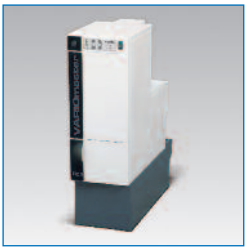
FZ1
VARIOmaster®

Suction Unit



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zubler

Operation Instructions 08-2006

www.zubler.de

Contents

Signs and Symbols

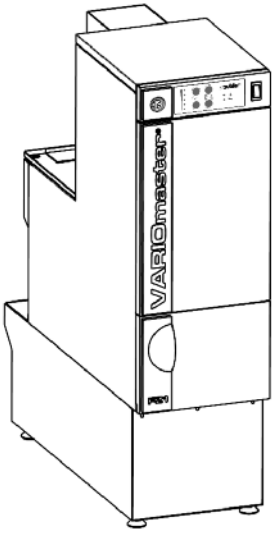
Risks and dangers

This symbol marks safety instructions that must be followed to prevent injury or death.

Risk of electric shock

0. Einleitung

0.1 Conformity Declaration



We, Zubler Gerätebau GmbH
Buchbrunnenweg 26
89081 Ulm-Jungingen,
Germany

hereby declare, that the suction unit

FZ1 VARIOmaster®

is in compliance with the protective requirements in accordance with the provisions of the following directives:

98/37/EG	Machines Directive
73/23/EWG	Low-Voltage Directive
89/336/EWG	EMV Directive

In the event of any amendments being made to the product without our agreement, then this statement shall no longer be valid.

Ulm, den 15. July 2005

Kurt Zubler
Managing Director

0.2 General information

Dear customer:

Thank you for purchasing a Zubler 2-position vacuum system. We hope this system will give you a pleasant workplace experience. Our technology undergoes continuous improvement and development based on our cooperation with experienced dental technicians. Our objective is to make vacuum technology quieter and ever more agreeable to work with. Performance and economy are of course basic requirements.

In order to ensure seamless operation, we recommend reading these Instructions for Use carefully.

We would also like to point out that complex technical devices require service and repair tasks to be performed by specially trained personell. Zubler ensures that all repairs are properly executed using a regional technical center. Each repair performed by Zubler is guaranteed for six months.

0.3 Proper use

This vacuum system is intended exclusively for dry dust!

Removing other types of dust or gases must be approved by the manufacturer prior to setting up the unit.

If visible dust clouds occur or if the vacuum performance is clearly not sufficient, discontinue your work and turn off the unit, then contact your dealer or our customer service team.

The volume of air circulated by all vacuum systems taken together and returned to the room must not exceed 50% of the indoor air volume per hour for all enclosed spaces. An air change factor of ? 1/hour is required. Removal of the exhaust air generated by the vacuum system to outside the building is preferable to recirculation.

This system may only be operated by persons who have been instructed in its use and specifically tasked with its operation. We reserve the right to make changes to the system without such changes necessarily being reflected by these Instructions of Use.

0.4 Functions

The FZ1 Variomaster vacuum system is a centralized vacuum system for the operation of up to 2 vacuum positions simultaneously. It may be expanded to include up to 4 vacuums positions, operated alternatingly.

This vacuum system consists of a central suction unit with integrated filter technology and independent vacuum position openers at the individual working positions.

It is possible to connect all devices that generate dry dust in the dental laboratory.

The vacuum system allows the assignment of four suction levels (1–4) that can be programmed individually for each vacuum position, depending on the amount of dust generated. This function is active only for as long as only a single vacuum position is open.

Level	1	2	3	4	Maximum
Suction power (approx.)	16 l/s	20 l/s	25 l/s	35 l/s	45 l/s

If 2 vacuum positions are open simultaneously, both will have the same suction power independent of any program settings; this suction power will correspond to suction level 3 (factory setting). The suction level for concurrent use can also be programmed.

Polishing units with 2 intakes or units that require excessive air volumes must be connected via dual valves (see special applications).

The FZ1 Variomatic vacuum system keeps the preprogrammed suction level constant at each vacuum position, automatically compensating for filter clogging.

The filter will be automatically cleaned as soon as the vacuum turbine has reached its maximum performance level. In addition, the filter will be cleaned at preselected intervals in order to keep energy consumption low. The AP501 automated vacuum position opener automatically opens the vacuum positions as soon as the dust-generating unit connected to it is turned on.

The R1400 intake system allows all vacuum positions to be opened manually.

All opening modules require a control line connecting it to the suction unit for turning the unit on or off.

