

POLYTRON® PT 3100 D



Stand-disperser (High-End Line)

FLEXIBLE-USE DISPERSER

With digital controller, numerous applications

« Working volume 0.1 to 10,000 ml »



KINEMATICA
DISPERSING AND MIXING TECHNOLOGY

POLYTRON® - Efficient, Powerful, Digital Controls

Applications with the highest demands for reproducibility and scaling up can be efficiently performed with this device. The fully digitized control and regulation system is very easy to operate. The illuminated LCD display shows all the parameters, which can be changed with the membrane keypad.

TECHNICAL INFORMATION

Processing volume (water)
0.1 to 10,000 ml

Tip speed
Up to max. 32 m/s

Applicable aggregates
ø 5 to 36 mm

Speed range
500 to 30,000 rpm

Drive coupling
Aggregates with F coupling

Noise level (drive without aggregate)
66 dB(A) at 25,000 rpm
73 dB(A) at 30,000 rpm

Motor
Universal with carbon brushes

Drive power
1200W

Connection voltage
110 - 230 V ± 10%, 50Hz / 60Hz

Relative humidity (max.)
80% during storage
80% during operation

Operating temperature
0 - 40 °C

PC interfaces
RS-232 (D SUB 9)
USB socket B

Protection class acc. to DIN
IP 20

Dimensions (L x W x H)
Drive: 240 x 130 x 265 mm

Weight
Drive: 3.9 kg

EMC standards
IEC/EN 61000-6-2 / EN 61000-6-3

Safety standard
IEC/EN 61010-2-51

THE EXPERT FOR YOUR LABORATORY

For more than 60 years, we have been perfecting the rotor/stator technology, working in close cooperation with users and universities. When using our technology, your test samples will be dispersed into homogeneous, chemical systems. Depending on the type of samples you will get homogeneous emulsions, dispersions or suspensions. This is the best foundation for all subsequent analyses or formulations.

ERGONOMICS

- Easy operation with an on-off switch and membrane keypad
- Digital speed control for long equipment life
- Protection against overheating, overload and blocking
- Speed stability even with changes in viscosity
- Easy to adjusted motor height (depending on the stand)
- Aggregates quickly switched with Click & Go coupling
- Easy aggregate clean-up with EasyClean Design

SCALE-UP



LABORATORY

PILOT PLANT

PRODUCTION

You can use test results to scale-up to our pilot plant and industrial POLYTRON® machines. The volume range for on batch units is seamlessly available up to 10,000 liters.

RESULTS ARE CONVINCING

SMALLEST SIZES OF PARTICLES/DROPLETS
because precise analysis require homogeneous samples

EFFICIENT SAMPLE PREPARATION
because fast dispersion saves time

STANDARD OR CUSTOM-MADE AGGREGATES
perfected for and in cooperation with the users

CLEANING AND DISASSEMBLY
EasyClean Design makes it very simple

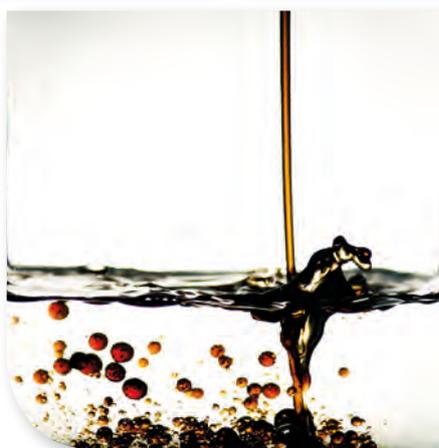
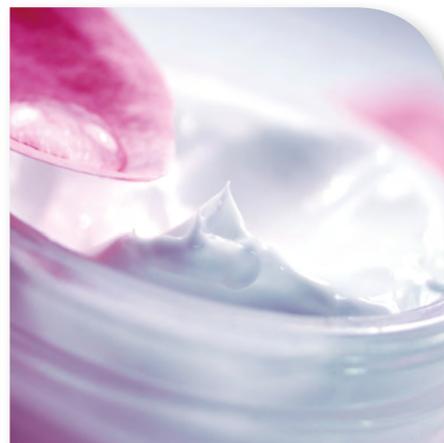
QUICK ENGAGEMENT OF THE AGGREGATES by using Click & Go

