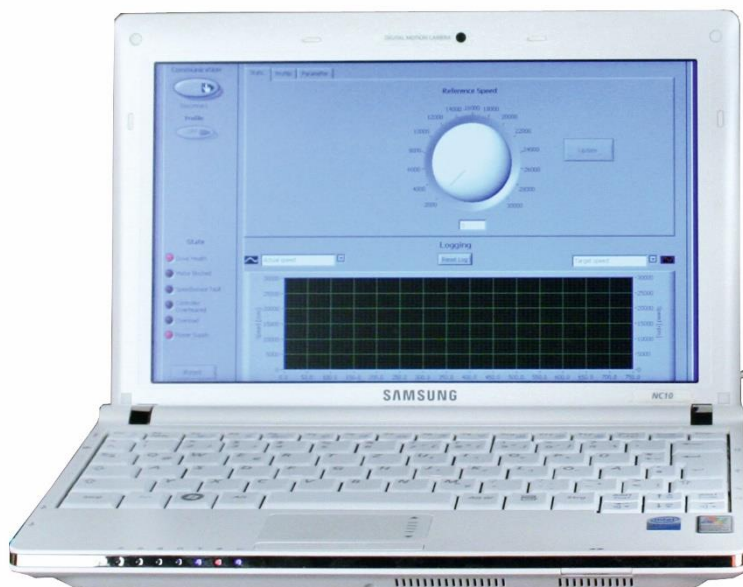




KINEMATICA

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POLYTRON®










POLYTRON® SYSTEM PT 1300 D
Instruction manual

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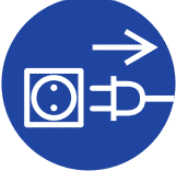

GENERAL SAFETY INSTRUCTIONS

	Respect the instructions given in this document.
	When unpacking the unit check all parts for possible transport damage. Report to us or your dealer immediately about any discrepancies. If possible, please send some photos next to your report to laboratory@kinematica.ch .
	Ensure that all legal and environmental regulations of the country where the unit will be installed are respected.
	Ensure that the supply voltage matches the rated voltage of the unit. To ensure safe and successful operation it is important that the mains supply where the unit is plugged in complies with the information on the data label of the unit and the international standards for power supplies.
	Do not modify the unit without a written confirmation by KINEMATICA.
	It is strictly forbidden to run the unit with disassembled or bridged safeguards, for example safety limit switches, emergency switches or covers.
	Only use original spare parts for repair or maintenance.

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	<p>The unit must be disconnected from the electrical supply before any service or inspection work. Make sure the unit cannot be restarted unintended by a third person during service or inspection work.</p>	
	<p>After every inspection and maintenance work the service engineer has to do a test-run. The unit should be stored in a dry, dust-free and vibration-free area. If necessary a protection against foreign bodies should be mounted.</p>	
	<p>If necessary an ear protection should always be used when working nearby the unit.</p>	
	<p>Never leave the unit unattended during operation. During automatic operation: the unit will continue to run in case of communication disconnection to the PC.</p>	
	<p>The plug of the handheld unit shall not be connected to / disconnected from the base station under voltage. Always turn off the base station at the main switch first.</p>	
	<p>Never manipulate the unit during operation / automatic operation – danger of severe injuries. The automatic operation is indicated alternating to the speed indication on the LED display.</p>	
	<p>Interference from the outside cannot induce automatic start of the unit.</p>	

WARNUNGEN

	<p>Do not operate the unit in explosion endangered areas and areas with inflammable gases, liquids or dusts respectively.</p> <p>It is not allowed to process highly inflammable liquids. It is not allowed to homogenize materials which result in highly inflammable or explosive mixtures or which can cause strong exothermal reactions.</p>
	<p>The electrical installation has to be carried out by an expert / professional.</p>
	<p>Sufficient air circulation has to be ensured at ventilation slots at the backside of the unit. Insufficient cooling may lead to a high motor temperature and a decrease of power output.</p> <p>The unit has to be installed / operated in a manner that no dirt or fluids can enter through the ventilation slots at the backside of the unit.</p>
	<p>The unit may only be opened by KINEMATICA authorized service staff.</p>
	<p>The mains supply has to be disconnected before exchanging any dispersing aggregate.</p>
	<p>Before operating make sure that the dispersing aggregate is properly connected (coupled) to the drive. When uncoupling always fix the dispersing aggregate with one hand to prevent any uncontrolled dropping.</p> <p>Never push up the coupling ring of the quick coupling at the drive during operation – risk of injury.</p>
	<p>The saw teeth of the dispersing aggregates are extremely sharp. Avoid any unwary handling – risk of injury.</p>

