E

Operating Instructions and Spare Parts List

PZ 1 Powder Centre

ITW Gema

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1. SAFETY NOTES

INSTALLATION

Installation work to be done by the customer must be carried out according to local safety regulations.

GROUNDING

Check the booth, and powder centre grounding before every start-up. The grounding connections are customer specific, and are fitted on the base the booth, on the Monocyclone, and on the powder centre housing. The grounding of the workpieces and other plant units must also be checked.

OPERATING THE EQUIPMENT

In order to be able to operate the equipment safely, it is necessary to be familiar with the Safety Notes, the workings, and functioning of the various plant units.
For this purpose, read the Safety Notes, and these Operating Instructions before starting up the plant.
In addition, all further equipment-specific Operating Instructions e.g. the APS Series, and all additional components should also be studij .

To obtain practice in operating the Plant it is absolutely essential to start the operation according to the Operating Instructions.
Also later on they serve as a useful aid with possible faults or unclearness, and will make many enquiries unnecessary.
For this reason the Operation Instructions must always be available at the equipment.
Should difficulties arise, however, your ITW Gema Service Centre is always ready to assist. The contact address of your ITW Gema Service Centre is found on the inside title page of most Operating Instructions.

INSPECTION CHECKS

The following points are to be checked at every booth start-up:

- No foreign material in the central suction units of the powder centre or booth.
- The Sieve Machine is connected to the Monocyclone and the clamps are tightly locked down.
- Pneumatic hoses and powder hoses connected on the Dense Phase Conveyor.
- Pneumatic hoses connected to the After Filter, the filter element door is closed, the waste container is fitted and locked in.

REPAIRS

Repairs must be carried out by trained personnel only.

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2. FUNCTIONAL DESCRIPTION

2.1 FIELD OF APPLICATION

The powder centre was designed for quick colour changes and replaces the traditional coating from powder containers.

Powder boxes or powder containers are used, as delivered from the powder manufacturer, in the place of fluidized powder hoppers. After use these can be returned to the powder store.
The powder centre is an integral part of the quick colour change system and is largely responsible for the quality of the end product. As a part of the process controlled powder coating plant it is laid out for fully automatic operation.

The important characteristics of the powder centre are:

- Processing powder from the original or from fresh powder containers.
- Functional unit with its own exhaust system
- Integrated electrical and pneumatic controls.
- Powder level monitoring through level sensors
- Level controlled raising, and lowering station with built-in injectors, and local fluidizing suction tubes.
- Automatic internal cleaning of the suction tubes, injectors, powder hoses, and powder guns.
- Return of the recovered powder directly into the powder container.
- Built-in exhaust unit prevents powder particles from escaping during the coating process, and especially during cleaning at a colour change.

2.2 OPERATING SEQUENCE

With the typical operation of a powder centre the powder box is placed on the vibration table. The injectors are lowered into the box through the level control and fluidized in the area around the suction tubes. The fluidized powder is sucked up by the injectors and fed through the powder hoses to the spray nozzles. The powder which does not adhere to the workpieces falls to the booth floor and is sucked into the Monocyclone as a powder/air mixture. In the Monocyclone the powder is separated by the Cyclone and the powder transported back into the powder centre by the Dense Phase Conveyor. In the powder centre the powder can be passed through a sieve into the powder box to avoid contamination.

At a colour change the injectors are raised out of the powder box, the box is placed next to the injector unit on the vibration table and the transport hose, with the venting head, is replaced on the box. Through the release of a cleaning processes the injectors and suction tube are transported into the cleaning position, that is, they travel to the blow-off valve below on the vibration table. The powder in the hose lines is blown out by pre-rinsing through an automatic operation. With the following rinsing operation the suction tubes, injectors, powder hoses and guns are cleaned internally, at full pressure. These parts are blown off externally, by hand, in preparation for the next colour. The box is now closed and the powder replaced in the powder store. The powder

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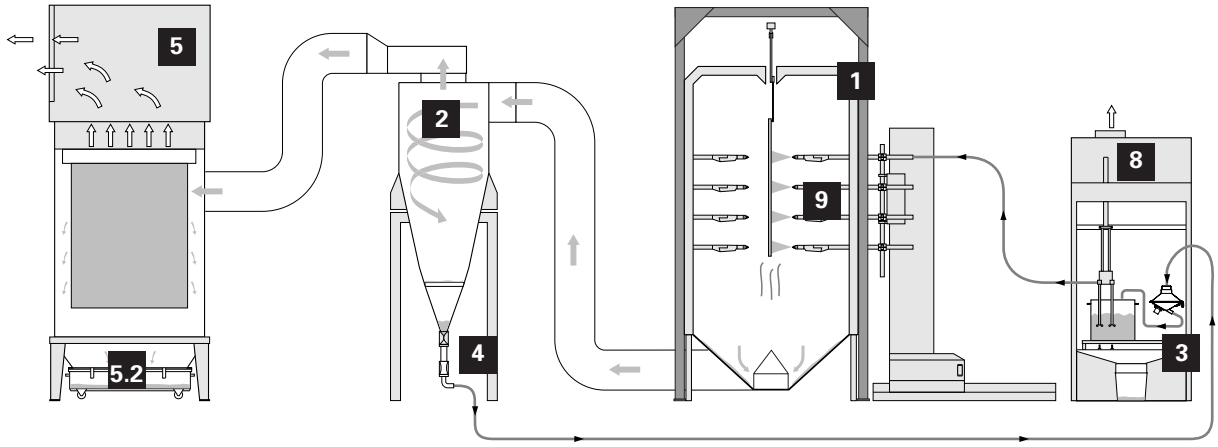
still in the system is caught in a waste container.
The powder returned from the Cyclone is also cleaned by rinsing.

After this cleaning process a new powder box can be used and coating with the next colour can continue. It is recommended, during the first minutes of operation with the new powder, the powder which is recovered should be collected in a waste container and not reused.



1 Booth
2 Cyclone separator
3 Sieve
4 Dense phase conveyor
5 After Filter
5.2 Waste container
8 Powder centre
9 Automatic guns

3. TECHNICAL DATA

DIMENSIONS	Floor area:	1330 mm wide, 1790 mm deep
	Height:	2370 mm
	Weight:	approx. 650 kg (according to Plant design)
ELECTRICAL DATA	Voltage:	3 x 400 V
	Frequency:	50 / 60 Hz
	Power consumption:	3.5 kW
	Type of protection:	IP54
PNEUMATIC DATA	Compressed air: consumption:	6-10 bar approximately 300 Nm^3/h
	max. Water vapour content:	1.3 g/m^3
	max. Oil content:	0.1 mg/kg (oil/water)
AIR EXHAUST UNIT	Air volume:	approximately 3000 Nm^3/h
POWDER TRANSPORT	Conveying performance:	160 kg/h

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4. SETTING VALUES / PARAMETERS

SETTING VALUES

Caution: These setting values are approximate values and must be checked on Start-up and adapted, if necessary.

4.1 ELECTRICAL SETTINGS

Description (Valve number)	Approximate value	Set at Start-up	Changed on Changed by
Fan			
Motor protection switch	6.2 A		
Vibrator			
Motor protection switch	0.35 A		
Sieve			
Motor protection switch	0.19 A		

4.2 PNEUMATIC SETTINGS

Precleaning (12.01)	2.0 bar
Fluidizing (10.01)	1.0 bar
Lifting cylinder - up (5.03)	6.0 bar
Lifting cylinder - down (5.04)	4.0 bar
Pressure tank	
Filter cleaning (6.01)	5.0 bar
Control pressure (8.07)	3.0 bar
Transport air (8.01/9.01)	0.3 bar
Conveying air	
Powder transport (8.03/9.03)	1.0 bar

4.3 EXHAUST SETTINGS

ΔP Filter (6.03)	0,5 kPa
Cleaning at	1,5 kPa
Air volume	3000 Nm^3/h
Fan -	
Vane opening	80 mm (for 60 Hz - 70 mm)

4.4 MISCELLANEOUS

Distance:	
Level sensor / Suction tube	90 mm
Imbalance	
Vibration table	50% (for 60 Hz - 34 %)
Imbalance Vibrator	
Sieve machine	100%

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4.5 PARAMETERS

Caution: The parameters are set at the factory and should not be changed by the customer. If the parameters must be altered, then only after consultation with an ITW Gema Service centre.

Description	Basic value	Display	Changed	Changed
Remarks		Operating panel	on	by
Level sensor delay	0.5	Nsensor delay		
	3.0	PLevel OK		
	1.0	CYLinder DOWN		
Fresh powder	10.0	FP To ON		
	20.0	FP To OFF		
	100	FP Message		
Injectors	3.0	INJ Clean ON		
	1.0	INJ Clean OFF		
	30.0	INJ Clean TOTAL		
	1.5	INJ Blow off		
Dense phase conveyor	6.0	PV UP / DOWN		
	2.0	PV OPEN		
	0.7	Conveying air		
	3.0	PT Clean ON		
	1.0	PT Clean OFF		
Cartridge filter	0,5	CART Clean ON		
	3.0	CART Clean OFF		
	30.0	PC Message		
	2.0	NSensor setting		
	1.0	Horn ON		
	2.0	Horn OFF		

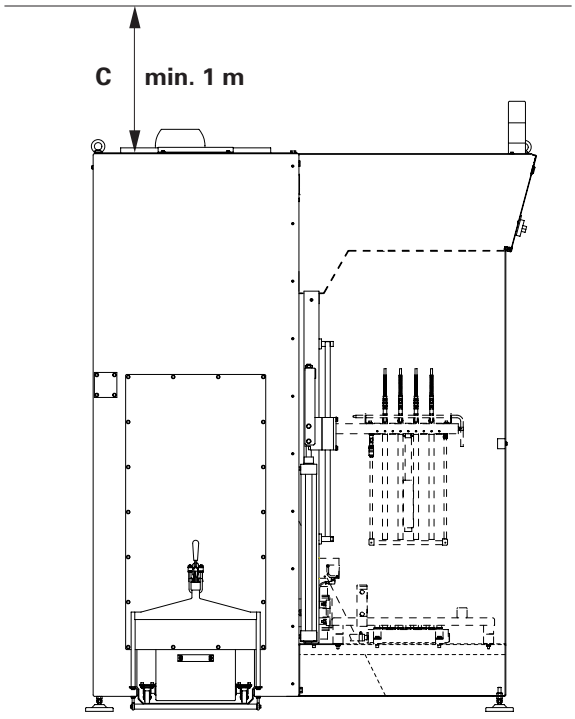
5. ASSEMBLY NOTES

On assembly of the powder centre the following points are to be observed:

- The powder centre is set up on 4 levelling pads.

