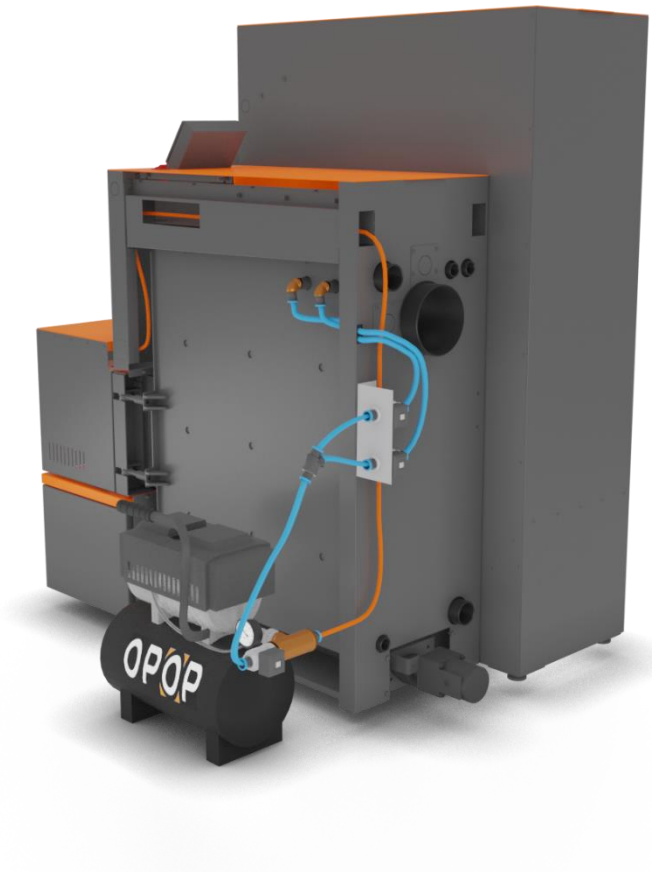



# KOMPRESSOR CLEANING

## USER & INSTALLATION MANUAL

Compressor cleaning of the burner and the heat exchanger can be installed on boilers of the Biopel MINI series from 10 to 40kW and further on boilers of the Biopel v9 PREMIUM series up to 80kW.

Compressor cleaning extends the interval required for manual cleaning of the burner and the boiler heat exchanger, thus increasing the automation of the device and adding user comfort that is at the highest level in its class. Read the manual carefully to familiarize yourself with the installation of the device, its activation and subsequent use.

OPOP spol. s.r.o. I Zašovská 750, 757 01 Valašské Meziříčí I tel.: +420 722 454 250 I www.opop.cz

## CONTENT

## 1. TECHNICAL PARAMETERS

You will find the following parts in the package of the compressor cleaning of the burner and the heat exchanger:

1. 1pc oil-free compressor Silent
2. 2 pcs of heat exchanger tubes small
3. 2 pcs of heat exchanger tubes long
4. 4pcs elbow brass pipe for connecting small and long heat exchanger tubes
5. 3 solenoid valves (1x for burner cleaning, 2x for heat exchanger cleaning)
6. 3 pcs connecting cable (for connecting the solenoid valve with an external socket on the boiler)
7. 3 pcs of binding strap black
8. 2.5m polyurethane hose, D8, 0.8MPa
9. 2m polyurethane hose, D12, 0.8MPa
10. 2pcs burner cleaning tubes
11. 1pc socket brass T-piece G1 / 2 "
12. 1pc reduction external G1 / 2 "- external G1 / 4"
13. 1pc reduction internal G¾ "- external G1 / 2"
14. 5pcs reduction inner G¾ "- outer G3 / 8"
15. 5pcs push-in coupling, straight, 12mm, G3 / 8 ", OUTER THREAD
16. 1pc push-in coupling, straight, 8mm, G3 / 8 ", INNER THREAD
17. 2pcs nipple outer ½ "for 3/8"
18. 1pc push-in coupling U, 12mm
19. 1pc push-in coupling U, 8mm
20. 2 pcs of couplings 90 ° angular, 8mm
21. 1pc instructions for use

Damped oil-free compressor. Technical specifications:

- Capacity: 105 l / min
- Pressure vessel volume: 6-24 l
- Power: 0.6 kW / 0.46 kW
- Voltage: 230 V / 50 Hz
- Oil-free
- Engine speed: 1440 RPM
- Maximum pressure: 8 bar
- Height, width, depth: 46.5 x 17 x 49 cm
- Weight: 10 kg

Solenoid valves. Technical specifications:

- Type: Solenoid valve indirectly operated
- Voltage: 230 V / 50 Hz
- Maximum operating pressure: 10bar
- Minimum operating pressure: 0.5 bar
- Connection dimensions: internal ¾ "
- Normally closed: NC
- Max medium temperature: 75 ° C
- Medium: air

Polyurethane hoses. Technical specifications:

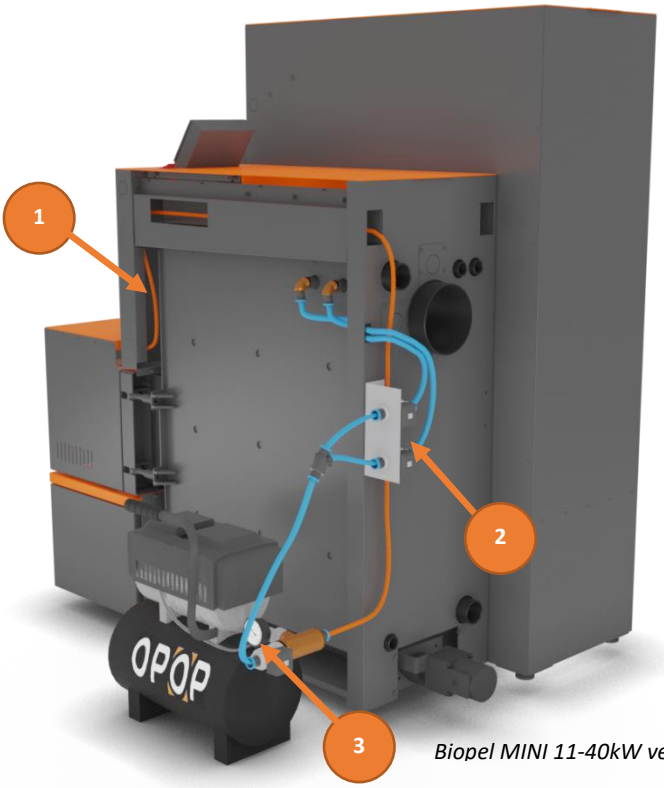
- Maximum operating pressure: 8MPa
- Outer diameter: 8mm, 12mm
- Max medium temperature: 60 ° C

## 2. BASIC DESCRIPTION

Compressor cleaning of the burner and the heat exchanger is performed using the same compressor. Hoses are connected to it so that the compressed air is led to the burner and the heat exchanger. This air is then let in by means of solenoid valves, which are controlled by the control unit of the boiler. The valves open independently of each other according to the settings in the boiler control unit.

The compressor set consists of 3 main parts:

1. Burner cleaning components
2. Heat exchanger cleaning components
3. Compressor and its components

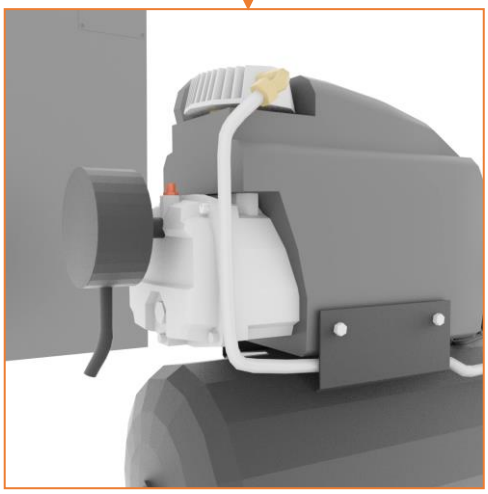


*Biopel MINI 11-40kW version*

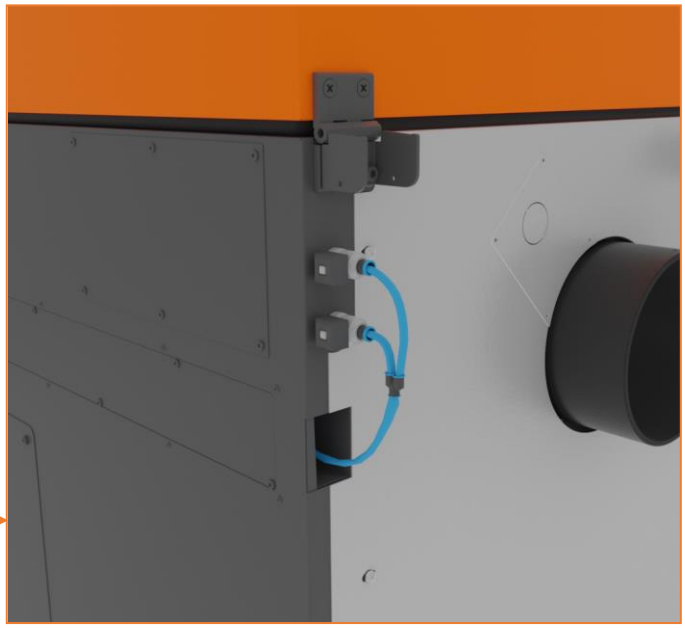
All components are ready for installation on the boiler and burner. A sheet metal "L" profile is installed in the rear part of the boiler, on which it holds 2 solenoid valves for cleaning the heat exchanger.

Make sure that all connections on the solenoid valves are tight so that no pressure escapes out of the compressor. If the pressure in the compressor is lost, then all connections must be checked. In most cases, leaking air can be heard.

Also install a black filter and condensate drip hose on the compressor itself. Without the filter fitted, the compressor is noisy. After installing the filter, the noise from the compressor will be reduced.



The only difference in the version for Biopel v9 PREMIUM 60 to 80kW is that the solenoid valves for exchanger cleaning are placed directly in the holes in the boiler casing and the exchanger cleaning tubes are 4. Otherwise, the connection is identical.



