

Technical dataEppendorf Research® plus
English (EN)**11 Technical data****11.1 Adjustable sub-steps****Single-channel pipettes**

Model	Color symbol	Color name	Increment
0.1 µL – 2.5 µL		dark gray	0.002 µL
0.5 µL – 10 µL		medium gray	0.01 µL
2 µL – 20 µL		light gray	0.02 µL
2 µL – 20 µL		yellow	0.02 µL
10 µL – 100 µL		yellow	0.1 µL
20 µL – 200 µL		yellow	0.2 µL
30 µL – 300 µL		orange	0.2 µL
100 µL – 1000 µL		blue	1 µL
0.25 mL – 2.5 mL		red	2 µL
0.5 mL – 5 mL		violet	0.005 mL
1 mL – 10 mL		turquoise	0.01 mL

Multi-channel pipettes

Model	Color symbol	Color name	Increment
0.5 µL – 10 µL		medium gray	0.01 µL
1 µL – 20 µL		light pink	0.02 µL
5 µL – 100 µL		light yellow	0.1 µL
10 µL – 100 µL		yellow	0.1 µL
30 µL – 300 µL		orange	0.2 µL
120 µL – 1200 µL		dark green	1 µL

11.2 **Ambient conditions**

Operation

Operating temperature	5 °C – 40 °C
Relative humidity	10 % – 95 %

Storage in transport packing

Air temperature	-25 °C – 55 °C
Relative humidity	10 % – 95 %

Storage without transport packing

Air temperature	-5 °C – 45 °C
Relative humidity	10 % – 95 %

11.3 Errors of measurement

Single-channel pipettes with fixed volume setting

Model	Test tip epT.I.P.S.	Error of measurement			
		Systematic		Random	
		±%	±μL	%	μL
10 μL  medium gray	0.1 μL – 20 μL  medium gray 40 mm	1.2	0.12	0.6	0.06
20 μL  light gray	0.5 μL – 20 μL L  light gray 46 mm	0.8	0.16	0.3	0.06
10 μL  yellow	2 μL – 200 μL  yellow 53 mm	1.2	0.12	0.6	0.06
20 μL yellow		1.0	0.2	0.3	0.06
25 μL  yellow		1.0	0.25	0.3	0.08
50 μL  yellow		0.7	0.35	0.3	0.15
100 μL yellow		0.6	0.6	0.2	0.2
200 μL  yellow		0.6	1.2	0.2	0.4
200 μL  blue	50 μL – 1000 μL  blue 71 mm	0.6	1.2	0.2	0.4
250 μL  blue		0.6	1.5	0.2	0.5

Model	Test tip epT.I.P.S.	Error of measurement			
		Systematic		Random	
		±%	±μL	%	μL
500 μL  blue		0.6	3.0	0.2	1.0
1000 μL  blue		0.6	6.0	0.2	2.0

Single-channel pipettes with variable volume setting

Model	Test tip epT.I.P.S.	Testing volume	Error of measurement			
			Systematic		Random	
			±%	±μL	%	μL
0.1 μL – 2.5 μL  dark gray	0.1 μL – 10 μL  dark gray 34 mm	0.1 μL	48	0.048	12	0.012
		0.25 μL	12	0.03	6.0	0.015
		1.25 μL	2.5	0.031	1.5	0.019
		2.5 μL	1.4	0.035	0.7	0.018
0.5 μL – 10 μL  medium gray	0.1 μL – 20 μL  medium gray 40 mm	0.5 μL	8.0	0.04	5.0	0.025
		1 μL	2.5	0.025	1.8	0.018
		5 μL	1.5	0.075	0.8	0.04
		10 μL	1.0	0.1	0.4	0.04
2 μL – 20 μL  light gray	0.5 μL – 20 μL L  light gray 46 mm	2 μL	5.0	0.1	1.5	0.03
		10 μL	1.2	0.12	0.6	0.06
		20 μL	1.0	0.2	0.3	0.06
2 μL – 20 μL  yellow	2 μL – 200 μL  yellow 53 mm	2 μL	5.0	0.1	1.5	0.03
		10 μL	1.2	0.12	0.6	0.06
		20 μL	1.0	0.2	0.3	0.06
10 μL – 100 μL  yellow	2 μL – 200 μL  yellow	10 μL	3.0	0.3	1.0	0.1
		50 μL	1.0	0.5	0.3	0.15

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Model	Test tip epT.I.P.S.	Testing volume	Error of measurement			
			Systematic		Random	
			±%	±μL	%	μL
	53 mm	100 μL	0.8	0.8	0.2	0.2
20 μL – 200 μL  yellow	2 μL – 200 μL  yellow 53 mm	20 μL	2.5	0.5	0.7	0.14
		100 μL	1.0	1.0	0.3	0.3
		200 μL	0.6	1.2	0.2	0.4
30 μL – 300 μL  orange	20 μL – 300 μL  orange 55 mm	30 μL	2.5	0.75	0.7	0.21
		150 μL	1.0	1.5	0.3	0.45
		300 μL	0.6	1.8	0.2	0.6
100 μL – 1000 μL  blue	50 μL – 1000 μL  blue 71 mm	100 μL	3.0	3.0	0.6	0.6
		500 μL	1.0	5.0	0.2	1.0
		1000 μL	0.6	6.0	0.2	2.0
0.25 mL – 2.5 mL  red	0.25 mL – 2.5 mL  red 115 mm	0.25 mL	4.8	12	1.2	3
		1.25 mL	0.8	10	0.2	2.5
		2.5 mL	0.6	15	0.2	5
0.5 mL – 5 mL  violet	0.1 mL – 5 mL  violet 120 mm	0.5 mL	2.4	12	0.6	3
		2.5 mL	1.2	30	0.25	6.25
		5.0 mL	0.6	30	0.15	7.5
1 mL – 10 mL  turquoise	0.5 mL – 10 mL  turquoise 165 mm	1.0 mL	3.0	30	0.6	6
		5.0 mL	0.8	40	0.2	10
		10.0 mL	0.6	60	0.15	15

