KINEMATICA
Homogenizing perfected.

# POLYTRON®


## POLYTRON® SYSTEM PT 4000
Operating instructions

**Garantie**
Warranty
**Upgrade**

**Jetzt registrieren / Register now:**
kinematica.ch/garantie-upgrade
kinematica.ch/warranty-upgrade

1 INTRODUCTION ..... 4
1.1 OPERATING INSTRUCTIONS ..... 4
1.1.1 RANGE OF VALIDITY ..... 5
1.1.2 TARGET AUDIENCE ..... 5
1.2 ORGANISATIONAL MATTERS ..... 6
1.2.1 LOCATION OF THE OPERATING INSTRUCTIONS ..... 6
1.2.2 MANUFACTURER AND CONTACT ADDRESS ..... 6
1.3 WARNING NOTICES ..... 7
2 SAFETY ..... 8
2.1 SUMMARY ..... 8
2.2 SAFETY CONCEPT ..... 8
2.2.1 INTENDED USE OF THE EQUIPMENT ..... 8
2.2.2 IMPROPER USE ..... 9
2.2.3 USER ROLES ..... 9
2.2.4 DANGER AREA ..... 10
2.2.5 AREAS OF RESPONSIBILITY ..... 10
2.2.6 GENERAL SAFETY RULES ..... 11
2.3 RESIDUAL DANGERS ..... 12
2.4 WARNINGS ..... 13
3 DESCRIPTION OF EQUIPMENT ..... 14
3.1 SUMMARY ..... 14
3.2 DRIVE UNIT ..... 15
3.3 STAND ..... 16
3.4 POLYTRON® DISPERSION ATTACHMENTS ..... 17
3.5 TECHNICAL SPECIFICATIONS ..... 18
4 INSTALLATION ..... 19
4.1 UNPACKING ..... 19
4.2 ASSEMBLY ..... 19
4.3 COMMISSIONING ..... 20
5 SERVICE ..... 21
5.1 DRIVE ..... 21
5.2 AGGREGATES ..... 22
6 TROUBLESHOOTING ..... 24
7 ACCESSORIES ..... 25
8 GUARANTEE ..... 26
9 DISPOSAL ..... 27

# 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 4000, 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 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 4000

| Article number | Description |
|---|---|
| 11010060 | PT-MR 4000, 230 V (EU- plug) |
| 11010061 | PT-MR 4000, 230 V (CH- plug) |
| 11010066 | PT-MR 4000, 230 V (UK- plug) |
| 11010062 | PT-MR 4000, 115 V (US- plug) inkl. Transformer |
| | |
| 11030012 | PT-DA 05/2EC-E085 |
| 11030031 | PT-DA 07/2EC-E107 |
| 11030062 | PT-DA 12/2EC-E123 |
| 11030069 | PT-DA 20/2EC-E192 |
| 11030264 | PT-DA 25/2EC-E192 |
| 11030265 | PT-DA 25/2FEC-E192 |
| | |
| 11040051 | ST-P 20/600 |

### 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:

**THIS SYMBOL SHOWS THAT SAFETY NOTICES ARE TO BE OBSERVED WITHOUT FAIL DURING OPERATION**

**THIS SYMBOL SHOWS THAT ABSOLUTE CARE IS TO BE EXERCISED WITH REGARD TO ELECTRICAL CONNECTIONS OR THE ELECTRICAL PART OF THESE INSTRUCTIONS**

# 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.

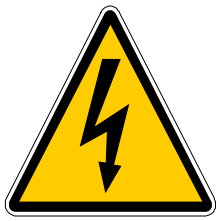
## 2.3 RESIDUAL DANGERS

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 |

**THE ELECTRICAL INSTALLATION MUST BE CARRIED OUT ONLY BY A QUALIFIED ELECTRICIAN!**

## 2.4 WARNINGS

| | |
|---|---|
|  | • Ensure that the rated voltage of the equipment matches the supply.<br>• The equipment may only be opened by KINEMATICA AG authorised service specialists.<br>• The equipment may not be operated in areas where there is a danger of explosion.<br>• The PT 4000 drive may only be operated using the PT 4000 controller. No equipment other than the PT 4000 drive may be connected to the equipment socket of the controller. |
|  | • POLYTRON® dispersion attachments may not be operated dry – the lower journal bearing is cooled and lubricated by the medium being processed. Running dry will destroy the journal bearing.<br>• Dispersion attachments may only be changed with the power source disconnected.<br>• Ensure that dispersion attachments are thoroughly cleaned after every use.<br>• 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.<br>• 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.<br>• During operation, the sliding ring of the coupling may not be actuated; otherwise, the attachment may fall from the coupling.<br>• The equipment may not be operated in areas where there is a danger of explosion.<br>• In the event of any power cut, the equipment must be switched off; otherwise, it may start again without proper supervision.<br>• 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 EQUIPMENT

The PT 4000 complies with all the usual CE directives, carry the CE marking and are delivered with a corresponding declaration of conformity.

