

STREBEL

S-FAX Boiler Range

Models 150 - 300 - 450 - 600

Floor Standing High Efficiency Condensing Boiler

Installation, Operating & Maintenance Manual



Please read and understand before commencing installation and leave the manual with the customer for future reference.

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Direct buttons

The direct buttons (details 8, 9, 10 - fig. 1) always have the same function.

Menu/navigation buttons

The menu/navigation buttons (details 5, 6, 7, 11, 12, 13 - fig. 1) are used to navigate among the various menus implemented in the control panel.

Menu structure

From the Home page, press the main Menu button (detail 12 - fig. 1).

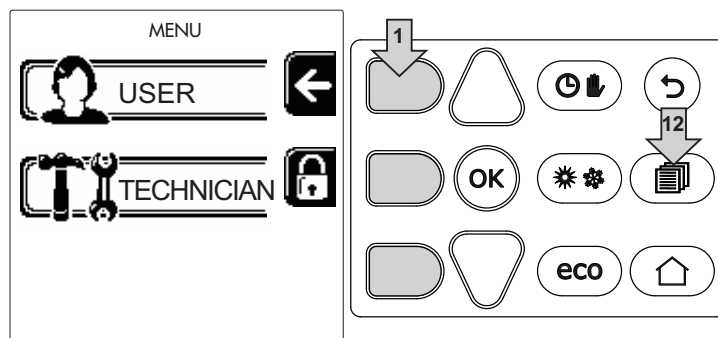


fig. 2

Access the "User" menu by pressing contextual button 1 (detail 1 - fig. 1). Then use the "menu navigation" buttons to access the different levels described in the following table.

USER MENU				
HEATING				
	 Adjustment Temp		See fig. 14	
	 Reduction Adjustment Temp		See fig. 15	
	 Sliding Temperature	 Curve1		See fig. 30
		 Offset1		See fig. 31
		 Heating Off External Temp		See page 17
		 Curve 2		/
		 Offset 2		/
 Time Program	See “Time programming” on page 10			
DOMESTIC HOT WATER				
	 Adjustment Temp		See fig. 16	
	 Reduction Adjustment Temp		See fig. 17	
	 Legionella	See “Legionella programming (with optional hot water tank installed)” on page 13		
	 Time Program	See “Time programming” on page 10		
VACATION FUNCTION				
		See “Vacation Function” on page 14		

MAINTENANCE			
		Test Mode	See page 42
			See fig. 86
		Cascade Test Mode	See fig. 98
		Service Information	See "Service Information" on page 337
		Service Intervention Date	See "Service Intervention Date" on page 337
SETTINGS			
		Language	See fig. 9
		Unit of measure	/
		Date setting	See fig. 10
		Time setting	See fig. 11

Indication during operation

Heating

A heating request generated by Room Thermostat or Remote Timer Control or 0-10 Vdc signal is indicated by activation of the circulating pump and by the hot air above the radiator (fig. 3).

"Heating only/Double circulating pump" configuration

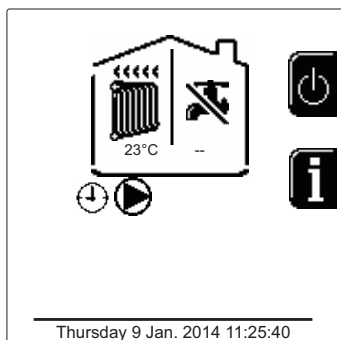


fig. 3

"Circulating pump and 3-way valve" configuration

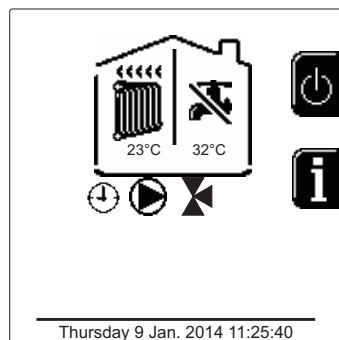


fig. 4

DHW circuit (with optional hot water tank installed)

A hot water tank heating request is indicated by activation of the droplet under the faucet (fig. 5 and fig. 6).

"Double circulating pump" configuration

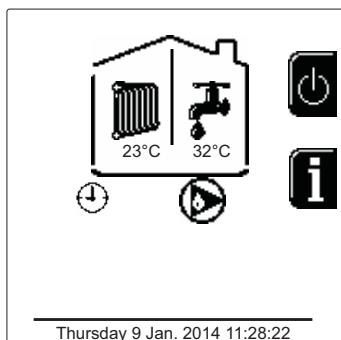


fig. 5

"Circulating pump and 3-way valve" configuration

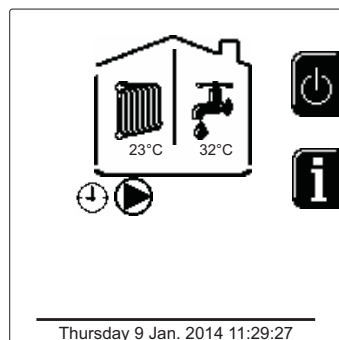


fig. 6

Exclude hot water tank (economy)

Hot water tank temperature maintaining/heating can be excluded by the user. If excluded, domestic hot water will not be delivered. The hot water tank can be deactivated by the user (ECO mode) by pressing the **eco/comfort** button (detail 10 - fig. 1). In ECO mode the display activates the symbol ☹️. To activate COMFORT mode, press the **eco/comfort** button (detail 10 - fig. 1) again.

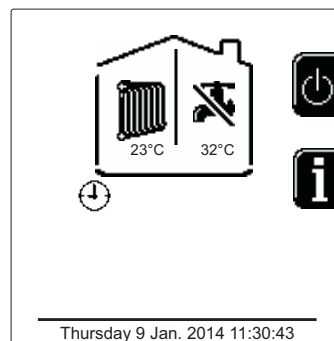


fig. 7- Economy

Information

From the main screen (Home - detail A of fig. 8), press contextual button 2. Access the screen for choosing the module with information to view.

Select the module using buttons 5 and 7 (detail B and C of fig. 8) and then press **OK**.

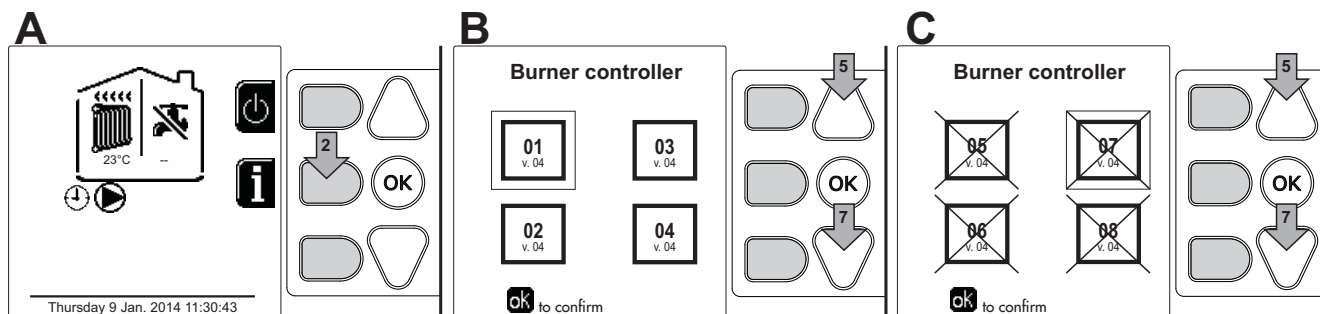


fig. 8

Then use the "Menu Navigation" buttons to display the following values:

1	Heating demand	OT - OpenTherm control request TA - Room thermostat request 0-10Vdc - 0-10Vdc signal request TA2 - Second room thermostat request
2	Heating circulating pump	ON/OFF
3	Heating 3-way valve	ON/OFF
4	DHW 3-way valve	ON/OFF
5	Standby time	ON/OFF
6	T Delta protection	ON/OFF
7	Flame Supervisor	ON/OFF
8	Heating sensor 1 (Flow)	°C
9	Heating sensor 2 (Safety)	°C
10	Return sensor	°C
11	DHW sensor	°C
12	External probe	°C
13	Fume sensor	°C
14	Cascade heating sensor	°C
15	Fan frequency	Hz
16	Burner load	%
17	System water pressure	1.4bar = ON, 0.0 bar = OFF
18	Modulating circulating pump	% (unused)
19	Cascade modulating circulating pump	% (unused)
20	Ionization current	uA
21	Input 0-10Vdc	Vdc
22	Heating adjustment temperature	Setpoint (°C)
23	Power level adjustment 0-10Vdc	Setpoint (%)

1.3 Turning on and off

Boiler lighting

Press the On/Off button (detail 14 - fig. 1).

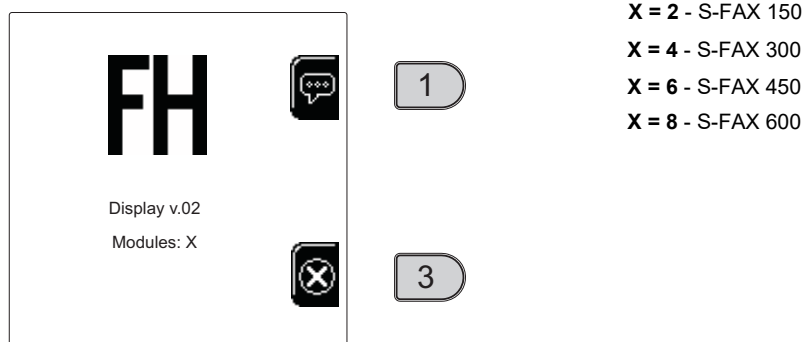


fig. 9- Boiler ignition (X indicates the number of burners)

By pressing contextual button 1 it is possible to choose the desired language and confirm it with the “OK” button.

By pressing contextual button 3 it is possible to interrupt the FH mode.

If neither of the two choices described above is made, continue as follows.

- For the following 300 seconds the display will show FH which identifies the heating system air venting cycle.
- The display also shows the firmware version of the cards.
- Open the gas cock ahead of the boiler.
- When the message FH disappears, the boiler is ready to operate automatically in case of a room thermostat request.

Settings

Contrast adjustment

To adjust the display contrast, press the **contextual button 2** and the **OK button together**. Then press the button ref. 5 of fig. 1 to increase the contrast or the button ref. 7 of fig. 1 to decrease it.

Date and Time Adjustment

Go to the screen shown in fig. 10, navigating in the menu and following the path "USER MENU" ➡ "Settings" ➡ "Set Date". Press navigation buttons 5 and 7 to select the value and modify it with contextual buttons 1 and 2. Confirm with the OK button.

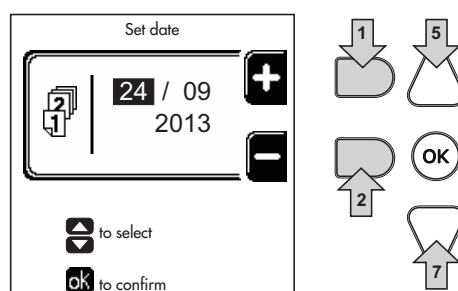


fig. 10- Date Adjustment

Go to the screen shown in fig. 11, navigating in the menu and following the path "USER MENU" ➡ "Settings" ➡ "Set Time". Press navigation buttons 5 and 7 to select the value and modify it with contextual buttons 1 and 2. Confirm with the OK button.

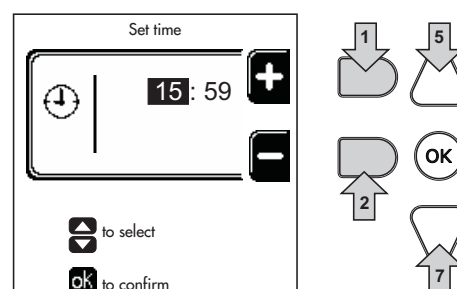


fig. 11- Time Adjustment

Boiler shutdown

From the main screen/Home, press the contextual button  and confirm with the button .

When the boiler is turned off, the PCB is still powered.

Domestic hot water (with optional hot water tank installed) and heating operation are disabled. The frost protection system remains on.

To relight the boiler, press the contextual button again .

The boiler will be immediately ready to operate whenever domestic hot water is drawn (with optional hot water tank installed) or in case of a room thermostat request.

To completely disconnect the unit from the power supply, press the button detail 14 fig. 1.

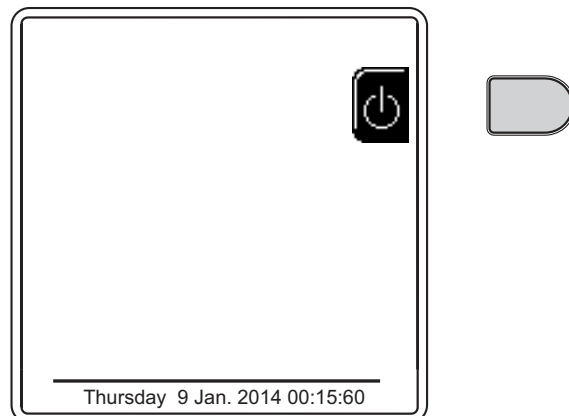


fig. 12- Turning the boiler off



The frost protection system does not work when the power and/or gas to the unit are turned off. To avoid damage caused by freezing during long shutdowns in winter, it is advisable to drain all water from the boiler, the DHW circuit and the heating system water; or drain just the DHW circuit and add a suitable antifreeze to the heating system, as prescribed in sec. 2.3.

1.4 Adjustments

Summer/Winter Switchover

Press the button  (detail 9 - fig. 1) for 1 second.

The display activates the **Summer** symbol. The heating function is deactivated while possible DHW production remains active (with optional external hot water tank). The frost protection system remains on.

To deactivate Summer mode, press the button  (detail 9 - fig. 1) again for 1 second.

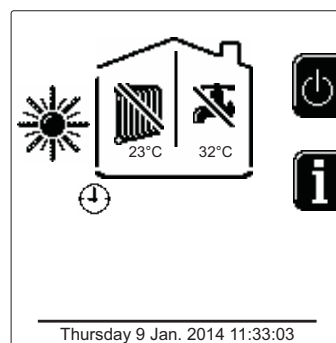


fig. 13- Summer

Heating temperature adjustment

Access the “**Adjustment Temp**” menu to vary the temperature from a minimum of **20 °C** to a maximum of **90 °C**. Confirm with the OK button.



The boiler comes with the time program not activated. Therefore, if requested, this is the setpoint value.

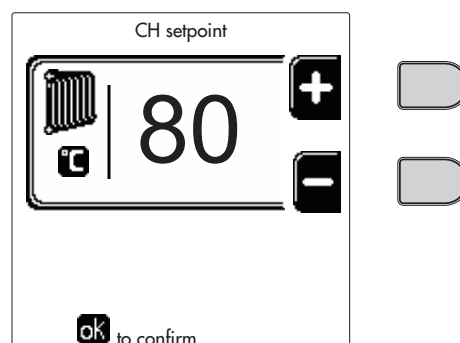


fig. 14

Heating temperature reduction

Access the “**Reduction Adjustment Temp**” menu to vary the temperature from a minimum of 0°C to a maximum of 50°. Confirm with the OK button.

 This parameter is used only if time programming is activated. See “Time programming”

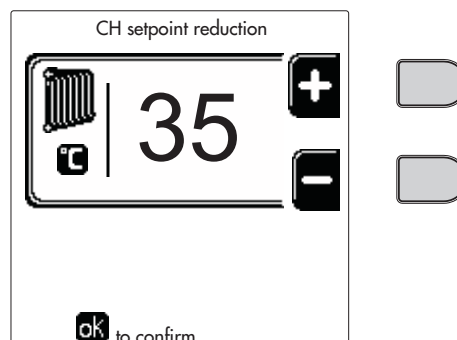


fig. 15

DHW temperature adjustment (with optional hot water tank installed)

Access the “**Adjustment Temp**” menu to vary the temperature from a minimum of 10°C to a maximum of 65°C. Confirm with the OK button.

 The boiler comes with the time program not activated. Therefore, if requested, this is the setpoint value.

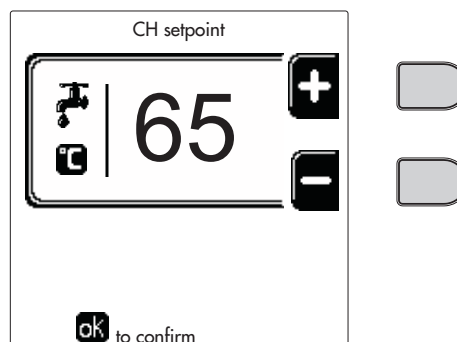


fig. 16

DHW temperature reduction (with optional hot water tank installed)

Access the “**Reduction Adjustment Temp**” menu to vary the temperature from a minimum of 0°C to a maximum of 50°C. Confirm with the OK button.

 This parameter is used only if time programming is activated. See “Time programming”

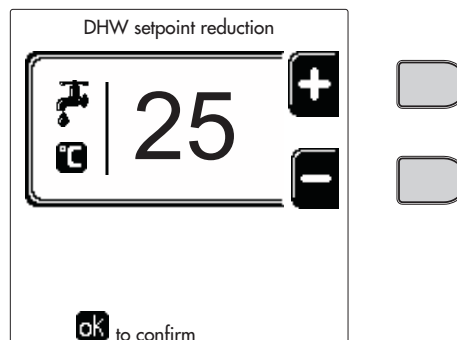


fig. 17

Time programming

Time programming is done in the same way both for heating and for DHW; the two programs are independent.

To program **Heating**, access the “Time Program” menu by following the path “USER MENU” ➡ “HEATING” ➡ “Time Program”.

To program **DHW**, access the “Time Program” menu by following the path “USER MENU” ➡ “DOMESTIC HOT WATER” ➡ “Time Program”.

Choose the type of programming to carry out and follow that described below.

Select the day (fig. 18) or the interval of days to program (fig. 19) and confirm with the **OK** button.

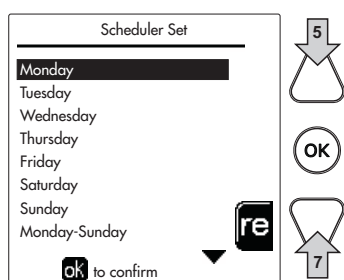


fig. 18

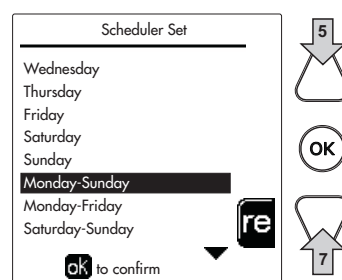


fig. 19

The program is weekly: this means that 6 independent time bands can be set for each day of the week (fig. 20); 4 options can be chosen for each time band:

- **ON**. In case of a Heating/DHW request, the boiler works at the set Heating/DHW Adjustment Temperature (fig. 14/fig. 16).
- **re**. In case of a Heating/DHW request, the boiler works at the Reduced Adjustment Temperature. The Reduced temperature is obtained by subtracting the Reduction Adjustment Temperature (fig. 15/fig. 17) value from the set Heating/DHW Adjustment Temperature (fig. 14/fig. 16).
- **OFF**. In case of a heating/DHW request, the boiler will not activate the Heating/DHW mode.
- **-- : -- OFF**. Time band disabled.

 The boiler comes with the time program not activated. In fact, every day will be programmed from 00:00 to 24:00h in ON mode (fig. 20).

First, set the start time of the first time band (fig. 20) using contextual buttons 1 and 2.

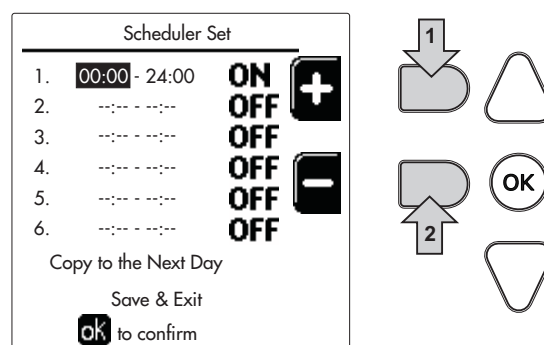


fig. 20

Press navigation button 7 to go to the end time of the first time band (fig. 21) and set it to the desired value using contextual buttons 1 and 2.

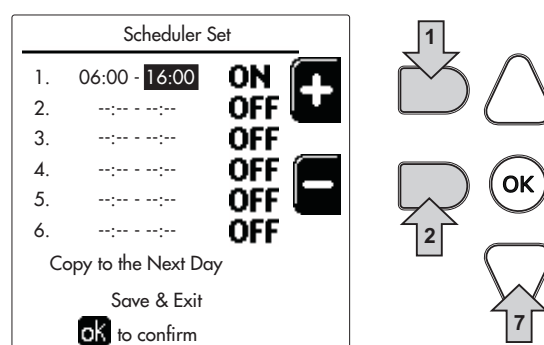


fig. 21

Press navigation button 7 and use contextual buttons 1 and 2 to set the work mode during the first time band (fig. 22)

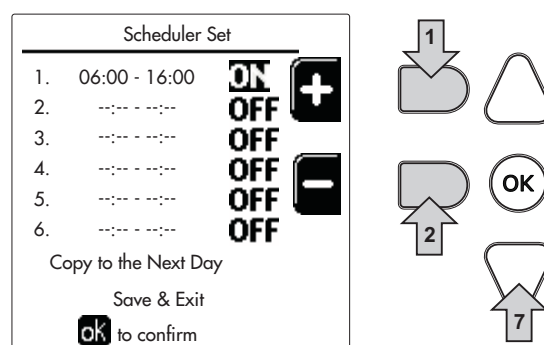


fig. 22

Then, press navigation button 7 to set (if necessary) the subsequent time bands (fig. 23, fig. 24 and fig. 25).

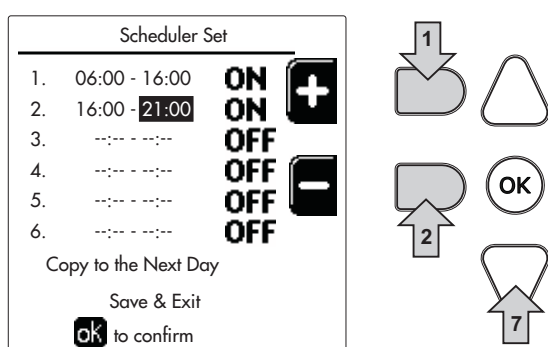


fig. 23

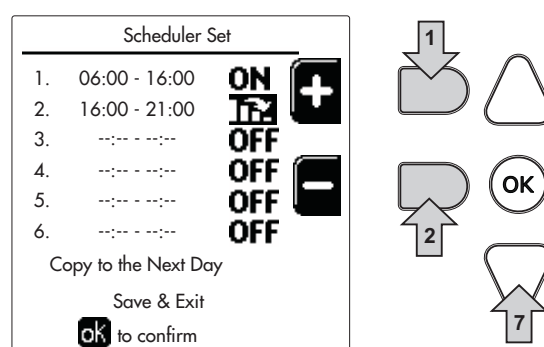


fig. 24

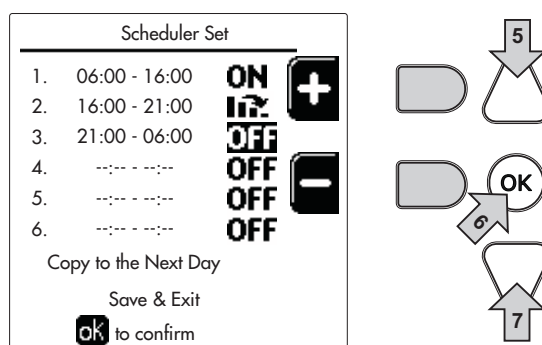


fig. 25

When the day has been programmed, press the OK button; the item "Save & Exit" will automatically be selected (fig. 26). Use navigation buttons 5 and 7 to modify the previous settings or press OK to confirm: in this case the display will return to showing the day (fig. 18) or the interval of days to be programmed (fig. 19). The same procedure can then be followed to complete the desired weekly program.

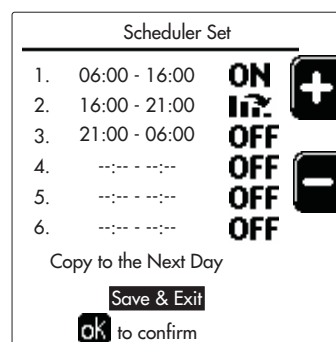


fig. 26

To program the following day in the same way, select "Copy to next day" and press OK to confirm (fig. 26).



To restore the time program to the factory values, press **contextual button 3** in the **Time Program** menu (fig. 27) and confirm with **OK**.

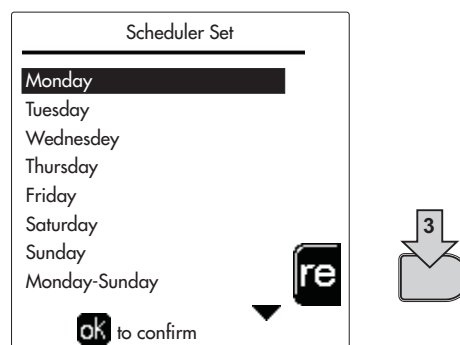


fig. 27



The two Heating and DHW hourly programs are independent even in case of Reset to factory value.

Legionella programming (with optional hot water tank installed)

To enable the **Anti-Legionella Function** it is necessary to set parameter **P23**, within the "TECHNICAL MENU", to **ON**.

To program the function it is necessary to access the "**Legionella**" menu via the path "**USER MENU**" ➡ "**DOMESTIC HOT WATER**" ➡ "**Legionella**".

In this menu it is possible to set the following options:

- **Anti-Legionella day**. Defines the day of the week during which the function will be activated. The function can only be activated once a week.
- **Anti-Legionella time of day**. Defines the start time of the function.
- **Anti-Legionella duration**. Defines the duration (in minutes) of the function.
- **Anti-Legionella Adjustment Temp**. Defines the DHW Adjustment temperature during the function.



ATTENTION

- In **ECO** mode the function **is not active**.
 - The **Anti-Legionella Function** will only be active if the boiler is set to "**Automatic**" mode (☺) and only in the time bands set to **ON** or to "**Reduced temperature**" (🔥).
- Otherwise, in the time bands set to **OFF**, the function will not be activated, even if set.
- In **vacation mode** (☂) the **Anti-Legionella Function** is active.
 - If the **Anti-Legionella Function** is not carried out correctly, the message shown in fig. 28 is displayed. Even in the presence of this message, the boiler will continue to operate correctly.

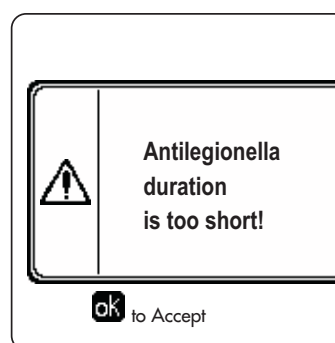


fig. 28- Message Anti-legionella function not completed



The temperature set via the "**Anti-Legionella Adjustment Temp.**" menu must NOT be higher than the maximum DHW adjustment temperature set via parameter **P19** within the TECHNICAL MENU.



If a circulating pump is installed in the system, for water circulation during the **Anti-Legionella Function**, parameter **b08** must be set to **1**. In this way the contact between terminals **9-10** (ref. **300** - fig. 127) closes when the function is activated.

Vacation Function

Access the "HOLIDAY FUNCTION" menu by following the path "USER MENU" ➡ "HOLIDAY FUNCTION" in order to set:

- Holiday start date.
- Holiday end date.

The display can activate two types of icons:

-  - The Holiday function is programmed but not yet active.
-  - The Holiday function is in progress. The boiler will behave as if Summer mode and Economy mode were active (with optional hot water tank installed).
The frost protection function and Legionella function (if activated) will remain active.

Service Intervention Date

This informs when the alert of programmed maintenance by the technician will be activated. It does not represent an alarm or a fault but just a notice. After that date, whenever the Main menu is accessed, the boiler will activate a screen indicating that programmed maintenance is due.

Service Information

This information shows the telephone number to contact in case of assistance (if programmed by the technician).

Room temperature adjustment (with optional room thermostat)

Using the room thermostat, set the temperature required in the rooms.

Room temperature adjustment (with optional remote timer control)

Using the remote timer control, set the temperature desired in the rooms. The boiler unit will set the system water according to the required room temperature. For information on the remote timer control, please refer to its user's manual.

Modules operation sequence

Activation of the modules of which the unit is composed is organised so that the work load is equally divided among them.

First module ON

At each new heating demand (or after 24 h of continuous operation) the module that starts first will follow the progressive positioning sequence.

Successive modules ON/OFF

Switching modules ON/OFF is managed in accordance with the following logic:

New module ON - If the average heat outputs of the active modules is greater than the value set in **P.07** for a time longer than **P.05**, the next module in the sequence will be switched on in order to optimize system operation.

Module OFF - If the average heat outputs of the active modules is lower than the value set in **P.08** for a time longer than **P.06**, the last module to be activated will be switched off.

Slope (ascent ramp) of the single module

After pump pre-circulation, the burner ignites and each module reaches the setpoint gradually, following a Virtual set point.

The starting point is the maximum value between the return probe value on ignition and parameter **P03**.

The slope is determined by parameter **P02**.

The virtual set point then intercepts the **user set point**, or **control set point** in case of ambient compensation.

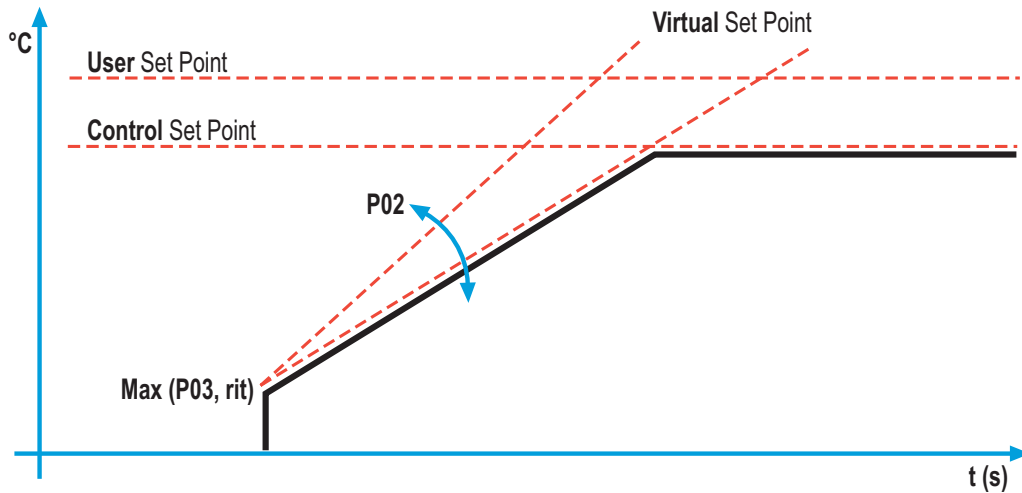


fig. 29- Ascent ramp (slope)

Possible cases

- Without cascade temperature sensor

The heat output of the module depends on the difference between the delivery probe (of the module) and the virtual set point.

- With cascade temperature sensor

The heat output of the module depends on the difference between the cascade probe (of the boiler) and the virtual set point.

In this case, the delivery probe is used to monitor over temperature of the single module and limit heat output if the exchanger protection trips (**P26**).

Sliding Temperature

When the external probe (optional) is installed, the relevant external temperature symbol is activated on the control panel display. The boiler control system works with "Sliding Temperature". In this mode, the heating system temperature is regulated according to weather conditions, to ensure high comfort and energy efficiency throughout the year. In particular, as the outside temperature increases the system flow temperature decreases according to a specific "compensation curve".

With Sliding Temperature adjustment, the "Heating adjustment" temperature becomes the maximum system flow temperature. It is advisable to set a maximum value to allow system adjustment throughout its useful operating range.

The boiler must be adjusted at the time of installation by qualified personnel. The user can still make further adjustments for better comfort.

Compensation curve and curve offset

Access the Sliding Temperature menu. Choose the desired curve from 1 to 10 according to characteristic (fig. 32) via parameter "**Curve1**" and confirm with the OK button.

By setting the curve to 0, the sliding temperature adjustment is disabled.

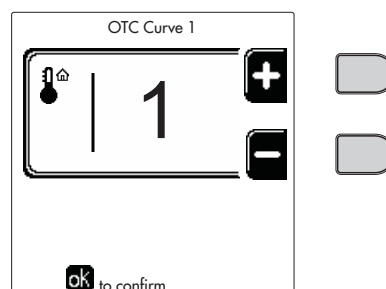


fig. 30- Compensation curve

Adjust the parallel offset of the curves from 20 to 60 °C (fig. 33), via the parameter "**Offset1**" and confirm with the OK button.

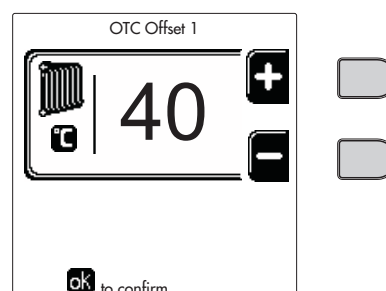


fig. 31- Parallel curve offset

If the room temperature is lower than the desired value, it is advisable to set a higher order curve and vice versa. Proceed by increasing or decreasing in steps of one and check the result in the room.

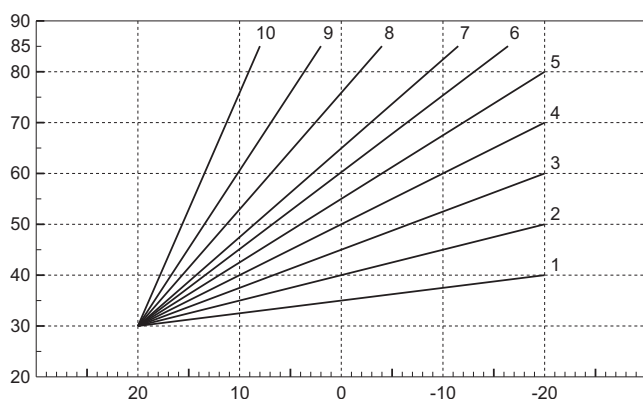


fig. 32- Compensation curves

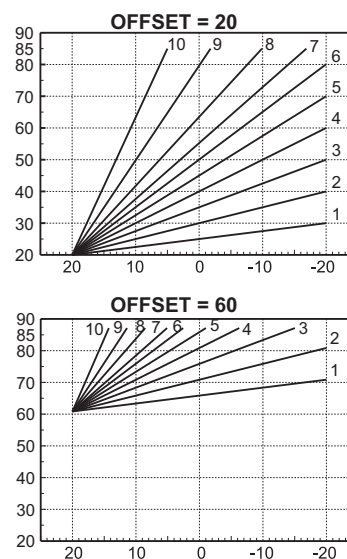


fig. 33- Compensation curve parallel offset

Outside Temperature Heating OFF

Access the "Out Temp Heat Off" to activate the function: between 7°C and 30°C.

If activated, this function will deactivate the heating demand whenever the temperature measured by the external probe is higher than the programmed value.

The heating demand will be reactivated as soon as the temperature measured by the external probe is lower than the programmed value.

Adjustments from remote timer control



If the boiler is connected to the Remote Timer Control (optional), the previously described adjustments are managed as described in table 1.

Table 1

Heating temperature adjustment	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
DHW temperature adjustment (with optional hot water tank installed)	Adjustment can be made from the Remote Timer Control menu and the boiler control panel.
Summer/Winter Switchover	Summer mode has priority over a possible Remote Timer Control heating request.
Eco/Comfort selection (with optional hot water tank installed)	On disabling DHW from the Remote Timer Control menu, the boiler selects Economy mode. In this condition, the button detail 10 - fig. 1 on the boiler panel, is disabled.
	By enabling DHW from the Remote Timer Control menu, the boiler selects Comfort mode. In this condition, use the button detail 10 - fig. 1 on the boiler panel to select one of the two modes.
Sliding Temperature	Both the Remote Timer Control and the boiler card manage the Sliding Temperature adjustment: between the two, the Sliding Temperature of the boiler card has priority.

System water pressure adjustment

The filling pressure with the system cold must be approx. 1.0 bar. If the system pressure falls to values below minimum, the boiler card will activate **fault 37** and the number of the module (fig. 34).



Once the system pressure is restored, the boiler will activate the 300-second air venting cycle indicated on the display by FH.

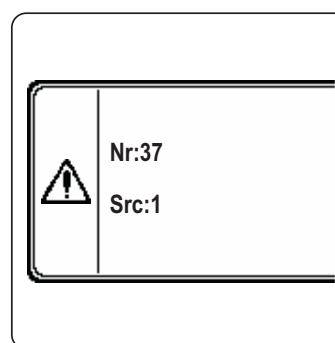


fig. 34- Module 1 insufficient system pressure fault

2. Installation

2.1 General Instructions

BOILER INSTALLATION 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.

2.2 Place of installation

Handling

The boiler is delivered with the feet fully supported and can be lifted, in these conditions, with a forklift with the distance between the forks no less than 650 mm (see fig. 35).

NOTE: 150 models - since the internal components are off-centre, it is necessary to position the forks to ensure maximum load stability (see fig. 36).

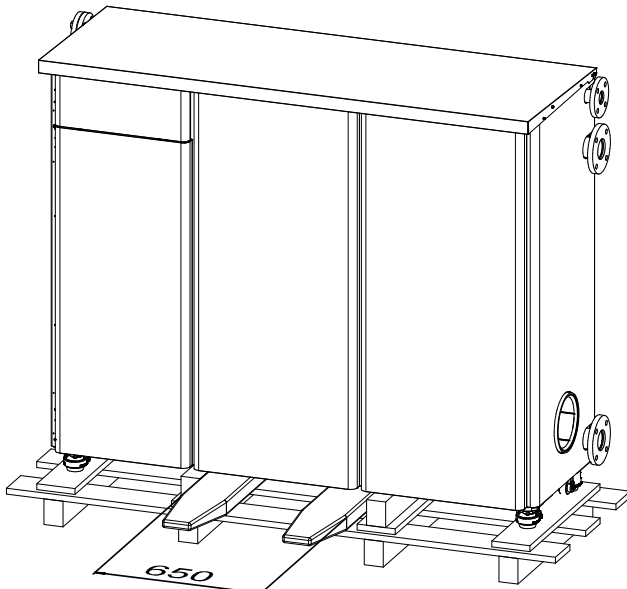


fig. 35

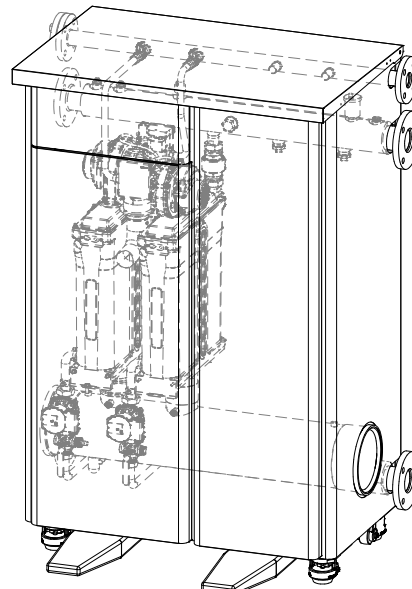


fig. 36

Once on the ground, the boiler can be moved on wheels by retracting the feet using a 19 mm open-end wrench and acting on the nut located under the ferrule (fig. 37).

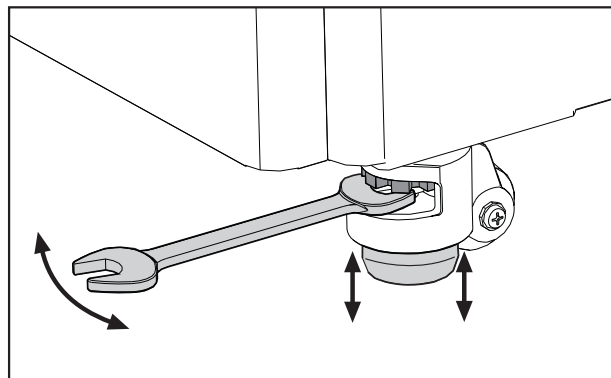


fig. 37



After positioning the boiler, put the feet back in place.

Positioning

The generator can be **installed in suitable rooms** with ventilation openings towards the outside, in conformity with current regulations. It can also be **installed outdoors**, without requiring any form of weather protection (up to temperatures of -5°C).

If there are several appliances 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 enough space around the unit for normal main-tenance operations (see fig. 38).

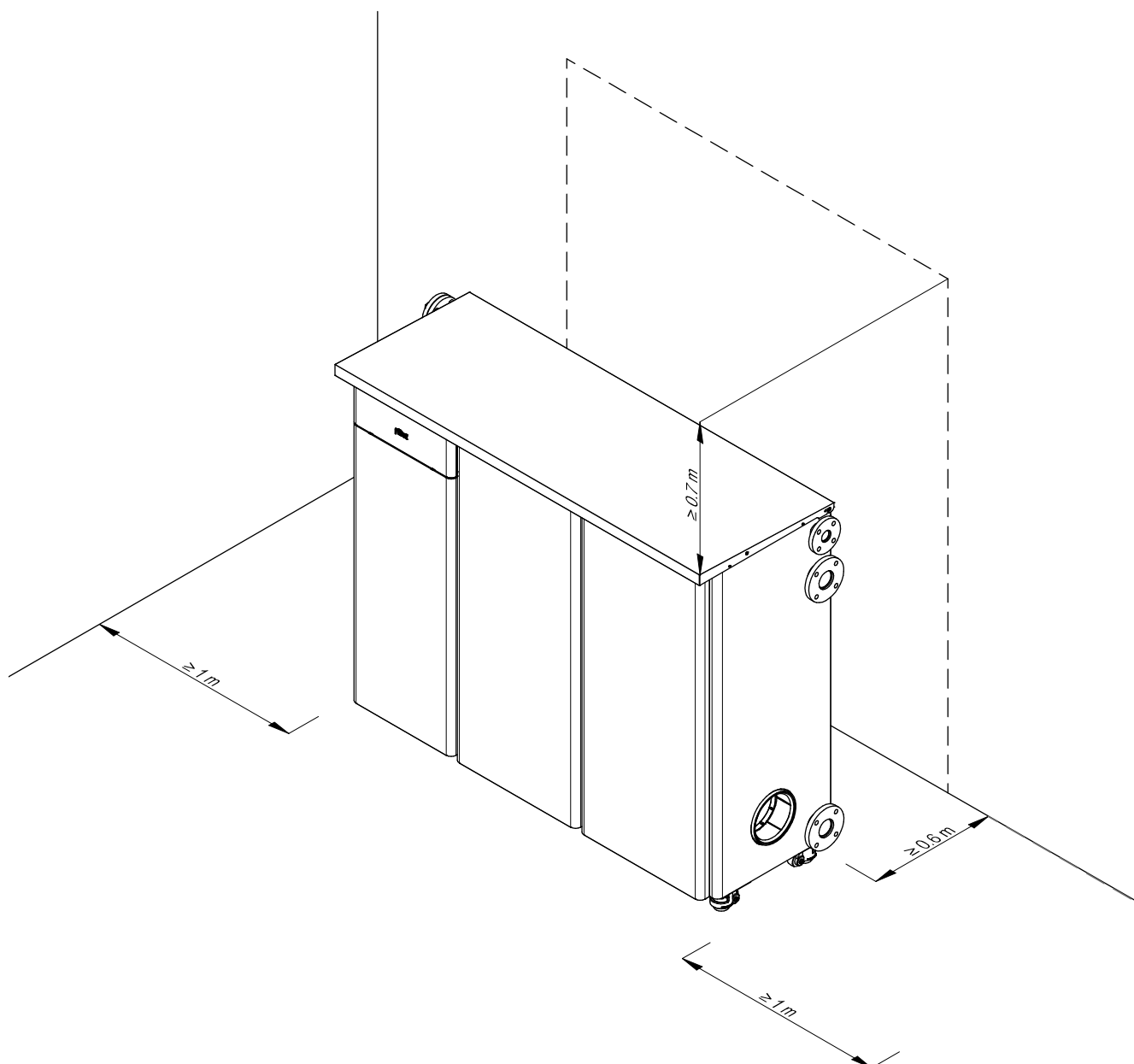


fig. 38- Positioning with distances to be respected

2.3 Plumbing connections

For correct operation of the appliance a hydraulic separator or a plate exchanger must be installed between the unit and the system as indicated in fig. 39.

A pump external to the unit must not be used in the generator hydraulic loop (1), as the circulation of heat transfer fluid in the loop (1) is ensured by the circulating pumps inside the unit and managed by its control system. An adequately sized external pump must be provided for circulation only in the system hydraulic loop (2).

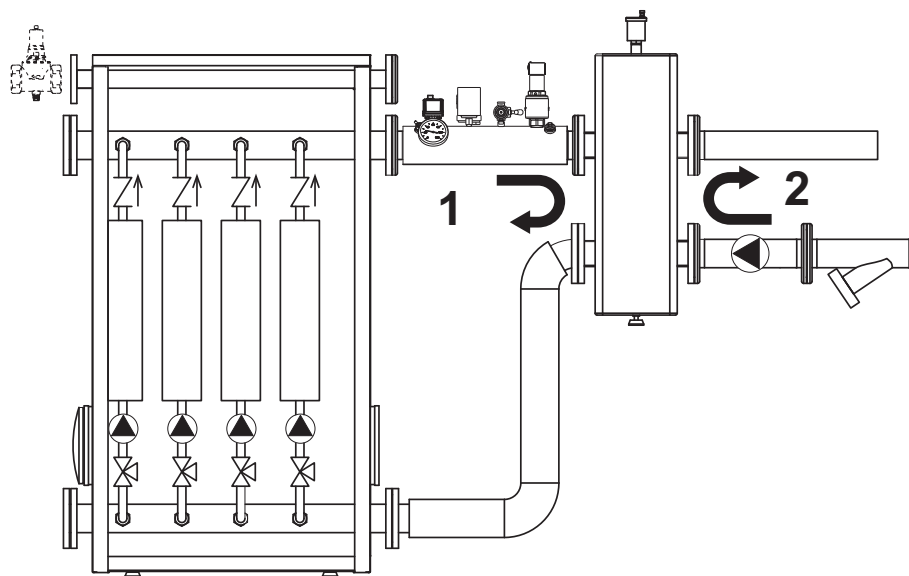


fig. 39



The unit's internal circulating pumps are sized for circulation only in the generator hydraulic loop, and cannot be used for direct circulation in systems without a hydraulic separator.

The heating capacity of the unit must be previously established by calculating the building's heat requirement according to current regulations. The system must be provided with all the components for correct and regular operation. In particular, provide for all the protection and safety devices required by current regulations. They must be installed on the hot water circuit flow piping, upstream of the hydraulic separator, within a distance of not more than 0.5 m, without interposing shutoff devices. **The unit is not supplied with an expansion tank or safety valve; these components must therefore be connected by the Installer.**



The safety valve outlet must be connected to a funnel or collection pipe to prevent water spurting onto the floor in case of overpressure in the heating circuit. Otherwise, if the discharge valve cuts in and floods the room, the boiler manufacturer cannot be held liable.

Do not use the water system pipes to ground electrical appliances.



Before installation, flush all the pipes of the system thoroughly to remove any residuals or impurities that could affect proper operation of the unit. Use chemical conditioners suitable for the purpose; i.e. able to remove from the walls and bottom of the pipes and the various components of the system, sludge, metal oxides and, in low temperature systems, also biomass, with just the circulation of the water, with system hot and/or cold. The products used must not be corrosive and/or aggressive for metals and plastics and must not significantly alter the natural pH of the water.



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

A filter must be installed when replacing generators in existing systems. The manufacturer declines any liability for damage caused to the generator by failure to install or inadequate installation of this filter.

Make the connections to the corresponding connections according to the drawing in fig. 40.

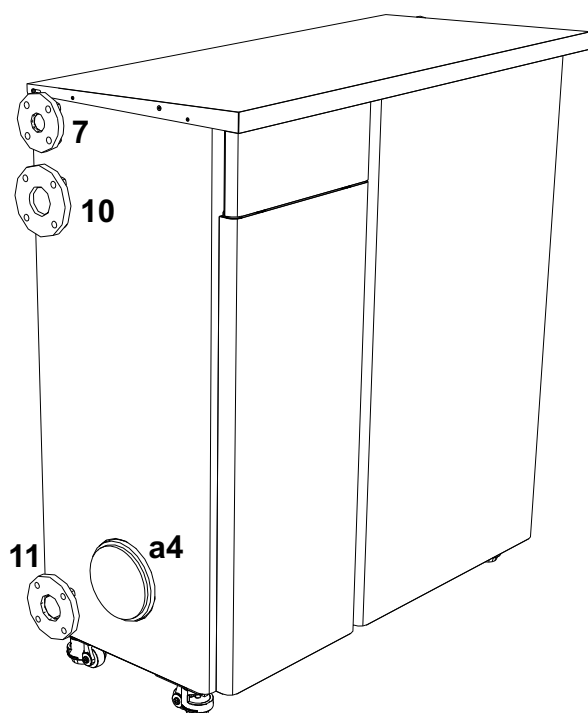


fig. 40

Table 2- SIZE OF CONNECTIONS

10- System flow	DN65 flanged
11- System return	DN65 flanged
7- Gas inlet	DN40 (150 / 300) & DN50 (450 / 600) Flanged
a4- Flue connection	Ø 200

Installation of Accessories

S-FAX boilers are configured for connection on the right side, left side, or using hybrid solutions.

Depending on the chosen side, certain accessories must be positioned adequately.

NOTE: The tubing from air vent valve 1 must be connected to trap 6 (fig. 41)

Legend fig. 42, fig. 43, fig. 44 and fig. 45

- 1** - Vent valve
- 2a** - Cascade probe
- 2b** - Cascade probe holder socket
- 3** - Plug
- 4** - Blank flange
- 5** - Fume sensor
- 6** - Trap
- 7** - Plug
- 8** - Cap
- 9** - Plug

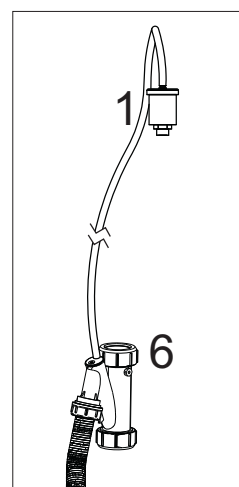


fig. 41

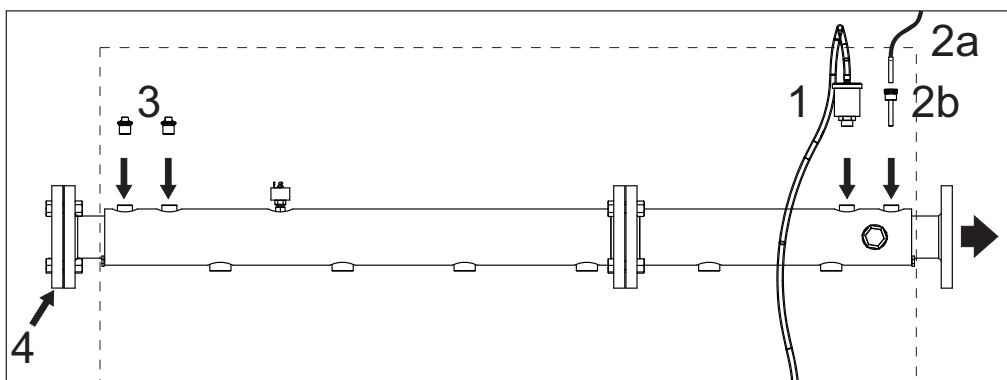


fig. 42- Right side delivery

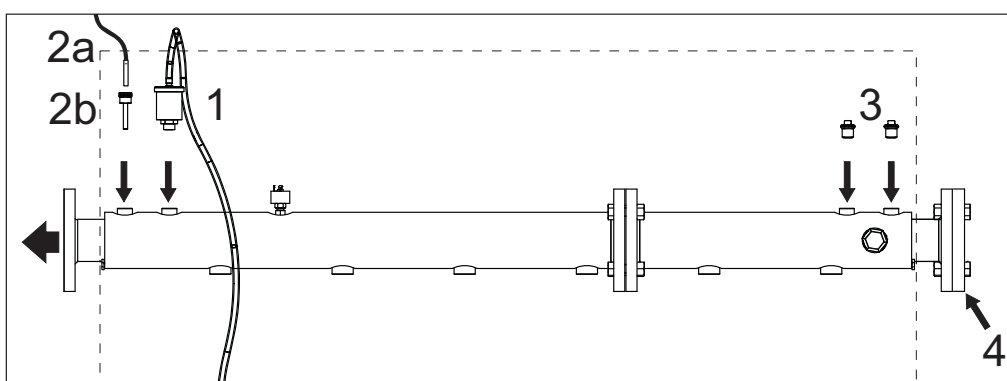


fig. 43- Left side delivery

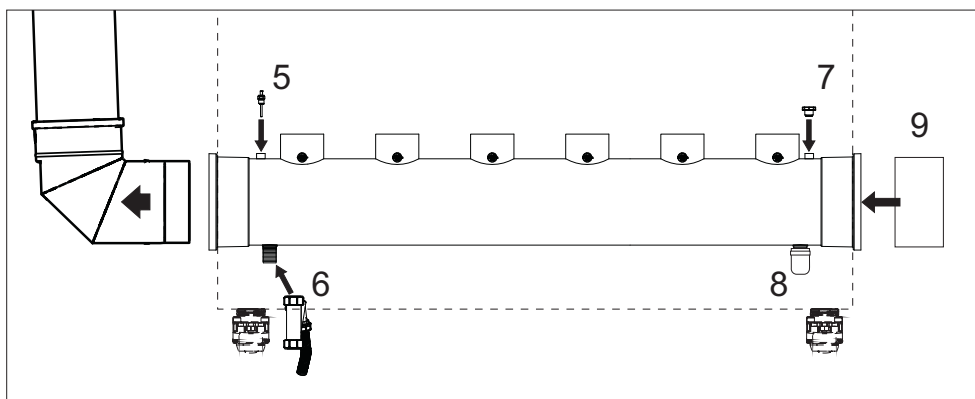


fig. 44- Left side fumes outlet

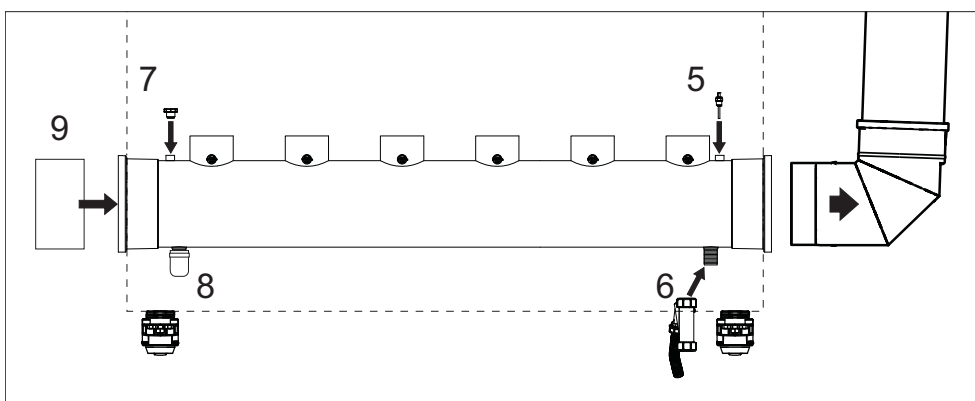


fig. 45- Right side fumes outlet

System water characteristics

Before installing the S-FAX, the new or existing system must be properly cleaned in order to eliminate installation residues, solvents, sludge and contaminants in general that may compromise the effectiveness of the protective conditioning treatments. Use neutral cleaning products that do not attack metals, rubber and plastic parts of the generator/system. Empty, wash and recharge the system in compliance with the following instructions. A dirty system will not guarantee the life of the generator over time, even with the use of protective conditioners.



S-FAX boilers are suitable for installation in heating systems with non-significant entry of oxygen (ref. systems "**case I**" EN14868). A physical separator (e.g. plate heat exchanger) must be provided in systems with continuous entry of oxygen (e.g. underfloor systems without anti-diffusion pipes or open vessel), or frequent water replenishment.

The water in a heating system must be treated in compliance with the laws and regulations in force, have the characteristics required by UNI 8065, and comply with the provisions of EN14868 (protection of metallic materials against corrosion).

The filling water (first filling and subsequent replenishments) must be potable, clear, with hardness under the values indicated in the table below and treated and conditioned with chemical conditioners declared suitable by the maker (see following list), in order to prevent encrustations, corrosive or aggressive phenomena on the metals and plastics of the generator and system, the formation of gas, and the proliferation of bacterial or microbial masses in low temperature systems.

The water contained in the system, as well as the replenishment water, must be checked periodically (at every start-up of the system, after any non-scheduled intervention such as, for example, replacement of the generator or other system components, as well as at least once a year during mandatory routine maintenance operations as required by UNI 8065). The water must have a clear appearance and respect the limits given in the following table.

	EXISTING SYSTEM	NEW SYSTEM
WATER PARAMETER		
Total filling water hardness (°f)	<10	<10
Total system water hardness (°f)	<15	<10
PH	7 < Ph < 8.5	
Copper Cu (mg/l)	Cu < 0.5 mg/l	
Iron Fe (mg/l)	Fe < 0.5 mg/l	
Chlorides (mg/l)	Cl < 50 mg/l	
Conductivity (µS/cm)	< 600 µS/cm*	
Sulfates	< 100 mg/l	
Nitrates	< 100 mg/l	

* In the presence of conditioners, the limit increases to **1200 µS/cm**.

In case of differing values or difficult verification of values with conventional analysis/testing procedures, contact the company for additional evaluations. The conditions of the feed water to be treated can vary even significantly depending on the geographical areas where the systems are located.

Chemical conditioners deoxygenating, anti-scaling, corrosion inhibiting, anti-bacterial, anti-algae, frost protection, PH correction products, etc., must also be suitable for the materials of the generator and system. They must be put in the system respecting the quantity indicated by the supplier of the chemical product and verified in their concentration.



A chemical conditioner in insufficient concentration will not be able to ensure the required protection.

Always check the product concentration each time it is added and cyclically, at least once a year, using qualified technical personnel such as our authorized technical assistance network.

Table 3- Chemical conditioners declared suitable and available at our network of Authorized Technical Assistance Centers

	Description	Sentinel type alternative products
LIFE PLUS/B - MOLY - MOLY K	Molybdenum-based corrosion inhibitor	X100
LIFE DUE	Noise reduction/anti-scaling maintenance	X200
BIO KILL	Biocidal anti-algae	X700
PROGLI	Propylene frost protection	X500
Products with equivalent characteristics may be used		

Antifreeze Function

The device is equipped with an anti-freeze function that activates the boiler for heating when one of the following conditions is met:

- The supply water temperature is < 5 °C.
- The supply water temperature is < 15 °C and the return temperature < 5 °C.
- The cascade temperature (if parameter **P.02** = 1 or 2) is < 5 °C and the supply temperature < 30 °C.

The function ends when the flow water temperature or the cascade water temperature exceeds 15°C.
The function is not active if the appliance is disconnected from the electricity and / or gas supply.

If necessary, use a suitable antifreeze liquid for plant protection, which meets the same requirements outlined above and specified by UNI 8065 standards.

WARNING

To ensure the reliability and correct operation of the boilers, always install a mechanical filter in the loading circuit and, in the system, a dirt separator (possibly magnetic) and a deaerator as required by the UNI 8065 as well as a volumetric meter on the system replenishment line.



Failure to comply with the provisions of this paragraph, "System water features", will involve non-recognition of the warranty and damage due to such shortcomings.

Hydraulic circuit examples

In the examples described below, the checking/change of some parameters may be required.

To do this it is necessary to access the Technical menu.

From the Home page, press the main Menu button (detail 12 - fig. 1).

Access the "Technical" menu by pressing contextual button 2 (detail 2 - fig. 1).

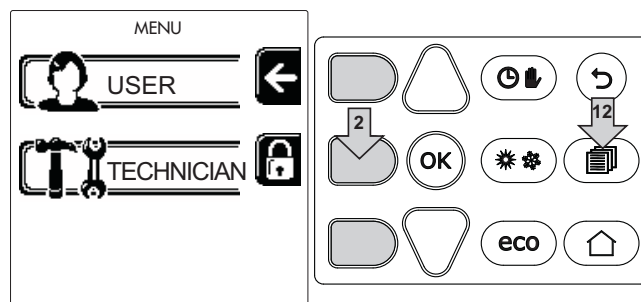


fig. 46

Enter the code "4 1 8" with contextual buttons 1 and 2. Confirm each number with the OK button.

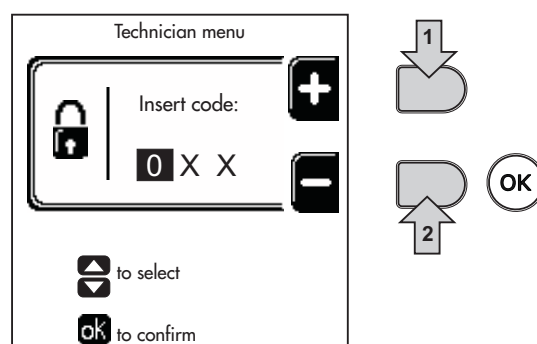


fig. 47

Press the OK button to access the Parameters Menu.

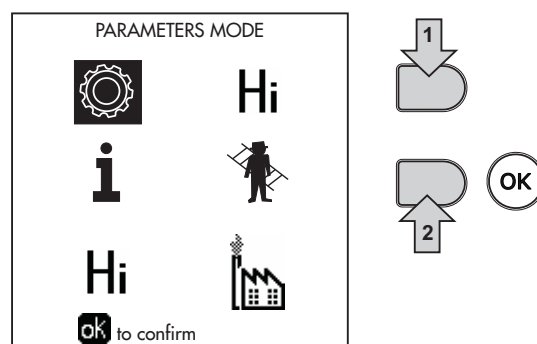


fig. 48

Access the "Configuration Menu" or "System Type Menu" according to the parameter to be modified as given in each hydraulic circuit example.

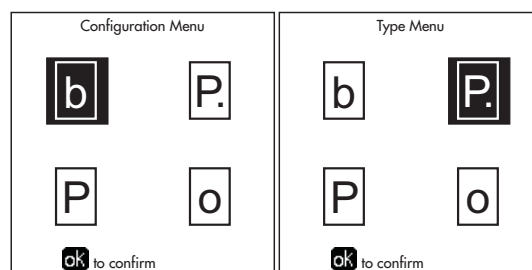


fig. 49

Example 1 - A direct heating circuit with 0-10 Vdc controller

- Schematic diagram

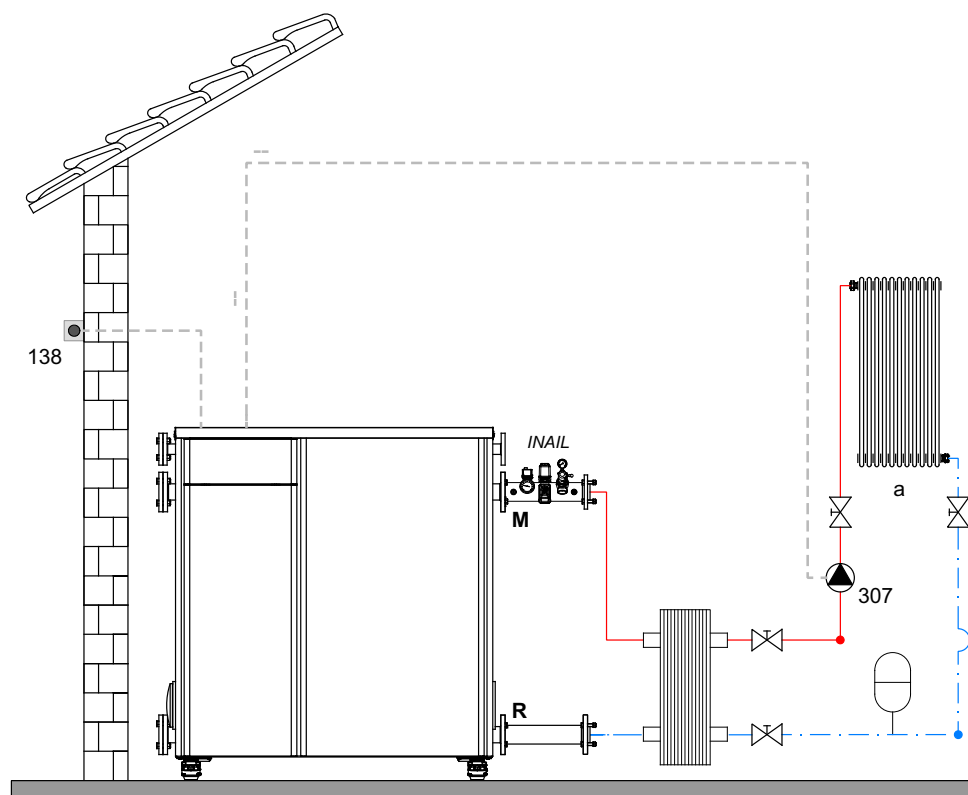


fig. 50

- Electrical connections

After installation, carry out the necessary electrical connections as shown in the wiring diagram.

Then configure the controller as described in the specific section.

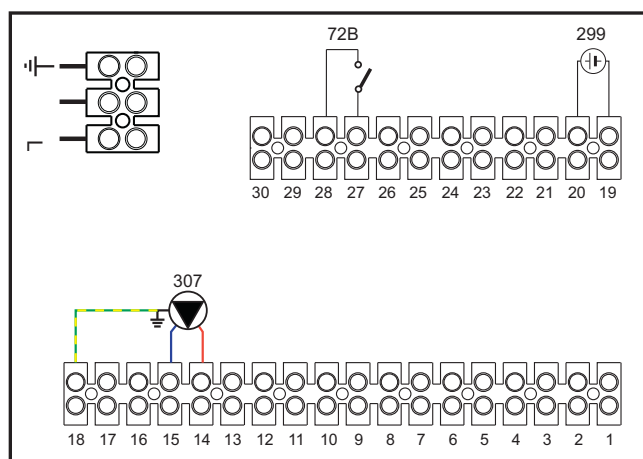


fig. 51

Legend (fig. 55 and fig. 56)

- 72b** 2nd zone (direct) room thermostat
- 138** External probe
- 299** Input 0-10 Vdc
- 307** 1st zone (direct) circulating pump
- a** 1st zone (direct)
- M** Flow
- R** Return button

INAIL (National Institute for Insurance against Accidents at Work)INAIL safety section

(When required. Not supplied)

To manage the sliding temperature it is necessary to purchase the external probe accessory.

- Parameters

Each system requires a different parameterization. Follow the access procedure given below.

“System Type Menu”

Change parameter **P.01** of the “System Type Menu” to **2** (control in temperature) or **3** (control in power).

Now change the parameters from **P.12** to **P.16** (control in temperature) or from **P.17** to **P.21** (control in power) based on the following graphs.

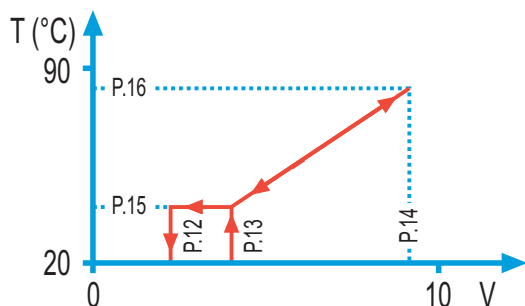


fig. 52- Control in temperature

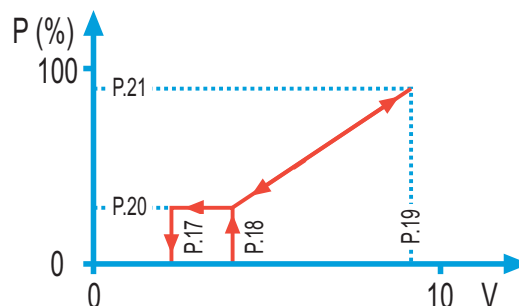


fig. 53- Control in power

- Optional features

In addition to the electrical connections of the previous figure (necessary for this system configuration) there are options that do not require settings.

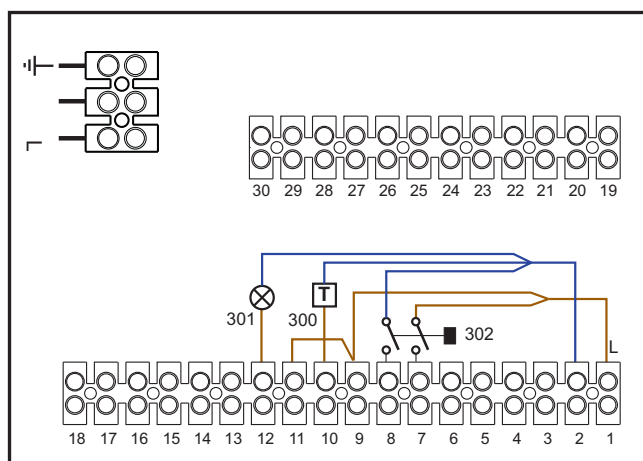


fig. 54

Legend

- 300** Burner on indication (voltage-free contact output): the example shows the connection of a 230 Vac hour meter
- 301** Fault indication (voltage-free contact output): the example shows the connection of a 230Vac lamp
- 302** Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault

Example 2 - Two direct heating circuits

- Schematic diagram

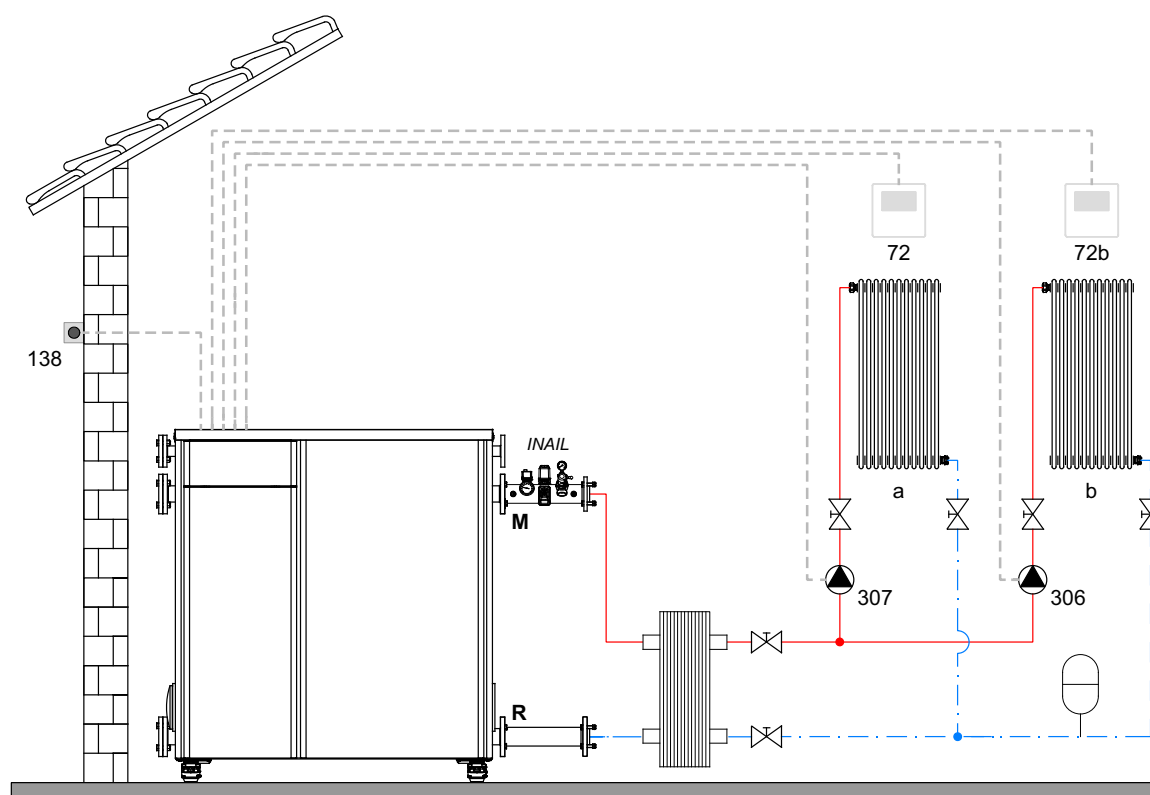


fig. 55

- Electrical connections

After installation, carry out the necessary electrical connections as shown in the wiring diagram.

Then configure the controller as described in the specific section.

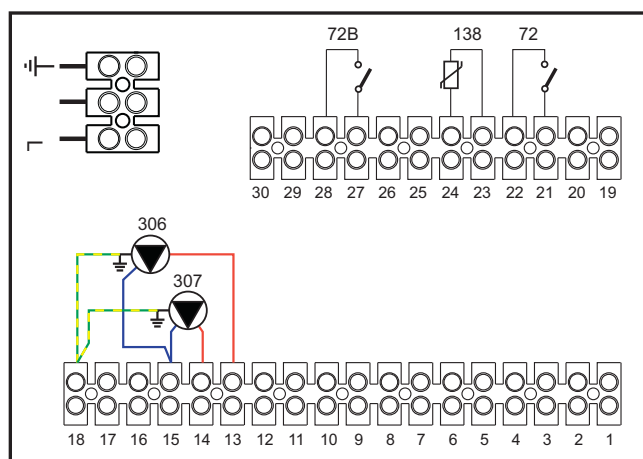


fig. 56

Legend (fig. 55 and fig. 56)

- 72** 1st zone (direct) room thermostat
- 72b** 2nd zone (direct) room thermostat
- 138** External probe
- 307** 1st zone (direct) circulating pump
- 306** 2nd zone (direct) circulating pump
- a** 1st zone (direct)
- b** 2nd zone (direct)
- M** Flow
- R** Return button

INAIL (National Institute for Insurance against Accidents at Work)INAIL safety section

(When required. Not supplied)

To manage the sliding temperature it is necessary to purchase the external probe accessory.

- Parameters

Each system requires a different parameterization. Follow the access procedure given below.

“System Type Menu”

Change parameter **P.01** of the “System Type Menu” to **4**.

- Optional features

In addition to the electrical connections of the previous figure (necessary for this system configuration) there are options that do not require settings.

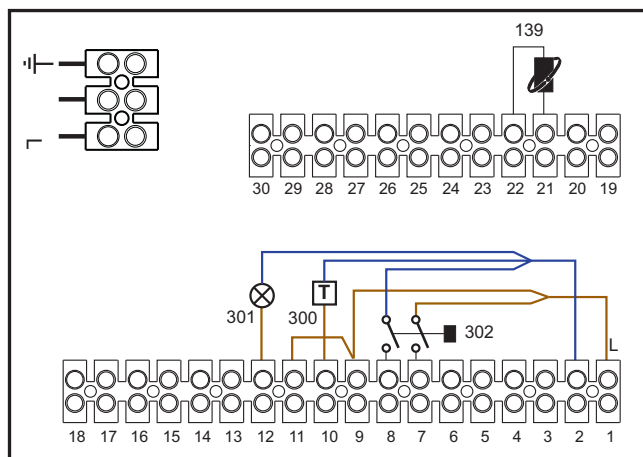


fig. 57

Legend

- 139** Remote control: it can be installed instead of 72 to manage the request of the 1st zone (direct)
- 300** Burner on indication (voltage-free contact output): the example shows the connection of a 230 Vac hour meter
- 301** Fault indication (voltage-free contact output): the example shows the connection of a 230Vac lamp
- 302** Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault

Example 3 - A direct heating circuit and a DHW circuit with circulating pump

- Schematic diagram

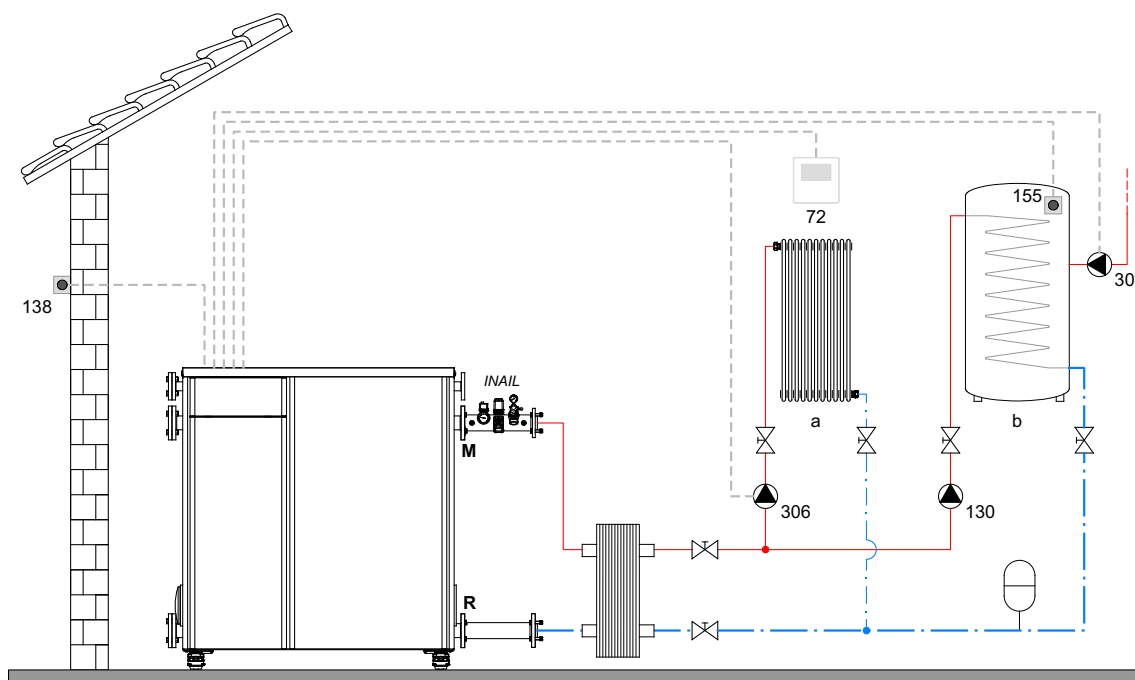


fig. 58

- Electrical connections

After installation, carry out the necessary electrical connections as shown in the wiring diagram.

Then configure the controller as described in the specific section.

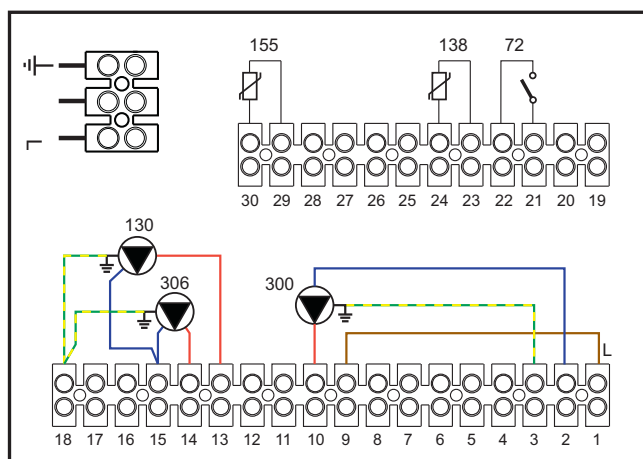


fig. 59

Legend (fig. 58 and fig. 59)

- 72** 1st zone (direct) room thermostat
- 130** Hot water tank circulating pump
- 138** External probe
- 155** Hot water tank probe
- 300** Anti-Legionella circulating pump
- 306** 1st zone (direct) circulating pump
- a** 1st zone (direct)
- b** Hot water tank circuit
- M** Flow
- R** Return button

INAIL (National Institute for Insurance against Accidents at Work)INAIL safety section

(When required. Not supplied)

To manage the sliding temperature it is necessary to purchase the external probe accessory.

If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory.

- Parameters

Each system requires a different parameterization. Follow the access procedure given below.

“Configuration - Parameters Menu”

Check/Change parameter **b02** of the “Transparent Parameters Menu” to **2**.

Check/Change parameter **b08** of the “Transparent Parameters Menu” to **1**.

- Optional features

In addition to the electrical connections of the previous figure (necessary for this system configuration) there are options that do not require settings.

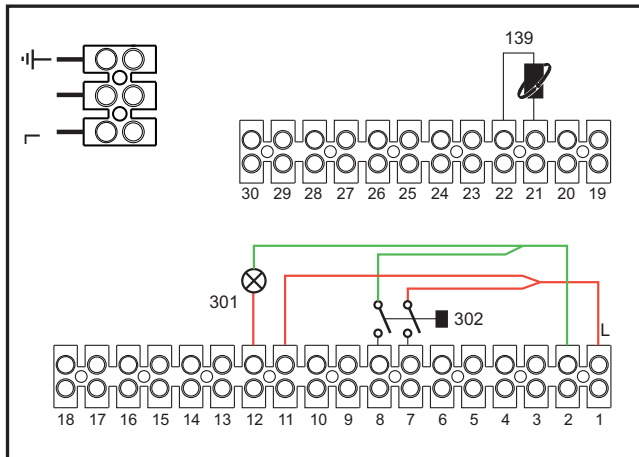


fig. 60

Legend

- 139** Remote control: it can be installed instead of 72 to manage the request of the 1st zone (direct)
- 301** Fault indication (voltage-free contact output): the example shows the connection of a 230Vac lamp
- 302** Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault

Example 4 - A direct heating circuit and a DHW circuit with diverter valve (3-wire)

- Schematic diagram

Use diverter valves with 3 wires:

- OPENING PHASE 230V - CLOSING PHASE 230V - NEUTRAL

with switching times (from all closed to all open) of not more than 90 seconds.

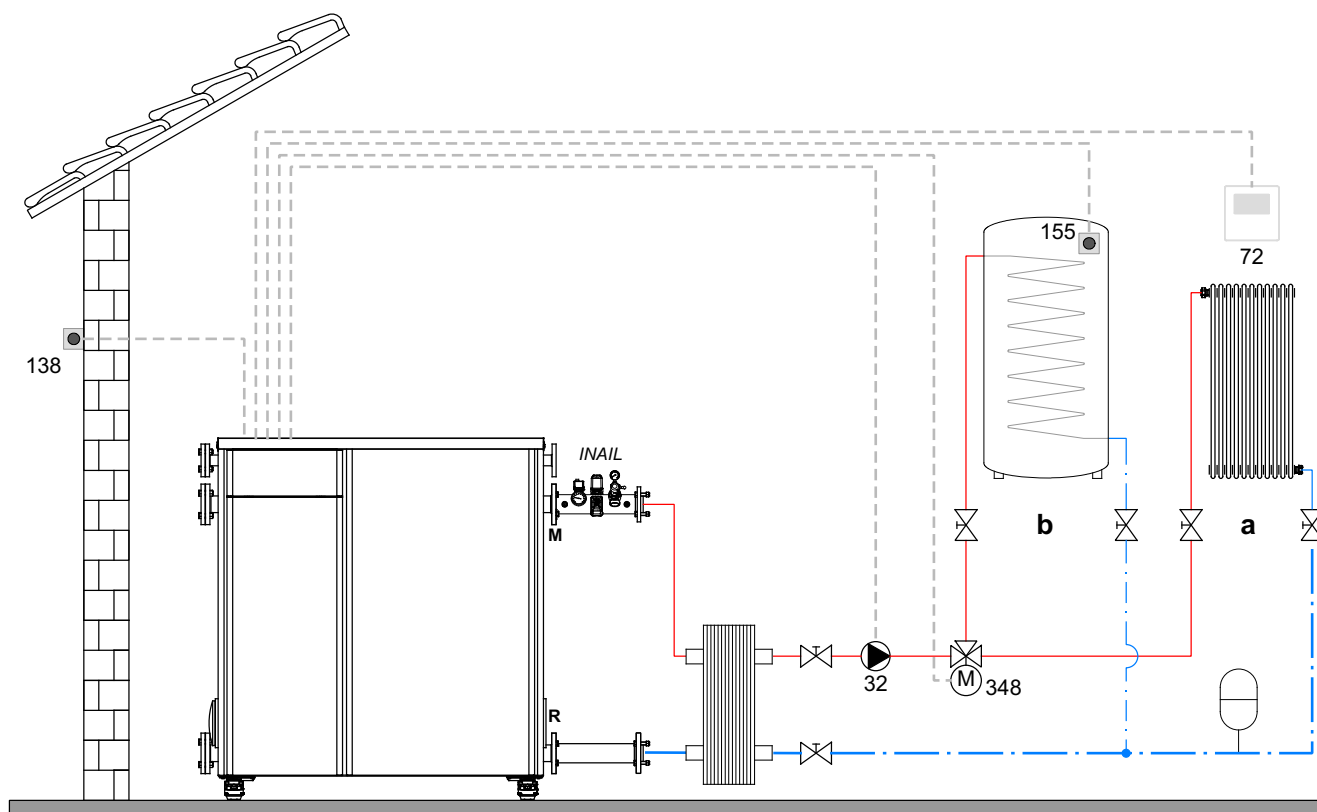


fig. 61



Note that using this secondary pump management solution results in loss of the facility to manage the anti-Legionella pump, which has the same electrical connections as circulating pump 32.

Legend (fig. 61 and fig. 62)

- 32** Heating circulating pump
- 72** 1st zone (direct) room thermostat
- 138** External probe
- 155** Hot water tank probe
- 348** 3-way valve (3-wire)
 - A = OPENING PHASE
 - B = NEUTRAL
 - C = CLOSING PHASE
- a** 1st zone (direct)
- b** Hot water tank circuit

- M** Flow
- R** Return button
- K1/K2** Coil at 230Vac and nominal power <2.2VA
 - 1 switch with nominal voltage 230Vac and nominal current >=8A

INAIL (National Institute for Insurance against Accidents at Work) INAIL safety section
(When required. Not supplied)

- Electrical connections

After installation, carry out the necessary electrical connections as shown in the wiring diagram.

Then configure the controller as described in the specific section.



To avoid damaging the board, it is advisable to use external relays to control the 3-way valve, as indicated in fig. 62.

To allow adequate system post circulation, use of a relay with programmable delay before de-energisation is recommended (e.g.: Finder 80.41).

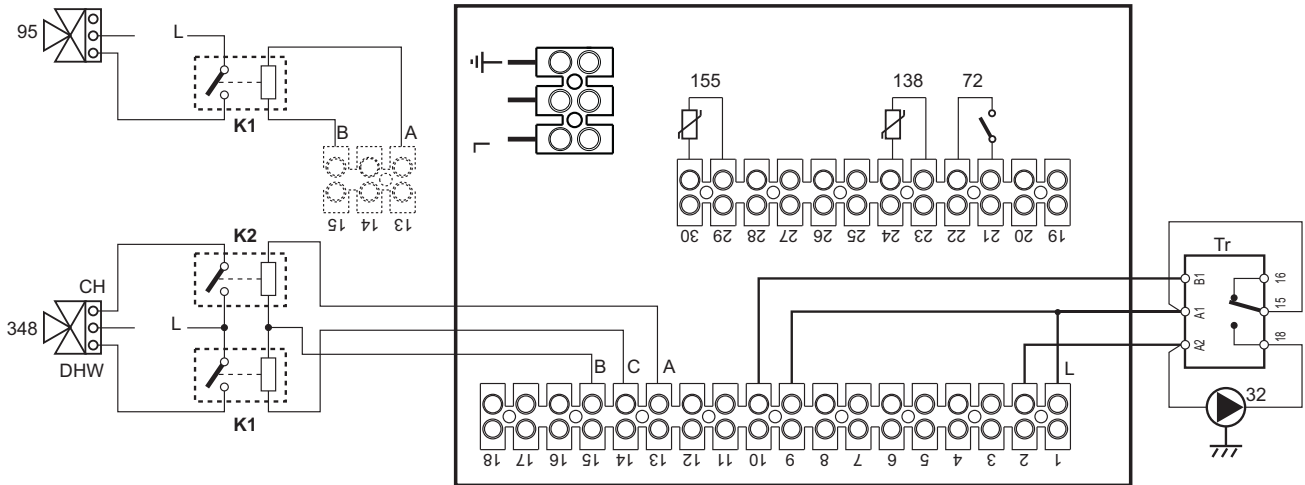


fig. 62

To manage the sliding temperature it is necessary to purchase the external probe accessory.

If a hot water tank probe (not supplied) is used, it is necessary to purchase the NTC probe accessory.

- Parameters

Each system requires a different parameterization. Follow the access procedure given below.

“Configuration - Parameters Menu”

Check/Change parameter **b02** of the “Configuration - Parameters Menu” to **3**.

Check/Change parameter **b08** of the “Configuration - Parameters Menu” to **0**.

- Optional features

In addition to the electrical connections of the previous figure (necessary for this system configuration) there are options that do not require settings.

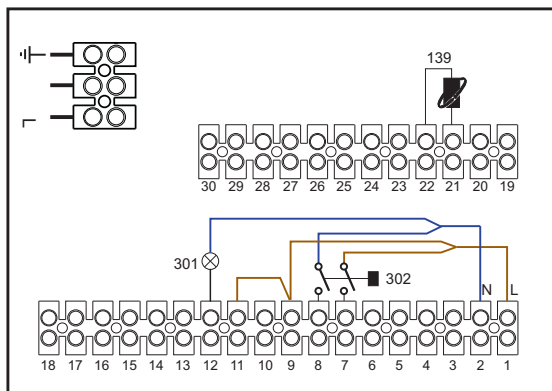


fig. 63

Legend

- 139** Remote control: it can be installed instead of 72 to manage the request of the 1st zone (direct)
- 301** Fault indication (voltage-free contact output): the example shows the connection of a 230Vac lamp
- 302** Remote reset input (230Vac): the example shows the connection of a double-pole switch at 230Vac, allowing the resetting of a block type fault

2.4 Gas connection



Before making the connection, check that the unit is arranged for operation with the type of fuel available and carefully clean all the system gas pipes to remove any residues that could affect proper functioning of the boiler.

Make sure all the gas connections are tight. The gas meter capacity must be suitable for the simultaneous use of all the units connected to it. The diameter of the gas pipe leaving the boiler is not decisive for choosing the diameter of the pipe between the unit and the meter; it must be chosen according to its length and pressure losses, in conformity with the current regulations.



Do not use the gas pipes to ground electrical appliances.

2.5 Electrical connections

Connection to the power supply



Electrical safety of the unit is obtained only when it is correctly connected to an effective grounding system as required by current safety standards. Have the efficiency and suitability of the grounding system checked by professionally qualified personnel; the Manufacturer declines any liability for damage caused by failure to ground the system. Also make sure the electrical system is adequate for the maximum power absorbed by the unit, as specified on the boiler data plate.

The boiler is pre-wired and equipped with a "Y" type connection cable to the electric line without plug. The connections to the mains must be made with a fixed connection and equipped with a double-pole switch with contact opening gap of at least 3 mm, interposing **16 A fuses** max. between boiler and line. It is important to respect the polarity (LINE: brown wire / NEUTRAL: blue wire / GROUND: yellow-green wire) in the connections to the power line. When installing or replacing the power cable, the ground wire must be left 2 cm longer than the others.



The unit's power cable must not be replaced by the user. If the cable gets damaged, turn the unit off and have the cable replaced only by professionally qualified personnel. In case of power supply cable replacement, use only cable "**HAR H05VV-F**" 3 x 1.5 mm² with a maximum external diameter of 8 mm.

Room thermostat (optional)



CAUTION: The room thermostat must have clean contacts. **CONNECTING 230 V. TO THE TERMINALS OF THE ROOM THERMOSTAT WILL IRREPARABLY DAMAGE THE ELECTRONIC CARD.**

When connecting a remote timer control or a timer switch, do not take the power supply for these devices from their cut-out contacts. Their power supply must be taken with a direct connection from the mains or with batteries, depending on the kind of device.

External probe (optional)

Connect the probe to its respective terminals. The maximum permissible length of the boiler – external probe connection electric cable is 50 m. A common 2-core cable can be used. The external probe should preferably be installed on the North, North-West wall or on the wall with most of the main living room. The probe must never be exposed to the sun in the early morning, and in general, as far as possible, it must not receive direct solar radiation; if necessary, it must be protected. In any case, the probe must never be mounted near windows, doors, ventilation openings, flues or heat sources that could affect the reading.

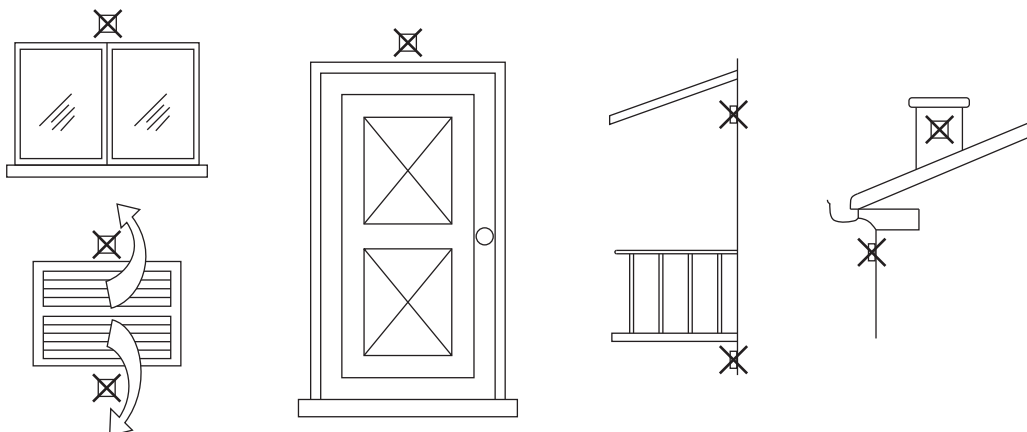


fig. 69- Positioning of external probe not recommended

Accessing the electrical terminal block

To access the electrical terminal block, lift the top panel and rotate the panel. Make the electrical connections as shown in the wiring diagram on fig. 127 and run the cables through the special cable glands.

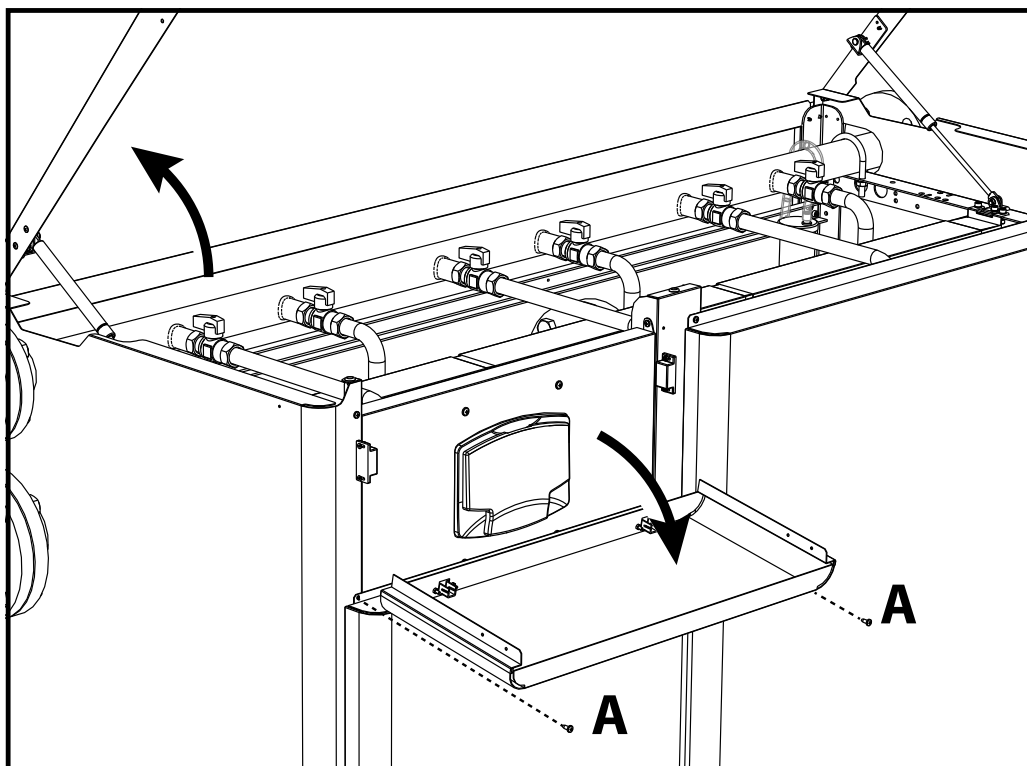


fig. 70

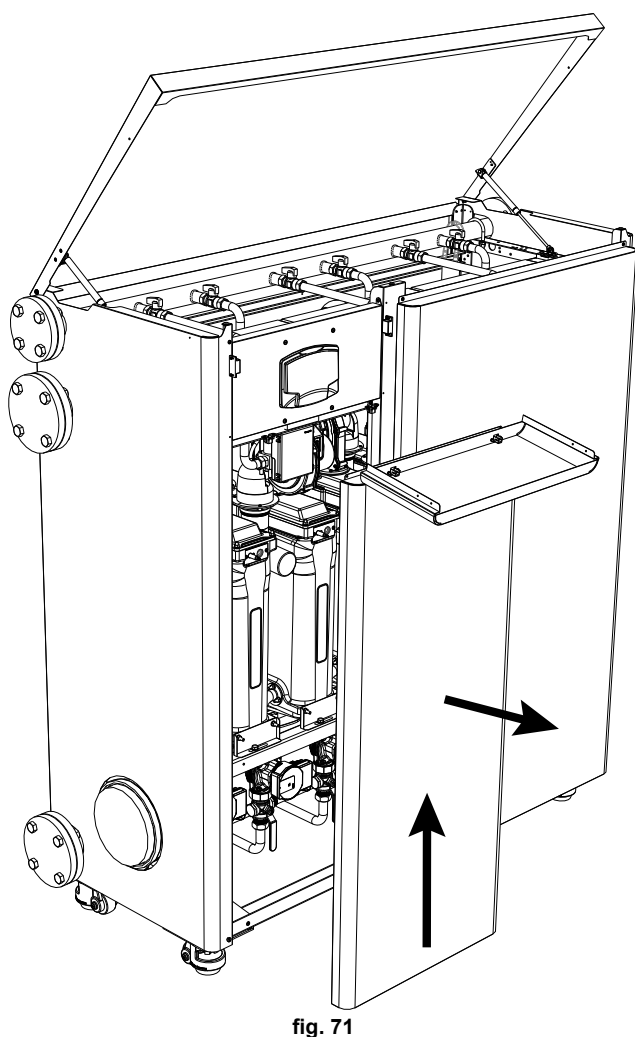


fig. 71

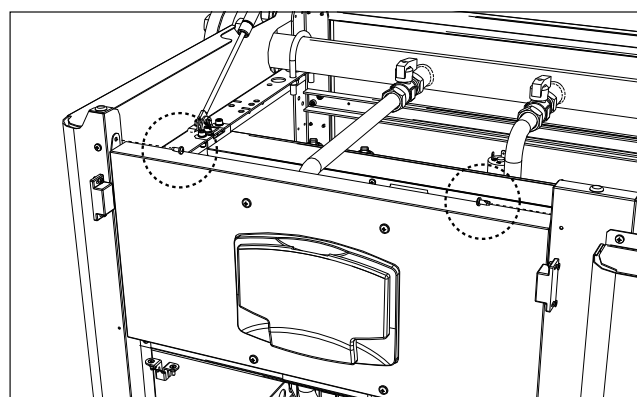


fig. 72

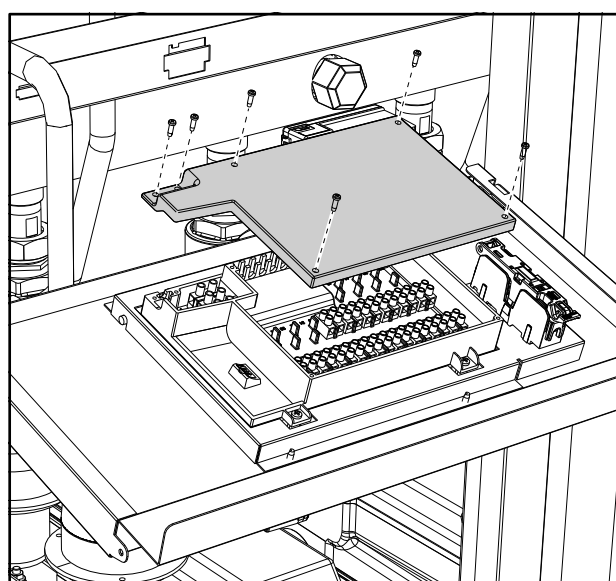


fig. 73



Maximum applicable loads:

- Heating circulating pump: **230Vac 0.8A max**, $\cos\phi = 0.6$
- 3-way valve: **230 Vac, 0.8 A max**, $\cos\phi = 0.6$ for max 1 minute, **0.4 A continuous**
- Alarm: **230 Vac, 0.8 A max**, $\cos\phi = 0.6$

2.6 Flue connection

Important

The unit is **B23** type with combustion air drawn from the place of installation, and fume exhaust by means of a fan (operation with flue pressurised), and must be connected to one of the discharge systems indicated below. Before proceeding with installation, check and carefully comply with the local regulations and provisions. Also, comply with the provisions on the positioning of wall and/or roof terminals and the minimum distances from windows, walls, ventilation openings, etc.

Manifold, ducts and flue must be suitably sized, designed and made in compliance with the current regulations. They must be made of suitable materials, i.e. resistant to heat and corrosion, smooth on the inside and tight. In particular, joints must be condensate proof. Also, provide for adequate condensate drainage points, connected to a trap to prevent the condensate formed in the flues from running into the generators.

Connection



Every unit has two flue connections in order to offer greater flexibility in installation. Use only one of the outlets and check that the other is properly plugged (see fig. 74 - fig. 75 - fig. 76).

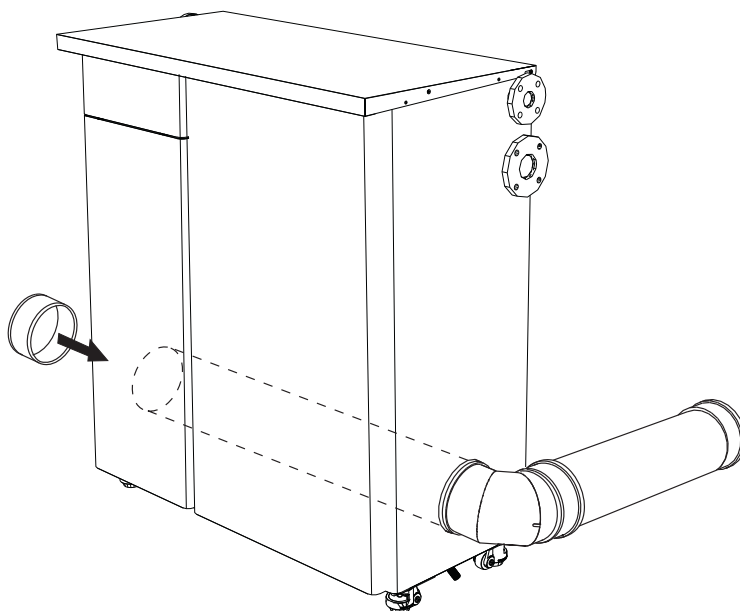


fig. 74

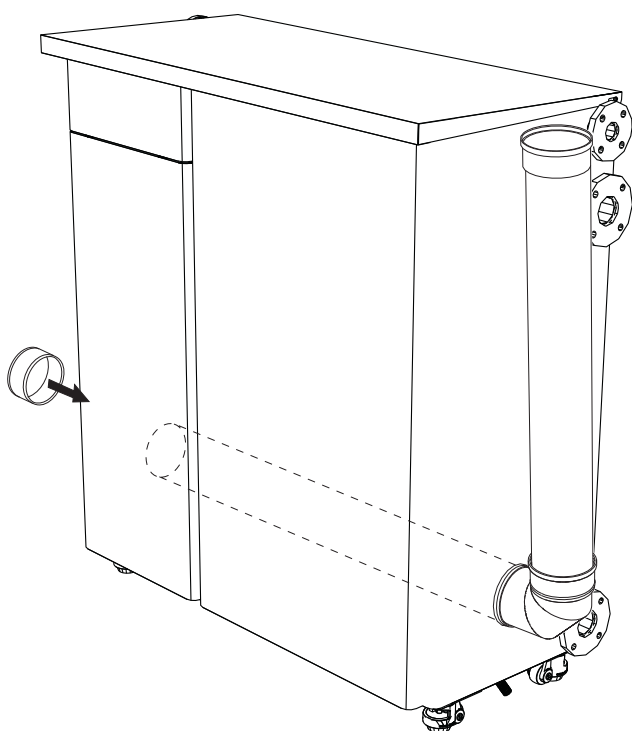


fig. 75

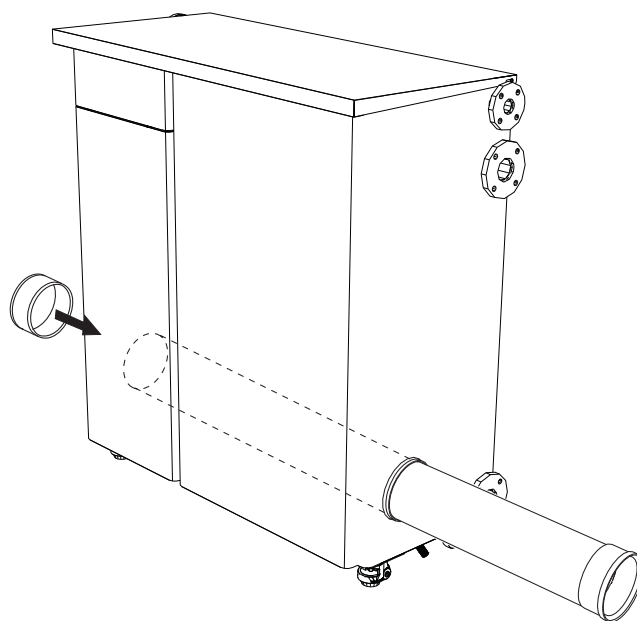


fig. 76



Before making the flue connection fill the condensate trap with approx. 0.5 liters of water through the flue connections.

To calculate the maximum length of the fume ducts, refer to the maximum available head .

Maximum flue head = 185 Pa

2.7 Condensate drain connection

The boiler has a trap to drain condensate.

The trap must be connected to a drainage system, in compliance with statutory legislation and any local bylaws. The system must be constructed so that freezing of condensate cannot occur under any circumstances.

If necessary, a boiler acid neutraliser can be interposed.

The air vent valve tubing must be connected directly the trap (see fig. 41).



ATTENTION: The unit must never be operated with the trap empty!

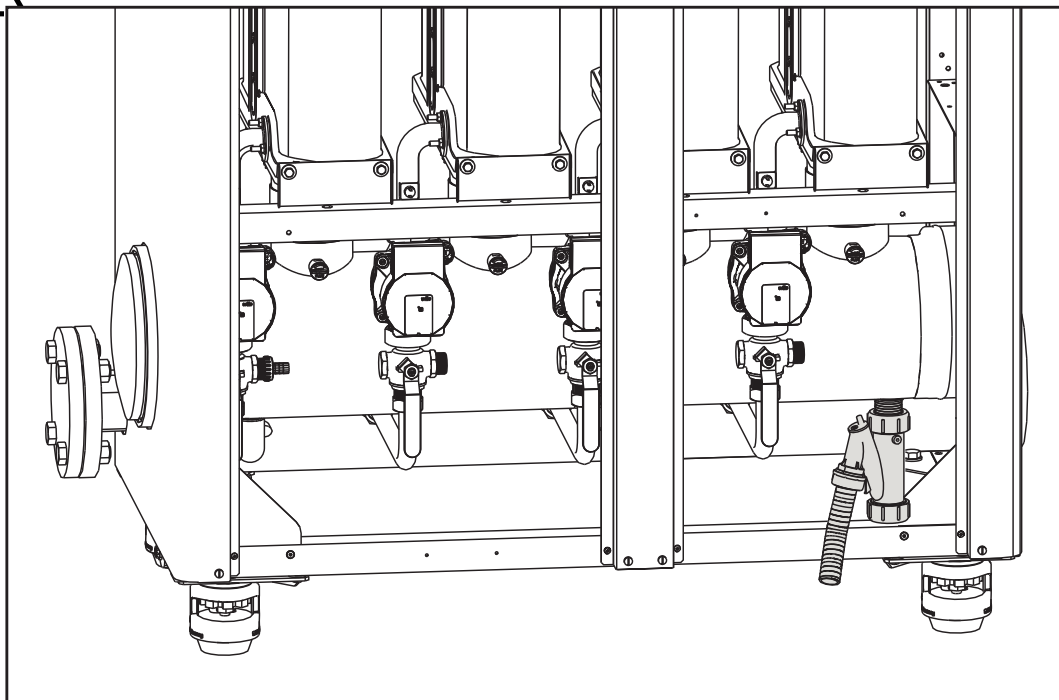


fig. 77- Condensate drain connection

3. Service and maintenance

All adjustment, conversion, commissioning and maintenance operations described below must only be carried out by Qualified Personnel (meeting the professional technical requirements of current regulations) such as the personnel of the Local After-Sales Technical Service at least once per year.

Strebel Ltd declines any liability for damage and/or injury caused by unqualified and unauthorized persons tampering with the unit.

3.1 Adjustments

Gas conversion

The unit can run on natural gas or LPG and is factory-set for use with one of these two gases, as clearly shown on the packing and on the data plate. Whenever a different gas to that for which the unit is set has to be used, the special conversion kit will be required, proceeding as follows:



DISCONNECT THE POWER and GAS to the boiler.

1. Remove the panels (see fig. 103).
2. Undo the screw “E” and remove the control unit from the gas valve (fig. 78).
3. Remove the compensation tube “N” and loosen the screw “H” (see fig. 79).

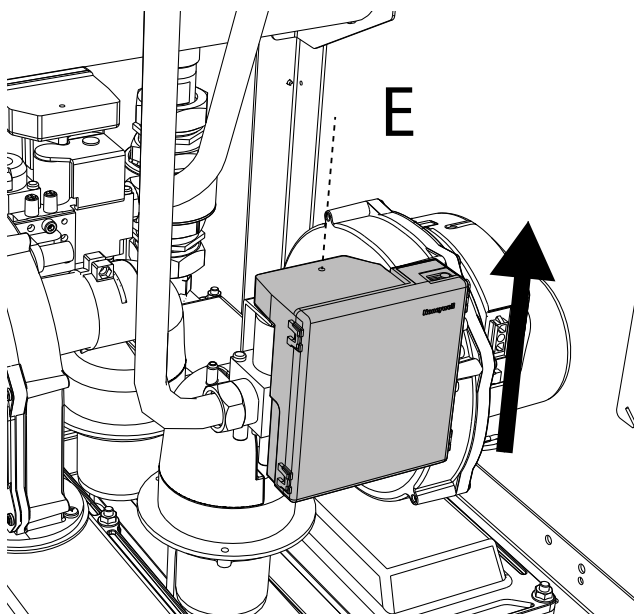


fig. 78

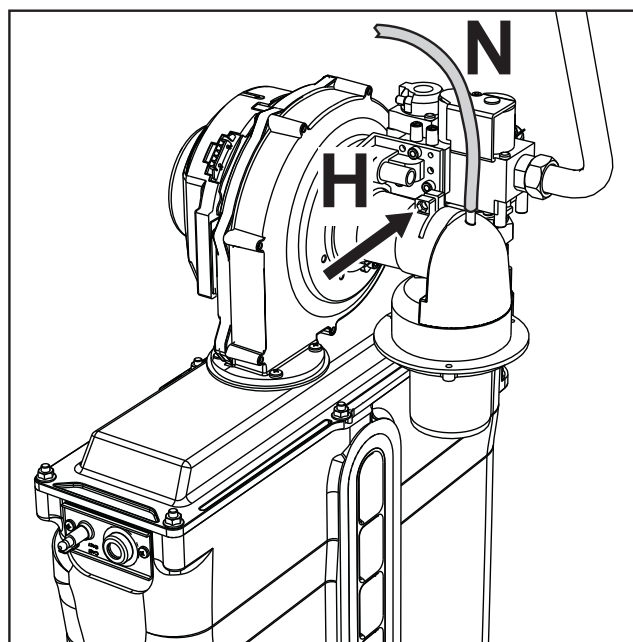


fig. 79

4. Rotate and remove the silencer "L" (see fig. 80).

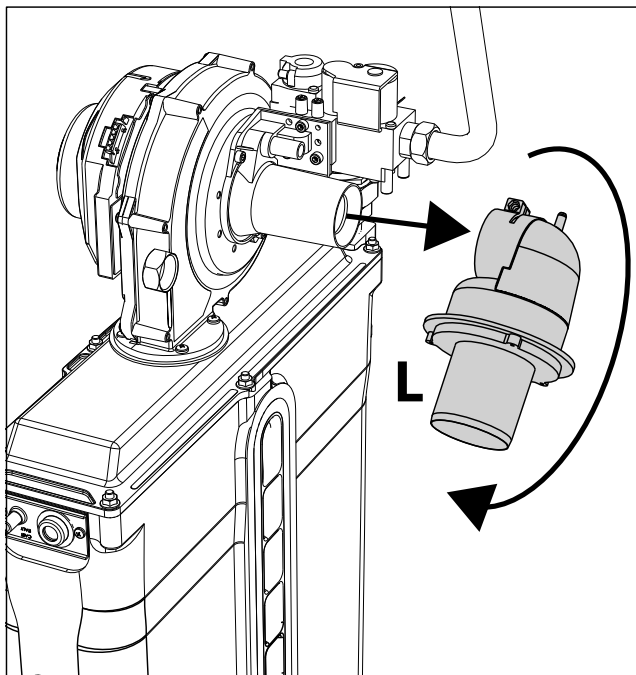


fig. 80

5. Loosen the swivels and disconnect the gas pipe "A" together with the cock "B" (fig. 81).

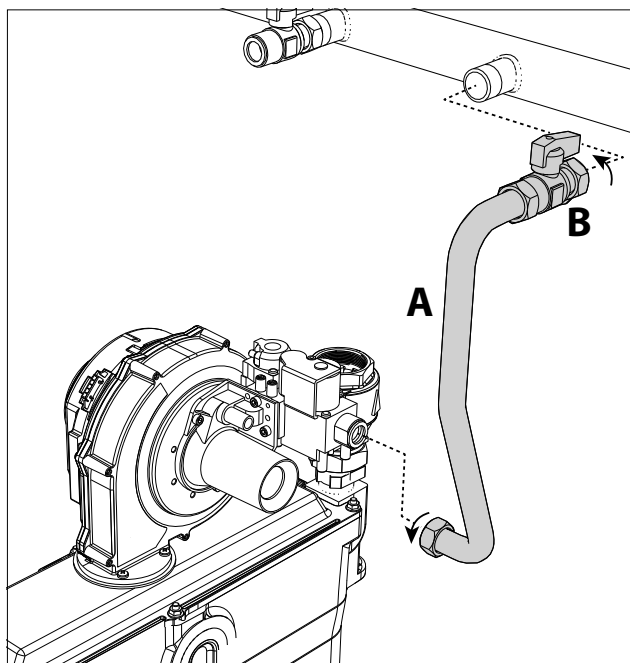


fig. 81

6. Remove the "Venturi Group" from the fan by undoing the two screws "F" (fig. 82).

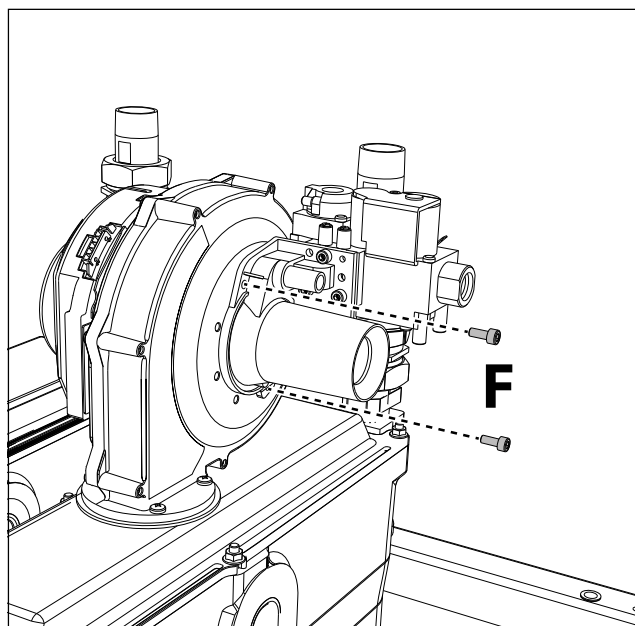


fig. 82

7. Remove the Venturi "V" by undoing the 3 screws (see fig. 83).

Replace the gas nozzle "C", positioning it inside the gasket "D", with that contained in the conversion kit (see fig. 83). Reassemble the "Venturi Group" and secure it to the fan (see fig. 83 and fig. 82).

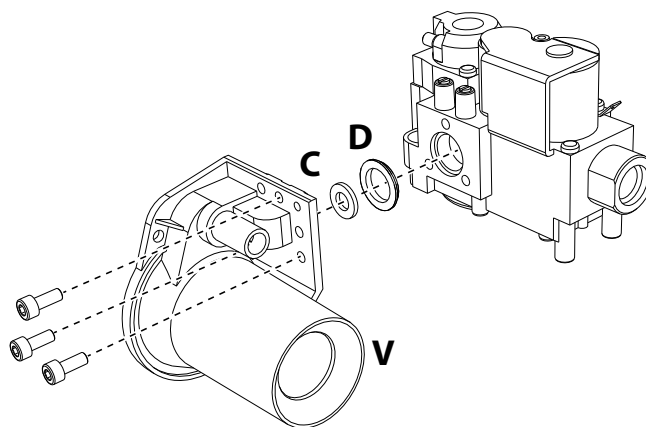


fig. 83

8. In case of **conversion to LPG**, the existing gasket between cock “B” and gas manifold must be replaced with nozzle “M” (fig. 84). Re-fit cock “B” on the gas manifold, taking care to keep tightening torque below **25 Nm** to avoid damaging the nozzle (fig. 85).

ATTENTION: The nozzle “M” (see fig. 84) **must not** be inserted with the unit running on **Natural Gas**.

ATTENTION: The chamfer of the diaphragm must face the gas manifold.

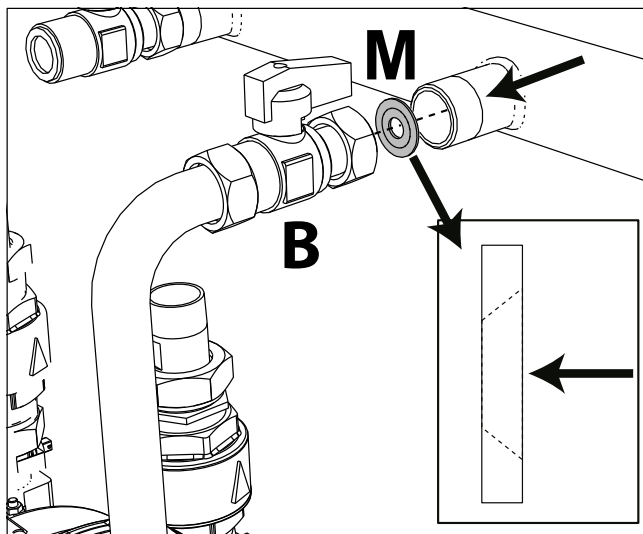


fig. 84- Nozzle for use with LPG

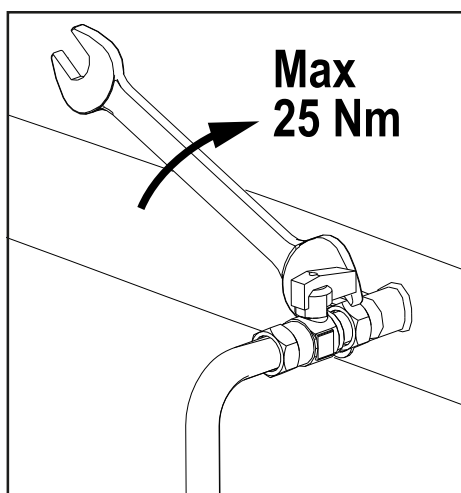


fig. 85

9. Reassemble all the components and check the seals.
10. Repeat the operations from point 3 to point 9 for each module.
11. Modify the parameter for the type of gas as described below.

Reach the screen displayed in fig. 86 by browsing the menu and following the path “USER MENU ➡ Maintenance ➡ Test Mode ➡ Gas Type Selection”. Press contextual buttons 1 and 2 to select the type of gas. Confirm with the OK button.

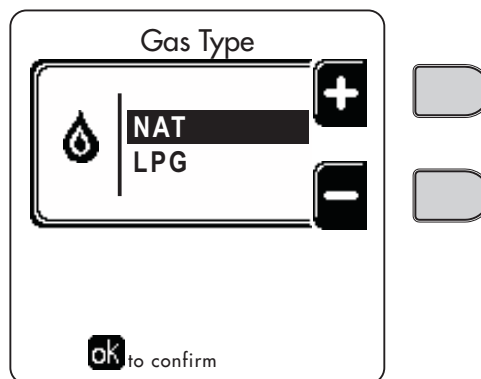


fig. 86- Gas type selection

12. Apply the label, contained in the conversion kit, near the data plate.

Activation of TEST mode and combustion control of the individual modules

Press the 

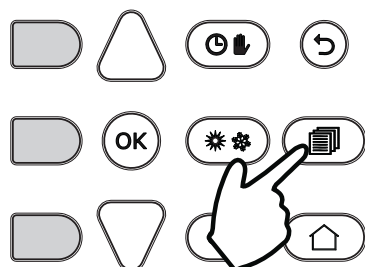


fig. 87

Press contextual button 1 

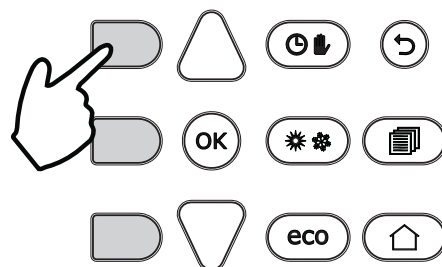


fig. 88

Using **buttons 5 and 7**, select the **Maintenance** menu. Press 

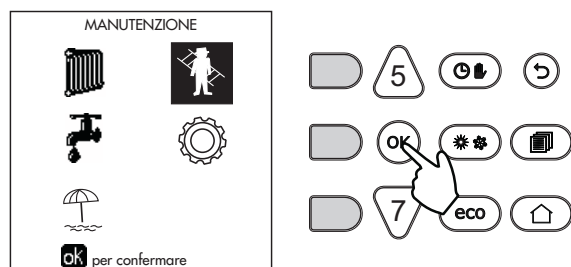


fig. 89

Using **buttons 5 and 7**, select the **Test Mode** menu. Press 

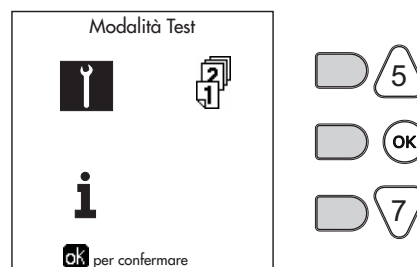


fig. 90

Using **buttons 5 and 7**, select the **Test Mode** menu. Press 

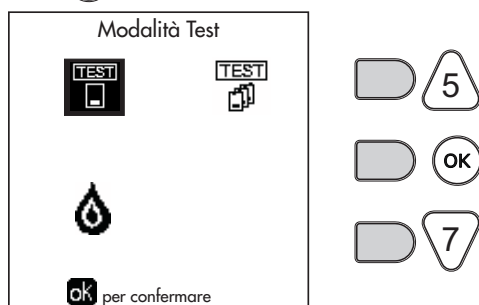


fig. 91

Using **contextual buttons 1 and 2**, select the number of the **module control unit**. Press 

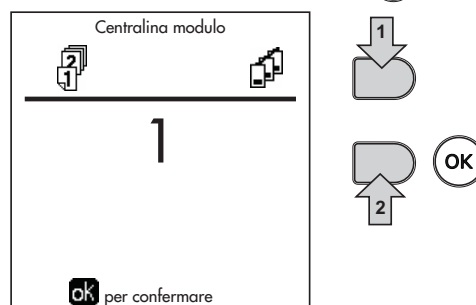


fig. 92

The boiler ignites, reaching maximum heating power (Range Rated).

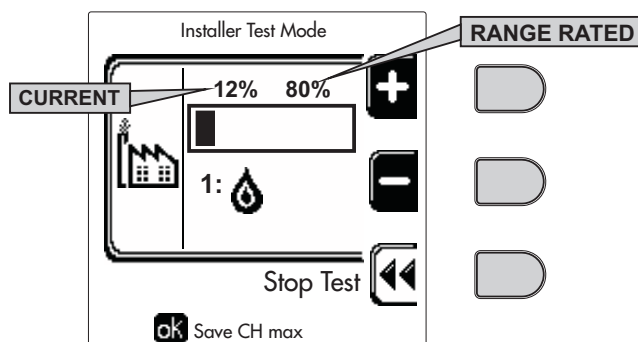


fig. 93- TEST mode (ex. heating power = 80%)

CO₂ control and measurement

 The sampling of combustion fumes must be done by inserting the analyzer probe into the fumes outlet of the single module (see fig. 94).

AVOID SAMPLING FUMES FROM THE FLUE as the returned value will not be correct.



After performing the combustion analysis, always close the fumes outlet.

OTHERWISE, THERE IS A DANGER OF ASPHYXIA DUE TO COMBUSTION FUMES ESCAPING.

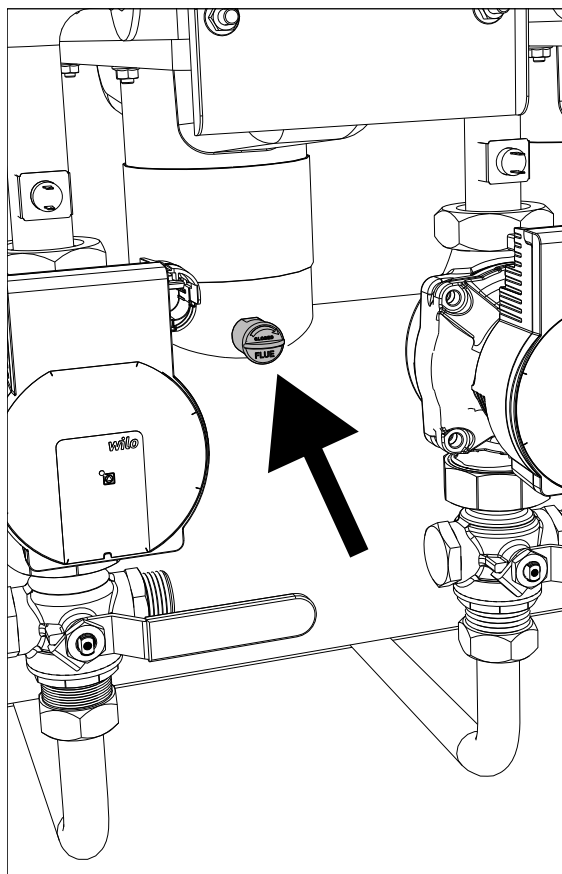


fig. 94- Single module fumes outlet

CO₂ measurement and adjustment at maximum heating capacity

- By means of **contextual button 1**  (+) bring the value to **100%**.
- Insert a combustion analysis instrument in the fumes outlet (see fig. 94).
- Check that the CO₂ value corresponds to:
9.1 % for Natural Gas
10.5 % for Propane Gas
- If the values do not correspond to those indicated, adjust the CO₂ with the adjustment screw (see fig. 95), bringing them back to those indicated.

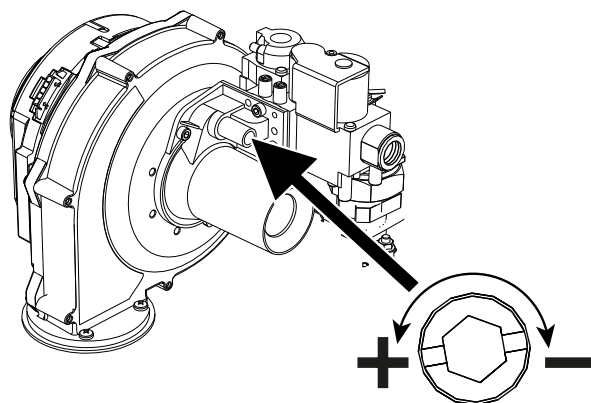


fig. 95- Maximum capacity adjustment screw

Adjusting the CO₂ at minimum heating capacity

- By means of **contextual button 2**  (-) bring the value to **0%**.
- Insert a combustion analysis instrument in the fumes outlet (see fig. 94).
- Check that the CO₂ value corresponds to:
8.5 % for Natural Gas
10.0 % for Propane Gas
- If the values do not correspond to those indicated, adjust the CO₂ with the OFFSET adjustment screw (see fig. 96), bringing them back to those indicated.

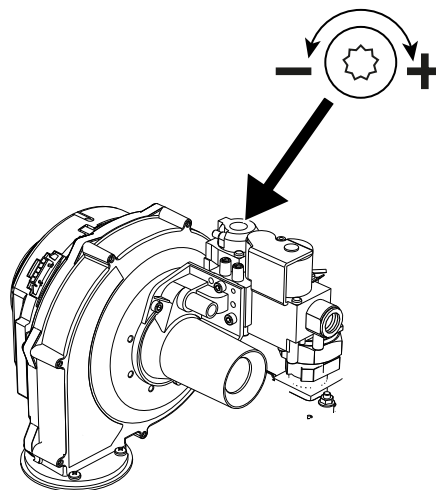


fig. 96- OFFSET minimum capacity adjustment screw

REPEAT THE ENTIRE COMBUSTION CHECK PROCEDURE FOR ALL BOILER MODULES.

 To exit the TEST mode, only use the **"Stop Test"** contextual button.

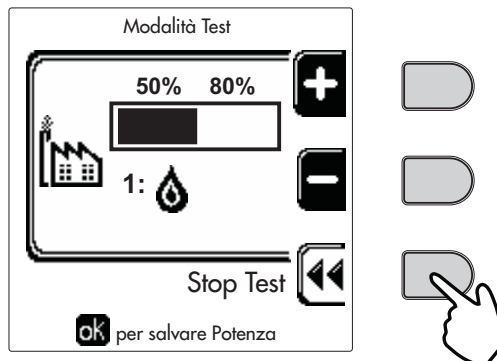


fig. 97

The TEST mode is automatically disabled in any case after 15 minutes.

DO NOT TURN OFF THE BOILER ELECTRICALLY DURING THE TEST.

Otherwise, when the power is switched on again, the system starts to work as if still in **TEST** mode and not like for a normal heating request.

Check of simultaneous activation of all modules

Within the **Test Mode** menu screen, select TEST (See fig. 98). Press 

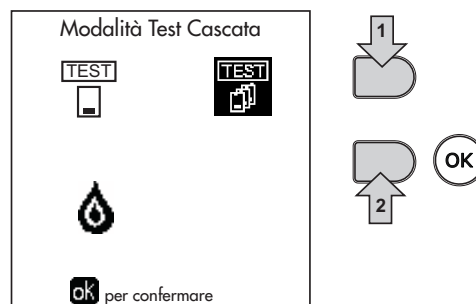


fig. 98

Using **contextual button 2** immediately bring the value  (-), to **0%**

PREVENT THE BOILER FROM IMMEDIATELY OPERATING AT MAXIMUM POWER.

INCREASE THE POWER SLOWLY TO AVOID THERMAL SHOCK.

Reach the value of 100% power in a time of 2-3 minutes.

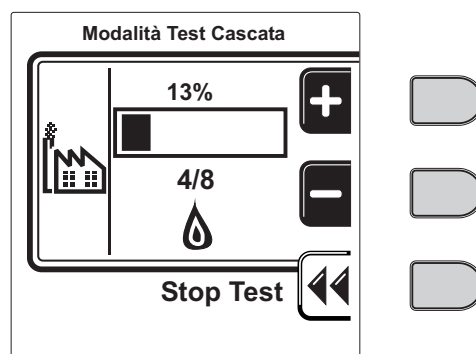


fig. 99

With all modules on at the same power (maximum or minimum), combustion can be checked at the boiler flue outlet.

Heat Capacity Adjustment (RANGE RATED)



This is a “**RANGE RATED**” boiler (according to EN 15502) and can be adjusted to the system's thermal requirement by setting the maximum heating capacity for operation in heating mode, as follows:

- Put the boiler in TEST mode (see sec. 3.1).
- Press the **contextual buttons 1 and 2** to increase or decrease the heating capacity (minimum = 00 - maximum = 100). See the diagram “Heating Capacity Adjustment” (fig. 100).
- By pressing the **OK button** (detail 6 - fig. 1) the maximum heating capacity will remain that just set. Exit TEST mode (see sec. 3.1).

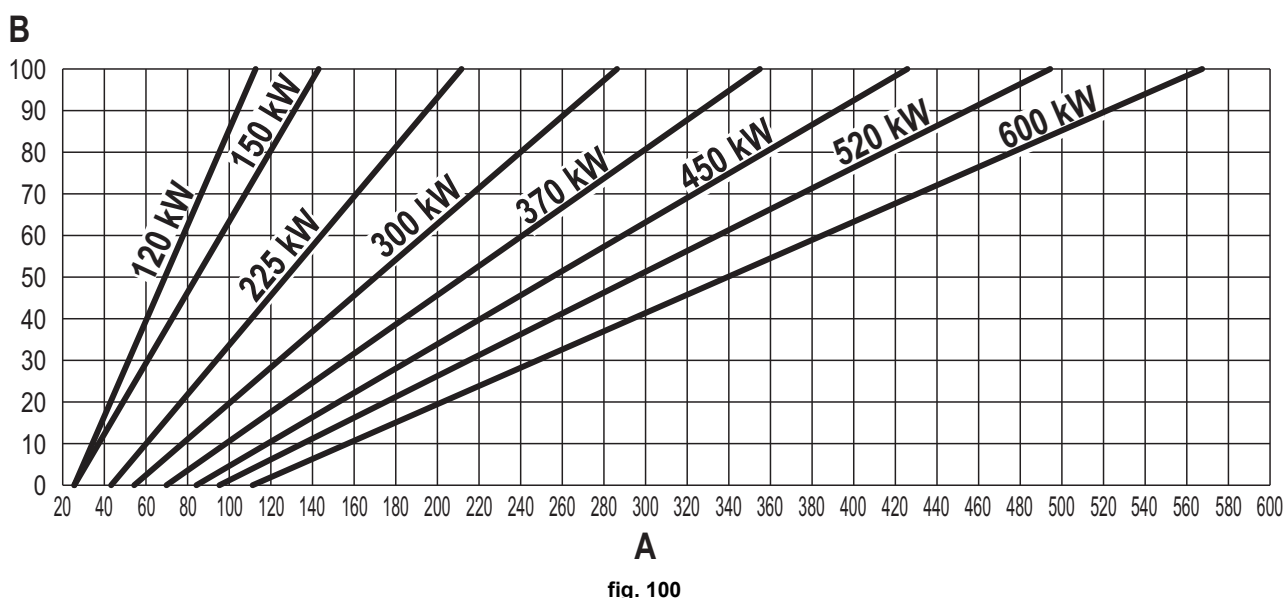
After setting the desired heating capacity, write the value on the sticker provided and place it on the boiler under the data plate. For subsequent checks and adjustments, refer to the set value.



THE HEAT CAPACITY ADJUSTMENT THUS MADE ENSURES THE EFFICIENCY VALUES DECLARED IN cap. 4.4 “Technical data table”

Heating capacity adjustment diagram

A = kW - B = Electronic Board Parameter



TECHNICAL MENU

ONLY QUALIFIED PERSONNEL CAN ACCESS THE SERVICE MENU AND MODIFY PARAMETERS.

Accessing the Technical Menu is only possible after entering the code **4 1 8**. It is valid for 15 minutes.

Editing a parameter:

To edit a parameter, select the parameter of interest from the list and press **OK** to enter.

Edit the value and confirm with **OK**.

Copying a parameter:

To copy a parameter to the other boiler modules, select the parameter from the list, press **OK** to enter the parameter and then press the button **ECO/COMF** (fig. 101). In this way the parameter is replicated on all modules.



It is advisable to make the various modules work with the same parameter values,

in order to have optimal balance of the working point.

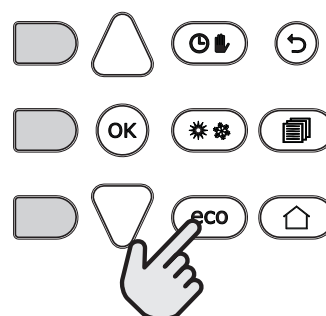


fig. 101

Configuration - Parameters Menu

19 parameters are available, indicated by the letter “**b**”, which are not modifiable from Remote Timer Control.

Table 4- Parameters - Configuration

Parameter	Description	Range	
b01	Gas type selection	Natural Gas/LPG	Natural gas
b02	Boiler type selection	1 = Heating only 2 = Combi with storage tank with double pump 3 = Combi with storage tank with diverter valve 4 ÷ 9 = Not used	1
b03	System water pressure protection selection	0 = Pressure switch 1 = Flow switch 1 sec 2 = Flow switch 3 sec 3 = Flow switch 5 sec 4 = Flow switch 10 sec 5 = Pressure transducer	0
b04	Fan max. frequency in DHW	0-255 Hz	210 Hz
b05	Fan max. frequency in heating	0-255 Hz	210 Hz
b06	Fan min. frequency in DHW/heating	0-255 Hz	60 Hz
b07	Fan min. Frequency Offset	0-255 Hz	40 Hz
b08	Variable output Relay operation selection	0=Burner lit 1=Legionella pump 2=Boiler room ventilation 3=Motor-operated shutoff valve	0
b09	Post-Ventilation	0-120 seconds	30
b10	Boiler room pre-ventilation	1-15 minutes	1
b11	Boiler room post-ventilation	1-15 minutes	1
b12	Fume sensor	Display version V.01	
		Module 1	ON
		Module 2..N	OFF
		Display version V.02	
		Module 1..N	ON
b13	Not implemented	0 ÷ 90 °C	45
b14	Fumes Max Temperature	0-125 °C	110
b15	Fan type selection	--	--
b16	Pump antiblock operation time	0-20 seconds	5
b17	High voltage input	0 = Remote reset 1 = Disable all modules 2 = Not used 3 = Enable heating request	0
b18	Password	0 ÷ 999	418
b19	Module Activation	ON-OFF	ON

Notes

- Parameters with more than one description vary their function and/or range in relation to the setting of the parameter given in brackets.
- Parameters with more than one description are reset to the default value if the parameter given in brackets is modified.

Parameters Menu - Transparent Parameters

31 parameters are available, indicated by the letter “P”, which are not modifiable from Remote Timer Control.

Table 5- Parameters - Transparent

Parameter	Description	Range	
P01	Ignition power	0-100%	30
P02	Heating ramp	1-10°C/minute	1
P03	Virtual setpoint min. temperature	20 ÷ 80°C	20
P04	Heating standby time	0 ÷ 10 minutes	4
P05	Heating Post-Circulation	0 ÷ 255 minutes	3
P06	Pump modulation strategy	0 = The pump modulates to reach “ $\Delta t = P25$ ” 1 = Like 0, but pump operation continues 2 = The pump modulates to reach “ $\Delta t = P25$ ”, but the initial modulation is linked to the heating ramp (P02) 3 = DO NOT USE	0
P07	Modulating pump min. speed (unused)	0 ÷ 100%	30
P08	Modulating pump start speed (unused)	0 ÷ 100%	75
P09	Modulating pump max. speed (unused)	30 ÷ 100%	100
P10	Pump deactivation temperature during Post-Circulation	0 ÷ 100°C	35
P11	Pump activation hysteresis temperature during Post-Circulation	0 ÷ 20°C	5
P12	Heating user min. setpoint	10 ÷ 90 °C	20
P13	Heating user max. setpoint	20 ÷ 90 °C	80
P14	Max. output in heating	0-100%	80
P15	DHW ramp	1-10°C/min	5
P16	DHW standby time	0-255 seconds	120
P17	DHW pump Post-Circulation	0-255 seconds	30
P18	With B02 = 7 - Not implemented	--	--
	With B02 = 8 - DHW user min. setpoint	10° ÷ 40°	10°
	With B02 = 9 - DHW user min. setpoint	10° ÷ 40°	10°
P19	With B02 = 7 - Not implemented	--	--
	With B02 = 8 - DHW user max. setpoint	40° ÷ 70°	65°
	With B02 = 9 - DHW user max. setpoint	40° ÷ 70°	65°
P20	Max. output in DHW	0-100%	80%
P21	With B02 = 7 - Not implemented	--	--
	With B02 = 8 - Hot water tank hysteresis	0° ÷ 60°	2°
	With B02 = 9 - Hot water tank hysteresis	0° ÷ 60°	2°
P22	With B02 = 7 - Not implemented	--	--
	With B02 = 8 - Primary setpoint	70° ÷ 85°	80°
	With B02 = 9 - Primary setpoint	70° ÷ 85°	80°
P23	With B02 = 7 - Not implemented	--	--
	With B02 = 8 - Legionella protection	ON - OFF	OFF
	With B02 = 9 - Legionella protection	ON - OFF	OFF
P24	Fan frequency in standby mode	0-255 Hz	0
P25	Modulating pump adjustment temperature (unused)	0-60°C	20
P26	Primary exchanger protection temperature	0-80°C	35
P27	System min. pressure value	--	--
P28	System nominal pressure value	--	--
P29	Exchanger protection intervention	0 = No F43, 1-15 = 1-15°C/second	0
P30	Heating hysteresis after ignition	6-30°C	10
P31	Timer for heating hysteresis after ignition	0-180 seconds	60

Notes

- Parameters with more than one description vary their function and/or range in relation to the setting of the parameter given in brackets.
- Parameters with more than one description are reset to the default value if the parameter given in brackets is modified.
- The Maximum Heating Power parameter can also be modified in Test Mode.

System Type - Parameters Menu

27 parameters are available, indicated by the letter "P." which are not modifiable from Remote Timer Control.

Parameter	Description	Range	
P.01	Heating request selection	0 = Normal heating request 1 = Request from remote control with external on-off enabling 2 = 0-10V signal request with temperature control with external on-off enabling 3 = 0-10V signal request with external on-off enabling 4 = Control of 2 climatic curves with remote control-room thermostat and second room thermostat 5 = Control of 2 climatic curves with remote control-room thermostat and second room thermostat	0
P.02	Cascade sensor selection	0 = Disabled 1 = Enabled in HEATING and DHW operation 2 = Enabled for only HEATING operation	0
P.03	No function	0-1	0
P.04	3-way valve time	0 ÷ 255 seconds	0
P.05	Activation timer*	0 ÷ 255 minutes	1
P.06	Deactivation timer*	0 ÷ 255 minutes	1
P.07	Activation power*	0 ÷ 100%	70
P.08	Deactivation power*	0 ÷ 100%	25
P.09	Hydraulic separator function	OFF = Disabled, ON = Enabled	OFF
P.10	System filling function	OFF = Disabled, ON = Enabled	OFF
P.11	3-way valve selection	2/3 = 2 or 3 wires 2 = 2 wires	2/3
P.12	0-10Vdc Heating OFF voltage (Temperature Control)**	0.1-10 Vdc	2.5
P.13	0-10Vdc Heating ON voltage (Temperature Control)**	0.1-10 Vdc	3.0
P.14	0-10Vdc Max. voltage (Temperature Control)**	0.1-10 Vdc	10
P.15	0-10Vdc Min. temperature (Temperature Control)**	0 ÷ 100°C	20
P.16	0-10Vdc Max. temperature (Temperature Control)**	0 ÷ 100°C	90
P.17	0-10Vdc Heating OFF voltage (Power Control)**	0.1-10 Vdc	2.5
P.18	0-10Vdc Heating ON voltage (Power Control)**	0.1-10 Vdc	3.0
P.19	0-10Vdc Max. power (Power Control)**	0.1-10 Vdc	10
P.20	0-10Vdc Min. power (Power Control)**	0-100%	0
P.21	0-10Vdc Max. power (Power Control)**	0-100%	100
P.22	NOT USED	--	OFF
P.23	Slave boiler continuous Comfort	OFF = Disabled, ON = Enabled	OFF
P.24	Activation timer ***	0 ÷ 255 minutes	1
P.25	Deactivation timer ***	0 ÷ 255 minutes	5
P.26	Activation power ***	0 ÷ 100 %	70
P.27	Deactivation power ***	0 ÷ 100 %	25
P.28	Communication anomaly with remote chrono-control (ref. 139).	OFF = The error code is displayed if at least one module is malfunctioning. ON = The error code is communicated if all available modules are malfunctioning	OFF

Notes

- * These parameters regard heating mode.
- ** These parameters are active only when the system operates with input 0-10Vdc.
- *** These parameters regard DHW mode.

Parameter P.01 settings

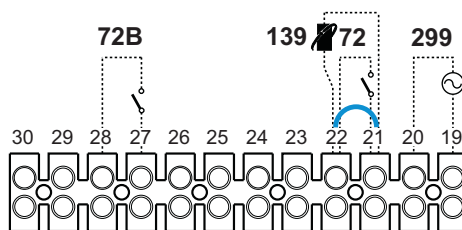


fig. 102- Par. P01 connections diagram P.01

P.01	299	72	139	72b	CH	CH Setting	Notes
0		○	○	○			
		◐		◐	ON	Fixed	
			●	○		Modulating	
			◐	●		Fixed	
1			◐	○	OFF		
			◐	●	ON	Modulating	
2	0 - 10 V			○	OFF		
				●	ON	Temperature	
3	0 - 10 V			○	OFF		
				●	ON	Power	
4		○	○	○	OFF		
		◐		◐	ON	Fixed	P.02 = 1 P.09 = 1
			●	○		Modulating	
			◐	●		Fixed	
5		○	○	◐	OFF		
		◐	◐	○	ON	Reduced climatic curve (Curve 2, Offset 2)	
		◐	◐	●		Comfort climatic curve (Curve 1, Offset 1)	

- Demand absent
 ● Demand present
 ◐ Demand present or absent

3.2 Commissioning



Checks to be done at first lighting, and after all maintenance operations that involved disconnection from the systems or work on safety devices or parts of the boiler:

Before lighting the boiler

- Open any on-off valves between the boiler and the systems.
- Check the tightness of the gas system, proceeding with caution and using a soap and water solution to detect any leaks in connections.
- Check correct prefilling of the expansion tank (ref. sec. 4.4).
- Fill the water system and make sure all air contained in the boiler and the system has been vented, by opening the air vent valve on the boiler and any vent valves on the system.

- Fill the condensate trap and check correct connection of the condensate elimination system.
- Make sure there are no water leaks in the system, DHW circuits, connections or boiler.
- Check correct connection of the electrical system and efficiency of the earthing system
- Make sure the gas pressure value for heating is that required.
- Make sure there are no flammable liquids or materials in the immediate vicinity of the boiler



IF THE ABOVE INSTRUCTIONS ARE NOT OBSERVED THERE MAY BE RISK OF SUFFOCATION OR POISONING DUE TO GAS OR FUMES ESCAPING; DANGER OF FIRE OR EXPLOSION. ALSO, THERE MAY BE A RISK OF ELECTRIC SHOCK OR FLOODING THE ROOM.

Checks during operation

- Turn the unit on as described in sec. 1.3.
- Check the tightness of the fuel circuit and water systems.
- Check the efficiency of the flue and air-fume ducts during boiler operation.
- Check the correct tightness and efficiency of the condensate removal system and trap.
- Check correct water circulation between the boiler and systems.
- Make sure the gas valve modulates correctly in heating and hot water production.
- Check proper lighting of the boiler by performing various tests, turning it on and off with the room thermostat or remote control.
- Using a combustion analyzer connected to the fumes outlet of the single module (see), check the CO₂ content in the fumes.
- Make sure the fuel consumption indicated on the meter matches that given in the technical data table in sec. 4.4.
- Check the correct programming of the parameters and carry out any required customization (compensation curve, power, temperatures, etc.).

3.3 Maintenance

IMPORTANT



ALL MAINTENANCE WORK AND REPLACEMENTS MUST BE CARRIED OUT BY SKILLED QUALIFIED PERSONNEL.

Before carrying out any operation inside the boiler, disconnect the power and close the gas cock upstream. Otherwise there may be a danger of explosion, electric shock, suffocation or poisoning.

Periodical inspection

To ensure proper operation of the unit, it is necessary to have an annual inspection carried out by qualified personnel, providing for the following:

- heat exchanger check and cleaning with suitable products if dirty or clogged
- check and possible cleaning of burner (do not use chemical products or wire brushes)
- check and cleaning of electrodes, which must be free of deposits and properly positioned
- seal and gasket check (burner, sealed chamber, etc.)
- check and cleaning of sludge remover filters and system filters
- check, cleaning and filling of condensate drain traps
- check of wiring, contacts, electrical actuators
- check and cleaning of generator air inlets and boiler room air intakes
- check and cleaning of fume evacuation duct-manifold-flue system.
- expansion tank check and prefilling
- check of correct and stable system water pressure, ensuring conformity with the required working pressure.



The use of automatic filling systems for reinstatement of operating conditions must provide for adequate treatment of the water (ref. "System water characteristics").

- check of heating system water chemical and physical parameters (ref. "System water characteristics")
- water and gas system tightness check

- check of correct and stable gas supply pressure to plant (20 mbar for operation with natural gas); any fluctuations or pressure drops below the declared value can create malfunctioning and stops with need for manual resetting.
- burner ignition and control and safety device check (gas valve, flowmeter, thermostats, etc.)
- circulating pump check, freeing when necessary
- fume analysis and check of combustion parameters



The casing, control panel and aesthetic parts of the boiler can be cleaned with a soft damp cloth, possibly soaked in soapy water. All abrasive detergents and solvents should be avoided.

Opening the casing

To open the boiler casing:

1. Undo the screws **A**.

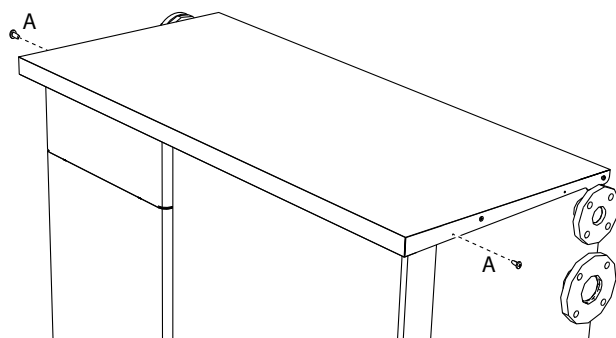


fig. 103- Cover opening

3. Lift the cover (See fig. 104)

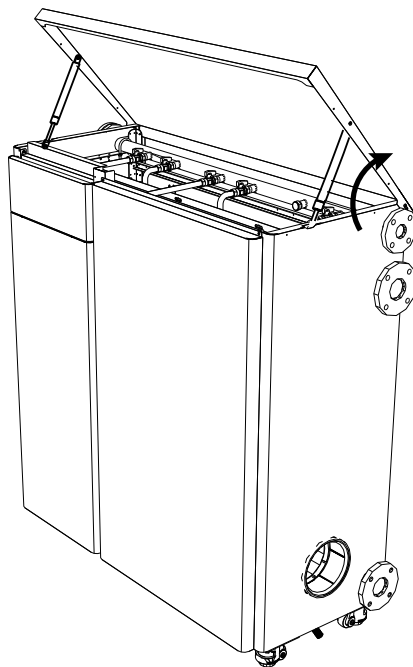


fig. 104

-
4. Undo the screws, lift and remove the panels.

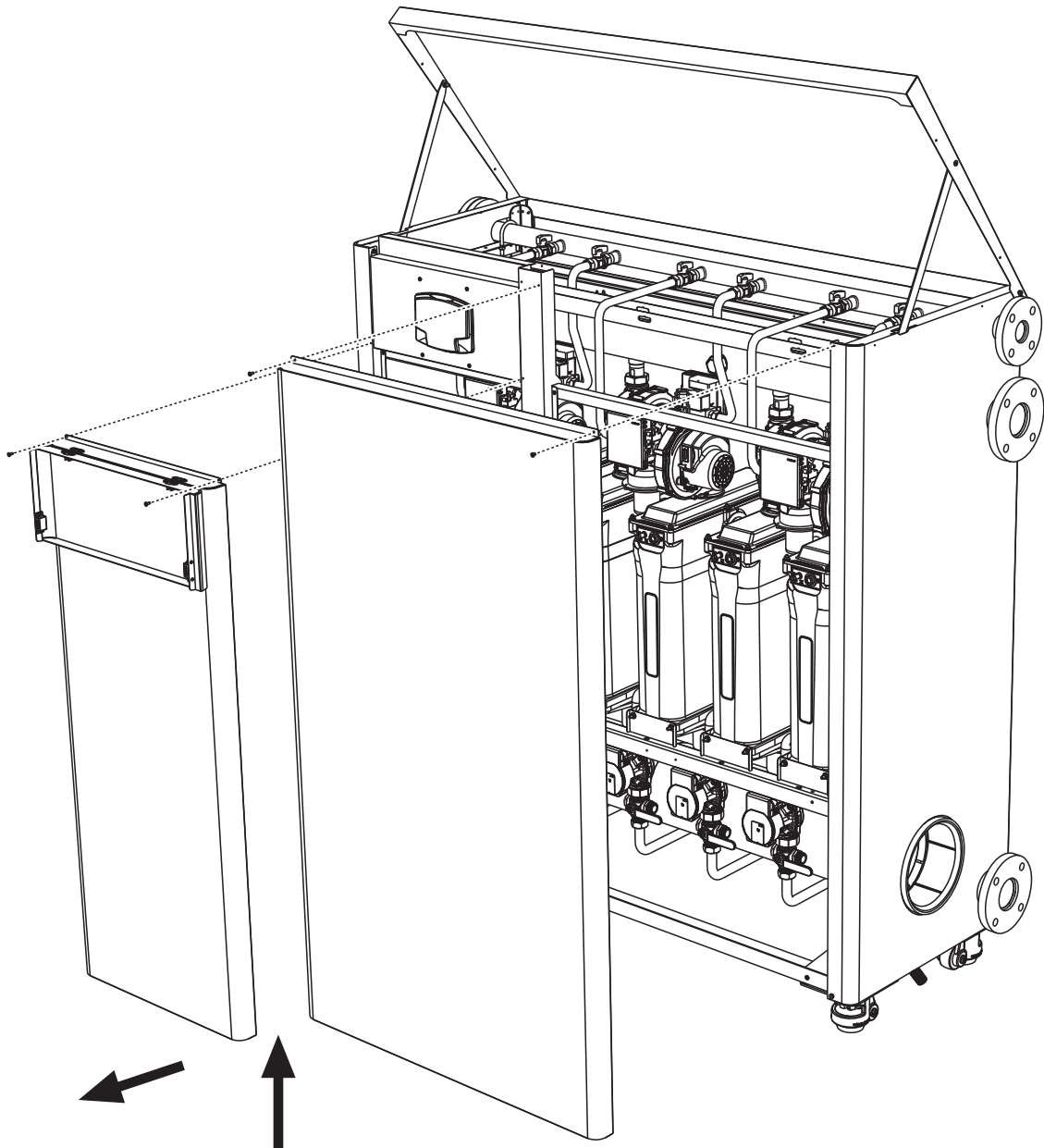


fig. 105

Module maintenance

The modular structure of the S-FAX allows maintenance or replacement of parts to be carried out on the individual internal modules independently of each other.

Disconnect the unit from the power supply and close the gas cock (ref. 106 - fig. 106) of the module undergoing maintenance. If necessary, drain the hydraulic circuit by connecting the hose connector pre-installed in the first module, using a suitable rubber hose (not supplied), to a drain or a collection manifold, on the side outlet of the three-way cock (ref. 252 - fig. 106) located on the module return. Close the three-way cock (ref. 252) on the return in order to drain.

Once the maintenance operations have been carried out, proceed in reverse order, returning the three-way return cock (ref. 252) to the "open" position.

 **IMPORTANT:** At the end of the maintenance operations, before turning the unit on again, check that all the module shutoff cocks are in the "open" position.

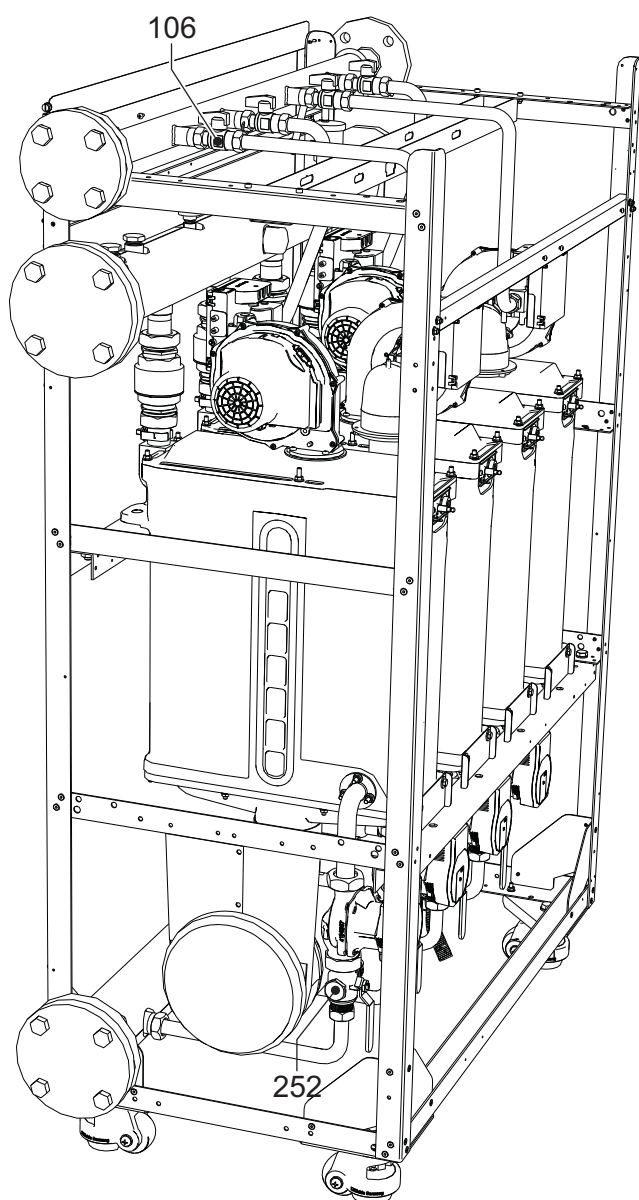


fig. 106

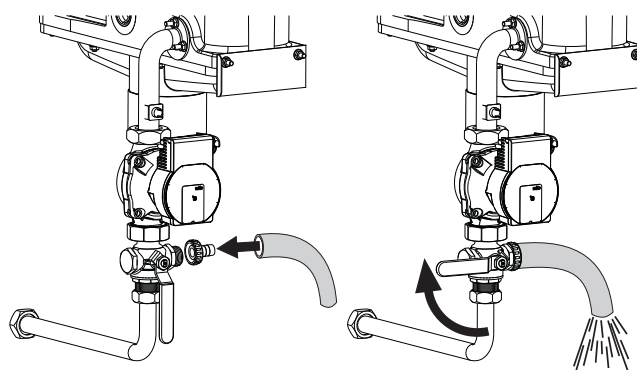


fig. 107

Electrode replacement

Follow the operation shown in fig. 108:

- Detach connector 1 and Faston terminal 2 from their seats, taking care not to damage the cables.
- Undo screws 3.
- Extract electrode 4 and remove gasket 5.



Due to the assembly tolerances, to replace the electrode located behind the upright supporting the front panels, the operation described above may be difficult (see fig. 109). If you are unable to extract the electrode due to interference, undo screw 6 fig. 110 so you can shift the upright slightly from its original position.

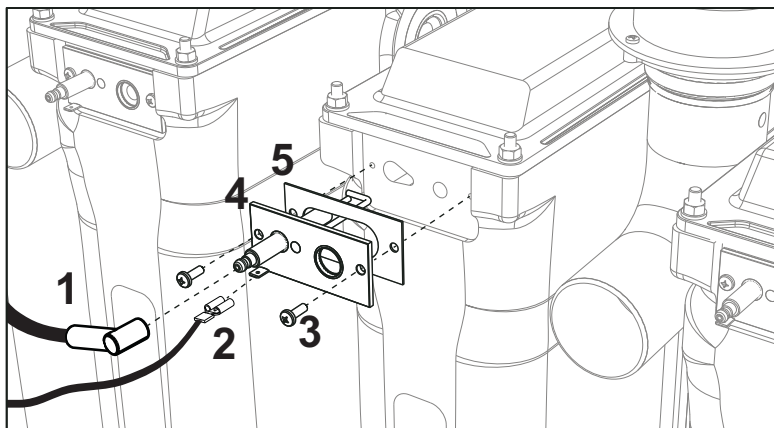


fig. 108

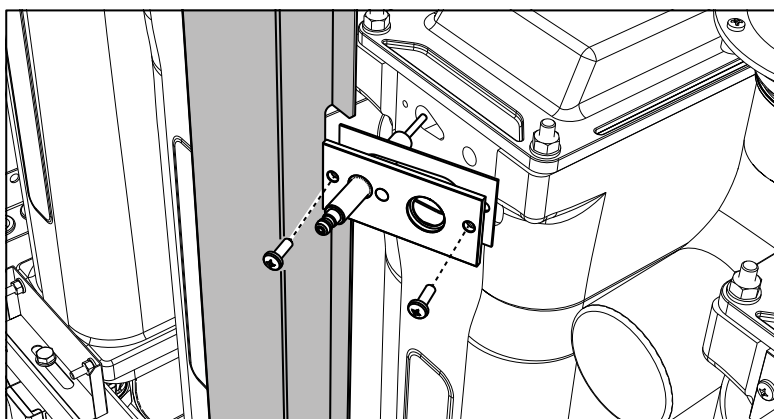


fig. 109

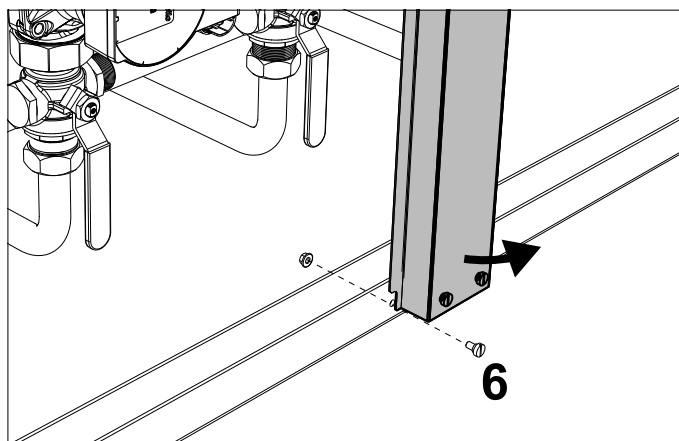


fig. 110

Connection between exchanger units and fumes collector

If you need to replace the exchanger unit, pay attention to positioning of the connection hose between the unit and the fumes collector. To ensure a condensate-tight connection, the sleeve must be installed as shown in the sequence in fig. 111. Pay special attention to insertion of the double lip on the collector (see figures A and B).

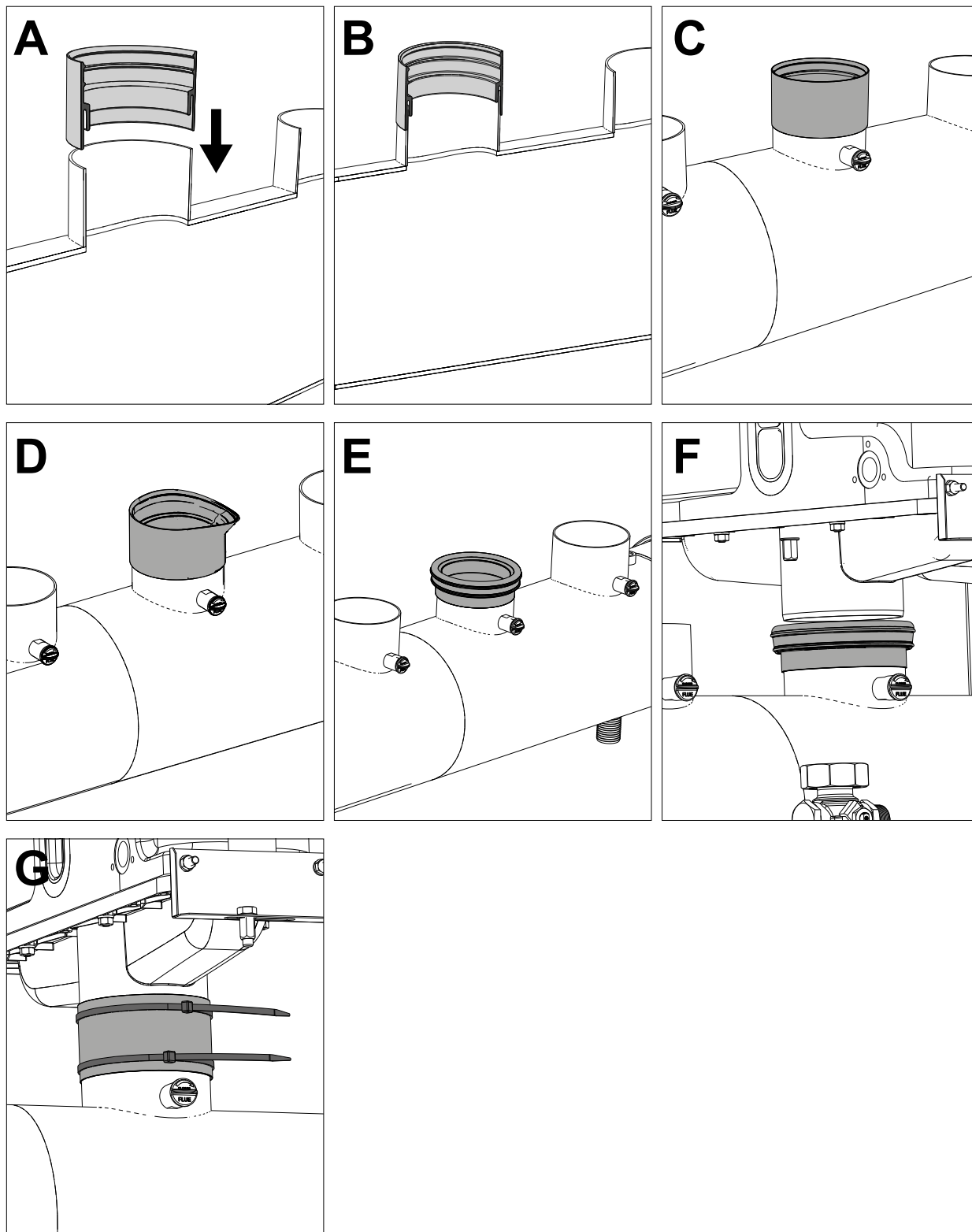


fig. 111

3.4 Troubleshooting

Diagnostics

The boiler is equipped with an advanced self-diagnosis system. In case of a boiler fault, the display lights up indicating the fault code and the module number.

There are faults that cause permanent shutdowns (indicated with the symbol **OK** to reset): to restore operation, simply press the **OK** button for 1 second or via the **RESET** of the remote timer control (optional) if installed; if the boiler does not restart, the fault must be eliminated first.

Other faults cause temporary shutdowns which are automatically reset as soon as the value returns within the boiler's normal working range.

Table of faults

Table 6- List of faults

Fault code	Fault	Possible cause	Cure
01	No burner ignition	No gas	Check the regular gas flow to the boiler and that the air has been eliminated from the pipes
		Ignition/detection electrode fault	Check the wiring of the electrode and that it is correctly positioned and free of any deposits
		Faulty gas valve	Check the gas valve and replace it if necessary
		Insufficient gas supply pressure	Check the gas supply pressure
		Trap blocked	Check the trap and clean it if necessary
		Card fault	Check the card
02	Flame present signal with burner off	Electrode fault	Check the ionization electrode wiring
		Card fault	Check the card
03	Overtemperature protection intervention	Heating sensor damaged	Check the correct positioning and operation of the heating sensor
		No water circulation in the system	Check the circulating pump
		Air in the system	Vent the system
05	Fan protection intervention	Fault F15 generated for 1 hour (consecutive)	See fault F15
06	No flame after ignition phase (6 times in 4 minutes)	Ionization electrode fault	Check the position of the ionization electrode and replace it if necessary
		Flame unstable	Check the burner
		Gas valve Offset fault	Check the Offset adjustment at minimum power
		air/fume ducts obstructed	Remove the obstruction from the flue, fume extraction ducts, air inlet and terminals
		Trap blocked	Check the trap and clean it if necessary
07	High fume temperature	Exchanger dirty	Clean the exchanger
		Exchanger deteriorated	Check the integrity of exchanger
		Sensor does not indicate the correct temperature	Check the fume sensor or replace it
08	Heating sensor 1 (flow) overtemperature indication (Viewable only in the History Menu)	insufficient system water circulation	check water circulation
09	Return sensor overtemperature indication (Viewable only in the History Menu)	insufficient system water circulation	check water circulation
10	Flow sensor 1 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
11	Return sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	

Fault code	Fault	Possible cause	Cure
12	DHW sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
13	Anomalia parametri scheda	Errata impostazione parametro b12 scheda	Verificare ed eventualmente modificare il parametro b12
	Anomalia sensore fumi	Sensore danneggiato	Verificare il cablaggio o sostituire il sensore
		Cablaggio in corto circuito	
		Cablaggio interrotto	
14	Flow sensor 2 fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
15	Fan fault	No 230V power supply	Check the 3-pin connector wiring
		Tachometric signal interrupted	Check the 5-pin connector wiring
		Fan damaged	Check the fan
26	RESET button fault on controller fitted on gas valve.	RESET button on controller fitted on gas valve blocked or faulty.	Check the RESET button and replace the controller on the gas valve if necessary.
34	Supply voltage under 170V	Electric mains trouble	Check the electrical system
35	Faulty mains frequency	Electric mains trouble	Check the electrical system
37	Pressure switch contact open	Low system pressure	Check the system water pressure
39	External probe fault	Probe damaged or wiring shorted	Check the wiring or replace the sensor
		Probe disconnected after activating the sliding temperature	Reconnect the external probe or disable the sliding temperature
41	Sensor positioning	Flow sensor disconnected from pipe	Check the correct positioning and operation of the heating sensor
42	Heating sensor fault	Sensor damaged	Replace the sensor
50	Cascade temperature sensor fault	Sensor damaged	Check the wiring or replace the sensor
		Wiring shorted	
		Wiring disconnected	
52	Heating sensor fault	Sensor damaged	Replace the sensor
56	Parameter b12 anomaly	Incorrect configuration of parameter b12	Check that parameter b12 is set as indicated Table 4, "- Parameters - Configuration," on page 374
61	Controller fault	Controller internal error	Check the ground connection and replace the controller if necessary.
62	No communication between controller and gas valve	Controller not connected	Connect the controller to the gas valve
		Valve damaged	Replace the valve
63 64 65 66	Controller fault	Controller internal error	Check the ground connection and replace the controller if necessary.
99	No communication between controller and display	Wiring disconnected	Check the wiring of the 6 wires between controller and display

4. Technical data and characteristics

4.1 Dimensions and connections

Front view for models S-FAX 150 - 300 - 450

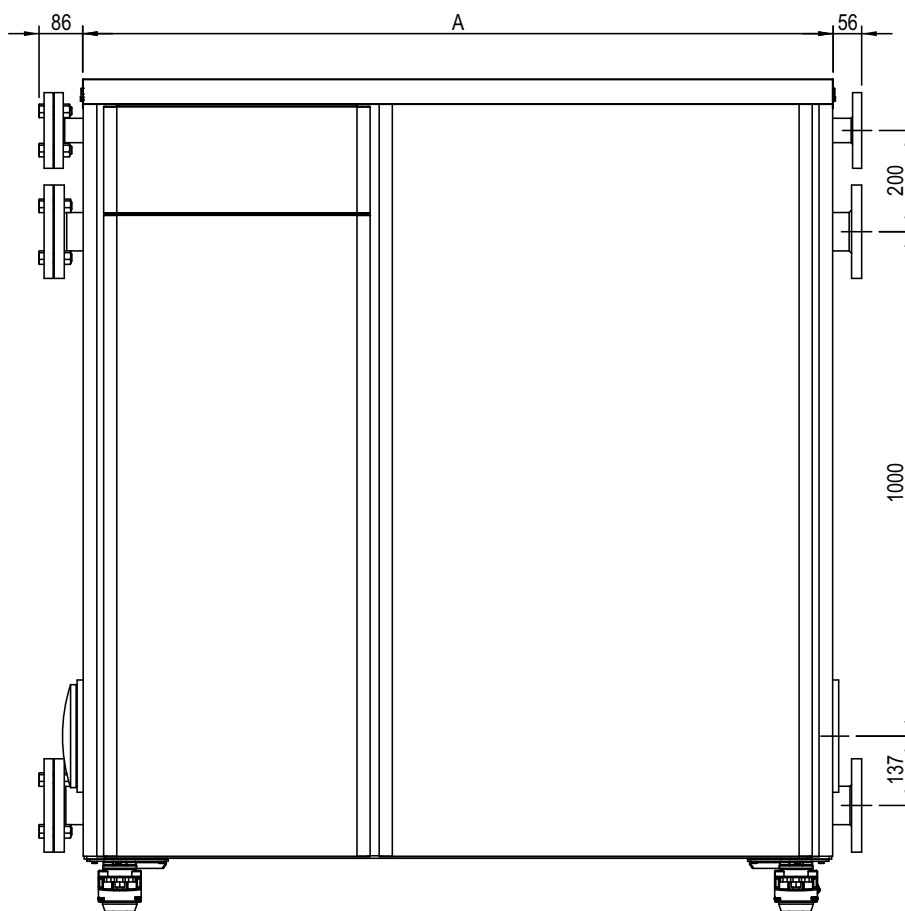


fig. 112- Front view

Model	A mm
S-FAX 150 S-FAX 300	1047
S-FAX 450	1487

Front view for model S-FAX 600

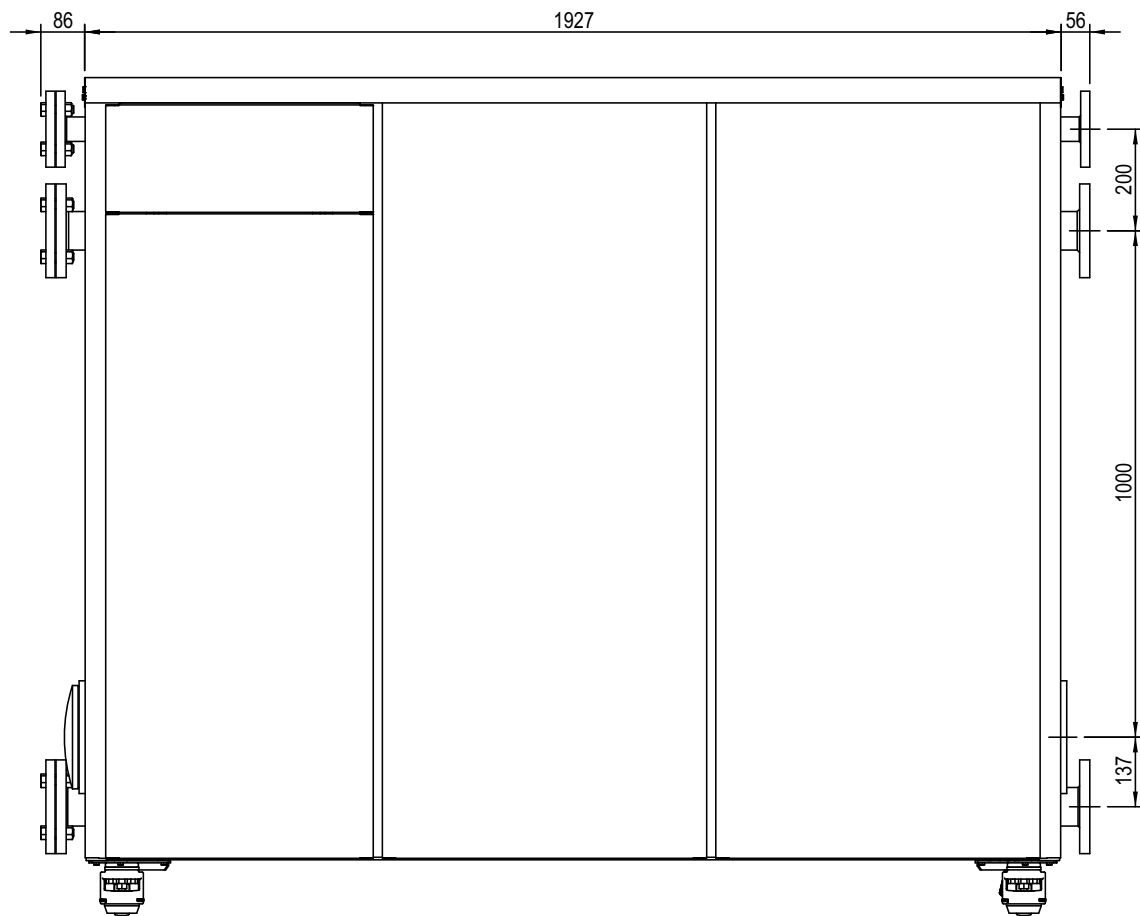


fig. 113

Side view

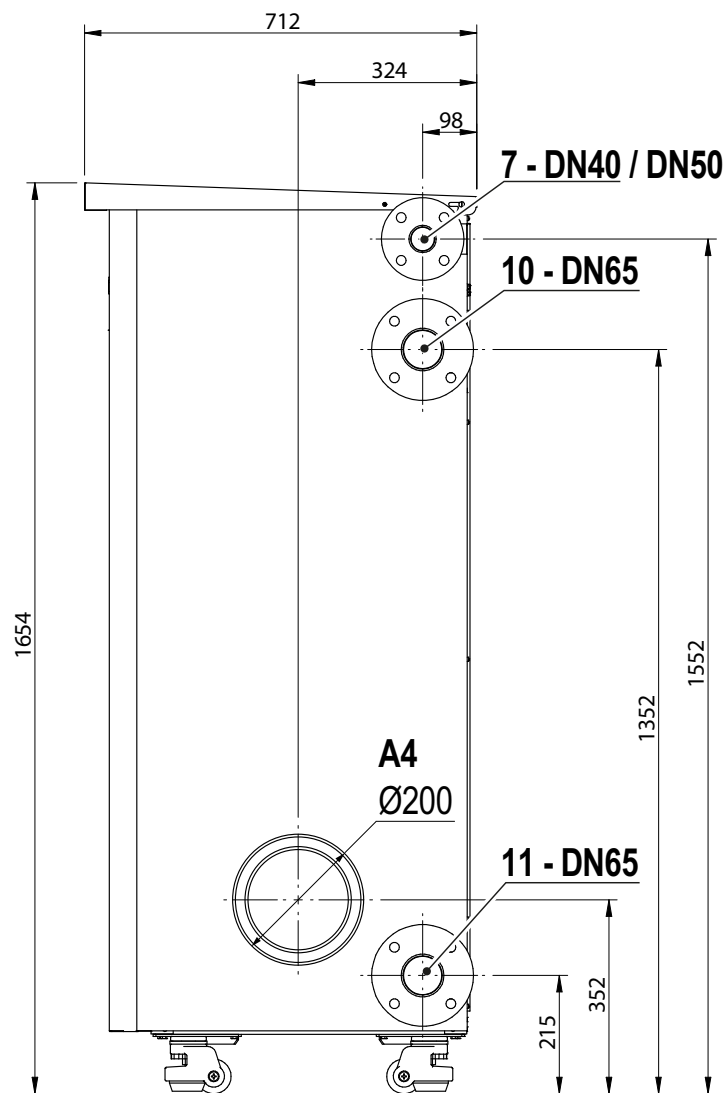


fig. 114- Side view

Legend of figures fig. 114

- a4** Fumes outlet - Ø 200
- 7** Gas inlet - DN 40 (S-FAX 150 / 300) & DN50 (S-FAX 450 / 600) flanged
- 10** System flow - DN 65 flanged
- 11** System return - DN 65 flanged

4.2 Main components

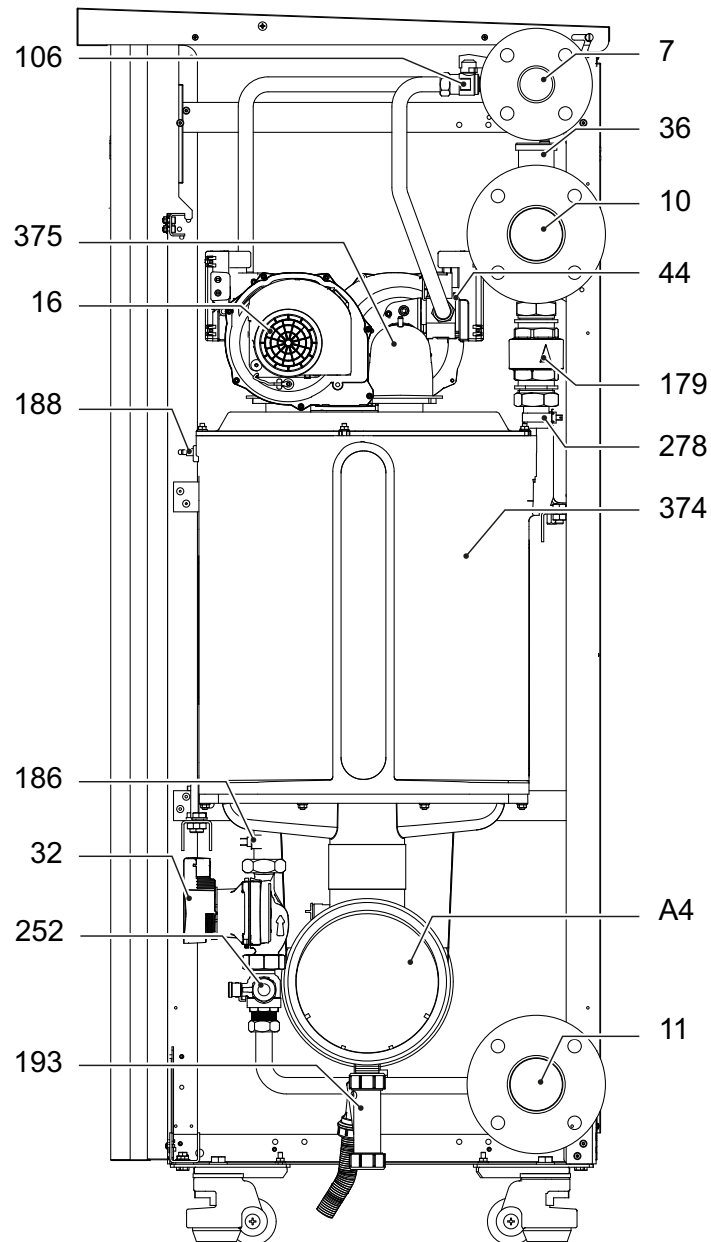


fig. 115- Main components

Legend of figures fig. 115

- a4** Fumes outlet - Ø 200
- 7** Gas inlet - DN 40 / DN 50 flanged
- 10** System flow - DN 65 flanged
- 11** System return - DN 65 flanged
- 16** Fan
- 32** Heating circulating pump
- 36** Automatic air vent
- 44** Gas valve
- 106** Gas cock
- 179** Non-return valve
- 186** Return sensor
- 188** Ignition/Ionization electrode
- 193** Trap
- 252** 3-way drain and shutoff cock

- 278** Double sensor (Safety + Heating)
- 374** Aluminum exchanger
- 375** Silencer

4.3 Hydraulic circuit

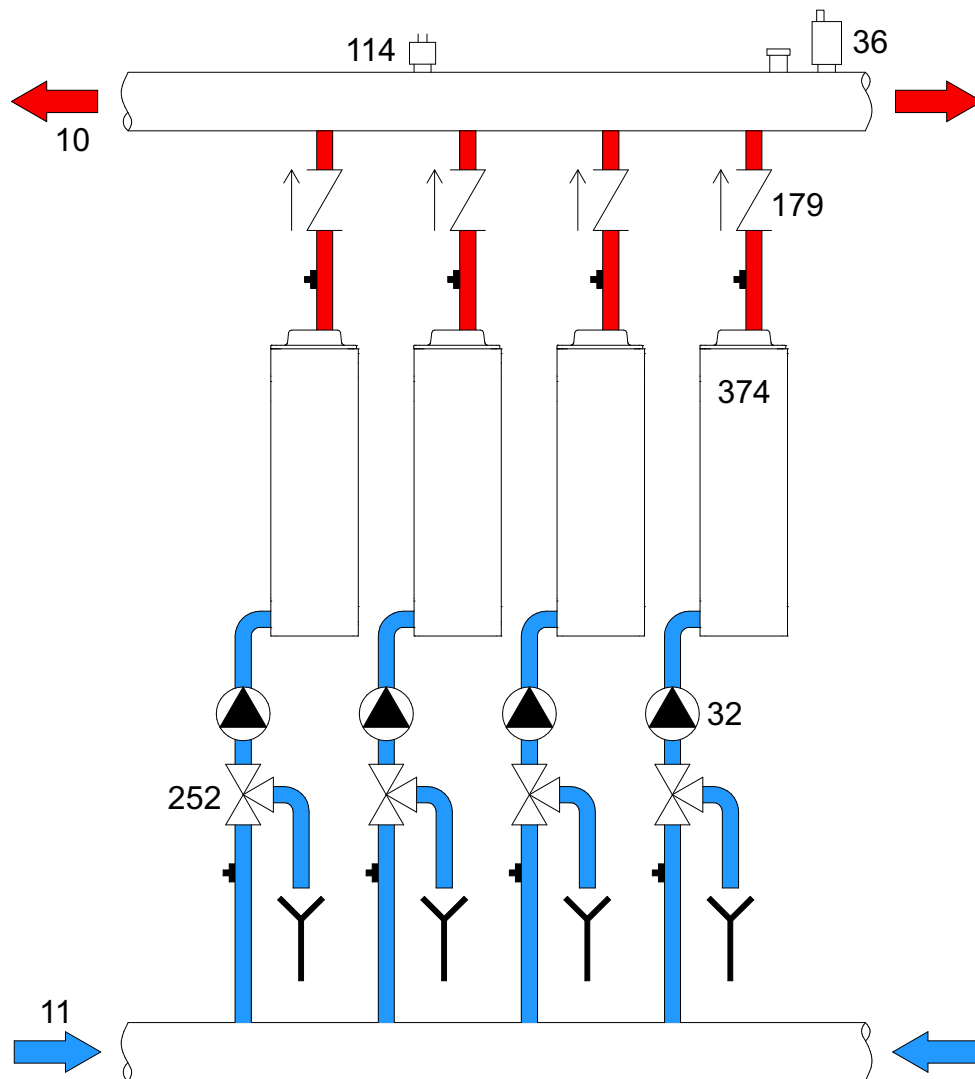


fig. 116- Hydraulic circuit

Legend of figures fig. 115

- 10 System flow - DN 65 flanged
- 11 System return - DN 65 flanged
- 36 Automatic air vent
- 44 Gas valve
- 114 Water pressure switch
- 179 Non-return valve
- 252 3-way drain and shutoff cock
- 374 Aluminum exchanger

4.4 Technical data table

The column on the right gives the abbreviation used on the data plate.

S-FAX 150						
S-FAX 300						
S-FAX 450						
S-FAX 600						
COUNTRIES OF DESTINATION		IT ES RO PL NL HU RS GB				
GAS CATEGORY		II2HM3P(IT) II2H3P(RO ES RS) II2EK3P(NL) II2E3P (PL) I2Hs(HU)				
PRODUCT IDENTIFICATION CODES			S-FAX 150	S-FAX 300	S-FAX 450	S-FAX 600
PIN CE			CE-0085DN0121			
Max. heating capacity	kW	142,0	284,0	426,0	568,0	Qn
Min. heating capacity	kW	14,0	14,0	14,0	14,0	Qn
Max. heat output in heating (80/60 °C)	kW	139,2	278,4	417,7	556,9	Pn
Min. heat output in heating (80/60 °C)	kW	13,7	13,7	13,7	13,7	Pn
Max. heat output in heating (50/30 °C)	kW	148,4	296,8	445,2	593,6	Pn
Min. heat output in heating (50/30 °C)	kW	15,1	15,1	15,1	15,1	Pn
Efficiency Pmax (80/60 °C)	%	98,2	98,2	98,2	98,2	
Efficiency Pmin (80/60 °C)	%	97,7	97,7	97,7	97,7	
Efficiency Pmax (50/30 °C)	%	104,5	104,5	104,5	104,5	
Efficiency Pmin (50/30 °C)	%	108,2	108,2	108,2	108,2	
Efficiency 30%	%	108,0	108,1	108,2	108,2	
Flue losses with burner ON (80/60 °C) - Pmax / Pmin	%	1,60 1,30	1,60 1,30	1,60 1,30	1,60 1,30	
Shell losses with burner ON (80/60 °C) - Pmax / Pmin	%	0,36 1,00	0,36 1,00	0,36 1,00	0,36 1,00	
Flue losses with burner ON (50/30 °C) - Pmax / Pmin	%	1,20 0,60	1,20 0,60	1,20 0,60	1,20 0,60	
Shell losses with burner ON (50/30 °C) - Pmax / Pmin	%	0,14 0,40	0,14 0,40	0,14 0,40	0,14 0,40	
Flue losses with burner OFF (50K / 20K)	%	0,02 0,01	0,02 0,01	0,02 0,01	0,02 0,01	
Shell losses with burner OFF (50K / 20K)	%	0,15 0,06	0,15 0,06	0,15 0,06	0,15 0,06	
Fume temperature (80/60 °C) - Pmax / Pmin	°C	62 60	62 60	62 60	62 60	
Fume temperature (50/30 °C) - Pmax / Pmin	°C	48 31	48 31	48 31	48 31	
Max combustion products temperature in overheating	°C	110,0	110,0	110,0	110,0	
Fume flow rate - Pmax / Pmin	g/s	65,7 6,9	131,5 6,9	197,2 6,9	262,9 6,9	
Gas supply pressure G20	mbar	20	20	20	20	
Gas nozzle G20	Ø	8,5	8,5	8,5	8,5	
Gas flow rate G20 - Max / min	m3/h	15,03 1,48	30,05 1,48	45,08 1,48	60,11 1,48	
CO2 - G20	%	9,1±0,3	9,1±0,3	9,1±0,3	9,1±0,3	
CO - G20 - Max / min	mg/kWh	104 2	104 2	104 2	104 2	
Gas supply pressure G31	mbar	37	37	37	37	
Gas nozzle G31	Ø	6.4 - 6.0	6.4 - 6.0	6.4 - 6.0	6.4 - 6.0	
Gas flow rate G31 - Max / min	kg/h	11,12 1,10	22,24 1,10	33,36 1,10	44,48 1,10	
CO2 - G31	%	10,5±0,4	10,5±0,4	10,5±0,4	10,5±0,4	
CO - G31 - Max / min	mg/kWh	110 1	110 1	110 1	110 1	
NOx emissions class	-	6 (<56 mg/kwh)				NOx
Max. working pressure in heating	bar	6,0	6,0	6,0	6,0	PMS
Min. working pressure in heating	bar	0,8	0,8	0,8	0,8	
Maximum operating temperature	°C	85	85	85	85	tmax
Heating water content	liters	24,0	46,0	68,0	90,0	
Heating expansion vessel capacity	liters	--	--	--	--	
Heating expansion vessel precharge pressure	bar	--	--	--	--	
Protection rating	IP	IPX4D	IPX4D	IPX4D	IPX4D	
Power supply voltage	V/Hz	230V~50HZ				
Electrical power input	W	380	760	1140	1520	W
Empty weight	kg	215,0	290,0	395,0	500,0	
Type of unit	B23					

4.5 ErP tables

ErP product fiche

MODEL: S-FAX 150

MODEL: S-FAX 300

MODEL: S-FAX 450

MODEL: S-FAX 600

			S-FAX 150	S-FAX 300	S-FAX 450	S-FAX 600
TRADEMARK: STREBEL						
Condensing boiler			YES	YES	YES	YES
Low-temperature boiler (**)			YES	YES	YES	YES
B1 Boiler			NO	NO	NO	NO
Combination heater			NO	NO	NO	NO
Cogeneration space heater			NO	NO	NO	NO
Item	SYMBOL	UNIT	VALUE			
Rated heat output	P_n	kW	139	279	418	558
Seasonal space heating energy efficiency	η_s	%	92	93	93	93
Useful heat output						
Useful heat output at rated heat output and high-temperature regime (*)	P₄	kW	139,4	278,9	418,3	557,8
Useful heat output at 30% of rated heat output and low-temperature regime (**)	P₁	kW	23,0	23,0	23,0	23,0
Useful efficiency						
Useful heat output at rated heat output and high-temperature regime (*)	η₄	%	88,4	88,4	88,4	88,4
Useful heat output at 30% of rated heat output and low-temperature regime (**)	η₁	%	97,3	97,3	97,4	97,4
Auxiliary electricity consumption						
At full load	el_{max}	kW	0,230	0,460	0,690	0,920
At part load	el_{min}	kW	0,025	0,025	0,025	0,025
In standby mode	PSB	kW	0,005	0,007	0,009	0,011
Other items						
Standby heat loss	P_{stby}	kW	0,240	0,480	0,720	0,960
Ignition burner power consumption	P_{ign}	kW	0,000	0,000	0,000	0,000
Annual energy consumption	QHE	GJ	236	452	667	883
Sound power level	LWA	dB	69	72	75	78
Emissions of nitrogen oxides	NOx	mg/kWh	36	36	36	36

(*) High-temperature regime means 60°C return temperature at heater inlet and 80°C feed temperature at heater outlet.

(**) Low temperature means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature (at heater inlet).

4.6 Diagram

Residual head curves at the system S-FAX 150

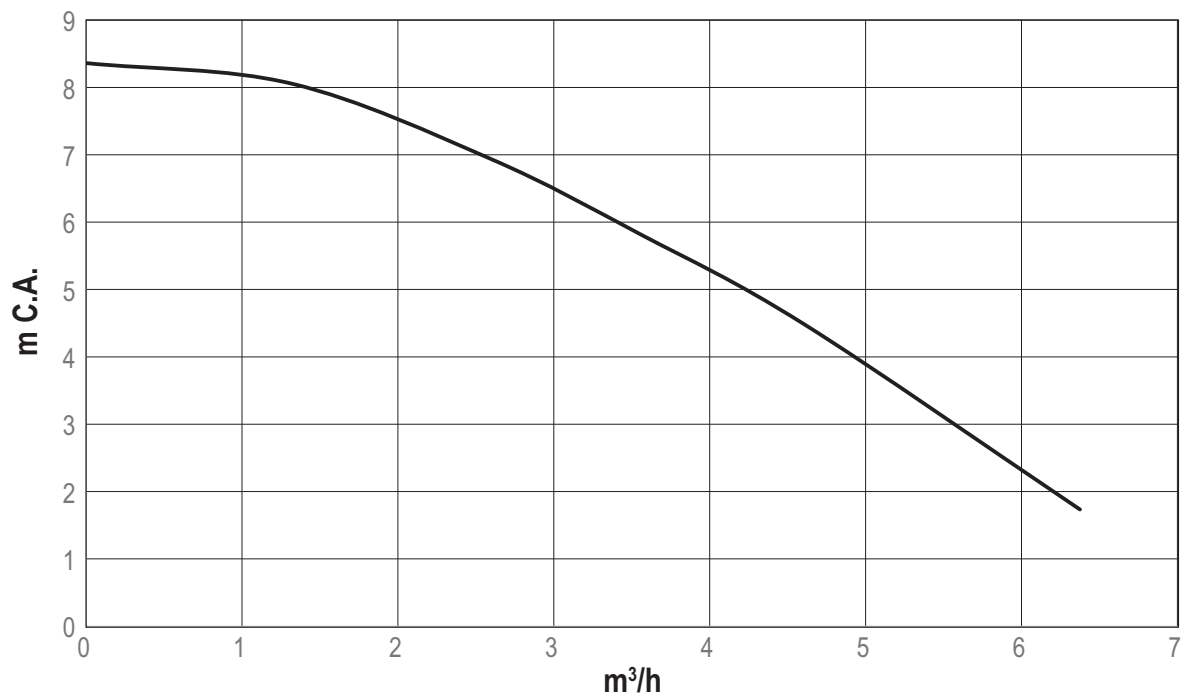


fig. 117 - Head diagram

- A flow rate
B head at the system

Residual head curves at the system S-FAX 300

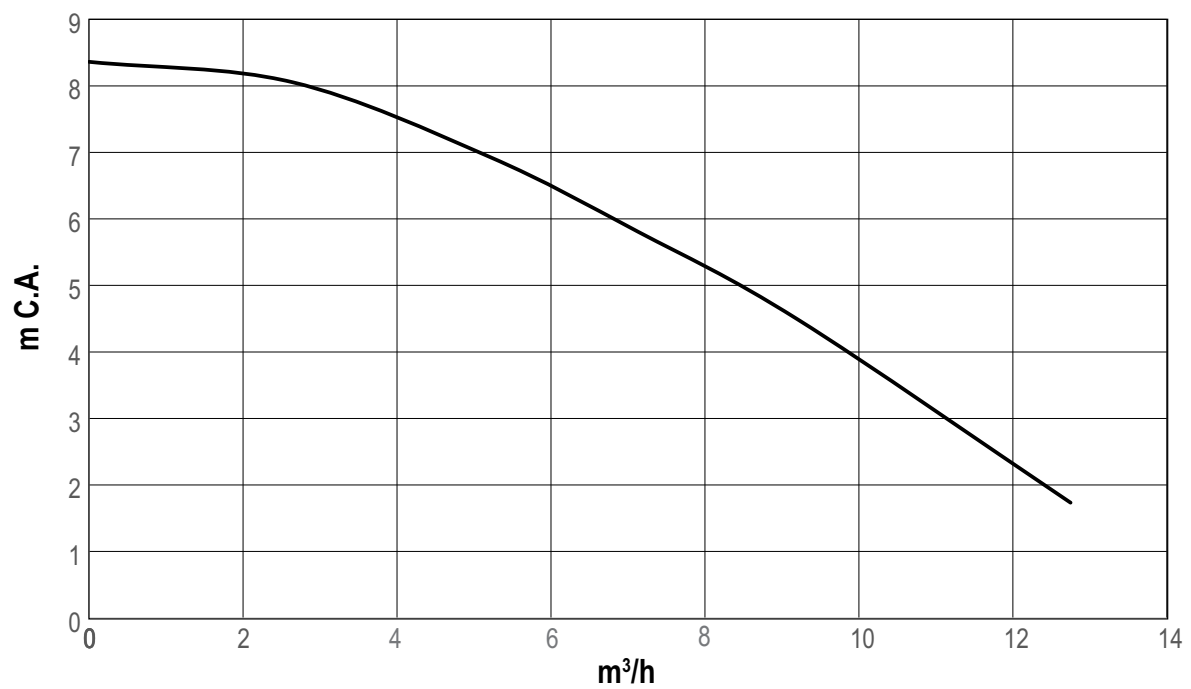


fig. 119 - Head diagram

- A flow rate
B head at the system

Residual head curves at the system S-FAX 450

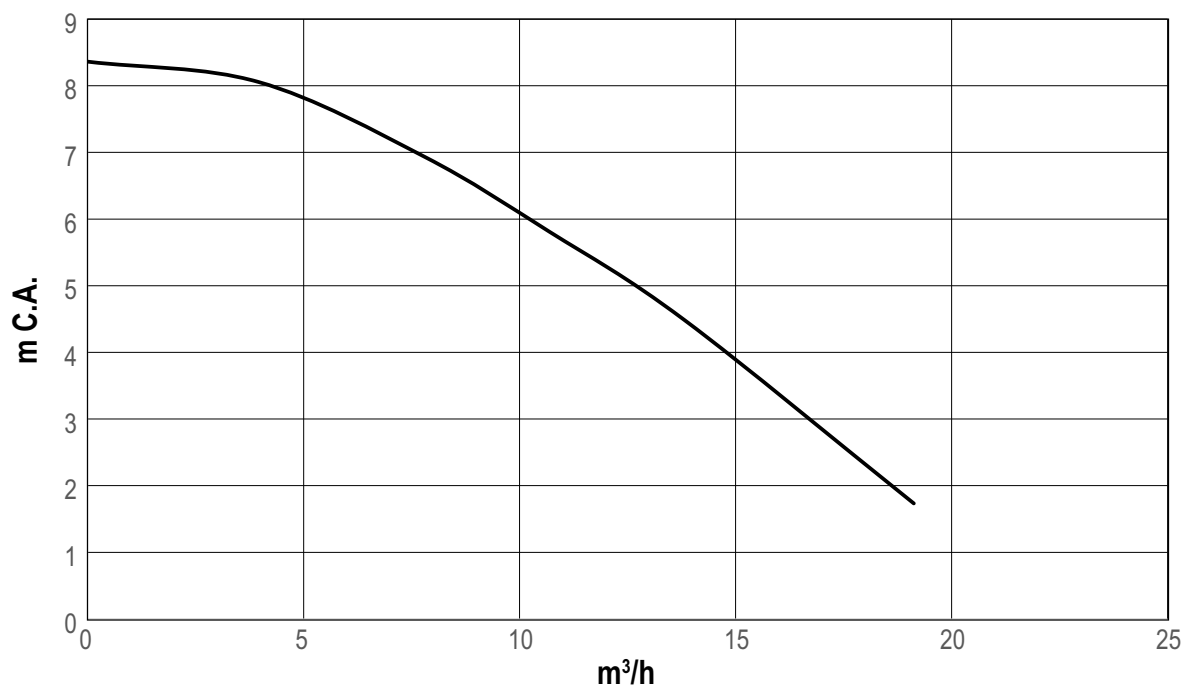


fig. 121 - Head diagram

- A flow rate
B head at the system

Residual head curves at the system S-FAX 600

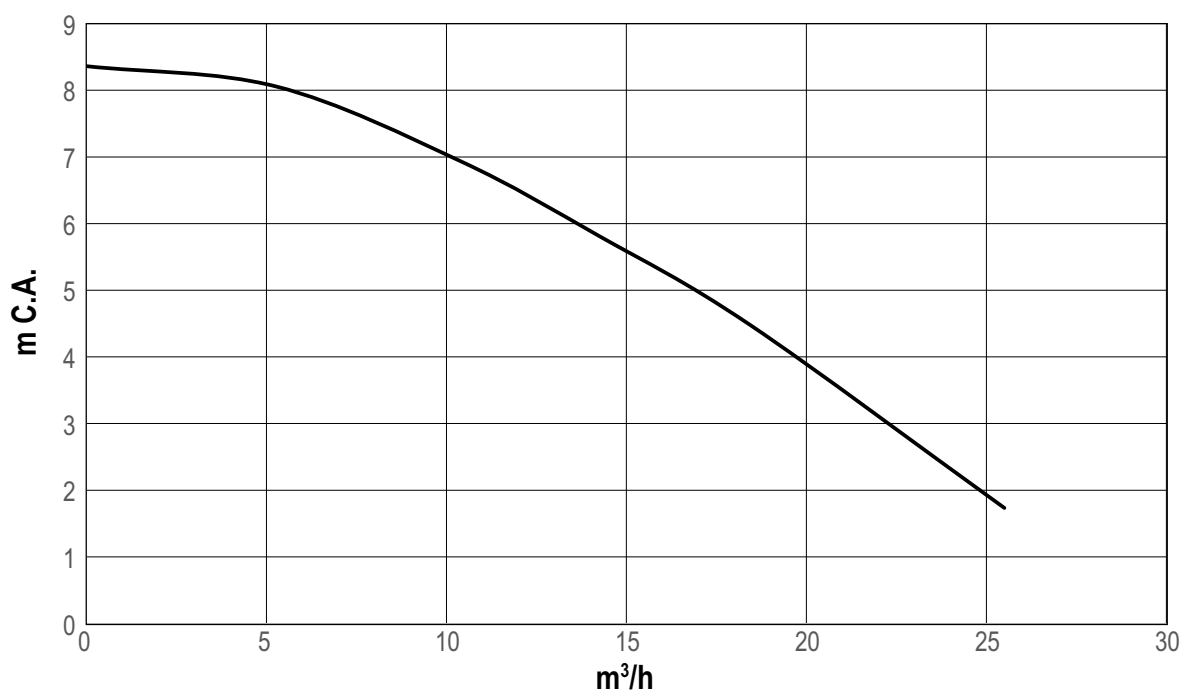


fig. 123 - Head diagram

- A flow rate
B head at the system

4.7 Wiring diagrams

ATTENTION: Remove the jumper on the terminal block before connecting the room thermostat or the remote timer control.

ATTENTION: To connect the 3-way valve (terminals 13 - 14 - 15), refer to the diagrams of fig. 124 and fig. 125.

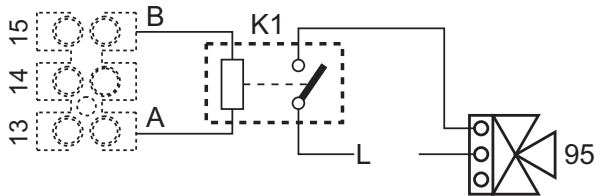


fig. 124- Connection of the 3-way valve with 2 wires

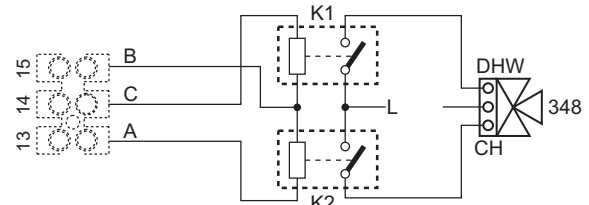


fig. 125- Connection of the 3-way valve with 3 wires

ATTENTION: In case of instability in the reading of the 0-10V signal by the electronic controller, it is advisable to connect the signal reference to ground, and insert a 10K resistor in parallel, as per fig. 126.

ATTENTION: Terminals 16 and 17 (see fig. 127) must not be used.

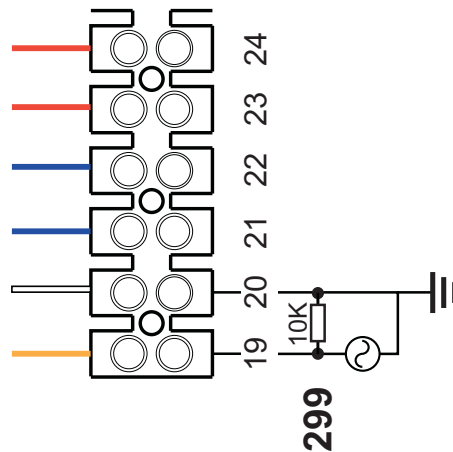


fig. 126-

Legend of figures fig. 124, fig. 125, fig. 126 and fig. 127

F Fuse

R1 620 Ohm 1/4W

K1/K2 Coil at 230Vac and nominal power <2.2VA

1 switch with nominal voltage 230Vac and nominal current $\geq 8A$

72 Room thermostat (not supplied)

72b Second room thermostat (not supplied)

95 3-way valve - 2 wires (not supplied)

A = Heating phase

B = Neutral

98 Switch

130 DHW circulating pump (not supplied)

138 External probe (not supplied)

139 Remote timer control (not supplied)

155 Hot water tank temperature probe (not supplied)

298 Cascade temperature sensor (not supplied)

299 Input 0-10 Vdc

300 Burner lit contact (voltage-free contact)

301 Fault contact (voltage-free contact)

302 Remote reset input (230 Volt)

306 Heating system circulating pump (not supplied)

307 Heating system second circulating pump (not supplied)

348 3-way valve - 3 wires (not supplied)

A = Heating phase

B = Neutral

C = DHW phase

Display wiring diagram

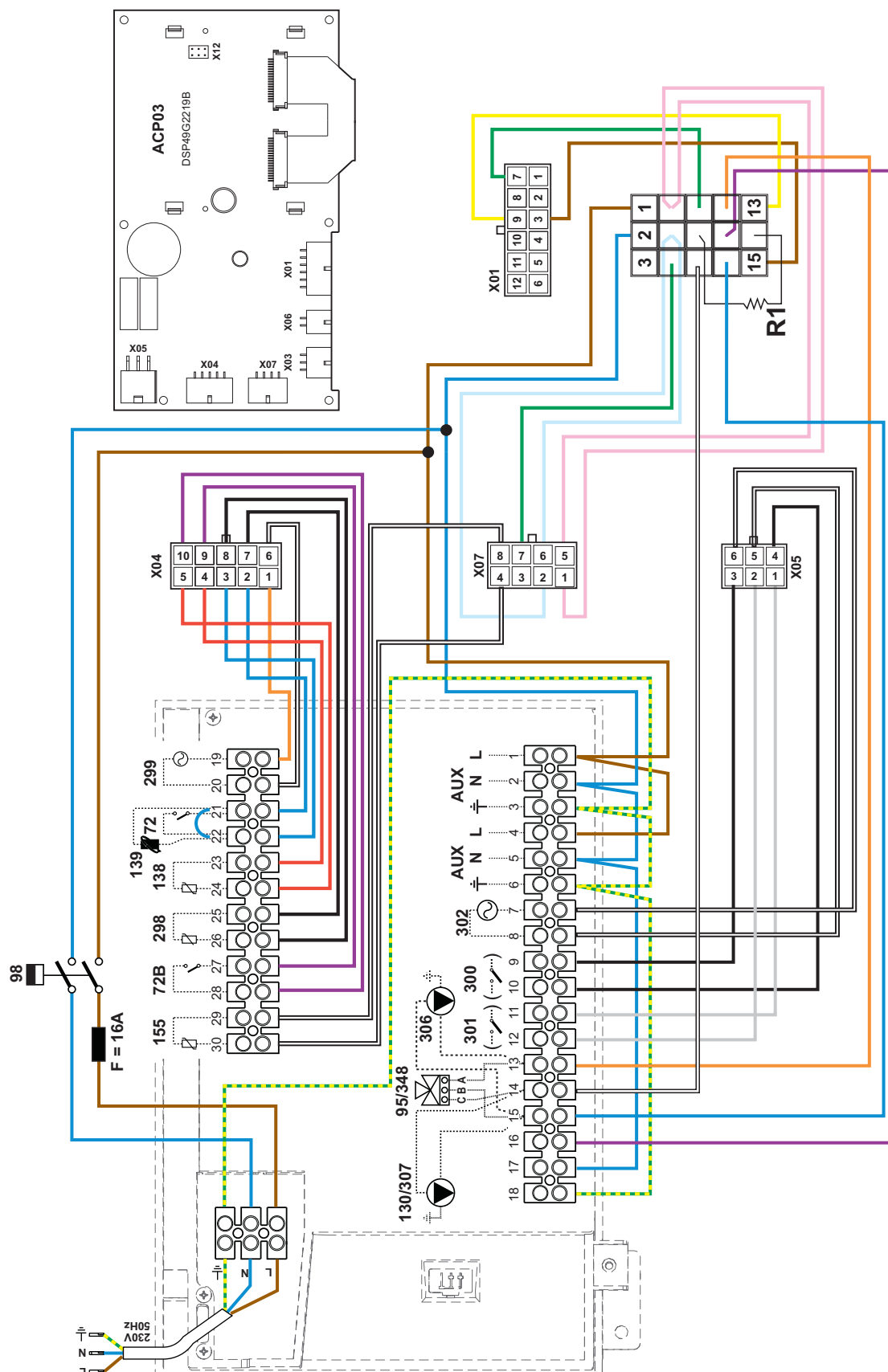


fig. 127- Display wiring diagram

First module wiring diagram

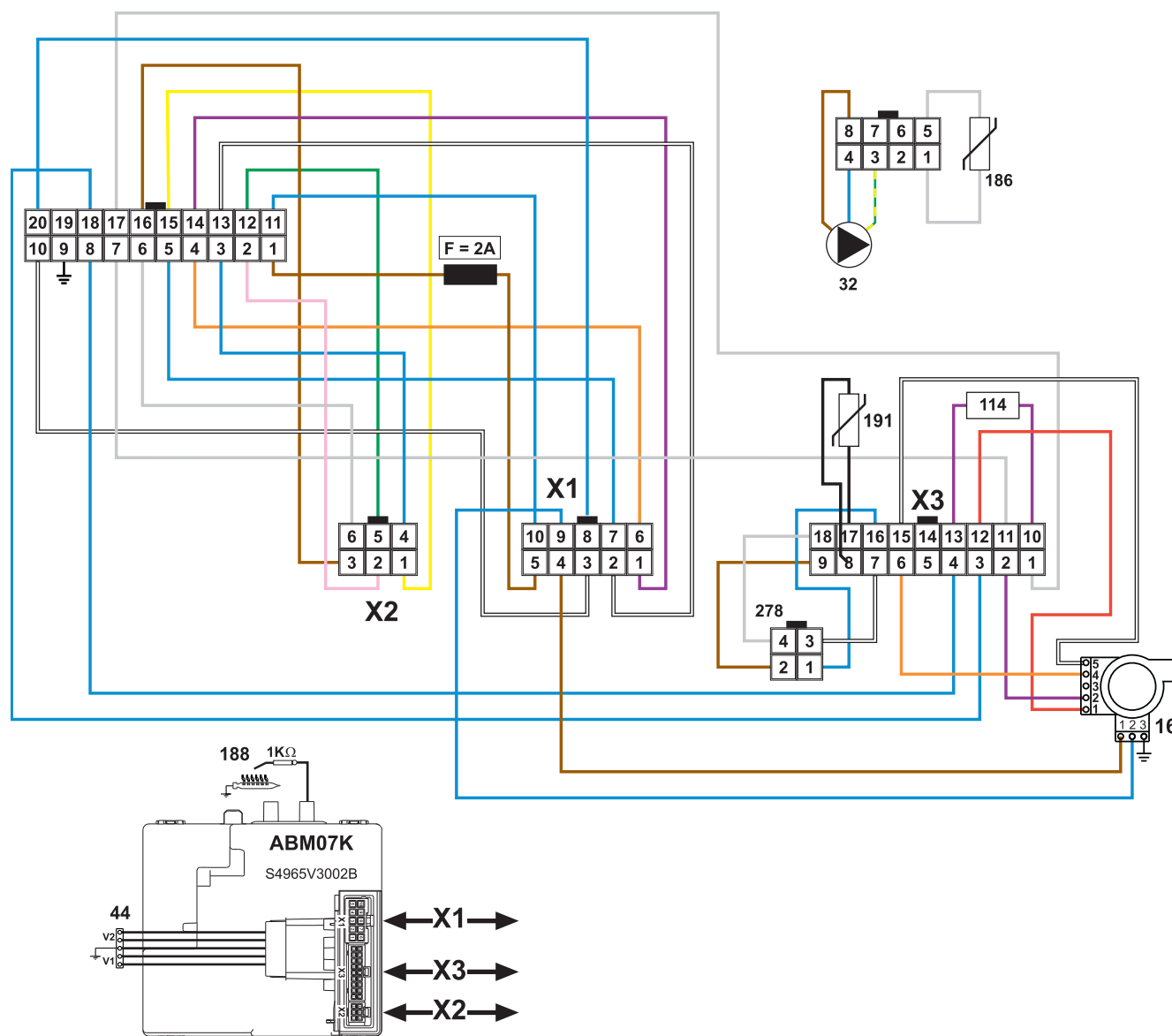


fig. 128- First module wiring diagram

Legend of figures fig. 128

- 16 Fan
- 32 Heating circulating pump
- 44 Gas valve
- 114 Water pressure switch
- 186 Return sensor
- 188 Ignition/Ionization electrode
- 191 Fume temperature sensor
- 278 Double sensor (Safety + Heating)

Intermediate module wiring diagram

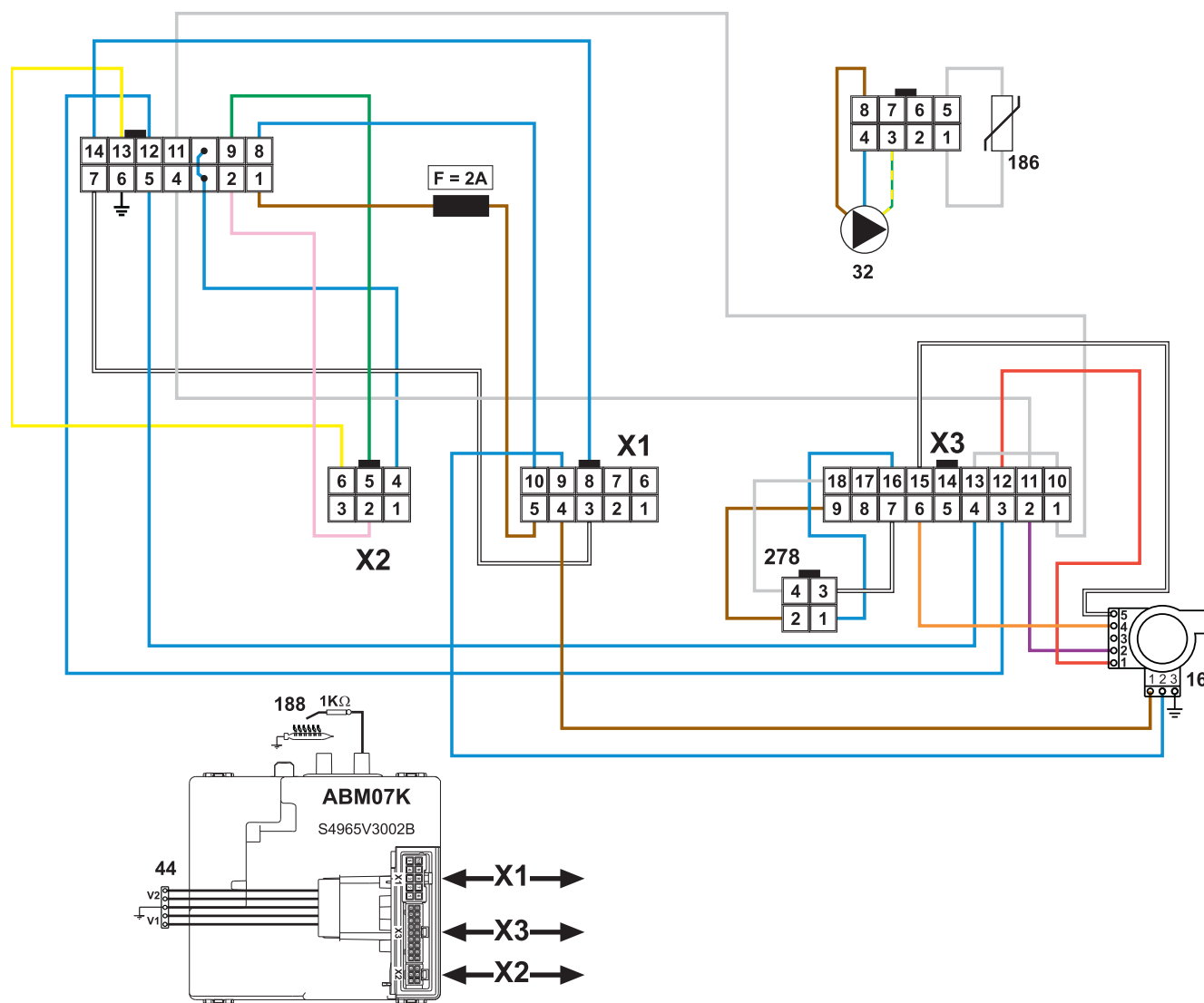


fig. 129- Intermediate module wiring diagram

Legend of figures fig. 129

- 16 Fan
- 32 Heating circulating pump
- 44 Gas valve
- 186 Return sensor
- 188 Ignition/Ionization electrode
- 278 Double sensor (Safety + Heating)

Last module wiring diagram

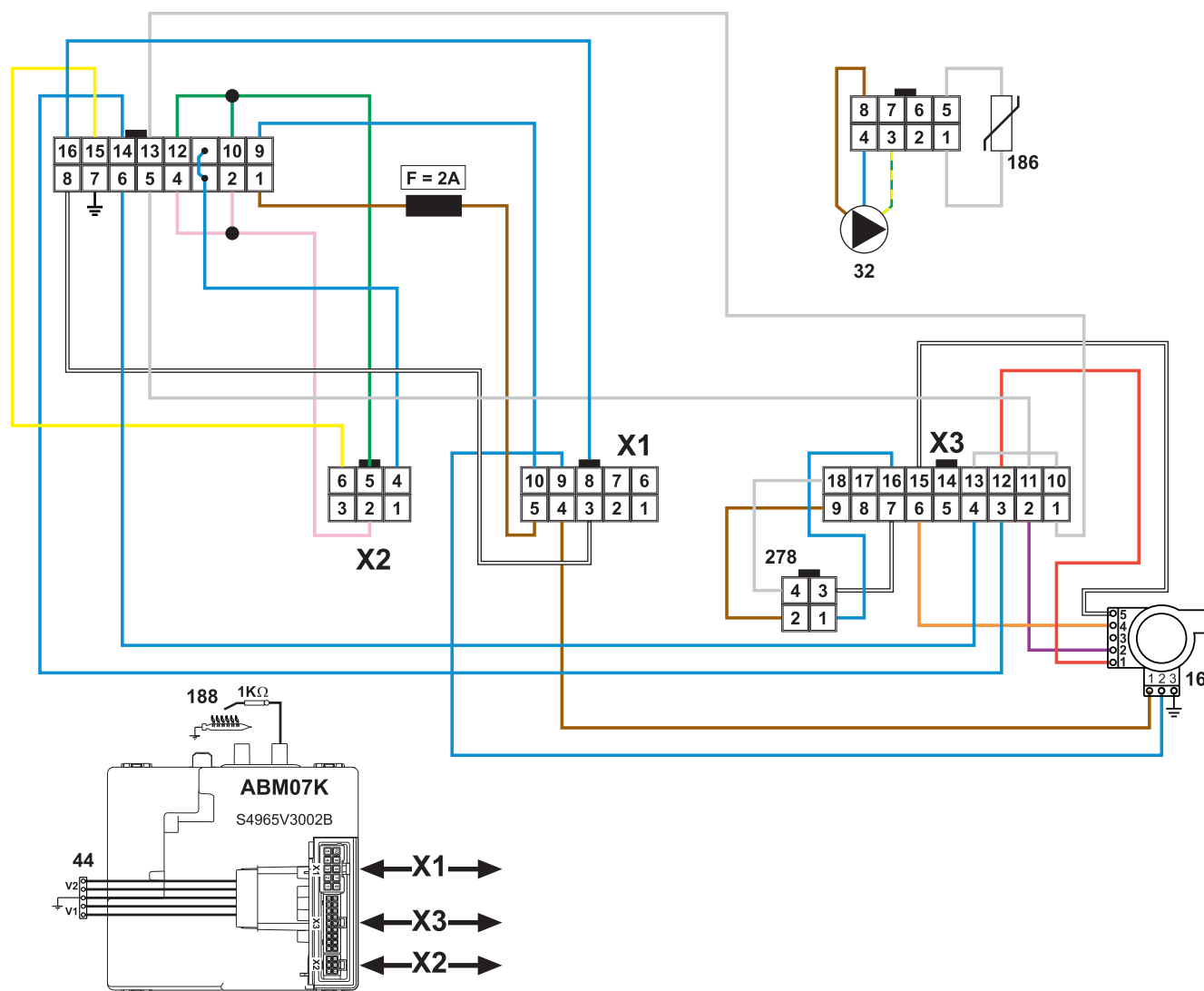
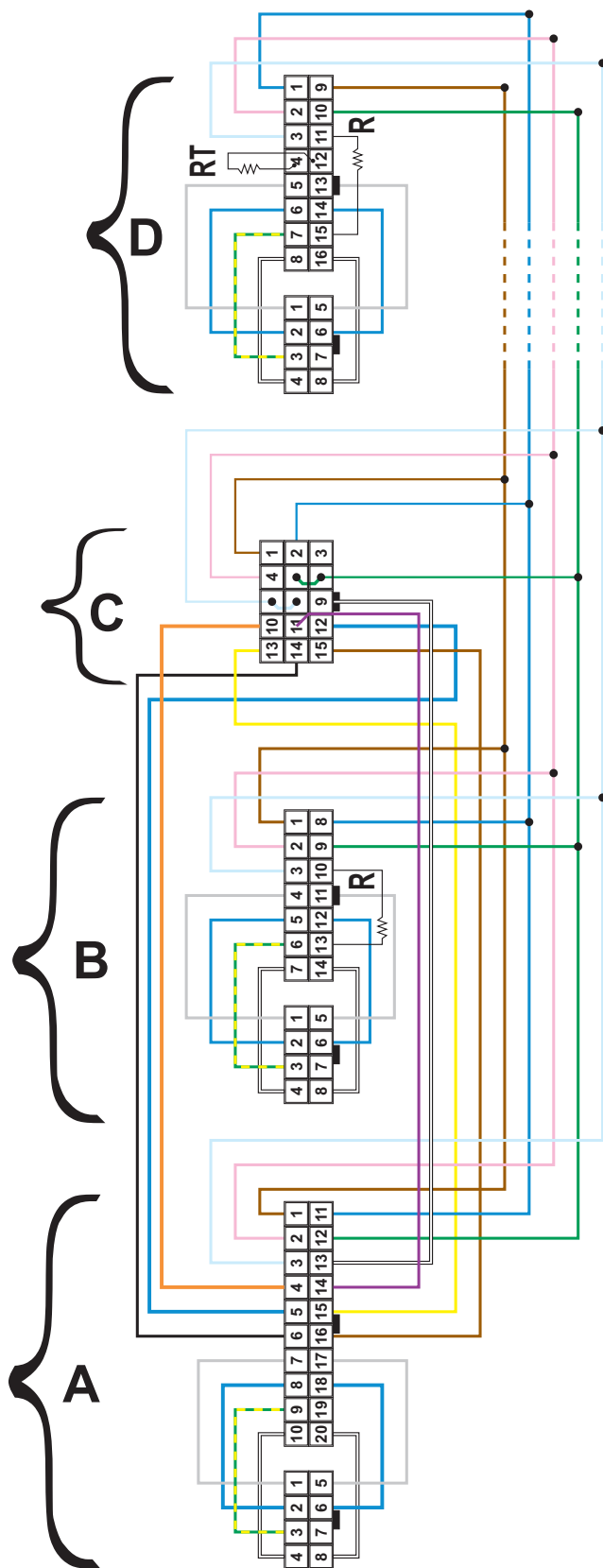


fig. 130- Last module wiring diagram

Legend of figures fig. 130

- 16** Fan
- 32** Heating circulating pump
- 44** Gas valve
- 186** Return sensor
- 188** Ignition/Ionization electrode
- 278** Double sensor (Safety + Heating)

Module connection cables wiring diagram



Legend

- A - First module
- B - Intermediate module
- C - Display
- D - Last module
- R - (Module 2) 1k3 Ohm 1/4W
- R - (Module 3) 2k2 Ohm 1/4W
- R - (Module 4) 3k3 Ohm 1/4W
- R - (Module 5) 4k3 Ohm 1/4W
- R - (Module 6) 5k6 Ohm 1/4W
- R - (Module 7) 7k5 Ohm 1/4W
- R - (Module 8) 9k1 Ohm 1/4W
- RT - 120 Ohm 1/4W

fig. 131- Module connection cable wiring diagram

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