



# Sigma 1-16 Sigma 1-16K



Microcentrifuge

- Unrefrigerated
- Refrigerated



# Exactly what you want – a microcentrifuge tailored to your needs



**Sigma is a leading international manufacturer of laboratory centrifuges for diverse sectors, including biotechnology, pharmaceutical, medical, and environment analysis. Laboratories, institutions and companies everywhere in the world have been relying on premium Sigma quality – Made in Germany – for more than 40 years. The company stands for innovative products and development of durable, energy-efficient and especially user-friendly devices.**

The compact Sigma 1-16 bench centrifuge and the refrigerated version 1-16K are specifically designed for working with microliter tubes. Their outstanding specifications and extensive range of rotors and accessories make this device series especially suitable for research applications with a medium to high volume of samples. Along with a maximum capacity of up to 36 x 2 ml, these devices boast RCF exceeding 20,600 x g, enabling shorter separation times and enhanced separation results. These proven models are used in a wide variety of microbiology applications, such as DNA, RNA or protein isolation. They also have a strong track record in clinical chemistry, paediatrics, biotechnology and bacteriology.

# Clear application orientation

## User-friendly, powerful and sturdy

Along with excellent specifications, the Sigma 1-16 series offers high-quality finishing and smart features. A unique feature is the motorised lid lock for convenient, effortless closing. Users also appreciate the ten programs and the high-performance cooling system of the Sigma 1-16K, including the pre-cooling function and standstill cooling.

The Sigma 1-16 and 1-16K additionally boast compact design and low-noise operation. Thanks to optimal air guidance and smart fan

control, the 36-position fixed-angle rotor can be operated in the refrigerated centrifuge at maximum speed with an astonishingly low noise level (52 dB(A) maximum).

The short acceleration and deceleration times of this microliter centrifuge are equally impressive. In combination with high RCF, this avoids wait times and optimises throughput.

Both bench centrifuges are also available in IVD versions.

### Sigma 1-16

- Universal microcentrifuge
- Speed range up to 15,000 rpm
- Maximum capacity: 36 x 2 ml
- Simple and convenient Spincontrol Basic controller
- Clearly organised display
- Ten programs
- Compact, space-saving device
- Short acceleration and braking times
- Low noise level
- Motorised lid lock
- Automatic lid unlocking
- Low temperature rise in continuous operation
- Durable, easy-care stainless steel chamber
- Window in lid for external speed monitoring
- Manufactured according to the latest national and international standards (e.g. EN 61010-2-020)

### Sigma 1-16K

All features of the Sigma 1-16, plus:

- High-performance cooling
- Temperature setting range: -10 °C to +40 °C
- Rotor temperature control also possible at standstill
- Pre-cooling program
- Energy-efficient and low-noise fan control
- Guaranteed  $\leq +4$  °C at maximum speed with all rotors





# Rotors and accessories

## Large selection and a multitude of applications

A broad selection of fixed-angle rotors for 0.2–5 ml reaction tubes is available for the Sigma 1-16 series. This extensive portfolio is complemented by a haematocrit rotor for determination of the volume percentage of erythrocytes in blood samples and a rotor for centrifugation of PCR tubes.

The innovative design of the 18-position fixed-angle rotor 12118 allows it to be used not only with microliter tubes but also with all common spin column kits (minipreps). The fixed-angle rotor 12136

features a maximum capacity of up to 36 x 2 ml and a Biosafe certificate. Sigma gives customers a choice of polypropylene and aluminium rotors. Due to their better thermal conductivity, aluminium rotors are recommended for use in refrigerated centrifuges, while polypropylene (PP) rotors have better chemical resistance and are less prone to corrosion.

Sigma offers a wide range of rotors, and if desired can also produce custom accessories tailored to customer needs.

