

“*Simple, reliable,
efficient split heat pump!
Equipped with CS controller*”



Heating nominal capacity : 4 to 15kW
Cooling nominal capacity : 14 to 16kW



Cooling or
heating



POMPE À CHALEUR
www.marque-nf.com



*Reversible mode only with three-phase models
** except three-phase models

Use

The **YUNA II** air-to-water split heat pump is designed for heating applications in new, existing individual homes and small businesses.

When installed alone, YUNA II is compatible with low to medium temperature emitters (underfloor heating, fan coil units, water cassettes, radiators, mixed installations, etc.). YUNA II is also compatible with high temperature emitters for boiler backup operation.

Each device is tested in the factory and delivered ready for operation.

Range

YUNA II's range is composed by 6 single-phase and three-phase models.

Operation in cooling mode with an outdoor temperature of 0°C to 46°C (only three-phase units).

Operation in heating mode with an outdoor temperature of -20°C to +30°C.

If the heat pump is the only source of heat:

Below this temperature, heating must be provided by a separate heating source or an additional electrical supply.

If the heat pump is used for backup operation:

Operates down to the equilibrium point (temperature below which the heat pump can no longer keep up with heating needs). Below this point, the heat pump and boiler run alternately (heat pump OR boiler).

Conformity

Low Voltage Directive 2006/95/EC

EMC: ElectroMagnetic Compatibility 2004/108/EC

PED: Pressure Equipment Directive 97/23/EC

WEEE: Waste Electrical & Electronic Equipment 2012/19/EU

RoHS: Restriction of Hazardous Substances Directive 2011/65/UE

Yuna II air-to-water split system heat pumps with built-in inverter technology are designed for residential and light commercial applications. They offer excellent energy efficiency values, exceptionally quiet operation and meet the most stringent operating temperature demands.

The units integrate the latest technological innovations: **Non-ozone depleting refrigerant R410A**, DC inverter twin-rotary compressors, low-noise fan and microprocessor control.

With exceptional energy efficiency values, the inverter air-to-water split-system heat pumps qualify for local tax reductions and incentive plans in all the EU countries.



Ecodesign is the European Directive that sets mandatory requirements for Energy related Products (ErP) to improve their energy efficiency. CIAT supports initiatives to reduce the environmental impact of its products.

Features

- Wide operating range in both heating and cooling mode offers high performance in a wide temperature range.
- DC inverter twin-rotary compressors with Pulse Amplitude Modulation (PAM) and Pulse Width Modulation (PWM) provide enhanced reliability, low energy consumption and smooth vibration-free operation under all operating conditions.
- Variable-speed fans with an innovative patented fan blade shape ensure improved air distribution at exceptionally low noise levels.
- Pre-set or customised selection of the appropriate climate curve for stable output capacity to match the heat load.
- Output to link and integrate the unit with the existing heat sources offers a dual-energy approach, increased savings and optimum comfort in all weather conditions.
- Able to control two independent comfort zones with a two-zone kit added to the main comfort module.
- Leaving water temperature up to 60 °C for radiator and domestic hot water applications, making hot water readily available.

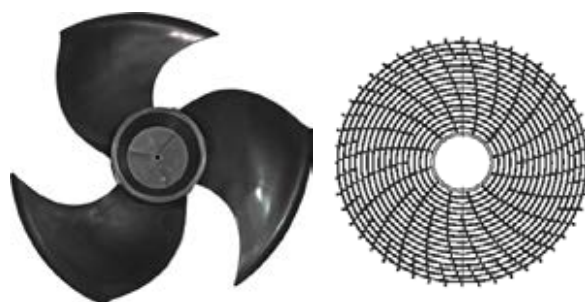
Adapted to your needs

- Heating only or reversible comfort module
- Backup heating, either electrical (single-energy applications) or gas boiler (dual-energy applications)
- Comfort is ensured via the user interface and the possibility of integrating two leaving water temperature zones.

Advanced technology

- Electronic system management: Several sensors placed in key positions in the refrigerant circuit electronically detect the operational system status. Two micro-controllers receive the input from the sensors, manage them using advanced control algorithms and optimise the refrigerant flow and the functioning of all the core components - the compressor, fan motors and the pulse modulation valve.
- The pulse modulation valve, a bi-flow electronic expansion device, optimises the refrigerant amount in the circuit and the superheat, and prevents the refrigerant migration back into the compressor. This device further enhances high system performance and reliability.
- The air management system, which consists of a propeller fan, orifice and an air discharge grille, guarantees minimised noise levels.

