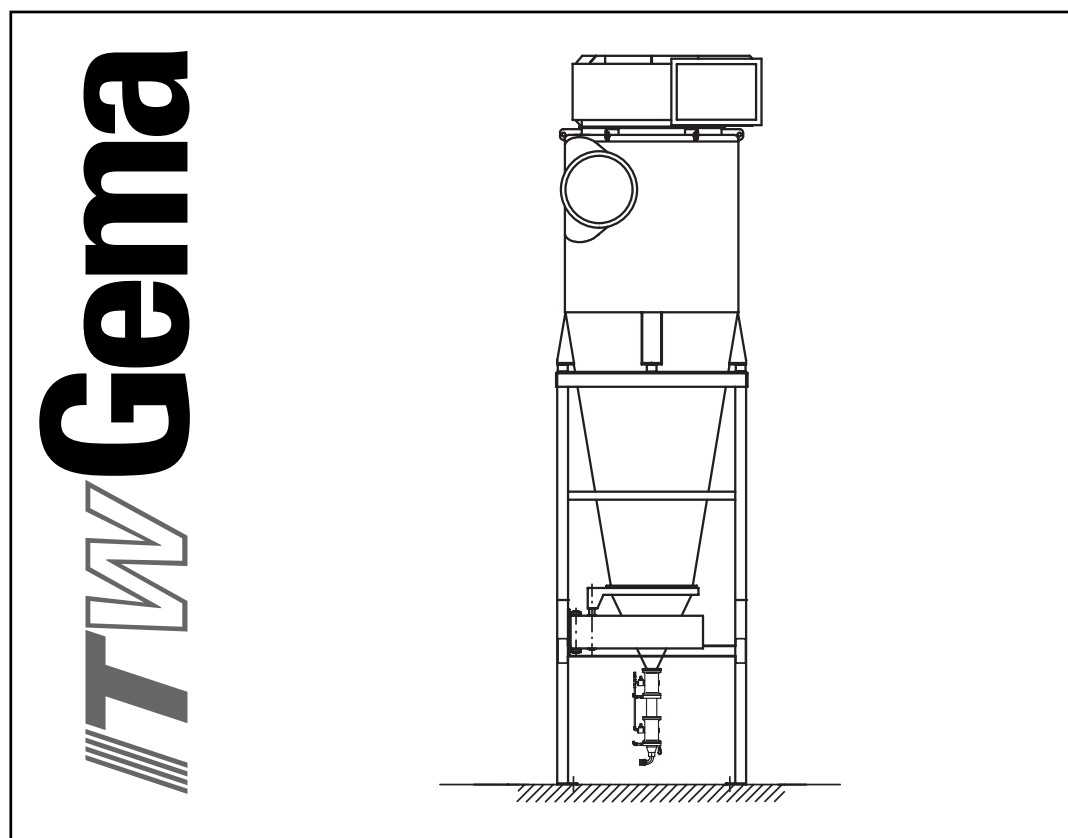

Operating instructions and spare parts list

EZ02 Monocyclone



Documentation EZ02 Monocyclone

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the EZ02 Monocyclone.

These safety regulations must be read and understood before the EZ02 Monocyclone 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 EZ02 Monocyclone 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 EZ02 Monocyclone 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 EZ02 Monocyclone 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 EZ02 Monocyclone 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 EZ02 Monocyclone 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.

Technical safety regulations for stationary electrostatic powder spraying equipment

General information

The powder spraying equipment from ITW Gema is designed with safety in mind and is built according to the latest technological specifications. This equipment can be dangerous if it is not used for its specified purpose. Consequently it should be noted that there exists a danger to life and limb of the user or third party, a danger of damage to the equipment and other machinery belonging to the user and a hazard to the efficient operation of the equipment.

1. The powder spraying equipment should only be started up and used once the operating instructions have been carefully studied. Improper use of the controlling device can lead to accidents, malfunction or damage to the control itself.
2. Before every start-up check the equipment for operational safety (regular servicing is essential)!
3. Safety regulations BGI 764 and VDE regulations DIN VDE 0147, Part 1, must be observed for safe operation.
4. Safety precautions specified by local legislation must be observed.
5. The plug must be disconnected before the machine is opened for repair.
6. The plug and socket connection between the powder spraying equipment and the mains network should only be taken out when the power is switched off.
7. The connecting cable between the controlling device and the spray gun must be set up so that it cannot be damaged during operation. Safety precautions specified by local legislation must be observed!

8. Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. Damage caused by other parts is not covered by guarantee.
9. If ITW-Gema powder spraying equipment is used in conjunction with machinery from other manufacturers then their safety regulations must also be taken into account.
10. Before starting work familiarize yourself with all installations and operating elements, as well as with their functions! Familiarization during operation is too late!
11. Caution must be exercised when working with a powder/air mixture! A powder/air mixture in the right concentration is flammable! Smoking is forbidden in the entire plant area!
12. As a general rule for all powder spraying installations, persons with pacemakers should never enter high voltage areas or areas with electromagnetic fields. Persons with pacemakers should not enter areas with powder spraying installations!



WARNING!

We emphasize that the customer himself is responsible for the safe operation of equipment. ITW-Gema is in no way responsible for any resulting damages!

Safety conscious working

Each person responsible for the assembly, start-up, operation, service and repair of powder spraying equipment must have read and understood the operating instructions and the "Safety regulations"-chapter. The operator must ensure that the user has had the appropriate training for powder spraying equipment and is aware of the possible sources of danger.

The control devices for the spray guns must only be set up and used in zone 22. Only the spray gun should be used in zone 21.

The powder spraying equipment should only be used by trained and authorized personnel. This applies to modifications to the electrical equipment, which should only be carried out by a specialist.

The operating instructions and the necessary closing down procedures must be followed before any work is carried out concerning the set-up, start-up, operation, modification, operating conditions, mode of operation, servicing, inspection or repairs.

The powder spray equipment can be turned off by using the main switch or failing that, the emergency shut-down. Individual components can be turned off during operation by using the appropriate switches.

Individual safety regulations for the operating firm and/or operating personnel

1. Any operating method which will negatively influence the technical safety of the powder spraying equipment is to be avoided.
2. The operator should care about no non-authorized personnel works on the powder spraying equipment (e.g. this also includes using the equipment for non-conform work).
3. For dangerous materials, the employer has to provide an operating instructions manual for specifying the dangers arising for hu-

mans and environment by handling dangerous materials, as well as the necessary preventive measures and behavior rules. The operating instructions manual has to be written in an understandable form and in the language of the persons employed, and has to be announced in a suitable place in the working area.

4. The operator is under obligation to check the powder spraying equipment at least once every shift for signs of external damage, defects or changes (including the operating characteristics) which could influence safety and to report them immediately.
5. The operator is obliged to check that the powder spraying equipment is only operated when in satisfactory condition.
6. As far as is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).
7. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.
8. No safety devices should be dismantled or put out of operation. If the dismantling of a safety device for set-up, repair or servicing is necessary, reassembly of the safety devices must take place immediately after the maintenance or repair work is finished. The powder spraying device must be turned off while servicing is carried out. The operator must train and commit the responsible personnel to this.
9. Activities such as checking powder fluidization or checking the high-voltage spray gun etc. must be carried out with the powder spraying equipment switched on.

Notes on special types of hazard

Power

It is necessary to refer once more to the danger of life from high-voltage current if the shut-down procedures are not observed. High voltage equipment must not be opened - the plug must first be taken out - otherwise there is danger of electric shock.

Powder

Powder/air mixtures can be ignited by sparks. There must be sufficient ventilation in the powder coating booth. Powder lying on the floor around the powder spraying device is a potentially dangerous source of slipping.

Static charges

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Charging of objects must be avoided - see "Earthing".

Grounding/Earthing

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, part 102) must be earthed 1.5 meters either side and 2.5 meters around each booth opening. The earthing resistance must amount to maximally 1 M Ω . The resistance must be tested on a regular basis. The condition of the machinery surroundings as well as the suspension gear must ensure that the machinery remains earthed. If the earthing of the machinery includes the suspension arrangements, then

these must constantly be kept clean in order to guarantee the necessary conductivity. The appropriate measuring devices must be kept ready in the workplace in order to check the earthing.

