



Donaldson  
FILTRATION SOLUTIONS

# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## WSO Flex Mist Collectors



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## SAFETY RECOMMENDATIONS

This manual contains specific precautionary statements relative to worker safety in appropriate sections. To avoid dangerous situations we give you the following advice:



*Refers to special information on how to use the mist collector most efficiently.*



*Refers to special information directed towards preventing damage.*



*Refers to special information designed to prevent injury or death.*



*The mist collector has been built in accordance with state-of-the-art standards and recognised safety rules. Nevertheless if not handled carefully, it may put people at risk, or also cause damages.*



*The mist collector must only be used in technically perfect condition in accordance with its designated use and the instructions set out in the operation manual. Any functional disorders, especially those affecting the safety, should therefore be rectified immediately.*



*Make sure to give proper training to operators before start-up. The mist collector is designed exclusively for use in accordance with the scope of delivery, drawing(s) and the specification sheet.*



*The mist collector is not designed for applications with combustible materials involving a potential explosion risk.*



*WSO Flex mist collectors can only be used for oils with an LEL > 15g/m<sup>3</sup>. f) Oil mist is potentially flammable and WSO Flex mist collectors are only suitable for working in ambient temperature conditions and handling fluids with a flash point > 65°C.*



*It is not allowed to put lit cigarettes or any burning object into the mist collection system.*



*Regular maintenance is important for a good performance of your mist collector. A prudent user of Donaldson equipment should consult and comply with all relevant Fire Codes and / or other appropriate codes when determining the location and operation of mist collector equipment. A hand operated supply disconnecting device is necessary for each incoming electrical supply in accordance with the Declaration of Conformity.*



*To prevent accidents the access to the fan wheel must be impossible during operation. Refer to Declaration of Conformity.*



*Disconnect all power before servicing. All electrical work must be done by a qualified electrician according to local codes.*



*All exposed conductive parts of the electrical equipment and the mist collector shall be connected to the protective bonding circuit (refer to Declaration of Conformity).*



*Mist collectors do not contain fire extinguishing equipment. A manufacturer of fire extinguishing equipment, familiar with this type of fire hazard and local fire codes, should be consulted for recommendations and installation of the proper fire extinguishing equipment.*



*WSO Flex mist collectors cannot be placed or operated in potentially explosive atmospheres as classified by the Declaration of Conformity, unless stated otherwise on the nameplate of the unit and scope of delivery.*



*The user of the mist collector is responsible to dispose of any contaminant generated by the process, according to local regulations.*



*Operation of the WSO Flex mist collector fan should be interlocked with the oil mist generation process such that in the event of fan failure, oil mist generation must stop immediately to prevent the increase to unsafe concentration levels.*

## INTRODUCTION

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### Product information

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The WSO Flex mist collector is used for the collection of airborne mists. Whether in answer to the problem of air pollution, or as part of a manufacturing process, the mist collector provides highly efficient, continuous, on-line mist collection.

The WSO Flex mist collector is designed to collect oil, water soluble and synthetic coolant mists from a variety of machining operations and other industrial processes. The unit will also collect a small amount of dust from machining operations. With the optional HEPA (High Efficiency Particulate Air) filter, smoke from machining operations can also be captured.

The filter element is the heart of the mist collector. This filter element helps to ensure that only cleaned air is returned to the plant environment. The filter element is either a Dryflo or a Synteq XP element depending on the scope of the delivery.

Technical and field support are available from your local Donaldson representative or distributor to answer your questions.

### Function

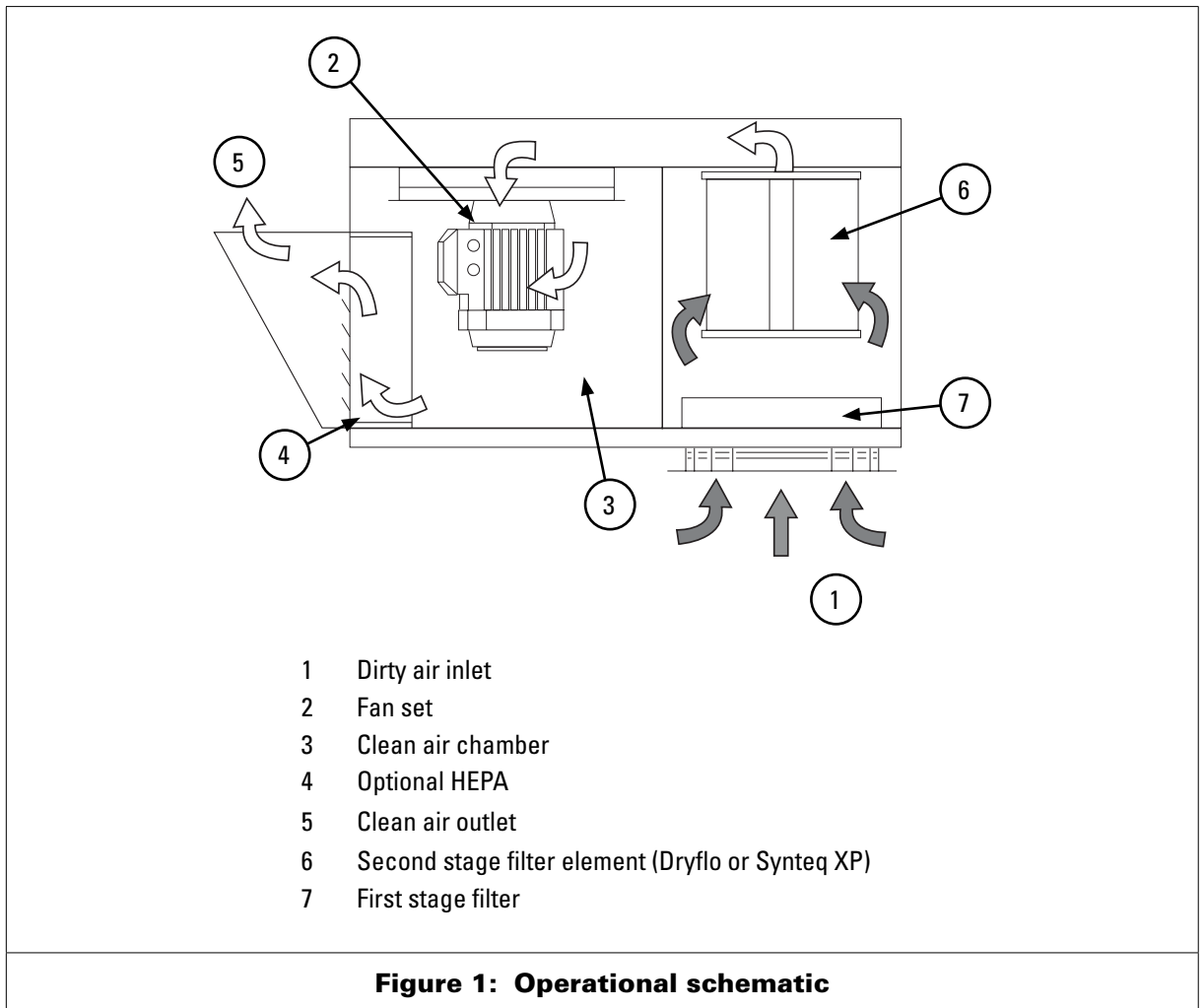
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During operation, contaminated air enters the WSO Flex mist collector through the dirty air inlet, located on the bottom of the unit. The air then passes through the first stage filter which is designed to collect and coalesce large droplets and particles. After the first stage filter the air still contains smaller mist droplets.

For Dryflo element specific, the filter element wrap provides an additional level of filtration compared to the Synteq XP element. This standard filter element wrap is designed to collect and coalesce fine mist into larger droplets. The vertical orientation of the wrap promotes drainage of the droplets. The filter element wrap also collects particulate that may be in the airstream, extending the life of the third stage filter element.

In the core and most efficient stage of filtration, the air passes through the filter element.

As mist particles coalesce and form larger droplets, the droplets become large enough to run down the filter element. During operation, the droplets will drain on both the inside and outside of the filter element. The filtered air exits the filter element into the clean air chamber, where it exits through the clean air outlet and can be recirculated into the environment.



## PRIOR TO INSTALLATION

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### Location

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The WSO Flex mist collector should be located with consideration for:

- hopper drainage
- shortest runs of inlet and outlet ductwork
- radius bends on elbows as big as possible
- easy access to electrical connections
- convenience of maintenance



*Consult the technical datasheet and drawings for the mist collector weight and dimensions.*

For calculating for foundation or supporting structure consider the following factors :

- the weight of the mist collector
- the material being collected
- all auxiliary equipment
- live loads

### Required tools and equipment

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- crane / fork lift
- slings / clevis pins and adequate lifting equipment
- standard tools (e.g. screwdrivers, wrenches, etc.)
- drill
- pipe sealant
- level
- reciprocating saw

### Delivery and inspection

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*The mist collector is normally shipped by truck as a completely mounted mist collector and should be checked for any damage that may have occurred during shipping. Compare the parts received against the packing list. If there is damage or parts missing, notify the delivery company and your local Donaldson representative.*

Parts shipped loose with the delivery (depending on your order):

- adjustable mounting stand
- collection bottle
- inlet hopper with flex duct pack
- inlet collars
- inlet hopper / impact separator pack
- spare parts
- hardware / sealant



## INSTALLATION

### Unloading and transport to location



Before unloading, remove all packing and strapping.

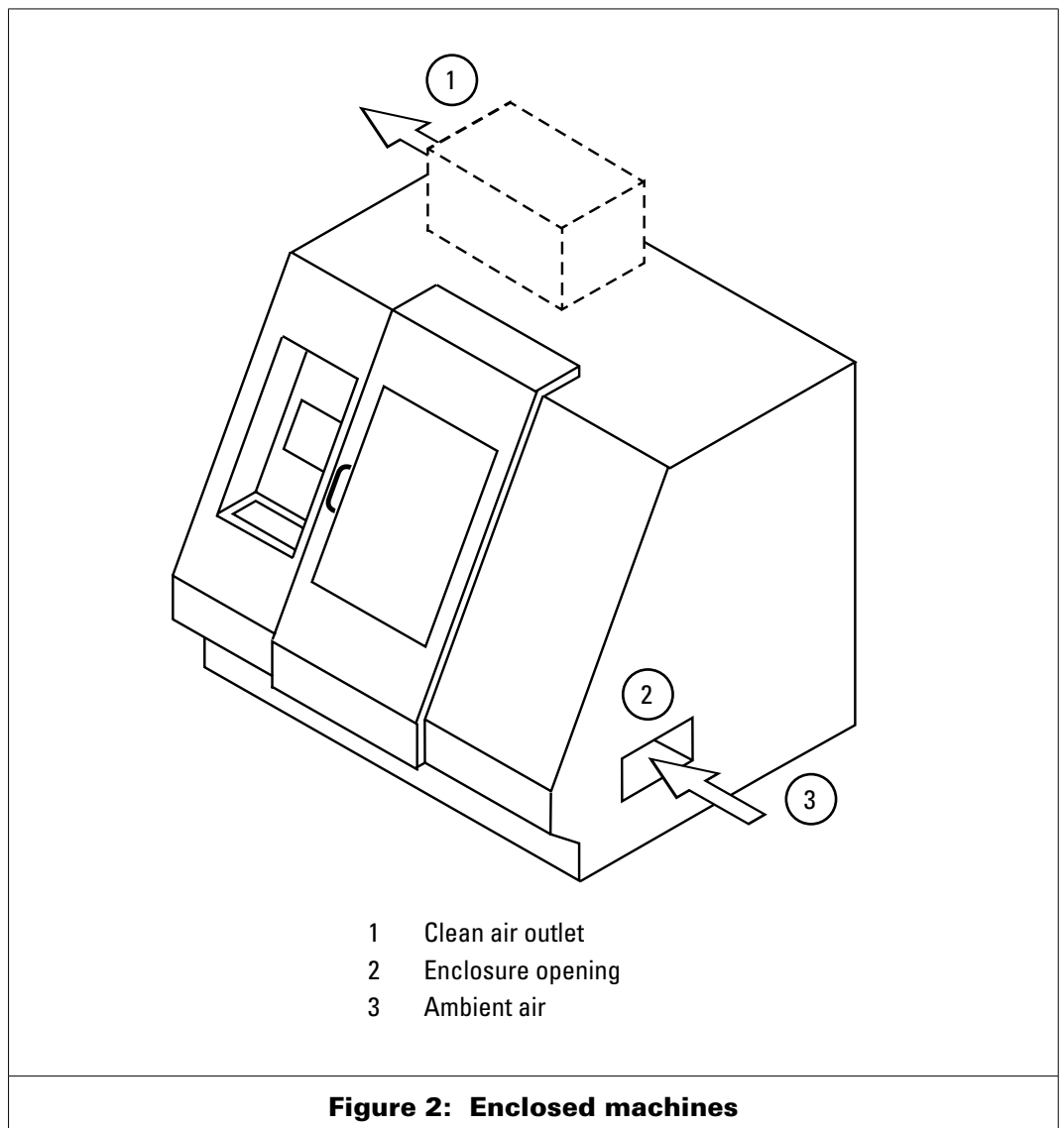


A crane or forklift is recommended for the unloading, transport and installation of the mist collector.

