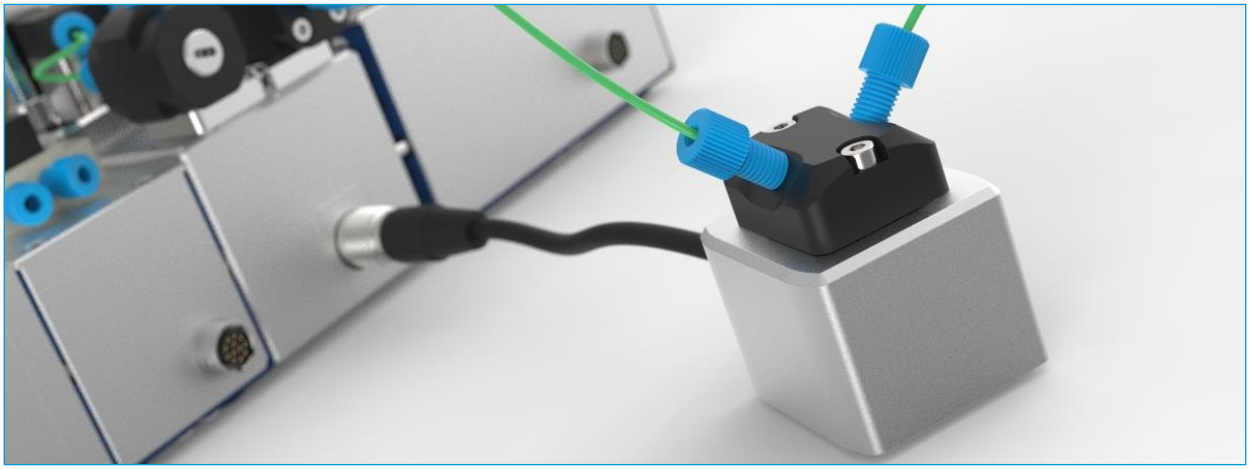
CETONI

# CE PRESSURE SENSOR

## Hardware Manual



**ORIGINAL INSTRUCTIONS 1.12– MARCH 2017**

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# 1 Overviews & Indexes

## 1.1 Content

## 1.2 Change History

| REV | DATE | CHANGE |
|---|---|---|
| 1.01 | 28.08.2013 | Creation of the manual |
| 1.10 | 09.03.2015 | Added safety advices |
| 1.11 | 10.03.2016 | Revision Guide Design |
| 1.12 | 16.03.2017 | Added OEM-versions |

# 2 Introduction

## 2.1 Foreword

Thank you for deciding to purchase a CETONI product. We would like to support you with this handbook as far as possible in your interaction with the neMESYS Pressure Sensor. We are directly available for any questions or suggestions that you may have.

The neMESYS Pressure Sensor may only be taken in operation after carefully reading and understanding this manual. We wish you much success in your work with the neMESYS Pressure Sensor.

## 2.2 Symbols and Key Words Used

The following symbols are used in this manual and are designed to aid your navigation through this document:

**HINT**. Describes practical tips and useful information to facilitate the handling of the software.

**IMPORTANT**. Signifies important hints and other useful information that not describe potentially dangerous or harmful situations.

**CAUTION**. Identifies a potentially harmful situation. Failure to avert this situation may result in damage to the product or anything in its proximity.

**ATTENTION**. Indicates a potentially dangerous situation. Failure to avert this situation may result in light or minor injuries or property damage.

## 2.3 Norms and Guide Lines

CETONI GmbH declares under its sole responsibility, that the individual neMESYS Pressure Sensor complies with the health and safety requirements of the relevant European directives.

## 2.4 Application Purpose

### 2.4.1 General Description of the Device

The neMESYS Pressure Sensor is a small chemically resistant pressure sensor with low dead volume for connection to the I/O interface of other CETONI devices.

