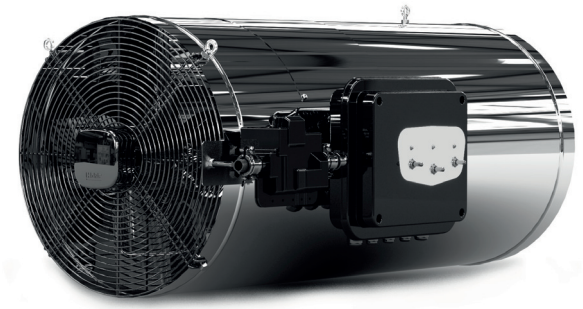
Installation Instructions MR70/95



CE

Air heater

GB other languages: check our website info on last page

FR autres langues: voir les informations sur notre site web à la dernière page

ES otros idiomas: consulte la información de la última página de nuestro sitio web

PT outras línguas: consultar as informações no nosso sítio Web na última página

CN 其他语言：请查看最后一页的网站信息

GB

Table of Content

1 Safety Guidelines

Please read through these instructions carefully before installing or operating. Following the installation, pass the instructions on to the operator. This unit must be installed and commissioned in accordance with the regulations and standards in force. These instructions can also be found at www.ermaf.nl.

1.1 Liability

We will not be held liable for damage resulting from non-observance of the instructions and non-compliant use.

1.2 Safety instructions

Information that is relevant for safety is indicated in the instructions as follows:

⚠ **DANGER!**
Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

⚠ **WARNING!**
Indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ **CAUTION!**
Indicates a hazardous situation which, if not avoided, will result in minor or moderate injury.

All interventions may only be carried out by qualified gas technicians. Electrical interventions may only be carried out by qualified electricians.

Persons under the age of 18 as well as persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge are not allowed to use, clean or service this device.
Staying near the device or its use is prohibited, even if said persons are supervised or have been instructed on the safe use of the devices and are aware of the resulting dangers.

2 Technical Data

Pressure values		
Max. inlet pressure p_U:	60 mbar	
Specifications	**MR70**	**MR95**
Gas types:	II2E3B/P	
Natural gas H (gases of category 2)	20 mbar	
LPG gas (gases of category 3)	30 - 50 mbar	
Gas connection:	R $^1/_2$ to ISO 7-1	
Gas consumption: Natural gas H LPG	 6.55 m^3/h 2.5 m^3/h (4.6 kg/h)	 8.8 m^3/h 3.4 m^3/h (6.3 kg/h)
Connection rating:	230 V AC, -15/+10%, 50/60 Hz	
Electrical protection:	IP54*	
Current consumption I_N:	50 Hz: 1.13 A 260 W 60 Hz: 1.6 A 370 W	50 Hz: 1.85 A 426 W 60 Hz: 2.65 A 610 W
NOx Class:	Depending on gas type up to Class 5.	
Capacity:	70 kW Hs	95 kW Hs
Jet length:	35 m	40 m
Velocity at the jet end:	0.5 m/s	
Staged control:	On/Off signal 230 V AC. Burner control unit with direct spark ignition and ionization control.	
Main fan type:	Axial	
Housing material:	Stainless steel	
Combustion chamber:	Stainless steel	
Burner control unit:	Flame-retardant acrylonitrile butadiene styrene copolymer (ABS)	
Air circulation Controlled air flow:	 50 Hz ± 4225 60 Hz ± 4800	 50 Hz ± 4615 60 Hz ± 5300
Sound level:	≤ 68 dB	
Dimensions:	1066 x 601 x 500 mm	
Weight:	32 kg	34 kg

*Resistant to high-pressure cleaning.

2.1 Logistics

2.1.1 Transportation and Storage

Keep parts in their original packaging and unpack them shortly before use.

The following parameters apply during transportation and storage:

Parameter	Value
Environment:	clean, dry and dust free
Min. storage temperature:	-20 °C
Max. storage temperature:	50 °C
Storage time:	6 months before using for the first time. If stored for longer than this, the overall service life will be reduced by the corresponding amount of extra storage time.
Ambient temperature $T_{max.}$:	-10 ≤ 40 °C
Temperature differential $\Delta T_{max.}$:	≤ 35 °C

Example for calculating the jet temperature:
T + ΔT = 40 °C + 35 °C = 75 °C

2.1.2 Packaging

The packaging material is to be disposed of in accordance with local regulations.

2.1.3 Disposal

Observe the local requirements regarding correct waste recycling/disposal!

WEEE Directive 2012/19/EU
Waste of Electrical and Electronics Equipment Directive Disposal Information -
Do not dispose this device and contained batteries with the general household waste. For proper treatment, recovery and recycling, please take the device and contained batteries to designated collection points. Disposing of this device and of contained batteries correctly will help save valuable resources and prevent any potential negative effects on human health and the environment, which could otherwise arise from inappropriate waste handling.

3 Declaration of conformity

We, the manufacturer, hereby declare that the product MR70/95 complies with the requirements of the listed Directives and Standards.

Directives:

- 2014/30/EU – EMC
- 2014/35/EU – LVD

Regulation:

- (EU) 2016/426 – GAR

Standards:

- EN 17082-2000
- EN 60335-1:2012
- EN 60335-2-102:2016
- EN 55011:2016
- EN 61000-6-2:2016
- EN 50465:2015

The relevant product corresponds to the tested type sample.
The production is subject to the surveillance procedure pursuant to Regulation (EU) 2016/426 Annex III, No. 2, Module C2.
Ademco 2 GmbH
Scan of the Declaration of conformity (D, GB) – see www.ermaf.nl

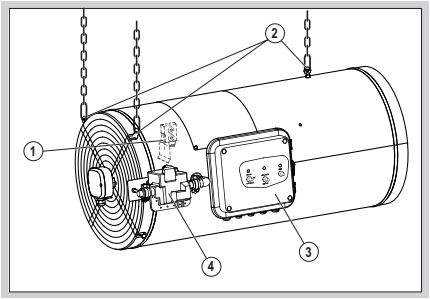
4 Checking the usage

Heater with direct, open combustion for animal sheds and horticultural greenhouses. Depending on the type and setting, the heater can be operated with natural gas or LPG (propane/butane).
This function is only guaranteed when used within the specified limits – see chapter 2 Technical Data. Any other use is considered as non-compliant.

4.1 Type code

Type	
Code	Description
MR	Heater
70	Capacity 70 kW, jet length 35 m
95	Capacity 95 kW, jet length 40 m

4.2 Part designations



1 Wind vane
2 Mounting eyebolts
3 Control box
4 Gas valve VK4105

4.3 Type label

Air displacement, electric connection data, voltage, heating power, gas type / category, supply pressure, burner pressure, IP-class: see type plate on the heater.

Before installation, check whether the device is suitable for the regional gas type and the specified limits, see chapter 4.1 Type code and chapter 2 Technical Data.

5 Installation

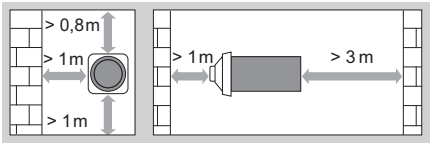
DANGER!
Danger of death!
Gases are generated during the storage of slurry which remain partly dissolved in the liquid. If the slurry is strongly agitated during mixing and purging, poisonous, explosive gases such as hydrogen sulphide and methane are released. If an ignition source is present, the released gas can explode.

To avoid damage during operation, please observe the following:

- Switch off the heater before mixing and purging the slurry.
- Close the slide valves when storing slurry outside.
- The fan for the air supply must not be part of a closed pipe system.
- The space to be heated must be adequately ventilated. For mechanical extraction equipment: at least 10 m^3/h of air per installed capacity. In the case of natural ventilation, the structure must have two apertures with a free opening area of 60 x B in cm^2. “B” is the installed capacity in kW. Replacement of the full air volume per hour is thus ensured.
- In the case of natural ventilation, the maximum allowable total capacity of the heater is 1 kW per 20 m^3 of volume.
- Respect the safety distance of the heater to inflammable materials, see chapter 5.1 Installation position.
- Consult your fire insurance provider and/or local fire protection engineer to assess the foreseeable, general risk of fire.
- For cleaning, care and maintenance, note the applicable national regulations and directives.
- No condensation permitted. Comply with ambient temperature, see chapter 2 Technical Data.

