



# Sigma 2-16P Sigma 2-16KL Sigma 2-16KHL



Benchtop centrifuge

- Unrefrigerated
- Refrigerated
- Refrigerated/  
heatable



# Multitalent for everyday lab tasks



**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 Sigma 2-16 series features high performance, compact size and versatility. These compact universal centrifuges are easy to use, pleasantly quiet, and provide extraordinary capacity with 4 x 100 ml in a swing-out rotor or 4 x 85 ml in a fixed-angle rotor.

The extensive accessories and high RCF of up to 21.913 x g make the Sigma 2-16P and the refrigerated version 2-16KL ideal for a wide variety of applications in medicine, clinical diagnostics, research, industry and biotechnology. The coolable and heatable version Sigma 2-16KHL is used with specimens whose viscosity needs to be lowered during centrifuging, and in molecular biology to improve the viability of cells.

Along with versatility, the Sigma 2-16 series scores top marks for performance. For example, 50 ml culture tubes can be centrifuged at more than 15,000 x g in a fixed-angle rotor, and up to 24 blood tubes (16 x 100 mm) can be centrifuged in a swing-out rotor.

# Universal centrifuge with a broad application spectrum

## Safe, versatile and intuitive

The Sigma 2-16 series represents a unique combination of performance, versatility and ease of use. With their high RCF, advanced controller and impressive safety features, they excite even demanding users.

Standard routines can be stored and recalled conveniently in up to 50 programs. Ten selectable acceleration and braking curves facilitate optimisation of separation processes and additionally shorten run

times. The refrigerated version Sigma 2-16KL and the coolable and heatable version Sigma 2-16KHL have a high-performance cooling system with precisely settable temperature over the range of -10 °C to +40 °C or -10 °C to +60 °C, respectively. The pre-cooling function "Rapid Temp" allows the centrifuge chamber and accessories to be cooled to a defined temperature. That guarantees optimum safety for work with heat-sensitive specimens.

### Sigma 2-16P

- Universal laboratory centrifuge
- Speed range up to 15,000 rpm
- Maximum capacity: 4 x 100 ml
- Intuitive Spincontrol Universal controller
- Backlit buttons for start, stop and lid opening
- Fifty programs
- Compact, space-saving device
- Low noise level
- Automatic rotor identification
- Zero-maintenance induction motor
- Electromechanical lid opening
- Automatic imbalance monitoring
- Easily cleaned stainless steel chamber
- Window in lid for independent speed checking
- Manufactured according to the latest national and international standards (e.g. EN 61010-2-020)

### Sigma 2-16KL

All features of the Sigma 2-16P, plus:

- Speed range up to 15,300 rpm
- User-friendly Spincontrol L controller
- High-performance cooling
- Temperature setting range: -10 °C to +40 °C
- Rotor cooling also possible at standstill
- Pre-cooling program "Rapid Temp"

### Sigma 2-16KHL

All features of the Sigma 2-16KL, plus:

- Heatable refrigerated centrifuge
- Standstill cooling or heating
- Temperature setting range: -10 °C to +60 °C





# Rotors and accessories

## Large selection of rotors and capacities

The Sigma 2-16 series can be used with fixed-angle and swing-out rotors for PCR, reaction, round-bottom and conical tubes as well as microtiter plates. This extensive portfolio is rounded out with a haematocrit rotor for determination of the volume percentage of erythrocytes in blood.

A total of 17 swing-out and fixed-angle rotors are available, along with a wide range of accessories. The tube capacity extends from 0.2 ml to 85 ml in fixed-angle rotors or 0.2 ml to 100 ml in swing-out rotors. A highlight is the 6 x 50 ml Falcon fixed-angle rotor 12181 with a maximum RCF of up to 15,294 x g – an absolute best

value in this class. Specifically for clinical diagnostics, the innovative 6-place bucket 13296 has been developed to hold virtually all commonly used blood collection tubes. Thanks to the intelligent design, the swing-out rotor allows up to 24 blood collection tubes (16 x 100 mm) per run to be centrifuged at a maximum RCF of up to 3,717 x g.

As a special feature, Sigma can produce custom accessories upon request. The rotors and accessories are made from certified high-grade materials to withstand the most severe stresses.

### Swing-out rotors starting on page 9

#### Swing-out rotor 11170

- Max. capacity: 4 x 100 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,215 / 3,969 x g
- Angle: 90°



▶ p.9

#### Swing-out rotor 11124

- Max. capacity: 24 x 2 ml
- Max. speed (2-16P / 2-16KL): 12,500 / 14,000 rpm
- Max. RCF (2-16P / 2-16KL): 12,927 / 16,215 x g
- Angle: 90°



▶ p.12

### MTP swing-out rotors on page 13

#### Swing-out rotor 11122

- Max. capacity: 6 microtiter plates
- Max. speed (2-16P / 2-16KL): 3,000 rpm
- Max. RCF (2-16P / 2-16KL): 1,218 x g
- Angle: 90°



▶ p.13

#### Swing-out rotor 11123

- Max. capacity: 6 microtiter plates
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,111 x g
- Angle: 90°



▶ p.13

## Fixed-angle rotors starting on page 14

▶ p. 14

### Fixed-angle rotor 12104 for PCR strips

- Max. capacity: 96 x 0.2 ml PCR tubes
- Max. speed (2-16KL): 14,000 rpm
- Max. RCF (2-16KL): 21,475 x g
- Angle: 45° (both rows)



