FISCHER MESS- UND REGELTECHNIK

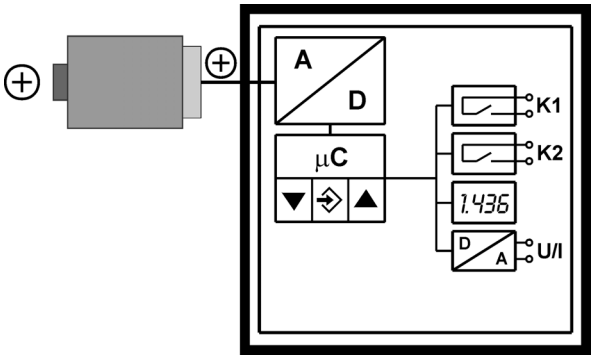
EA14M || Pressure Indicator

The EA14M consists of an electronic module and a pair of separated pressure transmitters. It is an intelligent multi-function instrument that measures and displays pressure and (optionally) transmits the measured value as a standardized 3-wire electrical signal. Its programmable limit detection functions enable it also to act as an accurate and versatile pressure switch.

Principles of Operation

The electronic module converts the analog signal from the pressure sensor and then digitally processes the input value Its microcontroller provides a high degree of user programmability and tremendous versatility. The electronic module controls the module's digital display and limit signaling on-off outputs, and (optionally) produces a new analog signal output. The readings can be filtered, scaled, inverted, or linearized through a user-defined look-up table.

The external pressure transmitter is connected to the electronic module through flexible signal cables terminated by plug-in connectors. Only the pressure transmitter supplied as part of the instrument set can be used. The pressure ratings of the pressure transmitter and the measuring range of the instrument are matched and calibrated at the factory, and marked accordingly on the product identification label.



Schematic Diagram

Features

- Large bright LED display
- Selectable pressure units
- 2 independent limits with a choice of logic modes
- optional analogue signal output, with user-programmable scaling, linearization, inversion, and offset adjustment
- User-defined look-up table for signal conversion, with up to 30 points
- Fully programmable from a PC, using the optional Model EU03 PC Adaptor

Typical Applications

- Pressure switch / pressure display for unconvenient accessible measuring places
- Level measurement
- Simplified pump control
- Monitoring of pumps and compressors

Specifications

General

Measuring range	bar	all
Straight line error (max.)°	%FS	0.1
Straight line error (typ.)°	%FS	< 0.05
Tc span (max.)°°	%FS 10K	<0.1
Tc span (typ.)°°	%FS 10K	< 0.025
Tc zero point (max.)°°	%FS 10K	<0.1
Tc zero point (typ.)°°	%FS 10K	<0.025

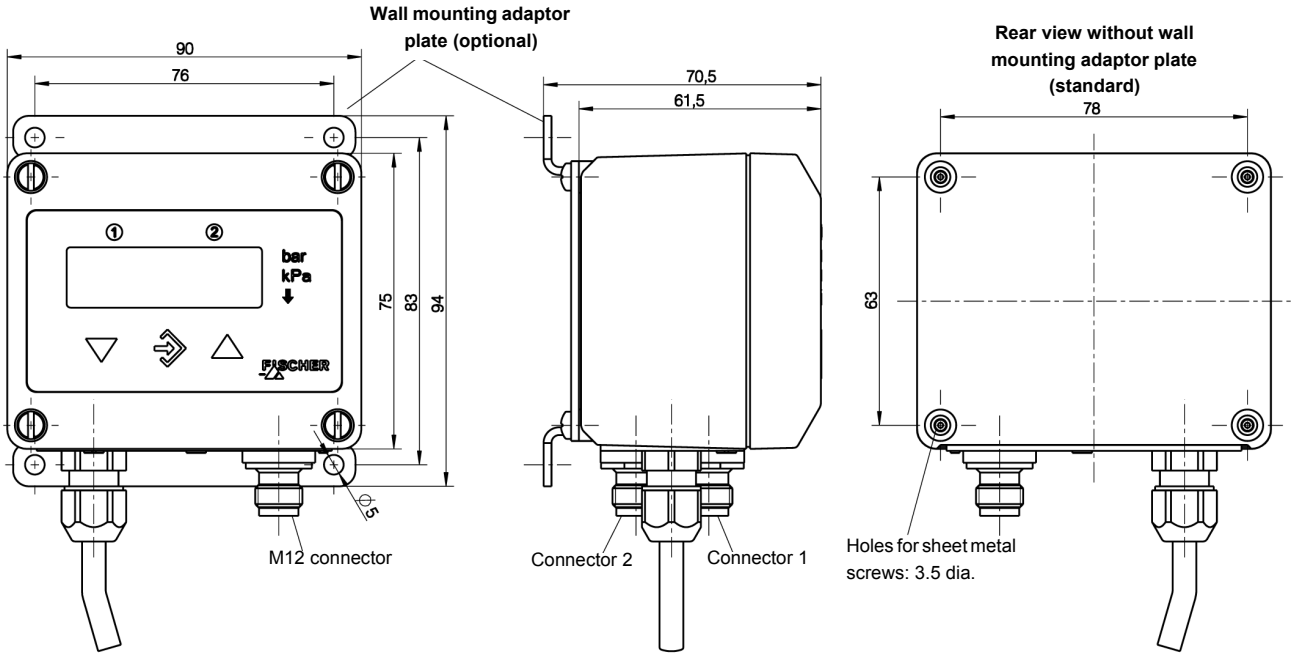
Shown values characterize the electronic module only, values of the attached pressure transmitter are not included (see data sheet of pressure transmitter).

