Knick

Installation Guide
English

Protos II 4400(X)
FRONT and BASE Modules

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 accompanying safety guide – 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.

⚠ **CAUTION** Risk of losing the specified ingress protection.
Fasten the cable glands and screw together the housing correctly.
Observe the permissible cable diameters and tightening torques.
Only use original accessories and spare parts.
In a hazardous location, only cable glands with suitable approvals may be used. The installation instructions of the manufacturer must be observed.

Intended Use

The Protos II 4400(X) is a process analysis system for recording and processing electrochemical quantities in liquids and gases.

Package Contents

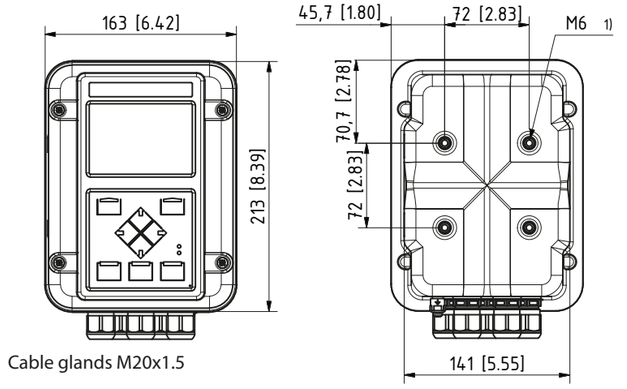
- Protos basic unit (FRONT and BASE modules)
- Wall-mount kit (2x wall-mount bracket, 4x hex bolt M6x10)
- Bag containing small accessory parts (2x reduction sealing insert, 2x blanking plug, 1x multiple sealing insert)
- Test Report 2.2 acc. to EN 10204
- Installation Guide
- Safety Guide

For Ex-version Protos II 4400X:

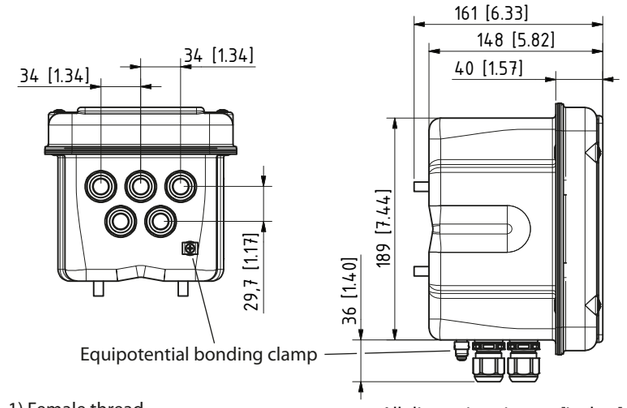
- Attachment to certificates (KEMA 03ATEX2530, IECEx DEK 11.0054)
- EU Declaration of Conformity

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

Dimension Drawings



Cable glands M20x1.5



1) Female thread

All dimensions in mm [inches]

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This document was published on November 13, 2020
The latest documents are available for download on the website under the corresponding product description.

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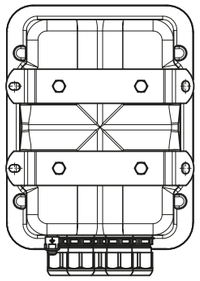
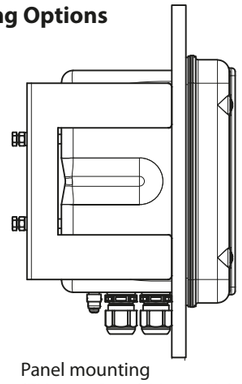
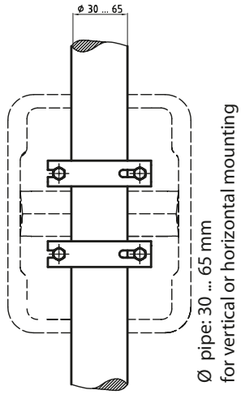
Mounting Options



Wall mounting (Package Contents)

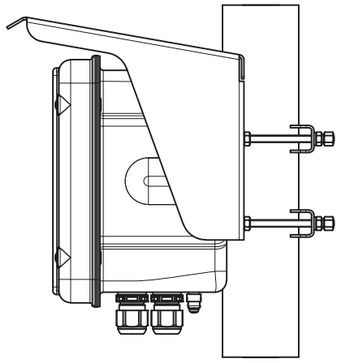


Panel mounting
(ZU 0545 Panel-Mount Kit)