▶ p. 14

### Fixed-angle rotor 12148

- Max. capacity: 24 x 2 ml
- Max. speed (2-16P / 2-16KL): 15,000 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 20,627 / 21,460 x g
- Angle: 45°



▶ p. 15

### Fixed-angle rotor 12133

- Max. capacity: 30 x 2 ml
- Max. speed (2-16P): 12,000 rpm
- Max. RCF (2-16P): 16,099 x g
- Angle: 45°



▶ p. 15

### Fixed-angle rotor 12132

- Max. capacity: 30 x 2 ml
- Max. speed (2-16KL): 14,000 rpm
- Max. RCF (2-16KL): 21,913 x g
- Angle: 45°



▶ p. 16

### Fixed-angle rotor 12180

- Max. capacity: 12 x 5 ml conical
- Max. speed (2-16P / 2-16KL): 14,000 / 15,000 rpm
- Max. RCF (2-16P / 2-16KL): 17,530 / 20,124 x g
- Angle: 40°



▶ p. 16

### Fixed-angle rotor 12141

- Max. capacity: 10 x 10 ml
- Max. speed (2-16P / 2-16KL): 13,500 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 15,485 / 19,890 x g
- Angle: 35°



▶ p. 17

### Fixed-angle rotor 12071

- Max. capacity: 12 x 15 ml + 6 x 50 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,254 x g
- Angle: 35° (both rows)



▶ p. 18

### Fixed-angle rotor 12072

- Max. capacity: 20 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,486 x g
- Angle: 33°



▶ p. 19

### Fixed-angle rotor 12073

- Max. capacity: 30 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,486 x g
- Angle: 33° (both rows)



▶ p. 20

### Fixed-angle rotor 12139

- Max. capacity: 6 x 30 ml round-bottom
- Max. speed (2-16P / 2-16KL): 13,500 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 15,893 / 20,414 x g
- Angle: 29°



▶ p. 20

### Fixed-angle rotor 12181

- Max. capacity: 6 x 50 ml conical
- Max. speed (2-16P / 2-16KL): 10,000 / 12,000 rpm
- Max. RCF (2-16P / 2-16KL): 10,621 / 15,294 x g
- Angle: 28°



▶ p. 21

### Fixed-angle rotor 12138

- Max. capacity: 4 x 85 ml round-bottom
- Max. speed (2-16KL): 9,400 rpm
- Max. RCF (2-16KL): 9,484 x g
- Angle: 27°



▶ p. 22

### Haematocrit rotor 11409

- Max. capacity: 24 capillary tubes
- Max. speed (2-16P / 2-16KL): 12,000 rpm
- Max. RCF (2-16P / 2-16KL): 14,489 x g
- Angle: 90°







## Swing-out rotor 11170













### Round bucket 13299 (1 set = 2 pcs.)\*

















- Max. capacity: 4 x 100 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,215 / 3,969 x g
- Max. tube length in middle of bucket without / with cap: 126 / 117 mm
- Hermetically closable with cap 17299
- Tmin at maximum speed: <4°C
- Angle: 90°

\* Bucket not autoclavable



The regular greasing of the rotor bolts is no longer necessary – this minimises non-productive time and guarantees maximum safety.

Tube										
Rated capacity (filling volume) [ml]	0,5	1,5	2	5	5	6 (5)	7	10	10	10
Diameter x length [mm]	10.8 x 46.5	10.7 x 42	10.7 x 42	17 x 60	12 x 75	12 x 100	12 x 100	16.1 x 81.1	16.1 x 81.1	16.1 x 81.1
Tube material	PP	PP	PP	PPCO	PS	Glass	Glass	PF	PC	PPCO
Item no.	Paediatrics	15008	15040	–	15060	15007	15027	15000	15010	15039
<b>Adapter</b>										
for round bucket 13299										
Bore diameter x length [mm]	11.1 x 35		17 x 52		13.5 x 52			16.5 x 56		
Tubes per adapter / rotor	4 / 16		3 / 12		5 / 20			4 / 16		
Centrifuging radius [mm]	137		139		139			138		
Item no.	14301*		14309		14302			14303		

Tube										
Rated capacity (filling volume) [ml]	10	10	14	14	15 (13)	15	25	25	25	30 (26)
Diameter x length [mm]	16 x 100	16 x 100	17 x 100	17 x 100	17 x 110	16.5 x 120	25 x 90	24 x 100	24 x 100	25.3 x 98
Tube material	Glass	Glass	PS	PP	Glass	PP	PP	Glass	Glass	PF
Item no.	15015	15024	15020	15023	15022	15115	–	15025	15026	15029
<b>Adapter</b>										
for round bucket 13299										
Bore diameter x length [mm]	16.5 x 56		17.5 x 67.5			17 x 76	25.5 x 56	25.5 x 58		
Tubes per adapter / rotor	4 / 16		3 / 12			2 / 8	1 / 4	1 / 4		
Centrifuging radius [mm]	138		140			126	138	140		
Item no.	14303		14307			14300**	14308	14304		

\* If used with paediatric tubes, only partial loading is possible in some cases \*\* Only possible without cap 17299
















## Swing-out rotor 11170







### Round bucket 13299 (1 set = 2 pcs.)\*

- Max. capacity: 4 x 100 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,215 / 3,969 x g
- Max. tube length in middle of bucket without / with cap: 126 / 117 mm
- Hermetically closable with cap 17299
- Tmin at maximum speed: <math><4^{\circ}\text{C}</math>
- Angle:  $90^{\circ}$

