

FILTRO A MANICHE
WAMGROUP mod. WAMFLO



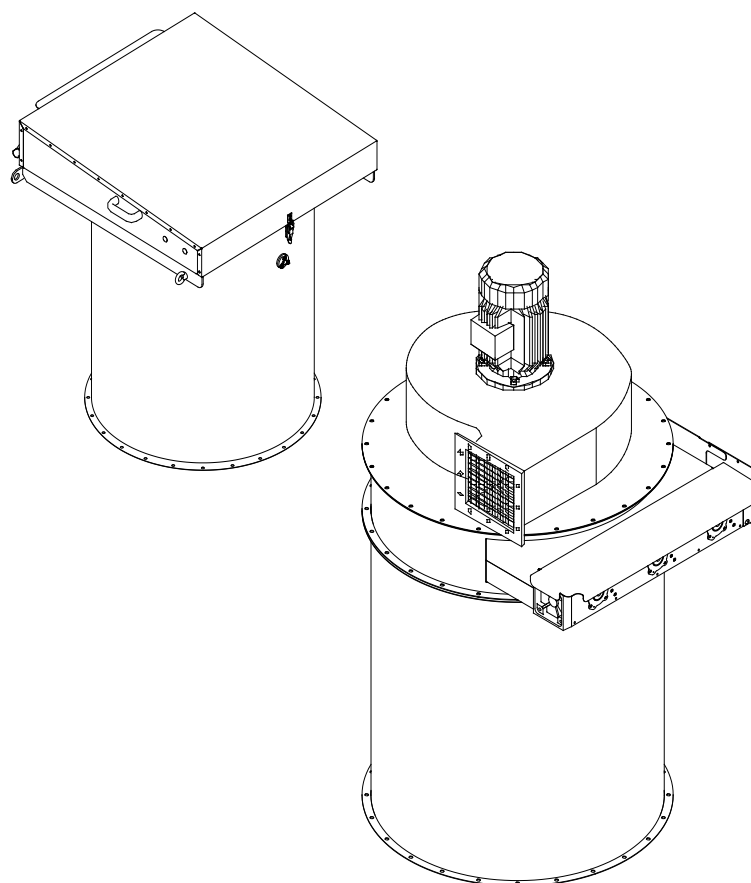
WAMFLO®



*ROUND FILTERS
FOR POTENTIALLY EXPLOSIVE
ATMOSPHERES*

ASSEMBLY AND MAIN INSTRUCTIONS FOR USE AND MAINTENANCE

2



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WAM®



All the products described in this catalogue are manufactured according to **WAMGROUP S.p.A. Quality System procedures**. The Company's Quality System, certified in July 1994 according to International Standards **UNI EN ISO 9002** and extended to the latest release of **UNI EN ISO 9001**, ensures that the entire production process, starting from the processing of the order to the technical service after delivery, is carried out in a controlled manner that guarantees the quality standard of the product.

This publication cancels and replaces any previous edition and revision.
We reserve the right to implement modifications without notice.
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SCOPE OF THE MANUAL

This Manual, prepared by the Manufacturer, is an integral part of the **WAMFLO® ATEX**; and since it contains operating technical information regarding installation, operation and maintenance, it must accompany the filter right up to its dismantling and must be easily available for rapid consultation by the operators and Works Manager involved in the site operations.

If the machine changes ownership, the Manual must be handed over to the new owners.

Before carrying out any operation with or on the **WAMFLO® ATEX**, the personnel concerned must have read this Manual carefully.

If the Manual is lost, damaged or becomes illegible, download a new copy from our website **www.wamgroup.com** and check to make sure it is the latest version.

The Manual provides warnings and indications concerning the safety standards for accident-prevention at the workplace. However, the various operators must strictly follow the safety standards according to the regulations in force.


Modifications, if any, to the safety standards, made over time, must be duly implemented.

With the basic features of the machine described remaining unchanged, the Manufacturer reserves the right to make modifications if necessary to organs, parts, and accessories deemed necessary for improvement of the product, or for constructional or marketing requirements, at any moment, without obligation to update this document promptly. The latest version of this catalogue is available on our website **www.wamgroup.com**

GLOSSARY AND TERMINOLOGY

To highlight certain parts of the text, important for reasons of safety or to indicate important information, certain symbols have been used, the meaning of which is described below.

It is important to comply with and scrupulously follow the information highlighted by the symbols.

	DANGER! <ul style="list-style-type: none">- INDICATES situations of serious danger which, if ignored, can be risky for the health and safety of persons.- The sign indicates special important technical information which must not be ignored.
---	---

A. OPERATOR!

Person appropriately trained and authorized by the production manager for operating the machine and carrying out routine maintenance.

B. INSTALLER!

Enterprise which has specialist technicians and suitable equipment capable of carrying out installation and extraordinary maintenance without risks.

C. SPECIALIST TECHNICIAN!

Person appointed for and authorized by the Manufacturer, owner or installer, for carrying out operations on the machine, which require specific technical skills depending on the sector concerned (electrical, mechanical, etc). The specialist technician, apart from being familiar with the screw feeder, must also be familiar with the working of the plant or machine in which the filter is installed.


D. ROUTINE MAINTENANCE!

Includes all the actions necessary to keep the machine in good working conditions, to ensure greater operating durability and to keep the safety requisites constant.

E. EXTRAORDINARY MAINTENANCE!

All the actions meant to keep the machine in perfect working order

3
Year



WAMGROUP

CE
0032

WAM S.p.A. via Cavour 338-Ponte Motta / Cavezzo (MO) - ITALY

TYPE: ①	Kg
Serial No.: ②	
	Tamb. -20°C / +40°C
Ex II 2/2 D X ④ Cert. N°	
X: T 80 °C WITHOUT FAN ON BODY FILTER IF THE AIR FLOW TEMPERATURE IS <= 80°C. T 200°C WITH FAN ON BODY FILTER IF THE AIR FLOW TEMPERATURE IS <= 80°C.	
5	

3
Year


WAMGROUP

CE
0032

WAM S.p.A. via Cavour 338-Ponte Motta / Cavezzo (MO) - ITALY

TYPE: ①	Kg
Serial No.: ②	
	Tamb. -20°C / +40°C
Ex II 2/3 D X ④	
X: T 135 °C ON BODY FILTER IF THE AIR FLOW TEMPERATURE IS <= 80°C.	
5	

- 1) Machine code;
- 2) Machine Serial Code;
- 3) Year of manufacture of the machine;
- 4) Group and category;
- 5) Surface Tmax.

LEGIBILITY OF THE DATA PLATE

The ID plate must be kept in perfect condition by cleaning it periodically so that the data are perfectly legible. If the ID plate is damaged and/or is no longer legible, as regards even just one of the information elements shown therein, contact the Manufacturer for a copy and replace the old one.

REQUESTING ASSISTANCE

For all technical assistance, contact the Manufacturer's dealers network. For every request, provide the machine identification data, the type of problem encountered and all other information which may be useful for identification of the problem.

WARRANTY

The conditions for validity and applicability of the warranty are specified in the sales contract.

EXCLUSION OF RESPONSIBILITIES

The manufacturer shall not accept responsibility for the safety of persons, objects and working if the operations involved in loading on and unloading from a truck, transport, positioning at the work site, use, repairs, maintenance etc. are not carried out in compliance with the warnings described in this Manual, and in accordance with the legislation in force.

Likewise, the manufacturer shall not accept any responsibility if the filter is used:

- Improperly;
- By unauthorized persons and/or persons not sufficiently trained for installation, operation and maintenance;
- With modifications made to the original configuration without the Manufacturer's permission;
- With spare parts that are not genuine or are not specific for the model;
- Without maintenance,
- Non conforming to the regulatory standards and national or local legislation on the matter of occupational safety workplaces;
- Non conforming to the recommendations in this Manual or on the warning and danger plates applied on the machine.

The warranty does not apply to breakages and/or defects caused by incorrect installation or use, or incorrect maintenance or modifications made without the Manufacturer's permission. The warranty does not cover parts subject to normal wear and electrical parts.

Specifically, the warranty lapses if the filter:

- has been tampered with or modified;
- has been used incorrectly;
- has been used without respecting the limits indicated in this Manual and/or has been subjected to excessive mechanical stresses;
- has not been subjected to the necessary maintenance or maintenance has been performed only partly and/or incorrectly;
- has been damaged owing to negligence during transport, installation and use;
- the spare parts inserted are not genuine.