°: Straight line error = nonlinearity + hysteresis; at 25°C; pressure within specified range (characteristic linear, not spreaded)

°°: Pressure within specified range (characteristic linear, not spreaded)

Operating temp. (ambient)	-10 … 70°C
Operating temp. (media)	See data sheet pressure transmitter
Storage temperature	-20 … 70°C
Protection class (housing)	IP 65 per DIN EN 60529
	Electrical
Nominal supply voltage	24 V DC / AC
Operating supply voltage	12 ... 32 V DC / AC
Output signal	0 ... 20 mA, 4 ... 20 mA, or 0 ... 10 V DC (3-wire)
Output signal load	For current output $R_L \leq (U_B - 4\ V) / 0{,}02\ A$ ($U_B \leq 26V$), else $R_L \leq 1100\ \Omega$ For voltage output $R_L \geq 2\ K\Omega$ ($U_B \geq 15\ V$), $R_L \geq 10\ K\Omega$ ($U_B = 12$ …15V)
Power consumption	Approx. 2 W / VA
Switching contacts	2 sets of programmable voltage free relay contacts: N/O or N/C U_{max} = 32 V DC/AC, I_{max} = 2 A, P_{max} = 64 W/VA Optional, instead of relay outputs: 2 programmable voltage free MOSFET switch outputs, NO/NC U = 3…32 V DC/AC, I_{max} = 0.25 A, P_{max} = 8 W/VA, $R_{ON} \leq 4\ \Omega$
Display	3½ digit LED
	Connections
External transmitter supply	Supply of EA14M, fused via PTC (approx. 8 Ω)
Max. current	≤ 250 mA for the external pressure transmitter (limited by PTC)
Electrical connections	Two round-shell multi-pin connector sockets (M12, male) Connector 1: 5-pin: power input and analog signal output Connector 2: 4-pin: relay contacts / solid-state switch outputs
External pressure transmitter	Two round-shell multi-pin connector sockets (M12, female) or square-shell 4-pin connector (female), acc. to DIN EN 175 301-803-A, 1m cable
	Materials, Mounting
Materials, housing	Polyamide PA6,6
Materials, media contact	See data sheet pressure transmitter
Mounting	Mounting holes at rear for panel mounting Wall mountable using adaptor plate If the instrument is intended for outdoor application, we highly recommend using an adequate protective housing (or at least a big enough shelter) as protection against UV-radiation on the membrane keyboard and against exposure of the instrument to rain or snow.