► p.7

### Fixed-angle rotor 12135 for PCR strips

- Max. capacity: 32 x 0.2 ml PCR tubes
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 16,602 x g
- Angle: 45°



► p.7

### Fixed-angle rotor 12118 for spin column kits (minipreps)

- Max. capacity: 18 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Angle: 45°



► p.8

### Fixed-angle rotor 12024

- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Angle: 45°



► p.8


### Fixed-angle rotor 12134

- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Angle: 43°



► p.9

### Fixed-angle rotor 12136

- Max. capacity: 36 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Biosafe with aluminium lid 17613 
- Angle (outer / inner): 30° / 50°



► p.9

### Fixed-angle rotor 12180

- Max. capacity: 12 x 5 ml conical
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Angle: 40°



► p.10

### Haematocrit rotor 11024

- Max. capacity: 24 capillary tubes
- Max. speed (1-16 / 1-16K): 14,000 rpm
- Max. RCF (1-16 / 1-16K): 18,626 x g
- Angle: 90°



## Fixed-angle rotor 12135

### with lid 17930

- Max. capacity: 32 x 0.2 ml PCR tubes
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 16,602 x g
- Hermetically closable with polysulphone lid 17930
- Tmin at maximum speed: <4°C
- Angle: 45°



## Fixed-angle rotor 12118

### for reaction tubes with filter (spin column kits / minipreps) with lid 17615

- Max. capacity: 18 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Hermetically closable with aluminium lid 17615
- Tmin at maximum speed: <4°C
- Angle: 45°



### Tube



Rated capacity (filling volume) [ml]	0.2	0.2
Diameter x length [mm]	5.8 x 20	–
Tube material	PP	–
Item no.	15042	PCR strips

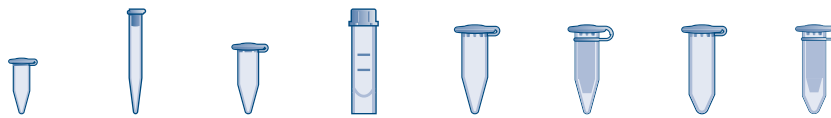
### Adapter

for fixed-angle rotor 12135



Bore diameter x length [mm]	6.3 x 18.5	6.3 x 18.5
Tubes per rotor	32	4 x 8
Centrifuging radius [mm]	66	66
Item no.	–	–

### Tube



Rated capacity (filling volume) [ml]	0.2	0.4	0.5	0.5	1.5	1.5	2	2
Diameter x length [mm]	5.8 x 20	5.8 x 47	7.9 x 28	10.8 x 47.6	10.7 x 42	10.7 x 42	10.7 x 42	10.7 x 42
Tube material	PP	PE	PP	PP	PP	PP	PP	PP
Item no.	15042	15014	15005	Paediatrics	15008	–	15040	–

### Adapter

for fixed-angle rotor 12118



Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8.1 x 45	11.1 x 29.5	11.1 x 38.5			
Tubes per adapter / rotor	1 / 18	1 / 18	1 / 18	1 / 18	– / 18			
Centrifuging radius [mm]	76	78	78	71	80			
Item no.	13021	13000	13002	13074*	–			

\* Only partial loading possible in some cases, depending on choice of paediatric tubes

## Fixed-angle rotor 12024

### with lid 17828

- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Hermetically closable with polysulphone lid 17828
- Tmin at maximum speed: <4°C
- Angle: 45°









## Fixed-angle rotor 12134

### with lid 17929

- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Hermetically closable with polysulphone lid 17929
- Tmin at maximum speed: <4°C
- Angle: 43°








### Tube

						
Rated capacity (filling volume) [ml]	0.2	0.4	0.5	0.5	1.5	2
Diameter x length [mm]	5.8 x 20	5.8 x 47	7.9 x 28	10.8 x 47.6	10.7 x 42	10.7 x 42
Tube material	PP	PE	PP	PP	PP	PP
Item no.	15042	15014	15005	Paediatrics	15008	15040







### Adapter

for fixed-angle rotor 12024



					
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8.1 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 24	1 / 24	1 / 24	1 / 24	- / 24
Centrifuging radius [mm]	78	80	80	73	82
Item no.	13021	13000	13002	13074*	-