BEST MATERIALS AVAILABLE
because without them, we could not call it Swiss Made

DURABILITY is a Swiss virtue



Users / Application ranges



General homogenizer applications

Dispersions, suspensions, and emulsions

Dispersing of resins and pigments

Dispersion of plant, animal and human tissue samples in various liquids and volumes

Dissolving solids even at higher viscosities

Formulation of lotions, creams and foodstuffs

Extraction of active pharmaceutical ingredients (API) in pills and tablets

Preparation of samples for quality assurance/control

This list provides a small selection of possible applications.

Kinematic dispersion using the rotor/stator system

Who is the founder of it?

The roots of today's KINEMATICA began in the former chemical/physical research institute of Prof. P. Willems in Lucerne Switzerland, the inventor of the modern rotor/stator dispersion technology.

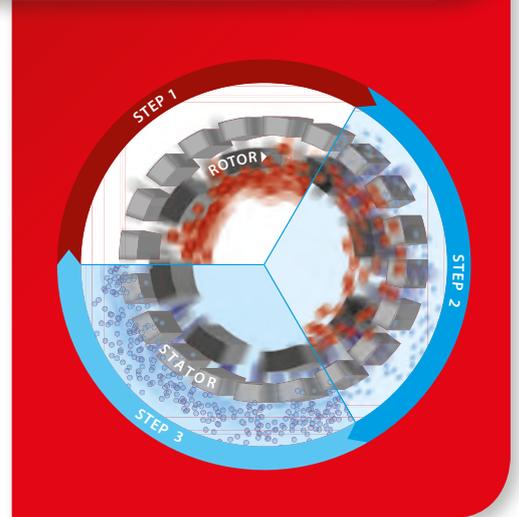
THE PRINCIPLE:

The spinning rotor generates a vacuum. The sample is drawn in and discharged to the outside through the stator's slots. Between the rotor/stator (shear gap), the product is subject to high deceleration-tangential and radial acceleration forces. The individual particles/droplets are torn apart and thus reduced in size; they are reduced several micrometers in size through additional cutting and crashing effects.

THE RESULT:

Microscopic dispersions, emulsions, suspensions, and foams are generated. Droplets, particles, and gas bubbles are reduced to several micrometers or smaller. Small and large substances are dispersed more economically, faster, and better than with any other system.

Your samples are efficiently «**POLYTRONIZED**».



Aggregate Technology

Unrivaled!

The high efficiency and the uniqueness of our POLYTRON® dispersing aggregate can only be achieved through superior manufacturing precision and the sophisticated KINEMATICA design method. This is 100% Swiss Made.

STANDARD AGGREGATES (EC DESIGN, WITH TWO OR MORE SPROCKETS)

This is all you need for popular applications in the preparation of samples and formulation development. The cutting teeth embedded in the head of the tool optimize the pre-crushing of the sample. An enclosed ring design provides optimum protection for those teeth and prevents them from bending.

SPECIAL AGGREGATES (W, M, B, DS, Z DESIGN)

Specializations in the chemical, pharmaceutical, cosmetic, and food industry, as well as the life sciences, makes new designs inevitable. These aggregates are based on state-of-the-art technology and only available from KINEMATICA.

The highly specialized tool is subject to further development that involves close cooperation with our customers and universities. Thus, it is continuously perfected for specific applications.

MATERIALS

Whether you need a tool with standard or special geometry, all aggregates are manufactured from high-alloy stainless steel 316L, electrolytically polished and made in Switzerland.

BEARINGS

Depending on the diameter, our aggregates are made with high-quality plastic, special carbide or bronze/carbide bearings. They have excellent mechanical properties and chemical resistance and have FDA approvals. Super high-speed ball bearings are used in the couplings to provide stability at speeds of up to 30,000 rpm.

