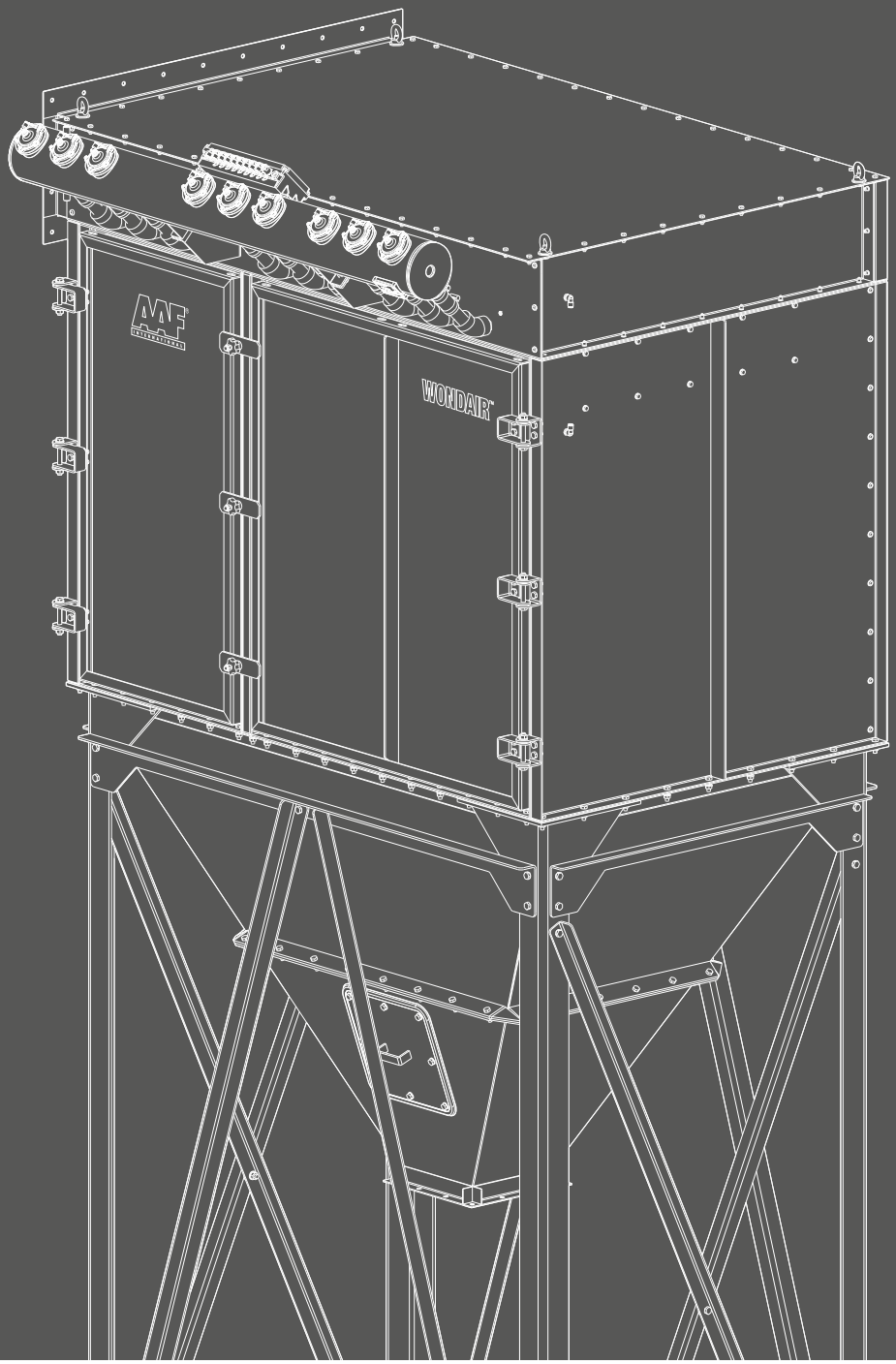
WONDAIR™ Mid

Installation and Operations Manual



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Meaning of the safety signs on the equipment

Do not enter. Authorised personnel only

Caution. Finger trap

Caution. Compressed air

Gloves, safety boots, face mask, hearing protection and safety glasses required

TABLE OF CONTENTS

Meaning of the symbols used in this document

NOTE. Additional information related to a specific operation.

NOTICE. Noteworthy or important information that the user must bear in mind.

WARNING. Warning that operation may be dangerous. Possible bodily injury or material damages.

General safety guidelines

CAREFULLY READ THIS MANUAL PRIOR TO HANDLING AND INSTALLING THE EQUIPMENT.

AAF International will not be held responsible for improper use, or for any possible errors resulting from improper assembling/installation.

- Personnel responsible for the installation, handling and removal of the equipment as well as conducting maintenance must be properly qualified to carry out these tasks. To accomplish this, we must be familiar with and follow all basic safety recommendations (mechanical, electrical, potentially explosive atmosphere, etc.).

- The equipment should be operated under the conditions that are defined and recommended by the manufacturer in accordance with the order. Any equipment modification that has not been previously authorised by AAF International may alter its operation, which would entail a modification of the warranty framework and cancellation of the declaration of conformity.

- Contact the manufacturer prior to making any modifications to the dust collector, the safety system, the process, the product or the location of the filter. Otherwise, AAF International cannot guarantee the optimum performance of the filter.

- The filter shall be stored just as it was supplied. Remove the filter from its packaging only prior to installation.

- The user is responsible for checking that the equipment has not suffered any damage during shipment and that the technical data that appears on the nameplate matches the information listed in the order.

- The equipment may only be used when it is in perfect material condition as determined by a technician based on its intended use. Any faulty operation, especially when it affects the safety of the device, must be immediately corrected. Likewise, the equipment shall be used according to the instructions provided in this manual.

- The equipment incorporates different hoisting points to facilitated unloading it. The weight and size of the unit are indicated in the drawings or documentation supplied by AAF International. Shipping as well as handling must be carried out using equipment that is suitable for handling its weight and size. The equipment must not be hoisted from the eye bolts that are installed on the components. For example, the eye bolts that are installed on the motors, which are designed for independent transport.

- **Except in cases where the equipment has the *ATEX* certificate for operating in potentially explosive atmospheres (Directive 2014/34/UE), the unit must not be installed in these types of environments. Also, the equipment shall not be used in explosive applications.** It is important to note that if the *ATEX* condition is not expressly stated in the nameplate, the supplied unit is not suitable for use in explosive atmospheres under any circumstance.

- In cases where the equipment is going to be used for handling potentially explosive dust or is going to be located in a potentially explosive atmosphere, **all the motors shall be connected to the thermal protective devices to prevent exceeding the maximum temperature of the surface. The electrical equipment must be compliant with category EN 60079-0.**

- **If the dust to be removed can cause an exothermic reaction, including self-ignition, the installation must include an explosive protection system. To prevent this risk, we recommend frequently cleaning the equipment to remove any layers of dust.**

- The equipment must be installed and anchored to a fixed based using the bolts that are supplied by the installer. The manufacturer shall not be responsible for an improper installation of the machine at its final location.

- The maximum operating temperature of the WONDAIR™ Mid oscillates between 80 and 100 ºC, while capable of withstanding peaks up to 120 ºC.

- When the electrical connection is made by personnel that are not employed by AAF or any of its authorised installers, AAF International recommends paying special attention to the type of current and nominal voltage of the unit.

- The equipment shall be connected to electrical power supplies that incorporate short-circuit and over-current protections and shall comply with the low voltage regulations of the country where the machine is installed.

- Any work on the equipment must be carried out when the equipment is stopped and disconnected from the electrical and pneumatic power supplies as well as pneumatically depressurised (which keeps the cleaning system turned on after the power is disconnected until the manifold pressure drops to 0 bar). To disconnect the power supplies:

  - The electrical power supply will incorporate a circuit breaker installed on the outside of the user panel.

  - The pneumatic power to the manifold, provided by the user, shall have a shut-off valve.

- These disconnect devices on the power supplies shall have a lock-out if they cannot be monitored from the maintenance areas. The lock-out tags shall be clearly labelled.

- If an explosion occurs, a stop signal from the equipment is required.

- Maintenance on the equipment must be carried out under the proper lighting conditions.

- Once the maintenance is completed, the installation must be returned to its original state (fasteners, guards, locks, connections and grounds).

- In order to maintain the warranty and the validity of the declaration of conformity, the user must make an optimum use of the equipment and carry out regular maintenance on the machine, removing any dust and inspecting the cleaning mechanism, among other tasks. AAF International recommends carrying out this practice at least once a month.

- While maintenance is being carried out, personnel assigned these tasks must use appropriate personal protective equipment according to the nature of the task (toxicity, harmfulness, etc.).

- If the unit is equipped with an internal fall protection screen, its condition must be inspected periodically and replaced if any damage is found.

- To guarantee a proper operation of the equipment, only authorised parts and original spares supplied by the AAF International shall be used. Refer to the spare parts information provided for this equipment.

- Original parts and accessories have been especially designed for this machine. Take into account that parts and accessories not supplied by the manufacturer have not been tested by them and therefore, installing these parts may negatively affect the machine's properties. The manufacturer shall not be responsible for any damage caused by non-original parts or accessories.

- For cleaning the filtering fabric, we recommend using compressed air on those filters that can be cleaned using reverse air flow. However, if the product being treated is flammable and excessive air can be harmful in case of an explosion, we can opt for using some type of inert gas instead of air.

- During the risk assessment of possible ignition sources in dust and gas mixtures with a low level of EMI, a risk of electrostatic discharge has been detected in accumulated dust. In these cases, safety will be based on using a conductor container, dust of an average particle size lower than 400 µm and frequent emptying.

- We recommend using a sprinkler system in applications that involve handling explosive or flammable materials.

The safety of the equipment may be negatively affected if any changes are made in the original design of the filter or the process without modifying the safety system. A defective or negligent maintenance can also affect the safety of the equipment.

This unit has been designed for specific filtering conditions (flow and temperatures included in the Datasheet). If the conditions change or new filtering applications are required, AAF International recommends consulting with the manufacturer regarding other units that may be suitable for handling these new requirements.

No fan can be considered fully sealed since they are equipped with an open inlet or outlet. For this reason, the internal and external atmospheres can be the same in terms of the classification of explosive atmospheres.

Standard fan assemblies must not exceed 3000 rpm (50 Hz) in systems equipped with an inverter.

AAF International shall not be responsible in cases where in order to disassemble the equipment or its spares, these are not cleaned and disposed of in accordance with current codes and standards and it is not carried out through a manager authorised to recycle this type of waste.

As part of their commitment to protect the environment, AAF International recommends responsibly disposing of the waste elements resulting from equipment use (packaging materials and rubbish, as well as cartridges or bags that are removed to be destroyed).

The machine must be maintained and operated exclusively by qualified and authorised personnel. New personnel must be properly trained in operating the system.

The machine may be operated by a single person. In cases where more than one person is located in the installation area, the responsibility of operating the machine must be unequivocally coordinated by this personnel.

All unauthorised personnel must remain outside the machine working area.

The application software and control of the system can only be operated and modified by personnel authorised and qualified to carry out these tasks.

The system shall only be adjusted by personnel authorised and qualified to carry out this task.

Any operating mode that might place the safety of the machine at risk shall be avoided.

The stickers that are located on the equipment shall never be removed. The user must be familiar with all safety information as well as the hazards associated with the machine. This information must be kept in a legible format along with the rest of the information about the machine.

Personnel must not let their hair down, wear baggy clothing or jewellery (excluding rings, chains or collars) when they are in contact with the machine. Otherwise, bodily harm may occur as a result of the user's clothing becoming entangled in the machines moving parts. The operator must follow the safety regulations related with accident prevention at the workplace.

Regularly verify operators are familiar with the safety measures as well as the hazards in accordance with the machine documentation.

If any modifications are discovered on the machine that affect its safety or modify the way it operates, the machine shall be immediately stopped and responsible personnel shall be notified.

Original parts and accessories have been especially designed for this machine. Take into account that parts and accessories not supplied by the manufacturer have not been tested by them. Installing these parts may negatively affect the machine's properties. The manufacturer shall not be responsible for any damage caused by non-original parts or accessories.

Follow the fire prevention regulation when handling flammable products.

The fire prevention installation must be expanded and adapted to the machine's location by the user if necessary.

Immediately turn off and close the machine if a malfunction occurs. Correct the malfunction as soon as possible.

Before turning on the machine, make sure nobody is in a dangerous situation that could be injured when the machine is turned on.

The commissioning, maintenance and inspection tasks, including the replacement of parts or components, shall only be carried out by qualified personnel.

If the machine is turned off for maintenance or repair, the machine must be protected against inadvertent start-ups by opening the electrical power circuit breaker and locking it out with a padlock.

When performing maintenance on the machine to replace a component that is located above the head, use appropriate safety ladders or platforms. In no case shall operators climb on the machine or use any of its parts as a ladder.

The operator must ensure that only authorised personnel use the machine.

At least once per shift, operators must inspect the machine looking for visible defects and inform appropriate personnel if a modification is discovered affecting the safety or operation of the machine.

If safety equipment needs to be removed for the purpose of installing a component on the machine or to conduct maintenance or repairs, the safety equipment must be reinstalled and immediately inspected once the repair or maintenance task has been completed.

Machine users must ensure the workstation is properly illuminated for safety and ergonomic reasons.

When handling the equipment, make sure the external surface temperature is lower than 60ºC.

Make sure the installation is equipped with a lightning arrestor.

Declarations of conformity

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CE EU Declaration of Conformity

AAF-SA declares that the following product:

Designation	WONDAIR™ Mid			
Model	4-168	4-252	4-336	4-420
	6-168	6-252	6-336	6-420

has been designed and manufactured in compliance with the following European Directives:

- **Directive 2006/42/EC** on machinery
- **Directive 2014/68/EU** on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment
- **Directive 2014/30/EU** on the harmonisation of the laws of the Member States relating to electromagnetic compatibility
- **Directive 2014/35/EU** on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits

Vitoria (Spain), April 2024
Bruno Vincent *Engineering Manager*

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- **Directive 2014/35/EU** on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits
- **Directive 2014/34/EU** on the harmonisation of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres

  Being its marking *(check Equipment Nameplate to see which applies):*

  II 2D Ex h IIIC T135ºC Db
  II 2G Ex h IIB T3 Gb
  Technical file: LOM 06ATEX0021

  II 3D Ex h IIIC T135ºC Dc
  II 3G Ex h IIB T3 Gc

Vitoria (Spain), April 2024
Bruno Vincent *Engineering Manager*

The applied harmonised standards are EN ISO 80079-36 (2016), EN ISO 80079-37 (2016) and EN 1127-1 (2011). In the case of a **2DG** unit, the applicable technical documentation has been provided to the Notified Body for safekeeping "Laboratorio Oficial J. M. Madariaga-LOM", with address at Eric Kandel, 1 – 28906 Getafe (Madrid), with the following codes: Supplement Number 5, with code "AAF ATEX-201014" (provided to LOM for safekeeping on 24 February 2021), of the Technical Report Custody Certificate LOM 06ATEX0021, with code "AAF ATEX 60227".

