Appendix V Technical specifications

	µAutolab type III	**Autolab with PGSTAT12**	**Autolab with PGSTAT302N**	**Autolab with PGSTAT100**
maximum output current	± 80 mA	± 250 mA	± 2 A	± 250 mA
maximum output voltage	± 12 V	± 12 V	± 30 V	± 100 V
potentiostat	yes	yes	yes	yes
galvanostat	yes	yes	yes	yes
potential range	± 5 V	± 10 V	± 10 V	± 10 V
applied potential accuracy	± 0.2% of setting 2 mV	± 0.2% of setting 2 mV	± 0.2% of setting 2 mV	± 0.2% of setting 2 mV
applied potential resolution	150 µV	150 µV	150 µV	150 µV
measured potential resolution	300 or 30 µV	300 or 30 µV	300 or 30 µV	300 or 30 µV
current ranges	10 nA to 10 mA in seven ranges	10 nA to 100 mA in eight ranges	10 nA to 1 A in nine ranges	10 nA to 100 mA in eight ranges
applied and measured current accuracy	± 0.2% of current and ± 0.2% of current range	± 0.2% of current and ± 0.2% of current range	± 0.2% of current and ± 0.2% of current range	± 0.2% of current and ± 0.2% of current range
applied current resolution	0.015% of current range	0.015% of current range	0.015% of current range	0.015% of current range
measured current resolution	0.0003% of current range	0.0003% of current range	0.0003% of current range	0.0003% of current range
- at current range of 10 nA	30 fA	30 fA	30 fA	30 fA
potentiostat bandwidth (1)	500 kHz	500 kHz	>1 MHz	500 kHz
- potentiostat risetime/falltime (1 V step, 10-90%) (1)	1 µs	< 500 ns	< 250 ns (with external source)	< 500 ns
potentiostat modes	high speed/ high stability	high speed/ high stability	high speed/ high stability	high speed/ high stability
input impedance of electrometer	> 100 GΩ//< 8 pF	> 100 GΩ//< 8 pF	> 1 TΩ//< 8 pF	> 100 GΩ//< 8 pF
input bias current @25°C	< 1 pA	< 1 pA	< 1 pA	< 1 pA
bandwidth of electrometer	> 4 MHz	> 4 MHz	> 4 MHz	> 4 MHz
IR-compensation	n.a.	depending on selected range: 0Ω-200Ω at 100 mA range to 0Ω-200 MΩ at 10 nA range, current interrupt and positive feedback available	depending on selected range: 0Ω-20Ω at 1 A range to 0Ω-200 MΩ at 10 nA range, current interrupt and positive feedback available	depending on selected range: 0Ω-200Ω at 100 mA range to 0Ω-200 MΩ at 10 nA range, current interrupt and positive feedback available
- resolution	n.a.	0.025%	0.025%	0.025%
four electrode control	no	yes	yes	yes
front panel meter	no	potential and current	potential and current	potential and current
Analog outputs (BNC connector)	potential and current	potential, current and optionally charge	potential, current and optionally charge	potential, current and optionally charge
control voltage input	no	yes	yes	yes
multichannel option	no	multipleWE option	multipleWE option	no

	µAutolab type III	**Autolab with PGSTAT12**	**Autolab with PGSTAT302N**	**Autolab with PGSTAT100**
booster option	no	no	yes	on request BSTR10A only
analog integrator	yes	optionally available	optionally available	optionally available
- time constants	10 and 100 ms, 1 and 10 s	10 and 100 ms, 1 and 10 s	10 and 100 ms, 1 and 10 s	10 and 100 ms, 1 and 10 s
interfacing	USB	USB	USB	USB
A/D converter	16-bit with software programmable gains of 1, 10 and 100	16-bit with software programmable gains of 1, 10 and 100	16-bit with software programmable gains of 1, 10 and 100	16-bit with software programmable gains of 1, 10 and 100
auxiliary input channels	1	2	2	2
D/A converter	16-bit three channels	16-bit, four channels (optionally eight)	16-bit, four channels (optionally eight)	16-bit, four channels (optionally eight)
auxiliary output channel	1	1	1	1
digital I/O lines	48	48	48	48
(W x D x H)	26 x 26 x 10 cm³	52 x 42 x 17 cm³	51.5 x 41.6 x 16 cm³	52 x 42 x 17 cm³
weight	3.6 kg (4.2kg / FRA2)	18 kg	18 kg	21 kg
power requirements	144 W 100-240 V, 50/60 Hz	247 W 100-240 V, 50/60 Hz	247 W 100-240 V, 50/60 Hz	300 W 100-240 V, 50/60 Hz

Notes: (1) Measured at 1 mA current range, 1 kOhm impedance, high speed mode when applicable. All specifications at 25°C.

