Sigma 1-16
Sigma 1-16K

Microcentrifuge

- Unrefrigerated
- Refrigerated

www.sigma-zentrifugen.de

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.

To save energy and costs, the cooled centrifuge has the ECO mode feature. After an individually adjustable time, the centrifuge automatically switches to standby mode when not in use. This is not only energy-efficient but also improves the working atmosphere in the laboratory by significantly reducing the noise level by switching off the cooling system.

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 12136 can be operated in the refrigerated centrifuge at maximum speed with an astonishingly low noise level of less than 48 dB(A).

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.

Video
Watch our video for more information:

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 ≤ +4 °C at maximum speed with all rotors
- Energy-saving standby mode ECO mode adjustable

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 12120

- 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
- Biosafe with aluminium lid 17580 ☣
- Angle: 45°

▸ 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.10

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

Polypropylene fixed-angle rotor 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

Aluminium fixed-angle rotor 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	–			

Fixed-angle rotor 12024

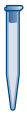
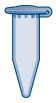
Aluminium fixed-angle rotor with lid 17828

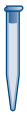
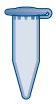
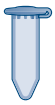
- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Hermetically closable with polysulphone lid 17828
- Tmin at maximum speed: <4°C
- Angle: 45°

Fixed-angle rotor 12134

Polypropylene fixed-angle rotor 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*	–	

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

Fixed-angle rotor 12120

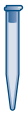
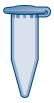
Aluminium fixed-angle rotor with lid 17580

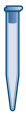
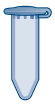
- Max. capacity: 24 x 2 ml
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,627 x g
- Biosafe with aluminium lid 17580 ☣
- Tmin at maximum speed: <4°C
- Angle: 45°

Fixed-angle rotor 12136

Aluminium fixed-angle rotor 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°

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 12120						
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 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*	–	

* Only partial loading possible in some cases, depending on choice of paediatric tubes; ** Only possible without lid 17180

Fixed-angle rotor 12180

Aluminium fixed-angle rotor with lid 17180

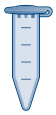
- Max. capacity: 12 x 5 ml conical
- Max. speed (1-16 / 1-16K): 15,000 rpm
- Max. RCF (1-16 / 1-16K): 20,124 x g
- Hermetically closable with aluminium lid 17180
- Tmin at maximum speed: <4°C
- Angle: 40°

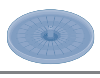
Haematocrit rotor 11024

Haematocrit rotor with 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) [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	–	

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

Optionally available: Capillary tube sealing kit (10 plates) 17005

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)
Autoclave resistant	Yes	Yes	No	No	Yes
Elasticity	Not elastic	Not elastic	Not elastic	Good	Not elastic
Transparency	Transparent	Translucent	Transparent	Translucent	Translucent
Microwave resistant	Moderate	Yes	No	Limited	Moderate
Chemical resistance					
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
Note:	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
Autoclave resistant	Yes	Yes	Yes	Yes
Elasticity	Moderate	Not elastic	Not elastic	Not elastic
Transparency	Translucent	Transparent	Transparent	Opaque
Microwave resistant	Moderate	Yes	Yes	No
Chemical resistance				
Weak acids	Yes	Yes	Yes	Limited
Strong acids	Yes	Yes	Yes	Limited
Alcohols and alkalis	Yes	Yes	Yes	Yes
Salts	Yes	Yes	Yes	Limited
Note:		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°C to +40°C with fine adjustment in 1°C increments. Along with the pre-cooling function, the Sigma 1-16K features standstill cooling.

Optionally, an ECO mode can be set which switches off the centrifuge after a certain time if it has not been used.

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; min:s)	10 – 99:59
Short run, Continuous run	+ , +
Time increment [s]	1
Speed increment [rpm]	100
Temperature increment [°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	+
ECO Mode	+*

* Only Sigma 1-16K

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
Max. capacity [ml]		
Fixed-angle rotor	36 x 2	36 x 2
Max. RCF	20,627	20,627
Maximum speed [rpm]	15,000	15,000
Minimum speed [rpm]	200	200
Noise level at maximum speed (approx.) [dB(A)]		
Fixed-angle rotor 12134	≤ 59	≤ 48
Max. acceleration time [s]		
Fixed-angle rotor 12134	≤ 16	≤ 16
Max. braking time [s]		
Fixed-angle rotor 12134	≤ 16	≤ 16
Temperature adjustment range [°C]	–	-10 – +40
Power consumption [W]	170	420
Height x width x depth [mm]	271 x 310 x 418	291 x 310 x 660
Height with open lid [mm]	527	547
Weight without rotor [kg]	14	34
Refrigerant		R134a / R513a*
Filling quantity [kg] / Max. permissible pressure [bar]		0.136 / 23
CO_2 equivalent [t]		0.194 / 0.083**

* Complete conversion to R513a from 01/01/2023; ** Refers to the refrigerant R513a

Service Sigma
For maintenance and repairs please contact our Service department at:

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 documents	(item no. 170000)
IQOQ on site	(upon request)

Sigma 1-16 centrifuge
100–240 V, 50/60 Hz (item no. 10045)

