

# ApenGroup



Heat Exchangers for Industrial Processes,  
Air Handling Units and Roof Tops



**ApenGroup**<sup>®</sup>

# HISTORY

**1967**

## **THE ORIGINS: THERMOVÜR**

The company - founded under the name Thermovür - began its great adventure with the production and sale of oil and gas burners. The founding partners are two brothers-in-law having the same name - Angelo Rigamonti - with the assistance and great professionalism of their father/father-in-law Emilio Rigamonti.

**1980'S**

## **EXPERIENCE AND KNOW-HOW**

The heating sector is evolving rapidly, the building boom and the need to keep everyone warm leads to the need for new and different products: floor-standing boilers, wall-hung boilers, gas burners, gas-fired wall-mounted warm air heaters, gas radiators.

**2000'S**

## **NEW PROJECTS, NEW PRODUCTS**

In 2008, confirmation of the company's technical capabilities in the field of air conditioning was confirmed by the introduction on the market of the Kondensa product (a condensation rooftop warm air heater), air handling units and RoofTop monobloc machines with built-in condensation heat exchanger.

**1973**

## **AERMAX**

Thermovür is supported by the company AERMAX for the marketing of floor-standing warm air heaters and burners, particularly for the foreign market.

**1991**

## **APENGROUP IS BORN**

The two companies create a single company, which will benefit from the wealth of knowledge of the two brands and the know-how now internalised by the company: APEN GROUP SPA is born, a group of companies for new energies. Apen Group today.

**2022**

**RESEARCH,  
INNOVATION AND  
ECOLOGY**

We are always evolving. The market, the experiences, the difficulties have made us stronger and more committed to facing new challenges, new technologies, new countries. We want to defend the values we believe in to be able to improve environmental comfort, attention to people and the use of energy. We also want our company to contribute to a better future!

**2017**

**50 YEARS OF  
LOVE FOR THE  
CLIMATE!**

We are proud to have celebrated our first 50 years in business. In the book "La storia siamo Noi" (We are history), we have recounted the main events that have marked the most important milestones which have made us grow in terms of competence and technological know-how in the heating sector. A continuous evolution, because progress is a never ending process.



# RESEARCH, ECOLOGY AND ENERGY SAVING

## OVERVIEW

APEN GROUP S.p.A. is a leading company in the manufacture of heating systems, offering a wide range of products: condensing boilers, condensing heat exchangers, wall-mounted and floor-standing condensing warm air heaters. It has always been at the forefront thanks to the constant product and process innovation and the continuous search for cutting-edge solutions in the technological field.

## VISION

We consider Love for the Climate (Environment, People, Relationships, Collaborations) our way towards excellence.

## MISSION

Design, manufacture and market products for air conditioning of buildings that stand out for their high quality and attention to the environment (low polluting emissions, high efficiency and reduced energy consumption), working with a team of people that shares with us the passion, harmony, courage, transparency and ethics in relationships.

## MODERN INDUSTRIAL REALITY

With a covered area of about 11,000 m<sup>2</sup> APEN GROUP S.p.A. represents the central nucleus alongside which many small companies operate.

All production is the result of careful development, quality work and research for the future.

There are many distinctive competencies that the company has made its own and that guarantee its prolonged success.

The presence of a family and management team ensures consistency in the definition of company policies and rapid decision-making. An IBM AS400 operating system, perfectly integrated with a network of Personal Computers, manages the entire organisation, ensuring ease and timeliness in inter-company communications.

The website [www.apengroup.com](http://www.apengroup.com) and the e-mail [apen@apengroup.com](mailto:apen@apengroup.com), allow for fast communication with all entities outside the company (be they customers, suppliers, associations).

## ENVIRONMENT

Environmental protection is essential for the quality of life of present and future generations. The challenge of APEN GROUP is to invest in research and development activities that ensure the design and manufacture of products with very low environmental impact. This care, well summarised in the current communication "Apem Group, Love for the climate", naturally involves the entire company organization: search for suppliers and partners that share this entrepreneurial vision, internal staff, optimisation of consumption of natural resources and definition of any action for prevention, control and correction, so that the specific quality and environmental objectives are fulfilled.

## CUSTOMER SERVICE

APEN GROUP meets any design requirement by creating customised products. A flexible production organisation, the presence of technologically advanced machines for sheet metal processing, allow contained costs in relation to the quality-price ratio.

## PRODUCTION EXCELLENCE

The implementation of the projects is intended and designed to optimise the operation of all production processes. Numerically controlled machinery, welding robots, computerised machines, high automation, ensure high quality products, but also flexibility in processing and timely deliveries.

All the devices are manufactured in the departments of a modern industrial company where innovation, originality and reliability become product standards.

## SALES EFFICIENCY

Apem Group operates nationally and internationally and is present in Italy thanks to an efficient and well-distributed organisation: professional agents, technical consultants and designers, are ready to meet customer requirements anytime and anywhere. In all other foreign countries, distributors, dealers and joint ventures with foreign partners share with the company the principles of distribution of highly quality equipment in relation to the needs of the individual countries. 350 Technical Service Centres carry out maintenance and emergency service for all APEN GROUP products with care and expertise.

## TECHNOLOGICAL EXCELLENCE

A qualified team of designers and researchers (present in the committees for the definition of the UNICIG standards) studies and creates products using CAD systems - translating into production the best ideas obtained from research. Furthermore, it develops cutting-edge technical and constructive solutions.

## CERTIFIED QUALITY

APEN GROUP S.p.A. ranges among the first Italian companies to be certified by an industry-wide acknowledging system at European level. We have been audited and certified to be in compliance with the quality standards defined in UNI EN ISO 9001:2015 protocol. Certification has been obtained for the design, manufacturing, marketing and service of hybrid systems, of warm air heaters, condensation heaters and exchangers, condensing boilers, water fan units, air destratifiers, air handling central units, and burners. The commitment to quality took by the company dates back to the beginning of our history, and it is confirmed by the following milestones:

In 1988 APEN GROUP was certified by DVGW Deutscher Verein Des Gas Und Wasserfaches E.V. and it was approved as a trading partner for suspended heaters in Germany. Then approvals for the sale of these heaters in other markets followed, such as France, Switzerland, the Netherlands, and Belgium.

In 1995 all the gas-fired appliances we manufacture were certified according to EC Directives.

In 1991 we were the first Italian company in the HVAC industry to be registered in accordance with UNI EN ISO 9003 requirements.

In 1993 the auditing was extended to include compliance with UNI EN ISO 9002 standards.

In 2003, we were acknowledged to be compliant with UNI EN ISO 9001:2000, and the registration was confirmed in 2006.

In 2013 the Board of Directors has adopted the organizational model 231.

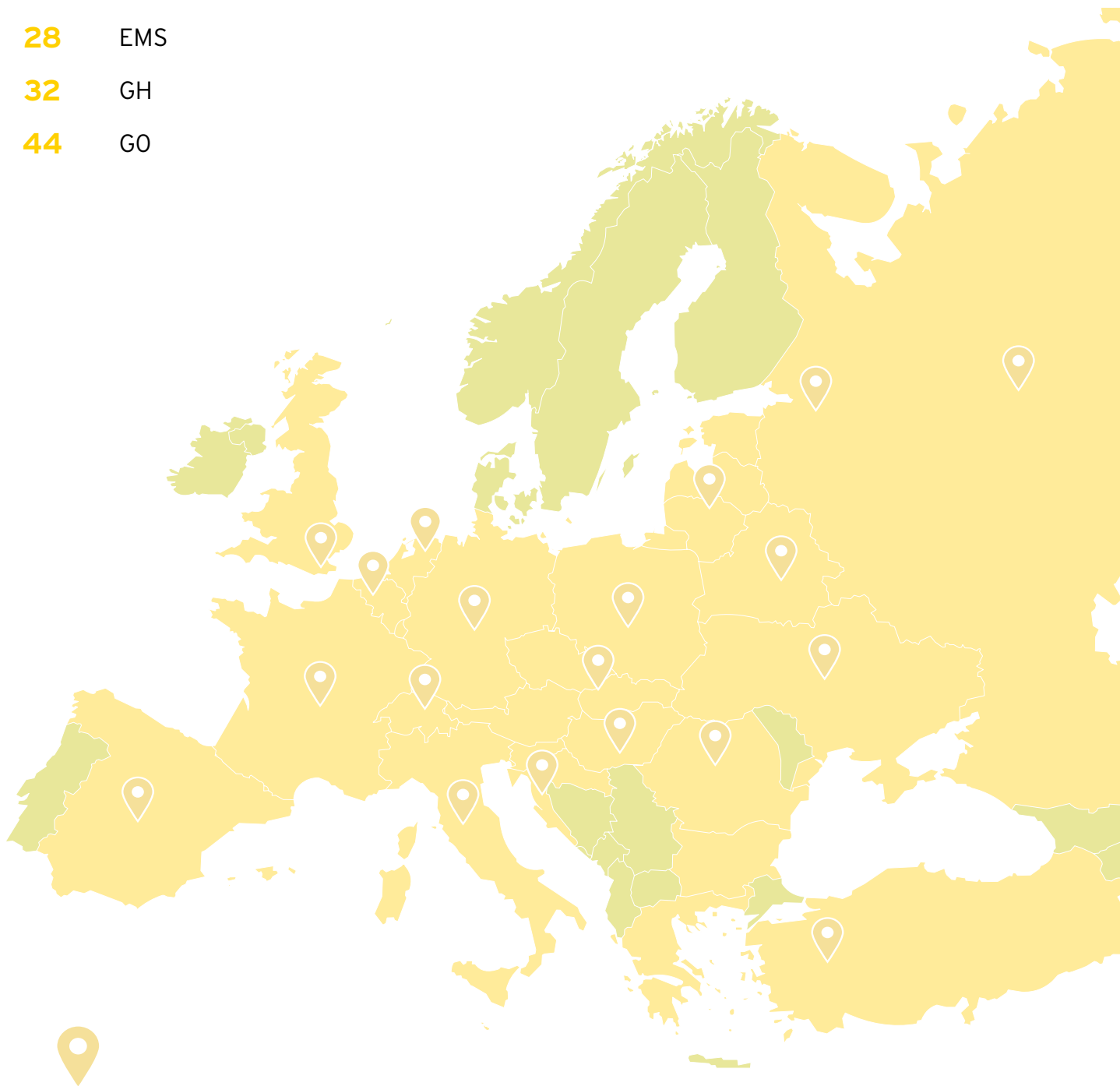
In 2017 we obtained the certification in compliance with the UNI EN ISO 9001:2015.

## INTERNATIONAL CERTIFICATES

Apem Group's products have been tested and certified by Gastec-Kiwa CERMET, the famous Dutch Notified Body, with test labs accredited by the EC.



- 2** Apen Group History
- 4** Company Presentation
- 7** Index
- 8** Heat Exchanger's Range
- 10** Heat Exchanger's Choice
- 14** PCH
- 28** EMS
- 32** GH
- 44** GO



ApenGroup has an international presence. Contact us at [export@apengroup.it](mailto:export@apengroup.it) to get our distributor's name in your country, or to become our partner.

# SYSTEMS FOR INDUSTRIAL APPLICATIONS, ROOFTOP AND AHU

Manufacturing processes often require different forms of heating, as for heat treatment or the drying or drying processes, using the air as a heat convector.

Apen Group has nearly fifty years of experience in the study and production of hot air generators for industrial processes.

Our Investments in R&D projects for the development and construction of energy efficient systems, allow the industrial customer to benefit from:

reliable products, energy-saving advantages and low maintenance requirements which help to reduce the operating costs.

Process safety and equipment's lifespan is guaranteed by high quality resistant materials and design. ApenGroup is able to supply an extended range of heat exchangers and to fulfill customized requirements. Our design department is able to support the customer in finding the optimal solution in any planning phase.

## Application fields:

- Coating and Painting
- Drying of food processes.
- Drying processes for components
- Ceramics drying processes
- Textile and clothes drying
- Heating in concrete making for construction industry
- Agricultural products drying as for Cereals and Tobacco.

## AHU or ROOF TOP Applications

Apen Group has developed the series of high efficiency condensing modules with premixed burner and stainless steel exchangers to combine with gas burners and fuel oil burners, to satisfy all the needs of heating and heat integration within air handling units and roof top.



Textile and Clothes Drying



Drying of Food Processes



Coating and Painting



Ceramics Drying Processes



## PCH Exchanger Modules

PCH exchanger modules are equipped with the premixing and modulation technology, which can achieve efficiencies up to 109% (calculated on lower heating value).

The module can operate autonomously. For the start-up just connect power and gas supplies

Modules heat output goes from 5 to 97 kW; for higher values several modules must be combined.

The modules can be assembled in parallel, achieving high power levels (up to 400 kW).

The regulation can be made:

- proportionally, with external control voltage in 0-10Vdc;
- with ON-OFF control;
- with insertion in cascade, in the case of multiple units..

## EMS/GH Exchanger Modules

The exchanger modules EMS and GH series are manufactured in 14 different capacity range from 14 kW to 1,050 kW.

The modules can be fueled either with gaseous fuels or with liquid fuels.

The difference between the GH models and EMS models is related to the type of use for which they were designed.

**EMS Modules:** designed to be directly canalized or connected in series to AHU; the structure is composed by an aluminum frame and sandwich panels, insulated with glass wool, in white painted sheet (towards the outside) and in galvanized steel sheet (towards the inside).

**GH Modules:** designed to be inserted inside the air handling units, they have a galvanized sheet lightweight chassis that allows its inclusion in dedicated units.

## GO Exchanger Module

The GO series of combustion chambers (heat exchangers) are built in 12 different capacity range from 14 kW to 1,050 kW, for a total of 48 models depending on the type of construction; can be powered either by gaseous fuels or with liquid fuels.



Textile and Clothes Drying



Industry



Roof Top



Air Handling Unit

# OUR RANGE

## HEAT EXCHANGERS WITH BURNER PREMIX



### PCH SERIE, HIGH EFFICIENCY MODULATING

High efficiency condensing heating module already equipped with a premix burner with low emissions of NOx. Available capacity range from 5 kW to 400 kW.

## EXCHANGERS WITHOUT BURNER WITH INSULATED PANELS



### EMS-K SERIE, HIGH EFFICIENCY

High efficiency heat exchanger module, without fan assembly and electrical panel, particularly suitable for installation in positioning systems with downstream and external to the machine. Available capacity range from 27 kW to 1.050 kW.

