



Bruker BioSpin


LC Pressure Sensor

Sensor Systems
Technical Manual

Version 001

think forward

NMR Spectroscopy



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P/N: Z31910

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Declaration of Conformity



DECLARATION OF CONFORMITY

The undermentioned product

**Pressure Sensor LC
H115858/H115859/H115862
Power Supply 1802512
Clip Kit 1802513**

conforms to the main requirements
set by the commission for the
Harmonization of Regulations of the EU Member States
with regards to electromagnetic compatibility
(EMI 89/336/ECC) and safety (Low Voltage Electrical
Equipment: 72/23/ECC) regulations.

For the assessment the following norms were applied:

EMI: EN 61326-1: 2001

Safety: EN 61010-1: 2nd ed. (2001)

Documentation: Z31910 Docu Standard: Pressure Sensor

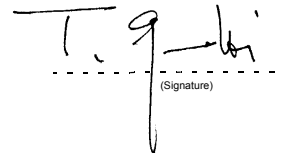
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(Signature)



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1 Introduction

This manual is included with the delivery of the Bruker Pressure Sensor unit. It provides instructions on how to:

- Wire and operate the sensor.
- Service and maintain the unit.

1.1 Disclaimer

The sensor should only be used for the purposes intended as described in this manual. Use of the sensor for any purpose other than that for which it is intended will be taken at the users own risk and will invalidate any and all manufacturer warranties.

Service or maintenance work on the unit must only be carried out by trained, qualified personnel.

Read this manual before operating the sensor. Pay particular attention to any safety related information.

1.2 Warnings and Notes Used in this Manual

There are four types of warning notices used in this manual. These notices highlight important information or warn the user of a potentially dangerous situation.



DANGER

- ▶ Indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

- ▶ Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



⚠ CAUTION

- ▶ Indicates a hazardous situation which, if not avoided, may result in minor or moderate injury or major material damage.

NOTICE

- ▶ Hazard, which could result in material damage.

Other important information that has been identified for the user is highlighted using the following information block:

-
- i** Note providing additional information or useful tips.
-

2 General Information

2.1 Purpose

The pressure sensor is designed for use with BRUKER sample preparation systems. The pressure sensors increase the operating reliability of the sample preparation systems by detecting problems in the flow path, so it is possible to react in time before a major malfunction occurs.

2.2 Sensor Function

The main function of the pressure sensor is to monitor relevant liquid chromatography (LC) transfer lines. Using the sensors it is possible to detect an abnormal pressure profile while a sample preparation is in use. The most common pressure abnormalities occur, for example, when a flow tube is broken, a connection leaks or a flow path is blocked.

2.3 Acceptable Usage

The pressure sensor is designed for use in BRUKER sample preparation systems which are used in analytical chemistry research and development laboratories.

The sensor is mounted in the flow system near the HPLC pump or before the probe, and is used to control the system pressure of the transfer line.

The sensor's through hole diameter must match the inner diameter of the connected capillary.

The system pressure must be monitored and **must not exceed 30 bar** in order to protect the pressure sensor.

To provide for safe operation, the sensor must be mounted using the two M2 screws to fix the sensor body to the flow system transfer line.

To ensure that the membrane is not blocked, monitor the ambient pressure.

The sensor must only be used with aqueous solutions (H₂O/ D₂O).

Only use the power cable (P/N HZ16684) and the power supply (P/N 1802512, corresponding clip kit P/N 1802513) to connect the sensor to the electrical power supply (outlet).

3 Components

There are three versions of pressure sensors available, which differ only in their through hole diameter:

- P/N H115858 (through hole 0.3 mm).
- P/N H115859 (through hole 0.5 mm).
- P/N H115862 (through hole 1.0 mm).

3.1 Pressure Sensor Components

The Pressure Sensor LC consists of six components:

- Pressure Sensor Device
- Fittings Plug (flat PTFE 1/4")
- Connection screws M2 x 20 mm V2A
- Connector Cable
- Wall Power Supply
- Clip Kit for Wall Power Supply

3.1.1 Pressure Sensor

Figure 3.1 indicates the location of the key subcomponents of the pressure sensor device. The location of the components is the same for all sensors variations.

