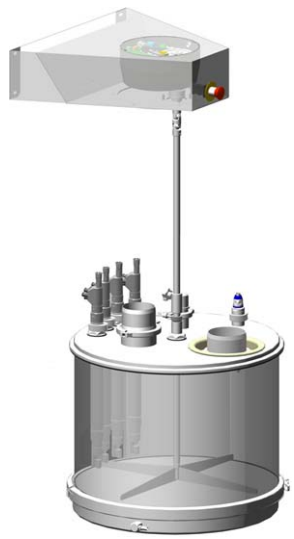
Operating instructions and spare parts list

Powder hopper HFF01

▶ Only the powdered foods approved by Gema and tested in connection with this product may be processed!



Translation of the original operating instructions

Gema

Documentation HFF01

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Table of contents

About these instructions

General information

This operating manual contains all important information you will need to work with the HFF01. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the functional mode of the individual system components should be referenced in the respective enclosed documents.

Keeping the Manual

Please keep this Manual ready for later use or if there should be any queries.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema operating instructions. The general safety precautions must also be followed as well as the regulations in the relevant operating instructions.

⚠ DANGER

Indicates a hazardous situation which,
if not avoided, will result in death or serious injury.

⚠ WARNING

Indicates a potentially hazardous situation which,
if not avoided, could result in death or serious injury.

⚠ CAUTION

Indicates a potentially hazardous situation which,
if not avoided, could result in minor or moderate injury.

ATTENTION

Indicates a potentially harmful situation which,
if not avoided, the equipment or something in its surrounding may be damaged.

ENVIRONMENT

Indicates a potentially harmful situation which,
if not avoided, may have harmful consequences for the environment.

MANDATORY NOTE

Information which must be observed.

NOTE

Useful information, tips, etc.

Presentation of the contents

Figure references in the text

Figure references are used as cross references in the descriptive text.

Example:

Safety

General information

This chapter provides the user and third parties who operate this product with all essential safety regulations, the adherence to which is imperative.

These safety regulations must be read and understood in their entirety before the product is put into operation.

The standards and guidelines applied during the development, manufacture and configuration are described in the EC declaration of conformity and in the manufacturer's declaration.

⚠ WARNING

Working without instructions

Working without operating instructions or with individual pages from the operating instructions may result in damage to property and personal injury if relevant safety information is not observed.

- ► Before working with the device, organize the required documents and read the section on "Safety regulations".
- ► Work should only be carried out in accordance with the instructions in the relevant documents.
- ► Always work with the complete original document.

Basic safety instructions

– This product is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.

– Any other use is considered non-compliant. The manufacturer is not responsible for any incorrect use, and any associated risks are assumed by the user alone. If this product is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.

– Start-up (i.e. the execution of intended operational tasks) is forbidden until it has been established that this product has been set up and wired according to the guidelines for machinery. The standard "Machine safety" must also be observed.

– Unauthorized modifications to the product exempt the manufacturer from any liability from resulting damage.

– The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
– Furthermore, the country-specific safety regulations also must be observed.

Product-specific safety information

– This product is a constituent part of the equipment and is therefore integrated in the system's safety concept.
– If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.
– The installation work to be done by the customer must be carried out according to local regulations.
– It must be ensured, that all components are earthed according to the local regulations before start-up.

▶ For further security information, see the more detailed Gema safety regulations.

Product description

Intended use

The powder hopper contains the powder used for coating. The discharge blades agitate the powder and keep it in loose condition. The injectors conveying the powder and the level detectors monitoring the powder level are installed in the lid of the powder hopper. All materials meet the highest corrosion resistance and biocompatibility demands.

