Original Manual

Air blast assembly

BM - 18/40/60/100/140/200 - EXC /VRFTHPc3s

Manufacturer:	Official distributor:
gritco Klompenmakerstraat 16d NL-2984 BB Ridderkerk the Netherlands Tel: +31-(0)180-412855 Fax: +31-(0)180-418218 E-mail: info@gritco.com URL: http://www.gritco.com	

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1. PREFACE

This manual is to be read by the operator(s) and maintenance people. Both should have knowledge and skills considering blasting systems.

Failure to properly use of this machine could result in severe injuries or death.
Read this manual first before operating the machine.

Keep this manual in a safe place for future reference and spare part orders.

2. SAFETY INSTRUCTION

Always respect local regulations regarding installation and use of the machine.

Used blast media should be disposed according the local regulations

Be aware that blasting activities can result in static electricity and/or sparks.
Consult local authorities or your supplier for suitable measures too avoid any risks!

The use of the machines is only allowed with:

- suitable non-bleeding positive deadman handle or remote control system
- suitable blast hose and blast hose couplings
- suitable nozzle

Contact your supplier or the manufacturer for detailed info.

Only use original parts for maintenance and repair.

Only use accepted blasting media. Never use blast media containing free silica!

Never direct the installed blasthose and nozzle towards yourself or others.

Never perform any maintenance or disconnect hoses when the machine is in use.

The sound level is determined by blasting pressure, nozzle orifice and (amount of) blasting media. The sound level at the nozzle can be between 100 - 125 dB. The sound level at the operator and the machine itself will be lower.

Furnish the operator(s) with approved:
- helmet or mask,
- respiratory equipment,
- protective clothing,
- safety shoes or boots,
- gloves,
- ear protection

Also warn and/or protect people nearby the blasting process with the above items.

3. INTRODUCTION / DATA

This machine is for surface treatment purposes like: cleaning, paint and/or rust removal, surface roughening, surface embellishing etc.
This is done by directing blasting media with compressed air through a hose and nozzle onto the surface. The impact of the blast media onto the surface results in physically removing dirt or paint or the distortion of the surface.

Dimensions (mm): (*l x w x h*)	model 18:	560 x 460 x 790	model 100: 800 x 700 x 1130
	model 40:	570 x 560 x 920	model 140: 870 x 840 x 1250
	model 60:	700 x 510 x 1060	model 200: 870 x 840 x 1440
Vessel contents:	model 18:	18 litres	model 100: 100 litres
	model 40:	40 litres	model 140: 140 litres
	model 60:	60 litres	model 200: 200 litres
Weight:	model 18:	45 kg	model 100: 110 kg
	model 40:	55 kg	model 140: 150 kg
	model 60:	80 kg	model 200: 170 kg

For all models:

Maximum system pressure:	**10 bar**
Minimum system pressure:	5 bar
Maximum compressed air temperature:	50 °C
Minimum compressed air temperature:	5 °C
Maximum ambient temperature:	50 °C
Minimum ambient temperature:	5 °C

beware that the used compressor does not exceed this value!

Maximum pressure changes						
ΔP bar	18 litre	40 litre	60 litre	100 litre	140 litre	200 litre
0 – 6 – 0	790.500	707.330	489.310	211.510	298.410	298.410
0 – 8 – 0	391.100	365.230	206.290	89.274	143.200	143.200
0 – 10 – 0	226.500	215.410	105.750	45.723	75.043	75.043

Coupling connections:	Compressed air:	Claw coupling acc. DIN 3481/3489
	Remote control hose:	Quick coupling acc. DN 7,2 / DN 5
	Blast hose:	European standard

Make sure the compressor has the right capacity to 'feed' the chosen nozzle and wanted blasting pressure.
The compressed air consumption of the machine is determined by the blasting pressure and the used nozzle orifice diameter:

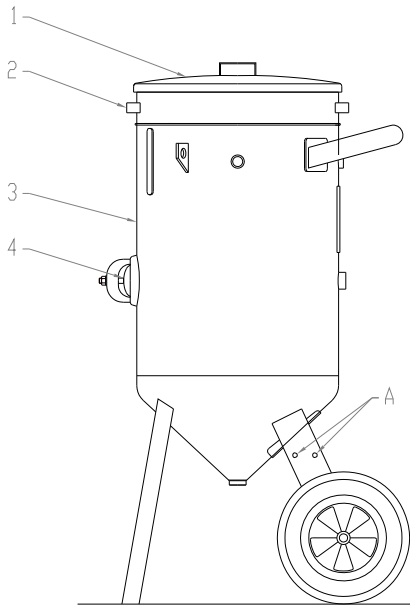
Compressed air consumption in m³/minute									
Diameter	Blasting pressure in bar								
mm	2	3	4	5	6	7	8	9	10
3	0,08	0,25	0,33	0,42	0,50	0,58	0,66	0,75	0,83
4	0,30	0,44	0,59	0,74	0,89	1,03	1,18	1,33	1,48
5	0,46	0,69	0,92	1,15	1,38	1,62	1,85	2,08	2,31
6	0,66	1,00	1,33	1,66	1,99	2,33	2,66	2,99	3,32
7	0,90	1,36	1,81	2,26	2,71	3,17	3,62	4,07	4,52
8	1,18	1,77	2,36	2,95	3,55	4,14	4,73	5,32	5,91
9	1,50	2,24	2,99	3,74	4,49	5,23	5,98	6,73	7,48
10	1,85	2,77	3,69	4,62	5,54	6,46	7,39	8,31	9,23
11	2,23	3,35	4,47	5,59	6,70	7,82	8,94	10,05	11,17
12	2,66	3,99	5,32	6,65	7,98	9,31	10,64	11,96	13,29
13	3,12	4,68	6,24	7,80	9,36	10,92	12,48	14,04	15,60

For data on other nozzles or pressures please contact your supplier or the manufacturer.

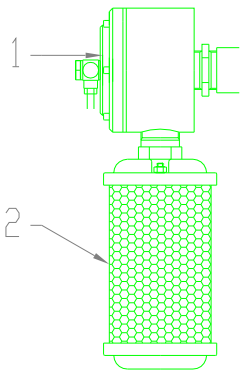
Theory:
The pot of the machine is filled with blasting media and then pressurised. When the machine is started an air flow with the same pressure starts flowing underneath the pot through the blast hose to the nozzle Because pot pressure and transportation air pressure are the same, the blasting media can fall freely inside the transportation air and is directed onto the surface.

4. DESCRIPTION

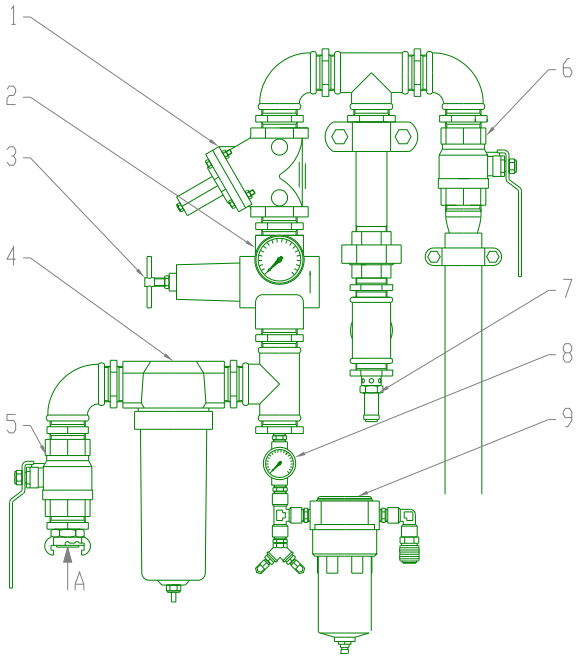
Overview of the machine:



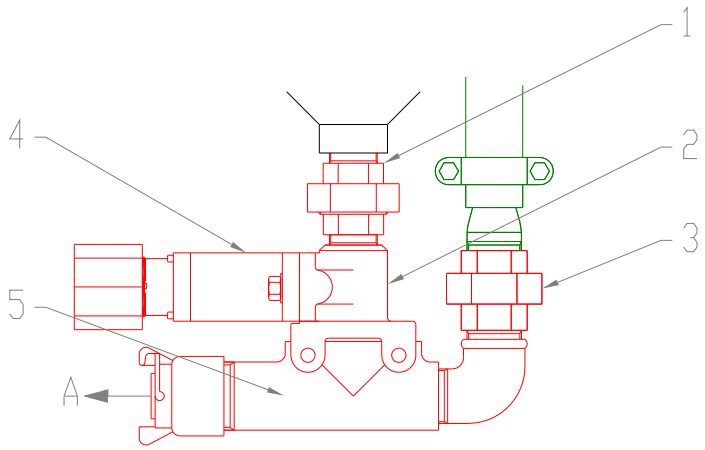
#	Item description	Function
01	Cover (option)	Avoids foreign objects entering the pot.
02	Sieve (option)	Avoids too big particles entering the pot.
03	Vessel	Contains the blast media
04	Inspection hatch	To check the inside of the pot for maintenance purposes.
A	Quick couplings	Connects the machine to the control hoses



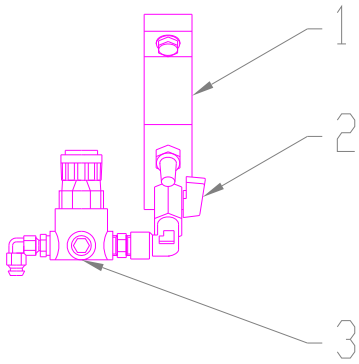
#	Item description	Function
01	Decompression valve	Depressurises the tank (filling, stopping).
02	Silencer	Silences the decompression of the tank.