### Tube

						
Rated capacity (filling volume) [ml]	0.2	0.4	0.5	0.5	1.5	2
Diameter x length [mm]	5.8 x 20	5.8 x 47	7.9 x 28	10.8 x 47.6	10.7 x 42	10.7 x 42
Tube material	PP	PE	PP	PP	PP	PP
Item no.	15042	15014	15005	Paediatrics	15008	15040

### Adapter

for fixed-angle rotor 12134




					
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8.1 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 24	1 / 24	1 / 24	1 / 24	- / 24
Centrifuging radius [mm]	78	80	80	73	82
Item no.	13021	13000	13002	13074*	-



## Fixed-angle rotor 12136

### with lid 17613

- Max. capacity: 36 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Biosafe with aluminium lid 17613 
- Tmin at maximum speed: <4°C
- Angle (outer / inner): 30° / 50°








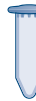
## Fixed-angle rotor 12180

### with lid 17180

- Max. capacity: 12 x 5 ml conical
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Hermetically closable with aluminium lid 17180
- Tmin at maximum speed: <4°C
- Angle: 40°







### Tube

						
Rated capacity (filling volume) [ml]	0.2	0.4	0.5	0.5	1.5	2
Diameter x length [mm]	5.8 x 20	5.8 x 47	7.9 x 28	10.8 x 47.6	10.7 x 42	10.7 x 42
Tube material	PP	PE	PP	PP	PP	PP
Item no.	15042	15014	15005	Paediatrics	15008	15040






### Adapter

for fixed-angle rotor 12136



					
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8.1 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 36	1 / 36	1 / 36	1 / 36	- / 36
Centrifuging radius [mm]	76	78	78	71	80
Item no.	13021	13000	13002	13074*	-





### Tube

					
Rated capacity (filling volume) [ml]	1.5	1.5–1.8	1.5	2	5
Diameter x length [mm]	11.7 x 34	12.3 x 49	10.7 x 42	10.7 x 42	17 x 60
Tube material	Glass	PP	PP	PP	PPCO
Item no.	HPLC	Cryo tube	15008	15040	-

### Adapter

for fixed-angle rotor 12180



				
Bore diameter x length [mm]	12.5 x 28	12.7 x 32	11.1 x 38.5	17 x 52
Tubes per adapter / rotor	1 / 12	1 / 12	1 / 12	- / 12
Centrifuging radius [mm]	53	57	63	80
Item no.	14081	14080**	14082	-

## Haematocrit rotor 11024

with lid 17874 and evaluation card 17029  
(see figure)

- Max. capacity: 24 capillary tubes
- Max. speed (1-16 / 1-16K): 14,000 rpm
- Max. RCF (1-16 / 1-16K): 18,626 x g
- Tmin at maximum speed: <4°C
- Angle: 90°



Evaluation card 17029

### Tube

Rated capacity (filling volume) [µl]	50
Diameter x length [mm]	1.5 x 75
Tube material	Glass
Item no.	15001



### Adapter

for  
haematocrit  
rotor 11024



Bore diameter x length [mm]	–
Capillary tubes per rotor	24
Centrifuging radius [mm]	85
Item no.	–



Optionally available:  
Evaluation disc 17024

# Material properties

## Guideline for optimal tube selection

Due to the many factors that influence material properties, this overview is only intended as a general recommendation. There is no guarantee of the stated properties. Users should therefore carefully

test materials for suitability under specific application conditions. Tubes should be discarded as soon as they show any sign of material fatigue.