In the case of a **3DG** unit, take into account that the unit referred to in this declaration has been manufactured based on the assembly comprised of a machine manufactured bag filter in compliance with Category 2, with marking ⟨Ex⟩ II 2 D Ex h IIIC T135ºC Db and/or ⟨Ex⟩ II 2 G Ex h IIB T3 Gb (Technical Report and its 5 supplements provided to the Notified Body "Laboratorio Oficial J. M. Madariaga-LOM", with address at Eric Kandel, 1 – 28906 Getafe (Madrid), with the following codes: LOM 06ATEX0021, coded as AAF ATEX 60227), which external part and without affecting its internal part as far as potentially ignition sources is concerned, has been equipped with sub-units which, instead of being a Category 2, could be Category 3 sub-units and therefore, the marking of the resulting assembly is the one listed in this declaration; that is: ⟨Ex⟩ II 3 D Ex h IIIC T135ºC Dc and/or ⟨Ex⟩ II 3 G Ex h IIB T3 Gc.

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UK CA Declaration of Conformity

AAF-SA declares that the following product:

Designation	WONDAIR™ Mid			
Model	4-168	4-252	4-336	4-420
	6-168	6-252	6-336	6-420

has been designed and manufactured in compliance with the following **UK Legislations**:

- Pressure Equipment (Safety) Regulations 2016
- The Supply of Machinery (Safety) Regulations 2008
- Electromagnetic Compatibility Regulations 2016
- The Electrical Equipment (Safety) Regulations 2016

is in conformity with the applicable requirements of the following applied **Standards**:

BS-EN-ISO 12100:2012	BS-EN 60204-1:2019
BS-EN-ISO 13849-1:2008	BS-EN-ISO 13850:2007
BS-EN-ISO 4414:2011	BS-EN-ISO 13857:2008

Vitoria (Spain), April 2024
Bruno Vincent *Engineering Manager*

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UK CA Declaration of Conformity

AAF-SA declares that the following product:

Designation	WONDAIR™ Mid			
Model	4-168	4-252	4-336	4-420
	6-168	6-252	6-336	6-420

has been designed and manufactured in compliance with the following **UK Legislations**:

- Pressure Equipment (Safety) Regulations 2016
- The Supply of Machinery (Safety) Regulations 2008
- Electromagnetic Compatibility Regulations 2016
- The Electrical Equipment (Safety) Regulations 2016
- Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations 2016

  Being its marking *(check Equipment Nameplate to see which applies):*

  II 2D Ex h IIIC T135ºC Db
  II 2G Ex h IIB T3 Gb
  Technical file: LOM 06ATEX0021

  II 3D Ex h IIIC T135ºC Dc
  II 3G Ex h IIB T3 Gc

is in conformity with the applicable requirements of the following applied **Standards**:

BS-EN-ISO 12100:2012	BS-EN 60204-1:2019
BS-EN-ISO 13849-1:2008	BS-EN-ISO 13850:2007
BS-EN-ISO 4414:2011	BS-EN-ISO 13857:2008
EN 60079-0:2012	

Vitoria (Spain), April 2024
Bruno Vincent *Engineering Manager*

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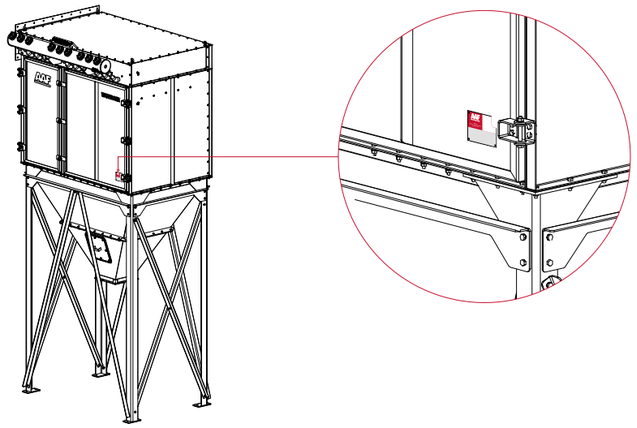
Nameplate

This manual contains the declarations of conformity for *ATEX* and *non ATEX* equipment. To check if your machine is suitable for use in explosive atmospheres, refer to the nameplate on your unit.

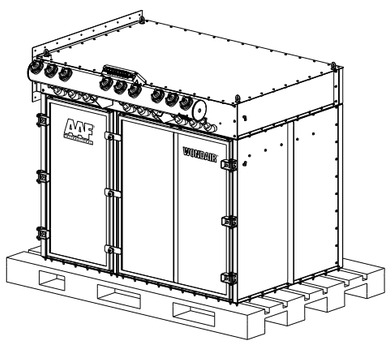


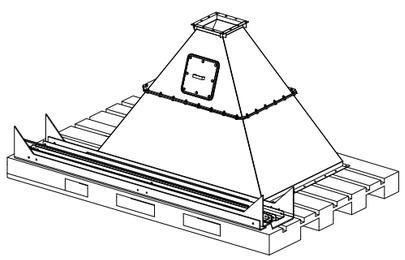
This plate is located on the front of the unit, on the lower right hand corner of the door

Logistics and delivery terms

WONDAIR™ Mid is supplied partially disassembled. On the one hand, the body with the manifold, the doors and the pre-assembled bag cartridges and on the other hand, the hopper with the parts of the structure (disassembled).

Consult with AAF International regarding the options that are available for packaging and shipping the equipment.





Standards applicable to the design and manufacture of the machine

UNE-EN ISO 12100:2012 / BS EN ISO 12100:2010
Safety of machinery — General principles for design — Risk assessment and risk reduction

UNE-EN ISO 13849-1:2016 / BS EN ISO 13849-1:2015
Safety of machinery — Safety-related parts of control systems — Part 1: General principles for design

UNE-EN ISO 13857:2020 / BS EN ISO 13857:2019
Safety of machinery — Safety distances to prevent hazard zones being reached by upper and lower limbs

UNE-EN ISO 13850:2016 / BS EN ISO 13850:2015
Safety of machinery — Emergency stop function — Principles for design

UNE-EN 894-1:1997+A1:2009 / BS EN 894-1:1997+A1:2008
Safety of machinery — Ergonomics requirements for the design of displays and control actuator
Part 1: General principles for human interactions with displays and control actuators

UNE-EN ISO 4414:2011 / BS EN ISO 4414:2010
Pneumatic fluid power — General rules and safety requirements for systems and their components

UNE-EN ISO 14120:2016 / BS EN ISO 14120:2015
Safety of machinery — Guards — General requirements for the design and construction of fixed and movable guards

UNE-EN 981:1997+A1:2008 / BS EN 981:1996+A1:2008
Safety of machinery — System of auditory and visual danger and information signals

UNE-EN 60204-1:2019 / BS EN 60204-1:2018
Safety of machinery — Electrical equipment of machines — Part 1: General requirements

UNE-EN 61439-1:2012 / BS EN 61439-1:2011
Low-voltage switchgear and control gear assemblies — Part 1: General rules

UNE-EN 61000-6-3:2002 / BS EN IEC 61000-6-3:2021
Electromagnetic compatibility (EMC) — Part 6-3: Generic standards
Emission standard for residential, commercial and light-industrial environments.

UNE-EN 61000-6-4:2002 / BS EN IEC 61000-6-4:2019
Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments.

UNE-EN 61000-6-1:2007 / BS EN 61000-6-1:2007
Electromagnetic compatibility (EMC) — Part 6-1: Generic standards
Immunity for residential, commercial and light-industrial environments

UNE-EN 61000-6-2:2006 / BS EN IEC 61000-6-2:2019
Electromagnetic compatibility (EMC) — Part 6-2: Generic standards — Immunity for industrial environments

WONDAIR™ Mid

WONDAIR™ Mid is a dry dust collector that uses compact bags and is capable of treating air volumes between 4,000 m^3/h and 30,000 m^3/h.

The unit incorporates an automatic counterflow compressed air cleaning system that allows operating continuously for prolonged periods of time. This system, which can operate even during normal use of the filter, is not only useful for maintaining an optimum performance at all times, but also allows the unit to operate at a constant speed, which ensures the loss of charge is uniform.

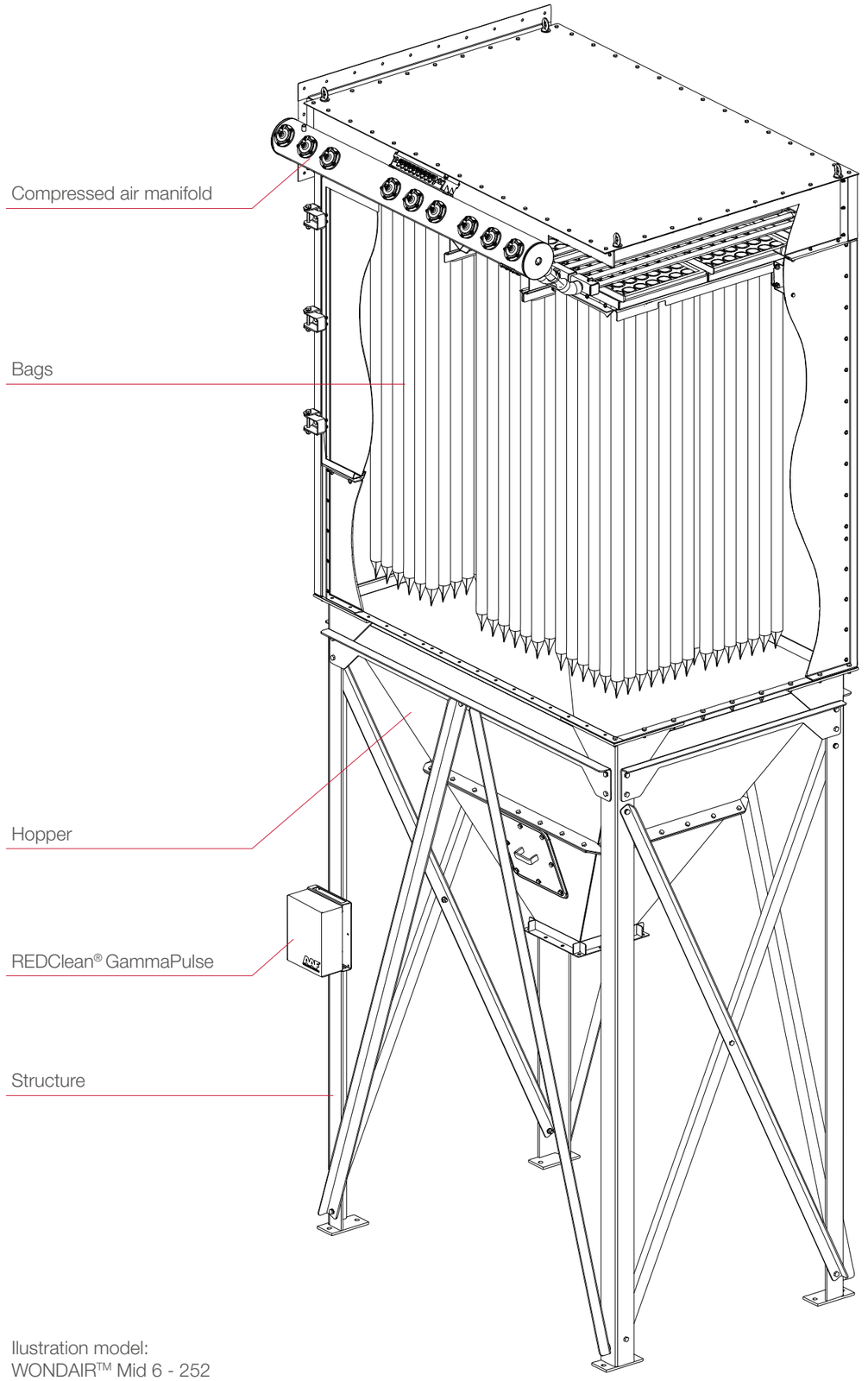
The basis of all the types of WONDAIR™ filters is a set of filtering bags measuring 57 mm in diameter that are mounted on a galvanised stainless steel support plate (bag plate) with springs inserted and fixed to a cast aluminium venturi. As an assembly, the support plate and bags form a bag cartridge, also referred to as cassette, that act as spacers between the unit's dirty and clean air chambers. This plate is installed and removed through the maintenance door.

An insert type version (Arrengement B) of this unit is available without a hopper or structure but with its own built-in dust collector hopper and support structure (Arrengement C).

WONDAIR™ Mid is designed to operate in different environments. The operating temperature and the application it is used for will depend on the type of material specified for the bags. For more information please ask AAF International about the available options.

Among the different versions of the WONDAIR™ Mid that are available, there is a model that can be used in potentially explosive atmospheres according to Directive 2014/34/EC, which meets the requirements of group II category 2G or 2D and 3G or 3D T135°C.

For more information about the elements and technical options, refer to the equipment Datasheet.



Ilustration model:
WONDAIR™ Mid 6 - 252

Sizes

The WONDAIR™ Mid dust collector is available in the following sizes:

Depending on the number of bags:	
Size 168	Four (4) cassettes with 42 bags each
Size 252	Six (6) cassettes with 42 bags each
Size 336	Eight (8) cassettes with 42 bags each
Size 420	Ten (10) cassettes with 42 bags each

Depending on the length of the bags:
4 feet
6 feet

All the filter sizes can be combined with the different bag lengths.

