

# Universal Centrifuges

■ Z 446

■ Z 446 K



**HERMLE**  
LABORTECHNIK

4 x 750 ml

Z 446

Z 446 K



## Specifications

- Maintenance-free induction drive
- Microprocessor with large LCD display
- Motor driven lid lock
- Automatic rotor identification system with over speed protection, immediately upon rotor insertion
- Active imbalance identification and cut off (rotor-specific)
- CFC-free refrigeration system
- A large variety of rotors and accessories
- Audible signal at the end of each run with several melody options
- Noise level < 65 dBA (depend on rotor)
- Manufactured according to international safety regulations, i. e. IEC 61010
- Stainless steel chamber

These high-volume centrifuges Z 446 and Z 446 K achieve a throughput of 68 x 15 ml conical tubes or 28 x 50 ml conical tubes at a max. RCF of 3434/4346 xg. If higher speeds are required, we also offer e.g. an angle rotor with a max. RCF of 16022 xg for 10 x 50 ml. The fixed-angle and swing-out rotors are suitable for almost all applications in everyday use in clinical, industrial and research laboratories.

## Technical Data

max. speed:	16000 rpm
max. RCF:	24325 xg / 26328 xg
max. volume:	4 x 750 ml
speed range:	200 - 16000 rpm
Temperature range	
Z 446 K:	-20°C to 40°C
Running time:	59 min 50 s / 10 s increments 99 h 59 min / 1 min increments

Dimensions:	
Z 446:	54 cm x 39 cm x 67 cm (WxHxD)
Z 446 K:	73 cm x 39 cm x 67 cm (WxHxD)

Weight:	
Z 446:	79 kg
Z 446 K:	111 kg

Power input:	
Z 446:	640 W
Z 446 K:	1630 W

Order numbers:	
Z446:	316.00 V01 - Z446, 230 V / 50 - 60 Hz 316.00 V02 - Z446, 120 V / 50-60 Hz
Z446K:	317.00 V01 - Z446 K, 230 V / 50 - 60 Hz 317.00 V02 - Z446 K, 120 V / 50-60 Hz



## Distinct Control Panel

- Simple one handed operation
- Easy to program with gloves on
- Foil keyboard
- Permanent indication of preset and actual values
- Selection of speed in both rpm and g-force, with increments of 10
- 10 acceleration and deceleration rates, possibility of unbraked deceleration
- Temperature range from -20°C bis 40°C with 1°C increments
- Pre-cooling program
- Standstill cooling
- Pre-selection of the running time from 10 s to 99 h 59 min or continuous
- Storage of up to 99 runs including rotor
- Quick-key for short runs

# Accessories Z 446 and Z 446 K

Rotor/Bucket	Adapter		
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Order No.:  
221.36 V02  
Swing out rotor 4 place  
Angle: 0-90°



616.102  
PC-Screw cap  
for round bucket 616.100



616.112  
PC-Lid  
for rectangular bucket 616.110



Order No.:  
616.100  
Round bucket



Acceleration in s: 47/483  
Deceleration in s: 49/1287  
Acceleration in s: 55/551  
Deceleration in s: 54/1501  
max. speed: 4000/4500 rpm  
max. RCF: 3434/4346 xg  
max. radius: 19,2 cm  
Temp. at max. speed: 4°C

616.111  
Removing aid  
for rectangular bucket 616.110



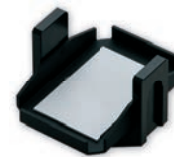
Order No.:  
616.110  
Rectangular bucket  
for Microtitre plates



Acceleration in s: 47/483  
Deceleration in s: 49/1287  
Acceleration in s: 55/551  
Deceleration in s: 54/1501  
max. speed: 4000/4500 rpm  
max. RCF: 3130/3961 xg  
max. radius: 17,5 cm  
max. loading height: 80 mm  
max. loading weight: 640 g  
Temp. at max. speed: 4°C

Adapters for rectangular bucket  
on request

Order No.:  
616.120  
Microtitre carrier



Acceleration in s: 47/482  
Deceleration in s: 49/1287  
Acceleration in s: 55/551  
Deceleration in s: 54/1501  
max. speed: 4000/4500 rpm  
mac. RCF: 2754/3486 xg  
max. radius: 15,4 cm  
max. loading height: 72 mm  
max. loading weight: 310 g  
Temp. at max. speed: -3°C