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	<p>Never dry-run the slide bearing and/or mechanical seal of the POLYTRON® dispersing aggregate – they are cooled and lubricated by the processed medium. Dry-run will destroy the slide bearing and/or mechanical seal.</p>
	<p>The maximum immersion depth of the dispersing aggregate is limited by the upper rinse hole of the shaft tube. The operator has to be assured that no foreign bodies can fall into the process vessel.</p>
	<p>Make sure that the dispersing aggregates are always cleaned after operation. Neither place the handheld unit with a coupled dispersing aggregate horizontally on a table nor vertically with uplooking dispersing aggregate tip - risk of destroying the unit through fluid leaking into the coupling and motor / control electronic. Always put the handheld unit back into the intended holder at the base station after operation.</p>
	<p>The operator has to assure that the processed / used products, fluids, solvents and detergents are compatible with the used materials of construction and the installed sealings / slide bearings.</p>
	<p>In case hazardous chemicals or health endangering materials are processed which can affect the surrounding or the use of the unit appropriate counter-measures have to be taken.</p>
	<p>Long-run operation and high load can lead to heating-up the coupling and the surrounding areas – risk of skin burn.</p>
	<p>Never manipulate the unit / the area of the coupling / the coupled dispersing aggregate with your hands or tools when the unit is plugged to the mains supply. Risk of severe injuries due to rotating shaft and/or rotor.</p>

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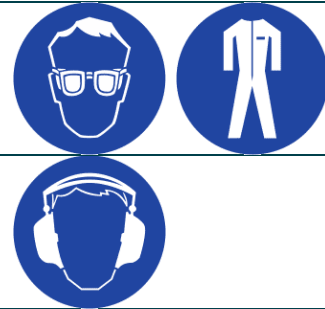


In addition follow all preventive measurements or user guidelines given in the following chapters.

RESIDUAL DANGERS

When using the unit as prescribed only a few residual dangers remain.

Residual danger	Countermeasure
Tripping over supply lines, mains cable, etc.	Proper installation.
Breakage of glass vessels	Wear protective clothing, goggles, etc.
Splashing of the product	
Noise; loss of hearing due to permanent noise exposure.	Use ear protection.
Tilting of the unit	Use stable, non-slip base. Use stands from KINEMATICA.



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1 INTRODUCTION

KINEMATICA is a specialist for design and manufacture of dispersing and mixing equipment and machines.

The aim of this instruction manual is to instruct new users in the effective utilization and in the safe operation of our equipment.

In order to operate and maintain the unit in a safe manner, it is essential to study the following chapters in detail and to follow the instructions in this document.

KINEMATICA homogenizers are user friendly and easy to maintain. Nevertheless an accurate use and good care of the equipment is mandatory for a long lifetime.

KINEMATICA homogenizers are designed and manufactured regarding the latest state-of-the-art and according to accepted safety guidelines and standards.



KINEMATICA AG products comply with all usual CE directives, carry the CE marking and are delivered with a corresponding declaration of conformity.

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1.1 Intended use

The POLYTRON® PT 1300 D system is a handheld homogenizer. Depending on the chosen POLYTRON® Dispersing Aggregate (see also accessories) the following basic applications can be handled:

- Producing dispersions and suspensions
- Producing finest emulsions
- Homogenizing of plant, human or animal tissues in liquid
- Crushing of cells and tissues in a small amount of liquid
- Dispersing of pigments and resins in liquid
- Dispersing of fibrous, stringy and brittle samples in liquid
- Dissolution of solid material
- Enhancing extractions
- General sample preparation in liquid

Additional the POLYTRON® PT 1300 D can be equipped with optional stands or special dispersing vessels (see also accessories).

As standard the POLYTRON® PT 1300 D is equipped with an USB port and can also be used and controlled by a PC. An USB cable and a free to use KINEMATICA software is already included in the scope of supply.