#	Item description	Function
01	Main air valve	Controlled by the control system to start and stop blasting. Pressurising the vessel and start/stop of transportation air flow.
02	Pressure gauge (option R)	Indicates the set pressure by the pressure reducer.
03	Pressure reducer (option R)	To set the wanted blasting pressure.
04	Compressed air filter (option F)	Takes out last bits of dirt and moisture from the compressed air.
05	System ball valve	Pressurises the machine.
06	Choke valve	Shuts of transportation air (no blasting pressure) for ‘pushing’ small blockages through the abrasive metering valve.
07	Safety valve	Avoids a too high pressure of the tank (10 bar)
08	Gauge system pressure	Indicates the system pressure (from compressor).
09	Helmet air filter (option H)	Removes the oil odour from the compressed air.
A	Claw coupling	Connects the machine to the compressed air line.

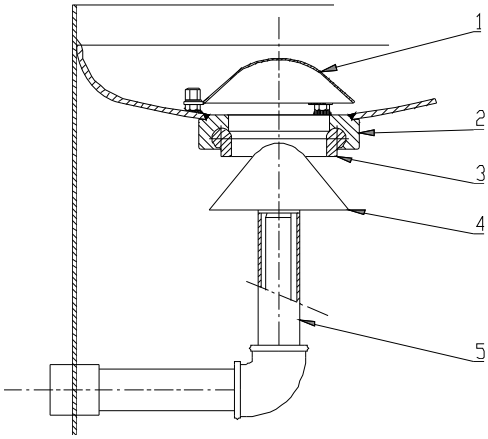


#	Item description	Function
01	Coupling	To release the metering valve from the machine's vessel.
02	Housing	Connects vessel, metering valve and mixing tube together
03	Media metering valve PU 12	Opens and closes by signal of the deadman handle or controlsystem to start and stop the flow of abrasive from the pot. Also to set the amount of media.
04	Coupling	To release the metering valve from the machine's piping.
05	Mixing tube	Where abrasive and transportation air are mixed.
A	Blast hose coupling	Connects the machine to the blast hose of the hose package.



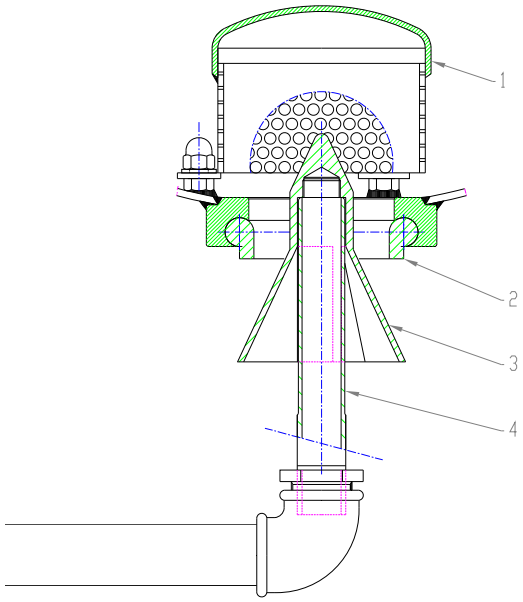
#	Item description	Function
01	Ball vibrator (option T)	Keeps the abrasive in motion for better flow (especially with very fine angular and/or hygroscopic material.
02	Pressure reducer (option T)	Sets the maximum pressure of the ball vibrator
03	Ball valve (option T)	To start/stop an regulate the ball vibrator

Inside the pot:



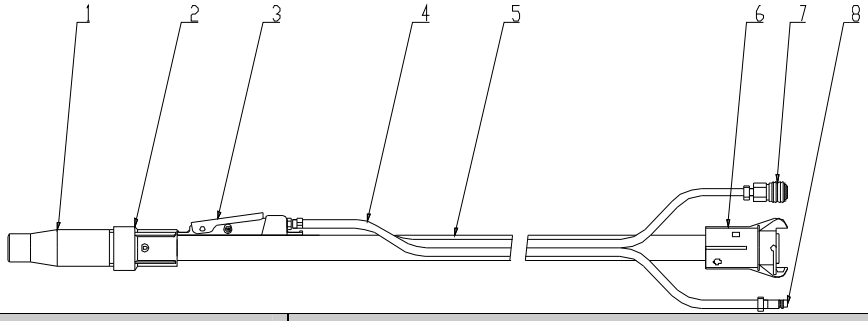
#	Item description	Function
1	Pop-up protection cover	Avoids foreign objects to get stuck between pop-up and pop-up ring.
2	Flange	Holds the pop-up ring.
3	Pop-up ring	Closes the pot together with the pop-up.
4	Pop-up	Comes up and closes the pot together with the pop-up ring.
5	Guidance pipe	Guides the pop-up up to the pop-up ring through the compressed air flow and then fills the pot with this compressed air.

Inside the pot option “V”



#	Item description	Function
1	Pop-up hood	Leafs enough space for the pop-up to come up when the blastpot is placed under a silo.
2	Pop-up ring	Closes the pot together with the pop-up.
3	Pop-up	Comes up and closes the pot together with the pop-up ring.
4	Guidance pipe	Guides the pop-up up to the pop-up ring through the compressed air flow and then fills the pot with this compressed air.

Example of recommended hose package with deadman handle and nozzle (not included):



#	Item description	Function
1	Blast nozzle	Directs the media onto the surface.
2	Nozzle holder	Connects the nozzle to the blast hose.
3	Deadman handle	Controls the operation of the machine (start and stop). Opening / closing of main air valve and metering valve.
4	(Remote) control hose	Directs the control/signal air between machine - deadman handle - machine
5	Blast hose	Directs the media and transportation air flow to the nozzle
6	Blast hose coupling	Connects the blast hose to the machine.
7	Quick coupling	Connects the control hose to the machine (signal from machine)
8	Insert nipple	Connects the control hose to the machine (signal to machine)

5. INSTALLING

Use the drawings from chapter 4 when reading these instructions.

The machine should be installed according local regulations. Local legislation might oblige to have the installation approved by a notified body before first use.

Make sure the machine is installed on a straight and steady surface.
Take the machine's weight for account but also that of the blasting media and operator.
Make sure the machine cannot move during operation.

Don't expose the machine to water and/or moist because this makes the blasting media clog making it impossible to work with the machine.

For problem free operation of the machine, dry and clean compressed air is required.
An after cooler with separator (and filters) is necessary. In a fixed execution this can be extended with a dryer and air receiver.

Connect a compressed air hose to the machine. Consult your supplier for the right size.
Make sure the compressor's pressure does not exceed 10 bar!

Connect the blast hose from to the machine.

Connect the control hoses from an approved deadman handle or remote control system to the machine.

Make sure that all hoses are in good condition and secured in their respective couplings.
Refrain from unnecessary curves of the hoses and tension on the machine.
The blast hose should be laid out in a straight line or big radius curves to avoid quick wear.

6. OPERATION

Before operating the machine the first time follow all points of this chapter but without the use of blasting media.
Use the drawings from chapter 4 when reading these instructions.

Fill the machine with dry and clean blasting media.

Optional: Use the sieve when filling and put on the cover before start up

Make sure nothing unusual is situated between the pop-up and the closing ring.

Make sure the system ball valve is closed.

Pressurise the machine by starting the compressor or opening the ball valve between the compressor and the machine.

Now open the system ball valve. The system pressure is indicated on the gauge.
This pressure will be on/about the blasting pressure.

Optional: Set the wanted blasting pressure with the pressure reducer. Turning clockwise will increase the pressure, turning it anti-clockwise will decrease the pressure. The set pressure can read of the gauge. Minimum blasting pressure is about 1,5 bar.

Optional: Start the ball vibrator by completely opening the ball valve. Then slowly close it until a soft vibrating is reached. *Do not change the setting of the ball vibrator's pressure reducer.*

The machine is now stand-by for operation.

Firmly hold or fix the end of the installed blast hose and direct the nozzle on the to be treated surface.

Start the machine with the installed deadman handle or the remote control system.

The main air valve is opened and the decompression valve is closed.

Compressed air flows to the pop-up valve. The pop-up will close the pot.
Pressure builds up in the pot.

The compressed air also flows to the blast hose and nozzle (transportation air).

The metering valve is opened as well, so the blasting media can fall into the transportation air and is carried along.

Metering the amount of blast media:
Setting the amount of metering can best be done with two people. One holding the hose package and nozzle, the other operating the abrasive metering valve.
Start with the metering valve completely closed. Slowly open by turning the knob anti-clockwise. Stop opening the valve when a constant and regular flow of abrasive out of the installed nozzle is created.

Too much media will lead to an irregular flow and will not increase the production!

Keep the installed nozzle at an angle and distance so the biggest area is covered and still cleaned sufficiently. Move the nozzle in the direction in which it is pointed and work towards the ‘dirty’ area.