Multi-channel pipettes with fixed cone spacing

Model	Test tip epT.I.P.S. epT.I.P.S. 384	Testing volume	Error of measurement			
			Systematic		Random	
			±%	±μL	%	μL
0.5 μL – 10 μL  medium gray 8-/12-channel	0.1 μL – 20 μL  medium gray 40 mm	0.5 μL	12	0.06	8.0	0.04
		1 μL	8.0	0.08	5.0	0.05
		5 μL	4.0	0.2	2.0	0.1
		10 μL	2.0	0.2	1.0	0.1
1 μL – 20 μL  light pink 16-/24-channel	1 μL – 20 μL  light pink 42 mm	1 μL	12	0.12	8	0.08
		2 μL	8	0.16	5	0.1
		10 μL	4	0.4	2	0.2
		20 μL	2	0.4	1	0.2
5 μL – 100 μL  light yellow 16-/24-channel	5 μL – 100 μL  light yellow 53 mm	5 μL	6	0.3	4	0.2
		10 μL	3	0.3	2	0.2
		50 μL	1.2	0.6	0.8	0.4
		100 μL	1	1	0.6	0.6
10 μL – 100 μL  yellow 8-/12-channel	2 μL – 200 μL  yellow 53 mm	10 μL	3.0	0.3	2.0	0.2
		50 μL	1.0	0.5	0.8	0.4
		100 μL	0.8	0.8	0.3	0.3
30 μL – 300 μL  orange 8-/12-channel	20 μL – 300 μL  orange 55 mm	30 μL	3.0	0.9	1.0	0.3
		150 μL	1.0	1.5	0.5	0.75
		300 μL	0.6	1.8	0.3	0.9
120 μL – 1200 μL  dark green 8-/12-channel	50 μL – 1200 μL L  dark green 103 mm	120 μL	6.0	7.2	0.9	1.08
		600 μL	2.7	16.2	0.4	2.4
		1200 μL	1.2	14.4	0.3	3.6

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Multi-channel pipettes with variable volume setting

Model	Test tip epT.I.P.S. epT.I.P.S. 384	Testing volume	Error of measurement			
			Systematic		Random	
			±%	±μL	%	μL
 1 μL – 20 μL light pink 8-/12-channel	 1 μL – 20 μL light pink 42 mm	1 μL	15	0.15	8	0.08
		2 μL	10	0.2	5	0.1
		10 μL	4	0.4	2	0.2
		20 μL	2	0.4	1	0.2
 5 μL – 100 μL light yellow 8-/12-channel	 5 μL – 100 μL light yellow 53 mm	5 μL	6	0.3	4	0.2
		10 μL	3	0.3	2	0.2
		50 μL	1.2	0.6	0.8	0.4
		100 μL	1	1	0.6	0.6
 30 μL – 300 μL orange 4-/6-/8-channel	 20 μL – 300 μL orange 55 mm	15 μL	7.4	1.1	2	0.3
		30 μL	3.7	1.1	1.8	0.5
		150 μL	1	1.5	0.6	0.9
		300 μL	0.7	2.1	0.6	1.8
 120 μL – 1200 μL dark green 4-/6-/8-channel	 50 μL – 1250 μL L dark green 103 mm	50 μL	14.5	7.25	2	1
		120 μL	6	7.2	1.3	1.6
		600 μL	2.7	16.2	0.4	2.4
		1200 μL	1.2	14.4	0.3	3.6

11.4 Test conditions

Test conditions and test evaluation in accordance with DIN EN ISO 8655. Tested using a certified analytical balance with evaporation protection.

- Number of determinations per volume: 10
- Water according to ISO 3696
- Testing at 20 °C (±3 °C) – 27 °C (±3 °C)
Maximum temperature fluctuation during measurement ±0.5 °C
- Dispensing onto the tube inner wall

11.5 **Materials**

Component	Material
Outer surfaces of the upper part	• Improved Polypropylene (PP) • Polycarbonate (PC) • Polyetherimide (PEI) • Foil
Viewing window	• Polycarbonate (PC)
Lower parts outside and inside	• Improved Polypropylene (PP) • Polyvinylidene fluoride (PVDF) • Polyetherimide (PEI) • Polyphenylene sulfide (PPS) • Polyetheretherketone (PEEK) • Polytetrafluorethylene (PTFE) • Ethylene propylene diene rubber (EPDM) • Silicone • Steel (stainless steel and spring steel)