Formula Air
Supporting your performance

FS Cyclone

Maintenance Manual

Contents

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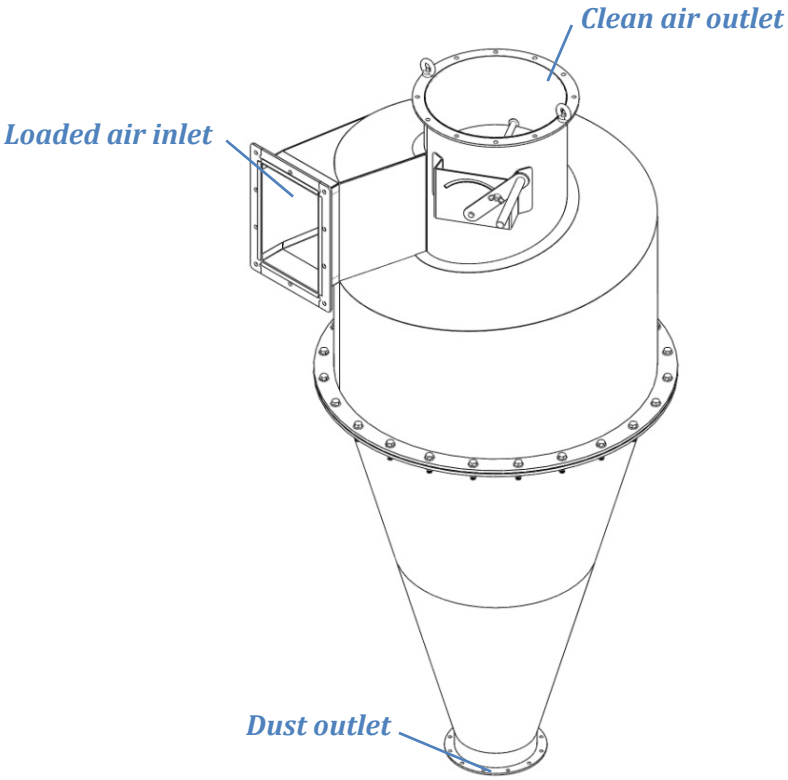
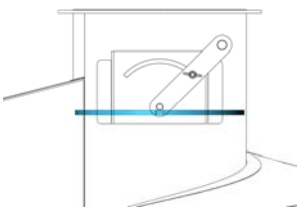
FS Cyclone . Maintenance Manual

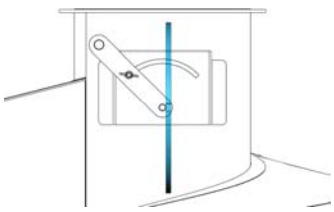
1. PRODUCT DESCRIPTION



The cyclone is designed to separate material from air before filtration. FS Cyclones are used for the separation of particles in the wood and paper industry, but also in the grain industry, and many more applications can be found. Cyclones FS are placed, in general, in all industries that do not require a high efficiency of material separation. Manufactured in 1,25 mm galvanized sheet metal, legs and dustbin are optional and are available separately. A throttle valve is included to control the airflow. The desired position of the valve can be manually adjusted with the handle and locked in place with a butterfly nut.

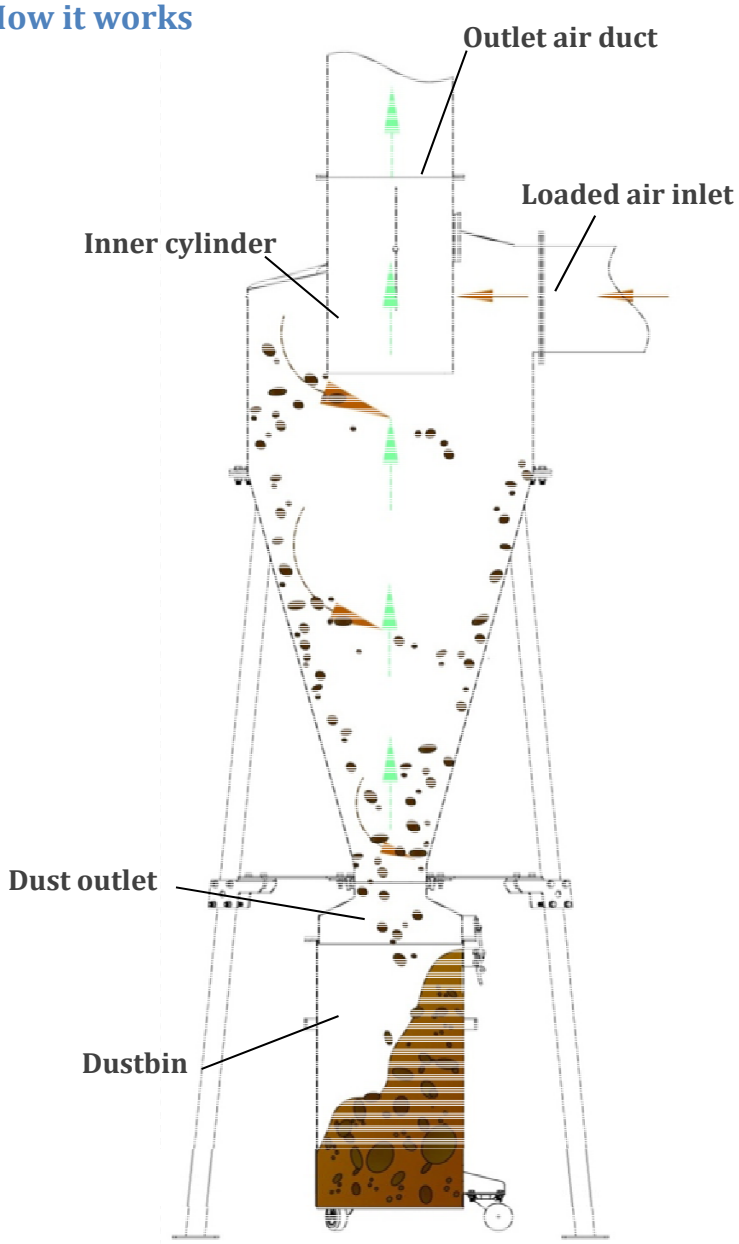


THE VALVE IS CLOSED. NO AIRFLOW



THE VALVE IS OPENED. FULL AIRFLOW

1.1. How it works



- During normal operation, particle loaded air enters the FS cyclone unit through the loaded air inlet.
- The air and the material are diverted into a spiral motion around the inside perimeter. The centrifugal force applied by the sidewall allows the heavier material to fall out the dust outlet into the dust bin, or through a rotary valve.
- Clean air is carried through the inner cylinder and discharges into the atmosphere or to secondary filters.

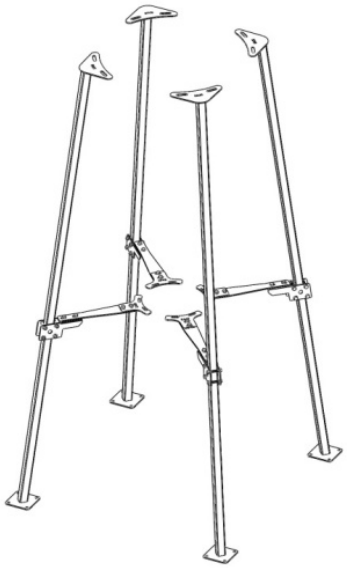
1.2. Accessories

1.2.1. Supporting legs

Square profile legs, welded to 5mm or 8mm sheet metal holders. Powder coated RAL 5010.

* *For overall dimensions, please see attached tables in* ***Chapter 1.3****.*

*** For technical data, please see attached tables in* ***Chapter 1.4****.*



1.2.2. Heavy dustbin

The heavy dustbin collects the dust or other particles from the cyclone that is subtracted from the air. It can be easily removed by opening the locks and removing the two bolts. Once removed, the dustbin can be rolled out on its integrated wheels and the contents can be emptied. The dustbin is made out of 2 mm ST37 sheet metal, powder coated in RAL 5010.

CAUTION! The waste material must be disposed of in compliance with the national laws and/or local legislations in force.

