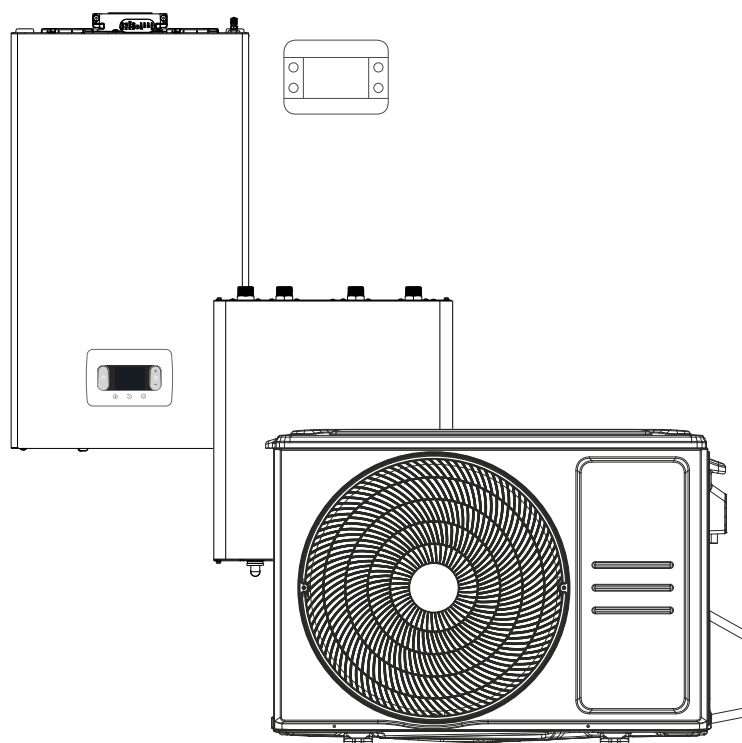


BERETTA HARMONY HYBRID

Hybrid systems - Wall-hung solutions



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Product Description

BERETTA HARMONY HYBRID is the factory-made multi-energy residential system - cost-effective, compact, and easy to install - that is part of the energy transition process in which Beretta is actively involved.

It consists of the heat pump BERETTA HARMONY 3.5 or 5.0 kW in R32, the HYBRID HYDRAULIC KIT indoor unit, the condensing boiler CIAO X in a 25 or 30 kW combination version, and the system manager HI, COMFORT T300-HY, it meets the needs of heating, cooling, and domestic hot water production in a single system for year-round home comfort.

Beretta Harmony Hybrid is a compact and versatile solution designed to adapt to multiple system requirements while minimizing space requirements both inside and outside the home: the small-sized hydronic kit can be easily positioned either below or to the side of the boiler, up to a maximum distance of 15m; the heat pump, synonymous with compactness, can be installed either on the floor or hung on the wall with suitable support brackets, up to a maximum distance of 25m in length and 10m in height from the indoor unit.

Plug&Play technology makes installation simple, quick, and flexible, making Harmony the ideal solution for both installers and end users.

The proprietary system intelligence is housed in the control panel and can also be managed remotely via the Hi, Comfort App. It allows advanced management of the home environment, optimizing consumption and adapting to user needs thanks to the choice between economic optimization mode, for savings on bills, or ecological mode, to contribute to the reduction of CO₂ emissions.

System combinations

HYBRID SYSTEM	BERETTA HARMONY HYBRID CIAO 3.5 - 25	BERETTA HARMONY HYBRID CIAO 3.5 - 30	BERETTA HARMONY HYBRID CIAO 5.0 - 25	BERETTA HARMONY HYBRID CIAO 5.0 - 30
OUTDOOR UNIT	BERETTA HARMONY 3.5	BERETTA HARMONY 3.5	BERETTA HARMONY 5.0	BERETTA HARMONY 5.0
INDOOR UNIT	HYBRID HYDRAULIC KIT	HYBRID HYDRAULIC KIT	HYBRID HYDRAULIC KIT	HYBRID HYDRAULIC KIT
BOILER	CIAO X 25C	CIAO X 30C	CIAO X 25C	CIAO X 30C
CONTROL PANEL	Hi, Comfort T300-Hy	Hi, Comfort T300-Hy	Hi, Comfort T300-Hy	Hi, Comfort T300-Hy

Technical data for outdoor and indoor unit

DESCRIPTION	NOTES	UoM	BERETTA HARMONY	
Outdoor unit			HP OUTDOOR UNIT R32	
			3.5	5.0
Indoor unit			HYBRID HYDRAULIC KIT	
ELECTRICAL FEATURES				
Electrical supply		V/Ph/Hz	220-240V/1PH/50HZ	
Nominal power consumption		A	3,67	5,0
Maximum absorbed current		A	9	13,5
Minimum current consumption		A	1,5	1,9
Maximum power consumption		W	1850	2950
Outdoor unit protection degree			IPX4	
Indoor unit protection degree			IPX4	
HYDRAULIC AND GAS CONNECTIONS				
Refrigerant lines (to be connected to A port on the outdoor unit)				
Liquid connections		mm	6,35	
Gas connections		mm	9,52	
Maximum total length		m	25	
Maximum length with pre-charged gas		m	5	
Max height difference between outdoor and indoor units		m	10	
COMPRESSOR				
Compressor		Type	Rotary	
Oil		Type	VG74	
Oil charge		l	0,44	0,50
Refrigerant		Type	R32	
Refrigerant charge		kg	0,71	0,90
Maximum permitted pressure		MPa	4,4	
Discharge and suction pressure		MPa	4,3/1,7	
Maximum heating frequency		Rps	98	
Minimum heating frequency		Rps	26	20
Maximum cooling frequency		Rps	55	80
Minimum cooling frequency		Rps	25	20
Fan				
Fan		TYPE	Axial Flow Fan	
Quantity		no.	1	
Nominal air flow rate		m³/h	2200	2100
Minimum speed		rpm	230	
Maximum speed		rpm	900	850
Maximum power consumption		kW	0,034	
NOISE LEVELS IN COOLING MODE - ODU				
Sound power		dB(A)	65	
Sound pressure		dB(A)	57	
NOISE LEVELS IN HEATING MODE - ODU				
Sound power		dB(A)	65	
Sound pressure		dB(A)	57	
SOUND LEVELS - IDU				
Sound power		dB(A)	47	53
TEMPERATURES				
Min/max operating ambient temperature		°C	-15 / 50	
Max operating temperature of system water (heating)		°C	60	
Min operating temperature of system water (heating)		°C	24	
Max operating temperature of system water (cooling)		°C	22	
Min operating temperature of system water (cooling)		°C	5	

Hybrid system energy data

DESCRIPTION	UoM	BERETTA HARMONY	
Outdoor unit		BERETTA HARMONY 3.5	BERETTA HARMONY 5.0
Indoor unit		HYBRID HYDRAULIC KIT	
Boiler		CIAO X 25 / 30 C	
ROOM HEATING			
Temperate zone - Low temperature (30/35°C) EU Reg.811_2013			
Seasonal energy efficiency	%	151	151
SCOP		3,86	3,86
Prated	kW	3,5	5,00
Annual energy consumption	kWh/year	1884	2687
Energy class	D → A+++ ^(*)	A++	A++
Temperate zone - Medium temperature (47/55°C) EU Reg.811_2013			
Seasonal energy efficiency	%	111	111
SCOP		2,85	2,85
Prated	kW	3,5	5,00
Annual energy consumption	kWh/year	2548	3637
Energy class	D → A+++ ^(*)	A+	A+
Outdoor unit sound power	dB(A)	65	65
Indoor unit sound power	dB(A)	47	53
ROOM COOLING TO 7°C - SEASONAL DATA			
Prated (declared cooling capacity) @35°C	kW	3,2	5,0
Seasonal EER (seer)		4,81	4,60
Annual energy consumption (Qce)	kWh	399	652

NOTES

The performances comply with the UNI EN 14511 and UNI EN 14825 standards.