## 3.1 SUMMARY

The POLYTRON® System PT 4000 prepares the finest dispersions and homogenisations and is suitable for use with working volumes up to 2500 ml (depending on the viscosity of the product and the dispersion attachment used). The drive unit can be fitted with 6 different POLYTRON® dispersion attachments (dispersion head diameters from 5 mm to 25 mm). The attachments can easily be changed by means of the speed coupling.

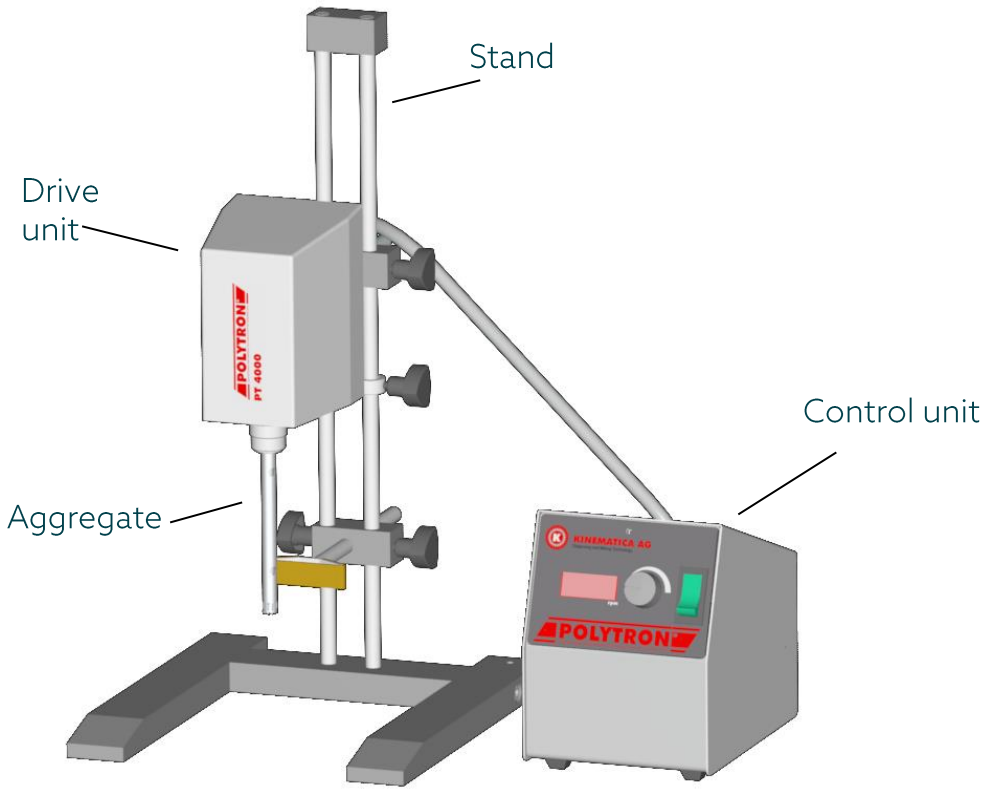
For a ready-to-use system you need:

**- the PT-MR 4000 drive with control unit**
**- a ST-P 20/600 stand**
**- a dispersion attachment**
**- a 230V (or 115V) electricity outlet**

## 3.2 DRIVE UNIT

The PT-MR 4000 drive is equipped with a powerful 500 W, high-frequency, induction motor and separate fan. The control unit regulates the drive by means of a built-in, variable frequency inverter. Thus, the rotational speed, for example, is shown on a display; this display also serves as an information centre for any error messages (see also Troubleshooting, chapter 6). The POLYTRON PT 4000 system can be set up in a few simple steps.