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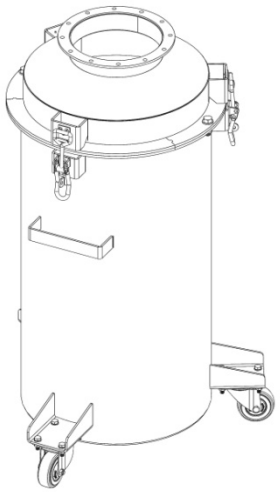
* *For overall dimensions, please see attached tables in* ***Chapter 1.3****.*

*** For technical data, please see attached tables in* ***Chapter 1.4****.*



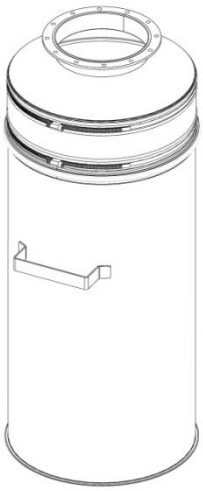
1.2.3. Light dustbin

The light dustbin serves the same purpose as the heavy execution. It can be easily removed by opening the lock-ring. Once removed, the dustbin can be carried away and the contents can be emptied. The dustbin is made out of 1 mm galvanized sheet metal.

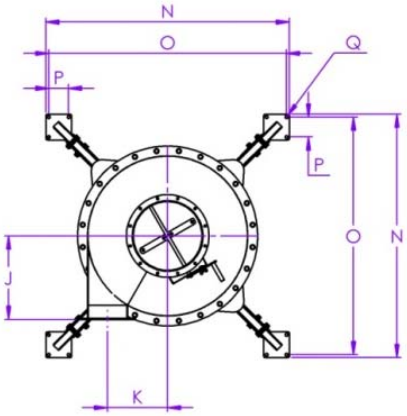
CAUTION! The waste material must be disposed of in compliance with the national laws and/or local legislations in force.

* *For overall dimensions, please see attached tables in* ***Chapter 1.3****.*

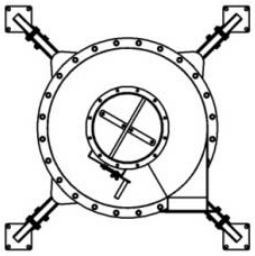
*** For technical data, please see attached tables in* ***Chapter 1.4****.*



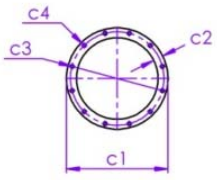
1.3. Overall dimensions



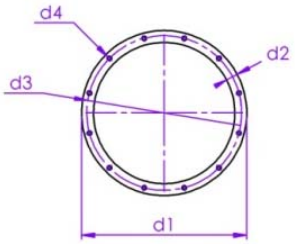
LEFT VERSION
TOP VIEW



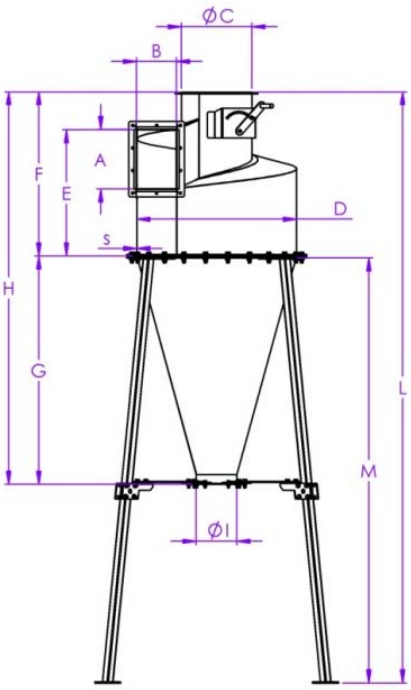
RIGHT VERSION
TOP VIEW



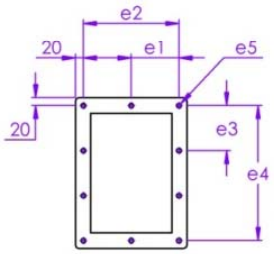
LOWER FLANGE
HOLE PATTERN



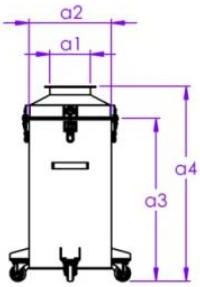
HIGHER FLANGE
HOLE PATTERN



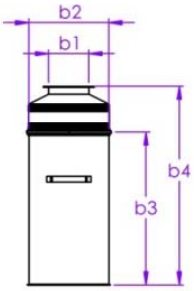
FRONT VIEW



INLET FRAME
HOLE PATTERN



HEAVY DUSTBIN
FRONT VIEW



LIGHT DUSTBIN
FRONT VIEW

Cyclone

Type	A mm	B mm	C mm	D mm	E mm	F mm	G mm	H mm	I mm	J mm	K mm	s mm
FS-3	300	200	ø 354	ø 803	640	830	1150	1980	ø 200	420	302	1,25
FS-4	350	250	ø 404	ø 903	740	950	1130	2280	ø 200	500	325	1,25
FS-6	400	300	ø 454	ø 1123	840	1080	1500	2580	ø 250	580	411	1,25
FS-8	450	350	ø 504	ø 1253	950	1230	1700	2930	ø 250	675	451	1,25
FS-11	530	400	ø 604	ø 1604	1130	1410	1900	3310	ø 300	790	601	1,25
FS-16	640	480	ø 704	ø 1804	1350	1700	1900	3600	ø 300	970	661	1,25
FS-20	800	500	ø 1004	ø 2004	1410	1750	1700	1447	ø 400	980	750	2

Legs

Type	L mm	M mm	N mm	O mm	P mm	Q mm
FS-3	2980	2140	1225	1195	100	ø 14
FS-4	3280	2321	1330	1300	100	ø 14
FS-6	3580	2489	1531	1501	100	ø 14
FS-8	3930	2689	1667	1637	100	ø 14
FS-11	4310	2889	1959	1929	100	ø 14
FS-16	4600	2889	2170	2130	140	ø 14
FS-20	4447	2690	2273	2233	140	ø 14

Dustbin (Heavy and light)

Type	a1 mm	a2 mm	a3 mm	a4 mm	b1 mm	b2 mm	b3 mm	b4 mm
FS-3	ø 200	ø 410	820	980	ø 200	ø 400	770	1000
FS-4	ø 200	ø 410	820	980	ø 200	ø 400	770	1000
FS-6	ø 250	ø 410	820	980	ø 250	ø 400	770	1000
FS-8	ø 250	ø 410	820	980	ø 250	ø 400	770	1000
FS-11	ø 300	ø 410	820	980	ø 300	ø 400	770	1000
FS-16	ø 300	ø 410	820	980	ø 300	ø 400	770	1000
FS-20	ø 400	ø 410	820	980	ø 400	ø 400	770	1000

Flanges

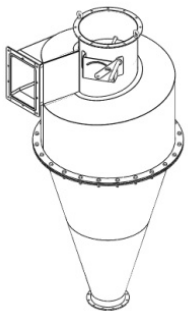
Type	c1 mm	c2 mm	c3 mm	c4 mm	d1 mm	d2 mm	d3 mm	d4 mm
FS-3	ø 255	25	ø235	ø 9 (x12)	ø 415	30	ø389	ø 11 (x12)
FS-4	ø 255	25	ø235	ø 9 (x12)	ø 465	30	ø 439	ø 11 (x16)
FS-6	ø 305	25	ø285	ø 9 (x12)	ø 515	30	ø 489	ø 11 (x16)
FS-8	ø 305	25	ø285	ø 9 (x12)	ø 555	30	ø 540	ø 11 (x16)
FS-11	ø 355	25	ø336	ø 9 (x12)	ø 665	30	ø 640	ø 11 (x16)
FS-16	ø 355	25	ø336	ø 9 (x12)	ø 785	40	ø 750	ø 11 (x24)
FS-20	ø 465	30	ø439	ø 11 (x16)	ø 1085	40	ø 1050	ø 11 (x24)

Type	e1 mm	e2 mm	e3 mm	e4 mm	e5 mm
FS-3	120	240 (2 x 120)	113	340 (3 x 113)	ø 11.5
FS-4	97	290 (3 x 97)	97,5	390 (4 x 97.5)	ø 11.5
FS-6	113	340 (3 x 113)	110	440 (4 x 110)	ø 11.5
FS-8	97,5	390 (4 X 97.5)	490	98 (5 X 98)	ø 11.5
FS-11	110	440 (4 x 110)	114	570 (5 X 114)	ø 11.5
FS-16	104	520 (104 X 5)	113	680 (6 X 113)	ø 11.5
FS-20	108	540 (5 X 108)	105	840 (105 X 108)	ø 11.5

1.4. Technical datasheet

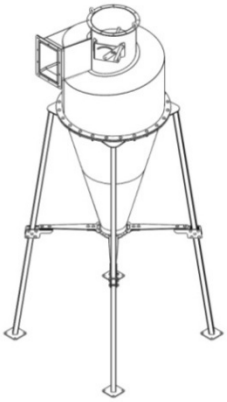
FS Cyclone

Type	Total volume m^3	Total mass kg	Higher cone kg	Lower cone kg
FS-3	0,48	68	41	27
FS-4	0,69	83	49	34
FS-6	1,38	122	71	51
FS-8	1,9	147	86	61
FS-11	3,6	206	121	84
FS-16	4,7	252	158	94
FS-20	6,1	409	265	143



