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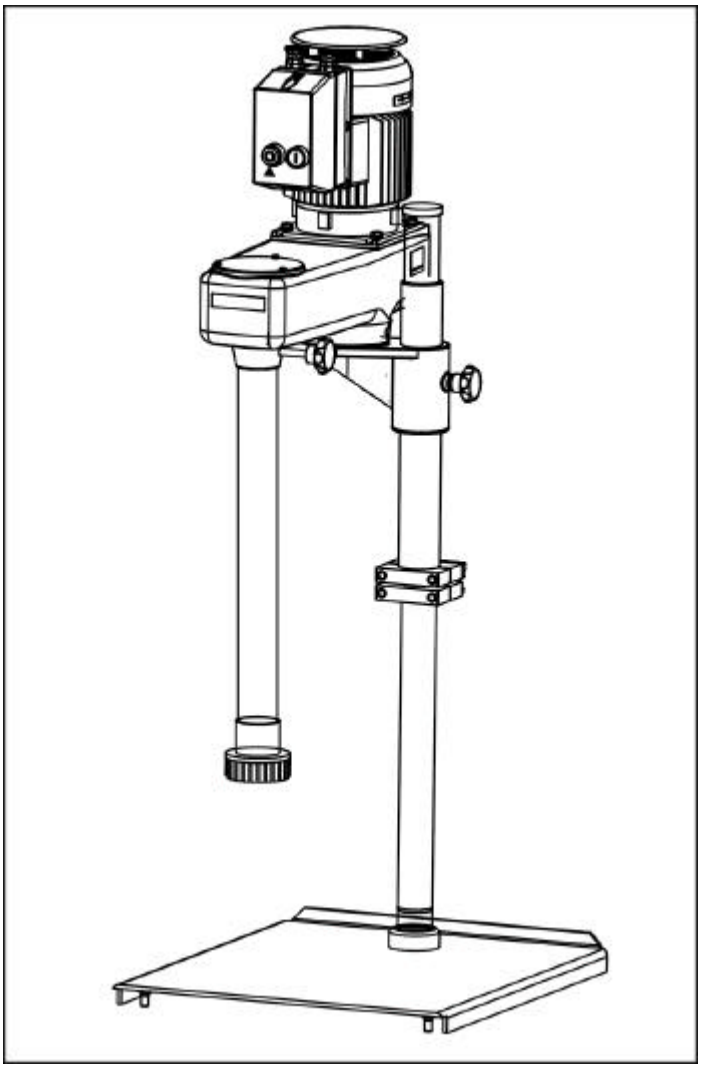
IKA® WERKE

IKA® T 65 D Dispersion unit



OPERATING INSTRUCTIONS *EN/USA*

T 65D 042005

CE-KONFORMITÄTSERKLÄRUNG ***DE***

Wir erklären in alleiniger Verantwortung, dass dieses Produkt den Bestimmungen der Richtlinien 89/336EG, 98/37/EG und 73/023EG entspricht und mit den folgenden Normen und norminativen Dokumenten übereinstimmt:
DIN EN 61 010-1; EN 60 204-1; EN 292-1, -2; EN 414; EN 61 326-1.

CE-DECLARATION OF CONFIRMITY ***EN***

We declare under our sole responsibility that this product corresponds to the regulations 89/336EG, 98/37/EG and 73/023EG and conforms with the standards or standardized documents:
DIN EN 61 010-1; EN 60 204-1; EN 292-1, -2; EN 414; EN 61 326-1.

DÉCLARATION DE CONFORMITÉ CE ***FR***

Nous déclarons sous notre propre responsabilité que se prodiut est conforme aux réglementations 89/336EG, 98/37/EG et 73/023EG et en conformité avec les normes ou documents normalisés suivant:
DIN EN 61 010-1; EN 60 204-1; EN 292-1, -2; EN 414; EN 61 326-1.

DECLARACION DE CONFORMIDAD DE CE ***ES***

Declaramos por nuestra responsabilidad propia que este produkto corresponde a las directrices 89/336EG, 98/37/EG y 73/023EG y que cumple las normas o documentos normativos siguientes:
DIN EN 61 010-1; EN 60 204-1; EN 292-1, -2; EN 414; EN 61 326-1.

CE-DICHIARAZIONE DI CONFORMITÀ ***IT***

Dichiariamo, assumendone la piena responsabilità, che il prodotto è conforme alle seguenti direttive: 89/336EG, 98/37/EG e 73/023EG, in accordo ai seguenti regolamenti e documenti:
DIN EN 61 010-1; EN 60 204-1; EN 292-1, -2; EN 414; EN 61 326-1.

Explanation of symbols

This symbol identifies information **that is of vital importance for safeguarding your health and safety**. Disregarding this information can lead to health impairment and injuries.

This symbol identifies information **that is of importance for the technically correct functioning of the system**. Disregarding this information can result in damage to the T 65 D dispersion unit or to system components.

This symbol identifies information and notes that are of importance for correct handling of the T 65 D dispersion unit.

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1 Notes for the user

1.1 Correct use

The T 65 D dispersion unit, used in conjunction with the IKA® dispersion tools, is suitable for mixing, emulsifying and dispersing free-flowing and liquid media in batch operation. It is designed for use in technical colleges and for small-scale production. For operation, the T 65 D dispersion unit must be mounted on the T 653 telescopic stand. It must only be used with dispersion tools from the S 65 range.

1.2 For your safety

Operating conditions

For correct use, the unit must be secured on the T 653 telescopic stand by two bolts, in accordance with Section 3 "Set-up and commissioning". The telescopic stand must be installed so that it cannot topple over or slide about, and must be equipped with a safety disconnection device which operates when the stand is moved upwards. In particular, please also read the safety notes for use of the telescopic stand (see Appendix, Section 7.5, "The T 653 telescopic stand).

The unit is not suitable for manual operation. Please observe the applicable safety notes and directives, as well as health and safety regulations and safety rules for use in the laboratory.

If the emergency stop switch of the dispersion unit is not within reach when the unit is operating, an additional emergency stop switch must be installed within easy reach, in the working area.

During operation never touch the dispersion tools to avoid injury. Some dispersion tools have overlapping cutting edges and teeth.

When working with the dispersion unit, the user must select and wear his/her personal protection equipment to suit the danger class of the product to be mixed. With faulty or unsuitable protection equipment, the user can be endangered due to splashing.

The T 65 D dispersion unit must not be used in hazardous areas, for dispersing hazardous substances, or used for operation under water.

The T 65 D dispersion unit must not be used for processing any inflammable or combustible materials.

Only dispersion tools approved by IKA® for this unit must be used.

Danger due to glass breakage

Imbalance of the dispersion unit tool shaft can lead to uncontrolled resonance behaviour of the unit and the entire installation. Glass apparatus and vessels can be damaged or can shatter, and if this happens, the user could be injured. If uneven running of the unit is noticed, the dispersion tool should be checked and replaced if necessary.

The vessels used for the dispersing process must be secured. Glass vessels must always be secured with a clamp to prevent them spinning. When working in glass vessels, the dispersion tool must not come into contact with the glass. Either elastic couplers must be used when working with flasks, or sufficient clearance maintained between dispersion tool and vessel, in order to avoid glass breakage.

Danger due to explosion or overheating

In some circumstances, the region between medium and drive shaft, or between rotor and stator, can become electrostatically charged, and ignite an explosive atmosphere caused by evaporation of the medium. In addition, with advanced evaporation of the medium, the slide ring seal can overheat to such an extent that it would lead to an ignition or combustion of the medium.

For this reason, no inflammable or combustible materials must be processed with the T 65 D dispersion unit.

Danger due to electric shock

Before commissioning, the unit must be wired up by a skilled worker.

Even in the case of repair work, the unit must only be opened by a skilled worker. Before opening, the mains plug must be pulled out. Live parts inside the unit can remain live for a long time after the mains plug is pulled out.

The accessory must only be fitted after the mains plug is disconnected.

Checking the handwheel bolt

The handwheel bolt on the flange of the drive unit can become loose due to vibration. For safety's sake, check the tightness of the handwheel bolt regularly, and retighten it if necessary.