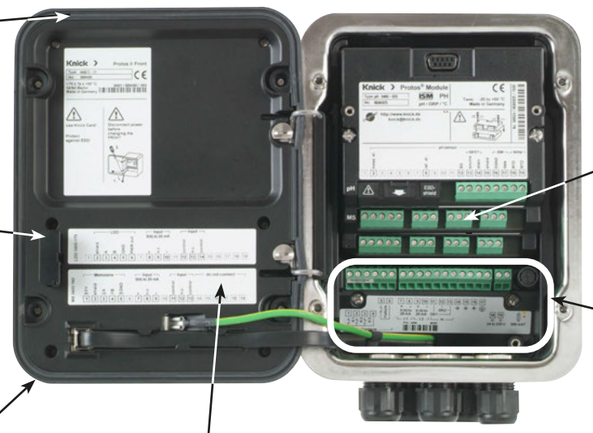
Ø pipe: 30 ... 65 mm
for vertical or horizontal mounting

Post/pipe mounting
(ZU 0544 Pipe-Mount Kit)



Mounting with protective hood
(ZU 0548 Protective Hood)

Device Overview



⚠ **CAUTION!** Risk of losing the specified ingress protection.
The circumferential sealing ensures IP65/NEMA 4X protection.
Do not contaminate, do not damage.

Memory card slot
Observe installation guide for the memory card.

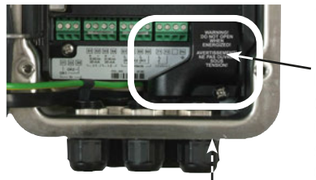
Replacement of FRONT module
See separate guide.

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.

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

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

BASE module connections
Non-Ex version
2 current outputs
(free assignment of process variables),
4 relay contacts,
2 digital inputs



BASE module connections
Ex version with power terminal cover (Package Contents):
intrinsically safe wiring of the signal terminals.
Optional terminal cover ZU1042: wiring of the signal terminals with type of protection ec EPL Gc.

Equipotential bonding clamp
See dimension drawing for exact position.

Operating States

Operating mode	Current outputs	Contacts	Controller (PID module)	Timeout [1]
Measuring	▒	▒	▒	–
Diagnostics	▒	▒	▒	–
Calibration [2]	▩	▩	■	–
Maintenance [2]				
Sensor monitor	▩	▩	■	–
Current source	▨	▩	■	–
Manual controller	▩	▩	▨	–
Parameter setting [2]	▩	▩	■	20 min
Rinse function [2]	▩	▩ [3]	■	At end of rinse time

Legend:
▒ Active (output functions normally)
■ Last value or fixed default value
▨ Manual control of outputs
▩ Depending on parameter setting

1) "Timeout" means that the device will switch to measuring mode after 20 minutes with no key activity.
2) Function check (HOLD) is active.
3) Rinse contact is active.

Electrical Installation

⚠ WARNING Shock potential.
An appropriately arranged and easily accessible disconnecting device for the product must be present in the system installation. The disconnecting device must disconnect all non-grounded, current-carrying wires. The disconnecting device must be labeled in a way that enables the associated product to be identified.

Before commencing with the installation, make sure that all lines to be connected are de-energized.

NOTICE! Strip the insulation from the wires using a suitable tool to prevent damage.

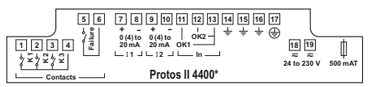
1. Connect the current outputs (or deactivate later during parameter setting).
2. Connect relay contacts and inputs as required.
3. For Ex version: Remove the power terminal cover.
4. Connect the power supply. Be sure to connect the protective ground terminal ⏚ of the BASE module with the grounding conductor of the power cord.
5. For Ex version: Connect the equipotential bonding clamp on the BASE module (underside of the housing) to the equipotential bonding of the system.
6. For Ex version: Replace the power terminal cover.
7. Insert the module (see module installation guide).
8. Connect the sensor (see module installation guide).
9. Check whether all connections are correctly wired.
10. Close the device and tighten the screws on the front.
11. Before switching on the power supply, make sure its voltage is within the specified range.
12. Switch on the power supply.

⚠ CAUTION! Incorrect parameter settings or adjustments can result in incorrect outputs.
The Protos II 4400(X) must therefore be commissioned by a system specialist, all its parameters must be set, and it must be fully adjusted.

Wiring

Terminal Assignments
BASE 4400-029 Module
VariPower broad-range power supply 24 ... 230 V AC/DC

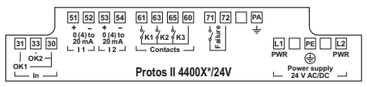
1	K1	Relay contacts, freely assignable
2	K2	
3	K3	
4	K1, K2, K3	
5	Failure	Relay contact
6		
7 +	I1	Current output 1 0(4) ... 20 mA
8 –		
9 +	I2	Current output 2 0(4) ... 20 mA
10 –		
11	OK1	Optocoupler input
12	OK2	
13	OK1, OK2	
14	⏚	Ground
15	⏚	
16	⏚	
17*	⏚	Protective ground
18	≈	Voltage supply 24 ... 230 V AC / DC
19	≈	
		500mAT fuse



*) Terminal 17 or PE must be connected.