On receiving the product, check to make sure it shows no defect or damage deriving from transport and/or incompleteness of the supply. Defects, damage or incompleteness must be immediately reported to the Manufacturer in writing and countersigned by the transporting Company.

1.1**GENERAL RULES**

This Manual, prepared by the Manufacturer, is an integral part of the **WAMFLO® ATEX**; and must therefore accompany it right up to its dismantling and must be easily available for rapid consultation by the operators and Works Manager involved in the site operations. If the machine changes ownership, the Manual must be handed over to the new owners.

Before carrying out any operation with or on the **WAMFLO® ATEX**, the personnel concerned must have read this Manual carefully. If the Manual is lost, damaged or becomes illegible, download a copy from our website **www.wamgroup.com** and check the date of the latest version. The Manual provides warnings and indications concerning the safety standards for accident-prevention at the workplace. However, and in any case, the various operators must strictly follow the safety regulations that concern them as imposed by the standards in force. Modifications, if any, to the safety standards, made over time, must be duly implemented.

With the basic features of the machine described remaining unchanged, the Manufacturer reserves the right to make modifications if necessary to organs, parts, and accessories deemed necessary for improvement of the product, or for constructional or marketing requirements, at any moment, without obligation to update this document promptly.

The latest version of this catalogue is available on our website **www.wamgroup.com**.

DECLARATION OF CONFORMITY

The equipment is accompanied by a declaration of conformity to the Directives in force, but, since it is a component to be integrated in a complete plant, its safety depends on the compliance with all the Directives applicable in the assembly of the final machine.

All improper use of the filter without following the indications given in this Manual will free the manufacturer of all related responsibility concerning poor working of the filter.

Unless otherwise specified, all the dimensions are in millimetres.



The manufacturer:

WAMGROUP S.p.A.

located in

Strada degli Schiocchi, 12 - I-41124 Modena - Italy

under its own responsibility declares that:WAMFLO® ATEX**DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY****Annex II B 2006/42/CE Directive** of the European Parliament and the Council of 17 May 2006 on machinery **comply with the RES Directive 2006/42/EC**

1.1.1	Definitions	1.5.6	Fire
1.1.2	Principles of safety integration	1.5.7	Explosion
1.1.3	Materials and products	1.5.8	Noise
1.1.5	Design of machinery to facilitate its handling	1.5.9	Vibrations
1.3.1	Risk of loss of stability	1.5.13	Emissions of hazardous materials and substances
1.3.2	Risk of break-up during operation	1.5.15	Risk of slipping, tripping or falling
1.3.3	Risks due to falling or ejected objects	1.6.1	Machinery maintenance
1.3.4	Risks due to surfaces, edges or angles	1.6.2	Access to operating positions and servicing points
1.3.7	Risks related to moving parts	1.6.4	Operator intervention
1.3.8	Choice of protection against risks arising from moving parts	1.6.5	Cleaning of internal parts
1.3.9	Risks of uncontrolled movements	1.7.1	Information and warnings on the machinery
1.5.4	Errors of fitting	1.7.2	Warning of residual risks
1.5.5	Extreme temperatures	1.7.4	Instructions

And, where applicable,**EU DECLARATION OF CONFORMITY****complies with the requirements imposed by the following directives:****Directive 2014/30/EU** of the European Parliament and the Council of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility;**Directive 2014/35/EU** of the European Parliament and the Council of 26 February 2014 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.**The relevant technical documentation is compiled in accordance with Annex VII B of the Machinery Directive 2006/42/EC****Harmonized standards, national standards and technical regulations in question:**
UNI EN ISO 12100: 2010**It's forbidden to operate all these products before the machine, in which they will be installed, is declared in conformity with 2006/42/EC AND SUBSEQUENT AMENDMENTS****They also comply with the Directive 2014/34/EU of 26 February 2014 (ATEX)****CE**  **II 2/3 D X**EN 1127-1:2011
EN 13463-1:2009

Temperature -20°C / +40°C

X: Temperature 135° C if the fluid temperature is ≤ 80° C

The technical documentation has been filed with the following notified body:
0032 TÜV NORD CERT storage number n° 8000 327 618

The signing company is committed to provide, in response to a reasoned request by national authorities, relevant information on products covered by this declaration, without prejudice to the rights of intellectual property of the manufacturer. The information will be transmitted directly to the national authorities having requested.

Strada degli Schiocchi, 12 - I-41124 Modena - Italy, July 1st 2016The person authorized to provide
the technical documentation:
Vainer Marchesini

The legal representative:

Vainer Marchesini

**WAMGROUP S.p.A. - Strada degli Schiocchi, 12 - I-41124 Modena - Italy**

The manufacturer:

WAMGROUP S.p.A.

located in


Strada degli Schiocchi, 12 - I-41124 Modena - Italy

under its own responsibility declares that:WAMFLO® ATEX**DECLARATION OF INCORPORATION OF PARTLY COMPLETED MACHINERY****Annex II B 2006/42/CE Directive** of the European Parliament and the Council of 17 May 2006 on machinery
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UNI EN ISO 12100: 2010

It's forbidden to operate all these products before the machine, in which they will be installed, is declared in conformity with 2006/42/EC AND SUBSEQUENT AMENDMENTS**They also comply with the Directive 2014/34/EU of 26 February 2014 (ATEX)** II 2/2 D XEN 1127-1:2011
EN 13463-1:2009

Temperature -20°C / +40°C

X: Temperature of 80°C on filter body without suction unit and if the fluid temperature is ≤ 80°C
Temperature of 200°C if suction unit is present and the fluid temperature is ≤ 80°C

The technical documentation has been filed with the following notified body:

0032 TÜV NORD CERT storage number n° 8000 327 618

The signing company is committed to provide, in response to a reasoned request by national authorities, relevant information on products covered by this declaration, without prejudice to the rights of intellectual property of the manufacturer. The information will be transmitted directly to the national authorities having requested.

Strada degli Schiocchi, 12 - I-41124 Modena - Italy, July 1st 2016The person authorized to provide
the technical documentation:

Vainer Marchesini



The legal representative:

Vainer Marchesini



1.2

DESCRIPTION AND USE

WAMFLO[®] ATEX is a range of dust filters consisting of a round body made of AISI304 stainless steel. The filter elements are inserted vertically inside the body. The filter is equipped with a cleaning system with compressed air in countercurrent.

The **WAMFLO[®] ATEX** dust filter can be used as a “venting” unit, applied directly on a silo or on any equipment that requires dedusting (conveyor belt, bucket elevator, chain conveyor, etc.), or as a “stand-alone” unit coupled with a standard **WAM[®] “DK”** type dust collection hopper.

- They are made entirely of AISI 304 except for the elements-holder plate which is made of iron. As option the elements-holder plate may be made of AISI 304 or 316. As option, the filter body may be made of AISI 316.
- The filter elements cleaning system involves an innovative cleaning system with “full immersion” solenoid valves and cleaning tube connected directly to the tank.
- Thanks to the various choices in terms of volumes and filtering surfaces, the **WAMFLO[®] ATEX** filters are suitable for application in all industrial sectors.
- The technical features and compressed air cleaning system make it suitable for continuous use.
- For dimensional requirements, it sometimes becomes necessary to insert the filter elements in the silo/hopper that is to be dedusted. This is why the range of “**INSERTABLE**” filters does not have a body so as to limit the height.

INTENDED USE

The **WAMFLO[®] ATEX** dust filter has the function of separating the dust particles carried in suspension by a current of air or gas, using pocket type filter elements made of polyester fibre felt or using pleated filter elements made of non-woven fabric polyester. The dusty air current passes through the filter media which is capable of holding back the dust particles, allowing the air to flow outwards.

The dust collected on the surface of the filter elements (the “filter cake”) is removed periodically by the action of the reverse compressed air cleaning system. The dust that comes off can be collected in the hopper at the bottom (stand-alone) or may fall into the dedusted volume to be sent back directly to the production circulation. The air to be filtered may come in through the flange on the lower part of the filter body .

IMPROPER USE

The filter must not be used as an element for discharging overpressure inside closed volumes. One or more blow-off valves must always be provided in the plant to keep the pressure level within the filter resistance limits.

The air flow handled by the filter must never exceed the value defined in the order phase.

Using the filter if its components (filter elements, cleaning system, fan, if present, etc) are not in perfect conditions can cause harm to persons and to the environment.

INDICATIONS FOR USE

The machine is designed and constructed for use in area classified as 22 or 21 or non classified in conformity with the indications of ATEX Directive 94/9/EC.

