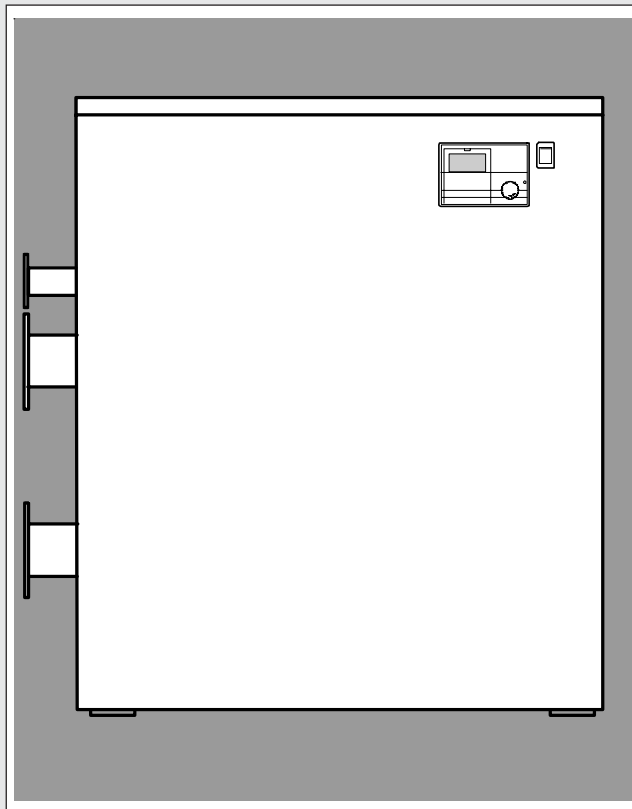


Unical[®]

SuperModulex

*440 - 550 - 660 -
770 - 900*

**MODULAR CONDENSING
BOILER**



**INSTALLATION
AND SERVICING
INSTRUCTIONS**

Warning: this manual contains instructions to be used exclusively by the installer and/or a competent person in accordance with the current laws in force.

The end user MUST not make any alterations to the boiler.

Failure to follow the instructions indicated in this manual, which is supplied with the boiler, could cause injury to persons, animals or damage to property.

UNICAL shall not be held liable for any injury and/or damage.

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1

GENERAL INFORMATION

1.1 - SYMBOLS USED IN THIS GUIDE

When reading this guide particular care has to be given to the parts marked with the followings symbols:



DANGER!
Indicates serious danger for your personal safety and for your life



WARNING!
Indicates a potentially dangerous situation for the product and the environment



NOTE!
Suggestions for the user

1.2 - CORRECT USE OF THE APPLIANCE



The ALKON appliance has been designed utilizing today's heating technology and in compliance with the current safety regulations. However, following an improper use, dangers could arise for the safety and life of the user or of other people, or damage could be caused to the appliance or other objects. The appliance is designed to be used in pumped hot water central heating systems. Any other use of this appliance will be considered improper. UNICAL declines any responsibility for any damages or injuries caused by an improper use; in this case the risk is completely at the user's responsibility. In order to use the appliance according to the scopes it was designed for it is essential to carefully follow the instructions indicated in this guide.

1.3 - INFORMATION TO BE HANDED OVER TO THE USER



The user has to be instructed on the use and operation of his heating system, in particular:

- Hand over these instructions to the end user, together with any other literature regarding this appliance, placed inside the envelope contained in the packaging. **The user has to keep these documents in a safe place in order to always have them at hand for future reference.**
- Inform the user on the importance of air vents and of the flue outlet system, stressing the fact that is absolutely forbidden to make any alterations to the boiler.
- Inform the user how to check the system's water pressure as well as informing him how to restore the correct pressure.
- Explain the function of time and temperature controls, thermostats, heating controls and radiators, to ensure the greatest possible fuel economy.
- Remind the user that it is obligatory to carry out a comprehensive service annually and a combustion analysis every two years (in compliance with the national law).
- If the appliance is sold or transferred to another owner or if the present user moves home and leaves the appliance installed, ensure yourself that the manual always follows the appliance so that it can be consulted by the new owner and/or installer.

Failure to follow the instructions indicated in this guide, which is supplied with the boiler, could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any such injury and/or damage.

1.4 - SAFETY WARNINGS



WARNING!

The installation, adjustment, and servicing of this appliance must be carried out by a competent person and installed in accordance with the current standards and regulations. Failure to correctly install this appliance could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any injury and/or damage.



DANGER!

Servicing or repairs of the appliance must be carried out by UNICAL authorised service technicians; UNICAL recommends drawing up a service contract. Bad or irregular servicing could compromise the safe operation of the appliance, and could cause injury to persons, animals or damage to property for which UNICAL shall not be held liable.



Modifications to parts connected to the appliance

Do not carry out any modifications to the following parts:

- the boiler
- to the gas, air, water supply pipes and electrical current
- to the flue pipe, safety relief valve and its drainage pipe
- to the constructive components which influence the appliance's safe operation



WARNING!

When tightening or loosening the screw pipe connections, use only adequate fork spanners. The improper use and/or the use of inadequate equipment can cause damages (for example water or gas leakages).



WARNING!

Indications for appliances operating with propane gas

Ensure yourself that before installing the appliance the gas tank has been purged.

For a correct purging of the tank contact the liquid gas supplier or a competent person who has been legally authorized.

If the tank has not been correctly purged problems could occur during ignition.

If this occurs contact the liquid gas tank's supplier.



Smell of gas

If you smell gas follow these safety indications:

- Do not turn on or off electrical switches
- Do no smoke
- Do not use the telephone
- Close the main gas tap
- Open all windows and doors where the gas leakage has occurred
- Inform the gas society or a company specialized in installing and servicing heating systems



Explosive and easily inflammable substances

Do not use or leave explosive or easily inflammable material (as for example: petrol, paint, paper) in the room where the appliance has been installed.



WARNINGS

The boiler has to be installed in such way to avoid, under the foreseen operation conditions, the congelation of the water and to prevent that the control devices are exposed to a temperature lower than -15°C and higher than 40°C.

The boiler has to be protected against environmental variations with:

- ALL WETHER protection and covering KIT foreseen by the manufacturer.
- The insulation of the hydraulic pipelines and the condensate evacuation
- The adoption of specific antifreeze products in the C.H. installation.

General information

1.5 - DATA PLATE

CE Marking

The CE marking documents that the boilers satisfy:

- The essential requirements of the Directive regarding gas appliances (Directive 90/396/CEE)

- The essential requirements of the Directive regarding electromagnetic compatibility (Directive 89/336/CEE)
- The essential requirements of the Efficiency Directive (Directive 92/42/CEE)
- The essential requirements of the low voltage Directive (Directive 73/23/CEE)

Unical CE ①

②

Model ③ CEE 92/42 ★ ④

S.N° ⑤ PIN ⑥

Types ⑦ NOx ⑧

A **Central Heating**

Pn ⑨ kW Pcond ⑩ kW

Qmax ⑪ kW Adjusted Qn ⑫ kW

PMS ⑬ bar T max ⑭ °C

B **Domestic hot water**

Qnw ⑮ kW D ⑯ l/min

R factor ⑰ F factor ⑱

PMW ⑲ bar T max ⑳ °C

C **Electrical Power supply**

⑳ V Hz ㉑ W

IP class: ㉒

D **Countries of destination**

㉔ ㉕ ㉖

E **Factory setting**

㉗ mbar

mbar

mbar

mbar

mbar

mbar

mbar

mbar

㉘

㉙

LEGEND:

- | | |
|--|--|
| 1 = Year of CE certification issue | 17 = (R factor) N° taps based on the quantity of water declared EN 13203-1 |
| 2 = Boiler type | 18 = (F factor) N°stars based on the quality of water declared EN 13203-1 |
| 3 = Boiler model | 19 = (PMW) Max. pressure D.H.W. system |
| 4 = Number of stars (Directive 92/42/CEE) | 20 = (T max) Max. temperature D.H.W system |
| 5 = (S.N°) Serial number | |
| 6 = P.I.N. code | |
| 7 = Approved fluing configurations | |
| 8 = (NOx) NOx class | |
| A = Central Heating circuit features | C = Electrical features |
| 9 = (Pn) Nominal output | 21 = Electrical power supply |
| 10 = (Pcond) Condensing nominal output | 22 = Consumption |
| 11 = (Qmax) Nominal heat input | 23 = Protection grade |
| 12 = (Adjusted Qn) Adjusted for nominal Heat input | D = Countries of destination |
| 13 = (PMS) Max. pressure C.H. system | 24 = Direct and indirect country of destination |
| 14 = (T max) Max. C.H. temperature | 25 = Gas family |
| | 26 = Supply pressure |

B = Domestic Hot Water circuit features

- 15 = (Qnw) Nominal heat input in D.H.W. mode (if different from Qn)
- 16 = (D) Specific D.H.W. flow rate according to EN 625 - EN 13203-1

E = Factory setting

- 27 = Adjusted for gas type X
- 28 = Space for national brands

1.6 - GENERAL WARNINGS

This instruction manual is an integral and indispensable part of the product and must be retained by the person in charge of the appliance.

Please read carefully the instructions contained in this manual as they provide important indications regarding the safe installation, use and servicing of this appliance.

Keep this manual in a safe place for future reference.

The installation and servicing must be carried out in accordance with the regulations in force according to the manufacturer's instructions and by legally competent authorized persons.

By a competent person, we imply a person who has a specific technical qualification in the field of components for central heating systems for domestic use, domestic hot water production and servicing. The person must have the qualifications foreseen by the current laws in force.

Bad or irregular servicing could compromise the safe operation of the appliance, and could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any such injury and/or damage.

Before carrying out any cleaning or servicing turn off the electrical supply to the boiler by means of the ON/OFF switch and/or by means of the appropriate shutdown devices.

Do not obstruct the intake/outlet terminal ducts.

In the event of failure and/or faulty functioning of the appliance, switch off the boiler. Do not attempt to make any repairs: contact qualified technicians.

Any repairs must be carried out by Unical authorized technicians and using only original spare parts. Non-observance of the above requirement may jeopardize the safety of the appliance.

To guarantee the efficiency and correct functioning of the appliance it is indispensable to have the boiler serviced annually by a qualified person.

If the boiler remains unused for long periods, ensure that any dangerous parts are rendered innocuous.

If the appliance is sold or transferred to another owner or if the present user moves home and leaves the appliance installed, ensure yourself that the manual always follows the appliance so that it can be consulted by the new owner and/or installer.

Only original accessories must be used for all appliances supplied with optionals or kits (including electrical ones). This appliance must be used only for the purposes for which it has been expressly designed. Any other use shall be considered incorrect and therefore dangerous.

2

TECHNICAL FEATURES AND DIMENSIONS

2.1 - TECHNICAL FEATURES

- MODULEX is a compact, gas fired, Low NO_x, condensing boiler, made up by one sectional boiler body, This boiler body consists of two or more modules (from 4 to 8), which cannot be separated from each other, being under the same protecting casing, and are set to operate separately or in cascade. These modules are connected to a single smoke exhaust manifold and are controlled by a single microprocessor, which manages completely the temperatures from the point of view, both operational and safety.
- Efficiency at full load with temperature 30/50°C = 103%. At part load (30% of the nominal) with 30°C return temperature = 108,3%.
- Efficiency Class: ☆☆☆☆☆
- Each module, is composed of a combustion chamber, metallic fiber pre-mix burner, modulating fan, gas valve, ignition electrode, flame detection, NTC sensor for management control (BMM), local temperature control and safety thermostat.
- Each single boiler is equipped with NTC sensors for global temperature control on the flow and return manifolds.
- Integral, non allergic, synthetic wool insulation.
- Fully pre-mixed, radiating, modulating, metallic sponge burner, Automatic no return diaphragm for separation from combustion chamber.
- Nominal input, per module: max. 108 kW, min. 22 kW.
- Noise level at maximum output: lower than 49 dBA.
- Modules configuration possibilities:
- Possible cascade installation of 2 or more Supermodulex
- Heating Operation: setting of instantaneous output by a main microprocessor, with a comparison parameters pre-setting between the requested temperature (or calculated by the outer compensator) and the global flow temperature.

- Logic of operation:
 - A) Output sharing on as many modules as possible at min. load (down to 22 kW) for the max. efficiency..
 - B) Automatic operation hour splitting-up system for each module to guarantee the best homogeneous use.
 - C) D.H.W. production, via a storage tank loading pump or a three way diverting valve, controlled by a priority sensor through the E 8 heating controller.
 - D) Output check of each module for any calibration and/or assistance by secret access code.
- Possibility of controlling the output of each single module.
- Heating request control: temperature set point and modulation level.
- Monitoring of boiler and temperature status.
- Alarm control.
- Parameters setting.
- Relay for control of the operation of a pump at constant flow rate.
- 0÷10V analogical output for control of a modulating pump.
- Emergency operation: it avoids C.H. system shut down caused by an interruption in communication with the boiler plant's automation system: : (in case of remote control of the complete boiler house):
- Input for "Constant setpoint": 55°C, maximum output 50%.
- Alarm reset input.
- Alarm relay signal.
- Gas connecting pipes, flow/return water pipes, arranged for any connection (by the opposite end).
- Integral easily removable panel set (painted steel panels).
- Smoke exhaust pipe, adjustable on the right, the left and behind the heating system.
- Condensate collecting tank equipped with drain siphon and stainless steel smoke chamber.
- Built-in air vent.
- Weights and dimensions are limited (see table at par. 1.2)

SENSORS supplied with the boiler:

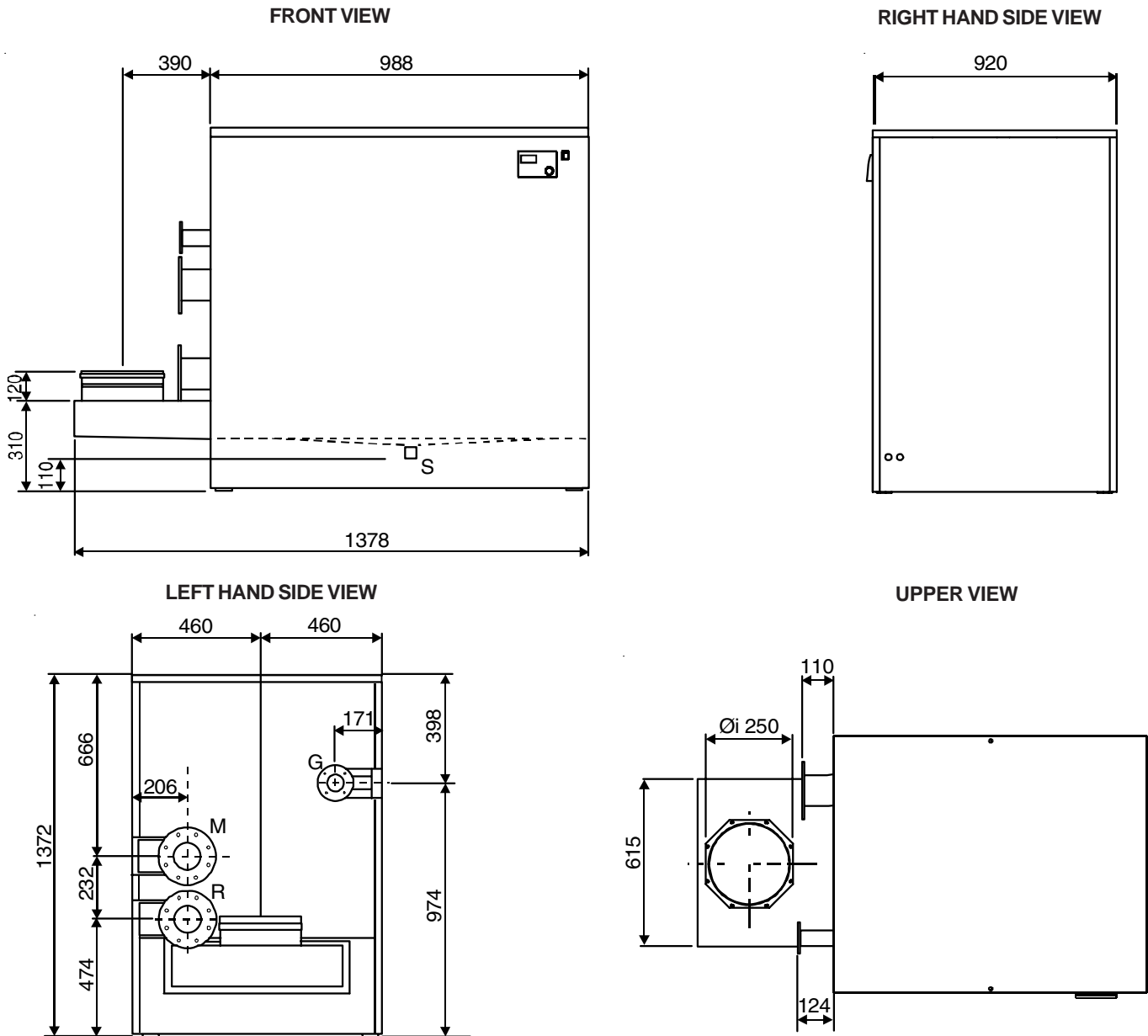
- outdoor temperature sensor
- flow temperature sensor for mixed zone
- boiler temperature sensor code N. 00262210
- D.H.W. storage temperature sensor, code N. 00262211

Optional accessories

- **Acid condensate inhibitor**
- **Primary circuits: hydraulic system interface with additional safety devices and modulating pump.**
- **Mixing header**
- **"all weather": stainless steel protection for outdoor installation.**

Thermal element No.	Model	Input range kW	Modulation ratio
4	440	22 a 432 kW	1:19,6 (100 a 5 %)
5	550	22 a 540 kW	1:25 (100 a 4 %)
6	660	22 a 648 kW	1:29 (100 a 3,3%)
7	770	22 a 756 kW	1:34 (100 a 2,9%)
8	900	22 a 864 kW	1:39 (100 a 2,5%)

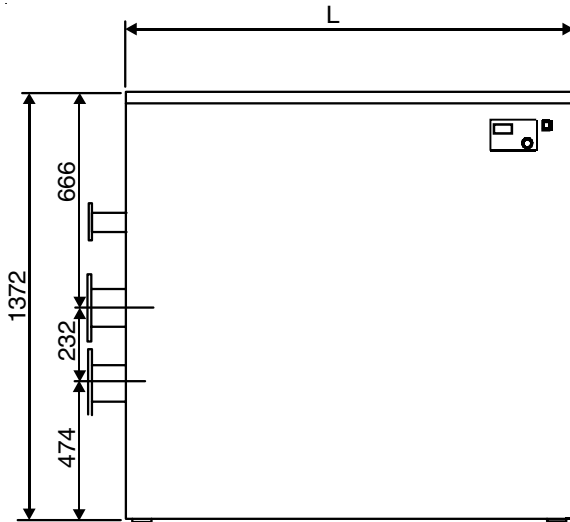
2.2 - DIMENSIONS



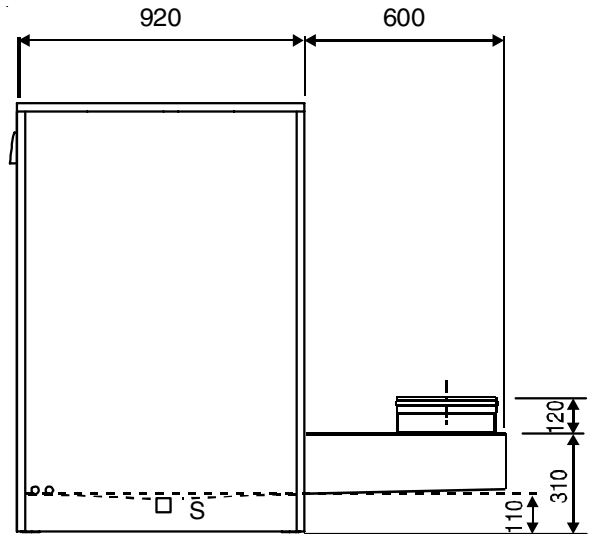
	SuperModulex	440
Dimension		
No. of Modules		4
Height	mm	1372
Width	mm	1378
Depth	mm	920
Connections		
Gas	mm (inch)	50 (2)
C.H. system Flow M	mm (inch)	80 (3)
C.H. system Return R	mm (inch)	80 (3)
Chimney connection "D"	mm	250
Chimney width "H"	mm	615
Condensate drain diameter	mm	40

Technical features and dimensions

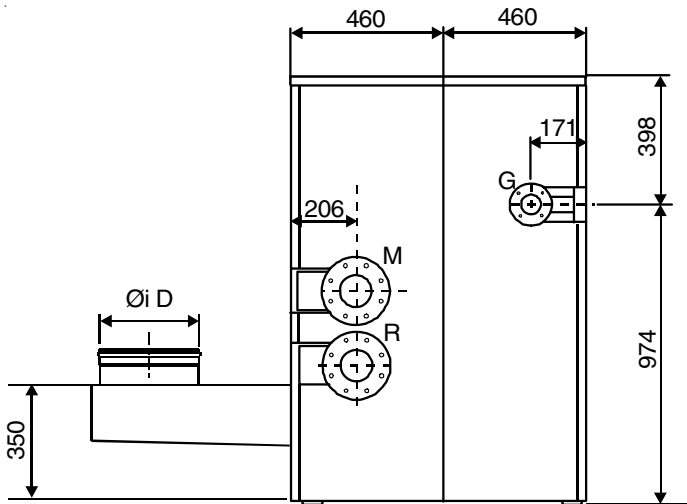
FRONT VIEW



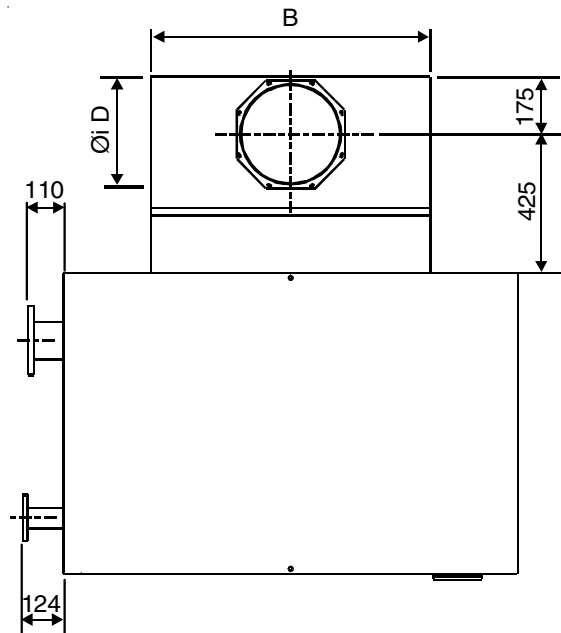
RIGHT HAND SIDE VIEW



LEFT HAND SIDE VIEW



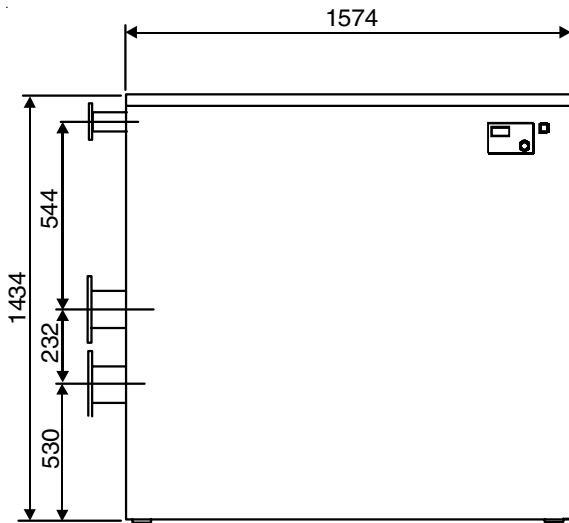
UPPER VIEW



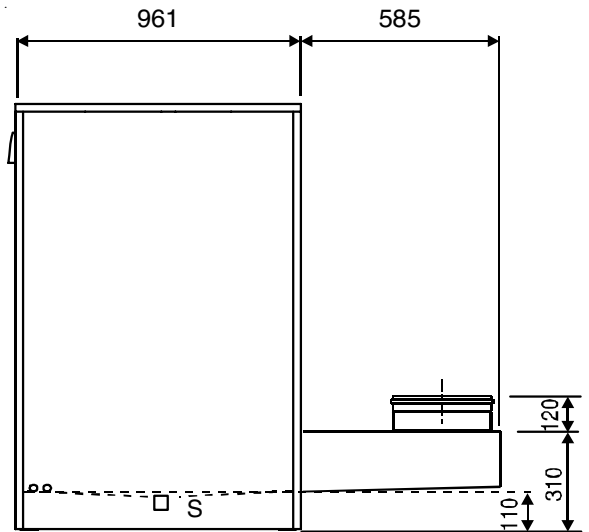
	SuperModulex	550	660	770
Dimension				
No. of Modules		5	6	7
Height	mm	1372	1372	1372
Width "L"	mm	1122	1256	1390
Depth	mm	1520	1520	1520
Connections				
Gas	mm (inch)	50 (2)	50 (2)	50 (2)
C.H. system Flow M	mm (inch)	80 (3)	100 (4)	100 (4)
C.H. system Return R	mm (inch)	80 (3)	100 (4)	100 (4)
Chimney connection "D"	mm	250	300	300
Chimney width "B"	mm	615	721	855
Condensate drain diameter	mm	40	40	40

