

Unical

ALKON 90.



ALKON 90



MODEL			ALKON 90
max/min nominal heat output	condensing	kW	24,0 ÷ 93,6
	conventional	kW	21,1 ÷ 87,5
max/min heat input		kW	22 - 90
efficiency class (Directive 92/42)			★★★★

Moving in the present with the future in mind

A pioneer in condensing technology and innovative home heating solutions, Unical has developed the ALKON 90 boiler, which guarantees, in time, the best energetic performances and minimum fuel consumption, even in the most difficult heating applications.

Natural habitat: outdoor installation

- A single cast heat exchanger (an exclusive Unical design) of aluminium-silicon-magnesium alloy for a 90 kW heat input, enclosed in a compact cabinet, built in corrosion-resistant steel paint, ideal for both indoor and outdoor installations, thanks to the maximum protection grade IP X5D rating.
- 90 kW maximum and 22 kW minimum modulating input, in order to guarantee an extraordinary adaptation to the various heat demands.
- Electronic controls derived from the prestigious range of Unical Modulex boilers.
- The ALKON 90 boiler can be installed in a cascade formation, thanks to its special I.TOTHEM modulating system. A single heating cascade controller can control 2 modular banks of 4 boilers each (720 kW).

Comprehensive versatility

A wide range of optional accessories are available which permit you to create a flexible combination valid for every type of heating system.

The reasons for choosing an ALKON 90 boiler



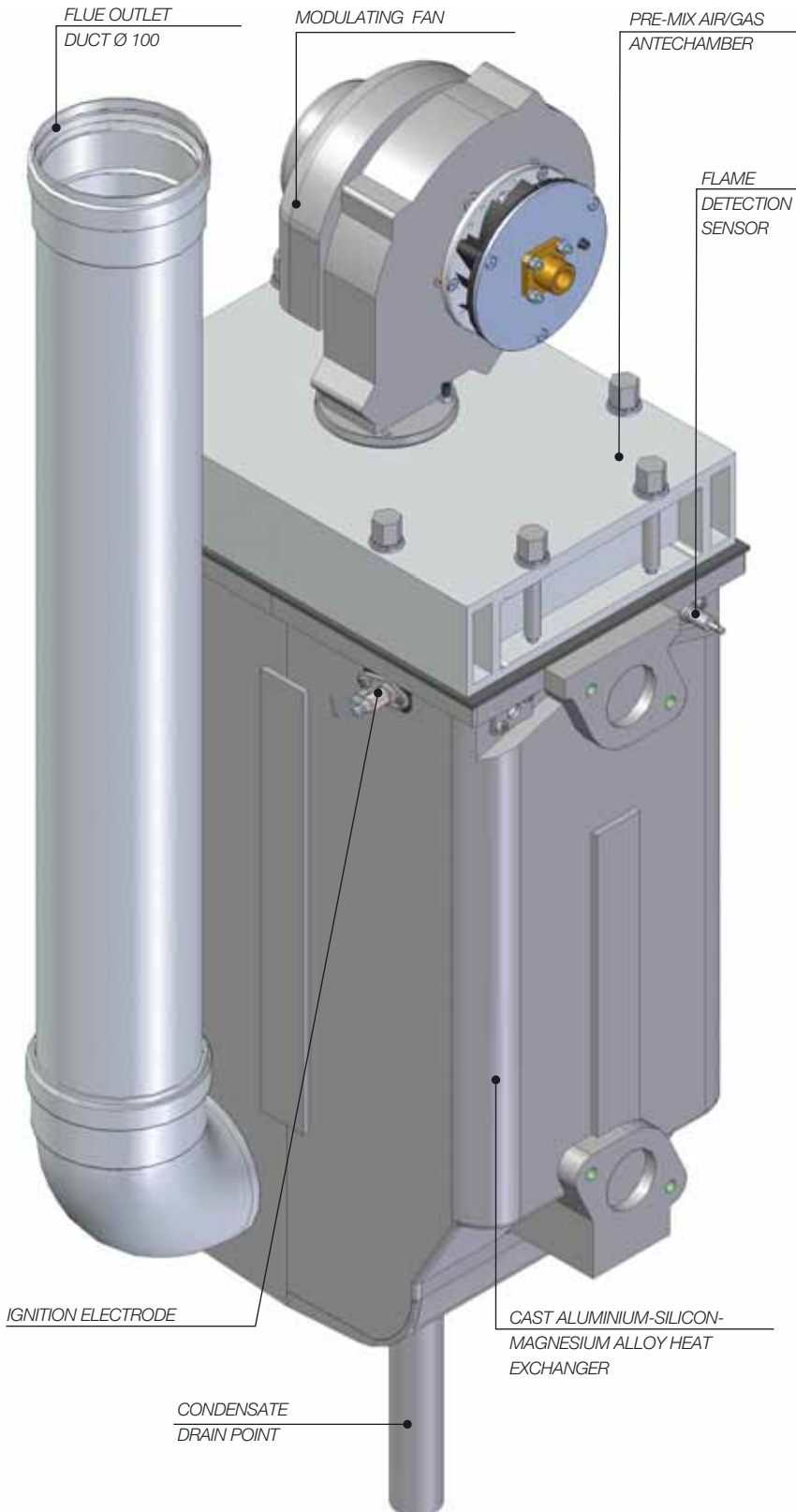
- **Contained dimensions:**
Height: 130 x Width: 51 x Depth: 60 cm
- **Innovational combustion:** *pre-mix multigas modulating burner with constant CO₂ emission*
- **Up to 109% efficiency on N.C.V.**
- **Low NO_x emissions - CLASS 5 rating (EN 483)**
- **Elevated modulating ratio: 1:4**
- **Easy to install:** *compact and simple connections*
- **Standard modulating pump controlled directly by the boiler**
- **BCM (Burner Cascade Manager) interface for remote control (optional)**
- **I.TOTHEM cascade formation for a bank of up to 4 boilers (2x)**
- **IP X5D protection grade for outdoor installation**
- **Dedicated series of accessories:**
 - *Mixing headers*
 - *Additional safety devices*
 - *E8 heating controller*
 - *Acidic condensate neutralizing kit*



Analysis ...

