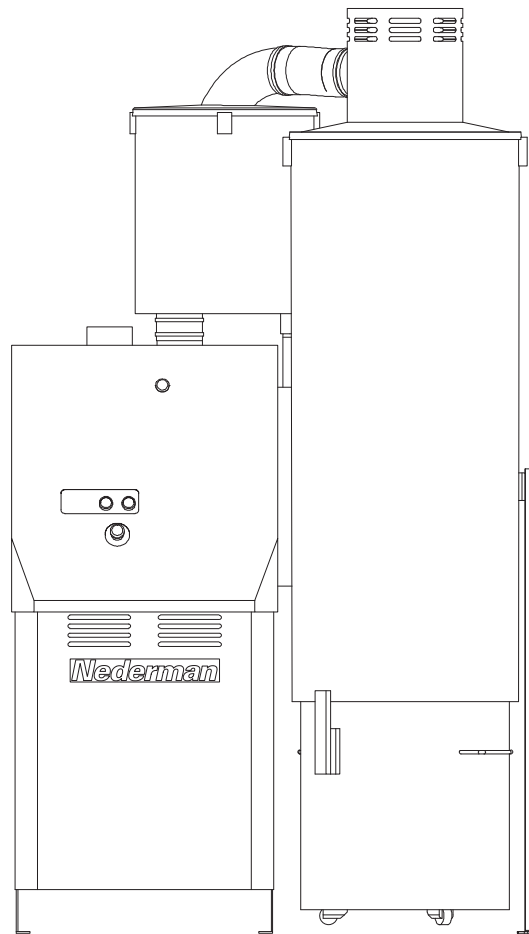


PAK-M with Standard Dust Separator

PAK-M



Original user manual

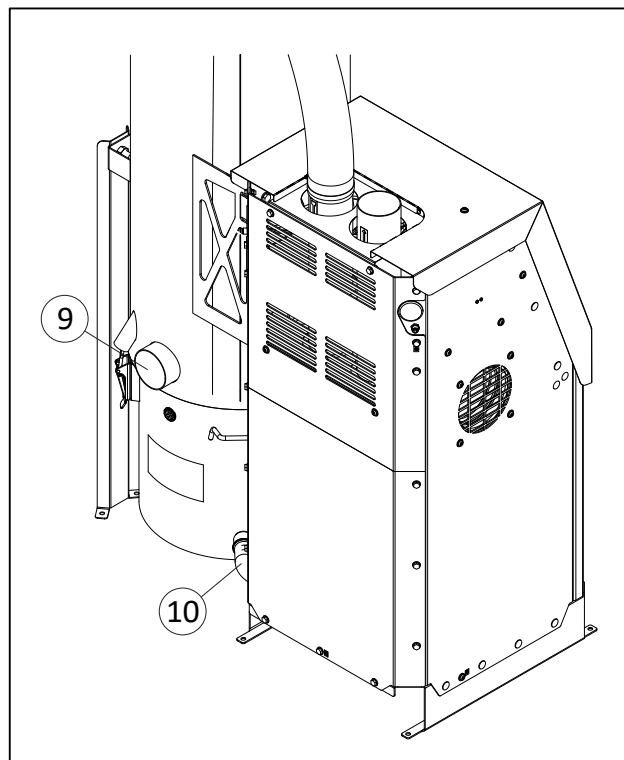
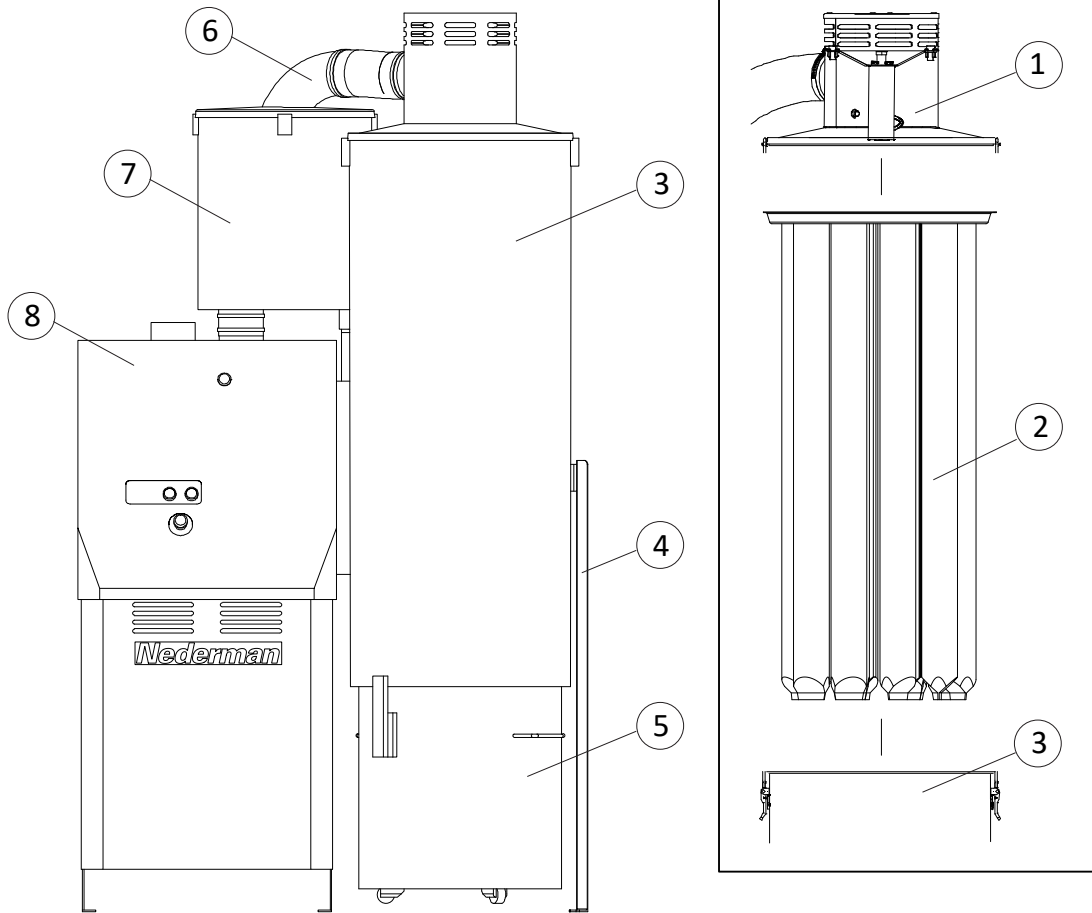
