

## Operating Instructions

### Cyclone Separators and Filters for Compressed Air



**BOGE Cyclone Separators Z 6-2 to Z 480-2**  
**BOGE Filters F 6-2 to F 380-2 (P, M, A)**

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# Installation

# Installation Recommendations

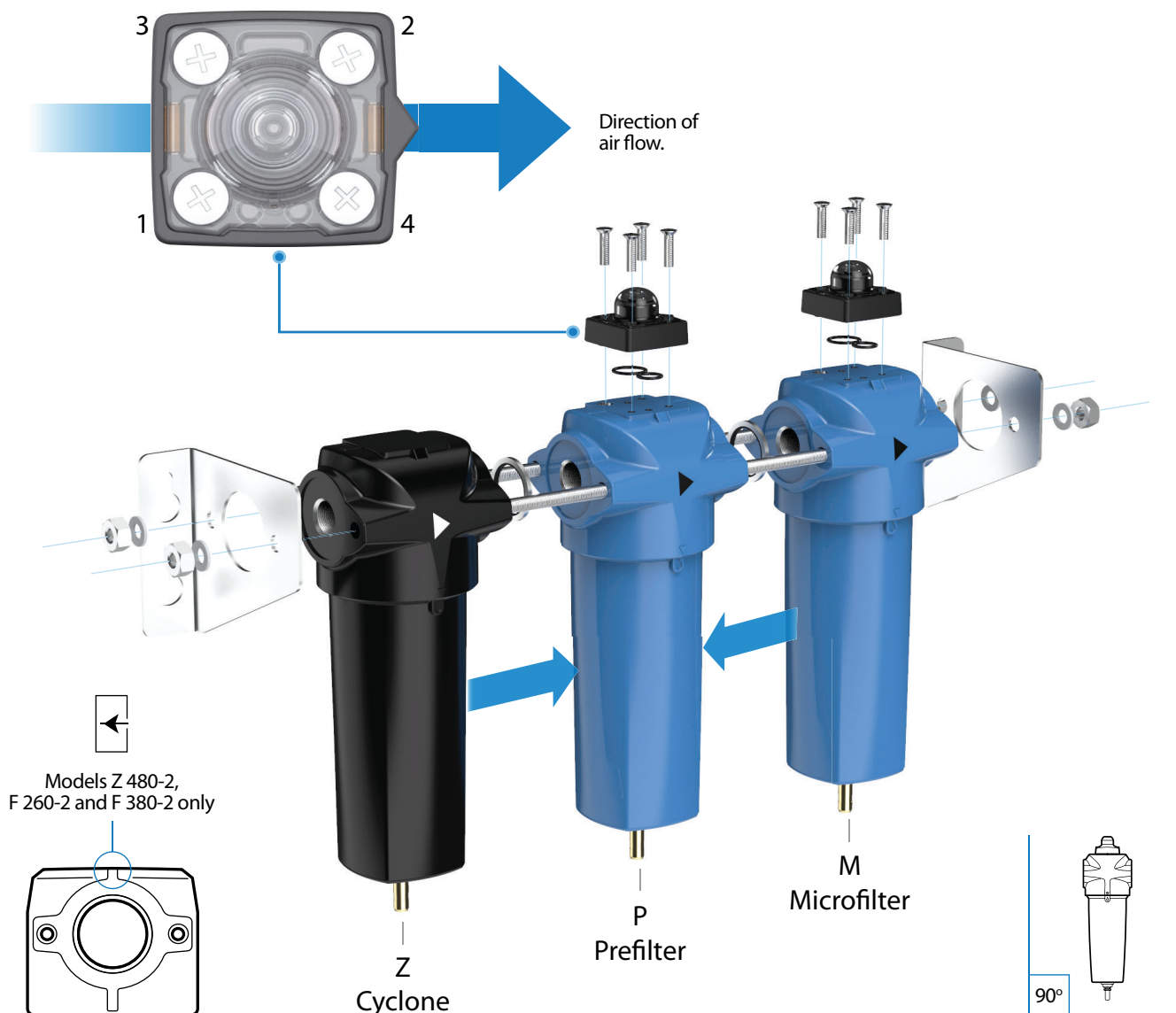
- It is recommended that the compressed air is treated prior to entry into the distribution system and also at critical usage points / applications.
- Installation of compressed air dryers to a previously wet system could result in additional dirt loading for point of use filters for a period whilst the distribution system dries out.
- Filter elements may need to be changed more frequently during this period.
- For installations where oil-free compressors are used, water aerosol and particulate are still present, general purpose and high efficiency grades should still be used.
- When liquids are present in the compressed air stream, cyclone separators must be used to protect coalescing filters from bulk liquid contamination.
- A general purpose filter must always be installed to protect the high efficiency filter from bulk liquid aerosols and solid particulate.
- Install purification equipment at the lowest temperature above freezing point, preferably downstream of after coolers and air receivers.
- Point of use purification equipment should be installed as close to the application as possible.
- Purification equipment should not be installed downstream of quick opening valves and should be protected from possible reverse flow or other shock conditions.
- Purge all piping leading to the purification equipment before installation and all piping after the purification equipment is installed and before connection to the final application.
- If by-pass lines are fitted around purification equipment, ensure adequate filtration is fitted to the by-pass line to prevent contamination of the system downstream.
- Fit drain lines from the coalescing filters directly to a condensate separator. If it is not possible to connect the drain lines directly to a separator, the lines should be vented in to a condensate manifold (vented at one end) and then in to a single inlet of a condensate separator.
- Provide a facility to drain away collected liquids from the purification equipment.
- Collected liquids should be treated and disposed of in a responsible manner.

# Installing the Filter System

## Differential Pressure Indicator (DPI)

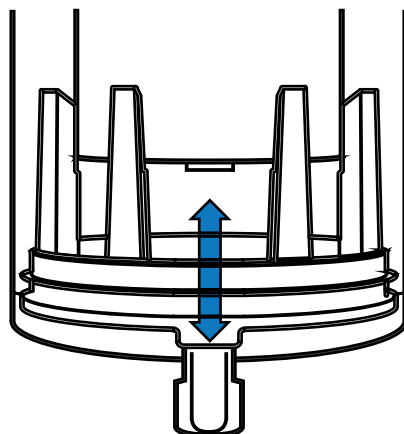
Fitted as standard to M & P filters.

Hand tighten mounting screws and then torque to 2.5 Nm in sequence as shown - 1,2,3,4  
No DPI fitted to A or Z models.



Before pressurising the filter ensure that the head and bowl are correctly fitted and that the locking detail is properly aligned as shown in the maintenance section of this manual.

