

Operating Instructions and Spare Parts List

EZ 01 Monocyclone

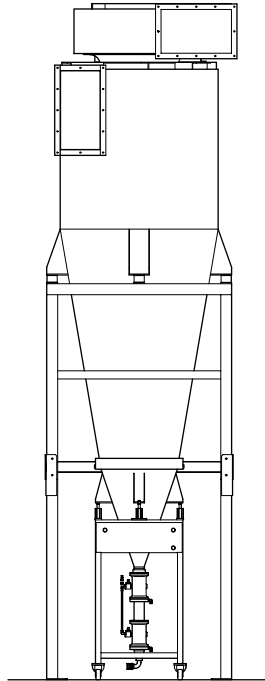


Table of Contents

Safety rules**Technical Data**

Exhaust air volume / Powder Application

Setting value / Parameter

About these Operating Instructions	1
Description of function	2
Assembly Notes	4
Preparation for Start-Up	5
Dense phase conveyor	6
Function sequence	6
Colour changes	7
Maintenance	8
Pinch Valve maintenance	9
Replacing a Pinch valve sleeve	9
Troubleshooting	10
Spare parts list	11
Ordering Spare parts	11
EZ 01 Monocyclone	12
Delivery unit - complete	13
Dense Phase Conveyor (Monocyclone)	14
Dense Phase Conveyor - Connections	16

SAFETY RULES

1. The installation work to be done by the customer must be carried out according to local regulations.
2. Before starting up the plant the safety rules in the operating instructions must be observed for the different equipment.
3. 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).
4. It must be observed, that the EZ 01 Monocyclone, the filter unit and the ducting are grounded, according to local regulations, before the Start-Up.
5. Only original ITW Gema spare parts are to be used. If damage is caused by the use of foreign parts all guarantee claims become invalid.
6. Repairs may only be done by personnel correspondingly trained by ITW Gema.

TECHNICAL DATA**EXHAUST AIR VOLUME / POWDER APPLICATION**

	EZ 01-10000	EZ 01-14000	EZ 01-17000	EZ 01-21000
Exhaust air volume	10000-13000 m ³ /h	14000-16000 m ³ /h	17000-20000 m ³ /h	21000-24000 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 VALUE / PARAMETER

	EZ 01-10000	EZ 01-14000	EZ 01-17000	EZ 01-21000
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 (delayed)	0.7 sec			

ABOUT THESE OPERATING INSTRUCTIONS

These operating instructions contain all the important information which is required to operate the EZ 01 Monocyclone. It will guide you safely through the installation stage, also give notes and tips for the optimum use of your new powder coating equipment. The information about the functioning of the individual system components - booth, manual powder gun or powder injector etc. - will be found in the respective accompanying documentation.

DESCRIPTION OF FUNCTION

The EZ 01 Monocyclone is used to separate the booth exhaust air from the coating powder contained in the exhaust air.

The volume of the exhaust air, dependent 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 is set in motion in the cyclone, through the ducting and the tangential air input. The powder is separated around the cyclone wall by centrifugal force and the exhaust air rises in the centre of the cyclone up the central tube and passes on to the filter unit, where the residual powder is retained, before the air is returned into the workshop environment.

The separated powder is removed from the operating cyclone by the filter unit. The filter unit, consists of a mobile frame, a cyclone connection and the dense phase conveyor, which can be positioned manually and connected pneumatically under the cyclone. The separated powder collects in the lower conical part and passes through the open, upper pinch valve into the intermediate chamber between both pinch valves. The upper pinch valve closes and the lower valve opens at regular intervals. After this the powder from the intermediate chamber is transported by the conveying air through the transport hose to the sieve machine or powder hopper etc. After the conveying cycle the lower pinch valve closes again and the upper valve opens. During the whole operation a small air movement must be present in the transport hose, so that no blockages occur. This is achieved with transport air, which is introduced into the hose connection after the lower pinch valve.

A periodic extraction of powder from the cyclone takes place, which is fed back into the powder coating circuit again after passing through the sieve machine.

