

OPERATING MANUAL

Digital High Speed Homogenizer

D-500D



WIGGENS
THE MAGIC MOTION

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Congratulations!

You have made an excellent choice.

WIGGENS thanks you for the trust you have placed in us.

This operating manual has been designed to help you gain an understanding of the operation and possible applications of our instruments. For optimal utilization of all functions, we recommend that you thoroughly study this manual prior to beginning operation.

Unpacking and Inspecting

Please unpack the device carefully. Check that the package is right-side-up and then open it. Check that model of the product is one that you ordered. Check that there is no damage. If there is any damage, file a damage claim with the carrier. In the case of any damage a damage report should be requested immediately. These instructions must be followed fully for us to guarantee our full support of your claim for protecting against loss from concealed damage. The form required for filing such a claim will be provided by the carrier.

Changes without prior notification reserved

Important: keep operating manual for future use

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1. Intended Use

The D-500D homogenizer is a high speed dispersing instrument. It employs the rotor / stator technology where the shaft, rotor, and stator can be easily disassembled convenient accessory change and easy cleaning. The dispersing tool consisting of the rotor and stator are completely assembled for immediate use with the homogenizer main unit. For dismantling (e.g. for cleaning) please refer to this operation manual. The D-500D homogenizers is for laboratory use only and can be used in the chemical, cosmetic, pharmaceutical, and paint industries as well as in universities and a wide range of medical laboratories. It is designed as a high performance dispersing/homogenizing instrument and can also be used as a high-speed mixing unit with certain dispersing shafts. The main unit is suitable for volumes from 10ml to 2,000ml, with actual volume rates depending on the dispersing shaft used. There is a wide range of dispersing shafts in different forms and sizes available. The D-500D homogenizer is designed as stationary equipment mounted in a stand and not to be used as a handheld instrument.

2. Operator Responsibility

Use

For homogenizing, emulsifying

or suspending samples;

Range of use

- Laboratories
- Schools
- Pharmacies
- Research institute etc.....

This device is suitable for use in all areas except:

- Residential areas
- Areas that are connected directly to a low-voltage supply network that also supplies residential areas.

The safety of the user cannot be guaranteed if the appliance is operated with accessories that are not supplied or recommended by the manufacturer or if the appliance is operated improperly contrary to the manufacturer's specifications.

The products of WIGGENS ensure safe operation when installed, operated, and maintained according to common safety regulations. This section explains the potential dangers that may arise when operating the instrument and also specifies the most important safety precautions to preclude these dangers as far as possible.

- The operator is responsible for the qualification of the personnel operating the instrument.
- The personnel operating the instrument should be regularly instructed about the dangers involved with their job activities as well as measures to avert these dangers.
- Make sure all persons tasked with operating, installing, and maintaining the instrument have read and understand the safety information and operating instructions.

- When using hazardous materials or materials that could become hazardous, the instrument may be operated only by persons who are absolutely familiar with these materials and the instrument. These persons must be fully aware of possible risks.
- Only qualified personnel are authorized to perform configuration, installation, maintenance and repairs of the instrument.
- Routine operation can also be carried out by untrained personnel who should however be instructed by trained personnel.

If you have any questions concerning the operation of your instrument or the information in this manual, please contact us!

2.1. Disposal



At the end of its service life the instrument is to be disposed of in accordance with the local regulations specified for the disposal of electronic industry waste in an environmentally friendly manner.

CE Conformity



The products described in the operating instructions conform to the requirements of the following European guidelines:

Low voltage regulations with respect to legal harmonization of the member countries concerning electric devices for use within certain voltage limits.

EMC guideline with respect to legal harmonization of the member countries concerning electromagnetic compatibility.

APPROVALS European	EN61326-1:20132014/30/EU
	EN61010-1: 20102014/35/EU
	EN60204-1:20062006/42/EC
	EN50581: 20122011/65/EU

2.2. Technical Specifications

Model	D-500D
Motor type	Universal motor
Supply voltage	AC 230V
Supply frequency	50/60Hz
Max. speed	30'000rpm
Speed indication	LED,3 digits, actual speed
Speed measurement	Digital, direct by HAL-probe(no calibration needed)
Input power	Max.500W
Output power	Max.280W
Soft-start	Yes
Noise emission(drive only)	Lower than 72 dB(A) at 30'000rpm
Direction of rotation	Clockwise, seen from above
Ambient temperature	0-40 °C
Relative humidity	95%max.
Protection type	IP 20
Max. period of continuous operation	Depending on load & speed 100% duty time is possible.
Dimensions	170×102×255mm(L×W×H)
weight	Drive unit 1.8kg

All measurements have been carried out at the stated voltage, frequency, and an ambient temperature of 25°C.
 Technical changes without prior notification reserved.