## HEAT EXCHANGERS WITHOUT BURNER WITH CASING



### GH-K SERIE, HIGH EFFICIENCY

High efficiency heat exchanger module in stainless steel INOX AISI 441 or in AISI 310, already equipped with supporting structure, fan thermostat and limit thermostat.

## HEAT EXCHANGERS WITHOUT BURNER WITH INSULATED PANELS



### EMS-N SERIE, STANDARD

Heat exchanger module, without fan assembly and electrical panel, particularly suitable for installation in positioning systems with downstream and external to the machine.  
Available capacity range from 27 kW to 550 kW.

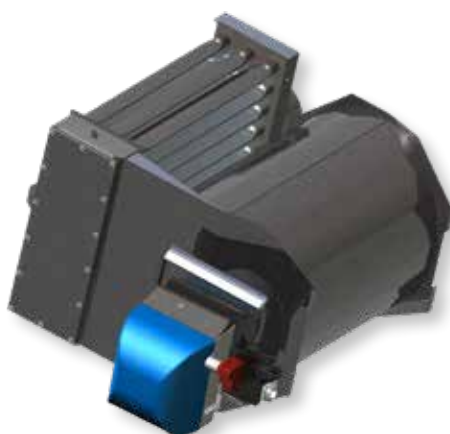
## HEAT EXCHANGERS WITHOUT BURNER WITH CASING



### GH-N SERIE, STANDARD

Heat exchanger module in stainless steel INOX AISI 441 or in AISI 310, already equipped with supporting structure, fan thermostat and limit thermostat.

## HEAT EXCHANGERS WITHOUT BURNER WITHOUT CASING



### GO AND GOK SERIE

Heat exchanger available in stainless steel AISI 441 and AISI 310  
Particularly suitable for use in industrial processes.  
The module, to operate, must be placed within a structure, properly isolated, and coupled to a burner that use liquid or gaseous fuel.

# Method of Calculation for Process Heat Exchanger Choice

Apen Group' engineers are at your disposal in order to support the right choice and definition of the appropriate heat exchanger suitable for your process plant application. Following page is giving you an initial technical overview on the method of calculation to identify the appropriate product module.

## CHOICE OF HEAT EXCHANGER

When looking at technical characteristics included in description pages for products GO/GH/EMS, starting from page 14 of this brochure, appropriate power values must be corrected on the base of the following procedures and charts.

## DELIVERED AIR TEMPERATURE

If delivery temperature from the exchanger is over 70°C, the max heat input set for the burner must be reduced by the percentage shown in chart 1.

Please note that when delivered air temperature exceeds 257°F (125°C), AISI 310 exchangers are recommended.

Example:

GH7980 / EMS190N-00A Exchanger	
Max heat output	230 kW
Delivered air temperature	257°F (190°C)
Max heat input set [burnt]	$230 \times 0.87 = 200$ kW

## CONSISTENT HEAT DROP

If heat drop is > 95°F (35°C), the max heat input set for the burner must be reduced by the percentage shown in chart 2. If heat drop is > 239°F (115°C), AISI 310 exchangers are recommended.

Example:

GH7980 / EMS190N-00A Exchanger	
Max heat output	230 kW
Heat drop	120 °K
Max heat input set [burnt]	$230 \times 0.88 = 202$ kW

## COMBINED EFFECT

If the exchanger is used with both high delivered air temperature and consistent heat drop, these two conditions and relevant efficiency reductions must be taken into account.

Example:

GH7980 / EMS190N-00A Exchanger	
Max heat output	230 kW
Heat drop	120 °K
Delivered air temperature	392°F (200°C)
Max heat input set [burnt]	$230 \times 0.88 \times 0.86 = 174$ kW AISI 310 exchanger

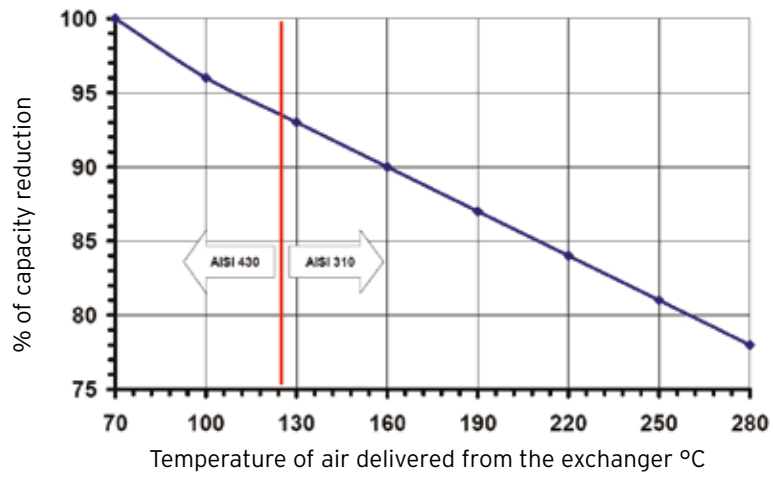
## LIMIT CONDITIONS FOR USING HEATERS ARE THE FOLLOWING:

AISI 430	Maximum delivery temperature 239°F (115°C)
	Maximum heat drop 100°K with maximum delivery temperature 212°F (100°C)
AISI 310	Maximum delivery temperature 392°F (200°C)
	Maximum heat drop 180°K with delivery temperature 356°F (180°C)

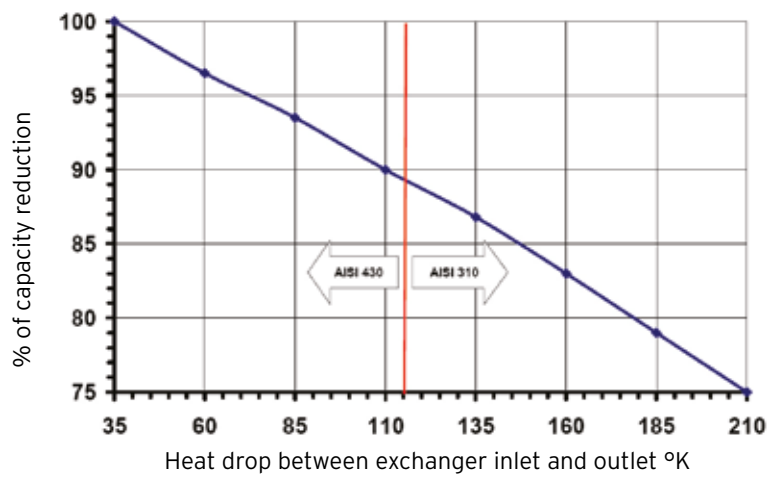
Contact APEN GROUP for different requirements of running parameters.



# CHART 1



# CHART 2



# PCH / Condensing Gas Heating Moduls for Air Handling Units and Rooftop



## Very High Efficiency

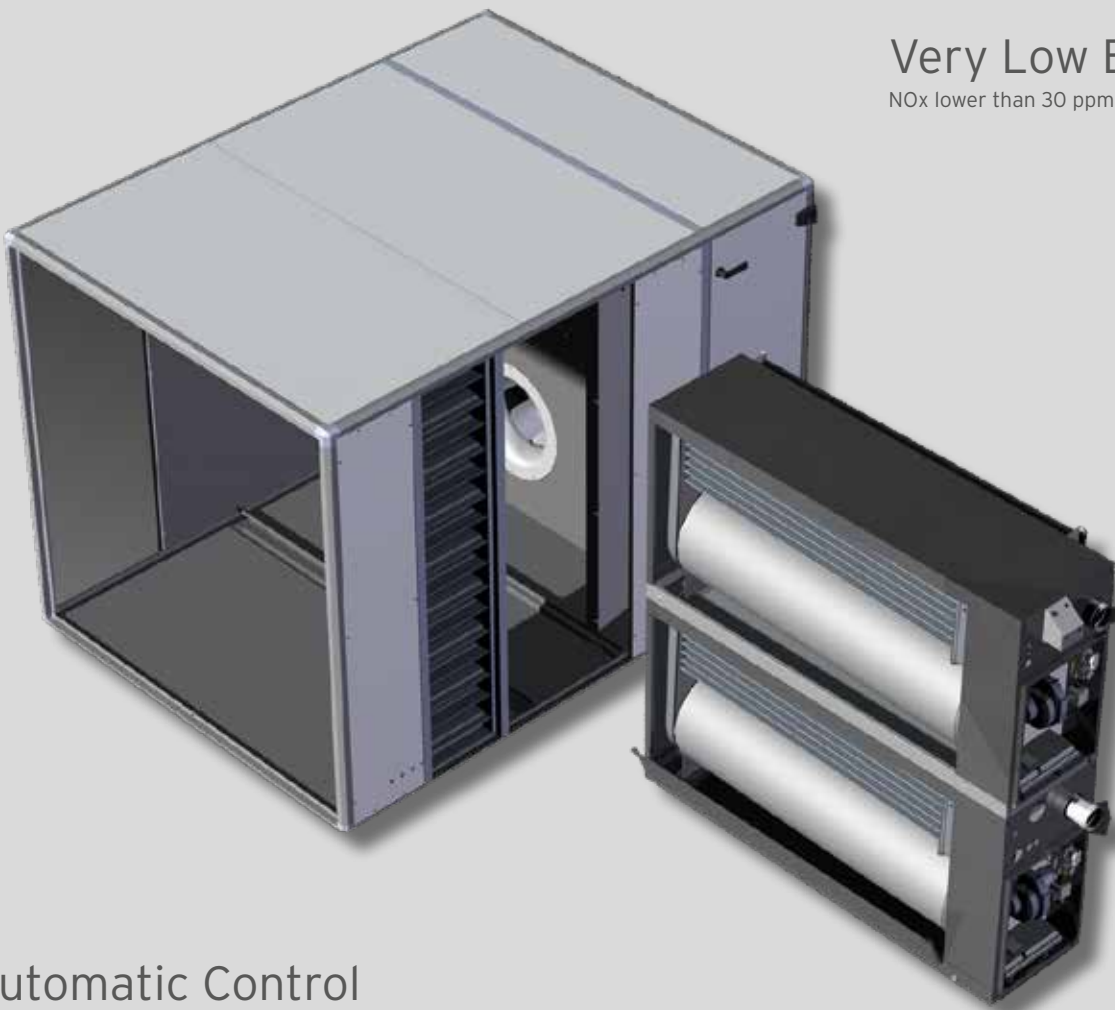
PCH: efficiency up to 109%

## Capacity Range

14 models from 5 kW to 500kW

## Very Low Emissions

NOx lower than 30 ppm : Class 5



## Automatic Control

Electronic ignition and simple electrical connection

## Fine Tuning

Standard power level managed by 0 - 10 volt control input from air handling unit

## Extended Modulation

Standard continuous modulation from 100% to 20%



## PCH Series: Condensing Gas Exchanger Modules

Apen Group has designed and developed PCH heating module, specially designed for insertion into air treatment units and roof-tops, with premix and modulation technology, allowing condensation to reach up to 109% calculated based on the lower calorific value (Hi). The new heating module is built with environment-friendly, totally recyclable materials, such as stainless steel and aluminium, which produces "ecological and rational" thermal energy due to the "clean combustion" achieved with the burner that fully premix air-and gas, and due to the ability to continuously and rationally adapt the thermal power delivered to the time variations of energy requirements of the rooms to be heated. A microprocessor-based device controls continuous modulation of thermal power output and adjusts it to heat requirements.

An innovative main burner power device monitors and modulates, in the correct proportions, the amount of combustion air and fuel gas during the thermal power modulation phase.

### Clean Combustion

The new exchanger module is equipped with a burner that fully premix air and gas. The thermal power modulation device characterizes condensing modules with:

- NO emissions of carbon monoxide (CO = 0);
- Very low emission of nitrogen oxides, below 30 parts per million (NOx < 30 ppm);
- Low emission of CO<sub>2</sub>, thanks to high combustion efficiency (109%) and to reduction of fuel consumption arising from heat output modulation.

### Undirect Heat Exchange

A few minutes are enough for the environment to warm up thanks to the absence of thermal inertia. The heat produced PCH is directly transferred to ambient air through undirect exchange with combustion products. These products flow inside a sealed system, totally separated from the air heated for environment. No intermediate fluid is required, so the hydraulic circuit is unnecessary and water freezing becomes an out-of-date issue.

### No Need for Boiler Room

The heat exchanger module also allows:

- Savings on plant building cost (boiler, burner, pumps, safety and regulation devices, masonry work);
- Less space is required (units are smaller and require less clearance);
- No need for plant certification (our PCH module is already fully certified).

### Savings on Fuel Consumption Up to 50%

The high combustion efficiency of up to 109% (referring to lower calorific power), the continuous modulation of the delivered thermal power, the reduced warm air stratification allows to save fuel from 30% to 50% compared to conventional heat exchangers.



PCH Gas Modules present an extended power range which goes from 5 kW to 400 kW. This result is achieved thanks to the possibility to assemble standard modules in parallel configurations.

We can choose between three gas module configurations:

### A - Single Modules

#### A System

Consist of a single exchanger.

The range includes 6 models for PCH with maximum power output up to 100 kW.

The modules can be installed either vertically or horizontally, depending on the air flow direction. If the installation is expected that the air flow direction is vertical, you must indicate this when ordering.



### B - Horizontally Combined Modules

#### B System

They consist of two or more exchangers: burners, gas appliances and chimneys are equal in number to the number of the heat exchangers.

Gas and electrical connection is unique for the double modules.

For modules with three or four exchangers there are two gas connections and one electrical connection.

The range includes the models in two modules, three modules and four modules, to arrive at a maximum output power of about 400 kW.

The modules are inserted in cascade with the signal 0/10 Vdc and/or with the ON/OFF signal carried on the single module.

The modules can be installed either vertically or horizontally, depending on the air flow direction, regardless of the orientation of the generator. If the installation is expected that the air flow direction is vertical, you must indicate this when ordering.



### C - Vertically Combined Modules

#### C System

They consist of two exchangers: burners, gas appliances and chimneys are equal in number to the number of the heat exchangers.

Gas and electrical connection is unique for all modules.

