BOILERS COSMOGAS®

MADE IN ITALY

THE EXPERT of stainless steel condensing heating systems

ECO-FRIENDLY

HLW LLC C US

AGUAPLUS™

- innovative condensing stainless steel instantaneous water heater with built-in integrated storage tank
- no minimum flow required

Patented R.V.C. Titanium stainless steel heat exchanger with built-in AISI 316 stainless steel storage tank

DELUXE FINISH
Fashionable Italian style

With only a 4.5 ft² footprint and with a sophisticated and modern design, the AGUAplus's elegant lines and red casing make the AGUAplus suitable to be harmoniously placed in any setting.

ECO-FRIENDLY

TITANIUM

AGUAPLUS: INNOVATIVE CONDENSING INSTANTANEOUS WATE

The innovative design of AGUAplus combines the **on-demand** heating technology of a **condensing instantaneous water heater** with an efficient **storage tank.** The result? **Hot water high performance exactly when you need it!**
AGUAplus with an advantaced instantaneous condensing technology heats water quickly and with the inner stainless steel tank provides more hot water during peak demand to meet with hot water needs of large properties and commercial applications.
Each water heater is composed of 1 to 2 R.V.C. heat exchangers. Each **R.V.C. exchanger** is designed, built and **patented by Cosmogas.** R.V.C. exchangers are made of **AISI 316 Ti (Titanium) stainless steel** without welded joints and they are marked by compactness, lightness and resistance: this allows the manufacturing

250,000 Btu/hr

199,000 Btu/hr

500,000 Btu/hr

399,000 Btu/hr

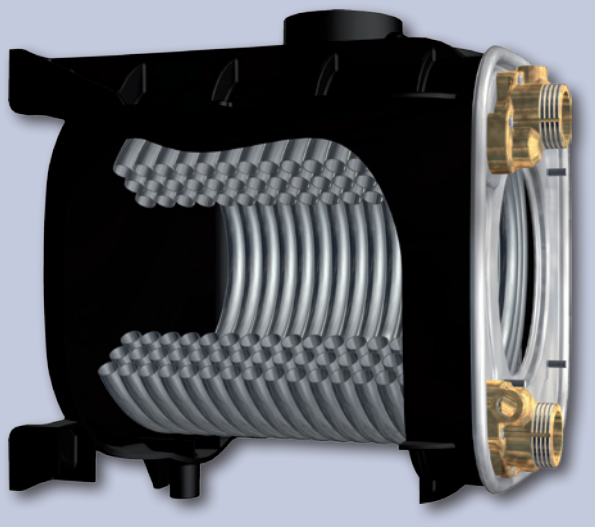
WORKING PRESSURE UP TO 160 PSI

ER HEATER WITH STAINLESS STEEL BUILT-IN STORAGE TANK

of small, lightweight water heaters able to bear a **working pressure up to 160 PSI.**
All AGUAplus water heaters are equipped with **premixed burners,** made of Fecralloy fibre, for a high efficiency combustion and low polluting emissions (CO<15 ppm and NOx<15 ppm), with special air/gas mixer Cosmomix allow appliances to reach **turndown ratio up to 10:1**.

Designed for saving space, AGUAplus has vertical development: it allows to recover and optimize space in new or retrofitted plants. Only 4.5 ft^2 footprint, enclose the power of 500,000 Btu/hr, capable of producing up to 13 GPM (Δt 75°F) of continuous flow. Thanks to their light weight they are easy to transport and can be relocated if necessary.
The condensate neutralizer box is integrated.

Patented R.V.C. heat exchanger with a heart of TITANIUM



The heart of the new AGUAplus is COSMOGAS's specially designed 316 Ti (TITANIUM) stainless steel heat exchanger type R.V.C., built on nearly 50 years experience in the manufacture of heating and hot water products.

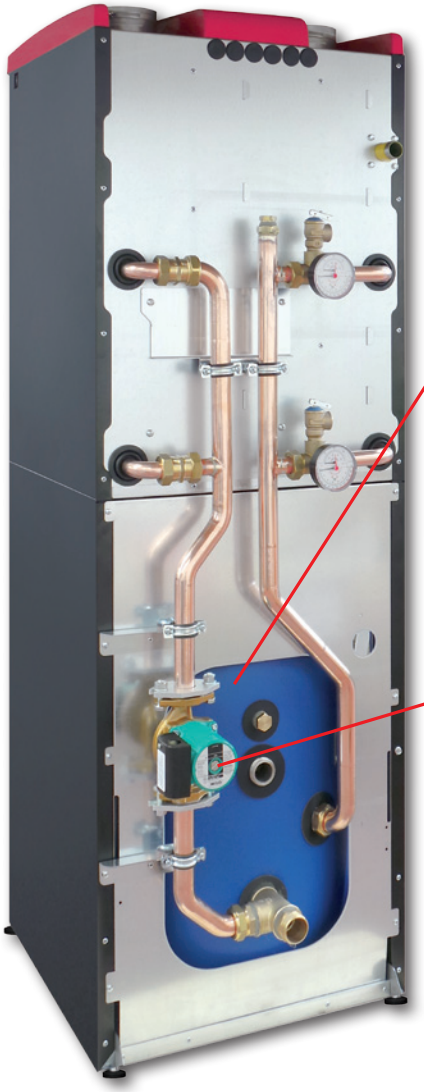
Patented and unique heat exchanger: the new patented R.V.C. (Radiant Variable Circulation) heat exchanger is composed by 3 series of stainless steel round tubes. Built in AISI 316 Ti (TITANIUM) stainless steel.

