Greenspec BV

pH sensor

Art. nr. 4401.1

Greenspec PH sensor Art. Nr 4401.1

Compact pH sensor consisting of measurement unit in its protective housing with connecting cable to the electronic board in its own protective housing. The unit can be easily calibrated using the AFP software , see the instructions on the rear. The package consists of the pH electrode in a storage bottle and the electronics box with connecting coax-cable and the chosen connector.

New: Replacement pH sensor by Xylem 0-10 bar pH sensor with new connector fitting.

Connecting to:

Electrical connection to AFP or AFP light by ground, 15V and signal from the pH electronics box. Mount the box maximum 2 m from the pH sampling point. Connect the pH electrode to the pH electronics box by the coaxial cable. For programming details see page 2.

Hardware installation:

New installation: The pH sensor must be in the flow of the ferti solution, see the picture. It can be fixed in screw-on (art. nr. 4406.1) or in a glued holder (art. nr. 4407.1).

Install the holder in the pipe line. Take the pH sensor out of the transport tube. *Insert it in adaptor tube with flat side on top in the holder. Slip the long screw top on the coax cable* and screw it handtight without using force: *glass!* Connect the coax cable to the pH electronics box.

Retrofitting: easy, take out the pH sensor and replace sensor and coax cable. *For replacement orders we provide a cap and adaptor.*

Maintenance:

The pH sensor should be kept wet, if you close down the installation, take out the sensor and put it in the shipping bottle. If the bulb is dried out, it should first be soaked in such a solution (*KCl 3.8M*) before use.

Complete package 4401.1

Amplifier box art. nr. 4404.1

pH in box in storage solution, art. nr. 4402.2

Holder art. nr. 4406.1 with thread

Holder art. nr. 4407.1 to glue

Ph electrode in holder

Install the holder in the pipe line. Take the pH sensor out of the transport tube. Insert it in adaptor tube with flat side on top in the holder. Slip the long screw top on the coax cable and screw it handtight without using force: glass!
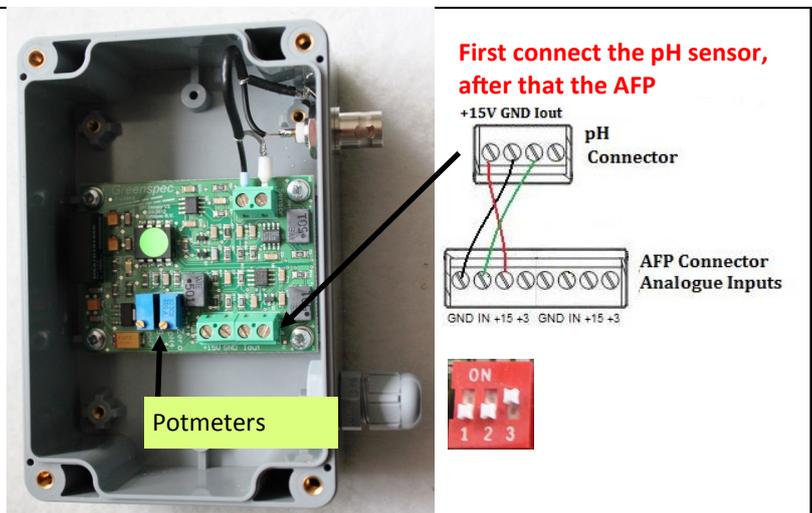
Electrical connection to AFP:

Fix the electronics box at a suitable place. **FIRST** connect the coax cable to the pH electronic box.

Open the box by taking out the 4 screws with a Phillips screwdriver.

Connect the 3 output cables to an analog input of the AFP as according to the schedule.

The dipswitch setting should be as indicated.

See page 2 for calibration, you need a multimeter, a 00 screwdriver and nailpolish for adjustment of the 2 blue potmeters on the electronics board,

indicated as Zero=pH 4 and Gain=pH 7.

Close the box once you are ready with the hardware calibration.

