



Donaldson®
FILTRATION SOLUTIONS

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

Dust Collectors TDP

TDP450, TDP675, TDP900, TDP1350

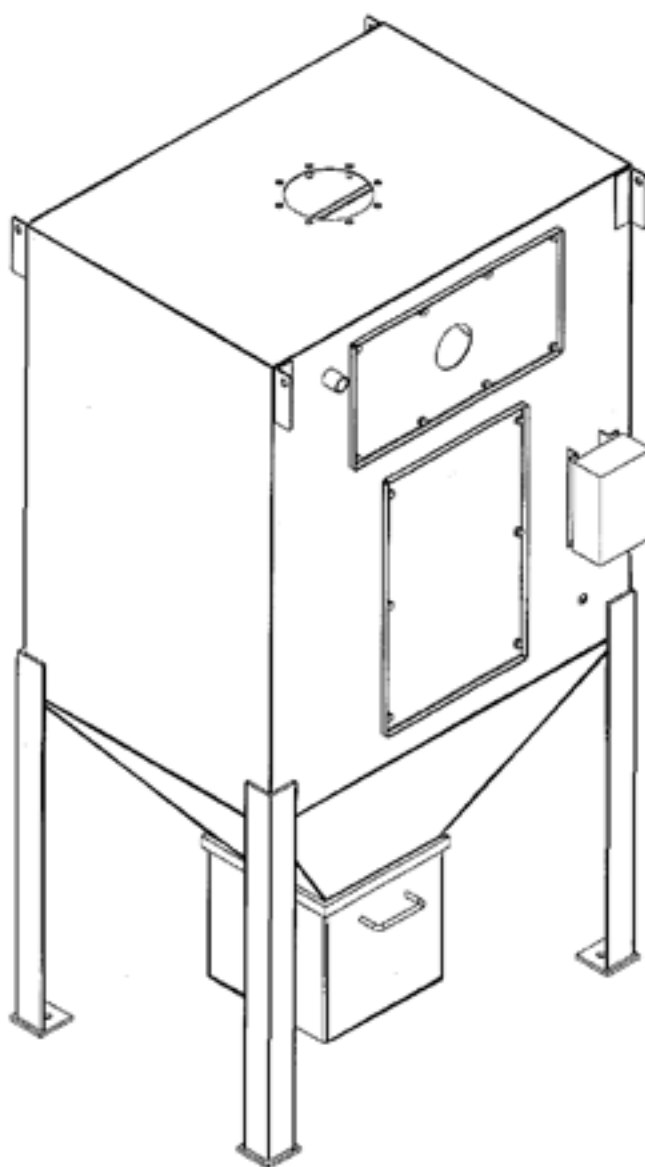


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GENERAL SAFETY REQUIREMENTS

This manual contains specific precautionary statements relative to worker safety in appropriate sections. To avoid dangerous situations we give you the following advice:



Refers to special information on how to use the dust collector most efficiently.



Refers to special information directed towards preventing damage.



Refers to special information designed to prevent injury or extensive damage.



The dust collector has been built in accordance with state-of-the-art standards and recognized safety rules. Nevertheless, if not handled carefully, it may put people at risk or also cause damages.



The dust collector must only be used in technically perfect condition in accordance with its designated use and the instructions set out in the operation manual. Any functional disorders, especially those affecting the safety, should therefore be rectified immediately.



Make sure to give proper training to operators before start-up. The dust collector is designed exclusively for use in accordance with the scope of delivery, drawing(s) and the specification sheet.



The dust collector is not designed for applications with combustible materials involving a potential dust explosion risk (e.g. buffing lint, paper, wood dust, aluminium and magnesium).



It is not allowed to put lit cigarettes or any burning object into the hood or ducting of any dust collection system.



Regular maintenance is important for a good performance of your dust collector. A prudent user of Torit DCE equipment should consult and comply with all relevant Fire Codes and/or other appropriate codes when determining the location and operation of dust collector equipment. A hand operated supply disconnecting device is necessary for each incoming electrical supply in accordance with EN 60204-1.



To prevent accidents the access to the fan wheel must be impossible during operation. Refer to EN 294.



Disconnect all power before servicing. All electrical work must be done by a qualified electrician according to local codes.



All exposed conductive parts of the electrical equipment and the dust collector shall be connected to the protective bonding circuit (refer to EN 60204-1).



Shutoff and bleed-off compressed air supply before doing any service work.

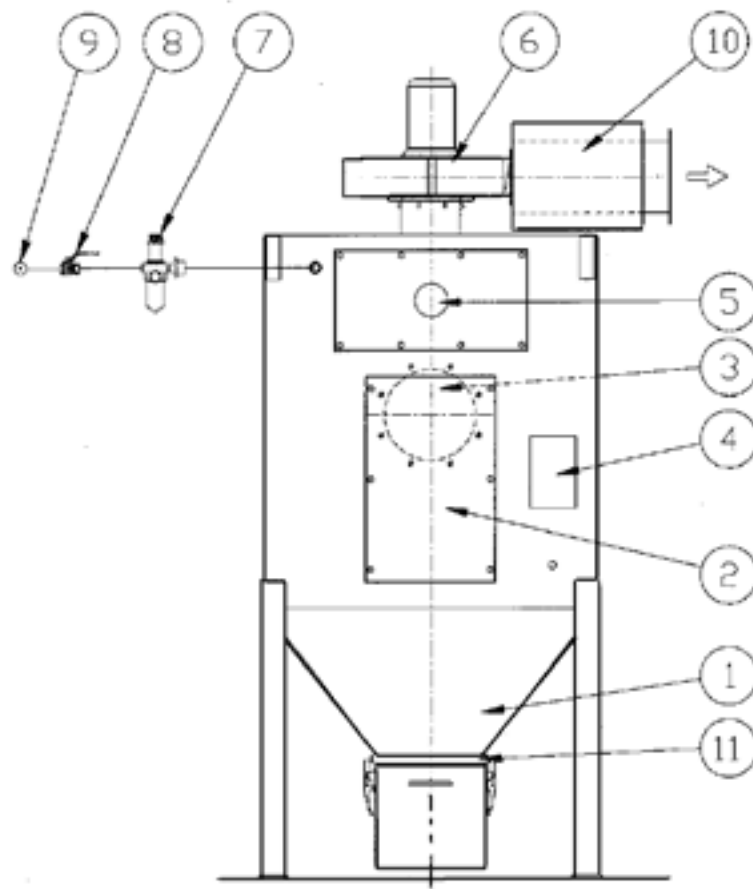


The dust collector cannot be used in a potentially explosive atmosphere (according ATEX directive 94/9/EC), unless stated otherwise on the nameplate of the unit and scope of delivery.



