fill level | water level | pressure | temperature | flow | visualization | signal converter | sensoric

Data Sheet

Flowcont LN
Electromagnetic Flowmeter

A first-class choice for
all hygienic applications

Intuitive operation
— Softkey-based functionality
— “Easy Set-up” function

Non-contact buttons
— Enable the device to be parameterized without the need to open the housing

Diagnostics for real-life situations
— Status messages in accordance with NAMUR
— Help texts in the display

Maximum measuring accuracy
— Maximum measuring error: 0.2 % of rate

Universal transmitter
— Reduces spare parts inventory costs and storage costs

Flowmeter sensor featuring state-of-the-art memory technology
— Prevents errors and enables quick and reliable commissioning

Approvals for explosion protection
— In accordance with ATEX, IECEx
— In accordance with FM, cFM, GOST

HART, PROFIBUS PA, FOUNDATION fieldbus
— Access to all status information

ACS-CONTROL-SYSTEM
knowledge and systems
Your partner for measuring technology and automation

Introduction

The industrial standard

Flowcont LN is designed specifically to meet the requirements of the food and beverages and the pharmaceutical industries. The modular design concept offers flexibility, cost-saving operation and reliability whilst providing a long service life and exceptionally low maintenance.

Integration into ACS asset management systems and usage of the self-monitoring and diagnostic functions increases the plant availability and reduces downtimes.

Advanced diagnostic functions

Using its advanced diagnostic functions, the device monitors both its own operability and the process.

Limit values for the diagnostic parameters can be set locally. When these limits are exceeded, an alarm is tripped.

For further analysis, the diagnostic data can be read out via an advanced DTM. Critical states can, thus, be recognized early and appropriate measures can be taken.

As a result, productivity is increased and downtimes are avoided.

The status messages are classified in accordance with the NAMUR recommendations.

In the event of an error, a diagnostic-dependent help text appears on the display which considerably simplifies and accelerates the troubleshooting procedure. The gives maximum safety for the process.

Superior and reliable sensor

The variable connection concept and common sensor design provide for flexibility and easy installation.

The spare parts inventory and stockkeeping costs are reduced.

The reinforced PFA liner improves vacuum stability and prevents potential liner deformation, meeting the highest demands. The sensor is fully CIP/SIP cleanable up to 150 °C (302 °F).

Using advanced filtering methods, the device improves accuracy even under difficult conditions by separating the noise from the measuring signal. This leads to a max. measuring error of 0.2 % of rate.

Easy and quick commissioning

Advanced data storage inside the sensor eliminates the need to match sensor and transmitter in the field. The on-board sensor memory automatically identifies the transmitter. On power-on, the transmitter self-configuration function is run and replicates all sensor data and TAG-specific parameters into the transmitter. This eliminates the opportunity for errors and leads to an increased startup speed and reliability.

Intuitive, convenient navigation

The factory-set parameters can be modified quickly and easily via the user-friendly display and the non-contact buttons, without opening the housing. The "Easy Set-up" function reliably guides unpracticed users through the menu step by step.

The softkey-based functionality makes handling a breeze - it's just like using a cell phone. During the configuration, the permissible range of each parameter is indicated on the display and invalid entries are rejected.

Universal transmitter - powerful and flexible

The backlit display can be easily rotated without the need for any tools. The contrast is adjustable and the display fully configurable. The character size, number of lines and display resolution (number of decimals) can be set as required. In multiplex mode, several different display options can be pre-configured and invoked one after the other.

The smart modular design of the transmitter unit allows for easy disassembly without the need to unscrew cables or unplug connectors.

Whether count pulses, 20 mA signals or the status output are active or passive, the universal transmitter always delivers the correct signal. HART is used as the standard protocol.

Optionally, the transmitter is available with PROFIBUS PA or FOUNDATION fieldbus communication.

The universal transmitter simplifies the spare parts inventory and reduces the stockholding costs.

ScanMaster - the diagnostic tool

Can I rely on the measured values?

How can I determine the technical condition of my device?

ScanMaster can answer these frequently asked questions.

And ScanMaster allows you to easily check the device for proper functioning.

Flowcont LN - the first choice

Overview of the Flowcont LN series

Flowcont LN is available in two series.

Flowcont LN with basic functionality and Flowcont LN with extended functions and options. The following table gives an overview.

	Flowcont LN	
Measuring accuracy 0.4 % (optionally 0.2 %) of measured value	X	-
Measuring accuracy 0.3 % (optionally 0.2 %) of measured value	-	X
Batch functions Presetting counter, overrun correction, external start/stop, batch end contact	-	X
Other software functions Mass units, editable counter,	X	X
Two measuring ranges	-	X
Graphic display Line recorder function	X	X
Diagnostic functions Detection of gas bubbles or deposits on electrodes, conductivity monitoring, temperature monitoring, finger print, trend	-	X
Hardware options DN 1 ... 2	-	X
Startup functions Grounding check	-	X
Fieldbus PROFIBUS PA, FOUNDATION fieldbus	X	X
Verifications / Diagnostic tool ScanMaster	X	X

Contents

1 Flowcont LN - Overview of technology

Model overview (compact design)		
(without explosion protection) Dual-compartment transmitter housing  G00574  G01313 Single-compartment transmitter housing	**(with explosion protection, Zone 2 / Div. 2)** Dual-compartment transmitter housing  G00574	**(with explosion protection, Zone 1 / Div. 1)** Dual-compartment transmitter housing  G00883
	ATEX / IEC Gases Zone 2 Dust Zone 21, 22	**ATEX / IEC** Gases Zone 1 Dust Zone 21, 22
	FM / cFM CL I Div 2 (NI, DIP)	**FM / cFM** CL I Div 1, 2 (XP, NI, DIP)
	GOST Zone 2	**GOST** Zone 1
	For further information about the instruments' explosion protection approval please refer to the Ex test certificates	

Measured value error	Standard: 0.4 % of rate Option: 0.2 % of rate	
Nominal diameter	DN 3 ... 100 (1/10 ... 4“)	
Process connection	Wafer type design	DN 3 ... 100 (1/10 ... 4“)
	Flange in acc. with DIN 2501 / EN 1092-1	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Flange in acc. with ASME B16.5	DN 3 ... 100 (1/10 ... 4“), ASME CL 150, 300
	Flange in acc. with JIS	DN 3 ... 100 (1/10 ... 4“), 10K
	Threaded pipe connection in acc. with DIN 11851	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Weld stubs	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Tri-Clamp in acc. with DIN 32676	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Tri-Clamp in acc. with ASME BPE	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	External thread in acc. with ISO 228 / DIN 2999	DN 3 ... 25 (1/10 ... 1“), PN16
Lining	PFA (vacuum-tight)	
Conductivity	> 5 µS/cm (20 µS/cm for demineralized water)	
Electrodes	CrNi steel 1.4571 (AISI 316Ti), 1.4539 [904L], Hastelloy B, Hastelloy C, platinum-iridium, tantalum, titanium	
Process connection material	Flange: Stainless steel, variable process connections: 1.4404	
Degree of protection	IP 65, IP 67	
Medium temperature	Flange: -25 ... 180 °C (-13 ... 356 °F), variable process connections: -25 ... 130 °C (-13 ... 266 °F)	
Approvals		
Explosion protection approvals	ATEX / IEC Zone 1, 2, 21, 22 FM / cFM CL 1 Div. 1, CL 1 Div. 2 GOST Zone 1, 2	
Pressure Equipment Directive 97/23/EC	Conformity assessment in accordance with category III, fluid group 1	
CRN (Canadian Reg. Number)	On request	
Certificates		
	3A, FDA-approved materials, EHEDG (cleanability)	
Transmitter		
Power supply	AC 100 ... 230 V (-15 / +10%), AC 24 V (-30 / +10%), DC 24V (-30 / +30%)	
Current output	4 ... 20 mA, active or passive	
Pulse output	Can be configured locally as active or passive using software	
Switch output	Optocoupler, programmable function	
Contact input	Optocoupler, programmable function	
Display	Graphical display, fully configurable	
Housing	Integral mount design, choice of single-compartment housing or dual-compartment housing	
Communication	HART protocol (standard), PROFIBUS PA / FOUNDATION fieldbus (option)	

Model overview (remote mount design)	
Flowmeter sensor	
Flowmeter sensor (without explosion protection)	**Flowmeter sensor with explosion protection, Zone 2 / Div. 2)**
 G00576	 G00576
	ATEX / IEC Gases Zone 2, dust Zone 21, 22
	FM / cFM CL I Div 2 (NI, DIP)
	Gost Zone 2 For further information about the instruments' explosion protection approval please refer to the Ex test certificates

Transmitter		
Flowmeter sensor (without explosion protection)	**Flowmeter sensor (with explosion protection, Zone 2 / Div. 2)**	**Flowmeter sensor (without explosion protection)**
 G01084	 G00490	 G01084
	ATEX / IEC Gases Zone 2 Dust Zone 21, 22	
	FM / cFM CL I Div 2 (NI, DIP)	
	Gost Zone 2 For further information about the instruments' explosion protection approval please refer to the Ex test certificates	

Measured value error	Standard: 0.4 % of rate Option: 0.2 % of rate	
Nominal diameter	DN 3 ... 100 (1/10 ... 4“)	
Process connection	Wafer type design	DN 3 ... 100 (1/10 ... 4“)
	Flange in acc. with DIN 2501 / EN 1092-1	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Flange in acc. with ASME B16.5	DN 3 ... 100 (1/10 ... 4“), ASME CL 150, 300
	Flange in acc. with JIS	DN 3 ... 100 (1/10 ... 4“), 10K
	Threaded pipe connection in acc. with DIN 11851	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Welded spuds	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Tri-Clamp in acc. with DIN 32676	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	Tri-Clamp in acc. with ASME BPE	DN 3 ... 100 (1/10 ... 4“), PN 10 ... 40
	External thread in acc. with ISO 228 / DIN 2999	DN 3 ... 25 (1/10 ... 1“), PN16
Lining	PFA (vacuum-tight)	
Conductivity	> 5 µS/cm (20 µS/cm for demineralized water)	
Electrodes	CrNi steel 1.4571 (AISI 316Ti), 1.4539 [904L], Hastelloy B, Hastelloy C, platinum-iridium, tantalum, titanium	
Process connection material	Flange: Stainless steel, variable process connections: 1.4404	
Degree of protection	IP 65, IP 67 (NEMA 4X), IP 68	
Medium temperature	Flange: -25 ... 180 °C (-13 ... 356 °F), variable process connections: -25 ... 130 °C (-13 ... 266 °F)	
Approvals		
Explosion protection approvals	ATEX / IEC Zone 2, 21, 22 FM / cFM Cl 1Div. 2 GOST Zone 1, 2	
Pressure Equipment Directive 97/23/EC	Conformity assessment in accordance with category III, fluid group 1	
CRN (Canadian Reg. Number)	On request	
Certificates		
	3A, FDA-approved materials, EHEDG (cleanability)	
Transmitter		
Power supply	AC 100 ... 230 V (-15 / +10%), AC 24 V (-30 / +10%), DC 24V (-30 / +30%)	
Current output	4 ... 20 mA, active or passive	
Pulse output	Can be configured locally as active or passive using software	
Switch output	Optocoupler, programmable function	
Contact input	Optocoupler, programmable function	
Display	Graphical display, fully configurable	
Housing	Field-mount housing, choice of single-compartment housing or dual-compartment housing	
Communication	HART protocol (standard), PROFIBUS PA / FOUNDATION fieldbus (option)	

2 Performance specifications

2.1 General

2.1.1 Reference conditions according to EN 29104

Fluid temperature	20 °C (68 °F) ± 2 K
Ambient temperature	20 °C (68 °F) ± 2 K
Supply power	Nominal voltage acc. to name plate U_n ± 1 %, frequency f ± 1 %
Installation conditions	- Upstream >10 x DN, straight section - Downstream >5 x DN, straight section
Warm-up phase	30 min.

2.1.2 Maximum measuring error

Pulse output

- Standard calibration:
  ± 0.4 % of measured value, ± 0.02 % $Qmax_{DN}$ (DN 3 … 100)
- Optional calibration:
  ± 0.2 % of measured value, ± 0.02 % $Qmax_{DN}$ (DN 10 … 100)

$Qmax_{DN}$: See table in Section 2.4 „Flowmeter sizes, flow range“.

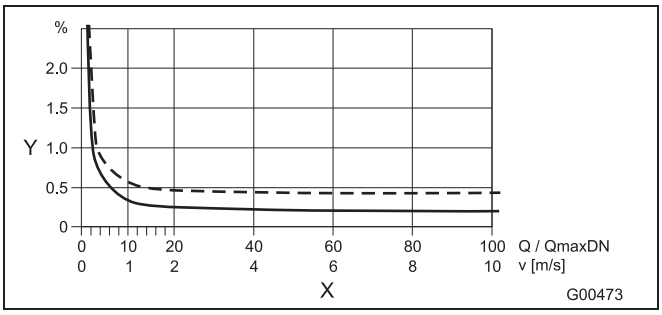


Fig. 1

Y Accuracy ± of measured value in [%]
X Flow velocity v in [m/s], Q/QmaxDN [%]

Analog output effects

Same as pulse output plus ± 0.1 % of measured value ± 0.01 mA

2.2 Reproducibility, response time

Reproducibility	≤ 0.11 % of measured value, t_{meas} = 100 s, v = 0.5 ... 10 m/s
Response time of current output with damping of 0.02 seconds	As step function 0 ... 99 % 5 τ ≥ 200 ms at 25 Hz excitation frequency 5 τ ≥ 400 ms at 12.5 Hz excitation frequency 5 τ ≥ 500 ms at 6.25 Hz excitation frequency

2.3 Transmitter

2.3.1 Electrical properties

Supply power	**AC** 100 ... 230 V (-15 % / +10 %) **AC** 24 V (-30 % / +10 %) **DC** 24 V (-30 % / +30 %), ripple: < 5 %
Line frequency	47 ... 64 Hz
Excitation frequency	6 1/4 Hz, 7 1/2 Hz, 12 1/2 Hz, 15 Hz, 25 Hz, 30 Hz (50 / 60 Hz power supply)
Power consumption	(flowmeter sensor including transmitter) **AC** S ≤ 20 VA **DC** P ≤ 12 W (switch-on current 5.6 A)
Electrical connection	Screw terminals

2.3.1.1 Isolation of input/outputs

The current output, digital outputs DO1 and DO2, and digital input are electrically isolated from the flowmeter sensor input circuit and from each other. The same is valid for the signal outputs of the versions with PROFIBUS PA and FOUNDATION fieldbus.

2.3.1.2 Empty pipe detection

The "empty pipe detection" function requires:

A conductivity of the measured fluid ≥ 20 µS/cm, a signal cable length ≤ 50 m (164 ft), a nominal diameter DN ≥ DN 10, and the flowmeter sensor must not be provided with a preamplifier.

2.3.2 Mechanical properties

Integral mount design (transmitter mounted directly on the flowmeter sensor)	
Housing	Cast aluminum, painted
Paint	Paint coat ≥ 80 µm thick, RAL 9002 (light gray)
Cable gland	Polyamide
	Stainless steel (in the case of hazardous area design for ambient temperature of -40 °C (40 °F))
Remote mount design	
Housing	Cast aluminum, painted
Paint	Paint coat ≥ 80 µm thick, mid-section RAL 7012 (dark gray), front cover / rear cover RAL 9002 (light gray)
Cable gland	Polyamide
	Stainless steel (in the case of hazardous area design for ambient temperature of -40 °C (40 °F))
Weight	4.5 kg (9.92 lb)

2.3.2.1 Storage temperature, ambient temperature

Ambient temperature

-20 ... 60 °C (-4 ... 140 °F) Standard range
-40 ... 60 °C (-40 ... 140 °F) Extended range

Storage temperature

-40 ... 70 °C (-40 ... 158 °F)

2.3.2.2 Protection class for transmitter housing

IP 65, IP 67, NEMA 4X

2.3.2.3 Vibration according to EN 60068-2

Transmitter

- In the range 10 ... 58 Hz with max. 0.15 mm (0.006 inch) deflection*
- In the range 58 ... 150 Hz max. 2 g acceleration*

* = Peak load

2.4 Flowmeter sizes, flow range

The flow range end value can be set between 0.02 x Q_{max}DN and 2 x Q_{max}DN.

Nominal diameter		Min. flow range end value	$Qmax_{DN}$	Max. flow range end value
DN	"	0.02 x Q_{max}DN (≈ 0.2 m/s)	0 … ≈ 10 m/s	2 x Q_{max}DN (≈ 20 m/s)
3	1/10	0,08 l/min (0,02 US gal/min)	4 l/min (1,06 US gal/min)	8 l/min (2,11 US gal/min)
4	5/32	0,16 l/min (0,04 US gal/min)	8 l/min (2,11 US gal/min)	16 l/min (4,23 US gal/min)
6	1/4	0,4 l/min (0,11 US gal/min)	20 l/min (5,28 US gal/min)	40 l/min (10,57 US gal/min)
8	5/16	0,6 l/min (0,16 US gal/min)	30 l/min (7,93 US gal/min)	60 l/min (15,85 US gal/min)
10	3/8	0,9 l/min (0,24 US gal/min)	45 l/min (11,9 US gal/min)	90 l/min (23,78 US gal/min)
15	1/2	2 l/min (0,53 US gal/min)	100 l/min (26,4 US gal/min)	200 l/min (52,8 US gal/min)
20	3/4	3 l/min (0,79 US gal/min)	150 l/min (39,6 US gal/min)	300 l/min (79,3 US gal/min)
25	1	4 l/min (1,06 US gal/min)	200 l/min (52,8 US gal/min)	400 l/min (106 US gal/min)
32	1 1/4	8 l/min (2,11 US gal/min)	400 l/min (106 US gal/min)	800 l/min (211 US gal/min)
40	1 1/2	12 l/min (3,17 US gal/min)	600 l/min (159 US gal/min)	1200 l/min (317 US gal/min)
50	2	1,2 m^3/h (5,28 US gal/min)	60 m^3/h (264 US gal/min)	120 m^3/h (528 US gal/min)
65	2 1/2	2,4 m^3/h (10,57 US gal/min)	120 m^3/h (528 US gal/min)	240 m^3/h (1057 US gal/min)
80	3	3,6 m^3/h (15,9 US gal/min)	180 m^3/h (793 US gal/min)	360 m^3/h (1585 US gal/min)
100	4	4,8 m^3/h (21,1 US gal/min)	240 m^3/h (1057 US gal/min)	480 m^3/h (2113 US gal/min)

3 Functional and technical properties - Flowcont LN

3.1 Flowmeter sensor

3.1.1 Protection type according to EN 60529

IP 65, IP 67, NEMA 4X

IP 68 (for external flowmeter sensors only)

3.1.2 Pipeline vibration according to EN 60068-2-6

The following applies to compact devices:

(transmitter mounted directly on the flowmeter sensor)

- In the 10 ... 58 Hz range with max. 0.15 mm (0.006 inch) deflection
- In the 58 ... 150 Hz range with max. 2 g acceleration

The following applies to devices with a separate transmitter:

Transmitter

- In the 10 ... 58 Hz range with max. 0.15 mm (0.006 inch) deflection
- In the 58 ... 150 Hz range with max. 2 g acceleration

Flowmeter sensor

- In the 10 ... 58 Hz range with max. 0.15 mm (0.006 inch) deflection
- In the 58 ... 150 Hz range with max. 2 g acceleration

3.1.3 Installation length

The flange devices comply with the installation lengths specified in VDI/VDE 2641, ISO 13359, or according to DVGW (process sheet W420, design WP, ISO 4064 short).