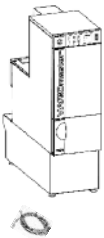
0.5 Technical requirements

Temperature	+5°C to +40°C (+41°F to +104°F)
Relative humidity	max. 80% (at 30°C)
Power rating	230V/110V – 1200 W
Exhaust connector	Ø 75 mm (optional)

0.6 Scope of delivery

The vacuum system is delivered complete with installation components allowing two vacuum positions to be created on one side of the vacuum system at a distance of approximately 6 m.

Make sure to check the installation components provided for completeness. Some of the components will be found in the dirt container of the vacuum system.



1x **FZ1 VARIOmaster®** vacuum system

1x Power cord

1x Programming module

5m 50-mm hose

2m 40-mm hose

2x 50/40 x 45° Y branch

1x 50-mm double sleeve

2x 50-mm dummy covers

1x 50-mm pipe joint

1.

1.1 FZ1 VARIOmaster vacuum system

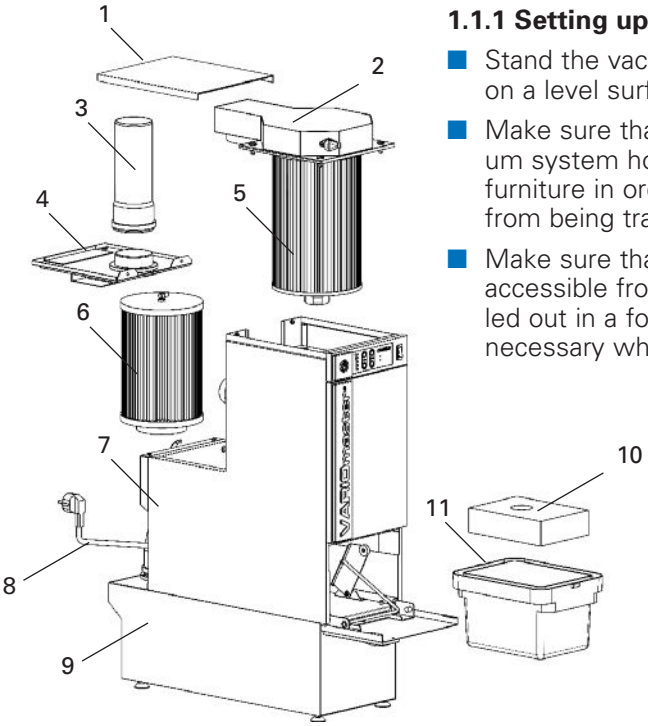


Fig. 1: **FZ1 VARIOmaster**

1	Cover
2	Filter suspension
3	Connecting pipe
4	Filter cover
5	Shake/deflate filter
6	Safety filter
7	Main unit housing
8	Power cord
9	Foundation housing
10	Transport lock
11	Dirt container

1.1.1 Setting up the unit

- Stand the vacuum system vertically on a level surface.
- Make sure that the walls of the vacuum system housing do not touch any furniture in order to prevent vibrations from being transmitted.
- Make sure that the vacuum system is accessible from above or can be pulled out in a forward direction. This is necessary when replacing the filter.
- Make sure all connections are accessible from behind.
- Remove the installation components from the dirt container (11).
- Remove the styrofoam transport lock below the filter (10)

1.1.2 Connecting the unit

- You can choose to have the exhaust air of the vacuum system blowing up to the left, to the right or to the back by rotating the exhaust pipe (14).
- We recommend allowing the exhaust air to be removed from the building. To do so, install a DN75 pipe that ends outside the building. The length of the pipe should not exceed 10 m. Do not use any 90° angles!
- The exhaust air, once the dust has been removed, may also be returned to the room

  (see chapter 0.3, page 5)
- Connect the vacuum positions and the intake nozzles (12) with the 50-mm suction hose (see Figs. 3 and 4, page 10).
- Use the control cable to connect one of the connectors (13) on the suction unit to the appropriate socket on the vacuum position opener.
- Connect the power cable (8) to the vacuum system and to the wall socket.
- Make sure that the exhaust and intake air promoter cooling at the back of the unit (16) can circulate freely.