Observe direction of rotation of the motor

Before commissioning, the correct direction of rotation of the motor must always be ensured (test run without dispersion tool: motor rotation as indicated on the arrow plate, or clockwise rotation, looking down on motor). The wrong direction of rotation can lead to the rotor or stator coming off the shaft.

If the unit is operated in different locations with a 5-pin plug, the direction of rotation must be checked before commissioning, with no dispersion tool fitted.

Impairment of the machine function

Ventilation slots and cooling vanes on the motor must not be covered.

Avoid shocks or impacts on the dispersion tool. Even slight, undetectable damage leads to imbalance and uneven running of the drive shaft. Careful handling ensures the safe operation and durability of the unit.

If possible, only switch on the drive with the lowest speed (in combination with a speed controller DS). Increase the speed slowly to the desired value.

Dispersion tools must only be operated in the medium. The sealing surfaces are cooled by the free-flowing medium. Running dry destroys the sealing surfaces.

Never use the dispersing unit without dispersion tools.

Rapid temperature change (thermal shock!) can destroy the hard metal sealing surfaces.

In order to avoid high risk of injury never touch the dispersion tool during operation! Some dispersion tools have prominent blades and teeth.

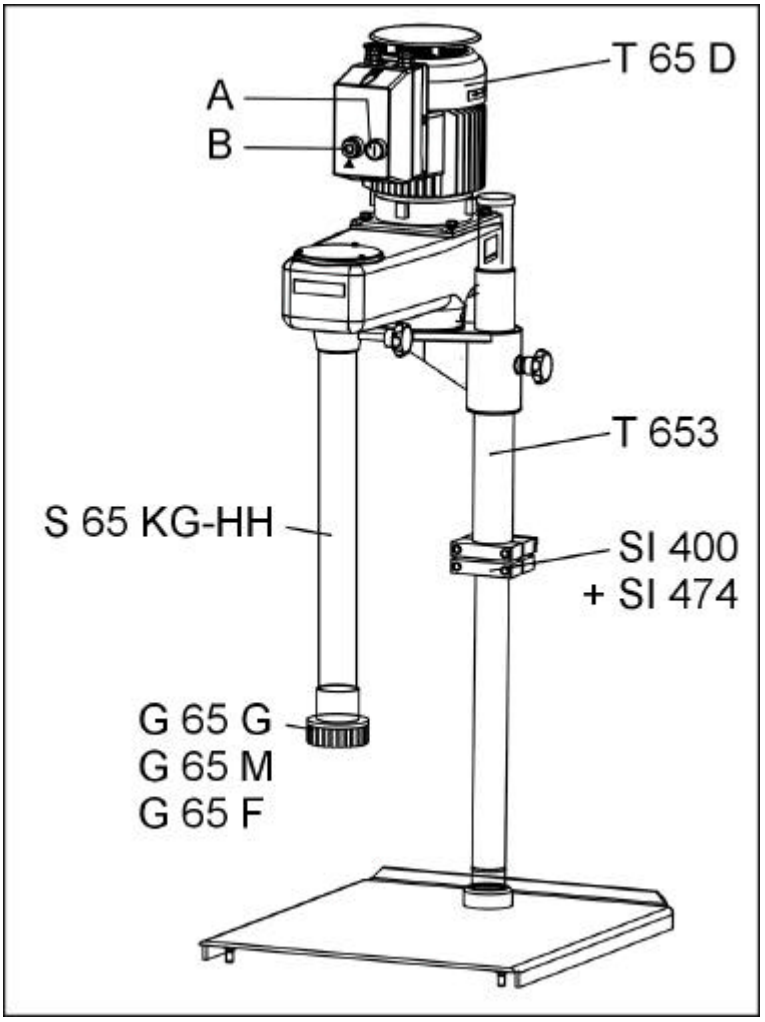
1.3 Guarantee

You have purchased an original IKA laboratory machine which meets the highest engineering and quality standards. In accordance with IKA guarantee conditions, the guarantee period is 24 months. For claims under the guarantee please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.

2 Product description

2.1 The T 65 D dispersion unit

The IKA® T 65 D dispersion unit is a high-quality product that guarantees trouble-free use, as a result of the sturdy unit construction and the simple operation. The drive shaft - driven by a Poly-V-belt – has a fixed speed of 7200 r.p.m. and, in turn, drives the rotor. As a result, the S 65 range of dispersion tools that can be used achieve tip speeds of 21.9 m/sec. These tip speeds lead to optimal dispersing or emulsifying results in batch operation.



For operation, the T 65 D dispersion unit must be mounted on the IKA® T 653 telescopic stand. It must only be operated with the S 65 KG-HH shaft and the dispersion tools from the S 65 range (G 65 G, G 65 M, G 65 F). The unit is switched on and off by pressing the ON button (A) and the emergency stop button (B). If the emergency stop switch of the dispersion unit is not within reach, an additional emergency stop switch must be installed within easy reach, in the working area.

Safety disconnection device

If the telescopic stand is moved upwards when the unit is operating, the dispersion unit must switch off. To facilitate this, the telescopic stand must be equipped with a safety disconnection device. For this purpose, we recommend the installation of the SI 400 safety limit switch together with the SI 400 mounting support (accessories).

Wiring by skilled worker

The unit is supplied without connecting cable, as the installations on the user's premises do not permit a standard cable length, because of the different accommodating spaces. The layout of connections is shown in the wiring diagram (see Section 6.3 "Wiring diagram"), for the information of skilled workers.

The unit heats up in service. The generously-proportioned cooling surfaces on the motor achieve an even distribution and emission of the heat.

Motor protection

The AC motor runs in ball bearings and is maintenance-free. In its attached control cabinet, it has a special safety device for operation on overcurrent and undervoltage (undervoltage trip), to permanently switch the motor off and avoid any thermal damage. The unit can only be put back in service when the power supply required for the motor is restored.

The basic connection and performance data for the motor can be obtained from the motor rating plate.

The connection facility for the IKA® SI 400 safety limit switch is also provided in the motor control cabinet.

2.2 Dispersion tools in the S 65 range

A dispersion tool in the S 65 range consists of a shaft and a generator (stator/rotor). The shaft carries the marking S 65 KG-HH, where KG stands for the ball bearing and HH for a slide ring seal made of hard metal. The seal prevents liquid rising up the shaft and destroying the ball bearing. The top end of the shaft is in the form of a plug-in coupling. The bottom end of the shaft carries a thread for mounting the stator. The shaft – running in ball bearings- carries the rotor.

For the S 65 range, there are three types of generator, designated G 65 G, G 65 M, G 65 F, where the prefix G stands for generator and the suffices G for coarse, M for medium and F for fine. The appropriate generator must be used according to the medium. When the starting material is too coarse for the generator, the generator can clog up and hence become ineffective. In addition, the sealing surfaces run dry, so that they are damaged.

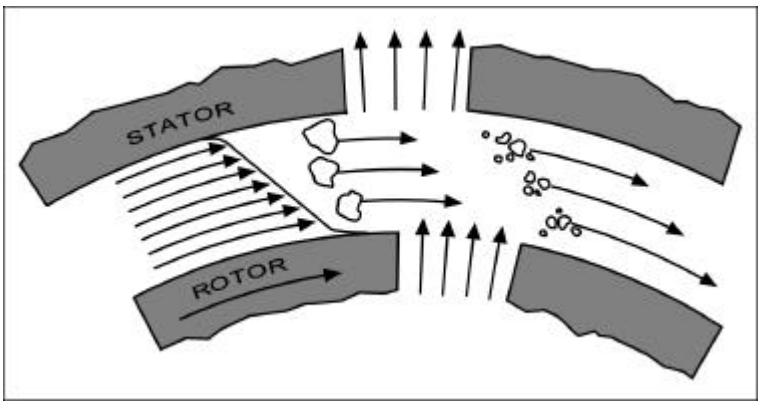
The generators are suitable for solids components with the following grain sizes:

Generator type	Grain size
G 65 G	40 mm
G 65 M	8 mm
G 65 F	1 mm

It can often be helpful to process a medium with all three generators in sequence, starting with generator G 65 G. Although it is easy to change the generators, in such cases, it is worth buying three shafts, that can then be changed with fewer manipulations.

