Handling and lifting pit intake filters

When an pit intake filter has to be lifted or moved, placing lifting straps correctly to balance the unit is vital.
Simatek pit intake filters are fitted with 2 x lifting brackets - 4 x lifting eyes.

⚠	All work concerning strapping up and lifting must comply with applicable safety rules.

Lifting pit intake filters

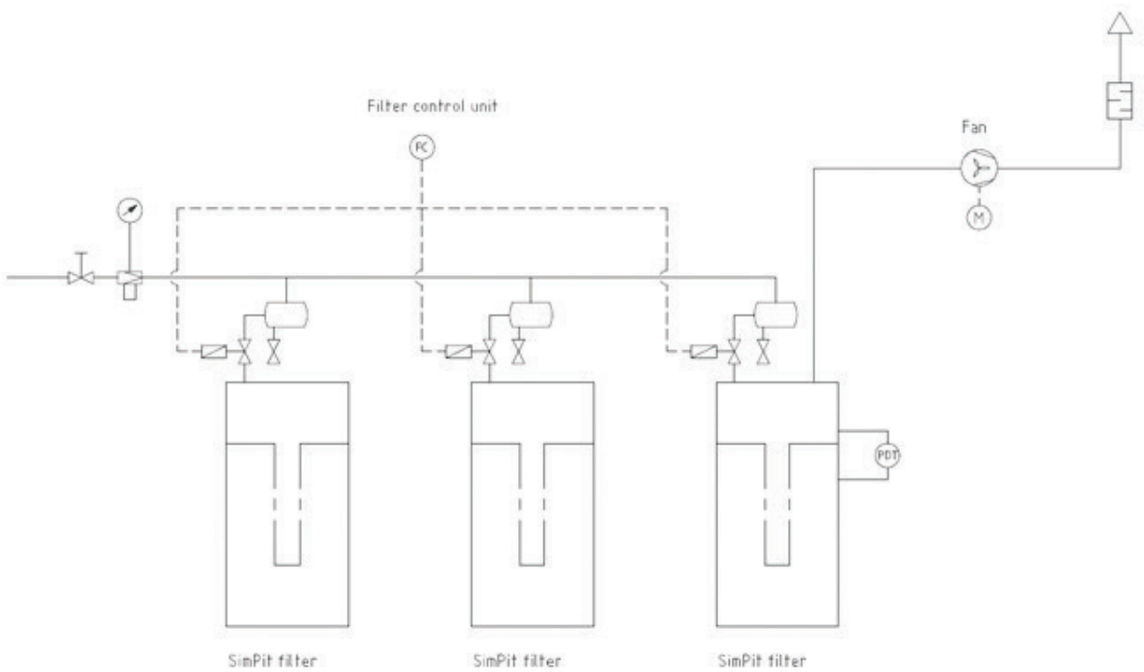
Transporting pit intake filters

Pit intake filters are delivered as standard on a pallet.

The pallet can be lifted using a fork lift truck or straps fastened to the filter's lifting eyes. Always ensure that the filter is balanced.

Assembling pit intake filters

Pit intake filters are normally delivered as modules.
The modules are assembled as described in this section.
Connect the clean air pipes to the outlet opening on the top section of the modules before fitting bags. Failure to do so makes it impossible to fit the flange bolts.
Attach a common 1” supply pipe to all compressed air recievers.
Fit the reduction valve supplied onto the supply pipe using a ball valve in front for shut-off.
Fit the manometer to the
connector on the reduction valve after removing the pipe plug.
Fit the filter bags as described in "Removing filter bags from below - cage type HR".



Differential pressure gauge

Figures in brackets refer to Figs. 01 and 03
Description

Filter element (4) prevents dust penetration into the GFCD control unit/differential pressure gauge.
Drill 2 x 13 mm holes in the clean chamber and dust chamber before starting assembly. As shown in Figs. 02 and 04.

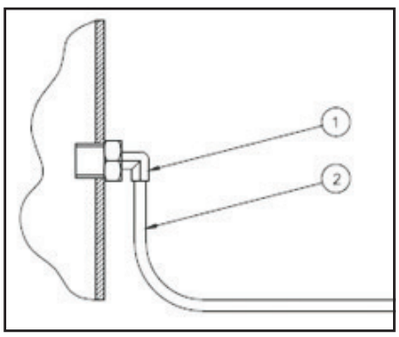


Fig. 01

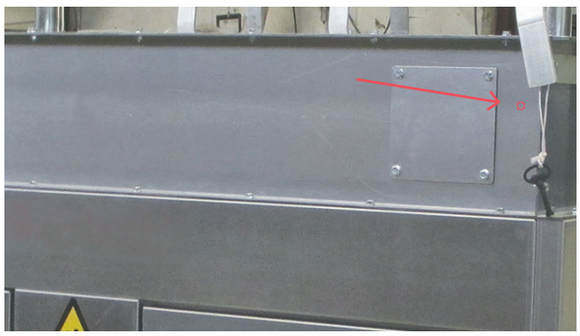


Fig. 02
Drill a 13 mm hole in the clean air chamber with a distance of 100 mm from the outer edge of the clean air chamber, and 150 mm above the dust chamber.

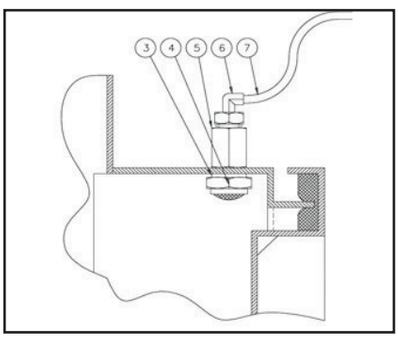


Fig. 03

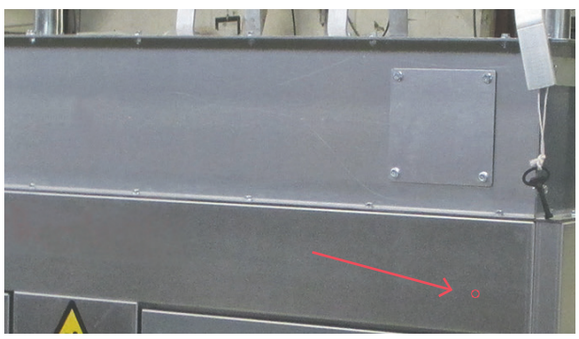


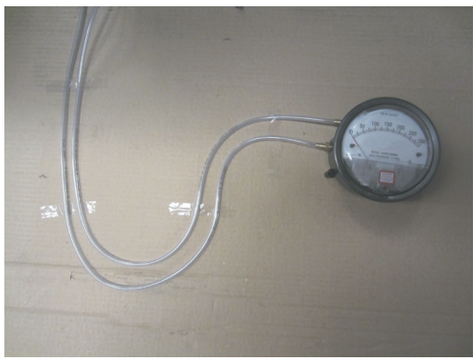
Fig. 04
Drill a 13 mm hole in the dust chamber with a distance of 100 mm from the outer edge of the dust chamber, and 100 mm above the door.