EZ 01 Monocyclone

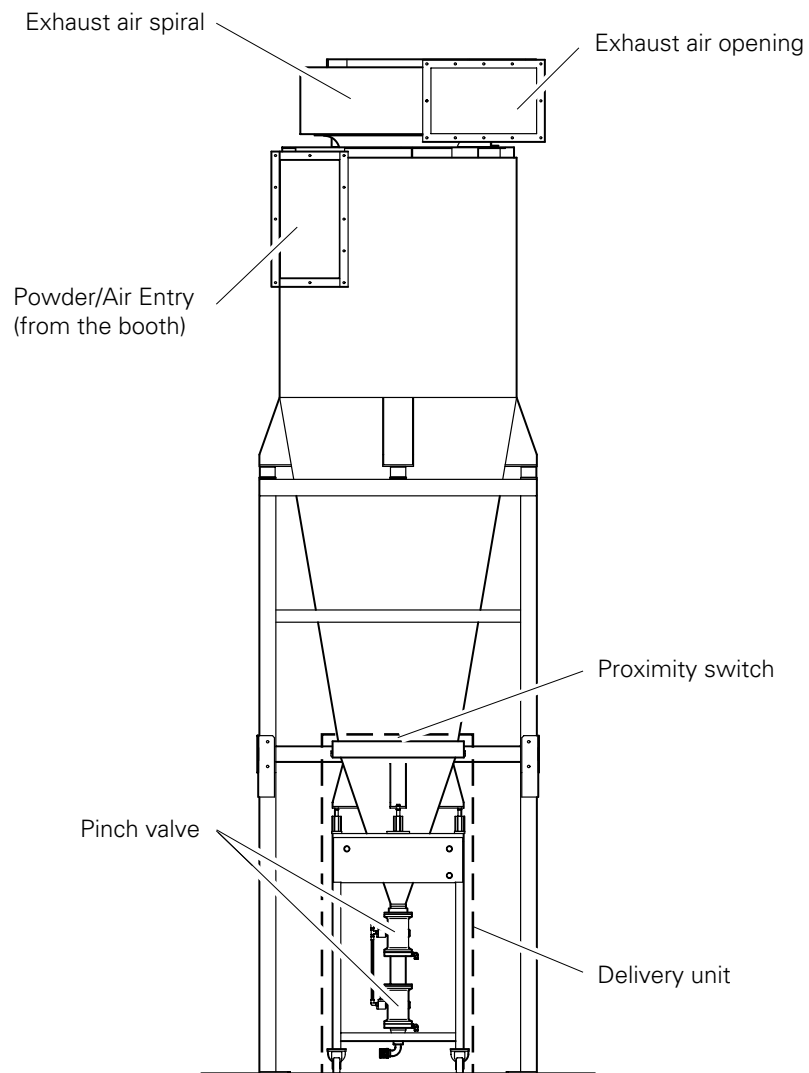


Figure 1

ASSEMBLY NOTES

The assembly procedure for setting up of the cyclone must be adapted to the resources available.

Because heavy and bulky parts are being handled, the safety of the assembly personnel must specially taken into account.

In order to guarantee operating safety, all assembly work must be checked by trained personnel.

Above all, the following points must be observed:

- The angle between the air entry, and exit can be set by 15° through the existing slots (Slot $\pm 7.5^\circ$). If the angle must be displaced further, the exit spiral must be completely dismantled and can be displaced in a 15° step.
- The connecting joint on all connections (exit spiral, discharge cone etc.) must be sealed.
- It must be observed that all joints in the ducting, and inside the cyclone etc. must be as smooth as possible, so that no powder can deposit.
- In order to ensure the grounding connection of the frame to the cyclone, a vibration damper must be bridged with the grounding cable supplied.
- On the separation point of the frame feet with 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 the filter unit to be moved in and out. This position can be chosen on assembly, according to local conditions.
- The Monocyclone must be firmly anchored to the workshop floor.
- The ducting must be assembled as free from tension as possible.
- The filter unit is preassembled ready for assembly.
- For monitoring the correct position of the filter unit a proximity switch must be fitted on the cyclone, so that when the filter unit is positioned on the cyclone a signal is given and the plant is released for operation.
- The transport hose must be secured to the dense phase conveyor by the steel cable fitted with a spring hook supplied, so that rinsing in the disconnected condition no uncontrolled movement can take place, thereby endangering personnel.
- The lengths of connecting hoses for controlling the filter unit, and the dense phase conveyor are to be chosen so that the filter unit can be moved away for cleaning without disconnecting the hose connections.

PREPARATION FOR START-UP

The Start-Up should only be done by trained personnel. Foreign objects in the booth or in the ducting can cause damage to the plant.

Before the 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 properly connected?
- Are there any foreign objects, e.g. screws, small parts etc. in the booth, the cyclone or the ducting?
- Is the filter unit completely assembled?
- Are all plant units grounded?
- Is the filter unit connected?
- Is the transport hose connected correctly on the exhaust side?
- Are the settings for the dense phase conveyor correct?