General dimensions

WONDAIR™ Mid - Arrangement B - Side outlet

4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	1802	1802	1802	1802
Width (mm)	B	1476	2181	2726	3431
Length (mm)	C	1761	1761	1761	1761

Weight	4-168	4-252	4-336	4-420
Weight (kg)	525	753	971	1146

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	2411	2411	2411	2411
Width (mm)	B	1476	2181	2726	3431
Length (mm)	C	1761	1761	1761	1761

Weight	6-168	6-252	6-336	6-420
Weight (kg)	622	877	1118	1320

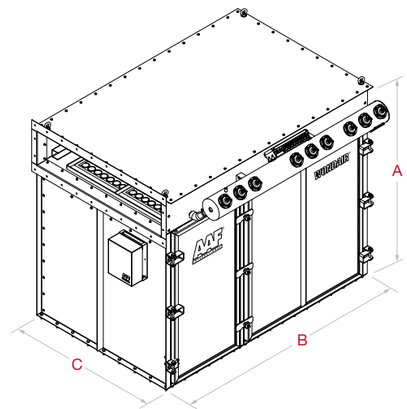


Illustration model:
WONDAIR™ Mid 4 252 B

WONDAIR™ Mid - Arrangement B - Top outlet

4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	1802	1802	1802	1802
Width (mm)	B	1476	2181	2726	3431
Length (mm)	C	1761	1761	1761	1761

Weight	4-168	4-252	4-336	4-420
Weight (kg)	525	753	971	1146

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	2411	2411	2411	2411
Width (mm)	B	1476	2181	2726	3431
Length (mm)	C	1761	1761	1761	1761

Weight	6-168	6-252	6-336	6-420
Weight (kg)	622	877	1118	1320

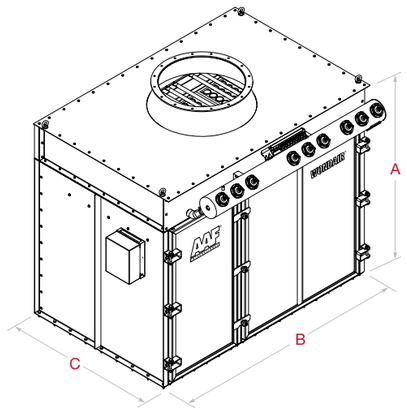


Illustration model:
WONDAIR™ Mid 4 252 B

WONDAIR™ Mid - Arrangement C - Side outlet

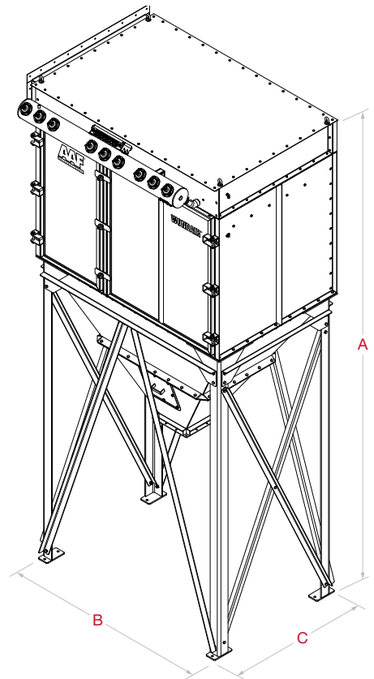
4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	4315	4730	4730	4730
Width (mm)	B	1413	2118	2663	3368
Length (mm)	C	1777	1777	1777	1777

Weight	4-168	4-252	4-336	4-420
Weight (kg)	929	1229	1507	1807

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	4924	5339	5339	5339
Width (mm)	B	1413	2118	2663	3368
Length (mm)	C	1777	1777	1777	1777

Weight	6-168	6-252	6-336	6-420
Weight (kg)	1035	1359	1672	1981

Illustration model:
WONDAIR™ Mid 4 252 C



WONDAIR™ Mid - Arrangement C *ATEX* - Side outlet

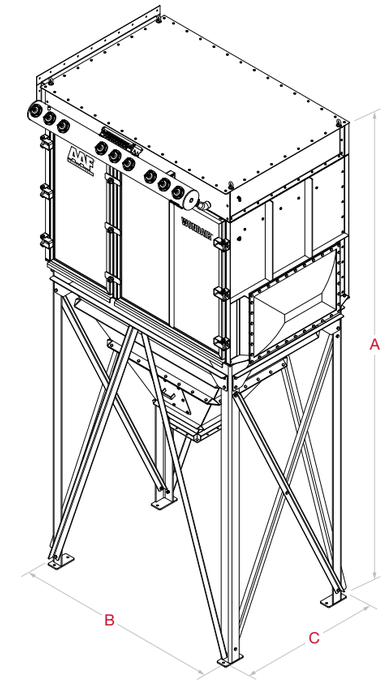
4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	4315	4730	4730	4730
Width (mm)	B	1553	2258	2803	3508
Length (mm)	C	1781	1781	1781	1781

Weight	4-168	4-252	4-336	4-420
Weight (kg)	1017	1341	1658	1971

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	4924	5339	5339	5339
Width (mm)	B	1553	2258	2803	3508
Length (mm)	C	1781	1781	1781	1781

Weight	6-168	6-252	6-336	6-420
Weight (kg)	1130	1482	1832	2173

Illustration model:
WONDAIR™ Mid 4 252 C *ATEX*



WONDAIR™ Mid - Arrangement C - Top outlet

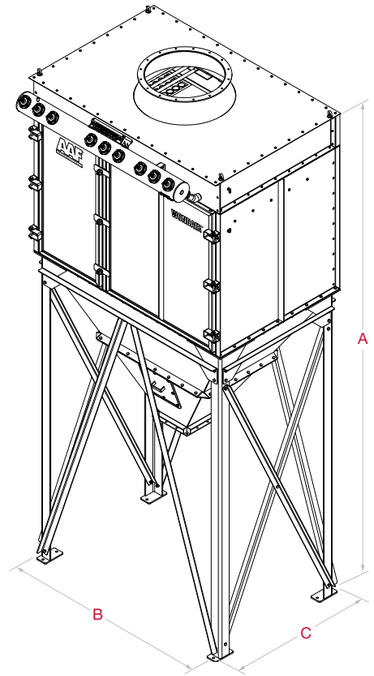
4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	4392	4807	4807	4807
Width (mm)	B	1376	2081	2626	3331
Length (mm)	C	1777	1777	1777	1777

Weight	4-168	4-252	4-336	4-420
Weight (kg)	938	1237	1516	1797

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	5001	5416	5416	5416
Width (mm)	B	1376	2081	2626	3331
Length (mm)	C	1777	1777	1777	1777

Weight	6-168	6-252	6-336	6-420
Weight (kg)	1046	1366	1683	1991

Illustration model:
WONDAIR™ Mid 4 252 C



WONDAIR™ Mid - Arrangement C *ATEX* - Top outlet

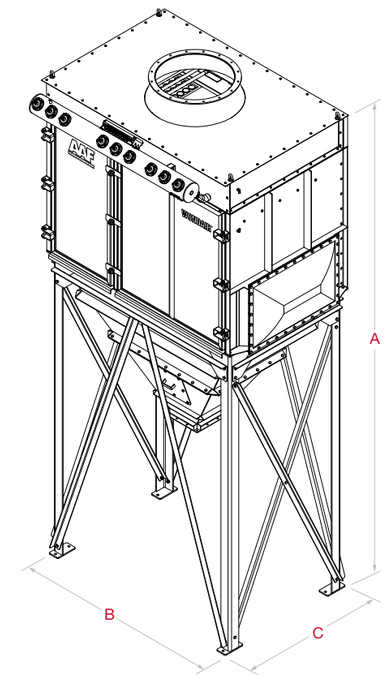
4' Bags					
Dimensions		4-168	4-252	4-336	4-420
Height (mm)	A	4392	4807	4807	4807
Width (mm)	B	1549	2241	2799	3504
Length (mm)	C	1781	1781	1781	1781

Weight	4-168	4-252	4-336	4-420
Weight (kg)	1044	1346	1664	1978

6' Bags					
Dimensions		6-168	6-252	6-336	6-420
Height (mm)	A	5001	5416	5416	5416
Width (mm)	B	1549	2241	2799	3504
Length (mm)	C	1781	1781	1781	1781

Weight	6-168	6-252	6-336	6-420
Weight (kg)	1138	1486	1837	2180

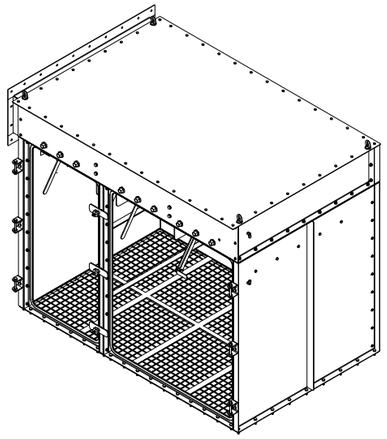
Illustration model:
WONDAIR™ Mid 4 252 C *ATEX*



Constructive elements

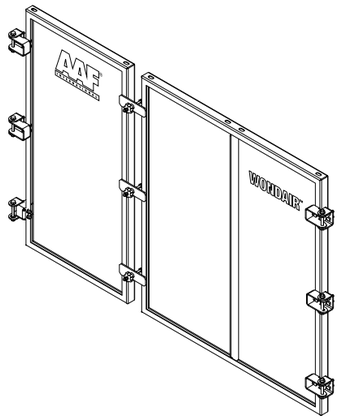
Body of the filter

The body of the WONDAIR™ Mid is made of carbon steel sheet. This is the most important part of the unit and is comprised of riveted panels that provide it with the rigidity required for inserting the bag plate or cassette fastening mechanism. This mechanism is actuated using a set of levers that allow sealing and separating the dirty area from the clean area and which allow replacing the bags during maintenance.



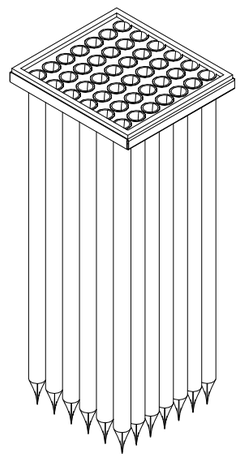
Access door

Manufactured in carbon steel, the access door ensures the filter is airtight thanks to its threaded locking system, which can be easily adjusted. The unit also incorporates hinges that offer a safe and comfortable access to the bags area.



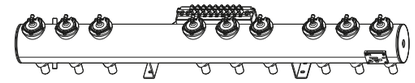
Bag plate

The bag plate (also called "cassette") is comprised of a galvanised steel sheet with inserted springs, which provide rigidity to the bags when the unit is operating. The bags are fastened using cast aluminium venturi.



Compressed air manifold

The compressed air manifold is made of carbon steel and is a different size depending on the filter, adapting the number of outlets to the rows of bags since a blow valve is located at each outlet. It has a 1” BSPP female thread air inlet.



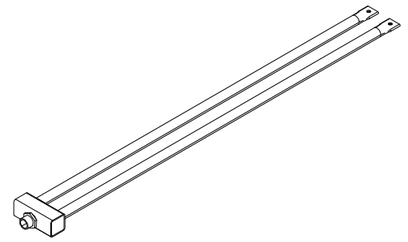
Another ¼” Gas threaded female connection is available for other uses and another identical one is located at the bottom side, which can also be used for purging.

The additional 1/4" BSP/Gas female thread connection must be covered prior to inserting the compressed air.

Compressed air blow tube

The blow tubes are located on the clean side of the filter, above the bag plate; each tube is aligned with each row of bags.

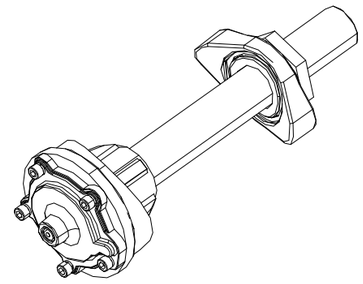
Next to each bag, the tube has an orifice where compressed air is discharged for cleaning the bag. These tubes are connected to a diffuser two at a time and each diffuser is connected to a blow valve that allows the air from the manifold to pass through it.



Valves

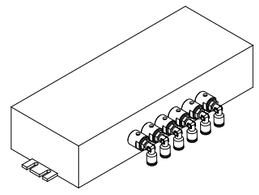
The valves are installed directly on the compressed air manifold following the full Immersion design system. These are blow valves with membrane aperture technology and are controlled by a solenoid box that commands the blow sequence. The blowing can be electrically or pneumatically controlled.

Manufactured in cast aluminium and 1" in size, they are arranged in a manner that each one blows on two rows of bags.



Solenoid valve box

The solenoid valve box transmits the commands from the cleaning controller (REDClean® GammaPulse) to the different valves. This system minimises the number of cables around the equipment.



Bags

The bag is the basic filtering element used in the WONDAIR™ Mid dust collector. These bags can be made of different materials so the filter can be perfectly adjusted to any type of process or dust.

Bags are available in the following materials:

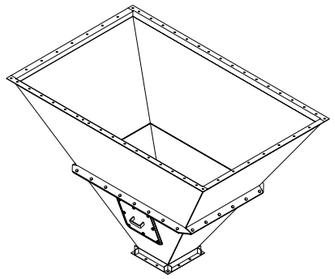
- Acrylic
- Anti-static acrylic
- Teflon-coated acrylic
- Fibre glass with a Teflon membrane
- Nomex
- Teflon-coated Nomex
- Polyester
- Anti-static polyester
- Anti-static polyester with a Teflon membrane
- Anti-static and Teflon-coated polyester
- Polyester with a Teflon membrane
- Teflon-coated polyester
- Polypropylene
- Teflon with a Teflon membrane

There is also the possibility of studying each special case and designing a tailor made bag for each process. For more information please contact AAF International.

Additional construction elements in Arrengement C

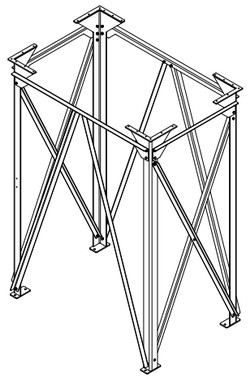
Hopper

The hopper is manufactured using carbon steel and, if included in the supply, allows controlling and using its own system for evacuating the dust that is collected by the filter.



Support structure

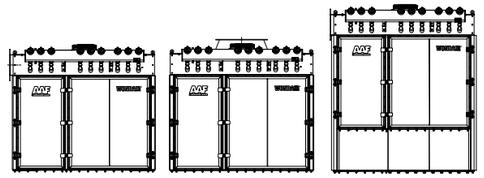
The unit, as a complete filtering and dust collection system, is supported on a structure manufactured in steel that is easy to assemble and which provides it with the stability required for it to be installed on different surfaces and locations.



Options

Arrengements

WONDAIR™ Mid is supplied in two arrengements as standard:

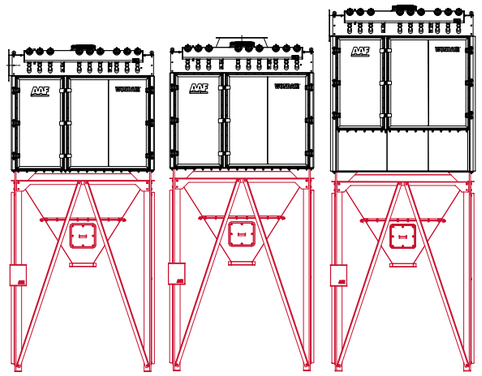


Arrengement B

Insert type unit without a hopper or structure.

The bags are protected from strong system currents by a metal body, which helps to homogeneously distribute the air flows and the dust.

The flange that connects to the system is located on the body of the filter.



