

# EV-97

## OPERATING MANUAL



### INTRODUCTION

The EV-97 is a microprocessor controlled display unit for use with standard 4 to 20 mA signals for universal application. It is self-powered directly from the two-wire current loop. The measured value is displayed on a 4-digit LCD display, with a maximum range of -1999 to +9999 digits.

The EV-97 is designed for connection to any transmitter with a two-wire 4 to 20 mA output signal. The operating display range can be set up directly without requiring calibration equipment, by simply entering the maximum and minimum range limits and the decimal point position. These values are entered on three internal buttons, accessible after removing the front cover. All the programmable parameters are saved on EEPROM, which will store the values for at least 10 years without power.

The EV-97 has a self-diagnostic system which tests for "sensor damage", "short circuit" and values falling outside previously set limits. This ensures maximum operational reliability.

Prior to delivery, the EV-97 is tested and calibrated to your instructions. However, make sure you configure the unit to your specific requirements. Please refer to the section on "Configuration".

### SAFETY ADVICE

In order to exclude any risk to the operator, the following points should be observed:

- a) Immediately switch off the unit in the case of any visible damage or obvious malfunction.
- b) Always disconnect the voltage source from the unit before opening it.
- c) Standard regulations for opening and safety for electrical light and heavy current equipment have to be observed, with particular attention having to be paid to national safety regulations (e.g. VDE 0100).
- d) When connecting the EV-97 to other transmitters with different wiring (e.g. with GND connected to protective earth) beware of undesirable voltage potentials.

**Attention: When running electric devices, parts of these devices may be highly energised. Unless the warnings are observed, serious personal injuries or damage to property may result. Skilled person - nel only should be allowed to work with this unit. For trouble-free and safe operation of the unit, please ensure professional transport, storage, installation and connection as well as proper operation and maintenance.**

## ELECTRICAL CONNECTION

Remove the DIN 43650 connector from the pressure transmitter. Plug the EV-97 onto the transmitter. Orientate as desired. Replace the DIN 43650 connector. Note that the locking screw will have to be replaced with the longer one supplied.

Supply voltage: The EV-97 is loop-powered from the measuring circuit.

*Electric connection and commissioning of the unit must be carried out by trained and skilled personnel. Wrong connection may lead to the destruction of the display unit, in which case we cannot assume any warranty. **Do not exceed the maximum input current rating of 40 mA under any circumstances !***



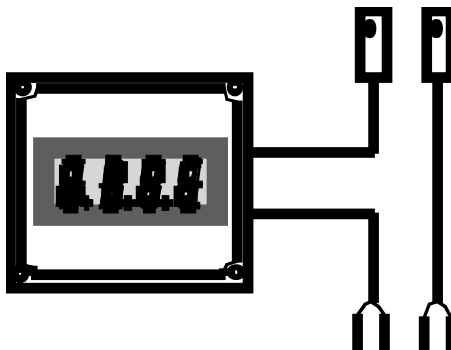
### PLUG-CONNECTION

This instrument is wired for operation with all KELLER 2-wire transmitters fitted with DIN 43650 connectors.

### CONNECTIONS (NOT POLARIZED):

Standard (on Stock)	1 - 2
Series 21/21R/21S	1 - 3
Series 23(S)/25(S)/33(S)/35(S)	2 - 3

The corresponding connections are marked on the packing.



**The polarity is not relevant!**

## TECHNICAL SPECIFICATION

Input signal:	4 to 20 mA (2-wire)
Max. permissible input current:	40 mA
Reverse voltage protection:	Polarized installation
Voltage load:	Approx. 3,5 V
Display:	10 mm high LCD-display
Display range:	Starting and end value freely selectable
Maximum display value:	9999 digits
Minimum display value:	- 1999 digits
Decimal point:	Any position
Measuring accuracy:	0,2 % $\pm$ 1 digit
Temperature drift:	100 ppm / °C
Measuring interval:	Approx. 5 measurements/sec.
Filter:	3 stages can be selected
Nominal temperature:	25 °C
Ambient temperature:	0 to 50 °C
Relative atmospheric humidity:	0 to 80 % (non condensing)
Electromagnetic compatibility:	In accordance with EN50081-1 and EN50082-1
additional error:	< 1 %
Housing:	Case: ABS. Front screen: Polycarbonate. 48,5 x 48,5 x 35,5 mm (L x W x D)
Connection:	Specially designed adaptor for use with DIN 43650 connector (3 pole + earth). M3 x 75 mm screw supplied.
IP rating:	Front side IP65