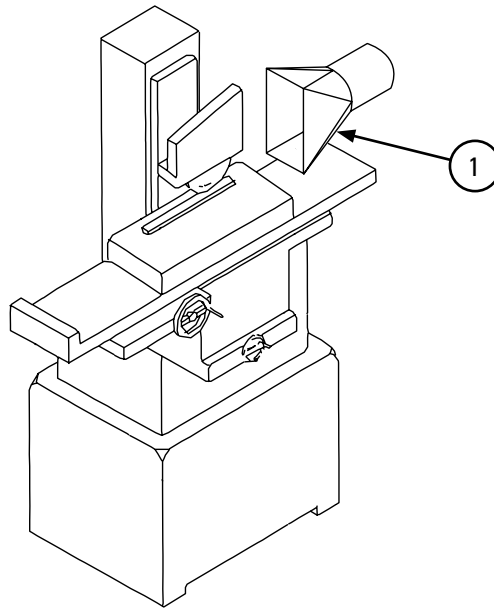
Connect lifting sling to the lifting eye bolts with clevis pins and distribute loads equally. Use spreader bar if necessary. If a forklift is used, fasten the unit securely to the forklift using straps that are tied around the unit and mast of the forklift.

### Installation tips

Enclosed machines: do not place the mist collector inlet directly above an opening (e.g. chip conveyor on CNC turning center)



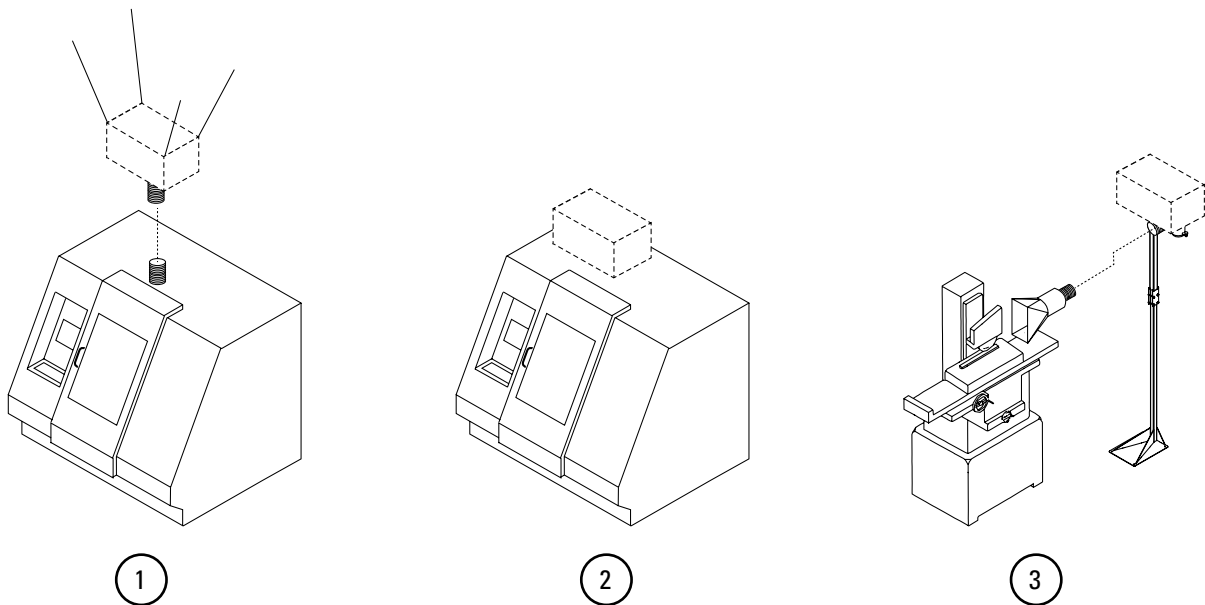
Open machines: be sure that the air is drawn across the source and into the collector (e.g. on a wet surface grinder a collection hood is positioned near the source for the best results).



1 Collection hood

**Figure 3: Wet surface grinder**

Examples of additional mounting options



1

2

3

- 1 Ceiling mounting
- 2 Teleduct mounting
- 3 Adjustable mounting stand with impact separator and collection bottle (only for MMA)

**Figure 4: Mounting options**

## Installation and assembly

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### a. Ceiling mounting

When ceiling mounting the WSO Flex mist collector, you must first calculate the total mist collector weight including material being collected, ductwork and any auxiliary equipment that is attached to the unit.

#### Option 1

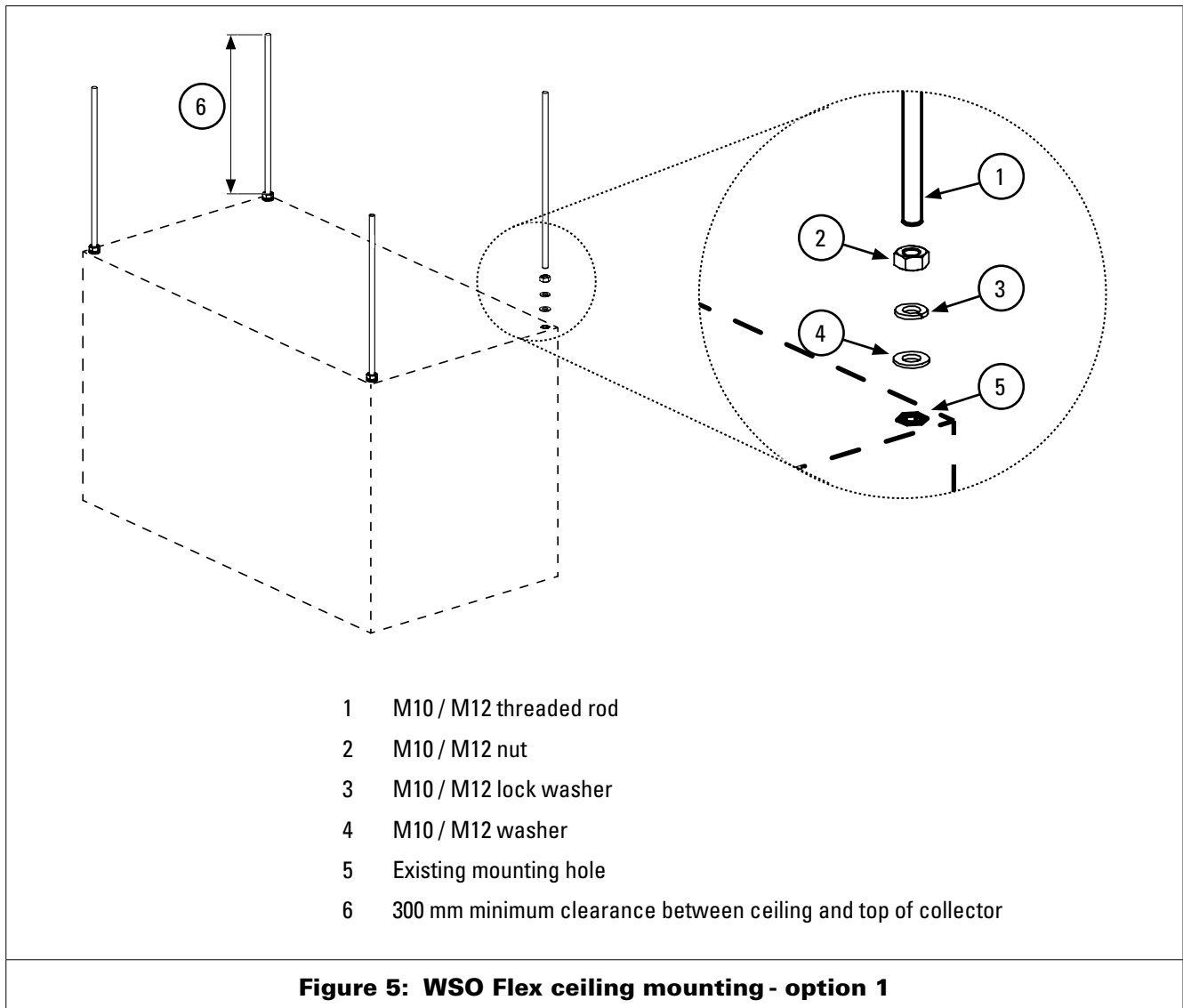
1. Remove the lifting eyebolts.
2. Use four threaded M10/M12\* rods (quality 12.9) for hanging the unit. Thread an M10/M12 (DIN 934) nut onto the threads of each rod for at least 25 mm.
3. Apply MS polymer sealant around the existing mounting holes on the top of the unit.
4. Place an M10/M12 lock washer and an M10/M12 flat washer on each rod before threading the rod into the mounting holes.
5. Thread the rods into the holes and tighten nuts.
6. Use the connection at the ceiling, not at the mist collector, to level the unit in all directions.

\* WSO Flex MMA = M10

WSO Flex MMB = M12



*300 mm clearance required above mist collector for exhaust air.  
Level the unit before tightening any hardware.*



Option 2

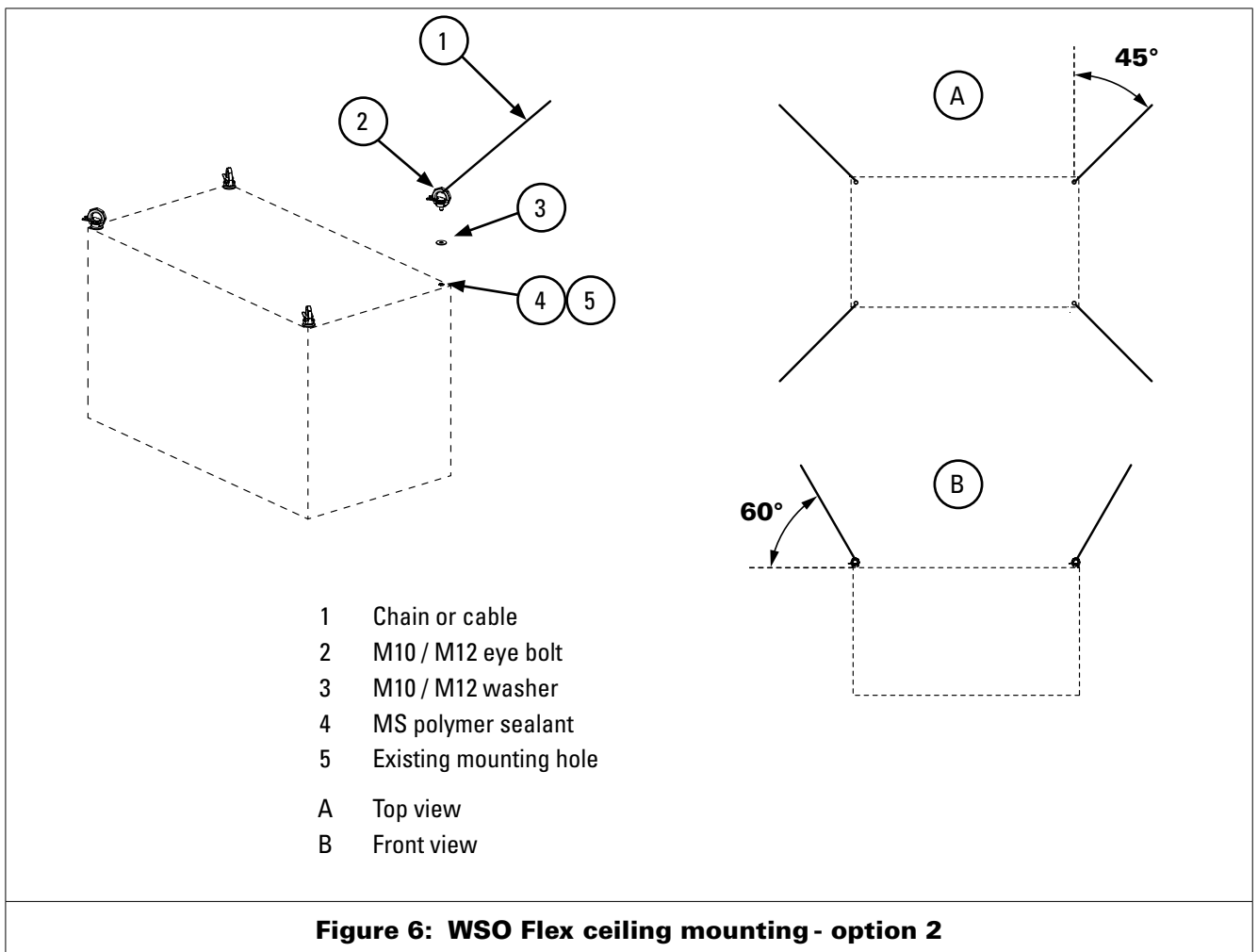
1. Remove the lifting eyebolts.
2. Apply MS polymer sealant around the existing mounting holes on the top of the unit.
3. Place an M10 / M12 washer on each eyebolt and thread into the unit until tight.
4. Use a cable or chain to suspend the unit from each eyebolt.

