

# **INSTRUCTION BOOK**

## **COMPRESSED AIR FILTERS**

DD 7+-630+, DDp 7+-630+, PD 7+-630+, PDp 7+-630+, QD 7+-630+, UD 7+-630+

*Atlas Copco*





# Atlas Copco

## Compressed air filters

DD 7+-630+, DDp 7+-630+, PD 7+-630+, PDp 7+-630+,  
QD 7+-630+, UD 7+-630+

### Instruction book

Original instructions

#### **COPYRIGHT NOTICE**

Any unauthorized use or copying of the contents or any part thereof is prohibited.

This applies in particular to trademarks, model denominations, part numbers and drawings.

This instruction book is valid for CE as well as non-CE labelled machines. It meets the requirements for instructions specified by the applicable European directives as identified in the Declaration of Conformity.

## Table of contents



<b>1</b>	<b>Safety.....</b>	<b>4</b>
1.1	SAFETY ICONS.....	4
1.2	SAFETY PRECAUTIONS DURING INSTALLATION.....	4
1.3	SAFETY PRECAUTIONS DURING OPERATION.....	5
1.4	SAFETY PRECAUTIONS DURING MAINTENANCE OR REPAIR.....	5
1.5	DISMANTLING AND DISPOSAL.....	6
<b>2</b>	<b>Description.....</b>	<b>8</b>
2.1	DESCRIPTION OF FILTERS.....	8
2.2	FILTERS WITH INPASS™.....	9
2.3	FILTERS WITHOUT INPASS™.....	11
2.4	OPTIONS.....	12
<b>3</b>	<b>Installation.....</b>	<b>16</b>
3.1	GENERAL REMARKS.....	16
3.2	SPECIFIC REMARKS.....	17
3.3	SMART SERVICE INDICATOR.....	17
3.4	ISO 12500.....	20
<b>4</b>	<b>Maintenance.....</b>	<b>22</b>
4.1	MAINTENANCE.....	22
4.2	FILTER ELEMENT CHANGE WITH INPASS™.....	22
4.3	FILTER ELEMENT CHANGE WITHOUT INPASS™.....	27
4.4	DRAIN REPLACEMENT.....	28
4.5	SERVICE INTERVALS.....	29
<b>5</b>	<b>Technical data.....</b>	<b>30</b>
5.1	REFERENCE CONDITIONS.....	30

5.2	PRINCIPAL DATA.....	30
5.3	SPECIFIC DATA.....	30
5.4	RATED FLOW AT REFERENCE CONDITIONS.....	32
5.5	CORRECTION FACTORS.....	33
5.6	DIMENSIONS AND WEIGHT.....	33
5.7	SUPPLIED COMPONENTS.....	36
<b>6</b>	<b>Pressure equipment directives.....</b>	<b>38</b>

# 1 Safety


## 1.1 Safety icons

### Explanation

	Danger to life
	Warning
	Important note

## 1.2 Safety precautions during installation

1. Install the equipment where the ambient air is cool and as clean as possible. Consult section Reference conditions and limitations.
2. During installation or any other intervention on the equipment or one of the connected machines, the machines must be stopped, de-energized and the isolating switch opened and locked before any maintenance or repair. As a further safeguard, persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the start equipment.
3. Install the equipment in an area free of flammable fumes, vapours and particles, e.g. paint solvents, that can lead to internal fire or explosion.
4. The electrical connections must correspond to the applicable codes. The equipment must be earthed and protected against short circuits by fuses in all phases. A lockable power isolating switch must be installed near the equipment.
5. For machines controlled by a central control system, a sign stating "This machine may start without warning" must be affixed near the instrument panel.
6. In multiple compressor systems, manual valves must be installed to isolate each compressor. Non-return valves (check valves) must not be relied upon for isolating pressure systems.
7. Never remove or tamper with the safety devices.
8. If the maximum pressure of the compressor is higher than the design pressure of the connected equipment (e.g. a nitrogen generator or an oxygen generator), a full flow safety valve must be installed between the compressor and the connected equipment, in order to be able to blow off the excessive pressure.

	<p>Also consult following safety precautions: <a href="#">Safety precautions during operation</a> and <a href="#">Safety precautions during maintenance or repair</a>.</p> <p>These precautions apply to electrical devices.</p> <p>For precautions applying to the connected equipment consult the relevant instruction book.</p> <p>Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your device.</p>
---	---

## 1.3 Safety precautions during operation



All responsibility for any damage or injury resulting from neglecting these precautions, or non-observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

1. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
2. Never operate the device in the presence of flammable or toxic fumes, vapours or particles.
3. Never operate the device below or in excess of its limit ratings.
4. Do not operate the device when there are flammable or toxic fumes, vapors or particles.
5. Keep all bodywork doors and panels closed during operation. The doors may be opened for short periods only, e.g. to carry out routine checks.
6. People staying in environments or rooms where the sound pressure level reaches or exceeds 90 dB(A) shall wear ear protectors.
7. Periodically check that:
  - All guards and fasteners are in place and tight
  - All hoses and/or pipes are in good condition, secure and not rubbing
  - There are no leaks
  - All electrical leads are secure and in good order
8. Never remove or tamper with the safety devices.



Also consult following safety precautions: [Safety precautions during installation](#) and [Safety precautions during maintenance](#) or repair.  
 These precautions apply to electrical devices.  
 For precautions applying to the connected equipment consult the relevant instruction book.  
 Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.

## 1.4 Safety precautions during maintenance or repair



All responsibility for any damage or injury resulting from neglecting these precautions, or non observance of the normal caution and care required for installation, operation, maintenance and repair, even if not expressly stated, will be disclaimed by the manufacturer.

1. Use only the correct tools for maintenance and repair work.
2. Use only genuine spare parts.
3. A warning sign bearing a legend such as "Work in progress - do not start" shall be attached to the starting equipment, including all remote start equipment.
4. Persons switching on remotely controlled machines shall take adequate precautions to ensure that there is no one checking or working on the machine. To this end, a suitable notice shall be affixed to the remote start equipment.
5. Never use flammable solvents or carbon tetrachloride for cleaning parts. Take safety precautions against toxic vapors of cleaning liquids.
6. Scrupulously observe cleanliness during maintenance and repair. Keep dirt away by covering the parts and exposed openings with a clean cloth, paper or tape.

7. Never use a light source with open flame for inspecting the interior of the device.
8. All regulating and safety devices shall be maintained with due care to ensure that they function properly. They may not be put out of action.
9. Before clearing the device for use after maintenance or repair, check that operating pressures, temperatures and time settings are correct. Check that all control and shutdown devices are fitted and that they function correctly.
10. Make sure that no tools, loose parts or rags are left in or on the device.
11. Never use caustic solvents which can damage materials of the device.



Also consult following safety precautions: [Safety precautions during installation](#) and [Safety precautions during operation](#).  
 These precautions apply to electrical devices.  
 For precautions applying to the connected equipment consult the relevant instruction book.  
 Some precautions are general and cover several machine types and equipment; hence some statements may not apply to your machine.



Units and/or used parts must be disposed of in an environmentally friendly and safe manner and in line with the local recommendations and legislation.

## 1.5 Dismantling and disposal

### Dismantling

Once the end of life of the machine is reached, please follow next steps:

1. Stop the machine.
2. Check all safety precautions mentioned in the previous chapters to secure safe handling (e.g. LOTO, cool-down, depressurize, discharge, ...).
3. Separate the harmful from the safe components (e.g. drain oil from oil containing parts).
4. Refer to the disposal topic mentioned below.

### Disposal of electrical and electronic appliances (WEEE)

This equipment falls under the provisions of the European Directive 2012/19/EU on waste electrical and electronic appliances (WEEE) and may not be disposed as unsorted waste.



The equipment is labelled in accordance with the European Directive 2012/19/EU with the crossed-out wheeled bin symbol.

At the end of life-time of the electric and electronic equipment (EEE) it must be taken to separate collection.

For more information check with your local waste authority, customer center or distributor.

