OCTOGON

MANUAL

FEMB

BUBBLING-THROUGH PRESSURE TRANSDUCER

Operating manual



Document	Version	Date	Applies to
Operating manual	V00x	10/2026	FEMB, aluminium and plastic casing

This operating manual describes mounting, connection, function and settings of the FEMB bubbling-through pressure transducer with external hose pump.

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1 About this manual

1.1 Notices

Notice	Meaning
Caution	Risk of injuries and/or damages.
Important	Pay particular attention.

1.2 Device

Feature	Version
Casing	aluminium or plastics (section 4)
Pressure sensor	0 ... 1000 mbar, 0 ... 50 mbar, 0 ... 100 mbar, 0 ... 200 mbar or 0 ... 350 mbar (pressure table section 8.2)
Interface	RS232, option CAN-Bus or Profibus
Pump	external hose pump, supplied by the device with 24 V DC (250 mA)
Manufacturer type	ADLM-P

2 Safety instructions

Caution When mounting, starting up and operating this pressure transducer, observe safety precautions and regulations. Only personnel with a corresponding qualification is allowed to work with the pressure transducer. A non-compliance with safety regulations may cause serious injuries and/or damages. Check the suitability of the pressure transducer for this application before start-up. Comply with the technical data of this operating manual.

3 Technical data

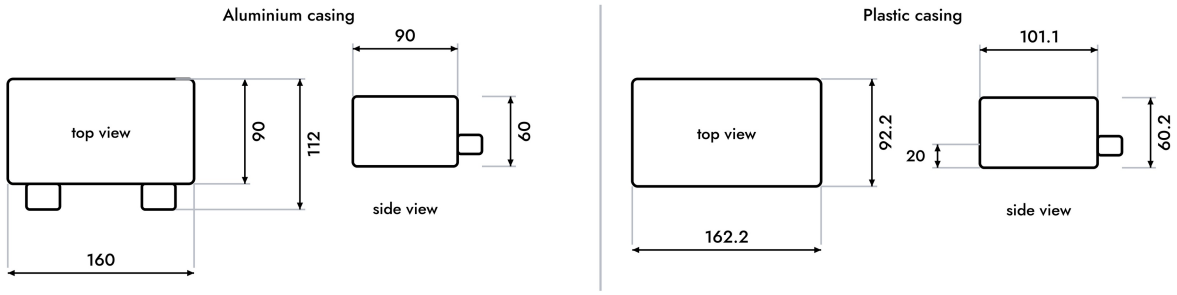
Item	Value
Input	
Kind of pressure	positive relative pressure (hydrostatic pressure)
Pressure sensor	0 ... 1000 mbar / 0 ... 50 mbar / 0 ... 100 mbar / 0 ... 200 mbar / 0 ... 350 mbar
Overpressure limit	for overpressure limits and burst pressure see pressure table (section 8.2)
Output	
Analog	0 ... 10 V and 4 ... 20 mA
Current	load < 500 Ω
Voltage	load resistance > 10 kΩ
Interface	RS232 (option: CAN-Bus / Profibus)
External pump	24 V DC (250 mA)
Indication	
Display	multifunction indicator for current values / switch points / diagnostic values
Function	4 keys for programming
Adjustment	
Settings	4 keys on display unit
Tare	key on front or externally
Volume calculation	20 calibration points for linearization
Accuracy	
Resolution	12 bit (pressure sensor)
Combined error	± 1 % FS
TC	< 50 ppm/K
Power supply	
Voltage	24 V DC, ± 20 %
Power consumption	maximum 5 W
Residual ripple	200 mV
Environmental conditions	
Operating temperature	–10 ... +60 °C
Storing temperature	–20 ... +70 °C

