PROBA

WALKER FILTRATION

Instruction & Technical Manual

42 264 001 01

Table of Contents

Table of Contents

section 1

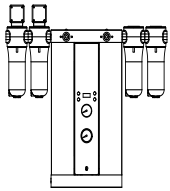
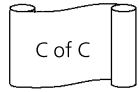
Introduction

The product to which this manual refers must not be supplied, installed, used, operated or serviced until the contents of the manual have been fully read and understood by all relevant personnel.

Breathing and medical air systems must be installed and maintained in accordance with local regulations and standards.

The system is delivered configured for operation at 7 barg. It is important to ensure that the correct purge plug is fitted applicable to the operating pressure.

The purifier package includes:

1x	1x	1x	1x	1x
				

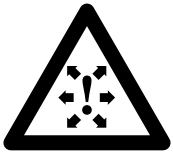
Model shown is BA-025 (for illustrative purposes only).

Safety

Installation, maintenance and disposal to be carried out by competent and authorised personnel only, in accordance with operating instructions, relevant standards, regulations and legal requirements.

The following symbols give indication of potential hazard. Appropriate measures must be taken to reduce risk to any user or operator of the machine wherever such hazard exists.

Warning:
Risk of Danger

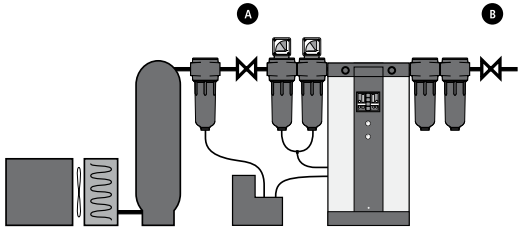


Caution:
Risk of High Pressure

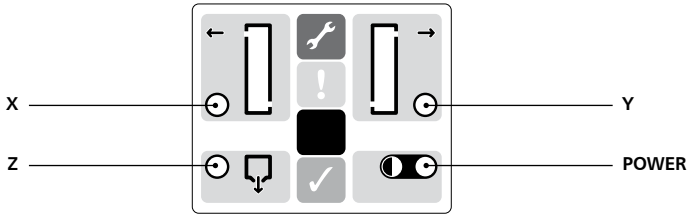
Caution:
Risk of Electric Shock

Start up procedure

Start up procedure



1. Close valves A and B.
2. Switch on compressor. Allow system to fully pressurise.
3. Open valve A slowly.
4. Check there are no leaks from the system.
5. Switch on electric power. All four display panel LED's will flash simultaneously green four times then simultaneously red four times to acknowledge application of power and readiness to function. Observe display panel for one complete cycle. Note: cycle described is factory setting.



(i) Power LED illuminates green and tower LED X illuminates green.

(ii) After 120 seconds, tower LED X switches off and drain LED Z illuminates green.

(iii) After a further 50 seconds drain LED Z switches off and tower LED Y illuminates green.

(iv) After a further 120 seconds, tower LED Y switches off

(v) After a further 50 seconds, tower LED X illuminates green - this is (i) in the cycle described above.

(vi) The above cycle (i-iv) repeats.

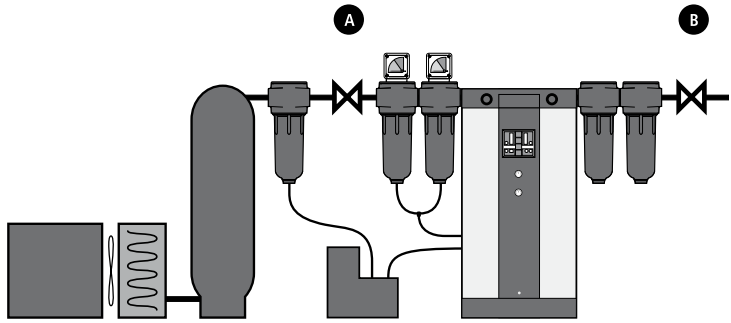
(vii) Run the system for a minimum of 6 hours to ensure dewpoint is adequate.

(viii) Open valve B slowly.

Shut down procedure

Shut down procedure

1. Close valve B
2. Close valve A
3. Leave system running for 15 minutes to fully de-pressurise. Check gauges are displaying zero pressure.
4. Switch off all electrical power to the system.