Position the cables or chains so that they form a 60° angle with the top of the mist collector and a 45° angle with the side surfaces.



*Always use cable or chain that is rated for the appropriate weight of the mist collector and any auxiliary equipment that is attached to the unit.*

5. Level the unit in all directions.



**b. Adjustable mounting stand (only for WSO Flex-MMA)**

An adjustable mounting stand is available for machines with no mounting surface and for machines, which need to be totally isolated from vibration.

1. Use M10 anchor bolts to fasten the mounting stand to the floor. The anchor bolts should extend 40 mm above the floor.



*Use a crane or fork truck to lift and hold up the unit while installing the mounting stand.*



*The mounting stand must be anchored to the floor before it is assembled to the mist collector.*

*Level the mounting stand before securing anchor bolts.*

2. Adjust the mounting stand by loosening the four locking bolts on the upper part of the stand. Slide this section up to obtain the required height. Tighten bolts to secure the stand in place.

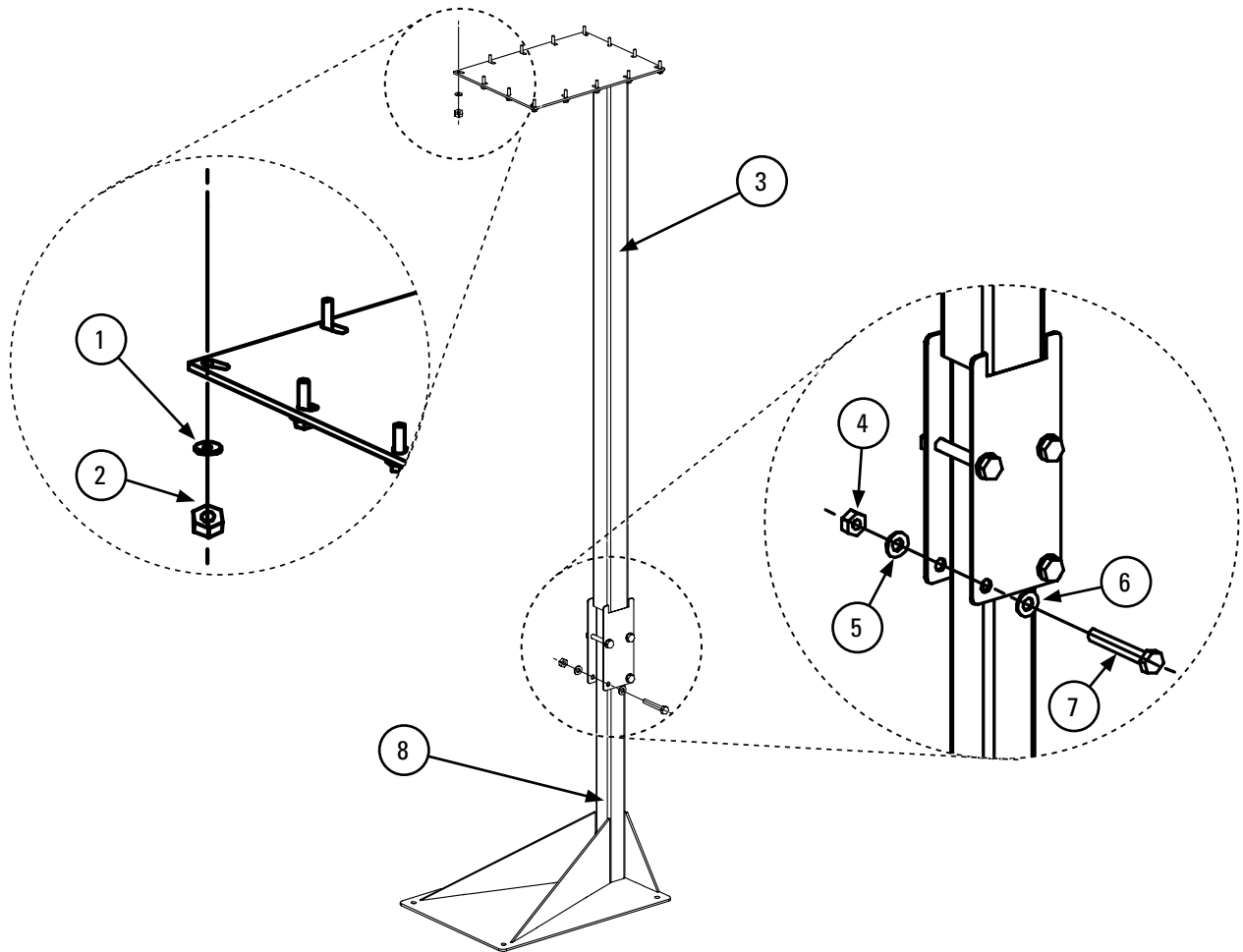


*Do not adjust the stand over a height of 2590 mm.*

3. Position the unit over the stand and align the holes of the top plate of the mounting stand with the studs.
4. Lower the unit onto the mounting stand. Use hardware shipped loose (nuts and washers) to fasten the top plate of the mounting stand to the unit.
5. Before removing the lifting gear, re-check the hardware for tightness.



*Make certain all nuts are tightened securely.*



- 1 Washer
- 2 Nut
- 3 Stand extension
- 4 Nut
- 5 Washer
- 6 Washer
- 7 Locking bolt
- 8 Stand base

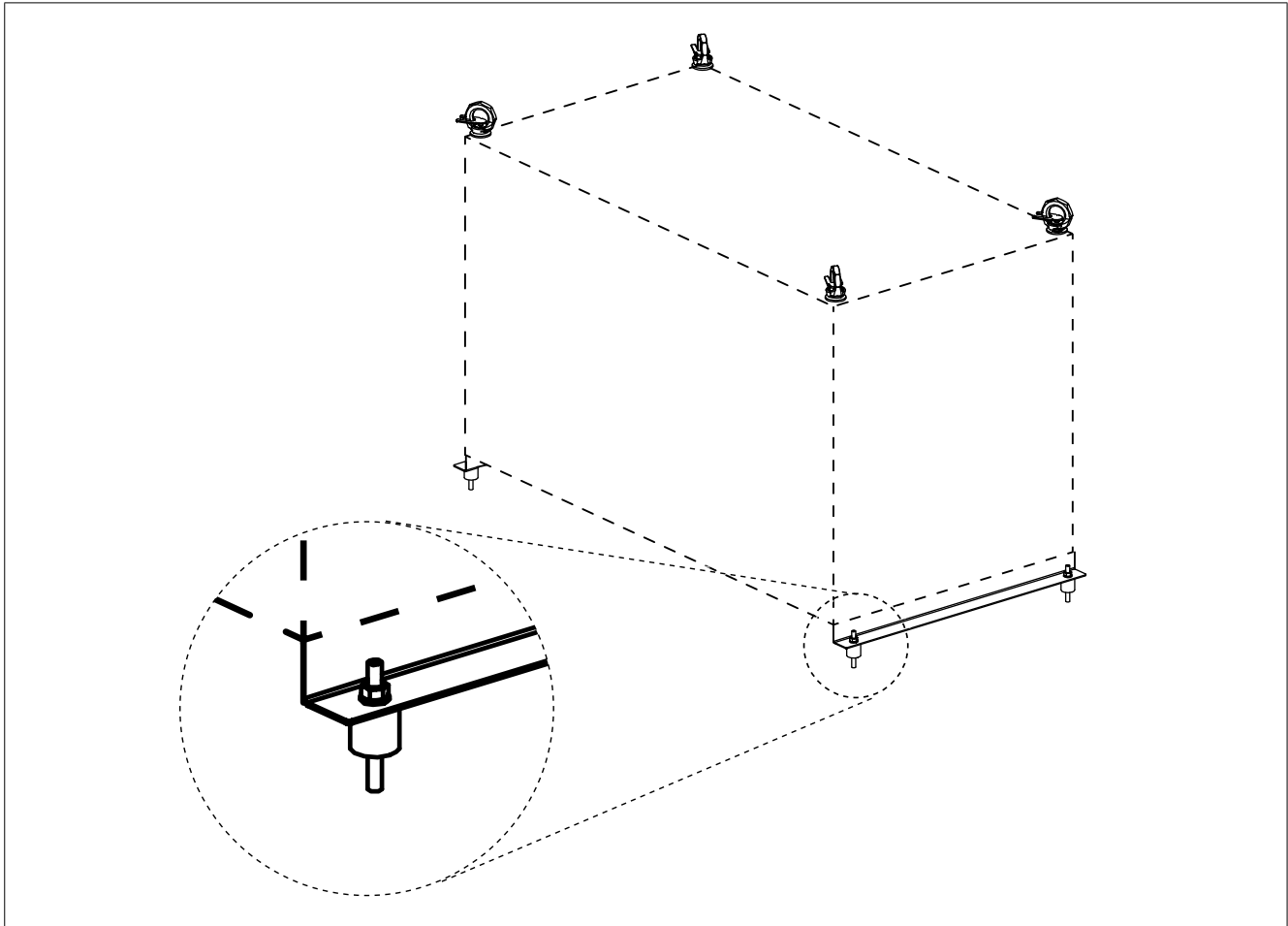
**Figure 7: Adjustable mounting stand**

### c. Vibration isolation

These are standard delivered for all units. This option is a must for top mounted units that are installed on machines that are sensitive to vibration.



*When installing, make sure unit stays level.*

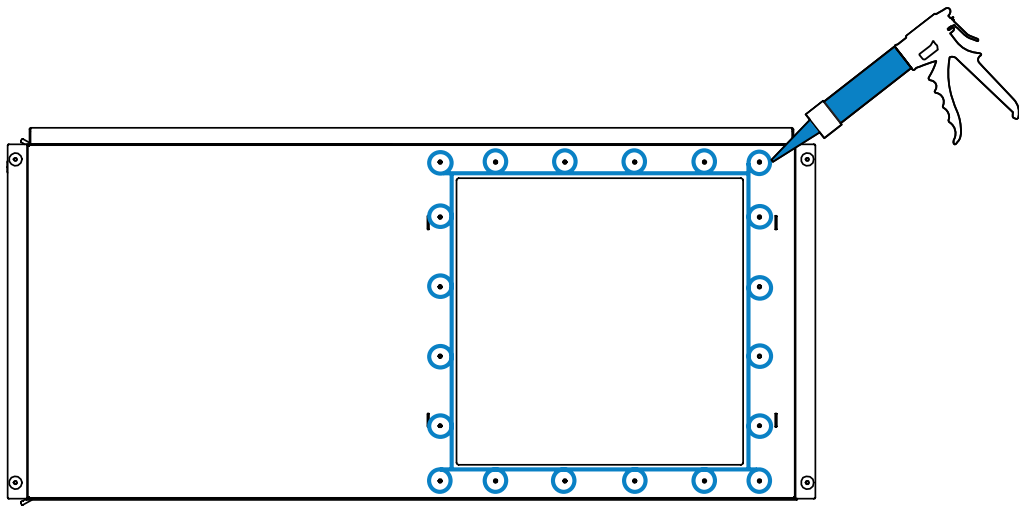


**Figure 8: Vibration isolation**



**d. Inlets**

Before installing inlet option and to ensure correct sealing, apply MS polymer sealant around every hole and along inside of hole pattern, as shown in figure.