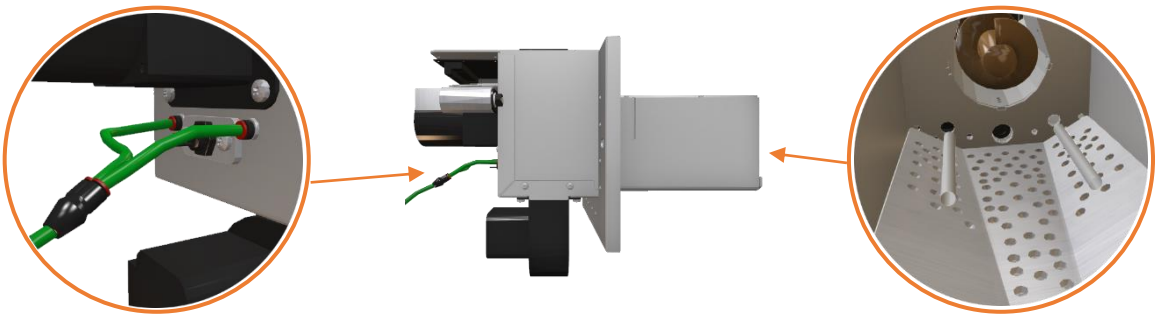
*Biopel v9 PREMIUM 60-80kW version*

## 3. INSTALLATION

The installation process consists of 4 steps. Installation of burner cleaning, installation of heat exchanger cleaning, compressor installation, electrical installation of solenoid valves and their connection to the external boiler socket.

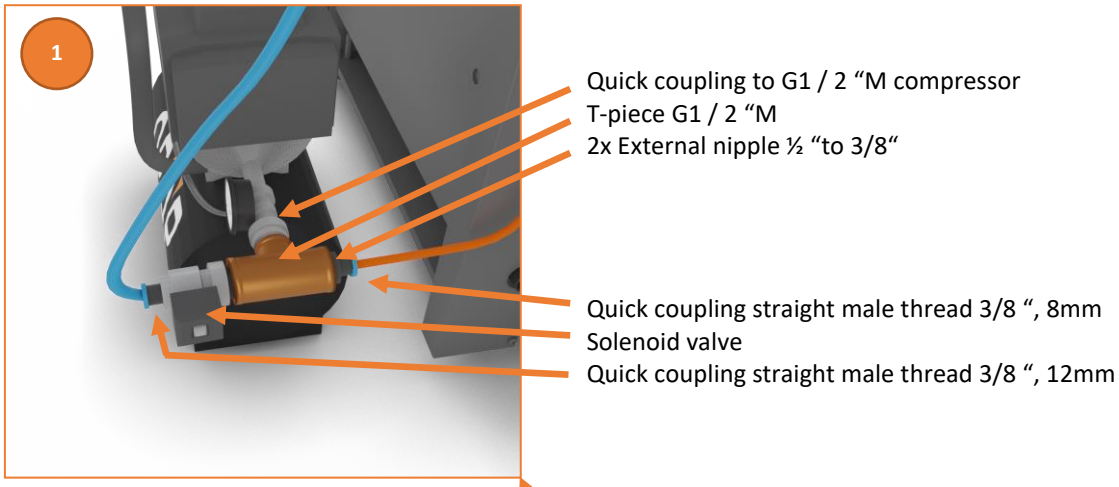
**Burner cleaning**

Two metal tubes are inserted into the burner. These are inserted from the side of the grate with their narrower side and are fixed on the back of the burner by means of 2 pieces of plastic cable ties to prevent their arbitrary movement. Connect 2 pcs of 90 ° angled 8mm connectors to the outlet of metal tubes. Connect 2 pieces of polyurethane hoses D8 to 8mm connectors and connect them to the plug-in coupling U, 8mm, which will then be connected to the compressor. See pictures below.



