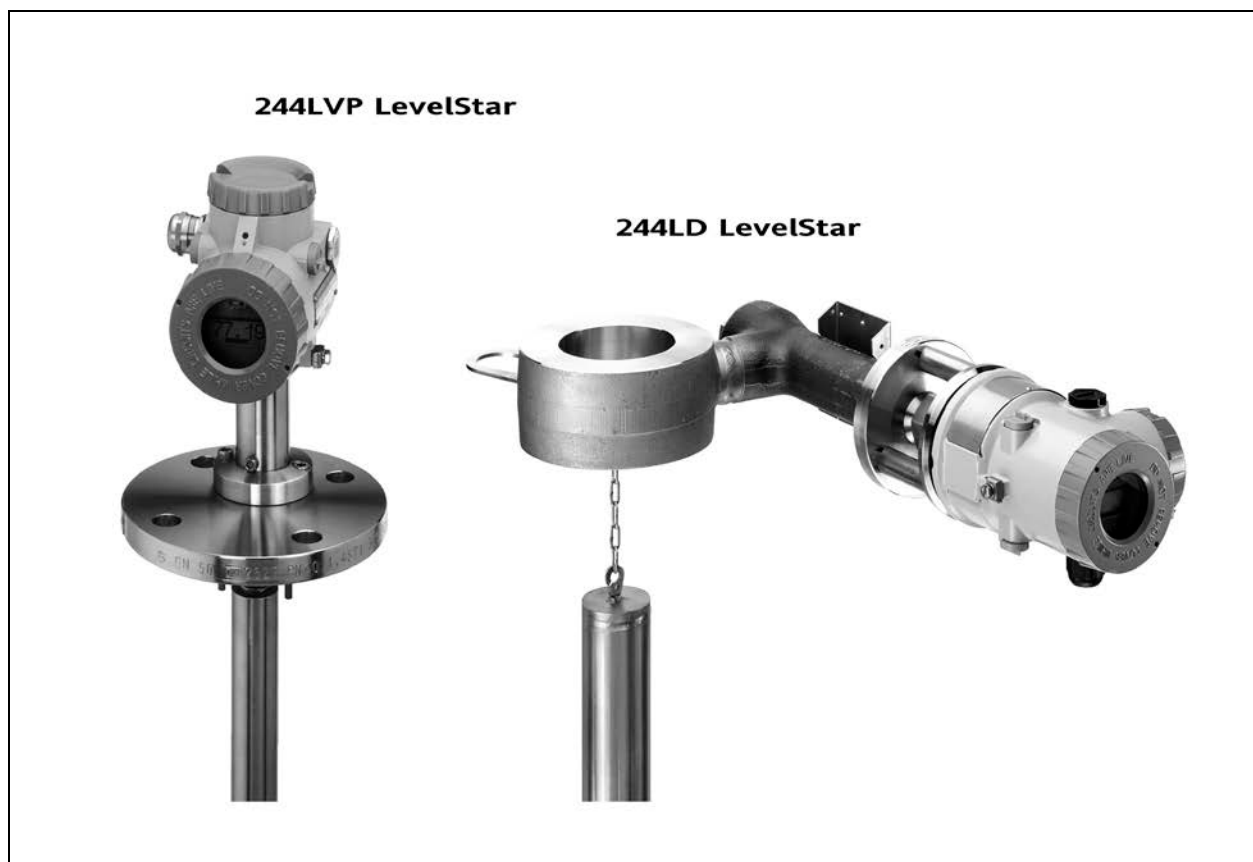


Safety Instructions for 240 Series Devices

244LD LevelStar, 244LVP LevelStar



for Measuring Amplifier

AID 421, AD 931
(intrinsically safe in HART / Profibus / Foundation Fieldbus, Flameproof and Dust Tight)

Electrical Safety

Compliance with the essential Health and Safety Requirements EN 61010-1:2010, measurement category II and pollution degree 3.

Any work on electrical parts must be done only by qualified personnel, if any power supply is connected to the equipment.

The equipment components have to be used only according to their electrical data and for their designated purpose and have to be connected in accordance with their wiring diagrams.

