

# High Capacity Universal Centrifuge

■ Z446

■ Z446-K



**HERMLE**  
**Benchmark** 

4 x 750 ml

# Z446

# Z446-K



## Specifications

- Maintenance-free induction drive
- Microprocessor with large LCD display
- Motor driven lid lock
- Automatic radio-frequency rotor identification system (RFID) 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

The Z446 universal centrifuge series offers the highest capacity of any benchtop Hermle-Benchmark model. With air-craft grade, premium alloy construction, the 4 x 750ml swing out rotor can withstand centrifugal forces upwards of 4,000 x g with full loads of up to 28 x 50ml or 68 x 15ml tubes. Advanced microprocessor controls allow for instant rotor identification, which automatically converts the rotational speed to the relevant g-force (rcf), preventing the user from setting a speed above the capabilities of the installed rotor. In addition to retrieving saved programs, the easy to use front panel can adjust accel/ decel rates, and change the end of run alarm tone. Rotor exchange is simple and requires less than one minute.

## Technical Data

max. speed:	16,000 rpm
max. RCF:	24,325 xg / 26,328 xg
max. volume:	4 x 750 ml
speed range:	200 - 16,000 rpm
Temperature range	
Z446-K:	-20°C to 40°C
Running time:	59 min 50 s / 10 s increments 99 h 59 min / 1 min increments
Dimensions:	
Z446:	21 in x 15 in x 26 in (W x H x D) 54 cm x 39 cm x 67 cm (W x H x D)
Z446-K:	29 in x 15 in x 26 in (W x H x D) 73 cm x 39 cm x 67 cm (W x H x D)
Weight:	
Z446:	174 lbs / 79 kg
Z446-K:	245 lbs / 111 kg
Power input:	
Z446:	640 W
Z446-K:	1,630 W
Order numbers:	Z446, 120 V / 50-60 Hz Z446-E, 230 V / 50-60 Hz Z446-K, 120 V / 50-60 Hz / 15 A Z446-K-E, 230 V / 50-60 Hz / 20 A*

\* The speed of rotor Z446-750 lower by 500 rpm (can be toggled with 20A line)



## 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 to 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
- Timer: the centrifuge starts at the preselected time

# Accessories Z446 and Z446-K

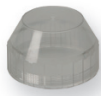
## Rotor/Bucket

Order No.:  
Z446-750-AC\*  
Swing out rotor 4 place  
Angle: 0-90°



\*Z446-750  
Swing out rotor with  
round buckets included

Z446-750-LID\*  
PC-Screw cap  
for round bucket



## Adapter

Order No.:  
Z446-750-BUK  
Round bucket

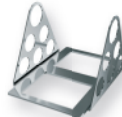


Acceleration in s: 47/483  
Deceleration in s: 49/1,287  
Acceleration in s: 55/551  
Deceleration in s: 54/1,501  
max. speed: 4,000/4,500 rpm  
max. RCF: 3,434/4,346 xg  
max. radius: 19.2 cm  
Temp. at max. speed: 4°C

Z446-MP-LID\*  
PC-Lid  
for rectangular bucket



Z446-MP-RA  
Removing aid  
for rectangular bucket



Order No.:  
Z446-MP-BUK  
Rectangular bucket  
for Microplates

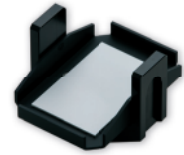


Acceleration in s: 47/483  
Deceleration in s: 49/1,287  
Acceleration in s: 55/551  
Deceleration in s: 54/1,501  
max. speed: 4,000/4,500 rpm  
max. RCF: 3,130/3,961 xg  
max. radius: 17.5 cm  
max. loading height: 80 mm  
max. loading weight: 640 g  
Temp. at max. speed: 4°C

Adapters for rectangular bucket  
on request

\*hermetically sealable

Order No.:  
Z446-750-MP  
Microplate carrier



Acceleration in s: 47/482  
Deceleration in s: 49/1,287  
Acceleration ins s: 55/551  
Deceleration in s: 54/1,501  
max. speed: 4,000/4,500 rpm  
mac. RCF: 2,754/3,486 xg  
max. radius: 15.4 cm  
max. loading height: 72 mm  
max. loading weight: 310 g  
Temp. at max. speed: -3°C

