Formula Air
Supporting your performance

FA cyclones

Rev. 1.0-2024

Content

1. Introduction

This manual cannot be reproduced, even partially, without prior written consent by Formula Air Group. Every step of the cyclone along its life cycle has been deeply analyzed by Formula Air Group in the expected area during the design, construction, and maintenance manual creation. However, it is understood that nothing can replace the experience, training and good sense of the professionals who work with the device.

Ignoring the cautions and warning from the present manual, improper use of parts or the whole device supplied, using unauthorized spare parts, manipulating the device by non-qualified personnel, violation of any safety norm regarding design, construction and use expected by the supplier, exempt Formula Air Group from all responsibility in case of damages to people or properties.

Formula Air Group does not take any responsibility for the non-observance of the user about the preventive safety measures presented in this manual.

The utilization implies compliance and knowledge of the Machine Directive 2006/42/EU.

Failure to comply with the requirements of the operating manual or incorrect use of the extraction arm during operation can lead to the damage of the cyclone and the loss of the function performed by the cyclone itself. This will result in termination of the warranty on the item and will release the manufacturer from any liability.

WARRANTY

In regards to the device's warranty, see the sales general condition in the contractual center.

ATTENTION !

Before proceeding with the installation of the cyclone, ensure that the markings on the product are compatible with the site of use. Failure to comply with this prescription can cause serious injury to persons including death and/or serious damage to property.

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.

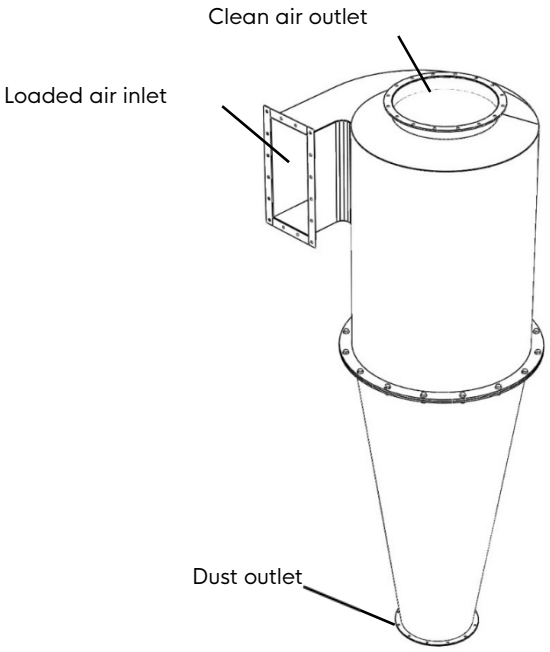
2. Product description

The cyclone FA is a high efficiency separator which guarantees an efficient separation of the fine as well as the bigger particles. It can be used for several industrial applications, such as heavy molding, grinding, planing, cabinet workshops, dust transfer systems or material separation.

It is an economical solution to a wide range of dust collection problems.

Manufactured in 2.0 mm or 3.0 mm sheet metal, powder coated RAL 5010 with a rustproof protection; it is easily mounted in or outdoors.

Legs, dustbin and expansion chamber are optional and are available as separate parts.



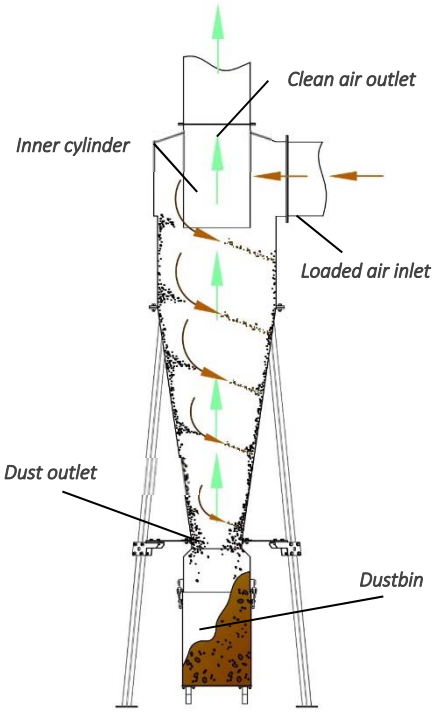
2.1 How it works

During normal operation, dust laden air enters the FA 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 secondary filters.

NOTE : installing, start up and operational use are exclusively admissible after getting acquainted with the contents of the Use and Maintenance Manual.



2.2. Accessories

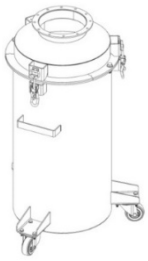
2.2.1. Supporting legs

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

* For overall dimensions, please see attached tables in Chapter 2.5.

** For technical data, please see attached tables in Chapter 2.5.

2.2.2. 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.

* For overall dimensions, please see attached tables in Chapter 2.5.

** For technical data, please see attached tables in Chapter 2.5.

2.2.3. 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.

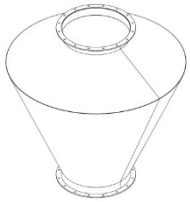
CAUTION ! The waste material must be disposed of in compliance with the national laws and/or local legislations in force.

* For overall dimensions, please see attached tables in Chapter 2.5.

** For technical data, please see attached tables in Chapter 2.5.

2.2.4. Expansion chamber

The expansion chamber allows to optimize the FA cyclone's efficiency and gives a better air/ dust separation. The expansion chamber is made of ST37 sheet metal, powder-coated RAL 5010.