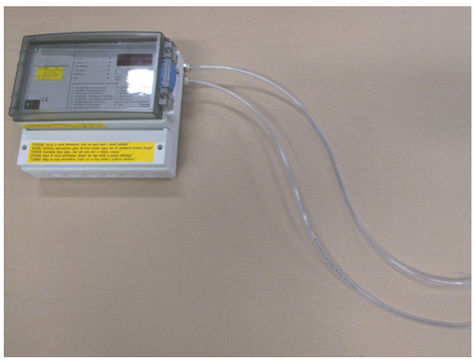
Installation

Figures in brackets refer to Figs. 01 and 03
Connection consists of two units: clean air side (1-2) and product side (3-7), connected before commissioning:
1) Fit hose (2) on hose nozzle (1).
2) Fit hose (7) on filter holder (6).
If the GFCD control unit or differential pressure gauge is fitted under the level for connection on the product side, the hoses must be fitted bending downwards so that condensate cannot run into the GFCD control unit/differential pressure gauge.
Art. no. on filter element (4): 5253

Connection

Fit the hose from the clean air chamber to nozzle (-) on the GFCD control unit/differential pressure gauge.
Fit the hose from the product side to nozzle (+) on the GFCD control unit/differential pressure gauge.
Check that the hoses are fitted correctly: Suction applied to the hose from the clean air chamber should give a positive reading on the gauge. If not, switch the hoses around.
Hoses supplied by Simatek are PVC, diameter 4/6 mm. They can therefore be connected directly to the GFCD control unit/differential pressure gauge.
PVC hose temperature limit: -5°C - +60°C.



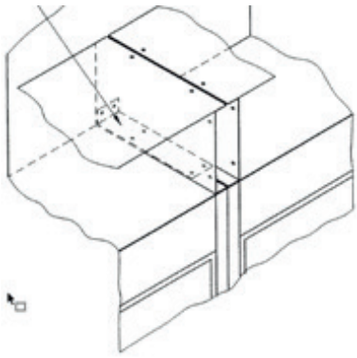


Service and maintenance
Product side:
If the filter holder is located by the door, the filter element can be inspected through the door.
If the filter element requires replacement:
1) Detach the filter holder hose.
2) Detach the filter element (4) and blow clean or replace with a new element.
3) Refit filter element (4) and filter holder.

Fitting pit intake filter

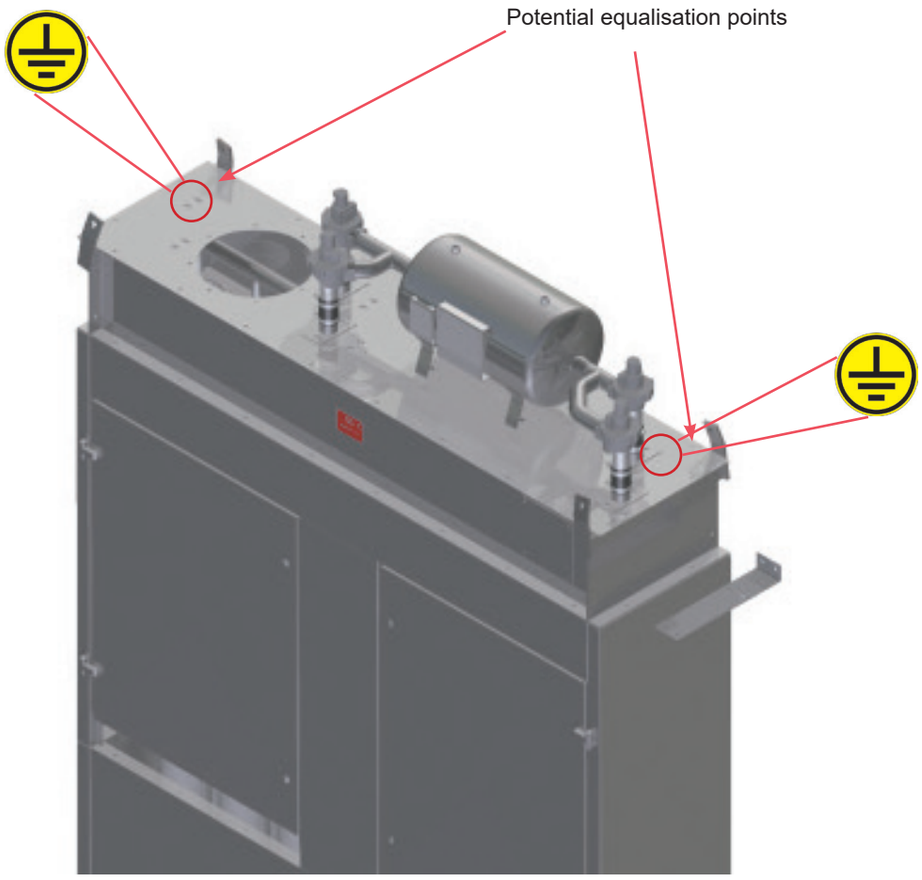
Ensure that the floor is level so that the lower module can be secured using e.g. expansion bolts. We recommend fastening to all holes in the lower flange.
The top section can now be fitted to the lower section and fastened with M8 bolts. Remember potential equalisation using safety washers on at least 2 assemblies per flange assembly.