Models Z 480-2,  
F 260-2 and  
F 380-2 only



The lower closure plate may move when the filter is not pressurised

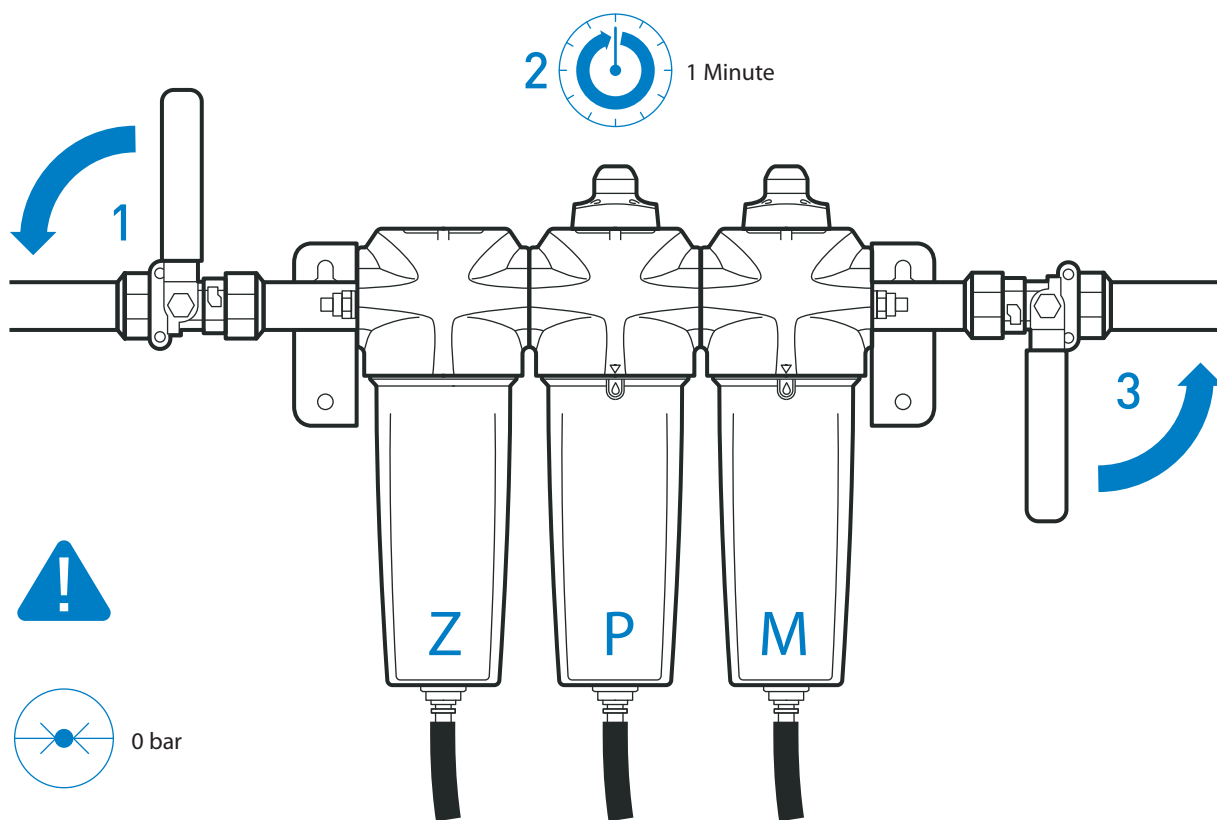
The lower closure plate is a non serviceable item and should never be removed.

# Start-Up Procedure

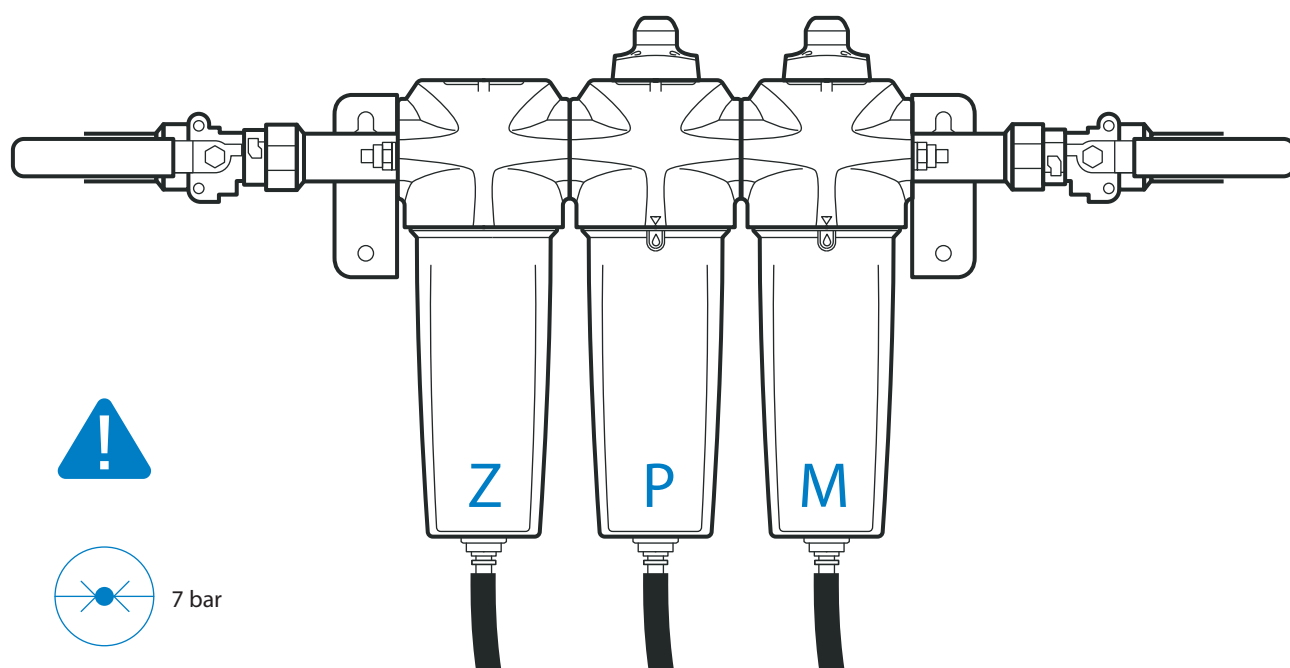
## Start-Up Procedure

Before pressurising the filter ensure that the head and bowl are correctly fitted and that the locking detail is properly aligned. Slowly open the inlet valve (1) to gradually pressurise the filter and wait 1 minute (2) before slowly opening the outlet valve (3) to re-pressurise the downstream piping.

Note: Do not open inlet or outlet valves rapidly or subject unit to excessive pressure differential as damage may occur.



## Running Configuration



# Product Maintenance



# Maintenance Intervals

To ensure optimal filter performance the Grade P and Grade M coalescing and dry particulate filter elements require changing every 12 months (8736 hours) along with the automatic float drain.

Unlike coalescing and dry particulate filter elements which are changed annually to guarantee compressed air quality, the lifetime of an adsorption filter element / cartridge can be attributed to various factors and will require more frequent changes. Factors affecting the lifetime of adsorption filters are:

## **Oil vapour concentration**

The higher the inlet concentration of oil vapour, the faster the adsorption material capacity will be used, resulting in reduced adsorption filter element / cartridge lifetime.

## **Bulk oil**

Adsorption filters are designed only to reduce oil vapours and odours, not liquid oil or oil aerosols. Poorly maintained or non-existent pre-filtration (coalescing filters) will cause the adsorption filter capacity to be used quickly resulting in reduced adsorption filter element / cartridge lifetime.

## **Temperature**

Oil vapour content increases exponentially to inlet temperature, reducing adsorption filter element / cartridge lifetime. Additionally, as temperature increases, the adsorption capacity of the adsorbent material decreases, again reducing adsorption filter element / cartridge lifetime.

## **Relative Humidity or Dewpoint**

Wet air reduces the adsorptive capacity of the adsorbent material, reducing adsorption filter element / cartridge lifetime. Ideally, in-line adsorption filters should always be placed downstream of a compressed air dryer to prolong adsorption filter element / cartridge lifetime.