New patented fan blade shape and grille profile with low pressure drop



Advanced performance

- Yuna II have an extremely high energy efficiency ratio in both cooling and heating mode, ensuring significant energy savings. Large and efficient coils and optimised circuiting feature ensure that all the combinations meet the European tax rebate efficiency targets. Efficiency at part-load conditions (seasonal energy efficiency) reaches the highest level in the industry.
- Year-round comfort: The advanced technology used in Yuna II provides optimised comfort levels for the end users, both in terms of water temperature control and silent operation. The desired temperature is quickly reached and effectively maintained without fluctuations. Yuna II offers optimised individual comfort levels - both in winter and in summer.
- Wide temperature operating range: Yuna II can operate efficiently in extreme temperature conditions. For end user comfort the units operate down to -20 °C outdoor temperature in heating mode, and in the summer, they produce hot water up to 60 °C at up to 30 °C outside temperature for domestic hot water applications.

Environmental care

- Non-ozone depleting refrigerant R410A:
 - Chlorine-free refrigerant of the HFC group with zero ozone depletion potential
 - High-density refrigerant, therefore less refrigerant required
 - Very efficient, therefore gives an increased energy efficiency ratio (EER)
- The new packaging ensures high protection during transport and handling and is 100% recyclable.

Fast and simple installation and service

- Easy access to all internal components: Unscrew only three screws to remove the complete front panel to access the refrigerant piping connections, control box and electrical connections, as well as the compressor and other key parts.
- Advanced circuit design and component selection has resulted in a compact unit with an exceptionally small footprint that is easy to transport through narrow doors.
- Reduced weight and a handle on the unit panels to facilitate transport.
- No additional buffer tank required. This simplifies and speeds up the installation process.
- 3-bar pressure relief valve as standard
- 8-litre internal expansion tank
- High-temperature refrigerant protection
- Water flow switch to ensure that the circuits contain enough water to operate correctly.
- Various power cable outlet options: Pre-punched holes in the cabinet panels permit cable exit on the side, front or rear.
- Dealer service tool connection kit includes the software and connections to monitor the operating parameters from a personal computer, giving an easy-to-read display with visual graphs and statistics indicators.
- Yuna II units are equipped with 1 inch gas MPT water connections.
- Yuna II internal module reduces space requirements and simplifies the installation. Only the power and the water supply and return piping need to be connected.
- Condensate drain piping connection
- Specially shaped anchorage feet ensure correct and safe fixing of the unit.
- The programmable thermostat periodically runs system checks to monitor and assess the unit operating parameters. If a problem occurs, troubleshooting fault codes and messages help the service technician to identify the fault.

Superior reliability

- Exceptional endurance tests:
 - All the units are tested at various stages on the production line for circuit leakage, electrical compliance, water and refrigerant pressures.
 - End-of-line test of all unit operating parameters
 - Corrosion resistance test
 - Accelerated ageing test on critical components and complete assembled units, simulating thousands of hours of continuous operation.
 - Packaging crash test to ensure that the units are adequately protected against accidental shocks
 - Extensive field and site testing.

DC inverter twin-rotary compressor

- Advanced technology provides maximum energy-efficiency with high capacity available at peak conditions and optimised efficiency at low and mid compressor speeds. Yuna II DC inverter uses Intelligent Power Drive Unit (IPDU) hybrid inverter technology, combining two electronic management logics: Pulse Amplitude Modulation (PAM) and Pulse Width Modulation (PWM) for optimised compressor operation in all conditions, minimised temperature fluctuations, and provides perfect individual comfort control with significantly reduced energy consumption:
 - PAM: Pulse Amplitude Modulation of the direct current controls the compressor at maximum load conditions (start-up and peak load), and increases the voltage at fixed frequency. The compressor works at high speed to rapidly achieve the desired temperature.
 - PWM: Pulse Width Modulation of the direct current controls the compressor at partial load conditions, and adjusts the frequency at fixed voltage. The compressor speed is fine-tuned and the system provides high-level comfort (no temperature fluctuations) at exceptionally efficient working conditions.
- Compressor frequency is increased continuously up to the maximum level. This ensures that there are no current draw peaks in the start-up phase and safe connection to a single-phase power supply even in large-capacity systems. The maximum operating current of Yuna II is below 12 A (systems up to 6.5 kW) and below 23 A for larger systems (up to 11.5 kW). Inverter ramp-up speed makes soft starts unnecessary and ensures immediate maximum power.
- The two rotary compression cylinders, offset from each other by 180°, and the DC brushless motor with the shaft in perfect balance ensure reduced vibration and noise, even at very low operating speeds. This results in an extremely wide range between minimum and maximum capacity with continuous operation, guaranteeing that the system is always optimised and provides maximum comfort at exceptionally high efficiency levels.
- Twin-rotary cylinders, low vibrations and low load to the shaft ensure highest compressor reliability and a long trouble-free operating life.
- All DC brushless twin-rotary compressors are equipped with crankcase heaters as standard.
- A double compressor shield for acoustic insulation further reduces noise levels.