CLEANING AND DISASSEMBLY

EasyClean: Our technology ensures the simplest removal and fast cleaning, either by hand, dishwasher, or autoclave. Disassembling the precisely fitting components is simple and fast.

LOCKING SYSTEM

All our POLYTRON® aggregates are fitted with a high-precision quick-release system: The Click & Go

Dispersing aggregates for PT 3100 D

Your applications, our response
KINEMATICA aggregates solve all problems you are faced with every day in the laboratory. Using our Click & Go quick release makes the changing of aggregates very easy.



EC «STANDARD DISPERSING AGGREGATE»



Design

The universal geometry uses two rows of teeth, is suitable for a large spectrum of laboratory applications, and it is reliable and efficient

Selection and applications

- All standard dispersing tasks
- Grinding of animal and human tissue samples in a variety of fluids and volumes
- Sample preparation for the extraction and dissolution of organic materials

- Sample preparation for medical diagnostic procedures as well as DNA analysis
- Extractions of systems/substances from vegetable-derived samples
- Disruption of animal and human cells
- Deagglomeration of united cell structures
- Intensive mixing

| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|-------------------|-------------|-------------|--------------------|
| 11030297 | PT-DA 05/2EC-F078 | 5 / 78 | 0.1 - 5 | 5 |
| 11030298 | PT-DA 07/2EC-F101 | 7 / 101 | 0.3 - 10 | 8 |
| 11030299 | PT-DA 12/2EC-F154 | 12 / 154 | 3 - 250 | 14 |
| 11030302 | PT-DA 20/2EC-F193 | 20 / 193 | 20 - 2'000 | 22 |
| 11030305 | PT-DA 30/2EC-F250 | 30 / 250 | 100 - 4'000 | 30 |
| 11030311 | PT-DA 30/4EC-F250 | 30 / 250 | 100 - 4'000 | 30 |
| 11030313 | PT-DA 36/2EC-F250 | 36 / 250 | 200 - 4'500 | 34 |
| 11030317 | PT-DA 36/4EC-F250 | 36 / 250 | 200 - 4'500 | 34 |

M «OUTSIDE CUTTING BLADES»



Design

Outside blades pre-crush samples that are larger than the rotors diameter. Subsequently, they can be dispersed inside the generator

Selection and applications

- Dispersing of large samples made simple
- All standard dispersing applications similar to EC aggregate

| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|--------------------|-------------|-------------|--------------------|
| 11030300 | PT-DA 12/2MEC-F154 | 12 / 154 | 3 - 250 | 14 |
| 11030303 | PT-DA 20/2MEC-F193 | 20 / 193 | 20 - 2'000 | 22 |
| 11030307 | PT-DA 30/2MEC-F250 | 30 / 250 | 100 - 4'000 | 30 |
| 11030308 | PT-DA 30/2MG-F273* | 30 / 273 | 100 - 4'000 | 30 |
| 11030315 | PT-DA 36/2MEC-F250 | 36 / 250 | 200 - 4'500 | 34 |

* M-design aggregate in gas-tight model

W «W-DESIGN»



Design

The W design prevents fibrous, stringy or solid samples from clogging the aggregate

Selection and applications

- Dispersing fibrous, stringy or solid samples (e.g., pieces of meat)
- All standard dispersing applications similar to EC aggregate

| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|-----------------------|-------------|-------------|--------------------|
| 11030301 | PT-DA 12/2WEC-F154 | 12 / 154 | 3 - 250 | 14 |
| 11030304 | PT-DA 20/2WEC-F193 | 20 / 193 | 20 - 2'000 | 22 |
| 11030294 | PT-DA 20/2G-F210* | 20 / 210 | 20 - 2'000 | 30 |
| 11030309 | PT-DA 30/2WEC-F250 | 30 / 250 | 100 - 4'000 | 30 |
| 11030345 | PT-DA 30/2WMEC-F250** | 30 / 250 | 100 - 4'000 | 30 |
| 11030319 | PT-DA 36/2WEC-F250 | 36 / 250 | 200 - 4'500 | 34 |
| 11030346 | PT-DA 36/2WMEC-F250** | 36 / 250 | 100 - 4'500 | 34 |

