

## 10 Technical data

### 10.1 Power supply

Mains/power connection	230 V, 50 – 60 Hz 120 V, 50 – 60 Hz	
Current consumption	5804/5810 (230 V): 6 A 5804/5810 (120 V): 11 A 5804 R/5810 R (230 V): 9 A/10 A 5804 R/5810 R (120 V, 20 A): 16 A 5804 R/5810 R (120 V, 15 A): 12 A	
Power consumption	5804/5810 (230 V): max. 900 W 5804/5810 (120 V): max. 950 W 5804 R/5810 R (230 V): max. 1650 W 5804 R/5810 R (120 V, 20 A): max. 1650 W 5804 R/5810 R (120 V, 15 A): max. 1300 W	
EMC: noise emission (radio interference)	5804/5810 (230 V): EN 61326-1 – Class A 5804/5810 (120 V): CFR 47 FCC Part 15 – Class A 5804/5810 (100 V): EN 61326-1 – Class A 5804 R/5810 R (230 V): EN 61326-1/EN 55011 – Class A 5804 R/5810 R (120 V): CFR 47 FCC Part 15 – Class A 5804 R/5810 R (100 V): EN 61326-1/EN 55011 – Class A	
EMC: noise immunity	EN 61326-1	
Overvoltage category	II	
Fuses	5804/5810 (230 V) 5804/5810 (120 V) 5804 R/5810 R (230 V) 5804 R/5810 R (120 V, 20 A) 5804 R/5810 R (120 V, 15 A)	Excess current switch 12 A Excess current switch 12 A Excess current switch 12 A Excess current switch 18 A Excess current switch 15 A

### 10.2 Ambient conditions

Environment	For indoor use only The surroundings must not be moist.	
Ambient temperature	5804	4 °C – 35 °C
	5810	4 °C – 40 °C
	5804 R, 5810 R	10 °C – 35 °C
Max. relative humidity	75 %, non-condensing humidity	
Atmospheric pressure	75 kPa – 106 kPa Use up to an altitude of 2000 m above MSL	
Pollution degree	2	

**Technical data**

Centrifuge 5804/5804 R Centrifuge 5810/5810 R  
English (EN)

**10.3 Weight/dimensions****10.3.1 Centrifuges**

Dimensions (W × D × H)	5804	466 × 550 × 337 mm Depth of footprint: 496 mm
	5804 R	634 × 550 × 342 mm Depth of footprint: 496 mm
	5810	535 × 608 × 345 mm Depth of footprint: 536 mm
	5810 R	700 × 608 × 345 mm Depth of footprint: 536 mm
Weight without rotor	5804	55 kg
	5804 R	80 kg
	5810	68 kg
	5810 R	99 kg

		Rotor				
		A-4-81 (4 × 500 mL)	A-4-44 (4 × 100 mL)	F-34-6-38 (6 × 85 mL)	S-4-104	FA-45-6-30
Noise level	5804	–	< 65 dB(A)	< 51 dB (A)	–	< 55 dB(A)
	5804 R	–	< 56 dB(A)	< 58 dB(A)	–	< 54 dB(A)
	5810	< 65 dB(A)	< 65 dB(A)	< 53 dB(A)	< 70 dB(A)	< 56 dB(A)
	5810 R	< 56 dB(A)	< 56 dB(A)	< 59 dB(A)	< 56 dB(A)	< 55 dB(A)

The noise level was measured according to DIN EN ISO 3745 frontally in a sound measuring room with accuracy class 1 at a distance of 1 m from the device and at lab bench height.

### 10.3.2 Rotor weights

<b>Rotor</b>	<b>Accessories</b>	<b>Weight [g]</b>
S-4-104		5220
	Bucket	575
	DWP bucket	790
A-4-81		5400
	Bucket	585
	Flex bucket	810
	Form bucket 7x50	880
A-4-62		2900
	Bucket	460
	MTP bucket	730
S-4-72		3100
	Bucket	290
A-4-44		1600
	Bucket	290
	Form bucket	420
A-2-DWP-AT		5250
	Bucket	970
A-2-DWP		2000
	MTP bucket	630
F-34-6-38		3220
FA-45-6-30		3300
FA-45-48-11		2400
FA-45-30-11		1300
F-45-30-11		900
FA-45-20-17		2800
F-35-48-17		2100
	Sleeve	30
T-60-11		2100
F-45-48-PCR		1000

