Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

LPGmass

MODBUS RS485

Division 1

Ex documentation

Safety instructions for electrical apparatus for explosion-hazardous areas according to FM APPROVALS standards → Page 3

Safety instructions for electrical apparatus for explosion-hazardous areas according to CANADIAN STANDARDS ASSOCIATION → Page 11

XA118D/06/en/06.07
71043195

Endress+Hauser
People for Process Automation

Examples for markings according to FM and CSA:

Temperature Class

Maximum surface temperature		
T1	842 °F	450 °C
T2	572 °F	300 °C
T2A	536 °F	280 °C
T2B	500 °F	260 °C
T2C	446 °F	230 °C
T2D	419 °F	215 °C
T3	392 °F	200 °C
T3A	356 °F	180 °C
T3B	329 °F	165 °C
T3C	320 °F	160 °C
T4	275 °F	135 °C
T4A	248 °F	120 °C
T5	212 °F	100 °C
T6	185 °F	85 °C

FM APPROVALS

Example: **XP / I / 1 / ABCD**

Type of Protection

XP	Explosionproof
IS	Intrinsically Safe Apparatus
AIS	Associated Apparatus with Intrinsically Safe Connections
ANI	Associated Nonincendive Field Wiring Apparatus
PX,PY,PZ	Pressurized
APX,APY,APZ	Associated Pressurization Systems/Components
NI	Nonincendive
DIP	Dust-Ignitionproof
S	Special Protection

Class

I	Class I (Gas)
II	Class II (Dust)
III	Class III (Fibre)

Division

1	Division 1
2	Division 2

Group

FM /NEC	Gases, vapours and dust examples	Min. ignition temperature [µJ]
A	Acetylene, carbon disulfide (Class I)	0.02
B	Hydrogen, ethyl nitrate (Class I)	0.02
C	Ethylene, isoprene (Class I)	0.06
D	Acetone, ethane, benzene, ethanoic acid, gasolines, diesel oil, aircraft fuel, methane, heating oil,crude oil, hexane, ether (Class I)	0.18
E	Metallic powder (Class II)	
F	Coal dust (Class II)	
G	Mill dust (Class II)	
	Textile fibres (Class III)	

Temperature Class

Maximum surface temperature		
T1	450 °C	842 °F
T2	300 °C	572 °F
T2A	280 °C	536 °F
T2B	260 °C	500 °F
T2C	230 °C	446 °F
T2D	215 °C	419 °F
T3	200 °C	392 °F
T3A	180 °C	356 °F
T3B	165 °C	329 °F
T3C	160 °C	320 °F
T4	135 °C	275 °F
T4A	120 °C	248 °F
T5	100 °C	212 °F
T6	85 °C	185 °F

Canadian Standards Association

Example: **Class I, Division 1, Group ABCD**

Class

I	Class I (Gas)
II	Class II (Dust)
III	Class III (Fibre)

Division

1	Division 1
2	Division 2

Group

CSC /NEC	Gases, vapours and dust examples	Min. ignition temperature [µJ]
A	Acetylene, carbon disulfide (Class I)	0.02
B	Hydrogen, ethyl nitrate (Class I)	0.02
C	Ethylene, isoprene (Class I)	0.06
D	Acetone, ethane, benzene (Class I)	0.18
E	Metallic powder (Class II)	
F	Coal dust (Class II)	
G	Mill dust (Class II)	
	Textile fibres (Class III)	

Type of Protection

Explosionproof
Intrinsically Safe Apparatus
Associated Apparatus with Intrinsically Safe Connections
Associated Nonincendive Field Wiring Apparatus
Pressurized
Associated Pressurization Systems/Components
Nonincendive
Dust-Ignitionproof
Special Protection

A0005630-en

Level Pressure Flow Temperature Liquid Analysis Registration Systems Components Services Solutions

Safety Instructions

LPGmass

MODBUS RS485

Division 1

Ex documentation

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

- BA133D, LPGmass Modbus RS485

Table of Contents FM

XA118D/06/en/06.07
71043195

Endress+Hauser
People for Process Automation

Special conditions

- Install per National Electrical Code NFPA 70. Install intrinsically safe circuits per National Electrical Code NFPA 70 and ISA RP 12.6 respecting the explosionproof integrity of the enclosure.
- Control room equipment shall not use or generate more than 250 V rms.
- The device must be integrated into the potential equalization system.
- For terminals No. 20 to No. 27 of the transmitter, only devices with ratings $U_m \leq 250$ V and $I_m \leq 1$ A are allowed to be connected.
- The specified temperature class in conjunction with the ambient temperature and the medium temperature must be in compliance with the tables on Page 6.
- It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.
- Use of the devices is restricted to mediums against which the process-wetted materials are adequately resistant.
- Class II Group G: The surface temperature of the apparatus cannot exceed 329 °F.
- Transmitter enclosure explosionproof for use in Class 1 Division 1 Groups A, B, C, D (factory sealed, conduit seal not required) and dust-ignition proof for Class II, III Division 1 Groups E, F, G.
- Sensor circuits are intrinsically safe for Cl. I, Div. 1, Group A, B, C, D. Sensor enclosure is dust ignition proof for Cl. II, III, Div. 1, Group E, F, G.
- Substitution of components may impair intrinsic safety.
- All ratings of the flow meter (see also nameplate) have to be respected.

☝ Caution!

- Use supply wires suitable for 9 °F above ambient temperature, but at least for 176 °F.

