Centrifuge 5804/5804 R/5810/5810 R

Operating manual

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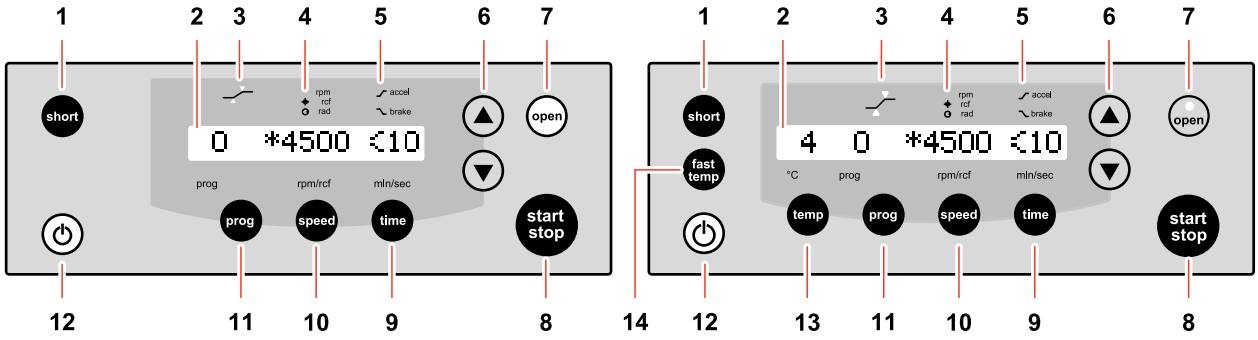
5820 900.040-00/0611

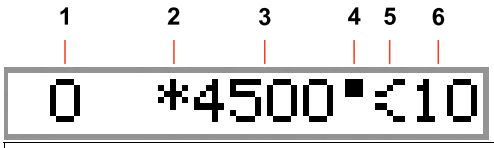
You will find a detailed description of these figures in your language in Chapters 2.1 and 5.1.

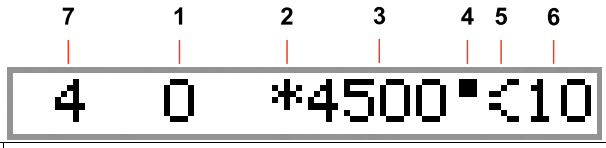
1 Centrifuge lid	**2 Monitoring glass**
3 Control panel with display	**4 Emergency release**
5 Condensation water tray (only Centrifuge 5804 R/ 5810 R)	

Task/function	Press	Display	Details
Set parameter	1. Press speed or time etc. 2. Press ▲ or ▼.	1. Selected parameter flashes. 2. New value appears.	Chapter 5.4.1
Soft start/stop	1. Press time repeatedly. 2. Press ▲ or ▼ to select ramp.	⌐: Acceleration ramp 0 (long) ... 9 (short). ¬: Deceleration ramp 0 (long) ... 9 (short).	Chapter 6.2 (English, German)
Alarm ON/OFF	▸ Press speed + time simultaneously.	Alarm on/Alarm off	Chapter 6.7.2 (English, German)
Programming (during rotor stop only)	1. Set parameter. 2. Press 2 x prog. 3. Store: Press prog > 2 s.	1. Parameter. 2. P...: first idle program no. 3. ok	Chapters 6.4 - 6.6 (English, German)
At set rpm (with open centrifuge lid only)	Press start stop > 4 s.	: on/ : off	Chapter 6.3 (English, German)



1 Short spin centrifugation	2 Display
3 Status of At set rpm function	4 Indicate speed (rpm), g-force (rcf) ✳ and radius setting ↻.
5 Symbol for acceleration ⟋ and braking ⟍	6 Set parameters and values
7 Release centrifuge lid	8 Start or stop centrifugation
9 Adjust centrifuging duration	10 Set speed of centrifugation
11 Select or save program	12 Standby
13 Adjust temperature (only 5804 R/5810 R)	14 Start temperature control run FastTemp (only 5804 R/5810 R)

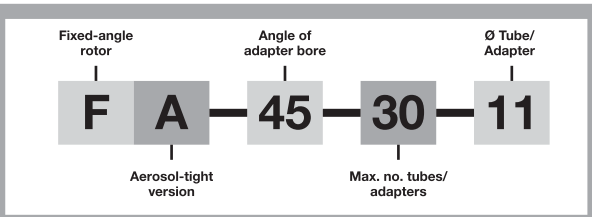




1 Program number	2 Symbol for g-force (rcf)
3 g-force (rcf)/speed (rpm)	4 Symbol flashes when rotor is in motion
5 Symbol for acceleration ⟋ and braking ⟍	6 Centrifuging duration
7 Temperature (only 5804 R/5810 R)	

Rotor code:

All Eppendorf® rotors are identified using a simple, alphanumeric format that represents the technical specifications in a uniform series of letters and numbers.



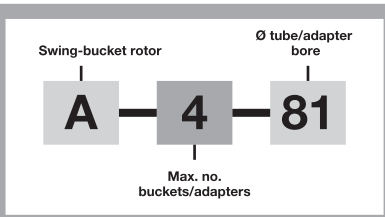


Table of contents

1 Operating instructions

1.1 Using this manual

- Please read this operating manual completely before using the device for the first time. Also observe the instructions for use enclosed with the accessories.
- Please view this operating manual as part of the product and keep it somewhere easily accessible.
- When passing the device on to third parties, be sure to include this operating manual.
- If this manual is lost, please request another one. The current version can be found on our website www.eppendorf.com.

1.2 Danger symbols and danger levels

1.2.1 Danger symbols

	**Biohazard**		**Explosion**
	**Electric shock**		**Crushing**
	**Hazard point**		**Material damage**

1.2.2 Danger levels

The danger level is a part of a safety note and distinguishes the possible results of non-observance from each other.

DANGER	*Will* lead to severe injuries or death.
WARNING	*May* lead to severe injuries or death.
CAUTION	May lead to light to moderate injuries.
NOTICE	May lead to material damage.

1.3 Symbols used

Example	Meaning
▸	You are requested to perform an action.
1. 2.	Perform these actions in the sequence described.
•	List.
start stop	Press this key to perform the described action.
Text	Terms from the display of the device.
	References useful information.

1.4 Abbreviations used

MTP	Micro test plate
NN	Mean sea level (MSL)
PCR	Polymerase Chain Reaction
PTFE	Polytetrafluorethylene
RCF	Relative centrifugal force – g-force in m/s^{-2}
RPM	Revolutions per minute – in rpm
UV	Ultraviolet radiation

2 Product description

2.1 Main illustration

Fig. 1: Depiction of Centrifuge 5810 and Centrifuge 5810 R. The Centrifuge 5804 and Centrifuge 5804 R are similar in design.

1 Centrifuge lid	**2 Inspection glass** Visual control for rotor stop or option for speed check via stroboscope
3 Control panel with display (see *Overview of operating controls on p. 36)*	**4 Emergency release** (see *Emergency release on p. 53)*
5 Condensation water tray (only Centrifuge 5804 R/ 5810 R)	

The depiction of the centrifuge can be found on the front fold-out page (see Fig. 1).

2.2 Delivery package

Each delivery package consists of one of the following centrifuges and the accessories listed in the following.

Quantity	Order No. (International)	Order No. (North America)	Description
1	-	-	**5804/5804 R/5810/5810 R centrifuge** See chapter *Ordering Information* for corresponding device version, equipment and order number
1	5810 350.018	022664166	**Rotor key** Standard
1	-	-	**Power cable** see chapter *Ordering information* for corresponding power cable variants and order numbers

Quantity	Order No. (International)	Order No. (North America)	Description
1	5820 900.040	5820900040	**Operating manual** Centrifuge 5804/5804 R/5810/5810 R Languages: EN, DE, FR, ES, IT, PT
1	5820 900.059	5820900059	**Operating manual** Centrifuge 5804/5804 R/5810/5810 R Languages: DA, EL, FI, NL, SV (230 V devices only)
1	5820 901.004	-	**Test log book** (for Germany only)

2.3 Features

The versatile 5804/5804 R/5810/5810 R centrifuge has a maximum capacity of 4 x 100 mL (5804/5804 R centrifuge) or 4 x 500 mL (5810/5810 R centrifuge) and reaches max. 20,800 x g/ 14,000 rpm. The versatility is reflected in the available rotor options. You can select between 8 (5804/5804 R centrifuge) or 13 (5810/5810 R centrifuge) different rotors to centrifuge the following tubes for your various applications:

- Micro test tubes (0.2 to 2.0 ml)
- PCR strips
- Microtainers
- Spin columns
- Cryotubes
- Falcon tubes (15/50 mL)
- Bottles (180 to 500 mL)
- Various tubes (3 to 120 mL)
- Microplates
- PCR plates
- Deepwell plates (max. height 29 mm)
- Slides (with CombiSlide adapter)
- Cell culture bottles

Handling the centrifuge is facilitated by:

- Low access height of 28 cm for loading and unloading the rotors
- Automatic rotor detection with rotational speed limit
- Automatic rotor imbalance detection
- Clear digital display

All centrifuges in these series have 35 program spaces for user-defined settings and 10 different acceleration and braking ramps.

Adapter-specific manual radius adjustment guarantees maximum RCF accuracy.

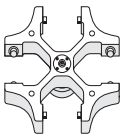
The Centrifuge 5804 R/5810 R has an additional temperature control function for centrifugation between -9 °C and 40 °C. Use the **FastTemp** function to start a temperature control run without samples to adjust the rotor chamber incl. rotor, carriers and adapters quickly to the set target temperature. Continuous cooling also maintains the temperature in the rotor chamber with the centrifuge lid closed when the centrifuge is not in use.

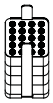
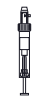
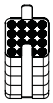
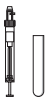
The built-in condensation drain eliminates water accumulation and prevents corrosion.

2.4 Rotors

2.4.1 Rotor A-4-81 (only 5810/5810 R)

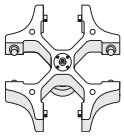
Rotor A-4-81 with 500 mL rectangular bucket

			Max. g-force:	3,220 x *g*
Rotor A-4-81 Swing-bucket rotor with 4 x 500 mL rectangular buckets	**Rectangular bucket 500 mL**	**Aerosol-tight cap**	Max. speed:	4,000 rpm
			Max. load per bucket (adapter, tube and contents):	780 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters** **Order no. (International)**	**Adapter bottom shape** **Tube diameter** **Max. tube length with/without aerosol-tight bucket cap**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Tube 1.5/2 mL 20/80	 5810 745.004	flat Ø 11 mm 43 mm/43 mm	2,950 x *g* 4,000 rpm 16.5 cm
	Blood collection tube 1.2 to 5 mL 20/80	 5810 746.000	flat Ø 11 mm 108 mm/108 mm	3,000 x *g* 4,000 rpm 16.8 cm
	Tube 2.6 to 7 mL 25/100	 5810 720.001	flat Ø 13 mm 107 mm/108 mm	3,000 x *g* 4,000 rpm 16.8 cm
	Tube 5 mL 18/72	 5825 717.007	flat Ø 13 mm 108 mm/108 mm	3,000 x *g* 4,000 rpm 16.8 cm
	Blood collection tube 3 to 15 mL 16/64	 5810 748.003	flat Ø 16 mm 108 mm/108 mm	3,000 x *g* 4,000 rpm 16.8 cm
	Tube 7 to 17 mL 16/64	 5810 721.008	flat Ø 17.5 mm 118 mm/118 mm	3,000 x *g* 4,000 rpm 16.8 cm

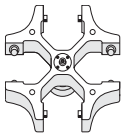
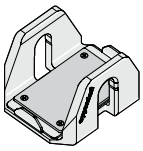
Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with/without aerosol-tight bucket cap	Max. g-force Max. speed Centrifugation radius
	Falcon 15 mL 12/48	 5810 722.004	conical Ø 17.5 mm 119 mm/121 mm	3,100 x *g* 4,000 rpm 17.3 cm
	Falcon 50 mL 5/20	 5810 723.000	conical Ø 31 mm 116 mm/122 mm	3,100 x *g* 4,000 rpm 17.3 cm
	Centriprep 50 mL 5/20	 5810 739.004	flat Ø 31 mm -/121 mm	3,100 x *g* 4,000 rpm 17.3 cm
	Falcon, skirted 50 mL 5/20	 5810 739.004 5804 737.008	flat Ø 31 mm -/119 mm	3,100 x *g* 4,000 rpm 17.3 cm
	Bottles 180 to 250 mL 1/4	 5825 722.000	flat Ø 62 mm -/133 mm	3,100 x *g* 4,000 rpm 17.3 cm
	Wide-neck bottle 400 mL 1/4	 5810 728.002	flat Ø 81 mm -/133 mm	3,220 x *g* 4,000 rpm 18.0 cm
	Wide-neck bottle, rectangular 500 mL -/4	-	flat 83 mm 134 mm/134 mm	3,220 x *g* 4,000 rpm 18.0 cm

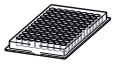
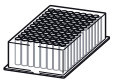
Rotor A-4-81 with Falcon bucket

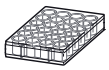
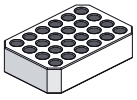
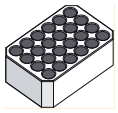
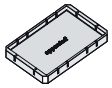
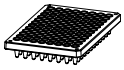
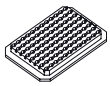
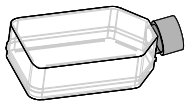
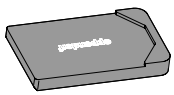
		Max. g-force:	3,220 x *g*
Rotor A-4-81 Swing-bucket rotor with 4 Falcon buckets	**Falcon bucket**	Max. speed:	4,000 rpm
		Max. load:	7 x 75 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters** **Order no. (International)**	**Bottom shape** **Tube diameter** **Max. tube length**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Falcon 15 mL 7/28	 5820 718.005	conical Ø 17.5 mm 120 mm	3,184 x *g* 4,000 rpm 17.8 cm
	Falcon 50 mL 7/28	-	conical Ø 30 mm 117 mm	3,220 x *g* 4,000 rpm 18.0 cm

Rotor A-4-81 with MTP/Flex carrier

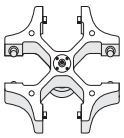
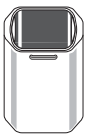
		Max. g-force:	2,900 x *g*
Rotor A-4-81 Swing-bucket rotor with 4 MTP/Flex carriers	**MTP/Flex carriers**	Max. speed:	4,000 rpm
		Max. load per carrier:	380 g

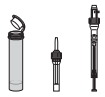
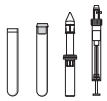
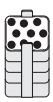
Tube	**Plate** **Capacity** **Plates, rack or glass slides per adapter/ rotor**	**Adapters** **Order no. (International)**	**Bottom shape** **Tube diameter** **Max. loading height**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Micro test plate 96/384 wells 4/16	-	flat - 60 mm	2,900 x *g* 4,000 rpm 16.3 cm
	Deepwell plate 96 wells 1/4	-	flat - 60 mm	2,900 x *g* 4,000 rpm 16.3 cm