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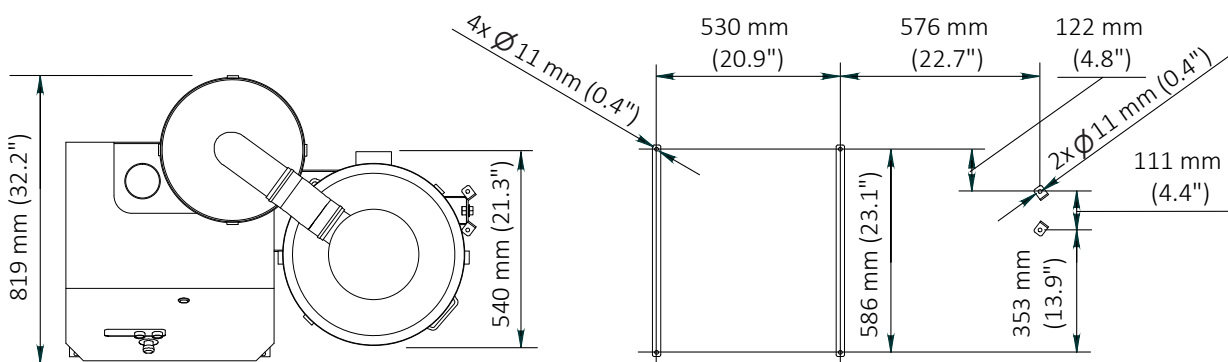
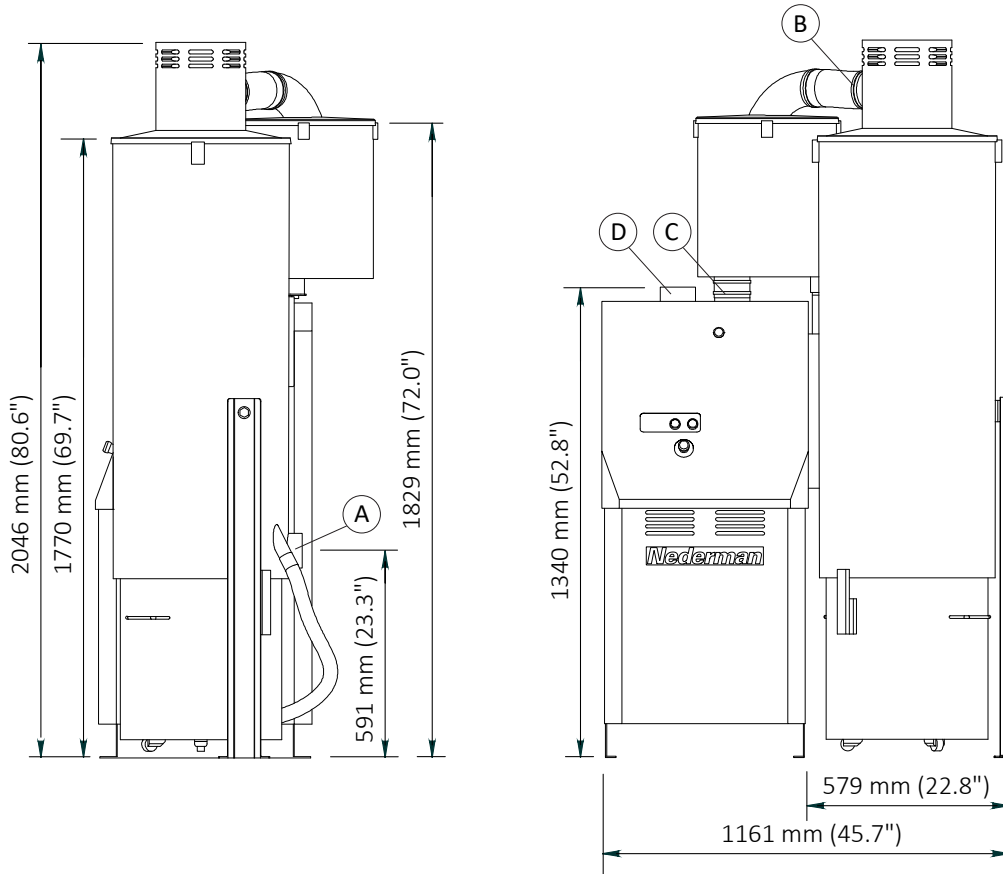