5.1 Installation position

- To ensure that the vane functions faultlessly, install the unit in the horizontal position.
- Note the safety distance to walls and inflammable materials.

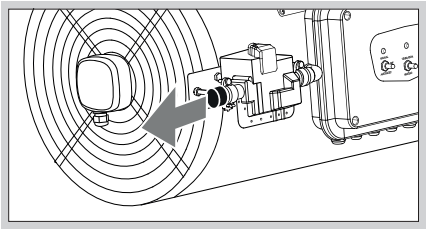


- Ensure sufficient free space around the device. There must be no obstructions in front of the inlet and outlet side of the heater.
- To avoid overheating, do not cover the electric motor.

5.2 Connecting the gas supply

- If the heater is suspended on chains, use an approved flexible gas hose.

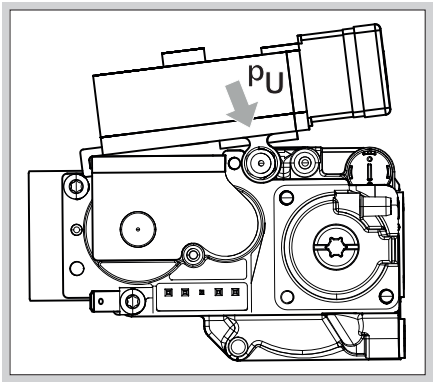
1. Disconnect the system from the electrical power supply.
2. Shut-off the gas supply.
3. Remove the sealing plug at the inlet tube of the gas valve.



4. Connect the gas pipe with threaded connection (R $^1/_2$" thread) or gas hose (see chapter 15.1 Accessories) to the inlet tube of the gas valve.
   - Use approved sealing material only.
   - Note the maximum inlet pressure, see chapter 2 Technical Data.

6 Tightness test

1. Remove the PVC protection cover.
2. Open the left pre-pressure test point on the valve.
3. Connect a pressure gauge to test point p_U.



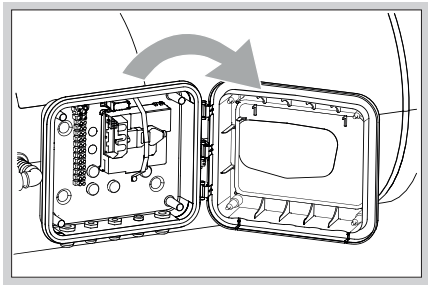
4. Switch on the power supply.
5. Release the gas supply.
   - Inlet pressure p_U max. = 60 mbar.
6. Shut-off the gas supply.
7. Check the gas pressure on the pressure gauge.
   - The pressure must not drop.

7 Wiring

CAUTION!
Danger of electric shocks!

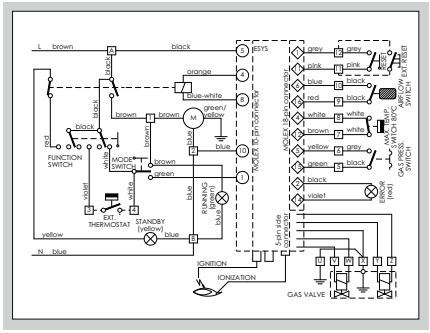
- Before working on possible live components, ensure the unit is disconnected from the power supply.

1. Disconnect the system from the electrical power supply. The mains plug may only be pulled out once the device has been switched off.
2. Shut-off the gas supply.
3. Open the cover of the control box.
   - To do so, turn the 4 cross-head screw anti-clockwise.
4. Open the cover of the burner control unit.



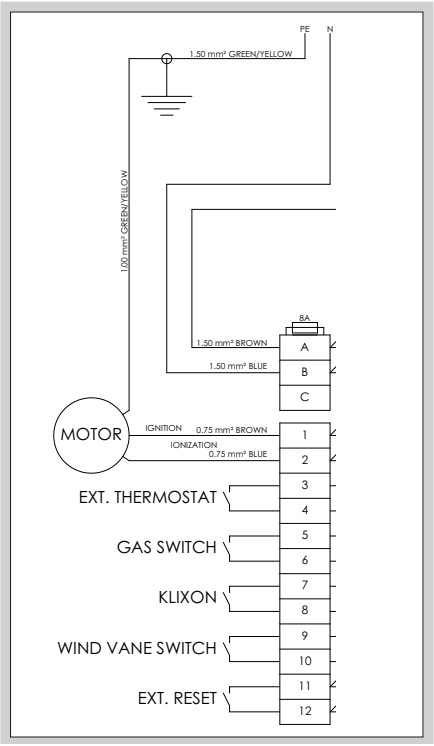
7.1 Internal connection diagram

Also check the diagram on the inner side of the control box, and the number on the connection terminals.



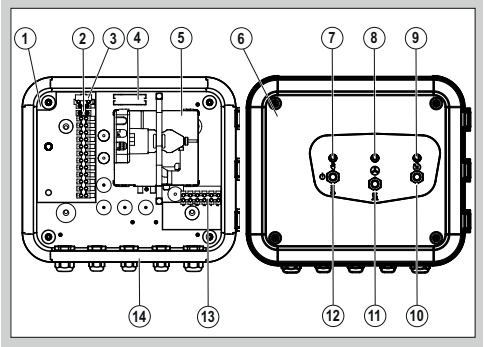
(Full size see chapter 16.1 Simplified internal connection diagram)

7.2 External connections



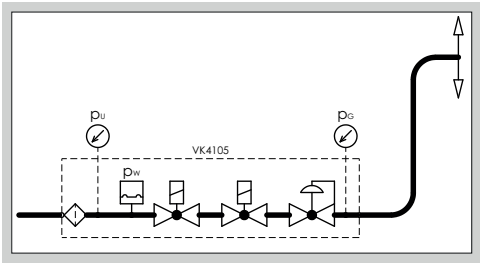
(Full size see chapter 16.2 Full internal connection diagram)

7.3 The Control box explained



1 Lower cabinet
2 Main terminal strip
3 Fuse-holder with terminals
4 Relay
5 Burner-control
6 Upper cabinet
7 Green LED
8 Yellow LED
9 Red LED
10 RESET switch
11 FUNCTION switch
12 MODE switch
13 Terminal strip gas valve
14 Cabin sealing

7.4 Gas block diagram



7.5 Connecting the room thermostat

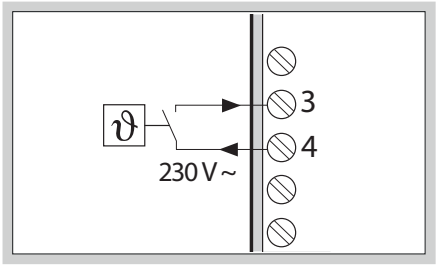
CAUTION!
To avoid damage to the heater, please observe the following:

- ▶ Provide post-cooling for the heater. The heater requires a continuous supply of 230 V AC, 50/60 Hz.
- ▶ In case of a power failure, an emergency power supply unit should automatically take over the power supply.

- Use a room thermostat with a hysteresis of ± 1°C. It switches on if the room temperature is 1°C less than the set temperature and switches off again once the room temperature is 1°C more than the set temperature.
- No 3 and 4 on the terminal strip are used to connect to the room thermostat. (230V output)
- If the room thermostat is connected to the mains supply of the terminal strip (connector A and B), the heater will be damaged.