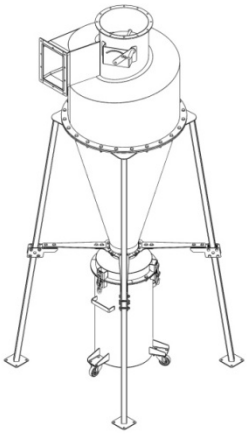
FS Cyclone with legs

Type	Total mass kg	Legs kg
FS-3	113	45
FS-4	131	48
FS-6	174	52
FS-8	203	56
FS-11	266	60
FS-16	385	133
FS-20	537	128



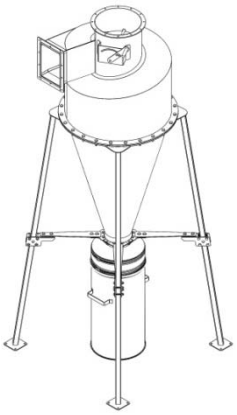
FS Cyclone with legs and heavy dustbin

Type	Total mass kg	Dustbin kg	Dustbin m^3
FS-3	146	33	0,1
FS-4	164	33	0,1
FS-6	207	33	0,1
FS-8	236	33	0,1
FS-11	299	33	0,1
FS-16	418	33	0,1
FS-20	570	33	0,1



FS Cyclone with legs and light dustbin

Type	Total mass kg	Dustbin kg	Dustbin m^3
FS-3	126	13	0,1
FS-4	144	13	0,1
FS-6	187	13	0,1
FS-8	216	13	0,1
FS-11	279	13	0,1
FS-16	398	13	0,1
FS-20	550	13	0,1



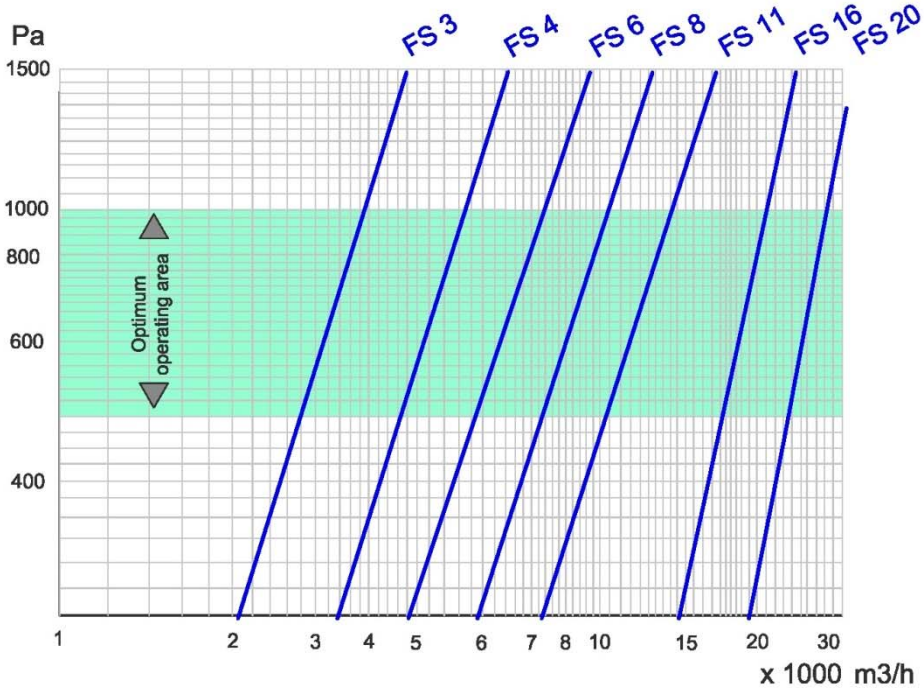


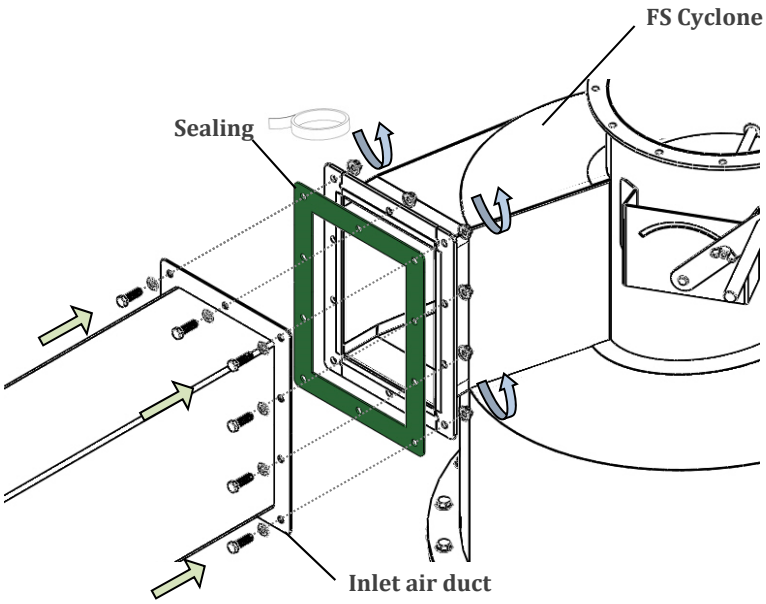
Diagram stating the pressure loss in FS cyclones at a given air volume.

2. INSTALLATION

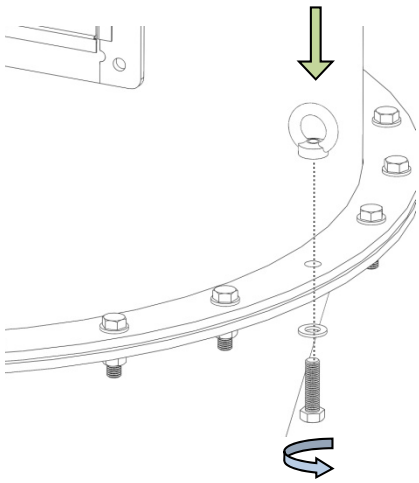
The installation of the cyclone has to be performed by qualified personnel only. For heavy parts use the right equipment and do not work alone.

2.1. Cyclone installation

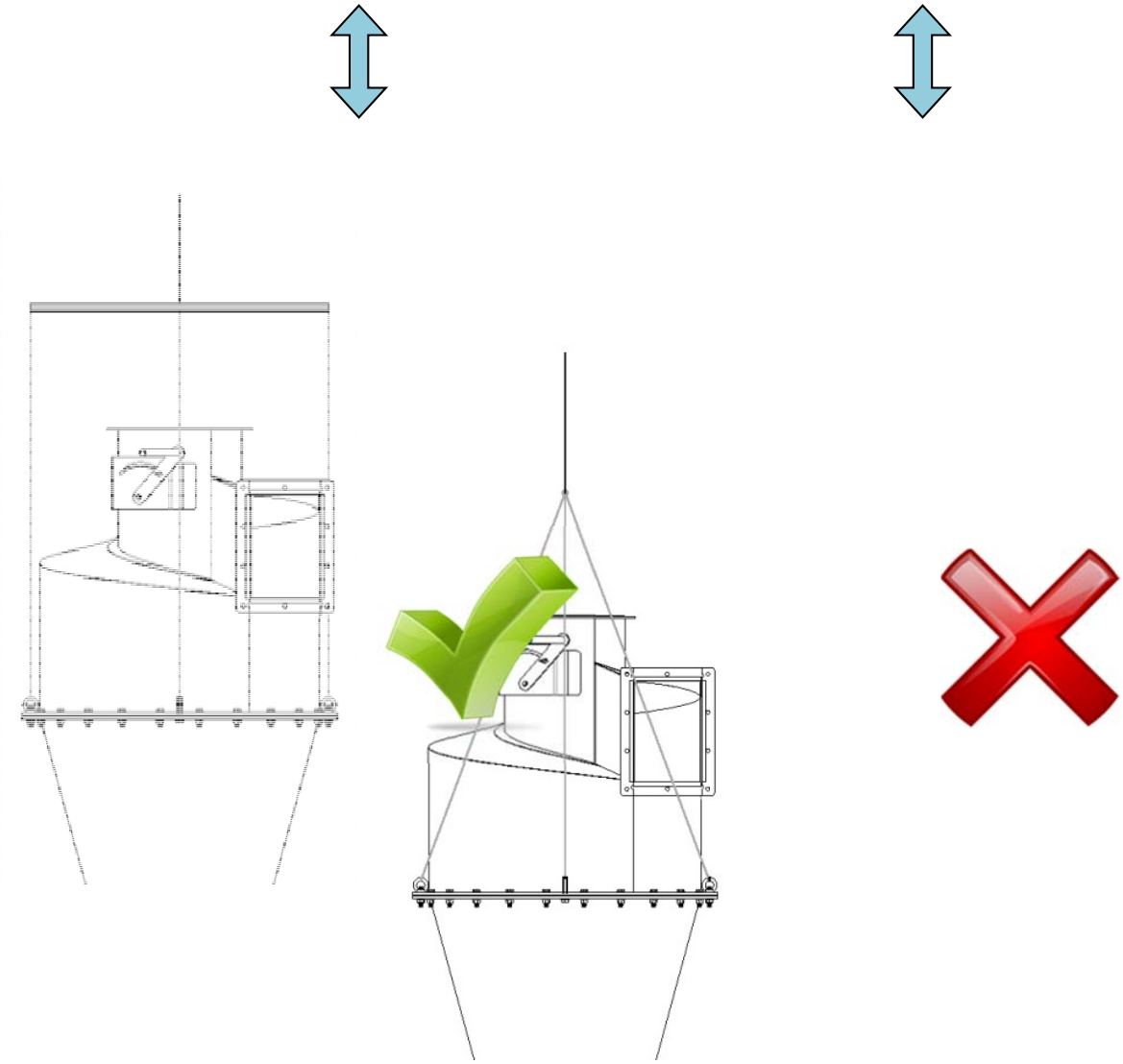
Step 1: Use sealing on the cyclones rectangular inlet duct and connect it to the duct with the correct fasteners.