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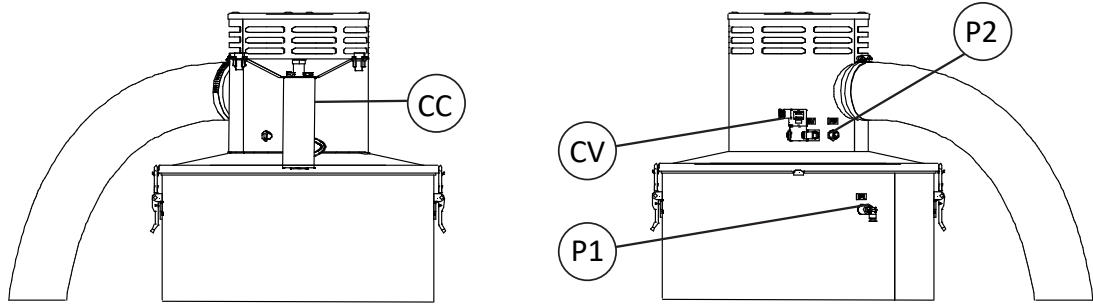
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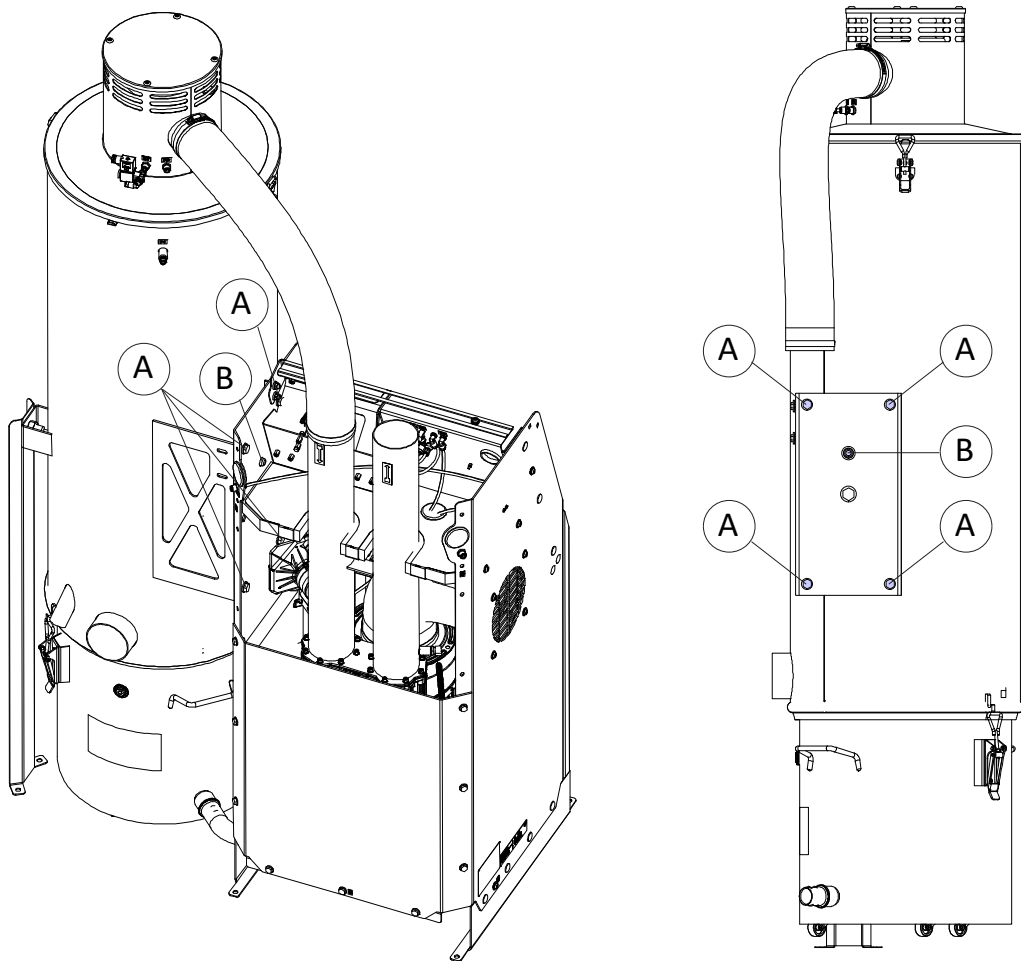