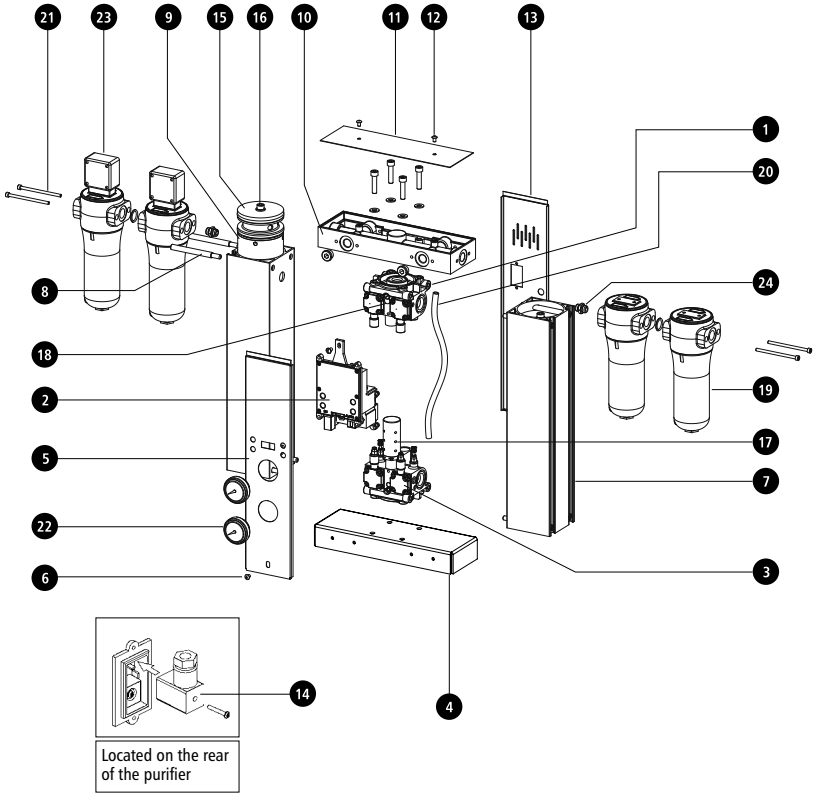


section 2

BA025-BA035

2

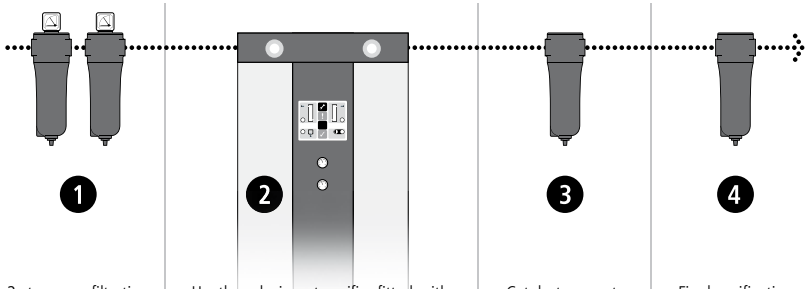
Description of the main components



1 Top valve assembly
2 Control unit
3 Bottom valve assembly
4 Bottom mounting block
5 Front panel
6 Front panel fixing screw
7 Pressure housing
8 Pressure housing retaining bolt
9 Pureflow desiccant cartridge c/w dust filter
10 Multiport manifold
11 Top cover
12 Top cover fixing screw
13 Rear panel
14 DIN connector
15 Banjo fixing bolt
16 Pressure seal
17 Exhaust silencer
18 Purge plug
19 Final purification stage
20 Air transfer downpipe
21 Filter connecting kit
22 Tower pressure gauges
23 Pre-filtration stage
24 Male/male nipple

Explanation of the main components

Purification process



2 stage pre-filtration removes particles down to 0.01 micron and oil/water aerosol down to 0.01 mg/m^3

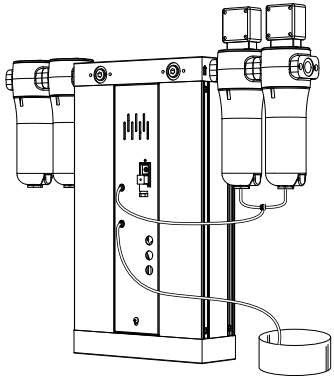
Heatless desiccant purifier fitted with *Pureflow* cartidges, reduces the moisture content in the air down to -40°C pressure dewpoint and controls the level of CO_2.

Catalyst converts CO into CO_2 by oxidation.

Final purification stage removes odours and particles down to 0.01 micron.

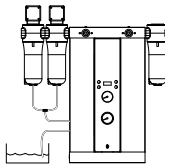
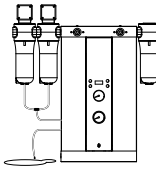
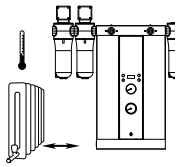
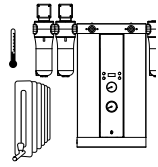
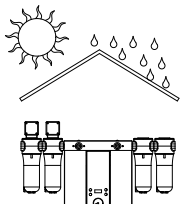
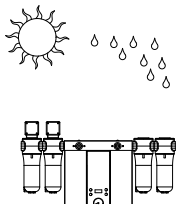
Connecting the drainage system

1. Fit 4mm (5/32”) black tubing to filter and drain valve inlet.
2. Pipe away condensate with 4mm (5/32”) tubing from drain outlet. Ensure condensate is drained into an oil/water separator.
3. Fit any further filtration or ancillary equipment.
4. Drain kits to be supplied with system and comprise of the following:- Swivel elbow adapter and 4mm tubing.



⚠ All tubing should be secured up to the point of drain to prevent whipping during discharge.

Installation requirements

✓	✘
< 35°C	< 1.5°C
< 16 barg	< 4 barg
	
	
	

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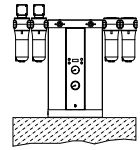
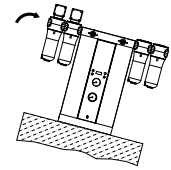
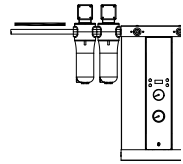
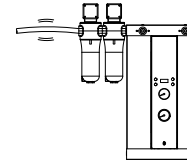
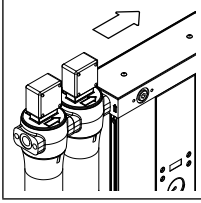
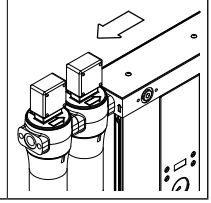
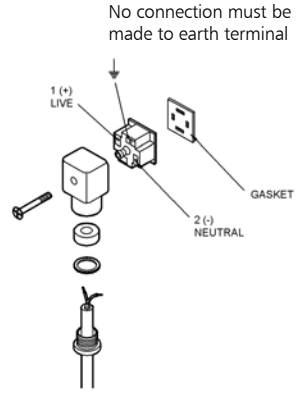
	
	
	

Electrical supply

Connection

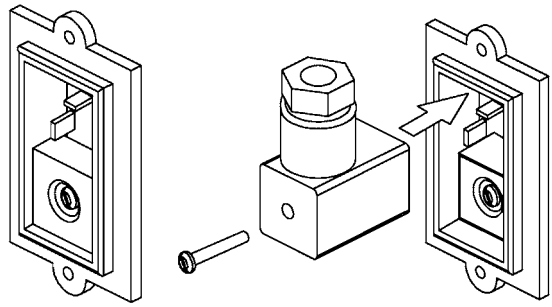
1. The system is designed to operate on either an AC or DC supply voltage. Ensure only one power source is connected at any one time, and it is connected to the correct socket. Cover supplied must be fitted to the power connection not in use.
2. The system is double insulated therefore no earth is required.
3. Suitable external fuse connection must be provided.
4. The cable selection must suit local installation regulations and be appropriate to power consumption.