Excellent resistance to corrosion: the tubes of the R.V.C. heat exchanger are assembled and hydraulically connected without welding, maintaining unaltered the chemical and physical characteristics of stainless steel, with maximum warranty against corrosion.

High efficiency: the R.V.C. heat exchanger is designed to reach an optimal heat transfer over its entire length. Exceptional efficiency up to 98%.

High resistance to the working pressure: the patented heat exchanger of AGUAplus works with very low pressure drops and a high resistance to the working pressure, up to 160 PSI.

Long life span: the external case is pre-formed with an innovative composite material PPX 830, which gives it exceptional robustness, lightness and durability in time.



OPTIMAL INSULATION

Minimal energy losses

The inner stainless steel storage tank is equipped by a high quality polyurethane thermal insulation.

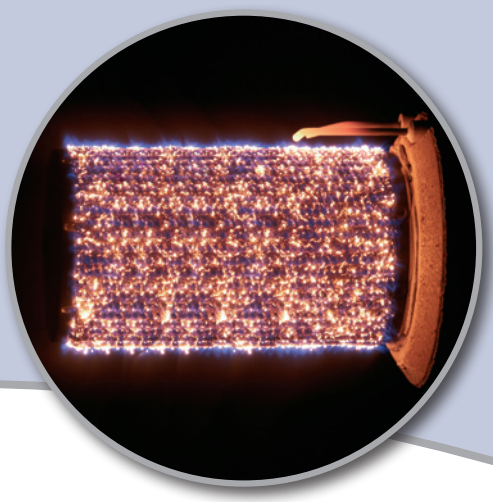
RECIRCULATION AND ANTI-LIME SCALE PUMP

Comfort & Life span

The function of the recirculation pump is not only to increase comfort, but also to prevent the formation of lime scale on the surface of the heat exchanger which retains its high performance throughout its service life.

Ecologic modulating Premix gas burner

AGUAplus is equipped with a premix burner made of Fecralloy fibre for high efficiency combustion and low polluting emissions.
The special air/gas mixer Cosmomix allows AGUAplus to reach turndown ratio up to 5:1 (each burner).



ADVANTAGES

- Premix natural gas/LPG modulating burner.
- High efficient combustion
- Low Emissions (CO<15 ppm and NOx<15 ppm)
- Safe and quiet
- Turndown ratio up to 5:1 per heat exchanger
- Negative Pressure gas valve
- It also operates with up to 3" W.C. low gas inlet pressure

AGUAplus concept & high quality components

EASY MAINTENANCE
Quickly replace components

All components can be serviced and maintained from the front for easy maintenance, quick replacement of components and more versatility in installation.

R.V.C. HEAT EXCHANGER
Patented Design

Each water heater is composed of 1 to 2 R.V.C. heat exchangers, designed, built and patented by Cosmogas. R.V.C. exchangers are made of AISI 316 Ti (Titanium) stainless steel without weld joints. This allows the manufacturing of lightweight boilers able to bear a working pressure up to 160 PSI.

COSMOMIX COMBUSTION SYSTEM AND FECRALLOY MODULATING BURNER
Ecology and Efficiency

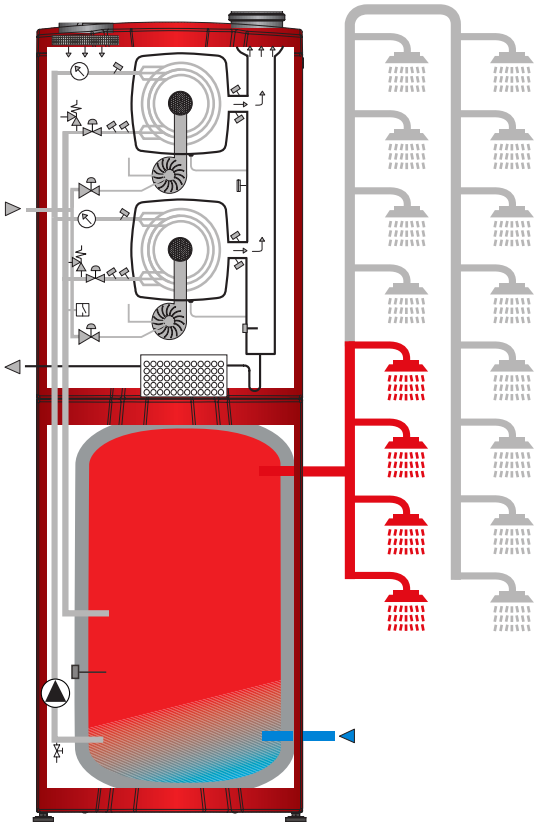
Premix burners built in Fecralloy fibre and special air/gas mixer Cosmomix allows AGUAplus to reach turndown ratio up to 10:1, very good tuning in the hot water delivery, high efficiency combustion and low polluting emissions.