**Technical data**

Centrifuge 5804/5804 R Centrifuge 5810/5810 R  
English (EN)

**10.4 Application parameters**

Run time	1 – 99 min, adjustable in 1 min increments. infinite ( $\infty$ )	
Temperature (only 5804 R/5810 R)	-9 °C – 40 °C	
Relative centrifugal force (RCF)	10 – 20913 × g, adjustable to 3000 × g in 10 × g increments, then in increments of 100 × g.	
Speed	200 – 14000 rpm, adjustable up to 5000 rpm in 10 rpm increments, then in increments of 100 rpm.	
Max. load	5804/5804 R 5810/5810 R	4 × 250 mL 4 × 750 mL
Max. kinetic energy	5804/5810 5804 R 5810 R	19000 J (11000 rpm) 19000 J (11000 rpm) 23000 J (12100 rpm)
Inspection obligation in Germany	Yes	
Permitted density of the material for centrifuging (at max. g-force/ rotational speed and max. load)	1.2 g/mL	
Standardized interface (optional)	RS 232 C	

All rotors of the Centrifuge 5804 R/5810 R maintain a temperature of 4 °C ±2 °C safety at maximum speed. An exceptions are rotors F-34-6-38 and FA-45-6-30 on the Centrifuge 5810 R:

Tab. 10-1: Influence of speed on the temperature

Centrifuge	Rotor	Temperature at max. speed	Speed for safe maintenance of 4 °C ±2 °C
5810 R 120 V	F-34-6-38	< 11 °C	10000 rpm
	FA-45-6-30	< 12 °C	10500 rpm
5810 R 230 V	F-34-6-38	< 9 °C	11000 rpm
	FA-45-6-30	< 10 °C	11000 rpm

Temperature accuracy at maximum speed under the following conditions:

- pre-cooled
- after 45 min. run time
- set to 4 °C

**Acceleration and deceleration times (according to DIN 58970)**

Tab. 10-2: Approximate acceleration times of the different rotors for the levels 0 to 9 (in seconds) for 230 V devices

5804/ 5804 R	5810/5810 R	Rotor	0	1	2	3	4	5	6	7	8	9
-	•	A-4-81	227	198	173	149	132	111	97	85	60	35
-	•	A-4-81- MTP/ Flex	223	195	170	147	129	109	95	83	59	33
-	•	A-4-62	222	195	170	148	129	110	96	85	59	27
•	•	A-4-44	373	299	257	215	190	142	106	75	45	20
-	•	A-2-DWP-AT	256	223	191	167	147	126	111	98	72	45
•	•	A-2-DWP	203	176	133	117	100	78	61	45	36	18
•	•	FA-45-6-30	468	378	285	203	179	156	136	103	78	47
•	•	F-34-6-38	467	376	282	199	176	153	132	99	74	36
•	•	F-45-30-11/ FA-45-48-11	282	143	96	73	59	50	44	37	33	19
•	•	F-45-48-PCR	244	123	83	63	51	43	38	32	28	14
•	•	T-60-11	284	145	99	77	63	55	49	43	39	28
-	•	S-4-104 (round bucket)	217	189	166	144	126	108	84	58	43	35
-	•	S-4-104 (plate bucket)	217	189	165	142	125	107	82	55	41	33
•	•	S-4-72	304	247	209	175	154	115	56	29	18	14
•	•	F-35-48-17	704	330	277	233	206	152	72	38	23	17

Tab. 10-3: Approximate deceleration times of the different rotors for the levels 0 to 9 (in seconds) for 230 V devices

5804/ 5804 R	5810/5810 R	Rotor	0	1	2	3	4	5	6	7	8	9
-	•	A-4-81	466	203	178	154	137	118	95	86	57	31
-	•	A-4-81- MTP/ Flex	513	201	176	154	135	115	94	85	57	30
-	•	A-4-62	477	199	175	151	133	114	95	86	57	26
•	•	A-4-44	282	288	230	201	178	138	90	69	47	21
-	•	A-2-DWP-AT	611	227	197	172	153	130	108	97	66	34
•	•	A-2-DWP	274	182	140	122	105	83	57	45	34	14
•	•	FA-45-6-30	113 9	392	296	216	190	167	131	98	80	53
•	•	F-34-6-38	735	385	290	210	184	161	130	97	80	48