### 2.4.2 Intended Use

The neMESYS Pressure Sensor is intended to be used to monitor the pressure in a fluidic system, driven by neMESYS syringe pumps, or to build a pressure regulation.

Application usually takes place in laboratory.

### 2.4.3 Reasonably Foreseeable Faulty Application

A use for applications distinct from the intended purpose can lead to dangerous situations and is to be omitted.

**CAUTION**. The unit must not be used as a medical device or for medical purposes.

### 2.4.4 Safety Advice

The safety of the user and a failure-free operation of the devices are assured only if original parts are used. Only original accessories may be used. Warranty claims will not be accepted for damage due to the use of alien accessories or expendables.

The devices have been developed and constructed in such a way as to largely rule out hazards due to its intended use. Nevertheless, you must observe the following security measures in order to exclude any remaining hazards.

- CETONI GmbH points out the responsibilities of the operator for the operation of the devices. The laws and regulations of the place of installation must be observed while operating the devices! To ensure a safe work routine, operators and users must assume responsibility for adhering to regulations.
- The devices must not be used as a medical device or for medical purposes.
- The neMESYS Pressure Sensor is designed and approved to work in fluidic systems that do not exceed a maximum volume of 1 liter and a maximum pressure of 200 bar. CETONI GmbH is not liable for consequences that may arise if the user expands the system by peripheral devices, such that one of the values or both values are exceeded.

  It is explicitly stated to observe the validity of the Pressure Equipment Directive 2014/68/EU, wherein Article 4 “Technical requirements“ has to be paid particular attention.

  It is the user's responsibility to become familiar with the mentioned Pressure Equipment Directive and to comply with the prevailing requirements.
- Before operating the unit, the user must at all times ensure the operational reliability and the adequate and orderly condition of the unit.
- The user must be familiar with the operation of the device and the software.
- The device as well as cables and pipes must be checked for damage before operation. Damaged pipes, cables and plug devices must be replaced immediately.
- Cables and pipes must be laid in a way that avoids any risk of stumbling.
- It is not allowed to use the device in an explosive atmosphere or with potentially explosive substances.
- Wear protective glasses if you are working with corrosive, hot or otherwise dangerous substances during assembly work on the device.
- Transportation, storage or operation of the device below 0°C with water in the fluid passages may cause damage to the device.

## 2.4.5 Measures for Safe Operation

### 2.4.5.1 ELECTROMAGNETIC EMISSIONS

The neMESYS Pressure Sensor is intended to be operated with a neMESYS System which is connected directly to the public power supply network that supplies buildings used for domestic purposes.

### 2.4.5.2 ELECTROSTATIC DISCHARGE

Floors should be made of wood, concrete, or ceramic tiles. If the flooring is made of a synthetic material, the relative humidity must be at least 30%.

#### 2.4.5.3 ELECTRIC DISTURBANCES

The quality of the supply voltage should be to the standard of a typical business or hospital environment.

#### 2.4.5.4 MAGNETIC DISTURBANCES

Do not place power connector cables, even of other appliances, in close proximity of the devices and their cables. Mobile communication devices may not be used in closer proximity of the devices or their cables than the recommended safety distance!

### 2.4.6 Safety Devices on the System

The system can be switched off at any time in an emergency using the main switch on the Base Module (rocker switch on the side of the housing); this will cause no damage to the unit.

### 2.4.7 Condition of the Devices

Irrespective of the faultless manufacture of the device, damage can occur whilst the unit is in operation. With this in mind, always carry out a visual check of the components mentioned before use. Pay particular attention to crushed cables, damaged tubing, and deformed plugs. If you should notice any damage, please do not use the device and inform CETONI GmbH without delay. CETONI will put your device back to an operational condition at the earliest. Do not attempt to repair the device yourself.

## 2.5 Warranty and Liability

The device left our company in perfect condition. Only the manufacturer is permitted to open the device. All guarantee and liability entitlements, particularly damage entitlements due to personal injuries, are void if the devices are opened by an unauthorized person.