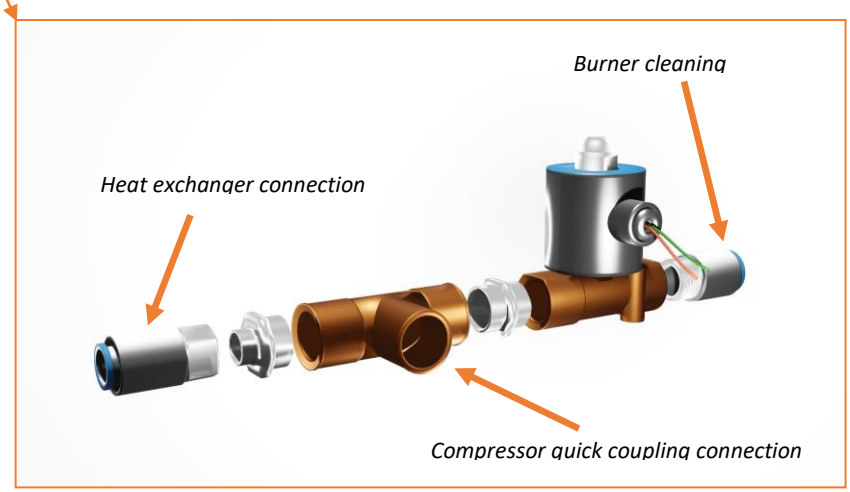
**Heat exchanger cleaning**

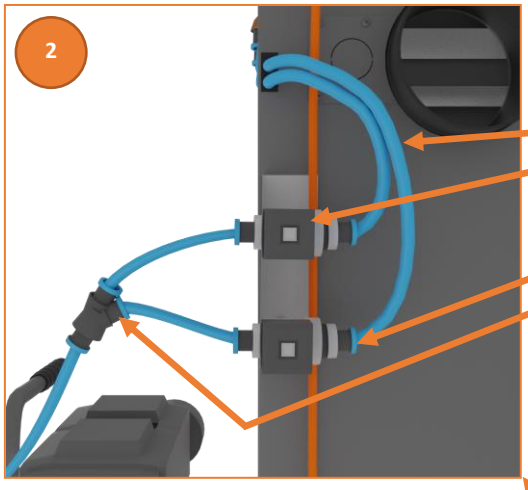
The heat exchanger tubes can be installed on the left or right of the boiler‘s heat exchanger. Therefore, decide in advance from which side you will install the heat exchanger cleaning. Thanks to the correct installation, according to the dispositions of the boiler room, you will have easy access to the heat exchanger cleaning from the boiler side.




This assembly (pictured right) is already assembled at the factory. Therefore, during installation, you only connect the entire assembly to the compressor using a quick coupler.

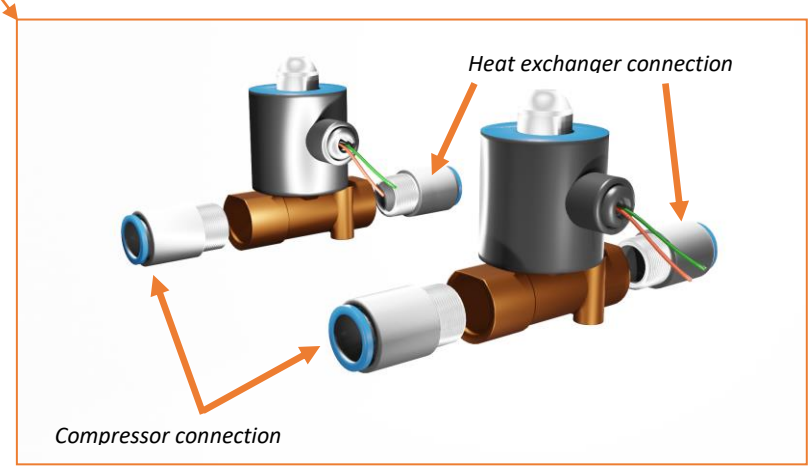
Then it is necessary to connect 2 types of hoses (blue 12mm and orange 8mm) to the burner and the boiler exchanger.





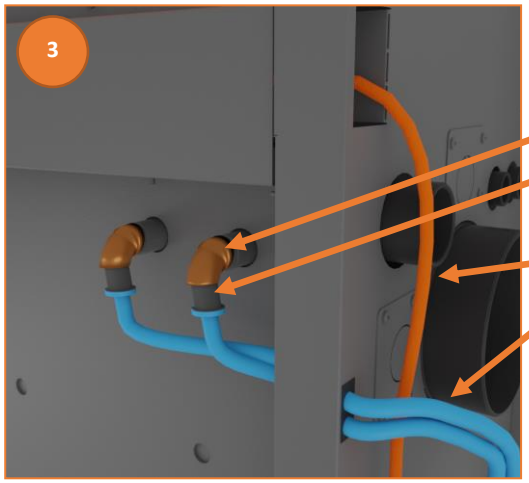

Hose to the boiler exchanger 12mm
2 pcs solenoid valve

4pcs quick coupling straight female thread 3/8 "
1pc quick coupler Y 12mm



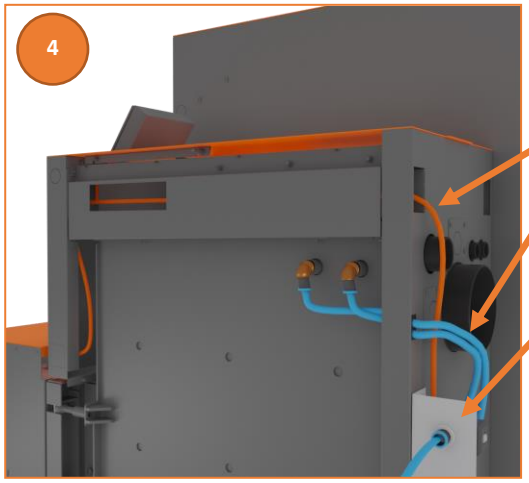

Use a 2.5m polyurethane hose, D12, 0.8MPa to connect the hose from the compressor to both solenoid valves to clean the exchanger.

Divide the hose near the valves with 1 piece of plug-in coupling U, 12mm so that the 2 ends of the hose are connected one by one to each of the solenoid valves on the back of the boiler. See Figure 2 above.