\* Bucket not autoclavable



Tube									
Rated capacity (filling volume) [ml]	30 (26)	30 (28)	30	30	50	50	50	50	50
Diameter x length [mm]	25.3 x 98	25.3 x 98	24 x 105	25 x 107	34 x 100	34 x 100	35 x 100	34 x 100	28 x 115
Tube material	PPCO	PC	Glass	PP	Glass	Glass	Glass	PC	PP
Item no.	15032	15030	15033	–	15045	15050	15056	15049	–
<b>Adapter</b>									
for round bucket 13299									
Bore diameter x length [mm]		25.5 x 58	25.5 x 56		35.5 x 58		29.5 x 67	29.6 x 90	
Tubes per adapter / rotor		1 / 4	1 / 4		1 / 4		1 / 4	1 / 4	
Centrifuging radius [mm]		140	138		140		139	142	
Item no.		14304	14308		14305		14310*	14299	

Tube				
Rated capacity (filling volume) [ml]	100 (75)	100 (90)	100	100
Diameter x length [mm]	44 x 100	44 x 100	44 x 100	45 x 100
Tube material	Glass	Glass	Glass	PC
Item no.	15078	15106	15100	15103
<b>Adapter</b>				
for round bucket 13299				
Bore diameter x length [mm]		45.1 x 98.5		
Tubes per adapter / rotor		1 / 4		
Centrifuging radius [mm]		139		
Item no.		16051		

## Swing-out rotor 11170

### Round bucket 13299 (1 set = 2 pcs.)\*

- Max. capacity: 4 x 100 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,215 / 3,969 x g
- Max. tube length in middle of bucket without / with cap: 126 / 117 mm
- Hermetically closable with cap 17299
- Tmin at maximum speed: <4°C
- Angle: 90°

\* Bucket not autoclavable



## Swing-out rotor 11170





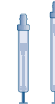

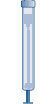

### Bucket 13296 (1 set = 2 pcs.)\*

- Max. capacity: 24 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,011 / 3,717 x g
- Tmin at maximum speed: <4°C
- Angle: 90°

\* Bucket not autoclavable








### Blood and urine tubes

								
Rated capacity (filling volume) [ml]	1.1 – 1.4	2.7 – 5	1.6 – 6	1.8 – 7	4 – 8.5	6 – 10	10	9 – 10
Diameter x length with lid [mm]	8 x 82	11 x 82–108	13 x 81–106	13 x 81–107	15 x 91–108	16 x 107	15 x 118	16 x 108
Tube material	PP	PP	PP	PET	PP	PET	PP	PP
Item no.	–	–	–	–	–	–	–	–







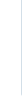

### Adapter

for round bucket 13299



					
Bore diameter x length [mm]	13.5 x 52		16.5 x 56	16.5 x 56	17.5 x 67.5
Tubes per adapter / rotor	5 / 20		4 / 16	4 / 16	3 / 12
Centrifuging radius [mm]	139		138	138	140
Item no.	14302*		14303	14303**	14307



### Tube

								
Rated capacity (filling volume) [ml]	10	10	10	10	10	14	14	15 (13)
Diameter x length [mm]	16 x 100	16 x 100	16.1 x 81.1	16.1 x 81.1	16.1 x 81.1	17 x 100	17 x 100	17x110
Tube material	Glass	Glass	PF	PC	PPCO	PS	PP	Glass
Item no.	15015	15024	15000	15010	15039	15020	15023	15022

### Adapter

for bucket 13296



		
Bore diameter x length [mm]	17.5 x 64.5	17.5 x 67.5
Tubes per bucket / rotor	6 / 24	6 / 24
Centrifuging radius [mm]	130	133
Item no.	16020	–

## Swing-out rotor 11170

## Bucket 13296 (1 set = 2 pcs.)\*

- Max. capacity: 24 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,500 / 5,000 rpm
- Max. RCF (2-16P / 2-16KL): 3,011 / 3,717 x g
- Tmin at maximum speed: <4°C
- Angle: 90°

\* Bucket not autoclavable












## Swing-out rotor 11124

## with 3 sets (quantity 6) buckets 13124 and aluminium lid 17878

- Max. capacity: 24 x 2 ml
- Max. speed (2-16P / 2-16KL): 12,500 / 14,000 rpm
- Max. RCF (2-16P / 2-16KL): 12,927 / 16,215 x g
- Hermetically closable with aluminium lid 17878
- Tmin at maximum speed: <4°C
- Angle: 90°



## Blood and urine tubes







									
Rated capacity (filling volume) [ml]	1.1–1.4	2.7–5	1.6–6	1.8–7	4–10	8–9	6–10	9–10	10
Diameter x length with lid [mm]	8 x 82	11 x 82–108	13 x 81–106	13 x 81–107	15 x 91–108	16 x 107	16 x 106	16 x 108	15 x 118
Tube material	PP	PP	PP, PET	PET	PP, PET	PET	PET	PP	PP
Item no.	–	–	–	–	–	–	–	–	–

## Adapter

for  
bucket  
13296

Bore diameter x length [mm]	17.5 x 67.5
Tubes per bucket / rotor	6 / 24
Centrifuging radius [mm]	133
Item no.	–