WIGGENS Order Numbers consist of the Basic Order Number (BON) and the Order Number Addition (ONA) which explains different characteristics of the product that can vary from country to country. Order Numbers as stated on the product label and box label are stated as Full Order Numbers (FON), consisting of the BON followed by the ONA. For a full explanation of the ONA of your product, please ask your local WIGGENS support or refer to the Order Number Guide in the *WIGGENS* General Catalog.

3. Safety Instructions

3.1. Explanation of Safety Notes

In addition to the safety warnings listed, warnings are posted throughout the operating manual. These warnings are designated by an exclamation mark inside an equilateral triangle. "Warning of a dangerous situation (Attention! Please follow the documentation)."

Symbol	Additional term / Description
Warning signs 	The danger is classified using a signal word. Read and follow these important instructions for averting dangers.
	Warning! Describes a possibly highly dangerous situation. If these instructions are not followed, serious injury and danger to life could result.
	Caution! Describes a possibly dangerous situation. If this is not avoided, slight or minor injuries could result. A warning of possible property damage may also be contained in the text.
	Notice! Describes a possibly harmful situation. If this is not avoided, the product or anything in its surroundings can be damaged.
	Note! Draws attention to something special.
	Important! Indicates usage tips and other useful information.


3.2. For your protection

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



Any incorrect use of the installed equipment can be dangerous. Inadequately trained users can cause material damage and personal injury

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

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

- Make sure you read and understand all instructions and safety precautions listed in this manual before installing or operating your instrument.
- Only use the homogenizer for its intended purpose.
- Keep the operation instructions in a place where they can be accessed by everyone.
- Make sure the product is checked for proper condition regularly (depending on the conditions of use). Regularly check (at least every 2 months) the proper condition of the mandatory, warning, prohibition and safety labels.
- Connect the instrument to a power socket with earthing contact (PE-protective earth)!
- The power supply plug serves as a safe disconnecting device from the line and must always be easily accessible.
- Do not stay in the area below the instrument.
- To avoid electrical shock, do not open the housing. Remove the power cord from the power source when the unit needs to be checked or serviced. This instrument must only be opened by qualified service personnel.
- Never touch the spinning rotor, shaft, or the motor side coupling parts, while the unit is under operation or hasn't fully come to a halt.
- Do not operate the unit after any malfunctions or after it has been damaged in any manner. In case of malfunction or damage contact the equipment distributor where you purchased the unit.
- Never operate instruments with damaged mains power cables.
- Observe all warning labels.
- Never remove warning labels.
- Switch off the unit before changing the dispersing element.
- Only suitable dispersing shafts from WIGGENS may be used.
- Glass vessels must always be secured with the strap or a clamp to prevent them from sliding or tipping.
- Use caution when adjusting the speed to avoid possible spraying of the medium.
- The ventilation slots of the drive must not be obstructed.
- Never let the rotor / stator touch the bottom of the vessel.
- Be aware of tripping! Never route the connection cable in highly frequented areas!
- Repairs are to be carried out only by qualified service personnel
- Always turn off the instrument and disconnect the mains cable from the power source before performing any service or maintenance procedures, or before moving the instrument.
-  **Warning!** This is not an explosion proof instrument. Do not use with any highly flammable or explosive

materials.

- Be aware of the danger of electric shocks!
-  **Warning!** Wear your personal protective equipment in accordance with the hazard category of the media to be processed. Otherwise there is a risk from:
 - Splashing and evaporation of liquids
 - Ejection of parts
 - Release of toxic or combustible gases.
-  **Warning!** When in an emergency, disconnect the main power plug.
- Gradually increase the speed.
- Reduce the speed if:
 - The medium splashes out of the vessel because the speed is too high
 - The appliance is not running smoothly
- The container moves on the base plate.
- Beware of hazards due to:
 - Flammable materials
- Combustible media with a low boiling temperature
- Glass breakage
- Incorrect container size
- Overfilling of media
- Unsafe condition of container.
- Only process media that will not react dangerously to the extra energy produced through processing. This also applies to any extra energy produced in other ways, e.g. through light irradiation.
- Please observe the operating instructions for any accessories used.
- Safe operation is only guaranteed with the accessories described in the "Accessories" chapter.
- Accessories must be securely attached to the device and cannot come off by themselves. The center of gravity of the assembly must lie within the surface on which it is set up.
- The homogenizer must not be used in highly combustible areas and operated with easily inflammable liquids. It is recommended to run the unit in fume hoods during operation.