BOTTOM VIEW

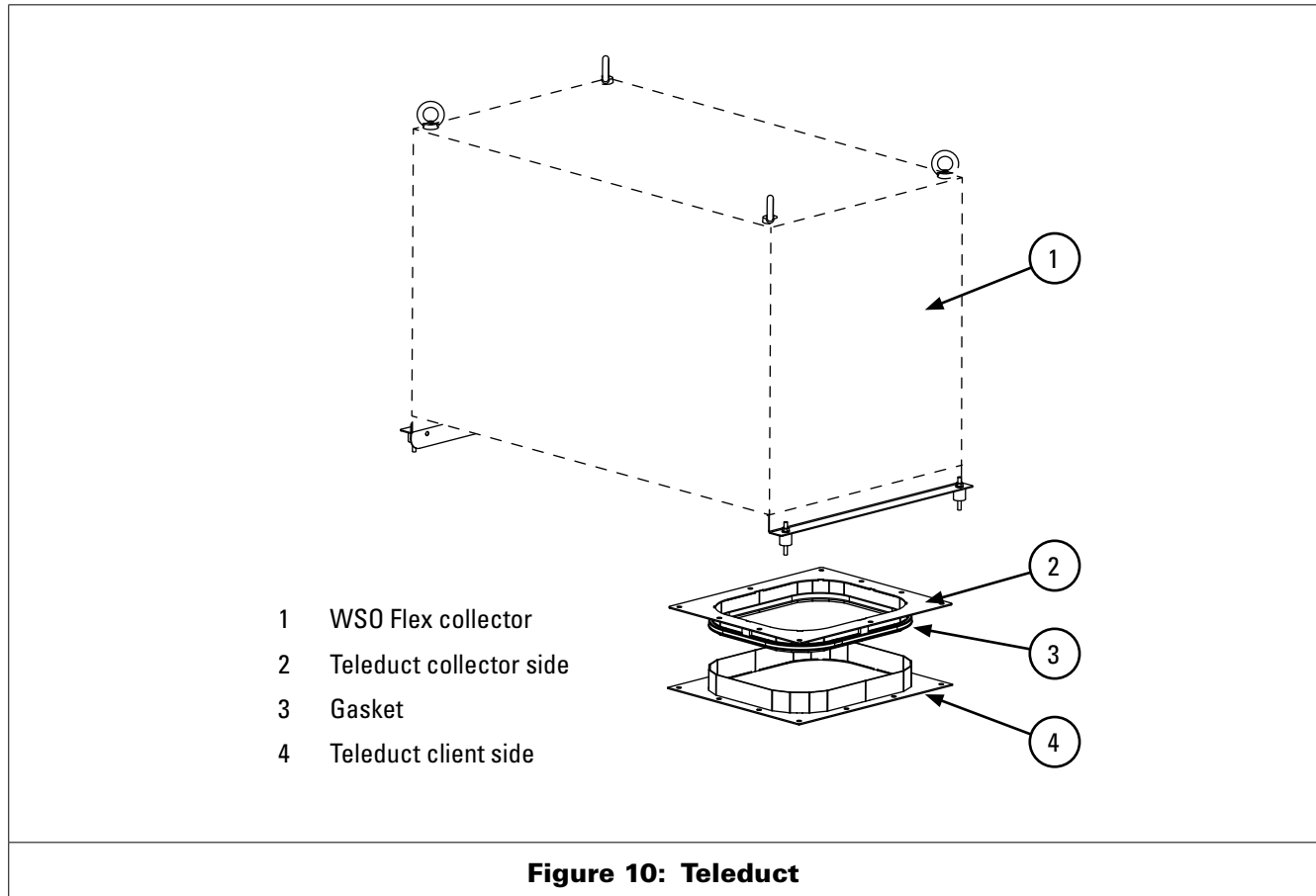
**Figure 9: Sealing details**

## Teleduct

Teleduct is the default option for the WSO Flex.



*Make sure that the gasket is installed as on image.*



**Figure 10: Teleduct**

## Inlet hopper with flex duct pack

This option is available for mist collectors which are mounted off the machine.



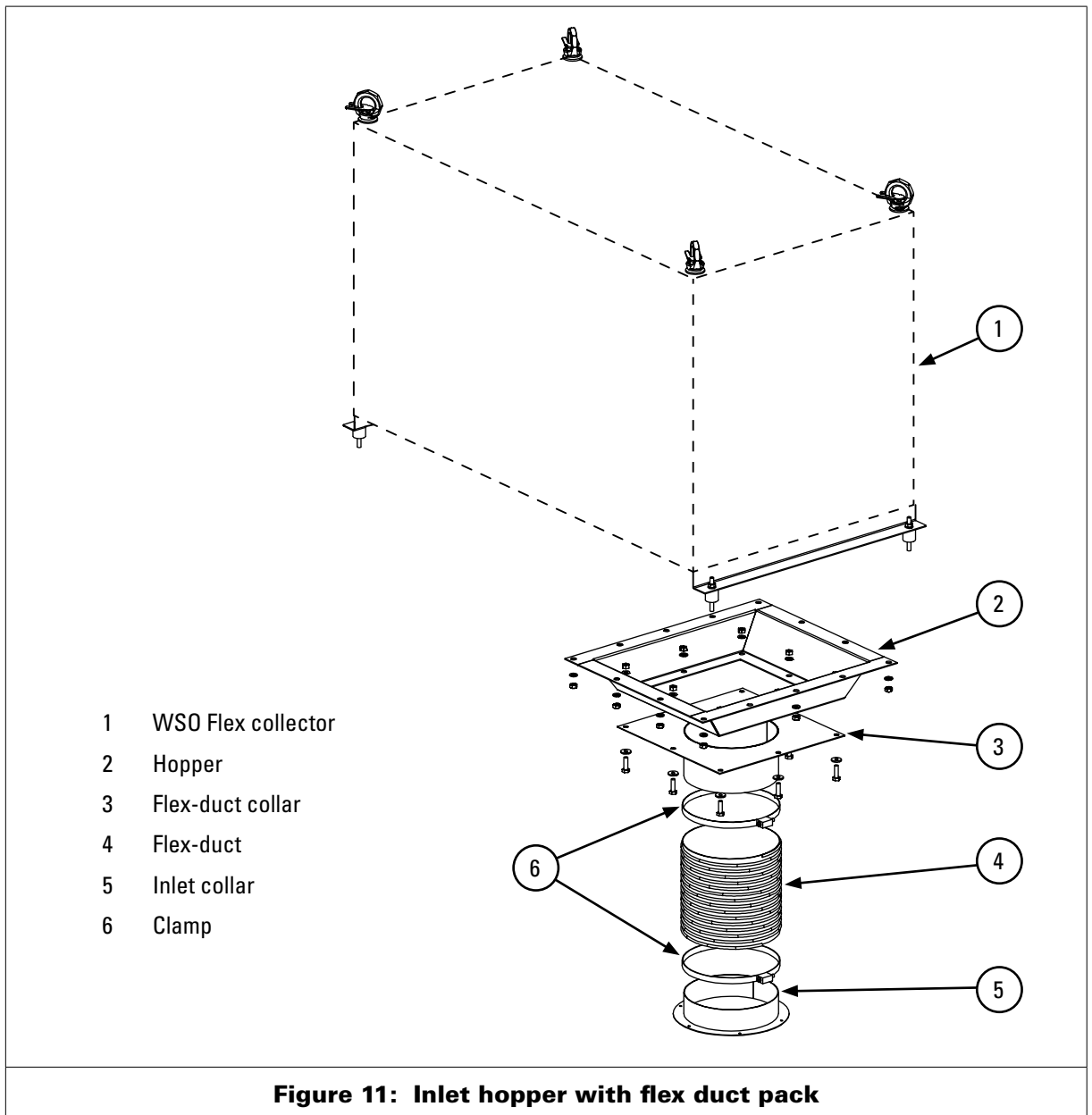
*Level the unit before tightening any hardware.*

1. Raise the unit to a height of approximately 1,5 m.
2. Align the hole pattern of the flex-duct collar with the bottom flange of the hopper and fasten with bolts, washers and nuts.
3. Align the top flange of the hopper with the hole pattern on the bottom of the mist collector and fasten it with the nuts and washers supplied.
4. Fasten the flex-duct to the flex-duct collar using the clamp supplied.
5. Position the inlet collar and trace the inlet opening and hole pattern onto the machine.
6. Remove the unit and cut out the inlet hole. Drill the hole pattern using a 4 mm diameter bit.
7. Apply MS polymer sealant to the newly cut hole pattern on the machine. Align the inlet collar with the opening and fasten the mist collector to the machine using bolts, washers and nuts.
8. Connect the flex-duct using the clamp supplied.

Depending on the option provided, please apply MS polymer sealant or use the included gasket.



*When using gasket, do not overcompress (more than 50%).*



### **Inlet hopper / impact separator**

This option is used on processes that generate a large number of particles. It must be positioned on a stand or mounted from the ceiling.



*Level the unit before tightening any hardware.*

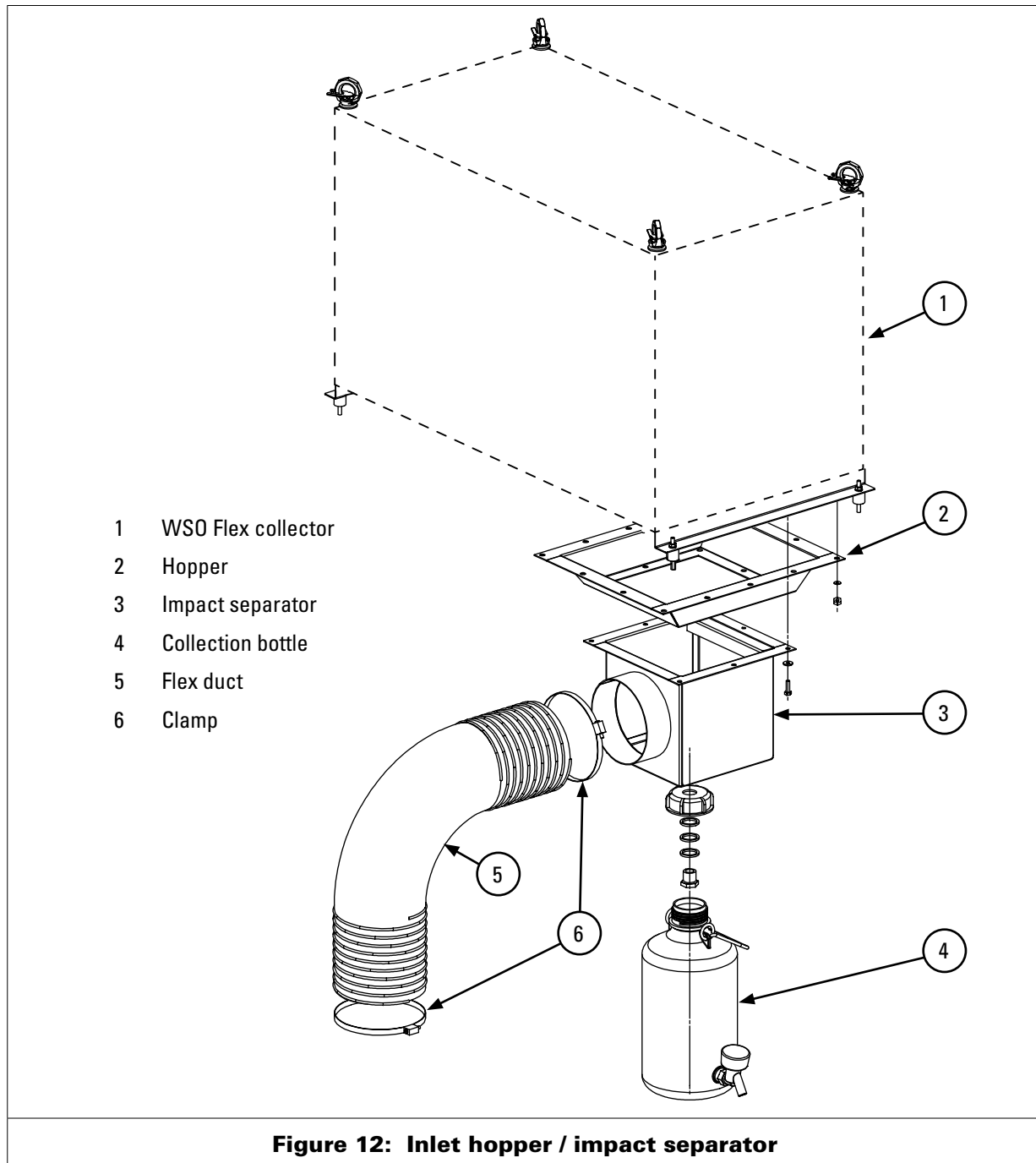
1. Raise the unit to a height of approximately 1,5 m.
2. Align the hole pattern of the impact separator with the bottom flange of the hopper and fasten with bolts, washers and nuts.

Depending on the option provided, please apply MS polymer sealant or use the included gasket.



*When using gasket, do not overcompress (more than 50%).*

3. Align the top flange of the hopper with the hole pattern on the bottom of the mist collector and fasten it with the bolts and washers supplied.
4. Fasten the flex-duct to the side inlet of the impact separator using the clamp.
5. Fasten the other end of the flex duct to either an angular nozzle, inlet collar or fitting (not included).
6. Fasten the collection bottle to the drain as described in the section "Collection bottle"



**Collection bottle (only for use with the inlet hopper / impact separator)**

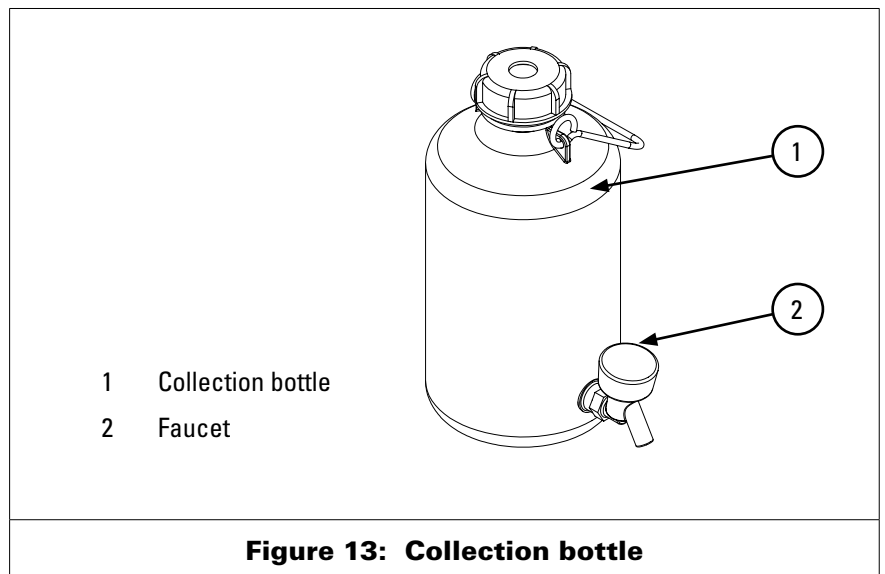
The collection bottle can be installed during stand installation or after the unit has been installed in its operating position. This collection bottle can hold up to 3,7 litres of collected liquid.