The user of the dust collector is responsible to dispose of any dust generated by the process, according to local regulations.

INTRODUCTION



- | | |
|--------------------|-------------------------|
| ① Hopper | ⑦ Filter regulator * |
| ② Inspection cover | ⑧ Shut-off valve |
| ③ Inlet | ⑨ Compressed air supply |
| ④ Controlbox | ⑩ Silencer * |
| ⑤ Magnehelic | ⑪ Dust bin |
| ⑥ Fan * | |

(*) items are not included with the dust collector

Figure 1: Typical installation view

Product information

The dust collector is used for the collection of airborne dust and particulate. Whether in answer to the problem of air pollution, or as part of a manufacturing process, the dust collector provides highly efficient, continuous, on-line dust collection.

The filter elements are the heart of the dust collector. These filter elements help ensure that only cleaned air is returned to the plant environment.

Technical and field support are available from your local Torit DCE Representative or distributors to answer your questions.

Function

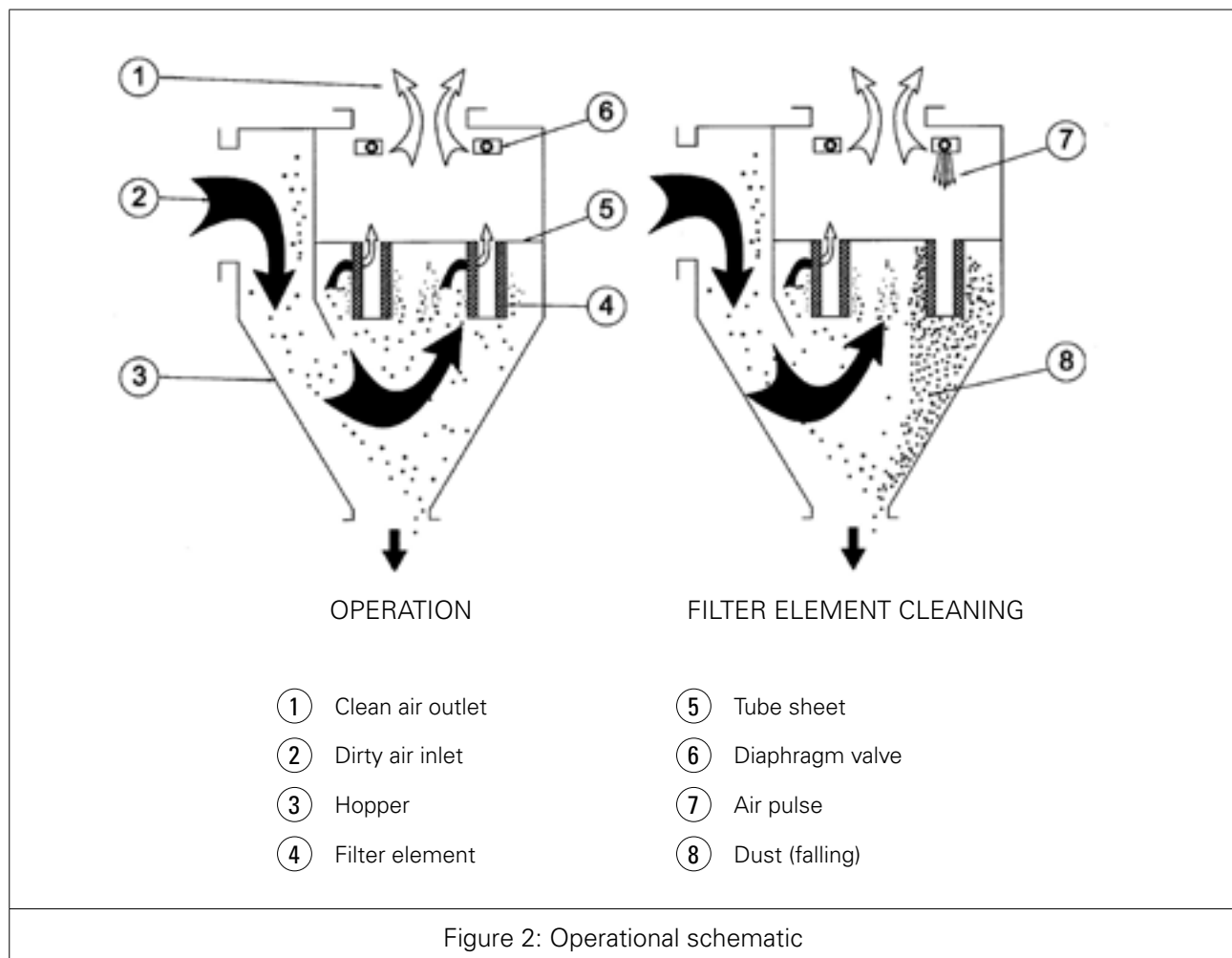
During operation, contaminated air enters the dust collector through the dirty air inlet area and passes through the filter elements.

Dust is collected on the outside surface of the filter elements. The filtered air flows through the center of the filter elements into the clean air chamber, where it exits through the clean air outlet and can be recirculated into the environment.

To ensure the optimal performance of your dust collector it is necessary that the filter elements are cleaned automatically and sequentially.

During the filter cleaning sequence, the timer energises a solenoid valve, causing the corresponding diaphragm valve to send a pulse of compressed air through the filter elements (from the inside outward), removing the collected dust from the outside surfaces of the filter elements.

The dust falls through the hopper into the dust disposal system.



PRIOR TO INSTALLATION

Location

The dust collector should be located with consideration for:

- emptying the dust disposal
- shortest runs of inlet and outlet ductwork
- radius bends on elbows as big as possible
- easy access to electrical and compressed air connections
- convenience of maintenance



Consult the technical specification sheet and drawings for the dust collector weight and dimensions.