The duration of the warranty is 1 year from the day of delivery. It is not extended or renewed due to work carried out under warranty.

CETONI GmbH considers itself responsible for the device with regard to safety, reliability and function only if assembly, new settings, changes, extensions and repairs are carried out by CETONI GmbH or an authorized centre, and if the device has been used in accordance with the instruction manual.

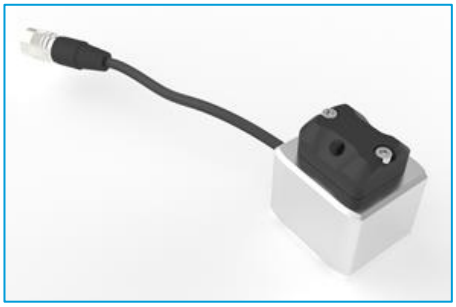
The neMESYS Pressure Sensor conforms to the basic safety regulation standards. Industrial property rights are reserved on the circuits, methods, names, software programs, and units.

# 2.6 Scope of Supply

The delivery should correspond to the order. The following items should be included in the scope of supply:

neMESYS Pressure Sensor according to order with:

- Hirose cable plug 12p round for neMESYS standard module
- JST cable socket 12p flat for neMESYS OEM module
- free leads with ferrules for Qmix I/O-B module



Hardware-manual

# 3 Technical Data & Handling

## 3.1 Technical Data

### 3.1.1 Environment

| | |
|---|---|
| **OPERATING TEMPERATURE** | 0°C to 50°C |
| **STORAGE TEMPERATURE** | -20°C to 75°C |
| **OPERATING AIR HUMIDITY** | 20% to 90%, non-condensing |
| **STORAGE AIR HUMIDITY** | 20% to 90%, non-condensing |

**CAUTION**. Transportation, storage or operation of the modules below 0°C with water in the fluid passages may cause damage to the module.

### 3.1.2 Interfaces

| | |
|---|---|
| **HIROSE CABLE PLUG 12p round** | for connection to neMESYS I/O-interface |
| **JST CABLE SOCKET 12p flat** | for connection to neMESYS OEM I/O-interface |
| **FREE LEADS WITH FERRULES** | for connection to Qmix I/O-B module |

# 3.2 Wetted Materials

In the following picture the wetted parts of the pressure sensor are marked with blue identifiers.


| NO. | DESCRIPTION | MATERIAL |
|---|---|---|
| 1 | Cover | PPS GF40 (Polyphenylene sulfide 40% glass fiber) |
| 2 | Seal | FKM (Viton shore 80) |
| 3 | Sensor | $Al_2O_3$ (aluminum oxide ceramics) |

**CAUTION**. Before using the neMESYS Pressure Sensor, please check the chemical resistance of the wetted materials against the dosing liquid.

# 3.3 Pressure Range/Configuration

Before using the sensor, it must be selected or configured in software. The procedure is described in the software manual. During configuration, you must specify the pressure range and the output signal.

The pressure range can be found on the nameplate on the bottom of the device. The output signal is 0.5 – 4.5 V.


In operation, the pressure rating of the sensor must not be exceeded permanently. However in case of a failure, the sensor is able to withstand an overload pressure which is twice the rated pressure.

# 3.4 Electrical Connection

**IMPORTANT**. Please read and observe the respective section of the associated software manual before connecting the device.