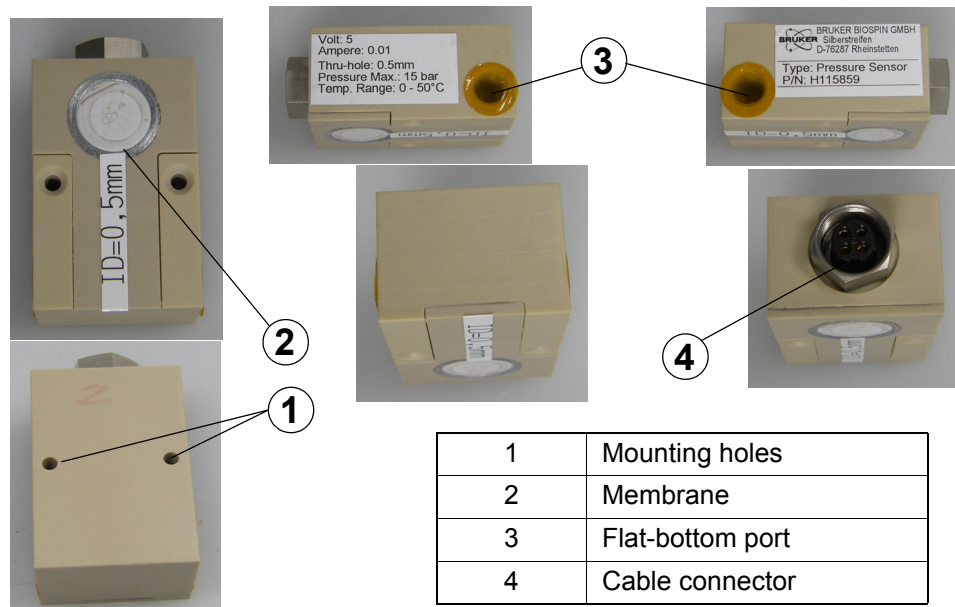


Figure 3.1 Key components of the pressure sensor

3.1.2 Connector Cable

The connector cable supplies power to the sensor and connects the sensor's analog output to an A/D converter.



Part Number: HZ16684
Cable Length: 2000 mm

Figure 3.2 Connector Cable

3.1.3 Wall Plug Power Supply

The Wall Plug Power Supply connects to the cable HZ16684 and supplies one sensor.



Part Number: 1802512

Figure 3.3 Wall-Plug Power Supply

The power supply's Clip Kit provides adaptors needed to connect the power supply in country specific wall socket outlets.



Part Number: 1802513

Figure 3.4 Clip Kit

3.1.4 Mounting Screws

The two mounting screws are used to securely mount the pressure sensor to the flow system.



Part Number: 60743

Description: M2 x 20 mm

Figure 3.5 Mounting Screws

3.1.5 Fitting Plugs

The two 1/4" flat PTFE fitting plugs protect the inside of the sensor from damage.



Part Number: 84516

Description: 1/4" flat PTFE fitting plugs

Figure 3.6 Fitting Plugs

3.2 Pressure Sensor Kits

Bruker offers pressure sensor kits for each of the through hole diameters. Each kit includes all the parts required to connect and supply one sensor.

Quantity	Part No.	Description
1	H115858	Pressure sensor 0.3 mm
1	HZ16684	Connector cable
2	84516	Fitting plug flat PTFE 1/4"
2	60743	Screw M2 x 20 mm V2A
1	1802512	Wall Plug Power Supply
1	1802513	Clip Kit for Power Supply

Table 3.1 Kit 1 with through hole 0.3 mm sensor (part No. H118273)

Quantity	Part No.	Description
1	H115859	Pressure sensor 0.5 mm
1	HZ16684	Connector cable
2	84516	Fitting plug flat PTFE 1/4"
2	60743	Screw M2 x 20 mm V2A
1	1802512	Wall Plug Power Supply
1	1802513	Clip Kit for Power Supply