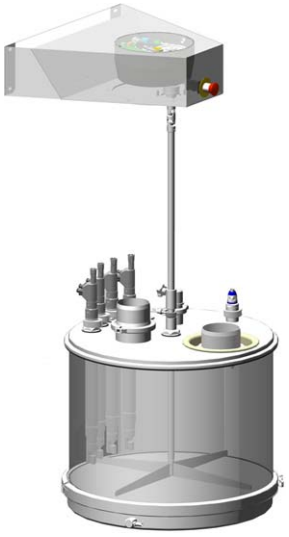


Fig. 1: Powder hopper HFF01

▶ The powder hopper is approved for the following zone if powder hoses with guide strips are applied and the earthing resistance is less than 1 MOhm!

Explosion protection	Zone
CE Ex II (2) D	22

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the conformity of use. This product should only be used, maintained and started up by trained

personnel, who are informed about and are familiar with the possible hazards involved.

Any other use is considered non-compliant. The manufacturer is not responsible for any incorrect use, and any associated risks are assumed by the user alone.

Reasonably foreseeable misuse

Using moist or over-tempered powder

Insufficient fluidizing

Incorrectly assembled individual parts

– Use with insufficient compressed air quality
– Operation without the proper training

Structure

Overall view

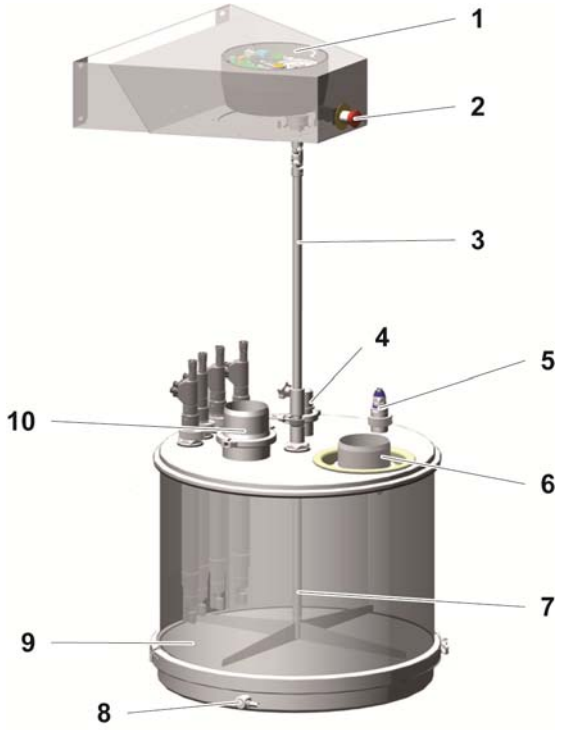


Fig. 2

1	Agitator drive	6	Filler cap with nozzle
2	Emergency STOP button	7	Discharge shaft with rotors
3	Connecting shaft	8	Connection for fluidizing air
4	Air mover connection	9	Fluid plate
5	Level detector	10	Connection

Technical Data

Versions

The powder hopper is available in two versions.

	HFF01-60	HFF01-120
Content	60 dm³	120 dm³
Number of injectors	12	24

Pneumatic data

	HFF01-60	HFF01-120
Air consumption fluid air	~ 8 Nm³/h	~ 11 Nm³/h
Air consumption air mover	4 Nm³/h	4 Nm³/h
Max. compressed air consumption	~ 12 Nm³/h	~ 15 Nm³/h
Max. water vapor content of the compressed air	1.3 g/m³	
Max. oil vapor content of the compressed air	0.1 g/m³	

Dimensions

	HFF01-60	HFF01-120
Diameter of powder hopper	605 mm	605 mm
Height of powder hopper	316 mm	526 mm

Accessories / Options

– Level probe (refer to associated documentation)
– Vibrating sieve (refer to associated documentation)

Assembly / Connection

Connecting the powder hopper

The powder hoppers delivered by the manufacturer are ready for operation. Only a few hoses still have to be connected.

Connecting the supply

Connecting the electrics

Only locally authorized specialists may install and inspect the electrical elements of the machine.

In the event of customizations, the wiring plan may differ.

Connecting the pneumatic system

▶ The compressed air must be free of oil and water!