3.3. For protection of the equipment

- You have received a product designed for industrial and experimental use. Nevertheless, avoid strikes to the housing, vibrations, damage to the operating-element panel, and contamination.
- Ensure that the correct electric voltage of the instrument corresponds with power supply used.
- Make sure that the mains power supply has low impedance to avoid any negative effects on instruments being operated on the same mains.
- Do not expose the unit to sunlight
- Sudden drops may cause damage in the interior of the instrument.
- Transport the instrument with care.
- The device can be damaged when sucking in aggressive gases or vapor through the installed ventilator!
- Press the power button to interrupt the stirrer, rather than disconnect the main power plug directly.
- Do not cover the device, even partially e.g. with metallic plates or film. This results in overheating.
- Ensure that the base plate is kept clean
- The D-500 must never be operated without the stator / rotor being fully immersed in liquid - the lower slide bearing is cooled and lubricated by the liquid phase of the treated medium. Any dry running will destroy the slide bearing.
- Ensure that the dispersing shafts are cleaned properly after use. When cleaning, remove the power cord from the power source.

4. Operating Procedures

4.1. Environmental Operating Conditions

The Digital High Speed Homogenizer must operate in the following conditions:

- Indoors
- Altitudes up to 2000 meters
- Temperatures from +5°C to +40°C
- Maximum relative humidity 80% for temperatures up to +31°C, linear decrease down to 50% relative humidity at a temperature of +40°C
- Max. mains fluctuation of $\pm 10\%$ are permissible
- Protection class according to EN 60 529: IP20
- The unit corresponds to Class I
- Overvoltage category II

4.2. Installation

The WIGGENS system D-500D prepares finest dispersions and homogenizations and is suitable for use with working volumes up to 2000ml (depending on the viscosity of the product and the dispersing aggregate used). The drive can be equipped with a wide range of WIGGENS dispersing-aggregates. The aggregates are easy to change using the quick-coupling.

For a ready-to-use system you need:

- Drive D-500D
- A stand
- A dispersing aggregate
- A mains connection according to the type label

On the following pages pictures and a description of the main components of the complete system D-500D can be found.

4.2.1. Unpacking the digital high speed homogenizer and stands

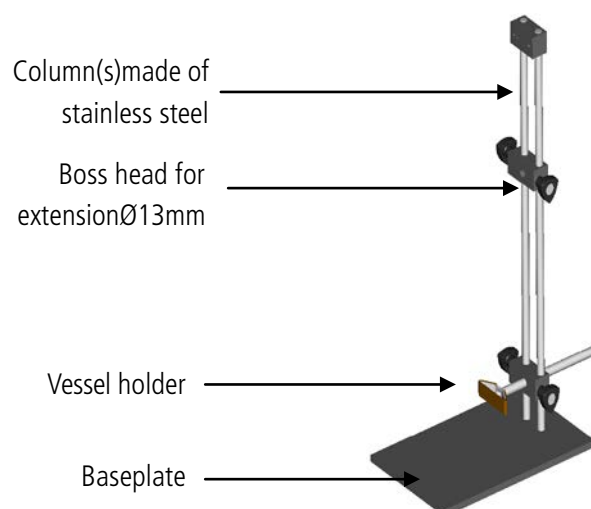
Open the dispatch box and check that the contents agrees with the packing list.