Table 3.2 Kit 2 with through hole 0.5 mm sensor (part No. H118274)

Quantity	Part No.	Description
1	H115862	Pressure sensor 1.0 mm
1	HZ16684	Connector cable
2	84516	Fitting plug flat PTFE 1/4"
2	60743	Screw M2 x 20 mm V2A
1	1802512	Wall Plug Power Supply
1	1802513	Clip Kit for Power Supply

Table 3.3 Kit 3 with through hole 1.0 mm sensor (part No. H118275)

3.3 Specifications

Pressure range maximum	0 - 30 bar
Measurement range (differential)	0 - 15 bar
Resolution	>= 0.1 bar
Response time	< 0.1 sec
Accuracy	< 3% of full scale
Temperature range	0 to + 50 °C
Connection technology	1/4" 28 flangeless fitting to connect 1/16" capillary tubes (FEP, PEEK). Tube ID: 1 mm, 0.5 mm, 0.3 mm
Media Compatibility	Water, buffer (saline, PH 3 -9)
Media isolation	None
Flow path	Based on the capillary ID (0.3 mm, 0.5 mm, 1 mm).
Power Supply	5 V
Supply current max.	10 mA
Output Signal	0.5 V - 4.5 V

Table 3.4 Physical Specifications

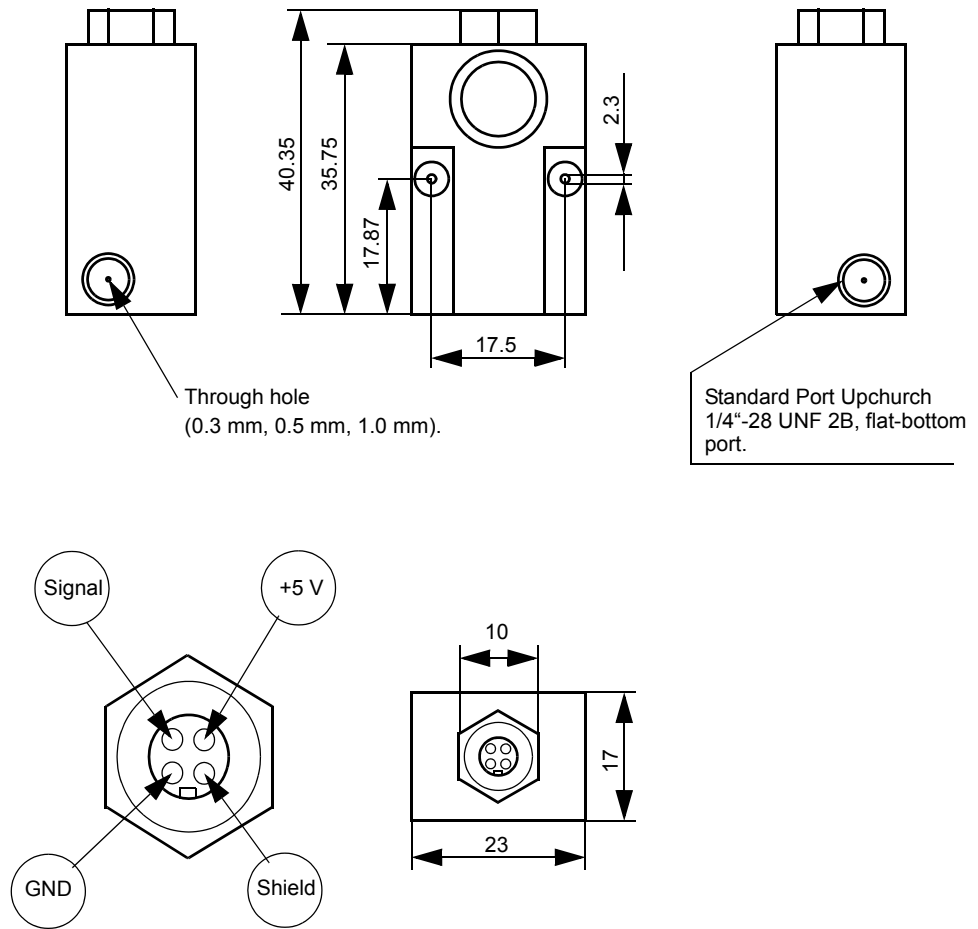


Figure 3.7 Physical Dimensions

4 Safety

4.1 Safety Recommendations

CAUTION



Accident hazard from hazardous materials.

