



# ECONCEPT 100

**HEAT GENERATOR RUNNING ON GAS,  
PRE-MIXED WITH CONDENSATION**



**INSTRUCTIONS FOR USE,  
INSTALLATION  
AND MAINTENANCE**







- Carefully read the warnings in this instruction booklet since they provide important information on safe installation, use and maintenance.
- This instruction booklet is an integral part of the product and must be carefully kept by the user for future reference.
- If the unit is sold or transferred to another owner or if it is to be moved, always make sure that the booklet accompanies the boiler so that it can be consulted by the new owner and/or installer.
- Installation and maintenance must be carried out by professionally qualified personnel, according to current regulations and the manufacturer's instructions.
- Incorrect installation or poor maintenance can cause damage or physical injury. The manufacturer declines any responsibility for damage caused by errors in installation and use or by failure to follow the manufacturer's instructions
- Before carrying out any cleaning or maintenance operation, disconnect the device from electrical power supply using the switch and/or the special cutoff devices.
- In case the unit breaks down and/or functions poorly, deactivate it, do not make any attempt to repair it or directly intervene. Contact professionally qualified personnel.
- Any repair/replacement of products must only be carried out by qualified professional personnel using exclusively genuine parts. Failure to comply with the above could affect the safety of the unit.
- Yearly maintenance carried out by qualified personnel is essential for guaranteeing good operation of the unit.
- This unit must only be used for the purpose for which it was designed. Any other use is considered improper and therefore hazardous.
- After removing the packing, check the integrity of the contents.
- Packing materials must not be left within the reach of children as they are potentially hazardous.
- In case of doubt do not use the unit, and contact the supplier.



This symbol indicates "**Caution**" and is placed next to all safety warnings. Strictly follow these instructions in order to avoid danger and damage to persons, animals and things.



This symbol calls attention to a note or important notice

## Declaration of conformity



Manufacturer: FERROLI S.p.A.

Address: Via Ritonda 78/a 37047 San Bonifacio VR Italy

declares that this unit complies with the following EU directives:

- Gas Appliance Directive 90/396
- Efficiency Directive 92/42
- Low Voltage Directive 73/23 (amended by 93/68)
- Electromagnetic Compatibility Directive 89/336 (amended by 93/68)

President and Legal Representative

Car. del Lavoro  
Dante Ferroni





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## 1. OPERATING INSTRUCTIONS

### 1.1 Introduction

Dear Customer,

Thank you for choosing **Econcept 100**, a FERROLI heat generator of the latest generation featuring advanced design and cutting-edge technology.

**Econcept 100** is a high-efficiency modular heat generator for **condensation pre-mixed** heating with very low emissions, running on natural gas or LPG.

Each **Econcept 100** module is equipped with a twin aluminium laminar exchanger and a twin ceramic pre-mixed burner contained in an upright cabinet made of AISI 316 stainless steel.

Each boiler shell (exchanger + burner) is governed by its own microprocessor control system with self-diagnosis, capable of working independently.

The user interface is easy to use with a keyboard and display, making it possible to know the unit's operating status at any time. The operating parameters and historical data are stored internally and can be retrieved via the interface with a Personal Computer to make Service operations easier.

The plumbing circuits of the exchangers, each one equipped with its own local circulation pump, run into system delivery and return manifolds in the module.

A cascade control unit, available on request, provides effective and economical control of the two internal boiler shells or a number of **Econcept 100** modules connected in cascade.

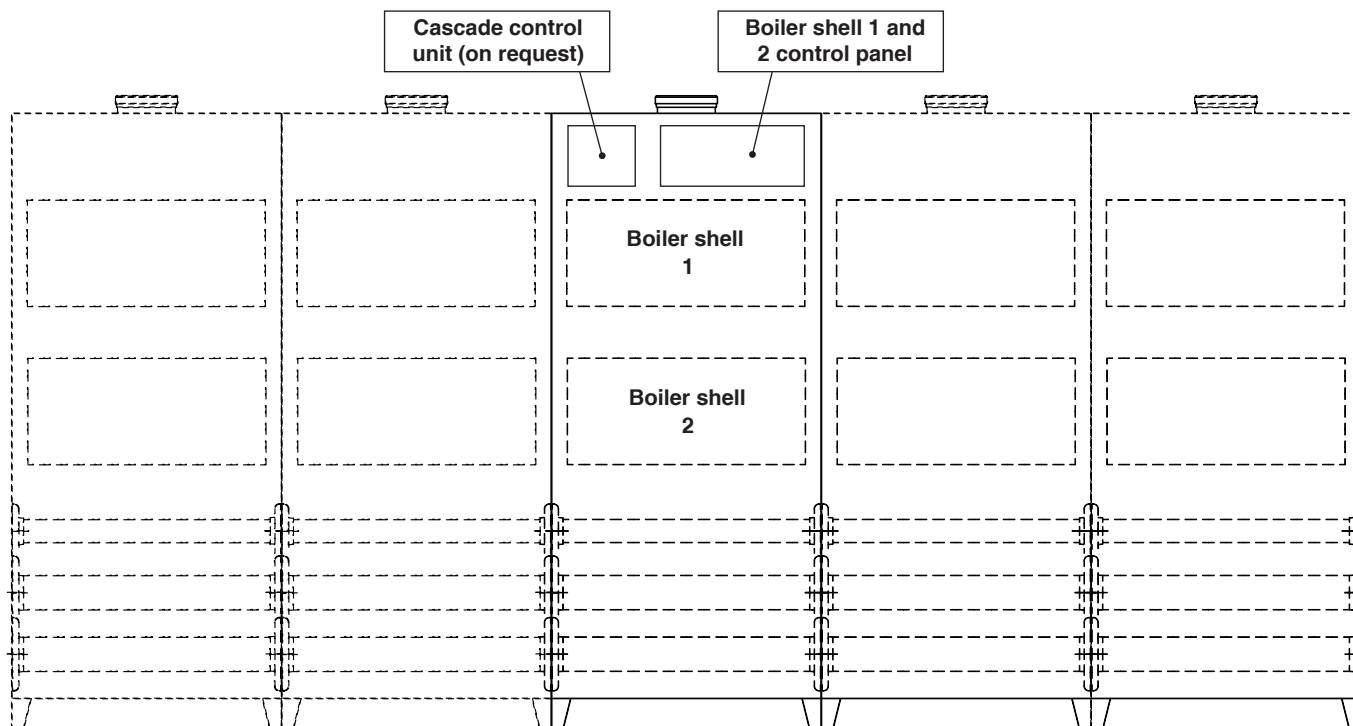


Fig. 1

## 1.2 Control panel

The control panel permits displaying the operating status, the setting of the operating parameters of the two exchanger + burner shells inside the module.

At the control panel level, operating adjustment and display are entirely independent for the two internal boiler shells.

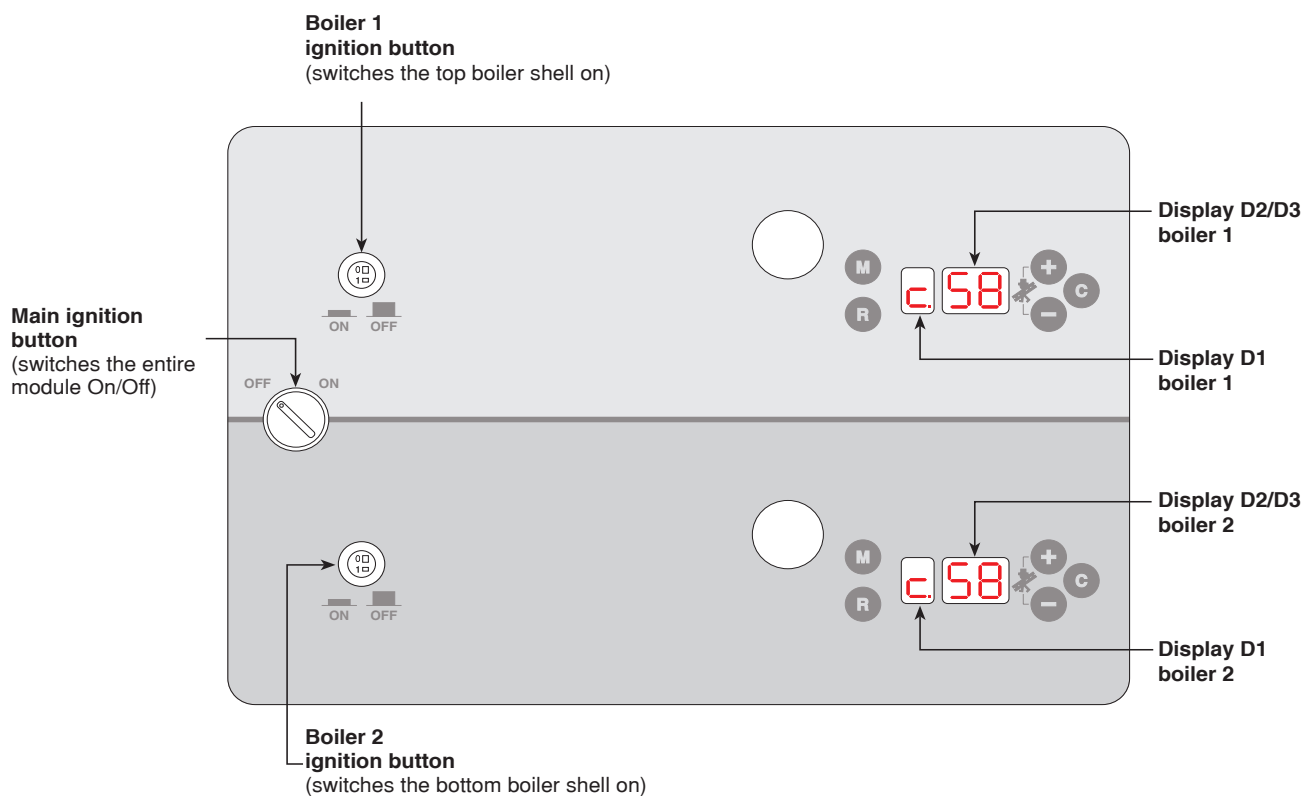


Fig. 2

### Key functions



**MODE** key - to scroll through the parameters.



**RESET** key - to reset generator operation after a shutdown.



**EDIT** keys - to edit the settings.



**CONFIRM** key - to enable the setting made.

### Display information



**MODE** Display - shows the generator operating mode or the selected parameter.



**DATA** Display - shows the value of the parameter



## Operating information on display

During operation, without pressing any keys, the display shows the unit's status:

Operating mode	Display "D1"	Display "D2/D3"
Standby	□	System delivery temperature
Heating	□	System delivery temperature
Standby after heating op.	9	System delivery temperature

## Accessing the operational menu

Pressing the "M" mode key a first time takes you to the operational menu. Press the "M" mode key again to display the following parameters and information in sequence:

DISPLAY D1	DISPLAY D2 - D3
0--	Summer/Winter selection (00 = Summer • 11 = Winter)
000	<b><u>DO NOT CHANGE THIS PARAMETER*</u></b>
1--	System delivery temperature display and setting
2--	Not used
3--	System return temperature display
4--	Outside temperature display
5--	Not used
6--	Not used
7--	Not used
8--	Boiler power display
9--	Compensation curve display and setting
9--	Not used

**\*Important: For the generator to work correctly, this parameter must be set on "00".**



## Adjustments

### Setting the system temperature

To set the system delivery temperature on the single boiler shell, access the operational menu and press the key **M** to display parameter 1 – system delivery temperature. On pressing one of the keys **+/-**, the display starts blinking and the delivery temperature setpoint is displayed. Use the keys **+/-** to set the required value. To activate the new setting, press **C**. To cancel, do not press the key **C** and press **M**.

### Summer/Winter selection

For the Summer/Winter selection, go to the operational menu and press **M** to display parameter "0."

In relation to parameter "0.", pressing one of the keys **+/-** displays the Summer/Winter selection (the parameter "0." blinks); by using these same keys you can select Summer operation (set 00) or Winter operation (set 11). To activate the new setting, press **C** and to exit without activating the selection, press **M**.

In "Summer" mode (00) heating is off. The antifreeze function stays on.

### Sliding Temperature

When the optional outside sensor is installed the generator adjustment system works with "Sliding Temperature". In this mode, the temperature of the heating system is governed according to the weather conditions outside so as to ensure a high degree of comfort and energy savings throughout the year. In particular, as the outside temperature increases the system delivery temperature decreases according to a specific "compensation curve."

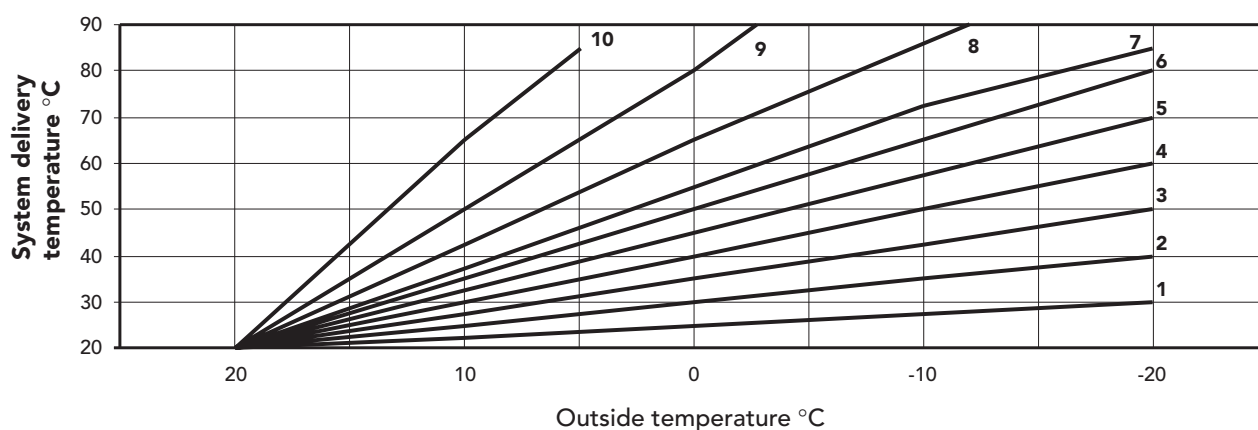
With the Sliding Temperature adjustment, the temperature set in parameter 1 of the operational menu becomes the maximum system delivery temperature. It is recommended to set a maximum value to permit system adjustment throughout its useful working range.

The generator must be regulated at the time of installation by qualified personnel. Any adjustments can anyhow be made by the user to improve comfort: the compensation curve can be modified from the operational menu with the **M** key and scrolling through the menu again with the **M** key to parameter 9.

The set compensation curve is displayed (cfr. graph beneath). On pressing one of the **+/-** keys, the display starts blinking and it is possible again with the **+/-** to set the required value. To activate the new curve, press **C**. To cancel, do not press the **C** key and press **M**.

If the room temperature is lower than as required, it is recommended to set a curve of a higher degree and vice versa. Proceed by increasing or decreasing in steps of one and check the outcome in the room.

### Compensation curves







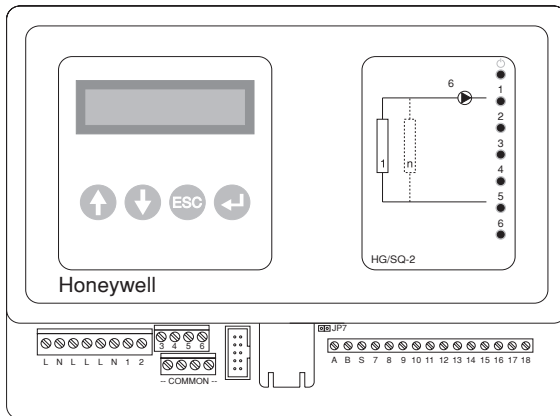
## 1.3 Cascade control unit (code 1KWMH18A)

A cascade control unit, available on request, provides advanced control of the operation of the two internal boiler shells.

One control unit can handle up to 5 internal boiler shells.

Control unit/module combinations are given in the following table.

For the connection and operating instructions, refer to the manual supplied with the control unit.



N° of Econcept 100 modules	N° of cascade control units
1	1
2	1
3	2
4	2
5	2

Fig. 3

## 1.4 Turning on and off

### Ignition

Check that the external system shut-off valves are open. Open the gas cock upstream from the generators, turn the main switch ON and press the ignition keys on the control panel. The boiler will run a self-test cycle of approximately one minute, after which it is ready for operation. The burner switches on and off entirely automatically depending on the system heat requirements.

### Turning off

If the unit is not to be used for a long time, close the gas cock upstream from the generators and disconnect the electrical power. In this case, the boiler antifreeze protection, which switches on the burner for system temperatures below 5°C, is also turned off.

#### Dangers of freezing



The best protection during extremely cold periods is to keep the boiler and services working so that the entire system is involved. Alternatively, add antifreeze fluid to the system water, in the proportion directed by the supplier according to the presumed minimum ambient temperature.

## 1.5 Anomalies

In the event of operating problems or trouble, the display blinks and a fault identification code appears.

Faults marked with the letter "F" cause temporary shutdowns that are automatically reset as soon as the value comes back within the generator's normal working range.

Faults marked with the letter "A" cause a generator shutdown that the user can reset. To restore operation, you need to press the (reset) key.

If the problem remains, or for any other trouble, refer to the "troubleshooting" section in this manual for further details and, if necessary, call in Qualified Personnel or the assistance centre.



In case the unit breaks down and/or functions poorly, deactivate it, do not make any attempt to repair it or directly intervene. Contact authorized and professionally qualified personnel.



## 2. INSTALLATION

### 2.1 General Instructions

This device must only be used for the purpose for which it is specially designed. This unit is designed to heat water to a temperature below boiling point at atmospheric pressure and must be connected to a heating system compatible with its performance, characteristics and heating capacity. Any other use is considered improper.