Technical features and dimensions

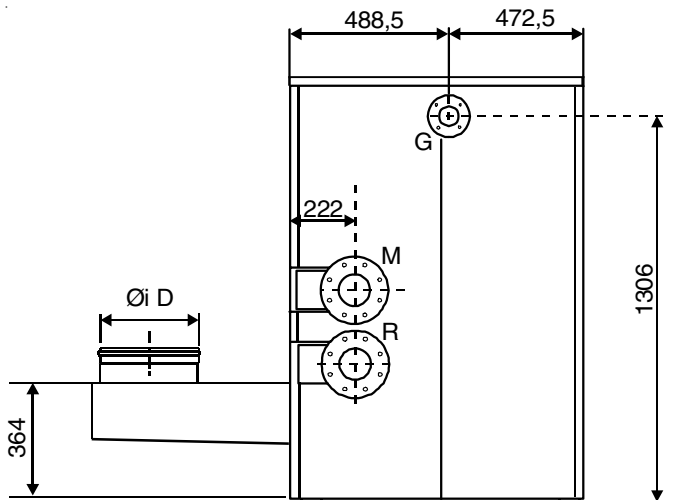
FRONT VIEW



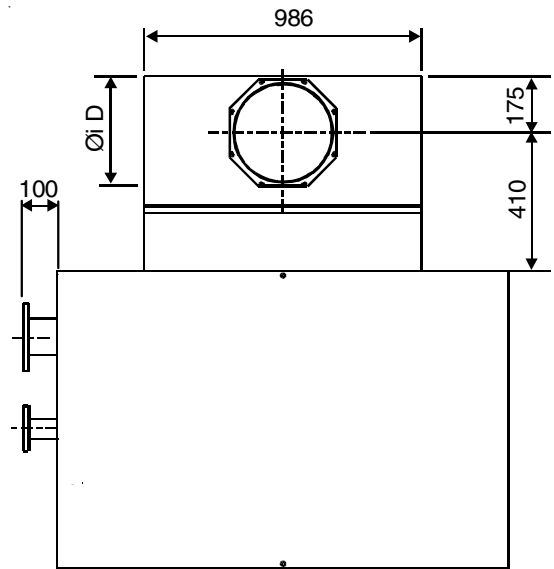
RIGHT HAND SIDE VIEW



LEFT HAND SIDE VIEW



UPPER VIEW



	SuperModulex	900
Dimension		
No. of Modules		8
Height	mm	1434
Width	mm	1674
Depth	mm	1546
Connections		
Gas	mm (inch)	80 (3)
C.H. system Flow M	mm (inch)	100 (4)
C.H. system Return R	mm (inch)	100 (4)
Chimney connection "D"	mm	300
Chimney width	mm	986
Condensate drain	mm	40

Technical features and dimensions

2.3 - PERFORMANCE DATA

BOILER TYPE	SUPERMODULEX	440	550	660	770	900
Appliance category	II _{2H3P}					
Nominal Heat Input on P.C.I. Q_n	kW	432	540	648	756	864
Minimum Heat Input on P.C.I. Q_{min}	kW	22	22	22	22	22
Nominal Output (Tr 60 / Tm 80 °C) P_n	kW	424,27	530,33	636,40	742,47	848,53
Minimum Output (Tr 60 / Tm 80 °C) $P_{n min}$	kW	20,33	20,33	20,33	20,33	20,33
Nominal Output (Tr 30 / Tm 50 °C) P_{cond}	kW	442,37	554,04	667,44	780,95	894,24
Minimum Output (Tr 30 / Tm 50 °C) $P_{cond min}$	kW	23,94	23,94	23,94	23,94	23,94
Efficiency at max. output (Tr 60 / Tm 80°C)	%	98,21	98,21	98,21	98,21	98,21
Efficiency at min. output (Tr 60 / Tm 80°C)	%	92,4	92,4	92,4	92,4	92,4
Efficiency at max. output (Tr 30 / Tm 50°C)	%	102,4	102,6	103,0	103,3	103,5
Efficiency at min. output (Tr 30 / Tm 50°C)	%	108,8	108,8	108,8	108,8	108,8
Efficiency Class acc. to Directive 92/42 CEE		4	4	4	4	4
Combustion efficiency at nominal load	%	97,42	97,47	97,49	97,42	97,42
Combustion efficiency at part load	%	98,43	98,43	98,43	98,43	98,43
Stand-by losses with burner in operation	%	0,2	0,2	0,2	0,2	0,2
Flue losses with burner with burner off	%	0,1	0,1	0,1	0,1	0,1
Flue losses with burner with burner in operation	%	2,58	2,53	2,51	2,58	2,58
Flue gas temperature t_f-t_a (max)	°C	52	51	50,6	52	52
Flue gas mass flow rate (max)	kg/h	699	874	1049	1224	1399
Excess of air λ	%	24,25	24,25	24,25	24,25	24,25
(**) CO ₂ at min/max. output	%	-	-	-	-	-
NO _x (value according EN 297/A3 + EN 483)	mg/kWh	47	47	47	47	47
NO _x class		5	5	5	5	5
Min. water flow rate in CH circuit (ΔT 20°C)	l/h	18243	22804	27365	31926	36487
Minimum pressure in CH circuit	bar	0,5	0,5	0,5	0,5	0,5
Maximum pressure in CH circuit	bar	7	7	7	7	7
DHW specific flow rate	l	73	88	103	118	133
Gas Consumption Natural gas G 20 (20 mbar) Q_n	m ³ /h	45,68	57,10	68,52	79,94	91,36
Gas Consumption Natural gas G 20 (20 mbar) Q_{min}	m ³ /h	2,33	2,33	2,33	2,33	2,33
Gas Consumption G25 (supply pressure 25 mbar) Q_n	m ³ /h	53,13	66,41	79,69	92,97	106,25
Gas Consumption G25 (supply pressure 25 mbar) Q_{min}	m ³ /h	2,71	2,71	2,71	2,71	2,71
Gas Consumption G31 (supply pressure 37/50 mbar) Q_n	kg/h	33,53	41,92	50,30	58,68	67,07
Gas Consumption G31 (supply pressure 37/50 mbar) Q_{min}	kg/h	1,71	1,71	1,71	1,71	1,71
Max. available pressure at the chimney base	Pa	100	100	100	100	100
Condensate production max	kg/h	73,4	91,7	110	128,4	146,7
Emissions						
CO with 0% of O ₂ in the flue system	ppm	<95	<95	<95	<95	<95
NO _x with 0% of O ₂ in the flue system	ppm	<30	<30	<30	<30	<30
Sound level	dBA	<49	<49	<49	<49	<49
Electrical Data						
Voltage / Frequency	V/Hz	230/50	230/50	230/50	230/50	230/50
Fuse on main supply	A (F)	4	4	4	4	4
Max power absorbed		612	765	918	1071	1224
Insulation degree	IP	40	40	40	40	40
Standby Consumption	W	10	10	10	10	10

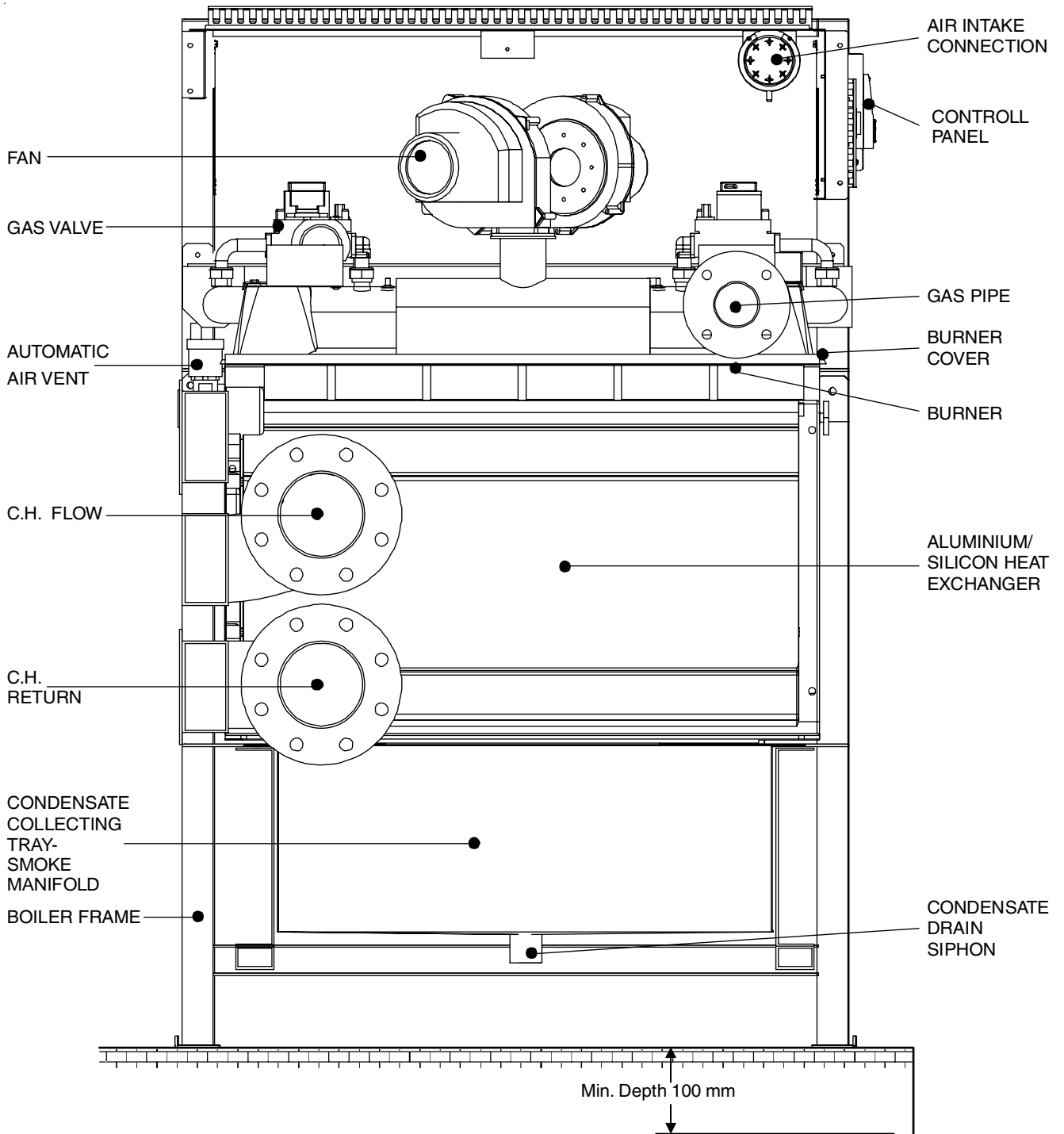
(*) Room Temperature = 20°C

(**) See paragraph "INJECTORS – PRESSURES"



The Technical data plate is placed under the casing over the forehead stirrup.

2.4 - R.H. SIDE VIEW, WITH MAIN COMPONENTS



Smoke outlet on the L.H. side (per modulex 348 e 440) - on the BACK side (per modulex 550 - 660 - 770 - 900)
C.H. flow connection on the L.H. side
C.H. return connection on the L.H. side
Gas connection on the L.H. side
BCM: under the frontal panel

3

INSTRUCTIONS FOR THE INSTALLER

3.1 - GENERAL WARNINGS



WARNING!

This boiler has to be destined for the use for which it has been expressly designed for. Any other use shall be considered improper and therefore dangerous.

This boiler is designed to heat water at a temperature inferior to boiling point at an atmospheric pressure.



WARNING!

These appliances are exclusively designed to be installed inside adequate boiler rooms. Therefore these appliances must not be installed and operated externally.



Before installing the boiler the following points have to be carried out by a competent engineer:

- a) The whole system should be thoroughly flushed in order to remove any residual dirt or grime which could compromise the correct boiler operation.

- b) Check that the boiler has been preset for operating with the gas type available.

This is verifiable via the indication on the packaging and on the data badge;

- c) Check that the chimney/flue pipe has an adequate draught, does not have any constrictions, and that no other appliance's flue outlets have been fitted, unless the chimney is serving more than one heating appliance, according to the specific standards and regulations in force.

The connection between the boiler and chimney/flue outlet can be made only after this

verification has been carried out.



WARNING!

In rooms where there is the presence of aggressive vapours or dust the appliance must operate independently from the air present in the boiler's location room!



WARNING!

The appliance must be installed by a qualified engineer, who complies to the technical-professional requirements according to the national applicable law and who, under his own responsibility, guarantees the compliance with the standards according to the latest regulations.



WARNING!

Install the appliance respecting the minimum clearances for operation and servicing.



The boiler must be connected to a heating system which is compatible to its performances and output.

3.2 - STANDARD CODES FOR INSTALLATION

The appliance must be installed in compliance to the instructions contained in this manual.

The installation must be carried out by a competent qualified engineer, whom will assume the responsibility of complying to all the local and/or national regulations published in the official publications, as well as all the applicable codes of practice.

Before installing the appliance please contact the gas supply company.

The installation must be carried in accordance to the codes of practice, the regulations and the requirements hereby indicated which constitute an indicative list, but not a complete one, as these continue to undergo evolve devolpments.

Moreover, the boiler must be installed in accordance to all the regulations regarding the boiler room, the building regulations and the prescriptions regarding central heating plants in force in the country where the boiler is installed.

The appliance must be installed, commissioned and serviced according to the regulations in force. This is also valid for the hydraulic system, the flue outlet system and the boiler location room.

Instructions for the installer

3.3 - PACKING



The boiler MODULEX is delivered assembled and protected by a plastic bag inside a strong cardboard box and fixed on pallet. This allows the boiler to be handled also by forklift. The boiler, with the packaging, can go through a door of 800 mm, whereas, without packaging, it can go through a door of 700 mm.



Remove both straps and finally the cardboard box from above, making sure the product is intact. The packing elements (cardboard box, straps, plastic bags, etc...) **shall not be left to children's hand since they may be dangerous.**

For the removal of the boiler from the pallet it is necessary to have a jib crane, to avoid to damage, during the removal, the pressure switches, the valves gas or the electric wirings.

- Remove the casings and make the sling with the belts " Á " fig. 3, having care to pass the belts inside the flow, return and gas manifolds.
- Tie the belts to the arm " B "; during these operations act with caution.

On the L.H. side of the boiler, for Modulex 440, and on the R.H. side of the boiler for Modulex 550 - 660 - 770 - 900 there is the terminal of the smoke chamber, inside which there are:

- A plastic bag containing:
 - The gaskets (gasket between smoke chamber and its terminal, gasket for the base of flue socket, gasket Ø 250 or 300, according to the models, to be put inside the flue socket)
 - The curves + a Te piece + a plastic plug, for the condensate evacuation system
 - The fixing screws
- The sensors (3x).
- The flanges
- The flue socket

Inside the casing, on the L.H. side:

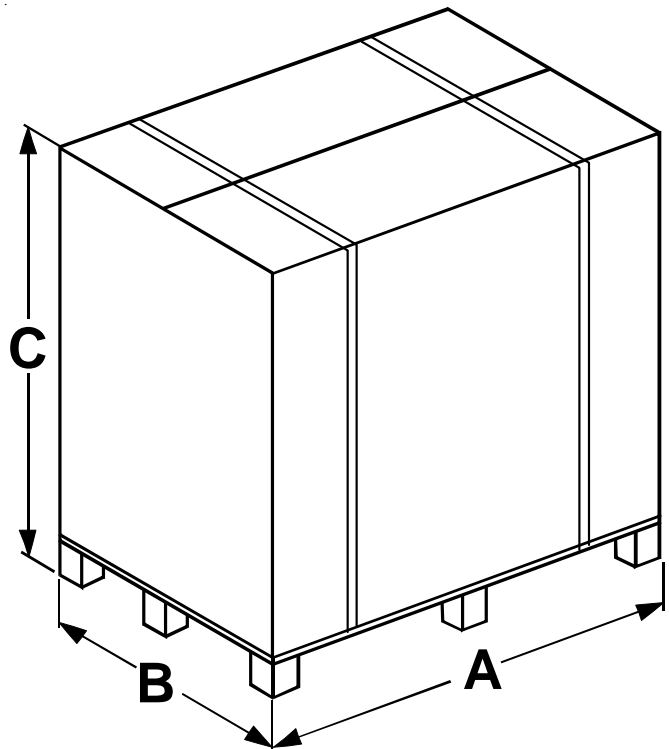
- Two pipes for the condensate evacuation system of 1 m each.

Inside the condensate tray:

- One aluminium painted steel plate for closing the space below the flue terminal, only for models 550 - 660 - 770 - 900
- Kit of supports for the flue terminal.

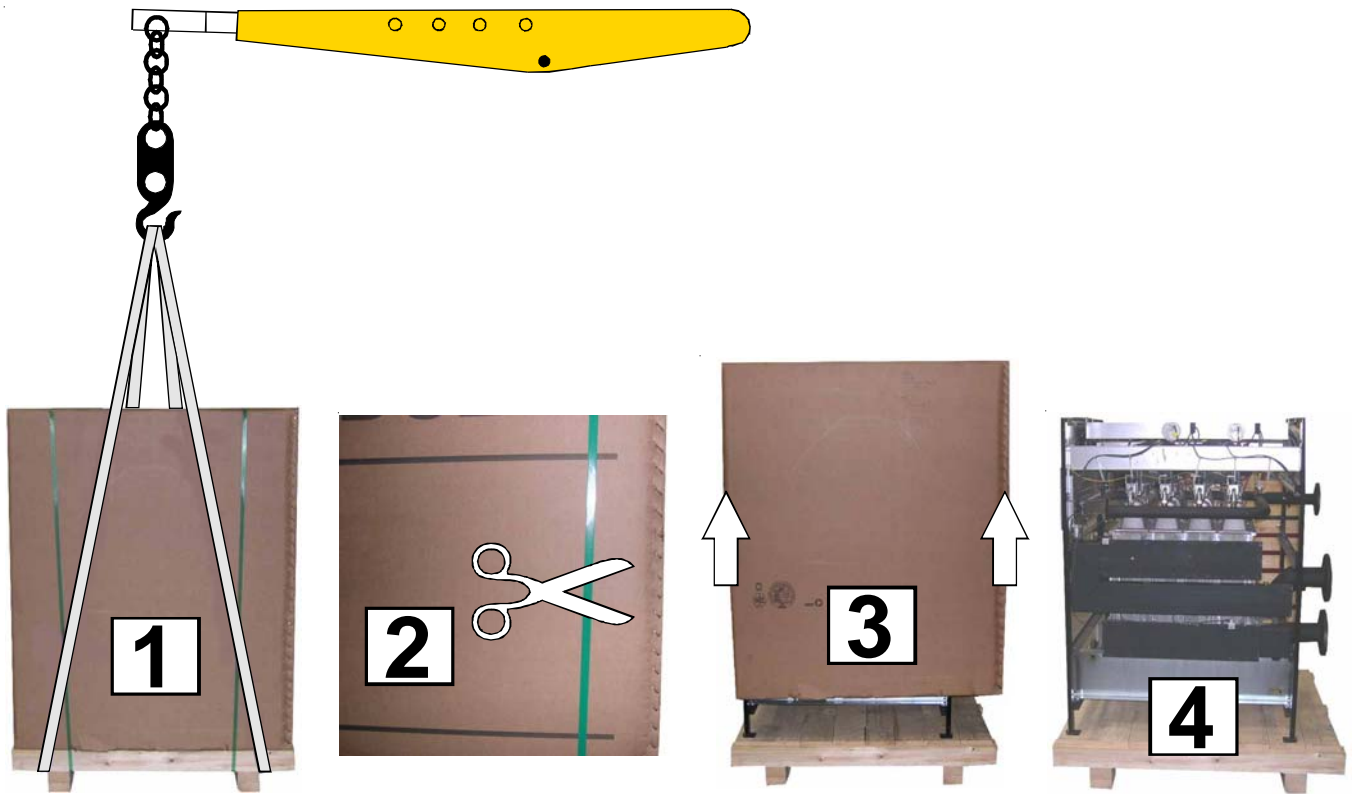
Above the top cover of the boiler:

- A plastic bag containing:
 - This instructions manual for the installer
 - Instructions manual for the user
 - Instruction manual for the use of the E8 controller
 - Certificate of guarantee
 - A label for spare parts order

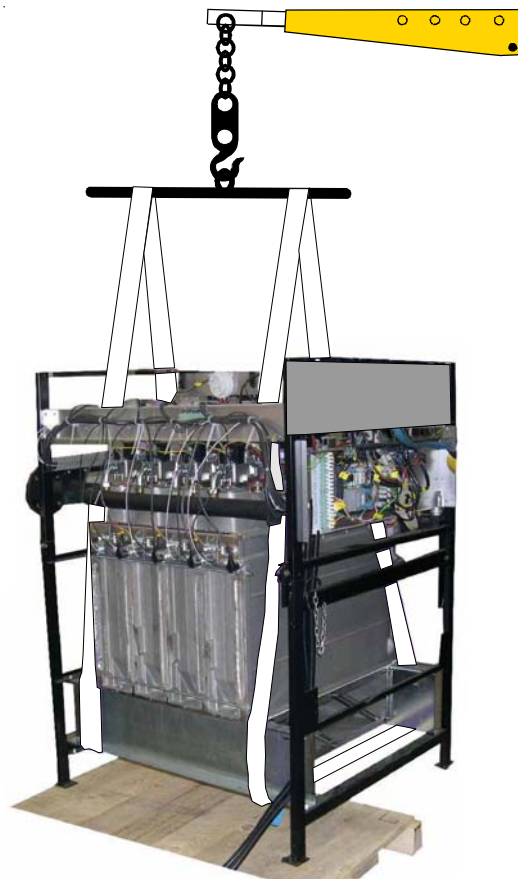
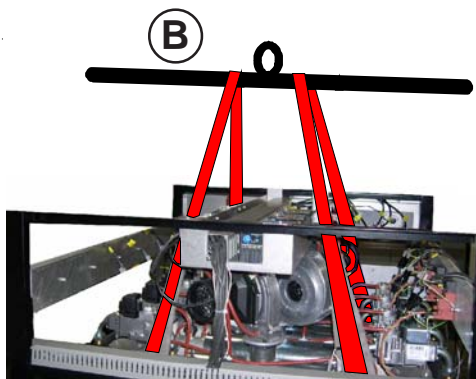
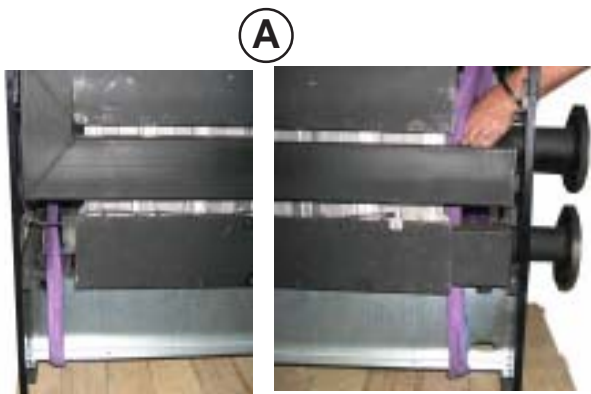


Model	A	B	C	Gross Weight
440	1200	1020	1650	512 kg
550	1550	1020	1650	608 kg
660	1700	1020	1650	692 kg
770	1840	1020	1650	770 kg
900	2000	1100	1480	925 kg

BOILER UNLOADING AND PACKAGE REMOVAL



PALLET REMOVAL



Instructions for the installer

3.4 - BOILER LOCATION INSIDE A BOILER HOUSE

Special attention shall be paid to local regulations and laws about boiler houses and particularly to the obligation of keeping minimum clearances and empty space around the boiler. The installation shall be in compliance with all latest regulations and laws about boiler houses, installations of heating and hot-water systems, ventilation, chimneys capable of evacuating the flue gases of condensing boilers and any other applicable requirement.

When selecting the position for the installation of the boiler it has to be considered that, for the cleaning and washing operations of the boiler body, one of the boiler sides must be accessible for the removal of a special baffle placed under the aluminum sections.

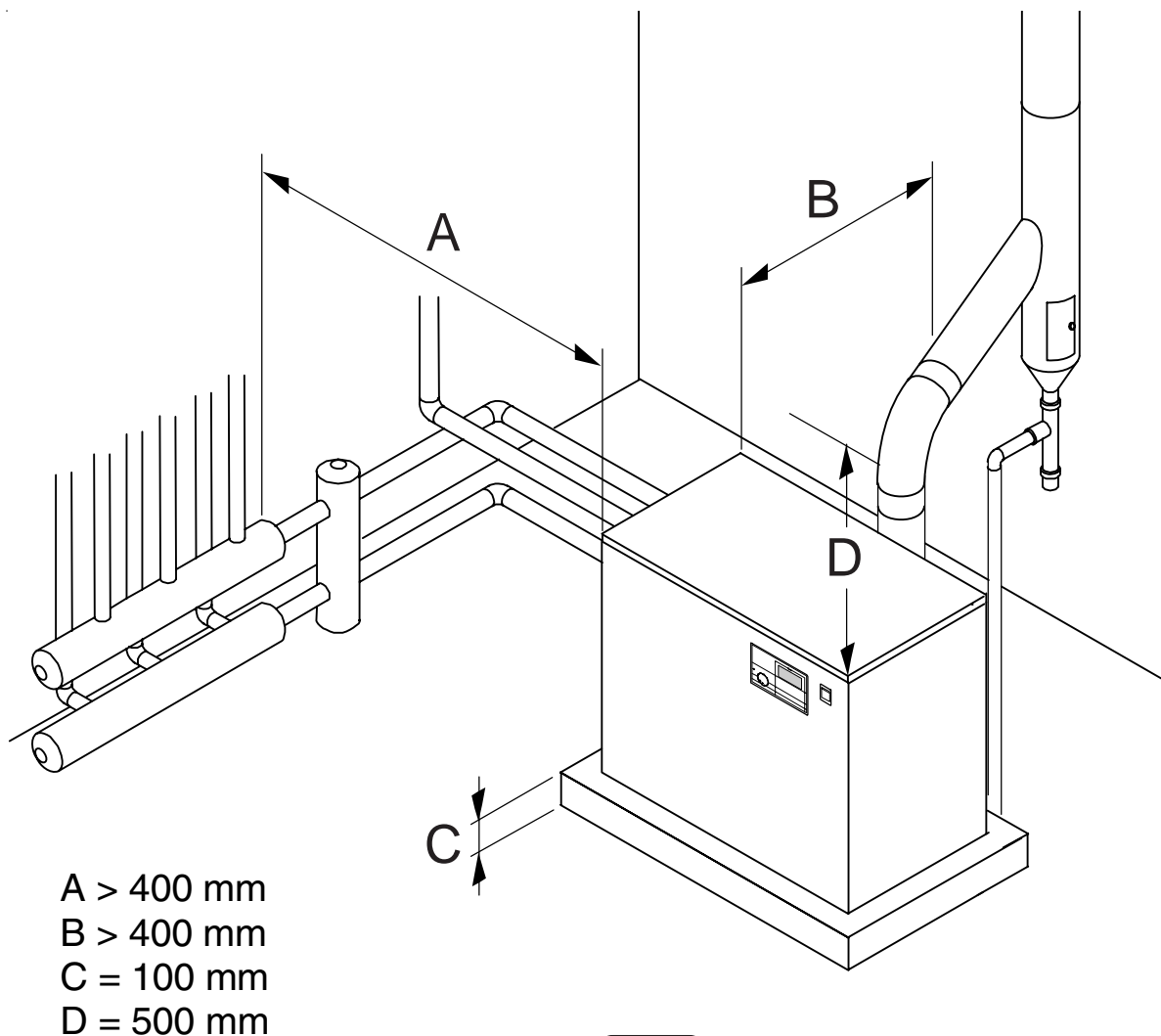
This baffle can be fixed, indifferently, from the R.H or L.H. side of the condensate tray. If no modification has been made, the boiler must have its R.H. side accessible, with the chimney connection fitted on the R.H or L.H. side. But, if the

smoke chamber terminal, with the flue socket, is left to the R.H. side and if, from this same side, the baffle has to be removed, then the flue socket must have the possibility to be also removed.