3.1.4 Signal cable (for external transmitters only)

A 5 m (16.4 ft) cable is supplied.

If you require more than 5 m (16.4 ft), a cable can be purchased using order number D173D027U01.

Preamplifier

Maximum signal cable length between flowmeter sensor and transmitter:

a) Without preamplifier:

- Max. 50 m (164 ft) for conductivity ≥ 5 µS/cm

A preamplifier is required for cables > 50 m (164 ft).

b) With preamplifier

- Max. 200 m (656 ft) for conductivity ≥ 5 µS/cm

3.1.5 Temperature range

Storage temperature

- 40 ... 70 °C (-40 ... 158 °F)

Min. permissible pressure as a function of fluid temperature

Lining	Nominal diameter	$P_{Operating}$ at mbar abs.	$T_{Operating}$*
PFA	3 ... 100 (1/10 ... 4")	0	< 180 °C (356 °F)

* * For CIP/SIP cleaning, higher temperatures are permitted for limited time periods; refer to the table titled "Maximum permissible cleaning temperature“.

Max. permissible cleaning temperature

CIP cleaning	Flowmeter sensor lining	T_{max}	T_{max} minutes	$T_{amb.}$
Steam cleaning	PFA	150 °C (302 °F)	60	25 °C (77 °F)
Fluids	PFA	140 °C (284 °F)	60	25 °C (77 °F)

If the ambient temperature is > 25 °C, the difference must be subtracted from the max. cleaning temperature. T_{max} - Δ °C.

(Δ °C = T_{amb} - 25 °C)

Max. permissible temperature shock

Lining	Max. temp. shock Temp. diff. in °C	Temp. gradient °C/min
PFA	Any	Any

Max. ambient temperature as a function of fluid temperature

Important (Note)

When using the device in explosion hazardous areas, the additional temperature specifications in the section titled "Ex relevant specifications" on the data sheet or in the the separate Ex safety instructions (SM/FEX300/FEX500/ATEX/IECEX) or (SM/FEX300/FEX500/FM/CSA) must be observed.

Standard temperature design

Model	Process connection	Ambient temperature		Fluid temperature	
		Min. temp [1]	Max. temp.	Min. temp.	Max. temp [2]
Flowcont FN	Flange	-20 °C (-4 °F)	60 °C (140 °F) 40 °C (104 °F)	-25 °C (-13 °F)	100 °C (212 °F) 130 °C (266 °F)
	Variable process connections	-20 °C (-4 °F)	60 °C (140 °F) 40 °C (104 °F)	-25 °C (-13 °F)	100 °C (212 °F) 130 °C (266 °F)

High temperature design (from size DN 10 (3/8“))

Model	Process connection	Ambient temperature		Fluid temperature	
		Min. temp [1]	Max. temp.	Min. temp.	Max. temp.
Flowcont FN	Flange	-20 °C (-4 °F)	60 °C (140 °F)	-25 °C (-13 °F)	180 °C (356 °F)

1) The following is valid for the low temperature design (option): -40°C (-40°F).
2) For CIP/SIP cleaning, higher temperatures are permitted for limited time periods; refer to the table “**Max. permissible cleaning temperature**” on page 10.

3.1.6 Material load

Limits for the permissible fluid temperature (TS) and permissible pressure (PS) are calculated on the basis of the lining and flange material used in the device (refer to the name plate on the device).

Process connection	Nominal diameter	PS_{max} bar (PSI)	TS
Wafer type	DN 3 ... 50 (1/10 ... 2“) DN 65 ... 100 (2 1/2 ... 4“)	40 (580) 16 (232)	-25 ... 130 °C (-13 ... 266 °F)
Welded spuds	DN 3 ... 40 (1/10 ... 1 1/2“) DN 50, DN 80 (2“, 3“) DN 65, DN 100 (2 1/2“, 4“)	40 (580) 16 (232) 10 (145)	-25 ... 130 °C (-13 ... 266 °F)
Threaded pipe connection conforming to DIN 11851	DN 3 ... 40 (1/10 ... 1 1/2“)	40 (580)	-25 ... 130 °C (-13 ... 266 °F)
	DN 50, DN 80 (2“, 3“)	16 (232)	
	DN 65, DN 100 (2 1/2“, 4“)	10 (145)	
Tri-Clamp conforming to DIN 32676	DN 3 ... 50 (1/10 ... 2“) DN 65 ... 100 (2 1/2 ... 4“)	16 (232) 10 (145)	-25 ... 121 °C (-13 ... 250 °F)
Tri-Clamp in acc. with ASME BPE	DN 3 ... 100 (1/10 ... 4“)	10 (145)	-25 ... 130 °C (-13 ... 266 °F)
External thread ISO 228 / DIN 2999	DN 3 ... 25 (1/10 ... 1“)	16 (232)	-25 ... 130 °C (-13 ... 266 °F)
OD tubing	DN 3 ... 50 (1/10 ... 2“)	10 (145)	-25 ... 130 °C (-13 ... 266 °F)

DIN flange stainless steel to DN 100 (4")

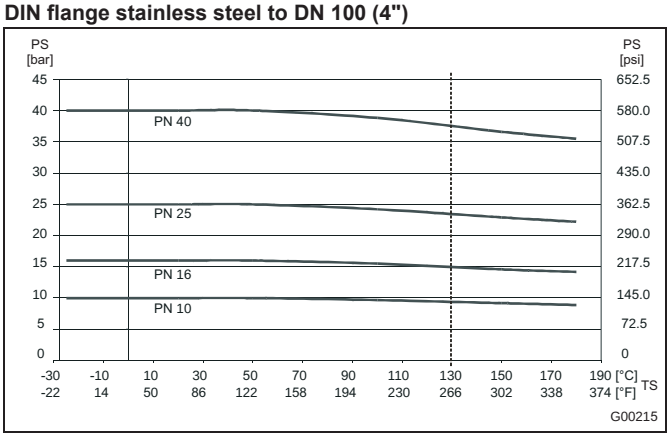


Fig. 2

ASME flange, stainless steel, up to DN 100 (4") (CL150 / 300)

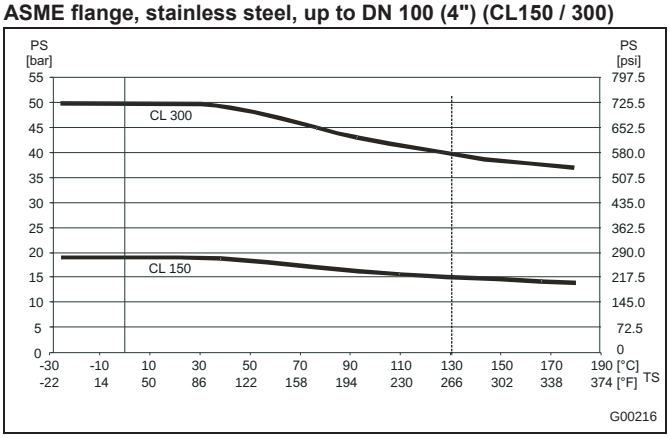


Fig. 3

For CIP / SIP cleaning, higher temperatures are permitted for limited time periods; refer to the table titled "Maximum permissible cleaning temperature".

JIS 10K-B2210 flange

Nominal diameter	Material	PN	TS	PS [bar]
25 ... 100 (1 ... 4")	Stainless steel	10	-25 ... 180 °C (-13 ... 356 °F)	10 (145 psi)

Wafer type design

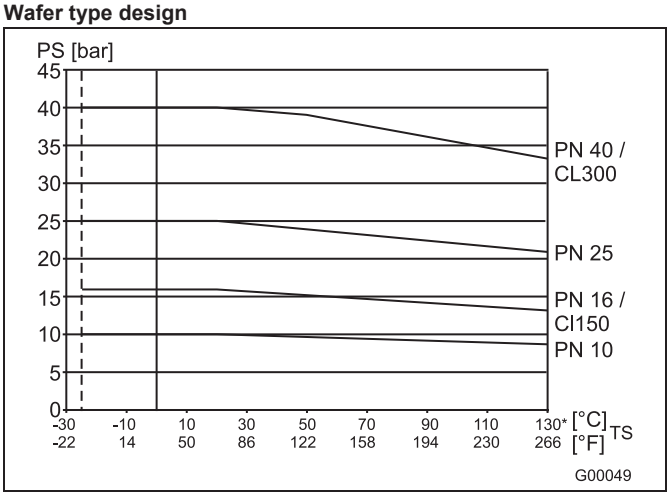


Fig. 4

JIS 10K-B2210 wafer type design

Nominal diameter	Material	PN	TS	PS [bar]
DN 32 ... 100 (1 1/4 ... 4")	1.4404 1.4435 1.4301	10	-25 ... 130 °C (-13 ... 266 °F)	10 (145 psi)

3.1.7 Mechanical properties

Parts that come into contact with fluid

Part	Standard	Option
Lining	PFA	-
Signal and grounding electrode	CrNi steel 1.4539 (AISI 904L)	CrNi steel 1.4571 (AISI 316Ti) Hast. C-4 (2.4610) Hast. B-3 (2.4600) Titanium, tantalum, Platinum-iridium
Gaskets (for Weld stubs, threaded connection, Tri-Clamp, external threads)	EPDM (Ethylene-Propylene) with FDA approval, silicone with FDA approval (CIP-resistant, no oils or grease)	Silicone with FDA approval (option, oil or grease resistant) PTFE with FDA approval (DN 3 ... 8)
Process connection		-
- Welded spuds, Tri-Clamp, etc.	CrNi steel 1.4404 (AISI 316L)	-
- OD tubing	CrNi steel 1.4435 (AISI 316L)	-

Parts that do not come into contact with fluid

	Standard	Option
Flange	CrNi steel 1.4571 (AISI 316Ti)	-

Flowmeter sensor housing

	Standard
Housing	Deep-drawn housing CrNi steel 1.4301 (AISI 304), 1.4308
Terminal box	CrNi steel 1.4308 (AISI 304)
Meter tube	Stainless steel
Cable gland	Polyamide
	Stainless steel (in the case of hazardous area design for ambient temperature of -40 °C (40 °F))

3.2 Electrical connection

3.2.1 Model **Flowcont LN** with HART protocol

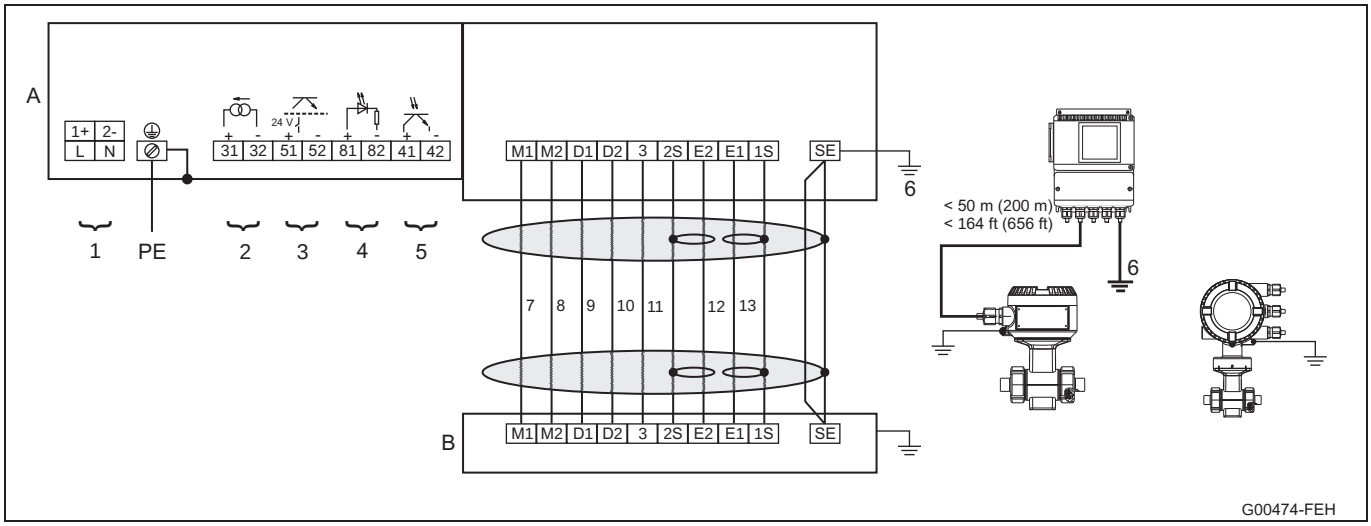


Fig. 5

A **Transmitter**

B **Flowmeter sensor**

1 **Power supply**
See name plate

2 **Current output (terminals 31 / 32)**
The current output can be operated in "active" or "passive" mode.
- Active: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
- Passive: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
  Supply voltage for the current output: minimum 11 V, maximum 30 V at terminals 31 / 32.

3 **Digital output DO1 (terminals 51 / 52) (pulse output or digital output)**
Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Pulse Output".
The output can be configured as an "active" or "passive" output (in the case of the transmitter with the dual-compartment housing, the output is configured using the software; in the case of the transmitter with the single-compartment housing, it is configured by means of jumpers on the transmitter backplane).
Configuration using software.
- Configuration as pulse output.
  Max. pulse frequency: 5250 Hz.
  Pulse width: 0.1 … 2000 ms.
  The pulse factor and pulse width are interdependent and are calculated dynamically.
- Configuration as contact output
  Function: System alarm, empty pipe alarm, max. / min. alarm, flow direction signaling, other
- Configuration as "active" output
  U = 19 ... 21 V, I_{max} = 220 mA , f_{max} ≤ 5250 Hz
- Configuration as "passive" output
  U_{max} = 30 V, I_{max} = 220 mA, f_{max} ≤ 5250 Hz

4 **Digital input (terminals 81 / 82) (contact input)**
Function can be configured locally using software:
External output switch-off, external totalizer reset, external totalizer stop, other

Data for the optocoupler: 16 V ≤ U ≤ 30 V, Ri = 2 kΩ

5 **Digital output DO2 (terminals 41 / 42) (pulse output or digital output)**
Function can be configured locally as "Pulse Output" or "Digital Output" using software.
Factory setting is "Digital Output", flow direction signaling.
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA, f_{max} ≤ 5250 Hz

6 Functional ground
7 Yellow
8 Brown
9 Green
10 Red
11 Blue
12 Orange
13 Violet

3.2.2 Model **Flowcont LN** with PROFIBUS PA, FOUNDATION fieldbus

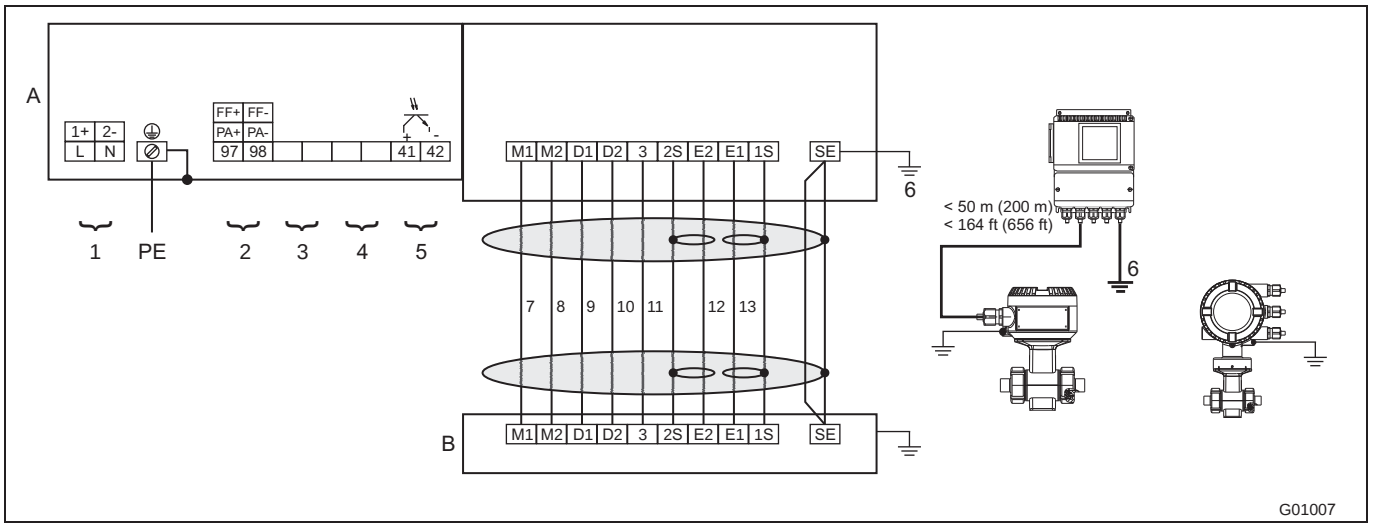


Fig. 6

A **Transmitter**
B **Flowmeter sensor**
1 **Power supply**
See name plate
2 **Digital communication (terminal 97 / 98)**
- **PROFIBUS PA in acc. with IEC 61158-2 (PA+ / PA-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error / FDE)
Bus connection with integrated protection against polarity reversal
The bus address can be set via the DIP switches in the device (with dual-compartment transmitter housing only), the transmitter display or the fieldbus.

