
Operating instructions and spare parts list

Manual coating equipment

OptiFlex F



Documentation OptiFlex B manual coating equipment

© Copyright 2004 ITW Gema AG

All rights reserved.

This publication is protected by copyright. Unauthorized copying is prohibited by law. No part of this publication may be reproduced, photocopied, translated, stored on a retrieval system or transmitted in any form or by any means for any purpose, neither as a whole nor partially, without the express written consent of ITW Gema AG.

OptiTronic, OptiGun, EasyTronic, EasySelect, OptiFlow and SuperCorona are registered trademarks of ITW Gema AG.

OptiMatic, OptiMove, OptiMaster, OptiPlus, MultiTronic and Gematic are trademarks of ITW Gema AG.

All other product names are trademarks or registered trademarks of their respective holders.

Reference is made in this manual to different trademarks or registered trademarks. Such references do not mean that the manufacturers concerned approve of or are bound in any form by this manual. We have endeavored to retain the preferred spelling of the trademarks, and registered trademarks of the copyright holders.

To the best of our knowledge and belief, the information contained in this publication was correct and valid on the date of issue. ITW Gema AG makes no representations or warranties with respect to the contents or use of this publication and reserves the right to revise this publication and make changes to its content without prior notice.

Printed in Switzerland

ITW Gema AG
Mövenstrasse 17
9015 St. Gallen
Switzerland

Phone: +41-71-313 83 00
Fax.: +41-71-313 83 83

E-Mail: info@itwgema.ch
Homepage: www.itwgema.ch

Table of contents

General safety regulations	3
Safety symbols (pictograms).....	3
Conformity of use.....	3
Product specific security measures	4
About this manual	5
General information	5
Function description	7
Field of application	7
Typical characteristics.....	7
OptiFlex F manual coating equipment	8
Structure.....	8
OptiStar control unit	8
OptiFlow injector	8
Fluidized powder hopper.....	9
Scope of delivery	10
OptiFlex 1-F	10
Additional supply for OptiFlex 2-F.....	10
Technical data	11
OptiFlex F manual coating equipment	11
Electrical data	11
Pneumatical data	11
Connectable guns	11
Dimensions	12
Start-up and operation	13
Connecting guide	13
Preparation for start-up	14
Prepare the fluidized powder hopper	14
Switching on the booth.....	14
Start-up	14
Switch on the control unit.....	14
Color change	15
General information	15
Maintenance and cleaning	17
Daily maintenance	17
Weekly maintenance.....	17
If in disuse for several days	17
Powder hose rinsing	17
Cleaning.....	18
Cleaning the powder hopper.....	18

Cleaning the OptiSelect manual powder gun	18
Maintenance and cleaning of the filter unit	19
Replacing the filter element	19
Troubleshooting	21
General information	21
Schematic diagrams	23
OptiFlex 1-F/2-F - pneumatic diagram	23
OptiFlex 1-F/2-F - wiring diagram	23
Spare parts list	25
Ordering spare parts	25
OptiFlex F manual coating equipment - spare parts list	26
OptiFlex F manual coating equipment - spare parts list	27
OptiFlex F manual coating equipment - powder hopper	28
OptiFlex F manual coating equipment - powder hopper	29
OptiFlex F - filter unit	Fehler! Textmarke nicht definiert.

General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the OptiFlex B manual coating equipment.

These safety regulations must be read and understood before the OptiFlex B manual coating equipment is used.

Safety symbols (pictograms)

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

**DANGER!**

Danger due to live electricity or moving parts. Possible consequences: Death or serious injury

**WARNING!**

Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment



**INFORMATION!**

Useful tips and other information

Conformity of use

1. The OptiFlex B manual coating equipment is built to the latest specification and conforms to the recognized technical safety regulations. It is designed for the normal application of powder coating.
2. Any other use is considered as non-conform. The manufacturer is not responsible for damage resulting from improper use of this equipment; the end-user alone is responsible. If the OptiFlex B manual coating equipment is to be used for other purposes or other substances outside of our guidelines then ITW Gema AG should be consulted.

3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The OptiFlex B manual coating equipment should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.
4. Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the OptiFlex B manual coating equipment has been set up and wired according to the guidelines for machinery (98/37 EG). EN 60204-1 (machine safety) must also be observed.
5. Unauthorized modifications to OptiFlex B manual coating equipment exempts the manufacturer from any liability from resulting damage.
6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
7. Furthermore the country-specific safety regulations must be observed.

Explosion protection	Protection type	Temperature class
  II 3 D	IP54	T6 (zone 21) T4 (zone 22)

Product specific security measures

- The installation work, to be done by the customer, must be carried out according to local regulations
- Before starting up the plant a check must be made that no foreign objects are in the booth or in the ducting (input and exhaust air)
- It must be observed, that all components are grounded according to the local regulations, before start-up

About this manual

General information

This operating manual contains all important information which you require for the working with the OptiFlex B manual coating equipment. 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 function mode of the individual system components - booth, gun control unit, manual gun or powder injector - you will find in the corresponding enclosed documentations.