5 year guarantee

Thanks to its particular technical configuration, synonymous of quality and safety, the ALKON 90's heat exchanger is supplied with a 5 year guarantee.



Discovering the ALKON 90 boiler

■ The heat exchanger

A real work of art in aluminium-silicon-magnesium alloy, weighing 35 kg, with a surface of heat transfer superior to 2 m² and compact dimensions (50x23x34 cm). It is characterized by its very fast water circulation circuit, designed for maximum efficiency, thanks to the hydraulic distribution which, from a central collector, converges the water flow to the external walls. It contains about 8 litres of water and is completely insulated. Thanks to these characteristics, the ALKON 90 boiler reacts rapidly to every type of user request, favoured by:

- *The primary ring* appositely dimensioned by Unical
- *NTC temperature sensors* positioned on the flow and return pipes, which by controlling the difference in temperature in real time, are able to adapt the output constantly and instantaneously.

Therefore *heat inertial is nonexistent*, the appliance fires or stops immediately, thereby avoiding energy waste when unrequested (an inevitable phenomenon with high water content generators, obviously much more slower in responding).

■ The burner

The new *modulating multigas burner* (Natural gas/LPG), fitted with a *two-valve one block Dungs system*, is avant-garde in the field of combustion technology. Combined with the special *double stainless steel metallic fibre burner*, it offers you reliability, silent operation and very high combustion efficiency.

■ Modulation

The optimal modulation ratio (1:4) permits the following types of performances:

- Steady CO₂ equal to 9,6% on all the output range from 22-90 kW.
- NO_x equal to 35,62 mg/kWh which classifies the ALKON 90 boiler in the 5th NO_x Class.
- CO equal to 104,4 mg/kWh
- Condensate production from 1,8 kg/h to 14,5 kg/h

...point by point

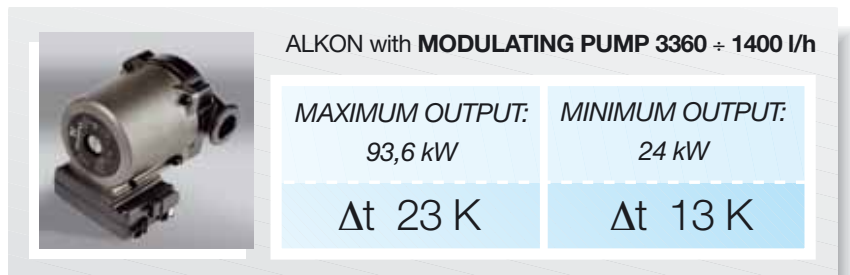
■ Standard modulating pump

- *Maximum efficiency*
- *Drastic reduction of fuel and electricity consumption*
- *Condensate production optimization*

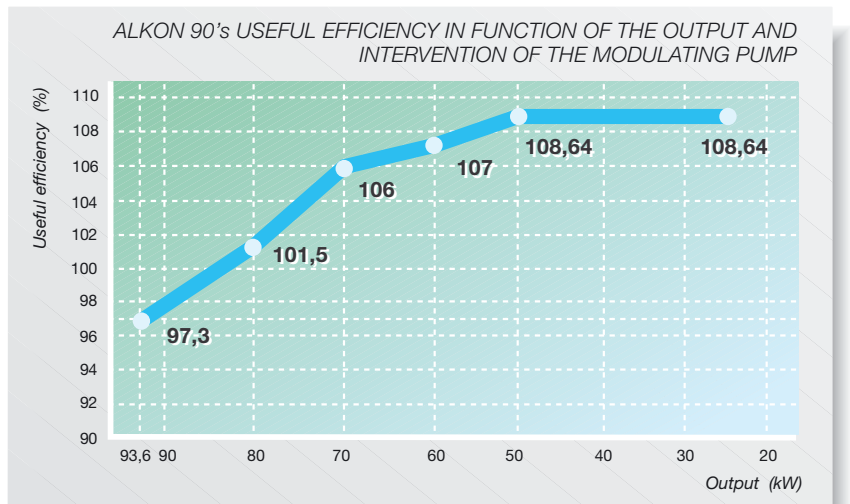
The ALKON 90 boiler incorporates an advanced microprocessor control board which is able to constantly control the data regarding the temperature difference (ΔT between the flow and return rate and the rated output).

Thanks to this supervision, if the manometric head is not within the calculated parameters the pump adapts its flow rate immediately, thereby ensuring optimization of the condensate production and maximum efficiency, as well as a drastic reduction of electricity consumption absorbed by the pump:

Modulation (%)	Electrical absorption (W)
100 %	170 max
25 %	95 min



THE MODULATING PUMP ENSURES THAT THE ΔT (REFER TO TABLE) BETWEEN THE FLOW AND RETURN IS MAINTAINED AT A HIGH LEVEL AND SUBSEQUENTLY THE BOILER WILL OPERATE IN CONDENSING MODE FOR A LONGER PERIOD.