The rotor/stator principle

Due to the high rotation speed of the rotor, the medium to be processed is automatically drawn axially into the dispersion head and then forced radially through the slots in the rotor/stator arrangement. The high accelerations acting on the material produce extremely strong shear and thrust forces. In addition, high turbulence occurs in the shear gap between rotor and stator, which provides optimum mixing of the suspension.



The dispersion effectiveness is heavily dependent on the product of the shear gradient and the time the particles spend in the shear zone. The optimum range for the circumferential velocity of the rotor/stator arrangement is 10 to 24 m/s.

A processing time of a few minutes is usually sufficient to produce the desired fineness. Long prccessing times bring only insignificant improvements in the obtainable fineness; the energy expended serves merely to increase the temperature of the medium.

With small quantities, a rapid heating-up of the medium must be expected, because of the high motor power, which is mainly converted into heat.

If the viscosity of the material to be processed is too high (above about 5 Pas.), or the vapour pressure of the liquid is very high, the flow is unable to follow the rapid accelerations of the generator, and breaks down. This leads to dry running, and hence to destruction of the sealing surfaces. Such substances must be fed to the generator by force. Use a continuous flow unit (i.e. IKA® Laborpilot) for this, and/or an additional pump.

2.3 T 653 telescopic stand

In conjunction with the IKA® T 653 telescopic stand, the T 65 D dispersion unit can also be used for tall mixing vessels. For information on this product, please refer to the Appendix to this document.

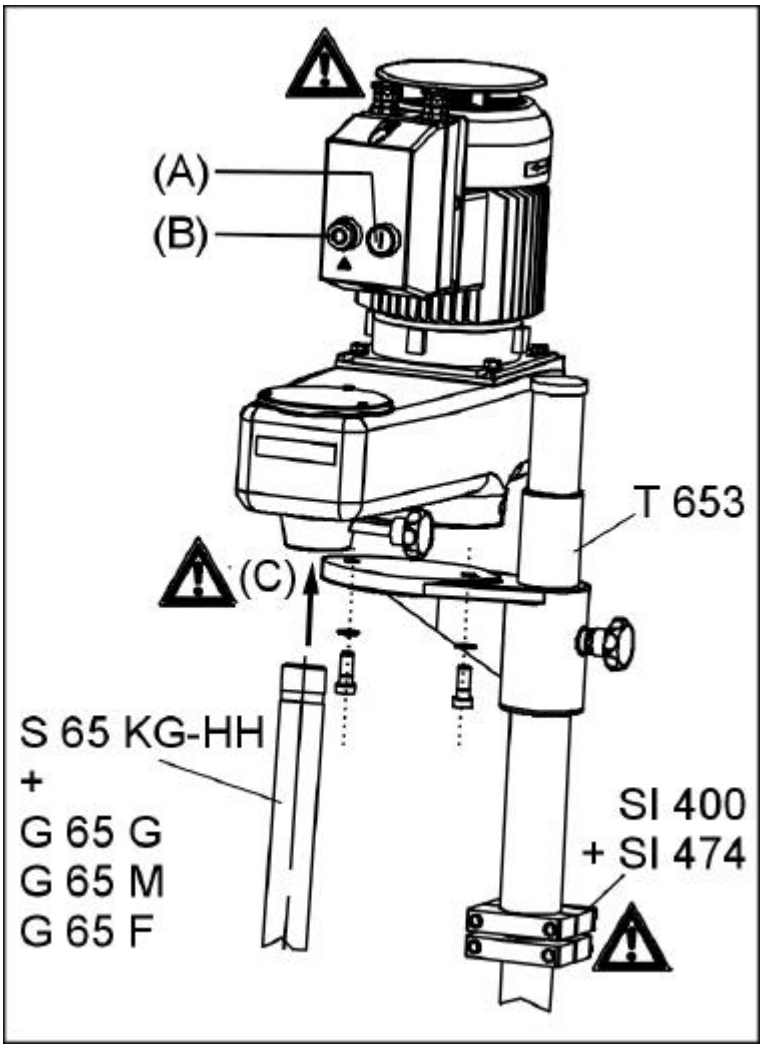
3 Set-up and commissioning

3.1 Unpacking

Please unpack the system components carefully and check closely for any damage. It is important to recognize any damage that occurred during shipping while you are unpacking. If damage has occurred, you will need to make a written assessment of the damage and send it to us by mail, rail or special delivery.

The delivery package of the unit comprises: one T 65 D dispersion unit corresponding to the type ordered (see Section 5, "Technical data"), one set of tools and one set of operating instructions.

3.2 Assembly and electrical installation of the dispersion unit



Mounting the dispersion unit

As shown in the diagram, the T 65 D dispersion unit is mounted on the T 653 telescopic stand with two M12 hexagon socket head (Allen) screws and toothed lock washers. The screws and toothed lock washers are included in the delivery package of the stand. An assistant is required for screwing on the T 65 D dispersion unit.

The telescopic stand must be installed such that it does not tilt or slide about. It must not move about when the unit is operating.

Particular danger points, such as crushing/trapping positions, rotating parts, locking screws for the stand column, are identified by an exclamation mark in the "Dispersion unit assembly" diagram. Particular regard should be paid to these danger points when the unit is in service!

The electrical connections of the T 65 D dispersion unit must be made by a skilled worker in accordance with the wiring diagram (see Section 6.3, "Wiring diagram").

3.3 Mounting the safety limit switch

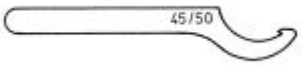
There is a danger of trapping between the safety limit switch, switch contact and the end stop!

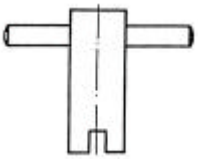
Mount the SI 400 safety limit switch together with the SI 474 mounting support on the T 653 telescopic stand. For this, follow the mounting instructions on the next page.

3.4 Pre-assembly of dispersion tools

Before the dispersion tools are connected to the dispersion unit, the shaft and generator are pre-assembled. The following tools (set of tools included in the T 65 D delivery package) are required to change the generator:

Rotor wrench 

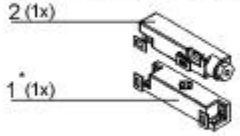
Hook wrench 

Shaft wrench 

The slide ring seal must be correctly fitted before pre-assembly of the shaft and generator.

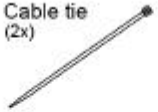
Delivery package:

SI 400 - safety limit switch



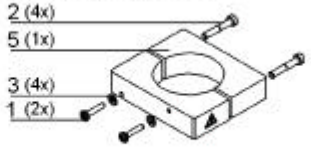
Cable tie base (2x)

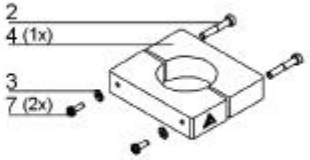
Cable tie (2x)



Delivery package

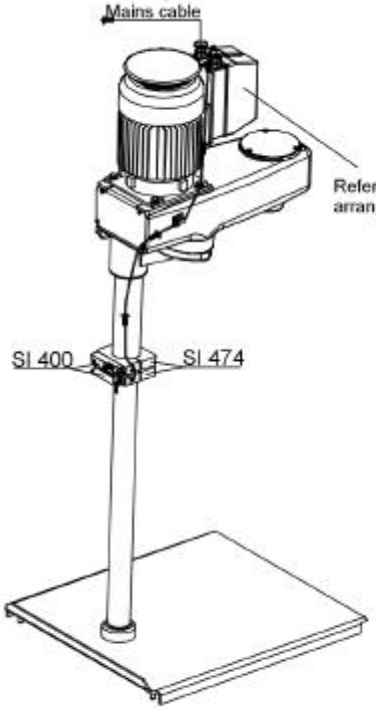
SI 474 - support holder





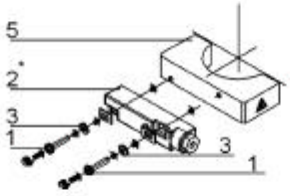
Assembly instructions:

Fixing the SI 400 safety limit switch with the SI 474 support holder on the T 653 telescopic stand