Function description

Field of application

The OptiFlex F manual coating equipment (with fluidized powder hopper) is designed exclusively for electrostatic coating with organic powders. Any other use beyond this is not intended. The manufacturer is not responsible for any damage resulting from this; the risk for this is assumed by the user alone!

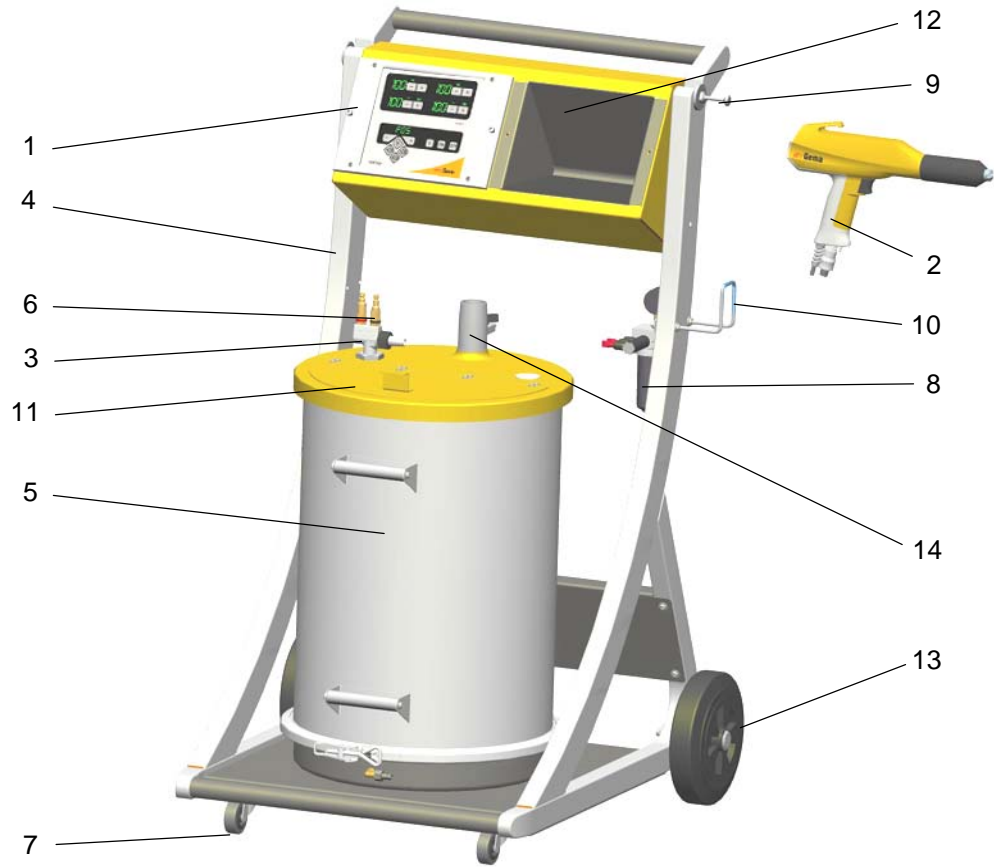
The OptiFlex F electrostatic powder manual coating equipment with the OptiSelect manual powder gun is ideally suited for manual coating of objects in small series.

Typical characteristics

- Processing the powder from the fluidized powder hopper
- Quick and simple color change
- Supplied ready for use
- Available with one or two guns (extensible)

OptiFlex F manual coating equipment

Structure



OptiFlex F Manual coating equipment - Structure

- | | | | |
|---|------------------------------|----|--------------------|
| 1 | OptiStar control unit | 8 | Filter unit |
| 2 | OptiSelect manual powder gun | 9 | Gun holder |
| 3 | OptiFlow injector | 10 | Hose holder |
| 4 | Mobile frame with hand rail | 11 | Powder filler flap |
| 5 | Fluidized powder hopper | 12 | Shelf |
| 6 | Hose connections | 13 | Rubber wheel |
| 7 | Swivel wheel | 14 | Airmover |

OptiStar control unit

All information about the OptiStar control unit will be found in the corresponding enclosed documentation!