For calculating for foundation or supporting structure consider the following factors:

- the weight of the dust collector
- the material collected
- all auxiliary equipment
- live loads
- for outdoor installation: snow and wind loads

Required tools and equipment

- Crane/Fork lift
- Slings/ Clevis Pins and adequate lifting equipment
- Standard tools (e.g. screwdrivers, wrenches, etc.)
- Drill
- Pipe Sealant

Delivery and inspection



The dust collector is normally shipped by truck as a completely mounted dust collector and should be checked for any damage that may have occurred during shipping. Compare the parts received against the packing list. If there is damage or parts missing, notify the delivery company and your local Torit DCE representative.

Parts shipped loose with the delivery (depending on your order):

- Dust disposal system
- Transition pieces
- Fan set (if not premounted)
- Fan box
- Silencer
- Platform
- Spare parts
- Anchor bolts
- Hardware/Sealant

INSTALLATION

General guidance to lifting



The collector should be lifted using either the four-point lifting arrangement or the fork-lifting arrangement by a qualified competent person (refer to figures 2 and 3).



During all lifting operations a crane or forklift with an adequate SWL (safe working load) must be used. (Refer to lifting label located adjacent to lifting points for weight of equipment supplied by Donaldson).



When using the four-point lifting method, chains or slings with an adequate SWL (safe working load) must be used. (Refer to lifting label located adjacent to lifting points for weight of equipment supplied by Donaldson). Chains must be long enough to ensure that the included angle between diagonal chains is not greater than 90° (refer to figure 2 and 3).



Care should be taken as the unit might have a high center of gravity.



Do not use the lifting lugs of the spark trap.



Before unloading, remove all packing and strapping.

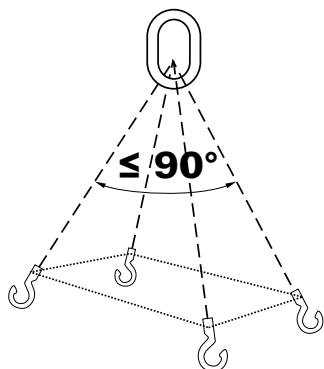


Figure 3: Four-point lifting arrangement

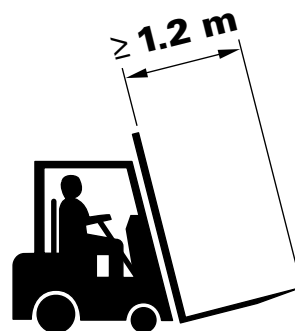


Figure 4: Fork lifting arrangement

Installation and assembly



When fitted with a fan box with HEPA, the fan box will be shipped separately.



Anchor the dust collector to the foundations.



If one of the following equipment is ordered and not mounted, please follow the according instructions.

Leg installation

Assembly of demountable legs (optional)

1. Stand the leg set up and position as shown in the drawing at the anchor bolt location.
2. Lift the dust collector into position over the leg set and lower into position carefully.
3. Use a set of drift pins to align the holes in the collector and legs, and attach the legs with the M10 x 25 bolts and washers. Do not tighten hardware at this time!
4. Use a set of drift pins to align the holes in the wind bracings to the rear side of the leg set. Attach the windbraces with M10 x 25 bolts and washers. Do not tighten the hardware at this time!



The wind bracing supplied with the legs (in case of demountable legs) must be fixed in both directions.

5. Recheck the position of the leg sets and windbracing against the outline drawing.



The dust collector must be anchored (refer to the replacement part list for the type of anchor).

6. Level the dust collector while it is still being supported by a forklift (or crane). Tighten all hardware on legs, windbracing and foundation anchors.
7. Before releasing the dust collector from the forklift (or crane), recheck all of the hardware to make sure it is securely tightened.

Fan set

If the fan set is not premounted, place and anchor it on the foreseen position.

When installing the fan set:

- Use proper equipment and safety guidelines when lifting and installing.



Use the lifting lugs on the fan box to lower the fan box onto the collector.



Lifting lugs on the fan box are designed to carry the weight of the fan box only, never lift the collector with the lifting lugs on the fan box.



To lift the collector, use lifting lugs located on side of the collector, see figure below.

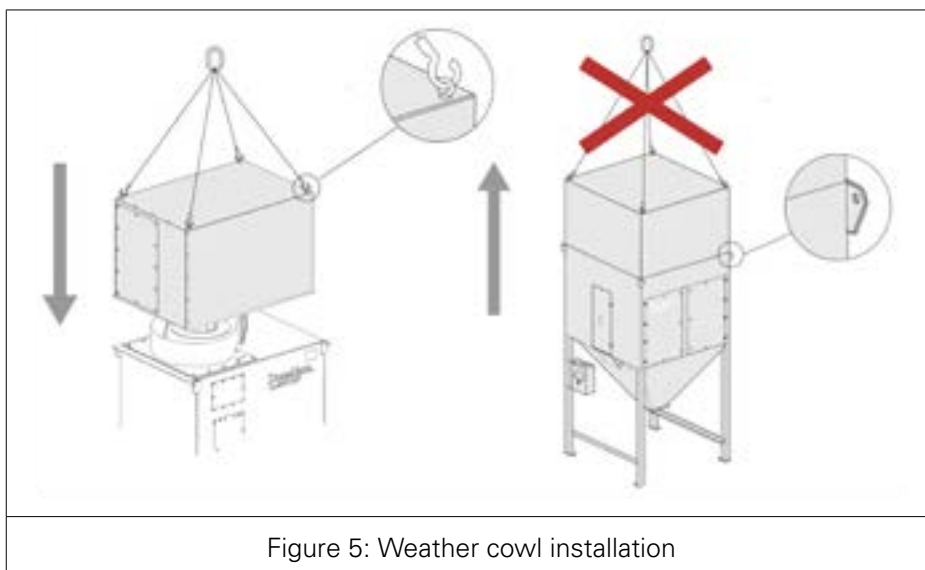


Figure 5: Weather cowl installation

- Rotate the fan wheel before and after installing into the fan housing to assure proper clearance.
- Check the rotation of the fan wheel (direction of the arrow).

In- and outlets

If not premounted, mount the in- and outlets as shown on the specific drawings.