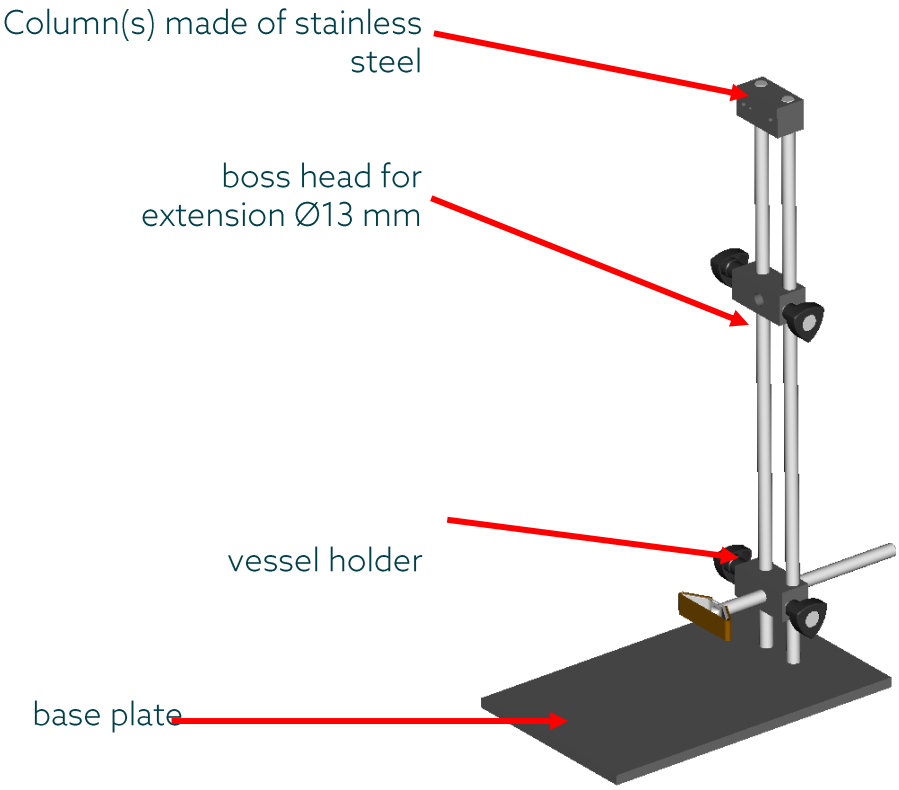
Below is an illustration of the PT-MR 4000 with appropriate labelling and explanation of the components.



## 3.3 STAND

The PT-MR 4000 drive was developed for use on a stand. KINEMATICA AG recommends the universal stand ST-P20/600. Depending on the size of the work container, it is recommended that an optional container holder should be used.

➔(A drawing with dimensions and article numbers is to be found in appendix.)



## 3.4 POLYTRON® DISPERSION ATTACHMENTS

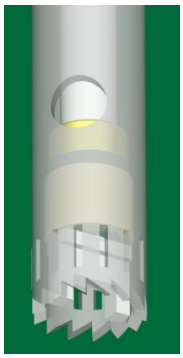
Six dispersion attachments, with diameters of 5, 7, 12, 20 and 25 mm, are available for the PT-MR 4000 drive. The illustration below shows the separate parts of a POLYTRON® dispersion attachment. If you have any further questions regarding POLYTRON® dispersion attachments, do not hesitate to contact us or your preferred specialist dealer.


PT-DA 05/2EC

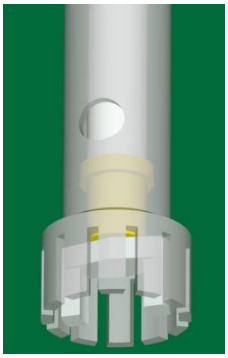

PT-DA 07/2EC


PT-DA 12/2EC

PT-DA 20/2EC

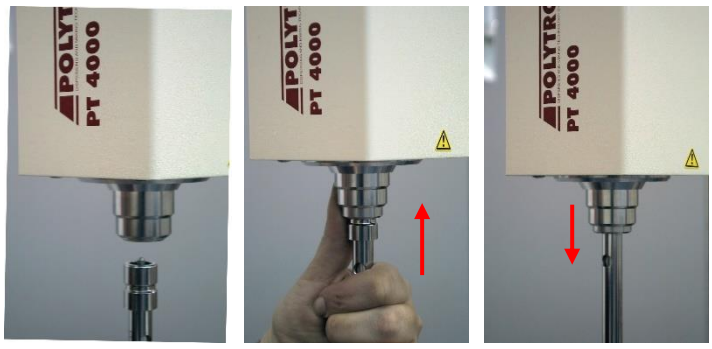


PT-DA 25/2EC



PT-DA 25/2FEC

Thanks to the unique speed coupling, it is very easy to connect the dispersion attachments to the POLYTRON® drive.
Simply lift the coupling ring, fit the dispersion attachment into the coupling and release the coupling ring while holding the attachment firmly in place.