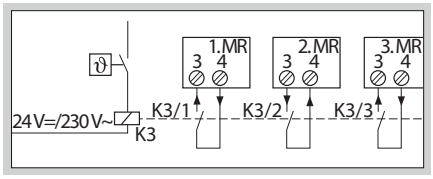
7.6 Connecting a single heater to a room thermostat

1. Connect a room thermostat for 230 V AC
   - Power supply via the heater.

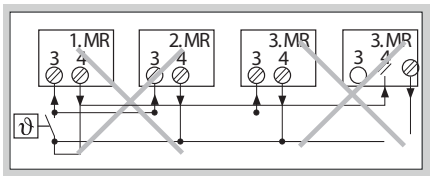


7.7 Connecting multiple heaters to a room thermostat or an environmental control computer

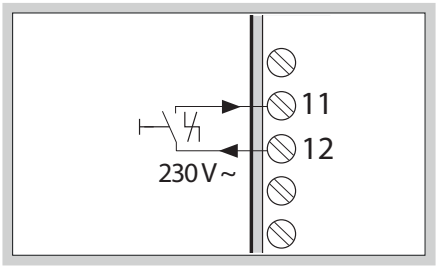
1. Connect a room thermostat for 230 V AC
   - Phase reversal will result in a short-circuit.
   - Do not install different phases of a three-phase current system at the inputs if the voltage between the phases exceeds 230 V (+ 10%).
   - Multiple heaters must be wired to the thermostat via a relay.



- Do not directly connect the thermostat to multiple heaters.
- Do not connect terminals 3 and 4 directly to the next heater. A short-circuit can occur due to different phases and polarities.



7.8 Remote reset



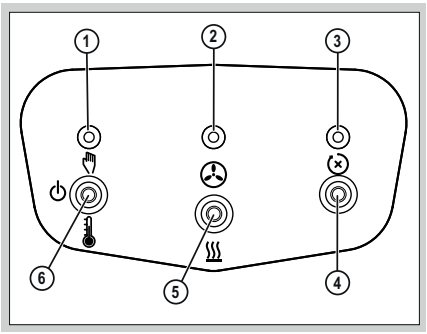
- An external remote reset may be connected to connection 11 and 12.

8 Commissioning

WARNING!
To avoid damage to the heater, please observe the following:

- ▶ Ensure that the heater, gas pipes, mains voltage supply and room thermostat have been installed by authorized trained personnel according to the regulations.
- ▶ The heater may only be operated with the gas type specified on the type label.
- ▶ If the device needs to be converted to be operated with a different gas type:
- Use the correct nozzle, see chapter 15.2 Spare Parts.
- Set the appropriate pressure on the burner, see table in chapter 9 Adjusting the heater, and then seal the gas pressure setting.

8.1 Control panel



1 LED "in operation"
2 LED "standby"
3 LED "error"
4 Reset
5 Ventilation / Heating mode
6 Manual / Off / Auto mode

8.1.1 Description of Function

① **LED "in operation":**
Lights up green when Burner or ventilation is started.

② **LED "standby":**
Lights up yellow once switched in Auto mode (thermostat). Once heater is started and ventilator is activated, this yellow LED will switch off.

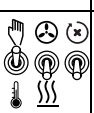
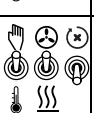
③ **LED "error":**
Lights up when any error appears

④ **Manual / Off / Auto mode:**
Middle position is "off"
- Switch down to "auto" for operation via external thermostat
- Switch up to "manual" for manual operation

⑤ **Ventilation / Heating mode:**
- Switch down to "heating" for heating mode
- Switch up to "ventilation" for ventilation only

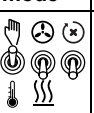
(Both positions will work in manual and auto mode)

⑥ **Reset**
To reset any error once the heater is in error mode
- Switch up and hold the switch at least 3 (but not more than 5) seconds
- When the reset switch is pulled to long, the controller generates an error and goes into lockout: the fault indicator lights up permanently.

Operation mode	Explanation
	Left switch middle position: heater off in all modus
	Left switch down to "auto", and middle switch down at "heating" : Heater is standby and will start heating once thermostat is activated
	Left switch down to "auto", and middle switch up at "ventilating": Ventilator is standby and will start ventilating only once thermostat is activated
	Left switch up to "manual", and middle switch down at "heating" : Heater will start manually (left switch middle, will stop the heater)
	Left switch up to "manual", and middle switch up at "ventilating": Ventilator will start manually (left switch middle, will stop the heater)
	When heater is in error mode, switch the right switch up and keep it up for at least 3 seconds and maximum 5 seconds until the red LED will switch off

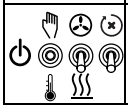
8.2 Switching on/off manual heating mode

- For service operation, manual mode only
- This mode ignores any external thermostat

Operation mode	Explanation
	Left switch up to "manual", and middle switch down at "heating" : Heater will start manually (left switch middle, will stop the heater)
	Left switch middle position: heater off in all modus

8.3 Switching on/off automatic heating mode

- In this mode the external thermostat is used when connected

Operation mode	Explanation
	Left switch down to "auto", and middle switch down at "heating" : Heater is standby and will start heating once thermostat is activated
	Left switch middle position: heater off in all modus

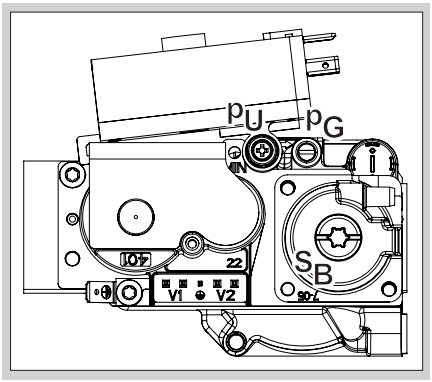
CAUTION!
Do not disconnect the heater from the electrical power supply until the post-cooling process has been completed.

- Once switched off, no LED should light up, except when it was in some error mode before switching off

9 Adjusting the heater

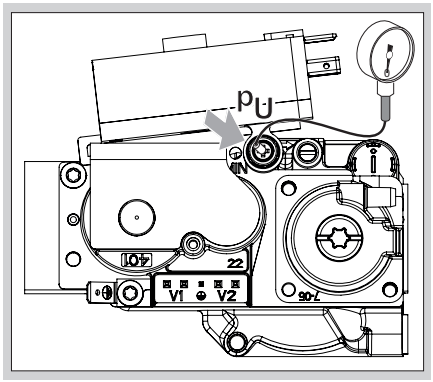
9.1 Burner gas pressure S_B

p_U = sample point Inlet pressure
p_G = sample point burner pressure
The gas pressure on the burner is adjusted using p_G on the gas valve.



To do this, the outlet pressure p_G must be measured on the gas valve.

1. Disconnect the system from the electrical power supply. The mains plug may only be pulled out once the device has been switched off and post-cooling is complete.
2. Shut-off the gas supply.
3. Open the pressure test point p_G.
4. Connect a pressure gauge with display range 0 to 50 mbar to p_G.



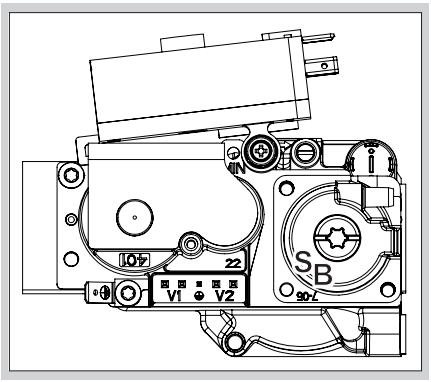
5. Switch on the power supply.
6. Release the gas supply.
   - The inlet pressure p_U must comply with the technical data, see chapter 2 Technical Data.
7. Switch on the burner control unit: Middle switch down at "heating" and left switch up to "manual"
8. Let all heaters burn for at least 20 s.
   - The required gas pressure on the burner depends on the heating value/Wobbe index.
9. Select the required gas pressure on the burner from the tables:

MR70 Natural gas, LPG			
Gas type	Heating value	Nozzle size	[mbar]
	[MJ/m³]		
Natural gas H G 20	37.78	12x2.3	10.1
LPG G 30/31	125.81	12x1.5	19.0

MR95 Natural gas, LPG			
Gas type	Heating value	Nozzle size	[mbar]
	[MJ/m³]		
Natural gas H G 20	37.78	12x2.7	11.0
LPG G 30/31	125.81	12x1.7	22.1

- Always use a pressure gauge at p_G to adjust the burner gas pressure.