Check all parts for possible transport damage. Inform us or your dealer immediately about any disagreement or fault. If possible send us digital photos by email to info@wiggens.com

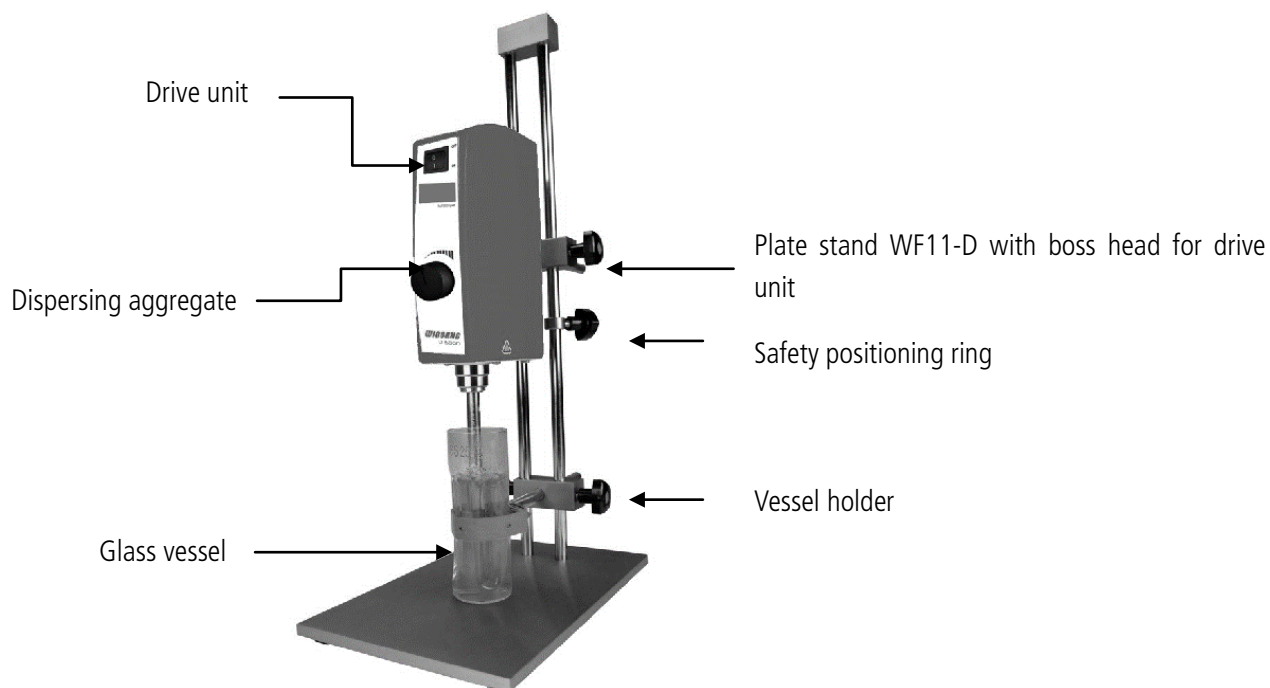
4.2.2. Description of the stands

The derive D-500D is designed for using with a stand. WIGGENS recommends the standard plate stand WF11-D (double rod design).According to the size of the working vessel a vessel holder may use.



4.2.3. Installation the Digital High Speed Homogenizer with a Stand

The D-500D drive arrives fully equipped with the extension suitable for the stand WF11-D. Just mount the drive at the stand and plug the line cord into the power inlet connection at the back side.



4.2.4. Installation of DISPERSING-AGGREGATES

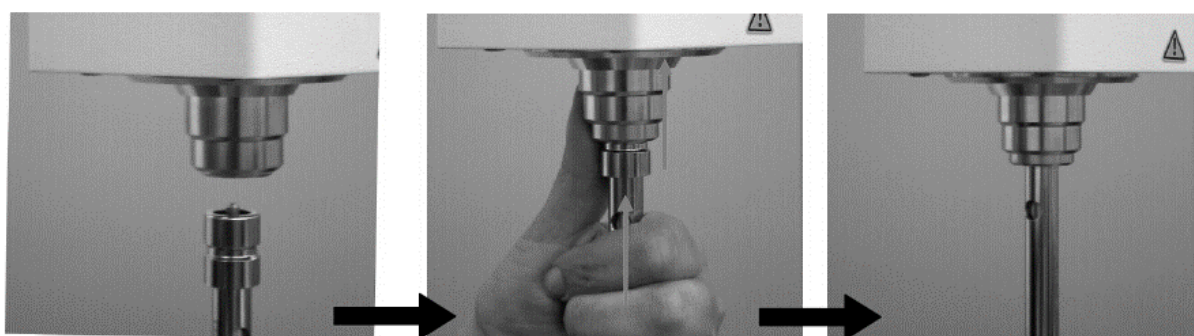
a wide range of dispersing aggregates with diameters of 3, 5, 7, 12, 20 and 25 mm are available. For questions concerning WIGGENS dispersing aggregates please get in contact with WIGGENS of your local specialist dealer.