* For overall dimensions, please see attached tables in Chapter 2.5.

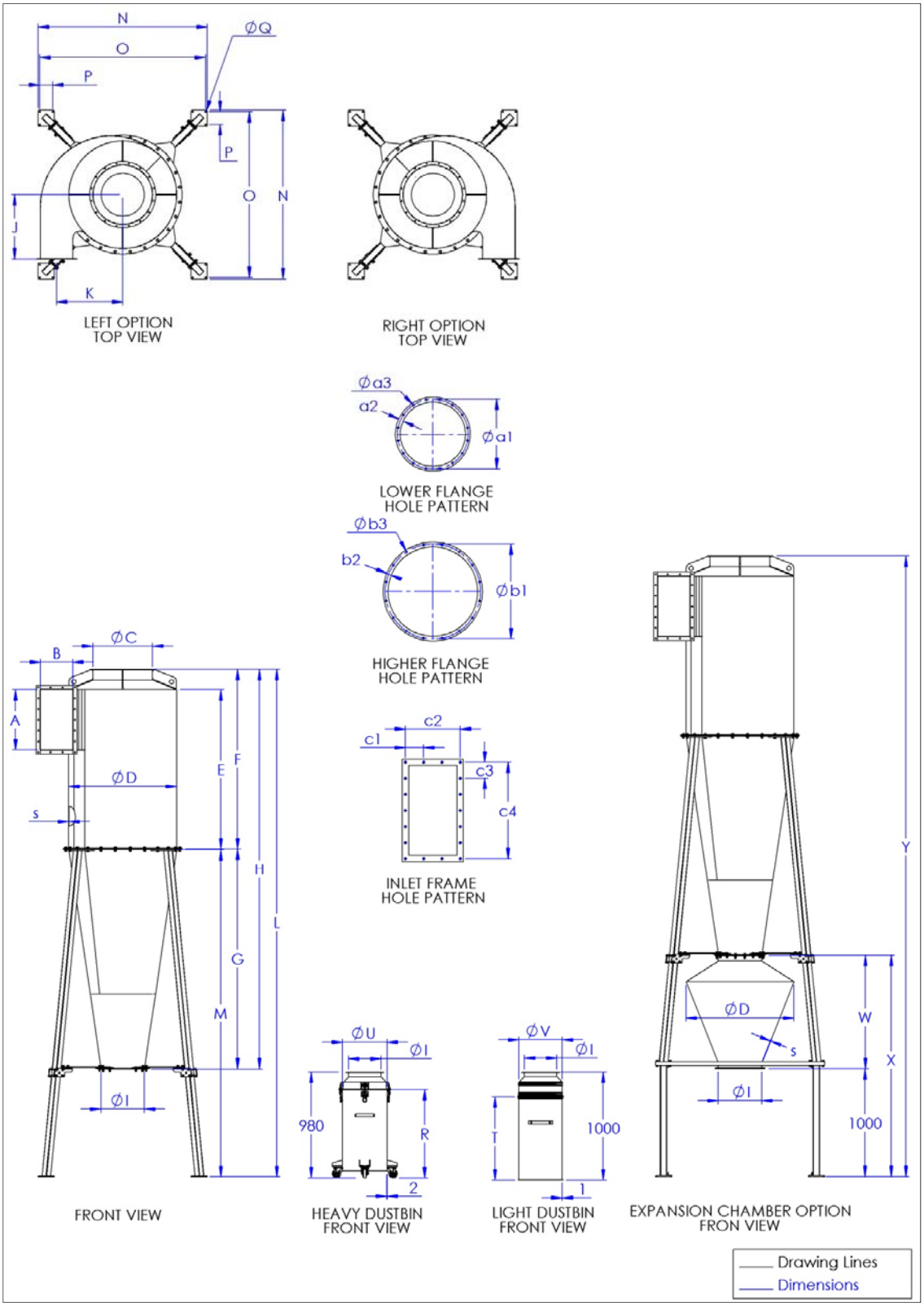
** For technical data, please see attached tables in Chapter 2.5.

2.4 Restrictions

1. Producer is not responsible for failures arising during the use that is inconsistent to the purpose of application,
2. Installing any additional elements not belonging to the normal device structure (or accessory set) is not acceptable,
3. Any structural changes or modification of the unit carried out by User on one's own are not permitted,
4. Prior to installing examine the load capacity of the structure in points where the device shall be mounted, Unsure mounting could cause hazard to personnel / people in the vicinity, as well as damage of the device itself,
5. **Do not use the device for conveying the air mixture with combustible substances, in form of gas, steams or hybrid mixing, unstable chemical substances, explosive substances, or pyrotechnic substances – that might create explosive atmosphere,**
6. Do not apply the device for conveying the air containing viscous compounds that would deposit on the surface of the device elements,
7. Do not apply the device for conveying the air containing aggressive compounds that would have destructive effect on the device elements.