The user must make sure the plant in which the filter is to be installed has been appropriately set in safe conditions from the point of view of risk of explosion before it is started up and that the “document regarding protection against explosions” has been prepared as envisaged by ATEX Directive 99/92/EC.

WAMFLO[®] ATEX is designed and constructed in such a manner as to avoid abnormal overheating during operation.

To be able to operate in safe conditions it is necessary to make sure the powders handled have a minimum ignition temperature higher than the temperature value shown on the rating plate:

- the filter must be installed with sufficient space around it to allow for normal assembly/disassembly, cleaning and maintenance;
- If the machine is used with very hot materials, such that the temperature exceeds 60°, the installer must insulate the filter or install mechanical barriers to prevent personnel from reaching the hot parts. The necessary warning notices and symbols must also be provided.

1.3
LIMITS OF USE

The **WAMFLO® ATEX** filters perform their function in compliance with the following limits of use.

1) Maximum permitted temperatures of the air flow:

POSITIVE:

80° C continuous

100° C peak

NEGATIVE:

-20° C

Note | if the pneumatic timer is present, the minimum temperature is -5°C (-15°C with two drying stages)

2) Maximum permitted static pressure of the filter body:

POSITIVE:

750 mmH₂O

(0.075 bar - 7.5 kPa)

NEGATIVE:

-500 mmH₂O

(-0.05 bar - 5 kPa)

Maximum surface temperature (94/9/EC)

The maximum temperature developed by the filter surfaces is shown on the rating plate, and depends on the standard operating environment conditions: T amb: -20 - +40 °C.

Area of use (94/9/EC):

The round filter is designed and tested for operating in areas with potentially explosive atmospheres classified as zone 22 or 21.

Directive 94/9/EC defines:

1) zone 22:

- occasional presence of explosive atmosphere in the form of combustible dust clouds in extraordinary conditions (for eg. fault) or in ordinary conditions for a short period (for example, near machinery or equipment opened for maintenance, packaging material depots and bags subject to breakage).

2) zone 21:

- area in which the formation of an explosive atmosphere in the form of a combustible dust cloud in the air occurring during normal activities is probable.

VALUES FOR CLASSES ST1, ST2

The filter is designed and tested for handling powders with explosiveness Class St1, St2. **WAMFLO® ATEX** it has a structural resistance Pred = 1 bar relative (10.000 mm H₂O, 1000 millibar, 100 KPascal).

Parameter	Unit of measurement	Zone 22 Category 3D	Zone 21 Category 2D	
			Without suction fan	With suction fan
Minimum ignition temperature of a 5 mm layer of dust (LIT (GT))	°C	≥210	≥155	≥275
Minimum ignition temperature of suspended dust (MIT)	°C	≥210	>120	>300
Minimum ignition energy (MIE)	mJ	>3	>3	>3
Maximum explosion pressure (Pmax)	bar	≤9	≤9	≤9
Reactivity parameter (Kst)	bar m/s	≤300	≤300	≤300

The use of round filters in the presence of powders having more severe features than those shown above or in zones with different classification is directly and exclusively the responsibility of the User.

NOTE: | The **WAMFLO® ATEX** filter must be installed on a plant appropriately equipped with prevention/protection and subdivision systems in accordance with standards ATEX 94/9/EC.

1.4**COMPLIANCE TO ATEX DIRECTIVE**

The **WAMFLO[®] ATEX** filters are designed and constructed in accordance with the essential health and safety requisites for equipment meant to be used in potentially explosive atmosphere (94/9/EC). The **WAMFLO[®] ATEX** filters specifically conform to the principles of built-in safety against explosions, and are designed for:

1. Preventing the production or emission of explosive mixtures by the production equipment and systems themselves as far as possible;
2. Preventing triggering of an eventual explosive atmosphere, taking into account the nature of each potential triggering source (electrical and non electrical);
3. Optimizing the maintenance and checking conditions, in order to maintain perfect efficiency;
4. Dealing with expected surrounding environmental conditions;
5. Allowing controlled venting of a flame, in the event of an explosion that can be dangerous for persons and objects with direct or indirect effect. This makes it possible to circumscribe the area affected by the flames and the pressure deriving from the explosion, in a definable manner, if necessary.

NOTE FOR CONFORMITY OF THE PLANT

The **WAMFLO[®] ATEX** filters are components suitable for use in complex systems in the presence of potentially explosive atmospheres in accordance with standard 94/9/EC.

If the filter is ordered complete with explosion vent panel (optional) and special **WAM[®]** hopper, the body + panel + hopper system constitutes a complete system in itself, entirely suitable for the ATEX standards.

If the filter is purchased for use independently of the **WAM[®]** hopper, the protection system MAY NOT BE ADEQUATE. In this case, the installer must size the protection system appropriately (according to standard ATEX – 94/9/EC) in the design phase if necessary.

1.5**PERSONAL PROTECTION EQUIPMENT****PERSONAL PROTECTION DEVICES**

The presence of an operator is not necessary for the working of the machine, so no personal protection devices are required.

NOTE FOR CONFORMITY OF THE PLANT

The **WAMFLO[®] ATEX** filters are components suitable for use in complex systems in the presence of potentially explosive atmospheres in accordance with standard 94/9/EC.

If the filter is ordered complete with explosion vent panel (optional) and special **WAM[®]** hopper, the body + panel + hopper system constitutes a complete system in itself, entirely suitable for the ATEX standards.

If the filter is purchased for use independently of the **WAM[®]** hopper, the protection system MAY NOT BE ADEQUATE. In this case, the installer must size the protection system appropriately (according to standard ATEX 94/9/EC) in the design phase if necessary.

1.6
SAFETY WARNING


All personnel involved in installation, use and maintenance operations of the equipment and of its components has to receive the suitable technical training as regards the tasks to be carried out, particularly referred to potentially explosive atmospheres areas.

Any modification on this equipment can void its safety requirements. Always follow the instructions provided by the manufacturer.



The apparatus is suitable for operation in ZONE 22.

The zones are defined as follows.

ZONE 0: an area in which an explosive gas or air mixture of flammable substances atmosphere is present continuously or for long periods

ZONE 1: an area in which an explosive gas or air mixture of flammable substances atmosphere is likely to occur in normal operation

ZONE 2: an area in which an explosive gas or air mixture of flammable substances atmosphere is not likely to occur in normal operation and, if it occurs, will only exist for a short time.

Zone 20: a place in which an explosive atmosphere in the form of a cloud of combustible dust in air is present continuously, or for long periods or frequently.

Zone 21: a place in which an explosive atmosphere in the form of a cloud of combustible dust in air is likely to occur in normal operation occasionally.

Zone 22: a place in which an explosive atmosphere in the form of a cloud of combustible dust in air is not likely to occur in normal operation but, if it does occur, will persist for a short period only.

It is forbidden to use the apparatus in areas classified as zone 20, 21, zone 0, 1 or 2.



The apparatus is suitable to operate with granular materials containing possibly small quantities of combustible dusts, non-conductive, with the following characteristics:

Minimum ignition temperature (MIT)	°C	> 210
Minimum ignition temperature of a dust layer of 5mm thickness LIT	°C	>210
Min ignition energy (MIE) All operating temperatures	mJ	≥ 3

It is forbidden to use the apparatus with hybrid mixtures, explosives, ST2 and ST3 class powders, chemically unstable powders.



WAM®

1.7

WAMFLO® ATEX

SAFETY WARNING

09.18

2

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The user must make sure the equipment is used according to the intended use, particularly in the ZONES that match those for which the equipment has been declared fit by the manufacturer.
The permitted ambient temperature is: $-20^{\circ}\text{C} \leq T_{\text{amb}} \leq 60^{\circ}\text{C}$.



Any electrical or mechanical components to be installed on the apparatus must have certified category suitable for use:

- category 3D (Zone 22)

During maintenance or cleaning operations the user must ensure the equipment used (fans, portable lamps etc.) belong to the category suitable to the environment:

- category 3D (Zone 22)



The user shall make sure that the plant in which the apparatus is to be installed has been properly set in safety conditions from an explosion risk point of view before starting it up and that the "Explosion protection document" has been written according to the Directive ATEX 1999/92/CE. (81-2008).



The installer has to make sure the process specifications match the features of the apparatus given on the plate (regarding, for instance, the maximum surface temperature).

If the features of the material are not compatible, it is forbidden to use the apparatus.



The user must never open the housing.

The installation, mounting and disassembling operations must be carried out with equipment switched off or in the absence of potentially explosive atmosphere.



It is forbidden to drill holes in the housing.