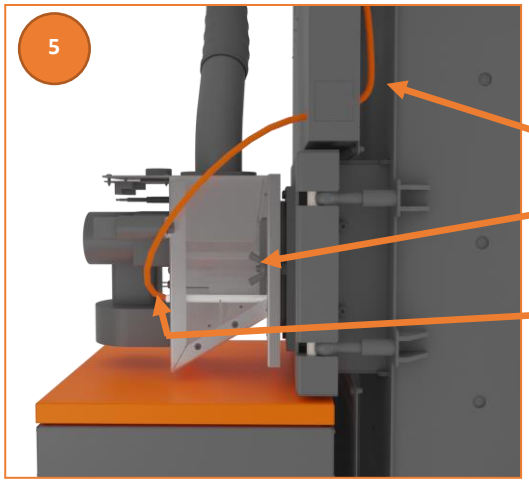

4pcs Brass elbows ¼ “
2pcs coupling straight male thread ¼ “

Orange 8mm hose guide for burner cleaning
Blue 12mm hose line for heat exchanger cleaning



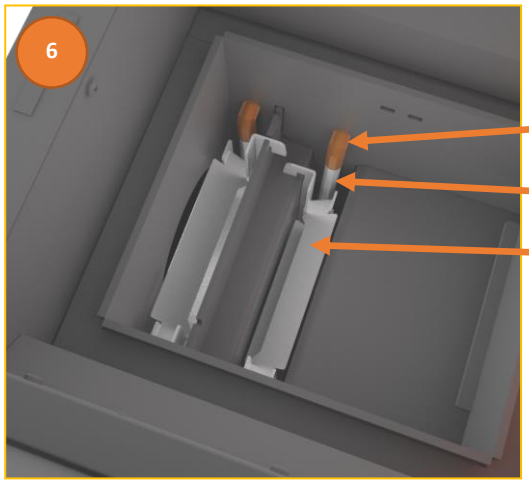

Orange 8mm hose for burner cleaning
Blue 12mm hose line for heat exchanger cleaning

Sheet metal for mounting solenoid valves for cleaning the boiler




Orange 8mm hose for cleaning the burner under the front casing of the boiler
Blower tube 2 pcs located in the burner, inserted from the side of the grate

2 pcs of quick couplings 90 ° angled 8mm




2pcs brass elbows ¼ “

2 pcs straight tube

2 pcs of flue gas turbulators

Follow the same procedure to install the compressor cleaning of the heat exchanger for Biopel v9 PREMIUM boilers with outputs of 60 and 80 kW. The only difference is that with these boilers, 4 pieces of exchanger tubes are installed in the exchanger, instead of 2 pieces, which are mounted in Biopel MINI boilers. Otherwise, the installation is identical to the procedure in this manual.

The solenoid valves, which are supplied in compressor cleaning, are supplied with 230V mains voltage, so make sure that the connection to the control unit is safe, without exposed live wires on which voltage is applied. The valve is called NC, ie "normal close". It opens when voltage is applied to it.

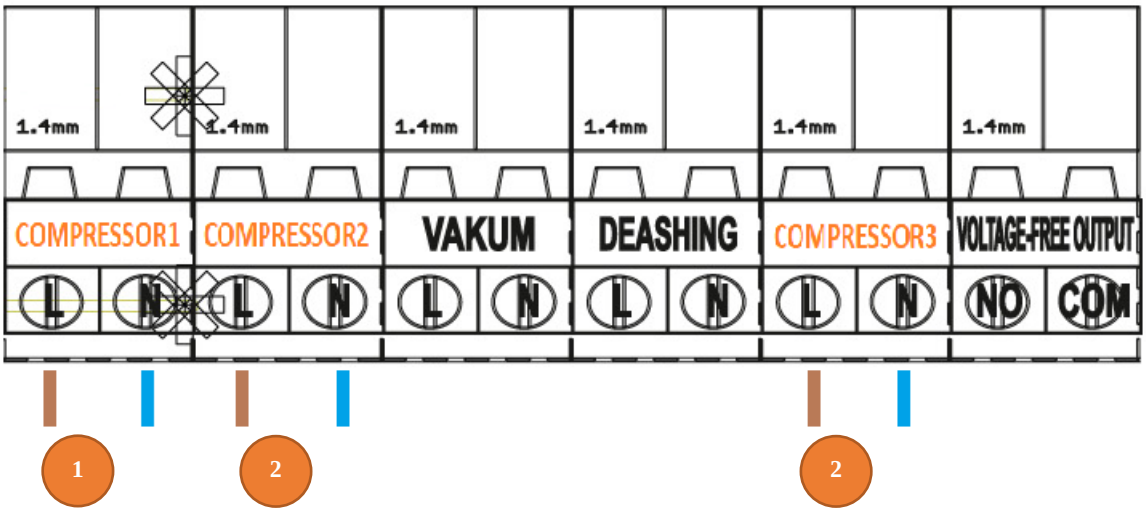

Route the wiring of the solenoid valves through the upper part of the boiler to the boiler control unit. Then connect them to the appropriate outputs, which are described in the next chapter.

## 4. FIRST START

Now it is necessary to connect 3 solenoid valves using connecting cables. These must be connected to the external socket of the boiler and on the other hand connected to the solenoid valves. There are three valves and, as mentioned, 1 is used to clean the burner and the other two are used to clean the boiler heat exchanger.

Compressor outputs 1, 2 and 3 can be freely configured so that the settings correspond to either heat exchanger cleaning or burner cleaning.

The recommended connection is as follows. Connect the solenoid valve for cleaning the burner to the outlet in the external socket of the boiler marked Compressor 1. Next, connect the solenoid valves for cleaning the heat exchanger to the outlets Compresor 2 and Compressor 3.