  The vibration table must be levelled exactly on assembly.

  In order to prevent the powder centre from moving during operation, the levelling pads must be fixed to the floor.
- The powder centre must be grounded according to local regulations.
- In order to prevent disturbing air turbulence at the expulsion of the exhaust air there must be a free space (**C**) of min. 1 m.
- When laying out the hose connections the largest radii possible (when possible min. 300 mm radius) are to be used. This greatly reduces the pressure losses in the air lines and limits wear and depositing in the powder hose. A clean hose layout improves the overview, increases operating safety, and simplifies the search for faults.



6. PREPARATION FOR START-UP

Before the start-up of the powder centre the following points must be observed:

6.1 CHECK THE POWDER CENTRE GROUNDING

6.2 CHECK ALL CABLE AND HOSE CONNECTIONS

Check all cable and hose connections for satisfactory layout and firm seating of the connection elements.

6.3 SET THE BOX SENSOR

A sensor monitors the vibration table to determine if a powder box is present. It must be set according to the following steps:

SETTING THE SWITCHING POINT:

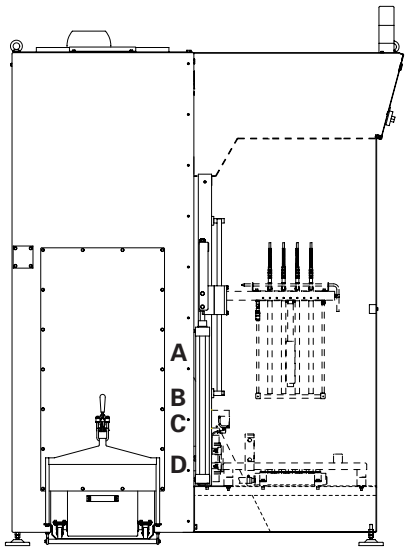
1. Point the sensor at the object and clean the lenses
2. Set the sensitivity with the potentiometer so that the switching point is between the target and the background (or between light and dark targets).

Caution: The scanning range depends on the target surface and colour of the object being monitored.

A blinking LED shows that the sensor is working without excess gain. Either the sensor is not aligned to the object, the lens surfaces are soiled or the target does not emit enough light.
The lenses must be cleaned regularly!

6.4 SETTING THE END SWITCHES ON THE LIFTING CYLINDER

There are 4 proximity switches on the lifting cylinder for the following functions, from top to bottom:



- **A** Working position for automatic Fresh powder supply (Level sensor in fill position, Fresh powder - working position)
- **B** Lowest working position (Level sensor in end position, lowest suction level)
- **C** Cleaning position for blowing off the suction tube
- **D** Cleaning position for blowing off the suction tubes, injectors and powder hoses

The proximity switches are set with the following steps:

1. Proximity switch for working position **A** with automatic Fresh powder supply fitted 330 mm from the upper cylinder end piece
2. Proximity switch for the lowest working position **B** fitted 440 mm from the upper cylinder end piece
3. Proximity switch for the blow-off position **C** fitted 550 mm from the upper cylinder end piece
4. Proximity switch for the blow-off position **D** fitted 600 mm from the upper cylinder end piece
5. Move the cylinder to the upper end position
6. Move the cylinder to the working position for automatic fresh powder supply
7. Check, if the distance between suction tube and fluid plate of the powder container, resp. floor of the powder box is approximately 100-300 mm.

   These settings can be made according to the customers specifications. A greater distance from the floor means a large powder volume to run the plant, gives, however, greater safety with short breaks in the fresh powder supply.
8. Move the cylinder to the blow-off position of the suction tube.

   Check, if the distance between the suction tubes and nozzles are approximately 20-30 mm.

   With this distance the blow-off effect of the suction tube is influenced and can be accommodated to the customer's specifications.
9. Move the cylinder to the blow-off position.
10. Check if the end switch 4 is in operation (cylinder is under pressure)

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6.5 EXHAUST SYSTEM: SET DIFFERENTIAL PRESSURE SWITCH

6.6 SET EXHAUST VOLUME

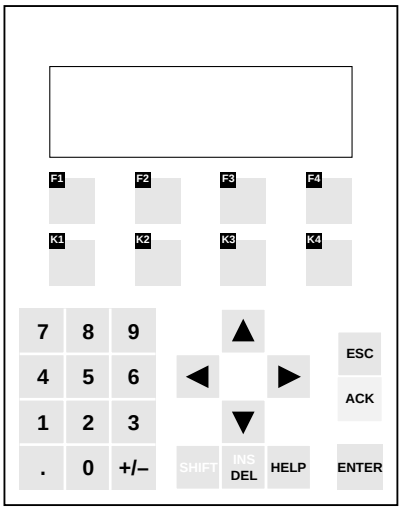
Caution: When too large exit openings are chosen, this can lead to premature clogging or to damage on the filter cartridges!

The exhaust air volume can be influenced with the vanes on the fan exhaust. In order to achieve the correct air volume, the unobstructed exhaust exit of the fan at Start-up must be 80 mm.

7. POWDER CENTRE CONTROL

7.1 OP 7 CONTROL OPERATING PANEL

The operation, and monitoring of the PZ 1 Powder Centre is achieved through the OP 7 Control panel.
The OP 7 Control Panel serves to initiate the powder centre function commands, which are necessary for the satisfactory operation of the powder centre. The function parameters are also input through the control panel. These are set at the factory and, therefore, may only be



altered after consultation with an ITW Gema Service Centre.

The display is a four vertical row, twenty horizontal alphanumeric field LCD display.
Caution: The input keys must only be pressed with fingertips and under no circumstances with fingernails or hard objects!

The keys have the following functions:

- Switching to the next Mask or the corresponding function are activated with the keys - **F1**-**F4**.
- Switching from one display field to another is done with the "Arrow" keys.
- The **ESC** key switches back to the previous Mask.

Caution: These keys should only be operated by trained personnel:

- Keys **1-0** are used to input function parameters.
- The **+/-** key has no function here.
- The **ENTER** key has no other application than the acknowledgment of the input of function parameters
- The **ACK** key serves the acknowledgment of error messages

Caution: The function parameters are set at the factory and should **not** be changed by the customer. However, if parameters do have to be changed, then **only after** consultation with an ITW Gema Service Centre.

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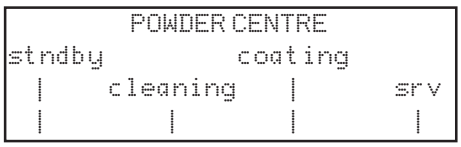
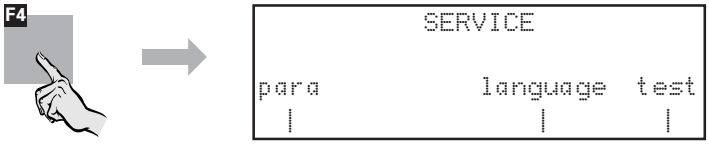
7.2 LANGUAGE CHANGE

In order to input the settings on the operating panel, the plant must be in operation. To do this proceed as follows:

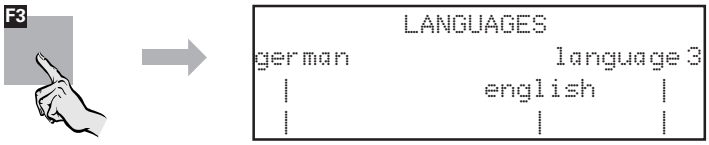
1. Switch the booth on (For further information, see the separate Booth Operating Instructions)
2. Switch the Main Switch on
3. Switch on the control voltage with the Key switch:
   – The Key switch returns to its starting position
   – The interior lighting is activated
   – The exhaust fan starts up



4. Press the key **F4**



5. Press the key **F3**



6. Press the **F** key for the desired language.

7. Press the **ESC** key, the previous Mask appears
   (Press the key a number of times, until the desired Mask appears)

Caution: The operating parameters are shown in the **"Para"** Mask, which are input at the initial Start Up. This Mask is password protected and **must not be changed without consulting an ITW Gema Service Centre.**

8. COATING OPERATION

8.1 BEFORE SWITCHING THE POWDER CENTRE ON

Before switching the powder centre on the following points must be observed:

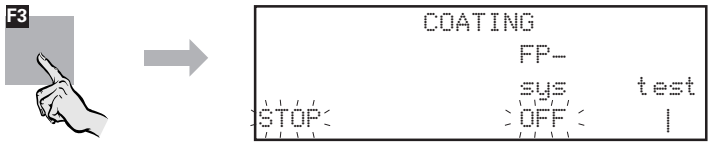
- Observe the Safety Notes
- Check the grounding of the powder centre, the booth, and the other plant units and, if necessary, make the connection
- Check the compressed air supply

8.2 STARTING UP THE POWDER CENTRE

Caution: The input keys must only be pressed with fingertips and under no circumstances with fingernails or hard objects!

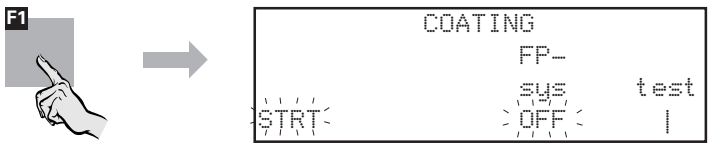
At the Start-up the following steps must be taken:

1. Switch the booth on (For further information, see the separate Booth Operating Instructions)
2. Switch on the powder centre main switch
3. Switch on the control voltage with the Key switch:
   - The Key switch returns to its starting position
   - The interior lighting is activated
   - The exhaust air fan starts up
4. Place the powder box on the vibration table
5. Press the **F3** key - „Coating“



„STOP“, and „FP-SYS OFF“ blink .
   - Fluidizing switches on

6. Press the key **F1**.



„STRT“, and „FP-SYS OFF“ blink
   - The injectors travel downwards
   - The level control is activated
   - The vibration table is started

7. Check the fluidizing in the powder container
   - The powder must „boil“ lightly (setting with the pressure regulating valve(s) in back wall of the powder centre)

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8.3 STARTING UP THE POWDER CENTRE AFTER AN EMERGENCY STOP

1. Switch the booth on (For further information, see separate Booth Operating Instructions)
2. Switch on the powder centre main switch
3. Switch on the control voltage with the Key Switch:
   – The Key switch returns to its starting position
   – The interior lighting is activated
   – The exhaust air fan starts up
4. Press the key **F3** - „Coating“

„STOP“, and „FP-SYS OFF“ blink .
   – Injectors travel upwards automatically (to the starting position).