It is forbidden to modify the wiring diagram.

If no cable gland is used, it is compulsory to cover the hole with a certified stopper.



The equipment has been tested and certified by WAM to be used in ATEX environments and it is supplied with air piping and cable glands which have not been separately certified (i.e. they do not bear individually the ATEX marking, but they have been certified with the case that contains them).

IT IS FORBIDDEN TO MODIFY THE CABLES, CABLE GLANDS, PIPING AND CONNECTIONS.



WAM®

1.7



INSTALLATION - START UP

Prior to the installation and start-up check to make sure the supply has not suffered damages during shipping.

The tools used for the installation must be compliant to EN 1127-1 depending on the zone of use.

The electrical connections must be performed by qualified personnel and in accordance with the indications given on the wiring diagram.

The equipment must not be installed in a position which may subject it to electrostatic charges, as for instance in case of a pneumatic transfer of powders or in electrostatic spraying of powders coating processes.



The user must clean the equipment to prevent the formation of combustible dust layers.

It is recommended to avoid using compressed air for cleaning the dust layers; use, instead, a suction system suitable for potentially explosive powders (ATEX certified vacuum cleaner).



LIGHTNING: protection against atmospheric discharges.

The plant in which the equipment is being used must be protected against atmospheric discharges.



In the classified ZONES and near them there must not be any ignition sources such as:

- flames;
- coals;
- hot surfaces;
- sparks (e.g. caused by cutting of metals);
- stray currents and cathodic protection systems;
- electrical or mechanical features which are not ATEX certified;
- electrostatic charges borne by the operators or mobile equipment;
- radio frequency (RF) and electromagnetic waves (from 104Hz to 3* 1011Hz);
- electromagnetic waves (from 3x1011Hz to 3x1015Hz);
- ionizing radiations;
- ultrasound;
- adiabatic compression and shock waves;
- exothermic reactions (including phenomena of self-priming of the powders).



GENERAL SAFETY PRESCRIPTIONS

Read the Instruction Manual carefully, and strictly follow the instructions it contains, especially those regarding safety. Most accidents at the workplace are the result of carelessness, failure to observe the basic safety standards and improper use of tools and equipment. Accident can be prevented and avoided by adopting due care, suitable equipment and adequate preventive measures. Apply and respect all the standards in force on the matter of hygiene, accident prevention and safety at the workplace.

The personnel trained and authorized for the task must have the required psychological-physical requisites, experience in the sector concerned and the technical skills necessary to carry out the operations assigned. All those involved in any type of operation must be: instructed, informed and trained on the matter of possible risks and the behaviour to be adopted. Pay attention to the meaning of the plates applied on the machine, keep these legible and respect the information given therein. Use instruments, equipment and tools that have been approved and are intrinsically safe, and cannot alter the safety level of the operations or damage the filter during installation, use and maintenance. No modifications must be made to the filter components for any reason whatsoever without the manufacturer's permission.

SAFETY PRESCRIPTION FOR HANDLING

Carry out all the handling and transport operations in accordance with the procedures and instructions shown on the packing and in the Manual supplied. All the operations must be performed by qualified authorized personnel. Those authorized for handling operations must have the specific capacities and experience and must adopt all the measures necessary to ensure one's own safety and that of persons directly involved.

The choice of the features of the lifting and handling means (crane, travelling crane, forklift truck, etc.) must take into account the weight to be handled, the dimensions and the gripping points.

In the lifting phase, use only accessories such as eyebolts, hooks, shackles, clamp hooks, belts, slings, chains, ropes, etc. that are certified and are suitable for the weight to be lifted. During the handling phases, strictly follow the instructions applicable for handling loads. Keep the filter horizontal, keep the load low and make the necessary movements gently. Avoid sudden, dangerous jerks, oscillations and rotations, guiding the movements manually if necessary, and place the load gently on the ground. Once they are placed on the ground, do not pull or push the filters.

SAFETY PRESCRIPTIONS FOR INSTALLATION

Before starting with installation, a "Safety Plan" must be implemented for safeguarding the persons directly involved and those who carry out operations in the surrounding area.

All the laws must be strictly applied, especially those concerning workplace safety. Before proceeding with installation operations, mark off the work area to prevent access by unauthorized persons. The electrical connections must be made in compliance with the standards and laws in force. Those in charge of the electrical connections must first check to make sure the regulatory and legal requirements have been satisfied, before carrying out the test.

SAFETY PRESCRIPTIONS FOR USE AND OPERATION

Do not tamper with the filter using any kind of device, to obtain performances different from those of the design. All unauthorized changes will affect the health of persons, thereby affecting the integrity of the filter. The operators must wear protective clothing and must be equipped with Personal Protection Equipment suitable for carrying out the operations and as required by the standards for safety and accident prevention. Before use, make sure all the safety devices are installed and work correctly. During operations, prevent access to the work area by unauthorized persons. Remove all obstacles or sources of danger from the work area.

SAFETY PRESCRIPTIONS FOR MAINTENANCE AND REPLACEMENT OF COMPONENTS

The machine must be kept in conditions of maximum efficiency: in order to do so, follow the scheduled maintenance plan provided by the Manufacturer. Good maintenance will not only preserve the functional features and essential safety features over time, but will also make it possible to extend the working life of the machine and achieve the best possible performance. All the operations must be performed by qualified, authorized personnel in agreement with the Safety L.D. 81/08 and subsequent additions.

Strictly abide by the procedures indicated in the Manual. Make sure all the safety devices are in working order and active. Mark off the work area in such a manner as to prevent access by unauthorized persons. Replace worn and damaged components exclusively with genuine spare parts, for which the safety, reliability and interchangeability have been established with certainty.

After the validity of the warranty, the manufacturer declines all responsibility for damage to objects and harm to persons deriving from the use of spare parts that are not genuine or modifications made during repairs without express written permission. Use recommended oils and lubricants. Do not dump polluting wastes in the environment and act in conformity with the regulations in force.

On completion of maintenance and replacement operations, before resuming production, check to make sure no foreign bodies (rags, tools, etc) are left inside the filter.

**DANGER!**

- Before carrying out any work on the machine, ensure that it is switched off and disconnected from all electric supplies and use suitable devices to make sure it cannot be reconnected accidentally.

1.7**WARNINGS**

The manufacturer shall not accept responsibility for the safety of persons, objects and working if the operations involved in loading on and unloading from a truck, transport, positioning at the work site, use, repairs, maintenance etc. are not carried out in compliance with the warnings described in this Manual.

Likewise, the manufacturer shall not accept any responsibility if the filter is used:

- improperly;
- by unauthorized persons or those not suitably trained for the job;
- with modifications to the original configuration;
- with spare parts that are not genuine;
- non conforming to the standard and legislation currently in force;
- Non conforming to the recommendations in this Manual or on the warning and danger plates applied on the machine.

It is compulsory for the user to check carefully, before carrying out any operation, that the work area is clear of obstacles, persons or machines that could be potential sources of danger. The operations involved in lifting, transport, installation at the site, start-up checking the stability and working, routine and extraordinary maintenance, etc. must be carried out by qualified authorized personnel who must work according to the indications given in this Manual and in compliance with the standards in force regarding safety. At the time of positioning the filter at the work site, the filter must be connected to the earthing.

- It is forbidden to carry out maintenance, repairs or modifications with the machine running;
- Before each operation it is compulsory to disconnect all the electric power supplies to the machine;
- Do not remove the guards and safety devices provided on the machine;
- Before start-up make sure all the guards have been installed correctly.

