Capacitive Pressure Transmitter

From 1 mbar Full Range* / Resolution 1 µbar

Series 41X
Series 41X-Ei

The Series 41X combines the ceramic measurement cell for low pressure ranges with the µP electronics of the digital Series 30 transmitter. The pressure values from the signals of the pressure and temperature sensors are determined by polynomial compensation (see reverse). The values can be displayed and stored on a PC via an RS485 interface and programming can also be carried out.

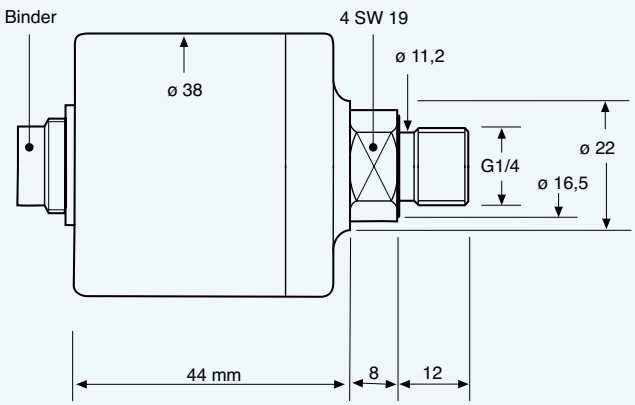
The transmitters are calibrated to the base range. The CCS30 software permits programming of the analog output signal in each section of the range within the base range (e.g. range 100 mbar. Output 4…20 mA for 20…60 mbar).

With the CCS30 software and the KELLER converter K-114, the calculated pressure can be displayed on a computer. The CCS30 software also allows the recording and graphic display of pressure signals. Up to 128 transmitters can be hooked together to a Bus-system.

This pressure transmitter is also available as an intrinsically safe version (Series 41X-Ei) and can be used as a partition wall device at the border of Zone 0 and Zone 1. Pressure transmitters in the 41X-Ei series may only be used in conjunction with proven intrinsically safe equipment.

II 1/2 G
Ex ia IIC T4 Ga/Gb
PTB 06 ATEX 2011 X
IECEx PTB 21.0018 X
EPS 23 UKEX 1 183 X

*by splitting the 30 mbar range



Edition 12/2023
Subject to alterations
info@keller-druck.com

Specifications

	Standard FS Pressure Ranges			
PR-41X (relative) PD-41X (diff.)	30	100	300	mbar
Overpressure	300	1000	1500	mbar
Neg. Overpressure	30	100	300	mbar

	2-Wire	3-Wire
Supply (U_B) 41X	8…28 VDC	13…28 VDC
Supply (U_B) 41X-Ei	10…30 VDC	15…30 VDC
Analog Output (scaleable)	4…20 mA	0…10 V
Load (kΩ)	$<(U_B-U_{B\,min.})$ / 20 mA	≥ 100
Error Band typ.*	± 0,1 %FS	± 0,2 %FS
Error Band max.*	± 0,2 %FS	± 0,3 %FS

* Within the compensated temperature range

Stability	FS ≥ 100 mbar: ± 0,1 %FS	FS ≤ 100 mbar: ± 0,1 mbar

Operating Temperature	-20…80 °C
Compensated Range	10…50 °C

Pressure Connection	G1/4 male, Viton® flat seal
Electrical Connection	Binder series 723*, M12 or cable Others on request * Mating connector included
Material in Contact with Media	Stainless Steel (AISI 316L), Nitrile O-Ring, gold-coated ceramic membrane
PD-Reference side	Non-aggressive dry gases
Protection / Weight	IP40 / ca. 190 g
EMC Conformity	EN 61000-6-1 to 6-4 / EN 61326-1 / EN 61326-2-3
Special Versions	- IP67 - Alternative plugs (see front page) - Cable version - Pressure ranges neg./pos.: Example: -10…+10 mbar - Intrinsically safe version for use in explosion exposed areas (must only be used in combination with certified intrinsically safe equipment!)

All intermediate ranges for the analog output are realizable with no surcharge by spreading the standard ranges.
** Option: Adjustment directly to intermediate ranges (below 20 pieces against surcharge).
For higher pressure ranges and for «wet/wet»-differential applications, KELLER offers Series 33X resp. Series 39X.

** *Note that the error band will then increase proportionally*

PD-41X
Dimensions ø 50 x 62 mm

Polynomial Compensation

This uses a mathematical model to derive the precise pressure value (P) from the signals measured by the pressure sensor (S) and the temperature sensor (T). The microprocessor in the transmitter calculates P using the following polynomial:

$$P(S,T) = A(T)\cdot S^0 + B(T)\cdot S^1 + C(T)\cdot S^2 + D(T)\cdot S^3$$

With the following coefficients A(T)…D(T) depending on the temperature:

$$A(T) = A_0\cdot T^0 + A_1\cdot T^1 + A_2\cdot T^2 + A_3\cdot T^3$$
$$B(T) = B_0\cdot T^0 + B_1\cdot T^1 + B_2\cdot T^2 + B_3\cdot T^3$$
$$C(T) = C_0\cdot T^0 + C_1\cdot T^1 + C_2\cdot T^2 + C_3\cdot T^3$$
$$D(T) = D_0\cdot T^0 + D_1\cdot T^1 + D_2\cdot T^2 + D_3\cdot T^3$$

The transmitter is factory-tested at various levels of pressure and temperature. The corresponding measured values of S, together with the exact pressure and temperature values, allow the coefficients A0...D3 to be calculated. These are written into the EEPROM of the microprocessor.

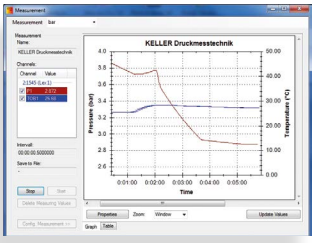
When the pressure transmitter is in service, the microprocessor measures the signals (S) and (T), calculates the coefficients according to the temperature and produces the exact pressure value by solving the P(S,T) equation.

Interface

The X-line products have a digital interface (RS485 halfduplex), which supports the MODBUS RTU and KELLER Bus protocols. Details of the communication protocols can be found at www.keller-druck.com. To integrate the communication protocol into your own software, documentation, a Dynamic Link Library (DLL) and various program examples are available.

Accessories

The connection to a computer is established via an RS485-USB interface converter. To ensure smooth operation, we recommend the K-114 with the corresponding mating connector, robust driver module, fast RX/TX switching and connectable bias and terminating resistors.



Software

The licence-free software CCS30 is used to carry out configurations and record measured values.

Measurement collection
- Graphical live display
- Adjustable measurement and storage interval
- Export function
- Parallel recording in Bus operation

Configuration
- Call up of information (pressure and temperature range, software version, serial number etc.)
- Readjustment of zero point and amplification
- Rescaling of analog output (unit, pressure range)
- Adjustment of low-pass filter
- Selection of instrument address and baud rate

Edition 12/2023
Subject to alterations
info@keller-druck.com