## 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  
bucket  
13124

Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 24	1 / 24	1 / 24	1 / 12*	– / 24
Centrifuging radius [mm]	70	72	72	73	74
Item no.	13021	13000	13002	13074	–

## MTP swing-out rotor 11122

### with 1 set (quantity 2) rectangular buckets 13222

- Max. plate height: 56 mm
- Max. speed (2-16P / 2-16KL): 3,000 rpm
- Max. RCF (2-16P / 2-16KL): 1,218 x g
- Max. load per carrier: 337 g
- Tmin at maximum speed: <4°C
- Angle: 90°



## MTP swing-out rotor 11123

### with 1 set (quantity 2) rectangular buckets 13223

- Max. plate height: 50 mm
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,111 x g
- Max. load per carrier: 346 g
- Tmin at maximum speed: <4°C
- Angle: 90°



### Plate



Description	MTP (without lid)	MTP (with lid)	DWP	PCR plate 96-fold
W x D x H [mm]	128 x 86 x 15	128 x 86 x 17.5	128 x 86 x 44.5	128 x 86 x 20

### Adapter

for  
rectangular  
bucket  
13222



Bore diameter x length [mm]	-			
Plates per rotor	6	6	2	4
Centrifuging radius [mm]	121			
Item no.	-			

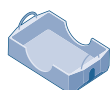
### Plate



Description	MTP (without lid)	MTP (with lid)	DWP	PCR plate 96-fold
W x D x H [mm]	128 x 86 x 15	128 x 86 x 17.5	128 x 86 x 44.5	128 x 86 x 20

### Adapter

for  
rectangular  
bucket  
13223



Bore diameter x length [mm]	-			
Plates per rotor	6	4	2	4
Centrifuging radius [mm]	118			
Item no.	-			

## Fixed-angle rotor 12104

### with aluminium lid 17867

- Max. capacity: 96 x 0.2 ml PCR tubes
- Max. speed (2-16KL): 14,000 rpm
- Max. RCF outer row (2-16KL): 21,475 x g
- Max. RCF inner row (2-16KL): 18,297 x g
- Hermetically closable with aluminium lid 17867
- Max. speed for 4°C: 13,200 rpm
- Angle: 45° (both rows)





## Fixed-angle rotor 12148

### with aluminium lid 17864

- Max. capacity: 24 x 2 ml
- Max. speed (2-16P / 2-16KL): 15,000 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 20,627 / 21,460 x g
- Hermetically closable with aluminium lid 17864
- 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 12104



		
Bore diameter x length [mm]	6.3 x 15.5	6.3 x 15.5
Tubes per rotor	96	12 x 8
Centrifuging radius (outer / inner) [mm]	98 / 83	98 / 83
Item no.	–	–







### 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 12148



						
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8 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 12133

### with aluminium lid 17863

- Max. capacity: 30 x 2 ml
- Max. speed (2-16P): 12,000 rpm
- Max. RCF (2-16P): 16,099 x g
- Hermetically closable with aluminium lid 17863
- Angle: 45°









## Fixed-angle rotor 12132

### with aluminium lid 17849

- Max. capacity: 30 x 2 ml
- Max. speed (2-16KL): 14,000 rpm
- Max. RCF (2-16KL): 21,913 x g
- Hermetically closable with aluminium lid 17849
- Max. speed for 4°C: 13,500 rpm
- Angle: 45°







### 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 12133



					
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 30	1 / 30	1 / 30	1 / 30	- / 30
Centrifuging radius [mm]	96	98	98	91	100
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 12132



					
Bore diameter x length [mm]	6.3 x 18.5	6 x 45	8 x 45	11.1 x 29.5	11.1 x 38.5
Tubes per adapter / rotor	1 / 30	1 / 30	1 / 30	1 / 30	- / 30
Centrifuging radius [mm]	96	98	98	91	100
Item no.	13021	13000	13002	13074*	-

## Fixed-angle rotor 12180

### with aluminium lid 17180

- Max. capacity: 12 x 5 ml conical
- Max. speed (2-16P / 2-16KL): 14,000 / 15,000 rpm
- Max. RCF (2-16P / 2-16KL): 17,530 / 20,124 x g
- Hermetically closable with aluminium lid 17180
- Tmin at maximum speed: <4°C
- Angle: 40°




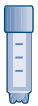



## Fixed-angle rotor 12141

### with aluminium lid 17850

- Max. capacity: 10 x 10 ml
- Max. speed (2-16P / 2-16KL): 13,500 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 15,485 / 19,890 x g
- Hermetically closable with aluminium lid 17850
- Tmin at maximum speed: <4°C
- Angle: 35°







### 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) [ml]	10	10	10
Diameter x length [mm]	16.1 x 81.1	16.1 x 81.1	16.1 x 81.1
Tube material	PF	PC	PPCO
Item no.	15000	15010	15039

### Adapter

for fixed-angle rotor 12141



Bore diameter x length [mm]	16.3 x 69
Tubes per adapter / rotor	– / 10
Centrifuging radius [mm]	76
Item no.	–































## Fixed-angle rotor 12071

### with 12 buckets 13011 and 6 buckets 13151

- Max. capacity: 12 x 15 ml + 6 x 50 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF outer row (2-16P / 2-16KL): 2,254 x g
- Max. RCF inner row (2-16P / 2-16KL): 1,842 x g
- Tmin at maximum speed: <math><4^{\circ}\text{C}</math>
- Angle:  $35^{\circ}$  (both rows)