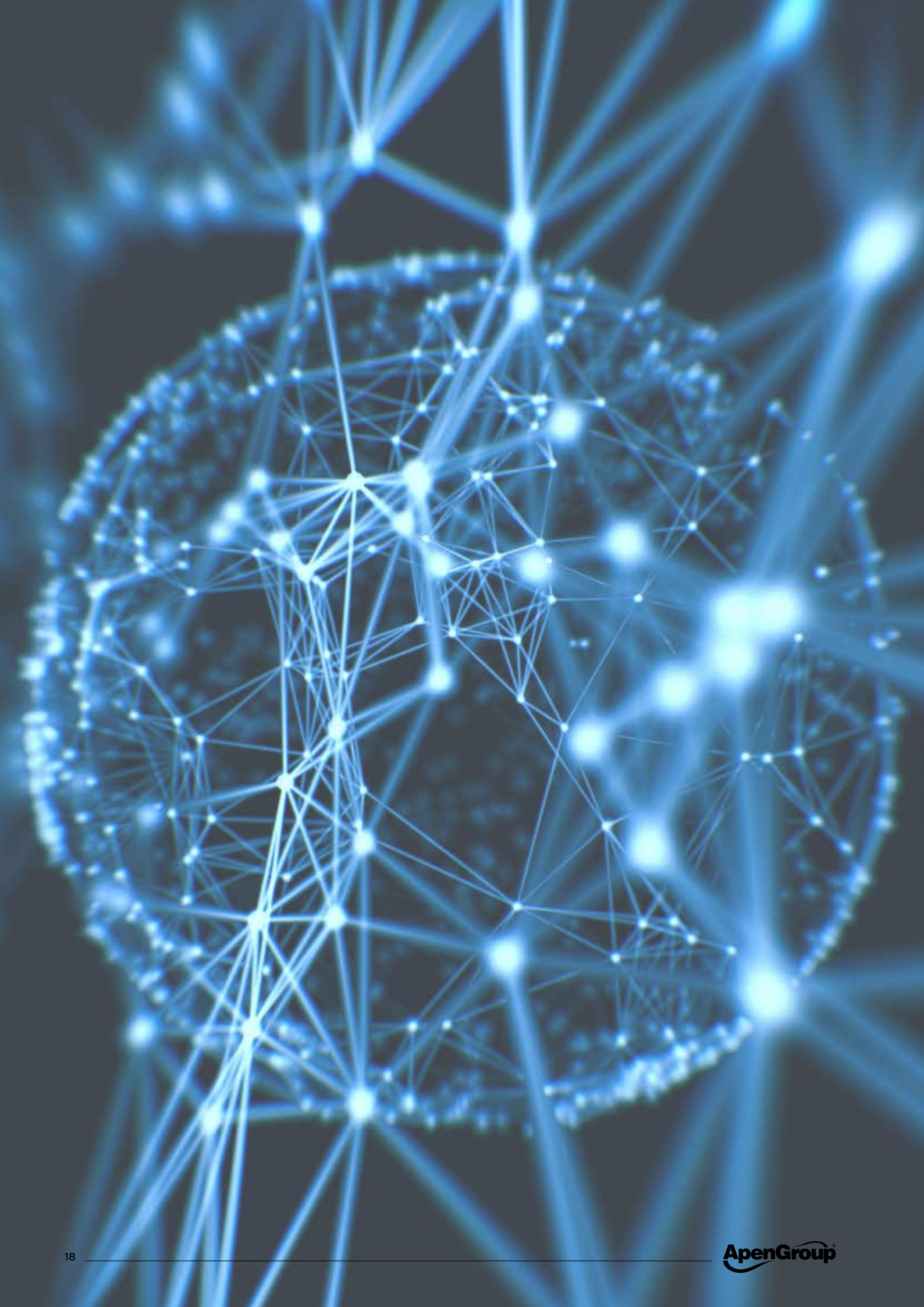
These modules present a width limited space and low pressure loss to the air flow.

The range includes the models in two modules, up to a maximum power of about 200 kW.

The modules are inserted in cascade with the signal 0/10 Vdc and/or with the ON/OFF signal carried on the single module.

The modules can be installed only with the direction of the horizontal airflow.





## Heat Exchanger

Furnace and air/flue exchanger are entirely manufactured with stainless steel (with low carbon content) AISI 441 which assures maximum reliability and long life cycle.

The new cylinder shaped furnace and the air/flue exchangers, whose tube bundle is custom designed, guarantee performance that place PCH/new modules among the leading units for heat efficiency, with an outstanding value of 109%.

## Premix Burner

The burner is entirely made of AISI 430 steel and undergoes specific engineering processing that guarantee top reliability and high thermal-mechanical performance.



## Safety and Control Devices

The safety and control devices are constituted by:

1. Safety thermostat with manual reset and positive safety;
2. Electronic ignition device for the burner and ionization flame control device;
3. Ignition and flame detection electrodes.
4. Pressure switch/condensation sensor.

## Air/Gas Mixing : Guaranteed Safety

An advanced technique of air/gas mixing guarantees total safety. The gas valve delivers gas according to the air/gas ratio set at the premises. If combustion air fails, the gas valve shuts up.

If combustion air decreases, the valve automatically reduces gas flow while maintaining optimal combustion parameters.

## Electronic Card

The microprocessor-based electronic card regulates continuous modulation of heat output and controls both the electrical fan for air/gas mixing and the gas valve.

## Multifunction LCD Panel

The PCH module is fitted as standard with a multifunction LCD panel located inside the burner housing, and is used to control, configure and diagnose all operating parameters of the equipment..

The instrument panel is fitted with a red 3 digits LCD display and 4 function keys:

↑ , ↓ , ESC and ENTER.

The display allows the user to display the heater operating mode and its Faults.



## Gas Directive Certification

Technical features of PCH modules have been thoroughly checked and tested, then they have been approved and certified by KIWA GASTEC, the respected and renowned Body for European Certification.

By assigning to PCH modules the approval number 0476CQ0451, KIWA GASTEC has certified that these modules comply with the following Directives:

- 2016/426/CE Gas Appliance Regulation.
- 2014/30/UE - Electromagnetic Compatibility Directive.
- 2014/35/UE - Low Voltage Directive.
- 2016/2281/UE - ErP Regulation.

## CAD Drawings

When ordering the PCH modules, ask for its size drawings. We supply drawings in 3D CAD format to ease your assembling work of the PCH module into your installation!

## Exhausted Fumes

PCH heat exchanger modules are certified for exhaust fumes and air intake in the following ways:

- "C" type: sealed combustion circuit, with combustion air being drawn from outside;
- "B" type: open combustion circuit and with combustion air being drawn from the heater installation site.

## Standard Accessories

PCH exchanger modules are provided with some essential accessories for the proper installation:

- An intake terminal;
- An exhaust terminal for application of B23 type;
- An exhaust fumes terminal.

## Accessories on Request

PCH exchanger modules are provided with front panel made of galvanized sheet that not suitable for outdoor installation and without door panel.

A kit including one front panel and one door panel is available upon request.



Kit front panel and door panel

# PCH /Technical Data (A System)

Model		PCH020	PCH034	PCH045	PCH065	PCH080	PCH105						
Type of equipment		B23P - C13 - C43 - C53 - C63											
EC approval	PIN.	0476CQ0451											
NOx Class	Val	5											
Type of fuel		Gaseous											
<b>Heater Performance</b>													
		min	max	min	max	min	max	min	max	min	max	min	max
Furnace heat input (Hi)	kW	4.75	19.00	7.60	34.85	8.50	42.00	12.40	65.00	16.40	82.00	21.00	100.00
Useful heat output [ $P_{min}$ , $P_{rated}$ ]*	kW	4.97	18.18	8.13	33.56	8.97	40.45	13.40	62.93	17.77	80.03	22.77	97.15
Hi Efficiency (N.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	104.63	95.68	106.97	96.30	105.50	96.30	108.06	96.82	108.35	97.60	108.40	97.15
Hs efficiency (G.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	94.26	86.20	96.37	86.76	95.07	86.76	97.36	87.22	97.62	87.93	97.68	87.52
Flue losses with burner on (Hi)	%	0.4	4.3	0.6	3.7	0.5	3.7	0.2	3.2	0.3	2.4	0.2	2.8
Flue losses with burner off (Hi)	%	<0,1		<0,1		<0,1		<0,1		<0,1		<0,1	
Max. condensation <sup>(1)</sup>	l/h	0.4		0.9		1.1		2.1		3.3		2.7	
<b>Flue gas emissions</b>													
Carbon monoxide - CO - (0% of O <sub>2</sub> ) <sup>(2)</sup>	ppm	< 5		< 5		< 5		< 5		< 5		< 5	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hi) <sup>(3)</sup>		29 mg/kWh - 16 ppm		51 mg/kWh - 29 ppm		36 mg/kWh - 20 ppm		45 mg/kWh - 25 ppm		31 mg/kWh - 18 ppm		40 mg/kWh - 23 ppm	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hs) <sup>(4)</sup>		26 mg/kWh - 15 ppm		46 mg/kWh - 26 ppm		32 mg/kWh - 18 ppm		41 mg/kWh - 23 ppm		28 mg/kWh - 16 ppm		36 mg/kWh - 20 ppm	
Pressure available at the flue	Pa	80		90		100		120		120		120	
<b>Electrical Characteristics</b>													
Supply voltage	V	230 Vac - 50 Hz single-phase											
Rated power [ $e_{l_{min}}$ - $e_{l_{max}}$ ]*	kW	0.011	0.045	0.011	0.074	0.024	0.082	0.015	0.097	0.020	0.123	0.020	0.130
Protection Rating	IP	IP X5D											
Operating Temperatures	°C	from -15°C to +40°C - for lower temperatures, a burner housing heating kit is required <sup>(6)</sup>											
<b>Connections</b>													
Ø Gas connection		UNI/ISO 228/1-G 3/4"		UNI/ISO 228/1-G 3/4"		UNI/ISO 228/1-G 3/4"		UNI/ISO 228/1-G 3/4"		UNI/ISO 228/1-G 3/4"		UNI/ISO 228/1-G 3/4"	
Intake/exhaust pipes Ø	mm	80/80		80/80		80/80		80/80		80/80		80/80	
<b>Air flow rate</b>													
Air flow rate (15°C) <sup>(5)</sup>	m <sup>3</sup> /h	2700		4300		4500		7800		9000		11100	
<b>Weight</b>													
Net Weight	kg	39		48		58		72		98		118	

**NOTES:**

\* Symbol of conformity with Reg.EU/2281/2016.

(1) Max. condensation produced acquired from testing at 30%Qn.

(2) Value referred to cat. H (G20).

(3) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to net calorific value (Hi, N.C.V).

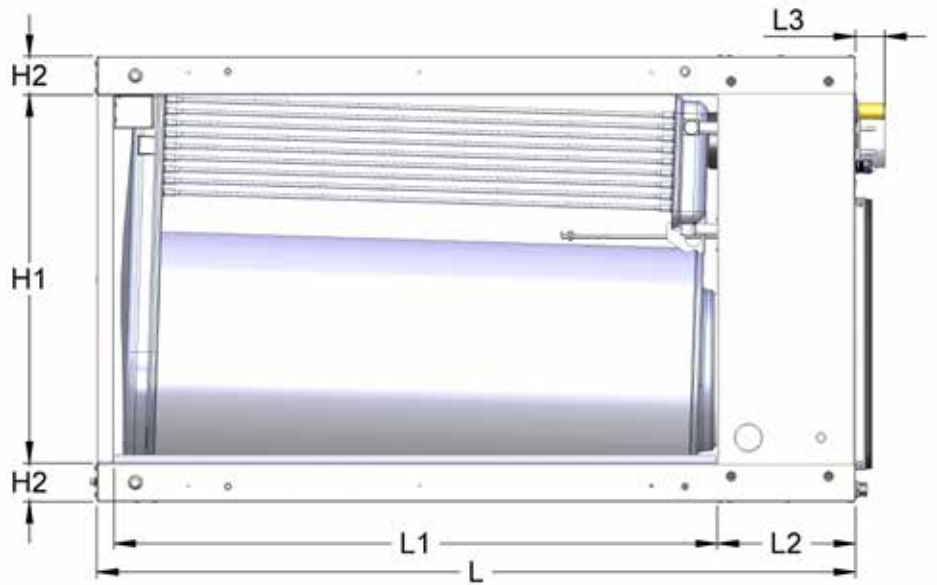
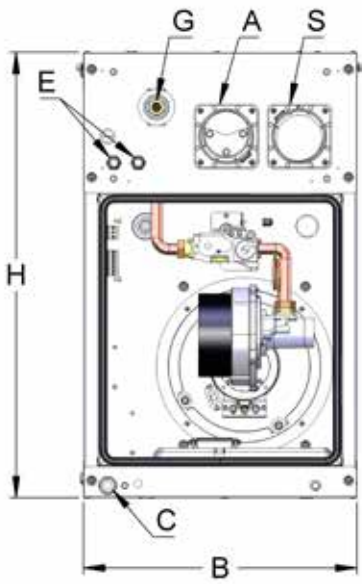
(4) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to gross calorific value (Hs, G.C.V).

(5) Reference air flow rate for the calculation of yields and season energy efficiencies and emissions listed in the table

(6) If the burner housing heater kit is installed, add 105 W (230V) per module to the rated power value on the nameplate.



# PCH / Dimensions (A System)



DIMENSIONS (mm)

Model	B	H	L	H1	H2	H3	L1	L2	L3	E	G*	A	S	C*
PCH020	450	660	710	534	63	-	450	230	47	2X Ø21	G 3/4"	Ø 80	Ø 80	G 1/2"
PCH034			950				690							
PCH045		730	1.250	604			990							
PCH065			1.440	1.180										
PCH080			1.670	1.410										
PCH105		815	1.670	689			1.410							

**KEY:**

E electrical connections; G gas connection; A intake; S flue gas drainage; C condensate drainage; \* reference ISO 228/1.



