



Temperature Transmitter ETS 4100

Integrated temperature probe

Accuracy 0.4 %

HART interface
Optional pressure measurement



Description:

The ETS 4100 with HART interface is an electronic temperature transmitter for monitoring of temperature in hydraulic systems.

Based on a silicon semiconductor device and corresponding evaluation electronics, the temperature sensor is designed to measure temperatures within a range of -25 °C .. +100 °C.

In addition to the analogue 4 .. 20 mA output of the measured value, digital communication is possible by means of the HART protocol.

The instrument provides the option of a pressure sensor. The pressure signal is given out as a digital signal via the HART protocol and the temperature signal is still available as an analogue signal (4 .. 20 mA).

The main fields of application are condition monitoring and power plant technology.

Technical data:

Input data						
Measuring range	-25 .. +100 °C					
Probe length	mm	10.7	50	100	250	350
Probe diameter	mm	8	8	8	8	8
Pressure resistance	bar	600	125	125	125	125
Mechanical connection	G1/4 A ISO 1179-2					
Tightening torque, recommended	20 Nm					
Parts in contact with fluid	Stainless steel Seal: FKM					
Output data						
Output signal, permitted load resistance	4 .. 20 mA, 2-conductor, with HART protocol $R_{Lmax} = (U_B - 12 V) / 20 \text{ mA [k}\Omega\text{]}$ for HART communication min. 250 Ω					
HART Communication	Acc. to HART 7 specifications					
HART Common Practice Commands i.e.	Altering of measuring range limits (see table)					
Accuracy (at room temperature)	$\leq \pm 0.4 \%$ FS typ. $\leq \pm 0.8 \%$ FS max.					
Temperature drift (environment)	$\leq \pm 0.01 \%$ FS / °C					
Response time acc. to DIN EN 60751	$t_{50}: \sim 10 \text{ s}$ $t_{90}: \sim 15 \text{ s}$					
Environmental conditions						
Operating temperature range ¹⁾	-40 .. +85 °C / -25 .. +85 °C					
Storage temperature range	-40 .. +100 °C					
Fluid temperature range ¹⁾	-40 .. +125 °C / -25 .. +125 °C					
CE mark	EN 61000-6-1 / 2 / 3 / 4					
Vibration resistance acc. to DIN EN 60068-2-6 at 10 .. 500 Hz	$\leq 20 \text{ g}$					
Protection class acc. to DIN EN 60529 ²⁾	IP 67					
Other data						
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	$\sim 280 \text{ g}$ (probe length 10.7 mm) $\sim 315 \text{ g}$ (probe length 50 mm, 100 mm) $\sim 350 \text{ g}$ (probe length 250 mm) $\sim 385 \text{ g}$ (probe length 350 mm)					

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

FS (Full Scale) = relative to complete measuring range

B.F.S.L. = Best Fit Straight Line

¹⁾ -25 °C with FKM seal, -40 °C on request

²⁾ With mounted mating connector in corresponding protection class

Measuring range limits:

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

Measuring range limits of the primary variable, temperature:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
-25 °C	75 °C	0 °C	100 °C	25 °C	125 °C

Model code:

ETS 4 1 4 X - F21 - XXX - 000

Mechanical connection

4 = G1/4 A ISO 1179-2

Electrical connection

5 = male, EN 175301-803, 3 pole + PE
(IP 67 mating connector supplied)

6 = male M12x1, 4 pole (mating connector not supplied)

Output signal

F21 = 4 .. 20 mA, 2-conductor, with HART protocol

Probe lengths

010 = 10.7 mm
050 = 50 mm
100 = 100 mm
250 = 250 mm
350 = 350 mm

Modification number:

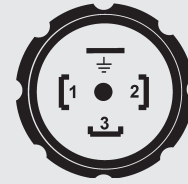
000 = standard

Accessories:

Appropriate accessories, such as mating connectors, can be found in the Accessories brochure.

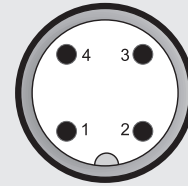
Pin connections:

EN 175301-803



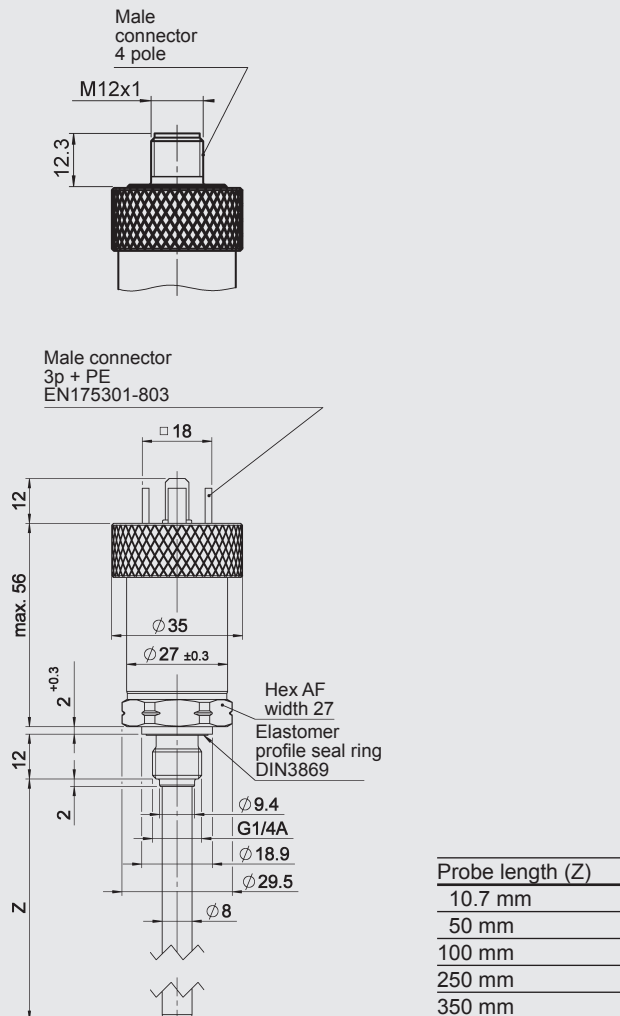
Pin	ETS 41x5-F21
1	Signal +
2	Signal -
3	n.c.
⊥	PE

M12x1



Pin	ETS 41x6-F21
1	Signal +
2	n.c.
3	Signal -
4	n.c.

Dimensions:



Additional technical data with pressure measurement option:

Input data								
Measuring ranges	bar	16	40	60	100	250	400	600
Overload pressures	bar	32	80	120	200	500	800	1000
Burst pressure	bar	200	200	300	500	1000	2000	2000
Mechanical connection	G 1/2 A ISO 1179-2 with probe							
Tightening torque, recommended	45 Nm							
Probe length	7 mm							
Output data								
Output signal Temperature	4 .. 20 mA with HART Protocol							
Output signal Pressure	available via HART protocol as a digital signal							
Accuracy acc. to DIN 16086, terminal based	≤ ± 0.25 % FS typ. ≤ ± 0.5 % FS max.							
Accuracy, B.F.S.L.	≤ ± 0.15 % FS typ. ≤ ± 0.25 % FS max.							
Temperature compensation	≤ ± 0.008 % FS / °C typ.							
Zero point	≤ ± 0.015 % FS / °C max.							
Temperature compensation	≤ ± 0.008 % FS / °C typ.							
Span	≤ ± 0.015 % FS / °C max.							
Non-linearity acc. to DIN 16086, terminal based	≤ ± 0.3 % FS max.							
Hysteresis	≤ ± 0.1 % FS max.							
Repeatability	≤ ± 0.05 % FS							
Long-term drift	≤ ± 0.1 % FS typ. / year							
Environmental conditions								
Compensated temperature range	-25 .. +85 °C							

Measuring range limits:

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

Measuring range limits of the secondary variable, pressure:

Lower measuring range limit		Upper measuring range limit		Measuring span	
min	max	min	max	min	max
0 % FS	112.5 % FS	37.5 % FS	150 % FS	37.5 % FS	150 % FS

Model code with pressure measurement option:

ETS 4 1 2 X – F21 – 007 – P – XXXX – 000

Mechanical connection

2 = G1/2 A ISO 1179-2

Electrical connection

5 = male, EN 175301-803, 3 pole PE (IP 67 mating connector supplied)

6 = male M12x1, 4 pole (mating connector not supplied)

Output signal

F21 = 4 .. 20 mA, 2-conductor, with HART protocol

Probe length

007 = 7 mm

With pressure measurement

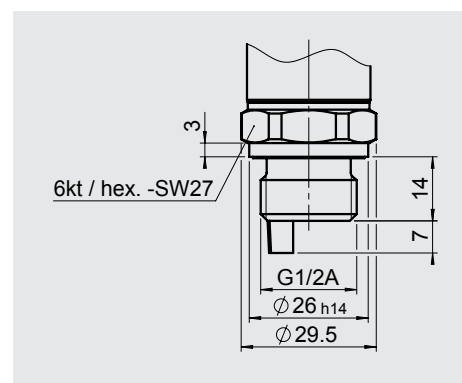
Measuring ranges in bar

0016; 0040; 0060; 0100; 0250; 0400; 0600

Modification number

000 = standard

Dimensions with pressure measurement option:



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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