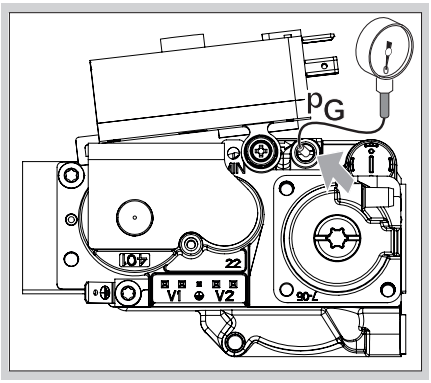
10. If all heaters are heating at the same time, compare the required gas pressure on the burner with the gas pressure p_G read off the pressure gauge.
11. Monitor the pressure gauge and set the gas pressure s_B.



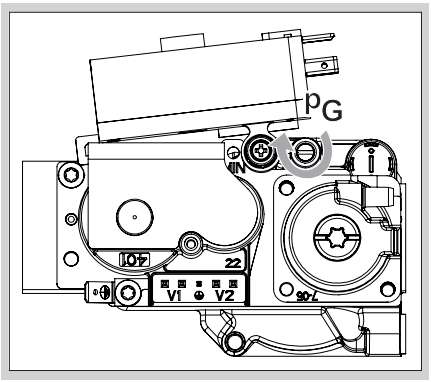
- Remove the protection cap using flat screwdriver or torx T30 to expose the burner pressure regulator screw s_B (counter clockwise).
- Use the same tool to adjust the pressue regulator carefully.
  - Clockwise to increase
  - Counterclockwise to decrease
- All heaters must be operating for this adjustment.

12. Monitor combustion.
- The flame must be blue and must remain inside the device.
- Check and adjust if necessary the burner pressure p_G on all devices so that the system operates correctly.
- You can also check flame signal on all devices so that the system operates correctly. (see chapter 9.2 Flame signal)

13. Remove the pressure gauge from the test point p_G.

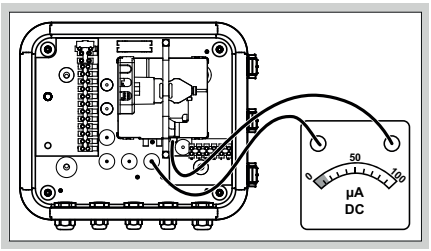


14. Close the pressure test point p_G.



9.2 Flame signal

- The flame signal can be measured while the burner is operating.



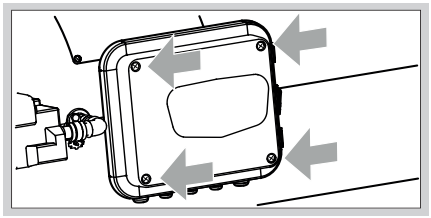
15. Use a Multimeter to measure the Ionization current
  - Important: Due to the Multimeter device, the ionization signal is showing half of the microcurrent which is generated: so when you readout a value of 10: it is actually 20 µA
  - The Ionization current must be minimal 2 µA on average (4 on the multimeter); If the ionization is less, then clean or replace the electrode (see chapter 10 Cleaning), and if its not improving check burner on correct working (see chapter 9.1 Burner gas pressure SB).

10 Cleaning

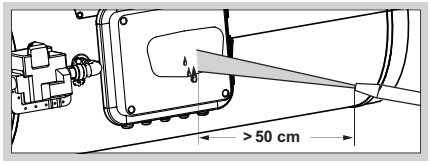
CAUTION!
To ensure that no damage occurs during operation and cleaning, please observe the following instructions. Otherwise, injuries or damage to the device may occur and/or the function of the device may be impaired, and the manufacturer's warranty will be cancelled.

- ▶ Sharp-edged metal sheets. Always wear protective gloves.
- ▶ Clean the heater once a year when used in horticulture and at regular intervals as well as after each fattening period when used in agriculture, as described below. Inadequate or irregular cleaning can cause damage to the device or lead to fire damage. For example, dirt particles can catch fire and can be blown out of the heater.
- ▶ After cleaning, check that the components on and in the heater are in good condition. The device may only be restarted if all safety devices have been installed and the safety functions have been checked.

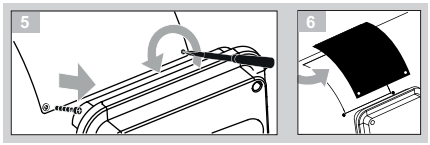
1. Switch off the burner control unit by switching the left switch into middle position ⏻.
   - Left switch to middle position
2. Disconnect the system from the electrical power supply.
   - The mains plug may only be pulled out once the device has been switched off and post-cooling is complete.
   - Also check if no other external voltage is applied
3. Shut-off the gas supply.
4. Check the cover on the burner control unit and the housing cover to ensure they are both tightly closed and also check if the Gas valve protection cover is installed properly.



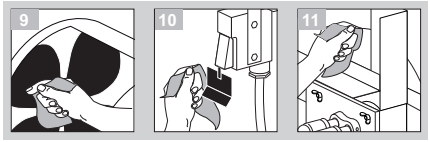
- The housing cover and cable glands on the control box must be closed during the cleaning process.
- The heater is made of high-quality stainless steel and is resistant to external influences such as dirt and moisture.
- The heater can be cleaned carefully both inside and outside with a high-pressure cleaner.
- The water jet from the high-pressure cleaner can cause serious damage to the heater components. For example, the blade can be bent or other parts such as the spark plug or rubber seals can be displaced. Avoid direct contact.
- The distance between the nozzle and the surface to be cleaned must be at least 50 cm. Placing the high-pressure cleaner at too short a distance can cause serious damage to the device.



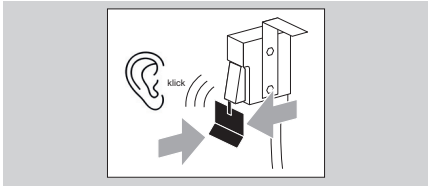
- Do not direct the water jet straight at electrical components such as the vane, motor junction box, and intensively on the seams of the control box and gas valve cover.
- Do not spray water or chemical cleaning agents directly into the space between the fan shaft/ impeller wheel and motor. Do not clean the fan shaft/impeller wheel with a high-pressure cleaner.
- The housing cover and cable glands on the control box must be closed during the cleaning process.
- Never direct the nozzle of the high-pressure cleaner at the heater when the cleaner is set to "water jet". Always use the spray setting.
- To facilitate cleaning of the components inside the housing, the hatch on the casing can be opened.



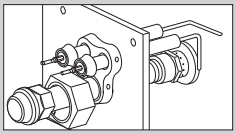
7. Clean the grille.
8. Clean the fan and vane using a cloth.



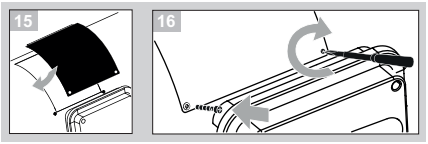
12. Clean the interior of the device carefully using air or clean the plates for the air intake and the burner head using a cloth.
    - The vane must not be bent.
13. Check that the vane switch is functional.
    - If the vane is moved a little in the direction of the arrow, a quiet click can be heard. This means that the switching path is correct.



14. Check the burner head, nozzle and electrodes for dirt and remove it.

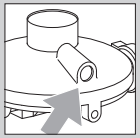


10.1 Assembly



- Check the burner is functioning faultlessly in normal operation, see chapter 12 Checking the safety functions and burner operation

17. When operating with propane, check that the breather orifice of the pressure reducer on the connection kit is clean.



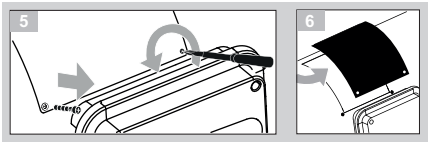
18. After cleaning, select manual mode ventilation, both switches up so that the interior of the device can dry properly.

11 Maintenance

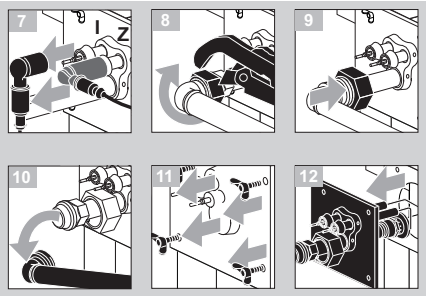
CAUTION!
To ensure that no damage occurs during operation and maintenance, please observe the following instructions. Otherwise, injuries or damage to the device may occur and/or the function of the device may be impaired. The supplier/manufacturer cannot accept liability for damage resulting thereof.

