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Safety Instructions
Nivotester FailSafe FTL825

Control Drawing AIS + ANI

FM APPROVED

Document: XA00646F-A
Safety instructions for electrical apparatus for explosion-hazardous areas → 3

Endress+Hauser
People for Process Automation

Nivotester FailSafe FTL825

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Associated documentation

This document is an integral part of the following Operating Instructions:

BA01038F/00

Manufacturer address

Endress+Hauser SE+Co. KG
Hauptstraße 1
79689 Maulburg, Germany

Address of the manufacturing plant: See nameplate.

Extended order code

The extended order code is indicated on the nameplate, which is affixed to the device in such a way that it is clearly visible. Additional information about the nameplate is provided in the associated Operating Instructions.

Structure of the extended order code

FTL825	–	**********	+	A*B*C*D*E*F*G*..
(Device type)		*(Basic specifications)*		*(Optional specifications)*

* = Placeholder
At this position, an option (number or letter) selected from the specification is displayed instead of the placeholders.

Basic specifications

The features that are absolutely essential for the device (mandatory features) are specified in the basic specifications. The number of positions depends on the number of features available.
The selected option of a feature can consist of several positions.

Optional specifications

The optional specifications describe additional features for the device (optional features). The number of positions depends on the number of features available. The features have a 2-digit structure to aid identification (e.g. JA). The first digit (ID) stands for the feature group and consists of a number or a letter (e.g. J = Test, Certificate). The second digit constitutes the value that stands for the feature within the group (e.g. A = 3.1 material (wetted parts), inspection certificate).

More detailed information about the device is provided in the following tables. These tables describe the individual positions and IDs in the extended order code which are relevant to hazardous locations.

Extended order code: Nivotester FailSafe

The following specifications reproduce an extract from the product structure and are used to assign:
- This documentation to the device (using the extended order code on the nameplate).
- The device options cited in the document.

Device type

FTL825

Basic specifications

Position 1, 2 (Approval)		
Selected option		**Description**
FTL825	FB	FM AIS, ANI AIS Cl. I, II, III, Div. 1, Gr. A-G, [AEx/Ex ia] IIC ANI Cl. I, Div. 2, Gr. A-D, [AEx/Ex ic/nL] IIC
	8C	FM/CSA AIS, ANI AIS Cl. I, II, III, Div. 1, Gr. A-G, [AEx/Ex ia] IIC ANI Cl. I, Div. 2, Gr. A-D [AEx/Ex ic/nL] IIC

Position 3 (Housing)		
Selected option		**Description**
FTL825	3	Rail mounting; 45 mm, 1-channel

Position 4 (Power Supply)		
Selected option		**Description**
FTL825	A	85-253 VAC/DC
	E	20-30 VAC/20-60 VDC

Position 5 (Switch Output)		
Selected option		**Description**
FTL825	4	2x SPST safety contact level + 1x SPST signal contact + 1x SPDT alarm

Optional specifications

ID Lx (Additional Approval)		
Selected option		**Description**
FTL825	LC	WHG overfill prevention, Leckage
	LE	GL marine certificate
	LF	ABS marine approval
	LV	VdTÜV100 liquified gas approval