OptiFlow injector

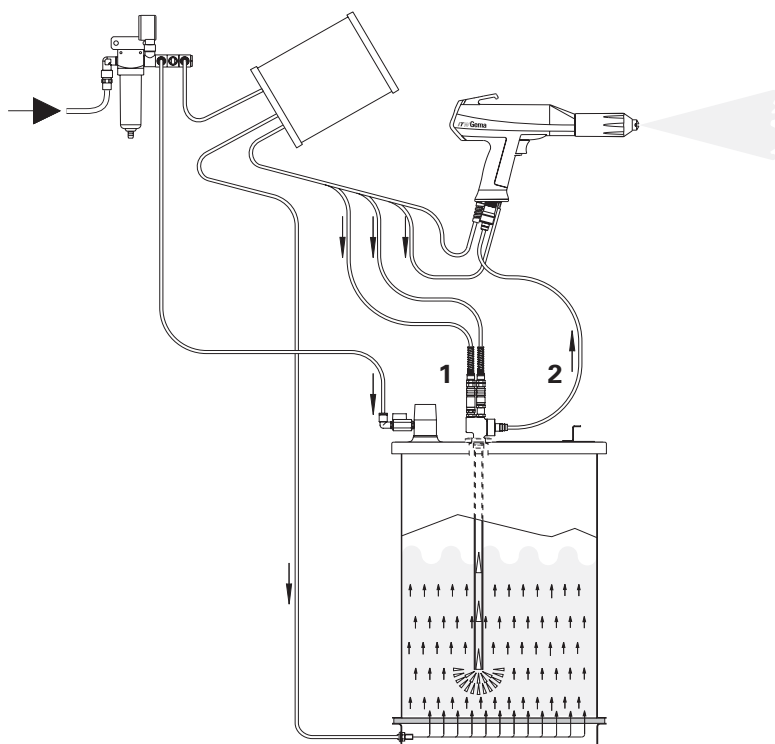
All information about the OptiFlow injector will be found in the corresponding enclosed documentation!

Fluidized powder hopper

The fluidized powder in the powder hopper is sucked into the injector by means of the conveying air (1 - red hose). The powder/air mixture reaches the powder gun through the powder hose (2). The powder is electrostatically charged at the gun nozzle. In addition, an electrostatic field is created between the gun nozzle and the grounded object. The charged powder spray remains adhered to the surface of the object.

The powder is fluidized by air forced through a porous plastic plate from below. The powder acquires, thereby, fluid-like characteristics.

The conveying air, supplementary air, and rinsing air are set on the control unit.



Fluidized powder hopper - Function

Scope of delivery

OptiFlex 1-F

- A OptiStar control unit in a metal case with power supply cable
- A mobile trolley with a gun/hose support
- A fluidized powder hopper
- A plug-in OptiFlow Injector
- An OptiSelect manual powder gun with gun cable, powder hose, rinsing air hose and standard nozzle set (see therefore the OptiSelect manual powder gun user manual)
- Pneumatic hoses for conveying air (red), supplementary air (black) and fluidizing air (black)

Additional supply for OptiFlex 2-F

- An additional OptiStar control unit, complete with gun holder, special powder supply cable and connecting material
- An additional OptiSelect manual powder gun with gun cable, powder hose, rinsing air hose and standard nozzle set
- Pneumatic hoses for conveying air (red), supplementary air (black), as well as a pneumatic connection with dual distributor from pressure reducing valve to control unit
- Mains adaptor for twin equipment

Technical data

OptiFlex F manual coating equipment

Electrical data

OptiFlex F manual coating equipment	
Nominal input voltage	230-240 VAC (110-120 VAC)
Frequency	50/60 Hz
Input value	150 VA
Nominal output voltage (to the gun)	max. 12 V
Nominal output current (to the gun)	max. 1 A
Protection type	IP 54
Temperature range	0 bis 40°C (+32 °F to +104 °F)
Approval	

Pneumatical data

OptiFlex F manual coating equipment	
Compressed air main connection	G1/4" - internal thread
Max. input pressure	10 bar
Min. input pressure	6 bar
Max. water vapor content of the compressed air	1,3 g/m ³
Max. oil vapor content of the compressed air	0,1 mg/kg
Max. compressed air consumption	8 m ³ /h

Connectable guns

OptiFlex F manual coating equipment	connectable
OptiSelect GM02	yes
OptiGun GA02	yes
PG1/PG2-A	yes (without remote control)
TriboJet	yes, with adapter*

* The gun type must be set on the control unit (see therefore the corresponding user manual)!



Attention:
The OptiFlex F manual coating equipment may be used only with
the specified gun types!

Dimensions

OptiFlex F manual coating equipment	
Width	690 mm
Depth	800 mm
Height	1135 mm
Weight	58 kg

Start-up and operation

Connecting guide

1. Check the compressed air connection from the filter unit to the control unit. Connect the compressed air supply hose from the compressed air circuit directly to the filter unit main connection on the rear side of the equipment (connecting thread G 1/4").



