EDD575 Differential Pressure Transmitter

Turn Down up to 1:16

Accuracy better than 0.1%

High long term stability

Diff. pressure range 3.75 mbar...20 bar

Line pressure up to 140 bar

HART® communication

Zero adjustment

Damping

Robust and modular design

Square root output (FKK)

Linearisation table (FKK)

Analogue or digital display (Option)

Description

The EDD575 differential pressure transmitter accurately measures differential pressureand transmits a 4...20mA/ HART® signal based on linear output or square root (FKK).

0.1% accuracy for all configured spans is the standard feature covering differential ranges from 0.0375 bar to 20 bar.

The micro-capacitance silicon sensor element assures this accuracy for all elevated or suppressed measuring ranges without additional adjustment. Silicon has great mechanical properties, such as no hysteresis featuring an excellent repeatability.

The compensation data is stored in the sensor device, making it possible to replace the electronics unit, the HART® communication module and the local indicators without re-calibrating the complete assembly.

The HART® communication module can be configured with a standard HART® communicator.

Analogue and digital indicators can be mounted displaying individual read-outs.

The EDD575 is suitable for a wide range of process applications in differential pressure, level and flow measurements.

Technical Data

Static pressure, span and range limits

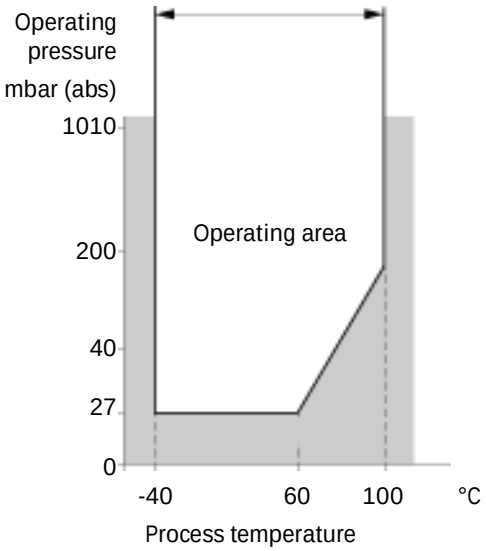
Type	Static pressure (bar)	Span limits (mbar) FHK Min.	FKK Min.	FHK/FKK Max.	Range limit (mbar)
FxKx12	-1...32	6	3.75	60	±60
FxKx33	-1...140	32	20	320	±320
FxKx35	-1...140	130	81.25	1300	±1300
FxKx36	-1...140	500	312.5	5000	±5000
FxKx37	-1...140	2000	1250	20000	±20000

Process connection

1/4-18 NPT, meets DIN 19213.

Static pressure - lower limit

Silicone Oil:



Fluorinated oil:
660 mbar abs at temperatures below 80°C

Static pressure - overrange limit

Diff. pressure < 60 mbar: 32 bar
Diff. pressure > 60 mbar: 140 bar

Media

Liquid, gas or vapour

Unit conversion

1MPa=10^3kPa=10bar=10.19716kgf/cm^2=145.0377PSI

1kPa=10mbar=101.9716mmH_2O=4.01463inH_2O

Output

Model FHK: 4...20mA, 2-wire, linear

Model FKK: 4...20mA, 2-wire with HART® linear or square root

Normal / reverse output

Model FHK: Selectable with a jumper pin located on the electronics unit.

Model FKK: Selectable from the Hand Held Communicator

Output linearization

(Model FKK only)
14 points linearization table configurable from HHC.

Accuracy for lineary output

(including linearity, hysteresis and repeatability)

Span > 1:10 of URL: ±0.1% of span

Span < 1:10 of URL (model FKK only):

± (0.05 + 0.05(0.1 x URL/Span))% of span

Accuracy for square root output

(Model FKK only)

Output	**Span > 1:2.5 of URL**
50..100%	±0.1%
20...50%	±0.25%
10..20%	±0.5%
Output	**Span < 1:2.5 of URL**
50..100%	±(0.05 + 0.05 x 0.1 x URL/span)%
20...50%	±2.5 x (0.05 + (0.05 x 0.1 x URL/span))%
10..20%	±5 x (0.05 + (0.05 x 0.1 x URL/span))%

Communication

(Model FKK only)