Stop blasting with the deadman handle or the remote control system.

The control air signal to the machine will decompress and main air valve and media metering valve will close (assisted by their springs) and the decompression valve will open.
Hold the installed hose package firmly until all air has released the blast hose.

The pot will decompress and the pop-up falls down.

Refilling
The machine can now be refilled

Blasting activities can be restarted with the deadman handle or the remote control system.
The amount of media does not have to be set again.

Stopping
The blasted objects can be blown off with air only. Close the media metering valve with the red handle of the optional PL36 or by closing the ball valve of the optional “third signal” on the machine or installed hose package.
Resume the blasting activities. Because the signal air to the media metering valve is now shut off, it will not open. Only air comes out of the nozzle so the blasted objects can be air washed.

To stop working shut off the compressor or close the ball valve in the supply line.
If the machine has to be transported or the airline disconnected make sure the machine and the air supply line are being depressurised.
Wait until all air has been released and the system pressure gauge indicates “0” before disconnecting any of the hoses!

Emergency stop:

In case of an emergency close the system ball valve. Blasting activities will stop and the pot will depressurize.

7. TRANSPORT AND STORAGE

Store the machine empty.

Store the machine in a dry place.

Only transport when the machine is empty.

Never move the machine when it’s in use.

Never move the machine with attached any hoses.

Always lift or transport the machine with the wheels facing downwards.

The machine can be lifted at the handle bar. If the machine is executed with lifting brackets these must be used.

The machine can be transported by putting one foot on the axle and tilting the machine with the handlebar onto the two wheels.
Do not tilt the machine too far to avoid a sudden extra load for the mover.
Place one foot on the axle and put back the machine gently on front leg and wheels.

8. MAINTENANCE CHECKLIST

Before performing the next points, always depressurise the machine and air supply line first and keep the system ball valve closed. Use chapter 10 for executing repair / maintenance.

Check before every use the machine on damage.

Check before every us the condition and function of the installed deadman handle or remote control system.

Check after every use the silencer of the decompression valve and clean it.

Check every 50 hours the wear of the membrane of the decompression valve.

Check every 100 hours the quality of the couplings and their gaskets.

Check every 500 hours the main air valve.

Clean all parts of the media metering valve every 750 hours.

Check all parts of the optional pressure reducer every 750 hours.

Check and clean all parts of the optional compressed air filter every 750 hours.

Replace the filter cartridge of the option helmet air filter every 1500 hours.

The next points should be checked when the machine is pressurised and in operation by some else than the operator. Wear approved protective items

Check every 250 hours the functioning of the pressure gauge(s).

Check every 250 hours the machine for leakages.

Check every 250 hours the closing of the pot at the pop-up and pop-up ring.

The machine should be periodically checked according local regulations.

9. TROUBLESHOOTING

The machine doesn’t react when starting up.

- There is no signal to the machine.
  - Check the installed remote control system.

- The main air valve doesn’t function.
  - Check the membrane and replace it if necessary.

- The membrane of the decompression valve has worn out.
  - Check the membrane and replace it if necessary.

The machine decompresses slower then before.

- The silencer is dirty.
  - Remove the silencer and clean or replace.

The machine keeps on blasting after stopping with the installed remote control system.

- The membrane of the decompression valve has a hole in it (wear).
  - Replace the membrane.

- The main air valve doesn’t close.
  - The valve disc, O-ring or spring of the main air valve are worn out / broken.
    - Check and replace if necessary.
  - Something is blocking the closing of the valve.
    - Check and clean the inlet and outlet side.

- The signal to the machine is not decompressed.
  - Check the couplings and hose of the remote control systems.

Problems with setting the right pressure of the optional pressure reducer or air keeps leaking from the reducer.

- The reducer is probably dirty.
  - Clean the interior.

The pressure keeps on dropping during blasting.

- The capacity of the compressor is too small.
  - Set a lower a pressure with the optional pressure reducer or use a smaller nozzle and check if this is possible.

The automatic drain of the optional compressed air filter doesn't function well

- There's probably a blockage.
  - Clean the bowl and drain.

Not enough abrasive flows out of the nozzle or nothing at all.

- No signal to the abrasive metering valve.
  - Check the installed remote control system.
  - Check if the optional "3rd signal" on the hose package is opened.
  - If the compressor's capacity is too small for the chosen blastpressure/nozzle the system pressure will drop. Check if during blasting the system pressure gauge remains above 5 bar. This is the minimum pressure required to open the metering valve against the spring's tension.
- The abrasive metering valve doesn't open.
  - Check the parts of the valve on damages / wear.
- There is a blockage.
  - Close and open the choke valve 3-4 times quickly during blasting. The pot will be in a 'over-pressure' and small blockages will be pumped through the orifice of the media metering valve.
- There is a blockage too big to be pumped through.
  - Open the metering valve completely by turning the knob anti clockwise. When the blockage is gone put the valve back to its former setting.
- There is a big blockage in the mixing tube of the metering valve.
  - Take off mixing tube and check whether it's dirty.
- There is a big blockage at the bottom of the pot.
  - Remove the metering valve and clean the outlet at the bottom.

If clean abrasive is refilled and no blockage found it is still possible that the abrasive flow is irregular or doesn't come at all. This is pointing at an over-pressure of the transportation air that is caused by leakage at the pot of the machine.
First check if the decompression valve is completely closed. This is best done by a second person. Remove the silencer and check if no air come out during blasting. Wear protective items! If air comes out check the valve and the membrane.
If this is OK check the following connections very carefully with soap-suds, when the machine is working.
1. Pop-up ring - pop-up.
2. Pot - abrasive metering housing.
3. Pot - decompression valve.
4. The piping to the guiding pipe.
5. The gasket of the inspection hatch.
6. Diaphragm of the decompression valve.

If after following these points problems still occur, please contact your supplier or the manufacturer.

10. EXECUTING REPAIRS / MAINTENANCE

Before performing next points, always depressurise the machine and air supply line first and keep the system ball valve closed.

To make the repairs / maintenance easier it is recommended to take the parts from the vessel so they can be put in a vice.
To remove the media metering valve assembly the couplings both have to be loosened.
The piping of the blastpot can be removed by loosening the coupling as well as the two bolts of the clamp.
The coloured control hoses can be taken out of their couplings by first pressing the hose towards the coupling, then hold the black ring of the coupling and pull out the hose.

It is advised to use the required drawings from chapter 12 when executing following repairs / maintenance.

Main air valve AP 100/112
Replace / check the membrane:

- Remove the four bolts and nuts of the cap.
- Loosen the nut on the shaft. Hold the shaft with a screwdriver.
- Remove the membrane together with the upper and lower membrane plate.
- Take the two plates from each other and place a new membrane.
- When putting everything back make sure the spring is situated over the nut.

Replace the valve disc and/or O-ring:

- Remove the cap and membrane as above
- The retainer bushing is visible now.
- With a screwdriver and hammer the bushing can be loosened
- Remove the retainer bushing.
- Shaft and valve disc can be taken out. Replace the valve disc and/or O-ring.
- When putting everything back make sure the spring is situated over the nut.

Special tools can be ordered to ease the loosening of the bushing. Contact your supplier or the manufacturer.

Decompression valve PM35/PU 34
Replace the membrane and/or rubber wear disc:

- Remove the six internal wrenching bolts of the cover.
- Replace the diaphragm and or rubber wear disc
- Place the cover back with the six bolts.

Abrasive metering valve PU 12

Replacing the cone with rubber:

- Remove the two M12 bolts.
- Take the metering valve out the housing (PU 16 DR).
- The cone can now be screwed off the piston rod and be replaced.
- Place everything back, and mind the positioning and O-ring.

Checking the parts.

- Take out the metering valve and remove the cone as above
- Screw the positioner out of the rear cover.
- Now take out the four internal wrenching bolts.
- The piston and piston rod can be taken out of cylinder housing.
- Check the O-ring, scrapers and groove rings and replace them if necessary.
- Place everything back in reverse order.

Optional pressure regulator

- Remove both hoods / caps with a wrench.
- The internal parts can be taken out and cleaned.
- Oil all parts lightly and place them back
- Put back the hoods / caps and tighten them gently with a wrench.

Optional compressed air filter

- Remove the bowl by removing the collar (turn it anti-clockwise)
- Remove the nut on the outside of the bowl.
- The automatic drain can now be removed and cleaned.
- Clean the bowl.
- Remove the filter element by turning the buffer plate anti-clockwise
- Clean the element thoroughly with some warm water. Let dry before you place it back.
- Replace the bowl, drain and element.

Optional helmet air filter

- Remove the bowl by turning it anti-clockwise
- Clean the bowl.
- Remove the filter cartridge by turning it anti-clockwise
- Replace a new cartridge.
- Replace the bowl.