2.5 Technical datasheet

2.5.1. Cyclone dimensions



Cyclone dimensions

Type	A	B	ØC	ØD	E	F	G	H	ØI	J	K	s
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
FA-20	230	100	225	400	570	645	820	1465	160	240	234	2
FA-35	285	125	250	500	710	770	1020	1790	200	300	290	2
FA-50	350	160	250	500	710	770	1020	1790	200	300	308	2
FA-65	445	200	400	710	998	1095	1405	2500	300	420	419	2
FA-100	560	300	550	1000	1490	1675	2050	3725	400	600	615	2
FA-130	750	400	700	1250	2000	2270	2820	5090	450	700	782	3
FA-160	1100	500	800	1600	2000	2270	3150	5420	550	900	1050	3
FA-180	1500	500	1000	1800	2500	2800	3450	6250	630	950	1150	3

Legs, dust bin & expansion chamber dimensions

Type	L	M	N	O	P	ØQ	R	T	ØU	ØV	W	X
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
FA-20	2465	1816	670	840	100	14	980	720	410	400	454	1454
FA-35	2790	2012	981	951	100	14	980	720	410	400	554	1554
FA-50	2790	2012	981	951	100	14	980	720	410	400	554	1554
FA-65	3518	2414	1214	1184	100	14	980	720	410	400	764	1764
FA-100	4725	3042	1573	1543	120	14	980	720	410	400	1054	2054
FA-130	6089	3810	1955	1915	140	14	980	720	410	400	1304	2304
FA-160	6420	4140	2258	2218	140	14	980	720	410	400	1654	2654
FA-180	7250	4440	2501	2461	170	14	980	720	410	400	1854	2854

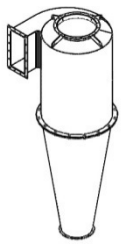
Flange connections

Type	Øa1	a2	Øa3	Øb1	b2	Øb3	c1	c2	c3	c4	Øc5
	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
FA-20	195	25	8 x 9.5	280	25	12 x 9.5	70	140 (2x 70)	90	270 (3x 90)	13
FA-35	235	25	12 x 9.5	305	25	12 x 9.5	82.5	165 (2x 82.5)	108	325 (3x 108)	13
FA-50	235	25	12 x 9.5	305	25	12 x 9.5	100	200 (2x 100)	97.5	390 (4x 97.5)	13
FA-65	336	25	12 x 9.5	439	30	16 x 11.5	80	240 (3x 80)	97	485 (5x 97)	13
FA-100	439	30	16 x 11.5	615	30	16 x 11.5	113	340 (3x 113)	100	600 (6x 100)	13
FA-130	489	30	16 x 11.5	785	40	24 x 11.5	110	440 (4x 110)	99	790 (8x 99)	13
FA-160	590	30	16 x 11.5	885	40	24 x 11.5	108	540 (5x 108)	104	1140 (11x 104)	13
FA-180	670	30	24 x 11.5	1085	40	24 x 11.5	108	540 (5x 108)	103	1540 (15x 103)	13

2.5.2. Cyclone characteristics

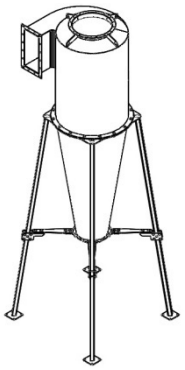
FA Cyclone

Type	Total volume	Total mass	Upper body mass	Lower body mass
	m^3	kg	kg	kg
FA-20	0.13	40	25	15
FA-35	0.25	57	35	23
FA-50	0.25	58	36	23
FA-65	0.7	113	70	43
FA-100	2.08	226	143	83
FA-130	4.3	538	339	199
FA-160	7.3	754	475	278
FA-180	10.95	1025	682	342



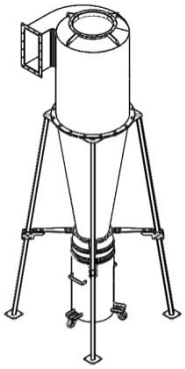
FA Cyclone with legs

Type	Total volume	Total mass	Leg mass
	m³	kg	kg
FA-20	0.13	78	37
FA-35	0.25	99	41
FA-50	0.25	100	41
FA-65	0.7	162	49
FA-100	2.08	326	100
FA-130	4.3	692	154
FA-160	7.3	922	168
FA-180	10.95	1301	276



FA Cyclone with legs and heavy dust bucket

Type	Total mass	Dustbin mass	Dustbin volume
	kg	kg	m³
FA-20	111	34	0.1
FA-35	132	34	0.1
FA-50	133	34	0.1
FA-65	195	34	0.1
FA-100	360	34	0.1
FA-130	747	34	0.1
FA-160	977	34	0.1
FA-180	1356	34	0.1

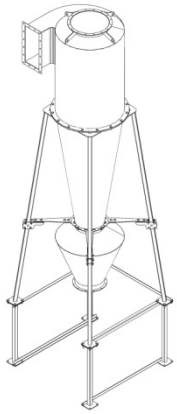


FA Cyclone with legs and light dust bucket

Type	Total mass	Dustbin mass	Dustbin volume
	kg	kg	m³
FA-20	91	13	0.1
FA-35	112	13	0.1
FA-50	113	13	0.1
FA-65	175	13	0.1
FA-100	339	13	0.1
FA-130	705	13	0.1
FA-160	935	13	0.1
FA-180	1315	13	0.1

FA Cyclone with legs and expansion chamber

Type	Total mass	Expansion chamber mass	Expansion chamber volume
	kg	kg	m³
FA-20	101	8	0.02
FA-35	128	12	0.05
FA-50	129	12	0.05
FA-65	210	24	0.15
FA-100	421	46	0.4
FA-130	875	101	0.75
FA-160	1231	164	1.54
FA-180	1724	206	2.22