General warnings

- Installation, connection to the electricity supply, commissioning and maintenance of the devices must be carried out by qualified specialists trained to work on Ex-rated devices.
- Transmitter housing and cable entries have to be sealed tight.
- Open device only when disconnected or when atmosphere is known to be non-hazardous. Make sure, that no dust /humidity enters the enclosure when opened.
- A worm screw prevents undesired movement of the transmitter housing (please refer to the operating manual). When released the transmitter housing can be rotated contiously until an internal retaining ring comes to a stop. The worm screw has to be retightend once the housing has been rotated.
- If the transmitter and sensor have to be separated (e. g. for the purpose of repair), the retaining ring can be destroyed if considerable force is applied. In such a case, a new genuine Endress+Hauser retaining ring must be installed when reassembling. The worm screw has to be retightend.

Approvals

General

The system meets the fundamental health and safety requirements for the design and construction of devices and protective systems intended for use in potentially explosive atmospheres in accordance with the National Electrical Code.

No. / approval type

J.I. 3027806

Notified body

FM APPROVALS

Identification

The identification of the system must contain the following specifications:

- XP-IS-DIP / I, II, III / 1 / ABCDEFG / T6-T1

☝ Caution!

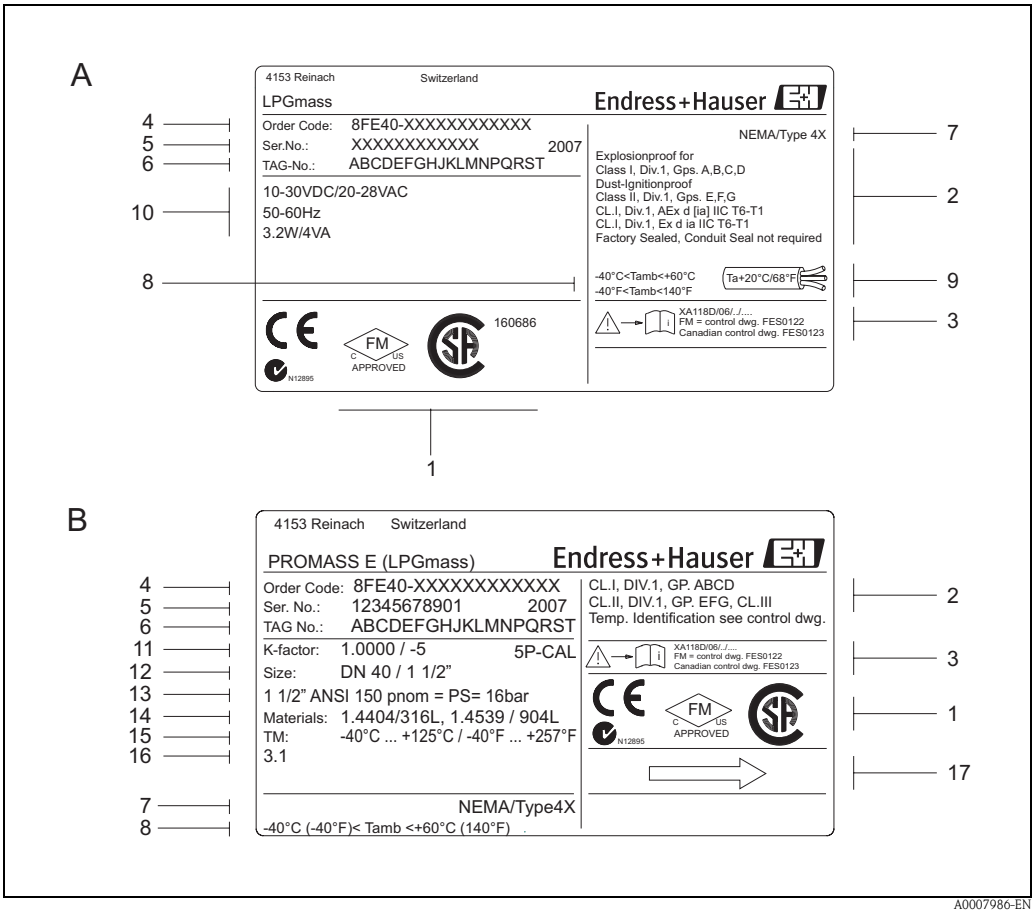
The installation instructions for the safe use of the system must be observed → Page 4 .

Description of measuring system

The measuring system consists of a compact version:
transmitters and sensors form a mechanical unit.

Nameplates

The nameplate, which is mounted in a clearly visible position on the device, contains all of the relevant information about the measuring system.