To release the attachment, simply reverse the procedure: lift the coupling ring and pull the dispersion attachment from the coupling.

When releasing, changing or connecting dispersion attachments, the equipment must be disconnected from the electrical supply.

## 3.5 TECHNICAL SPECIFICATIONS

| PT-MR 4000 drive | | |
|---|---|---|
| Motor type | 3-ph. induction motor | |
| Supply voltage | 230 V ~ | 115 V ~ |
| Supply frequency | 50/60 Hz | |
| Speed with no load | 40000 $min^{-1}$ | |
| Output power | 500 W | |
| Soft-start | Yes | |
| Noise emission | 70 dB(A) at 40,000 $min^{-1}$ | |
| Direction of rotation | Clockwise, seen from above | |
| Ambient temperature | 0 – 50°C | |
| Relative humidity | 95% max. | |
| Protection type | IP 21 | |
| Max. period of continuous operatio | About 60 minutes uninterrupted operation at f load. Depending on load and thermal conditior can also be longer. | |
| Dimensions | See appendix | |
| Weight | Drive unit 7.5 kg + Control unit 2.5 kg | |

| ST-F 20/600 stand | |
|---|---|
| Dimensions HxWxD in mm | 585x300x340 |
| Weight | 5 kg |

| Dispersion attachments | | | |
|---|---|---|---|
| | PT-DA 05/2EC | PT-DA 07/2EC | PT-DA 12/2EC |
| Shaft length, mm | 68 | 92 | 123 |
| Stator/Rotor Ø, mm | 5.5/3 | 7.8/5 | 12/9 |
| Processing volume | 0.3 -3 ml | 0.5 -10 ml | 3 -500 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. | | |

| Dispersion attachments | | | |
|---|---|---|---|
| | PT-DA 20/2EC | PT-DA 25/2EC | PT-DA 25/2 F EC |
| Shaft length, mm | 192 | 192 | 192 |
| Stator/Rotor Ø, mm | 20/15 | 25/18.2 | 25/20.4 |
| Processing volume | 50 -2,000 ml | 100 -2,500 ml | 100 -2,500 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 ASSEMBLY

- Drive (see illustration in chapter 3.2.)
  All that is required is to screw the outrigger rod **tightly** home, using the tool provided.
  It would be advantageous to use loctite, if available, to glue the outrigger rod in place.

- Stand
  Assemble according to illustration in chapter 3.3. Item 2 is to be screwed tight.
  Attach the drive to the stand by means of the sleeve clamp (item 3).

- Connect the drive to the regulator unit.

- Attachments: couple the desired attachment (see chapter 3.4)

## 4.3 COMMISSIONING

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

- Immerse the attachment in the product. The optimum depth of immersion of the dispersion attachment is about 2/3 of the total depth of product in the container. Never immerse the upper cross-drilling of the dispersion attachment.
- Turn on at the main switch.
- Set the desired speed.

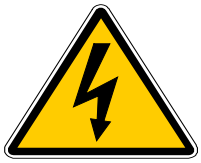
Note:
In some cases it is better to position the dipersion attachment off centre in order to obtain more turbulence and better mixing. This can be achieved by tilting the drive by about 15°.

- Never allow the POLYTRON® dispersion attachment to run without a liquid phase. Running dry will destroy the journal 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 grave danger of injury.

Note that the equipment has internal overload protection.
If the drive is overloaded, the display on the control unit will blink. After long periods of overload, the drive switches off automatically and the display shows **I.t-trP**.