If the equipment is used for any purpose other than the intended use without the written consent of the manufacturer or the equipment will be used outside the technical possibilities (improper use) the manufacturer cannot be held liable for any resulting damage.

If there are any questions regarding the use of the equipment which are not answered by this instruction manual do not hesitate to contact KINEMATICA directly or your preferred dealer.

This instruction manual should be stored always near the equipment in order to be available for the user or in case of questions.

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2 Description of the device

2.1 Overview



Scope of supply:

- Handheld unit
- Base station
- Mains cable
- USB cable and KINEMATICA Software
- Instruction manual



- LED – speed indication
- Keyboard
- Hinge stand ST-P01/200 (accessory)
- Coupling
- Main Switch (On/Off), lighted
- Dispersing aggregate (accessory)

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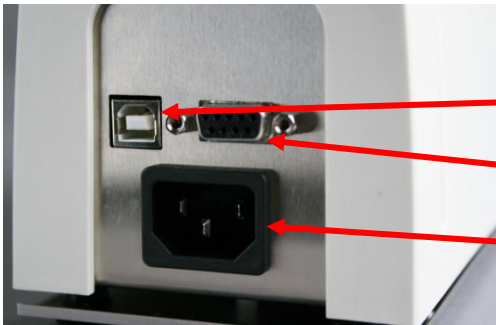


- Plate stand ST-P15/320 with base station and handheld unit holder (accessory)
- Homogenizing vessel (accessory)



Keyboard:

- UP – button
- DOWN – button
- MEMO – button
- ON / OFF – button



Backside:

- USB – interface
- RS232 - interface
- Socket for mains cable

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2.2 Function of the keyboard

ON/OFF	<p>To start the operation push the ON/OFF button on the handheld unit. The main switch at the base station must be turned on first.</p> <p>The default speed is set to 2'000 rpm when the unit is switched on at the main switch at the base station. Else it will start with the last manually set speed.</p> <p>To stop the operation push again the ON/OFF button on the handheld unit. The integrated vent will continue to work for approx. 1 min to enhance the cooling of the motor.</p> <p>If the unit will not be used for a longer period of time the whole unit should be switched off using the main switch at the base station.</p>
UP	<p>With the UP button the rotational speed will be increased by incremental steps of 100 rpm. The possible speed range is between 2'000 and 30'000 rpm.</p> <p>Keep the button pushed to increase the speed faster.</p>
DOWN	<p>With the DOWN button the rotational speed will be decreased by incremental steps of 100 rpm. The possible speed range is between 2'000 and 30'000 rpm. Der Bereich reicht von 2'000 bis zu 30'000 min⁻¹.</p> <p>Keep the button pushed to decrease the speed faster.</p>
MEMO	<p>When pushing the MEMO button for approx. >1 sec. the actual set speed will be saved and confirmed by flashing (3 times) of the LED.</p> <p>The memorized speed can be called up when pushing the MEMO button.</p>

IMPORTANT:

The maximum possible speed depends also on the size of the dispersing aggregate, the type of product and viscosity. If the actual speed deviates from the set speed (e.g. through strong changes of viscosity) or the set speed cannot be reached, the LED display will start to flash to indicate overload. When the drive will be overloaded for a longer time and overheat, the unit will be switched off by the integrated thermal fuse.

2.3 Technical Data

POLYTRON® PT 1300 D	
Motor type	Brushless DC-motor, electronically commuted

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Mains supply voltage	90 - 260 VAC		
Voltage supply of handheld unit	approx. 28V DC, electrically isolated		
Supply frequency	50/60 Hz		
Max. input power	100 W		
Max. output power	85 W		
Speed	2'000 to approx. 30'000 rpm, stepless adjustable		
Direction of rotation	clockwise, seen from above		
Ambient temperature	0 – 40°C		
Relative humidity	Max. rel. 80%		
Standards	EMV: certified by IEC/EN 61000-6-1 / 61000-6-3 / 61326-1 Safety: certified by IEC/EN 61010-2-51 & 61010-1		
Safety type	IP 20		
Safety class	Class I		
Max. period of continuous operation	100%		
Noise level	< 70 dB (A) at full load with dispersing aggregate PT-DA12/2EC-E157 in H ₂ O		
On/Off switch	<ul style="list-style-type: none"> - Main switch at base station - ON/OFF button at handheld unit 		
Current consumption	max. 0.5 A at 230 V max. 1 A at 100-120 V		
Interface	USB oder RS232 (D-SUB 9 pin Buchse)		
Communication prot.	Standard MODBUS, Optional RS 232		
Weight	Handheld unit 1040 g / Base station 620 g		
Order references:	11010030	PT 1300 D, MODBUS (with EU-Stecker)	
	11010031	PT 1300 D, MODBUS (with CH-Stecker)	
	11010039	PT 1300 D, MODBUS (with UK-Stecker)	
	11010032	PT 1300 D, MODBUS (with 115V-Stecker)	