The liquid used in high pressure LC systems may be dangerous to your health. The liquids may also be under high pressure.

- ▶ Avoid skin contact with liquids.
- ▶ Be careful when opening connections.
- ▶ Always wear protective clothing perscribed by the laboratory supervisor.

NOTICE

Material damage hazard from material contact with NMR solvents.

The silicone glue between the sensor chip and the case are not resistant to some NMR solvents, damage to the sensor may occur.

- ▶ Solvents used are restricted to aqueous solutions.

-
- i** **Correctly Locking a Capillary Connection:** Take the end of the capillary and insert the fitting and the ferrule into the slot and tighten the fitting. While tightening be sure to press the capillary to the limit stop.
-

NOTICE

Material damage hazard from contamination.

When the plug fittings are not in place on the capillary ports it is possible that the sensor may become contaminated.

- ▶ Always seal the capillary ports with the plug fittings.

-
- i** The sensor's through hole diameter should be the same as the internal diameter of the capillary used. Available through hole sensor diameters are 1.0 mm, 0.5 mm, and 0.3 mm.
-

CAUTION



Accident hazard from loose cables.

Loose cables or capillaries may create an unsafe work environment if they are not securely fasten.

- ▶ Fix all cables and capillaries using appropriate fixation devices.

NOTICE

Material damage hazard from obstructed membrane or solvents.

Material damage may result if the sensor membrane becomes obstructed or if solvents come in contact with the membrane.

- ▶ Ensure that nothing is blocking the membrane entrance.
- ▶ Use extra care when handling solvents in the vicinity of the membrane.

5 Installation

Before the installation verify that all required parts are available (see parts list).

i The sensor's through hole diameter should be the same as the internal diameter of the capillary used. Available through hole sensor diameters are 1.0 mm, 0.5 mm, and 0.3 mm.

1. Mount the sensor to an appropriate position near the HPLC pump or before the probe using the two mounting screws.
2. Install the capillaries by the correct fittings and ferrules on the sensor. The flow direction through the sensor does not matter.

i **Correctly Locking a Capillary Connection:** Take the end of the capillary and insert the fitting and the ferrule into the slot and tighten the fitting. While tightening be sure to press the capillary to the limit stop.

3. Remove the air from the sensor and the capillaries.
4. Connect one end of the cable (P/N HZ16684) to the sensor and the other end to the connector box (yellow = GND, white = signal out). The sensor's output signal range is 0.5 V - 4.5 V.
5. Connect the wall plug power supply cable to the cable (P/N HZ16684).
6. Connect the wall plug power supply to a 100 to 240 VAC/50 to 60 Hz mains wall socket.
7. Fasten all the cables and capillaries in a safe position in the flow system.

The sensor is now available for use.

