



Read before installation.
Keep for future use.

www.knick.de

Safety

Read the user manual for the basic unit (FRONT and BASE modules) and the corresponding measuring and communication modules, observe the technical specifications and follow the safety instructions in the safety guide (Package Contents for the basic unit Protos II 4400(X)) – for Ex versions, additionally the information provided in the documents in the Package Contents.

The user manual, safety guide and other product information can be downloaded from www.knick.de.

NOTICE! Potential damage.
Never try to open the module. The Protos modules cannot be repaired by the user. For inquiries regarding module repair, please contact Knick Elektronische Messgeräte GmbH & Co. KG at www.knick.de.

Intended Use
The module is used for the simultaneous measurement of pH value and temperature with Pfaudler probes.

Note: The specifications on the module's rating plate take precedence.

Package Contents

- Measuring module
- Installation Guide
- Test report 2.2
- Adhesive label with terminal assignments
For Ex version PH 3400X-033:
- Appendix to certificates (KEMA 03ATEX2530, IECEx DEK 11.0054)
- EU Declaration of Conformity
- Control Drawings

Check all components for damage upon receipt.
Do not use damaged parts.

Operating States

The function check (HOLD) operating state is active:

- During calibration (only the corresponding channel)
- During maintenance
- During parameter setting
- During the automatic rinse cycle
(use of the rinse contact)

The behavior of the current outputs depends on the parameter setting, i.e., they may be frozen at the last measurement or set to a fixed value.

For detailed information, refer to the user manual of the basic unit (FRONT and BASE modules).

Headquarters
Beuckestr. 22 • 14163 Berlin
Germany
Phone: +49 30 80191-0
Fax: +49 30 80191-200
info@knick.de
www.knick.de

Local Contacts
www.knick-international.com

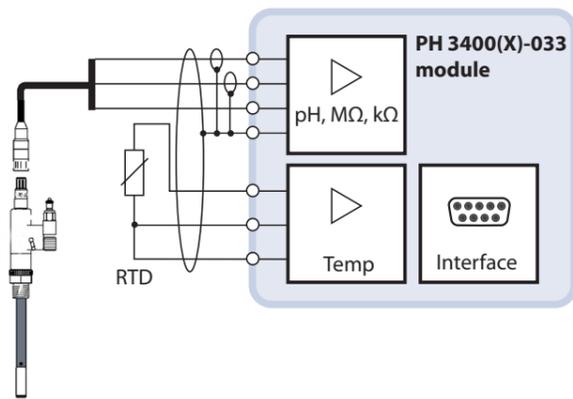
Copyright 2019 • Subject to change
Version: 1
This document was created on April 8, 2019.
The latest documents are available on our website below the corresponding product description.
Installation guides can be downloaded in the following languages: German, English, French, Spanish, Portuguese



TI-201.033-KNE01

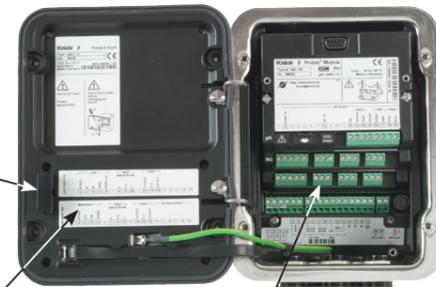
095258

Device Overview/Module Concept



WARNING! Shock potential.
Make sure the device is de-energized before reaching into the terminal compartment.

Memory card slot
Follow the instructions in the installation guide for the memory card.



Terminal plate adhesive label ("concealed" modules)
The adhesive labels (Package Contents) for the modules at slot 1 or slot 2 can be affixed here.
This simplifies maintenance and service.

Module configuration
Any combination of up to 3 measuring and communication modules is possible.
Module identification:
Plug & Play

Inserting the Module

CAUTION! Electrostatic discharge (ESD).
The modules' signal inputs are sensitive to electrostatic discharge. Take measures to protect against ESD before inserting the module and wiring the inputs.

Note: Strip the insulation from the wires using a suitable tool to prevent damage.

