puls-air
HEIZGERÄTE

Operating and maintenance instructions
TÜV test reports
CE Declaration of Conformity

Honoured with the Bavarian State Prize 2008
and the Austrian State Prize
for energy research and the environment.

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Operating and maintenance instructions

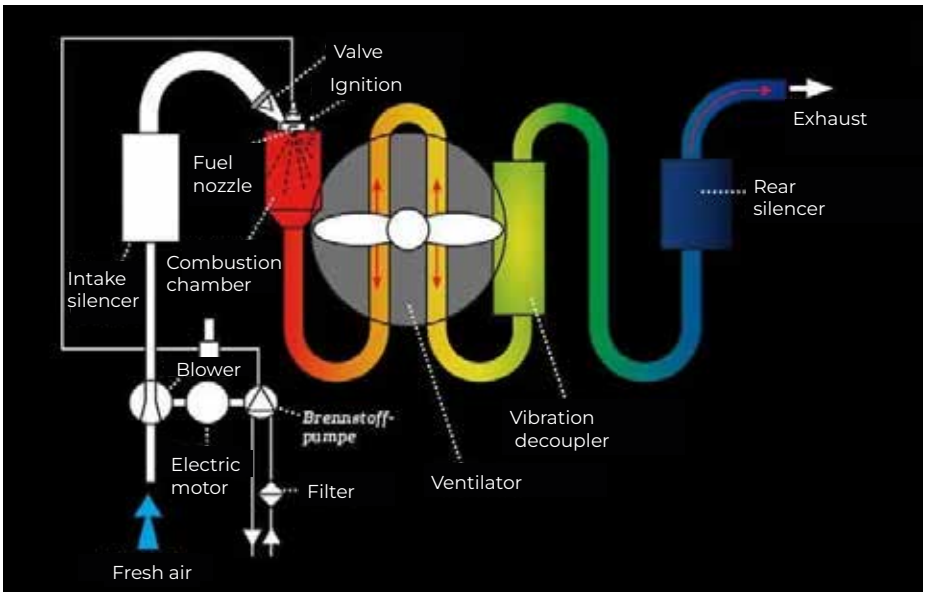
1. General description

In contrast to the oil and gas burners with continuous combustion that have been used in large numbers to date, this heater utilises a new pulsating combustion process. In this system, an oscillating gas column occurs in the 'exhaust pipe' between the combustion chamber and the oscillation decoupler during operation. The gas changes its flow direction 62 times a second and the pressure in the combustion chamber changes just as often between negative and positive pressure. The resulting high flow turbulence achieves the finest fuel distribution, which leads to excellent exhaust gas values. Soot or crusts never form in the combustion chamber or on the flue gas ducts. This means heat transfer of consistent quality.
Due to the overpressure created in the combustion chamber, the exhaust gases are blown out automatically, just like in a motor vehicle piston engine. Thermal buoyancy of a chimney is not necessary. The flue gas pipe consists of a stainless steel pipe with an outer diameter of 35 mm (32 x 1.5 mm = 35 mm outer diameter). As with a car exhaust pipe, it is not necessary to clean this pipe.

The pulse-air burner is equipped with a standard oil atomising nozzle. Ignition electrodes, ignition transformer and control unit as well as oil pump and filter unit are also commercially available parts. Burner safety is guaranteed by a maintenance-free vacuum switch.

The burner has a 2-stage design for better adaptation to the required output. Separate adjustment of the combustion air is not
The burner automatically draws in more air at higher fuel pressure and less air at reduced pressure.

Schematic of the system:



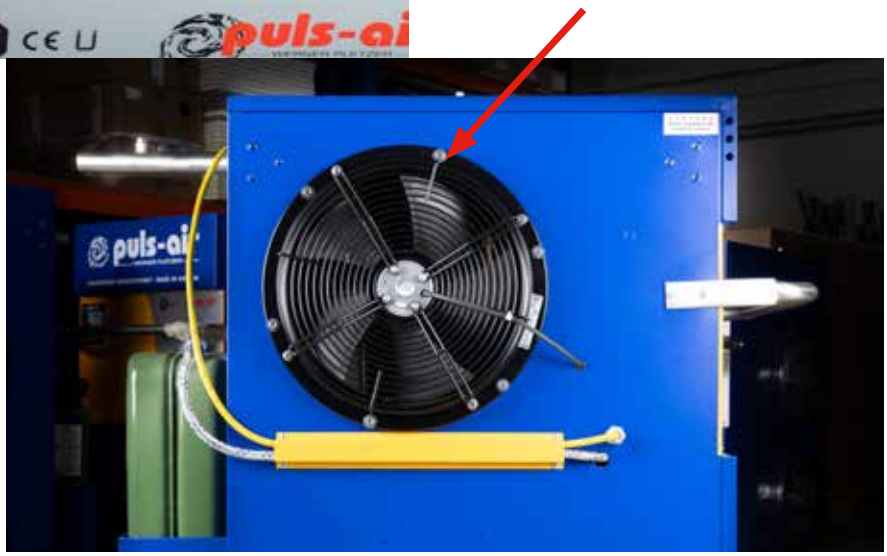
2. General important notes

1) The Puls-air heaters must be commissioned exactly in accordance with the operating instructions.

2) If components on the appliance are modified, this will invalidate any warranty and the manufacturer‘s liability.

3) The flue gas system must be installed as described in the text and illustration. The flue gas must not be released into the room under any circumstances and must be routed outside via the roof!

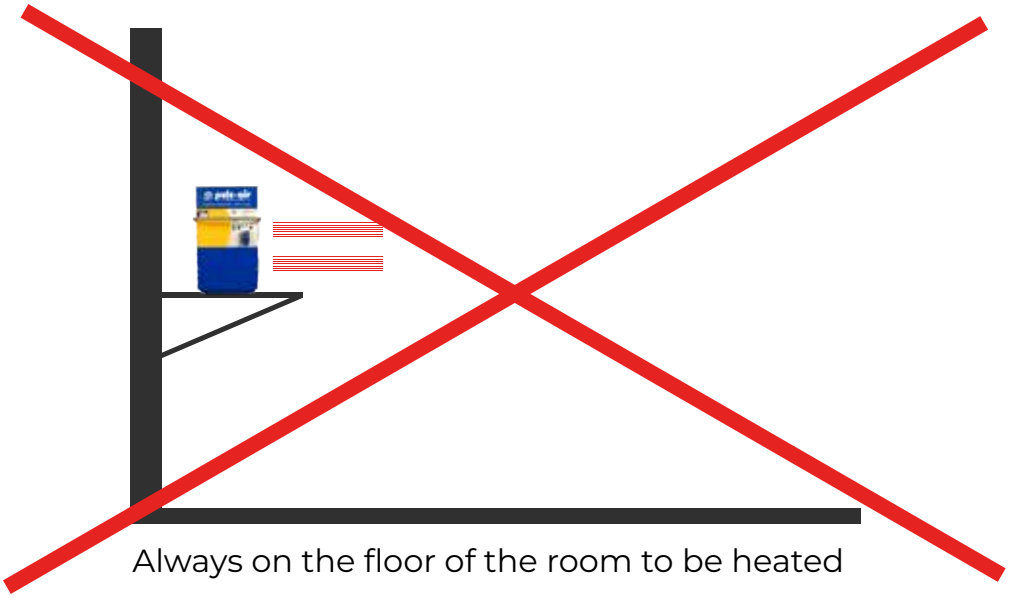
4) The overtemperature switch must be pressed if the appliance is disconnected from the power supply during operation, e.g. due to a power failure or by disconnecting it from the power supply. The fault button does not light up and the appliance does not react when switched on. To be able to press the overtemperature switch, the large cover must be removed at the top using the 2 screws. The overtemperature switch is located on the yellow electrical box. Remove the plastic cap and carefully press the button with a small screwdriver. It should be noted that the fan switches on approx. 3 minutes after the appliance is started, as the overtemperature switch also operates if the fan is faulty.