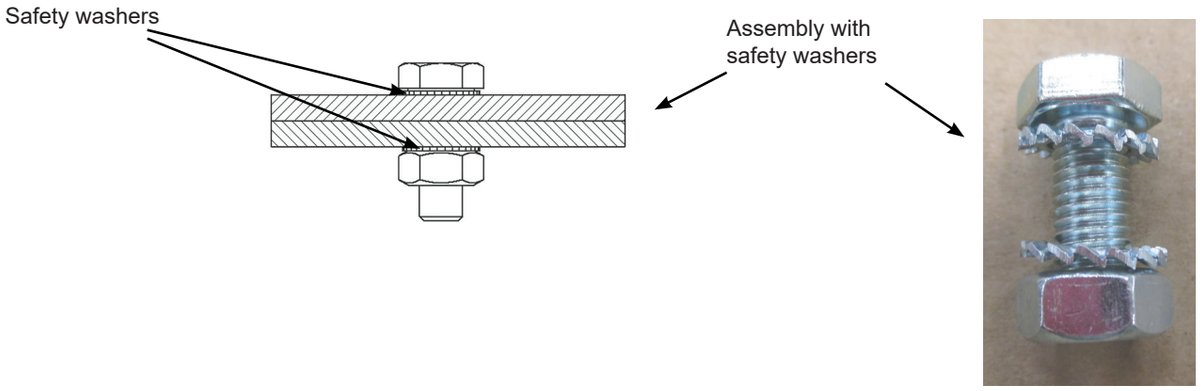
If the sections are assembled with a bracket on the top of the dust chamber:



Potential equalisation between modules

The actual pit intake filter is potential-equalised at panel joints using two sets of nuts and bolts with safety washers for all bolt assemblies.
Potential equalisation for all modules is interconnected.
The complete set of modules must be connected to the main potential equalisation rail for the full plant.

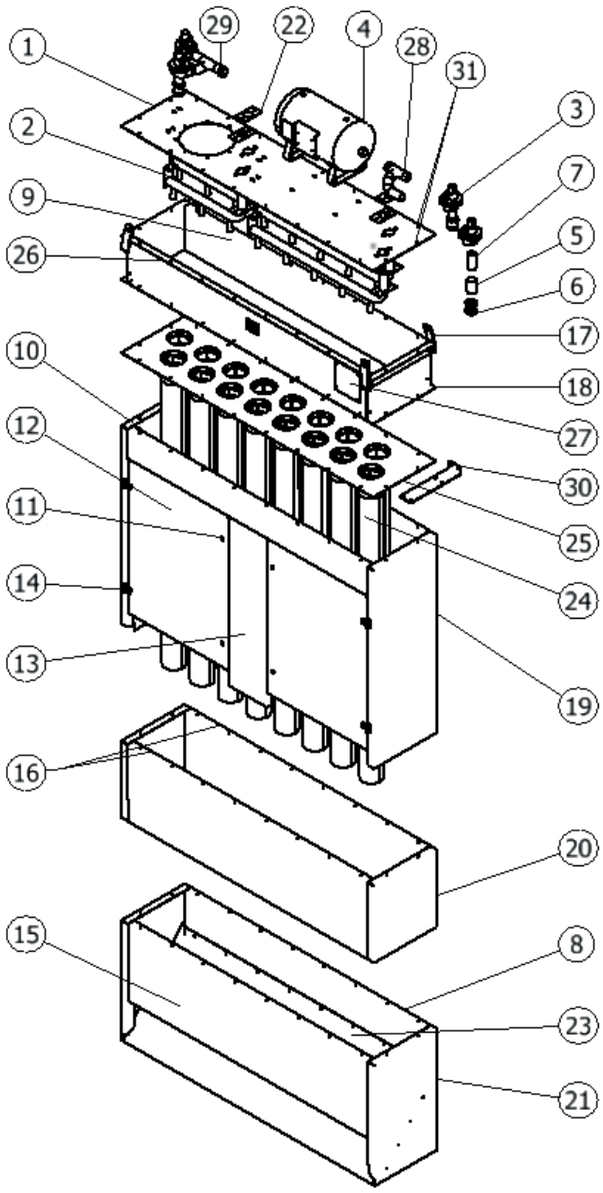




Positioning of each part

These assembly instructions may mention components that are not supplied with the Simatek delivery in question.

Item no.	Component
01	Top plate
02	Jet pipe
03	Solenoid
04	Compressed air reciever
05	Rubber bushing
06	Hose clip
07	Weld adapter
08	Back plate, dust chamber
09	Front and back plates, top section
10	Front plate, dust chamber
11	Lock insert, complete (for door)
12	Dust chamber door
13	Dust chamber centre panel
14	Hinge, complete (for door)
15	Front plate
16	Front and back plates, dust chamber
17	Lifting bracket
18	Side plate, clean air chamber
19	Side plate, top section
20	Side plate, centre section
21	Side plate, base section
22	Tightener for jet pipes
23	Angled plate, dust chamber
24	Filter bag
25	Perforated plate
26	Flange bolt
27	Cover for inspection hole
28	Y-pipe for compressed air reciever, right
29	Y-pipe for compressed air reciever, left
30	Base plate
31	Countersunk screws, washers and nuts

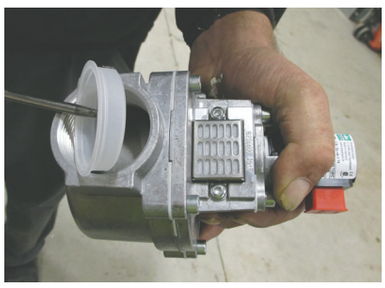


Fitting air reciever, solenoids, junction box, filter regulator and manometer

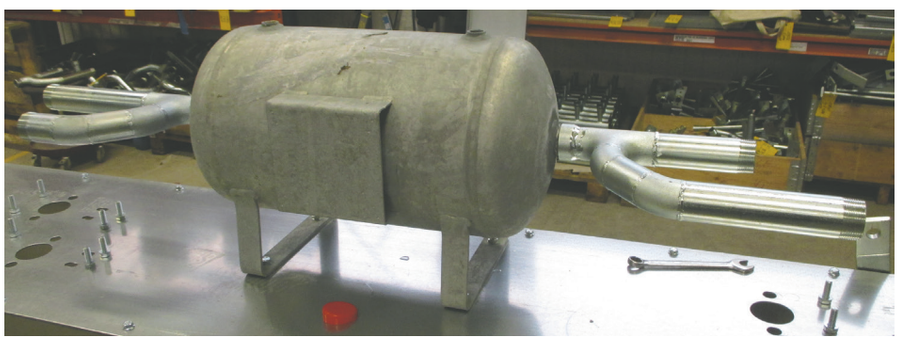
All threads on metal parts should be packed with a suitable pipe sealant.
Simatek recommends LocTite 55 pipe sealing cord.