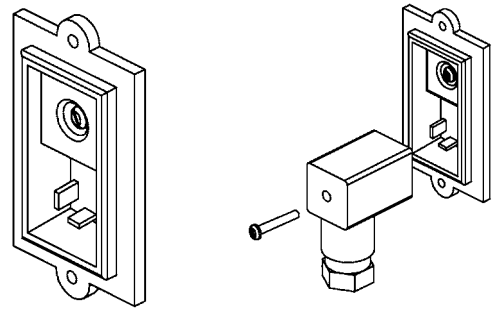
Supply	Amp
12 VDC	0.8
24 VDC	0.4
100 VDC	0.16
115 VDC	0.14
230 VDC	0.07
240 VDC	0.067

DIN plug drawings

100 to 240 VAC

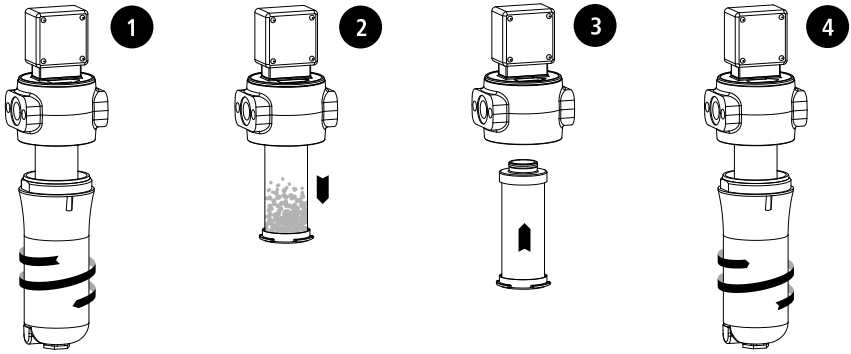


12 to 24 VDC



Changing the filter element

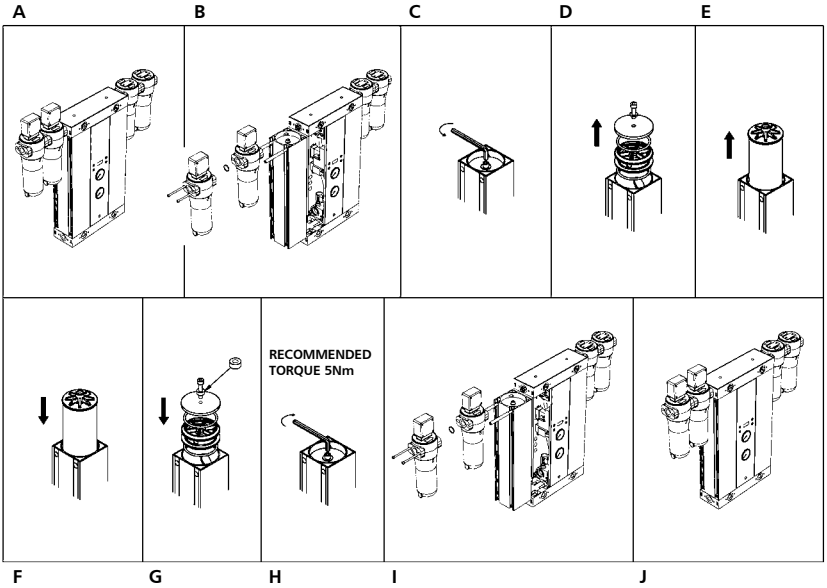
Changing the filter element



Replacement element part numbers

Model	Pre-filtration 12M		Final Purification 6M	
BA025	E511X1	E511XA	E521HC	E511AC
BA035	E511X1	E511XA	E521HC	E511AC

Changing the desiccant cartridges



1. Dispose of desiccant cartridges in accordance with local waste regulations.
2. Follow the start-up procedure as detailed on page 7.

Replacement cartridge kit part numbers

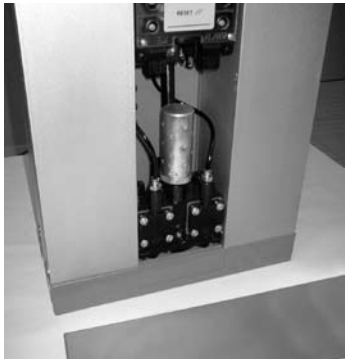
Model	Cartridge replacement kit number
BA025R07	PDC025DF-12000
BA035R07	PDC035DF-12000

Replacement silencer part numbers

Model	Silencer replacement kit number
BA025R07	WPN3631600101
BA035R07	WPN3631600101

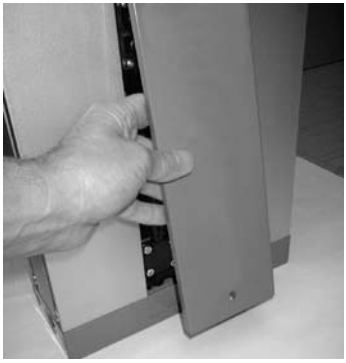
Removing and replacing the front panel

1. System with front facia panel fitted.


4. System with front facia panel removed.


2. Remove single retaining screw.


5. Re-fit front facia panel by insertion of tongue into groove and pushing upwards and inwards.


3. Remove front facia panel by tilting outwards and downwards.


6. Replace single retaining screw.

⚠ Purge plug removal

1. Remove the front panel and locate purge plug in upper valve block.

2. Remove purge plug fixing screw from upper valve block.

3. Remove purge plug from port in upper valve block downwards.

4. Orifice in purge plug can be cleaned with warm soapy water. Do not use sharp implements or tools.

5. After thoroughly drying purge plug, push back into port in valve block. Ensure that O-rings are in place and in good condition.

