

# BD5000 Portable Filtration Unit

## User Manual



October 2015

V1.00

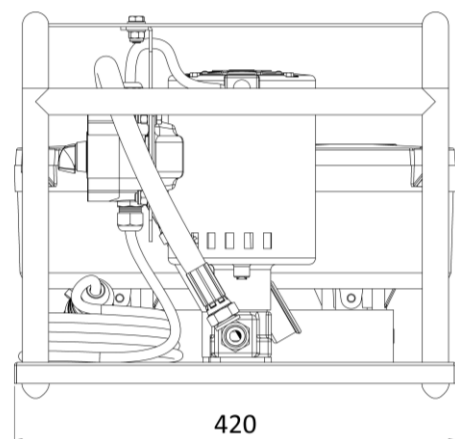
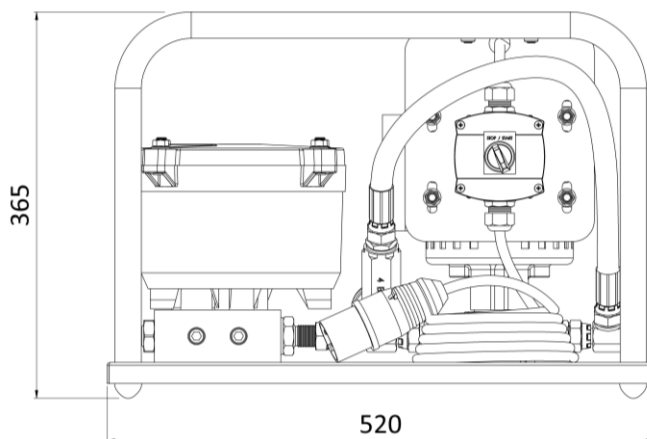
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## Specifications

Specification	Detail	
	BD5000-2-110	BD5000-2-240
Dimensions	(w)520 mm x (d)420 mm x (h)365 mm	
Weight	20 kg	
Frame	Mild steel	
Finish	Powder coated RAL 5004 (black blue) satin	
Voltage	110 VAC (+10% to -6%)	240 VAC (+10% to -6%)
Frequency	50 Hz (+/-2%)	
Current	6.2 Amps	3.1 Amps
Power	750 Watts	750 Watts
Pump type	Gear pump	
Flow rate (max)	10 ltr/min	
Viscosity range	2 to 200 cSt	
Duty Cycle	Continuous	
Filtration	2 x Hippo filter housings (optional SRLT housing)	
Filter blocked indicator	Pressure gauge	
Filter bypass	4.5 bar (65 psid)	
Connections	1/2" BSP male hydraulic	
Suction hose	3m long x 1/2" BSP female swivel hydraulic (with strainer)	
Discharge hose	3m long x 1/2" BSP female swivel hydraulic	
Ambient temperature	-10°C to +40°C	
Maximum humidity	90% relative humidity, non-condensing	
Motor enclosure	ODP (open drip proof) IP12	



## Typical Applications

Typical applications for the filtration unit include:

- Filtering the fluid in a hydraulic reservoir periodically as a supplement to continuous filtration by system filters.
- Cleaning up your hydraulic system before restarting the system following component failure.
- Providing clean fluid when re-filling and adding fluid to the system reservoir.
- Reclaiming contaminated fluid.
- Pre-filling and cleaning up hydraulic systems on new or re-built machinery and equipment.
- Off line contamination of hydraulic systems.
- Emptying waste fluid quickly.

## Health, Safety & Environmental Considerations

- This equipment should only be used for its intended purpose by competent and authorised persons, inappropriate use could cause serious injury or death.
- Prolonged contact with oil can cause damage to the skin. Appropriate PPE (personal protective equipment) should be worn when operating the unit e.g. protective gloves, safety glasses, safety shoes etc. Always observe local health and safety requirements.
- The unit should only be used on a flat, even surface and be attended at all times.
- Do not operate switches with wet hands.
- The unit must always be disconnected from the mains supply before carrying out any routine maintenance or repairs.
- Electrical cables and hoses should be checked for any signs of damage before starting the unit.
- Ensure a spill kit is available in case of any accidental spills.
- Used filters must be disposed of in accordance with local environmental requirements.

## Basic Description

The BD5000 portable filtration unit is a compact, self-contained filtration system, equipped with high efficiency filter elements capable of removing particulate contaminants and/or water quickly, conveniently and economically. It is designed for on-site preventative maintenance and includes two standpipes and hoses for efficient fluid transfer. The suction standpipe is fitted with a strainer to trap any large contaminants and protect the pump.