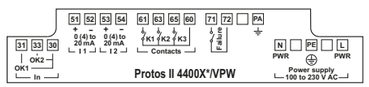
Terminal Assignments
BASE 4400X-026/24V Module
Ex version with 24 V AC/DC power supply

31	OK1	Optocoupler input
33	OK2	
30	OK1, OK2	
51 +	I1	Current output 1 0(4) ... 20 mA
52 –		
53 +	I2	Current output 2 0(4) ... 20 mA
54 –		
61	K1	Relay contacts, freely assignable
63	K2	
65	K3	
60	K1, K2, K3	
71	Failure	Relay contact
72		
PA	⏚	Ground (equipotential bonding)
L1	PWR	Voltage supply 24 V AC / DC
PE*	⏚	Protective ground
L2	PWR	Voltage supply 24 V AC / DC

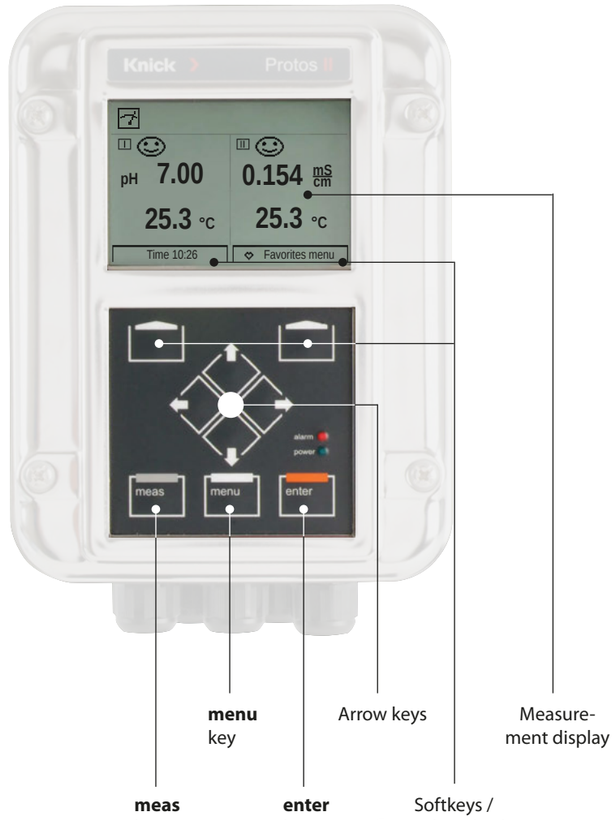


Terminal Assignments
BASE 4400X-025/VPW Module
Ex version with VariPower power supply (100 ... 230 V AC)

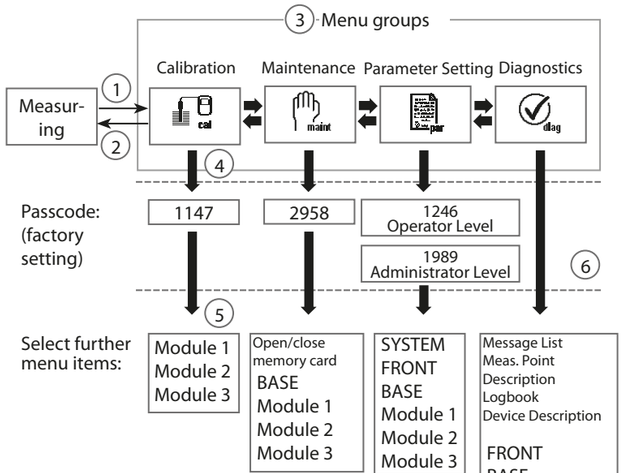
31	OK1	Optocoupler input
33	OK2	
30	OK1, OK2	
51 +	I1	Current output 1 0(4) ... 20 mA
52 –		
53 +	I2	Current output 2 0(4) ... 20 mA
54 –		
61	K1	Relay contacts, freely assignable
63	K2	
65	K3	
60	K1, K2, K3	
71	Failure	Relay contact
72		
PA	⏚	Ground (equipotential bonding)
N	PWR	Voltage supply 100 ... 230 V AC
PE*	⏚	Protective ground
L	PWR	Voltage supply 100 ... 230 V AC



Display, Keypad



Overview of Menus



①	Pressing the **menu** key accesses menu selection
②	Pressing the **meas** key returns to measurement
③	Menu groups are selected using the arrow keys
④	Press **enter** to confirm, enter passcode
⑤	Further menu items are displayed
⑥	Selected functions of the Diagnostics menu can be recalled via softkey even when in measuring mode