(*) The range of energy efficiency class of this hybrid system category is between D and A+++.

Heat pump energy data

DESCRIPTION	UoM	BERETTA HARMONY	
Outdoor unit		BERETTA HARMONY 3.5	BERETTA HARMONY 5.0
Indoor unit		HYBRID HYDRAULIC KIT	
Electrical resistance		-	
ROOM HEATING			
Temperate zone - Low temperature (30-35°C) EU Reg. 811_2013			
Seasonal energy efficiency	%	150	150
SCOP		3,83	3,83
Prated	kW	3,50	5,00
Energy class	D → A+++ ^(*)	A++ ^(*)	A++
Outdoor unit sound power	dB(A)	62	65
Indoor unit sound power	dB(A)	45	53
Temperate zone - Medium temperature (47-55°C) EU Reg. 811_2013			
Seasonal energy efficiency	%	110	110
SCOP		2,83	2,83
Prated	kW	3,50	5,00
Energy class	D → A+++ ^(*)	A+ ^(*)	A+
Outdoor unit sound power	dB(A)	65	65
Indoor unit sound power	dB(A)	47	53
ROOM COOLING TO 7°C - SEASONAL DATA			
Prated (declared cooling capacity) @35°C	kW	3,2	5,0
Seasonal EER (SEER)		4,81	4,60
Annual energy consumption (Qce)	kWh	399	652

NOTES

The performances comply with the UNI EN 14511 and UNI EN 14825 standards.

(*) The range of energy efficiency class of this product category is between D and A+++.

Uni 11300 parts 3 and 4: performance according to uNI EN 14511 and uni en 14825

Outdoor unit (ODU):
BERETTA HARMONY 3.5

Indoor unit (IDU):
HYBRID HYDRAULIC KIT

HEATING - Full load data				
Dry bulb temperature air inlet (°C)	Water flow rate (m³/h)	Water temperature outlet (°C)	Capacity (kW)	COP
-15	0,6	35	2,00	1,70
-7	0,6	35	2,90	2,34
2	0,6	35	2,89	3,10
7	0,6	35	3,50	4,00
12	0,6	35	3,55	4,40
-15	0,6	45	2,10	1,40
-7	0,6	45	2,89	2,00
2	0,6	45	2,75	2,70
7	0,6	45	3,50	3,40
12	0,6	45	3,55	3,80
-7	0,39	55	2,80	1,60
2	0,39	55	2,70	1,90
7	0,39	55	3,50	2,50
12	0,39	55	3,50	3,00
COOLING - Full load data				
Dry bulb temperature air inlet (°C)	Water flow rate (m³/h)	Water temperature outlet (°C)	Capacity (kW)	EER
35	0,55	7	3,20	2,90
35	0,55	18	3,30	4,40
27	0,55	7	3,30	3,80
27	0,55	18	3,40	4,90
46	0,55	7	1,95	1,70

HEATING - Partial load data					
Tbival (-7°C)		A	B	C	D
Outdoor temperature (°C)		-7	2	7	12
PLR - Climate load factor		0,88	0,54	0,35	0,15
DC - Full load power		2,90	2,89	3,50	3,55
COP at full load		2,34	3,10	4,00	4,40
COP at partial load		2,33	3,28	3,47	3,68
CR - Load factor		1,00	0,65	0,35	0,15
f COP - Adjustment factor		1,00	1,06	0,87	0,84
COOLING - Partial load data					
Condition (A) 35°C		Pdc (declared cooling capacity)		3,24	kW
		EERd (declared EER)		3,08	-
		Cdc (degradation coefficient)		0,983	-
Condition (B) 30°C		Pdc (declared cooling capacity)		2,46	kW
		EERd (declared EER)		4,25	-
		Cdc (degradation coefficient)		0,969	-
Condition (C) 25°C		Pdc (declared cooling capacity)		1,61	kW
		EERd (declared EER)		6,21	-
		Cdc (degradation coefficient)		0,932	-
Condition (D) 20°C		Pdc (declared cooling capacity)		1,53	kW
		EERd (declared EER)		5,49	-
		Cdc (degradation coefficient)		0,936	-

HEATING

The performances comply with the UNI EN 14511 and UNI EN 14825 standards.
Partial load performance refers to a water flow temperature of 35°C.

COOLING

Performance according to UNI EN 14825 standards

Uni 11300 parts 3 and 4: performance according to uNI EN 14511 and uni en 14825

Outdoor unit (ODU):
BERETTA HARMONY 5.0

Indoor unit (IDU):
HYBRID HYDRAULIC KIT

HEATING - Full load data				
Dry bulb temperature air inlet (°C)	Water flow rate (m³/h)	Water temperature outlet (°C)	Capacity (kW)	COP
-15	0,86	35	3,90	2,00
-7	0,86	35	4,00	2,30
2	0,86	35	4,80	3,30
7	0,86	35	5,00	4,20
12	0,86	35	5,10	4,80
-15	0,86	45	3,70	1,70
-7	0,86	45	3,80	1,90
2	0,86	45	4,70	2,70
7	0,86	45	5,00	3,20
12	0,86	45	5,00	3,90
-7	0,54	55	3,70	1,70
2	0,54	55	4,60	2,00
7	0,54	55	5,00	2,50
12	0,54	55	4,80	2,90
COOLING - Full load data				
Dry bulb temperature air inlet (°C)	Water flow rate (m³/h)	Water temperature outlet (°C)	Capacity (kW)	EER
35	0,86	7	5,10	4,00
35	0,86	18	5,00	5,20
27	0,86	7	5,00	2,80
27	0,86	18	5,10	5,00
46	0,86	7	3,70	1,90

HEATING - Partial load data				
Tbival (-7°C)	A	B	C	D
Outdoor temperature (°C)	-7	2	7	12
PLR - Climate load factor	0,88	0,54	0,35	0,15
DC - Full load power	4,00	4,80	5,00	5,10
COP at full load	2,30	3,30	4,20	4,80
COP at partial load	2,40	3,02	4,10	3,63
CR - Load factor	1,00	0,56	0,35	0,15
f COP - Adjustment factor	1,00	0,91	0,98	0,76
COOLING - Partial load data				
Condition (A) 35°C	Pdc (declared cooling capacity)	5,0	kW	
	EERd (declared EER)	2,70	-	
	Cdc (degradation coefficient)	0,90	-	
Condition (B) 30°C	Pdc (declared cooling capacity)	3,85	kW	
	EERd (declared EER)	3,62	-	
	Cdc (degradation coefficient)	0,90	-	
Condition (C) 25°C	Pdc (declared cooling capacity)	2,40	kW	
	EERd (declared EER)	5,60	-	
	Cdc (degradation coefficient)	0,90	-	
Condition (D) 20°C	Pdc (declared cooling capacity)	2,10	kW	
	EERd (declared EER)	7,70	-	
	Cdc (degradation coefficient)	0,90	-	

HEATING

The performances comply with the UNI EN 14511 and UNI EN 14825 standards.
Partial load performance refers to a water flow temperature of 35°C.