The old handheld unit (version 2) is not interchangeable with the new base station (version 3).
The new handheld unit (version 3) is not interchangeable with the old base station (version 2).



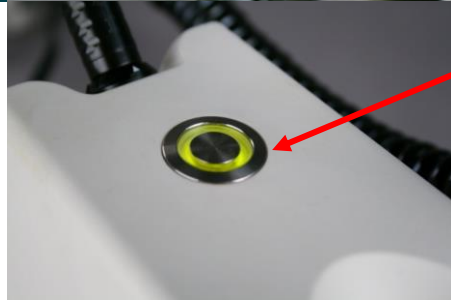
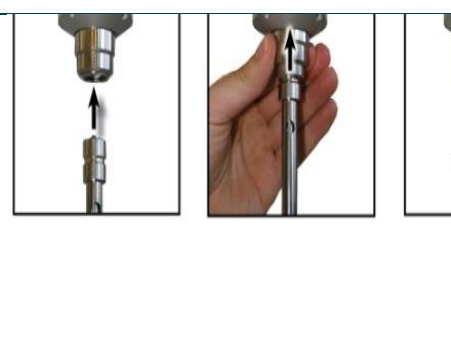
3 Working with the PT 1300 D

3.1 Unpacking

When unpacking the unit immediately check the content for possible transport damages and completeness (compare with the delivery note). In case of any discrepancies report immediately to your dealer or directly to KINEMATICA.

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3.2 Installation and Commissioning

	<ul style="list-style-type: none"> • Plug the device cable of the handheld unit into the intended socket on the base station.
	<ul style="list-style-type: none"> • Plug the mains cable into the mains socket on the backside of the base station. • Connect the mains cable to an appropriate power supply.
	<ul style="list-style-type: none"> • Turn on the unit by pushing the main switch on the base station (the switch will light up). The unit is ready to use. • When turning on the actual firmware of the unit is shown on the LED display, for example C01. After that the display will show "OFF", indicating that the unit is not running.
	<ul style="list-style-type: none"> • Install the chosen Dispersing Aggregate to the handheld unit by using the quick coupling. • To do so, just push the coupling ring up, carefully insert the coupling part of the Dispersing Aggregate completely into the coupling of the handheld unit, release the coupling ring, the Dispersing Aggregates snaps in and will be hold by the coupling.

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- Immerse the Dispersing Aggregate into an appropriate working vessel filled with your liquid based product. The lower rinse holes of the Dispersing Aggregate have to be completely immersed in the product at least.
- The optimum immersion depth is approx. at 2/3 below the liquid surface and approx. 1/3 above the ground of the working vessel respectively. Through an angular immersion of approx. 15° the homogenizing effect can be enhanced in some cases.



- Set the desired speed level (UP / DOWN - buttons); the minimum speed is 2000 rpm
- Start / stop the drive (ON / OFF – button)
- The speed can be adjusted by using the UP / DOWN buttons also during operation.
- The optimum speed level can be memorized and recalled using the MEMO button.
- During operation the actual speed is displayed.

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- Alternatively the POLYTRON® PT 1300 D can also be controlled and used by a PC incl. data logging and programming of application specific time / speed profiles.
- A USB cable and the KINEMATICA Software are included in the scope of supply as standard.
- The control of the device is done by an open Modbus protocol. This allows also to create own software solutions by using e.g. LabView.
- For more information, please refer to the separate manual „User Interface PT 1300 D“.

4 Maintenance

Your POLYTRON® PT 1300 D homogenizer is user friendly and easy to maintain. Nevertheless an accurate use and good care of the equipment is mandatory for a long lifetime.

