

# **MULTIVAC**

**Instruction Manual  
English (EN)**

**Universal vacuum  
test unit**



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## 1 Safety Regulations



We would like to draw your attention to some dangers which may occur. You should therefore read the following instructions carefully and proceed accordingly.

- ⚠ It is prohibited to run the machine in moist, dusty or explosive environment! There is a danger of a short circuit!
- ⚠ The suction hose as well as all visible cables have to be checked frequently!
- ⚠ Do not cover or seal off the ventilation openings.  
=> The openings at the bottom and the rear side of the housing have to be kept clear AT ALL times!
- ⚠ The Multivac device must be used only according to the designated applications in the instruction manual. Any other application is not designated and therefore will not be accepted by MIRA liability- and warranty declarations.
- ⚠ Do not use the device with an opened cover sheet!
- ⚠ Switch off the vacuum pump if not in use!
- ⚠ Overpasting or bridging the ON-OFF switch is dangerous!
- ⚠ Safety Goggles have to be worn while using the device!  
With long hair, either a head covering must be worn or the hair must be bound up.
- ⚠ Power must be disconnected prior to any electrical work or repair operations!
- ⚠ Repair operations may only be performed by the manufacturer (Minelli Corporation) or by the local Mira representative!
- ⚠ Use only genuine MIRA spare parts that are listed in the respective instruction manuals!
- ⚠ Avoid contact with the electrical circuits of the machine! => Risk of electrocution!
- ⚠ Modifications of the electronic components may have serious consequences!

### Earthing of the workstation

To minimize shock hazard, the Multivac system must be connected to an electrical ground. Earthing equipment must be connected to the protective earthing conductor of the power supply!

### Do not use in explosive environment!

Operation of this device in the presence of inflammable gases, fumes or dust may cause an ignition of this environment and has to be prevented.

### CAUTION!

1. It is not permitted to operate the machine in dusty surroundings as there is a risk of fire resulting from the overheating of small particles.
2. To avoid shock hazards, do not expose this machine to moisture, rain or dew as this may cause an electrical short between mains and controls.
3. Installation, adjustment and service of this device must be made by qualified personal only. Works or repairs on electrical parts of the device is very dangerous because of the high voltages the circuit is working with. These high voltages are capable of causing death and are present even after disconnecting mains. Before starting servicing and repairs, it is essential to disconnect any mains.
4. It is not permitted to work on the outputs if the power supply is switched on, even if the connected motor is not activated or the drive is interlocked.
5. Operation of this machine without a mechanical ON/OFF switch and a fuse in the supplying wiring is not permitted.
6. Do not attempt internal service or adjustment unless another person, capable of disconnecting mains and rendering first aid, is present.
7. This machine should never be used as a safety device or for realizing an emergency function. A malfunction of the connected motor even with switched on mains cannot be prevented.
8. Do not touch the electrical parts of the devices. During operation the electrical parts are carrying dangerous voltages and might lead to death. In addition, the device can be damaged if the electrical circuit is touched, as a result of static discharge effects.
9. To prevent additional hazards, do not make modifications or installation of substitute parts. Before any modification, installation of substitute parts or additions are made, ask for the authorisation of the manufacturer (Minelli Corporation).
10. Avoid the intake of dirt and liquids.
11. Check the filter and suction hose frequently.
12. If polluted, clean the suction hose completely and replace the filter element.
13. During installation and operation of the machine, pay attention to any further safety regulations and advices specified in the respective chapters in this instruction manual.

## 2 Copyright ©

The exclusive copyright of this instruction manual remains in the hands of the MINELLI Corporation (MIRA).

This instruction manual is appointed to the operator and the corresponding employees.

**Minelli Corporation  
MIRA Division  
Mattenstrasse 3  
8330 Pfäffikon ZH  
Switzerland CH**

For the provided technical documentation see the authorised person in chapter „Declaration of conformity“ on page 5.

### 3 Non-liability

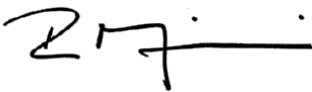
The MIRA Multivac universal vacuum test unit may only be operated according to the instruction manual. The manufacturer refuses to accept any liability for accidents and damages caused by incorrect operation and non-designated use. He also refuses any liability for alienated use of the machine.

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### 4 Warranty

In case of manufacturing or material defects Minelli Corporation will replace the defective part or parts at no charge within 12 months after the date of final purchase. No further claims can be covered under the warranty. Defective parts must be returned along with proof of purchase. Warranty does not cover any subsequent damage caused by these defective parts. Warranty does not cover non-designated handling, the use of incorrect electronic parts or deliberate damage, nor does it cover shipping and packing costs.