Tube	Plate Capacity Plates, rack or glass slides per adapter/ rotor	Adapters Order no. (International)	Bottom shape Tube diameter Max. loading height	Max. g-force Max. speed Centrifugation radius
	Cell culture plate 24 wells 2/8	-	flat - 60 mm	2,900 x *g* 4,000 rpm 16.3 cm
	Kit 1/4	-	flat - 60 mm	2,900 x *g* 4,000 rpm 16.3 cm
	Tube in IsoRack 24 x 0.5 mL 1/4	 5825 708.008	flat Ø 6 mm 60 mm	2,700 x *g* 4,000 rpm 15.0 cm
	Tube in IsoRack 24 x 1.5/2 mL 1/4	 5825 709.004	flat Ø 11 mm 60 mm	2,600 x *g* 4,000 rpm 14.6 cm
	384-well PCR plate 1/4	 5825 713.001	flat - 60 mm	2,700 x *g* 4,000 rpm 15.8 cm
	96-well PCR plate 1/4	 5825 711.009	flat - 60 mm	2,600 x *g* 4,000 rpm 16.1 cm
Slides	CombiSlide 12/48 or 8/32	 5825 706.005	flat - 60 mm	1,000 x *g* 2,372 rpm 15.9 cm
	Cell culture bottle with/ without filter 75 cm^2: Sarstedt 83.1811.002/ 83.1811 25 cm^2: Sarstedt 83.1810.002/ 83.1810 Greiner Bio-One 690175/690160 TPP 90026/90025 IWAKI 3102-025 1/4	 5825 719.000	flat - 60 mm	1,000 x *g* 2,501 rpm 14.3 cm

2.4.2 Rotor A-4-62 and A-4-62-MTP (only 5810/5810 R)

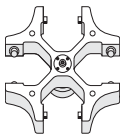
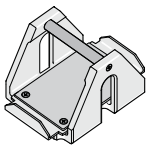
Rotor A-4-62 with 250 mL rectangular bucket

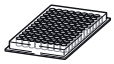
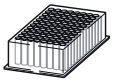
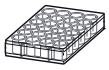
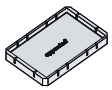
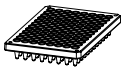
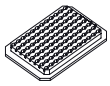
			Max. g-force:	3,220 x *g*
Rotor A-4-62 Swing-bucket rotor with 4 x 250 mL rectangular buckets	**Rectangular bucket 250 mL**	**Aerosol-tight cap**	Max. speed:	4,000 rpm
			Max. load per bucket (adapter, tube and contents):	620 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters** **Order no. (International)**	**Adapter bottom shape** **Tube diameter** **Max. tube length with/without aerosol-tight bucket cap**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Tube 1,5/2 mL 16/64	 5810 751.004	flat Ø 11 mm 43 mm/43 mm	3,000 x *g* 4,000 rpm 17.1 cm
	Tubes 1.2 to 5 mL 25/100	 5810 750.008	flat Ø 11 mm 115 mm/123 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tubes 2.6 to 7 mL 15/60	 5810 752.000	flat Ø 13 mm 118 mm/121 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tubes 3 to 15 mL 12/48	 5810 753.007	flat Ø 16 mm 116 mm/121 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tubes 7 to 17 mL 12/48	 5810 754.003	flat Ø 17.5 mm 114 mm/118 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Falcon 15 mL 9/36	 5810 755.000	conical Ø 17.5 mm 121 mm/127 mm	3,150 x *g* 4,000 rpm 17.8 cm

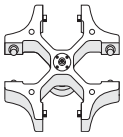
Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with/without aerosol-tight bucket cap	Max. g-force Max. speed Centrifugation radius
	Tube 7 to 18 mL 8/32	 5810 756.006	flat Ø 20 mm 119 mm/126 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tube 18 to 30 mL 4/16	 5810 757.002	flat Ø 26 mm 116 mm/119 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Falcon 50 mL 3/12	 5810 758.009	conical Ø 31 mm 116 mm/122 mm	3,150 x *g* 4,000 rpm 17.8 cm
	Falcon 50 mL 4/16	 5810 763.002	conical Ø 31 mm -/122 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tube 30 to 50 mL 4/16	 5810 759.005	flat Ø 31 mm -/119 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Falcon, skirted 50 mL 4/16	 5810 759.005 5804 737.008	flat Ø 31 mm -/119 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tube 50 to 75 mL 2/8	 5810 760.003	flat Ø 35 mm 118/122 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Tube 80 to 120 mL 1/4	 5810 761.000	flat Ø 45 mm 125/138 mm	3,050 x *g* 4,000 rpm 17.3 cm
	Bottles 180 to 250 mL 1/4	 5810 770.009	flat Ø 62 mm 127/136 mm	3,220 x *g* 4,000 rpm 18.0 cm

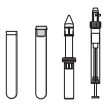
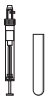
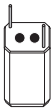
Rotor A-4-62 with MTP carrier

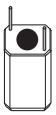
		Max. g-force:	2,750 x *g*
Rotor A-4-62 Swing-bucket rotor with 4 MTP carriers	**MTP carriers**	Max. speed:	4,000 rpm
		Max. load per carrier:	380 g

Tube	**Plate** **Capacity** **Plates or glass slides per adapter/ rotor**	**Adapters** **Order no. (International)**	**Bottom shape** **Max. loading height**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Micro test plate 96/384 wells 3/12		flat 53 mm	2,750 x *g* 4,000 rpm 15.4 cm
	Deepwell plate 96/384 wells 1/4		flat 53 mm	2,750 x *g* 4,000 rpm 15.4 cm
	Cell culture plate 24 wells 2/8		flat 53 mm	2,750 x *g* 4,000 rpm 15.4 cm
	384-well PCR plate 1/4	 5825 713.001	flat 53 mm	2,700 x *g* 4,000 rpm 14.9 cm
	96-well PCR plate 1/4	 5825 711.009	flat 53 mm	2,600 x *g* 4,000 rpm 15.2 cm
Slides	CombiSlide 12/48 or 8/32	 5825 706.005	flat 53 mm	1,000 x *g* 2,442 rpm 15.0 cm

2.4.3 Rotor A-4-44

			Max. g-force:	4,400 x *g*
Rotor A-4-44 Swing-bucket rotor with 4 x 100 mL rectangular buckets	**Rectangular bucket 100 mL**	**Aerosol-tight cap**	Max. speed:	5,000 rpm
			Max. load per bucket (adapter, tube and contents):	310 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters** **Order no. (International)**	**Adapter bottom shape** **Tube diameter** **Max. tube length with/without aerosol-tight bucket cap**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Tube 1,5/2 mL 12/48	 5804 751.000	flat Ø 11 mm 43 mm/43 mm	4,100 x *g* 5,000 rpm 14.8 cm
	Tubes 1.2 to 5 mL 14/56	 5804 750.004	flat Ø 11 mm 102 mm/105 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Tubes 2.6 to 7 mL 9/36	 5804 752.007	flat Ø 13 mm 106 mm/108 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Tubes 3 to 15 mL 7/28	 5804 753.003	flat Ø 16 mm 106 mm/108 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Tubes 7 to 17 mL 6/24	 5804 754.000	flat Ø 17.5 mm 106 mm/110 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Falcon 15 mL 4/16	 5804 755.006	conical Ø 17.5 mm -/121 mm	4,300 x *g* 5.000 rpm 15.5 cm
	Falcon 15 mL 2/8	 5804 717.007	conical Ø 17.5 mm 121 mm/121 mm	4,400 x *g* 5,000 rpm 15.7 cm

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with/without aerosol-tight bucket cap	Max. g-force Max. speed Centrifugation radius
	Tube 7 to 18 mL 4/16	 5804 756.002	flat Ø 20 mm 104 mm/107 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Tube 18 to 30 mL 2/8	 5804 757.009	flat Ø 26 mm 100 mm/110 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Falcon 50 mL 1/4	 5804 758.005	conical Ø 31 mm -/122 mm	4,300 x *g* 5,000 rpm 15.5 cm
	Falcon 50 mL 1/4	 5804 718.003	conical Ø 31 mm 119 mm/122 mm	4,400 x *g* 5,000 rpm 15.7 cm
	Falcon 50 mL -/8	 5804 706.005 Max. load 144 g (insert, tubes and contents)	flat with conical insert - -/120 mm	4,500 x *g* 5,000 rpm 16.1 cm
	Tube 30 to 50 mL 1/4	 5804 759.001	flat Ø 31 mm 108 mm/122 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Falcon, skirted 50 mL 1/4	 5804 759.001 5804 737.008	flat Ø 31 mm 108 mm/122 mm	4,200 x *g* 5,000 rpm 15.0 cm
	Tube 50 to 75 mL 1/4	 5804 760.000	flat Ø 35 mm 108 mm/119 mm	4,200 x *g* 5,000 rpm 15.0 cm

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with/without aerosol-tight bucket cap	Max. g-force Max. speed Centrifugation radius
	Tube 80 to 100 mL 1/4	 5804 761.006	flat Ø 45 mm 100 mm/114 mm	4,200 x *g* 5,000 rpm 15.0 cm

2.4.4 Rotor A-2-DWP-AT (only 5810/5810 R)

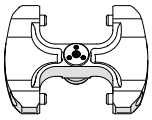
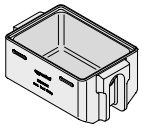
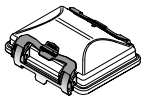
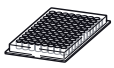
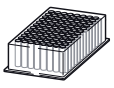
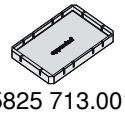
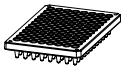
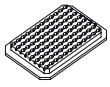
			Max. g-force:	3,486 x *g*
Rotor A-2-DWP-AT Swing-bucket rotor with 2 aerosol-tight buckets	**Bucket**	**Aerosol-tight cap**	Max. speed: Max. load per bucket (adapter, tube and contents):	4,500 rpm 500 g

Plate	Plate Capacity Plates per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Max. loading height	Max. g-force Max. speed Centrifugation radius
	Micro test plate 96/384 wells 1/2	 5820 712.007	flat 67 mm	3,486 x g 4,500 rpm 154 mm
	Deepwell plate 96 mL 1/2	 5820 712.007	flat 67 mm	3,486 x g 4,500 rpm 154 mm
	384-well PCR plate 1/4	 5825 713.001	flat 67 mm	3,373 x *g* 4,500 rpm 14.9 cm
	96-well PCR plate 1/4	 5825 711.009	flat 67 mm	3.441 x *g* 4,500 rpm 15.2 cm

2.4.5 Rotor A-2-DWP

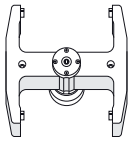
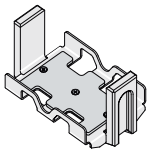
		Max. g-force:	2,250 x *g*
Rotor A-2-DWP Swing-bucket rotor with 2 Deepwell plate carriers	**Deepwell plate carrier**	Max. speed:	3,700 rpm
		Max. load per carrier (adapter, tube and contents):	380 g

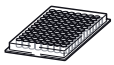
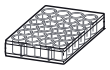
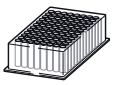
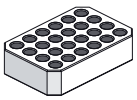
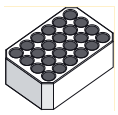
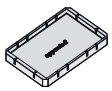
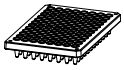
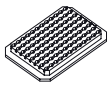
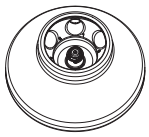
Plate	Plate Capacity Plates per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Max. loading height	Max. g-force Max. speed Centrifugation radius
	Micro test plate 96/384 wells 5/10	SBS adapter* 5825 718.003	flat 89 mm	2,250 x *g* 4,000 rpm 14.7 cm
	Cell culture plate 24 wells 4/8	SBS adapter* 5825 718.003	flat 89 mm	2,250 x *g* 4,000 rpm 14.7 cm
	Deepwell plate 96 wells 1/4	SBS adapter* 5825 718.003	flat 89 mm	2,250 x *g* 4,000 rpm 14.7 cm
	Kit 1/2	SBS adapter* 5825 718.003	flat 89 mm	2,250 x *g* 4,000 rpm 14.7 cm
	Tube in IsoRack 24 x 0.5 mL 1/2	 5825 708.008	flat Ø 6 mm 89 mm	2,050 x *g* 3,700 rpm 13.8 cm
	Tube in IsoRack 24 x 1.5/2 mL 1/2	 5825 709.004	flat Ø 11 mm 89 mm	1,990 x *g* 3,700 rpm 13.3 cm
	384-well PCR plate 1/2	 5825 713.001	flat 89 mm	2,170 x *g* 3,700 rpm 14.2 cm

Plate	Plate Capacity Plates per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Max. loading height	Max. g-force Max. speed Centrifugation radius
	96-well PCR plate 1/2	 5825 711.009	flat 89 mm	2,220 x *g* 3,700 rpm 14.5 cm

*) Optional. Secures the plate against slipping .

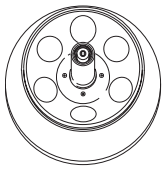
2.4.6 Rotor FA-45-6-30

	**Rotor FA-45-6-30** Fixed-angle rotor for 6 Falcon tubes	Max. g-force: Max. speed: Max. load (adapter, tube and contents):	16,639 x *g* (5810 R: 20,130 x *g*) 11,000 rpm (5810 R: 12,100 rpm) 6 x 75 g

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with rotor lid	Max. g-force at 11,000 rpm (5804/ 5804 R/5810) Max. g-force at 12,100 rpm (5810 R) Centrifugation radius
	Falcon 15 mL 1/6	 5820 717.009	conical Ø 17 mm 125 mm	16,233 x *g* 19,642 x *g* 12.0 cm
	Falcon 50 mL 1/6	-	conical Ø 30 mm 127 mm	16,639 x *g* 20,130 x *g* 12.3 cm
	Oak Ridge 10 mL 1/6	 5820 719.001	round Ø 16.1 mm 84 mm	16,233 x *g* 19,642 x *g* 12.0 cm
	Oak Ridge 16 mL 1/6	 5820 720.000	round Ø 18.1 mm 107 mm	16,233 x *g* 19,642 x *g* 12.0 cm
	Oak Ridge 30 mL 1/6	 5820 721.006	round Ø 25.7 mm 104 mm	14,204 x *g* 17,187 x *g* 10.5 cm

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with rotor lid	Max. g-force at 11,000 rpm (5804/ 5804 R/5810) Max. g-force at 12,100 rpm (5810 R) Centrifugation radius
	Oak Ridge 35 mL 1/6	 5820 722.002	conical Ø 28.7 mm 113 mm	15,151 x *g* 18,333 x *g* 11.2 cm

2.4.7 Rotor F-34-6-38

	**Rotor F-34-6-38** Fixed-angle rotor for 6 x 85 mL tubes	Max. g-force: Max. speed: Max. load (adapter, tube and contents):	15,550 x *g* (5810 R: 18,500 x *g*) 11,000 rpm (5810 R: 12,000 rpm) 6 x 125 g

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with rotor lid	Max. g-force at 11,000 rpm (5804/ 5804 R/5810) Max. g-force at 12,100 rpm (5810 R) Centrifugation radius
	Tube 1.5/2 mL 4/24	 5804 770.005	round Ø 11 mm 43 mm	15,300 x *g* 18,200 x *g* 11.3 cm
	Blood collection tube 2 to 5 mL 3/18	 5804 738.004	round Ø 13 mm 80 mm	14,339 x *g* 17,065 x *g* 10.6 cm
	Blood collection tube 4 to 7 mL 3/18	 5804 739.000	round Ø 13 mm 107 mm	15,442 x *g* 18,353 x *g* 11.4 cm
	Tube 7 to 15 mL 2/12	 5804 771.001	round Ø 16 mm 112 mm	15,150 x *g* 18,000 x *g* 11.2 cm
	Falcon 15 mL 1/6	 5804 776.003	conical Ø 17.5 mm 123 mm	14,450 x *g* 17,200 x *g* 10.7 cm