4.1 Maintenance of the Base station

The base station does not require any special maintenance. There are no parts that need or can be serviced or replaced by the operator. In the case of a malfunction, please contact KINEMATICA or your dealer.

4.2 Maintenance of the Handheld unit

The handheld unit does not require any special maintenance. There are no parts that need or can be serviced or replaced by the operator. In the case of a malfunction, please contact KINEMATICA or your dealer.

5 TROUBLE SHOOTING

PROBLEM	POSSIBLE REASON	SOLUTION
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Unusual noises	Damaged bearings at drive unit	Service needed at KINEMATICA or at authorized service partner.
	Damaged bearings at dispersing aggregate	Check the dispersing aggregate and change the damaged bearing parts.
	Rotor and stator touch	Check rotor and stator and whether the shaft or shaft tube is bent. Defective parts have to be exchanged.
Drive stops	Unsufficient cooling, LED indicates „HOT“	Check if ventilation slots are clear. Let the unit cool down, and then restart.
	Thermal overload, LED indicates „HOT“	Control board overheated. Let the unit cool down, and then restart.
	Internal Hal sensor failure, LED indicates „HAL“	Service needed at KINEMATICA or at authorized service partner.
	Internal voltage failure, LED indicates „SUP“	Service needed at KINEMATICA or at authorized service partner.
	Dispersing Aggregate blocked or drive failure, LED indicates „BLC“	Check and remove possible solid parts blocking the dispersing aggregate. In case of drive failure service needed at KINEMATICA or at authorized service partner.
Vibrations at the dispersing aggregate	Bent shaft	Replace shaft.
	Worn bearings	Replace bearings.
	Coupling failure	Check rotor and stator and whether the shaft or shaft tube is bent. Defective parts have to be exchanged.
Drive does not start or suddenly stops	Internal control board failure	Service needed at KINEMATICA or at authorized service partner.
	Drive is blocked, LED indicates „BLC“	Aggregat am Generator auf eingeklemmte Fremdkörper überprüfen.
Main switch is on but handheld unit does not work	Device cable not connected properly	Check that device cable is well plugged.

5.1 Error messages

5.1.1 Drive overload

The maximum possible speed depends on the size of the Dispersing Aggregate and the processed media (e.g. viscosity). „OL“ will be displayed on the LED alternating to the actual speed if the load

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on the motor exceeds the available power range followed by not reaching or holding the set speed. This can happen e.g. through a strong change in viscosity. When the speed level is reached again or the set speed is lowered to a suitable value the message “OL” will vanish.

5.1.2 Thermal overload protection

If the motor temperature exceeds above 80°C the internal thermal fuse will switch of the motor. “Hot” will be displayed on the LED and an acoustic signal sounds. To reset the unit has to be turned off by using the main switch on the base station. Before turning on the drive unit again, the motor has to be cooled down (<60°C) first. After that the unit will be ready to operate.

5.1.3 Blocking protection

If the Dispersing Aggregate will be blocked by e.g. foreign bodies the drive unit will stop immediately. The LED indicates „BLC“ and an acoustic signal sounds. To reset the unit has to be turned off by using the main switch on the base station. Before turning on the drive unit again, check the dispersing aggregate and remove any blocking. After that the unit will be ready to operate.

5.1.4 Hall sensors

The drive unit is equipped with three Hal sensors for speed detection and regulation. In case of a sensor failure the unit will stop, the LED indicates „HAL“ and an acoustic signal sounds. To reset the unit has to be turned off by using the main switch on the base station. In case the failure remains after switching the unit back on, service is needed at KINEMATICA or at an authorized service partner.

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6 Accessory

6.1 Dispersing aggregates

The following Dispersing Aggregates are available for the system POLYTRON® PT 1300 D as standard:

Order Code	Description	Stator / Rotor \emptyset mm	Shaft length mm	Working volume ml (approx.)
11030004	PT-DA 03/2EC-E050	3.5 / 2.2	50	0.05 – 2
11030009	PT-DA 05/2EC-E085	5.5 / 3.0	85	0.1 – 3
11030031	PT-DA 07/2EC-E107	7.8 / 5.0	107	0.5 – 10
11030030	PT-DA 07/2SYN-E082 (Pack à 25 Stk. Kunst- stoff-Aggregate, steril verpackt)	7.8 / 5.0	82	0.5 – 10
11030062	PT-DA 12/2EC-E123	12.0 / 9.0	123	3 – 250
11030042	PT-DA 12/2EC-E157	12.0 / 9.0	157	3 – 250
11030266	PT-DA 12/2MEC-E157	12.0 / 9.0	157	3 – 250
11030060	PT-DA 12/2WEC-E157	12.0 / 9.0	157	3 – 250