**5 Declaration of conformity**

<p><b>MINELLI®</b></p> <p>Minelli AG  Mattenstrasse 3  8330 Pfäffikon ZH  Schweiz / Switzerland  www.minelli.ch  sales@minelli.ch</p>	<p><b>Konformitätserklärung</b>  <i>Déclaration de conformité</i>  <b>Declaration of conformity</b>  <b>Dichiarazione di Conformità</b></p>
<p>Wir/Nous /We/Noi,</p> <p><b>erklären in alleiniger Verantwortung, dass das Produkt</b>  <i>déclarons de notre seule responsabilité que le produit</i>  bearing sole responsibility, hereby declare that the product  dichiariamo sotto la nostra sola e completa responsabilità che il prodotto</p>	<p><b>Minelli AG</b>  <b>Mattenstrasse 3</b>  <b>CH-8330 Pfäffikon ZH</b></p> <p><b>Beschreibung des Produkts</b>  Multivac  <b>Description du produit</b>  <i>Multivac</i>  <b>Description of product</b>  Multivac  <b>Descrizione del Prodotto</b>  Multivac  <b>Typenreihe/ Série type/ Type Series/ Serie Tipo</b>  0318</p>
<p><b>auf das sich diese Erklärung bezieht, mit der/den folgenden Norm(en) oder normativen Dokumenten übereinstimmt:</b>  <i>auquel se rapporte la présente déclaration est conforme aux normes ou aux documents normatifs suivants:</i>  referred to by this declaration is in conformity with the following standards or normative documents:  riferente a questa dichiarazione è conforme alle seguenti regole e normative:</p>	
<p><b>Bestimmungen der Richtlinie</b>  <i>Désignation de la directive</i>  Provisions of the directive  Denominazione della Direttiva</p>	<p><b>Titel und/oder Nummer sowie Ausgabedatum der Norm(en)</b>  <i>Titre et/ou numéro ainsi que date d'émission de la/des norme(s)</i>  Title and/or number and date of issue of the standard(s)  Titolo e/o numero e data di promulgazione della norma</p>
<p><b>2006/42/EG: Maschinenrichtlinie</b>  2006/42/CE: <i>Directive sur les machines</i>  2006/42/EC: Machinery directive  2006/42/CE: Direttiva Macchine</p>	<p>SN EN 1037+A1: 2008-07  DIN EN ISO 12100: 2011-03</p>
<p><b>2014/35/EU: Niederspannungsrichtlinie</b>  2014/35/UE: <i>Directive basse tension</i>  2014/35/EU: Low voltage directive  2014/35/UE: Direttiva bassa tensione</p>	<p>SN EN 60204-1: 2006-06  SN EN 60269-1+A1+A2: 2015-05  SN EN 61310-3: 2008-02</p>
<p>Ort und Datum  <i>Lieu et date</i>  Place and date  Luogo e Data</p>	<p style="text-align: center;"></p> <p>Pfäffikon ZH, 20.07.2023</p> <p><b>Reto Minelli (CEO/Geschäftsführer)</b>  <i>L'administrateur délégué</i>  General Manager  Amministratore delegato</p>

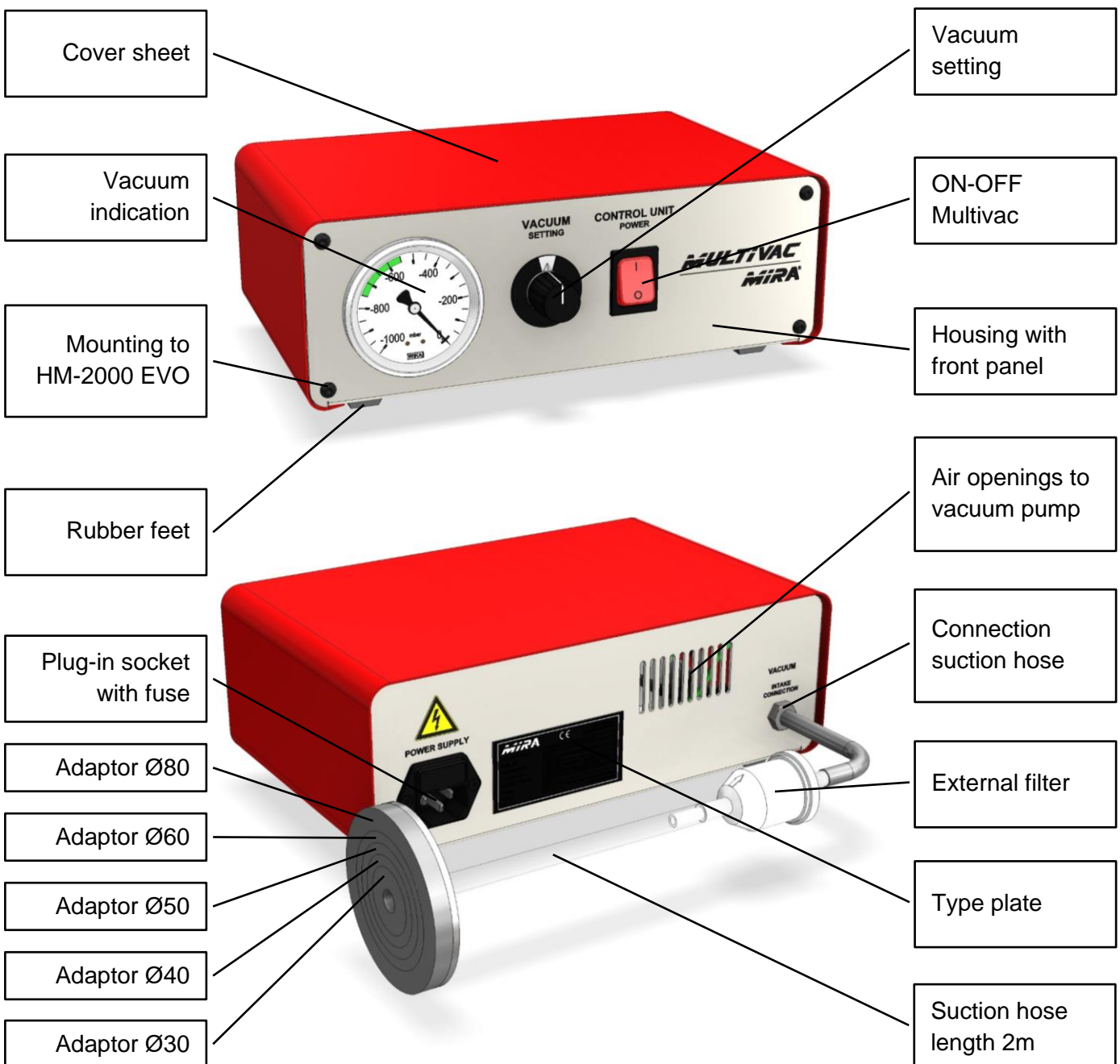
# MULTIVAC (Series 0318)