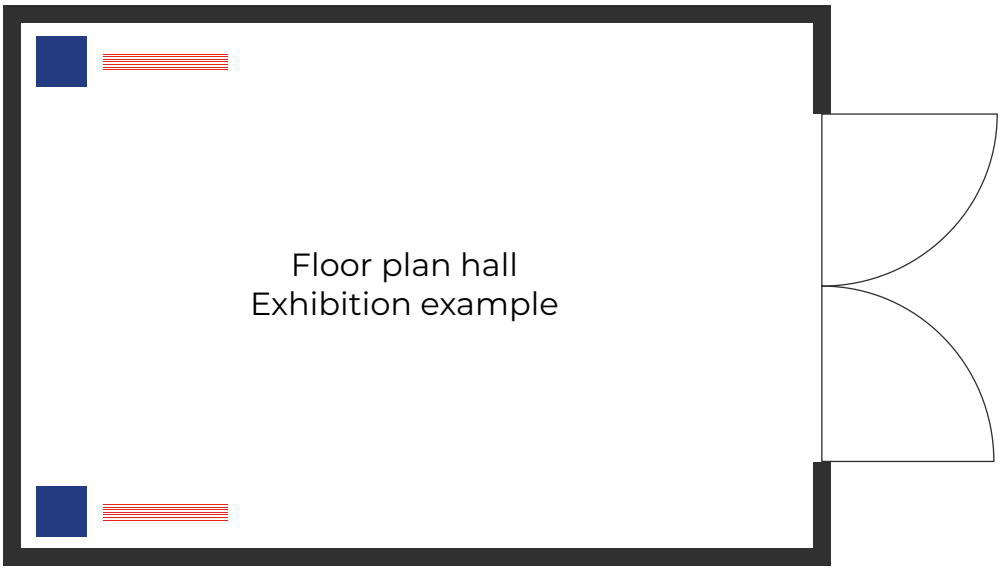
3. Installation site

- Always on the ground

Min. 30 cm distance from the wall



Always on the floor of the room to be heated



4. Fuel supply

Fuel:

- Heating oil extra light, ÖNORM C 1109
- Diesel
- EL heating oil, DIN 51603-1
- For companies in alpine altitudes: ‘polar diesel’

Variant 1: Refuelling the canister on the appliance

- Use a clean container.
- Store oil in accordance with legal regulations.
- Use a funnel with sieve for filling!
- Do not run out of fuel and top up in good time.
- Never leave fuel or fuelled appliance in the cold -> heating oil flocculates or stagnates -> appliance cannot be started.

Variant 2: Connect the appliance to a larger heating oil tank (recommended):

- Professional installation by a heating engineer.
- Connect the tank and appliance with an 8 mm copper pipe (outer diameter).
- ATTENTION: The tank must not stand in the cold due to flocculation of the heating oil.
- Max. Max. length 30 m.
- Max. Max. height difference between appliance and tank 3.5 m.
- Fit the pipe with a non-return valve.
- Vent the pipe.
- Connect the pipe to the appliance.
- Never leave fuel in the cold -> heating oil flocculates or stagnates -> appliance cannot be started.

5. Exhaust system

Variant 1: Stationary use

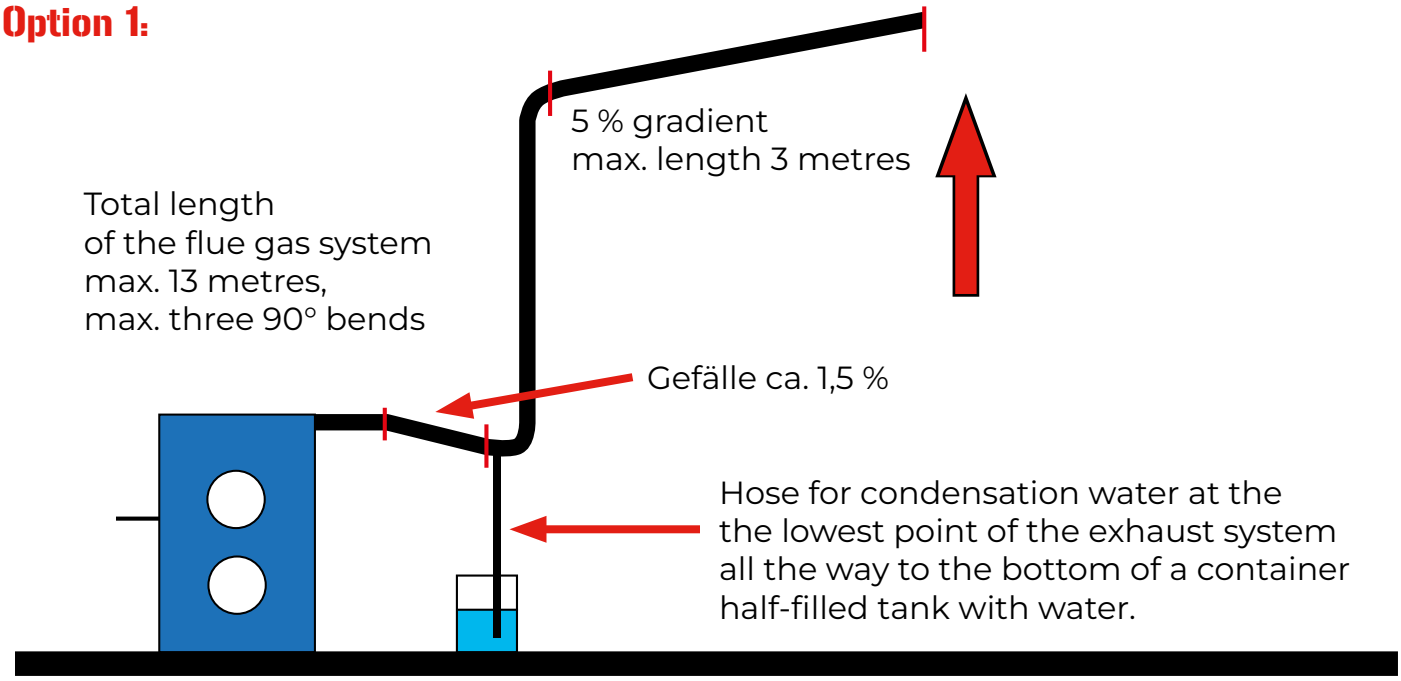
Exhaust system = 35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter) above roof. NO CHIMNEY NECESSARY!

1. Place the Puls-air device on the floor of the room.
2. Maintain a distance of at least 30 cm from the wall.
3. Weld a 90° welding elbow (32 x 1.5 mm = 35 mm outer diameter) to the device.
4. Drill an 8 mm hole at the bottom of the elbow. (For condensation water)
   Weld the 8 mm pipe to the hole and lead a hose down into a container half-filled with water (20 litres) so that the condensation water can drain off.
5. Route flue gas with 35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter) via the roof to the outside. NO ADDITIONAL CHIMNEY IS REQUIRED,
   THE STAINLESS STEEL PIPE IS THE FLUE GAS SYSTEM! (TÜV tested)
6. Optional: For pressfittings, the seals must have a temperature resistance of > 150 degrees.
7. Max. Length of the exhaust system 13 metres, maximum three 90° bends.

According to the TÜV SÜD test ‘Exhaust gas discharge from an oil-fuelled hot air heater’, the Puls-air must be operated with a 35 mm stainless steel exhaust pipe (32 x 1.5 mm = 35 mm outer diameter). The exhaust gases must be channelled outside.

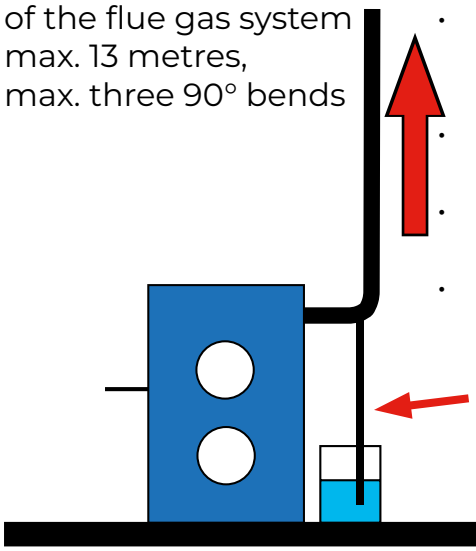
Sketch: Stationary use
Always route exhaust gas through the roof to the outside!