2.6 Pressure loss

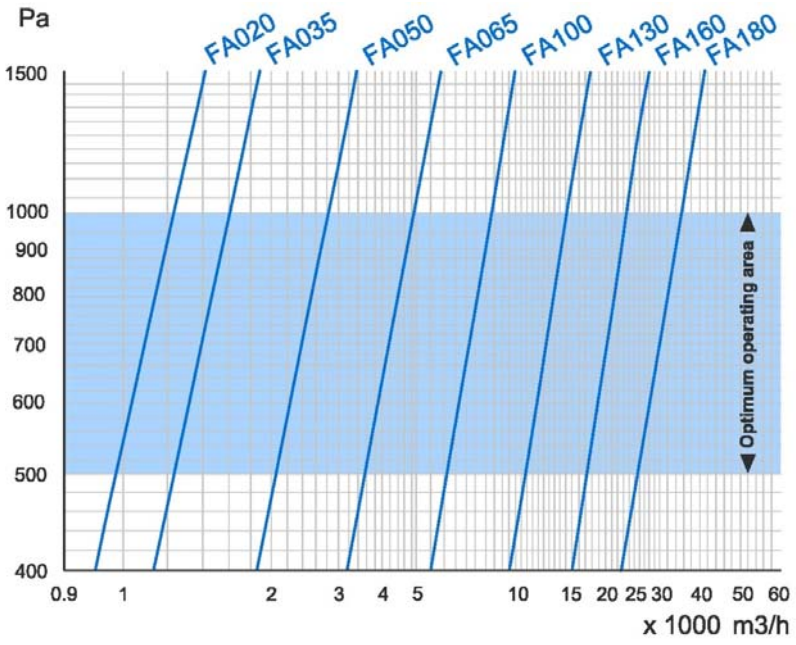


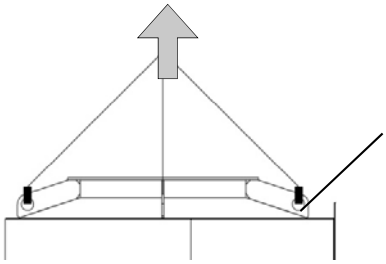
Diagram stating the pressure loss in FA cyclones at a given air volume.

3. Mounting instructions

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.

3.1. Lifting the cyclone

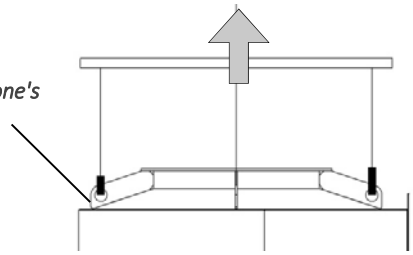
Always move and lift the cyclone to the desiderate place with the help of the lifting eyes.



Recommended lifting method for models FA-20 up to FA-65

FA lifting eyes

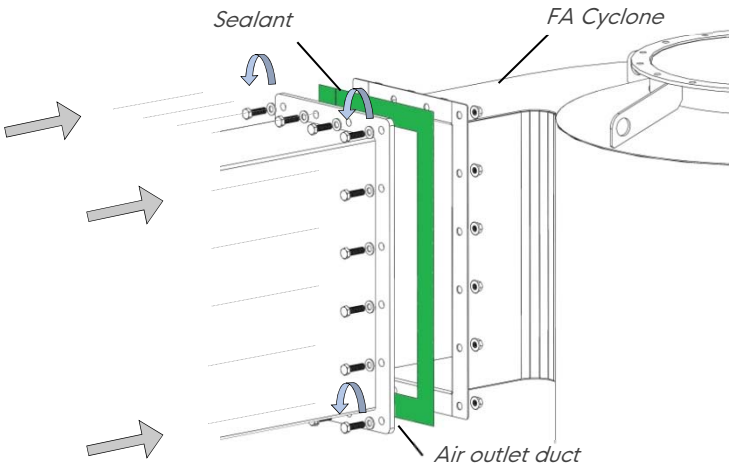
Cyclone's



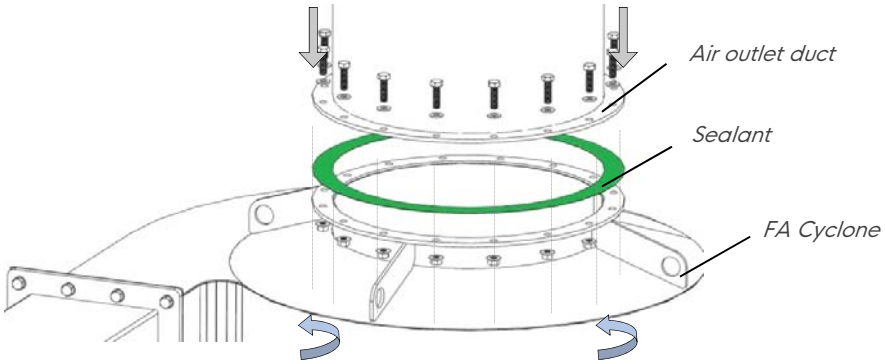
Recommended lifting method for models as of FA-100

3.2. Cyclone connections to the ducting

Step 1 : Use sealant (or sealing tape) on the cyclones rectangular inlet duct and connect it to the duct with the correct fasteners.