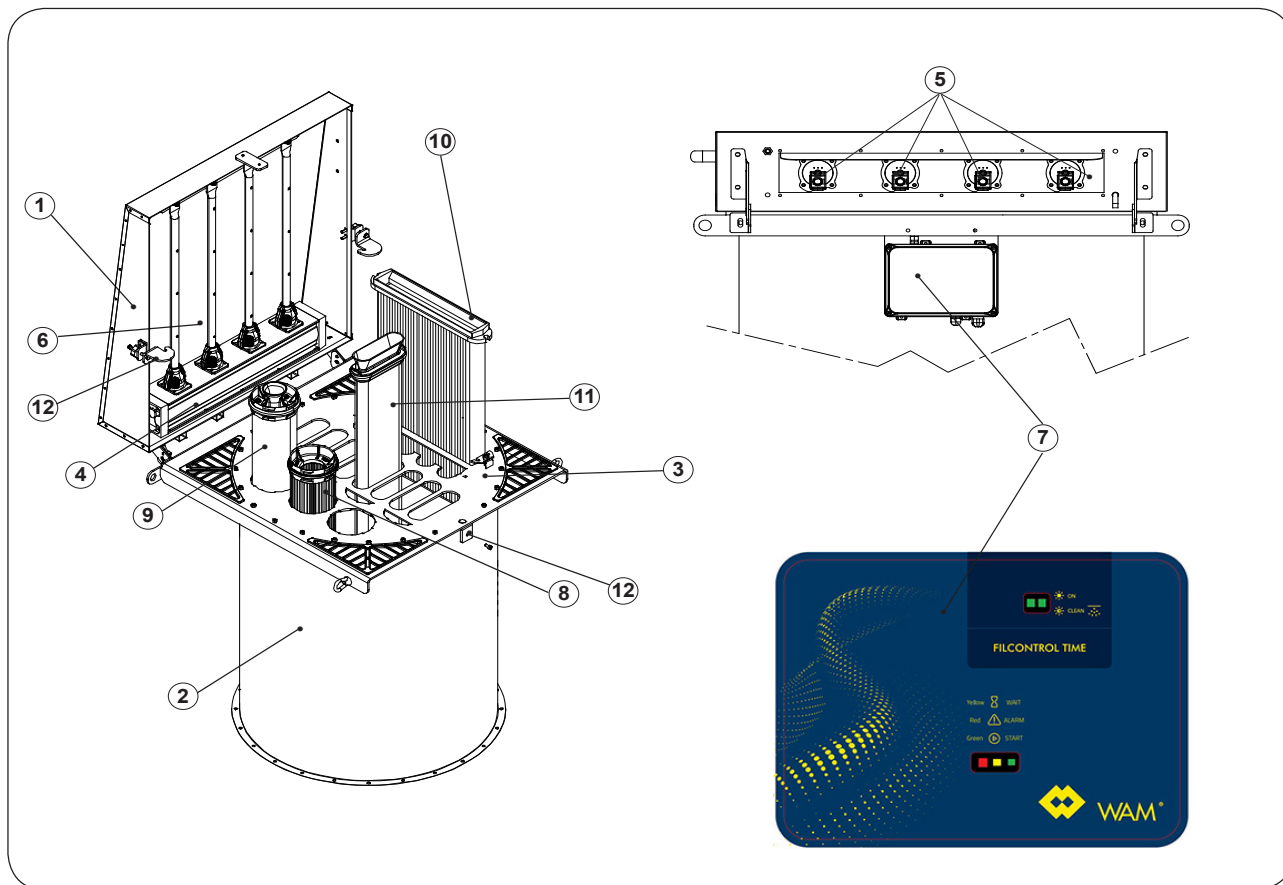
1.8**WARRANTY CONDITIONS**

WAM® Spa acknowledges a 12-months warranty on products manufactured by it. The period comes into effect from the date on the delivery note. The warranty is not applicable in case of breakage and/or defects caused by incorrect installation or use, or incorrect maintenance or modifications made without the manufacturer's permission. The warranty is not applicable to parts subject to normal wear and electrical parts.

Specifically, the warranty lapses if the filter:

- has been tampered with or modified;
- has been used incorrectly;
- has been used without respecting the limits indicated in this Manual and/or has been subjected to excessive mechanical stresses;
- has not been subjected to the necessary maintenance or the maintenance operations have been carried out only partly and/or incorrectly;
- has been damaged owing to negligence during transport, installation and use;
- the spare parts inserted are not genuine.

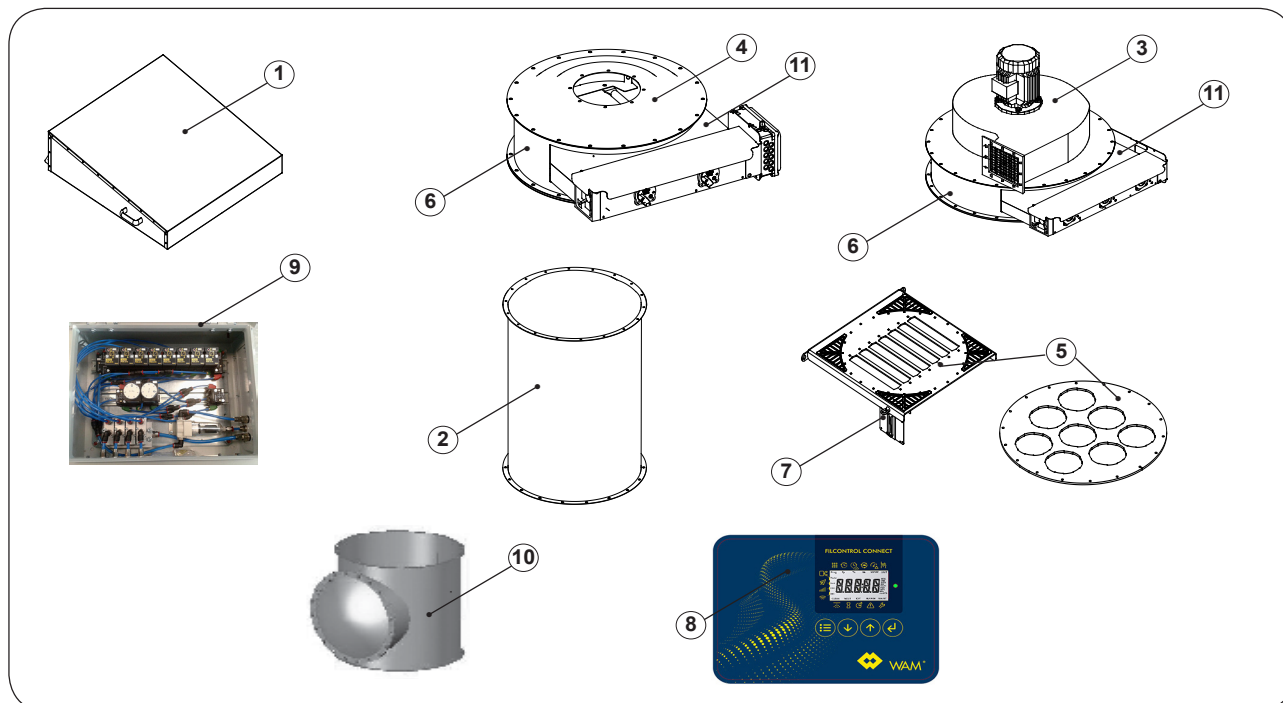
On receiving the product, check to make sure it shows no defect or damage deriving from transport and/or incompleteness of the supply. The manufacturer must be immediately informed of defects, damage or incompleteness, if any, with a written communication countersigned by the carriers.

2.0
BASIC SUPPLY: MATERIALS AND FINISHES


Item Pos.	Description	Material	Thickness	Finish
1**	Cover	AISI 304	1.2 mm	2B (UNI EN 10088-2/4-1997)
2	Filter body	AISI 304	2 mm	2B (UNI EN 10088-2/4-1997)
3	Elements-holder plate	Carbon steel	6 mm	Powder painted RAL 9010 antistatic
4	Compressed air tank	Aluminium	3 mm	Light anodized
5	Solenoid valves	Aluminium	--	Matt black cataphoresis
6	Cleaning tubes	AISI 441	1.5 mm	Satin finish 120 - 180 (4/4/IV*)
7**	Electronic timer	--	--	--
8	Cartridges	--	--	--
9	Bags	--	--	--
10	Elliptical bags	--	--	--
11	POLYPEAT	--	--	--
12	Clamp hooks	AISI 304	6 mm	2B (UNI EN 10088-2/4-1997)

*In accordance with UNI-EN 10088 (1997)/AISI (1974) / DIN 17440 (1985)