Option 1:



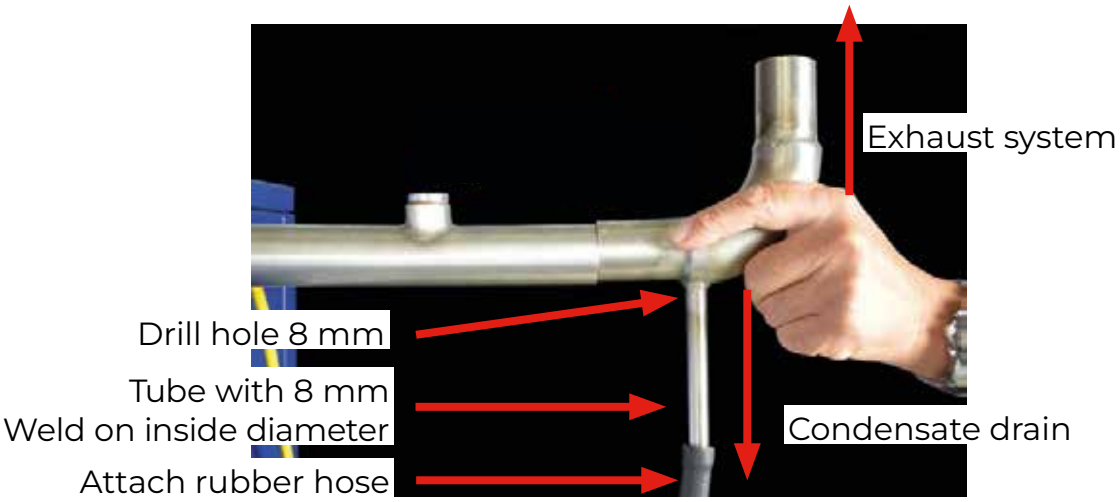
- Max. Exhaust system length: 13 metres, max. three 90° bends
- 35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter) away from the appliance: 1.5 % gradient to the condensate drain
- Gradient with horizontal distortion of the flue gas pipe: 5 % with a maximum length of 3 metres
- Must be reported to the chimney sweep, see operating instructions.
- Purpose: The condensation water should be channelled to the condensate drain. Run the hose for condensation water at the lowest point of the flue gas system right to the bottom of a container half-filled with water. See pictures!

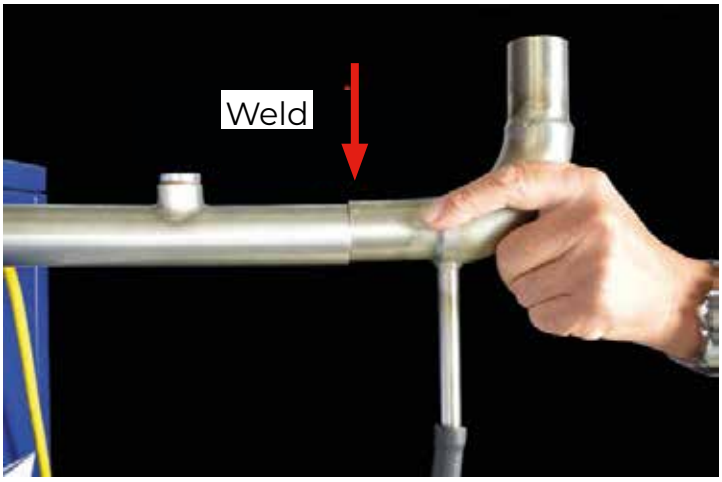
Option 2:

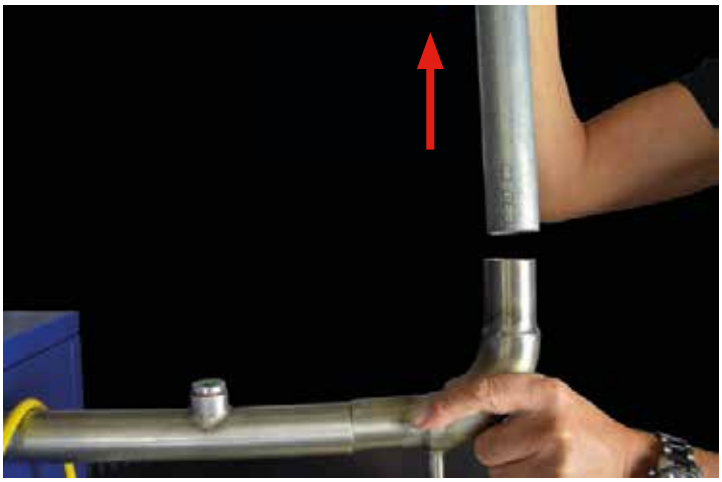


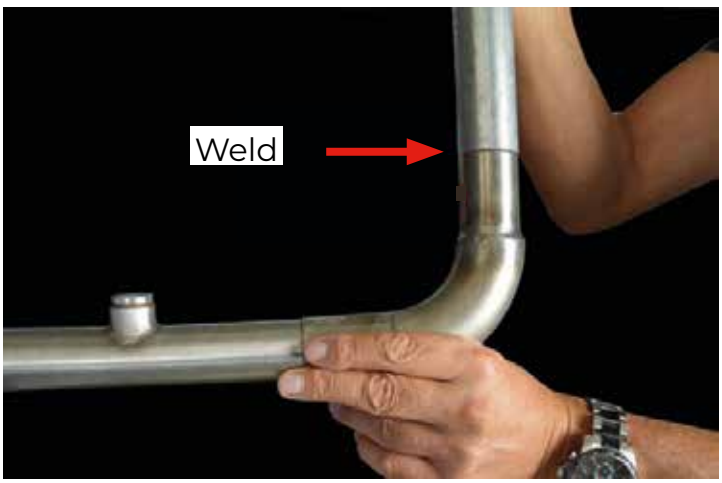
- Max. Length of the flue gas system: 13 metres
- 35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter) away from the appliance: 1.5 % gradient to the condensate drain
- Incline with horizontal distortion of the flue gas pipe: 5 % with max. length of 3 metres
- Obligation to report to chimney sweep, see operating instructions.
- Purpose: The condensation water should be channelled to the condensate drain.
  Run the hose for condensation water at the lowest point of the flue gas system right to the bottom of a container half-filled with water.

Exhaust pipe material:
35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter,
material 1.4404 unannealed), wall thickness 1.5 mm.


Exhaust system
Drill hole 8 mm
Tube with 8 mm
Weld on inside diameter
Attach rubber hose
Condensate drain