Platforms and ladders

When installing platforms and ladders care must be given during the erection for a safe handling with a crane or a forklift.



Make sure all bolts are securely tightened and the legs of the platform and ladder will be anchored to the foundations.

Control box



The control box is factory mounted on the dust collector, according to our standards (except when specified by order).



All the instructions related to the controls are mentioned in a separate manual [(1A3119-8064) (IPC)].

Compressed air connection

- Compressed air pressure must be between 6 and 7 bar.
- Be sure that all compressed air components are adequately sized to meet the maximum system requirements of 45 Nliters per pulse at max 7 bar supply pressure (= design pressure).
- It is a requirement that adequate precaution is taken to avoid exceeding this pressure. Relief safety valve is required if the connected supply can exceed this pressure. A label is also attached to each manifold indicating manifold design details.
- Compressed air supply needs to be both oil and moisture free.
- The piping should be installed to provide a fall in the directions of the air flow to assist in the drainage. A blow-down cock should be provided at the lowest point of the installation.
- Purge compressed air lines to remove debris before connecting to the manifold.
- Connect the compressed air supply line to the compressed air connection of the dust collector.
- Use thread-sealing tape or pipe sealant on all compressed air connections.
- A compressed air shut-off valve, a filter/water separator with automatic condensate drain, a pressure regulator with gage must be installed on the compressed air supply line. Locate these components for convenient service, in the immediate vicinity of the dust collector.

Electrical connection



Amperage and voltage information is shown on the nameplate ratings of the fan motor. Over amperage of manufacturer's recommended service of motor will cause damage.

If the fan is not premounted, connect the fan motor to the control box according wiring diagram.

Connect the main power to the control box according the wiring diagram included in the control box.



Check the rotation of the fan wheel (direction of the arrow on the fan housing). If the fan is running in the wrong way, it will deliver only approximately 40 % of its rated air volume.

Lock out all electrical input power and interchange any two wire leads (3 phase only) on the output side of the motor starter to reverse fan rotation.

Duct connections and damper valve

Connect:

- Fan and dust collector
- Inlet
- Outlet if needed



All connections must be sealed properly.



*If not integrated in the unit it is **ABSOLUTELY NECESSARY** to install a damper valve to adjust the airflow.*

START-UP CHECKLIST



Follow all steps before first start-up and when the dust collector is not been used for a long period. For daily use follow steps 1, 2, 4, 5 and 7.

1. Check that the outlet of the fan is free of debris before starting.
2. Make sure the dust disposal system is properly installed under the hopper.



Too much airflow can cause electrical failure of the fan motor or dramatically reduce the life of the filter elements.

3. Check if the damper valve is 50 % closed.
4. Check if the access covers are closed.
5. Switch main power on and press switch 'on'.
6. Check the airflow with a pitot tube and a micro-manometer in the ductwork and adjust the damper valve to the desired airflow.



In case of an integrated damper valve, switch the fan off before opening the access cover.

7. Turn on the compressed air supply. Adjust to 6.5 bar of pressure with the compressed air regulator.



Do not increase compressed air pressure beyond 7 bar as component damage may result.

The cleaning cycle only starts when necessary. For customized settings see the controls manual.

OPERATION SCHEDULE

To ensure a good performance of your dust collector follow the checkpoints mentioned below according to the timetable.

No.	Checkpoint	Type of control	Recommended action	Day	Weeks			
					2	4	8	26
1	Control board	Visual check alarm light (illuminated)	See trouble shooting guide in Control manual	x				
2	Dust disposal system	Check contents of dustbin(s)	If $\frac{3}{4}$ full, empty dustbin	x				
3	Fan set	Excessive noise	See trouble shooting guide	x				
4	Clean air chamber	Emission: dust carry over in clean air chamber	See trouble shooting guide		x			
5	Controls settings	Check settings of both potentiometers (pulse time 100 milliseconds, interval time 10 seconds) on the control board (see separate manual)	Interval time normally to be set at 10 seconds. Pulse time 100 milliseconds.		x			
6	Filter/regulator	Oil and/or water is in the reservoir	Switch off and bleed compressed air prior servicing. Clean oil/water separator. Check compressor.		x			
7	Diaphragm valves	Noise of escaping air is produced	See trouble shooting guide			x		
8	Covers	Visual check gaskets	Replace gaskets if necessary			x		
9	Connecting ducts	Check for leakage	Repair if necessary				x	
10	Dust collector and platform	Check damage, strength and corrosion	Repair or replace if necessary					x
11	Filter element	Preventive replacement of all filter elements	Unless otherwise specified in the scope of delivery every 2 years.					

SERVICE



Disconnect electrical power before servicing.



Shut off and bleed compressed air supply before servicing any compressed air components.



No welding should be performed inside without fire protection.



Avoid contact or exposure to dust during servicing or maintenance.

Dust removal



Do not let the dustbin overfill. It can cause poor dust collector performance.

Turn off the dust collector and empty the dustbin on a regular base (recommend to empty the dustbin when 3/4 full).

The bin can be installed and removed as shown below:

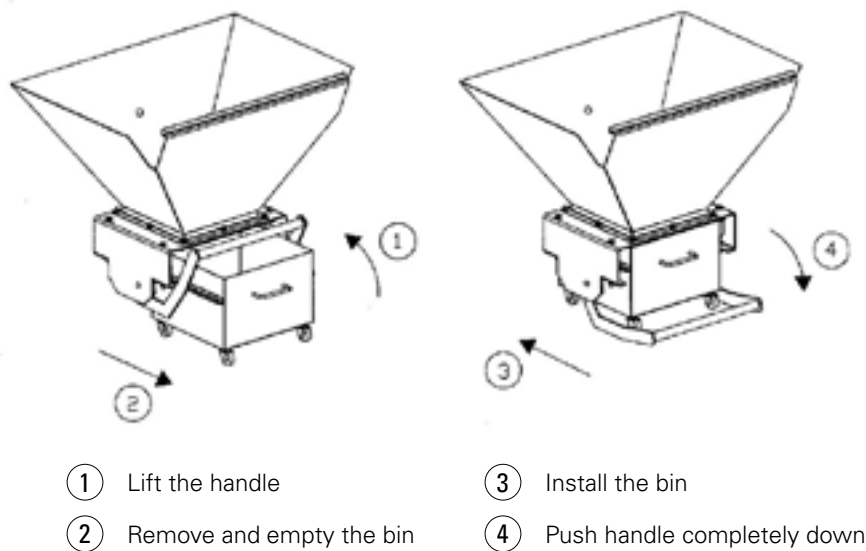
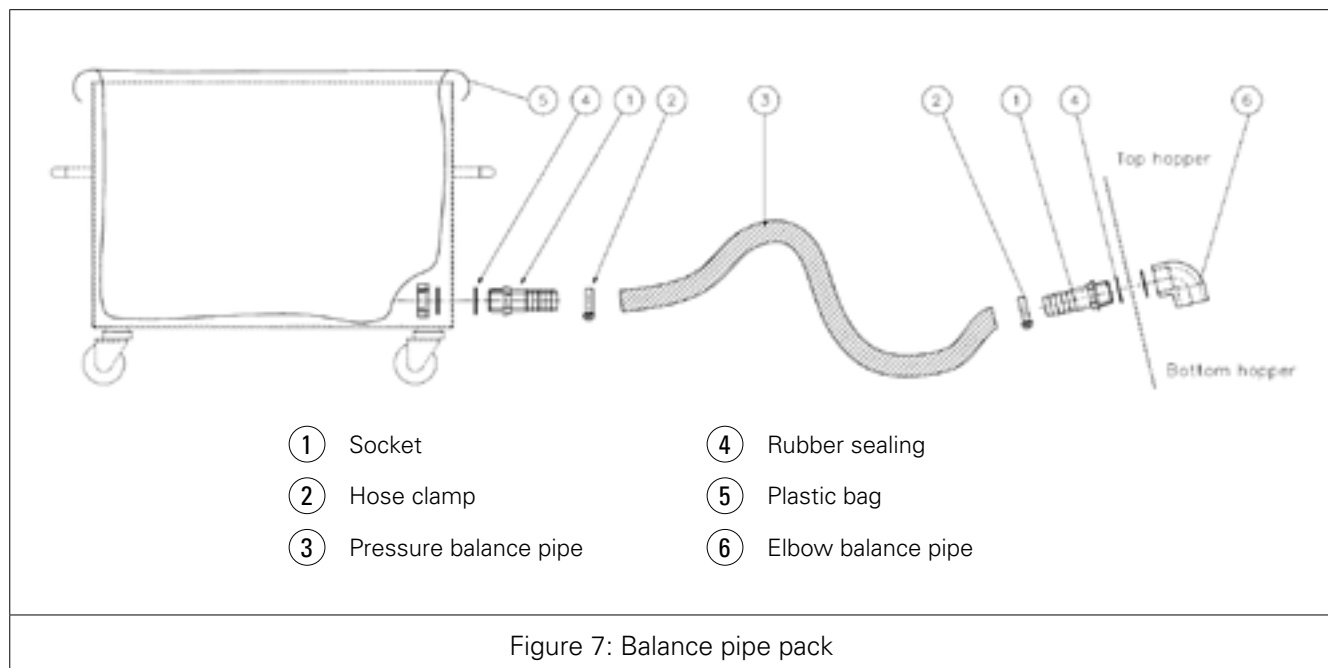


Figure 6: Dust removal for quick release dust disposal system

If plastic bags are used, a pressure balance pipe is recommended. If shipped loose must to be mounted according to below figure.



A hole is already predrilled in the back of the hopper for the connection. If the system is installed to remove the bin from the back (0° position), a hole (diameter 28.5 mm) has to be drilled on the opposite side of the hopper. The predrilled hole has to be cleared.

Change of filter elements



All filter elements should be changed at the same time.



Dust laden filter elements may be heavy and difficult to handle. Provide appropriate means of access to replace filter elements safely in case no platform is installed.

1. Open the dirty air chamber cover.
2. Remove filter element by unscrewing the crank counterclockwise by hand. Set crank aside.
3. Rotate the filter elements to break the gasket seals between the filter element and the tube sheet (see figure 'Operational schematic') and dump any loose build up dust from the top of the filter element. Push nut of the crank out of the slot and take the filter element out of the dust collector.



The genuine Torit DCE filter element is the only replacement filter element that will provide the high level of performance that you expect from your investment in the Torit DCE Dust collector.

Do not drop or rap the new filter element on the floor or any other hard surface. Damage to the filter element will occur, resulting in leakage.