## **Compressor oil changes**

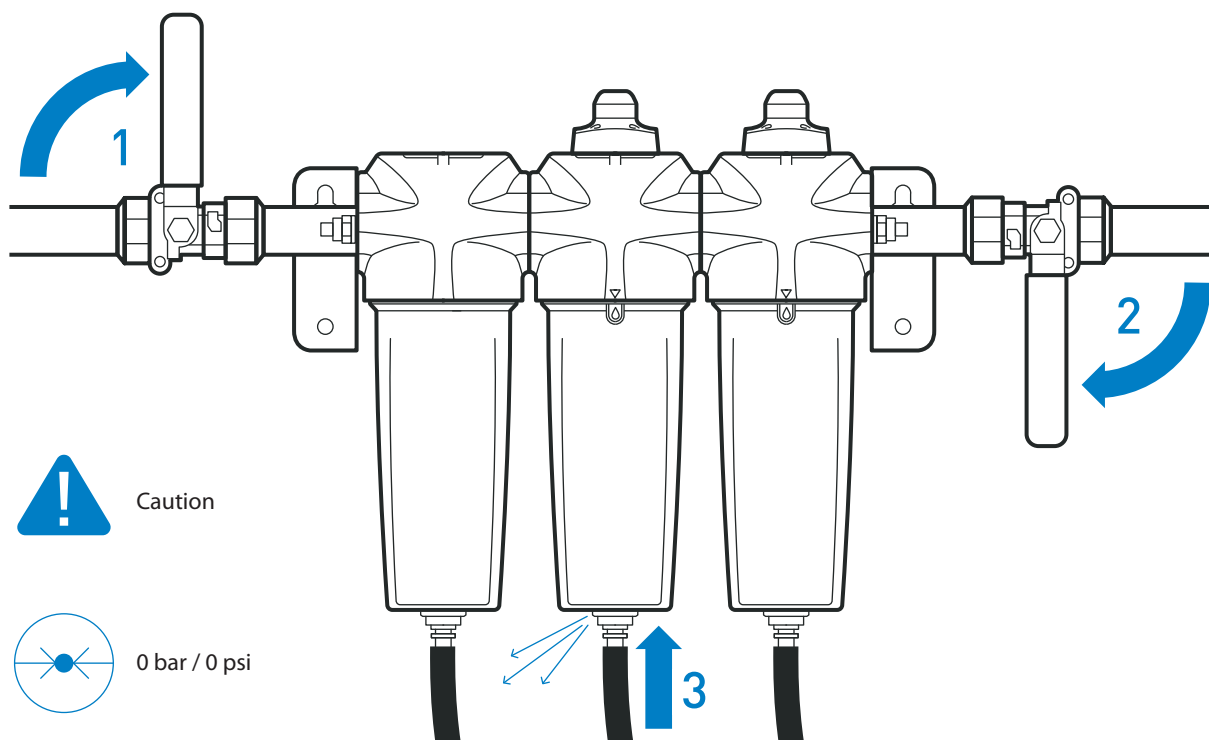
When compressor oil is changed, the new lubricant burns off "light ends" which increases the oil vapour content for hours or even weeks afterwards. This increase in oil vapour content is adsorbed by the adsorption filter element / cartridge, reducing the adsorption filter element / cartridge lifetime.

## **Grade A Adsorption Filters**

The performance of the grade A element is based upon a nominal inlet temperature of 21°C, with a pressure dewpoint of -40°C and a maximum oil vapour inlet concentration of 0.018mg/m3. Under these conditions, grade A will have a lifetime of 650 hours. Operating grade A at higher inlet temperatures / higher inlet oil vapour concentrations / or before a refrigeration or adsorption dryer will result in lower adsorption filter lifetime. Replace the carbon filter element upon detection of vapour, odour or taste. grade A are recommended for point of use applications only where frequent element changes are acceptable.

## System Depressurisation

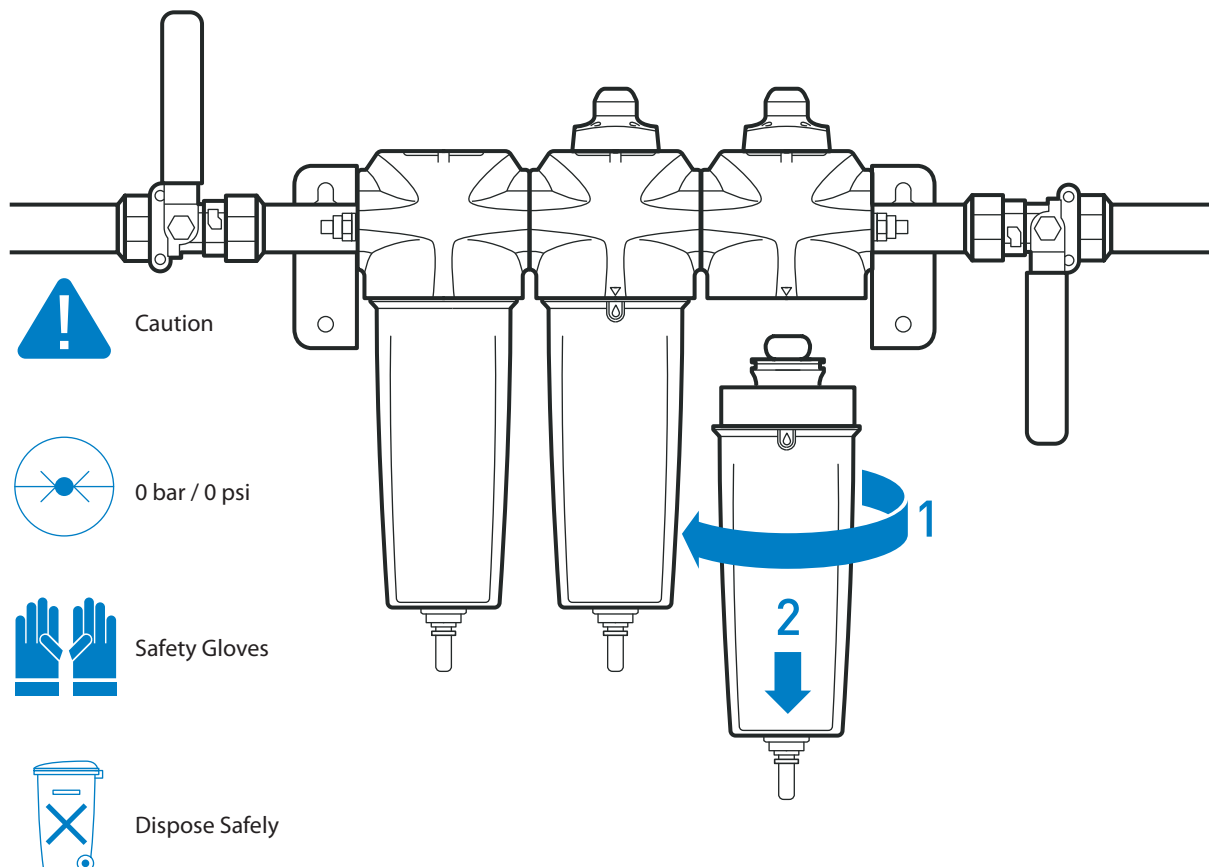
Slowly close the inlet (1) and outlet (2) valves and depressurise the filter (3) using the drain.