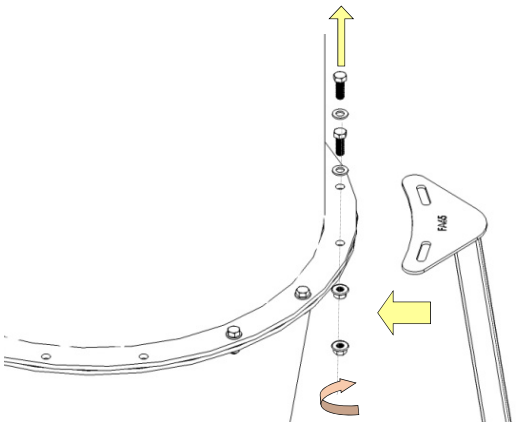
Step 2: Use sealing tape on the cyclones higher flange and connect it to the duct with the correct fasteners.



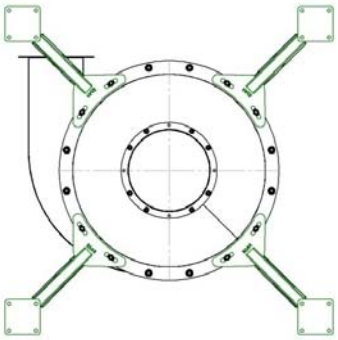
3.3. Cyclone leg assembly

Step 1: Please follow the installation steps in Chapter 3.1. for cyclone installation.

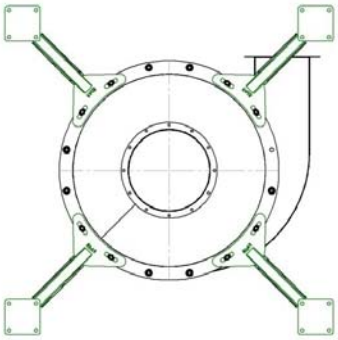
Step 2: Unscrew the bolts where legs are being positioned and position the leg to the bottom part of the cyclone's hopper flange.



CAUTION ! Make sure each leg is in the right position.

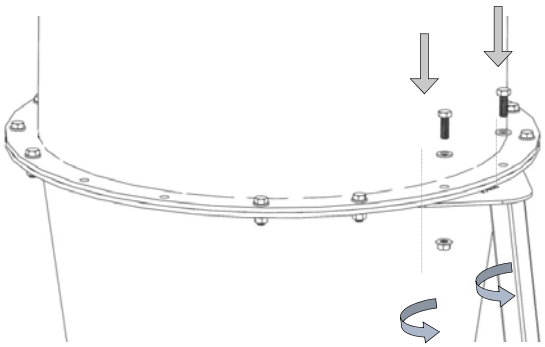


LEG SUPPORT POSITIONING FOR FA CYCLONES LEFT SIDE



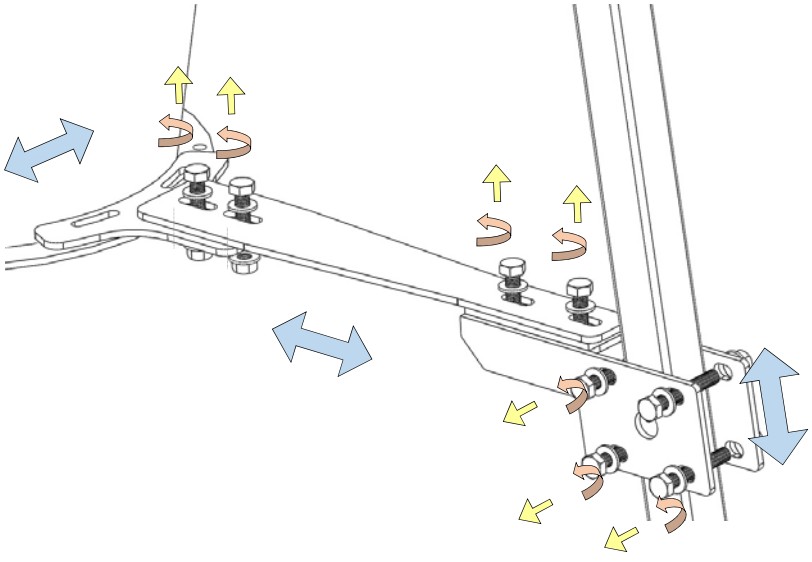
LEG SUPPORT POSITIONING FOR FA CYCLONES RIGHT SIDE

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

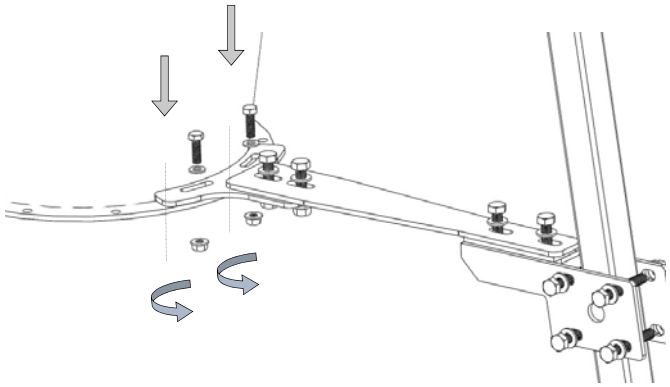


Step 4: Repeat Step 2 and Step 3 to attach the other three leg supports.