Start-up

ATTENTION

Cross-contamination

For technical reasons, the fluid plate consists of porous material and is therefore able to capture residual amounts of powder particles.

► Always use the fluid plate corresponding with the processable powder and end product!

Cleaning the interior of the powder hopper

The interior of the powder hopper must be hygienically clean before start-up.

1. Cleaning the interior of the powder hopper. Refer to chapter on "Cleaning the interior of the powder hopper" on page 25.
   – The interior of the powder hopper is hygienically clean.

Filling the powder hopper with powder

1. Place the powder hopper onto the portable frame or the ground

⚠ CAUTION

May cause foot injury!

Toes in the vicinity of the hopper and the frame/ground may be squashed when placing the powder hopper onto the portable frame or the ground.

► Wear steel-capped safety boots.

2. Set the ventilation (Airmover)
   – Open the ball valve completely
   – use the throttle valve to adjust
3. Inserting the powder
   – Open the filler cap of the powder hopper.
   – Insert the powder

   Only fill the powder up to the half mark of the powder hopper to prevent fluidizing powder escaping from the lid.

– Close the filler cap of the powder hopper.

4. Set the coating parameters

Set fluidization

Powder fluidization depends on the nature of the powder, humidity and ambient temperature. Fluidization occurs by activating the system.

1. Connect the quick-coupling to the fluidizing air connection of the powder hopper
2. Set the fluidizing air at the pneumatics/fluidizing unit.
3. Start the discharge rotors
4. Check powder fluidization in the powder hopper
   – The powder should be “cooking” slightly but regularly

⚠ CAUTION

Major dust development possible!

If fluidization is set incorrectly, the coating powder will cause a dust cloud, which may lead to respiratory distress.

► Set fluidization correctly.

Check that everything is working well

Start-up inspection

No.	Inspection	✓
1	All screw connections are tight.	
2	Power levels are correct. Refer to chapter on "Manually filling the powder hopper" on Page 18.	
3	Fluidization air is set correctly.	
4	The interior of the powder hopper is hygienically clean. Refer to chapter on "Cleaning the interior of the powder hopper" on page 25.	
5	The operating manual is stored with the machine close to the work station.	
6	The operator has been told that he is responsible for instructing the personnel.	
7	Assembly and installation have been concluded in accordance with the operating manual.	
8	Electrical and mechanical safety equipment is in perfect working order.	

Operation

Safety

Product contamination through foreign matter

Foreign matter entering the powder hopper through the open lid may contaminate the powder.

1. Take measures to ensure that foreign matter is unable to enter the powder hopper.

Preparing for production

⚠DANGER

Explosive atmosphere.

Death or severe injury.

- ► Only use products and materials that are approved for the explosion hazard.
- ► Stop the machine immediately if you hear unusual noises during operation.

⚠ WARNING

Rotating agitator unit.

Squashing of limbs.

- ► Ensure that there are no unauthorized persons near or at the machine.
- ► Ensure that the powder hopper lid is closed.

1. Start the machine.
2. Start the fluidization process.
3. After a prolonged shutdown of the system or before a product change, clean the interior powder hopper. Refer to chapter on "Cleaning the interior of the powder hopper" on page 25.

Operation

ATTENTION

Grazing agitator unit.

Mechanical damage.

- ► In the event of a grazing agitator unit, deactivate the drive motor immediately!
- ► Empty the powder hopper and eliminate the cause!

1. Refer to the operating manual of the system control unit.

Manually filling the powder hopper

The hopper can be manually filled through the open filler cap. In this case, powder may escape, depending on the degree of fluidization,

⚠ CAUTION

Major dust development possible.

Respiratory distress.

- ► Wear protective clothing and safety goggles!

⚠ CAUTION

Foreign objects.

Contamination by foreign objects.

- ► Ensure that no foreign objects can fall into the powder hopper during manual filling!

1. Open the filler cap (1)

2. Insert the powder.
3. Close the filler cap.

Automatically filling the powder hopper

The connection piece on the hopper cover is intended for automatic filling.