Corrosion-resistant casing



Economical operation

- Increased energy efficiency at part load:
- The exceptionally high energy efficiency of the Yuna II is the result of a long qualification and optimisation process.
- Use of ambient air as primary source of energy in domestic heating applications significantly reduces the overall energy consumption and minimises CO2 emissions.
- Night mode operation at reduced compressor speed, results in low-noise operation and a significant reduction in energy consumption.
- Easy-to-set and economical silent mode, reduces the compressor speed.
- R-410A refrigerant is easier to use than other refrigerant blends.

GMC board

- The new GMC controller is specifically developed for Yuna II, and incorporates new control algorithms. It features customised or pre-defined climate curves, domestic hot water control, a night-time noise reduction function, a defrost/alarm output signal, an external heat source, a pump block prevention function, freeze protection and compressor operation management.

New user interface

- Yuna II has an easy-to-use user interface with easy-to-read LCD screen. It provides enhanced control capability for maximised performance, reliability and indoor comfort and has extended programming features such as weekly scheduling. The sleek contemporary design blends in with any room decor.



New comfort module

- With its enhanced aesthetics and compactness, combined with features and options, Yuna II sets new standards in energy savings and comfort. Using the two-zone kit, two separate terminal units or two independent comfort zones can be closely monitored. Domestic hot water production is made easy and can be interfaced with solar thermal panels.



Two-zone kit

- The new design facilitates the installation process and makes two independent comfort zones, which are easy to control. This kit includes a hydronic disconnection collector, the necessary circulating pumps and modulating valve. Installed together with the domestic hot water tank, the two-zone kit can integrate all accessories, such as the diverting valve and T-connection.



DESCRIPTION OUTDOOR AND INDOOR UNITS

Outdoor unit		Indoor unit
Yuna II 5H	5 kW nominal capacity	Heating only, 1 zone, max. heating capacity 6.5 kW with 3 kW 1-ph electric heater backup
Yuna II 6H	6.5 kW nominal capacity	
Yuna II 9H	9 kW nominal capacity	
Yuna II 11H	11.5 kW nominal capacity	Heating and cooling, 1 zone, max. heating capacity 15 kW with 6 kW 3-ph electric heater backup
Yuna II 12HT	12 kW nominal capacity	
Yuna II 15HT	15 kW nominal capacity	