Z446-MP-STK  
Microplate stacking adapter

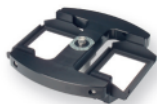


Volume	Corning®				Corning®	Falcon®	conical	conical	50 ml	30 ml	conical	conical
	750 ml	500 ml	500 ml	250/290 ml	250 ml	175/225 ml	50 ml	50 ml	50 ml	30 ml	15 ml	15 ml
ø in mm	99	99	97	62	60	61	29	29	29	26	17	17
Round bucket												
Length min./max. (mm)	152	114	148	122/137	159	118/137	116	116	102/123	102/123	120	120
Tubes per rotor	4	4	4	4	4	4	20	28	32	32	56	68 <sup>1</sup>
Radius correction (cm)	0	0	0.5	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.1	0.3
Order No. Adapter Z446-750	without	without	-A500	-A250	-A250F	-A225	-A50-E	-A50	-A50R	-A30	-A15-E	-A15
												-A15R

<sup>1</sup> 2-level

Volumen	Vacutainer®			
	1.8-5 ml	4-7 ml	5 ml	6-10 ml
ø in mm	13	13	16	16
Round bucket				
Length min./max. (mm)	75	100	75	100
Tubes per rotor	108	108	72	72
Radius correction (cm)	0.3	0.3	0.3	0.3
Order No. Adapter Z446-750	-A57	-A57	-A10	-A10

Order No.:  
Z326-02MP



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

Acceleration in s: 27/251  
Deceleration in s: 23/602  
max. speed: 4,500 rpm  
max. RCF: 2,716 xg  
max. radius: 12 cm  
max. loading height: 63 mm  
max. loading weight: 310 g  
Temp. at max. speed: -8°C

Order No.:  
BT1500-A1520  
BT1500-A05  
Z326-MPCA

Tube rack  
20 x 1.5 ml (2.0 ml) Tubes  
20 x 0.5 ml Tubes  
3 x Chamber slide or 35/60 mm petri dish

Order No.:  
Z326-3020H



Angle rotor 30 x 1.5/2.0 ml  
Angle: 45°

Acceleration in s: 24/218  
Deceleration in s: 30/526  
max. speed: 15,000 rpm  
max. RCF: 23,643 xg  
max. radius: 9.4 cm  
max. ø: 11 mm  
Temp. at max. speed: 1°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
C1008-A5-6	1 x 0.5 ml	8	45
C1008-A2-6	1 x 0.4/0.2 ml PCR	6	45

# Accessories Z446 and Z446-K

## Rotor/Bucket

Order No.:  
Z326-0685



Angle rotor 6 x 85 ml  
Angle: 38°

## Adapter

Acceleration in s: 49/462  
Deceleration in s: 46/1,655  
Acceleration in s: 69/549  
Deceleration in s: 67/1,307  
max. speed: 11,000/13,000 rpm  
max. RCF: 15,555/21,726 xg  
max. radius: 11.5 cm  
max.  $\varnothing$ : 38 mm  
Temp. at max. speed: 8°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 85 ml	38	113
Z326-85-A50R	1 x 50 ml	29	105
Z326-85-A50	1 x 50 ml conical	29	116
Z326-85-A30	1 x 30 ml	25	90/103
Z326-85-A15R	1 x 15 ml	17	103/110
Z326-85-A15	1 x 15 ml conical	17	120

Order No.:  
Z326-0485



Angle rotor 4 x 85 ml  
Angle: 30°

Acceleration in s: 50/448  
Deceleration in s: 45/1,251  
Acceleration in s: 61/480  
Deceleration in s: 47/1,220  
max. speed: 15,000/16,000 rpm  
max. RCF: 23,140/26,328 xg  
max. radius: 9.2 cm  
max.  $\varnothing$ : 38 mm  
Temp. at max. speed: 7°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 85 ml	38	113
Z326-85-A50R	1 x 50 ml	29	105
Z326-85-A50	1 x 50 ml conical	29	116
Z326-85-A30	1 x 30 ml	25	90/103
Z326-85-A15R	1 x 15 ml	17	103/110
Z326-85-A15	1 x 15 ml conical	17	120

Order No.:  
Z366-06250



Angle rotor 6 x 250 ml  
Angle: 28°

Acceleration in s: 66/573  
Deceleration in s: 84/1,871  
max. speed: 8,000 rpm  
max. RCF: 10,016 xg  
max. radius: 14 cm  
max.  $\varnothing$ : 62 mm  
Temp. at max. speed: -1°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 250 ml	62	122
Z366-06250-A50	1 x 50 ml conical	29	118
Z366-06250-A50R	1 x 50 ml	29	103
Z366-06250-A30	2 x 30 ml	26	92
Z366-06250-A15	4 x 15 ml conical	17	120

