PH 3400 (X)-033 Module Specifications

pH/mV input	pH measurement with pH differential probes, e.g., Pfaudler Measuring electrode input Reference electrode input Auxiliary electrode input		
	Measuring range	pH value ORP value rH value	–2.00 ... +16.00 –2000 ... +2000 mV 0.0 ... 42.5
	Permitted cable capacitance < 2 nF		
	Measuring electrode input[1)]	Input resistance Input current[4)] Impedance range	> 1 x 10^{12} Ω < 1 x 10^{-12} A 0.5 ... 1000 MΩ
	Reference electrode input[1)] (high-resistance)	Input resistance Input current[4] Impedance range	> 1 x 10^{11} Ω < 1 x 10^{-11} A 0.5 ... 1000 MΩ
	Measurement error[2.3)] (display)	pH value < 0.02 ORP value < 1 mV	TC < 0.001 pH/K TC < 0.05 mV/K
Temperature input*)	Pt 100 / Pt 1000 / NTC 30 kΩ / 8.55 kΩ (Mitsubishi) 3-wire connection, adjustable		
	Measuring range	–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[1.2)]	0.2% of measured value + 0.5 K (< 1 K at NTC > 100 °C / 212 °F)	
Temperature compensation, media-related	Reference temperature 25 °C / 77 °F – Linear temperature coefficient, specifiable from –19.00 to 19.99 %/K – Ultrapure water 0 ... 150 °C / 32 ... 302 °F – Table 0 ... 95 °C / 32 ... 203 °F, specifiable in 5 K steps		
Sensocheck	Automatic monitoring of measuring 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		
Adaptive calibration timer*)	Automatic calculation of calibration interval (Sensoface message), dependent on process variables		
Sensor diagram	Graphical representation of the current sensor parameters in a radar chart 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 input/measuring electrode impedance/reference electrode impedance/ temperature/RTD		

PH 3400 (X)-033 Module Specifications – *Continued*

Tolerance band recorder (SW 3400-005 / FW4400-005)	Tolerant calibration/adjustment, adjustable tolerance limits, graphical recording of zero point and slope for the last 40 calibrations/adjustments	
KI recorder (SW3400-001, Protos 3400(X))	Adaptive representation of process flow with monitoring and signaling of critical process parameters	
pH sensor adjustment*)	Operating modes: 1-/2-/3-point calibration (best fit line) – Calimatic automatic buffer recognition – Entry of individual buffer values – Calculation of nominal zero point – Product calibration – Data entry: premeasured electrodes	
Drift check*)	Fine / standard / coarse	
Calimatic buffer sets*)	Fixed buffer sets: Mettler Toledo: Knick CaliMat: DIN 19267: NIST standard: NIST technical buffers: Hamilton Hamilton buffer A: Hamilton buffer B: Kraft: HACH: Ciba: Reagecon:	 2.00/4.01/7.00/9.21 2.00/4.00/7.00/9.00/12.00 1.09/4.65/6.79/9.23/12.75 4.006/6.865/9.180 1.68/4.00/7.00/10.01/12.46 2.00/4.01/7.00/10.01/12.00 2.00/4.01/7.00/9.00/11.00 2.00/4.01/6.00/9.00/11.00 2.00/4.00/7.00/9.00/11.00 4.01/7.00/10.00 2.06/4.00/7.00/10.00 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 / FW4400-002)	
Nominal zero point*)	pH 0 ... 14	Permitted span ΔpH = ±1
Nominal slope (25 °C / 77 °F)*)	25 ... 61 mV/pH	Permissible calibration range 80 ... 103 %
pH_{is}*)	0 ... 14	
Calibration record	Recording of: Zero point, slope, Uis, response time, calibration procedure with data and time	
Statistics	Recording of: zero point, slope, Uis, response time, calibration procedure with data and time for last three calibrations and first calibration	
Temperature compensation, media-related	Reference temperature 25 °C / 77 °F – Linear temperature coefficient – Ultrapure water – Table	 Specifiable –19.00 ... 19.99 %/K 0 ... 150 °C / 32 ... 302 °F 0 ... 95 °C 32 ... 203 °F, specifiable in 5 K steps
HE output PH3400X-033: Ex ia IIC	+3 V –3 V For operation of an ISFET adapter (with Protos 3400(X) only)	(U_0 = 2.9 ... 3.1 V/R_i = 360 Ω) (U_0 = –3.5 ... –3.0 V/R_i = 360 Ω)

PH 3400 (X)-033 Module Specifications – *Continued*

Explosion protection	See Ex Certificates and EU Declaration of Conformity or www.knick.de	
EMC	NAMUR NE 21 EN 61326-1, EN 61326-2-3	
	Emitted interference	Industrial applications*) (EN 55011 Group 1 Class A)
	Immunity to interference	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 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
[3)] Plus sensor error
[4)] At 20 °C, doubles every 10 K
*) Adjustable

PH 3400 (X)-033 Module Terminal Assignments