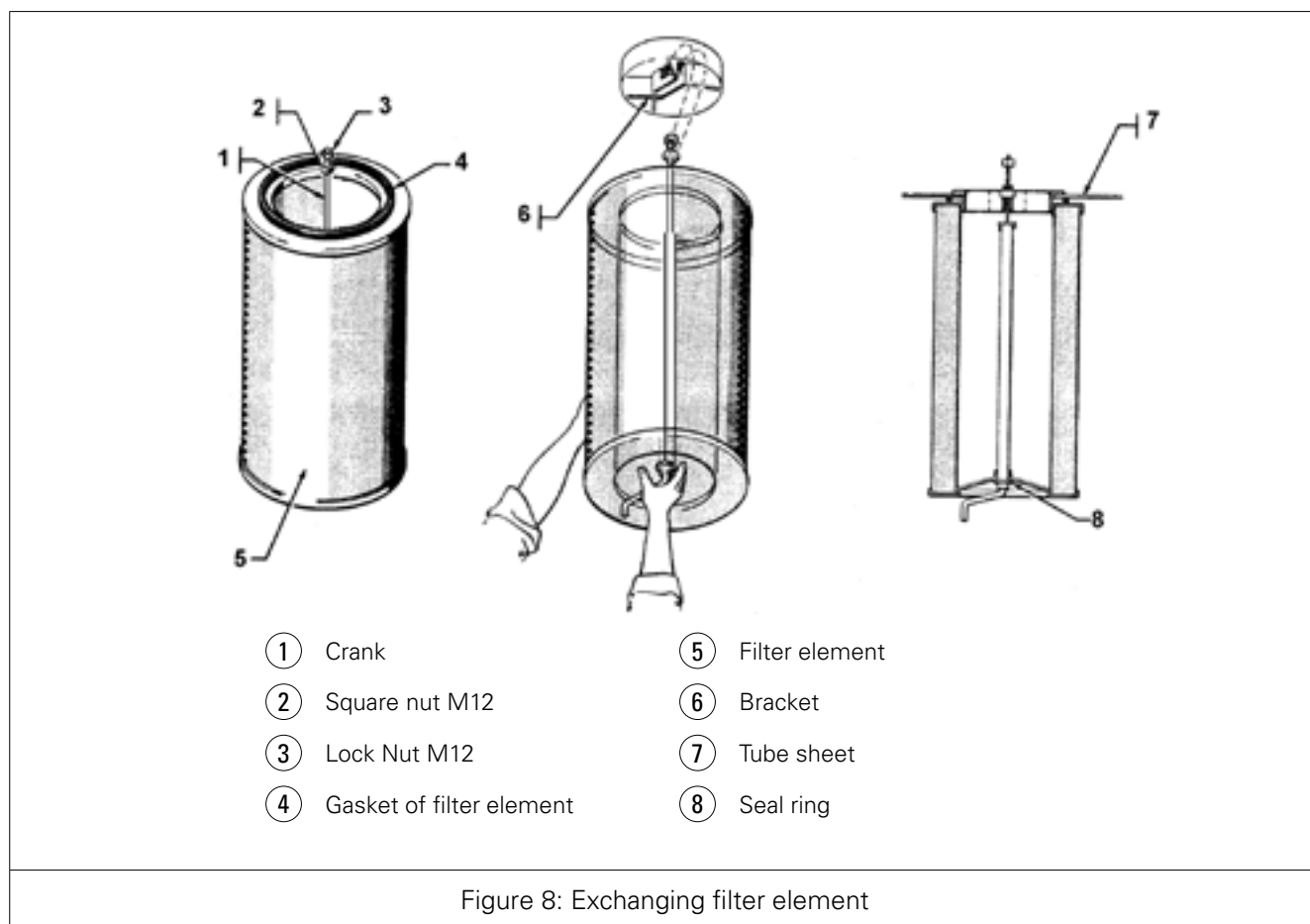
It is necessary to clean the dust off of the tube sheet all around the opening to ensure a positive seal of the filter element gasket.

4. Apply a thin coating of grease or vaseline film to the gasket and hang the element on the bracket with the square nut descended into the slot provided for this purpose. The gasket has to face the tube sheet.
5. Turn the crank by hand. Tighten securely, to prevent leakage, by hand, do not use any tools to achieve this.



If the gasket is damaged it must be replaced.

Lack of compression of the filter element gaskets can cause leakage.



Valve disassembly / reassembly



Do not overtighten pipe connections.

1. Switch off the compressed air.



Make sure manifolds are depressurized before any work is carried out.

2. Open the clean air access door.



Before disassembly, be sure to turn OFF the power supply and pressure supply, and then release the residual pressure.

Confirm that the solenoid coil temperature has dropped sufficiently before removing the product.

Disassembly

1. Remove the clip, and then remove the solenoid coil.
2. Loosen the hexagon bolts (cross recessed round head screws), and remove the bonnet assembly (bonnet), O-ring, and the main valve (sub-valve).

Assembly

1. Attach the main valve (sub-valve) to the body. The main valve (sub-valve) has a predetermined mounting direction. If the valve is assembled incorrectly, it can cause a malfunction.
2. Mount the O-ring to the body groove. After mounting the O-ring, check to make sure that the O-ring is fitted properly into the groove. If it is not in the groove, external leakage and/or operation failure may occur.

3. Attach the bonnet assembly (bonnet) to the body.
4. Tighten the hexagon bolts (cross recessed round head screws) diagonally (tightening torque 12.5 to 13.8 Nm).
5. Secure the solenoid coil with a clip (see also Replacing solenoid coil).
6. After maintenance, operate valve a few times to ensure proper operation.