Items	HART® Protocol Display	Set	FXW Protocol Display	Set
Tag no.	x	x	x	x
Model no.			x	x
Serial no.	Yes		x	
Engineering unit	x	x	x	x
Range limit	x		x	
Measuring range	x	x	x	x
Damping	x	x	x	x
Output mode	x	x	x	x
Burnout direction	x		x	x
Adjustment	x	x	x	x
Output adjust	x	x	x	x
Data	x		x	
Self diagnoses	x		x	
Printer			x	
External switch lock	x	x	x	x
Display {1}			x	x
Linearise {2}			x	x
Re-range {2}			x	x

Notes

{1} A standard HHC (e.g. model 275) must be higher than version 5.0 or a FXW####1-#2 must be used, e.g. FXW 28AA1-A2

{2} HHC must be higher than version 5.3

Technical Data

Zero and span adjustment

Model FHK and FKK:
Zero and span are adjustable with an external adjustable screw. The function is determined with the MODE switch.

MODE	Function
Zero	Adjust zero
Span	Adjust span
Inhibit	Disable adjustment screw

Model FKK only:

Span	Adjustable with the Hand Held Communicator
Zero	Adjustable with the Hand Held Communicator

Zero elevation / suppression

–100...100% of URL

Low flow cut-off

User configurable for any point between 7...20% of output (Model FKK only)

Burnout direction

If the self-diagnostic function detects a transmitter failure, the analog signal will be driven to either "Output Hold", "Output Overscale" or "Output Underscale" modes.

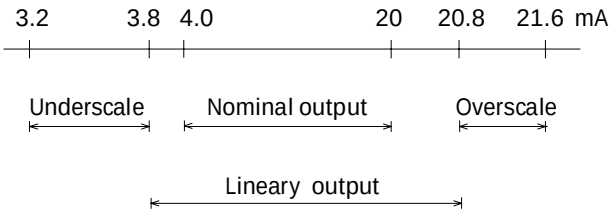
Model FHK: Unless otherwise specified in the order, the transmitter will be shipped in "Output Hold" mode.

Model FKK: Selected from HHC

"Output Hold": Output signal is hold as the value just before failure happens.

"Output Overscale": Approx. 21.6 mA
(Adjustable within 20.8...21.6 mA with the HHC)

"Output Underscale": Approx. 3.8 mA
(Adjustable within 3.2...3.8 mA with the HHC)



Loop-check output

Model FHK: The transmitter can output a constant signal of 4mA, 12mA or 20mA if the MODE switch is set to „loop check“ mode.

Model FKK: Transmitter can be configured to provide a constant output of 3.8...21.6mA by HHC.

Indication

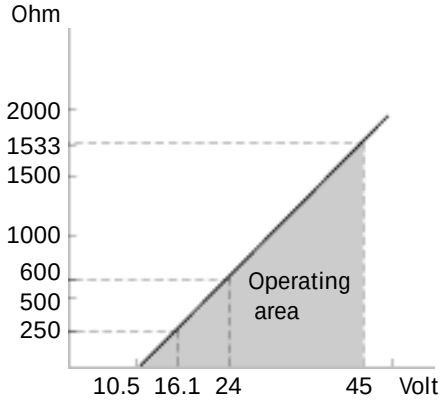
Analog indicator or 4 ½ digit LCD meter

Power supply

Supply range	10.5...45V_{DC}
Arrester option	10.5V...32V_{DC}

Load limitations

Note: Communication with a handheld communicator requires a min. circuit resistance of 250 Ohms.



Operational conditions

Ambient temperature

Standard model	–40...85°C
With LCD indicator	–20...80°C
With Arrester option	–40...60°C
With Fluorinated oil filling	–10...60°C

Process temperature

Silicone oil filling	–40...100°C
Fluorinated oil filling	–20...80°C
Storage temperature	–40...90°C
Humidity	100% RH

Mounting position effect

Per 10° tilt in any plane

Span: No effect

Zero shift: < 1.2mbar for silicone oil

Zero shift: < 2.4mbar for flourinated oil

This error can be corrected by adjusting Zero.

