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POLYTRON®



POLYTRON® SYSTEM PT 1200 E
Operating instructions

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1 INTRODUCTION

This chapter gives information on the the structure of this document. It will assist you in making use of it and show how to find the required information quickly.

1.1 OPERATING INSTRUCTIONS

Please read through these operating instructions before switching on or attempting to use the equipment. They describe the use of the POLYTRON® PT 1200 E, its installation and maintenance and the appropriate replacement parts and accessories.
They will help you avoid erroneous use and consequent damage. Although POLYTRON® machines are designed for ease of service, this does not release you from the obligation to inspect your equipment carefully and to clean it thoroughly.

KINEMATICA AG is a specialist manufacturer of machines and equipment for dispersion and mixing technology.

An important objective of these operating instructions is to fully inform you, the user, about the correct and safe use of our equipment.

In order to achieve this, it is essential that you should carefully study chapter 2, "Safety", and follow the instructions in this book.

1.1.1 RANGE OF VALIDITY

The information in these operating instructions relates to the POLYTRON® identified as follows:

Manufacturer: **KINEMATICA AG,** CH-6014 Lucerne
Product name: **POLYTRON®**
Type designation: **POLYTRON® PT 1200 E**

Article number	Description
11010025	PT 1200 E, 230 V, (with EURO-plug))
11010026	PT 1200 E, 115 V, (with US-plug)
11010027	PT 1200 E, 230 V, (with CH-plug)
11010028	PT 1200 E, 230 V, (with GB-plug)
11010127	PT 1200 E, 230 V, with fixed 25'000 rpm (with EU-Plug)
11010127	PT 1200 E, 230 V, with fixed 25'000 rpm (with GB-Plug)
Dispersing Aggregates (selection)	
11030004	PT-DA 03/2EC-E050
11030012	PT-DA 05/2EC-E085
11030031	PT-DA 07/2EC-E107
11030062	PT-DA 12/2EC-E123
11030030	PT-DA 07/2SYN-E082
Stands	
11040006	HS 1200 E
11040007	ST-P 13/320

1.1.2 TARGET AUDIENCE

These operating instructions are intended for all authorised users of our machines/equipment. We distinguish different user roles, taking account of the different demands placed on the user by the activity to be carried out.

You will find the definitions of user roles with the demands on the user in chapter 2, "Safety". You can fulfil one or more of these roles, provided that you meet the corresponding demands.

1.2 ORGANISATIONAL MATTERS

If you are unable to find the answer to any question in the operating instructions, please contact the equipment manufacturer directly.

1.2.1 LOCATION OF THE OPERATING INSTRUCTIONS

The operating instructions can only be of use to you if you always have them to hand. They should, therefore, always be kept at the place where the equipment is used.

1.2.2 MANUFACTURER AND CONTACT ADDRESS

KINEMATICA AG
Luzernerstrasse 147a
CH-6014 Lucerne

TEL: +41 41 259 65 65
FAX: +41 41 259 65 75

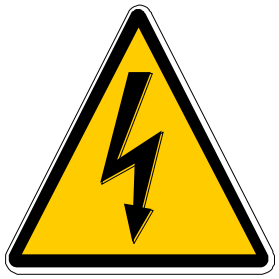
E-Mail: laboratory@kinematica.ch

1.3 WARNING NOTICES

Please be aware of the meaning of the following warning signs:



Safety instructions must be observed to ensure safe operation



This symbol indicates high voltage, with risk to health and environment

2 SAFETY

This chapter is directed at all users of KINEMATICA laboratory equipment. It includes information on safe and optimum use.

2.1 SUMMARY

Any incorrect use of the installed equipment can be dangerous. Inadequately trained users can cause material damage and personal injury. This chapter informs you of the safety concept and the requirements for safe and optimum use of the equipment.

All those authorised to operate, service and repair the equipment are required to study chapter 2, "Safety".

2.2 SAFETY CONCEPT

The safety concept sets down the entitlement to use the equipment and the resposibilities of the individual users.

The machines and equipment are designed and constructed according to the state of the art and the recognised safety rules.