* W-design aggregate in gas-tight model

** W-Design aggregate with knives

G «GAS TIGHT»

Design

Integrated mechanical seals

Selection and applications

- Under pressure or vacuum
- Preventing air from being added to emulsions
- Corrosive acid mixtures



| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|------------------|-------------|-------------|--------------------|
| 11030295 | PT-DA 20/2G-F210 | 12 / 210 | 20 - 2'000 | 22 |
| 11030306 | PT-DA 30/2G-F273 | 30 / 273 | 100 - 4'000 | 30 |
| 11030312 | PT-DA 30/4G-F273 | 30 / 273 | 100 - 4'000 | 30 |
| 11030316 | PT-DA 36/2G-F273 | 36 / 273 | 200 - 4'500 | 34 |
| 11030318 | PT-DA 36/4G-F273 | 36 / 273 | 200 - 4'500 | 34 |

Z «Z-DESIGN»

Design

Breaking up of hard samples, with integrated V-notch technology. Additional, integrated holes for cleaning

Selection and applications

- Hard and brittle material
- Sweet corn and grain
- Breaking, open and dispersing of pills
- Breaking, hard grains



| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|--------------------|-------------|-------------|--------------------|
| 11030310 | PT-DA 30/2ZEC-F250 | 30 / 250 | 100 - 4'000 | 29 |

B «BIOTRONA® HIGH-TURBULENCE MIXER»

Design

High-turbulence mixing head with the least possible shear forces and energy inputs

Selection and applications

- Quick removal and suspension of solid particles; also suitable for high viscosity applications



| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|-------------------|-------------|--------------|--------------------|
| 11030296 | PT-DA 20/BEC-F193 | 20 / 193 | 100 - 2'000 | 21 |
| 11030314 | PT-DA 36/BEC-F250 | 36 / 250 | 500 - 10'000 | 34 |

DS «DISSOLVER»

Design

A processing head with teeth. The product is radially accelerated

Selection and applications

- Fast mixing and homogenizing of solids in liquid
- Processing of highly viscous products



| Sales No.: | Description | ø/length mm | Volume ml | max. Tip speed m/s |
|------------|------------------|-------------|--------------|--------------------|
| 11030344 | PT-DA 30/DS-F250 | 30 / 250 | 500 - 10'000 | 30 |

TIN «TITANIUM NITRATED» - UPGRADE

Design

Rotor and/or stator with up to three rows of teeth with a titanium nitrated (TiN) coating

Selection and applications

- All dispersing applications with abrasive samples



| Sales No.: | Description |
|------------|--|
| 11035050 | TiN rotor for the selected dispersing aggregate, ø 12-36 mm |
| 11035150 | TiN stator for the selected dispersing aggregate, ø 12-36 mm |

Dispersing vessels

Choosing the right dispersing aggregate is crucial for good results. The right vessel also helps contribute to achieving the desired results.

THE PROBLEM

For normal cylindrical beakers, the flow creates a vortex. The mixing and dispersing efficiency decreases considerably since the product is no longer being optimally processed through the dispersing generator head. This lengthens processing times, requiring more energy input. Depending on the shape of the vortex, this may also lead to additional air being introduced.

THE SOLUTION

Our specially designed GS jars have a cloverleaf-like shape. This effectively interrupts the flow in the radial direction and generates additional counteracting forces. These high turbulences maximize the mixing and dispersion efficiency, thus minimizing processing time and requiring less energy.

THE SELECTION

Our GS-glasses are available in chemical- and temperature-resistant borosilicate glass or in stainless steel, with working volumes from a few milliliters to several liters, with or without lid and with or without sealed feedthrough.