1. **Burner cleaning**

*Activation:*
Fitters menu – Compressor cleaning 1

*Recommended settings:*

| **Fitters menu, Compressor 1: (burner)** | **11kW** | **15kW** | **21kW** | **30kW** | **40kW** | **60Kw** | **80Kw** |
|---|---|---|---|---|---|---|---|
| Cleaning time | 1min | 1min | 1min | 2min | 2min | 2min | 2min |
| Opening time | 2s | 2s | 2s | 2s | 2s | 3s | 3s |
| Cycle time | 25s | 25s | 25s | 25s | 25s | 35s | 35s |
| Cleaning interval | 0h | 0h | 0h | 20h | 20h | 15h | 15h |

2. **Heat exchanger cleaning**

*Activation:*
Fitters menu – Compressor cleaning 2 and 3

*Recommended settings:*

| **Fitters menu, Compressor 1 and 2: (heat exchanger)** | **11kW** | **15kW** | **21kW** | **30kW** | **40kW** | **60Kw** | **80Kw** |
|---|---|---|---|---|---|---|---|
| Cleaning time | 1min | 1min | 1min | 2min | 2min | 2min | 2min |
| Opening time | 3s | 3s | 3s | 3s | 3s | 3s | 3s |
| Cycle time | 25s | 25s | 25s | 25s | 25s | 35s | 35s |
| Cleaning interval | 8h | 8h | 8h | 6h | 5h | 4h | 4h |

The automatic cleaning operation is preset at the factory. Automatic cleaning works according to preset run and pause times. This setting can be changed at any time in Fitters menu, Compressor 1, 2 and 3.

Compressor cleaning can be performed in 2 main ways, namely:

- During boiler operation, ie when there is a flame in the boiler and heating is in progress.
- During the extinguishing phase, ie at the time of switching off the boiler due to reaching the required temperature.

We recommend cleaning burners with smaller outputs (up to 30 kW) only during the extinction phase. If we clean the burner during the operation of the boiler (ie when there is a flame in the boiler), flame will be lost after cleaning and the boiler must automatically ignite again. For larger burner outputs (from 40 kW and above), it is possible to consider cleaning the burner during boiler operation, as the ash formation is so large that it is better to clean more often. However, if the boiler reaches the required temperature several times during the working day and switches off automatically, then it is sufficient to clean the burner only during the extinguishing phase.

Setting the burner cleaning method:

- **On:** if we enter "on" in the compressor settings, then we activate the compressor cleaning during the operation of the boiler (ie also when there is a flame in the boiler). The frequency of this cleaning is then defined by the Cleaning interval function, which indicates after what boiler operation time the compressor cleaning is activated. The compressor will also clean during the extinction phase.
- **Off:** if we enter "off" in the compressor settings, then we clean with the compressor only during the extinguishing phase, ie when there is no flame in the boiler and the boiler is deactivated due to reaching the required temperature.

Description of compressor cleaning setting items. You will find the settings in the fitters menu, Compressor 1, 2 or 3.

| **7. Compressor 1, 2, 3** | Cleaning the burner and the boiler exchanger using a compressor set. | ON state | OFF state |
|---|---|---|---|
| **7.1 ON** | When switched on, the compressor always cleans after the switch-off phase and also during PID operation according to the time set in the Cleaning interval function. After cleaning during PID work, light is lost (photosensor does not detect flame) and the boiler switches to ignition phase after a specified time. This time is 20 s without flame set in the Service menu. | Activated for cleaning during operation | |
| **7.2 OFF** | When deactivated, the compressor cleans only after shutdown and does not clean during PID operation. This setting is recomended for most of the burner sizes. For heatexchanger cleaning however we recomnd to activate (set ON) the cleaning during operation. | | Deactivated for cleaning during operation |
| **7.3 Cleaning time** | Total compressor cleaning time. We recommend in the range of 1-3 min. larger burner, longer cleaning time. During this time, the solenoid valve opens and closes regularly according to the values set in the Opening Time and Cycle Time functions.<br>When set to On, it is necessary to complete the total cleaning time before the automatic ignition takes place so that the compressor does not blow out the pellets for ignition. Therefore, the Cleaning Time setting is a maximum of 1 min. | 1min | 3min |
| **7.4 Opening time** | Opening the solenoid valve. Time of one cleaning period. We recommend in the range of 1-2 s. | 2s | 2s |
| **7.5 Cycle time** | The time required to repressurize the compressor so that the valve can open again and clean again. 25s is recommended. | 25s | 20s |
| **7.6 Cleaning interval** | Pause time between cleanings. Recommended between 10 and 20 hours. This time only applies if cleaning during PID operation, ie if the compressor is switched ON in 7.1 column. | 10-24h | We do not take into account *1 |

*1 The compressor in the Off setting only works after the Extinguishing phase (when switched off). That is why we do not deal with Cleaning interval.

* Connection of the compressor solenoid valve to one of the "Compressor 1, 2 or 3" outputs in the external socket.

**Recapitulation:**

- If you want to clean the burner only during extinguishing (when there is no flame in the boiler) - leave the compressor in the "off" setting.
- If you want to clean the burner during operation and during extinction (if a large amount of ash is formed, which needs to be cleaned more often) - select the compressor setting "on".