## Filter Bowl Removal

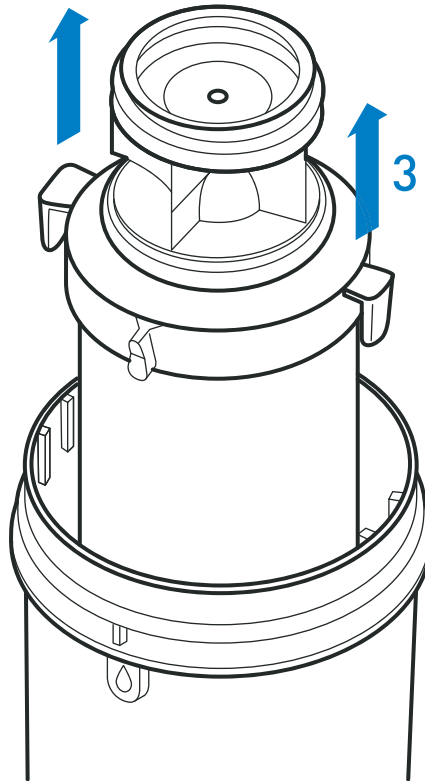
Unscrew the filter bowl (1 & 2) and remove the used element (3- see next page).

Note: A strap wrench may be required for the removal of the F 260-2 & F 380-2 filter bowl.



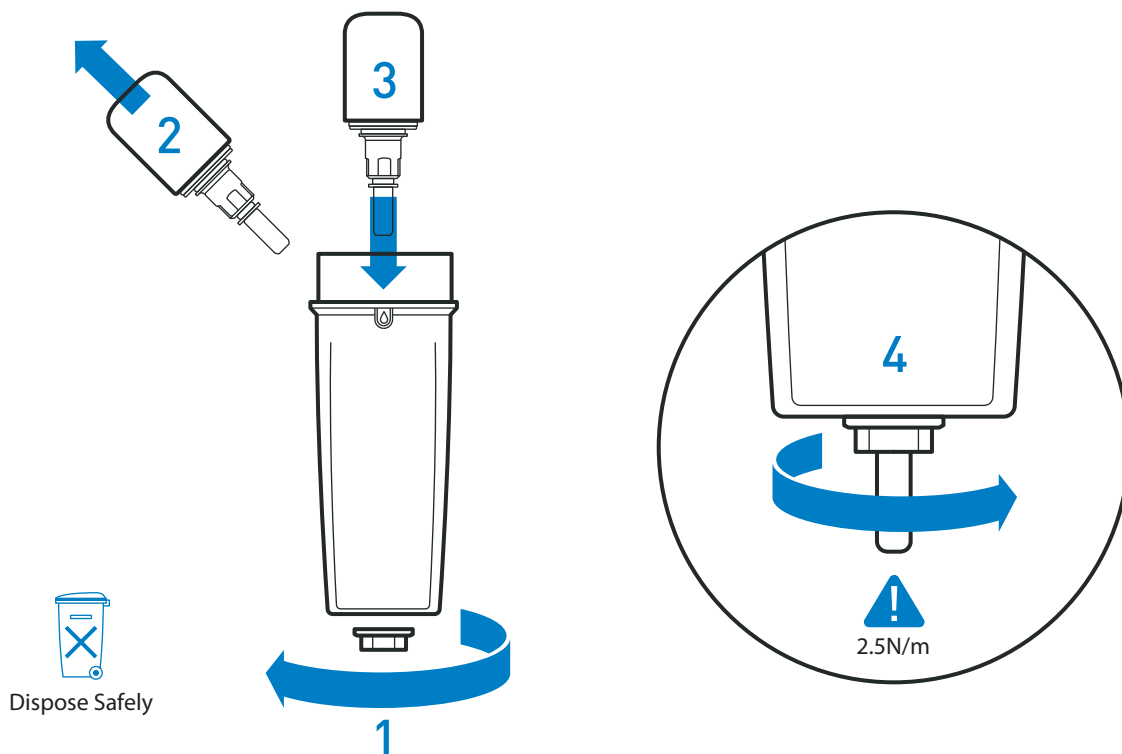
## Removal of Element from Filter Bowl

Remove the element from the filter bowl.



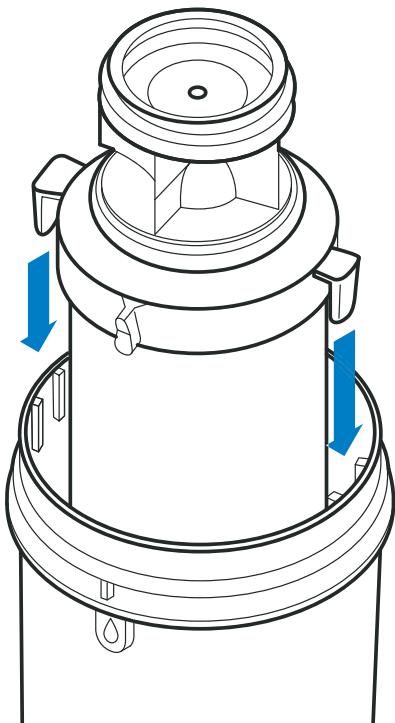
## Automatic Drain Replacement

Unscrew the automatic drain (1) and discard (2). Fit the new drain (3) and tighten (4).



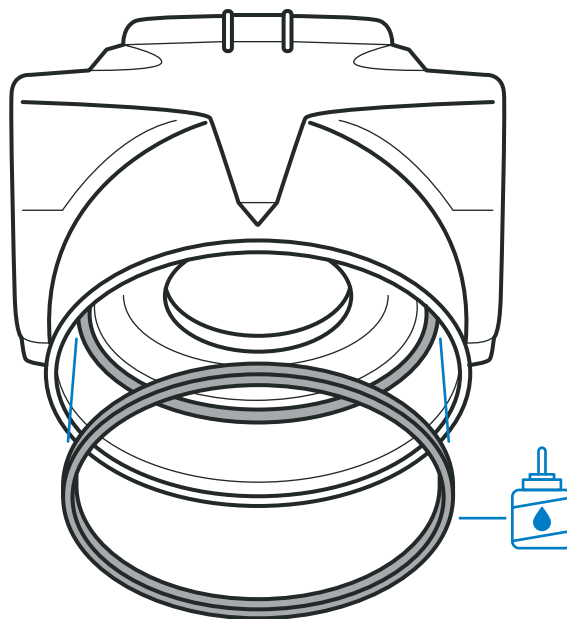
## Insertion of Replacement Element into Filter Bowl

Insert the new element into the filter bowl ensuring that the lugs are seated correctly in the grooves.



## Replacement of Filter Head O Ring Seal

Replace the O-ring located in the filter head with the new O-ring provided.

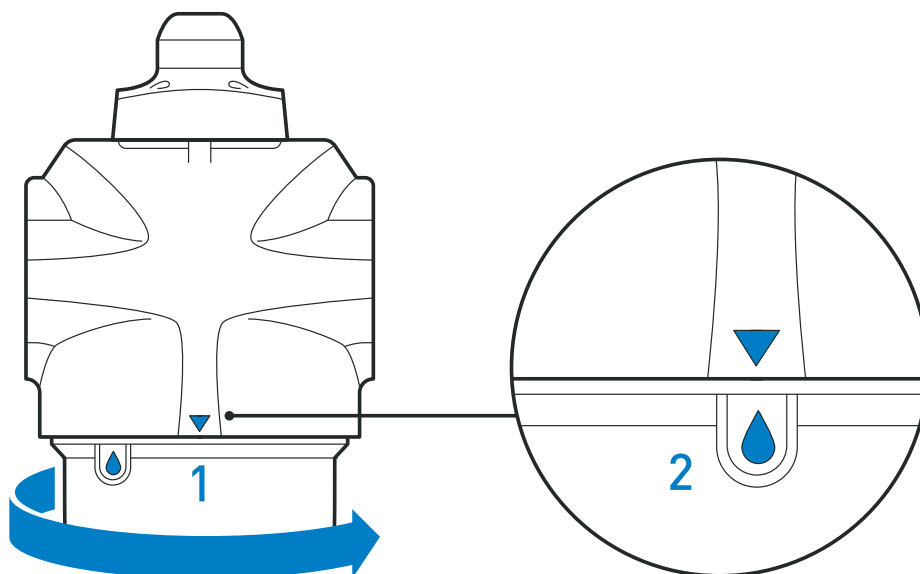


Ensure to lubricate the O-ring and threads with a suitable acid free Petroleum jelly.