⚠	**NB!** When the filter is fully assembled, always check that there is unrestricted access to the air reciever and solenoids for service.
⚠	Photographs and explanations in these assembly instructions can differ depending on the components supplied.

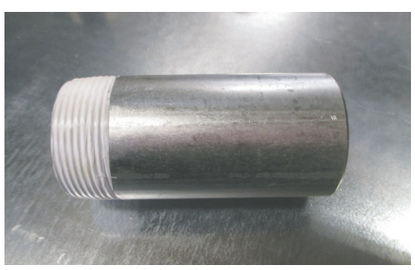
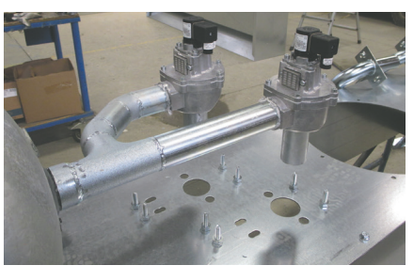
Most pit intake filters are supplied from the factory with compressed air reciever, jet pipes and solenoids fitted.
If this is not the case, follow the instructions below.
Fit the compressed air reciever to the pit intake filter.
Remove the cover from the solenoid.
Remove the Twist-on coil from two of the solenoids (they cannot be fitted otherwise).

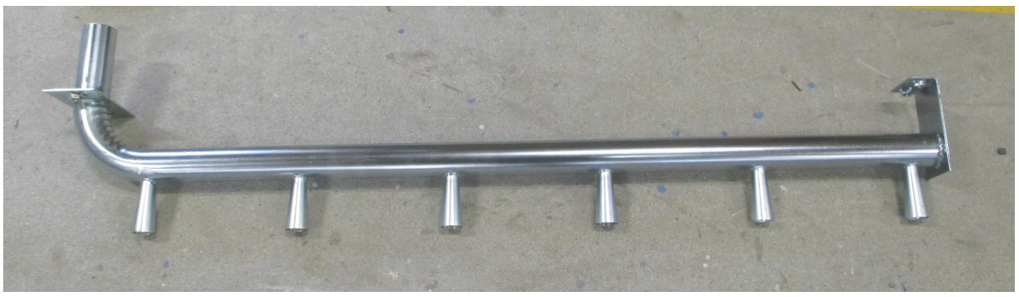

Pack the thread at both ends on the air reciever with a suitable pipe sealant.
Fit the Y-pipe at both ends of the compressed air reciever.
Pack the threads of both Y-pipes.

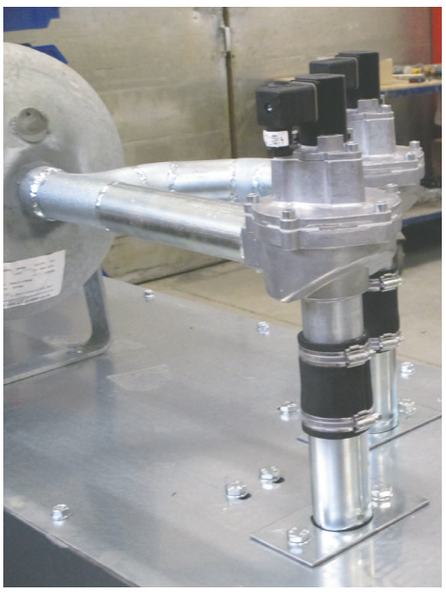



Pack all weld adapters with a suitable pipe sealant and screw them onto the air reciever.
Fit solenoids on Y-pipes. Tighten solenoids 4-5 turns.
Fit twist-on coils on the 2 solenoids where they were previously detached from.

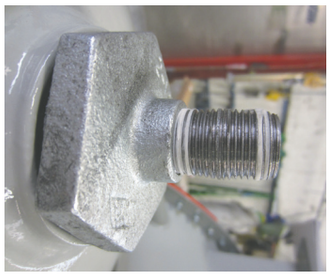
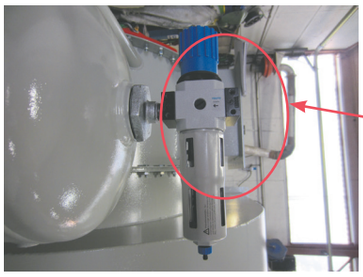
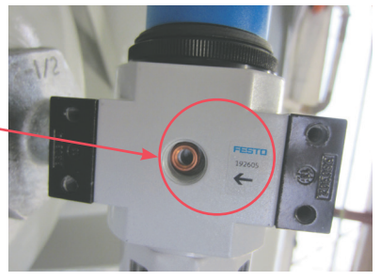
Push the rubber grommets onto the weld adapters on the solenoids.
We recommend lubricating the rubber grommet and weld adapter with a suitable lubricant. E.g. KEMA CS-1300.
Loosely place the clamp plate for the jet pipe over the holes in the top plate of the clean air chamber.
Place 2 hose clips on top of the hole in the clamp plate.
Fit the jet pipe from below. Push the nozzle up through the top plate of the clean air chamber.
Loosely screw the jet pipe in place at both ends.
Once the jet pipe is in place, tighten all 4 bolts.
Adjust the solenoid so that the weld adapter is straight above the jet pipe nozzle.
Pull the rubber grommet down until it half covers the weld adapter and half covers the jet pipe nozzle.
Fit hose clip. Tighten to max. 5 Nm.