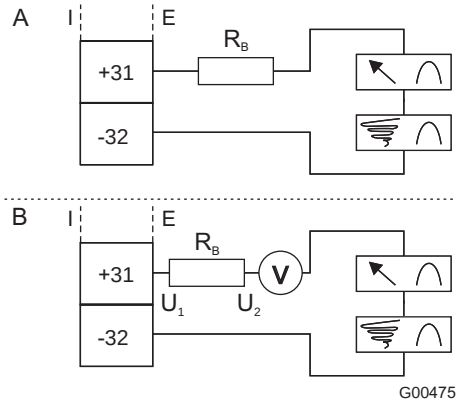
or

- **FOUNDATION fieldbus in acc. with IEC 61158-2 (FF+ / FF-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error / FDE)
Bus connection with integrated protection against polarity reversal

3 Not assigned
4 Not assigned
5 **Digital output DO2 (terminals 41 / 42) (pulse output or digital output)**
Function can be configured locally as "Pulse Output" or "Digital Output" using software.
Factory setting is "Digital Output", flow direction signaling.
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA, $f_{max} \leq$ 5250 Hz
6 Functional ground
7 Brown
8 Red
9 Orange
10 Yellow
11 Green
12 Blue
13 Violet

3.2.3 Connection examples for the peripherals

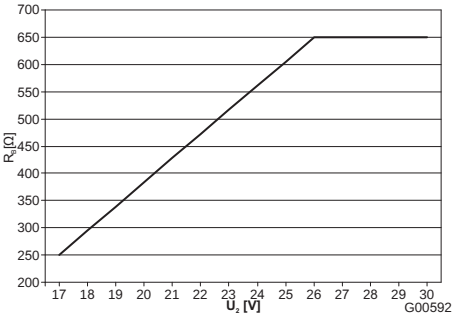
Current output



A = "Active" configuration:
4 ... 20 mA, HART
Load: 0 =R = 650 Ω (300 Ω for Ex Zone 1 / Div. 1)
Min. load with HART: 250 Ω

B = "Passive" configuration:
4 ... 20 mA, HART
Load: 0 =R = 650 Ω
Min. load with HART: 250 Ω
Supply voltage for the current output, terminals 31 / 32:
U1: Min. 11 V, max. 30 V

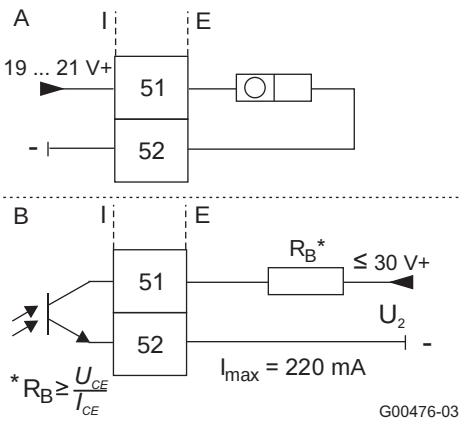
Max. permissible load (R_B) as a function of the source voltage (U_2)



I = internal, E = external

Fig. 7

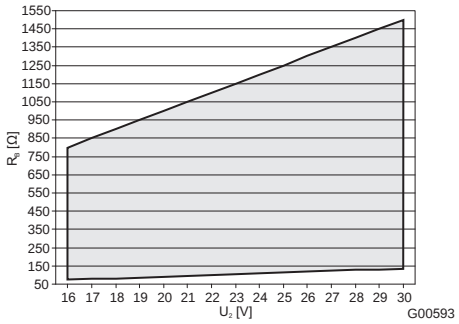
Digital output DO1



A = "Active" configuration

B = "Passive" configuration

Max. permissible load (R_B) as a function of the source voltage (U_2)

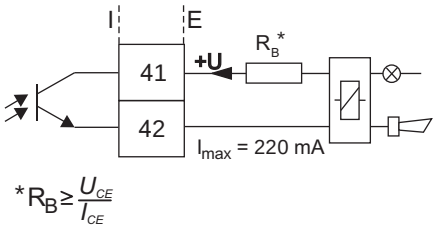


I = internal, E = external

= Permissible range

Fig. 8

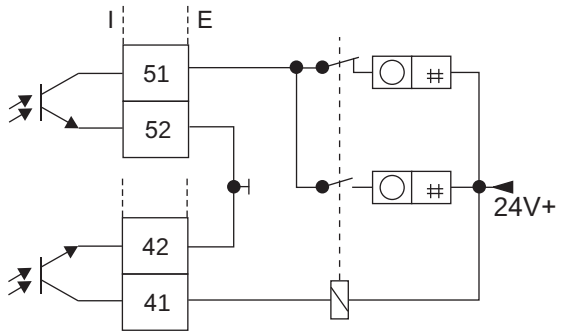
Digital output DO2, e.g., for system monitoring, max. / min. alarm, empty meter tube or forward / reverse signal, or counting pulses (function can be configured using software)



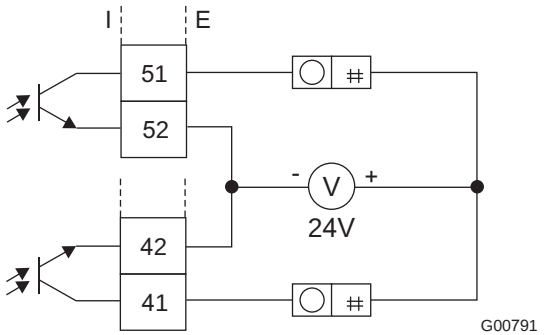
I = internal, E = external

Fig. 9

Digital outputs DO1 and DO2, separate forward and reverse pulses



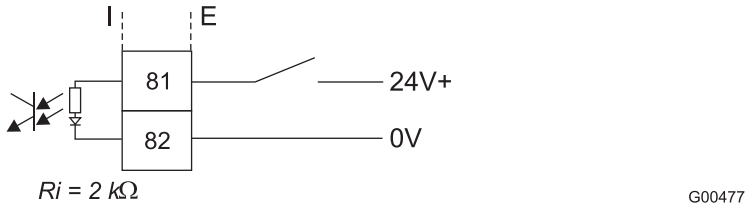
Digital outputs DO1 and DO2, separate forward and reverse pulses (alternative connection)



I = internal, E = external

Fig. 10

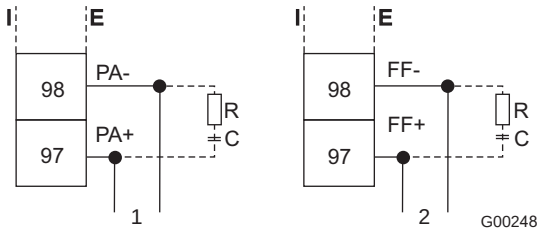
Digital input for external output switch-off or external totalizer reset



I = internal, E = external

Fig. 11

PROFIBUS PA and FOUNDATION fieldbus



The resistance R and condenser C form the bus termination. They must be installed when the device is connected to the end of the entire bus cable.

R = 100 Ω; C = 1 µF

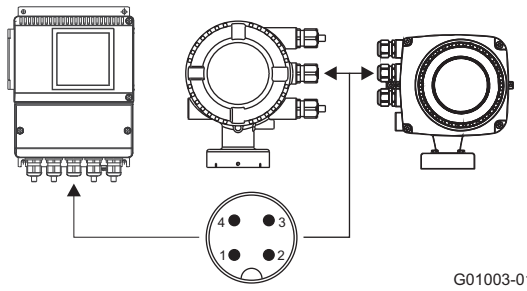
1 PROFIBUS PA

2 FOUNDATION fieldbus

I = internal, E = external

Fig. 12

Connection via M12 plug (only for PROFIBUS PA in non-hazardous areas)



Pin assignment

(Front view showing pin insert and pins)

PIN 1 = PA+

PIN 2 = nc

PIN 3 = PA-

PIN 4 = shield

Fig. 13

Digital communication

The transmitter has the following options for digital communication:

HART protocol

The unit is registered with the HART Communication Foundation.

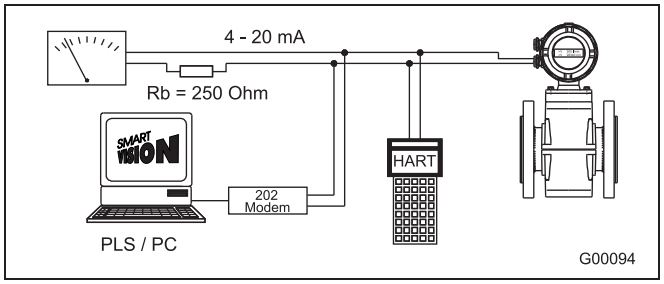


Fig. 14

HART protocol	
Configuration	Directly on the device Software DAT200 Asset Vision Basic (+ HART-DTM)
Transmission	FSK modulation on current output 4 ... 20 mA acc. to Bell 202 standard
Max. signal amplitude	1.2 mA_{ss}
Current output load	Min. 250 Ω, max. = 560 Ω
Cable	AWG 24 twisted
Max. cable length	1500 m
Baud rate	1,200 baud
Display	Log. 1: 1,200 Hz Log. 0: 2200 Hz

For additional information, see the separate interface description.

System integration

In conjunction with the DTM (Device Type Manager) available for the device, communication (configuration, parameterization) can occur with the corresponding framework applications according to FDT 1.21 (DAT200 Asset Vision Basic).

Other tool/system integrations (e.g., Emerson AMS/Siemens PCS7) are available upon request.

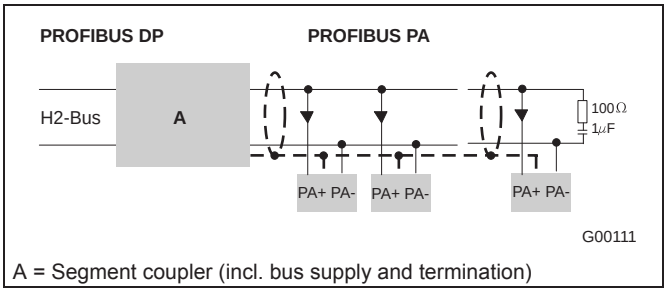
A free of charge version of the DAT200 Asset Vision Basic framework application for HART® or PROFIBUS is available upon request.

The required DTMs are contained on the DAT200 Asset Vision Basic DVD or in the DTM Library.

PROFIBUS PA protocol

The interface conforms to profile 3.01 (PROFIBUS standard, EN 50170, DIN 19245 [PRO91]).

PROFIBUS PA ID no.:	0x3430
Alternative standard ID no.:	0x9700 or 0x9740
Configuration	Directly on the device Software DAT200 Asset Vision Basic (+ PROFIBUS PA-DTM)
Transmission signal	Acc. to IEC 61158-2
Cable	Shielded, twisted cable (acc. to IEC 61158-2, types A or B are preferred)



A = Segment coupler (incl. bus supply and termination)

Fig. 15: Example for PROFIBUS PA interface connection

Bus topology

- Tree and/or line structure
- Bus termination: passive at both ends of the main bus line (RC element R = 100 Ω, C = 1 µF)

Voltage / current consumption

- Average current consumption: 10 mA
- In the event of an error, the integrated FDE function (=Fault Disconnection Electronic) integrated in the device is ensures that the current consumption can rise to a maximum of 13 mA.
- The upper current limit is restricted electronically.
- The voltage on the bus line must lie in the range of 9 ... 32 V DC.

For additional information, see the separate interface description.

System integration

ACS provides three different GSD files (equipment master data) which can be integrated in the system.

Users decide at system integration whether to install the full range of functions or only part.

The change-over is done using the “ID-number selector” parameter.

ID number 0x9700, GSD file name: PA139700.gsd

ID number 0x9740, GSD file name: PA139740.gsd

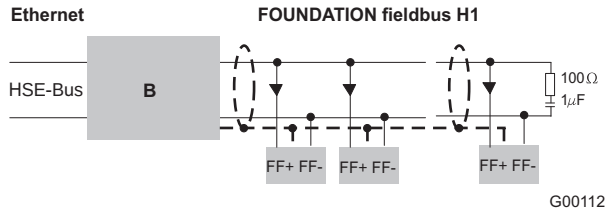
ID number 0x3430, GSD file name: ABB_3430.gsd

The interface description appears on the CD included in the scope of supply.

The files required for operation can be downloaded from www.profibus.com.

FOUNDATION fieldbus (FF)

Interoperability test campaign no.	ITK 5.20
Manufacturer ID	0x000320
Device ID	0x0124
Configuration	• Directly on the device • Via services integrated in the system • National configurator
Transmission signal	Acc. to IEC 61158-2



B = Linking device (incl. bus supply and termination)

Fig. 16: Example for FOUNDATION fieldbus interface connection

Bus topology

- Tree and/or line structure
- Bus termination: passive at both ends of the main bus line (RC element R = 100 Ω, C = 1 µF)

Voltage / current consumption

- Average current consumption: 10 mA
- In the event of an error, the integrated FDE function (=Fault Disconnection Electronic) integrated in the device is ensures that the current consumption can rise to a maximum of 13 mA.
- Upper current limit: electronically restricted.
- The voltage on the bus line must lie in the range of 9 ... 32 V DC.

Bus address

The bus address is automatically assigned or can be set in the system manually.

The identifier (ID) is formed using a unique combination of manufacturer ID, device ID, and device serial number.

System integration

The following are required:

- DD (Device Description) file, which includes the device description.
- The CFF (Common File Format) file is required for engineering the segment. Engineering can be performed online or offline.

The interface description appears on the CD included in the scope of supply.

The files required for operation can also be downloaded from http://www.fieldbus.org.

4 Ex-relevant specifications for operation in zones 1, 21, 22 / Div. 1

4.1 General

The device with dual-compartment transmitter housing is approved for operation in the following potentially explosive areas:

- ATEX / IECEx Zone 1, 21, 22
- FM Div.1
- cFM Div.1
- GOST Zone 1

Important (Note)

For detailed information on the individual approvals, refer to Section 1 „ Flowcont LN - Overview of technology“.

Important (Note)

The housing for the transmitter and flowmeter sensor must be connected to the potential equalization PA. The operator must ensure that when connecting the protective conductor (PE) no potential differences can occur between protective conductor and potential equalization (PA).

A temperature of 70 °C (158 °F) at the cable entry is assumed for the Ex calculations. Therefore, the cables used for the supply power and the signal inputs and outputs must have a minimum specification of 70 °C (158 °F).

For devices with remote mount design for use in FM / cFM Div. 1 or FM / cFM Div. 2 the signal cable between the flowmeter sensor and the transmitter must have a minimum length of 5 m (16.4 ft).

4.2 Electrical connection

4.2.1 Flowcont LN in Zone 1 / Div. 1 with HART protocol

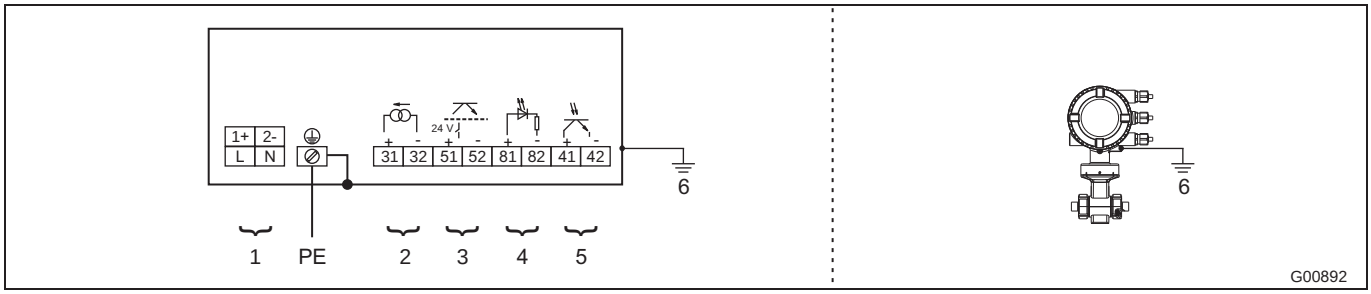


Fig. 17

A **Transmitter**
B **Flowmeter sensor**
1 **Supply power:**
See name plate
2 **Current output (terminals 31/32)**
Depending on the design, either an "active" or "passive" output will be available.
For devices designed for use in Ex Zone 1, the current output cannot be reconfigured locally.
- Active: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 300 Ω
- Passive: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω,
Supply voltage for the current output: min. 11 V, max. 30 V at terminals 31/32.

3 **Digital output DO1 (terminal 51/52)**
The output is always a "passive" output (optocoupler).
- Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA,

Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Pulse Output".
- Configuration as pulse output Max. pulse frequency: 5250 Hz, pulse width: 0.1 … 2.000 ms. The pulse factor and pulse width are interdependent and are calculated dynamically.
- Configuration as contact output. Function: System alarm, empty pipe alarm, max./min. alarm, flow direction signaling, other

4 **Digital input: (Terminal 81/82)**
Only available in combination with "passive" current output.
Function can be configured locally using software: External output switch-off, external totalizer reset, external totalizer stop, other
Data for the optocoupler: 16 V ≤ U ≤ 30 V, Ri = 2 kΩ

5 **Digital output DO2 (terminal 41/42)**
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA
Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Digital Output", flow direction signaling.

6 **Potential equalization PA**

All inputs and outputs are electrically isolated from each other and from the supply power.
The electrical specifications are operating values.

4.2.2 Flowcont LN in Zone 1 / Div. 1 with PROFIBUS PA or FOUNDATION fieldbus

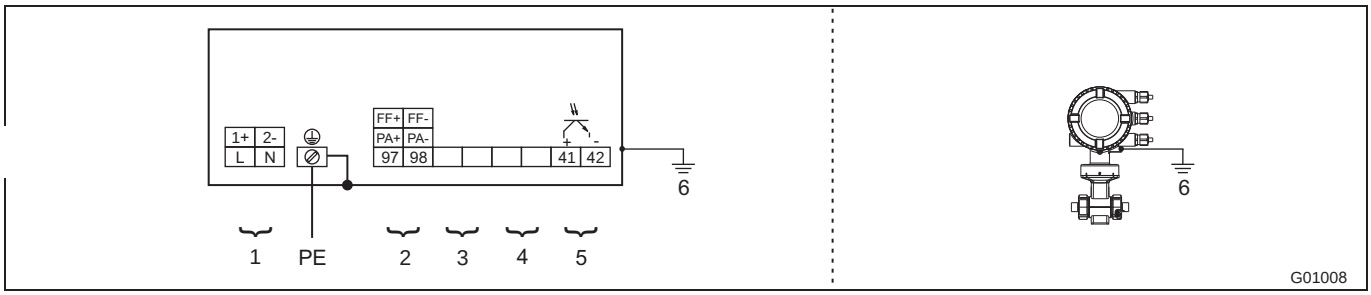


Fig. 18

A **Transmitter**
B **Flowmeter sensor**
1 **Supply power:**
See name plate
2 **Digital communication (terminal 97 / 98)**
- **PROFIBUS PA in acc. with IEC 61158-2 (PA+ / PA-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error)
Bus connection with integrated protection against polarity reversal
The bus address can be set via the DIP switches in the device (with dual-compartment transmitter housing only), the transmitter display or the fieldbus.

or

- **FOUNDATION fieldbus in acc. with IEC 61158-2 (FF+ / FF-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error / FDE)
Bus connection with integrated protection against polarity reversal

3 **Not assigned**
4 **Not assigned**
5 **Digital output DO2 (terminal 41 / 42)**
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA
Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Digital Output", flow direction signaling.
6 **Equipotential bonding**
7 **Brown**
8 **Red**
9 **Orange**
10 **Yellow**
11 **Green**
12 **Blue**
13 **Violet**

All inputs and outputs are electrically isolated from each other and from the supply power.

The electrical specifications given are operating values.

For devices with PROFIBUS PA or FOUNDATION fieldbus the bus termination must conform to the FISCO model or the explosion protection regulations, respectively.

4.3 Electrical data for operation in Zone 1 / Div. 1

4.3.1 Devices with HART protocol

When operating in potentially explosive areas, observe the following electrical data for the signal inputs and outputs of the transmitter. For the correct current output design (active/passive), see the marking contained in the device's terminal box.

	Operating values		Ex data Explosion protection type Ex i, IS					
Inputs and outputs	**U_N [V]**	**I_N [mA]**	**U_O [V]**	**I_O [mA]**	**P_O [mW]**	**C_O [nF]**	**C_{OPA} [nF]**	**L_O [mH]**
Active current output Terminal 31 / 32	30	30	20	100	500	210	195	6
			U_I [V]	**I_I [mA]**	**P_I [mW]**	**C_I [nF]**	**C_{IPA} [nF]**	**L_I [mH]**
			60	425 4)	2000 4)	8,4	24	0,065
Passive current output Terminal 31 / 32	30	30	**U_I [V]**	**I_I [mA]**	**P_I [mW]**	**C_I [nF]**	**C_{IPA} [nF]**	**L_I [nH]**
			60	500 4)	2000 4)	8,4	24	170
Passive digital output DO2 Terminal 41 / 42	30	220	**U_I [V]**	**I_I [mA]**	**P_I [mW]**	**C_I [nF]**	**C_{IPA} [nF]**	**L_I [nH]**
			60	425 1) 4) 500 2) 4)	2000 4)	3,6	3,6	170
Passive digital output DO1 Terminal 51 / 52	30	220	60	425 1) 4) 500 2) 4)	2000 4)	3,6	3,6	170
Passive digital input DI 3) Terminal 81/82	30	10	60	500 4)	2000 4)	3,6	3,6	170

1) For "active" current output
2) For "passive" current output
3) Only available in conjunction with passive current output
4) Intrinsically safe single-channel or multi-channel barriers (supply isolators) with resistance characteristic must be used.