6. Replace and tighten purge plug fixing screw in upper valve block.

⚠ Diaphragm replacement

1. Remove the front panel and locate purge plug in upper valve block.

5. Disconnect tubing from fitting on bonnet.

2. Lower bonnets.

6. Locate diaphragm assembly to be changed.

3. Remove bonnets by means of four fixing screws.

7. Remove diaphragm assembly.

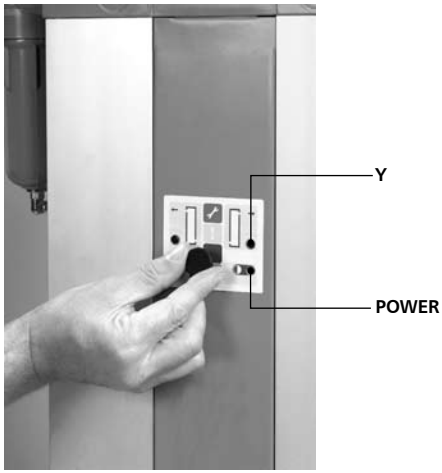
4. Separate bonnet from valve block.

8. Diaphragm and bonnet components.

9. Replace diaphragm and bonnet by following above procedure in reverse.
Repeat above procedure for all diaphragms on system.

Resetting the controller

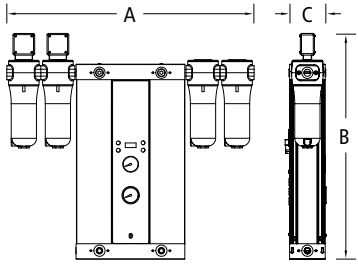
1. After following the start up procedure it is necessary to reset the controller. This is done by using the re-set disc (supplied with 12/24 month service kit) then:
2. Hold the disc against the blue pad on the front display of the system panel for 5 seconds.
3. During the five second period, the POWER indicator will flash green. When the reset has been successful indicator Y will flash red once to confirm that it has been completed successfully.



Technical data

model	pipe size	inlet flow rate		outlet flow rate		dimensions (mm)		
		Nm^3/h	SCFM	Nm^3/h	SCFM	A	B	C
BA 025	3/8	42	25	34	20	545	1045	92
BA 035	3/8	59	35	48	28	545	1440	92

Note: All flow rates are based on 7 barg (100 psig) and 30°C (86°C) at the inlet of the system.



Models BA025 and BA035

Specifications		
Maximum operating pressure	16 barg	232 psig
Minimum operating pressure	4 barg	58 psig
Maximum recommended inlet temperature	30ºC	86ºF
Minimum inlet temperature	1.5ºC	35ºF
Power Supply	12VDC to 24VDC	100VAC to 240VAC

Pressure correction factors									operating pressure shown in barg and (psig)
Operating pressure	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)
Correction factor	0.62	0.75	0.87	1.00	1.12	1.37	1.62	1.87	2.12

Purge plug identification

	operating pressure (barg)												
model	4	5	6	7	8	9	10	11	12	13	14	15	16
BA 025	PPK020	PPK018	PPK016	PPK015	PPK014	PPK014	PPK013	PPK012	PPK012	PPK012	PPK011	PPK011	PPK011
BA 035	PPK028	PPK023	PPK021	PPK020	PPK018	PPK018	PPK016	PPK015	PPK014	PPK014	PPK013	PPK013	PPK013

Notes

1. The system is delivered configured for operation at 7 barg (100 psig).

2. To confirm pressure rating, please see rating label on side of system

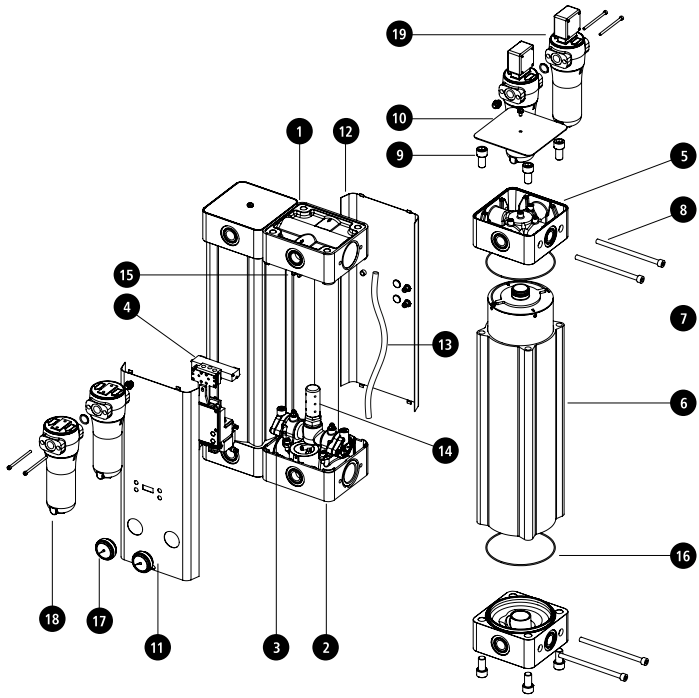
3. Where system is being operated at inlet pressure other than originally specified, select the appropriate purge plug from the table above.

section 3

BA045-BA175

3

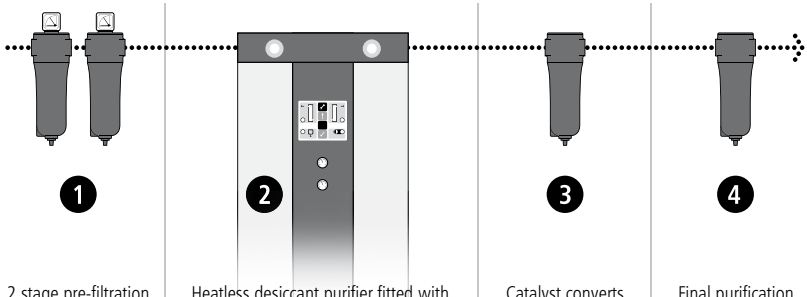
Description of the main components



1 Inlet valve assembly
2 Bottom valve assembly
3 Exhaust valve assembly
4 Controller
5 Quadra-port manifold
6 Pressure housing
7 Pureflow desiccant cartridge c/w dust filter
8 Pressure housing retaining bolt
9 Quadra-port manifold retaining bolt
10 Quadra-port manifold top cover
11 Front panel
12 Back panel
13 Air transfer downpipe
14 Silencer
15 Purge plug
16 O-ring seal
17 Tower pressure gauges
18 Pre-filtration stage
19 Final purification stage

Explanation of the main components

Purification process



2 stage pre-filtration removes particles down to 0.01 micron and oil/water aerosol down to 0.01 mg/m^3

Heatless desiccant purifier fitted with *Pureflow* cartidges, reduces the moisture content in the air down to -40°C pressure dewpoint and controls the level of CO_2.