COOLING

Performance according to UNI EN 14825 standards

Operating range

Indoor unit

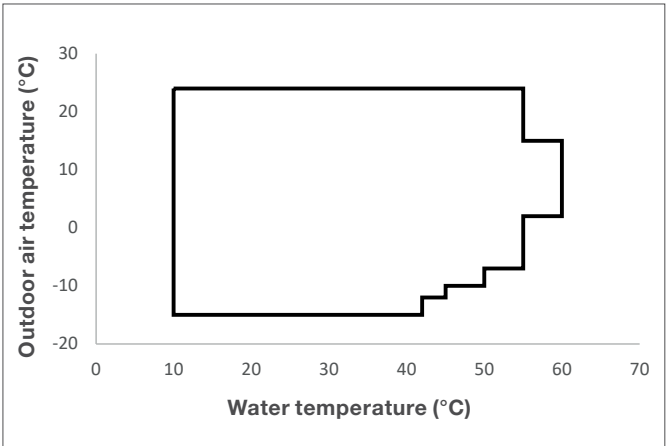
Heating cycle		Minimum	Maximum
Ambient air (B.S)	°C	5	30
Outdoor air (B.S)	°C	-15	24
Cooling cycle			
Ambient air (B.S)	°C	16	32
Outdoor air (B.S)	°C	10	50

The limits are based on the following conditions:
Pipe length: 5m
Height difference: 0m
Air flow rate: maximum

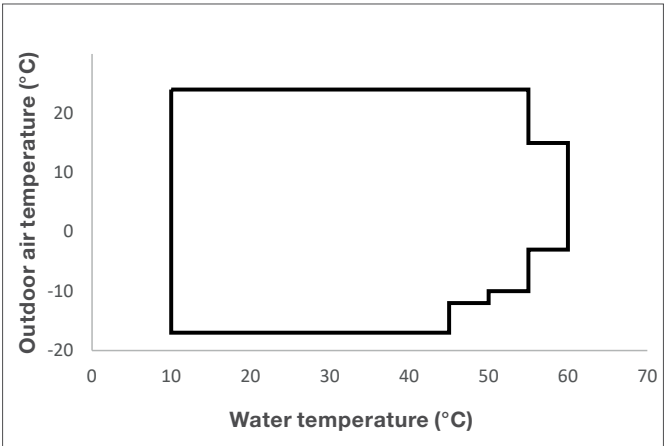
Outdoor unit

HEATING MODE

3.5 kW

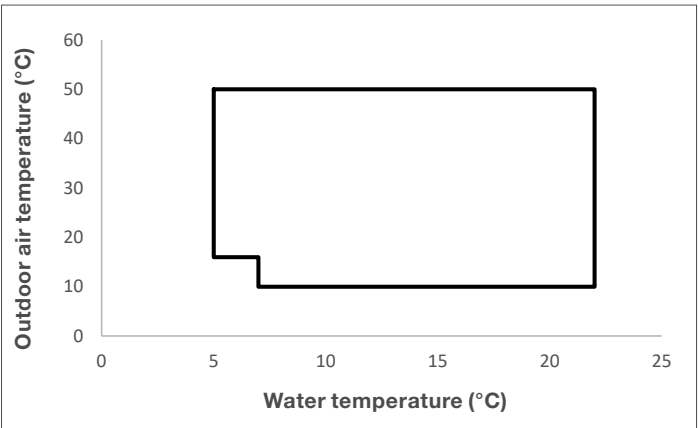


5.0 kW



COOLING MODE

3.5 - 5.0 kW



Technical data CIAO X C

Description		NOTES	UoM	CIAO X 25C			CIAO X 30C				
				G20	G230	G31	G20	G230	G31		
Heating	Nominal heat output (***)		kW-kcal/h	20,00-17200			25,00-21500				
	Nominal heat output (80-60°C)		kW-kcal/h	19,38-16667			24,38-20963				
	Nominal heat output (50-30°C)		kW-kcal/h	20,92-17991			26,78-23027				
	Reduced heat output		kW-kcal/h	3,10-2666		5,00-4300	3,95-3397		5,00-4300		
	Reduced heat output (80-60°C)		kW-kcal/h	2,94-2525		4,80-4128	3,79-3261		4,81-4132		
	Reduced thermal output (50-30°C)		kW-kcal/h	3,04-2613		5,11-4395	4,09-3519		5,19-4459		
	Nominal heat output Range Rated (Qn)		kW-kcal/h	20,00-17200			25,00-21500				
DOMESTIC WATER	Minimum heat output Range Rated (Qm)		kW-kcal/h	8,20-7052		8,20-7052	12,00-10320		12,00-10320		
	Nominal heat output (***)		kW-kcal/h	25,00-21500			30,00-25800				
	Nominal heat output (*)		kW-kcal/h	25,00-21500			30,00-25800				
Reduced heat output			kW-kcal/h	3,10-2666		5,00-4300	3,95-3397		5,00-4300		
Reduced heat output (*)			kW-kcal/h	3,10-2666		5,00-4300	3,95-3397		5,00-4300		
Useful efficiency Pn max - Pn min (80-60°C)			%	96,9-94,7			97,5-96,0				
Combustion efficiency			%	97,2			97,7				
Useful efficiency Pn max - Pn min (50-30°C)			%	104,6-98,0			107,1-103,6				
Useful efficiency 30% Pn max (30°C return)			%	109,1			108,8				
Efficiency at average P Range Rated (80-60°C)			%	97,0			97,3				
Efficiency at average P Range Rated 30% (30°C return)			%	109,3			109,0				
Total electrical power (max heating - domestic hot water power)			W	62 - 95			85 - 102				
Circulator electrical power (1000 l/h)			W	42			42				
Supply voltage			V-Hz	230-50			230-50				
Electrical protection			Protection	X5D			X5D				
Losses at shutdown			W	30			32				
Chimney losses with burner off - burner on			%	0,09-2,80			0,08-2,26				
Heating operation											
Max pressure			bar	3			3				
Min pressure for standard operation			bar	0,25-0,45			0,25-0,45				
Maximum temperature			°C	90			90				
H ₂ O heating temperature selection range (Std/low temp.)			°C	20÷80/20÷45			20÷80/20÷45				
Pump: maximum head available for the system			mbar	408			408				
at flow rate of			l/h	1000			1000				
Diaphragm expansion tank			l	8			8				
Precharge expansion tank (heating)			bar	1			1				
DHW operation											
Max pressure			bar	8			8				
Min pressure			bar	0,5			0,5				
Hot water quantity	with Δt 25°C		l/min	14,3			17,2				
	with Δt 30°C		l/min	11,9			14,3				
	with Δt 35°C		l/min	10,2			12,3				
Minimum domestic water flow rate			l/min	2			2				
Domestic hot _{water} temperature selection range			°C	37-60			37-60				
Flow regulator			l/min	10			12				
Gas pressure				G20	G20.2	G230	G31	G20	G20.2	G230	G31
Nominal natural gas pressure (G20 - I2H)			mbar	20	-	-	-	20	-	-	-
MTN-H nominal pressure (G20.2 - I2Y20)			mbar	-	20	-	-	-	20	-	-
Nominal Air Propane pressure (G230 - I2M)			mbar	-	-	20	-	-	-	20	-
Nominal LPG pressure (G31 - I3P)			mbar	-	-	-	37	-	-	-	37
Heating flow rates				G20		G230	G31	G20		G230	G31
Air flow rate			Nm³/h	24,298		24,120	24,819	30,372		30,150	31,024
Flues flow rate			Nm³/h	26,304		26,454	26,370	32,880		33,068	32,963
Flue gas mass flow rate (max-min)			g/s	9,086-1,408		9,327-1,446	9,297-2,324	11,357-1,794		11,658-1,842	11,621-2,324
DHW flow rates				G20		G230	G31	G20		G230	G31
Air flow rate			Nm³/h	30,372		30,150	31,024	36,447		36,180	37,228
Flues flow rate			Nm³/h	32,880		33,068	32,963	39,456		39,681	39,555

Description	NOTES	UoM	CIAO X 25C			CIAO X 30C		
			G20	G230	G31	G20	G230	G31
Flue gas mass flow rate (max-min)		g/s	11,357-1,408	11,658-1,446	11,621-2,324	13,629-1,794	13,990-1,842	13,946-2,324
Fan performance								
Residual head concentric flue 0,85 m		Pa	60			60		
Residual head of separate pipes 0,5 m		Pa	180			190		
Residual head of boiler without pipes		Pa	186			196		
NOx			class 6			class 6		
Emission values at maximum and minimum flow rate (**)			G20	G230	G31	G20	G230	G31
Maximum-minimum	CO s.a. less than	p.p.m.	140-10	80-10	140-30	150-10	130-10	150-20
	CO ₂	%	9,0-9,0	10,0-10,0	10,0-10,0	9,0-9,0	10,0-10,0	10,0-10,0
	NOx s.a. less than	p.p.m.	50-30	50-50	40-40	50-40	50-50	40-50
	T flue gases	°C	77-64	78-61	81-63	70-63	71-59	72-60

(*) Average value between various operating conditions in DHW applications

(**) Test performed with concentric pipe Ø 60-100, length 0.85 m - heating water temperatures 80-60°C - values measured with casing completely closed

(***) The heat output with G20.2 gas (I2Y20) is reduced:

- CIAO X 25C: Nominal heat output in heating mode = 18kW; Nominal heat output in domestic hot water mode = 23kW.