Safety precautions taken in the equipment may be rendered ineffective if the equipment is not operated in accordance with Master Instructions.

Limitation of power supply for fire protection must be complied with according to EN 61010-1:2010, Chapter 9.6.

National application regulations for electrical equipment have to be adhered to.

The transmitters are suitable for use in potentially explosive atmospheres.

Explosion Protection

Technical Data for explosion protection, see product specifications and Certificates of Conformity.

For equipment intended for use in potentially explosive atmospheres, all relevant national and installation regulations must be complied with, i.e. in Germany ElexV and EN 60079-14.

Repair of Ex-Equipment

When repairing or altering explosion protection equipment, only manufacturer's original parts can be used. Repairs or alterations involving parts required for equipment for use in potentially explosive atmospheres, must either be carried out by the manufacturer or by a relevant authorised specialist or a relevant authorised certification body and certified by authorisation stamp or certificate.

CE Identification

Electromagnetic compatibility according to 2004/108/EC is ensured. Operating location is an industrial environment.

Pressure vessels and pressure holding equipment parts 244LD, 167LP and their accessories are in compliance with Pressure Equipment Directive 97/23/EC (Appendix III, Module D).

Mounting Location

Protect transmitters against direct and extreme sun and/or heat exposure. The maximum permissible ambient temperature ranges have to be complied with.

Type of Protection IP66

To meet type of protection IP66 requirement, a correct installation of the cable glands and all O-rings has to be ensured.

Decommissioning

Prior to decommissioning take precautions to avoid operation disturbances:

- Comply with explosion protection
- Switch off power supply
- Caution with hazardous process media!
- Vessels/tube conduits must be depressurised
- With toxic, flammable or environmental harmful process media, observe relevant safety regulations.

Process Media

For dealing with process media comply with the relevant safety regulations.

Process temperature and thus housing temperature can be between -196°C and +500°C!

Caution: Danger of Injuries!

Caution with Oxygen: Danger of Fire!

Therefore special attention has to be paid for oxygen measurement:

- Use only transmitters suitable for oxygen measurement!
- Use only fittings free of oil and grease!
- Check whether all parts that may come in contact with oxygen are free of oil and grease!

Recurring Checks

The user has to ensure that the electrical process equipment is checked under the responsibility and supervision of an electro specialist, with respect to their proper condition of mounting, installation and operation, and this is required before the initial start-up and during specified intervals.

For pressure instruments we recommend (according to BetrSichV dated 27.09.2002) a check cycle of 2 years for the outer check, of 5 years for the inner check, and of 10 years for the resistance strength check. With corrosive and abrasive process media the check cycles have to be shortened.

Combinations

For equipment with explosion protection:

Our transmitters are assembled according to a modular design principle. The corresponding components are for multiple use and have each their own certificate for explosion protection.

The certificates are marked with a code (i.e. "AD 931"); these codes appear also on the labels and on the documents "Certificates of Conformity" (see also <http://www.foxboro-eckardt.com>).

As follows, the safety regulations of all certificates of this instrument family are listed. **Please comply with the safety regulations of your instrument version.**

Equipment	Type of protection	
	d	ia d
244LD	AD 931 + AD 432	AID 421
244LVP	AD 931 + AD 406	AID 421
HART T4		AID 421
HART T6		AID 421
PROFIBUS Foundation Fieldbus		AID 421

AD 931 (EEx d) – see Label

With "EEx d" certified equipment, the screw hole is ½ - 14 NPT or M20 x 1,5.

"EEx d" certified equipment must be connected by means of suitable cable entries or conduit systems, which meet the requirements of EN 60079-1 Part 13.1 and 13.2, and for which a separate certificate has been issued.

For cable entries or conduit systems the user assumes responsibility.

An opening not used must be sealed with a certified cover screw.

The housings of equipment with "EEx d" certificate must not be opened in potentially explosive atmospheres. This is not applicable only if instruments are not connected to any terminals or it is ensured that for the particular time there is no danger of explosion in the concerned areas.

With equipment with certificate "EEx ia d", the cover for the terminal box may be opened safety technically unrestricted. The user assumes responsibility.

With "EEx d" protection all housing covers and all securing screws have to be sealed and have to be secured against unintentional opening.

