

D2610

Miniature Precise SMART Pressure Transmitter with LHP Communication

- Only seven basic ranges cover pressures from 4 kPa to 60 MPa
- Programmable current output 4 to 20 mA with LHP communication
- Possibility of easy remote configuration, zero setting and reversal
- Accuracy 0.2 or 0.1 %, miniature dimensions
- Stainless steel diaphragm, various input designs including front-flush diaphragm
- Remote reconfiguration by LHPConf configurator or by the HARTWinConf software and standard HART modem



Application

The D2610 pressure transmitter is designed for multipurpose use in all industry fields. It converts gas or liquid pressures into the electric current or voltage signal. The output is the 4 to 20 mA current loop signal with possibility of zero setting, range resetting and output reversal via LHP communication along the output line. Reversed range is set by entering the higher pressure value for the range start and the lower pressure value for the range end. The model with the voltage output converts pressure into the 1 to 5 V voltage signal.

Thanks to adjustable damping it enables suppression of undesirable quick variations and oscillations of the output signal. Measured pressure medium should be compatible with the 1.4571 and 1.4435 stainless steels and with the used seal (see ordering table).

Description

Output voltage signal of the pressure sensor is transferred to the digital signal and further processed by the microcomputer. These values are recalculated to the pressure value through the production calibration constants and the user characterization constants. The output current is sent out via the D/A converter and the output circuits in accordance with the computed pressure value and the set range.

In addition to production calibration the transmitter is equipped with user characterization (up to five-point characterization is available) that enhances measurement accuracy by 0.1 %. User characterization is available in the user configuration program and it can be reset at any time and returned to the status at release after production completion.

Output of the transmitter is analogue signal of the current loop 4 to 20 mA or the 1 to 5 V voltage signal. The output can be used even for testing the current loop and the associated apparatus.

Transmitter adjustment requires the hand-held LHPConf (HARTConf) configurator, or the PC with the LHPWinConf program and the HARTMod (MH-02) modem, or with the equivalent communication interface. The transmitter communicates via its own LHP communication protocol that is partly compatible with the HART protocol with which it shares the same connection. Communication serves mainly for converter configuration and it is not intended for communication distance over 20 m. By means of the standard HART communicator it is possible to display basic setting parameters and to adjust the range by application of the input pressure.

Technical specifications

Supply voltage:

9 to 35 VDC for 4 to 20 mA current output
15 to 35 VDC for 1 to 5 voltage output
(internally protected against polarity inversion)

Power consumption:

max 0.8 W

Range of ambient temperature:

-20 to +85 °C
-40 to +60 °C with sealing Viton PARKER

Humidity:

0 to 100 % r. h. with condensation

Working position:

arbitrary (for lower pressure zero calibration after installation may be needed)

Connection of wires:

screw terminals for cross section 0.5 to 1.5 mm²

Protection:

IP 65 (in the short-term)

Dimensions:

see dimensional drawing

Weight:

approx. 140 g

Materials:

housing - stainless steel 1.4301, connector - PA
media wetted materials:
pressure port - stainless steel 1.4571
diaphragm - stainless steel 1.4435
seals – see ordering table

Reference conditions:

temperature 23 ± 5 °C
vertical working position with pressure port down
zero based range with span between 20 % and 100 % of max span
supply voltage 24 VDC
load of 250 Ohm
damping of 0.1 s

Input

Input pressure ranges:
see ordering table

Design of pressure port:
see ordering table and dimensional drawings

Overpressure:
min. 2 times of max span

Output

Output signal:
4 to 20 mA or 20 to 4 mA current signal
optional 1 to 5 V voltage signal with output internal resistance of 250 Ohm

Characteristics:
linear with pressure with possibility of custom linearization

Total accuracy:
≤ ±0.2 % of span (±0.1 % for code P01)
(Valid for reference conditions. For span between ±10 % and ±20 % of max span is total error
≤ ±0.04 % x max span / range span and for ranges with zero offset the error is multiplied by suppression coefficient = max. range span / range span.)

Nonlinearity:
≤ ±0.1 % of range

Hysteresis:
≤ ±0.1 % of range

Adjustability of span:
from ±10 % to ±100 % of max span
(negative values are valid for reversed range)

Adjustability of start:
from 0 % to 100 % of max span

Damping:
0 to 60 s

Step response time (90 %):
0.6 s for damping of 0.0 s
0.9 s for damping of 0.1 s
60 s for damping of 60 s

Sampling rate:
approx. 4 measurement per second

Load resistance:
 $R_L [\text{Ohm}] \leq (U_N [\text{V}] - 9) / 0.022$

Dielectric strength:
500 VAC (output against the metal housing)