PHYSICAL DATA, OUTDOOR AND INDOOR UNITS

Outdoor unit (heat pump)				5HK	6HK	9HK	11HK	12HTK	15HTK
Indoor unit (confort module)				5-63D	5-63D	9-113D	9-113D	12-156D	12-156D
Cooling									
Full load performances*	C1	Nominal capacity	kW	3.57	4.73	5.95	6.8	10.3	12.6
	C1	EER	kW / kW	2.6	2.6	3.07	2.88	3.41	3.17
	C1	Eurovent class cooling		D	D	B	C	A	A
	C2	Nominal capacity	kW	5.1	6.55	7.88	9	13.5	15.79
	C2	EER	kW / kW	3.4	3.4	4.05	3.8	4.74	4.24
	C2	Eurovent class cooling		-	-	-	-	-	-
Seasonal efficiency**		ESEER	kW / kW	3.71	3.71	4.45	4.37	4.56	4.79
Heating									
Full load performances*	H1	Nominal capacity	kW	5.01	6.55	9.27	11.5	12	15.01
	H1	COP		4.15	4.15	4.48	4.1	4.65	4.3
	H2	Nominal capacity	kW	4.37	5.7	8.7	11.3	11.2	14.02
	H2	COP		3.42	3.34	3.45	3.32	3.7	3.4
	H3	Nominal capacity	kW	4.25	5.52	7.86	10.95	11.48	11.91
	H3	COP		2.65	2.86	2.9	2.79	3.12	3.1
Seasonal efficiency**	H1	SCOP		3.1	3	3.2	3.19	3.82	3.67
	H1	η _s	%	121	117	125	125	150	144
	H1	P _{rated}	kW	2.34	2.52	8.83	10.09	9.89	11.00
	H1	Energy efficiency class		A	A+	A+	A+	A++	A+
	H3	SCOP		3	2.98	2.99	2.94	3.45	3.29
	H3	η _s	%	117	116	117	115	135	128
	H3	P _{rated}	kW	1.90	2.16	7.60	8.75	8.37	9.38
	H3	Energy efficiency class		A+	A+	A+	A+	A++	A++
Indoor unit									
Sound levels									
Sound power level ⁽¹⁾ (H3)			dB(A)	49	49	49	49	49	49
Dimension, H x L x D			mm	800 x 450 x 320	800 x 450 x 320	800 x 450 x 320	800 x 450 x 320	800 x 450 x 320	800 x 450 x 320
Operating weight ⁽³⁾			kg	48	48	50	50	52	52
Pump				Variable speed circulator					
Expansion tank volume			l	8	8	8	8	8	8
Availabale static pressure (C1)			kPa	70	68	68	65	55	41
Availabale static pressure (H1)			kPa	66	60	54	40	45	25
Availabale static pressure (H2)			kPa	68	64	57	41	50	31
Max. water-side operating pressure			kPa	300	300	300	300	300	300
Water connections									
Diameter			inch	1 M	1 M	1 M	1 M	1 M	1 M
Outside tube diameter			mm	25.4 M	25.4 M	25.4 M	25.4 M	25.4 M	25.4 M
Connections, Liquid / Gas side			inch	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8
Chassis paint colour				White					
Outdoor unit									
Sound levels									
Sound power level ⁽¹⁾ (H3)			dB(A)	64	67	68	69	69	69
Sound power level ⁽¹⁾ (C1)			dB(A)					68	68
Dimension, H x L x D			mm	690 x 900 x 320	820 x 900 x 320	1360 x 900 x 320	1360 x 900 x 320	1360 x 900 x 320	1360 x 900 x 320
Operating weight ⁽³⁾			kg	49	51	88	88	100	100
Refrigerant				R410A					
Circuit charge ⁽³⁾			kg	1.17	1.36	2.1	2.1	3.9	3.9
			CO ₂ eq.	2.4	2.8	4.4	4.4	8.1	8.1
Compressors				DC Inverter Twin-Rotary					
Fans				Variable speed 3 blades fan					
Quantity				1	1			2	2
Air flow			m ³ /h	2620	2820	5970	6360	5770	5770
Maximum connection pipe length			m	50	30	70	70	70	70
Maximum height difference Out/In - In/Out			m	30 - 15	30 - 15	30 - 15	30 - 15	30 - 15	30 - 15
Precharged length			m	20	20	20	30	30	30
Connections, Liquid / Gas side			inch	1/4 - 1/2	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8	3/8 - 5/8
Chassis paint colour				Beige					

* In accordance with standard EN14511-3:2013

** In accordance with standard EN14825:2013, average climate

C1 Cooling mode conditions: evaporator water entering/leaving temperature 12°C/7°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W

C2 Cooling mode conditions: evaporator water entering/leaving temperature 23°C/18°C, outside air temperature 35°C, evaporator fouling factor 0 m² K/W

H1 Heating mode conditions: Water heat exchanger water entering/leaving temperature 30°C/35°C, fouling factor 0 m² K/W. Outside air temperature 7°C db/6°C wb,

H2 Heating mode conditions: Water heat exchanger water entering/leaving temperature 40°C/45°C, fouling factor 0 m² K/W. Outside air temperature 7°C db/6°C wb,

H3 Heating mode conditions: Water heat exchanger water entering/leaving temperature 47°C/55°C, fouling factor 0 m² K/W. Outside air temperature 7°C db/6°C wb,

(1) In dB ref=10-12 W, (A) weighting. Declared dual number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1.