- ▶ Have the heater cleaned at least once a year by qualified maintenance personnel.
- ▶ Have the safety functions checked at least once a year by qualified maintenance personnel, see chapter 12 Checking the safety functions and burner operation.
- ▶ Clean the heater once a year when used in horticulture and at regular intervals as well as after each fattening period when used in agriculture, as described below. Inadequate or irregular cleaning can cause damage to the device or lead to fire damage. For example, dirt particles can catch fire and can be blown out of the heater.
- ▶ After cleaning or repair work, check that the components on and in the heater are in good condition. The device may only be restarted if all safety devices have been installed and the safety functions have been checked, see chapter 12 Checking the safety functions and burner operation.

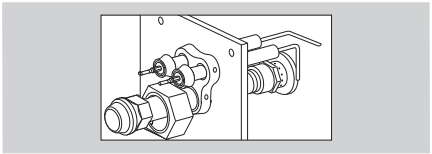
1. Switch off the burner control unit.
   - ⏻
   - Left switch to middle position
2. Disconnect the system from the electrical power supply.
   - The mains plug may only be pulled out once the device has been switched off and post-cooling is complete.
   - Also check if no other external voltage is applied.
3. Shut-off the gas supply.
4. To facilitate cleaning of the components inside the housing, the service cover on the casing can be opened.



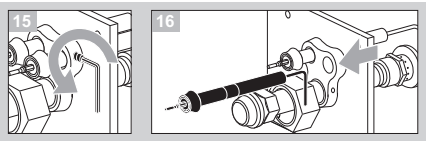
I = Ionization electrode, Z = Ignition electrode



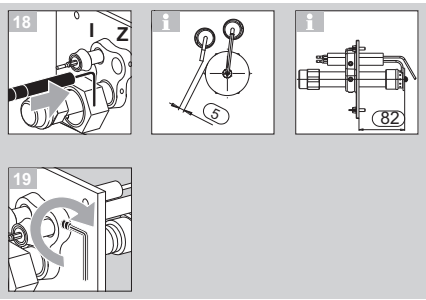
13. Check the burner head (nozzle and baffle plate) and the electrodes for dirt and if necessary, clean using a cloth. Remove stubborn dirt on the ionization electrode using fine abrasive paper.



14. Check electrodes and porcelain insulators for cracks and replace the electrodes in case of damage.
    - Replace the electrodes if necessary.
    - Fit the electrode seal.

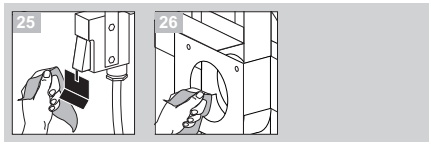


17. Ensure correct positioning of the electrodes.

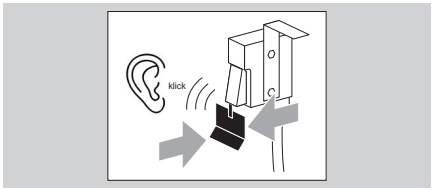


20. When replacing the flame rod, the porcelain insulator must be flush with the spark electrode insulator.
21. Clean the grille and fan using a cloth only.

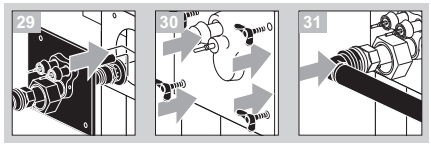
24. Clean the vane and plates for the air intake using a cloth only.



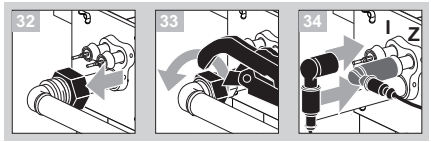
27. Clean the interior of the device carefully using air.
    - The vane must not be bent.
28. Check that the vane switch is functional.
    - If the vane is moved a little in the direction of the arrow, a quiet click can be heard. This means that the switching path is correct.



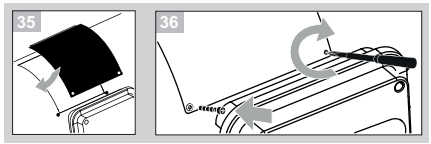
11.1 Assembly



- The connector with separate blue sealing surfaces must be screwed tight. Otherwise, gas can escape.
- Please check the sealing carefully on damages, we recommend to replace the sealing after reusing it.



- Ensure that the rubber seals between the electrodes and the terminal boots are fitted correctly.



- Check the safety functions before commissioning, see chapter 12 Checking the safety functions and burner operation.

12 Checking the safety functions and burner operation

WARNING!
If these checks are not carried out, the gas valves might remain open allowing non-combusted gas to escape. Risk of explosion!

12.1 Safety functions

1. Switch off the burner control unit by switching the left switch into middle position ⏻.
   - The flame goes out < 1 s.
   - The fan cools down the heater for 1 minute
2. Remove the valve plug on the combination control during operation.
   - The gas valves close < 1 s.
   - The flame goes out without Alarm LED.
   - The burner control unit will initially attempt to restart and, if all attempts are used, will perform a fault lock-out.
   - Red Alarm LED lights up.
3. Shut-off the inlet pressure during operation.
   - The gas valves close < 1 s.
   - The flame goes out without Alarm LED.
   - The burner control unit will not attempt to restart until inlet pressure is restored
   - Restore the inlet pressure
   - The burner control unit will initially attempt to restart.
   - If the burner control unit responds in a different way to that described, a fault has occurred, see chapter 13 Assistance in the event of malfunction.

CAUTION!
The fault must be remedied before the system may be operated.

12.2 Checking burner operation

1. Switch on the burner control unit: Middle switch down at "heating" ♨ and left switch up to "manual" ✋
2. Allow the burner to burn for 15 minutes.
3. During this time, monitor the flame pattern.
   - The flame must be blue.
   - No dirt particles must come out of the heater.

13 Assistance in the event of malfunction

WARNING!
To avoid harm to persons and animals or damage to the heater, please observe the following:

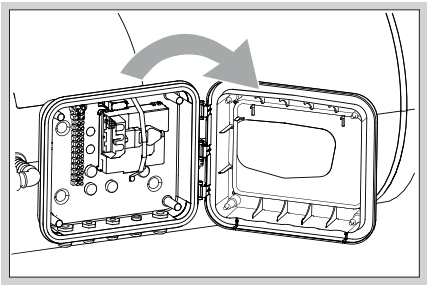
- ▶ Electric shocks can be fatal! Before working on possible live components, ensure the unit is disconnected from the power supply.
- ▶ Fault-clearance must only be undertaken by authorized trained personnel!
- ▶ Keep safe distance when observing the ignition of the heater, during trouble shooting as the mixture can cause a flash fire
- ▶ Repairs to components, e.g. the burner control unit or the gas valve, may only be carried out by the manufacturer. Otherwise, the guarantee will be cancelled. Unauthorized repairs or incorrect electrical connections, e.g. the connection of power to outputs, can cause gas valves to open and the burner control unit to become defective. In this case, fail-safe operation can no longer be guaranteed.

- In the event of an installation fault, the burner control unit closes the gas valves and the status indicator light will be red at the latest after a restart has been unsuccessful.
- Check the troubleshooting diagram for finding the cause and remedies.

13.1 Internal wiring

- To rectify a fault, it is sometimes necessary to check the internal wiring.

1. Open the cover of the control box.
   - To do so, turn the 4 cross-head screw anti-clockwise.
2. Open the cover of the burner control unit.



3. Check the connection using the full internal connection diagram at chapter 16.2 Full internal connection diagram.

14 Troubleshooting

Problem	Cause	Remedy
A) After switching on the heater nothing happens, and no any indicator is activated or flashing	1. The power supply to the heater is broken.	• The power supply is interrupted – Check the power supply.
	2. The fuse is broken.	• Replace the 8A slow fuse. – Check what did cause the problem.
	3. There is no gas pressure detected.	• Pressure switch does not switch. – Check inlet pressure p_U. • Gas pressure on the burner too low. – Readjust gas pressure p_G on the gas valve, see chapter 9 Adjusting the heater.
B) After switching on the heater nothing happens, and immediately the fault indicator starts flashing (not continuously)	1. The reset switch was used more than 5 times in 15 minutes.	• Wait until 15 minutes have passed. • Shortly disconnect and reconnect the heater from the mains.
	2. The minimal or maximal voltage supply is exceeded.	• Restore and secure voltage supply. • Error disappears automatically 10 seconds after voltage is secured. • This error can also appear during operation: – It can be that before start the voltage is just enough, but not enough when heater starts. – It can be that other heaters on the same system cause a voltage drop, in that case install delay timers to avoid that all heaters start simultaneously.

