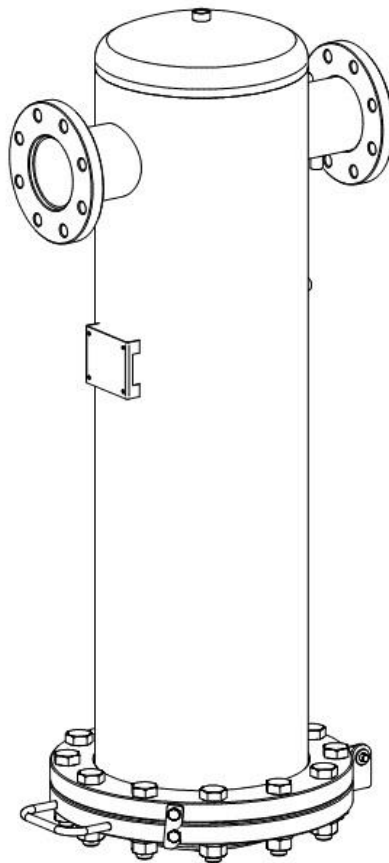




BERG Kompressoren GmbH
Compressed Air Technology | Air Separation

INSTALLATION AND OPERATING MANUAL

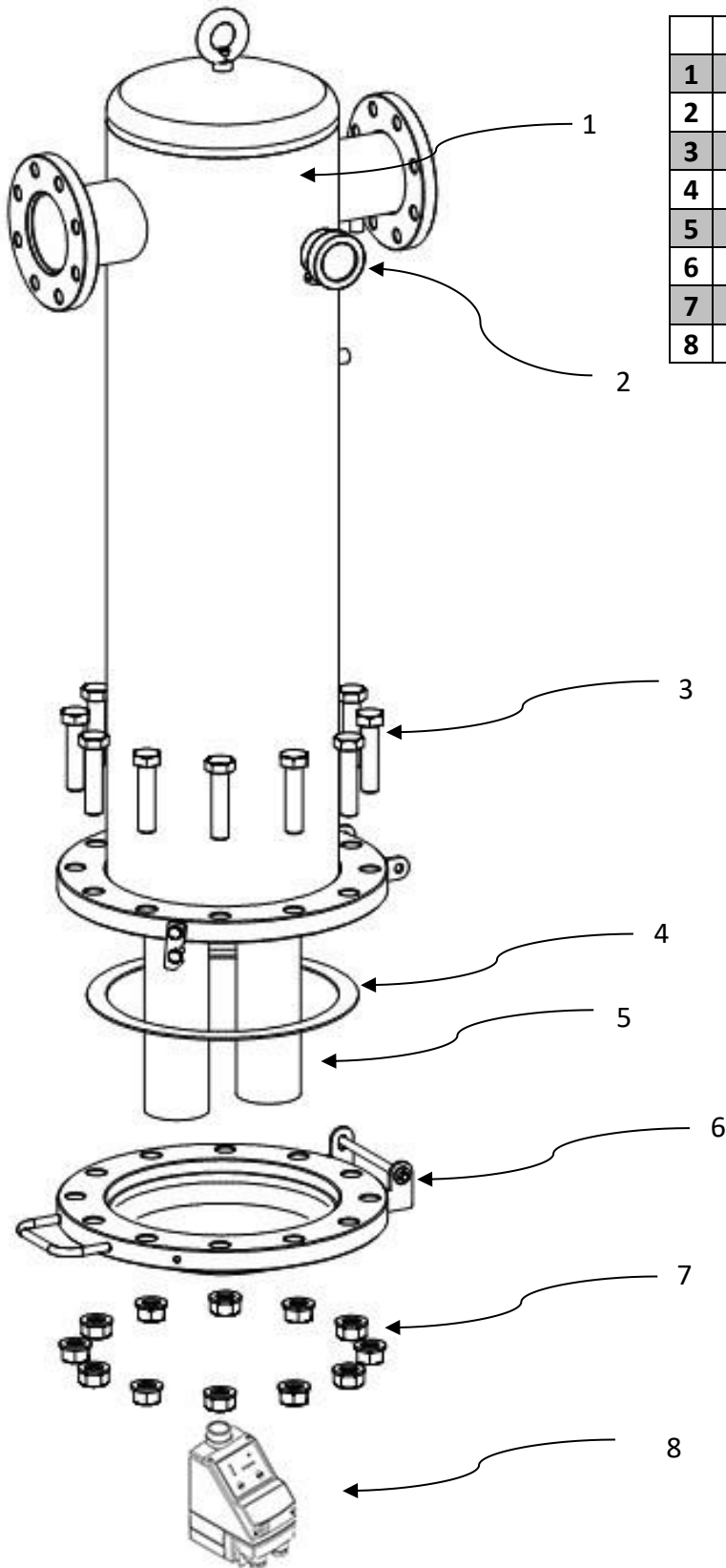
Compressed Air Filtration PUREBERG FFW



Please read the following instructions carefully before installing filter into service. Trouble-free and safe operating of the filter can only be guaranteed if recommendations and conditions stated in this manual are respected.



Components



	Part
1	Filter bowl
2	Pressure drop indicator (optional)
3	Bolts
4	Washer
5	Filter element
6	Filter head
7	Nuts
8	Condensate drain (optional)

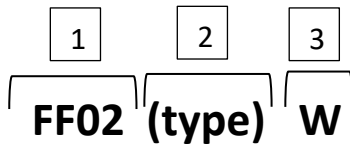
Product identification

[1] = Size: Housing

[2] = Filter elements

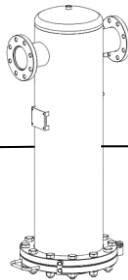
[3] = Attachment components top

[4] = Attachment components bottom (optional)



1

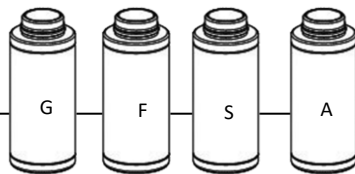
Size: Housing



FF 40 (type) W
FF 53 (type) W