Arrengement C

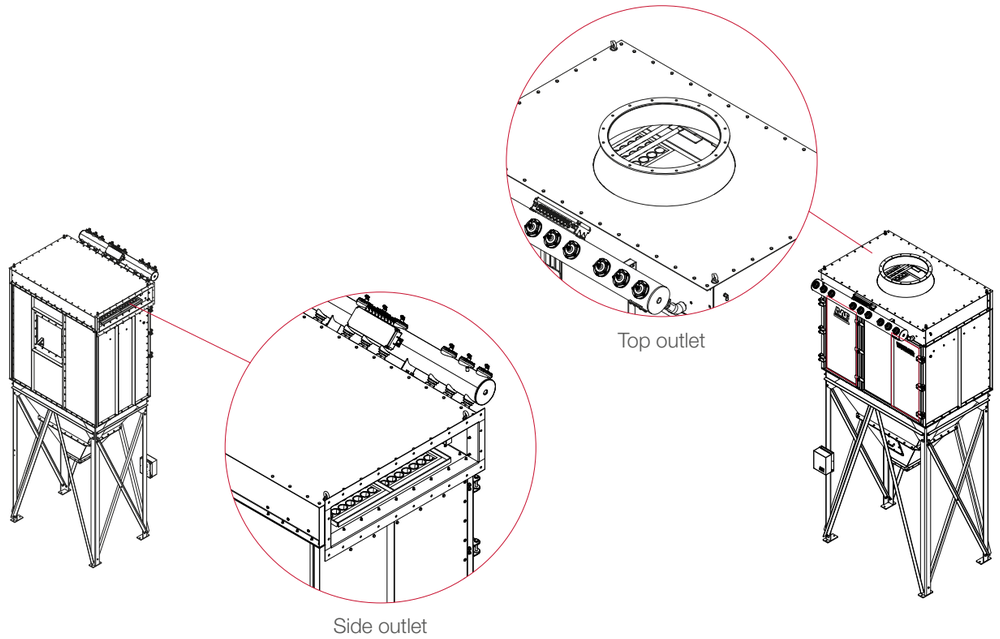
Complete and independent unit that includes a dust collection hopper and a supporting structure.

Allows locating the unit in the best location, where it does not interfere with the process and where it is easier to access to remove the extracted dust.

All arrengements are available in different combinations in terms of the number of bags and their lengths.

Outlet

In order to increase the functionality of the equipment and offer as many alternatives as possible for installation, WONDAIR™ Mid provides several configuration options for installing the clean air outlet ducts. A side outlet option is available where we can chose any side of the unit (left or right). Likewise, the air outlet may be located on the top section of the unit as shown in the following images. The final configuration will be selected by the client based on the application and the characteristics of the facilities where the final installation of the equipment is going to be carried out.

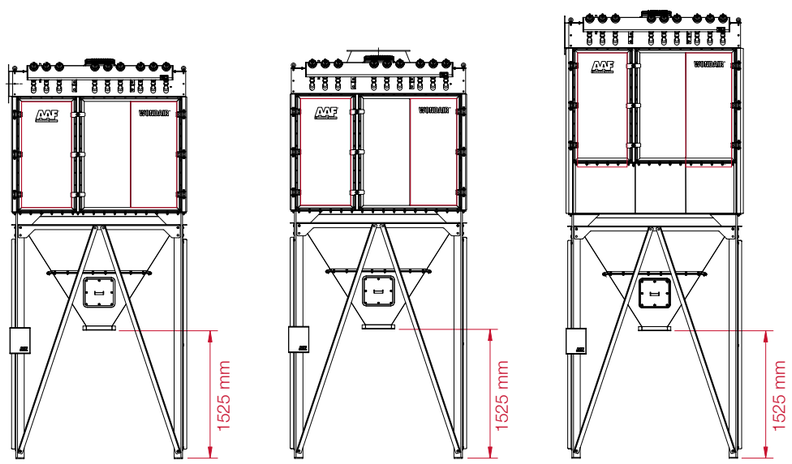


Top outlet

Side outlet

Height

Arrengement C of the WONDAIR™ Mid has a hopper discharge flange height of 1525 mm.



The full designation of the unit includes this data based on the following definition:

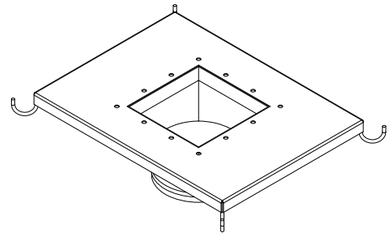
WONDAIR™ Mid | Bag lengths | No. of bags | Arrengement | Type

For example, a filter with 252 bags measuring 4 feet in length, hopper and structure, would have the following designation:

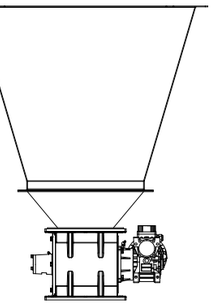
WONDAIR™ Mid 4 - 252 C

Types of discharge

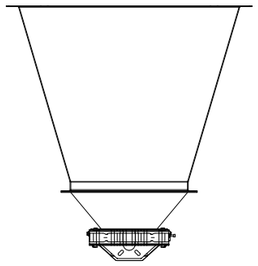
We offer the option of manufacturing it with:



Big Bag support bracket



Rotary valve



Slide valve

To request other types of special discharges, please contact AAF International.

Optional devices

High temperature construction

The filter is designed to operate at the maximum recommended temperature of 80ºC. If you wish to operate the unit in environments where the temperature is higher than 80ºC, please contact AAF International.

Construction for corrosive environments

In cases where the unit is to be installed in high corrosion environments, we offer the possibility of protecting the manufactured steel parts with a coat of level C5 paint.

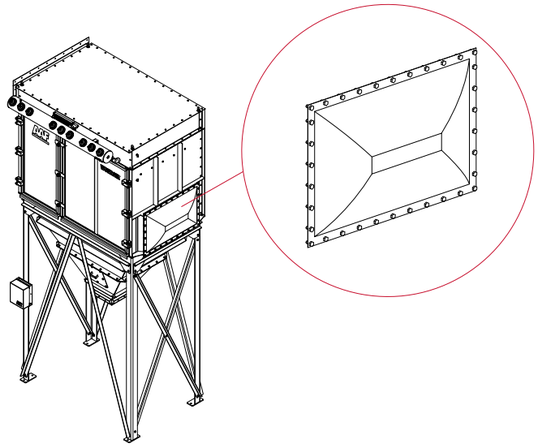
For a higher level of protection that includes commercial parts, hardware, etc., we recommend contacting AAF International to study the existing options.

Construction for explosive atmospheres

Venting panel

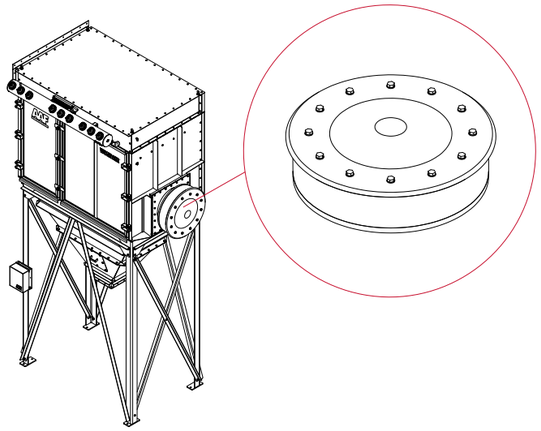
WONDAIR™ Mid units may be supplied ready to operate in explosive atmospheres; in *ATEX* zones 21 and 22 as well as in categories 2D and 3D.

The end user and/or the person responsible for the installation is ultimately responsible for all the explosive atmosphere protection systems. The installer or user must make sure that all the systems are properly installed and meet the applicable *ATEX* directives and requirements.



Relief valve

The relief valve is a safety feature to protect against possible explosions by relieving the pressure and preventing any flame that could be generated inside the unit from exiting or propagating in case of fire.



Principle of operation

Dust filled air or gases enters the unit through the side of the filtering bags chamber (through the bottom in Arrengements B and C) against the plenum that distributes the gases throughout the entire bags filter chamber.

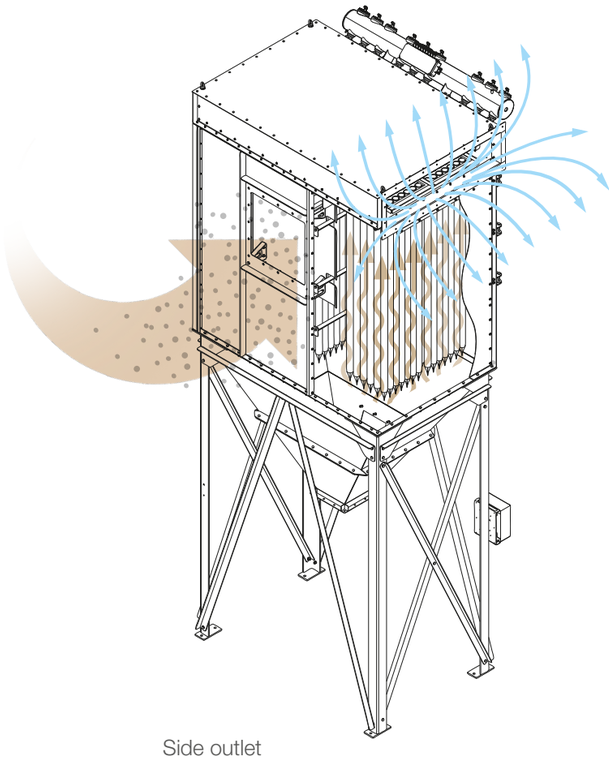
These gases pass through the filtering bags and the dust is collected inside the bags while the clean air passes through the bags to the top chamber through the venturi tubes or top part of the cage.

The outlet of this chamber to the outside may be carried out though the different options that are available on the unit (side or top) as shown in the following images.

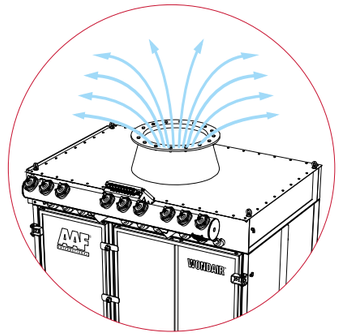
The bags have a metal spring inside them that act as a support for the bags and prevents them from collapsing. The bags are fixed to the plate by means of a cast aluminium venturi that acts as a seal between the bag itself and the plate. The cages are supported on the bag plate.

The cleaning of the bag; in other words, removing the dust that is collected inside it, is accomplished using industrial compressed air. This compressed air may be supplied by a compressor that is used exclusively for cleaning the bag filter or it may be supplied by the client's air supply grid.

The manifold (compressed air collector) is a lung that prevents continuously operating the compressor and guarantees that air is regularly available for each blow cycle.



Side outlet



Top outlet

Basic self-cleaning principle

The cleaning process of the bags is carried out as follows:

Step 1 →	Step 2 →	Step 3 →	Step 4
The compressed air reaches the filter and accumulates inside the cylindrical shaped manifold that is located on the back side of the filter.	The diaphragm valves are connected to the manifold and their function is to generate the instantaneous triggering of compressed air on the bags through the blow tubes.	Each diaphragm valve (normally closed) is piloted from a solenoid valve box that incorporates a sequencer. An electrical pulse on the solenoid valve controls and actuates the opening of the diaphragm valve, which allows generating an instantaneous triggering of compressed air through the blow tube and on to the filtering bags.	The filtering bag receives a burst of compressed air that generates a pressure wave and shakes the filtering fabric. This detaches the dust that is adhered to the outside of the bag, which falls by gravity onto the hopper of the filter.

The electrical pulses on the solenoid valves are generated by the cleaning control system (REDClean® GammaPulse), which is supplied with the unit. A digital pressure gauge is also supplied with the unit, which allows viewing the differential pressure at which the filtering bags operate at all times.

Description of the operation of the cleaning system

1 | The control system starts the filter cleaning when the predetermined differential pressure is reached ("Automatic" mode) or continuously ("Manual" mode), which sequentially activates the solenoid valves of each membrane valve (located on the compressed air collector), producing a strong burst of compressed air in the blow tube that is in line with each column of bags.

2 | This burst of compressed air in the blow tube turns into a shock wave that moves through the centre of the bag.

3 | The shock wave removes the layer of dust from the bags.

4 | The configuration allows for the released dust to free fall into the bottom hopper.

Remember to disconnect the controller from the electrical grid prior to conducting any type of maintenance.

Installation and assembling

Mechanical Installation

Basic knowledge of the filter and its operation will be used as a guide by the head of maintenance.

We recommend this person becomes familiar with the description of the filter in a manner that he or she will be able to properly identify and easily locate the different construction elements.

The space required by the equipment is the minimum needed to carry out the maintenance operations on the filtering bags and diaphragm valves and therefore, we recommend leaving an 800 mm free space around it.

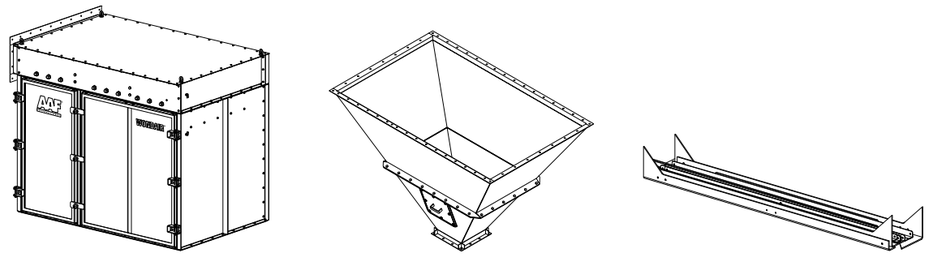
The dust collection hopper is not a storage hopper although it may serve this purpose under certain circumstances. The frequency with which it is emptied will depend on the hours of operation and the amount of dust that is collected.

The alternative solution consists of installing an evacuation system, like for example a dust collection bin or a continuous system using a worm gear and rotary type sealed shut-off valves with continuous discharge.

Assembly at the factory

The WONDAIR™ Mid dust collectors are partially or fully assembled depending on their arrangement:

- Arrangement B equipment are supplied fully assembled from the factory.
- Arrangement C equipment are supplied partially assembled and in three main parts: the body, the hopper and the structure disassembled.



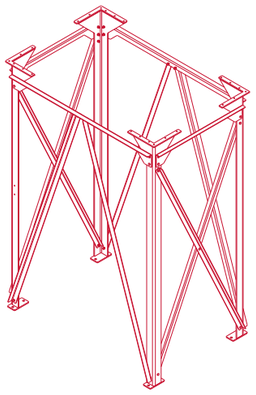
The collector is supplied with the bag cartridges already installed. Detailed instructions are provided in the sections below.