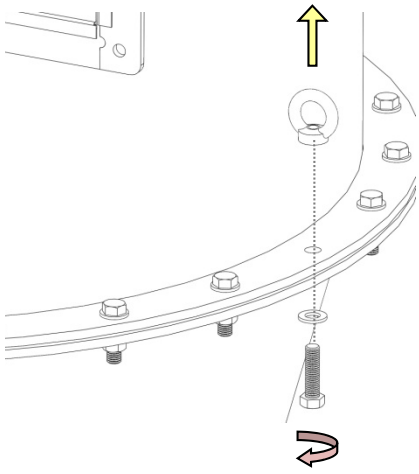
Step 2: To lift and handle the FS cyclone, fix the lifting eyes to the central flanges.



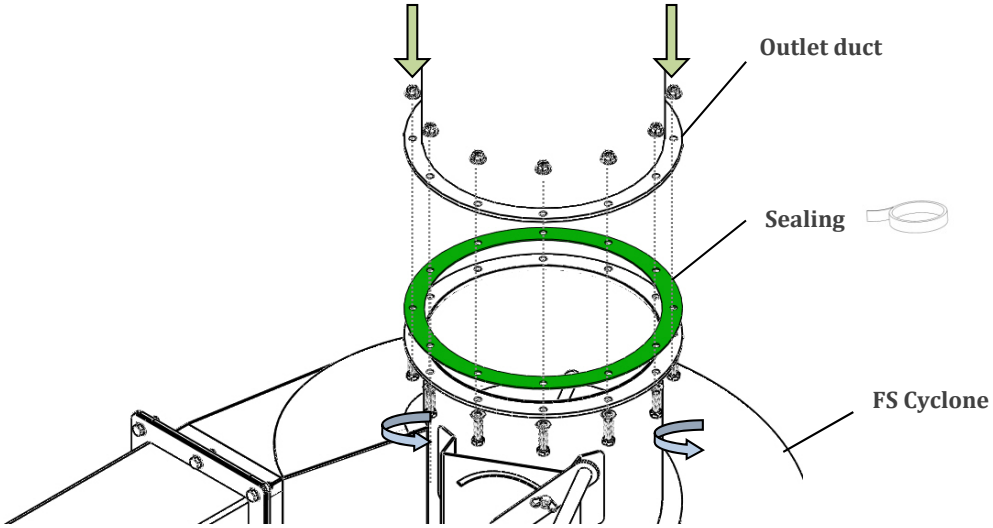
Step 3: Make sure that the ropes hold the cyclone vertically.



Step 4: Unscrew the lifting eye nuts and replace them with the correct fasteners.



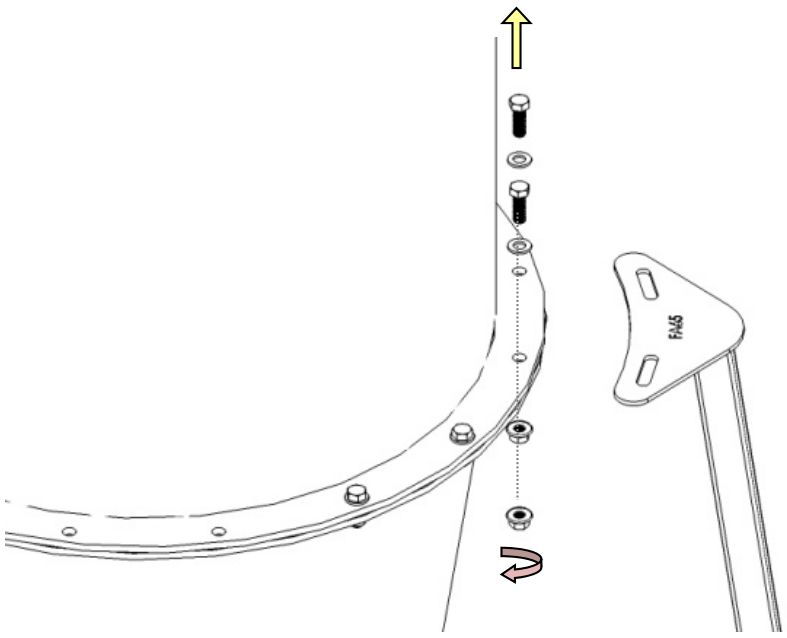
Step 5: Use sealing on the cyclone's higher flange and connect it to the duct with the correct fasteners.



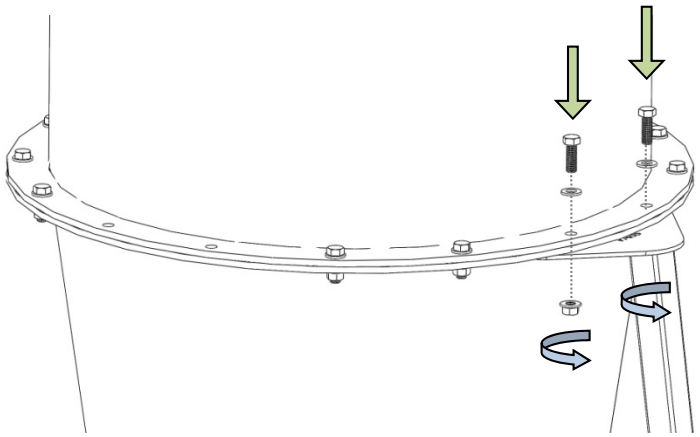
2.2. Installation of the cyclone with legs

Step 1: Please follow the installation steps in *Chapter 2.1.* for cyclone installation.

Step 2: Unscrew the bolts where legs are being positioned and position the leg to the bottom part of the cyclone's hopper flange.

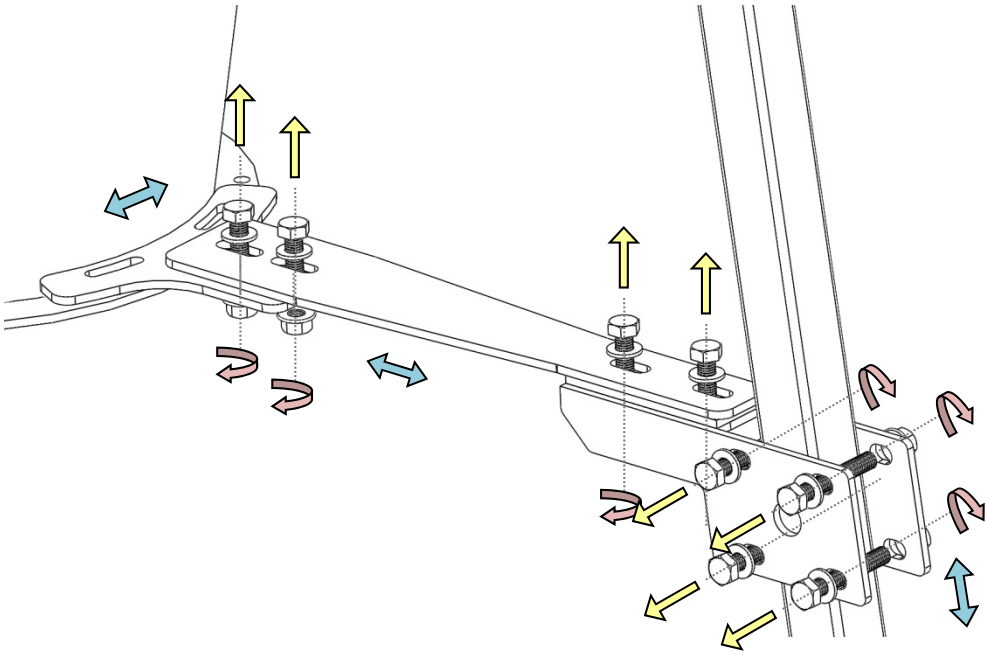


Step 3: Attach the top of the leg to the middle flange of the cyclone with the correct fasteners.