A0007986-EN

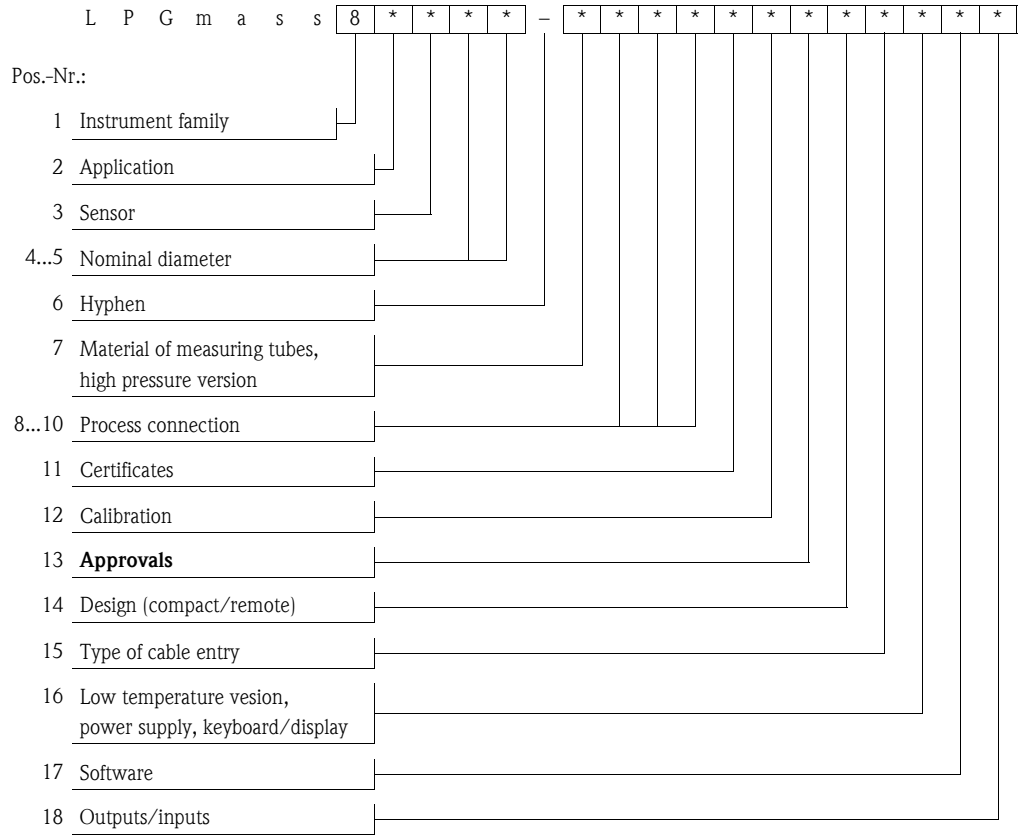
Fig. 1: Example for nameplates

A Transmitter nameplate
B Sensor nameplate

1 Label of the inspection authority: FM APPROVALS and CANADIAN STANDARDS ASSOCIATION
2 Space for marking of class, division and group
3 Associated Ex documentation and corresponding control drawings
4 Order code
5 Serial number
6 TAG number
7 Enclosure protection
8 Ambient temperature range
9 Maximum cable temperature
10 Power supply, frequency and power consumption
11 Calibration factor/zero point; 5P-CAL = 5-point calibration
12 Device nominal diameter
13 Nominal diameter/nominal pressure
14 Materials in contact with the medium
15 Fluid temperature range
16 Additional information, e.g. 3.1 = 3.1 B certificate for wetted material
17 Direction of flow

Type code

The type code describes the exact design and the equipment of the measuring system.
It can be read on the nameplate of the transmitter and sensor and is structured as follows:



Approvals (Item No. 13 in type code)

*	Approval	Sensor
N	Cl. I, Div. 1, Group ABCD	LPGmass DN 08 (¼"), 15 (½"), 25 (1"), 40 (1½")

✎ Note!
A detailed explanation of these values with regard to the outputs and inputs available, as well as a description of the associated terminal assignment and connection data can be found as of Page 9.

Temperature table

Max. medium temperature [°F] for T1-T6 in relation to the maximum ambient temperature T_a.

T_a = 113 °F	DN	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
8FE**-************	08 (¼"), 15 (½")	113	203	257	257	257	257

T_a = 122 °F	DN	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
8FE**-************	08 (¼"), 15 (½")	–	203	257	257	257	257
	25 (1"), 40 (1½")	122	203	257	257	257	257

T_a = 140 °F	DN	T6 (185 °F)	T5 (212 °F)	T4 (275 °F)	T3 (392 °F)	T2 (572 °F)	T1 (842 °F)
8FE**-************	08 (¼"), 15 (½"), 25 (1"), 40 (1½")	–	203	257	257	257	257

The minimum **medium temperature** is –40 °F for LPGmass.

The minimum **ambient temperature** T_a for LPGmass is –40 °F.

Design of measuring system

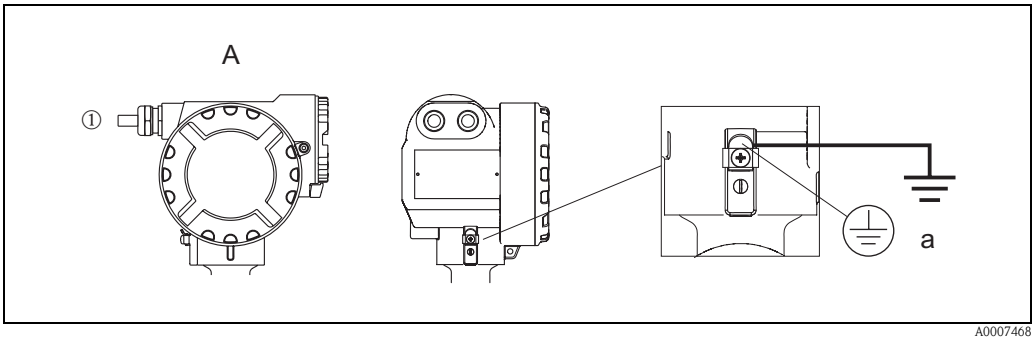


Fig. 2: Design of the measuring system
A Transmitter housing (compact version)
a Screw terminal for connecting to the potential equalization
① see following chapter "Cable entries"

Cable entries

① Cable entries for transmitter terminal compartment (XP version) power supply/communication cable. Choice of thread for cable entry: ½" NPT.

Make sure that the XP cable glands/entries are secured to prevent working loose.

Potential equalization

The transmitter must be safely integrated into the potential equalization via the screw terminal on the outside of the transmitter housing. Alternatively, the transmitter can be integrated into the potential equalization via the pipeline as long as the pipeline provides a ground connection conforming to regulations.

✎ Note!
Further information about potential equalization, screening and grounding can be found in the associated Operating Instructions.