**Technical data**

Centrifuge 5804/5804 R Centrifuge 5810/5810 R  
English (EN)

5804/ 5804 R	5810/5810 R	Rotor	0	1	2	3	4	5	6	7	8	9
•	•	F-45-30-11/ FA-45-48-11	317	148	77	54	42	36	27	23	20	18
•	•	F-45-48-PCR	171	128	69	47	36	31	23	20	17	15
•	•	T-60-11	638	295	153	107	85	69	50	43	40	35
-	•	S-4-104 (round bucket)	690	196	173	152	133	114	70	49	38	32
-	•	S-4-104 (plate bucket)	621	196	170	149	131	114	69	48	37	32
•	•	S-4-72	337	242	196	172	152	119	55	32	21	17
•	•	F-35-48-17	310	287	248	214	189	143	73	41	27	16

These values are to be considered as guidelines. Level 9 means "strongest braking", level 0 means "free deceleration". Considerable fluctuations can occur depending upon the condition of the device and the load. The deceleration times for the 230 and 120 V devices are almost identical.

## 10.5 Service life of accessories



### **WARNING! Risk of injury from chemically or mechanically damaged accessories.**

Even minor scratches and cracks can lead to severe internal material damage.

- ▶ Protect all accessory parts from mechanical damage.
- ▶ Inspect the accessories for damage before each use. Replace any damaged accessories.
- ▶ Do not use rotors, rotor lids, buckets or caps showing any signs of corrosion or mechanical damage (e.g. deformations).
- ▶ Do not use any accessories which have exceeded their maximum service life.
- ▶ When inserting the buckets and rotors, ensure that they do not become scratched.



### **CAUTION! Risk of injury due to chemically damaged rotor lids or caps.**

Transparent rotor lids or caps made from PC, PP or PEI may lose their strength under the impact of organic solvents (e.g. phenol, chloroform).

- ▶ If rotor lids or caps have come into contact with any organic solvents, they should be cleaned immediately.
- ▶ Regularly check the rotor lids and caps for damage and cracks.
- ▶ Replace any rotor lids or caps showing any cracks or milky discolorations immediately.

Eppendorf states the maximum service life of rotors and accessories in cycles and years. The number of cycles is decisive. If determination of the number of cycles is not possible, the service life in years applies.

Each centrifugation run during which the rotor is accelerated and braked is counted as a cycle, independent of the speed and the duration of the centrifugation run.

Rotor	Maximum service life after initial setup	
A-2-DWP-AT	100 000 cycles	15 years
A-2-DWP	34 000 cycles	7 years
A-4-44	34 000 cycles	7 years
A-4-62	40 000 cycles	7 years
A-4-81	100 000 cycles	15 years
F-34-6-38	75 000 cycles	10 years
FA-45-6-30	100 000 cycles	15 years
FA-45-48-11	100 000 cycles	15 years
FA-45-20-17	100 000 cycles	15 years
F-35-48-17	100 000 cycles	15 years
S-4-72	100 000 cycles	15 years
S-4-104	100 000 cycles	15 years
T-60-11	n/a	7 years

Unless stated otherwise (in the manual of the centrifuge, indication of the number of cycles on the rotor, in the instructions for use of the rotor), all other rotors and rotor lids can be used over the entire service life of the centrifuge if the following prerequisites are met:

- proper use
- recommended maintenance
- undamaged condition

Accessories	Maximum service life after initial setup	
Rotor lid of polycarbonate (PC), polypropylene (PP) or polyetherimide (PEI)	–	3 years
Aerosol-tight rotor lid, without replaceable seals	50 autoclaving cycles	–
QuickLock rotor lid		3 years
Seals of the QuickLock rotor lids	50 autoclaving cycles	–
Caps of polycarbonate (PC), polypropylene (PP) or polyetherimide (PEI)	50 autoclaving cycles	3 years
Adapter	–	1 year

The date of manufacture is stamped on the rotors and buckets in the format *03/15* or *03/2015* (= March 2015). On the inside of the plastic-rotor lids and aerosol-tight caps, the date of manufacture is stamped in the form of a clock ⌚.

**Measures to ensure aerosol tightness:**

- ▶ Replace the seal of QuickLock rotor lids after 50 autoclaving cycles.
- ▶ Exchange aerosol-tight rotor lids without replaceable seals after 50 autoclaving cycles.
- ▶ Replace aerosol-tight caps after 50 autoclaving cycles.