

distillation & filtration & separation & sample preparation



HOMOGENIZER - "light duty"

- Practical solution if mixing, emulsification, shredding or chopping is required for small samples.
- Easy to hold due to the light weight for one hand operation. Can be used both hand-held or post mounted.
- High torque motor with a variable speed adjustment enables rapid and effective disruption of a wide range of samples.
- Flexible configuration of different rotors and stators enables the homogeniser adaptive to most applications.
- Can rapidly homogenize samples in the range 0,1 ml to 50 ml or 1 ml - 250 ml of liquid depending on the rotor/stator type.
- During operation, the sample is drawn into the core of the homogenizer. The material is repeatedly cycled through narrow slits in the probe where it is rapidly disintegrated by high shear.
- Maximum speed of 30.000 rpm rate reduces processing time significantly.
- Complete homogenization of samples is usually achieved in a few seconds. Reliable results are assured with extremely high pressure.
- Smooth motor drive makes working very safe and comfortable. Smooth acceleration also prevents unnecessary spills.
- Shafts, rotors and stators are constructed of quality AISI 316 stainless steel which is inert to aggressive solutions.
- Assembly and disassembly of rotors can be done without requirement of special tools.
- Shafts, rotors, stators are not supplied as a standard accessory. These should be ordered separately.

<i>catalogue no</i>	<i>621.11.001</i>
<i>dimensions / weight (mm / kg)</i>	46 x 55 x 230 / 0,6
<i>motor type</i>	carbon brush motor
<i>power (W)</i>	160
<i>voltage (V)</i>	220
<i>frequency (Hz)</i>	50
<i>working volume (ml)</i>	0,1 - 50 with shaft 621.11.050
<i>working volume (ml)</i>	1 - 250 with shaft 621.11.250
<i>speed range (rpm)</i>	8000 - 30000
<i>speed control</i>	6 stage
<i>max. circum. speed (m/sec)</i>	6,3 - 14
<i>max. viscosity (mPas)</i>	5000
<i>overload protection</i>	no
<i>protection class</i>	IP 20
<i>permissible ambient Temperature (°C)</i>	0 - 40
<i>permissible relative humidity (%)</i>	85
<i>noise level (dB)</i>	< 54
<i>optional accessories</i>	stand & bosshead & various shafts



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HOMOGENIZER - "heavy duty"

- Offers right solution for dispensing, homogenizing and mixing of samples in larger volumes.
- High torque motor with a variable speed adjustment enables rapid and effective disruption of a wide range of samples.
- Flexible configuration of different rotors and stators enables the homogenisator adaptive to most applications.
- Can rapidly homogenize samples in 10 ml to 8.000 ml of liquid depending on the rotor/stator type.
- During operation, the sample is drawn into the core of the homogenizer. The material is repeatedly cycled through narrow slits in the probe where it is rapidly disintegrated by high shear power.
- Maximum speed of 30.000 rpm rate reduces processing time significantly.
- Complete homogenization of samples is usually achieved in a few seconds. Reliable results are assured with extremely high precision.
- Smooth motor drive makes working very safe and comfortable. Smooth acceleration also prevents unnecessary spills.
- An overload protection feature significantly increases the life span of the motor.
- Shafts, rotors and stators are constructed of quality AISI 316 stainless steel which is inert to aggressive solutions.
- Assembly and disassembly of rotors can be done without requirement of special tools.
- Shafts, rotors, stators are not supplied as a standard accessory. These should be ordered separately.



catalogue no	621.12.001
dimensions / weight (mm / kg)	70 x 70 x 255 / 1,3
motor type	carbon brush motor
power (W)	500
voltage (V)	220
frequency (Hz)	50
working volume (ml)	10 - 5000 with shaft 621.12.905
working volume (ml)	100 - 8000 with shaft 621.12.908
speed range (rpm)	10000 - 30000
speed control	6 stage
max. circum. speed (m/sec)	22,7 - 36
max. viscosity (mPas)	10000
overload protection	yes
protection class	IP 20
permissible ambient Temperature (°C)	0 - 40
permissible relative humidity (%)	85
noise level (dB)	< 72
optional accessories	stand & bosshead & various shafts

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HOMOGENIZER - "paddle blender"



- Designed for homogenisation of samples while isolating them from any possible contamination.
- Widely used in food, feed, cosmetics and pharmaceutical laboratories for homogenization proses during microbiological or toxicological testing.
- The two stainless steel paddles gently, but thoroughly homogenize the sample with the diluent and microorganisms are forced to join the liquid phase.
- High quality enduring motors ensure a safe and efficient homogenization with minimum sound level.
- Samples are prepared in disposable sterile bags so that the cross contamination is avoided. The UV light source in the homogenization chamber also reduce the risk of cross contamination.
- Heater control enables a temperature operating range from ambient to 60°C.
- Windowed door ensures permanent control over blending process for perfect results.
- Featured with a LCD control panel with programmable settings of all parameters.
- Supplied with a stainless steel bag stand for 4 bags with color differentiated bag clamps and two paddle protector.



<i>catalogue no</i>	<i>608.01.001</i>
<i>dimensions / weight (mm / kg)</i>	420 x 245 x 340 / 18,5
<i>voltage (V)</i>	220
<i>frequency (Hz)</i>	50
<i>power (W)</i>	500
<i>capacity (ml)</i>	3 - 400
<i>time control (min.)</i>	0,1 - 99
<i>rap speed (times/sec)</i>	3 - 12
<i>UV sterilisation</i>	yes
<i>door with window</i>	yes
<i>permissible ambient temperature (°C)</i>	0 - 60
<i>permissible relative humidity (%)</i>	80



Supplied complete with homogenizer bag holding stand that carries for bags with color differentiated bag clamps. Also two plastic paddle protectors are supplied.

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BAGS - “homogenization” - “sterile”



► Manufactured from polyethylene, Specially designed for fast and effective crushing of solid samples to the liquid phase.

► Sterilized with gamma irradiation, **free of RNase, DNase, and pyrogene**.

► Even at low temperatures they maintain the stability of the specimen's microbiological status.

► While working with infectious samples, bags can be sealed by any ordinary bag sealer to prevent the escape of aerosols.

- Alternative 3 products
- Bag without filter
- Bag with side filter
- Bag with full filter

ACCESSORIES - “for homogenization bags”

► **Bag stand** is manufactured from high quality, chemical and corrosion resistant AISI 304 grade stainless steel. Can carry 4 homogenisation bags of any type.

► Specially designed for hanging homogenisation bags. Accelerates the homogenisation applications.

► **Bag latches** are manufactured from a special grade of polypropylene for quick closing of the bags. Practical closing system guarantees tight closure. Color coded in 4 different colors for fast and easy identification.

bag stand	pack quantity	bag latches	pack quantity
608.01.101	1 piece	039.35.200	set of 4

bag with no filter

bag with side (lateral) filter

bag with full (page) surface filter



Bags without filter are generally used for standard and common practises.

Bags with side (lateral) filter divides the bag in 2 non-equal compartments. They are suitable for small samples such as PCR applications.

Bags with full (page) filter divides the bag in 2 equal compartments. After homogenisation solid sample remains in it's compartment while the liquid phase moves to the second one.

catalogue number	bag type	volume	width x height	wall thickness	pore size	packing specifications
039.23.003	no filter	400 ml	190 x 300 mm	70 microns	-	50 pcs / pack - 500 pcs / case
039.23.002	side filter	400 ml	190 x 300 mm	70 microns	< 250 microns	50 pcs / pack - 500 pcs / case
039.23.001	full filter	400 ml	190 x 300 mm	70 microns	< 280 microns	50 pcs / pack - 500 pcs / case

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LABORATORY BLENDER SET



blender set parts

- 400 W powerful motor ensuring perfect blending.
- 1500 ml capacity stainless steel jar with handle and lid.
- 1500 ml capacity heat resistant glass jar with handle and lid.
- 300 ml capacity plastic grinder jar with lid.

catalogue no	602.21.001
voltage (V)	220
frequency (Hz)	50
power (W)	400
glass jar - capacity (ml)	1500
steel jar - capacity (ml)	1500
grinder jar - capacity (ml)	300
volume graduation	at only for glass jar
pulse function	Yes
speed function	2
Permissible Ambient Temperature (°C)	0 - 50
Permissible Relative Humidity (%)	80

- Blender set is ideal for grinding, mixing, and dispersion of large variety of products including ice.
- Powerful blender motor ensures fast, perfect and homogenous blending.
- Two step speed control and pulse function provides excellent results during blending and mixing.
- Stainless steel unique formed cutting blade guarantees also perfect dry blending and is easy to clean after use.
- Provides highest standing stability due to the stable engine housing.
- Non-slipping rubber feet prevents the blender from "walking" during operation.
- Supplied as a set of housing and 3 blender jars.

LABORATORY KETTLE



Monoblock seamless stainless steel boiling vessel.
Insulated heating elements and perforated pouring filter.