■ Safety measures

The standard safety measures of the ALKON 90 boiler have been increased with:



A close-up view of the 3-way valve

- *a gas pressure switch*: it shuts down the boiler if the gas supply pressure is lower than 14 mbar;
- *a low water pressure switch*: it shuts down the boiler in case of pressure drops;
- *safety level sensor*: it shuts down the boiler if the condensate does not drain away correctly
- *safety valve*: set at 7 bar
- *electrical connection for additional safety devices*.

Moreover, for practical drainage of the appliance at the condensate drainage point and for total safety in case of maintenance, the ALKON 90 is supplied with a:

- *3-way valve* with full opening on the flow pipe
- *2-way valve* integrated with flow-stop on the return pipe.

The control panel

Simple to use

The ALKON 90 is a versatile boiler. Particular care has been given to the flexibility of the controls. The control panel is equipped with an alphanumeric display with 6 pre-selection keys, which enable the user to view the following information:

Boiler operation

- Boiler status; flow and return temperature;
- Fault diagnostic display;

User's parameters

- Maximum temperature settings
- On/off central heating

Parameters with access code

- Type of mode selected: room thermostat (on/off), remote heating control, on-off or modulating pump;
- Pump overrun
- Fan ignition speed

Data readout

- Global flow and return temperature
- DHW temperature (if incorporated with a hot water cylinder)



BCM board
(Burner Cascade Manager)

■ BCM control board

The ALKON 90 boiler is able to reach its maximum performance when the optional accessory BCM (Burner Cascade Manager) is incorporated in the heating system.

- Heating demand control: it controls the modulation level and the temperature
- Boiler operation management
- Communication with PLC controlled plants
- Burner controller alarm reset.
- Emergency function in case of E8 failure

Temperature increase key

Reset key/Fault code display



DHW set key

Central heating adjustment key

Temperature decrease key

CH selection key: Stand-by/Central heating

Fault diagnostic display

ALKON's intelligent brain

E8: the intelligent heating controller

The application and connection of the dedicated **E8** heating controller (optional), permits a decisive qualitative leap in boiler management in function of the applied loads. The E8, as well as becoming the window of dialogue with the boiler, thanks to its features, permits the complete management of the CH system, exploiting the maximum modulating output and the maximum obtainable condensation.



Functions which can be activated with the E8



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).



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.



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.



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.



Swimming pool heating function



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.



Antilegion

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.



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 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.



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



Integration with renewable energy sources

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

And more:

- **Management of up to 15 mixed circuits** controlled by the outdoor sensor (refer to accessories: BM8 digital remote control with interface for bus-can, outdoor temperature sensor for BM8)
- **0-10 volt signal:** the great flexibility of the E8 also permits the ALKON 90 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.
- **Remote controls:** *available in the near future* via appropriate software, this function enables the reduction of system management, remote indication of boiler run, thereby avoiding unnecessary inspection visits.

Range of system components



The new vision of the modern heating system is no longer satisfied with just the boiler! Therefore, Unical places at your disposal a rich catalogue of components which facilitate the system's layout and enable you to obtain the maximum result from the technology employed and the heating system design.

Note: Several additional safety devices are not supplied because their setting is subject to the type of heating system installed.

BOILER

- ALKON 90 "MASTER" boiler

natural gas
LPG

cod. 41010081
cod. 41010082

Complete with:

Side panels, blind flanges with bolts and nuts, single boiler top, gas feed pipings, flow and return system pipings, modulating pump.

Note: It is possible to order the outdoor cover kit (code 00361529) for containing and protecting the additional safety devices kit. In this case the Cover for 2 is needed (code 00361522 – incorporated with an unused flue outlet closure tap).

COMPONENTS FOR EXPANDING THE ELECTRONIC CONTROLS

- E8 heating controller kit cod. 00361332
Composed of:
Electronic heating control, outdoor sensor, mixed flow sensor, boiler sensor, DHW storage tank sensor, terminal strip
- E8 WAG holder for wall mounting installation cod. 00361359
- Expanding module E8.1124 cod. 00361545
- Additional zone control BM8 (digital timer with outdoor sensor for connection to CAN-BUS 4 wires) cod. 00361358
- BCM board cod. 00361602

MIXING HEADER and additional safety devices

- Mixing header up to 180 kW cod. 00361499
- Mixing header connection kit DN 65 cod. 00361484
- Y filter DN 65 cod. 00361488
- Additional safety devices pipe kit + hydraulic and gas collectors cod. 00361528
- Additional safety devices kit cod. 00361316
Composed of:
3-way cock 1/2", pressure gauge R 3/8", n°2 bulb holders, 100°C H.L. thermostat, 5 bar safety max pressure switch, thermometer, shock absorber for pressure gauge.
- Outdoor cover kit complete with additional safety device holders cod. 00361529
- Additional safety devices holder kit cod. 00361463

ACIDIC CONDENSATE NEUTRALIZER

- Condensate neutralizing kit NH 500 cod. 00361551

FLUE OUTLET ACCESSORIES (in aluminium)

- Vertical flue terminal Ø 100 cod. 00361493
- Horizontal flue terminal Ø 100 cod. 00361494
- Extension Ø 100 L=1000 cod. 00361495
- 90° elbow Ø 100 cod. 00262514
- 45° elbow Ø 100 cod. 00262476

Other accessories

DHW STORAGE – PRODUCTION CYLINDERS

To complete the heating system, in the catalogue, there are different models of DHW storage and production cylinders available, with a coil heat exchanger and with solar integration (from 100 to 2000 litre capacity, and supplied with a magnesium anode)