Isolation resistance:
min. 100 MOhm

Supplementary parameters

Lifetime:
≥ 100 x 10⁶ pressure cycles

Output current limitation:
signal 3.8 to 20.5 mA acc. to NAMUR NE43

Indication of sensor or transmitter error:
optionally by > 21 mA or < 3.6 mA current acc. to NAMUR NE43

Supply voltage effect:
≤ ±0.005 % of span per 1 V

Influence of ambient temperature:

zero accuracy < ±0.6 % of max span for temperature from -20 to +85 °C for G116 to G910 and A116 to A240 ranges
span accuracy < ±0.8 % of span for temperature from -20 to +85 °C for G116 to G910 and A116 to A240 ranges
zero accuracy < ±1.5 % of max span for temperature from 0 to +50 °C for G040 and A040 ranges
span accuracy < ±1 % of span for temperature from 0 to +50 °C for G040 and A040 ranges

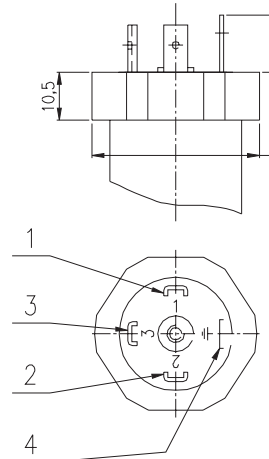
Warm-up time:
5 s

Long-term stability:
≤ ±0.1 % of max span per year for ranges G116 to G910, A116 to A240
≤ ±0.25 % of max span per year for ranges G040 and A040

Electrical connection

Connector EN 175301-803-A (IP 65, in the short-term, not suitable for outdoor installation without additional rain-proof protection).

When measuring small relative pressures, it is necessary to use the electric cable with a through capillary for supply of ambient atmospheric pressure to the measuring membrane in order to provide correct measurement results.



Output 4 to 20 mA, power supply from the current loop:
1 - PLUS output and power supply
2 - MINUS output and power supply, minus TEST (mA)
3 - plus TEST (mA)
4 - case, shield

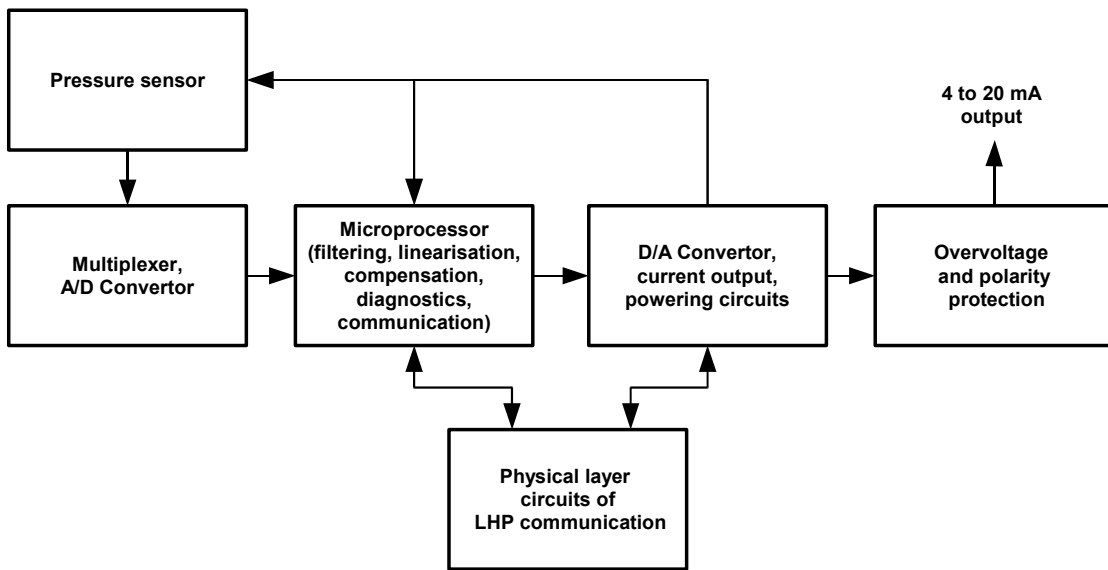
The TEST terminals are designed for measuring the output current by the ammeter with internal resistance $R_i < 15 \text{ Ohm}$.

The modem or the configurator are to be connected to the terminals 1 and 2. Loop impedance should be 200 Ohm at least to ensure communication.