- Kettle with 1500 ml volume and 1500 W heating.
- Featured with automatic stop after heating, on/off switch with indication lamp, fully insulated heating element and cord storage.
- Monoblock seamless stainless steel vessel with insulated heating element and perforated pouring filter.



catalogue no: 611.01.001

MIESZADŁO MECHANICZNE Ogólnego stosowania SERIA JB

Ładna opływowa obudowa, sprawia, że mieszadło doskonale komponuje się z pozostałymi urządzeniami w Państwa pracowni. Niski poziom hałasu nie męczy użytkownika. Zastosowany cyfrowy wyświetlacz, pozwala na precyzyjną regulację prędkości obrotów. Mieszadło sprzedawane w komplecie z :

1. podstawa statywu
2. pręt do statywu
3. przedłużacz pręta
4. łącznik i łapa do mocowania naczyń
5. łącznik do mocowania mieszadła

Podstawa statywu 310 x 210 mm. Wysokość pręta 520mm.

Wysokość przedłużki 230mm, długość mieszadełka po zamontowaniu 300mm, wymiar perforowanej końcówki mieszającej 60 x 60mm

numer katalogowy	06-JB90B	06-JB300S
Moc wejściowa(W)	150	510
Moc wyjściowa(W)	90	300
Zakres prędkości(rpm)	100-1400	50-1500
Prędkość (nastawa)		płynna
Zasilanie(V/Hz)		AC 220/50



MIESZADŁO MECHANICZNE seria OS Niebieska seria CHEMLAND

Dokładna kontrola prędkości mieszania. Technologia kontroli gwarantuje dokładność prędkości. System kontroli startu umożliwia płynny i łagodny start, zapobiega to wylewaniu i rozpryskiwaniu się próbki. Wyświetlane są wartości zadane i bieżące. Monitoring czasu, momentu siły i prędkości. Ochrona przed przeciążeniem. Silnik zatrzymuje się automatycznie, w przypadku wykrycia usterki. Praca z PC poprzez łącze RS232 (OS40-PRO oraz OS20-PRO).



OS20-Pro

numer katalogowy	model	nazwa
06-OS40 PRO C	OS40-Pro	Mieszadło mechaniczne z wyświetlaczem cyfrowym max obj. mieszanej cieczy 40L bez osprzętu
06-OS20 PRO C	OS20-Pro	Mieszadło mechaniczne z wyświetlaczem cyfrowym max obj. mieszanej cieczy 20L bez osprzętu
06-OS40 E	OS40-S	Mieszadło mechaniczne analogowe z wyświetlaczem LED max. obj. mieszanej cieczy 40l. bez osprzętu
06-OS20 E	OS20-S	Mieszadło mechaniczne analogowe z wyświetlaczem LED max. obj. mieszanej cieczy 20l. bez osprzętu
06-18900131		statyw z prętem do mieszadeł oraz łącznik

model	OS40-Pro	OS20-Pro	OS40-S	OS20-S
Max. objętość mieszania cieczy (H_2O) (L)	40	20	40	20
Wejście silnika (W)	120	60	120	60
Wyjście silnika (W)	100	50	100	50
Zakres prędkości (rpm)	50-2200	50-2200	0-2200	0-2200
Dokładność wyświetlania prędkości (rpm)	± 3	± 3		
Wyświetlacz prędkości	LCD	LCD	LED	LED
Rozdzielcość wyświetlacza prędkości (rpm)	1	1	1	1
Max. moment siły (Nm)	60	40	60	40
Ochrona przed przeładowaniem.	Alarm wizualny-dioda LED		Alarm wizualny-dioda LED	
Ochrona silnika	wyłączenie urządzenia		wyłączenie urządzenia	
Max. lepkość (mPas)	50 000	10 000	50 000	10 000
Rozmiar pręta średnica x długość (mm)	14 x 220	14 x 220	14 x 220	14 x 220
Wymiary szer. x wys. x głębokość (mm)	83x220x186	83x220x186	83x220x186	83x220x186
Waga (kg)	2.4	2.4	2.4	2.4
Napięcie (VAC)	100-240	100-240	100-240	100-240
Częstotliwość (Hz)	50/60	50/60	50/60	50/60
Moc (W)	130	70	130	70
Klasa ochrony wg DIN/EN 60529	IP42	IP42	IP42	IP42
Temperatura (°C)	5-40	5-40	5-40	5-40
Dopuszczalna wilgotność względna (%)	80	80	80	80
Łącze RS 232	tak	tak	brak	brak

ŁOPATKI DO MIESZADEŁ

numer katalogowy	typ
06-18900071	krzyżowe stal nierdzewna 316L
06-18900072	proste stal nierdzewna 316L
06-18900073	łopatkowe stal nierdzewna 316L
06-18900074	wirówkowe stal nierdzewna 316L
mieszadła pokryte teflonem	
06-18900075	krzyżowe stal nierdzewna 316L + PTFE
06-18900076	proste stal nierdzewna 316L + PTFE
06-18900077	łopatkowe stal nierdzewna 316L + PTFE
06-18900078	wirówkowe stal nierdzewna 316L + PTFE



PRĘCIK DO MIESZADEŁ MECHANICZNYCH

pręt mieszający - łopatki ruchome zakrzywione wykonane z teflonu.

numer katalogowy	z łopatkami [mm]	długość łopatek [mm]
06-585.P30050	300	50
06-585.P35070	350	70
06-585.P35080	450	80
06-585.P45095	500	90



MŁYNEK LABORATORYJNY 21000 rpm

Uniwersalny młynek o zastosowaniu w przemyśle górniczym, rolniczym, w geologii, w medycynie. Komora ze stali nierdzewnej, wysoka wydajność, łatwa obsługa, atrakcyjny wygląd.

numer katalogowy	szczepkość [rpm]	rozdrobnienie [mesh]	pobór [W]	wymiary [mm]
06-FW-80,1	21000	60~200	400	110x260
06-FW-80,11	część zamienna - nóż			



MŁYNEK LABORATORYJNY 24000 rpm

Młynek o dużej dokładności rozdrabniania. Posiada komorę ze stali nierdzewnejłatwą w utrzymaniu czystości. Chłodzony powietrzem silnik doskonale radzi sobie z rozdrabnianiem substancji o różnej gęstości. Możliwość ustawienia kąta pracy komory rozdrabniającej.

numer katalogowy	szczepkość [rpm]	rozdrobnienie [mesh]	pobór [W]	wymiary [mm]
06-FW-177.0	24000	60~200	1200	240x360
06-FW-177.00	część zamienna - nóż			



MIESZADŁO MECHANICZNE dwuzakresowe AM 120Z-H digital

Mieszadło laboratoryjne przeznaczone do cieczy o objętości 20L (H₂O).

o szerokim zakresie lepkości.

* Stała kontrola prędkości.

* Cyfrowy wyświetlacz prędkości, płynna regulacja.

* Przelącznik dwuzakresowy prędkości - siły uciągu.

* Łatwość obsługi.

numer katalogowy	AM120Z-H
Objętość mieszanej cieczy (H ₂ O)	20
Moc wejścia (W)	180
Moc wyjścia (W)	120
Max moment obrotowy(Ncm)	52
Max moment obrotowy - pręt(Ncm)	50
Zakres prędkości (rpm)	
Wyświetlacz	poziom niski: 60~500 poziom wysoki: 240~2000 <40 cyfrowy skok 10 rpm <90%
Dopuszczalna temperatura otoczenia(°C)	
Dopuszczalna wilgotność względna (°C)	
Wymiary zew.	320x220x760



Emulsyfikator laboratoryjny AE 300S-H digital AE 500S-H digital

Przeznaczony jest do emulsyfikacji, mieszania i miksuowania ciekłych mediów w laboratoriach chemicznych, naukowo badawczych.

* Wysoka wydajność do objętości cieczy 40 L (H₂O).

* Kontrola równomierności pracy.

* Wyświetlacz cyfrowy prędkości z płynną nastawą.

* Wzmocniona konstrukcja.



numer katalogowy	AE 300S-H	AE 500S-H
Objętość mieszanej cieczy (H ₂ O) (L)	40	60
Moc wejścia (W)	510	850
Moc wyjścia (W)	300	500
Max moment obrotowy(Ncm)	96	178
Max moment obrotowy - pręt(Ncm)	93	176
Zakres prędkości (rpm)	200~13000	200~12000
Wyświetlacz	cyfrowy	cyfrowy
Dopuszczalna temperatura otoczenia(°C)	<40	<40
Dopuszczalna wilgotność względna (°C)	<90%	<90%
Wymiary zew.	360x260x760	360x26x760

5. Sample preparation

Mixing, Homogenisation/Dispersers

1



1 Homogeniser, POLYTRON® PT 1200 E

This handheld homogeniser is ideal for quick processing of small sample quantities and volumes, for example in Life science or genetic.

KINEMATICA GmbH

Application volume: 0.05 to 250ml

- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 12 m/s
- Ergonomic design and various models of dispersing aggregates in Easy-to-Clean design

Applications:

- General homogenisation applications (dispersion and emulsification)
- Sample preparation for subsequent extraction of pharmaceutical agents (API)
- Cell disruption, RNA/DNA isolation from tissue
- Dispersion of small quantities from plants, animals or human tissue

Please order tools separately.