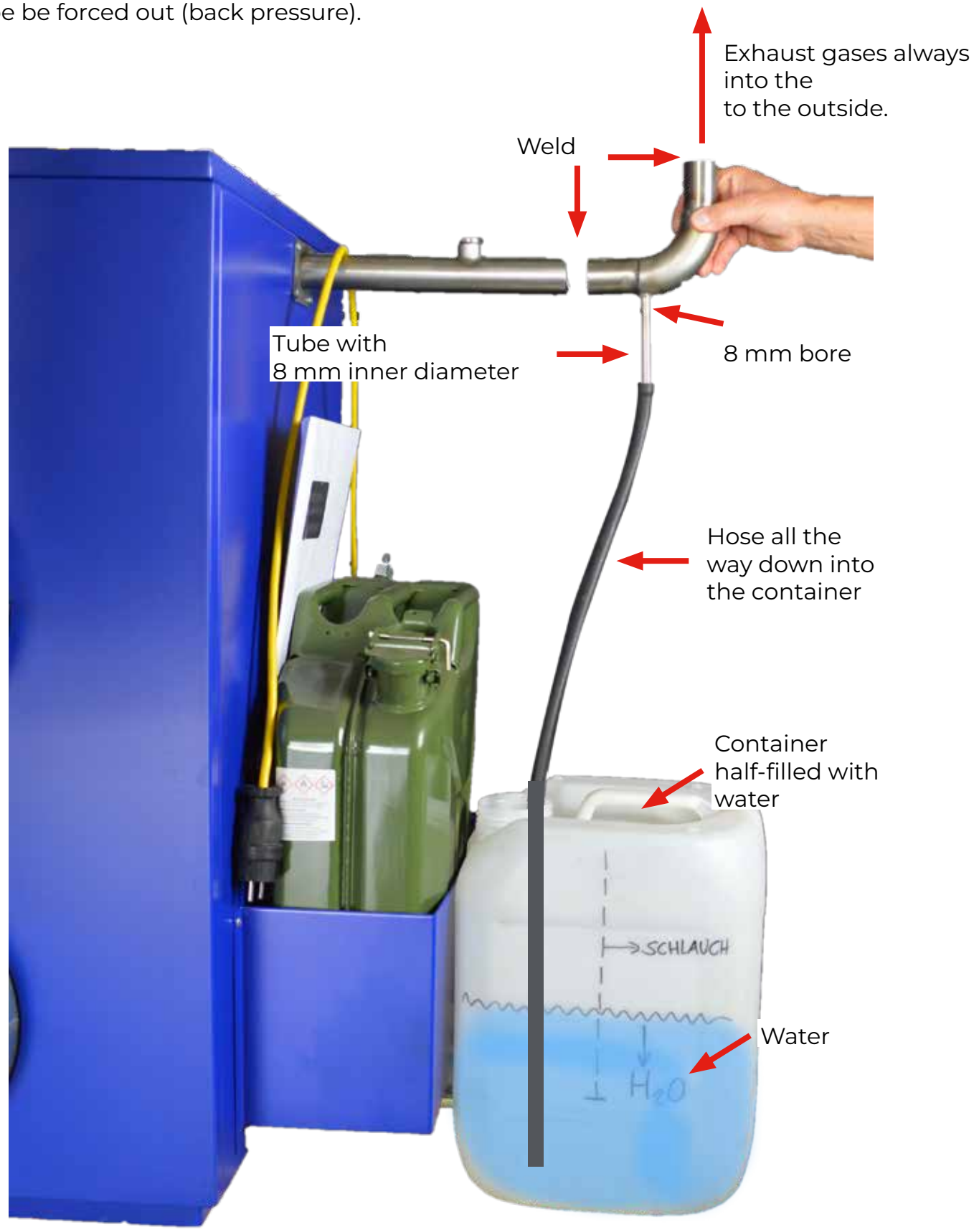

Weld




Weld

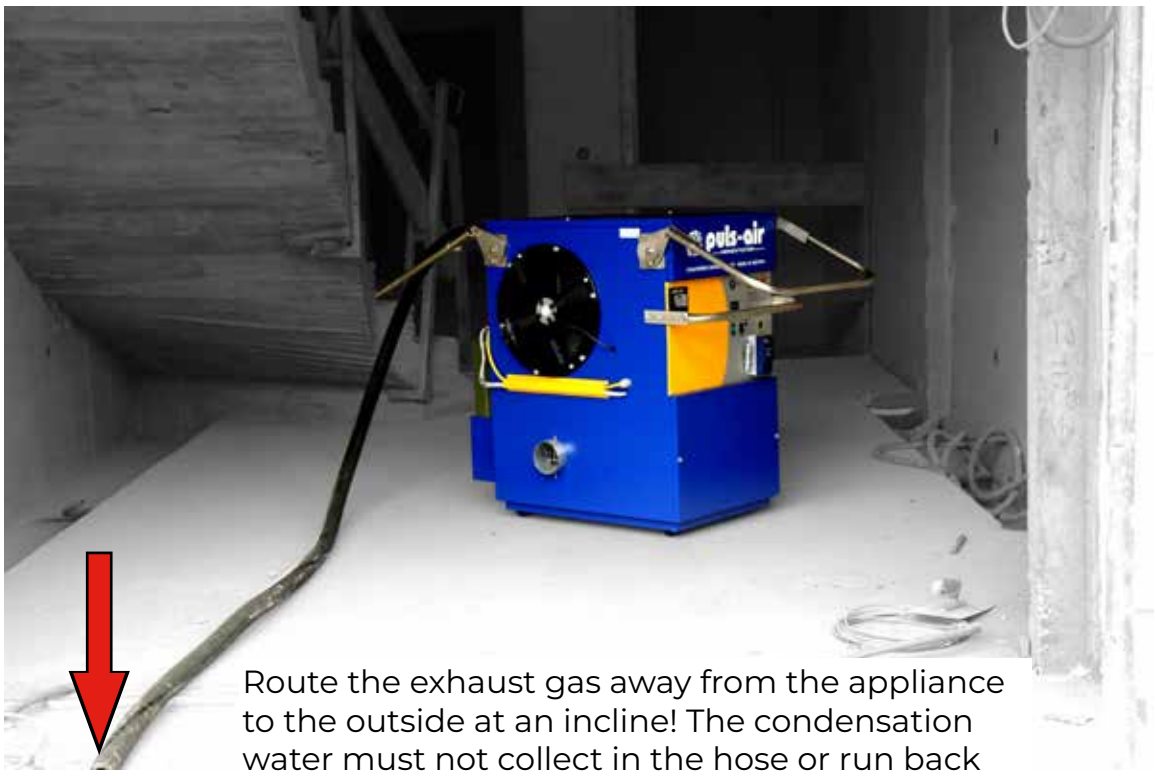
Condensate drain

The condensate drain must be installed according to the pictures and sketches.
The condensate drain keeps the flue gas system free and the flue gas can escape.
can escape. The condensate container is half filled with water so that the flue gas cannot be be forced out (back pressure).



Variant 2: Mobile use of the device

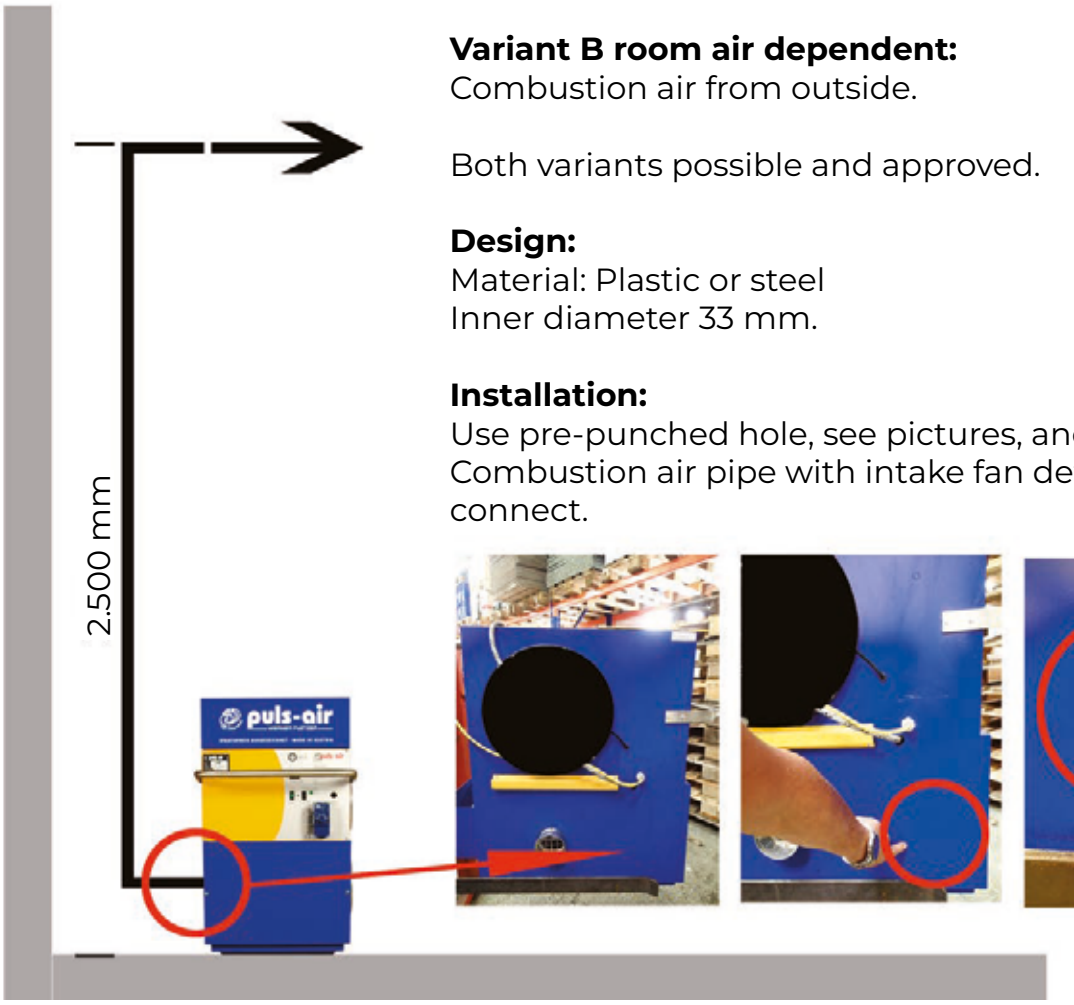
- Exhaust gas with 1.5 % gradient and 35 mm stainless steel pipe (32 x 1.5 mm = 35 mm outer diameter) to the outside or with flue gas hose (industrial hose 35x6 mm 15 bar) (construction site use) to the outside.
- ALWAYS ROUTE EXHAUST GAS TO THE OUTSIDE.



