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

Benchtop centrifuge

- Unrefrigerated
- Refrigerated
- Refrigerated/ heatable

www.sigma-zentrifugen.de

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 ml) 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

SIGMA
11123

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

▸ p.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.12

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°

MTP swing-out rotors on page 13

▸ p.13

Swing-out rotor 11222

- 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°

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

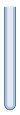
Haematocrit rotor 11409

- 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°

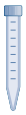
Swing-out rotor 11170

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°

Tube										
Rated capacity (filling volume) [ml]	1.5	2	5	5	6 (5)	7	10	10	10	10
Diameter x length [mm]	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	16 x 100
Tube material	PP	PP	PPCO	PS	Glass	Glass	PF	PC	PPCO	Glass
Item no.	15008	15040	–	15060	15007	15027	15000	15010	15039	15015

Adapter 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	14	14	15 (13)	15	25	25	25	30 (26)	30 (26)
Diameter x length [mm]	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	25.3 x 98
Tube material	Glass	PS	PP	Glass	PP	PP	Glass	Glass	PF	PPCO
Item no.	15024	15020	15023	15022	15115	–	15025	15026	15029	15032

Adapter 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

* 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: <4°C
- Angle: 90°

Tube										
Rated capacity (filling volume) [ml]	30 (28)	30	30	50	50	50	50	50	50	100 (75)
Diameter x length [mm]	25.3 x 98	24 x 105	25 x 107	34 x 100	34 x 100	35 x 100	34 x 100	29 x 117	29 x 117	44 x 100
Tube material	PC	Glass	PP	Glass	Glass	Glass	PC	PP	PP	Glass
Item no.	15030	15033	–	15045	15050	15056	15049	–	15151	15078
Adapter 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	45.1 x 98.5
Tubes per adapter / rotor	1 / 4		1 / 4	1 / 4				1 / 4	1 / 4	1 / 4
Centrifuging radius [mm]	140		138	140				139	142	139
Item no.	14304		14308	14305				14310*	14299	16051

Tube			
Rated capacity (filling volume) [ml]	100 (90)	100	100
Diameter x length [mm]	44 x 100	44 x 100	45 x 100
Tube material	Glass	Glass	PC
Item no.	15106	15100	15103
Adapter 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		

* 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: <4°C
- Angle: 90°

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°

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 cap [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 adapter / rotor	6 / 24		6 / 24					
Centrifuging radius [mm]	130		133					
Item no.	16020		–					

* Only possible without cap 17299

Swing-out rotor 11170

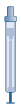
Bucket 13296 (1 set = 2 pcs.)

- 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°

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	8
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	16 x 131
Tube material	PP	PP	PP, PET	PET	PP, PET	PET	PET	PP	PP	Glass
Item no.	–	–	–	–	–	–	–	–	–	–
Adapter for bucket 13296										
Bore diameter x length [mm]	17.5 x 67.5					17.5 x 67.5				17.5 x 67.5
Tubes per adapter / rotor	6 / 24					4 / 16*				2 / 8*
Centrifuging radius [mm]	133					133				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 / 24	– / 24	
Centrifuging radius [mm]	70	72	72	73	74	
Item no.	13021	13000	13002	13074	–	

* Observe loading

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°

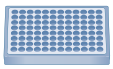
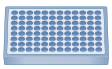
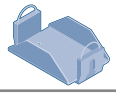
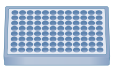
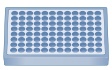
Plate				
Description	MTP (without lid)	MTP (with lid)	DWP	PCR plate 96-fold
W x D x H [mm]	128 x 86 x 15	128 x 86 x 17.5	128 x 86 x 44.5	128 x 86 x 20
Adapter				
for rectangular bucket 13222 				
Bore diameter x length [mm]	–			
Plates per rotor	6	6	2	4
Centrifuging radius [mm]	121			
Item no.	–			

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*	–	

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

Fixed-angle rotor 12133

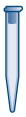
with aluminium lid 17863

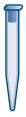
- Max. capacity: 30 x 2 ml
- Max. speed (2-16P): 12,000 rpm
- Max. RCF (2-16P): 16,099 x g
- Hermetically closable with aluminium lid 17863
- Angle: 45°

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*	–	

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

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.	–		

** Only possible without lid 17180

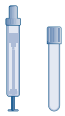
Fixed-angle rotor 12071

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: <4°C
- Angle: 35° (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