Tube	Tube Capacity Tubes per adapter/ rotor	Adapters Order no. (International)	Adapter bottom shape Tube diameter Max. tube length with rotor lid	Max. g-force at 11,000 rpm (5804/ 5804 R/5810) Max. g-force at 12,100 rpm (5810 R) Centrifugation radius
	Tube 15 to 18 mL 1/6	 5804 772.008	round Ø 18 mm 123 mm	14,750 x *g* 17,550 x *g* 10.9 cm
	Tube 20 to 30 mL 1/6	 5804 773.004	round Ø 26 mm 123 mm	14,900 x *g* 17,700 x *g* 11.0 cm
	Tube 50 mL 1/6	 5804 774.000	round Ø 29 mm 123 mm	15,150 x *g* 18,000 x *g* 11.2 cm
	Falcon 50 mL 1/6	 5804 775.007	conical Ø 29.5 mm 121 mm	14,600 x *g* 17,400 x *g* 10.8 cm
	Tube 85 mL -/6	-	- Ø 38 mm 121 mm	15,550 x *g* 18,500 x *g* 11.5 cm

2.4.8 Rotor FA-45-30-11 and F-45-30-11

	**Rotor FA-45-30-11** Aerosol-tight fixed-angle rotor for 30 tubes **Rotor F-45-30-11** Fixed-angle rotor for 30 tubes	Max. g-force: Max. speed: Max. load (adapter, tube and contents):	20,800 x *g* 14,000 rpm 30 x 3.5 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters** **Order no. (International)**	**Adapter bottom shape** **Tube diameter**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Tube 1.5/2 mL -/30	-	- Ø 11 mm	20,800 x *g* 14,000 rpm 9.5 cm
	PCR tube 0.2 mL 1/30	 5425 715.005	conical Ø 6 mm	16,200 x *g* 14,000 rpm 7.4 cm
	Tube 0.4 mL 1/30	 5425 717.008	conical Ø 6 mm	20,800 x *g* 14,000 rpm 9.5 cm
	Tube 0.5 mL 1/30	 5425 716.001	- Ø 6 mm	18,400 x *g* 14,000 rpm 8.4 cm
	Microtainers 0.6 mL 1/30	 5425 716.001	- Ø 8 mm	20,800 x *g* 14,000 rpm 9.5 cm

2.4.9 Rotor F-45-48-PCR

	**Rotor F-45-48-PCR** Fixed-angle rotor for tube strips or 0.2 mL PCR tubes	Max. g-force: Max. speed: Max. load (tube and contents):	15,350 x *g* 12,000 rpm 6 x 3.5 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters**	**Tube diameter**	**Max. g-force** **Max. speed** **Centrifugation radius**
	8-tube/5-tube tube strips 8/5 x 0.2 mL -/6 x 8 or -/6 x 5	-	Ø 6 mm	15,350 x *g* 12,000 rpm 9.5 cm
	Tube 0.2 mL -/48	-	Ø 6 mm	15,350 x *g* 12,000 rpm 9.5 cm

2.4.10 Rotor T-60-11

	**Rotor T-60-11** Drum rotor for tubes	Max. g-force: Max. speed: Max. load (tube and contents):	14,000 x *g* 16,400 rpm 6 x 70 g

Tube	**Tube** **Capacity** **Tubes per adapter/ rotor**	**Adapters**	**Tube diameter**	**Max. g-force** **Max. speed** **Centrifugation radius**
	Tube 1.5/2 mL 10/60	-	Ø 11 mm	16,400 x *g* 14,000 rpm 7.5 cm
	Tube 0.4 mL 20/120	-	Ø 6 mm	16,400 x *g* 14,000 rpm 7.5 cm

3 Safety

3.1 Intended use

Also observe the information on intended use (Eppendorf Centrifuge – Intended Use), which is enclosed with some centrifuges.

The 5804/5804 R/5810/5810 R centrifuge is intended exclusively for indoor use and for separating aqueous solutions and suspensions of various densities in approved test tubes.

CAUTION!

Poor safety due to incorrect accessories and spare parts.

The use of accessories and spare parts other than those recommended by Eppendorf may impair the safety, function and precision of the device. Eppendorf cannot be held liable or accept any liability for damage resulting from the use of incorrect or non-recommended accessories and spare parts or from the improper use of such equipment.

- Only use accessories and original spare parts recommended by Eppendorf.

3.2 User profile

This device may only be operated by trained specialist staff. They must have carefully read the operating manual and be familiar with the function of the device.

3.3 Application limits

3.3.1 Declaration concerning the ATEX directive (94/9/EC)

DANGER!

Danger of explosion!

- Do not operate the device in areas where work is completed with explosive substances.
- Do not use this device to process any explosive or highly reactive substances.
- Do not use this device to process any substances which could create an explosive atmosphere.

Due to its design and the environmental conditions on the inside of the device, the 5804/5804 R/5810/5810 R centrifuge is not suitable for use in a potentially explosive atmosphere.

The device must therefore only be used in a safe environment, such as in the open environment of a ventilated laboratory or an extractor hood. The use of substances which may contribute to a potentially explosive atmosphere is not permitted. The final decision with regard to the risks connected with the use of such substances is the responsibility of the user.

3.3.2 Maximum service life for accessories

CAUTION!

Risk of injury from chemically or mechanically damaged accessories.

Even minor scratches and cracks can result in serious damage to the accessories.

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

CAUTION!

Risk of injury through chemical damage to the caps.

Transparent caps can lose strength if exposed to organic solvents (e.g., phenol, chloroform).

- Check the caps regularly for damage and cracks.
- Immediately replace caps with cracks or milky discolorations.

Rotor/accessories	Maximum service life from first commissioning
Rotor A-2-DWP-AT, A-2-DWP, A-4-44, A-4-62, A-4-62-MTP, A-4-81, A-4-81-MTP/Flex, FA-45-6-30, F-34-6-38 and T-60-11, including the associated carriers and the rotor lid	7 years
Transparent rotor lids, lid of the FA-45-6-30 and caps of the rectangular buckets made of polypropylene (PP) or polycarbonate (PC)	3 years
Plastic adapters	1 year

For the other rotors and rotor lids of this centrifuge (see *Rotors on p. 13)*, there is no limit for their service life, as long as the following conditions are met: proper use, recommended maintenance and undamaged condition. To ensure aerosol tightness, the lid of the FA-45-30-11 must be replaced after a maximum of 10 autoclaving cycles (121 °C, 20 min) or after each autoclaving cycle (142 °C, 2 h). For the rotors FA-45-6-30 and A-2-DWP-AT, the sealing in the lid groove must be replaced after a maximum of 50 autoclaving cycles.

The date of manufacture is stamped on the rotors in the format *03/10* (= March 2010) or on the inside of the plastic rotor lids and caps in the form of a clock. This is for information only and does not have any reference to the service life.

3.4 Information on product liability

In the following cases, the designated protection may compromise the safety of the device. Liability for material damage and personal injury is transferred to the operator:

- The device is not used in accordance with the operating manual.
- The device is used outside of its intended use.
- The device is used with accessories or consumables (e.g., tubes and plates) which are not recommended by Eppendorf.
- The device is maintained or repaired by persons not authorized by Eppendorf.
- The owner has made unauthorized modifications to the device.

3.5 Warnings for intended use

Read the operating manual first and observe the following general safety instructions before using the 5804/5804 R/5810/5810 R centrifuge.

3.5.1 Personal injury or damage to the equipment

WARNING!

Electric shock due to damage to device or mains cable.

- Only switch on the device if the device and mains cable are undamaged.
- Only use devices that have been properly installed or repaired.
- In case of danger, disconnect the device from the mains supply.

WARNING!

Lethal voltages inside the device.

- Ensure that the housing is always closed and undamaged so that no parts inside the device can be contacted by accident.
- Do not remove the housing of the device.
- Do not allow any liquids to penetrate the inside of the housing.
- Do not allow the device to be opened by anyone except service personnel who have been specifically authorized by Eppendorf.

WARNING!

Risk from incorrect supply voltage

- Only connect the device to power supplies which correspond with the electrical requirements on the nameplate.

WARNING!

Damage to health due to handling infectious liquids and pathogenic germs.

- Observe the national regulations for handling these substances, the biological security level of your laboratory, the material safety data sheets and the manufacturer's application notes.
- For the centrifugation of these substances, use suitable aerosol-tight closure systems.
- When working with pathogenic germs belonging to a higher risk group, more than one aerosol-tight bioseal must be used.
- Wear personal protective equipment (PPE).
- Follow the instructions regarding hygiene, cleaning and decontamination.
- Comprehensive information on the regulations for handling germs and biological material in risk group II or higher can be found in the "Laboratory Biosafety Manual" (source: World Health Organization, Laboratory Biosafety Manual, in the valid version).

CAUTION!

Centrifuge lid can crush. Keep hands clear.

- When opening or closing the device lid, do not reach between the lid and device or into the latching mechanism of the lid.
- Always open the centrifuge lid completely to prevent it from falling.

WARNING!

Danger of crushing if the centrifuge lid falls down due to a defective gas spring.

A defective gas spring is an insufficient support for the centrifuge lid.

- Make sure that the centrifuge lid can be opened completely and that it will remain in this position.
- Regularly check the gas spring for its proper function.
- Have defective gas springs replaced immediately.

We recommend an exchange by a service technician every two years.

NOTICE!

Damage to device by spilling liquids in the rotor or rotor chamber.

1. Switch the device off.
2. Disconnect the device from the power supply.
3. Clean the device and the accessories carefully in accordance with the cleaning and disinfection instructions in the operating manual.
4. If a different cleaning and disinfecting method is to be used, contact Eppendorf AG to ensure that the intended method will not damage the device.

NOTICE!

Damage to electronic components due to condensation.

After the device has been moved from a cool to a warmer environment, condensation may form inside the device.

- 5804/5810Wait at least three hours before connecting it to the power supply.
- 5804 R/5810 R Wait at least four hours before connecting it to the power supply.
- **Only 5804/5810:** Alternatively: let the device run for half an hour before transporting it.

NOTICE!

Centrifuge 5804 R/5810 R: Compressor damage after improper transport.

- Only switch on the centrifuge 4 hours after installation.

3.5.2 Incorrect handling of the centrifuge

NOTICE!

Damage from knocking against or moving the device during operation.

A rotor banging against the rotor chamber wall can cause considerable damage to the device and rotor.

- Do not move or knock against the device during operation.

3.5.3 Incorrect handling of the rotors

CAUTION!

Risk of injury from improperly attached rotors and rotor lids.

- Centrifuge only with the rotor and rotor lid firmly tightened.
- If unusual noises occur when the centrifuge starts, the rotor or the rotor lid may not be properly secured. Immediately press the **start/stop** key to stop centrifuging.

CAUTION!

Risk of injury from unsymmetric loading of rotors.

- Load rotors symmetrically with identical tubes and/or buckets and plates.
- Only load adapters with suitable tubes and/or plates.
- Always use tubes and/or plates of the same type (weight, material/density and volume).
- Ensure that tubes that are located opposite each other contain liquids with the same rate of evaporation. Otherwise an imbalance can occur and the concentration may automatically stop.
- Check for symmetric loading by balancing the adapters and tubes and/or plates used with scales.

CAUTION!

Risk of injury from overloaded rotor.

The 5804/5804 R/5810/5810 R centrifuge is designed for the centrifugation of material with a max. density of 1.2 g/mL at maximum speed and filling volume and/or load.

- Observe the information on each rotor relating to maximum load (adapter, tube and contents) per rotor bore/per bucket and make sure it is not exceeded.

NOTICE!

Damage to rotors from aggressive chemicals.

Rotors are high-quality components which withstand extreme stresses. This stability can be impaired by aggressive chemicals.

- Avoid the use of aggressive chemicals, including strong and weak alkalis, strong acids, solutions with mercury, copper and other heavy metal ions, halogenated hydrocarbons, concentrated saline solutions and phenol.
- If the rotor is contaminated with aggressive chemicals, clean it immediately using a neutral cleaning agent and then rinse it thoroughly with water. This applies to the rotor bores in particular.

NOTICE!

If handled incorrectly, the rotor can fall over.

The buckets of swing-bucket rotors must not be used as handles.

- Before moving the rotor, remove the buckets.
- Always pick up the rotor at the rotor cross, using both hands.

3.5.4 Extreme strain on the centrifuging tubes

CAUTION!

Risk of injury from overloaded tubes.

- Note the loading limits specified by the tube manufacturer.
- Only use tubes which are approved by the manufacturer for the required rcf.

NOTICE!

Risk from damaged tubes.

Damaged tubes must not be used, as this could cause further damage to the device and the accessories and loss of the samples.

- Before use, carry out a visual check of all tubes for any damage.

NOTICE!

Risk from open tube lids.

Open tube lids can break off during centrifugation and cause damage to the rotor as well as to the centrifuge.

- Carefully close all tube lids before centrifuging.

NOTICE!

Hazard to plastic tubes from organic solvents.

When using organic solvents (e.g., phenol, chloroform) the strength of plastic tubes is reduced, i.e., the tubes could get damaged.

- Follow the manufacturer's information about the chemical resistance of tubes.

NOTICE!

Sample tubes heat up.

In non-refrigerated centrifuges, the temperature in the rotor chamber, rotor and sample can rise to above 40 °C dependent on the run time, g-force (rcf)/speed (rpm) and ambient temperature.

- Note that this can reduce the centrifugation resistance of the sample tubes.
- Please note the temperature resistance of the samples.

3.5.5 Aerosol-tight centrifugation

WARNING!

Risk to health due to limited aerosol tightness with incorrect rotor/rotor lid combination.

Aerosol-tight centrifugation is guaranteed only if the rotors and rotor lids intended for this purpose are used. The identification of fixed-angle rotors always starts with **FA**.

- Only use aerosol-tight rotors/beakers in combination with the associated rotor lids/caps.

WARNING!

Risk to health due to limited aerosol tightness in the event of incorrect.

Autoclaving, mechanical stresses and contamination by chemicals or other aggressive solvents can impair the aerosol-tightness of the rotors and rotor lid.

- Regularly check that the seals of aerosol-tight rotor lids are undamaged.
- Only use aerosol-tight rotor lids with undamaged and clean gaskets.
- Thinly brush the threads of the rotor lid screw with pivot grease (order no. int.: 5810 350.050 / North America: 022634330). Do not apply the pivot grease to the gaskets.
- Replace the lid of the FA-45-30-11 after a maximum of 10 autoclaving cycles (121 °C, 20 min). Replace the sealing in the lid groove of the rotors FA-45-6-30 and A-2-DWP-AT after a maximum of 50 autoclaving cycles.
- Aerosol-tight rotors should **never** be stored with rotor lids screwed on.

3.6 Safety instructions on the device

Depiction	Meaning	Location
	**WARNING** General hazard point. Follow the operating manual.	Right side of the device

4 Installation

4.1 Selecting the location

NOTICE!

Damage to objects in the immediate vicinity of the device.

If damage occurs to the rotor or an imbalance occurs, it may cause the location of the device to change slightly.

- In accordance with the recommendations of EN 61010-2-020, leave a safety distance of **30 cm** clear around the device during operation.

NOTICE!

Damage from overheating.

- Do not place the device close to sources of heat (e.g., radiator, drying cabinet).
- Do not expose the device to direct sunlight.
- Ensure free circulation of air by maintaining a distance of at least 30 cm on all sides of the device from adjacent devices or the wall and keep the underside of the device clear.
- Make sure that the air slots in the device are always free of obstruction.

NOTICE!

Radio interference.

This device is a category A product in accordance with EN 55011. There may be disturbance to radio reception in residential areas.

- Ensure that appropriate preventive measures are taken.

Select the location for the device according to the following criteria:

- Suitable power connection as per the name plate (230 V/120 V/100 V).
- Stable, horizontal and resonance-free lab bench. Weight of the device: 55 kg (5804) or 80 kg (5804 R), 68 kg (5810), 99 kg (5810 R).
- A well ventilated environment which is protected from direct sunlight to prevent the device from heating up more.