⚠ CAUTION

Major dust development possible.

Respiratory distress.

► Wear protective clothing and safety goggles!

⚠ CAUTION

Foreign objects.

Contamination by foreign objects.

► Ensure that no foreign objects can fall into the powder hopper during manual filling!

Ending production

1. Empty the powder hopper.
2. In the event of impurities, clean the powder hopper.
   - Clean the exterior of the powder hopper.
   - Clean the interior of the powder hopper. Refer to chapter on "Cleaning the interior of the powder hopper" on page 25.

Decommissioning / Storage

Introduction

Requirements on personnel carrying out the work

All work should be carried out only by authorized technical personnel.

Storage conditions

Hazard notes

There is no danger to personnel or the environment if the unit is stored properly.

Type of storage

For safety reasons, the product must be stored in vertical position.

Storage duration

If the physical conditions are maintained, the unit can be stored indefinitely.

Space requirements

The space requirements correspond to the sizes of the product.

There are no special requirements concerning distance to neighboring equipment.

Physical requirements

Storage must be inside a dry building at a temperature between +5 – 50 °C.

Shut-down

Decommissioning

1. Deactivate the system and secure against reactivation.
2. Empty the powder hopper completely.
3. Cleaning the interior of the powder hopper. Refer to chapter on "Cleaning the interior of the powder hopper" on page 25.

Maintenance during storage

Maintenance schedule

No maintenance schedule is necessary.

Maintenance works

During long-term storage, periodically perform a visual check.

Maintenance / Repairs

ATTENTION

Any unauthorized modifications and alterations to the product are not permitted for safety reasons and exclude the manufacturer's liability for any resulting damage!

Regular and conscientious cleaning and maintenance increase the service life of the product and ensure a consistent coating quality!

– The parts to be replaced during maintenance work are available as spare parts. These parts can be found in the associated spare parts list!

General information

The product is designed to require a minimum of maintenance.

Safety

Securing against unexpected start-up

The machine starting unexpectedly may cause serious injuries to persons working on the machine.

1. Set the safety switch to <0> and lock it.
2. Remove the key and keep it with you.

Explosion protection

Lack of maintenance and a lack of ignition protection can lead to explosions.

– Do not modify the machine.

– Do not use potentially explosive products, operational material or cleaning liquids.

– Maintain, clean and lubricate the machine correctly.

– Only use original spare parts.

Pressurized pneumatics system

The pressurized pneumatics system may trigger dangerous situations.

1. Disconnect the compressed air supply before working on the pneumatics system.
2. Depressurize the pneumatics system.
3. Secure the compressed air supply against reactivation.

Cleaning

The powder hopper and (optional) accessories must be cleaned daily.

Cleaning / Sterilization can be carried out by means of hot water or steam.

ATTENTION

Container components may be damaged during the cleaning process.

Observe the operating temperatures.

- ► Cleaning the system with the gaskets but WITHOUT A FLUID PLATE, the operating temperature may not exceed 125°C!
- ► Remove all gaskets when cleaning/sterilizing at temperatures above 125°C!
- ► Clean individual parts with compressed air and, if required, dissolve any sintering on metal parts with cellulose thinners.
- ► Do not scratch the surfaces!

ATTENTION

Damage to O-rings when using impermissible cleaning agents

- ► Only use elasto-compatible cleaning agents! Refer to chapter on "Material declaration" on Page 39.

Cleaning intensity depends of the powder used. For optimal cleaning / sterilization results, we recommend dismantling the entire powder hopper into its dismantle components.

ATTENTION

Hopper components may be damaged during the cleaning process.

- – Please dismantle carefully to avoid damages!

Cleaning the interior of the powder hopper

Apart from these instructions, please also observe the generally valid and product-specific information from the manufacturer.

