



## CAPACITIVE PRESSURE TRANSMITTER

FROM 1 mbar FULL RANGE\* / RESOLUTION 1  $\mu$ bar

The Series 41 X combines the ceramic measurement cell for low pressure ranges with the  $\mu$ P 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).

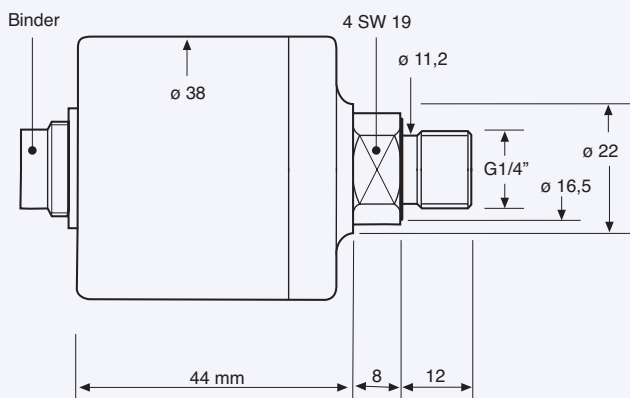
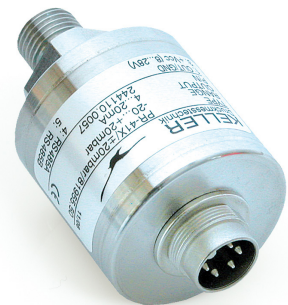
With the CCS30 software and the KELLER converter K-114, the calculated pressure can be displayed on a computer. The CCS30 software also allows the recording and graphic display of pressure signals. Up to 128 transmitters can be hooked together to a Bus-system.

This pressure transmitter is also available as intrinsically safe version (Series 41 X Ei). It is used in explosion exposed areas, where the categories 1 and 2 are required.



\*by splitting the 10 mbar range

## SERIES 41 X SERIES 41 X Ei



### 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





## Specifications

	Standard FS Pressure Ranges		
PR-41 X (relative) PD-41 X (diff.)	30	100	300 mbar
Overpressure	300	1000	1500 mbar
Neg. Overpressure	30	100	300 mbar
	2-Wire	3-Wire	
Supply (U <sub>B</sub> ) 41 X	8...28 VDC	13...28 VDC	
Supply (U <sub>B</sub> ) 41 X Ei	10...30 VDC	15...30 VDC	
Analog Output (scaleable)	4...20 mA	0...10 V	
Load (kΩ)	$<(U_B - U_{Bmin}) / 20 \text{ mA}$	≥ 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 (5 pole)
Material in Contact with Media	DIN 43650*, Binder series 723*, M12, MIL-C 26482, Subconn BH MSS and MCBH MSS or cable
	* Mating connector included
PD-Reference side	Non-aggressive dry gases
Protection / Weight	IP 40 / ca. 190 g
EMC Conformity	EN 61000-6-1 to 6-4 / EN 61326-1 / EN 61326-2-3
Special Versions	- IP 67 - 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 33 X resp. Series 39 X.

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



PD-41 X  
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:

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

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](http://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