Due to the quick coupling, WIGGENS dispersing aggregates can be fitted and replaced very easily. The three below show the mounting of an aggregate.

For easy mounting, the coupling part of the aggregate and the drive unit should be free of dirt.

Push the slider of the coupling upwards, at the same time push the aggregate into the coupling.

Push the aggregate upwards and at same time twist it a little until it has snapped in and the slider returns downwards



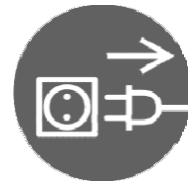


CAUTION! :

BEFORE REMOVING AND PUSHING UP THE SLIDER OF THE COUPLING, HOLD YOUR DISPERSING AGGREGATE IN ONE HAND AVOIDING THE AGGREGATE TO FALL DOWN WHEN PUSHING UP THE SLIDER.



WHEN REPLACING AN AGGREGATE THE LINE CORD HAS TO BE DISCONNECTED FROM THE POWER SUPPLY

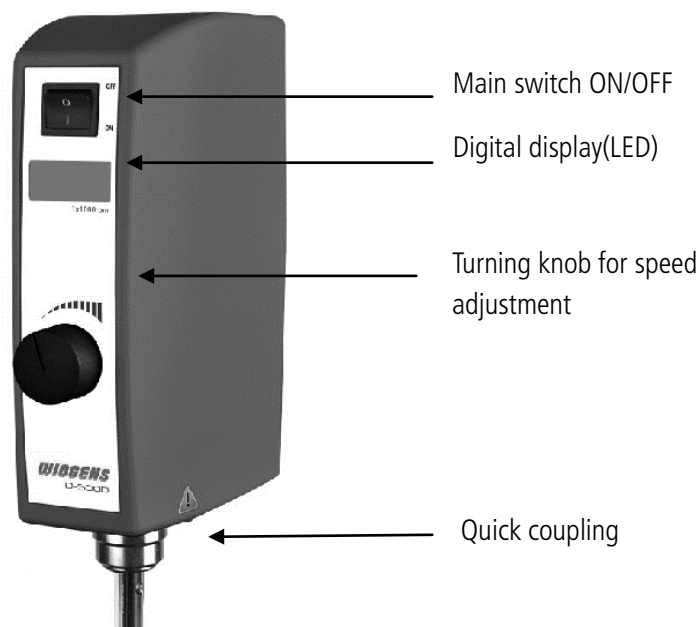


CAUTION!

AT LONG TERM USE AT HIGH LOADS, THE AGGREGATE & THE COUPLING CAN HEAT UP TO HIGH TEMPERATURE LEVELS – DANGER OF SKIN BURN

4.3. Operation

4.3.1. Overview of the Digital High Speed Homogenizer



4.3.2. Operation of the Digital High Speed Homogenizer

The drive unit D-500D is equipped with a 500 W motor and will be started using the main switch placed at the front side. The speed will be adjusted using knob on the front side of the device. Within the speed range of up to 30'000 rpm, the integrated closed loop speed control will tune the speed to any adjusted value independent from load changes. The actual speed can be read from the digital display (LED)

Furthermore the electronic control system is equipped with safety functions with automatic shutdown to prevent the drive being overheated or blocked. A description of possible errors and counter measurements is listed in chapter "TROUBLE SHOOTING"

1. Turn on the instrument by press main switch.
2. The LED display will light up and indicate the current RPM of the instrument
3. Twist the turning knob to set the desired speed, now the LED display indicate the set RPM (turn clockwise to increase the set value, turn anti-clockwise to decrease the set value).
4. After reach the set RPM, the LED display will indicate the set RPM also current RPM simultaneously.

CAUTION!



Ensure that the voltage marked on the type label complies with your power supply
Immerse the aggregate in the product. The optimum depth of immersion of the dispersion attachment is about 70% of the total depth of product in the container. Never immerse the upper coupling head and upper hole of the dispersion aggregate.

CAUTION!



In some cases it can be advantageous to place the vessel eccentric in order to get more turbulences for better mixing of the product.

CAUTION!



WIGGENS dispersing aggregates may not be operated dry-the lower sleeve bearing is cooled and lubricated by the medium being bearing.

The dispersing aggregates should be cleaned after every operation.

Never touch the rotating aggregate-danger of severe cut-injuries.