If it is preferred, the baffle can be moved in order to have its fixation screw on the opposite side, regardless the position of the smoke chamber terminal.

The boiler can be put on a flat and sufficiently strong base with the same dimensions as the boiler ones and at least 100mm high (see fig. 2), in order to assemble the condensate drain siphon. An alternative to this base may be a 100mm deep well next to the boiler as siphon housing (see fig. 2). After installation the boiler shall be

perfectly horizontal and stable, to reduce any possible vibrations or noises.



Give the boiler the minimum clearances as shown in the drawing, in order to be able to make the normal service and cleaning operations.

3.5 - INSTALLATION ON EXISTING HEATING SYSTEMS

When the appliance is installed on existing systems, ensure yourself that:

- The flue outlet pipe is suitable for condensing boilers, for the temperature of the products of combustion, calculated and manufactured according to the regulations in force. It must be installed as much as possible in a straight line, tested for soundness, insulated and must not have any occlusions or restrictions.
- The flue outlet pipe has a connection for the discharge of condensate.
- The boiler room has a suitable outlet for the discharge of condensate produce by the boiler.
- The electrical system has been fitted in compliance to the specific norms and the work has been carried out by a competent person.
- The circulation pump's output, the head and flow direction are suitable.
- The gas feeding supply pipe and the eventual tank are constructed according to the regulations in force.
- The expansion vessels assure the total absorption of the dilatation of the fluid contained in the system.
- The system has been cleaned of impurities and lime scale.

When a Modulex boiler is installed onto an existing heating system:



In case the replacement of an existing boiler in an old system can be programmed, it is necessary to thoroughly clean out the system with a basic solution. The system must be cleaned 4 weeks before the substitution, with the system firing at a temperature of 35°C to 40°C.

WARNING!

If it is noticed that a new Modulex has replaced, in an old system the existing boiler without having first performed what said in the previous paragraph, Do not wash now the system, as residual products, present in the circuit, could lead to system gathering in the boiler body, causing damage. UNICAL recommends contacting a specialised company for water treatment.

Instead, if installing a Modulex boiler in a new system, it is still recommended to thoroughly clean out the system with an adequate product and fit a Y filter with two isolating valves on the boiler's return pipe, so that, when necessary, it can be cleaned. This filter will protect the boiler from the dirt coming from the heating system.

When sizing pumps, it is necessary to take into consideration the pressure losses which occur in the primary circuit.

3.6 - BOILER CONNECTION

The boiler Modulex leaves the factory predisposed for the hydraulic and gas connection on the back side of the boiler. **The smoke outlet is placed on the back side of the boiler for MODULEX 440; it's placed on the R.H. side of the boiler for MODULEX 550 - 660 - 770 - 900.**

For the smoke chamber fixing, use the screws and gaskets included into the instruction bag, and a cross screwdriver at least 300 mm of length.

Instructions for the installer

3.7 - GAS CONNECTION

The gas supply pipe must be connected to the boiler via the respective pipe connection R 2" - 3" as indicated on page 8-9-11.

The gas supply pipe must have a section which is identical or greater than the one used on the boiler and must assure a correct gas pressure.

It is however important to comply with the specific norms and requirements in force, foreseeing on-off valves, gas filter, anti-vibrating joint etc.

Before commissioning an internal gas distribution system and therefore before connecting it to the gas meter, the complete installation must be tested for gas soundness.

If any part of the system is concealed from view the gas soundness test must be carried out before covering the pipes.



DANGER!

The gas connection must be carried out by a registered engineer who will have to respect and comply to the regulations in force and to the requirements indicated by the local gas supplier. An incorrect installation could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any injury and/or damage.



Before installing the boiler it is recommended to thoroughly clean all the supply piping in order to remove any eventual residual grime which could compromise the boiler's correct functioning.



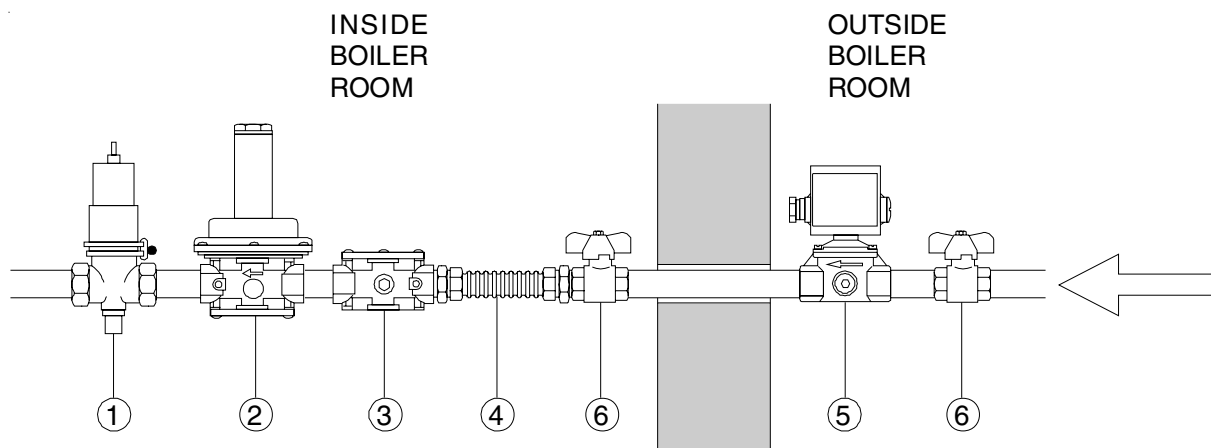
If you smell gas:

- Do not turn on or off electrical switches, use the telephone or any other object which can provoke sparks;
- Open all doors and windows in order to allow fresh air to enter and purify the room;
- Close all gas cocks
- Contact a service engineer, qualified installer or the gas supply company.



As a safety measure against gas leaks, Unical recommends installing a surveillance and protective system made up of a gas leakage detector combined with an on-off selenoid valve on the gas supply line.

EXAMPLE OF A GAS SUPPLY SYSTEM



1. On-off gas supply valve
2. Double membrane regulator
3. Gas filter
4. Anti-vibrating joint
5. Selenoid valve
6. On-off cock

3.8 - FLOW AND RETURN PIPE CONNECTIONS

The CH flow and return circuits have to be connected to the boiler via the respective connections 3"- 4" M and R as indicated on page 9-11.

When determining the size of the CH circuit pipes it is essential to bear in mind the pressure losses induced by any of the system's components and by the configuration of the same system.

The route of the piping has to be conceived taking all the necessary precautions in order to avoid air locks and to facilitate the continuous purging of the system.



WARNING!

Before installing the boiler we recommend that the system is flushed out with a suitable product in compliance to the norm UNI-CTI 8065, in order to eliminate any metallic tooling or welding residues, oil and grime which could reach the boiler and affect the proper running of the boiler.

Non-observance of these instructions could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any such injury and/or damage.



Ensure yourself that the system's piping is not used as the earth clamps for the electrical or telephonic system. They are absolutely unsuitable for this use. In a short time this could cause serious damage to the piping, boiler and radiators.



WARNING!

IT IS ABSOLUTELY FORBIDDEN TO FIT ON-OFF VALVES ON THE GENERATOR TO THE FORE OF THE SAFETY DEVICES

Instructions for the installer

3.9 - DETERMINATION OF PRIMARY BOILER PUMP OR BOILER SYSTEM PUMP

The boiler pump must have a delivery head which can ensure the water flow rate as shown in the diagram "Water pressure losses".

The following table gives an indication of the pump's flow rate in function of the Δt of the primary circuit if the installation has a mixing header.

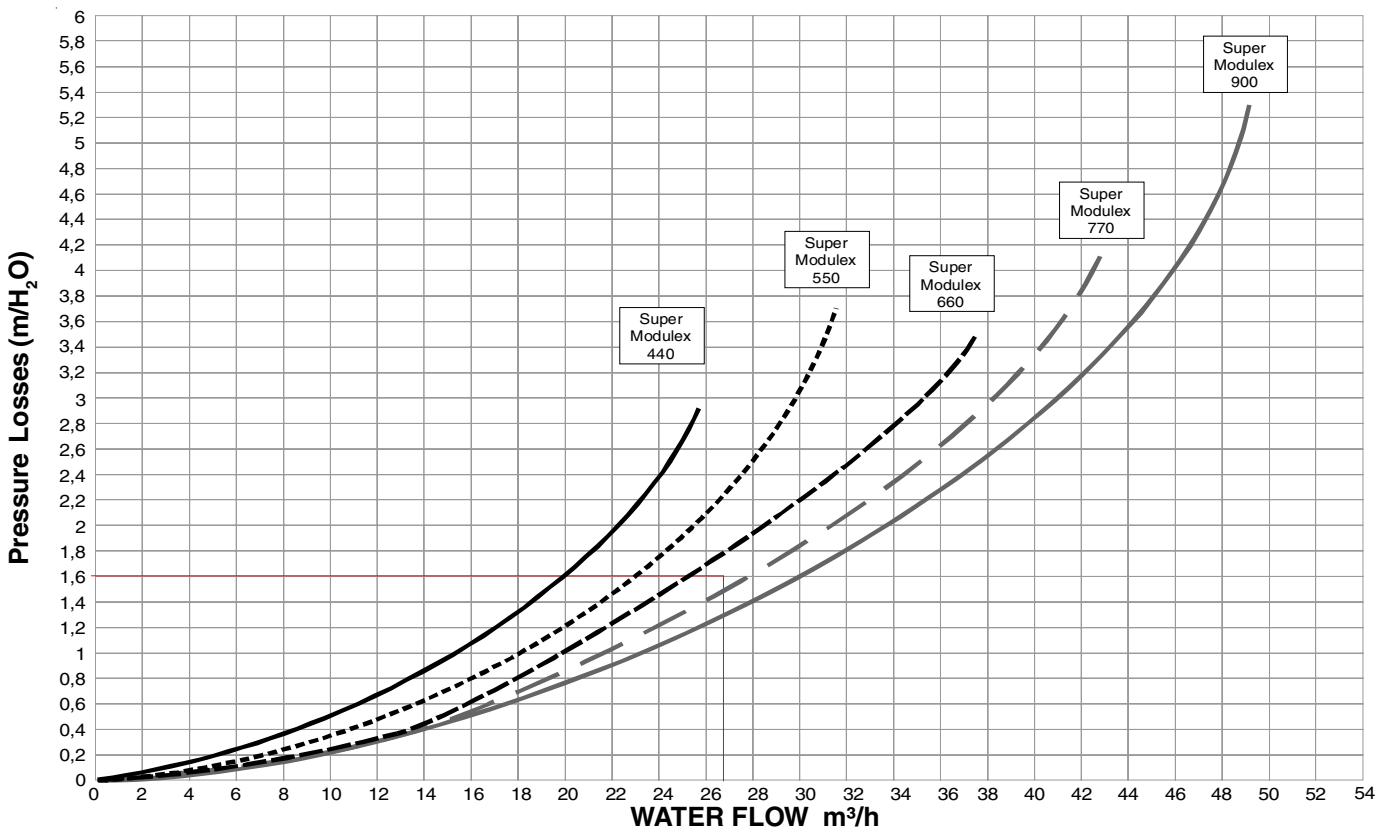


The size of the pumps must be determined by installers or technical engineers according to boiler data and system design.

The water side resistance curve of the boiler is shown in the following diagram. The pump is not an integral part of the boiler.

It is recommended to choose a pump with the rate and delivery head at about 2/3 of its characteristic heating curve.

Boiler Model	440	550	660	770	900
Max water flow rate Demanded in l/h ($\Delta t=15$ K)	24202	30248	36297	42346	48397
Max water flow rate Demanded in l/h ($\Delta t=20$ K)	18152	22686	27223	31760	36298



For a ΔT 20 K, of a MODULEX 660 boiler, the max. water flow rate requested is 27,2 m³/h. From the graph of the boiler's pressure losses, it can be determined that the pump must be able to guarantee a delivery head of at least 1,7 m/H₂O.



NOTE: The use of a mixing header fitted between the boiler circuit and the system circuit is always advisable. It becomes **INDISPENSABLE** if the system requires flow rates superior to the maximum permitted boiler flow rates, which is to say lower than 15K.

3.10 - ADDITIONAL SAFETY AND CONTROL DEVICES ACCORDING TO THE ITALIAN LAW

CERTIFICATION OF THE ADDITIONAL SAFETY DEVICES:

SAFETY DEVICES

1. On-off gas valve: a device which has the function of cutting off the gas supply when the water temperature reaches the max. predetermined value. The sensible element has to be installed as nearest as possible to the generator (flow pipe) at a distance which has to be < 500 mm and must not be able to be cut-off.

2. Pressure relief valve: it has the function of discharging in the atmosphere the fluid contained in the generator when this has, for whatever motive, reached the maximum working pressure.

2a Visible drain funnel

PROTECTIVE DEVICES

3. Overheat thermostat: it has the function of shutting down the generator if the safety thermostat fitted in the boiler malfunctions. It must be calibrated to a value of $< 100^{\circ}\text{C}$, which **MUST** not be changed.

6. Safety pressure switch: it has the function of shutting down the generator if it reaches the maximum working pressure. It must be able to be reset manually.

PRIMARY OR BOILER CIRCUIT KIT, WITH ADDITIONAL SAFETY DEVICES

SUPERMODULEX 360 - 450	cod. 00361375
SUPERMODULEX 540 - 660	cod. 00361375
SUPERMODULEX 770 - 900	cod. 00361560

CONTROL DEVICES

7. Pressure indicator with shock absorber tube (7a) and pressure gauge holder valve (7b): it indicates the effective pressure existing in the generator. It must be graduated in "bar" and must have the maximum operating pressure in scale and be equipped with a 3-way valve with the connection for the manometer.

5. Thermometer: it indicates the effective water temperature contained in the generator. It must be graduated in degrees Celsius with a temperature scale not exceeding 120°C .

4. Inspection pocket: approved for inserting the control thermometer

8. Calibrated expansion vessel: it permits the absorption of the increase in volume of the system's water following an increase in temperature.

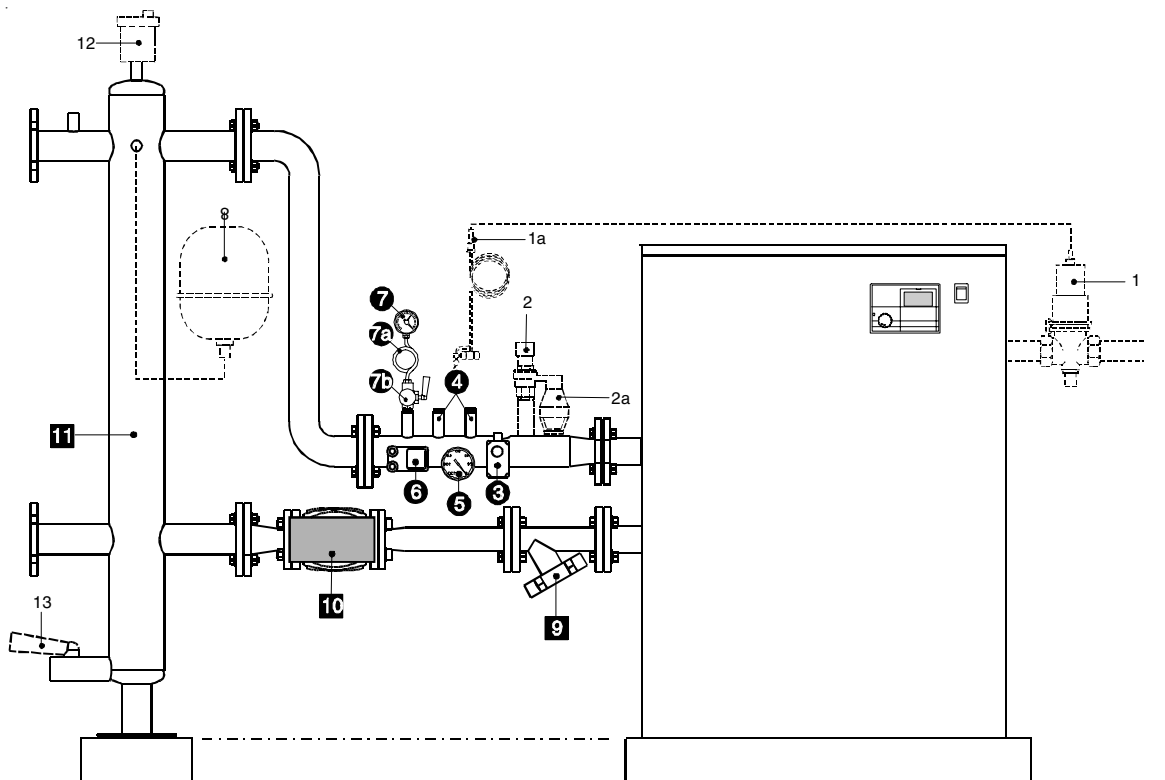
9 Y filter

10 Modulating pump

11 Mixing bottle

12 Automatic air vent. Not supplied by Unical

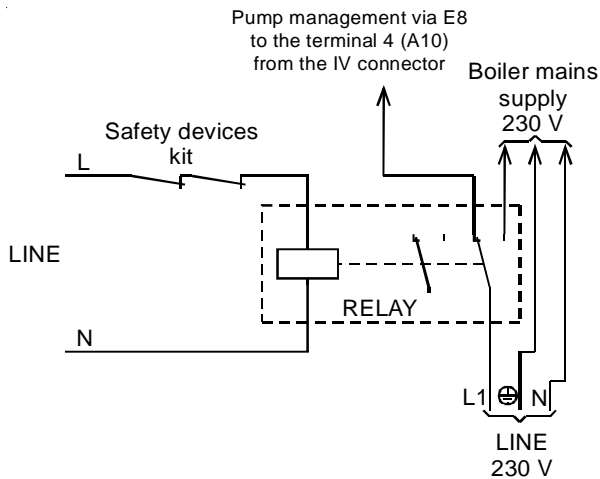
13 Drain cock. Not supplied by Unical.



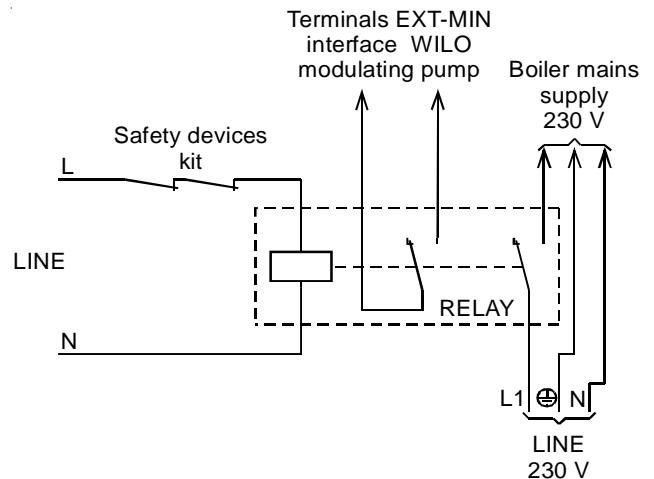
Instructions for the installer

3.11 - WIRING DIAGRAM FOR ADDITIONAL SAFETY DEVICES

ON-OFF PUMP



MODULATING PUMP



3.12- PRESSURE RELIEF VALVE DRAIN PIPE



A pressure relief valve must be fitted on the flow pipe, within 0,5 m from the boiler. It must be dimensioned for the capacity of the boiler and must comply to the regulations in force,



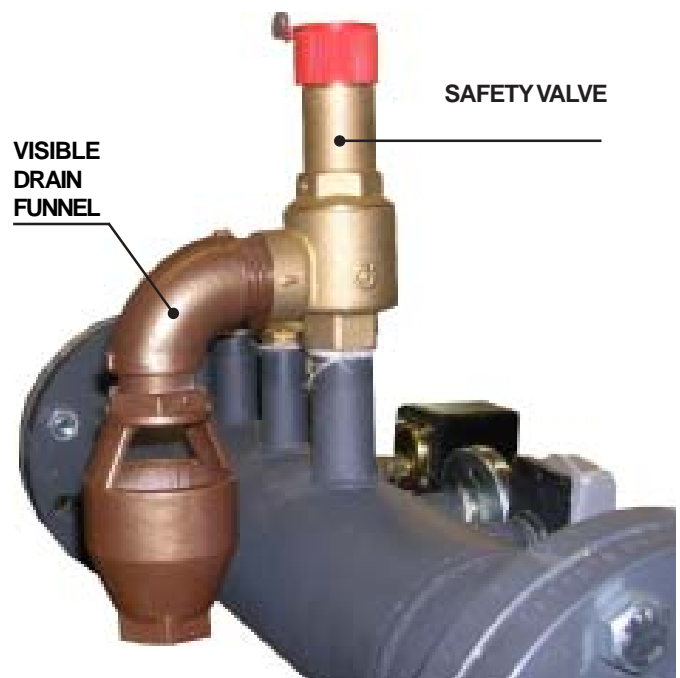
WARNING!

Please remember that it is forbidden to interpose, between the boiler and the pressure relief valve, any type of cutting-off device. Moreover it is recommended to use cutting-off valves which do not exceed the maximum allowable operating pressure.



WARNING!

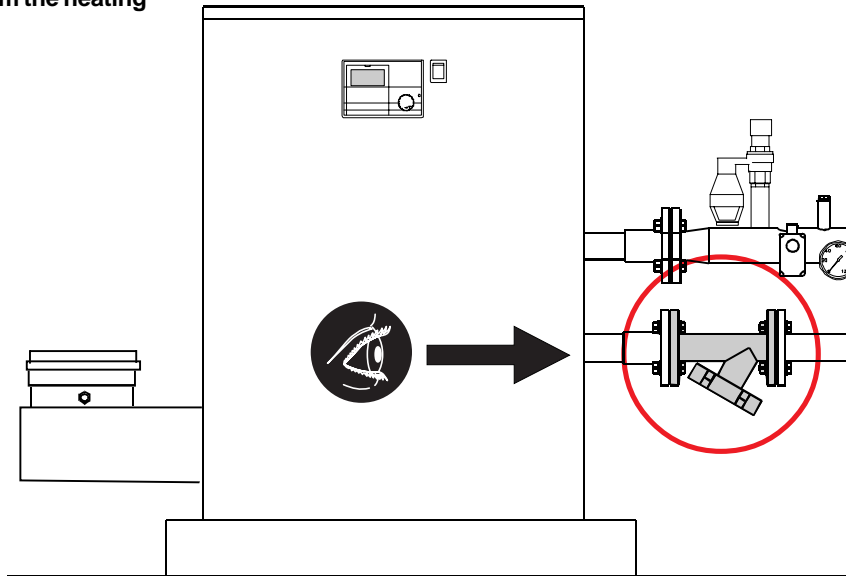
In correspondence to the heating pressure relief valve foresee the installation of a discharge pipe with a funnel and a siphon which lead to an adequate drainage. The drainage has to be controllable by sight. If this precaution is not made, an eventual intervention of the pressure relief valve could cause injury to persons, animals or damage to property. The manufacturer shall not be held liable for any injury and/or damage.



3.13 - MIXING HEADER FILTER



UNICAL suggests the installation of a Y filter on the return pipe so that it can be cleaned if necessary. This filter will protect the boiler from the heating system dirt.



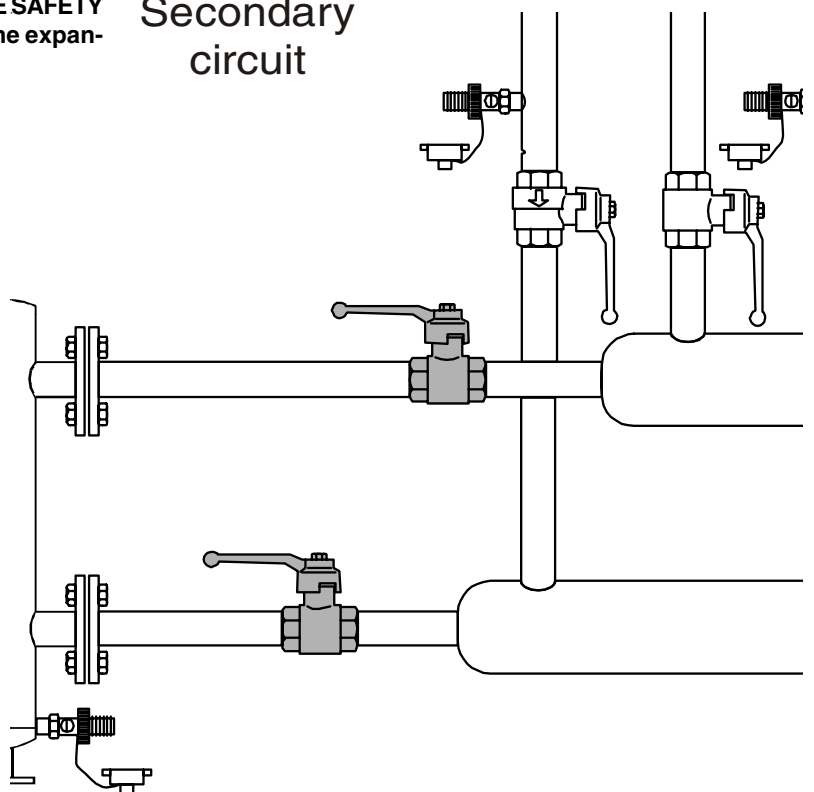
3.14 - BALLSTOP VALVES

The installation of ballstop gate valves, on the C.H. flow and return connection, is recommended. Doing so, in case of normal or extraordinary service, the boiler can be drained without emptying the whole C.H. system.