5. Press the key **F1**

„STRT“, and „FP-SYS OFF“ blink
   – The injectors move downwards
   – The level sensor is active
   – The vibration table switches on

6. Check the fluidizing in the powder container
   – The powder must „boil “lightly (setting on the pressure regulating valve on the back wall of the powder centre)

8.4 SWITCHING OFF THE POWDER CENTRE

The following steps must be taken to switch off the powder centre:

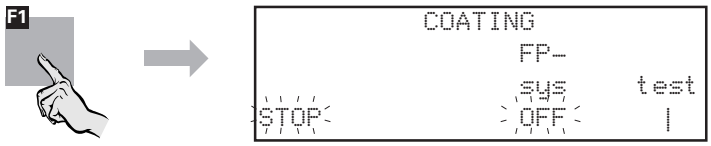
1. Check if all the workpieces have been coated
2. Press the key **F1**.

„STOP“, and „FP-SYS OFF“ blink
   – The injectors move upwards
   – The level sensor control switches off
   – The vibration table switches off
3. Switch off the powder centre with the Key switch
   – The interior lighting goes off
   – The exhaust air fan switches off
4. Switch off the main switch

8.5 CHANGING THE POWDER CONTAINER DURING COATING

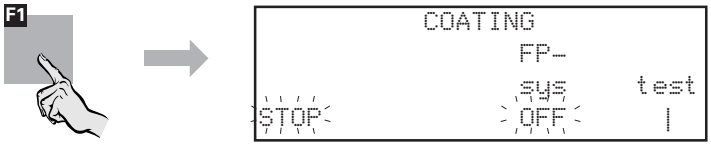
Changing a powder box during the coating process takes place with the following steps:

1. Check if coating can be interrupted
2. Press the key **F1**.



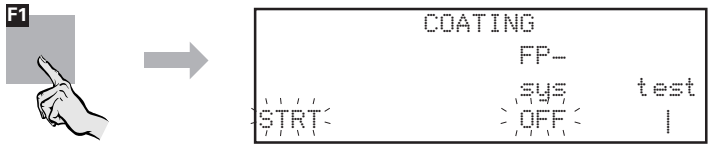
„STOP“, „FP-SYS OFF“ blink

– The injectors move upwards.
– The level sensor control switches off
– The vibration table switches off



3. Replace the new powder box on the vibration table.

4. Press **F1** key.

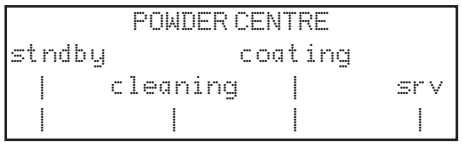


„STRT“, and „FP-SYS OFF“ blink

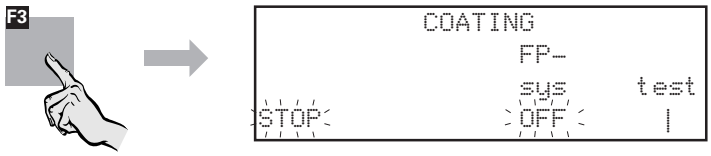
– The injectors move downwards
– The level sensor control is active
– The vibration table switches on

8.6 WORKING WITH THE AUTOMATIC FRESH POWDER SUPPLY

1. Switch the booth on (see separate Booth Operating Instructions)
2. Switch on the powder centre main switch.
   The Mask below appears on the display:



3. Switch on the control voltage with the Key switch:
   – The Key switch returns to its starting position
   – The interior lighting switches on
   – The exhaust air fan starts up
4. Place the powder box on the vibration table.
5. Press the key **F3** - „Coating“



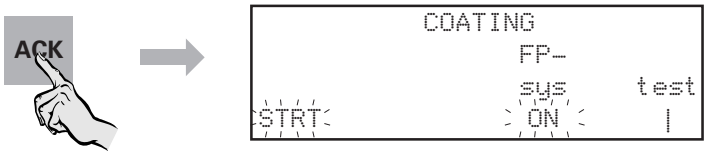
„STOP“, and „FP-SYS OFF“ blink.
   – The injectors move upward automatically (to the starting position).
6. Press the key **F1**.

„STRT“, and „FP-SYS ON“ blink
   – The injectors move downwards to the fresh powder working position
   – The level sensor control is activated
   – The vibration table switches on
   – The fluidizing switches on
7. Check the fluidizing in the powder container
   – The powder must „boil“ lightly (Set with the pressure regulating valve(s) on the back wall of the powder centre)

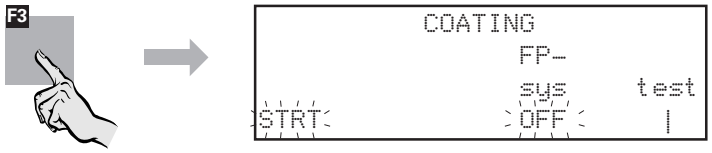
8.7 PROCEDURE AT A FAULT IN THE AUTOMATIC FRESH POWDER SUPPLY

If no or only an unsatisfactory fresh powder supply takes place within the set time, then the following display appears:

– The flashing light switches on, the display blinks „no fresh powder"



1. Press the Key **ACK**
   „STRT, „FP-SYS ON" blink
2. Press the key **F3**.



„STRT", and „FP-SYS OFF" blink

– Injectors move to the actual powder level
– Coating takes place without automatic powder supply

When the fresh powder supply is ready to operate, the following procedure will activate the system again:

1. Press the key **F1**.

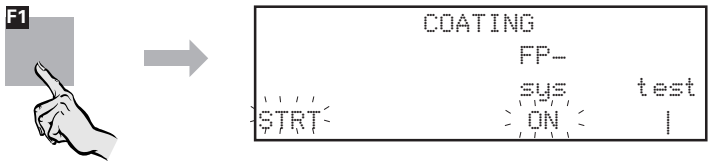
„STOP", and „FP-SYS OFF" blink

– The injectors move upwards
– The level sensor control switches off
– The vibration table switches off

2. Press the key **F3**.

„STOP", and „FP-SYS ON" blink

3. Press the key **F1**.



„STRT“, and „FP-SYS ON“ blink

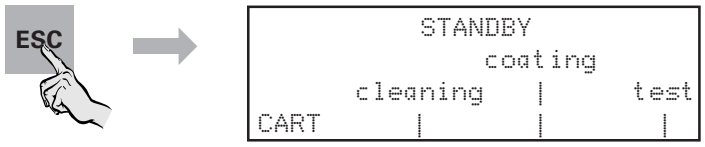
- The injectors move downwards to the fresh powder working position
- The level sensor control is activated
- The vibration table switches on
- The fluidizing switches on

Coating with fresh powder is now in operation again.

8.8 FILTER CLEANING

Filter cleaning can only be carried out when the powder centre is in operation, with the following steps:

1. Check if the coating can be interrupted
2. Press the key **ESC**



– The injectors move upwards
– The level sensor control switches off
– The vibration table switches off

3. Press the key **F1**.

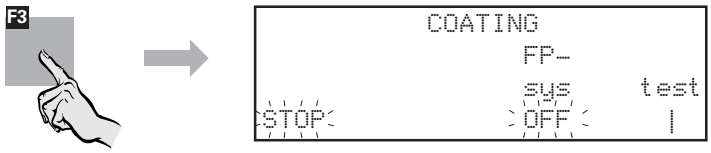
– Both filter cartridges are cleaned, one after the other (Caution: loud air blast)

This cleaning process can be repeated, as required.

Caution: The cleaning times are set at the factory. If the filter cartridges must be cleaned after a few hours of operation because the max. differential pressure has been overstepped (at which the fault message „ CLEAN filter cartridge“ is displayed), contact must be made with an ITW Gema Service centre.

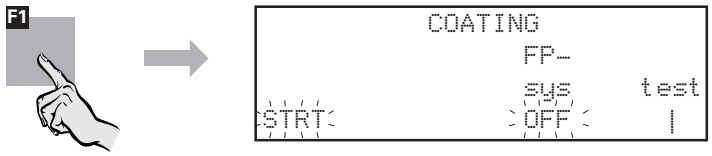
The upper limit value, at which the fault message is displayed, is customer specific and is set on assembly by the ITW Gema Service personnel.

4. Press the key **F3** - „Coating“



„STOP“, and „FP-SYS OFF“ blink

5. Press the key **F1**.



„STRT“, and „FP-SYS OFF“ blink
- The injectors move downwards
- The level sensor control is activated
- The vibration table switches on
- The fluidizing switches on

9. COLOUR CHANGE OPERATION - CLEANING

9.1 GENERAL

The procedure at a colour change in an automatic plant is described below. If the powder centre is used for other applications, it can happen that some of the following points are not applicable and can, therefore, be skipped over.

A prerequisite for a quick, and efficient colour change is the operation with 2 people, so that some of the steps can be carried out simultaneously. The colour change can begin when the last workpieces have left the booth. Coating is stopped automatically in automatic operation.

1. Close the booth, and manual coating doors
   – this prevents the powder from escaping when blowing off, and blowing the guns through
2. Switch the booth to cleaning operation
3. Move the reciprocator, and XT axes to the cleaning position
4. Set the operating panel to the Mask - „Powder Centre“

```
        POWDER CENTRE
stndby          coating
  |    cleaning    |       srv
  |        |       |        |
```

5. Remove the powder container from the vibration table
6. Press the key **F2**.


```
            CLEANING

guns   pulsetrs Test
CLEAN     ON    CLEAN      |
```

9.2 GUN CLEANING

Caution: The guns must be in the cleaning position, see the instructions for the booth, and axes.

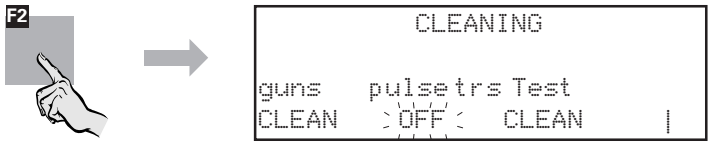
Pressing the key **F1** releases the following automatic procedure:

- The injectors move downwards to just above the cleaning position
- The blow off nozzles switch on, the suction tubes are blown off externally
- The injectors move completely to the cleaning position
- The blow-off nozzles switch on, the suction tubes, injectors, powder hoses, and guns are rinsed internally
- The injectors remain in the cleaning position

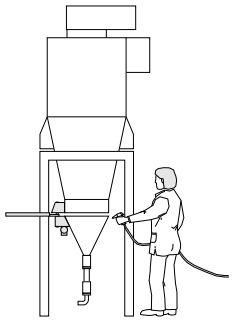
- This procedure can be repeated by pressing the key **F1** again!
- During this procedure the outsides of the suction tubes, injectors, supports etc. can be cleaned manually with the compressed air gun.