Catalyst converts CO into CO_2 by oxidation.

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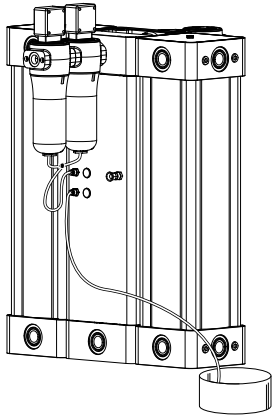
Connecting the drainage system

1. Fit 4mm (5/32”) black tubing to filter and drain valve inlet.
2. Pipe away condensate with 4mm (5/32”) tubing from drain outlet. Ensure condensate is drained into an oil/water separator.
3. Fit any further filtration or ancillary equipment.
4. Drain kits to be supplied with system and comprise of the following:- Swivel elbow adapter and 4mm tubing.



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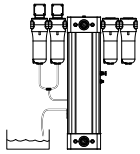
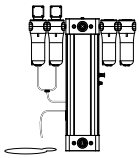
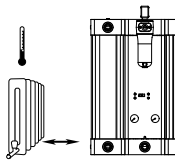
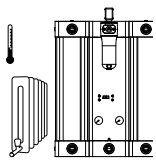
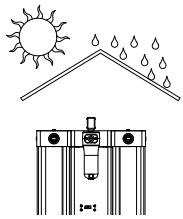
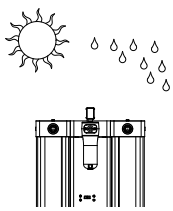
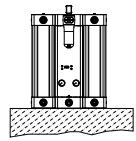
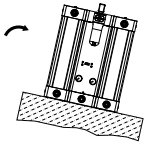
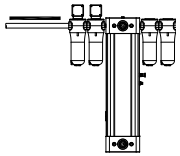
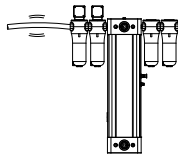
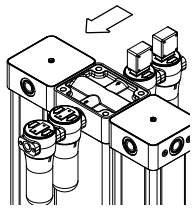
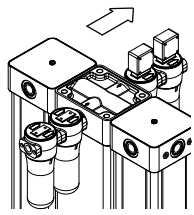
Installation requirements

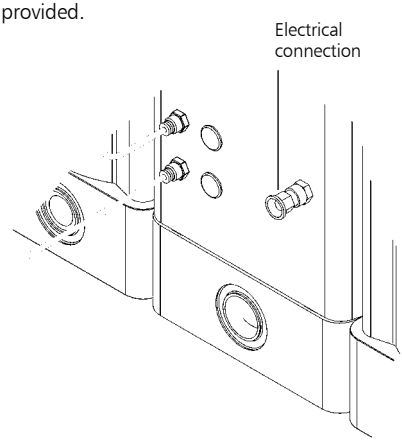
✓	✘
< 35°C	< 1.5°C
< 16 barg	< 4 barg
	
	
	

✓	✘
	
	
	

Electrical supply

Connection

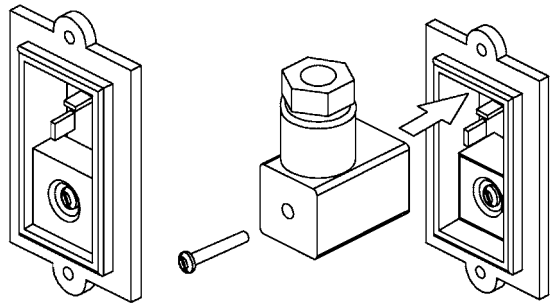
1. The system is designed to operate on either an AC or DC supply voltage.
   Ensure only one power source is connected at any one time, and it is connected to the correct socket. Cover supplied must be fitted to the power connection not in use.
2. The system is double insulated therefore no earth is required.
3. Suitable external fuse connection must be provided.
4. The cable selection must suit local installation regulations and be appropriate to power consumption.



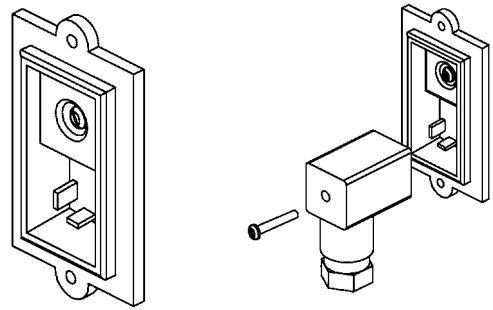
Supply	Amp
12 VDC	0.8
24 VDC	0.4
100 VDC	0.16
115 VDC	0.14
230 VDC	0.07
240 VDC	0.067

