TRIDENT

MANUAL

INSTALLATION OPERATION MAINTENANCE

Cleansweep Microfilters

Intended use

Cleansweep Microfi ter are compressed air filtration devices manufactured for industrial use.

Contaminants regularly found in air lines include dust, oil, rust and condensed water. Cleansweep Microfilters remove all these contaminants.

Unpacking the filter

Your Cleansweep Microfilter is shipped fully assembled in one carton. When you are ready to install the filter, take it out of the carton it was shipped in. Remove the plastic wrapping.

The carton is made of cardboard and is biodegradable.

The plastic wrapping is made of polyethylene and is not recyclable. It must be disposed of in accordance with prevailing environmental laws.

You will find the following,

For IA Model:

1. Filter Assembly with connectors.
2. User Manual

For EA Model,

1. Filter Assembly with connectors.
2. Compact Timer Drain
3. User Manual.

If any of the expected items is missing, please contact your dealer or Trident with details of your purchase.

The unpacked filter must be installed according to the procedure described in this manual (Installation).

Using this manual

This manual has been specially designed so that you can use your Trident Cleansweep Microfilter optimally and safely. Before you start using the filter, go through this manual thoroughly. It contains vital information regarding the installation and maintenance of the filter.

All the information, illustrations and specifications in this manual are based on the latest product information at the time of preparation of the manual. Trident reserves the right to make changes in the product at any time without notice.

Ensure that this manual is available at all times to the personnel operating your compressed air system.

Functional description

Compressed air inlet. This is one of the two compressed air ports on the filter. The compressed air from the air receiver or compressor of your system enters the filter through this port. You can identify the inlet using the arrow symbol marked on the filter. The arrow points away from the inlet.

Compressed air outlet. Compressed air free of impurities and moisture is delivered by the filter through this port. The arrow symbol points towards the air outlet.

Head. This unit houses the compressed air inlet and outlet of the filter. A pressure gauge is also mounted on the head.

Pressure gauge. This gauge indicates the pressure drop across the filter. The gauge is provided with two dials for convenience. When there is a flow of compressed air through the filter, the needle of the gauge indicates the pressure drop qualitatively. If the filter element within the Cleansweep Microfilter is clean, the pressure drop across it is low, and the needle is in the green region. As the filter is used, the impurities in the air accumulate within the filter element, and the pressure drop increases. When the needle is in the yellow or red region, the pressure drop is high, and the filter element needs to be changed.

Housing. This protects the filter element. The drain valve is also housed within it. The housing may be detached from the head by turning it by hand.

Dummy caps. These are provided on the inlet and outlet for protection during storage and transport. They must be removed during installation. They may be removed by unscrewing by hand.

Water outlet. Condensed water in the compressed air collects in the filter, along with oil, during operation. The oil and water are discharged periodically through the outlet.

CTD. The CTD is an automatic drain valve. It is normal for a mixture of water, oil and impurities to collect in a Cleansweep Microfilter during operation. The CTD opens periodically to drain this liquid. The CTD is provided with a bi-coloured LED indicator. When the CTD is energised, the indicator glows red; when the valve is open, it glows green.