Attention: Impact test - The glass window of the electronics compartment cover passed the impact test at the low impact energy of 2 Joule.

(Profibus-Fieldbus) – see Label

Electrical Connections

The bus wirings have to be lead onto the identified housing clamps, whereby no polarity has to be observed.

If the transmitter is operated in an interconnection with other instruments according to the FISCO model, the installation references according to the PNO-Manual for PROFIBUS PA, (Version 1.2/Outline) have to be complied with. If this is not the case, the rules for interconnection according to the PTB-Report PTB-ThEx-10 are applicable and have to be complied with.

Electrical Data of the Transmitter

Permissible ambient temperature range:

- 40°C to + 85°C at temperature class T4
- 40°C to + 65°C at temperature class T6

The transmitter, with reference to PNO-Outline chapter 2.1, can be used for connection to intrinsic safe supply circuits.

	Intrinsically safe ia/ib IIC, FISCO ¹	Intrinsically safe ia/ib IIB, FISCO ¹	Intrinsically safe ia/ib IIC, linear ²
According to FISCO-Model	yes	yes	no
Max. Output Voltage U _o	17.5 V	17.5 V	24 V
Max. Short Circuit Current I _o	360 mA	380 mA ³	250 mA
Max. Output Performance P _o	2.52 W	5.32 W	1.2 W
¹ Supply instrument with rectangular or trapezoidal characteristics curve acc. to FISCO Model. ² Supply instrument or barrier with linear characteristics curve. If a grounding of the barrier is necessary, only the input lead may be grounded. ³ The current limit value can be determined by assuming a rectangular characteristics curve.			

The transmitter complies with the requirements of the FISCO model when connected to a FISCO supply instrument and for this reason, can be interconnected with other FISCO instruments when adhering to the installation guide.

244LVP Max. Force (N)	Overload limit max. (bar)	Safety limit (bar)
40	Up to 400	600
	500	600

or:

For connection to a certified intrinsically safe circuit with the following maximum values:

$$U = 24 \text{ V} \quad I = 380 \text{ mA} \quad P = 5.2 \text{ W}$$

Mechanical Loading Capacity and Corrosion Resistance of the Membrane

The explosion protection also depends on the density of the membrane of the measuring cell (rust free, corrosion resistant metals, membrane thickness > 0,06 mm). The transducer may therefore be used only for gases and liquids for which the membrane is sufficiently resistant chemically and resistant against corrosion.

Caution! The membrane has to be protected from mechanical influences.

AD 432 + AD 931, AID 421

– see Label

Mounting on side of vessel (vessel extension)

When used in Zone 0, fittings resistant to flame penetration must be used.

Mechanics

Displacers of more than 3 m length must be secured against oscillating when used in Zone 0.

Guide devices over 3 m length must also be secured against bending.

Electrostatic Adhesion

To avoid the danger of electrostatic ignition, a connection to the transmitter with good conductivity must be ensured. The volume resistance between the lower end of the displacer and the ground may not exceed 10^6 Ohm.

When used in Zone 0 apart from displacers of metal only ones of PTFE + 25% carbon (surface resistance $< 10^6$ Ohm) and com-posed moulded pieces may be used.

Potential Equalization

A potential equalization line must be mounted as an electrical bypass of the displacer suspension(s), if the residual displacer weight is < 10 N or if more than 6 contact points are present.

Cover Screws

Ensure accurate and tight fitting of all cover screws!

Flushing Connection

If a flushing connection is welded to the pressure body, it has to be equipped with fittings resistant to flame penetration or completely sealed.

Mounting of Sensor Elements

To avoid contacts to earth during mounting or dismantling of the pressure sensor or the connection cables, these tasks have always to be done if the current supply is switched off.

Attention: The connection must be completely isolated from earth!

AID 421 HART-PA/FF (EEx ia d T6)

– see Label

The terminal compartment is intrinsically safe, whereas the electronics is located in the pressure containing housing. For this reason the electronics compartment, in contrast to the terminal compartment, must not be opened in potentially explosive atmospheres.

For the connection of the intrinsically safe circuits the instructions of the EC Certificate of Conformity are valid.