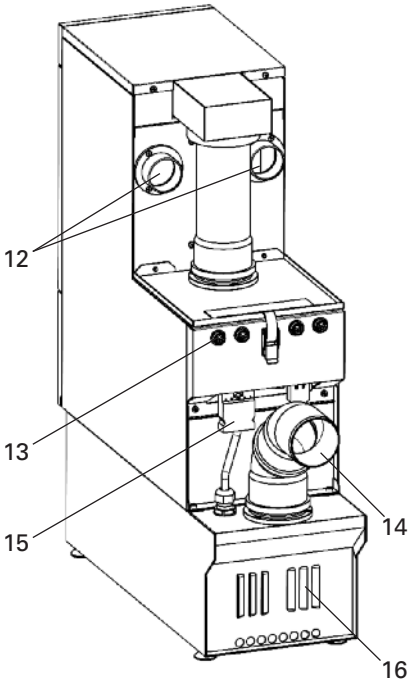


Fig. 2: **FZ1 VARIOmaster** rear view

12	50-mm intake nozzle
13	Control cable connector
14	DN75 exhaust pipe
15	Motor cord
16	Motor cooling exhaust

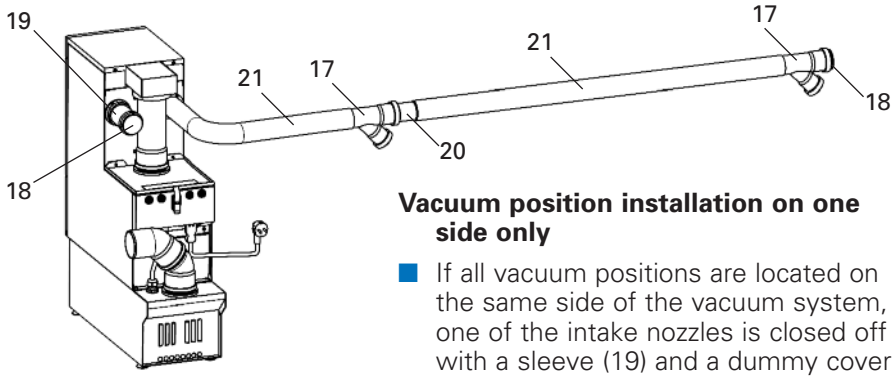


Fig. 3:

Vacuum position installation on one side only

- If all vacuum positions are located on the same side of the vacuum system, one of the intake nozzles is closed off with a sleeve (19) and a dummy cover (18).
- The maximum distance that is possible with the installation material enclosed is approximately 6m (19 feet).

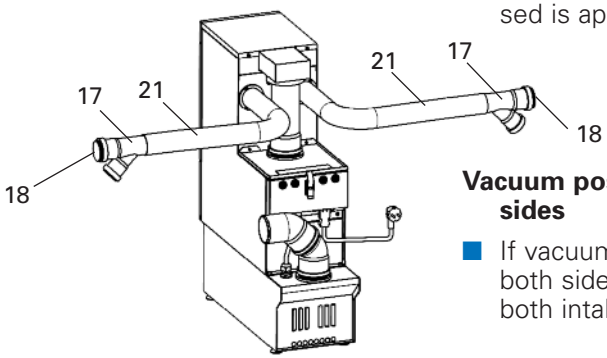


Fig.4:

Vacuum position installation on both sides

- If vacuum positions are located on both sides of the vacuum system, both intake nozzles are used.

17 Branch
18 Dummy cover
19 Sleeve
20 50-mm pipe joint
21 50-mm suction hose or pipe

- Branches (17) where a suction line ends are closed with a dummy cover (18).
- Use the 50mm pipe joint (20) to connect the line to the next vacuum position.
- Branches (17) should always be located approximately 30–50cm away from the following vacuum position.
- Alternatively, the entire installation can be executed in standard 50mm flexible pipe.

1.2 AP501 automated opening module

- Each working position must be connected to the vacuum system via a vacuum position opener. The vacuum position openers actuate the vacuum system via their control cables (22).

1.2.1 AP501 automated opening module

- The AP501 automated vacuum position opener (23) automatically opens the vacuum position and starts the vacuum system once the handpiece or other connected device is actuated.
- The vacuum position valves (24) are inserted directly into the branches (17).