Note:

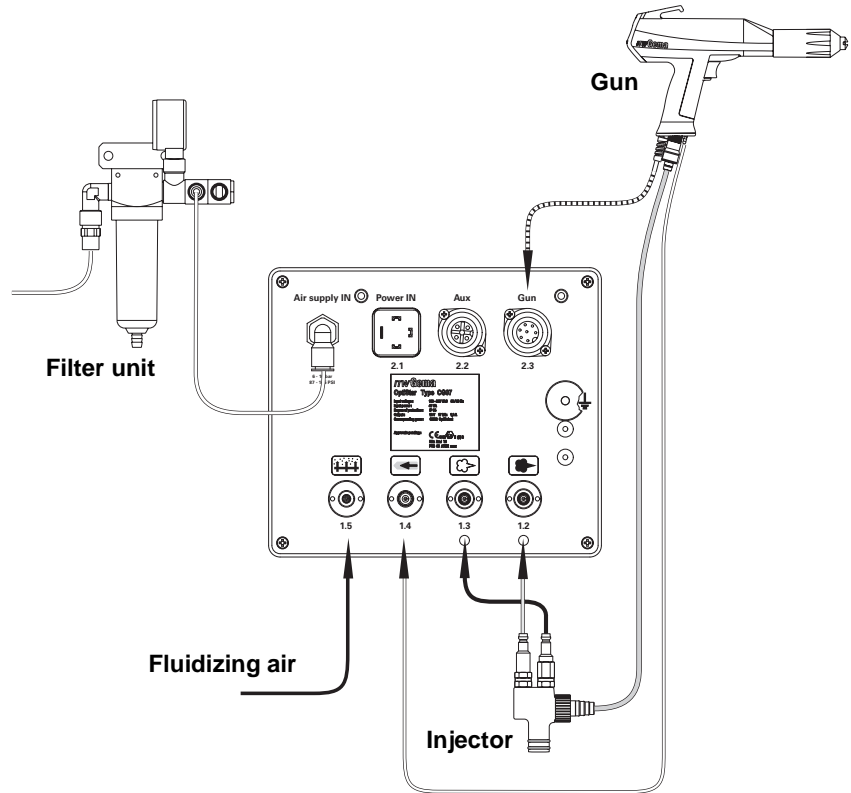
The compressed air must be free from oil and water!

2. Connect the black hose for fluidizing (electrically conductive) air to the output **1.5** on the rear side of the control unit
3. Connect the grounding connection cable to the control unit with the grounding screw, and the 5 m long grounding cable with the clamping clip to the booth or the suspension device
4. Connect the gun cable plug to the socket **2.3** on the rear side of the control unit
5. Connect the rinsing air hose to the electrode rinsing air output **1.4** and to the powder gun
6. Attach the injector, connect the powder hose to the injector and to the powder gun
7. Connect the red hose for conveying air to the corresponding output **1.2** on the rear side of the control unit and to the injector
8. Connect the black hose for supplementary air to the corresponding output **1.3** on the rear side of the control unit and to the injector (this hose is electrically conducting)
9. Connect the mains cable to the **2.1 Power IN** plug and bolt it on



Note:

If no vibration motor (OptiFlex B) is connected, close the 2.2 Aux output with the provided dust protection cap!



Connecting guide - overview

Preparation for start-up

Prepare the fluidized powder hopper

1. Set the Airmover
2. Fill in powder
3. Adjust the fluidization on the control unit

Switching on the booth

The coating booth is switched on according to the corresponding user manual.

Start-up

Switch on the control unit

1. Press the **ON** power switch.
The displays illuminate and the control unit is ready for operation



Note:

The further start-up procedure for the OptiFlex F manual coating equipment gun is explicitly described in the OptiStar CG07 control unit operating instructions (chapter "Initial start-up" and "Daily start up")!

Color change

General information

When a color change takes place, the individual components of the manual coating equipment must be cleaned carefully. Thereby, all powder particles of the former color must be removed!

Procedure:

1. Empty the powder hopper and clean thoroughly
2. Clean the powder hose:
 - Strip the powder hose from the hose connection on the injector
 - Point the gun into the booth
 - Blow through the hose manually with a compressed air gun
 - Fit the powder hose again to the hose connection on the injector
3. Dismantle and clean the powder gun (see therefore the user manual of the OptiSelect manual powder gun)
4. Clean the injector (see therefore the user manual of the OptiFlow injector)
5. Prepare the manual coating equipment with new powder for start-up

Maintenance and cleaning



Note:

Regular and conscientious maintenance increases the life span of the manual coating equipment and provides for a longer continuous coating quality!