The Multivac was designed especially for leak testing of valve seats and cylinder heads. The system can be used on the AV-Mobile or HM-2000 EVO workstation in combination with a Vario Drive electric drive unit. Furthermore, the device is allowing fast and simple diagnosis on built-in engines. The installed vacuum pump enables function controls and leak tests to a max. vacuum of -800mbar.

The Multivac is designated for the following applications:

1. **Leak tests** => valve seats, valve stem guides etc.
2. **Vacuum tests** => Intake vacuum and ignition timing tests on a running engine.
3. **Function controls of vehicle components** => Vacuum controlled parts on a vehicle.
4. **Leakage tests** => Power break vacuum boosters, vacuum amplifiers and vacuum diaphragms.

## 6 Device parts and controls



## 7 Connections and type plate

The power connection of the Multivac will be carried out according to chapter 8.3 on page 8 and schematically on chapter 11 on page 12. The type plate is located on the rear side of the Multivac. => Manipulation and removing of the type plate are not allowed. The original specifications on the type plate (serial-no., fabrication-no. and technical specifics) must be in readable condition if service repairs and warranty is required.

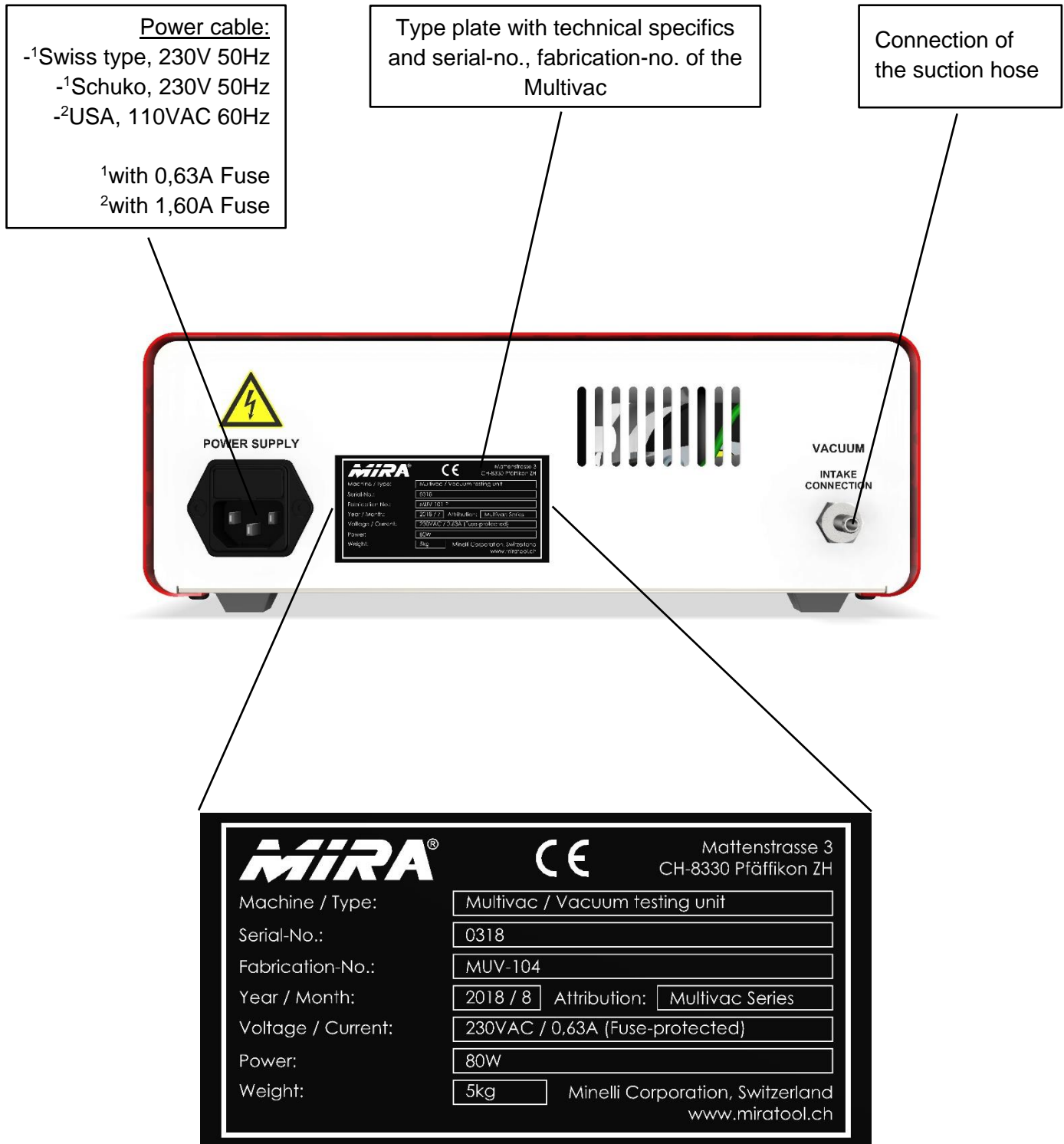


Fig. 1 - Type plate Multivac



## 8 Installation and startup



Fig. 2 - AV-Mobile with Multivac

### 8.1 Workstation (AV-Mobile)

If using the AV-Mobile workstation, the Multivac can be placed on the clamping plate and connected to the power network according to chapter 8.3. If the testing operation is finished, the Multivac device can be put away to regain the required operation area for the respective valve seat refacing units (VGX-21 etc.).