Technical specifications

Ordering Part No.	Legacy Part No.	Grade	Description	Rated Flow [1]	Connection Size	Dimensions (inches)			Replacement Element
				SCFM	NPT	W	H	Clearance	Part No.
8059 2408 35	PF265A	P	T20PIA	11	½"	2.5	10.0	2.0	8059 2404 44
8059 2402 50	PF265A	X	T20XIA	11	½"	2.5	10.0	2.0	8059 2400 48
8059 2402 51	PF265B	Y	T20YIA	11	½"	2.5	10.0	2.0	8059 2400 49
8059 2402 52	PF265C	A	T20AIA	11	½"	2.5	10.0	2.0	8059 2400 50
8059 2408 39	PF269	P	T32PIA	18	⅜"	2.5	10.0	2.0	8059 2404 44
8059 2408 40	PF269A	X	T32XIA	18	⅜"	2.5	10.0	2.0	8059 2400 48
8059 2408 41	PF269B	Y	T32YIA	18	⅜"	2.5	10.0	2.0	8059 2400 49
8059 2408 42	PF269C	A	T32AIA	18	⅜"	2.5	10.0	2.0	8059 2400 50
8059 2408 09	PF152	P	T100PIA	60	½"	3.4	11.6	2.0	8059 2400 61
8059 2402 32	PF152A	X	T100XIA	60	½"	3.4	11.6	2.0	8059 2400 60
8059 2402 33	PF152B	Y	T100YIA	60	½"	3.4	11.6	2.0	8059 2400 59
8059 2402 34	PF152C	A	T100AIA	60	½"	3.4	11.6	2.0	8059 2400 62
8059 2408 13	PF154	P	T250PIA	150	1"	4.5	15.7	2.0	8059 2404 14
8059 2402 36	PF154A	X	T250XIA	150	1"	4.5	15.7	2.0	8059 2400 54
8059 2402 37	PF154B	Y	T250YIA	150	1"	4.5	15.7	2.0	8059 2400 53
8059 2402 38	PF154C	A	T250AIA	150	1"	4.5	15.7	2.0	8059 2400 55
8059 2408 18	P156	P	T600PIA	350	1 ½"	4.5	18.7	2.0	8059 2404 15
8059 2402 39	P156A	X	T600XIA	350	1 ½"	4.5	18.7	2.0	8059 2400 57
8059 2402 40	P156B	Y	T600YIA	350	1 ½"	4.5	18.7	2.0	8059 2400 56
8059 2402 41	P156C	A	T600AIA	350	1 ½"	4.5	18.7	2.0	8059 2400 58
8059 2408 19	P166	P	T851PIA	500	2"	5.8	26.2	2.0	8059 2400 63
8059 2402 42	P166A	X	T851XIA	500	2"	5.8	26.2	2.0	8059 2400 64
8059 2402 43	P166B	Y	T851YIA	500	2"	5.8	26.2	2.0	8059 2400 65
8059 2402 44	P166C	A	T851AIA	500	2"	5.8	26.2	2.0	8059 2400 66
8059 2408 30	P178	P	T1210PIA	710	2"	5.8	29.0	2.0	8059 2404 16
8059 2402 73	P178A	X	T1210XIA	710	2"	5.8	29.0	2.0	8059 2404 17
8059 2402 74	P178B	Y	T1210YIA	710	2"	5.8	29.0	2.0	8059 2400 67
8059 2408 31	P178C	A	T1210AIA	710	2"	5.8	29.0	2.0	8059 2404 18
8059 2408 24	P169	P	T1810PIA	1065	3"	8.3	30.0	2.0	8059 2407 37
8059 2402 45	P169A	X	T1810XIA	1065	3"	8.3	30.0	2.0	8059 2404 19
8059 2402 46	P169B	Y	T1810YIA	1065	3"	8.3	30.0	2.0	8059 2404 20
8059 2408 25	P169C	A	T1810AIA	1065	3"	8.3	30.0	2.0	8059 2404 21

Specifications	P	X	Y	A
Filter element	borosolicate	borosolicate	borosolicate	activated carbon
Housing	extruded aluminum alloy epaxy power coating			
Particle removal	5 micron	1 micron	0.01 micron	0.01 micron
Max. oil carryover	5 ppm	0.5 ppm	0.01 ppm	removes odor [2]
Max. working temperature	176°F	176°F	176°F	176°F
Initial pressure loss	2.13 psi	2.13 psi	2.13 psi	2.13 psi
Pressure drop for element change	5.69 psi	5.69 psi	5.69 psi	5.69 psi
Element end cap color	green	red	yellow	black

Before installation

General

1. Condensed water and the contaminants in the compressed air, including oil, accumulate at the bottom of the filter housing during operation. This water - and-contaminant mixture must be discharged from the filter periodically. Provide a hose of sufficient length to discharge the accumulated liquid at a safe collection point. The oily waste should not be drained into water or into soil. Treat it according to local rules before discharging it into any system.
2. Supports should be provided for the compressed air line on either side of the filter at a distance of 0.5 m.
3. Verify that the needle of the differential pressure (DP) gauge lies within the green region of the dial. This indicates that the filter element is clean.
4. Verify that the filter element replacement sticker is pasted on the filter housing.