All inputs and outputs are electrically isolated from each other and from the supply power.

Special connection conditions:

The output circuits are designed in such a way that they can be connected to both intrinsically-safe and non-intrinsically-safe circuits. It is not permitted to combine intrinsically safe and non-intrinsically safe circuits. In the case of intrinsically safe circuits, equipotential bonding is required.

The rated voltage of the non-intrinsically safe circuits is U_M = 60 V.

Provided that rated voltage U_M = 60 V is not exceeded if connections are established to non-intrinsically safe external circuits, intrinsic safety is still guaranteed.

4.3.2 Devices with PROFIBUS PA or FOUNDATION fieldbus

When operating in potentially explosive areas, observe the following electrical data for the signal inputs and outputs of the transmitter. For the correct design (PROFIBUS PA or FOUNDATION fieldbus), see the marking contained in the device's terminal box.

The fieldbus (terminal 97 / 98) and the digital output (terminal 41 / 42) can be connected in Zone 1 / Div. 1 in three different variants.

Variant 1 Intrinsically safe fieldbus connection in acc. with FISCO, intrinsically safe connection of the digital output

	Operating values		Ex data Explosion protection type Ex i, IS and FISCO					
Inputs and outputs	**U_N [V]**	**I_N [mA]**	**U_i [V]**	**I_i [mA]**	**P_i [mW]**	**C_i [nF]**	**C_{iPA} [nF]**	**L_i [µH]**
Passive digital output DO2 Terminal 41 / 42	30	220	60	200 1)	5000 1)	3,6	3,6	0,17
Fieldbus Terminal 97 / 98	32	30	17	380	5320	1	1	5

1) Intrinsically safe single-channel or multi-channel barriers (supply isolators) with resistance characteristic must be used.

Variant 2 Intrinsically safe fieldbus connection (not in acc. with FISCO!), intrinsically safe connection of the digital output

	Operating values		Ex data Explosion protection type Ex i, IS					
Inputs and outputs	**U_N [V]**	**I_N [mA]**	**U_i [V]**	**I_i [mA]**	**P_i [mW]**	**C_i [nF]**	**C_{iPA} [nF]**	**L_i [µH]**
Passive digital output DO2 Terminal 41 / 42	30	220	60	200 1)	5000 1)	3,6	3,6	0,17
Fieldbus Terminal 97 / 98	32	30	60	500	5000	1	1	5

1) Intrinsically safe single-channel or multi-channel barriers (supply isolators) with resistance characteristic must be used.

Variant 3 Fieldbus connection in acc. with FNICO (Zone 2, Div. 2), connection of digital output (Zone 2, Div. 2)

	Operating values		Ex data Explosion protection type Ex n, NI and FNICO					
Inputs and outputs	**U_N [V]**	**I_N [mA]**	**U_i [V]**	**I_i [mA]**	**P_i [mW]**	**C_i [nF]**	**C_{iPA} [nF]**	**L_i [µH]**
Passive digital output DO2 Terminal 41 / 42	30	220	-	-	-	-	-	-
Fieldbus Terminal 97 / 98	32	30	60	500 1)	5000 1)	1	1	5

1) Single-channel or multi-channel barriers (supply isolators) with resistance characteristic must be used.

All inputs and outputs are electrically isolated from each other and from the supply power.

Special connection conditions:

The output circuits are designed in such a way that they can be connected to both intrinsically-safe and non-intrinsically-safe circuits. It is not permitted to combine intrinsically safe and non-intrinsically safe circuits. In the case of intrinsically safe circuits, equipotential bonding is required.

The rated voltage of the non-intrinsically safe circuits is UM = 60 V.

Provided that rated voltage UM = 60 V is not exceeded if connections are established to non-intrinsically safe external circuits, intrinsic safety is still given.

4.4 Temperature values

Model name	Surface temperature
Flowcont LN	70 °C (158 °F)

The surface temperature depends on the fluid temperature.
With increasing fluid temperature > 70 °C (158 °F) the surface temperature also increases to the level of the fluid temperature.

Important (Note)
The maximum permissible fluid temperature depends on the lining and flange material, and is limited by the operating values in Table 1 and the explosion protection specifications in Tables 2 ... n.

Table 1: Fluid temperature as a function of lining and flange material

Lining	Process connection	Material	Fluid temperature (operating values)	
			Minimum	Maximum
PFA	Flange	Stainless steel	-25 °C (-13 °F)	180 °C (356 °F)
PFA	Wafer type	-	-25 °C (-13 °F)	130 °C (266 °F)
PFA	Variable process connection	Stainless steel	-25 °C (-13 °F)	130 °C (266 °F)

Table 4: Fluid temperature (Ex data)

Nominal diameter	Design	Temperature class	Ambient temperature											
			(- 40 °C)[1] - 20 °C ... + 40 °C				(- 40 °C)[1] - 20 °C ... + 50 °C				(- 40 °C)[1] - 20 °C ... + 60 °C			
			Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
			Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
DN 3 ... DN 100	NT	T1	130 °C								110 °C	20 °C	80 °C	40 °C
	HT		180 °C								120 °C	20 °C	120 °C	20 °C
	NT	T2	130 °C								110 °C	20 °C	80 °C	40 °C
	HT		180 °C								120 °C	20 °C	120 °C	20 °C
	NT	T3	130 °C								110 °C	20 °C	80 °C	40 °C
	HT		180 °C								120 °C	20 °C	120 °C	20 °C
	NT	T4	120 °C								110 °C	20 °C	80 °C	40 °C
	HT		120 °C								120 °C	20 °C	120 °C	20 °C
	NT	T5	85 °C								85 °C	20 °C	80 °C	40 °C
	HT		85 °C								85 °C	20 °C	85 °C	20 °C
	NT	T6	70 °C								70 °C	20 °C	70 °C	40 °C
	HT		70 °C								70 °C	20 °C	70 °C	20 °C

1) Low-temperature version (option)

NT standard version, T_{medium} maximum 130 °C (266 °F).
HT high temperature version, T_{medium} maximum 180 °C (356 °F).
Not thermally insulated: The flowmeter sensor is not surrounded by pipe insulation material.
Thermally insulated: The flowmeter sensor is surrounded by pipe insulation material.

Important (Note)
The standard version includes explosion protection for gases and dust. Explosion protection for dust is only available for devices featuring a transmitter in a dual-compartment housing.

- If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.
- If the installation location for the device is classified as a potentially explosive area for gases only, the temperature data in the "Gas" column in the table must be taken into consideration.

4.5 Special features of version designed for operation in Ex zone 1 / Div. 1

4.5.1 Configuring the current output

For devices designed for use in Ex Zone 1 / Div.1, the current output cannot be reconfigured subsequently.

The configuration required for the current output (active/passive) must be specified when the order is placed.

For the correct current output design (active/passive), see the marking contained in the device's terminal box.

4.5.2 Configuration of the digital outputs

For version designed for operation in Ex zone 1 / Div. 1, the digital outputs DO1 (51/52) and DO2 (41/42) can be configured on a NAMUR switching amplifier. On leaving the factory, the device is configured with the standard wiring (non-NAMUR).

Devices with PROFIBUS PA or FOUNDATION fieldbus only have the digital output DO2 (41 / 42).

Important (Note)

The outputs' type of protection remains unaffected by this. The devices connected to these outputs must conform to the applicable regulations for explosion protection.

The jumpers are located on the backplane in the transmitter housing.

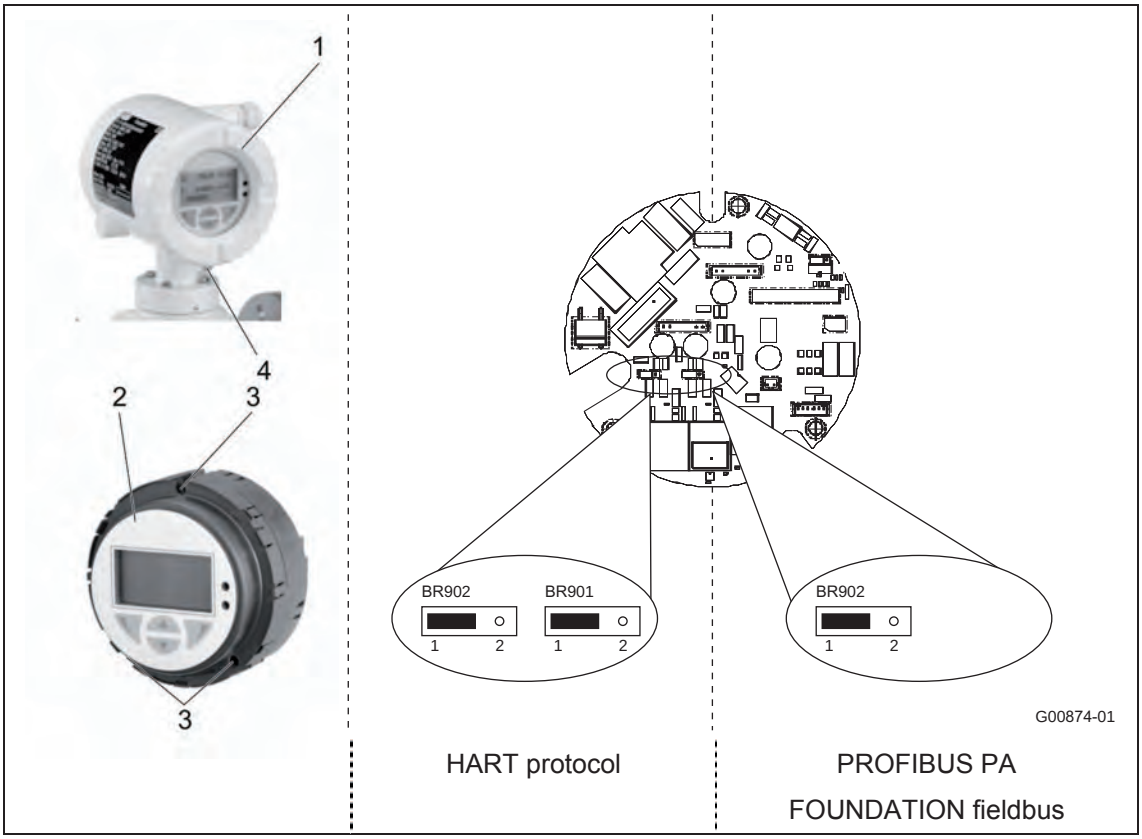


Fig. 19

BR902 for digital output DO1	**BR901 for digital output DO2**
BR902 in position 1: Standard (non-NAMUR) BR902 in position 2: NAMUR	BR901 in position 1: Standard (non-NAMUR) BR901 in position 2: NAMUR

Configure the digital outputs as described:

1. Switch off the supply power and wait at least 20 minutes before the next step.
2. Open the cover safety device (4) and housing cover (1).
3. Loosen screws (3) and pull out transmitter plug-in (2).
4. Insert the jumpers in the required positions.
5. Put the transmitter plug-in (2) back into the housing and retighten the screws (3).
6. Close the housing cover (1) and lock the cover by unscrewing the screw (4).

5 Ex-relevant specifications for operation in zones 2, 21, 22 / Div. 2

5.1 General

Devices with dual-compartment transmitter housing are approved for operation in the following potentially explosive areas:

- ATEX / IECEx Zone 2, 21, 22
- FM Div. 2
- cFM Div 2

Important (Note)
For detailed information on the individual approvals, refer to Section 1 „ Flowcont LN - Overview of technology“.

A temperature of 70 °C (158 °F) at the cable entry is assumed for the Ex calculations. Therefore, the cables used for the supply power and the signal inputs and outputs must have a minimum specification of 70 °C (158 °F).

For devices with remote mount design for use in FM / cFM Div. 1 or FM / cFM Div. 2 the signal cable between the flowmeter sensor and the transmitter must have a minimum length of 5 m (16.4 ft).

5.2 Electrical connection

5.2.1 Flowcont LN in Zone 2 / Div. 2, outside the hazardous area with HART protocol

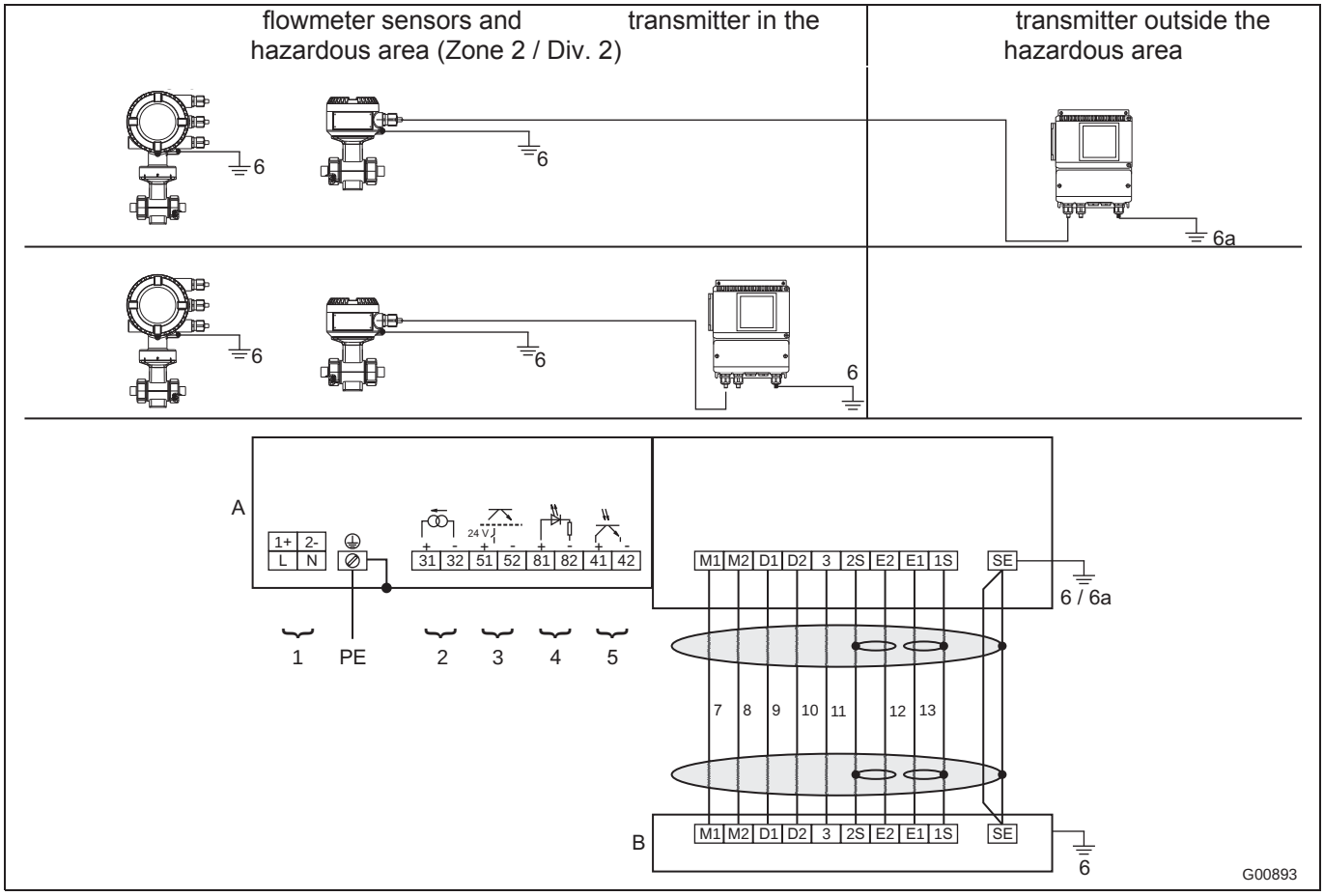


Fig. 20

A **Transmitter**
B **Flowmeter sensor**
1 **Supply power**:
See name plate
2 **Current output (terminals 31 / 32)**
The current output can be configured locally as an "active" or "passive" output.
- Active: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
- Passive: 4 ... 20 mA, HART protocol (standard), load: 250 Ω ≤ R ≤ 650 Ω
Supply voltage for the current output: minimum 11 V, maximum 30 V at terminals 31 / 32.

3 **Digital output DO1 (terminal 51 / 52)**
The digital output can be configured locally as an "active" or "passive" output (in the case of the transmitter with the dual-compartment housing, the output is configured using the software; in the case of the transmitter with the single-compartment housing, it is configured by means of jumpers on the transmitter backplane).
- Active: U = 19 ... 21 V. I_{max} = 220 mA, f_{max} ≤ 5250 Hz
- Passive: U_{max} = 30 V, I_{max} = 220 mA, f_{max} ≤ 5250 Hz

Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Pulse Output".
- Configuration as pulse output. Maximum pulse frequency: 5250 Hz, pulse width: 0.1 … 2000 ms. The pulse factor and pulse width are interdependent and are calculated dynamically.
- Configuration as contact output. Function: System alarm, empty pipe alarm, max. / min. alarm, flow direction signaling, other

4 **Digital input: (terminal 81 / 82)**
Function can be configured locally using software: External output switch-off, external totalizer reset, external totalizer stop, other
Data for the optocoupler: 16 V ≤ U ≤ 30 V, Ri = 2 kΩ

5 **Digital output DO2 (terminal 41 / 42)**
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA, f_{max} ≤ 5250 Hz
Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Digital Output", flow direction signaling.

6 **Equipotential bonding**
6a **Functional ground** (only with transmitter outside the hazardous area)
7 Brown
8 red
9 Orange
10 yellow
11 Green
12 blue
13 Violet

All inputs and outputs are electrically isolated from each other and from the supply power. The electrical specifications given are operating values.