GS vessel principle
(viewed from above)



THE RIGHT DISPERSING VESSEL

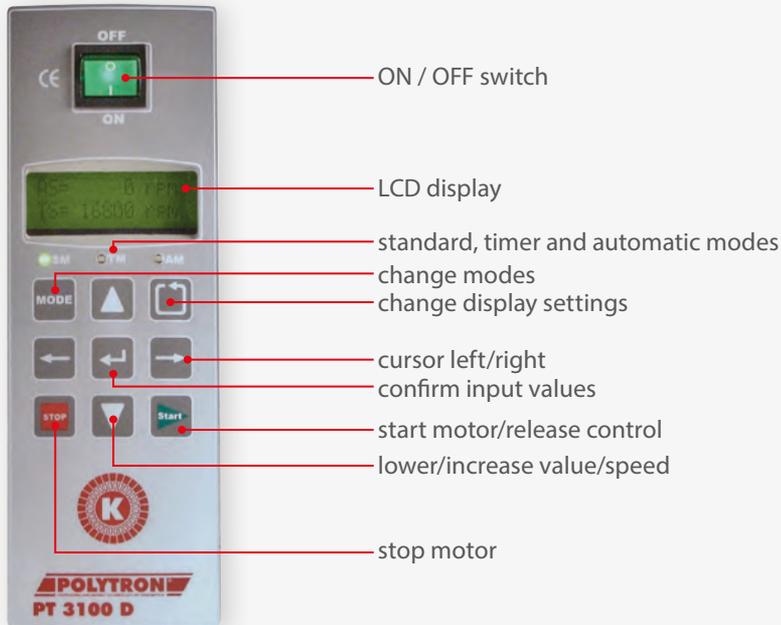


| Designation | Sales no.: | Ø / H (mm) | Process volume | Model | | |
|--------------|------------|------------|----------------|-----------------------------|------------------------|---|
| GS 15 | 11050010 | 30 / 150 | 35 ml | Cloverleaf shaped | Borosilicate glass | |
| GS 25 | 11050011 | 55 / 150 | 150 ml | | | top open without cover |
| GS 40 | 11050012 | 80 / 200 | 500 ml | | | with screw cover, glass inlet: GS 15K Ø 9 mm GS 25K Ø 25 mm GS 40/50/60K Ø 40 mm |
| GS 50 | 11050013 | 90 / 250 | 1000 ml | | | |
| GS 60 | 11050014 | 100 / 300 | 1300 ml | | | |
| GS 15 K | 11050020 | 30 / 150 | 35 ml | | | |
| GS 25 K | 11050021 | 55 / 150 | 150 ml | | | with screw cover and sealed feedthrough 7.5, 12, 20, 25 mm |
| GS 40 K | 11050022 | 80 / 200 | 500 ml | | | |
| GS 50 K | 11050023 | 90 / 250 | 1000 ml | | | |
| GS 60 K | 11050024 | 100 / 300 | 1300 ml | | | |
| GS 15 KL 7.5 | 11050030 | 30 / 150 | 35 ml | Cloverleaf. Stainless steel | glass inlet (as above) | |
| GS 25 KL 12 | 11050031 | 55 / 150 | 150 ml | | | |
| GS 25 KL 20 | 11050032 | 55 / 150 | 150 ml | | | |
| GS 40 KL 25 | 11050034 | 80 / 200 | 500 ml | | | |
| GS 50 KL 25 | 11050036 | 90 / 250 | 1000 ml | | | |
| GS 60 KL 25 | 11050038 | 100 / 300 | 1300 ml | | | |
| GS 100 | 11050050 | 155 / 200 | 3000 ml | Cylindrical Stainless steel | open top with cover | |
| GS 100 Z | 11050060 | 100 / 150 | 900 ml | | open top without lid | |
| GS 130 Z | 11050061 | 125 / 170 | 2000 ml | | | |
| GS 155 Z | 11050062 | 175 / 190 | 3500 ml | | | |