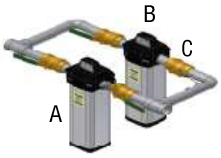
Location

1. The filter should be installed in a location that is not exposed to direct sunshine or rain.
2. There should be a clear space of 500mm all around the filter after it is installed.
3. The filter should be installed at least 1000mm above the ground for ease of removal of the filter element during servicing.

Layout

The filter should preferably be installed in parallel with a bypass filter as shown in the accompanying illustration:

Recommended Layout



No interruption to air flow

No waiting time

Can be used in Critical places where clean air is used continuously

A - Regular Filter B - Bypass Filter
C - Ball valve

Air line

1. The filter may be installed on a 0.5 inch compressed air line.
2. Verify that the air line does not have any leaks.
3. Depressurise the compressed air line before installing the filter. There should be no flow of air in the line during installation.

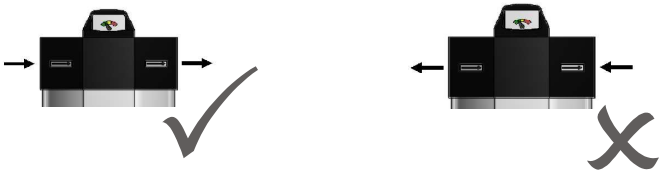
Installation

The Trident Cleansweep Submicron Filter may be installed using standard hand tools.

⚠ Ensure that the end connector of the filter is a BSP or NPT connector.

1. The filter must be installed in the vertical position (fig B) along with the connectors.

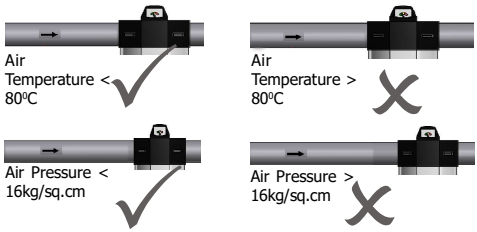
2. The filter should be connected so that the air flow is in the direction indicated by the arrow (fig A).



3. For filters with external drains, always use a box spanner to remove or assemble the EA connector and then install the drain valve. Use Loctite 243 as a sealant to seal the threads of the EA connector. For filters with internal drains, these are not required.

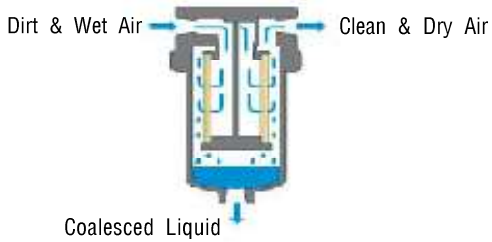
4. For external drains, ensure the power supply to the drain valve.

5. Ensure that the air inlet temperature to the filter is less than 80^{0}C and that the air pressure is less than 16 kg/cm^2 (fig C & D).



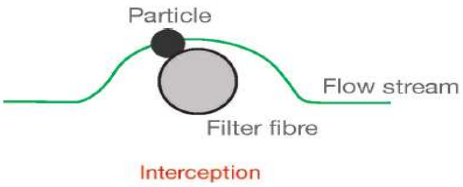
Operation

Within the housing of each Cleansweep Submicron Filter is a filter element. This element has a specially designed multi-layered structure. Compressed air from your supply passes through the various layers sequentially, moving outwards from the centre of the element. Typically, air from an industrial compressor contains oil, condensed water and solid particles, including rust.