Daily maintenance

1. Clean the injector (see therefore the user manual of the OptiFlow injector)
2. Clean the powder gun (see therefore the user manual of the OptiSelect manual powder gun)
3. Clean the powder hose, see therefore in chapter "Color change"

Weekly maintenance

1. Clean fluidizing/suction unit, injector and powder gun. Just place the fluidizing/suction unit in the powder shortly before restarting operation
2. Check the control unit grounding connections to the coating booth, the suspension devices of the work pieces, or the conveyor chain

If in disuse for several days

1. Disconnect the mains plug
2. Clean the coating equipment
3. Turn off the compressed air main supply

Powder hose rinsing

If lengthy downtimes take place, the powder hose must be cleaned.

Procedure:

1. Strip the powder hose from the hose connection on the injector
2. Point the gun into the booth
3. Blow through the hose manually with a compressed air gun
4. Fit the powder hose again to the hose connection on the injector

Cleaning

Cleaning the powder hopper

1. Disconnect the fluidizing air supply
2. Remove the injector
3. Remove the cover, blow out with compressed air and clean with a clean dry brush and cloth
4. Clean the suction tube, and injector
5. Empty the remaining powder into a container
6. Vacuum the hopper and, above all, the floor of the hopper
7. Clean the hopper with a cloth
8. Reassemble the powder hopper



Note:

Refill the powder hopper shortly before reusing! Never clean the powder hopper with solvents or water!

Cleaning the OptiSelect manual powder gun

Frequent cleaning of the gun helps to guarantee the coating quality.



Note:

Before cleaning the powder gun, switch off its control unit. The compressed air used for cleaning must be free from oil and water!

Daily:

1. Blow off the outside of the gun and wipe, clean etc.

Weekly:

2. Remove the powder hose from the connection
3. Remove the spray nozzle from the gun and clean it
4. Blow out the gun from the connection in flow direction with compressed air
5. Clean the gun tube with the provided gun brush
6. Blow through the gun with compressed air again
7. Clean the powder hose
8. Reassemble the gun and connect it



Note:

See therefore the user manual of the OptiSelect manual powder gun!

Maintenance and cleaning of the filter unit

The filter unit on the OptiFlex F manual coating equipment measures and cleans the compressed air. Here, the main compressed air connection of the equipment is located.

Replacing the filter element

Procedure:

1. Unscrew the filter glass on the filter unit
2. Loosen the cap screw
3. Remove the complete filter element
4. Replace the filter element
5. Clean the filter glass on the inside and install it again

Troubleshooting

General information

Fault	Causes	Fault elimination
---	Power pack defective	Replace the power pack
---	Main valve defective	Replace main valve coil
---	Gun not connected Gun plug, gun cable or gun cable connection defective Remote control on powder gun defective	Connect the gun Replace corresponding part or send in for repair Replace remote control (gun cap)
---	Rinsing air solenoid valve of flat jet nozzle defective	Replace valve coil
---	Rinsing air solenoid valve of round jet nozzle defective	Replace valve coil
---	Gun plug, gun cable or gun cable connection defective	Replace corresponding part or send in for repair
Gun LED remains dark, although the gun trigger is operated	Gun plug, gun cable or gun cable connection defective Remote control on powder gun defective	Replace corresponding part or send in for repair Replace remote control (gun cap)
Powder does not adhere to object, although the gun trigger is operated and the gun sprays powder	High-voltage and current deactivated High voltage cascade defective Objects are not properly grounded	Press the selection key (application key) Send in the gun for repair Check the grounding

Fault	Causes	Fault elimination
Control unit displays remain dark, although the control unit is switched on	Control unit is not connected to the mains Power pack fuse defective Power pack defective	Connect the equipment with the mains cable Replace the fuse Replace the power pack
The powder is not fluidized	Compressed air not present Fluidizing air is set too low on the control unit Motor throttle defective	Connect the equipment to the compressed air Set the fluidizing air correctly Replace motor throttle
The gun does not spray powder, although the control unit is switched on and the gun trigger is operated	Compressed air not present Injector, motor throttle or nozzle on injector, powder hose or powder gun are clogged Nozzle in the injector is clogged Nozzle is not inserted Fluidizing not running No conveying air: Motor throttle defective Solenoid valve defective Front plate defective	Connect the equipment to the compressed air Clean corresponding part Replace Insert the insert sleeve (see above) Replace the motor throttle Replace the solenoid valve Send in for repair

Schematic diagrams

OptiFlex 1-F/2-F - pneumatic diagram

OptiFlex 1-F/2-F - wiring diagram

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** OptiFlex B manual coating equipment, **serial no.** 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 wear 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)



WARNING!

Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the ITW Gema guarantee conditions!

