www.absolent.com

US

User's manual in original

Oil mist and Oil smoke filter

- ODR 6000
- ODR 12000
- ODR 18000
- ODR 24000

ODR-T

Absolent

US 1. BASIC INFORMATION

1.1 Introduction

In the following documentation you will find all essential information concerning safety, installation, start-up and maintenance.

This product is manufactured and designed in accordance with the EU directives that this product is embraced by.
In order to maintain this status, installation, repair and maintenance may only be carried out by qualified personnel and the use of original spare parts.
For advice regarding technical service or the need of spare parts please contact Absolent AB or your closest accredited dealer. Contact information can be found under the heading“Service addresses”.

1.2 Range of Application

The filter unit ODR is only designed to clean oil-contaminated air. Other use of the filter unit is prohibited, except where the manufacturer guarantees the function.

Read and understand the user’s manual before beginning work in the filter unit.

1.3 Table of Contents:

US 2. APPROVED TO CE-DIRECTIVES, UL AND CSA STANDARDS

The ODR-T product line is approved to:

Machine directive	2006/42/EG
Electromagnetic Compatibility (EMC)	2004/108/EG
Low Voltage Directive (LVD)	2006/95/EG

EC declaration of conformity, see chapter 16.

All electrical components are UL approved.
The electrical motor is CSA approved.

The CSA approval is solely applicable to the electrical motor.

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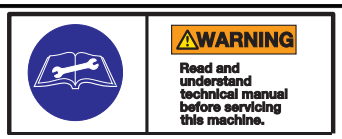
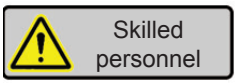
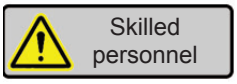
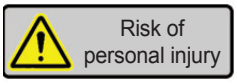
2009-12-28

Tony Landh, CEO

US 3. LIST - WARNING SIGNS

	**Danger - Read the instructions** Read and understand the user guide before working on the filter unit. The sign is positioned on the right-hand side of the filter unit.
	**Warning - Dangerous voltage** All electrical work must be carried out by qualified electricians. The sign is located next to the electrical cabinet.
	**Warning - Tip risk** The filter unit has a high centre of gravity and with that a risk of tipping. In order to avoid damage, see the lifting instructions under the heading “Transport/Set up/Installation”. This sign is placed on the packaging and on the right-hand side of the filter unit.
	**Danger - Heavy products** The filter cassettes become heavier with use. Check the current weight of the filter cassette before handling. Weight details can be found on the filter cassette’s rating plate and under the heading 11 “ Handling the filter cassettes”.
	**Danger - Rotating parts** Caution the filter unit/ and pump can be started by the timer, remote control or by a connected processing machine. The sign is positioned on the right-hand side of the filter unit.
	**Warning - Risk of injury** Caution the filter unit can contain fluids dangerous to health. Refer to the product sheet for the fluids in question before handling. The sign is positioned on the right hand side of the filter unit.

US 4. SAFETY PRECAUTIONS

Type of warning	Warning text
	**Warning - Hazardous voltage!** The filter unit works with a high electrical voltage. The electrical installation must be performed by qualified electricians. Disconnect the power supply to the filter unit before it is opened and/or before starting work on the filter unit.
	Warning - Do not connect the filter unit to explosive gases! Do not connect the filter unit to processing machines that can bring about an explosion risk. Furthermore, the filter unit must not be connected to media that are highly inflammable without preventative measures being taken to stop the spread of the explosion or fire to the filter unit.
	**Caution - Read and understand the user's manual!** Read and understand the user guide before working on the filter unit.
	**Caution - Qualified personnel only!** All work concerning transport, installation and maintenance must be performed by qualified personnel.
	**Risk of trapping injury!** Do not insert your hand into the filter unit when the fan is running. Do not wear loosely hanging clothing near the fan when operational. These can be sucked into the fan or get caught.
	Risk of tipping over! Always check the weight of the filter unit (technical data, heading 7) before lifting. When equipped with an integrated fan unit the centre of gravity of the filter unit is relatively high. When transporting the filter unit, secure well - an alternative can be to transport the filter unit horizontally.
	Heavy products! Filter cassettes are heavy. Check the current weight of the filter cassette before handling. Weight details can be found on the filter cassette's rating plate and under heading 11 "Handling the filter cassettes". Lifting equipment or the like must be used during service and inspection work above the ground.
	Risk of slipping! Keep the floor clean. Remove oil spill to prevent injury due to slipping.
	High noise levels! If the sound level at the control panel/workplace exceeds 75 dB(A) ear protection must be worn.
	Dangerous fluids! Use requisite personal safety equipment with all types of service work, as the filter unit can contain liquids dangerous to health. Refer to the product sheet for the liquids in question before handling.Use required personal safety equipment with all types of service work, as the filter unit can contain liquids dangerous to health. Refer to the product sheet for the liquids in question before handling.
	Caution when recirculating air back into the building! Note that in its standard design the filter unit does not separate gas molecules.

US 5. TRANSPORT / SET UP / INSTALLATION

5. General

Check that the unit is undamaged on arrival and when unpacking. Contact the carrier in the event of transport damage.

5.1 Transport and delivery

The filter unit is supplied on a wooden pallet wraped in plastic foil. ODR 6000 is supplied assembled. Larger filter units are assembled on-site. Larger filter units are supplied unassembled. The top section is then positioned on the bottom section and the filter parts are delivered separately. The packaging should remain on the filter unit up until installation in order to prevent damage. Secure the filter firmly, or transport the filter horizontally (ODR 6000). One of the following methods must be used when lifting:

5.1.1 Lifting the filter unit on a wooden pallet with an overhead crane.

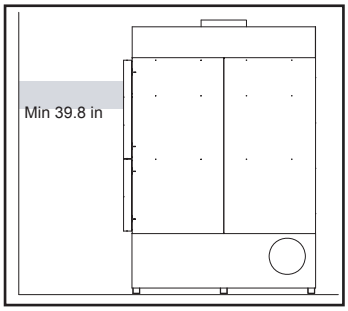
5.1.2 Lifting the filter unit on a wooden pallet with a forklift truck.

5.1.3 Lifting a vertical filter section using a forklift truck or overhead crane.

5.2 Set up

The filter unit must be set up horizontally on a flat and firm surface. The surface must be designed to support the weight of the filter unit. When setting up the filter unit and ducts, pipes, and electrical cables, ensure that the service doors can be opened freely (see figure 1) and that internal components such as the filter cassettes can be removed as required.

Figure 1



5.2.1 Lift to the vertical position ODR 6000T

1. Ensure that the toggle fasteners on the inspection hatches are secured , before the filter unit is lifted to a vertical position.
2. When the filter is to be raised, fit the lifting device in the two lifting eyes, as shown in figure 1. Carefully lift the unit as shown in figures 2 and 3.
3. Position the filter unit in the correct position and bolt to the floor.
4. Open the hatch and check that the filter cassettes are secured. If they have become loose during transport, secure the filter unit and close the service hatches.
7. Connect the drainage.
8. Connect the suction pipe with control damper (the control damper is not required if the fan is equipped with frequency control). Using a branch pipe the recommended connection is a 30° elbow, as this gives a low pressure drop for the entire installation.
9. Connect the unit electrical (possible fan, pump and/or other accessories). Also see heading 8 “Electrical connection”.

Figure 1

Figure 2

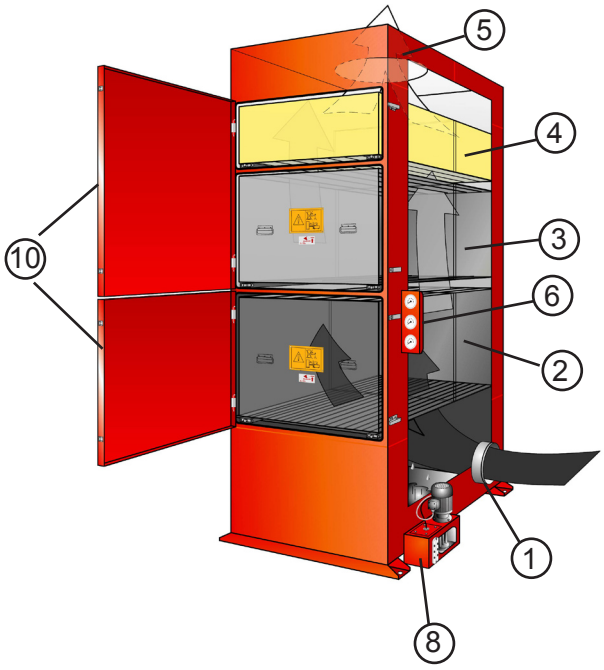
Figure 3

US 6. OPERATION /DESIGN

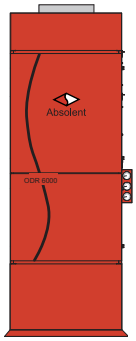
ODR

Contaminated air is sucked into the inlet (1) in the lower section of the filter unit and passes through: filter stage 1 (2), where the majority of the the oil particles are trapped.
When filter stage 1 unit reaches a state of equilibrium, the oil drops that have been caught drain down into the bottom of the filter, which acts as a collection container and are pumped (8)(accessory) or drained away. The air passes through an additional Absolent filter (3), where remaining particles are filtered out and on via a HEPA filter (4) to the external fan. Generally the air is now so clean it can be returned directly to the premises.

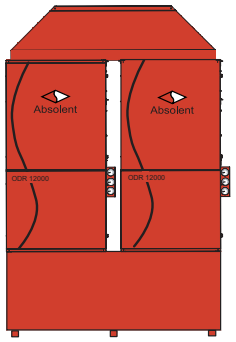
1. Inlet, pipe connection
2. Filter stage 1 (Absolent filter)
3. Filter stage 2 (Absolent filter)
4. Hepa filter
5. Outlet
6. Pressure gauges
7. Control cabinet (not illustrated, accessory)
8. Return oil tank /pump & pump (accessory)
9. Outlet
10. Service doors



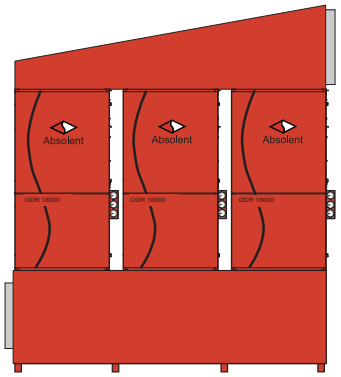
US 7. TECHNICAL DETAILS, ODR



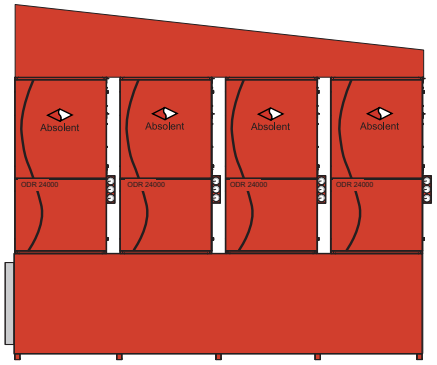
ODR 6000



ODR 12000



ODR 18000



ODR 24000

		ODR 6000T	ODR 12000T	ODR 18000T	ODR 24000T
Height, centred outlet	[in]	113.4	113.8	-	-
Height, side outlet	[in]	113.4	113.8	153.7	153.7
Width, excl pump case (with pump case +3.1 mm)	[in]	45	89.2	134.8	180.5
Depth	[in]	83.5	85.2	85.2	85.2
Standard connection inlet	[in]	ø15.8	ø24.8	ø31.5	ø35.4
Standard connection outlet	[in]	ø19.7	ø31.5	ø31.5	-
Standard connection return oil (with pump W 3/4)	[inch]	W 1 1/4	W 1 1/4	W 1 1/4	W 1 1/4
Weight dry filter (wet/dirty filter)	[lbs]	2866 (3307)	5512 (6614)	8267 (8818)	11023 (13228)
Filter cassettes					
Absolent filter	[no.]	4	8	12	16
HEPA (H13)	[no.]	2	4	6	8
Performance					
Max. air flow	[cfm]	4700	9400	14100	18800

[2] The sound level for filters with an external fan is stated in the user guide for the fan.

Electrical data:
Fan = fan's user guide, electrical motor plate
Pump and pump control = wiring diagram (in the control cabinet)
Diverse accessories = enclosed user instructions.

US 8. ELECTRICAL CONNECTION

Danger! High Voltage
All electrical work must be carried out by qualified electricians.

8.1 General

ODR central filter units have no electrical standard equipment, however the unit is usually equipped with a pump to evacuate the oil. The fan is normally fitted freestanding. It is possible to mount the fan in direct connection to or on the unit. Other common accessories include frequency converter, pressure sensor for flow regulation and pressure switches for monitoring the pressure drop over the filter cassettes.
Instructions for the connection of accessories are not included in this user guide, but are supplied separately with each accessory. In order for the warranty to apply, all electrical connections must be made by a qualified electrician and in accordance with applicable directives.

8.2 Instructions for the connection of accessories

- **Return oil pump with level sensor and control cabinet:** The wiring diagram can be found in the control cabinet.
- **Fan:** The user guide accompanying the fan from the fan supply.
- **Frequency converter:** User guide provided by the supplier. A separate instruction is included, which describes how the frequency inverter must be connected with the pressure sensor if flow regulation is required.
- **Pressure sensor for regulation:** User guide provided with the pressure sensor.
- **Pressure switch:** See heading 12.3 “Differential pressure switch”.
- **Spray system:** Separate instruction supplied with the filter unit.
- **Other accessories:** User guide provided by the supplier.

8.3 Checking the fan’s direction of rotation

Ensure the impeller rotates in the right direction as indicated by the arrow on the fan housing. If you do not have the possibility to look at the motor with the fan rotating, read off the pressure drop over the filter cassette on the pressure gauges, stop the fan, shift two phases, restart and read off the pressure drop. The connection that gave the highest pressure drop is the correct connection.

8.4 Level sensor

The level sensor is located next to the pump in the external oil container.
The sensor has a float with following function:

1. Lower float in its lower position = pump switched off.
2. Lower float in its upper position = pump starts.
3. Upper float in its upper position = alarm (indication connected by the customer).

US 9. STARTING THE FILTER UNIT FOR THE FIRST TIME

9.1 General

The following functions must be checked when starting the filter unit for the first time:

- Check the air flow (heading 9.2.1).
- Read off the pressure gauges (heading 10)
- Check that any accessories are connected and activated (heading 12).

9.2 Important parameters to check when starting for the first time

9.2.1 **Air flow**

The air flow must be checked, so that the value does not exceed the design level for the installation (refer to the quote or unless otherwise stated the nominal flow under heading “Technical data ODR”). The air flow can be adjusted with the damper or with the frequency converter if fitted. If it is difficult to reach the required flow, check the direction of rotation of the fan motor according to 8.3. If the unit is run with a too high flow, there is a large risk that the life span of the filter cassettes will be shortened.

9.2.2 **Pressure drop over the filter cassettes**

Read and note down the values on the pressure gauges on the different filter stages (heading 10).

These values can then be used as a basic value to assess the pressure increase /life span of the different filter cassettes.

9.2.3 **Return oil pump**

Check that the pump starts, preferably by lifting the floats on the level sensor (see 8.4).

9.2.4 **Spray system:**

If the filter unit is equipped with a spray system its function must be checked as this has a large effect on the life span of the filter cassettes.

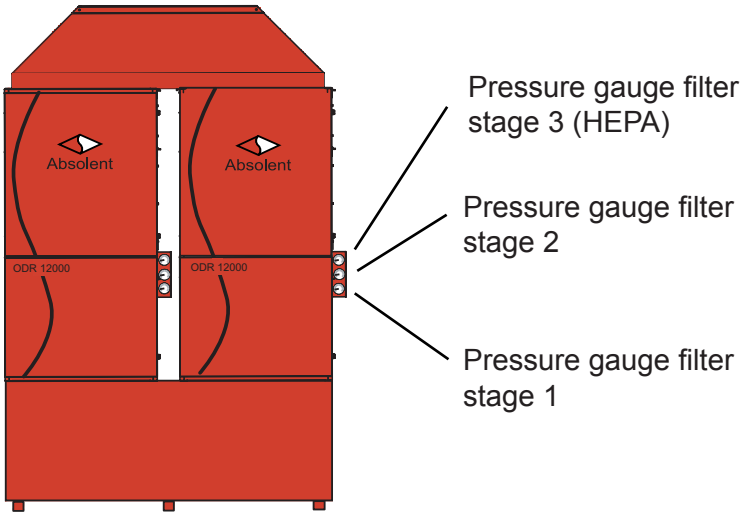
The function of the spray system and fault tracing are described in the separate user guide.

US 10. CARE/MAINTENANCE

10.1 General

Preventive maintenance and regular service extend the life span and ensure that the filter unit maintains its performance. The filter unit maintains its degree of full filtration even if you do not replace the filter cassettes and maintain the unit. However, you risk that the air flow will decrease, which can result in leakage from the machine. Leakage from the machine can cause contaminated air in the premises.

There is a pressure gauge for each filter stage in order to facilitate inspection of the filter cassette status. These are positioned on the front of the filter unit as shown in the diagram below:



The picture shows an ODR 12000T, however the principle is the same for all central filters.

The pressure gauges are graduated in [Pa] and contain green, yellow and orange sectors. The filter cassette should be replaced when these pressure gauges have reached the orange sector. The yellow sector is a warning that the filter cassette replacement should be planned. For a service contact see the heading “Service addresses”.

If the filter stage is used with the pressure drop within the orange sector, the filter unit gives a reduced air volume.

Note however, that the filter unit will not be damaged when operated with a clogged filter stage, but the required air flow will not be attained. Handling during service is described under “Changing the filter, 11.2”.

10.2 Service schedule

	Monthly	Six monthly	Annually
Filter cassettes Read the pressure drop on each pressure gauge	X[1)]		
Bottom section / Drainage Check that the return oil pipe is not blocked	X[2)]	X[2)]	
Fan Check that there is no abnormal noise or vibration			X

1) In order to get to know your new installation, the filter cassettes should be checked once a month during the first six months the filter unit is in use. The service interval is then adapted according to the installation in question. However, no longer than six months between inspections. Note that when the pressure drop enters the yellow sector, the inspection interval must be increased as the pressure drop increase.

2) In order to get to know your new installation, the bottom section and drainage should be checked once a month during the first six months the filter unit is in use. The service interval is then adapted according to the installation in question.

US 11. HANDLING THE FILTER CASSETTES

Warning!
Use requisite personal protection equipment when performing service work on the filter unit.
Lifts or the like must be used when carrying out service work above the ground.

11.1 General

Filter cassettes are heavy, especially when filled with fluid after a period of use. Below is a table of weight for the different filter cassettes available. The type designation of the supplied filter cassette can be found on the rating plate located on the front of the filter cassette.

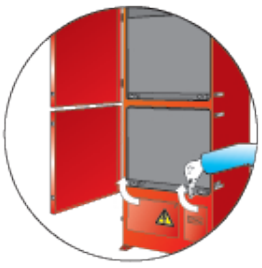
Filter type	Filter cassette type	Weight new cassette (dry)[lb]	Weight fluid filled cassette [lb]
ODR central filter	Stage 1: S1/914	342 lb	463 lb
	Stage 2: S10B3/914 & S10/914	342 lb	463 lb
	Stage 3: HEPA TRSA-S 1000x914	60 lb	

11.2 Instruction for replacing the filter cassette on the ODR Central filter

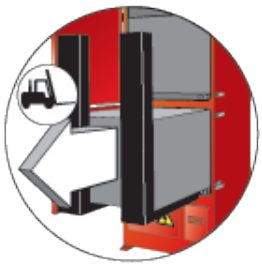
1. Shut down the fan.
2. Open the service hatch.
3. Loosen the cassette by releasing the two bolts (figure A).
4. Lift out the filter cassettes that show a pressure drop which exceeds the service level according to “Care and maintenance” (figure B). When replacing Filter stage 1, check and remove any dirt from the bottom of the filter unit.
5. Check that the sealing strip is undamaged before the new filter cassette is slid in (figure C). The sealing strip must be seated upward.
6. Secure the filter cassette (figure D).
7. Start the fan and check the pressure drop.

NOTE! When the supply air contains a large number of chips the drainage hole in the bottom section should be checked frequently to avoid this being clogged.

A

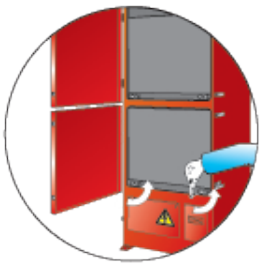


B



C

D



11.3 Used filter cassettes

When the filter cassette is used, it should be washed and the liquid must be taken for destruction.
After washing the cassette can be pressed together and left for landfill or the cassette can be dismantled, and the metal case and aluminium separators can be recycled. Depending on local regulations the filter material can be sent to a disposal facility or incineration.

12. ACCESSORIES

There are a number of accessories available for Absolent's oil mist and oil smoke filter, type ODR. Installation instructions for these are presented on the following pages. Note that the products must be ordered separately.

12.1 Liquid trap

The liquid trap is connected to the filter unit's return oil pipe.

As the filter unit has suction fans the liquid trap must be fitted tight against the filter unit and filled with liquid.

12.2 Spraysystem

When the contamination is "too dry" or contains liquid particles with a high viscosity (viscous), the filter cassette's self-cleaning capacity is reduced and the life span can be shortened. In order to increase the liquid content in the contamination and/or reduce the viscosity, small drops of liquid are added to the air by means of a spray nozzle. The liquid added musts dissolve the liquid used in the process - water is used for emulsions.

The spray nozzle is fitted before the filter unit in the inlet channel. The spray nozzle is controlled by a time relay with adjustable pause and spray times.
For instructions concerning safety, installation and maintenance, see the separate user guide!

US 12.3 Differential pressure switch

General
The differential pressure switch of types DTV-2000 and DTV-5000 are designed to indicate a specific pressure drop over the Absolent's filter cassettes.

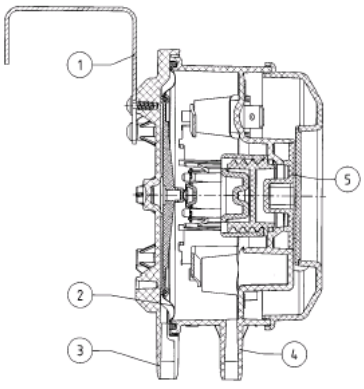
The pressure switch can be equipped with LEDs (24 V) and supplemented with a lamp which, in an assured manner, indicates filter replacement.
It can also be used to forward a potential free signal. This can then be captured by the machine operator's control screen or sent on to a central maintenance department.

Operation
The pressure connected to P1 is compared with the pressure connected to P2. When the differential pressure exceeds the set value the contactors switch.

The set value is set using a dial under the cover. The value set with the dial can be read from the outside through the cover. The fixed hysteresis is set at the factory. Installation and service is facilitated as the cover is designed with only one securing screw.

Design
The pressure switch consists of a glass fibre reinforced plastic sensor housing with a synthetic diaphragm. The differential pressure affects the spring suspended diaphragm which is linked to a changeover contact.

1. Angle bracket
2. Diaphragm
3. P1 connection of the high pressure
4. P2 connection of the lower pressure

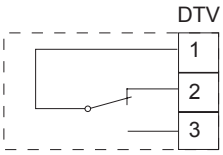


Technical details

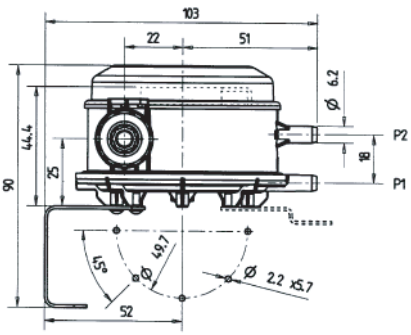
Type:	DTV-2000 and DTV-5000
Setting range:	DTV-2000: 500-2000 Pa (ODR2000) DTV-5000: 1000-5000 Pa (ODR3000)
Contact data:	1A, 250 VAC, changeover contact
Hysteresis	See above
Mains connection:	Screw terminal, PG11 cable gland
Ambient temperature:	-20...+85°C
Storage temperature:	-40...+85°C
Max differential pressure:	5000 Pa
Pressure connections:	Nipples for hoses with internal ø 6mm
Sensor housing material:	Glass fibre reinforced plastic
Diaphragm material:	Silicon LSR
Angle bracket:	Galvanized sheet steel, two securing holes ø5 mm c-c 40 mm
Enclosure class:	IP54
Weight:	0.12 kg
CE:	The product conforms to the require-
ments set out in	European LVD standard IEC669-1 and IEC669-2 and is CE marked.