### **Disposal of other used material**

Used filters or any other used material (e.g. filter bags, filter media, desiccant, lubricants, cleaning rags, machine parts, etc.) must be disposed of in an environmentally friendly and safe manner, and in line with the local recommendations and environmental legislation.

## 2 Description

### 2.1 Description of filters

Type	Description	Air flow
DD+	<ul style="list-style-type: none"> <li>Coalescing filters for general purpose protection, removing solid particles, liquid water and oil aerosol</li> <li>Air purity class in a typical installation: [2:-:3]</li> </ul>	from inside to outside
PD+	<ul style="list-style-type: none"> <li>High efficiency coalescing filters, removing solid particles, liquid water and oil aerosol</li> <li>Air purity class in a typical installation and when preceded by a DD+ filter: [1:-:2]</li> </ul>	from inside to outside
UD+	<ul style="list-style-type: none"> <li>High efficiency coalescing filters, removing solid particles, liquid water and oil aerosol</li> <li>Air purity class in a typical installation: [1:-:2]</li> </ul>	from inside to outside
DDp+	<ul style="list-style-type: none"> <li>Particulate filters for dust protection</li> <li>Air purity class in a typical installation: [2:-:-]</li> </ul>	from outside to inside
PDp+	<ul style="list-style-type: none"> <li>High-efficiency particulate filters for dust protection</li> <li>Air purity class in a typical installation: [1:-:-]</li> </ul>	from outside to inside
QD+	<ul style="list-style-type: none"> <li>Oil vapour and odour removal filters</li> <li>Air flows through the activated carbon which is contained in the QD filter element and which absorbs oil vapours and odours</li> <li>Air purity class in a typical installation: [1:-:1]</li> </ul>	from inside to outside

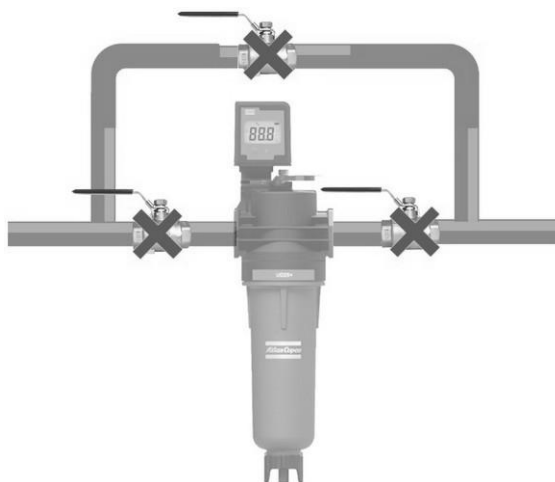


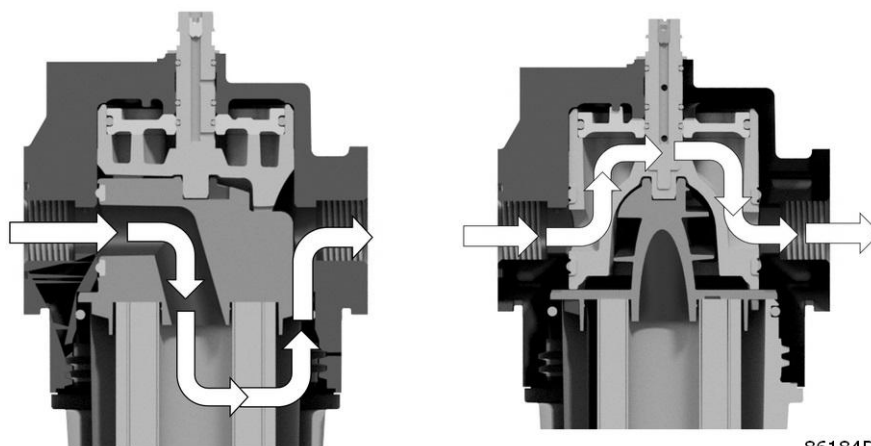
The QD+ filter does not remove methane, carbon monoxide, carbon dioxide or other toxic gases and fumes, and therefore is not to be used for breathing air purposes.

## 2.2 Filters with inPASS™



The premium range filters are equipped with an integrated inPASS™ valve in the housing. This inPASS™ valve will be used to service the filter and replace the filter element without interrupting operation and compressed air flow.





86184D

In normal filtration operation the air flow is directed into the filter element and passes through several filter media layers before being guided to the outlet port of the filter. When the inPASS™ valve is activated, the compressed air flow is redirected through this valve to the filter outlet. This creates the opportunity to depressurize the filter housing, using the drain valve at the bottom of the filter, and service the filter element. As a result, there is no need any more to install the filter in a 3-valve bypass.

Refer to section [Filter element change](#) for the instructions on filter element service on an inPASS™ filter.



During service while the inPASS™ valve is activated, there can be an increased pressure drop over the filter housing up to 1 bar(e) or 15 psig, depending on the size of the filter and the working conditions.



86182D

The DD+, PD+, UD+, DDp+ and PDp+ filters that are equipped with an inPASS™ valve will also have a smart service indicator installed for all sizes. At start-up and during normal operation, this digital pressure drop indicator will show pressure drop indication in a range from 0 to 750 mbar, running hours and days in use. Above predefined pressure drops, running hours or days in use, a warning and alarm signal (LED or external alarm contact) will be activated.

- **Warning mode:** Flashing LED indicates a warning mode, meaning service is necessary.
- **Alarm mode:** Above the predefined thresholds the LED will turn red non-stop, meaning immediate service action is required

Refer to section [Service intervals](#) for more information on service intervals.

## 2.3 Filters without inPASS™



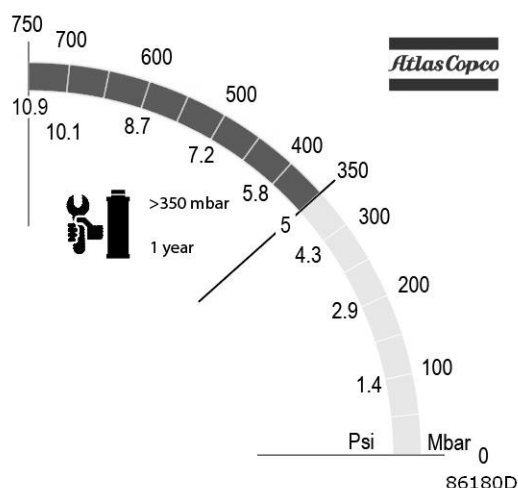
86177D

The standard range filter is not equipped with an integrated inPASS™. The DD+, PD+, UD+, DDp+ and PDp+ filters have a differential pressure indicator for sizes 7+ to 45+ and a differential pressure gauge for sizes 45+ to 630+.



86178D

At start-up and during normal operation, the differential pressure indicator will be yellow; it turns partially red when the pressure drop of the filter increases.



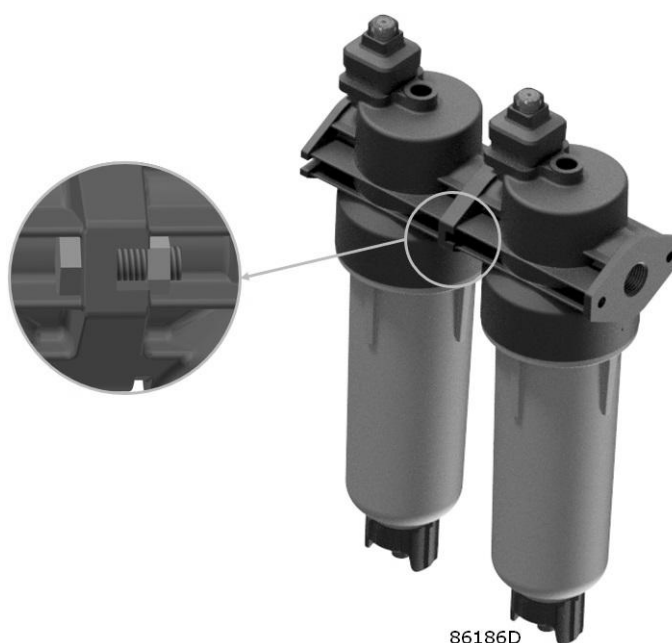
The differential pressure gauge indicates the pressure drop on an indicative scale from 0 to 750 mbar.