4.2 Preparing installation

The weight of the device is 55 kg (5804) or 80 kg (5804 R), 68 kg (5810), 99 kg (5810 R).

- Transport the device without the rotor inserted.
- Only transport the device in the original packaging.
- The device must always be transported by 2 people.
- Use a transport aid for longer distances (e.g., hand cart).
- Retain the packaging material and the transport protection device for subsequent transport or storage. See also the instructions relating to transport (see p. 54).

Perform the following steps in the sequence described.

1. Open the carton.
2. Remove the covering cardboard.
3. Remove the accessories.

4.3 Installing the instrument

WARNING!

Risk from incorrect supply voltage

- Only connect the device to power supplies which correspond with the electrical requirements on the nameplate.
- Only use sockets with a protective earth (PE) conductor and a suitable mains cable.

NOTICE!

Centrifuge 5804 R/5810 R: Compressor damage after improper transport.

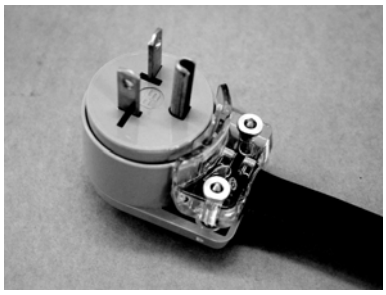
- Only switch on the centrifuge 4 hours after installation.

Perform the following steps in the sequence described.

1. Lift the centrifuge by the underside in the vicinity of the device feet and place it directly on a suitable lab bench.
2. Allow the device to warm up for at least 3 hours (5804/5810) or 4 hours (5804 R/5810 R) to the ambient temperature to prevent damage to the electronic components from condensation and damage to the compressor (only5804 R/5810 R).
3. Check that the mains voltage and frequency match the requirements on the device type plate.

   Centrifuge 5804 R/5810 R with power supply voltage 120 V: See also the notes on the power supply at the end of this chapter.
4. Connect the centrifuge to the mains and switch it on using the mains power switch on the right side of the device.
   - The key **open** lights up.
   - The display is active.
5. Open the centrifuge lid using the **open** key.
6. Use the details included in the scope of delivery to check that the delivery is complete (see *Delivery package on p. 11)*.
7. Check all parts for any transport damage. Contact your dealer if any damage is found.
8. **Only 5804 R/5810 R:** Insert the condensation water tray at the front of the device into the holder provided (see Fig. A)

Tab. 1: Centrifuge 5804 R / 5810 R with mains voltage 120 V in two versions

15 A IEC power cable	**20 A variant**
	
• Conventional IEC power cable. • Connection to standard socket (120 V/ 15 A). • Standard cooling performance: – Increased minimum achievable temperatures at maximum rotational speed. – Slower cooling down to target temperature.	• Power cable fitted permanently to the device. • Special mains connection required (120 V/ 20 A). • Increased cooling performance. – Lower temperatures at maximum rotational speed possible. – Faster cooling down to target temperature.

5 Operation

5.1 Overview of operating controls

Before using the centrifuge for the first time, familiarize yourself with the operating controls and the display.

The depiction of the control panel and the device display can be found on the front fold-out page (see Fig. 2 and Fig. 3).

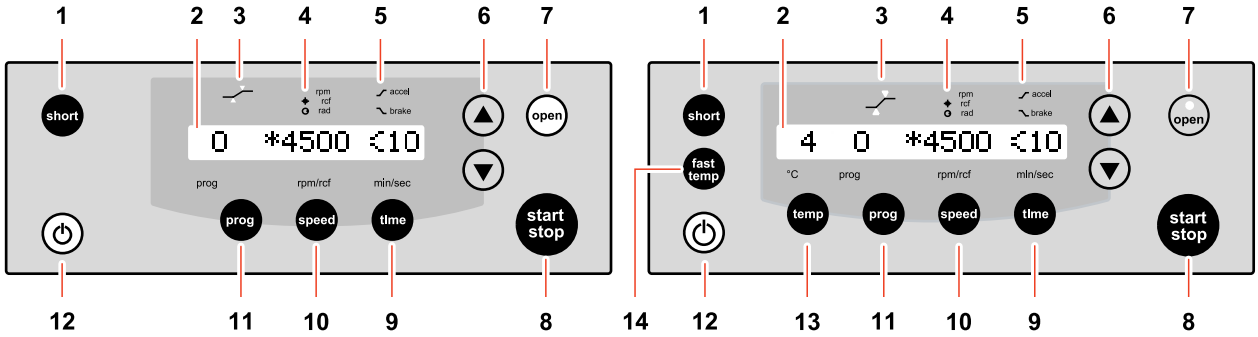


Fig. 2: Control panel of the Centrifuge 5804/5810 and the Centrifuge 5804 R/5810 R.

1 Short spin centrifugation	**2 Display**
3 Status of At set rpm function ⌐: Start of runtime when 95% of the specified g-force (rcf)/speed (rpm) has been reached. ⌐: Start of run time immediately.	**4 Indicate speed (rpm), g-force (rcf) ✳ and radius setting ↻.**
5 Symbol for acceleration ⌐ and braking ⌙	**6 Set parameters and values**
7 Release centrifuge lid	**8 Start or stop centrifugation**
9 Adjust centrifuging duration	**10 Set speed of centrifugation**
11 Select or save program	**12 Standby**
13 Only 5804 R/5810 R: Setting the temperature	**14 Only 5804 R/5810 R: Start temperature control run FastTemp**

Fig. 3: Display Centrifuge 5804/5810 and Centrifuge 5804 R/5810 R

1 Program number	**2 Symbol for g-force (rcf)**
3 g-force (rcf)/speed (rpm)	**4 Symbol flashes during centrifugation**
5 Symbol for acceleration ⌐ and braking ⌙	**6 Centrifuging duration**
7 Only 5804 R/5810 R: Temperature	

The display of the centrifugation parameters changes depending upon the condition of the device:

- Rotor stop: display of target values.
- Centrifugation: display of actual values.

When you press the **temp**, **time** or **speed** keys during centrifugation, the respective target value is displayed for 2.5 seconds.

Please also read the precise description of the individual functions (see p. 45).

5.2 Preparing for centrifugation

5.2.1 Switching on the centrifuge

1. Switch on the centrifuge using the mains power switch or the ⏻ standby key.
2. Open the closed centrifuge lid by pressing the **open** key.
   The parameter settings of the last run are displayed.

5.2.2 Inserting the rotor

Requirement

When attaching the rotor to or releasing it from the motor shaft, the temperature of the rotor and motor shaft must be within the range of 10 – 30 °C.

Swing-bucket rotor: Before inserting or removing the rotor, remove the carriers and grip the rotor by the rotor cross with both hands .

1. Place the rotor vertically onto the motor shaft.
2. Insert the rotor key supplied into the rotor nut.
   Rotor cross A-4-81: Use the special rotor key.
3. Turn rotor key **clockwise** until the rotor nut is firmly tightened.

5.2.3 Automatic rotor detection

The centrifuge has automatic rotor detection. It detects a newly inserted rotor during centrifugation and displays its maximum g-force (rcf)/speed (rpm) for approx. 2 seconds. The set g-force (rcf)/speed (rpm) is automatically limited to the maximum permissible value of the rotor, if necessary.

If you start centrifuging immediately after a rotor change, then the centrifuge has not yet carried out an automatic rotor detection. The speed set for the previous rotor may exceed the maximum permitted speed for the new rotor. In this case the centrifuge stops after the automatic rotor detection. In the display SPEED flashes. If you have started a program cycle, the program number is set to zero.

You can now restart centrifugation with the automatically limited g-force (rcf)/speed (rpm) or adjust it.

After a rotor change and before centrifugation, carry out a short short-spin run for rotor detection (see p. 43).

- Always check the set g-force (rcf)/speed (rpm) after a rotor change and adjust it if necessary .

5.2.4 Loading the rotor

CAUTION!

Risk of injury from unsymmetric loading of rotors.

- Load rotors symmetrically with identical tubes and/or buckets and plates.
- Only load adapters with suitable tubes and/or plates.
- Always use tubes and/or plates of the same type (weight, material/density and volume).
- Check for symmetric loading by balancing the adapters and tubes and/or plates used with scales.

CAUTION!

Risk from damaged or overloaded tubes!

- When loading the rotor, note the safety instructions with regard to risks from overloaded or damaged tubes (see *Warnings for intended use on p. 30)*

Fixed-angle rotors

Rotor lid!

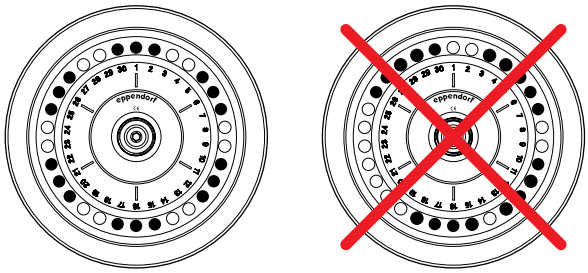
- Fixed-angle rotors may only be operated with the appropriate rotor lid in each case. This is clearly shown by the identical rotor name labeling on the rotor and on the rotor lid.
- To carry out an aerosol-tight centrifugation, an aerosol-tight rotor must be used in combination with the corresponding rotor lid or cap.

To load the rotor, proceed as follows:

1. Check the maximum load (adapter, tube and contents) per rotor bore.

   The information about this can be found on the rotor and in this operating manual (see *Rotors on p. 13)*.

2. Load rotors and adapters only with the tubes intended for them.
3. Insert tubes opposite each other in pairs into the rotor bores. For symmetrical loading, tubes that are opposite each other must be of the same type and contain the same filling quantity.



   In order to minimize weight differences between filled sample tubes, we recommend taring with a scale. This will reduce wear on the drive and cut running noise.

4. Attach and tighten rotor lid.

Swing-bucket rotor

Requirement

- A combination of rotor, carrier and adapter, approved by Eppendorf.
- The carriers are sorted by weight category. Carriers that are located opposite each other must belong to the same weight category. It is stamped onto the side of the groove, e.g. *68* (the last 2 digits in grams). When reordering - also plate carriers - make sure to specify the existing weight category.
- Matching and tested tubes and plates.
- Do not remove the middle guiding elements of the modular adapters of the rectangular buckets in order, e.g., to increase capacity through multi-level centrifugation.

NOTICE!

Damage to adapters due to incorrect stacking.

- Stack the adapters in rectangular buckets in a closed row only from the bottom of the bucket. Do not leave any gaps between the modules.

NOTICE!

Filling the plates too high can cause overflowing.

During the run the meniscuses in the tubes along the edges of the plates are at an angle. This is due to the centrifugal forces and cannot be avoided.

- Fill the wells of the plates to a maximum of 2/3 of the max. filling volume.

To load the rotor, proceed as follows:

1. Check the carrier grooves for cleanliness and grease lightly with pivot grease (order no. Int.: 5810 350.050 / North America: 022634330).

   Dirty grooves and pivots prevent buckets from swinging out evenly.

2. Hang the buckets into the rotor.

   All rotor positions must be loaded with carriers.

3. Check that all carriers are hanging properly and can swing freely.
4. If a plate type is used for the first time or for overlength tubes (> 100 mm) carry out a manual loading and swing test.
5. Check the maximum load per carrier (adapter, tube or plate and contents) and the loading height.

   The information about this can be found on the rotor and in this operating manual (see *Rotors on p. 13)*.

6. Load the buckets symmetrically.

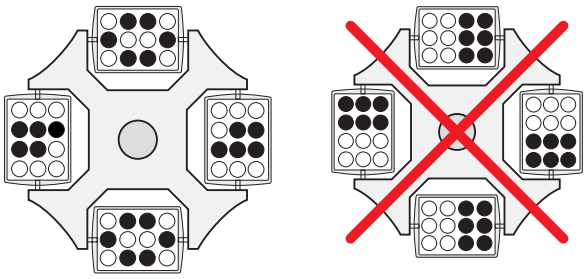


Fig. 4: Incomplete, but symmetric loading of the buckets. The pegs of each bucket must be loaded equally.

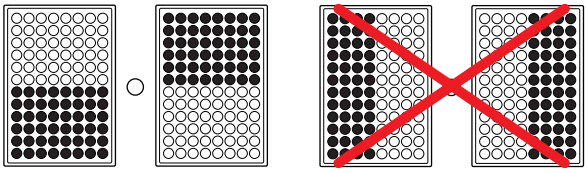


Fig. 5: Symmetrical loading of the plates.

The plate arrangement shown on the right-hand side is incorrect, as the buckets will not swing properly.

The same principle also applies to the loading of rotor A-4-81-MTP/Flex with 4 plates.

The plates have some play in the buckets.

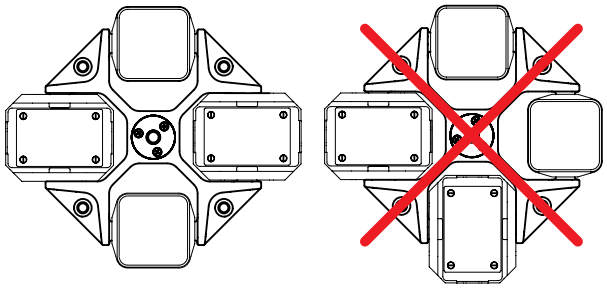


Fig. 6: Possible mixed loading of rotor A-4-81, A-4-81-MTP/Flex with 2 plate carriers and 2 rectangular buckets. All 4 locations must be filled. A mixed load with Falcon buckets is also possible.

For reasons of mechanical stability, all positions in the rotors A-4-44 and A-4-62/A-4-62-MTP must be loaded with the carriers of the same type.

5.2.5 Closing the centrifuge lid

CAUTION!

Centrifuge lid can crush. Keep hands clear.

- When opening or closing the device lid, do not reach between the lid and device or into the latching mechanism of the lid.
- Always open the centrifuge lid completely to prevent it from falling.

1. Check correct attachment of rotor and rotor lid.
2. Push down the centrifuge lid until the lid latch engages and the lid is automatically closed.

The centrifuge will close automatically.

The **open** key lights blue. The display shows the ∎ symbol.

5.3 Cooling (only 5804 R/5810 R)

5.3.1 Temperature adjustment

- Select the temperature setting using the **temp** key.
- Set the temperature using the arrow keys between -9 °C and +40 °C.

5.3.2 Temperature display

If the rotor is stopped:	Set temperature
During centrifugation:	Actual temperature

5.3.3 Temperature monitoring

After the set temperature has been reached the centrifuge responds as follows to temperature fluctuations during centrifugation:

Deviation from the target value	Action
ΔT > 3 °C	Temperature display flashes.
ΔT > 5 °C	Periodic warning tone. Centrifugation is stopped automatically.

5.3.4 FastTemp

This function can be used to start a temperature control run directly without samples with a rotor and temperature-specific speed in order to quickly adjust the rotor chamber, including the rotor, carriers and adapters, to the set nominal temperature.

Requirement

- The centrifuge is switched on.
- The rotor and rotor lid are properly attached.
- The centrifuge lid is closed.
- The temperature and g-force (rcf)/speed (rpm) are set for the subsequent centrifugation (see *Centrifuging on p. 42)*.

1. Press the **fast temp** key.

   The display shows from left to right: actual temperature value, FT, g-force (rcf)/speed (rpm) and -- (time).

   The temperature control cycle ends automatically when the target temperature has been reached. A periodic signal tone sounds.
2. Press the **start**/**stop** key to terminate the temperature control run early.

After the target temperature has been reached and the temperature control cycle is complete, the centrifuge keeps the rotor chamber with the centrifuge lid closed at the set target temperature if the temperature is below the ambient temperature. Irrespective of the target temperature, however, this continuous cooling does not go below 4 °C to prevent the rotor chamber from freezing.