*The collection bottle is intended for applications in which relatively small amounts of oil is collected.*



*The collection bottle faucet should only be opened when the WSO Flex mist collector is turned off. If the faucet is open when the fan is on, air will be drawn through the faucet and the bottle will not drain properly.*

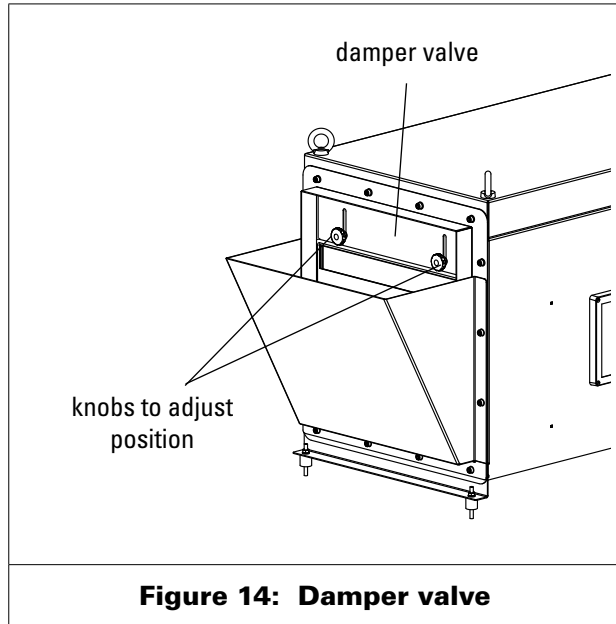


## e. Outlet accessories

### **Damper valve (for AC fan only)**

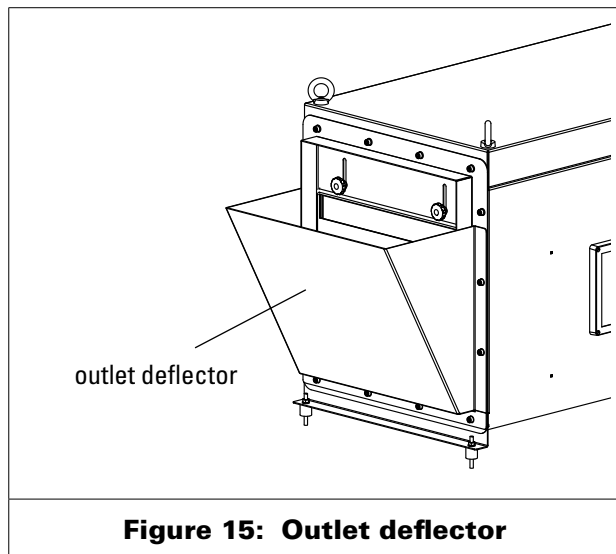
The damper valve is situated at the outlet. This damper valve functions as an airflow regulator to change airflow speed. To adjust the damper valve's position and thus the speed of the airflow, unscrew the 2 knobs and lower or lift the slide according to the required airflow needed for your application.

The range of speed regulations is between 100% (fully opened) to 80% (fully closed).



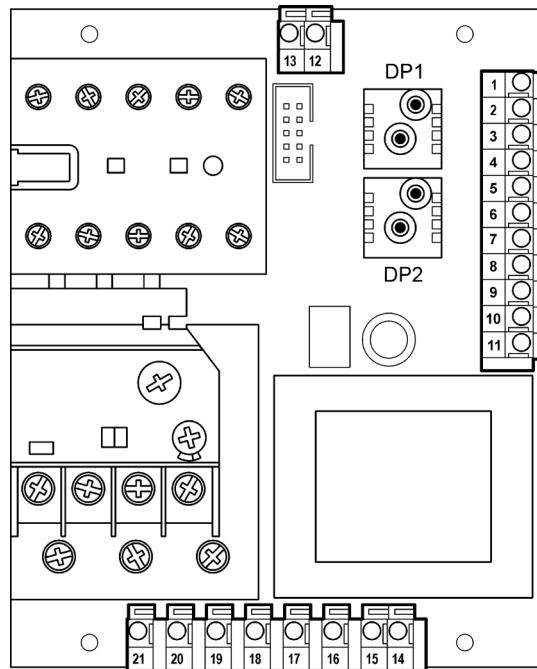
### **Outlet deflector**

The outlet deflector guides the air stream up into the environment, away from the operator.



## CONTROLLER, ELECTRICS AND PNEUMATICS

### Controller terminal allocation plan



Terminal No.	Description
1	24 V DC / Motor overload
2,3	External ON (closed = on, open = off; if contact is closed and the controller is running, stop with I/O button will be possible; To restart the Fan by pressing the I/O button while the "External ON" contact is present, the External ON contact has to be opened.)
4,5	Connection to EBM Papst EC fan 4 = PWM out 5 = PWM GN
6,7	Alarm relay contact, NO
8	Input motor alarm
9, 10, 11	Pot. free contact motor operation
12, 13	Connection motor contactor
14	PE, protection earth for supply
15	PE, protection earth for EC motor, 3~ motor
16	L1 connection (230 V version) / L1 (400 V version) for supply
17	L2 connection 400 V version for supply
18	N wire (230 V version) / L3 (400 V version) for supply
19	L1 for motor
20	L2 for motor
21	L3 (or N for 230 V) for motor

Sensor	Filter
DP1	Main filter $\pm 3500$ Pa 1 %
DP2	HEPA filter $\pm 3500$ Pa 1 %
DP alarm set values can be found in datasheet of WSOflex	

A complete purpose made WSOflex-controller is manufactured to control the unit's operation. The WSOflex-controller is designed with a display to show the lifetime of the filter element. The display is showing continuously the real-time pressure drop value over the used main filter element (and optional HEPA) to follow maintenance of the element (and optional HEPA). Alarms are integrated as well in the WSOflex-controller to show when a maintenance/replacement of the filter (and optional HEPA) is required to be executed. Another alarm is integrated as well for a fan/motor failure.

To connect the WSOflex-controller execute following steps:

1. Remove the front cover of the controller to access the terminals.
2. Connect pneumatic hoses: DP coupling MAIN with DP1 and DP coupling HEPA with DP2.



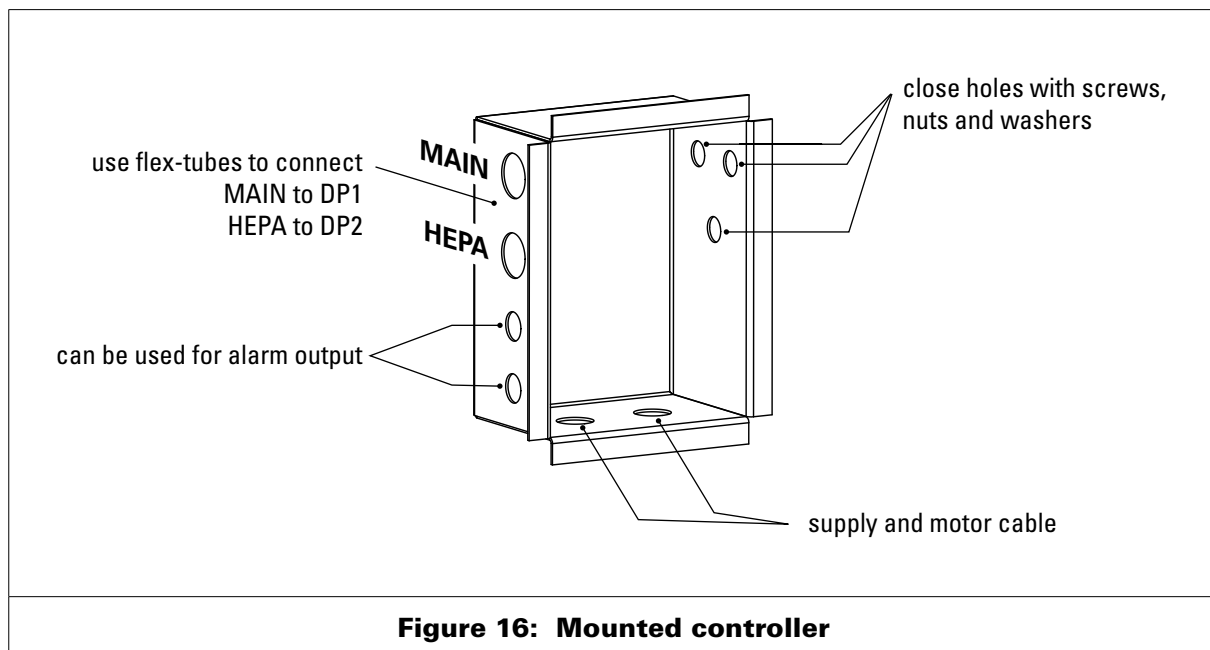
*The DP coupling HEPA has only one tube connected inside the unit.*

3. Wire the supply cable according the allocation plan shown in the controller manual.

There are 2 possible manners of controller mounting:

### Controller mounted on the unit

Use the supplied hardware to block the holes in the controller back plate as illustrated in Figure 16.



**Figure 16: Mounted controller**

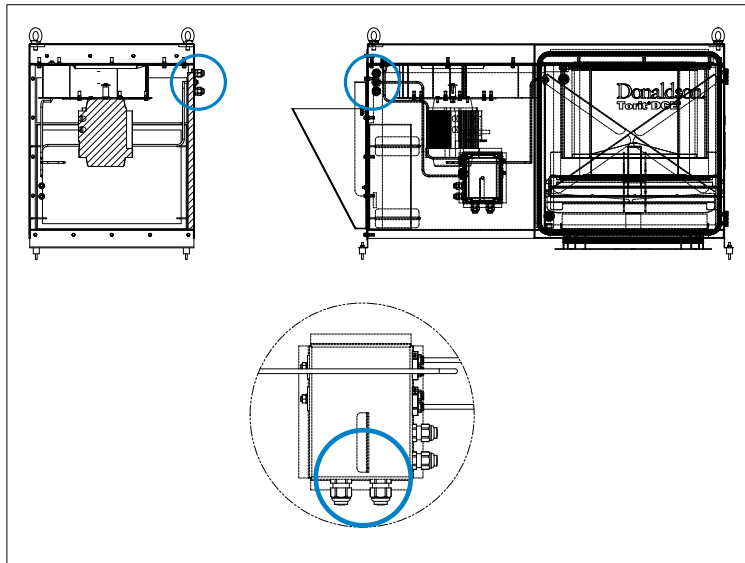
1. Wire the motor cable to the controller with mentioned terminals (19, 20, 21 and 15) in the allocation plan.

If a motor starter is used (19, 20 and 21 already connected) connect the motors' phases to the F1 block (T1, T2 and T3) and the PE (Protection Earthing) to terminal 15.

If an EC fan is supplied, wire the 4 electrical signals according the allocation plan and terminal diagram in WSOflex controller manual (COM (EC fan) to 8, GND (EC fan) to 5, Ain1-U (EC fan) to 4 and NC (EC fan) to 1).

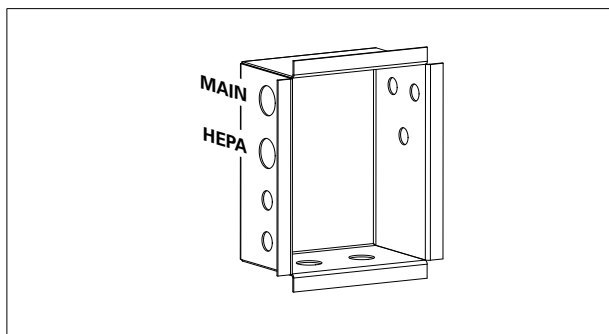


- Wire the supply cable inside the unit using glands at the back of the unit and the gland inside the controller back plate and connect phases and PE of the supply cable to the controller panel with mentioned terminals in the allocation plan (16, 17, 18 and 14).