5. Cleaning and Maintenance

Your WIGGENS unit is designed for ease servicing. Never the less, it is essential to inspect your equipment carefully and to clean it thoroughly.

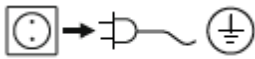


During any work on the equipment, in order to avoid any personal injury or other damage when changing or removing the dispersing aggregate

5.1. Routine Cleaning

Wipe the housing of the instrument with a damp cloth using a mild soap and water solution.

Cleaning



For cleaning disconnect the main plug.

Only use cleansing agents which have been recommended by *WIGGENS*

Use to remove:

Dyes isopropyl alcohol

Construction materials isopropyl alcohol/water containing surfactant

Cosmetics isopropyl alcohol/water containing surfactant

Foodstuffs water containing surfactant

Fuels water containing surfactant

- Do not allow moisture to get into the appliance when cleaning.
- Wear protective gloves when cleaning the devices.
- Please consult with *WIGGENS* before using any cleaning or decontamination methods, other than those recommended here.



Note:

Do not use chlorine bleach, chlorine-based cleanser, abrasives, ammonia, steel wool or scouring pads with metal content or similar harsh solvents or abrasives. These may damage the surface of the instrument.

5.2. Cleaning EC-aggregates.

(EC stands for EASY CLEAN) are easy to disassemble and clean. They can be sterilized in an autoclave by standard methods. In the following chapters the de/assembling procedures will be described.

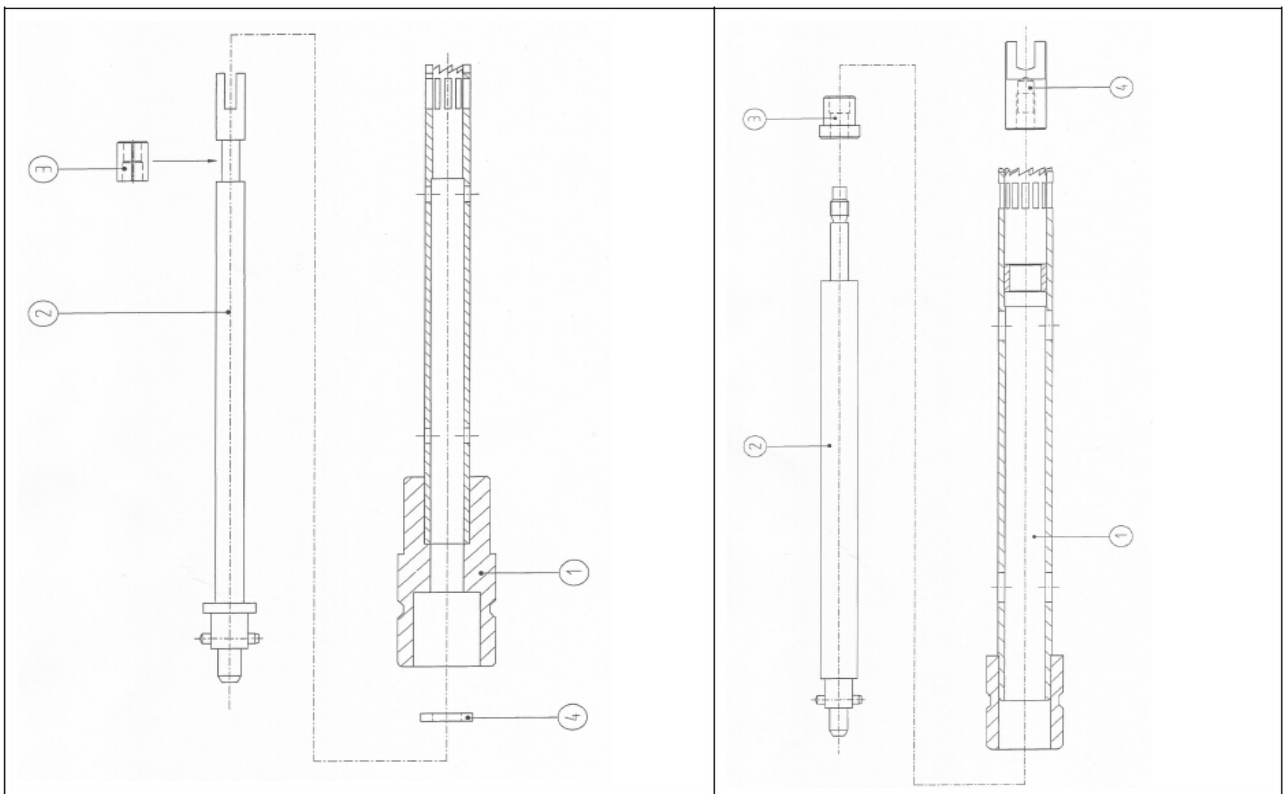


CAUTION!