Compressed air

When there are longer pauses or stand-still times between working, the powder spraying equipment should be drained of compressed air. There is a danger of injury when pneumatic hoses are damaged and from the uncontrolled release and improper use of compressed air.

Crushing and cutting

During operation, moving parts may automatically start to move in the operating area. It must be ensured that only instructed and trained personnel go near these parts. The operator should ensure that barriers comply with the local security regulations.

Access under exceptional circumstances

The operating firm must ensure that local conditions are met when repairs are made to the electronic parts or when the equipment is restarted so that there are additional measures such as barriers to prevent unauthorized access.

Prohibition of unauthorized conversions and modifications to machines

All unauthorized conversions and modifications to electrostatic spraying equipment are forbidden for safety reasons.

The powder spraying equipment should not be used if damaged, the faulty part must be immediately replaced or repaired. Only original ITW-Gema replacement parts should be used. Damage caused by other parts is not covered by guarantee.

Repairs must only be carried out by specialists or in ITW-Gema workshops. Unauthorized conversions and modifications may lead to injury or damage to machinery. The ITW Gema AG guarantee would no longer be valid.

Safety requirements for electrostatic powder coating

1. This equipment is dangerous if the instructions in this operating manual are not followed.
2. All electrostatic conductive parts, in particular the machinery within 5 meters of the coating equipment, must be earthed.
3. The floor of the coating area must conduct electricity (normal concrete is generally conductive).
4. The operating personnel must wear electricity conducting footwear (e.g. leather soles).
5. The operating personnel should hold the gun with bare hands. If gloves are worn, these must also conduct electricity.
6. The supplied earthing cable (green/yellow) must be connected to the earthing screw of the electrostatic powder spraying hand appliance. The earthing cable must have a good metallic connection with the coating booth, the recovery unit and the conveyor chain and with the suspension arrangement of the objects.

7. The electricity and powder supply to the hand guns must be set up so that they are fully protected against heat and chemical damage.
8. The powder coating device may only be switched on once the booth has been started up. If the booth cuts out then the powder coating device must be switched off.
9. The earthing of all electricity conducting devices (e.g. hooks, conveyor chains) must be checked on a weekly basis. The earthing resistance must amount to maximally 1 MOhm.
10. The control device must be switched off if the hand gun is cleaned or the nozzle is changed.
11. When working with cleaning agents there may be a risk of hazardous fumes. The manufacturers instructions must be observed when using such cleaning agents.
12. The manufacturers instructions and the applicable environmental requirements must be observed when disposing of powder lacquer and cleaning agents.
13. If any part of the spray gun is damaged (broken parts, tears) or missing then it should not be used.
14. For your own safety, only use accessories and attachments listed in the operating instructions. The use of other parts can lead to risk of injury. Only original ITW-Gema replacement parts should be used.
15. Repairs must only be carried out by specialists and under no circumstances should they be carried out in the operating area. The former protection must not be reduced.
16. Conditions leading to dangerous levels of dust concentration in the powder spraying booths or in the powder spraying areas must be avoided. There must be sufficient technical ventilation available, to prevent a dust concentration of more than 50% of the lower explosion limit (UEG) (UEG = max. permissible powder/air concentration). If the UEG is not known then a value of 10 g/m³ should be used.

A summary of the rules and regulations

The following is a list of relevant rules and regulations which are to be observed:

Guidelines and regulations, German professional association

BGV A1	General regulations
BGV A2	Electrical equipment and material
BGI 764	Electrostatic coating
BGR 132	Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline "Static Electricity")
VDMA 24371	Guidelines for electrostatic coating with synthetic powder ¹⁾ - Part 1 General requirements - Part 2 Examples of use

Leaflets

ZH 1/310	Leaflet for the use of tools in locations where there is danger of explosion ¹⁾
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EN European standards

RL94/9/EC	The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres
EN 292-1 EN 292-2	Machine safety ²⁾
EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171	Electrical equipment for locations where there is danger of explosion ³⁾
EN 50 050	Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment ²⁾
EN 50 053, part 2	Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Hand-held electrostatic powder spray guns ²⁾
EN 50 177	Stationary electrostatic spraying equipment for flammable coating powder ²⁾
PR EN 12981	Coating plants - Spray booths for application of organic powder coating material - Safety requirements
EN 60 529, identical: DIN 40050	IP-Type protection: contact, foreign bodies and water protection for electrical equipment ²⁾
EN 60 204 identical: DIN VDE 0113	VDE regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V ³⁾

VDE (Association of German Engineers) Regulations

DIN VDE 0100	Regulations for setting-up high voltage equipment with nominal voltages up to 1000V ⁴⁾
DIN VDE 0105 part 1 part 4	VDE regulations for the operation of high voltage equipment ⁴⁾ General regulations Supplementary definitions for stationary electrical spraying equipment
DIN VDE 0147 part 1	Setting up stationary electrostatic spraying equipment ⁴⁾
DIN VDE 0165	Setting up electrical equipment in locations in areas with danger of explosion ⁴⁾

***Sources:**

- ¹⁾ Carl Heymanns Verlag KG, Luxemburger Strasse 449, 5000 Köln 41, or from the appropriate employers association
- ²⁾ Beuth Verlag GmbH, Burgrafenstrasse 4, 1000 Berlin 30
- ³⁾ General secretariat, Rue Bréderode 2, B-1000 Bruxelles, or the appropriate national committee
- ⁴⁾ VDE Verlag GmbH, Bismarckstrasse 33, 1000 Berlin 12

Special 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 EZ02 Monocyclone. 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.

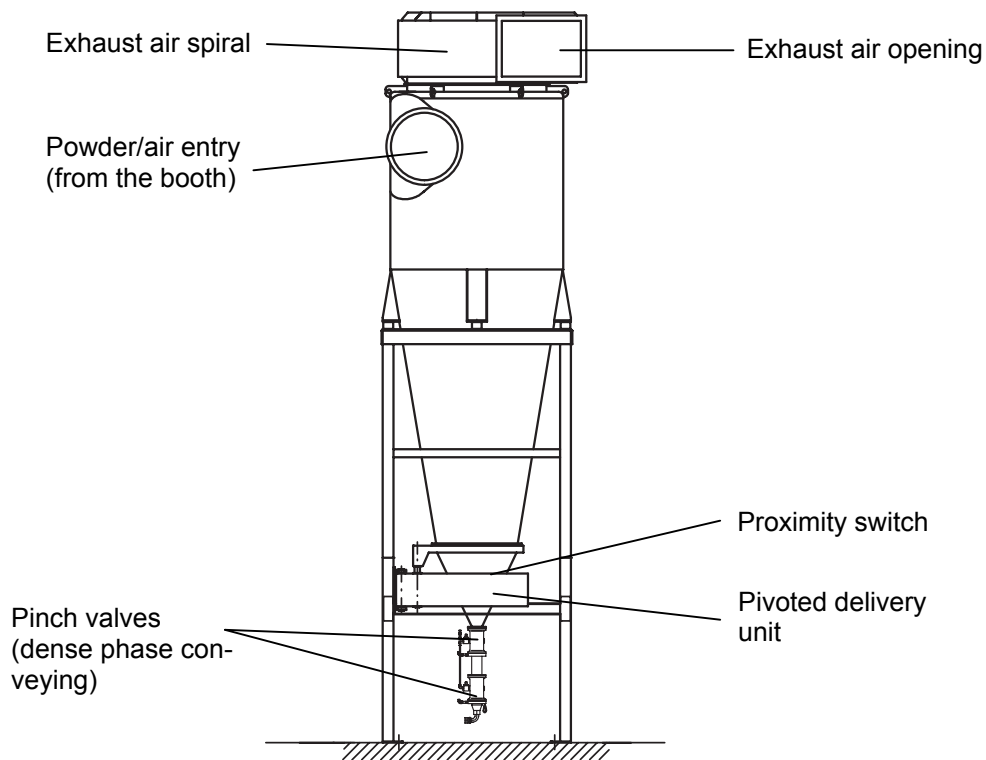
Information about the function mode of the individual system components - reciprocators, booths, powder gun controls, powder guns etc. - you will find in the corresponding enclosed documentations.

Description of function

EZ02 Monocyclone

The EZ02 Monocyclone (as a matter of principle a centrifugal cyclone) separates the coating powder from the booth exhaust air.