FF 78 (type) W
FF 105 (type) W
FF 157 (type) W

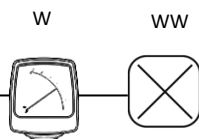
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Filter elements



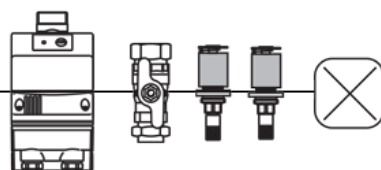
3

Attachment components top



4

Attachment components bottom (optional)



Technical data

FILTER HOUSING	CONN. SIZE [DN]	FILTER ELEMENT	FLOW CAPACITY		DIMENSIONS [mm]				VOLUME	WEIGHT
			[Nm ³ /h]	[scfm]	A	B	C	D	[l]	[kg]
FF 40 (type) W	80	1 x EF100 (type)	1680	989	1145	450	1640	219	38	71
FF 53 (type) W	100	2 x EF100 (type)	3150	1853	1330	560	1780	324	100	110
FF 78 (type) W	125	3 x EF100 (type)	4700	2765	1330	560	1780	324	100	115
FF 105 (type) W	150	4 x EF100 (type)	6300	3706	1360	620	1780	368	125	154
FF 157 (type) W	150	6 x EF100 (type)	9400	5530	1420	680	1810	405	168	195

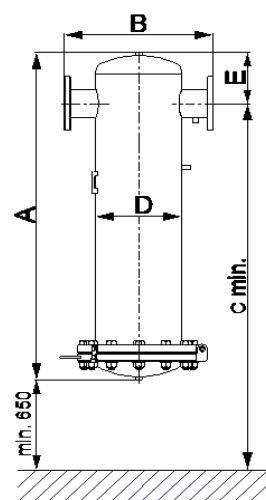
Flow capacity at 7 bar(g), 20°C

Standard is connection flange EN 1092-1/01 PN16, flange connection ANSI B16.5 is on request.

