a Mano 2000 product

EV-120

PRESSURE INDICATOR

OPERATING MANUAL

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EV-120

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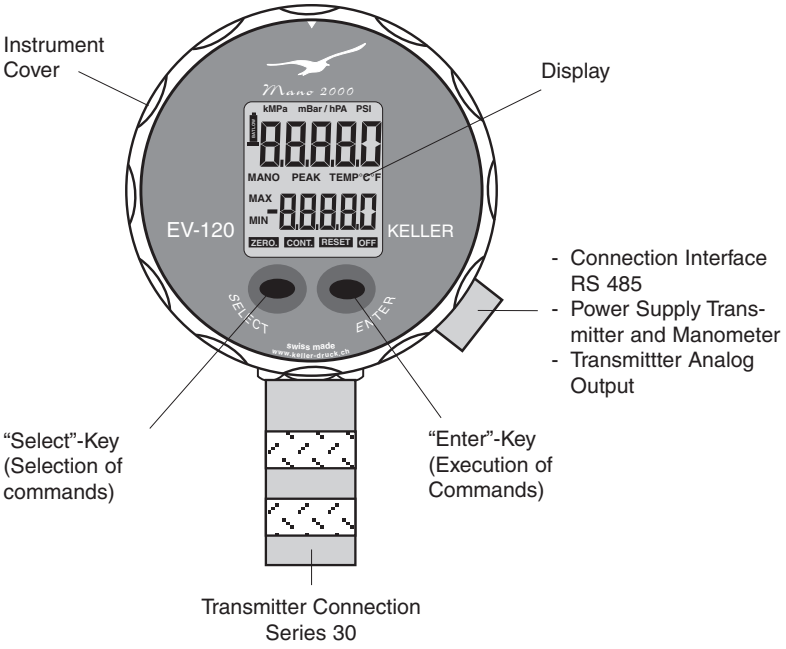
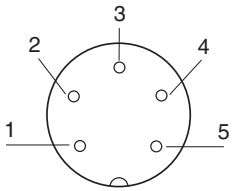
View of Instrument



Connections (for both plugs)

Output	Function	Binder 723/581
4…20mA	OUT / GND	1
2 Wire	+Vcc	3
0…10V	GND	1
3 Wire	OUT	2
	+Vcc	3
Inter-	RS 485A	4
face	RS 485B	5



EV-120

General Description

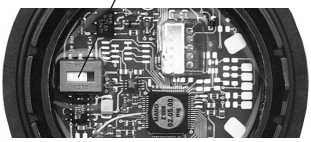
The EV-120 is a digital pressure indicator, designed for use in conjunction with a KELLER Series 30 transmitter. Together, these two instruments build a highly precise pressure measuring device. The EV-120 interrogates the Series 30 transmitter and updates the display two times every second. The display shows after turn-on the full-scale pressure range of the transmitter and then the actual pressure reading. No manual adjustments are required; the EV-120 automatically configures itself to any Series 30 transmitter. Because the pressure is communicated and read in digital format, there are no signal conversion errors. The Series 30 transmitters are based on a microprocessor (µP) circuit. The sensor signals are digitized, numerically compensated in the µP and again converted by the D/A converter into an analog norm signal (0…10V or 4…20 mA). The EV-120 reads out the compensated digital pressure value.

EV-120 as a Manometer: Equipped with an internal 9 V battery for both the supply of the instrument and the transmitter, the EV-120 builds together with the transmitter an autonomous digital pressure measuring device.

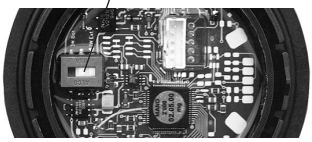
EV-120 as a Local Pressure Indicator: The EV-120 can be interposed between a transmitter and the transmitter supply, to use as a local pressure indicator. In this application, the EV-120 is powered from the transmitter supply and does not require the internal 9 V battery. The analog output signal of the transmitter and the serial interface are not influenced by the EV-120.

Attention: If an EV-120 as a local indicator is interposed to a 4…20 mA transmitter, the blue switch inside the housing must be in position 2W$_{Ext.}$. The external supply voltage must then be 12…28 V. For all other applications, the switch lays in position 3W$_{Bat.}$.

Switch position 3W$_{Bat.}$:

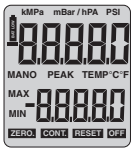


Switch position 2W$_{Ext.}$:



(open the housing to change switch position -> see battery change)

When installing the battery or when connecting to external supply, all segments start flashing. This is just an operational test. The instrument is ready to use shortly thereafter.



The 4-20 mA output can have an offset of ≈0,25 %FS.