3.1 Mechanics

Item	Casing aluminum	Casing plastics
Type	aluCase AC 092 with clip-on design covers	U-CASE 2
Dimensions	160 × 90 × 60 mm	162.2 × 92.2 (101.1) × 60.2 mm
Material	die-cast aluminum	ASA 757G Luran S
Flammability	–	UL94 HB
Mounting	covered screw channels	4 mounting holes
Color	RAL 9006 (aluminum white)	black
Weight	approx. 1.1 kg (with options)	approx. 0.7 kg (with options)
Cable entry	2 screwed cable glands M20 × 1.5	2 screwed cable glands M20 × 1.5
Protective insulation	–	according VDE100

Item	Value
Protection	IP65
Connection	plug-in terminal strip, lockable, up to maximum 2.5 mm²
Pressure connection	for tube 6 mm O/D (made of nylon, PA, PUR, Hytrel); sealing: O-ring (silicone free)
Airing	pressure compensation part (PA6)

4 Dimensions and mounting



Dimensions in mm. Left: casing aluminum, right: casing plastics.

4.1 Mounting of the device for casing aluminum

Hole spacings: 142 mm × 40 mm.

1. Prepare the mounting holes according to hole spacings
2. Remove left and right design cover
3. Remove the 4 screws of the top cover
4. Fold down top cover
5. Fasten the device with 4 screws (Ø 6 mm maximum)
6. Put the top cover back on
7. Fasten the 4 screws of the top cover
8. Put the design covers back on

4.2 Mounting of the device for casing plastics

Mounting dimensions: 146.90 mm × 76.90 mm, 4 holes Ø 6.2 mm.

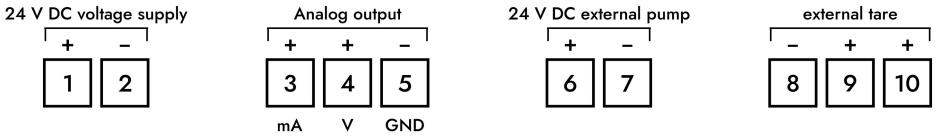
1. Prepare the mounting holes according to hole spacings
2. Fasten the device with 4 screws (Ø 6 mm maximum)

5 View and electrical connection

5.1 View (without top cover)

Under the top cover: pump, connection terminals, interface PC (serial), 4 mounting holes; on the outside of the casing: pressure connection and airing.

5.2 Electrical connection



plug-in terminal strip, up to 2.5 mm²

Terminal assignment

Terminal	Polarity	Function
1	+	voltage supply 24 V DC
2	ground	voltage supply 24 V DC
3	+	analog output current (0)4 ... 20 mA
4	+	analog output voltage 0 ... 10 V
5	ground	analog output, common ground
6	+	24 V DC external pump
7	ground	24 V DC external pump
8	ground	external tare / pump control manually
9	+	external tare / pump control manually
10	+	external tare (with solder bridge, section 5.3)

The tare input can also control the pump: operation mode 1 (address 3) runs the pump while the tare input = 1.

5.3 External tare

Solder bridge	Tare	Drive	Wiring
without solder bridge	active	24 V DC	terminal 8 ground, terminal 9 + external 24 V DC
with solder bridge	passive	contact	external potential free contact between terminals 9 and 10

The solder bridge is located on the PCB next to the serial interface.

6 Pressure connection (push-in tube fitting)

1. Ensure that the end of the tube is cut square and is free from burrs. Tube: 6 mm O/D (nylon, PA, PUR, Hytrel).
2. Push the tube through the collet into the fitting.
3. Push the tube firmly through the O-ring until it bottoms on the tube stop, then pull back.
4. To disconnect, push the tube into the fitting, hold down the collet and withdraw the tube.

7 Functional description

The hose pump generates a pressure in the bubbling-through tube (pulse). At the end of the tube air escapes when the hydrostatic pressure is reached (density × filling height). The existing pressure is transferred continuously to the system. After each break the process repeats again. If the level of the liquid changes during the break, the output signal follows because the built-up pressure in the tube changes at the same time.

8 Application example

Important Ensure that the pressure connections (device, junctions and bubbling-through construction) are sealed tight and absolutely free of any leakage.