Volume	750 ml	500 ml	250 ml	225 ml	175 ml	100 ml	50 ml	50 ml	50 ml	30 ml	15 ml	15 ml	15 ml	10 ml	7 ml
ø in mm	98	98	62	61	61	41,5	29	29	29	26	17	17	17	16	13
<b>Round bucket</b>															
Length min./max. (mm)	152	114	135	137	118	102/123	116	116	102/123	102/123	121	121	97/120	70/121	98/119
<b>Tubes per rotor</b>	4	4	4	4	4	12	20	28	28	32	56	68 <sup>1</sup>	72	84	128
Radius correction (cm)	0	0	0,4	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,1	0,3	0,5	0,4	0,6
<b>Order No. Adapter</b>	without	without	716.024	716.100	716.100	716.023	716.101	716.102	716.021	716.020	716.103	716.104	716.018	716.015	716.016

<sup>1</sup> 2-level

	Vacutainer				Sarstedt								
Volume	1,8 - 5 ml	4 - 7 ml	5 ml	6 - 10 ml	1,1 - 4 ml	2 - 3 ml	3,5 - 5 ml	2,6 - 2,9 ml	2,7 - 4,3 ml	4,9 ml	4,0 - 5,5 ml	7,5 - 8,2 ml	9 - 10 ml
ø in mm	13	13	16	16	8	11	11	13	13	13	15	15	16
<b>Round bucket</b>													
Length min./max. (mm)	75	100	75	100	66	66	92	65	75	90	75	92	92
<b>Tubes per rotor</b>	84	84	72	72	152	84	84	84	84	84	72	72	72
Radius correction (cm)	0,3	0,3	0,3	0,3	0,4	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
<b>Order No. Adapter</b>	716.106	716.106	716.105	716.105	716.109	716.106	716.106	716.106	716.106	716.106	716.105	716.105	716.105

Order No.:  
221.16 V03



Swing out rotor 2 x 3 Microtitreplates  
Angle: 0-90°

Acceleraton in s: 27/249  
Deceleration in s: 23/488  
max. speed: 4500 rpm  
max. RCF: 2716 xg  
max. radius: 12 cm  
max. loading height: 63 mm  
max. loading weight: 310 g  
Temp. at max. speed: -8°C

Order No.:  
706.000  
Tube rack  
48 x 1,5 ml (2,0 ml)  
Reaction tubes

Order No.:  
221.17 V07



Angle rotor 30 x 1,5/2,0 ml  
Angle: 45°

Acceleration in s: 23/221  
Deceleration in s: 30/561  
max. speed: 15000 rpm  
max. RCF: 23643 xg  
max. radius: 9,4 cm  
max. ø: 11 mm  
Temp. at max. speed: 3°C

Order No.:	Tube rack	ø (mm)	Length (min./max.)
without	1 x 2,0 ml	11	40
without	1 x 1,5 ml	11	40
704.005	1 x 0,5 ml	8	45
704.004	1 x 0,4/0,2 ml PCR	6	45

# Accessories Z 446 and Z 446 K

## Rotor/Bucket

Order No.:  
220.86 V02  
Swing out rotor 4 place  
Angle: 0-90°



## Adapter

610.000  
Rectangular bucket



Acceleration in s: 26/252  
Deceleration in s: 28/560  
Acceleration in s: 30/273  
Deceleration in s: 31/626  
max. speed: 4500/5000 rpm  
max. RCF: 3894/4807 xg  
max. radius: 17,2 cm  
Temp. at max. speed: 4°C

611.000  
Round bucket



Acceleration in s: 26/250  
Deceleration in s: 27/415  
Acceleration in s: 30/277  
Deceleration in s: 30/526  
max. speed: 4500/5000 rpm  
max. RCF: 3894/4807 xg  
max. radius: 17,2 cm  
Temp. at max. speed: 0°C

Volume	250 ml	225 ml	100 ml	85 ml	80 ml	50 ml	50 ml	50 ml	25 ml	15 ml	15 ml	7 ml	5 ml
ø in mm	62	61	40	38	44	34	29	28,5	24	17	17	13	13
<b>Rectangular bucket</b>													
Length min./max. (mm)	100/120	138	90/120	90/125	90/120	90/115	116	90/120	90/115	120	85/120	90/100	55/75
<b>Tubes per rotor</b>	4	4	4	4	4	8	8	8	20	24	48	80	80
Radius correction (cm)	0,3	0,4	0,6	0,4	0,6	0,6	0,4	0,4	0,6	0,3	0,7	0,6	0,6
<b>Order No. adapter</b>	710.000	710.001	710.002	710.003	710.004	710.005	710.007	710.006	710.009	710.011	710.010	710.013	710.014

