

MODULEX EXT.

ENBLOC MODULATING BOILER



A flexible “machine”

Inimitable efficiency

- *deep modulation*
- *very high seasonal efficiency*
- *guarantee of operation*
- *compactness*
- *silence*
- *can be directly used in outdoor installation*
- *maximum accessibility to the components*

This is the DNA of MODULEX EXT.

A careful evolution of the previous one, of which it preserves the excellent prerogatives of success.

MODULEX EXT resolves any installation problem, both, hydraulic and electronic ones.

MODULEX EXT boasts, in absolute, the best ratio between: output/overall dimensions and weight.

- **Wide range formed by 12 gas condensing models**, with outputs from 100 to 900 kW.
- **Very high modulation ratio**, up to **1:40**, in order to supply always the “correct power”.
- Just one **technological boiler block**:
 - pre-assembled thermal elements in **aluminium, silicon and magnesium casting**
 - Unical patented, electronic management system, to instantly give the **maximum efficiency** at any modulated capacity: up to **109%** at the least modulated capacity.
- Integration of the electronic controller within the **disappearing panel board**.
- **Compact** ideal for difficult installations.
- **Light**, thanks to the reduced weight, it allows easy maneuverability in the introduction in the boiler house; *it can also be supplied in loosen parts and reassembled in the boiler house.*
- **Silent**: a “breath” also at its maximum capacities, thanks to its combustion characteristics and to the sophisticated technology of the new fans, gas valves and multi-gas burners.

MODULEX EXT	ErP heating class	Thermal modules	Output condensing mode (kW)	Modulation ratio	Production of condensate (kg/h)	Dimensions (W x D x H)
100	A	2	12÷100	1:8	15,3	764x770x1150
116	A	3	12÷116	1:9,7	17,7	764x770x1150
150	A	3	12÷150	1:12	23	764x770x1150
200	A	4	12÷200	1:16	30,6	1032x770x1150
250	A	5	12÷250	1:20	38,3	1032x770x1150
300	A	6	12÷300	1:24	45,9	1300x770x1150
350	A	7	12÷350	1:28	53,6	1300x770x1150
440	*	4	22÷432	1:19,6	73,4	1087x946x1448
550	*	5	22÷540	1:25	91,7	1355x946x1448
660	*	6	22÷648	1:29	110	1355x946x1448
770	*	7	22÷756	1:34	128,4	1623x946x1448
900	*	8	22÷864	1:39	146,7	1623x946x1448

* Appliances not covered by Directive 2009/15/EC



*A “beating Motor” that goes beyond
the simple concept of boiler.*

The difference in 8 points



MODULEX EXT, the perfection of the technology applied to the heat production, was born from 10 years of experience, of success and updates.

BREVETTO
Unical
PATENT

15 claims

Patented constructive technology



first generator with **modular sections complete of premix modulating burners**



castings of the **thermal elements in light alloy**



cooling water ways in serpentine shape



original fin to increase its exchange surface



standardized flow and return manifolds without interceptions between every section and hydraulically balanced



burners, complete of safety devices



non return smoke valve



command and control electronic system with **proportional regulation** of one/all the thermal elements

The details



HIGH EFFICIENCY MODULATING PUMP



CROSS-SECTION OF THE PREMIX MULTI-BURNER



WORKING AND SAFETY TEMPERATURE SENSORS
IGNITION ELECTRODES & IONISATION PROBES



BUILT-IN NON RETURN
SMOKE VALVES



PREMIX BURNERS WORKING AT
CONSTANT CO₂



STANDARDIZED HYDRAULIC
MANIFOLDS



PRIMARY CIRCUITS WITH ADDITIONAL
SAFETY DEVICES KIT



PRIMARY RINGS
WITH PLATE HEAT EXCHANGERS

Maximum saving and seasonal efficiency

High efficiency thanks to:

- certified efficiency up to **109%** at the minimum modulated capacity
- seasonal efficiency: **+ 30%** if compared with the conventional boilers
- inimitable modulation ratio: **UP TO 1:40**
- **modulating pump** directly managed by the boiler to assure the maximum condensation at all regimes

Total safety

- high reliability due to **MULTIBURNER** composition and to the low number of parts in movement
- **working** and **safety temperature sensors** on every casting section
- premixing within **the fan with non return built-in valve**
- **auxiliary electronic circuits**
- **emergency operation** in case the E8 controller is out of service

Flexibility of installation

- outdoor installation: protection degree **IPX5D**
- compact, light, of easy connection:
 - **reversible hydraulic and gas connections** (up to the mod. 350 kW)
 - **smoke evacuation: possible on 3 sides** (for all the models)

Low environmental impact

- **low polluting emissions** : <31 ppm Low NO_x (according to EN 15420)
- **low acoustic impact** <49 dBA
- **low chimney flue losses**
- **totally premix, radiation, modulating burners**, working at constant CO₂

Exclusive electronic technology

- **electronic management and thermal regulation** completely automatic and pre-programmed (patented)
- possible **cascade installation up to 8** boilers
- predisposition for **telemangement and telecontrol**

Wide range of dedicated accessories:

- Primary ring with additional safeties Kit
- Plate heat exchanger with additional safeties Kit
- Acidic condensate neutralizers
- Regulation of additional zones

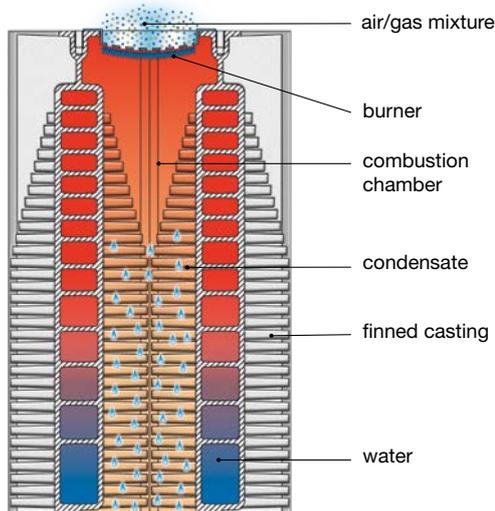
Pre-assembled thermal elements

MODULEX EXT is a thermal module fruit of the assembly of complete combustion units. Every unit is constituted by pre-assembled thermal elements, in **Al/Si/Mg**.

Every element supplies, in continuous and progressive way, from 12 to 50 kW for the models up to 350 kW, and from 22 up to 108 kW for larger models.

More than 10 years experience assure:

- **resistance to the corrosion of the acidic condensate**
- **keeping of the very high thermal efficiency**

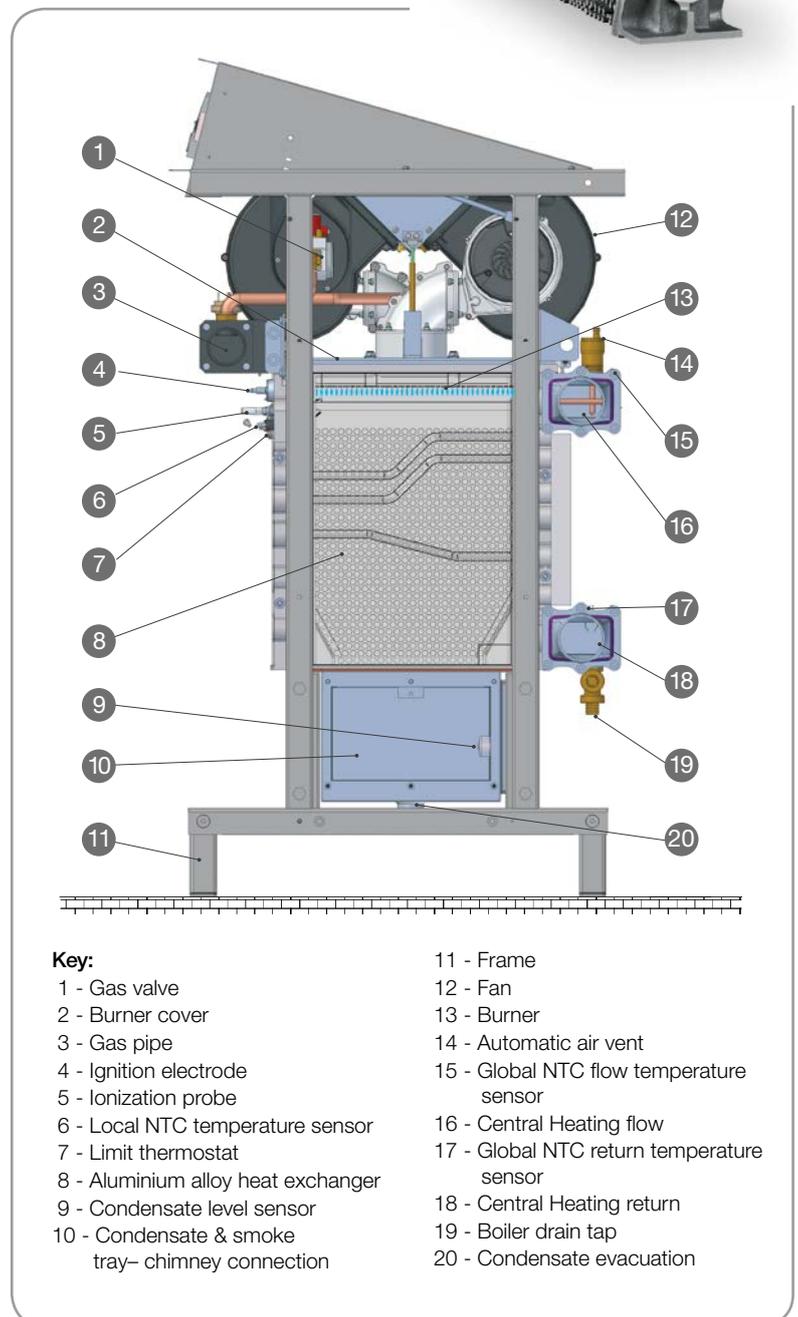


The basic element is formed by **two aluminium alloy castings** that, on the smoke side, have dense **finns**, with increasing height toward the smoke evacuation, placed in lower part of the casting, in order to increase its exchange surface (**Unical patent**).

Inside the castings there are the water channels that, always with more reduced section, zigzag cross the casting, granting an exceptional heat transfer from combustion gases to the water. Every thermal element is equipped with:

- *premix modulating radiation burner*
- *two stage modulating gas valve*
- *electronic ignition and ionization*
- *NTC working temperature sensor*
- *safety thermostats*
- *flame sight glass.*

The smoke and acidic condensate of the thermal elements are collected in a stainless steel tray.



Radiation combustion

Totally premix

Main protagonist for a perfect combustion and therefore the maximum efficiency, is the **modulating fan** (1000-6000 rpm) of which every unity is equipped.

The number of rpm of the fan, together with the opening of the valve gas and the flame control, is directly programmed and controlled by the electronics of every burner (**BMM Burner Modular Module**) and, at their turn, they are managed by the E8 controller.

The output modulation depends on the rotation speed of the fan and is based on the difference between *the C.H. required temperature, the maximum planned one and that indeed measured.*

The opening of the valve gas is produced by the “*Venturi effect*” in the Cochlea of the fan and the mixture air and gas happens to its inside before being introduced in the combustion chamber (premix).