The centrifuge stops the cycle automatically if the rotor or the buckets have reached the set temperature. Therefore, there may be a delay between the display of the achieved set temperature and the automatic end of the temperature control run.

When using aerosol-tight buckets, always carry out a FastTemp run at low temperatures without a cap. There is a danger otherwise of the caps becoming fixed by suction due to a vacuum. Do not pull on the bracket or hooks to loosen the cap. Adjust the temperature of the buckets to room temperature so that the caps can be removed easily.

5.3.5 Continuous cooling

When the rotor is stopped the rotor chamber is kept at the target temperature when the following prerequisites are met:

- The centrifuge is switched on.
- The centrifuge lid is closed.
- The target temperature is below the ambient temperature.
- The centrifuge is not in standby mode.

During continuous cooling the following applies:

- The target and actual temperature are displayed alternately.
- Irrespective of the target temperature, continuous cooling does not go below 4 °C to prevent the rotor chamber from freezing and increased condensation in the device.
- Because the rotor does not rotate during this process the temperature adjustment is slower.

To end continuous cooling, open the centrifuge lid or press the standby key.

If the centrifuge is not used for more than 8 hours, the continuous cooling is switched off automatically (ECO shut-off). The device then switches to standby mode. This protects against ice formation in the rotor chamber and increased condensation in the device. The display shows Standby off and the measured temperature in the rotor chamber. With **FastTemp** you can quickly reach the desired temperature again (see p. 41).

You can also change from automatically switching off continuous cooling after 8 hours (ECO shut-off) to unlimited continuous cooling.

NOTICE!

Ice formation and compressor overheating during continuous cooling.

- Switch the centrifuge off regularly to eliminate any ice formation by thawing.
- Regularly remove condensation from the rotor chamber using a soft, absorbent cloth.
- Empty and clean the condensation water tray regularly.

1. Press the **temp** and **prog** keys simultaneously.
   The display shows `Standby 8h`.
2. Press the **fast temp** key immediately.
   Endless operation for continuous cooling is activated. The display shows `Standby endless`.
3. To change back to `Standby 8h`, repeat the process.

5.4 Centrifuging

CAUTION!

Risk from incorrectly loaded rotors and damaged/overloaded tubes!

- Before commencing centrifugation, follow the safety instructions relating to risks from asymmetrically loaded and/or overloaded rotors and from overloaded, damaged and/or open tubes (see *Warnings for intended use on p. 30)*.

CAUTION!

Risk of injury from improperly attached rotors and rotor lids.

- Centrifuge only with the rotor and rotor lid firmly tightened.
- If unusual noises occur when the centrifuge starts, the rotor or the rotor lid may not be properly secured. Immediately press the **start/stop** key to stop centrifuging.

Each of the centrifuging variants described here must be preceded by the preparation described above (see *Preparing for centrifugation on p. 37)*.

5.4.1 Centrifuging with preset time

Perform the following steps in the sequence described.

1. Speed (rpm) setting: press once. g-force (rcf) setting: press repeatedly until the ✳ symbol also appears in the display.
   The displayed g-force (rcf)/speed (rpm) flashes and can be set with the arrow keys.
   For the g-force (rcf) setting also check the set radius (see *Rotors on p. 13)*, (see *Setting the radius on p. 45)*.

2. Use the arrow keys to set the g-force (rcf)/speed (rpm).
   The new target value appears in the display.

3. Select the runtime setting and set it with the arrow keys.

4. **Only 5804 R/5810 R:** Select the temperature setting and set it with the arrow keys.

5. Start centrifugation.
   - In the display ■ flashes while the rotor is running.
   - The remaining runtime is displayed in minutes. The last minute is counted down in seconds.
   - **Only 5804 R/5810 R:** The current temperature is displayed.
   - The current g-force (rcf)/speed (rpm) of the rotor is displayed.
   - You can display all target values for 2.5 s by pressing a parameter key (**Temp**, **Speed**, **Time**).
   - You can terminate centrifugation early by pressing the **start/stop** key.
   - After completion of the set time, the centrifuge stops automatically.
   - During braking the elapsed centrifugation time is displayed flashing.

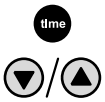
6. Open the centrifuge lid as soon as the key lights.
7. Remove the centrifugate.

During the run you can modify the total run time, the temperature (only Centrifuge 5804 R/ 5810 R) and the g-force (rcf)/speed (rpm). The new parameters are adopted immediately. The time which has already elapsed is considered in the newly set total run time. Note that the shortest new total runtime which can be set is the time which has already elapsed plus 2 minutes.

5.4.2 Centrifuging in continuous operation

Perform the following steps in the sequence described.

1. Set the g-force (rcf)/speed (rpm) and possibly the temperature as previously described (see p. 42).
2. Select the runtime setting.



3. Set continuous operation below 1 min or above 99 min.
   In the display ∞ indicates continuous operation.
4. Start centrifugation.

- In the display ■ flashes while the rotor is running.
- The timing is counted upwards. If the centrifuge runs for more than 99 min, 99. in appears in the display.
- **Only 5804 R/5810 R:** The current temperature is displayed.
- The current g-force (rcf)/speed (rpm) of the rotor is displayed.

5. End centrifugation after the desired time.

- During braking the elapsed centrifugation time is displayed flashing.

6. Open the centrifuge lid as soon as the key lights.

7. Remove the centrifugate.

5.4.3 Short spin centrifugation

You can carry out a short spin with the currently set or with the maximum g-force (rcf)/ speed (rpm) of the rotor used.

Setting the speed option

▸ Press and hold down the key with the centrifuge lid open.
One of the following options appears in the display:
rpm max: the rotor accelerates up to its maximum g-force (rcf)/speed (rpm) (see *Automatic rotor detection on p. 37*).
200 - rpm: the rotor only accelerates up to its set g-force (rcf)/speed (rpm).

▸ Press and hold down the key for more than 3 s with the centrifuge lid open to switch between the rpm max and 200 - rpm options.
The selected option appears for 2 s in the display and is retained.

Starting the short spin run

1. When 200 - rpm is set, set the g-force (rcf)/speed (rpm) for the short spin run (see p. 42).
2. **Only 5804 R/5810 R:** set the temperature (see p. 42).

3. Keep the key pressed to start the short spin run.
   - In the display SH appears while the rotor is running.
   - The time is counted upwards in seconds.

4. Release to end the short spin run.

During the braking process, centrifuging can be restarted up to two more times by pressing the **short** key again.

5. Open the centrifuge lid as soon as the key lights.
6. Remove centrifuge contents.

5.4.4 Removing the rotor

Requirement

When attaching the rotor to or releasing it from the motor shaft, the temperature of the rotor and motor shaft must be within the range of 10 – 30 °C.

Swing-bucket rotor: Before inserting or removing the rotor, remove the carriers and grip the rotor by the rotor cross with both hands .

1. Turn the rotor nut with the rotor key **in a counterclockwise direction**.
2. Remove the rotor by lifting it vertically.
3. **Only 5804 R/5810 R:** Switch off the centrifuge after use and empty the tray for condensation water. Leave centrifuge lid fully opened and protect it against closing.

5.4.5 Standby mode

▸ You can switch between standby mode and ready state at any time when centrifugation is not performed by pressing the standby key.

Standby mode

- The display goes out.
- The standby key lights red.
- **Only 5804 R/5810 R:** The rotor chamber is not cooled (see *Continuous cooling on p. 41)*.

Ready state

- The centrifugation parameters are displayed.
- The standby key lights green.
- **Only 5804 R/5810 R:** The rotor chamber is cooled when the centrifuge lid is closed (see *Continuous cooling on p. 41)*.

6 Operating controls and function

6.1 Setting the radius

When you control the rotational speed via the g-force (rcf, RCF), and not via the speed (rpm), the internal conversion of speed to g-force takes place by default with the largest radius of the used rotor (see *Rotors on p. 13)*. You can adapt this radius to an applied adapter:

1. Press repeatedly until the ↻ symbol also appears in the display.
   The current radius flashes.
2. Set the new radius.
3. Wait for 3 seconds (if the rotor is stopped: 10 seconds).
   The changed g-force appears.

6.2 Setting the acceleration and braking times

You can set the acceleration and braking time in the levels 0 to 9 (see Tab. on p. 57). Level 9 is preset (shortest acceleration and braking time).

1. Press twice until the ⌐ symbol for acceleration level (accel) appears.
2. Select acceleration level 0 to 9.
3. Press once until the ¬ symbol for braking level (brake) appears.
4. Select braking level 0 to 9.
   Braking level (brake) 0 corresponds to free deceleration.

The device only shows the ⌐ and ¬ symbols continually when levels 0 to 8 have been set.

6.3 At set rpm

The centrifuge can count down the set time either immediately from the start of centrifugation or only once 95% of the specified g-force (rcf)/speed (rpm) has been reached (At set rpm). The respective setting is indicated by the flashing triangle in the symbol above the display:

Preset time: the set time is counted down immediately after the start of centrifugation.

At set rpm: the set time is counted down once 95% of the specified g-force (rcf)/ speed (rpm) has been reached.

Requirement

The centrifuge lid is open.

▸ Hold down this key for at least 4 s to switch between the two settings.

When this key is pressed, both triangles of the symbol will flash alternately.

6.4 Saving the program

You can save the current centrifugation parameters and functions (*At set rpm*, acceleration and braking times and radius) under up to 35 program numbers.

Requirement

Rotor stop.

1. Check the parameters and functions to be saved.
2. Press key twice.
   The first free program number appears with P... in the display.
3. Select the program number (1...9,A...Z).

4. Press and hold key for 2 seconds.
   ok. appears in the display The current centrifugation parameters and functions are saved under the selected program number.

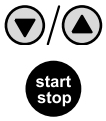
When you want to overwrite a saved program, you have to delete it before saving the new parameters (see *Deleting the program on p. 46)*.

6.5 Loading the program

Requirement

- Rotor stop.

1. Press once.
   Program number flashes:
   - 0: centrifugation parameters and functions of the last run.
   - 1...9, A...Z: stored programs.
2. Select the program number.



3. Closed centrifuge lid: centrifugation starts with the loaded centrifugation parameters and functions.
   When the centrifuge lid is open, you can press the **start**/**stop** key to return to program 0 or exit the programming mode.

If you change the centrifugation parameters during a run with a stored program, the centrifuge changes to program 0. The stored program remains unchanged.
You can also exit the stored program by loading program 0.

6.6 Deleting the program

Requirement

- Rotor stop.
- The centrifuge lid is open.

1. Press once.
   The program number flashes.
2. Select the program number.

3. Within 10 seconds, keep key pressed for 2 seconds
   until cleared appears in the display.
   The selected program is deleted. You can save new centrifugation parameters and functions under this program number.

6.7 Special functions

6.7.1 Display operating hours

Requirement

Rotor stop.

▸ Press both keys simultaneously.

The previous total run time of the centrifuge (in hours) appears in the display.

6.7.2 Switching on/off the warning signal

▸ Press both keys simultaneously to change the setting.

Alarm on or Alarm off appears after 2 seconds in the display.

6.7.3 Exiting the service program

- Press both keys simultaneously to exit a service program called by mistake.

6.7.4 Controlling the centrifuge via the serial interface (optional)

Optionally, you can also control all centrifuge functions via a serial interface (RS 232 c). For this a retrofit must be carried out by Eppendorf Service. Only devices verified according to IEC 950 must be connected to the serial interface.

7 Maintenance

7.1 Maintenance

WARNING!

Danger of crushing if the centrifuge lid falls down due to a defective gas spring.

A defective gas spring is an insufficient support for the centrifuge lid.

- Make sure that the centrifuge lid can be opened completely and that it will remain in this position.
- Regularly check the gas spring for its proper function.
- Have defective gas springs replaced immediately.

We recommend an exchange by a service technician every two years.

We recommend that the centrifuge with the associated rotors be checked at the latest every 12 months by Technical Service during maintenance. Observe the relevant national regulations.

7.2 Prepare cleaning / disinfection

- Clean all accessible surfaces of the device and the accessories at least weekly and when contaminated.
- Clean the rotor regularly. This way the rotor is protected and the durability is prolonged.
- Furthermore, observe the notes on decontamination (see *Decontamination before shipment on p. 50)* when the device is sent to the authorized Technical Service for repairs.

The procedure described in the following chapter applies to the cleaning as well as to the disinfection or decontamination. The table below describes the steps required on top of this:

Cleaning	**Disinfecting / decontamination**
1. Use a mild cleaning fluid to clean the accessible surfaces of the device and the accessories. 2. Carry out the cleaning as described in the following chapter.	1. Choose the disinfection method which corresponds to the legal regulations and guidelines in place for your range of application. For example, use alcohol (ethanol, isopropanol) or alcohol-based disinfectants. 2. Carry out the disinfection or decontamination as described in the following chapter. 3. Then clean the device and the accessories.

If you have any further questions regarding the cleaning and disinfection or decontamination or regarding the cleaning fluid to be used, contact the Eppendorf AG Application Support. The contact details are provided on the back of this manual.

7.3 Cleaning / disinfection

DANGER!

Electric shock as a result of penetration of liquid.

- Switch off the device and disconnect it from the power supply before starting cleaning or disinfecting work.
- Do not allow any liquids to penetrate the inside of the housing.
- Do not spray clean/spray disinfect the housing.
- Only connect the device to the power supply if it is fully dried inside and out.

NOTICE!

Damage from the use of aggressive chemicals.

- Do not use any aggressive chemicals on the device or its accessories, such as strong and weak bases, strong acids, acetone, formaldehyde, halogenated hydrocarbons or phenol.
- If the device becomes contaminated with aggressive chemicals, clean it immediately with a mild cleaning agent.

NOTICE!

Corrosion due to aggressive cleaning agents and disinfectants.

- Do not use corrosive cleaning agents, aggressive solvents or abrasive polishes.
- Do not incubate the accessories in aggressive cleaning agents or disinfectants for prolonged periods.

NOTICE!

Damage from UV and other high-energy radiation.

- Do not use UV, beta, gamma, or any other high-energy radiation for disinfecting.

Autoclaving

All rotors, rotor lids, carriers, adapters and buckets apart from rotor cross A-4-81 can be autoclaved (121 °C, 20 min).

Replace the lid of the FA-45-30-11 after a maximum of 10 autoclaving cycles (121 °C, 20 min). Replace the sealing in the lid groove of the rotors FA-45-6-30 and A-2-DWP-AT after a maximum of 50 autoclaving cycles.

The aerosol-tight rotor FA-45-30-11 can be autoclaved at 142 °C for 2 hours to destroy prions. Note that in this case the rotor lid must be replaced after each autoclaving.

Aerosol-tightness

Check that the seals are intact before use.

Replace the rotor lids of aerosol-tight rotors when the sealing rings on the lid screw and in the lid groove are worn. The sealing rings require regular care to protect the rotors.

Aerosol-tight rotors should never be stored with lids screwed on!

In order to prevent damage, lightly lubricate the lid thread of the aerosol-tight rotors with pivot grease (order no. Int.: 5810 350.050/North America: 022634330).

Swing-bucket rotor

- Before cleaning the rotor, remove old pivot grease from grooves and pivots.
- Make sure that the grooves and pivots are clean. Dirty grooves and pivots prevent carriers from swinging out evenly.
- After cleaning, lubricate the pivots of the rotor and the grooves of the buckets with pivot grease (order no. Int.: 5810 350.050/North America: 022634330) so that the carriers can move freely in a swinging manner.