5.2.2 Flowcont LN in Zone 2 / Div. 2, outside the hazardous area with PROFIBUS PA or FOUNDATION fieldbus

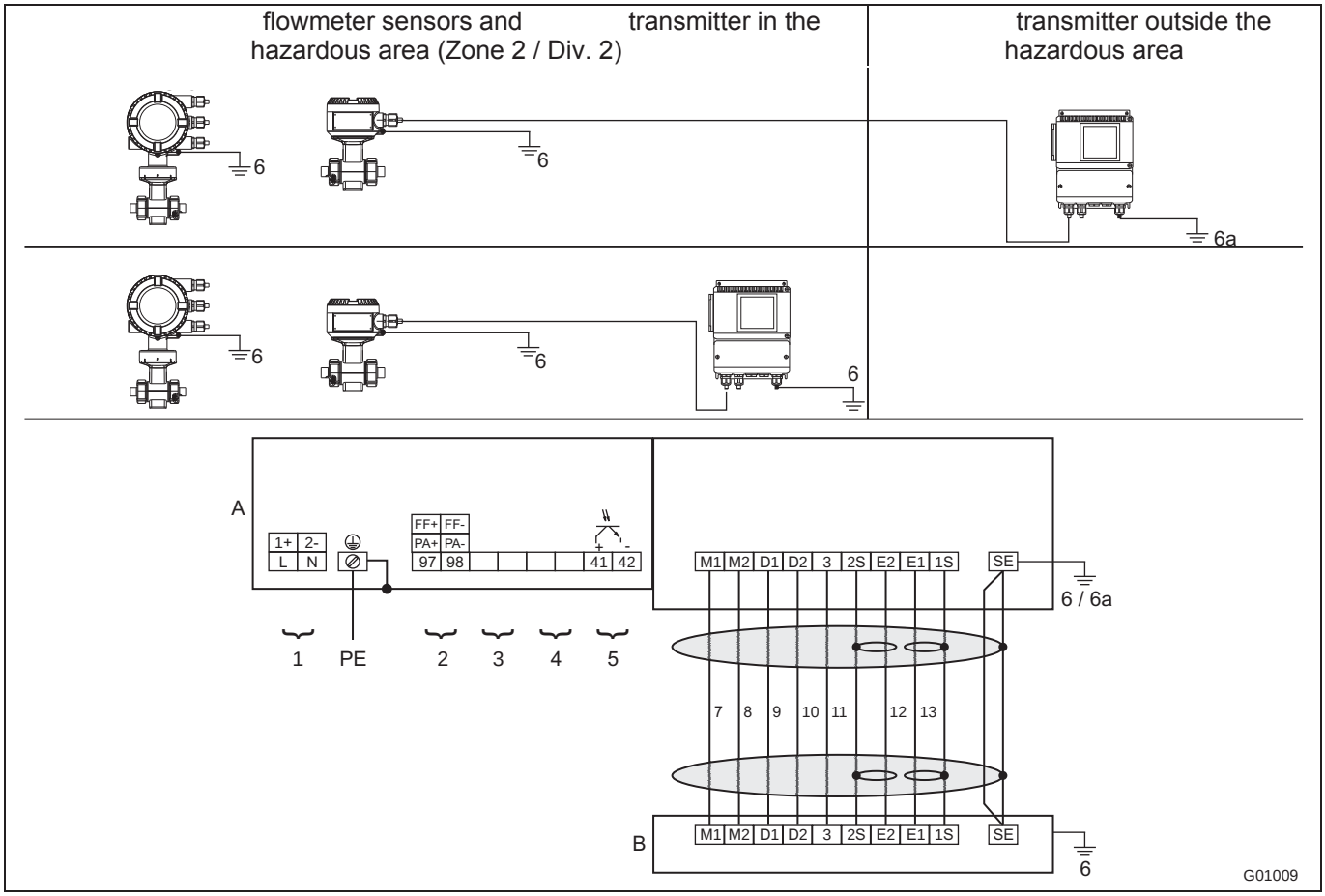


Fig. 21

A **Transmitter**
B **Flowmeter sensor**
1 **Supply power:**
See name plate
2 **Digital communication (terminal 97 / 98)**
- **PROFIBUS PA in acc. with IEC 61158-2 (PA+ / PA-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error)
Bus connection with integrated protection against polarity reversal
The bus address can be set via the DIP switches in the device (with dual-compartment transmitter housing only), the transmitter display or the fieldbus.

or

- **FOUNDATION fieldbus in acc. with IEC 61158-2 (FF+ / FF-)**
U = 9 ... 32 v, I = 10 mA (normal operation), I = 13 mA (in the event of an error / FDE)
Bus connection with integrated protection against polarity reversal

3 **Not assigned**
4 **Not assigned**
5 **Digital output DO2 (terminal 41 / 42)**
The output is always a "passive" output (optocoupler).
Data for the optocoupler: U_{max} = 30 V, I_{max} = 220 mA, $f_{max} \leq$ 5250 Hz,
Function can be configured locally as "Pulse Output" or "Digital Output" using software. Factory setting is "Digital Output", flow direction signaling.
6 **Equipotential bonding**
6a **Functional ground** (only with flowmeter sensor outside the hazardous area)
7 Brown
8 red
9 Orange
10 yellow
11 Green
12 blue
13 Violet

All inputs and outputs are electrically isolated from each other and from the supply power.

The electrical specifications given are operating values.

For devices with PROFIBUS PA or FOUNDATION fieldbus in Zone 2 / Div 2 the bus termination must conform to the FNICO model or the explosion protection regulations, respectively.

5.3 Electrical data for operation in Zone 2 / Div. 2

5.3.1 Devices with HART protocol

When operating in potentially explosive areas, observe the following electrical data for the signal inputs and outputs of the transmitter. For the correct current output design (active/passive), see the marking contained in the device's terminal box.

	Ex data		Operating values	
	Ex n/NI			
Signal inputs and outputs	**U_i [V]**	**I_i [mA]**	**U_i [V]**	**I_i [mA]**
Current output Active/passive Terminal 31/32	30	30	30	30
Digital output DO1 Active/passive Terminal 51/52	30	220	30	220
Digital output DO2 passive Terminal 41/42	30	220	30	220
Digital input DI Terminal 81/82	30	10	30	10

All inputs and outputs are electrically isolated from each other and from the supply power.

5.3.2 Devices with PROFIBUS PA or FOUNDATION fieldbus

When operating in potentially explosive areas, observe the following electrical data for the signal inputs and outputs of the transmitter. For the correct design (PROFIBUS PA or FOUNDATION fieldbus), see the marking contained in the device's terminal box.

	Operating values		Ex data Explosion protection type Ex n, NI and FNICO					
Inputs and outputs	**U_N [V]**	**I_N [mA]**	**U_i [V]**	**I_i [mA]**	**P_i [mW]**	**C_i [nF]**	**C_{iPA} [nF]**	**L_i [µH]**
Passive digital output DO2 Terminal 41/42	30	220	-	-	-	-	-	-
Fieldbus Terminal 97/98	32	30	32	500 [1)]	7000 [1)]	1	1	5

1) Single-channel or multi-channel barriers (supply isolators) with resistance characteristic must be used.

5.4 Temperature values

Model name	Surface temperature
Flowcont LN	70 °C (158 °F)

Table 1: Fluid temperature as a function of lining and flange material

Lining	Process connection	Material	Fluid temperature (operating values)	
			Minimum	Maximum
PFA	Flange	Stainless steel	-25 °C (-13 °F)	180 °C (356 °F)
PFA	Wafer type	-	-25 °C (-13 °F)	130 °C (266 °F)
PFA	Variable process connection	Stainless steel	-25 °C (-13 °F)	130 °C (266 °F)

Table 2: Fluid temperature (Ex data)

Nominal diameter		Design	Temperature class	Ambient temperature											
				- 20 °C ... + 40 °C				- 20 °C ... + 50 °C				- 20 °C ... + 60 °C			
				- 40 °C ... + 40 °C 1)				- 40 °C ... + 50 °C 1)				- 40 °C ... + 60 °C 1)			
				Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
				Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
ProcessMaster DN 3 ... DN 2000	Flowcont LN DN 3 ... DN 100	NT	T1	130 °C	130 °C	- - -	- - -	130 °C	100 °C 2) 110 °C 3)	- - -	- - -	80 °C	40 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	40 °C	180 °C	40 °C
		NT	T2	130 °C	130 °C	- - -	- - -	130 °C	100 °C 2) 110 °C 3)	- - -	- - -	80 °C	40 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	40 °C	180 °C	40 °C
		NT	T3	130 °C	130 °C	- - -	- - -	130 °C	100 °C 2) 110 °C 3)	- - -	- - -	80 °C	40 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	40 °C	180 °C	40 °C
		NT	T4	130 °C	130 °C	- - -	- - -	130 °C	100 °C 2) 110 °C 3)	- - -	- - -	80 °C	40 °C	- - -	- - -
		HT		130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	40 °C	130 °C	40 °C

1) Low-temperature version (option)
2) Temperature values
3) Temperature values Flowcont LN

NT standard version, T_{medium} maximum 130 °C (266 °F)

HT high-temperature version, T_{medium} maximum 180 °C (356 °F)

Not thermally insulated: The flowmeter sensor is not surrounded by pipe insulation material.

Thermally insulated: The flowmeter sensor is surrounded by pipe insulation material.

Important (Note)

The standard version includes explosion protection for gases and dust. Explosion protection for dust is only available for devices featuring a transmitter in a dual-compartment housing.

- If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.
- If the installation location for the device is classified as a potentially explosive area for gases only, the temperature data in the "Gas" column in the table must be taken into consideration.

Table 3: Fluid temperature (Ex data)

Nominal diameter		Design	Temperature class	Ambient temperature											
				- 20 °C ... + 40 °C				- 20 °C ... + 50 °C				- 20 °C ... + 60 °C			
				- 40 °C ... + 40 °C [1]				- 40 °C ... + 50 °C [1]				- 40 °C ... + 60 °C [1]			
				Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
				Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
ProcessMaster DN 3 ... DN 2000	Flowcont LN DN 3 ... DN 100	NT	T1	130 °C	130 °C	- - -	- - -	130 °C	130 °C	- - -	- - -	110 °C [2] 120 °C [3]	110 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C
		NT	T2	130 °C	130 °C	- - -	- - -	130 °C	130 °C	- - -	- - -	110 °C [2] 120 °C [3]	110 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C
		NT	T3	130 °C	130 °C	- - -	- - -	130 °C	130 °C	- - -	- - -	110 °C [2] 120 °C [3]	110 °C	- - -	- - -
		HT		180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C	180 °C
		NT	T4	130 °C	130 °C	- - -	- - -	130 °C	130 °C	- - -	- - -	110 °C [2] 120 °C [3]	110 °C	- - -	- - -
		HT		130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C	130 °C
		NT	T5	95 °C	95 °C	- - -	- - -	95 °C	95 °C	- - -	- - -	95 °C	95 °C	- - -	- - -
		HT		95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C	95 °C
		NT	T6	80 °C	80 °C	- - -	- - -	80 °C	80 °C	- - -	- - -	80 °C	80 °C	- - -	- - -
		HT		80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C	80 °C

1) Low-temperature version (option)
2) Temperature values
3) Temperature values Flowcont LN

NT standard version, T_{medium} maximum 130 °C (266 °F)

HT high-temperature version, T_{medium} maximum 180 °C (356 °F)

Not thermally insulated: The flowmeter sensor is not surrounded by pipe insulation material.

Thermally insulated: The flowmeter sensor is surrounded by pipe insulation material.

Important (Note)

The standard version includes explosion protection for gases and dust.

- If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.
- If the installation location for the device is classified as a potentially explosive area for gases only, the temperature data in the "Gas" columns in the table must be taken into consideration.

6 Explosion protection specifications for operation in areas with combustible dust

6.1 Information about using the device in areas with combustible dust

The device with dual-compartment transmitter housing is approved for use in potentially explosive areas (gas and dust).

The Ex certification is provided on the name plate.

Risk of explosion!

The dust explosion protection is also provided by the housing.
Modifications to the housing are not allowed (e.g., removing or omitting parts).

6.1.1 Maximum Allowable Surface Temperature

Model name	Maximum surface temperature
FEH325	T 85 °C (185 °F) ... T_{medium}
FEH315	T 70 °C (158 °F) ... T_{medium}
FET325	T 70 °C (158 °F)

The maximum surface temperature is applicable to dust layers of up to 5 mm (0.20 inch) in thickness. The minimum permissible ignition and smoldering temperatures of the dust atmosphere should be calculated in accordance with IEC61241ff.

With thicker dust layers, the maximum permissible surface temperature must be reduced. The dust can be conductive or non-conductive. IEC61241ff must be observed.

6.1.2 Min. signal cable length

In explosion protection areas, the signal cable cannot be shorter than 5 m (16.4 ft).

7 Installation requirements

7.1 Grounding

The flowmeter sensor must be connected to ground potential. For technical reasons, this potential should be identical to the potential of the metering fluid.

For plastic or insulated lined pipelines, the fluid is grounded by installing ground plates. When there are stray potentials present in the pipeline, a ground plate is recommended on both ends of the meter sensor.

7.2 Mounting

The following points must be observed for the installation:

- The meter tube must always be completely full.
- The flow direction must correspond to the identification if present.
- The maximum torque for all flange connections must be complied with. The max torque depends on the temperature, pressure, material of the flange bolts and gaskets and has to be choosen accordingly.
- The devices must be installed without mechanical tension (torsion, bending).
- Flowmeters with coplanar counter flanges may only be installed with suitable seals.
- Use flange seals made from a compatible material for the fluid and fluid temperatures.
- Seals must not extend into the flow area since possible turbulence could influence the device accuracy.
- The pipeline may not exert any unallowable forces and torques on the device.
- Do not remove the plugs in the cable connectors until you are ready to install the electrical cable.
- Install the separate converter at a largely vibration-free location.
- Do not expose the converter to direct sunlight or provide for appropriate sun protection where necessary.

7.2.1 Flow direction

The device measures the flowrate in both directions. Forward flow is the factory setting, as shown in Fig. 22.

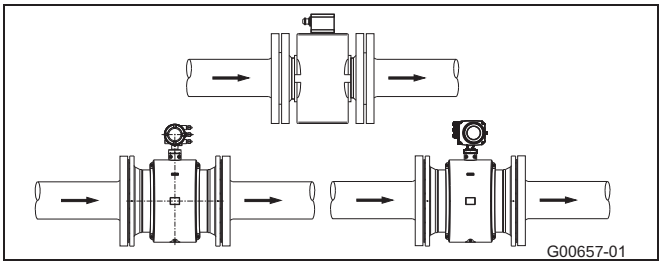


Fig. 22

7.2.2 Electrode axis

Electrode axis (1) should be horizontal if at all possible or no more that 45° from horizontal.

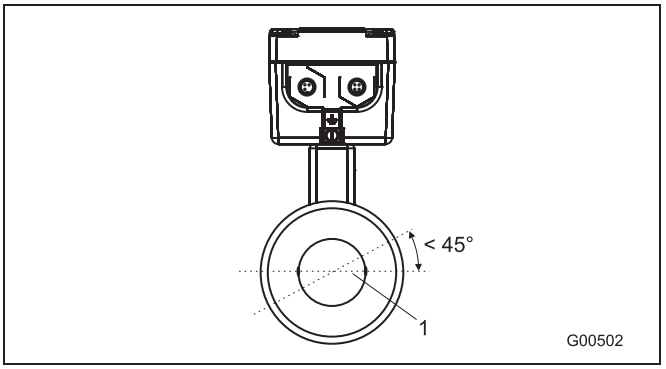


Fig. 23

7.2.3 In- and outlet pipe sections

The metering principle is independent of the flow profile as long as standing eddies do not extend into the metering section, such as may occur after double elbows (1), in the event of tangential inflow, or where half-open gate valves are located upstream of the flowmeter sensor.

In such cases, measures must be put in place to normalize the flow profile.

- Do not install fittings, manifolds, valves, etc., directly in front of the flowmeter sensor (1).
- Butterfly valves must be installed so that the valve plate does not extend into the flowmeter sensor.
- Valves or other turn-off components should be installed in the outlet pipe section (2).

Experience has shown that, in most installations, straight inlet sections 3 x DN long and straight outlet sections 2 x DN long are sufficient (DN = nominal diameter of the sensor Fig. 24).

For test stands, the reference conditions of 10 x DN straight inlet and 5 x DN straight outlet must be provided, in accordance with EN 29104 / ISO 9104.

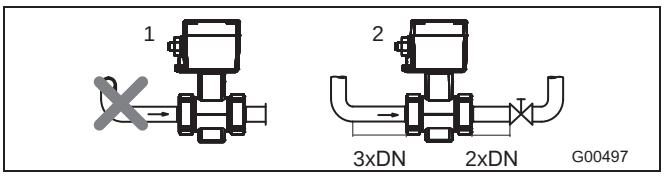


Fig. 24

7.2.4 Vertical connections

- Vertical installation for measurement of abrasive fluids, flow preferably from below to above.

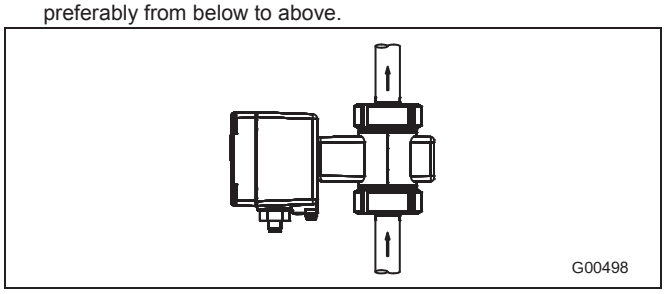


Fig. 25

7.2.5 Horizontal connections

- Meter tube must always be completely full.
- Provide for a slight incline of the connection for degassing.

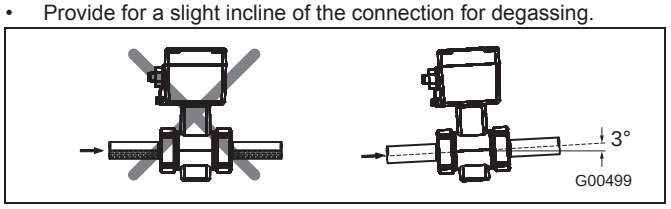


Fig. 26

7.2.6 Free inlet or outlet

- Do not install the flowmeter at the highest point or in the draining-off side of the pipeline, flowmeter runs empty, air bubbles can form (1).
- Provide for a siphon fluid intake for free inlets or outlets so that the pipeline is always full (2).

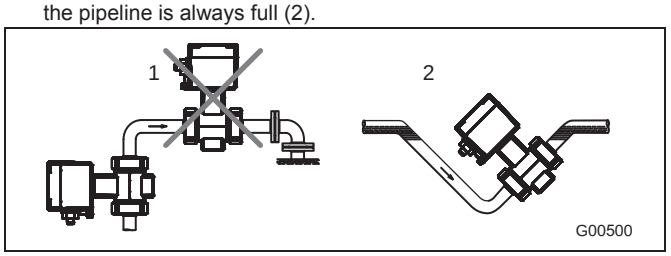


Fig. 27

7.2.7 Strongly contaminated fluids

- For strongly contaminated fluids, a bypass connection according to the figure is recommended so that operation of the system can continue to run without interruption the during the mechanical cleaning.

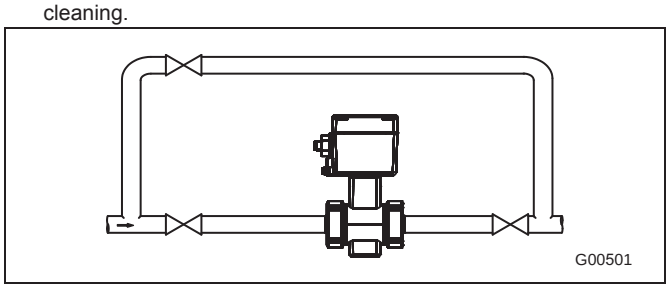


Fig. 28

7.2.8 Installation in the vicinity of pumps

- For flowmeter primaries which are to be installed in the vicinity of pumps or other vibration generating equip-ment, the utilization of mechanical snubbers is advantageous.

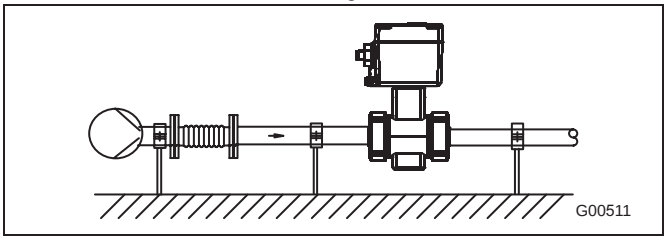


Fig. 29

7.2.9 Installing the high temperature design

The high temperature design allows for complete thermal insulation of the sensor. The pipeline and sensor must be insulated after installing the unit according to the following illustration.