1. Remove the lid of the powder hopper
2. Vacuum powder residues inside the hopper with a suitable industrial vacuum cleaner and soft suction brush
3. Remove hard deposits on the inside of the hopper and the discharge rotors with a plastic spatula.
4. Loosen the clamping ring and remove the fluid plate
5. Remove and clean the fluid plate gasket
6. Clean all metal parts thoroughly with warm water and a brush and then leave to dry
7. Clean the fluid plate

ATTENTION

The fluid plate may be damaged during the cleaning process.

Observe the correct operating means!

- ► Only apply a gentle jet of compressed air to clean the fluid plate!
- ► Never point the jet of compressed air directly onto the fluid plate and keep sufficient distance to the plate surface!
- ► Do not use liquids, do not scratch!

8. Reassembling the parts

ATTENTION

Incorrectly assembled parts may cause malfunctions or defects

- ► Reassembly is in reverse order!

ATTENTION

Undried machine components may cause malfunction.

Wet spots lead to powder adherence and favor bacterial growth.

- ► Only assemble completely dry machine components!

Maintenance

Daily maintenance

– Clean the exterior of the powder hopper with a dry cloth

– Check hose connections

Wearing part

Wearing parts replaced during maintenance can be individually purchased (refer to spare parts list).

Fault clearance

Safety

Securing against unexpected start-up

The machine starting unexpectedly may cause serious injuries to persons working on the machine.

1. Set the safety switch to <0> and lock it.
2. Remove the key and keep it with you.

Explosion protection

Lack of maintenance and a lack of ignition protection can lead to explosions.

– Do not modify the machine.
– Do not use potentially explosive products, operational material or cleaning liquids.
– Maintain, clean and lubricate the machine correctly.
– Only use original spare parts.

Pressurized pneumatics system

The pressurized pneumatics system may trigger dangerous situations.

1. Disconnect the compressed air supply before working on the pneumatics system.
2. Depressurize the pneumatics system.
3. Secure the compressed air supply against reactivation.

Faults

The following lists possible faults during operation and their clearance.

Fault	Cause	Corrective action
Powder is not agitated	Defective fuse in agitator unit	Replace
	Control cable not inserted or incorrect	Insert, use original cable, check wiring
	Emergency STOP button activated	Reset emergency STOP button
	Free movement of the agitator unit impaired	Check the mechanical operation of the agitator unit
Powder is not fluidized	Compressed air not available	Connect device to compressed air
	Fluidizing air set too low	Set fluidizing air correctly

Disposal

Introduction

Requirements on personnel carrying out the work

The disposal of the product is to be carried out by the owner or operator.

When disposing of components that are not manufactured by Gema, the instructions in the respective manufacturer's documentation must be observed.

Disposal regulations

The product must be disassembled and disposed of properly at the end of its service life.

- ► When disposing of the product, the applicable local and regional laws, directives and environmental regulations must be complied with!

Materials

The materials must be sorted into material groups and then taken to the relevant waste collection points.

Spare parts list

Ordering spare parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

– Type and serial number of your powder coating equipment

– Order number, quantity and description of each spare part

Example:

– **Type** OptiGun GA03 automatic powder gun

Serial number 1234 5678

– **Order no.** 203 386, 1 piece, Clamp – Ø 18/15 mm

When ordering cable or hose material, the required length must also be given. The spare part numbers of this yard/meter ware is always marked with an *.

The wearing parts are always marked with a #.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

ATTENTION

Use of non-original Gema spare parts

When using the spare parts from other manufacturers the explosion protection is no longer guaranteed. If any damage is caused by this use all guarantee claims become invalid!

► Only original Gema spare parts should be used!