9.3 DENSE PHASE CONVEYOR - CLEANING

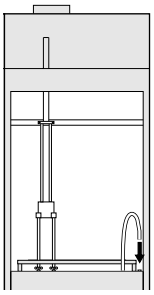
1. Press the key **F2**.



2. Release the clamping device on the Cyclone separator
3. Slowly swing out the sieve and clean with the compressed air gun

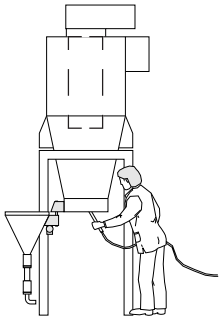


Caution: In order to avoid damage to the sieve when blowing the transport hose through, make sure that the sieve is swung out completely during the cleaning process!



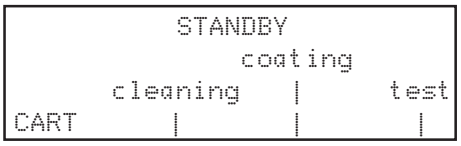
4. Connect the transport hose to the cleaning connection on the right-front side wall of the powder centre

5. Press the key **F3**.
   - The transport hose is blown through, in pulses, for a set time
   - This procedure can be repeated by pressing the key **F3** again!



6. Swing the funnel on the Cyclone slowly away and at the same time clean it off with the compressed air gun
7. Blow off the Cyclone with the air hose / air lance from top to bottom, carefully clean the internal and external surfaces of the interior tube (broken lines).
8. Close the sieve and funnel on the Cyclone again

9. Press the key **ESC**



10. Place the powder container with the desired colour on the vibration table.
11. Disconnect the Dense Phase Conveyor hose
12. Put the powder centre into operation according to Section 8.2

10. FAULT MESSAGES

A fault message always appears on the display when there are faults on the powder centre. The causes of these faults must be eliminated before further procedures are carried out. (See also „Troubleshooting Guide“)

When the fault is eliminated, the display returns to the Start Mask again.

1. Box MISSING
   - – Place the powder container on the vibration table Secure with the rubber band
   - – Acknowledge the fault with the key **ACK**

2. Remove Box
   - – Remove the powder container from the vibration table (Pull the rubber band away from the box)
   - – Acknowledge the fault with the key **ACK**

3. Swivel arm OPEN

   (Suction tube for use with manual gun - optional)
   - – Fix the swivel arm on the side wall
   - – Acknowledge the fault with the key **ACK**

4. Too little powder
   - – Exchange the powder container, see Point 8.5 (Pull the rubber band away from the box)
   - – Refill powder in the powder container
   - – Acknowledge the fault with the key **ACK**

5. No fresh powder
   - – see Section 8.7
   - – Acknowledge the fault with the key **ACK**

6. CLEAN cartridge filter
   - – see Section 8.8
   - – Acknowledge the fault with the key **ACK**

7. Booth NOT ready
   - – Put the booth in operation according to separate instructions
   - – Acknowledge the fault with the key **ACK**

8. Gema NOT in cleaning position!
   - – Bring the booth, guns, and axes into the cleaning position according to the separate instructions
   - – Acknowledge the fault with the key **ACK**

(Continued)

9. Motor protection FAN
   - Check the motor (Warming, operating characteristics, voltage etc.)
   - Check the fan wheel for contamination
   - Check the setting of the motor protection switch
   - Acknowledge the fault with the key **ACK**

10. Motor protection VIBRATION TABLE
   - Check the motor (Warming, operating characteristics, voltage etc.)
   - Check the setting of the motor protection switch
   - Acknowledge the fault with key **ACK**

11. Motor protection SIEVE
   - Check the motor (Warming, operating characteristics, voltage etc.)
   - Check the setting of the motor protection switch
   - Acknowledge the fault with the key **ACK**

11. MAINTENANCE

11.1 DAILY OR AFTER EVERY SHIFT

- Coarse clean the booth
- Carry out cleaning according to Sections 9.1 and 9.2
- Clean (dry) the sensor of the container recognition on the vibration table
- Check the nozzles for wear (see also operating instructions for the guns)
- Check the injector hose connections for wear or clogging with the help of ITW Gema plug gauge (**Order No. 362 280**).

11.2 CHECK WEEKLY

- Check the clean air chamber of the After Filter housing for powder deposits through the exhaust air opening; powder deposits are an indication of defect or badly fitted filter element(s)
- Clean the powder centre completely (Do not wet clean!!)
- Check the oil separator, if necessary, empty (if oil is present the air compressor must be checked)

11.3 CHECK EVERY 6 MONTHS

- Disconnect the measuring lines of the Manostats on the pressure gauges and blow through from the pressure gauge side to the measuring position (at the head of the line)

Caution: Use only the given blow-through direction!!!

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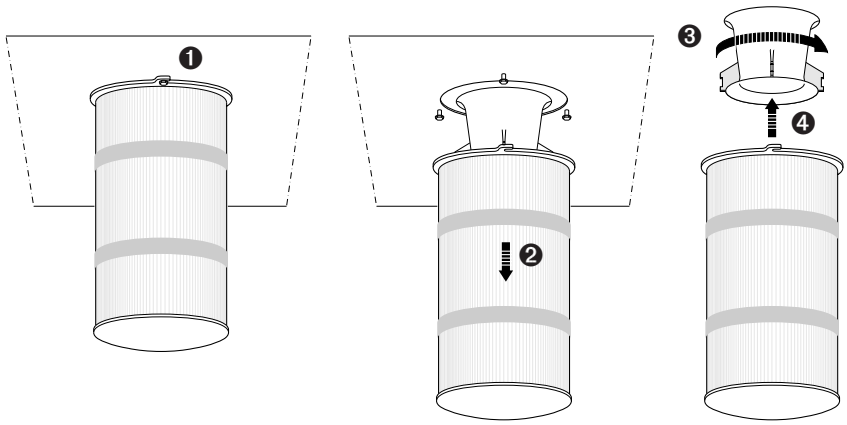
11.4 REPLACING THE FILTER CARTRIDGES

The filter cartridges must be replaced, when:

- Powder is present in the fan chamber in spite of satisfactory assembly.
- The fault message „CLEAN filter cartridge“ appears at short intervals.

A filter cleaning operation must be carried out before every filter cartridge replacement:

1. Start up the powder centre.
2. Clean all filter cartridges manually several times.
3. Switch off the powder centre.
4. Remove the service panel on the side of the exhaust air housing
5. Loosen the 3 filter cartridge fixing screws a couple of turns ❶ with the correct size spanner. (Do not unscrew completely!)
6. Turn the filter cartridge slightly and lift down from the fixing screws ❷
7. Turn the Venturi tube ❸ and dismantle from the filter cartridge ❹



8. Remove the displacement tube by pressing the locking spring and pull out of the filter cartridge, see sketch
9. Clean all parts, especially the seating surfaces, and threads on the filter cartridge connection
10. Fit the displacement tube and Venturi tube into the new filter cartridge
11. Hang the filter cartridge onto the fixing screws and turn to the stop
12. Tighten the fixing screws evenly to the spacing stop, so that the seal sits all the way round and the filter cartridge hangs vertically
13. Replace the service panel again

11.5 REPLACING THE FILTER PAD IN THE FAN HOUSING

The filter pad must be replaced when:

- Contamination is very thick and can no longer be blown off.
- The filter pad is clogged with powder residue.
- The air transmission is greatly reduced.

The filter grid can be opened after unscrewing the retaining grid, the filter pad replaced, and the grid can be screwed back.

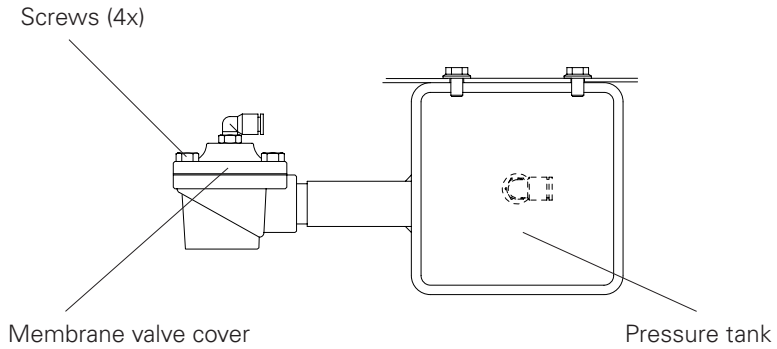
Caution: If the interior of the fan housing is covered with powder, it must be determined where the powder is entering this space, above all it is important to check the filter cartridges!

11.6 REPLACING A MEMBRANE VALVE ON THE PRESSURE TANK

Caution: Before work on the membrane valve can be carried out, it must be made sure that the pressure tank is empty!

The membrane valves, with a split nut, are screwed on the flushing tube of the pressure tank.
The following steps must be taken:

1. Vent the compressed air tank completely:
   Disconnect the compressed air supply to the powder centre.
2. Dismantle the filter cartridges according to Section 11.4
3. Check that the pressure gauge on the pressure reducing valve „Filter rinsing“ displays 0 bar.
4. Remove the membrane valve by unscrewing the split nut
5. Loosen the membrane valve hose connection
6. Fit the new membrane valve in the reverse order



Caution: The exhaust openings of the membrane valves must be fitted vertically, pointing downwards, in the centre of the filter cartridge.

12. TROUBLESHOOTING GUIDE

Caution: Faults must be rectified by trained personnel only!!

When an Emergency Stop occurs or there is a fault in the powder centre fan motor the whole plant is switched off.
A signal lamp illuminates simultaneous with the appearance of the fault message.
The fault message is acknowledged by pressing the key **ACK**.

Error/Fault/Problem	Precaution/Solution
– The fan does not run or switches off:	– Check the switching on procedure, see Section 8.2 – Check the motor protection setting – Check the temperature of the fan motor. – Check the contamination of the fan
– Too little suction	– Check the direction of rotation of the fan – Cleaning pressure too low, set to at least 2.5 bar – Filter cartridges clogged, clean according to Section 8.8 – Filter pad on the fan housing clogged, see Point 11.5 – Check the fan exhaust opening. See Section 6.6
– Powder in the clean air chamber or powder exits from the exhaust opening	– Filter cartridges defect or badly fitted (leaking), see also Section 11.4
– Filter cleaning (Jet Cleaning) does not work or only unsatisfactorily	– Check the cleaning pressure – Dirty compressed air (contains oil and/or water) – Check the control pressure of the membrane valve – Check the membrane valve according to Section 11.6
– Filter cleaning does not switch off	– Check the control pressure to the membrane valve – Replace the membrane valve, according to Section 11.6 – Check the exhaust opening of the membrane valve (vertically downwards)
– Air escapes from the safety valve on the compressed air tank (Hissing noise)	– Check the pressure set on the pressure regulator "Filter rinsing"

Caution: Do not make repairs or settings to the safety valve!!!
The pressure tank must be empty before service work on the membrane valves is carried out.