Solar integration

■ BISER 300	cod. 00262490
■ BISER 500	cod. 00262493
■ BISER 800	cod. 00262485
■ BISER 1000	cod. 00262494
■ BISER 1500	cod. 00262486
■ BISER 2000	cod. 00262487
■ BIKOMPACT 300	cod. 00262310
■ SANRIS 500	cod. 00262495
■ SANRIS 800	cod. 00262496
■ SANRIS 1000	cod. 00262497
■ SANRIS 1500	cod. 00262488
■ SANRIS 2000	cod. 00262489

Integration with only boiler

■ SANICAL SC 150	cod. 32703
■ SANICAL SC 200	cod. 32704
■ SANICAL SC 300	cod. 32705
■ SANICAL SC 400	cod. 32706
■ SANICAL SC 500	cod. 32707
■ SANICAL SC 600	cod. 32708
■ SANICAL SC 800	cod. 32709
■ SANICAL SC 1000	cod. 32710



From the left: SANICAL, SANRIS, BIKOMPACT, and BISER

Neutralizing kit

Optional acidic condensate neutralizing kit

The condensate water, produced during combustion, reacts with NO_x forming acidic molecules (pH value= 4,5). It could become necessary to neutralize these substances before their emission in the drainage system water. In order to respect the ecosystem Unical proposes the NH condensate neutralizer.

KIT NH 500 - for boiler outputs up to 500 kW (cod. 00361551). Neutralization occurs according to the principle of the passage of acidic condensate through the granular neutralizing material. The passage takes place from the bottom to the upper direction.

KIT NH 500		
FLOW RATE	l/h	UP TO 70
BOILER OUTPUT	kW	UP TO 500
FLUID TEMPERATURE	°C	5-40
STAGNATION POINT HEIGHT	mm	90
NEUTRALIZING SUBSTANCE		GENO® - Neutralit -Hz
DURATION OF NORMAL CONDENSATE		12 months (1500 working hours)
CONDENSATE/AMBIENT WATER TEMPERATURE	°C	5 - 60
DIMENSIONS (lengthxwidthxheight)	mm	476x300x185
INLET/OUTLET CONNECTION		DIN 15
INLET/OUTLET HEIGHT	mm	50/90

The NH 1000 kit is available for higher outputs

The key quality features



Aluminium (AlSiMg) heat exchanger/condenser (a detail of the combustion chamber)



Pre-mixed combustion system with constant CO₂ emission (modulating gas valve, modulating fan and stainless steel burner)



Modulating pump for maximum condensate production



The control panel can be opened to facilitate maintenance



I.TOTHEM: heat module complete with primary ring, composed of additional safety devices kit and mixing header



Simple installation (detailed view flange/flange)



Microprocessor boiler control board



E8 heating controller (optional) for complex heating plants and cascade applications with WAG holder

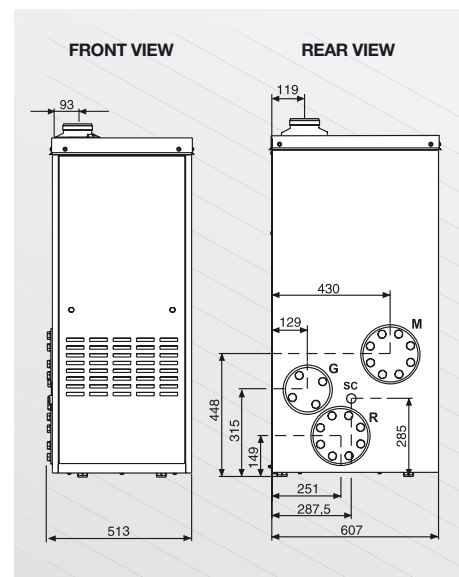


BCM board for remote control (optional accessory)

Dimensions and technical data



MODEL	ALKON 90	
Output		
MIN/MAX NOMINAL HEAT OUTPUT IN CONDENSING MODE	kW	24 + 93,6
MIN/MAX NOMINAL HEAT OUTPUT IN STANDARD MODE	kW	21,1 + 87,5
MIN/MAX HEAT INPUT	kW	22 - 90
Efficiency		
EFFICIENCY CLASS (DIRECTIVE CEE 92/42)		★★★★
REQUIRED EFFICIENCY AT NOMINAL LOAD (100%)	%	97,26
REQUIRED EFFICIENCY AT 30% PART LOAD	%	105,2
ACTUAL EFFICIENCY AT NOMINAL LOAD (100%) IN CONDENSING MODE	%	104,0
ACTUAL EFFICIENCY AT 30% PART LOAD IN CONDENSING MODE	%	108,64
COMBUSTION EFFICIENCY AT NOMINAL LOAD (100%)/ PART LOAD	%	98,15 / 98,31
STAND-BY LOSSES (MIN-MAX)	%	0,90
Combustion		
CO ₂	%	9,6
CO AT 0% OF O ₂ (MIN)	mg/kWh	21,5 - 104,4
NO _x (VALUE ACCORDING TO EN 483)	mg/kWh	35,62
MAX CONDENSATE PRODUCTION	kg/h	14,54
NO_x Class		5
APPLIANCE'S GAS CATEGORY		II2H3P
Central Heating		
MIN/MAX OPERATING TEMP. IN CH MODE	°C	30 / 85
MIN/MAX PRESSURE IN CH CIRCUIT	bar	0,5 - 8 *
MIN. WATER FLOW RATE IN CH CIRCUIT ΔT 20°C	l/min	15,14
Electrical Supply		
MAXIMUM ABSORBED POWER	W	303
ELECTRICAL SUPPLY / VOLTAGE / FREQUENCY	V/Hz	230/50
ELECTRICAL PROTECTION	IP	X5D
Weight		
NET WEIGHT	kg	135