After all these points are checked and any faults rectified the plant may be put into operation.

DENSE PHASE CONVEYOR

The powder is transported by the Dense phase conveyor to the Sieve machine in the powder centre and then to the powder container

This transport principle permits very careful and dust-free powder transport, because the air requirements necessary, and the transport speed are very low.

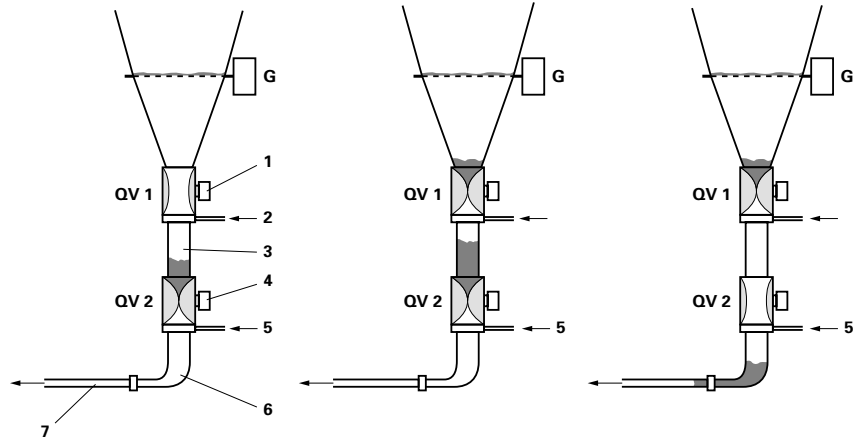


Figure 2

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

FUNCTION SEQUENCE

- 1) The upper Pinch valve - **QV1** opens.
The recovered powder falls through Pinch valve - **QV1** into the Intermediate tube (3).
- The lower Pinch valve - **QV2** is thereby closed.
- The Spiral air (5) is constantly in operation.
- The Conveying air (2) is switched off.
- 2) Pinch valve - **QV1** closes.
- 3) 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 over-pressure in the intermediate tube (3) the powder is transported through the Pinch valve **QV2** to the delivery tube and then through the Transport hose (7) to the Sieve machine in the Powder Centre.
- 4) Pinch valve - **QV2** closes.
- After a short delay Pinch valve - **QV1** opens again.
- Steps 1) to 4) are repeated continuously.

The transport efficiency is dependent on the type of powder, pulse rates, and length of the Transport hose (7) and the dimensions of the actual Pinch valve, and Transport hose used.

COLOUR CHANGES

The following points are to be observed at colour changes:

1. In order to save time and powder at a colour change, cleaning should be done in the direction of flow of the powder. But cleaning the powder guns and the booth should be done first. During this phase the powder can be conveyed with the dense phase conveyor back into the powder hopper or the powder container.
2. At an extreme colour change or with increased requirements the exhaust air ducting between the booth and the cyclone is blown out with compressed air. A compressed air hose is placed in the ducting while the plant is operating, causing turbulence which loosens the powder, this is then transported to the cyclone and discharged.
3. The filter unit is detached from the cyclone. Through the induction of additional air in the lower part of the cyclone the powder separator and all resulting powder is fed to the After Filter.
4. After switching off the dense phase conveyor the transport hose is now flushed through with compressed air from the exhaust side and so cleaned.
5. While the filter unit is slowly being moved away from the cyclone, the funnel of the filter unit is blown out and the dust generated is sucked up into the cyclone.
6. Now the inside wall of the cyclone is cleaned with a compressed air nozzle.
7. The cleaning of the centre tube is done with a special cleaning head, in which the nozzles are fitted in a semicircle.
8. The cleaning of the cyclone, the filter unit, and the ducting is now completed.

MAINTENANCE

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



All cleaning work should be carried out without scratching. 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 in the suction tube and clean	Increased depositing indicates a reduction of the exhaust air, and changes in the powder
- Check the cyclone for powder sintering	Increased sintering indicates increased exhaust air, changes in the powder
- Check for powder depositing in the delivery unit	Depositing indicates 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	Accumulations of powder indicate leakages, which can lead to a deterioration in performance
- Check the grounding connections of the plant units	

PINCH VALVE MAINTENANCE

REPLACING A PINCH VALVE SLEEVE

Dismantling:

1. Dismantle the pinch valve from the Monocyclone
2. Remove the black positioning pin ❶ with pliers.
3. Turn the pinch valve sleeve 45° counter-clockwise ❷.
4. Pull the pinch valve sleeve out of the housing ❸ and replace.