*Take caution that during installation the supply cable is not connected to the electric net supply.*

- Connect DP tubes from the DP couplings in the controller back plate to the 2 DP sensors on the controller panel. DP1 is the sensor for the MAIN DP coupling and DP2 is the sensor for the HEPA DP coupling. Double-check the DP tubes are connected to the correct gland (one tube connected to HEPA (if HEPA is present), others connected to MAIN) inside the unit.

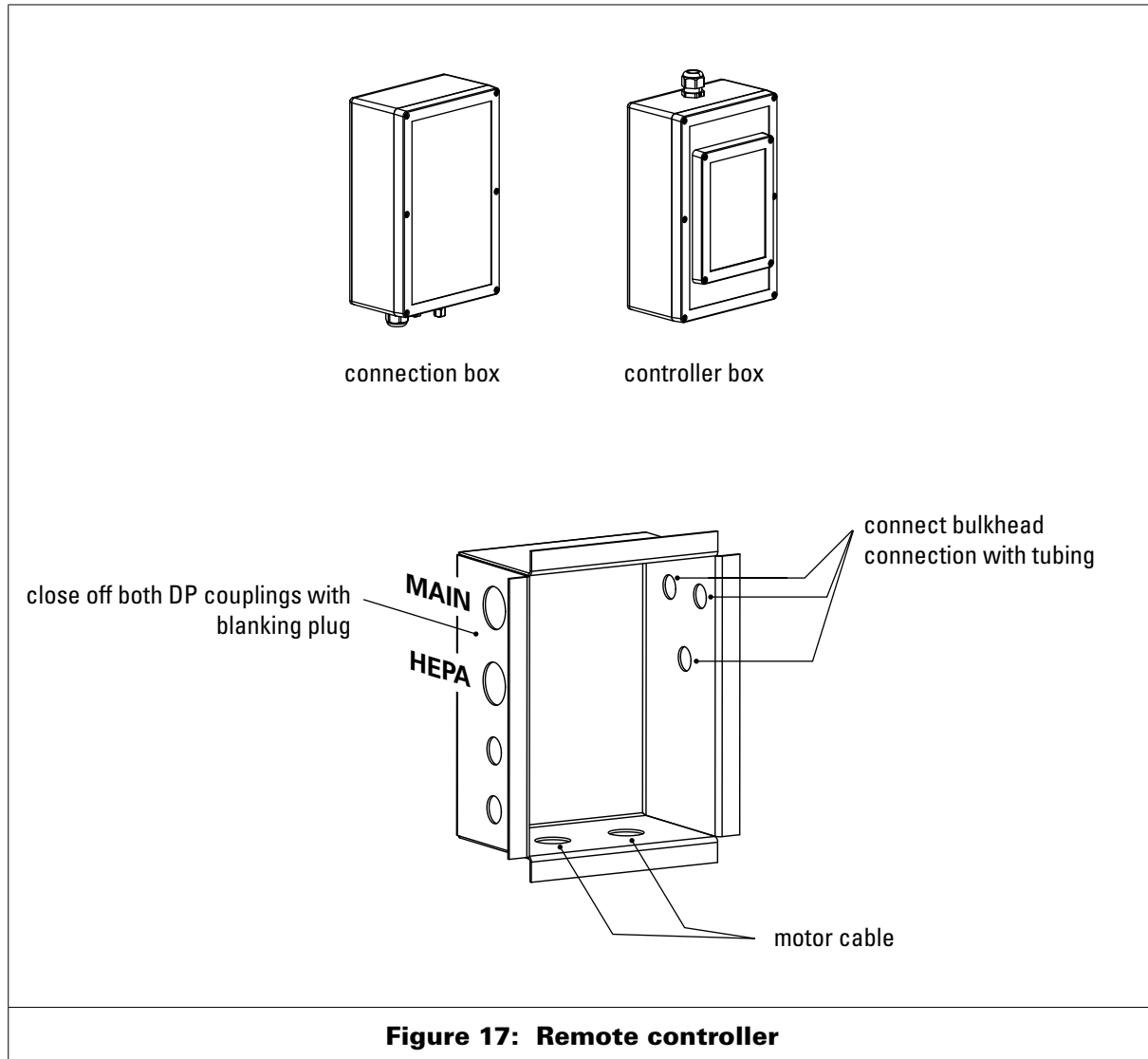


- Once everything is connected securely and double-checked, mount the controller onto the unit with the delivered bolts.



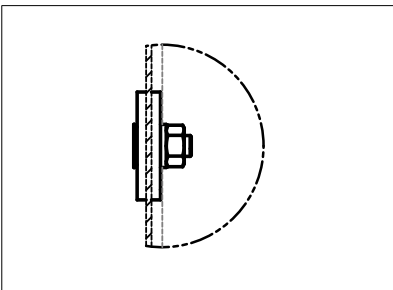
## Remote controller with wire

A remote controller consists of 2 casings: connection box and controller box.



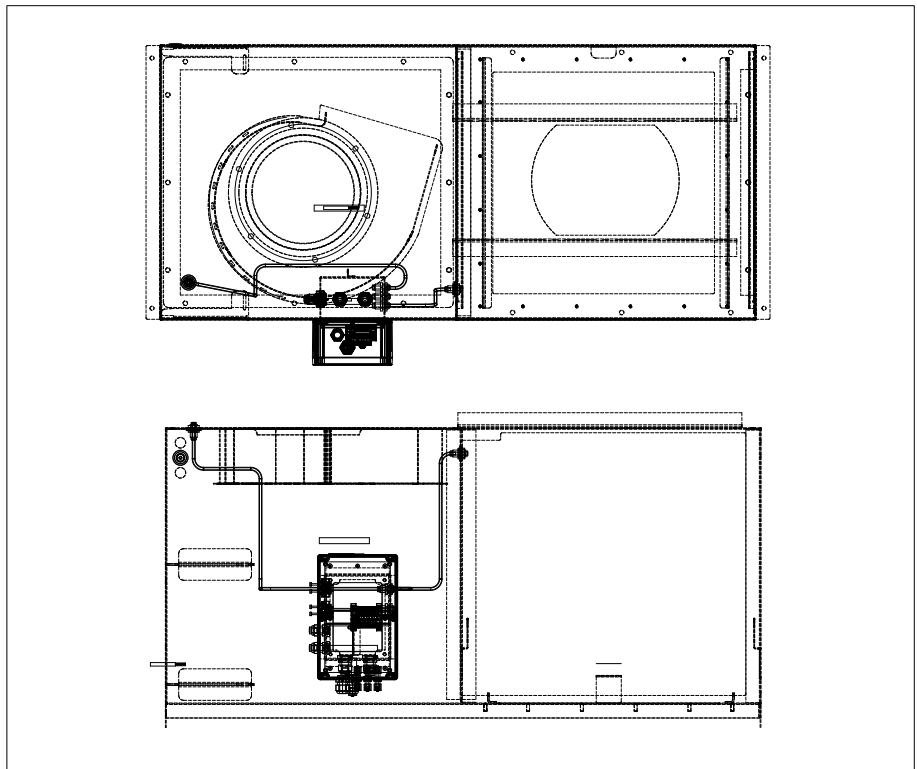
**Figure 17: Remote controller**

1. If a HEPA was delivered with the unit, change the mounted bulkhead connector with bolt, washers and nut at the back of the unit (if not done yet).

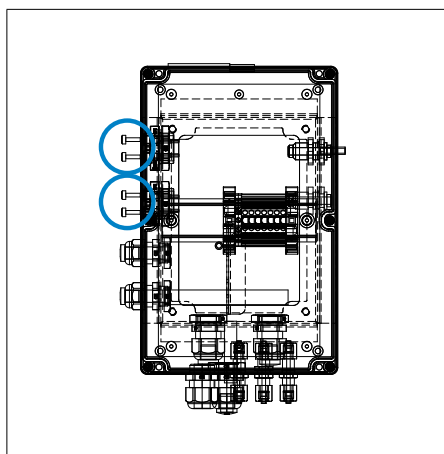


2. Change bolts, washers and nuts at the right side of the controller back plate to the delivered bulkhead connectors (If not done yet).

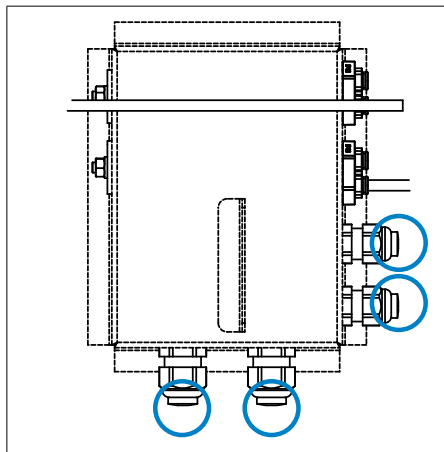
3. Change  $\Delta p$  tubes inside the unit according below picture and connect to the mounted bulkhead connectors.



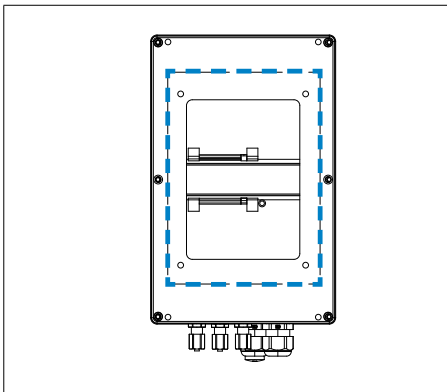
4. Plug the 4 holes of the  $\Delta p$  couplings with delivered blanking plug to block the gap.



5. Double-check whether the unused gland(s) is(are) sealed with plug.



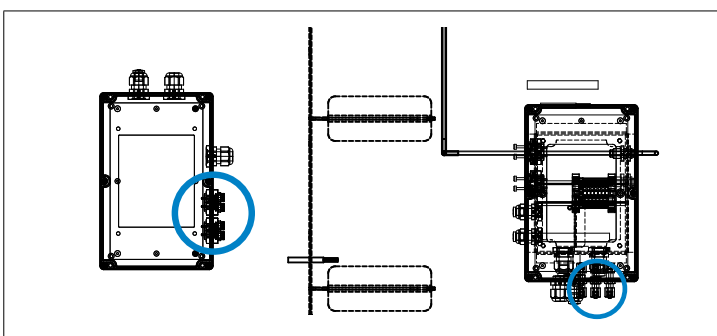
6. Install 2 (without HEPA) or 3 (with HEPA) times  $\Delta p$  tubes onto the recently installed bulkhead connectors and let them hang out the unit.
7. Apply the delivered adhesive gasket to the connection box with hole in the back, like illustrated below and remove the lid from the box (if not done yet).



8. Mount the box with 4 delivered washers and bolts to the unit and check whether sealing is done properly around the controller hole.
9. Wire the motor cable onto the terminals inside the connection box following the general standard of logic of phases. If an EC fan is supplied wire the electric cable to the other 4 terminals and mark them to connect as explained in the mounted version (see point 1 controller mounted on the unit).
10. Wire delivered electric cable through the open gland of the connection box and connect phases to the terminal inside the box with colored phases equally. If an EC fan is supplied wire other delivered electric cable through the plugged gland of the connection box and connect wires according logic of terminals (see point 1 controller mounted on the unit).
11. Cut the  $\Delta p$  tubes installed that are hanging out the box to the desired length, see that they are not stretched by any chance.
12. Connect the shortened  $\Delta p$  tubes to the connectors below provided in the connection box. If there is no HEPA connection required, leave the last one open.



13. Install rest  $\Delta p$  tubes onto the outside of the connection box with the connectors and connect them to the controller box on the  $\Delta p$ -coupling.



14. Open the controller box with taking off the lid. If the controller panel is still to be mounted on the controller box install the controller panel using 4 times of each delivered M4 screws and M4 nuts. Install the 2 plastic strips inside the box on top of the recently installed nuts and fasten strips with nuts delivered.
15. Wire the electric cable for motor through the side gland provided. If an EC fan is supplied wire as well the electric cable for electronic signals in the plugged gland.



16. Connect the electric cable (in the side gland) coming from the connection box to the motor terminals according the allocation plan (reference step 1 for controller mounted on the unit). If an EC fan is supplied wire as well the electric cable for electronic signals according allocation plan (see also point 1 controller mounted on the unit).
17. Install the flexible transparent  $\Delta p$  hoses from the  $\Delta p$  coupling ends to the  $\Delta p$  sensors on the controller panel.
18. At last wire supply cable (supplied by customer) through the bottom-gland and connect the supply phases to the controller panel according the allocation plan (reference step 2 for mounted controller).
19. Now double-check all connections are secure and safe. Once evaluated close all boxes with their equivalent lid.
20. Now the unit can be operated by the controller on a place mounted by customer's choice.

### Retrofit remote controller with wire

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If a standard controller is mounted with a controller back plate without holes at the right side, follow below procedure:

1. Install the tubes through provided holes like the M16 glands. If the glands are already taken by other wires take out the  $\Delta p$  couplings M25 and wire the tubes through these holes. Double-check whether the  $\Delta p$  tubes are long enough to be connected to the connectors in the connection box.
2. The rest of the procedure are stated in 'Controller mounted of the unit', starting from step 7.