11. STOCK

It’s recommended to take the following spares in stock:

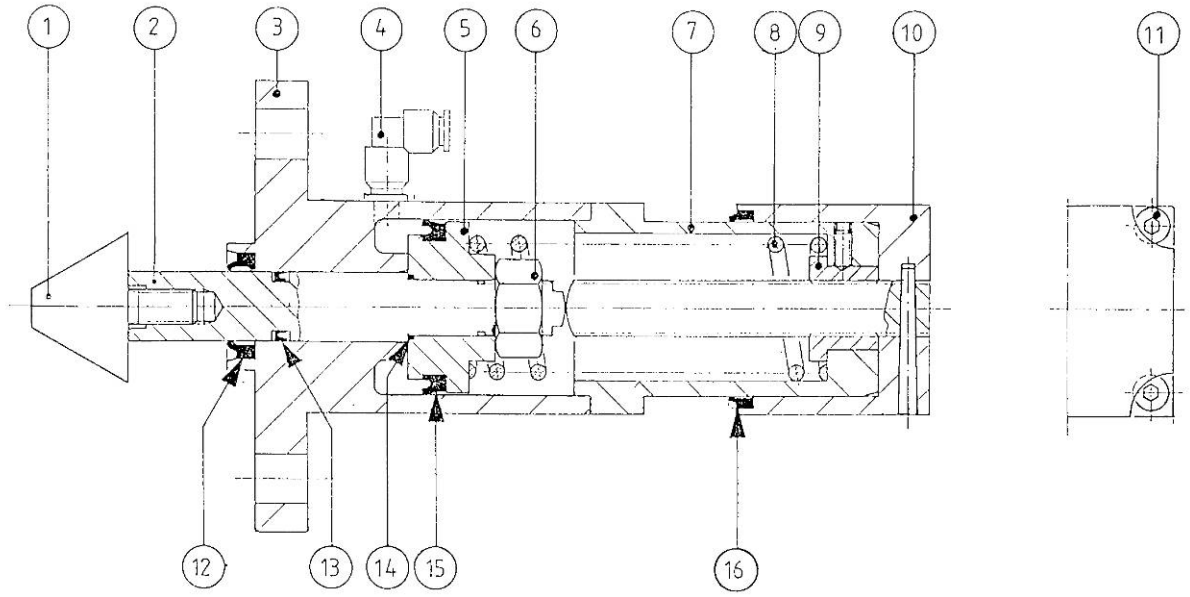
- Membrane and rubber wear disc for the decompression valve
- Silencer of the decompression valve
- Repair kit for the main air valve
- Pop-up ring
- Repair kit of media metering valve

12. DRAWINGS

On the next pages you’ll find the drawings of items of the machine and their various (spare) parts. Please use these drawings during maintenance and repair work.

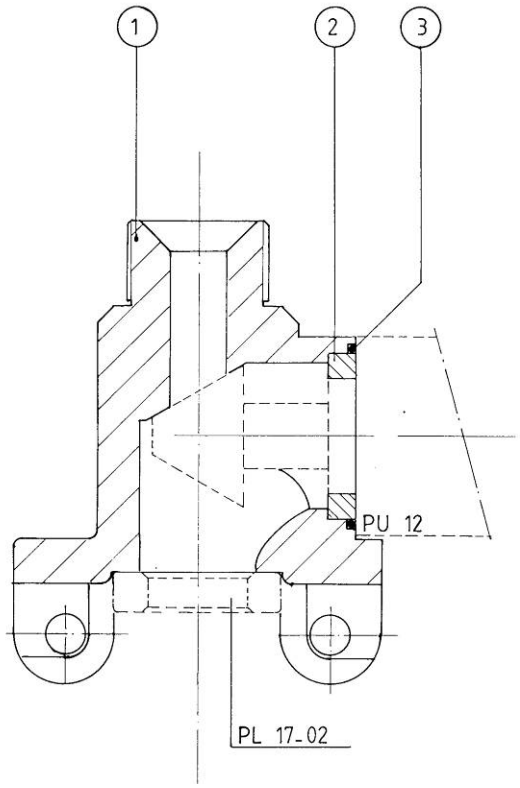
Use the mentioned article numbers for spare part orders or state the type and/or description of the item.

PU12	**Abrasive metering valve PU 12**	**21201200**
01) PU 16-03	Cone with rubber	21201603
02) PL 12-08	Piston rod	21101208
03) PL 12-09	Cylinder housing	- - - - - - - -
04) Kiki 1/8-6	Plug-in coupling	17830678
05) PL 12-19	Piston	21101219
06) M12	Nut	- - - - - - - -
07) PL 12-02	Rear cover	- - - - - - - -
08) PL 12-01	Spring	21101201
09)	Bushing, threaded	- - - - - - - -
10) PL 12-16	Positioner	- - - - - - - -
11) M6 x 25	Internal wrenching bolt	- - - - - - - -
12) PL 12-13	Scraper	21101213
13) PL 12-12	Groove ring	21101212
14) PL 12-21	O-ring	21101221
15) PL 12-20	Groove ring	21101220
16) PL 12-14	Scraper	21101214



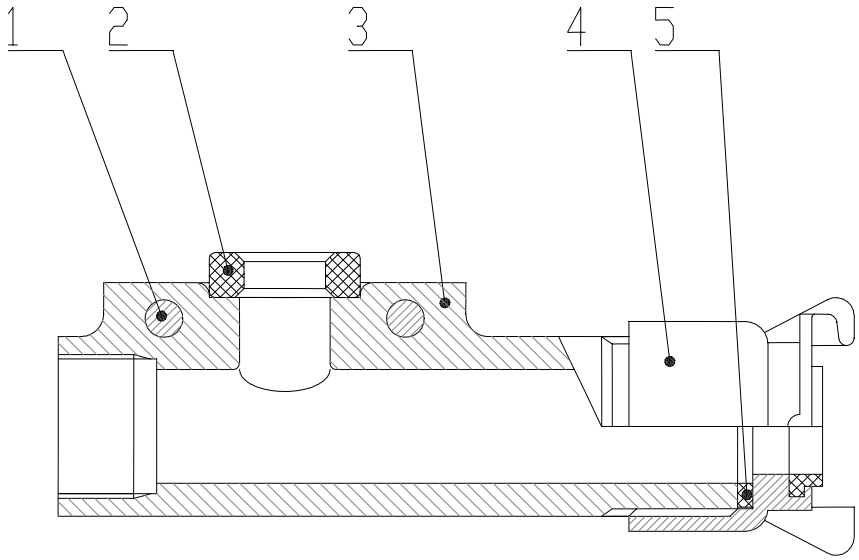
Abrasive housing PU 16-01 (G)

01) PU 16-01-DR	Housing with thread for PU 12	21201601(G)
02) PU 16-02	Positioning ring	21201602
03) PU 16-04	O-ring	21201604

