

Features

- Good price-performance ratio
- Measuring range 500(800)...1100 hPa
- High precision of ± 1 hPa
- 2 pressure ranges and 3 output values within one device, can be easily set by user
- Low power mode for solar supply, 5 mA
- High quality, rugged polycarbonate housing
- Power supply (5)12...30 VDC
- Electrical connection through clamp connectors · permanent tight fit, no more loose screws

Applications

- ▶ Reasonably priced barometric pressure sensor for general purposes
- ▶ Weather stations
- ▶ Building services
- ▶ Industrial applications



Description

The barometric pressure sensor type (8121M500) is equipped with a piezoelectric pressure gauge whose characteristics are linearised by means of a low power microcontroller.


In operational mode 0...20 mA or 4...20 mA, output signals are buffered by a precision operational amplifier with a resolution of 12 bit.

To reduce power consumption in mode 0...2 V the signal is buffered by a separate operational amplifier with very low quiescent current and the circuitry for current output is completely switched off, thus reducing the quiescent current of the whole pressure sensor to less than 4 mA (at 1 kΩ load). Resolution is 12 bit too. This feature makes the Sensor (8121M500) particularly suitable for solar powered applications.

The pressure range can easily be set by jumpers to 500...1100 hPa or 800...1100 hPa. For each range the output signal can be chosen to 0...20 mA, 4...20 mA or 0...2 V.

These settings take place after the next power up of the sensor, that is, after the power supply was switched off for several seconds. Only at power up new settings are accepted.

The sensors power supply lines are protected against reversed polarity and overvoltage up to 50 V.

 The voltage output must not be connected to an external power source. There is always a voltage present at the voltage output. This voltage is valid only if the appropriate mode (0...2 V output, voltage output mode) is set.

Settings for mode of operation are done by plug-in jumpers according to the following table.

In case of an error, the sensor switches to low power mode and switches the output to 0 mA and 0 V respectively. The sensor stays in this mode until the power supply is cycled one time. If the error is fixed, the sensor will proceed with normal operation after power on.

Block Diagram:

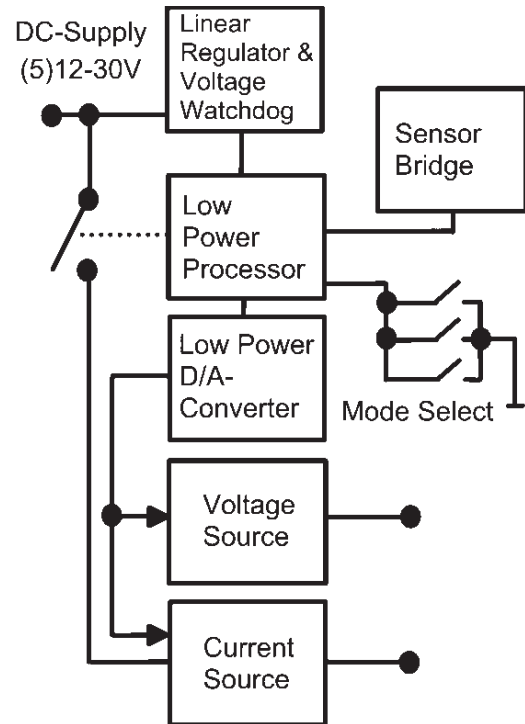


Table: Jumper settings for different modes of operation:

Pressure range	Output	Bridge No. 1	Bridge No. 2	Bridge No. 3	Bridge No. 4	Bridge No. 5	1 2 3 4 5
500...1100 hPa	0...20 mA						
	4...20 mA	plugged					
	0...2 V		plugged				
800...1100 hPa	0...20 mA			plugged			
	4...20 mA	plugged		plugged			
	0...2 V		plugged	plugged			
⚠ These settings must not be done by user. Additional equipment and standards are necessary!							
Calibration (by service)					plugged		
Setup (by manufacturer)						plugged	



Example 1:

Pressure range 500...1100 hPa, 0...2 V output signal = bridge no. 2 plugged in, all others pins left open (unconnected).

Example 2:

Pressure range 800...1100 hPa, 4...20 mA output signal = bridge no. 1 and bridge no. 3 plugged in, all others pins left open (unconnected).

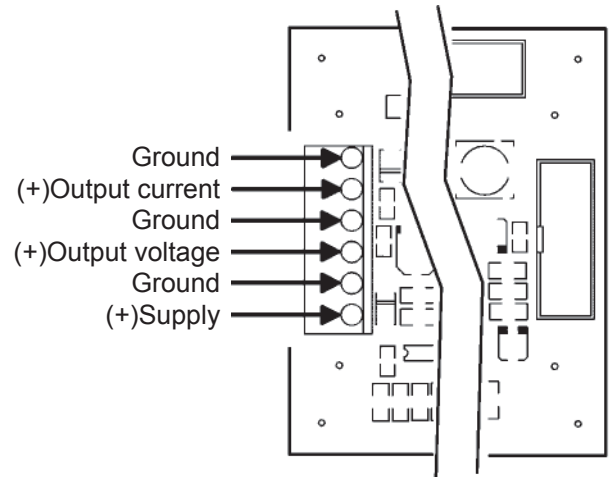
Example 3:

Pressure range 500...1100 hPa, 0...20 mA output signal = no (0) bridge plugged in, all pins left open (unconnected).