Legend: ✥ Arrow keys on keypad

Refer to the corresponding user manual for information on parameter setting

Parameter Setting Menu

System Control	
Memory Card	Only when memory card is inserted
Transfer Configuration	Transfers the device configuration to a memory card
Parameter Sets	2 parameter sets (A, B) are available in the device.
Function Control	Select the functions to be controlled via softkeys and OK inputs
Calculation Blocks	Calculate measured variables to new variables
Time/Date	Time, date, display format
Meas. Point Description	Free input of a tag number
Option Activation	Option activation via TAN
Restore Factory Settings	Reset the parameters
Passcode Entry	Change passcodes
Firmware Update	Update the firmware
Logbook	Set the logbook
Buffer Table	Select buffer table for pH calibration
FRONT Module	
Language	Select the menu language
Units	Select the measurement units
Formats	Select the display format
Measurement Display	Set the measurement display
Display	Brightness/contrast, auto-off
Measurement Recorder (Option)	See detailed "Options" manual
BASE Module	
Output Current I1, I2	Configure current outputs
Contact K4	Configure failure signaling
Contacts K3, K2, K1	Configure relay contacts
Control Inputs OK1, OK2	Configure optocoupler signal inputs

Specifications (Excerpt)

Power supply	
BASE 4400-029: Terminals 18/19	24 (- 15 %) ... 230 (+ 10 %) V AC/DC approx. 18 VA/10 W, AC: 48 ... 62 Hz
BASE 4400X-025/VPW: Terminals N/L/PE	100 (- 15 %) ... 230 (+ 10 %) V AC < 15 VA, 48 ... 62 Hz
BASE 4400X-026/24V: Terminals L1/L2/PE	AC: 24 V (- 15 %, + 10 %) < 15 VA, 48 ... 62 Hz DC: 24 V (- 15 %, + 20 %) < 10 W
Overvoltage category	II
Protection class	I
Terminals, inside	Tightening torque 0.5 ... 0.6 Nm
Wiring	Single or stranded wires 0.2 ... 2.5 mm²
	Stripping length max. 7 mm
	Temperature resistance > 75 °C / 167 °F
Equipotential bonding clamp PA	Tightening torque 1 Nm Cross section > 4 mm²
Protection against electric shock	Protective conductor terminal acc. to EN 61010-1: terminal 17 or PE
Inputs OK1/OK2	Galvanically isolated (optocoupler), Vi ≤ 30 V, floating, galvanic isolation up to 60 V
Switching voltage	0 ... 2 V AC/DC inactive, 10 ... 30 V AC/DC active (can be inverted)
Current output I1/I2	0/4 ... 20 mA (22 mA), max. 10 V, adjustable Galvanic isolation up to 60 V Electrically interconnected
Overrange	22 mA in the case of a message
Measurement error [1]	< 0.2 % current value + 0.02 mA
Current source	0.00 ... 22.00 mA
Relay contacts	4 relay contacts K1 ... K4, floating Galvanic isolation up to 60 V K1, K2, K3 interconnected on one side
Load capability	AC: < 30 V / < 3 A, < 90 VA DC: < 30 V / < 3 A, < 90 W (Ex: DC: < 30 V / < 500 mA, < 10 W)
RoHS conformity	According to EU directive 2011/65/EU
EMC	EN 61326-1, EN 61326-2-3, NAMUR NE 21
Emitted interference	Industrial applications[2] (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	5 ... 95 %
Climatic class	3K5 according to EN 60721-3-3
Location class	C1 according to EN 60654-1
Transport/storage temp	-20 ... 70 °C / -4 ... 158 °F
Pollution degree	2
Housing	Protos 4400(X)C: Steel, coated Protos 4400(X)S: Stainless steel, polished, 1.4305
Protection	IP65/NEMA 4X
Cable glands	5 cable glands M20 x 1.5 A/F 24 mm Safe area: WISKA Model ESKV M20 Ex: WISKA Model ESKE/1 M20
Clamping ranges	Standard sealing insert non-Ex: 6 ... 13 mm Standard sealing insert Ex: 7 ... 13 mm Reduction sealing insert: 4 ... 8 mm Multiple sealing insert non-Ex: 5 ... 6.5 mm Multiple sealing insert Ex: 5.85 ... 6.5 mm
Tensile load	Not permitted, suitable for "fixed installation" only
Tightening torque	Connecting thread: 2.3 Nm Cap nut: 1.5 Nm
Weight	Approx. 3.2 kg plus approx. 160 g per module

1) At rated operating conditions
2) This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.