Electrical Data of Transmitter AID 421

Permissible ambient temperature range:

–40°C to + 80°C

For connection to a certified intrinsically safe circuit with the following maximum values:

$U = 30$ V $I = 150$ mA $P = 0.9$ W

AT 421 (dust protected) – see Label

Dust sediments should be limited or avoided completely. To avoid an unusual rise in temperature of the dust tight housing through excessive dust sediments on the upper side, larger dust sediments should be removed.

If the equipment has to be opened for maintenance or repair, appropriate measurements have to be taken to avoid that dust penetrates into the housing interior.

When decommissioning, precautions should be taken that parts which are necessary for the tightness of the housing (gaskets, plane faces, etc.) are not damaged, if their exchange is intended.

Instruments which are identified with CE-identification according to PED 97/23/EC

Use, installation, start-up and maintenance of the equipment are permissible only according to manufacturer's instructions (see PSS and MI). The safe operation requires a regular check of the equipment (see recurring checks).

Screws, nuts, bolts and other equipment parts may only be loosened, opened or removed, if the equipment is in a depressurized condition.

An exception herefrom is the access to the electrical wiring and the control elements.

Restrictions through applicable basic atmospheric conditions

The transducers may be mounted to vessels and tube systems on which potentially explosive gas/air or vapour/air mixtures occur, at pressures of 0.8 bar to 1.1 bar and mixture temperatures of -20°C to +60 °C (potentially explosive atmosphere).

On vessels and tube systems with flammable gases and liquids, of which the pressures and temperatures are outside of the above mentioned ranges, the transducers may only be mounted if the flammable materials do not form potentially explosive mixtures.

For reasons of design a zone carry-over is securely eliminated.

Permissible Pressure Temperature Range with Pressure Equipment

Material	Pressure		°C	-60 to -10	-10 to +120	+200	+250	+300	+350	+400	Test Pressure
C 22.8 St 35.8	PN 16	DIN	bar	12	16	13	11	9	8		22.9
	cl150	ANSI	bar	14	16	14	12	10	8		29
	PN 40	DIN	bar	30	40	35	32	27	21		57.2
	cl 300	ANSI	bar	38	46	43	41	38	37		77
	PN 64	DIN	bar	48	64	50	45	39	30		91.5
	PN 100	DIN	bar	73	98	80	70	60	48		140.1
	cl 600	ANSI	bar	76	92	87	83	77	73		149
	PN 160	DIN	bar	120	160	130	112	96	90	76	228.8
	cl 900	ANSI	bar	114	139	131	123	116	110	90	224
	PN 250	DIN	bar	187	250	200	175	150	140	119	357.5
cl 1500	ANSI	bar	191	231	219	206	180	145	120	383	
Material	Pressure		°C	-196 to -10	-10 to +50	+100	+200	+300	+400		Test Pressure
1.4571 1.4404	PN 16	DIN	bar	16	16	16	12	9	7		22.9
	cl150	ANSI	bar	19	18	16	13	10	6		29
	PN 40	DIN	bar	40	40	35	32	28	25		57.2
	cl 300	ANSI	bar	49	49	42	35	31	27		75
	PN 64	DIN	bar	64	64	57	51	45	33		91.5
	PN 100	DIN	bar	100	100	95	80	70	64		143
	cl 600	ANSI	bar	99	99	84	71	63	58		149
	PN 160	DIN	bar	160	160	142	128	113	97		228.8
	cl 900	ANSI	bar	148	148	126	107	94	87		224
	PN 250	DIN	bar	250	250	230	200	177	162		357.5
cl 1500	ANSI	bar	248	248	211	178	158	145		373	
Material	Pressure		°C		-10 to +200	+300	+400	+450	+500		Test Pressure
1.5415 15 Mo 3 16 Mo 3	PN 16	DIN	bar		16	12	11	11	6		23.8
	cl150	ANSI	bar		14	10	6	4	2		30
	PN 40	DIN	bar		40	32	28	27	16		59.4
	cl 300	ANSI	bar		44	42	36	33	24		77
	PN 64	DIN	bar		63	50	44	43	25		93.5
	PN 100	DIN	bar		100	80	71	69	40		148.4
	cl 600	ANSI	bar		88	84	73	67	55		154
	PN 160	DIN	bar		160	128	113	110	64		237.5
	cl 900	ANSI	bar		132	126	109	101	72		230
	PN 250	DIN	bar		250	194	173	167	100		375
cl 1500	ANSI	bar		221	210	182	169	120		383	

