Bubbling-through pressure transducer with valve ADLM-PV

Characteristics

- Input:	positive relative pressure (hydrostatic pressure)
- Analog output:	4...20 mA and 0...10 V
- Voltage supply:	24 VDC +/-20%
- Combined error:	±1% FS
- Limit contacts:	2 relays (optionally)
- Indication:	LCD-display
- Pressure connection:	for 6 mm plstic pipe
- Interface:	RS485 / CANopen / Profibus (options)
- Degree of protection:	IP 65
- Data output:	interfaceRS232
- Volume calculation:	20 calibration points for linearization

Advantages in comparison with the other measuring methods

- No contact between sensor and medium (disadvantage with diving probe)
- No extensive mechanical construction (a pressure sensor needs a connection below the tank)
- Cost-effevtive solution (in difference to the use of radar engineering)
- Foaming has no influence (problem with ultrasonics)
- Easy mounting
- Reliable function

Technical data

Input	
Kind of pressure:	positive relative pressure (hydrostatic pressure)
Pressure sensor:	Standard: 0...1000 mbar / 0...10 m water column
Option:	0...50 mbar / 0...100 mbar / 0...200 mbar / 0...500 mbar / 0...2 bar
Bursting pressure:	0...50 mbar: 800 mbar / 0...100 mbar: 1,5 bar / 0...200 mbar: 1,5 bar
	0...500 mbar: 1,5 bar / 0...1 bar: 3 bar / 0...2 bar: 6 bar
Output	
Analog:	0...10 V and 4...20 mA
Current:	working resistance <500 Ω
Voltage:	load resistor >10 kΩ
Interface:	RS232 (option: RS485 / CANopen / Profibus)
Limiting value switch (optionally)	
Relays:	2 (changeover contact), fail safe, given values for resistive load
Current:	30 VDC 1 A
Power:	30 W

Applications

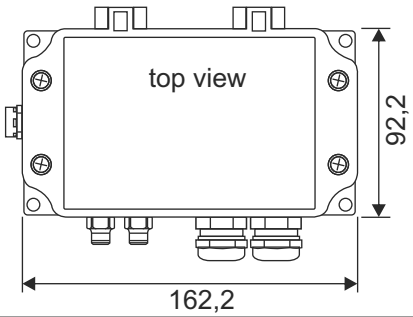
For use in all ranges where conventional level measuring is not possible or too expensive. Range of application: clarification plants, pump houses, well building, chemical industry, construction of special vehicles (tanks for water and fuel), foodstuff industry.

Technical data (continued)

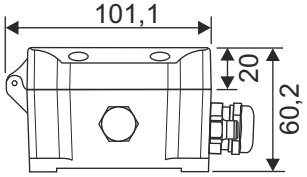
Indication		
Display:	multifuntion indicator for current values / switch points / diagnostic values	
Function:	4 keys for programming	
Adjustment		
Settings:	4 keys on display unit	
Tare:	key on front or externally	
Volume calculation:	20 calibration points for linearization	
Accuracy		
Resolution:	12 bit (pressure sensor)	
Combined error:	±1% FS	
TC:	<50 ppm/K	
Power supply		
Voltage:	24 VDC, ±20%	
Power consumption:	maximum 5 W	
Residual ripple:	200 mV	
Ambient conditions		
Operating temperature:	-10...+60°C	
Storing temperature:	-20...+70°C	
Mechanics		
Enclosure aluminium:	Type:	aluCase AC 092 with clip-on design covers
	Dimensions:	160 x 90 x 60 mm
	Material:	die-cast aluminium
	Mounting:	covered screw channels
	Colour:	RAL 9006 (aluminium white)
	Weight:	approx.1,1 kg (with options)
	Cable entry:	2 screwed cable glands M20x1,5
Enclosure plastics:	Type:	U-CASE 2
	Dimensions:	162,2 x 92,2 (101,1) x 60,2 mm
	Material:	ASA 757G Luran S
	Flammability:	UL94 HB
	Mounting:	4 mounting holes
	Colour:	black
	Weight:	approx. 0,7 kg (with options)
	Cable entry:	2 screwed cable glands M20x1,5
	Protective insulation:	according VDE100
Protection:	IP 65	
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)	

