



Flow Rate Transmitter HFT 3100 Ex applications

Turbine

High accuracy

Additional measuring connections

Flameproof enclosure
ATEX, IECEx, CSA, triple approval
HART interface



Description:

HFT 3100 with HART interface is a compact flow rate transmitter with flameproof enclosure specially developed for applications in hydraulic systems and other fluid power systems.

The triple approval in accordance with ATEX, IECEx and CSA enables universal, worldwide utilisation of the devices in potentially explosive atmospheres.

The HFT 3100 operates in accordance with the turbine principle, which means that the rpm of an impeller wheel rotating in the flow of the media is measured and converted into a 4 .. 20 mA analogue signal. In addition with the analogue output of the measured value, digital communication is possible by means of the HART protocol.

Two additional G1/4 threaded bore holes in the turbine housing provide the flow rate transmitter with additional connection options, e.g. for temperature and pressure sensors.

Protection types and applications:

cCSA_{US} Explosionproof - Seal not required
Class I Group A, B, C, D, T6, T5
Class II Group E, F, G
Class III
Type 4

ATEX Flameproof
I M2 Ex d I Mb
II 2G Ex d IIC T6, T5 Gb
II 2D Ex tb IIIC T110 .. 120 °C Db

IECEx Flameproof
Ex d I Mb
Ex d IIC T6, T5 Gb
Ex tb IIIC T110 .. 120 °C Db

Technical data:

Input data

Measuring range and operating pressure	1.2 .. 20.0 l/min	420 bar
	6.0 .. 60.0 l/min	420 bar
	15.0 .. 300.0 l/min	420 bar
	40.0 .. 600.0 l/min	420 bar

Additional connection options ¹⁾ 2x G 1/4 female threads for pressure or temperature sensors with relevant approvals

Housing material	Stainless steel 1.4404
Parts in contact with fluid	Stainless steel: 1.4404, 1.4460, tungsten carbide

Output data

Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, with HART protocol $R_{L,max} = (U_B - 12 V) / 20 \text{ mA [k}\Omega\text{]}$ for HART communication min. 250 Ω HART communication acc. to HART 7 specifications HART Common Practice Commands, e.g. altering of measuring range limits (see table)
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Accuracy $\leq 2\%$ of the actual value

Environmental conditions

Operating/ambient temperature range ²⁾	T6, T110 °C	Ta = -40 .. +60 °C
	T5	Ta = -40 .. +70 °C
Storage temperature range	-40 .. +100 °C	
Fluid temperature range ²⁾	T6, T110 °C	Ta = -40 .. +60 °C
	T5	Ta = -40 .. +70 °C

CE mark

Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz	$\leq 10 \text{ g}$
Protection class acc. to DIN EN 60529 ISO 20653	IP 69

Other data

Measuring medium	Hydraulic oil, water based fluid
Viscosity range	1 .. 100 cSt
Calibration viscosity	30 cSt
Supply voltage	12 .. 30 V DC
Residual ripple of supply voltage	acc. to FSK Physical Layer Specification (HCF_SPEC_054)
Current consumption	$\leq 25 \text{ mA}$
Weight	
HFT 31XX-F21-0020	2.5 kg
HFT 31XX-F21-0060	4.0 kg
HFT 31XX-F21-0300	5.7 kg
HFT 31XX-F21-0600	7.0 kg

Note: Reverse polarity protection of the supply voltage, overvoltage, override and short circuit protection are provided.

¹⁾ Not for measuring ranges 1.2 .. 20 l/min

²⁾ T120 °C at Ta = -40 .. +70 °C with electrical connection single leads available

Measuring Range Limits:

By means of HART Common Practice Commands, you have the opportunity to adjust the following measuring range limits:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
0 % FS	75 % FS	25 % FS	100 % FS	25 % FS	100 % FS

Fields of application:

	Single leads Electrical connection "9"	Jacketed cable Electrical connection "G"
CSA	Explosionproof (seal not required)	
ATEX	Flameproof	
IECEX	Flameproof	
cCSA_{US}	Class I Group A, B, C, D, T6, T5 Class II Group E, F, G Class III Type 4	
ATEX	I M2 Ex d I M II 2G Ex d IIC T6, T5 Gb	
	II 2D Ex tb IIIC T110 .. 120 °C Db	II 2D Ex tb IIIC T110 °C Db
IECEX	Ex d I Mb Ex d IIC T6, T5 Gb	
	Ex tb IIIC T110 .. 120 °C Db	Ex tb IIIC T110 °C Db

Model Code:

HFT 3 1 X X - F21 - XXXX - S - X - D - 000 (2m)

Mechanical process connection

- 1 = G 1/4" only for measuring range: 1.2 .. 20 l/min
- 3 = G 1/2" only for measuring range: 6.0 .. 60 l/min
- 6 = G 1 1/4" only for measuring range: 15 .. 300 l/min
- 7 = G 1 1/2" only for measuring range: 40 .. 600 l/min

Electrical connection

- 9 = 1/2-14 NPT Conduit male thread (single leads)
- G = 1/2-14 NPT Conduit male thread (jacketed cable)

Output signal

F21 = 4 .. 20 mA, 2-conductor, with HART protocol (4 mA ± 0 l/min)