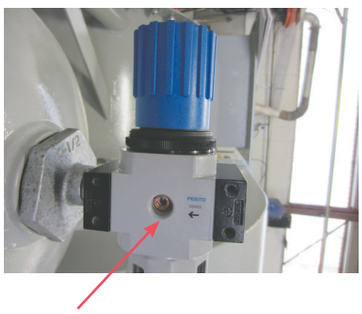


Fitting items of equipment to the air reciever

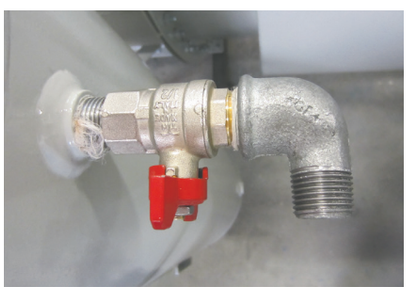
Fit nipple bushing, nipple pipe and filter regulator on the other end of the air reciever.
Remember to check flow direction to ensure correct fitting of the filter regulator.

Remove the black plastic block from the filter regulator and fit the manometer.
Remember to fit a copper washer under the manometer. The copper washer is in the plastic bag which the manometer comes in.
IMPORTANT! Before connecting the compressed air supply to the filter regulator, check that there is no dirt in the connection hoses etc.




There are two nozzles on the bottom of the air reciever. Fit a plug in one and nipple bushing, ball cock and elbow in the other.

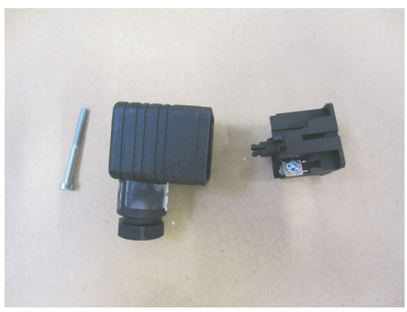
Electrical work

⚠	Electrical installation shall be performed by qualified personnel and according to the applicable law. Always use insulated grommets on all wires.

Attaching cables/solenoids

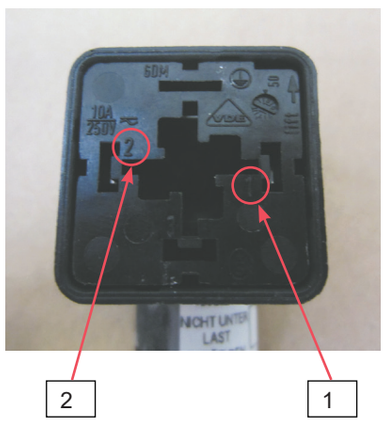
Each solenoid has 1 x cable and 1 x plug.
Remove screw from plug and remove the backing plate (use a screwdriver if necessary).

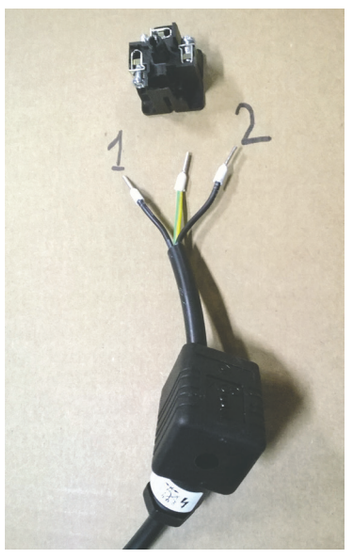




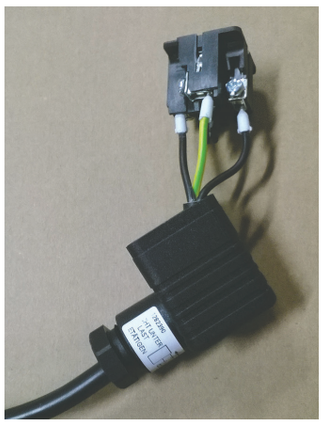
The cables have 3 wires: 2 x black marked no. 1 and no. 2 and 2 x green/yellow (earth).
Insert cable in plug.

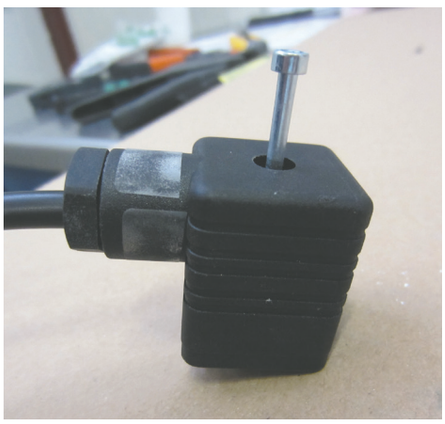
Wire no. 1 to the left. Yellow/green in the middle. Wire no. 2 to the right.
The backing plate is marked 1 and 2. Ensure that wire no. 1 is attached to screw no. 1 and wire no. 2 to screw no. 2.

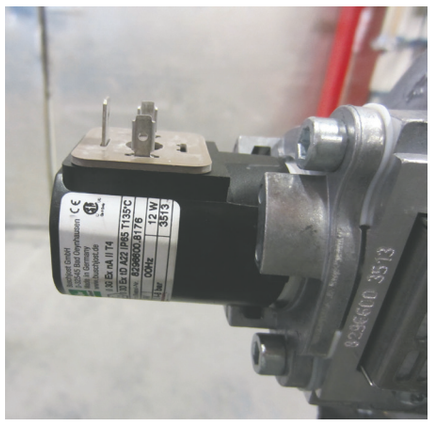




Assemble the plug and fit on the solenoid.
Remember to fit a gasket under the plug.