Potmeters

First connect the pH sensor, after that the AFP

+15V GND Iout

pH Connector

AFP Connector Analogue Inputs

GND IN +15 +3   GND IN +15 +3

ON
1 2 3

Setting of the pH sensor in the AFP config menu:

Choose **analog input**, give the correct **hardware input nr.**, set type and parameter **default**, give a **name**, set the range **–3.5 to 22.8**, measure with **average**. Save and exit. **If you want precision, calibrate the pH-sensor every 6 months.**

Calibrate with 2 pH solutions

To set up the pH unit correctly you need two calibration solutions, pH 4 and pH 7 as well as clean distilled water. Put the solutions in two glasses, when you switch between the 2 clean with distilled water. Wait each time 30 s before reading and adjusting.

The procedure for **hardware calibration has to be applied after replacement of the pH-sensor only**.

You need also a multimeter a 00 screwdriver and nailpolish to adjust and fix the potmeters.

The **software calibration check has to be repeated every 6 months upon cleaning the sensor**. You only need the fluids.

Hardware calibration : *only when you replace pH-sensor! Open the electronics box*

pH 4 = 8.57 mA ≈ 1172 (Codage 0/4095) and: pH 7 = 12 mA ≈ 1639 (Codage 0/4095)

First connect the sensor via the electronic box and check that the value on the AFP is In Value ca 0-10 ad Calc. Value –3.5.

Then connect the 3 wires to the AFP input.

Step 1 : Use pH 7 solution and set the potmeter for the value pH7 = 12mA

Step 2 : Clean the pH sensitive cell with distilled water

Step 3 : Use the PH 4 solution to set the Zero potmeter for the value pH4 = 8.57mA.

Repeat the Steps until almost no potentiometer change is necessary, Take note that the sensitive cell need a certain time to point out the correct value.

Once done, put nail polish on the potmeters to prevent any future undesired changes.

Software calibrations are done by clicking in the menu AFP config on the button:

Software calculation setting method 1: *can be used only for Greenspec pHsensor*

In case that the electronic Board is correctly calibrated you can go directly to the Menu AFP config, than "Select Type to Set Default Value" and choose pH Greenspec, than Apply. You activate then standard pH Greenspec setting and that should work. Test by putting the pH sensor in the pH 4 and pH7 solutions. **If not ok, then calibrate.**

Software calculation setting method 2:

In case that the electronic Board is correctly calibrated, you can also calibrate with the theoretical calculation and enter shown in the red square the measured values and the value range. Click calculate and apply. Test by putting the pH sensor in the pH 4 and pH7 solutions. **If not ok, then calibrate.**

Software calibration method 3: do the calibration with 2 points.

In case that by calculation the result of the pH measurement is not correct , you have to use the part of the menu "Analogue Input Calibration'.

Step 1: Put sensor in calibration solution of pH4, wait 30s, click save.

Step 2: Clean and repeat for pH 7, click save.

Step 3: After saving value for pH 7 click on Calculate and on Apply.

Technical specifications

General data	Greenspec pH Sensor V1.2
Mechanical construction	Dimensions box (L x B) 186 x 113 mm, pH sensor 100 x 30 mm Cable gland 2 x Pg 13.5 Weight approx. 0.5 kg,
Materials	Measurement box PE, pH sensor glass and PE
Input parameters	Measuring range pH 0 to 14 corresponds with 4 to 20 mA Accuracy error 5% of measured value.
Output parameters	Current range 4 ... 20 mA Resolution 0.1% of measuring range Measuring error 5% of current output range
Electrical connection data	Power supply 15 VDC Power consumption 5 W
Process conditions	Operating temperature range 0 ... +70 °C Operating pressure range 8 bar / 40 °C, 1 bar / 70 °C
Ambient conditions	Storage temperature –10 ... +50 °C Ingress protection IP 65 Electromagnetic compatibility Interference emission and immunity acc. to EN 61326:1997 / A1:1998 Subject to modification.