13. SPARE PARTS LIST

13.1 ORDERING SPARE PARTS

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

1. Type, and Serial No. of your powder coating equipment
2. Order Number, quantity, and description of each spare part

Example:

1. **Type** PZ 1 Powder Centre, **Serial no. :** xxxx.xxxx
2. **Order no.:** 320 650, 2 pieces, Filter pad

When ordering cable and hose material the length required must also be given. The spare part numbers for this yard/ metre ware is always marked with an *****.

The spare part number of yard/metre ware always begins with 1**.. ...** .

Wear parts are always marked with a **#**.

All dimensions of plastic hoses are given as external and internal diameters :

e.g. ø 8 / 6 mm = 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d).

Important: The number of spare parts mentioned and illustrated in this spare parts list can vary depending on the type of Powder Centre!

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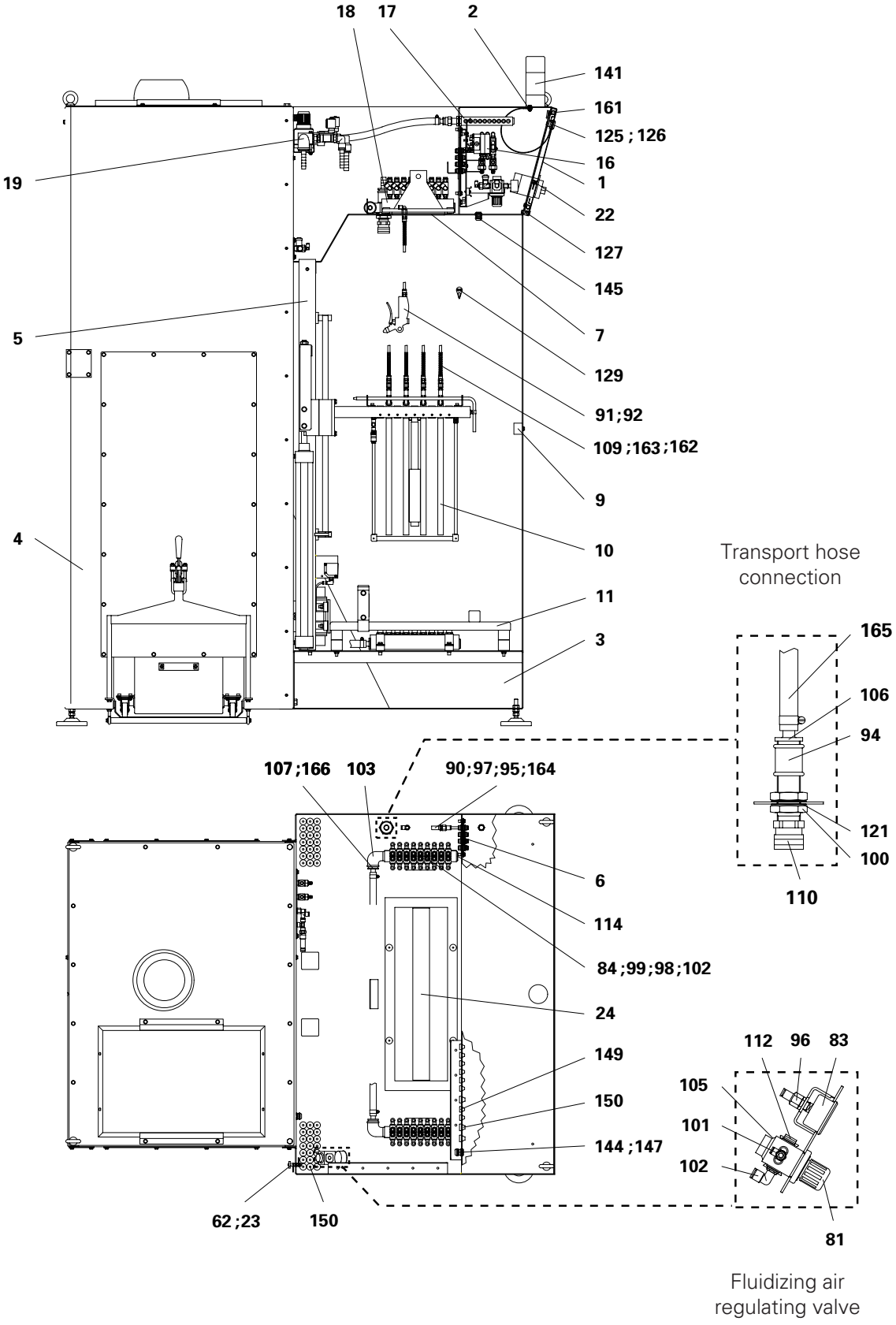
13.2 POWDER CENTRE - COMPLETE

3	Work area housing	379 999
1	Cover with OP7	373 044
	Cover with OP17	375 167
	Cover with GF1	375 179
2	Safety cable - L = 550 mm	373 940
4	Exhaust air chamber - complete	380 393
5	Cylinder unit- complete.	See page 38
6	Connection plate - 32x - complete	382 272
	Connection plate - 16x - complete	382 264
7	Plexiglas plate - Type 100	374 202
8	Cable bush	375 551
9	Double hose holder - complete	372 790
10	Injector holder - complete	see page 44
11	Vibration table - complete	see page 42
12	Blow-off block	373 079
13	Block holder bracket	379 913
14	Rubber nozzle	379 921
15	Blow-off nozzle	379 930
16	Pneumatic unit 1.0 (1 Dense Phase Conveyor).	see page 46
17	Distributor tube 1.0 - complete	379 158
18	Distrubutor tube 2.2	377 260
19	Pneumatic unit 2.0	see page 46
22	Grounding cable - APS 1	366 650
23	Studding	301 159
24	Lighting unit - Type 100-2-5 - complete	351 725
49	Rag bolt - M10 x 90 mm	245 216
62	Milled nut - M6	200 433
81	Pressure regulating valve - 0-4 bar	260 665
83	Pressure gauge - 0-4 bar	260 517
84	Or valve	259 217
90	Silencer - 1/8"	235 083**#**
91	Compressed air gun - 1/4"	258 210
92	Spiral hose - 1/4"-ø 8 mm- 4 m	258 229
93	Nut with kink protection - M12 x 11 mm-ø 8 mm	201 316
94	Adapter bush - 1"-1"	260 274
95	Connection bush - 1/4"-ø 8 mm	233 390
96	Connection bush - 1/4"-ø 6 mm	233 404
97	Adapter - 1/8"-1/4"	231 932
98	Adapter - 1/8"-1/4"	600 857
99	Adapter - 1/4"- ø 8 mm	259 322
100	Double adapter - 1"-1"	258 733

(Continued)

***** Indicate length required
Wear parts

13.2 Powder centre - complete



13.2 POWDER CENTRE COMPLETE (CONT.)

101	Adapter - 1/4"- ø 6 mm	203 033
102	Elbow joint - 1/4"-ø 8 mm	224 359
103	Elbow joint - 1"-1"	258 725
104	Elbow joint - 1/4"-ø 8 mm	254 002
105	Y-Connection - 1/4"-ø 8 mm	260 215
106	Hose connection - ø 19 mm-1"	259 250
107	Hose connection - ø 16 mm-1"	259 276
108	Socket - NW 5.2-1/8"	200 859
109	Quick-release connection - NW 5.2-ø 8 mm	203 181
110	Coupling - G1"	258 539
112	Plug cap - 1/4"	203 300
113	Plug cap - 3/8"	203 319
114	Plug cap - 1"	258 679
121	Gasket - ø 36 x 50 x 2 mm	200 751
122	Rubber bearing - ø 30 x 20 mm-M8	260 460
125	Panel lock	258 644
126	Tongue	262 153
127	Hinge - 180° - black	258 652
128	Levelling pad	255 610
129	Hook	260 207
141	Compact signal station - Orange	259 411
144	Lead-through - PG13	229 474
145	Lead-through - PG11	260 240
149	Cable lead-through	258 865
150	Cable lead-through	258 873
161	Edge protection band	104 655*****
162	Plastic hose - ø 8 / 6 mm - black - Antistatic	103 756*****
163	Plastic hose - ø 8 / 6 mm - red - PUR	103 500*****
164	Plastic hose - ø 6 / 4 mm - black	103 144*****
165	Solaflex hose - ø 19 / 26 mm	104 213*****
166	Solaflex hose - ø 16 / 3.5 mm	102 296*****

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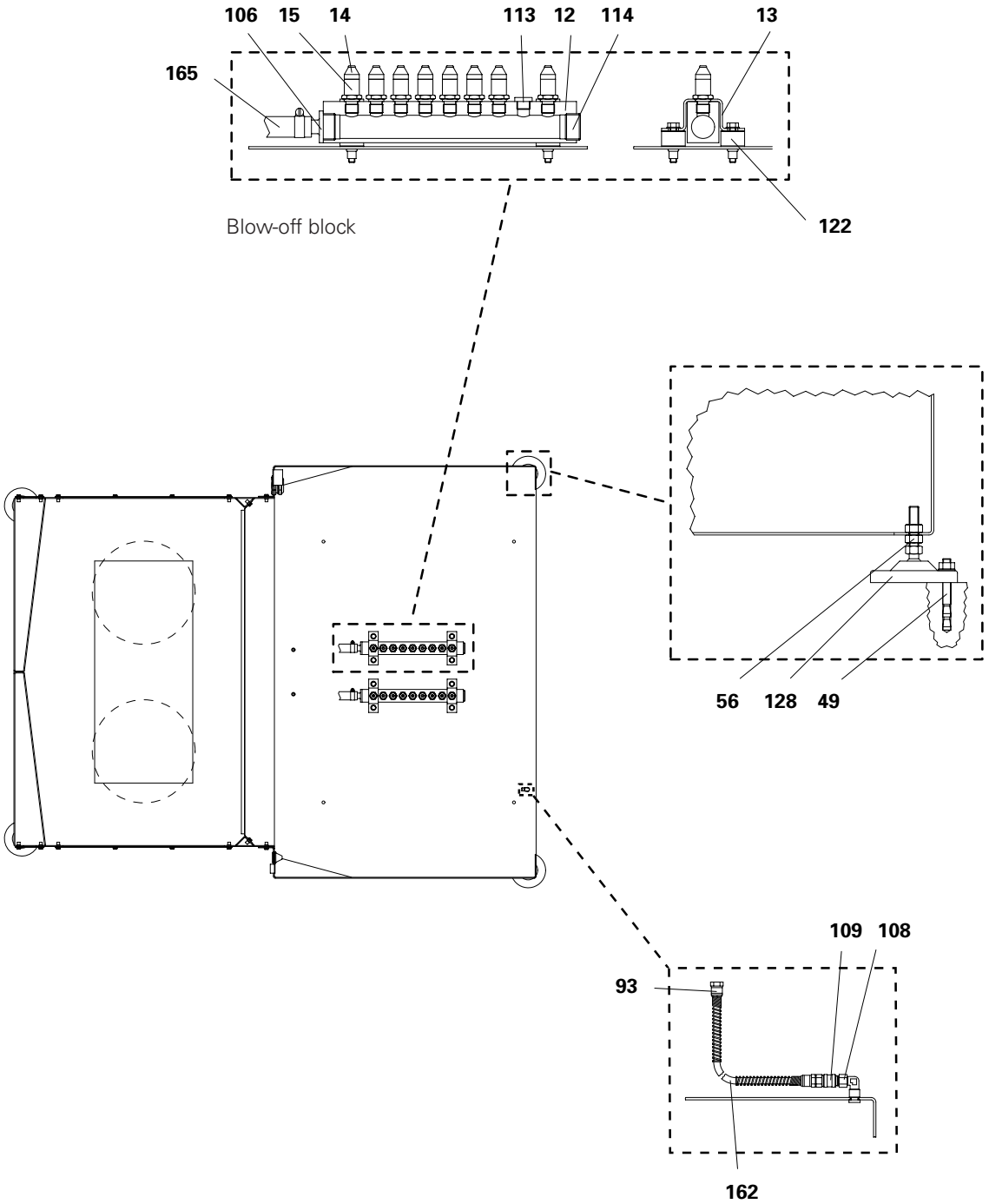
***** Indicate length required
Wear parts