Refer to wiring diagram for arrangement of connections

1



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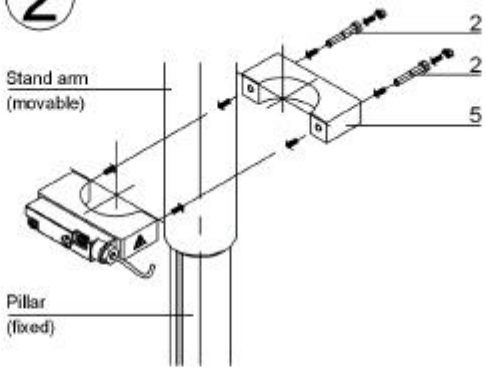

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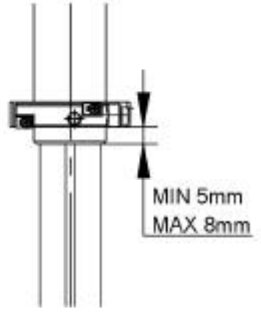

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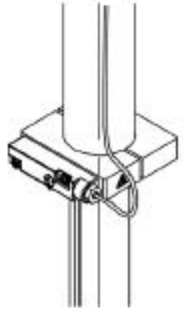

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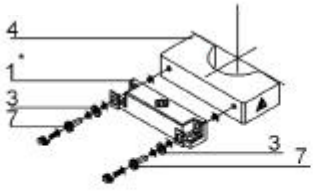

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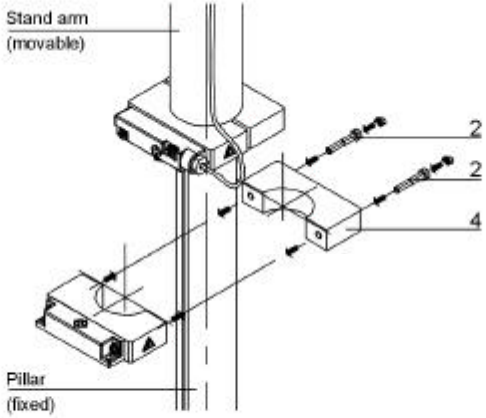

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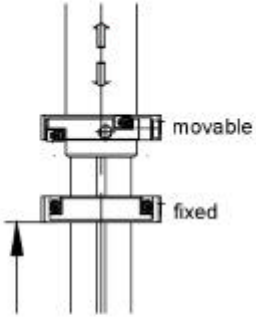

Fix item 4 on the stand pillar for the desired switch-off height

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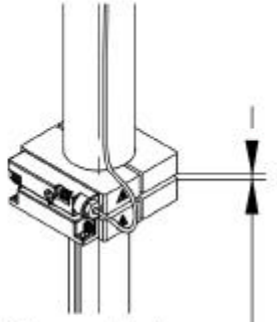
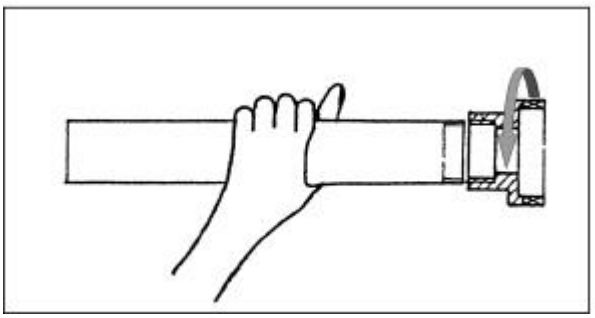


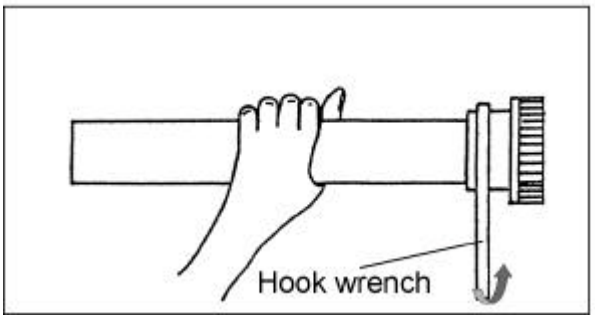
Before commissioning, check:
- the cable routing
- the installation clearances
- the bolted connections

Assemble the generator on the shaft as follows:

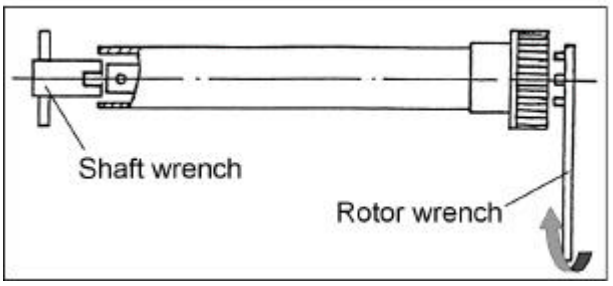
1. Screw the stator on to the stator tube counterclockwise by hand. Note the left-hand thread!



2. Gently tighten the stator with the hook wrench. The stator is turned in the same direction later, by the flow pressure of the rotor, and hence cannot come loose.



3. Screw the rotor clockwise on to the shaft (right-hand thread). To do this, hold the shaft with the shaft wrench at the coupling section and tighten the rotor with the rotor wrench. With the G 65 G generator, the rotor wrench is inserted between the teeth of the stator and turned.



3.5 Mounting the dispersion tool on the unit

The dispersion tool must only be mounted on the dispersion unit when the mains plug is pulled out and the drive shaft is stationary.

The pre-assembled element, consisting of shaft and generator, is now connected to the T 65 D dispersion unit. To do this, insert the pre-assembled dispersion tool in the dispersion tool receptacle (C) and secure it with the handwheel bolt. Make sure that the shaft is inserted right up to the stop in the receptacle. It can be helpful to turn the shaft lightly as it is inserted. The tool is locked in position by tightening the handwheel bolt. Make sure that the handwheel bolt is securely tightened, and also check the tightness frequently when the unit is in service.

3.6 Switching the unit on

Check that the voltage stated on the rating plate matches the available mains supply voltage. The socket used must be earthed (protective earth contact). If these condition are fulfilled, the unit is ready for service, after the mains plug is inserted. Otherwise, safe operation cannot be guaranteed, or the unit can be damaged.

Before switching the unit on, the dispersion tool must be immersed to the minimum immersion depth in the medium (see Section 5, “Technical data”). Because of the suction effect, the clearance to the base of the vessel must not be less than 30 mm. The dispersion tool must be brought into the vessel off-centre, to avoid rotational turbulence (vortexing).

For safety's sake, the vessel must always be well secured.

When operating with the SI 400 safety limit switch, the unit is only ready for service when it has been locked in position at the planned working height and the switch contact operates the safety limit switch.

The unit is started by pressing the ON button (A).

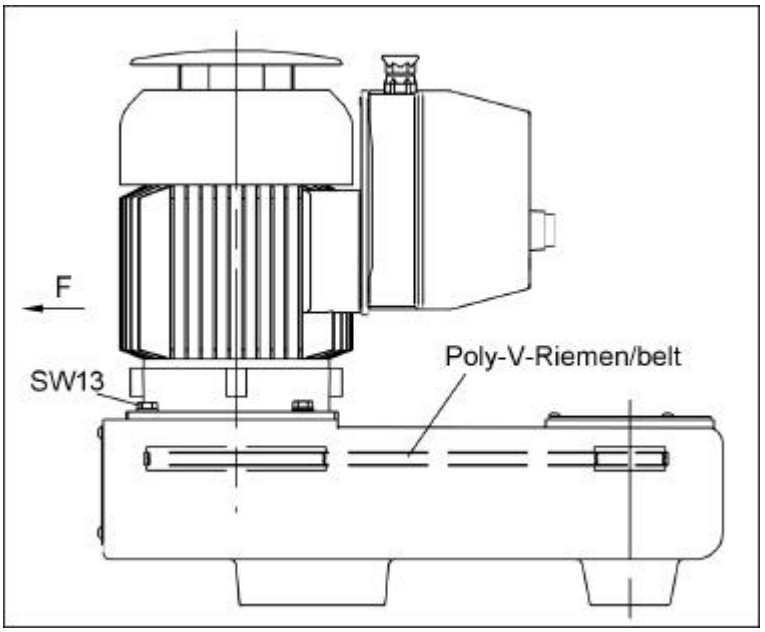
The unit is stopped by pressing the EMERGENCY STOP button (B).