This perfect “mixing” combines the air and gas in parts always proportionate to produce, through the multi-gas burner, the “*radiation combustion*”.

This system, characterized by the issue of electromagnetic radiations, is the most efficient for the transmission of the thermal energy.

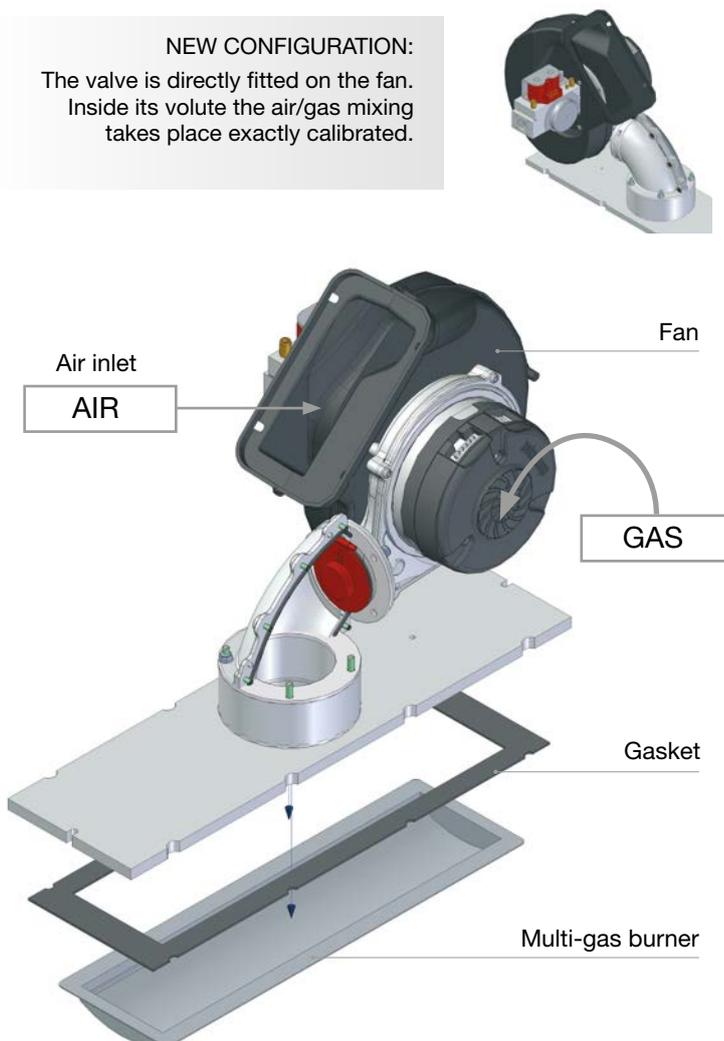
The wide surface, on which the combustion happens, guarantees:

- *low combustion temperature*
- *reduced turbulence*

with the following **advantages**:

- long lasting of the burner thanks to the low thermal and mechanical solicitations and to the physical inalterability of its mesh in FeCr Alloy fibre that, thanks to its chemical-physical structure, constitutes an ideal radiation means
- high combustion silentness thanks to the low pressure and to the anti-resonance structure of the fan, capable of developing a soft flame
- simple maintenance thanks to the use of few components and easy accessibility
- larger quantity of transmitted energy in comparison to a traditional burner with the same flame temperature
- absolute working safety for the absence of turbulences
- very small production of pollutants due to the complete oxidation of the gas molecules;
 - excellent combustion efficiency: maximum $CO_2 = 9,3\%$
 - efficiency optimization thanks to the low smoke temperature and the limited “air excess”
 - very low pollutant emissions: $NO_x < 53,8$ mg/kWh (pondered value according to EN 15420).

NEW CONFIGURATION:
The valve is directly fitted on the fan. Inside its volute the air/gas mixing takes place exactly calibrated.



Instant answer energy

MODULEX EXT, of revolutionary constructive conception, that, more than 10 years ago, broke the classical schemes of the boilers to the point not to find applicable reference standards, anticipates characteristics today become a must.

■ **Setting possibility according to the thermal needs of the C.H. system**

This function allows to drastically reduce the number of switching ON and OFF of the boiler. (Possible customization of the requested output).

Advantages:

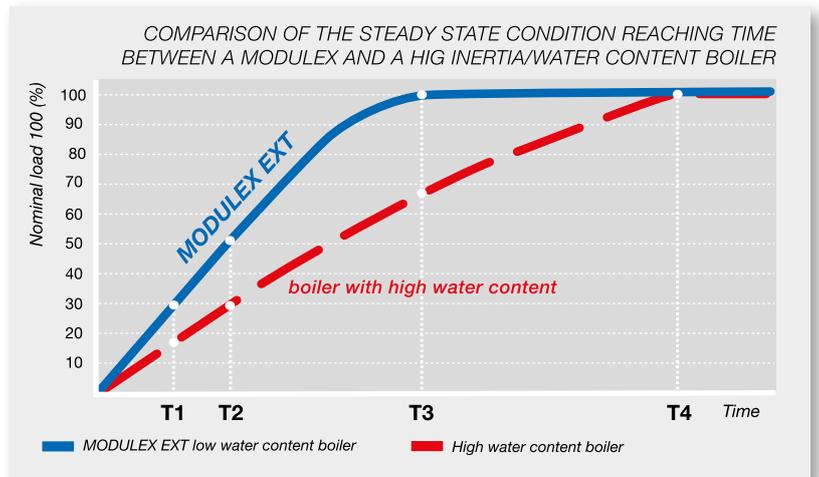
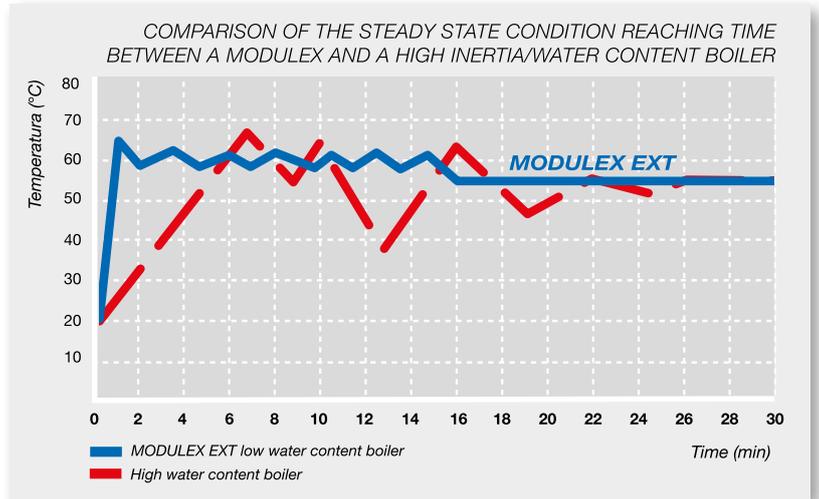
- Higher efficiency and lower flue losses when burner is OFF.
- Longer lasting of the parts in movement and of the ignition systems.

■ **Very low water content and high modulation speed with maximum output ratio up to 1:40**

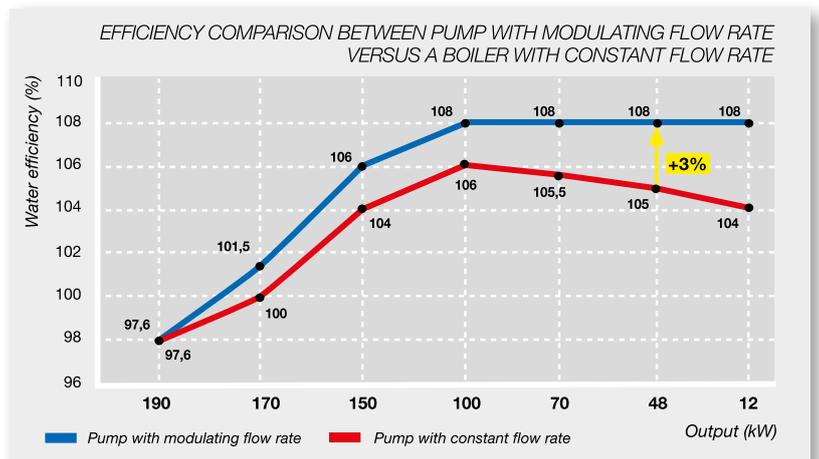
On average a boiler operates for satisfying the actual 50% of the thermal needs of the C.H. installation and descend also below 30%. MODULEX EXT adjusts in real time its output to these necessities, because it is not influenced by the thermal inertia, thanks to its low water content and, being equipped with modulating pump, it further reduces the electric consumptions.

■ **Class A, variable speed, electronic pumps, for the maximum condensate production**

This function exalts the production of condensate and therefore the fast economic recovery of the investment. All this in order to offer the user the possibility to save with the maximum comfort both, for C.H. and D.H.W. production, with a lower noise level than the traditional boilers.



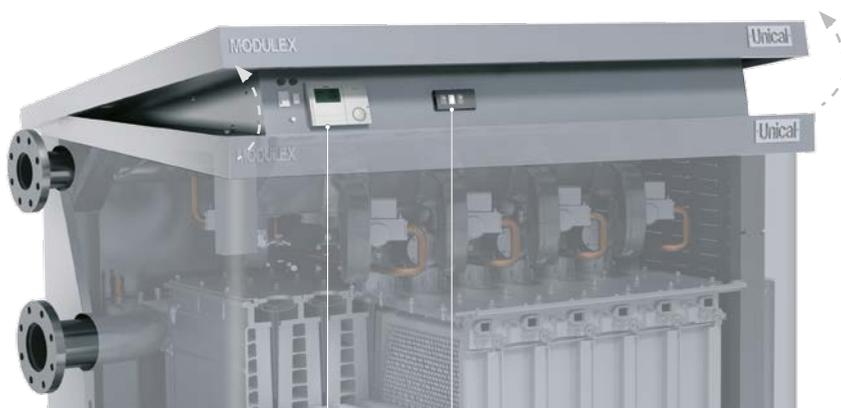
After the time "T1" from the starting, MODULEX EXT succeeds in satisfying the 30% of the load unlike a traditional boiler that, in the same time, is just at 15%.
 After the time "T2" MODULEX EXT is at 50% of the load, while the traditional one is at 30%.
 After the time "T3" MODULEX EXT is at 100% of the load and the traditional one is only at 70%.
 This is an example of speed of a genial boiler!



Disappearing panel board

Surprising the access to the panel board

A perfect pneumatic system with gas dampers lifts the impermeable cover of MODULEX EXT. The safety block prevents tampering.



E8 Thermo-controller

BCM Boiler Cascade Manager

This way appear:

- **E8** the Thermo-controller
 - **BCM** Boiler Cascade Manager
- that represent a decisive qualitative jump in the management of the boiler according to the applied loads.