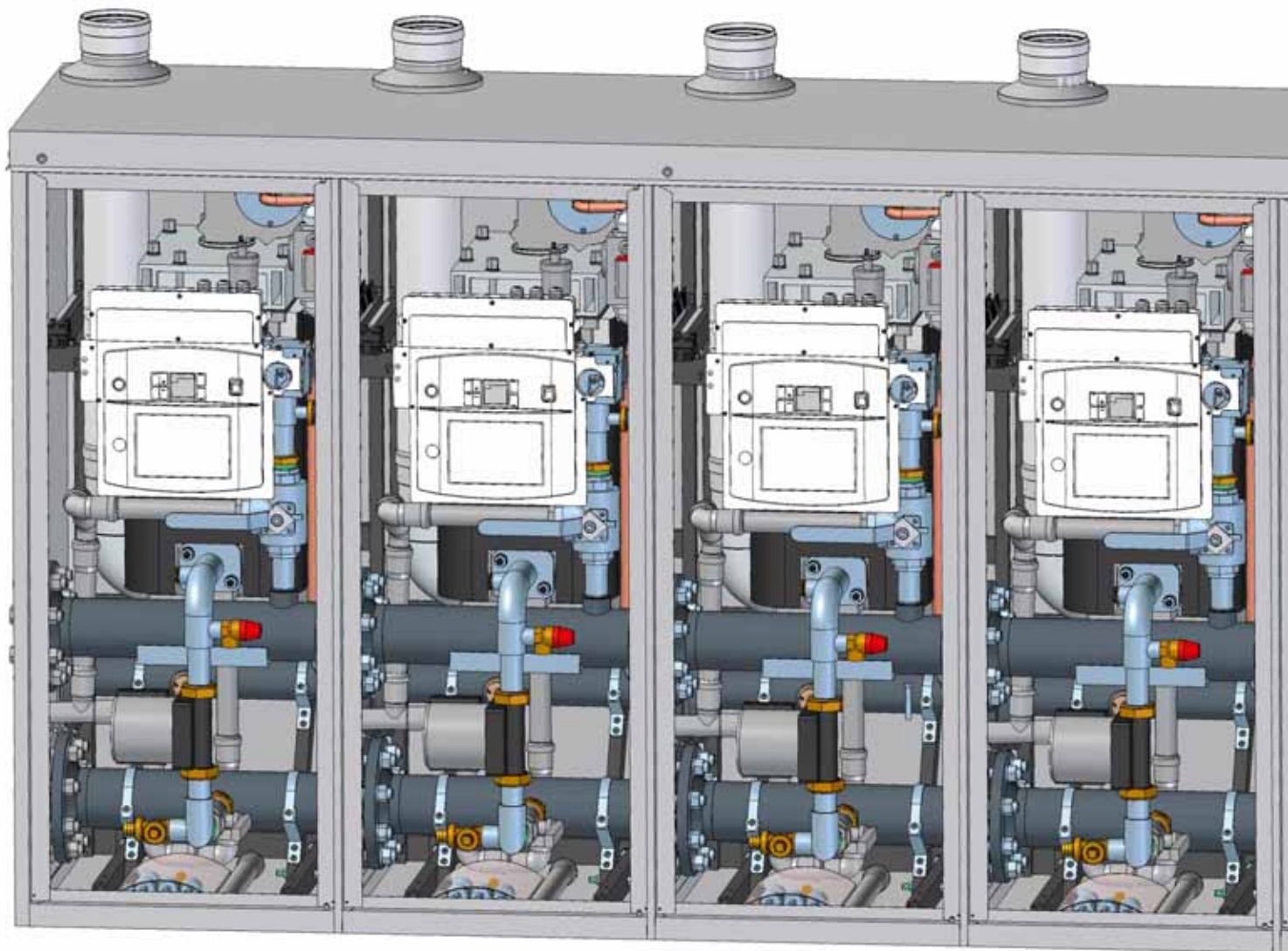


Legend:

- R** - Heating system return DN 80
- M** - Heating system flow DN 80
- G** - Gas inlet DN 50
- Sc** - Condensate siphon drain outlet Ø 32 mm

(*) Boilers approved at 8 bar. Safety valves are available on request.
Note: Values measured at room temperature = 20°C

I.TOTHEM



Integration and perfect compatibility

ALKON 90 multiplies itself! The flexible E8 heating controller, via the e-Bus connection system, permits the management, with only two wires, of up to 8 heating modules. The I.TOTHEM range of boilers with two banks of 4 boilers each, can supply a total output of up to 720 kW, for maximum flexibility of use. All approved and certified according to the relevant Standards and requirements.