Temperature effect - Lineary output

Per 28°C change at the process connection in the range –40...85°C:

Ordering code (6th digit)	Effect
„2“	Zero: ±(0.25 x URL/span)% Total: (Zero effect + 0.25)%
„3, 5, 6, 7“	Zero: ±(0.1 x URL/span)% Total: (Zero effect + 0.075)%

Temperature effect - Square root output

(Model FKK only)

Per 28°C change at the process connection in the range –40...85°C:

Ordering code (6th digit)	Shift at 20% output point
„2“	±(0.625 x URL/span) %
„3, 5, 6, 7“	±(0.25 x URL/span) %

Technical Data

Static pressure effect

Ordering code (5th digit)	Effect
„1“ (per 32 bar)	Zero: ±0.4% of URL Span: ±0.4% of span
„3“ (per 100 bar)	Zero: ±0.2% of URL Span: -0.5...0% of span

Overrange effect

Ordering code (5th digit)	Effect
„1“ (per 32 bar)	Zero: ±0.4% of URL
„3“ (per 140 bar)	Zero: ±0.4% of URL

Supply voltage effect

Less than 0.05% of span per 10V.

RFI effect

Less than 0.2% of URL for the frequencies of 20 to 1000MHz and field strength 30 V/m when electronics covers on.

(Classification: 2-abc: 0.2% span per SAMA PMC 33.1)

Stability

0.2% of upper range limit (URL) for 24 months

(In case of 6th digit ordering code "3", "5", "6", "7")

Damping

Model FHK:
Time constant fixed: 0; 0.3; 1.2; 4.8; or 19.2 sec.

Model FKK:
Time constant adjustable in the range 0...38.4 sec.

Step response

(without electrical damping)

Ordering code (6th digit)	Time Constant	Dead Time
„2“	0.85 sec.	0.3 sec.
„3“	0.45 sec.	0.3 sec.
„5, 6, 7“	0.2 sec.	0.3 sec.

EMC data

Immunity	EN 50082-2
Emission	EN 50081-1

Approval EEx ia IIC T4/T5

Temperature class	T1...T4: $-40 < T_{amb} < 85°C$ T1...T5: $-40 < T_{amb} < 70°C$
Barrier data	$U < 30\ V_{DC}$; $I < 0.1$ A; $P < 0.75$ W
Zones	Media: 0; Housing: 0

Wetted parts material

Process cover, wetted sensor body and vent/drain
AISI 316 (W.1.4436 or W.1.4401)

Diaphragm
AISI 316L (W.1.4404 or W.1.4435)

Sensor gasket
Viton O-rings or PTFE square section gasket.

Non-wetted parts material

Electronics housing

Low copper die cast aluminum alloy (standard), finished with epoxy/polyurethane double coating.

Bolts and nuts

Cr-Mo alloy (standard):
AISI 316 (W.1.4436) or AISI 630 (W.1.4542)

Mounting bracket AISI 304 (W.1.4301)

Filling fluid

Silicone oil (standard) or fluorinated oil (Daifloil)

Other mechanical data

Protection class	IP67 and NEMA 4X
Mounting	On 50mm (2") pipe using mounting bracket, direct wall mounting or direct process mounting.
Weight	3.4kg without options. + 0.5kg for mounting bracket + 0.8kg for indicator (option)

Electrical connections

G1/2, 1/2-14 NPT, Pg13.5 or M20 x 1.5 conduit

Other electrical data

Dielectric strength	500 V_{AC}, 50/60 Hz, 1 min. between circuit and earth
Insolation resistance	> 100 Mohm at 500 V_{DC}
Power-on time	4 sec.

Internal resistance for external field indicator: < 12 Ohm

Optional features

Indicator
A plug-in turnable analog indicator (1.5% accuracy) can be located in the electronics compartment or in the terminal box of the housing.

An optional 4½ digits LCD meter is also available.

Arrester
A built-in arrester protects the electronics from lightning surges.

Lightning surge immunity: 4KV (1.2 x 50µs)

Oxygen measurement
Special cleaning procedures are followed throughout the process to maintain all process-wetted parts oil-free.

The filling fluid is fluorinated oil.

Degreasing
Process-wetted parts are cleaned, but the fill fluid is standard silicone oil.

Not for use for oxygen or chlorine measurement.

NACE specification
Metallic materials for all pressure boundary parts comply with NACE MR-01-75. AISI316 stainless steel bolts and nuts, ASTM B7M or L7M bolts and 2HM nuts (Class II).