E8 is supplied complete with:

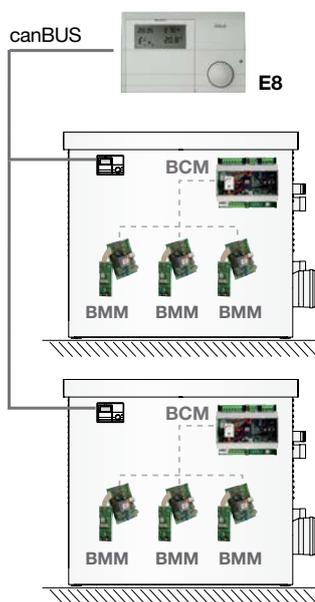
- external temperature sensor
- flow temperature sensor for mixed zone (zone 1)
- boiler temperature sensor
- D.H.W. storage tank temperature sensor

Besides to become the dialogue window with the boiler, thanks to its peculiarities, E8 allows the complete management of the C.H. system, exploiting the maximum attainable condensation and output modulation.

Modulation in cascade

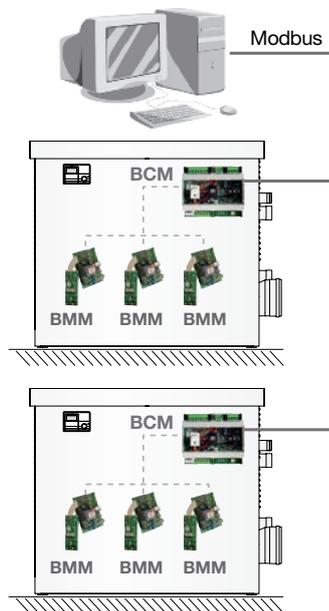
The applicable systems of communication: **eBUS**, **Mod-bus** and **canBUS** allow the maximum elasticity in the cascade management, leaving **free choice** to the consumer for the **last interface of management**.

CASCADE MANAGED BY E8



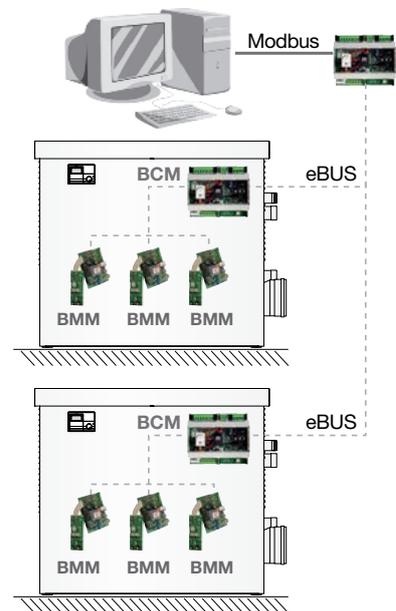
BMM= Burner modul manager

CASCADE MANAGED BY PLC



BMM= Burner modul manager

CASCADE MANAGED THROUGH BCM



BMM= Burner modul manager

E8, the thermo-controller

- **Cascade of 2 up to 8 MODULEX EXT** with simple connection.
- **KIT OF ZONE EXPANSION E8** to control 2 direct/mixed zones and a D.H.W. storage tank up to a maximum of 7 modules that can be connected with a two wire cable.
- **Remote management and remote control** through dedicated software and accessories, with electronic board CO.CO.PC and GSM connection.
- **Communication** with the central automation systems (PLC).

For additional information, please contact our pre-sale department.



SYSTEM OPTIMIZATION



BOILER HEATING OPTIMIZATION

The heating controller, on the basis of the timer/heating programme set by the user, once the system's characteristics have been evaluated, will activate the function for automatically bringing forward the heating ignition time so as to ensure that the set temperature is reached at the time requested by the user.



FAST SET TEMPERATURE

This is obtained by calculating the optimum ignition start-up time. This calculation can be carried out taking into consideration the outdoor temperature or the room temperature.



OVERHEATING PROTECTION

The boiler's safety temperature is controlled via the pump's overrun time in order to get rid of any thermal inertia.



SELF-ADAPTION

Through the elaboration of data transmitted by the room sensor, this function adjusts the boiler's output to the building's characteristics, ensuring a constant monitoring of the indoor temperature on the basis of the variation of the outdoor temperature, keeping in consideration the building's thermal inertia and the contribution of "free" heat (solar radiation, internal heat sources etc).



SLOPE OFFSET (HEATING SLOPE DISTANCE)

The boiler temperature that is required for a mixed circuit is calculated by adding to the calculated temperature setting for the heating circuit temperature the heating slope distance. The heating slope distance compensates for sensor tolerances and heat loss up to the mixer.



NUMBER OF BURNER IGNITIONS

It stabilizes the number of ignitions of each burner.



BURNER RUN HOURS

It stabilizes the run hours of each burner.



VALVE OPENING TIME

Based on the characteristics of the servomotor.



FROST PROTECTION MODE

The frost protection operation mode prevents the CH system from freezing by automatically switching heating operation on. In the frost protection mode, the room temperature for all the heating circuits is set to 5°C and the storage tank sensor frost protection is activated when the temperature drops below 10°C.

DHW CONTROL



DOMESTIC HOT WATER PRODUCTION

There are many programmes which control the domestic hot water production. You can choose from the maximum of comfort to the maximum fuel saving. In order to permit the storage cylinder to supply hot water rapidly, the heating controller brings the boiler's temperature to the maximum set value.



ANTI Legion

Every 20th heating start-up or once a week on Saturday at 01:00 hrs, the storage tank is heated up to 60°C. This function will eliminate any eventual pathogens which have formed in the DHW.



DHW OPTIMIZATION (LOADING PUMP)

The DHW loading pump is switched on only if the boiler temperature exceeds by 5°C the storage tank temperature. It is deactivated when the boiler temperature drops below the storage tank temperature or if the storage tank temperature is higher than the nominal temperature.

SETTING



PROGRAMME SETTING

The heating programmes can be set daily or weekly, with more than one On-Off firing times or temperature reductions during the arch of the day.



MULTIPLE ZONE CONTROL

With the same heating control device you can control 2 independent circuits with different characteristics, though having ensured all the described functions, including the deep sliding temperature function.



0-10 VOLT SIGNAL

the great flexibility of the E8 also permits the boiler set point to be controlled by an external control signal. This will enable, having at disposal an even more complex system, to exploit all the heating control's functions..



MANAGEMENT OF UP TO 15 MIXED CIRCUITS

controlled by the outdoor sensor.

ENERGY SOURCES CONTROL



INTEGRATION WITH RENEWABLE ENERGY SOURCES

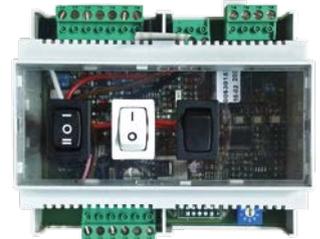
As for example: solar systems and/or solid fuel fired boilers.

BCM: Boiler Cascade Manager

BCM, powerful electronic module, created by Unical for:

- Managing the inside cascade of the boiler thermal elements
- Supplying double certainty of operation (emergency operation in case of breakdown to the thermo-controller E8, with activation of the heat request at constant setpoint with maximum capacity of 50%)
- Managing the modulating pump of the primary rings (Analogical outlet 0-10 V) with significant efficiency increase at part loads
- Allowing the integration in the boiler house automation systems, realized with industrial PC /lonWorks/Modbus for Building Automation

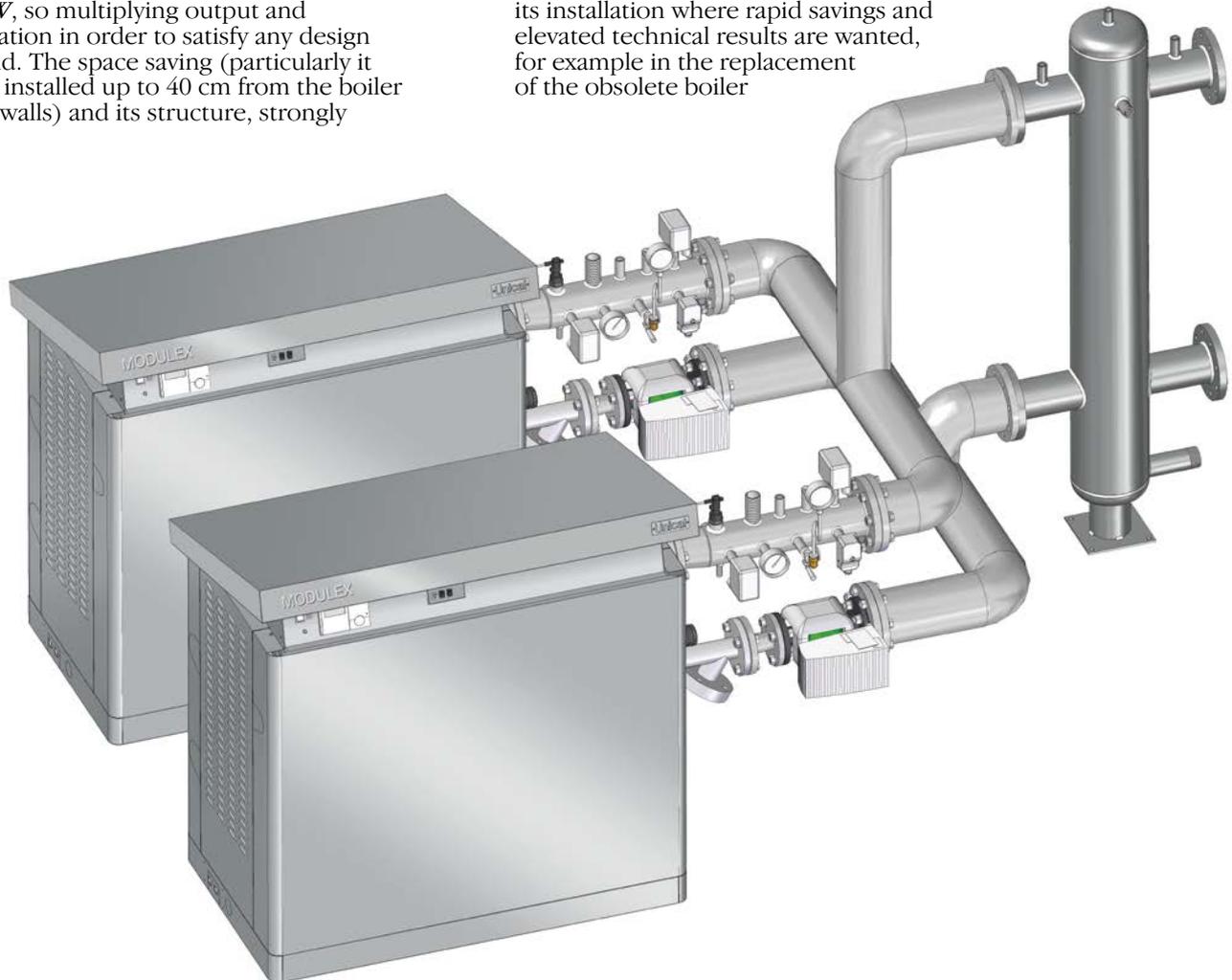
- Checking the heat demand: temperature setpoint and modulation level
- Monitoring the state of working temperatures
- Planning the parameters
- Managing and resetting the alarms
- Remoting alarm signals through relay.