Route the exhaust gas away from the appliance to the outside at an incline! The condensation water must not collect in the hose or run back into the appliance!

6. Combustion air supply - Requirement for car workshops

The combustion air for the warm air heater must be drawn in via a sufficiently tight air intake at a height of at least 2.5 m above the floor.
The combustion air pipe must at least fulfil the requirements for the tightness of flue gas systems. Can also be made of plastic. The cross-section of the combustion air pipe must be selected according to the diameter of the running fan intake connection.



Variant A room air dependent:
via intake snorkel 2.5 m above floor, see sketch.

Variant B room air dependent:
Combustion air from outside.

Both variants possible and approved.

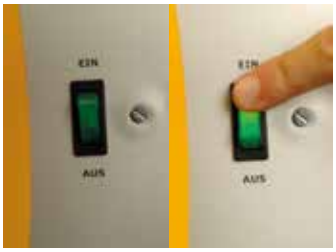
Design:
Material: Plastic or steel
Inner diameter 33 mm.

Installation:
Use pre-punched hole, see pictures, and Combustion air pipe with intake fan detachably connect.

7. Establish power connection

- Connect the appliance to the 230 volt plug.

8. Start the appliance



- Set the green switch to ‘ON‘
- Select power level (power level 1 or power level 2)
- Set the thermostat to the desired temperature.

9. Set temperature

- Set the desired room temperature on the thermostat located on the appliance.
- The Puls-air heater then regulates its running times so that the set temperature is maintained.

10. Switch off the device

- Set the green switch to ‘OFF’.
- NEVER disconnect the appliance from the power supply to switch it off, due to overrunning
- Never interrupt the after-running process due to overheating The fan continues to run for approx. 3 minutes and then switches off automatically.

11. Nozzle

- Only use Danfoss brand oil burner nozzle 0.4 - 45°S
- Pump pressure Puls-air Standard 17.5 kW: 1st stage 10 bar, 2nd stage 12 bar
- Pump pressure Puls-air Plus 23.5 kW: 1st stage 12 bar, 2nd stage 17 bar
- Both Puls-air heaters (Puls-air Standard and Puls-air Plus) are operated with the same nozzle.

12. Interference button:

When the fault button lights up, wait 3 minutes. Press the button after 3 minutes

13. Fuse:

Overtemperature switch jumps in the event of fan failure or power cut-off
Fuse can be pushed back in with a screwdriver. Where is the
fuse? See component description in the appendix. Air to be heated is channelled over hot metal parts in the appliance.

14. Device authorisation

Test no. 2209117-2 TÜV SÜD LGÖ
Tested in accordance with European directives
According to Ö-Norm EN 13842
CE tested see declaration of conformity

15. Manufacturer

Ing.W. Pletzer, Autoh.-Puls Air e. U.
Innsbrucker Straße 10, 6363 Going am Wilden Kaiser
ATU 31880809

16. Service and customer service:

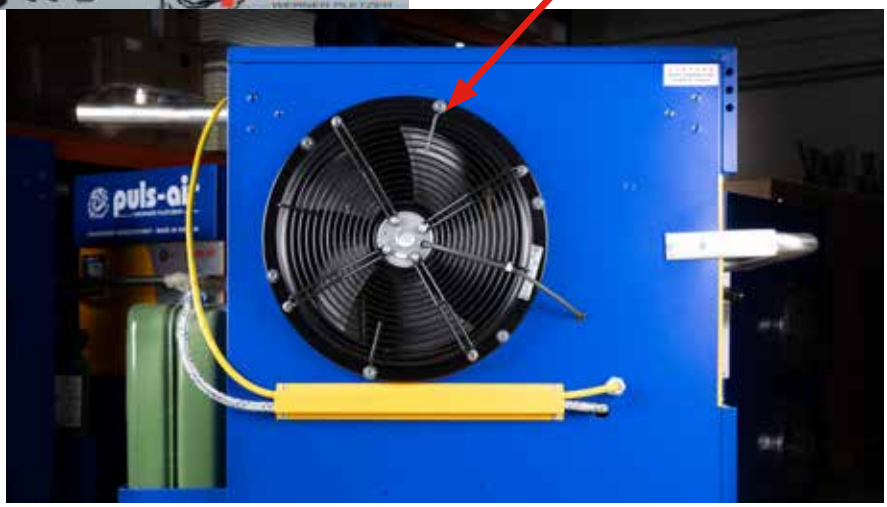
Monday to Friday 7.30 - 12.00 and 13.00 - 17.00,
Tel for GER, CH: + 43 5358 3600
Tel for AUT: + 43 664 20 15 883
The operating instructions must be read carefully and observed!
Any modifications to the appliance will invalidate the warranty!

17. Maintenance:

The required annual maintenance (see www.pulsair.net/wartungsfilm/) can be carried out independently.