## FAULT CODES

In case of unacceptable conditions in the system a fault code will be displayed.

**Fault codes are defined as follows:**

### **FE1: Measuring range has been exceeded**

This fault code indicates that the measuring range of the A/D converter has been exceeded.

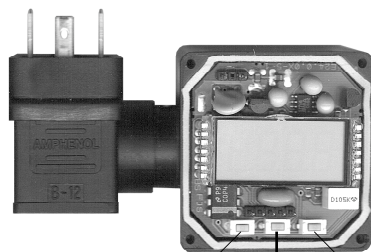
Potential fault cause:	Transmitter damaged. Short-circuit in transmitter connection. EV-97 incorrectly configured.
Remedies:	FE1 will be reset as soon as the measuring values are back within their permissible range. Please check your transmitter and transmitter connecting cables.

### **FE2: Measuring values have fallen below permissible range**

This fault code indicates that the measuring values of the A/D converter have fallen below the permissible range.

Potential fault cause:	Transmitter damaged. Transmitter connection interrupted. EV-97 incorrectly configured.
Remedies:	FE2 will be reset as soon as the measuring values are back within their permissible range. Please check your transmitter and transmitter connecting cables.

# EV-97



Button 2 Button 1 Button 3

## CONFIGURATION

1. Press button 1, "dP" (decimal point) will be displayed.  
Select decimal point position desired using buttons 2 and 3.  
Acknowledge decimal point position by pressing button 1. "dP" will be displayed again.
2. Press button 1 again. "An 4" (display for 4 mA) will be displayed.  
*Buttons 2 and 3 will scroll the display up (button 2) and down (button 3) by 1 digit at a time, for 6 seconds. The scrolling speed will then increase.*  
Acknowledge correct value by pressing button 1 again. The new value of "An 4" will be displayed.
3. Switch to the next parameter by pressing button 1 once again. "An20" will be displayed (display for 20 mA).  
Use buttons 2 and 3 to set value to be displayed on the EV-97 for an input signal of 20 mA. Acknowledge value displayed by pressing button 1. "An20" will be displayed again.
4. Press button 1 once again. "LI" (limit) will be displayed.  
Select measuring range limits required using buttons 2 and 3.  
0 = Values exceeding/falling below limits are acceptable. (FE1, FE2 displayed for hardware limits).  
1 = Values exceeding/falling below limits are not acceptable. (FE1, FE2 displayed for area limits).  
Acknowledge selection made by pressing button 1. "LI" will be displayed again. For pressure measuring transmitters always enter "LI 0". For transmitters for relative humidity, pH and similar measuring units always enter "LI 1".
5. Press button 1 once again. "FILt" (filter) will be displayed.  
Select input filter 0, 1, 2 or 3 required using buttons 2 and 3.  
0 = no filter  
1 = filter 1 active  
2 = filter 2 active  
3 = filter 1 and filter 2 active  
**Filter 1:** For filtering the short spikes generated by adjacent relays or contactors, activate "FILt 1".  
Additional delay: approx. 0,5 s.  
**Filter 2:** To prevent "jumping" of the last digit, a phenomenon often found in digital displays, activate "FILt 2". This is recommended if the display range exceeds 2000 digits.  
Additional display delay: approx. 1 s.  
  
Acknowledge selection made by pressing button 1 again. "FILt" will be displayed.

The adjustment of the EV-97 to the transmitter is now completed. The EV-97 can be switched over to display the current measuring value by pressing button 1.