Refer to section [Service intervals](#) for more information on service intervals.

## 2.4 Options

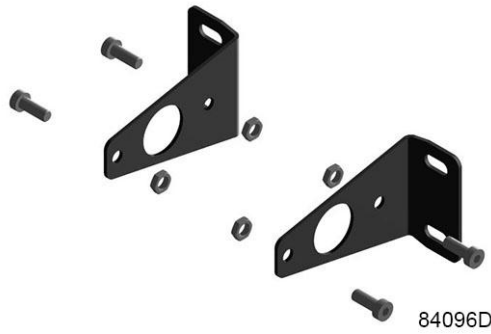
### Filter connection kit

If two or more filters are used in combination, build the filter heads together by means of a serial connection in the correct air flow direction. An arrow for the air flow direction is shown on the filter head or on the differential pressure indicator and gauge.



### Wall mounting kit

For wall mounting, a special set is available as option. Fit the mounting brackets with bolts, washers and nuts to a solid frame within easy reach, leaving sufficient space for maintenance and service.

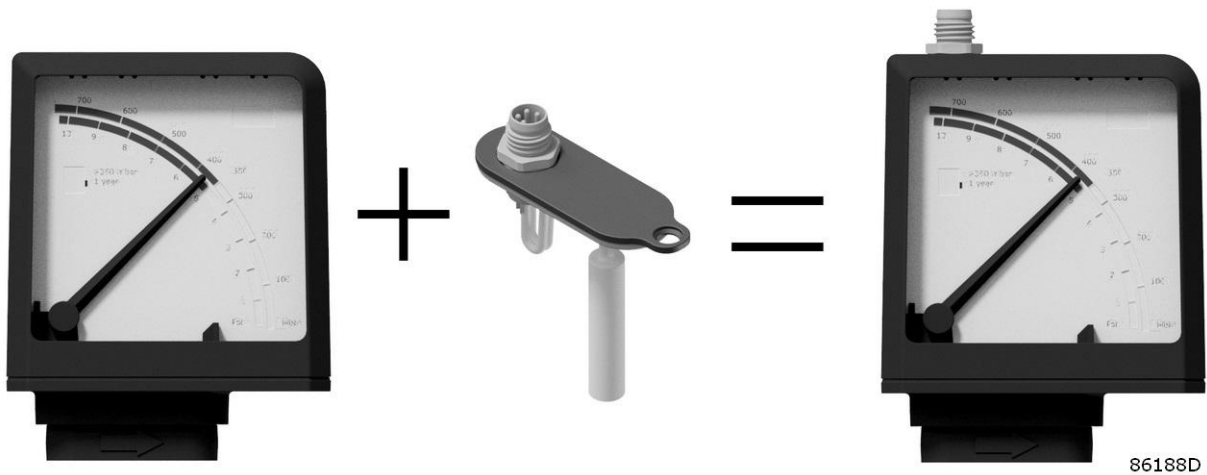


84096D

### Voltage-free contact

A voltage-free switch, mounted in the differential pressure gauge, closes at a pressure drop of 0.35 bar (5 psi) and can be used for remote control or alarm purposes.

The maximum switching voltage and current are 30 VAC/VDC and 0.2 A respectively.



86188D

### External power supply

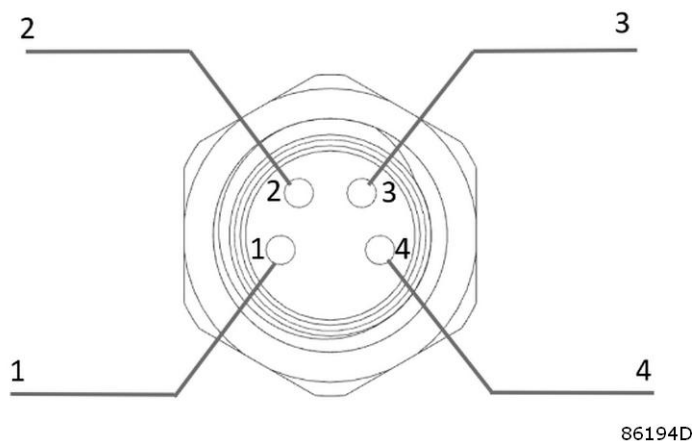
Optionally, the smart service indicator can be fitted with an external power supply and alarm contact. Alarm contact will be triggered based on the pre-defined service criteria.

The optional connection kit consists of a male M8 connector including wiring and connection to the PCB of the smart service indicator.

Please find following wiring plan in order to connect the option kit.

Cable diameters: 0.75 mm<sup>2</sup>

Power supply spec: 24Vdc, min. 200mA-5W, Max. 500mA-13W



Reference	Description
1	+VCC from external power supply
2	GND (ground) from power supply
3	Output signal NO (normally open). If needed, the contact can be changed to NC (normally closed) in the settings menu.
4	–

## Electronic drain

The electronic drain is optional on the DD+, PD+ and UD+ filters.



The electronic drain is a zero loss, electronically operated drain valve, specially designed to drain oil condensate. A sensor senses the condensate level. If this level exceeds a preset value, the drain waits for a fixed programmed time, then a solenoid valve is activated and the condensate is discharged. When all the condensate is discharged, the solenoid valve closes and condensate is collected again. This way, the loss of air is reduced to a minimum.

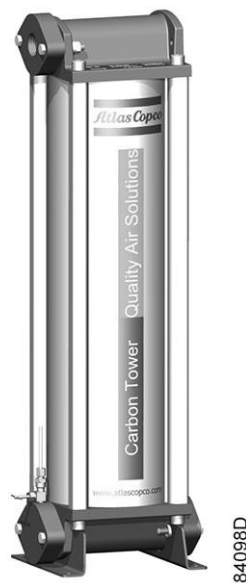
If the microcontroller registers a malfunction, the automatic drain valve will automatically change to alarm mode. This alarm signal can be relayed via a potential-free contact.

The electronic drain is available for 3 operating voltages: 220 V, 115 V and 24 V (50/60 Hz). An extra electric wiring can be foreseen to connect the potential free contacts and an external test button.



Always remove the manual drain or the automatic drain of the filter before installing the electronic drain.

## Activated Carbon Tower QDT



QDT filters are designed for the removal of **oil vapours and odours** from compressed air.

The air flows through the activated carbon which is contained in the QDT filter element and which adsorbs oil vapours and odours. The QDT has to be preceded by a DD+ and PD+ filter or an UD + filter. A DDp+ or a DDp+-PDp+ filter can be installed downstream a QDT to improve air purity.

QDT filters adsorb all oil and most of the organic volatile compounds in the air.

Some volatile organic substances are more difficult to remove. As an example, this filter does not remove methane, carbon monoxide, carbon dioxide and some other toxic gases and fumes.

Therefore air from the QDT can not always directly be used for breathing purposes.

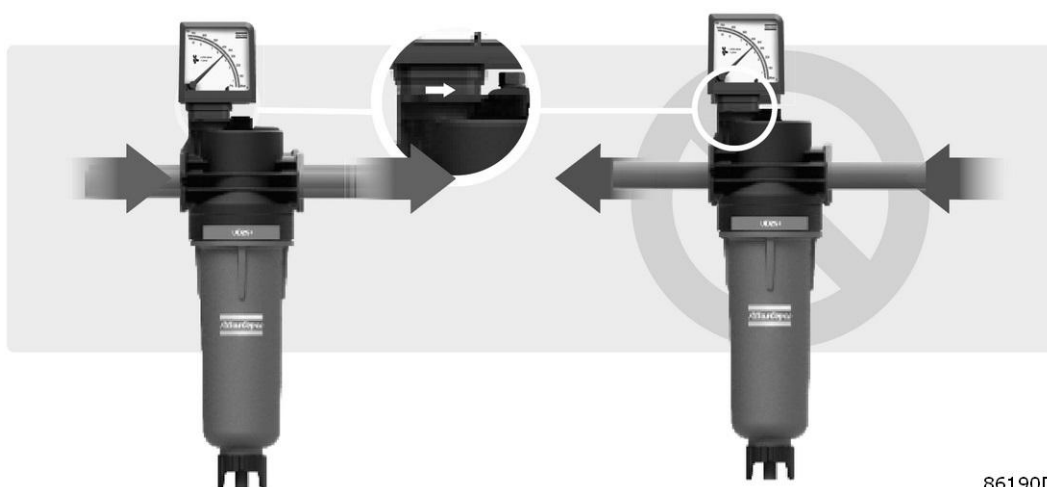
For more information on QDT 20-310, refer to Instruction book 29xx 7090 72.