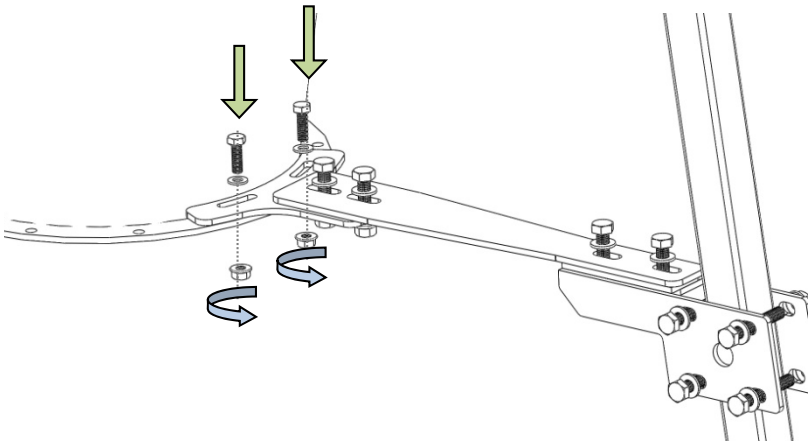


Step 4: Repeat Step 2 and Step 3 to attach the other three leg supports.

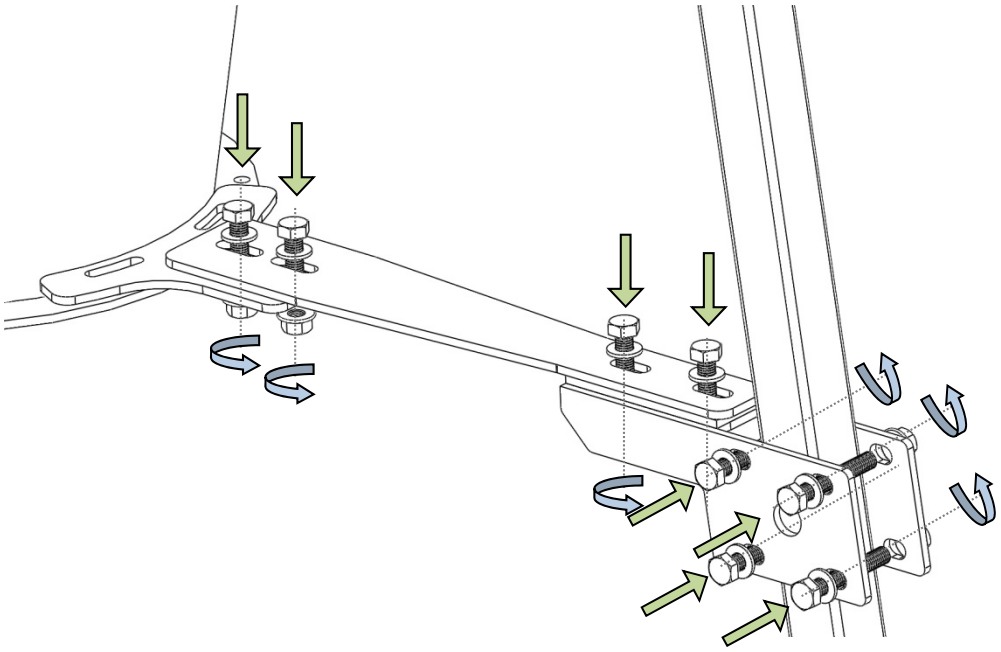
Step 5: Loosen all the fasteners from the lower arm of the leg support.



Step 6: Attach the lower arm to the cyclone's hopper lower flange with the correct fasteners.



Step 7: Tighten all the loose fasteners for a good fixation.



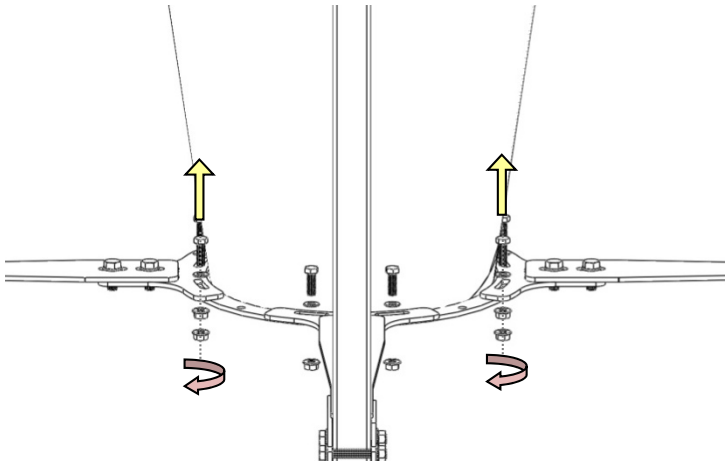
Step 8: Repeat the Step 5, Step 6 and Step 7 for the other leg supports.

Step 9: Anchor the legs to the floor with the correct fasteners.

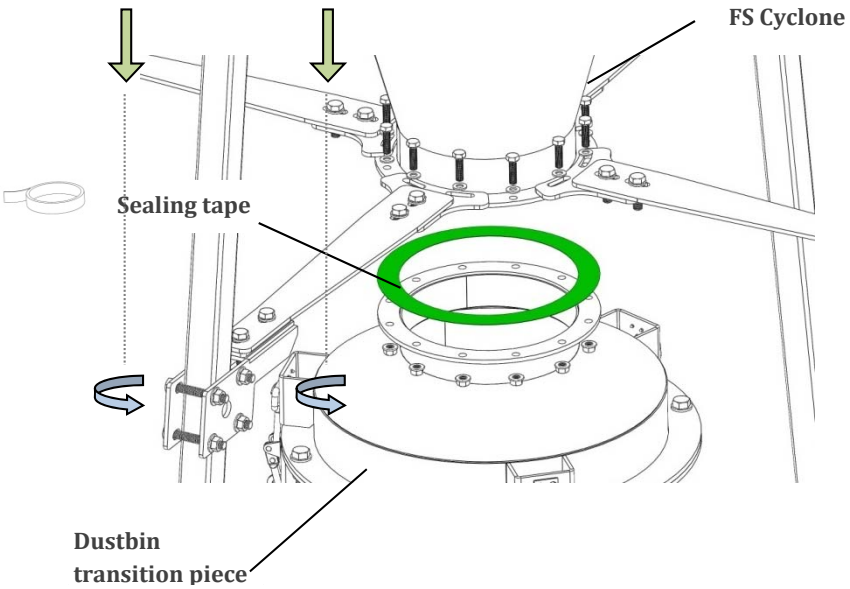
2.3. Installation of the heavy dustbin

Step 1: Please follow the installation steps in *Chapter 2.2.* for cyclone and legs installation.

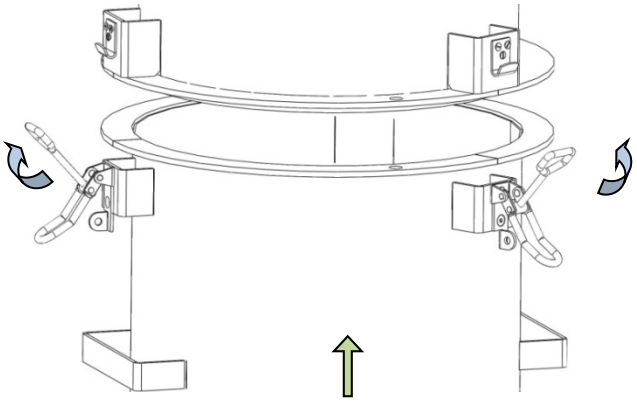
Step 2: Remove all fasteners from the lower flange of the cyclone.