Tube										
Rated capacity (filling volume) [ml]	5	6 (5)	10	10	14	14	15	25	30	50
Diameter x length [mm]	12 x 75	12 x 100	16.1 x 81.1	16 x 100	17 x 100	17 x 100	16.5 x 120	25 x 90	25 x 107	29 x 117
Tube material	PS	Glass	PPCO	Glass	PS	PP	PP	PP	PP	PP
Item no.	15060	15007	15039	15015	15020	15023	15115	–	–	15151
<b>Adapter</b>										
for fixed-angle rotor 12071										
Bore diameter x length [mm]	13.5 x 69	12.5 x 85	17.9 x 77.8							25.5 x 71
Tubes per adapter / rotor	1 / 12	1 / 12	1 / 12							1 / 6
Centrifuging radius (outer / inner) [mm]	104 / –	120 / –	116 / –							– / 80
Item no.	13071	13072	13073							13064

Blood and urine tubes										
Rated capacity (filling volume) [ml]	1.1–1.4	2.7–3.1	1.6–5.3	2.7–5	7.5–8.5	4.9–6	9.5–10	6–10	9-10	8
Diameter x length with cap [mm]	8 x 82	11 x 82	13 x 81–91	11 x 82–108	15 x 108	13 x 106–107	15 x 106–118	16 x 106–107	16 x 108	16 x 131
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP	Glass
Item no.	–	–	–	–	–	–	–	–	–	–
<b>Adapter</b>										
for fixed-angle rotor 12071										
Bore diameter x length [mm]		13.8 x 60	12.5 x 85							17.9 x 77.8
Tubes per adapter / rotor		1 / 12	1 / 12							1 / 12
Centrifuging radius (outer / inner) [mm]		95 / –	120 / –							116 / –
Item no.		13070	13072							13073










## Fixed-angle rotor 12072

### with 20 buckets 13011

- Max. capacity: 20 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF (2-16P / 2-16KL): 2,486 x g
- Tmin at maximum speed: <4°C
- Angle: 33°






### Tube

										
Rated capacity (filling volume) [ml]	5	6 (5)	10	10	10	10	14	14	15 (13)	15
Diameter x length [mm]	12 x 75	12 x 100	16.1 x 81.1	16.1 x 81.1	16 x 100	16 x 100	17 x 100	17 x 100	17 x 110	16.5 x 120
Tube material	PS	Glass	PC	PPCO	Glass	Glass	PS	PP	Glass	PP
Item no.	15060	15007	15010	15039	15015	15024	15020	15023	15022	15115







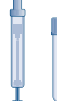



### Adapter

for fixed-angle rotor 12072



										
Bore diameter x length [mm]	13.5 x 69	12.5 x 85	17.9 x 77.8	17.9 x 87.8						
Tubes per adapter / rotor	1 / 20	1 / 20	1 / 20	- / 20						
Centrifuging radius [mm]	117	133	129	139						
Item no.	13071	13072	13073	-						






### Blood and urine tubes

										
Rated capacity (filling volume) [ml]	1.1–1.4	2.7–3.1	1.6–5.3	2.7–5	7.5–8.5	4.9–6	9.5–10	6–10	9–10	8
Diameter x length with cap [mm]	8 x 82	11 x 82	13 x 81–91	11 x 82–108	15 x 108	13 x 106–107	15 x 106–118	16 x 106–107	16 x 108	16 x 131
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP	Glass
Item no.	-	-	-	-	-	-	-	-	-	-

### Adapter

for fixed-angle rotor 12072











								
Bore diameter x length [mm]	13.8 x 60	12.5 x 85	17.9 x 77.8	17.9 x 87.8			17.9 x 77.8	17.9 x 87.8
Tubes per adapter / rotor	1 / 20	1 / 20	1 / 20	- / 20			1 / 20	- / 20
Centrifuging radius [mm]	108	133	129	139			129	139
Item no.	13070	13072	13073	-			13073	-

## Fixed-angle rotor 12073

### with 30 buckets 13011

- Max. capacity: 30 x 15 ml
- Max. speed (2-16P / 2-16KL): 4,000 rpm
- Max. RCF outer row (2-16P / 2-16KL): 2,486 x g
- Max. RCF inner row (2-16P / 2-16KL): 2,111 x g
- Tmin at maximum speed: <4°C
- Angle: 33° (both rows)






Tube										
Rated capacity (filling volume) [ml]	5	6 (5)	10	10	10	10	14	14	15 (13)	15
Diameter x length [mm]	12 x 75	12 x 100	16.1 x 81.1	16.1 x 81.1	16 x 100	16 x 100	17 x 100	17 x 100	17 x 110	16.5 x 120
Tube material	PS	Glass	PC	PPCO	Glass	Glass	PS	PP	Glass	PP
Item no.	15060	15007	15010	15039	15015	15024	15020	15023	15022	15115











### Adapter

for fixed-angle rotor 12073



Adapter								
Bore diameter x length [mm]	13.5 x 69	12.5 x 85	17.9 x 77.8				17.9 x 87.8	
Tubes per adapter / rotor	1 / 30	1 / 30	1 / 30				- / 30	
Centrifuging radius (outer / inner) [mm]	117 / 96	133 / 112	129 / 108				139 / 118	
Item no.	13071	13072	13073				-	