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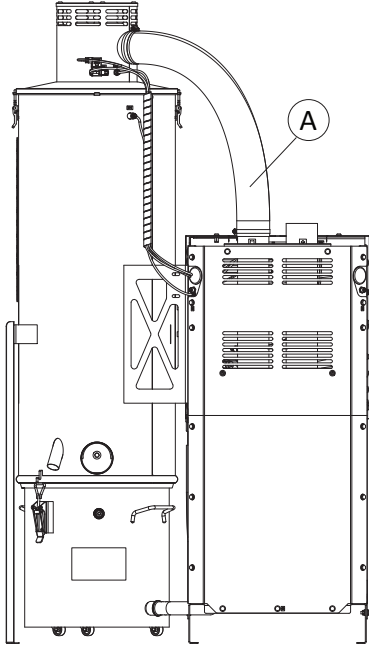


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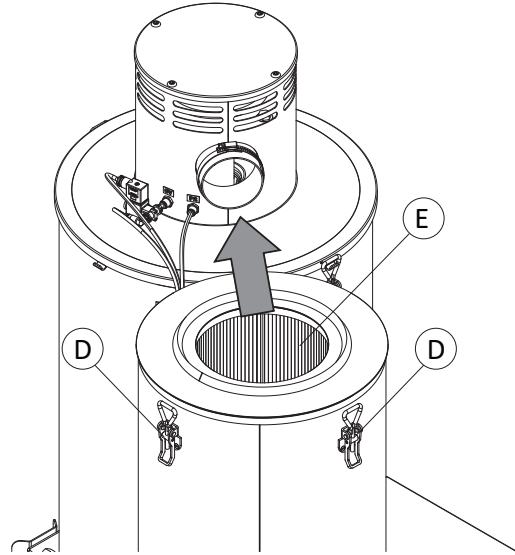