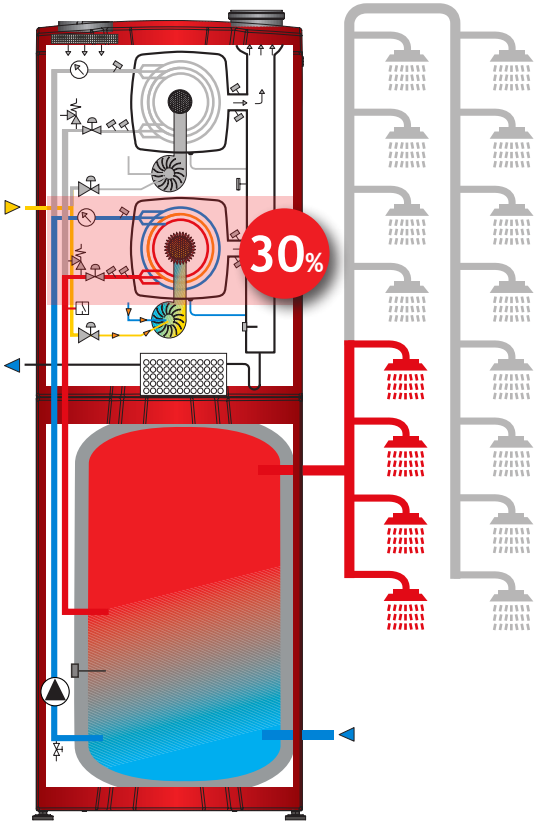
INTEGRATED CONDENSATE NEUTRALISER KIT
Safe collection of condensate

AGUAplus is equipped with a condensate neutralizer kit and filled with 22 lb of limestone (volume of 2.64 gal) for safe collection and draining of condensate.

32 GAL STAINLESS STEEL TANK
Corrosion resistant

The 32 gallons inner storage tank is made of stainelss steel, exceptionally resistant to the corrosion. Provided with sacrificial anode rod.





1 START OF HOT WATER DEMAND

When a call for hot water comes, heated water exits the system from the top of the tank. While hot water exits from the top of the tank, cold water enters the system at the bottom of the tank. A built-in temperature sensor and the 32 gal buffer, a minimum water flow is not required.

2 FIRST HEAT EXCHANGER WORKS AT 30% RATED INPUT

When the temperature of the tank decreases under the setpoint temperature, automatically the system activates the first heat exchanger that works to the 30% of its rated input.

Modularity and continuity

AGUAplus system allows modulation of power, from the minimum output of one heat exchanger up to the maximum output of both, reaching turndown ratio up to 10:1.

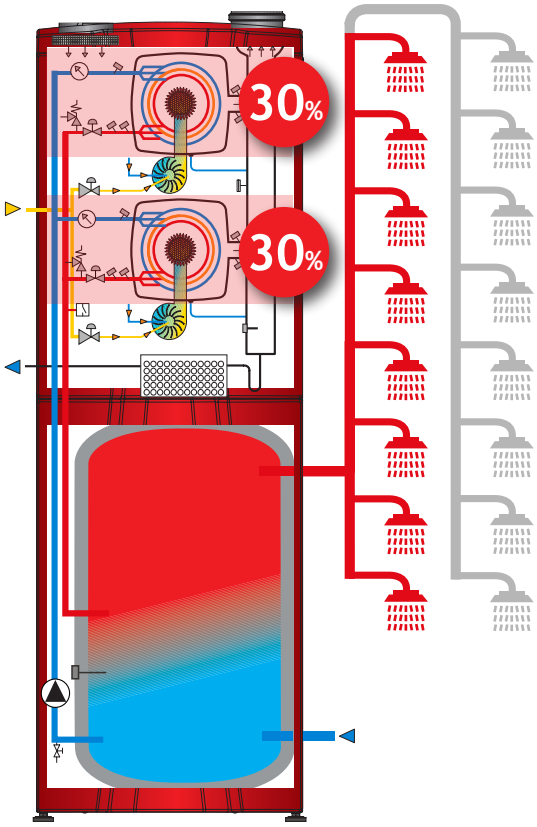
- AGUAplus 199 turndown ratio 4:1
- AGUAplus 250 turndown ratio 5:1
- AGUAplus 399 turndown ratio 8:1
- AGUAplus 500 turndown ratio 10:1

By doing this, system efficiency is optimal, emissions are held to a minimum and hot water heater performance is fully modulating. For the AGUAplus 399 and 500 models if a burner or an heat exchanger fail, the water heater continues to work, ensuring a minimum level of service and continuing to provide hot water.

