

FlexBar HRT Pressure Transmitter

4...20 mA, 2-wire transmitter,
HART® communication

Configurable span, unit
and damping

Turn down 25:1

Zero point adjustment

2-point calibration

-1(0)...400 bar

Gauge or absolute pressure

400% overpressure safety limit

Hygienic process connections

EEx ia IIC T5/T6, ATEX II 1G

Ex N IIC T5/T6



Description

FlexBar HRT is a loop powered, configurable pressure transmitter. FlexBar HRT measures the pressure by means of a polysilicon strain gauge sensor. The electronics are separated from the media by a thin diaphragm and an oil-filling. Three different oil fillings are available including a mineral oil complying with demands from FDA for use in the food and pharmaceutical industry.

The electronics are located in a separate sealed housing giving FlexBar HRT superb resistance to moisture. Cable connection is via gland or plug.

The HART® communication features on-line process calibration/adjustment and transmitter configuration.

FlexBar HRT is used in food, chemical and petrochemical industries to measure absolute or gauge pressure for machine and hydraulic applications etc.

The wide range of process connections together with the configurable facilities make FlexBar HRT the ideal choice for all pressure measuring applications.

Hygienic process connections for a wide range of standards are available for FlexBar HRT with a flush diaphragm and G1/2A nipple. Please refer to the data sheet for FlexBar HRT Accessories .

The FlexView LC-display is optional.

Technical Data

Input

Measuring limits	See "Ordering Details"
Overpressure	400% of f.r., max. 600 bar (continuously)

Output

Signal span	4...20 mA or 20...4 mA {1} 2-wire, HART® communication
Output limits	3.5...23 mA {1}
Characteristic	Linear or customized with max. 30 points {1}
Accuracy	<0.25% f.r.
Isolation voltage	500 V _{ac} (From housing to 4...20 mA connection)
Resolution	12 bit
Load equation	$R_L < (V_{cc} - 6.5) / 23$ [kOhm]

Display (optional)

Please refer to FlexView data sheet

Opto-relay

Voltage, standard	Max. 230 V _{ac}
Voltage, GL-approved	Max. 60 V _{ac}
DC-voltage	Max. 50 V _{dc}
Current, continuously	Max. 50 mA
Current, pulse	Max. 500 mA
Relay function	Set/reset {1}

Configuring limits

Span	4...100% of full range {1}
Zero point	0...96% of full range {1}
Auto zero	-10...10% of full range {1}

Communication

FlexProgrammer	PC-program (Windows) 2-way communication (Refer to data sheet)
HART® protocol	HCF standard
Features {1}	Read serial number Read/Change user ID Read/Change configuration Read input signal value Read output signal value Input signal logging 2-point sensor trim Current output trim

Power supply

Nominal	24 V _{dc}
Supply voltage	6.5...35 V _{dc}
Effects caused by changes in power supply:	
Zero point	0.005% per V
Measuring range	0.001% per V

Error handling

Up/Down scaling	23 mA/3.5 mA {1}
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Operational conditions

Storage temperature	-40...85°C
Process temperature	Standard: -30...120°C Cleaning <135°C for 15 min. Cooling neck: -30...200°C
Ambient temperature	-10...70°C
Relative humidity	<98%, condensing
Protection class	Plug: IP 65 Gland: IP 65 + IP 66
Vibrations	Lloyds Register, test 2
Shock test	100g for 10 msec.

Operational condition effects

Ambient temperature influence, measured at -10...70°C and max. span:	
Zero point:	<0.05% per 10K
Span:	<0.05% per 10K
Process temperature:	<0.2% per 10K
Cooling neck only: Media temperature (t _m) influence in the temperature interval 100...200°C:	
G1/2A:	20 mbar + (t _m - 100) x 2.0 mbar
DS 722:	20 mbar + (t _m - 100) x 0.5 mbar
ISO 2852:	20 mbar + (t _m - 100) x 0.5 mbar
3A/DN38:	20 mbar + (t _m - 100) x 1.0 mbar
3A/DN76:	20 mbar + (t _m - 100) x 0.5 mbar
Varivent:	20 mbar + (t _m - 100) x 0.5 mbar

Transitional behaviour

Switch-on time	4 sec.
Sample time	0.5 sec.
Step response time	<1 sec.
Damping, t _{sp}	0...60 sec. (2 sec. steps) {1}
Long-term drift	Typ. 0.1% per year

EMC data

Immunity	EN 50082-2
Emission	EN 50081-2

EX data (Demko)

Supply range	6.5...30 V _{dc}
Approval	EEx ia IIC T5/T6, ATEX II 1G
EEx ia IIC T1...T5:	-10 < T _{amb} < 70°C
EEx ia IIC T6:	-10 < T _{amb} < 50°C
Standards	EN 50014 and EN 50020
Approval	Ex N IIC T5/T6
Ex N IIC T1...T5:	-10 < T _{amb} < 70°C
Ex N IIC T6:	-10 < T _{amb} < 50°C
Standard	BS 6941:1988
Internal inductivity	L _i < 10 µH
Internal capacity	C _i < 1 nF
Barrier data	U _{max} = 30 V _{dc} ; I _{max} = 0.1 A P _{max} = 0.75 W

Note

{1} Configurable

Technical Data

Materials

Housing:	Stainless steel (AISI 304/W1.4301)
Pressure sensor:	Polysilicon strain gauge
Fill fluid:	Ondina, Halocarbon or DC550
Wetted parts:	Acid-proof stainless steel (AISI 316L/W1.4404) or Hastelloy C PTFE-teflon coating

Disposal of product and packing

According to national laws or by returning to Haenni.