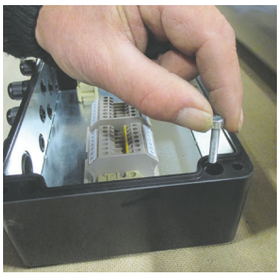






Attaching cables from solenoids in junction box

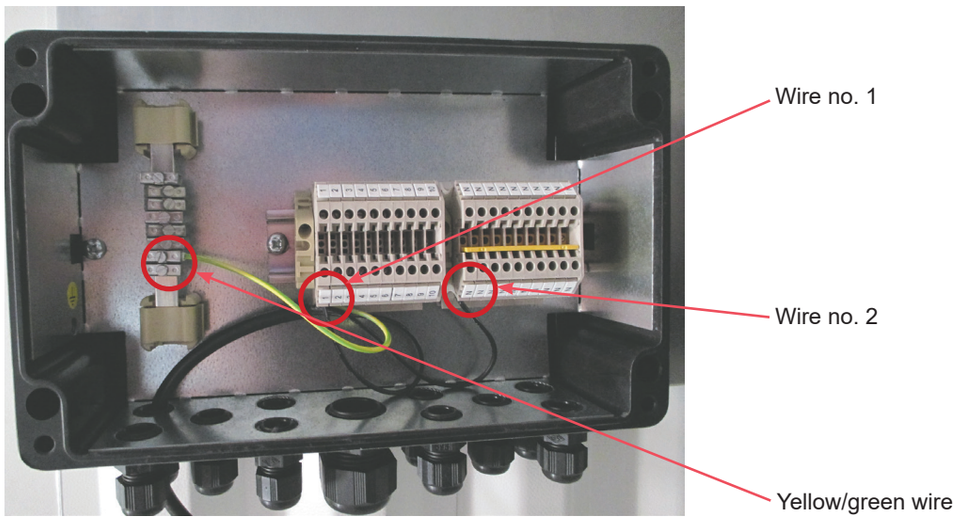
Attach the junction box to the plate on the air reciever.



⚠	Use insulated grommets on all wires.

Run wires from the solenoids into the junction box.
The cables from the solenoids have 3 wires. 2 x black marked no. 1 and no. 2. 1 green/yellow to earth.
Start with the solenoid to the far left.

Connect the wires from the solenoid mounted farthest to the left on the pipes as follows:
Wire no. 1 to no. 1 on terminal clamp. No. 1 is the solenoid, which is activated first.
Wire no. 2 to the far left terminal N on the terminal clamp.
Yellow/green to the first terminal.



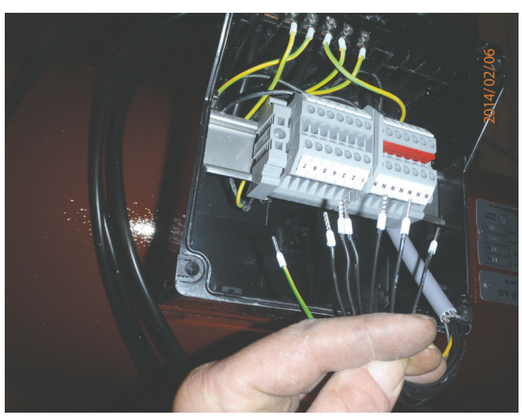
Connect the wires from the solenoid second from the left as follows:
Wire no. 1 to no. 2 on terminal clamp.
Wire no. 2 to the next outer left terminal N on the terminal clamp.
Yellow/green to the second terminal.

Continue this sequence until all wires from the solenoids are connected in the junction box.

Attaching cable for control system in junction box

This cable contains 12 wires.
11 wires are marked from no. 1 to 11.
1 yellow/green wire.

Wire no. 1 – x connected to the row numbered 1 – x (depending on how many valves there are on the air reciever).
Wire no. 11 is connected to the far left N.
Yellow/green wire connected to earth.
Cut off any surplus wire.



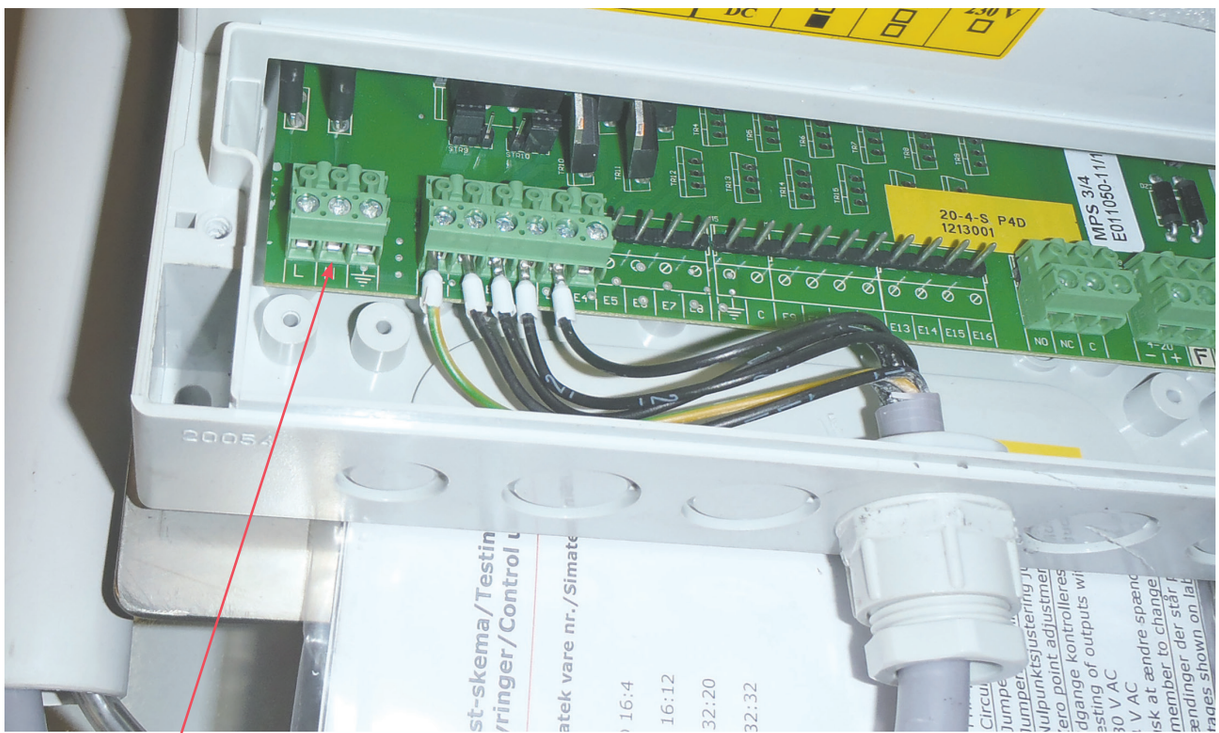
Attaching cable in control unit

⚠	Use insulated grommets on all wires.