Potential equalization for fieldbus versions, when both sides of the screen are grounded

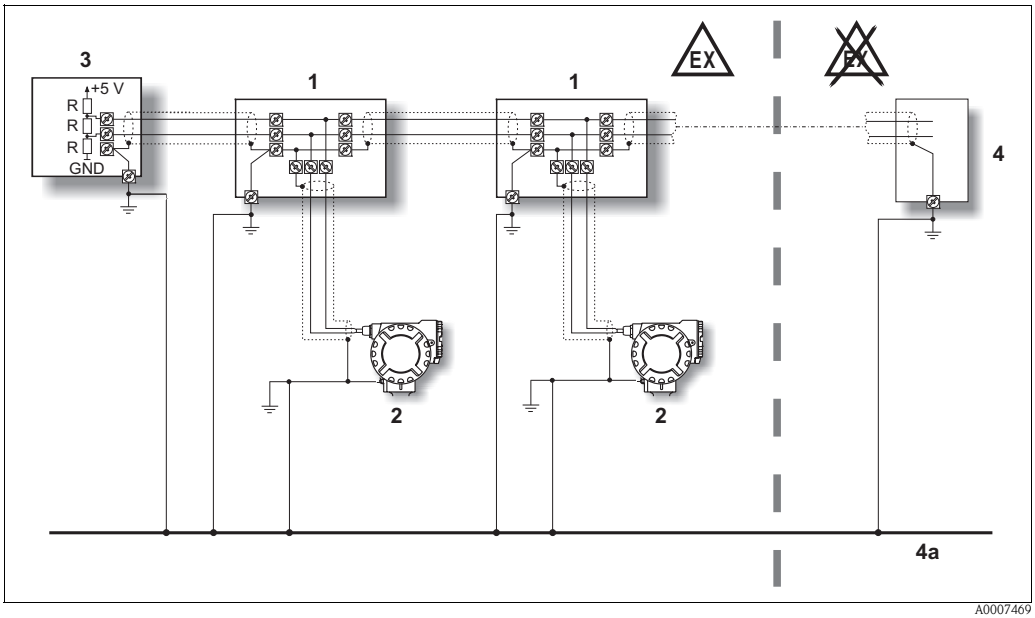


Fig. 3: Example for connecting potential equalization lines
1 Distributor/T-Box
2 Bus devices for potentially explosive atmospheres
3 Bus termination MODBUS RS485
4 Bus power supply unit or automation system
4a Potential equalization line is fed out into the safe area

✎ Note!
The length of the spurs is to be considered.

Electrical connection

Connection compartment

Transmitter housing compact/remote version (terminal assignment, connection data → Page 8 ff.)

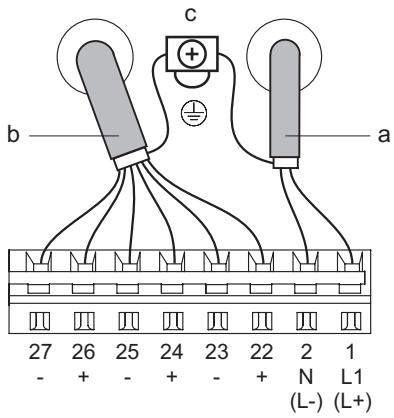


Fig. 4 A0007034

a Power supply cable, terminal assignment and connection data see below)
b Signal cable/fieldbus cable (terminal assignment and connection data → Page 9)
c Ground terminal, signal cable shield / RS485 line

Terminal assignment and connection data, power supply

Terminal assignment and connection data

all transmitters	1 L (+)	2 N (–)	3
Designation	Supply voltage		Protective earth
Functional values	AC: U = 20…28 V; DC: U = 10…30 V Power consumption: AC: <4 VA DC: < 3.2 W		Caution! Observe the grounding plans of the system!
Intrinsically safe circuit	no		
U_m	253 V AC		

Terminal assignment and connection data for signal circuits

✎ Note!
The following tables contain values/specifications, which are dependent on the type code (type of measuring device). Please compare the following type code to the one shown on the nameplate of your measuring device. A graphic representation of the electrical connections can be found on Page 8.

Terminal assignment

Transmitter	Terminal no. (outputs)					
	22 (+)	**23 (–)**	**24 (+)**	**25 (–)**	**26 (+)**	**27 (–)**
Non-convertible communication boards (fixed assignment)						
8FE**- *...*N	Pulse / Frequency / Status output 1		Pulse / Frequency / Status output 1		MODBUS RS485[1)] B	MODBUS RS485[1)] A

[1)] MODBUS RS485:
– Terminal 26 (+) → B (RxD/TxD-P)
– Terminal 27 (–) → A (RxD/TxD-N)

Safety-related and functional values of signal circuits

Signal circuits	Functional values	Safety-related values
Pulse/frequency output	galvanically isolated passive 30 V DC / 250 mA Open Collector Full scale frequency 100 to 5000 Hz	intrinsically safe = no U_m = 253 V I_m = 1 A
Status output	galvanically isolated passive 30 V DC / 250 mA Open Collector	
MODBUS RS485	galvanically isolated, RS485 as per Standard EIA/TIA-485	

Service adapter

The service adapter is only used for connecting service interfaces approved by Endress+Hauser.

⚠ Warning!
It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.

Technical Data

Dimensions

The dimensions of the instruments for the hazardous area correspond to those in the Technical Information documentation.

Weight

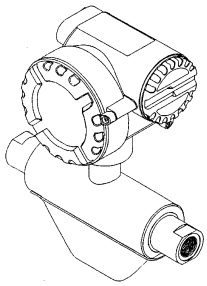
The weight of the Ex d version is equivalent to the weight in the Technical Information documentation.

✎ Note!
Technical Information for LPGmass → TI080D

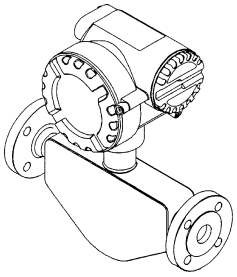
Control Drawing

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the FM APPROVALS standard.