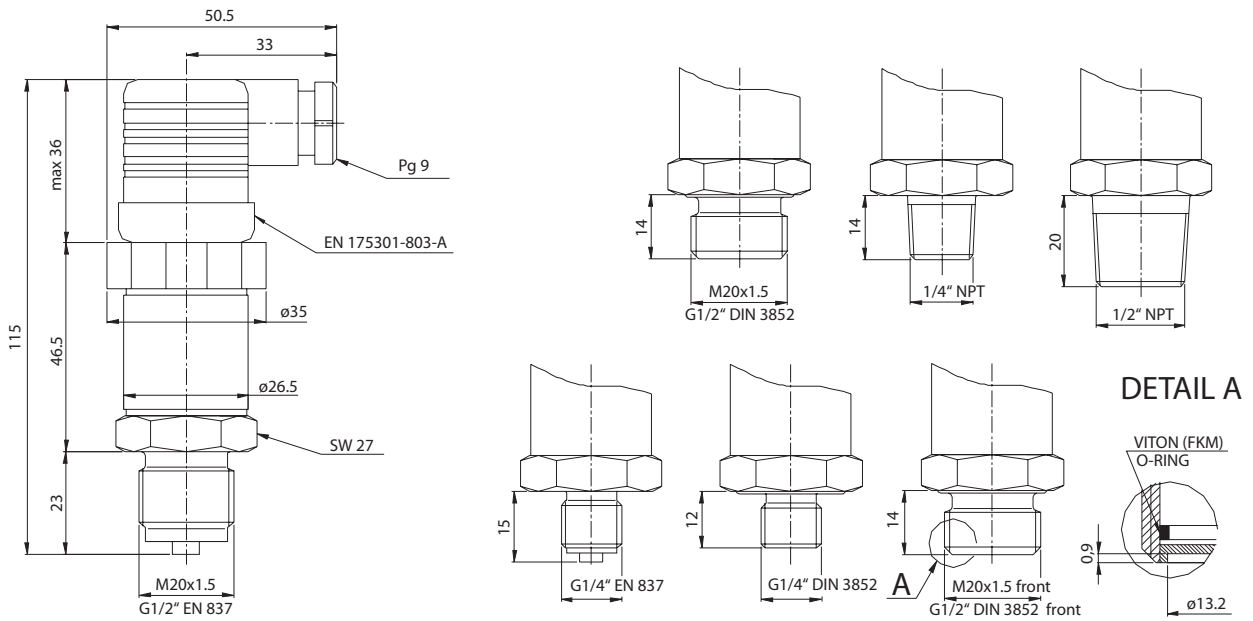
Output 1 to 5 V:
1 - PLUS power supply
2 - MINUS output and power supply
3 - plus OUTPUT (output internal resistance 250 Ohm)
4 - case, shield

The modem or the configurator are to be connected to the terminals 1 and 3, or 2 and 3.