The clamping plate must be in an even and horizontal position to provide a safe operation area for the Multivac. Use an external operation area for the device (workbench, side table etc.) if the clamping plate has to be inclined intensely (tilted valve seats). (Please pay attention to the maximum operation length of the suction hose L=2m to the cylinder head)

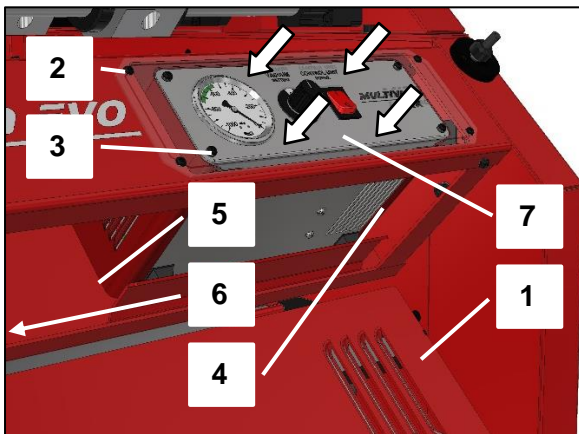


Fig. 3 - Multivac installed in HM-2000 EVO

### 8.2 HM-mounting of the multivac

The Multivac can be operated as a stand-alone device on the clamping plate of the HM-2000 EVO (similar to AV-Mobile startup) or fixly installed as following:

1. Unscrew the 6 pan head screws and remove the HM-service sheet (HM-front panel).
2. Remove the right HM-front cover.
3. Remove the 4 pan head screws on the Multivac front side.
4. Release the red Multivac cover sheet at the bottom side and move it back until it is flush mount with the Multivac front side => mount the right HM-front cover on to the front side of the Multivac (flush mount).
5. Connect the provided suction hose (of the HM-2000 EVO hose retractor) as well as the power cable to the Multivac.
6. Lead the power cable through the left cable bushing to the rear side of the HM-2000 EVO and connect it according to chapter 8.3.
7. Insert and mount the Multivac with the HM-front cover into the HM-front panel and carefully place the suction hose behind the Multivac (do not bend the hose intensely!)
8. Close the HM-service sheet.



#### **ATTENTION!**

The Multivac device must be connected in a de-energised mode! Isolate the device from the power network and secure it against unintended re-powering!

### 8.3 Connecting to the power network

#### 8.3.1 220-240VAC / 50-60Hz

The standardised power network for operation of the Multivac in the following countries: **Switzerland, EU, UK, Africa, Russia, Australia, Asia and parts of Latin America.**

=> The device can be connected directly to the local 230VAC power network or to the multiple socket / voltage transformer (HM-version 110VAC) of the HM-2000 EVO workstation via the provided Schuko or Swiss type power cable.

#### 8.3.2 100-125VAC / 50-60Hz

The standardised power network for operation of the Multivac in the following countries: **USA, Japan, Central America und parts of Latin America.**

=> The device can be connected directly to the local 110VAC power network or to the multiple socket (HM-version 110VAC) of the HM-2000 EVO via the provided Nema 5-15 power cable.

## 9 Leak tests

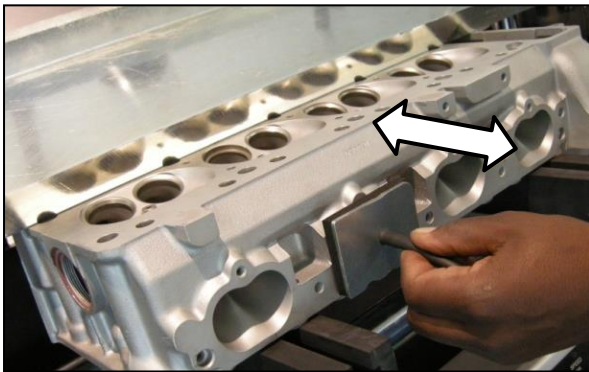
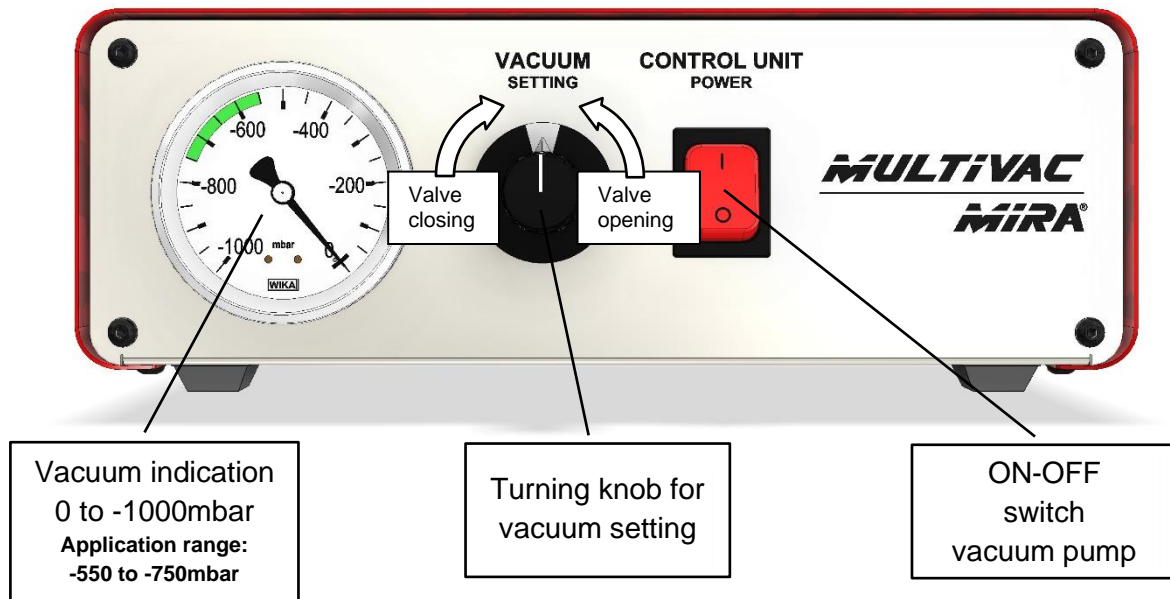