13.2 Powder Centre complete



13.3 EXHAUST AIR UNIT

1	Cover plate	373 133
2	Ramp	374 431
3	Bracket	374 423
4	Service cover plate	376 370
5	Exhaust air housing	379 980
6	Pressure tank	380 377
7	Connection plate - complete	see page 40
8	Cover plate	374 407
9	Stop bracket	375 209
10	Connection plate	382 426
11	Perforated plate	382 434
12	Deflector	382 442
13	Waste powder container - complete	see page 50
14	Regulating valve	373 419
15	Support bracket - rear	374 377
16	Support bracket - front	374 385
17	Quick-change frame - 400 x 600 mm	320 633
18	Filter pad - 405 x 605 x 23 mm - CRS-H/D	320 650**#**
51	Membrane valve - DN20 - 3/4"-1/8"	259 985**#**
61	Double adapter - 1"-1"	258 733
62	Elbow joint - 1/4"-ø 8 mm	224 359
63	Elbow joint - 1/8"-ø 8 mm	203 050
64	Coupling - G1"	258 539
71	Fan - 2.40 - 3 kW	259 756
73	Rubber buffer - ø 30 x 20 mm-M8	260 460
74	Toggle clamp	202 053
75	Filter cartridge - ø 325 x 1000 mm	258 830**#**
76	Displacement tube	258 849
77	Venturi nozzle	258 857
78	Rubber buffer - ø 20 x 15 mm-M6	211 770
81	Lead-through - PG11 - Long	260 240
91	Plastic hose - ø 8 / 6 mm - black	103 152*****

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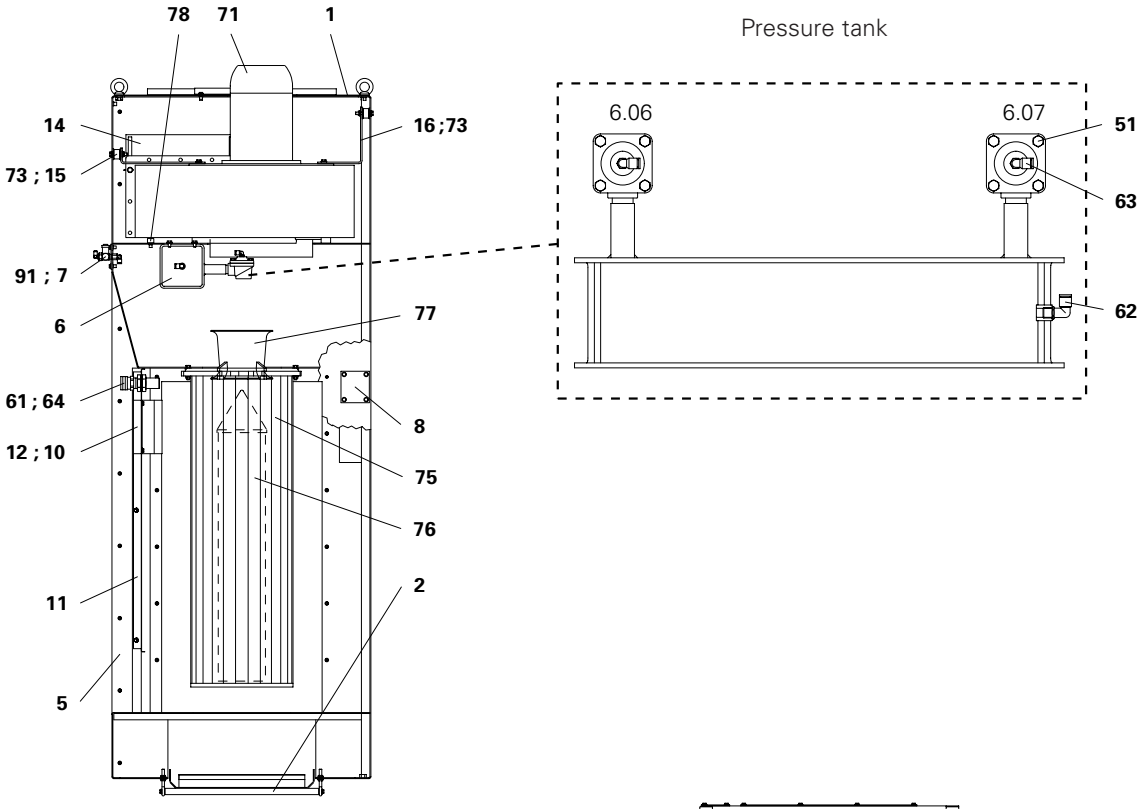
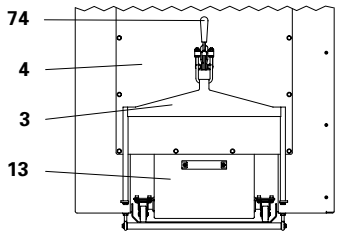
***** Indicate length required
Wear parts

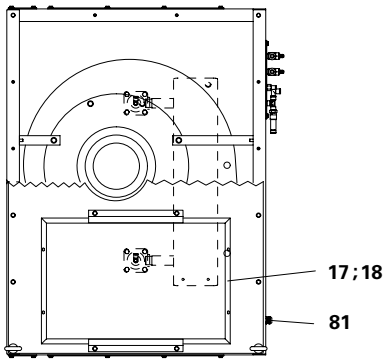
13.3 Exhaust Air Unit



Side view - Cross-section



Side view



Top view

13.4 CYLINDER UNIT - COMPLETE

	Cylinder Unit - complete	380 652
1	Cylinder holder	380 644
2	Carrier plate	380 750
3	Clamping bush	380 768
4	Intermediate plate	380 660
5	Cylinder holder	380 679
6	Spacer	380 687
7	Rubber disk	380 695
8	Linear carriage	380 776
26	O-Ring - ø 20 x 3 mm - Nitril	224 863
31	Cylinder	258 784
36	Elbow joint - 1/4"-ø 8 mm	225 479
37	Elbow joint - 1/4"-ø 8 mm	224 359
38	Elbow joint - 1/4"-ø 8 mm	254 002
41	Reflected light switch	260 150
42	Cylinder switch	259 438
43	Connection cable with angled plug	260 169
44	Connection cable with angled plug	259 420

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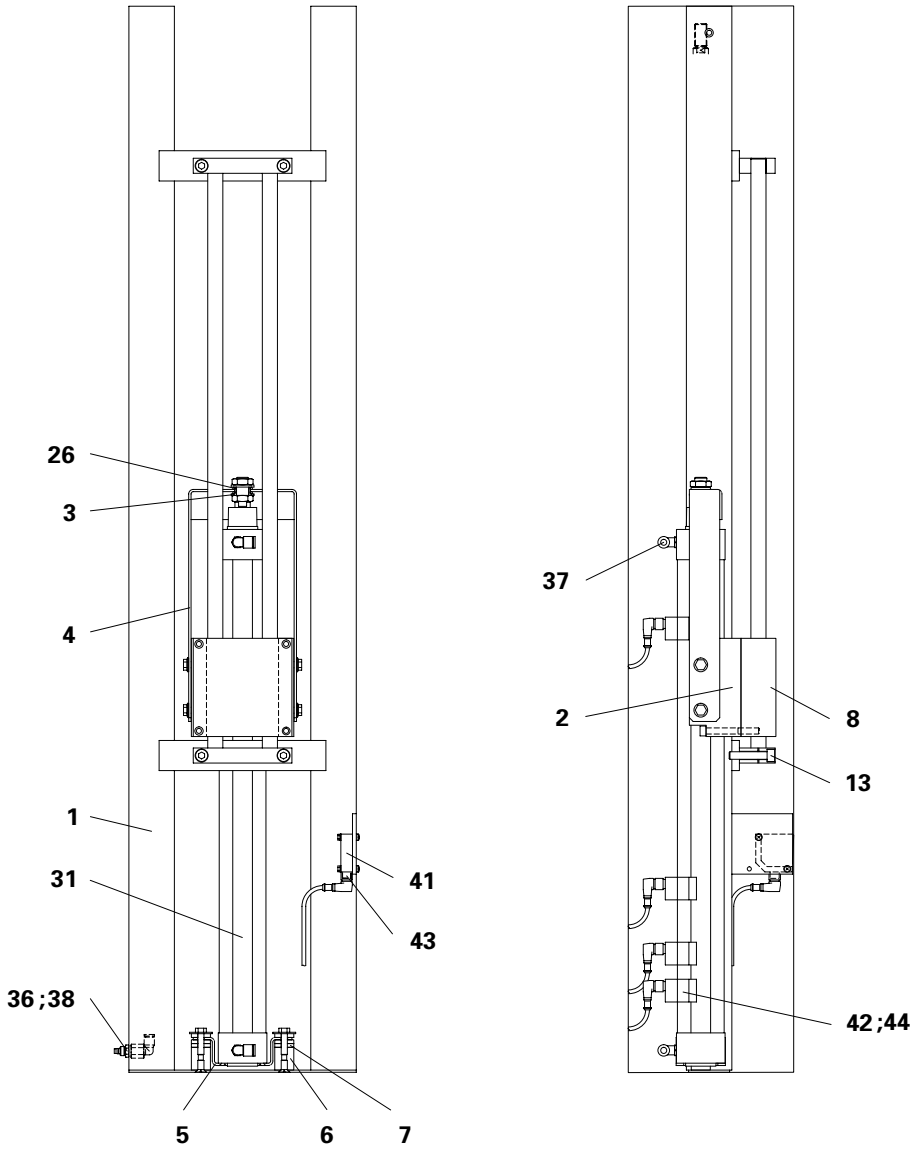
13.4 Cylinder Unit - complete