7.3.1 Cleaning / disinfecting the device

1. Switch off the device at the mains power switch while the lid is open, and disconnect the power plug from the power supply.
2. Unscrew the rotor nut by turning it counterclockwise with the rotor key.
3. Remove rotor.
4. Use the agents specified above (see p. 47) to clean and disinfect the device and the rotor chamber.
5. Wipe all accessible surfaces of the device and accessories including the mains cable with a damp cloth.
6. Thoroughly clean the rubber seal of the rotor chamber with water.
7. Rub the dry rubber seal with glycerine or talcum powder to prevent it from becoming brittle. Other components of the device, such as the lid latch, lid springs, motor shaft and rotor cone, must not be lubricated.
8. Clean the motor shaft with a soft, dry and lint-free cloth.
9. Check device and accessories for corrosion and damage.

7.3.2 Cleaning / disinfecting the rotor

After every 200 runs, the centrifuge displays `clean rotor` three times to remind you to regularly clean the rotor.

1. Clean rotors, rotor lid, carriers, adapters and buckets with the agents mentioned above and disinfect them (see p. 47).
2. Use a bottle brush to clean and disinfect the rotor bores.
3. Rinse rotors, rotor lid, carriers, adapters and buckets thoroughly with water. Pay particular attention to the rotor bores of the fixed-angle rotors. Do not submerge the rotor as otherwise liquid may enter the hollow spaces.
4. Place rotors and accessories onto a cloth to dry. Place fixed-angle rotors with the rotor bores facing downwards to allow the bores to dry as well.
5. Clean the rotor cone with a soft, dry and lint-free cloth and inspect for damage. Do not lubricate the rotor cone.
6. Place the dry rotor onto the motor shaft.
7. Tighten the rotor nut firmly by turning it clockwise with the rotor key.
8. Load the fixed-angle rotor with the cleaned adapters or the swing-bucket rotor with the cleaned buckets and adapters, if necessary.

7.4 Additional service instructions for Centrifuge 5804 R/5810 R

- Empty and clean the condensation water tray regularly and especially after liquid spillage in the rotor chamber. Pull out the tray for condensation water at the front right under the device.
- Also regularly clean the condensate drainage channels, e.g., using a bottle brush.
- Clear the rotor chamber regularly of ice formations by thawing, either by leaving the centrifuge lid open or carrying out a brief temperature control run at approx. 30 °C.
- Leave the centrifuge lid open when not in use for a long period.

  This allows residual moisture to escape.

  The gas pressure spring is relieved.
- Wipe up condensate in the rotor chamber. To do so, use a soft absorbent cloth.
- Remove dust deposits from the ventilation slits of the centrifuge using a brush or swab at the latest every six months. First switch off the device and remove the power plug.

7.5 Glass breakage

When using glass tubes there is a risk of glass breakage in the rotor chamber. The resulting glass splinters are swirled around during centrifugation in the rotor chamber and have a sand blasting effect on the rotor and accessories. Fine glass particles can become lodged in the rubber parts (e.g., in the motor sleeve, in the sealing of the rotor chamber and in the rubber mats of adapters).

NOTICE!

Glass breakage in the rotor chamber

Centrifugation at a too high g force may cause the glass tubes to break in the rotor chamber. Glass breakage causes damage to the rotor and accessories and can contaminate the samples.

- Please note the manufacturer's information on the recommended centrifugation parameters (load and speed).

Effects of glass breakage in the rotor chamber:

- Fine black metal abrasion in the rotor chamber (in the case of metal rotor chambers)
- Scratching of rotor chamber and accessory surfaces
- Reduction of the rotor chamber's chemical resistance
- Contamination of samples
- Wear on rubber parts

How to proceed when breakage of glass occurs

1. Remove all splinters and glass powder from the rotor chamber and accessories.
2. Thoroughly clean both rotor and rotor chamber. Especially thoroughly clean the bores of the fixed-angle rotors.
3. If required, replace rubber mats and adapters to prevent any further damage.
4. Regularly check the rotor bores for deposits and damage.

7.6 Decontamination before shipment

If you are shipping the device to the authorized Technical Service for repairs or to your authorized dealer for disposal please note the following:

WARNING!

Risk to health from contaminated device

1. Follow the instructions in the decontamination certificate. It is available in PDF format on our homepage (www.eppendorf.com/decontamination).
2. Decontaminate all the parts you want to dispatch.
3. Enclose the fully-completed decontamination certificate for returned goods (including the serial number of the device) with the dispatch.

8 Troubleshooting

If the suggested measures fail repeatedly, please contact Technical Service. You can find the contact addresses at the end of the operating manual or on the Internet at www.eppendorf.com.

8.1 Resetting the excess current switch

The 230 V and 120 V devices have built-in thermal excess-current switches which function as (all-pole) fuses. When the overload protection is actuated, these switch the power switch to OFF, but do not switch it on again automatically.

To switch on the excess current switch again, proceed as follows:

1. Switch off the centrifuge using the power switch.
2. Wait for at least 20 seconds and switch on the centrifuge again.

The excess current switch will be automatically reactivated and the centrifuge is ready for operation.

8.2 General errors

Symptom/message	Cause	Remedy
No display.	No mains connection.	▸ Check the mains connection.
No display.	Power failure.	▸ Check the mains fuse for the device (see *Resetting the excess current switch on p. 51)*. ▸ Check the mains fuse for the laboratory.
Lid of the device cannot be opened.	Rotor is still running.	▸ Wait for rotor to stop.
Lid of the device cannot be opened.	Power failure.	1. Check the mains fuse for the device (see *Resetting the excess current switch on p. 51)*. 2. Check the mains fuse for the laboratory. 3. Activate the emergency lid release (see p. 53).
Clean rotor	200 runs.	▸ Clean the rotor and chamber (see p. 47).
Standby off	Centrifuge not used for 8 h.	▸ Open and close again the lid of the device.
Centrifuge brakes during a short run centrifugation, although the **short** key is pressed.	The **short** key was released briefly more than twice (protective function for the drive).	▸ Press the **short** key continuously during a short run centrifugation.

8.3 Error messages

If one of the following error messages appears, proceed as follows:

1. Remove fault (see Remedy).
2. Press **open** key to clear the error message.
3. If necessary, repeat centrifugation.

Some errors can have various causes. The actual cause is described in the message in the device display.

Symptom/message	Cause	Remedy
No rotor Centrifuge does not start up.	No rotor.	▸ Insert the rotor.
No rotor Centrifuge does not start up.	Error in the drive or in the rotor detection.	▸ Switch the centrifuge off and back on again after > 20 s.
Press Open	Centrifuge lid could not be locked.	1. Press the **open** key. 2. Try again to close centrifuge lid.
Close lid	Centrifuge lid not closed properly.	▸ Close the centrifuge lid firmly.
Lift lid The centrifuge lid does not open.	The centrifuge lid cannot open automatically.	▸ Lift the centrifuge lid manually.
IMBAL The centrifuge shakes when it starts up and switches off.	Rotor unsymmetrically loaded.	▸ Load the rotor symmetrically (see p. 37).
ROTOR The centrifuge shakes when it starts up and switches off.	Rotor not screwed sufficiently.	1. Tighten the rotor nut (see p. 37). 2. Check the rotor cone and motor shaft for grooves and damage.
ROTOR The centrifuge shakes when it starts up and switches off.	• Centrifuge was pushed. • Table is not stable.	▸ Position the centrifuge on a stable table (see p. 34).
SPEED Centrifuge switches off.	Nominal speed for rotor too high.	▸ Enter the appropriate nominal speed (see p. 13).
change rotor	The maximum service life of the rotor has been reached. The warning is displayed after 98,000, 99,000 and 99,600 runs (3 times after each run). After 100,000 runs, it is displayed after every run.	▸ Contact Technical Service.
Temperature display flashes. (only 5804 R/5810 R)	Temperature deviation from set value: ΔT > 3°C.	▸ Check the settings. ▸ Wait until the set temperature has been reached. ▸ Check unhindered air circulation through the air slots. ▸ Thaw ice or switch off device and allow it to cool down.

Symptom/message	Cause	Remedy
Overtemp (only 5804 R/5810 R) Centrifuge switches off and issues a warning tone.	Temperature deviation from the set value in the rotor chamber: ΔT > 5 °C.	▸ Check the settings. ▸ Check unhindered air circulation through the air slots. ▸ Thaw ice or switch off device and allow it to cool down.
Clear memory	Program memory full.	▸ Delete some programs (see p. 46).
Interrupt	Mains power failure during a run.	▸ Check the mains connection.
Error 1	Error in speed measuring system.	▸ If this error message appears again, test with a different rotor.
Error 2	Imbalance sensor faulty.	▸ Repeat the run.
Error 3	Error in speed measuring system.	▸ Insert the rotor and screw it tight.
Error 3	Error in speed measuring system.	▸ Allow the centrifuge to stand for 12 min when switched on until the **open** key lights up.
Error 4	Lid latch sensor faulty.	▸ Switch the centrifuge off and back on again after > 20 s.
Error 5	Prohibited opening of lid or lid switch is defective during a run.	1. Wait for rotor to stop. 2. Open and close again the lid of the device. 3. Repeat the run.
Error 6 or overload	Mains voltage too low.	▸ Check the mains voltage.
Error 6 or overload	• Converter overloaded. • Brake faulty.	▸ Switch off centrifuge, allow to cool down for at least 5 min, and then switch on again.
Error 8	• Drive fault. • Rotor loose. • Motor defective.	1. Wait for rotor to stop. 2. Tighten the rotor. 3. Repeat the run.
Error 9 to Error 25	Electronics fault.	▸ Switch the centrifuge off and back on again after > 20 s.

8.4 Emergency release

If the centrifuge lid cannot be opened, you can activate the emergency release manually.

WARNING!

Risk of injury from rotating rotor.

- ▸ Wait for the rotor to stop before activating the emergency release.
- ▸ Wait for the rotor to stop before activating the emergency release. The rotor can continue rotating for up to 8 min.
- ▸ To check, look through the monitoring glass in the centrifuge lid.

You need the standard rotor key supplied with the centrifuge.

1. Disconnect the power plug.
2. Remove the plastic cover for the emergency release. This is located in the center on the front side of the device.
3. Insert the rotor key into the hexagonal opening behind until some resistance can be felt.
4. While keeping the rotor key pressed, turn it in a counterclockwise direction.
   This will release the centrifuge lid.
5. Open the centrifuge lid.
6. Remove the rotor key and put the plastic covers back on.

9 Transport, storage and disposal

9.1 Transport

- Take the rotor out of the centrifuge before transporting it.
- When transporting the centrifuge, use its original packaging only.
- Use a transport aid for transporting over longer distances.

	Air temperature	**Rel. humidity**	**Atmospheric pressure**
General transportation	-25 to 60 °C	10 to 75%	30 to 106 kPa
Air freight	-20 to 55 °C	10 to 75%	30 to 106 kPa

9.2 Storage

	Air temperature	**Rel. humidity**	**Atmospheric pressure**
In transport packaging	-25 to 55 °C	10 to 75%	70 to 106 kPa
Without transport packaging	-5 to 45 °C	10 to 75%	70 to 106 kPa

9.3 Disposal

In case the product is to be disposed of, the relevant legal regulations are to be observed.

Information on the disposal of electrical and electronic devices in the European Community:

Within the European Community, the disposal of electrical devices is regulated by national regulations based on EU Directive 2002/96/EC pertaining to waste electrical and electronic equipment (WEEE).

According to these regulations, any devices supplied after August 13, 2005, in the business-to-business sphere, to which this product is assigned, may no longer be disposed of in municipal or domestic waste. To document this, they have been marked with the following identification:

Because disposal regulations may differ from one country to another within the EU, please contact your supplier if necessary.

10 Technical data

10.1 Power supply

Power connection:	230 V, 50 to 60 Hz 120 V, 60 Hz	
Current consumption:	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:	6 A 11 A 9 A/10 A 16 A 12 A
Power consumption:	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:	max. 900 W max. 950 W max. 1650 W max. 1650 W max. 1300 W
EMC: Interference emission (radio interference)	EN 61326-1 Class A	
EMC: Noise immunity	EN 61326	
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.	
Ambient temperature:	5804/5810: 5804 R/5810 R:	2 to 40 °C 15 to 35 °C
Max. relative humidity:	75%, non-condensing humidity	
Atmospheric pressure:	Use up to an altitude of 2000 m above MSL.	
Degree of pollution:	2	

10.3 Weight/dimensions

Dimensions: (W × D × H)	5804:	466 × 550 × 337 mm (18.4 × 21.7 × 13.3 in.) Depth of footprint: 496 mm (19.5 in.)
	5804 R:	634 × 550 × 342 mm (25.0 × 21.7 × 13.5 in.) Depth of footprint: 496 mm (19.5 in.)
	5810:	535 × 608 × 345 mm (21.1 × 21.1 × 13.6 in.) Depth of footprint: 536 mm (21.1 in.)
	5810 R:	700 × 608 × 345 mm (27.6 × 23.9 × 13.6 in.) Depth of footprint: 536 mm (21.1 in.)

Weight without rotor:	5804:	55 kg (121 lb.)		
	5804 R:	80 kg (176 lb.)		
	5810:	68 kg (150 lb.)		
	5810 R:	99 kg (218 lb.)		
		Rotor		
		A-4-81 (4 x 400 mL)	A-4-44 (4 x 100 mL)	F-34-6-38 (6 x 85 mL)
Noise level:	5804:	-	< 67 dB(A)	< 51 dB(A)
	5804 R:	-	< 56 dB(A)	< 58 dB(A)
	5810:	< 65 dB(A)	< 65 dB(A)	< 53 dB(A)
	5810 R:	< 56 dB(A)	< 56 dB(A)	< 59 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.

10.4 Application parameters

Runtime:	1 to 99 min, adjustable in 1 min increments. infinite (∞)	
Temperature (only 5804 R/5810 R):	-9 °C to 40 °C	
Relative centrifugal force (RCF or rcf):	10 to 20,800 x g, adjustable up to 3,000 x g in 10 x g increments, thereafter in 100 x g increments.	
Speed:	200 to 14,000 rpm, adjustable up to 5,000 min^{-1} in 10 min^{-1} increments, thereafter in 100 rpm increments.	
Max. load:	5804/5804 R: 5810/5810 R:	4 × 100 mL 4 × 500 mL
Max. kinetic energy:	5804/5810: 5804 R: 5810 R:	19,000 Nm (11,000 rpm) 19,000 Nm (11,000 rpm) 23,000 Nm (12,000 rpm)
Test log mandatory in Germany:	Yes	
Permitted density of the centrifugate (at max. g-force/rpm and max. load):	1.2 g/mL	
Standardized interface (optional)	RS 232 C	

Deceleration times according to DIN 58 970

Tab. 2: 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	532	189	174	143	131	109	95	85	59	31
-	●	A-4-81- MTP/ Flex	643	191	174	142	131	110	94	83	58	30
-	●	A-4-62	740	190	170	140	130	110	95	85	55	26
-	●	A-4-62-MTP	620	190	170	140	130	110	95	85	55	26
●	●	A-4-44	470	300	270	220	200	140	100	75	45	23
-	●	A-2-DWP-AT	857	231	202	176	157	135	112	102	69	39
●	●	A-2-DWP	304	174	130	118	100	75	51	44	32	14
●	●	FA-45-6-30	759	423	322	231	205	178	148	113	93	58
●	●	F-34-6-38	880	370	280	190	170	150	125	95	75	54
●	●	FA-45-30-11	240	140	70	45	35	30	25	22	19	18
●	●	F-45-30-11	240	140	70	45	35	30	25	22	19	18
●	●	F-45-48-PCR	169	119	60	41	31	26	22	19	17	16
●	●	T-60-11	800	280	140	95	70	55	45	40	36	36

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.

11 Ordering Information

11.1 Centrifuge 5804/5804 R

Also refer to our catalogue.