## 3 Installation

### 3.1 General remarks

When installing the filter, keep in mind the following:

- Be sure that the piping is internally clean, especially downstream of the filter.
- Sizing of filter should be done carefully, taking into account the application requirements. Maximum flow capacity, as listed in Chapter 5.4 or 6.4 "Rated flow at reference conditions", should never be exceeded to make sure that filtration performance and filter lifetime are guaranteed.
- Take into account the flow direction mentioned on the filter service indicator with an arrow:



86190D

- The filters must be mounted vertically:



86191D

- If the unit is integrated in a multiple line system, provide isolating valves and (if required) a bypass.
- The automatic drain has a threaded connection allowing easy installation of a hose or a quick coupling to pipe away the drained liquid. This drained liquid should be fed into a non-pressurized vessel or drain pipe. In case two filters are installed next to each other, the drain pipe length per filter should be at least 2 meters before connecting them together. The pipe diameter of the collector should be at least twice the diameter of the pipes connected to the filter drain.
- Open and close isolating valves slowly, as a sudden pressure rise or pressure drop can cause irreversible damage to the filter element.

## Process piping recommendations

To reach class 1 for solid particles according to ISO8573-1, it's recommended to use stainless steel piping or AIRnet aluminum piping. Other types of piping, like brass or copper piping's are not recommended as the surface roughness is too high, which makes class 1 difficult to reach.

### inPASS™ filter

When installing the filter with inPASS™, it is important that this inPASS™ is completely turned in filter mode.

Refer to section [inPASS™ instructions](#) for more information on how to use the inPASS™ correctly.

## 3.2 Specific remarks

### DD+ filter

The filter should be preceded by a water separator if no water separator is integrated in the after cooler of the compressor. In case a dryer is preceding the filter, a water separator is no longer required.

### PD+ filter

It is recommended to install a DD+ filter upstream the PD+ filter. If not, the load on the PD+ filter element may become too high and will reduce its lifetime.

### DDp+ and PDp+ filter

When the DDp+ and PDp+ filters are used with an adsorption type air dryer, install the filter downstream of the dryer.

### UD+ filter

The filter should be preceded by a water separator if no water separator is integrated in the after cooler of the compressor. In case a dryer is preceding the filter, a water separator is no longer required.

### QD+ filter

To protect the active carbon element, a QD+ filter must always be preceded by a DD+ and PD+ or UD+ filter.

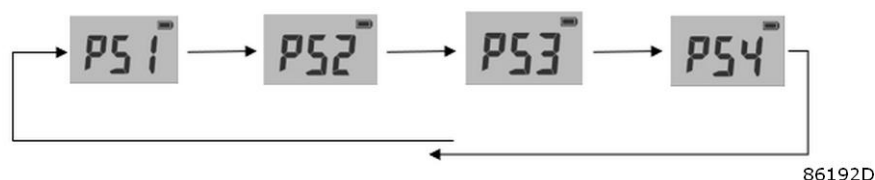
The filter should be mounted as close as possible to the point of use of the air.

## 3.3 Smart service indicator

### Commissioning

When installing the filter, the smart service indicator needs to be set up correctly according to the filter grade:

- Remove the back-cover and insert 3 AA batteries. Make sure to use high quality batteries to ensure functionality. Batteries should at least comply to the following specification: AA size, alkaline, capacity: 2xxx mAh, voltage: 1.5V.
- The device will boot up automatically
- At first start up, a selection needs to be made in function of the filter grade. By pushing once (<1s) you can scroll through the different options.
- Select the required setting according to the installed filter grade and press the button for 2 seconds:
  - S1 - Setting 1: DD+, PD+, UD+, DDp+, PDp+ – grade – metric, NO (Normally open) 350 mbar, 8000 hours
  - S2 - Setting 2: QD+ metric, NO 350 mbar, 2000 hours
  - S3 - Setting 3: DD+, PD+, UD+, DDp+, PDp+ – grade – imperial, NO 5.08 psi, 8000 hours
  - S4 - Setting 4: QD+ imperial, NO 5.08 psi, 2000 hours



You can ignore the 'PRE' menu, as this is for future reset purposes.

- The device is now setup correctly and following menu should appear displaying time in use, running hours and differential pressure drop.



## Checking filter parameters

In order to see the values for time in use, running hours and pressure drop you can scroll through the following menu by pressing the button once (<1s).

When the device is not in use, it will be switched to stand-by mode. This means the display will blink every 10 seconds showing the latest parameters. The device is being activated after pushing the button. The device counters and alarms will be continuously updated and saved even in stand-by mode.



## Warning and service alarms

### Warning mode

The LED on the front of the device will be flashing once every 2 seconds in case a warning mode is triggered. This means that one of the three parameters (pressure drop, time in use and running hours) is approaching its alarm threshold. Service of the filter and battery change are imminent at this stage and should be scheduled shortly.

Also, if the battery level is becoming too low, the warning mode will be activated, and the battery outline symbol will blink.



### Alarm mode

The LED on the front of the device will be flashing once every 5 seconds in case an alarm mode is triggered. This means that one of the three parameters (pressure drop, time in use and running hours) reached its alarm threshold. Service of the filter and battery change are mandatory at this stage.

Also, if the battery status needs to be replaced, the alarm mode will be activated, and the battery outline symbol will blink.



### Reset of the device after service

Once the filter service is completed (refer to section 4.2), the device should be reset following below procedure:

- Press (<5s) and wait till following screen appears.



- Press (>5s) and wait till the 'PRE' screen appears



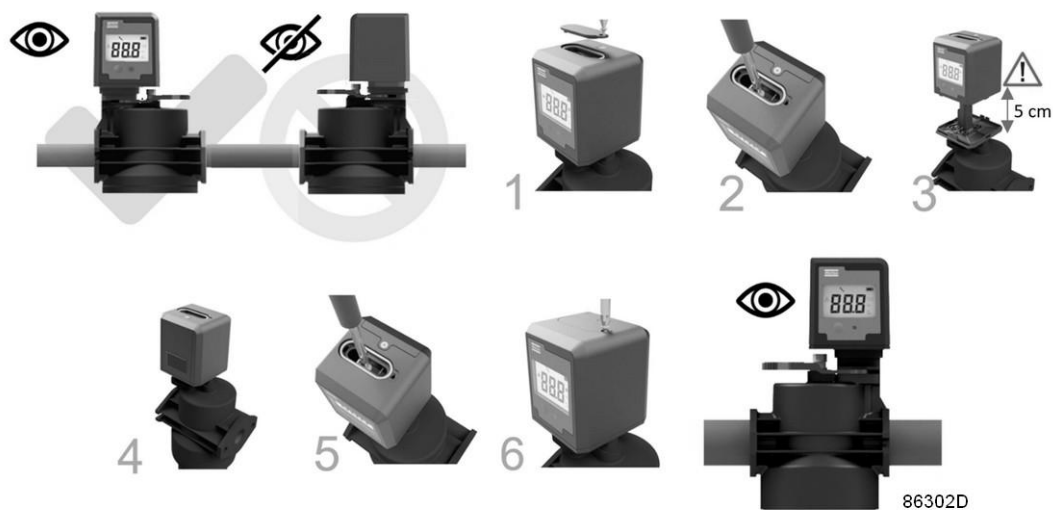
In case you press short (<5s) you will see the options explained in section [Specific remarks](#) and a new 'PRE' selection should be selected.