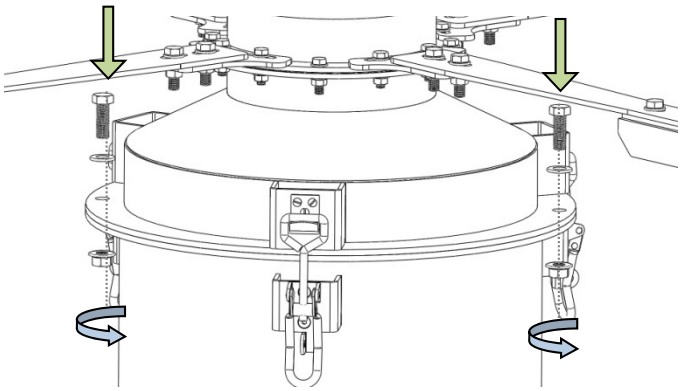
Step 3: Use sealing tape to seal the cyclone and the dustbin transition. Fix both parts with the correct fasteners.



Step 4: Lock the dustbin to the transition piece with the three locks.

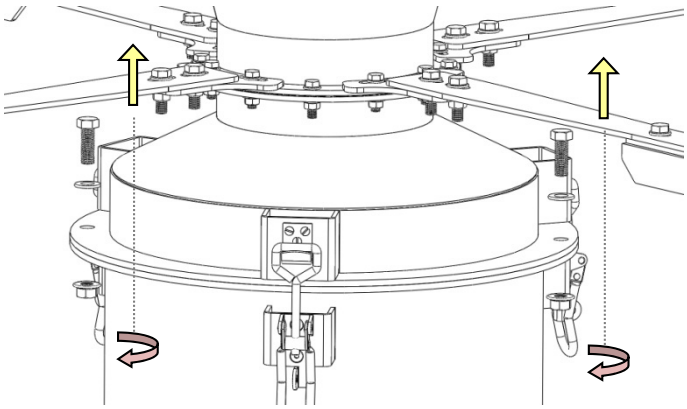


Step 5: Screw the bolts to the flange of the dustbin.

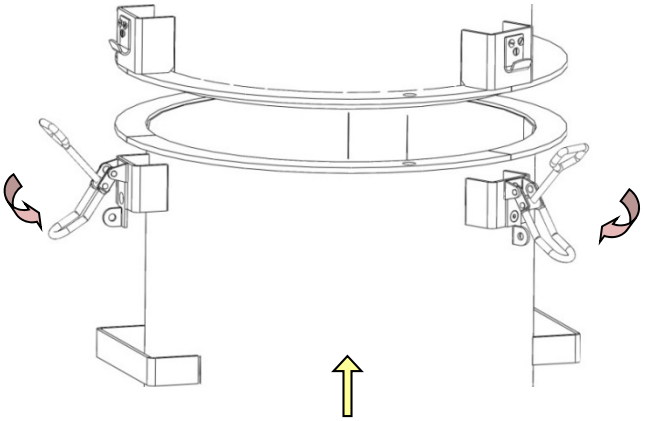


2.4. Emptying the heavy dustbin

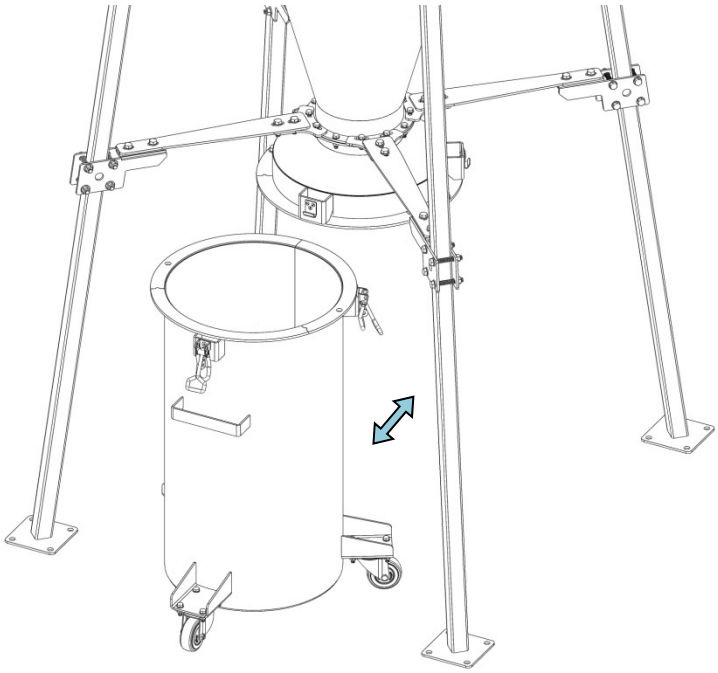
Step 1: Remove the fasteners of the flange of the dustbin.



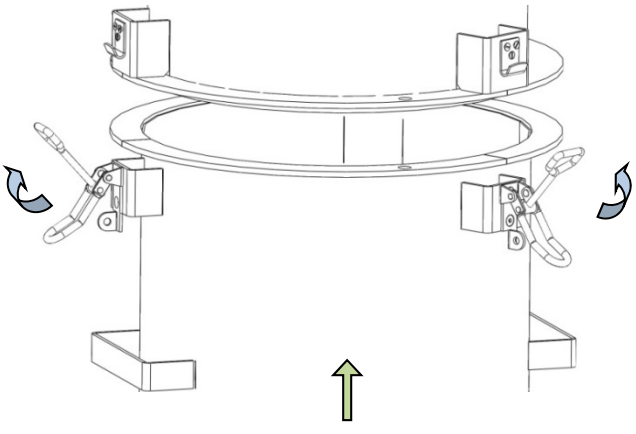
Step 2: Unlock the three clamps from the dustbin.



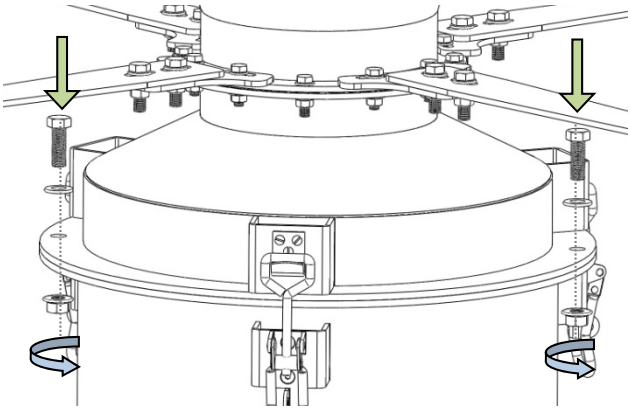
Step 3: Roll the dustbin to the desired location and empty its contents.



Step 4: Place the dustbin under the transition and lock the three clamps.



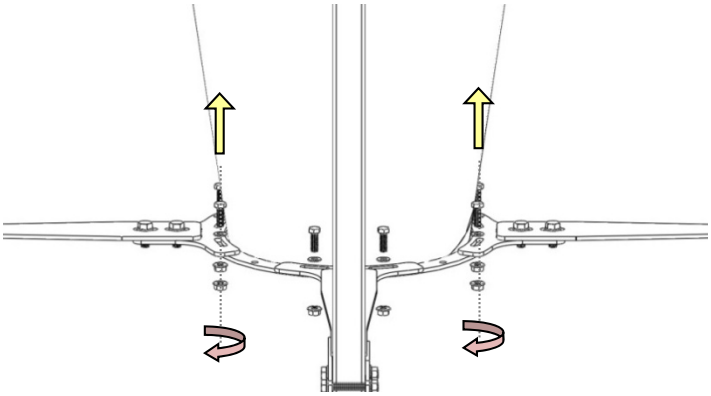
Step 5: Screw the bolts to the flange of the dustbin.



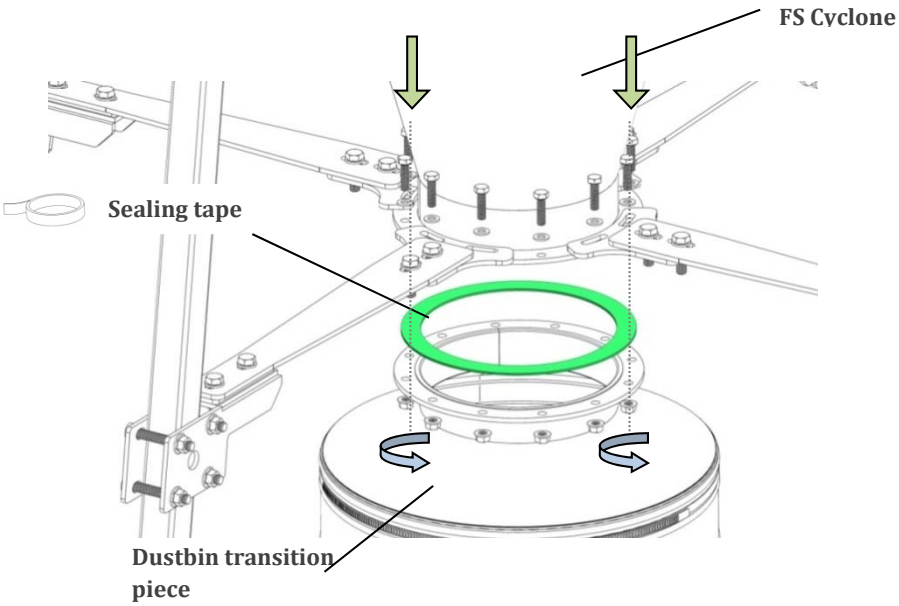
2.5. Installation of the light dustbin

Step 1: Please follow the installation steps in *Chapter 2.2.* for cyclone and legs installation.