- CIAO X 30C: Nominal heat output in heating mode = 23kW; Nominal heat output in domestic hot water mode = 27,5kW.

The data provided must not be used to certify the system; for certification, the data indicated in the "System Booklet" measured at the time of first start-up must be used.

ERP technical data for CIAO X C

DESCRIPTION	Symbol	UoM	CIAO X 25C	CIAO X 30C
Seasonal space heating energy efficiency class	-	D → A+++ ⁽¹⁾	A	A
Water heating energy efficiency class	-	F → A+ ⁽²⁾	A	A
Rated heat output	P _{nomiale}	kW	19	24
Seasonal space heating energy efficiency	η _s	%	93	93
Useful heat output				
At rated heat output, high-temperature regime (*)	P ₄	kW	19,4	24,4
At 30% of rated heat output and low-temperature regime (**)	P ₁	kW	6,5	8,2
Useful efficiency				
At rated heat output and high-temperature regime (*)	η ₄	%	87,3	87,6
At 30% of rated heat output and low-temperature regime (**)	η ₁	%	98,5	98,2
Auxiliary electricity consumption				
At full load	el _{max}	W	32,0	38,0
At part load	el _{min}	W	12,0	12,0
In Stand-by mode	PSB	W	3,0	3,0
Other parameters				
Standby heat losses	P _{stby}	W	30,0	32,0
Pilot flame energy consumption	P _{ign}	W	-	-
Annual energy consumption	Q _{HE}	GJ	42	56
Sound power level, indoors	L _{WA}	dB	50	53
NOx emissions	NOx	mg/kWh	22	22
Acqua calda sanitaria				
Declared load profile			XL	XL
DHW energy efficiency	η _{wh}	%	84	84
Daily electricity consumption	Q _{elec}	kWh	0,133	0,152
Daily fuel consumption	Q _{fuel}	kWh	23,183	23,306
Annual electricity consumption	AEC	kWh	29	33
Annual fuel consumption	AFC	GJ	18	18

(*) High-temperature regime means: 60°C Return and 80°C Flow of the boiler.

(**) Low temperature regime means for condensing boilers 30°C, for low-temperature boilers 37°C and for other heaters 50°C return temperature.

(1) The range of energy efficiency class of this products category is between D and A+++.

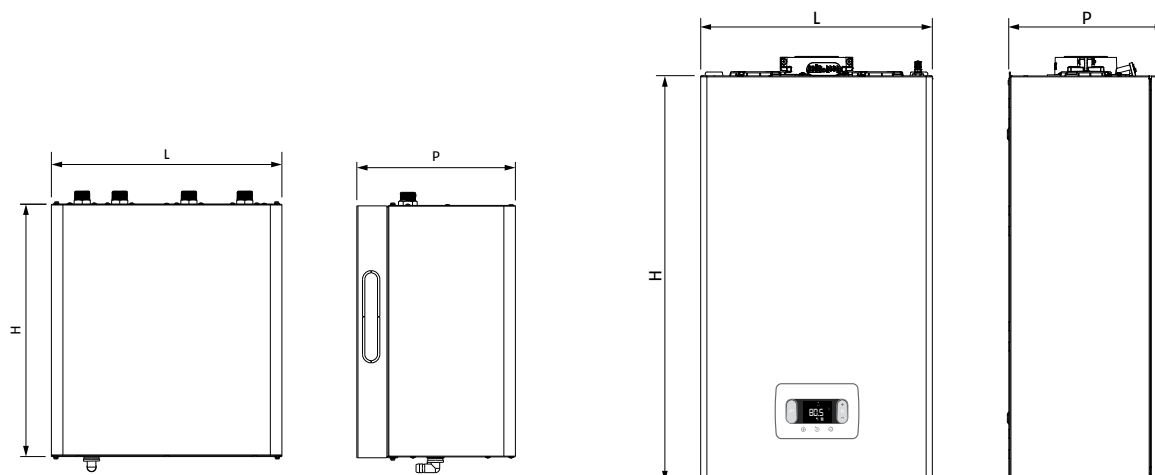
(2) the range of energy efficiency class of this products category is between F and A+

NOTE

With reference to Delegated Regulation (EU) No 811/2013, the data shown in the table can be used to complete the product fiche and labelling for space heaters, combination heaters, packages of space heaters, temperature controls and solar devices:

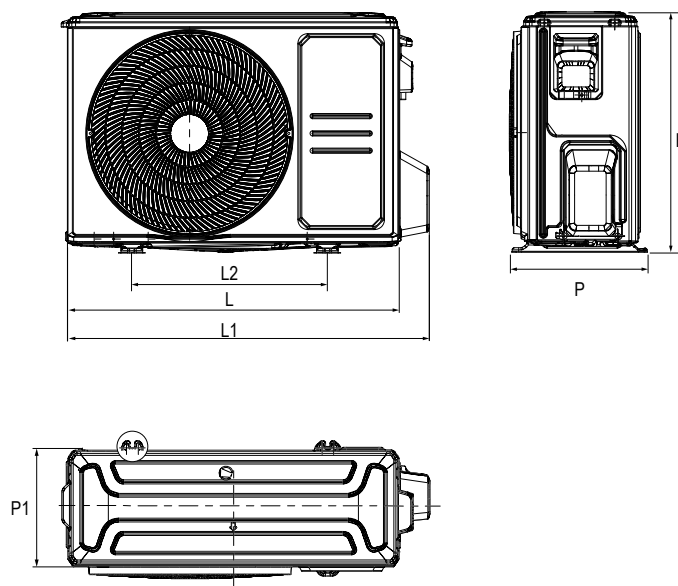
	CLASS	BONUS
OUTDOOR PROBE	II	2%
OT+ REMOTE CONTROL	V	3%
OUTDOOR PROBE + OT+ REMOTE CONTROL	VI	4%

Overall dimensions and weights



Indoor unit and boiler

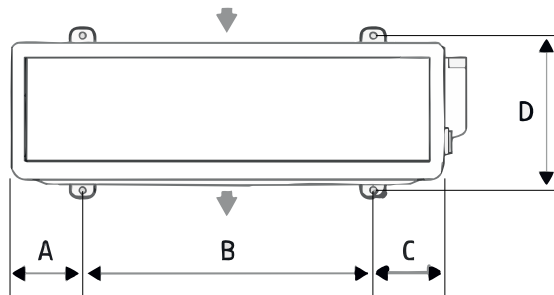
Models		UoM	Hybrid hydraulic kit	CIAO X	
Outdoor unit				25 C	30 C
Height	H	mm	436	700	700
Length	L	mm	400	400	400
Depth	D	mm	275	275	275
Net weight		kg	20,1	28,5	30,0



Outdoor unit

Models		UoM	Beretta HARMONY	
Outdoor unit			3.5	5.0
Height	H	mm	557	554
Length	L	mm	771	805
Length	L1	mm	839	874
Length	L2	mm	452	511
Depth	D	mm	304	321
Depth	D1	mm	274	299
Weight		kg	28,1	31,9

Installation dimensions



Installation dimensions

REF.	UoM	BERETTA HARMONY	
		3.5	5.0
A	mm	156,5	123,6
B	mm	452	511
C	mm	159,5	180,4
D	mm	286	346

Installation location

PRELIMINARY WARNINGS FOR R32

The appliance must be installed in well-ventilated areas with a minimum floor space as shown in the '**Outdoor unit**' section below, depending on the total refrigerant charge of the circuit. The refrigerant charge refers to the total charge of the circuit, which is the sum of the factory charge and any additional charge. For the quantity of refrigerant gas charged in the unit, refer to the technical plate on the matching outdoor unit. If the appliance is located in a poorly ventilated area, precautions must be taken to prevent stagnation in the event of a refrigerant leak, so as not to create a risk of fire or explosion. The appliance must be placed in a room where there are no continuously operating open flames (e.g., a gas appliance in operation) or sources of ignition (e.g., an electric heater in operation).