C) After switching on the heater nothing happens, and immediately the fault indicator lights up permanently	1. Heater is in previous error mode.	• Switch up the reset switch for at least 3 and maximal 5 seconds.
	2. The safety thermostat is triggered.	• Heater has been overheated and the safety thermostat was activated. – Leave heater to cool down for longer. • The main fan does not switch on. – Check the main fan. – Check the relay of the main fan. • Wiring fault. – Check the wiring to actuate the main fan, see chapter 7 Wiring. • The plug on the safety thermostat is not placed correctly. – Check the position and fixation of plug that it is properly tightened. • The safety thermostat is incorrectly aligned. – Check the position and fixation of the safety thermostat. • Ambient temperature exceeded. – The temperature is > 40°C. Allow the room to cool. • The safety thermostat is defect – Replace the safety thermostat. • The heater is badly soiled. – The heater must be cleaned urgently. • Installation position. – The heater is too close to other heaters, see chapter 5 Installation. • Device incorrectly set. – The heater is not set correctly and must be adjusted, see chapter 9 Adjusting the heater. • In the event of a power failure during operation, the heater will be switched off without a cooling phase. If the power failure lasts less than 5 minutes, the combustion chamber will heat the device and the safety temperature sensor is activated. – In this case, a reset is possible after the temperature is back on normal level.
D) After switching on the heater nothing happens (ventilator doesn't start), and the fault indicator starts flashing after 10 seconds (not continuously on)	1. Vane switch does not switch off during the "no flow" state check on burner start-up.	• Reset using the RESET button on the control box or via the remote reset. • Check that the vane switch is functional, see chapter 11 Maintenance. • Heater is not placed horizontaly. – Correct horizontal positioning.

E) After switching on the heater nothing happens (ventilator doesn't start), and heater tries automatically another 4 restarts (1+4 max). Then the fault indicator lights up permanently after 10 seconds (not flashing)	1. Ventilator motor defective.	• Replace the motor and return it to the supplier.
	2. Motor Relay doesn't receive a start signal from burner controller, or is defective.	• Check if Motor relay is switching, see chapter 7.3 The Control box explained. • If motor relay is not switching check if it receives a 230VAC signal between 4 and 8 from 10 Pin connector at Esys burner control unit, if not the burner control unit is probably defect; replace it and send it to the manufacturer for inspection. • If motor relay does get a signal but is not activated, replace the relay.
F) After switching on the heater, the ventilator starts but the ignition and gas valve is not activated within 5 seconds; the ventilator stops and start another 4 retrials before the fault indicator lights up permanently after 10 seconds (not flashing)	1. The vane switch has not switched on 10 s after the fan has been switched on.	• Check the function of the vane switch, see chapter 11 Maintenance. • Vane, fan or grille are dirty. – Clean, see chapter 10 Cleaning. • Heater is not placed horizontaly. – Correct horizontal positioning.
G) After switching on the heater, the ventilator starts but the ignition and gas valve is not activated within 5 seconds; immediately the fault indicator lights up permanently (not flashing)	1. Burner controller detects a false burner signal (ionization) before gas valve is opened.	• Check the internal wiring and especially the Ionization circuit on false leaking current. • Check if the valve is mechanically closing and check if the valve is closing immediately after you shut down the heater. – If not, the valve has internal damage or dirt in gas circuit prevent the valve from closing.
H) After switching on, the ventilator starts, and after 5 seconds the ignition is activated (visible spark) but there is no flame appearing and heater tries automatically another 4 restarts (1+4 max). Then the fault indicator lights up permanently (not flashing)	1. Air in the gas pipe.	• (Normally only occurs with new installations or new gas tank (fill). • Vent the gas pipe.
	2. Not enough oxygen for ignition.	• Check if room is enough ventilated, see chapter 5 Installation. • Check the air inlets on heater and remove dirt and obstacles. – The protection grill from fan. – The air inlet ports from combustion chamber.
	3. Gas pressure not sufficient (drops during start).	• Check inlet pressure p_U and observe during start.
	4. Gas pressure on the burner too low.	• Check burner pressure p_G during the start. – If no burner pressure at all, go to next step at 5. • Readjust gas pressure p_G on the gas valve, see chapter 9 Adjusting the heater.

	5. Valves do not open.	• Check Valve cable and connector, especially on the valve, if properly good connected and in good condition. • On the horizontal 6-pole terminal strip, measure the voltage between V and W and Y and Z during the safety time. If the voltage is not provided, the burner controller might be defect: – First check and replace the valve as shortcut in the valve might have caused the defect. – **Attention!** Only commission the new burner controller once the short-circuit or fault on the valve output of the valve has been remedied. Otherwise, the new control board will be damaged again. – Replace the burner controller as well. – Return the burner control unit, and the valve (if defect) to the manufacturer for inspection.
I) After switching on, the ventilator starts, and after 5 seconds the valve is activated but there is no ignition activated (No visible spark), and heater tries automatically another 4 restarts (1+4 max). Then the fault indicator lights up permanently (not flashing)	1. Ignition is not working properly.	• Clean the spark electrode and check for correct distance, see chapter 11 Maintenance. • Check the connection of the ignition cables for damage or moisture. • The spark plug must be fitted correctly. • Check the ignition spark optically and acoustically from the fan side during the 5-second ignition time.
	2. Burner controller doesn't give ignition spark signal.	• Replace the burner control unit, and return to the manufacturer for inspection.
	3. Gas-Valve cable unplugged.	• This is causing an internal error. – Check if the connector is properly good connected on the valve, and not corroded on both sides. • Check if the cable is properly good connected on the terminal strip (V,W,X,Z).
J) After the ignition (spark) the flame is appearing, but it goes out after 5 seconds but within 20 seconds. Heater makes another restart and error repeats in approx. same time. After 4 restarts (1+4 max). Then the fault indicator lights up permanently (not flashing)	1. Very poor flame at start due to incorrect burner adjustment. The burner flame doesn't look stable.	• Readjust gas pressure p_G on the gas valve, see chapter 9 Adjusting the heater. • Check burner and nozzle if the openings are not clogged with dirt. And clean it.
	2. Poor flame signal due to dirty/ badly connected ionization electrode. (the burner flame looks stable)	• Clean the flame rod and check for correct distance, see chapter 11 Maintenance. • Check the cable connection, cable and terminal boot for damage or moisture. The terminal boot must be fitted correctly. • Check the yellow and green burner ground cable for corrosion and to ensure it is firmly connected. • If not successful replace the flame rod.
	3. Delayed pressure-drop due to incorrect gas supply.	• Connect a manometer to burner pressure p_G and check if pressure drops during start, if so do the same for the inlet pressure p_U as well. See chapter 9 Adjusting the heater • When Pressure is dropping the gas supply is insufficient to run the capacity of the heater. • Check the gas supply.

K) Repeatedly, but randomly during operation, burner goes out, and heater makes another restart, error repeats it randomly and occasionally	1. Poor flame signal due to aged, worn, dirty or bad flame rod.	• Clean the flame rod and check for correct distance, see chapter 11 Maintenance. • If not successful replace the flame rod.
	2. Pressure-drop due to instable gas supply. This could be: – almost empty gas tank – other Appliances consumes to much gas	• Connect a manometer to inlet pressure p_U (see chapter 9 Adjusting the heater) and check if pressure drops during the time. Especially when other appliances starts. • When Pressure is dropping the gas supply is insufficient to run the capacity of the heater. • Correct the gas supply.
	3. Vane switch switches off randomly during burner operation. Also when observing the vane it is notably wiggling (moving) in the airstream (moving > 5 mm).	• Check the function of the vane switch, see chapter 11 Maintenance. • Correct the vane position, that it stops to much moving. • Vane, fan, or grille are dirty which is blocking the air way. Clean, see chapter 11 Maintenance.
	4. Very poor flame due to incorrect burner adjustment or dirty burner / nozzle. The burner flame doesn't look stable.	• Check and readjust gas pressure p_G on the gas valve, see chapter 9 Adjusting the heater • Check burner and nozzle if the openings are not clogged with dirt. And clean it.