Adapter for fixed-angle rotor 12071									
Bore diameter x length [mm]	13.5 x 69	12.5 x 85	17.9 x 77.8	17.9 x 87.8				25.5 x 71	30 x 100
Tubes per adapter / rotor	1 / 12	1 / 12	1 / 12	– / 12				1 / 6	– / 6
Centrifuging radius (outer / inner) [mm]	104 / –	120 / –	116 / –	126 / –				– / 80	– / 103
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
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
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP
Item no.	–	–	–	–	–	–	–	–	–

Adapter for fixed-angle rotor 12071							
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 / 12		1 / 12	1 / 12	– / 12		1 / 12
Centrifuging radius (outer / inner) [mm]	95 / –		120 / –	116 / –	126 / –		116 / –
Item no.	13070		13072	13073	–		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
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
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP
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
Tubes per adapter / rotor	1 / 20			1 / 20	1 / 20	– / 20			1 / 20
Centrifuging radius [mm]	108			133	129	139			129
Item no.	13070			13072	13073	–			13073

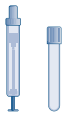
Fixed-angle rotor 12073

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				
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									
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
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
Tube material	PP	PP	PET	PP	PP	PET	PP, PET	PET	PP
Item no.	–	–	–	–	–	–	–	–	–

Adapter for fixed-angle rotor 12073					
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

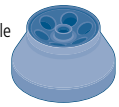
- Max. capacity: 6 x 30 ml round-bottom
- Max. speed (2-16P / 2-16KL): 13,500 / 15,300 rpm
- Max. RCF (2-16P / 2-16KL): 15,893 / 20,414 x g
- Hermetically closable with aluminium lid 17851
- Tmin at maximum speed: <4°C
- Angle: 29°

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				
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				
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	–

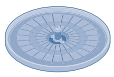
Haematocrit rotor 11409

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
- 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 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)
Autoclave resistant	Yes	Yes	No	No	Yes
Elasticity	Not elastic	Not elastic	Not elastic	Good	Not elastic
Transparency	Transparent	Translucent	Transparent	Translucent	Translucent
Recommended temperature range [°C]					
Embrittlement temperature [°C]	≤ -20	≤ -20	≤ -10	≤ -20	≤ -20
Max. working temperature [°C]	≥ +125	≥ +125	≥ +80	≥ +90	≥ +125
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
Recommended temperature range [°C]				
Embrittlement temperature [°C]	≤ -20	≤ -20	≤ -20	≤ -20
Max. working temperature [°C]	≥ +125	≥ +200	≥ +200	≥ +200
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 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.

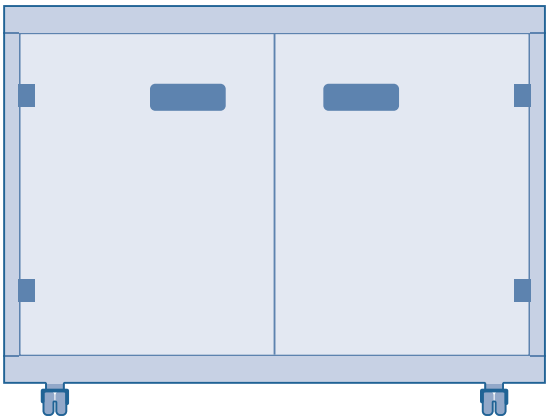
The high-performance cooling system provides precise control over the range of -10 °C to +40 °C with fine adjustment in 1 °C increments. Along with the pre-cooling function, the Sigma 2-16KL and 2-16KHL feature optionally selectable standstill cooling.

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
Max. capacity [ml]			
Swing-out rotor	4 x 100	4 x 100	4 x 100
Fixed-angle rotor	6 x 50	4 x 85	4 x 85
Max. RCF	20,627	21,913	21,913
Maximum speed [rpm]	15,000	15,300	15,300
Minimum speed [rpm]	100	100	100
Noise level at maximum speed (approx.) [dB(A)]			
Fixed-angle rotor 12141	≤ 53	≤ 53	≤ 53
Swing-out rotor 11170 with buckets 13299 and caps	≤ 65	≤ 52	≤ 52
Max. acceleration time [s]			
Fixed-angle rotor 12141	38	31	31
Swing-out rotor 11170 with buckets 13299 and caps	15	17	17
Max. braking time [s]			
Fixed-angle rotor 12141	37	37	37
Swing-out rotor 11170 with buckets 13299 and caps	15	15	15
Temperature adjustment range [°C]	–	-10–+40	-10–+60
Power consumption [W]	340	720	720
Height x width x depth [mm]	300 x 365 x 452	310 x 550 x 570	310 x 550 x 570
Height with open cap [mm]	610	705	705
Weight without rotor [kg]	32	60	60

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 Service
For maintenance and repairs please contact our Service department at 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.