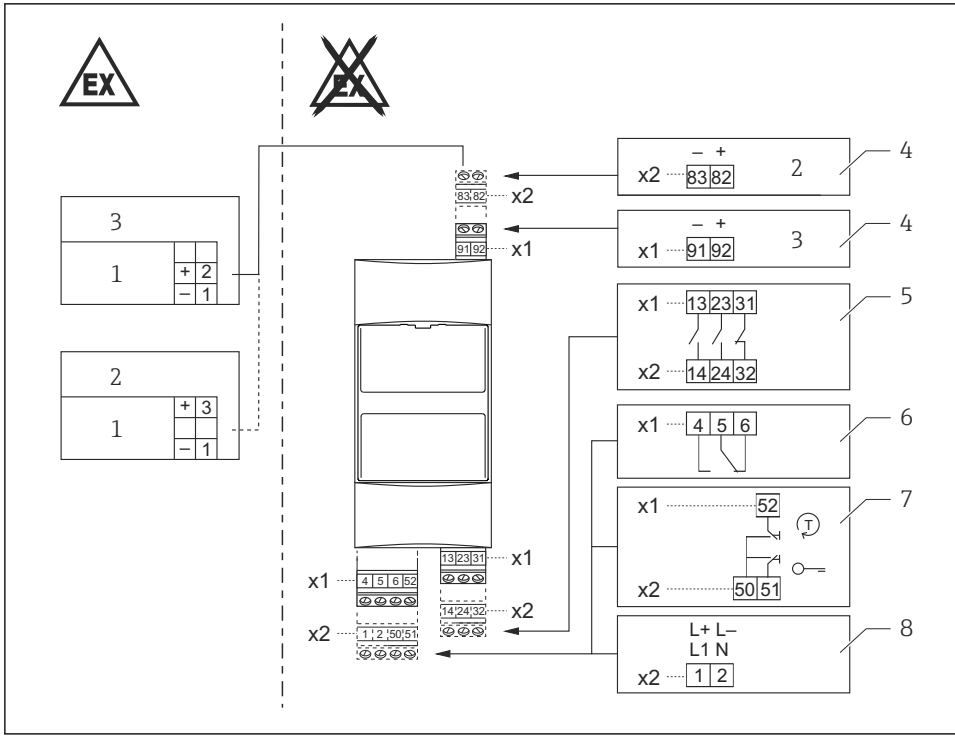
ID Px, Rx (Accessory Enclosed)		
Selected option		**Description**
FTL825	PA	Field housing, R4 182x180x165, 5xM20, PC, IP66

Safety instructions: Special conditions

Permitted ambient temperature range at the electronics housing:
$-20\ °C \leq T_a \leq +60\ °C$

In case of series installation: Restriction to $-20\ °C \leq T_a \leq +50\ °C$

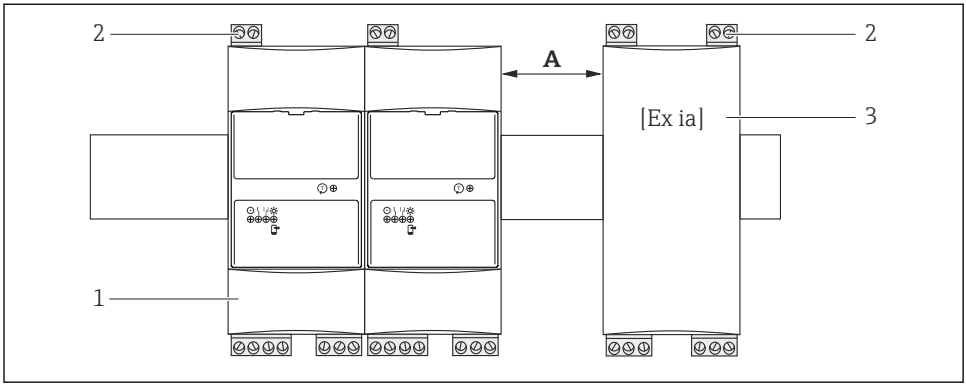
Safety instructions: Installation



1

1 *Liquiphant FailSafe FTL8x with electronics FEL85*
2 *Min. level safety*
3 *Max. level safety*
4 *Sensor*
5 *Level relay*
6 *Fault signal relay*
7 *Remote operation: test and unlocking*
8 *Power supply*

Installation on the top hat rail



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A Min. 6 mm
1 Nivotester FTL825
2 Intrinsically safe contacts
3 Other type, other product

Class I, Div. 1 or 2; Class II, Div. 1 or 2 and Class III

Associated Intrinsically safe, AEx ia IIC
AIS Class I, Div. 1+2, Groups A, B, C, D, Class II, Div. 1+2, Groups E, F, G, Class III; Class I, Zone 0 [AEx/Ex ia] IIC