DIN plug drawings

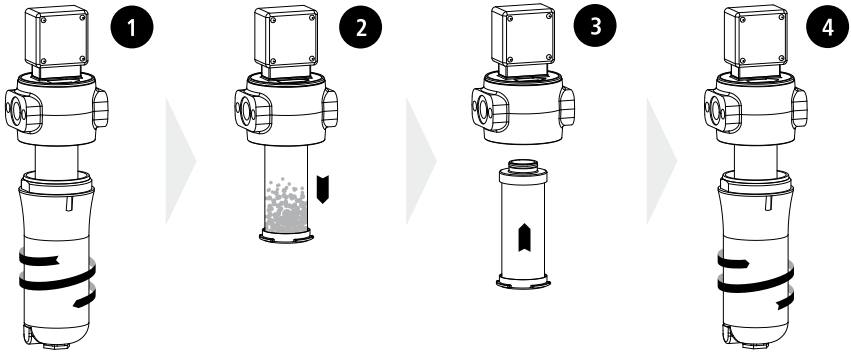
100 to 240 VAC



12 to 24 VDC



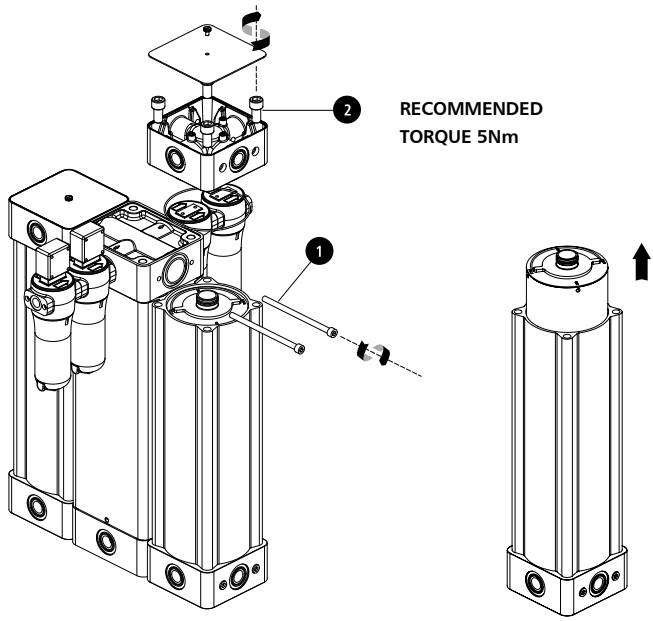
Changing the filter element



Replacement element part numbers

Model	Pre-filtration 12M		Final Purification 6M	
BA045	E711X1	E711XA	E811HC	E711AC
BA055	E711X1	E711XA	E811HC	E711AC
BA065	E711X1	E711XA	E811HC	E711AC
BA085	E811X1	E811XA	E731HC	E811AC
BA105	E811X1	E811XA	E731HC	E811AC
BA135	E731X1	E731XA	E731HC	E731AC
BA175	E731X1	E731XA	E731HC	E731AC

Changing the desiccant cartridges



Tools required:

1. 8mm hex key
2. 14mm hex key

Replacement cartridge kit part numbers

12M Model	Cartridge replacement kit number
BA045R07	PDC045DF-12000
BA055R07	PDC055DF-12000
BA065R07	PDC065DF-12000
BA085R07	PDC085DF-12000
BA105R07	PDC105DF-12000
BA135R07	PDC135DF-12000
BA175R07	PDC175DF-12000

Replacement silencer part numbers

Model	Silencer replacement kit number
BA045R07	WPN3698300101
BA055R07	WPN3698300101
BA065R07	WPN3698300101
BA085R07	WPN3698300101
BA105R07	WPN3535500101
BA135R07	WPN3535500101
BA175R07	WPN3535500101

Removing and replacing the front panel

1. Unscrew and remove filter bowl from head.

2. Remove filter element from head.

3. Remove front facia panel by tilting outwards and downwards.

4. Front facia panel removed.

5. Re-fit front facia panel by insertion of tongue into groove and pushing upwards and inwards.

6. Replace single retaining screw.

⚠ Purge plug removal

1. Remove the front panel and locate purge plug in upper valve block.

2. Remove purge plug fixing screw from upper valve block.

3. Remove purge plug from port in upper valve block downwards.

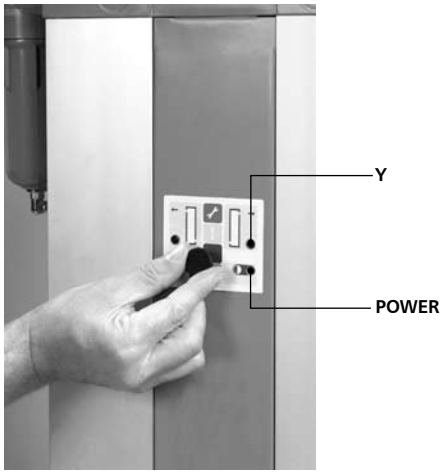
4. Orifice in purge plug can be cleaned with warm soapy water. Do not use sharp implements or tools.

5. After thoroughly drying purge plug, push back into port in valve block. Ensure that 'o' rings are in place and in good condition.

6. Replace and tighten purge plug fixing screw in upper valve block.

Resetting the controller

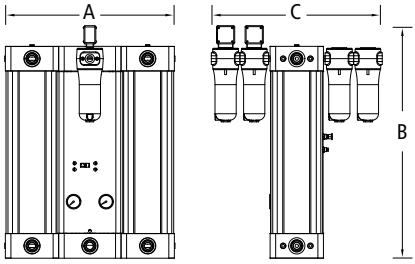
1. After following the start up procedure it is necessary to reset the controller. This is done by using the re-set disc (supplied with 12/24 month service kit) then:
2. Hold the disc against the blue pad on the front display of the system panel for 5 seconds.
3. During the five second period, the POWER indicator will flash green. When the reset has been successful indicator Y will flash red once to confirm that it has been completed successfully.



Technical data

model	pipe size	inlet flow rate		outlet flow rate		dimensions (mm)		
		Nm^3/h	SCFM	Nm^3/h	SCFM	A	B	C
BA 045	¾	76	45	61	36	520	660	525
BA 055	¾	93	55	75	44	520	760	525
BA 065	¾	110	65	88	52	520	860	525
BA 085	1	144	85	116	68	520	1060	525
BA 105	1	178	105	143	84	520	1370	525
BA 135	1	229	135	184	108	520	1570	525
BA 175	1	297	175	238	140	520	1970	525

Note: All flow rates are based on 7 barg (100 psig) and 30°C (86°C) at the inlet of the system.