After an interruption in the power supply, or a mechanical interruption during a dispersing process, the unit does not automatically re-start.

4 Maintenance and care

4.1 T 65 D dispersion unit

The Poly-V-belt should be retightened after about 50 operating hours. To do this, proceed as follows:



1. Slacken off the four hexagon head bolts near the motor using a 13mm a/f wrench.

2. Pull the motor in direction F with a force of about 100 N, as shown in the diagram.

3. Retighten the bolts whilst still applying the force.

Apart from this, the T 65 D operates maintenance-free. It is simply subject to the natural ageing of the components and their statistical failure rate.

When ordering spare parts, please quote the serial number and unit type stated on the rating plate, together with the item number and designation of the spare part.

Only send units back for repair that have been cleaned and are free from substances hazardous to health.

When cleaning IKA® devices, use only these cleaning agents that are approved by IKA®:

Type of dirt	Cleaning agent
• Paint	Isopropanol
• Construction materials	Water with detergent, isopropanol
• Cosmetics	Water with detergent, isopropanol
• Food	Water with detergent
• Fuels	Water with detergent
• Substances not named	Please inquire with IKA®

We also recommend that you wear gloves while cleaning. Electrical devices must not be placed in the cleaning agent for cleaning purposes.

4.2 Dispersion tools

Cleaning the shaft and generator

The shaft must be cleaned immediately after the unit has been used. This prevents any substance residues adhering to the rotor and stator threads, or bacteria cultures forming in undesired places.

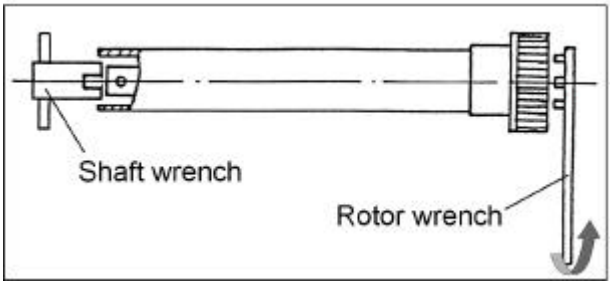
Run the dispersion tool in a solvent which will dissolve substance residues but not harm the seals. As a result, because of the high flow speeds, the rotor and stator will then only be lightly soiled.

Do not put the dispersion tool in a vessel containing solvent to dissolve substance residues. The seals are mainly dynamic-acting, and quickly start to leak when stationary.

Clean the dispersion tools and shaft as follows:

1. With the drive switched off, dismount the dispersion tool from the drive by slackening the handwheel bolt.

2. Unscrew the generator from the shaft.
   The disassembly procedure is the reverse of the assembly procedure (see Section 3.2 “Pre-assembly of dispersion tool”).



   The stator can be very tightly seated on the shaft tube, particularly when working with viscous substances, or when cleaning has been neglected, or when medium has penetrated into the thread between shaft tube and stator. In this case, the shaft tube can be held in a vice with soft jaws to crack the thread. Note the left-hand thread!

3. Rinse all threads and clean them with a brush if necessary.

The shaft and dispersion tool can now be pre-assembled again, ready for use.

Sterilization and disinfection

Wet chemical methods are permissible for sterilization and disinfection of the dispersion tools. Many instances of disinfection can be solved by means of bactericidal solutions. It is important that the remains of the disinfectant are subsequently removed with sterilized water.

No moisture must be allowed to enter the ball bearing, so, basically, the upper end of the shaft tube must be sealed (e.g. with silicone plugs)

Other sterilization methods (e.g. moist heat 120 °C at 2 bar, or killing the bacteria with hot air at 160 °C to 190 °C) are not allowed.

Maintenance

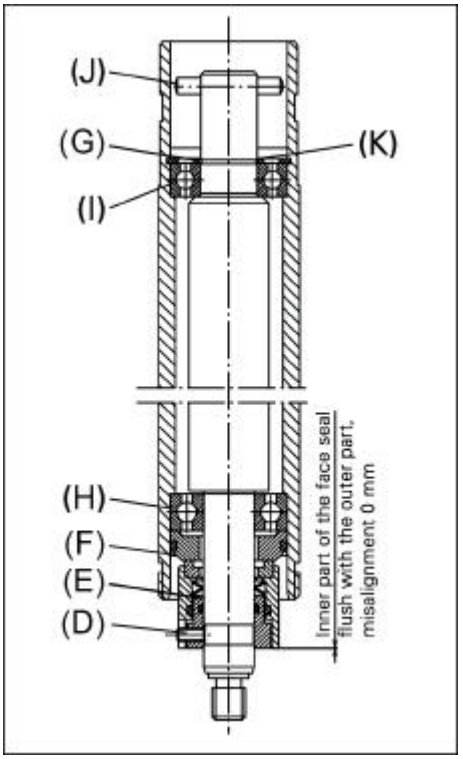
The correct functioning of the generator essentially depends on the sharpness of the edges of the tooth crests on the rotor and stator. The edges can wear with abrasive media, reducing the effectiveness of the dispersion.

When ordering spare parts, please quote the type of the dispersion tool and the designation of the spare part

The seals in the shafts must be regularly inspected. In the event of leakage, the suction effect of the rotating spindle can cause the medium to rise up the shaft and enter the drive unit.

4.3 Changing the slide ring seal

To prevent damage to the unit, the slide ring seal must only be changed by a skilled mechanical person.



To change the slide ring seal and the ball bearings, proceed as follows:

1. Unscrew the three grub screws (D) and pull the lower part of the slide ring seal (E) downwards and remove. This will now free the lock ring (F). Pull down and remove the lock ring.

2. In order to be able to change the ball bearings you must first dismantle the output shaft. To do this, remove the circlip (G) using a pair of circlip pliers and then push the output shaft upwards and out of the tube. The upper ball bearing (I) will slide out of the shaft tube together with the shaft. Remove the cross pin (J) and the circlip (K) and slide the upper ball bearing off the shaft. Remove the lower ball bearing from below.

   Caution: When dismantling dirty units which are difficult to dismantle you should avoid striking or knocking the output shaft. Do not strike the output shaft. Knocking or sharp blows will damage the shaft.

3. Reassembly. Fit the ball bearing (I) and the cross pin (J) to the shaft and then slide this assembly into the shaft tube from above. Fix the shaft in place with the circlip (G). Slide the lower ball bearing (H) onto the shaft and then into the shaft tube. Fit the lock ring (F) and then the bearing ring seal (E).

4. When you have finished reassembly, you should adjust the contact pressure of the two seal surfaces. Before you tighten the assembly, adjust the contact pressure so that the inner part of the bearing ring seal (E) is pushed tight up against the outer part (clearance 0 mm

5 Technical data

5.1 T 65 D dispersion unit technical data

Motor data

Rated voltage [V AC]	3 x 400 Y	3 x 230 ?	3 x 400 Y	3 x 230 ?
Rated frequency [Hz]	50	50	60	60
Motor speed [r.p.m.]	2880	2850	3520	3520
Power consumption [W]	1943	1943	2381	2381
Power output [W]	1500	1500	1800	1800

Additional data

Shaft speed	7200 r.p.m.
Tip speed	21.9 m/sec
Perm. duty cycle	100 %
Ingress protection to DIN 40 050	IP 54
Overvoltage category	II
Protection class	I (protective earth)
Pollution degree	2
Protection on overload	Overcurrent and undervoltage switch on the AC motor
Perm. ambient temperature	+5 °C to +40 °C
Perm. relative humidity	80 %
Operating position	On the stand, dispersion tool vertically downwards
Drive	Vane-cooled AC motor with Poly-V-belt drive transmission stage
Stand mounting	Flange in lower section of housing
Housing	Aluminium
Max. dimensions (W x H x D)	190 mm x 580 mm x 380 mm
Weight	28 kg
Use at altitude (above NSL)	max. 2000 m