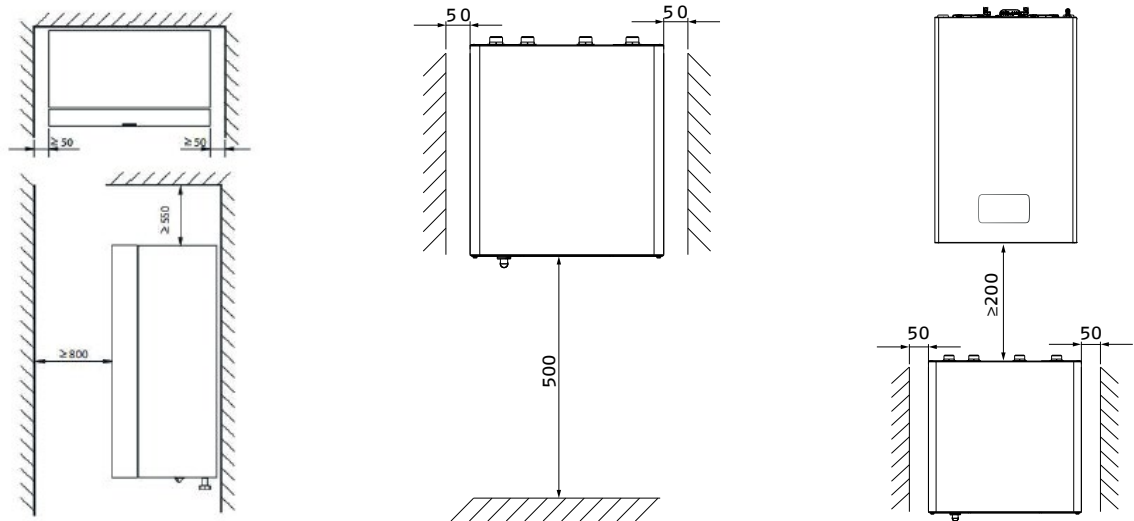
Any ventilation openings must be kept free from obstacles.

Perform the following checks:

- carry out safety checks to ensure that the risk of combustion is minimized
- avoid working in confined spaces
- delimit the area around the workspace
- ensure safe working conditions around the area by controlling flammable material.

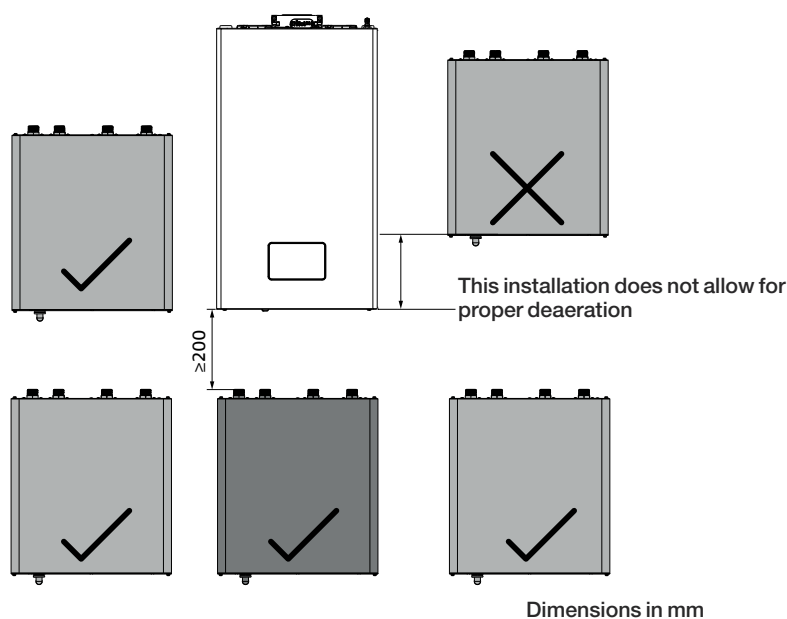
Indoor unit

The clearance areas for installation and maintenance of the appliance are shown in the figure. The specified spaces are necessary to avoid obstructions to air flow and to allow normal cleaning and maintenance operations.



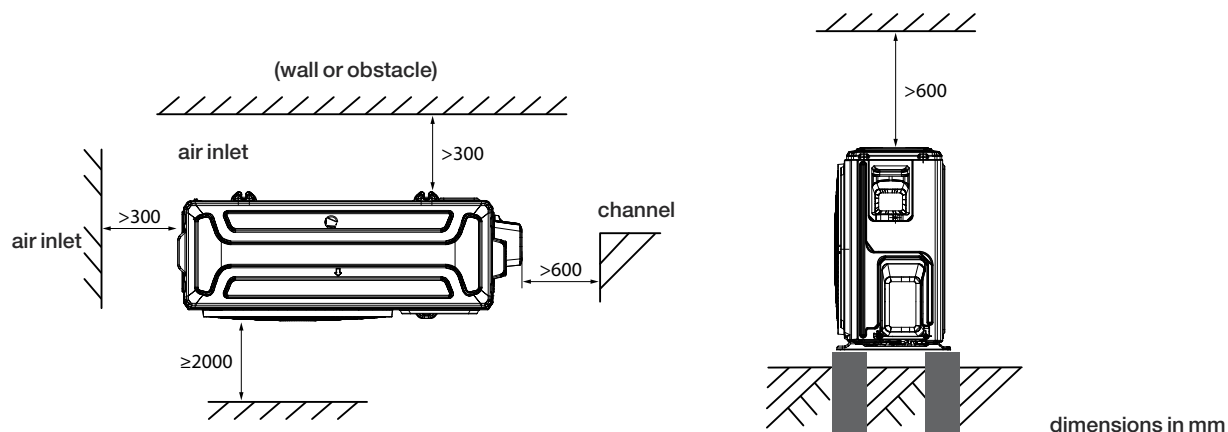
Position the appliance, keeping in mind that:

- must be installed on a wall capable of supporting its weight;
- must not be positioned above a stove or other cooking appliance;
- it is forbidden to leave flammable substances in the room where the kit is installed.
- the hydraulic kit must be mounted below the boiler or to the side of it, at a distance equivalent to a linear pipe with a 3/4" section not exceeding 15 meters on the supply side and 15 meters on the return side.
- the hydraulic kit cannot be positioned above the vertical level of the boiler



Outdoor unit

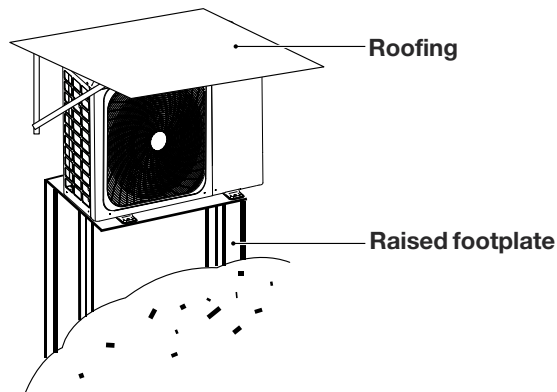
The clearance areas for installation and maintenance of the appliance are shown in the figure. The specified spaces are necessary to avoid obstructions to air flow and to allow normal cleaning and maintenance operations.