HFF01

1	Connector	1014 919
2	Locking clip – 100	1015 532
3	Sealing ring – 100	1015 534
4	Connection – 40	1015 545
5	Locking clip – 40	1015 533
6	Level probe - complete	1015 115
7	Nozzle	1015 110
8	Rubber lid – Ø 200 mm	1014 889
9	Plug – NW7,4-1/4"	256730
10	Bulkhead fitting – complete, incl. pos. 11	1014 883
11	Hexagonal nut	1014 907
12	Foam rubber profile	103438
13	Clamping ring - complete	1014 357
14	Fluid base seal	1014 356
15	Fluid plate – 10 µm	1014 353
16	Edge protection profile	105198
17	Sealing ring – 40	1015 535
18	Guide bush - complete, incl. pos. 19 and 20	1014 891
19	O-Ring – Ø 38x4 mm	239151
20	Sealing ring – Ø 57/49/3 mm	1014 896
21	O-Ring – Ø 42x2 mm	242160
22	Counter nut – complete, incl. pos. 20 and 21	1015 63
23	Clamping element - ID38	1014 894
24	Screw – M6x20 mm	216429

* Please indicate length

Wearing part

HFF01 – Spare parts

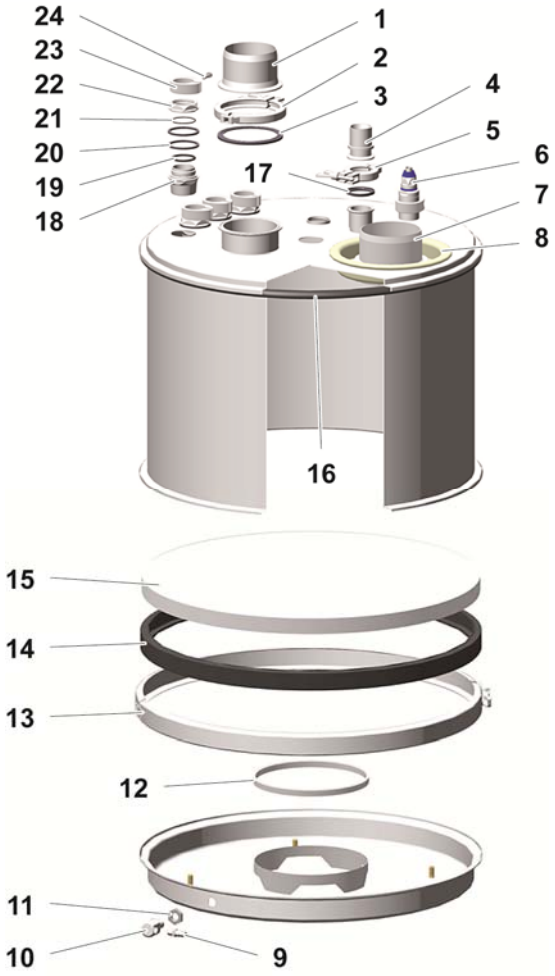


Fig. 3

Agitator unit

1	Adjusting ring – Ø 20/32x14 mm	1004 213
2	Sliding bearing – Ø 20/23x21 mm	250589
3	Counter nut – complete, incl. pos. 4 and 5	1014 892
4	O-Ring – Ø 42x2 mm	242160
5	Sealing ring – Ø 57/49x3 mm	1014 896
6	Guide bush - complete, incl. pos. 5	1014 904
7	Sliding bearing – Ø 20/22x20 mm	255556
8	Radial shaft seal – Ø 35/20x8 mm	1014 921
9	Feather key – 6x6x25 mm, round	250570
10	Discharge shaft	1014 898
10 -1	Discharge rotor	1014 899
11	Screw – M6x16 mm	1005 679
12	Coupling piece	1014 903
13	Star grip – Ø 40-M6	257028
14	Connecting shaft	1014 902
15	Universal joint	1014 928
16	Seal holder	1014 924
17	Connector	1014 929
18	Slip clutch	1015 116
19	-	1014 901
20	Connector	1015 321
21	Agitator motor - complete	393940