Order No. (International)	Order No. (North America)	Description
		Centrifuge 5804
		without rotor
5804 000.013	022622552	230 V/50 - 60 Hz
5804 000.137	022622501	120 V/50 - 60 Hz
		Centrifuge 5804 R
		refrigerated, without rotor
5805 000.017	022623559	230 V/50 - 60 Hz
5805 000.130	022623508	120 V/50 - 60 Hz, 15 A
5805 000.530	022625080	120 V/50 - 60 Hz, 20 A

11.2 Centrifuge 5810/5810 R

Order No. (International)	Order No. (North America)	Description
		Centrifuge 5810
		without rotor
5810 000.017	022625055	230 V/50 - 60 Hz
5810 000.130	022625004	120 V/50 - 60 Hz, with US-plug
		Centrifuge 5810 R
		refrigerated, without rotor
5811 000.010	022625551	230 V/50 - 60 Hz
5811 000.134	022625501	120 V/50 - 60 Hz, 15 A, with US-plug
5811 000.533	022625101	120 V/50 - 60 Hz, 20 A, with US-plug

11.3 Rotors and accessories

11.3.1 Rotor A-4-81 (only 5810/5810 R)

Rotor A-4-81, 500 mL bucket

Order No. (International)	Order No. (North America)	Description
		Rotor A-4-81
		for 500 mL rectangular buckets or MTP/Flex-buckets
5810 718.007	022638602	incl. 4 x 500 mL rectangular buckets
5810 743.001	022638611	without buckets
5810 730.007	022638629	**Rectangular bucket 500 mL** set of 4
5810 724.007	022638661	**Aerosol-tight cap** for 500 mL rectangular buckets, 2 pieces
5810 733.006	022638670	**Replacement cap sealing for aerosol-tight caps** for 500 mL rectangular buckets, 4 pieces

Order No. (International)	Order No. (North America)	Description
		Adapter for 500 mL rectangular buckets
5810 745.004	022638704	for 20 sample tubes (1.5/2.0 mL, max. Ø 11 mm), set of 2
5810 746.000	022638707	for 20 blood collection tubes (1.2 - 5 mL, max. Ø 11 mm), set of 2
5810 720.001	022638700	for 24 tubes (2.6 - 7 mL, max. Ø 13 mm), set of 2
5825 717.007	022638718	for 18 tubes (5 mL, Monovette, max. Ø 13 mm), set of 2
5810 748.003	022638721	for 16 blood collection tubes (3 - 15 mL, max. Ø 16 mm), set of 2
5810 721.008	022638726	for 16 tubes (7 - 17 mL, max. Ø 17.5 mm), set of 2
5810 722.004	022638742	for 12 Falcon tubes (15 mL, max. Ø 17.5 mm), set of 2
5810 723.000	022638769	for 5 Falcon tubes (50 mL, max. Ø 31 mm), set of 2
5810 739.004	022638904	for 5 Centriprep Centrifugal Filter Units (max. Ø 31 mm), set of 2
5825 722.000	022638921	for 1 bottle (180 - 250 mL, max. Ø 62 mm), set of 2
5810 728.002	022638785	for 1 bottle (400 mL, max. Ø 81 mm), set of 2
5810 734.002	022638688	**Replacement rubber mat** for adapters for 500 mL rectangular buckets set of 4
5810 735.009	022638696	**Replacement clamp** for adapters for 500 mL rectangular buckets set of 2
5804 737.008	022654373	**Adapter** for 50 mL skirted Falcon tubes, set of 8
5810 729.009	022638653	**Wide-neck bottle for Rotor A-4-81** 400 mL, set of 2
5820 707.003	022638657	500 mL, rectengular, set of 2
5810 718.309	022664174	**Rotor key** for Rotor A-4-81

Rotor A-4-81, MTP/Flex carrier

Order No. (International)	Order No. (North America)	Description
5810 725.003	022638807	**Rotor A-4-81-MTP/Flex** Swing-bucket rotor, incl. 4 MTP/Flex buckets
5810 743.001	022638611	**Rotor A-4-81** for 500 mL rectangular buckets or MTP/Flex-buckets without buckets
		Retrofit kit MTP/Flex buckets for Rotor A-4-81 or A-4-81-MTP/Flex for use with IsoRack and cell culture flask adapters as well as MTP and DWP
5810 741.009	022638840	set of 4
5810 742.005	022638866	set of 2
5825 708.008	022638980	**IsoRack adapter** for 24 x 0.5 mL tubes in the IsoRack, set of 2
5825 709.004	022638998	for 24 x 1.5/2.0 mL tubes in the IsoRack, set of 2
5825 721.004	022510070	**IsoRack starter set for Flex buckets** 2 × IsoRack Adapter, 2 × IsoRacks with lid, 2 × cool packs (0 °C IsoPack) for 0.5 mL and 1.5/2.0 mL sample tubes
		Adapter used in A-4-81-MTP/Flex, A-4-62-MTP, A-2-DWP-AT and A-2-DWP
5825 711.009	022638947	for 96-well PCR plates, set of 2
5825 713.001	022638955	for 384-well PCR plates, set of 2

Order No. (International)	Order No. (North America)	Description
5825 706.005	022638963	**Adapter** used in A-4-81-MTP/Flex, A-4-62-MTP and A-2-DWP Combislide Adapter, set of 2
5825 719.000	5825719000	**Adapter** used in A-4-81-MTP/Flex for 1 cell culture bottle, set of 2

Rotor A-4-81, Falcon bucket

Order No. (International)	Order No. (North America)	Description
5825 730.003	022638614	**Falcon Bucket for A-4-81** for 7 50 mL Falcon tubes, set of 4
5820 718.005	5820718005	**Adapter** used in FA-45-6-30 for 15 mL Falcon tubes, set of 7

11.3.2 Rotor A-4-62 and A-4-62-MTP (only 5810/5810 R)

Rotor A-4-62

Order No. (International)	Order No. (North America)	Description
5810 709.008	022638009	**Rotor A-4-62** incl. 4 x 250 mL rectangular buckets
5810 716.004	022638084	**Rectangular bucket 250 mL** set of 4
5810 710.006	022638033	**Aerosol-tight caps** for 250 mL rectangular buckets, set of 2
5810 713.005	022638017	**Spare sealing for aerosol-tight caps** for 250 mL rectangular buckets, set of 4
5810 751.004	022638220	**Adapter** for 250 mL rectangular buckets for 16 sample tubes (1.5/2.0 mL, max. Ø 11 mm), set of 2
5810 750.008	022638203	for 25 tubes (1.2 - 5 mL, max. Ø 11 mm), set of 2
5810 752.000	022638246	for 15 tubes (2.6 - 7 mL, max. Ø 13 mm), set of 2
5810 753.007	022638262	for 12 tubes (3 - 15 mL, max. Ø 16 mm), set of 2
5810 754.003	022638301	for 12 tubes (7 - 17 mL, max. Ø 17.5 mm), set of 2
5810 756.006	022638327	for 8 tubes (7 - 18 mL, max. Ø 20 mm), set of 2
5810 757.002	022638360	for 4 tubes (18 - 30 mL, max. Ø 26 mm), set of 2
5810 759.005	022638386	for 4 tubes (30 - 50 mL, max. Ø 31 mm), set of 2
5810 760.003	022638408	for 2 tubes (50 - 75 mL, max. Ø 35 mm), set of 2
5810 761.000	022638424	for 1 Gefäß (80 - 120 mL, max. Ø 45 mm), set of 2
5810 770.009	022638441	for 1 bottle (180 - 250 mL, max. Ø 62 mm), set of 2
5810 755.000	022638289	for 9 Falcon tubes (15 mL, max. Ø 17.5 mm), set of 2
5810 758.009	022638343	for 3 Falcon tubes (50 mL, max. Ø 31 mm), set of 2
5810 763.002	022638351	for 4 Falcon tubes (50 mL), operation w/o aerosol-tight cap, set of 2
5810 782.007	022638483	**Replacement rubber mat** for adapters for 250 mL rectangular buckets set of 4

Order No. (International)	Order No. (North America)	Description
5810 781.000	022662431	**Replacement clamp** for adapters for 250 mL rectangular buckets set of 2
5810 783.003	022638459	**Replacement rubber mat** for adapter 5810 770.009/022638441 set of 4
5804 737.008	022654373	**Adapter** for 50 mL skirted Falcon tubes, set of 8

Rotor A-4-62-MTP

Order No. (International)	Order No. (North America)	Description
5810 711.002	022638041	**Rotor A-4-62-MTP** incl. 4 MTP buckets
5810 702.003	022638068	**Replacement MTP bucket for A-4-62** for 4 MTP or 1 DWP set of 4
5825 711.009 5825 713.001	022638947 022638955	**Adapter** used in A-4-81-MTP/Flex, A-4-62-MTP, A-2-DWP-AT and A-2-DWP for 96-well PCR plates, set of 2 for 384-well PCR plates, set of 2
5825 706.005	022638963	**Adapter** used in A-4-81-MTP/Flex, A-4-62-MTP and A-2-DWP Combislide Adapter, set of 2

11.3.3 Rotor A-4-44

Order No. (International)	Order No. (North America)	Description
5804 709.004	022637401	**Rotor A-4-44** incl. 4 x 100 mL rectangular buckets
5804 741.005	022637436	**Rectangular bucket 100 mL** set of 4
5804 712.005	022637428	**Aerosol-tight cap** for 100 mL rectangular buckets, set of 2
5804 713.001	022637444	**4 Replacement gasket for aerosoltight caps** for 100 mL rectangular buckets, set of 4

Order No. (International)	Order No. (North America)	Description
		Adapter for 100 mL rectangular bucket
5804 751.000	022637525	for 12 sample tubes (1.5/2.0 mL, max. Ø 11 mm), set of 2
5804 750.004	022637509	for 14 tubes (1.2 - 5 mL, max. Ø 11 mm), set of 2
5804 752.007	022637541	for 9 tubes (2.6 - 7 mL, max. Ø 13 mm), set of 2
5804 753.003	022637568	for 7 tubes (3 - 15 mL, max. Ø 16 mm), set of 2
5804 754.000	022637584	for 6 tubes (7 - 17 mL, max. Ø 17.5 mm), set of 2
5804 756.002	022637622	for 4 tubes (7 - 18 mL, max. Ø 20 mm), set of 2
5804 757.009	022637649	for 2 tubes (18 - 30 mL, max. Ø 26 mm), set of 2
5804 759.001	022637681	for 1 tube (30 - 50 mL, max. Ø 31 mm), set of 2
5804 760.000	022637703	for 1 tube (50 - 75 mL, max. Ø 35 mm), set of 2
5804 761.006	022637720	for 1 tube (80 - 100 mL, max. Ø 45 mm), set of 2
5804 755.006	022637606	for 4 Falcon tubes (15 mL, max. Ø 17.5 mm), set of 2
5804 717.007	022637614	for 2 Falcon tubes (15 mL, max. Ø 17.5 mm), set of 2
5804 758.005	022637665	for 1 Falcon tube (50 mL, max. Ø 31 mm), set of 2
5804 718.003	022637673	for 1 Falcon tube (50 mL, max. Ø 31 mm), set of 2
		Adapter
5804 737.008	022654373	for 50 mL skirted Falcon tubes, set of 8
		Rubber mat
		for adapters of Rotor A-4-44
5804 782.003	022662503	set of 4
		Replacement clamp
		for adapters of rotor A-4-44
5804 781.007	022662511	set of 2
		Falcon bucket for A-4-44
5804 706.005	022637452	for 2 Falcon tubes (50 mL, max. Ø 31 mm), set of 4
		Adapters
		Form inserts for Falcon buckets
5804 728.009	022637479	for 1 Falcon tube (50 mL, max. Ø 31 mm), set of 8

11.3.4 Rotor A-2-DWP-AT (only 5810/5810 R)

Order No. (International)	Order No. (North America)	Description
		Rotor A-2-DWP-AT
5820 710.004	5820710004	incl. 2 buckets, 2 aerosol-tight caps and 2 plate holders
		Bucket for rotor A-2-DWP-AT
5820 711.000	5820711000	set of 2
		Aerosol-tight bucket cap, Rotor A-2-DWP-AT
5820 713.003	5820713003	2 pcs.
		Spare seal for aerosoltight cap
5820 705.000	5820705000	2 pcs.
		Plate holder for bucket, Rotor A-2-DWP-AT
5820 712.007	5820712007	set of 2
		Adapter
		used in A-4-81-MTP/Flex, A-4-62-MTP, A-2-DWP-AT and A-2-DWP
5825 711.009	022638947	for 96-well PCR plates, set of 2
5825 713.001	022638955	for 384-well PCR plates, set of 2

Aerosol tightness tested and certified by the Centre of Emergency Preparedness and Response, Health Protection Agency, Porton Down (UK).

11.3.5 Rotor A-2-DWP

Order No. (International)	Order No. (North America)	Description
5804 740.009	022638564	**Rotor A-2-DWP** Deepwell plates rotor, incl. 2 buckets
5804 743.008	022638556	**Deepwell plate bucket** used in A-2-DWP set of 2
5825 718.003	5825718003	**SBS adapter** for plates with rims in the SBS format set of 2
5825 708.008 5825 709.004	022638980 022638998	**IsoRack adapter** for 24 x 0.5 mL tubes in the IsoRack, set of 2 for 24 x 1.5/2.0 mL tubes in the IsoRack, set of 2
5825 711.009 5825 713.001	022638947 022638955	**Adapter** used in A-4-81-MTP/Flex, A-4-62-MTP, A-2-DWP-AT and A-2-DWP for 96-well PCR plates, set of 2 for 384-well PCR plates, set of 2
5825 706.005	022638963	**Adapter** used in A-4-81-MTP/Flex, A-4-62-MTP and A-2-DWP Combislide Adapter, set of 2

11.3.6 Rotor FA-45-6-30

Order No. (International)	Order No. (North America)	Description
5820 715.006	5820715006	**Rotor FA-45-6-30** aerosol-tight*, aluminum, 45° angle, 6 places, for 15/ 50 mL Falcon tubes, incl. rotor lid (aluminum)
5820 716.002	5820716002	**Rotor lid for FA-45-6-30** aerosol-tight*, aluminum
5418 709.008	022652109	**Seal for rotor lid FA-45-18-11 and FA-45-6-30** 5 pcs.
5820 717.009 5820 719.001 5820 720.000 5820 721.006 5820 722.002	5820717009 5820719001 5820720000 5820721006 5820722002	**Adapter** used in FA-45-6-30 for 15 mL Falcon tubes, set of 2 for 10 mL Oak Ridge, set of 2 for 16 mL Oak Ridge, set of 2 for 30 mL Oak Ridge, set of 2 for 35 mL Oak Ridge, set of 2

Aerosol tightness tested and certified by the Centre of Emergency Preparedness and Response, Health Protection Agency, Porton Down (UK).