The volume of exhaust air, depending on the booth size, the number of guns etc. is created by a fan fitted after the monocyclone and a filter separator. The powder/air mixture arrives at the cyclone through the ducting and the tangential air input. Now the powder is set in rotation, separated from the air by the centrifugal force and isolated around the cyclone wall. The exhaust air rises up through the central immersion tube in the cyclone and arrives at the filter separator. Herein, the residual powder is retained and the cleaned air is returned into the workshop environment.

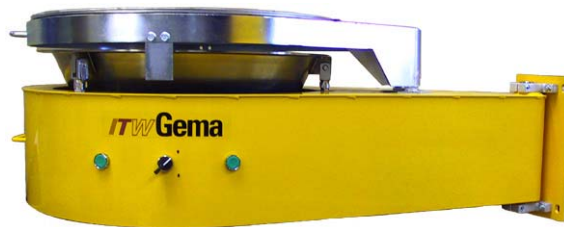


EZ02 Monocyclone

Delivery unit

The separated powder is removed from the operating cyclone by the pivoted delivery unit. The delivery unit, consisting of the cyclone connection, the sieve insert and the dense phase conveying, is pivoted manually under the cyclone and fitted pneumatically. The separated powder collects in the lower cone part and passes through the opened upper pinch valve into the intermediate tube between both pinch valves. At regular intervals, the upper pinch valve closes and the lower valve opens. The powder is now transported by the conveying air from the intermediate tube through the transport hose to the sieve machine or to the powder hopper. After the conveying cycle the lower pinch valve closes and the upper valve opens again. During the whole operation a small air movement must exist in the transport hose, therewith no clogging occurs. This is achieved with the transport air, which is introduced into the hose connection after the lower pinch valve (see also chapter "Dense phase conveying").

Consequently, a periodical extraction of powder takes place, which is regained and fed back to the powder coating circuit.



Delivery unit

Security-operation of the delivery unit

The delivery unit is pivoted manually under the cyclone and fitted pneumatically. The appropriate operation is provided for safety reasons with a two-hand function.



Two-hand security-operation of the delivery unit

Technical Data

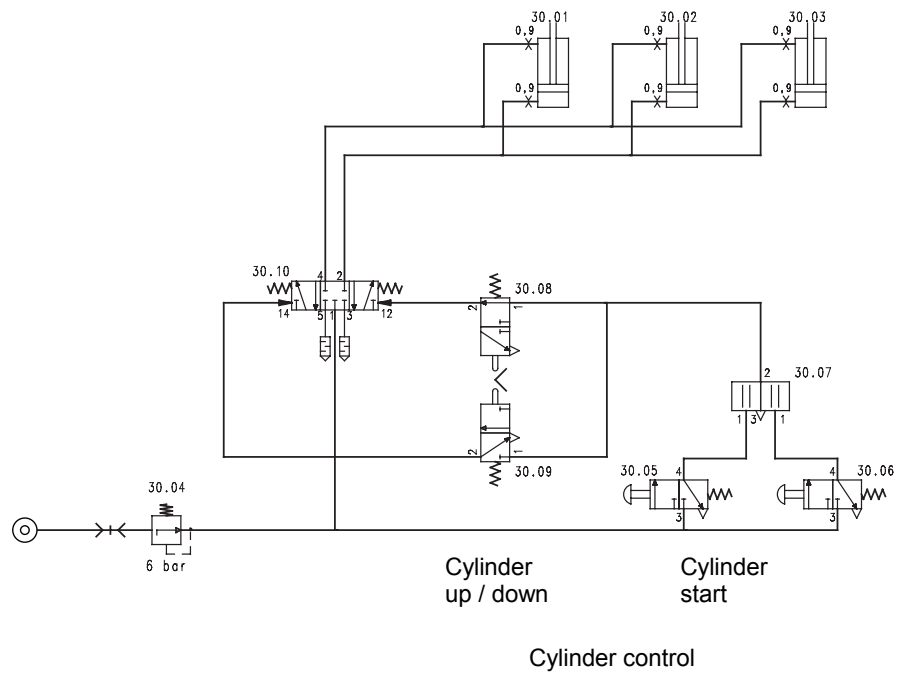
Exhaust air volume / powder application

Monocyclone	EZ02-12000	EZ02-16000	EZ02-20000	EZ02-24000
Exhaust air volume	11000-12000 m ³ /h	14000-16000 m ³ /h	18000-20000 m ³ /h	22000-24000 m ³ /h
Powder application				
Pinch valve	NW 65			
Conveying performance	approx. 2,5 kg/min			
Compressed air consumption	approx. 4 Nm ³ /h			

Setting values / parameters

Monocyclone	EZ02-12000	EZ02-16000	EZ02-20000	EZ02-24000
Pinch valve control pressure	max. 3 bar			
Conveying air pressure	approx. 1 bar			
Transport air pressure	approx. 0,3 bar			
Pinch valve closing time	6 secs			
Pinch valve opening time	2 secs			
Conveying air on (retarded)	0,7 secs			

Pneumatical scheme



Pneumatical scheme

Assembly notes

Setting up and mounting



The assembly procedure for setting up the cyclone must be adapted to the available resources of the customer. Since it concerns heavy and bulky parts, special attention must be given to the security of the assembly personnel. In order to guarantee operating safety, all assembly work must be checked by trained personnel!

Especially the following points must be observed:

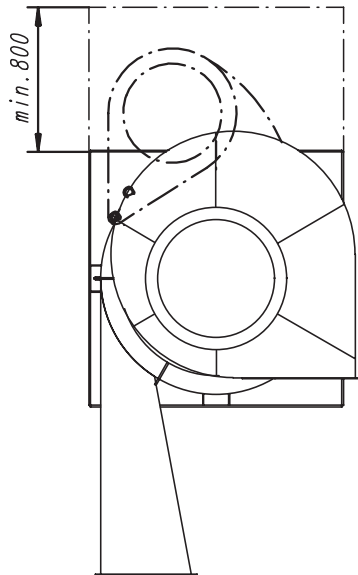
- The angle between the air entry and exit can be set by 15° with the existing slots (slots $\pm 7.5^\circ$). If the angle must be displaced further, the exit spiral must be completely dismantled and can be displaced in 15° steps
- All connecting joints (exit spiral etc.) must be locked hermetically
- It must be observed that all connecting joints in the ducting and inside the cyclone etc. are as smooth as possible, so that no powder can deposit
- In order to ensure the grounding connection from the frame to the cyclone, a vibration damper must be bridged with the supplied grounding cable
- On the separation point of the frame feet and their extensions, the feet must also be connected to one another. Three connection profiles are supplied for this. The fourth connection point must be left free for pivoting the delivery unit. The position can be chosen by assembly, according to local conditions
- The monocyclone must be firmly anchored to the workshop floor
- The ducting must be assembled as tension-free as possible
- The delivery unit is preassembled ready and for mounting
- For monitoring the correct position of the delivery unit, a proximity switch must be fitted on the cyclone, which gives a signal when the delivery unit is pivoted and lifted to the cyclone and releases the plant for operation
- The transport hose must be secured with the supplied steel cable to the spring hook of the dense phase conveyor, so

that no uncontrolled movement can take place by revertive rinsing and thereby endangering personnel

- The connecting hoses of the delivery unit control and the dense phase conveyor are to be applied in such a way that the delivery unit can be tilt out for cleaning without disconnecting the hose connections
- The delivery unit and the cyclone must be closed tightly during operation. The seals of the cyclone and of the swivel frame are to be examined regularly

Space requirement for delivery unit

Swinging out the delivery unit needs at least 800 mm swiveling area. This place may not be closed or blocked and is used also for operation, cleaning and maintenance.



Space requirement for delivery unit

Preparation for start-up

Important notes



**The start-up should be done only by trained personnel!
Foreign objects in the booth or in the ducting can cause damages to the plant!**

Before start-up, the following points are to be checked:

- Are all screw connections on the cyclone and on other plant units firmly tightened?
- Is the ducting and the interior of the cyclone cleaned properly?
- Are all ducting and hose connections connected correctly?
- Are there no foreign objects (e.g. screws, small parts etc.) in the booth, the cyclone or the ducting?
- Is the delivery unit completely assembled?
- Are all plant units grounded?
- Is the delivery unit connected correctly? Does the two-hand function (security-operation) of the delivery unit works correctly?
- Is the transport hose connected correctly on the exhaust side?
- Are the settings for the dense phase conveyor correct?