2.2.1 INTENDED USE OF THE EQUIPMENT

The equipment is designed and constructed for the following use:

- Dispersion and homogenisation of pumpable fluid products in accordance with the technical specifications (see point 3.5) and compatibility with the materials coming into contact with the products.

If you use the equipment for any purpose other than those listed, the manufacturer cannot be held liable for any resulting damage.

2.2.2 IMPROPER USE

Any use other than the "proper use" without the written approval of the manufacturer or operation outside the technical limits of use is improper use.

2.2.3 USER ROLES

To guarantee safety, we place requirements on the users of the equipment that must be met without fail. Only persons meeting the requirements are authorised to work with the equipment.

We describe all those who work with the equipment as users. Since the requirements of these users are very much dependent on their activity, we ditinguish the following user roles.

Contract partner:
The manufacturer can impose legal obligations on the contract partner when the equipment is purchased. The contract partner is obliged to ensure that the equipment is properly used.

Operating company:
The operating company ensures that the equipment is properly used and authorises persons who are entitled to work with the equipmrnt in any one of the defined user roles. He is under the obligation to instruct the users.

Note:
Contract partner and operating company can be the same person.

Service technician:
The service technician is an employee of the operating company and looks after the equipment in special operating mode(s). He is a specialist with mechanical, electrical and electronic professional training. The service technician undertakes commissioning, decommissioning service and repair of the equipment. He must be appropriately trained to be able to carry out the service work required.

Operator:
The operator turns the equipment on and off. In the event of an alarm signal he informs the service technician.

2.2.4 DANGER AREA

System/equipment
The system danger area includes the whole system/equipment including the connecting lead and controls.

Proximity danger area
This refers to all areas within a defined distance of the equipment.

User danger area
This danger area includes all persons working with the equipment.

2.2.5 AREAS OF RESPONSIBILITY

In order that the system/equipment can be used safely and without risk, the users in various roles bear the responsibility for particular danger areas.

Contract partner:
The contract partner bears the responsibility for the "proximity danger area".

Operating company:
The operating company bears the responsibility for the "user danger area". Only those users may be authorised to operate the system/equipment who fulfil all requirements of the user roles concerned. In so doing, attention must be paid to the following points:

- It is to be ensured that all users of the system/equipment have fully read and understood chapter 2, "Safety" and act accordingly in a safety-conscious manner.
- It is to be ensured that no unauthorised person carries out work with the system/equipment.
- It is to be ensured that users are informed of the possible risks and dangers connected with the system/equipment.
- It is to be ensured that those being trained or engaged in general training are under the permanent supervision of a trained and authorised person.

Service technician:
The service technician bears the responsibility for the "system/equipment danger area". He ensures that the system/equipment is at all times free from technical faults, safe and functions correctly.

2.2.6 GENERAL SAFETY RULES

Observe the following general safety rules:

- follow these operating instructions,
- in addition, observe the legal obligations and requirements for accident prevention and environmental protection of the country in which you operate the equipment,
- do not make any modifications to the equipment without the written authorisation of the manufacturer,
- only original replacement parts may be used for repairs,
- before any service work on the equipment, it must be ensured that the electrical supply is switched off,
- after any service, maintenance or repair work has been carried out on the system/equipment, it must be given a test run by the service technician.
- depending on the place at which it is installed, circumstances may require that hearing protection is worn when remaining in the vicinity of the equipment for long periods.

2.3 RESIDUAL DANGERS

When the system/equipment is used in accordance with rules and regulations, residual dangers are minimal.

Residual danger	Countermeasures
Tripping over feed or return lines	These should be appropriately laid
Noise	Wear hearing protection
Breakage of glass containers	Wear protective clothing (goggles etc.)
Tipping of the equipment	Stand it on a slip-proof, stable horizontal surface
Spitting of the product	Wear protective clothing (goggles etc.)
Rotating coupling	Never operate without attachment, never attempt to touch coupling or rotor