### AC Fan

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Please see DOL Fan version terminal diagram on page 11 of the WSOflex-controller manual. On this page the connections are described to be done. For maintenance the motor with impeller can be dismantled from the fan housing. Either for replacement to an EC fan, the fan housing can be dismantled by unscrewing the bolts in the roof.



*Plug supply in and out to check correct fan rotation (only for AC fan) shown by 'Fan direction' sticker situated on fan housing together with the cooling fan in the motor at the bottom by the aid of a mirror.*

## EC fan

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Please see EC Fan version terminal diagram on page 11 of the WSOflex-controller manual. On this page the connections are described to be done. See below terminal allocation plan.

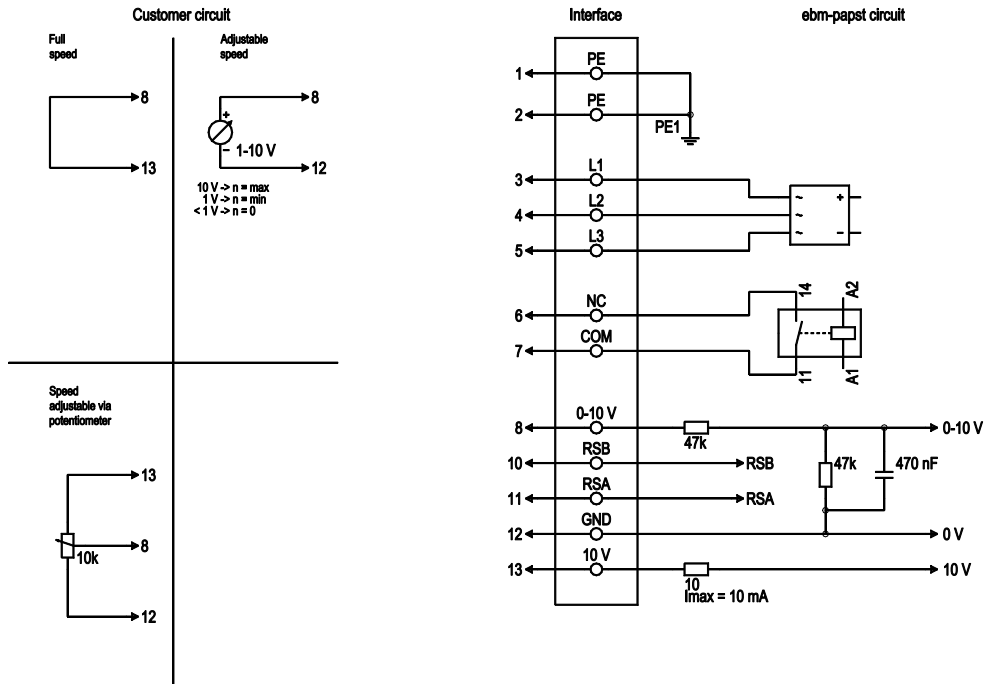


*The EC fan is rotating always in the correct direction, no need for fan rotation check-up.*



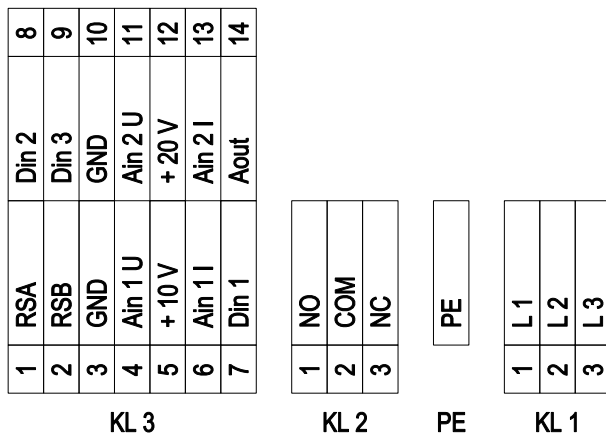
*Be aware that EC fan has no fan housing inside the unit.*

### MMA EC fan terminal allocation plan



No.	Conn.	Designation	Color	Function/assignment
1	1, 2	PE	green/yellow	Protective earth
1	3	L1	black	Power supply
1	4	L2	black	Power supply
1	5	L3	black	Power supply
1	6	NC	white 1	Status relay, floating status contact, break for failure, contact rating 250 VAC / 2 A (AC1) / min. 10 mA; reinforced insulation on supply side and basic insulation on control interface side
1	7	COM	white 2	Status relay, floating status contact, break for failure, contact rating 250 VAC / 2 A (AC1) / min. 10 mA; reinforced insulation on supply side and basic insulation on control interface side
2	8	0-10V	yellow	Analog input (set value), 0-10 V, R <sub>i</sub> = 100 kΩ, adjustable curve, SELV
2	10	RSB	brown	RS485 interface for MODBUS, RSB; SELV
2	11	RSA	white	RS485 interface for MODBUS, RSA; SELV
2	12	GND	blue	Reference ground for control interface, SELV
2	13	+10V	red	Fixed voltage output 10 VDC, +10 V ±3%, max. 10 mA, short-circuit-proof power supply for external devices (e.g. pot), SELV fixed voltage input 24 VDC for setting parameters via MODBUS without line voltage supply

**MMB EC fan terminal allocation plan**



No.	Conn.	Designation	Function/assignment
KL 1	1	L1	Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz
KL 1	2	L2	Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz
KL 1	3	L3	Supply connection, power supply 3-phase 380-480 VAC, 50/60 Hz
PE		PE	Ground connection, PE connection
KL 2	1	NO	Status relay, floating status contact; make for failure
KL2	2	COM	Status relay, floating status contact; changeover contact; common connection; contact rating 250 VAC / max. 2 A (AC1) / min. 10 mA
KL2	3	NC	Status relay, floating status contact; break for failure
KL 3	1	RSA	Bus connection RS485, RSA, MODBUS-RTU; SELV
KL 3	2	RSB	Bus connection RS485, RSB, MODBUS-RTU; SELV
KL 3	3 / 10	GND	Reference ground for control interface; SELV
KL 3	4	Ain 1 U	Analog input 1, set value: 0-10 V, Ri = 100 kΩ, adjustable curve, only usable as alternative to input Ain 1 I; SELV
KL 3	5	+ 10 V	Fixed voltage output 10 VDC, +10 V ±3%, max. 10 mA, short-circuit-proof power supply for external devices (e.g. pot); SELV
KL 3	6	Ain 1 I	Analog input 1, set value: 4-20 mA, Ri = 100 Ω, adjustable curve, only usable as alternative to input Ain1U; SELV
KL 3	7	Din1	Digital input 1: enable electronics, enable: pin open or applied voltage 5-50 VDC disable: bridge to GND or applied voltage < 1 VDC reset function: triggers software reset after a level change to < 1 VDC; SELV
KL 3	8	Din2	Digital input 2: Switching parameter sets 1/2, according to EEPROM setting, the valid or used parameter set can be selected via bus or via digital input DIN2. Parameter set 1: pin open or applied voltage 5-50 VDC Parameter set 2: bridge to GND or applied voltage < 1 VDC; SELV
KL 3	9	Din3	Digital input 3: according to EEPROM setting, the integrated controller's direction of action can be selected as normal/inverse via bus or digital input normal: pin open or applied voltage 5-50 VDC inverse: bridge to GND or applied voltage < 1 VDC; SELV
KL 3	11	Ain 2 U	Analog input 2, measured value: 0-10 V, Ri = 100 kΩ, adjustable curve, only usable as alternative to input Ain2I; SELV
KL 3	12	+ 20 V	Fixed voltage output 20 VDC, +20 V ±25/-10%, max. 50 mA, short-circuit-proof power supply for external devices (e.g. sensors); SELV
KL 3	13	Ain 2 I	Analog input 2, measured value: 4-20 mA, Ri = 100 Ω, adjustable curve, only usable as alternative to input Ain2U; SELV
KL 3	14	Aout	Analog output 0-10 VDC, max. 5 mA, output of current motor modulation level / motor speed adjustable curve; SELV



## START-UP CHECK LIST

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*Follow all steps before first start-up and when the mist collector is not been used for a long period.*

*For daily use follow steps 1, 2, 3, 4 and 6.*

1. Check that the outlet of the fan is free of debris before starting.



*Too much airflow can cause electrical failure of the fan motor or dramatically reduce the life of the filter elements.*

2. Be sure that the inlet ducting is properly installed and duct joints are sealed.
3. Make certain the filter element is properly installed.
4. Check if the access door is closed (markings on latch should be aligned).
5. If a collection bottle is used, make sure that the faucet is closed.
6. Connect the mist collector to the main power.
7. Adjust speed of the airflow to your convenience/dependency on application with damper valve at the outlet panel. Check with your application engineer.

## OPERATION SCHEDULE

To ensure a good performance of your mist collector, follow the check points below according to the time table.

No.	Checkpoint	Type of control	Recommended action	Day	Weeks			
					2	4	8	26
1	Fan set	Excessive noise	See trouble shooting guide	•				
2	Clean air chamber	Emission: oil mist emission over in clean air chamber	See trouble shooting guide		•			
3	Exhaust	Leakage at the exhaust	Check third stage filter element and HEPA filter (if applicable) for positive gasket seals				•	
4	Controller	Controller is giving alarm	See trouble shooting guide	•				
5	Door	Visual check gaskets	Replace gaskets if necessary			•		
6	Connecting ducts	Check for leakage	Repair if necessary				•	
7	Mist collector	Check damage, strength and corrosion	Repair or replace if necessary					•
8	Filter element	Preventive replacement of all filter elements	Unless otherwise specified in the scope of delivery every 2 years.					

## SERVICE

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*Disconnect and lock out electrical power before servicing.  
No welding should be performed inside without fire protection.  
Avoid contact or exposure to collected liquids during servicing.*

### Inlet hopper / impact separator

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For applications where both liquid and particulate are collected, it may become necessary to clean the hopper and impact separator (if supplied).

- Access the hopper and impact separator through the access door.
- Remove the first stage filter, the filter element and the filter retention system.
- Clean the hopper and impact separator by scraping the particulate out.



*Be careful to keep the particulate out of the drain.*

### Collection bottle

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If the collection bottle requires cleaning, remove it from the impact separator drain. Clean the collection bottle and faucet and re-install (see figure 12).



*Only remove the collection bottle when the mist collector is turned off.*

### Change of filter elements

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#### a. First stage filter

This is a permanent filter, which is designed to last the life of the WSO Flex mist collector. This filter may need to be periodically cleaned.

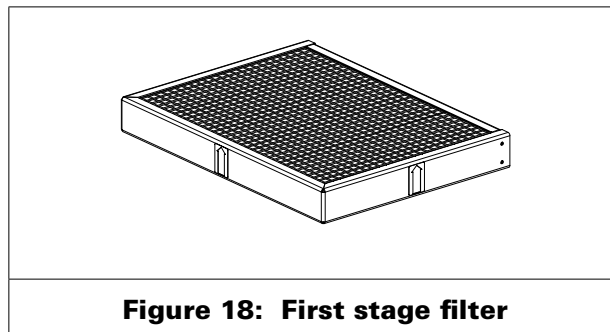
Access the first stage filter through the access door. Remove it out of the unit by pulling it out. The first stage filter can be cleaned by rapping it over a waste container to dislodge particulate.

If further cleaning is required, wash or soak, rinse and dry the first stage filter.

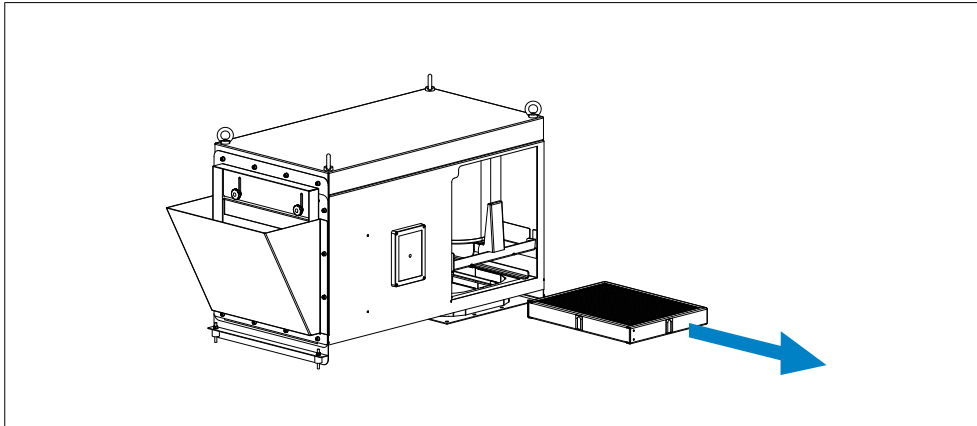
An optional polypropylene first stage filter is available for applications involving heavy liquid loading.