The cable from the junction box has to be connected in the control unit.
If using GFC/GFCD control unit supplied by Simatek, connect as follows:

Connect yellow/green cable in terminal marked 

Connect wire no. 1 to clamp E1.
Connect wire no. 2 to clamp E2.
Carry on in this sequence until all wires from the solenoids are connected.
Connect wire no. 11 to clamp C.
Cut off any surplus wire.



Connect power cable here.

Potential equalisation

General guidelines for potential equalisation in dusty EX environments.

Excerpt from EN 60079-14/Ed5: Explosive atmospheres – Part 14: Electrical installations design, selection and erection:

6.4 Potential equalization

6.4.1 General

Exposed conductive parts need not be separately connected to the equipotential bonding system if they are firmly secured to and are in conductive contact with structural parts or piping which are connected to the equipotential bonding system. Extraneous conductive parts which are not part of the structure or of the electrical installation, for example frames of doors or windows, need not be connected to the equipotential bonding system, if there is no danger of voltage displacement.

The minimum size for bonding conductors for the main connection to a protective rail shall be 6 mm2 and supplementary connections shall be a minimum of 4 mm2. Consideration should also be given to using larger conductors for mechanical strength.

Description of suggested test procedure:
Check that potential equalisation of the filter, associated components and any electrically conductive parts is correct.
Measure potential equalisation of the plant using a constant current generator 200 mA. Result must read ≤ 2Ω.
Measurement points compared to assembly/site drawing.

Excerpt from EN 60204-1: Safety of Machinery - Electrical equipment of machines – Part 1: General requirements:

18.2 Verification of the conditions for protection in the event of automatic disconnection of the power supply

18.2.1 General points

The conditions for automatic disconnection of the power supply (see 6.3.3) shall be verified by testing.
The test methods for TN systems are described in 18.2.2, their use in the event of various supply scenarios is stipulated in 18.2.3.
See IEC 60364-6-61 for TT and IT systems.

18.2.2 Test methods on TN systems

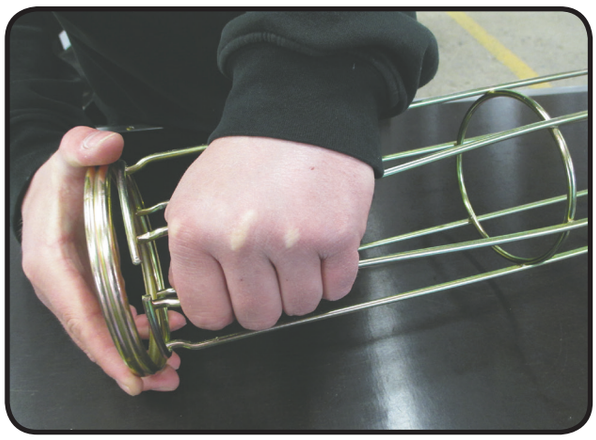
Test 1 verifies continuity in the protective equalisation circuit. Test 2 verifies the conditions for protection in the event of automatic disruption to the power supply

Test 1 Verification continuity in the protective equalisation circuit.

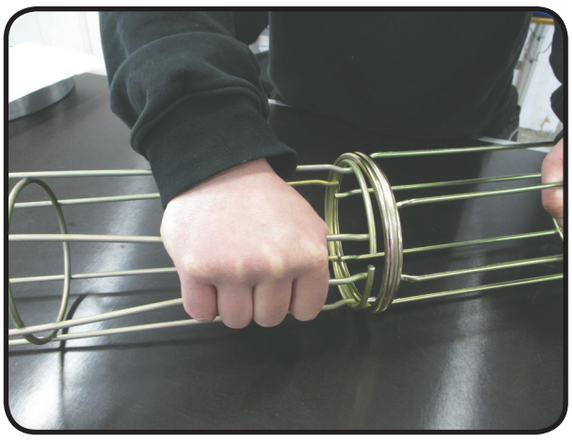
Resistance in any protective equalisation circuit between the PE clamp (see 5.2 and figure 3) and relevant points that are part of each protective equalisation circuit shall be measured using a current of between at least 0.2 A and approx. 10 A, that comes from an electrically separated supply source (e.g. SELV, see 413.1 in IEC 60064-4-41), and that has maximum standby voltage of 24 V AC or DC. The use of a PELV supply is not recommended, as such supplies can cause misleading results in this test. Measured resistance shall be within the expected range in relation to the length of, cross-section area of and the material in the equalisation strap(s) connected for protection.

NOTE 1: If higher currents are used for the continuity test, accuracy will be increased, especially for small resistance values, i.e. greater cross-section areas and/or shorter strap length.

Connecting filter cage type HR



Squeeze the wire staves at the opening of the cage together and fit the collar.



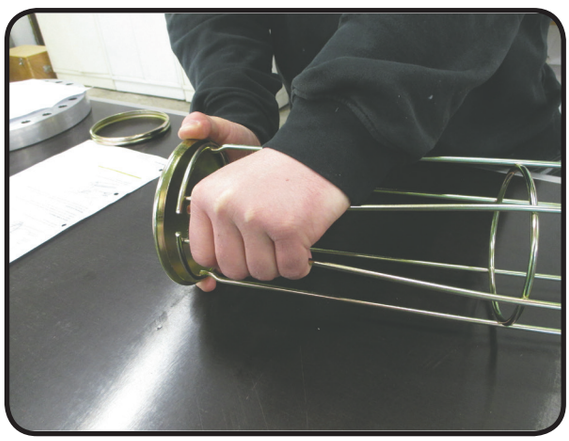
Insert the other half of the cage in the collar.

Joining split filter cages

If the filter cages are supplied in sections, join them as shown in the figures above.
Note that the upper section has two rings mounted on the top.
The extension has only one ring at either end.

Fitting the base plate

Before fitting cages in the filter, fit the base plates as shown on the right.
Correct fitting of the base on all cages is important for filter bag lifetime.