WARNING!
IT IS NOT ALLOWED TO ISOLATE THE SAFETY DEVICES, as the safety valve and the expansion vessel, FROM THE BOILER.

Secondary circuit



Instructions for the installer

3.15 - BOILER FREEZE PROTECTION

Should the flow temperature (measured at global flow temperature NTC) decrease under 7°C, the system pump is set up. Should temperature decrease to under 3°C, all modules will start at min. output until the return temperature reaches 10°C. Such protection device is exclusively for the boiler. For the protection of the system, a second freeze protection thermostat is necessary to switch on the heating system pump. To protect the C.H. system from freezing when boiler is not in operation during cold season, it is necessary to add to the C.H. system water an anti freezing solution.

NB: The antifreezing solution must be compatible with the materials present in the system, and mainly with the aluminum.



WARNING

AFTER A LONG INOPERATION PERIOD OF THE BOILER, IN CASE THE BOILER TEMPERATURE IS BELOW 3°C, ABSOLUTELY DO NOT TRY TO START THE BOILER.

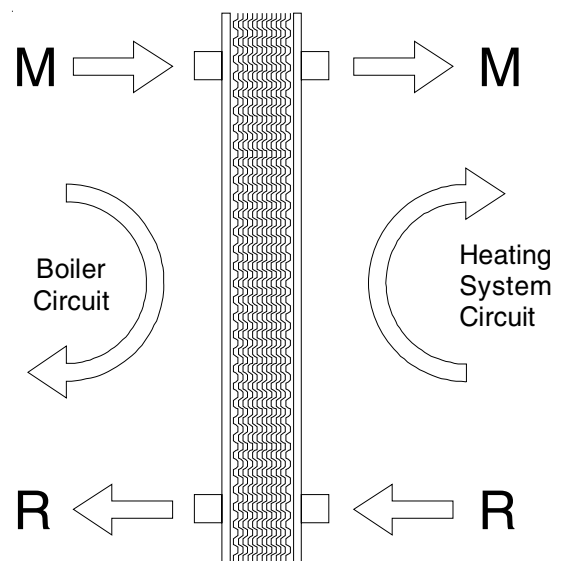
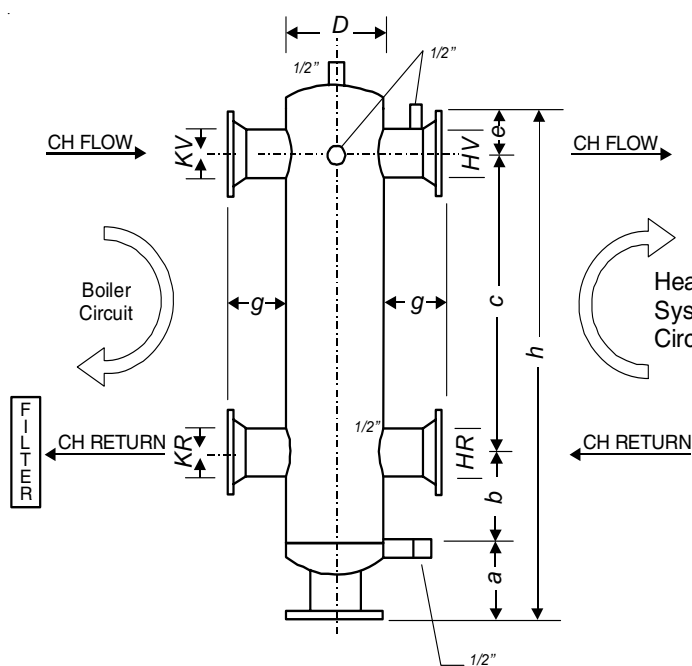
THIS CAN BE ALLOWED ONLY IF YOU ARE SURE THAT AN ANTIFREEZE SOLUTION HAS BEEN ADDED, IN THE PROPER PERCENTAGE, TO THE C.H. WATER.

3.16 - MIXING HEADER AND PLATE HEAT EXCHANGER

In order to ensure correct boiler operation it is necessary to use a mixing header which guarantees:

- the separation and collection of circuit dirt
- optimal air venting
- hydraulic de-coupling of the two hydraulic circulation circuits
- balancing of the circuits

The plate heat exchanger, conveniently dimensioned, has the advantage to keep hydraulically the two circuits (primary and secondary), thus allowing the installation of the MODULEX boiler also in industrial processes.



See the Unical catalogue and the price list to identify the most convenient mixing header and primary circuit.

TABLE FOR THE RECOMMENDED DIMENSION OF THE HYDRAULIC COMPENSATOR

MODULEX MODEL	FLOW RATE l/h	D mm	KV DN	KR DN	HV DN	HR DN	a mm	b mm	c mm	e mm	h mm	g mm
440	30.000	250	125	125	200	300	1.000	150	1.650	200		
550	50.000	300	150	150	250	300	1.000	150	1.700	200		
660 - 900	100.000	400	200	200	250	300	1.500	200	2.250	200		
power supply over > 340 kW	150.000	500	250	250	300	400	1.500	300	2.500	200		
	200.000	600	300	300	300	400	1.800	300	2.800	200		

3.17 - CONDENSATE DRAIN

Avoid the condensate stagnation inside the combustion products evacuation system, (for this reason the evacuation duct must have an inclination toward the drain of at least 30 mm/m (3/8 in. / ft) except the liquid column, inside the condensate siphon, which needs to be filled with water after installation: its minimum height, when all the fans are in operation, must be at least 25 mm (1 in.).

In order to avoid ice formation while the boiler is operating, which can cause the stop of the boiler, the whole condensate evacuation system has to be well insulated. It is forbidden to evacuate the condensate through a gutter: risk of ice forming and corrosion.

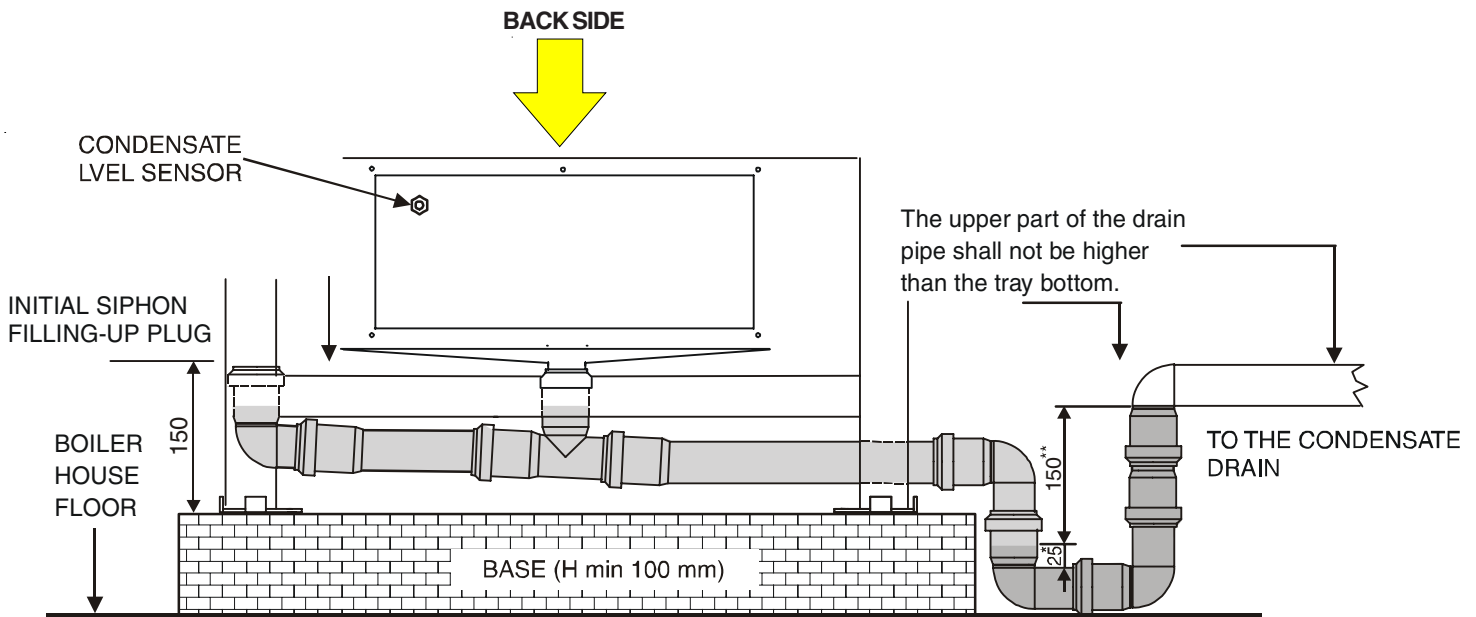
The condensate, before being evacuated to the sewer, has to be neutralized, neutralisation which can be obtained by mixing the drain water coming from washing machines, dish washing machines, etc., which normally have a basic pH.

The connection to the sewer will be through a visible drain. Given the high acidity degree (pH 3 to 5) only plastic material can be used for the condensate evacuation pipes. Moreover it must be dimensioned and constructed so as to allow the correct out-flow of drains, preventing any bottleneck and any leakage.

The outlet of the condensate drain pipe will be on the same side of the smoke chamber, passing below the smoke chamber.



Before commissioning the boiler fill the condensate siphon with water, from the dedicated filling-up plug.



* Min. height of the condensate column, with all fans operating at max. speed, requested by the EN standards.

** Min. height of the condensate column, with all fans operating at max. speed. In the case it is not possible to create a 100 mm basement, install the boiler on the floor and foresee a min. 100 mm well to lodge the siphon.

Instructions for the installer

3.18 - WATER TREATMENT

The chemical-physical characteristics of the filling water and reinstatement water in heating systems are of fundamental importance for guaranteeing correct and safe boiler operation.

Before filling the CH circuit with water, it is necessary to analyse the water and decide for a proper treatment.

The purpose of this treatment is finalized to eliminate or substantially reduce the following problems:

- lime scale deposit
- corrosions
- deposits
- biological growths (moulds, bacteria, algae, fungi, etc)

The chemical treatment of the network water enables the prevention of these problems and guarantees safe boiler operation and economical advantages, in terms of maintenance and global thermal efficiency.

The chemical analysis of the water enables us to obtain a lot of information on the system's condition and state of "health".

It is essential to avoid any problems with the boiler. The pH is a measure of the acidity or alkalinity of a solution. The pH scale has a range of 0-14, where 7 is neutral. Values inferior to 7 indicate acidity, values above 7 indicate alkalinity.

The ideal pH value for water in heating systems fitted with aluminium boilers is between 6,5 and 8, with a hardness of 15°F.

In heating systems where the water has a value outside this range, this considerably accelerates the destruction of the protective oxidized layer which naturally develops inside the aluminium bodies: if the pH is below 6, acidity is present, if it is above 8, the water is alkaline or it is caused by an alkaline treatment (for example phosphate or glycol used as an antifreeze) or in several cases it is due to the natural formation of alkaline in the system.

Vice versa, if the pH value is between 6,5 and 8, the aluminium surfaces of the boiler body are passivated and protected from further corrosive attacks.

To minimize corrosion it is essential to use a scale inhibitor, however in order for this to function correctly, the metallic surfaces have to be clean.

The best corrosion inhibitors on sale also contain a protective system for aluminium which acts by stabilizing the water's pH value, preventing unforeseen variations.

We recommend that the heating system's water pH value is systematically controlled (minimum twice a year). In order to do this, it is not necessary to run a chemical analysis in a laboratory, but it is sufficient to use a simple analytical 'kit' contained in portable cases, easily found on sale.

Therefore, prior to filling the heating system with water it will be necessary to fit the devices indicated in the figure below.



THE CONNECTION MUST BE FITTED ON THE PRIMARY CIRCUIT'S RETURN PIPE DOWNSTREAM OF THE CIRCULATING PUMP

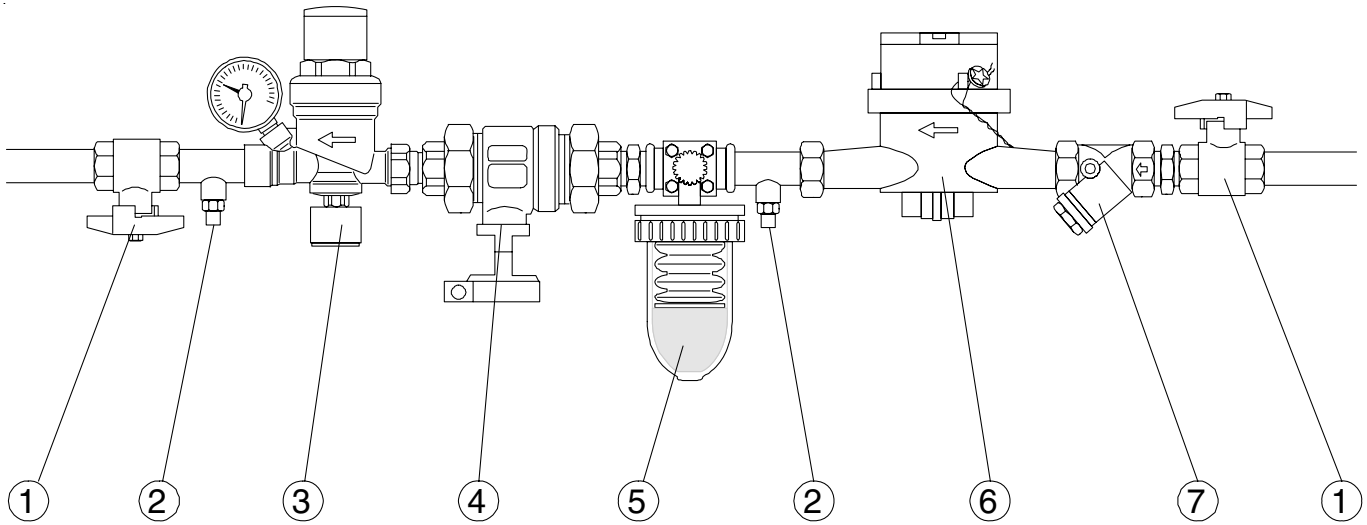
All the necessary precautions must be taken in order to avoid the formation and localization of oxygen in the system's water. For this reason, the plastic pipes used in underfloor heating systems must be impermeable to oxygen.

If any antifreeze solutions are used ensure yourself that they are compatible with aluminium and with any other components and materials fitted on the system.



**WARNING!
ANY DAMAGE CAUSED BY THE BOILER, DUE TO THE FORMATION OF LIME SCALE OR DUE TO CORROSIVE WATER WILL INVALIDATE THE APPLIANCE WARRANTY.**

EXAMPLE OF SCALE REDUCING DEVICE CONNECTION FOR WATERTREATMENT



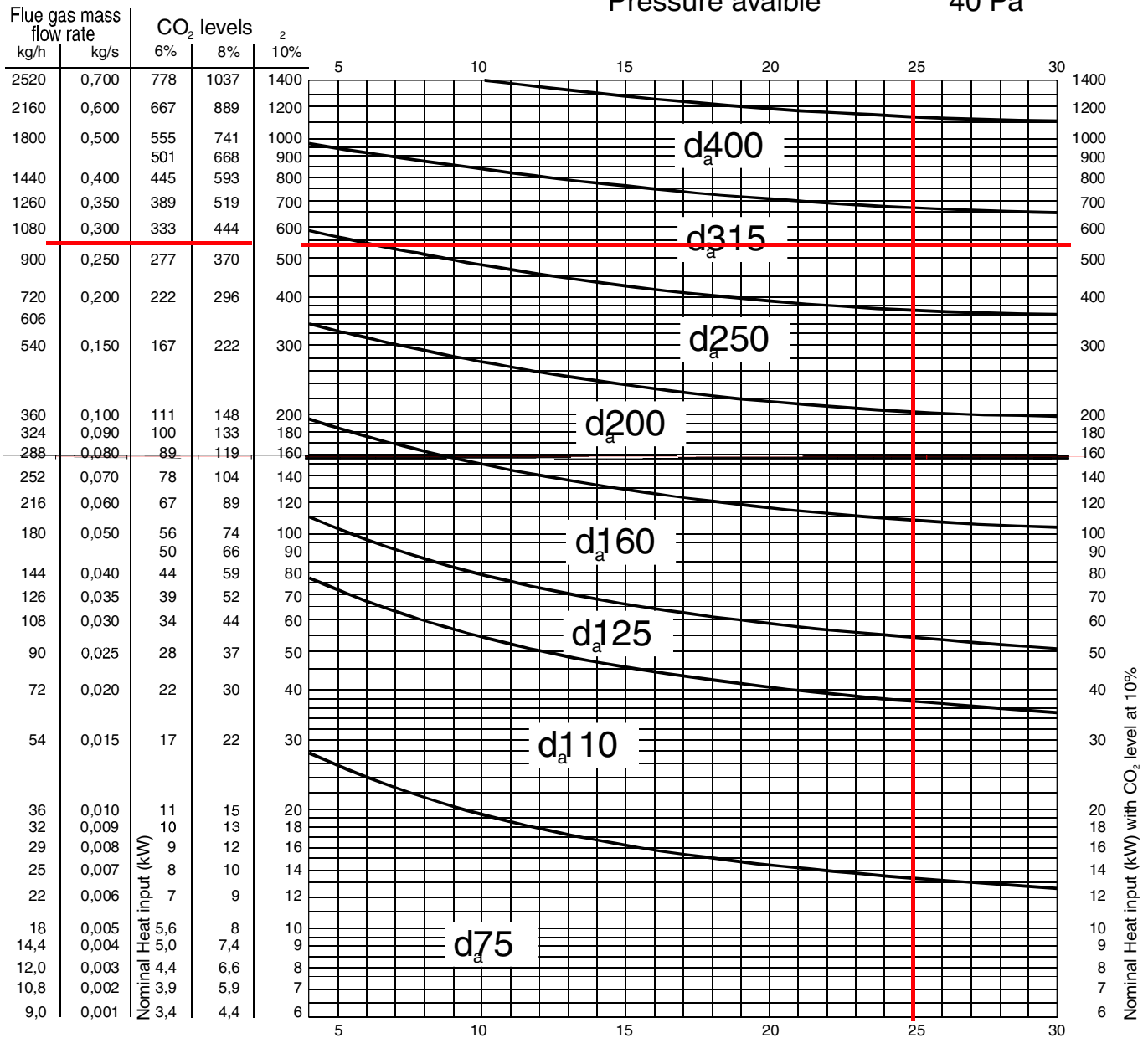
- 1. Ball valve
- 2. Inspection pocket
- 3. Filling-up group
- 4. Disconnector
- 5. Scale reducing device
- 6. Litre counter
(recommended)
- 7. "Y" filter

Model	Modules	Ø Flue socket
440	4	250
550	5	250
660	6	300
770	7	300
900	8	300

Instructions for the installer

Chimney dimension
DIN 4705

Flue Gas Temperature 40°C
Pressure available 40 Pa



Flue gas mass flow rate	
SuperModulex	Flue gas mass flow rate (max) kg/h
440	700
550	874,5
660	1049
770	1224
900	1399

Example:
SUPERMODULEX 550
Flue gas mass flow rate = 1049 Km/h
Chimney height = 25 m
Chimney connection Ø = 315 mm



NOTA:
Il diagramma
fornisce valori indicativi

3.20 - BOILER OPERATION

The SuperModulex is made of inter-linked modules; each module is made of:

- Combustion Chamber
- Burner
- Fan
- Gas valve
- Local NTC ((Negative Temperature Coefficient) sensor (checks the flow temperature of each aluminium section)
- Scheda di controllo BMM (Burner Modular Manager)
- BMM (Burner Modular Manager) control PCB.
- High Limit thermostat
- Ignition electrode
- Ionization electrode
- Air pressure switch

Max. output of a module is 108 kW. So, a SuperModulex 440 (Nom. Input 432 kW) consists of 4 modules.

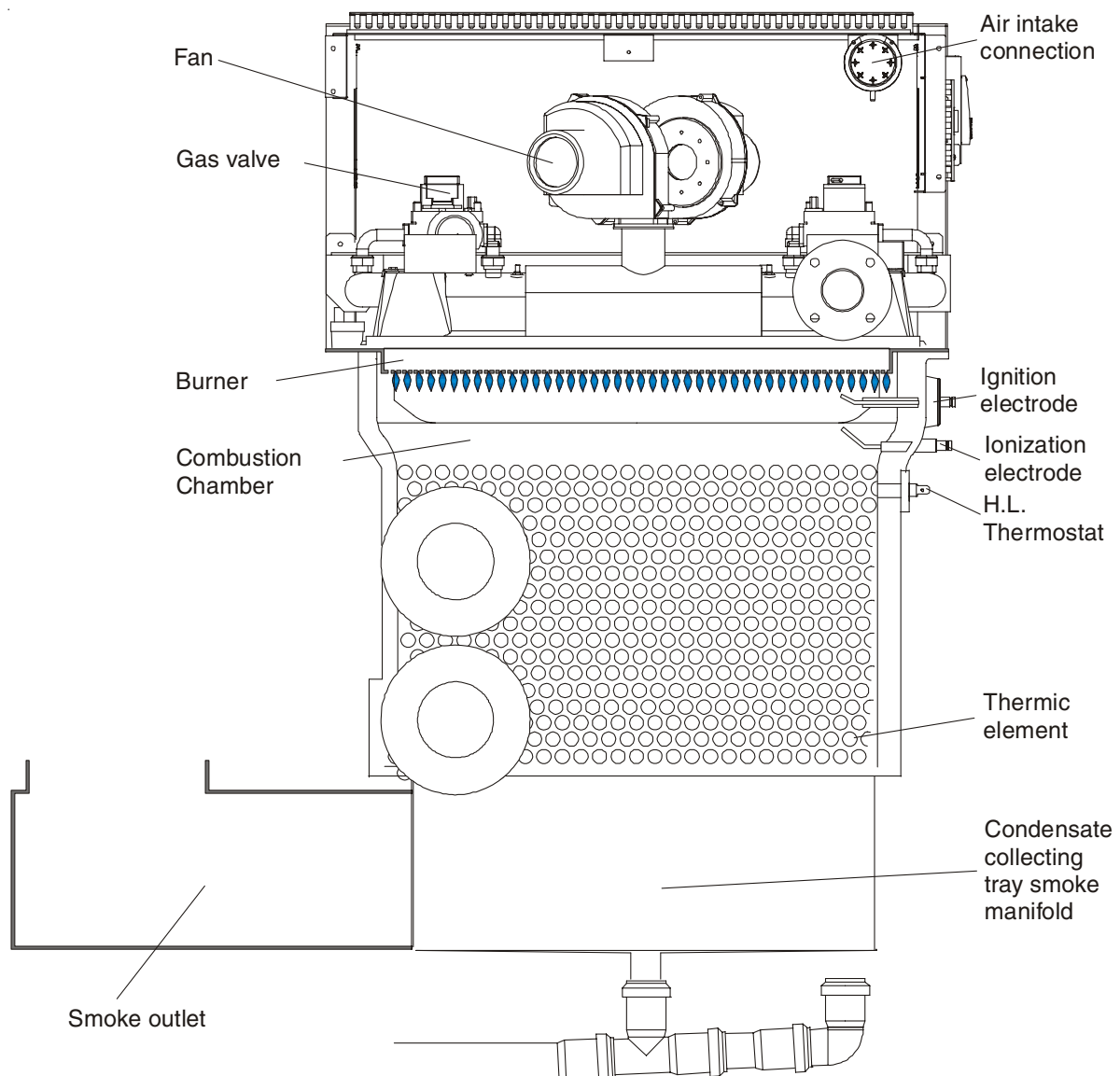
Each module has its own temperature sensor NTC - Negative Temperature Coefficient - called local NTC, which locally checks the flow temperature of each aluminium section.

The flow temperature at the boiler outlet and the return temperature at the boiler inlet are controlled by global NTC temperature sensors.

In case of more heat request by heating or DHW systems, the boiler starts up and water will be heated by the aluminium boiler body

Then the boiler pump will send the water to the mixing bottle and from here to the radiators, according to the heating system chosen.

The combustion air is supplied by fans which take it from the boiler room. The combustion air is then pushed into the pre-mixing chamber through a diaphragm. Beyond the diaphragm, the air mixes with gas and such mixture, passing through the non-return valve, is sent to the burner. Then, on leaving the burner surface, the air/gas mixture ignites electrically and the resulting combustion gases, after being transported (and cooled) through finned sections, enter the condensate collecting manifold and then are evacuated through the chimney.



Instructions for the installer

When there is a heat request from the E8 controller or from a BCM (Boiler Cascade Manager), the E8 or BCM calculates the necessary output according to the difference between the set temperature (or the temperature calculated by the outer compensator) and the global flow temperature. The number of thermal elements (each thermal element represents a maximum input of 110 kW) x 100% determines the maximum input expressed in %.

When the input has been determined, the boiler pump (not supplied by Unical) is set up and the fan of one thermal element is set in motion at starting speed. The gas valve opens and ignition is to occur within 5 sec. When the ionisation electrode detects the flame, the thermal element starts operating. Subsequently other thermal elements are likely to start in the same way. One of the operation principles for this boiler is letting as many burners as possible operate simultaneously at minimum load to reach the maximum efficiency.

For example, if a 4 thermal element boiler is requested to operate at its max input, this shall be 400% i.e. :

108 kW x 4 thermal elements = 432 kW = 400%.

If it is requested to operate at 200% input, thanks to the input sharing system on the highest number of thermal elements, each thermal element will operate at 50% output i.e. :

**200% : 4 thermal elements = 50%
equal to a total of 216 kW, that is 54 kW for each thermal element.**

Such principle provides clearly efficiencies much higher than those obtained in traditional groups of small boilers installed in cascade.