- Press (>2s) and you are back in the normal operation menu.



- Check if all warning and alarm modes are reset and that all counters are set at zero. If not OK, repeat previous steps.

## Rotation of the Smart service indicator



It is possible to rotate the display of the Smart service indicator for both installation directions of the filter.

1. Remove the top cover by removing the screw with the appropriate tool.
2. Remove the second screw inside with the appropriate tool, and make sure the tool is properly aligned with the screw.
3. Lift the Smart Indicator housing by max. 5cm to prevent any of the wiring from coming loose.
4. Rotate the Smart Indicator housing over 180° and lower it back on to its base.
5. Tighten the screw from Step 2 with the appropriate tool, and make sure the tool is properly aligned with the screw.
6. Position the top cover on the housing again and tighten the screw from Step 1 with the appropriate tool.

## 3.4 ISO 12500

### ISO 12500

ISO 12500 has been introduced specifically to test purification equipment for compressed air and complements ISO 8573.

ISO 12500 currently consists of:

- Part 1: Oil aerosol filters
- Part 2: Oil vapor filters
- Part 3: Particulate filters

#### ISO 12500-1:2007 - Testing of Coalescing filters

ISO 12500-1:2007 provides a set of standardized conditions on which coalescing filters should be tested in order to show their filtration performance. The testing will provide the user with an oil aerosol carry-over figure in  $\text{mg/m}^3$  and saturated (or wet) pressure drop in mbar. This is the filter performance at the reference conditions and can be used for benchmarking purposes.

#### ISO 12500-3:2009 - Testing of Dust removal filters

ISO 12500-3:2009 provides a set of standardized test conditions on which particle filters should be tested in order to show their filtration performance at reference conditions, which can be used

for benchmarking purposes. The testing will provide the user with an efficiency value on the required particle size and the initial pressure drop at nominal flow conditions.

## 4 Maintenance

### 4.1 Maintenance

When maintaining the filter, keep in mind the following:

- On filters with manual drain valve, open the latter at regular intervals to evacuate collected dust or liquid.
- In case an automatic drain valve or a solenoid timer drain is installed, manual draining can be carried out by turning the connection nipple of the automatic drain valve counterclockwise.



When the filter has to process air with a temperature higher than the specified maximum temperature, the filter's lifetime will be reduced considerably!

### 4.2 Filter element change with inPASS™

#### inPASS™ instructions

During a service event (e.g. filter element replacement, drain replacement), the inPASS™ valve can be used to isolate the filter element and the drain from the compressed air flow by bypassing the filter housing.



It is mandatory to use the lock-out feature as a safety measure to lock the inPASS™ valve in position, both when the filter is in use and when it is being serviced. This ensures the inPASS™ can't be used accidentally during service or cut of the compressed air flow during normal operation of the filter. A padlock can be used to prevent unauthorized use of the inPASS™ functionality.



The inPASS™ functionality should only be used during filter element replacement; continuous activation of the inPASS™ may lead to irreversible damage to the inPASS™.

Following steps can be taken to change the filter to inPASS™ mode for a service event:

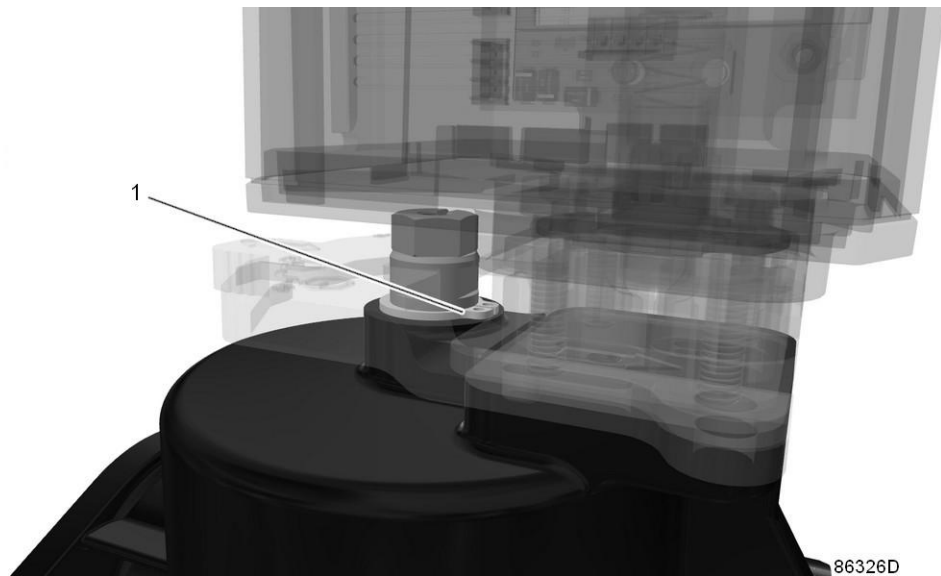
1. Unlock and remove the lock from the lock-out feature.  
Slide the lock-out feature sideways to free the hexagonal nut for rotational movement.



For safety reasons, the inPASS™ should never be operated while the bowl is dismounted (fully or only partly) from the head.



- Before operating the inPASS™, please check if the circlips (1) is correctly positioned (supported by the inPASS™ groove and the horizontal face on top of the filter head) just below the hexagonal nut. In case of any doubts, please contact your supplier.



- Place the appropriate tool (wrench, spanner) over the hexagonal nut and make sure there is room for rotational movement as indicated on the lock-out feature. Rotate the inPASS™ valve over 90° in a fluent motion (to not hinder the air flow) in the direction indicated on the lock-out feature. Fully rotate the inPASS™ until it is stopped, but keep in mind the maximal torque values shown in the table below.



- Slide the lock-out feature back into its original position to restrict the hexagonal nut from rotational movement. Use the lock to secure the lock-out feature until the service interval is done.



When in inPASS™ mode, no contaminants are filtered and pressure drop over the housing will be higher. Therefore the duration of the service events must be kept as short as possible.

Following steps can be taken to switch back to filter mode after the service event is finished:

- Unlock and remove the lock from the lock-out feature. Slide the lock-out feature sideways to free the hexagonal nut for rotational movement.



86303D



86201D

2. Place the appropriate tool (wrench, spanner) over the hexagonal nut and make sure there is room for rotational movement as indicated on the lock-out feature. Rotate the inPASS™ valve over 90° in a fluent motion (to not hinder the air flow) in the direction indicated on the lock-out feature. Fully rotate the inPASS™ until it is stopped, but keep in mind the maximal torque values shown in the table below.



86204D

3. Slide the lock-out feature back into its original position to restrict the hexagonal nut from rotational movement. Use the lock to secure the lock-out feature until the service interval is done.



86203D



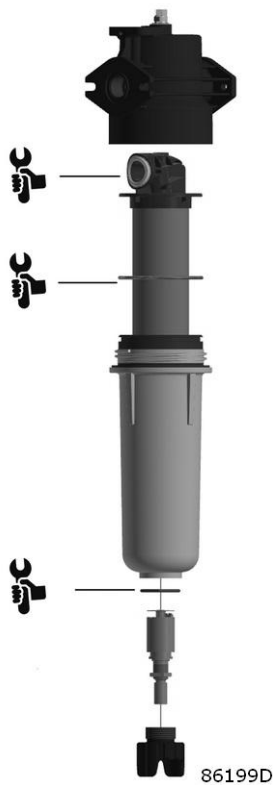
The table below indicates for every size range the expected torque values when rotating the inPASS™ valve, the maximum torque that can be used to rotate the inPASS™ valve and the recommended tool to use. Maximum torque values should not be exceeded to prevent damage to the inPASS™ valve.