* Please indicate length

Wearing part

Agitator unit

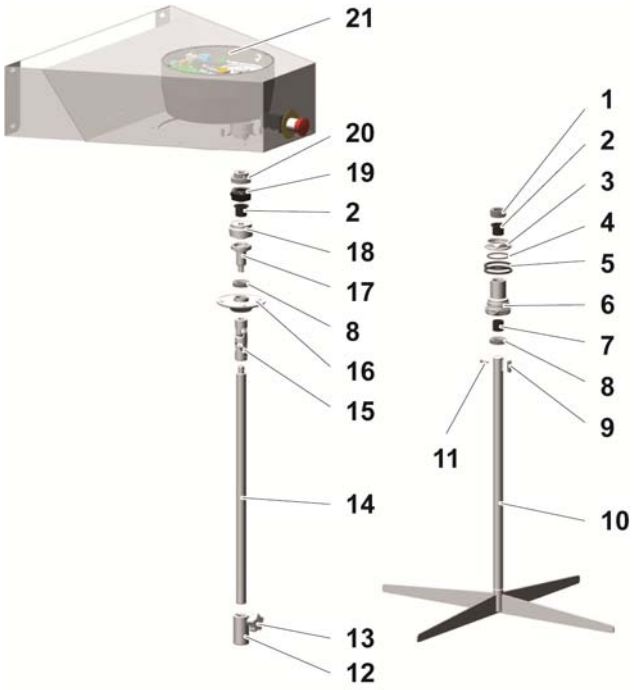


Fig. 4

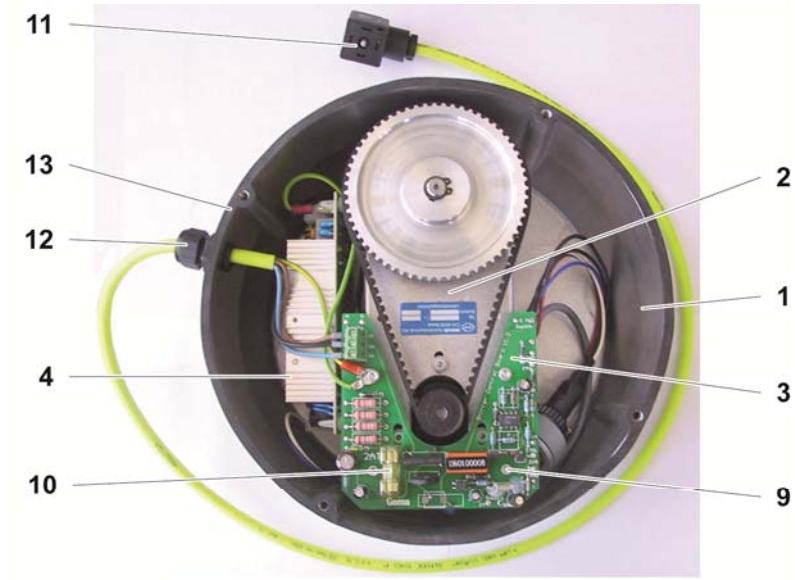
Agitator drive

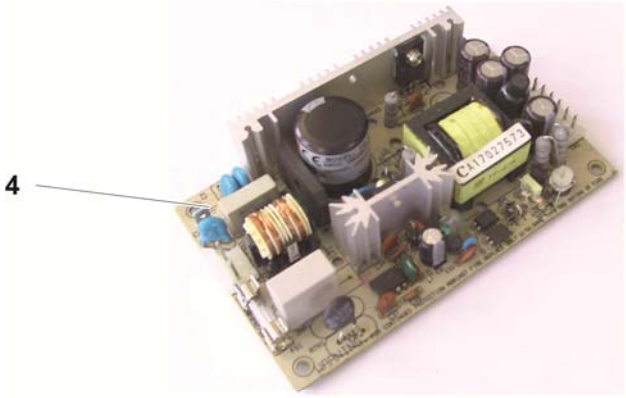
	Agitator drive – complete (pos. 1-13)	393940
1	Agitator motor (with gearing and agitator housing)	393932
2	Agitator motor (with sprocket)	268950
	Agitator motor	269255
	Drive belt	268941
3	Electronic card for agitator control unit - complete, incl. pos. 5	388173
4	Electronic card for power supply	389277
5	Power button - complete, with cable	390542
	Stranded wire set, consisting of:	
6	Connection cable for power supply unit	390550
7	Connection cable 24 VDC	390569
8	Earth wire	391867
9	Attachment set for power supply unit, each consisting of two:	
	Spacers – M3, SW5,5x12 mm	267775
	Spacers – M3, SW5,5x10 mm	267007
	Cylinder screws	245321
	Serrated washers	205885
10	Fuses – 2 AT	221872
11	Adapter cable for agitator unit connection	391905
12	Stuffing box	265780
13	Gasket for agitator motor	393924