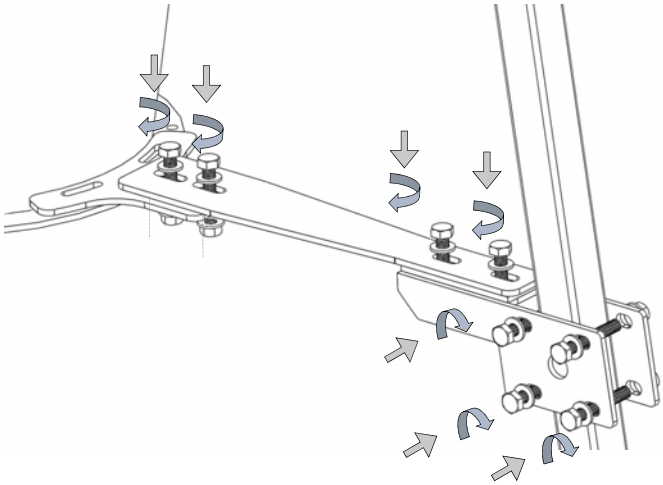
Step 5: Loosen all the fasteners from the lower arm of the leg support.



Step 6: Attach the lower arm to the cyclone's hopper lower flange with M10 fasteners.



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



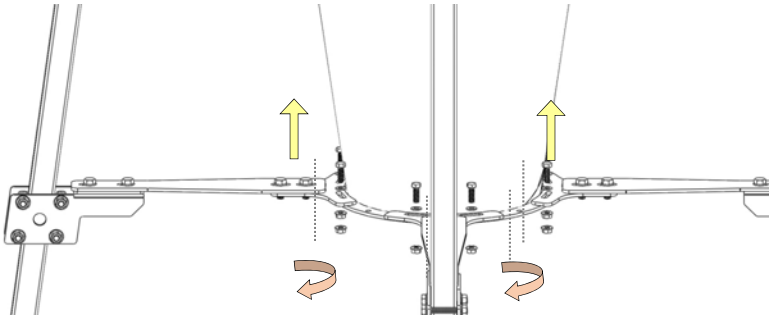
Step 8: Repeat the Step 5, Step 6 and Step 7 for the other leg supports.

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

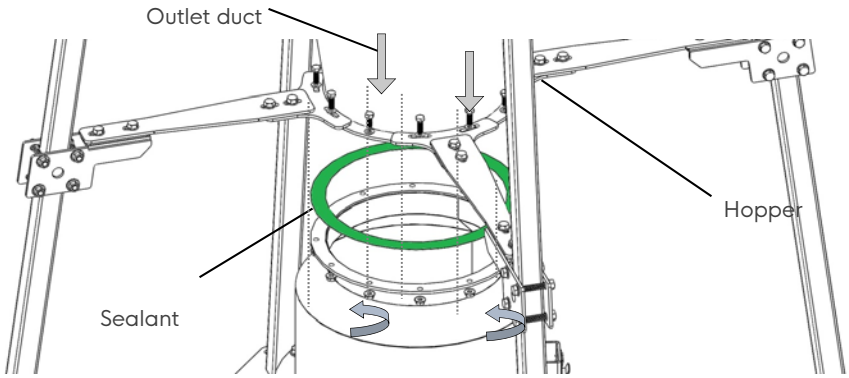
3.4. Cyclone dust bin assembly

Step 1: Please follow the installation steps in Chapter 3.2. for cyclone and legs installation.

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



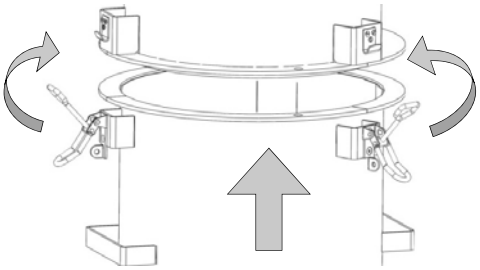
Step 3: Use sealing tape on the connector's flange and connect it to the lower flange of the cyclone with the correct fasteners.



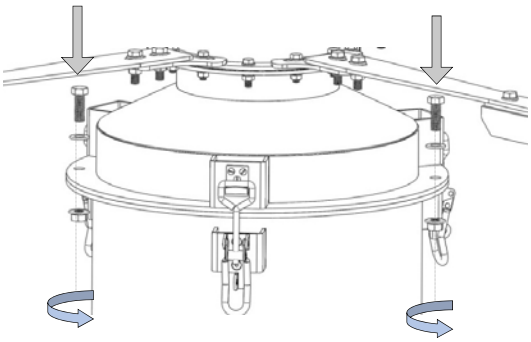
Step 4: Attach the dustbin :

3.4.1. For heavy dustbin

Step 1 : Lock the dustbin to the transition with the three clamps.

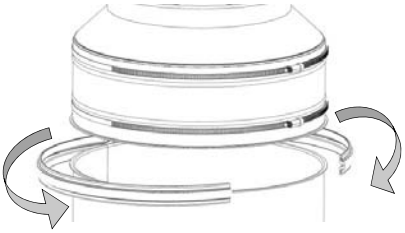


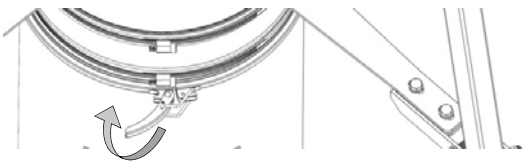
Step 2 : Screw the bolts to the flange of the dustbin.



3.4.2. For dustbins with flexible connection

Step 1 : Lock the dustbin to the connector with the lock ring.