# PCH / Technical Data (B system)

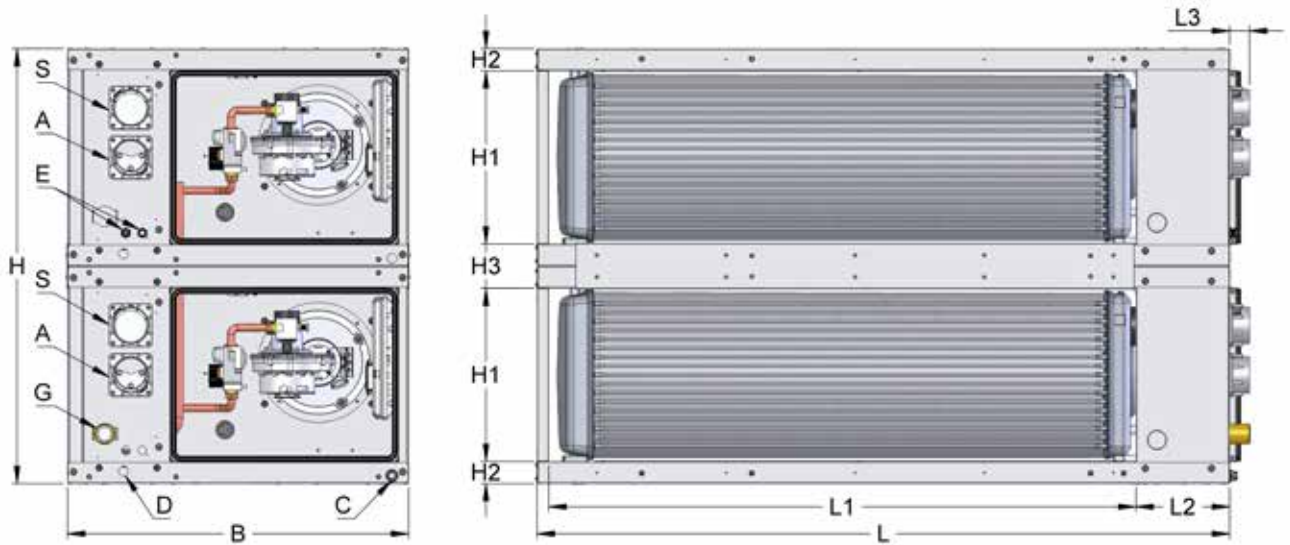
Model		PCH130	PCH160	PCH210	PCH320	PCH420					
Type of equipment		B23P - C13 - C43 - C53 - C63									
EC approval	PIN.	0476CQ0451									
NOx Class	Val	5									
<b>Heater Performance</b>											
		min	max	min	max	min	max	min	max	min	max
Furnace heat input (Hi)	kW	12.40	130.00	16.40	164.00	21.00	200.00	21.00	300.00	21.00	400.00
Useful heat output [ $P_{min}$ , $P_{rated}$ ]*	kW	13.40	125.86	17.77	160.06	22.77	194.30	22.77	291.45	22.77	388.60
Hi Efficiency (N.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	108.06	96.82	108.35	97.60	108.40	97.15	108.40	97.15	108.40	97.15
Hs efficiency (G.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	97.36	87.22	97.62	87.93	97.68	87.52	97.68	87.52	97.68	87.52
Flue losses with burner on (Hi)	%	0.2	3.2	0.3	2.4	0.2	2.8	0.2	2.8	0.2	2.8
Flue losses with burner off (Hi)	%	<0,1		<0,1		<0,1		<0,1		<0,1	
Max. condensation <sup>(1)</sup>	l/h	4.2		6.6		5.4		8.1		10.8	
<b>Flue gas emissions</b>											
Carbon monoxide - CO - (0% of O <sub>2</sub> ) <sup>(2)</sup> ppm		< 5		< 5		< 5		< 5		< 5	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hi) <sup>(3)</sup>	45 mg/kWh - 25 ppm			31 mg/kWh - 18 ppm		40 mg/kWh - 23 ppm		40 mg/kWh - 23 ppm		40 mg/kWh - 23 ppm	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hs) <sup>(4)</sup>	41 mg/kWh - 23 ppm			28 mg/kWh - 16 ppm		36 mg/kWh - 20 ppm		36 mg/kWh - 20 ppm		36 mg/kWh - 20 ppm	
Pressure available at the flue	Pa	120		120		120		120		120	
<b>Electrical Characteristics</b>											
Supply voltage	V	230 Vac - 50 Hz single-phase									
Rated power [ $e_{min}$ - $e_{max}$ ]*	kW	0.015	0.194	0.020	0.246	0.020	0.260	0.020	0.390	0.020	0.520
Protection Rating	IP	IP X5D									
Operating Temperatures	°C	from 15°C to +40°C - for lower temperatures, a burner housing heating kit is required <sup>(6)</sup>									
<b>Connections</b>											
Ø gas connection		UNI/ISO 228/1-G 1½"		UNI/ISO 228/1-G 1½"		UNI/ISO 228/1-G 1½"		UNI/ISO 228/1-1 x G 1½" + 1 x G ¾"		UNI/ISO 228/1-2 x G 1½"	
Intake/exhaust pipes Ø	mm	2 x 80/80		2 x 80/80		2 x 80/80		3 x 80/80		4 x 80/80	
<b>Air flow rate</b>											
Air flow rate (15°C) <sup>(5)</sup>	m <sup>3</sup> /h	15600		18000		22200		33300		44400	
<b>Weight</b>											
Net Weight	kg	154		206		250		375		500	

## NOTES:

- \* Symbol of conformity with Reg.EU/2281/2016.
- (1) Max. condensation produced acquired from testing at 30%Qn.
- (2) Value referred to cat. H (G20).
- (3) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to net calorific value (Hi, N.C.V).
- (4) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to gross calorific value (Hs, G.C.V).
- (5) Reference air flow rate for the calculation of yields and season energy efficiencies and emissions listed in the table
- (6) If the burner housing heater kit is installed, add 105 W (230V) per module to the rated power value on the nameplate.



# PCH / Dimensions (B system)



DIMENSIONS (mm)

Mod. PCH-00H0	B	H	L	H1	H2	H3	L1	L2	L3	E	G*	A	S	C*	D
PCH034-00H0	740	525	960	418	53	-	690	230	47	2X Ø21	G 3/4"	Ø 80	Ø 80	G 1/2"	Ø 21
PCH045-00H0			1260				990								
PCH065-00H0			1450				1180								
PCH080-00H0	825		1680				1410								
PCH105-00H0															

DIMENSIONS (mm)

Model	B	H	L	H1	H2	H3	L1	L2	L3	E	G*	A	S	C*	D
PCH130	740	1.050	1.260	418	53	108	1.000	230	47	2X Ø21	G 1 1/2"	2X Ø 80	2X Ø 80	1X G 1/2"	Ø 21
PCH160			1.450				1.190								
PCH210			1.680				1.420								
PCH320	825	1.575	1.680								1xG 1 1/2" + 1xG 3/4"	3X Ø 80	3X Ø 80		
PCH420															

**KEY:**

E electrical connections; G gas connection; A intake; S flue gas drainage; C condensate drainage; D condensate vent \* reference ISO 228/1.



# PCH / Technical Data (C system)

Model		PCH132		PCH162		PCH212	
Type of equipment		B23P - C13 - C43 - C53 - C63					
EC approval	PIN.	0476CQ0451					
NOx Class	Val	5					
<b>Heater Performance</b>							
		min	max	min	max	min	max
Furnace heat input (Hi)	kW	12.40	130.00	16.40	164.00	21.00	200.00
Useful heat output [ $P_{min}$ , $P_{rated}$ ]*	kW	13.40	125.86	17.77	160.06	22.77	194.30
Hi Efficiency (N.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	108.06	96.82	108.35	97.60	108.40	97.15
Hs efficiency (G.C.V.) [ $\eta_{pl}$ , $\eta_{nom}$ ]*	%	97.36	87.22	97.62	87.93	97.68	87.52
Flue losses with burner on (Hi)	%	0.2	3.2	0.3	2.4	0.2	2.8
Flue losses with burner off (Hi)	%	<0,1		<0,1		<0,1	
Max. condensation <sup>(1)</sup>	l/h	4.2		6.6		5.4	
<b>Flue gas emissions</b>							
Carbon monoxide - CO - (0% of O <sub>2</sub> ) <sup>(2)</sup>	ppm	< 5		< 5		< 5	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hi) <sup>(3)</sup>		45 mg/kWh - 25 ppm		31 mg/kWh - 18 ppm		40 mg/kWh - 23 ppm	
Emissions of nitrogen oxides - NOx* (0% of O <sub>2</sub> ) (Hs) <sup>(4)</sup>		41 mg/kWh - 23 ppm		28 mg/kWh - 16 ppm		36 mg/kWh - 20 ppm	
Pressure available at the flue	Pa	120		120		120	
<b>Electrical Characteristics</b>							
Supply voltage	V	230 Vac - 50 Hz single-phase					
Rated power [ $e_{l_{min}}$ - $e_{l_{max}}$ ]*	kW	0.015	0.194	0.020	0.246	0.020	0.260
Protection Rating	IP	IP X5D					
Operating Temperatures	°C	from -15°C to +40°C - for lower temperatures, a burner housing heating kit is required <sup>(6)</sup>					
<b>Connections</b>							
Ø gas connection		UNI/ISO 228/1- G 1½"		UNI/ISO 228/1- G 1½"		UNI/ISO 228/1- G 1½"	
Intake/exhaust pipes Ø	mm	2 x 80/80		2 x 80/80		2 x 80/80	
<b>Air flow rate</b>							
Air flow rate (15°C) <sup>(5)</sup>	m <sup>3</sup> /h	15600		18000		22200	
<b>Weight</b>							
Net Weight	kg	148		200		240	

## NOTES:

\* Symbol of conformity with Reg.EU/2281/2016.

(1) Max. condensation produced acquired from testing at 30%Qn.

(2) Value referred to cat. H (G20).

(3) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to net calorific value (Hi, N.C.V).

(4) Weighted value to EN17082:2019 ref. to cat. H (G20), referred to gross calorific value (Hs, G.C.V).

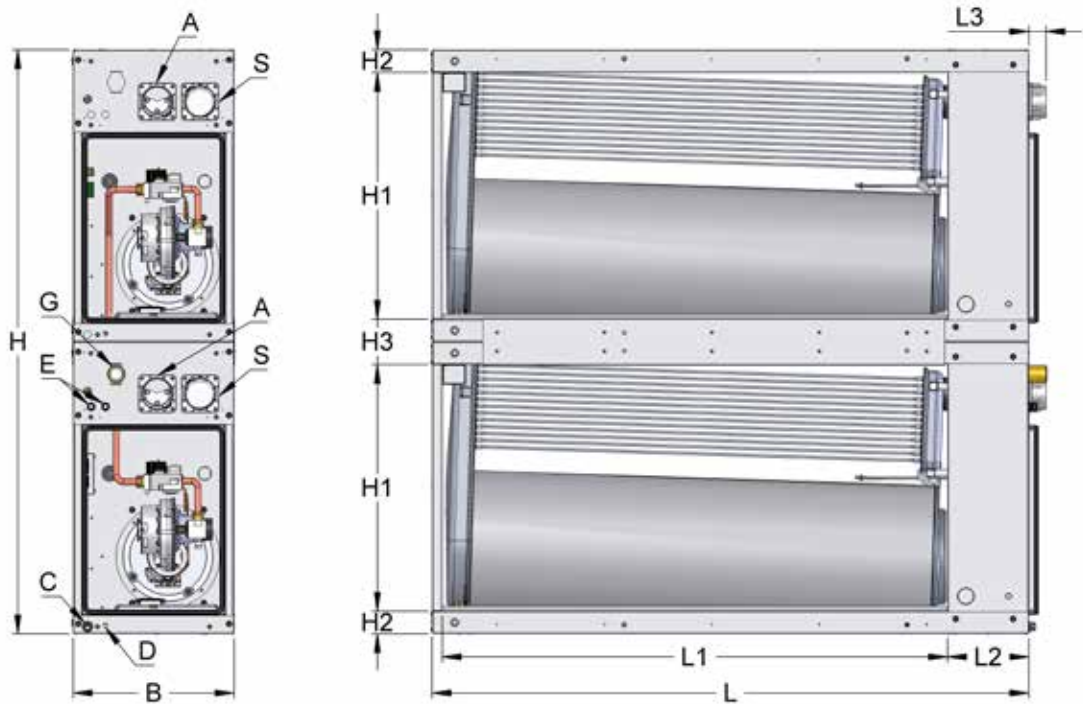
(5) Reference air flow rate for the calculation of yields and season energy efficiencies and emissions listed in the table

(6) If the burner housing heater kit is installed, add 105 W (230V) per module to the rated power value on the nameplate.





# PCH / Dimensions (C system)



DIMENSIONS (mm)

Model	B	H	L	H1	H2	H3	L1	L2	L3	E	G*	A	S	C*	D
PCH132	450	1.460	1.250	604	63	126	990	230	47	2X Ø21	G 1½"	2X Ø 80	2X Ø 80	1X G ½"	Ø 18
PCH162		1.630	1.440	689			1.180								
PCH212		1.670	1.410	1.410											

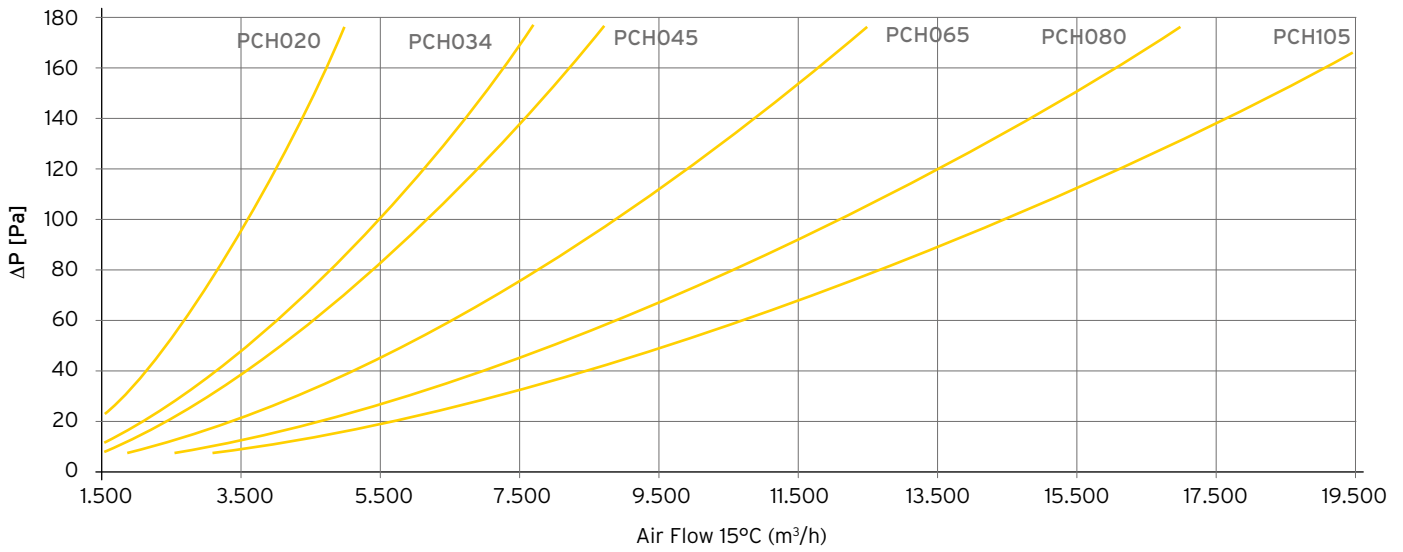
**KEY:**

E electrical connections; G gas connection; A intake; S flue gas drainage; C condensate drainage; D condensate vent \* reference ISO 228/1.