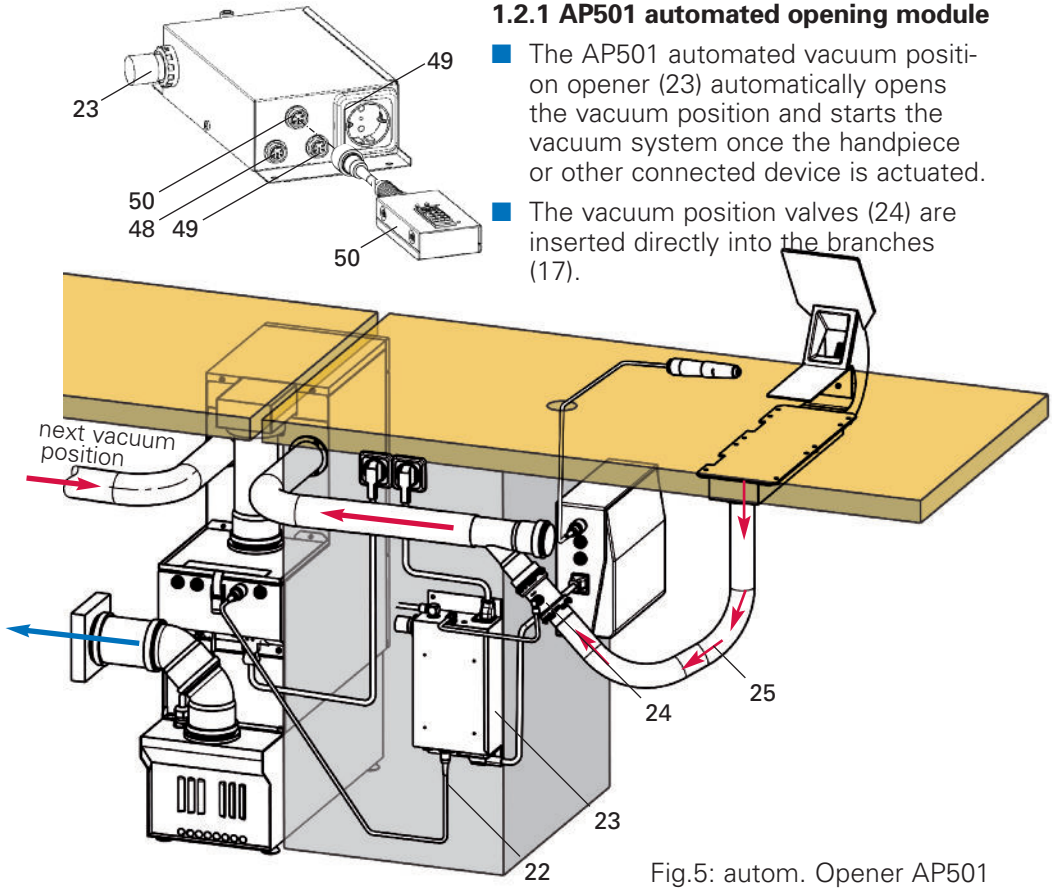
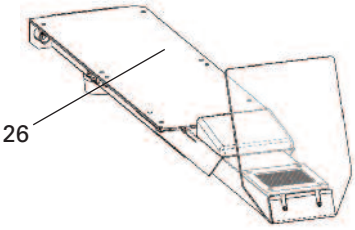


Fig.5: autom. Opener AP501

22	Control cable
23	AP501 vacuum position opener
24	Vacuum position valve
25	40-mm hose
48	FZ1 connector
49	Switch
50	Programming module

- The vacuum position valve and the intake system are connected with a 40mm hose (25) whose maximum length must not exceed 1.5m (5 feet).

1.2.2 R1400 intake system



- The R1400 intake is a combination of a mechanical vacuum position opener and a suction funnel. The vacuum position is opened and the vacuum system started by pulling out the suction hood.
- When installing mechanical openers, a 40-mm pipe joint is used instead of a vacuum position valve (27).

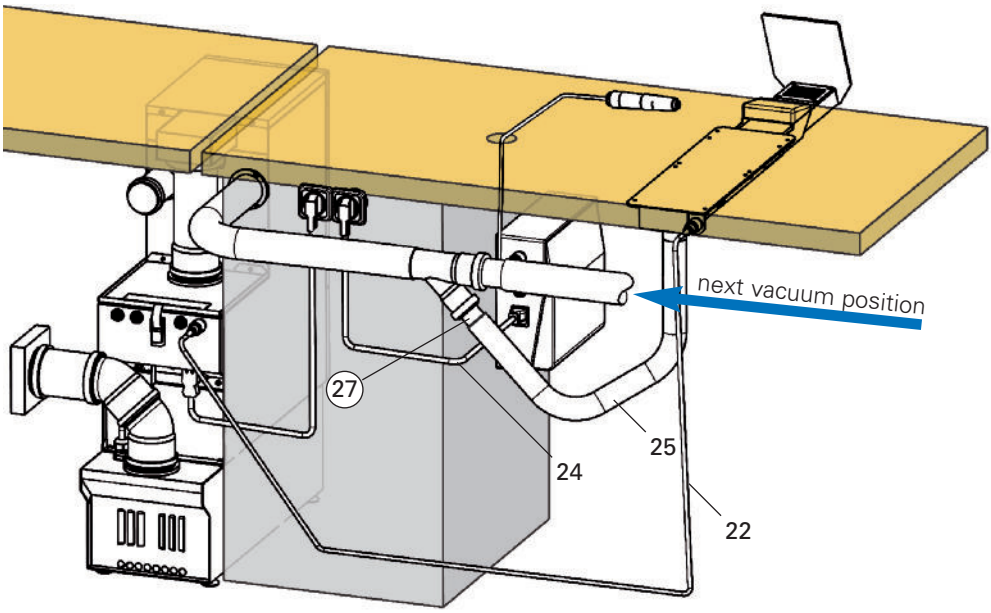


Fig.6:

26 R1400 intake system
27 40-mm pipe joint

Note: The R1400 intake system is a manual opener. Its use in connection with vacuum systems tested by TÜV for BIA has not been approved by the relevant German employers' mutual insurance association, BGFE.

2. Operation

2.1 LED indicators

- The suction power indicator LED (29) indicates the suction level of the active vacuum position.
- A blinking red Container indicator LED (32) indicates that the programmable timer for checking the container has run down. It is possible to continue working until the next start of the vacuum system. The timer is reset by lowering the dirt container.
- A steadily lit red Container indicator LED (32) indicates that the dirt container has been lowered.
- A blinking red Service indicator LED (34) indicates that the necessary minimum air volume cannot be achieved despite cleaning. The vacuum motor will be deactivated, and the vacuum system will not be operative. Possible causes are a clogged main or fine filter or clogged motor air outlets.
- A steadily lit red Service indicator LED (34) indicates an electrical problem.

2.2 Display

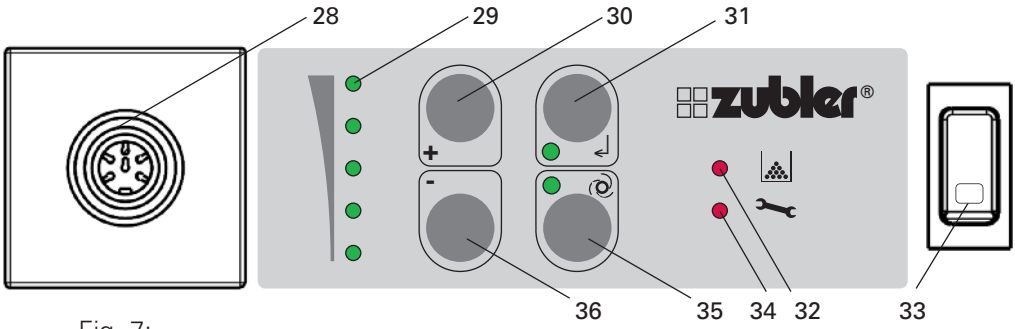


Fig. 7:

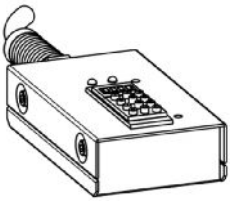
28	Input module connector
29	Suction power indicator LEDs
30	Plus key (+)
31	Enter key with LED
32	Container indicator LED
33	Main switch with LED
34	Service indicator LED
35	Auto/Duration key with LED
36	Minus key (–)

2.3 Setup

- Turn on the unit by switching the main switch (33) to the ON position. The green switch indicator LED will be lit.
- The vacuum system turns on the vacuum motor to maximum power and then successively opens the valves of the connected AP501 automated vacuum position opener in order to automatically clean the suction hoses.
- This is followed by a cleaning cycle with three successive cleaning impulses.
- The vacuum system is now ready for use. The AP501 automated vacuum position openers will be activated, and the devices connected can now be used.
- All that remains to be done is to adjust the sensitivity of the AP501 automated vacuum position openers to the specific devices you are using. For details, please consult the AP501 Instructions for Use manual.
- When operating a single device, the suction power can be adjusted individually to the necessary suction level by pressing the Plus (30) and Minus (36) keys. Confirm the setting by pressing the Enter key (31).

Note: Automatic cleaning of the pipes will only be performed if an AP501 vacuum position opener is connected. If only manual openers are connected, the vacuum system will immediately proceed to the filter-cleaning step.

2.4 Settings



- The input module can be used to modify the basic parameters of the FZ1 VARIOmaster vacuum system; the same one is also used for adjusting the sensitivity of the AP501 automated vacuum position opener.
- Connect the plug of the input module to the appropriate socket (28) on the vacuum system.