2.4 WARNINGS



- Ensure that the rated voltage of the equipment matches the supply.
- The equipment may only be opened by KINEMATICA AG authorised service specialists.
- The equipment may not be operated in areas where there is a danger
of explosion.
- The PT 1200 E drive may only be operated using the PT 1200 power pack.
- The PT 1200 E is not qualified for continuous duty
- POLYTRON® dispersion attachments may not be operated – the lower
sleeve bearing is cooled and lubricated by the medium beir processed.
Running dry will destroy the sleeve bearing.
- Dispersion attachments may only be changed with the pov source disconnected.
- Ensure that the venting will never be covered by dust or any other objects. The efficiency of the motor will decrease.
- Ensure that dispersion attachments are thoroughly cleaned after every use.
- In the event that hazardous chemicals or materials that endanger health can influence the surroundings or use of the equipment, appropriate countermeasures must be taken.
- Ensure that before starting-up, no foreign objects are in the product .
- When the power supply is connected, **never** bring hands or tools within the vicinity of the coupling of the coupled dispersion attachment. Danger of injury by the rotating shaft and rotor.



- In the event that hazardous chemicals or materials that endanger health can influence the surroundings or use of the equipment, appropriate countermeasures must be taken.
- Ensure that before starting-up, no foreign objects are in the product .
- When the power supply is connected, **never** bring hands or tools within the vicinity of the coupling of the coupled dispersion attachment. Danger of injury by the rotating shaft and rotor.
- During operation, the sliding ring of the coupling may not be actuated; otherwise, the attachment may fall from the coupling.
- After longer use (15 min) the coupling could get very hot (over 40°C)
- Never turn your PT 1200 E upside down, if a dispersing unit with remains of fluid is clutched in. The fluid may damage the bearing of the motor.
- In the event of any power cut, the equipment must be switched off; otherwise, it may start again without proper supervision.
- The stator saw teeth present a danger of injury, as they are very sharp.

CE marking

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

3 DESCRIPTION OF LABORATORY EQUIPMENT

POLYTRON® PT 1200 E Hand Unit is designed to homogenize, emulsify, blend and mix small quantities of organic and inorganic materials. The PT 1200 E conforms to all current and relevant CE regulations, carries the CE sign and is supplied with the relevant certificate of conformity.

3.1 OVERVIEW

The POLYTRON® PT 1200 E system produces fine dispersions, emulsions and homogenisations and is suitable for applications with working volumes up to 250 ml (depending on the product's viscosity and the dispersing equipment being used).
The drive motor unit can be equipped with 4 different POLYTRON® dispersing units (dispersing head diameters from 3, 5, 7 and 12 mm) and they are easily exchanged via the quick release coupling.

For a workable system you require:

- the PT 1200 E drive motor with power pack
- an appropriate dispersing unit
- an electrical supply of 100 – 230 V, 50– 60 Hz

3.2 PT 1200 E DRIVE MOTOR

The PT 1200 E is fitted with a strong 24VDC-motor and a revolution setting unit.

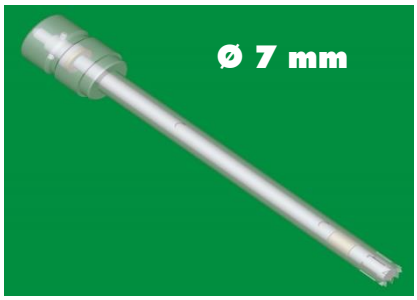
The PT 1200 E with fixed 25'000 rpm (Ordner No. 11010127) has the setting knob too, but it's not active. The revolution is fixed according to the costumers request.

3.3 POLYTRON® DISPERSING EQUIPMENT

Dispersing units with diameters of 3, 5, 7 and 12 mm are available for the PT 1200 E drive motor. The illustrations below show the individual parts of a POLYTRON® dispersing unit. If you should have any further questions regarding the POLYTRON® dispersing equipment, do not hesitate to contact either the dealer of your choice or us.



PT-DA 05/2EC-E85



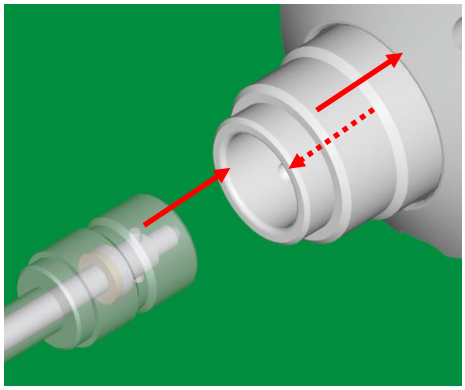
PT-DA 07/2EC-E107



PT-DA 12/2EC-E123

The unique quick release coupling makes it very easy to connect the dispersing unit to the POLYTRON® drive motor.
Simply slide the coupling ring upwards, push the dispersing unit into the coupling and then release the coupling ring. The dispersing unit is securely held in place.