Specifications

Application volume:	0.05 to 250ml
Motor input power:	100W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm X EC-E116 Aggregate
Speed range:	Stepless up to 25.000min ⁻¹
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	220 x 44 x 55 mm
Weight drive:	440g
Tested to:	EN/IEC 61010, 61326-1

Type	PK	Cat. No.
PT 1200 E, 230V (with EU-plug)	1	9.571 492

2



9.571 493

Homogeniser, POLYTRON® PT 1300 D

This digital Homogeniser, is ideal for quick processing of small sample quantities and volumes, for example in Life science or genetic. Storing the desired speed ensures repetitive and reproducible homogenisations. When the unit is switched off, the last stored speed is saved. This drive can be controlled using our KIN software from a PC via USB or RS232.

KINEMATICA GmbH

- Application volume 0.05 to 250ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 14 m/s
- Speed remains constant even when viscosity changes
- PC interfaces (RS 232 and USB)
- MEMO function of the stored speed
- Ergonomic design and various models of dispersing aggregates in Easy-to-Clean design

Applications look also at PT 1200 E:
- Reproducible processes

Specifications

Application volume:	0.05 to 250ml
Motor input power:	100W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm X EC-E116 Aggregate
Speed range:	Stepless up to 30.000min ⁻¹
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	210 x 40 x 45mm Drive, 230 x 205 x 95mm Base
Weight drive:	620g
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT 1300 D, 230V (with EU-plug)	1	9.571 493

5. Sample preparation

Mixing, Homogenisation/Dispersers

1 Homogeniser, POLYTRON® PT 2500 E

The PT2500 E is the ideal solution for cost-conscious laboratories. It is able to perform a lot of applications.

KINEMATICA GmbH

- Application volume 0.05 to 2500ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32 m/s
- Speed remains constant even when viscosity changes
- Various models of dispersing aggregates in Easy-to-Clean design

Applications:

- General homogenisation applications (dispersion and emulsification)
- Formulation of lotions, creams and food
- Production of oil-water emulsions

Please order tools separately.

Specifications

Application volume:	0.05 to 2500ml
Motor input power:	500W
Aggregates:	dia. 3, 5, 7 and 12mm and dia. 20mm and 25mm
Speed range:	Stepless up to 30.000min ⁻¹
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	157 x 76 x 236mm
Tested to:	IEC/EN61326-1/IEC/EN 61000-6-2/EN 61000-6-4 IEC/EN 61010-2-51



Type	PK	Cat. No.
POLYTRON® PT 2500 E	1	4.013 108

Dispersing aggregates for Homogeniser POLYTRON® 1200 E, 1300 D and 2500 E

KINEMATICA GmbH

For model	Type	Length	Diam.	Working volume	PK	Cat. No.	
					mm	mm	ml
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 03/2 EC-E050	50	3	0.05 - 2	1	6.258 269	2
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 05/2 EC-E085	85	5	0.1 - 5	1	9.570 223	
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 07/2 EC-E107	107	7	0.3 - 10	1	6.258 271	
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 07/2SYN-E082	82	7	0.3 - 10	25	6.258 273	3
PT 1200 E	PT-DA 12/2SYN-E126			0.05 - 250	10	6.261 033	
PT 2500 E	PT-DA 12/2 EC-E157	157	12	2 - 250	1	9.570 225	
PT 2500 E	PT-DA 20/2 EC-E192	192	2	100 - 2500	1	6.258 234	
PT 1200 E / PT 1300 D / PT 2500 E	PT-DA 20/2X EC-E116	116	20	10 - 250	1	9.570 226	
PT 2500 E	PT-DA 25/2 EC-E192	192	25	100 - 2500	1	9.570 227	



6.258 269



6.258 273

Dispersing aggregates for Homogeniser POLYTRON® 10-35 GT, 3100 D and 6100 D

KINEMATICA GmbH

For model	Type	Length	Diam.	Working volume	PK	Cat. No.	
					mm	mm	ml
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 20/2 EC-E192	192	2	100 - 2500	1	6.258 234	
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 30/2 EC-F250	250	2	100 - 4000	1	9.570 228	
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 30/4 EC-F250	250	4	100 - 4000	1	6.258 233	
PT 10-35 GT / PT 3100 D / PT 6100 D	PT-DA 36/2 EC-F250	250	2	200 - 4500	1	9.570 229	
PT 3100 D / PT 6100 D	PT-DA 40/2 EC-F250	250	2	200 - 5000	1	9.570 230	
PT 3100 D / PT 6100 D	PT-DA 45/2 EC-F250	250	2	200 - 6000	1	9.570 231	
PT 3100 D / PT 6100 D	PT-DA 45/6 EC-F250	250	6	200 - 6000	1	9.570 232	
PT 3100 D / PT 6100 D	PT-DA 50/2 EC-F250	250	2	1000 - 10000	1	9.570 233	

5. Sample preparation

Mixing, Homogenisation/Dispersers

1



1 Homogeniser, POLYTRON® PT 10-35 GT

The powerfull motor is useful for sample preparation and also for formulation in scaleup matters

KINEMATICA GmbH

- Application volume 0.1 up to 10.000ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32m/s
- Speed remains constant even when viscosity changes
- Various models of dispersing aggregates in Easy-to-Clean design

Applications:

- General homogenisation applications (dispersion and emulsification)
- Formulation of lotions, creams and food
- Production of oil-water emulsions
- Dispersion of small quantities from plants, animals or human tissue

Specification

Application volume:	0.1 to 10.000ml
Motor input power:	1200W
Aggregates:	Ø 20, 30, 36mm
Speed range:	Stepless up to 30.000min ⁻¹
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	95 x 210 x 247mm
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 10-35 GT, 230V/EU package with ST-P10/600, drive holder, vessel holder, safety pos. ring	1	9.571 490

2



2 Homogeniser, POLYTRON® PT 3100 D/PT 6100 D

These dispersion units are a unique class. Applications with highest demands on reproducibility or requiring a scale-up step are excellently served by this unit. The complete digitalised control and regulating system can be easily operated using the membrane keyboard. The bright and informative display shows all parameters. Via PC interface, diverse parameters such as speed profile or times can be specified using the enclosed KIN software. Results can be recorded as an Excel file.

KINEMATICA GmbH

- Application volume 0.1 up to 30.000ml
- Soft start prevents splashing of homogenate from sample vessel
- Tip speed up to 32m/s
- Speed remains constant even when viscosity changes
- PC interfaces (RS 232 and USB)
- Digital display for showing different process parameters and messages
- Various models of dispersing aggregates in Easy-to-Clean design

Applications (see also POLYTRON® PT10-35-GT):

- reproducibility of work routine
- testing for scale-up

Specification

Application volume:	PT 3100 D 0.1 to 10 litres PT 6100 D 0.1 to 30 litres
Motor input power:	PT 3100 D with 1200W PT 6100 D with 1700W
Aggregates:	Ø 20, 30, 36, 40, 45, 50mm
Speed range:	Stepless up to 30.000min ⁻¹
Max. viscosity:	6000mPas
Drive Dimensions (L x W x H):	PT 3100 D 240 x 130 x 265mm PT 6100 D 360 x 164 x 313mm
Tested to:	IEC/EN 61000-6-2/EN 61000-6-3/IEC/EN 61010-2-51

Type	PK	Cat. No.
PT-MR 3100 D, 230V/EU package with ST-F10/600	1	6.235 534
PT-MR 6100 D, 230V/EU package with ST-F11/855	1	9.571 491

5. Sample preparation

Mixing, Homogenisation/Dispersers

4 Disperser System Ultra-Turrax® Tube Drive

Disperse, stir and grind using a single drive unit. Patented disposable disperser system for volumes from 2ml to 50ml with hermetically sealable, disposable sample tubes.

Provides protection and safety from: Infectious samples, toxic substances, strong-smelling materials.

- no possibility of cross-contamination
- suitable for individual or serial operations
- increased safety due to low voltage (24V) power
- chemically resistant plastic containers
- anti-locking function
- patented
- worldwide service guaranteed by Ika®

ULTRA-TURRAX® Tube Drive Workstation additionally with:

- USB interface for experiment control and documentation
- Collecting tray for protection against leaking liquids
- Simple, precise and multilingual menu navigation with OLED display
- Programmable sample conditions (library)
- Tubo button for short-term, intensive mixing, dispersing and grinding
- Adjustable reverse operation

ULTRA-TURRAX® Tube Drive Workstation supplied with:

Ultra Turrax® Tube Drive, 2 x DT-20 dispersing tubes incl. hook for removing the rotor-stator unit, 2 x ST-20 stirring tubes, 2 x BMT-20 G/S Ball-mill-tubes (with glass balls/stainless steel balls, respectively), power supply and 1 x removal hook for removal the rotor-stator unit.

Dispersing tubes (20ml and 50ml) with pierceable membrane and γ -sterilised are available on request.

ULTRA-TURRAX® Tube Drive control Workstation supplied with:

ULTRA-TURRAX® Tube Drive control , 1 x ST-20, 1 x DT-20 incl. 1 removal hook for removal the rotor-stator unit, 2 x BMT-20 G/S, power supply.