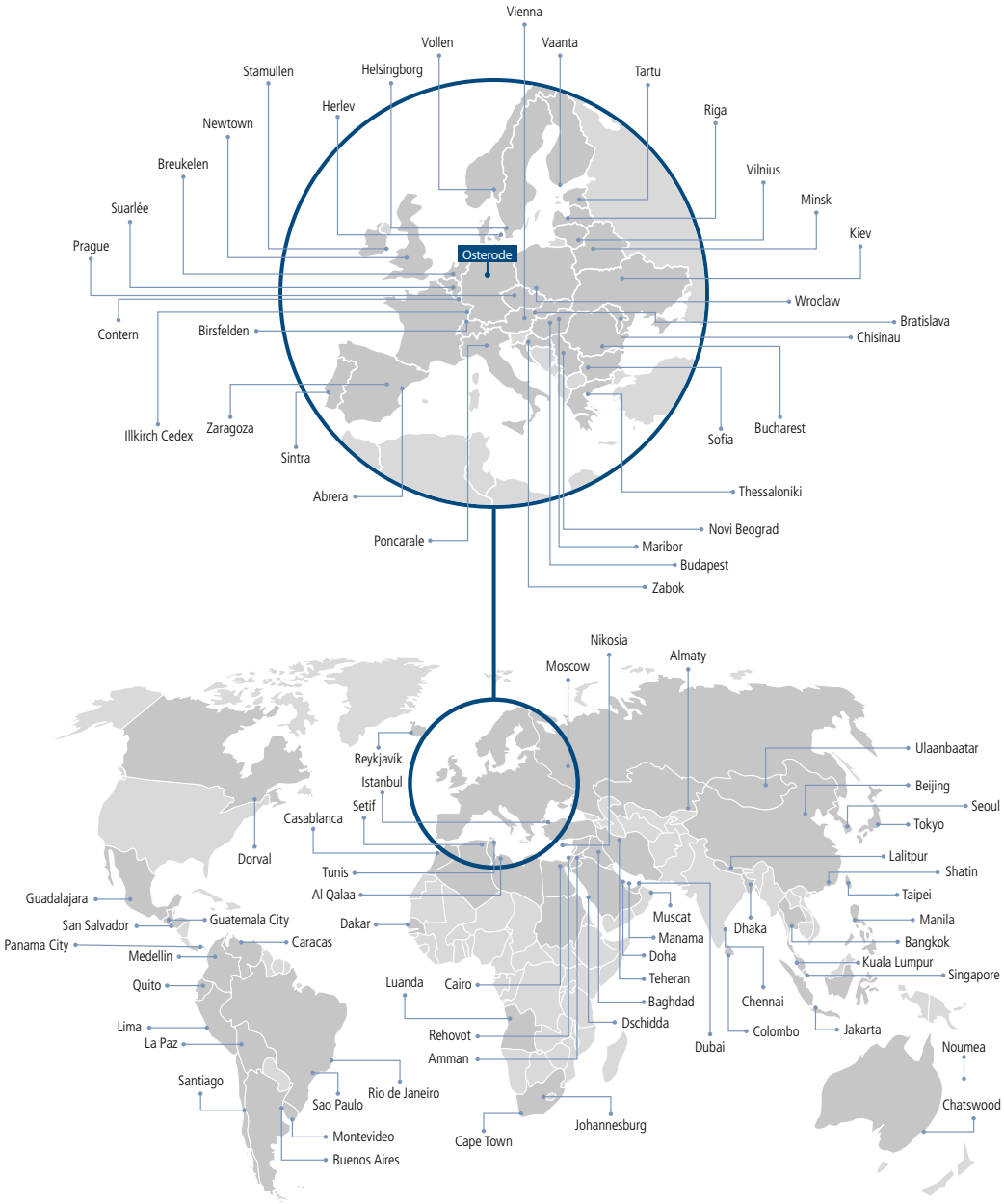
IQOQ package for:
Unrefrigerated centrifuges (item no. 17710)
Refrigerated centrifuges (item no. 17711)
An additional rotor (item no. 17712)

WEEE-Reg.-Nr. DE 76714077

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

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An der Unteren Söse 50
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info@sigma-zentrifugen.de
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03/2018