Interface for mercury electrodes (IME 303 and IME663)

Supported electrodes

- Metrohm VA Stand 663
- EG&G PAR303(A)
- dropping mercury electrodes with knock-off hammer

Control lines

- new drop
- purge on/off
- stirrer on/off

Burettes

- Metrohm Dosimat 665/765
- Schott T90 and T100

Hardware specifications of optional modules

SCAN-GEN, SCAN250: analog scan generator module

	SCAN-GEN	**SCAN250**
scan range	± 5 V relative to initial potential	± 5 V relative to initial potential
vertex potentials	2.5 mV resolution and 5 mV accuracy	2.5 mV resolution and 2 mV accuracy
output offset	± 1 mV maximum	± 0.2 mV maximum
ranges of scan rates	100 mV/s to 10 kV/s full scale (6 ranges)	100 mV/s to 10kV/s full scale (6 ranges)
scan rate - resolution	1 in 4096	1 in 4096
- accuracy	± (0.2% full scale+500 µV/s)	± (0.2% full scale+500 µV/s)
- temperature dependence	<0.04%/K	<0.04%/K
- minimum	100mV/s	100mV/s
- maximum	10kV/s	10kV/s
hold mode	available	available
maximum number of scans	32767	32767
monitor output (BNC)	scan signal	scan signal

ADC750: dual channel fast ADC module

• number of ADCs	2, each with four input channels
• maximum conversion rate	750 kHz
• maximum integration time	5.5 ms (mean of 4096 AD conversions)
• basic resolution	1 in 4096 (12 bit)
• resolution of measurements	- potential 5 mV at range 10 V 2 mV at range 4 V 1 mV at range 2 V
	- current 0.5%, 0.05% and 0.005% of full scale
• memory	128000 samples per channel (optionally 512000 samples)

ECD: low current amplifier module

• current ranges	100 pA to 100 µA full scale (seven ranges) 1 pA and 10 pA with selectable-gain amplifier
• current measurement	± 0.5% accuracy
• type of filter	third order Sallen-Key
• filter time constants	RC-times 0 s, 10 ms, 100 ms and 500 ms
• compensation of current offset	± 10 µA maximum
• monitor output (BNC)	current

BIPOT, ARRAY and BA: (bipotentiostat) module

	BIPOT/ARRAY	**BA**
current ranges	100 nA to 10 mA full scale (6 ranges)	10 nA to 10 mA full scale (7 ranges)
current measurement	± 0.2% of current ± 0.2% of current range	± 0.2% of current ± 0.2% of current range
maximum current output	± 35 mA	± 50 mA
potential range	± 5 V	± 10 V
potential accuracy	± (0.2% + 2 mV)	± (0.2% + 2 mV)
monitor output (BNC)	current	current

FI20: filter and integrator module

• filter section	
- type of filter	third order Sallen-Key
- filter time constants	RC-times 0 s, 10 ms, 100 ms and 500 ms
- output offset	± 2 mV
- monitor output (BNC)	filter output
• integrator section	
- ranges	10 ms, 100 ms, 1 s and 10 s
- charge measurement	0.2% accuracy
- temperature dependence	< 0.04%/K
- monitor output (BNC)	charge output

BSTR10A or Booster20A: current booster

	BSTR10A	**Booster20A**
maximum output voltage	± 20 V	± 20 V
maximum output current	± 10 A	± 20 A
maximum output power	200 W	400 W
bandwidth	4 kHz full power	20 kHz
current measurement	10 A full scale ± 0.5% accuracy	.1% of full scale = 20mA
dimensions (W x D x H)	37 x 36 x 15.5 cm^3	52 x 42 x 17 cm^3
weight	approx. 9 kg	approx. 25 kg

Note: Specifications subject to change without notice. All specifications at 25°C.