<b>Round bucket</b>													
Length min./max. (mm)	122	138	114	80/120	85/110	85/120	116	95/130	85/120	120	105/120	100	55/75
<b>Tubes per rotor</b>	4	4	4	4	4	4	4	4	8	16	28	48	48
Radius correction (cm)	0,1	0,2	0,2	0,2	0,7	0,7	0,3	0,2	0,5	-/	0,5	0,5	0,5
<b>Order No. adapter</b>	without rack	713.009	713.010	713.011	711.003	711.004	711.006	711.005	711.007	711.009	711.008	711.010	711.011

Volume	Vacutainer				Sarstedt			
	1,8 - 5 ml	4 - 7 ml	5 ml	6 - 10 ml	2 - 5 ml 3,5-5 ml	4,9 ml	4 - 5,5 ml 7,5 - 8,2 ml	9 - 10 ml
ø in mm	13	13	16	16	11	13	15	16,5
<b>Rectangular bucket</b>								
Length min./max. (mm)	75	100	75	100	66/92	90	75/92	92
<b>Tubes per rotor</b>	56	56	48	48	60	60	48	32
Radius correction (cm)	0,4	0,4	0,4	0,7	0,6	0,4	0,4	0,4
<b>Order No. adapter</b>	710.016	710.017	710.015	710.010	710.022	710.021	710.020	710.019

<b>Round bucket</b>								
Length min./max. (mm)	75	100	75	100	66/92	90	75/92	92
<b>Tubes per rotor</b>	32	32	28	28	48	48	28	20
Radius correction (cm)	0,2	0,2	0,2	0,5	0,5	0,5	0,7	0,2
<b>Order No. adapter</b>	713.002	713.003	713.001	711.008	713.004	713.006	713.005	713.007

Order No.:  
221.08 V04  
Swing out rotor  
4 place  
Angle: 90°



625.100  
PC-Screw cap for round  
bucket

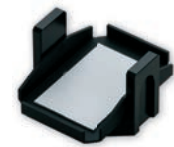


Order No.:  
625.004  
Round bucket



Acceleration in s: 35/320  
Deceleration in s: 34/751  
max. speed: 4500 rpm  
max. RCF: 4210 xg  
max. radius: 18,6 cm  
Temp. at max. speed: 0°C

Order No.:  
625.020  
Mikrotitre carrier








Acceleration in s: 34/319  
Deceleration in s: 33/727  
max. speed: 4500 rpm  
max. RCF: 3327 xg  
max. radius: 14,7 cm  
max. loading height: 63 mm  
max. loading weight: 310 g  
Temp. at max. speed: -2°C





Volume	Vacutainer									Sarstedt		
	500 ml <sup>2</sup>	250 ml	50 ml	50 ml <sup>2</sup>	15 ml	1,5/2,0 ml	1,8 - 5 ml	4 - 7 ml	5 ml	6 - 10 ml	2,6 - 2,9 ml	4 - 5,5 ml
ø in mm	80	62	28,5	28,5	16	11	13	13	16	16	13	16
Length min./max. (mm)	126	110/130	120	120	120	42	75	100	75	100	65/90	75/92
<b>Tubes per rotor</b>	4	4	20	28	48	100	88	88	76	76	76	56
Radius correction (cm)	0,9	0,6	0,4	0,4	0	6,4	3,8	1,4	0,2	1,7	0,1	0,2
<b>Order No. adapter</b>	625.004	625.003	625.002	625.001	625.000	625.013	625.009	625.014	625.023	625.010	625.008	625.007