Prevention of snow accumulation

In case of snow, lift the unit above the base pad to prevent ice buildup and damage to the coil. Hung the unit high enough to exceed common snow accumulation, with a minimum height of 18 inches (approximately 45 cm).

In cold weather conditions

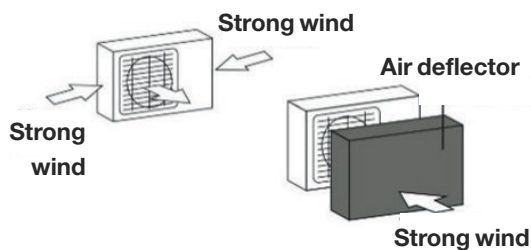


The image is purely indicative

Special considerations for extreme weather

If the unit is exposed to strong winds

Install the unit so that the air outlet fan is at a 90° angle to the wind direction. If necessary, build a barrier in front of the unit to protect it from extremely strong winds.



If the unit is often exposed to heavy rain or snow

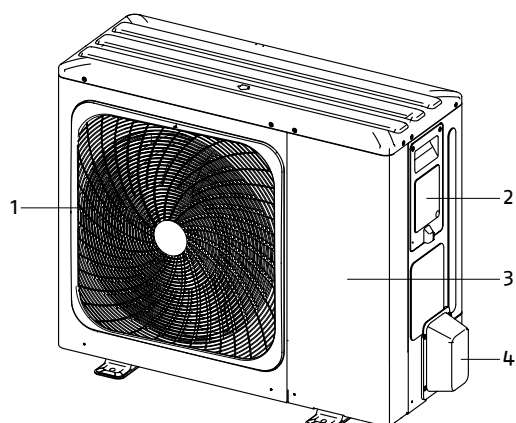
Build a shelter over the unit to protect it from rain or snow. Be careful not to obstruct the airflow around the unit.

If the unit is often exposed to salty air (coastal locations)

Use an outdoor unit specifically designed to resist corrosion.

System layout

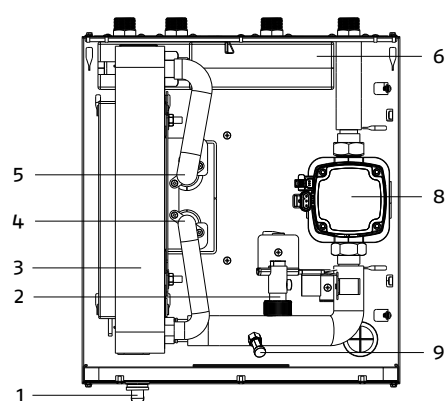
Outdoor unit



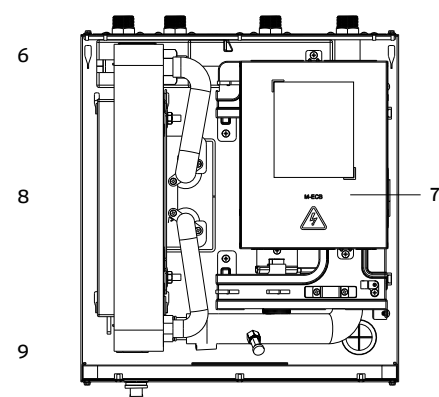
- 1 Electric fan grille
- 2 Electrical connection panel
- 3 Access panel
- 4 Hydraulic connection panel

The image is purely indicative

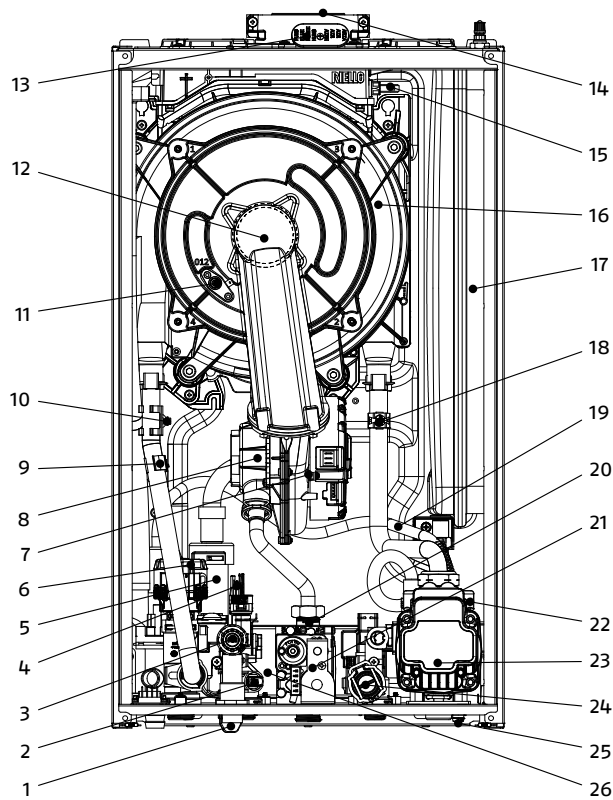
Indoor unit



- 1 Drain pipe
- 2 Flow meter
- 3 Gas-water plate heat exchanger
- 4 Refrigerant liquid exchanger outlet
- 5 Refrigerant gas exchanger inlet
- 6 Hydraulic separator
- 7 Electrical connection box
- 8 Circulator (7 m)
- 9 Drain tap



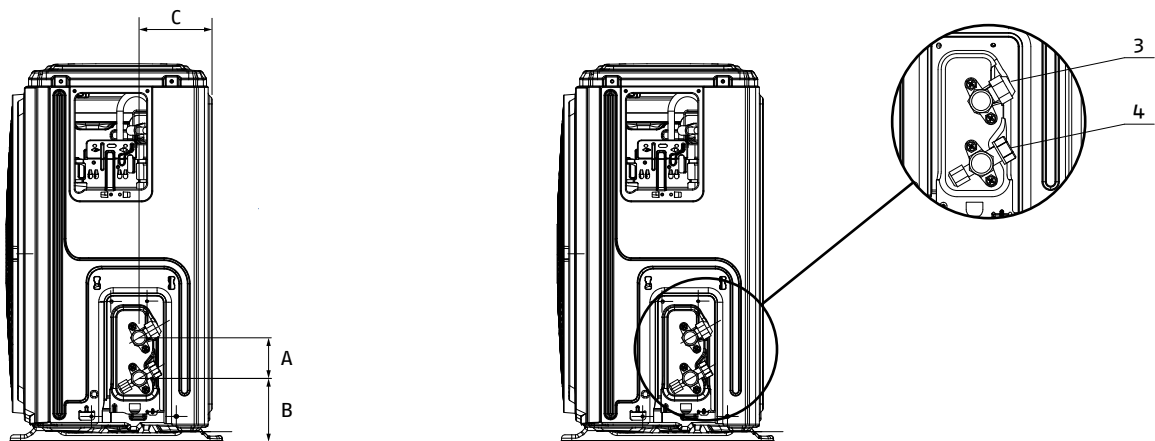
Boiler



- 1 Filling tap
- 2 DHW NTC probe
- 3 Safety valve
- 4 Pressure transducer
- 5 Siphon
- 6 Three-way valve
- 7 Fan
- 8 Mixer
- 9 NTC flow probe
- 10 Limit thermostat
- 11 Electrode
- 12 Burner
- 13 Flue gas air intake cap
- 14 Flue gas discharge
- 15 Flue probe
- 16 Heat exchanger
- 17 Expansion vessel
- 18 NTC return probe
- 19 Degassing tube
- 20 Gas diaphragm
- 21 Gas valve
- 22 Air vent valve
- 23 Pump
- 24 Flow meter
- 25 System drain tap
- 26 DHW exchanger