## Best Efficiency

When used for recirculation filtration (as opposed to transfer filtration) position the ends of both the inlet and outlet standpipe as far apart as possible inside the reservoir in order to ensure proper recirculation and cleaning.

Cycle the hydraulic system thoroughly in order to flush the contaminated fluid from the lines and system components so that all the system fluid will be filtered through the unit.

When transferring operate the filtration unit until the total volume of the system fluid passes through the filtration unit. For recirculation filtration, cycle the reservoir fluid through the filter unit six to eight times to ensure the total system fluid is filtered completely.

## Precautionary Measures

- Never start up or run a dry pump. This will cause galling, seizing or destructive wear between the rotors, end plates and casing.
- The filtration unit is designed for diesel fuel, hydraulic and lubrication oils only.
- It is not to be used for highly volatile fluids, such as gasoline, paint thinners etc.

### CAUTION - DO NOT USE THE UNIT WITH THE FOLLOWING FLUIDS:

Fluids not to be used	Related dangers
Gasoline	Fire / Explosion
Inflammable liquids with PM <55°C	Fire / Explosion
Water	Oxidation
Corrosive chemicals	Oxidation / Injury to persons
Solvents	Fire / Explosion / Damage to gaskets

## Achieving ISO Cleanliness Codes

Filtertechnik has a wide range of elements available to effectively achieve the required cleanliness level for the intended system. Maintaining the fluid at the required cleanliness level is a cost effective way of extending the service life of system components. The tables below can be used to determine the required micron rating of the filter to achieve the desired cleanliness code, understand the ISO 4406 contamination scale, conversion between the various cleanliness standards and understanding how the ISO 4406 scale relates to the NAS contamination scale.

Desired Cleanliness Level (ISO Code)	Recommended Filtration Media
20/18/15 – 19/17/14	25 µm
19/17/14 – 18/16/13	10 µm
18/16/13 – 15/13/10	5 µm
15/13/10 – 14/12/9	3 µm
14/12/9 – 13/11/8	1 µm

Table 1 – Absolute Filter Media Selection Guide

Number of Particles per 1ml of Fluid		ISO Scale Number
More Than	Up to and Including	
1,300,000	2,500,000	28
640,000	1,300,000	27
320,000	640,000	26
160,000	320,000	25
80,000	160,000	24
40,000	80,000	23
20,000	40,000	22
10,000	20,000	21
5,000	10,000	20
2,500	5,000	19
1,300	2,500	18
640	1,300	17
320	640	16
160	320	15
80	160	14
40	80	13
20	40	12
10	20	11
5	10	10
2.5	5	9
1.3	2.5	8
0.64	1.3	7
0.32	0.64	6
0.16	0.32	5
0.08	0.16	4
0.04	0.08	3
0.02	0.04	2
0.01	0.02	1
0.00	0.01	0