AGUAplus: how it works

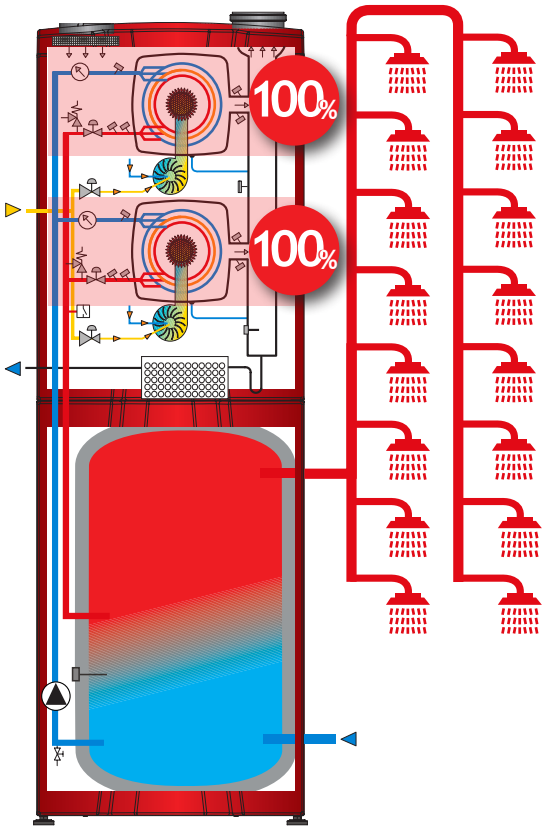
AGUAplus is a unique combination of blending the benefits of advanced condensing instantaneous water heater technology to a simple storage. It pairs a small 32 gallons storage tank with the Cosmogas patented condensing heat exchanger in order to create an innovative “on demand” condensing system with a large capacity of hot water as well as technology to help maintain and quickly replenish the hot water supply.

AGUAplus is always ready to supply hot water on demand.



3 SECOND HEAT EXCHANGER WORKS AT 30% RATED INPUT

If hot water demand is still increasing, also the second heat exchanger starts to work till the 30% of its rated input.



4 BOTH HEAT EXCHANGERS WORK AT 100% RATED INPUT

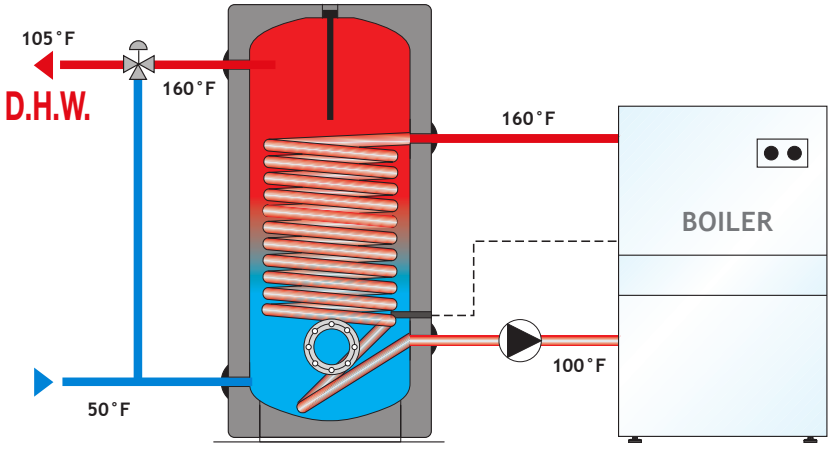
To satisfy continuous hot water demands the two heat exchangers work together to their rated input and continually replenish the tank with hot water. When the hot water demand stops, the heat exchangers continue heating hot water until the temperature setpoint is satisfied.

What are the main strengths of AGUAplus condensing water heater?

To find them you need a simple and intuitive comparison

TRADITIONAL SYSTEM: heating boiler + indirect water heater

In the traditional system during the pre-heating time, when the tank is half heated, the coil is half immerged in hot water, losing his efficiency, working with a higher return temperature. The boiler stops condensing. The coil becomes a “limit” of the system and the input of the boiler is not translated into efficiency.



WORK IN CONDENSING MODE
(ΔT BETWEEN HEATING FLOW AND HEATING RETURN = 90°F)

DISADVANTAGES:

- The **efficiency** of the system **depends on the surface of the coil.**
- The boiler works **only partially in condensing mode.**
- The **recovery time is reduced** and the capacity of the indirect water heater must be increased to reach the same performances of an AGUAplus same input.
- The system, composed of boiler + indirect water heater, **occupies a lot of space on floor.**