8.1 Set-up

Part	Connection / version
Bubbling-through tube/hose	approx. 1/2″, from the pressure connection of the device into the liquid (level); tip of the bubbling-through point cut at 45° (details bubbling-through)
Supply	voltage supply of the device (section 5.2)
Multimeter	at the analog output (section 5.2)

8.2 Pressure table

Nominal pressure	Maximum pressure	Burst pressure	Note
50 mbar	550 mbar	800 mbar	
100 mbar	550 mbar	800 mbar	
200 mbar	1 bar	1.5 bar	
350 mbar	1 bar	1.5 bar	
500 mbar	1 bar	1.5 bar	older models only
1 bar	2 bar	3 bar	
2 bar	4 bar	6 bar	older models only

Older models can also come equipped with 500 mbar or 2 bar pressure sensors. In these cases, please refer to the rows marked accordingly.

8.3 Notes

- Maximum distance to point of bubbling-through: 50 m.
- Level measuring in all liquids possible.
- Aggressive and abrasive media are no problem.
- During the bubbling-through period the output signal is held.
- Every material possible for the bubbling-through tube or hose.
- The end of the bubbling-through tube should have an angle of 45° (to have a defined point of bubbling).

9 Transducer settings

9.1 Keys on the display PCB

Key	Function (programming mode)	Special function (operation mode)
UP (triangle up)	increase address or value	–
P	ESC (leave editing mode / programming mode or reject input)	Pump is working as long as the key is pressed (pulse).
DOWN (triangle down)	decrease address or value	Pulse time and break time of the pump are shown in the display.
T	enter (accept address or value)	Tare ON/OFF (symbol for tare is shown in the display).

9.2 Programming mode

To enter programming mode, press the keys UP and DOWN simultaneously. The display indicates this mode with **`Prog`**.

Selecting an address

Pressing the UP or DOWN key selects the address. The display indicates the address in the top line; the stored value of this address is indicated in the lower line. To change the stored value, press key T to enter editing mode.

Editing mode

The editing mode is indicated with the symbol of two arrows (up/down). The top line of the display indicates the value which is stored with the selected address; this indication is for support. The value of the lower line can be changed by pressing the UP or DOWN key. With key T this value is stored. The display indicates the proper transfer of data with a box with a tick; if the transfer of data was faulty, this is indicated with a box with a cross. Pressing the T key leaves the editing mode, and another address can be selected with the UP or DOWN key.

The editing mode can be left with the P key, too. In this case all changes at this address will not be stored, and a new address can be selected with the UP or DOWN key.

When the UP or DOWN key is pressed for a longer time in editing mode, the unit position changes first (20 counts), then the tens digit, the hundreds digit and in the end the thousands digit (each 20 counts).

Leaving programming mode

To leave the programming mode, press the P key.

10 Addresses (program numbers)

Addr.	Status	Function	Bytes	Value	FS*
0	R	software version	2	(x.xx)	
1	R	sensor type	2	1 = standard	1
2	R/W	mode	2	0 = input AD value manually; 1 = input AD value auto	1
3	R/W	operation mode	2	0 = timer controlled; 1 = pump is running, when tare input = 1	0
4	R/W	pump is running > pulse (s)	2	–	10
5	R/W	pump is waiting > break (s)	2	–	3600
6	R	tare offset	2	0	0
7	R	sensor temperature (°C)	2	–	–
10	R/W	number calibration points (CP)	2	2 ... 20	2
11	R/W	decimal place	2	0 ... 4	1
51 ... 70	R/W	indication CP1 ... CP20	2	0 ... 65000	CP1: 0 %, CP2: 100 %, others –
71 ... 90	R/W	AD value CP1 ... CP20	2	–	–
100	R/W	CurrentMinCal	2	0 ... 4095	750
101	R/W	CurrentMaxCal	2	0 ... 4095	3600
102	R/W	VoltageMinCal	2	0 ... 4095	0
103	R/W	VoltageMaxCal	2	0 ... 4095	3600

* FS = factory settings.