5.1 Sensor Wiring

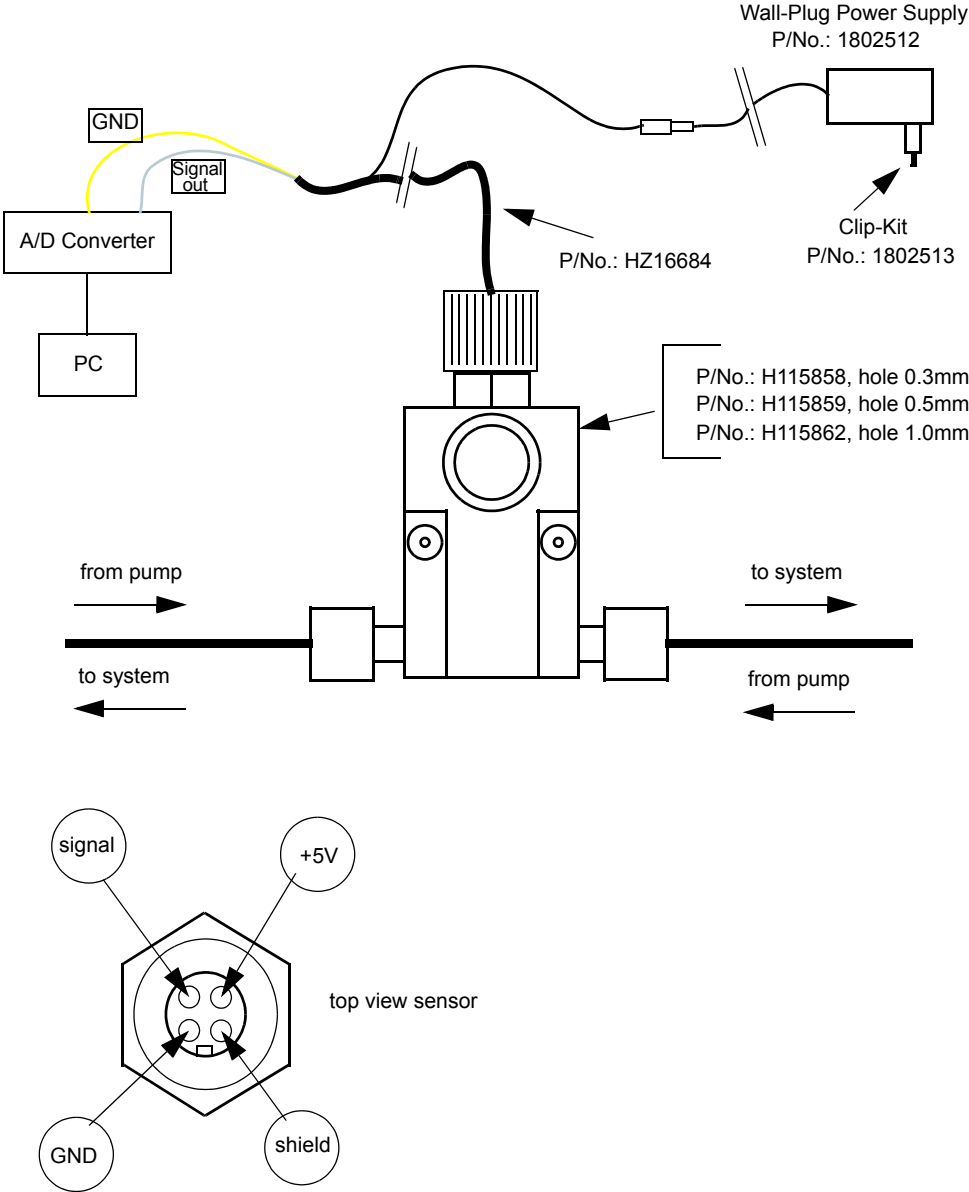


Figure 5.1 Sensor Wiring

6 Maintenance and Service

6.1 Membrane Notice

NOTICE

Material damage hazard from obstructed membrane or solvents.

Material damage may result if the sensor membrane becomes obstructed or if solvents come in contact with the membrane.

- ▶ Ensure that nothing is blocking the membrane entrance.
- ▶ Use extra care when handling solvents in the vicinity of the membrane.

6.2 Wiring Notice

CAUTION



Accident hazard from loose cables.

Loose cables or capillaries may create an unsafe work environment if they are not securely fasten.

- ▶ Fix all cables and capillaries using appropriate fixation devices.

6.3 Sensor Liquid Ports

NOTICE

Material damage hazard from contamination.

When the plug fittings are not in place on the capillary ports it is possible that the sensor may become contaminated.

- ▶ Always seal the capillary ports with the plug fittings.

7 Contact

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Appendix

A

A.1 Warning Signs

C

Caution

- Accident hazard from hazardous materials. 19
- Accident hazard from loose cables. 20, 23

N

Note

- Correctly Locking a Capillary Connection 19, 21
- The sensor's through hole diameter should be the same as the internal diameter of the capillary used. 20, 21

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- Material damage hazard from contamination. 19, 23
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