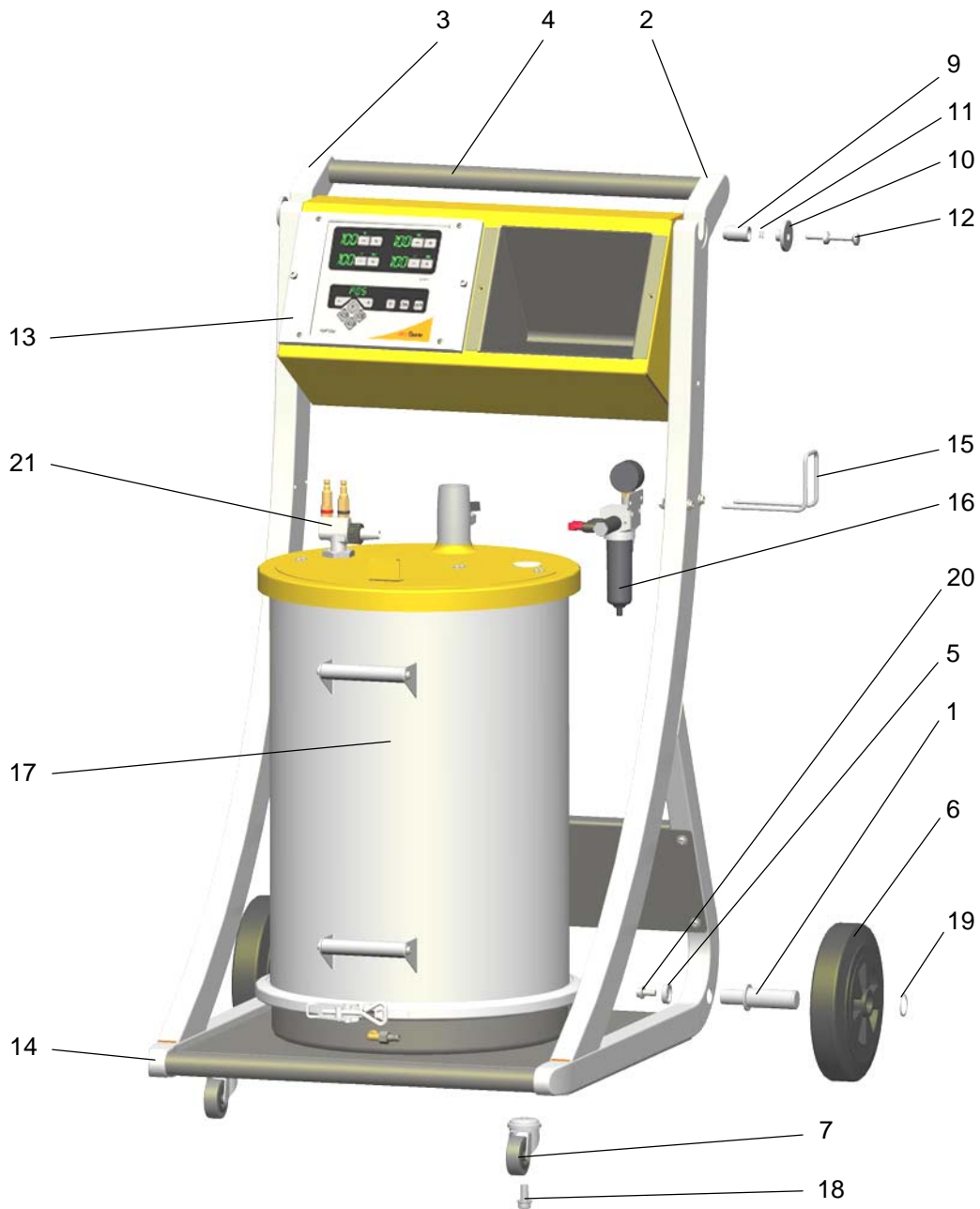
OptiFlex F manual coating equipment - spare parts list

1	Bearing bolt	1000 453
2	Handle piece, right	1000 811
3	Handle piece, left	1000 812
4	Handle bar	1000 460
5	Counter washer	1000 454
6	Rubber wheel - Ø 200 mm	260 592
7	Swivel wheel - Ø 50 mm	260 606
8	Rubber buffer - Ø 35x40 mm, M8/a (not shown)	211 664
9	Bearing bolt - L=33	1000 953
10	Conical spring washer	1000 943
11	Compression spring - 0,63x8x16 mm, RF	1000 565
12	Gun holder	1001 140
13	CG07 gun control unit - complete (see corresponding operating manual)	1001 060
14	Bumper	1000 779
15	Bracket	1000 699
16	Filter unit - complete (see corresponding spare parts list)	1001 147
17	Powder hopper HF03-50-2, without injector (see corresponding spare parts list)	1001 655
18	Hexagon ribbed cylinder screw - M10x20 mm	260 584
19	Snap ring - A	237 094
20	Hexagon ribbed cylinder screw - M8x16 mm	261 793
21	OptiFlow IG02-V injector - complete (see corresponding user manual)	391 530