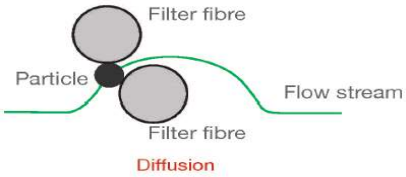


As the air passes through a Cleansweep filter element, the contaminants are removed through three mechanisms:

Interception-larger contaminant particles, of size around 10 microns or more, are blocked by a fine-pore medium.

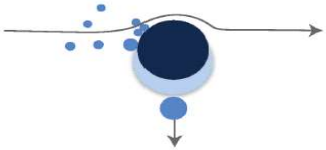


Diffusion-finer (submicron) particles that are carried further into the filter element are enmeshed in fibres. The fibres are made of borosilicate. The trapping action is the result of the labyrinthine passages through the fibrous medium.



Diffusion

Coalescence-water and oil droplets adhere initially to the fibres upon impinging on them. They merge to form larger drops and are held in the fibrous medium by surface tension.


Coalescence

The contaminant particles are trapped both at the inner surface of the filter element and within the medium. The liquid drops that coalesce in the element flow down, accumulating at the bottom of the housing. A drain valve is provided to discharge the liquids. Cleansweep Microfilters are fitted with either electro-adjustable (EA) or internal automatic (IA) drain valves. In EA systems, electrical coils periodically open the drain valve, discharging the accumulated liquid. The interval between discharges may be adjusted. In an IA system, the drain valve is opened mechanically by a float whenever the oil-and-water level crosses a limit.

Clean, contaminant-free air flows out of the Cleansweep Microfi ter to your application.

Maintenance

The following checks must be carried out on the Cleansweep Microfilter on a monthly basis:
1. Filter element replacement check
2. Drain valve function check

Tools required
Cutting pliers - to loosen the internal float drain
4 mm Allen key - for assembling pressure gauge
20 - 22 box spanner and Loctite 243 - to connect the EA connector
30, 32 spanner - to remove the bottom
Belt wrench - removing and fixing the bottom housing

Only experienced and licensed electricians who are appropriately trained in working with compressed air systems should service or repair Trident products.
Before starting up the system or performing any maintenance on any Trident filter, drain system or other equipment, you must turn off the mains supply and disconnect the equipment from the compressed air line.
Bypass the filter and depressurize it to 0 PSIG before performing any maintenance.

⚠ Failure to follow these instructions can lead to serious injury or death.

Filter element replacement check
Note the position of the needle of the pressure gauge when there is a flow in the air line.

If the needle is in the green region, the filter element is in good condition and no action required.

If the needle is in the yellow or red region, impurities are clogging the filter element, affecting the performance of the filter. The filter element needs to be replaced.

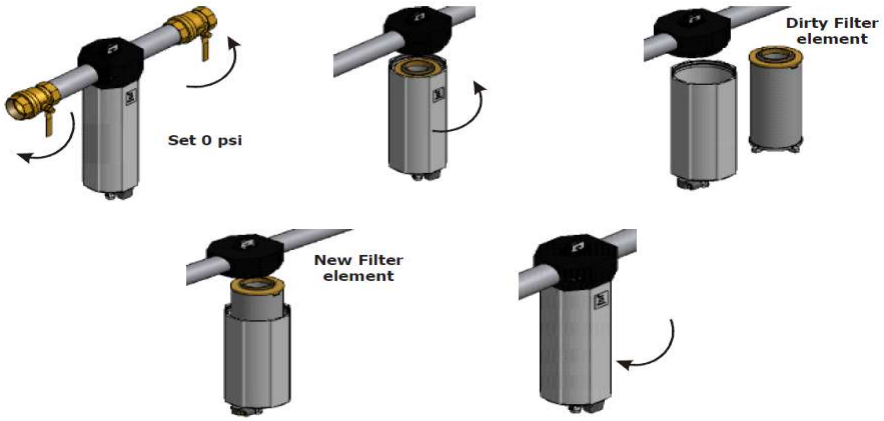
Filter elements need to be replaced yearly once (8000 hrs approx.), even if the gauge is showing Yellow or Green region

Steps involved in replacing the filter element

Cut off the flow of air through the Cleansweep Microfilter.
Detach the housing from the pressure gauge by unscrewing it by hand.
Remove the dirty filter element from the housing.
Place a new, clean filter element in the housing. Note that the filter element must be of the grade appropriate for the air quality required by you (refer to the performance table in the technical specifications).