11.3.7 Rotor F-34-6-38

Order No. (International)	Order No. (North America)	Description
5804 727.002	022637207	**Rotor F-34-6-38** 34° angle, 6 places for 85 mL tubes, incl. rotor lid
5804 727.509	022662961	**Rotor lid for F-34-6-38**

Order No. (International)	Order No. (North America)	Description
		Adapter
		used in F-34-6-38
5804 770.005	022637215	for 4 sample tubes 1.5/2.0 mL (max. Ø 11 mm), set of 2
5804 738.004	022637279	for 3 round-bottom and blood collection tubes (13 x 75 mm), set of 2
5804 739.000	022637282	for 3 round-bottom and blood collection tubes (13 x 100 mm),set of 2
5804 771.001	022637223	for 2 tubes (7 bis 15 mL, max. Ø 16 mm), set of 2
5804 776.003	022637274	for 1 Falcon tube (15 mL, max. Ø 17 mm), set of 2
5804 772.008	022637231	for 1 tube (15 bis 18 mL, max. Ø 18 mm), set of 2
5804 773.004	022637240	for 1 tube (20 bis 30 mL, max. Ø 26 mm), set of 2
5804 774.000	022637258	for 1 tube (50 mL, max. Ø 29 mm), set of 2
5804 775.007	022637266	for 1 Falcon tube (50 mL, max. Ø 29.5 mm), set of 2

11.3.8 Rotor FA-45-30-11 and rotor F-45-30-11

Order No. (International)	Order No. (North America)	Description
5804 726.006	022637100	**Rotor FA-45-30-11** aerosol-tight*, 45° angle, 30 places for 1.5/2.0 mL tubes, incl. rotor lid (aluminum)
5804 736.001	022637126	**Rotor lid for FA-45-30-11** aerosol-tight*, aluminum
5804 715.004	022637002	**Rotor F 45-30-11** 45° angle, 30 places for 1.5/2.0 mL tubes, incl. rotor lid (aluminum)
5804 715.403	022662970	**Rotor lid for F-45-30-11** not aerosol-tight, aluminum
		Adapter
		used in FA-45-30-11 and F-45-30-11
5425 715.005	022636260	for 1 PCR tube (0.2 mL, max. Ø 6 mm), set of 6
5425 717.008	022636243	for 1 sample tube (0.4 mL, max. Ø 6 mm), set of 6
5425 716.001	022636227	for 1 sample tube (0.5 mL, max. Ø 6 mm) or 1 Microtainer (0.6 mL, max. Ø 8 mm), set of 6

11.3.9 Rotor F-45-48-PCR

Order No. (International)	Order No. (North America)	Description
5804 735.005	022638581	**Rotor F-45-48-PCR** 45° angle, for 6 x 8-tube strips, 6 x 5-tube strips or 48 x 0.2 mL PCR tubes

11.3.10 Rotor T-60-11

Order No. (International)	Order No. (North America)	Description
		Rotor T 60-11
		for 60 x 1.5/2.0 mL tubes
5804 730.003	022638505	incl. rotor lid, and 6 adapters for 1.5/2 mL sample tubes
		Adapter
		used in T-60-11
5804 731.000	022638521	for 10 sample tubes (1,5/2,0 mL, max. Ø 11 mm), set of 6
5804 732.006	022638548	for 20 sample tubes (0.4 mL, max. Ø 6 mm), set of 6

11.3.11 Miscellaneous

Order No. (International)	Order No. (North America)	Description
		Captain Eppi rotor key holder
5703 350.102	022639609	1 piece
5703 350.110	022639625	10 pieces
		Rotor stand
5804 720.008	022639021	suitable for all rotors of Centrifuge 5804/5804 R/5810/5810 R
		Pivot grease
5810 350.050	022634330	Tube 20 mL
		Rotor key
5810 350.018	022664166	Standard
5811 001.068	022662678	**Tray for condensation water**
		Conversion kit for RS 232 interface
on request	on request	For Centrifuge 5804
on request	on request	For Centrifuge 5804 R

Mains/power cable for Centrifuge 5804 and Centrifuge 5810

Order No. (International)	Order No. (North America)	Description
		Mains/power cable
0113 200.111	-	230 V/50 Hz, Europe
0013 594.490	-	230 V/50 Hz, GB/HK
0013 613.952	-	230 V/50 Hz, CN
0013 592.454	-	230 V/50 Hz, AUS
0113 200.863	022664999	120 V/60 Hz, USA
5804 652.002	-	202 V, Japan
0013 613.973	-	230 V/50 Hz, ARG

Mains/power cable for Centrifuge 5804 R and Centrifuge 5810 R

Order No. (International)	Order No. (North America)	Description
		Mains/power cable
0113 204.486	-	230 V/50 Hz, Europe
0113 204.680	-	230 V/50 Hz, GB/HK
0013 613.953	-	230 V/50 Hz, CN
0113 204.699	-	230 V/50 Hz, AUS
0113 200.863	022664999	120 V/60 Hz, USA
5821 609.005	-	202 V, Japan
0113 205.105	-	230 V/50 Hz, ARG

EG-Konformitätserklärung
EC Conformity Declaration

Das bezeichnete Produkt entspricht den einschlägigen grundlegenden Anforderungen der aufgeführten EG-Richtlinien und Normen. Bei einer nicht mit uns abgestimmten Änderung des Produktes oder einer nicht bestimmungsgemäßen Anwendung verliert diese Erklärung ihre Gültigkeit.

The product named below fulfills the relevant fundamental requirements of the EC directives and standards listed. In the case of unauthorized modifications to the product or an unintended use this declaration becomes invalid.

Produktbezeichnung, Product name:

Centrifugen 5804 / 5804 R , 5810 / 5810 R

einschließlich Zubehör / including accessories

Produkttyp, Product type:

Laborzentrifugen / Laboratory Centrifuges

Einschlägige EG-Richtlinien/Normen, Relevant EC directives/standards:

2006/95/EG, EN 61010-1, EN 61010-2-20

2004/108/EG, EN 61000-6-1, EN 61000-3-2, EN 61000-3-3, EN 61326-1

98/79/EG, EN 14971, EN 61010-2-101, EN 61326-2-6

Vorstand, Board of Management:

Projektmanagement, Project Management:

18.09.2009

Hamburg, Date:

ISO CERTIFIED 9001

eppendorf

Eppendorf AG · Barkhausenweg 1 · 22339 Hamburg · Germany

Northbrook, Illinois • (847) 272–8800
Melville, New York • (631) 271–6200
Santa Clara, California • (408) 985–2400
Research Triangle Park,
North Carolina • (919) 549–1400
Camas, Washington • (360) 817–5500

Underwriters Laboratories Inc.®

CERTIFICATE OF COMPLIANCE

CERTIFICATE NUMBER: 060203 - E215059

ISSUE DATE: February 06, 2003

Issued to: Eppendorf A G - Dept Mp
Barkhausenweg 1
D-22339 Hamburg Germany

Report Reference: E215059, February 19, 1999

This is to Certify that representative samples of: Laboratory Centrifuges, Models 5804, 5804R, 5810, 5810R.

Have been investigated by Underwriters Laboratories Inc.® in accordance with the Standard(s) indicated on this Certificate.

Standard(s) for Safety:
UL 3101-1 - Electrical Equipment for Laboratory Use; Part 1: General Requirements
UL 3101-2-20 - Electrical Equipment for Laboratory Use, Part 2: Laboratory Centrifuges
CSA C22.2 No. 1010-1 - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part I: General Requirements

Additional Information: Electrical Ratings:

Ratings	Voltage	Frequency(Hz)	Power(W)
5804	120	60	850
5804R	120	60	1400
5810	120	60	950
5810R	120	60	1650

Only those products bearing the UL Listing Mark for the US and Canada should be considered as being covered by UL's Listing and Follow-Up Service meeting the appropriate requirements for US and Canada.

The UL Listing Mark for the US and Canada generally includes: the UL in a circle symbol with "C" and "US" identifiers: c UL us the word "LISTED"; a control number (may be alphanumeric) assigned by UL; and the product category name (product identifier) as indicated in the appropriate UL Directory.

LOOK FOR THE UL LISTING MARK ON THE PRODUCT

Engineer:
Bogdan Maliszewski - Senior Project Engineer
UL International Germany GmbH

Review Engineer:
Daniel Bejnarowicz - Engineering Group Leader
UL International Germany GmbH

Pursuant to the Corporate Services Agreement between UL International Germany GmbH and Underwriters Laboratories Inc. ("UL"), UL hereby accepts and issues this Certificate of Compliance. For questions in Germany, you may call 49 6102 3690.

Centre of Emergency Preparedness and Response
Health Protection Agency
Porton Down
Salisbury
Wiltshire SP4 0JG
United Kingdom

Certificate of Containment Testing

Containment Testing of Swing Out Rotor with Buckets [A-2-DWP-AT (5820 710.004-00)] and Autoclaved (x50) lids in the Eppendorf Centrifuge 5810

Report No. 104-09 B

Report prepared for: Eppendorf AG, Hamburg, Germany
Issue Date: 31st March 2010 (amended 17th Aug 10)

Test Summary

Swing out rotor with buckets [A-2-DWP-AT (5820 710.004-00)] and autoclaved (x50) lids was containment tested in the Eppendorf 5810 centrifuge, in accordance with Annex AA of IEC 1010-2-20. The sealed bucket was shown to contain the spill of micro-organisms and therefore prevent any release.

Report Written By **Report Authorised By**

Health Protection Agency
Microbiological Services
Porton Down
Salisbury
Wiltshire SP4 0JG
United Kingdom

Certificate of Containment Testing

Containment Testing of Rotor A-4-44 and Sealed Buckets and Lids (Cap 100, Order no. 5804 712.005) in the Eppendorf Centrifuge 5810

Report No. 352-97 (Part 1)

Report prepared for: Eppendorf AG, Hamburg, Germany
Issue Date: Original report issued 8th September 1997
Certificate issued 18th October 2010

Test Summary

Rotor A-4-44 and sealed buckets and lids (Cap 100, Order no. 5804 712.005) were containment tested in the Eppendorf Centrifuge 5810, using Annex AA of IEC 1010-2-020. The sealed buckets were shown to contain the spill within the centrifuge.

Report Written By

Anna May

Report Authorised By

Health Protection Agency
Microbiological Services
Porton Down
Salisbury
Wiltshire SP4 0JG
United Kingdom

Certificate of Containment Testing

Containment Testing of Rotor A-4-62 and Sealed Buckets and Lids (Cap 250/1, Order no. 5810 710.006) in the Eppendorf Centrifuge 5810

Report No. 352-97 (Part 2)

Report prepared for: Eppendorf AG, Hamburg, Germany
Issue Date: Original report issued 8th September 1997
Certificate issued 18th October 2010

Test Summary

Rotor A-4-62 and sealed buckets and lids (Cap 250/1, Order no. 5810 710.006) were containment tested in the Eppendorf Centrifuge 5810, using Annex AA of IEC 1010-2-020. The sealed buckets were shown to contain the spill within the centrifuge.

Report Written By

Anna May

Report Authorised By

Centre of Emergency Preparedness and Response
Health Protection Agency
Porton Down
Salisbury
Wiltshire SP4 0JG
United Kingdom

Certificate of Containment Testing

400ml Rectangular Buckets fitted with Sealed Caps in Eppendorf Centrifuge 5810 containing Rotor A-4-81

Report No. 1000-06

Report prepared for: Eppendorf AG, Hamburg, Germany
Issue Date: 21st March 2006

Test Summary

400 ml rectangular buckets fitted with sealed caps were containment tested in the Eppendorf centrifuge 5810 containing rotor A-4-81, using Annex AA of IEC 1010-2-20. The buckets were shown to contain a large spill.

Report Written By

Report Authorised By

Centre of Emergency Preparedness and Response
Health Protection Agency
Porton Down
Salisbury
Wiltshire SP4 0JG
United Kingdom

Certificate of Containment Testing

Containment Testing of Rotor FA-45-6-30 [(5820 715.103-00) and autoclaved lid (x50)] in the Eppendorf Centrifuge 5810R

Report No. 40-10B

Report prepared for: Eppendorf AG, Hamburg, Germany
Issue Date: 19th July 2010 (amended 17th Aug 10)

Test Summary

Rotor FA-45-6-30 (5820 715.103-00) and autoclaved lid (x50) was containment tested in the Eppendorf centrifuge 5810R, in accordance with Annex AA of IEC 1010-2-20. The sealed rotor was shown to contain the spill of micro-organisms and therefore prevent any release.

Report Written By

Report Authorised By

Eppendorf offices

AUSTRALIA & NEW ZEALAND
Eppendorf South Pacific Pty. Ltd.
Phone: +61 2 9889 5000
Fax: +61 2 9889 5111
E-mail: Info@eppendorf.com.au
Internet: www.eppendorf.com.au

AUSTRIA
Eppendorf Austria GmbH
Phone: +43 (0) 1 890 13 64 - 0
Fax: +43 (0) 1 890 13 64 - 20
E-mail: office@eppendorf.at
Internet: www.eppendorf.at

BRAZIL
Eppendorf do Brasil Ltda.
Phone: +55 11 30 95 93 44
Fax: +55 11 30 95 93 40
E-mail: eppendorf@eppendorf.com.br
Internet: www.eppendorf.com.br

CANADA
Eppendorf Canada Ltd.
Phone: +1 905 826 5525
Fax: +1 905 826 5424
E-mail: canada@eppendorf.com
Internet: www.eppendorfna.com

CHINA
Eppendorf China Ltd.
Phone: +86 21 38560500
Fax: +86 21 38560555
E-mail: market.info@eppendorf.cn
Internet: www.eppendorf.cn

CZECH REPUBLIC
Eppendorf Czech & Slovakia s.r.o.
Phone: +420 323 605 454
Fax: +420 323 605 454
E-mail: eppendorf@eppendorf.cz
Internet: www.eppendorf.cz

FRANCE
Eppendorf France S.A.R.L.
Phone: +33 1 30 15 67 40
Fax: +33 1 30 15 67 45
E-mail: eppendorf@eppendorf.fr
Internet: www.eppendorf.fr

GERMANY
Eppendorf Vertrieb
Deutschland GmbH
Phone: +49 2232 418-0
Fax: +49 2232 418-155
E-mail: vertrieb@eppendorf.de
Internet: www.eppendorf.de

INDIA
Eppendorf India Limited
Phone: +91 44 42 11 13 14
Fax: +91 44 42 18 74 05
E-mail: info@eppendorf.co.in
Internet: www.eppendorf.co.in

ITALY
Eppendorf s.r.l.
Phone: +390 2 55 404 1
Fax: +390 2 58 013 438
E-mail: eppendorf@eppendorf.it
Internet: www.eppendorf.it

JAPAN
Eppendorf Co. Ltd.
Phone: +81 3 5825 2363
Fax: +81 3 5825 2365
E-mail: info@eppendorf.jp
Internet: www.eppendorf.jp

NORDIC
Eppendorf Nordic Aps
Phone: +45 70 22 2970
Fax: +45 45 76 7370
E-mail: nordic@eppendorf.dk
Internet: www.eppendorf.dk

SLOVAKIA
Eppendorf Czech & Slovakia s.r.o.
Phone: +421 911 181 474
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Internet: www.eppendorf.sk

SOUTH & SOUTHEAST ASIA
Eppendorf Asia Pacific Sdn. Bhd.
Phone: +60 3 8023 2769
Fax: +60 3 8023 3720
E-mail:
eppendorf@eppendorf.com.my
Internet: www.eppendorf.com.my

SPAIN
Eppendorf Ibérica S.L.U.
Phone: +34 91 651 76 94
Fax: +34 91 651 81 44
E-mail: eppendorf@eppendorf.es
Internet: www.eppendorf.es

SWITZERLAND
Vaudaux-Eppendorf AG
Phone: +41 61 482 1414
Fax: +41 61 482 1419
E-mail: vaudaux@vaudaux.ch
Internet: www.eppendorf.ch

THAILAND
Eppendorf (Thailand) Co. Ltd.
Phone: +66 2 379 4212-5
Fax: +66 2 379 4216
E-mail: info@eppendorf.co.th
Internet: www.eppendorf.com.my

UNITED KINGDOM
Eppendorf UK Limited
Phone: +44 1223 200 440
Fax: +44 1223 200 441
E-mail: sales@eppendorf.co.uk
Internet: www.eppendorf.co.uk

USA
Eppendorf North America, Inc.
Phone: +1 516 334 7500
Fax: +1 516 334 7506
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