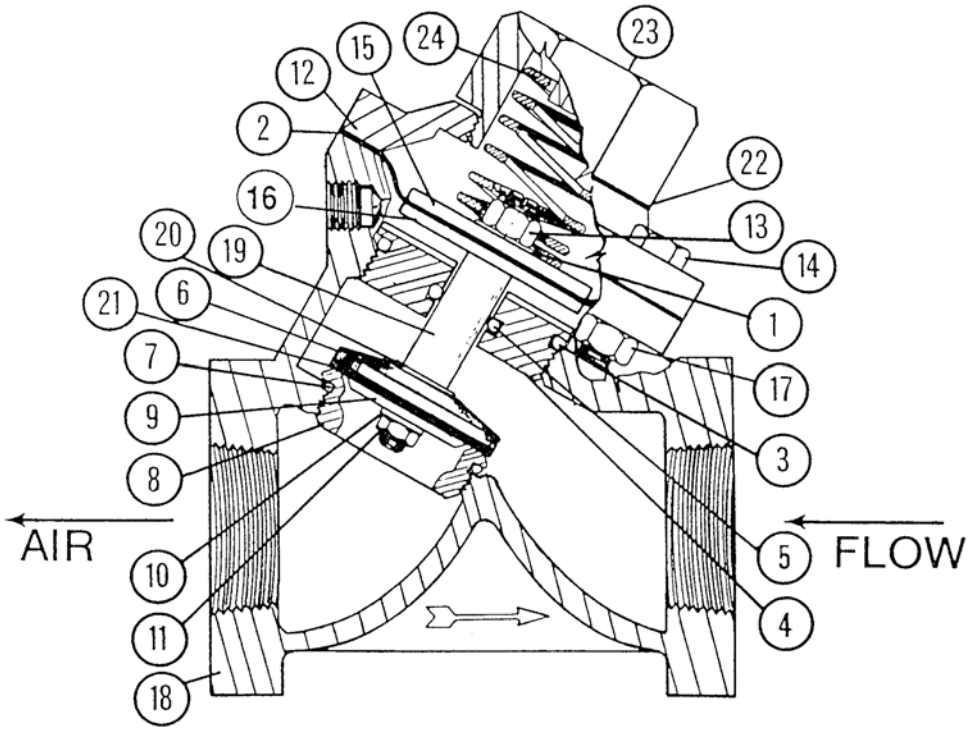


Mixing tube assembly PU 17-01-DR

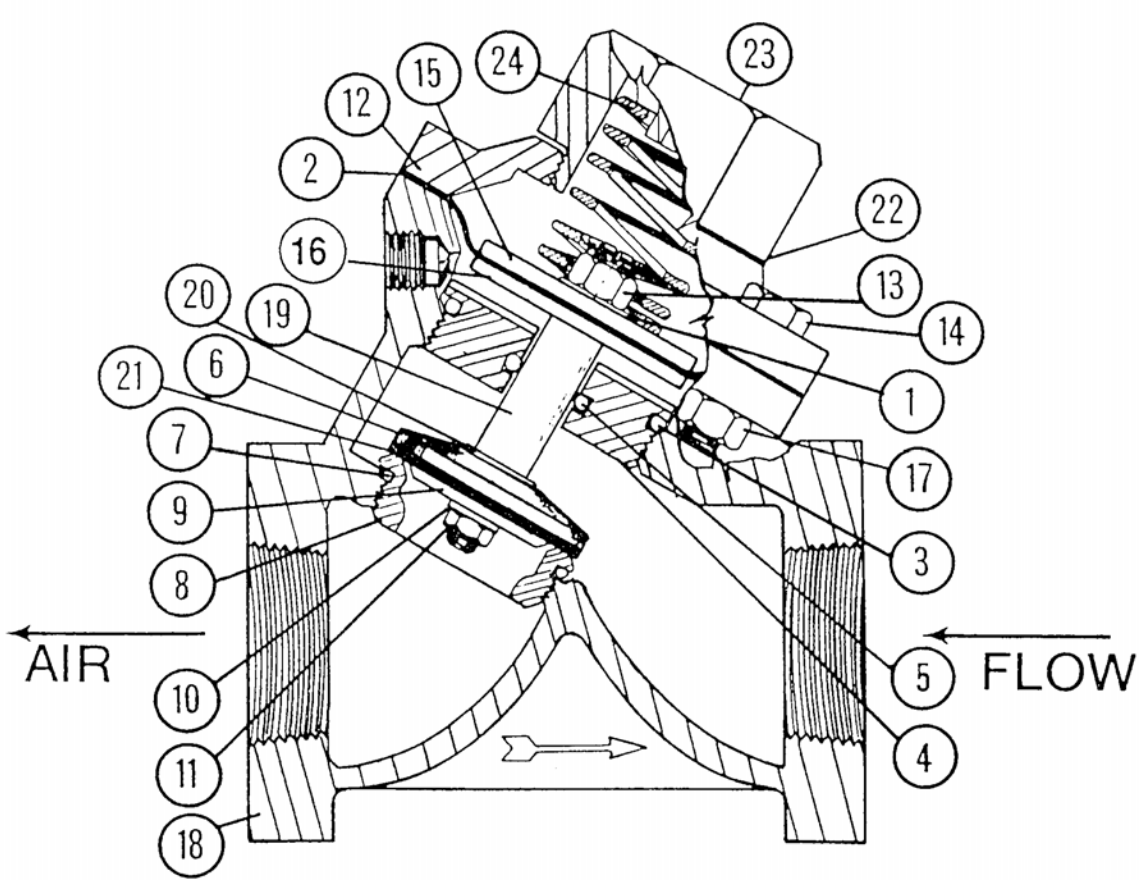
01) PL 17-03	Lock pin	21101703
02) PL 17-02	Closing ring	21101702
03) PU 17-01-DR	Mixing tube, 2 x thread	21201701DR
04) PU 17-04	Blasthose coupling, 2”	21201704
05) PU 17-05	Rubber closingring	21201705



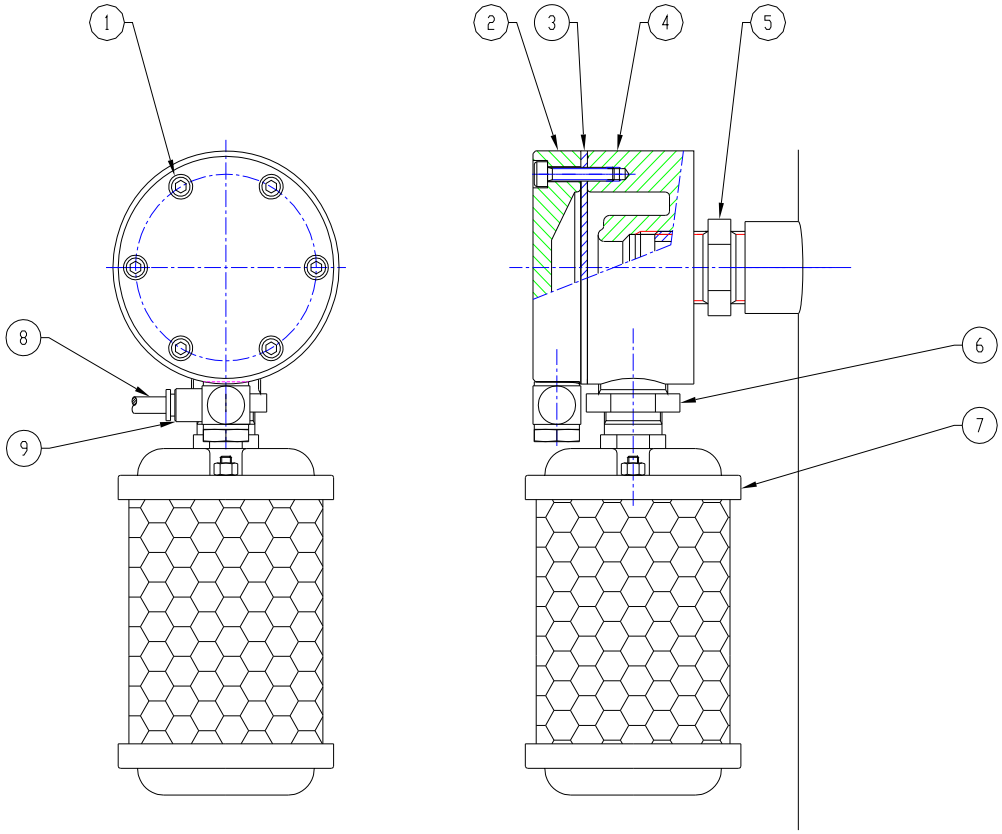
AP 100	**Main air valve, 1˝- 1˝ (18/40 liter)**	**21100000**
01) AP 100-01#	Packing	- - - - - - - -
02) AP 100-02#	Membrane	21100002
03) AP 100-03#	O-ring	- - - - - - - -
04) AP 100-04+	Retainer bushing	- - - - - - - -
05) AP 100-05#	O-ring	- - - - - - - -
06) AP 100-06+	Disc retainer	- - - - - - - -
07) AP 100-07#	O-ring	- - - - - - - -
08) AP 100-08	Seat	- - - - - - - -
09) AP 100-09+	Disc plate	- - - - - - - -
10) AP 100-10#	Lock washer	- - - - - - - -
11) AP 100-11#	Lock nut	- - - - - - - -
12) AP 100-12	Cap	- - - - - - - -
13) AP 100-13#	Lock nut	- - - - - - - -
14) AP 100-14	Bolt	- - - - - - - -
15) AP 100-15+	Upper membrane plate	- - - - - - - -
16) AP 100-16+	Lower membrane plate	- - - - - - - -
17) AP 100-17	Nut	- - - - - - - -
18) AP 100-18	Body	- - - - - - - -
19) AP 100-19+	Shaft	- - - - - - - -
20) AP 100-20#	Packing	- - - - - - - -
21) AP 100-21#	Valve disc	- - - - - - - -
22) AP 100-22	Packing	- - - - - - - -
23) AP 100-23	Spring retainer	- - - - - - - -
24) AP 100-24	Spring	- - - - - - - -
KIT 421-RA	Spares kit containing all # marked items	21230021
KIT 421-RF	Spares kit containing all + marked items	21230020