18. Overtemperature switch: Disconnection from the power disconnection or power failure during operation

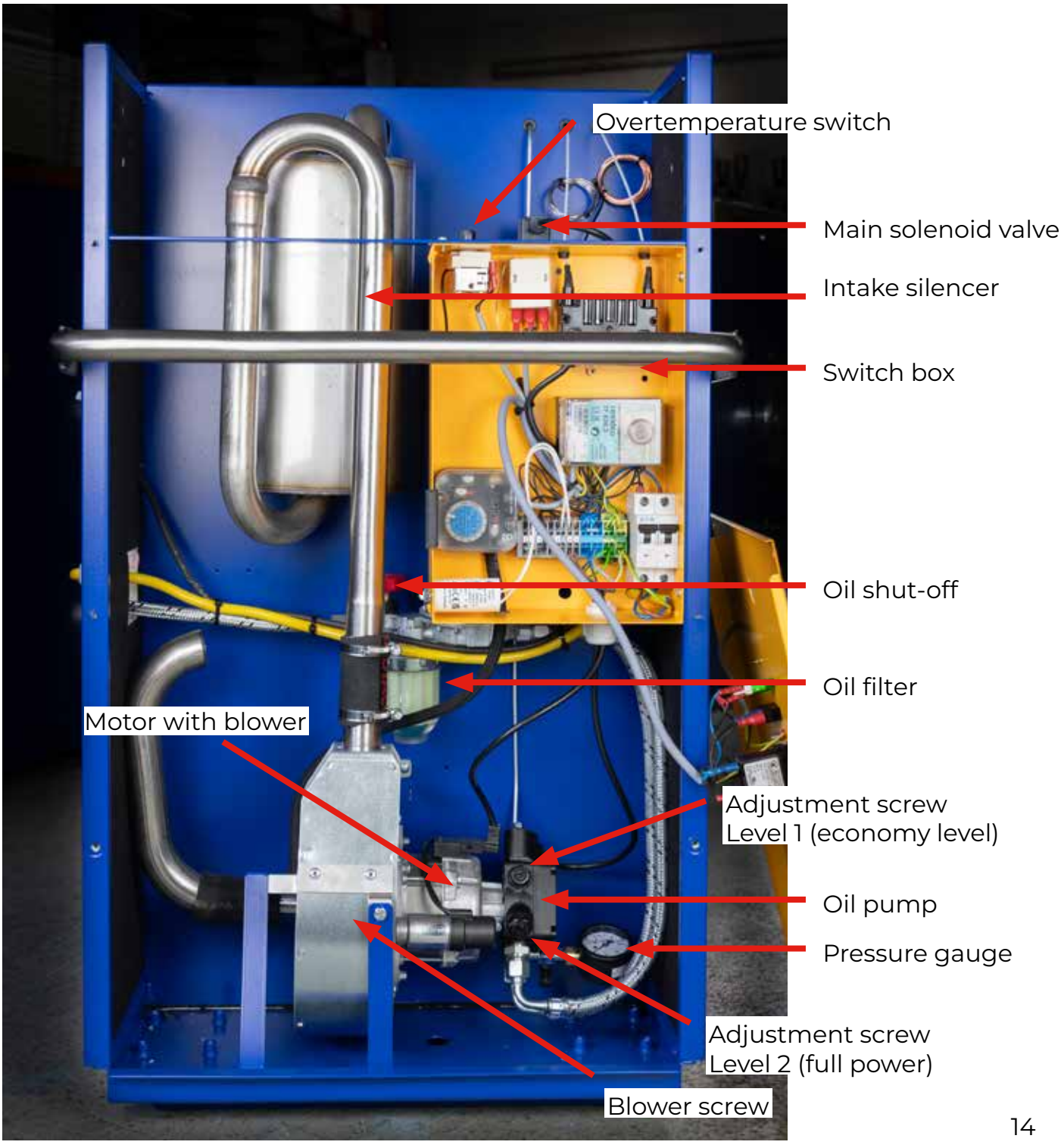
The appliance must never be disconnected from the power supply during operation. The reason for this is that the combustion unit is cooled down by the fan after combustion. If the appliance is disconnected from the power supply during operation, e.g. due to a power failure or unplugging, the overtemperature switch is activated. This prevents the appliance from restarting after 'overheating', e.g. if the fan is defective. When the appliance is disconnected from the power supply, cooling of the burner
burner stops cooling and the overtemperature switch is activated. Behaviour of the appliance: The fault button does not light up and the appliance shows no reaction when switched on. To be able to press the overtemperature switch, the large top cover must be removed using the 2 screws. The overtemperature switch is located on the yellow electrical box. Remove the plastic cap and carefully press the button with a small screwdriver. Make sure that the fan switches on approx. three minutes after starting the appliance, as the overtemperature switch also operates if the fan is faulty.



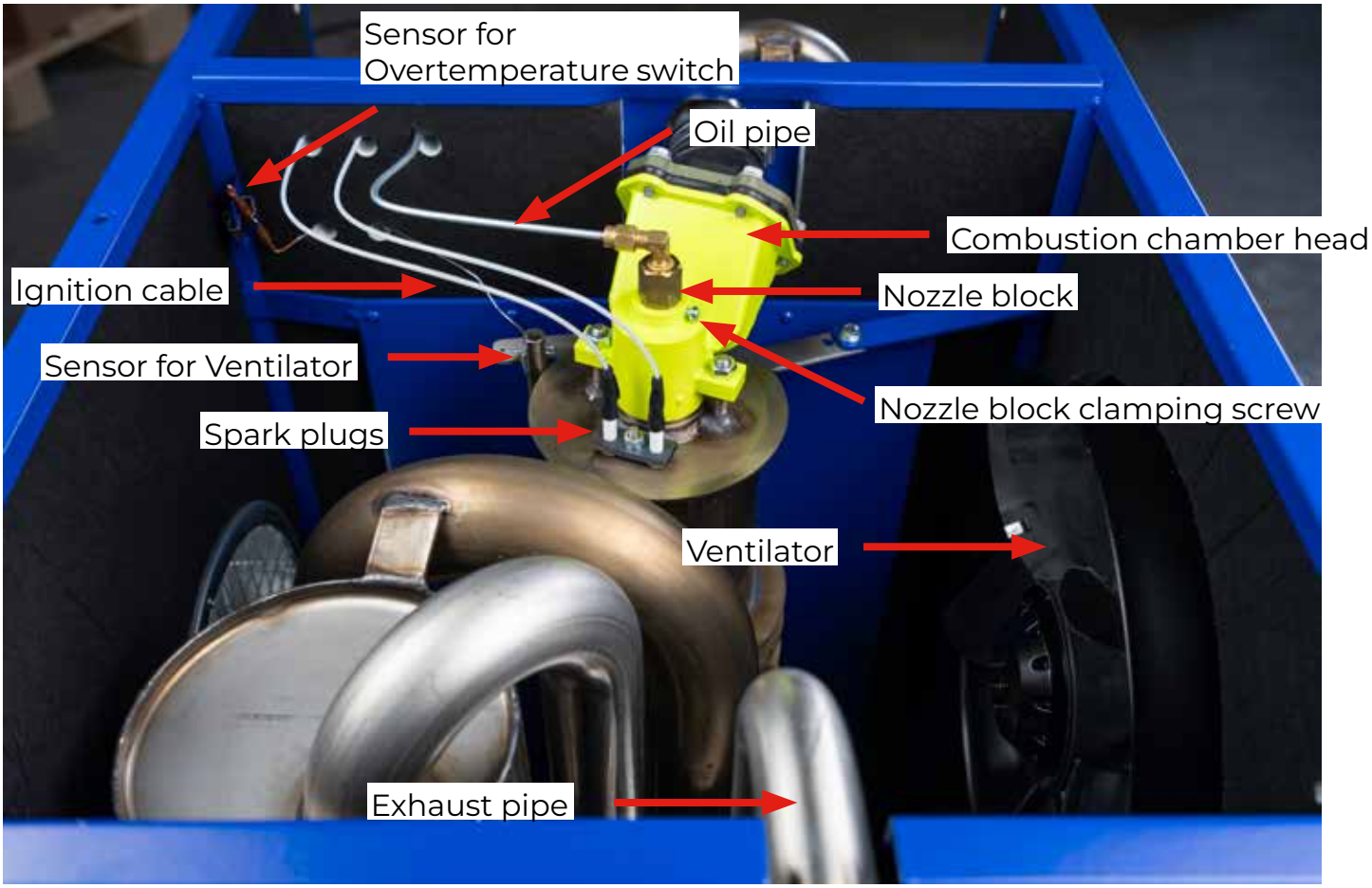
19. Inspection by the chimney sweep:

- According to the expert opinion of the Federal Association of Chimney Sweeps - Central
  Zentralinnungsverband (ZIV), Dr Stehmeier (Technical Director) and Dipl.-Ing. Seelbach (Technical Consultant), an annual inspection by the chimney sweep is chimney sweep is mandatory in both Austria and Germany.
- Part of this inspection:
  Flue gas measurement, visual inspection of combustion unit and flue gas system.
- The Puls-air product is subject to compulsory chimney sweep registration