**Only for Zone 22 category 3D

2.1
OPTIONS: MATERIALS AND FINISHES


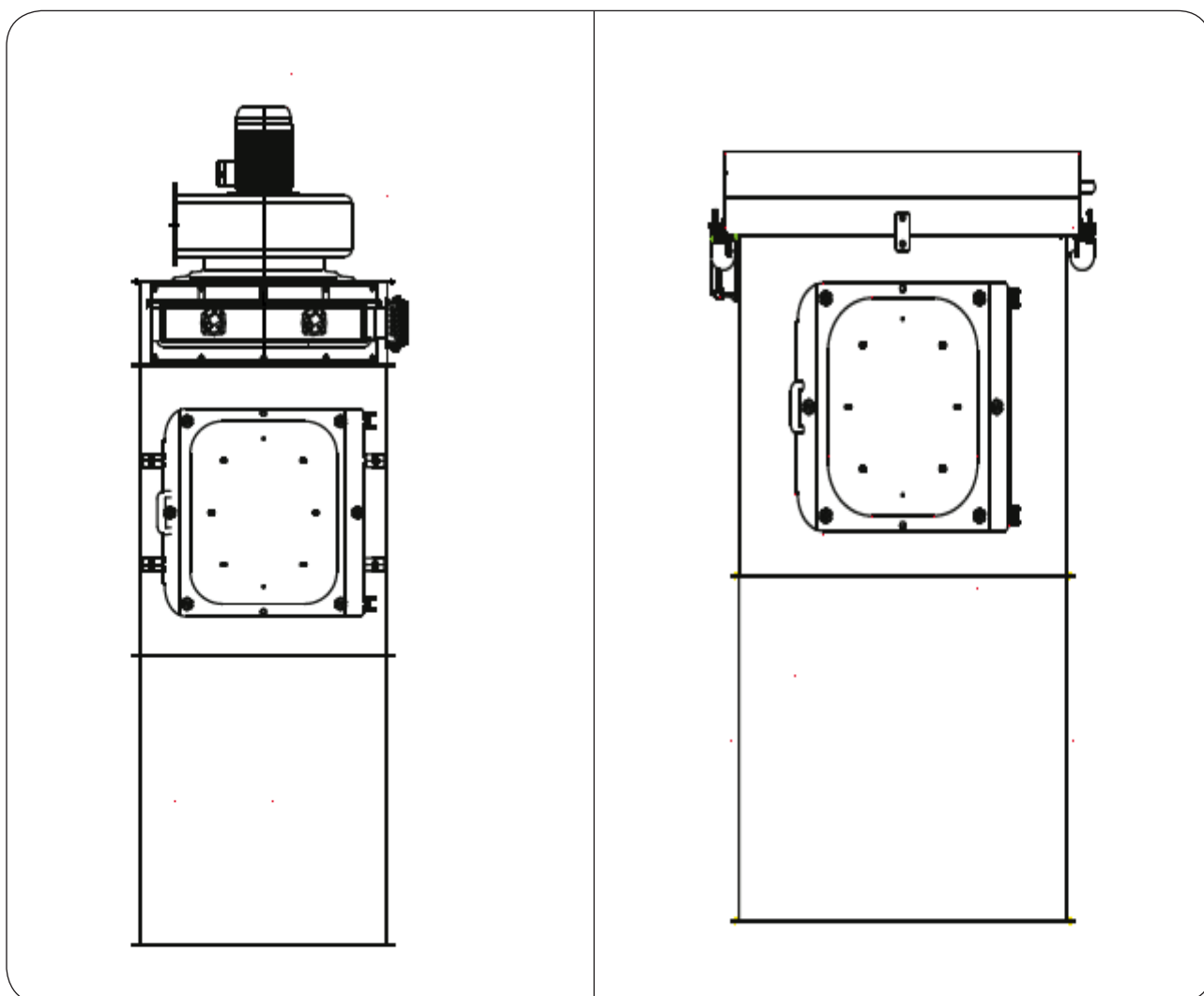
Item Pos.	Description	Material		Thickness	Finish
1**	Cover	AISI 304		1.2 mm	2B (UNI EN 10088-2/4 1997)
		AISI 316		1.2 mm	
2	Filter body	AISI 316		2 mm	
3	Suction fan				
4	Top connector for suction	Carbon steel		2 mm	Powder painted RAL 7001
		AISI 304		2 mm	2B (UNI EN 10088-2/4 1997)
		AISI 316		2 mm	2B (UNI EN 10088-2/4 1997)
5	Elements-holder plate	AISI 304		6 mm	Satin finish 120 - 180 (4/4/IV*)
		AISI 316			
6	Upper body	AISI 304		2 mm	2B (UNI EN 10088-2/4 1997)
		AISI 304		2 mm	
7	MDP	-		-	-
8	MDPE	-		-	-
9	Pneumatic timer	-		-	-
10	Membrane-holder module for explosion vent panel (not envisaged for ø400)	AISI 304	ø600	body 2 mm	-
			ø800		-
			ø1000		-
		AISI 304	ø600	flange 4 mm	-
			ø800		-
11	Panel	Thermoplastic material		-	RAL 7001

*In accordance with UNI-EN 10088 (1997)/AISI (1974) / DIN 17440 (1985)

**Only for Zone 22 category 3D

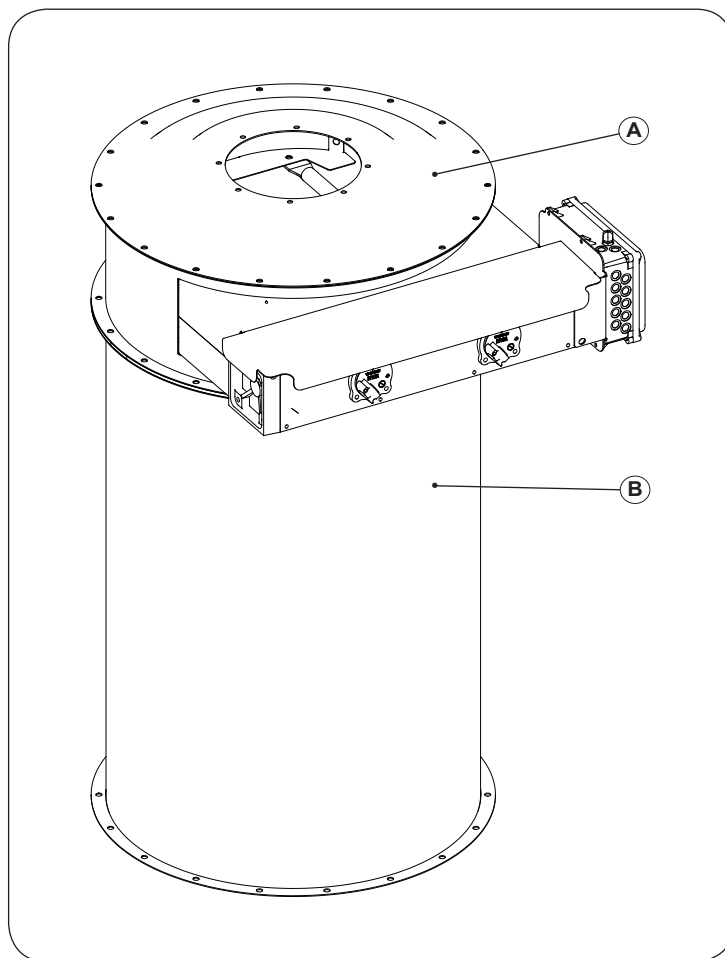
2.2
CARTRIDGES AND BAGS REMOVABLE FROM THE FRONT
DESCRIPTION

The range of filters with elements that can be removed from the front is designed to satisfy the requirements of plants where height is reduced or for filters with suction fan to simplify maintenance operations. The range of filters concerned is provided with a hatch (for filters with diameter 1000, a second hatch is provided as optional) with “floating” hinges (Italian patent pending) and four fastening hooks. The hatch is fitted with a gasket made of technopolymer and an “anti-stagnation plate” (Italian patent pending) which prevents stagnation of material in the area inside the hatch. The maintenance door is not available for ATEX ZONE 21.



2.3
OPTIONS - TYPE OF FILTER
ROUND FILTERS IN NEGATIVE PRESSURE:

These find application in pneumatic conveying systems in “negative pressure”: a pump with pressure head max- 6000 mm H₂O positioned near the filter sets the entire filter in negative pressure. To avoid damage to the structure, the following modifications are made to the basic model:


A) FILTER COVER:

Made of flat plate with thick sheet metal for reinforcement. A hole is drilled in the centre so that the customer can connect the pump tube.