Installation

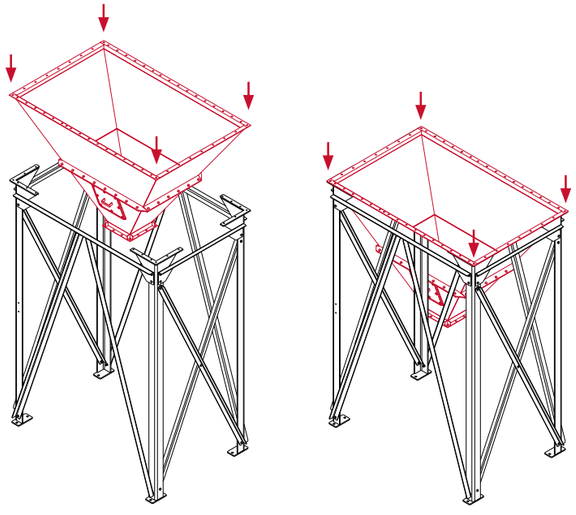
Taking into account that the assembling of the WONDAIR™ Mid is carried out directly at the factory prior to shipping to the client, we recommend using a crane for unloading, assembling and installing the dust collector.

Once the unit is received, check that the bags or venturi have not suffered any damage. The springs installed inside the bags must run from the bottom of the bag to the venturi orifice. Check that the orifices on the venturi have not become misaligned during shipping.

Once a general inspection is carried out of the main components of the system, the steps provided below must be followed to install and assemble the equipment at the work area:



1 Assembling of the structure.

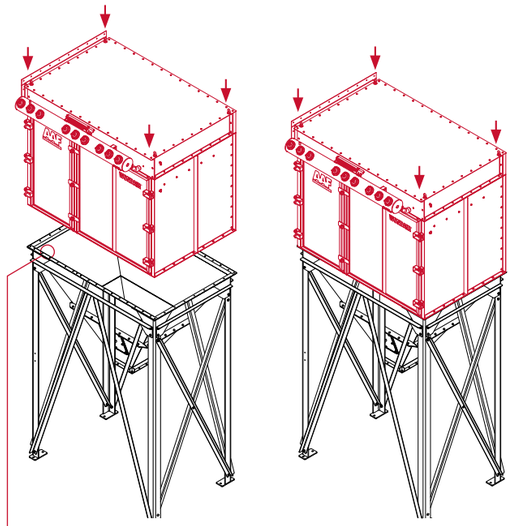


2 Pre-assembling of the hopper on the structure.

Personnel carrying out the installation or any maintenance on the equipment must be familiar with and shall follow all the pertinent safety measures.

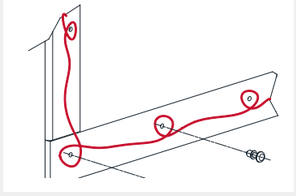
Equipment that is not ATEX certified shall not be installed in an area classified as an explosive atmosphere.

Raise the collector assembly with its legs and position it over the foundation on the anchoring screws. Tighten all the bolts on legs and braces. Also tie the unit to the anchoring bolts using flat washers, washers and nuts and release the crane.

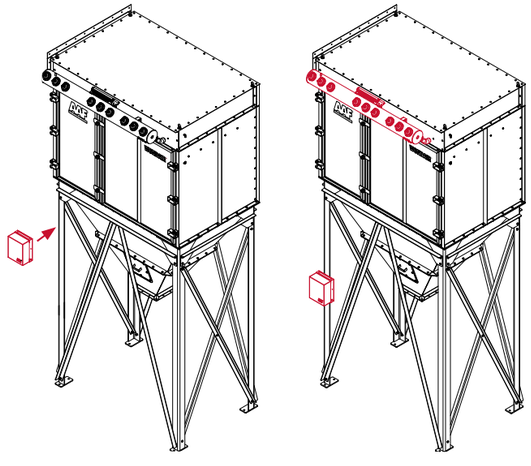


3 Assembling of the filter body on the hopper-structure assembly.

Sealant (putty, silicone or Ø3 mm ceramic cord) must be applied around the mounting holes between the equipment components, hopper and body to ensure these are properly sealed.



The sealant and screws used for assembling the unit are included in the shipment of the equipment.



4 Installation of the cleaning controller and wiring with the solenoid box.

5 Differential pressure connections between the collector and the control system.

6 Connecting of the compressed air supply.

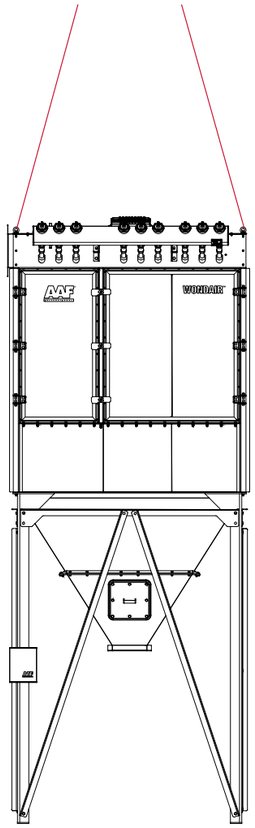
Recommendations for handling the unit

The WONDAIR™ Mid dust collector is normally shipped by truck and must be inspected to make sure it has not suffered any damage during transport. Any damage must be recorded and reported to the transport agent no later than 24 hours after its reception.

WONDAIR™ Mid is shipped disassembled in three parts; the body with the manifold and the bags assembled, the hopper and the structure. We recommend following the safety regulations concerning the hoisting of cargo.

When handling the equipment, the lifting lugs that are installed on the top part of the equipment shall be used (refer to the image).

For handling the hopper, install threaded shackles to the holes that are available on the flanges.



Personnel carrying out the installation or any maintenance on the equipment must be familiar with and shall follow all the pertinent safety measures.

Taking into consideration that the WONDAIR™ Mid dust collector is generally shipped on its side by truck, it must be inspected upon its reception in case it suffered any damage during transport. Any damage must be recorded and reported to the transport agent no later than 24 hours after its reception.

Hook the hoisting cables to at least four hoisting points in order to distribute and balance the load.

Use safety hooks instead of claws on the hoisting cables.

We recommends using distribution bars with all hoisting cables.

Sealing

All bolted joints shall be airtight and watertight. Unless otherwise indicated, a sealed joint with a 3 mm ceramic cord (or similar type) shall be installed between flanges, supplemented with an outer or inner putty seal suitable for the type of gases to be filtered.

To ensure a good seal, all bolted joints shall be airtight and watertight. Unless otherwise indicated, a sealed joint with a 3 mm ceramic cord (or similar type) shall be installed between flanges, supplemented with an outer or inner putty seal suitable for the type of gases to be filtered.

Foundation and anchors

WONDAIR™ Mid may be anchored to a civil work prepared with the anchors or it may be installed directly on a sufficiently strong concrete floor and anchored to it using mechanical expansion anchors or chemical anchors.

The unit may also be mounted on a roof or directly as a unit that can be inserted in process equipment.

When conducting the calculation of the concrete foundation as well as the roof, the weight of the dust collector, collected material and the auxiliary equipment must be taken into account along with the snow, wind and seismic loads as well as the rest of the normal loads used for calculating the reactions of the unit support mounts.

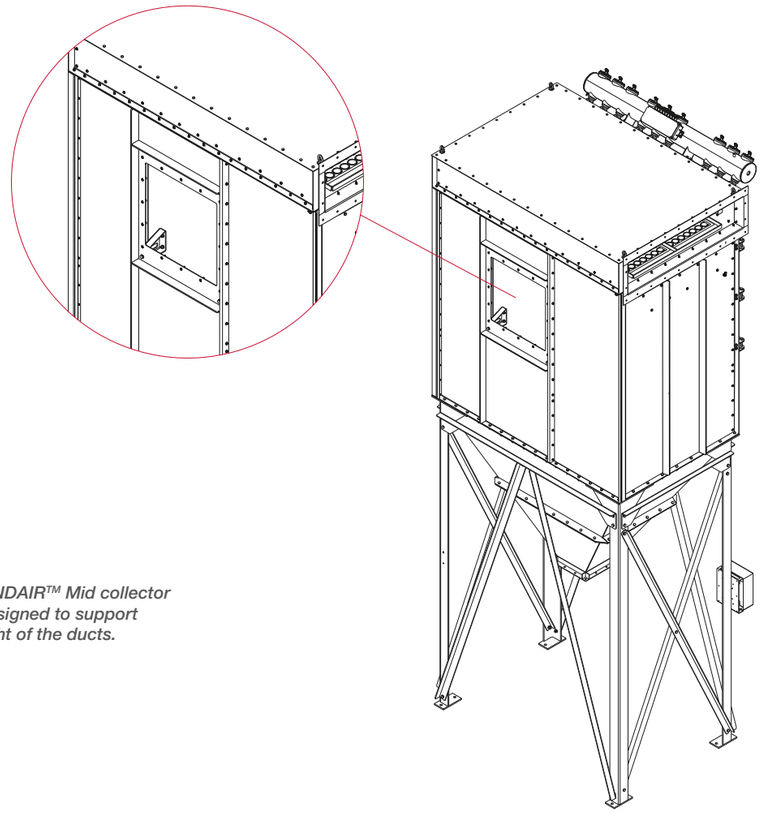
On the other hand, the collector must be arranged with the emptying of the hoppers in mind as well as the minimum distance travelled by the dust, the electrical and compressed air connections and maintenance.

We recommend disconnecting the crane prior to tightening all the legs, braces and anchors.

The installation location must be free of any obstacle such as cables or roof overhangs, since a crane must be used to install the collector in its position.

Suction ducts and accessories

Prior to commissioning the WONDAIR™ Mid, we must connect the inlet duct to the unit's inlet flange. The ducts must be thick enough to withstand the design pressure and these must be attached independently to the collector. Likewise, we must screw-on the discharge transitions to the hoppers.



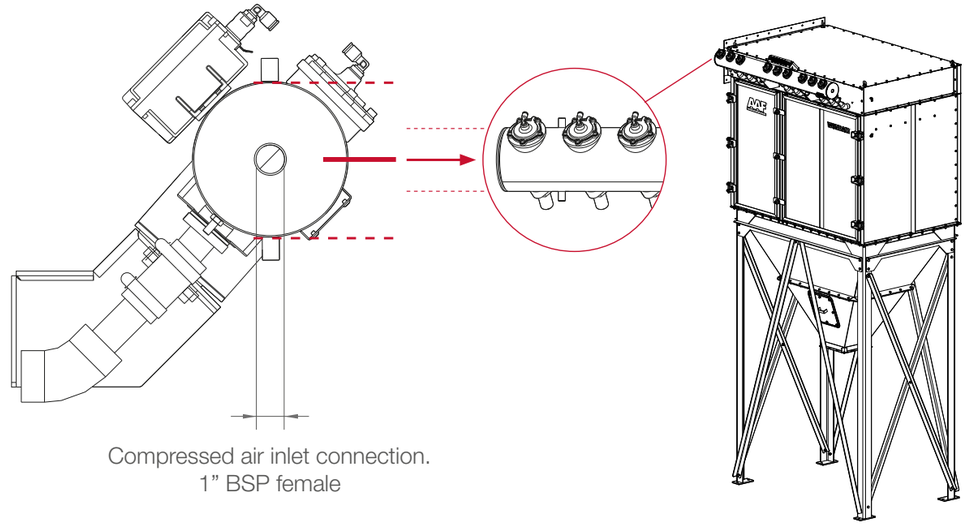
The WONDAIR™ Mid collector is not designed to support the weight of the ducts.

Compressed air connection

The compressed air blowing tubes are oriented towards the centre of the bags to ensure each cleaning blow cycle is as effective as possible.

The bag blowing tubes are connected directly to the blowing valves via the diffuser, which allows blowing two rows of bags at once by the air blown through each valve.

The manifold has a 1" BSP female thread connection. The unit is designed to supply power to the manifold through this connection. It is important for the compressed air to be clean and dry to prevent the valves from deteriorating.



Compressed air inlet connection.
1” BSP female

Also, a connector with a ¼” BSP/Gas female thread is available, which can be used to install other components such as a pressure gauge or an overpressure safety valve. The installation of this last component is recommended for any type of application. Both can be installed using a T figure on the manifold connection.

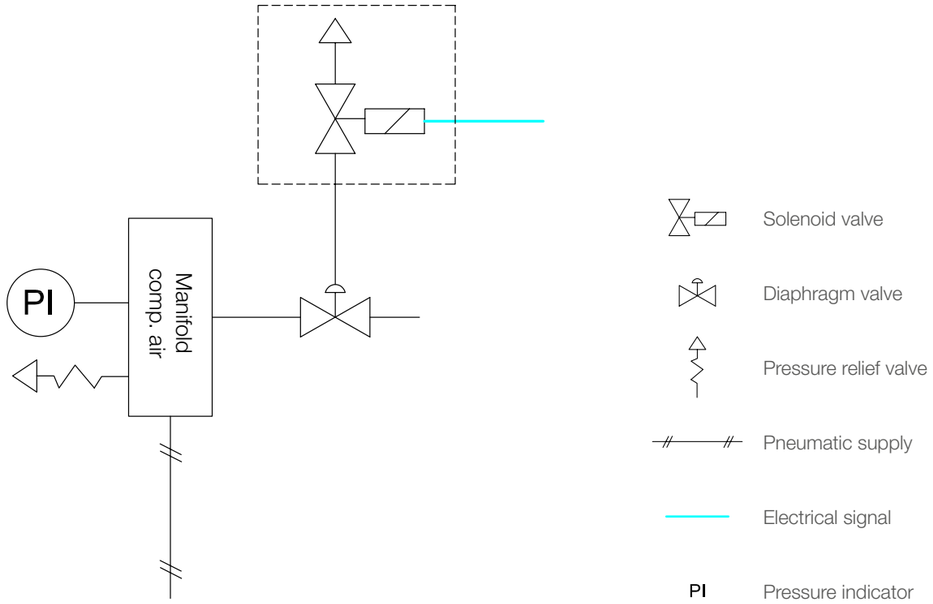
Another connector with a ¼” BSP/Gas female thread is installed on the bottom, which can be used to install the purge valve. The blow pressure depends on the application and type of dust; we recommend contacting the manufacturer.

The WONDAIR™ Mid dust collector requires dry compressed air (-40°C. dew point, 4-7 bar) and oil free for cleaning. The amount of nominal compressed air that is required with a 30 sec interval and a duration of 100 msec is about 75 Nl/min.

The normal cleaning pressure on the bags ranges from 4 to 7 bar; however, for special applications where the bags are made of a delicate material such as fibre glass, we recommend operating with lower pressures of about 2 bar. We recommend contacting AAF to determine the proper blowing pressure for the application.

The adverse conditions of the system may require reducing the time interval, which will increase the compressed air consumption.

Pneumatic diagram



Electrical Installation

Cleaning control system

The WONDAIR™ Mid dust collector may be supplied with the bag cleaning control system or with a full IP65 control cabinet, which houses the cleaning controller as well as the fan and rotary starter.