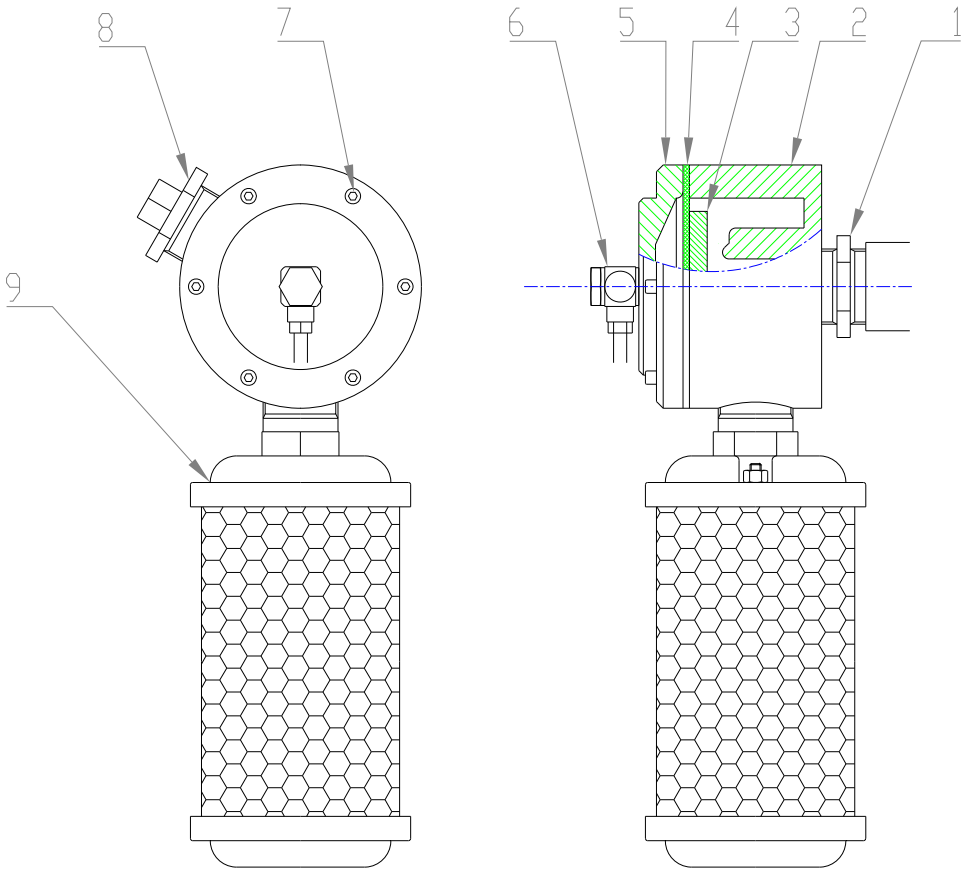
AP 112	**Main air valve, 1½˝-1½˝ (60- 200 liter)**	**21230000**
01) AP 112-01#	Packing	- - - - - - - -
02) AP 112-02#	Membrane	21230002
03) AP 112-03#	O-ring	- - - - - - - -
04) AP 112-04+	Retainer bushing	- - - - - - - -
05) AP 112-05#	O-ring	- - - - - - - -
06) AP 112-06+	Disc retainer	- - - - - - - -
07) AP 112-07#	O-ring	- - - - - - - -
08) AP 112-08	Seat	- - - - - - - -
09) AP 112-09+	Disc plate	- - - - - - - -
10) AP 112-10#	Lock washer	- - - - - - - -
11) AP 112-11#	Lock nut	- - - - - - - -
12) AP 112-12	Cap	- - - - - - - -
13) AP 112-13#	Lock nut	- - - - - - - -
14) AP 112-14	Bolt	- - - - - - - -
15) AP 112-15+	Upper membrane plate	- - - - - - - -
16) AP 112-16+	Lower membrane plate	- - - - - - - -
17) AP 112-17	Nut	- - - - - - - -
18) AP 112-18	Body	- - - - - - - -
19) AP 112-19+	Shaft	- - - - - - - -
20) AP 112-20#	Packing	- - - - - - - -
21) AP 112-21#	Valve disc	- - - - - - - -
22) AP 112-22	Packing	- - - - - - - -
23) AP 112-23	Spring retainer	- - - - - - - -
24) AP 112-24	Spring	- - - - - - - -
KIT 424-RA	Spares kit containing all # marked items	21230025
KIT 424-RF	Spares kit containing all + marked items	21230022



PM 35	**Decompression valve PM 35 (18/40 liter)**	**21003500**
01) M5 x 25	Bolt	- - - - - - - -
02) PM 35-04	Cover	- - - - - - - -
03) PM 35-02	Membrane	21003502
04) PM 35-01	Lower housing	- - - - - - - -
05)	Nipple, ¾”	- - - - - - - -
06)	Reductionring, ¾”-½”	- - - - - - - -
07) ATO 12	Silencer, ½”	23000012
08) KIKI	Coupling	17830614
09) PU 6-4	Control air hose	16306000

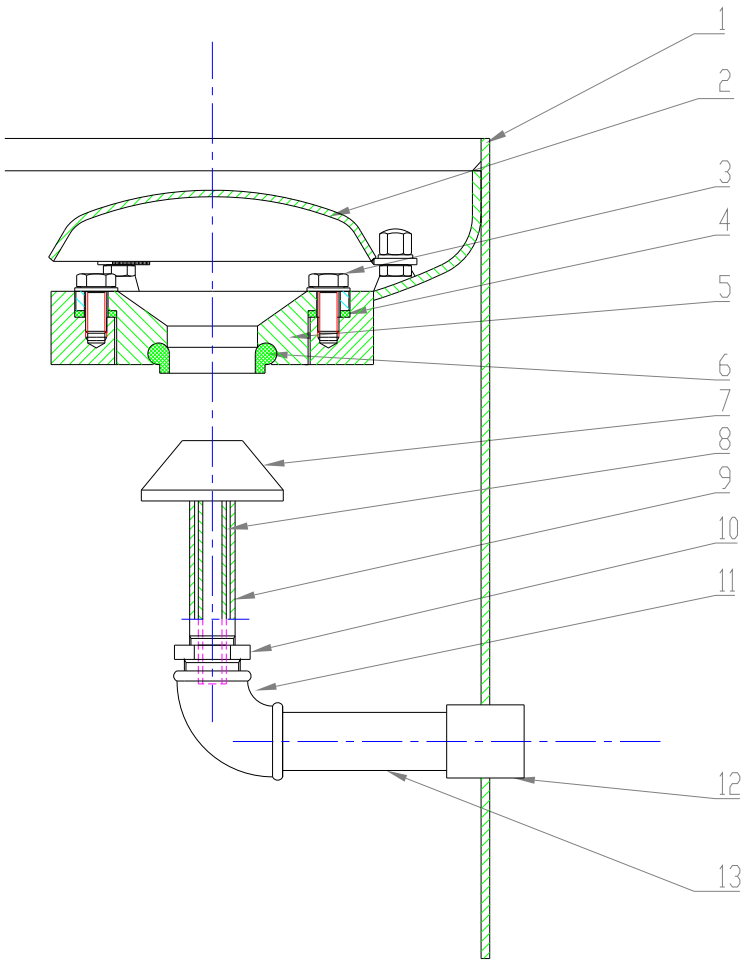


PU 34	**Decompression valve, without silencer (60- 200 liter)**	**21203410**
01)	Nipple	- - - - - - - -
02) PU 34-02	Lower housing	21203402
03)	Rubber wear disc	21203404
04) PL 18-16-V	Membrane, Vulcolan	21101816(V)
05) PL 18-02	Cover	21101802
06)	Coupling	- - - - - - - -
07) M6 x 25	Bolt	- - - - - - - -
08)	Pipe plug	- - - - - - - -
09) ATO 1	Silencer 1"	23000600



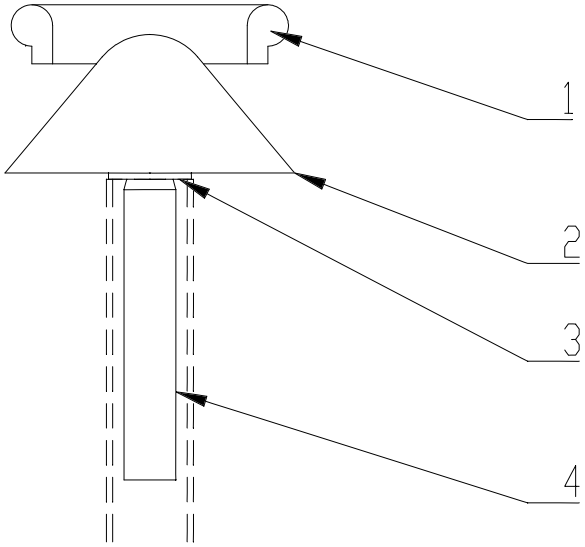
Mini Pop-up assembly (18 litre pots)

01)		
02)	Pop-up protection	21001420
03) M10 x 30	Bolt, M10 x 30	
04) PM 14-07	Packing	21001407
05) PM 14-08	Flange	21001408
06)	Pop-up ring, with lip, Mini	24700053
07)	Pop-up, Mini	24700052
08)	Pop-up pipe, Mini	incl.
09)	Pipe nipple ½" x 80	197004080G
10)	Reduction ring ¾"-½"	19502410504
11)	Elbow ¾"	195009005
12)	Welding socket	
13)	Pipe nipple ¾" x 100	197005100

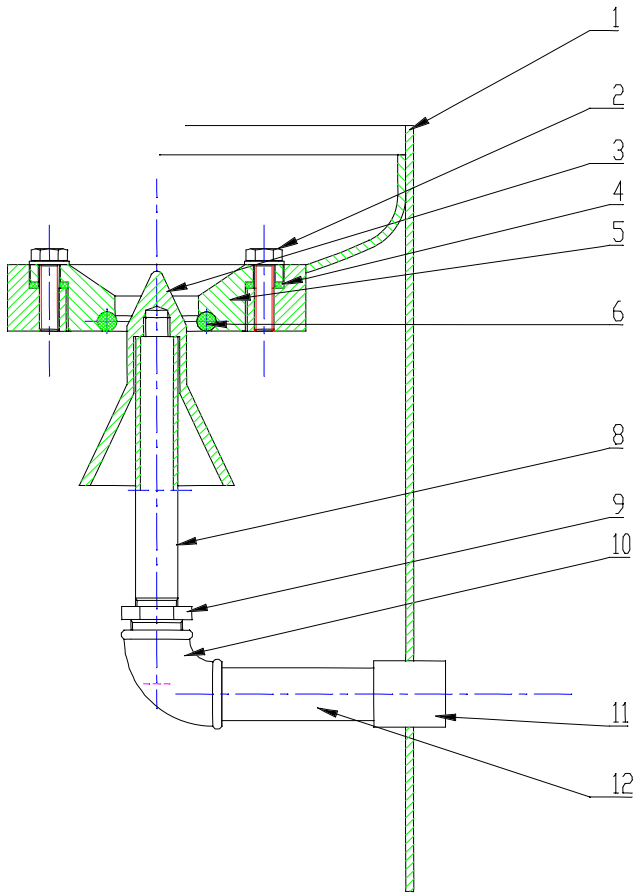


Pop-up assembly (40 - 200 litre pots)