Diaphragm
Gold coating upon request

Technical Data

Accessories

Oval flanges
Converts process connection to 1/2-14 NPT
Material AISI 316 (W.1.4436 or W.1.4401)

Three-valve manifold
Available in carbon steel or in AISI 316 (W.1.4436 or W.1.4401) stainless steel and in pressure rating 140 bar.

Hand-held communicator
Model FXW or model 275

Communication module
(standard for model FKK)

When using this module for model FHK, remote setting function becomes available.

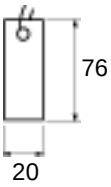
Note :
When the communication module is connected, the operation mode of external zero/span adjustable screw is changed to zero adjustment only.

Test certificate

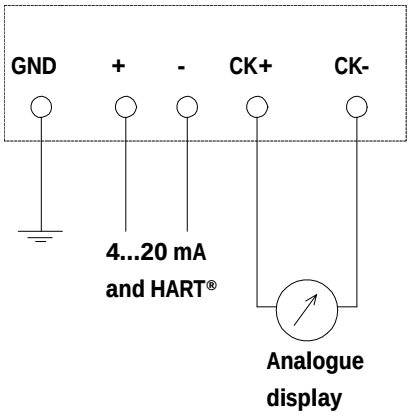
Test certificate based on 5 measuring points up and down is included.

Optional stainless steel tag

A stainless steel tag with customer data is wired to the transmitter.



Connection diagram



Ordering Details

EDD 575 differential pressure transmitter

FxK xxxx xxxx xxxx	Type
H	Output 4...20 mA (linear output)
K	Output 4...20 mA + HART® communication (configurable linear or square root output)

	Process connection	Oval flange screw	Electrical connection
T	1/4 - 18 NPT	7/16 - 20 UNF	1/2 - 14 NPT
V	1/4 - 18 NPT	M10 or M12 {3}	PG13.5
W	1/4 - 18 NPT	M10 or M12 {3}	M20 x 1.5
X	1/4 - 18 NPT	7/16 - 20 UNF	PG13.5

	Static pressure	Span (max)	Diaphragm	Cover and body
12V	-1...32 bar	-60...60 mbar {4}	AISI316L	AISI316
33V	-1...140 bar	-320...320 mbar {4}	AISI316L	AISI316
35V	-1...140 bar	-1.3...1.3 bar {4}	AISI316L	AISI316
36V	-1...140 bar	-5...5 bar {4}	AISI316L	AISI316
37V	-1...140 bar	-20...20 bar {4}	AISI316L	AISI316

	Indicator	Arrester
1A	None	none
1B	Analogue, 0...100% linear scale	none
1C	Analogue, 0...100% square root scale	none
1D	Analogue, customer scale	none
1J	Analogue, double scale, please specify	none
1E	None	yes
1F	Analogue, 0...100% linear scale	yes
1G	Analogue, 0...100% square root scale	yes
1H	Analogue, customer scale	yes
1K	Analogue, double scale, please specify	yes
1L	Digital, 0...100%	none
1P	Digital, customer scale (FKK only)	none
1M	Digital, 0...100%, square root scale	none
1Q	Digital, 0...100%	yes
1S	Digital, customer scale (FKK only)	yes
1N	Digital, 0...100%, square root scale	yes

	Ex Approval
A	None (standard)
K	EEx ia IIC T4/T5

	Side vent/drain	Mounting bracket
A	None	None
C	None	Yes, stainless steel
D	Yes	None
F	Yes	Yes, stainless steel

	Tag plate
Y	None
B	Yes

	Treatment	Filling fluid
Y	None (standard)	Silicone oil
G	Degreasing	Silicone oil
A	Oxygene application	Fluorinated oil
N	NACE, Note {5}	Silicone oil

	Process cover gasket in stainless steel flange
A	Viton
C	PTFE square section gasket

	Bolts material
A	Cr-Mo (standard)
C	NACE (ASTM A193 B7M bolts and A194 2HM nuts)
D	NACE (ASTM A320 L7M bolts and A194 2HM nuts)
E	AISI 316 bolts and AISI 316 nuts, Note {5}
F	AISI 630 bolts and AISI 304 nuts