*Because of temperature limitations of the polypropylene filter, high temperature cleaning methods such as steam cleaning should not be used.  
Do not operate the mist collector without the first stage filter installed.  
Significant reduction in filter element life may result.*



**Figure 18: First stage filter**



**Figure 19: First stage filter removal**

### b. Dryflo wrap



*Only round Dryflo comes with wrap.*

To determine if the wrap needs replacement, install a clean filter element wrap, restart the mist collector and check the dp value on the controller.

If MAIN dP value is low (7dP), the second stage filter element will not require replacement and can continue operation with the clean wrap.

If MAIN dP value is high (40dP) with the clean wrap, the filter element will need to be replaced.

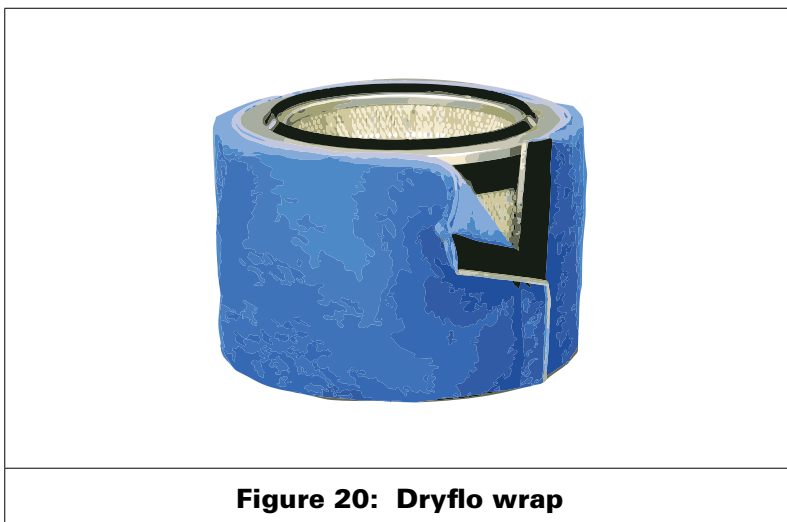
For easiest maintenance, the wrap and second stage filter element can be changed at the same time. Access the wrap through the access door. The wrap can now be replaced using the hook and loop seam to open the wrap.



*Do not operate the mist collector without the wrap installed on the Dryflo. Significant reduction in second stage filter element life may result.*

*Wear gloves when handling filter element and filter element wrap.*

*Due to accessibility, it may sometimes be easier to replace the filter element wrap by removing the complete filter element assembly from the unit.*



**Figure 20: Dryflo wrap**

### c. Second stage filter element

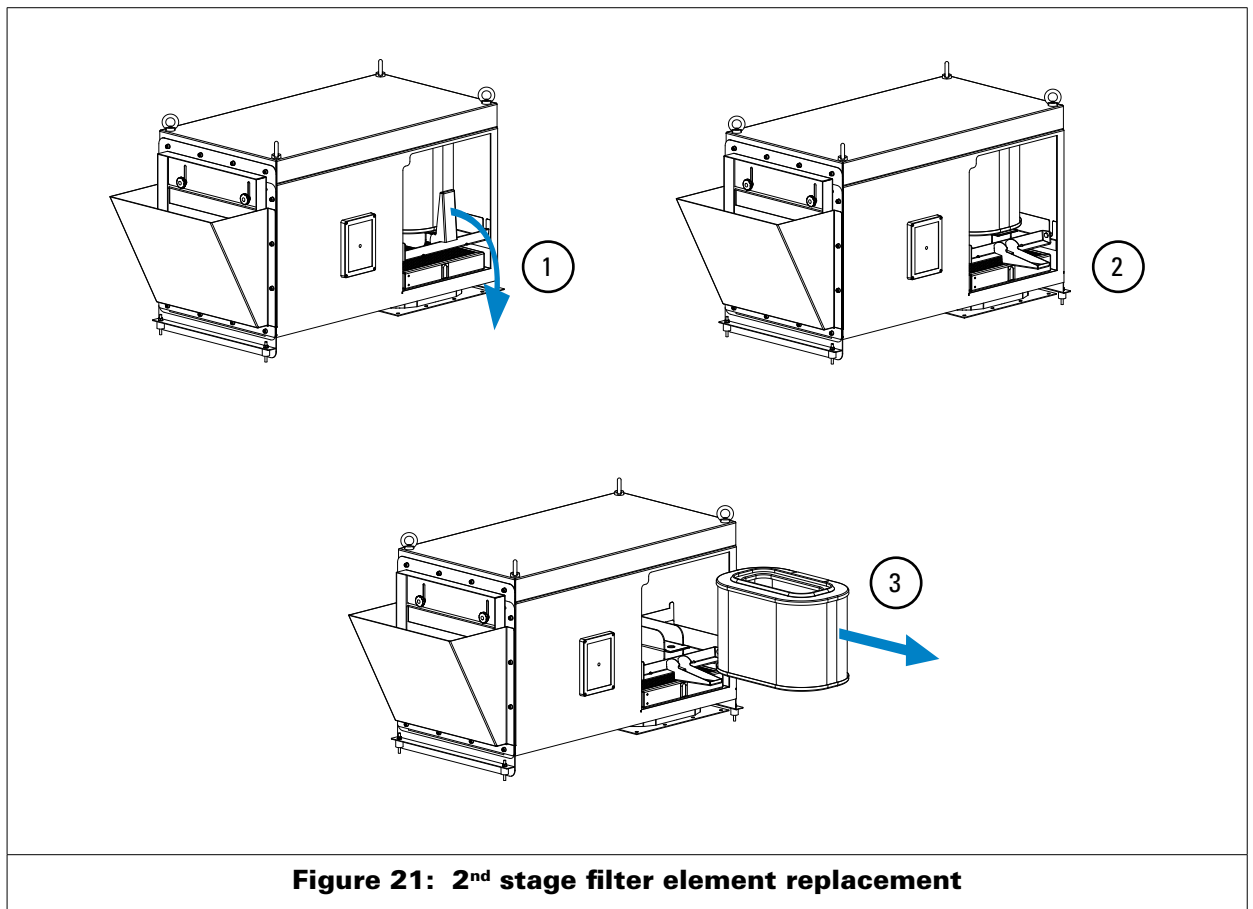


The genuine filter element is the only replacement filter that will provide the high level of performance that you expect from your investment in the WSO Flex Mist collector.

Do not drop or rap the new filter element on the floor or any other hard surface. Damage to the filter element will occur.

For easiest maintenance, the wrap and second stage filter element can be changed at the same time. The second stage filter element is accessed through the door.

1. Pull the retention handle out and down to a horizontal position.
2. Slide the filter element out of the unit.
3. As the filter element is being removed, a plastic garbage bag can be slipped over the top of the filter element. The filter element may then be tipped as it is removed while the bag is being closed over the bottom of the filter element.
4. Install the new filter element (with a new wrap) in the unit by placing the new filter element on the platform with the gasket up. The platform can be flipped to fit either the Synteq or Dryflo element.
5. Push it back in until the filter element stops.
6. Lift the retention lever up into the unit.

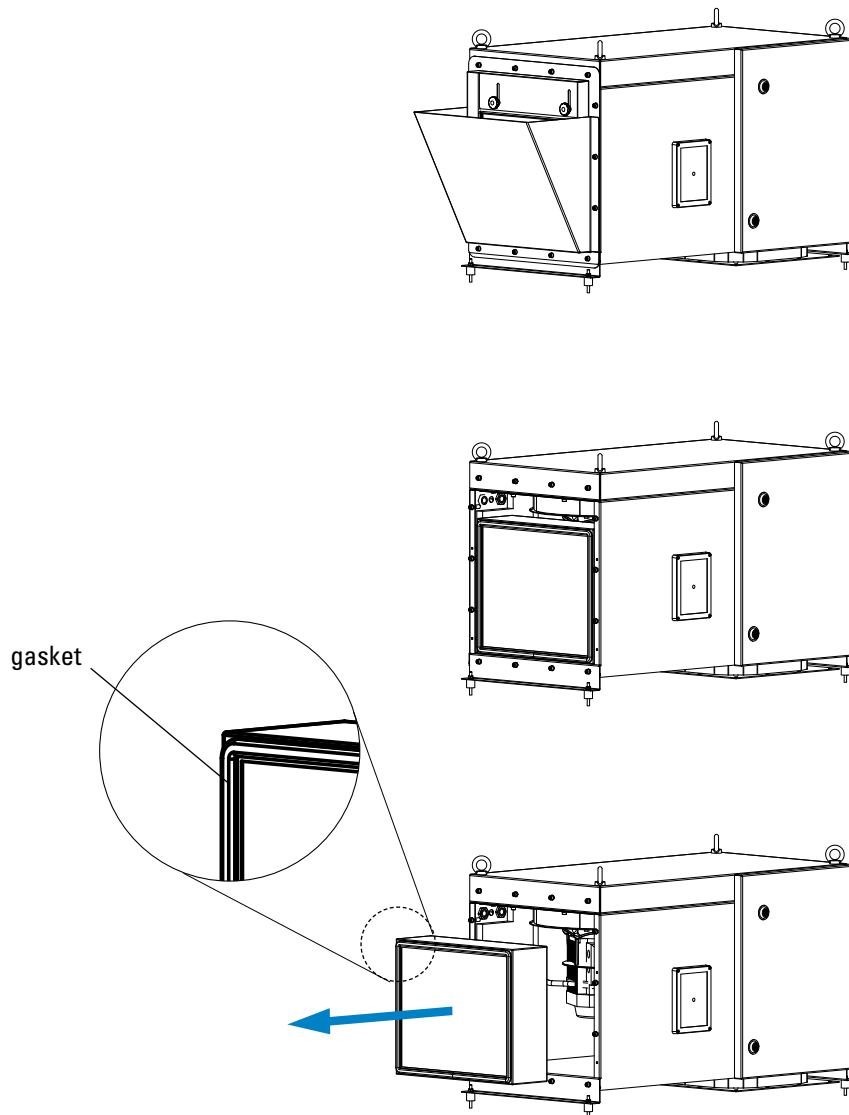


**Figure 21: 2<sup>nd</sup> stage filter element replacement**

**d. HEPA filter or 3rd stage filter element**

*Replace the HEPA filter at the same time as the second stage filter element is replaced.*

1. Remove the HEPA filter by unscrewing the outlet access panel at the side.
2. Install the new HEPA filter in reverse order. Make sure the HEPA filter gasket is facing the outlet access panel.




**Figure 22: HEPA or 3rd stage filter replacement**

## TROUBLE SHOOTING GUIDE



*Disconnect all power supply before services.*

Trouble	Possible cause	Remedy
Fan does not start	Not wired correctly	Check and correct internal motor wiring for proper connections for your voltage (use controller manual).
	Proper wire size not used for motor	Rewire per national and local electric codes for proper wire size.
Fan set starts, but does not keep running or ALARM FAN on controller	Incorrect overload protection is installed	Check for proper motor overload protection. Replace if needed for proper value on the F1 block and reset by pushing the button.
	Mist collector door is open or not closed tight	Tighten door securely.
	Electrical circuit fuses	Check if the supply circuit has sufficient power to run all equipment.
Excessive noise / vibration of the fan  <b>If this happens it should be rectified at once</b>	Deposit on the blades	Clean the blades.
	Worn blades	The fan wheel has to be replaced.
	Worn bearings	The bearings have to be replaced.
Oil mist emission	Filter element installed improperly	Check that the gasket on the filter element is firmly pressed to the top plate and that the filter element is correctly installed.
	Filter element damage, dents in the end caps, gasket damage or holes in pleated media	Replace the filter element.
	Door not airtight	Tighten doors securely and check sealing.
Insufficient airflow	Fan wheel rotating wrong way	Check fan rotation. Refer to rotation arrow sticker on fan housing. To access fan housing, refer to figure 20, HEPA filter replacement.
	Openings not properly sealed	Check if door is closed and tightened securely.
	Outlet is restricted	Check outlet for blockage. Remove material or debris that is blocking the outlet.
	Plugged first stage filter.	Remove and clean or replace.
	Plugged second stage filter element wrap and / or third stage filter element.	Filter element wrap and / or filter element needs to be replaced.
Insufficient hopper discharge	Plugged HEPA filter	HEPA filter needs to be replaced.
	Plugged collection bottle	Remove and clean collection bottle and bottle faucet.

<b>Trouble</b>	<b>Possible cause</b>	<b>Remedy</b>
Liquid leaking from collector door	Plugged or full collection bottle	Drain, remove and clean collection bottle and bottle faucet.
Controller MAIN dP alarm	Plugged second stage filter element and/or Dryflo wrap	Replace second stage filter element and/or Dryflo wrap.
Insufficient airflow and controller gives no alarm screen	Plugged first stage filter and / or inlet ducting	Clean first stage filter and inlet ducting.
Controller HEPA dP alarm	Plugged HEPA filter	Replace HEPA filter.