IKA
9.570 500



9.570 506



4.008 150



4

Specifications

Motor rating input/output

ULTRA-TURRAX® Tube Drive:

20/17 W

ULTRA-TURRAX® Tube Drive control:

28/17 W

Volume:

2ml to 50ml

Viscosity max.:

5000mPas

Speed range

ULTRA-TURRAX® Tube Drive:

300rpm to 6000rpm

ULTRA-TURRAX® Tube Drive control:

400rpm to 8000rpm

Noise without element:

50dB(A)

Timer

ULTRA-TURRAX® Tube Drive:

1 to 59sec. (300 to 6000rpm)

ULTRA-TURRAX® Tube Drive control:

1 to 29min. (300 to 4000rpm)

Protection class according to DIN EN 60529:

1 sec. up to 30min. (continuously adjustable)

Supply requirements:

IP20

Tested to DIN EN IEC 61010-1.

100v - 240V /50/60Hz

Description	Dimensions (W x D x H) mm	Weight kg	PK	Cat. No.
Ultra-Turrax® Tube Drive	100 x 160 x 40	0.75	1	9.570 500 1
Ultra-Turrax® Tube Drive Workstation	100 x 160 x 40	0.75	1	9.570 506 2
ULTRA-TURRAX® Tube Drive control	122 x 178 x 54	0.90	1	4.008 150 3
ULTRA-TURRAX® Tube Drive control Workstation	122 x 178 x 54	0.90	1	4.008 135
DT-20 Dispersing Tube with dispersing unit, 20ml			25	9.570 507
DT-20 eco Dispersing Tube with dispersing unit, 20ml			25	6.265 701
ST-20 Stirring Tube, 20ml			25	9.570 508
BMT-20 G Ball-Mill-Tube (with glass balls), 20ml			25	9.570 509
BMT-20 S Ball-Mill-Tube (with stainless steel balls), 20ml			25	9.570 510
50 ml tubes available on request.				

5. Sample preparation

Mixing, Homogenisation/Dispersers

1



1 Homogeniser T 10 basic ULTRA-TURRAX®

Small dispersing instrument for volumes from 0.5ml to 100ml (H₂O). It offers a wide speed range from 8000rpm to 30000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications.

IKA

- Quick-connect coupling for changing dispersing elements easily
- Ideal for manual operation due to its light weight and ergonomic design
- Extremely mobile due to direct line power (no transformer required)
- Stainless steel dispersing elements can be cleaned quickly and easily as they can be dismounted without tools
- Plastic disposable dispersing elements are available in two sizes, particularly suitable for PCR analysis
- High performance drive ensures immense speed stability
- Quiet operation

Specifications

Motor rating input/output:	125W/75W
Working volume range (H ₂ O):	0.5ml to 100ml
Viscosity max.:	5000mPas
Speed range:	8000rpm to 30000rpm
Speed display:	scale
Speed control:	stepless
Noise without element:	65dB(A)
Extension arm diam./length:	8mm/130mm
Dimensions (WxDxH):	56 x 66 x 178mm
Weight:	0.5kg
Power supply:	230V, 50/60Hz
Protection class DIN EN 60529:	IP 30

Type	PK	Cat. No.
T 10 basic ULTRA-TURRAX®	1	9.570 940
T 10 basic S2 ULTRA-TURRAX® UK	1	9.570 941
T 10 basic S3 ULTRA-TURRAX® CH	1	9.570 942

2



2 | 3 Dispersing instrument T 10 standard ULTRA-TURRAX® PCR Kit

Competitively priced dispersing instrument for volumes of 0.5ml to 100ml. A wide speed range allows you to work at high circumferential speeds.

IKA

- maintains speed with various media thanks to high performance 125W drive
- ideal for manual operation thanks to its light weight and ergonomic form
- extremely mobile thanks to direct mains operation (no transformer required)
- stainless steel dispersing elements (5mm, 8mm and 10mm diameter) can be cleaned quickly and easily as they can be dismantled without tools
- plastic disposable dispersing elements in two sizes, particularly suitable for PCR analysis
- quick-release coupling makes changing the dispersing elements easy

Supplied with: storage case incl. drive, clamp and plastic dispersing elements.

Specifications

Motor rating input/output:	125/75W
Working volume range (H ₂ O):	0.5 to 100ml
maximum viscosity:	5000mPas
Speed range:	8000 to 30000rpm
Speed adjustment:	stepless
Speed display:	Scale (1 to 6)
Clamping rod diameter/length:	8 mm/100mm
Dimensions:	46 x 57 x 201mm
Weight:	0.4kg
Protection rating to DIN EN 60529:	IP30
Tested to DIN EN IEC 61010-1.	

3



Type	PK	Cat. No.
T 10 standard ULTRA-TURRAX® PCR Kit	1	9.570 959

5. Sample preparation

Mixing, Homogenisation/Dispersers

Dispersing heads Ultra Turrax® T 10 standard/T 10 basic

Dispersing heads, plastic: Autoclavable. Dispersing heads, stainless steel: Ultimate fineness emulsions 1 to 10µm and suspensions 5 to 25µm, sterilisable by all methods.

IKA

Type	Material	Diam. rotor / stator	Max. immersion depth	Working volume	PK	Cat. No.
		mm	mm	ml		
S 10 D-7 G-KS - 65	PC, PSU	4,8 / 7	65	1 - 20	24	6.262 140
S 10 D-7 G-KS - 110	PC, PSU	4,8 / 7	110	1 - 40	24	9.570 878 1
S 10 N - 5 G	PTFE, AISI 316L	3,8 / 5	75	0,5 - 10	1	7.631 964 2
S 10 N - 8 G	PTFE, AISI 316L	6,1 / 8	95	1 - 50	1	6.225 614 3
S 10 N - 10 G	PTFE, AISI 316L	7,6 / 10	100	1 - 100	1	6.225 477 4



9.570 878



7.631 964



6.225 614



6.225 477

5

Homogeniser T 18 digital ULTRA-TURRAX®

Competitively priced dispersing instrument for volumes from 1ml to 1500ml (H₂O) with digital speed display. It offers a wide speed range from 500rpm to 25000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications.

IKA



- Digital speed display
- Electronic speed control
- Electronic overload protection
- Stainless steel dispersing elements can be cleaned quickly and easily
- Plastic disposable dispersing elements are available in two sizes
- Error code display
- Quiet operation

Specifications

Motor rating input/output:	500W/300W
Working volume range (H ₂ O):	1ml to 1500ml
Viscosity max.:	5000mPas
Speed range:	500rpm to 25000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	75dB(A)
Extension arm diam./length:	13mm/160mm
Dimensions (WxDxH):	87 x 106 x 271mm
Weight:	2.5kg
Power supply:	200-240 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

PK Cat. No.

T 18 digital ULTRA-TURRAX®	1	9.570 943
T 18 digital S2 ULTRA-TURRAX® UK	1	9.570 944
T 18 digital S3 ULTRA-TURRAX® CH	1	9.570 945
T 18 digital ULTRA-TURRAX® Package	1	9.570 946
T 18 digital S2 ULTRA-TURRAX® Package UK	1	9.570 947
T 18 digital S3 ULTRA-TURRAX® Package CH	1	9.570 948

6

Dispersing heads for Ultra Turrax® T18 digital

Plastic dispersing heads: Autoclavable

IKA

Stainless steel dispersing heads: Ultimate fineness emulsions 1 to 10µm and suspensions 10 to 50µm, sterilisable by all methods.



PK Cat. No.

Type	Diam. rotor / stator	Max. immersion depth	Working volume	Material	PK	Cat. No.
	mm	mm	ml			
S 18 D-10 G-KS	6.75 / 10	85	10 to 100	PC, PEEK	12	9.570 855
S 18 D-14 G-KS	9.5 / 14	85	10 to 500	PC, PEEK	12	9.570 857
S 18 N - 10 G	7.5 / 10	70	1 to 100	PTFE, AISI 316L	1	9.570 841
S 18 N - 19 G	12.7 / 19	170	10 to 1500	PTFE, AISI 316L	1	9.570 842

5. Sample preparation

Mixing, Homogenisation/Dispersers

1



1 Homogeniser T 25 digital ULTRA-TURRAX®

High-performance dispersing instrument for volumes from 1 to 2000ml (H₂O) with digital speed display. It offers a wide speed range from 500 to 25000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements adds versatility. Applications ranges from homogenizing waste water samples, use in laboratory reactors, dispersion tasks under vacuum/pressure and sample preparation in medical diagnostics.

IKA

- Digital speed display
- Electronic speed control
- Electronic overload protection
- Stainless steel dispersing elements can be cleaned quickly and easily
- Plastic disposable dispersing elements are available in two sizes
- Error code display
- Quiet operation

Specifications

Motor rating input/output:	800/500W
Working volume range (H ₂ O):	1 to 2000ml
Viscosity max.:	5000mPas
Speed range:	500 to 25000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	75dB(A)
Extension arm diam./length:	13mm/160mm
Dimensions (WxDxH):	87 x 106 x 271mm
Weight:	2.5kg
Power supply:	200-400 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

Type	PK	Cat. No.
T 25 digital ULTRA-TURRAX®	1	9.570 949
T 25 digital S2 ULTRA-TURRAX® UK	1	9.570 950
T 25 digital S3 ULTRA-TURRAX® CH	1	9.570 951

Dispersing heads for T25 basic Ultra-Turrax®

IKA

Plastic dispersing heads: Autoclavable.

Stainless steel dispersing heads: Ultimate fineness: emulsions 1µm to 10µm and suspensions 5µm to 50µm, sterilisable by all methods.