# 5 SERVICE

Your POLYTRON® unit is designed for ease of 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:

- Attention: Danger of electrical shock! The equipment may first be opened ten minutes after disconnection from the 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-MR 4000 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 Aggregates

| PT-DA 05/2 EC<br>PT-DA 07/2 EC | PT-DA 12/2 EC | PT-DA 20/2EC<br>PT-DA 25/2EC<br>PT-DA 25/2 F EC |
|---|---|---|
| With the universal tool supplied, carefully knock the rotor and attached shaft out in the direction of the coupling and the 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. | Using the tool supplied, hold the shaft still and turn the rotor anti-clockwise and withdraw it. You can then withdraw the shaft from its tube. The stator is unscrewed clockwise from the tube. |
| The lower journal bearing is slit and can be opened and pulled over the shaft. The upper journal bearing can be pulled off in the direction of the rotor. | Using the tool, the journal bearing can be knocked out in the direction of the coupling. | The journal bearing can be pressed out of the stator with the shaft. |
| Replace defective parts. Journal bearings should be replaced in pairs. | Replace defective parts. | Replace defective parts. |
| Reassemble in the reverse order. | Use the shaft to press the journal bearing into the stator tube from the coupling side. Screw on the rotor and tighten gently. | Use the shaft to press the journal bearing into the stator from the coupling side. screw the stator onto the tube. Insert the shaft in the 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 TROUBLESHOOTING

| PROBLEM | CAUSE | CORRECTIVE MEASURES |
|---|---|---|
| Unusual noises | Damaged drive bearings<br>Damaged attachment bearings<br>Rotor/stator interference | Change ball bearings<br>Change journal bearings<br>Trace and replace defective parts (shaft, bearings) |
| Runs hot | Inadequate ventilation<br>Damaged bearings<br>Overload | Check ventilation slits are clear<br>Change ball bearings<br>Check manner of use |
| Vibrations | Bent shaft<br>Worn bearing(s)<br>Defective coupling | Replace shaft<br>Replace bearing(s)<br>Trace and replace defective parts |
| Drive does not run<br>The display shows O-I | Drive is overloaded<br>Attachment is jammed<br>Defect in motor or wiring | Check drive for overload and for jams. Check wiring<br>Return potentiometer to zero (reset) and start again. |
| Drive overruns<br>The display shows O-Uolt | Overvoltage in inverter<br>Braking time too short | Check supply voltage<br>Turn potentiometer back more slowly |
| Drive does not run<br>The display shows O-Uolt | Undervoltage in inverter | Check supply voltage |
| Drive does not run any longer<br>The display shows I.t-trP | Drive is overloaded<br>150% current for more than one minute | Check load<br>Check attachment<br>Return potentiometer to zero (reset) and start again. |
| Drive does not run any longer<br>The display shows E-triP | Motor overheated<br>Defect in cable from regulator unit to drive | Check ventilation slits are clear<br>Check fan operation<br>Check equipment cables.<br>Allow drive to cool.<br>Clear fault by switching off |
| Drive does not run<br>The display shows th-Flt, EE-F, PS-trP, O-T, Ain-F or lin-F | Internal fault in inverter | Turn off and try again after 10 minutes. If the fault recurs, 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

La société KINEMATICA AG garantit le fonctionnement sans faille de l'appareil fabriqué par ses soins pendant une période de **24 mois** en ce qui concerne des vices de matériel ou de fabrication.

**GARANTIE COMPLÉMENTAIRE APRÈS ENREGISTREMENT**
Avec la livraison de l'appareil et l'enregistrement dans les 20 jours qui suivent, vous bénéficiez en tant que client final d'une extension de garantie gratuite de 12 mois. La garantie après enregistrement est donc de 36 mois.

## S'ENREGISTRER MAINTENANT

kinematica.ch/warranty-upgrade

La société KINEMATICA AG réparera l'appareil gratuitement ou bien remplacera des pièces défectueuses livrées à titre gratuit à condition qu'un examen approfondi révèle des vices de fabrication ou de matériel. Sont hors garantie, des pièces soumises à l'usure habituelle, des modifications ayant effectuées par des tiers ne faisant pas partie du personnel de la société KINEMATICA AG ou bien des représentants en ayant été chargés par la société ainsi que des préjudices émanant du non respect du manuel d'utilisation, imprudence, accident, utilisation mal appropriée ou tension de réseau incorrecte.

**Veuillez respecter les autres conditions de garantie ainsi que les procédures correctes de demande de réparation sur notre site Web :**

http://www.kinematica.ch/en/contact-service/service-and-repair.html (ANGLAIS)

La société KINEMATICA AG se réserve le droit d'effectuer des modifications techniques aux appareils sans pour autant avoir l'obligation d'effectuer ces modifications sur des appareils déjà livrés. Lors de problèmes techniques (pièces de rechanges, conseils...) adressez-vous à notre représentant régional officiel ou bien directement chez nous.

KINEMATICA AG
Werkstrasse 7, C-D
CH-6102 Malters
Suisse

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.