## Reconnecting the Filter Bowl with Head

Refit the filter bowl and head ensuring that the threads are fully engaged (1) and the locking details are aligned (2).

Note: To ensure that the bowl is fully engaged into the head, the 6-2 to 65-2 bowl requires one full turn until the thread stop, two full turns for the 95-2 to 190-2 bowl and one and a half turns for the 260-2 to 380-2 bowl.



## Service Reminder Label

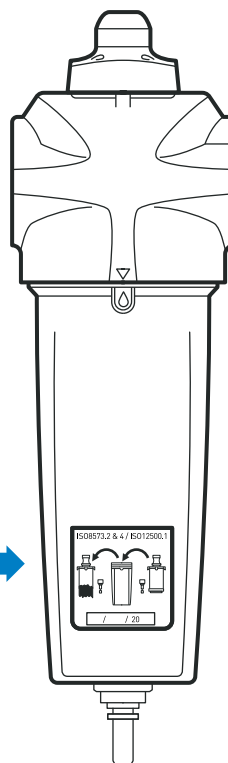
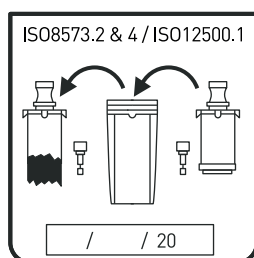
Attach the element change date label to the filter bowl and write on the date the element is to be replaced. i.e 12 months after element change.



Do not use solvents or alcohol to clean the labels as this could cause damage.

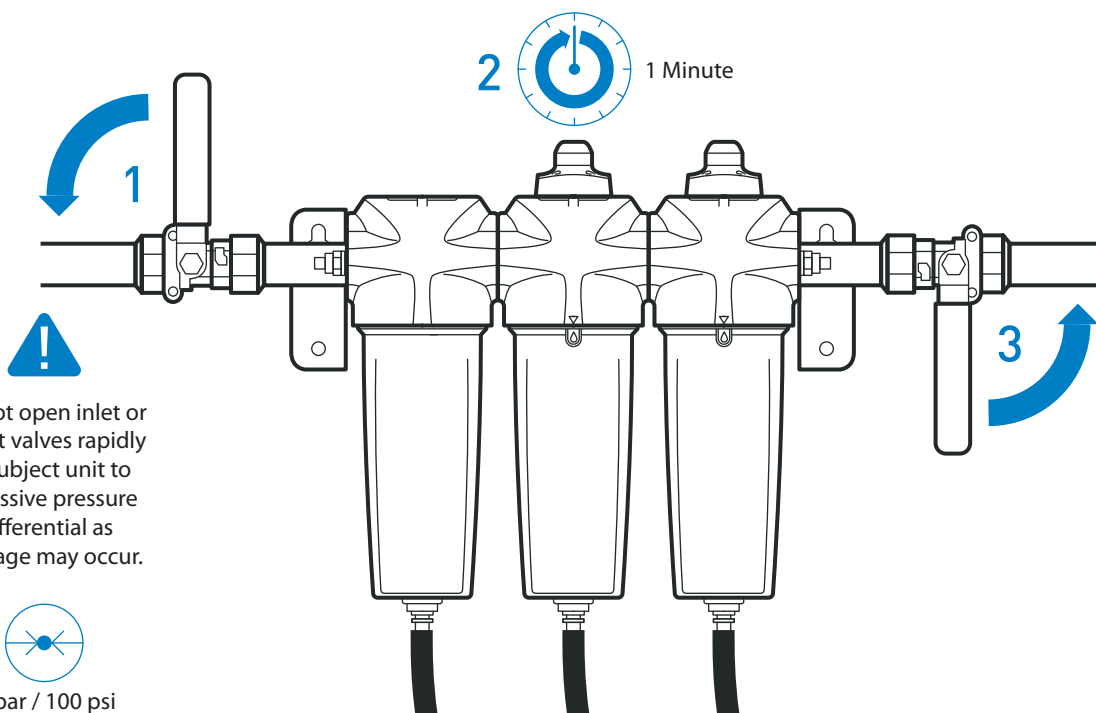


0 bar / 0 psi



## System Start Up Procedure

Slowly open the inlet valve (1) to gradually pressurise the filter and wait 1 minute (2) before slowly opening the outlet valve (3) to re-pressurise the downstream piping.



# Technical Specification

## Cyclone Separator Flow Rates

| Type    | Connection | L/s | m³/min | m³/hr | cfm  |
|---------|------------|-----|--------|-------|------|
| Z 6-2   | 1/2        | 10  | 0.6    | 36    | 21   |
| Z 24-2  | 1/2        | 40  | 2.4    | 144   | 85   |
| Z 24-2  | 3/4        | 40  | 2.4    | 144   | 85   |
| Z 66-2  | 1          | 110 | 6.6    | 396   | 233  |
| Z 66-2  | 1 1/2      | 110 | 6.6    | 396   | 233  |
| Z 210-2 | 1 1/2      | 350 | 21.0   | 1260  | 742  |
| Z 210-2 | 2          | 350 | 21.0   | 1260  | 742  |
| Z 210-2 | 2 1/2      | 350 | 21.0   | 1260  | 742  |
| Z 480-2 | 3          | 800 | 48.0   | 2880  | 1695 |

CFP – Correction Factor Minimum Inlet Pressure (Cyclone Separators)

| Minimum Inlet Pressure | bar g | 1    | 2    | 3    | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   |
|------------------------|-------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|
|                        | psi g | 15   | 29   | 44   | 58   | 73   | 87   | 100 | 116  | 131  | 145  | 160  | 174  | 189  | 203  | 218  | 232  |
| Correction Factor      | f1    | 0.25 | 0.38 | 0.50 | 0.63 | 0.75 | 0.88 | 1   | 1.06 | 1.12 | 1.18 | 1.22 | 1.27 | 1.32 | 1.37 | 1.41 | 1.47 |

**Example:**

**Pressure (P) : 8 bar; Free air delivery (V): 4.8 m³/min, Factor (f): 1.06**

**Volume flow (V):** 4.8      **4.53 --> Z 66-2**  
**Factor (f):** 1.06

## Filter Flow Rates

| Type    |         | Connection | L/s | m³/min | m³/hr | cfm  | Replacement Element Kit |         | No. |
|---------|---------|------------|-----|--------|-------|------|-------------------------|---------|-----|
| F 6-2   | [Grade] | ¼          | 10  | 0.6    | 36    | 21   | FE 6-2                  | [Grade] | 1   |
| F 9-2   | [Grade] | ½          | 10  | 0.6    | 36    | 21   | FE 9-2                  | [Grade] | 1   |
| F 12-2  | [Grade] | ½          | 20  | 1.2    | 72    | 42   | FE 12-2                 | [Grade] | 1   |
| F 18-2  | [Grade] | ¾          | 30  | 1.8    | 108   | 64   | FE 18-2                 | [Grade] | 1   |
| F 36-2  | [Grade] | 1          | 60  | 3.6    | 216   | 127  | FE 36-2                 | [Grade] | 1   |
| F 65-2  | [Grade] | 1 ½        | 110 | 6.6    | 396   | 233  | FE 65-2                 | [Grade] | 1   |
| F 95-2  | [Grade] | 1 ½        | 160 | 9.6    | 576   | 339  | FE 95-2                 | [Grade] | 1   |
| F 130-2 | [Grade] | 2          | 220 | 13.2   | 792   | 466  | FE 130-2                | [Grade] | 1   |
| F 190-2 | [Grade] | 2 ½        | 330 | 19.8   | 1188  | 699  | FE 190-2                | [Grade] | 1   |
| F 260-2 | [Grade] | 2 ½        | 430 | 25.8   | 1548  | 911  | FE 260-2                | [Grade] | 1   |
| F 380-2 | [Grade] | 3          | 620 | 37.3   | 2232  | 1314 | FE 380-2                | [Grade] | 1   |