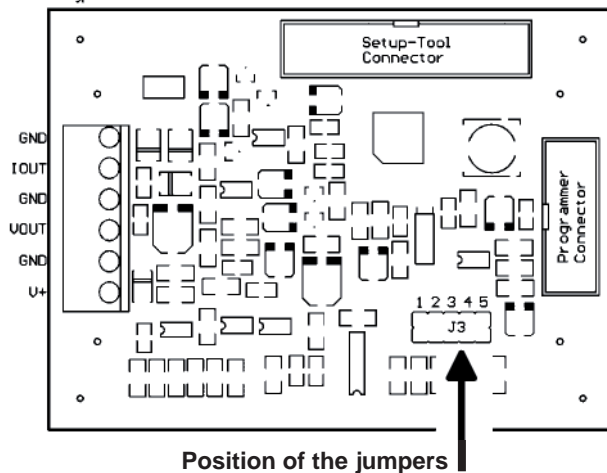


Modes „Calibration“ and „Setup“ should only be set by qualified personnel because this settings clear basic settings irretrievably. Wrong settings during this mode leave the sensor useless.

The jumpers (bridges) location on the printed circuit board is depicted in the parts placement pattern below. Numbering in this picture is the same as in the table on page 2.



Barometric Pressure Sensor
Type 812 S11



Please note the loss of warranty and non-liability by unauthorised manipulation of the system. You need a written permission from LAMBRECHT meteo GmbH for changes of system components. These activities must be operated by a qualified technician.

The warranty does not cover:

1. Mechanical damages caused by external impacts (e. g. icefall, rockfall, vandalism).
2. Impacts or damages caused by over-voltages or electromagnetic fields which are beyond the standards and specifications in the technical data.
3. Damages caused by improper handling, e. g. by wrong tools, incorrect installation, incorrect electrical installation (false polarity) etc.
4. Damages which are caused by using the device beyond the specified operation conditions.

Electrical Connection

For electrical connection it is recommended to use cable type AWG 20 resp. 16 or equivalent.

Core	AWG colour code	Function
1	black blk	(+) Power Supply (V+)
2	brown brn	GND
3	red red	(+) Signal-Output
4	orange ora	GND

Electric Terminal: 6-pole female clamp connector for solid wire or cord with end sleeves, suitable for wire cross sections of 0.5...1.5 mm².



Technical data

(8121M500) Air Pressure Sensor
Id-No. 00.08121.110 002

General data

Measuring element: Piezoresistive pressure measuring cell

Pressure media: Clean dry air or other non-condensing and non-corrosive gases

Measuring range: 500...1100 hPa switchable to 800...1100 hPa

Pressure limits: Min. 10 hPa · max. 5.000 hPa

Accuracy: ± 1 hPa within the range of -10...+60 °C
< ± 2 hPa within the range of -20...-10 °C

Resolution: 0.1 hPa

Range of application:
Altitudes: 0...4000 m
Temperatures: -20...+70 °C
Humidity: 0...99 % r. h. non condensing

Housing: Polycarbonate · RAL 7035 (light-grey) · IP 66 · wall mounted · 1 cable entrances · 1 pressure equalisation · 2 m connecting cable · 4-pole

Electric terminal: 6-pole female clamp connector for solid wire or cord with end sleeves · suitable for wire cross sections of 0.5...1.5 mm² resp. AWG 20...16

Dimensions: 130 x 80 x 60 mm

Weight: approx. 0.3 kg with cable

Electrical data

Supply voltage: 20 mA-mode:
12...30 VDC, smoothed, non stabilized
2 V-mode:
5...30 VDC, smoothed, non stabilized
To drive a current of 20 mA through a signal line with a series resistance of 600 Ω a power supply voltage of 18 V minimum is needed.

Current consumption: 12...30 V · 20 mA-mode · without load :
< 10 mA quiescent current · typical approx. 8 mA
12...30 V · 20 mA-mode · 20 mA output current: < 30 mA · typical approx. 28 mA
12...30 V · 2 V-mode, without load:
< 3 mA · typical approx. 2 mA
5...30 V · 2 V-mode · 1000 Ω load impedance:
< 5 mA · typical approx. 4 mA
(5...30 V · 2 V-mode · 470 Ω load impedance:
< 7 mA · typical approx. 6 mA · not specified)

Power Consumption: 30 V x 30 mA = 900 mW max.
5 V x 2 mA = 10 mW min.

Analog Outputs: 0...20 mA · 4...20 mA · 0...2 V selectable/ adjustable
current output:
20 mA max. · 30 V max. · series impedance 600 Ω max.
Voltage output:
2 V max. at 1000 Ω min. parallel
100 nF max.

Inrush current depending on source impedance, equivalent capacity at power supply input: approx. 47 µF.
Time from power on to first valid value: approx. 3 seconds.
Every following measurements are taken in intervals of approx. 3 seconds. Due to sealing of the enclosure measured values lag behind the true pressure by 30 s...60 s.