When the input shared on each thermal element is less than 22 kW, one thermal element after the other is automatically excluded and the remaining input is shared on thermal elements having the smallest number of operation hours (by the automatic operation-time calculating system).

Modulation, i.e. input reduction, is based on the difference between the set temperature (or the temperature calculated by the outer compensator) and the global flow temperature. When no ignition occurs, the ignition device repeats two more times the ignition sequence and then puts to lock out position the thermal element concerned.

1 Thermal element (module) = 108 kW = 100%

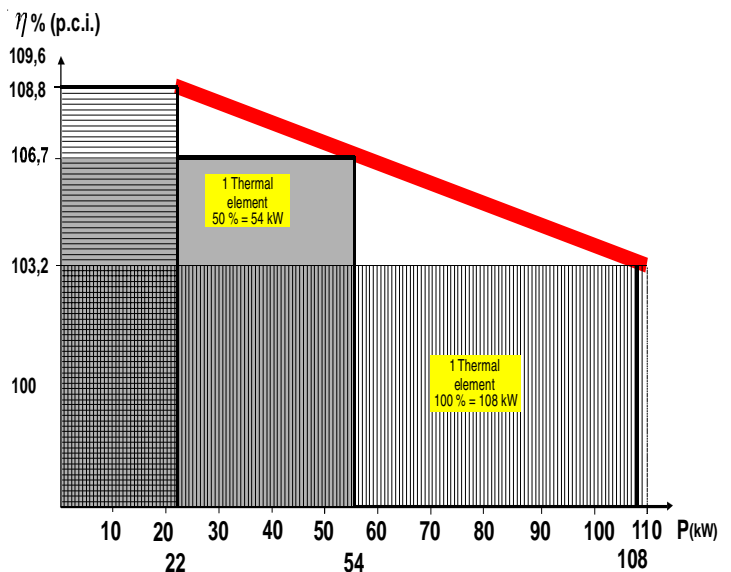
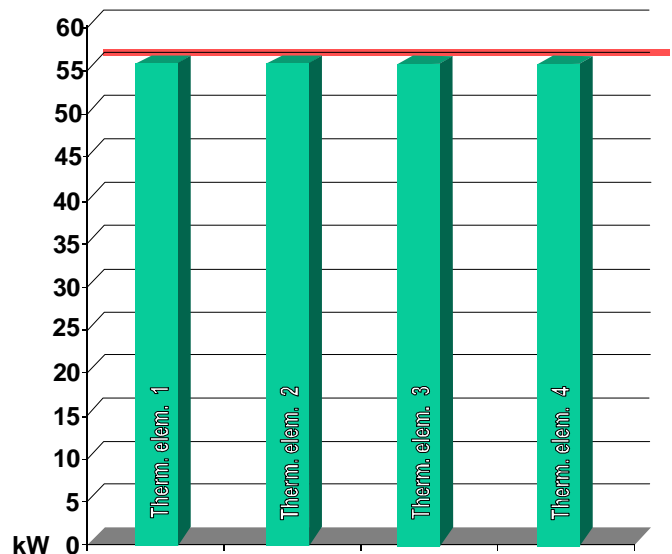
4 Thermal elem. = 108 kW x 4 = 432 kW = 400%

400% : 332kW = 200% : X

X = (432x200) : 400 = 216 kW input shared on 4 thermal elements

Input shared on 4 thermal elements : total input = 216:432 = 0,5 = 50%

4 thermal elements of 108 kW each working at 50% of the output give = 216 kW = (200%), i.e. 54 kW / thermal element



Efficiency of a thermal element working at full capacity 108 kW = 103,2 % (in condensation)

Efficiency of a thermal element working at reduced capacity 54 kW = 106,7 % (in condensation)

Efficiency of a thermal element working at minimum capacity 22 kW = 108,8 % (in condensation)

All the thermal elements work in parallel at the same output, equalizing, thus, the C.H. system efficiency to the one of the thermal element.

3.21 - ELECTRICAL CONNECTIONS

Regulations in force

The gas and water feeding pipes and the CH system pipes cannot be used as ground plates.

Ensure that the above safety electrical requirements subsist; in case of doubt, ask for a professionally qualified technician to check the appliance's electrical system.

UNICAL refuses responsibility for any damages arising from failure to earth the boiler correctly.

It is necessary that a qualified technician verifies that the electrical system is adequate to the appliance's maximum absorbed power, indicated on the data plate, verifying in particular that the section of the system's cables is suitable to the appliance's maximum absorbed power.

For the appliance's general electrical supply the use of adaptors, multiple sockets and/or extension cords is strictly forbidden.

The use of any power supplied equipment implies the observance of several fundamental rules, such as:

- Do not touch the appliance with any wet part of your body and/or barefooted;
- Do not pull the supply cables
- Do not expose the boiler to sunlight, rain, etc., unless it is explicitly foreseen;
- Do not permit children or inexpert people to use the appliance.



Mains electrical supply connection 230V

The boiler is provided complete with a mains supply cable 1,5 m long and with a cross section area of 3x0,75 mm².

The electric connections of the boiler are shown in the section named "WIRING DIAGRAMS" (paragraph 3.19 page 30)

A mains supply of 230 V – 50 Hz is required. The wiring to the boiler must be in accordance with the current CEI regulations.



WARNING!

We remind you that upstream of the electrical connection, it will be necessary to foresee a service relay (NOT SUPPLIED) which, when the electrical safety devices (ISPESL) intervene, shuts down the electrical supply to the on-off fuel valve fitted on the gas supply circuit, but not to the boiler so as to guarantee the running of the pump and permit the boiler to cool down.



DANGER!

The electrical connections must be carried out only by a qualified engineer. Before carrying out the connections or any other operation on the electrical parts, always switch off and disconnect the electricity supply and ensure yourself that it cannot be accidentally turned on.

It is necessary to fit a double pole switch on the electrical supply line, having a 3 mm contact separation in both poles, in an easy accessible position in order to make quick and safe the servicing operations.

The boiler electrical supply (230 V – 50 Hz – single phase) is to be done directly on the three pole plug supplied with the boiler.

It is necessary to fit a double pole switch on the supply line in an easy accessible position in order to make quick and safe the service operations.

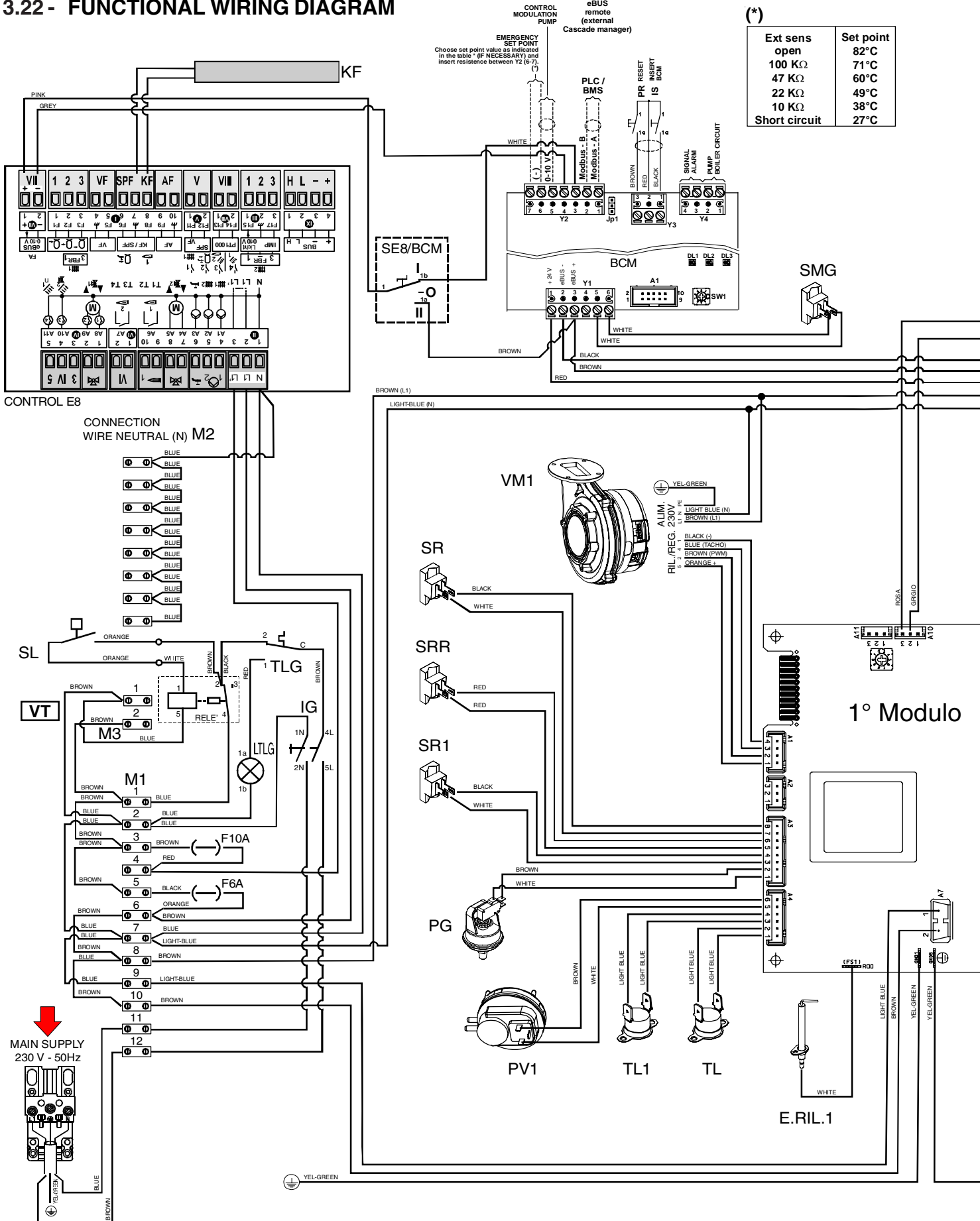


WARNING!

230 V cables shall be separated from 24 V ones, using the two plastic conduits supplied within the boiler casing L.H. side panel.

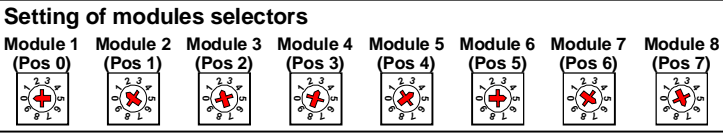
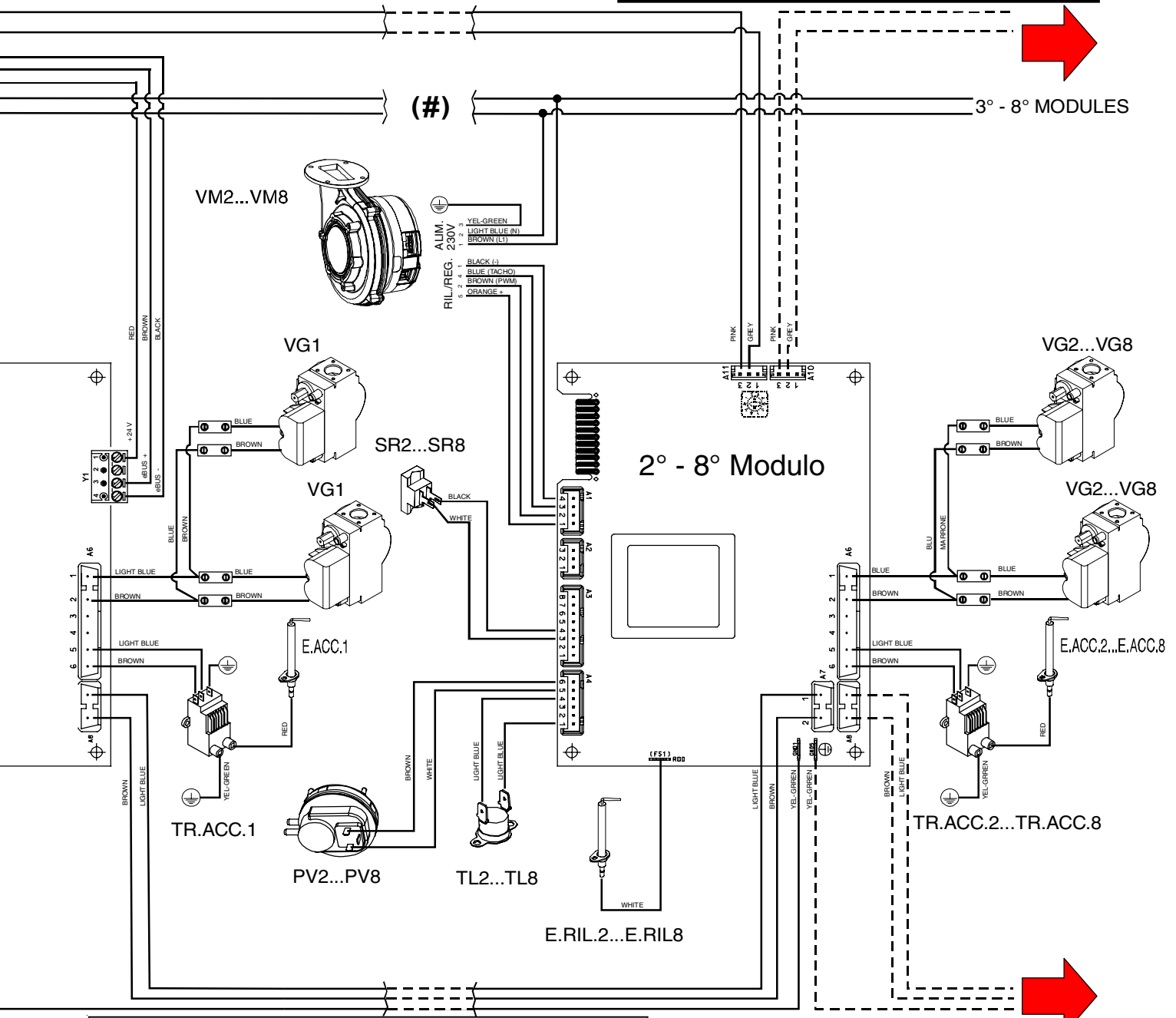
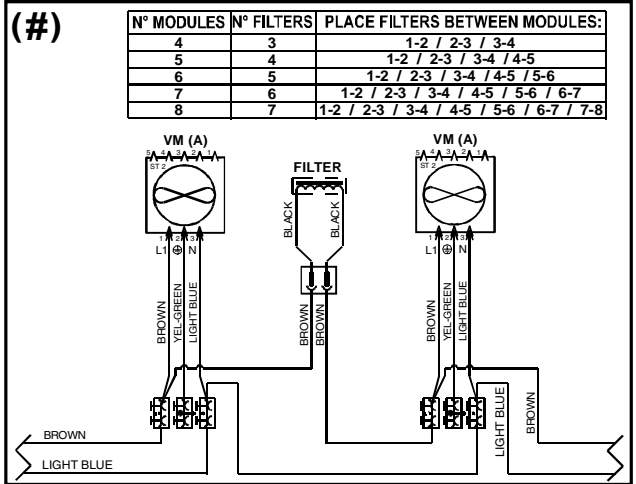
Instructions for the installer

3.22 - FUNCTIONAL WIRING DIAGRAM



Instructions for the installer

- E.ACC 1....8 Ignition electrode
- E.RIL 1....8 Ionization electrode
- IG Main switch
- IS Insert BCM Board
- KF Global Flow Temperature Sensor E8
- LTLG Warning lampe for the General Limit Thermostat
- PG Minimum Gas pressure switch (not supplied)
- PR Reset push button
- PV 1....8 Fan pressure switch
- SMG Global Flow Temperature Sensor BCM
- SL Condensate level sensor
- SE8/BCM E8/BCM selector
- SR Flow NTC Temperature sensor
- SR 1....8 Local Flow NTC Temperature sensor
- SRR Global Return NTC Temperature sensor
- TL High limit thermostat
- TL 1....8 Local High limit thermostat
- TLG Global High limit thermostat
- VG 1....8 Gas Valve
- TRA.ACC 1....8 Ignition Transformer
- VM 1....8 Modulating Fan



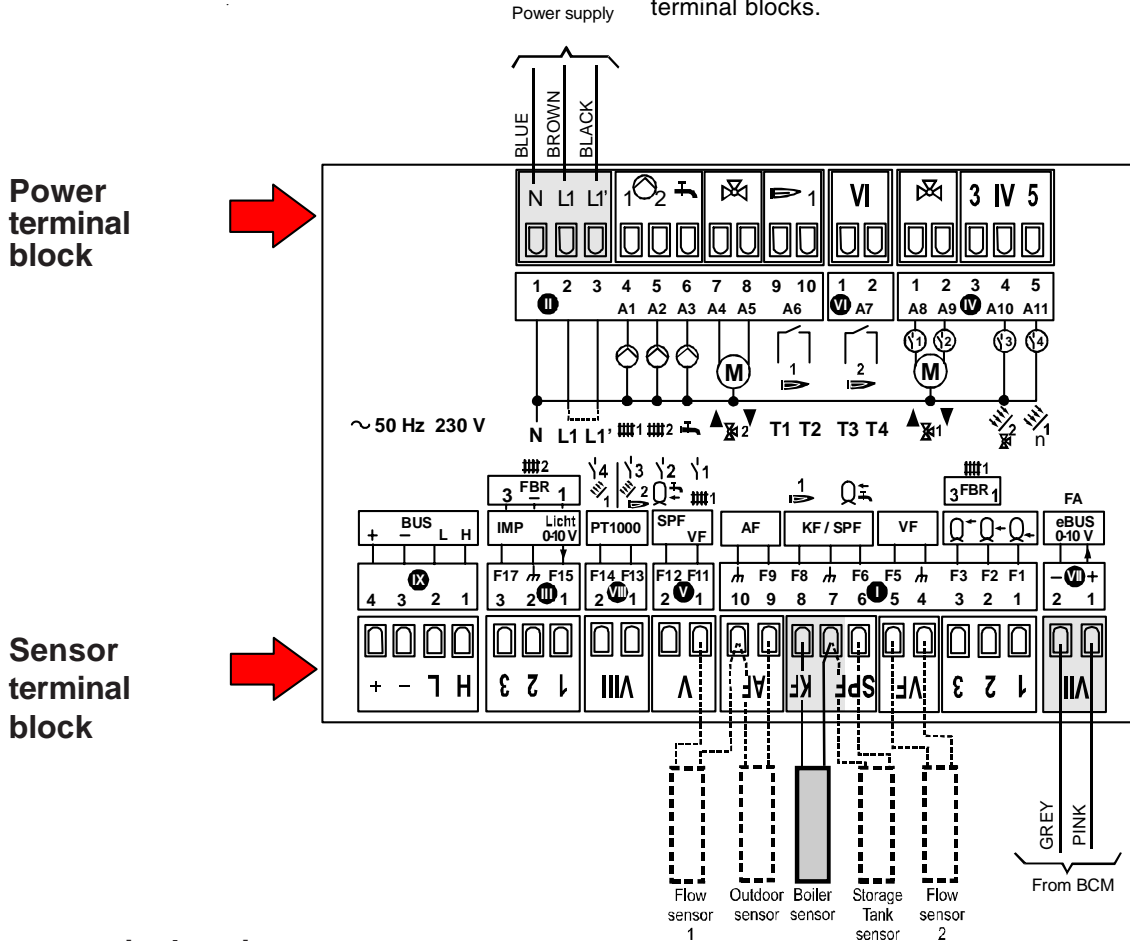
3° - 8° MODULES

Instructions for the installer

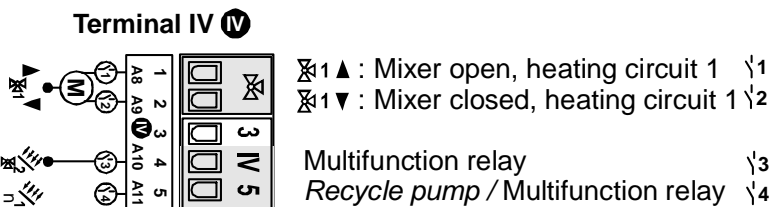
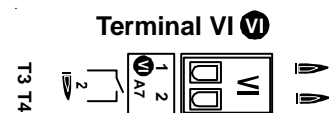
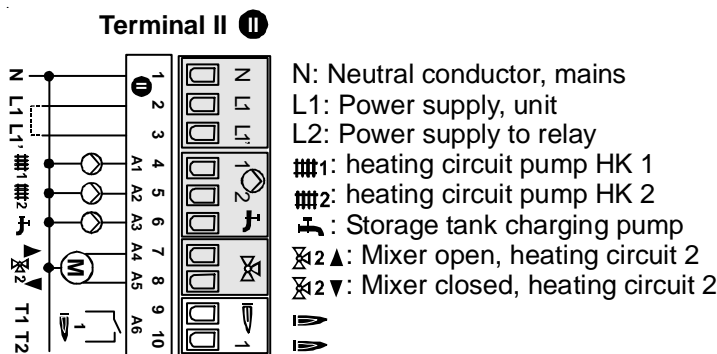
3.23 - WIRING DIAGRAM FOR CONNECTIONS AND MANAGING

On the back side of the E8 regulator there are two terminal blocks, of which one is for the mains (230 V) connections and the other one is for the low tension connections.

The main controls, necessary for the C.H. system management and for the boiler control, as well some components which are part of the boiler house, must be connected to the terminal blocks.

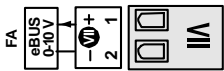


Power terminal assignments



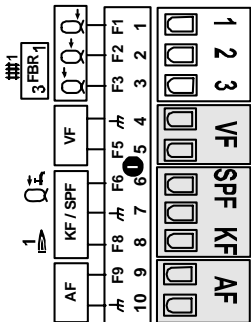
Sensor terminal assignments

Terminal VII Connection to BCM



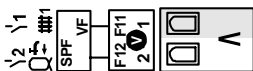
Pin 1: eBUS (FA) or 0-10V output
Pin 2: (Ground)

Terminal I



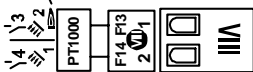
Buffer storage tank low sensor
Buf. stor. tank middle sensor / FBR heat. circ. 1 (room sensor)
Buf. stor. tank top sensor / FBR heat. circ. 1 (set value)
Pin 4: Flow sensor, heating circuit 2 (ground)
Pin 5: Flow sensor, heating circuit 2
Pin 6: Storage tank sensor
Pin 7: Storage tank and boiler sensor (ground)
Pin 8: Boiler sensor
Pin 9: Outdoor sensor
Pin 10: Outdoor sensor (ground)

Terminal V



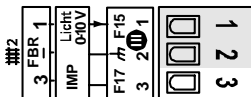
Pin 1: Flow sensor heating circuit 1 / sensor multifunction 1
Pin 2: Service water low sensor / sensor multifunction 2

Terminal VIII



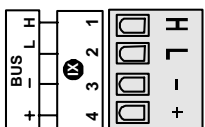
Pin 1: Sensor HS2 / Solar 2 / Multifunction relay 3
Pin 2: Sensor Solar 1 / Sensor multifunction relay 4

Terminal III



Pin 1: FBR heating circuit 2 (room sensor) / 0-10V IN / Light
Pin 2: FBR heating circuit 2 (ground)
Pin 3: FBR heating circuit 2 (set value) / Pulse counter for

Morsetto IX For connection to remote control devices

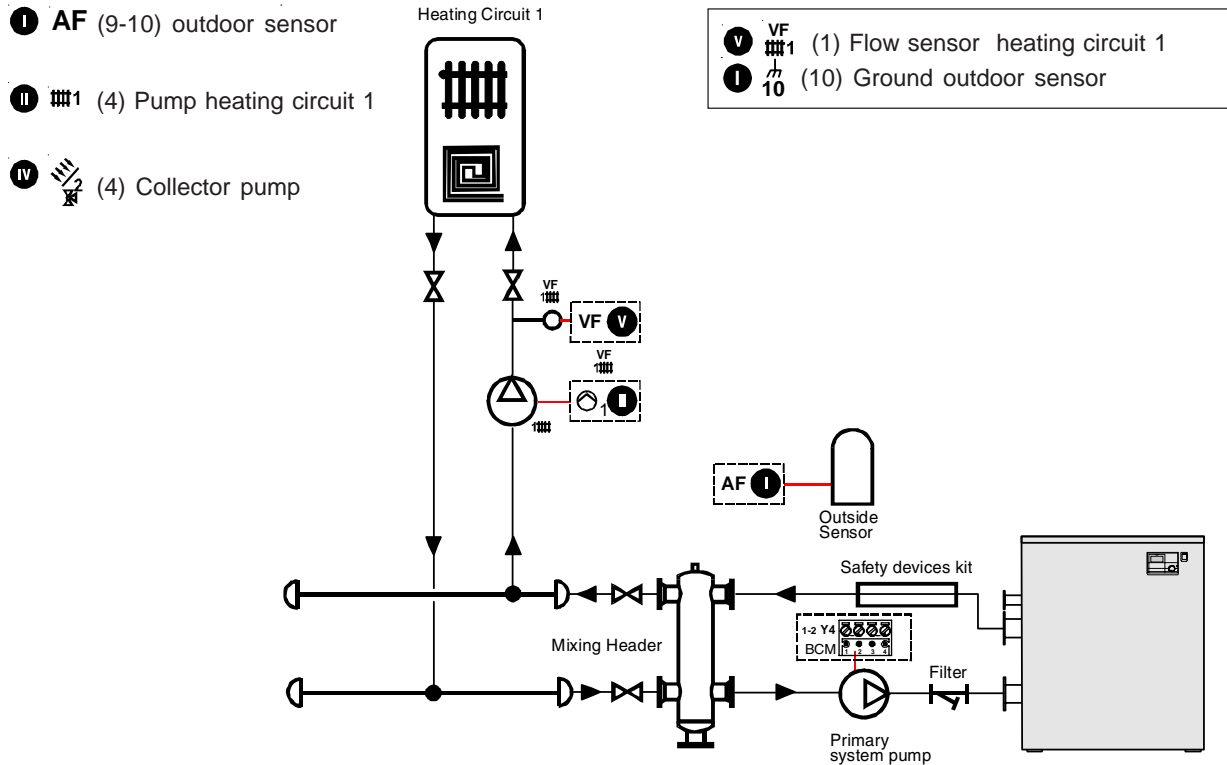


H CAN Bus Pin 1 = H (Data)
L CAN Bus Pin 2 = L (Data)
- CAN Bus Pin 3 = - (ground, Gnd)
+ CAN Bus Pin 4 = + (12V supply)