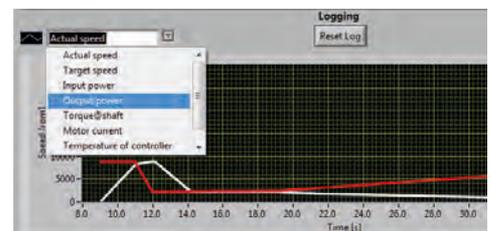
PC control software

CONTROL PANEL

The PT 3100 D is controlled digitally via a keypad. All important operating parameters can be read on the 2-line LCD display



The free-of-charge software «User Interface PT 3100 D» was developed for the operation and control of the laboratory dispersing system POLYTRON® PT 3100 D. A USB or RS232 interface provides the communication to the computer. The data transmission protocol complies with the Modbus specifications.



OPERATING MODE

- STANDARD MODE: Operation by manual control
- TIMER MODE: Automatic shutdown by recording speed and time
- AUTO MODE: Complete control through the included KINEMATICA software

KINEMATICA SOFTWARE

- Set the speed via PC
- Store speed/time profile to reproduce formulas or processes
- Adjustable temperature limits as stop criterion, for example, to prevent product overheating (with Pt100 temperature probe)
- Graphical representation of parameters with time diagram
- Continuous recording of all parameters listed above in MS Excel format
- PC software and cable included

ADDITIONAL FEATURES

- Memory function: remembers the last speed setting and the time when the device shut off
- displays the product temperature by means of the optional Pt100 temperature probe

PARAMETERS RETRIEVABLE VIA LCD DISPLAY

- Actual speed [AS, rpm]
- Target speed [TS, rpm]
- Power in [Pin, W]
- Power out [Pout W]
- Moment of force [M Ncm]
- Motor current [I, A]
- Supply voltage [U, V]
- Product temperature (with optional Pt100 temperature probe) [TP, °C]
- Internal temperature controller [Tc, °C]
- Operating hours meter [Oh, h]
- Firmware

SYSTEM REQUIREMENTS:

- Operating system: Windows® XP / 7 / 8
- Required interfaces: 1 x USB or 1 x RS-232



Comfort at the highest level

Modern laboratories want equipment that is easy to handle. This rugged electric tripod offers a variety of benefits.

REQUIREMENTS

The processing of large sample volumes or viscous products requires larger, higher torque drive units and larger aggregates which are quite heavy. These factors were the reasons for making this stand available to our customers.

Now, what has long been a part of the standard equipment in the pilot plants, is now available for laboratory use.

PRINCIPLE

- Powerful motor mounted onto the telescopic lifting arm
- Durable, robust construction
- High stability due to the massive aluminum base plate

RESULT

- Easy height adjustment by means of two buttons
- Anti-slip mat included
- Available with optional vessel holder



OTHER STANDS AND ORDER NUMBERS

| Figure | 1 | 2 | 3 | 3 | 3 | 3 |
|-------------|--|--|--|-------------------------------------|-------------------------------------|-------------------------------|
| Sales no.: | 11040025 | 11040032 | 11040033 | 11040036 | 11040037 | 11040034 |
| Designation | ST-F 10/600 | ST-F 13/820 | ST-P 14/590+500, 230 V (EU-plug) | ST-P 14/590+500, 230 V (CH-plug) | ST-P 14/590+500, 230 V (UK-plug) | ST-P 14/590+500, 100-120 V |
| Description | H-foot stand made of anodized aluminum and the height adjustable, swiveling PTFE-coated work table with vessel holder. Weight: 5.5 kg | H-foot „Economy“ stand with a column, two cross joints, safety ring and vessel holder. If you want to use this stand with the PT 3100 D, you will need the optional adapter bracket 2 Weight: 10.5 kg | Electric plate stand with lifting telescopic bar for more ease of use. Incl. up/down button and mat to prevent slipping. The electronics are designed for ambient temperatures of +5°C to +40°C and were tested per EN 60335-1 and UL 962. Weight: 11 kg | | | |



1



2

STAND ACCESSORIES

| Sales no.: | Designation | Description |
|------------|-------------------|--|
| 11045013 | Adapter Bracket 2 | For the „Economy“ stand ST-F 13/820 |
| 11036005 | Vessel holder | Vessel holder with guide for ST-P 14/590+500 |

Order information and accessories

Depending on your specific requirements, it is possible to expand the PT 3100D drive with our functional accessories. Our expert personnel will be happy to assist you and answer all the questions you might have.