Filter size	Expected torque		Maximum torque		Recommended tool
	Nm	lb-ft	Nm	lb-ft	
7 - 25	10	7.38	30	22.13	Open-ended spanner
45 - 75	15	11.06	45	33.19	Ring spanner
110 - 180	25	18.44	75	55.32	Ratchet spanner
240 - 300	35	25.81	105	77.44	Ratchet spanner
390 - 510	60	44.25	180	132.76	Ratchet spanner

## Filter element change



The hand-tool icon on the figure indicates the items provided in a dedicated filter kit.

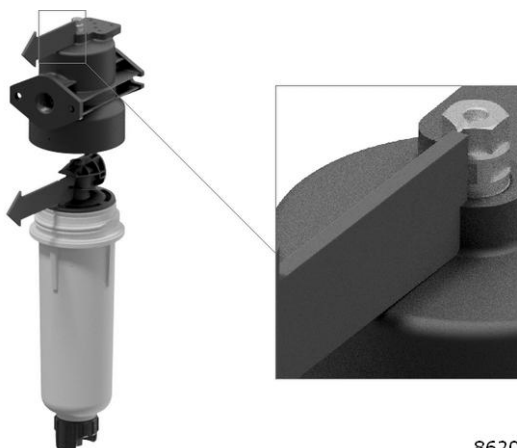


1. Before filter element change, check for any leakages at the bottom of the filter bowl (connection of manual and automatic drain) during normal filter operation. If any leakage is observed, replace the drain according to the instructions from section [Drain replacement](#).
2. Change the filter to inPASS™ mode by rotating the inPASS™ valve according to the instructions from section [inPASS™ instructions](#).
3. Depressurize the filter by turning the connection nipple of the automatic drain valve counterclockwise or by opening the manual drain valve.
4. Unscrew the bowl. A whistling noise will warn you if the bowl is not fully depressurized. If this occurs, the bowl should be tightened again, and the venting should be repeated.



In case the filter cannot be depressurized by venting via the drain port, do not continue with the filter element change and contact your supplier for further assistance.

5. Discard the used filter element.
6. Position the new filter element on top of the bowl and align the filter element fin with the groove in the top of the hexagonal nut, as can be seen in the figure below.



86205D

This is the only correct way the filter element can be installed, fitting the fin of the filter element in the foreseen space in the inPASS™ valve.



86206D

7. Screw the bowl (with the filter element resting on top) completely on the head.
8. Change the filter back to filter mode by rotating the inPASS™ valve according to the instructions from section [inPASS™ instructions](#).
9. Replace smart service indicator batteries with new high-quality batteries or directly connect to the external power supply. Refer to section [Smart service indicator](#) for detailed instructions.
10. Reset the smart service indicator to restart tracking of the next service interval. Refer to section [Smart service indicator](#) for detailed instructions.

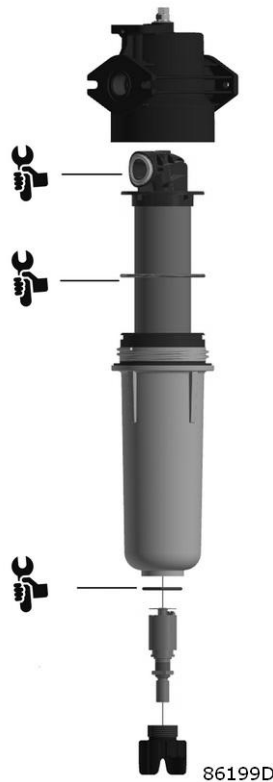


A small amount of acid-free vaseline may be applied to the threads and O-ring of the bowl to facilitate the assembly. No lubricant of any sort should be used on the filter element seal or inPASS™ seals.

## 4.3 Filter element change without inPASS™

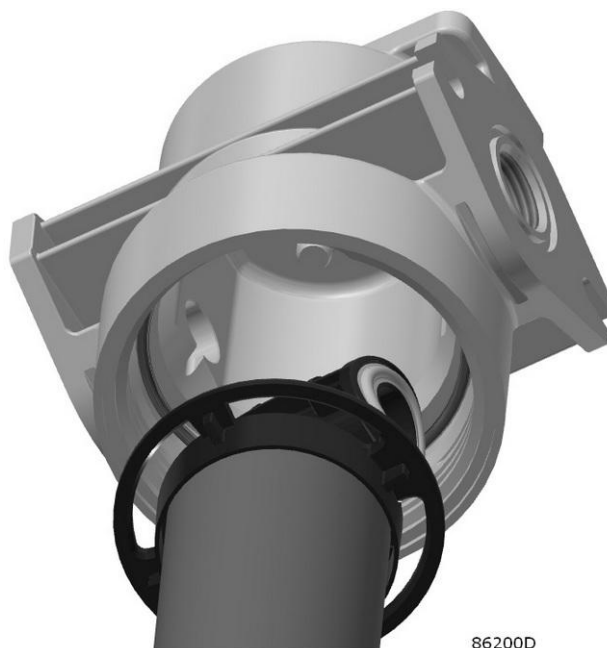


The hand-tool icon on the figure indicates the items provided in a dedicated filter kit.



1. Before filter element change, check for any leakages at the bottom of the filter bowl (connection of manual and automatic drain) during normal filter operation. If any leakage is observed, replace the drain according to the instruction from section [Drain replacement](#).
2. Isolate the filter from the air net.
3. Depressurize the filter by turning the connection nipple of the automatic drain valve counterclockwise or by opening the manual drain valve.
4. Unscrew the bowl. A whistling noise will warn you if the bowl is not fully depressurized. If this occurs, the bowl should be screwed back and the venting should be repeated.
5. Discard the filter element.
6. Position the new filter element on top of the bowl and align the filter element:
  - For the DD+, PD+, UD+ and QD+ the inlet of the filter element should be aligned with the inlet of the filter head.
  - For the DDp+ and PDp+ the inlet of the filter element should be aligned with the outlet of the filter head.

This is the only correct way the filter element can be installed, fitting the fin of the filter element in the foreseen groove in the filter head.



7. Screw the bowl (with the filter element resting on top) completely on the head.

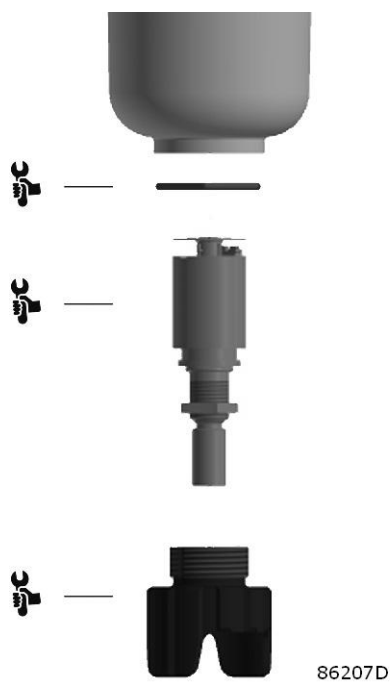


A small amount of acid-free vaseline may be applied to the threads and O-ring of the bowl to facilitate the assembly. No lubricant of any sort should be used on the filter element seal.

## 4.4 Drain replacement



The hand-tool icon on the figure indicates the items provided in a dedicated filter kit.



1. Start by isolating the filter housing from the compressed air flow.
  - For a filter without inPASS™ valve, this is done externally.
  - For a filter with inPASS™ valve, this is done by rotating the inPASS™ valve into inPASS™ mode, following the instructions in section [inPASS™ instructions](#).
2. Depressurize the filter by turning the connection nipple of the automatic drain valve counterclockwise or by opening the manual drain valve.
3. If the filter housing is isolated and depressurized it is safe to take out the old drain by loosening the plastic drain nut (max. 3.5 Nm).
4. Discard the used drain and securing nut.
5. The new drain can now be installed and secured by tightening the plastic drain nut (max. 3.5 Nm).
6. Finally, the filter housing can be used again for filtering purposes. For a filter with inPASS™ valve, this means rotating the inPASS™ valve back into filter mode, following the instructions in section [inPASS™ instructions](#).

## 4.5 Service intervals

### DD+, DDp+, PD+, PDp+, UD+

The filter elements must be replaced after 8000 hours, 12 months in use or when the pressure drop reaches 350 mbar (whatever comes first).