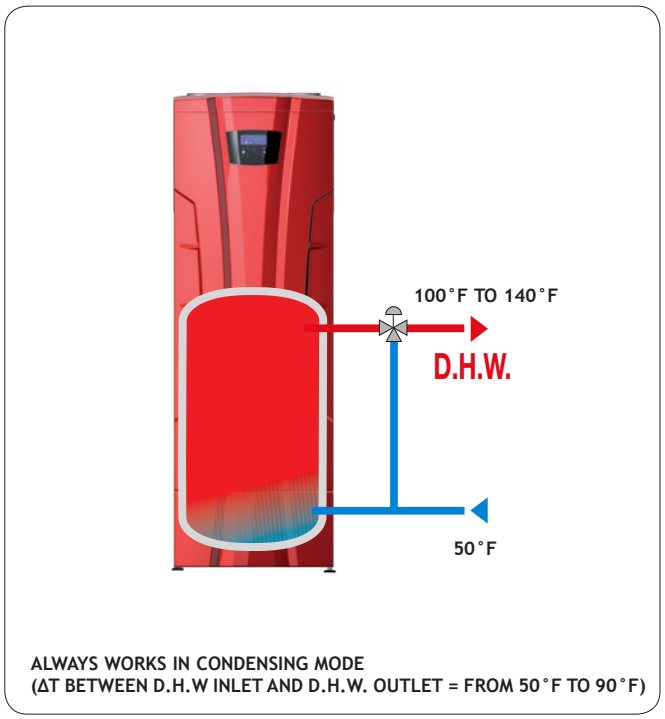
CONDENSING D.H.W.: the real Energy Saver

Requirements for heating output are reduced at the same time **hot water usage is increasing** as high performance showers, luxury bathing facilities and wellness centers. If we consider that the **hot water is used 365 days a year and at all latitudes**, save when it produces hot water has become a priority. AGUAplus advanced condensing technology allows you to gain the maximum efficiency and **energy saving in the hot water production.**

AGUAplus works always in condensing mode

AGUAplus: condensing instantaneous water heater with built-in storage tank

The series of condensing AGUAplus water heater have been designed to satisfy all residential and commercial hot water heating needs: this means hot water delivery always at constant temperature, high water quantity, fast recovery times and quick response also when the flow of water can change in few seconds.



ALWAYS WORKS IN CONDENSING MODE
(ΔT BETWEEN D.H.W INLET AND D.H.W. OUTLET = FROM 50°F TO 90°F)

ADVANTAGES:

- Continuously **works in condensate mode** till the tank is completely heated, thereby maximizing efficiency.
- Direct heat transfer prevents over sizing the volume of the inner tank and thereby **reduce recovery** time and energy consumption.
- The entire output of the AGUAplus is dedicated to the **continuous production** of hot water.
- AGUAplus combines the on-demand heating technology of a condensing instantaneous water heater with an efficient storage tank, in a compact appliance, with a footprint of **less then 4.5 ft²**.

AGUAplus enjoys the advantages of the instantaneous hot water generator with an integrated accumulation becoming the ideal solution for small and large applications, from small capacities for a shower or sink (it does not require minimum water flow), to the large simultaneity of all the showers at the same time of an hotel, a multi-apartment building, a camping, an industrial process, etc...
The patented heat exchanger of AGUAplus transfer directly the heat to the water producing more hot water and working always in condensing mode, much faster than the traditional system.

Digital intelligent control

- Very intuitive control system
- Display back-lightening turns off after 5 minutes of inactivity
- Auto diagnostic of all components and functions, visualization of errors and lockouts, temperature sensors, ionisation current, fan rotation speed
- Possibility of maximum and minimum power setting
- Forcing high or low fire to facilitate combustion analysis
- Anti-blocking pump system
- Integrated MODBUS communication board to communicate with building management system
- PC connection for diagnostic
- Can be connected in cascade
- Exit for alarm connection
- Low gas pressure operation up to 3” W.C.
- Zero clearances to combustible material
- Anti freeze protection system
- Integrated air filter
- Integrated condensate neutralizer kit. Volume of 2.64 gal, content 22 lb of limestone
- On/off switch
- Readable on the control system: water flow sensor (you can see the real GPM are running inside each heat exchanger), supply temperature sensor, flue temperature sensor and tank temperature sensor
- Low water flow protection
- Water pressure sensor (display shows continuously the pressure inside the water system)
- Low water pressure protection
- Flue blocked pressure switch
- Adjustable leveling feet
- Condensate trap
- Back flue preventer (flapper)

Customer Friendly Display

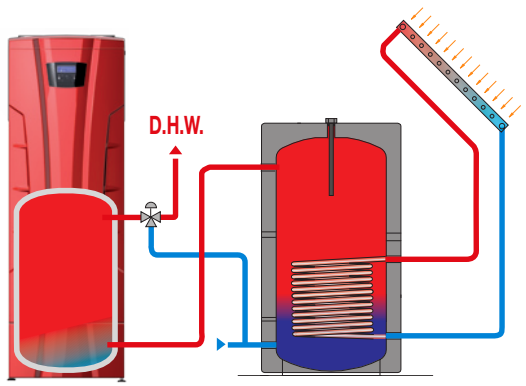
- **Simple interface**
- **LCD with back-light**
- **Low electric consumption**
- **Easy to use**

AGUAplus is perfect for:

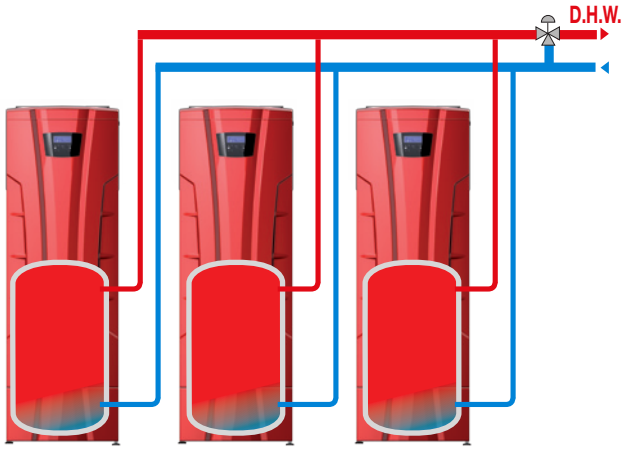
- Hotels
- Camping sites
- Restaurants
- Houses
- Apartaments
- Thermal stations
- Fast food
- Schools
- Sports centers
- Catering
- Car washes
- Abattoirs
- Tanneries
- Distilleries
- Industry
- Agriculture
- Beauty centers
- Hospitals and clinics

AGUAplus: anywhere there is a need for abundant hot water

AGUAPLUS CONNECTED WITH SOLAR SYSTEM



AGUAPLUS CASCADE SYSTEM



Exemples of application

1. AGUAplus connected with solar system

AGUAplus can be coupled with a solar heating system: in this case hot water is pre-heated by sun and AGUAplus works only when the sun is not enough.

2. AGUAplus cascade system

The installation of more than one AGUAplus in cascade offers increased energy savings and more flexible performance than comparable systems, whether in new build or renovation, for commercial and industrial applications requiring high volume hot water output.

By connecting two, three, four or more AGUAplus together in battery most hot water demands can be met.

Parallel connection is recommended to supply even the largest hot water requirement.
No minimum flow required.

Energy saving and ecology is preserved: AGUAplus only heats the needed water.

AGUAplus means:

- Constant hot water temperature
- Larger availability of hot water in continuous and in peak flow
- Reduced cycling, high efficiency

More than 13 gallons of D.H.W. in the first hour in only 4.5 ft² footprint!

Cosmogas with AGUAplus started a conceptual revolution that defined a new pattern where energy saving and respect for the environment were brought to a new level.

AGUAplus is a unique product which combine an innovative "on demand" condensing system with a reduced volume stainless steel storage tank. As an instantaneous water heater AGUAplus produces continuous and never-ending hot water to which adds the 32 gallons of storage of the inner tank to increase the volume of hot water for peak demand, avoiding the disadvantages of space, cost and efficiency.

The result is a highly efficient condensing water heater which gives exceptional output for its size.

AGUAplus > All the advantages of an instantaneous condensing water heater + the benefits of an integrated stainless steel storage tank

CONTINUOUS HOT WATER
- Endless supply of hot water
- Quick recovery time
- Hot water always ready
- No minimum flow required

IDEAL for PEAK DEMANDS
- The 32 gallons inner tank increases the volume of hot water during peak demand

HOT WATER "On demand"
- Operate only when hot water is need
- Energy saving

NO ENERGY for SMALL Withdrawals
- The 32 gallons storage tank allows no energy consumption for small water withdrawals
- Energy Saving