Rapid installation and maximum compact

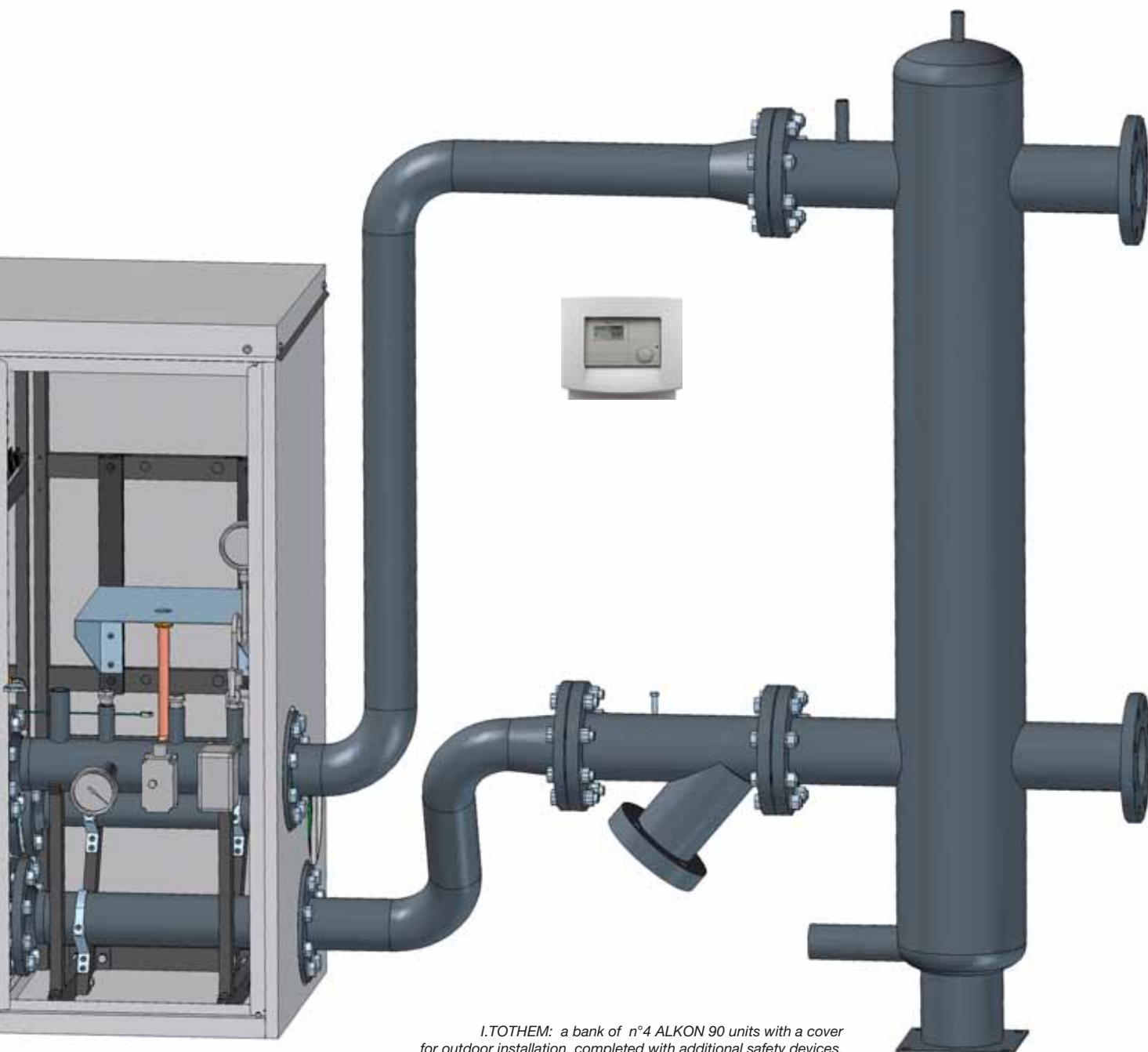
The ALKON 90 boiler has been designed with a modular structure. The external cover is made in steel (with non corrosive paint and a IP X5D protective level) and contains a heat exchanger, pump, and pre-fitted pipings. Installation is simplified by the rapid flange/flange assembly on both the water and gas sides. The same cover can also contain and protect the additional safety devices and an eventual primary expansion vessel.

Easy to service

- Doors with reversible openings
- Control panel which can be opened for facilitating access and removing components for inspection
- Rapid division of the circuits and isolation of each heating module via the ball valves supplied as standard.

Very high efficiency

This gives us the advantage of having at disposal, where space is at a



I.TOTHEM: a bank of n°4 ALKON 90 units with a cover for outdoor installation, completed with additional safety devices.

premium, high efficiency heating modules, guaranteeing:

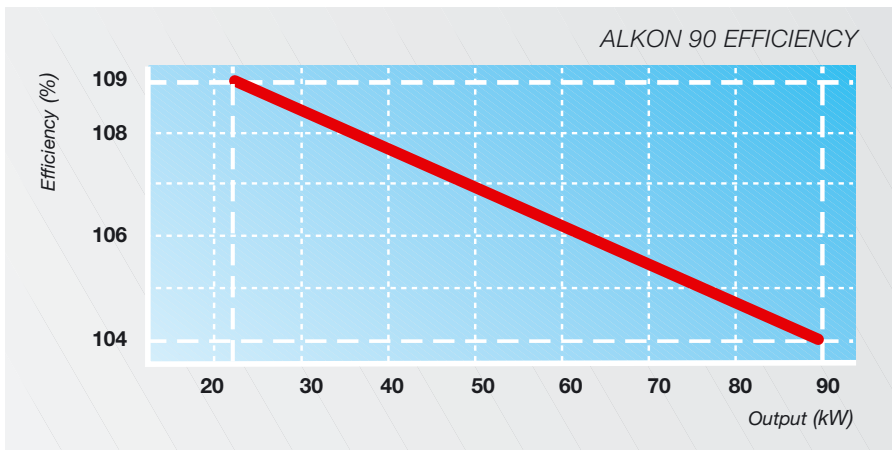
- *Recovery and restoration of old heating plants.*
- *Better efficiency levels thanks to the excellent modulation ratio which reduces the output in all the boilers proportionally to the load required and shuts them down in sequence.*
- *Reliable operation under every condition thanks to load matching.*

Custom made for the heating system

The versatility of combinations which the ALKON I.TOTHEM modular system offers is practically endless. In this case you can choose an ALKON 90 as the lead boiler who, via the E8 heating controller “controls” the successive ALKON 90 boilers, who are also equipped with a pump. Choosing from the accessories available, the multiple formation of boilers will be constructed on the basis of the system’s requirements. Each boiler can be fitted with a single flue outlet or the flue gases can be conveyed into a sole collector.