Follow the reverse sequence to remove the unit, slide the coupling ring upwards and pull the dispersing unit out of the coupling.



Attention



The drive motor must be disconnected from the power supply wher removing, exchanging or connecting a dispersing unit.

Ensure that the dispersing unit is well fixed in the coupling before activating the drive motor.

3.4 SPECIFICATIONS / TECHNICAL DATA

PT 1200 E drive motor unit	
Type of motor	universal-motor with carbon brushes
Voltage	100-120 V / 230 V ~
Frequency	50 – 60 Hz
Speed at no-load-operation	Approx. 25000 rpm
Output Power	72 W
Input Power	200 W
Softstart	yes
Noise Level	65 dB(A) at 25'000 min^{-1}
Rotatting Direction	clockwise (viewed from above)
Ambient Temperature	-20 to 70°C
Ambient Temperature on duty	0 to 40°C
Relative Humidity	Max. rel. 95 %
Protection Class	IP 20
Max. period of continuous operation	Approx. 30 min at maximum load. Could be even more, dependent upon load and temperature.
Dimensions	220 x 55 x 44 mm
Weight	427 g

Dispersing units				
	PT-DA 03/2EC-E50	PT-DA 05/2EC-E85	PT-DA 07/2EC-E107	PT-DA 12/2EC-E123
Shaft length, mm	50	85	107	123
Stator/Rotor Ø, mm	2.2/3.5	5.5/3	7.8/5	12/9
Processing volume	approx. 0.05 – 2 ml	approx. 0.1 – 3 ml	approx. 0.5 – 10 ml	approx. 3 – 250 ml
Temperature	up to about 90 °C processing temperature			
Pressure	not pressurised			
Materials	stainless steel 1.4435 (316L) and PTFE compound			
Cleaning	can be sterilised by all the usual methods, e.g. autoclave			
Product requirements	The product to be dispersed must be pumpable and fluid and must not contain any solid particles that might destroy the attachment.			

4 INSTALLATION

4.1 UNPACKING

Open the dispatch box and check that the contents agrees with the delivery note.



Check all parts for possible transport damage.
Inform us or your dealer immediately of any disagreement or fault.

4.2 ASSEMBLING

After unpacking the PT 1200 E System is ready to use. You just have to clutch in the desired dispersing unit (see Chapter 3.4)

4.3 COMMISSIONING

Connect the drive unit to the electrical supply. **Check the supply voltage against the rating plate.**

- Immerse the dispersing unit in the product. The optimum depth of immersion of the dispersion unit is about 2/3 of the total depth of product in the container. Never immerse the upper holes of the dispersion attachment.
- Set the desired speed.

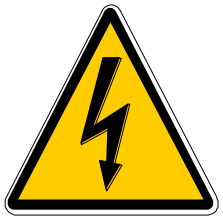
Note:
In some cases it is better to position the dispersion unit off centre in order to obtain more turbulence and better mixing. This can be achieved by tilting the drive by about 15°.



- Never allow the POLYTRON® dispersion attachment to run without a liquid phase. Running dry will destroy the sleeve bearing.
- Ensure that the dispersion attachment is thoroughly cleaned after every use.
- Never touch the rotor of a POLYTRON® or BIOTRONA® dispersion attachment when rotating. There is great danger of injury.

5 SERVICE

Your POLYTRON® unit is designed for easy service. Nevertheless, it is essential to inspect your equipment carefully and to clean it thoroughly. Drawings of the separate components are to be found in appendix.



The equipment must be disconnected from the electrical supply:
- During any work on the equipment, in order to avoid any personal injury or other damage
- When changing or removing the dispersion attachment

5.1 DRIVE

Under normal working conditions, the PT 1200 E drive requires no servicing.
Parts such as the motor armature and bearings are subject to natural wear.