Block diagram



Dimensional drawings



Miniature precise SMART Pressure Transmitter D2610 with LHP Communication

Type	Description
● D2610	Miniature SMART pressure transmitter with LHP communication
Code	Basic range
● G040	Gauge pressure, setting from 0 ÷ 4 kPa to 0 ÷ 40 kPa
● G116	Gauge pressure, setting from 0 ÷ 16 kPa to 0 ÷ 160 kPa
● G160	Gauge pressure, setting from 0 ÷ 60 kPa to 0 ÷ 600 kPa
● G216	Gauge pressure, setting from 0 ÷ 160 kPa to 0 ÷ 1.6 MPa
● G240	Gauge pressure, setting from 0 ÷ 400 kPa to 0 ÷ 4 MPa
G316	Gauge pressure, setting from 0 ÷ 1.6 MPa to 0 ÷ 16 MPa
G360	Gauge pressure, setting from 0 ÷ 6 MPa to 0 ÷ 60 MPa
○ G910	Under-pressure, setting from -100 ÷ 0 kPa to -10 ÷ 0 kPa
○ A040	Absolute pressure, setting from 0 ÷ 4 kPa to 0 ÷ 40 kPa
● A116	Absolute pressure, setting from 0 ÷ 16 kPa to 0 ÷ 160 kPa
● A160	Absolute pressure, setting from 0 ÷ 60 kPa to 0 ÷ 600 kPa
● A216	Absolute pressure, setting from 0 ÷ 160 kPa to 0 ÷ 1,6 MPa
○ A240	Absolute pressure, setting from 0 ÷ 400 kPa to 0 ÷ 4 MPa
Code	Pressure connector
○ GD2	G1/2" DIN 3852
○ GE2	G1/2" EN 837-1/-3 (manometric)
● GD4	G1/4" DIN 3852
○ GE4	G1/4" EN 837-1/-3 (manometric)
○ MD2	M20x1.5 DIN 3852
● ME2	M20x1.5 EN 837-1/-3 (manometric)
○ FG2	G1/2" DIN 3852, front
○ FM2	M20x1.5 DIN 3852, front
○ N2	1/2" NPT
○ N4	1/4" NPT
P50	flat flange according to ČSN 131160 DN50 (only for P02)
P80	flat flange according to ČSN 131160 DN80 (only for P02)
999	Other
Code	Sealing
● 1	Viton (FKM)
○ 1F	Viton PARKER (for temperature -40 to +60 °C)
○ 2	All-welded version for ammoniac without sealing (only for EN 837-1/-3)
○ 3	EPDM
○ 7	FFKM
○ 9	Other
Code	Accuracy
● P02	0.2 % (standard)
○ P01	0.1 %
Code	Calibration
○ KTL	Certificate of calibration
Code	Output signal
● CR	4 to 20 mA, EN 175301-803-A connector (DIN 43650) (IP 65)
○ VR	1 to 5 V, EN 175301-803-A connector (DIN 43650) (IP 65)
Code	Software setting range
● NR	Without setting, range set to maximum limits of base range and DP (0.1 s) ECH
● RL	Setting lower value (fill in value and units)
● RH	Setting upper value (fill in value and units)
Code	Software setting damping
● DP	Output damping, fill value in seconds, standard DP (0.1 s)
Code	Software setting errors alarm
● ECL	Error current below 3.6 mA
● ECH	Error current above 21 mA
Code	Other software settings
● TAG	Optional text designation, max. 8 characters Packed ASCII, such as TAG (AXR125-34)
● DES	Optional text description, max. 16 characters Packed ASCII
● DAT	Optional date
Code	Optional accessories
● BZS	Label customer indications with description according to order
● LHPWinCom USB1	Set of configuration program LHPWinConf for PC, modem HARTMod and interface USB-RS232C
● LHPConf	Field configurator for transmitters with LHP communication, function of transmitter supply, without charging
● HARTConf	HART-USB modem and field communicator for LHP and HART transmitters, function of transmitter supply, supplied from USB or built-in accumulator, charged from USB
● HARTMod	HART modem with galvanic isolation for interface RS232
● LHPWinConf	Configuration software LHPWinConf (CZ+EN) for PC (WIN XP/Vista/7/8/10)
● USB-RS232	Communication interface RS232 for USB port of the PC
○ TTRN 1	Pressure shock absorber, M20x1.5 EN 837-1/-3 / M20x1.5 (DIN 3852, EN 837-1/-3), stainless steel
● TTRN 2	Pressure shock absorber, M20x1.5 EN 837-1/-3 / G1/2" (DIN 3852, EN 837-1/-3), stainless steel
○ TTRN 4	Pressure shock absorber, G1/2" EN 837-1/-3 / G1/2" (DIN 3852, EN 837-1/-3), stainless steel
○ TTRN 5	Pressure shock absorber, G1/2" EN 837-1/-3 / M20x1.5 (DIN 3852, EN 837-1/-3), stainless steel
● VZOG	Testing valve of carbon steel with G1/2" nut (for pressure connector code GE2), (1 110 491, see data sheet No. 0082)
● VZNG	Testing valve of stainless steel with G1/2" nut (for pressure connector code GE2), (1 110 492, see data sheet No. 0082)
● VZOM	Testing valve of carbon steel with M20x1.5 nut (for pressure connector code ME2), (1 110 415, see data sheet No. 0082)
● VZNM	Testing valve of stainless steel with M20x1.5 nut (for pressure connector code ME2), (1 110 416, see data sheet No. 0082)
● 1 780 067	Condensation loop, U-form, type B, PN 250, Tmax 300 °C, connection M20x1.5, carbon steel 1.0570 (see data sheet No. 0082)
● 1 780 059	Condensation loop, U-form, type B, PN 250, Tmax 300 °C, connection M20x1.5, stainless steel 1.4541 (see data sheet No. 0082)
● 1 780 069	Coiled condensation loop, type D, PN 250, Tmax 300 °C, connection M20x1.5, carbon steel 1.0570 (see data sheet No. 0082)
● 1 780 061	Coiled condensation loop, type D, PN 250, Tmax 300 °C, connection M20x1.5, stainless steel 1.4541 (see data sheet No. 0082)
● NP 1	Adapter with connection M20x1.5, PN 630, Tmax 400 °C, material of adapter 1.0570 / connection 1.4301 (see data sheet No. 0082)
● NP 4	Adapter with connection M20x1.5, PN 630, Tmax 400 °C, material of adapter 1.4301 / connection 1.4301 (see data sheet No. 0082)
DMS	Bracket for pressure sensor with pipe union, material 1.4541, PN 400, for mounting on the wall (see data sheet No. 2280)

2-year warranty

Example of order: D2610 G116 GD2 1 P02 KTL CR NR
D2610 A160 ME2 1 P02 KTL CR RL (100 kPa) RH (250 kPa) ECH

● ... Ex stock version ○ ... Marked version can be dispatched up to 10 working days