(3) Weights are guideline only. Refer to the unit nameplate.



Eurovent certified values

ELECTRICAL DATA, OUTDOOR AND INDOOR UNITS

Outdoor unit		5HK	6HK	9HK	11HK	12HTK	15HTK
Power supply	V-ph-Hz	230-1-50	230-1-50	230-1-50	230-1-50	400-3+N-50	400-3+N-50
Voltage range	V-ph-Hz	198-264	198-264	198-264	198-264	400-3N-50	400-3N-50
Full load current	A	12	12	23	23	15.4	15.4
Fuse rating*	A	16	16	25	25	16	16
Operating current	A	5.3	6.91	9.43	12.22	6.45	8.72
Power consumption	W	1220	1590	2170	2810	2580	3490
Main power wire size	mm ²	2.5	2.5	4	4	2.5	2.5
Power factor	%	0.95	0.95	0.95	0.95	0.95	0.95

* Time delay fuse

Indoor unit		5-63D	9-113D	12-156D
Power supply	V-ph-Hz	230-1-50	230-1-50	400-3+N-50
Voltage range	V-ph-Hz	207-253	207-253	376-424
Power input	kW	3	3	6
Operating current				
L1	A	13.0	13.0	8.7
L2	A	-	-	8.7
L3	A	-	-	8.7
N	A	13.0	13.0	-
Power factor	%	1	1	1
Indoor unit power supply and communication cable - H07 RN-F	mm ²	2G x 1	2G x 1	2G x 1
Backup heater power supply cable - H07 RN-F	mm ²	3G x 4	3G x 4	5G x 2.5
User interface cable (additional or remote) - FROH2R	mm ²	4 x 0.75	4 x 0.75	4 x 0.75
Booster heater power supply cable - H05VV-F	mm ²	3G x 2.5	3G x 2.5	3G x 2.5
DHW booster heater activation cable - FROH2R	mm ²	2 x 1	2 x 1	2 x 1
DHW hot water sensor cable - FROH2R	mm ²	2 x 0.5	2 x 0.5	2 x 0.5
Remote outdoor sensor cable - FROH2R	mm ²	2 x 0.5	2 x 0.5	2 x 0.5

SOUND LEVELS, OUTDOOR UNITS

Cooling mode										
Outdoor unit		Octave bands, Hz							Sound power levels	
		125	250	500	1000	2000	4000	8000		
12HTK	dB	71	69	66	63	59	56	49	dB(A)	68
15HTK	dB	72	68	66	63	60	54	50	dB(A)	68
Heating mode										
Outdoor unit		Octave bands, Hz							Sound power levels	
		125	250	500	1000	2000	4000	8000		
5HK	dB	68	62	61	60	54	54	46	dB(A)	64
6HK	dB	73	67	67	63	56	56	51	dB(A)	68
9HK	dB	73	66	68	63	57	56	51	dB(A)	69
11HK	dB	70	68	69	64	60	57	51	dB(A)	70
12HTK	dB	72	69	66	63	59	56	50	dB(A)	68
15HTK	dB	72	68	67	63	59	56	50	dB(A)	68