Operating temperature	-20 - 120 °C	-4 - 248 °F
Operating pressure	0 - 16 bar(g)	0 - 232 psi

MATERIALS

Housing material	Carbon steel
Fittings, Screws	Brass, Brass-zinc plated, Steel
Sealing	Aramid fibre with a nitrile rubber binder
Corrosion protection (internal)	Epoxy coat
Outside protection	Powder paint coated (Epoxy-polyester base)
Lubricant	Shell cassida grease RLS 2



CORRECTION FACTORS

To calculate the correct capacity of a given filter based on actual operating conditions, multiply the nominal flow capacity by the appropriate correction factor(s).

CORRECTED CAPACITY = NOMINAL FLOW CAPACITY x C_{OP}

[bar]	3	4	5	6	7	8	9	10	11	12	13	14	15	16
[psi]	44	58	72	87	100	115	130	145	160	174	189	203	218	232
C _{OP}	0,5	0,63	0,75	0,88	1	1,13	1,25	1,38	1,50	1,63	1,75	1,88	2,00	2,13

PRESSURE EQUIPMENT DIRECTIVE PED 2014/68/EU (Fluid group 2)

FF 40 (type)W	Category 2, Module H
FF 53 (type)W - FF 157 (type) W	Category 3, Module H1

PRESSURE EQUIPMENT DIRECTIVE PED 2014/68/EU (Fluid group 1)⁽⁴⁾

FF 40 (type)W	Category 3, Module H
FF 53 (type)W - FF 157 (type) W	Category 4, Module H1

⁽⁴⁾Fluid group must be specified in the order, if not standard fluid group 2 is selected

There is Technical datasheet available. For additional technical specification, contact manufacturer.

Safety instructions



This notice must be complied with in order to avoid damage to or destruction of the filter or its equipment.



MANDATORY: Instructions must be read by persons operating with the filters!
The instruction manual supplied and all other applicable instructions, regulations must be read and understood by operating personnel before using the filters.



MANDATORY: Protectors for eyes must be worn!
Protectors for eyes must be worn when working with the filters.



WARNING: Operating with high pressure!
Depressurize the filter before carrying out any work on the filter.

The relevant safety at work and accident prevention regulations, plus operating instructions, shall apply for operating the pressure vessel.

The pressure vessel has been constructed in accordance with the generally recognized rules of engineering. It complies with the requirements of directive PED 2014/68/EU concerning pressure equipment.

Ensure that installation complies with local laws for operation and routine testing of pressure equipment at the place of installation.

The operator/user of the unit should make himself familiar with the function, installation and start-up of the unit. All the safety information is always intended to ensure your personal safety.

- Do not exceed max. operating pressure or operating temperature range (see data label).
- The medium used may not have any corrosive components that could attack the materials of the filter in a way that is not permitted.
- Do not use the filter in hazardous areas with potentially explosive atmospheres.
- All installation and maintenance work on the filter may only be carried out by trained and experienced specialists.
- It is forbidden to carry out any kind of work on the filter and piping, including welding and constructional changes, etc.
- Use the device for an appropriate purpose only.
- Do not open the pressure vessel until you made sure that it is not pressurized any more.

- The product should only be used in a technically perfect condition and the intended manner, which takes into account safety-related considerations, danger-related considerations and the operating instructions.
- In addition to the manual, follow and advise the generally applicable binding regulations for accident prevention and for environmental protection.
- When exchanging the filter keep in mind that it might have operating temperature.
- Always wear safety goggles and gloves when working on the filter.

Intended use

FFW series filters are intended for high efficient removal of solid particles, water, oil aerosols, hydrocarbons and odour vapours from large compressed air systems within the performance limits and in accordance with the permitted environmental conditions specified in the technical data. All other uses are to be considered incorrect.

Specifically:

- filter is not intended for human breathing without proper additional equipment.
- filter can only be used for "GROUPE 2" fluids (PED 2014/68/EU).
- filter can be used for explosive, toxic, flammable, corrosive and "GROUPE 1" fluids (PED 2014/68/EU).