1. Switch off the power supply to the device.
2. Open the device (loosen the 4 screws on the front).
3. Plug the module into the slot (D-SUB connector), see figure on the right.
4. Tighten the module's fastening screws.
5. Open the ESD shield (covering terminals 2 and 8).
6. Connect the sensor and separate temperature probe if necessary, see "Wiring" on the next page.
Note: To avoid interferences, the cable shielding must be completely covered by the ESD shield.
7. Fit the ESD shield back into place (covering terminals 2 and 8).
8. Check whether all connections are correctly wired.
9. Close the device by tightening the screws on the front.
10. Switch on the power supply.

CAUTION! Incorrect measurement results.
Incorrect parameter setting, calibration or adjustment may result in incorrect measurements being recorded. Protos must therefore be commissioned by a system specialist, all its parameters must be set, and it must be fully adjusted.



NOTICE! Moisture ingress.
The cable glands must be tightly sealed. If necessary, use suitable filler plugs or sealing inserts.

Module Compatibility

	Protos 3400	Protos 3400X	Protos II 4400	Protos II 4400X
Protos PH 3400-033 module	x		x	
Protos PH 3400X-033 module		x		x

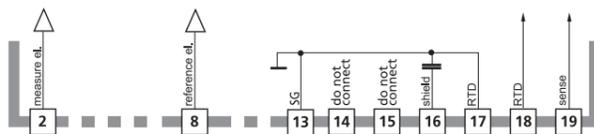
Wiring

(for detailed diagrams, see the user manual)

	pH measurement with Pfaudler differential probe, blue cable	Sensors with VP connector, VP cable: VP 6
2	measure el.	Coax white (1)
8	reference el.	Coax brown (2)
13	SG	Blue (5)
14	do not connect	
15	do not connect	
16	shield	Shield (3 x) yellow (7), purple (8), orange (9)
17	RTD	Temperature probe (brown) (3)
18	RTD	Temperature probe (green) (4)
19	sense	Temperature probe (black) (6)

]= Insert jumper

⋮ = Jumper for sensors without solution ground



Menu Overview for the PH 3400(X)-033 Module

Parameter setting

Input filter	Pulse suppression
Sensor data	Select sensor type, temperature detection, Sensoface, sensor monitoring
Cal presettings	Select buffer set, drift check, calibration timer, Cal tolerance band ¹⁾
TC process medium	Set the temperature compensation
ORP/rH value	Select reference electrode type, conversion to SHE, calculate rH with factor
Delta function	(Output value = measurement - delta value)
Messages	pH, ORP, rH, temperature, mV: Off, device limits max., variable limits

Calibration/Adjustment

Calimatic – automatic calibration/adjustment
 Manual – entry of buffer values
 Product calibration/adjustment
 Data entry – premeasured sensors
 ORP calibration/adjustment
 Temperature probe adjustment (with Protos II 4400(X))
 Nominal zero

1) Only available with Cal tolerance band add-on function (SW3400-005 / FW4400-005)

Maintenance

Sensor monitor	For validation of sensor and complete signal processing (with Protos 3400(X))
Temperature probe adjustment	

Diagnostics

Message list	List of all messages
Logbook	Shows the last 50 events with date and time
Meas. point description	Shows the tag number and annotation (input in system control)
Device description	Hardware version, serial number, (module) firmware, options
Module diagnostics	Internal function test
Sensor monitor	Shows the values currently measured by the sensor
Cal record	Dates of the last adjustment/calibration
Sensor diagram	Graphic display of the current sensor parameters
Statistics	Shows the First Calibration and difference of the last 3 calibrations

Messages/Troubleshooting

(for detailed tables, see the user manual)