### Blood and urine tubes

Blood and urine tubes										
Rated capacity (filling volume) [ml]	1.1–1.4	2.7–3.1	1.6–5.3	2.7–5	7.5–8.5	4.9–6	9.5–10	6–10	9–10	8
Diameter x length with cap [mm]	8 x 82	11 x 82	13 x 81–91	11 x 82–108	15 x 108	13 x 106–107	15 x 106–118	16 x 106–107	16 x 108	16 x 131
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP	Glass
Item no.	-	-	-	-	-	-	-	-	-	-

### Adapter

for fixed-angle rotor 12073



Adapter							
Bore diameter x length [mm]	13.8 x 60	12.5 x 85	17.9 x 77.8			17.9 x 87.8	17.9 x 77.8
Tubes per adapter / rotor	1 / 30	1 / 30	1 / 30			- / 30	1 / 30
Centrifuging radius (outer / inner) [mm]	108 / 87	133 / 112	129 / 108			139 / 118	129 / 108
Item no.	13070	13072	13073			-	13073

## Fixed-angle rotor 12139

### with aluminium lid 17851

- Max. capacity: 6 x 30 ml round-bottom
- Max. speed (2-16P / 2-16KL): 13,500 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 15,893 / 20,414 x g
- Hermetically closable with aluminium lid 17851
- Tmin at maximum speed: <4°C
- Angle: 29°









## Fixed-angle rotor 12181

### with aluminium lid 17931

- Max. capacity: 6 x 50 ml conical
- Max. speed (2-16P / 2-16KL): 10,000 / 12,000 rpm
- Max. RCF (2-16P / 2-16KL): 10,621 / 15,294 x g
- Hermetically closable with aluminium lid 17931
- Tmin at maximum speed: <4°C
- Angle: 28°





### Tube

						
Rated capacity (filling volume) [ml]	10	10	10	30 (26)	30 (26)	30 (28)
Diameter x length [mm]	16.1 x 81.1	16.1 x 81.1	16.1 x 81.1	25.3 x 98	25.3 x 98	25.3 x 98
Tube material	PF	PC	PPCO	PF	PPCO	PC
Item no.	15000	15010	15039	15029	15032	15030





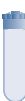

### Adapter

for fixed-angle rotor 12139



		
Bore diameter x length [mm]	16.5 x 70	26 x 83
Tubes per adapter / rotor	1 / 6	- / 6
Centrifuging radius [mm]	68	75
Item no.	13059	-





### Tube

						
Rated capacity (filling volume) [ml]	15	25	30	50 (38)	50 (43)	50
Diameter x length [mm]	16.5 x 120	25 x 90	25 x 107	28.8 x 107	28.5 x 107	29 x 117
Tube material	PP	PP	PP	PPCO	PF	PP
Item no.	15115	-	-	15052	15051	15151

### Adapter

for fixed-angle rotor 12181













				
Bore diameter x length [mm]	17 x 107	25.5 x 71	29.5 x 95	29.5 x 100
Tubes per adapter / rotor	1 / 6	1 / 6	1 / 6	- / 6
Centrifuging radius [mm]	94	72	90	95
Item no.	13060	13064	13079	-

## Fixed-angle rotor 12138

### with aluminium lid 17897

- Max. capacity: 4 x 85 ml round-bottom
- Max. speed (2-16KL): 9,400 rpm
- Max. RCF (2-16KL): 9,484 x g
- Hermetically closable with aluminium lid 17897
- Tmin at maximum speed: <4°C
- Angle: 27°














Tube										
Rated capacity (filling volume) [ml]	10	10	10	14	14	15	15	30 (26)	30 (26)	30 (28)
Diameter x length [mm]	16.1 x 81.1	16.1 x 81.1	16.1 x 81.1	17 x 100	17 x 100	17.5 x 106	16.5 x 120	25.3 x 98	25.3 x 98	25.3 x 98
Tube material	PF	PC	PPCO	PS	PP	HS glass	PP	PF	PPCO	PC
Item no.	15000	15010	15039	15020	15023	15085	15115	15029	15032	15030

### Adapter

for fixed-angle rotor 12138







Adapter				
Bore diameter x length [mm]	16.2 x 71	18 x 87	17 x 107	26 x 83
Tubes per adapter / rotor	2 / 8	1 / 4	1 / 4	1 / 4
Centrifuging radius [mm]	67	88	95	79
Item no.	13084	16019	13081	13083

Tube							
Rated capacity (filling volume) [ml]	30	50 (38)	50 (43)	50	50	85 (73)	85 (76)
Diameter x length [mm]	23.6 x 106	28.8 x 107	28.5 x 107	28.5 x 101.5	29 x 117	38 x 112	38 x 112
Tube material	HS glass	PPCO	PF	Stainless steel	PP	PF	PPCO
Item no.	15086	15052	15051	13055	15151	15080	15076

### Adapter

for fixed-angle rotor 12138



Adapter				
Bore diameter x length [mm]	24.5 x 88	29 x 97	30 x 100	38.3 x 99
Tubes per adapter / rotor	1 / 4	1 / 4	1 / 4	- / 4
Centrifuging radius [mm]	89	93	96	96
Item no.	16031	13082	13080	-

## Haematocrit rotor 11409

### with lid and evaluation card 17029

- Max. capacity: 24 capillary tubes
- Max. speed (2-16P / 2-16KL): 12,000 rpm
- Max. RCF (2-16P / 2-16KL): 14,489 x g
- T<sub>min</sub> 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 11409



Bore diameter x length [mm]	–
Capillary tubes per rotor	24
Centrifuging radius [mm]	90
Item no.	–



Optionally available:  
Evaluation disc 17024

# Cleanroom

## Robust and resistant



### Cleanroom coating

Available for all accessories

An extremely resistant cleanroom coating is available from Sigma for all aluminium buckets and rotors. This coating provides reliable corrosion protection for accessories, especially where aggressive chemicals are used. The cleanroom coating can even withstand

exposure to sodium hydroxide and hydrochloric acid. The surfaces are also food-grade (FDA certified) and can easily be cleaned without residues.