ADAPTER

Adapters for use with dispersing aggregate with A coupling

| Sales No.: | Designation |
|------------|---------------------------|
| 11035001 | Adapter PT-DA / PTA (F/A) |

Description

This adapter connects older A-coupling dispersing aggregates such as PT-K / PT-G with this PT 3100 D motor (with F-coupling).



TEMPERATURE PROBE

For measuring the product temperature. The probe can be directly connected to the rear panel of the device.

| Sales No.: | Designation |
|------------|-------------|
| 11020050 | Pt100 |

Description

- Temperature range 0 ° C to 120 ° C
- Temperature displayed on LCD display
- If the temperature probe is used with the PC software, the temperature is displayed and you can set temperature limits and have the software record the current temperatures



DRIVES / COMPLETE SYSTEMS

| Sales No.: | Description |
|---|---|
| Motor | |
| 11010120 | POLYTRON® PT 3100 D, 230 V / CH -Power cord, PC software, RS-232/USB connection cable |
| 11010121 | POLYTRON® PT 3100 D, 230 V / EU -Power cord, PC software, RS-232/USB connection cable |
| 11010122 | POLYTRON® PT 3100 D, 230 V / UK -Power cord, PC software, RS-232/USB connection cable |
| 11010123 | POLYTRON® PT 3100 D, 100-120 V / Power cord, PC software, RS-232/USB connection cable |
| Motor is sold with stand and accessories | |
| 11090090 | PT 3100 D, 230 V , CH -Power cord, stand ST-F10/600, PC software, RS-232/USB connection cable |
| 11090091 | PT 3100 D, 230 V , EU -Power cord, stand ST-F10/600, PC software, RS-232/USB connection cable |
| 11090092 | PT 3100 D, 230 V , UK -Power cord, stand ST-F10/600, PC software, RS-232/USB connection cable |
| 11090093 | PT 3100 D, 100-120 V / Power cord, stand ST-F10/600, PC software, RS-232/USB connection cable |



KINEMATICA solutions for your homogenizing, dispersing, emulsifying, suspending, crushing, wet milling tasks.

Our staff will be happy to advise you. We will be glad to you additional documentation or present the POLYTRON® systems to you in person.

YOUR APPLICATION IS OUR FOCUS!

KINEMATICA is a leading manufacturer of dispersing and mixing technology for standard and customized applications in the lab, pilot plant and production areas of pharmaceutical, chemical, food, cosmetic and biotech or life science companies worldwide.

Our POLYTRON® batch and MEGATRON® In-line Homogenizers are suitable for many applications:

- Dispersing of non soluble liquids or solids into liquids to finest emulsions/multiple emulsions or suspensions
- Induction and dispersion of powders into liquids
- Foaming by gas induction into liquids
- Disintegration of tissue samples for preparation in further analysis
- Dispersing of various samples for quality control

We also deliver POLYMIX® Micro Dry Grinding Mills and a variety of POLYMIX® and MICROTRON® Overhead Stirrers and Mixers.

Whatever your application, we are confident that our team of specialists, with over 60 years of experience, will provide the best solution for you.

YOUR SATISFACTION IS OUR GOAL!



KINEMATICA
DISPERSING AND MIXING TECHNOLOGY



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BRAND NAMES WITH HISTORY



Batch dispersing/homogenizing units



High turbulent mixing



Inline dispersing/homogenizing units



Dispersing/homogenizing Reactors



Stirrers and dry Mills



Mixer/Blender



Viscometers