Turn On of Instrument

The EV-120 is turned on by pressing one of the two front keys. After turn-on, the instrument displays:

- "Mano 2000" on the upper display
- the instruments' software version (i.e. 30.1) on the lower display

After 1,5 seconds, the display changes and shows:

- the software version of the transmitters (i.e. 9942)

Another 1,5 seconds later, the display indicates:

- on the upper display:
  the compensated maximum pressure of the transmitter in bar
- on the lower display:
  the compensated minimum pressure of the transmitter in bar

If a PD-39 differential pressure transmitter is connected, **P1** (pressure at **+** connection) and **dIFF** (dIFF = Difference between **+** and **-** connection) is displayed. For all other applications, only **P1** is displayed.

- the EV-120 is operated with a differential pressure transmitter

Line Pressure

Diff.-Pressure
(only with PD-39)

If there is no data exchange or when a communication error occurs, "Err" flashes.

- indicates that no data exchange takes place
  (no transmitter connected)

Turn Off of Instrument

Shortly press the left front key (SELECT). The lower right display indicates OFF. Now press the right front key (ENTER). The instrument turns off.

Executing Commands, Changing Pressure Units

The commands and pressure units are called up by pressing the left key (SELECT). Releasing the key at the desired command or pressure unit followed by pressing the right key (ENTER) activates the command or unit.
When keeping the SELECT-key depressed, the displayed commands and units switch every second. If the ENTER key is not activated within 5 seconds after releasing the SELECT-key, the instrument automatically switches back to the measuring mode with the original measuring unit.

Command Structure:
OFF ▶ ZERO RES ▶ ZERO SET ▶ CONT OFF ▶ CONT ON

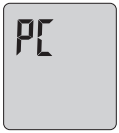
OFF	Turns off the instrument.
ZERO RES/ZERO SET	These functions change the zero of the transmitter. The new zero is permanently stored and also affects the analog output. The programmed zero remains active even when using the transmitter at a different location.
ZERO RES	Resets the zero to factory setting.
ZERO SET	Sets a new actual zero.
CONT OFF	Activates the auto-power-down function. The instrument automatically turns off 5 minutes after the last operation.
CONT ON	Inactivates the auto-power-down function. “CONT” starts flashing on the display.

The command structure is followed by the possible pressure unit setting:
Bar ▶ mBar/hPa ▶ Pa ▶ kPa ▶ MPa ▶ PSI

If the full range of a pressure unit cannot be displayed entirely, the display indicates **OFL** (Overflow) or **UFL** (Underflow).

Display Indication during Communication between PC and Transmitter

If the EV-120 is interposed between a PC and a transmitter (i.e. when used as a local indicator) with the PC communicating with the transmitter via RS485 interface, the display indicates “PC”. The function-keys of the EV-120 are disabled during this time.



- the PC is communicating with the transmitter

If a pressure is asked by the PC, it will be displayed. If this pressure is not asked again within half a second, “PC” will be redisplayed. This ensures that the indicated pressure is not “older” than half a second.

Should the instrument be turned off: It will turn on as soon as the PC is starting to communicate with the instrument.

The software READ30 and PROG30 as well as the interface converter K-102 or K-106 from RS232 to RS485 required for the communication between PC and transmitter can be acquired from KELLER.

General Information

Batteries
The EV-120 is fed by an internal 9 V battery. If the display starts to fade or if communication errors occur, it’s an indication that the battery charge is weakening. It is recommended to change the battery now.

Battery Change
Carefully turn the display ring beyond the limit stop (approx. 180 °). It will detach from the main housing. Detach the battery from the mounting and remove it. Insert the new battery. Set the display ring back in place.

Restarting the EV-120
If the program becomes locked, meaning that the instrument does not react anymore when operating one of the function-keys, an interruption of the power supply can activate the instrument again. Just follow the procedure described for the battery change

General Information

and disconnect the instrument from the battery for at least 20 second. After reconnection, start the instrument again.

Display OFL / UFL
If a pressure is read out from the transmitter which cannot be displayed by the EV-120, the display indicates **OFL** (Overflow) or **UFL** (Underflow).
This can also take place when activating a pressure unit that cannot be displayed, i.e. 1.000 Bar --> 100000 Pa (cannot be shown on the display).

Overpressure (flashing display)
If a calculating error occurs, i.e. when exceeding the maximum pressure, the last measured valid value is flashing.

Calibration
Since the measuring signal of the transmitter is read out digitally, a recalibration of the EV-120 is not required.

Technical Data

Total accuracy of the displayed pressure	see specifications Series 30
Resolution of display	depending on range (max. 0,025 % FS of basic range)
Overpressure	see specifications Series 30
Selectable pressure units	BAR / mBar-hPa / Pa / kPa / MPa / PSI (independent of the transmitter)
Measuring cycle	2 measurements per second
Storage - / Operating temperature	-20…60 °C / 0…50 °C
Compensated temperature range	see specifications Series 30
Supply of the EV-120 electronics	Block battery 9 V (6LR61)
Battery life	depending on conn. transmitter; > 16 hrs
Protection	IP65
Diameter x Height x Depth	76 x 122 x 42 mm
Total weight	≈ 229 g