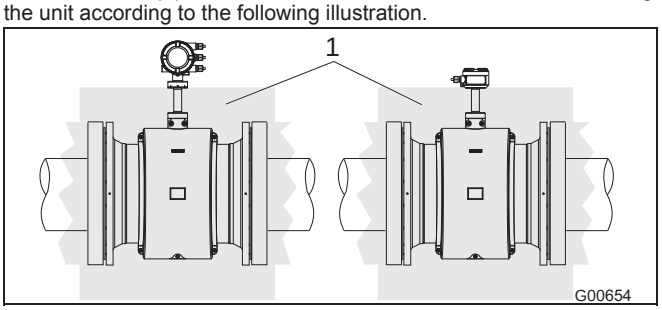


Fig. 30

1 Insulation

7.2.10 Installation in pipelines with larger nominal diameters

Determine the resulting pressure loss when using reduction pieces (1):

1. Calculate the diameter ratio d/D.
2. Determine the flow velocity based on the flow range nomograph (Fig. 32).
3. Read the pressure drop on the Y-axis in Fig. 32.

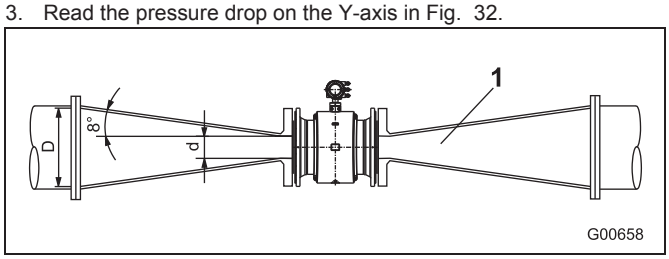


Fig. 31

1 = Flange transition piece
d = Inside diameter of the flowmeter
V = flow velocity [m/s]
Δp = pressure loss [mbar]
D = Inside diameter of the pipeline

Nomograph for pressure drop calculations

For flange transition piece with $\alpha/2 = 8°$

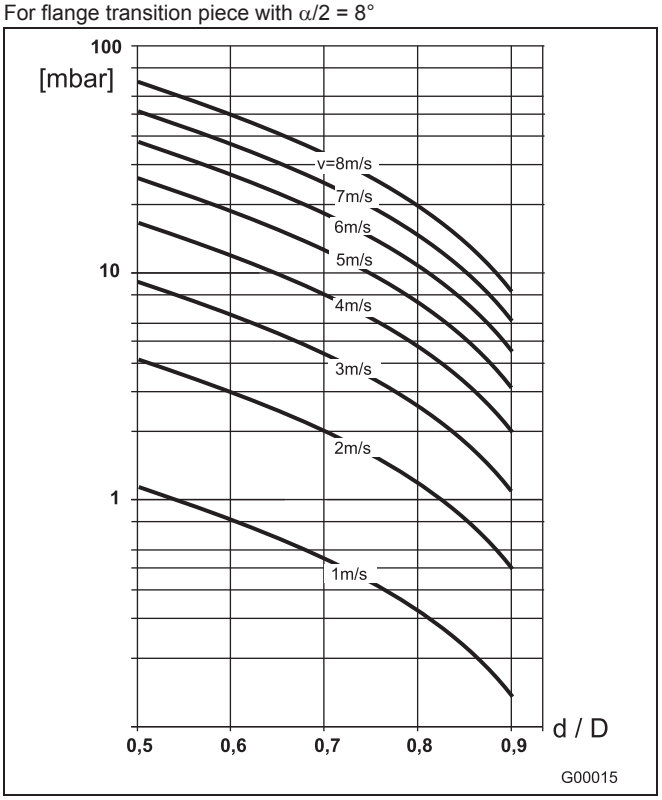


Fig. 32

8 Dimensions

8.1 Flange, DN 3 ... 40 (1/10 ... 1 1/2")

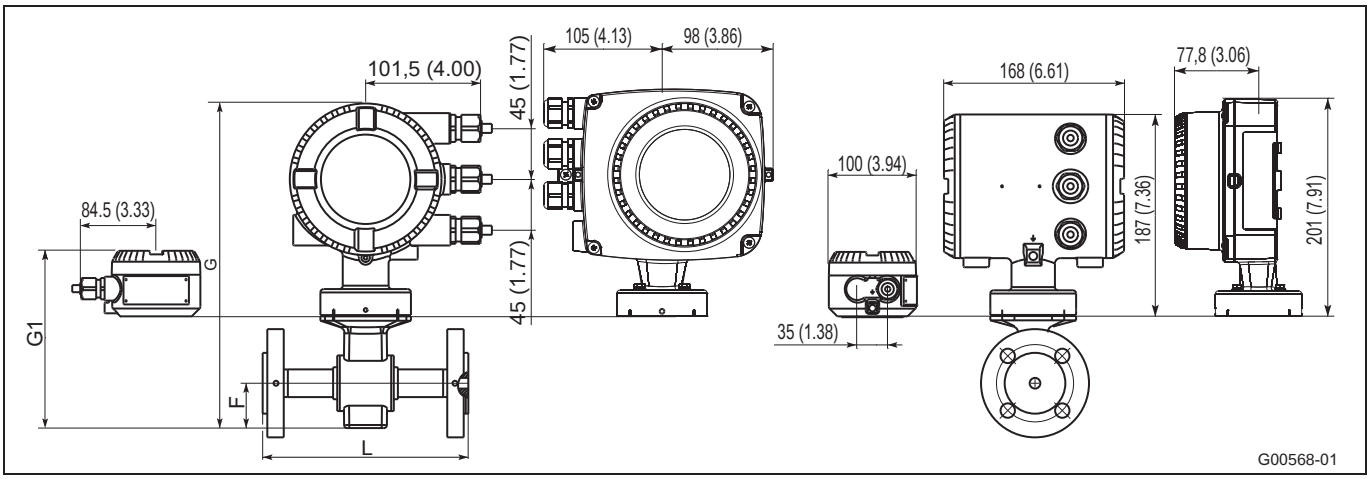


Fig. 33: Dimensions in mm (inch)

Flange in acc. with DIN/EN 1092-1 [1]

Dimensions [mm (inch)]						Approx. weight [kg (lb)]	
DN	PN [2]	L [3]	G [4]	G1 [4]	F	Compact design	Ext. Transmitter
3 ... 8 [5]	10 ... 40	130 (5.12)	293 (11.54)	180 (7.09)	38.5 (1.52)	7 (15.43)	5 (11.02)
10	10 ... 40	200 (7.78)	293 (11.54)	180 (7.09)	38.5 (1.52)	7 (15.43)	5 (11.02)
15	10 ... 40	200 (7.78)	293 (11.54)	180 (7.09)	38.5 (1.52)	8 (17.64)	8 (17.64)
20	10 ... 40	200 (7.78)	302 (11.89)	190 (7.84)	43 (1.69)	8 (17.64)	8 (17.64)
25	10 ... 40	200 (7.78)	311 (12.24)	199 (7.83)	48 (1.89)	9 (19.84)	9 (19.84)
32	10 ... 40	200 (7.78)	321 (12.64)	208 (8.19)	53 (2.09)	11 (24.25)	11 (24.25)
40	10 ... 40	200 (7.78)	330 (12.99)	217 (8.54)	57 (2.24)	11 (24.25)	11 (24.25)

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

Flange in acc. with ASME B16.5

Dimensions [mm (inch)]						Approx. weight [kg (lb)]	
DN	Inch	L [3]	G [4]	G1 [4]	F	Compact design	Ext. Transmitter
3 ... 8	1/8 ... 5/16 [6]	130 (5.12)	293 (11.54)	180 (7.09)	38.5 (1.52)	7 (15.43)	5 (11.02)
10	3/8 [6]	200 (7.78)	293 (11.54)	180 (7.09)	38.5 (1.52)	7 (15.43)	5 (11.02)
15	1/2	200 (7.78)	293 (11.54)	180 (7.09)	38.5 (1.52)	8 (17.64)	8 (17.64)
20	3/4	200 (7.78)	302 (11.89)	190 (7.84)	43 (1.69)	8 (17.64)	8 (17.64)
25	1	200 (7.78)	311 (12.24)	199 (7.83)	48 (1.89)	9 (19.84)	9 (19.84)
32	1 1/4	200 (7.78)	321 (12.64)	208 (8.19)	53 (2.09)	11 (24.25)	11 (24.25)
40	1 1/2	200 (7.78)	330 (12.99)	217 (8.54)	57 (2.24)	11 (24.25)	11 (24.25)

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

1) Connecting dimensions in acc. with EN 1092-1. For DN 65, PN 16 in acc. with EN 1092-1, please order PN 40.
2) Other pressure ratings available on request.
3) If grounding plates are installed (attached to both sides of the flange), this increases dimension L as follows: DN 3 ... 100 by 3 mm (0.118 inch).
4) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G1
Without explosion protection	Standard temperature design	0	0
	High temperature version	+127 mm (+5 inch)	+127 mm (+5 inch)
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2,91 inch)	Not available
	High temperature version	+127 mm (+5 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0
	High temperature version	+127 mm (+5 inch)	+127 mm (+5 inch)

5) Connection flange DN 10.
6) Connection flange 1/2".

8.2 Flange, DN 50 ... 100 (2 ... 4")

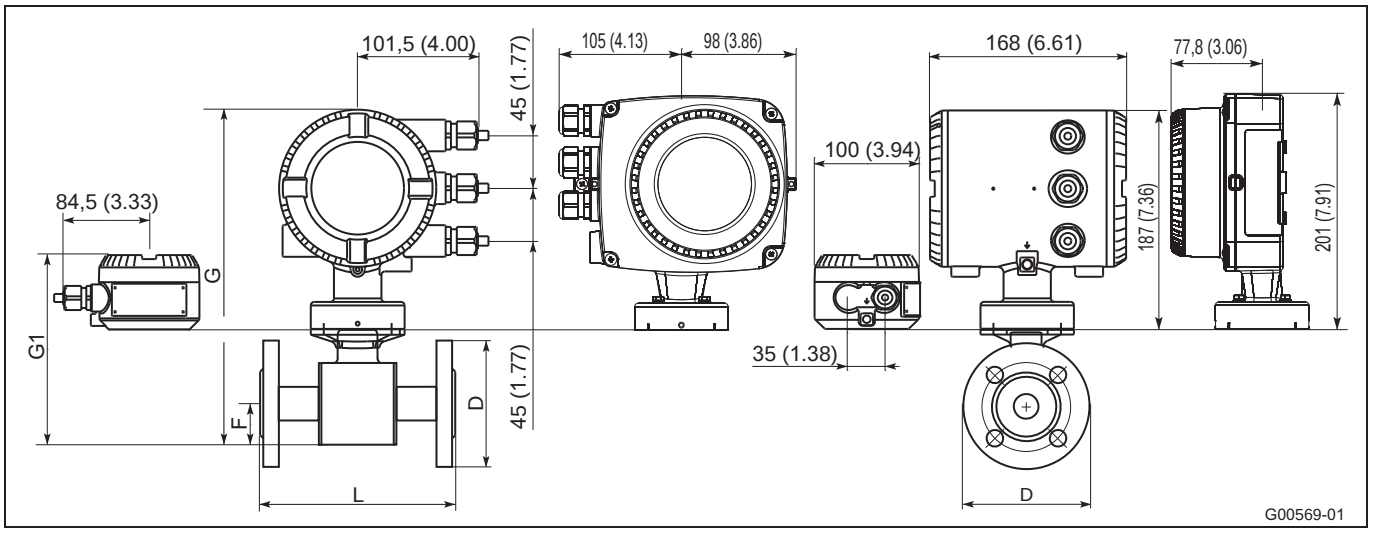


Fig. 34: Dimensions in mm (inch)

Flange in acc. with DIN/EN 1092-1

Dimensions [mm (inch)]							Approx. weight [kg (lb)]	
DN	PN 1)	D	L 2)	G 3)	G1 3)	F	Compact design	Ext. Transmitter
50	10 ... 40	165 (6.50)	200 (7.87)	332 (13.06)	213 (8.39)	50 (1.97)	13 (28.66)	11 (24.25)
65	10 ... 40	185 (7.28)	200 (7.87)	348 (13.7)	235 (9.26)	58 (2.28)	17 (37.48)	15 (33.07)
80	10 ... 40	200 (7.87)	200 (7.87)	365 (14.37)	252 (9.92)	66.5 (2.62)	20 (44.09)	18 (39.68)
100	16	220 (8.66)	250 (9.84)	392 (15.45)	280 (11.01)	80.2 (3.16)	23 (50.71)	21 (46.30)

Tolerance L: +0 / -3 mm, (+0 / -0.118 inch)

Flange in acc. with ASME B16.5

Dimensions [mm (inch)]								Approx. weight [kg (lb)]	
DN	Inch	CL150 D	CL300 D	ISO 13359 L 2)	G 3)	G1 3)	F	Compact design	Ext. Transmitter
50	2	153 (6.02)	165 (6.50)	200 (7.87)	332 (13.06)	213 (8.39)	50 (1.97)	13 (28.66)	11 (24.25)
65	2 1/2	178 (7.01)	191 (7.52)	200 (7.87)	348 (13.7)	235 (9.26)	58 (2.28)	17 (37.48)	15 (33.07)
80	3	191 (7.52)	210 (8.27)	200 (7.87)	365 (14.37)	252 (9.92)	66.5 (2.62)	20 (44.09)	18 (39.68)
100	4	229 (9.02)	254 (10)	250 (9.84)	392 (15.45)	280 (11.01)	80.2 (3.16)	23 (50.71)	21 (46.30)

Tolerance L: +0 / -3 mm, (+0 / -0.118 inch)

1) Other pressure ratings available on request.
2) If grounding plates are installed (attached to both sides of the flange), this increases dimension L by 3 mm (0.118 inch).
3) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G1
No ignition protection	Standard temperature design	0	0
	High temperature version	+127 mm (+5 inch)	+127 mm (+5 inch)
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2.91 inch)	Not available
	High temperature version	+127 mm (+5 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0
	High temperature version	+127 mm (+5 inch)	+127 mm (+5 inch)

8.3 Wafer type, DN 3 ... 40 (1/10 ... 1 1/2")

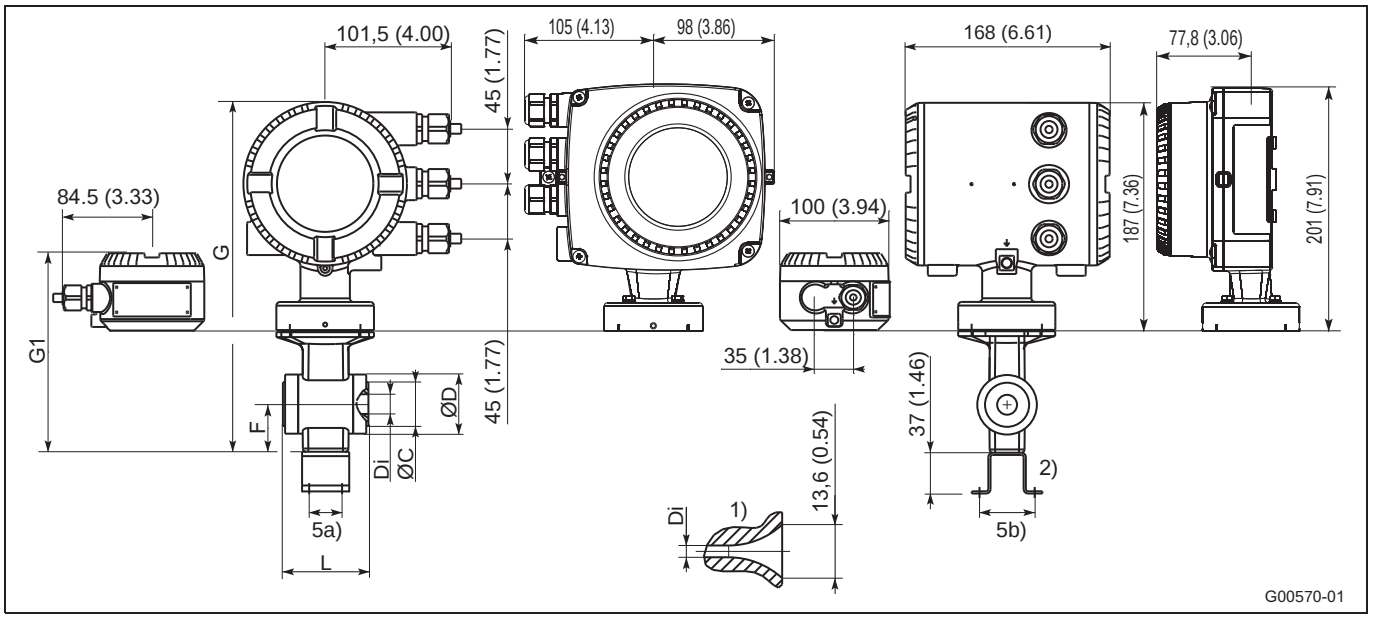


Fig. 35: Dimensions in mm (inch)

Dimensions [mm]									Approx. weight [kg]	
DN	PN	C	D	Di	F	G 4)	G1 4)	L 3)	Compact design	Ext. Transmitter
3 ... 8	10 ... 40	42	45	3 ... 8	38.5	293	180	68	3.5	1.5
10	10 ... 40	42	45	10	38.5	293	180	68	3.5	1.5
15	10 ... 40	42	45	13	38.5	293	180	68	3.5	1.5
20	10 ... 40	50	54	18	43	302	190	78	4	2
25	10 ... 40	59	63	24	48	311	199	90	4.5	2.5
32	10 ... 40	69	73	30	53	321	208	98	4.5	2.5
40	10 ... 40	77	82	36	57	330	217	103	5	3

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

Dimensions [inch]										Approx. weight [lb]	
DN	Inch		C	D	Di	F	G 4)	G1 4)	L 3)	Compact design	Ext. Transmitter
3 ... 8	1/8 ... 5/16	CL150 / CL300	1.65	1.77	0.12 ... 0.31	1.5	11.5	7.1	2.7	7.72	3.31
10	3/8	CL150 / CL300	1.65	1.77	0.39	1.5	11.5	7.1	2.7	7.72	3.31
15	1/2	CL150 / CL300	1.65	1.77	0.51	1.5	11.5	7.1	2.7	7.72	3.31
20	3/4	CL150 / CL300	1.97	2.13	0.71	1.7	11.9	7.5	3.1	8.82	4.41
25	1	CL150 / CL300	2.32	2.48	0.94	1.9	12.2	7.8	3.5	9.92	5.51
32	1 1/4	CL150 / CL300	2.72	2.87	1.18	2.1	12.6	8.2	3.9	9.92	5.51
40	1 1/2	CL150 / CL300	3.03	3.23	1.42	2.2	13	8.5	4.1	11.02	6.61

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

1) Only with DN 3 ... 8.
2) Bracket (optional), not available for 3A approval.
3) If a grounding plate is installed (attached to one side of the flange), this increases dimension L by 3 mm (0.118 inch).
4) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G1
No ignition protection	Standard temperature design	0	0
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2.91 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0

5) Installation hole spacing for angle bracket as per the table below.