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 IIC,
Class II Division 1 Groups EFG and Class III



CNGmass



LPGmass

Temperature table	max. medium temperature [°C / °F]					
	T6 [1]	T5	T4	T3	T2	T1
Ta = 45°C:						
LPGmass DN08/15	45 / 113	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
Ta = 50°C:						
CNGmass DN08/15/25	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN08/15	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN25/40/50	50 / 122	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
Ta = 60°C:						
CNGmass DN08/15	---	90 / 194	125 / 257	125 / 257	125 / 257	125 / 257
CNGmass DN25	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN08/15/25/40	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN50	60 / 140	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257

[1] LPGmass only

LPGmass : Tm min. is -40°C / -40 °F Ta min. = -40°C / -40 °F
CNGmass: Tm min. = -50°C / -58 °F Ta min. = -40°C / -40 °F

Notes:
1. Install all per NEC ANSI/NFPA 70.
2. Control room equipment shall not use or generate more than 250 V rms.
3. Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 70 °C / 158°F.
4. Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329°F.
5. Transmitter enclosure explosion proof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II Div. 1 Groups E, F, G, Class III.
6. CNGmass, LPGmass transmitter enclosure is factory sealed for use in Cl. I Div. 1 Groups A, B, C, D, conduit seal not required.
7. CNGmass is a dual seal rated device.

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Aenderungen:					Ersteller: FES / ID 1243 PiLE: FES0122_060724.doc		
	A		F				
	B		G				
	C		H				
	D		J				
	E		K				
FM Control Drawing Div. 1 / Zone 1					Massstab	Gezeichnet	24.07.2006 UD
						Geprüft	
Compact Version						Ex-geprüft	06.02.07
CNGmass, LPGmass						Gesehen	
Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach					FES0122		

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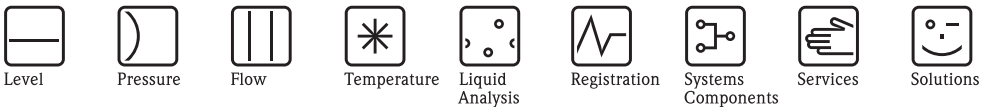

Safety Instructions

LPGmass

MODBUS RS485

Division 1

Ex documentation

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

- BA133D, LPGmass Modbus RS 485

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XA118D/06/en/06.07
71043195

Endress+Hauser

People for Process Automation

Special conditions

- Install per Canadian Electrical Code.
- Control room equipment shall not use or generate more than 250 V rms.
- The device must be integrated into the potential equalization system.
- For terminals No. 20 to No. 27 of the transmitter, only devices with ratings $U_m \leq 250$ V and $I_m \leq 1$ A are allowed to be connected.
- The specified temperature class in conjunction with the ambient temperature and the medium temperature must be in compliance with the tables on Page 14.
- It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.
- Use of the devices is restricted to mediums against which the process-wetted materials are adequately resistant.
- Use supply wires suitable for 5 °C above ambient temperature, but least for 80 °C.
- Transmitter enclosure explosionproof for use in Class 1 Division 1 Groups A, B, C, D (factory sealed, conduit seal not required) and dust-ignition proof for Class II, III Division 1 Groups E, F, G.
- Sensor circuits are intrinsically safe for Cl. I, Div. 1, Group A, B, C, D.
  Sensor enclosure is dust ignition proof for Cl. II, III, Div. 1, Group E, F, G.
- Substitution of components may impair intrinsic safety.
- All ratings of the flow meter (see also nameplate) have to be respected.

☝ Caution!
- Use supply wires suitable for 5 °C above ambient temperature, but at least for 80 °C.

General warnings

- Installation, connection to the electricity supply, commissioning and maintenance of the devices must be carried out by qualified specialists trained to work on Ex-rated devices.
- Transmitter housing and cable entries have to be sealed tight.
- Open device only when disconnected or when atmosphere is known to be non-hazardous. Make sure, that no dust /humidity enters the enclosure when opened.
- A worm screw prevents undesired movement of the transmitter housing (please refer to the operating manual). When released the transmitter housing can be rotated contiously until an internal retaining ring comes to a stop. The worm screw has to be retightend once the housing has been rotated.
- If the transmitter and sensor have to be separated (e. g. for the purpose of repair), the retaining ring can be destroyed if considerable force is applied. In such a case, a new genuine Endress+Hauser retaining ring must be installed when reassembling. The worm screw has to be retightend.

Approvals

General

The system meets the fundamental health and safety requirements for the design and construction of devices and protective systems intended for use in potentially explosive atmospheres in accordance with the Canadian Electrical Code.

No. / approval type

160686

Notified body

CSA: Canadian Standard Association

Identification

The identification of the system must contain the following specifications:

- Class I, Groups ABCD
- Class I, Zone 1, Group IIC
- Class II, Groups EFG
- Class III

or

- Class I, Groups CD
- Class I, Zone 1, Group IIB
- Class II, Groups EFG
- Class III

☝ Caution!
The installation instructions for the safe use of the system must be observed → Page 12 .

Description of measuring system

The measuring system consists of a compact version:
transmitters and sensors form a mechanical unit.

Nameplate

The nameplate, which is mounted in a clearly visible position on the device, contains all of the relevant information about the measuring system.

