

PH 3400 (X)-035 Module Specifications

pH/ORP input	Analog glass electrode or ORP sensor Actuation of ISM sensors Glass electrode input Reference electrode input SG input: ORP sensor or auxiliary electrode	
Measuring range	pH value	-2.00 ... 16.00
	ORP value	-2000 ... 2000 mV
	rH value	0.0 ... 42.5
Permitted voltage	ORP + pH [mV]	2000 mV
Permitted cable capacitance	< 2 nF (cable length max. 20 m)	
Glass electrode input ¹⁾	Input resistance	> 1 x 10 ¹² Ω
	Input current	< 1 x 10 ⁻¹² A ³⁾
	Impedance range	0.5 ... 1.000 MΩ
Reference electrode input ¹⁾	Input resistance	> 1 x 10 ¹⁰ Ω
	Input current	< 1 x 10 ⁻¹⁰ A ³⁾
	Impedance range	0.5 ... 200 kΩ
Measurement error ²⁾ (display)	pH value	< 0.02
	ORP value	< 1 mV
Temperature input ^{*)}	3-wire connection, adjustable Pt 8.55/Pt 1000/NTC 30 kΩ/NTC 100 kΩ -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 / °F
	Measurement error ²⁾	0.2% of measured value + 0.5 (< 1 K for NTC > 100 °C / 212 °F)
Temperature compensation media-related	Reference temperature 25 °C / 77 °F – Linear temperature coefficient, specifiable –19.00 ... 19.99 %/K – Ultrapure water 0 ... 150 °C / 32 ... 302 °F – Table 0 ... 95 °C / 32 ... 203 °F, specifiable in 5 K steps	
ORP	Automatic conversion to standard hydrogen electrode (SHE) on specification of reference electrode type	
Sensor adjustment ORP ^{*)}	Zero offset	-200 ... 200 mV
pH sensor adjustment	1-/2-/3-point calibration (best fit line) Operating modes: – Calimatic automatic buffer recognition – Entry of individual buffer values – Product calibration – Data entry of premeasured electrodes	
Drift check ^{*)}	Fine / standard / coarse	

Protos 3400 (X), Protos II 4400 (X)

PH 3400 (X)-035 Module Specifications – Continued

Calimatic buffer sets*)	Fixed buffer sets: Mettler Toledo: 2.00/4.01/7.00/9.21 Knick CaliMat: 2.00/4.00/7.00/9.00/12.00 DIN 19267: 1.09/4.65/6.79/9.23/12.75 NIST standard: 4.006/6.865/9.180 NIST technical buffers: 1.68/4.00/7.00/10.01/12.46 Hamilton: 2.00/4.01/7.00/10.01/12.00 Hamilton buffer A: 2.00/4.01/7.00/9.00/11.00 Hamilton buffer B: 2.00/4.01/6.00/9.00/11.00 Kraft: 2.00/4.00/7.00/9.00/11.00 HACH: 4.01/7.00/10.00 Ciba: 2.06/4.00/7.00/10.00 Reagecon: 2.00/4.00/7.00/9.00/12.00
	– Manually specifiable buffer set with max. 3 buffer tables – Loadable buffer set (add-on function SW3400-002 and Smartmedia Card for Protos 3400 / FW4400-002 and Data Card for Protos II 4400)
Nominal zero point*)	pH 0 ... 14 Permitted span $\Delta\text{pH} = \pm 1$
Nominal slope (25 °C / 77 °F)*)	25 ... 61 mV/pH Permissible calibration range 80 ... 103 %
Uis*)	-1000 ... 1000 mV
Calibration/adjustment record	Recording of: Zero point, slope, Uis, response time, calibration procedure with data and time
Statistics	Recording of: zero point, slope, Uis, response time, glass and reference impedance with date and time for last three adjustments and first adjustment
Sensocheck	Automatic monitoring of glass and reference electrode, message can be deactivated
Sensoface	Provides information on the condition of the sensor: Zero point/slope, response time, calibration interval, Sensocheck, can be deactivated
Sensor diagram	Graphic display of the current sensor parameters in a sensor diagram on the display. Slope, zero point, reference impedance, glass impedance, response time, calibration timer
Sensor monitor	Direct display of measured values from sensor for validation: pH voltage/ORP voltage/glass and reference electrode impedance/RTD/temperature
Sensor wear monitor (ISM)	Display of wear parameters: sensor load/sensor operating time/autoclaving cycles/CIP and SIP cycles
Load diagram (ISM) with Protos 3400(X)	Graphical display of sensor load
KI recorder (SW 3400-001)	Adaptive representation of process flow with monitoring and signaling of critical process parameters
Adaptive calibration timer*)	Automatic calculation of calibration interval (Sensoface message), dependent on process variables
Tolerance band recorder (SW3400-005)	Tolerant calibration/adjustment, adjustable tolerance limits, recording of zero point and slope for the last 40 calibrations/adjustments

PH 3400 (X)-035 Module Specifications – Continued

Explosion protection	See Ex Certificates and EU Declaration of Conformity or www.knick.de	
RoHS conformity	According to EU directive 2011/65/EU	
EMC	NAMUR NE 21 and EN 61326-1, EN 61326-2-3	
	Emitted interference	Industrial applications ⁴⁾ (EN 55011 Group 1 Class A)
	Immunity to interference	Industrial applications
	Lightning protection	*According 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 temperature	-20 ... 70 °C / -4 ... 158 °F
Housing	Module enclosure	PC/ABS blend
	Color	Black
	Degree of protection	IP 20
	Dimensions (mm)	W x L x H 118 x 91 x 21
	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⁾ This equipment is not designed for domestic use, and is unable to guarantee adequate protection of the radio reception in such environments.

*) Adjustable

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PH 3400 (X)-035 Module Terminal Assignments