Sigma 1-16 centrifuge, IVD version
100–240 V, 50/60 Hz (item no. 10049)

Sigma 1-16K centrifuge
220 – 240 V, 50/60 Hz (item no. 10046)
120 V, 60 Hz (item no. 10047)
100 V, 50/60 Hz (item no. 10048)

Sigma 1-16K centrifuge, IVD version
220 – 240 V, 50/60 Hz (item no. 10052)
120 V, 60 Hz (item no. 10053)
100 V, 50/60 Hz (item no. 10054)

WEEE-Reg.-Nr. DE 76714077

energy saving + silent
cooling fan controlled by demand

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

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 2-7

- 4 x 100 ml
- 4,000 rpm
- 2,540 x g

- 30 x 15 ml
- 4,000 rpm
- 2,486 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

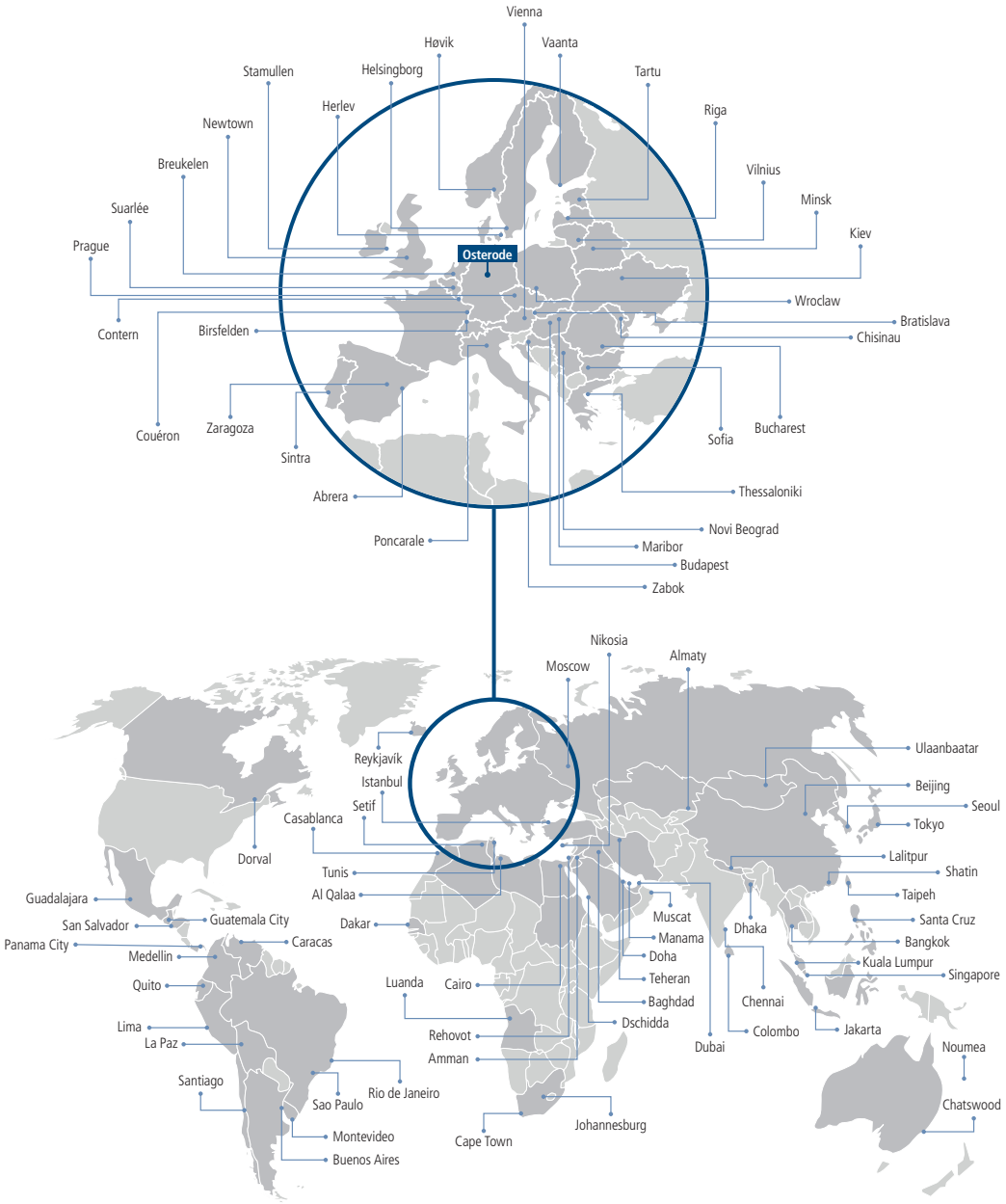
Legend

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

Global service

For local product security

Our trained service partners in over 100 countries ensure consistently high quality in accordance with national regulations. Our specialists can also be engaged quickly around the world, either remotely or on site in person.



Selected locations of our representatives.

An overview of all representatives with detailed contact information can be found at www.sigma-zentrifugen.de

Sigma Laborzentrifugen GmbH
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