Dimensions (in mm)

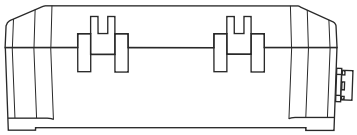
Enclosure plastics



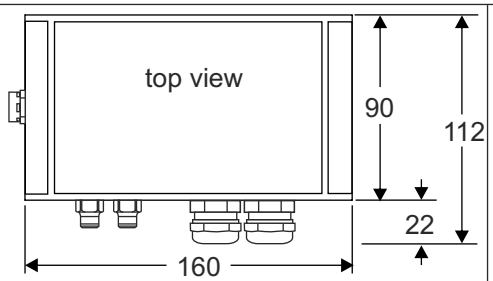
side view



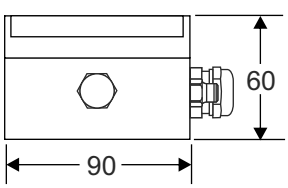
rear view



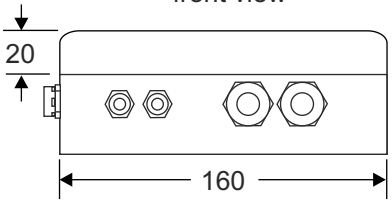
Enclosure aluminium



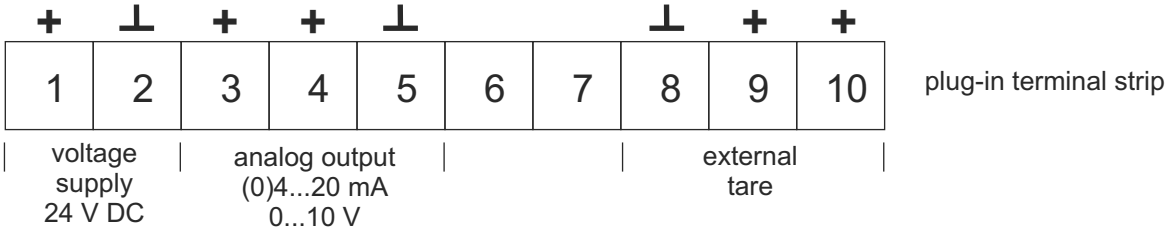
side view



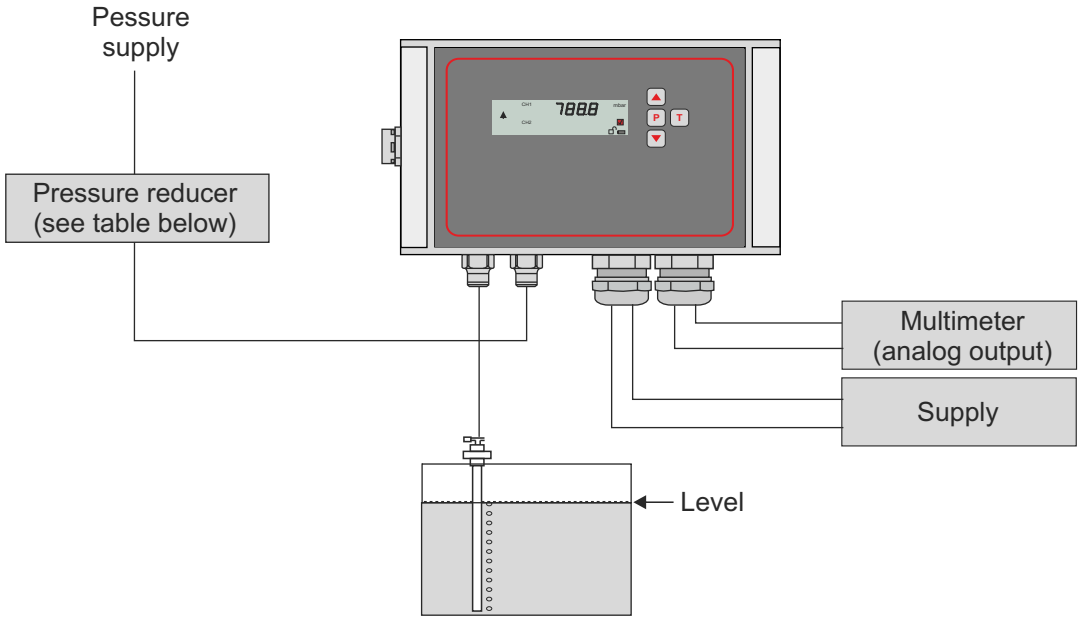
front view



Electrical connection



Example of application



Pressure table

Nominal pressure	50 mbar	100 mbar	200 mbar	500 mbar	1 bar	2 bar
Output pressure reducer	75 mbar	150 mbar	300 mbar	750 mbar	1,5 bar	3 bar
Proof pressure	550 mbar	1 bar	1 bar	1 bar	2 bar	4 bar
Burst pressure	800 mbar	1,5 bar	1,5 bar	1,5 bar	3 bar	6 bar

Note: Maximum distance to point of bubbling-through: 50 m
Level measuring in all liquids possible
Aggressive and abrasive medium is no problem
During bubbling through period the output signal is hold
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 devined point of bubbling)

Functional description

1. The system is in break time: a change of the level of liquid causes a propotional change of the pressure in the system and therefore also a change of the analog output signals.
2. Pulse time (valve open): The analog output signal holds the value, which there was before beginning of the pulse time and does not change during the pulse time. The input pressure from the pressure reducer is switched via the opened valve to the pressure output for the bubbling-through unit. After a certain time (dependend on diameter of tube or hose and the distance of the bubbling through point) air escapes at the end of bubbling-through unit, when the hydrostatic pressure is reached (density x filling height).