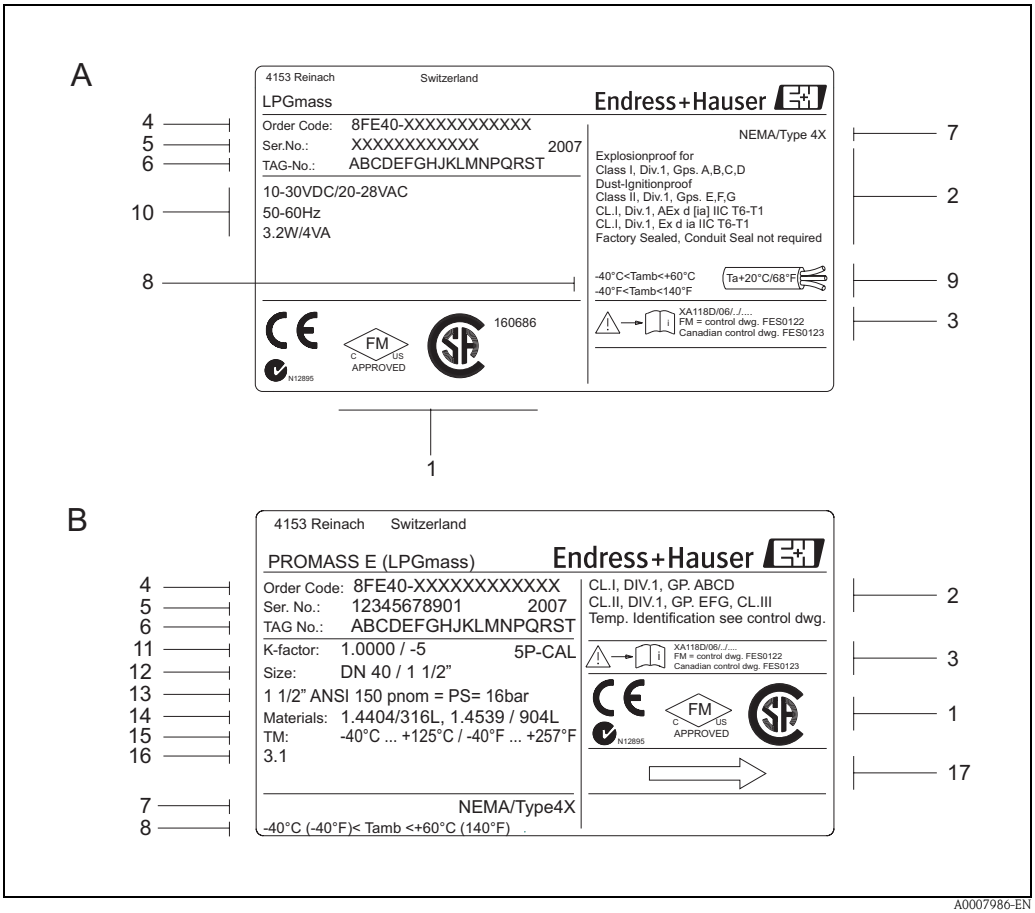

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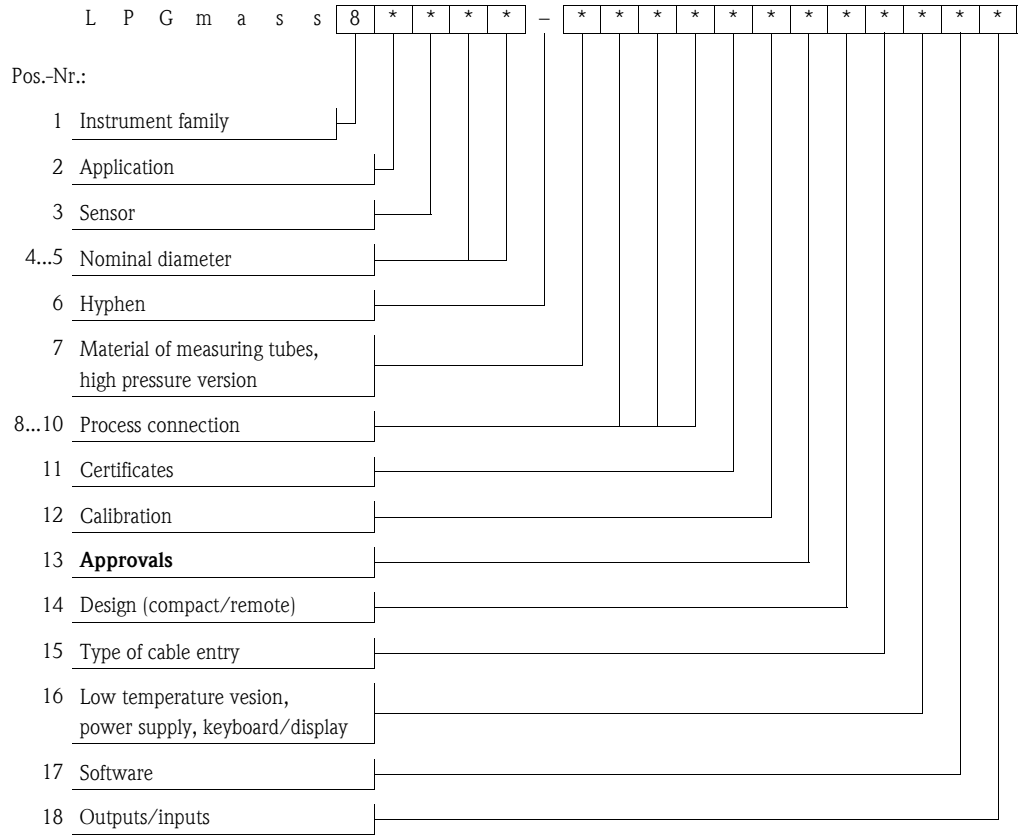
Fig. 1: Example for nameplates

A Transmitter nameplate
B Sensor nameplate

1 Label of the inspection authority: FM APPROVALS and CANADIAN STANDARDS ASSOCIATION
2 Space for marking of class, division and group
3 Associated Ex documentation and corresponding control drawings
4 Order code
5 Serial number
6 TAG number
7 Enclosure protection
8 Ambient temperature range
9 Maximum cable temperature
10 Power supply, frequency and power consumption
11 Calibration factor/zero point; 5P-CAL = 5-point calibration
12 Device nominal diameter
13 Nominal diameter/nominal pressure
14 Materials in contact with the medium
15 Fluid temperature range
16 Additional information, e.g. 3.1 = 3.1 B certificate for wetted material
17 Direction of flow

Type code

The type code describes the exact design and the equipment of the measuring system.
It can be read on the nameplate of the transmitter and sensor and is structured as follows:



Approvals (Item No. 13 in type code)

*	Approval	Sensor
N	Cl. I Div. 1 Group ABCD	LPGmass DN 08, 15, 25, 40

✎ Note!
A detailed explanation of these values with regard to the outputs and inputs available, as well as a description of the associated terminal assignment and connection data can be found as of Page 17.