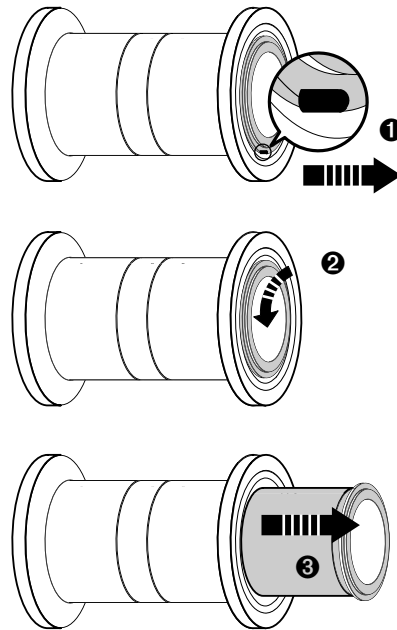


Figure 3

Assembly:

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

TROUBLESHOOTING

Problem / Fault / Malfunction	Cause	Procedure / 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 sealed - Delivery unit not connected to the cyclone	Check the settings of the After Filter and the fan Connect the delivery unit
- Contamination on the cyclone outer wall	- Connection points leaking	Reseal
- Contamination on the connection points of the delivery unit	- Seals on the delivery unit damaged - Sealing pressure of the delivery unit too low	Replace the seals Increase sealing air pressure
- Powder sintering in the cyclone	- Quick reacting powder quality - Air speed too high	Check the room temperature Check the air volume
- 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 settings / parameter according to Technical Data
- Continual heavy dust generation at the exit of the transport hose	- Transport air set too high	Guide value approx. 0.3 bar
- Strong dust generation at the exit of the transport hose during conveying	- Conveying air set too high	Guide value approx. 1 bar
- Too much powder in the After Filter		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:

1. Type of your powder coating equipment
2. Order number, quantity, and description of *each* spare part

Example:

1. **Type** *EZ 01 Monocyclone*
2. **Order No.:** *203 386, 1 piece, Hose clamp*

When ordering cable and hose material the length required must be given.

The spare part numbers of yard/meter ware always begins with 1..... and are always marked with an * in the spare parts list.

Wear parts are always marked with a #.

All dimensions for plastic powder hoses are given as external diameter (o/d) and internal diameter (i/d):

e. g.

ø 8 / 6 mm, 8 mm outside diameter / 6 mm inside diameter (i/d).

EZ 01 MONOCYCLONE

1	EZ 01 Monocyclone-10000-R [◇] - complete	376 078
1.1	EZ 01 Monocyclone-10000-L [◇] - complete	376 086
1.2	EZ 01 Monocyclone-14000-R [◇] - complete	375 489
1.3	EZ 01 Monocyclone-14000-L [◇] - complete	375 497
1.4	EZ 01 Monocyclone-17000-R [◇] - complete	376 477
1.5	EZ 01 Monocyclone-17000-L [◇] - complete	376 485
1.6	EZ 01 Monocyclone-21000-R [◇] - complete	376 035
1.7	EZ 01 Monocyclone-21000-L [◇] - complete	376 043
2	Leg (4x)	375 470
3	Delivery unit - complete	see page 13
4	Proximity switch Set	377 791