Intended use includes:

- Compliance with these instructions
- Compliance with all applicable legal regulations

The information on the product label must be observed. Non-observance of the data given there is regarded as improper use.

The manufacturer will under no circumstances be responsible for any damage resulting from improper, incorrect or unreasonable use.

The pressure vessel has been designed for a primarily static pressure. So, if you have a rapid changes in pressure, must be use special fittings by installation to avoid dynamic pressure.

Warranty exclusion / Improper use

Any use apart from the intended use mentioned above is considered to be not intended. The manufacturer/supplier can assume no liability for damage resulting from this type of usage, the user alone bears the risk of this.

The guarantee shall be void if:

- The operating instructions were not followed with respect to initial commissioning and maintenance.
- The unit was not operated properly and appropriately.
- The unit was operated when it was clearly defective.
- If unauthorized or unqualified persons work with or on the filter.
- When operating without safety equipment or with incorrect or non-functional safety equipment.
- Non-original spare parts or replacement parts were used.
- The unit was not operated within the permissible technical parameters.
- Unauthorized constructional changes were made to the unit or if parts of the unit that may not be opened were dismantled.
- The filter and filter elements did not be store indoors and in a dry place.
- If part of the filter was removed, when the filter was still pressurized!
Depressurize the filter before carrying out any work on the filter.
- The O-ring was damaged during the filter elements replacement and was not replaced.

Storage information

The following storage must be considered for proper operation:

- The filter and filter elements must be stored indoors in a dry place.
- Store them in original packing until they are used.

Installation

Operations should be performed only by qualified personnel. Never work on with installation under pressure. The user is responsible for ensuring that the filter never operates at a pressure and temperature exceeding the nominal values.

Eventual over-pressure and over-temperature could be dangerous and hazardous to the operator and the equipment.



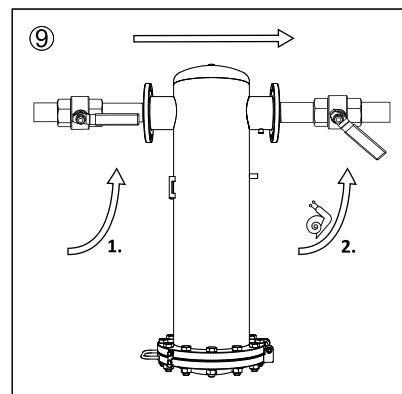
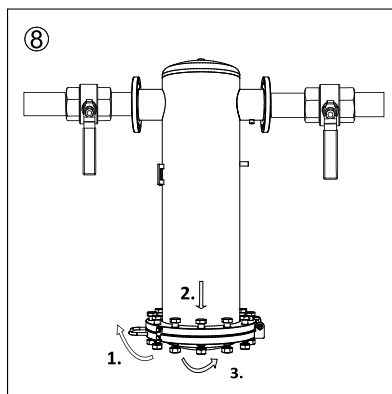
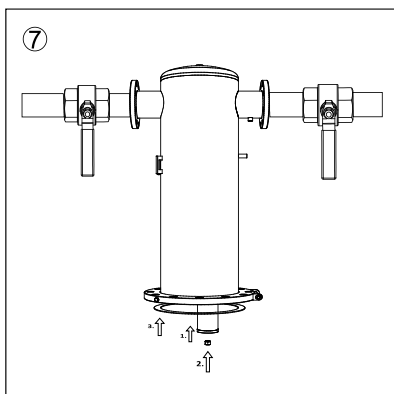
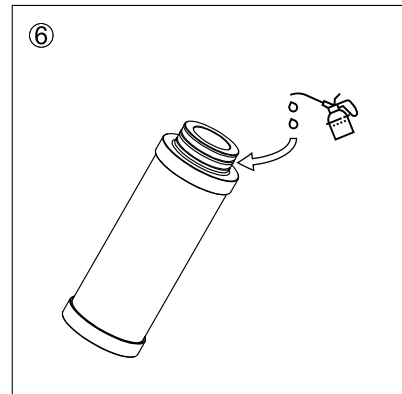
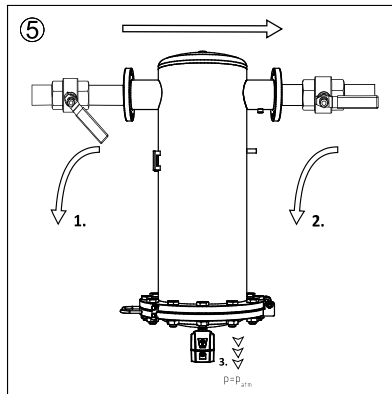
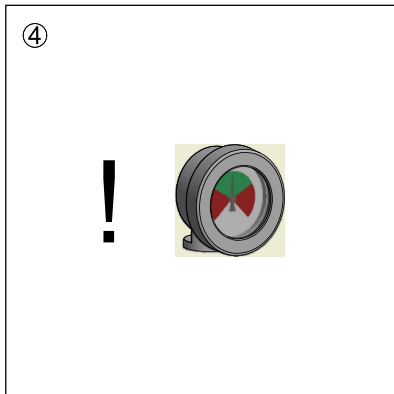
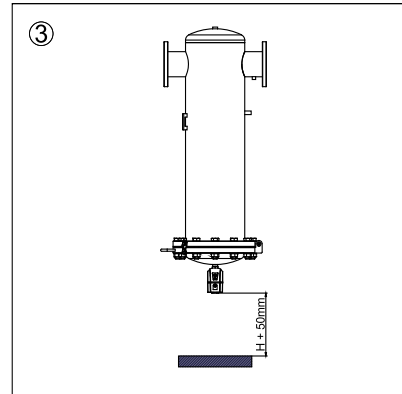
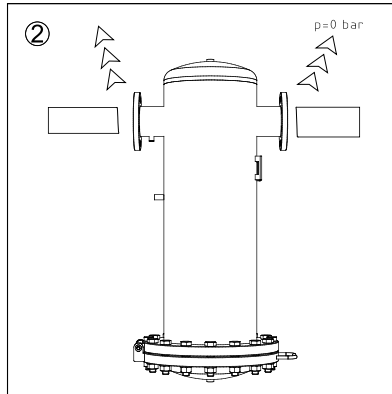
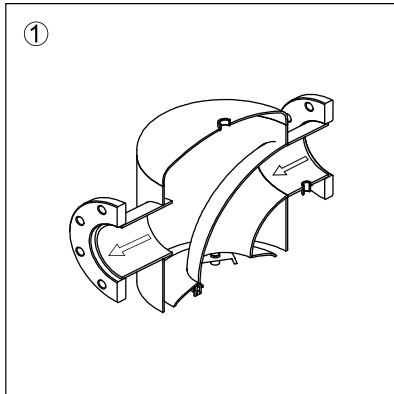
DANGER due to the release of a critical gas!

The release of a critical (Fluid group 1) gas from the network can constitute a considerable risk for man and environment.

INSTALATION INSTRUCTIONS

- The permissible working temperatures and pressures for ad-on parts and filter elements are given under Technical data for those ad-ons. The maximum temperature and pressure for the assembled system are the lowest of any individual part.
- Install suitable safety devices, such as safety valves, rupture discs or safety related measurement control and regulation devices, which ensure that the permissible operating value limits are not exceeded.
- It is necessary to ensure that the unit is equipped with the corresponding safety and test devices to prevent the permissible operating parameters from being exceeded.
- Ensure that the filter is not subject to vibrations that could cause fatigue fractures.
- A filter is not to be subjected to mechanical stresses.
- Depressurize the system before carrying out the installation work.
- Connect inline and outline pipe to the filter, see instruction on picture 1 and 2 on page 8. The filter housing and the system connections and accessory outlets must be leak tight.
- When connecting a pipe to the filter, take care that no dirt or foreign bodies or liquids enter the filter, the direction of flow IN – OUT is adhered to.
- Install the filter vertically and in such a way that the condensate exit is below.
- The filter must be installed with a minimum distance to the ground in relation to the height of the filter elements used and plus 50mm allowance, for easy replacement the filter elements. (The height of the filter elements is specified in the data-sheet of the filter elements).
- A pressure gauge, which shows the operational pressure, must be installed in the unit, respectively in the pipeline.
- The unit must be installed vertically in the piping.
- Install the pressure equipment in such a way that it is accessible for the possibly inspections and can be viewed from all sides.
- Install appropriate fittings (e.g.: non-return valves, pressure maintaining valves, ...) to avoid that the filter is subjected to unauthorized alternating stress.
- Wherever possible, installation of the filter housing should be made using an appropriate mounting bracket to avoid excessive loads on the piping.
- For install a drain condensate device see instructions and operating manual for condensate, the manual are attached to the condensate drain device.