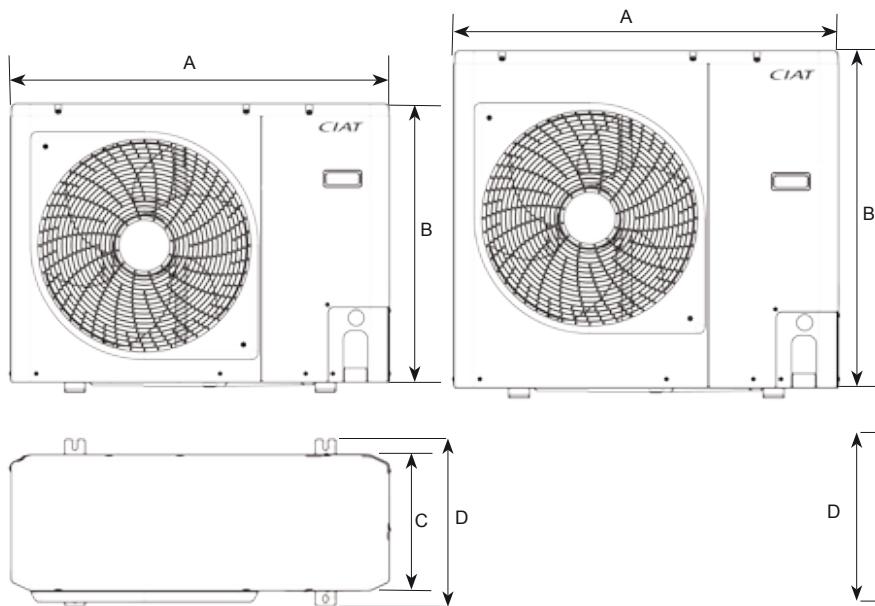
SOUND LEVELS, INDOOR UNITS

Sound power level	dB(A)	41
Sound pressure level*	dB(A)	27

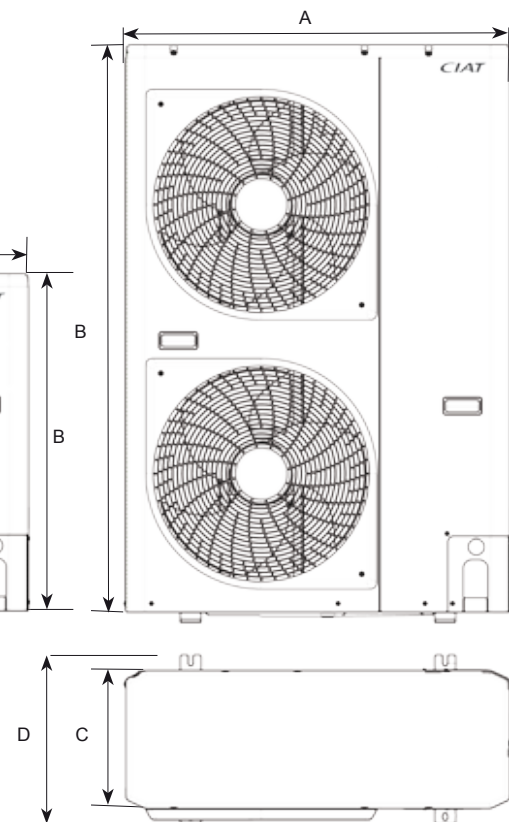
* Measured at 2 m distance, in accordance with UNI EN ISO 3741.

DIMENSIONS (MM), OUTDOOR UNITS

5H, 6H

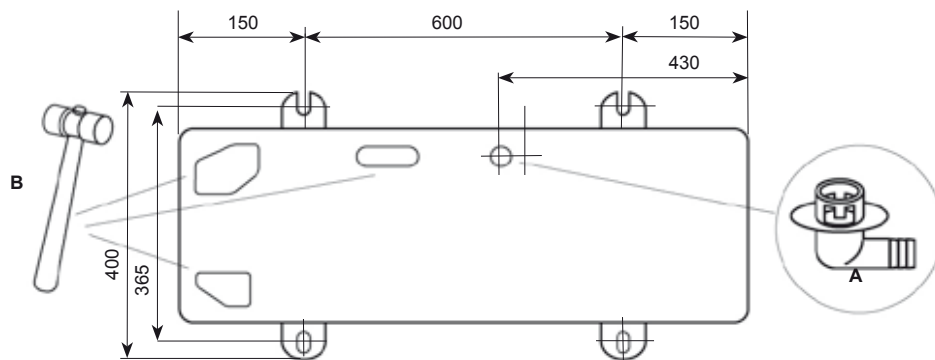


9H, 11H, 12HT, 15HT



Dimensions, mm	A	B	C	D	Weight, kg
5H	900	690	320	400	49
6H	900	820	320	400	51
9H, 11H	900	1360	320	400	88
12HT, 15HT	900	1360	320	400	100