	Installation hole spacing	
Nominal diameter	5a)	5b)
DN 3 … 20	28 mm (1.1 inch)	50 mm (1.97 inch)
DN 25 … 40	46 mm (1.81 inch)	70 mm (2.76 inch)

8.4 Wafer type, DN 50 ... 100 (2 ... 4")

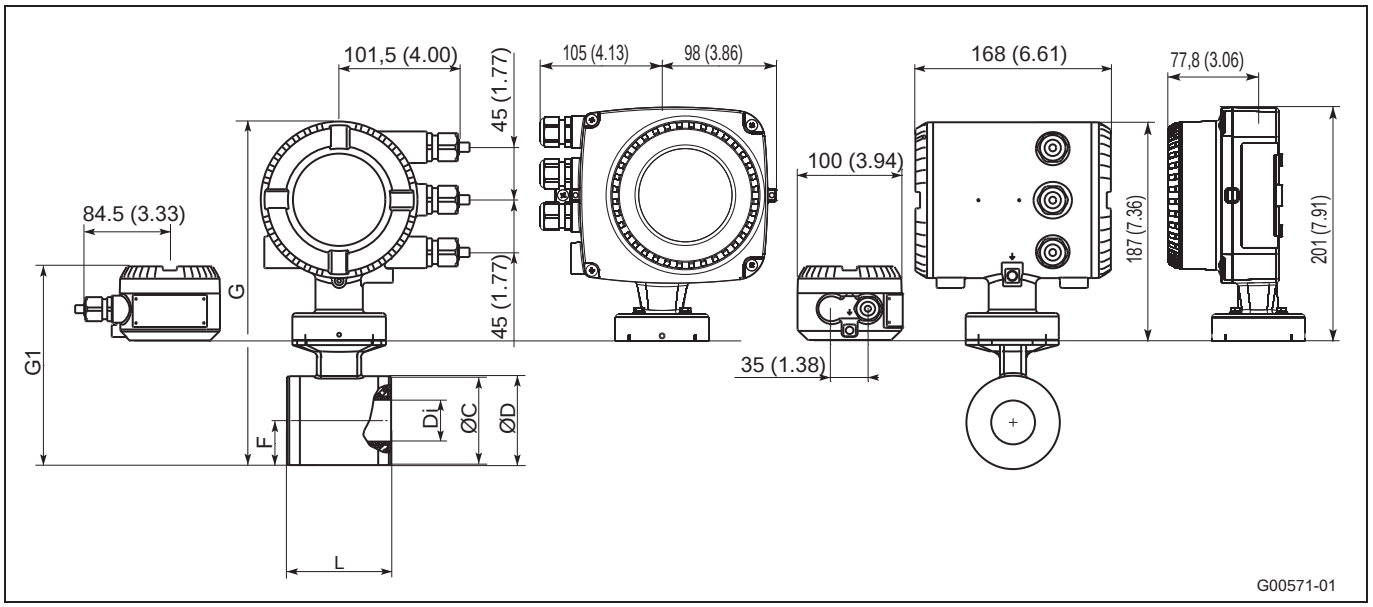


Fig. 36: Dimensions in mm (inch)

Dimensions [mm]									Approx. weight [kg]	
DN	PN	C	D	Di	F	G 2)	G1 2)	L 1)	Compact design	Ext. Transmitter
50	10 ... 40	95	100	47	50	332	213	117	6.5	4.5
65	16	111	116	62	58	348	235	103	7	5
80	16	128	133	74	66.5	365	252	103	8.5	6.5
100	16	155	160	96	80.2	392	280	133	11	9

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

Dimensions [inch]										Approx. weight [lb]	
DN	Inch	PN	C	D	Di	F	G 2)	G1 2)	L 1)	Compact design	Ext. Transmitter
50	2	CL 150 / 300	3.74	3.94	1.85	1.97	13.07	8.39	4.61	14.33	9.92
65	2 1/2	CL 150	4.37	4.57	2.44	2.28	13.70	9.25	4.06	15.43	11.02
80	3	CL 150	5.04	5.24	2.91	2.62	14.37	9.92	4.06	18.74	14.33
100	4	CL 150	6.10	6.30	3.78	3.16	15.43	11.02	5.24	24.25	19.84

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

1) If a grounding plate is installed (attached to one side of the flange), this increases dimension L by 3 mm (0.118 inch). The mounting bracket is an option and is not available in the 3A version.
2) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G
No ignition protection	Standard temperature design	0	0
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2.91 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0

8.5 Variable process connections, DN 3 ... 40 (1/10 ... 1 1/2")

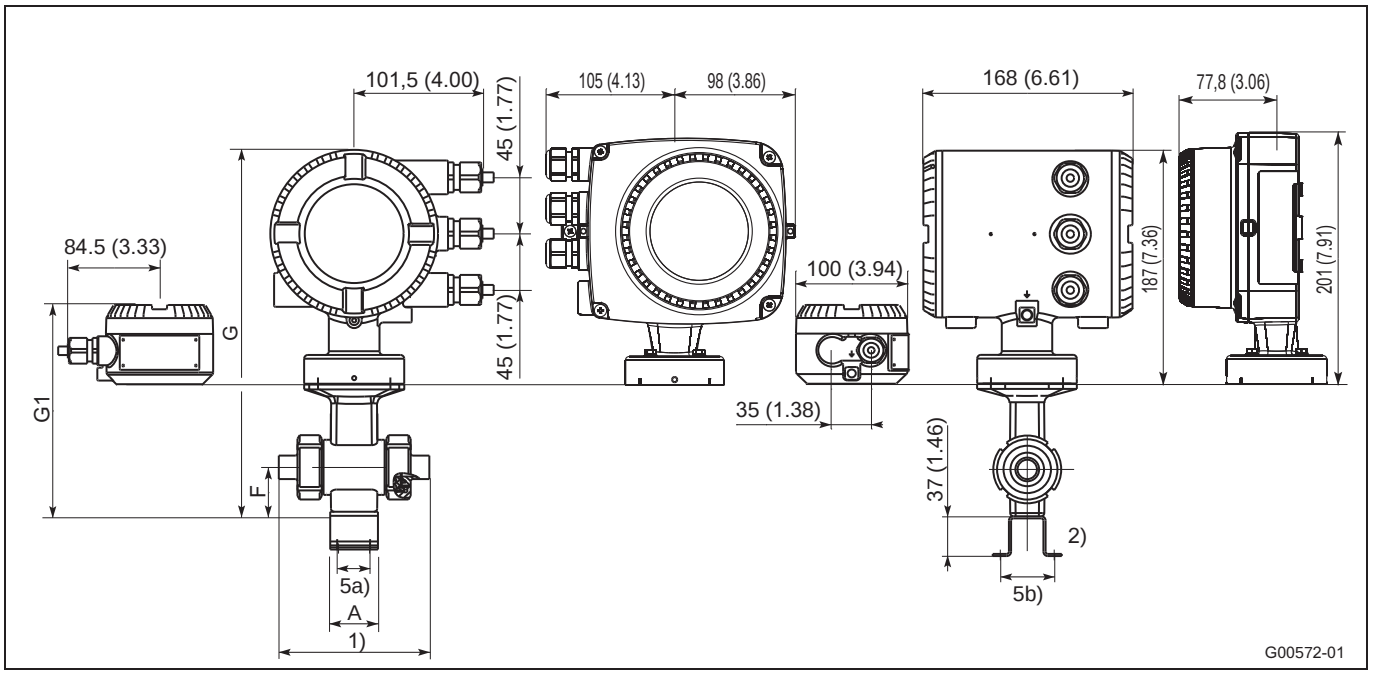


Fig. 37: Dimensions in mm (inch)

Dimensions [mm]						Approx. weight [kg] 3)	
DN	PN 2)	A	F	G 4)	G1 4)	Compact design	Ext. Transmitter
3 ... 8 5)	10 ... 40	37	38.5	293	180	4	2
10	10 ... 40	37	38.5	293	180	4	2
15	10 ... 40	37	38.5	293	180	4	2
20	10 ... 40	42	43	302	190	4.5	2.5
25	10 ... 40	54	48	311	199	5	3
32	10 ... 40	62	53	321	208	5	3
40	10 ... 40	67	57	330	217	5.5	3.5

Tolerance L: +0 / -3 mm

Dimensions [inch]						Approx. weight [lb] 3)	
DN	Inch	A	F	G 4)	G1 4)	Compact design	Ext. Transmitter
3 ... 8	1/8 ... 5/16	1.5	1.52	11.5	7.1	8.82	4.41
10	3/8	1.5	1.52	11.5	7.1	8.82	4.41
15	1/2	1.5	1.52	11.5	7.1	8.82	4.41
20	3/4	1.65	1.69	11.9	7.5	9.92	5.51
25	1	2.13	1.89	12.2	7.8	11.02	6.61
32	1 1/4	2.44	2.09	12.6	8.2	11.02	6.61
40	1 1/2	2.64	2.24	13.0	8.5	12.13	7.72

Tolerance L: +0 / -0.118 inch

1) Installation length including process connection: Refer to page 44.
2) Bracket (optional), not available for 3A approval.
3) Plus process connection weight: Refer to page 44.
4) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G1
No ignition protection	Standard temperature design	0	0
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2.91 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0

5) Installation hole spacing for angle bracket as per the table below.

	Installation hole spacing	
Nominal diameter	5a)	5b)
DN 3 … 20	28 mm (1.1 inch)	50 mm (1.97 inch)
DN 25 … 40	46 mm (1.81 inch)	70 mm (2.76 inch)

8.6 Variable process connections, DN 50 ... 100 (2 ... 4")

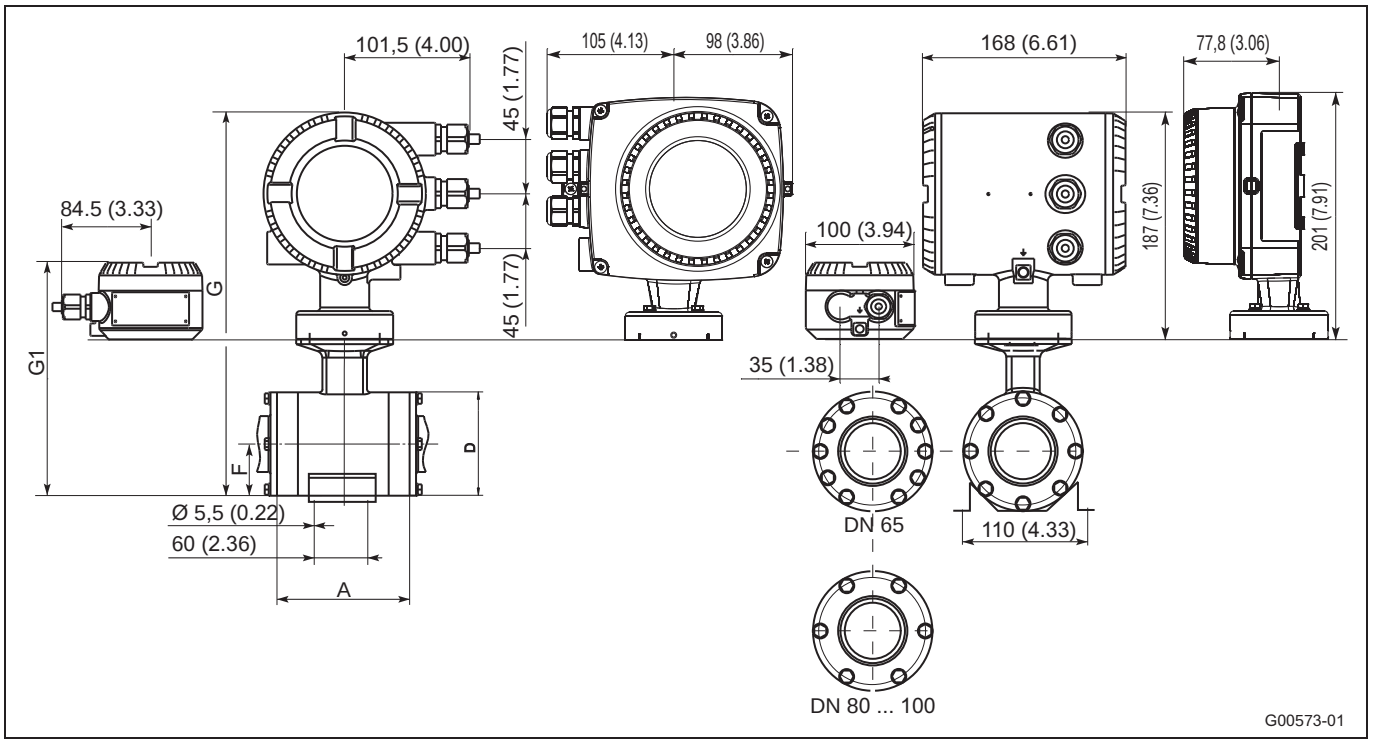


Fig. 38: Dimensions in mm (inch)

Dimensions [mm]						Approx. weight [kg] 3)	
DN	PN 2)	A	F	G 4)	G1 4)	Compact design	Ext. Transmitter
50	10 ... 40	128	50	332	213	4	2
65	10 ... 40	114	58	348	235	4	2
80	10 ... 40	114	67	365	252	4	2
100	10 ... 40	114	81	393	280	4.5	2.5

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

Dimensions [inch]						Approx. weight [lb] 3)	
DN	Inch	A	F	G 4)	G1 4)	Compact design	Ext. Transmitter
50	2	5.04	1.97	13.06	8.39	8.82	4.41
65	2 1/2	4.49	2.28	13.70	9.26	8.82	4.41
80	3	4.49	2.64	14.37	9.92	8.82	4.41
100	4	4.49	3.19	15.45	11.01	9.92	5.51

Tolerance L: +0 / -3 mm (+0 / -0.118 inch)

1) Installation length including process connection: Refer to page 44.
2) Bracket (optional), not available for 3A approval.
3) Plus process connection weight: Refer to page 44.
4) Depending on the device design, the dimensions change according to the following table.

Device design		Dimension G	Dimension G1
No ignition protection	Standard temperature design	0	0
Explosion protection Zone 1, Div. 1	Standard temperature design	+74 mm (+2.91 inch)	Not available
Explosion protection Zone 2, Div. 2	Standard temperature design	0	0

8.7 Adapter for variable process connections DN 3 ... 100 (1/10 ... 4")

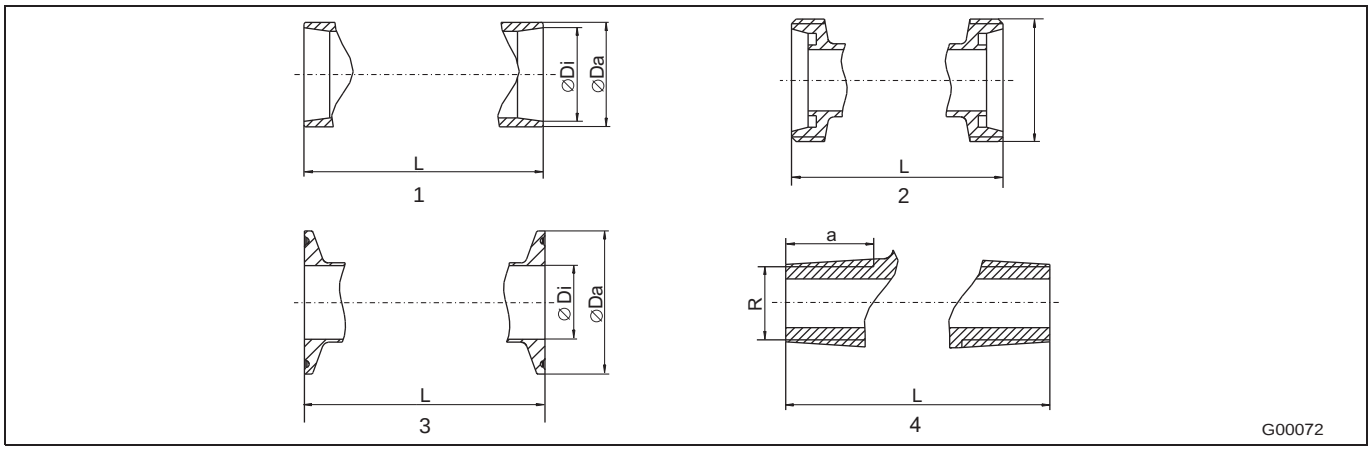


Fig. 39

1 Weld stubs
2 Threaded pipe connection in acc. with DIN 11851
3 Tri-Clamp
4 External threads

Weld stubs

Dimensions in mm

DN	ISO 2037		DIN 11850			SMS		DIN 2463		ISO 1127				Weight
	Ø Di	Ø Da	Ø Di	Ø Da	Series	Ø Di	Ø Da	Ø Di	Ø Da	Ø Di	Ø Da	Series	L	[kg]
3 ... 10	10	12	10	13	2	-	-	10.3	13.5	10.3	13.5	1	127	0.4
15	15.2	17.2	16	19	2	-	-	18.1	21.3	18.1	21.3	1	127	0.4
20	19.3	21.3	20	23	2	-	-	23.7	26.9	23.7	26.9	1	132	0.7
25	22.6	25	26	29	2	22.6	25	25	28	23.7	26.9	1	149	0.7
32	31.3	33.7	32	34	1	-	-	32	35	30.5	33.7	1	166	1
40	35.6	38	38	41	2	35.6	38	36.8	40	39	42.2	1	171	1
50	48.6	51	50	53	3	48.6	51	49	52	47.8	51	2	173	1
65	60.3	63.5	66	70	2	60.3	63.5	66	70	66	70	2	165	1.4
80	72.9	76.1	81	85	2	72.9	76.1	81	85	72.9	76.1	1	169	2
100	97.6	101.6	100	104	2	100	104	100	104	97.6	101.6	2	199	3

Dimensions in inches

DN	ISO 2037		DIN 11850			SMS		DIN 2463		ISO 1127				Weight
	Ø Di	Ø Da	Ø Di	Ø Da	Series	Ø Di	Ø Da	Ø Di	Ø Da	Ø Di	Ø Da	Series	L	[lb]
1/10 … 3/8	0.39	0.47	0.39	0.51	2	-	-	0.41	0.53	0.41	0.53	1	5	0.88
1/2	0.60	0.68	0.63	0.75	2	-	-	0.71	0.84	0.71	0.84	1	5	0.88
3/4	0.76	0.84	0.79	0.91	2	-	-	0.93	1.06	0.93	1.06	1	5.20	1.54
1	0.89	0.98	1.02	1.14	2	0.89	0.98	0.98	1.10	0.93	1.06	1	5.87	1.54
1 1/4	1.23	1.33	1.26	1.34	1	-	-	1.26	1.38	1.20	1.33	1	6.54	2.20
1 1/2	1.40	1.50	1.50	1.61	2	1.40	1.50	1.45	1.57	1.54	1.66	1	6.73	2.20
2	1.91	2.01	1.97	2.09	3	1.91	2.01	1.93	2.05	1.88	2.01	2	6.81	2.20
2 1/2	2.37	2.50	2.60	2.76	2	2.37	2.50	2.60	2.76	2.60	2.76	2	6.50	3.09
3	2.87	3	3.19	3.35	2	2.87	3	3.19	3.35	2.87	3	1	6.65	4.41
4	3.84	4	3.94	4.09	2	3.94	4.09	3.94	4.09	3.84	4	2	7.83	6.61