Type	Diam. rotor / stator mm	Max. immersion depth mm	Working volume ml	Material	PK	Cat. No.
S 25 D-10 G-KS	6.75 / 10	85	10 - 100	PC, PEEK	12	9.570 859 2
S 25 D-14 G-KS	9.5 / 14	85	10 - 500	PC, PEEK	12	9.570 861 3
S 25 N - 8 G	6.1 / 8	85	1 - 50	PTFE, AISI 316L	1	9.571 098
S 25 N - 10 G	7.5 / 10	85	1 - 100	PTFE, AISI 316L	1	9.571 207
S 25 N - 18 G	12.7 / 18	165	10 - 1500	PTFE, AISI 316L	1	9.571 119
S 25 NK - 19 G	12.7 / 19	165	25 - 1500	PTFE, AISI 316L	1	9.571 121
S 25 KV - 25 G	17.0 / 25	225	50 - 2000	FFPM / SIC, AISI 316L	1	9.571 198
S 25 N - 25 G	17.0 / 25	165	50 - 2000	PTFE, AISI 316L	1	9.571 200 4
S 25 N - 25 F	18.0 / 25	165	100 - 2000	PTFE, AISI 316L	1	9.571 201
S 25 KV - 25 F	18.0 / 25	225	100 - 2000	FFPM / SIC, AISI 316L	1	9.571 199
S 25-KR-18 G	12.7 / 18	185	10 - 1500	FKM, PTFE, AISI 316L	1	4.653 931
S 25-KR-25 G	17.0 / 25	185	50 - 2000	FKM, PTFE, AISI 316L	1	4.653 932
S 25-KR-18 G-ST	13.4 / 18	185	10 - 1500	FKM, PTFE, AISI 316L	1	4.653 933
S 25-KR-25 G-ST	20.0 / 25	185	50 - 2000	FKM, PTFE, AISI 316L	1	4.653 934
S 25-KR-25 F	18.0 / 25	185	100 - 2000	FKM, PTFE, AISI 316L	1	4.653 935

Further dispersing heads are available on request.

2



9.570 859

3



9.570 861

4



9.571 200

5. Sample preparation

Mixing, Homogenisation/Dispersers

Cleaning tool TS 25-3 for Dispersing heads

For dispersing heads S25N-18G/18G-ST, S25N-25G/F/25G-ST, S25KR-18G/18G-ST, S25KR-25G/25F/25G-ST and S25KV-18G/25G/25F.

IKA

Type	PK	Cat. No.
TS 25-3	1	6.265 708

1 High-power homogeniser T 50 digital ULTRA-TURRAX®

Powerful dispersing instrument for volumes from 0.25 to 30l (H₂O) with digital speed display. It offers a wide speed range from 500 to 10000rpm that enables users to work at high circumferential speeds even with small rotor diameters. A broad choice of dispersing elements guarantees a wide range of applications. Reproducible operations due to constant speed even with changes in viscosities.

IKA



Specifications

Motor rating input/output:	1100W/700W
Working volume range (H ₂ O):	0.25 to 30l
Viscosity max.:	5000mPas
Speed range:	500 to 10000rpm
Speed display:	LED
Speed control:	stepless
Noise without element:	72dB(A)
Extension arm diam./length:	16mm/220mm
Dimensions (WxDxH):	115 x 139 x 355mm
Weight:	5.76kg
Power supply:	200-240 V, 50/60Hz
Protection class DIN EN 60529:	IP 20

Type	PK	Cat. No.
T 50 digital ULTRA-TURRAX®	1	9.570 952
T 50 digital S2 ULTRA-TURRAX® UK	1	9.570 953
T 50 digital S3 ULTRA-TURRAX® CH	1	9.570 954

Dispersing heads for T50 digital ULTRA-TURRAX®

(NEW!)

Stainless steel dispersing heads

IKA

Type	Diam. rotor / stator mm	Max. immersion depth mm	Working volume l	Ult. fineness suspensions / emulsions µm	Material	PK	Cat. No.
S 50 KG - HH - G 45 G, FDA	36.0 / 45	260	0.5 - 20	40 - 100 / 10 - 30	FFPM/SIC, AISI 316L	1	4.653 936
S 50 KG - HH - G 45 G - ST, FDA	36.0 / 45	260	0.5 - 20	40 - 100 / 10 - 30	FFPM/SIC, AISI 316L	1	4.653 937
S 50 KG - HH - G 45 M, FDA	40.5 / 45	250	0.5 - 15	25 - 50 / 5 - 20	FFPM/SIC, AISI 316L	1	4.653 938
S 50 KG - HH - G 45 F, FDA	40.0 / 45	250	0.25 - 10	10 - 30 / 1 - 10	FFPM/SIC, AISI 316L	1	4.653 939
S 50 KG - HH - G 45 F	40.0 / 45	250	0.25 - 10	10 - 30 / 1 - 10	FFPM/SIC, AISI 316L	1	9.570 898
S 50 N - G 45 G*	36.0 / 45	250	0.5 - 20	40 - 100 / 10 - 30	PTFE, AISI 316L	1	9.570 882 2
S 50 N - G 45 M*	40.5 / 45	250	0.5 - 15	25 - 50 / 5 - 20	PTFE, AISI 316L	1	9.570 886 3
S 50 N - G 45 F*	40.0 / 45	250	0.25 - 10	10 - 30 / 1 - 10	PTFE, AISI 316L	1	9.570 896 4

* sterilisable by all methods

Further dispersing heads are available on request.

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9.570 882

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9.570 886

4



9.570 896

5. Sample preparation

Mixing, Homogenisation/Dispersers

Special dispersing heads for disperser T50 digital

R 50 "high speed" stirring shaft

Using the R 50 stirring shaft, the T50 digital is quickly converted into a high speed stirrer. 700W power and 10000rpm are provided for rapid mixing, dissolving, and breaking up pigment agglomerates. The conical shaft is supported by means of ball bearings, the mixing elements have a screw connection. For operational safety a protective cage is fitted around the mixing element.

IKA

S 50 N - W 80 SMK Jet mixer head

For shortening mixing and dissolving times. The vertical flow and the high tangential speed, up to 10000rpm, ensure intensive mixing. The head is used for adding gases or liquids, for lump-free suspension of difficult to dissolve powders or for dissolving sedimented, accreted substances.

S 50 N - W 65 SK Cutting head

To crush large pieces (up to 50mm) of fibrous materials, such as plant matter, vegetables and fruit.

Type	Max. immersion depth mm	Working volume l	PK	Cat. No.
R 50	180	0.25 to 30	1	9.571 350 1
S 50 N - W 80 SMK	350	1 to 50	1	9.570 926 2
S 50 N - W 65 SK	350	1 to 10	1	9.570 922 3



9.571 350



9.570 926



9.570 922

Stands and fittings for Dispersers T 10/T 18/T 25/T 50

IKA

Type	Description	Rod diam.	Height mm	For model	PK	Cat. No.
R 104	Stand	10	370	T 10	1	7.631 971 4
H 44	Bosshead			T 10	1	9.232 994 5
R 200	Clamp			T 10	1	6.225 158 6
R 1825	Stand with baseplate	16	560	T 18 / T 25	1	9.224 031 7
RH 5	Strap clamp			T 50	1	9.224 762
R 1826	Stand with baseplate	16	800	T 18 / T 25	1	9.224 032
R 1827	Stand with baseplate	16	1000	T 18 / T 25	1	9.224 033
R 182	Bosshead			T 18 / T 25	1	9.224 292 8
RH 3	Strap clamp			T 18 / T 25	1	9.224 761 9
R 2722	H-stand	34	1010	T 50	1	9.224 026
R 2723	Telescopic stand	34	620 - 1010	T 50	1	9.224 028
R 271	Bosshead			T 50	1	9.224 266



7.631 971



9.232 994



6.225 158



9.224 031



9.224 292



9.224 761

5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

1 Ultrasonic Homogeniser SONOPULS mini20

Ready-to-operate for volumes from 0.1 ml to 25ml, consisting of HF generator mini20, ultrasonic converter mini20 and microtip MS 2.5, diameter 2.5mm. Max. 12W_{eff} HF output. Automatic amplitude control.

Bandelin

- pulse: ON cycles 0.1 to 60 secs.; OFF cycles 0.2 to 60 secs.
- time modes, safety shut down: 59min, 59s
- energy monitoring in kJ
- remote control with PC: RS232 (infrared)
- HF power: max. 20W_{eff}
- processing frequency 30kHz
- electrical supply data: 230 V~, 50/60 Hz

HF generator GM mini20

Dimensions: 250 x 256 x 154mm
Weight: 2.0kg

Converter UW mini20

Dimensions, dia. x H: Approx. 50mm x 160mm
Weight: 270g
Titanium probes: Ø 1.5, 2.0, 2.5mm diameter



Type	PK	Cat. No.
SONOPULS mini20	1	9.650 160

2 Ultrasonic homogenisers, Sonopuls HD 2070/HD 2200

For cell disruption, emulsification and homogenising of materials, liquid degassing, dispersion, extraction and for sonochemistry. Amplitude adjustable from 10 to 100%. Values can be monitored on the digital display. Pulsation time and data can be stored in the integrated memory.