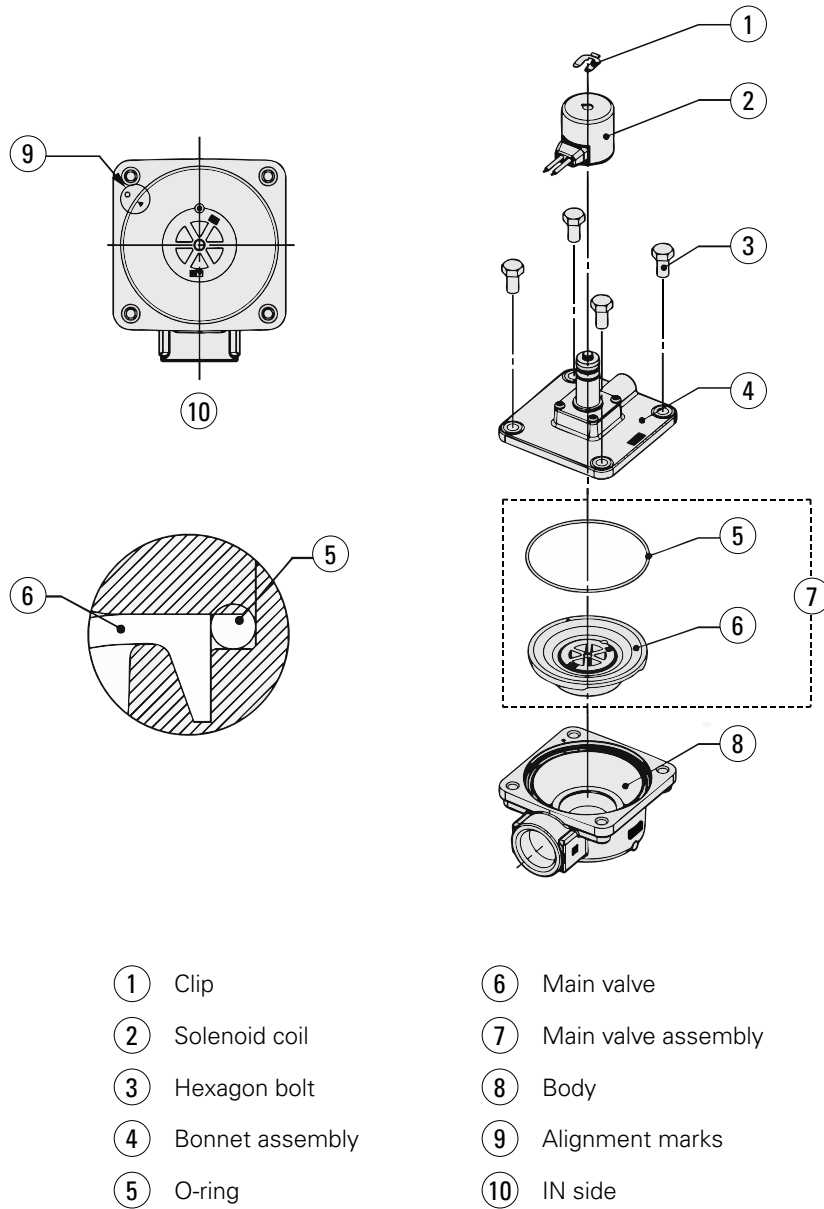


Figure 9: Valve assembly / reassembly

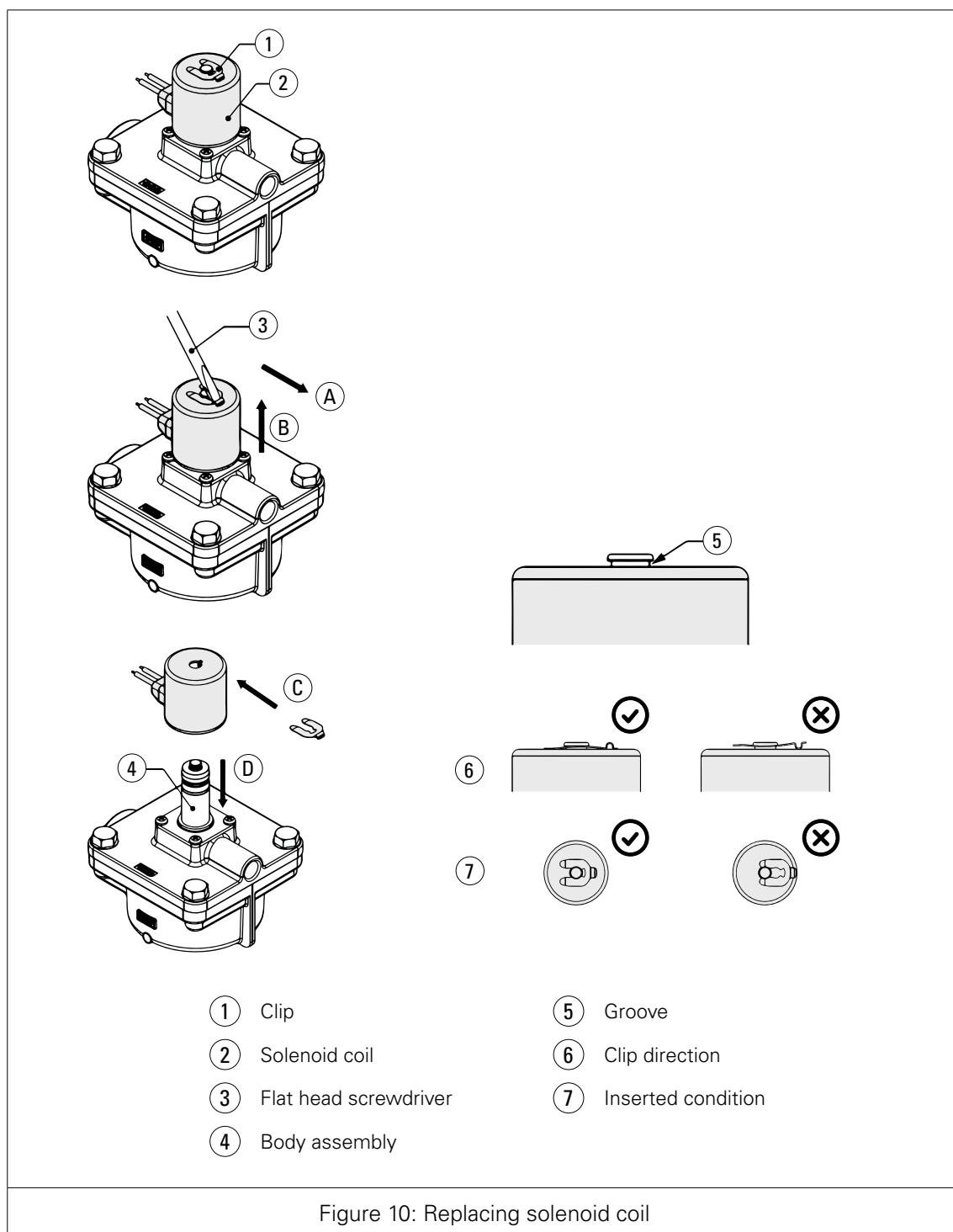
Replacing solenoid coil



Before replacing the solenoid coil, turn OFF the power supply

Due to the fluid temperature and the operating conditions, the solenoid coil may become extremely hot. Be careful when handling.

1. Insert a flat head screwdriver into the groove in the clip and slide it in the direction of (A) to remove it.
2. Remove the coil in the direction of (B).
3. Insert the replacement coil into the body assembly in the direction of (C).
4. Insert the clip in the direction of (D) by aligning it with the groove in the top of the body assembly. The clip is directional. Refer to the illustration (6) and (7) for correct clip direction and insertion.