◇R - Clockwise rotating fan
 ◇L - Counter-Clockwise rotating fan

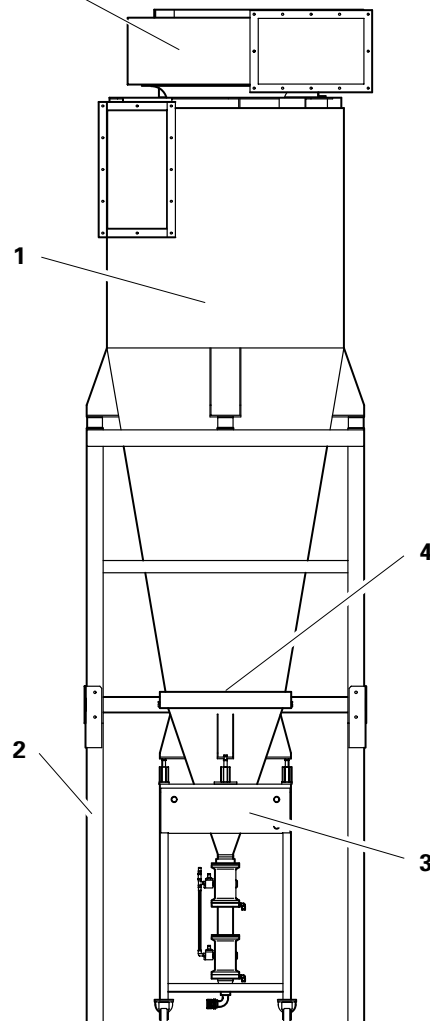
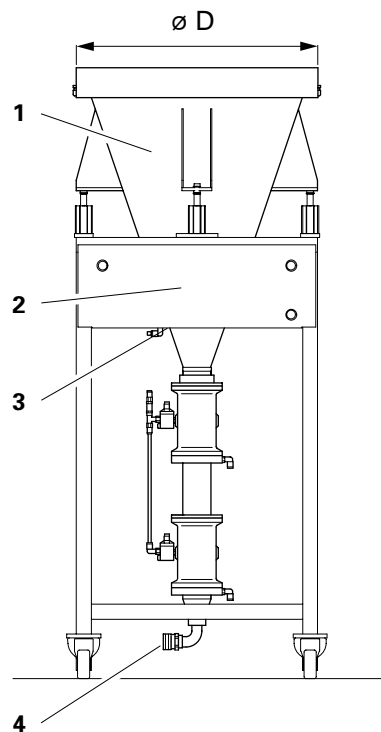


Figure 4

DELIVERY UNIT - COMPLETE

1	Delivery unit - EZ 10000 (ø D=655 mm) - complete	376 264
1.1	Delivery unit - EZ 14000 (ø D=740 mm) - complete	376 272
1.2	Delivery unit - EZ 17000 (ø D=846 mm) - complete	376 280
1.3	Delivery unit - EZ 21000 (ø D=846 mm) - complete	376 280
2	Multiple connection coupling (not shown)	
2.1	Fixed connection	363 766
2.2	Loose connection	363 774
2.3	Sleeve	224 006
2.4	Connecting nipple	224 014
2.5	Metallplast hose (Standard) - L = 5.0 m	102 385*
2.6	Lock nut - PG29	204 900
3	Quick-release coupling (not shown)	239 267
3.1	Hose - ø 16 / 10 mm	100 498*
3.2	Hose clamp - ø 18 / 15 mm	203 386
4	Connecting material (not shown)	
4.1	Transport hose - NW 25	104 604*
4.2	Hose clamp	226 335
4.3	Connecting nipple - ø 25 mm	258 547
4.4	Safety cord	374 628



* Please indicate length required

Figure 5

DENSE PHASE CONVEYOR (MONOCYCLONE)

	Dense Phase Conveyor - complete	372 820
1	Flange	372 803
2	Elbow connection	372 811
3	Intermediate tube	372 838
4	Funnel piece	372 846
5	Throttle - \varnothing 1.9 mm	372 900
13	Pinch valve - NW 65	258 520
13.1	Sleeve	011 576#
14	Valve - 1/8 - NW 5.5	258 512
15	Quick-release connection IG G1"	258 539
21	Non-return valve -1/8"-1/8"	202 240
22	Silencer - 1/8"	251 305
23	Elbow joint - 1/8"- \varnothing 8 mm	253 987
24	Elbow joint -1/8"- \varnothing 8 mm	203 050
25	T-Connection - 1/8"-1/8"-1/8"	237 760
26	Adapter - 1/8"- \varnothing 8 mm	236 020
27	Adapter - 1/8"- \varnothing 8 mm	246 956
28	Double adapter - 1/8"-1/4"	242 209
29	Plastic hose - \varnothing 8/ 6 - black	103 756*
30	Spring hook - 60 x 6 mm	250 694
31	Eye bolt - M 6 x 15 mm	261 122
35	O-Ring - \varnothing 26.7 x 1.78 mm	241 415
40	Allen screw - M 8 x 35 mm	216 526
41	Allen screw - M 8 x 20 mm	216 496
42	Allen grub screw - M 6 x 10 mm	214 841
43	Spring washer - M 8	215 953