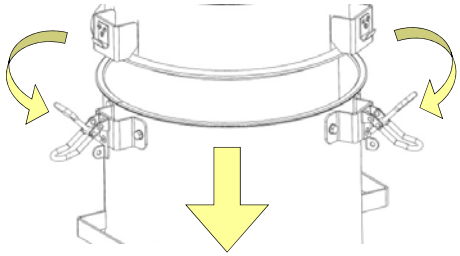


3.5. Removing the dustbin

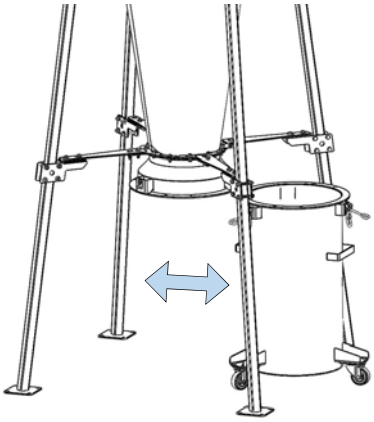
Step 1: Unlock the dustbin.

3.5.1. For dustbins with rigid connection

Step 1 : Unlock the three clamps from the dustbin.



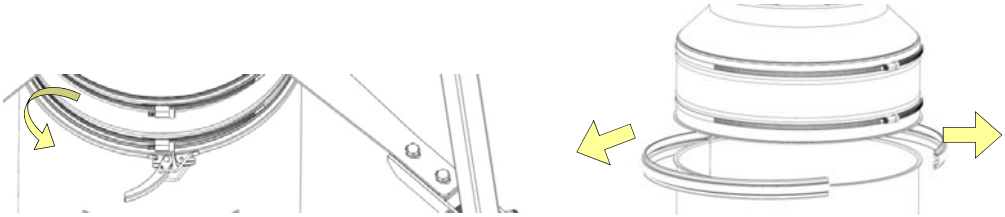
Step 2: Roll the dustbin to the desired location and empty its contents.



Step 3: Fix the dustbin again. Please follow the Step 4 in Chapter 3.3.

3.5.2. For dustbins with flexible connection

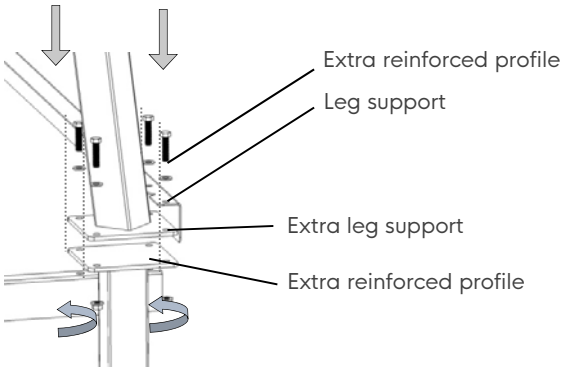
Step 1 : Unlock the lock ring which fixes the dustbin to the connector.



3.6. Installing the expansion chamber

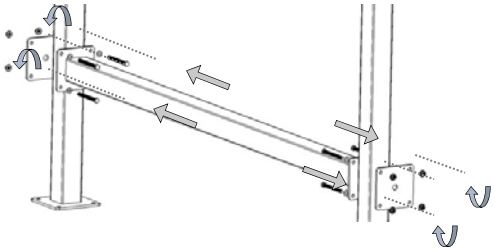
When using an expansion chamber, extra legs are added under the standard leg support, so that the space left between the floor and the lowest part of the cyclone is always 1 meter.

Step 1: Attach the extra leg support to the standard leg support with the correct fasteners. Repeat this step for the other legs.

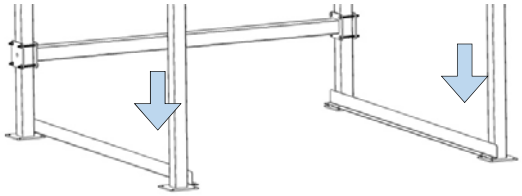


Step 2: For the leg support installation, please refer to Step 2 to Step 8 in Chapter 3.2.

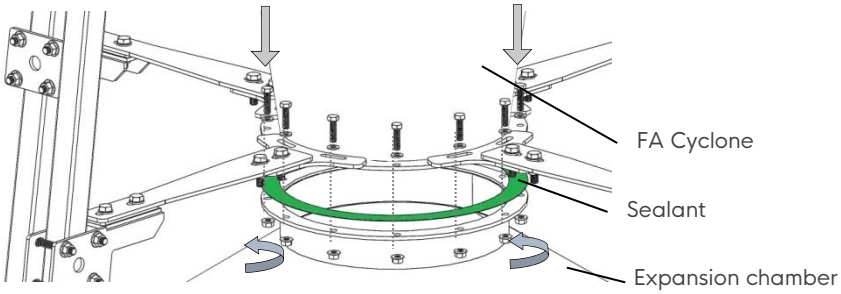
Step 3: For the biggest cyclones, place the crosspiece onto the extra leg support's profiles. Use M10 fasteners to attach the crosspiece to the leg support.



Step 4: Anchor the legs and to the floor with the correct fasteners. If necessary, add the extra reinforced profiles that are provided.



Step 5: Attach the expansion chamber by its flange to the lower flange of the cyclone with the correct fasteners.



4. Maintenance and spare parts

The installation, connection, start-up and maintenance of the cyclone has to be performed by qualified personnel only.

Clean the cyclone regularly.

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

Replace any components that are damaged or broken.

4.1. Replacing a cyclone body part

Reverse the procedure described in point 3.2.

4.2. Replacing the leg support

Reverse the procedure described in point 3.3.

4.3. Removing the dustbin transition

Reverse the procedure described in point 3.4.