5.2 S 65 dispersion tool technical data

S 65 KG-HH-	G 65 G	G 65 M	G 65 F
Working range	2 l - 50 l	2 l - 40 l	2 l - 30 l
Stator diameter	65 mm	65 mm	65 mm
Rotor diameter	58 mm	58 mm	58 mm
Circumferential speed	21.9 m/s	21.9 m/s	21.9 m/s
Min. / max. immersion depth	90 mm / 450 mm	80 mm / 450 mm	80 mm / 450 mm
Shaft length	520 mm	510 mm	500 mm
Materials in contact with medium	FFPM / SIC, AISI 316L	FFPM / SIC AISI 316L	FFPM / SIC, AISI 316L
pH range	2 - 13	2 - 13	2 - 13
Suitable for solvents	yes	yes	yes
Suitable for abrasive substances	no	no	no
Max. temperature	180 °C	180 °C	180 °C
Sterilization methods	wet chemical	wet chemical	wet chemical
Min. vacuum	1 mbar	1 mbar	1 mbar
Max. pressure	6 bar	6 bar	6 bar
Ultimate fineness, suspensions	25 µm - 75 µm	20 µm - 50 µm	5 µm - 20 µm
Ultimate fineness, emulsions	5 µm - 25 µm	5 µm - 15 µm	1 µm - 10 µm
Slide ring seal	tungsten carbide + 6 % cobalt	tungsten carbide + 6 % cobalt	tungsten carbide + 6 % cobalt
O-rings	FKM	FKM	FKM
Other parts	stainless steel AISI 316L	stainless steel AISI 316L	stainless steel AISI 316L

Quantity details
The quantities processed are limited, in particular, by the viscosity of the medium:

Viscosity	Volume
0,001 Pas	max. 30 l
0,1 Pas	max.10 l
1,0 Pas	max. 5 l
5,0 Pas	max. 3 l

At higher viscosities, a breakdown of the flow and dry-running conditions for the seal must be expected.

Consideration of flow anomalies
The quantity details given above apply for Newtonian fluids. Processing of substances with thixotropic or dilatant (shear thickening) behaviour is possible, but the particular volumes must always be determined by trials.

6 Accessories

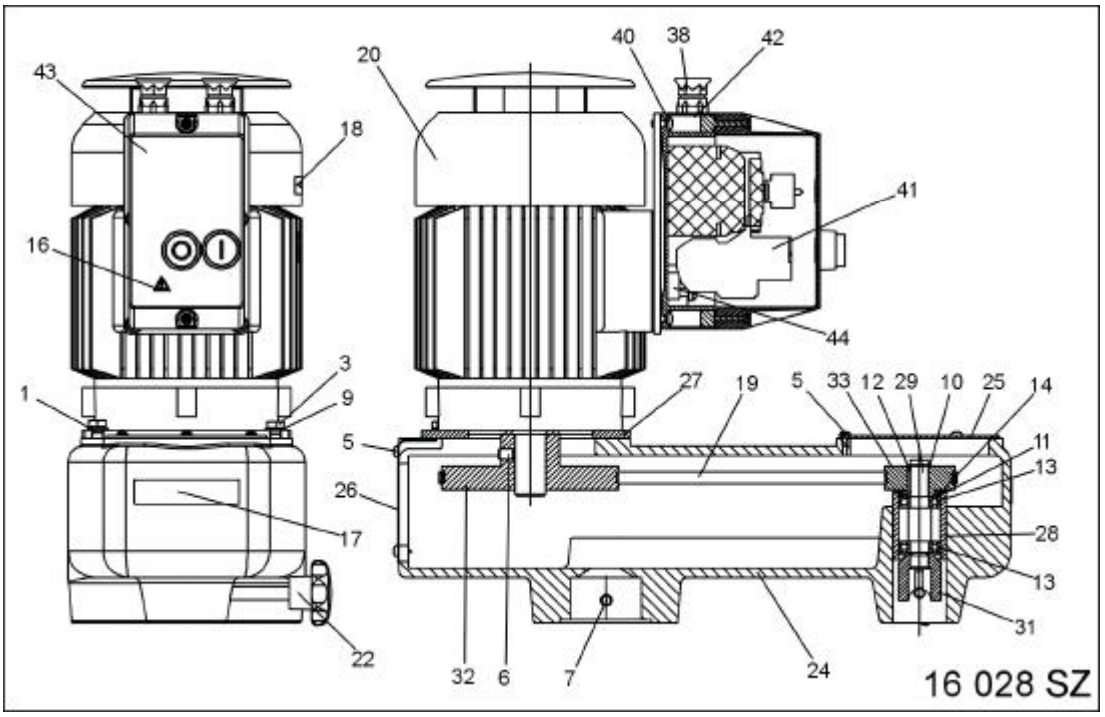
Order designation

T 653	Telescopic stand
SI 400	Safety limit switch
SI 474	Support holder
S 65 KG-HH	Shaft
S 65 KG-HH-G 65 G	Dispersion tool - coarse
S 65 KG-HH-G 65 M	Dispersion tool - medium
S 65 KG-HH-G 65 F	Dispersion tool - fine

7 Appendix

7.1 T 65 D dispersion unit spare parts diagram and list

Spare parts diagram for T 65 D unit



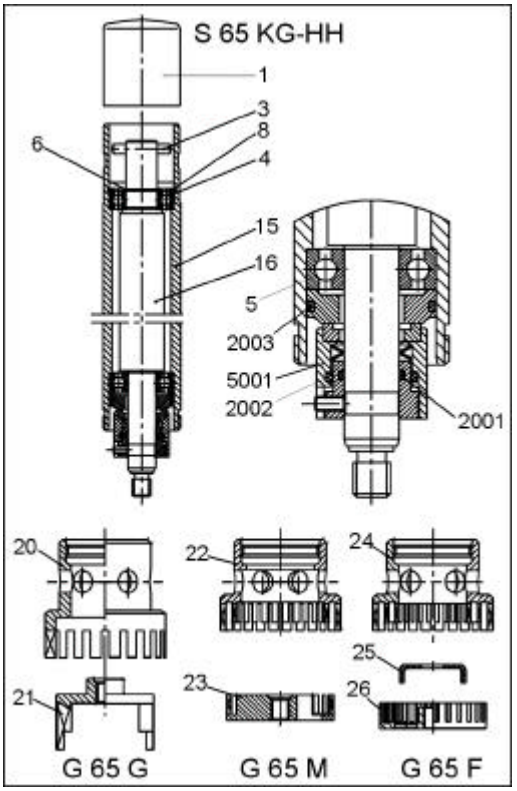
Spare parts list for T 65 D unit

Item	Designation
1	Toothed lock washer - DIN 6797 - A 8.4_1
3	Hexagon head screw - ISO 4017 - M8 X 20_1
4	Countersunk screw - ISO 7046-1 - M8 X 16 - 4.
5	Cheese-head screw
6	Grub screw - DIN 916 - M8 X 12_1
7	Grub screw_1
9	Washer - DIN 125 - A 8.4_1
10	Retaining ring - DIN 471 - 14 X 1_1
11	Ball bearing compensating disc
12	Adjusting spring - A 5 X 5 X 20 - DIN 6885_1
13	Grooved ball bearing - DIN 625 T1 - 6002 - 1
14	Retaining ring - DIN 472 - 32 X 1.2_1
16	Warning plate
17	Front plate
18	Arrow plate
19	Poly-V-belt
20	AC motor
22	Handwheel bolt
24	Transmission housing
25	Cover
26	Access plate
27	Supporting plate
28	Bearing bush
29	Drive shaft
31	Coupling
32	V-belt pulley

Item	Designation
33	V-belt pulley
38	Stuffing gland
40	Flat headed screw with cross-slot - ISO
41	Motor protection relay
42	Lock nut DIN 46320
43	Direct on-line motor starter
44	Terminal strip