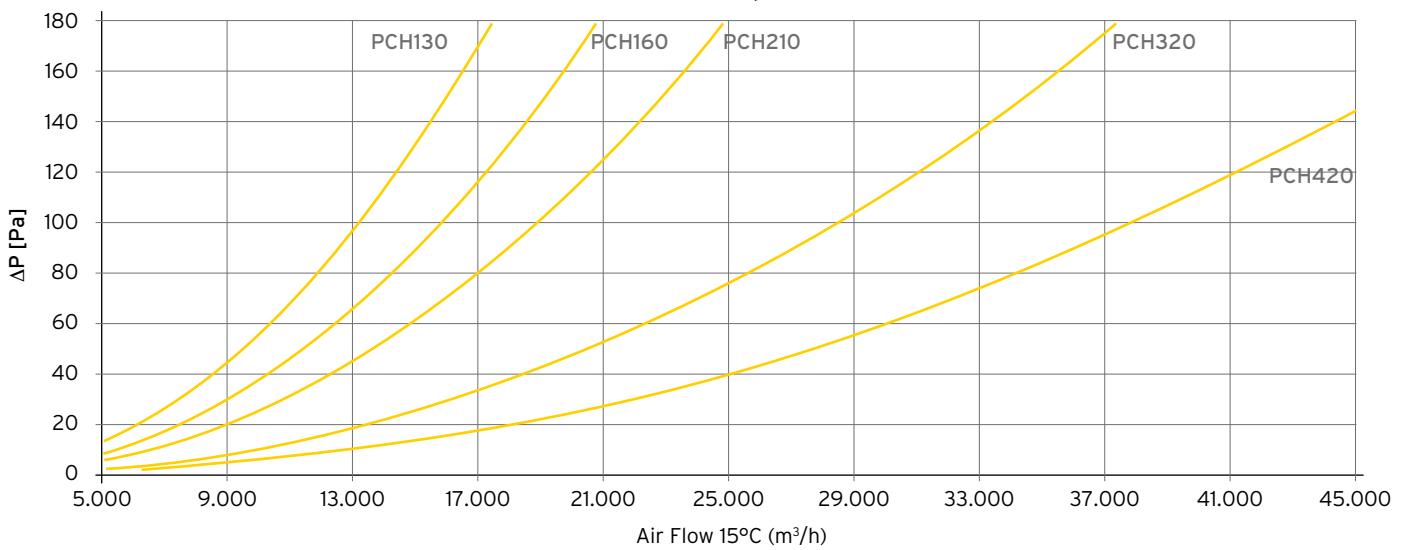


# PCH / Air Flow Rate - Pressure Drop Chart

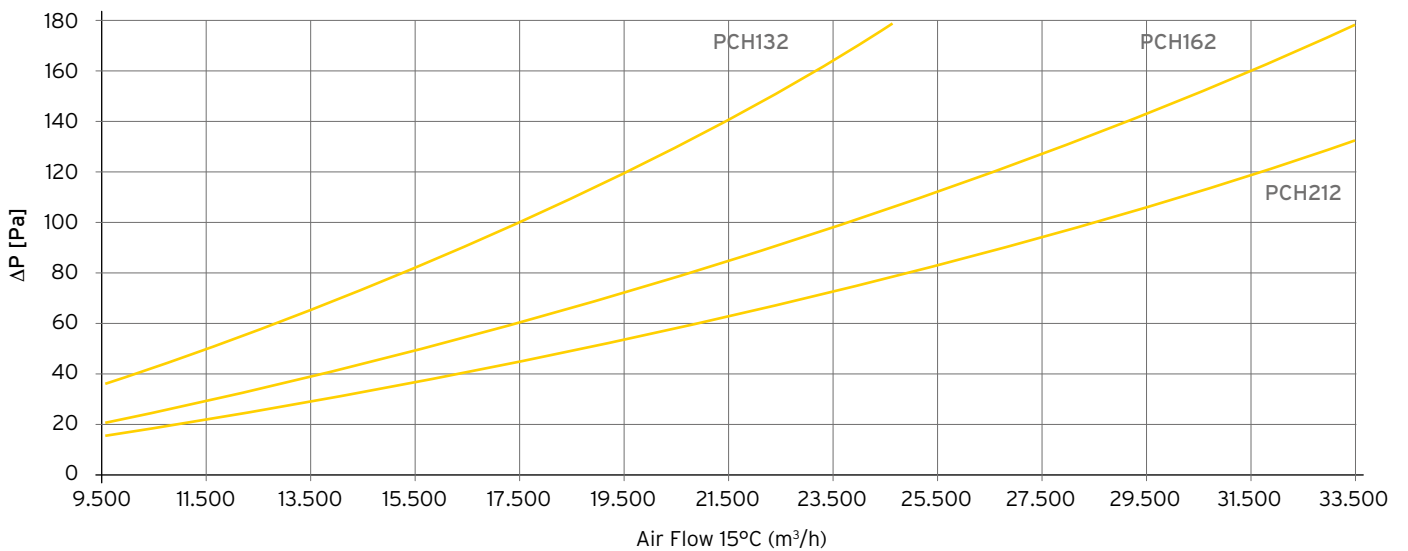
A - Single Modules



B - Horizontally Combined Modules

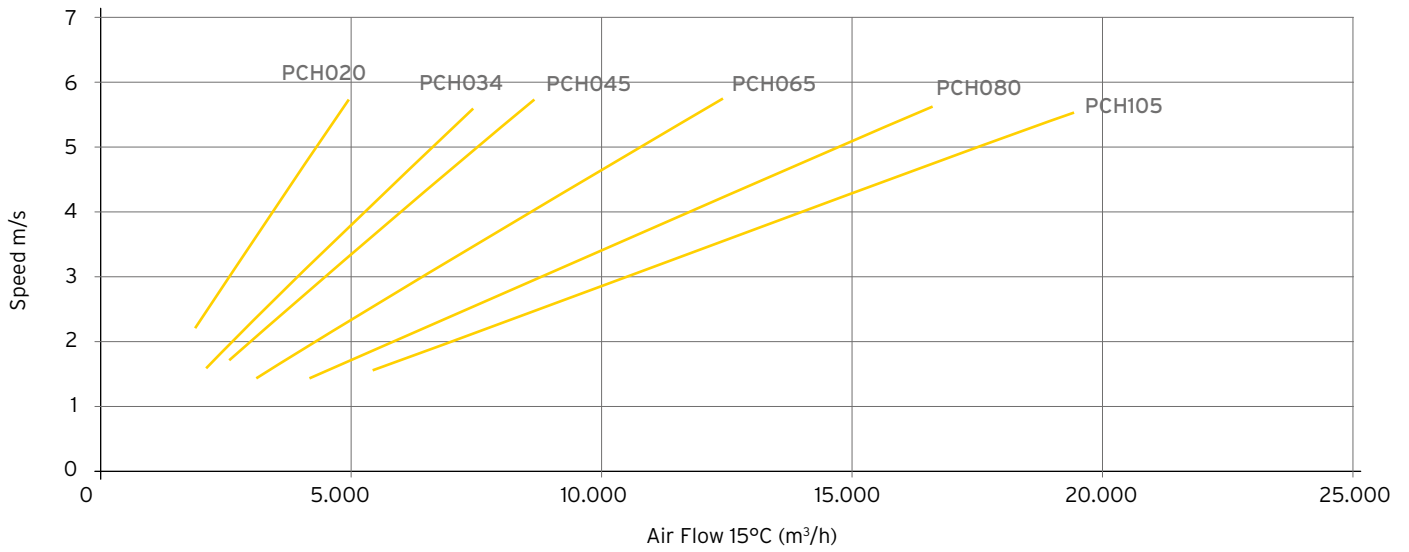


C - Vertically Combined Modules

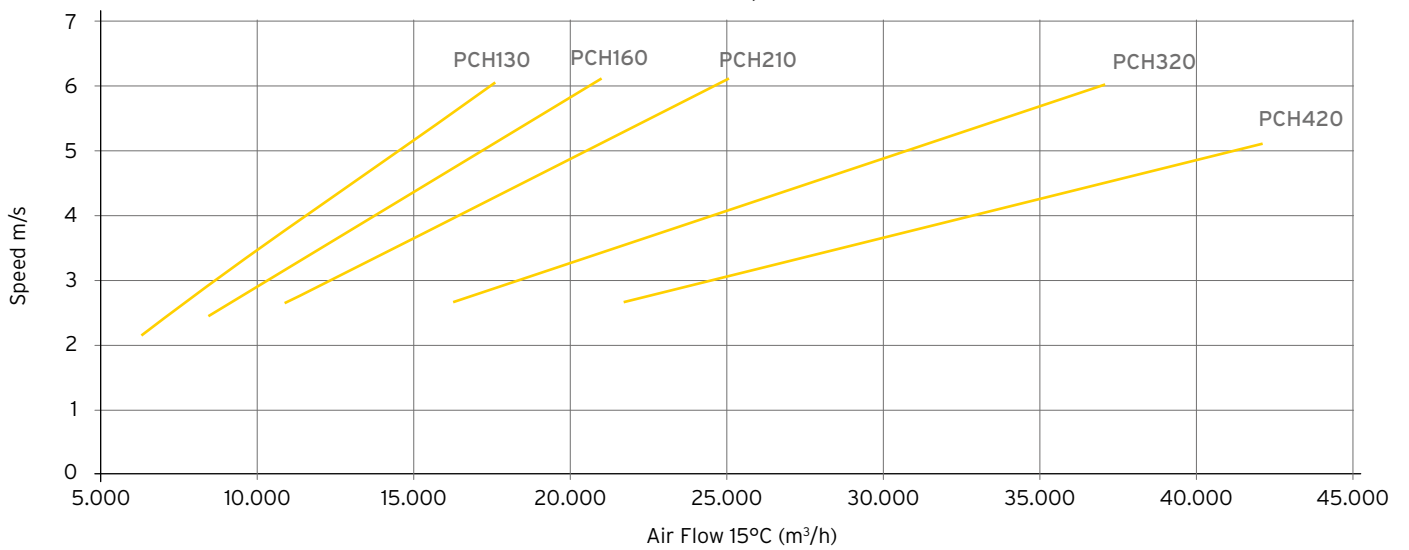


# PCH / Air Flow Rate - Throughput Speed Chart

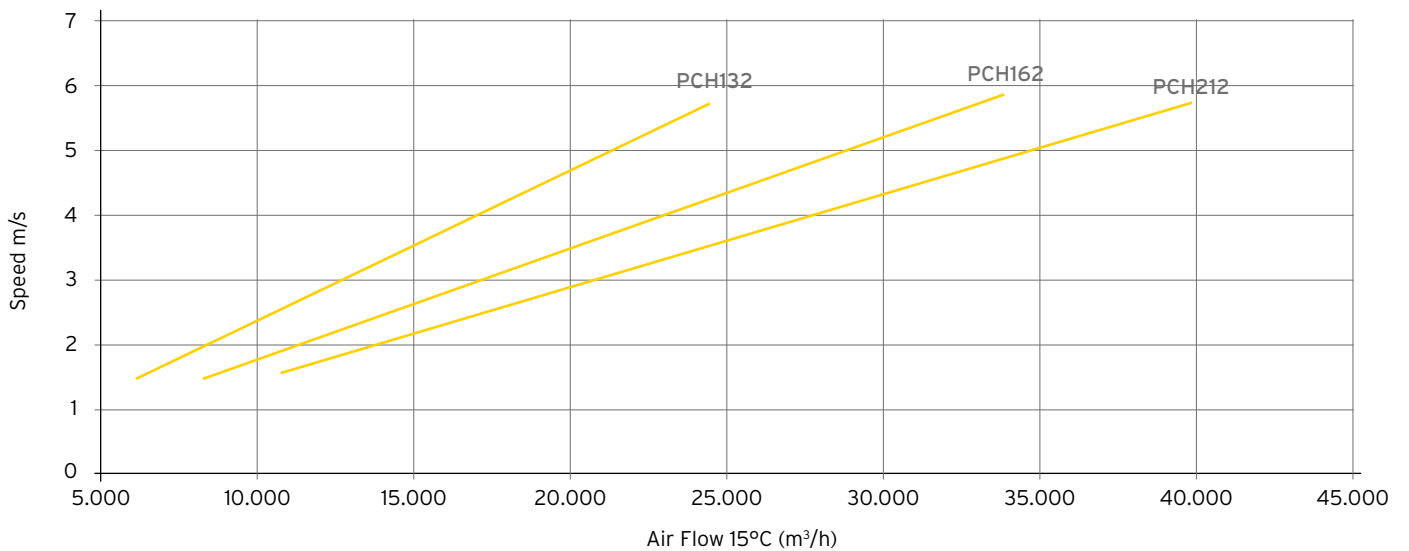
A - Single Modules



B - Horizontally Combined Modules



C - Vertically Combined Modules





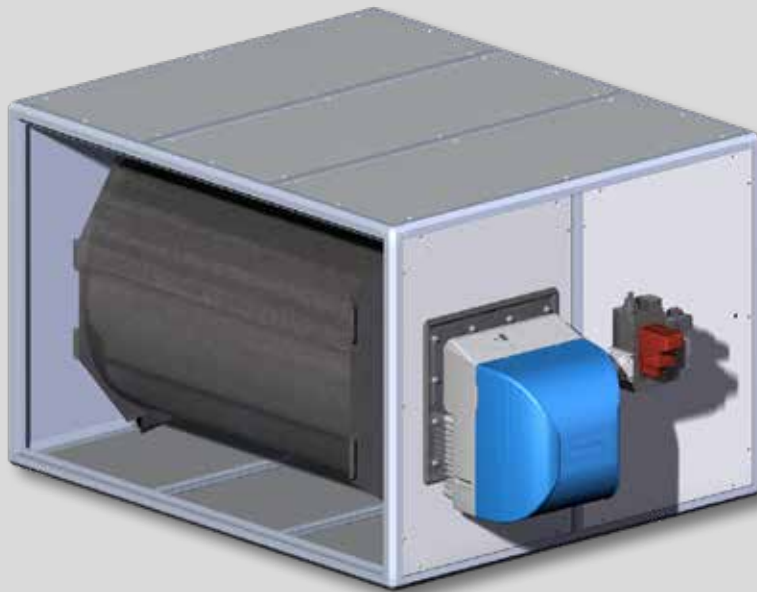
## Technical Features

The exchanger module EMS, without fan assembly and electric panel (available on request), is composed by a heat exchanger, a safety thermostat (limit), a fan thermostat (fan), an aluminum frame and a double layer paneling in pre-coated galvanized sheet with built-in thermal insulation. Supporting frame is made in aluminum.