# 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>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>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 L Controller

## Easy to operate, advanced safety features

The Spincontrol L controller combines intuitive operation with a multitude of options in a well-conceived package. It is fundamentally based on a Sigma patent. The brilliantly simple design of the Spincontrol L has only three buttons (Start, Stop, and Lid) along with the proven multifunction knob. Operating parameters can be entered conveniently and stored in up to 50 programs using the intuitive user interface. The backlit LCD display is easy to read at a distance.

A special feature is automatic monitoring of the number of operational rotor cycles. The integrated cycle counter keeps track of all completed rotor runs and informs the user when a defined limit value is reached. This alert system is based on real measurement data and helps to reliably avoid damage to rotors and the centrifuge.

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 2-16KL and 2-16KHL feature optionally selectable standstill cooling.

Display	Backlit LCD
Constant display of setpoints and actual values	+
Speed/RCF display	+
Timer (s; h:min)	10 – 99:59
Timer tracks time after setpoint speed is reached; switchable	+, +
Short run, Continuous run	+, +
Time increment [s]	1
Speed increment [rpm]	100
Temperature increment [°C]	1*
RCF increment [x g]	10
Programs	50
Acceleration curves	10
Braking curves	10
Free run-out	+
Automatic cap opening at end of run, switchable	+, +
Standstill cooling	+*
Pre-cooling program "Rapid Temp"	+*
Audible signal, switchable	+, +
Visual standstill indication	+
Rotor cycle monitoring	+
Rotor end-of-life warning	+
Lockable controller	+
Microprocessor control	+

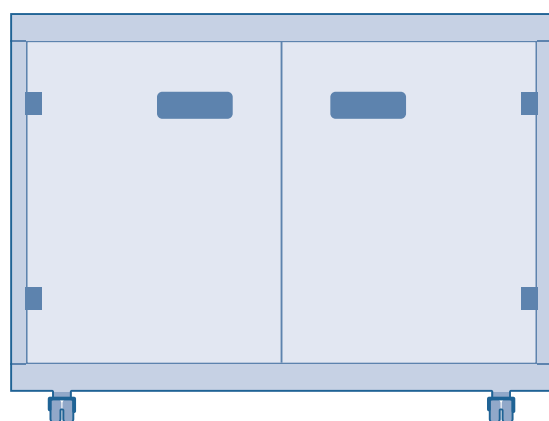
\* Only Sigma 2-16KL and 2-16KHL





# Centrifuge tables

Sigma centrifuge tables are available in six different sizes. Matched to the corresponding centrifuge dimensions, they combine convenient work height with an optimally calculated footprint. The tables are made from coated sheet steel and are equipped with a storage compartment (with two doors) and a convenient pull-out shelf. Lockable castors allow the centrifuge tables to be easily moved and positioned in the laboratory.



## Centrifuge table 17920

For Sigma 2-16KL

W x H x D [mm]: 600 x 501 x 550

## Centrifuge table 17921

For Sigma 6-16KS

W x H x D [mm]: 790 x 515 x 684

## Centrifuge table 17922

For Sigma 6-16S

W x H x D [mm]: 581 x 481 x 684

## Centrifuge table 17923

For Sigma 3-30KS

W x H x D [mm]: 570 x 481 x 616

## Centrifuge table 17926

For Sigma 3-16KL, 3-18KS, 4-16KS

W x H x D [mm]: 650 x 501 x 647

## Centrifuge table 17927

For Sigma 3-16L, 4-5L, 4-16S

W x H x D [mm]: 490 x 497 x 647

# Premium quality

## Made in Germany

The Sigma 2-16 series meets the highest technical requirements and 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 2-16P	Sigma 2-16KL	Sigma 2-16KHL
<b>Max. capacity [ml]</b>			
Swing-out rotor	4 x 100	4 x 100	4 x 100
Fixed-angle rotor	6 x 50	4 x 85	4 x 85
<b>Max. RCF</b>	20,627	21,913	21,913
<b>Maximum speed [rpm]</b>	15,000	15,300	15,300
<b>Minimum speed [rpm]</b>	100	100	100
<b>Noise level at maximum speed (approx.) [dB(A)]</b>			
Fixed-angle rotor 12141	≤ 53	≤ 53	≤ 53
Swing-out rotor 11170 with buckets 13299 and caps	≤ 65	≤ 52	≤ 52
<b>Max. acceleration time [s]</b>			
Fixed-angle rotor 12141	38	31	31
Swing-out rotor 11170 with buckets 13299 and caps	15	17	17
<b>Max. braking time [s]</b>			
Fixed-angle rotor 12141	37	37	37
Swing-out rotor 11170 with buckets 13299 and caps	15	15	15
<b>Temperature adjustment range [°C]</b>	–	-10–+40	-10–+60
<b>Power consumption [W]</b>	340	720	720
<b>Height x width x depth [mm]</b>	300 x 365 x 452	310 x 550 x 570	310 x 550 x 570
<b>Height with open cap [mm]</b>	610	705	705
<b>Weight without rotor [kg]</b>	32	60	60
<b>Refrigerant</b>		R134a	R134a
Filling quantity [kg] / Max. permissible pressure [bar]		0.255 / 23	0.255 / 23
CO <sub>2</sub> equivalent [t]		0.365	0.365