13.5 CONNECTION PLATE - LARGE - COMPLETE

	Connection plate - Large - complete	380 407
1	Connection plate - Large	380 385
2	Silencer - 1/8"	235 083
3	Stop valve	259 004
4	Safety valve - 1/4" - 6 bar	258 776
5	Adapter - 1/4"-ø 6 mm	233 404
6	Adapter - 1/8"-1/4"	231 932
7	Elbow connection - 1/4"-ø 8 mm	224 359
8	Elbow connection - 1/4"-ø 8 mm	254 002
9	T-Piece - 1/4"-1/4"-1/4"	261 173
10	Adhesive sealing strip	100 250*****

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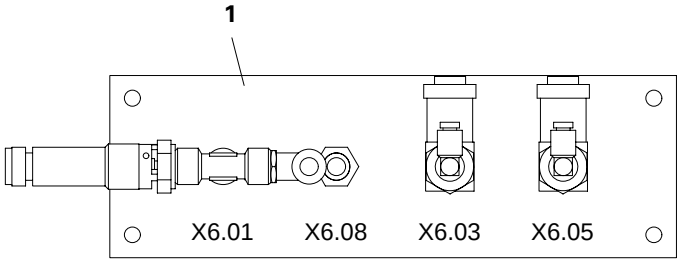
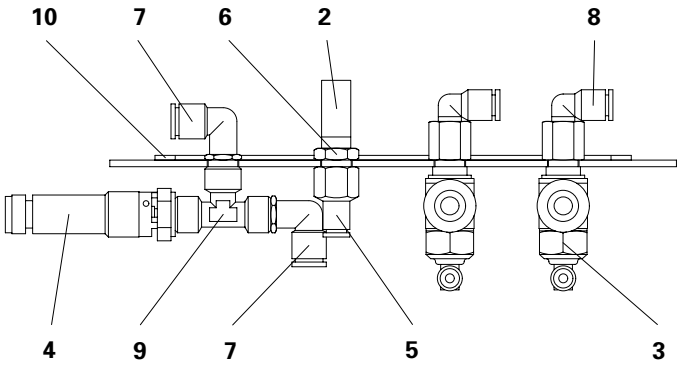
***** Indicate length required
Wear parts

13.5 Connection Plate - Large - Complete

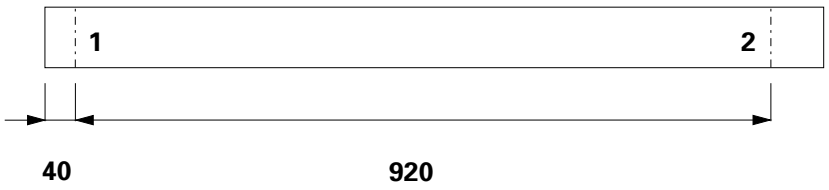




13.6 VIBRATION TABLE COMPLETE

1	Vibration table	375 411
2	Clamp plate	375 420
3	Rubber band	375 438**#**
21	Vibration motor	258 628
22	End caps	209 082
23	Rubber bearing - ø 40 x 40 mm-M8	223 000
24	Lead-through - PG13	204 919
31	Cable for Vibration motor	103 764*****

TENSIONING THE RUBBER BAND (3)



In order to give the rubber band sufficient tension, precede as follows:

1 Measure and mark 40 mm from one end, and mark a further 920 mm on the untensioned band.

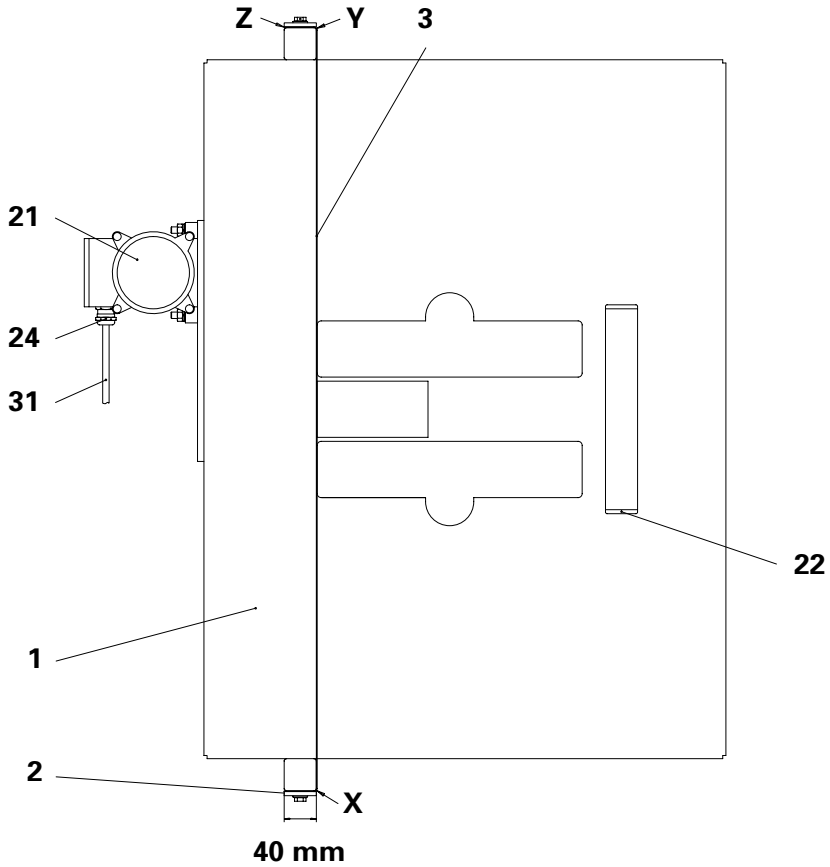
2 Fix the rubber band tight with the clamp plate (**2**) so that the first marking (40 mm) is at the position **X**.

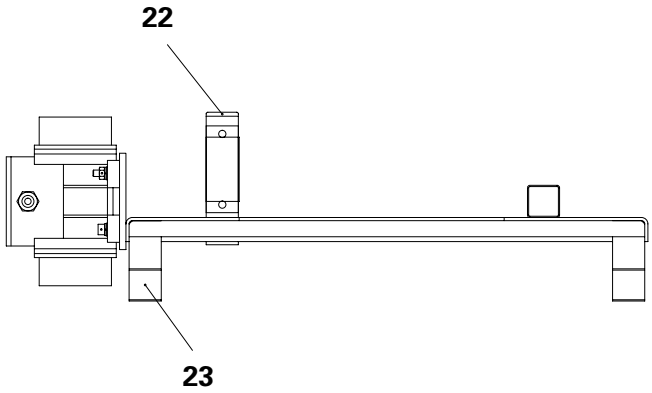
3 Stretch the rubber band to the second marking (920 mm) so that it is level with position **Y**, then clamp it tight with the second clamp plate.

4 Cut off any surplus rubber at the position **Z**.

***** Indicate length required
Wear parts

13.6 Vibration table complete





13.7 INJECTOR UNIT

1	Level sensor - complete	see page 51
2	Fluidizer - T-piece	373 150
3	Injector holder - 9 guns - Right	382 388
	Injector holder - 9 guns - Left	382 396
	Injector holder - 18 guns	373 346
	Injector holder - 27 guns - Right	382 400
	Injector holder - 27 guns - Left	382 418
4	Stop rod	372 986
5	Tie rod	373 052
6	Clamp	373 095
7	Fluidizing tube	373 109
8	Support tube - G1/8" x 342 mm	373 311
	Support tube - G1/8" x 382 mm	378 917
9	Support tube - G1/8" x 415 mm	373 303
	Support tube - G1/8" x 455 mm	378 909
10	Bracket - PI 3-V	373 338
	Bracket - PI 1-V	374 997
11	Suction tube - L = 450 mm	379 956
	Suction tube - L = 490 mm	382 450
16	Injector - PI 3-V	345 318
	Injector - PI 1-V	336 432
	Injector - PI 4-V	345 334
41	Check valve	259 330
42	Adapter - 1/8"-1/8"	259 551
43	Double adapter - 1/8"-1/8"	259 578
44	Elbow joint - 1/8"-ø 8 mm	203 050
45	T-piece - 1/8"-1/8"-1/8"	253 928
46	Cross piece - 1/8"	259 560
51	Socket clamp band - ø 10 mm	259 292
52	Grommet	259 586
56	Plastic hose - ø 8 / 6 mm - black - antistatic	103 756*****