Temperature table compact version

Max. medium temperature [°C] for T1-T6 in relation to the maximum ambient temperature T_a.

T_a = 45 °C	DN	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
8FE**-**********	08, 15	45	95	125	125	125	125

T_a = 50 °C	DN	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
8FE**-**********	08, 15	–	95	125	125	125	125
	25, 40	50	95	125	125	125	125

T_a = 60 °C	DN	T6 (85 °C)	T5 (100 °C)	T4 (135 °C)	T3 (200 °C)	T2 (300 °C)	T1 (450 °C)
8FE**-**********	08, 15, 25, 40	–	95	125	125	125	125

The minimum **medium temperature** is –40 °C for LPGmass.

The minimum **ambient temperature** T_a for LPGmass is –40 °C.

Design of measuring system

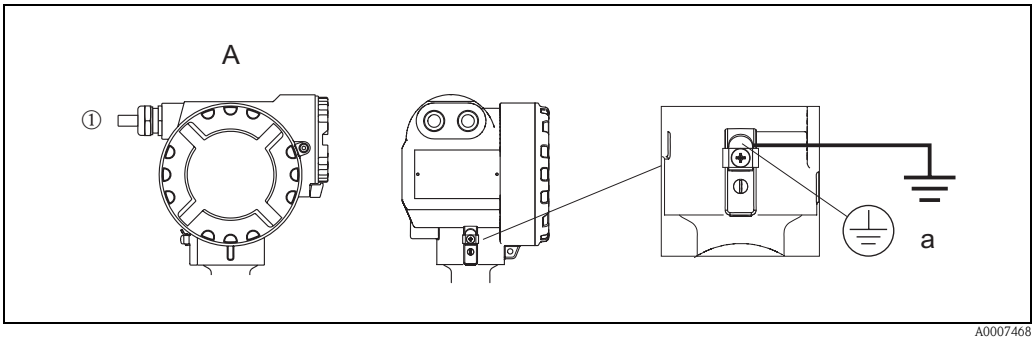


Fig. 2: Design of the measuring system
A Transmitter housing (compact version)
a Screw terminal for connecting to the potential equalization
① see following chapter "Cable entries"

Cable entries

① Cable entries for transmitter terminal compartment (XP version) power supply/communication cable. Choice of thread for cable entry: ½" NPT.

Make sure that the XP cable glands/entries are secured to prevent working loose.

Potential equalization

The transmitter must be safely integrated into the potential equalization via the screw terminal on the outside of the transmitter housing. Alternatively, the transmitter can be integrated into the potential equalization via the pipeline as long as the pipeline provides a ground connection conforming to regulations.

✎ Note!
Further information about potential equalization, screening and grounding can be found in the associated Operating Instructions.

Potential equalization for fieldbus versions, when both sides of the screen are grounded

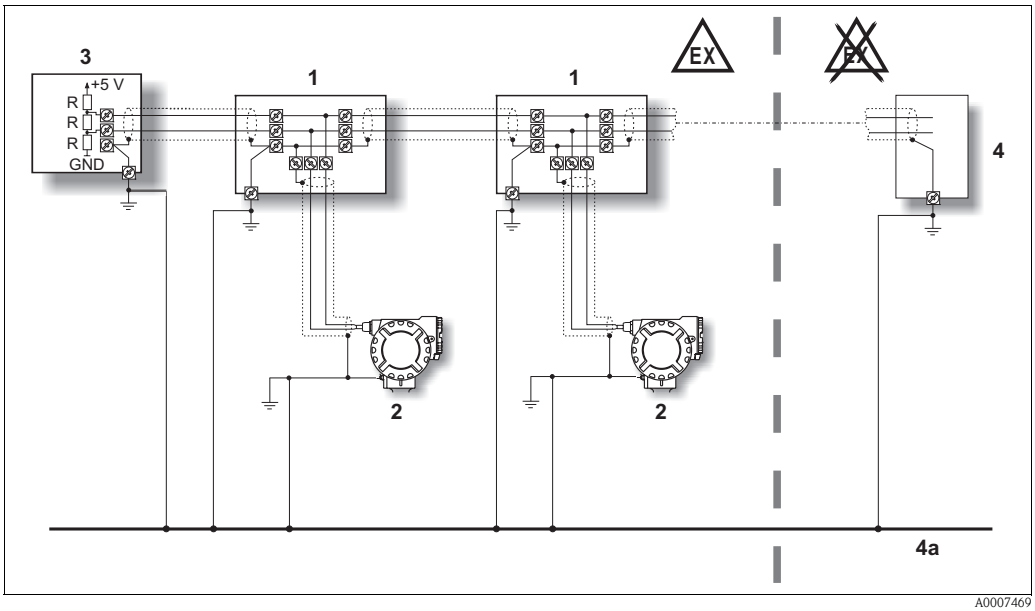


Fig. 3: Example for connecting potential equalization lines
1 Distributor/T-Box
2 Bus devices for potentially explosive atmospheres
3 Bus termination MODBUS RS485
4 Bus power supply unit or automation system
4a Potential equalization line is fed out into the safe area

✎ Note!
The length of the spurs is to be considered.

Electrical connection

Connection compartment

Transmitter housing compact/remote version (terminal assignment, connection data → Page 16 ff.)