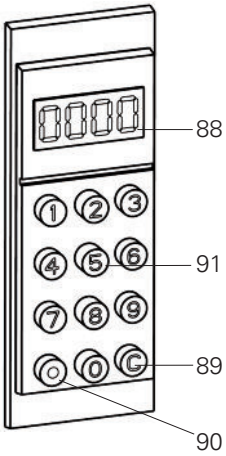


Fig. 8: Eingabemodul

88 LCD display
89 Code entry key
90 Enter key
91 Numeric keypad

C 1 ●

Display

Enter a value of 16 and confirm by pressing the Enter key.

1 6 ●

Display

2.4.1. Filter cleaning interval

The vacuum system automatically performs filter cleaning at regular intervals in addition to any necessary cleaning in the event of a seriously clogged filter. The objective is to save energy by making sure that the vacuum motor is not permanently operating near the level of maximum filter clogging.

The cleaning interval has been factory-preset to 2 hours. You may adjust this value as needed based on the amount of dust generated at your vacuum positions.

A value of 1 corresponds to an interval of 15 minutes.

A value of 8 corresponds to an interval of 8 x 15min, which is, 2 hours.

Example: You would like the filter cleaning to be performed only every four hours:

2.4.2. Dirt container checking interval

The filling status check for the dirt container is implemented in the form of a time-controlled power-down of the vacuum system. The actual filling level of the dirt container is not checked. You may adjust the dirt container checking interval after observing the amount of dust generated at your vacuum positions during the first few weeks of operation.

The factory interval 80 hours of operation (including standby times). This means that you would be prompted to check the dirt container every 1–2 weeks. For instructions on how to empty the dirt container, please consult chapter 3.1 on page 19.

A value of 1 corresponds to an interval of 1 hour.

A value of 80 corresponds to an interval of 80 hours (max. 250).

C 2 ●

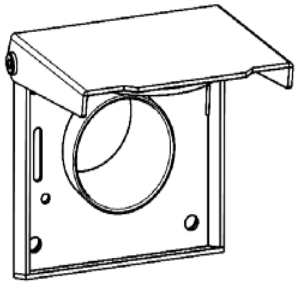
Display 

Example: You would like the unit to be powered down for checking the dirt container only every 150 hours:

Enter a value of 150 and confirm by pressing the Enter key.

1 5 0 ●

Display



2.4.3. Vacuuming Socket

With the vacuuming socket **ST03** and a cleaning set it is possible to clean the workspace and vacuum the floor.

- By opening the front cover of the vacuum socket, the suction is started.
- Therefore the wire (22) must be connected to one of the 4 data connectors (13) on the suction unit.
- Various cleaning sets and accessories are available within the delivery program.

Setup:

For vacuuming it is necessary to disable the regulation, otherwise the unit will always display "filter clogged".

Therefore the suction unit must be programmed with the information to which data connector (13) a vacuuming plug is connected.

C 3 1 ●

Display 0000 C

E.g.: There is a vacuuming plug connected to data connector No.1.

Enter a value of 1 and confirm by pressing the Enter key.

1 ●

For data connector No. 2-4 enter C32-C34 instead and change the value to 1.

The regulation is activated again by setting the value of C31-C34 back to 0

3. Maintenance and service

3.1 Emptying the dirt container

Once the timer for checking the dirt container has run down, the Container indicator LED (32) will be lit intermittently.

You may continue to work in this situation. If the vacuum system is powered on again, e.g. on the next working day, it will not be ready until the container has been checked.

Proceed as follows:

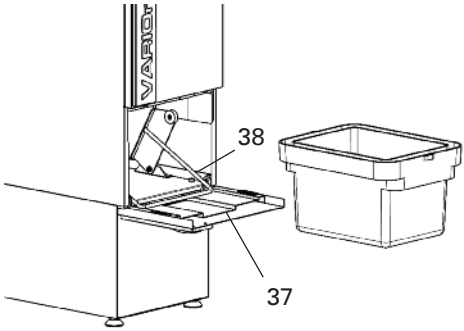


Fig. 9: container change

37 Container door
38 Bracket

- Leave the vacuum system turned on.
- Open the container door (37) and press the bracket (38) downward. The Container indicator LED (32) will now be lit permanently.
- Pull out the container and empty it of all dust.
- Reinsert the container as far as it will go and push the bracket (38) upward. The Container indicator LED (32) will be turned off, and the vacuum system will once again be operative. The timer for checking the dirt container is reset.
- Based on the amount of dust found in the dirt container, you may adjust the dirt container checking interval as appropriate, as described in chapter 2.4 on page 17.