Order No.:  
Z326-0650-HS



Angle rotor 6 x 50 ml (round)  
Angle: 26°

Acceleration in s: 28/263  
Deceleration in s: 31/922  
max. speed: 13,000 rpm  
max. RCF: 15,869 xg  
max. radius: 8.4 cm  
max.  $\varnothing$ : 29 mm  
Temp. at max. speed: -4°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 50 ml	29	95/115
Z326-50-A30	1 x 30	25	92/95
Z326-50-B15R	1 x 15 ml	17	100/105
Z326-50-A15R	1 x 15 ml conical*	17	120

\*only without rotor lid

Order No.:  
Z326-2010



Angle rotor 20 x 10 ml  
Angle: 30°

Acceleration in s: 32/305  
Deceleration in s: 37/984  
max. speed: 12,000 rpm  
max. RCF: 15,775 xg  
max. radius: 9.8 cm  
max.  $\varnothing$ : 16 mm  
Temp. at max. speed: -3°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 10 ml	16	80

Order No.:  
Z446-04500



Angle rotor 4 x 500 ml  
Angle: 24°

Acceleration in s: 73/575  
Deceleration in s: 84/2,317  
max. speed: 8,000 rpm  
max. RCF: 10,367 xg  
max. radius: 14.5 cm  
max.  $\varnothing$ : 69.5 mm  
Temp. at max. speed: 4°C

Order No.:	Tube rack	$\varnothing$ (mm)	Length (min./max.):
without Adapter	1 x 500 ml	69.5	165
Z446-500-A250	1 x 250 ml	62	122
Z446-500-A250F	1 x 250 ml conical	60	159
Z446-500-A225	1 x 175 ml Falcon®	61	118
Z446-500-A225	1 x 225 ml Falcon®	61	137
Z446-500-A50	1 x 50 ml conical	29	116
Z446-500-A15C	6 x 15 ml conical	17	120

Order No.:  
Z326-1050



Angle rotor 10 x 50 ml conical  
Angle: 38°

Acceleration in s: 60/480  
Deceleration in s: 68/1,747  
Acceleration in s: 61/480  
Deceleration in s: 480/1,747  
max. speed: 10,000/10,500 rpm  
max. RCF: 14,532/16,022 xg  
max. radius: 13 cm  
max.  $\varnothing$ : 29 mm  
Temp. at max. speed: 2°C

Order No.:	Adapter	$\varnothing$ (mm)	Length (min./max.):
Z326-50-B15HS	1 x 15 ml RB	17	97/123
Z326-15-A7*	1 x 7 ml	13.5	95/115
Z326-15-A5*	1 x 5 ml	13.5	70/90
Z326-50-A15	1 x 15 ml conical	17	120

\*only possible with adapter Z326-50-A15 or Z326-50-B15

# Accessories Z446 and Z446-K

## Rotor/Bucket

Order No.:  
Z326-2420



Angle rotor 24 x 1.5/2.0 ml  
Angle: 45°

## Adapter

Acceleration in s: 21/204  
Deceleration in s: 29/375  
max. speed: 16,000 rpm  
max. RCF: 24,325 xg  
radius: 8.5 cm  
max. ø: 11 mm  
Temp. at max. speed: 1°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
C1008-A5-6	1 x 0.5 ml	8	45
C1008-A2-6	1 x 0.4/0.2 ml PCR	6	45

## Rotor/Bucket

Order No.:  
Z326-2420H



Angle rotor 24 x 1.5/2.0 ml  
Angle: 45° | aerosol-tight

Acceleration in s: 21/204  
Deceleration in s: 29/394  
max. speed: 16,000 rpm  
max. RCF: 24,325 xg  
radius: 8.5 cm  
max. ø: 11 mm  
Temp. at max. speed: 1°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
C1008-A5-6	1 x 0.5 ml	8	45
C1008-A2-6	1 x 0.4/0.2 ml PCR	6	45

## Rotor/Bucket

Order No.:  
Z326-3202



Angle rotor 4 x 8-PCR Strips

Acceleration in s: 12/100  
Deceleration in s: 12/202  
max. speed: 15,000 rpm  
max. RCF: 15,353 xg  
max. radius: 6.1 cm  
max. ø: 6 mm  
Temp. at max. speed: -2°C

## Rotor/Bucket

Order No.:  
Z326-4420



Angle rotor 44 x 1.5/2.0 ml  
Angle: 32°/55°

Acceleration in s: 25/235  
Deceleration in s: 25/500  
max. speed: 16,000 rpm  
max. RCF: 24,325 xg  
max. radius: 8.5 cm  
max. ø: 11 mm  
Temp. at max. speed: -2°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
C1008-A5-6	1 x 0.5 ml	8	45
C1008-A2-6	1 x 0.4/0.2 ml PCR	6	45

## More from **HERMLE** **Benchmark**



Z216-M



Z366-K

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