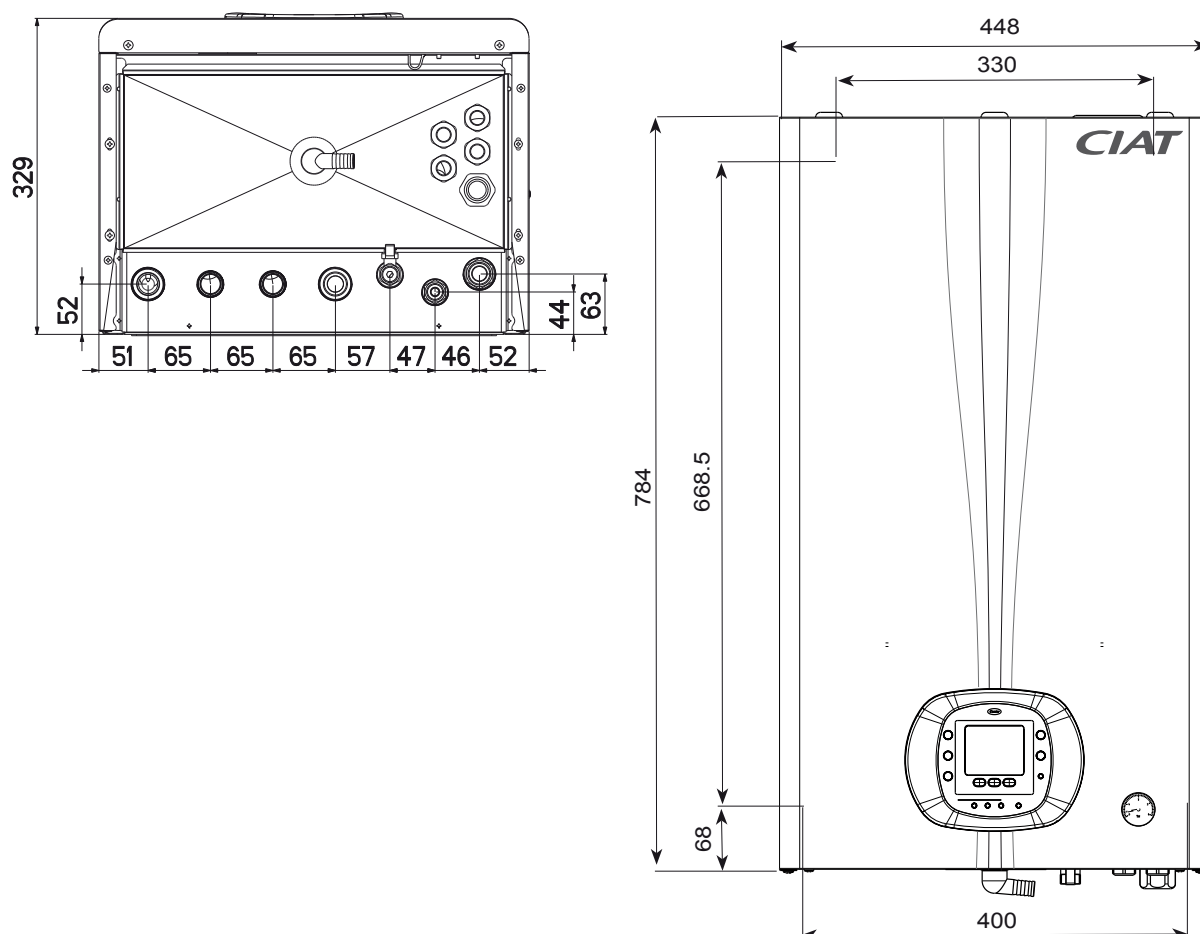
DRAIN HOSE AND BASE PAN KNOCKOUTS (MM)



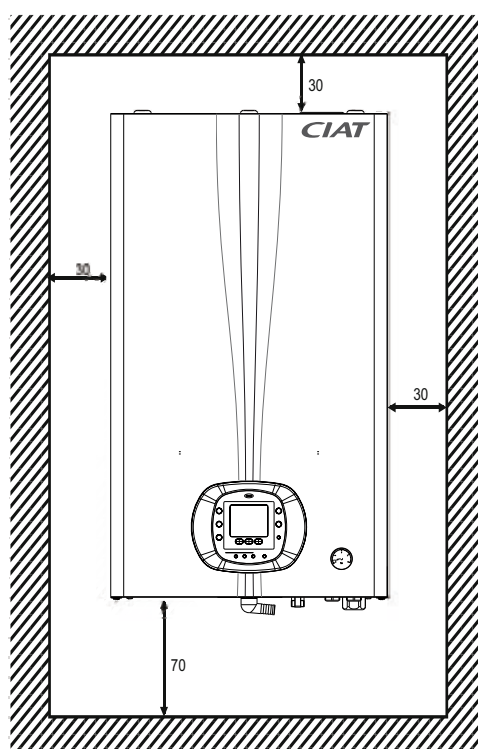
In case of draining through the drain pipe, attach the drain nipple (A) and use a drain hose with an inside diameter of 16 mm (to be provided). In cold outside temperatures when the drain pipe can freeze up, ensure that drainage is not obstructed.