7.2 S 65 range spare parts diagram and list

Spare parts diagram for S 65 range

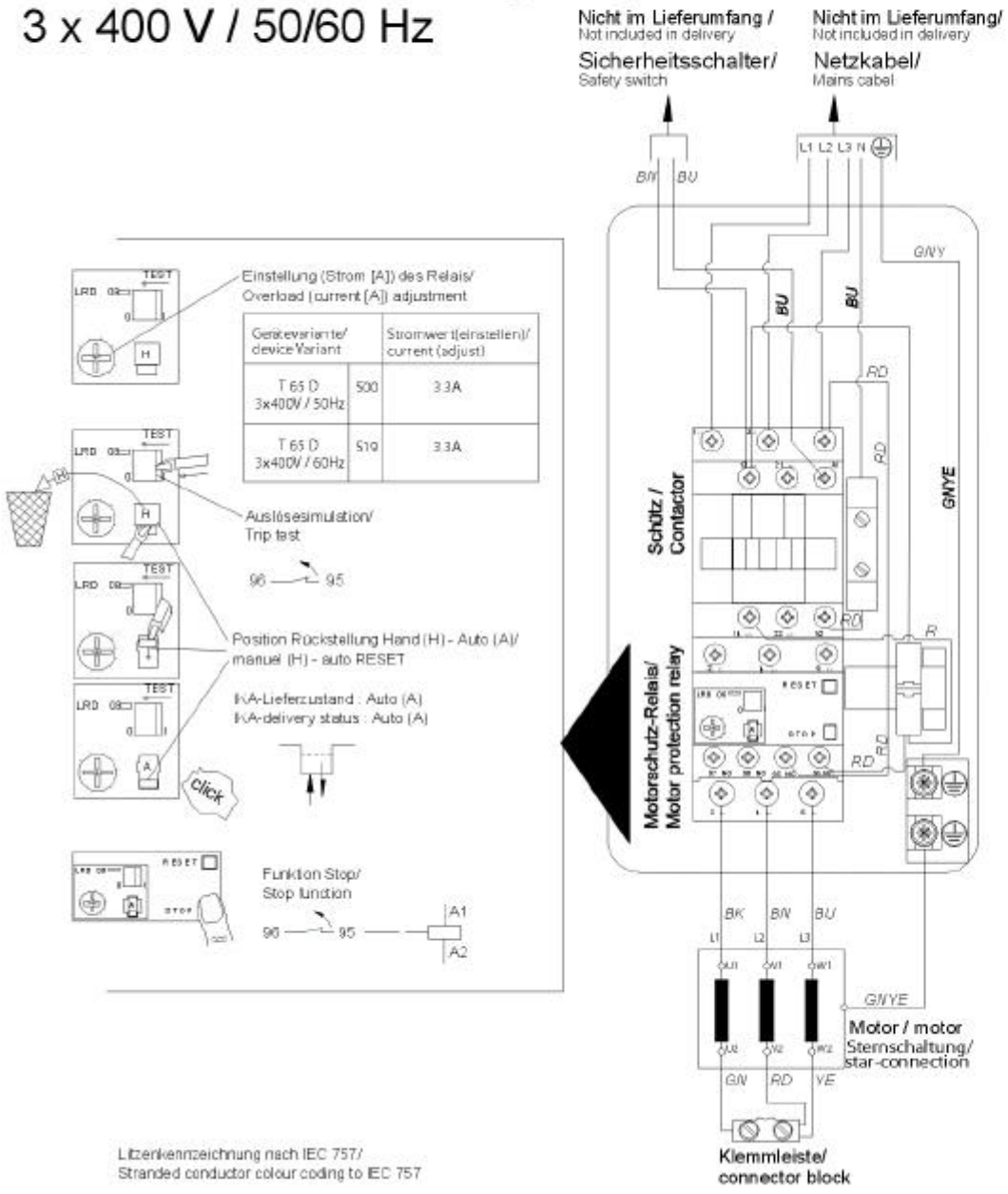


Spare parts list for S 65 range

Item	Designation
1	Protective cover
3	Grooved pin
4	Grooved ball bearing
5	Grooved ball bearing
6	Retaining ring
8	Retaining ring
15	Shaft tube
16	Shaft
20	Stator 65 G
21	Rotor 65 G
22	Stator 65 M
23	Rotor 65 M
24	Stator 65 F
25	Wing plate 65 F
26	Rotor 65 F
2001	O-ring 15 x 2.0 FFPM
2002	O-ring 22 x 2.5 FFPM
2003	O-ring 30 x 2.5 FFPM
5001	Slide ring seal

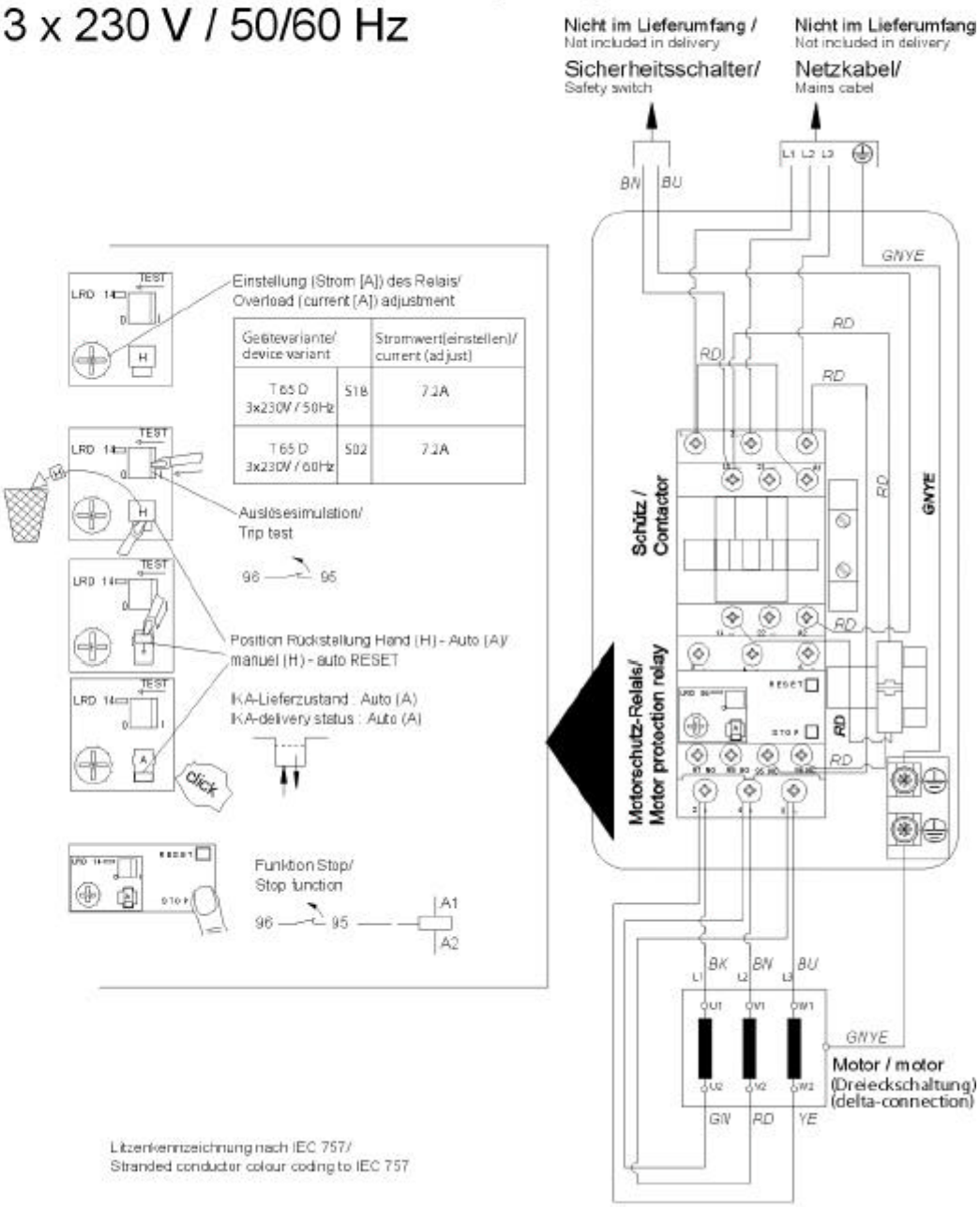
7.3 Wiring diagram of T 65 D dispersion unit

Verdrahtungsplan / wiring diagram:
3 x 400 V / 50/60 Hz



Litzenkennzeichnung nach IEC 757/
Stranded conductor colour coding to IEC 757

Verdrahtungsplan / wiring diagram:
3 x 230 V / 50/60 Hz



Litzenkennzeichnung nach IEC 757/
Stranded conductor colour coding to IEC 757

7.4 Applicable standards and regulations

Applicable EU Directives
EMC Directive: 89/336/EC
Low-voltage Directive: 73/023/EC
Machinery Directive: 98/37/EC

Construction in accordance with the following safety standards
IEC 1010-1
EN 61 010-1
EN 60 204-1
EN 292-1, -2
EN 414
UL 3101.1
CAN/CSA C22.2 (1010.1).