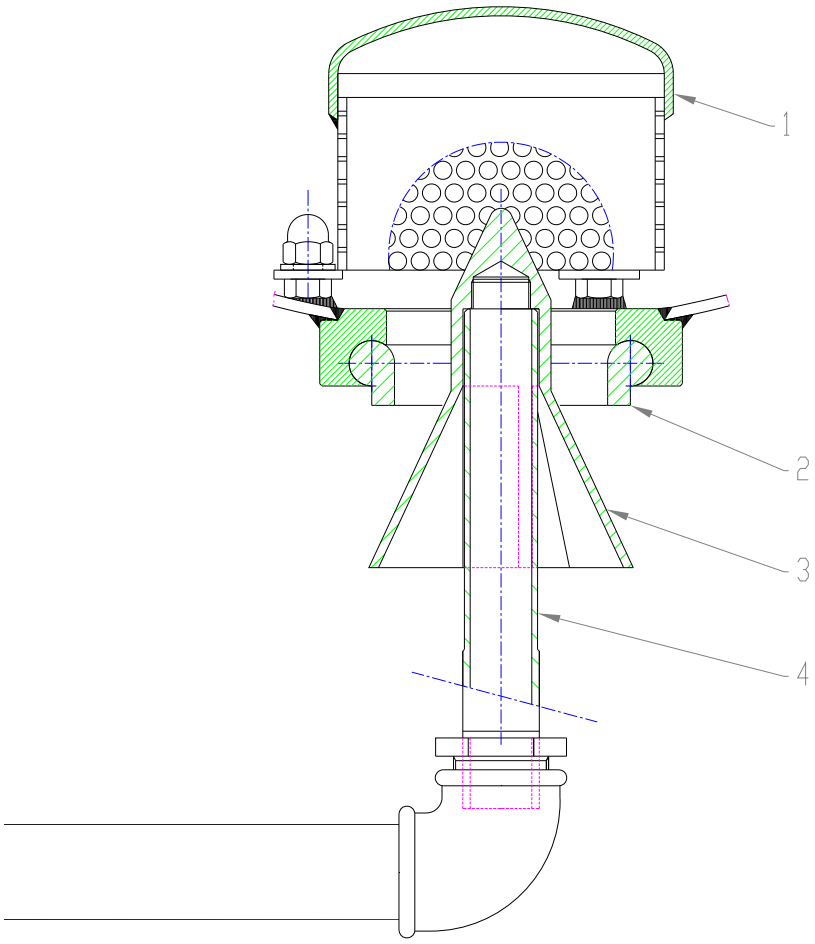
01) POP UP RING	Pop-up ring, with lip	24700003
02) POP UP	Pop-up	24700002
03)	Washer	24700005
04)	Pop-up pipe, square	24700006



PM 14	**Refilling cone assembly (Option “V” 18 litre pots)**	
01)	Pot	- - - - - - - -
02) M10 x 30	Bolt	- - - - - - - -
03) PM 14-04	Refilling cone, small	21001404
04) PM 14-07	Packing	21001407
05) PM 14-08	Flange	21001408
06) PM 14-06(R)	Closingring for PM 14-04 round	21001406(R)
08)	Guiding pipe	- - - - - - - -
09)	Reduction ring	- - - - - - - -
10)	Elbow	- - - - - - - -
11)	Welding socket	- - - - - - - -
12)	Pipe nipple	- - - - - - - -

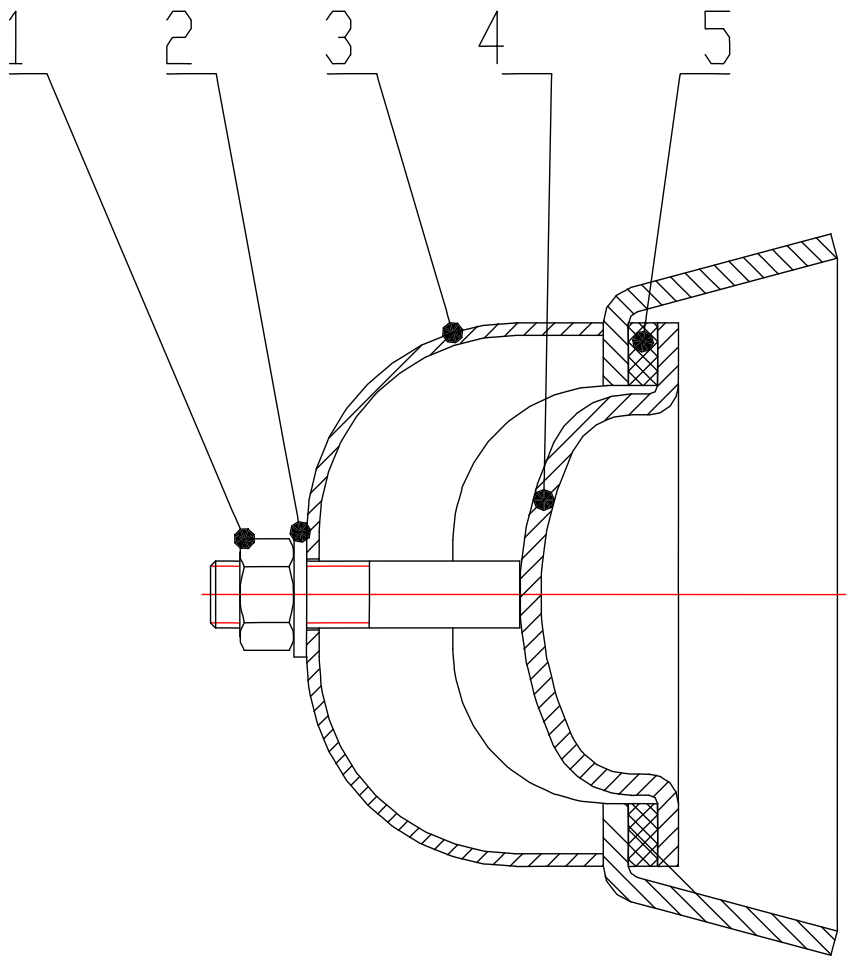


PL14	**Refilling cone assembly (Option “V” 60-200 litre)**	
01)	Filling cone cover, top closed	21101403
02)	Pop-up ring, with lip, hard	24700004
03)	Refilling cone, middle with grinded edge	21101404G
04)	Guiding pipe	21101401