Be aware of sharp edges and teeth when de/ assembling aggregates—danger of cut-injuries

5.2.1 Disassembling of EC-aggregates with size $\varnothing 3$, $\varnothing 5$, $\varnothing 7$ and $\varnothing 12$ mm

PT-DA 03/2EC-E050	PT-DA 05/2EC-E085	PT-DA 07/2EC-E107	PT-DA 12/2EC-E157
<p>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.</p>			<p>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.</p>
<p>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.</p>			<p>Using the tool, the sleeve bearing can be pushed out in the direction of the coupling.</p>
<p>Replace defective parts. Bearings should only be replaced in pairs.</p>			<p>Replace defective parts.</p>
<p>Reassemble in the reverse order.</p>			<p>Use the shaft to press the sleeve bearing into the stator tube from the coupling side. Screw on the rotor and tighten gently.</p>



5.3. Maintenance

Do not attempt to service or repair a WIGGENS digital high speed homogenizer. If the homogenizer's housing is opened the warranty becomes void. Contact WIGGENS for return authorization and return instructions.

Ordering spare parts

When ordering spare parts, please give:

- Machine type
- Manufacturing number, see type plate
- Item number and designation of the spare part.

Repair

Please only send devices in for repair that have been cleaned and are free of materials which might present health hazards. For this, use the "certificate of compliance" form which you can obtain from *WIGGENS*. If your appliance requires repair, return it in its original packaging. Storage packaging is not sufficient when sending the device - also use appropriate transport packaging.

6. Transport and Storage

- Clean the Digital High Speed Homogenizer that it is free from any materials which may be harmful to the health. Provide a material safety data sheet where appropriate.
- Place the Digital High Speed Homogenizer unit and its parts into the original packing or a container with necessary protection to prevent damage during transport. Seal the original packing or container with packing tape.
- Store the packed unit in a dry place.






CAUTION:

Failure to clean, maintenance, and handle the Digital High Speed Homogenizers outlined can lead to damages or be harmful to the health.

7. Accessories and Spare Parts

7.1. Disparager-Aggregate

Model	Description	Order No.
2503 	Length: 50mm Stator Diameter:3mm Rotor Diameter:1.8mm Linear Velocity:4.0m/s Volume Range:0.05-2ml Application: Small plant samples, animal and human tissue; fits to round bottom Eppendorf tubes	25030004
2505 	Length: 85 mm Stator Diameter:5.6mm Rotor Diameter:3mm Linear Velocity:4.7 m/s Volume Range:0.1-5ml Application: Small plant samples, animal and human tissue; solid solutes, cell disruptor	25030012
2507 	Length: 107mm Stator Diameter:7.8mm Rotor Diameter:5mm Linear Velocity:7.8m/s Volume Range:0.3-10ml Application: Animal tissue, solid solutes	25030031
2509 	Length: 82mm Stator Diameter:7.8mm Rotor Diameter:5mm Linear Velocity:7.8m/s Volume Range:0.3-10ml Application: Extracts, preparation of suspension and latex; one time use only (25 pcs per package; sterile)	25030030
2512	Length: 123mm Stator Diameter:12mm Rotor Diameter:9mm Linear Velocity:14.1m/s Volume Range:2-250ml Application: Cells, plants, animal tissue, human tissue	25030062

		
<p>2520</p> 	<p>Length: 192mm Stator Diameter:20mm Rotor Diameter:15mm Linear Velocity:22m/s Volume Range:100-2000ml Application: Plants, animal tissue, human tissue, resin, coloring matte</p>	<p>25200069</p>
<p>2520F</p> 	<p>Length: 170mm Stator Diameter:20mm Rotor Diameter:15mm Linear Velocity:22m/s Volume Range:100-2000ml Application: Preparation of suspension and latex, pharmaceutical shells</p>	<p>252F0091</p>



WIGGENS reserves the right to carry out technical modifications with repairs for providing improved performance of the instrument.