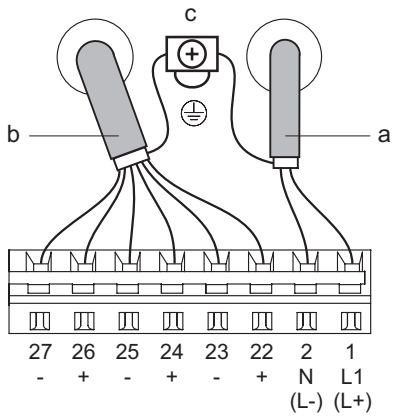


Fig. 4 A0007034

a Power supply cable, terminal assignment and connection data see below)
b Signal cable/fieldbus cable (terminal assignment and connection data → Page 17)
c Ground terminal, signal cable shield / RS485 line

Terminal assignment and connection data, power supply

Terminal assignment and connection data

all transmitters	1 L (+)	2 N (–)	3
Designation	Supply voltage		Protective earth
Functional values	AC: U = 20…28 V; DC: U = 10…30 V Power consumption: AC: <4 VA DC: < 3.2 W		Caution! Observe the grounding plans of the system!
Intrinsically safe circuit	no		
U_m	253 V AC		

Terminal assignment and connection data for signal circuits

✎ Note!
The following tables contain values/specifications, which are dependent on the type code (type of measuring device). Please compare the following type code to the one shown on the nameplate of your measuring device. A graphic representation of the electrical connections can be found on Page 16.

Terminal assignment

Transmitter	Terminal no. (outputs)					
	22 (+)	**23 (–)**	**24 (+)**	**25 (–)**	**26 (+)**	**27 (–)**
Non-convertible communication boards (fixed assignment)						
8FE**- *...*N	Pulse / Frequency / Status output 1		Pulse / Frequency / Status output 1		MODBUS RS485[1)] B	A

[1)] MODBUS RS485:
– Terminal 26 (+) → B (RxD/TxD-P)
– Terminal 27 (–) → A (RxD/TxD-N)

Safety-related and functional values of signal circuits

Signal circuits	Functional values	Safety-related values
Pulse/frequency output	galvanically isolated passive 30 V DC / 250 mA Open Collector Full scale frequency 100 to 5000 Hz	intrinsically safe = no U_m = 253 V I_m = 1 A
Status output	galvanically isolated passive 30 V DC / 250 mA Open Collector	
MODBUS RS485	galvanically isolated, RS485 as per Standard EIA/TIA-485	

Service adapter

The service adapter is only used for connecting service interfaces approved by Endress+Hauser.

⚠ Warning!
It is not permissible to connect the service adapter whilst the atmosphere is considered to be explosive.

Technical Data

Dimensions

The dimensions of the instruments for the hazardous area correspond to those in the Technical Information documentation.

Weight

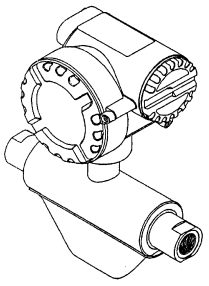
The weight of the Ex d version is equivalent to the weight in the Technical Information documentation.

✎ Note!
Technical Information for LPGmass → TI080D

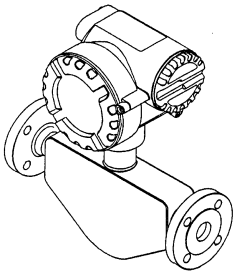
Control Drawing

Endress+Hauser Reinach hereby declares that the product is in conformity with the requirements of the CANADIAN STANDARDS ASSOCIATION.

Hazardous Locations
Class I Division 1 Groups ABCD or Class I Zone 1 IIC,
Class II Division 1 Groups EFG and Class III



CNGmass



LPGmass

Temperature table	max. medium temperature [°C / °F]					
	T6 [1]	T5	T4	T3	T2	T1
Ta = 45°C:						
LPGmass DN08/15	45 / 113	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
Ta = 50°C:						
CNGmass DN08/15/25	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN08/15	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN25/40/50	50 / 122	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
Ta = 60°C:						
CNGmass DN08/15	---	90 / 194	125 / 257	125 / 257	125 / 257	125 / 257
CNGmass DN25	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN08/15/25/40	---	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257
LPGmass DN50	60 / 140	95 / 203	125 / 257	125 / 257	125 / 257	125 / 257

[1] LPGmass only

LPGmass : Tm min. is -40°C / -40 °F Ta min. = -40°C / -40 °F
CNGmass: Tm min. = -50°C / -58 °F Ta min. = -40°C / -40 °F

Notes:
1. Install all per Candadian Electrical Code.
2. Control room equipment shall not use or generate more than 250 V rms.
3. Caution: Use supply wires suitable for 5 °C above ambient temperature, but at least for 70 °C / 158°F.
4. Class II Group G: The surface temperature of the apparatus cannot exceed 165 °C / 329°F.
5. Transmitter enclosure explosion proof for use in Cl. I Div. 1 Groups A, B, C, D and dust-ignitionproof for Cl. II Div. 1 Groups E, F, G, Class III.
6. Transmitter enclosure is factory sealed for use in Cl. I Div. 1 Groups A, B, C, D, conduit seal not required.
7. CNGmass is a dual seal rated device.

WARNING: SUBSTITUTION OF COMPONENTS MAY IMPAIR INTRINSIC SAFETY.

Aenderungen:				Alle gesetzlichen Urheberrechte vorbehalten. Diese Zeichnung darf ohne unsere Genehmigung weder vervielfältigt werden noch dritten Personen und Konkurrenzfirmen zugänglig gemacht werden.	Ersteller: FES / ID 1244 FILE: FES0123_060724.doc		
	A		F				
	B		G				
	C		H				
	D		J				
	E		K				
Canadian Installation Drawing Div. 1 / Zone 1					Massstab	Gezeichnet	24.07.2006 UD
						Geprüft	
Compact Version						Ex-geprüft	16.07.07
CNGmass, LPGmass						Gesehen	
Flowtec AG, Kägenstrasse 7, CH-4153 Reinach BL1, Postfach					FES0123		

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