Step 2: Remove all fasteners from the lower flange of the cyclone.

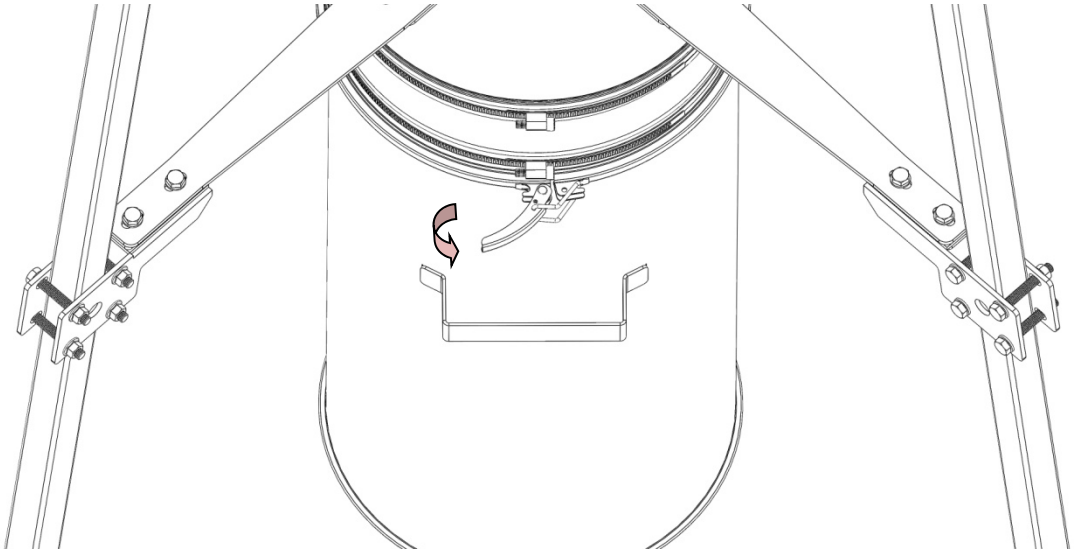


Step 3: Use sealing tape to seal the cyclone and the dustbin transition. Fix both parts with the correct fasteners.



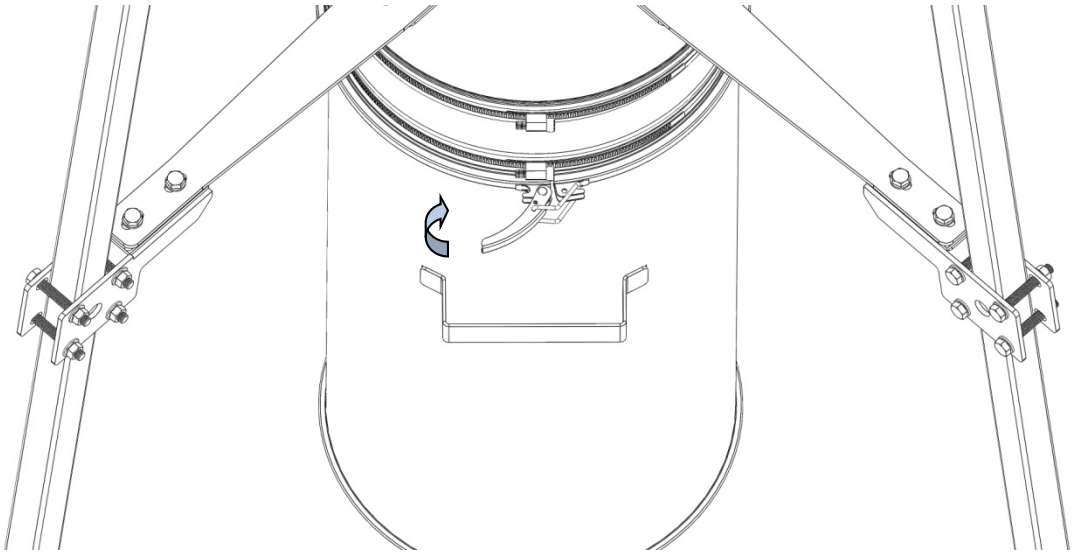
2.6. Emptying the light dustbin

Step 1: Unlock the lock-ring by opening the lock with the handle.



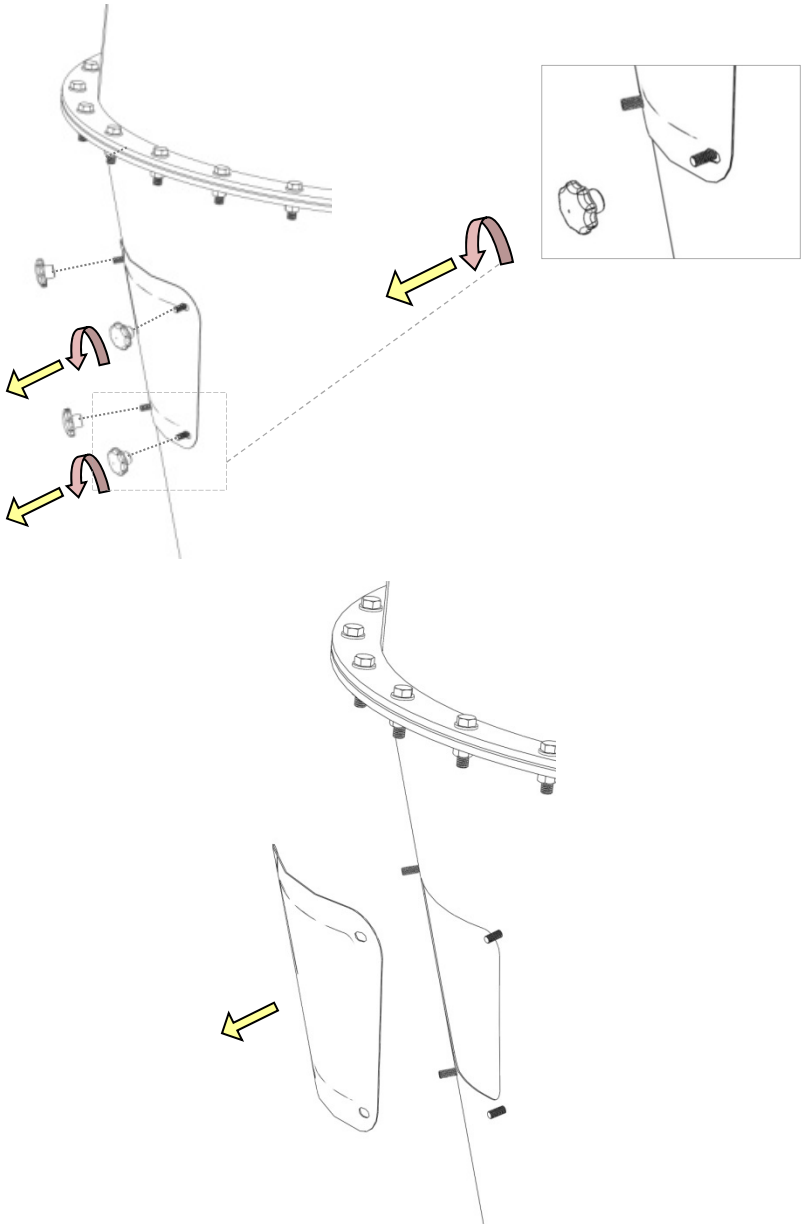
Step 2: Carry the dustbin, or put it on a trolley and roll it, to the desired location and empty its contents.

Step 3: Place the dustbin back under the transition and lock it with the lock-ring by closing it with the handle.



3. MAINTENANCE AND TROUBELSHOOTING

Clean the cyclone regularly. An inspection door is installed to check the inside of the cyclone. To open the door, unscrew the star knobs and remove the door.