Cascade installations

With the cascade installation, the boiler output range can be widened well **over 900 kW**, so multiplying output and modulation in order to satisfy any design demand. The space saving (particularly it can be installed up to 40 cm from the boiler house walls) and its structure, strongly

addressed to a service model highly rational and of fast intervention, will make convenient its installation where rapid savings and elevated technical results are wanted, for example in the replacement of the obsolete boiler



The top logic

Output flexibility and efficiency

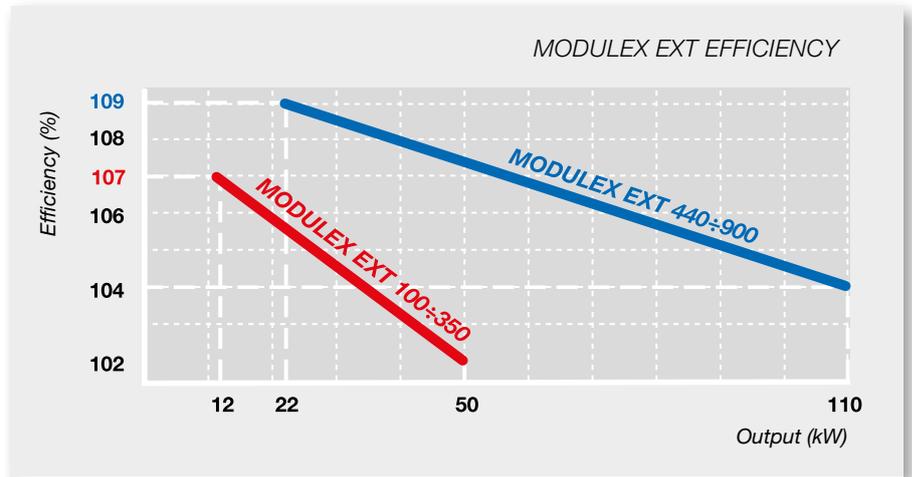
MODULEX EXT has a certified efficiency that, for the models superior to 350 kW, when working in condensation, progressively increases up to **109%** when the output is reduced.

The particularity of the thermo-controller E8 is to keep ON the **greater number of elements** as possible, working **at the smallest possible output** (as shown in the examples beside).

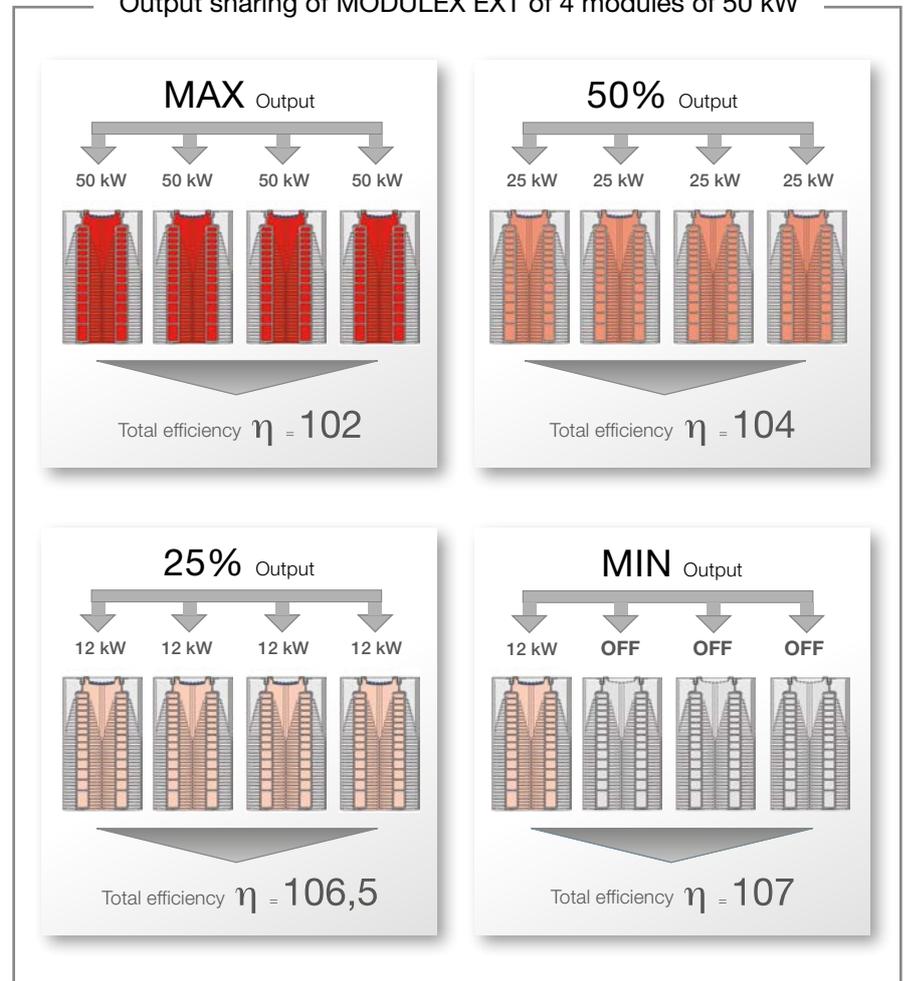
Exploiting this peculiarity, the system will always work in the conditions of maximum possible efficiency, independently from the supplied output.

Always with the same principle when the C.H. needs go reducing, also the capacity of every module will be regulated and reduced consequently in proportional measure. Being the least power of every module 12 kW (models up to 350 kW), if the requested output is lower than the addition of the least powers of the single modules (n° modules \times 12 kW), will be maintained operational only the elements necessary to the attainment of the requested output, working at the maximum efficiency, and disabled the others.

Besides, to assure an equal daily rotation of the modules, every 24 hours the ignition of the modules will be alternate so that every one operates for the same number of hours.



Output sharing of MODULEX EXT of 4 modules of 50 kW



The right solution...

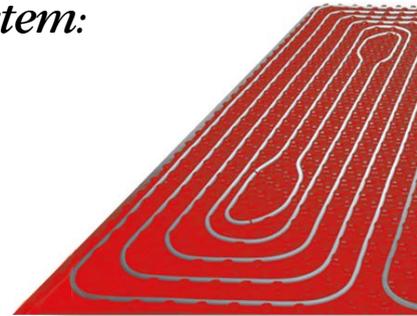
The integrated design of the building-installations system: from the boiler to the Unical integrated system

With the collaboration of the designers of heating systems, more sensitive to the actual energetic problems, Unical, in the time, has turned the MODULEX EXT in the fulcrum of a real dedicated system, “**PLUG & PLAY**” to realize installations that optimize:

- *Comfort and low energetic consumptions*
- *Small size installations (downsizing)*
- *Control of the investment cost (cost of the life cycle)*
- *Integration of the renewable sources*
- *Execution speed*
- *Reduction of the maintenance costs*

The professionals, therefore, can count on a series of coordinated elements, entirely studied and produced by Unical:

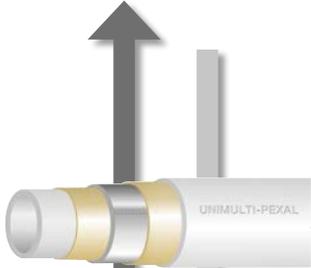
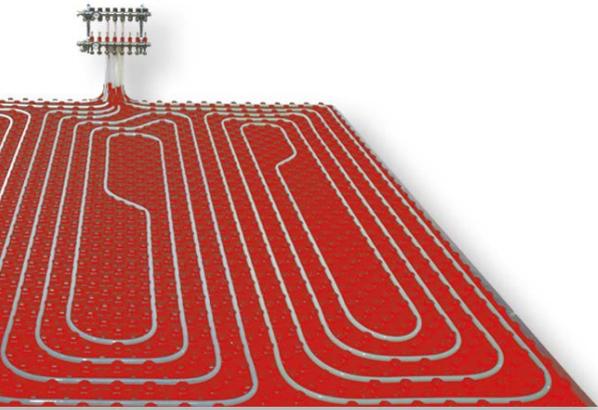
- **Primary rings** for installation interface plant with mixing header
- **Primary rings with plate heat exchanger**
- **Zone satellites** that, connected to the central boiler, allow the end user to have in his house the convenience of an autonomous boiler, without flame, assuring maximum individual comfort and minimum consumptions, always under control.



Floor heating
The low temperature operation is translated in less necessary heat with consequent saving.
With the range **STRATINOX**, the technician has all the necessary to realize a heating system that respects the comfort of the consumer, inclusive of the guarantee of Unical experience.



...for a perfect installation



MAX MULTYPEX

System of pipeline in multi-layer PEX-Al-PEX for heating /conditioning and sanitary use, with thermal insulation, complete of press fittings and all the accessories for an easy installation.



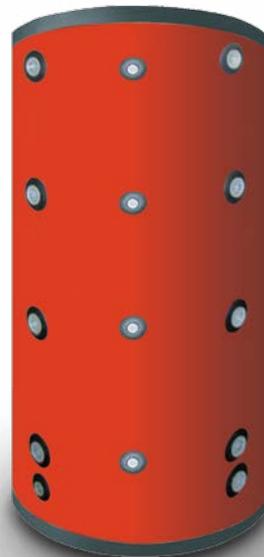
SATAL

Apartment modules for the autonomous management of the centralized heating, with room temperature regulation and devices for energy and sanitary water countering for the sharing of the expenses.



With the thermal solar panels the whole heat of the sun is captured: **TITANIUM, TITANIUM O, TITANIUM XL and SUN[®]** are the complete offer of Unical to get free heat.

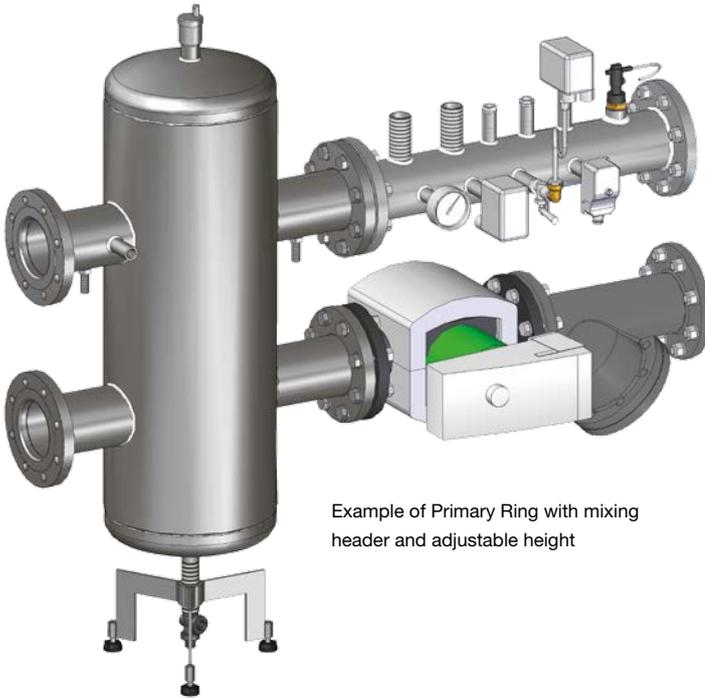
An efficient solar system needs reliable components, such as **solar circulation groups and controllers**. Unical puts **a complete range of accessories** at the service of the technician.



The range of **BISER, MULTIPOWER, MULTIPOWER PLUS**, storage tanks with high efficiency coil allow an elevated heat exchange and optimize the integration through the thermal solar panels.

The Unical pre-sale service will supply consultation to the planning to best exploit the exclusive characteristics of MODULEX EXT.

Primary rings with mixing header



Example of Primary Ring with mixing header and adjustable height

Primary rings pre-assembled and with jacket

MODULEX EXT is a low water content boiler and therefore a low thermal inertia boiler:

- *high speed of output supply*
- *immediate answer to the load variations*
- *minimal heat losses.*

The great variations of flow rate and temperature that follow are, therefore, conveniently balanced by the so-called hydraulic separator, before reaching these ultramodern “heating engines”.

Unical introduces **the new range of 5 primary rings with ultra-compact hydraulic separators.**

Advantages:

- *Complete system, developed and tested in our laboratories*
- *Rapidity of putting into service*
- *OGNITEMPO EXT, a special casing for coverage of the primary rings in outdoor installations (class IPX5D).*

Class A modulating high efficiency ErP pump

Balance between supplied output and water flow rate. Extraordinary strength's point for all the MODULEX EXT is the **modulating pump**, directly controlled by the boiler.

For the first time, in a low water content multi-section boiler, a perfect equilibrium is created between the supplied output and the water flow rate, practically under all the working conditions.

Thanks to the advanced electronic panel board, the BCM card elaborates, in continuous way, the data related to the Δt between flow and return and the supplied output.

The result of this comparison will bring to:

- **Increase of the pump flow rate** if the thermal jump increases too much
- **Reduction of the pump flow rate** if the thermal jump reduces too much.

It follows that the exploitation of the condensation is the best, because MODULEX EXT always operates with the return temperature as low as possible.



Mixing headers

Designed and manufactured in Unical, they follow rigorous sizing criteria, in terms of:

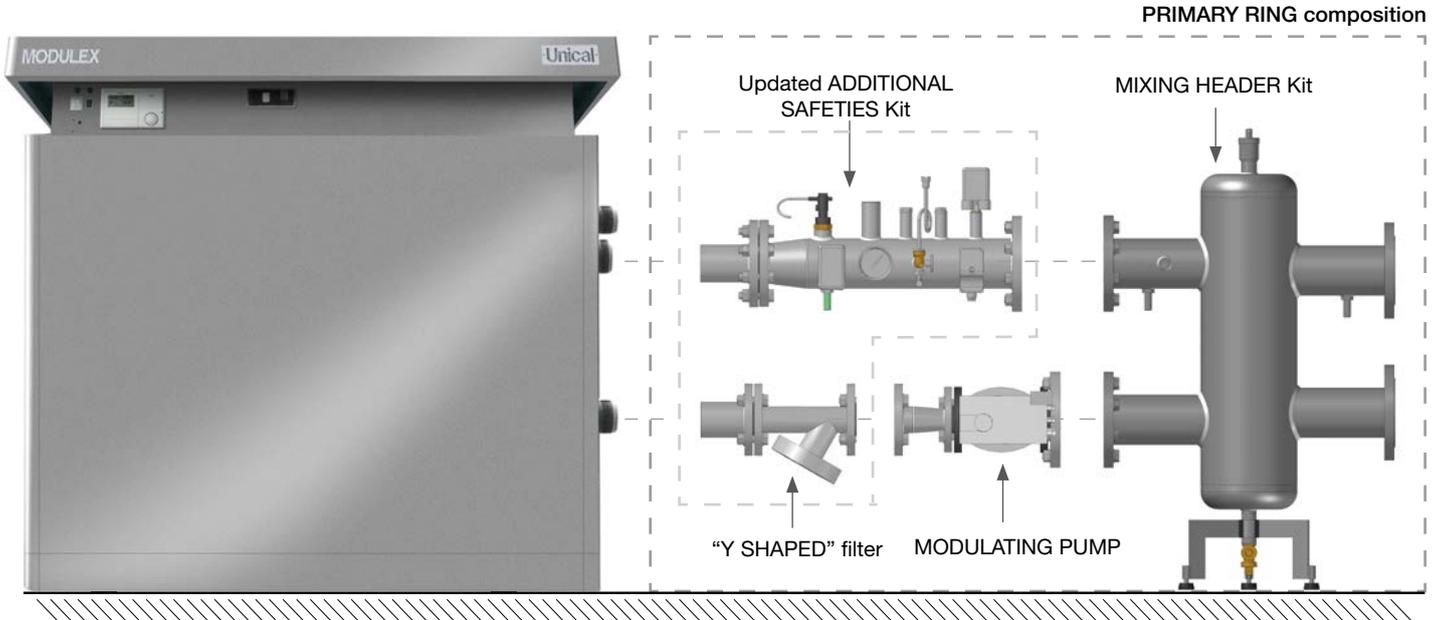
- **Ideal hydraulic balance** (interference almost nothing between primary and secondary ring)
- **Crossing speed near to zero** (minimal temperature increase on the boiler return to safeguard the condensing and the decanting effect)

developing three fundamental functions:

1. To make independent the connected circuits
2. “Deslimer”, allowing the collection of the mud of the circuits
3. “Deaerator”, to allow the automatic evacuation of the air.



Installation components



PRIMARY RINGS MIXING HEADER combination with MODULEX EXT	Maximum controlled output (kW)
100 ÷ 150	150
200 ÷ 250	250
300 ÷ 350	350
400 ÷ 770	756
900	864

* For higher capacities further sizings are available on demand. Some additional safety devices are not supplied because their sizing depends on the installation type.

MIXING HEADER KIT combination with MODULEX EXT	Maximum controlled output (kW)
100 ÷ 350	350
440 ÷ 900	864
> 900 ÷ 2700*	2700

* For information contact our pre-sale office.

ADDITION SAFETY DEVICES KIT combination with MODULEX EXT	Maximum controlled output (kW)
100 ÷ 350	350
440 ÷ 770	756
900	864

Coverage OGNITEMPO EXT for MIXING HEADER combination with MODULEX EXT
100 ÷ 350
440 ÷ 900

UPDATED ADDITIONAL SAFETIES ASSEMBLY

Following the evolution of the Standards, the pipe that lodges the safety devices foreseen by the rules in force, has been updated to foresee possible new devices.

CONTROL DEVICES

- 1 - Pressure gauge with shock absorber and a cock for manometer: it shows the actual pressure in the boiler, it must have the dial graduated in "bar", the bottom of the dial correlated to the maximum working pressure and be equipped with a three way cock for the connection of a master pressure gauge.
- 2 - Thermometer: it shows the real temperature of the water contained in the boiler; its dial must be graduated in centigrades, with bottom of the dial not superior to 120°C.
- 3 - Bulb holder: for master thermometer.
- 4 - Stub pipes R 1 1/4": for the insertion safety valves.
- 5 - Y shaped filter.
- 6 - Modulating pump.
- 7 - Mixing header.

Not furnished because to be sized according to the characteristics of the installation:

- Certified expansion vessel: it allows to absorb the volume increase of the C.H. system water following the temperature increase; the design pressure has not to be higher than the setting pressure of the safety valve.
- Purging valve and drain cock.
- Manometer.

PROTECTION DEVICES

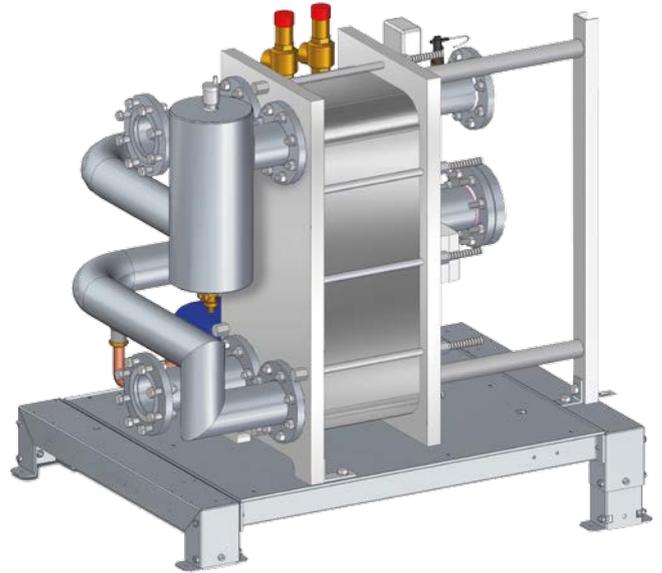
- 8 - Safety thermostat: it has the function to stop the boiler in case the limit thermostats, fitted in the boiler sections, are out of order. Its setting must NOT be changeable and must be smaller than 100°C.
- 9 - Minimum water pressure switch: it has the function to stop the boiler in case the minimal working pressure is below (0,5 - 1.7 bar). It has to be of manual reset type.
- 10 - Additional stub pipe R 1".
- 11 - Safety pressure switch: it has the function to stop the boiler in case of attainment of the maximum working pressure (5 bar). Adjustable 1 to 6 bar.

Primary rings with plate heat exchanger

For the completion of the installation interfaces, we propose a **new range of 6 primary rings with plate heat exchanger**.

Advantages:

- physical separation: hydraulic circulation is not present among the 2 circuits, the primary of boiler and secondary of the installation - possible different working pressure between primary and secondary circuit (for example: closed expansion vessel for the boiler and open expansion vessel for the C.H. circuit)
- boiler installation on old, obsolete C.H. circuits with potential risks of sludge or water leaks, with consequent frequent water reinstatements
- external installation with primary circuit protected against freezing and secondary circuit with not treated water
- variation of exchange parameters in case of C.H. system modifications, by adding or removing plates



PRIMARY RINGS with PLATE HEAT EXCHANGER combinations with MODULEX EXT	Maximum managed output (kW)
100 ÷ 200	200
250 ÷ 350	350
440 ÷ 550	550
660	660
770	770
900	900

The PRIMARY RING with PLATE HEAT EXCHANGER is composed with:

- PLATE HEAT EXCHANGER in specific stainless steel
- ADDITIONAL SAFETIES DEVICES KIT
- “CLASS A” MODULATING PUMP WILO STARTOS
- EXPANSION VESSEL
8 liters (mod. 100÷350) 24 liters (mod. 440÷900)
- AUTOMATIC AIR VENT
- FLOW and RETURN PIPES
- DRAIN COCK 3/4”
- FLANGES/ADAPTORS and necessary FITTINGS
- ADJUSTABLE SUPPORTING ELEMENTS
- SMALL ITEMS and GASKETS

The ADDITIONAL SAFETY DEVICES KIT is constituted by:

- 1/2” three way cock with shock absorber pipe for working manometer,
- thermometer with 1/2” bulb holder
- additional 1” pipe
- minimum water pressure switch 0.5-1.7 bar with manual reset
- 1” safety pressure switch 1-5 bar
- thermostat 100°C, 1/2” x 100 mm bulb holder for master temperature gauge
- 1/2” M/F bushing, Safety valve 5 bar
- paddle flow-switch for intervention in case of lack of water circulation.

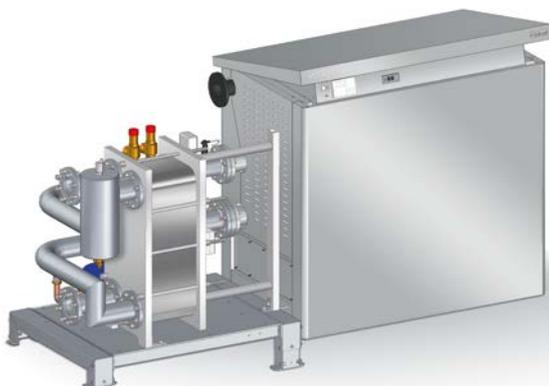


PLATE HEAT EXCHANGER combinations with MODULEX EXT	Heat exchanger designation	Number of plates	Maximum controlled power (kW)	FLOW RATE PRIMARY RING (m ³ /h) F/R 80°C / 65°C	FLOW RATE SECONDARY RING (m ³ /h) F/R 70°C / 60°C	Δp [mH ₂ O]		Weight (kg) heat exchanger only
						Primary circuit: ΔT 15°C	Secondary circuit: ΔT 10°C	
100	E 50 W - 31	31	200	5,9	8,8	0,7	1,6	152
150	E 50 W - 31	31	200	8,9	13,2	1,6	3,7	152
200	E 50 W - 31	31	200	11,8	17,6	2,7	6	152
250	E 50 W - 49	49	350	14,8	22,0	1,9	4,3	168
300	E 50 W - 49	49	350	11,7	26,3	2,6	6,0	168
350	E 50 W - 49	49	350	20,7	30,7	3,4	7,6	168
440	E 100 W - 61	61	550	26,0	38,6	0,6	1,4	388
550	E 100 W - 61	61	550	32,5	48,3	0,9	2,1	388
660	E 100 W - 61	61	660	19,0	57,9	1,4	3,1	388
770	E 100 W - 83	83	770	45,5	67,6	1,0	2,4	423
900	E 100 W - 83	83	900	53,2	79,0	1,5	3,3	423

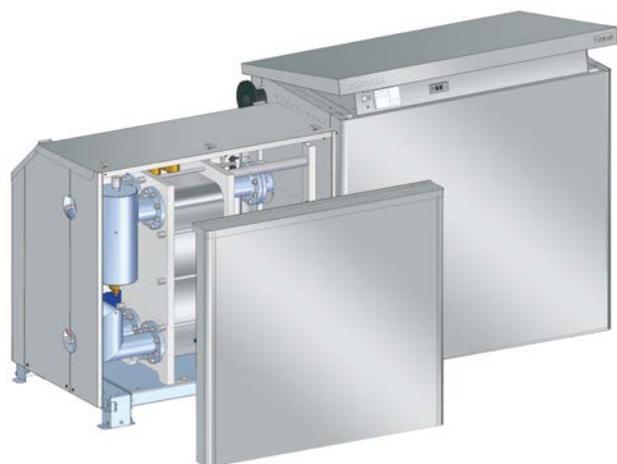
Nota: i valori di perdite di carico indicati nella tabella sono verificati con il modulo di calcolo relativo agli scambiatori e alle temperature di circuito primario e secondario considerate.

Thanks to the modulating pump all the advantages already seen for the models with mixing header are maintained:

- Δt nearly constant for all the outputs
- Efficacy in the condensating power
- Energy recovery.

The supply, in parts to be assembled on site, foresees:

- stainless steel AISI 316 L plate heat exchanger, with sealing gaskets in NBR, suitable for temperatures -15°C to 135 °C
- additional safety devices kit
- modulating pump
- mechanical filtration system for the sludge
- accessories, connections and basement
- *optional:* OGNITEMPO EXT for coverage of primary rings, suitable for external installations (class IPX5D).



OGNITEMPO EXT for coverage of PLATE HEAT EXCHANGER

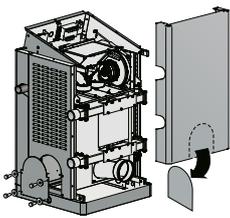
combination with MODULEX EXT

100 ÷ 350

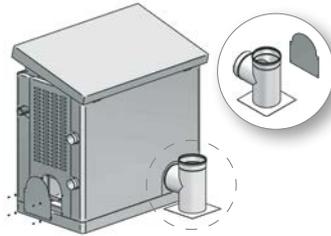
440 ÷ 900

Optional accessories

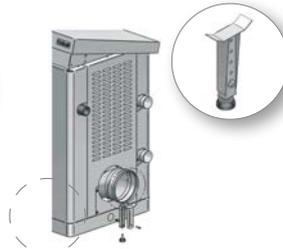
To complete the installation are besides available (optional) some practical supports to sustain the weight of the smoke channel, avoiding therefore that it charges directly on the smoke evacuation assembly of the boiler.



PRE-CUTTINGS CLOSING PLATES FOR MODULEX EXT 100 TO 200



REAR SMOKES EVACUATION KIT FOR MODULEX EXT 250 TO 350



FLUE TERMINAL SUPPORT KIT

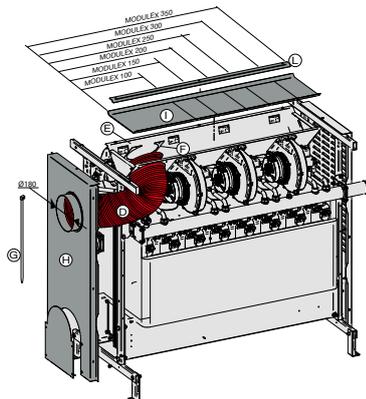
Regulation of additional zones

- E8 CONTROLLER KIT**
can be used for managing up to 8 modules
- E8 CONTROLLER WAG CASE**
- E8.1124 ZONE EXPANSION KIT**
- MIXED FLOW TEMPERATURE SENSOR (zone 2)**
- PT 1000 SENSOR for management of solar panels, with E8**



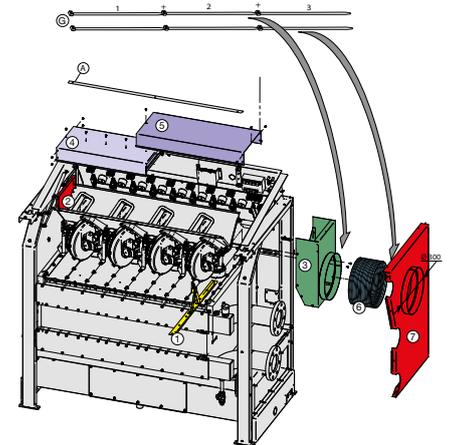
C63 sealed room kit MODULEX 100-350

Insert the hose "D" into the hole of the fans room "E", fix the pipe by means of the brackets "F" in the fans room "E". Fix the other end of the hose through the clamp "G", on the left side "H". Cut the cover of fans room "I" depending on the model of boiler at pre-sliced. Close the fans room with the metal fans "L". Covering the boiler.



C63 sealed room kit MODULEX 440-900

Secure the mounting bracket smokebox "1", fix the closing "2", the smoke box end "3". Close the fan room through the telescopic cover "4 + 5" and lock the fans room with the closing bracket "A". Insert the hose into the hole "6" into the fans room and into the hole on the left side "7" with the ties "G". Mantle of the boiler.



Neutralizers optional Kit

The condensate, produced during the combustion process, reacts with the NOX forming acidic molecules (PH = 4,5). It could be demanded that the condensate is neutralized before its immision in the sewerage. In the respect of the ecosystem, Unical proposes the neutralizers of condensate NH.

	KIT NH 300	KIT NH 1500-P
MAXIMUM FLOW RATE	l/h 70	550
MAXIMUM BOILER OUTPUT	kW 300	1500
MANOMETRIC HEAD	m -	3
STAGNATION HEIGHT	mm 95	90
NEUTRALIZING MATERIAL	Calcium carbonate	Calcium carbonate
DURATION OF NEUTRALIZING MATERIAL	12 months (1500 working hrs)	12 months (1500 working hrs)
DIMENSIONS (LxWxH)	mm 410x310x220	670x470x280
INLET/OUTLET CONNECTIONS	mm 25	25 / 10
INLET/OUTLET HEIGHT	mm 30/100	30
OVERFLOW HEIGHT	mm -	100
ELECTRICAL CONNECTION	-	230V/50Hz
ABSORBED ELECTRICAL POWER	W -	74
ABSORBED CURRENT	A -	0,33
POTECTION DEGREE	-	IP 54

KIT NH 300 - for boilers up to 300 kW
the neutralization happens according to the principle of the passage of the acidic condensate through the granular neutralization material. The passage happens upward from the lower part.

Kit NH 1500-P - for boilers up to 1500 kW
in the system NH 1500-P the condensate flows through a patented run in a zone filled with granular neutralizing material, in which an integrated filtering layer is also found.

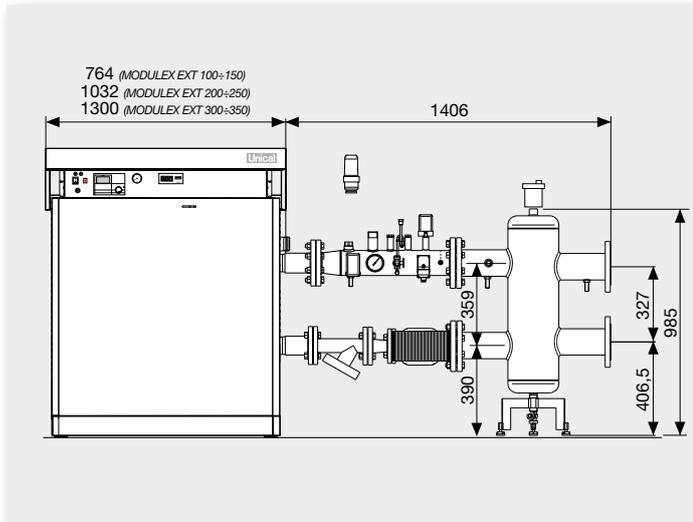
At the exit from such a zone the neutralized condensate reaches a level controlled pump, operating also as lifting system, that push it toward the evacuation duct. This system is able to treat up to 550 l/h of condensate, for boilers up to 1500 kW.

RECHARGE:

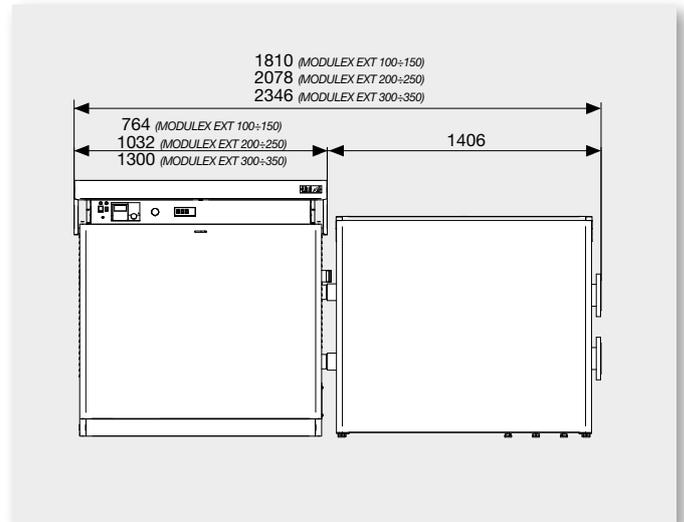
Neutralizing material 25 kgs: Refill NH

Dimensions

MODULEX EXT 100÷350

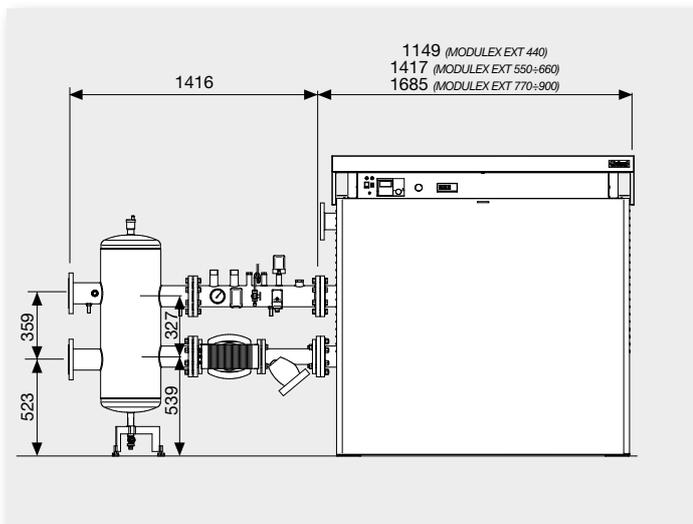


MIXING HEADER

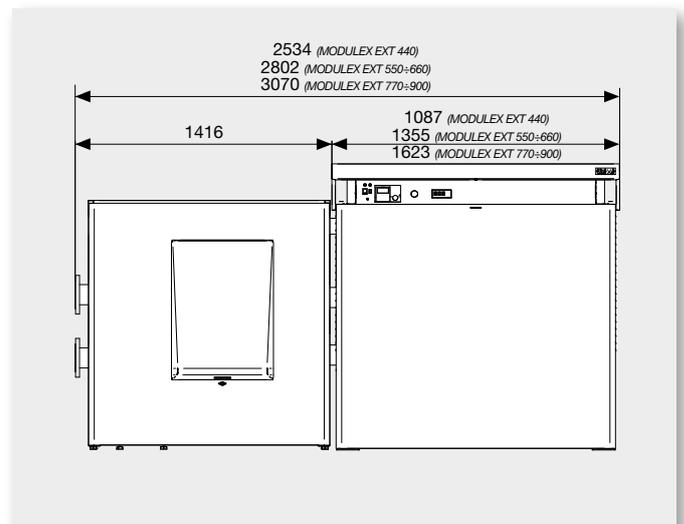


OGNITEMPO with MIXING HEADER

MODULEX EXT 440÷900



MIXING HEADER



OGNITEMPO with MIXING HEADER

Attention: factory layout.
In case of reversion from L.H. side to R.H. side consult our office.

Dimensions

MODULEX EXT 100÷350

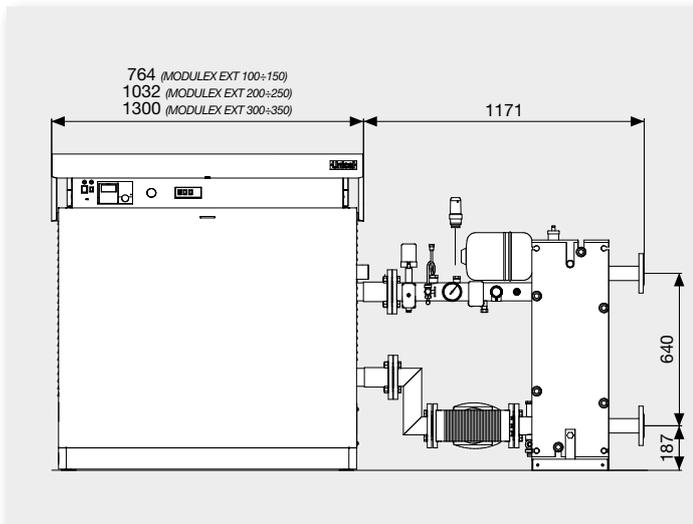
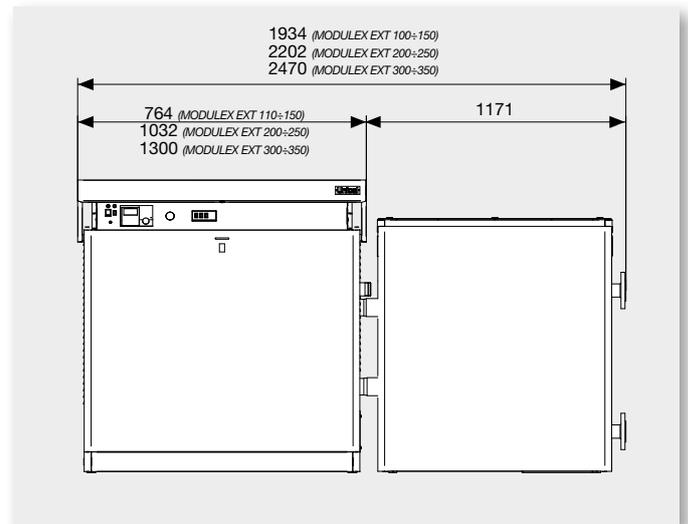


PLATE HEAT EXCHANGER



OGNIEMPO with PLATE HEAT EXCHANGER

MODULEX EXT 440÷900

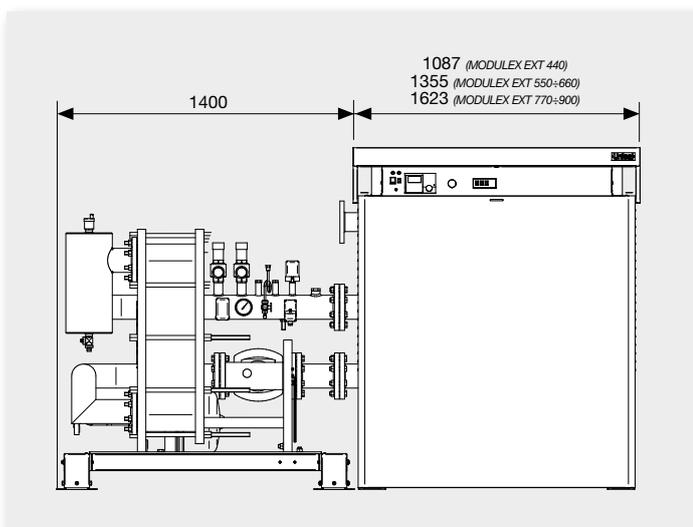
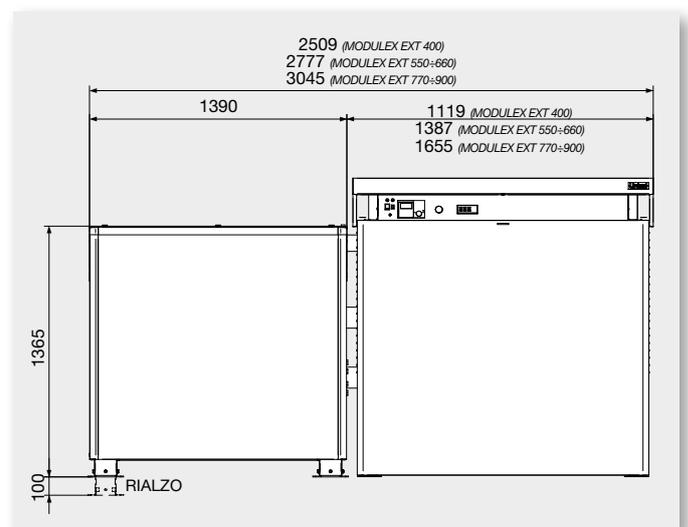


PLATE HEAT EXCHANGER

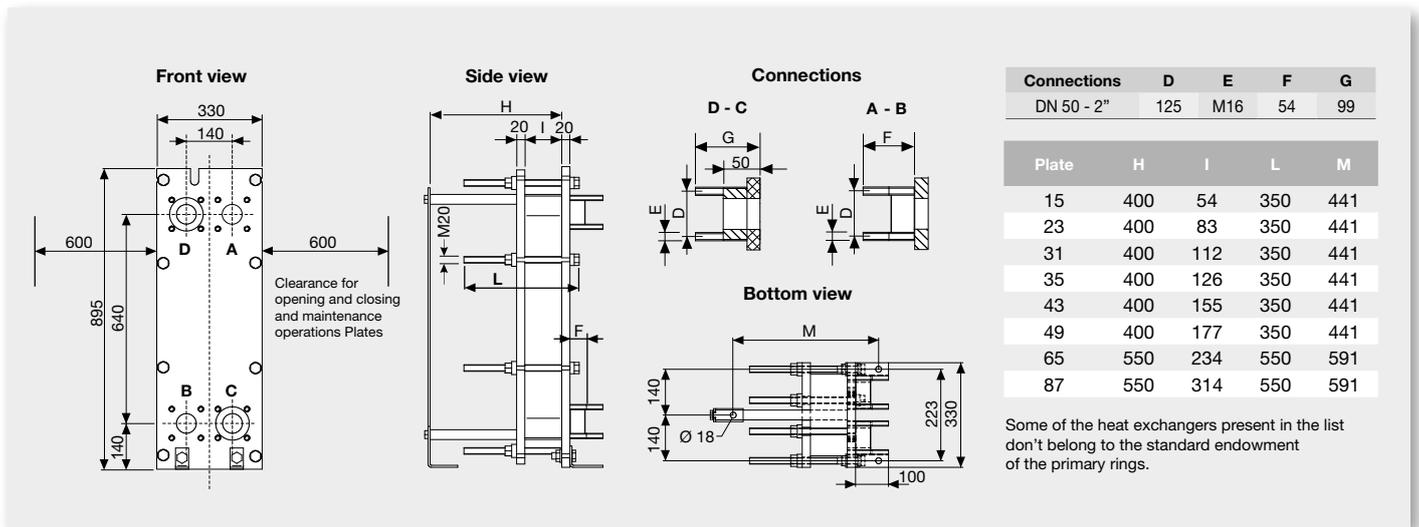


OGNIEMPO with PLATE HEAT EXCHANGER

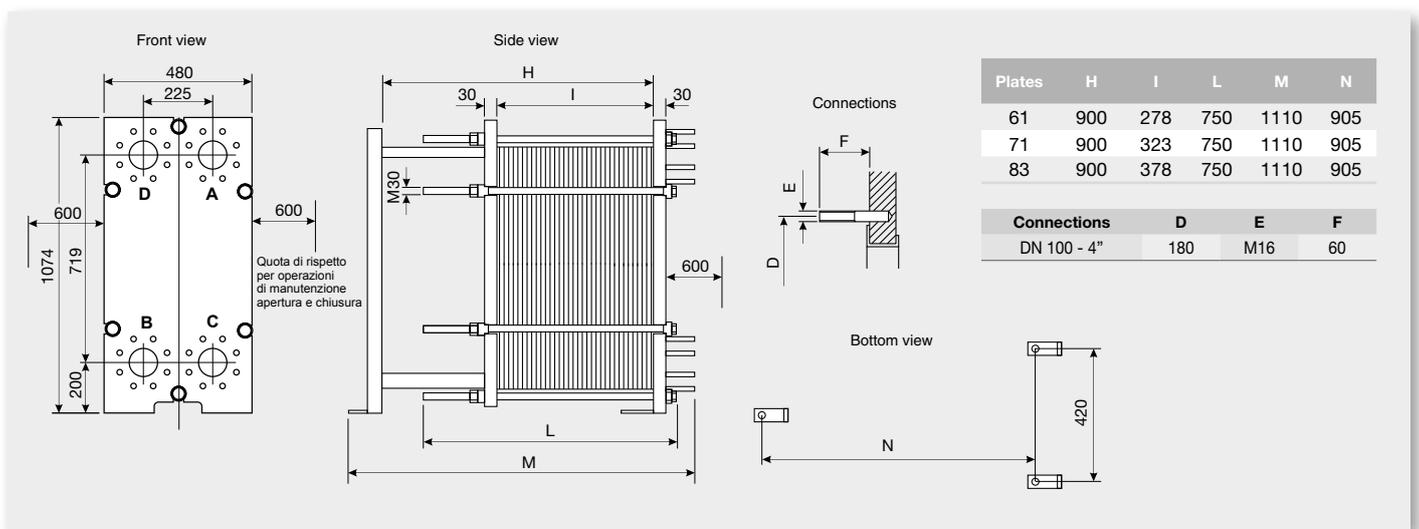
Attention: factory layout.
In case of reversion from L.H. side to R.H. side consult our office.