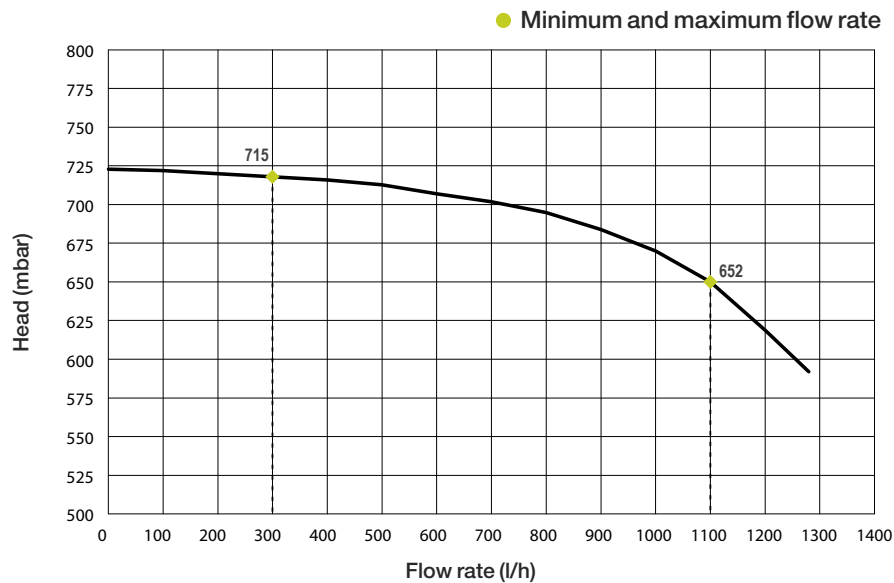
Water connections

Beretta HARMONY 3.5 - 5.0

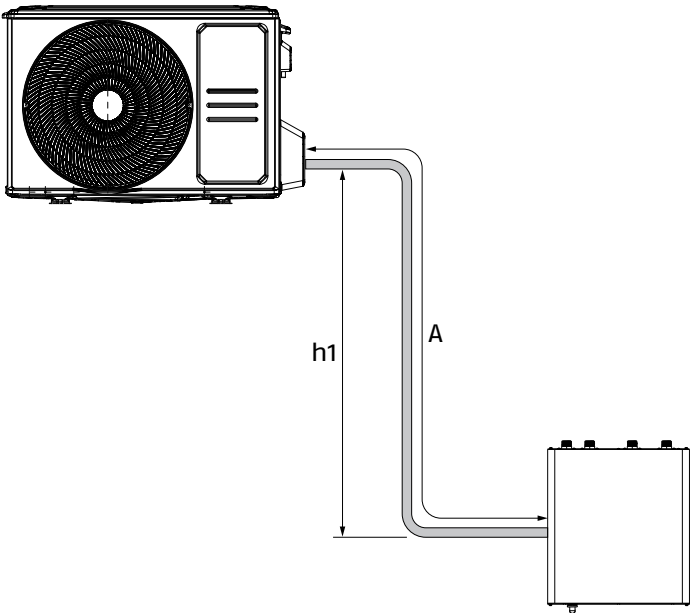


	Description	UoM	Beretta HARMONY 3.5	Beretta HARMONY 5.0
1	Hole for electrical connections	Ø mm	-	-
2	Condensate drain hose connection (supplied)	Ø mm	-	-
3	Refrigerant gas connection	inches (SAE Flare)	Ø 3/8"	
		mm	Ø 9,52	
4	Refrigerant liquid connection	inches (SAE Flare)	Ø 1/4"	
		mm	Ø 6,35	
A		mm	56	60
B		mm	82	95
C		mm	100	151

Residual head diagram - Indoor unit



Refrigeration connections between outdoor unit and indoor unit



Description		UoM	3.5 kW	5.0 kW
Minimum length allowed	A	m	3	
Maximum length allowed	A	m	25	
Elevation difference limit between the 2 units	h1	m	10	
Length of the connection pipes without additional gas charge		m	5	
Additional charge		g/m	12	

Hydraulic system

Water in heating systems

Before installation, the terminal and system must be cleaned and pressure tested as follows:

- Before connecting the equipment to the hydraulic system and the terminal, clean the hydraulic system and the terminal with clean tap water at least 3 to 5 times until the waste water is free of impurities (UNI8065).
- If the system is installed on old systems, clean the system using appropriate products, the water in the system must be treated and comply with the UNI CTI 8065 2019 standard.

Chemical-physical features

The chemical-physical features of the water must comply with the European standard EN 14868 and the tables below:

ALUMINUM GENERATORS with Firebox Power < 150 kW			
		First filling water	Water at full capacity (*)
ph		-	7-8
Hardness	°F	< 15°	-
Appearance		clear	-
Iron	mg/kg	-	< 0,5
Copper	mg/kg	-	< 0,1

(*) System water values after 8 weeks of operation.

New heating systems

The first filling of the system must be done slowly; once filled and deaerated, the system should not need any further refilling. During the first start-up, the system must be brought to its maximum operating temperature to facilitate deaeration (too low a temperature prevents the escape of gases).

Retrofitting of existing heating systems

When replacing a boiler, if the water quality in existing systems complies with the requirements, a refill is not recommended. If the water quality does not comply with the requirements, reconditioning the water or separating the system is recommended (water quality requirements must be met in the boiler circuit).

System water content and flow rate

- Always ensure a minimum flow rate of 300 l/h when there is an active heating/cooling demand.
- If the system volume is less than 20 litres, we recommend installing an accumulator on the heating system return (optional kit available on request).

Electrical connections

Boiler

The boiler CIAO X C leaves the factory fully wired. The following connections are sufficient:

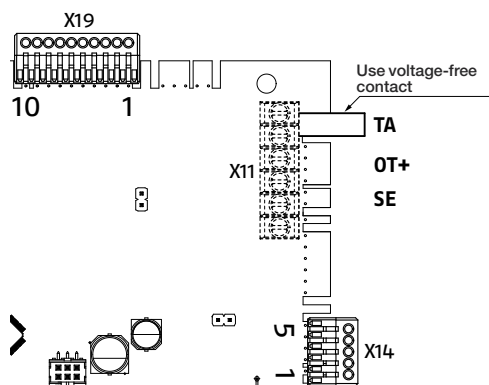
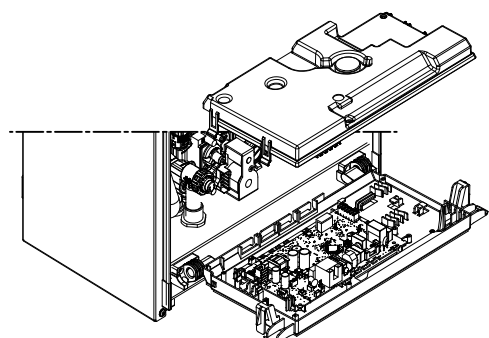
- to the single-phase 230V-50Hz electrical network, using the cable provided;
- to the 485 Bus (- A B +);
- to the low temperature thermostat (TBT);
- to the room thermostat (TA/OT+) - dry contact (Opentherm);
- to the external probe (SE).

The connection to the electrical network must be made via a separation device with an omnipolar opening of at least 3.5 mm (EN 60335-1, category III). The appliance operates on 230 Volt/50 Hz alternating current and complies with EN 60335-1 standard.

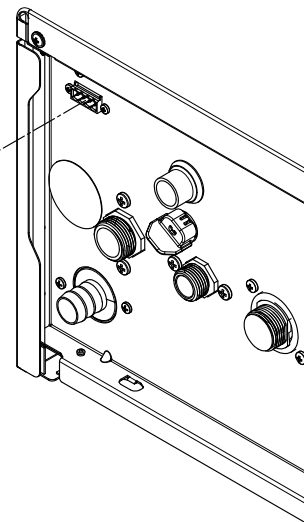
If replacing the power cable, use a HAR H05V2V2-F type cable, 3 x 0,75 mm², max. external diameter 7 mm.