3.2 Replacing the dust filter

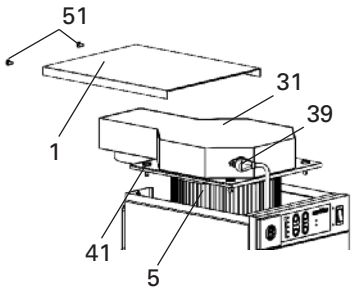


Fig. 10

- Turn off the unit by switching the main switch (33) to the OFF position.
- Pull out the vacuum system from underneath the workbench if necessary. You need free access to the top of the vacuum system.
- Remove the two screws (51) on the back of the unit. Remove the top cover (1). (I)
- Disconnect the cleaning cable (39) from the cleaning unit (40), and open the 4 twists screws (41) by turning them by 90° using a coin. (II)
- Remove the cleaning unit including the filter cartridge (5) by lifting it upward and out.

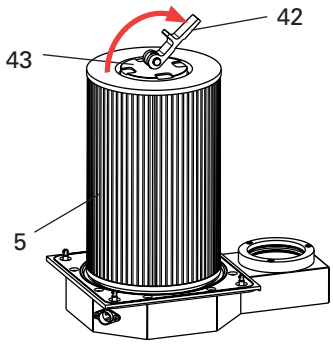


Fig. 11

- Opened the knurled knob (42) and remove the filter cartridge complete with its centring disc (43). (III)
- Reinstall new filter in reverse order.

1	Upper cover
39	Cleaning cable
40	Cleaning unit
41	Twist screw
5	Filter cartridge
42	Knurled knob
43	Centring disc
51	Screws

Wear suitable protective gear (protective gloves, respiratory protection) whenever replacing a main or fine filter

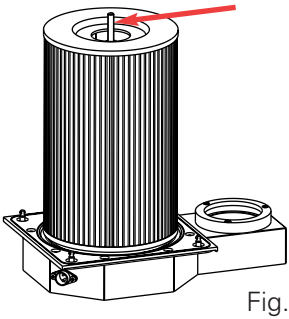


Fig. 12

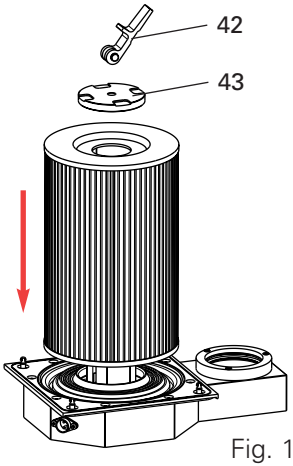


Fig. 13

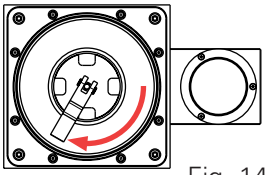
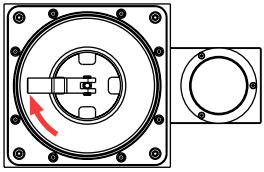


Fig. 14



- Pull the centering disk (43) off the thread rod. It may be necessary to loosen the sealing with a screw driver.
- Remove the filter cartridge by pushing the threaded rod. (Fig. 12)

  Before mounting the new filter cartridge remove dust from the sealing.

  Slide the cerntering disk (43) over the thread rod and ensure the new cartridge is centered on the sealing.
- Screw the clamping lever (42) onto the thread rod until touching the disk.

  Clamp the lever once but loosen it again.

  Now you can turn the lever again without pressure until the resistance starts. (Fig. 14a)

  From this point turn the lever at max. 90° to the next slot of the centering disk. (Fig. 14b)
- Clamp the Lever (42) that the latch matches with a slot of the centering disk (43).

  Place the cleaning unit back into the suction unit, tighten the 4 twist screws (41) and plug in the cleaning cable (39).

3.3 Replacing the fine filter

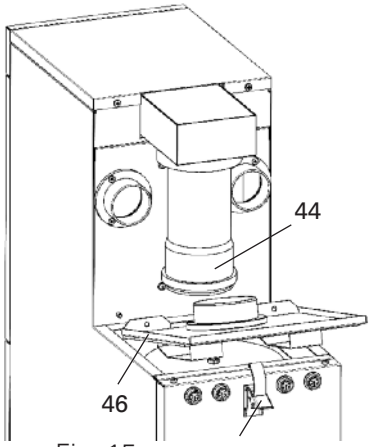


Fig. 15

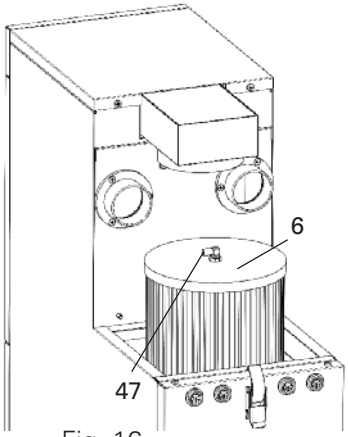


Fig. 16

- Turn off the unit by switching the mains switch (33) to the OFF position.
- Pull out the vacuum system from underneath the workbench if necessary. You need free access to the back of the vacuum system.
- Push the pipe section (44) all the way to the top and open the quick-release lock (45). (I)
- Remove the fine filter cover (46). Remove the pipe section from the upper seal. (II)
- Disconnect the vacuum hose (47) from the fine filter cartridge (6) and remove it by pulling it upward and out. (III)
- Reinstall new filter in reverse order.