Fig. 4 - Leak test on a cylinder head

The leak test with the Multivac vacuum testing unit is taking place after the complete refacing of the valve seats.

For a leak test after the valve seat refacing, it is sufficient enough to insert the clean valves into the valve stem guide and let them rest on their dead weight. The clearance of the valve stem guide will be causing an insignificant loss during the leak test.



### **Pay attention:**

**Avoid sucking in dirt and liquids. If the vacuum pump is polluted, it is possible that the testing vacuum cannot be accomplished anymore.**

**Testing surfaces have to be cleaned properly before applying any Multivac adaptor. Keep the adaptors in a clean and proper condition!**

**Do not bend the vacuum hose during operation and leak testing.**

1. Select the required diameter-size for the adaptor (corresponding to cylinder head) and apply the adaptor on to the suction hose of the Multivac.  
=> you may use Vaseline® for easy plug-in of the adaptor in the suction hose end.
2. Switch the ON/OFF switch of the Multivac unit to position 1. => vacuum pump ON!
3. Turn the knob of the vacuum setting clockwise until the arrow is in the white sector of the setting indication and the knob cannot be turned any further. (Thus, the vacuum valve will be closed and the testing vacuum can be established)
4. Pull out the selected adaptor with the vacuum hose from the hose retraction and apply the adaptor on to the testing area of the cylinder head.
5. Testing vacuum will be established and indicated => the reference range of the vacuum is green.
6. Turn the knob of the vacuum setting anti-clockwise. (The vacuum valve opens = vacuum is falling).
7. Take off the adaptor from the testing area and retract the vacuum hose.
8. Switch the ON/OFF switch to position 0. => vacuum pump OFF!

If the leak test is continuing after step 7, turn the knob of the vacuum setting clockwise to re-establish the vacuum for the next testing area. Repeat steps until the cylinder head is tested completely.

## 9.1 Additional applications

Beside the leak tests (main application), the Multivac can be used in a variation of further applications which are, if carried out carefully and correctly, fully adequate to the designated Multivac application range:

### 9.1.1 Vacuum tests

Operated on the running engine for intake vacuum or ignition timing tests etc. The Multivac device can therefore be used as a vacuum gauge control and does not to be connected to the power network (power-off mode => remove the power cable!).

### 9.1.2 Function control of vehicle components

Therefore, all vacuum controlled components on a vehicle (different carburettor functions, retardation valves, vacuum power door locks etc.) can be checked for correct functionality. A built-in pressure difference control allows a precise setting of any desired vacuum.

### 9.1.3 Leakage tests

For example: on power brake vacuum boosters, vacuum amplifiers and vacuum diaphragms.



**The advices below have also to be considered for the additional applications:**

**Avoid sucking in dirt and liquids. If the vacuum pump is polluted, it is possible that the testing vacuum cannot be accomplished anymore.**

**Testing surfaces have to be cleaned properly before applying any Multivac adaptor.**

**Keep the adaptors in a clean and proper condition!**

**Do not bend the vacuum hose during operation and leak testing.**

## 9.2 Troubleshooting

The following check questions are designed to help you eliminating possible sources of faults:

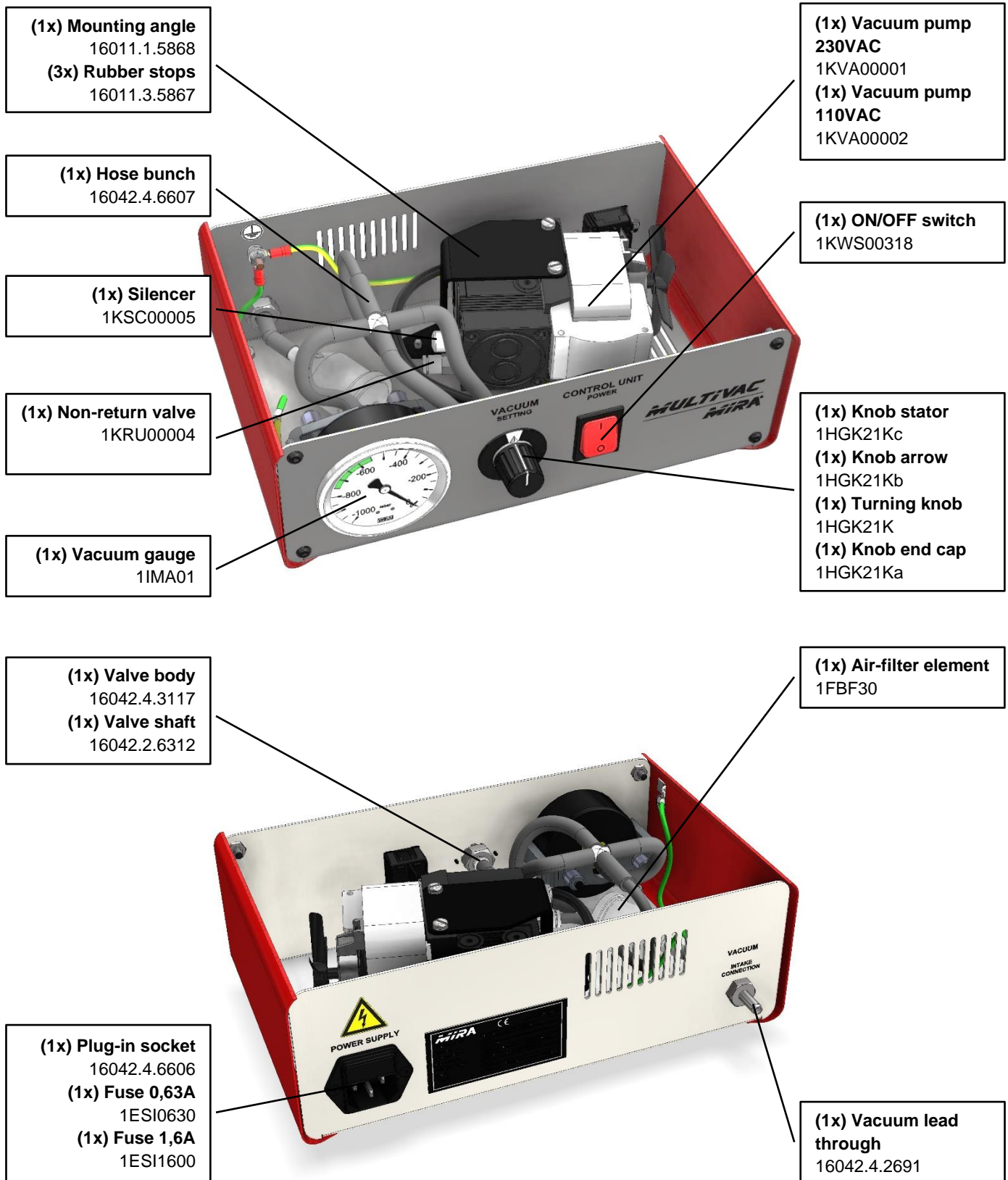
1. Is the power supply connected properly? (Local power network / multiple socket => Multivac)
2. Are all plugs connected correctly?
3. Are there any lose contacts?
4. Is the plug socket or the multiple socket functioning properly?
5. Is the 0,63A / 1,6A fuse from the Multivac in a proper condition?
6. Is the ON-OFF switch from the device in the „ON“ position? Is it illuminated?
7. Is the vacuum hose polluted with dirt?
8. Are the hoses installed correctly?
9. Are the cables connected properly to the vacuum pump?
10. Is the vacuum pump defective?
11. Is the vacuum adjusting defective?
12. Has the clearance from the valve to the valve stem guide been checked, according to the engine manufacturer's recommendation?
13. Is the valve seat clean?

If the **malfunction** still occurs **after the troubleshooting**, please refer to our technical support at MIRATOOL via [sales@minelli.ch](mailto:sales@minelli.ch)

