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 PROG30 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 intrinsically safe version (Series 41X-Ei). It is used in explosion exposed areas, where the categories 1 and 2 are required.

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*by splitting the 10 mbar range
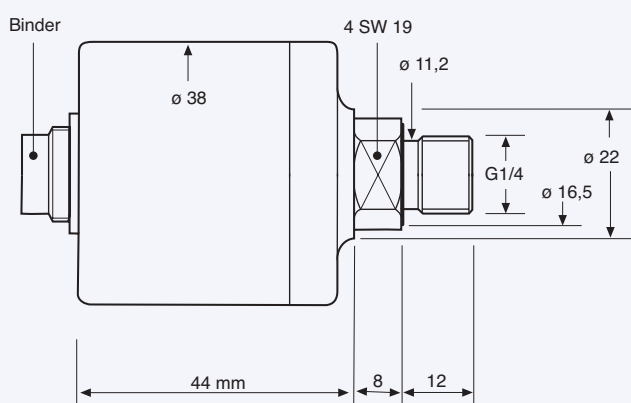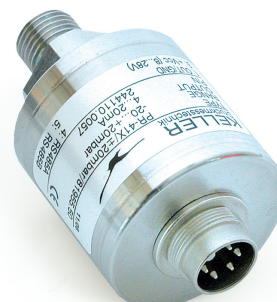
ELECTRICAL CONNECTIONS

Output	Function	Binder 723	M12 A-coded	DIN 43650	MIL C-26482	Cable
2-Wire Current	OUT/GND	1	1	1	C	white
	+Vcc	3	3	3	A	black
3-Wire Voltage	GND	1	1	1	C	white
	OUT	2	2	2	B	red
	+Vcc	3	3	3	A	black
Digital	RS485A	4	4	–	D	blue
	RS485B	5	5	–	F	yellow
Transmitter Housing				⏚		Shield

use shielded cable

Binder
4 SW 19
ø 11,2
ø 38
ø 22
G1/4
ø 16,5
44 mm
8
12

CE

For pricing or any further information, please contact Omni Instruments Ltd.

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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	DIN 43650*, Binder series 723*, M12, MIL-C 26482, Subconn BH MSS and MCBH MSS or cable
	* 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:

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

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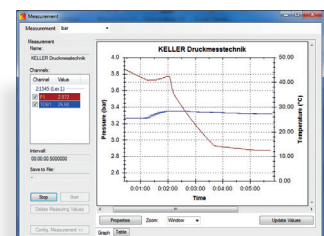
Software
The licence-free software CCS30 is used to carry out configurations and record measured values.

Measurement collection	Configuration
• Graphical live display	• Call up of information (pressure and temperature range, software version, serial number etc.)
• Adjustable measurement and storage interval	
• Export function	• Readjustment of zero point and amplification
• Parallel recording in Bus operation	• Rescaling of analog output (unit, pressure range)
	• Adjustment of low-pass filter
	• Selection of instrument address and baud rate

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