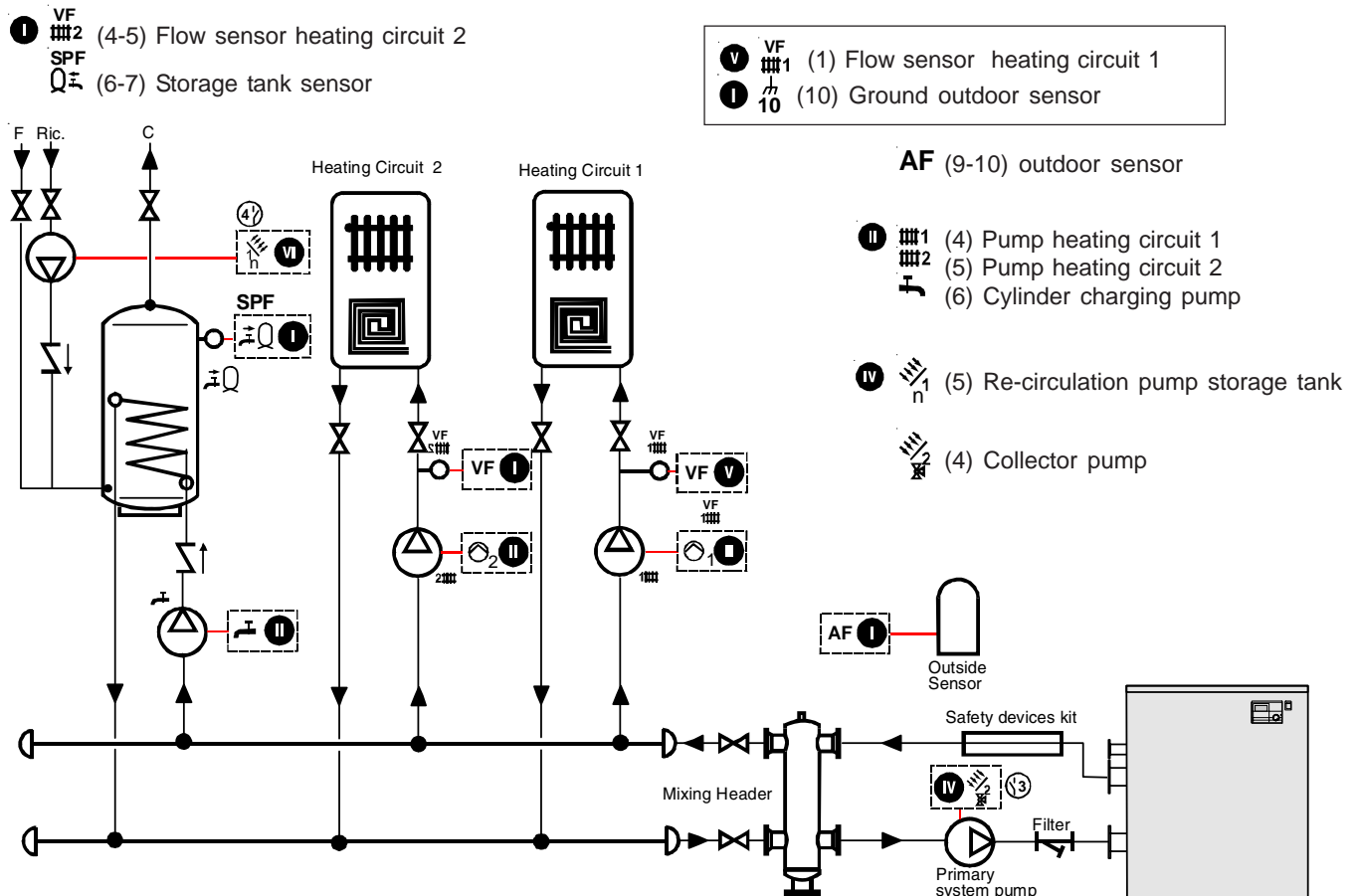
Instructions for the installer

3.24 - INSTALLATION EXAMPLES (functional wiring and connections description)

INSTALLATION OF A BOILER WITH CONNECTION TO A DIRECT HEATING ZONE



INSTALLATION OF A BOILER WITH CONNECTION TO TWO DIRECT HEATING ZONES + D.H.W. PRODUCTION

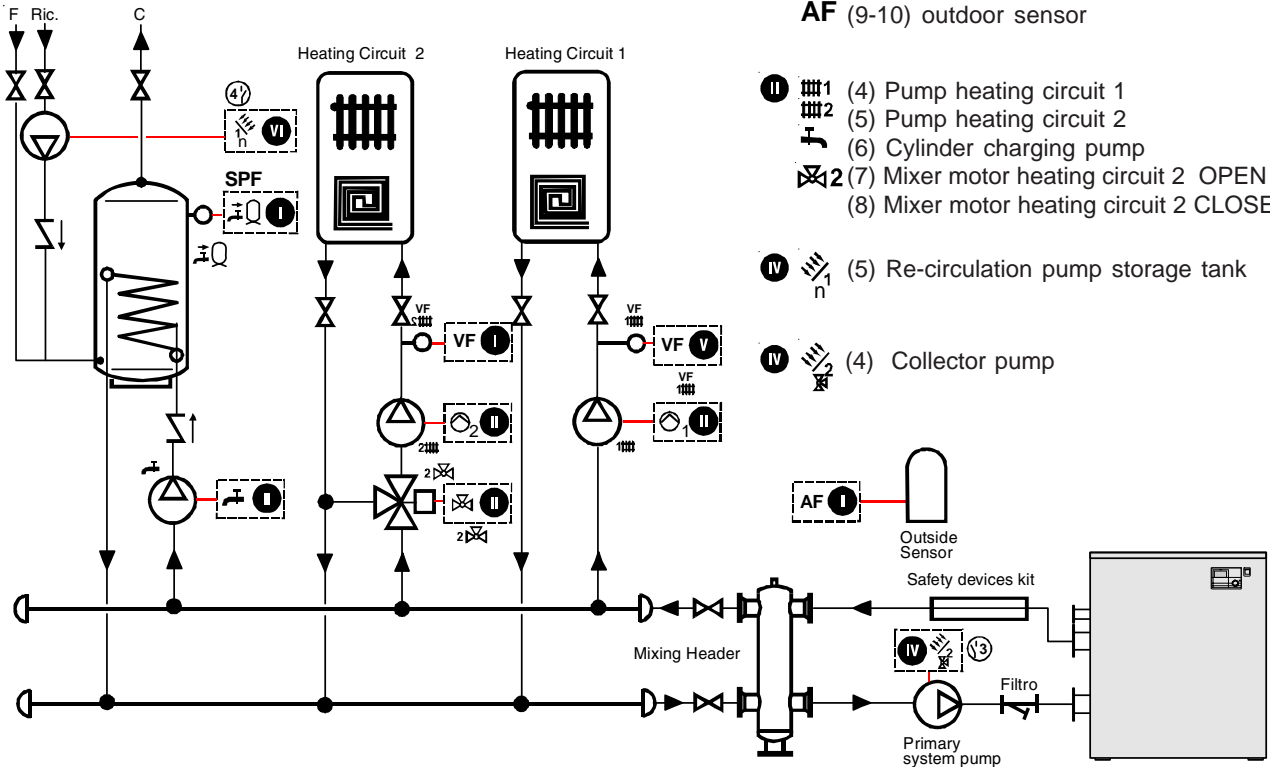


Instructions for the installer

INSTALLATION OF A BOILER WITH CONNECTION TO ONE MIXED AND ONE DIRECT HEATING ZONES + D.H.W. PROD.

- VF (4-5) Flow sensor heating circuit 2
- SPF Storage tank sensor
- Q (6-7) Storage tank sensor

- VF (1) Flow sensor heating circuit 1
- h (10) Ground outdoor sensor



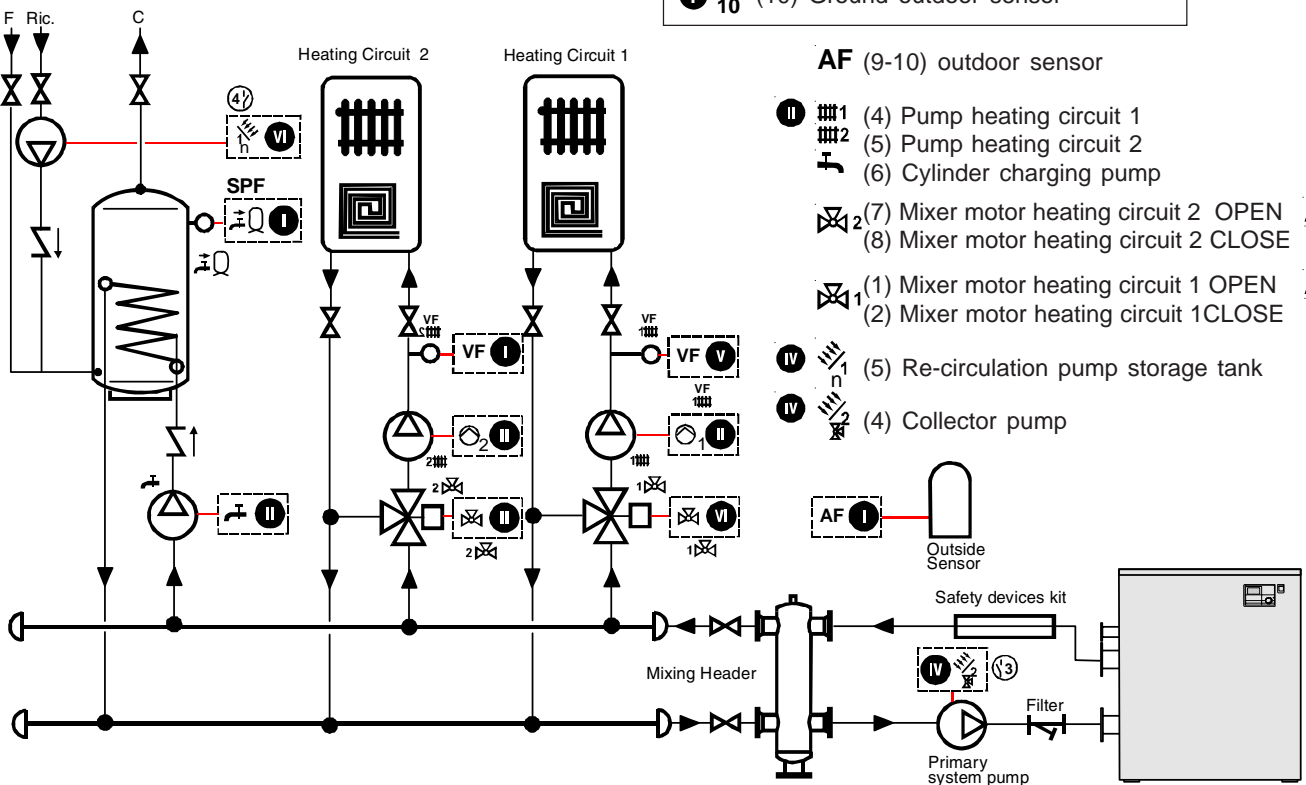
AF (9-10) outdoor sensor

- II (4) Pump heating circuit 1
- II (5) Pump heating circuit 2
- J (6) Cylinder charging pump
- 2 (7) Mixer motor heating circuit 2 OPEN ▲
- 2 (8) Mixer motor heating circuit 2 CLOSE ▼
- IV n1 (5) Re-circulation pump storage tank
- IV n2 (4) Collector pump

INSTALLATION OF A BOILER WITH CONNECTION TO TWO MIXED ZONES + D.H.W. PRODUCTION

- VF (4-5) Flow sensor heating circuit 2
- SPF Storage tank sensor
- Q (6-7) Storage tank sensor

- VF (1) Flow sensor heating circuit 1
- h (10) Ground outdoor sensor



AF (9-10) outdoor sensor

- II (4) Pump heating circuit 1
- II (5) Pump heating circuit 2
- J (6) Cylinder charging pump
- 2 (7) Mixer motor heating circuit 2 OPEN ▲
- 2 (8) Mixer motor heating circuit 2 CLOSE ▼
- 1 (1) Mixer motor heating circuit 1 OPEN ▲
- 2 (2) Mixer motor heating circuit 1 CLOSE ▼
- IV n1 (5) Re-circulation pump storage tank
- IV n2 (4) Collector pump

Instructions for the installer

INSTALLATION OF A BOILER WITH CONNECTION TO TWO MIXED ZONES + D.H.W. PRODUCTION BY SOLAR PANELS

- I** VF (4-5) Flow sensor heating circuit 2
- SPF (6-7) Storage tank sensor
- AF (9-10) outdoor sensor

- V** VF (1) Flow sensor heating circuit 1
- II** (10) Ground outdoor sensor

- II** (4) Pump heating circuit 1
- II** (5) Pump heating circuit 2
- J** (6) Cylinder charging pump

- 2** (7) Mixer motor heating circuit 2 OPEN ▲
- 2** (8) Mixer motor heating circuit 2 CLOSE ▼

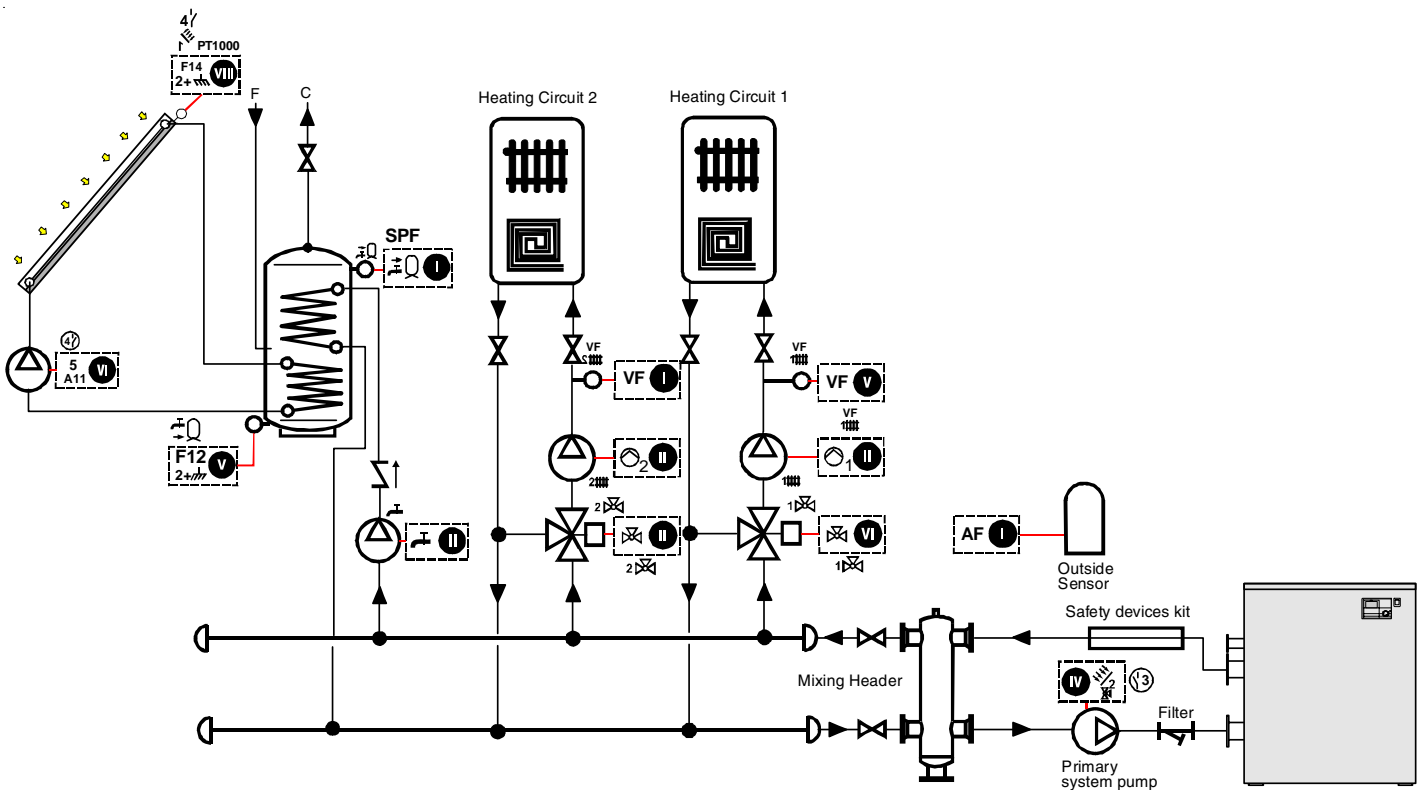
- 1** (1) Mixer motor heating circuit 1 OPEN ▲
- 2** (2) Mixer motor heating circuit 1 CLOSE ▼

- IV** (5) Re-circulation pump storage tank

- IV** (4) Collector pump

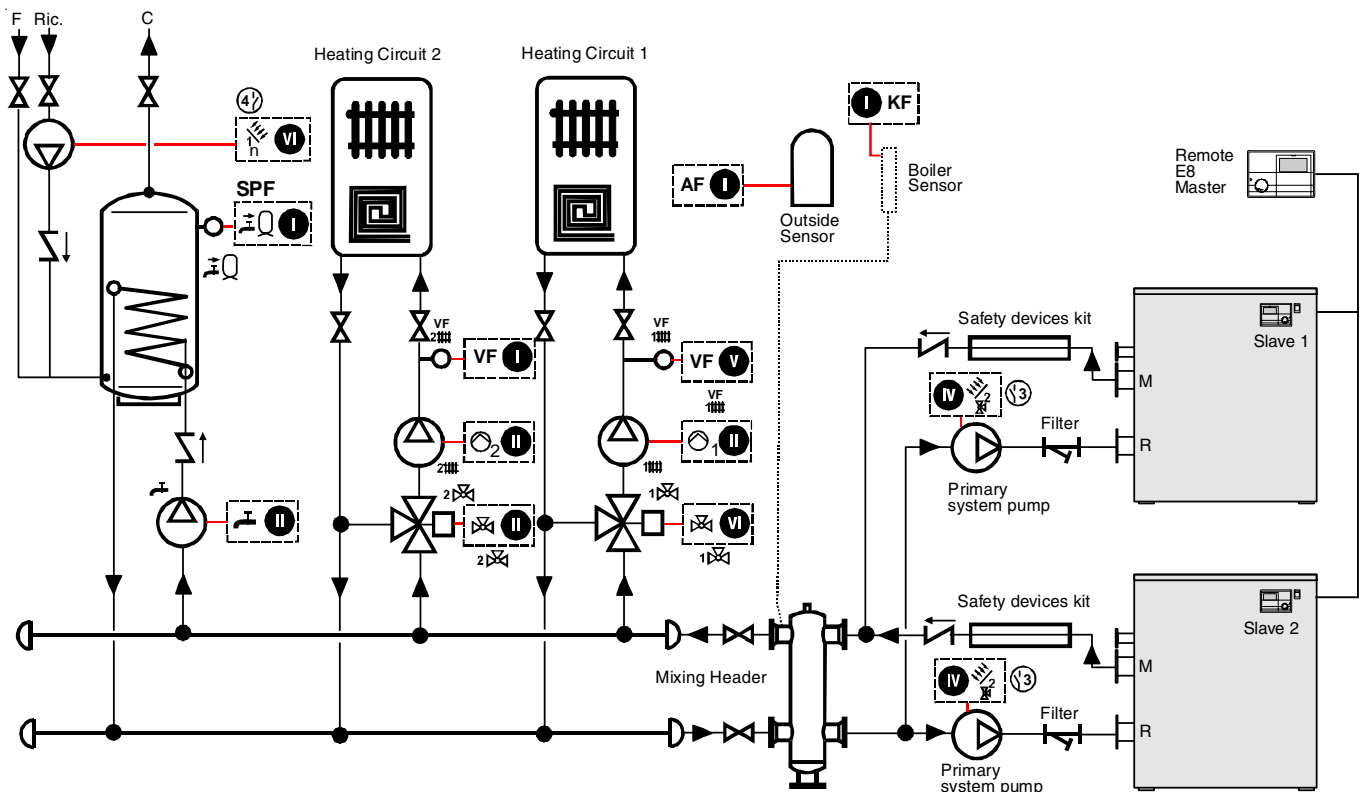
- V** (2) Hot water tank low / Multifunction relay sensor 2

- VIII** (2) PT1000 sensor solar 1 / Multifunction relay sensor 4



For the connection to a solar installation it is necessary to change some parameters. See Table:
 Expert AREA ⇒ Level SOLAR / MF ⇒ MF 4
 FUNCTION = "23"

INSTALLATION OF A BOILER WITH CONNECTION TO TWO MIXED ZONES + D.H.W. PRODUCTION



ATTENTION!

In this type of installation it is necessary to adjust, in the E8 controller, the parameter **BUS-ID HS**.

The external regulator E8 (MASTER) has to be set to: **----**,
the boiler regulators E8 (SLAVES) have to be set to: **01 to 08**.

Connections on to the MASTER controller

The connections of the secondary circuit have to be done on to the MASTER controller.

- I** VF #2 (4-5) Flow sensor heating circuit 2
- SPF (6-7) Storage tank sensor
- AF (9-10) outdoor sensor
- II** #1 (4) Pump heating circuit 1
- #2 (5) Pump heating circuit 2
- h (6) Cylinder charging pump
- IV** #2 (7) Mixer motor heating circuit 2 OPEN ▲
- #2 (8) Mixer motor heating circuit 2 CLOSE ▼
- IV** #1 (1) Mixer motor heating circuit 1 OPEN ▲
- #1 (2) Mixer motor heating circuit 1 CLOSE ▼
- n/1 (5) Re-circulation pump storage tank
- n/2 (4) Collector pump

- | | |
|----------------|-----------------------------------|
| V VF #1 | (1) Flow sensor heating circuit 1 |
| I h 10 | (10) Ground outdoor sensor |

3.26 - CASCADE MANAGER (BCM)

Application:

The BCM completes the range of functions offered by the Modulex boilers:

- ON/OFF alarm control
- Control of a modulating header pump with the aim of significantly increasing efficiency at low heating loads.
- Possibility of integrating the Modulex boilers in PLC controlled boiler plants
- Thanks to LonWorks/Modbus protocol converters been readily available also opens the road to installing Modulex boilers in the most advanced Building Automation Systems.

Features:

The BCM can be connected to the automation system of a boiler plant via one of its interfaces:

- eBUS: for connection to the series of E8 heating controllers or to an additional BCM
- Modbus: application in PLC controlled boiler plants

The communication protocols enable complete system management:

- Control of heating request: temperature set point and modulation level
- Monitoring of boiler operation and temperature status
- Alarm control
- Functional parameters setting

Management of the header pump:

- Relay command for running a pump at fixed rate
- 0÷10 analogical output for control of a modulating pump

Special functions

Emergency: it avoids system shutdown caused by an interruption in communication with the boiler plant's automation system:

- Input for "Constant setpoint" request: 55°C, maximum output 50%
- Alarm reset input
- Alarm relay signal

Monitor:

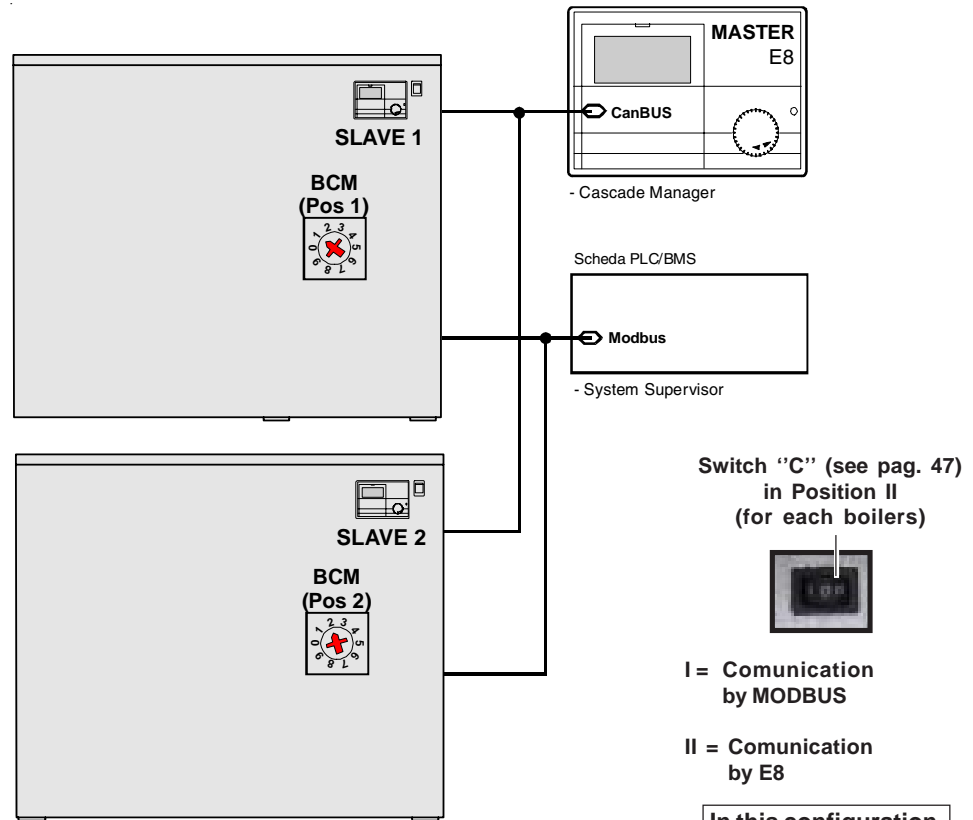
a BCM connected to a group of heating generators managed by a E8 heating controller, automatically selects the "monitor" mode.

In this condition the following services are supplied:

- Acquisition of all the operating data and diagnostics via the Modbus interface.
- Control of the modulating pump
- Control of the Alarm relays and control of the header pump
- If the E8 malfunctions, the BCM automatically resets normal boiler operation control and can enable the emergency function previously described.

Instructions for the installer

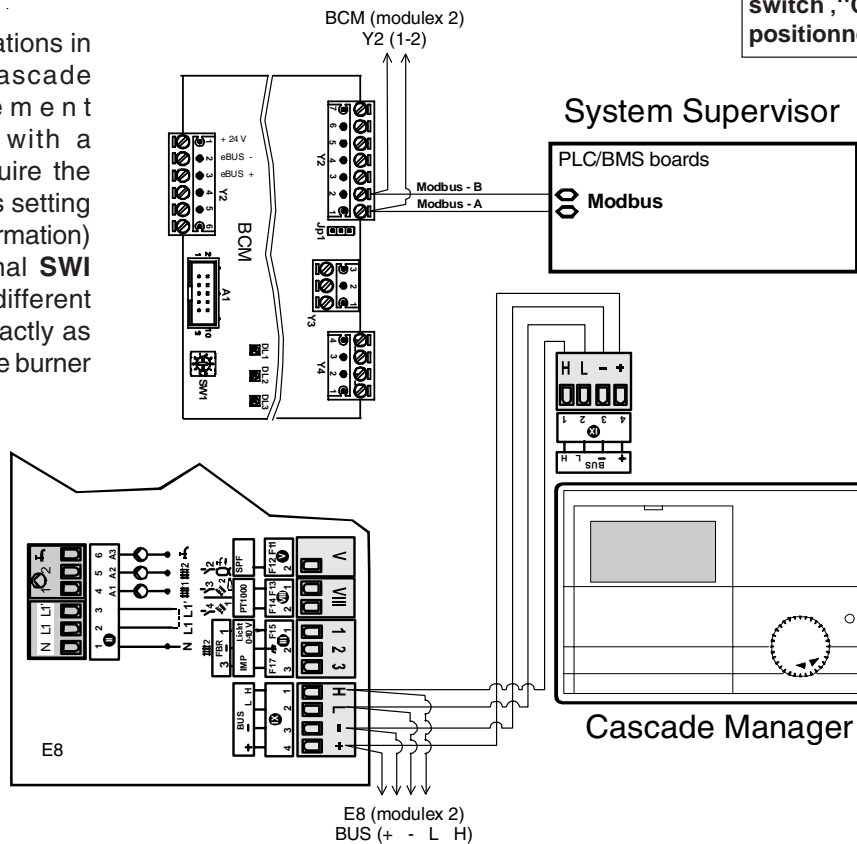
Connection for boilers in a cascade arrangement managed by a E8 heating controller with PLC supervision.



In this configuration, switch, "C" must be positioned on II.



The applications in a cascade arrangement managed with a PLC (Modbus) require the correct boiler address setting (within the cascade formation) via the BCM's internal **SWI selector: 1....7**, all different and in sequence, (exactly as requested by the single burner modules).

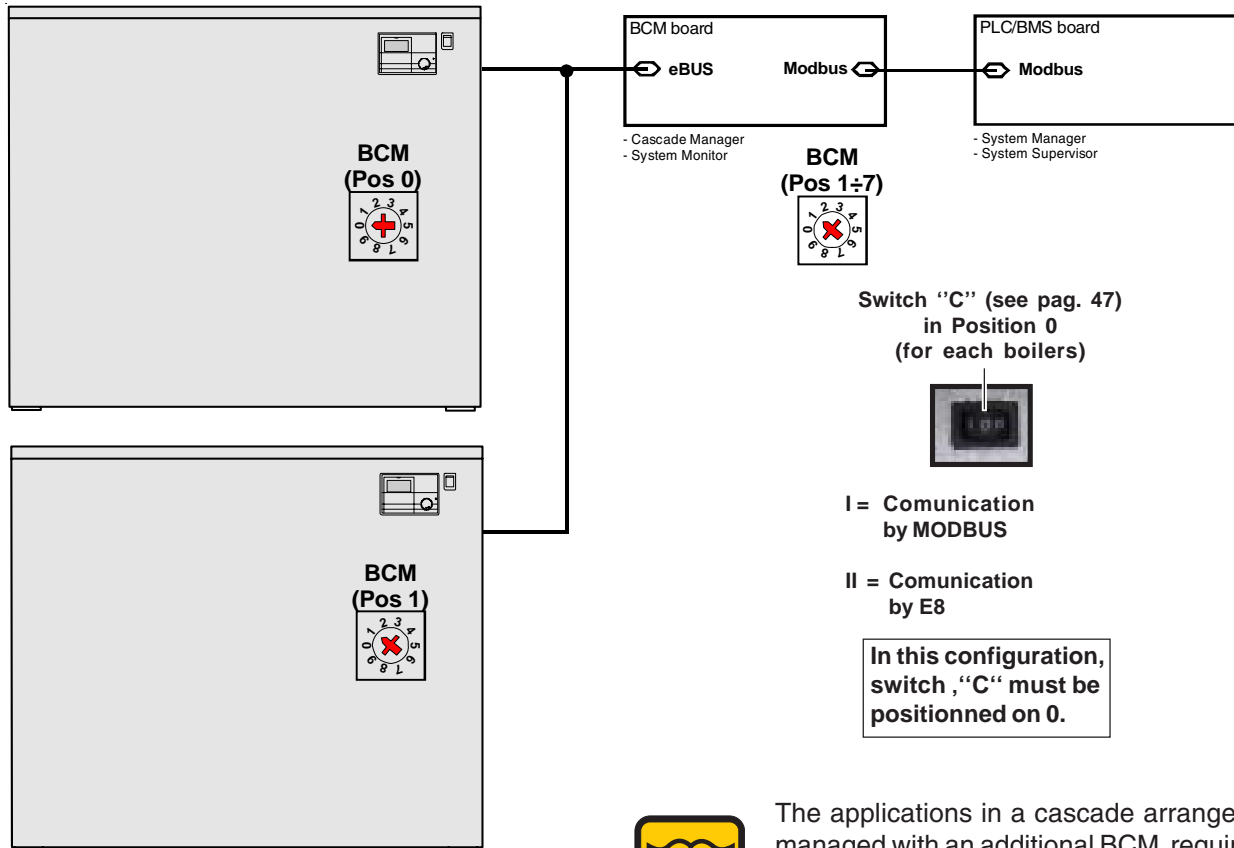


WARNING!
In this connection the "BUS-ID HS," parameter must be set on the E8 heating controller

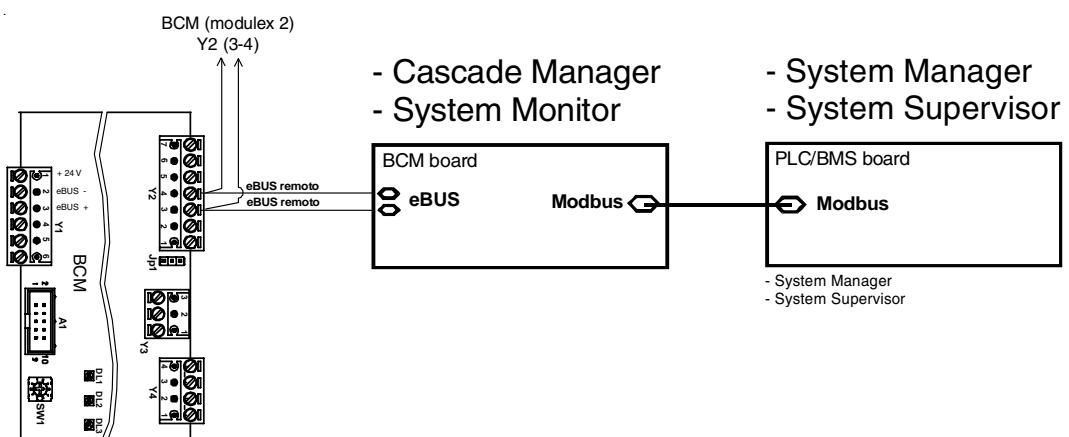
The external E8 heating controller (MASTER) must be set to: - - - - ,
The E8 heating controllers fitted on each boiler (SLAVE) must be set from: **01 to 08**.

Instructions for the installer

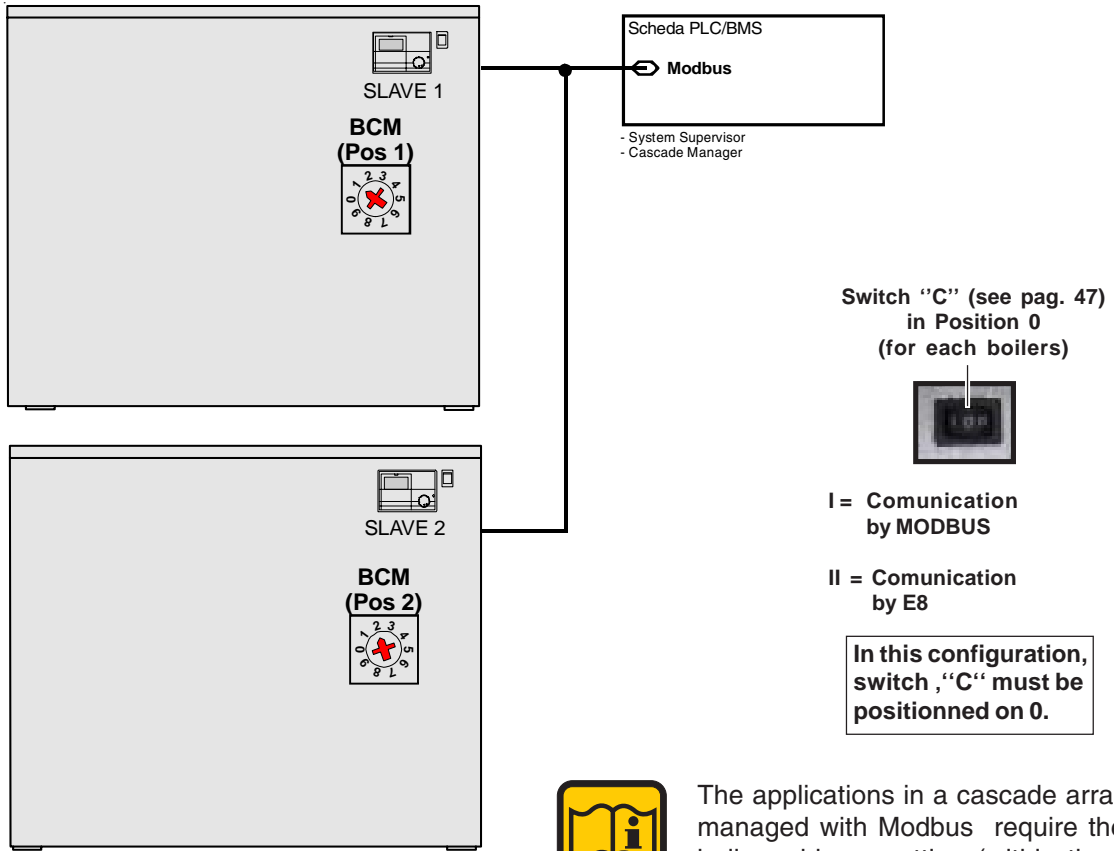
Connection for boilers in a cascade arrangement connected to an external BCM optional and managed by PLC/BMS (E8 disconnected).



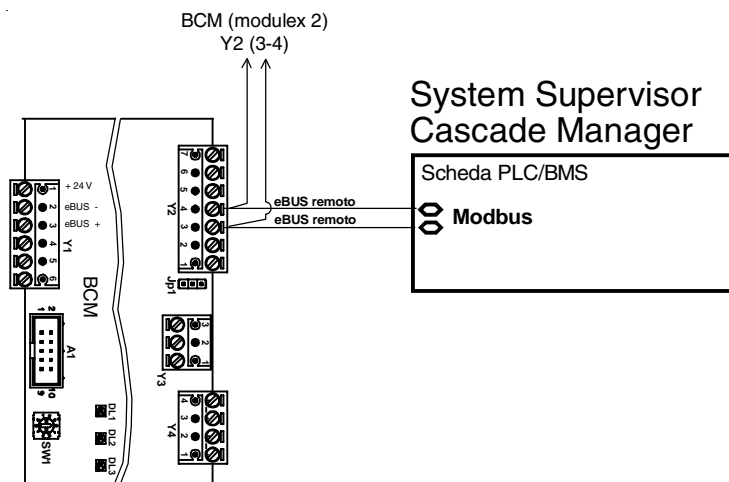
The applications in a cascade arrangement managed with an additional BCM require the correct boiler address setting (within the cascade formation) via the BCM's internal **SWI selector: 0...7**, all different and in sequence, (exactly as requested by the single burner modules).



Connection for boilers in a cascade arrangement managed by an external PLC (E8 disconnected)



The applications in a cascade arrangement managed with Modbus require the correct boiler address setting (within the cascade formation) via the BCM's internal **SWI selector: 1....7**, all different and in sequence, (exactly as requested by the single burner modules).



3.26 - CONFIGURATION WITH A:

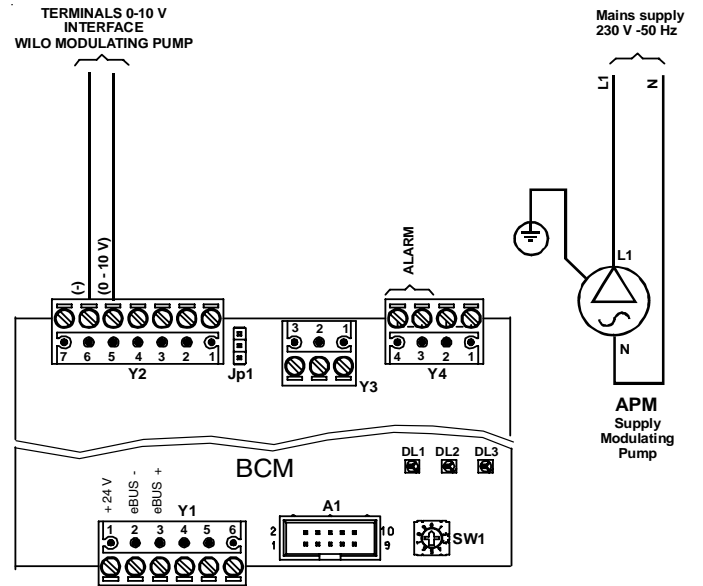
MODULATING PUMP

MODULATING PUMP

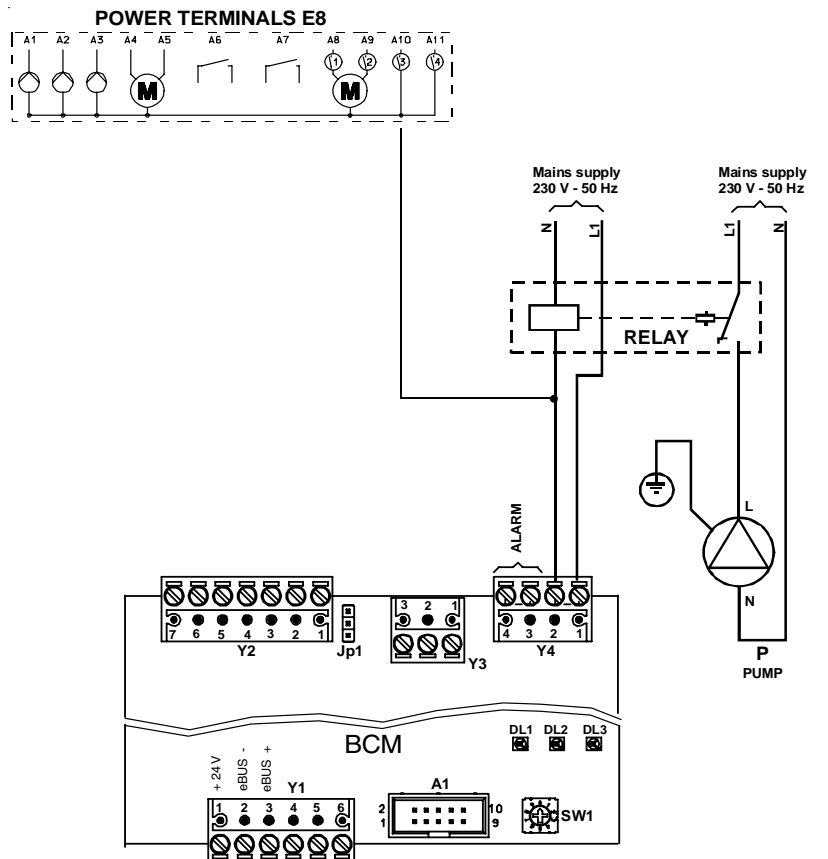
The BCM board elaborates the data concerning the thermal head (Δt between primary flow and return and supplied heat output). When the supplied heat output diminishes, the number of the pump's revolutions decreases and subsequently the hourly rate, maintaining the thermal head practically constant. Thus obtaining a higher efficiency in condensing mode and reducing energy costs.



The 0÷10 Volt modulation signal is preset to:
 -3 for minimum speed
 -10 Volt for maximum speed
 These values can be changed according to the type of pump fitted. For further information on the 0÷10 Volt signal, please also refer to the pump's manual.



ON-OFF PUMP



3.27 - FILLING THE SYSTEM



Warning!

Do not mix the CH system's water with anti-freeze or anti-corrosion solutions using wrong concentrations! It could cause damage to the washers and could provoke noise during normal boiler operation.

UNICAL refuses all liability for injury to persons, animals or damage to property deriving from not having respected the above mentioned recommendations.

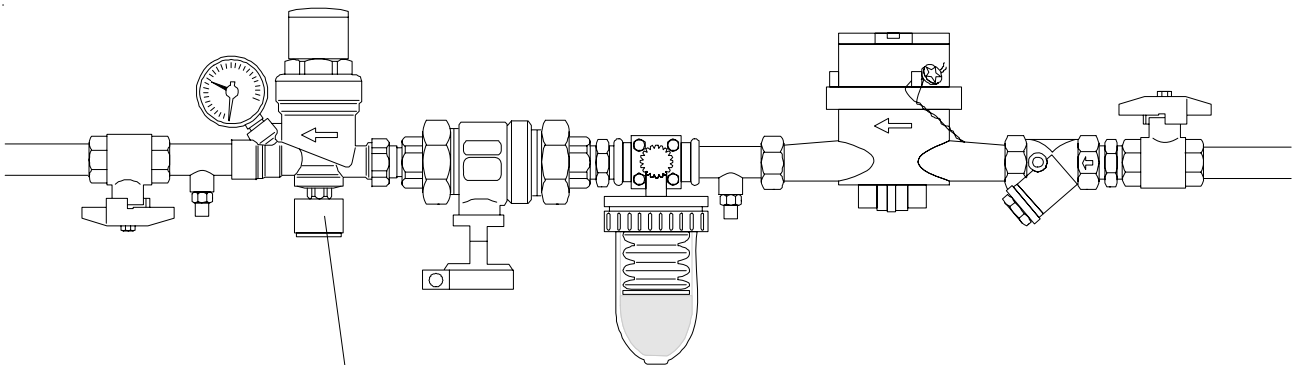
system itself shall be equipped with its own draining tap, whose size depends on the system capacity. The application of a filter on the return pipe to the boiler is advisable.

For filling-up the system a filling tap has to be foreseen on the system return pipe.

The filling-up can also be made through the draining tap on the boiler return manifold.

Never use such a tap to drain the system, since the system dirt could gather in the boiler and compromise its operation. The

EXAMPLE OF FILLING-UP SYSTEM MANIFOLD



Filling group with PRV



IMPORTANT NOTE

Once the system has been filled up at the right filling pressure, the filling group has to be closed.

Instructions for the installer

3.28 - BURNER ADJUSTMENT

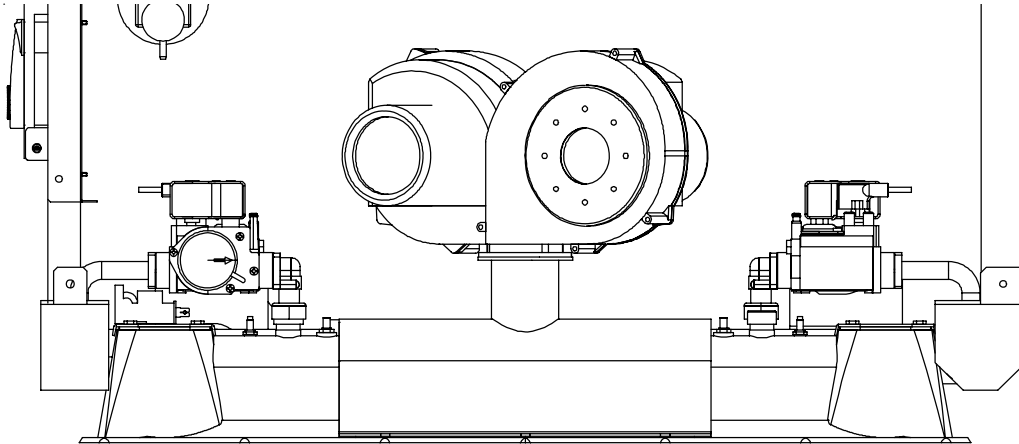


WARNING!

All the instructions indicated below are for the exclusive use of qualified UNICAL service technicians or installers.



All the boilers are supplied already calibrated and tested. If it is necessary to change the calibration due to gas conversion or adaptation to the mains supply system, the gas valve must be re-calibrated.

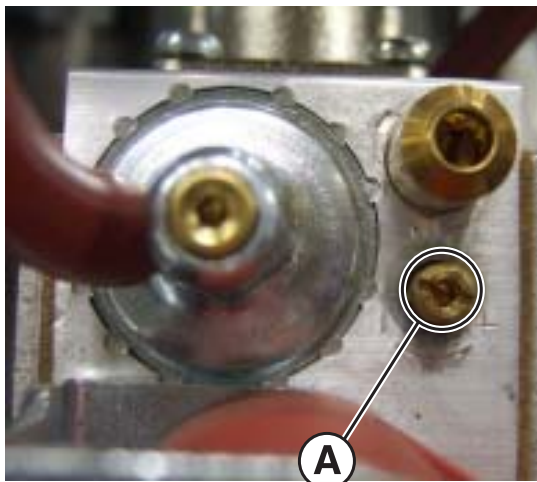


A) Max output adjustment

Remove the cap of the combustion gases sampling point

- Connect a suitable CO₂ gas analyser to the sampling point in the flue inlet/outlet terminal.
- Force the desired burner working at nominal output (CASCADE MAN 100%)
- Check that the CO₂ values are within the values indicated in the table "Burner pressures"
- If necessary correct the value by turning the adjustment screw "A" in a CLOCKWISE direction to decrease the value and in an ANTICLOCKWISE direction in order to increase it.

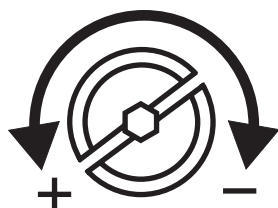
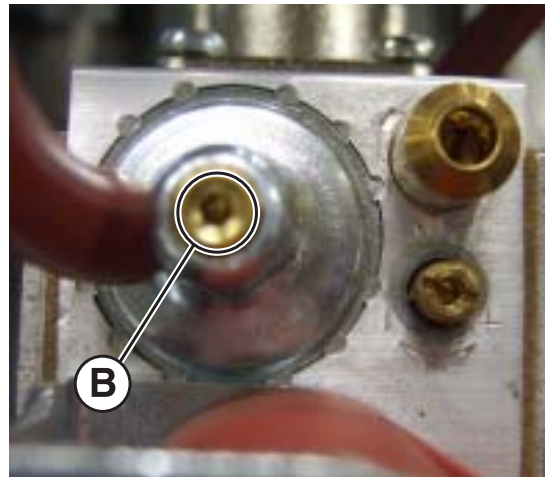
Follow this procedure also for the other burners



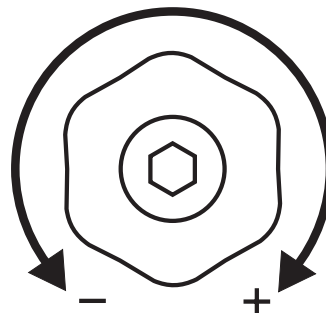
B) REGOLAZIONE ALLA POTENZA MINIMA

- Force the desired burner working at minimum output (CASCADE MAN 10%)
- Check that the CO₂ values are within the values indicated in the table "Burner pressures"
- If necessary correct the value by turning the adjustment screw "B" in a CLOCKWISE direction to increase the value and in an ANTICLOCKWISE direction in order to decrease it.

Follow this procedure also for the other burners



MAXIMUM OUTPUT
ADJUSTMENT SCREW

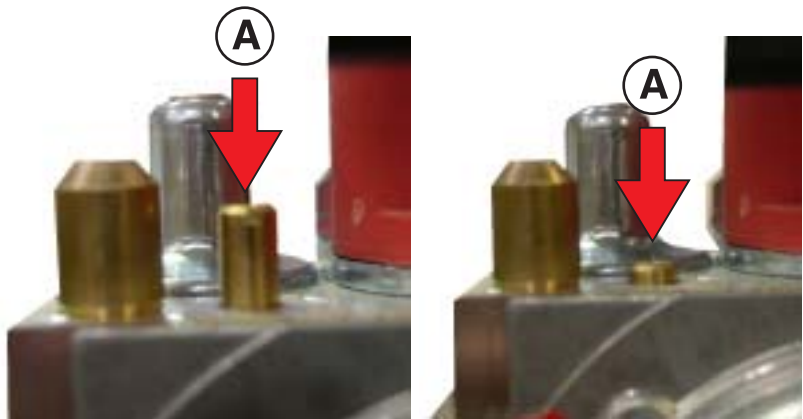


MINIMUM OUTPUT
ADJUSTMENT
SCREW

Instructions for the installer

In case of gas valve replacement or difficult ignition:

Tighten the maximum adjustment screw "A" in a clockwise direction until you arrive to the abutting end, than slacken for 3 turns. Verify the boiler ignition; if the boiler goes into lockout slacken the screw "A" again of one turn, than retry the ignition. If the boiler goes into lockout again, carry out the above indicated operations until the boiler is lighted. At this point carry out the burner adjustment as previously indicated.