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

#### Sigma 2-16P centrifuge

220–240 V, 50/60 Hz (item no. 10155)  
 120 V, 50/60 Hz (item no. 10156)  
 100 V, 50/60 Hz (item no. 10157)

#### Sigma 2-16KL centrifuge

220–240 V, 50/60 Hz (item no. 10350)  
 120 V, 60 Hz (item no. 10351)  
 100 V, 50/60 Hz (item no. 10352)



#### Sigma 2-16KL centrifuge, inert gas

220–240 V, 50/60 Hz (item no. 90903)

#### Sigma 2-16KHL centrifuge

220–240 V, 50/60 Hz (item no. 10353)

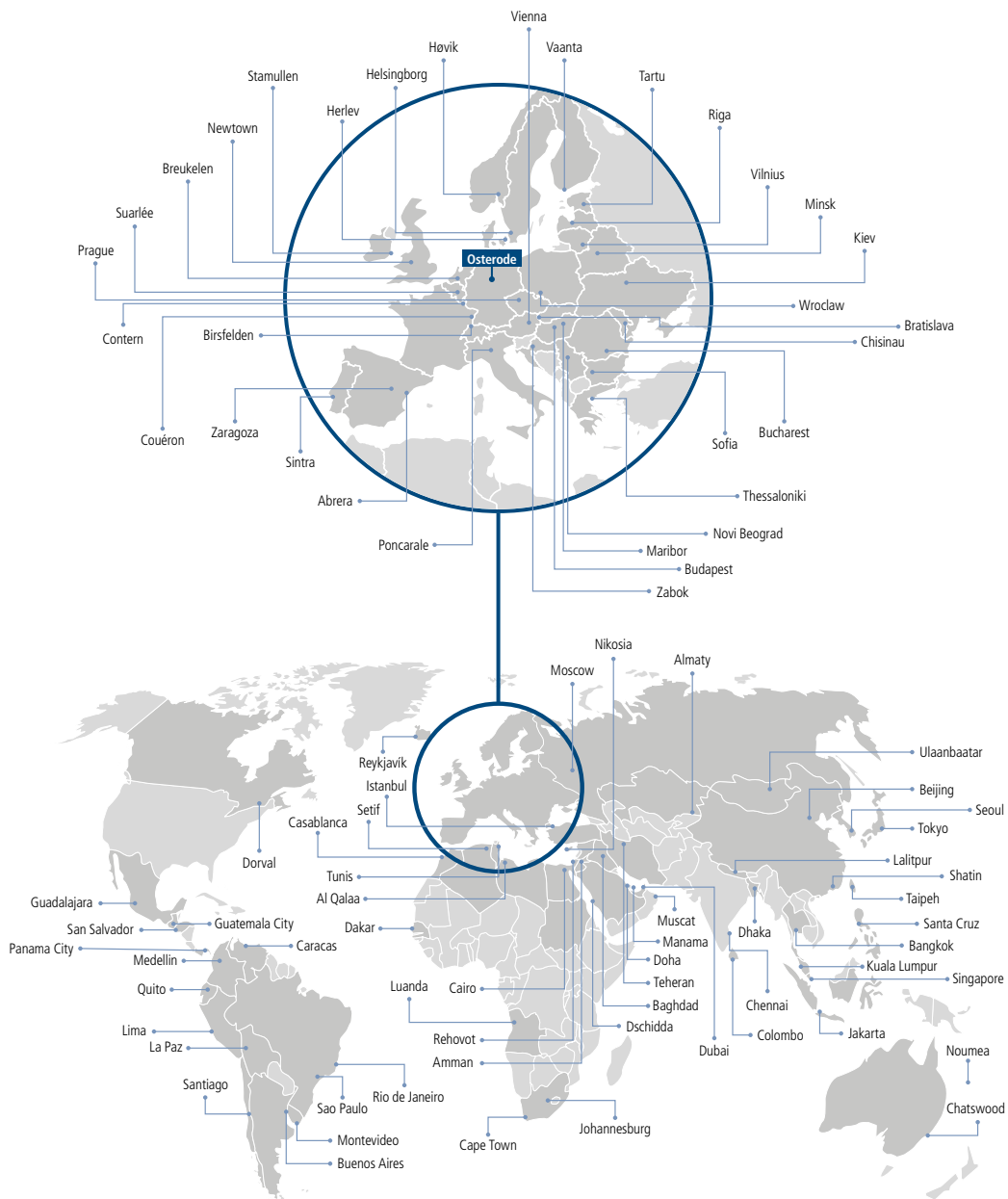
#### Sigma 2-16KHL centrifuge, inert gas

220–240 V, 50/60 Hz (item no. 91277)

# 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/en/sales-partners](http://www.sigma-zentrifugen.de/en/sales-partners)