Note that the gauge or pop-up is not a typical replacement indicator for coalescence filters, since oil and moisture maintain a stable pressure drop. Occasionally in polluted systems, a high dust load could be present and increases the pressure drop.

### QD+

For QD+ filters, the change interval of the adsorption element is approximately 2000 operating hours or 12 months in use (whatever comes first). Its pressure drop will not increase during its useful life. The adsorption element must be changed earlier when oil vapour levels are above defined levels from chapter [Technical data](#).

## 5 Technical data

### 5.1 Reference conditions

Air inlet pressure	7 bar(e)	102 psig
Air inlet temperature	20 °C	68 °F
Ambient temperature	20 °C	68 °F
Compressed air inlet dewpoint	3 °C	37 °F

### 5.2 Principal data

Maximum compressed air inlet pressure (for inPASS™ filters size 380–510)	14 bar(e)	203 psig
Maximum compressed air inlet pressure (for all other filters)	16 bar(e)	232 psig
Maximum compressed air inlet temperature	65 °C	149 °F
Minimum compressed air inlet pressure	1 bar(e)	15 psig
Minimum compressed air inlet temperature	1 °C	34 °F
Minimum ambient temperature	1 °C	34 °F
Maximum recommended pressure drop (worst case) (not for QD+ filters)	0.35 bar(e)	5 psig
Design temperature of the pressure casting	120 °C	248 °F
Maximum expected pressure drop over filter housing in inPASS™ mode	1 bar(e)	15 psig

### 5.3 Specific data

#### DD+/PD+/UD+

			DD+	PD+	UD+
Oil aerosol removal performance according to ISO12500-1:2007	Inlet oil aerosol concentration	mg/m³	10	10	10
	Average wet pressure drop	mbar	120	130	235
	Oil carry-over <sup>(1)</sup>	mg/m³	< 0.1	< 0.01	< 0.001

			<b>DD+</b>	<b>PD+</b>	<b>UD+</b>
Solid particle removal efficiency according to ISO12500-3:2009	1µm	%	> 99.999	> 99.999	> 99.999
	0.1µm <sup>(2)</sup>	%	97.03	99.67	99.94
	0.01µm	%	> 99.999	> 99.999	> 99.999
Air purity class ISO 8573-1:2010 in a typical installation			[2:-:3] <sup>(3)</sup>	[1:-:2] <sup>(4)</sup>	[1:-:2] <sup>(3)</sup>

(1) As aerosol

(2) At MPPS: Most Penetrating Particle Size

(3) Preceded by a liquid water separation device

(4) Preceded by a liquid water separation device and a DD+

## QD+

		<b>QD+</b>
Average pressure drop filter	mbar	75
Oil carry-over according to ISO8573-5:2001	mg/m <sup>3</sup>	< 0.003
Operating hours <sup>(1)</sup>	h	2000
Air purity class ISO 8573-1:2010 in a typical installation		[-:-:1] <sup>(2)</sup>

(1) In a typical installation with an oil vapour inlet concentration of 0.2 mg/m<sup>3</sup>, a pressure dewpoint of 3°C and an air inlet temperature of 30°C.

(2) Preceded by a dryer and a DD+, PD+ or UD+

## DDp+/PDp+

			<b>DDp+</b>	<b>PDp+</b>
Solid particle removal efficiency according to ISO12500-3:2009	Average pressure drop filter	mbar	50	55
	1µm	%	> 99.999	> 99.999
	0.1µm	%	97.55 <sup>(1)</sup>	99.97 <sup>(1)</sup>
	0.01µm	%	> 99.999	> 99.999
Air purity class ISO 8573-1:2010 in a typical installation			[2:-:-] <sup>(2)</sup>	[1:-:-] <sup>(3)</sup>

(1) At MPPS: Most Penetrating Particle Size

(2) Preceded by a dryer

(3) Preceded by a dryer and a DDp+

## 5.4 Rated flow at reference conditions

### Filters with inPASS™

Type	Flow	
	l/s	cfm
7+	7	15
15+	15	32
25+	25	53
45+	45	95
75+	75	159
110+	110	233
145+	145	307
180+	180	381
240+	240	509
300+	300	636
380+	380	805
425+	425	901
510+	510	1081

### Filters without inPASS™

Type	Flow	
	l/s	cfm
7+	7	15
15+	15	32
25+	25	53
45+	45	95
75+	75	159
110+	110	233
145+	145	307
180+	180	381
240+	240	509
300+	300	636
360+	360	763
430+	430	911
525+	525	1112
630+	630	1335

## 5.5 Correction factors



When the actual working pressure differs from the reference pressure, multiply the nominal capacity of the filter with the corresponding correction factor to obtain the correct capacity.

### Pressure correction factors (all filtration grades)

Working pressure (bar(e))	1	2	3	4	5	6	7	8	10	12	14	16
Working pressure (psig)	15	29	44	58	73	87	102	116	145	174	203	232
correction factor	0.38	0.53	0.65	0.75	0.83	0.92	1	1.06	1.20	1.31	1.41	1.5

### Temperature correction factors (only for QD+ filtration grade)

At higher temperatures more oil of the compressor oil is evaporated. When the actual working air inlet temperature differs from the reference, multiply the nominal capacity of the filter with the corresponding correction factor to obtain the correct capacity.

Compressed air inlet temperature (°C)	20	25	30	35	40	45	50	55	60
Compressed air inlet temperature (°F)	68	77	86	95	104	113	122	131	140
Correction factor oil free compressors	1	1	1	1	1	1	1	1	1
Correction factor oil lubricated compressors	1	1	1	1.2	1.5	1.7	2.1	2.4	2.6

Some environmental aspects could cause a higher amount of oil or volatile organic compounds in the air due to processes with organic solvents/oils nearby. Contact Atlas Copco when higher concentrations can be expected.

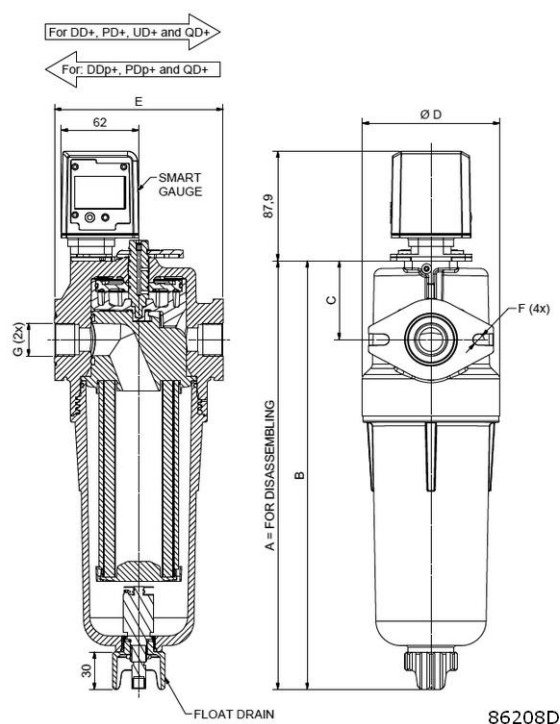
## 5.6 Dimensions and weight

## Filters with inPASS™

Type	Net mass (kg)	A	B	C	D	E	F	G	
7+	1.18	338	263	52	90	106	7	G 1/2	NPT 1/2
15+	1.24	338	263	52	90	106	7	G 1/2	NPT 1/2
25+	1.45	390.5	315.5	52	90	106	7	G 1/2	NPT 1/2
45+	2.35	418	343	63	110	135	9	G 3/4	NPT 3/4
75+	2.8	503	428	63	110	135	9	G1	NPT1
110+	5.4	559.5	459.5	84.5	143	175	8.5	G1 1/2	NPT1 1/2
145+	5.93	629.5	529.5	84.5	143	175	8.5	G1 1/2	NPT1 1/2
180+	6.45	699.5	599.5	84.5	143	175	11.5	G1 1/2	NPT1 1/2
240+	9.54	730	630	98	171	222	11.5	G2	NPT2
300+	10.71	873	723	98	171	222	11.5	G2	NPT2
	10.43							G2 1/2	NPT2 1/2
380+	13.6	1027.5	827.5	110	191	250	11.5	G3	NPT3
425+	14.95	1143.5	943.5	110	191	250	11.5	G3	NPT3
510+	19.6	1381.5	1181.5	110	191	250	11.5	G3	NPT3

Dimension G is G- (ISO 228-1) or NPT- (ANSI B1.20.1) thread.