For high-performance models, maximum energy efficiency with flame modulation and operating in condensation leads the efficiency more than 102%. These models are supplied as standard with condensate drain.

EC Approval in compliance with all applicable regulations.





## WHY CHOOSE EMS:

- Reliability
- Quality
- Advanced Technology
- Ecology
- Safety



## Burner Choice

The burners, to complement the EMS modules, can be:

- Modulating
- Two-stages (high - low flame)
- ON/OFF

The EMS modules can be installed with burners produced by the main burner manufacturers on the market. High efficiency exchanger modules can ONLY be matched to GAS burners.

## ErP Compliant

For modules to be inserted in the AHU and the Roof Top check the correct coupling of the burner to meet the requirements of ErP 2021.

# EMS / Materials

## Used Materials

The following table shows the correspondence and the composition for the type of stainless steels used for the construction of EMS heat exchangers.

Do not hesitate to contact us for specific offers with different steels.

TABLE OF USED STEEL

USA	EN	FORMULA
AISI 310	1.4845	X8 CrNi 25-21
AISI 441	1.4509	X2 CrTiNb 18

# EMS / Installation



Ducted EMS-HEA



Standard EMS installed after an AHU.

The EMS heat exchanger module can be assembled into air heating units either in horizontal position or in vertical position.

Air can flow in two directions:

- **EQUICURRENT FLOW:** cold air flows from warmer part of the exchanger [combustion chamber] to colder end.
- **COUNTER-CURRENT FLOW:** cold air flows from colder [tube bundle] to warmer end of the exchanger.

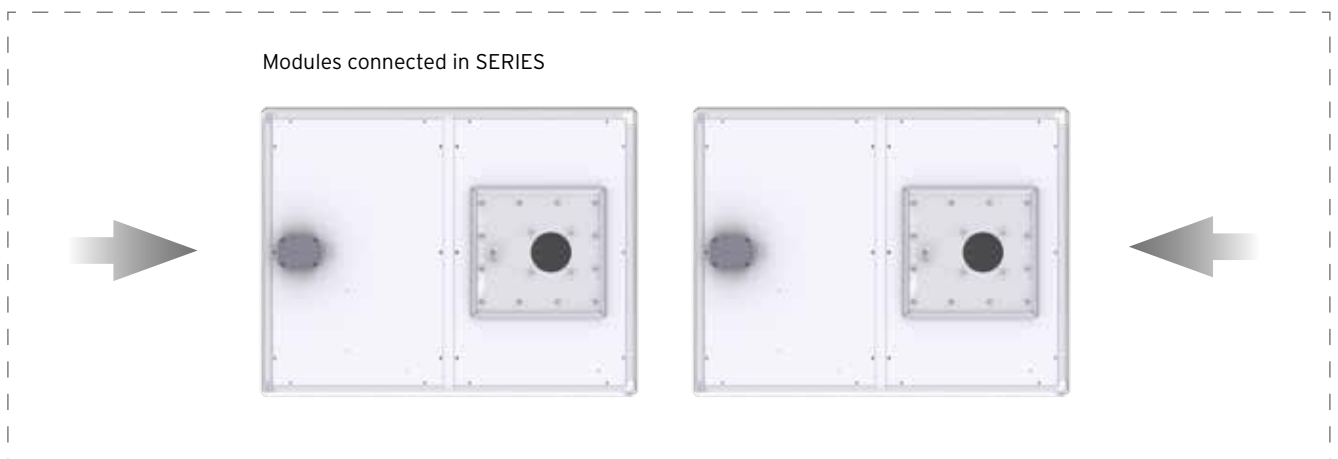
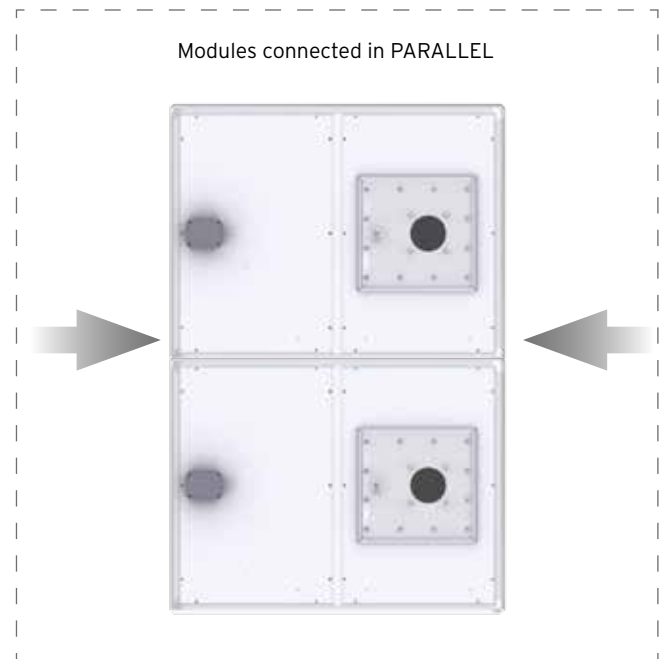
Depending on the application, it may be more convenient one or the other installation.



## Assembling one or more modules

When the required heat output exceeds the single module's output, or when you like to divide the minimum heat output below the minimum value of a single heat exchanger, multiple modules can be assembled into a single air handling, roof top

or process heater unit, thus covering any range of required output. Using convenient precautions, modules can be assembled either in series or in parallel layouts and the air flow can be equicurrent or counter-current to heat flow.





## Technical Features

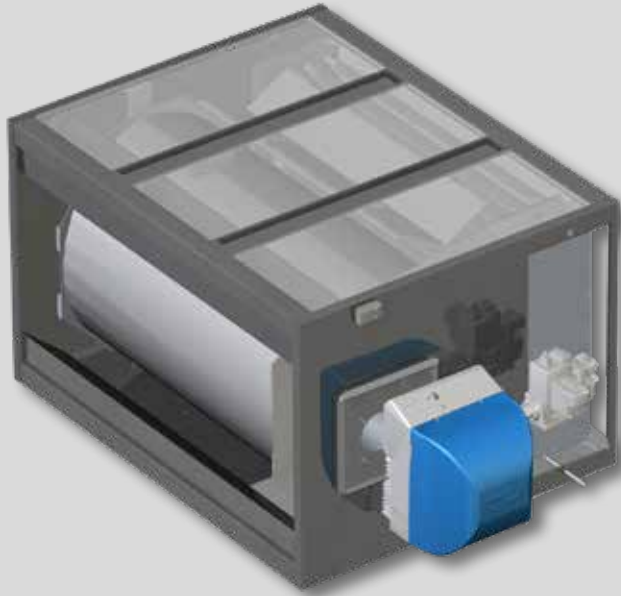
The innovative shape and the wide surface of the combustion chamber and the exchanger tubes guarantee a high performance and durability. Combustion chamber and exchanger tubes are entirely made of stainless steel (AISI 441 or AISI 310) while the surfaces in contact with the fumes (tube bundle) are in low-carbon stainless steel to offer a high resistance to corrosion. The design of the tube bundle is protected by patent.

The combustion chambers are built in the following versions:

- GH: standard combustion chamber
- GHK: high efficiency heaters with standard combustion chamber
- GH-2: for high pressures [2.500 Pa]
- GH-310: combustion chamber in AISI 310 for high temperature applications.





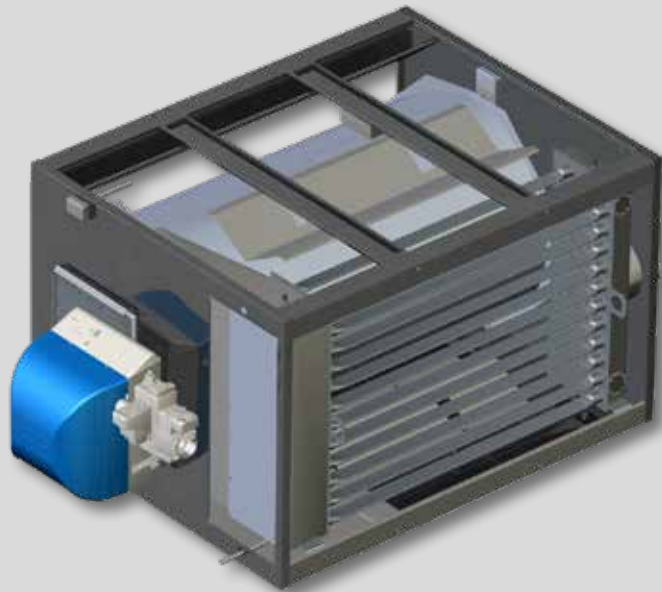


## Safety

The exchanger is supplied complete with safety devices; these must be positioned, obligatorily, by those who build the appliance that contains the exchanger.

## Certified Quality

The GH and GHK heat exchanger modules have performances certified by the certifying body Kiwa Gastec according to the EN1020 standard.



## Burner Choice

The burners, to complement the GH modules, can be:

- Modulating
- Two-stages (high - low flame)
- ON/OFF

The GH modules can be installed with burners produced by the main burner manufacturers on the market. High efficiency exchanger modules can ONLY be matched to GAS burners.

## ErP Compliant

For modules to be inserted in the AHU and in the Roof Top, check the correct coupling of the burner to meet the requirements of ErP 2021.

## Used materials

The following table shows the correspondence and the composition for the type of stainless steels used for the construction of GH heat exchangers.

Do not hesitate to contact us for specific offers with different steels.

TABLE OF USED STEEL

USA	EN	FORMULA
AISI 310	1.4845	X8 CrNi 25-21
AISI 441	1.4509	X2 CrTiNb 18

## Condensate Drain

When a GH heaters used into a Air Handling Unit and/or Roof Top Unit, where high flow rate and low thermal heat drop is requested, a condensate drain system shall be provided in the exchanger.

All exchangers are provided with five connectors for the evacuation of the condensate. The fittings are placed on the collectors (rear and front), on the sides (right and left) and on the lower wall of the rear of the flue gas collector.

The condensation is allowed only in case of coupling with gas burners, while it must be absolutely prohibited in case of use of oil burners.



The GH heat exchanger module can be assembled into air heating units either in horizontal position or in vertical position.

The air can flow in two directions:

- **EQUICURRENT FLOW:** cold air flows from warmer part of the exchanger [combustion chamber] to colder end.
- **COUNTER-CURRENT FLOW:** cold air flows from colder [tube bundle] to warmer end of the exchanger.

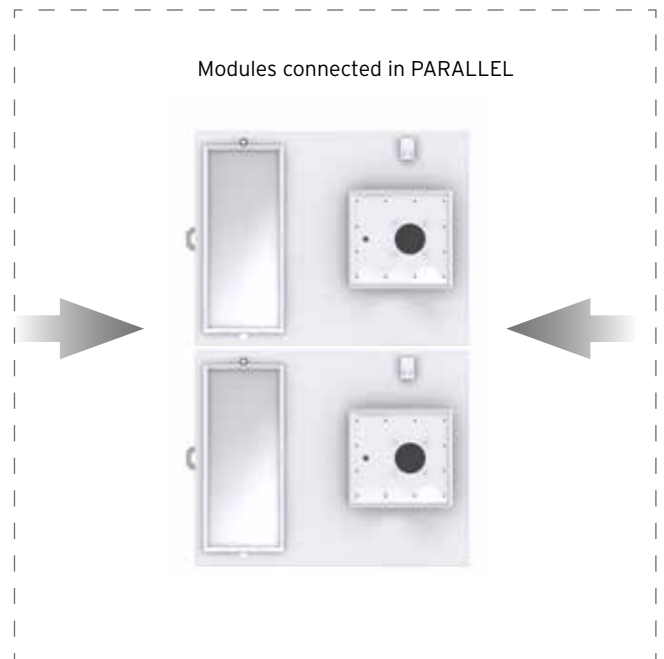
Depending on the application, it may be more convenient one or the other installation.



## Assembling one or more modules

When the required heat output exceeds the single module's output, or when you like to divide the minimum heat output below the minimum value of a single heat exchanger, multiple modules can be assembled into a single air handling, roof top or process heater unit, thus covering any range of required output.