Contact Trident (Trident Sales and Service Network) and specify the item code to order a new element. ee e e ent orderin rt n er nder tec nic ecific tion e

5. Fasten the housing with the filter element to the pressure gauge by hand.



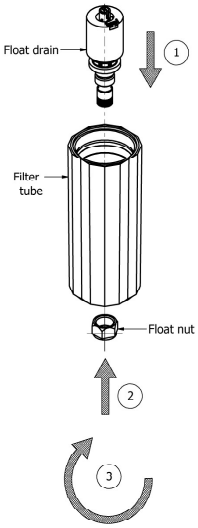
Drain valve function check

IA model : This check is not needed for IA model filters.
EA model : CTD are dislodged want to change as discharged.

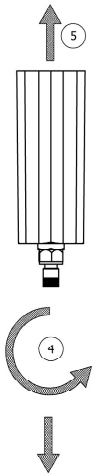
If the drain valve is found to be not functioning, address the problem by referring to the troubleshooting section in this manual (Troubleshooting).

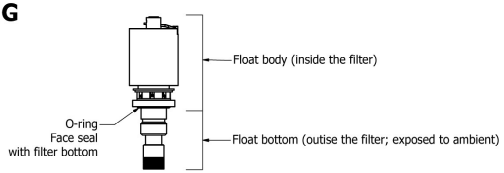
Assembly and Dismantling of Float Drain

ASSEMBLY



DISMANTLING





Notes:

ASSEMBLY:

1. Take the float assembly (without the float nut) and insert it into the filter tube. Let the face seal O-ring mate with the bottom of tube/ bottom plate.Now the float bottom portion will protrude out of the filter tube. Ensure the face sealing surface is clean and devoid of any burrs.
2. Assemble the nut from outside of the housing with the male thread in float bottom protruding outside.
3. Assembly is done by rotating the handscrew clockwise meanwhile locking float drain in place. The appx torque tightness shall be maintained around 8-10 Nm.
Now we can proceed for further assembly and testing.

DISMANTLING:

4. Filter tube is to be dismantled from head and element after depressurizing. Remove the float nut by rotating the nut in anti clockwise direction while securing the float inside.
5.The float drain can be taken out from inside.

Acceptance Criteria:

1. Subjected to pneumatic test for 16 barg pressure, no bubbles to be observed on applying soap oil solution in housing-float interface.

Troubleshooting

Trouble	Root cause	Solution
Pressure drop	Clogged filter element: the needle of the pressure gauge is in the green or yellow region.	Remove the dust in the filter by separating the head and the housing.
	Clogged filter element: the needle of the pressure gauge is in the red region	Change the filter element as described in the maintenance section of this manual.
Air leakage	Housing not assembled properly	Ensure that the head, housing and end cap are seated properly.
	Damaged O-ring	Remove the damaged O-ring and clean the groove using a cloth or compressed air. Stretch the new O-ring and fix it in the groove. Apply a small amount of grease on the O-ring and assemble the housing.
Drain valve not working		
Internal float leakage (IA models)	Accumulation of dust particles inside the float drain	Remove the bottom casing using a box spanner to expose the internal float. The float can then be removed mechanically. Clean the float using compressed air.
	Float failure	Replace the float with a new one.
CTD failure (EA model)	Coil not working	1. Switch on the power supply if it is switched off. 2. Replace the CTD if it still does not work still.
	Valve not working	Replace CTD if it fails to work.

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