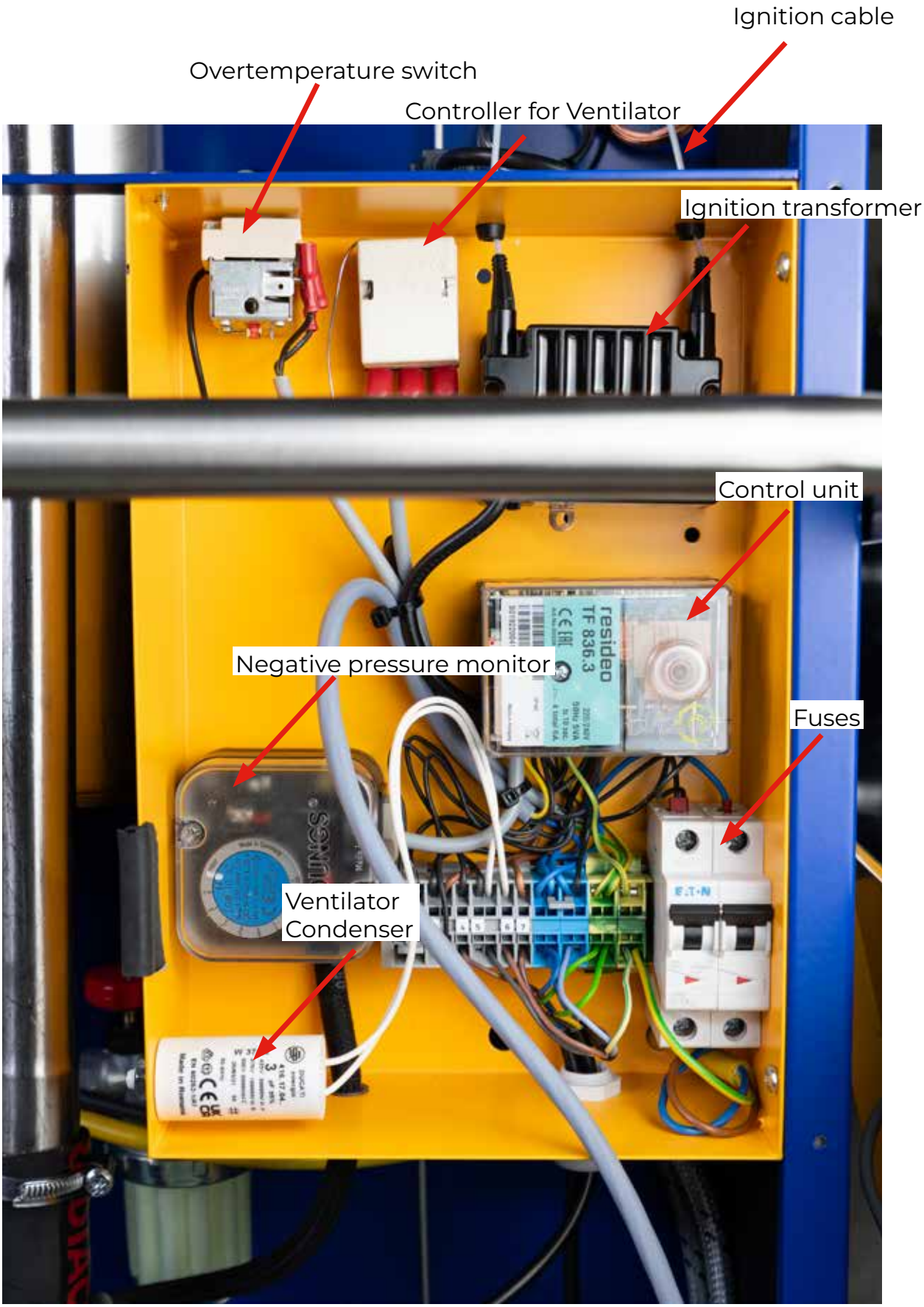
20. Illustrations and component description



Firing unit:


Sensor for
Overtemperature switch
Oil pipe
Combustion chamber head
Ignition cable
Nozzle block
Sensor for Ventilator
Nozzle block clamping screw
Spark plugs
Ventilator
Exhaust pipe

