due to an internal rectifier.

Division 2 and Zone 2 installation

Nonincendive Class I, Div.2, group A,B,C,D Hazardous Location Installation (not for LHCS-51 and not for versions with separate housing)

9. Installation shall be in accordance with NEC using threaded conduits or other wiring methods in accordance with articles 500 to 510.
 Intrinsic safety barrier not required. Max. supply voltage 32 V. For T-code see table.
10. Warning: Explosion Hazard- Do not disconnect equipment unless power has been switched off or the area is known to be non hazardous
11. 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 apparatus not specifically examined in combination as a system using any of the wiring methods permitted for unclassified locations, when $V_{max} \leq V_{oc}$ or V_t , $C_a \leq C_i + C_{cable}$, $L_a \leq L_i + L_{cable}$. Transmitter parameters are as follows: $V_{max} = 32 \text{ VDC}$; $C_i \leq 5 \text{ nF}$; $L_i \leq 10 \text{ }\mu\text{H}$; $I_{max} =$ see note 12
12. For these current controlled circuit, the parameter I_{max} is not required and need not to be aligned with parameter I_{sc} and I_t of the nonincendive field wiring or associated apparatus.

Warning: Substitution of Components may impair suitability for Class I, Div.2
 13. The transmitter is suitable to be installed according the FISCO (former FNICO) concept.

Class II, III installation

DIP for Class II and III, Div.1, group E, F, G Hazardous Location Installation (not for LHCS-51 and not for versions with separate housing)

14. Installation of transmitter wiring according to NEC using threaded conduits or other wiring methods in accordance with articles 500 to 510.

FM Control Drawing no. 116-0397

Dieses Dokument enthält sicherheitsrelevante Angaben. Es darf nicht ohne Absprache mit dem Normenfachmann (NE Ex) geändert werden!		
This document contains safety-relevant information. It must not be altered without the authorization of the norm expert (NE Ex)!		
CONFIDENTIAL acc. to ISO 16016	Only valid as long as released in EDM or with a valid production documentation!	date: 2014 March 04
 P+F Global	Control Drawing - FM	16-990FM-12A
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