The heat exchanger must be cleaned at regular intervals even during boiler operation. It is therefore necessary to activate the "on" item in the Compressor 2 and 3 settings so that the compressor cleans even during boiler operation. See description above.

**Attention:** keep in mind that you use 2 solenoid valves to clean the heat exchanger. These should be run at different times to maximize cleaning efficiency. You can achieve this by setting the "Cleaning interval" differently. For example:

- Compressor 2 - Break time = 6h
- Compressor 3 - Break time = 5h

This ensures that each of the valves starts at a different time, and compressed air is released to the boiler from each of the valves at a maximum possible pressure of 8 bar.

**Caution:** These settings are recommended by the manufacturer and can be used provided you use the highest quality pellets with a low bark content and a small amount of dust. Otherwise, it is necessary to adjust the heat exchanger and burner cleaning settings. Also keep in mind that the quality of combustion affects the amount and type of ash that is formed during combustion. In case of incorrectly set combustion, the ash formed is dark black, often moist. This then sits on areas that can only be removed by manual cleaning.

In this case, we recommend checking the quality of the pellets (reduce the amount of dust and bark, change the type of pellets), check the quality of combustion (amount of pellets supplied to the burner, amount of air), or combine automatic burner and heat exchanger cleaning with manual cleaning, which is described in a separate chapter in the instructions for use that came with the boiler.

## 5. MAINTENANCE

We recommend regularly checking the cleanliness of the grate and the heat exchanger and, if necessary, adjusting the frequency of automatic cleaning so that it is as efficient as possible. Also keep in mind that automatic cleaning only removes good quality burned fuel. This means that automatic cleaning removes ash that is fine, unbaked and dry. Any baked ash into hard slag cannot be cleaned automatically. In this case, it is necessary to first eliminate the causes of poor combustion and slag formation. Possible causes of poor combustion are as follows:

- Dust in pellets
- Poor quality pellets with a large amount of bark or other admixtures of non-wood origin
- Low chimney draft or clogged flue path
- Wrong position of the grate in the burner body
- Incorrect combustion setting (amount of air versus amount of fuel)

**Attention:** automatic cleaning significantly prolongs the intervals between the necessary manual cleaning of the burner and the boiler heat exchanger. The boiler, burner and flue gas path must always be cleaned manually. The intervals between the necessary manual cleaning depend on the quality of the pellets and the combustion process.

We recommend checking the cleanliness of the boiler and burner regularly and always clean it manually if necessary. Also observe the indicator of the temperature on the burner and the temperature in the chimney (see the operating instructions for the boiler). Higher than normal temperatures on the burner and in the chimney indicate an uncleaned burner, boiler or flue gas path. The basic requirement for manual cleaning of the boiler and burner is given in the boiler manual.

Water can form in the hoses due to the condensation of warm air, which can be cooled by the environment. The resulting water does not have a short-term effect on the efficiency of the cleaning, in any case, we recommend regularly checking the permeability of the hoses and also the cleanliness of the exchanger tubes. If necessary, clean these so that the efficiency of the compressor is not reduced!

## 6. WARRANTY CONDITIONS, GENERAL INSTRUCTIONS

The following points must be met not only to comply with the warranty conditions, but also to ensure that the installation is correct in terms of the applicable standards, safety and to ensure trouble-free operation of the boiler.