<sup>2</sup> only without bucket lid

# Accessories Z 446 and Z 446 K

Rotor/Bucket		Adapter			
<b>Order No.:</b> 221.18 V02   Angle rotor 6 x 85 ml Angle: 38°	Acceleration in s: 48/463 Deceleration in s: 46/1654 Acceleration in s: 69/549 Deceleration in s: 67/1307 max. speed: 11000/13000 rpm max. RCF: 15555/21726 xg max. radius: 11,5 cm max. ø: 38 mm Temp. at max. speed: 8°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		707.001	1 x 15 ml	17	103/110
		707.002	1 x 30 ml	25	90/103
		707.003	1 x 50 ml	29	105
		707.004	1 x 50 ml conical	29	118
		707.014	1 x 15 ml conical	17	120
		without	1 x 85 ml	38	113
		707.000	2 x 15 ml	17	95/100
		707.015	1 x 16 ml	18	103/110
<b>Order No.:</b> 221.20 V02   Angle rotor 4 x 85 ml Angle: 30°	Acceleration in s: 50/448 Deceleration in s: 45/1251 Acceleration in s: 61/480 Deceleration in s: 47/1220 max. speed: 15000/16000 rpm max. RCF: 23140/26328 xg max. radius: 9,2 cm max. ø: 38 mm Temp. at max. speed: 7°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		707.001	1 x 15 ml	17	103/110
		707.002	1 x 30 ml	25	90/103
		707.003	1 x 50 ml	29	105
		707.004	1 x 50 ml conical*	29	118
		707.014	1 x 15 ml conical*	17	120
		without	1 x 85 ml	38	113
		707.000	2 x 15 ml	17	95/100
		707.015	1 x 16 ml	18	103/110
			* only without rotor lid		
<b>Order No.:</b> 221.21 V02   Angle rotor 6 x 250 ml Angle: 28°	Acceleration in s: 66/573 Deceleration in s: 84/1903 max. speed: 8000 rpm max. RCF: 10016 xg max. radius: 14 cm max. ø: 62 mm Temp. at max. speed: -1°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		713.042	1 x 50 ml conical	29	118
		713.030	1 x 50 ml	29	103
		713.028	2 x 30 ml	26	92
		713.025	4 x 15 ml conical	17	120
		713.020	5 x 10 ml	16	80
		713.015	8 x 1,5 ml	11	40
		without	1 x 250 ml	62	122
<b>Order No.:</b> 221.22 V02   Angle rotor 6 x 50 ml Angle: 26°	Acceleration in s: 28/264 Deceleration in s: 32/921 max. speed: 13000 rpm max. RCF: 15869 xg max. radius: 8,4 cm max. ø: 29 mm Temp. at max. speed: -4°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		without	1 x 50 ml	29	95/115
		708.019	1 x 30 ml	25	92/95
		708.003	1 x 16 ml	18	100/105
		708.004	1 x 15 ml	17	100/105
		708.017	1 x 15 ml conical*	17,5	116/125
			* only without rotor lid		
<b>Order No.:</b> 221.28 V02   Angle rotor 20 x 10 ml Angle: 30°	Acceleration in s: 32/305 Deceleration in s: 37/988 max. speed: 12000 rpm max. RCF: 15775 xg max. radius: 9,8 cm max. ø: 16 mm Temp. at max. speed: -2°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		without	1 x 10 ml	16	80
<b>Order No.:</b> 221.51 V02   Angle rotor 4 x 500 ml Angle: 24°	Acceleration in s: 73/575 Deceleration in s: 82/2317 max. speed: 8000 rpm max. RCF: 10367 xg max. radius: 14,5 cm max. ø: 69,5 mm Temp. at max. speed: 0°C	<b>Order No.:</b>	Tube rack	ø (mm)	Length (min./max.)
		712.001	1 x 250 ml	61,5	195
		712.102	1 x 250 ml-Corning	60,5	171
		712.100	1 x 175 ml conical	61,5	118
		712.100	1 x 225 ml conical	61,5	137
		712.101	1 x 50 ml conical	29,5	115
		712.104	3 x 50 ml	29	103
		712.103	4 x 30 ml	25,5	92
		712.105	6 x 15 ml conical	17	120
<b>Order No.:</b> 221.52 V02   Angle rotor 10 x 50 ml conical Angle: 38°	Acceleration in s: 60/480 Deceleration in s: 68/1747 Acceleration in s: 56/458 Deceleration in s: 64/1700 max. speed: 10000/10500 rpm max. RCF: 14532/16022 xg max. radius: 13 cm max. ø: 29 mm Temp. at max. speed: 2°C		50 ml conical	15 ml conical	15 ml
					
		ø Tube in mm:	29	17	17
		Length in mm:	116	121	97-116
		Order No. adapter:	without	708.030	708.030