Measuring ranges

- 0020 = 1.2 .. 20 l/min
- 0060 = 6.0 .. 60 l/min
- 0300 = 15.0 .. 300 l/min
- 0600 = 40.0 .. 600 l/min

Housing material

- S = stainless steel

Housing design

- 1 = without additional hole (measuring range 0020)
- 2 = with two additional female threads G 1/4 ISO 1179-2 (measuring ranges 0060, 0300, 0600)

Approval

- D = **CSA** Explosionproof (seal not required)
- ATEX** Flameproof
- IECEX** Flameproof

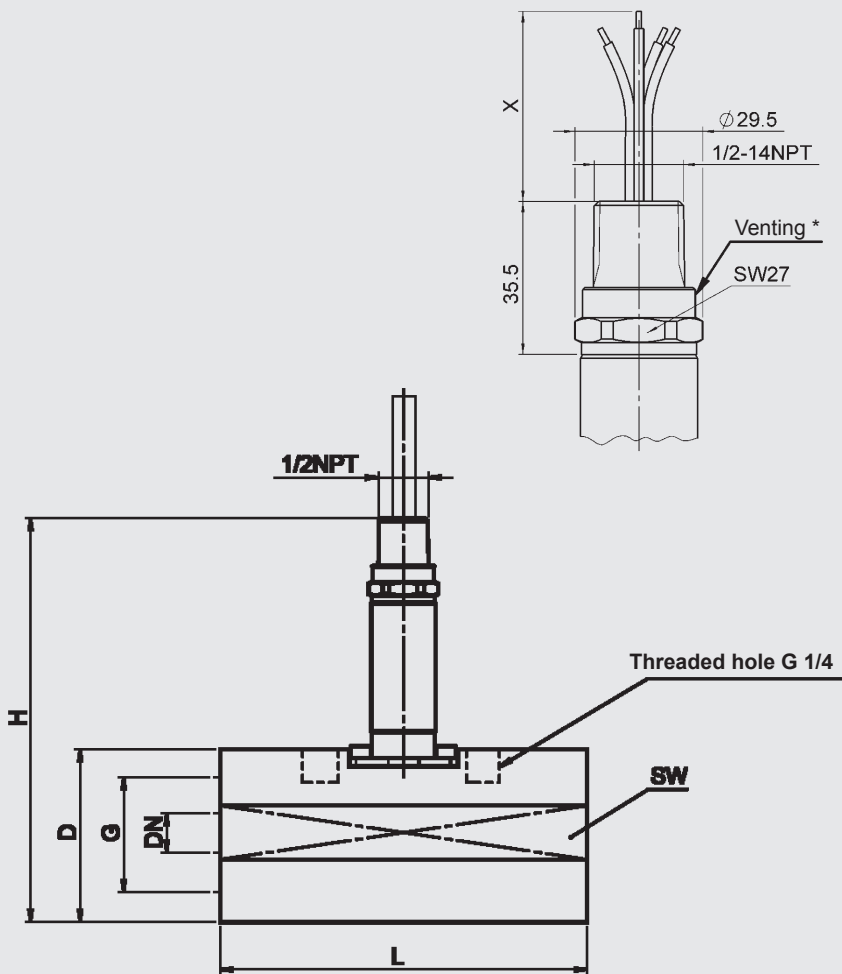
Modification number

- 000 = standard

Cable length in m

- Standard = 2 m

Dimensions:



Without threaded holes for temperature and pressure sensors:

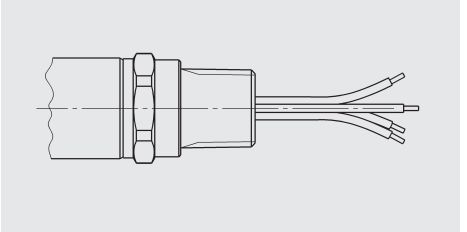
Model	Meas. range [l/min]	L [mm]	H [mm]	D / SW [mm]	G	Torque [Nm]	DN [mm]
HFT 31XX-F21-0020	1.2 .. 20	117	158	60 / 56	G 1/4"	35	7

With threaded holes for temperature and pressure sensors:

Model	Meas. range [l/min]	L [mm]	H [mm]	D / SW [mm]	G	Torque [Nm]	DN [mm]
HFT 31XX-F21-0060	6 .. 60	144	160	63 / 60	G 1/2"	65	11
HFT 31XX-F21-0300	15 .. 300	155	173	75.5 / 72	G 1 1/4"	240	22
HFT 31XX-F21-0600	40 .. 600	181	178	81 / 76	G 1 1/2"	290	30

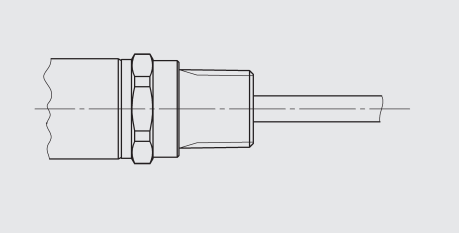
Pin connections:

Conduit (single leads)



Lead	HFT 31x9
red	Signal +
black	Signal -
green-yellow	Housing

Conduit (jacketed cable)



Lead	HFT 31xG
white	Signal -
brown	Signal +
green	n. c.
yellow	n. c.

Note:

The information in this brochure relates to the operating conditions and applications described. For applications or operating conditions not described, please contact the relevant technical department.

Subject to technical modifications.

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