Bandelin

Processing frequency: 20 kHz, which is particularly effective. Fail-safe protection against operating when sample vessel empty and during continuous operation. For 230V 50/60Hz supplies, alternatively available for 115V~, 50/60Hz supplies on request. CE-marked, also as a medical device compliant to the in-vitro diagnostics directive 98/79/EG.



On/off switch control:	Possible directly at the converter, at the ultrasonic generator or via remote control (foot switch)
Amplitude adjustment:	Electronically stabilised from 10 to 100%, ±1%
Pulsation control:	10 to 100% permits heat dissipation when processing sensitive samples
Timer:	1 sec. to 99 mins. : 59 sec. or continuous operation

3 Ultrasonic homogeniser, SONOPULS HD 2070

For volumes from 2ml to 50ml. Ready to operate, standard unit with GM 2070 generator, UW 2070 ultrasonic converter, SH 70 G titanium stepped horn probe with external thread and MS 73 3 mm diameter micro tip. HF-output: max. 70 W_{eff}. Titanium probes for other volumes (1ml to 200ml) are available with probes from 2mm to 13mm diameter.

Type	PK	Cat. No.
SONOPULS HD 2070	1	9.650 180

HD 2070 (stand and vessel are not included in delivery).



4 Ultrasonic homogeniser, SONOPULS HD 2200

For volumes from 20ml to 900ml. Ready-to-operate standard unit with GM 2200 generator, UW 2200 ultrasonic converter, SH 213 G booster horn with external thread and diameter 13mm titanium tip TT 13. HF-output: max. 200 W_{eff}. Titanium probes for other volumes (2ml to 1000ml) are available with probes from diameter 2mm to 25mm.

Type	PK	Cat. No.
SONOPULS HD 2200	1	9.650 185

HD 2200 (stand and vessel are not included in delivery).



5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

Ultrasonic homogenisers, SONOPULS HD 3100/3200/3400

- Amplichron® control
- amplitude setting adjustable in % or alternatively power control in W
- Working frequency 20 kHz
- Pulsation: operation intervals from 0.2 s up to 600 secs, rest intervals from 0.3 secs up to 600 secs
- Timer 9 h: 59 min: 59 secs
- Display of energy delivered to the sample in kJ
- 9 user programmes
- Probe monitoring (of specific probes)
- Automatic amplitude limiting after preselection of the probe
- Temperature indication from 0 up to 120°C (248°F), either with unit shutdown or alarm indication when the maximum temperature is exceeded, using optional temperature sensor
- WINPULS® remote control for process organisation with PC via RS232 and IR interfaces with IR adapter
- Backlit graphics LCD readout
- 230V~, 50/60Hz or 115V~, 50/60Hz

Bandelin

SONOPULS ultrasonic homogenisers are CE-marked, also as a medical device compliant to the in-vitro diagnostics directive 98/79/EG.

Applications: Disruption of highly-resistant bacteria, cells or tissues - Production of fine emulsions - Homogenization - Degassing of liquids - Sample preparation for grain size analysis - Catalysis of chemical reactions

1



1 Ultrasonic homogeniser, Sonopuls HD 3100

High-Tech for research - using small volumes.

Bandelin

For samples from 2 ml to 50ml, ready-to-operate standard set with GM 3100 generator, UW 3100 ultrasonic converter , SH 70 G standard horn and MS 73 microtip, diameter 3 mm.

Max. 100W HF-output. - Processing frequency 20kHz. - for 230V 50/60Hz or 115V 50/60Hz supplies - For volumes from 1 ml to 200ml - 5 titanium probes, 2mm to 13mm diameter, are available.

HF generator

Dimensions:

GM 3100

250 x 256 x 154mm

Weight:

2.0kg

Converter

Dimensions:

UW 3100

70 x 120mm diameter

Weight:

1kg

Titanium probes:

2mm, 3mm, 6mm, 13mm diameter (not supplied)

Type	PK	Cat. No.
SONOPULS HD 3100 HD 3100 (stand and vessel are not included in delivery)	1	9.650 170

2



2 Ultrasonic homogeniser, SONOPULS HD 3200

High-Tech for research - using larger volumes

Bandelin

For volumes from 20ml to 900ml, ready-to-operate standard set with generator GM 3200, ultrasonic converter UW 3200, booster horn SH 213 G and flat titanium tip TT 13 diameter 13 mm.

Max. 200W HF-output. - Processing frequency 20kHz. - For 230V 50/60Hz or 115V 50/60Hz supplies - For volumes from 2ml to 1000ml - 8 titanium probes available from 2mm to 25mm diameter.

HF generator

Dimensions:

GM 3200

250mm x 256mm x 170mm

Weight:

2.7kg

Converter

Dimensions:

UW 3200

70 diameter x 120mm

Weight:

1kg

Titanium probes (diameter):

2mm, 3mm, 6mm, 13mm, 19mm, 25mm (not supplied)

Type	PK	Cat. No.
SONOPULS HD 3200 HD 3200 (stand and vessel are not included)	1	9.650 175

5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

1



1 Ultrasonic Homogeniser Sonopuls HD 3400

High tech for research and pilot plant stations

Bandelin

Ready-to-operate, basic unit for 100ml to 2500ml volumes consisting of generator GM 3400, ultrasonic converter UW 3400, threaded booster horn SH 3425 G and probe VS 200 T, 25mm diameter VS 190, T 19mm diameter on request. HF out put max. 400W_{eff}.

HF generator

Dimensions:

Weight:

Converter

Dimensions, dia. x H:

Weight:

Titanium probes:

GM 3400

324 x 230 x 131mm

3.1kg

UW 3400

90 x 180mm

2.2kg

19mm; 25mm diameter (not supplied)

Type

PK Cat. No.

SONOPULS HD 3400

1 9.650 195

HD 3100/HD 3200 (stand and glas not included in delivery)

2



2 Ultrasonic homogeniser, SONOPULS HD 4050

For volumes up to 100 ml. Ready-to-operate basic equipment for volumes from 0.5 ml to 100 ml consisting of:

Bandelin

- HF generator GM 4100
 - ultrasonic converter UW 50
 - titanium probe TS 102, dia. 2 mm
- HF output max. 50 W_{eff}

HF generator

Dimensions:

Converter

Dimensions:

Titanium probes (diameter):

GM 4100

150 x 220 x 335mm

UW 50

45 diameter x 175mm

2mm, 3mm, 4mm, 5mm (not supplied)

Type

PK Cat. No.

SONOPULS HD 4050

1 9.650 151

HD 4050 (stand and vessel are not included)

3



3 Ultrasonic homogeniser, SONOPULS HD 4100

For volumes up to 250 ml. Ready-to-operate basic equipment for volumes from 2 ml to 250 ml consisting of:

Bandelin

- HF generator GM 4100
 - ultrasonic converter UW 100
 - standard horn SH 100 G
 - titanium probe TS 103, dia. 3 mm
- HF output max. 100 W_{eff}

HF generator

Dimensions:

Converter

Dimensions:

Titanium probes (diameter):

GM 4100

150 x 220 x 335mm

UW 100

70 diameter x 150mm

2mm, 3mm, 4mm, 5mm (not supplied)

Type

PK Cat. No.

SONOPULS HD 4100

1 9.650 152

HD 4100 (stand and vessel are not included)

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9.650 208

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9.650 217

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9.650 205

Booster horns and stepped horns for SONOPULS Ultrasonic homogenisers, titanium alloy

Booster horns, stepped horns (titanium alloy) for connection of interchangeable sonotrodes (probes). Further booster horns are available on request.

Bandelin

Type	Diam. mm	For	PK	Cat. No.
Booster horn SH 213 G	13	HD 2200 / HD 3200	1	9.650 208 4
Booster horn SH 219 G	19	HD 2200 / HD 3200	1	9.650 218 5
Booster horn SH 225 G	25	HD 2200 / HD 3200	1	9.650 217 6
Stepped horn SH 70 G	13	HD 2070 / HD 3100	1	9.650 205 7
Stepped horn SH 100 G	13	HD 4050 / HD 4100	1	9.650 156
Booster horn SH 3419	19	HD 3400	1	9.650 204
Booster horn SH 3425	25	HD 3400	1	9.650 209

5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

Ultrasonic homogenisers, SONOPULS, accessories

Stainless steel stands HG 5/11, with base plate.

Bandelin

Clamping device KL 7 with rod, swivelling clamp and quick clamp for reaction vessels of 15mm to 100mm diameter.

Support table AT 7 suitable for KL 7 or in LS 8 and LS 11, for the safe stationing of ultrasonic irradiation vessels.

Type	Description	For	PK	Cat. No.
HG 5	Stainless steel stand	HD 2070 / 3100 / 2200 / 3200	1	9.650 273 1
HG 10	Stainless steel stand	HD 3400	1	9.650 275
KL 7	Clamping device	HG 5 / HG 10	1	9.650 276 2
AT 7	Support table	KL 7 or LS 8 / LS 11	1	9.650 277 3

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Probes for Sonopuls Ultrasonic homogenisers, titanium

Titanium probes.

Bandelin

For connection to stepped horns/booster horns.