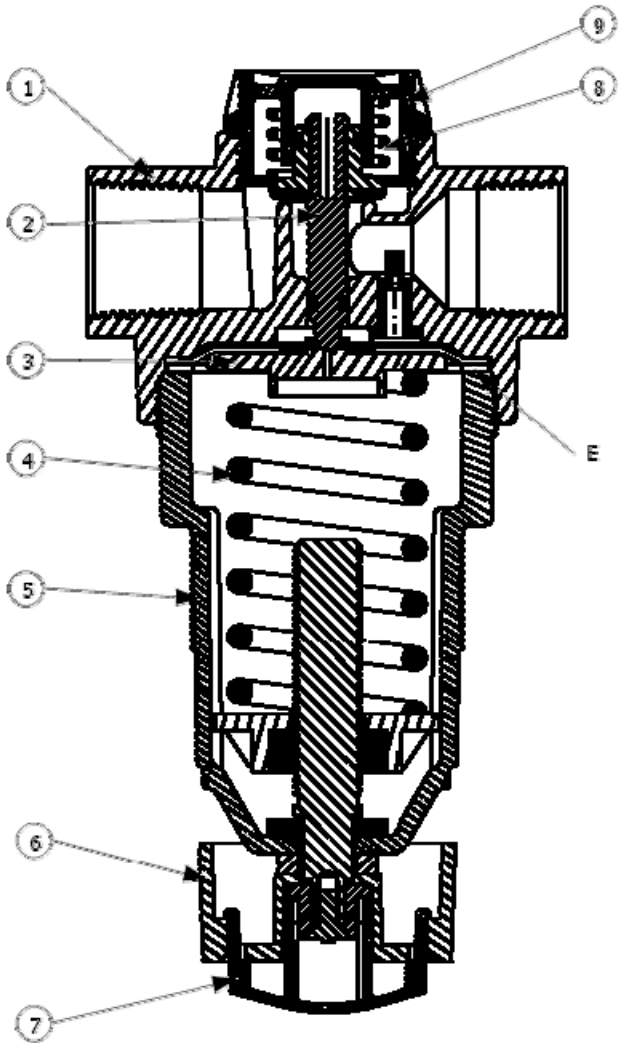


Inspection hatch

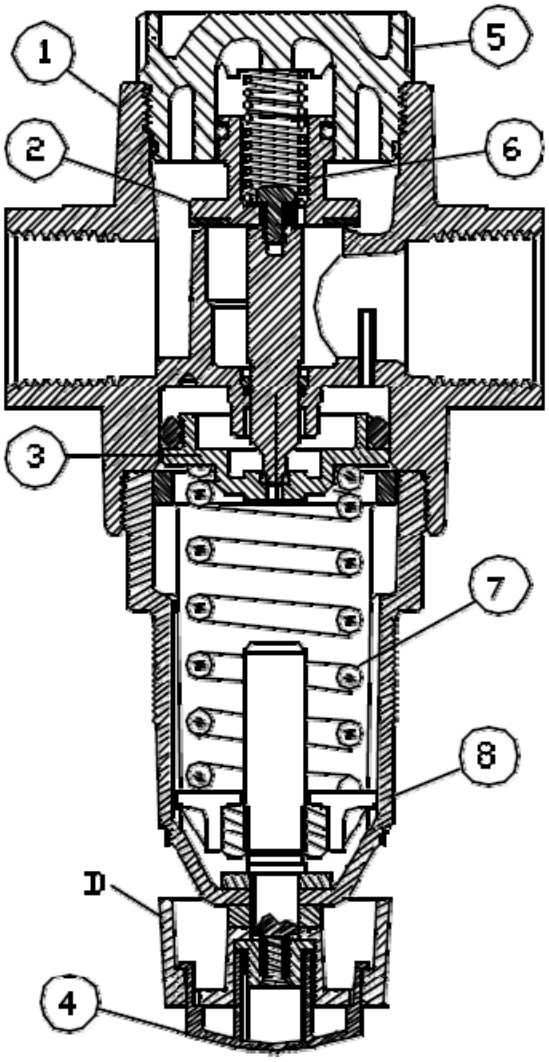
01) M16	Nut	- - - - - - - -
02) M16	Ring	- - - - - - - -
03)	Bracket	- - - - - - - -
04)	Hatch	- - - - - - - -
05) U9	Gasket	21800240



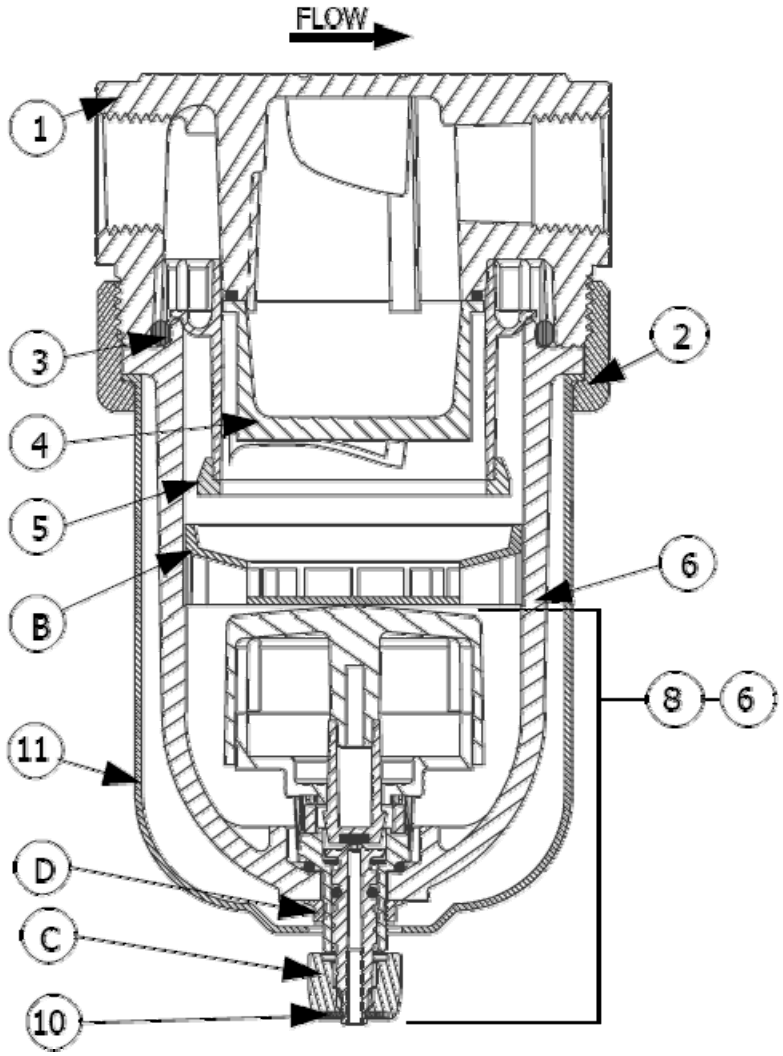
R 34 MP	**Pressure reducer ¾″ (18/40 liter)**	**19030002**
01) KAM-37-01-6W	Head assembly	19030000/01
02) A35-10M	Valve assembly	19030000/02
03) A37-03	Diaphragm assembly	19030000/03
04) 37-153	Spring kit	19030000/04
05) A37-02P	Dome assembly	19030000/05
06) KA37-62	Knob adjustment kit	19030000/06
07) 37-63	Adjusting key	19030000/07
08) KV35-11M	Spring kit	19030000/08
09) K37-50	Cap kit	19030000/09



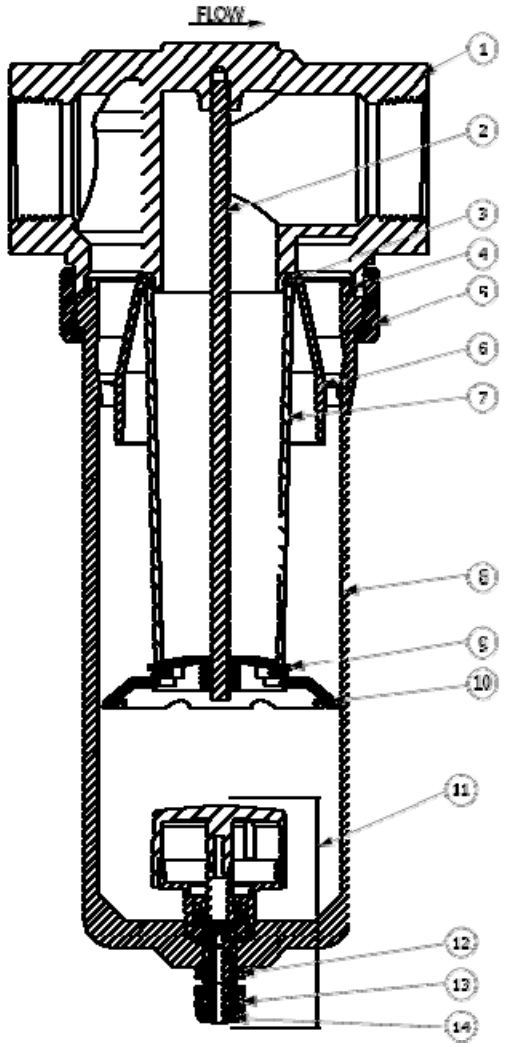
R112 MP	**Pressure reducer 1½˝ (60- 200 liter)**	**19030005**
01)	Head assembly	- - - - - - - -
02) KA37-198B	Valve assembly	19030501
03) KA37-200	Piston kit	19030502
04)	Adjusting key	- - - - - - - -
05)	Cap kit	- - - - - - - -
06)	Valve spring kit	- - - - - - - -
07)	Main spring kit	- - - - - - - -
08) A37-02P	Dome assembly	19030503



F 34 MP	**Filter ¾˝ (18/40 liter)**	**23000034**
01) M103-01-3/4W	Head	- - - - - - - -
02) MS103-80	Bowl ring	
03) 28-10	O-ring, bowl	
04) KA103-3PE	Element kit	F34 MP-4
05) 103-10P	Sleeve assembly	
06) AFD103-6M	Plastic bowl assembly auto drain (old model)	- - - - - - - -
06) ABFD103-117	Metal bowl assembly c/w auto drain	
08) D380	Auto drain kit (no bowl assembly)	23000201
10)	Retaining ring	- - - - - - - -
11) 103-60	Shatterguard (old model)	- - - - - - - -



F112 MP	**Filter 1½˝ (60- 200 liter)**	**23000112**
01)	Head	- - - - - - - -
02)	Stud	- - - - - - - -
03)	Upper baffle seal	- - - - - - - -
04)	Bowl ring	- - - - - - - -
05)	O-ring	- - - - - - - -
06)	Upper baffle seal	- - - - - - - -
07) A114-106E3	Filter element kit	23000202
08) ABFD114-100	Metal bowl c/w auto drain	
09) 114-108	Lower baffle seal # 114-108	23000203
10) 114-109	Lower baffle # 114-109	23000204
11) D380	Automatic drain	23000201
12)	Drain nut	- - - - - - - -
13)	Drain knob	- - - - - - - -
14)	Drain clip	- - - - - - - -



K16	**Vibrator, K16 complete (Option “T” 18/40 liter)**	**20000006**
K20	**Vibrator, K20 complete (Option “T” 60- 200 liter)**	**23200700**
01) K16	Vibrator, K16	23200K16
K20	Vibrator, K20	23200K25
02) M8 x 25	Bolt	- - - - - - - -
03) KIKI	Elbow plug-in coupling, ¼”x 6	17830614
04)	Reducer ¼”	19000014
05)	Nipple ¼”	- - - - - - - -
06)	Elbow ¼”	- - - - - - - -
07)	Petcock ¼”	19000000
08)	Silencer ¼”	- - - - - - - -