Ordering Details

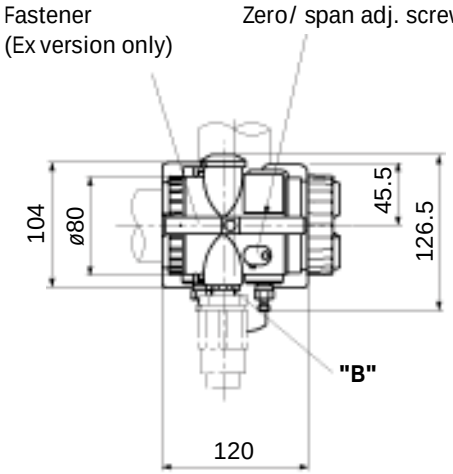
Notes

{3} Static pressure < 100 bar: M10 bolts
Static pressure 100...140 bar: M12 bolts

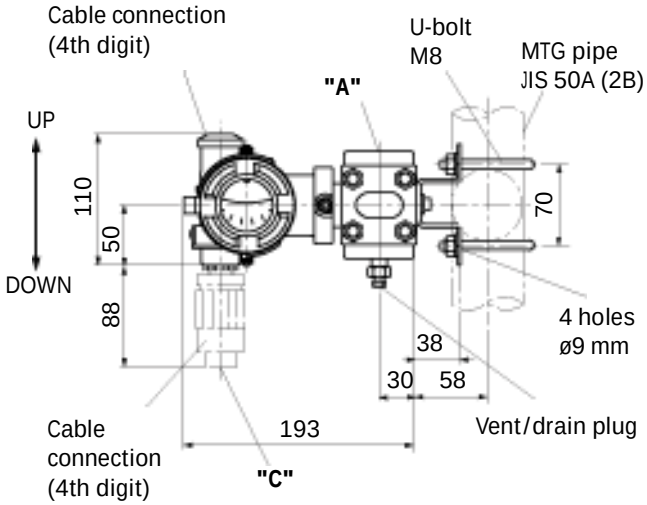
{4} See table page 2

{5} Static pressure max. 100 bar

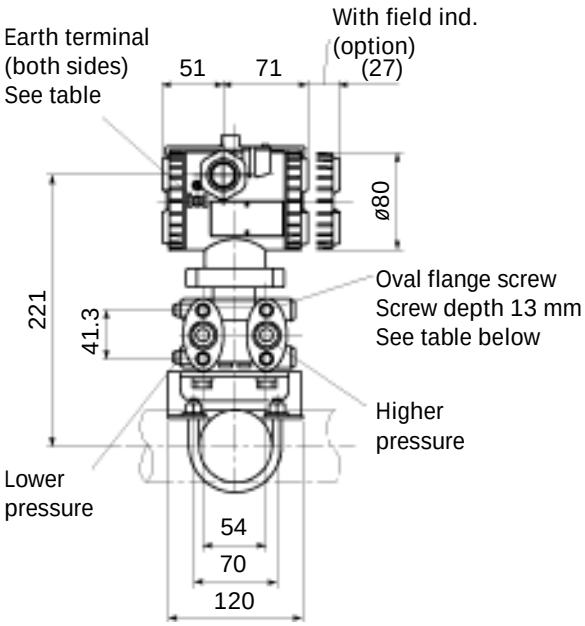
Dimensional Drawings



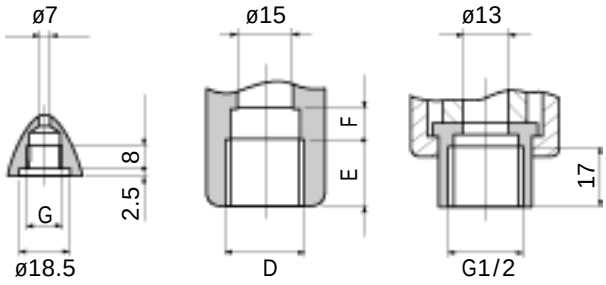
EDD575 Top view



EDD575 Front view



EDD575 Side view



Details of "A" Process Connection

Details of "B" Conduit Connection

Details of "C" Conduit Connection

Symbol	Conduit connector			Process connection	Oval flange screw	Earth
(4th digit)	D	E	F	G		terminal
T	1/2 - 14 NPT	16	5	1/4 - 18 NPT	7/16 - 20 UNF	No 8 - 32 UNC
V	PG13.5	8	4.5	1/4 - 18 NPT	M10 or M12	M4
W	M20 x 1.5	16	5	1/4 - 18 NPT	M10 or M12	M4
X	PG13.5	8	4.5	1/4 - 18 NPT	7/16 - 20 UNF	M4