Type	Diam. mm	Tip	For	For		PK	Cat. No.
				For bottle ml	For		
MS 72	2.0	microtip	SH 70 G	1 - 25	HD 2070 / 2200	1	9.650 244
			SH 213 G	2 - 30	HD 3100 / 3200		
MS 73	3.0	microtip	SH 70 G	2 - 50	HD 2070 / 2200	1	9.650 245 4
			SH 213 G	5 - 90	HD 3100 / 3200		
KE 76	6.0	tapered tip	SH 70 G	5 - 100	HD 2070 / 2200	1	9.650 246 5
			SH 213 G	10 - 350	HD 3100 / 3200		
TT 13	13.0	titanium flat tip	SH 70 G	10 - 200	HD 2070 / 2200	1	9.650 250
			SH 213 G	20 - 900	HD 3100 / 3200		
TT 13 FZ	13.0	titanium flat tip with hole	FZ 5 G	-	HD 2200 / 3200	1	9.650 247
			FZ 7 G				
TT 19	19.0	titanium flat tip	SH 219 G	25 - 900	HD 2200 / 3200	1	9.650 248
TT 25	25.0	titanium flat tip	SH 225 G	30 - 1000	HD 2200 / 3200	1	9.650 249
VS 70 T	13.0	probe long	SH 70 G	10 - 200	HD 2070 / 2200	1	9.650 239 6
			SH 213 G	20 - 900	HD 3100 / 3200		
VS 190 T	19.0	probe long	SH 219 G	25 - 900	HD 2200 / 3200	1	9.650 243
			SH 3419	500 - 1500	HD 3400		
VS 200 T	25.0	probe long	SH 225 G	30 - 1000	HD 2200 / 3200	1	9.650 240
			SH 3425	500 - 2500	HD 3400		
MS 1.5	1.5	microtip	UW mini20	0,1 - 10	Sonpuls mini20	1	9.650 165
MS 2.0	2.0	microtip	UW mini 20	0,25 - 20	Sonpuls mini20	1	6.251 521
MS 2.5	2.5	microtip	UW mini20	0,5 - 25	Sonpuls mini20	1	9.650 166
TS 102	2.5	titanium probe	SH 100 G	-	HD 4000 series	1	9.650 157
TS 103	3.0	titanium probe	SH 100 G	-	HD 4000 series	1	9.650 158
TS 104	4.5	titanium probe	SH 100 G	-	HD 4000 series	1	9.650 159

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5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers



1 Flow-through standard horn for Sonopuls Ultrasonic homogenisers

- Flow-through standard horn FZ 5 G with external screwthread and titanium flat tip TT 13 FZ.
- Flow-through standard horn FZ 7 G with external screwthread and titanium flat tip TT 13 FZ.

Bandelin

Type	For	PK	Cat. No.
FZ 5 G	HD 2070 / HD 3100	1	9.650 241
FZ 7 G	HD 2200 / HD 3200	1	9.650 242

2 Flow-through cell for SONOPULS Ultrasonic homogenisers, stainless steel

Flow-through cell for continuous flow-through processing. Stainless steel, sealed, vibration-free reaction vessel with cooling jacket. For connection to SH 70 G or SH 213 G with TT 13. For HD 2070, HD 2200, HD 3100 and HD 3200 homogenisers. Flow rate up to 50 L/hr.

Bandelin

Type	PK	Cat. No.
DG 4 G (flow-through)	1	9.650 269

3 Ultrasonic processing vessels for SONOPULS Ultrasonic homogenisers, plastic

Ultrasonic processing vessels. Plastic. For indirect ultrasonic irradiation. If BB 2 G is ordered, titanium flat tip TT 13 is required. BB 6 fits directly to UW 2200/UW 3200.

Bandelin

Microtube holder EH6. Stainless steel. For simultaneous, contact-free ultrasonic irradiation of up to 6 samples using the ultrasonic homogeniser HD 2200/HD 3200 and ultrasonic processing vessel BB 6.

Type	For	PK	Cat. No.
BB 6	HD 2200 / HD 3200	1	9.650 254
EH 6	BB6	1	9.650 258

4 Sleeve adapters for Sonopuls Ultrasonic homogenisers, PTFE

PTFE sleeve adapters for mounting probes into standard ground joint vessels.

Bandelin

For use with HD 2070/2200/3100/3200 homogenisers

- NA 29 G: for vessels with standard ground joint 29/32 and for SH 70/213 G horns
- NA 45 G: for vessels with standard ground joint 45/40 and for SH 70/213/219/225 G horns

Type	PK	Cat. No.
NA 29 G	1	9.650 228
NA 45 G	1	9.650 229

5 Ultrasonic homogeniser cup booster BR 30 for SONOPULS HD 2070/ 2200/ 3100/ 3200

For Sonopuls HD 2070, HD 2200, HD 3100 and HD 3200.

Bandelin

- BR 30 cup booster enables highly intensive sonication of small samples, disruption of cells or sonification of pathogenic or toxic substances.

- EH 3: Microtube holder for BR 30 for simultaneous sonification of up to 3 samples.

Specifications

Beaker capacity:	12ml
Int. height:	15mm
Int. diameter:	32mm
Max. ultrasound intensity:	3100 W/L (HD 2200/3200)
Material:	Titanium alloy

Type	PK	Cat. No.
BR 30	1	9.650 190 5
EH 3	1	9.877 745 6

Converter and stand are not included.

5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

Accessories for SONOPULS Ultrasonic homogenisers HD 2200, glass

Glass sample vessels for direct ultrasonic irradiation.

Bandelin

Type	For probes up to Ø mm	Capacity ml	For	PK	Cat. No.
KG 3 cooling vessel	13	15	HD 2070/2200/3100/3200	1	9.650 235 1
KG 5 cooling vessel	25	70	HD 2200/3200	1	9.650 223
DG 3 flow-through vessel with cooling jacket	13	15	HD 2070/2200/3100/3200	1	9.650 236 2
DG 5 flow vessel with cooling jacket	25	70	HD 2200/3200	1	9.650 224
RZ 1 rosett cell	13	25	HD 2070/2200/3100/3200	1	9.650 267
RZ 2 rosett cell	13	40	HD 2070/2200/3100/3200	1	9.650 268
RZ 3 rosett cell	13	110	HD 2070/2200/3100/3200	1	9.650 261 3
RZ 4 rosett cell	25	390	HD 2200/3200/3400	1	9.650 260
RZ 5 rosett cell	25	660	HD 2200/3200/3400	1	9.650 264

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4 Sound proof boxes LS series

Provides considerable noise level reduction.

Bandelin

LS 4: Made of plastic-coated walls. 10dB(A) damping.

LS 8/11: Made of stainless steel, with damping plates. 20dB(A) damping. With rod, swivelling clamp and bosshead for height adjustment of sample vessels.

4



→ For our Life Science product range - please see page 1180

Accessories for sound proof box LS 8

For sonification using the BR 30 cup booster, support frame UG 6 allows BB 6 or BB 2G

Bandelin

acoustic irradiation cups to rotate through 180° within the LS 8 noise protection box (not included with main instrument). Material: PTFE-coated, lacquered aluminium support with PTFE feet. Ultrasonic converter UW 2070/2200/3100/3200 can be securely attached using the rapid snap fastener.

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9.650 238

Description

PK Cat. No.

Support UG 6 for LS 8

1 9.650 238 5

Spacer AH 6 for LS 8*

1 9.650 225 6

* Required for direct sonification using long probes.

6



5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers

3 Ultrasonic Processor UP50H/UP100H

For manual operation or for stand use, frequency 30kHz, automatic frequency tuning system, amplitude adjustable 20% to 100%, pulse 0 to 100%, dry running protected, in portable case, with mounting for stand STH-16 and mounting tools, 230V a.c.

Hielscher Ultrasonics

Type	Rating W	PK	Cat. No.
UP50H	50	1	9.106 600 1
UP100H	100	1	6.235 231 2



Accessories for Ultrasonic Processor UP50H/UP100H

Sonotrode MS1, made of titanium, approx. length 80mm

Hielscher Ultrasonics

Sonotrode MS3, made of titanium, approx. length 80mm

Sonotrode MS7, made of titanium, approx. length 80mm

Sonotrode MS10, made of titanium, approx. length 80mm (only for UP100H)

Stand ST1-16, pole diameter 16mm, made of stainless steel, base (L x W x H) 300 x 150 x 600mm

Sound Protection Box SB2-16, with adjustable table and 16mm stand pole

Timer T1, from 00:00 to 99:59 (min:sec)

Type	Tip	For bottle ml	PK	Cat. No.
MS1	dia. 1mm	0,1 - 5,0	1	9.106 602
MS3	dia. 3mm	5,0 - 100	1	4.005 989
MS7	dia. 7mm	10,0 - 250	1	9.106 604
MS10	dia. 10mm	20,0 - 500	1	4.005 990
ST1-16			1	6.226 573
SB2-16			1	6.235 330
T1			1	6.235 003

4



4 Ultrasonic Homogeniser UP200St-G

Digital ultrasonic generator, UP200St-G, 200 watts, frequency 26kHz (auto-scan), amplitude 20-100%, pulse 10-100%, handheld and stand-mounted use, colored touch-screen, dry running protected, Ø45mm, approx. length 230mm, titanium horn Ø10mm (max. amplitude at horn 70µm), start/stop button, LEDs for sample illumination, simplified exchange sonotrodes, IP65 grade, amplitude or power control, countdown (timer): 0.1sec to 99 days, shutdown when final energy input reached (Ws, Wh, kWh), autom. Calibration of the amplitude-dependent idle power, data recording: amplitude, power, time, temperature on internal SD/USB ComboCard (1GB), display and remote control via browser on PC/MAC without software installation, remote control via PLC, with temperature sensor, temperature indication: °C/°F (-50°C to 200°C), temperature monitoring, power supply 100-240V~, 50-60Hz, IP51 grade, Carrying case incl. fixture for stand St1-Clamp and 3m network cable.