The wiring from the control panel to the different components, fan, rotary or between the solenoid valves and the cleaning system as well as the pneumatic connections for the differential pressure as indicated in the electrical connection diagram are all mounted at the factory unless otherwise specified by the client.

The cleaning control system must be programmed and adjusted during its commissioning. Check and ensure the wiring and its operation are correct.

The power supply for the REDClean® GammaPulse cleaning control system must be continuous at 24 Volts; however, as an option, it may be alternating at 24/115/230 Volts. When power is applied to the system, the unit begins to send cleaning pulses whenever the differential working pressure is reached (Automatic mode) or continuously (manual mode).

The blow pulses must not operate for long periods of time if there is no compressed air supply to the manifold. Operation without compressed air may damage the solenoid valves.

The interval and duration of each pulse is controlled by the control system. The blow cycle interval is set to 15 seconds, which is a time that is considered valid and correct for most applications. However, the amount of dust, the filtering speed and other factors may vary from one installation to another, which may require adjusting the interval between pulses for certain applications.

The duration of the pulses must be set to 100 milliseconds, which is also adjustable. Do not modify the duration of the blowing time without consulting with AAF International.

The REDClean® GammaPulse cleaning controller is an electronic box designed to control the cleaning of the bags and allows programming the blow cycles in terms of the time or loss of charge.

The mentioned values are generic. To optimise the results of the cleaning, we recommend contacting AAF International to study each process in detail.

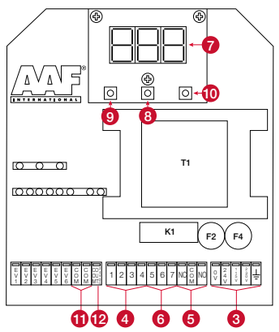
Possible electric shock. Disconnect the power supply prior to conducting maintenance. Only qualified personnel must work on this task.

To prevent damaging the cleaning control system, BEFORE installation, carefully read the manual that is supplied with the control unit.

REDClean® GammaPulse 6

Main characteristics

Power supply	24 VAC	115 VAC	230 VAC
(option)	24 VDC		
Fuses	F2 general fuse 2A 5x20		
	F4 solenoid power supply fuses 1.6A 5x20 delayed		
Operating temperature	-10 / +50 °C		
Connections	Terminals with screw. Use *ATEX* packing glands for the cable outlets in order to ensure the certification remains current		
Maximum absorbed power	100 VA		
Inputs	no.3 opto-isolated inputs		
Relay inputs	No.1 relay 2A resistive load 115 VAC		
Solenoid valve output	Triac outputs with ON/Off steel/crossing. 24, 115 or 230 VAC and 24 VDC with max. current of 2A		



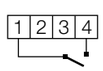
1 F2, Power supply protection fuse.

2 F4, Solenoid valves protection fuse.

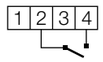
3 Power supply terminals.

4 Input terminals:

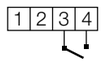
Terminals 1, 4	No.1 input contact
	Open Contact: non-active input Closed contact: active input



Terminals 2, 4	No.2 input contact
	Open contact: non-active input Closed contact: active input



Terminals 3, 4	No.3 input contact
	Open Contact: non-active input Closed contact: active input

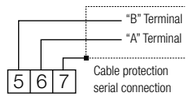


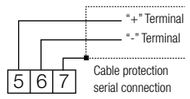
5 Relay output terminals

NC, COM, NO terminals	Contact with relay 1 (K1)
NCterminal	NCcontact
COM terminal	Common
NO terminal	NOcontact

6 Auxiliary output terminals (RS4856 optional):

Terminals 5, 6, 7	
With RS 485 serial output	
Terminal 5	Terminal B RS 485 serial card
Terminal 6	Terminal A RS 485 serial card
Terminal 7	RS 485 serial cable protection (optional, but recommended)
With analogue output	
Terminal 5	Analogue output positive terminal
Terminal 6	Analogue output negative terminal
Terminal 7	Analogue cable protection (optional, but recommended)





7 Display at 7 segments and 3 digits.

8 Enter key (E)

9 Down Key (↓)

10 Up Key (↑)

11 Common ground terminals with clean contact for Solenoid valves

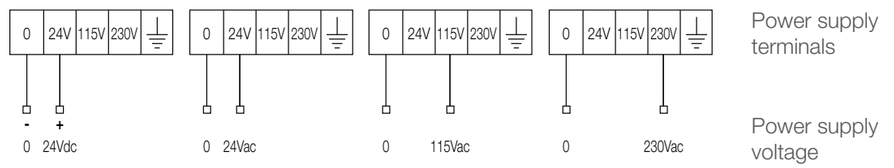
12 + 24 VDC common ground terminal for + 24 VDC Solenoid valves

The analogue output is the ACTIVE type.

REDClean® GammaPulse 6 power supply

The REDClean® GammaPulse 6 system may operate with a 24 VAC, 115 VAC or 230 VAC power supply. When requested, the REDClean® GammaPulse 6 may be adapted to accept a 24 VDC power supply.

To properly wire the solenoid valves, simply follow the diagram provided below:



ON/OFF REDClean® GammaPulse 6 must be installed in the general cabinet.

Connect the REDClean® GammaPulse 6 and the solenoid valves to ground.

Shielded cable must be used in cases where the REDClean® GammaPulse 6 is installed near inverter power cables.

Connecting of the solenoid valves

Use terminals 1-2 ….N to connect the solenoid valves and terminal C (common) to connect the commons with the power supply jumper. The C commons that are present in the REDClean® GammaPulse 6 are all connected with each other. Therefore, there is no need to make any external connection.

Depending on the power supply that is required, the Solenoid Valves may have coils that operate with different voltages:

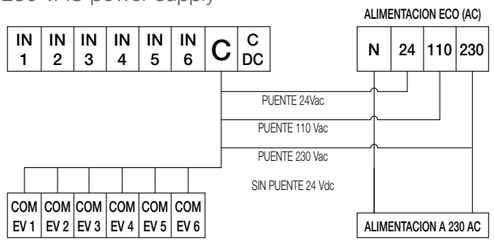
- 24 VAC power supply: we can use 24 VAC or 24 VDC coils.
- 115 VAC power supply: we can use 24 VAC to 115 VAC or 24 VDC coils.
- 230 VAC power supply: we can use 24 VAC, 115 VAC, 230 VAC or 24 VDC coils.
- 24 VDC power supply: we can only use 24 VDC coils. (Optional)

An external jumper between common C and the Solenoid Valves must be installed to provide the proper power to the coils through the REDClean® GammaPulse 6 power supply terminals. If the jumper is not installed, the LEDs for the Solenoid Valves will be illuminated steady and quickly when the control panel is turned on without the solenoid valves being activated.

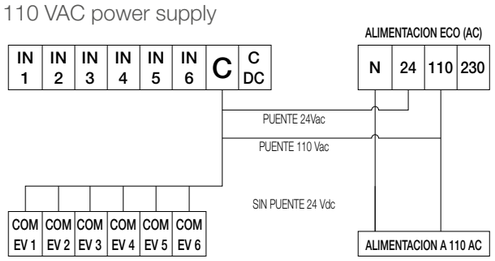
With the coils energised with 24 VDC, AAF International recommends not installing a jumper. Only use terminal C COMMON OUT 24DC. The card will automatically supply power to the coils 24 VDC.

Example of connections

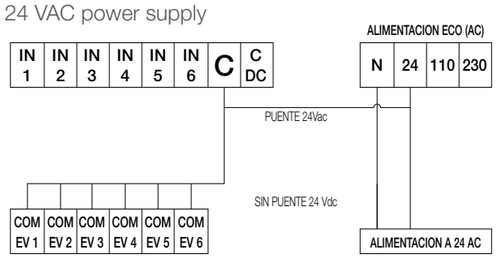
230 VAC power supply



110 VAC power supply



24 VAC power supply



For more information about the REDClean® GammaPulse 6 cleaning control system from AAF International, refer to the REDClean® GammaPulse 6 Operating and Programming Manual.

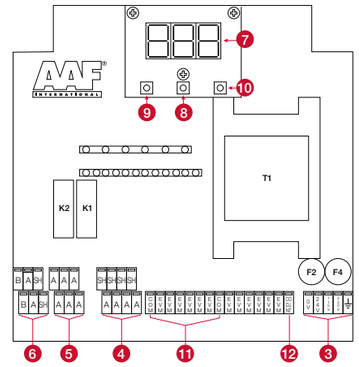
The electrical connections to the units must be properly protected against possible overloads.

ATEX certified equipment incorporate a ground connection that must be connected to the applicable grid to dissipate the electrostatic charges prior to powering up the unit.

REDClean® GammaPulse 12

Main characteristics

Power supply	24 VAC	115 VAC	230 VAC
(option)	24 VDC		
Fuses	F2 general fuse 2A 5x20		
	F4 solenoid power supply fuses 1.6A 5x20 delayed		
Operating temperature	-10 / +50 ºC		
Connections	Terminals with screw. Use *ATEX* packing glands for the cable outlets in order to ensure the certification remains current		
Maximum absorbed power	100 VA		
Inputs	no.4 opto-isolated inputs		
Relay inputs	No.2 relay 2A resistive load 115 VAC		
Solenoid valve output	Triac outputs with ON/Off steel/crossing. 24, 115 or 230 VAC and 24 VDC with max. current of 2A		

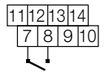


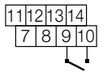
1 F2, Power supply protection fuse.

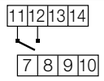
2 F4, Solenoid valves protection fuse.

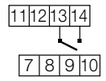
3 Power supply terminals.

4 Input terminals:

Terminals 7, 8	No.1 input contact
	Open contact: non-active input Closed contact: active input

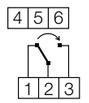
Terminals 9, 10	No.2 input contact
	Open Contact: non-active input Closed contact: active input

Terminals 11, 12	No.3 input contact
	Open Contact: non-active input Closed contact: active input

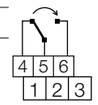
Terminals 13, 14	No.4 input contact
	Open Contact: non-active input Closed contact: active input

5 Relay output terminals

Terminals 1, 2, 3	Contact relay 2 (K1)
Terminal 1	NC contact
Terminal 2	Common
Terminal 3	NO contact

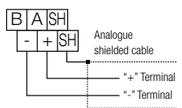


Terminals 4, 5, 6	Contact relay 1 (K2)
Terminal 4	NC contact
Terminal 5	Common
Terminal 6	NO contact



6 Analogue output terminals

+ Terminal	Analogue output positive terminal
- Terminal	Analogue output negative terminal
Ground terminal	Analogue cable protection (optional, but recommended)



7 Display at 7 segments and 3 digits.

8 Enter key (E)

9 Down Key (↓)

10 Up Key (↑)

11 Common ground terminals with clean contact for solenoid valves.

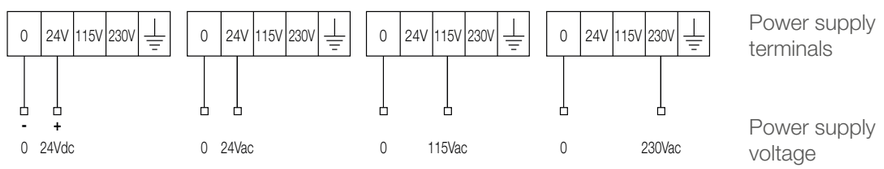
12 + 24 VDC common ground terminal for +24 VDC Solenoid valves

The analogue output is the ACTIVE type.

REDClean® GammaPulse 12 power supply

The REDClean® GammaPulse 12 system may operate with a 24 VAC, 115 VAC or 230 VAC power supply. When requested, the REDClean® GammaPulse 12 may be adapted to accept a 24 VDC power supply.

To properly wire the solenoid valves, simply follow the diagram provided below:



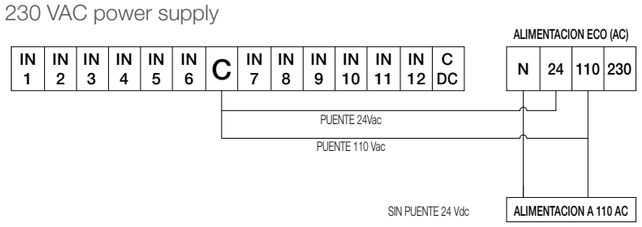
ON/OFF REDClean® GammaPulse 12 must be installed in the general cabinet.

Connect the REDClean® GammaPulse 12 and the solenoid valves to ground.

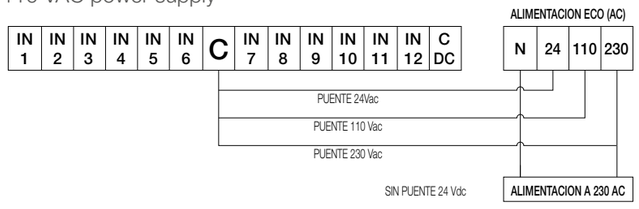
Shielded cable must be used in cases where the REDClean® GammaPulse 12 is installed near inverter power cables.

Connecting of the solenoid valves

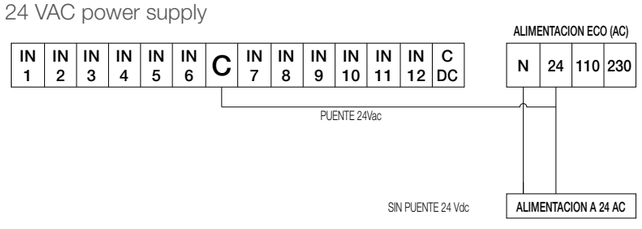
230 VAC power supply



110 VAC power supply



24 VAC power supply



For more information about the REDClean® GammaPulse 12 cleaning control system from AAF International, refer to the REDClean® GammaPulse 12 Operating and Programming Manual.

The electrical connections to the units must be properly protected against possible overloads.

ATEX certified equipment incorporate a ground connection that must be connected to the applicable grid to dissipate the electrostatic charges prior to powering up the unit.

Differential pressure connection

WONDAIR™ Mid incorporates a pressure connection in the clean air zone and another one in the dirty air zone. These are required for controlling the dirt accumulation and the state of clogging of the bags.

Control of the differential pressure between the clean air chamber and the dirty air chamber is important for controlling and maintaining the equipment.

Differential pressure indicator

The cleaning control system will provide a readout of the differential pressure on its display. To accomplish this, the proper lines must be connected to the collector. We recommend using 6x4 pipe. The (+) connection must be connected to the dirty chamber of the unit (where the filtering elements are located) while the (-) connection must be connected to the clean chamber of the filter. Both points are located on the top section of the collector.

Commissioning and adjustment

Verify the status of the described tasks prior to commissioning the equipment.

Prior to commissioning the equipment, a final inspection shall be conducted of the inside and outside of the bags filter. To accomplish this we recommend turning on the electrical equipment and verifying if it is operating properly.