Dimension A indicates the space needed for dismantling.

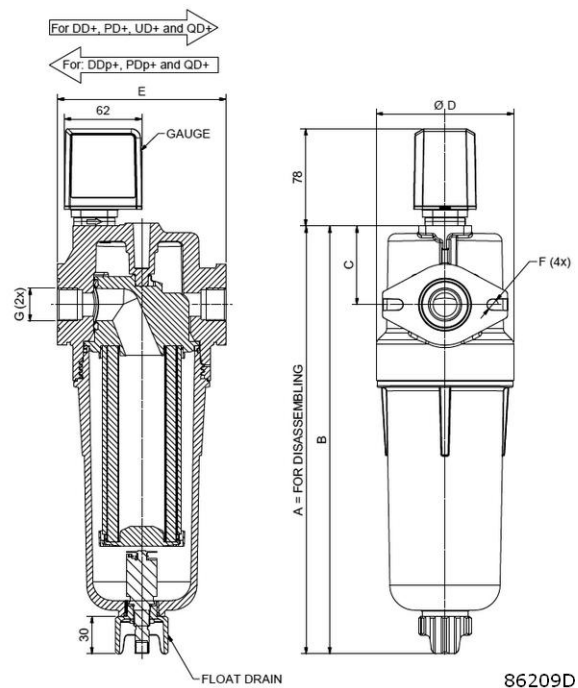


# Filters without inPASS™

Type	Net mass (kg)	A	B	C	D	E	F	G	
7+	1.2	338	263	52	90	106	7	G 1/2	NPT 1/2
15+	1.25	338	263	52	90	106	7	G 1/2	NPT 1/2
25+	1.43	390.5	315.5	52	90	106	7	G 1/2	NPT 1/2
45+	2.43	418	343	63	110	135	9	G 3/4	NPT 3/4
75+	2.87	503	428	63	110	135	9	G1	NPT1
110+	5.08	559.5	459.5	84.5	143	175	8.5	G1 1/2	NPT1 1/2
145+	5.6	629.5	529.5	84.5	143	175	8.5	G1 1/2	NPT1 1/2
180+	6.12	699.5	599.5	84.5	143	175	11.5	G1 1/2	NPT1 1/2
240+	9.34	730	630	98	171	222	11.5	G2	NPT2
300+	10.38	873	723	98	171	222	11.5	G2	NPT2
	10.2							G2 1/2	NPT2 1/2
360+	10.2	873	723	98	171	222	11.5	G2 1/2	NPT2 1/2
430+	13.98	1027.5	827.5	110	191	250	11.5	G3	NPT3
525+	15.32	1143.5	943.5	110	191	250	11.5	G3	NPT3
630+	19.24	1391.5	1181.5	110	191	250	11.5	G3	NPT3

Dimension G is G- (ISO 228-1) or NPT- (ANSI B1.20.1) thread.

Dimension A indicates the space needed for dismantling.



## 5.7 Supplied components

The table below gives an overview of the components provided on the different types of filters.

Abbreviations:

- PDSG .... Pressure Differential Smart service Indicator
- PDI .... Pressure Differential Indicator
- PDG .... Pressure Differential Gauge
- AD .... Automatic Drain
- MD ... Manual Drain

### Filters with inPASS™

Type	DD+, PD+, UD+	DDp+, PDp+	QD+
7+	PDSG+AD	PDSG+MD	MD
15+	PDSG+AD	PDSG+MD	MD
25+	PDSG+AD	PDSG+MD	MD
45+	PDSG+AD	PDSG+MD	MD
75+	PDSG+AD	PDSG+MD	MD
110+	PDSG+AD	PDSG+MD	MD
145+	PDSG+AD	PDSG+MD	MD
180+	PDSG+AD	PDSG+MD	MD
240+	PDSG+AD	PDSG+MD	MD
300+	PDSG+AD	PDSG+MD	MD
380+	PDSG+AD	PDSG+MD	MD
425+	PDSG+AD	PDSG+MD	MD
510+	PDSG+AD	PDSG+MD	MD

### Filters without inPASS™

Type	DD+, PD+, UD+	DDp+, PDp+	QD+
7+	PDI+AD	PDI+MD	MD
15+	PDI+AD	PDI+MD	MD
25+	PDI+AD	PDI+MD	MD
45+	PDG+AD	PDG+MD	MD
75+	PDG+AD	PDG+MD	MD
110+	PDG+AD	PDG+MD	MD
145+	PDG+AD	PDG+MD	MD
180+	PDG+AD	PDG+MD	MD
240+	PDG+AD	PDG+MD	MD
300+	PDG+AD	PDG+MD	MD
360+	PDG+AD	PDG+MD	MD
430+	PDG+AD	PDG+MD	MD
525+	PDG+AD	PDG+MD	MD

Type	DD+, PD+, UD+	DDp+, PDp+	QD+
630+	PDG+AD	PDG+MD	MD

## 6 Pressure equipment directives

### Components subject to 2014/68/EU Pressure Equipment Directive

The following table contains the necessary information for the inspection of all pressure equipment according to the Pressure Equipment Directive 2014/68/EU.

Size	Connection type	Connection size	Total volume (litres)	Maximum working pressure (bar)	PED category
7+	G	1/2 "	0.63	16	art. 4 par 3
	NPT	1/2 "	0.63	16	art. 4 par 3
15+	G	1/2 "	0.64	16	art. 4 par 3
	NPT	1/2 "	0.64	16	art. 4 par 3
25+	G	1/2 "	0.78	16	art. 4 par 3
	NPT	1/2 "	0.78	16	art. 4 par 3
45+	G	3/4"	1.46	16	art. 4 par 3
	NPT	3/4"	1.46	16	art. 4 par 3
75+	G	1"	1.87	16	art. 4 par 3
	NPT	1"	1.87	16	art. 4 par 3
110+	G	1 1/2"	3.49	16	CAT I
	NPT	1 1/2"	3.49	16	CAT I
145+	G	1 1/2"	4	16	CAT I
	NPT	1 1/2"	4	16	CAT I
180+	G	1 1/2"	4.58	16	CAT I
	NPT	1 1/2"	4.58	16	CAT I
240+	G	2"	7	16	CAT I
	NPT	2"	7	16	CAT I
300+	G	2"	8	16	CAT I
	NPT	2"	8	16	CAT I
	G	2 1/2"	8.12	16	CAT I
	NPT	2 1/2"	8.12	16	CAT I
360+	G	2 1/2"	8.12	16	CAT I
	NPT	2 1/2"	8.12	16	CAT I
380+	G	3"	12.44	14	CAT I
	NPT	3"	12.44	14	CAT I
425+	G	3"	13.96	14	CAT II
	NPT	3"	13.96	14	CAT II
510+	G	3"	18.31	14	CAT II
	NPT	3"	18.31	14	CAT II
430+	G	3"	12.44	16	CAT I
	NPT	3"	12.44	16	CAT I
525+	G	3"	13.96	16	CAT II
	NPT	3"	13.96	16	CAT II

Size	Connection type	Connection size	Total volume (litres)	Maximum working pressure (bar)	PED category
630+	G	3"	18.31	16	CAT II
	NPT	3"	18.31	16	CAT II





## ***COMMITTED TO SUSTAINABLE PRODUCTIVITY***

We stand by our responsibilities towards our customers, towards the environment and the people around us. We make performance stand the test of time. This is what we call — Sustainable Productivity.

[www.atlascopco.com](http://www.atlascopco.com)