## 10 Spare parts

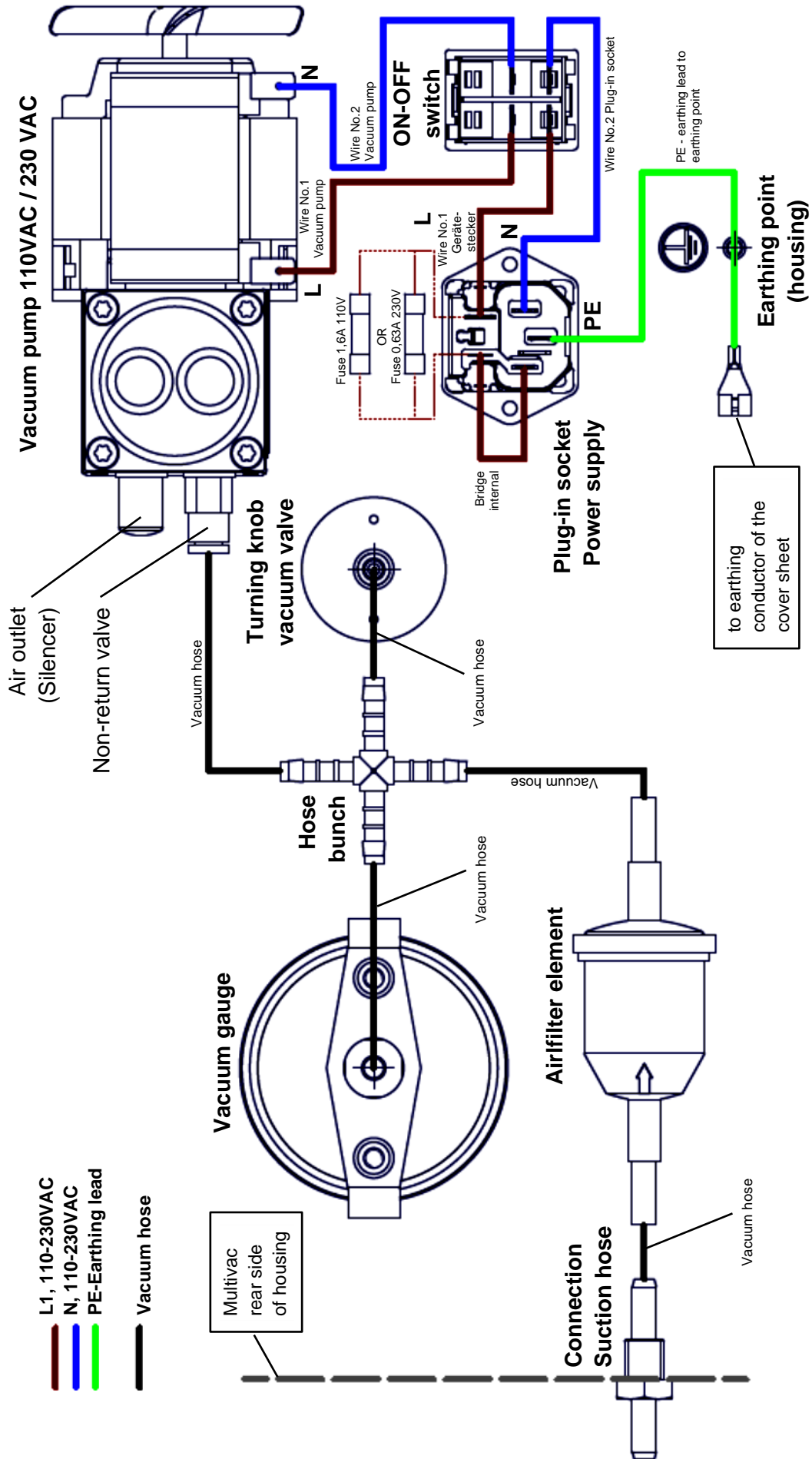
From Fabrication.No.: MUV-102      Serial-No.: 0318

When ordering spare parts, the serial- and fabrication number must always be indicated.





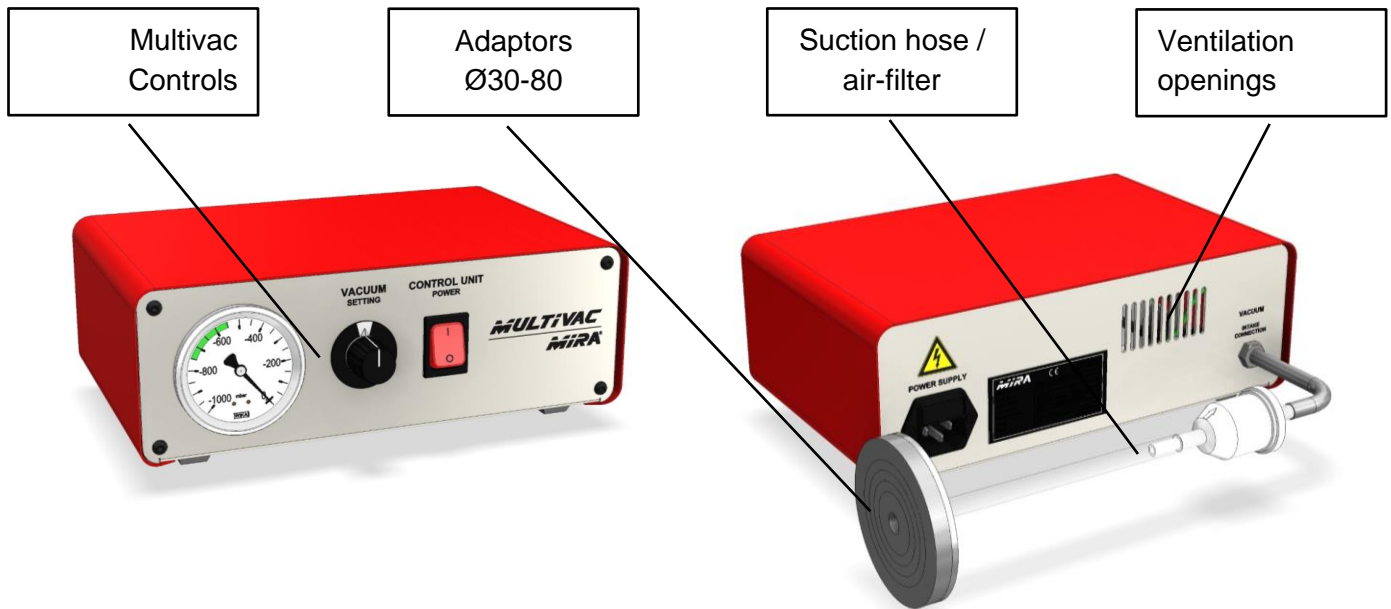
11 Schematic diagramm



## 12 Maintenance

Servicing and maintenance can be held at a minimum if the Multivac will be operated properly and without any modifications. The use of warm water and a cleaning cloth are recommended for cleaning the uncoated and powder-coated surfaces. Do not use any abrasive cleanser (acid, base, wire wool etc.) for surface cleaning.