- ☐ Check that the connection between the filter and the installation is correct, that the equipment is properly fastened and the joint is properly sealed.
- ☐ Check the bag cartridge or bag cartridges to ensure they are in the closed position on the separator. The cartridges are shipped installed but we must ensure they are properly sealed. Close the door firmly.
- ☐ Check that the air supply is connected to the compressed air manifold. Open the compressed air valve towards the manifolds and check that no leaks are detected in the different valve connections and fittings. Check the compressed air connection. Verify that pressure is present in the manifold. Maximum recommended pressure is 6 Bar.
- ☐ Check the fittings and for continuity in the electrical wiring. Check that the cleaning control system is properly connected and is receiving electrical power
- ☐ Check the fan is wired correctly and verify it is turning in the right direction.
- ☐ Ensure that foreign objects are not located inside the fan.
- ☐ Open the compressed air valve towards the manifolds and check that no leaks are detected in the different valve connections and fittings.
- ☐ Ensure that hopper discharge system is operating properly.

AAF International recommends following the instructions and indications provided by the manufacturer at all times.

Start-up of the installation

WONDAIR™ Mid has a material collection and discharge system. Therefore, it is advisable to verify that the material discharge is controlled and does not generate any problems during the operation of the unit.

Carry out the following steps to turn on the equipment:

1. If the unit has an automatic discharge system, turn it on from the start.
2. Connect the cleaning control system and conduct a test cycle.
3. Listen to the triggering of the solenoid valves and the diaphragm valves to check that they are operating properly. Then, check and verify that each time a solenoid is activated, a small amount of air is discharged through the diaphragm valve's air relief port.
4. Turn on the fan and monitor the differential pressure on the display. The displayed differential pressure indicates the loss of charge through the filtering surface and eventually of the layer of dust. A rising differential pressure indicates that the dust is reaching the filter. When the circuit is providing less resistance, the fan suctions more air, which produces an increase in the power consumption of the fan.

   In general, it must indicate a pressure between 80 and 150 mmwc with slight fluctuations each time an air burst is produced. If the pressure drop is not between 75 and 125 mmwc, the pre-set 30 second air burst interval must be modified. Decrease the interval for high pressure values and increase it for low pressure values. If not able to maintain the nominal pressure between 80 and 150 mmwc, consult with your AAF International representative.

   We recommend installing a butterfly valve on the general duct between the bag filter and the fan. During the first start and using new bags, partially close the valve. This will cause a loss of charge, which will prevent a higher power consumption of the fan.

Carry out the following steps to turn off the equipment:

1. Turn off the fan.
2. After some time, the cleaning control system will be turned off. Consult with AAF International regarding the recommended time delay since it will vary depending on the application.
3. Finally, and after a second time delay, the dust discharge system will be turned off in cases where the unit has a rotary valve or other automatic system installed. Consult with AAF International regarding this interval since, like in the previous case, it will depend on the application.

It is important to follow these indications when turning off the equipment so that when dust is no longer being suctioned, the cleaning system will continue to operate to leave the bags as clean as possible and at the same time, the discharge system will completely remove the material from the hoppers, preventing the material from accumulating on the hopper as well as future clogging problems.

Ensure the cleaning system has compressed air available at all times. Do not allow the cleaning system to operate for long periods of time without supplying compressed air to the filter. Operation without compressed air could cause damage to the solenoid valves.

Make sure that all the diaphragm valves blow air.

Adjustment

The adjustment of the cleaning system is essential for a proper operation of the unit. Also, a proper adjustment of the cleaning parameters does not ensure an optimum air consumption. Also, the service life of the filtering elements will be extended as much as possible when the cleaning pulses are properly programmed. We recommend consulting with the manufacturer and properly adjusting the parameters as soon as the filter is commissioned.

The adjusting of the cleaning compressed air trigger time (pulse) and especially, the time between cleaning triggers (interval) is directly related with the vacuum that is originated through the bag fabric. On the other hand, this vacuum indicates the resistance provided by the fabric, which is loaded with dust preventing air from passing through it. Therefore, the greater the vacuum, the greater amount of dust will be adhered to the bags.

The time elapsed between when the fan stops and the cleaning will depend on the type of product and the application.

The maximum vacuum for the operation and the suction to be correct is 180 mmwc. The operating values usually oscillate between 80 and 150 mmwc. This vacuum is measured at the differential pressure connections that are connected to the cleaning control system.

The cleaning pulses may generate differential pressure peaks. When making adjustments to the recommended values remember that:

- An increase in the pause time between blow cycles will increase the differential pressure.
- A decrease in the pause time between blow cycles will tend to lower the differential pressure.
- Excessive blowing may prematurely deteriorate the bags, which may negatively affect the efficiency of the filtering.

When starting up the unit with the bags clean, this vacuum will only depend on the permeability of the fabric of the bags, oscillating between 10 and 30 mmwc.

If by setting the time between two blow cycles to 25-30 seconds the vacuum is maintained below 150 mmwc, we must monitor the following::

- [ ] Make sure the compressed air pressure is correct 4 - 7 bar. Consult according to the process.
- [ ] That the cleaning control system is operating properly.
- [ ] That the pilot solenoid valves are energised.
- [ ] That the solenoid valves are working properly.
- [ ] That the compressed air is blown normally through the diaphragm valves.
- [ ] That no compressed air leaks are detected.
- [ ] That inside of the bag filter, air is detected being blown on the bags (with the fan turned off).

If all these checks are found to be good and the unit is still not responding, please contact the Technical Department of AAF International.

Never adjust the duration of the blow cycles without previously consulting the parameters recommended by AAF International.

Maintenance

Periodic inspections

AAF International recommends conducting periodic inspections of the units as a measure to guarantee the optimum operation of the units as well as to extend their useful service life. This practice will contribute to minimising lost time resulting from failures or improper operation of the equipment, which is considered especially critical in filters that are operating 24/7 to prevent the production from being affected.

The bags must operate under a suitable cleaning air pressure. An excessive pressure may cause irreparable damage in the filtering unit and not enough pressure may result in an inefficient cleaning and cause an improper operation of the filter.

It is essential that personnel are properly trained and are qualified to conduct maintenance on the equipment. This is the only way we can guarantee that proper maintenance is carried out as well as an optimum operation of the system. AAF International has a high quality Maintenance service available for its clients, which is led by technicians with a vast experience carrying out corrective, predictive and preventive maintenance. Consult the terms with AAF.

Daily or weekly – We recommend recording the differential pressure of the separator during the first 30 days of operation. AAF International recommends monitoring the vacuum that exists between the inlet and outlet of the bags daily. After starting up the unit, the pressure drop will be gradually increased until reaching a normal operating level between 80 and 150 daPa. We recommend the static pressure connections be connected to the Cleaning Control System.

Certain temperature-humidity conditions of the gas to be treated may slowly smother the bags, which will cause the differential pressure to increase (above 180 mmwc). Sometimes, we just need to stop the fans for a certain period of time in order for them to regain their porosity.

A visible emission of dust may be caused by a poor condition of the bags or by an improper seal.

Monthly – The access doors must be open to conduct an internal inspection every 30 days.

We recommend purging the manifold to remove any condensation and check that the compressed air supply maintains the recommended quality.

Also inspect the discharge elements of the hoppers to check their operation and seal.

A high differential pressure may be reduced by reducing the cleaning intervals or by increasing the duration of the injection or the compressed air pressure (up to 7.6 bar). We recommend monitoring the loss of charge of the bags weekly.

Additionally we recommend conducting a general visual inspection of the filter once a month.

Every six months – The collector inlet and outlet ducts must be inspected for possible obstructions at least once every six months. The following inspections shall also be carried out:

- [ ] Inspect the bags.
- [ ] Inspect the material condition of the seals where air or dust is found to be leaking.
- [ ] Check for condensation or dust inside the collector.
- [ ] Check that all the electrical components are operating properly.

- [ ] Check that the solenoid valves as well as the diaphragm valves are operating when they are turned on by the cleaning control system.
- [ ] We recommend inspecting the general condition of the fan and periodically check its consumption.
- [ ] Check the air discharge conditions and for signs of dust emission.

Annually - We recommend conducting a general inspection of the filter and its components.

- [ ] Check the general condition of the unit's body, chassis and supports.
- [ ] Check the condition of all the cover seals as well as the material condition of the flanges.
- [ ] Check the general condition of the bags and the cages, ensuring that they are properly fitted to their installation location.
- [ ] Check the general condition of the blow tubes and ensure the blow holes are clean and in good material condition.
- [ ] Inspect the condition of the bag access covers and verity they fit properly.
- [ ] Inspect the general condition of the compressed air manifold and verify that no leaks are detected and that all the installed components are also in good material condition and are not leaking.
- [ ] Inspect all the pneumatic connections.
- [ ] Check that humidity is not present inside the compressed air circuit.
- [ ] If the unit has a fan, check its general condition and operation. Check the consumptions, temperatures and vibration level.
- [ ] Inspect the electrical connections.

Wearing of the impeller will normally occur if a bag breaks. If a bag breaks, it is important to immediately remove it and cover the opening left by it on the support plate to prevent dust from passing through the impeller.

To replace the filtering bags, follow the instructions provided in the applicable section.

Prior to conducting any maintenance we recommend disconnecting the main electrical power supply and check that the unit is properly isolated pneumatically and depressurised.

If the unit is located inside an explosive atmosphere, we must follow all the safety measures that are recommended in these cases.

To guarantee an optimum operation of the equipment, AAF International recommends only using parts that are recommended by the manufacturer. Refer to the spare parts information that is provided.

Replacement of the cleaning valve

If a cleaning valve membrane needs to be replaced, we recommend using the AAF International spare parts kit.

Refer to the spare parts information provided by the manufacturer.

Manifold with 1" valve

To replace the pilot membrane:

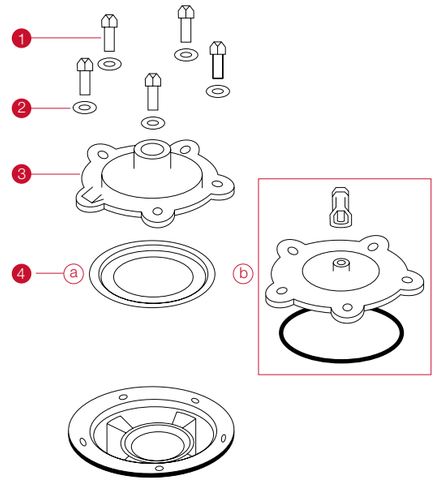
1 | Loosen the screws (item 1) on the main cover (item 3) of the valve.

2 | Lift the main cover of the assembly (item 3) to access the membrane (item 4).

a. For standard type membranes, replace the membrane with a new one.

b. For high temperature membranes (b) replace the entire kit, including the o-ring, membrane and spring.

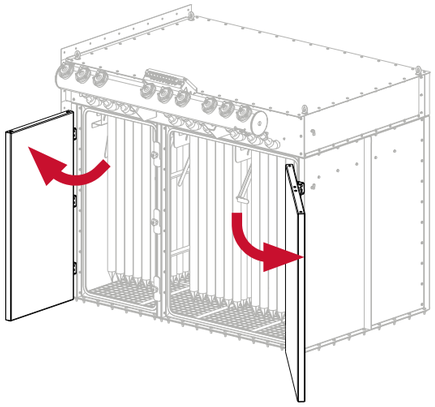
3 | Reinstall the main cover (item 3) and adjust it with the screws and washers (items 1 and 2).



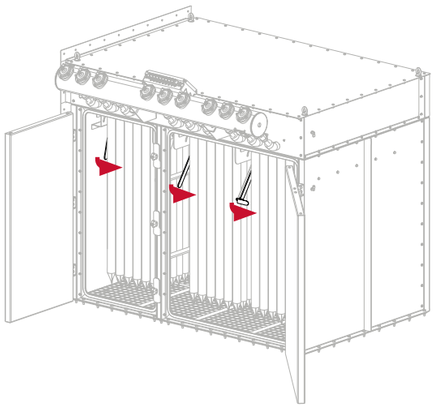
The high temperature membranes kit is recommended when temperatures of 200ºC are exceeded.

The high temperature membranes kit is supplied under order. Consult the terms with AAF International.

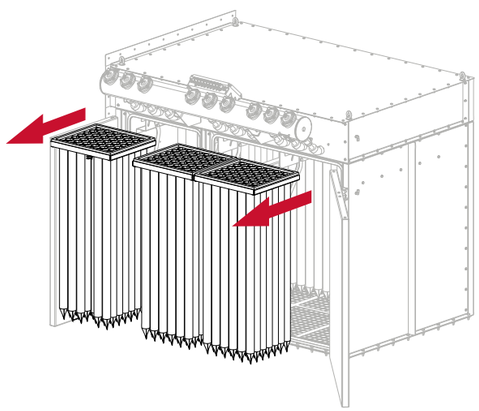
Bags replacement



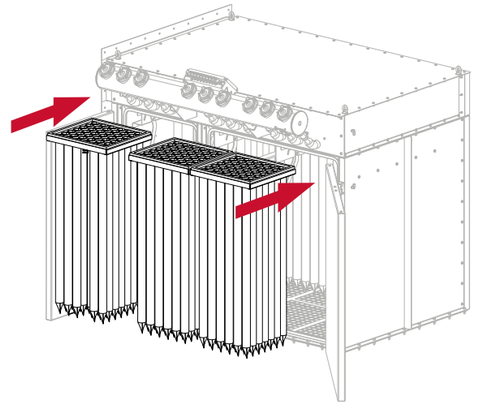
1 | Open the access door.



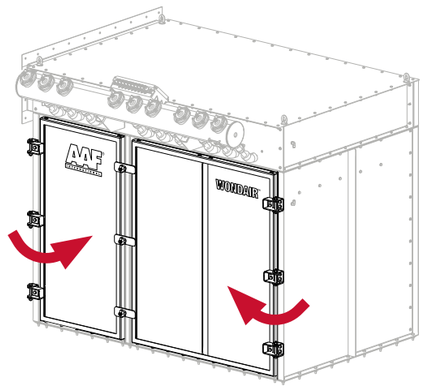
2 | To remove the bags, release the shut-off levers by pushing them towards the rear of the separator. This way we can unhook the cassette assembly and remove it.



3 | Slide the cassette assembly towards the door opening and remove it. If a second cassette is installed behind the first, it can also be removed by sliding it towards the door. This way we can unhook the cassette assembly and remove it.



4 | The new bags are inserted following the procedure in reverse order. Make sure the bags are installed flush against the inner stop prior to actuating the shut-off lever.



5 | Make sure the casettes are properly adjusted and close the access door on the unit again, checking that it is perfectly secure.