* Please indicate length

Wearing part

Agitator drive





Attachment

Material declaration

	Material
1	Stainless steel X5CrNi 18-10 (1.4301)
2	MVQ (silicone rubber) – refer to Manufacturer's Declaration of Conformity
3	Stainless steel – X2CrNiMo 17-12-2 (1.4404)
4	MVQ (silicone rubber) – refer to Manufacturer's Declaration of Conformity
5	Stainless steel – X2CrNiMo 17-12-2 (1.4404)
6	POM
7	TPE
8	EPDM – refer to Manufacturer's Declaration of Conformity
9	UHMV PE
10	Stainless steel X5CrNi 18-10 (1.4301)
11	EPDM – refer to Manufacturer's Declaration of Conformity
12	Stainless steel X5CrNi 18-10 (1.4301)
13	Stainless steel X5CrNi 18-10 (1.4301)
14	NBR70
15	MVQ (silicone rubber) – refer to Manufacturer's Declaration of Conformity
16	NBR70
20	NBR70
21	MVQ (silicone rubber) – refer to Manufacturer's Declaration of Conformity
22	Stainless steel X5CrNi 18-10 (1.4301)
23	POM C ELS – refer to Manufacturer's Declaration of Conformity
24	Stainless steel X5CrNi 18-10 (1.4301)
25	Stainless steel X5CrNi 18-10 (1.4301)
26	Stainless steel X5CrNi 18-10 (1.4301)

Material declaration

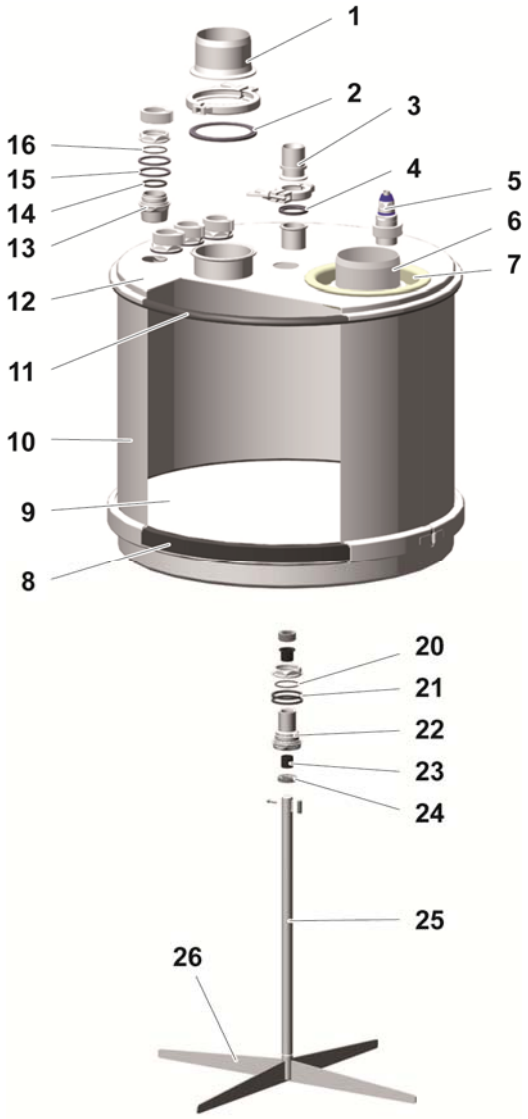


Fig. 6: Powder-contacting parts

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