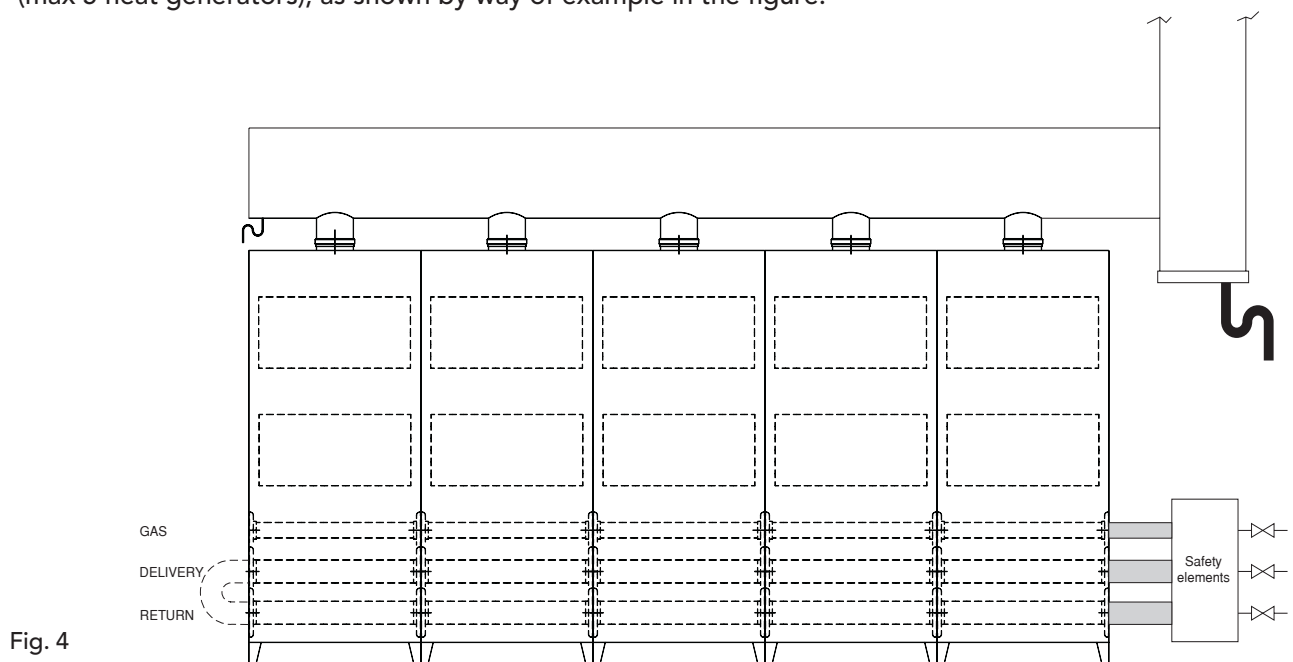


INSTALLATION OF THE GENERATOR MUST ONLY BE PERFORMED BY QUALIFIED PERSONNEL, IN ACCORDANCE WITH ALL THE INSTRUCTIONS GIVEN IN THIS TECHNICAL MANUAL, THE PROVISIONS OF CURRENT LAW, THE PRESCRIPTIONS OF NATIONAL AND LOCAL STANDARDS, AND THE RULES OF PROPER WORKMANSHIP.

Incorrect installation can cause damage or physical injury for which the manufacturer declines any responsibility.

### 2.2 Connection in cascade

Econcept 100 is a heat generator designed to operate either singly or in cascade. If the heating capacity required by the system exceeds 90.4 kW, two or more Econcept 100 generators can be connected in cascade (max 5 heat generators), as shown by way of example in the figure.



Generators connected in this way can be considered as a single "equivalent" heat generator with a total capacity of  $N \times 90.4$  kW. It is necessary to meet all the requirements of current standards and regulations applicable to this "equivalent" generator with a total heating capacity of  $N \times 90.4$  kW. In particular the place of installation, safety devices and fume extraction system must be adequate for the total heating capacity  $N \times 90.4$  of the bank of Econcept 100 units.

Please note that each Econcept 100 module is in actual fact a complete independent heat generator, equipped with its own safety devices. In particular, each Econcept 100 module is equipped with a water pressure switch, safety thermostat and electronic limiting device. In the event of over-temperature, a lack of water or of circulation in the unit, the protection devices cause the unit to switch off or shut down, preventing it from working.

The installation instructions given in the following paragraphs concern both single modules and cascade connections.



## 2.3 Place of installation

The generator can be installed directly outside or in a specific room with ventilation openings to the outside as prescribed by current regulations. If there are several burners or suction units that can work together in the same room, the ventilation openings must be sized for simultaneous operation of all the units.

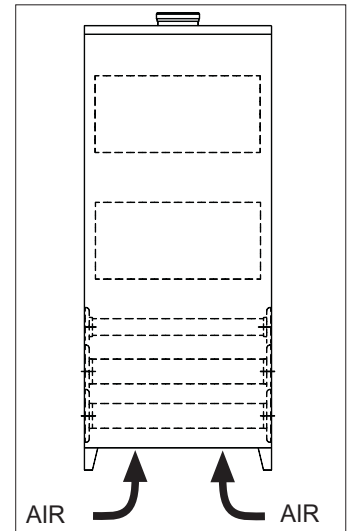
The place of installation must be free of flammable materials or objects, corrosive gases, powders or volatile substances.

For positioning, leave sufficient room around the modules for normal maintenance work.

In particular, check that the front door can open freely.



The air needed for combustion is drawn in through slits in the bottom of the door. Make sure these air passages do not get obstructed in any way.



## 2.4 Gas and water connections

### Plumbing connections

Make the connections to the corresponding connections as directed below.

Make the generator connection in such a way that its internal pipes are free of stress. For good operation and long life of the generator, the plumbing system must be well proportioned and always complete with all those accessories that guarantee regular operation and running.

In particular, make provision for all the protection and safety devices prescribed by current standards for the modular generator assembly. They must be installed on the hot water circuit delivery piping, immediately downstream from the last module, within a distance no greater than 0.5 metres, with no shut-off devices in between. The unit is not supplied with an expansion tank; its connection must therefore be made by the Installer.

In addition, a filter must be installed on the system return piping to prevent debris or sludge from the system clogging and damaging the heat generators.



The filter must definitely be installed when replacing generators in existing systems.

The manufacturer shall not be held liable for any damage caused to the generator by failure to install or inadequate installation of this filter.

### Characteristics of the water system

In the presence of water harder than 25° Fr, we recommend the use of suitably conditioned water in order to avoid possible scaling in the boiler, caused by hard water, or corrosion produced by aggressive water. It should be remembered that, because of its low thermal conductivity, even scaling of just a few mm thick causes significant overheating of the generator walls with consequent serious problems.

Water treatment is indispensable in the case of very large systems (containing large amounts of water) or with frequent introduction of replenishing water in the system. If partial or total emptying of the system becomes necessary under these conditions, it is advisable to refill it with treated water.

### Gas connection

The gas must be connected to the relative connector with a rigid metal pipe.

The capacity of the gas meter must be sufficient for the simultaneous use of all equipment connected to it. Make the gas connection of the generator in accordance with current regulations. The diameter of the gas pipe leaving the generator does not determine the diameter of the pipe between the unit and the meter; it must be chosen according to its length and loss of head.



## Connection instructions

Econcept 100 is equipped on the inside with 3 manifolds (gas, system delivery and return) and a condensate outlet pipe that facilitate both cascade connections and connecting the single module to the system. The manifolds are sized for connecting up to 5 modules in series. The cabinet contains a set of flanges, seals and screws for the connection.

To connect a single module (Fig. 5)

- After deciding on which side of the Econcept 100 module to make the water and gas connections, connect the flanges with the joining section, contained in the kit, on this side after appropriately welding them onto the system pipes so they are airtight. Take care to fit the seals, contained in the kit, correctly.
- Connect a pipe Ø40 to the condensate outlet pipe to evacuate the condensate produced during operation (see Fig. 7).
- Fit the blind flanges contained in the kit on the opposite side of the module, putting the seals in between.

To connect several modules in cascade (Fig. 6a).

- Connect the first module to the system and gas pipes, as described above, but without fitting the blind flanges on the opposite side of the module to that of the connection.
- On this side, instead, connect the second module, taking care to align the connection flanges and the condensate outlet pipe. Place the seals contained in the kit between the flanges of the two modules.
- Fit the bolts contained in the kit into the flanges from the inside of the first module, making them come out of the flanges in the second module. Partially tighten the nuts onto the bolts from inside the second module.
- Before tightening the nuts, check all the seals are correctly positioned and couple together the condensate outlet pipes of the two modules (see Fig. 8).
- Tighten the nuts and repeat the connection operations for the following modules (max.5)

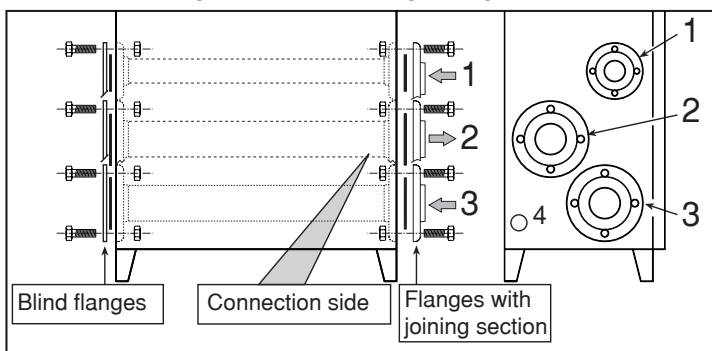
If using a water trap

- At the end, fit the blind flanges on the last module, putting the seals in between.

If using a direct pump

- Connect the delivery to the return on the last module (see Fig. 6b).

### Plumbing connection using one generator with a water trap



#### Key

- 1 - Gas inlet
- 2 - System delivery
- 3 - System return
- 4 - Condensate outlet

Fig. 5

### Plumbing connection using two or more generators with a water trap

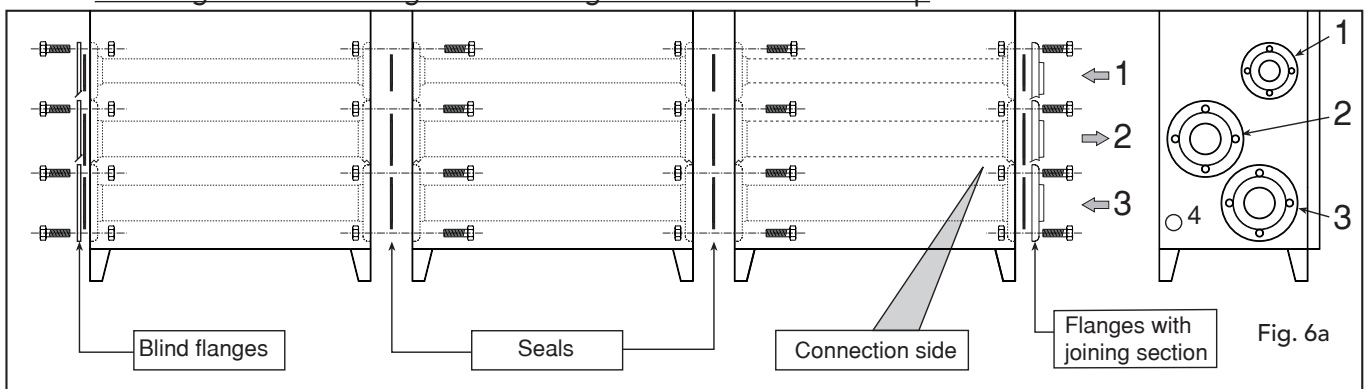


Fig. 6a



## Plumbing connection using one or more generators with a direct pump

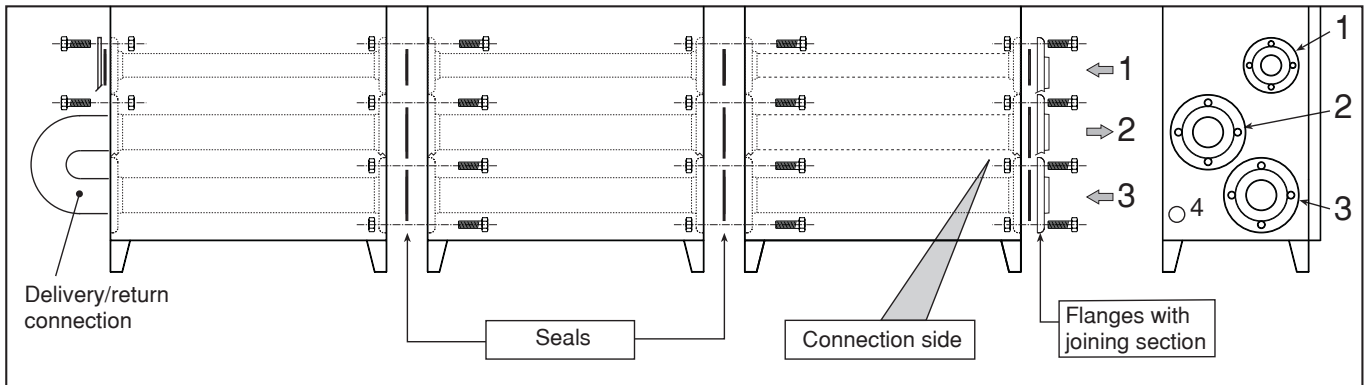


Fig. 6b

## Condensate outlet connection using one generator

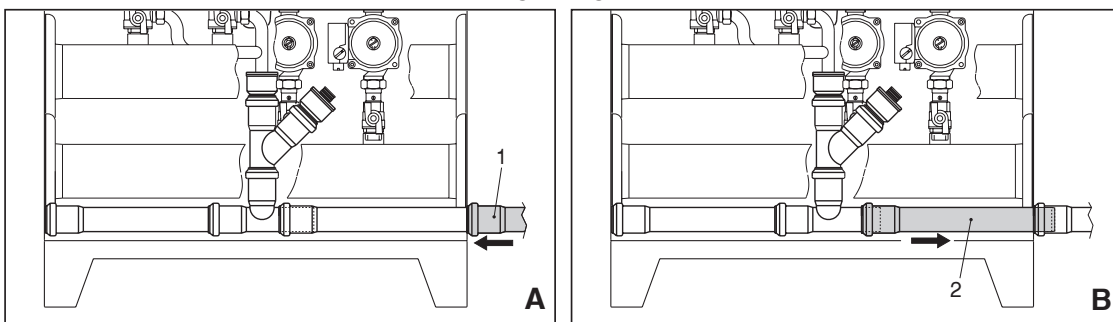


Fig. 7

**A** - Place the pipe 1 Ø40 (not supplied) on the side of the generator.

**B** - Slide the pipe 2 towards the side of the arrow for at least 2-3 cm so as to insert it into the pipe 1.

## Condensate outlet connection using two or more generators

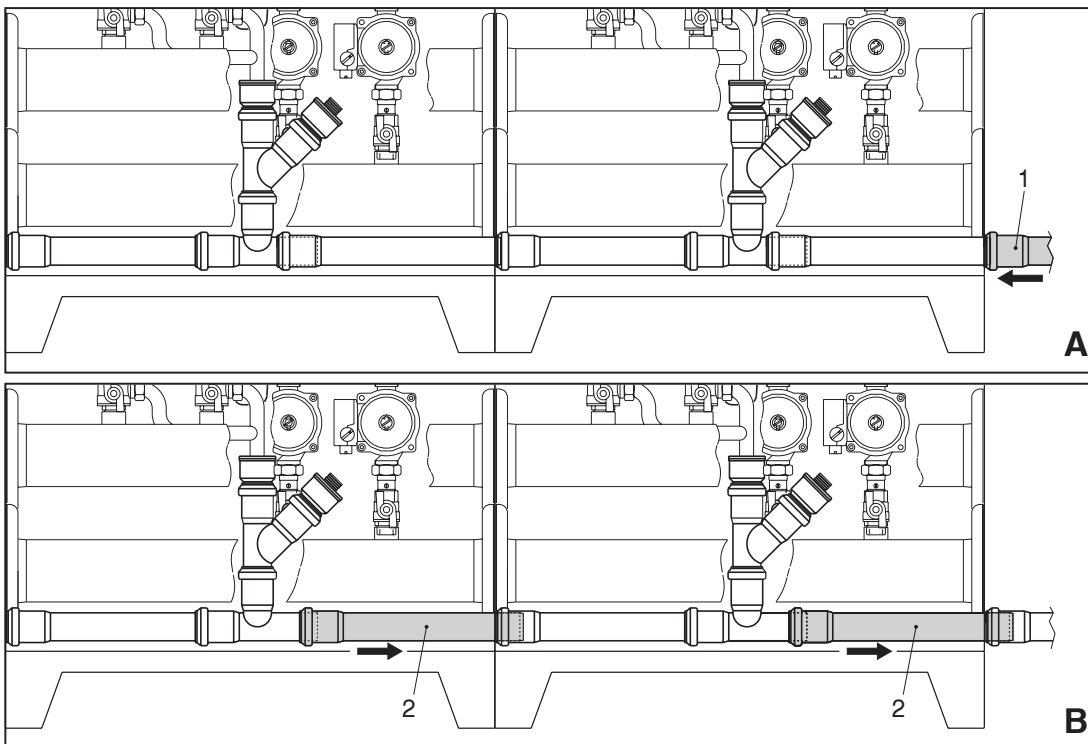


Fig. 8

**A** - Place the pipe 1 Ø40 (not supplied) on the side of the generator.

**B** - Slide the pipe 2 (of each generator) towards the side of the arrow for at least 2-3 cm so as to insert it into the pipe 1.



## 2.5 Electrical Connections

### Power supply

The generator should be connected to a single-phase power line, 230 Volt-50 Hz, interposing fuses of max. 3A between the boiler and the line, with a bipolar switch whose contacts have a minimum opening of at least 3 mm. It is always important to connect the boiler to a good earthing system.

When electrically connecting the boiler to a power system with phase and neutral, it is advisable to RESPECT THE polarities (LINE: brown wire / NEUTRAL: blue wire / : yellow-green wire). Note: If changing the electric power cable, use solely "HAR H05 VV-F" 3x0.75 mm<sup>2</sup> cable with a maximum outside diameter of 8 mm.

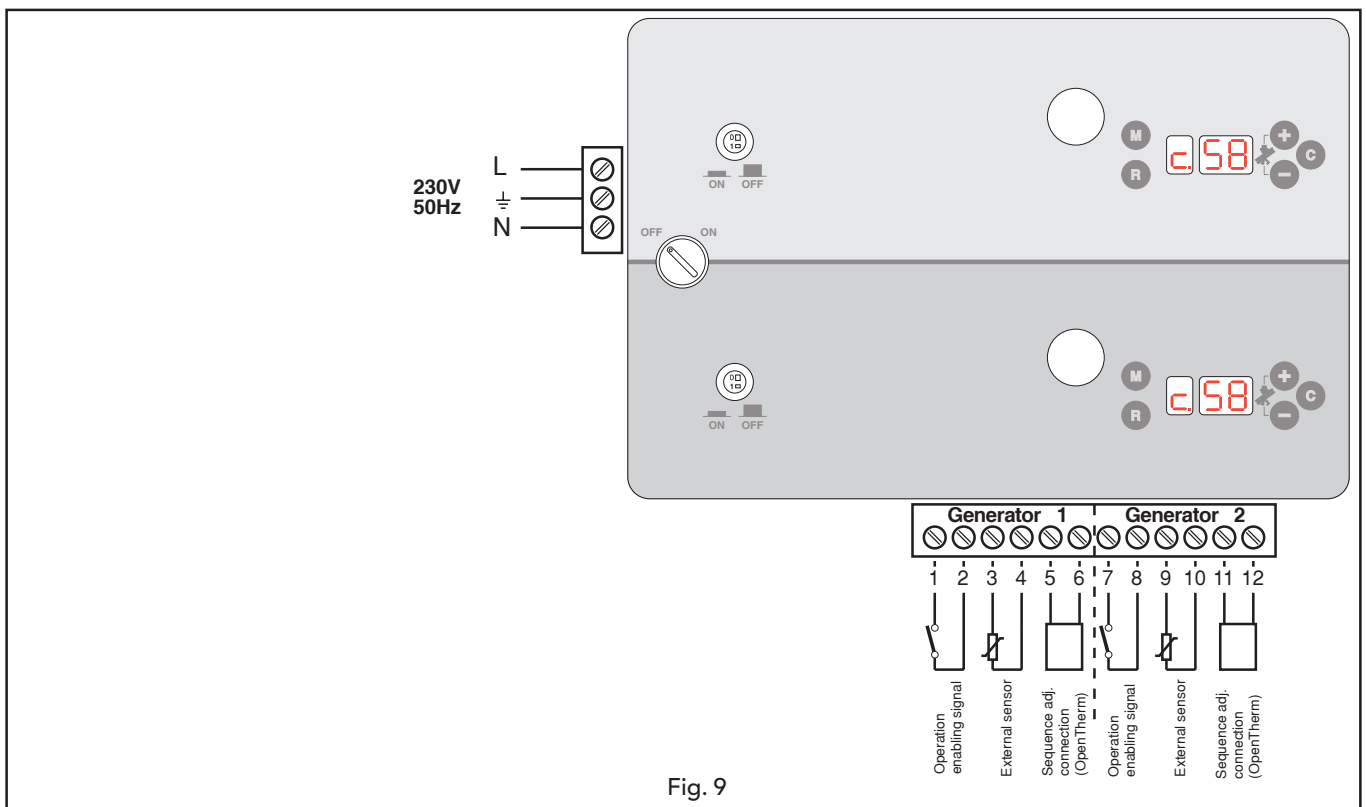


Fig. 9



## Positioning the external sensor

The external sensor should preferably be installed on the North, North-West wall or on the wall with most of the main living room. The sensor must never be exposed to early morning sunshine and in general, as far as possible, it must not be hit directly by the sun's rays; if necessary, it should be protected.

In any case, the sensor must never be fitted near windows, doors, ventilation openings, flues or sources of heat that could affect the reading.

**Note:** The maximum permissible length of the electric cable connecting the boiler - external sensor is 50 m. A common 2-wire cable can be used.

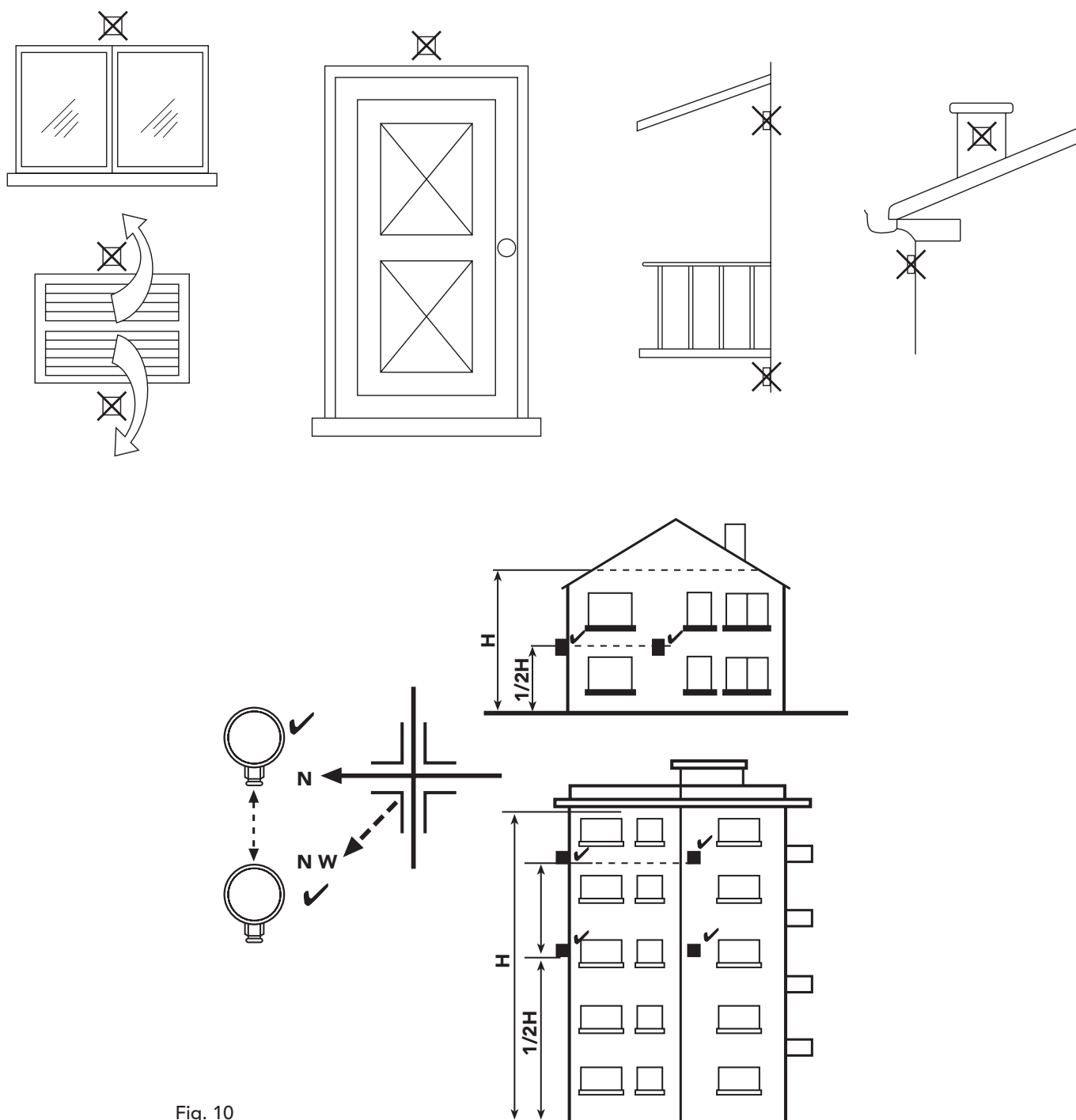


Fig. 10



## 2.6 Flue connection

- Manifold, ducts and flue must be suitably sized, designed and made in compliance with current regulations. They must be made of suitable materials, i.e. resistant to heat and corrosion, smooth on the inside and airtight. In particular, joints must be condensation-proof. In addition, make provision for adequate condensate drainage points, connected via an air-trap to prevent the condensation in the flues running into the generators.
- To connect several modules in cascade, connect the fume outlets ( $\varnothing 150$ ) of the single modules as shown in the figure, taking care to observe the manifold and flue diameters given in the table alongside here. The single flues must be coupled onto the manifold at an angle of approximately  $30^\circ$  to the vertical (Fig. 11).
- Air is drawn from the installation room, which must be equipped with adequate ventilation in accordance with current laws and regulations.

N° of Econcept 100 modules	$\varnothing$ manifold/flue
1	150
2	200
3	250
4	300
5	350

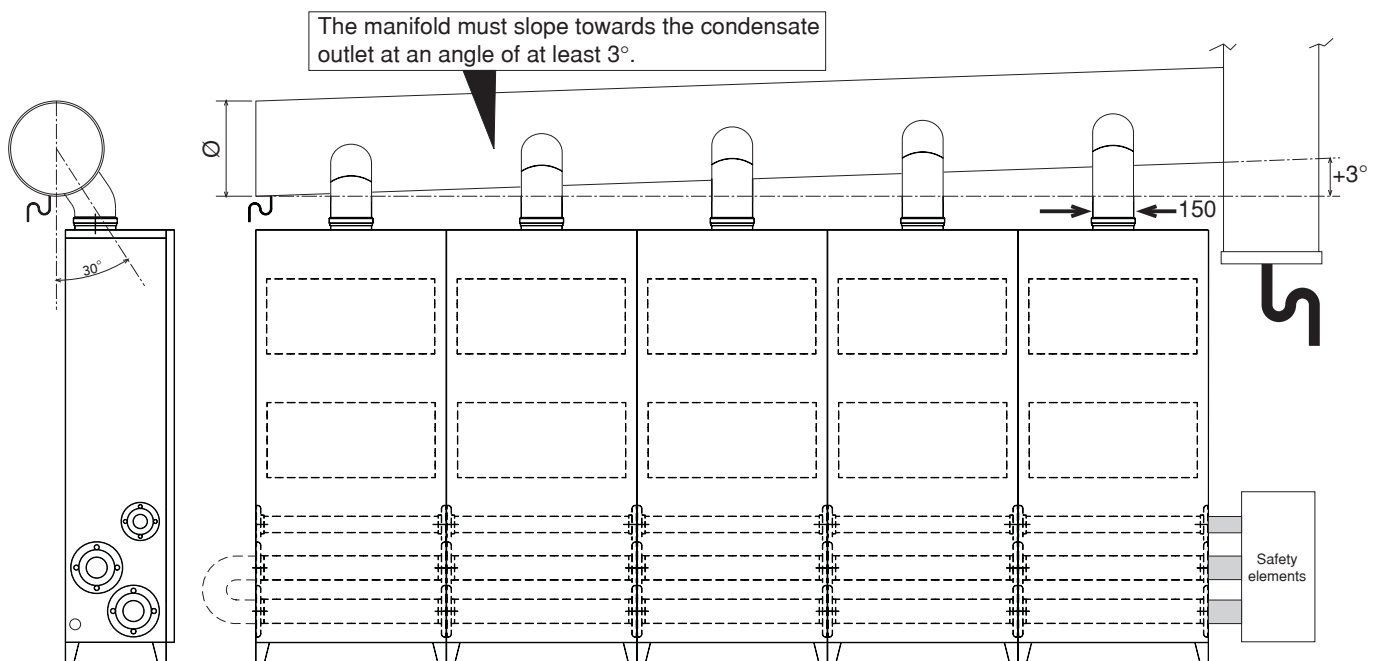


Fig. 11

## 2.7 Condensate outlet

The boiler is equipped with an internal air-trap to drain off the condensate, connected to an internal condensate outlet manifold 4 Fig. 12. Before starting up, open the cabinet and fill the air-trap with approximately 0.5 l. of water.

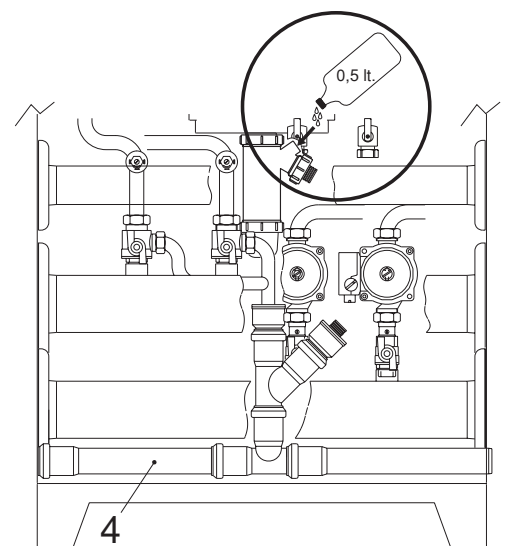


Fig. 12





## 3. SERVICE AND MAINTENANCE

### 3.1 Adjustments

All adjustment and conversion operations must be carried out by Qualified Personnel such as the personnel of the Local After-Sales Technical Service.

**Ferroli** declines any responsibility for damage or physical injury caused by unqualified and unauthorized persons tampering with the device.

#### Gas supply conversion

The unit can function with either Natural Gas or LPG and is factory-set for use with one of the two gases, as clearly shown on the packing and on the unit's dataplate. Whenever a different gas to that for which the unit is preset has to be used, a conversion kit will be required, proceeding as follows:

- 1 Unscrew the gas fittings **A** on the air/gas mixers **B**.
- 2 Change the nozzles in the mixers with the ones in the conversion kit.
- 3 Refit the fittings **A** and check the connections are airtight.
- 4 Apply the sticker, contained in the conversion kit, near the dataplate.

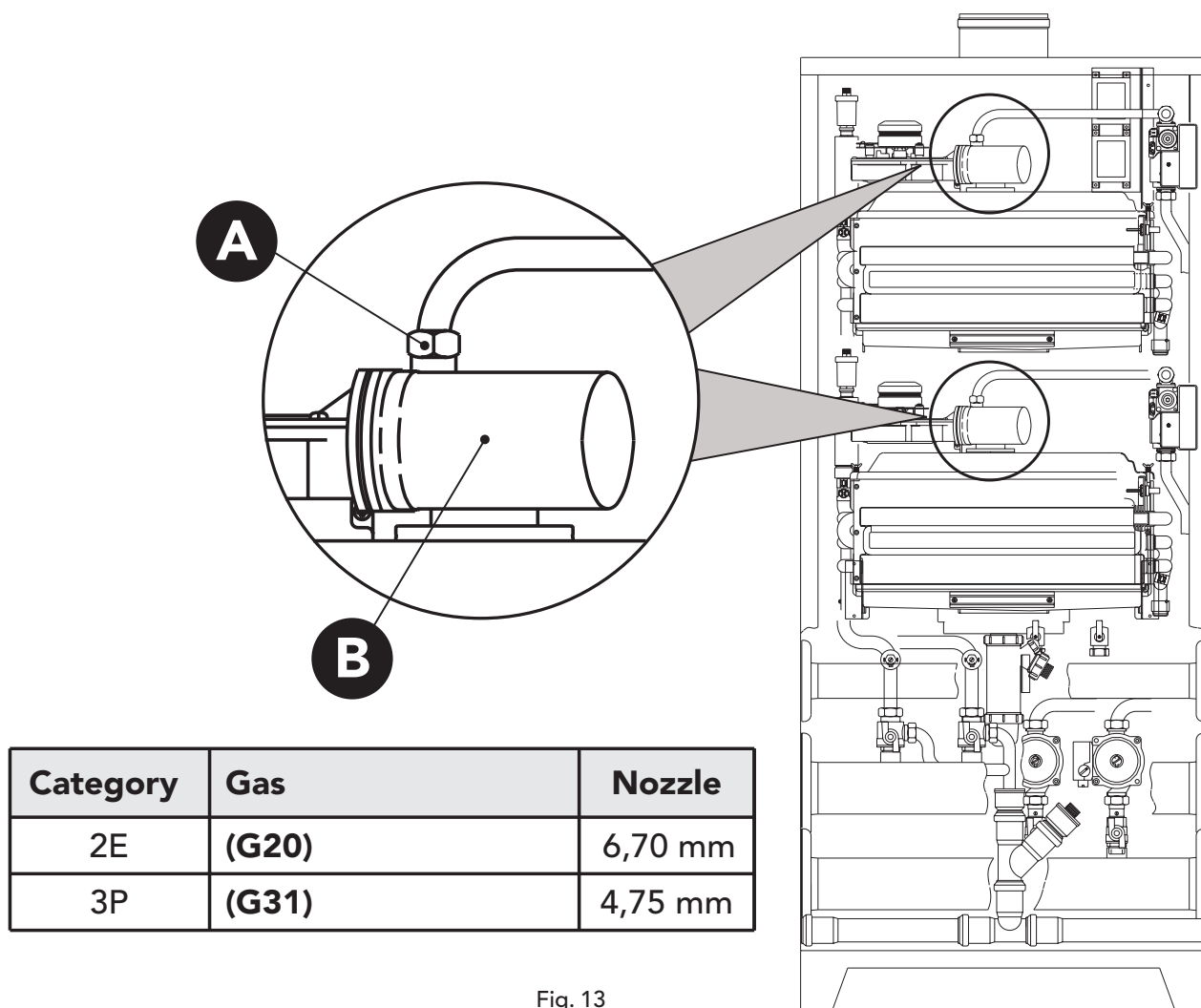


Fig. 13



## Boiler parameter adjustment

Pressing the **(M)** "mode" and **(+)** keys simultaneously for more than 3 seconds takes you to the boiler parameter menu.

On then pressing **(M)** you can scroll through the parameters, and with the **(+)** and **(-)** keys you can edit the settings.

For the modification to become active you must press **(C)** "confirm".


## Temperature adjustments

Pressing **(M)** "Mode" takes you to the user menu (cfr. chap. 1 for a full description) where it is possible to edit:

### Par. "1" • System temperature



Adjustable from:  
30 a 90°C

 The generator is equipped with a safety device that temporarily stops operation if  $\Delta t$  are too high.

## 3.2 System start-up

Commissioning must be performed by Qualified Personnel such as the staff of our Sales Organization and your local After-Sales Technical Service.

The first ignition is free of charge and must be requested as directed on the sticker on the generator.

Checks to be made at first ignition, and after all maintenance operations that involved disconnecting from the systems or work on safety devices or parts of the generator:



## **Before igniting the generator:**

- Open any on-off valves between the generator and the systems
- Check the airtightness of the gas system, proceeding with caution and using a soap and water solution to detect any leaks in connections.
- Fill the system as directed above and make sure that all air contained in the generator and the system has been vented by opening the air vent valve inside the unit and any vent valves on the system.
- Make sure there are no water leaks in the system, connections or generator.
- Make sure the electrical system is properly connected.
- Make sure that the unit is connected to a good earthing system.
- Check the unit is correctly connected to the condensate draining system and make sure the condensate evacuation system works properly.
- Make sure that the pressure and gas flow values are those required for heating.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the generator.

## **Turning on the generator:**

- Open the gas cock ahead of the generator.
- Vent the air from the pipe ahead of the gas valve.
- Turn on the switch or insert the plug ahead of the generator.
- Turn the main switch and the two boiler shell switches ON.
- The generator turns on and runs a full self-test cycle of approximately one minute, checking the main parts work properly. The display shows the following in sequence:

Software release

Parameter version

Operation in test mode - (F Hi)

- If the cycle is correctly passed:
  - If there is no call for heating, the display shows a lowercase " o " (standby operating mode) followed by the temperature value of the delivery sensor. Then use the room thermostat or the remote control to activate heating
  - If there is a call for heating, the display passes from standby " o " to the heating phase " c " and the generator starts working automatically, governed by its control and safety devices.
  - If any faults are found in the self-test cycle or during ignition, the display will show the relevant error code and the generator will shut down. Wait for approximately 15 seconds and press reset. The reset generator will repeat the ignition cycle. If the generator fails to light after the second attempt, consult the "Troubleshooting" paragraph.

**Note:** In the event of an electrical power failure while the generator is working, the burner will go out. When power returns, the boiler will run the self-test cycle again, after which the burner will automatically re-ignite (if there is still demand for heat).

## **Checks during operation**

- Check the airtightness of the fuel circuit and water systems.
- Check the efficiency of the flue and air-fume ducts while the generator is working.
- Check that the water is circulating properly between the boiler and the systems.
- Make sure that the gas valve modulates correctly in both the heating and hot water production phases.
- Check the proper ignition of the generator by performing various tests, turning it on and off with the room thermostat or remote control.
- Make sure that the fuel consumption indicated on the meter corresponds to that given in the technical data table.
- Check the parameters are programmed correctly and perform any required customization (compensation curve, power, temperatures, etc.).



## 3.3 Maintenance

The following operations are strictly reserved for Qualified Personnel, such as the staff of our Sales Organization and your local After-Sales Technical Service.

### Seasonal inspection of the generator and flue

Have the following checks carried out at least once a year:

- The control and safety devices (gas valve, flow meter, thermostats, etc.) must function correctly.
- The fume ducts must be free of obstructions and leaks.
- The condensate evacuation system must be efficient with no leakage or obstructions.
- The gas and water systems must be airtight.
- The burner and exchanger must be clean. Follow the instructions in the next paragraph.
- The electrodes must be free of scale and properly positioned.
- The water pressure in the cold water system must be about 1 - 1.5 bar; otherwise, bring it to that value.
- The gas flow and pressure must correspond to that given in the respective tables.
- The circulating pumps must not be blocked.

### Cleaning the generator and burner

The body and burner must not be cleaned with chemical products or wire brushes.

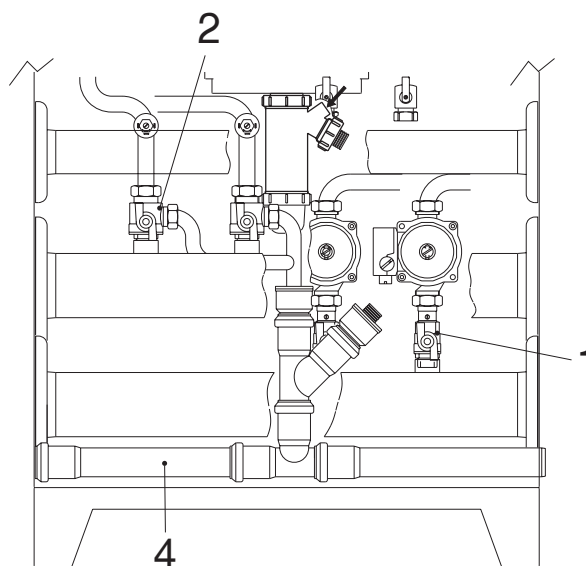
In addition, it is necessary to pay attention after performing all these operations to check and carry out all the phases of ignition and thermostat operation, the gas valves and circulation pumps.



After these checks, make sure there are no gas leaks.

### Shutting off the exchangers from the system

To cut the single exchanger off from the system and permit maintenance work, shut off first the return valve "1" and then the three-way delivery valve "2". In this way, the three-way valve "sets the exchanger in communication with the atmosphere", causing it to discharge into the manifold "4".





## 3.4 Troubleshooting

### Fault Diagnosis

The generator is equipped with an advanced self-diagnosis system. In the event of an operating fault, the display will blink and the fault identification code will appear. Faults marked with the letter "A" cause a permanent generator shutdown. To restore operation, you need to press the "R" (reset) key on the generator.

Faults marked with the letter "F" cause temporary shutdowns that are automatically reset as soon as the value comes back within the generator's normal working range.

The following table gives information for resolving trouble signalled by the generator. Work on the unit must be carried out solely by Qualified Personnel such as the personnel of the FERROLI After-Sales Technical Service. For work on the unit that requires opening the generator, always have it done by the assistance centre.

	<b>Fault</b>	<b>Possible cause</b>	<b>Cure</b>
A01	No burner ignition	<ul style="list-style-type: none"> <li>No gas</li> <li>Detection or ignition electrode fault</li> <li>Defective gas valve</li> </ul>	<ul style="list-style-type: none"> <li>Check the regular gas flow to the boiler and the air has been eliminated from the pipes</li> <li>Check that the electrodes are correctly positioned and free of any deposits</li> <li>Check and change the gas valve</li> </ul>
A02	Safety thermostat trips	<ul style="list-style-type: none"> <li>Delivery sensor not active</li> <li>No system circulation</li> </ul>	<ul style="list-style-type: none"> <li>Check the correct positioning and operation of the delivery sensor</li> <li>Check the circulator</li> </ul>
A03	Fume extraction duct safety device tripping	<ul style="list-style-type: none"> <li>Flue partially obstructed or insufficient</li> </ul>	<ul style="list-style-type: none"> <li>Check the efficiency of the flue, fume extraction ducts and outlet terminal</li> </ul>
A04	No flame after the ignition phase	<ul style="list-style-type: none"> <li>Obstructed air/fume ducts</li> </ul>	<ul style="list-style-type: none"> <li>Remove the obstruction from the flue, fume extraction ducts and air inlet and terminals</li> </ul>
F05	Low system water pressure	<ul style="list-style-type: none"> <li>System empty</li> </ul>	<ul style="list-style-type: none"> <li>Fill the system</li> </ul>
F06	Fan trouble	<ul style="list-style-type: none"> <li>Fan not powered</li> <li>Defective fan</li> </ul>	<ul style="list-style-type: none"> <li>Check the fan wiring</li> <li>Change</li> </ul>



	Fault	Possible cause	Cure
F 08	System delivery over-temperature	<ul style="list-style-type: none"> <li>• Circulator jammed</li> <li>• Circulator trouble</li> </ul>	<ul style="list-style-type: none"> <li>• Free the circulator by removing the plug and making the shaft turn with a screwdriver</li> <li>• Check or replace the condenser or circulator</li> </ul>
F 09	System return over-temperature	<ul style="list-style-type: none"> <li>• No system circulation</li> <li>• Tap water exchanger dirty or obstructed</li> </ul>	<ul style="list-style-type: none"> <li>• Check system and circulator</li> <li>• Clean tap water exchanger</li> </ul>
F 10	Delivery sensor fault	<ul style="list-style-type: none"> <li>• Sensor damaged or wiring broken</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring or change the sensor</li> </ul>
F 11	Return sensor fault	<ul style="list-style-type: none"> <li>• Sensor damaged or wiring broken</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring or change the sensor</li> </ul>
F 12	Resistor at terminals 7-8 of connector X5 not connected	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Check the value and the connection of the resistor</li> </ul>
F 13	Resistor at terminals 11-12 of connector X7 not connected	<ul style="list-style-type: none"> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Check the value and the connection of the resistor</li> </ul>
F 14	External sensor fault	<ul style="list-style-type: none"> <li>• Sensor damaged or wiring short circuit</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring or change the sensor</li> </ul>
A 16	No communication between main card and ignition equipment	<ul style="list-style-type: none"> <li>• Broken or incorrect wiring between main card and ignition equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Check the wiring and connections between the cards</li> </ul>
F 17 F 18 F 19	Microprocessor fault	<ul style="list-style-type: none"> <li>• Trouble with microprocessor operation</li> </ul>	<ul style="list-style-type: none"> <li>• Cut off and restore the electricity supply. If the trouble remains, check and/or change the main card</li> </ul>



## 4 TECHNICAL CHARACTERISTICS AND DATA

### 4.1 Dimensions and connections

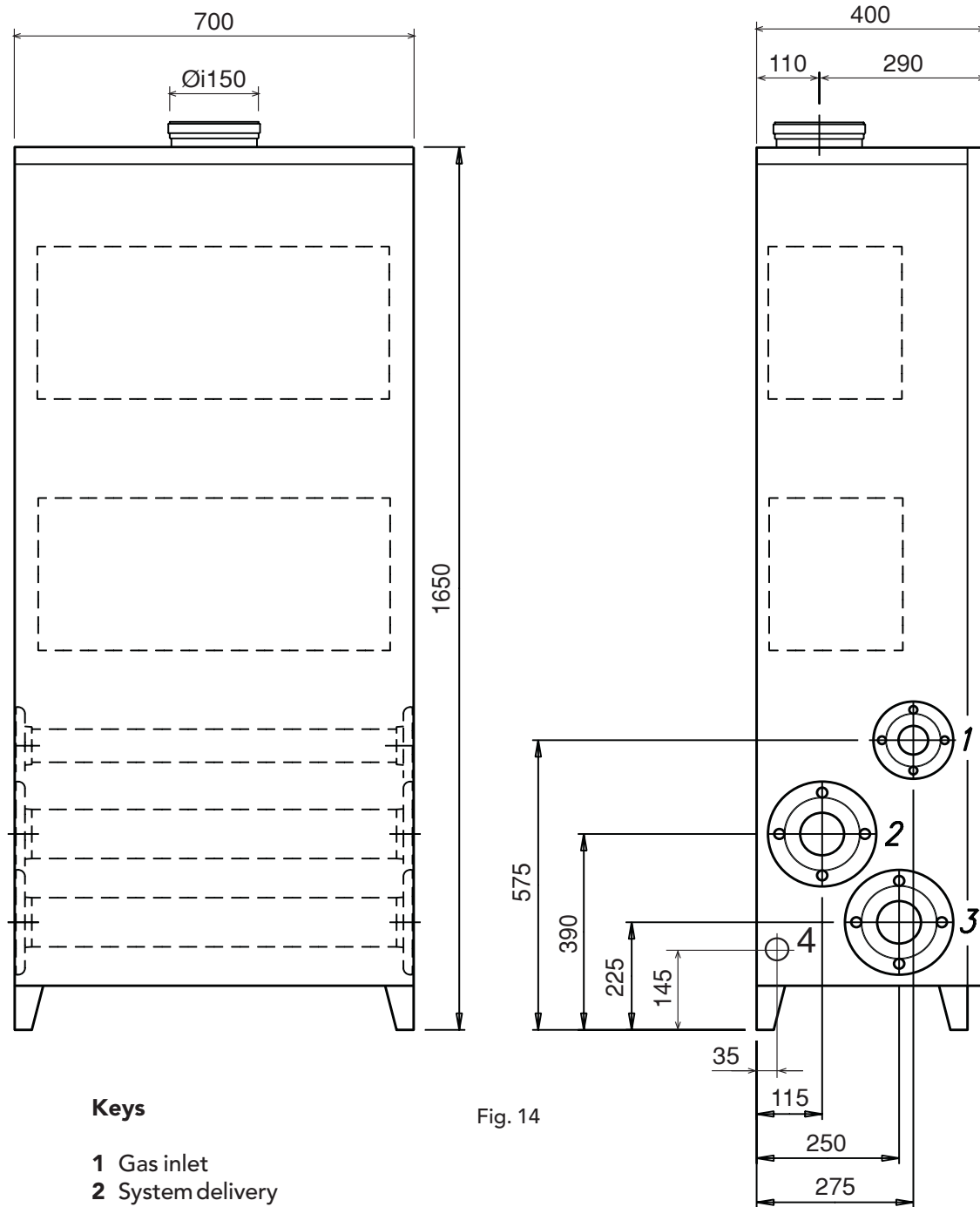


Fig. 14

#### Keys

- 1 Gas inlet
- 2 System delivery
- 3 System return
- 4 Condensate outlet



## 4.2 General view and main components

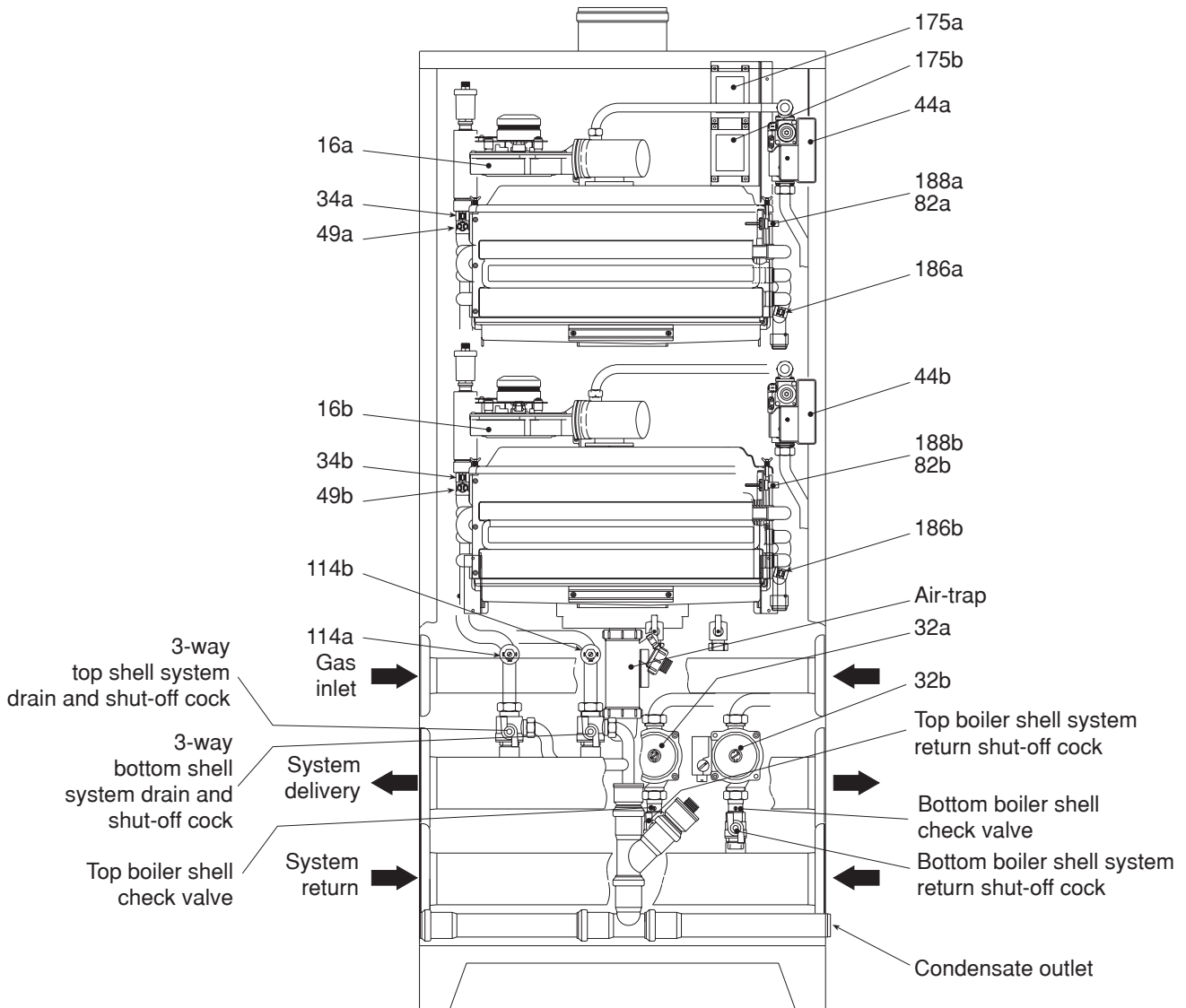


Fig. 15

The components marked with the letter A belong to the top boiler shell system; the ones marked with the letter B to the bottom shell.

### Key

16	Fan	68	Electric box with card
32	Heating circulator	82	Detection electrode
34	Heating temperature sensor	114	Water pressure switch
44	Gas valve	186	Return sensor
49	Safety thermostat	188	Ignition electrode
		175	Transformer 230v-24v





## 4.3 Technical data table

<b>Powers</b>		<b>Pmax</b>	<b>Pmin</b>
Heating Power (Net Heat Value - Hi)	kW	92.0	13.8
Useful heating power 80°C – 60°C	kW	90.4	13.6
Useful heating power 50°C – 30°C	kW	96.8	14.4
<b>Gas supply</b>		<b>Pmax</b>	<b>Pmin</b>
Gas nozzles G20	mm	6.70	
Feed pressure G20	mbar	20.0	
Delivery G20	nm <sup>3</sup> /h	9.72	1.46
Gas nozzles G31	mm	4.75	
Supply pressure G31	mbar	37.0	
Delivery G31	kg/h	7.2	1.8
Air nozzle	mm Ø	23.5	
<b>Heating</b>			
Maximum working pressure in heating	bar	4	
Boiler water content	litres	13	
<b>Dimensions, weights connections</b>			
Height	mm	1650	
Width	mm	700	
Depth	mm	400	
Weight with packing	kg	165	
Gas system connection		DN50	
Heating system delivery		DN80	
Heating system return		DN80	
<b>Electrical power supply</b>			
Max electrical power absorbed	W	300	
Power voltage/frequency	V/Hz	230/50	
Electrical protection rating	IP	X4D	



## 4.4 Diagram of losses of load / head of circulator

The figure shows the diagram of the local circulation pump and the losses of head of the single exchanger bodies.

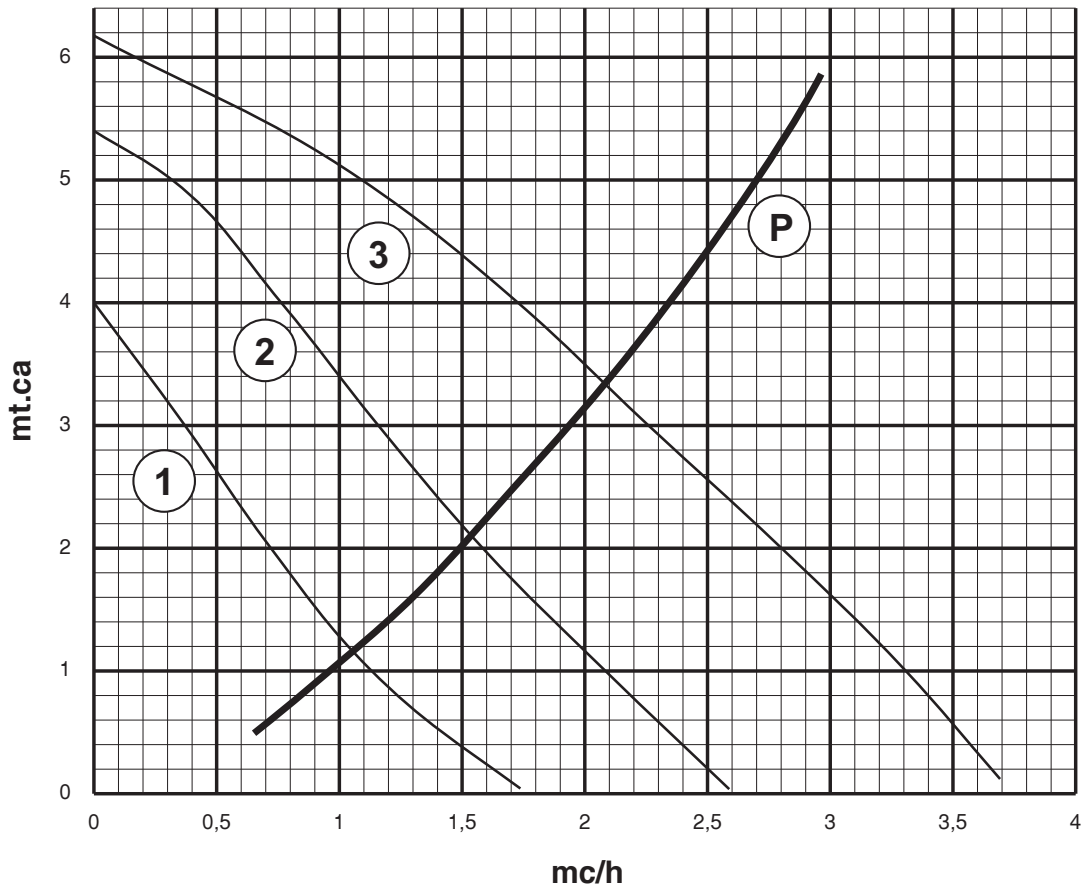


Fig. 16

**Key**

- 1 - 2 - 3 = Pump selector position
- P = Losses of head



## 4.5 Wiring diagram