TROUBLESHOOTING GUIDE

TABLE 1 – FAULT LOCATION

Symptom	Possible cause	Action		
Fan does not start	Not wired correctly	Check and correct internal motor wiring for proper connections for your voltage (see wiring diagram)		
	Proper wire size not used for motor	Rewire per national and local electric codes for proper wire size.		
Fan set starts, but does not keep running	Incorrect overload protection is installed	Check for proper motor overload protection. Reset or replace if needed for proper value.		
	Dust collector covers are open or not closed tight	Tighten covers securely.		
	Hopper open to atmosphere	Install dust bin under hopper and seal securely.		
	Damper valve not adjusted properly	Check airflow in ducting for proper requirements. Adjust the damper valve until the proper airflow is achieved. Do not attempt to run without inlet ducting attached. (see Start-up Checklist)		
	Electrical circuit fuses	Check if the supply circuit has sufficient power to run all equipment		
Excessive noise/ vibration of the fan  If this happens, it should be rectified immediately.	Dust deposit on the blades	Clean the blades.		
	Worn blades	The fan wheel must be replaced.		
	Worn bearings	The bearings must be replaced		
Dust emission	Filter elements installed improperly	Check that gaskets on the filter element(s) are firmly pressed to the tube sheet (the cranks should be fully tighten by hand).		
	Filter element damage, dents in the end caps, gasket damage or holes in pleated media	Replace the filter elements. (see chapter Service)		
	Covers not airtight	Tighten covers securely and check sealing		
Insufficient airflow	Fan wheel rotating wrong way	Check fan rotation. Refer to rotation sticker on fan housing (see chapter Installation)		
	Openings not properly sealed	Check covers, that they are closed and tightened securely (see figure 1). Also check hopper area that openings are closed off and that the hopper dust disposal is installed.		
	Outlet is restricted	Check outlet for blockage. Remove material or debris that is blocking the outlet.		
	Filter elements plugged:	Lack of compressed air	Check compressed air supply for 6 bar minimum. Increase pressure at maximum 7 bar.	
		Pulse cleaning not energized	Refer to the trouble shooting guide from the Control manual	
		Dust disposal system is too full or plugged	Clean out dust disposal system as described in Service chapter.	

Insufficient airflow	Filter elements plugged:	Hopper full of dust or plugged	Clean out the hopper.
		Slidegate valve (if fitted) closed under hopper	Open slide gate cover under hopper.
		Filter elements need to be replaced	Replace the filter elements.
	Solenoid valves/ diaphragm valves are not functioning:	Solenoid valves/diaphragm valves are leaking compressed air	Check for debris, obstruction, valve wear or diaphragm failure by removing the diaphragm cover on the solenoid valves. Also check for solenoid leakage damage. If diaphragm valves or solenoid valves are damaged replace it or replace damaged part(s).
		Pulse control printed circuit board has failed or is out of adjustment	Refer to Operating manual of the Controls.
Excessive noise of a diaphragm valve	Failure on the diaphragm valve	Check for debris, obstruction, valve wear or failure by removing the diaphragm cover. If the diaphragm valve is damaged, replace it or replace damaged part(s).	

SPARE PARTS

Item nr.	Part number	Description	
4	262-5002	Torit DCE filter element Ultra-Web®	see scope of delivery for type of filter element installed in your dust collector
4	262-5023	Torit DCE filter element Ultra-Web® FR	
4	262-5061	Torit DCE filter element Fibra Web®	
4	262-5074	Torit DCE filter element Torit-TEX™	
1	262-0139	Diaphragm valve 1"	
fig 10	262-0087	Diaphragm valve repair kit	
	262-0138	Leaded coil repair set	
2	0701-1625	seal ring	
3	262-2569	Gasket- inspection cover (2.5 m)	
5	0701-1144	Female connection 1" BSP	
6	262-2310	Latch	
7	262-3004	Lock nut	
8	262-3003	Square nut	
9	262-3002	Seal ring	
10	262-3001	Crank	
11	262-2325	Anchor bolt M12 (optional)	
12	1A31599361	Controlbox IPC	
12	1A31599362	Controlbox IPC Delta P	
13	0701-1615	Multiwire (per m) (7 x 1 mm ²)	please specify length
14	0701-1640	Bulkhead socket	
15	262-1295	Terminal board pack	
16	262-2015	Magnehelic	
17	262-3025	Elbow female	
18	262-3024	T piece M8	
19	262-0025	Nylon tubing black dia 6x4	



When ordering parts, give model number and serial number of dust collector, description and quantity of parts desired.

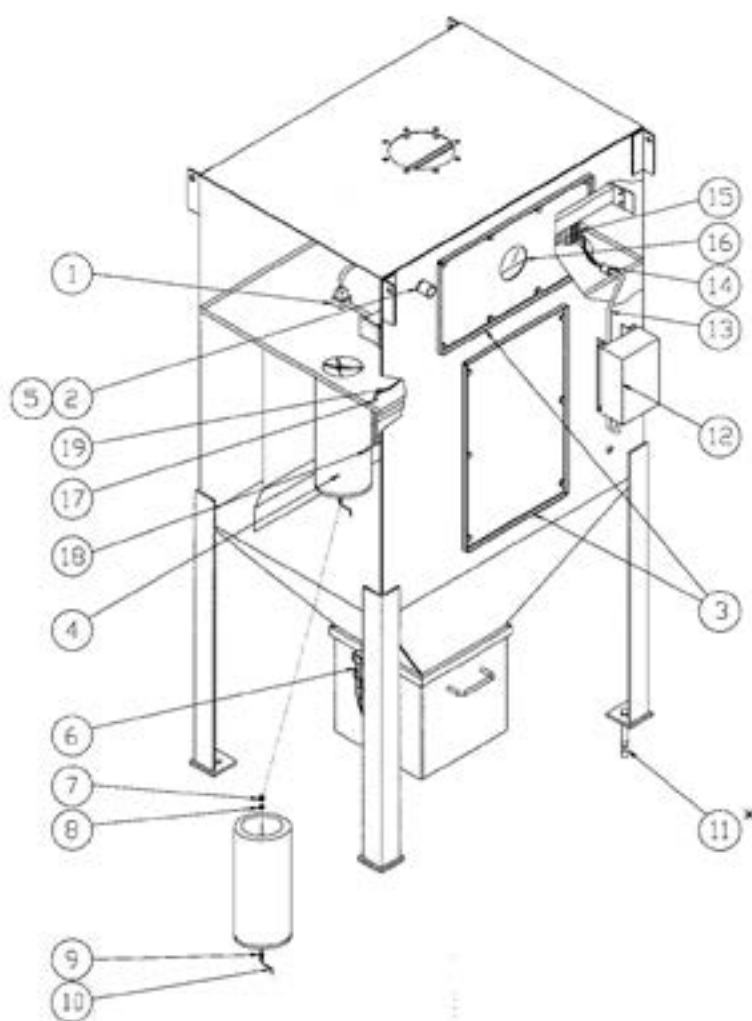


Figure 11: Spare parts