Other variable process connections

Dimensions in mm

DN	Threaded pipe connection			Tri-Clamp								
	DIN 11851			DIN 32676					ASME BPE			
	Rd. thd.	L	Weight [kg]	Ø Di	Ø Da	Series	L	Weight [kg]	Tri-Clamp	Ø Di	Ø Da	L	Weight [kg]
3 ... 10	28 x 1/8”	169	0.5	10	34	3	163	0.5	1/2”	9.4	25	143	0.5
15	34 x 1/8”	169	0.5	16	34	3	163	0.5	3/4”	15.7	25	143	0.5
20	44 x 1/6”	180	0.9	20	34	3	168	0.7	1”	22.1	50.4	143	0.7
25	52 x 1/6”	207	0.9	26	50.5	3	192	0.8	1”	22.1	50.4	143	1.2
32	58 x 1/6”	230	1.4	32	50.5	3	209	1.5	-	-	-	-	-
40	65 x 1/6”	237	1.4	38	50.5	3	214	1.4	1 1/2”	34.8	50.4	277	1.8
50	78 x 1/6”	243	1.4	50	64.0	3	216	1.2	2”	47.5	63.9	277	1.8
65	96 x 1/6”	245	2.2	66	91.0	1	221	1.6	2 1/2”	60.2	77.4	277	2.0
80	110 x 1/4”	259	3.2	81	106	1	225	2.4	3”	72.9	90.9	337	3.6
100	130 x 1/4”	307	4.4	100	119	1	255	3.1	4”	97.4	118.9	337	4.1

Dimensions in inches

DN	Threaded pipe connection			Tri-Clamp								
	DIN 11851			DIN 32676					ASME BPE			
	Rd. thd.	L	Weight [lb]	Ø Di	Ø Da	Series	L	Weight [lb]	Tri-Clamp	Ø Di	Ø Da	L	Weight [lb]
1/10 … 3/8	1.10 x 1/8”	6.65	1.10	0.39	1.34	3	6.42	1.10	1/2”	0.37	0.98	5.63	1.10
1/2	1.34 x 1/8”	6.65	1.10	0.63	1.34	3	6.42	1.10	3/4”	0.62	0.98	5.63	1.10
3/4	1.73 x 1/6”	7.09	1.98	0.79	1.34	3	6.61	1.54	1”	0.87	1.98	5.63	1.54
1	2.05 x 1/6”	8.15	1.98	1.02	1.99	3	7.56	1.76	1”	0.87	1.98	5.63	2.65
1 1/4	2.28 x 1/6”	9.06	3.09	1.26	1.99	3	8.23	3.31	-	-	-	-	-
1 1/2	2.56 x 1/6”	9.33	3.09	1.50	1.99	3	8.43	3.09	1 1/2”	1.37	1.98	10.91	3.97
2	3.07 x 1/6”	9.57	3.09	1.97	2.52	3	8.50	2.65	2”	1.87	2.52	10.91	3.97
2 1/2	3.78 x 1/6”	9.65	4.85	2.60	3.58	1	8.70	3.53	2 1/2”	2.37	3.05	10.91	4.41
3	4.33 x 1/4”	10.20	7.05	3.19	4.17	1	8.86	5.29	3”	2.87	3.58	13.27	7.94
4	5.12 x 1/4”	12.09	9.70	3.94	4.69	1	10.04	6.83	4”	3.83	4.68	13.27	8.84

External threads ISO 228 / DIN 2999, tapered

Dimensions in mm

DN	R	a	L	Weight [kg]
3 ... 10	3/8“	18	139	0.4
15	1/2“	18	139	0.4
20	3/4“	25	164	0.8
25	1“	25	179	0.8

Dimensions in inches

DN	R	a	L	Weight [lb]
1/10 ... 3/8	3/8“	0.71	5.47	0.88
1/2	1/2“	0.71	5.47	0.88
3/4	3/4“	0.98	6.46	1.76
1	1“	0.98	7.05	1.76

Weld stubs suitable for OD tubing

Dimensions in mm

DN	Weld stub size	Di	Da	L	Weight [kg]
10 (3/8“)	1/2“	9.40	12.70	127	0.4
15 (1/2“)	3/4“	15.75	19.05	127	0.4
20 (1“)	1“	22.10	25.40	132	0.7
25 (1“)	1“	22.10	25.40	149	1
40 (1 1/2“)	1 1/2“	34.80	38.10	171	1
50 (2“)	2“	47.50	50.80	173	1

Dimensions in inches

DN	Weld stub size	Di	Da	L	Weight [lb]
10 (3/8“)	1/2“	0.37	0.50	5	0.9
15 (1/2“)	3/4“	0.62	0.75	5	0.9
20 (1“)	1“	0.87	1	5.20	1.5
25 (1“)	1“	0.87	1	5.87	2.2
40 (1 1/2“)	1 1/2“	1.37	1.50	6.73	2.2
50 (2“)	2“	1.87	2	6.81	2.2

8.8 Transmitter housing (dual-compartment housing)

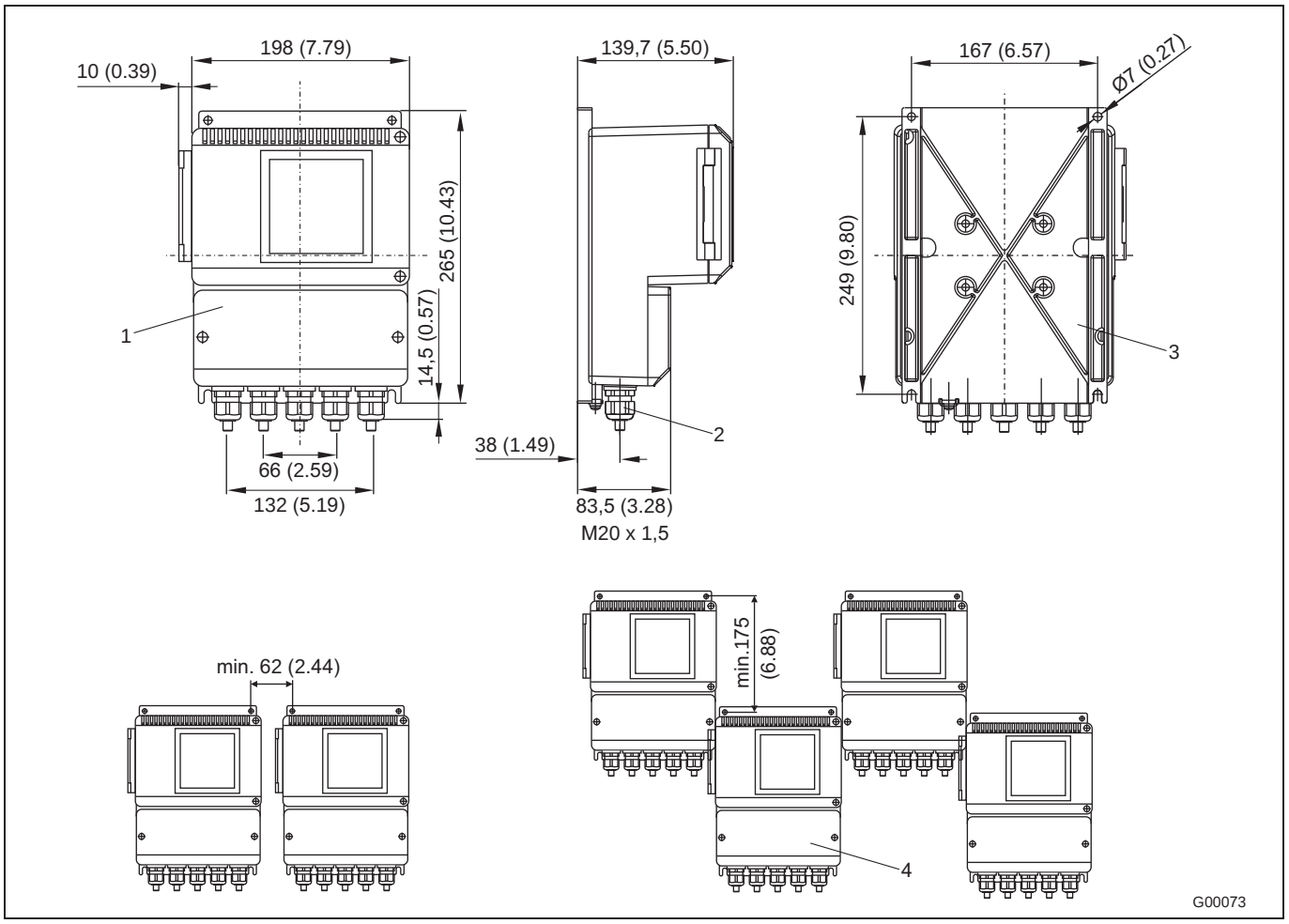


Fig. 40: Dimensions in mm (inch)

1 Field-mount housing with window
2 Cable gland M20 x 1.5
3 Installation holes for pipe mounting set, for 2" pipe installation; mounting set available on request (order no. 3KXF081100L0001)
4 Protection class IP 67

8.9 Transmitter housing (single-compartment housing)

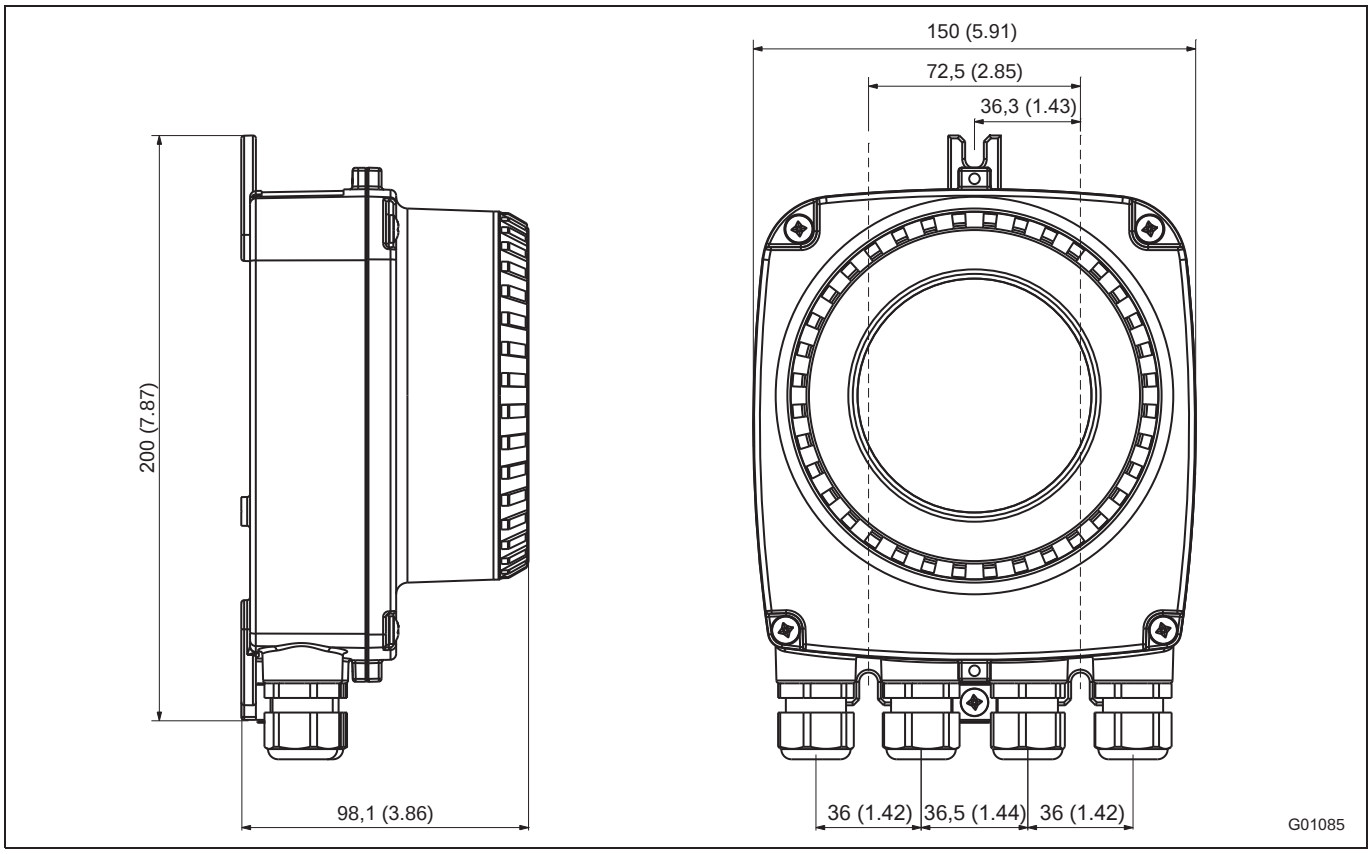


Fig. 41: Dimensions in mm (inch)

9 Ordering information

LN - Food design process connection

A	external thread ISO 228 / DIN 2999	*(only up to nominal size DN25)*
M	milk tube connection DIN 11851	DN3 - 32 DN40 - 100
R	welded hexagon socket DIN 11850	DN3 - 32 DN40 - 100
P	welded hexagon socket ISO 2037	DN25 - 32 DN40 - 100
Q	welded hexagon socket DIN 2463	DN3 - 32 DN40 - 100
S	welded hexagon socket OD Tubing	DN3 - 32 DN40 - 100
F	fixed flange DIN 2501	DN3 - 8 . . *(PN40)* DN10 - 15 . *(PN40)* DN20 . . . . *(PN40)* DN25 . . . . *(PN40)* DN32 . . . . *(PN40)* DN40 . . . . *(PN40)* DN50 . . . . *(PN40)* DN65 . . . . *(PN40, PN16)* DN80 . . . . *(PN40)* DN100 . . . *(PN40, PN16)*
T	Tri-Clamp DIN 32676	DN3 - 32 DN40 - 100
Z	connection flange	
-	other flanges	

compact version
with connection
flange

Nominal size

003	DN003	025	DN25 1"
004	DN004	032	DN32
006	DN006	040	DN40 bzw. 1½"
008	DN008	050	DN50 bzw. 2"
010	DN010	065	DN65
015	DN15 bzw. ½"	080	DN80 bzw. 3"
020	DN20	100	DN100 bzw. 4"

compact version
with welded hexagon
socket

Coating

E	PFA-Coating / seal material EPDM *(connection flange without seal material)*
Y	others

Pressure level

1	PN 40 connection flange *(DN 3...50)*, pipe screwing / welded hexagon socket *(DN 3...40)*, fixed flange *(DN 3...80)*
2	PN 16 connection flange/Tri-Clamp *(DN 3...50)*, pipe screwing / welded hexagon socket *(DN50, 80)*, fixed flange *(DN 100)*
3	PN 10 Tri-Clamp *(DN 65...100)*, external thread/pipe screwing / welded hexagon socket *(DN 65, 100)*
-	other pressure levels

wall mount cabinet

Process connection and flange material

U	Steel 1.4571 *(only with fixed flange)*
W	Steel 1.4404 *(316L with EPDM-sealing)*
G	Steel 1.4404 *(316L with Silikon-sealing)*
Z	ohne Process connection *(only with connection flange)*

separate version
withwelded hexagon
socket

Electrode assembly *(only measuring electrodes)*

2	1.4571 fully equipped
3	Hastelloy B3
4	Hastelloy C4
5	Tantal
6	Titan
7	CrNi-Steel *(food design)* 1.4539
8	Platin-Irdium

Measuring electrodes with ground electrodes

E	CrNi-Steel 1.4571
N	Hastelloy B3
0	Hastelloy C4 Standard
I	Titan
Q	Tantal
R	CrNi-Steel 1.4539 *(food design)*

separate version
with connection
flange

Explosion protectionsschutz

A	without
L	ATEX / IEC Zone 1 / 21 / 22
M	ATEX / IEC Zone 2 / 21 / 22
P	FM / cFM CI 1 Div. 2, Zone 2
R	FM / cFM CI 1 Div. 1, Zone 1

order code

Flowcont LN

Connection pieces

external thread

welded hexagon socket

connection flange

pipe screwing

TRI-Clamp

Certificates

0 measuring tub with DGRL admission
2 material confirmation with acceptance test certificate 3.1 EN 10204
3 pressure test AD-2000
4 material confirmation with acceptance test certificate 3.1 nach EN 10204 and pressure test AD-2000
7 material confirmation with acceptance test certificate 3.2 nach EN 10204
9 others

Versions

A compact version
K separate Version 19" *(FET-301)*
G separate Version with field case *(FET-321)*
H separate Version with field case *(FET-325)* Ex-version
X compact version with remote electronics; 10m Kabel (Ex-version)

Calibration

2 2-point 0,4 %
3 3-point 0,2 % up to DN80
DN100 - 300
DN350 - 600
DN700 - 800
5 5-point, DKD calibration
DN50-DN80
DN100-DN150
DN200-DN600
DN800
8 5-point, 0,4% standard accuracy - certified calibration
DN3-80
DN100

Display / In-/Output

0 HART + 20 mA passive + pulse + contact in-/ output
2 HART + 20 mA active + pulse + contact in-/ output (standard)
3 HART + 20 mA active + pulse + contact output (only at Ex-version)
S Profibus PA + contact output
6 Foundation Fieldbus contact output

Voltage

1 100...230 V AC, 50 Hz
2 24 V AC/DC, 50 Hz
3 100...230 V AC, 60 Hz
4 24 V AC/DC, 60 Hz

Protection

A protection IP-67
B protection IP-68 *(at separate version)*
C cable fitted and potted

Signal cable length for a separate version

0 without cable *(compact)*
1 5 m standard cable *(separate version)*
2 10 m standard cable *(separate version)*
3 20 m standard cable *(separate version)*
4 30 m standard cable *(separate version)*
5 50 m standard cable *(separate version)*
6 80 m standard cable *(separate version)*
7 100 m standard cable *(separate version)*
8 150 m standard cable *(separate version)*
9 others

Language of documentation

M1 german
M5 english
MW language set Western Europe / Scandinavia
ME language set Eastern Europe
MZ others

Number of test points

(according to „calibration" see above)
P2 2 point
P3 3 point
P5 5 point

Temperature sensor / Ambient temperature range

1 standard-sensor-design -20...60°C
Max. liquid temperature at standard-sensor-design:
130°C at PTFE, PFA, ETFE, Dick PTFE
90°C at hard rubber; 60°C at soft rubber
3 high-temperature-sensor-design -20...60°C
Max. liquid temperature at high-temperature-sensor-design:
180°C at PFA, Dick PTFE; 130°C at ETFE, PTFE
(high-temperature-sensor-design only available up to DN 300)

Electrode version

1 standard
5 pointed

S standard version

order code / continuation

S

fill level | water level | pressure | temperature | flow | visualization | signal converter | sensoric

ACS-CONTROL-SYSTEM GmbH
Lauterbachstr. 57
D- 84307 Eggenfelden

ACS-CONTROL-SYSTEM
knowledge and systems
Your partner for measuring technology and automation

ACS-CONTROL-SYSTEM GmbH
Lauterbachstr. 57
D- 84307 Eggenfelden

Tel.: +49 (0) 8721/ 9668-0
Fax: +49 (0) 8721/ 9668-30

info@acs-controlsystem.de
www.acs-controlsystem.de