The plant may be put into operation after all these points are checked and any faults are corrected!

Dense phase conveying

General information

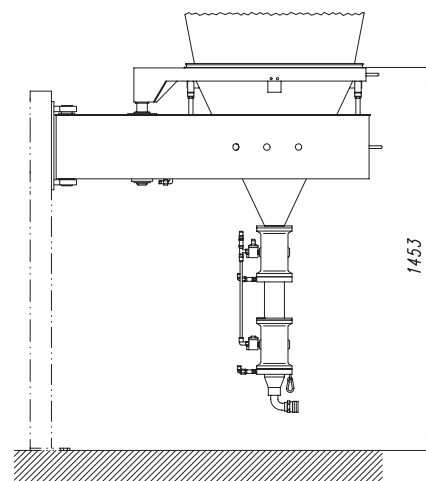
The dense phase conveying serves for the transport of the recovered powder to the powder container/hopper in the powder centre. This transport principle permits a very careful and dust-free powder transport because the air requirement and the transport speed are very low.

Dense phase conveying - PT06

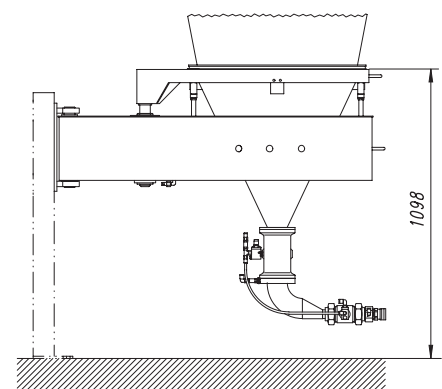
This type is the standard dense phase conveying, which is normally delivered with the cyclone and the delivery unit.

Dense phase conveying - PT07

This type is a curved special version and is only used by lack of space. Further information of this version will be found in the appropriate manual.



Dense phase conveying - PT06



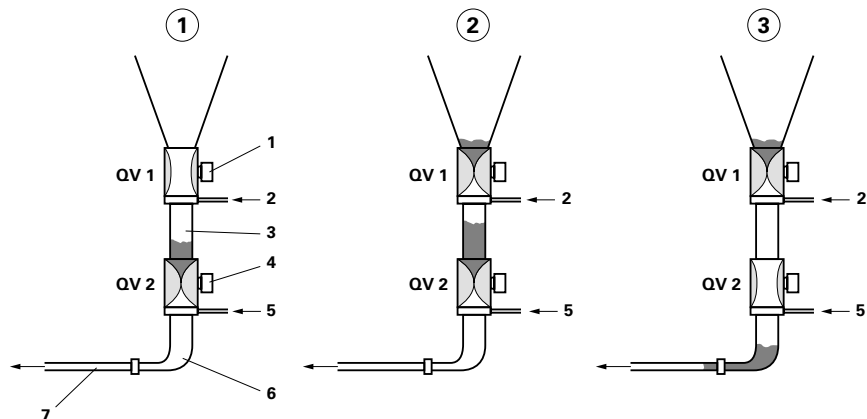
Dense phase conveying - PT07

Description of function

1. The upper pinch valve **QV1** opens. The recovered powder falls through the pinch valve **QV1** into the intermediate tube (3), see picture 1
 - The lower pinch valve **QV2** is thereby closed
 - The spiral air (5) is constantly in operation
 - The conveying air (2) is switched off
2. The pinch valve **QV1** closes
3. The pinch valve **QV2** opens
 - The pinch valve **QV1** is thereby closed
 - The spiral air (5) is constantly in operation
 - The conveying air (2) is switched on for a short time

Due to the overpressure in the intermediate tube (3), the powder is transported through the pinch valve **QV2** into the delivery tube and through the transport hose (7) into the sieve machine by the Powder Centre, see picture 2

4. The pinch valve **QV2** closes, see picture 3
 - After a short delay the pinch valve **QV1** opens again
 - The steps 1) to 4) are repeated continuously



Dense phase conveying - description of function

- 1 Switch valve above
- 2 Conveying air
- 3 Intermediate tube
- 4 Switch valve below
- 5 Spiral air (constantly on)
- 6 Delivery nozzle
- 7 Transport hose

The transport efficiency is dependent on the type of powder, the pulse rates and the length of the used transport hose with respective pinch valve and transport hose dimension.

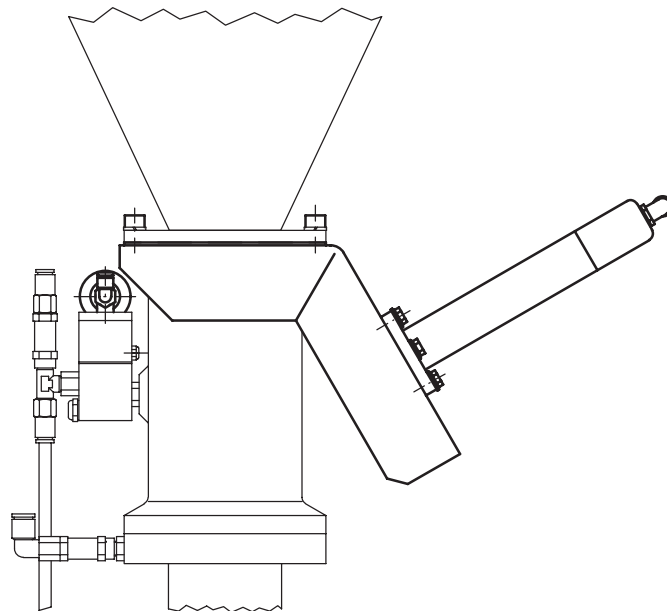
Vibrator mounting kit (option)

By using certain powder types, the danger exists that powder deposits can develop in the delivery unit. This is prevented by the optionally available vibrator mounting kit.

The vibrator is installed between the delivery unit and the dense phase conveying (see illustration). It shifts the cone of the delivery unit into easy oscillations and prevents thus accumulations of powder and the emergence of deposits and blockages.



The vibrator operates only if the upper pinch valve QV1 of the dense phase conveying is opened



Vibrator mounting kit (option)

Color change

Procedure

The following points are to be observed at colour changes:

1. In order to save time and powder at a colour change, the cleaning should be made in the flow direction of the powder. But cleaning the powder guns and the booth should be done first. During this phase, the powder can be transported back into the powder hopper or the powder container with the dense phase conveyor
2. The delivery unit is detached from the cyclone. By the aspirated wrong air at the cyclone lower part, the powder separation now is void and all resulting powder is fed to the After Filter
3. Procedure at an extreme colour change or with increased requirements:
 - Blow out the exhaust air ducting between the booth and the cyclone with compressed air
 - Let soak in the compressed air hose without nozzle in the ducting at the air exhaust while the exhaust is operating
 - The turbulences which are caused thereby will detach the powder in the ducting. After that, the powder is transported to the cyclone and discharged
4. After switching off the dense phase conveyor, the transport hose is now flushed with compressed air from the exhaust side and cleaned in this way
5. While the delivery unit is slowly being swivelled away from the cyclone, the cone of the delivery unit is blown out and the generated dust is sucked up into the cyclone
6. Now the inside wall of the cyclone is cleaned with the air nozzle
7. The cleaning of the immersion tube is done with a special cleaning head (see "Cleaning of the connection sleeves")
8. Now the cleaning of the cyclone, the delivery unit and the ducting is completed

Maintenance

Checkpoints and references

In order to guarantee a trouble-free operation, the following points should be checked regularly during a operation break:



Attention:

All cleaning work should be carried out without scratching. Any scratches on the surface lead to increased powder sintering and thus to increased cleaning effort!