# Accessories Z 446 and Z 446 K

Rotor/Bucket	Adapter																				
<p>Order No.: 220.87 V16</p>  <p>Angle rotor 24 x 1,5/2,0 ml Angle: 45°</p>	<p>Acceleration in s: 21/204 Deceleration in s: 30/421 max. speed: 16000 rpm max. RCF: 24325 xg max. radius: 8,5 cm max. ø: 11 mm Temp. at max. speed: 1°C</p> <table border="1"> <thead> <tr> <th>Order No.:</th> <th>Tube rack</th> <th>ø (mm)</th> <th>Length (min./max.)</th> </tr> </thead> <tbody> <tr> <td>without</td> <td>1 x 2,0 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>without</td> <td>1 x 1,5 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>704.005</td> <td>1 x 0,5 ml</td> <td>8</td> <td>45</td> </tr> <tr> <td>704.004</td> <td>1 x 0,4/0,2 ml PCR</td> <td>6</td> <td>45</td> </tr> </tbody> </table>	Order No.:	Tube rack	ø (mm)	Length (min./max.)	without	1 x 2,0 ml	11	40	without	1 x 1,5 ml	11	40	704.005	1 x 0,5 ml	8	45	704.004	1 x 0,4/0,2 ml PCR	6	45
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704.005	1 x 0,5 ml	8	45																		
704.004	1 x 0,4/0,2 ml PCR	6	45																		
<p>Order No.: 220.87 V15</p>  <p>Angle rotor 24 x 1,5/2,0 ml Angle: 45°   aerosol-tight</p>	<p>Acceleration in s: 21/205 Deceleration in s: 29/421 max. speed: 16000 rpm max. RCF: 24325 xg max. radius: 8,5 cm max. ø: 11 mm Temp. at max. speed: 1°C</p> <table border="1"> <thead> <tr> <th>Order No.:</th> <th>Tube rack</th> <th>ø (mm)</th> <th>Length (min./max.)</th> </tr> </thead> <tbody> <tr> <td>without</td> <td>1 x 2,0 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>without</td> <td>1 x 1,5 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>704.005</td> <td>1 x 0,5 ml</td> <td>8</td> <td>45</td> </tr> <tr> <td>704.004</td> <td>1 x 0,4/0,2 ml PCR</td> <td>6</td> <td>45</td> </tr> </tbody> </table>	Order No.:	Tube rack	ø (mm)	Length (min./max.)	without	1 x 2,0 ml	11	40	without	1 x 1,5 ml	11	40	704.005	1 x 0,5 ml	8	45	704.004	1 x 0,4/0,2 ml PCR	6	45
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704.004	1 x 0,4/0,2 ml PCR	6	45																		
<p>Order No.: 221.38 V01</p>  <p>Angle rotor 4 x 8-PCR Strips</p>	<p>Acceleration in s: 12/100 Deceleration in s: 12/201 max. speed: 15000 rpm max. RCF: 15343 xg max. radius: 6,1 cm max. ø: 6 mm Temp. at max. speed: -2°C</p>																				
<p>Order No.: 220.88 V09</p>  <p>Angle rotor 44 x 1,5/2,0 ml Angle: 32°/55°</p>	<p>Acceleration in s: 25/233 Deceleration in s: 30/283 max. speed: 16000 rpm max. RCF: 24039 xg max. radius: 8,4 cm max. ø: 11 mm Temp. at max. speed: 3°C</p> <table border="1"> <thead> <tr> <th>Order No.:</th> <th>Tube rack</th> <th>ø (mm)</th> <th>Length (min./max.)</th> </tr> </thead> <tbody> <tr> <td>without</td> <td>1 x 2,0 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>without</td> <td>1 x 1,5 ml</td> <td>11</td> <td>40</td> </tr> <tr> <td>704.005</td> <td>1 x 0,5 ml</td> <td>8</td> <td>45</td> </tr> <tr> <td>704.004</td> <td>1 x 0,4/0,2 ml PCR</td> <td>6</td> <td>45</td> </tr> </tbody> </table>	Order No.:	Tube rack	ø (mm)	Length (min./max.)	without	1 x 2,0 ml	11	40	without	1 x 1,5 ml	11	40	704.005	1 x 0,5 ml	8	45	704.004	1 x 0,4/0,2 ml PCR	6	45
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704.005	1 x 0,5 ml	8	45																		
704.004	1 x 0,4/0,2 ml PCR	6	45																		

## More from Hermle



Z 216 M



Z 366 K

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