A large selection of special homogenizing vessels is available, which can improve the efficiency of the processing of your product. Closed vessels to withstand vacuum or pressure can also be supplied,
 For more information, ask your dealer or contact WIGGENS directly

8. Service



Under normal working conditions, the D-500D drive, requires no special servicing. Parts such as the motor brushes and bearing are subject to natural wear.
 The following are standard values for wear parts of the drive:
 Ball bearings: several 1000's of operating hours.
 Motor brushes: Approx. 150hours of operating at rated power.

**CAUTION:**

We strongly recommend that service work and repairs should be carried out only by authorized WIGGENS service centers, where original replacement parts are available.

Any unauthorized modification or manipulation of the unit equipment leads to immediate annulment of the warranty. Contact *WIGGENS* for return authorization and return instructions.

8.1. Trouble Shooting

Problem	Reason	Corrective measures
Unusual noises	Damaged drive bearing	Change ball bearings. Trace & replace Defective parts (shaft, bearings)
	Damaged aggregate bearings	Change bearings
	Rotor/stator interference	Trace and replace defective parts (shaft, bearings)
Drive automatically stops & an alternating beeping sound is audible and the message "HO" is shown on the display	Inadequate ventilation	Check manner of use. Cool down the device & restart
	Thermal overload	Replace shaft
Vibrations	Bent shaft	Replace bearing(s)
	Worn bearing	Replace bearing
	Defective coupling	Trace and replace defective parts
Drive does not start respectively suddenly stops. A constant beeping sound is audible and the message "BL" is shown on the display	Defective internal control	Send the equipment to the nearest authorized WIGGENS service centre
	Drive is blocked	Check the aggregate for solid particles which may be blocking the rotor, remove the particles, turn off the drive and restart operation



WIGGENS reserves the right to carry out technical modifications with repairs for providing improved performance of the instrument.

8.2. Warranty

WIGGENS warrants its products against defects in material or in workmanship, when used under appropriate conditions and in accordance with appropriate operating instructions

Under no circumstances shall *WIGGENS* be liable for indirect, consequential or special damages of any kind.

WIGGENS reserves the right to any technical changes without prior notice.

For a Period of TWO YEARS.

This limited warranty covers parts and labor.

WIGGENS reserves the right to decide the validity of any warranty claim. In case of faults arising either due to faulty materials or workmanship, parts will be repaired or replaced free of charge.

Any other compensation claims, such as consumables, damages caused by corrosion or accidental breakage, are excluded from this guarantee.

This warranty may only be altered by a specifically published amendment. No individual has authorization to alter the provisions of this warranty policy or its amendments.

8.3. Contact /Technical Service

If your device is not working properly:

- Please inform *WIGGENS* Instruments by using our contact information.
You have contacted *WIGGENS* Instruments?
- Copy and complete the Confirmation of condition of unit from these operating instructions.
- Please repack the device appropriately for transport and send to *WIGGENS* Instruments together with the Confirmation of condition of unit.

Our contact details

WIGGENS GmbH

Add: Gässlesweg 22-24, 75334 Straubenhardt, Germany

Tel.: 0049 7248 4529088

Wiggens Co., Ltd.

Room 426, Hall A, Office Building M8, No.1 Jiuxianqiao East Road, Chaoyang District, Beijing 100015, China

Tel: +86 400-809-2068

Fax: +86 400-809-2068-112

info@wiggens.com

service@wiggens.com

www.wiggens.com

Confirmation of condition of unit

In the case of repair, copy and complete the Confirmation of condition of unit and send it to *WIGGENS* Instruments.

1. Details about the unit

Product number

Serial number

Reason for repair

2. Has the device been cleaned, decontaminated/sterilized?

Yes

No

3. Is the unit in a condition which does not represent any health threats for the staff of our service department?

Yes

No

If not, which substances has the unit come into contact with?

4. Legally binding declaration

The customer is aware of being legally liable to *WIGGENS* Instruments for any damages arising from incomplete and incorrect information.

Date

Signature

Company stamp

Please Note

The shipper is responsible for the return of the goods in well-packed condition, suitable for the mode of transport.

Sender information

Name

Company

Department, research group Street

Zip code, city

Country

Phone

E-mail



WIGGENS GmbH

Gässlesweg 22-24, 75334 Straubenhardt, Germany

Tel.: 0049 7248 4529088

WIGGENS China

Room 426, Hall A, Office Building M8, No.1 Jiuxianqiao East Road,

Chaoyang District, Beijing 100015, China

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