L) Please check at all mentioned errors above, what happens during a new restart, to find out the root cause for the problem, and remember this troubleshoot list is written in logical order of starting the burner.

a) Also, double check the Voltage supply during start, operation and especially when other appliances on the same net are activated.

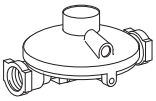
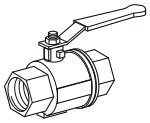
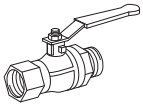
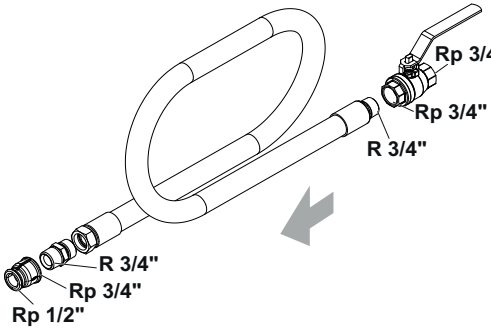
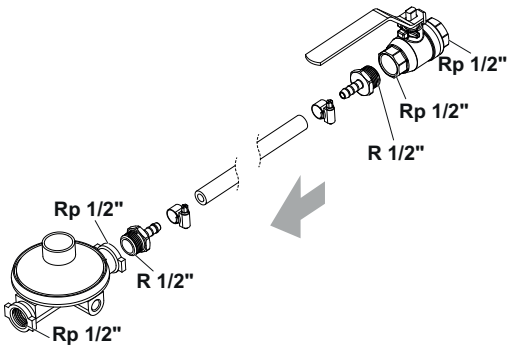
b) Measure the contacts during operation to check if the relevant parts are powered when necessary.

c) If the burner control unit does not respond even though all the possible faults have been rectified as described above, contact your supplier.

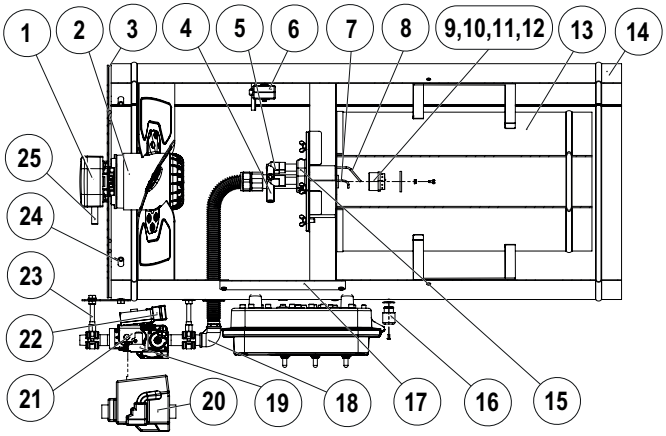
d) To reset any error once the heater is in error mode. Switch up and hold the switch at least 3 (but not more than 5) seconds.
   – When the reset switch is pulled to long, the controller generates an error and goes into lockout: the fault indicator lights up permanently

15 Ordering Information

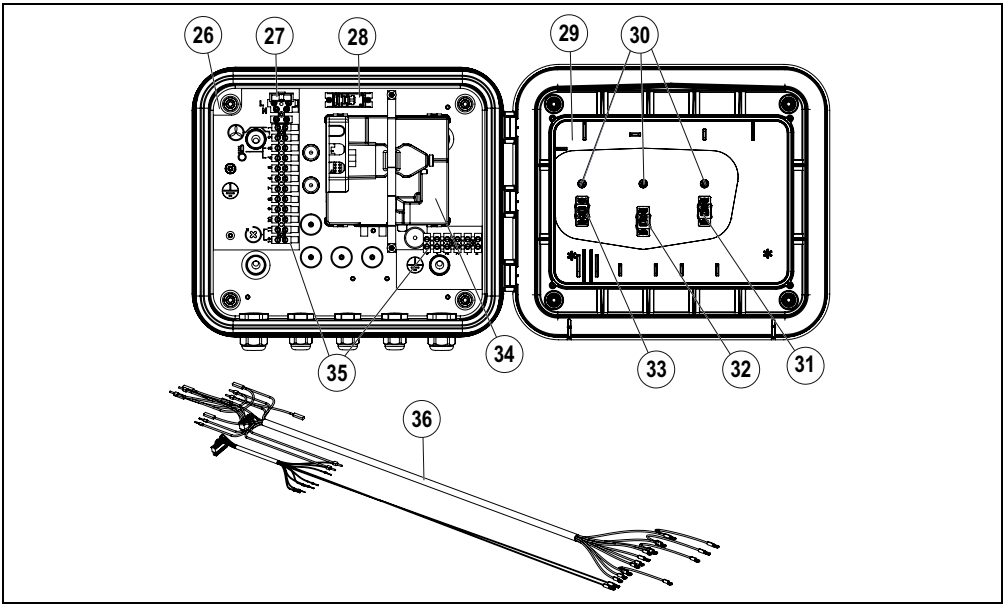
15.1 Accessories

	Description	Item No.
	**Room thermostat**	
	Use a room thermostat with a hysteresis of ±1 °C, 230 V, Type TH215.	N50260145
	**Pressure reducer** Pressure reducer for LPG.	
	RECA 1.5 bar to 50 mbar, 2 x 1/2" internal thread connection, 10 kg/h	N52600023
	**Manual ball valve LPG**	
	2 x 1/2" internal thread connection	N52600019
	**Manual ball valve LPG**	
	1/2" internal and external thread connection	N52600027
	**Connection kit for natural gas**	
	3/4" hose with Rp 3/4" - Rp 1/2" threaded connection, total length = 1.50 m	N20101000
	**Connection kit for propane / LPG**	
	Pressure reducer, manual valve, hose (length = 2 m), 2 hose clamps, to connect the gas valve to the gas supply	N20102000