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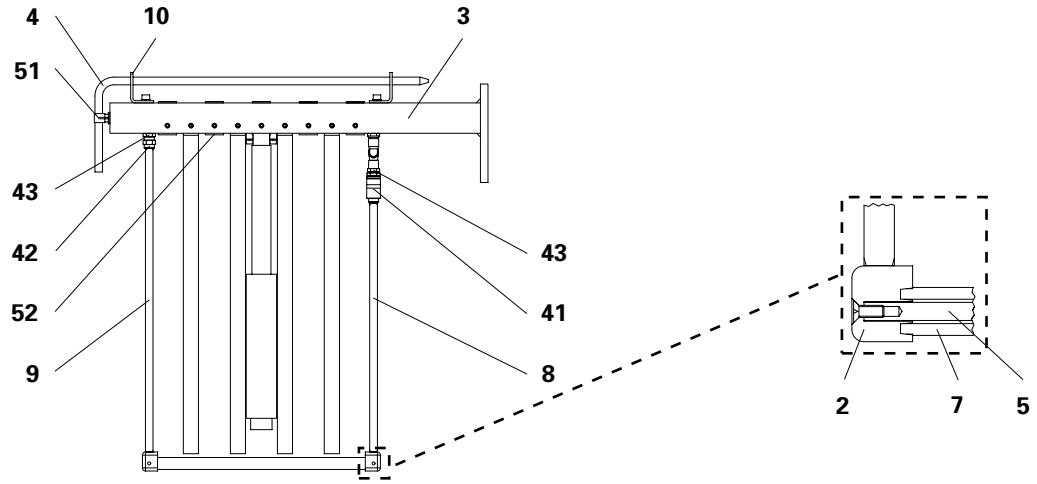
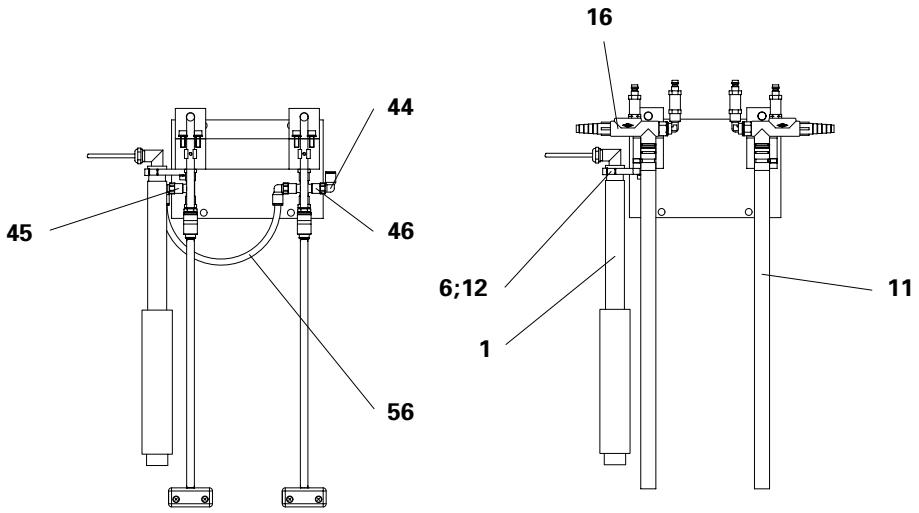
***** Indicate length required
Wear parts

13.7 Injector unit





13.8 CONTROL UNIT / PNEUMATIC 1

1	Assembly plate - complete	376 329
2	Assembly frame- complete (for 1 Dense phase conveyor - PZ 02)	378 313
3	Fitting rail	378 666
4	Fitting rail	373 281
5	Cable channel	373 257
6	Fitting rail - PZ 01	374 539
8	Valve holder (for 2 Dense Phase Conveyors) - complete	378 810
9	Valve block holder bracket	377 384
10	Fluidizing pad	404 780
14	Silencer - 1/2"	261 599
15	Silencer - 1/8"	251 305
16	Valve block (5.02) - PZ 02	263 010
17	Elbow joint - 1/4"-ø 6 mm	203 041
18	Elbow joint - 1/8"-ø 6 mm	254 061
19	Elbow joint - 1/4"-ø 8 mm	259 101
21	Silencer - 1/8"	251 305
22	Elbow joint - 1/4"-ø 8 mm	254 029
23	Throttle-Stop valve	258 768
35	Elbow joint - 1/8"-ø 8 mm	203 050
36	Plug - 1/8"	203 297
38	Pneumatic valve - NW4	257 125
39	Connection plate	257 141
50	Differential pressure monitor	259 110
60	Spacer - M4	256 501
66	Spacer (4 pieces)	238 325
70	Spacer screws (4 pieces)	261 688

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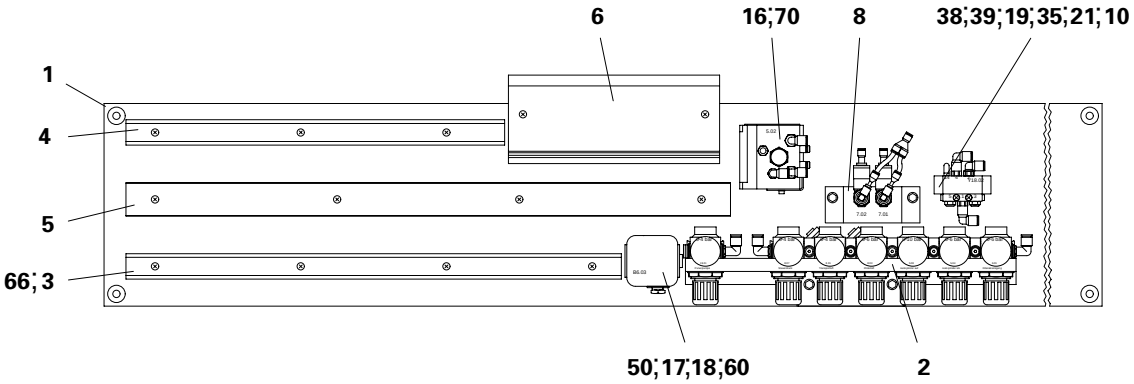
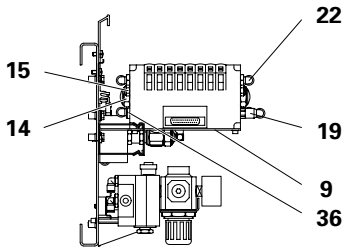
Wear parts

13.8 Control unit / Pneumatic 1





13.9 CONTROL UNIT / PNEUMATIC 2

1	Distributor tube 2.1	373 427
2	Distributor tube 2.0	373 435
3	Carrier plate	380 784
8	Ball valve - 3/4"-3/4"	259 764
10	Elbow - 1"-1"	258 725
12	Blind plug - 1/2"	259 306
13	Double adapter - 1/2"-1/2"	243 582
14	Solenoid valve - 1/2"- 24 VDC	259 195
15	Elbow -1/2"-1/2"	223 166
16	Hose connection - ø 16 mm-1/2"	259 268
17	Double adapter - 3/4"-3/4"	243 574
18	Solenoid valve - 3/4 - 24 VDC	259 209
19	Elbow - 3/4"-3/4"	259 233
20	Hose connection - 3/4"	226 343
21	Blind plug - 3/4"	259 314
22	Double adapter - 1"-1/2"	259 225
23	Pressure regulator - 0-10 bar	259 187
24	Pressure gauge - 1/8" - 0-10 bar	259 179
25	Check valve - 1/2"-1/2"	259 160
26	Hose connection - ø 16 mm-1"	259 276
33	Adapter - 1/8"-1/4"	231 932
35	Solaflex hose - ø 16 / 3.5 mm	102 296*****
36	Hose clamp - 25-35 mm	226 335

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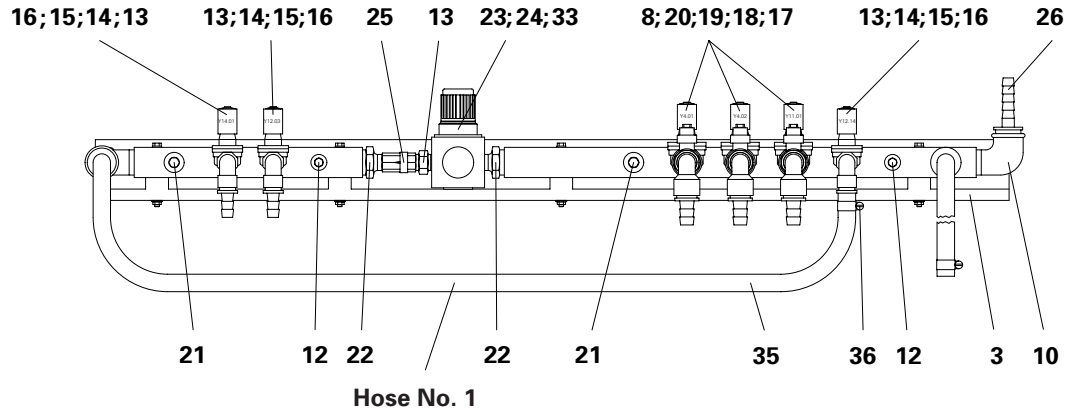
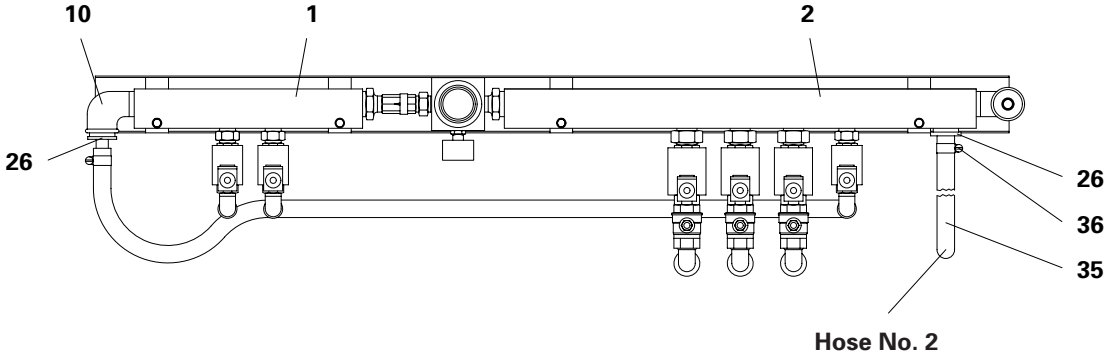
***** Indicate length required
Wear parts

13.9 Control unit / Pneumatic 2



Front view



Top view

Solaflex Hose

Hose No.	Length (mm)	Ø (mm)	Order No.
1	1520	23 / 16	102 296
2	460	23 / 16	102 296

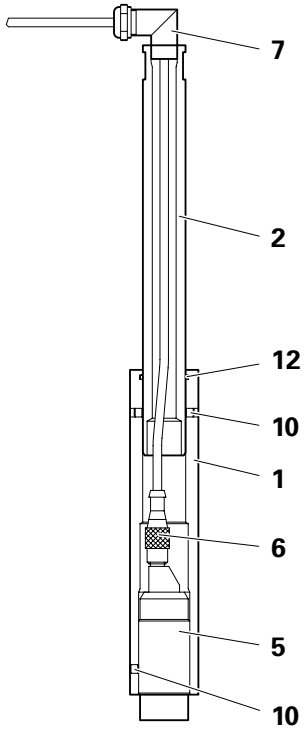
13.10 WASTE POWDER CONTAINER

	Waste powder container - complete	373 036
5	Roller - ø 50 mm	258 571
6	Handle	244 864
7	Edge protection profile - 16 x 16.5 mm	104 612

***** Indicate length required
Wear parts

13.11 LEVEL SENSOR

	Level sensor complete	373 192
1	Sensor holder	373 176
2	Holder extension	373 184
5	Proximity switch	258 911
6	Connection cable	258 920*****
7	Elbow Lead-through - PG9	258 938
10	Grub screw - M5x5 mm	258 908
12	O-Ring - ø 25x2 mm - Nitril	241 733**#**



***** Indicate length required
Wear parts

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