[Grade] = P, M or A

CFP – Correction Factor Minimum Inlet Pressure (Coalescing and Dry Particulate Filters)

| Minimum Inlet Pressure | bar g | 1    | 2    | 3    | 4    | 5    | 6    | 7   | 8    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18   | 19   | 20   |
|------------------------|-------|------|------|------|------|------|------|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                        | psi g | 15   | 29   | 44   | 58   | 73   | 87   | 100 | 116  | 131  | 145  | 160  | 174  | 189  | 203  | 218  | 232  | 248  | 263  | 277  | 290  |
| Correction Factor      | f1    | 0.25 | 0.38 | 0.50 | 0.63 | 0.75 | 0.88 | 1   | 1.06 | 1.12 | 1.18 | 1.22 | 1.27 | 1.32 | 1.37 | 1.41 | 1.47 | 1.56 | 1.61 | 1.64 | 1.69 |

**Example:**

**Pressure (P) : 8 bar; Free air delivery (V): 4.8 m³/min, Factor (f): 1.06**

**Volume flow (V):**

**4.8**

**4.53 --> F 65-2 P**

**Factor (f):**

**1.06**

## Technical Data

| Model | Min Operating Pressure |       | Max Operating Pressure |       | Min Recommended Operating Temp |    | Max Recommended Operating Temp |     |
|-------|------------------------|-------|------------------------|-------|--------------------------------|----|--------------------------------|-----|
|       | bar g                  | psi g | bar g                  | psi g | °C                             | °F | °C                             | °F  |
| Z     | 1                      | 15    | 16                     | 232   | 2                              | 35 | 80                             | 176 |
| P     | 1                      | 15    | 16                     | 232   | 2                              | 35 | 80                             | 176 |
| M     | 1                      | 15    | 16                     | 232   | 2                              | 35 | 80                             | 176 |
| A     | 1                      | 15    | 20                     | 290   | 2                              | 35 | 50                             | 122 |

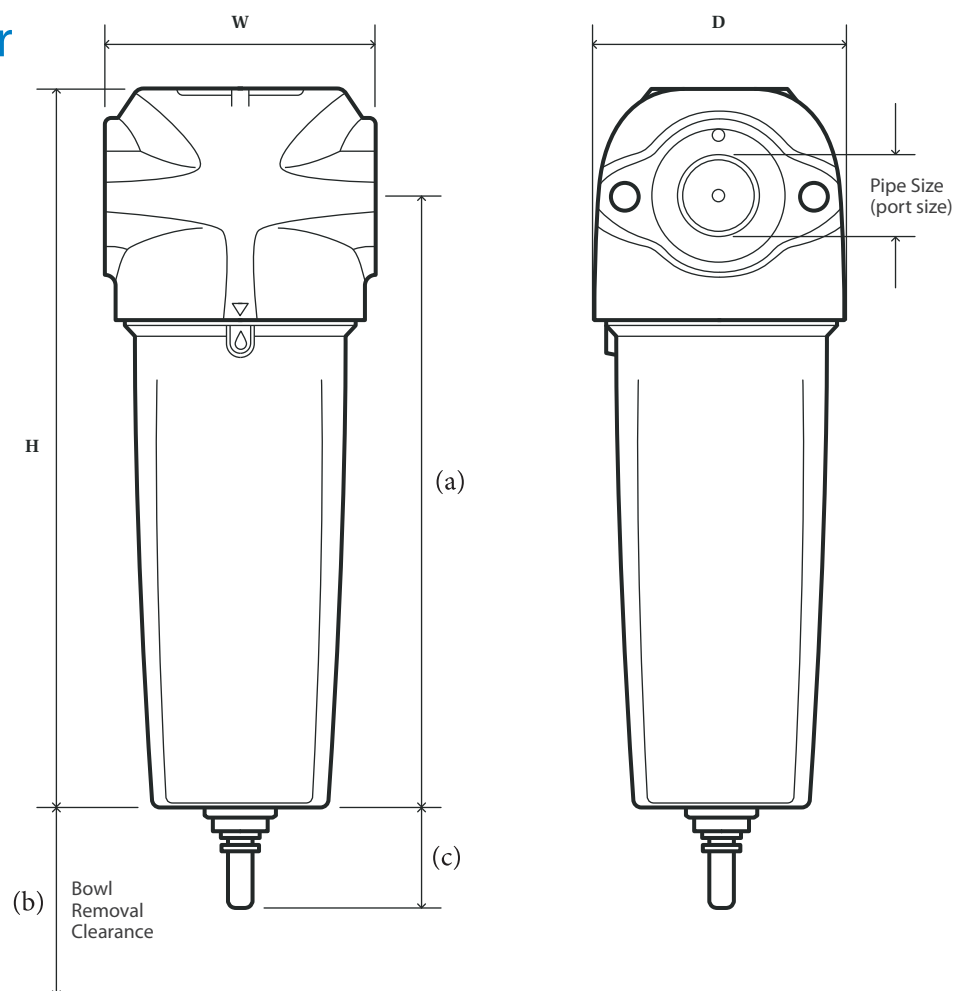
**Note:** P / M grade filters for use up to 16 bar g (232 psi g) are supplied with a float drain as standard.

For pressures between 16 and 20 bar g (232 and 290 psi g) a manual drain must be used and no differential pressure indicator may be installed.

A grade filters are supplied with a manual drain as standard.