If the actual flow rate is too low ascertain that the flue duct is not obstructed. If the flue duct is free, it means that the burner surface and/or the boiler body need to be cleaned.

Smokes sampling point



INJECTORS – PRESSURES

Check the CO₂ levels often, especially at low flow rate

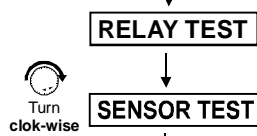
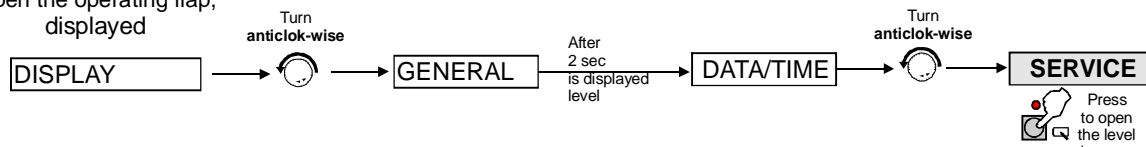
SUPERMODULEX 440 - 550 660 - 770 - 900	Gas type	Supply pressure (mbar)	Supply pressure (mbar)	Diaphragm	Fan speed		CO ₂ levels (%)		Starting power IG (%)
					min (rpm)	max (rpm)	min	max	
	Nat. gas (G20)	20	8,8	-	1800	6300	9,2	9,0	60
	Nat. gas (G25)	25	8,8	-	1800	6300	8,7	8,9	60
	Propan (G31)	37	8,8	-	1800	6300	10,3	10,1	60

Instructions for the installer

SERVICE MODE FUNCTION

Before open the operating flap
turn clock-wise Shaft encoder,
to symbol

Open the operating flap,
displayed



OTHER ENTRIES

Press to open the level

SW NO XXXX

CASCATA MANU

- Turn clock-wise
- Press to open the level
- BOILER 01 - 00%
- BOILER 02 - 00%
- BOILER 03 - 00%
- BOILER 04 - 00%
- BOILER 05 - 00%
- BOILER 06 - 00%
- BOILER 07 - 00%
- BOILER 08 - 00%

CHANGE PER CENT
0% = MIN
TO 100% = MAX



ATTENTION!
The chimney sweeper mode remains active for 15 minutes. Past this period, the standard parametre will be restored. Repeat this operation for each burner:
BOILER 01
BOILER 02
BOILER 03
BOILER 04
BOILER 05
BOILER 06
BOILER 07



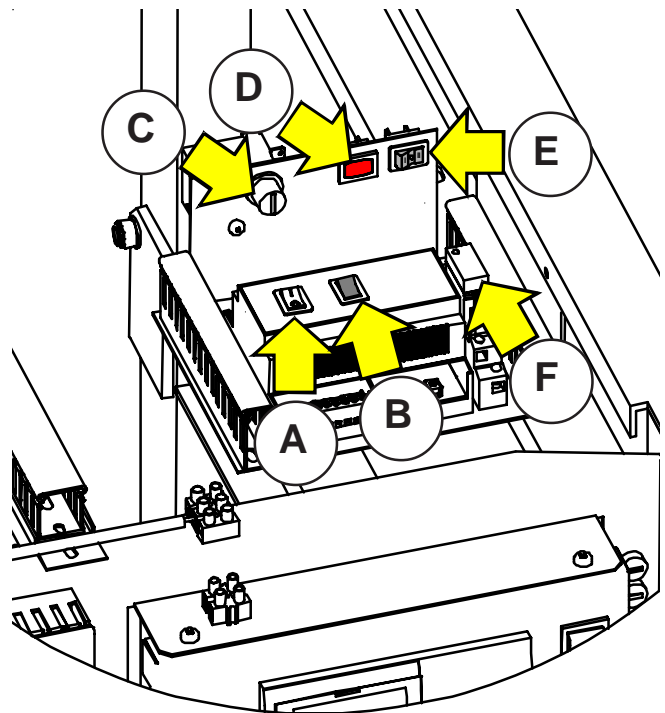
Per caldaia 01 ... 02 etc. si intende il numero dell'elemento termico che si desidera analizzare.

3.29 - EMERGENCY FUNCTIONS

It avoids system shutdown in case the main boiler plant's system management is out of use.

- A) In position I the plant will operate when requested at "CONSTANT SETPOINT": 70°C – Max heat output 50%
- B) Enables burner reset in case of lock-out
- C) TLG General Limit Thermostat: when it acts, it cuts the power supply to the boiler, the warning lamp D lights. To reset, remove the cap and push the reset button.
- D) Warning lamp of the thermostatic lockout of TLG
- E) Change-over
 - 0 = Emergency is active
 - I = Series connection (the cascade is managed by the BCM)
 - II = Parallel connection (the cascade is managed by the E8)
- F) Relay of the condensate level sensor: when the led is On it means every thing is OK;

when the led is Off it means that the condensate level sensor has cut the power supply to the boiler, and the boiler stays Off till the level of the condensate decreases under a certain level.



Yellow LED = Blinking
(communication between BMM and BCM)
OK

Green LED = ON (Pump enabled)

Red LED = ON (Failure code detected)



Note: The switches are positioned under the front panel.



Note: The emergency function enables the boiler's burners to fire only at 50% and at 50°C in system return. All the system's heating loads, including the header pump, must be controlled manually.

3.30 INITIAL LIGHTING

PRELIMINARY CHECKS



The first ignition must be carried out by a qualified technician. Failure to do so could cause injury to persons, animals or damage to property. UNICAL shall not be held liable for any injury and/or damage.

Before lighting the boiler check that:

- the boiler installation has been carried out in accordance with the specific Standards.
- the combustion air inlet and the discharge of the products of combustion occur in the correct way in accordance to the specific Standards in force;
- the gas supply system is correctly dimensioned for the boiler's output;
- the boiler's electrical supply is 230 V - 50 Hz;
- the system has been filled with water (pressure registered on the gauge 0,8/1 bar with pump not running);
- any of the system's on-off valves are open;
- the mains supply gas corresponds to the one which the boiler has been calibrated for: otherwise convert the boiler to use the available gas (refer to section: "GAS CONVERSION"); this operation must be carried out by a qualified technician in compliance to the regulations in force;
- the gas supply cock is open;
- there are no gas leaks;
- the external mains supply switch is on;
- the boiler system's safety valve is not blocked and that it is connected to the sewage system;
- the condensate drain siphon has been filled with water and that it is connected to the sewage system;



DANGER!
Before firing the appliance fill up the siphon through the filling hole and check the correct drainage of the condensate.
If the appliance is used with the condensate drain siphon empty this could cause poisoning caused by the leakage of the flue gasses.

- there are no water leaks;
- all the necessary ventilation conditions and minimum clearance distances are guaranteed for subsequent servicing in case the boiler is sited in a cupboard compartment.

Information to be passed on to the user

The user of the appliance must be instructed on the use and operation of his boiler and in particular detail:

- Hand over to the end user the booklet: "USER'S INSTRUCTIONS GUIDE", as well as all the other literature relative to the appliance and placed in the envelope contained in the packaging. **The user of the appliance must retain this literature for any future reference.**
- Inform **The user** of the importance of the air vents and of the flue outlet system, stressing the fact that absolutely no alteration can be made.
- Inform the user regarding the control of the system's water pressure and how to restore it to the correct value.
- Explain and demonstrate to **The user** the correct function and adjustment of the temperature, thermostats and radiators for the economic use of the system.
- Remind the user that in order to comply to the regulations in force the boiler has to be inspected and serviced regularly as indicated by the manufacturer.
- If the appliance is sold or transferred to another owner or if the present user moves home and leaves the appliance installed, ensure yourself that the manual always follows the appliance so that it can be consulted by the new owner and/or installer.

4

SERVICING SCHEDULE



To ensure the continued safe and efficient operation of the boiler it is highly recommended that it is checked at regular intervals and serviced when necessary, and that only original spare parts are used. The law in force states that the boiler must be serviced annually.



If the boiler is not checked and serviced when necessary it could cause material and personal damages.

For this reason UNICAL recommends that a servicing contract should be made with a heating installer.

The regular inspection is useful to determine the actual state of an appliance and to compare it with an optimum state. This is achieved through measurement, control and observation.

The service is necessary to eliminate eventual deviations of the actual state from the optimum state. This is normally done through the cleaning, the parameters setting and the eventual replacement of single components subject to mechanical wear.

The frequency of servicing will be determined by the service engineer and will depend on appliance's state of condition.

INSTRUCTIONS FOR SERVICING



To ensure a long life to all your boiler components and in order not to alter the conditions of the approved product only original UNICAL spare parts must be used.

After having carried out all the necessary maintenance, always follow these steps:

- Switch OFF the main switch
- Isolate the boiler from mains via a device having, at least, a 3 mm in the switch contacts (e.g.: safety devices or power switches) and make sure it cannot be switched ON accidentally.
- Switch off the gas gate valve upstream the boiler.
- If necessary, and in function of the type of work to be carried out, close any on-off valves fitted on the CH flow and return pipes, as well as the cold inlet valve.
- Remove the appliance's front panel.

After maintenance works have been finished, follow the next steps:

- Open the CH flow and return valves as well as the cold inlet valve (if previously closed),
- Purge and, if necessary, proceed with restoring the heating system's pressure until a pressure of 0,8/1 bar is reached.
- Open the on-off gas valve.
- Reconnect the appliance to the electrical supply and switch on the mains electrical supply.
- Test for gas soundness, on the gas side and on the water side.
- Replace the appliance's front panel..

TABLE OF THE RESISTANCE VALUES IN FUNCTION OF THE HEATING SENSOR (SR) AND RETURN HEATING SENSOR TEMPERATURE (SRR)

T°C	0	1	2	3	4	5	6	7	8	9
0	32755	31137	29607	28161	26795	25502	24278	23121	22025	20987
10	20003	19072	18189	17351	16557	15803	15088	14410	13765	13153
20	12571	12019	11493	10994	10519	10067	9636	9227	8837	8466
30	8112	7775	7454	7147	6855	6577	6311	6057	5815	5584
40	5363	5152	4951	4758	4574	4398	4230	4069	3915	3768
50	3627	3491	3362	3238	3119	3006	2897	2792	2692	2596
60	2504	2415	2330	2249	2171	2096	2023	1954	1888	1824
70	1762	1703	1646	1592	1539	1488	1440	1393	1348	1304
80	1263	1222	1183	1146	1110	1075	1042	1010	979	949
90	920	892	865	839	814	790	766	744	722	701

Relation between the temperature (°C) and the nom. resistance (Ohm) of the heating sensor SR and the return heating sensor SRR.

Example: At 25°C, the nominal resistance is 10067 Ohm
At 90°C, the nominal resistance is 920 Ohm

Servicing schedule



We recommend that periodical service is made by qualified technical personnel according to the frequency stated by national rules in force.

As much as the dust present in the air will be sucked inside the combustion chamber, the smoke side resistance will increase, which, finally, will result in a reduced heat input (and consequently a reduced output). Before cleaning the boiler body sections, check the boiler input and the CO₂ percentage (see 3.28).



Note! A reduction of the input can be caused by the obstruction of the evacuation duct or of the air intake. Check, first of all, that this is not the reason.

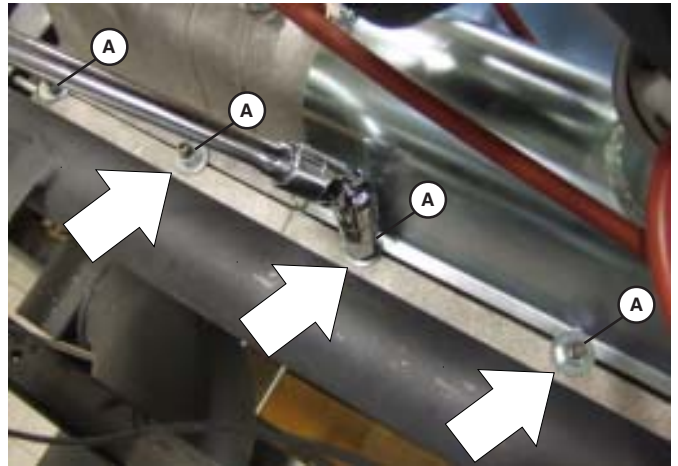
If the actual input (with the correct CO₂) is within 5% of the value shown in the chapter 3.24, the boiler does not need to be cleaned. The operation then, can be limited to the cleaning of the siphon.

1st phase - Disassembly

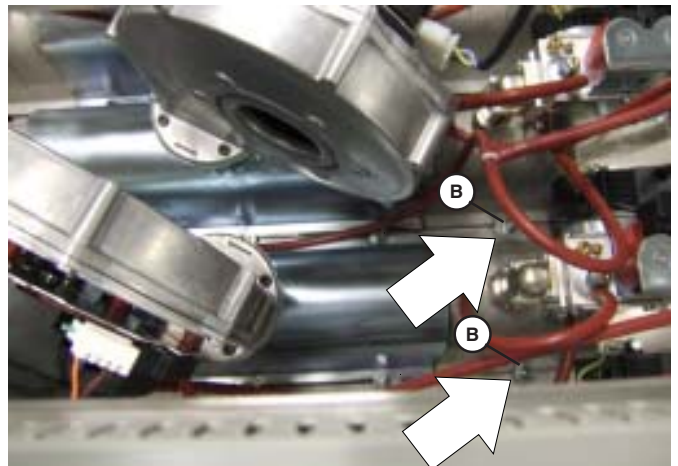
- Switch off power and gas supply and ascertain the gas cock is well closed.
- Unscrew the coupling at the gas inlet.
- Remove the front, rear and top panels of the casing.
- Remove the plug of the supply cord from the 230 V socket
Remove the electrical connections of the modules (it is suggested to regroup separately, with tape, the harness of each individual module)
 - Ignition electrode (orange)
 - Ionization probe (white)
 - Local limit thermostat
 - Heating lead (ignition transformer)



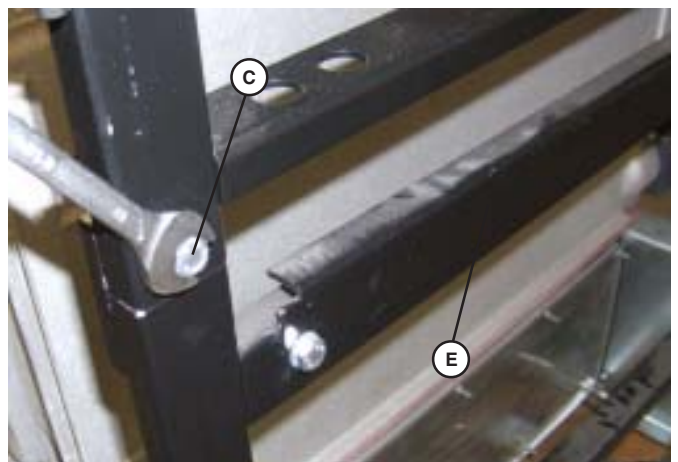
- Remove the screws "A", fixing the burner covers, with a 13 mm socket wrench.



- Remove the "B" fixing screws on the two sides of the burner manifold.

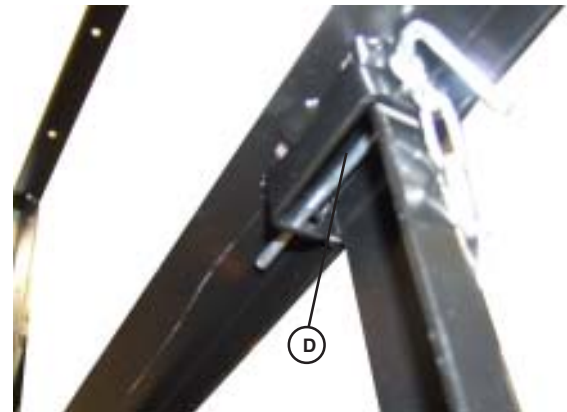


- Remove the 2 screws "C" from the front frame using a spanner of 13 mm



Service schedule

- Remove the safety clip "D" of the supporting rod "E".
- Rotate the burner assembly on its rotation axis (two persons required).



- Bring up the supporting rod "E" and fix it with the safety clip "D".



Servicing schedule

Dismantle burner procedure



Verify the condition of the silicone gaskets; if they are glued to the aluminum body, before removing them, sprinkle on them a silicone product and leave it to act for at least 5 minutes; then proceed as indicated here after.



Warning: proceed with caution, by using gloves and a cutter.

Q



O



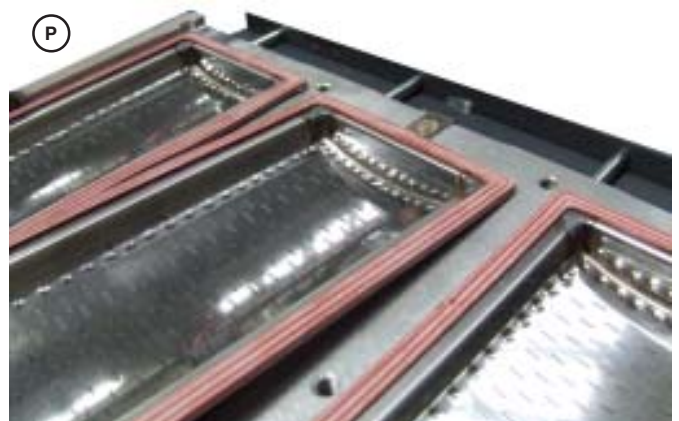
- Disjoin the burner from its seat by inserting a cutter between the red gasket and the aluminium body. Do this on the three sides "L", "M" and "N" of the burner.

- Remove the burner by lifting it **only** on the long sides, **right or left**, as shown in fig. "O", to avoid its deformation.

M



P



N



- Repeat the a. m. operations for each individual burner.



WARNING: AT EACH MAINTENANCE SERVICE IT IS COMPULSORY TO REPLACE THE SEALING GASKET OF EACH BURNER.

**GASKET KIT FOR
SUPERMODULEX Code No. 95251126**

**BURNER KIT FOR
SUPERMODULEX Code No. 95262515**

2nd phase – Cleaning

- Remove from their seat the sealing gaskets and the burners and blow them with compressed air from the convex side to the dished side.



The burner sealing gaskets, must be replaced at each cleaning of the burner.

- Wash, with a water jet, the combustion chamber: pay attention to not to wet the electrical wiring. During this operation ascertain that the condensate evacuation pipe is always free, so that the water cannot come out from the tray.
- Blow with compressed air in the combustion chamber, in between the sections, so that all dirty parts are removed from the aluminum protrusions.
- Once the cast aluminum sections have been washed, make sure the condensate evacuation siphon is free: if necessary clean it.
- Inspect the flue duct and the smoke chamber.

3rd phase – Reassembly

- **Replace the burner sealing gaskets**
- Reassemble all the components previously removed by following the reverse order.
- Before starting the boiler ascertain that the condensate siphon is filled with water.
- Before opening the gas cock on the burner manifold make sure the coupling is well tight. To do this, open the gas cock and check the soundness of the coupling using a soap solution.
- As soon as a burner is put into operation check immediately the soundness between the gas valve and the relevant premixing chamber.
- Make the combustion analysis and check the combustion parameters.
- Make sure that all the gas pressure test nipples, previously open, are closed and tight.

DICHIARAZIONE DI CONFORMITA' / DECLARATION OF CONFORMITY

Unical AG s.p.a

con sede / with headquarters in Castel d' Ario (MN) - via Roma, 123
in qualità di azienda costruttrice di caldaie a gas a condensazione / as gas fired condensing boiler manufacturers

DICHIARA / DECLARE

che tutti i modelli delle gamme / that all the models of the ranges:

Modulex...u: 80u - 120/16u - 120u - 160u - 200u - 240u - 280u - 300u
Modulex...p: 90p - 140p - 180p - 230p - 280p - 320p
Modulex 100: 100 - 116 - 145 - 190 - 240 - 290 - 340
Modulex: 349 - 360 - 450* - 540* - 630*
Supermodulex: 348 - 440* - 550* - 660* - 700* - 900* - 360 - 450* - 540* - 630* - 720*

(*) questi modelli non sono coperti dalla direttiva / These models are not covered by the European directive 92/42/EEC

non appartengono a nessuna delle categorie dell'art.9 del Decreto Legislativo n. 93 del 25 febbraio 2000, in attuazione della direttiva 97/23/CE (in materia di attrezzature a pressione) e che tutti i modelli sopra citati sono completi di tutti gli organi di sicurezza e di controllo previsti dalle norme vigenti in materia e rispondono, per caratteristiche tecniche e funzionali, alle prescrizioni delle norme: / do not belong to any of the categories specified in clause 9 of the European Directive 97/23/EC (regarding pressure equipment) and that all the a.m. models are fully equipped with all the safety and control instruments foreseen by the latest relevant regulations, and comply, with regards to the technical and operating characteristics, to the requirements stated in the following Standards and Directives:

EN 15417 Caldaie per riscaldamento centralizzato alimentate a combustibili gassosi. Requisiti specifici per caldaie a condensazione con portata termica nominale maggiore di 70 kW ma non maggiore di 1000 kW. / Gas-fired central heating boilers - Specific requirements for condensing boilers with a nominal heat input greater than 70 kW but not exceeding 1000 kW.

EN 656 Caldaie a gas per riscaldamento centrale alimentate a combustibili gassosi. Caldaie di tipo "B" di portata termica nominale maggiore di 70 kW ma non maggiore di 300 kW. / Gas-fired central heating boilers - Type B boilers of nominal heat input exceeding 70 kW but not exceeding 300 kW.

pr EN 15420 Caldaie per riscaldamento utilizzando combustibile gassoso - Caldaie di tipo "C" con portata termica nominale superiore a 70 kW ma inferiore a 1000 kW.
/ Gas-fired central heating boilers - Type C boilers of nominal heat input exceeding 70 kW, but not exceeding 1000 kW.

90/396/EEC Direttiva Gas / Gas Appliances Directive

92/42/EEC Direttiva Rendimenti / Boiler Efficiency Directive

2006/95/EC Direttiva Bassa Tensione / Low Voltage Directive

2004/108/EC Direttiva Compatibilità Elettromagnetica / Electromagnetic Compatibility Directive

Gli apparecchi sopra menzionati hanno ottenuto i requisiti di rendimento energetico corrispondente a 4 "Stelle", secondo la Direttiva Rendimenti 92/42/EEC, dall'Ente Omologante CERTIGAZ / The a.m. appliances, with output up to 400 kW, have obtained the 4 stars efficiency classification, according to the Efficiency Directive 92/42/EEC, from the notified body CERTIGAZ.

Sono inoltre marchiate /
All these boiler ranges have
the following



PIN n° 1312BM3615
PIN n° 1312BR4912
PIN n° 1312BR4795
PIN n° 1312BP4012
PIN n° 1312BS4959

Modulex ...u
Modulex ...p
Modulex 100
Modulex 360
Supermodulex

(IT) In attuazione del decreto ministeriale 18 febbraio 2007 e successive modifiche e integrazioni, attuativo della legge Finanziaria 2007 Gli apparecchi sopra menzionati hanno un rendimento termico utile, con carico pari al 100% della potenza utile nominale, maggiore o uguale a $93 + 2 \log P_n$, (dove $\log P_n$ è il logaritmo in base 10 della potenza utile nominale del singolo generatore, espressa in kW), come richiesto dal comma 1a dell'art. 9.

La Unical AG s.p.a. DECLINA ogni responsabilità per sinistri a persone, animali o cose derivanti da manomissioni dell'apparecchio da parte di terzi non autorizzati, ovvero da un'errata installazione, od una manutenzione o riparazione carente o irregolare. / Unical declines any responsibility for injuries to persons, animals or to property deriving from wrong handling of the boiler by unauthorized third parties, or by bad installation or servicing.

Unical AG s.p.a.

Castel d' Ario, 13 Maggio / May 2009

Direttore Tecnico / Technical Manager

Dino Lanza

(Directives 90/396/CEE « Appareils à gaz » et 92/42/CEE « Rendement des chaudières »)
(« Gas appliances » 90/396/EEC and 92/42/EEC « Boilers efficiency » Directives)

Numéro : 1312BS4959 (rév. 1)

CERTIGAZ, après examen et vérifications, certifie que l'appareil :
CERTIGAZ, after examination and verifications, certifies that the appliance :

- **Fabriqué par :**
Manufactured by : **UNICAL AG SpA**
Via Roma, 123
I-46033 CASTEL D'ARIO (MN)
- **Marque commerciale et modèle(s) :**
Trade mark and model(s) :

UNICAL

SUPERMODULEX 348 – 440(*) – 550(*) – 660(*)
770(*) – 900(*) – 360 – 450(*) – 540(*) – 630(*) – 720(*)
(*) ces appareils ne sont pas couverts par la directive 92/42 CEE
- **Genre de l'appareil :**
Kind of the appliance : **CHAUDIERE CONDENSATION (types B23P,C63)**
CONDENSING BOILER (TYPES B23P/C63)
- **Désignation du type :**
Type designation : **SUPERMODULEX**

Pays de destination <i>Destination countries</i>	Pressions (mbar) <i>Pressures (mbar)</i>	Catégories <i>Categories</i>
FR	20/25 ; 37	II2Esi3P
ES-GB-IE-IT-PT-GR-SE-NO	20 ; 37	II2H3P
AT-CH-TR-HR-CZ-SK-SI	20 ; 50	II2H3P
CN-RU-RO-BG-LV-EE-LT	20	I2E
DE	20 ; 50	II2ELL3P
BE	20/25	I2E(R)B
BE	37	I3P
HU	25 ; 50	II2HS3P
LU	20 ; 50	II2E3P
NL	25 ; 50	II2L3P
PL	20 ; 37	II2E3P

est conforme aux exigences essentielles des directives « Appareils à gaz » 90/396/CEE
et « Rendement des chaudières » 92/42/CEE
is in conformity with essential requirements of 90/396/EEC « Gas appliances » and 92/42/EEC
« Boiler efficiency » directives.

Paris le : 30/09/2008

CERTIGAZ
Le Directeur Général



Yannick ONFROY
Rév.2 : 1312BS4959 du 2007/05/10

Unical AG S.P.A.

46033 casteldario - mantova - italia - tel. 0376/57001 (r.a.) - fax 0376/660556
www.unical.ag - info@unical-ag.com

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