The following parts and assembly groups should be considered especially for the maintenance:



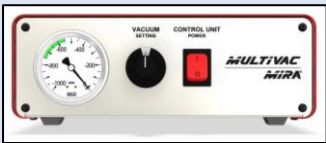

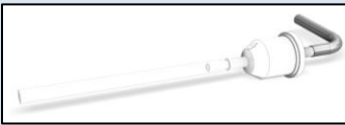

### MAINTENANCE RATE

(Increase, if pollution is higher than anticipated)

#### Weekly

#### Monthly

#### Annually

	Weekly	Monthly	Annually
<b>Controls</b> 	In case of pollution: Cleaning of the front panel with a clean soft cloth. Do not use abrasive cleanser!	Checking control elements for correct functioning.  Check the turning knob of the vacuum setting for leak-tightness.	Replacing as needed  <b>Contacting manufacturer if control elements are defective or damaged</b>
<b>Adaptors Ø30-80</b> 	-Clean the rubber pads with a soft and clean brush and store the adaptors in a dry environment -Check rubber pads for damages and wearing off	Check connection fitting of the adaptors for damages  Replace respective adaptors if necessary	<b>If the rubber pads are wearing off from the adaptors or experience corrosion, replace the respective adaptors.</b>
<b>Suction hose / air-filter</b> 	-Clean with a soft and moist cloth and let the suction hose drying. (Use only water) -Check the suction hose for damages and bends	Check the air-filter and replace it if polluted or damaged	/
<b>Ventilation openings</b> 	/	Check the ventilation openings on the rear and bottom side of the Multivac and clean them with a vacuum cleaner if polluted.	/

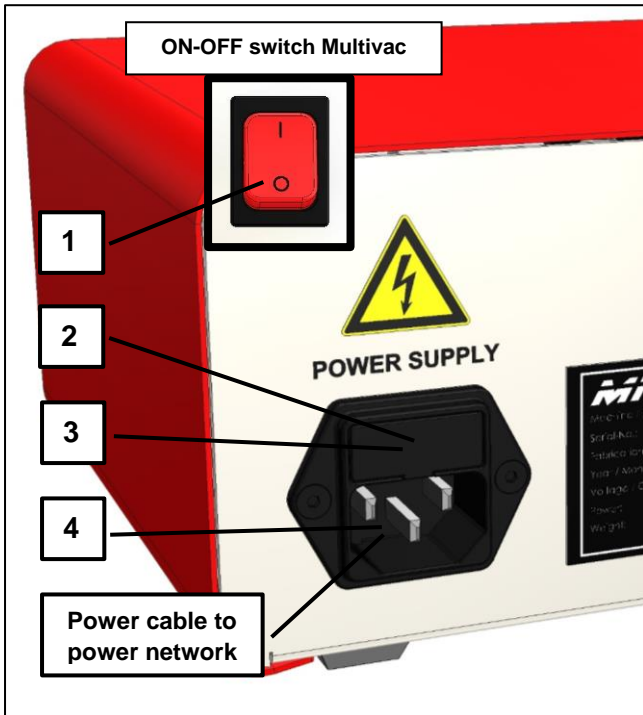
### 12.1 Fuse for Multivac

The Multivac device is secured with a **0,63A (230VAC) / 1,6A (110VAC) fuse** on the power supply side. In case of replacing the fuse, please follow the steps below:



**ATTENTION!**

The Multivac device must be connected in a de-energised mode! Isolate the device from the power network and secure it against unintended re-powering!



1. Switch the ON-OFF switch to position 0 (OFF) and disconnect the power cable from the left side.
2. Draw out the fuse bin and replace the defective fuse with a new one (max. 1pc.).
3. Insert the fuse bin back inside the plug-in socket.
4. Connect the power cable again to the left side of the Multivac.



**Spare fuse:**

Order-No.: **1ESI0630**  
 (Range of use **230VAC, 50Hz**)  
 Order-No.: **1ESI1600**  
 (Range of use **110VAC, 60Hz**)

Connect the Multivac to the power network and launch it for operational use.



For fuse replacing from the fixly installed Multivac in the HM-2000 EVO, please follow the respective instruction manual of the HM-2000 EVO workstation.

Fig. 5 - Replacing the fuse of the Multivac

### 13 Technical data

The following specifications are in context with the Multivac device. Specifications for other devices (VGX-21) and equipment can be reviewed in the respective instruction manuals.

**MULTIVAC**

<i>Dimensions Multivac:</i>	<b>270x180x70mm (width x depth x height)</b>
<i>Weight:</i>	<b>5kg</b>
<i>Type vacuum pump:</i>	<b>Diaphragm pump with AC electric motor</b>
<i>Range of vacuum:</i>	<b>-550 to -750mbar (max.-800mbar)</b>
<i>Length of the suction hose:</i>	<b>2000mm</b>
<i>Power supply:</i>	<b>230VAC, 50Hz / 110VAC, 60Hz</b>
<i>Type power cable:</i>	<b>Schuko (EU) / Swiss type / USA (Nema 5-15)</b>
<i>Nominal Power:</i>	<b>80W</b>
<i>Fuse:</i>	<b>1x0,63A (230VAC) / 1x1,6A (110VAC)</b>



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Manufacturer and worldwide distributor:

MINELLI CORPORATION  
Mattenstrasse 3  
8330 Pfäffikon ZH  
Switzerland

[www.miratool.ch](http://www.miratool.ch)

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Your local distributor: