



INSTRUCTION MANUAL

DUST FILTER

MODEL

**DS-20, DS-25, DS-40, DS-50
DS-2, DS-3, DS-4**

Before using this product, be sure to read this operation manual.

Keep this manual with care to use at any time.

ULVAC, Inc.
Components Division
<http://www.ulvac.co.jp/>

【Before using this product】

We thank you very much for purchasing our product.

You are kindly requested, upon delivery of this product, to check that the delivered product is exactly what you have ordered and it has no damage caused by transport or the like.

This manual gives description on operation and maintenance procedure appropriate to use this product in safe and effective way. Please read this manual beforehand to correctly use the Dust filter.

You are requested to install and operate this product in compliance with the laws and regulations relating to the safety, e.g. Fire Defense Law, Electric wiring regulation and so on in the country and region you use this product. Consequently you shall be requested to attend general safety lectures officially effective in the area, such as electrical safety, Cargo handling safety and so on. Note that any person not attended such lectures shall be restricted from handling this product. Operators shall need to attend such kind of training and have special knowledge, skill and title regarding the electricity, machinery, cargo, vacuum and so on.

This product is designed to conform to regulations valid at the time of issue of this manual and its conformity is not ensured if any of regulations shall be changed in the future.

The performance and safety of this product might not be ensured if any of the devices put together did not conform to same regulations or this product itself was modified. ULVAC shall be not liable to guarantee performance and safety in such cases above. Any modification of this product by the user is out of the scope of guarantee by us and not be guaranteed in any manner.

Be sure to clear any energy sources, e.g. electricity, coolant and so on of this product before installing or removing this product.

Please note that any of the parts used in this product shall keep the performance at the time of the shipment but shall not survive eternally. Any of the parts cannot, under any application supposed under socially-accepted idea, help but inevitably deteriorate its performance and get easily result in causing trouble of this product. You are kindly requested consequently to take your application situation into consideration and help yourself to implement the protective maintenance so as to avoid troubles.




Through implementation of the protective maintenance, you shall reduce occurrence of the trouble due to wear and/or failure of the part and bring reducing the occurrence of the downtime caused by this product trouble and fire as well as a risk of affecting the another process.

We would like to ask you again to establish the protective maintenance plan as well as conduct the part replacement and overhaul in accordance with such a plan.

Please do not hesitate to contact our sales office or agency closest to you or the Components Division if you had any question or unclear on the use.

Safety symbol mark

We display symbol marks regarding the safety in this manual and on this product to make clear items to observe. Descriptions attached to the symbol are classified as illustrated below;

	If the user makes a mistake in handling, it indicates an imminent possibility that the user is subject to death or heavy injury.
	If the user makes a mistake in handling, it indicates a possibility that the user is subject to death or heavy injury.
	If the user makes a mistake in handling, it indicates a possibility that the user is subject to moderate injury or it leads to significant damage of the machine. It indicates a possibility that damage of the machine is caused and the normal operation is impaired.

**DANGER**

When you clean up this product with organic solvents, please be based on laws and ordinances such as the Occupational Safety and Health Act or the Ordinance on the Prevention of Organic Solvent Poisoning concerned.

Because lack of oxygen might be caused, please ventilate the room enough based on laws and ordinances enough.

**DANGER**

When you perform the element exchange, there is a possibility that the element explodes when exposed to the air with powder (dust explosion).

Please conduct it after purging nitrogen well before exchange.

In addition, please eliminate any firing sources such as fire or the static electricity.

**WARNING**

Please do not disassemble or repair it other than repair engineers.

**WARNING**

Please carry out the leak test on connection points before use.

There is a possibility that the leakage happens in the case that vacuum pump exhausts toxic or flammable gases.

**WARNING**

When you use it for the exhaust of the poisonous gas, the contact points of the gas such as an element or the main case become harmful. Please note it at the time of the maintenance.

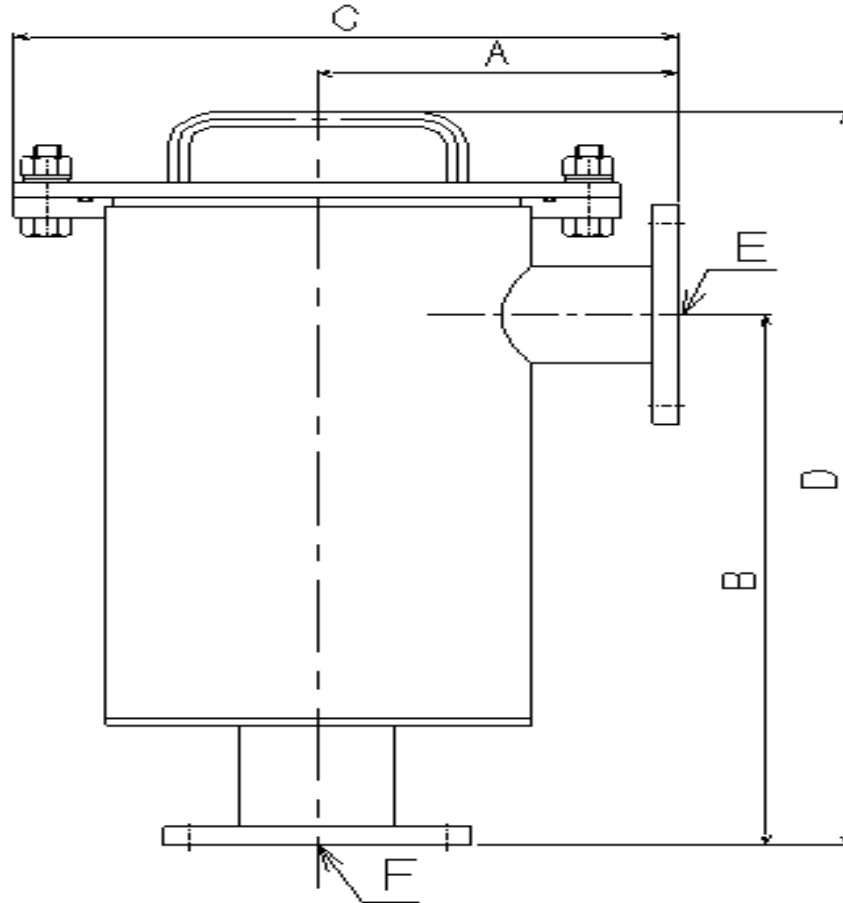
**CAUTION**

When you find an abnormality, to prevent an accident, please stop using it immediately and ask the nearest ULVAC branch for check and repair by all means.

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DS Series Dust Filter Out-Line Drawings

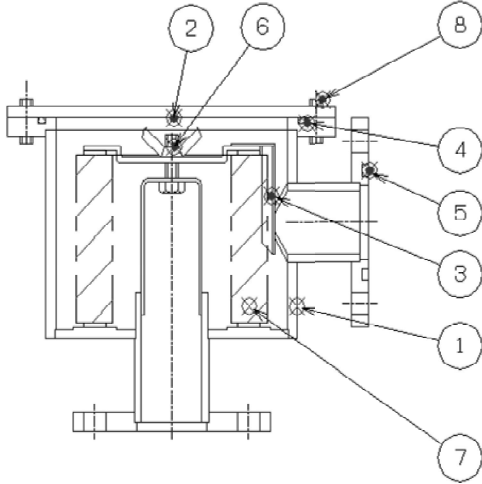


Type	Application Type	A	B	C	D	E	F	Weight (kg)
DS-20	PVD-180	90	90	165	140	VG20	VF20	2.9
DS-25	PVD-360	90	90	165	140	VG25	VF25	3.1
DS-40	VD30C,VD40C	140	195	188	306	VG40	VF40	9.0
DS-50	VD60C,VD90C	140	195	188	306	VG50	VF50	9.2
DS-2	PKS-016	140	290	188	401	VG50	VF50	11.0
DS-3	PKS-030	200	530	375	686	VG80	VF80	32.0
DS-4	PKS-070	220	583	420	767	VG100	VF100	46.0

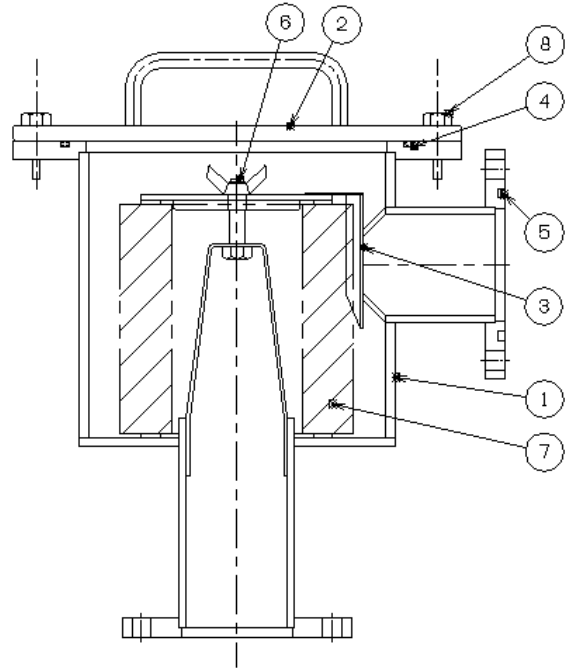
* PVD-180 and PVD-360 can attach an intake pipe to the RF series after exchange.

DS Series Dust Filter Structural Drawings

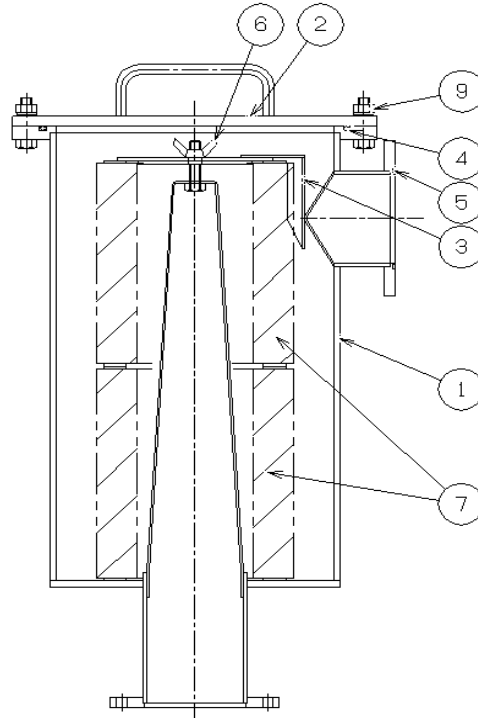
DS-20, 25



DS-40, 50



DS-2, 3, 4



Parts List

No	Description	Material	Q'ty	Remarks						
				DS-20	DS-25	DS-40	DS-50	DS-2	DS-3	DS-4
1	Filter case	SUS304	1							
2	Filter top lid	SUS304	1							
3	Filter presser plate	SUS304	1							
4	O ring	FKM	1	G120	G120	V175	V175	V175	V275	V325
5	O ring	FKM	1	V34	V40	V55	V70	V70	V100	V120
6	Butterfly nut	SUS304	1	M6	M6	M8	M8	M8	M10	M10
7	Filter element	Synthetic -resin	1	BR-206	BR-206	BR-208	BR-208	—	—	—
			2	—	—	—	—	BR-208	BR-209	BR-210
8	Hexagon head bolt	SUS304	3	M6×15L	M6×15L	M8×20L	M8×20L			
9	Hexagon head bolt	SUS304	4					M8×20L	M12×40L	M12×40L

【Important Notice】

- I change old-model dust filter and part constitution. Please be careful.
- Only in DS-25 in particular, mark ④ O ring is changed to G115 → G120.
- A model and the number of the filter element do not have the change.

1 GENERAL

The DS series dust filter removes powder particles 10 μm or more in diameter sucked in vacuum adsorption/transfer, vacuum molding, vacuum melting (furnace), vacuum heat treatment (furnace) and other processes, thereby reducing the damage and troubles that may be caused to vacuum pumps with powder particles.

2 Installation

(1) Inspection

Upon unpacking the case, check the following.

- (1) The filter is the one you ordered.
- (2) The filter is provided with the specified type of gasket.
- (3) No part is damaged in transit.
- (4) No screws and nuts are loosened or have come off in transit.

If any trouble or discrepancy is found, contact your local ULVAC representative or Components Division, ULVAC, Inc., Japan.

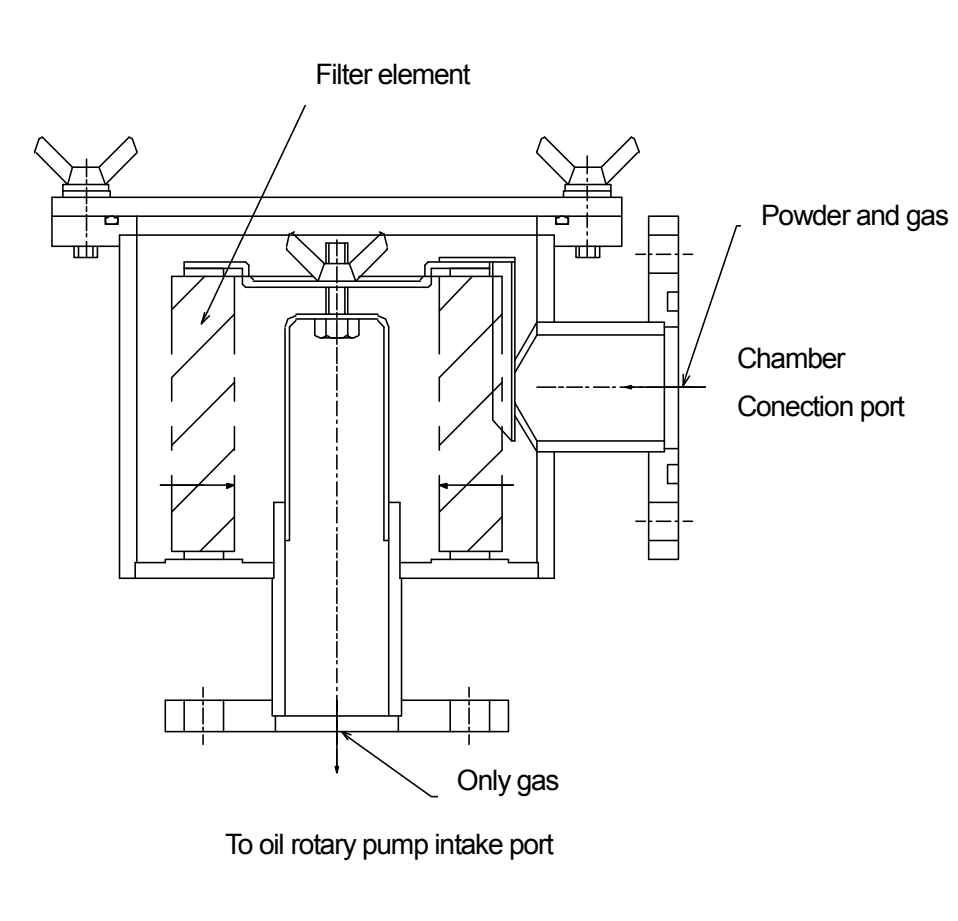
(2) Installation

Install the dust filter on the fore stage of the intake side of your oil rotary vacuum pump. It should be connected directly to the intake port of the oil rotary pump or to the piping on the intake side. Always install it in the vertical direction (filter is to be removed in the vertical direction).

Note If the filter is installed in the horizontal direction (if the filter is to be removed in the horizontal direction), the filter element may be shifted or its replacement will be awkward.

3 Structure

This dust filter removes only powder particles by passing gas containing powder particles through a radial fine element having maximum filtering efficiency with a minimum volume and exhausts the gas directly to the oil rotary pump. The filtering accuracy is 10 μm as standard. DS-20 to 50 has one filter element and DS-2 to 4 has two filter elements.



4 Cautions in Use

- (1) When this dust filter is installed to an oil rotary pump, the ultimate pressure will be slightly higher (lower vacuum) because of the outgas and resistance of the filter element, and the pumping speed will lower by 10 to 20 percent.
- (2) The filter element is made of synthetic fiber, so that much water content in air is adsorbed to it. If the oil rotary pump is used for pumping after the filter is replaced, water content adsorbed to the filter element will evaporate and penetrate into the pump, resulting in poor vacuum or making the pump oil turbid (milky white). Whenever the filter element is replaced, open the gas ballast valve before actuating the pump and run the pump for 5 to 6 hours.

- (3) The heat resistance of the filter element is about 60°C, but normally keep the temperature of the gas to be sucked into the pump should be not higher than 40°C.
- (4) The filtering accuracy of the filter element is 10µm as standard, but it is necessary to select a filter element suited to the process depending on the size and temperature of the power particles to suck. The filtering accuracy is available from 5 µm to 100 mesh (about 150 µm) by changing the element material from synthetic fiber to SUS mesh. For a special type of filter element, consult with your local ULVAC representative or Components Division, ULVAC, Inc., Japan.
- (5) The DS series filter element is usually installed in the fore stage of an oil rotary pump, but if it is installed in the fore stage of a mechanical booster pump, always select one that is larger by 1 to 2 sizes by considering the influence of conductance.

5 Inspection and Maintenance

5.1 Inspection and Maintenance

- (1) Replace the filter element if the pumping speed of the oil rotary pump has lowered or if the ultimate pressure has increased. The filter element is the dry type and can be reused by removing powder particles with compressed air blown from the inside of the filter element, then cleaning it with solvent or other and drying it. Note, however, that if there is solvent or water content remaining in the filter element, it will be mixed in the vacuum pump oil, deteriorating the ultimate pressure considerably. Therefore, dry it up or run the pump for several hours until it dries up. At this time, the pump oil will be deteriorated and must be changed with fresh oil.
- (2) When removing the filter element from the filter case for replacement, slowly lift it up and do not allow dust to fall into the pump intake port. Also completely remove the dust that has collected at the bottom of the filter case.
- (3) List of filter elements

Model	Type of element	Outside dimensions of element (OD×ID×length)	Q'ty
DS-20	DS-20E (BR-206)	87mm × 54mm × 70 mm	1 pc.
DS-25	DS-25E (BR-206)	87mm × 54mm × 70 mm	1 pc.
DS-40	DS-40E (BR-208)	122mm × 68mm × 120mm	1 pc.
DS-50	DS-50E (BR-208)	122mm × 68mm × 120mm	1 pc.
DS-2	DS-2E (BR-208)	122mm×68mm×120mm	2 pcs.
DS-3	DS-3E (BR-209)	200mm × 112mm × 160mm	2 pcs.
DS-4	DS-4E (BR-210)	216mm × 127mm × 250mm	2 pcs.

- (4) For the replacement of the O-ring, refer to the dust filter parts list.

6 Warranty

- (1) The equipment is guaranteed against defects in design, material or workmanship for one year after delivery.
- (2) Should any failure occur by normal operating procedure as defined below within this period, replacement of defective parts or repair shall be done at no charge.
 - ◇ Temperature of operating atmosphere is 10 ~ 40.
 - ◇ Evacuation gas is dry air or dry nitrogen below 40.
 - ◇ Operation is done according to the instruction manual.
- (3) However, the following is not covered by this warranty.
 - ◇ Failure due to force majeure, such as a natural calamity and fire.
 - ◇ Failure due to unusual atmosphere such as salty or polluted air.
 - ◇ Failure due to operation under conditions not specified in the instruction manual.
 - ◇ Failure that may be regarded by our engineer as caused by not complying with the operating conditions of this equipment.



This mark is applied to the electronic information product sold in the People's Republic of China. The figure at the center of the mark is the validity date of environmental protection. This product does not influence the environment, the human body and the property during the period reckoning the manufacturing date as long as the caution for safe use regarding the products are observed.

*The environmental protection validity date is not the product warranty period.

Table. Making format for names and contents of hazardous substances or elements

Name of parts	Hazardous substances or elements					
	Pb	Hg	Cd	Cr ⁶⁺	PBB	PBDE
Body	○	○	○	○	○	○

○: indicating that content of the hazardous substance or element in all homogeneous materials of the part does not exceed the requirements for concentration limits specified by SJ/T11363-2006.

×: indicating that content of the hazardous substance or element in, at least one kind of, homogeneous materials of the part exceeds the requirements for concentration limits specified by SJ/T11363-2006. Producer may further explain the technical excuse to the items marked with "X" perspecific conditions here.