Dense Phase Conveyor

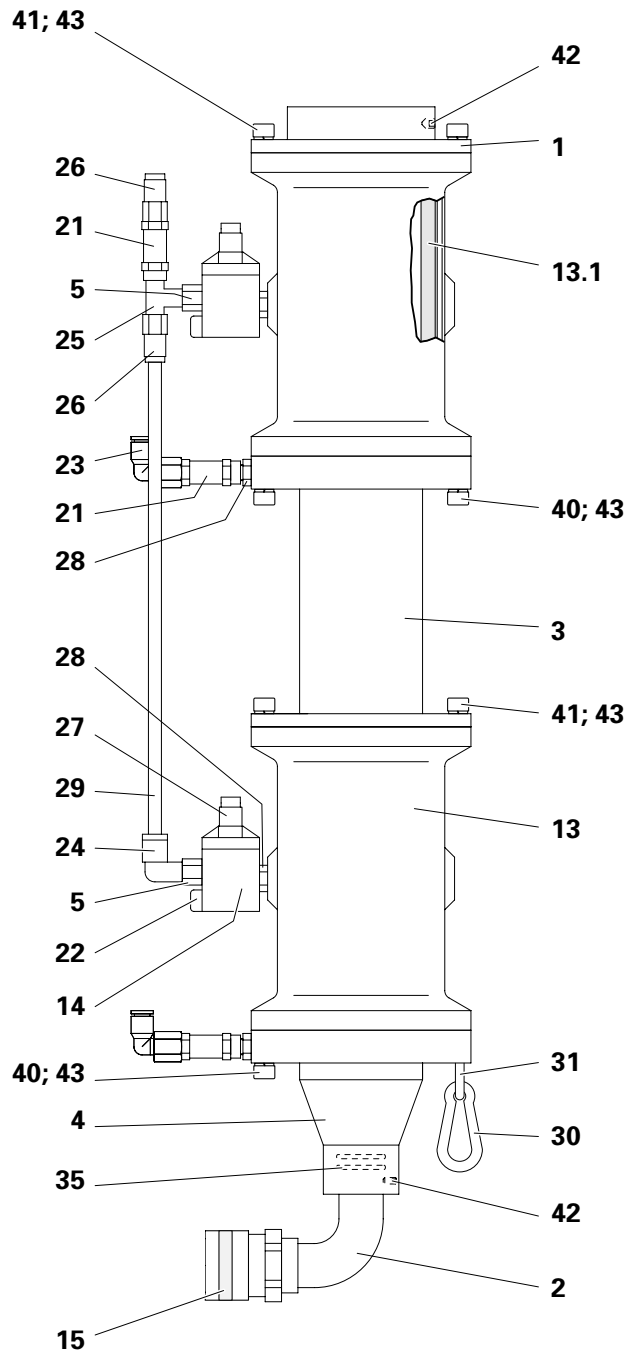


Figure 6

DENSE PHASE CONVEYOR - CONNECTIONS

1	Transport hose connection - \varnothing 25 mm Hose - \varnothing 33 / 25 mm Hose clamp - 25 / 35 mm Safety cord - L = 200 mm	258 547 104 604* 226 335 374 628
2	Hose - \varnothing 8 / 6 mm - black	103 756*

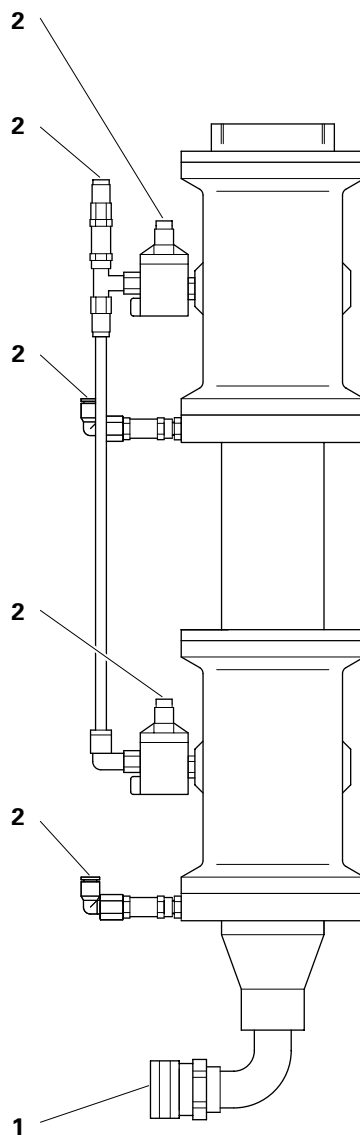


Figure 7

Wear part
* Please indicate length required

NOTES:

Documentation EZ 01 Monocyclone

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