Models BA045 and BA175

Specifications		
Maximum operating pressure	16 barg	232 psig
Minimum operating pressure	4 barg	58 psig
Maximum recommended inlet temperature	30ºC	86ºF
Minimum inlet temperature	1.5ºC	35ºF
Power Supply	12VDC to 24VDC	100VAC to 240VAC

pressure correction factors									operating pressure shown in barg and (psig)
Operating pressure	4 (58)	5 (72)	6 (87)	7 (100)	8 (115)	10 (145)	12 (174)	14 (203)	16 (232)
Correction factor	0.62	0.75	0.87	1.00	1.12	1.37	1.62	1.87	2.12

Purge plug identification

	operating pressure (barg)												
model	4	5	6	7	8	9	10	11	12	13	14	15	16
BA 045	PPK28	PPK25	PPK23	PPK22	PPK21	PPK20	PPK19	PPK19	PPK17	PPK17	PPK16	PPK16	PPK16
BA 055	PPK30	PPK27	PPK25	PPK24	PPK22	PPK21	PPK20	PPK19	PPK18	PPK18	PPK17	PPK16	PPK16
BA 065	PPK35	PPK32	PPK29	PPK28	PPK26	PPK25	PPK23	PPK22	PPK21	PPK21	PPK20	PPK19	PPK19
BA 085	PPK41	PPK38	PPK35	PPK33	PPK31	PPK29	PPK28	PPK26	PPK25	PPK24	PPK24	PPK23	PPK22
BA 105	PPK48	PPK44	PPK40	PPK38	PPK36	PPK34	PPK32	PPK31	PPK29	PPK28	PPK27	PPK26	PPK26
BA 135	PPK52	PPK47	PPK44	PPK41	PPK39	PPK37	PPK35	PPK33	PPK32	PPK31	PPK30	PPK29	PPK28
BA 175	PPK56	PPK51	PPK47	PPK44	PPK41	PPK39	PPK37	PPK36	PPK34	PPK33	PPK32	PPK31	PPK30

Notes

1. The system is delivered configured for operation at 7 barg (100 psig).

2. To confirm pressure rating, please see rating label on side of system.

3. Where system is being operated at inlet pressure other than originally specified, select the appropriate purge plug from the table above.

section 4

4

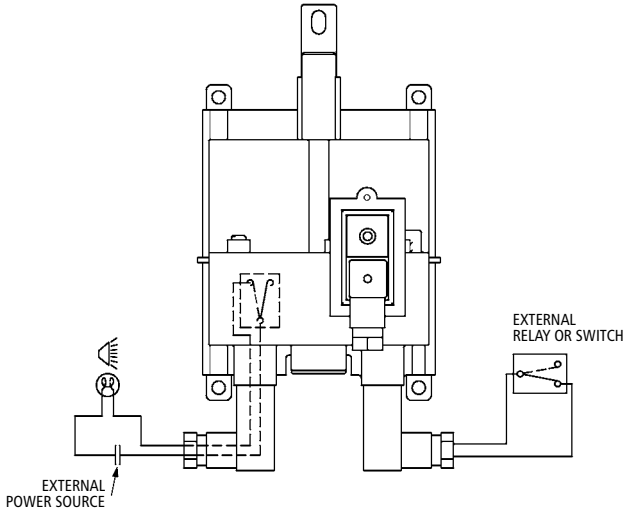
Alarm connection details

To enable the alarm facility it is recommended that a suitable cable is brought into the controller via the rear panel with a grommet. An external power source is required.:

1. Connect the switching pole of an externally powered alarm device to terminals 1 and 2 of alarm DIN connector.
2. With the power removed from the system and the alarm lead wired as described in 1 above, remove the cover from the DIN connection marked 'Alarm' and connect the wired DIN connector ensuring the seal and screw are fitted.

Alarm Relay Rating	3 Amp Max 28 VDC
Alarm connection type	Hirschmann GDS 207 industrial standard DIN connector or equivalent

Remote alarm wiring diagram



⚠ Troubleshooting

⚠

General troubleshooting

Before specific identification of any fault is looked for, the following general points must be verified:

- Has the system been damaged externally or are any parts missing?
- Is power being supplied to the system?
- Was startup carried out in accordance with the instructions in this manual?
- Are all external valves correctly set for operation?
- Do the operational conditions meet those specified at time of ordering and used for product selection?

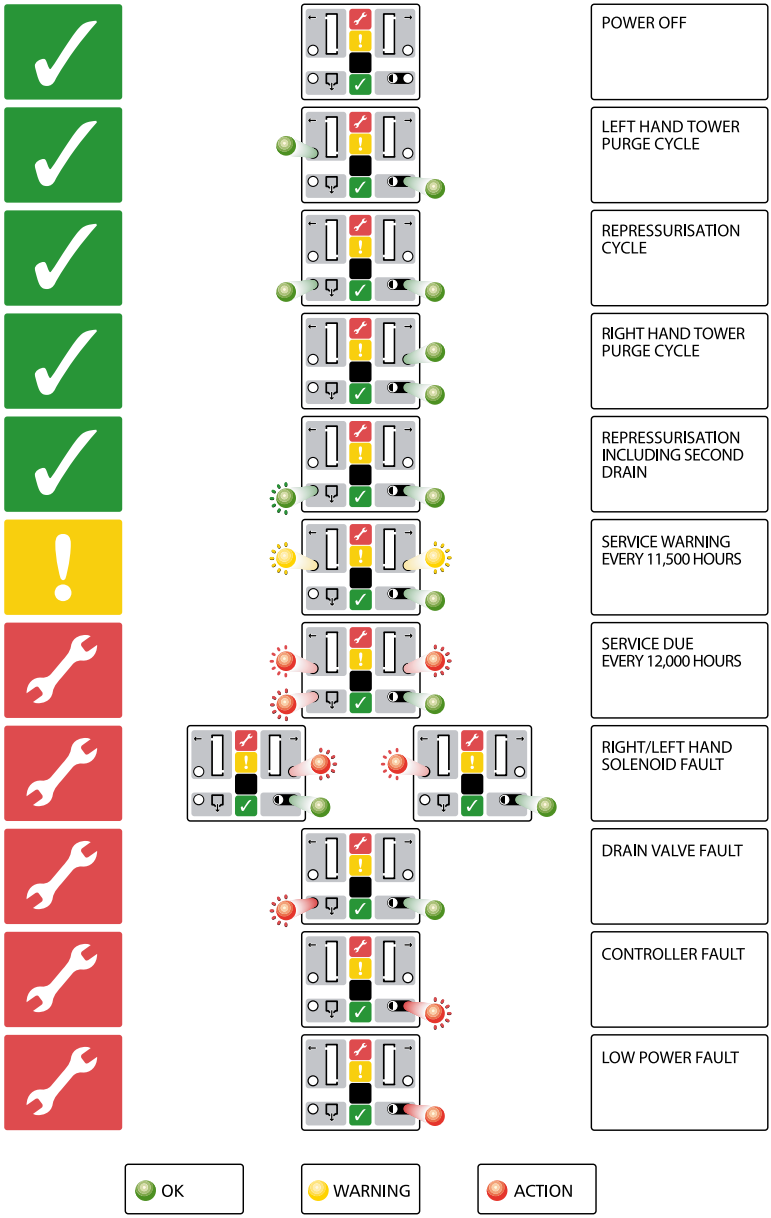
The table below gives possible causes and corrective actions to faults that may occur on the system:

Problem	Possible cause	Action
Poor dewpoint	Liquid water at inlet. Excessive flow	Check pre-filtration and drains. Check actual flow against maximum specified
	Low inlet pressure	Check against specification
	High inlet temperature	Check against specification
	Silencer blocked or damaged	Replace silencer
Incorrect system operation	Jammed shuttle valves or faulted electrical components	See electrical operation trouble-shooting section
Odour at outlet	Final purification – life span exceeded	Replace final purification filter
High pressure drop	Pre-filtration – life span exceeded	Replace final pre-filtration filters
Air quality non-compliant	Poor system operation – filtration life span exceeded	Check system operation is correct. Replace all filtration

Electrical troubleshooting (see service and fault diagnosis on page 44)

Problem	Possible cause	Display	Priority	Location	Action
No system function	No power supply	None			Check supply
Incorrect system operation	Left solenoid open or short circuit	Flashing red	P1	X LED	Replace solenoid valve
	Right solenoid open or short circuit	Flashing red	P1	Y LED	Replace solenoid valve
	Silencer blocked or damaged	Flashing red	P2	Power LED	Replace controller
	Lower power fault	Continuous red	P1	Power LED	Check supply
Drain not operating	Energy management active				Check installation
	Drain solenoid open or short circuit	Flashing red	P1	Z LED	Replace solenoid valve
	Controller fault	Flashing red	P2	Power LED	Replace controller

Service and fault diagnosis



Environmental conditions

All systems are designed to be safe under the following conditions:

- Indoor use
- Altitude up to 2000m
- Ambient temperature 5°C to 40°C
- Maximum RH 80% for temperatures up to 31°C, decreasing linearly to 50% RH at 40°C
- Mains supply voltage fluctuations not to exceed +/- 10% of nominal
- Transient over voltage IEC664 Class II
- Pollution degree 2, IEC 664

For operation extended from the above conditions, please contact Walker Filtration.

Warranties and liabilities

Claims for warranty and liability concerning personal injury or material damage are excluded if they resulted due to one or more of the following factors:

- Inappropriate use or application of the system.
- Technically incorrect installation, startup operation or maintenance of the system.
- Operation of a known damaged system.
- Failure to observe the information given in this manual concerning all life phases of the system.
- Undertaking constructional or operational modifications to the system without prior agreement with Walker Filtration.
- Inadequate monitoring and replacement of components of the system that are subject to wear or consumable.
- Improper completion of repairs.
- Use of non-original or non-approved parts for service or maintenance.

EC Declaration of Conformity

Name of Manufacturer	Walker Filtration Ltd	
Address of Manufacturer	Spire Road, Glover East, Washington, Tyne & Wear, NE37 3ES. England	
Description of Product	Breathing Air Purification Packages	
Designation of Product:	BA025, BA035, BA045, BA055, BA065, BA085, BA105, BA135, BA175	
Power Supply	12VDC to 24VDC	
Standards Used: Harmonised Standards* applied where available – with alternatives specified where harmonised standards do not exist.	Machines: 98/37/EC	ISO 12100-2:2003*
	LVD: 2006/95/EC	EN 60204-1:1997*
	EMC: 2004/108/EC	EN 61000-6-1:2001* EN 61000-6-2:2005* EN 61000-6-3:2001, A11:2004* EN 61000-6-4:2001*
	PED: 97/23/EC	Essential safety Requirements (97/23/EC) Generally in accordance with ASME VIII Div. I. 2004 Edition inc. 2005 Addenda
Notified Body **(97/23/EC only):**	Lloyd's Register EMEA, Notified Body No. 0038, 71 Fenchurch Street, London, EC3M 4BS. England	
Conformity Assessment Module **(97/23/EC only)**	Purifiers BA025 – 'Category I' - Module (A) Purifier BA035 – 'Category II' - Module (D1) COV0310124/1 Purifier BA045 – BA175 – 'Category II' – Module (B + C1) COV0712098/1 + COV0712137/2 Filter Units – SEP & Module A	
Notified Body (Quality Systems): **ISO9001:2000-LRQ0930553**	Lloyd's Register EMEA, Notified Body No. 0038, Hiramford, Middlemarch Office Village, Siskin Drive, Coventry, CV3 4FJ. England.	
Name of Authorised Representative	Andrew Chalmers	
Position of Authorised Representative	Group Technical Manager	
	I declare, on behalf of Walker Filtration Ltd and as the authorised representative, that the above stated products fulfil the requirements of the applicable New Approach Directives.	
	20.03.2009	

WALKER FILTRATION

The ultimate filtration & drying technology

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