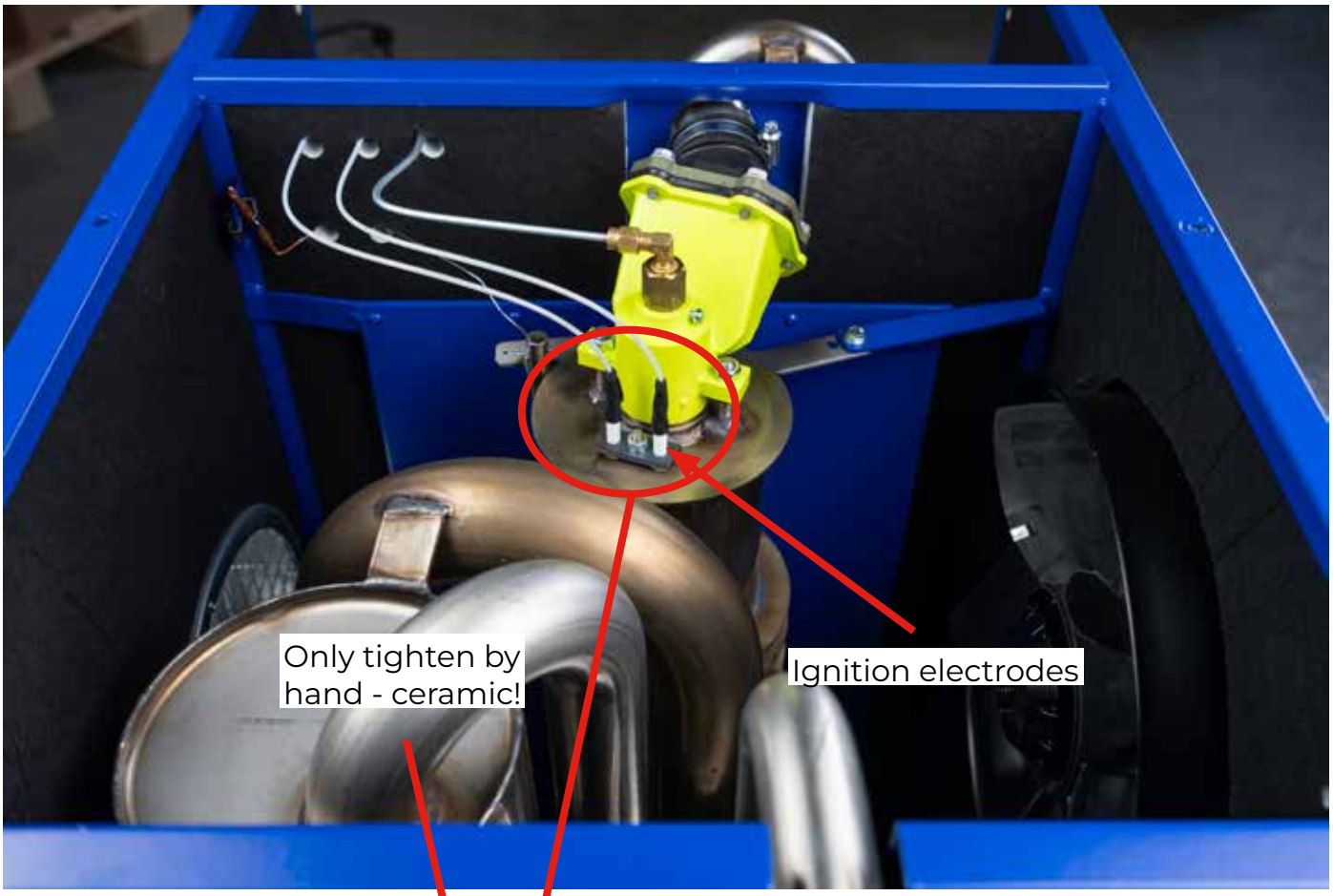
Switch box

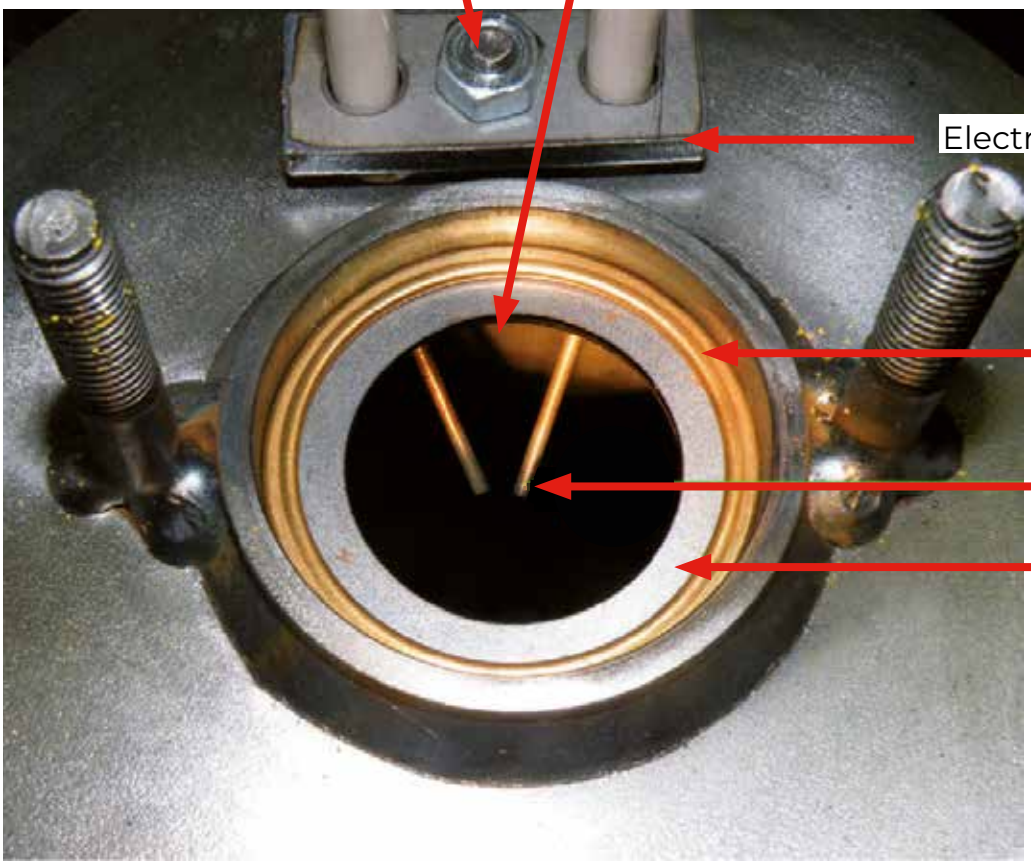

Ignition cable
Overtemperature switch
Controller for Ventilator
Ignition transformer
Control unit
Negative pressure monitor
Fuses
Ventilator
Condenser

Combustion chamber head

Ignition electrodes

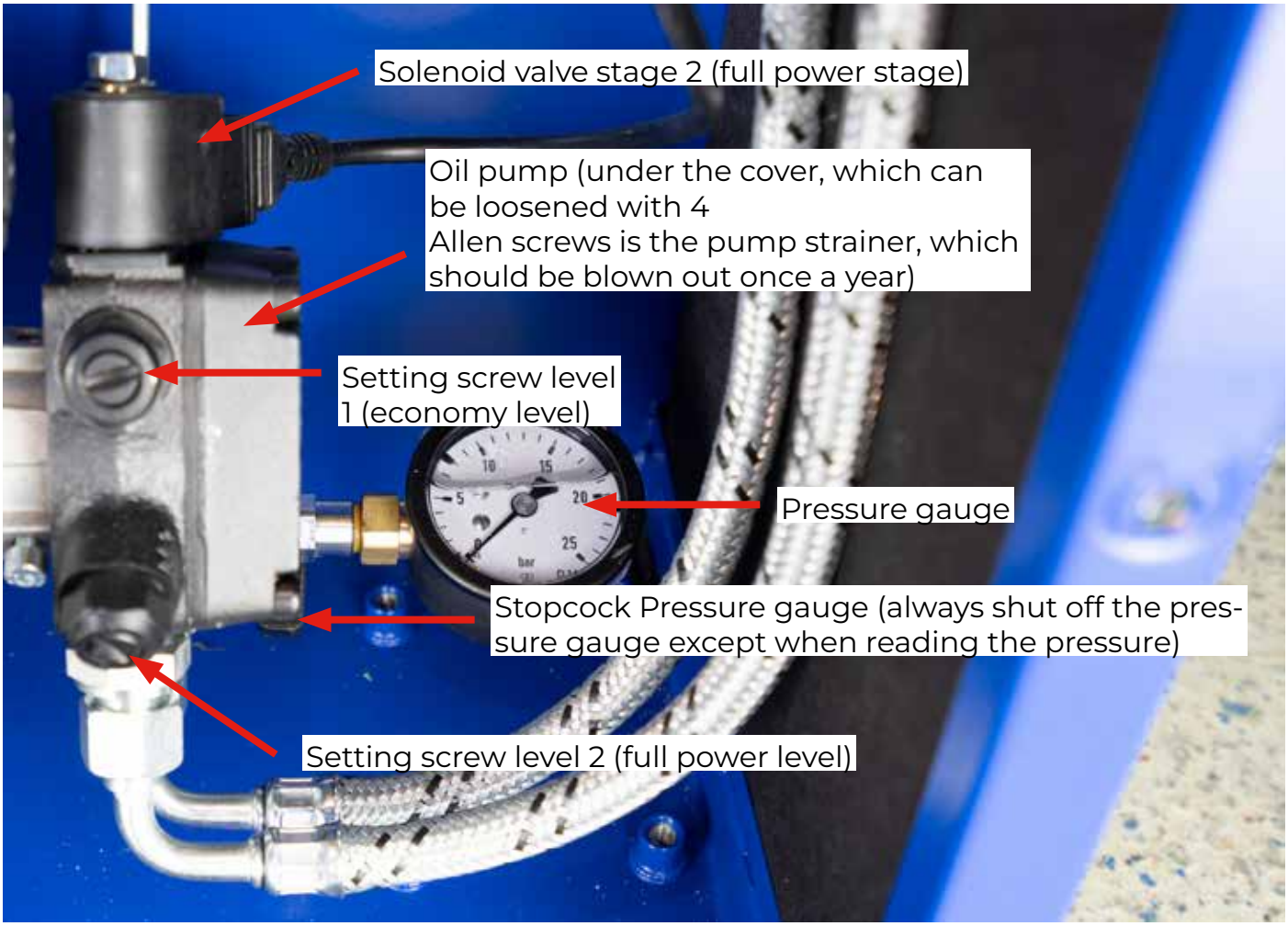
By removing the combustion chamber head, you can see the ignition electrodes.
ignition electrodes. The distance must be 3 mm. Only tighten the bridge hand-tight!





Oil pump with pressure gauge

The pump pressures are stated on the rating plate -> Do not change the pressures!



Vacuum switch for flame monitoring

Set to 1.5 mbar

EG-KONFORTMITÄTSERKLÄRUNG

gemäß Maschinenrichtlinie 2006/42/EG

Der Hersteller

Ing. W. Pletzer, Autoh.-Puls Air e.U.
Innsbrucker Straße 10
6353 Going

erklärt hiermit in alleiniger Verantwortung, dass die nachstehend beschriebene Maschine:

Bezeichnung: **PULS AIR**

Typen: **PRM1**

Eigenschaft: **Warmlufterhitzer**

übereinstimmt mit den Bestimmungen der EU-Richtlinien 2006/42/EG (Maschinenrichtlinie), 2014/35/EU (Niederspannungsrichtlinie) und 2014/30/EU (EMV-Richtlinie) und zwar mit den folgenden relevanten Fundstellen:

EN ISO 12100:2010	Sicherheit von Maschinen – Allgemeine Gestaltungsleitsätze – Risikobeurteilung und Risikominderung
EN 60335-2-102:2006 + A1:2010	Sicherheit elektrischer Geräte für den Hausgebrauch und ähnliche Zwecke – Teil 2-102: Besondere Anforderungen für Gas-, Öl- und Festbrennstoffgeräte mit elektrischen Anschlüssen
EN 61000-6-2:2005	Elektromagnetische Verträglichkeit (EMV) – Teil 6-2: Fachgrundnormen – Störfestigkeit für Industriebereiche
EN 61000-6-3:2007 + A1:2011	Elektromagnetische Verträglichkeit (EMV) – Teil 6-3: Fachgrundnormen – Störaussendung für Wohnbereich, Geschäfts- und Gewerbebereiche sowie Kleinbetriebe

Diese Erklärung ist nur in Verbindung mit einer in allen angegebenen Punkten geprüften und unterzeichneten Übergabeerklärung gültig. Durch Umbau und Veränderung an der Maschine sowie bei Nichtbeachtung der Bestimmungen der zugehörigen Bedienungs- und Montageanleitungen verliert diese Erklärung ihre Gültigkeit. Diese Konformitätserklärung gilt nicht für eingebundene fremde Komponenten außerhalb des Produktprogrammes.

puls-air
HEIZGERÄTE

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