Wearing part

* Please indicate length

OptiFlex F manual coating equipment - spare parts list

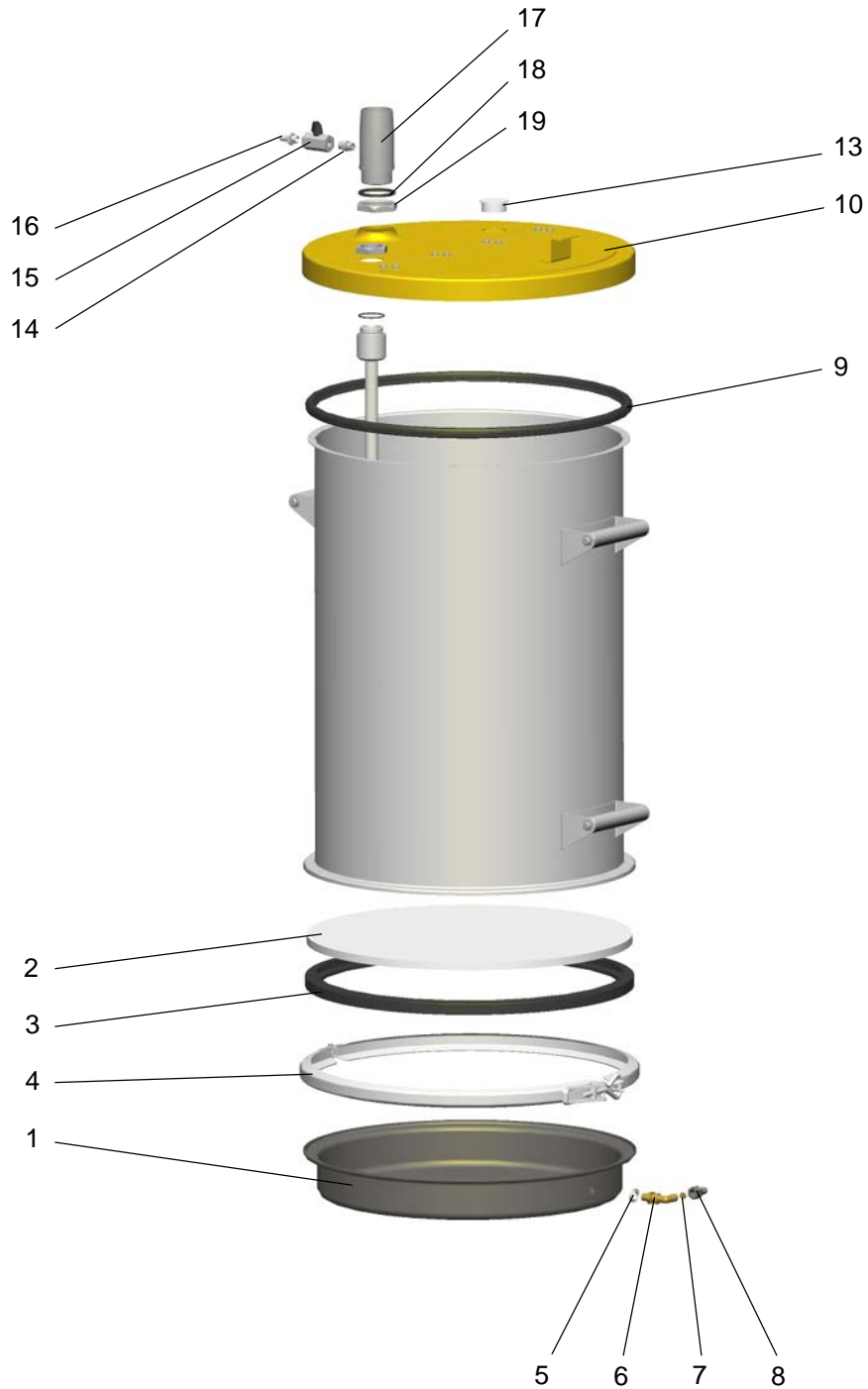


OptiFlex F manual coating equipment - spare parts

OptiFlex F manual coating equipment - powder hopper

A	Powder hopper - complete (incl. pos. B, 10, 12)	1001 653
B	Hopper body - complete (pos. 1-9)	1001 644
1	Floor plate	1001 640
2	Fluidizing plate	390 151
3	Fluidizing bed seal	390 186
4	Clamp ring	390 194
5	Sealing ring - Ø 10,2/17x3,8 mm	230 626
6	Elbow screw connection - 1/8"a-1/8"a	1001 079
7	Valve - Ø 1,4 mm	371 912
8	Connector - NW5, 1/8"l	200 859
9	Protective strip	103 837
10	Hopper cover - complete	1001 648
11	Airmover throttle valve, for pos. C (not shown)	1002 127
12	Spiral hose D40/45, for pos. C (not shown)	100 048
13	Blind grommet - Ø 36x12 mm	238 333
14	Suction tube - complete, L=504 mm (incl. pos. 15)	339 130
15	O-Ring - Ø 28,3x1,78 mm	224 987
16	Lock nut - PG21	234 869
C	Airmover - complete (incl. pos. 17-22)	380 202
17	Venting tube	375 845
18	O-Ring - Ø 38x4 mm	239 151
19	Locknut	342 343
20	Double nipple - 1/8"a-1/8"a	202 258
21	Ball valve	260 967
22	Connector - NW5-1/8"a	237 272

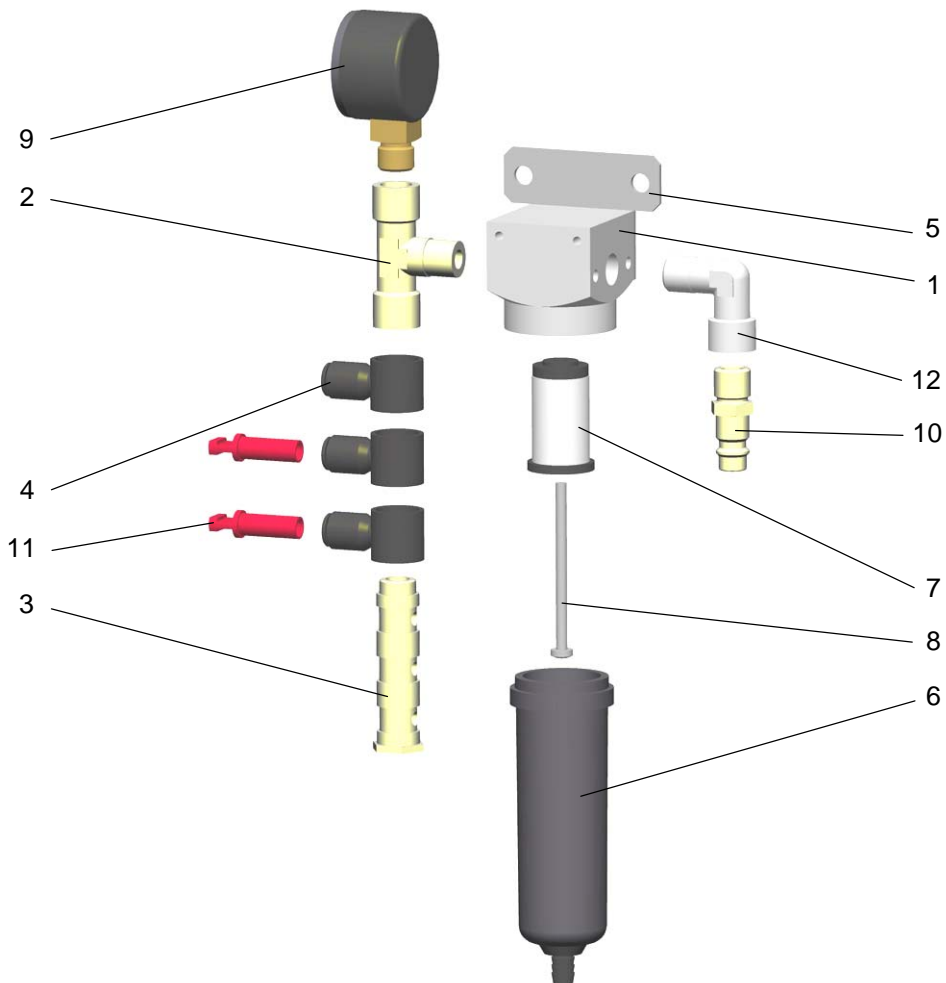
OptiFlex F manual coating equipment - powder hopper



OptiFlex F manual coating equipment - powder hopper

OptiFlex F - filter unit

	Filter unit - complete, without pos. 5	1001 147
1	Filter separator body - F14MD	1001 759
2	T-piece - 1/4"i-1/4"a-1/4"i	262 064
3	Hollow screw - 1/4"a, triple	222 623
4	Swivel ring - Ø 8mm,1/4", 1-fach, A type	225 762
5	Carrier plate	1001 758
6	Condensate container with drain valve	1001 761
7	Filter cartridge - 20 µm	1001 762
8	Cap screw - M4x60 mm	258 946
9	Manometer - G1/4", 0-10 bar	1001 764
10	Rectus nipple - NW 7,4-1/4"a	256 730
11	Grommet - Ø 8 mm	238 023
12	Elbow joint - 1/4"i-1/4"a	222 674
13	Rectus quick release connection (for pos. 10, not shown)	239 267



OptiFlex F - filter unit