SAVING SPACE
- Compact
- Only 4.5 ft² footprint

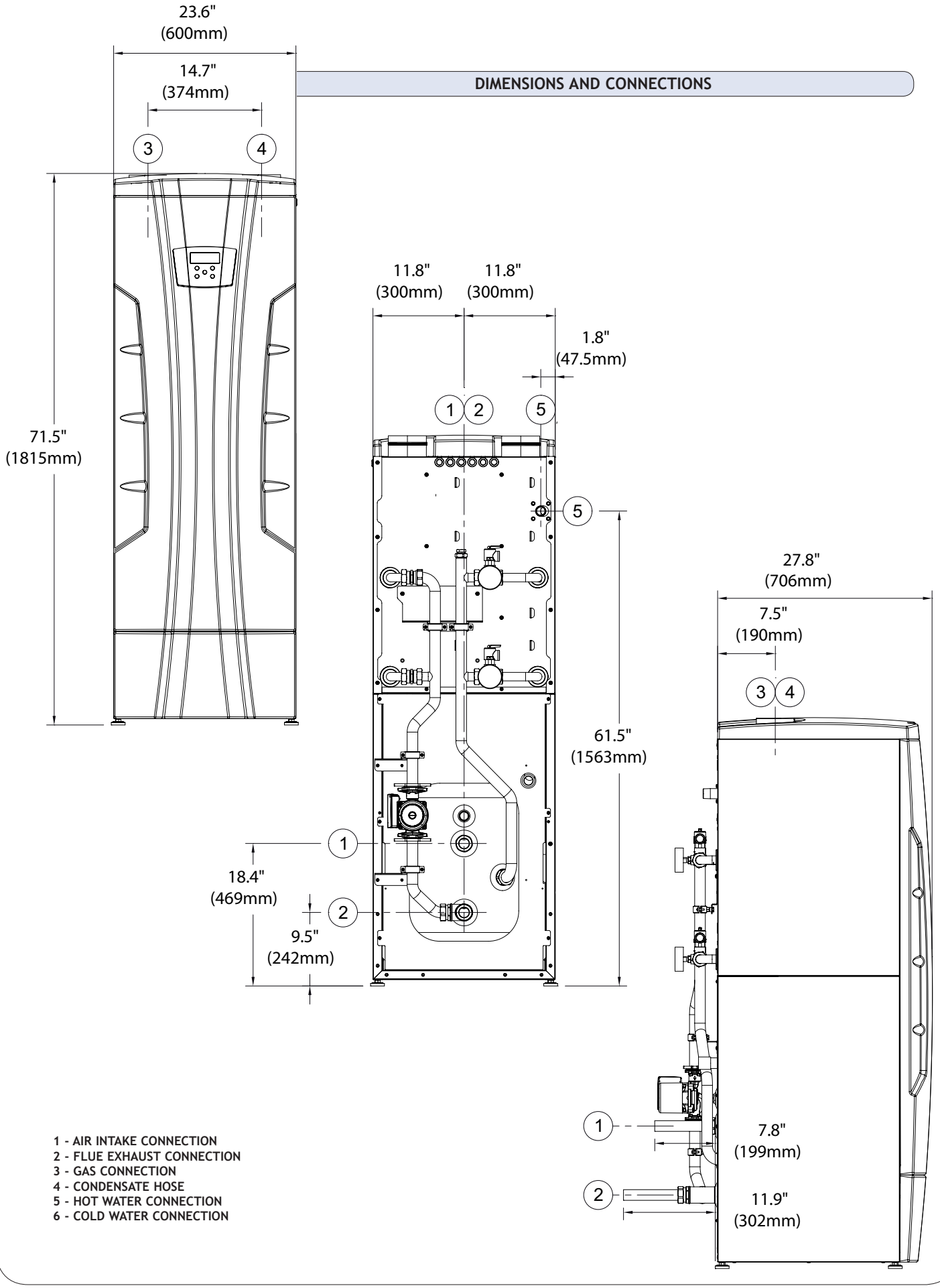
MODULARY & CONTINUITY
- AGUAplus system allows modulation of power, from the minimum output of one heat exchanger up to the maximum output of both, reaching turndown ratio up to 10:1

ECO-FRIENDLY and COST SAVING
- Condensing technology allows to save 30% of utility bill

LONG LASTING & RELIABILITY
- Stainless Steel and Cosmogas Quality are synonymous of long life span reliability

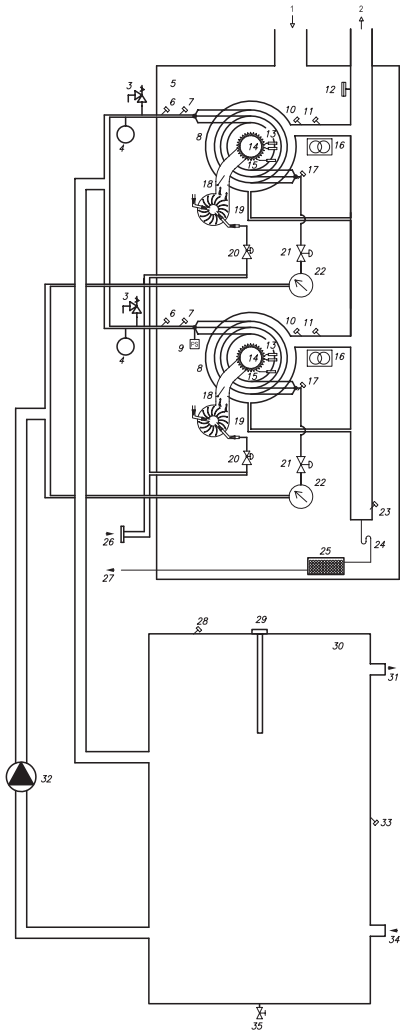
LIFETIME WARRANTY
LongLife

DIMENSIONS AND CONNECTIONS



1 - AIR INTAKE CONNECTION
2 - FLUE EXHAUST CONNECTION
3 - GAS CONNECTION
4 - CONDENSATE HOSE
5 - HOT WATER CONNECTION
6 - COLD WATER CONNECTION

AGUAplus: efficiency up to 98% in hot water production mode!



OPERATING SCHEME

1 - AIR INLET
2 - FLUE EXHAUST
3 - SAFETY P-T RELIEF VALVE
4 - PRESSURE AND TEMP. GAUGE
5 - SEALING CHAMBER
6 - HIGH LIMIT SUPPLY TEMP. SWITCH
7 - SUPPLY TEMP. SENSOR
8 - R.V.C. STAINLESS STEEL HEAT EXCHANGER
9 - WATER PRESSURE SENSOR
10 - FLUE GAS TEMP. SENSOR
11 - HIGH LIMIT FLUE GAS TEMP. FUSE
12 - BLOCKED FLUE PRES. SWITCH
13 - IGNITION ELECTRODES
14 - PREMIX BURNER
15 - DETECTION ELECTRODE
16 - IGNITOR
17 - RETURN TEMP. SENSOR
18 - BACK FLUE PREVENTER
19 - MODULATING PWM FAN
20 - GAS VALVE
21 - MOTORIZED VALVE
22 - WATER FLOW METER
23 - COND. BLOCKED DRAIN SWITCH
24 - CONDENSATE SIPHON
25 - CONDENSATE NEUTRALIZER BOX
26 - GAS SUPPLY
27 - CONDENSING DRAIN
28 - LOW WATER CUT OFF
29 - SACRIFICIAL ANODE ROD
30 - STORAGE TANK
31 - HOT WATER SUPPLY
32 - STORAGE TANK PUMP
33 - STORAGE TANK TEMP. SENSOR
34 - COLD WATER