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Design	All POLYTRON® Dispersing Aggregates for the system PT 1300 D are Easy Clean versions. They can be easily disassembled and cleaned or sterilized using common methods, e.g. using an autoclave.
Product requirements	The product to be processed has to be pumpable and flowable. Solid particles can lead to increased wear in the area of rotor and stator. Too large solid parts can lead to blocking or damaging of the dispersing aggregate. The fluid phase has to be able to lubricate the slide bearing in addition.
Temperature	Standard: up to approx. 90°C processing temperature
Pressure	Standard: pressureless
Materials	Stainless steel 316L, Slide bearings made from PTFE Compound (FDA approval)
Wear parts	Mainly slide bearings; depending on the product (e.g. solid particles) rotor / stator and shaft / shaft tube respectively can be worn as well.
Tools	Needed tools for disassembly / assembly are in the scope of supply of the dispersing aggregates.

Further information regarding use, maintenance and service can be found in the individual manuals for the dispersing aggregates.

6.2 Stands

The following stand models are available for the system POLYTRON® PT 1300 D:

Order Code	Description	Information
11040012	ST-P01/200	Hinge stand, consisting of the following components: <ul style="list-style-type: none"> • Base plate with support for the base station • Swivel arm 360° • Handheld unit support, tiltable up to 15°
11040011	ST-P22/600	Plate stand, consisting of the following components: <ul style="list-style-type: none"> • Base plate for vessel • Stand column with a maximum manual stroke of about 550mm • Drive holder
11040013	ST-P15/320	Plate stand, consisting of the following components: <ul style="list-style-type: none"> • Base plate and column with base station support • Drive holder

For further instructions please refer to the separate manuals of the stands.

6.3 Homogenizing vessels

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Order Code	Description	Information
11051010	GS 15	Working volume up to 35 ml, clover leaf shaped, Borosilicate glass
11051011	GS 25	Working volume up to 150 ml, clover leaf shaped, Borosilicate glass
11051020	GS 15 K	as GS 15, with screw cap
11051021	GS 25 K	as GS 25, with screw cap
11051030	GS 15 KL 8	as GS 15 K, with lead through hole 8mm and sealing
11051031	GS 25 KL 12	as GS 25 K, with lead through hole 12mm and sealing

Further homogenizing vessels and accessories are available on request.

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7 Warranty

KINEMATICA AG guarantees that the equipment that it produces will run free of any fault related to materials or manufacturing faults for **24 months**.

ADDITIONAL WARRANTY FOLLOWING REGISTRATION

Consumers who complete a warranty registration within 20 days of receiving their device will benefit from a free warranty extension of a further 12 months. This means that the total warranty period after registration is 36 months.

REGISTER NOW



kinematica.ch/warranty-upgrade

If thorough testing shows a fault to be due to either of the above causes, KINEMATICA AG guarantees that the equipment will be repaired or replaced free of charge. The guarantee does not cover parts that are subject to normal wear. It is void if any person other than an employee of KINEMATICA AG or their appointed representative has made modifications to the equipment or if the damage is due to failure to comply with the operating instructions, to carelessness, accident, incorrect use or incorrect supply voltage.

Please check our further warranty conditions and the correct procedure for a repair application on our website:

<http://www.kinematica.ch/en/contact-service/service-and-repair.html>

KINEMATICA AG reserves the right to make technical changes to the equipment without modifying equipment delivered earlier in the same way.

In the event of technical problems, for spare parts requirements or for advice, contact our regional appointed agent, your preferred dealer or us directly at:

KINEMATICA AG

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CH-6102 Malters
Switzerland

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8 Disposal



Within the European Union this symbol with the crossed waste container signifies that the product must not be disposed with household waste. It must be brought to a collection point for recycling electrical and electronic equipment. Recycling helps to reduce the consumption of raw materials and to protect the environment.