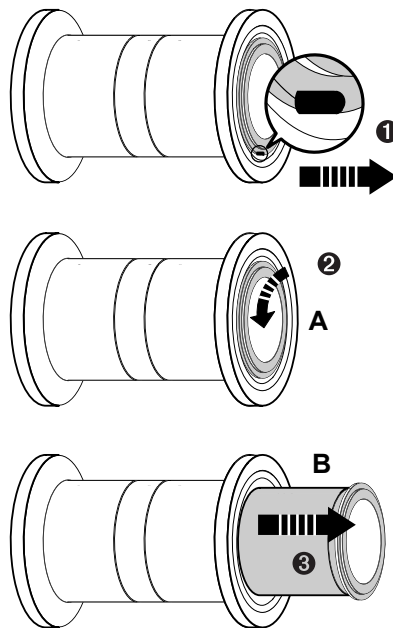
Points to check	Possible causes
Check for powder depositing in the booth and the suction tube and clean it	Increased deposits indicate a reduction of the exhaust air and changes in the powder
Check the cyclone for powder sintering	Increased sintering indicates increased exhaust air and changes in the powder
Check for powder depositing in the delivery unit	Deposits indicate higher powder development or reduced conveying performance
Check for sintering in the transport hose	Increased sintering indicates ageing of the hose or changes in the powder
Check the cleanliness of the cyclone exterior	Contaminations indicate any leakages in the coating environment
Check the grounding connections of the plant units	
Check the seals of the delivery unit and of the sieve insert	Defective seals worsen the efficiency substantially

Maintenance - pinch valve

Replacing a pinch valve sleeve

Dismantling:

1. Remove the dense phase conveying from the cyclone and dismantle the pinch valve
2. Remove the black positioning pin with pliers (1)
3. Turn the pinch valve sleeve 45° counter-clockwise (2)
4. Pull out the pinch valve sleeve and replace it (3)



Pinch valve/pinch valve sleeve

Assembly:

1. Place the wide tongue on the pinch valve sleeve into the wide slot on the pinch valve
2. Push in the pinch valve sleeve to the stop
3. Turn the pinch valve sleeve 45° clockwise to the stop
4. Refit the black positioning pin into its hole
5. Check the O-rings for damage and replace them, if necessary
6. Reassemble the pinch valve

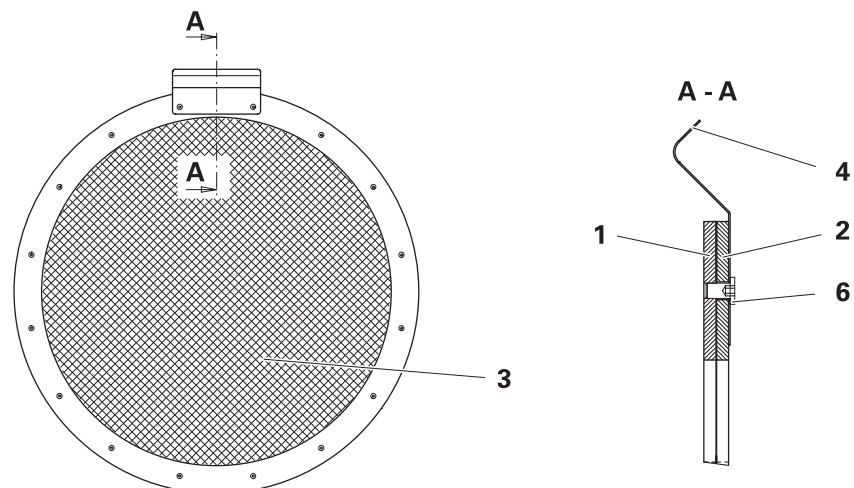
Maintenance - Sieve mesh tension



In order to prevent injuries by overhanging wires it is recommended to work with gloves on!

Use the following procedure to cloth the sieve mesh:

1. Place the supporting ring on the workbench
2. Put the sieve mesh (3) on the supporting ring (note that the mesh evenly stands out everywhere)
3. Apply the clamping ring (2), align the supporting ring (1) and the clamping ring (2) holes
4. At one hole, puncture the sieve mesh (3) with a sharp object (e.g. awl) and screw in a screw (6)
5. Stretch the sieve mesh on the opposite side with a combination pliers and, at the same time, puncture the sieve mesh (3) and insert a screw (6)
6. Turn the sieve 90°, stretch the sieve mesh again with a combination pliers, puncture the sieve mesh (3) and insert a screw (6)
7. Stretch the sieve mesh on the opposite side with a combination pliers and, at the same time, puncture the sieve mesh (3) and insert a screw (6)
8. Stretch the sieve mesh at each intermediate hole with a combination pliers, puncture the sieve mesh (3) and insert a screw (6)
9. Fit the additionally grounding spring (4) with two screws
10. Cut away the surplus mesh (3) with a sharp knife and remove the overhanging wires with a grinding wheel



Sieve insert/sieve mesh tension

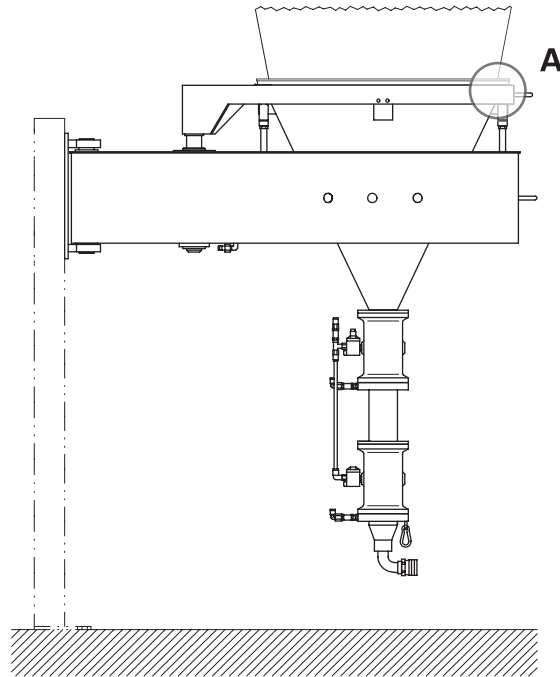


In order to achieve a good sieve-performance make sure that the sieve mesh is stretched uniformly tight!

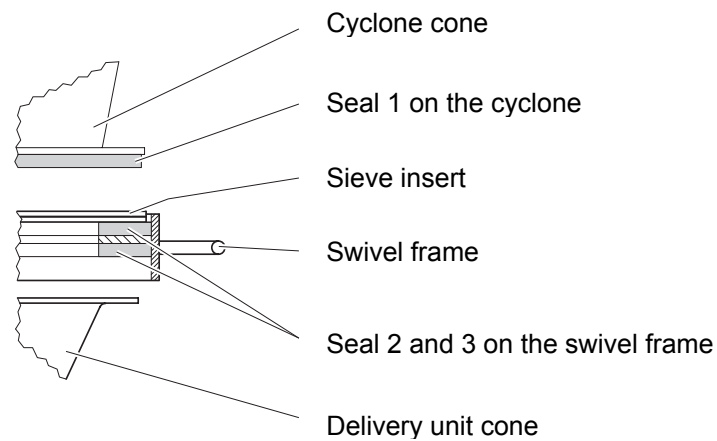
Small damages in the sieve mesh can be filled with 2-components adhesive.

Monocyclone sealing

In order to achieve a good cyclone-performance it is very important that the delivery unit is tightly closed during the operation. In order to ensure a perfect operation, three seals are intended in accordance with following drawing:



A



Monocyclone sealing/delivery unit

Seal 1	bottom of the cyclone cone flange	seals between cyclone cone and sieve insert or delivery unit cone
Seal 2	top of the swivel frame	seals between sieve insert and swivel frame
Seal 3	bottom of the swivel	seals between swivel frame

	frame	and delivery unit cone
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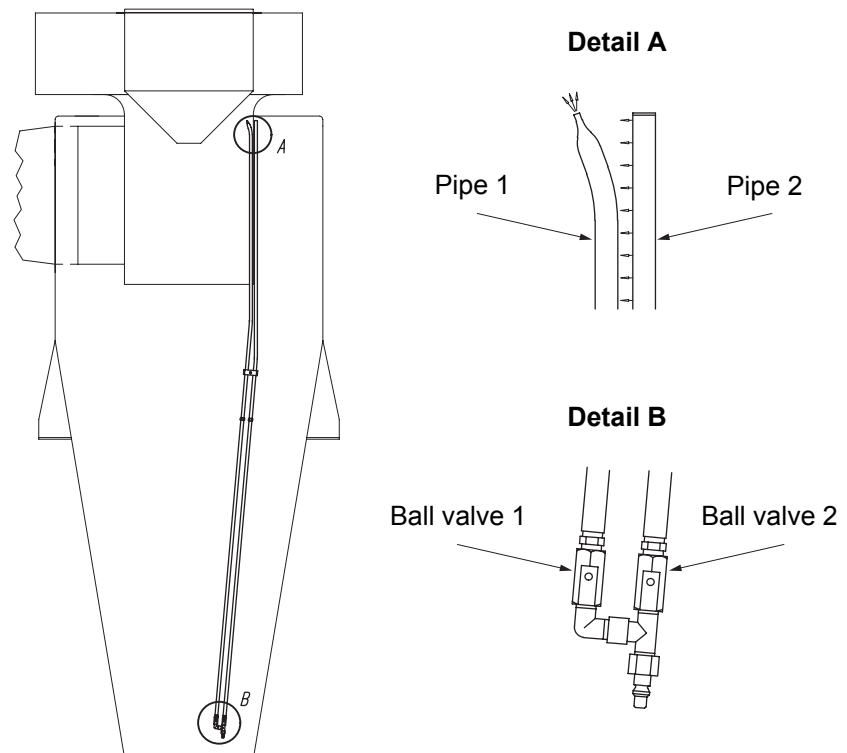
The seals are always to be checked during start up as well during the operation. Damaged seals are to be replaced immediately! Leakages on the cycone site will greatly decrease the efficiency of the cyclone, i.e. it goes more powder to the After Filter than into the recuperation.

Cleaning

Cleaning of the connection sleeves

The cleaning of the cyclone takes place with the provided cleaning lance. It is composed of two blast pipes with the following features:

Cleaning of the clean gas connecting sleeve



Cleaning lance / sleeves

The blast lance is put on the clean gas connecting sleeve, pipe 1 inside - pipe 2 outside. By turning on the compressed air on ball valve 2, the cleaning air for the outside diameter is turned on and the clean gas pipe is blown through on the entire level at once. During the blowing process, the lance is now conducted manually throughout the entire clean gas pipe thus cleaning the entire connecting sleeve. Pipe 1 inside the pipe prevents the blowing nozzle from being pushed off during cleaning.

Cleaning of the inlet connection sleeve

By using the pipe 1 and the compressed air at ball valve 1, individual ranges in the cyclone can be blown off purposefully.



In order to provide as much compressed air as possible during cleaning, only one ball valve should be opened for each cleaning process!

The following points are to be considered for the further maintenance and the care of the cyclone:

Item	Cleaning and/or check cycle	Remarks
Collecting funnel inside	daily	Blow out with compressed air - by using some powder types some sintering can develop, these will be cleaned with suitable cleaning agents
Cyclone cone inside	daily	Blow out with compressed air - by using some powder types some sintering can develop, these will be cleaned with suitable cleaning agents
Cyclon outside	monthly	Clean from outside, avoid dust deposits



Attention:

Absolutely consider that no cleaning agent/solvent arrives into the pinch valves of the dense phase conveying (danger of damage and clogging!)

The cleaning agent must be completely evaporated; it may not mix itself with the coating powder!

Cleaning of the sieve

The sieve must be cleaned when the meshes of the sieve are clogged/dirty by sintering of powder. Thereby the sieve is to be immersed into solvent, until all contamination can be removed. Then blow out the sieve and let it evaporate for approx. 1 day, until it is completely dried. It is to be considered that solvent may not contact with coating powder!

Troubleshooting guide

Problem fixing

Problem / Fault / Malfunction	Cause	Procedures / Remedy
Plant cannot be put into operation	The signal from the delivery unit is not present	Connect the delivery unit to the cyclone correctly
Too little exhaust air in the booth	Ducting booth/cyclone or cyclone/After Filter not leak-proof Delivery unit not connected to the cyclone	Search and repair the leak(s) Connect the delivery unit
Contamination on the outer cyclone wall	Connection points leaking	Reseal
Powder sintering in the cyclone	Quick reacting powder quality Air speed too high Solvent mixed itself with powder	Check the room temperature Check the air volume Clean the cyclone
Powder remains in the delivery unit	Powder accumulation in the cyclone too large Settings of the dense phase conveyor not correct	Check the conveying performance Check setting values / parameters according to technical data
Continual heavy dust generation at the exit of the transport hose	Spiral air is set too high	Guide value approx. 0.3 bar
Strong dust generation at the exit of the transport hose during conveying	Conveying air is set too high	Guide value approx. 1 bar
Too much powder in the After Filter	Sieve clogged	Clean the sieve Check the powder removal Check the seals on the cyclone and the delivery unit Check the air volume

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** EZ02 Monocyclone,
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 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!

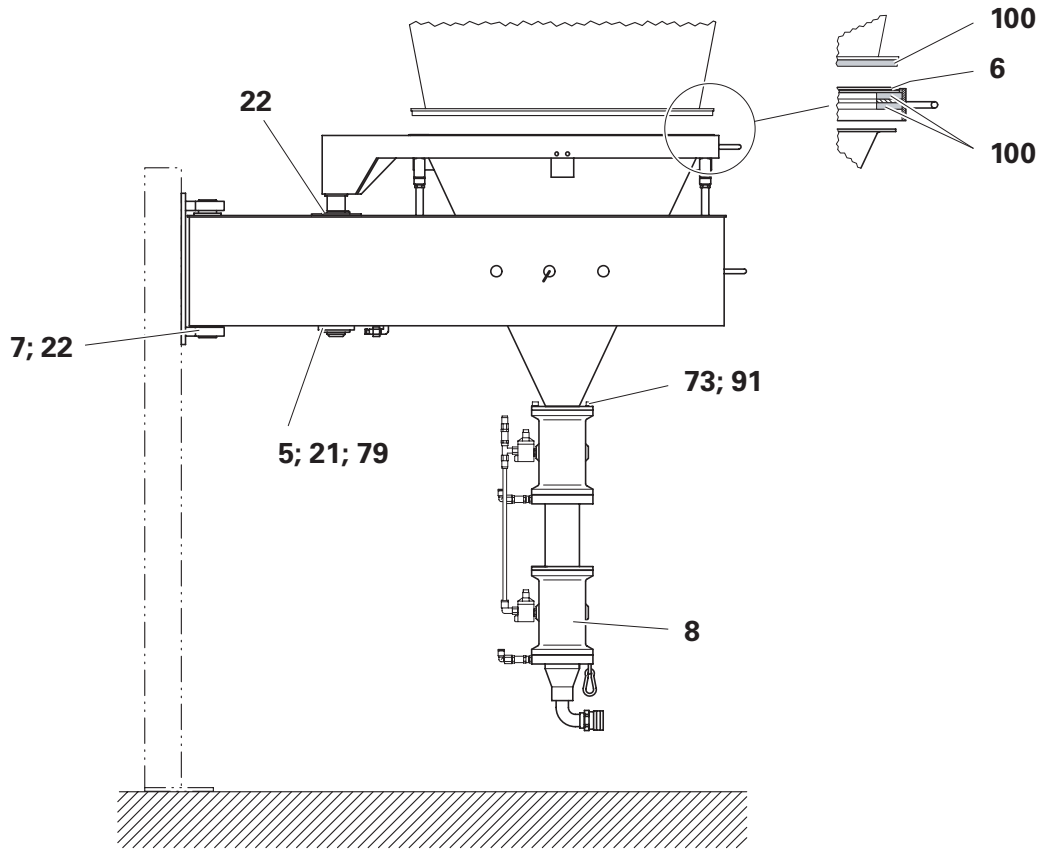
Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the ITW Gema guarantee conditions!