I.TOTHEM

maximum output and efficiency

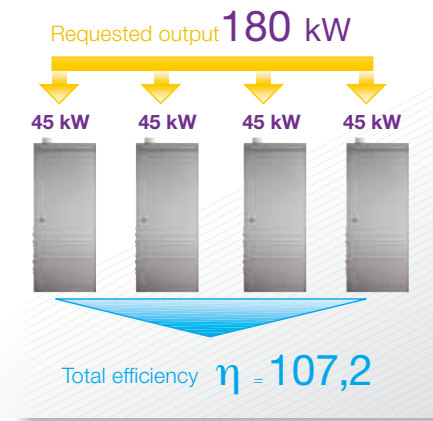
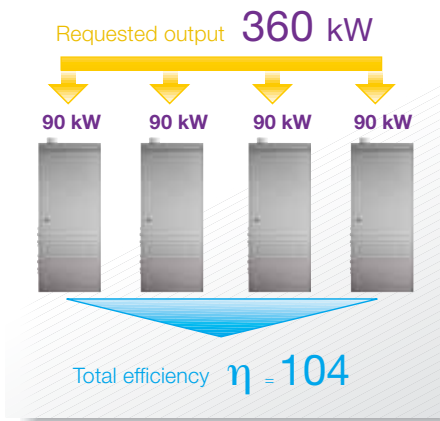


Maximum efficiency in every situation

The ALKON 90 boiler has an approved efficiency which, when the load reduces, increases progressively from 104 to 109% (in condensing mode).

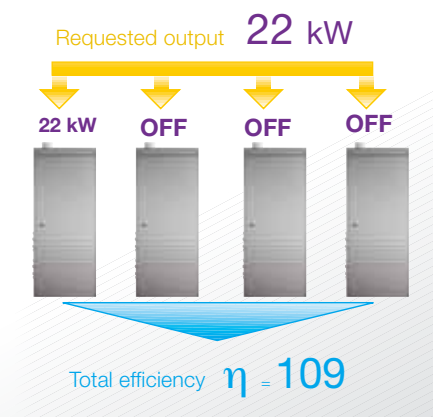
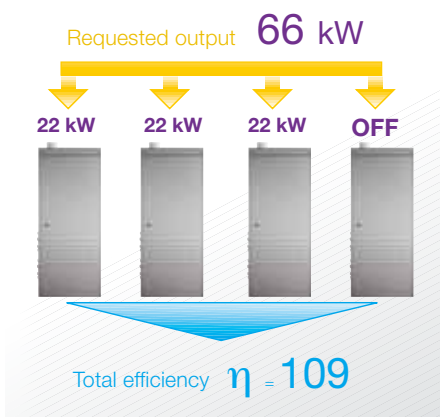
This is possible because the heat exchanger increases its efficiency and the flue temperature decreases when the input is reduced.

One of the prominent features of the E8 heating controller is to maintain the major number of ALKON 90 units, in the I.TOTHEM multiple boiler formation, firing at the lowest possible rate in order to increase the total operating efficiency.



Reduced heating load

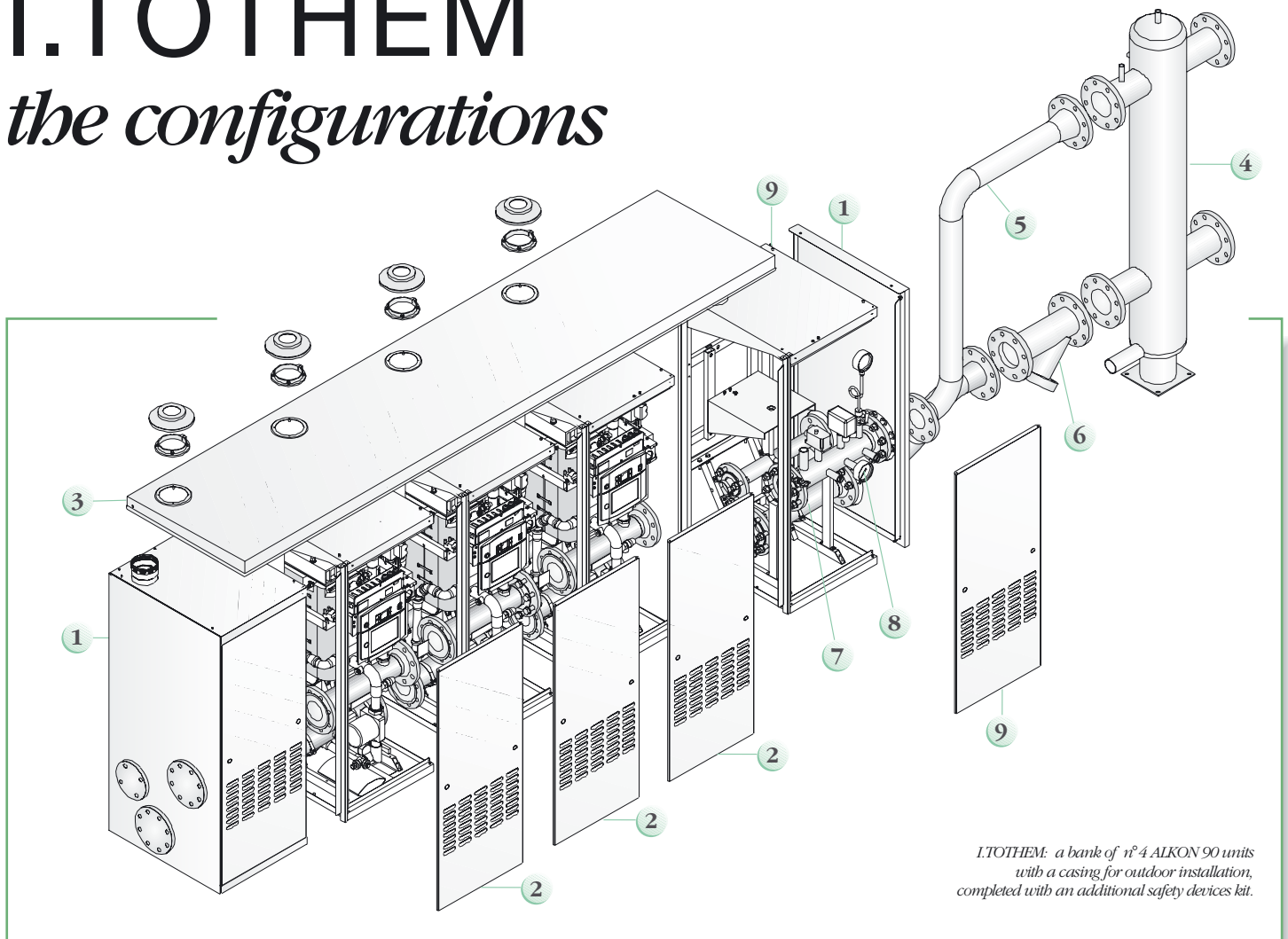
As illustrated in the sequence on this page, this proportional partition of the output reduces each heating module to 22 kW. If the required load is inferior to the total minimum output of the single units (n° units x 22 kW), only the ALKON 90 boilers needed to reach the requested output at the maximum efficiency level will be fired, and the other units will be shut down.