Store contaminated filters in a tightly sealed container or plastic bag immediately after removal and dispose of according to all applicable waste disposal regulations.

44	Pipe segment
45	Quick-release lock
46	Fine filter cover
47	Vacuum hose

4. Intake system

4.1 Requirements

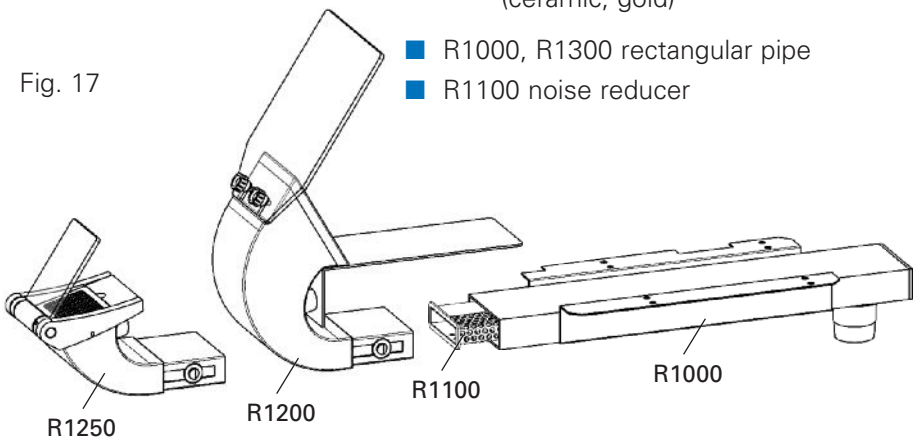
Basic requirements of an intake system include, in addition to the best possible retention of dust, minimization of airflow noises and support for an ergonomic working posture.

4.2 Zubler parts and accessories

These requirements can only be met if the Zubler intake system, which is perfectly attuned to the Zubler vacuum system, is used. It consists of:

- R1200, R1250 suction funnel (ceramic, gold)
- R1000, R1300 rectangular pipe
- R1100 noise reducer

Fig. 17

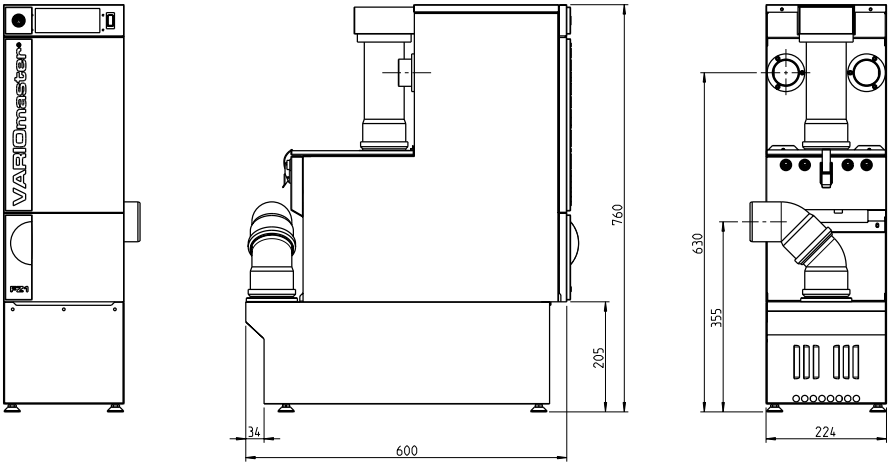


In your own interest, make sure to maintain an ergonomic posture while you work.

5. Specifications

5.1 Technical specifications:

Dimensions:	
W x H x D	224 x 760 x 410/600mm (8.8" x 30" x 16"/23.6)
Weight	38 kg (83.6 lb.)
Voltage	230 VAC ± 5%, 50–60 Hz
Power input	max. 1200 W
Suction power	70 l/s
Fan	1 fan motor, brushless
Dirt container volume	4.5 l
Filter quality	Dust class M
Filter surface	1.6 mÇ
Noise level	44–67 dB(A)



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technical changes without notice!

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