Table 2 – ISO 4406 Contamination Scale

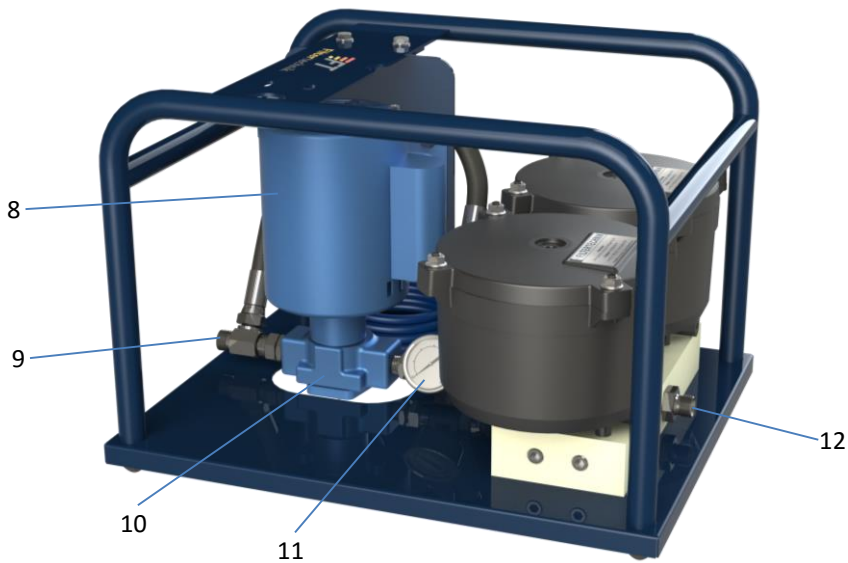
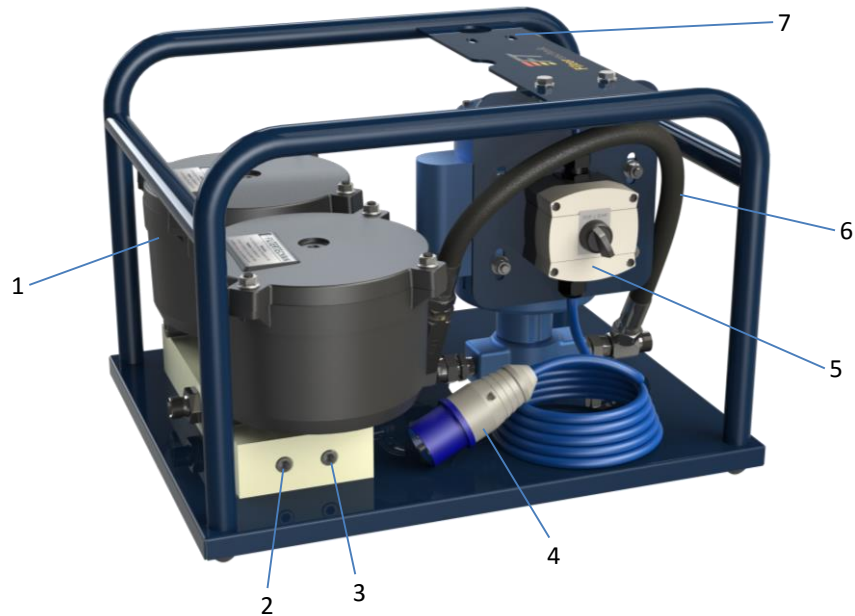
ISO 4406 Code 4µm / 6µm / 14µm	Mil Std. NAS 1638	Mil Std. 1246A	ACFTD Gravimetric Level mg/L	SAE Level
21/19/16	10			
20/18/15	9			6
19/17/14	8	300		5
18/16/13	7		1	4
17/15/12	6			3
16/14/12		200		
16/14/11	5			2
15/13/10	4		0.1	1
14/12/9	3			0
13/11/8	2			
12/10/8		100		
10/10/7	1			
12/10/6			0.01	
11/9/6				

Table 3 – Cleanliness Standards Conversion

Equivalent ISO 4406 Code (approx.)	NAS Code	Size Range in Microns (µm)				
		5-15	15-25	25-50	50-100	>100
-	00	125	22	4	1	0
-	0	250	44	8	2	0
10/12/7	1	500	89	16	3	1
13/11/8	2	1,000	178	32	6	1
14/12/9	3	2,000	356	63	11	2
15/13/10	4	4,000	712	126	22	4
16/14/11	5	8,000	1,425	253	45	8
17/15/12	6	16,000	2,850	506	90	16
18/16/13	7	32,000	5,700	1,012	190	32
19/17/14	8	64,000	11,400	2,025	360	64
20/18/15	9	128,000	22,800	4,050	720	128
21/19/16	10	256,000	45,600	8,100	1,440	256
22/20/17	11	512,000	91,200	16,200	2,880	512
23/21/18	12	1,024,000	182,400	32,400	5,760	1,020

Table 4 – ISO 4406 vs NAS 1638 Contamination

## Component Identification



Key:

1.) Hippo filter pot	7.) Mounting for SRLT finishing filter (optional)
2.) Sample point – after filtration (optional)	8.) Motor
3.) Sample point – before filtration (optional)	9.) Inlet port (1/2" BSP)
4.) Mains plug	10.) Pump head
5.) On/off switch	11.) Pressure gauge
6.) Pressure relief loop	12.) Outlet port (1/2" BSP)



## Starting & Stopping

Make sure the unit is plugged into a fused supply (with RCD when used outdoors) of the correct voltage rating and that the inlet and outlet hoses have been correctly attached. Before switching on the unit ensure hoses are connected to the fuel supply pipework and/or lances are securely inserted into the reservoir/tank.

To turn the unit on use the semi-rotary stop/start switch.