## Cyclone Separator Weights and Dimensions

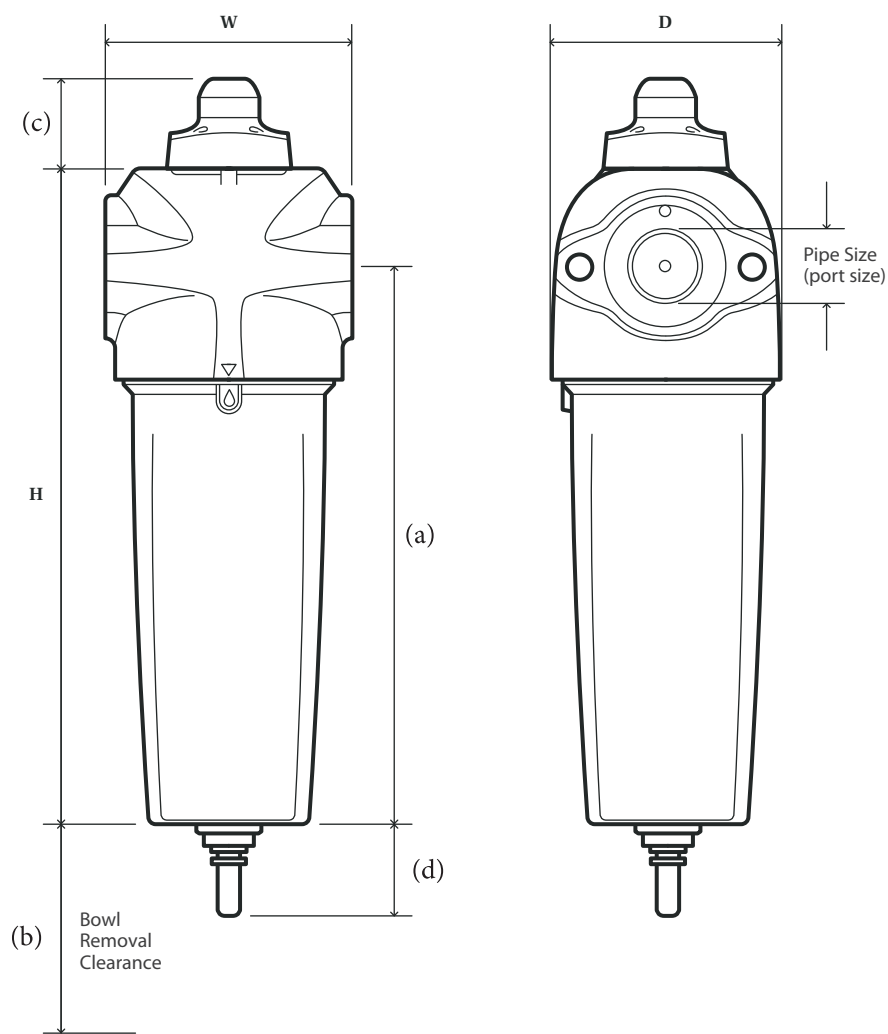


## Cyclone Separator Weights and Dimensions

| Type    | Connection | Height (H) |       | Width (W) |      | Depth (D) |      | (a) |       | (b) |      | (c) |      | Weight |       |
|---------|------------|------------|-------|-----------|------|-----------|------|-----|-------|-----|------|-----|------|--------|-------|
|         |            | mm         | ins   | mm        | ins  | mm        | ins  | mm  | ins   | mm  | ins  | mm  | ins  | Kg     | Lbs   |
| Z 6-2   | 1/2        | 180        | 7.09  | 76        | 2.99 | 65        | 2.56 | 154 | 6.06  | 50  | 1.97 | 38  | 1.5  | 0.78   | 1.72  |
| Z 24-2  | 1/2        | 238        | 9.37  | 89        | 3.5  | 84        | 3.31 | 202 | 7.95  | 50  | 1.97 | 38  | 1.5  | 1.08   | 2.39  |
| Z 24-2  | 3/4        | 238        | 9.37  | 89        | 3.5  | 84        | 3.31 | 202 | 7.95  | 50  | 1.97 | 38  | 1.5  | 1.35   | 2.98  |
| Z 66-2  | 1          | 277        | 10.91 | 120       | 4.72 | 115       | 4.53 | 232 | 9.13  | 70  | 2.76 | 38  | 1.5  | 2.64   | 5.83  |
| Z 66-2  | 1 1/2      | 277        | 10.91 | 120       | 4.72 | 115       | 4.53 | 232 | 9.13  | 70  | 2.76 | 38  | 1.5  | 2.54   | 5.61  |
| Z 210-2 | 1 1/2      | 440        | 17.32 | 164       | 6.46 | 157       | 6.18 | 383 | 15.08 | 100 | 3.94 | 38  | 1.5  | 6.69   | 14.74 |
| Z 210-2 | 2          | 440        | 17.32 | 164       | 6.46 | 157       | 6.18 | 383 | 15.08 | 100 | 3.94 | 38  | 1.5  | 6.46   | 14.23 |
| Z 210-2 | 2 1/2      | 440        | 17.32 | 164       | 6.46 | 157       | 6.18 | 383 | 15.08 | 100 | 3.94 | 38  | 1.5  | 6.28   | 13.85 |
| Z 480-2 | 3          | 516        | 20.31 | 192       | 7.56 | 183       | 7.20 | 444 | 17.48 | 120 | 4.72 | 40  | 1.57 | 10.83  | 23.89 |

**Note:** Cyclone Separators do not include a Differential Pressure Indicator, use dimension H for the total height.

## Filter Weights and Dimensions

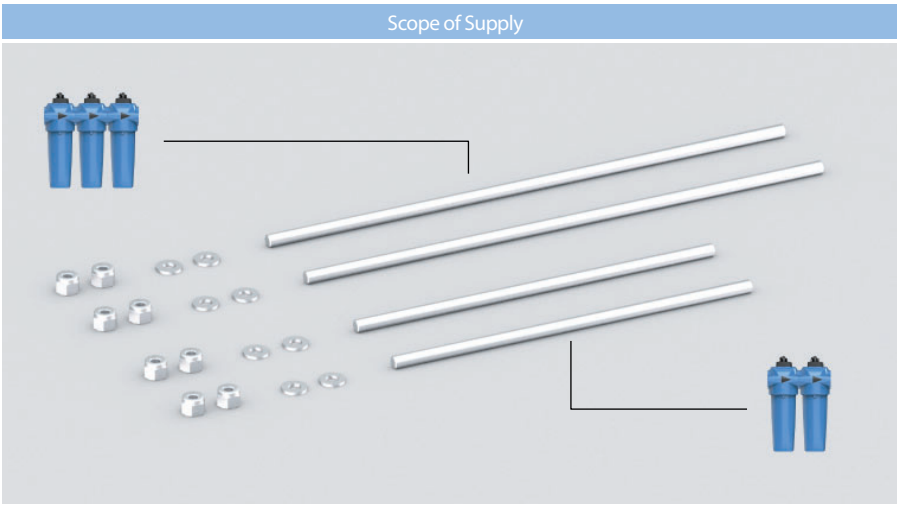
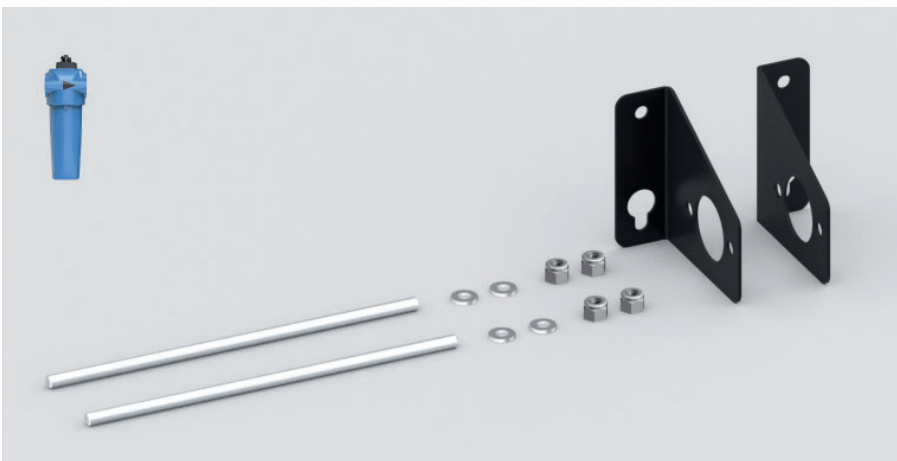
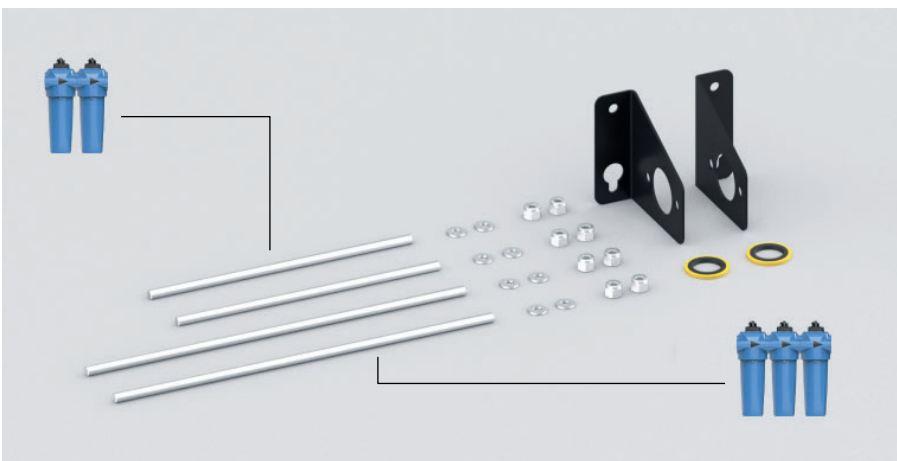