EZ02 Monocyclone - delivery unit, mechanical part

5	Counter plate	392 405
6	Sieve insert - complete (see "Sieve insert")	
7	Clamp - Ø 40 mm	355 291
8	Dense phase conveying-PT06 - complete (see "Dense phase conveying - PT06")	372 820
21	Snap ring - I 45	256 420
22	Sealing ring - Ø 42/55x2 mm	267 686
73	Cylinder screw hex. - M8x20 mm, galv.	216 496
79	Grub screw hex. - M6x10 mm, galv.	234 931
91	Lockwasher - M8	215 953
100	Foam rubber profile - 40x10 mm (indicate cyclone size/-type!)	105 163*

* Please indicate length

EZ02 Monocyclone - delivery unit, mechanical part



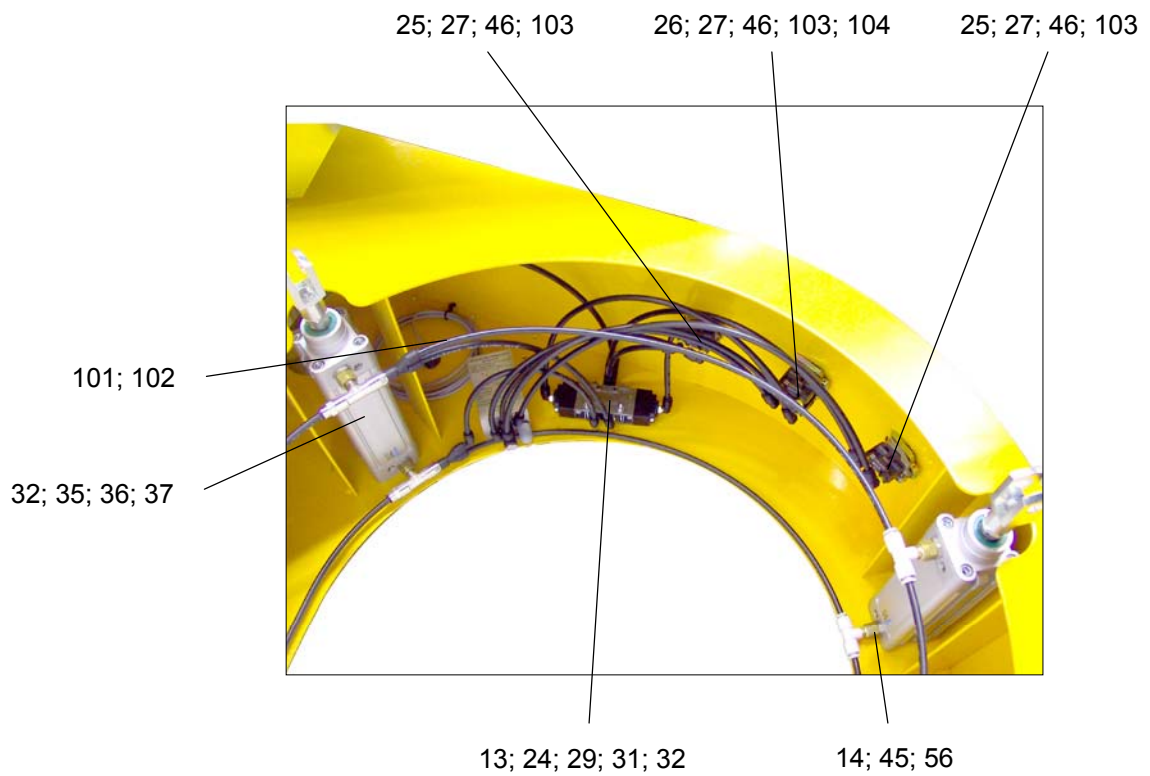
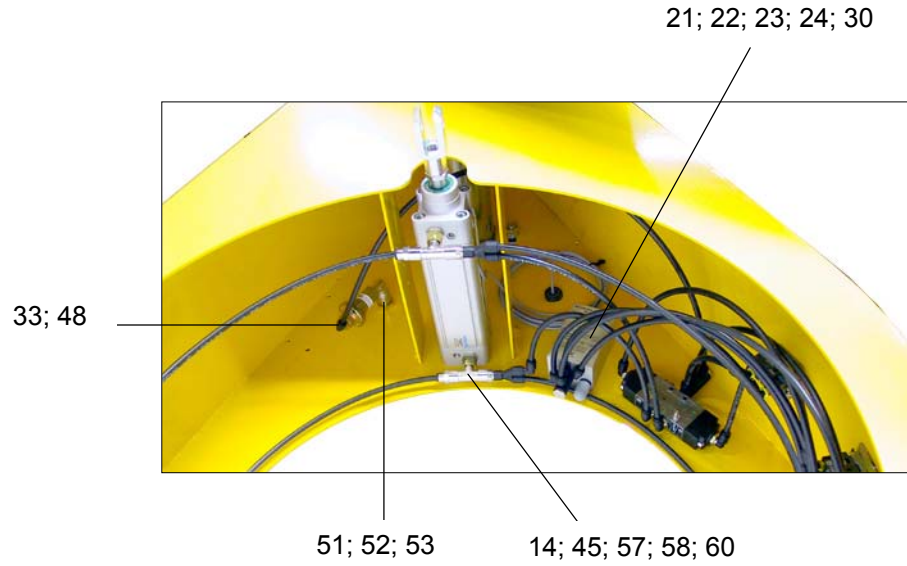
EZ02 Monocyclone - delivery unit

EZ02 Monocyclone - delivery unit, pneumatical part

13	Silencer - 1/8"	251 305
14	Bezel - 0,9 mm	403 652
21	Silencer	251 305
22	Elbow joint - 1/8", Ø 6 mm	254 061
23	Hollow screw - 1/8", dual	226 173
24	Swivel ring - 1/8", Ø 6 mm	226 165
25	Push button - green	267 830
26	Selector switch	267 864
27	Valve support	268 240
29	Elbow joint - 1/8", Ø 6 mm	254 061
30	Safety valve	268 275
31	Switch valve - 5/3-way-valve	268 283
32	Hollow screw - 1/8", triple	268 461
33	Inline regulator - 6 bar	263 320
35	Cylinder - DNC-40-100	267 643
36	Proximity switch	267 651
37	Clevis - M12x1,25 mm	250 678
45	Reduction - 1/4"a-1/8"i	231 932
46	Entering angle - Ø 4 mm, Ø 6 mm	261 181
48	Elbow joint - 1/4"a, Ø 6 mm	203 041
51	Elbow - 1/4"a-1/4"i	222 674
52	Elbow screw connection - 1/4"a-1/4"a	202 835
53	Plug - NW 7,4 mm-1/4"i	244 953
56	T-connection - Ø 6 mm-1/8"a, Ø 6 mm	245 950
57	T-connection - 1/8"i-1/8"a-1/8"i	264 717
58	Y-piece - 1/8"a-Ø 6 mm	264 725
60	Plug-in elbow - Ø 6 mm outside, Ø 6 mm inside	268 453
101	Plastic tube - D4/2,5 mm, black	104 469*
102	Plastic tube - Ø 6/4 mm, black	103 144*
103	Valve - maker	268 267
104	Valve - breaker	268 259

* Please indicate length

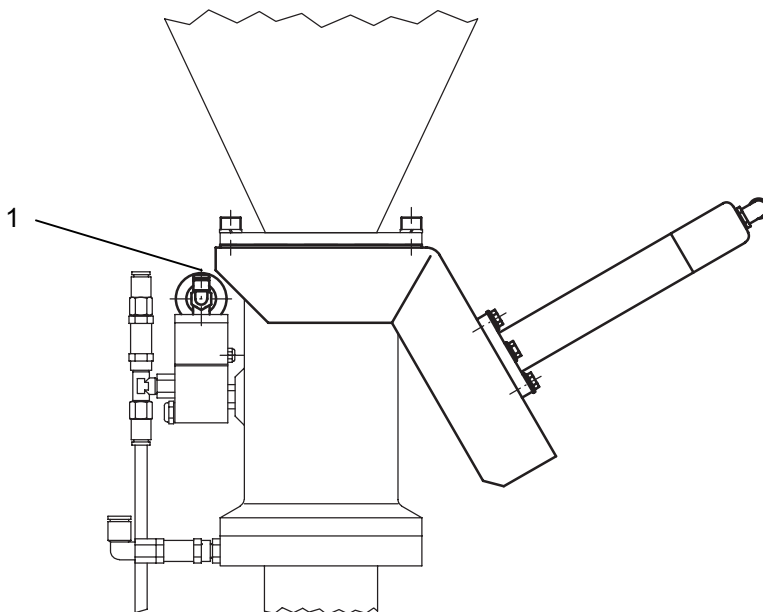
EZ02 Monocyclone - delivery unit, pneumatical part



Delivery unit - vibrator, mounting kit

	Vibrator - complete	395 455
1	Plastic tube - Ø 8/6 mm, black, antistatic	103 756*