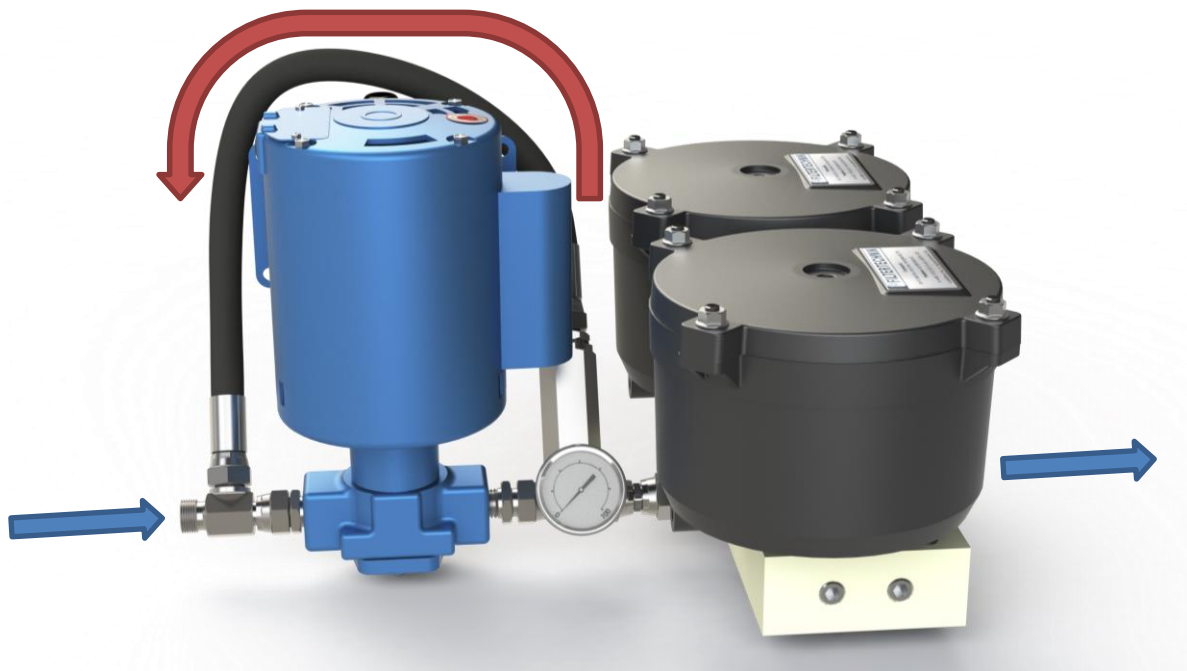
Key:

1.) Pump supply cable	3.) Mains supply cable
2.) Stop/start switch	

## Filtration

The BD5000 is fitted with two Hippo filter housings with a variety of available filters for removing particulate and water contamination.

When the filters become blocked the unit will go into bypass mode. This happens at approximately 4.5 bar (65 psi), where fluid will then circulate around the pump. At this point the filters will require changing.



### Filter change procedure

1. Ensure unit is switched off and disconnected from the mains supply.
2. Disconnect hoses & lances to prevent fluid siphoning from occurring.
3. Remove the 13mm nuts and lid from each filter pot.
4. Pull out the old filter using the black straps. Due to expansion the filter may be a tight fit.
5. Fit new elements with the brass ring facing upwards.
6. Inspect the lid seal and replace if necessary.
7. Fit the lid and tighten the 13mm nuts in a diagonal pattern to 15 N.m.
8. Reconnect the unit to the mains supply and resume filtering. The pressure gauge should now read between 1-2 bar (15-30 psi) with clean elements.
9. For the first few minutes of running observe the unit for signs of leaking.

## Hoses & Lances

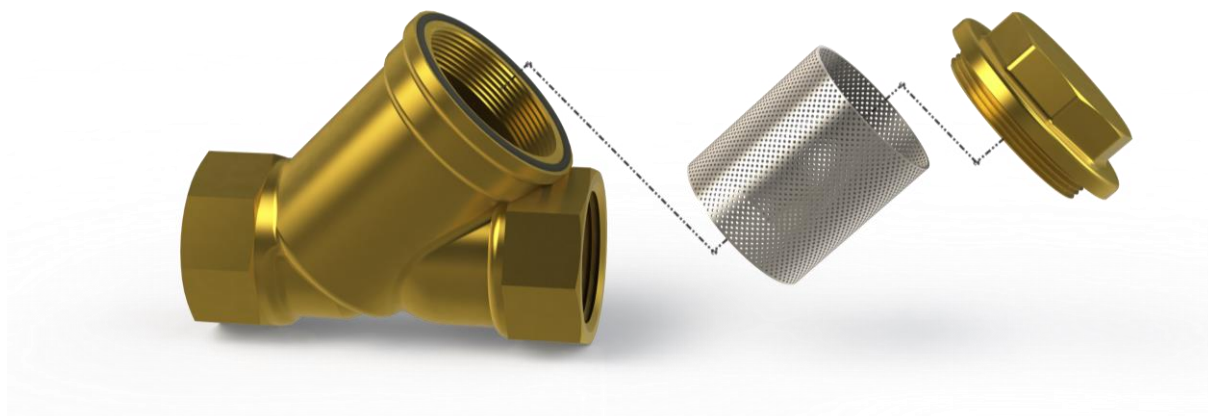
The unit is supplied with two 1/2" lances, a suction lance with strainer to protect the pump and a discharge lance. Each lance is 1000mm long.