DECLARATION OF CONFORMITY

- Directive 97/23/EC (according to Annex VII)

We herewith declare in sole responsibility, that the products:

Buoyancy Transmitter
Types: 244LD, 167LP and their accessories

comply with the Pressure Equipment Directive 97/23/EC and the
AD 2000-Instructions, TRB

Applied conformity assessment procedures:

Module B and D
EC-Type-Examination and Quality Assurance for Production

For these products the following EC-Certificates are existing:

P-IS-DDB-MAN-12-07-17329989-001
DGR-0036-QS-1021-11

The engaged Notified Body is:

TÜV SÜD Industrie Service GmbH, Dudenstr. 28, D-68167 Mannheim

- Directive 94/9/EC

For all below mentioned products of our Transmitter Series, in compliance with EC Certificates of Conformity, issued by the

Physikalisch Technische Bundesanstalt
Bundesallee 100
D-38166 Braunschweig
as Notified Body No. 0102

it is certified herewith that the products comply with the requirements established by the Directives for Alignment of the Legal Requirements of the Member States 94/9/EC dated 23 March 1994, relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, and Directive 2004/108/EC for electromagnetic compliance.

- Directive 2004/108/EC

The requirements for the electromagnetic compliance of the Directive 2004/108/EC dated 15. December 2004, are being fulfilled for all equipment components, in compliance with the following norms:

EN 55011	Group 1, Class B, date May 2000
EN 61326	date March 2002

Model range

Product	Type	Approval	Test Certificate	Guideline 94/9/EG
244LD HART/PA/FF				
intrinsically safe	AID 421	II 1/2 G EEx d ib/ia IIB/IIC T4/T6	PTB 04 ATEX 2011X	EN 60079-0: 2009 EN 60079-1: 2007 EN 60079-11: 2007 EN 60079-26: 2007 EN 1127-1: 2007
flameproof	AD 931	II 1/2 G EEx d IIC T4...T6	PTB 02 ATEX 1142	EN 60079-0: 2009 EN 60079-1: 2007 EN 60079-26: 2007
244LVP HART/PA/FF				
intrinsically safe	AID 421	II 2 G EEx d ib/ia IIB/IIC T4/T6	PTB 04 ATEX 2011X	EN 60079-0: 2009 EN 60079-1: 2007 EN 60079-11: 2007 EN 60079-26: 2007 EN 1127-1: 2007
flameproof	AD 931	II 2 G EEx d IIC T6...T4 II 2 G EEx d IIB T6...T4	PTB 02 ATEX 1025 X	EN 60079-0: 2009 EN 60079-1: 2007 EN 60079-26: 2007

This Declaration of Conformity is valid for all versions which are included in the type designation and are manufactured according to the type conformity documentation.

The transmitter family is designed for demanding industrial environments.

The metallic housing is coated and conforms to IP66 (DIN IEC 60529/A1).

The electronic room is locked for unintended opening and prevents electronic from contamination and moisture effects.

Fulfills tropical conditions: 1K5 (3K7), 1B1 (3B1), 1C2 (3C2 + 4C2), 1S3 (4S2), 1M2 (3M2) according to DIN EN 60721-3-1 and DIN EN 60721-3-4

Given by

FOXBORO ECKARDT GmbH
Pragstr. 82
D-70376 Stuttgart


Managing Director
Dr. Roger Ingemey

Stuttgart, 30 April 2014

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FOXBORO ECKARDT GmbH
Pragstr. 82
D-70376 Stuttgart
Germany
Tel. +49(0)711 502-0
Fax +49(0)711 502-597
<http://www.foxboro-eckardt.com>



DOKT 556 778 021

ECKARDT S.A.S.
20 rue de la Marne
F-68360 Soultz
France
Tel. + 33 (0)3 89 62 15 30
Fax + 33 (0)3 89 62 14 85