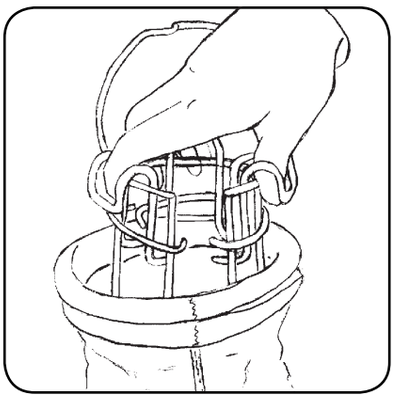


Squeeze the wire staves at the opening of the cage together and fit the base plate.

Bag change access is described in Section 5 – Service and maintenance

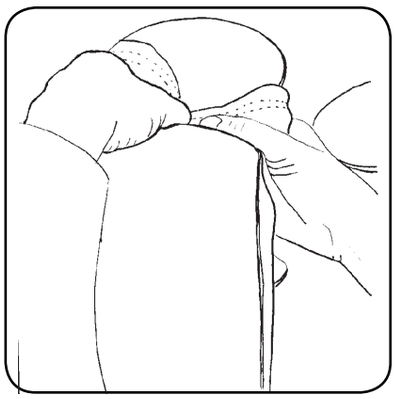
Fitting filter bags from below - cage type HR

IMPORTANT! To be able to fit the last cage and bag, the bag must be prepared by fitting it in one of the holes in the perforated plate until the collar easily slips into place by itself. This must be done before the next bag and cage are fitted. The lock arm also has to be removed from the last cage using pliers or a screwdriver.

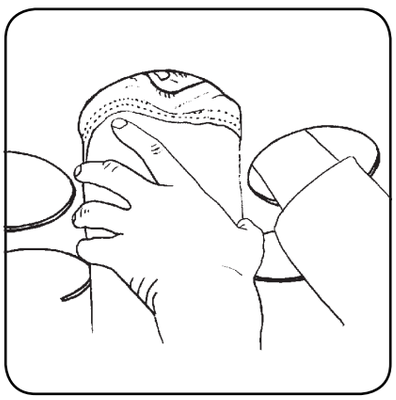


Squeeze the cage opening together to insert it into the bag.

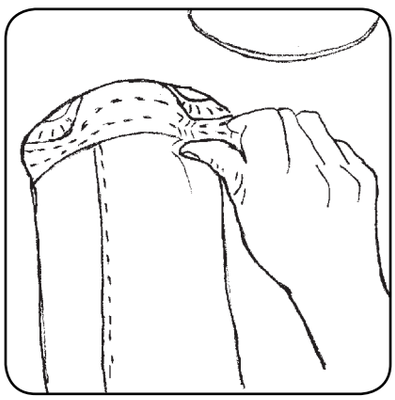
Slide the cage all the way down into the bag whilst holding the top together.



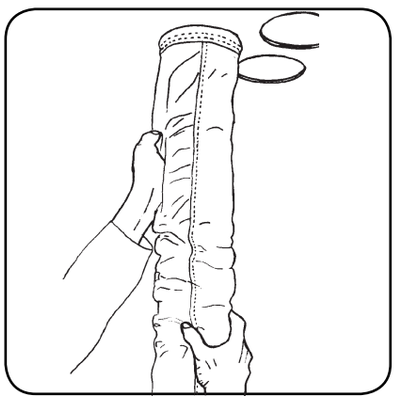
Squeeze the collar together and fit the groove around it into the hole. Press the collar hard around the dge of the hole.



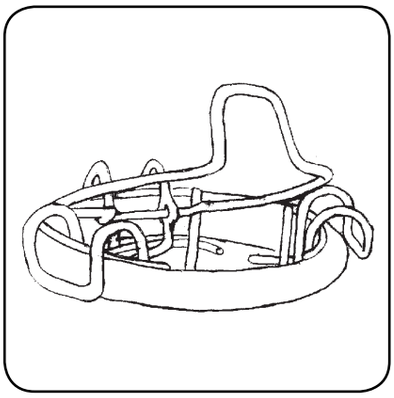
Lightly press the collar outwards until it pops into place and the bag forms a seal all the way around the edge of the hole. The easiest way to do this is to insert your hand through the neighbouring hole. (See "IMPORTANT" above, re. last bag).



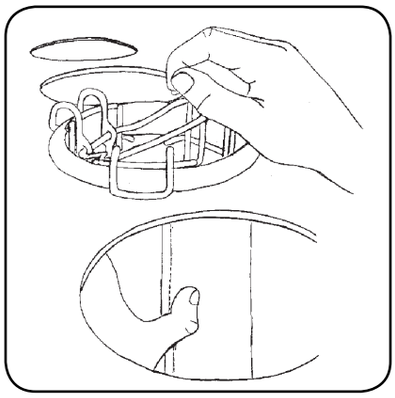
If the collar does not pop into place when pressed lightly, press it in elsewhere, and the first depression will pop out. Repeat until the ring pops into place easily.



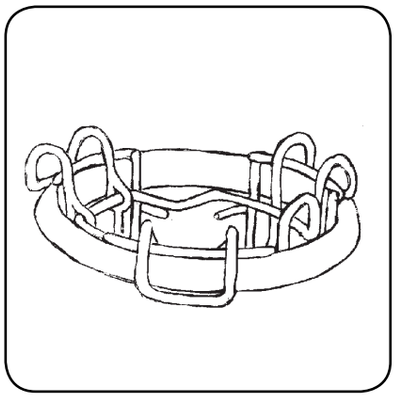
Pull the upper part of the bag downwards with one hand while pushing the cage upwards with the other.



Push the cage up until the 'feet' project above the top of the bag. Check that all feet are exposed and resting on the perforated plate.



Insert your hand through the nearest bag hole and press the lock arm into place. (See "IMPORTANT" above, re. last bag). Grip the cage below the plate and move from side to side if necessary while pressing the lock arm down.



Correctly fitted cage. All feet resting on the perforated plate and lock arm pressed fully down. Insert the last cage with no lock arm in the "prepared" bag (see "IMPORTANT" above) and fit loosely in the perforated plate.

Potential equalisation between perforated plate and cage/bag

All bags have potential equalisation tape.
When fitting cages/bags into the perforated plate, the tape ensures that there is an earth connection.