Associated Non-Incendively safe, AEx/Ex ic/nL IIC
ANI Class I, Div. 2, Groups A, B, C, D, Class II, Div. 2, Groups E, F, G, Class III; Class I, Zone 2 [AEx/Ex ic/nL] IIC

Hazardous locations installations

- WARNINGS: Substitution of components may impair intrinsic safety.
- FMRC apparatus must be installed in accordance with manufacturer instructions.
- Maximum safe area voltage: 250 V_{rms}
- Install as per NEC (National Electrical Code) (ANSI/NFPA70) and ISA RP 12.06.01.
- Install the device protected from dust and moisture.
- Use additional precautions such as wiring tie downs or special wiring methods to provide adequate separation, especially when terminals are arranged one above the other.
- Terminals of intrinsically safe circuits must be separated from terminals of non-intrinsically safe circuits by creepage and clearance distance of at least 50 mm (2 in).

Temperature tables

Ambient temperature range

Individual installation
−20 to +60 °C

Series installation / Field enclosure installation
−20 to +50 °C

Connection data

Power supply circuit

Basic specification, Position 4 (Power Supply) = A

Terminal 1, 2
Power supply U = 85 to 250 V_{AC}, 50/60 Hz P ≤ 3.8 VA U = 85 to 250 V_{DC} P ≤ 2 W

Basic specification, Position 4 (Power Supply) = E

Terminal 1, 2
Power supply U = 20 to 30 V_{AC}, 50/60 Hz P ≤ 3.6 VA U = 20 to 60 V_{DC} P = 2.5 W

Contact circuit

Fault signal relay	Terminal 4, 5, 6
Level relay	Terminal 13, 14 Terminal 23, 24 Terminal 31, 32
Power supply U ≤ 250 V_{AC} I ≤ 2 A P ≤ 500 VA at cos φ >0.7 U ≤ 40 V_{DC} I ≤ 2 A P ≤ 80 W	

Intrinsically safe installation [AEx/Ex ia] IIC

Signal circuit: Entity parameter

Only connect the device to terminals 82 and 83 or terminals 91 and 92, respectively.

Min. level safety **Max. level safety**	**Terminal 82 (+)** **Terminal 83 (–)** **Terminal 91 (–)** **Terminal 92 (+)**			
Connection data:	V_{oc} = 22 V I_{sc} = 166 mA P_o = 970 mW		$R_i \geq 132\ \Omega$ (Characteristic curve: linear) $C_i \leq 1$ nF, $L_i = 0$ $C_o \leq 0.165$ µF, $L_o \leq 2.8$ mH	
	Class I, Div. 1, Gr. A, B [AEx/Ex ia] IIC		**Class I, Div. 1, Gr. C-G [AEx/Ex ia] IIB, [AEx/Ex ia] IIA**	
	L_a	**C_a**	**L_a**	**C_a**
Max. external capacitance at max. external inductance	0.15 mH	100 nF	0.15 mH	700 nF
	0.50 mH	40 nF	0.50 mH	500 nF
	1.00 mH	20 nF	1.00 mH	500 nF
	-	-	2.00 mH	500 nF

	Class I, Div. 1, Gr. A, B [AEx/Ex ia] IIC		**Class I, Div. 1, Gr. C-G [AEx/Ex ia] IIB**		**Class I, Div. 1, Gr. C-G [AEx/Ex ia] IIA**	
	L_a	**C_a**	**L_a**	**C_a**	**L_a**	**C_a**
Max. external capacitance or max. external inductance	2.8 mH	165 nF	12.0 mH	1.14 µF	30 mH	4.2 µF

Nonincendive installation [AEx/Ex ic/nL] IIC

Only connect the device to terminals 82 and 83 or terminals 91 and 92, respectively.

Min. level safety	**Terminal 82 (+)** **Terminal 83 (–)**
Max. level safety	**Terminal 91 (–)** **Terminal 92 (+)**
Connection data:	$U_n \leq 21.4$ V $I_n \leq 22$ mA $P_n \leq 400$ mW $C_o \leq 0.690$ µF $L_o \leq 0.2$ H

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