TECHNICAL FEATURES AGUAplus

MODEL		AGUAplus 199	AGUAplus 250	AGUAplus 399	AGUAplus 500
Chymney category		II-IV	II-IV	II-IV	II-IV
Maximum heat input	Btu/hr	199,500	250,000	399,000	500,000
Minimum heat input	Btu/hr	50,000	50,000	50,000	50,000
Maximum heat output	Btu/hr	190,000	237,500	379,000	475,000
Efficiency at maximum heat output	%	95	95	95	95
Minimum heat output	Btu/hr	49,000	49,000	49,000	49,000
Efficiency at minimum heat output	%	98	98	98	98
Natural Gas flow rate	ft^3/hr	199.5	250	399	500
LPG Gas flow rate	ft^3/hr	80	100	160	200
Instantaneous D.H.W. production (Δt 75°F)	GPM	5.1	6.3	10.1	12.7
Min/Max water temperature	°F	68/180	68/180	68/180	68/180
Minimum water flow	GPM	0	0	0	0
Maximum working pressure	PSI	160	160	160	160
Minimum working pressure	PSI	14	14	14	14
Water pressure loss at 25 GPM	InWC	39	39	39	39
Electrical power supply	V/Hz	120/60	120/60	120/60	120/60
Absorbed electric power	W	210	250	320	400
Air Intake/Flue gas pipes diameter	inch	3	3	4	4
Flue gas pipes maximum length	ft	120	120	120	120
Balanced CO contents (0% O_2 with natural gas)	ppm	15	15	15	15
Balanced NOx contents (0% O_2 with natural gas)	ppm	15	15	15	15
Weight (empty of water)	lb	270	345	515	630

AGUAplus D.H.W. PERFORMANCE

AGUAplus 199

Water heater setpoint	Temperature rise	Peak water quantity (gallons)					Continuous Flow	Recovery time from 50°F to setpoint
°F	°F	3 min.	5 min.	10 min.	20 min.	40 min.	GPM	min.
140	50	48	64	102	178	330	7.60	8
	75	22	32	57	108	209	5.07	8
	90	13	21	42	84	169	4.22	8
170	50	68	83	121	197	349	7.60	10
	75	34	45	70	121	222	5.07	10
	90	23	32	53	95	180	4.22	10

AGUAplus 250

Water heater setpoint	Temperature rise	Peak water quantity (gallons)					Continuous Flow	Recovery time from 50°F to setpoint
°F	°F	3 min.	5 min.	10 min.	20 min.	40 min.	GPM	min.
140	50	54	73	121	216	406	9.50	6
	75	25	38	70	133	260	6.33	6
	90	16	26	53	106	211	5.28	6
170	50	73	92	140	235	425	9.50	8
	75	38	51	83	146	273	6.33	8
	90	27	37	63	116	222	5.28	8

AGUAplus 399

Water heater setpoint	Temperature rise	Peak water quantity (gallons)					Continuous Flow	Recovery time from 50°F to setpoint
°F	°F	3 min.	5 min.	10 min.	20 min.	40 min.	GPM	min.
140	50	71	101	177	329	632	15.16	4
	75	37	57	107	209	411	10.11	4
	90	25	42	84	168	337	8.42	4
170	50	90	121	196	348	651	15.16	5
	75	50	70	120	221	423	10.11	5
	90	36	53	95	179	348	8.42	5

AGUAplus 500

Water heater setpoint	Temperature rise	Peak water quantity (gallons)					Continuous Flow	Recovery time from 50°F to setpoint
°F	°F	3 min.	5 min.	10 min.	20 min.	40 min.	GPM	min.
140	50	83	121	216	406	786	19.00	3
	75	44	70	133	260	513	12.67	3
	90	32	53	106	211	422	10.56	3
170	50	102	140	235	425	805	19.00	4
	75	57	83	146	273	526	12.67	4
	90	42	63	116	222	433	10.56	4

COSMOGAS International Certifications

AENOR ER Empresa Registrada UNE-EN ISO 9001 · IQNet ISO 9001 · Certified Quality System ISO 9001 · CE EU · ASME USA · Design Certified USA · CSA Certified Canada · CSA LLC · CSA C US

AUTHORIZED DEALER

COSMOGAS srl • Via L. da Vinci, 16 • 47014 MELDOLA (FC) ITALY • Tel. +39 0543.49.83.70 • Fax +39 0543.49.83.92
www.cosmogas.com • info@cosmogas.com

6240130S - Novembre 2015