3. End of pulse time (valve is closed) = break time: After a certain time the pressure in the system is in balance (pressue at the point of bubling through = pressure at the pressure sensor). Now the analog output is released again. The applied pressure of the sensor causes again a proportional signal at current / voltage output. A change of the level of liquid causes a change of the system pressure and therefore also a change of the analog output signals.

Ordering code

E	V	X	X	X	X	X	X	-	X	X	X

Input:	positive relative pressure	0
Output:	4...20 mA, 0...10 V	0
Supply:	24 VDC	0
Pressure sensor:	0...1000 mbar (standard)	0
	0...50 mbar	1
	0...100 mbar	2
	0...200 mbar	3
	0...500 mbar	4
	0...2 bar	5
Measuring range:	(please indicate)[1]	0
Interface/limit contacts:	RS232	0
	RS232 and limit contacts	1
	RS232 and RS485	2
	RS232 and CANopen	3
	RS232 and Profibus	4
Enclosure:	AluCase 160x90x60	0
	Plastics 162x92x60	1
	Plastics 162x92x60 with EMC coating	2
Configuration:	factory settings[2]	0
	customized (please indicate)[3]	1
Other:	special model	0

1) Either a giving of pressure value (eg 0...600 mbar or 3 m water column) or the density of medium and the filling height (eg density 0,8 g/cm³ and filling height 4 m) is needed.

2) Factory settings: Measuring range: as given / analogue output: 0...10 V and 4...20 mA / indication: 0...100,0% / limit value 1: 40% / limit value 2: 60% / linearization: without / pulse: 10 s / break: 3600 s / external tare: active (24 V).

3) The possibilities of the technical data can be selected. In case of not given values the details of factory-setting are used.