Hielscher Ultrasonics

Type	PK	Cat. No.
Ultrasonic-Generator UP200St-G	1	9.106 621
Ultrasonic transducer UP200St-T	1	9.106 622

5. Sample preparation

Mixing, Homogenisation/Ultrasonic homogenisers-Homogenisers

1 Ultrasonic Homogeniser UP200Ht

Digital ultrasonic processor, 200 watts, for handheld and stand-mounted use, frequency 26kHz (auto-scan), amplitude 20-100%, pulse 10-100%, titanium horn Ø10mm (max. amplitude at horn 70µm), colored touch-screen, amplitude or power control, countdown (timer): 0.1sec to 99 days, shutdown when final energy input reached (Ws, Wh, kWh), autom. Calibration of the amplitude-dependent idle power, data recording: amplitude, power, time, temperature on internal SD/USB ComboCard (1GB), display and remote control via browser on PC/MAC without software installation, remote control via PLC, with temperature sensor, temperature indication: °C/F (-50°C to 200°C), temperature monitoring, dry running protected, sample illumination, anti-bacterial plastic housing, simplified exchange sonotrodes, power supply 100-240V~, 50-60Hz, IP41 grade, set weight: 1300g, Carrying case incl. fixture for stand STH-12 and 3m network cable

Hielscher Ultrasonics



Type

PK

Cat. No.

UP200Ht

1 9.106 620

2 Accessories for Ultrasonic Homogeniser UP200St and UP200Ht

Sonotrode S26d2, titanium, approx. length 120mm

Hielscher Ultrasonics

Sonotrode S26d7, titanium, approx. length 95mm

Sonotrode S26d14, titanium, approx. length 80mm

Sonotrode S26d40, titanium, approx. length 80mm

Sonotrode S26d7D, titanium, approx. length 95mm

Sonotrode S26d26G glass (DURAN®), approx. total length 200mm, approx. length of glass part 100mm

2



Flow Cell Reactor FC7K

stainless steel flow cell reactor with cooling jacket, for sonotrodes S26d2D or S26d7D, with NBR O-rings (19x3.2mm), hose connection, plastic clamps, and hose (2m), autoclavable

Sound Protection Box SPB-L

sound protection box, acryl glass, with divisible rod Ø12mm, vertically adjustable table, anti-slip mat, dimensions (LxWxH): 29x20x35cm, weight: 13kg, sound insulation: 22dB (A) open air measurement

Type	Tip	For bottle ml	PK	Cat. No.
Sonotrode S26d2	diam. 2mm	0,15 - 50	1	9.106 623
Sonotrode S26d7	diam. 7mm	20 - 500	1	7.980 806
Sonotrode S26d14	diam. 14mm	50 - 1000	1	7.980 807
Sonotrode S26d40	diam. 40mm	100 - 1000	1	7.970 924
Sonotrode S26d7D	diam. 7mm	20 - 500	1	9.106 625
Sonotrode S26d26G	diam. 26mm	50 - 1000	1	7.980 808
Flow Cell Reactor FC7K	-	-	1	9.106 626
Sound Protection Box SPB-L	-	-	1	7.980 809

Laboratory paddle blender MiniMix® 100

MiniMix® 100 paddle blenders, from the BagMixer® range, guarantees a quick and accurate blending of small samples. Thanks to the adjustable paddle system, blending is at its best. MiniMix® 100 is ideal for medical, veterinary and microbiological analysis.

interscience

Type	Volume ml	PK	Cat. No.
MiniMix® 100 P CC®	80-100	1	6.240 509 3
MiniMix® 100 P CC®	80-100	1	6.241 090 4

3



4



6.240 509

6.241 090

5. Sample preparation

Mixing, Homogenisation/Homogenisers

1



9.570 098

Laboratory mixer, BagMixer®

For sample preparation with easily adjustable paddle system. The BagMixer® is available in 3 sizes and blends all sample types prior to their microbial analysis. Thanks to their unique adjustable paddle system the blending chamber can be adjusted to the sample volume. Combined with the variable speed, a higher bacterial recovery rate is achieved. All BagMixer® units are fitted with a timer. Constructed in stainless steel. The fully opening door enables easy cleaning.

interscience

BagMixer® 400 P with stainless steel door.

BagMixer® 400 W and 400 CC with see through glass door.

Click & clean® System (only BagMixer® 400 CC): removable and autoclavable paddles.

All units have a 3-year warranty and life guarantee for shock absorbers and window door.

Type	Volume ml	Length mm	Width mm	Height mm	PK	Cat. No.
BagMixer® 400 P	50 to 400	390	260	290	1	6.204 551
BagMixer® 400 W	50 to 400	390	260	290	1	6.224 287
BagMixer® 400 CC	50 to 400	420	260	265	1	9.570 098 1

Laboratory mixer, BagMixer® Series S

BagMixer® 400 S/400 SW is a new generation of lab blenders, silent, easy-to-use and new design.

interscience

With great new features, along with the silent blending, it is adapted to all kinds of applications and with a guarantee of optimal bacterial extraction, it is a great tool for lab analyses avoiding all risks of cross-contamination.

BagMixer® 400 S without viewing window, BagMixer® 400 SW with viewing window.

All units have a 3-year warranty and life guarantee for shock absorbers and window door.

Type	Volume ml	Length mm	Width mm	Height mm	PK	Cat. No.
BagMixer® 400 S	50 to 400	290	450	370	1	6.261 704 2
BagMixer® 400 SW	50 to 400	290	450	370	1	6.261 705 3

2



6.261 704

3



6.261 705

4



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5

Rack form u for 14 stomacher bags, Stainless steel, seal bag clipsac, clips

Dimensions (LxDxH) : 360x180x195 mm

Description	PK	Cat. No.
Rack for 14 stomacher bag	1	9.570 018
Seal bag, stomacher clipsac green	50	9.570 017
Clips, blue for stomacher bag	10	9.570 016

5



5. Sample preparation

Mixing, Homogenisation/Homogenisers

Blender bags, BagSystem®

These highly resistant bags provide increased safety. The filter bags automatically filter the sample during the blending process, withholding particles behind the filter.

interscience

The sterile BagPage® has a full-width membrane filter.

The sterile BagFilter® P has a non-woven lateral filter.

Sample bags, RollBag®

Sterile bags with seal reinforced with metal wire for BagMixer® lab blender and for collecting samples in the food, dairy, water, sewage, medical, veterinary, environmental, soil and industrial fields. By whirling, the RollBag® becomes a leakproof bag. RollBag® is also thick and robust in order to resist bursting when handling a variety of samples.

Specifications Blender bags, BagSystem®

Capacity:	450ml
Blended volume:	5 to 50ml
Capacity:	1300ml
Blended volume:	50 to 300ml

Type	Description	Width mm	Height mm	PK	Cat. No.
BagLight® 100	plain bag, sleeve 25	110	185	500	9.570 075 1
BagLight® 400	plain bag, sleeve 25	175	300	1000	9.570 097
BagLight® 3500	plain bag, sleeve 25	380	510	500	9.570 077
BagFilter® 400 P	side filter bag, sleeve 25	190	300	500	9.570 078 2
BagFilter® 3500 P	side filter bag, sleeve 10	380	510	100	9.570 079
BagPage® 100	full-size filter bag, sleeve 25	180	95	500	9.570 080
BagPage® Plus 400	full-size filter bag, sleeve 25	190	300	500	9.570 081
BagPage® 3500	full-size filter bag, sleeve 10	380	510	100	9.570 082
RollBag® 1300 ml	plain single bags	175	290	500	9.570 096 3



9.570 075



9.570 078



9.570 096

4 | 5 | 6 | 7 Accessories for blender BagSystem®

interscience

Type	Description	PK	Cat. No.
BagOpen® 80/100	bag opener	1	9.570 083
BagOpen® 400	bag opener	1	9.570 084
BagOpen® 3500	bag opener	1	9.570 085
BagRack® 80/100	bag storage for 11 bags	1	9.570 086
BagRack® 400	bag storage for 10 bags	1	9.570 087
BagClip® 80/100	bag closure clip	50	9.570 088
BagClip® 400	bag closure clip	50	9.570 089
BagClip® 3500	bag closure clip	50	9.570 090
BagPipet®	pipette with 3 fixed graduations: 0.1, 0.9, 1.0ml	1	9.570 091
BagTips® Regular	straws for BagPipet®, 19cm, sterile	1000	9.570 092
BagTips® Jumbo	straws for BagPipet®, 24cm, sterile	1000	9.570 093