## Filter Weights and Dimensions

| Type    | Connection | Height (H) |       | Width (W) |      | Depth (D) |      | (a) |       | (b) |      | (c) |      | (d) |      | Weight |       |
|---------|------------|------------|-------|-----------|------|-----------|------|-----|-------|-----|------|-----|------|-----|------|--------|-------|
|         |            | mm         | ins   | mm        | ins  | mm        | ins  | mm  | ins   | mm  | ins  | mm  | ins  | mm  | ins  | Kg     | Lbs   |
| F 6-2   | 1/4        | 180        | 7.09  | 76        | 2.99 | 65        | 2.56 | 154 | 6.06  | 50  | 1.97 | 32  | 1.26 | 38  | 1.5  | 0.84   | 1.86  |
| F 9-2   | 1/2        | 180        | 7.09  | 76        | 2.99 | 65        | 2.56 | 154 | 6.06  | 50  | 1.97 | 32  | 1.26 | 38  | 1.5  | 0.82   | 1.81  |
| F 12-2  | 1/2        | 238        | 9.37  | 89        | 3.5  | 84        | 3.31 | 202 | 7.95  | 50  | 1.97 | 32  | 1.26 | 38  | 1.5  | 1.16   | 2.55  |
| F 18-2  | 3/4        | 238        | 10.91 | 89        | 3.5  | 84        | 3.31 | 202 | 7.95  | 50  | 1.97 | 32  | 1.26 | 38  | 1.5  | 1.44   | 3.19  |
| F 36-2  | 1          | 277        | 10.91 | 120       | 4.72 | 115       | 4.53 | 232 | 9.13  | 70  | 2.76 | 32  | 1.26 | 38  | 1.5  | 2.69   | 5.92  |
| F 65-2  | 1 1/2      | 367        | 14.45 | 120       | 4.72 | 115       | 4.53 | 322 | 12.68 | 70  | 2.76 | 32  | 1.26 | 38  | 1.5  | 3.04   | 6.70  |
| F 95-2  | 1 1/2      | 440        | 17.32 | 164       | 6.46 | 157       | 6.18 | 383 | 15.07 | 100 | 3.94 | 68  | 2.68 | 38  | 1.5  | 6.90   | 15.21 |
| F 130-2 | 2          | 532        | 20.94 | 164       | 6.46 | 157       | 6.18 | 475 | 18.7  | 100 | 3.94 | 68  | 2.68 | 38  | 1.5  | 7.30   | 16.09 |
| F 190-2 | 2 1/2      | 532        | 20.94 | 164       | 6.46 | 157       | 6.18 | 475 | 18.7  | 100 | 3.94 | 68  | 2.68 | 38  | 1.5  | 7.10   | 15.65 |
| F 260-2 | 2 1/2      | 654        | 25.75 | 192       | 7.56 | 183       | 7.20 | 582 | 22.91 | 120 | 4.72 | 68  | 2.68 | 40  | 1.57 | 10.30  | 22.71 |
| F 380-2 | 3          | 844        | 33.23 | 192       | 7.56 | 183       | 7.20 | 772 | 30.39 | 120 | 4.72 | 68  | 2.68 | 40  | 1.57 | 15.30  | 33.73 |

**Note:** Activated carbon filter do not include a Differential Pressure Indicator, use dimension H + (d).

## Accessories / Spare Parts (Service Kits)

| Type                       | Boge Material Number | Scope of Supply  |                        |             |   |
|----------------------------|----------------------|--|------------------------|-------------|---|
| F 6-2 / F 9-2              | 583004001            |    |                        |             |   |
| F 12-2 / F 18-2            | 583004002            |  |                        |             |   |
| F 36-2 / F 65-2            | 583004003            |  |                        |             |   |
| F 95-2 / F 130-2 / F 190-2 | 583004004            |  |                        |             |   |
| F 260-2 / F 380-2          | 583004005            |  |                        |             |   |
| F 6-2 / F 9-2              | 583003801            |   |                        |             |   |
| F 12-2 / F 18-2            | 583003802            |  |                        |             |   |
| F 36-2 / F 65-2            | 583003803            |  |                        |             |   |
| F 95-2 / F 130-2 / F 190-2 | 583003804            |  |                        |             |   |
| F 260-2 / F 380-2          | 583003805            |  |                        |             |   |
| F 6-2 / F 9-2              | 583003901            |  |                        |             |   |
| F 12-2 / F 18-2            | 583003902            |  |                        |             |   |
| F 36-2 / F 65-2            | 583003903            |  |                        |             |   |
| F 95-2 / F 130-2 / F 190-2 | 583003904            |  |                        |             |   |
| F 260-2 / F 380-2          | 583003905            |  |                        |             |   |
| F 6-2 to F 380-2 P/M       | 5756662034P          |   | F 6-2 to F 380-2 Z/P/M | 5756661620P |  |
| F 95-2 P to F 380-2 P      | 5756661187P          |   | F 6-2 to F 380-2 A     | 5756662035P |  |

# Declaration of Conformity

## EU Declaration of Conformity

EN

Boge Kompressoren  
Otto Boge GmbH & Co. KG Otto-Boge-Strasse 1-7 33739 Bielefeld Germany  
Compressed Air Filter & Cyclone Separator

Z6-2 to Z480-2  
F6-2 to F380-2

|                        |  |   |
|------------------------|--|---|
| Directives             | PED  | 2014/68/EU  |
|                        | -  | -   |
|                        | -  | -   |
|                        | -  | -   |
|                        | -  | -   |
| Standards used         | PED  | Generally in accordance with ASME VIII Div 1 :<br>2015 & AS1210 |
|                        | -  | -   |
|                        | -  | -   |
|                        | -  | -   |
|                        | -  | -   |
| PED Assessment Route:  | F6-2 - F65-2 & Z6-2 - Z66-2 Article 4, Paragraph 3 (SEP)<br>F95-2 - F190-2 & Z210-2 Category I according to Module B<br>+ D<br>F260-2 - F380-2 & Z480-2 Category II according to Module<br>B + D |   |
| PED Certificate Number | 50351  | COV1611839/2  |
| Notified body for PED: | 0525   |   |
|                        | Lloyd's Register Deutschland GmbH<br>Überseeallee 10,<br>D-20457 Hamburg, Deutschland  |   |

Authorised Representative      Mrs Mareike Heinrich  
Head of R & D  
Boge Kompressoren

### Declaration

This declaration of conformity issued under the sole responsibility of the manufacturer.

Signature:



Date: 16 October 2019

Declaration Number:  
00309 / 16.10.19







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