* Please indicate length



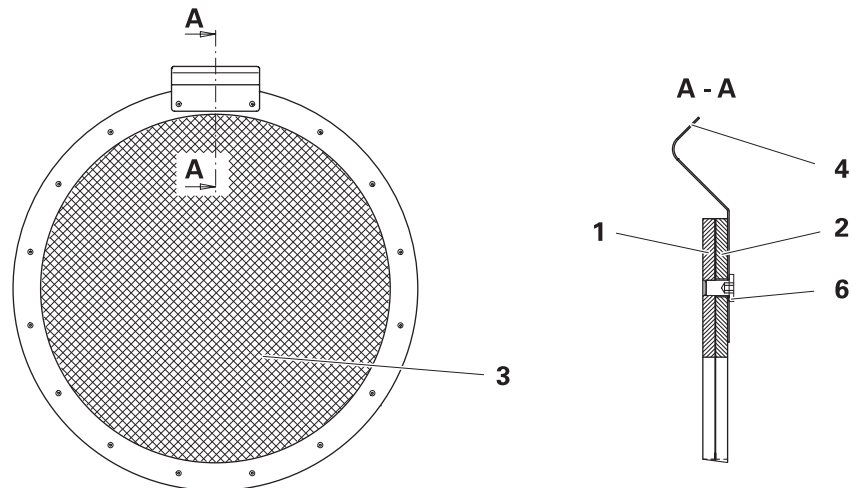
Delivery unit - vibrator, mounting kit

Sieve insert

Sieve insert complete - 600µm	392 499
Sieve insert complete - 400µm	395 340

The sieve is composed of following parts:

1	Supporting ring	392 472
2	Clamping ring	392 480
3	Sieve mesh - 600µm	105 180
3	Sieve mesh - 400µm	105 171
4	Grounding spring	392 464
6	Screw	248 568



Sieve insert

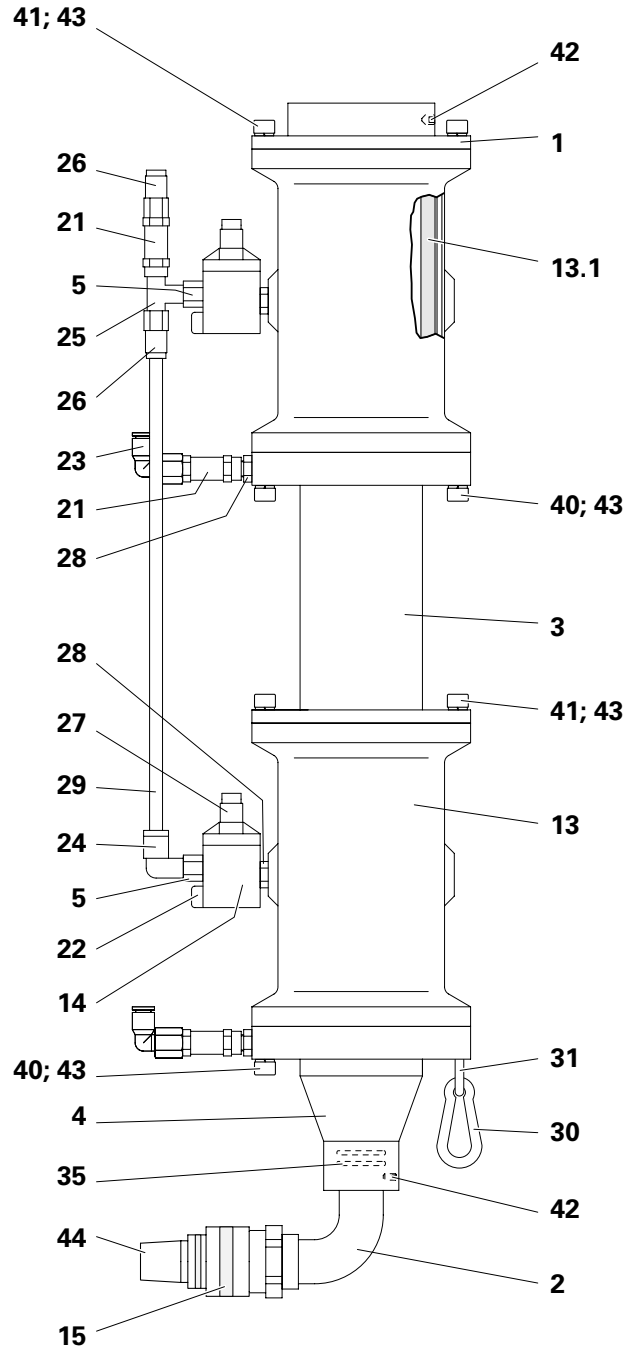
Dense phase conveying - PT06

	Dense phase conveying PT06 - complete	372 820
1	Flange	372 803
2	Pipe bend	372 811
3	Intermediate hopper	372 838
4	Rundown cone	372 846
5	Bezel - Ø 1,9 mm	372 900
13	Pinch valve - NW 65	258 520
13.1	Sleeve	011 576#
14	Servo valve - 1/8"- NW 5.5	258 512
15	Connector IG - G1	258 539
21	Non-return valve unit - 1/8"-1/8"	202 240
22	Silencer - 1/8"	251 305
23	Elbow joint - 1/8"-Ø 8 mm	253 987
24	Elbow joint - 1/8"-Ø 8 mm	203 050
25	T-connection - 1/8"-1/8"-1/8"	237 760
26	Connection sleeve - 1/8"-Ø 8 mm	236 020
27	Screw-in nipple - 1/8"-Ø 8 mm	246 956
28	Double nipple - 1/8"-1/4"	242 209
29	Plastic tube - Ø 8/6 mm, black	103 756*
30	Spring hook - 60x6 mm	250 694
31	Eyebolt - M6x15 mm	261 122
35	O-ring - Ø 26,7x1,78 mm	241 415
40	Hex. cylinder screw - M8x35 mm	216 526
41	Hex. cylinder screw - M8x20 mm	216 496
42	Hex. cylinder screw - M6x10 mm	214 841
43	Lock washer - M8	215 953
44	Transport hose connection (see "Dense phase conveying - connections")	

* Please indicate length

Wearing part

Dense phase conveying - PT06

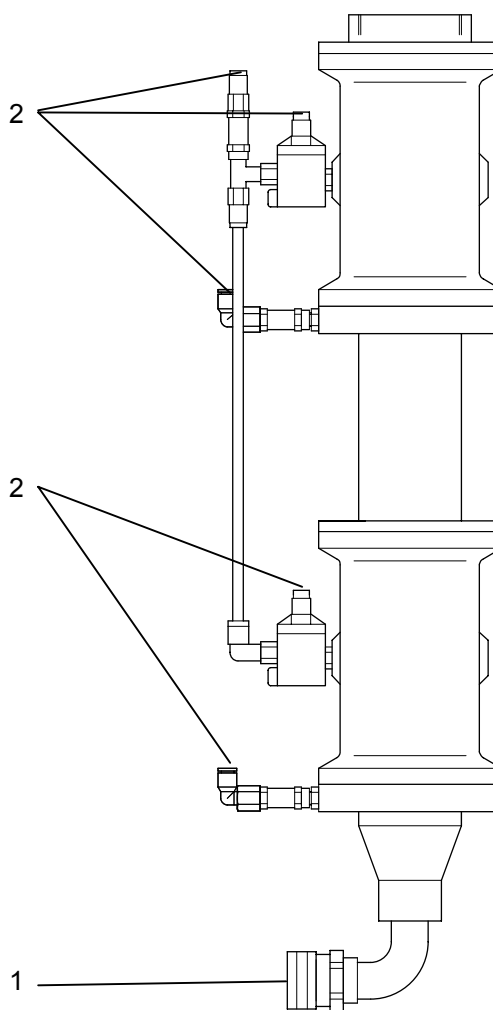


Dense phase conveying - array

Dense phase conveying - connections

1	Transport hose connection - Ø 25 mm	258 547
	Hose - 25/33 mm	104 604*
	Hose clamp - 25-35 mm	226 335
	Safety rope - length=200 mm	374 628
2	Hose - Ø 8/6 mm, black	103 756*

* Please indicate length



Dense phase conveying - connections