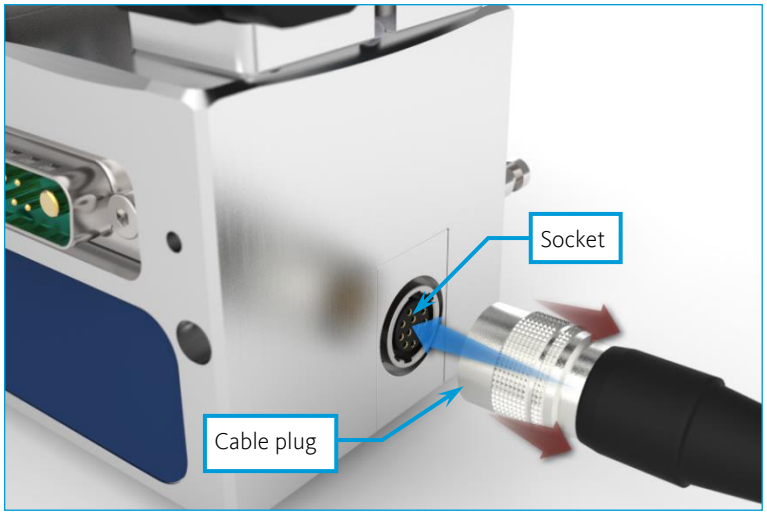
**ATTENTION**. Danger of stumbling due to connecting cables! Place cables and tubing in such way as to avoid any danger of stumbling!

## 3.4.1 Connection to neMESYS I/O-interface

The pressure sensor with the 12-pin Hirose cable plug can be connected to all neMESYS devices that are fitted with the corresponding 12-pin Hirose socket.

Plug the cable connector of the pressure sensor into the socket of the module until it snaps into place (blue arrow). Please note that the plug will fit only one way!

To remove it, pull on the metal sleeve of the plug. Thus, the lock is released and the plug can be easily removed. (red arrows)

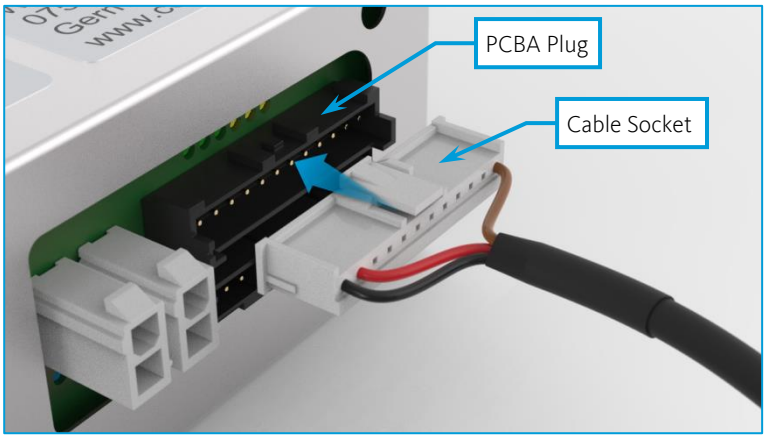


### 3.4.2 Connection to neMESYS OEM I/O-interface

The pressure sensor with the 12-pin JST cable socket can be connected to all neMESYS devices that are fitted with the corresponding 12-pin JST PCBA plug.

Plug the cable socket of the pressure sensor into the plug of the module until it snaps noticeable into place. Please note that the connection will fit only one way!

To remove it, pull on the snap-fit rocker of the cable socket. Thus, the lock is released and the cable can be removed easily.



### 3.4.3 Connection to Qmix I/O-B module

The pressure sensor with free leads can be connected to the Qmix I/O module or other suitable evaluation systems.

The following table shows the assignment of the wires according to their color:

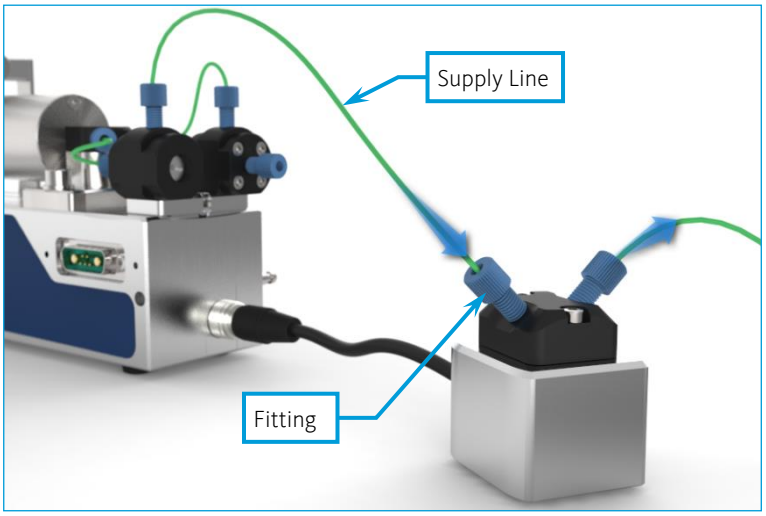
| WIRE COLOR | ASSIGNMENT |
|---|---|
| BLACK | Ground |
| RED | Supply Voltage 5 ± 0,5 VDC |
| BROWN | Signal 0,5 ... 4,5 V |

A possible connection variant on the Qmix I/O module is shown in the following figure. Depending on the terminals used, the actual cabling required may differ from the illustration.

# 3.5 Fluidic Connection

The pressure sensors are connected to the application with ¼”-28UNF fittings. Pay attention that the fittings and tubes of your choice withstand the pressure to be expected during application.

The direction of flow through the sensor does not matter. So it is your decision which of the ports you would like to be in- or outlet.




The illustration shows the fluidic connection for the standard version as an example. The fluidic connection for the OEM version is made in the same way.

**CAUTION**. Only use fittings and capillaries specified for the anticipated pressure levels.

**CAUTION**. After connecting, check the tightness of all fluidic connections on a regular basis.

# 4 Maintenance & Disassembly

## 4.1 Maintenance

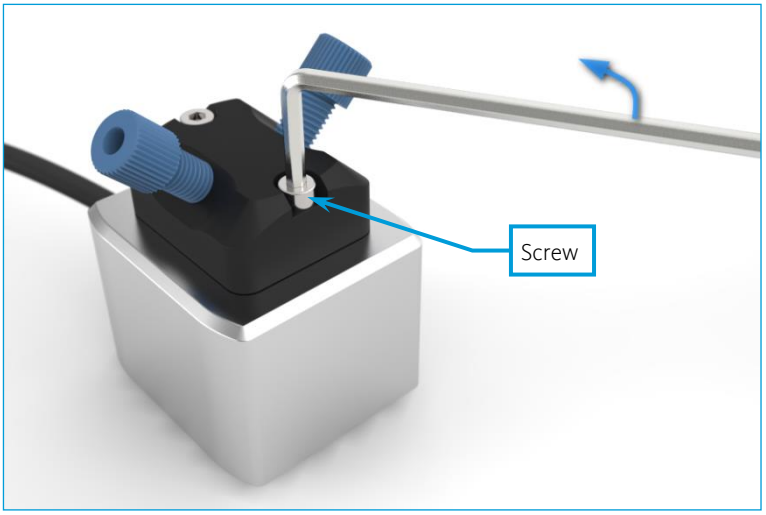
If used in accordance with intended purpose, the device is maintenance-free.

After use with aggressive fluids please thoroughly cleanse the pressure sensor with water followed by, if possible, drying with compressed air, in order to avoid any deposits on the inside.

To replace the seal, it is necessary to remove the cover. To do this, please proceed as follows:

## 4.2 Disassembly/Assembly

Remove the two Allen screws with a 2.5 mm Allen wrench and remove the cover. Now you can wipe the sensor surface and the inside of the housing carefully. Furthermore you can exchange the O-ring seal. (see picture in chapter 3.2).




During reassembly, pay attention that the O-ring seal is placed correctly in the recess of the housing. Then put the housing back on and tighten the two screws evenly.

# 5 Disposal

Please send your old devices back to CETONI GmbH. We will take care of proper disposal according to electric devices regulations.

If necessary, please decontaminate the device before sending it back and attach a completed decontamination declaration with your shipment.