B) FILTER BODY:

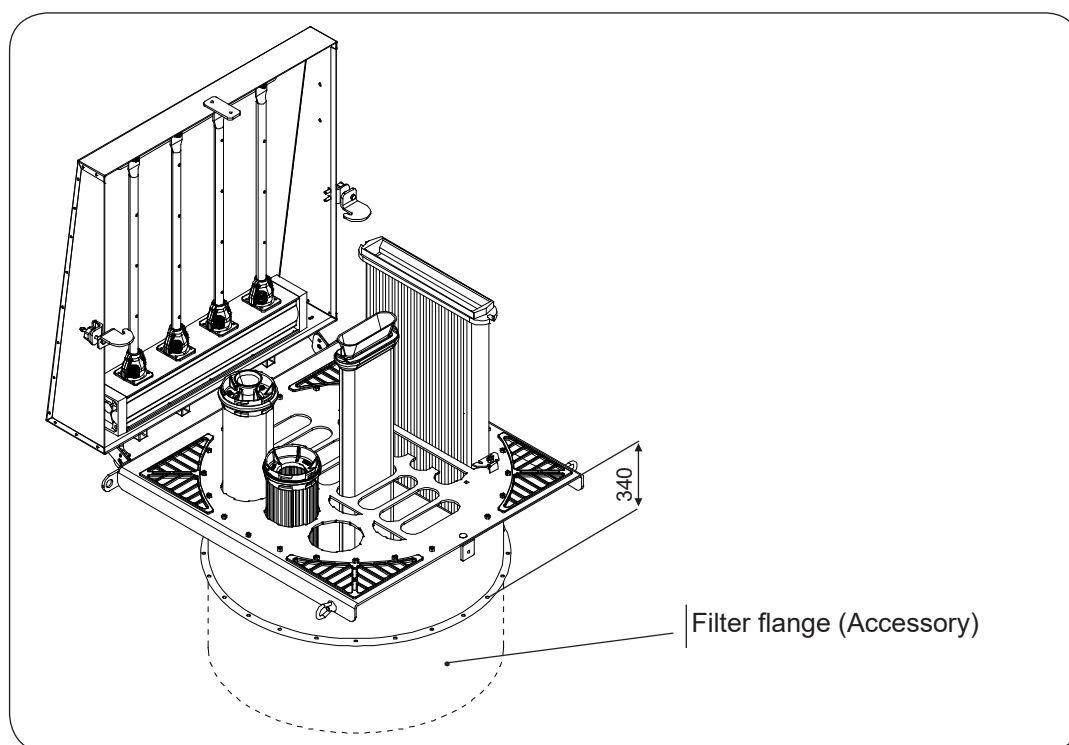
To ensure resistance to negative pressures of - 0.6 bar (- 6000 mm H₂O) the upper flange and the intermediate flange are made of thick sheet metal depending on the diameter as well as the height of the element.

NOTE: Negative pressure filters are available also with MAINTENANCE DOOR (filter type FNXS or FNXB)

In addition to the basic version, depending on the type of application and the dimension requirements, the **WAMFLO® ATEX** filters may be manufactured in the following models: I-insertable D-negative pressure E-insertable negative pressure.

INSERTABLE FILTERS.

For dimensional requirements, it sometimes becomes necessary to insert the filter elements in the silo/hopper that is to be dedusted. This is why the range of “**INSERTABLE**” filters has a body with H = 340 mm in such a way as to limit the height.



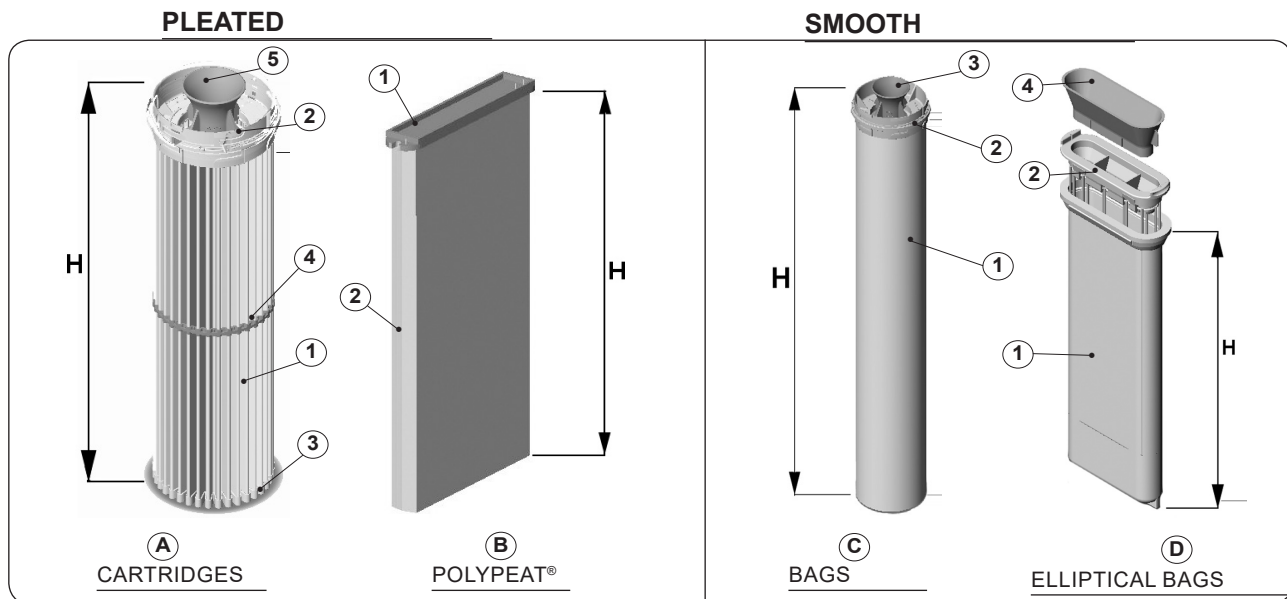
NOTE: THE FILTER FLANGE IS SUPPLIED SEPARATELY.

2.4
FILTER ELEMENTS

Circular or elliptical filter elements can be installed in **WAMFLO® ATEX** filters. The filter medium may be smooth (bags and elliptical bags) or pleated (cartridge and **POLYPLEAT®**). The latter solution ensures optimum use of the space available, but is incompatible with certain types of applications.

For more details consult the **WAM®** Engineering-Sales department.

The Venturi system applied in **WAMFLO® ATEX** filters is specially designed by **WAM®** to make the compressed air cleaning system more efficient. The Venturi for the **POLYPLEAT®** is directly built-into the filter medium head.



TYPE	ITEM POS.	DESCRIPTION	MATERIAL	H
CARTRIDGE (A)	01	Filter medium	Non-woven-fabric polyester	520 770 920
	02	Head	Thermoplastic material	
	03	Base plate		
	04	Strip		
	05	Venturi		
POLYPLEAT® (B)	01	Head	Technopolymer	520 770 920
	02	Filter medium	Non-woven-fabric polyester	
BAG (C)	01	Filter medium	Polyester felt	920 1360 1840
	02	Head	Thermoplastic material	
	03	Venturi		
ELLIPTICAL BAG (D)	01	Filter medium	Polyester felt	520 920 1360 1840
	02	Head	Technopolymer	
	03	Venturi	Thermoplastic material	
	04	Frame head		

FILTER MEDIA

For all the filter elements, it is possible to use different types of media, to satisfy all applications in the various industrial sectors. The **WAM®** filter media are certified by the