	Polycarbonate (PC)	Polyvinyl fluoride (PF)	Polystyrene (PS)	Polyethylene (PE)	Polypropylene (PP)
<b>Autoclave resistant</b>	Yes	Yes	No	No	Yes
<b>Elasticity</b>	Not elastic	Not elastic	Not elastic	Good	Not elastic
<b>Transparency</b>	Transparent	Translucent	Transparent	Translucent	Translucent
<b>Recommended temperature range [°C]</b>					
Embrittlement temperature [°C]	≤ -20	≤ -20	≤ -10	≤ -20	≤ -20
Max. working temperature [°C]	≥ +125	≥ +125	≥ +80	≥ +90	≥ +125
<b>Microwave resistant</b>	Moderate	Yes	No	Limited	Moderate
<b>Chemical resistance</b>					
Weak acids	Yes	Yes	Yes	Yes	Yes
Strong acids	No	Yes	Limited	Yes	Yes
Alcohols and alkalis	No	Yes	Yes	Yes	Yes
Salts	Limited	Yes	Limited	Yes	Yes
<b>Note:</b>	Frequent autoclaving leads to loss of strength	Tubes should be completely filled and closed for use at maximum RCF			

	PP copolymer (PPCO)	Glass	High-speed glass (HS glass)	Stainless steel
<b>Autoclave resistant</b>	Yes	Yes	Yes	Yes
<b>Elasticity</b>	Moderate	Not elastic	Not elastic	Not elastic
<b>Transparency</b>	Translucent	Transparent	Transparent	Opaque
<b>Recommended temperature range [°C]</b>				
Embrittlement temperature [°C]	≤ -20	≤ -20	≤ -20	≤ -20
Max. working temperature [°C]	≥ +125	≥ +200	≥ +200	≥ +200
<b>Microwave resistant</b>	Moderate	Yes	Yes	No
<b>Chemical resistance</b>				
Weak acids	Yes	Yes	Yes	Limited
Strong acids	Yes	Yes	Yes	Limited
Alcohols and alkalis	Yes	Yes	Yes	Yes
Salts	Yes	Yes	Yes	Limited
<b>Note:</b>		Max. RCF for all glass tubes approx. 4,000 x g	High-speed glass for maximum RCF of 13,100 x g	

# Spincontrol Basic

## Advanced control, intuitive operation

Spincontrol Basic is a programmable and user-friendly control unit with a clearly organised and intuitive user interface that simplifies everyday tasks in the lab. Operating parameters are entered using centrally arranged arrow buttons, and parameter settings can be changed during operation.

Spincontrol Basic can hold up to ten programs – a unique feature in its class. These user-modifiable programs can store standard routines for retrieval at any time. That makes the control unit ideal for institutions where tubes with different operating parameters must be centrifuged. Quick access to stored programs facilitates enhanced process reliability and quality of analytical results.

The high-performance cooling system provides precise control over the range of  $-10^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$  with fine adjustment in  $1^{\circ}\text{C}$  increments. Along with the pre-cooling function, the Sigma 1-16K features standstill cooling.

Two pairs of acceleration and braking curves help to optimise separation processes. Short or pulsed runs are also possible by pressing and holding the Start/Stop button.

Display	LCD
Speed/RCF display	+
Timer (s; h:min)	10 – 99:59
Short run, Continuous run	+, +
Time increment [s]	1
Speed increment [rpm]	100
Temperature increment [ $^{\circ}\text{C}$ ]	1*
RCF increment [x g]	10
Programs	10
Acceleration curves	2 (fast, soft)
Braking curves	2 (fast, soft)
Standstill cooling	+*
Pre-cooling program	+*
Microprocessor control	+

\* Only Sigma 1-16K






# Product portfolio

Sigma offers a broad product portfolio with more than 25 laboratory centrifuges. They can be combined with an extensive range of fixed-angle and swing-out rotors and a large range of accessories to obtain the right device configuration for every application.