Error	Message (Diagnostics Menu: Message List)	Possible Causes	Remedy
	Display is blank	FRONT or BASE power supply interrupted Input fuse has tripped Display switch-off is active	Check the power supply Replace the fuse (500 mA T) Deactivate the display switch-off
	No measurement, no error message	Module not plugged in correctly	Install the module correctly Check the measurement display under "Parameter setting / Administrator level / FRONT Module"
	Sensoface 😞	Sensor not calibrated/adjusted Glass impedance too high, sensor cable defective Glass impedance too low: Possible glass breakage on sensor, sensor cable defective	Calibrate and adjust Calibrate and adjust Check the sensor connection Clean and replace the sensor if necessary Replace the sensor cable Replace the sensor Replace the sensor cable
B073/ B078	Current I1/I2, load error	Open current output I1/I2: Current loop not closed, cable interrupted	Check the current loop Deactivate the current outputs
F232	Module configuration Ex/safe area	Ex and safe area modules have been inserted.	Select a uniform configuration (either Ex or safe area)
P010	pH range	No sensor connected, sensor cable defective, sensor connected incorrectly, wrong operating mode selected	Connect the sensor, check the sensor cable, and replace if necessary Check the sensor connection Adjust the operating mode
P015	Temperature range		

Specifications (Extract)

pH/ORP input (PH3400X-033: Ex ia IIC)	pH measurement with Pfaudler differential probes Measuring electrode input Reference electrode input Auxiliary electrode input
Measuring range	pH value -2.00 ... 16.00 ORP value -2000 ... 2000 mV rH value 0.0 ... 42.5
Adm. cable capacitance	< 2 nF (cable length max. 20 m)
Measuring electrode input ¹⁾	Input resistance > 1 x 10 ¹² Ω Input current < 1 x 10 ⁻¹² A ³⁾ Impedance range 0.5 ... 1000 MΩ
Reference electrode input ¹⁾	Input resistance > 1 x 10 ¹¹ Ω Input current < 1 x 10 ⁻¹¹ A ³⁾ Impedance range 0.5 ... 1000 MΩ
Measurement error ²⁾ (display)	pH value < 0.02 TC < 0.001 pH/K ORP value < 1 mV TC < 0.05 mV/K
Temperature input ⁴⁾ (PH3400X-033: Ex ia IIC)	Pt 100/Pt 1000/NTC 30 kΩ/NTC 8.55 kΩ
Measuring range	3-wire connection, adjustable -20 ... 150 °C / -4 ... 302 °F (Pt 100/Pt 1000/NTC 30 kΩ) -10 ... 130 °C / 14 ... 266 °F (NTC 8.55 kΩ, Mitsubishi)
Resolution	0.1 °C
Measurement error ²⁾	0.2 % meas. value + 0.5 K (< 1 K with NTC > 100 °C/212 °F)

Temperature compensation, media-related ⁴⁾	Reference temperature 25 °C/77 °F Linear temperature coefficient, user-defined from -19.99 to 19.99 %/K Ultrapure water 0 ... 150 °C / 32 ... 302 °F Table 0 ... 95 °C / 32 ... 203 °F, user-defined in 5 K steps
Nominal zero ⁴⁾	pH 0 ... 14; calibration range ΔpH = ± 1
Nominal slope (25 °C/77 °F) ⁴⁾	25 ... 61 mV/pH
pHis ⁴⁾	Calibration range 80...103 % 0 ... 14
RoHS conformity	According to EU directive 2011/65/EU
EMC	EN 61326-1, EN 61326-2-3 NAMUR NE 21
Emitted interference	Industrial applications ⁵⁾ (EN 55011 Group 1 Class A)
Interference immunity	Industrial applications
Lightning protection	to EN 61000-4-5, Installation class 2
Rated operating conditions	
Ambient temperature	Safe area: -20 ... 55 °C / -4 ... 131 °F Ex: -20 ... 50 °C / -4 ... 122 °F
Relative humidity	10 ... 95 %, not condensing
Transport/storage temperature	-20 ... 70 °C / -4 ... 158 °F
Screw clamp connector	Single or stranded wires up to 2.5 mm ²

1) at rated operating conditions

2) ± 1 count, plus sensor error

3) at 20 °C, doubles every 10 K

4) user-defined

5) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.