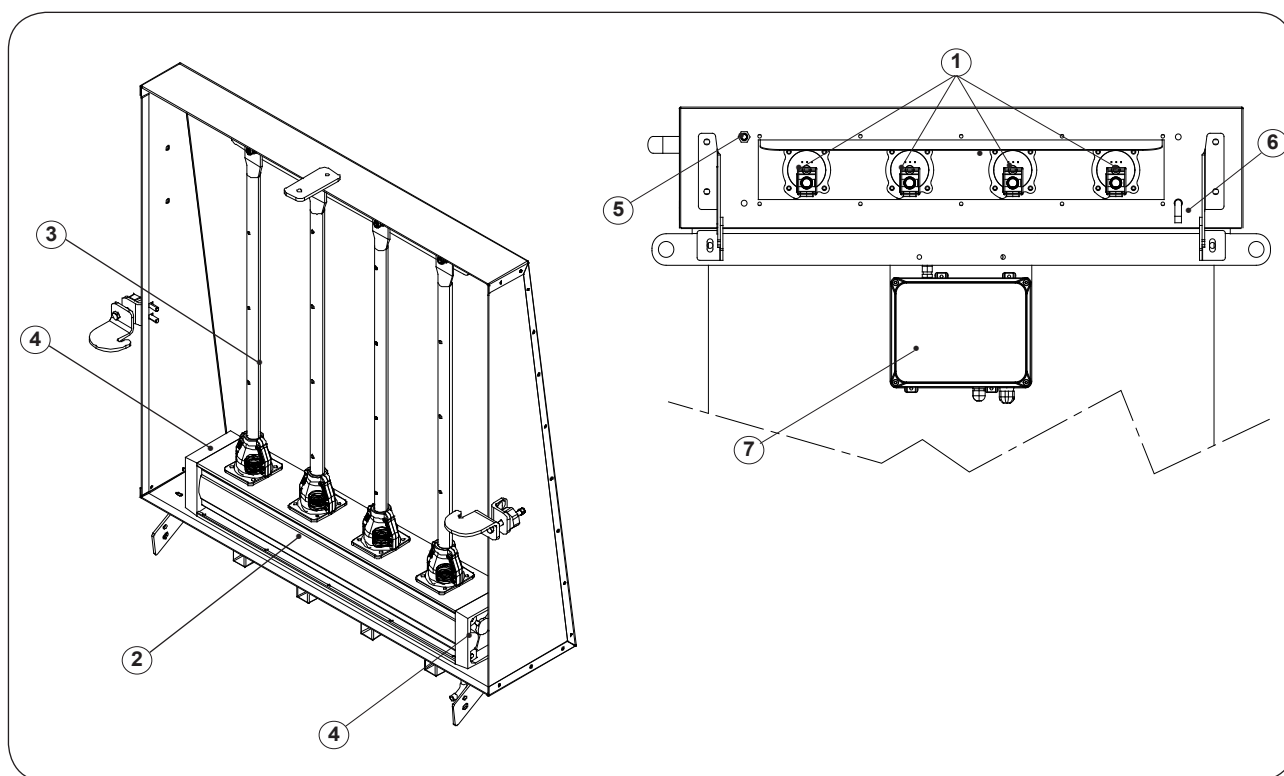
WAM® Code	MATERIAL	g/m ²	FIELDS OF APPLICATION	Class BIA
SMOOTH				
FA	Smooth polyester felt	550	Filtrations of electrostatically charged materials	L
FB	Smooth polyester felt	550	Filtrations of electrostatically charged materials and containing moisture or oils	L
FZ	Smooth polyester felt	485	Extreme filtrations of electrostatically charged materials	M
FG	Smooth polyester felt	350	flour milling industries filtration	-

WAM® Code	MATERIAL	Gr./ m ²	FIELDS OF APPLICATION	Class BIA
PLEATED				
PA	Spunbond polyester felt	265	Filtrations of electrostatically charged materials	M
PB	Spunbond polyester felt	265	Filtrations of electrostatically charged materials and containing moisture or oils	M
PZ	Spunbond polyester felt	290	Extreme filtrations of electrostatically charged materials	M

Note | For more information see “Filter Media” and “Selection Criteria” Catalogues.

2.5
CLEANING SYSTEM

For **WAMFLO® ATEX** filters the filter elements cleaning system can be selected in the order phase:
1- Reverse compressed air jet

Cleaning with reverse compressed air jet

CLEANING UNIT

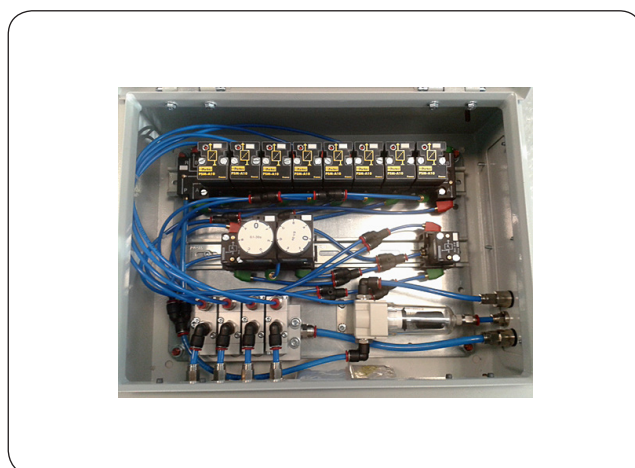
It consists of:

- Solenoid valves (1) mounted directly inside the compressed air tank (2) in such a way as to reduce load losses to the minimum;
- Cleaning tubes (3) made of AISI 441;
- Aluminium tank anodised externally with two heads (4) also made of aluminium with black matt cataphoresis treatment;
- Air inlet valve (5)
- Valve for condensate drainage (6).

The timer (7) sequentially controls the compressed air inlet to the cleaning tubes. The filter must be connected to a compressed air duct at a constant pressure of 6 bar. The air must be clean, dehumidified and oil-free.

2.6
TIMERS

The timer has the function of sequential control of the filter elements cleaning cycle with compressed air, with the possibility of changing the cleaning time and pause time between one cleaning operation and the next.


Fig. 1

Fig. 2
ELECTRONIC TIMER (FIG.1)

- Not available for Zone 21 filters.
- The **WAM®** electronic controller board can be powered with a 24V - 260V AC/DC, 50/60 Hz supply and installed inside a container which ensures a protection degree IP66 (in accordance with CEI EN 60529).
- The pause times range from 5 to 90 sec., the work times range from 100 to 300 milliseconds. The board is provided with a timer fixed for 10 minutes to allow further cleaning of the filter at the end of the work cycle.

PNEUMATIC TIMER (FIG.1)

- The **WAM®** pneumatic actuator is used when no electricity is available in the plant.
- In this case it is enough to connect the compressed air (5-6 bar) for the working. The pause time can be adjusted. There is no cycle end cleaning.

2.7
OPTIONS: No. OF SOLENOID VALVES
ELLIPTICAL BAGS

FNX E				
Filter			No. of Solenoid valves	
Type	m ²	Ø	Base	Possible*
FNXE 2 J03	2.4	600	2	-
FNXE 2 J05	4.4		2	-
FNXE 2 J07	6.6		2	-
FNXE 2 J09	8.9		2	-
FNXE 3 J04	3.5	800	3	-
FNXE 3 J07	6.6		3	-
FNXE 3 J10	9.9		3	-
FNXE 3 J14	13.3		3	-
FNXE 4 J07	6.7	1000	4	-
FNXE 4 J13	12.4		4	-
FNXE 4 J20	20		4	-
FNXE 4 J26	26		4	-

* To be specified in the Order code

POLYPEAT®

FNX W				
Filter			No. of Solenoid valves	
Type	m ²	Ø	Base	Possible*
FNXW 2 J07	7.5	600	2	4
FNXW 2 J11	11.4		2	4
FNXW 2 J14	13.7		2	4
FNXW 3 J13	13.1	800	3	5
FNXW 3 J20	20		3	5
FNXW 3 J24	24		3	5
FNXW 4 J27	27	1000	5	6
FNXW 4 J40	40		5	6
FNXW 4 J48	48		5	6

* To be specified in the Order code

BAGS

FNXB - FNXM					
Filter				No. of Solenoid valves	
Type		m ²	Ø	Base	Possible*
FNXB 1 J01	FNXM 1 J01	1.5	400	1	2
FNXB 1 J02	FNXM 1 J02	2.3		1	2
FNXB 1 J03	FNXM 1 J03	3.0		1	2
FNXB 2 J03	FNXM 2 J03	3.1	600	2	3
FNXB 2 J05	FNXM 2 J05	4.5		2	3
FNXB 2 J06	FNXM 2 J06	6.0		2	3
FNXB 3 J05	FNXM 3 J05	5.4	800	2	4
FNXB 3 J08	FNXM 3 J08	8.0		2	4
FNXB 3 J11	FNXM 3 J11	10.5		2	4
FNXB 4 J11	FNXM 4 J11	10.8	1000	4	6
FNXB 4 J16	FNXM 4 J16	16.0		4	6
FNXB 4 J21	FNXM 4 J21	21.0		4	6

* To be specified in the Order code

CARTRIDGES

FNXS - FNXC					
Filter				No. of Solenoid valves	
Type		m ²	Ø	Base	Possible*
FNXS 1 J02	FNXC 1 J02	1.7	400	1	2
FNXS 1 J03	FNXC 1 J03	2.5		1	2
FNXS 1 J04	FNXC 1 J04	3.3		1	2
FNXS 1 J05	FNXC 1 J05	5.1		1	2
FNXS 1 J06	FNXC 1 J06	6.2		1	2
FNXS 2 J07	FNXC 2 J07	6.7	600	2	3
FNXS 2 J10	FNXC 2 J10	10.2		2	3
FNXS 2 J12	FNXC 2 J12	12.3		2	3
FNXS 3 J12	FNXC 3 J12	11.7	800	2	4
FNXS 3 J18	FNXC 3 J18	18.0		2	4
FNXS 3 J22	FNXC 3 J22	22.0		2	4
FNXS 4 J24	FNXC 4 J24	24.0	1000	4	6
FNXS 4 J36	FNXC 4 J36	36.0		4	6
FNXS 4 J44	FNXC 4 J44	44.0		4	6

* To be specified in the Order code