Dimensions

PLATE HEAT EXCHANGER

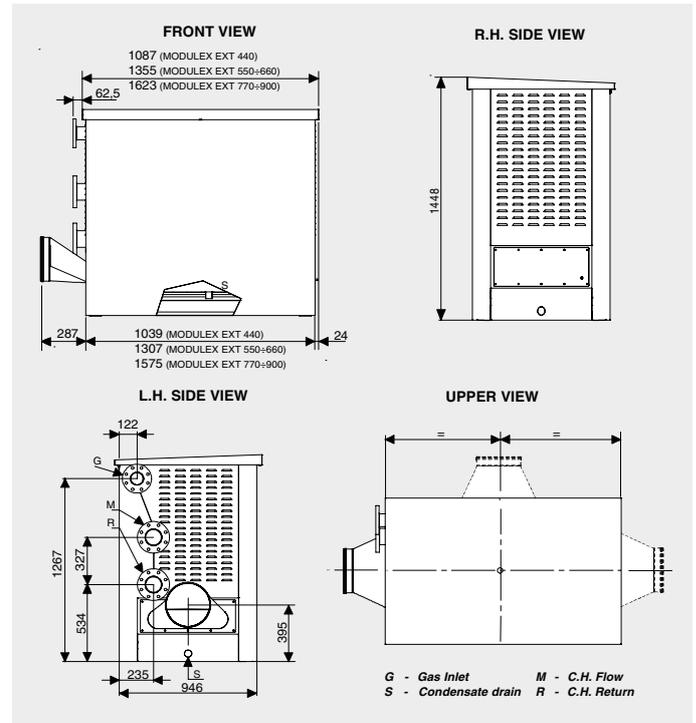
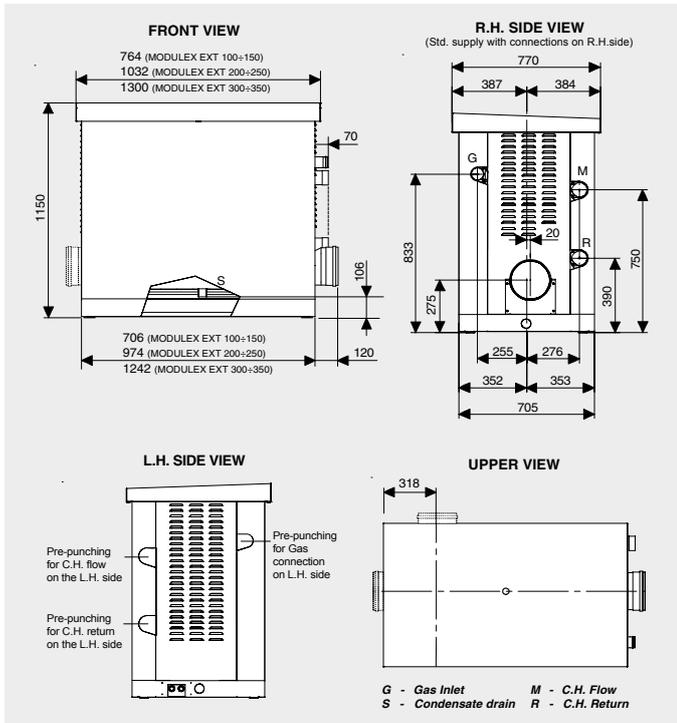


RANGE E 50W



RANGE E 100W

Dimensions and technical data



MODULEX EXT 100 ÷ 350

MODULEX EXT 440 ÷ 900

MODULEX EXT		100	150	200	250	300	350	440	550	660	770	900
NOMINAL INPUT on N.C.V.	kW	100	150	200	250	300	348	432	540	648	756	864
MODULATION RATIO		1:8,3	1:12,5	1:16,7	1:20,8	1:25	1:29	1:19,6	1:24,5	1:29,4	1:34,3	1:39,2
NOMINAL OUTPUT in condensation 30° / 50°C	kW	100,1	150	200,4	251,3	302,7	354,6	445	557,8	670,1	783,2	900,3
MINIMAL INPUT in condensation 30° / 50°C	kW	12,5	12,5	12,5	12,5	12,5	12,5	23,9	23,9	23,9	23,9	23,9
NOMINAL OUTPUT in std. conditions 60° / 80°C	kW	97,2	146,1	195,2	244,5	294	342,2	424,35	530,44	636,53	742,62	849,05
EFFICIENCY CLASS (ex dir. CEE 92/42)		★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★	★★★★
WATER EFFICIENCY at nom. load in condensation	%	100,1	100	100,2	100,5	100,9	101,9	104	104	104	104	104
WATER EFFICIENCY at part load in condensation	%	106,5	106,5	106,5	106,5	106,5	106,5	109	109	109	109	109
MAX. CONDENSATE PRODUCTION	kg/h	15,3	23	30,6	38,3	45,9	53,6	73,4	91,7	110	128,4	146,7
NO _x CLASS		5	5	5	5	5	5	5	5	5	5	5
WATER CONTENT	l	10,1	14,2	18,3	22,4	26,5	30,6	67	80	94	108	122
Min.-Max WATER PRESSURE	bar	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6	0,5 - 6
CHIMNEY BASE MAXIMUM PRESSURE AVAILABLE	Pa	100	100	100	100	100	100	100	100	100	100	100
CHIMNEY CONNECTION	mm	150	150	150	200	200	200	250	250	300	300	300
GAS CONNECTION	G	mm (inch)	50 (2)	50 (2)	50 (2)	50 (2)	50 (2)	80 (3)	80 (3)	80 (3)	80 (3)	80 (3)
C.H. FLOW / RETURN	F / R	mm (inch)	64 (2½)	64 (2½)	64 (2½)	64 (2½)	64 (2½)	100 (4)	100 (4)	100 (4)	100 (4)	100 (4)
PROTECTION DEGREE (obtained with cap down)	IP	X5D	X5D	X5D	X5D	X5D	X5D	X5D	X5D	X5D	X5D	X5D
MAXIMUM ABSORBED POWER	W	145	210	290	362	435	507	626	783	940	1096	1252
STAND-BY CONSUMPTION	W	10	10	10	10	10	10	20	20	20	20	20
GROSS WEIGHT	kg	203	236	295	325	386	419	585	643	707	806	858

Technical data according to ErP dir.

MODULEX EXT			100	150	200	250	300	350
EFFECTIVE NOMINAL OUTPUT	P_n	kW	97	146	195	244	294	342
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	η_s	%	92	92	92	92	92	92
SEASON EFFICIENCY CLASS TO DISCHARGE			A	A	A	A	A	A
FOR BOILERS TO HEAT THE ROOM AND MIXED BOILERS: USEFUL HEAT OUTPUT								
USEFUL HEAT OUTPUT with high temperature capacity (Tr 60 °C / Tm 80 °C)	P_4	kW	97,2	146,1	195,2	244,5	294,0	341,7
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity (Tr 60 °C / Tm 80 °C)	η_4	%	88	87,7	87,7	88,1	88,3	88,5
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	P_1	kW	32,2	49,3	64,4	80,5	96,6	112
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	η_1	%	96,7	96,7	96,7	96,7	96,7	96,7
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO			NO	NO	NO	NO	NO	NO
AUXILIARY ELECTRICITY CONSUMPTION								
WITH A FULL LOAD	$e_{l_{max}}$	kW	0,145	0,210	0,290	0,362	0,435	0,507
WITH A PARTIAL LOAD	$e_{l_{min}}$	kW	0,040	0,040	0,040	0,040	0,040	0,040
STANDBY MODE	P_{SB}	kW	0,010	0,010	0,010	0,010	0,010	0,010
OTHER ELEMENTS								
HEAT DISPERSION ON STANDBY	P_{stby}	kW	0,787	0,94	0,98	1,10	1,15	1,39
NITROGEN OXIDES EMISSIONS	NO_x	mg/kWh	54	54	54	54	54	54
SEASONAL DHW EFFICIENCY CLASS			-	-	-	-	-	-

MODULEX EXT			440	550	60	770	900	
EFFECTIVE NOMINAL OUTPUT	P_n	kW	424	530	636	743	849	
SEASONAL ENERGY EFFICIENCY TO HEAT THE ROOM	η_s	%	92	92	92	92	92	
SEASON EFFICIENCY CLASS TO DISCHARGE			*	*	*	*	*	
FOR BOILERS TO HEAT THE ROOM AND MIXED BOILERS: USEFUL HEAT OUTPUT								
USEFUL HEAT OUTPUT with high temperature capacity (Tr 60 °C / Tm 80 °C)	P_4	kW	-	-	-	-	-	
RATED HEAT OUTPUT EFFICIENCY with high temperature capacity (Tr 60 °C / Tm 80 °C)	η_4	%	-	-	-	-	-	
USEFUL POWER AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	P_1	kW	-	-	-	-	-	
PERFORMANCE AT 30% OF THE RATED HEAT OUTPUT with low temperature capacity (Tr 30 °C)	η_1	%	-	-	-	-	-	
BOILER WITH OUTPUT RANGE ADJUSTMENT: YES / NO								
AUXILIARY ELECTRICITY CONSUMPTION								
WITH A FULL LOAD	$e_{l_{max}}$	kW	0,626	0,783	0,940	1,096	1,252	
WITH A PARTIAL LOAD	$e_{l_{min}}$	kW	0,054	0,054	0,054	0,054	0,054	
STANDBY MODE	P_{SB}	kW	0,020	0,020	0,020	0,020	0,020	
OTHER ELEMENTS								
HEAT DISPERSION ON STANDBY	P_{stby}	kW	0,2114	0,2114	0,2114	0,2114	0,2114	
NITROGEN OXIDES EMISSIONS	NO_x	mg/kWh	49	49	49	49	49	
SEASONAL DHW EFFICIENCY CLASS			-	-	-	-	-	

* (Appliances not covered by Directive 2009/15 / EC)



FLEXIHEAT UK LTD

Flexible Heating & Dehumidification Solutions

01202 822221

www.flexiheatuk.com