15.2 Spare Parts



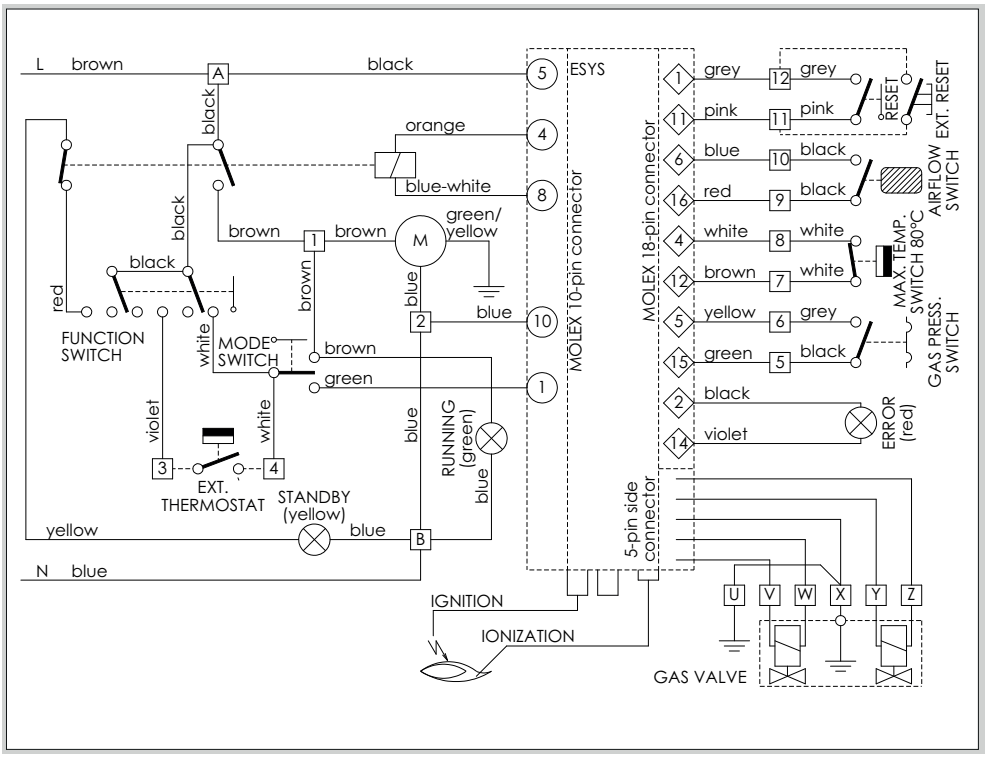
	Description	Comment	Item No.
1	Spare Capacitor 10 uF MR70/95	sole Capacitor	N20100020
2	Fan MR70 Fan MR95	complete including grill, fasteners and motor cable	N20100016 N20100017
3	Grill MR70 Grill MR95	Grill + Fixation-materials	N20100018 N20100019
4	Ignition cable set MR70/95	complete cable with connector on both sides and fixation material (P clamp)	N20100006
5	Ionization cable set MR70/95	complete cable with connector on both sides and fixation material (P clamp)	N20100007
6	Wind vane switch set MR70/95	wind vane switch + covers + bracket + cable	N20100012
7	Igniton electrode set MR70/95	including clamp and screw	N20100008
8	Ionization electrode set MR70/95	including clamp and screw	N20100009
9	MR70 Natural gas nozzle set	12x2.3 set with baffle plate and gasket	N20100023
10	MR70 Propane nozzle set	12x1.5 set with baffle plate and gasket	N20100024
11	MR95 Natural gas nozzle set	12x2.7 set with baffle plate and gasket	N20100025
12	MR95 Propane nozzle set	12x1.7 set with baffle plate and gasket	N20100026
13	MR70 Burner chamber	equipped with riveting nuts	N20100027
	MR95 Burner chamber		N20100028
14	Empty chassis MR70/95	fixations and packing, without typeplate	N20100010
15	MR70/95 Burner	gasket included	N20100029
16	Temperature limiter set MR70/95	klixon + its cable and fixation material	N20100011
17	MR70/95 Service hatch	including screws	N20100030
18	Gas pipe with gaskets MR70/95	set with all pipes and couplings until burner	N20100022
19	Gas valve cable	from cable to short terminal strip	N20100014
20	Cap for gas valve	including clips	N20100033
21	Gas valve with pressure switch MR70/95	assembled with inlet pipe	N20100021
22	Pressure-Switch Cable	With End-Serrule	N20100013
23	MR valve clamps set	including screws	N20100034
24	MR70/95 Small materials set	complete set of screws and nuts for whole heater	N20100031
25	Motor cable MR70/95	Sole motor cable MR70/95	N20100015



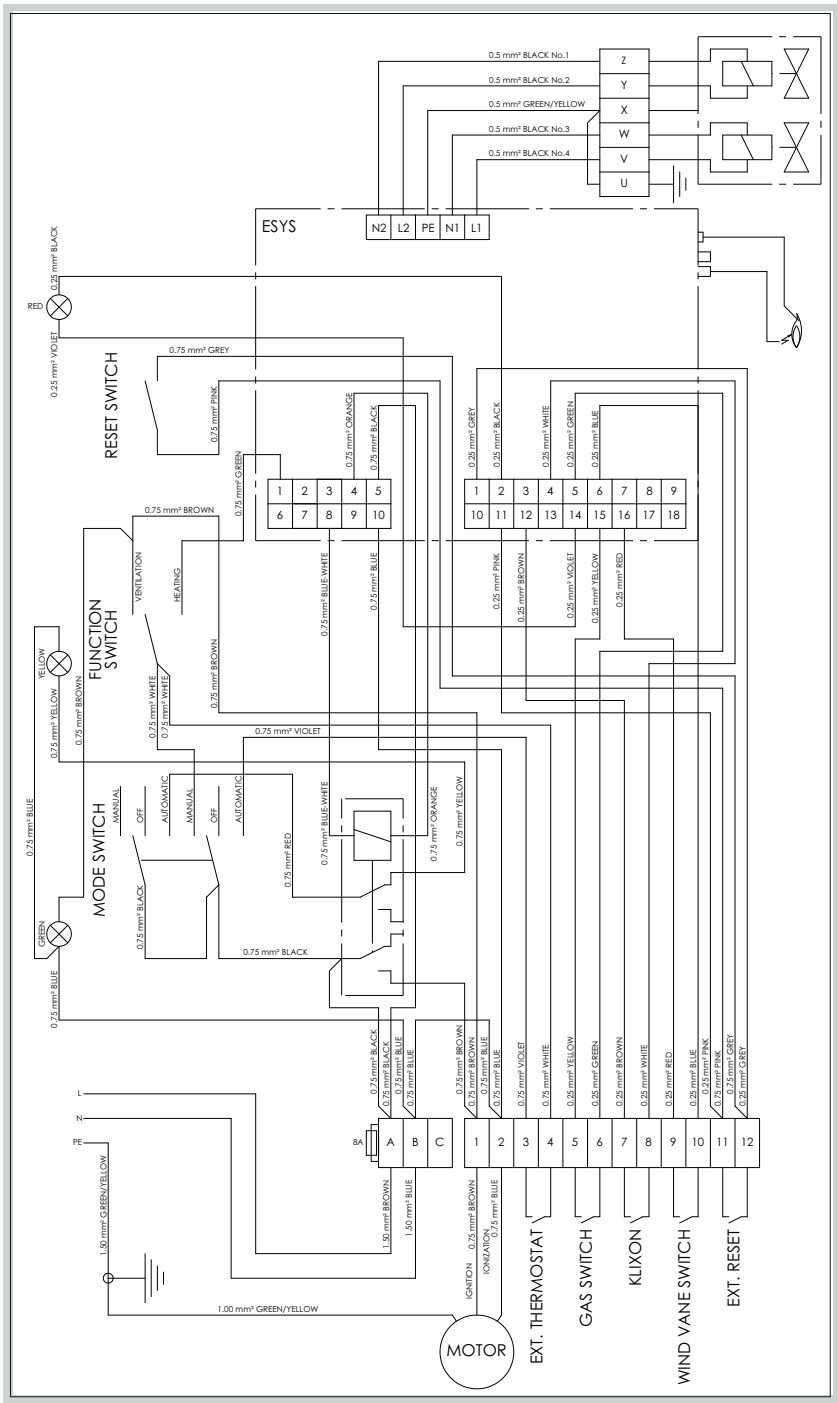
	Description	Comment	Item No.
26	Cabinet Lower Part MR70/95	complete with Terminal-Strips, connection to Esys and Fixation-material, without Esys and Relay	N20100001
27	Fuses MR70/95	Set of 10 pcs. + 1 Holder	N20100032
28	Spare Relay MR70/95	8A	N20100004
29	Cabinet Upper Part MR70/95	Complete with Switches, Lamps and Closing-screws	N20100002
30	LED-Set green/yellow/red MR70/95	Including Nuts and O-Rings	N20100035
31	Mode Switch MR70/95	Including Cap	N20100037
32	ON/OFF Function-Switch MR70/95	Including Cap	N20100036
33	Reset Switch MR70/95	Including Cap	N20100038
34	Control Electronics MR70/95	Esys with Strap and Fixation-Materials	N20100003
35	Terminal Strips MR70/95	Including Screws	N20100039
36	Wiring-Loom MR70/95	10 pin and 18 pin Molex connectors with all Wires	N20100005

16 Appendix

16.1 Simplified internal connection diagram



16.2 Full internal connection diagram



17 Goods return form

Name of the Operator:			
P.O. Box/Street:			
Postcode and Town/City:			
Tel.:			
E-Mail:			
Returned by (Mr./Ms.):			
Date:			
Number of returns:			
Heater serial number:			
Power supply [V/Hz]:			
Inlet pressure p_U [bar]:			
Reasons for return:			
Description of fault:			
Desired action:	Credit Note:	Replacement:	Repair:
Remarks:			
Date and signature:			

Note: Please send returns back to your supplier.

resideo

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