Installation position
Recommended installation position vertical (factory calibrated)

Dimensions and wiring



1. Common
2. Non pressurised closed
3. Non pressurised open



P1=connection of the higher pressure
P2=connection of the lower pressure

US 13. TROULBLESHOOTING

Malfunction	Possible cause	Action
Low capacity (air flow)	The fan rotates in the wrong direction.	Check the fan's direction of rotation (heading 8.3**)** **(only skilled personnel).**
	With speed regulation: The fan speed is set too low.	Check the fan speed **(only skilled personnel).**
	Too high pressure drop over one or more filter cassettes.	Check the pressure drop. If one of the pressure gauges is in the yellow sector, one of the filter cassettes should be replaced (heading 10).
	High pressure drop in the duct system.	Check and possibly change the duct system
	Adjustable damper is closed or incorrectly adjusted.	Check and possibly adjust the damper on the suction pipe between the machine and filter.
	The ducts are not sealed.	Check that there is no leakage from the suction pipe between the machine and filter.
Abnormally short replacement interval for the HEPA filter:	An incorrectly positioned or damaged sealing strip can result in leakage past filter stages 1, 2. Resulting in unfiltered air reaching the HEPA filter.	Check that filter stages 1, 2 are fitted with the seal upward. Also check that the sealing strip is undamaged.
	Cassettes that are not secured can result in air leakage past the filter cassettes. Unfiltered air will then reached the HEPA filter.	Check that filter stages 1, 2 are secured against the sealing frame correctly (heading 11).
	The filter cassette in stage 1 and/or 2 are not optimised for the application in question.	Check with Absolent that the correct filter cassette is being used in filter stage 1, 2 for the application in question.
Abnormally short service interval for the prefilter:	The filter cassette in stage 1 and/or 2 are not optimised for the application in question.	Check with Absolent that the correct field cassette is being used in filter stage 1 and/or 2 for the application in question.
	The filter cassettes have become clogged on account of high viscosity in the oil mist, which gives insufficient drainage.	If emulsions are used, filter clogging may be due to the filter running when production has stopped, which dries out the filter cassette (water evaporates). Consequently, switch off the filter unit when not in use. If the fluid in the process has a high viscosity, it is necessary to apply fluid with a spray system (heading 12).
	The filter cassettes have become clogged.	Check that chips have not been drawn down with the air into the filter unit. The problem with chips can be solved by calibrating the air flow or coarse filtering before the filter unit. Also check that sticky particles have not clogged filter stage no. 1 (for example, in foundry applications). Contact Absolent for appropriate measures.

14. SPARE PARTS

Absolent has a complete range of spare parts, which ensure the operation of installations.

Please supply the filter unit's serial number and the part number in order to guarantee delivery of the correct spare parts. These can be found on the machine plate, which is located on the right-hand side of the unit. See figure 1.

When ordering filter cassettes, the above details should be supplemented with the filter cassette's material code. This can be read on the filter cassette's rating plate by "type". See figure 2.

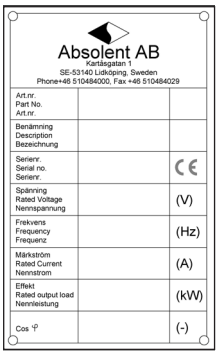


Figure 1

Figure 2

15. TECHNICAL SUPPORT

Absolent has a complete range of spare parts, which give full service, and ensure the operation of installations. In the event of questions concerning maintenance and spare parts please contact:

Head Office
Absolent AB
Kartåsgatan 1
SE-531 40 Lidköping
Sweden
Tel +46 (0)510 484000
Fax +46 (0)510 484029
E-mail: info@absolent.se
www.absolent.com

Dealer:

16. EC DECLARATION OF CONFORMITY

Machinery directive 2006/42/EG, 2A
AFS 2008:3, Appendix 2A

Manufacturer:
Absolent AB
Kartåsgatan 1
SE-531 40 Lidköping
Sweden
Phone: +46 (0)510-48 40 00

Authorized to compile technical documentation
Jan Berntsson
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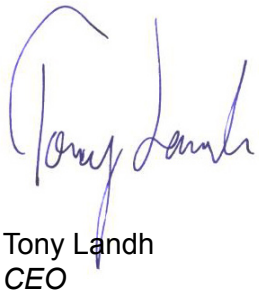
We, Absolent AB, declare under our sole responsibility that the product:

ODR-T

to which this declaration relates, is in conformity with the following standard(s) or other normative document(s)

Machinery directive	2006/42/EG
Electromagnetic Compatibility (EMC)	2004/108/EG
Low Voltage Directive (LVD)	2006/95/EG

Lidköping , 28th of December 2009



Tony Landh
CEO