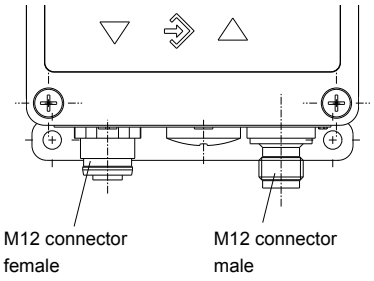
Dimensions (all units in mm unless stated otherwise)

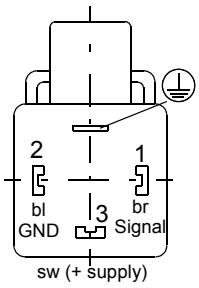


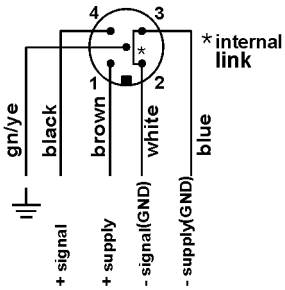
Square-shell 4-pin connector (female) acc. to DIN EN 175 301-803, 1m cable

Electrical connections

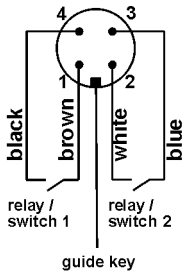
The pinning of connector 1 is also used for the M12 connector for the external pressure transmitter.







connector 1
supply input and analogue signal output



connector 2
relay / switch outputs

Programming

Via membrane key-switches or by using PC-programming interface (accessory).
Programming mode can be password protected.

	Settings
Input filtering	0.0...100.0s (10/90% step response time) for signal output, display seperated
Relay / switch 1/2	Activation point, de-activation point, response time delay (0...100 secs), logic (N/O or N/C)
Measurement unit selection	bar, kPa, „free unit“ start value, end value and decimal place for „free unit“
Output signal start/end value	Can be set at any point of measuring range (2)
Zero suppression	0...100 counts (1)
Zero pressure calibration	±100 counts (3)
Output characteristic	Linear, square rooted, horizontal cylindr. tank, table (3...30 entries)
Password range	001 … 999 (000 = password protection disabled)

(1) Measured value deviations up to 100 counts, symmetric about zero, are set to zero. Used for zero drift suppression.
(2) Maximum effective turn-down ratio = 4:1. Only the output signal is affected. Transfer function is inverted if start value > end value.
(3) Zero calibration setting may change with mounting orientation.

Ordering Code

Pressure Indicator EA14

M			0				K	0		M	

Pressure ..... M

Measuring range

0 . . . 0.6 bar	0	1
0 . . . 1 bar	0	2
0 . . . 1.6 bar	0	3
0 . . . 2.5 bar	0	4
0 . . . 4 bar	0	5
0 . . . 6 bar	0	6
0 . . . 10 bar	0	7
0 . . . 16 bar	0	8
0 . . . 25 bar	0	9
0 . . . 40 bar	1	0
0 . . . 60 bar	1	1
0 . . . 100 bar	1	2
0 . . . 160 bar	1	3
0 . . . 250 bar	1	4
0 . . . 400 bar	1	5
-1 . . . 0 bar	3	1
-1 . . . 0.6 bar	3	2
-1 . . . 1.5 bar	3	3
-1 . . . 3 bar	3	4
-1 . . . 5 bar	3	5
-1 . . . 9 bar	3	6
-1 . . . 15 bar	3	7
0 . . . -1 bar	3	9

Electrical connection transmitter

M12 round-shell multi-pin connector	M
Square shell 4-pin connector (f) acc. to DIN EN 175 301-803-A, 1m cable	H

Signal input

0 - 20 mA, 3-wire (STANDARD)	A
4 - 20 mA, 2-wire	B
0 - 10 V DC, 3-wire (STANDARD)	C

Signal output

No signal output	0
0 - 20 mA, 3-wire (STANDARD)	A
0 - 10 V DC, 3-wire (STANDARD)	C
4 - 20 mA, 3-wire (STANDARD)	P

Supply voltage

24 V DC/AC (12-32 V DC/AC)	K

Display and limit switching outputs

3½ digit LED display, 2 sets of voltage-free relay contacts	3
3½ digit LED display, 2 sets of solid-state switch outputs	6

Electrical connection

M12 round-shell multi-pin connectors	M

Mounting

Rear fastening holes (standard)	0
Wall mounting	W

Accessories

Ordering code	Designation	Pins	Application	Length
06401993	cable with M12 connector	4-pin	for relay / switch	2 m
06401994	cable with M12 connector	4-pin	for relay / switch	5 m
06401995	cable with M12 connector	5-pin	for supply / signal	2 m
06401996	cable with M12 connector	5-pin	for supply / signal	5 m
04005144	wall mounting adapter set			
EU03.F300	PC-programming interface with SW			

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