1. Biopel MINI boilers may only be installed by a company with a valid installation and maintenance licence. The installation must be supported by a project in accordance with the applicable regulations.
2. The heating system must be filled with water that meets requirements of ČSN 07 7401 and especially its hardness must not exceed the required parameters: The use of antifreeze is not recommended by the manufacturer.
3. Connection of the boiler to the system must be made in accordance with the applicable regulations and standards.
4. The flue pipe must be inspected by a chimney sweep company before the boiler is installed. An inspection report must be prepared, including the basic parameters of the flue, including the diameter of the chimney, its length and the chimney draft.
5. The flue must be no longer than 1m and fitted with a sweep hole. The flue may only be longer if the chimney draft has been measured and recorded no further than 30cm from the boiler and meets the minimum operating draft requirements, see chapter Main Parameters and Dimensions.
6. The Biopel boiler must be installed in a separate boiler room specially adapted for heating. The boiler room must have sufficient space for boiler installation and maintenance. Sufficient fresh air circulation for combustion must be ensured.
7. The boiler must never be installed in open spaces or balconies, in areas occupied by people such as the kitchen, living room, bathroom, bedroom, in areas where explosive and flammable materials are present.
8. It is recommended to install the boiler on a concrete base made of fire-resistant material.
9. Around the boiler and the pellet hopper must be a minimum handling space, free of obstructions, namely: 60cm from the rear and sides, 100cm from the front of the boiler and hopper.
10. Safe distance of 200 mm from combustible materials must be maintained during installation and operation of the boiler.
11. It is forbidden to store fuel behind the boiler or to stack it next to the boiler at a distance of less than 800 mm.
12. It is forbidden to store fuel between two boilers in the boiler room.
13. Distance between boiler and fuel min. 1000 mm must be observed or place the fuel in a different room than where the boiler is installed.
14. The warranty fuel is considered to be wood pellets only, with a diameter of 6mm or more, with the parameters specified in the instructions for use.
15. The manufacturer is not liable for the quality of the fuel, in terms of combustion quality, ash quantity or frequency of boiler cleaning due to the fact that these are only influenced by external factors such as pellet quality, dust and moisture in pellets, chimney draft or correct combustion settings.
16. It is forbidden to use flammable liquids (petrol, alcohol, etc.) to fire the boiler.
17. It is forbidden to overheat the boiler in any way during operation.
18. If there is a risk of flammable vapours or gases entering the boiler room or during work that creates a temporary risk of fire or explosion (gluing floor coverings, painting with flammable paints, etc.), the boiler must be shut down well in advance of work commencement.
19. The boiler must be thoroughly cleaned after the end of the heating season, including the flue gas outlet. The boiler room must be kept clean and dry.
20. It is forbidden to interfere with the boiler's construction and electrical installation.
21. The manufacturer is not liable for damage caused by improper adjustment or improper operation of the product.
22. Parts subject to wear and tear are not covered by the standard warranty period. These parts are: sealing cord, grenamat board, igniter, burner grate, lambda sensor. However, these parts will function for a long time if the boiler and its components are operated in accordance with the instructions for use. These parts are considered as consumables and are covered by a manufacturer's warranty of 6 months.
23. The manufacturer is not liable for rust on the boiler and its components, as this is always and only due to external influences such as moisture in the room, fuel or due to unprofessional installation without protecting the boiler against low temperature corrosion.
24. The boiler must be protected against low return water temperature by a valve that prevents cold water from entering the boiler. The minimum acceptable return water temperature is set by the manufacturer at 55°C.
25. The manufacturer is not responsible for condensation of cold air in the flue gas passage, as this must be prevented by correct installation of the flue gas passage and correct adjustment of the boiler combustion process.
26. The manufacturer is not liable for smoke leakage from the boiler into the room if this is caused by low chimney draft, incorrect boiler installation or incorrect adjustment of the combustion process.
27. The manufacturer is not liable for damage to parts caused by handling, transport, incorrect adjustment or misuse, or other external causes not directly related to the function of the individual boiler components.
28. The boiler installation, boiler additional devices and correct boiler set-up and start-up are always the responsibility of the installation company who sold the boiler to the end customer.
29. If it has been agreed that a third party (e.g., The so-called commissioning company) will hold the warranty conditions, then this must be stated and agreed by 3 parties, namely the boiler dealer, the boiler commissioning company and the end customer. All of the above-mentioned parties must agree to this and their signatures must be provided in the warranty addendum.

The manufacturer is not responsible for the incorrect selection of boiler power to the heating losses of the building (e.g., placing a boiler with too little or too much power in relation to the demand).

# 7. WARRANTY CARD

## Compressor cleaning for Biopel boilers

**Producer:** OPOP spol. s r.o., Valašské Meziříčí
**Tel.:** 571 675 589, **fax.:** 571 611 225

**Complaint procedure instructions:**
The user is obliged to entrust commissioning, regular maintenance and fault rectification only to a professional service. This warranty card contains a quality and completeness certificate. The manufacturer confirms that the product has been inspected and conforms in its design to the technical specifications and EN 303-5. We guarantee the boiler quality, function and performance for a period of 24 months from the date of sale to the relevant consumer, but no longer than 30 months from the date of being dispatched from the factory, in such a way that defects arising from proven faulty materials, faulty construction or faulty workmanship are rectified at our expense as soon as possible, provided that the product:

- is in normal technical condition according to the operating instructions and is operated in accordance with the operating instructions.
- has not been mechanically damaged by force (no unauthorised intervention has been carried out except as permitted in the operating instructions).
- the consumer presents this warranty card, duly completed, when making a claim
- the manufacturer's instructions for the use of the equipment have been followed
- if the purchaser fails to sell the product within the above-mentioned statutory warranty period, all liability for any defect in the product shall be borne by the purchaser
- it is connected to a chimney flue according to EN 73 4201:1989
- the costs associated with the handling of the complaint will be charged to the customer
- when reporting a defect, it is always necessary to present this warranty card, give the exact address and state the circumstances under which the defect occurred. The method and place of repair will be decided by our company.

Date and manufacturer's stamp:
(boiler manufacturer)

Date and plumber's stamp:
(plumbing company stamp that sold the boiler)

# 8. CONTACT INFORMATION

Below you will find a complete list of contacts that will help you to obtain comprehensive information from ordering products and spare parts, to technical advice on already installed products OPOP spol. s.r.o.

## 8.1.Sales department

Tel:
(+420) 571 675 240
(+420) 571 675 108
(+420) 571 675 589

Email:
sales@opop.cz

## 8.2.Spare parts

Telefon:
(+420) 571 675 578

Email:
nahradnidily@opop.cz

## 8.3.Technical support

Telefon:
(+420) 571 675 252

Email:
servis@opop.cz

OPOP | *partner for your heating*

We have been producing solid fuel boilers
in the Czech Republic since 1959.

OPOP spol. s.r.o. | Zašovská 750, 757 01 Valašské Meziříčí | www.opop.cz