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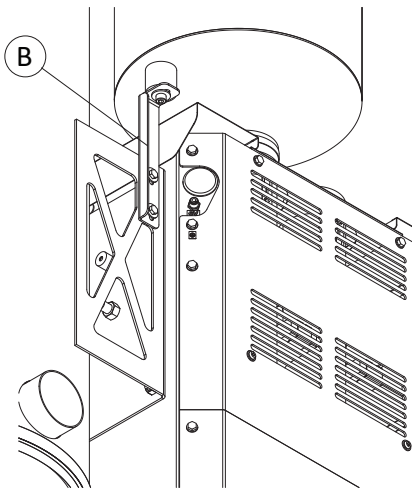
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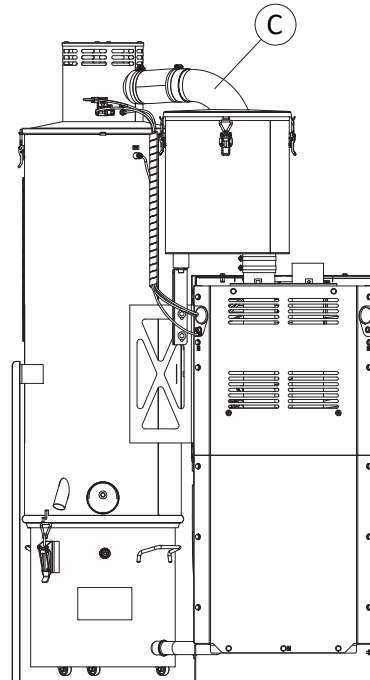
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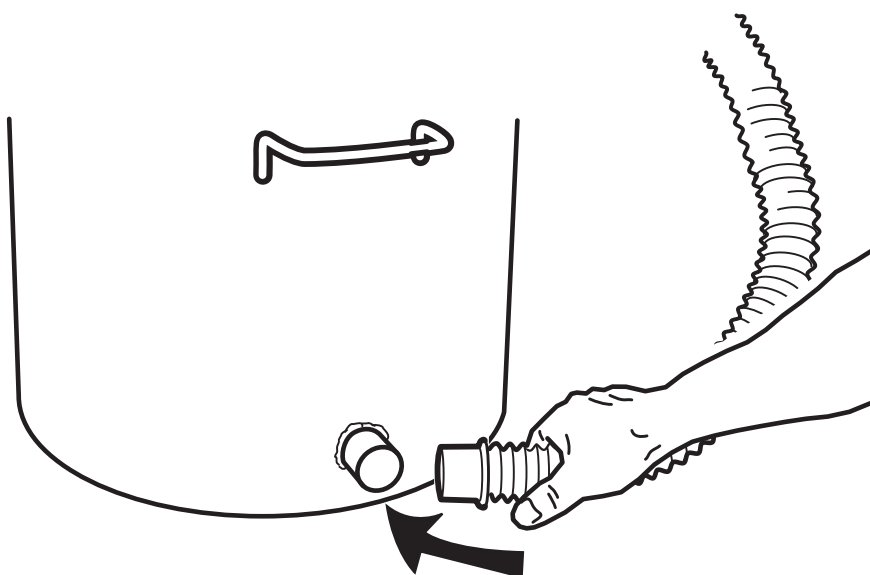
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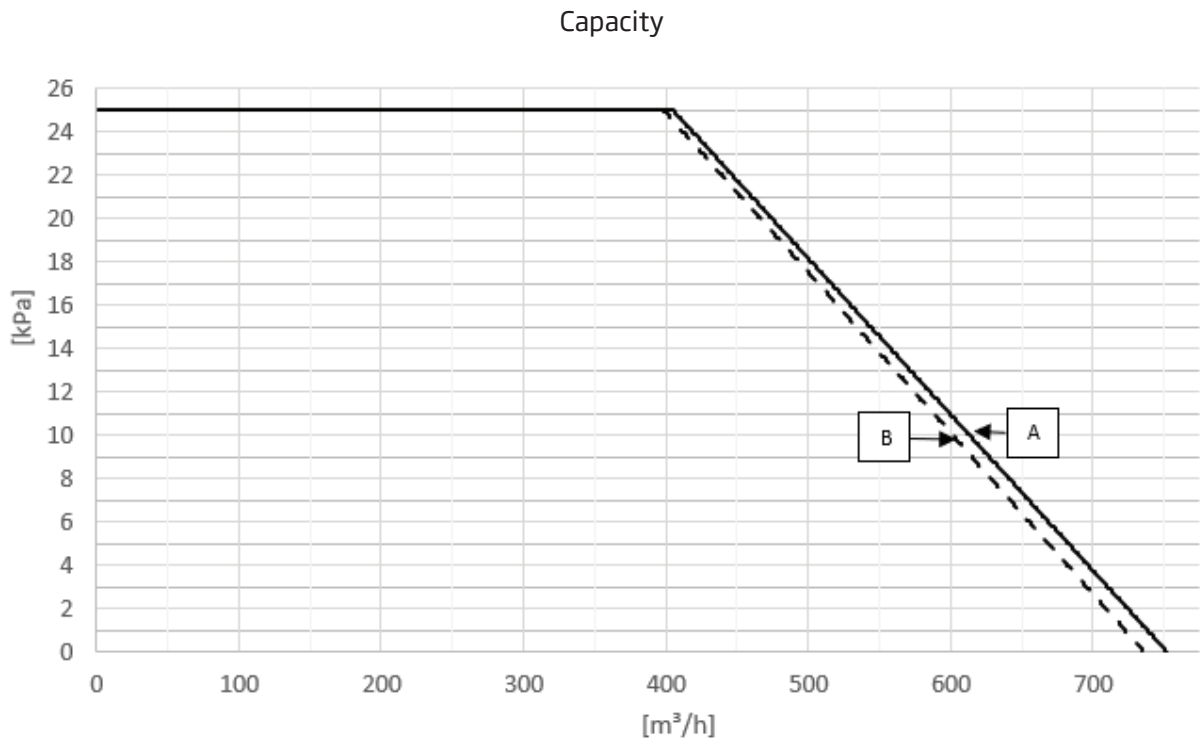
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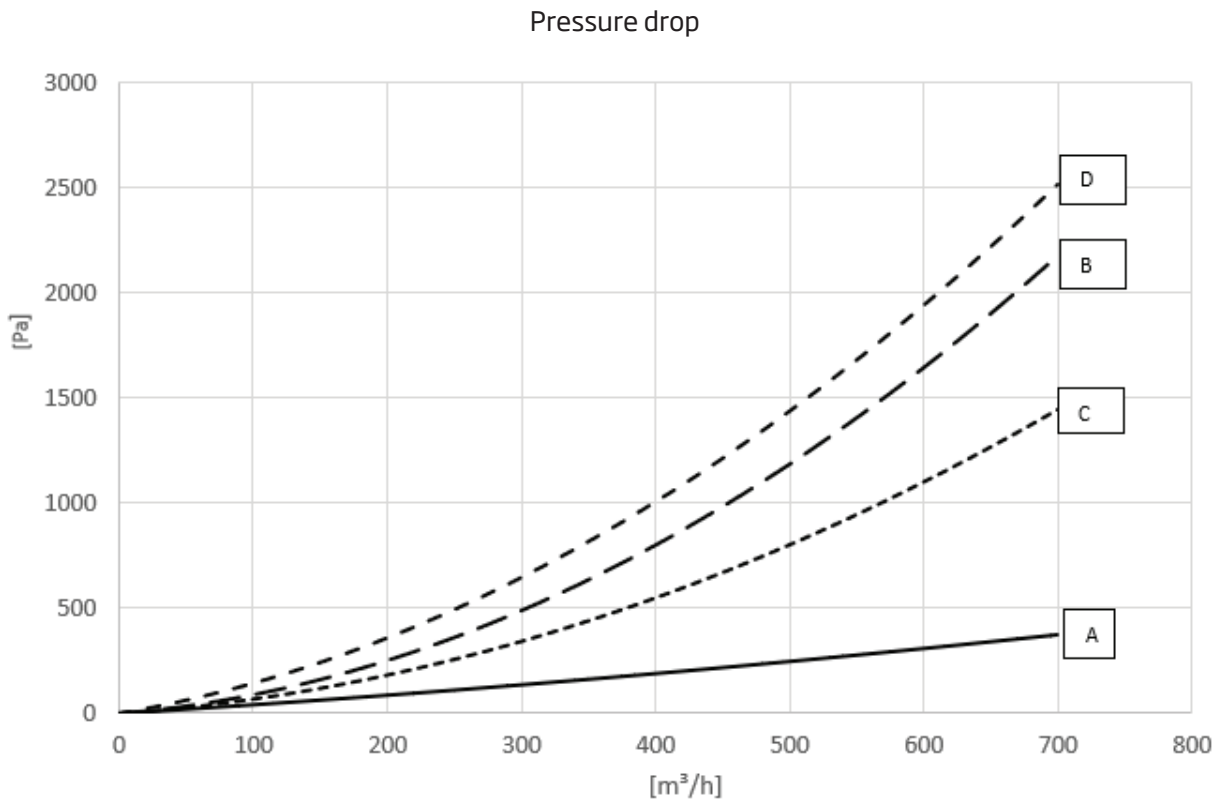
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1 Preface

Thank you for using a Nederman product!