Moreover, in order to ensure an equal daily rotation of each module, every 24 hours each unit will be fired alternately, so as to ensure that each one operates for the same number of hours.

I.TOTHEM

the configurations



I.TOTHEM: a bank of n°4 ALKON 90 units with a casing for outdoor installation, completed with an additional safety devices kit.

BASIC BOILER CONFIGURATION

- 1 — ■ ALKON 90 "MASTER" *natural gas* cod. 41010081
LPG cod. 41010082
- 2 — ■ ALKON 90 combined with "MASTER" *natural gas* cod. 41010046
LPG cod. 41010048

it does not include:

- Side panels, blind flanges with bolts and screw nuts, single boiler top.
- Top for 2 * cod. 00361522
- Top for 3 * cod. 00361523
- Top for 4 * cod. 00361524
- 3 — ■ Top for 5 * cod. 00361525

MIXING HEADER

for n°2 boilers

- Mixing header up to 180 kW cod. 00361499
- Mixing header connection kit DN 65 cod. 00361484
- Y filter DN 65 cod. 00361488

for n°3÷4 boilers

- 4 — ■ Mixing header up to 360 kW cod. 00361500
- 5 — ■ Mixing header connection kit DN 100 cod. 00361487
- 6 — ■ Y filter DN 100 cod. 00361489

Additional safety devices

- 7 — ■ Stub pipe kit + water and gas collectors cod. 00361528
- 8 — ■ Protection and control kit for water collector cod. 00361316
- 9 — ■ Casing kit for outdoor installation complete with additional safety devices support kit cod. 00361529
- Additional safety devices support kit cod. 00361463

COMPONENTS FOR EXPANSION ELECTRONIC MANAGEMENT

- E8 heating controller kit cod. 00361332
- WAG holder kit for wall mounting installation cod. 00361359
- Zone heating E8.1124 expansion kit cod. 00361545
- BM8 remote control kit cod. 00361358
- BCM board cod. 00361602

ACIDIC CONDENSATE NEUTRALIZERS

- Condensate neutralizing kit NH 500 cod. 00361551

ADDITIONAL FLUE OUTLET ACCESSORIES

- Vertical flue terminal Ø 100 cod. 00361493
- Horizontal flue terminal Ø 100 cod. 00361494
- Extension Ø 100 L=1000 cod. 00361495
- 90° elbow Ø 100 cod. 00262514
- 45° elbow Ø 100 cod. 00262476

ADDITIONAL FLUE OUTLET ACCESSORIES FOR MULTIPLE BOILER FORMATION (in pps)

- Flue thermostat cod. 00361451
- for n°2 boilers*
- Basic cascade kit n°2 ALKON 90 boilers Ø 160 cod. 00361339
- for n°3 boilers*
- Basic cascade kit n°2 ALKON 90 boilers Ø 160 cod. 00361339
- Extension kit n°3 ALKON 90 boilers Ø 200 cod. 00361340
- for n°4 boilers*
- Basic cascade kit n°2 ALKON 90 boilers Ø 160 cod. 00361339
- Extension kit n°3 ALKON 90 boilers Ø 200 cod. 00361340
- Extension kit n°4 ALKON 90 boilers Ø 200 cod. 00361341

Note: Several additional safety devices are not supplied because their setting is subject to the type of heating system installed. If installing a heating system with outputs superior to 360 kW please contact our After Sales Service Department.

* If the casing kit for outdoor installation complete with additional safety devices support kit (pos. 9) is installed, order the top (equipped with an unused flue outlet closure tap) considering an additional element (for example, for n°3 ALKON 90 units with the casing kit for outdoor installation complete with additional safety devices support kit, order the Top for 4)

Unical



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