Using convenient precautions, modules can be assembled either in series or in parallel layouts and the air flow can be equicurrent or counter-current to heat flow



# EMS-GH N / Technical Data

Model		EMS140N GH7880	EMS190N GH7980	EMS250N GH8080			
Type of appliance		B23					
EC approval		0476CT2224					
NOx Class	NO <sub>x</sub>	LOW NOx GAS BURNERS: CLASS 3 (<80 mg/kWh) according to EN676					
		MIN	MAX	MIN	MAX	MIN	MAX
Furnace Heat Input	P <sub>min</sub> ; P <sub>ated,h</sub> kW	96.0	195.0	115.0	230.0	154.0	310.0
Useful Heat Output	kW	90.2	171.0	108.1	205.9	145.0	275.0
Combustion Efficiency (Hi) *1	η <sub>pt</sub> ; η <sub>nom</sub> %	94.0	87.7	94.0	89.5	94.0	88.7
Combustion Efficiency (Hs)	%	84.7	79.0	84.7	80.6	84.7	79.9
Chimney loss - Burner ON (Hi)	%	6.0	12.3	6.0	10.5	6.0	12.3
Chimney loss - Burner OFF	%	< 0.1		<0,1		<0,1	
Casing losses *2	F <sub>env</sub> %	1.26		1.16		1.17	
Combustion Chamber pressure	Pa	13	50	10	40	10	50
Combustion Chamber volume	m <sup>3</sup>	0.37		0.52		0.76	
Minimum air flow rate *3	m <sup>3</sup> /h	5.200	9.850	6.200	11.850	8.350	15.800
Rated air flow rate *4	m <sup>3</sup> /h	10.500		14.000		18.000	
Max. applicable pressure *5	Pa	800		800		800	
Max. air temperature *6	°C	120		120		120	

## Note:

1. The efficiency is the one realised with air flow rates equal to a Δt of 35 K, with inlet air temperature at 15°C; for different applications, ask technical department.
2. Heat loss of the casing only refers to EMS/EMS-K heaters: it must be considered only when unit is installed outdoor or in a thermal station. If the unit is installed into the building to be heated, heat is irradiated inside, so heat losses are zero.
3. The minimum air flow rate has been calculated for a Δt of 50 K, suitable for process systems or special applications; for more severe applications, with Δt > 50 K, see above the efficiency and precautions to comply with. The values in the table refer to the maximum and minimum power. To satisfy the ErP requirements refer to its Handbook, Paragraph 3.11 with burner combinations.
4. The rated air flow rate is the one used to calculate and satisfy ErP 2018 requirements.
5. The maximum applicable pressure is valid for standard models code GH/GHK and EMS/EMS-K; for special models code GH-2, EMS-50A and GH/EMS-310 the maximum pressure is 2,500 Pa.
6. The air MAX temperature is valid for all models except codes GH/EMS-310 for which the maximum value is 200°C.



# EMS-GH N / Technical Data

Model		EMS320N GH8180		EMS420N GH8280		EMS550N GH83080	
Type of appliance		B23					
EC approval		0476CT2224					
NOx Class	NO <sub>x</sub>	LOW NOx GAS BURNERS: CLASS 3 (<80 mg/kWh) according to EN676					
		MIN	MAX	MIN	MAX	MIN	MAX
Furnace Heat Input	$P_{min}; P_{rated,h}$ kW	185.0	380.0	260.0	508.0	320	670
Useful Heat Output	kW	173.9	335.9	245.0	450.0	301	592
Combustion Efficiency (Hi) *1	$\eta_{pl}; \eta_{nom}$ %	94.0	87.7	94.4	88.6	94.3	88.4
Combustion Efficiency (Hs)	%	84.7	79.0	85.0	79.8	85.0	79.6
Chimney loss - Burner ON (Hi)	%	6.0	12.3	5.6	11.4	5.7	11.6
Chimney loss - Burner OFF	%	< 0.1		< 0.1		< 0.1	
Casing losses *2	$F_{env}$ %	1.02		1.03		0.97	
Combustion Chamber pressure	Pa	15	60	28	120	21	110
Combustion Chamber volume	m <sup>3</sup>	1.06		1.55		1.79	
Minimum air flow rate *3	m <sup>3</sup> /h	10.000	19.300	14.050	25.800	17.300	33.950
Rated air flow rate *4	m <sup>3</sup> /h	23.000		30.000		40.000	
Max. applicable pressure *5	Pa	800		800		800	
Max. air temperature *6	°C	120		120		120	

## Note:

1. The efficiency is the one realised with air flow rates equal to a  $\Delta t$  of 35 K, with inlet air temperature at 15°C; for different applications, ask technical department.
2. Heat loss of the casing only refers to EMS/EMS-K heaters: it must be considered only when unit is installed outdoor or in a thermal station. If the unit is installed into the building to be heated, heat is irradiated inside, so heat losses are zero.
3. The minimum air flow rate has been calculated for a  $\Delta t$  of 50 K, suitable for process systems or special applications; for more severe applications, with  $\Delta t > 50$  K, see above the efficiency and precautions to comply with. The values in the table refer to the maximum and minimum power. To satisfy the ErP requirements refer to its Handbook, Paragraph 3.11 with burner combinations.
4. The rated air flow rate is the one used to calculate and satisfy ErP 2018 requirements.
5. The maximum applicable pressure is valid for standard models code GH/GHK and EMS/EMS-K; for special models code GH-2, EMS-50A and GH/EMS-310 the maximum pressure is 2,500 Pa.
6. The air MAX temperature is valid for all models except codes GH/EMS-310 for which the maximum value is 200°C.

# EMS-GH K / Technical Data

Model		- GHK7580	- GHK7680	EMS100K GHK7780	EMS140K GHK7880	EMS190K GHK7980					
Type of appliance		B23									
EC approval		0476CT2224									
NOx Class	NO <sub>x</sub>	LOW NOx GAS BURNERS: CLASS 3 (<80 mg/kWh) according to EN676									
		MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX	MIN	MAX
Furnace Heat Input	P <sub>min</sub> ; P <sub>ated,h</sub> kW	14	34.6	22.0	72.0	26.5	114	38.0	152.0	48.0	200.0
Useful Heat Output	kW	14.3	32.0	22.5	66.5	27.1	105.4	38.5	140.8	48.3	182.2
Combustion Efficiency (Hi) *1	η <sub>pl</sub> ; η <sub>nom</sub> %	102.5	92.5	102.4	92.4	102.4	92.5	101.2	92.6	100.5	92.6
Combustion Efficiency (Hs)	%	92.3	83.3	92.3	83.2	92.3	83.3	91.2	83.4	90.5	83.4
Chimney loss - Burner ON (Hi)	%	/	7.5	/	7.6	/	7.5	/	7.4	/	7.4
Chimney loss - Burner OFF	%	< 0.1		< 0.1		< 0.1		< 0.1		< 0.1	
Casing losses *2	F <sub>env</sub> %	2.61		1.64		1.81		1.26		1.16	
Combustion Chamber pressure	Pa	8	40	12	100	14	100	15	140	15	130
Combustion Chamber volume	m <sup>3</sup>	0.06		0.12		0.24		0.37		0.52	
Minimum air flow rate *3	m <sup>3</sup> /h	820	1.835	1.290	3.815	1.550	6.050	2.210	8.075	2.770	10.450
Rated air flow rate *4	m <sup>3</sup> /h	2.700		5.000		7.300		10.500		14.000	
Max. applicable pressure *5	Pa	800		800		800		800		800	
Max. air temperature *6	°C	120		120		120		120		120	

## Note:

1. The efficiency is the one realised with air flow rates equal to a Δt of 35 K, with inlet air temperature at 15°C; for different applications, ask technical department.
2. Heat loss of the casing only refers to EMS/EMS-K heaters: it must be considered only when unit is installed outdoor or in a thermal station. If the unit is installed into the building to be heated, heat is irradiated inside, so heat losses are zero.
3. The minimum air flow rate has been calculated for a Δt of 50 K, suitable for process systems or special applications; for more severe applications, with Δt > 50 K, see above the efficiency and precautions to comply with. The values in the table refer to the maximum and minimum power. To satisfy the ErP requirements refer to its Handbook, Paragraph 3.11 with burner combinations
4. The rated air flow rate is the one used to calculate and satisfy ErP 2018 requirements.
5. The maximum applicable pressure is valid for standard models code GH/GHK and EMS/EMS-K; for special models code GH-2, EMS-50A and GH/EMS-310 the maximum pressure is 2,500 Pa.
6. The air MAX temperature is valid for all models except codes GH/EMS-310 for which the maximum value is 200°C.



Model		EMS250K GHK8080	EMS320K GHK8180	EMS420K GHK8280	EMS550K GHK8380
Type of appliance		B23			
EC approval		0476CT2224			
NOx Class	NO <sub>x</sub>	LOW NOx GAS BURNERS: CLASS 3 (<80 mg/kWh) according to EN676			
		MIN	MAX	MIN	MAX
Furnace Heat Input	$P_{min}^* ; P_{ated,h}$ kW	61.0	270.0	74.0	347.0
Useful Heat Output	kW	61.6	248.9	74.8	319.8
Combustion Efficiency (Hi) *1	$\eta_{pl} ; \eta_{nom}$ %	101.0	92.2	101.0	92.2
Combustion Efficiency (Hs)	%	91.0	83.1	91.0	83.1
Chimney loss - Burner ON (Hi)	%	/	7.8	/	7.8
Chimney loss - Burner OFF	%	<0,1		< 0.1	
Casing losses *2	$F_{env}$ %	1.17		1.02	1.03
Combustion Chamber pressure	Pa	19	175	23	225
Combustion Chamber volume	m <sup>3</sup>	0.76		1.06	
Minimum air flow rate *3	m <sup>3</sup> /h	3.535	14.270	4.290	18.335
Rated air flow rate *4	m <sup>3</sup> /h	18.000		23.000	
Max. applicable pressure *5	Pa	800		800	
Max. air temperature *6	°C	120		120	

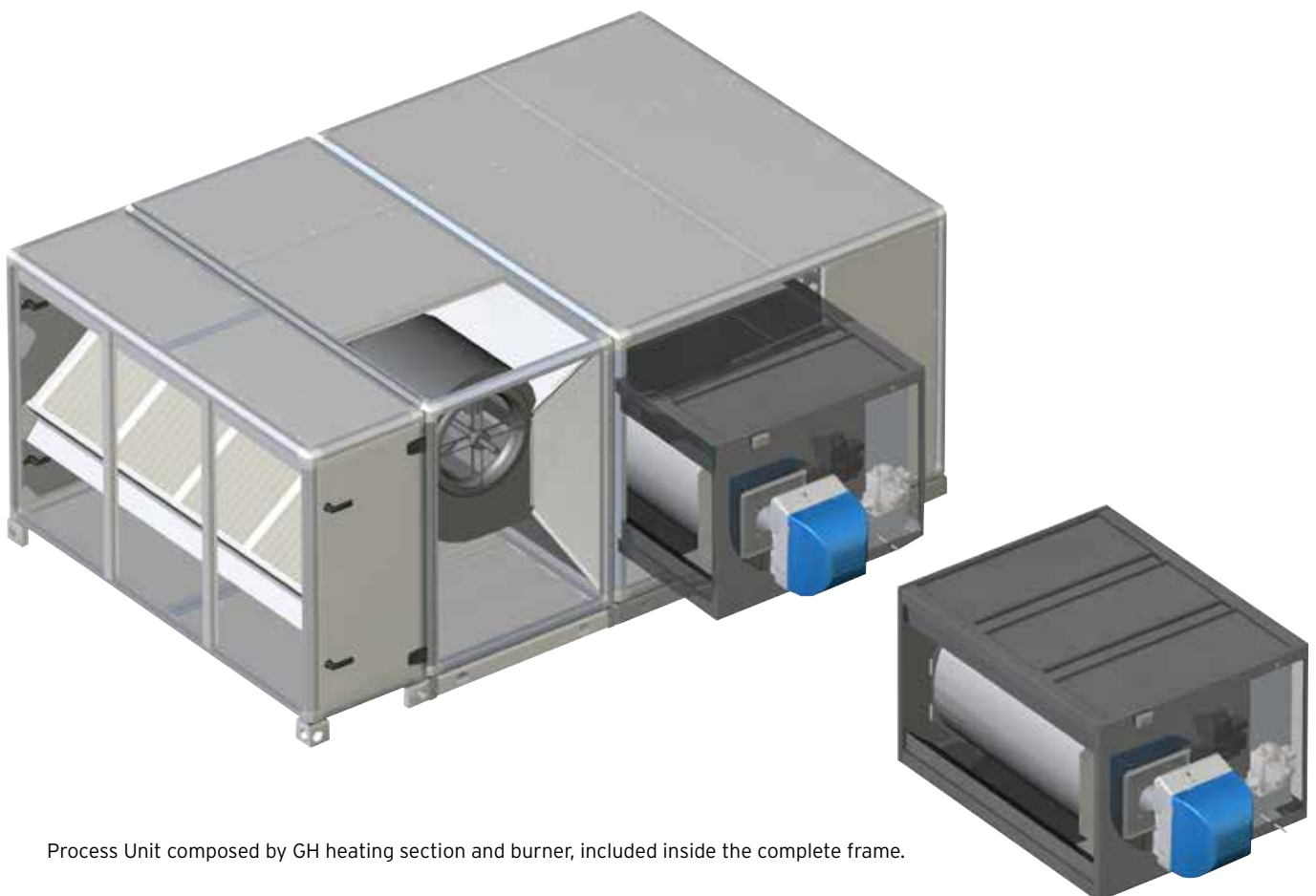
**Note:**

1. The efficiency is the one realised with air flow rates equal to a  $\Delta t$  of 35 K, with inlet air temperature at 15°C; for different applications, ask technical department.
2. Heat loss of the casing only refers to EMS/EMS-K heaters: it must be considered only when unit is installed outdoor or in a thermal station. If the unit is installed into the building to be heated, heat is irradiated inside, so heat losses are zero.
3. The minimum air flow rate has been calculated for a  $\Delta t$  of 50 K, suitable for process systems or special applications; for more severe applications, with  $\Delta t > 50$  K, see above the efficiency and precautions to comply with. The values in the table refer to the maximum and minimum power. To satisfy the ErP requirements refer to its Handbook, Paragraph 3.11 with burner combinations
4. The rated air flow rate is the one used to calculate and satisfy ErP 2018 requirements.
5. The maximum applicable pressure is valid for standard models code GH/GHK and EMS/EMS-K; for special models code GH-2, EMS-50A and GH/EMS-310 the maximum pressure is 2,500 Pa.
6. The air MAX temperature is valid for all models except codes GH/EMS-310 for which the maximum value is 200°C.





Process Unit composed by EMS heating section and burner, joined with fan and filter section.



Process Unit composed by GH heating section and burner, included inside the complete frame.