Installation



Operating

- Be sure that the filter housing and drain are tightly closed. Open the valve on the inlet side of the strainer. Slowly open the valve on the outlet side of the filter. The filter is now in service.
- Filtration start as soon as flow is steady through the filter. As the filter removes dirt from the air, the accumulated dirt causes a resistance to flow. As a result, the gauge pressure will rise and the flow will decrease.
- When the pressure rises to **(see the parameters about differential pressure in a technical data given attached to the filter elements)** above the starting pressure or when the flow decreases below the desired rate, clean or replace the filter element.
- Once your filter is running and there is a pressure reading, line up the green arrow with the current reading. When the pressure rises to or above the red or second arrow, it is time to clean or replace your filter elements.
- If too much air pressure is applied to the filter, you may burst the filter elements. You can hear change the sound of the pump when it is working. In technical data is stated a maximum allowed pressure, if this value of pressure is achieved, you must to replace the filter elements.
- Condensate should be drain regularly, for install and operating the drain condensate device see instruction for operating, which are attached to the device.

Maintenance



HAZARD due to a sudden release of pressure!

Never remove any parts of the filter, for as long as the filter is still pressurized!
Depressurize the filter before carrying out any work on the filter.



DANGER due to the release of a critical gas!

The release of a critical (Fluid group 1) gas from the network can constitute a considerable risk for man and environment. Therefore heed the following before working on filters for critical gases:

- flush the pipe section in question with inert gas
- have the notes on hazardous substances for the used gas ready
 - take appropriate protection measures



WARNING due to the hot touch surfaces!

The gaseous fluid flowing through the filter could have a temperature up to 120°C/248°F. **Do not touch hot surfaces!** Wear safety gloves if applicable.



WARNING: internal corrosion can seriously reduce the safety of installation!
Check it during changing the cartridge.

Filter elements are subject to wear. In order to maintain system efficiency, optimal performance and best air quality, these rules of proper maintenance should be followed:

INSTRUCTION FOR REGULAR CHECKS

- Once per year make a visual check of filter housing and make sure there is no visual damage.
- If installed, weekly check the pressure drop indicator to ensure the filter element is not saturated, and pressure drop is within acceptable limits.
- If installed, ensure a trouble-free operation of the condensate drain. Check at least once a week if condensate drain operates regularly.
- The filter has been primarily designed for a life of 10 years in a normal operating environment. For safe operation and respect local law regularly checks the filter according to local regulations.

MAINTENANCE

- Never use unsuitable tools to open and close the filter housing
- Replace filter elements, as stated in the filter element product data-sheet, which you get attached to the filter elements.
- B filter element can be cleaned with ultrasonic bath or with back flushing. Intervals of cleaning depend on the application. If necessary replace filter element with new one.
- The housing O-ring can be damaged during filter element change. To prevent air leakage and malfunction replace housing O-ring if necessary.
- Carry out a check for leaks once the maintenance work has been finished.
- Damaged components are to be replaced by new ones. If a marked degree of damage is found, the entire filter is to be replaced.

Disposing of filter elements:

The filter element or cartridge might be contaminated by the filtered substances. Heed the notes on hazardous substances for the filtered gas and appropriate disposal regulations when disposing.