Construction in accordance with the following EMC standards
EN 61 326-1
IEC 61 326-1

7.5 The T 653 telescopic stand

Applicability

The T 653 telescopic stand is used solely for mounting IKA® T 65 D dispersion units. For correct use, the following safety notes and the safety notes in the operating instructions for the T 65 D must be strictly observed.

Safety notes

- The stand pillar must be inserted into the baseplate so that the guide groove is at the back. Other alignments are not permissible, as otherwise the stand can topple over when a unit is mounted on it.
- The telescopic stand must be set up level and secure on the floor. Any small unevennesses that cause the stand to rock must be compensated for with the height-adjustable feet.
- The T 65 D dispersion unit must be lifted on to the guide head of the telescopic stand with the aid of an assistant, and secured with the two screws and toothed lock washers (supplied), in accordance with the T 65 D operating instructions. The unit must be mounted in front, vertically above the baseplate; a different alignment is not permissible, as otherwise the assembly could topple over.
- This telescopic stand must be fitted with a safety disconnection device, which stops the unit if the stand is moved upwards when the unit is operating.
- Switch the unit off before moving the telescopic stand upwards.
- When lowering the telescopic stand, take care that no parts of the body get between the safety switches (danger of crushing).
- Only switch the unit on when the dispersion tool is in the vessel.
- The handwheel bolt on the stand can come loose due to vibration, which would lead to the unit moving down. So, check the tightness of the handwheel bolt regularly when using the unit, and retighten it if necessary.
- Raise or lower the stand (after slackening the handwheel bolt) by applying the manual force as close as possible to the stand pillar. The further the force is applied from the pillar, the more force you need to apply, plus there is an increased risk of the equipment toppling over.
- Secure the vessel against spinning round, by using a clamp, for example.

Guarantee

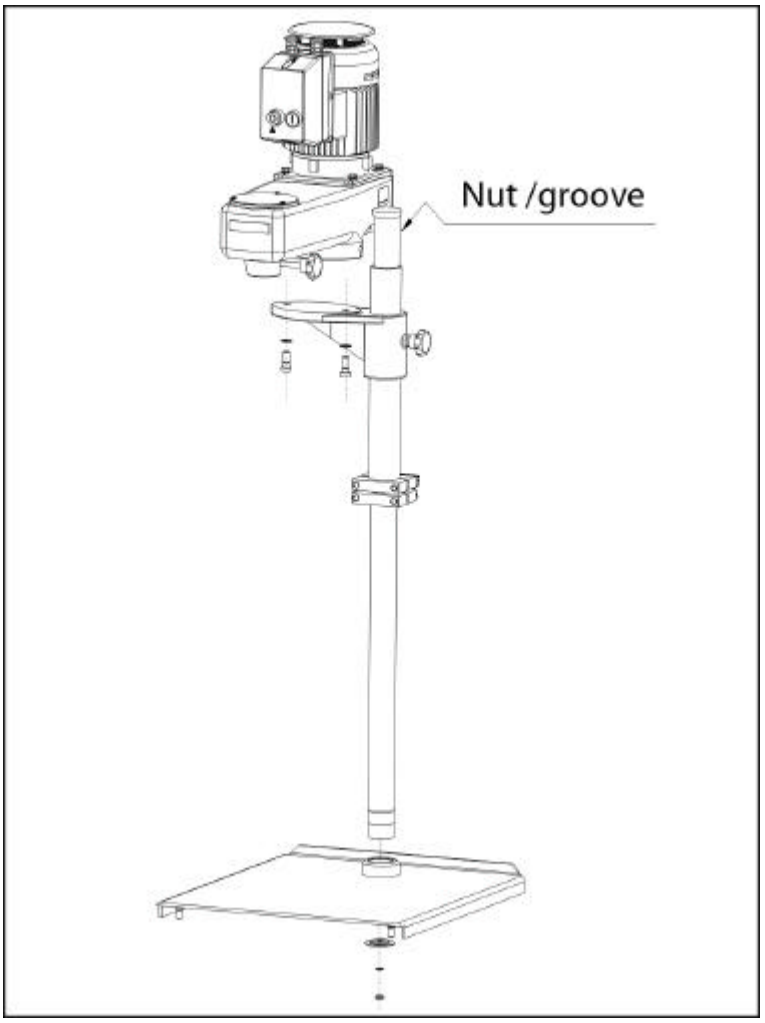
You have purchased an original IKA laboratory machine which meets the highest engineering and quality standards. In accordance with IKA guarantee conditions, the guarantee period is 24 months. For claims under the guarantee please contact your local dealer. You may also send the machine direct to our works, enclosing the delivery invoice and giving reasons for the claim. You will be liable for freight costs.

Unpacking

Please unpack the telescopic stand carefully and check closely for any damage. It is important to recognize any damage that occurred during shipping while you are unpacking. If damage has occurred, you will need to make a written assessment of the damage and send it to us by mail, rail or special delivery.

The delivery package of the unit comprises: one telescopic stand T 653 and one operating instructions. For technical reasons associated with shipping, the telescopic stand is supplied stripped down, as pre-assembled modules.

Setting up the stand



The stand pillar is inserted into the baseplate so that the guide groove is at the back. The black handwheel bolt is then on the right. The stand pillar is then secured from below with a hexagon nut, toothed lock washer and a large shaped washer.

All 4 rubber feet are height-adjustable, so the stand can be set up so it does not rock, even on uneven floors.

Mounting the unit

The T 65 D dispersion unit is placed on the arm of the stand and bolted on from below with the bolts supplied. The help of an assistant is needed for screwing on the T 65 D dispersion unit.

The cable clips included in the delivery package are required for fixing the power cable of the unit.

Safety disconnection device

The height-adjustable telescopic stand must be fitted with a safety disconnection device. We recommend installation of the SI 400 safety limit switch together with the SI 474 clamp support. You will find information on their installation in the operating instructions of this unit, see side 3.3.

Commissioning

The stand can be raised and lowered by loosening the handwheel bolt. The integral gas shock absorber helps to keep the manual force needed for this as light as possible. The manual force must be applied close to the stand pillar, so that the stand can be raised and lowered with only a slight use of force. If the force for raising or lowering is applied at a distance from the stand pillar, a turning moment results, leading to increased friction on the pillar guide. As a result, the stand can only be moved with great difficulty, or cannot be moved at all. Besides this, the danger of the stand toppling over is increased.

When the unit is at the correct height, the handwheel bolt is tightened by hand. Check the tightness of the handwheel bolt regularly when using the unit, and retighten it if necessary.

Maintenance and cleaning

The stand pillar must always be lightly oiled, so that raising and lowering is not made more difficult due to increased friction. Apart from this, the telescopic stand is maintenance-free.

When ordering spare parts, please quote the serial number and unit type stated on the rating plate, together with the item number and designation of the spare part.

Only send units back for repair that have been cleaned and are free from substances hazardous to health.

When cleaning IKA® devices, use only these cleaning agents that are approved by IKA®:

Type of dirt	**Cleaning agent**
• Paint	Isopropanol
• Construction materials	Water with detergent, isopropanol
• Cosmetics	Water with detergent, isopropanol
• Food	Water with detergent
• Fuels	Water with detergent
• Substances not named	Please inquire with IKA®

We also recommend that you wear gloves while cleaning. Electrical devices must not be placed in the cleaning agent for cleaning purposes.

Accessories	SI 400	Safety limit switch
	SI 474	Support holder

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