Any bag that is removed from the separator and is reinstalled back in it will be returned to its original position and will be positioned in a manner that will ensure it is sealed.

Troubleshooting

Total or partial loss of suction

Important loss of charge.

Probable cause	Action	
Problem derived from the compressed air supply to the cleaning system	Inspect the compressed air supply to the cleaning manifold, checking that the service pressure is correct.	
	Make sure no leaks are present in the blow valves caused by a defective membrane or a break in the tubing that connects the solenoid valve box to the blow valve.	Listen to ensure the solenoids are being triggered. Clean and if necessary replace the solenoids, pig-tails or membrane valves.
Partial or total clogging of the filtering elements	Check that the quality of the compressed air supplied to the cleaning system is good and meets what is specified in the manual. If the problem is caused by this, correct the compressed air quality problem and replace the filtering elements.	
	Change the cleaning times on the control unit (REDClean® GammaPulse) to achieve a more efficient cleaning (reduce the pause time between blowing cycles).	
Problem caused by an improper operation of the cleaning system.	Verify that the electrical power supply to the control unit (REDClean® GammaPulse) is correct: check the power supply voltage and the connections.	
	Check the proper operation of the cleaning valves.	Check the proper operation of the moving elements of the control unit's (REDClean® GammaPulse) solenoid valves: internal spring and internal membrane.
		Check the exhaust of the blow valves to verify that there is no foreign matter obstructing the air exhaust when the blow valves are operating.
		Check the membranes of the blow valves verifying that they are not stuck or in poor material condition.
		Clean and if necessary replace the solenoids, pig-tails or membrane valves.
	Check the parameters of the control unit (REDClean® GammaPulse).	Check the defined parameters: pause time between blow cycles and state of the rest of parameter values of the unit (check that none of the parameters affecting the blowing of the valves is disabled).

Total or partial loss of suction

Problems caused by an improper operation of the fan

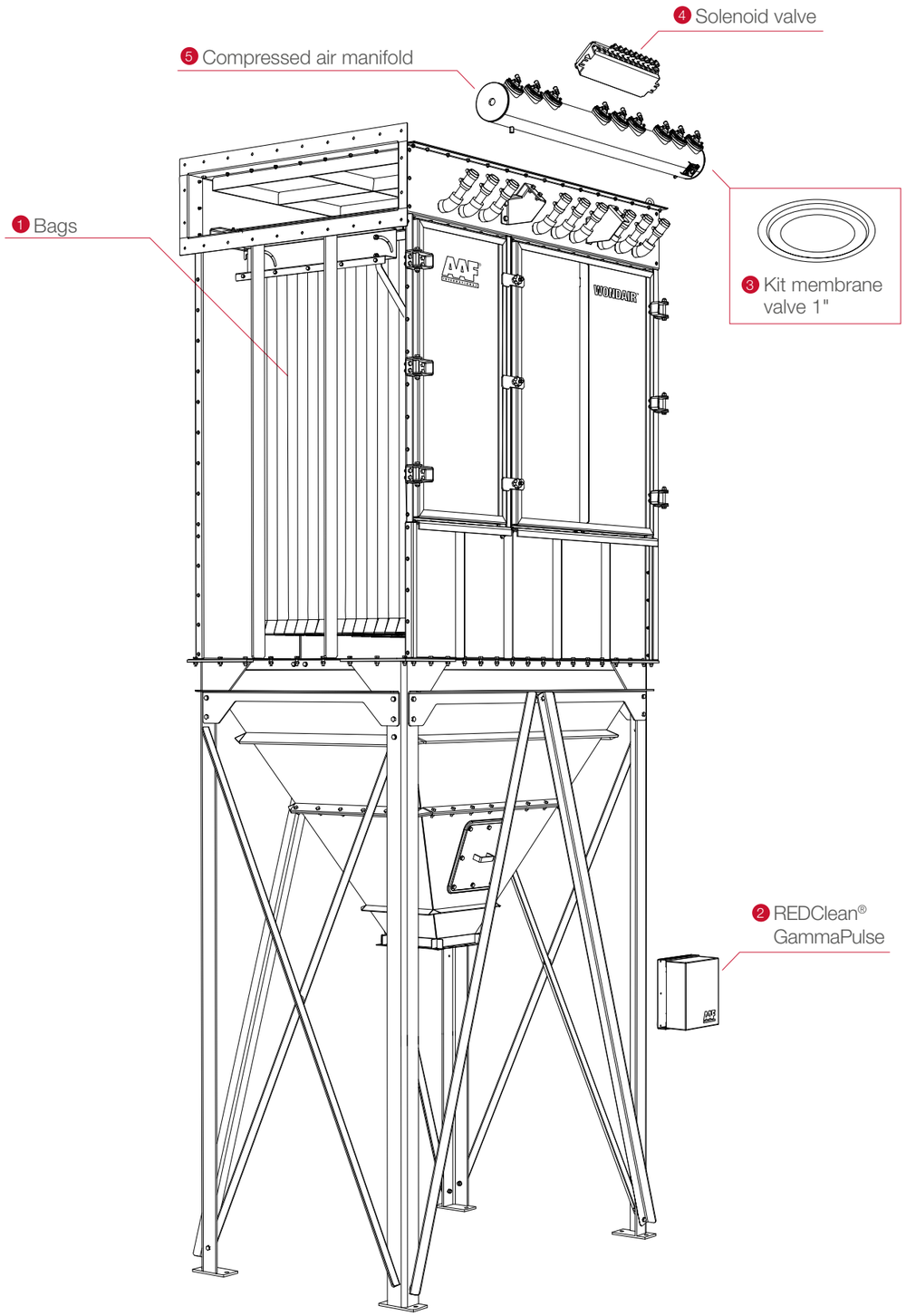
Probable cause	Action	
The fan is not rotating properly	Make sure the motor is properly connected, that it rotates in the proper direction and check the power supply to the motor.	
	Make sure that mechanically, there is no type of resistance preventing the impeller from rotating.	
Increase in static pressure of the fan	Check that there is no element preventing the fan from rotating.	
Excessive vibration of the fan	If dirty, clean it, restart it and check that the vibration is no longer present.	
	If clear signs of wear are noticed, replace it by carrying out the following steps.	1 | Remove the bag cartridges. 2 | Release the blow tube assembly. 3 | Release the suction cone. 4 | Remove the impeller, replace it with a new one and reinstall the aforementioned elements.
	If the impeller rubs against the suction inlet, clean the impeller and the cone and centre both of them.	Check the defined parameters: pause time between blow cycles and state of the rest of parameter values of the unit (check that none of the parameters affecting the blowing of the valves is disabled).

Migration of dust to the clean air outlet

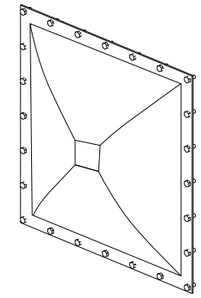
Improper sealing of the filtering elements (cages and bags)

Probable cause	Action
Improper sealing of the filtering elements (cages and bags)	Check the air-tightness of the elements and correct any problems that are found.
Filtering bag in poor condition	Bags replacement

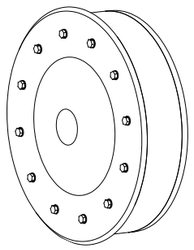
WONDAIR™ Mid Spares



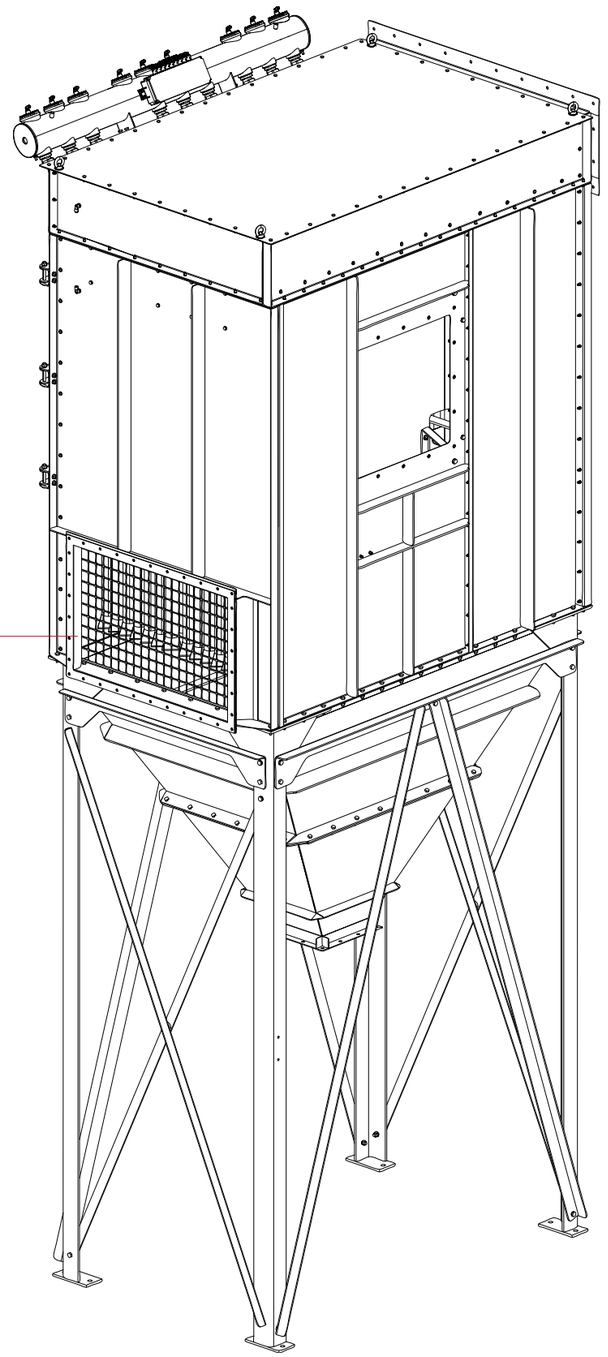
Explosion safety devices



6 Venting panel



7 Explosion relief valve



WONDAIR™ Mid Spares

1 Carbon steel cartridges with bags (42 u)

42 U	4"	6"
Polyester	A001579	A001323
Acrylic homopolymer antistatic	A001587	A001350
Acrylic homopolymer	A001583	A001335
Acrylic homopolymer with water+oil repellant treatment	A001584	A001338
Fiberglass with ptfe membrane	A001588	A001356
Nomex	A001585	A001341
Nomex with water+oil repellant treatment	A001591	A001374
Polyester antistatic	A001580	A001326
Polyester antistatic with water+oil repellant treatment	A001590	A001368
Polyester with ptfe membrane	A001582	A001332
Polyester with water+oil repellant treatment	A001581	A001329
Polypropylene	A001586	A001344
Teflon 100% with ptfe membrane	A001589	A001362

1 Carbon steel cartridges with bags (42 u) **WITH PACKING**

42 U	4"	6"
Polyester	A009652	A009613
Acrylic homopolymer antistatic	A009661	A009621
Acrylic homopolymer	A009656	A009617
Acrylic homopolymer with water+oil repellant treatment	A009657	A009618
Fiberglass with ptfe membrane	A009663	A009622
Nomex	A009658	A009619
Nomex with water+oil repellant treatment	A009662	A009625
Polyester antistatic	A009653	A009614
Polyester antistatic with water+oil repellant treatment	A009660	A009624
Polyester with ptfe membrane	A009655	A009616
Polyester with water+oil repellant treatment	A009654	A009615
Polypropylene	A009659	A009620
Teflon 100% with ptfe membrane	A009664	A009623

2 REDClean® GammaPulse

	Multi-voltage	24 VDC
REDClean® GammaPulse 6	A001744	A001746
REDClean® GammaPulse 12	A001745	A001747

3 Kit membrane valve 1"

Kit membrane valve 1"	A001894

4 Solenoid valves

EV 6 *ATEX* 22-24 VDC	A001907
EV 7 *ATEX* 22-24 VDC	A001712
EV 8 *ATEX* 22-24 VDC	A001901
EV 9 *ATEX* 22-24 VDC	A001713
EV 12 *ATEX* 22-24 VDC	A001904

5 Compressed air manifold

Manifold 6V1"	A009344
Manifold 9V1"	A009345
Manifold 12V1"	A009346
Manifold 15V1"	A009347
Safety valve 1/4"	A001825
Pressure indicator	A001826
Pressure reducer + filter	A001854

EXPLOSION SAFETY DEVICES

6	Venting panel	
	Venting panel 586x920 + break detector	A001937
	Break detector for venting panel support in ss304 2b	A001935

	Break detector	
	Break detector for venting panel xckd3906p16ex	A001940
	Kit break detector: 1x Break detector for venting panel xckd3906p16ex, 1x support, 2x nuts and 2x screw	A006881

7	Explosion relief valve (flameless)	2.0	3.0
	266 EVN + break detector	A001809	A001810
	320 EVN + break detector	A001811	A001812
	420 EVN + break detector	A001813	A001814
	480 EVN + break detector	A001815	A001816
	565 EVN + break detector	A001817	A001818
	645 EVN + break detector	A001819	A001820
	735 EVN + break detector	A001821	A001822

DISCHARGE SYSTEM

DBI-DBO-100 with 457 flange adapter RAL 7035	A014200
Dust bin lock	Y000022
Dust bin gasket 100L	Y000015
Dust bin wheels	A002101
Rotary valve 200x200 *Non ATEX*	A001855
Rotary valve *200x200 ATEX*	A001860
Rotary valve 200x200 ATEX flame proof	A001861
Rotary valve *300x300 ATEX*	A001862
Rotary valve 300x300 *ATEX* flame proof	A001863
Rotary valve 300x300 *Non ATEX*	A001856
Slide valve 200x200	A001875
Slide valve 300x300	A001876
Flexible D200	Y000286
Flexible D300	Y000287
Clamps D200	Y000070
Clamps D300	Y000071
Barrel top adapter for dust bin 100 l to diam 200 mm + dust bin 100 l	A014196
Barrel top adapter for dust bin 100 l to diam 300 mm + dust bin 100 l	A014198
Bin 100l with blind cap and closing latch ral 7035	A004942
Barrel top adapter for dust bin 200 l to diam 200 mm + dust bin 200 l	A014197
Barrel top adapter for dust bin 200 l to diam 300 mm + dust bin 200 l	A014199
Bin 200 l with blind cap and closing latch RAL 7035	A004943
Big-bag support 220 RAL 7035	A004941
Big-bag support 305 RAL 7035	A004940

Bringing clean air to life.®

AAF International

Filtration has been at the heart of our business since 1921 and thanks to the high calibre of our products and services, we are trusted by many of the world's leading power and industrial companies. We provide our customers with the expertise, the solutions and the best available filtration technology to increase operational performance. Bringing clean air to life, our products provide the highest levels of indoor air quality, the lowest environmental emissions and the optimum safety conditions for employees and the wider community.

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