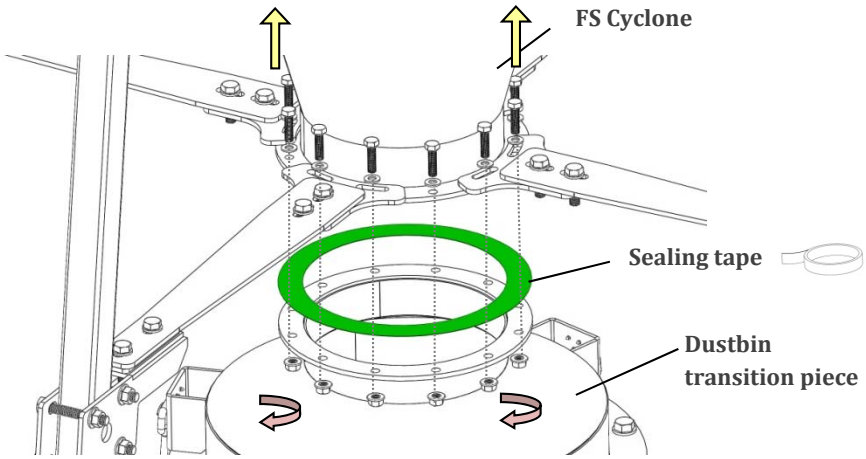
If the dust outlet is blocked, please clean the inside of the cyclone.

Replace any components that are damaged or broken.

CAUTION! Place the door back on the cyclone hopper and fix it with the correct star knobs before starting up the installation.

3.1. Removing the dustbin transition

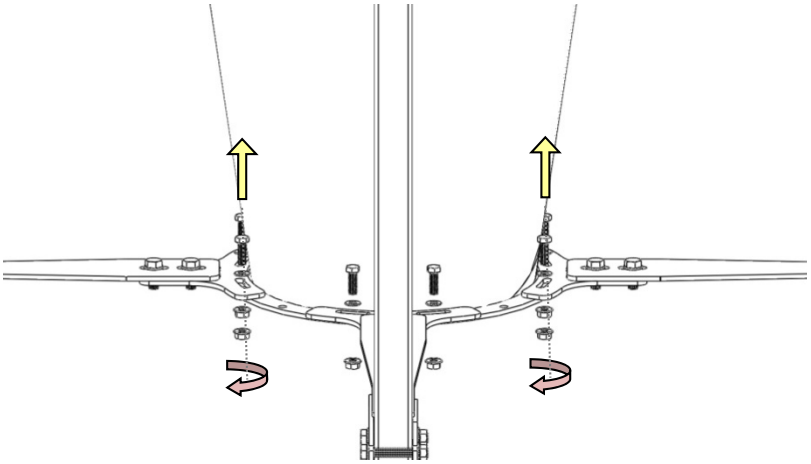
Step 1: Unscrew the fasteners which attach the dustbin transition to the cyclone.



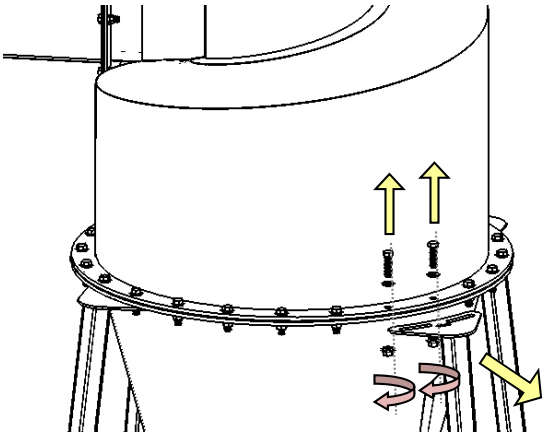
3.2. Replacing the leg support

Step 1: Detach the leg support from the floor.

Step 2: Unscrew the legs lower arm from the cyclone dust outlet flange.

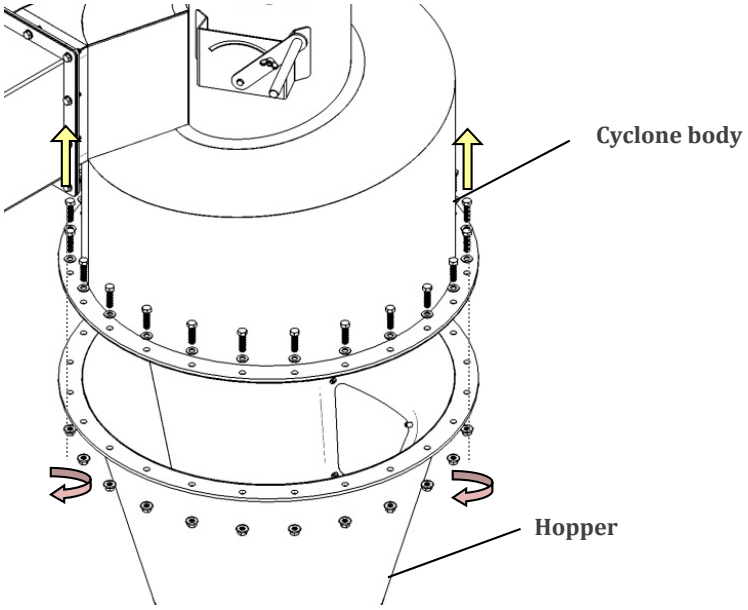


Step 3: Unscrew the fasteners from the higher part. Remove the leg supports.



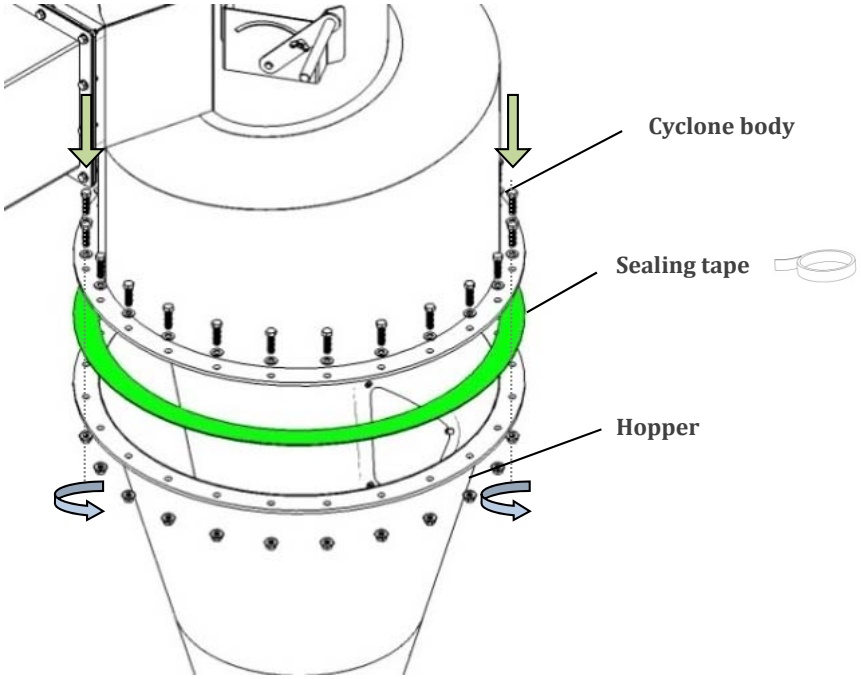
3.3. Replacing a cyclone's part

Step 1: Unscrew the fasteners from the middle part flanges.



Step 2: Replace the hopper or the higher part.

Step 3: Reassemble the cyclone with the correct fasteners. Use sealing tape to make it airtight.



4. DISMANTLING & RECYCLING

When dismantling a unit, be sure to keep in mind the following important information :

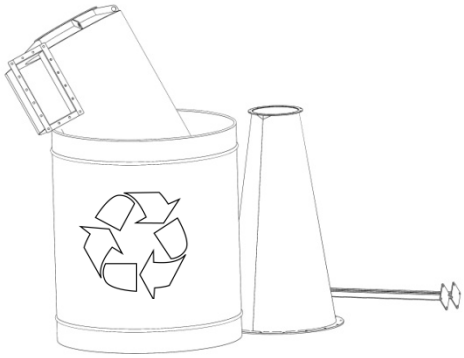
As the unit is dismantled, set aside all still functioning parts in order to re-use them on another unit.

You should always separate the different materials depending on their type : iron, rubber, oils, greases, etc...

Recyclable parts must be disposed of in the appropriate containers or brought to a local recycling company.

The rubbish must be collected in special containers with appropriate labels and disposed of in compliance with the national laws and/or local legislations in force.

CAUTION! It is strictly forbidden to dispose of toxic wastes in municipal sewerage and drain systems. This concerns all oils, greases, and other toxic materials in liquid or solid form.



5. SPARE PARTS

For spare parts please contact Formula Air Group.

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NOTE : All drawings and references contained within this manual are non-contractual and are subject to change without prior notice at the discretion of the Formula Air group and its partners.