5. Occupational Health and Safety

Prior to start and use, it is important to get acquainted with the present Use and Maintenance Manual.

WARNING : Unsure mounting could result in an uncontrolled detachment of the device and would cause serious hazard to personnel / people in the vicinity.

6. Transportation, storage & handling

6.1. Transportation

The cyclones are shipped secured, palletized, and properly packed to prevent shifting and damages during manipulation. The cyclones should always be transported covered and protected from atmospheric elements.

CAUTION **:** Do not stack during transport !

6.2. Storage

Store the cyclones palletized, and covered and protected from atmospheric elements.

6.3. Handling

Always lift with an even weight distribution. Never lift the cyclones by mobile or sensitive parts.

Make sure that the mounting surface is even, stable and that it can bear the load of the cyclones to ensure the proper functioning of the cyclones.

7. Terms of warranty

The period of warranty for the purchased device is indicated in the general sales conditions.

The warranty does not comprise:

- Producer accepts no liability for any consequences following from the operational use that is in contradiction to the purpose of application,
- Defects and damages arising during the incorrect use and in application that is inconsistent with the present manual,
- Mechanical and electrical damages being caused during improper storage and transport or incorrect maintenance,
- Structural modifications, or changes / adaptations introduced by the user on one's own, are not permitted,
- Inefficiency following from the normal operational exhaustion.

Infringement of the section "Restrictions" of the Use and Maintenance Manual and especially modifications undertaken by User on one's own shall result in the loss of warranty validity.

8. Troubleshooting Guide

Problem	Possible cause	Possible solution
– Premature wear on tangential inlet	– Very abrasive material	– Review the cyclone material (Hardox, AISI,..)
		– Use a replaceable outer wear plate on inlet
	– Air forced against outer wall	– Use an off-center inlet transition or reduce m/s
– Premature deterioration of cyclone body	– Very aggressive material	– Review the cyclone material (Hardox, AISI,..)
	– Very aggressive exterior elements (ex. Sea coast)	– Review the cyclone material (Hardox, AISI,..)
	– Unbalance/uneven/loose assembly	– Review assembly, base
– Insufficient separation	– Wrong model for application	– Select another model
	– Undersized cyclone for air volume	– Choose a bigger model
	– Air speed to fast	– Reduce air speed going in
	– Particles too light	– Wrong model for application
	– Too much turbulence at bottom of hopper	– Place an expansion chamber
– Material not "dropping" down	– Air speed to fast	– Reduce air speed going in
	– Particles too light	– Wrong cyclone for application
	– Too much turbulence at bottom of hopper	– Place an expansion chamber
	– Material is wet/sticky	– Improper use of cyclone
	– Material is electrostatically charged	– Improper use of cyclone
	– Leakage at dust outlet	– Insure airtightness of outlet
– Material is not evacuating	– Too much turbulence at bottom of hopper	– Place an expansion chamber
	– Material is wet or sticky	– Improper use of cyclone
	– "Doming" effect due to material nature	– Check material nature
	– Air coming in from underside	– Review airtightness of assembly &/or discharge equipment
	– Undersized rotary valve	– Choose bigger rotary valve
– Material sticking to the sides	– Material too wet/sticky	– Wrong application
	– Condensation along inner walls	– Avoid condensation / hot-cold reactions
– Paint is chipping/peeling	– High temperature material going through	– Reduce material temperature
	– External environment factors	– Change to AISI unpainted body
– Air not flowing through	– Clogging in inlet ducting	– Remove clog

If the above does not help, please contact your supplier.

9. Dismantling and 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 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.

14. Maintenance log

date	description

Contacts

Formula Air The Netherlands
Head Office / Production / Sales
Bosscheweg 36
5741 SX Beek en Donk,
The Netherlands
+31 492 45 15 45
info-nl@formula-air.com

Formula Air Germany
Sales
Dr.-Oetker Straße 10
54516 Wittlich
Germany
+49 6571 269860
info-de@formula-air.com

Formula Air France – West
Sales
6, avenue des Lions
44800 Saint-Herblain
France
+33 9 72 15 29 38
contact-ouest@formula-air.com

Formula Air Nordic
Sales
Stortorget 17
211 22 Malmö
Sweden
+46 40 654 06 10
info-scan@formula-air.com

Formula Air Belgium
Logistics / Sales
Rue des Dizeaux 4
1360 Perwez
Belgium
+32 81 23 45 71
info-be@formula-air.com

Formula Air France – North
Sales
Zac de la Carrière Dorée
BP 105, 59310 Orchies
France
+33 9 72 15 29 38
contact-fr@formula-air.com

Formula Air France – South
Sales
Chemin de Peyrecave
09600 Regat
France
+33 9 72 15 29 38
contact-sud@formula-air.com

Formula Air Export
Sales
Rue des Dizeaux 4
1360 Perwez
Belgium
+32 81 23 45 71
info-be@formula-air.com

Formula Air Baltic
Production / Sales
P. Motiekaičio g. 3
LT-77104 Šiauliai
Lithuania
+370 41 54 04 82
info-lt@formula-air.com

Formula Air France – East
Sales
2 Rue Porcherie
38460 Cremieu
France
+33 9 72 15 29 38
contact-est@formula-air.com

Formula Air Vietnam
Production / Sales
#33, Lot 2, Den Lu 1
Hoang Mai District, Hanoi
Vietnam
+84 (24) 38 62 68 01
info@vinaduct.com