When not in use it is advisable to plug the hoses and cap off the lances to prevent ingress of dust or other contaminants.

Lances should be cleaned prior to inserting in the tank/barrel being cleaned.



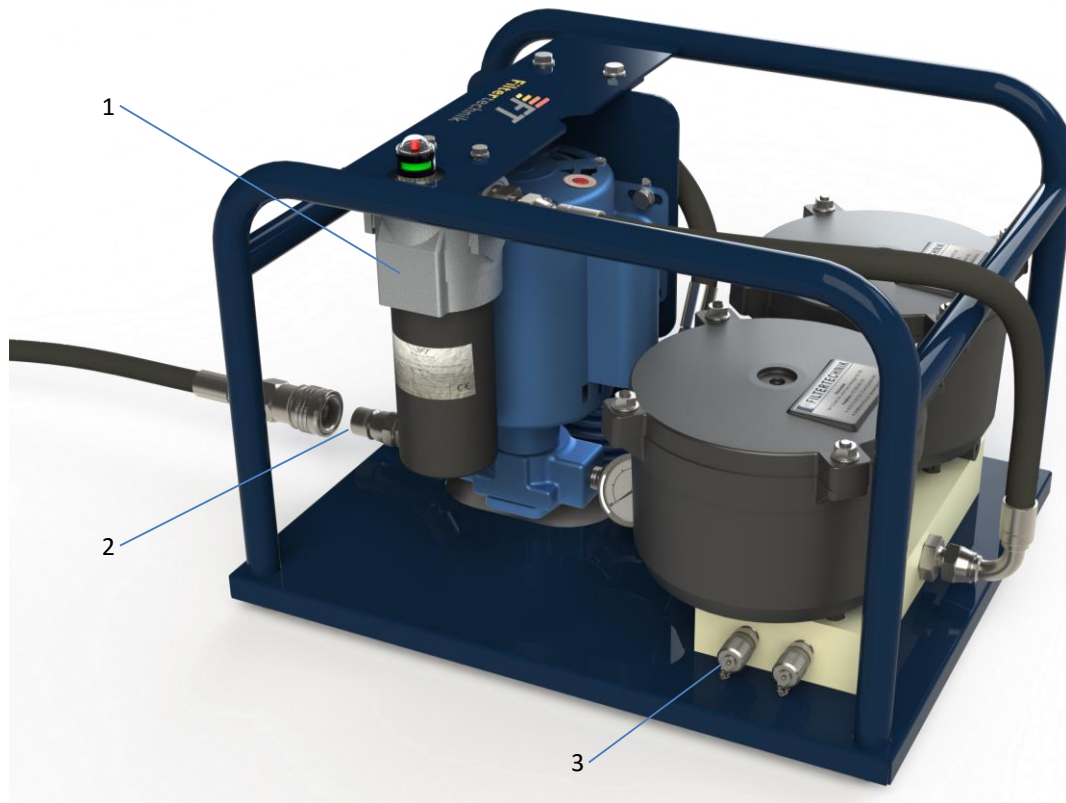
## Suction Strainer



The suction strainer will periodically need cleaning by unscrewing the cap, removing the mesh strainer and cleaning this out with a fluid suited for the units intended purpose e.g. hydraulic oil.

## Optional Extras

The unit can be equipped with a number of optional extras.



### 1 – SRLT Filter Housing

The SRLT filter housing allows fitting an absolute rated filter down to 1 micron where ISO 4406 cleanliness levels of 13/11/8 (NAS 2) can be achieved. The housing is monitored by a visual pop up indicator which switches at 40 psid (2.8 bar) to indicate a required filter change.

### 2 – QRC – Quick Release Couplings

The addition of QRC's provide a fast make or break connection between the unit and hoses. When disconnected they will automatically contain any fluid inside the line preventing accidental spillage.