**Microcentrifuge**  
**Sigma 1-16**








-  36 x 2 ml
-  15,000 rpm
-  20,627 x g



**Benchtop centrifuge**  
**Sigma 2-7**








-   4 x 100 ml
-  4,000 rpm
-  2,540 x g
-   30 x 15 ml
-  4,000 rpm
-  2,486 x g

**Floorstanding centrifuge**  
**Sigma 8KS**

-  12 x 1,000 ml
-  5,100 rpm
-  8,578 x g
-   6 x 1,000 ml
-  10,500 rpm
-  20,461 x g






**Benchtop centrifuge**  
**Sigma 3-30KS**

-  4 x 100 ml
-  5,000 rpm
-  3,969 x g
-   6 x 94 ml
-  30,000 rpm
-  70,121 x g



**Robot centrifuge**  
**Sigma 4-5KRL**

-  100 x 15 ml
-  4,700 rpm
-  4,470 x g

## Legend

-  Max. capacity
-  Max. speed
-  Max. RCF
-  Swing-out rotor
-  Fixed-angle rotor

# Premium quality

## Made in Germany

The Sigma 1-16 and Sigma 1-16K meet the highest technical requirements of laboratory standards. Developed and produced at our facility in Osterode, Germany, they are high-performance, durable and energy-efficient quality products and conform to the latest safety, emissions and environmental standards. Sigma guarantees the availability of spare parts and wearing parts for at least 10 years. Furthermore, you benefit from our extensive services portfolio,

including commissioning, maintenance, device calibration and more. Our qualified service technicians are ready to provide professional maintenance and repair as well as loaner devices if necessary. All support services are designed to ensure reliability and optimise system availability.

	Sigma 1-16	Sigma 1-16K
<b>Max. capacity [ml]</b>		
Fixed-angle rotor	36 x 2	36 x 2
<b>Max. RCF</b>	20,627	20,627
<b>Maximum speed [rpm]</b>	15,000	15,000
<b>Minimum speed [rpm]</b>	200	200
<b>Noise level at maximum speed (approx.) [dB(A)]</b>		
Fixed-angle rotor 12136	≤ 60	≤ 52
<b>Max. acceleration time [s]</b>		
Fixed-angle rotor 12136	≤ 26	≤ 26
<b>Max. braking time [s]</b>		
Fixed-angle rotor 12136	≤ 21	≤ 21
<b>Temperature adjustment range [°C]</b>	–	-10 – +40
<b>Power consumption [W]</b>	170	420
<b>Height x width x depth [mm]</b>	271 x 310 x 418	291 x 310 x 660
<b>Height with open lid [mm]</b>	527	547
<b>Weight without rotor [kg]</b>	13	32

### Sigma Service

For maintenance and repairs please contact our Service department at [www.sigma-zentrifugen.de/en/service](http://www.sigma-zentrifugen.de/en/service)

### Calibration

Documented proof of compliance with essential technical parameters.

Speed or run time (item no. 17713)  
 Speed and run time (item no. 17714)  
 Speed, run time, temperature (item no. 17715)

### Device qualification (IQOQ)

This comprehensive device qualification includes installation qualification and metrological checking of all functional parameters with a rotor.

IQOQ package for:

Unrefrigerated centrifuges (item no. 17710)  
 Refrigerated centrifuges (item no. 17711)  
 An additional rotor (item no. 17712)



energy saving + silent  
cooling fan controlled by demand

#### Sigma 1-16 centrifuge

220 – 240 V, 50/60 Hz (item no. 10025)  
 120 V, 60 Hz (item no. 10026)  
 100 V, 50/60 Hz (item no. 10027)

#### Sigma 1-16 centrifuge, IVD version

220 – 240 V, 50/60 Hz (item no. 10035)  
 120 V, 60 Hz (item no. 10036)  
 100 V, 50/60 Hz (item no. 10037)

#### Sigma 1-16K centrifuge

220 – 240 V, 50/60 Hz (item no. 10030)  
 120 V, 60 Hz (item no. 10031)  
 100 V, 50/60 Hz (item no. 10032)

#### Sigma 1-16K centrifuge, IVD version

220 – 240 V, 50/60 Hz (item no. 10040)  
 120 V, 60 Hz (item no. 10041)  
 100 V, 50/60 Hz (item no. 10042)





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