Open the knockout holes in the base pan to improve the drainage capacity. Use a hammer (B) to open the knockout holes.

DIMENSIONS (MM), INDOOR UNIT



CLEARANCES (MM), INDOOR UNIT



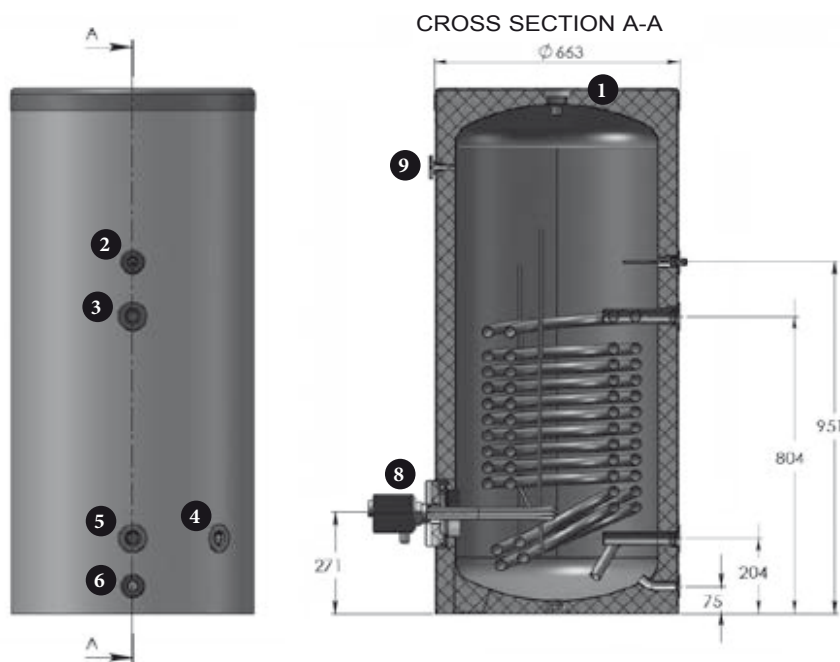
PHYSICAL DATA, OPTIONS / DOMESTIC HOT WATER (DHW)

		300 DHW tank
Water tank size	l	293
Number of coils		1
Electric heater backup	kW	3
Operating temperature range	°C	5 to 95
Operating pressure DHW	bar	0 to 8
Operating pressure heat exchangers	bar	0 to 6
Ambient operating temperature range	°C	5 to 45 °C
Storage temperature range	°C	-20 to +75°C
Heat exchanger	m ²	2.5
Diameter	mm	663
Height	mm	1422

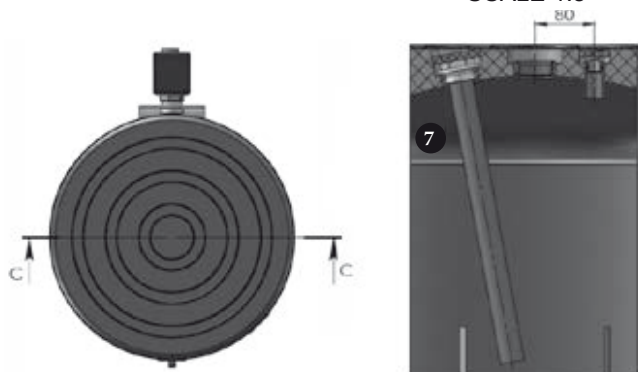


ELECTRICAL DATA, DOMESTIC HOT WATER (DHW)

Model		300 DHW tank
Maximum operating current	A	13.05 (230V) / 4.4 (400V)



CROSS SECTION C-C
SCALE 1:5



- ① Domestic hot water outlet G 1 1/2" F
- ② Location of the sensor G 1/2" F
- ③ Heat exchanger inlet G 1" F
- ④ Domestic cold water inlet G 1" F
- ⑤ Exchanger outlet G 1" F
- ⑦ Tank drain G 3/4" F
- ⑧ Magnesium anodes
- ⑧ 3 kW electrical heater
- ⑨ Thermometer



→ air-to-water heat pump

Yuna II

This document is non-contractual. As part of its policy of continual product improvement, CIAT reserves the right to make any technical modification it feels appropriate without prior notification.

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