### 3 – 1620 Test Points for Sampling

Test points can be fitted to the filter manifold block, allowing for fluid sampling both before and after filtration to gauge the performance of filtration and to determine through analysis when the fluid has reached the required cleanliness levels.

## Troubleshooting

Symptom	Problem	Solution
Does not start	On/Off switch No electrical power	Turn switch on Check fuses
Erratic motor noise	Defective motor Motor overheated Worn motor gears	Replace motor Allow motor to cool Replace motor gears
Intermittent start/stop operation	High viscosity fluids	High viscosity fluids cause the motor to overheat intermittently
Hot motor	Pumping heavy load	Motor will heat up, allow to cool
No flow	No oil in filter housing	Run the unit for a few seconds
Erratic pump noise	Suction leak	Check inlet fittings and hoses
No suction	Blocked strainer	Clean or replace strainer
Reduced oil flow	High viscosity Element dirty Obstruction in hoses Suction leak Worn gears	Normal for high viscosity fluids Replace elements Clean hoses Check tightness of fittings Replace gears
Element indicator shows red (optional SRLT)	Element dirty Oil extremely cold Oil viscous Obstructed outlet Defective indicator	Replace or clean element Allow system time to heat up Increase element micron size Clear outlet obstruction Replace indicator
Indicator does not move	No element fitted Defective indicator	Install element Replace indicator
Hoses discolour	Fluid Compatibility	May occur over time, should not impair performance
Hoses becoming rigid	Fluid Compatibility	Brittle hoses would require replacement
Oil spills under unit	Defective shaft seal Hose leaks	Replace seals where necessary Tighten all joints
Erratic system noise	Non-return valve open	Replace elements

## Spare Parts List

Part Number	Description
SDFC(W2)-DISC	2.8 µm solids removal & water absorption (most oils & fuels)
SDFC(W2P)	Solids removal only (water based oils & glycol)
MM4627-A1	10 µm absolute solids removal, 22 ltr/min flow rate (hydraulic & lubricating oils)
6RZ1	6" 1 µm absolute filter element
6RZ3	6" 3 µm absolute filter element
6RZ5	6" 5 µm absolute filter element
FTB-6-10	6" 10 µm absolute filter element
6RZ25	6" 25 µm absolute filter element


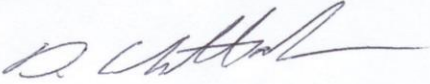
## Warranty Statement

All products manufactured or distributed by Filtertechnik Ltd are subject to the following, and only the following, Limited Express Warranties, and no others:

For a period of one (1) year from and after the date of delivery of a new Filtertechnik product, Filtertechnik warrants and guarantees only to the original purchaser/user that such a product shall be free from defects of materials and workmanship in the manufacturing process. The warranty period for pumps and motors is specifically limited to ninety (90) days from the date of delivery. A product claimed to be defective must be returned to the place of purchase. Filtertechnik, at its sole option, shall replace the defective product with a comparable new product or repair the defective product. This express warranty shall be inapplicable to any product damaged or impaired by external forces or used for any purpose other than that for which it was originally sold.

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## EC Declaration of Conformity

 <p><b>Filtertechnik</b> Filtration, Purification &amp; Separation Solutions</p>		<p><b>EC DECLARATION OF CONFORMITY</b></p>	
<p><b>Machinery Description</b></p>			
<b>Machine Type</b>	<input type="text" value="BD5000"/>		
<b>Serial Number</b>	<input type="text"/>		
<p><b>Applicable Directives</b></p> <p>Low voltage Directive 73/23/EEC (as ammended by 93/68/EEC) Electromagnetic Compatibility Directive 2004/108/EC Machinery Directive 98/37/EC</p>			
<p><b>Declaration</b></p> <p>We, Filtertechnik Limited, decalre that the above referenced product(s), to which the declaration relates, is in conformity with the provisions of the Directives listed above</p> <p><b>IMPORTANT</b></p> <p>This declaration is only valid when the machinery has been installed, operated and maintained in accordance with the applicable Installation, Operation and Maintenance Instructions and safety guidelines contained within as well as instructions supplied for equipment assembled with or intended for use with this equipment.</p> <p>The technical construction file for this product is maintained at the address given below.</p> <div style="text-align: center;">  </div> <p><b>Mr D Whittaker, Engineering Director</b> Filtertechnik Limited, 1 Central Park, Lenton Lane, Nottingham, NG7 2NR England.</p>			