The Nederman Group is a world-leading supplier and developer of products and solutions for the environmental technology sector. Our innovative products will filter, clean and recycle in the most demanding of environments. Nederman's products and solutions will help you improve your productivity, reduce costs and also reduce the impact on the environment from industrial processes.

Read all product documentation and the product identification plate carefully before installation, use, and service of this product. Replace documentation immediately if lost. Nederman reserves the right, without previous notice, to modify and improve its products including documentation.

This product is designed to meet the requirements of relevant EC directives. To maintain this status, all installation, maintenance, and repair is to be done by qualified personnel using only Nederman original spare parts and accessories. Contact the nearest authorized distributor or Nederman for advice on technical service and obtaining spare parts. If there are any damaged or missing parts when the product is delivered, notify the carrier and the local Nederman representative immediately.

1.1 PAK-M specifics

The Vacuum and Control unit can be used as a standalone vacuum source or be part of a complete PAK-M fitted with different dust separators, filters and accessories.

PAK-M comes in three main configurations:

- 1 A stand alone Vacuum and Control unit.
- 2 A Vacuum and Control unit with a Standard Dust Separator.
- 3 A Vacuum and Control unit with a Dust Separator in a DX/EX configuration.

The main manual is the User Manual for the stand alone Vacuum and Control unit. Other manuals are extensions of this manual. Please consider these notes:

NOTE!

- For each variant of PAK-M: Manuals are separated into User Manuals, Installation and Service Manuals, a Program Manual and accessory manuals.
- Refer to the correct manual in case of missing information. A manual generally describe the specific configuration; Dust Separator, ATEX, accessory, and so on.
- All manuals must be kept with care and made available to all persons involved in operating the equipment.
- Images in this User Manual may differ slightly from your model.

2 Safety

2.1 Classification of important information

This document contains important information that is presented either as a warning, caution or note, according to the following examples:



WARNING! Risk of personal injury

Warnings indicate a potential hazard to the health and safety of personnel, and how that hazard may be avoided.



CAUTION! Risk of equipment damage

Cautions indicate a potential hazard to the product but not to personnel, and how that hazard may be avoided.



NOTE!

Notes contain other information that is important for personnel.

2.2 Overall PAK-M safety

- PAK-M, including its configurations must be installed, used and maintained according to all related manuals in such a way that safety not will be neglected.
- All related manuals must be easily available, otherwise, the product will lack one of its fundamental safety requisites.

**WARNING! Risk of personal injury**

- Any functional disorders, especially those affecting the safety of the machine, must be rectified immediately. If improperly used, poorly connected, or altered, no matter how minor, the safety and reliability could be jeopardized.
- Grinding, welding or other hot works on PAK-M or the duct system should not be done without first stopping and cleaning the system.
- Do not collect items that may cause ignition or blocking. It is strictly prohibited to collect material that can undergo dangerous chemical or thermal reactions and/or self-ignite.
- Each PAK-M system must be dimensioned individually. To ensure that your system will be safe, a risk analysis must be performed for each installation and intended use.
- Do not make any changes to this product without consulting Nederman.

**NOTE!**

Some materials may undergo chemical reactions in combination with humidity/water. Such humidity may, for example, form if the humidity in the extracted air is condensed in the filters.

3 Description

PAK-M with Standard Dust Separator filters and collect dry dust and fumes in a high vacuum system, such as fumes from welding processes. Different filter solutions exist.

**WARNING! Risk of personal injury**

- The Standard Dust Separator is designed for collecting and filtering non-combustible dry dust. It is not to be used for combustible dust or extraction of combustible gases in explosive concentrations.
- Even though neither the concentration of dust nor gas is combustible, the combination may be. The Standard Dust Separator is not intended for use in these conditions.

3.1 Main parts

Figure 1 shows the different parts/modules of PAK-M with Standard Dust Separator.

- 1 Outlet with filter cleaning
- 2 Main filter
- 3 Main filter housing
- 4 Support leg
- 5 Collecting bin

- 6 Outlet hose
- 7 Secondary filter (optional)
- 8 Vacuum and Control unit
- 9 Inlet
- 10 Vacuum equalization hose

3.2 Collecting bin

The Dust Separator is equipped with a pressure equalized bin that collects the dust material in a plastic bag.

**NOTE!**

Other collection methods may be used if found to be safe in the system risk analysis.

3.3 Feed out devices

If a different feed-out device is used, like TVFD, butterfly, or rotary valves, see the respective manual for the feed-out device.

3.4 Filters

PAK-M with Standard Dust Separator is delivered with or without a secondary filter fitted in a separate housing. The secondary filter and the housing can be ordered as an accessory. See [Section 3.1 Main parts](#) and [Section 3.7 Technical data](#).

3.5 Accessories

PAK-M is prepared for Nederman accessories and customer connections.

The installation of accessories, extra equipment, and functions are described in the manual for each product and according to the electrical diagrams that came with it. Consult your local Nederman representative for available accessories.

3.6 Pressure measuring points and connections

Figure 3 shows the pressure measuring points and connections.

P1: Pressure sensing tube. Pressure measuring point for pressure upstream main filter, Ø 6 mm (0.24")

P2: Pressure sensing tube. Pressure measuring point for pressure downstream main filter, Ø 6 mm (0.24")

CV: Cleaning Valve, Ø 6 mm (0.24")

CC: Cleaning Cylinder

**CAUTION! Risk of equipment damage**

- Do not switch connections for pressure measuring points.
- Blue tubes are used for measuring and black for compressed air.

3.7 Technical data

PAK-M with Standard Dust Separator	
Capacity and pressure drop* :	Flow is shown in m ³ /h and pressure/pressure drop in kPa/Pa
- Capacity PAK-M	See Figure 8 , item A
- Capacity PAK-M with secondary filter	See Figure 8 , item B
- Pressure drop P1-P2 (main filter)	See Figure 9 , item A
- Pressure drop P2-P3 (secondary filter)	See Figure 9 , item B
- Pressure drop Dust Separator without secondary filter	See Figure 9 , item C
- Pressure drop Dust Separator with secondary filter (H14)	See Figure 9 , item D
Process air (dry) temperature	See the User Manual for the Vacuum and Control unit
Operating temperature	See the User Manual for the Vacuum and Control unit
Main filter, area	3,4 m ² (36.6 sqft)
Main filter, material	Polyester with PTFE coating
Main filter, material efficiency	Class M according to EN 60335-2-69
Secondary filter (optional):	See Figure 1 , item 7
- Area	6,16 m ² (66.3 sqft)
- Material	3 layer, polyester/glass fibre/polyester
- Efficiency	HEPA H14 (99.995% MPPS)
Protection class PAK-M	IP54
Weight Dust Separator, approx:	70 kg (154 lb)
Weight PAK-M with Standard Dust Separator, approx:	253 kg (558 lb)
Dimensions:	See Figure 2
- Inlet, Dust Separator (A)	Ø 100 mm (3.94 ")
- Outlet, Dust Separator (B)	Ø 100 mm (3.94 ")
- Inlet, Vacuum and Control unit (C)	Ø 100 mm (3.94 ")
- Outlet, Vacuum and Control unit (D)	Ø 100 mm (3.94 ")
Compressed air connection	Ø6 mm (0.24 ")

PAK-M with Standard Dust Separator	
Compressed air quality	Clean dry, ISO 8573-1 class 5
Compressed air pressure	6 - 10 bar (87 - 145 PSI)
Max air consumption (intermittent during filter cleaning)	700 N-Litres/min (25 cfm)
Control voltage Dust Separator	24 V DC \pm 10%
Material Dust Separator	Powder coated steel
Corrosion protection level Dust Separator	C2 according to ISO 12944-2
Material recycling Dust Separator, approx	98 weight-%
Collecting bin volume	70l

* New clean filters. See the Vacuum and Control unit User Manual for max pressure set point.

4 Using PAK-M



WARNING! Risk of personal injury

- PAK-M is intended to be used by experienced adult operators who are properly trained and understand how to use it.
- Use ear protection when appropriate.
- Use proper protective equipment where there is a risk of exposure to dust.
- Never run PAK-M without a main filter or a bin bag inserted.
- The outlet of the Dust Separator may reach high temperatures during normal operation.

4.1 Main filtration

Dust have widely different properties. Some kinds are easily cleaned off the main filter bags while others require more powerful cleaning.

Main filtration process:

- 1 The inlet module separates coarse particles.
- 2 The coarse particles fall down into the collecting bin.
- 3 Fine dust particles follow the up-going air flow through the filter unit. These particles are separated on the outside surface of the main filter. A long spiral spring in each filter bag keeps it from flattening as air passes through it from outside to inside.
- 4 The filtered air is continuous through the secondary filter.
- 5 The filtered air leaves the Dust Separator.

The pressure drop increases as more fine dust settles on the main filter bags. During filter cleaning, part of

the dust is dislodged and falls down into the collecting bin.

PAK-M with standard filter cleaning uses its own vacuum to generate a short blast of air backwards through the main filter bags. A compressed air cylinder in the top module opens a disc valve so that atmospheric air can rush into the housing to neutralize the vacuum stored inside it.

The higher the vacuum and the larger the connected duct system, the more air will flush backwards through the main filter and the cleaning will be more effective.



NOTE!

- It is not desirable to dislodge all dust from the main filter bags. A certain quantity of fine particles on them improves particle separation compared to using clean bin bags.
- Extracted materials are to be considered waste and are to be discarded.

5 Maintenance



WARNING! Risk of personal injury

- Use proper protective equipment where there is a risk of exposure to dust.
- Use proper lifting equipment and protective gear.
- Wear ear protection when work is carried out near the upper section of the Dust Separator.
- The compressed air supply needs to be securely disconnected during maintenance.
- Avoid spilling materials.



WARNING! Risk of explosion

Before performing any grinding, welding or other hot works on PAK-M, stop operation and clean all parts in contact with dust: filter housing, filters, collecting bin and so on.

5.1 Emptying the collecting bin

The collecting bag/bin bag should be replaced when filled up to 2/3. Regular checks or the use of a Nederman BLI (Bin Level Indicator) is recommended.



NOTE!

- Ensure that no vacuum is present before removing the collecting bin.
- The bin bag may be heavy.
- Use Nederman plastic bags.

Empty the collecting bin as follows:

- 1 Disconnect the vacuum equalization hose and remove the collecting bin.
- 2 Seal and remove the bin bag. Use a cable tie or equivalent, see [Figure 6](#).
- 3 Fit a new bag into the bin.
- 4 Refit the bin to the Dust Separator.
- 5 Inspect the vacuum equalization hose and secure that it is firmly attached to the bin, see [Figure 7](#).
- 6 Check that the bin seals properly once the vacuum returns.

5.2 Maintenance schedule

Type of maintenance	Frequency
Regular inspection	Regularly and after changed operating conditions
Yearly inspection	One month after installation and every year
Main filter change	6000 hours

5.3 Inspections

At least yearly:

- 1 Inspect all parts of PAK-M and pay special attention to the seals for the collecting bin and main filter. Also inspect the steel clamping rings holding together the housing/inlet/cone-modules. Replace damaged parts.
- 2 Check all parts of all attachments. Tighten bolts if necessary.
- 3 Make sure the outside, particularly the solenoids, sensors and connection box, are free from dust layers.
- 4 Make sure the inside of PAK-M and the connection pipes are free from deposits.

- 5 Clean the area around PAK-M, including all areas where the collected material is stored to ensure that there are no dust deposits.
- 6 Check that all signs/markings regarding safe operation are in place and that personnel know about them.

5.4 Changing the main filter package

The main filter should normally be replaced after 6000 hours of operation or when damaged. It should also be replaced if the filter function is insufficient.

The Dust Separator can be tilted if there is no clearance above to remove the filter. See [Section 5.5 Tilting the Dust Separator](#).



NOTE!

Replacement of filters should be registered in the Service protocol. It can be found in the Installation and Service Manual.



WARNING! Risk of personal injury

- Never run PAK-M without the required filters inserted.
- The vacuum and compressed air must be turned off before commencing a filter change.
- Use proper lifting equipment and protective gear.

- 1 Disconnect the outlet hose from the outlet.
- 2 Disconnect the pneumatic 3/2 cleaning valve from CV.
- 3 Remove the pressure sensing tubes, see [Figure 3](#), items P1 and P2. Continue with other added connections.
- 4 Remove the lid from the outlet.
- 5 Take out the main filter package and put it in a large plastic bag, or wrap it in plastic foil to avoid dust spreading.
- 6 Fit the new filter package.
- 7 Reconnect the pressure sensing tubes, pneumatic valve and outlet hose.

5.5 Tilting the Dust Separator



WARNING! Risk of personal injury

- Avoid placing PAK-M in an area that requires the Dust Separator to be tilted to access the main filter, consider it a last resort. Do a risk assessment before tilting.
- Use proper lifting equipment and protective gear.
- The support leg must be firmly anchored to the floor. See [Figure 1](#), item 4.

NOTE!

- Tilting requires the support, accessory, leg to be fitted.
- You need to make a gap of around 4 mm between the leg and the Vacuum and Control unit in order to tilt the filter.
- How to remove the Vacuum and Control unit panels is described in the Installation and Service Manual for the Vacuum and Control unit.

The Dust Separator tilts and swivels around two M16 bolts.

- 1 Remove ducting from the inlet.
- 2 Follow steps 1-3 in [Section 5.4 Changing the main filter package](#) for a filter change.
- 3 Remove the required Vacuum and Control unit panels.
- 4 Ensure that the M16 bolts are not tightened so the Dust Separator can pivot around them. Loosen to a gap of around 3 mm.
- 5 Remove the four M12 bolts in the bracket. See [Figure 4](#), items A.
- 6 Turn the filter housing by releasing the push-in lock pin. See [Figure 4](#), item B.
- 7 Rotate the filter housing 90°. The lock pin will automatically lock the position.
- 8 Follow steps 4-6 in [Section 5.4 Changing the main filter package](#).
- 9 Tilt the Dust Separator back into an upright position and fit the four M12 bolts on each side. See [Figure 4](#), items A.
- 10 Reconnect the ducting to the inlet.

5.6 Changing the secondary filter

See [Figure 5](#).

- 1 Disconnect the outlet hose, item 4C, from the Dust Separator.
- 2 Open the four locks on the filter housing, items 2D, and remove the lid.

**NOTE!**

Item 2 shows the filter with the lid removed.

- 3 Thread a plastic bag over the secondary filter housing and lift out the filter, item 2E, inside the plastic bag.
- 4 Fit the new filter.
- 5 Fit the lid.
- 6 Reconnect the outlet hose.

6 Spare Parts

**CAUTION! Risk of equipment damage**

Use only Nederman original spare parts and accessories.

Contact your nearest authorized distributor or Nederman for advice on technical service or if you require help with spare parts. See also www.nederman.com.

6.1 Ordering spare parts

When ordering spare parts always state the following:

- The part number and control number (see the product identification plate).
- Detail number and name of the spare part (see www.nederman.com/en/service/spare-part-search).
- Quantity of the parts required.

7 Recycling

The product has been designed for component materials to be recycled. Different material types must be handled according to relevant local regulations. Contact the distributor or Nederman if uncertainties arise when scrapping the product at the end of its service life.

Nederman

www.nederman.com