Electrical connection

Cable entry	Gland PG9, PG13.5 or M20 Plug DIN 43650, form B
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Approval

Germanischer Lloyd (with cable type no. 81 26-940)

Additional Description

The mounting of the pressure sensor ensures fast response time, excellent temperature compensation and high measuring accuracy. All diaphragm weldings are checked with a helium leak-tester.

FlexBar HRT can be configured either with a handheld HART® communicator or with the dedicated Haenni FlexProgrammer unit connected to a standard PC.

Unless specified FlexBar HRT is supplied with a standard configuration:

Pressure at 4 mA:	Minimum measuring limit
Pressure at 20 mA:	Maximum measuring limit
Damping:	0 sec.
Device address:	0

Accessories for FlexBar HRT are usually supplied separately and must be assembled by the customer. However, if you prefer the accessories to be assembled from the factory prior to delivery, please order type number 81 26-950.

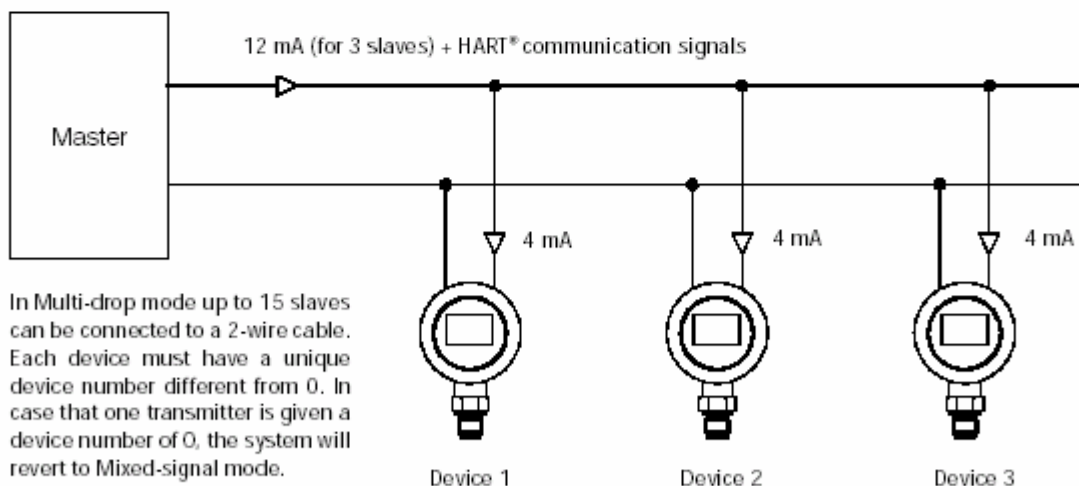
Having the HART® communication facilities the FlexBar HRT can be operated as a conventional 4...20 mA device, or it can be connected to other HART® devices in a 2-wire HART® network, in one of three connection methods:

Mixed-signal: Please refer to HART® literature

Point-to-point: See „Applications“

Multi-drop: See below

Multi-drop mode:



In Multi-drop mode up to 15 slaves can be connected to a 2-wire cable. Each device must have a unique device number different from 0. In case that one transmitter is given a device number of 0, the system will revert to Mixed-signal mode.

Measuring Units Conversion

bar	PSI	mH ₂ O	Pascal	kPa	MPa
1	14.5	10.197	10 ⁵	100	0.1

Ordering Details

FlexBar HRT

816x xxxx xxxx	Type			
1	4...20 mA			
2	4...20 mA with opto-relay			
3	4...20 mA with HART® communication			
4	4...20 mA with HART® communication and opto-relay			
Safety				
1	Standard version			
2	Ex ia IIC T5/T6, ATEX II 1G			
3	Ex N IIC T5/T6			
Cable connection				
1	Gland PG13.5			
2	Gland M20			
3	Plug DIN 43650, form B {2}			
4	Gland PG9			
Process connection position				
1	At the base			
2	At the rear			
3	At the base with cooling neck {3}			
4	At the rear with cooling neck {3}			
Diaphragm surface				
1	Standard			
2	Covered with Teflon {4}			
Oil filling				
1	Ondina (Recommended for food industry applications)			
2	Halocarbon (For Oxygen measuring)			
3	DC550 (Silicone oil for high temperature applications)			
Process connection standard				
1	Flush diaphragm	G1/2A	PN400	AISI 316L
2	Flush diaphragm	G1/2A	PN400	Hastelloy C-276
3	DS 722 union	DN40	PN16	AISI 316L
4	ISO 2852 clamp	DN38	PN40	AISI 316L
5	ISO 2852 clamp	DN51	PN40	AISI 316L
6	3A hygienic connection	DN38	PN40	AISI 316L
7	3A hygienic connection	DN76	PN40	AISI 316L
8	GEA Tuchenhagen Varivent		PN40	AISI 316L
9	SMS 1145 nipple	DN38	PN25	AISI 316L
E	M44 x 1.25 nipple, pulp and paper version		PN16	AISI 316L
F	M44 x 1.25 nipple, hygienic version		PN16	AISI 316L
G	ø43 mm hygienic connection		PN16	AISI 316L
H	DIN 11851 union	DN40	PN25	AISI 316L
J	DIN 11851 union	DN50	PN25	AISI 316L
K	SMS 1145 union	DN38	PN25	AISI 316L
L	SMS 1145 union	DN51	PN25	AISI 316L
S	Gauge connection for external seal {5}	G1/2A	PN16	DIN 16288
Pressure type				
1	Relative pressure (bar)			
2	Absolute pressure (bar)			
Pressure range				
1	-0.1...0.4	0...0.4		
2	-0.4...1	0...1		
3	-1.0...2.5	0...2.5		
4	-1.0...6	0...6		
5	-1.0...16	0...16		
6	-1.0...40	0...40		
7	-1.0...100	0...100		
8	-1.0...400	0...400		