We strongly recommend that service work and repairs should be carried out only by authorised KINEMATICA service centres or by KINEMATICA directly, where original replacement parts are available.

Any unauthorised modification or manipulation of the unit or its equipment leads to immediate annulment of the guarantee.

5.2 HOUSING

The housing is made of styrene butadiene and meets best fire protection requirements UL-94-V0. Only suitable cleaners should be used.

5.3 DISASSEMBLY OF DISPERSING UNITS

PT-DA 03/2EC-E050	PT-DA 05/2EC-E085	PT-DA 07/2EC-E107	PT-DA 12/2EC-E123
With the universal tool supplied, carefully knock the rotor and attached shaft out in the direction of the coupling and then draw them out in the same direction.			With this attachment you receive an additional tool. Use one tool to hold the shaft and the other to turn the rotor anti-clockwise and withdraw it. You can then withdraw the shaft from its tube.
The lower sleeve bearing is slit and can be opened and pulled over the shaft. The upper bearing can be pulled off in the direction of the rotor.			Using the tool, the sleeve bearing can be pushed out in the direction of the coupling.
Replace defective parts. Bearings should only be replaced in pairs.			Replace defective parts.
Reassemble in the reverse order.			Use the shaft to press the sleeve bearing into the stator tube from the coupling side. Screw on the rotor and tighten gently.
After every disassembly, and especially after changing the bearings, a functional test should be carried out in water.			

Criteria for changing the bearings:

Basically, it is the operating company that determines when and how often the bearings are to be changed. They should, however, be changed, at the latest, if:

- the rotor and stator come into contact,
- there is an increase in vibration,
- the rotor projects above the edge of the stator.

6 TROUBLE SHOOTING

PROBLEM	CAUSE	CORRECTIVE MEASURES
Unusual noises	Damaged drive bearings Damaged attachment bearings Rotor/stator interference	Change ball bearings Change bearings Trace and replace defective parts (shaft, bearings)
Runs hot	Inadequate ventilation Damaged bearings Overload	Check ventilation slits are clear Change ball bearings Check manner of use
Vibrations	Bent shaft Worn bearing(s) Defective coupling	Replace shaft Replace bearing(s) Trace and replace defective parts
Drive is heating up after longterm use.	Heating of electronics and motor	Turn the speed-controller to min so that drive can cool down.
Drive turns off during work.	Overload Electronic control causes automatic power shut-off to protect the drive.	Check dispersing unit. Check product. Turn off and on the drive. (RESET)
Drive is heating up and turns off and cannot be restarted anymore.	Thermal fuse has been released. Overheating caused by longterm overload use and unsufficient cooling.	Send the equipment to the nearest authorised KINEMATICA AG service centre or directly to KINEMATICA AG
Drive runs stutteringly.	Carbon brushes burnt Short circuit at motor anchor Defective speed-controller	Send the equipment to the nearest authorised KINEMATICA AG service centre or directly to KINEMATICA AG

7 ACCESSORIES

A large selection of special homogenising containers is available, which can improve the efficiency of the processing of your product. Closed vessels to withstand vacuum or pressure can also be supplied.

Ask your dealer or contact KINEMATICA AG directly.

8 GUARANTEE

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.

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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 prefered dealer or us directly at:

KINEMATICA AG
Luzernerstr. 147a
CH-6014 Luzern
Switzerland

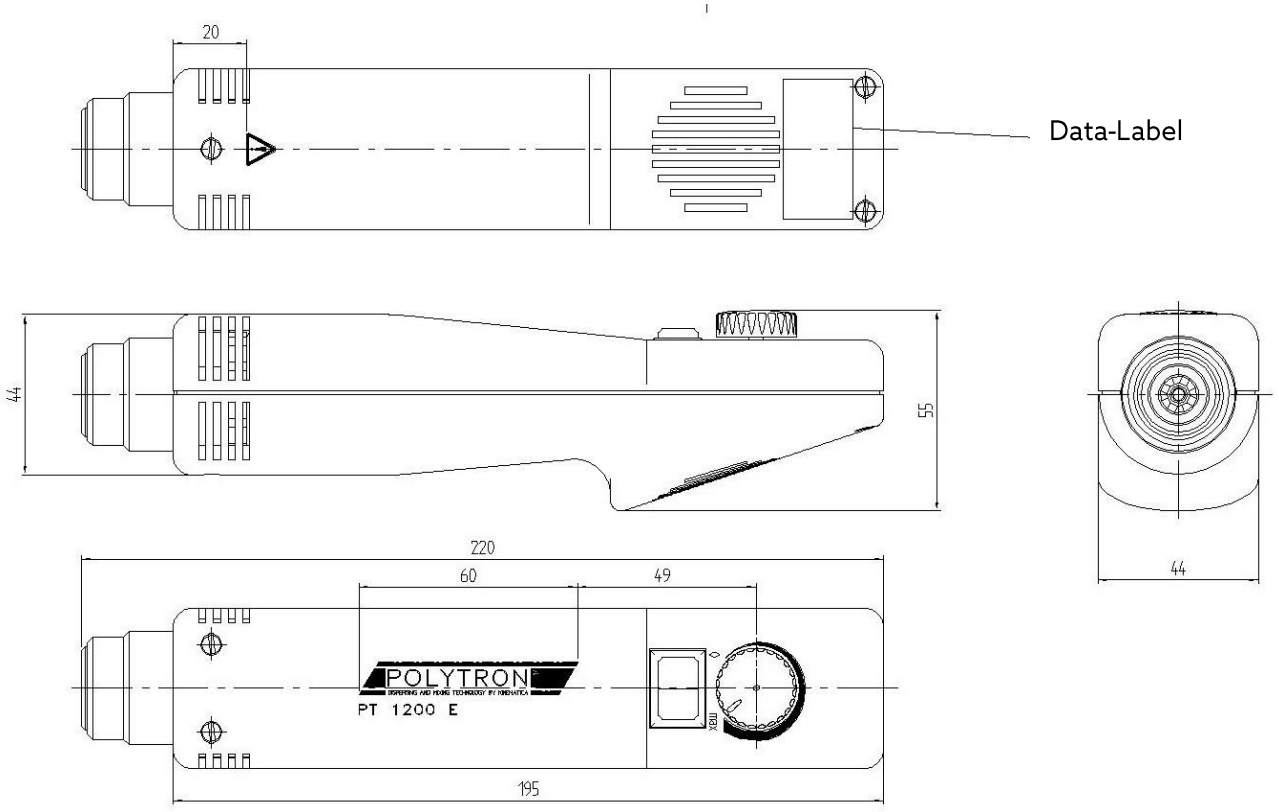
Tel. +41-41-259 65 65
Fax +41-41-259 65 75
Email service@kinematica.ch

9 DISPOSAL



The symbol of the crossed refuse container signifies that the product in the European Union to must be supplied to separate collection. Labeled products must not be disposed with household waste, rather must be left at a collection point for recycling electrical and electronic equipment. Recycling helps to reduce the consumption of raw materials and to protect the environment.

Appendix: Dimensional drawing and Art. No.



Assemby Group	Main Identification	Order No.	Product-Identification
Drive	PT 1200 E, 230 V	11010025/27/28	PT1200E, 230V
	PT 1200 E, 115 V	11010026	PT1200E, 115V
	PT 1200 E, 230 V, with fixed RPM	11010127	PT1200E, 230V. with fixed RPM
	PT 1200 E, 230 V, with fixed RPM	11010128	PT1200E, 230V. with fixed RPM
Dispersing-Units	PT-DA 03/2EC-E050	11030004	PT-DA 03/2EC-E050
	PT-DA 05/2EC-E085	11030012	PT-DA 05/2EC-E085
	PT-DA 07/2EC-E107	11030031	PT-DA 07/2EC-E107
	PT-DA 12/2EC-E123	11030062	PT-DA 12/2EC-E123
	PT-DA 07/2SYN-E082	11030030	PT-DA 07/2SYN-E082
Holder System	HS 1200 E	11040006	HS 1200 E
Dispersing Vessels	GS 15 (35 ml)	11050010	GS 15 (35 ml)
	GS 25 (150 ml)	11050011	GS 25 (150 ml)
Furhter Accessories on request.			