Model	Size			Chimney		Burner		Weight
	L	B	H	ØR	SH	SB	ØT	Kg
GH7580	730	800	520	120	260	207	135	65
GH7680	965	915	685	150	343	223	135	87
GH7780	1.065	1.080	810	180	405	295	135	125
GH7880	1.290	1.170	905	180	453	315	190	163
GH7980	1.415	1.320	1.045	250	523	295	190	190
GH8080	1.710	1.420	1.120	250	560	305	190	263
GH8180	1.915	1.420	1.120	250	560	305	230	310
GH8280	2.120	1.719	1.320	300	660	395	230	370
GH8380	2.540	1.795	1.320	300	660	395	230	426

# EMS Vertical / Dimensions

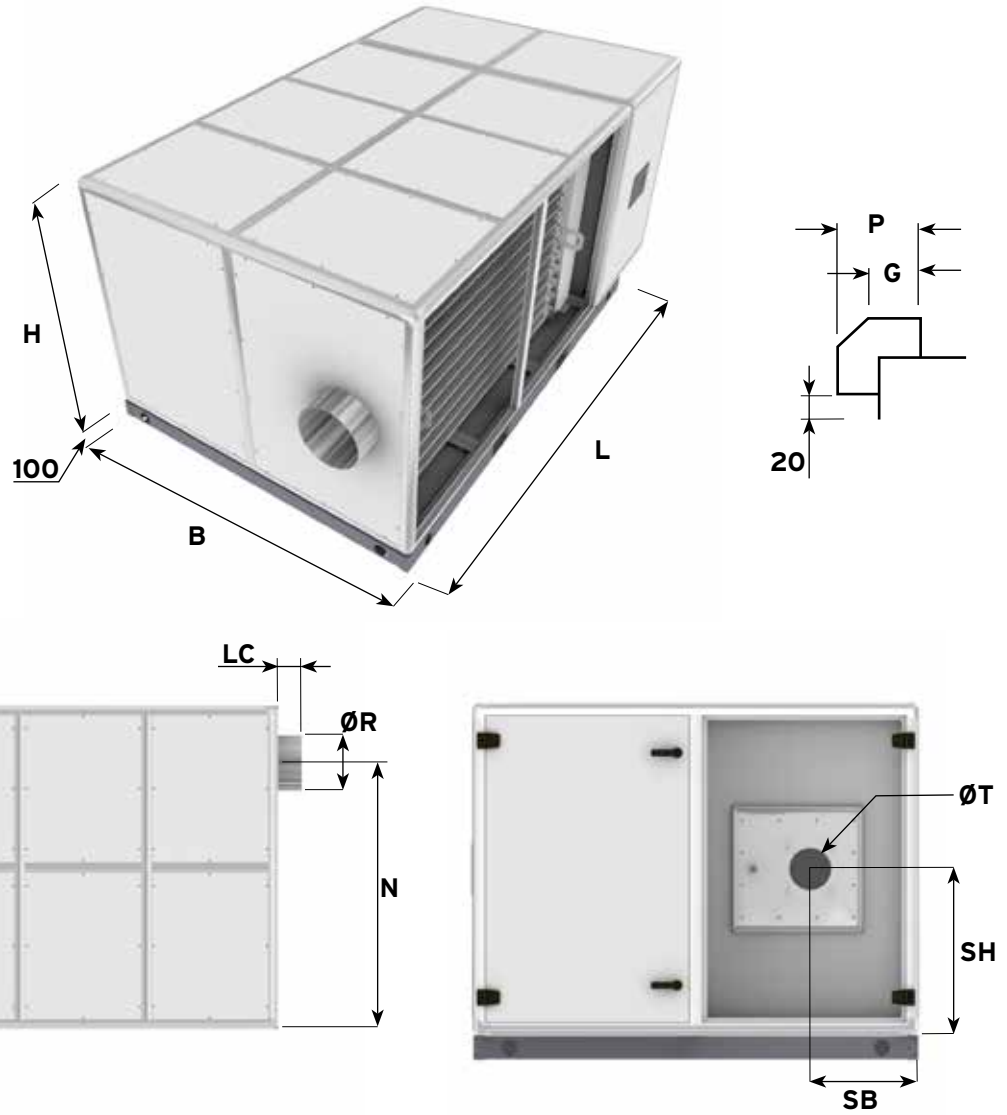


Model	Size			Intake/Delivery			Chimney		Burner		Weight Kg
	L	B	H	A	D	G	N	ØR	SB	ØT	
EMS100	1.100	1.180	800	1.020	720	40	920	180	350	135	144
EMS140	1.330	1.240	920	1.250	840	40	960	180	315	190	186
EMS190	1.460	1.390	1.060	1.380	980	40	1.120	250	370	190	289
EMS250	1.750	1.490	1.140	1.670	1.060	40	1.200	250	380	190	312
EMS320	1.960	1.490	1.140	1.880	1.060	40	1.200	250	340	230	354
EMS420	2.170	1.800	1.340	2.070	1.240	50	1.480	300	440	230	538
EMS550	2.600	1.880	1.340	2.500	1.240	50	1.510	300	440	230	632

## Notes

- If the module is to be installed horizontally, specify at order if air flow is rightward or leftward oriented. This information is required to install the safety thermostat on top of the heater.
- Order codes are different: EMS...-00ASX and EMS...-00ADX.

# EMS Horizontal / Dimensions



Model	Size			Chimney		Burner			Profile		Weight Kg
	L	B	H	N	ØR	SB	SH	ØT	P	G	
EMS100-HEA	1.600	1.180	800	920	180	350	400	135	40	25	205
EMS140-HEA	1.930	1.240	920	960	180	315	460	190	40	25	268
EMS190-HEA	2.190	1.390	1.060	1.120	250	370	530	190	40	25	397
EMS250-HEA	2.550	1.490	1.140	1.200	250	380	570	190	40	25	443
EMS320-HEA	2.760	1.490	1.140	1.200	250	340	570	230	40	25	502
EMS420-HEA	3.020	1.800	1.340	1.480	300	440	670	230	50	30	716
EMS550-HEA	3.600	1.880	1.340	1.510	300	440	670	230	50	30	854

## Notes

- If the module is to be installed horizontally, specify at order if air flow is rightward or leftward oriented. This information is required to install the safety thermostat on top of the heater.
- Order codes are different: EMS...-00ASX and EMS...-00ADX.



### Technical Features

- Combustion chamber, in AISI 441 or AISI 310 stainless steel, with wide exchange surface.
- Flame inversion furnace with three-pass, fully welded, flue gas layout.
- High efficiency heat exchanger made of AISI 441 stainless steel with low carbon content.  
The exchanger is formed by a streamlined tube bundle with conic section with an aerodynamic design (low pressure drops in air circuit and high efficiency)..
- Very wide range from 15 kW to 1.050 kW.
- Patented tube bundle
- Efficiency up to 94,6%.
- EC Approval in compliance with all applicable regulations.

### No alla Centrale Termica

Il sistema AquaKond AKY non necessita di locali tecnici particolari per il posizionamento. Le caldaie possono essere installate all'esterno, evitando l'utilizzo di spazio "operativo" all'interno del locale stesso.

## WHY CHOOSE GO?

- Reliability
- Quality
- Advanced Technology
- Ecology
- Safety



## Burner Choice

The burners, to complement the GO modules, can be:

- Modulating
- Two-stages (high - low flame)
- ON/OFF

The GO modules can be installed with burners produced by the main burner manufacturers on the market.

## Used materials

The following table shows the correspondence and the composition for the type of stainless steels used for the construction of GO heat exchangers.

Do not hesitate to contact us for specific offers with different steels.

TABLE OF USED STEEL

USA	EN	FORMULA
AISI 310	1.4845	X8 CrNi 25-21
AISI 441	1.4509	X2 CrTiNb 18

## Condensate Drain

When a GO heaters used into a Air Handling Unit and/or Roof Top Unit, where high flow rate and low thermal heat drop is requested, a condensate drain system shall be provided in the exchanger.

All exchangers are provided with five connectors for the evacuation of the condensate. The fittings are placed on the collectors (rear and front), on the sides (right and left) and on the lower wall of the rear of the flue gas collector.

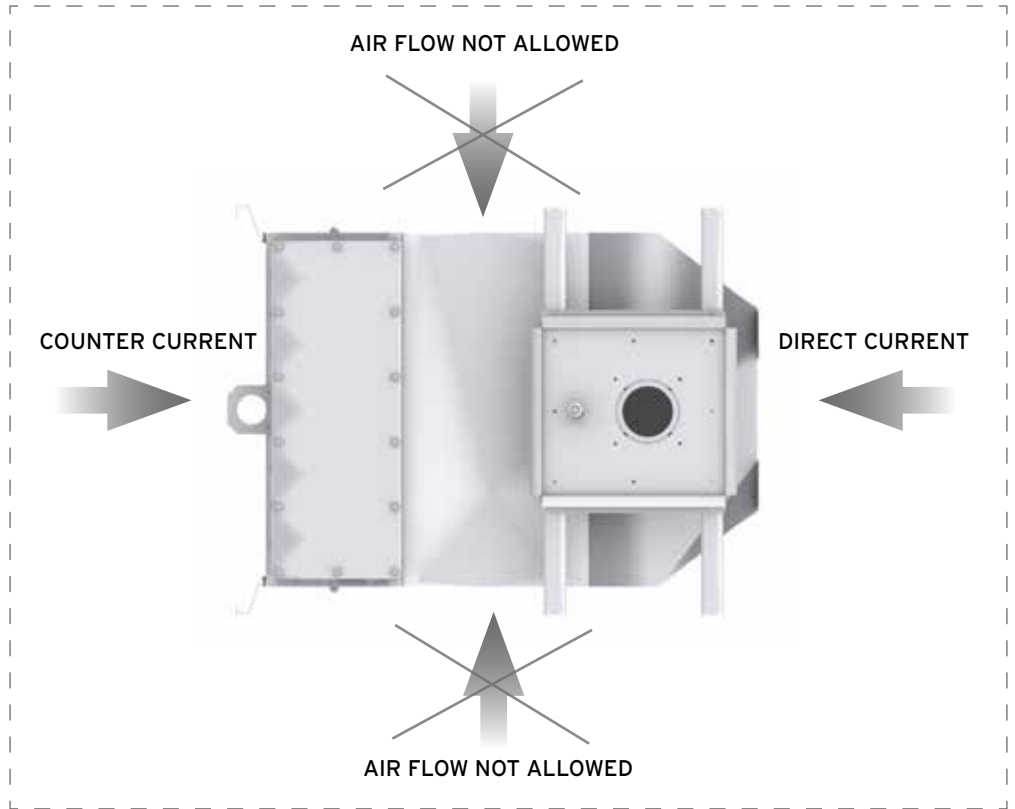
The condensation is allowed only in case of coupling with gas burners, while it must be absolutely prohibited in case of use of oil burners.



The heat exchanger module can be assembled into air heating units either in horizontal position or in vertical position. The air can flow in two directions:

- **EQUICURRENT FLOW:** cold air flows from warmer part of the exchanger [combustion chamber] to colder end.
- **COUNTER-CURRENT FLOW:** cold air flows from colder [tube bundle] to warmer end of the exchanger.

Depending on the application, it may be more convenient one or the other installation.

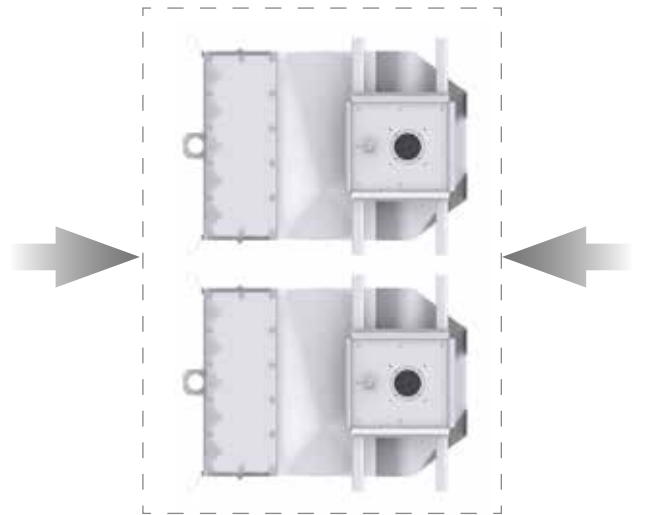


**Assembling one or more modules**

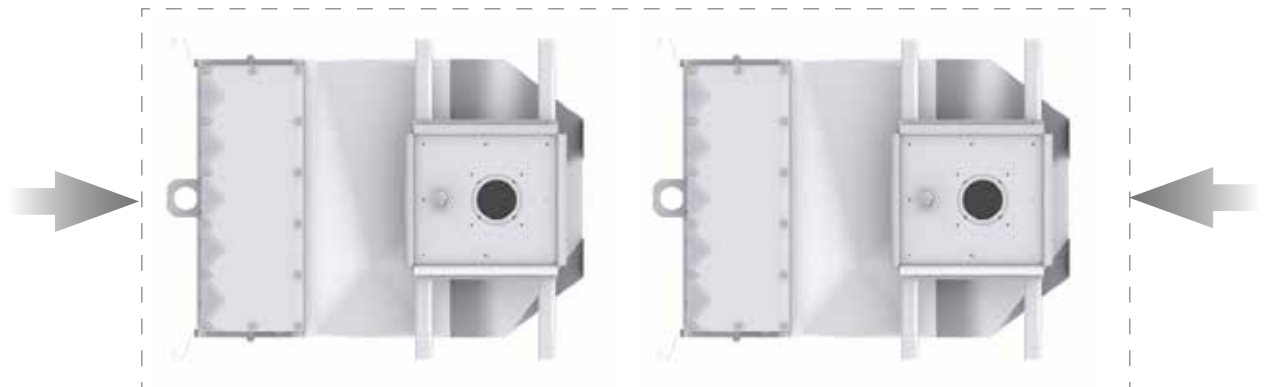
When the required heat output exceeds the single module's output, or when you like to divide the minimum heat output below the minimum value of a single heat exchanger, multiple modules can be assembled into a single air handling, roof top or process heater unit, thus covering any range of required output.

Using convenient precautions, modules can be assembled either in series or in parallel layouts and the air flow can be equicurrent or counter-current to heat flow

Modules connected in PARALLEL



Modules connected in SERIES





APEN GROUP S.p.A.  
Via Isonzo, 1 - Pessano con Bornago  
20060 (Milano) - Italy  
Tel +39 02 95 96 931 Fax +39 02 95 74 27 58  
www.apengroup.com apen@apengroup.com  
Cod. X01565GB ed. 2206  
Specifications in this marketing catalogue are subject to changes without notice, require technical instruction manual for specific design purpose.