It is mandatory:

- the use of an omnipolar magnetothermal switch, a switch disconnecter, compliant with CEI-EN standards (contact opening of at least 3 mm);
- respect the W (Phase) and N (Neutral) connections;
- use cables with a cross-section greater than or equal to 1,5 mm², complete with ferrules;
- establish an effective ground connection.



ModBus CE4
removable connector



Outdoor unit and indoor unit

Instructions for electrical connections to the power supply

It is necessary to install an omnipolar switch with:

- opening $> 3 \text{ mm}$;
- breaking capacity $\geq 16 \text{ A}$;
- outdoor unit power supply conductor cross-section $\geq 1,5 \text{ mm}^2$.
- modBus communication cable cross-section $0,75 \text{ mm}^2$

The power supply for the indoor unit is taken from the outdoor unit (conductor cross-section $\geq 0.5 \text{ mm}^2$).

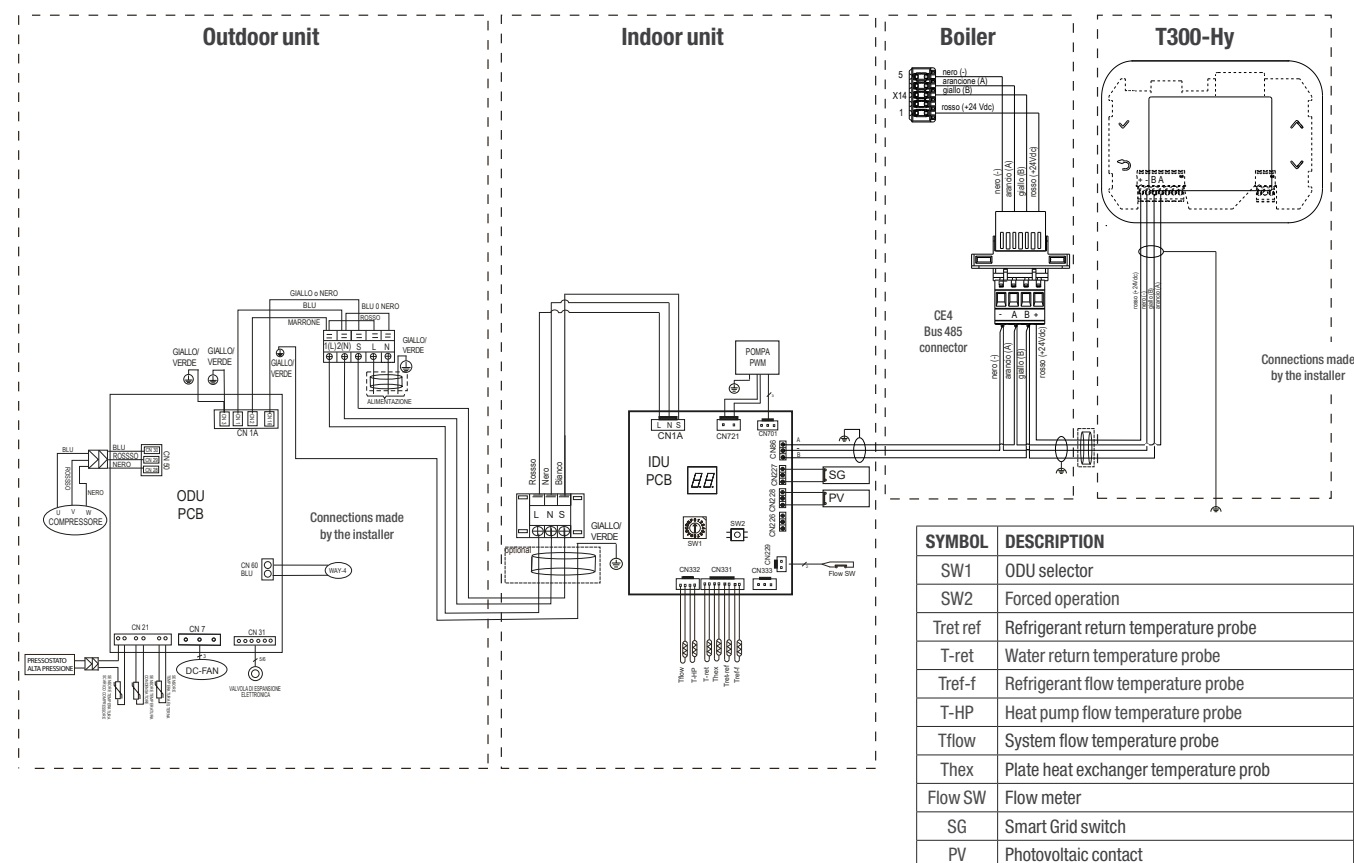
Prepare the power and signal cable (not included as standard) between the outdoor unit and the indoor unit terminal block.

Connect the Modbus cable (not included as standard) to the CE4 connector on the boiler, the CN86 connector on the indoor unit, and the T300-Hy.

The recommended total length for the connection between the T300-Hy, boiler, and hydraulic module is $\leq 30 \text{ m}$ (use shielded cable).

Control panel

Refer to the wiring diagram below for specific instructions on the electrical connections to be made.



Control panel

General information



The T300-Hy is the system's user interface and is the device that houses the system optimization logic. At the same time, it can be used to control the room temperature of the area in which it is installed.

When used as a machine interface, the device mainly manages the operation of the system components. Heating and cooling requests are managed using an external room thermostat or T200 connected via radio frequency.

When used as a machine interface + room control, in addition to its system interface functions, the device can also regulate the temperature of the room in which it is installed.

The touch interface of the Hi, Comfort T300-Hy is extremely simple and intuitive. The icon display and drop-down menus are elements that promote smart use of the product.

The four side buttons described below allow you to easily perform all the operations necessary for programming and customizing the device.

SYMBOL	DESCRIPTION
	Confirm
	Delete Return to the main screen (press > 2 sec.) Reset anomaly
	Navigate within a menu - scroll up
	Navigate within a menu - scroll down

When paired with the T300-Hy RF, the Hi, Comfort T200 Thermostat allows for optimal control of comfort within each room of the home, managing up to a maximum of 8 zones, including the main one.

CONSTRUCTION DESCRIPTION FOR SPECIFICATIONS

BERETTA HARMONY HYBRID is an R32 electric heat pump outdoor unit specifically designed for use in residential hybrid applications. It can be used in combination with the Hybrid Hydraulic Kit indoor unit, which allows it to operate in conjunction with the combi boilers in the CIAO X series.

BERETTA HARMONY HYBRID contributes to heating demands either simultaneously with the boiler or alternately, depending on the optimization mode set by the user via Hi, Comfort T300-Hy, the hybrid system's energy manager. If the system includes fan coils, BERETTA HARMONY HYBRID can also meet cooling needs.

The outdoor unit is designed to be installed outside the home, either on the ground or mounted on a wall using appropriate mounting brackets (not included as standard). The BERETTA HARMONY HYBRID comes complete with a condensate drain fitting and vibration dampers.

The HYBRID HYDRAULIC KIT is the indoor unit of the split heat pump that allows it to be integrated with the boiler. The hydraulic kit is to be installed inside the home, suspended below the boiler or to the side of it, at a distance equivalent to a 3/4" linear pipe not exceeding 15 meters for the supply line and 15 meters for the return line.

The connecting pipes between the hydraulic kit and the boiler are not included as standard. The HYBRID HYDRAULIC KIT comes complete with a 90° gas connection pipe, a 90° liquid connection pipe, a drain nozzle/water outlet pipe, a drain nozzle gasket, a condensate drain pipe, two expansion anchors, and four 3/4" gaskets.

Management of the available heat sources (boiler and heat pump), the system circulator, all electric actuators, and the regulation of heating or cooling temperatures is carried out through the built-in logic of the system electronics and the T300-Hy.

Programming and operational control of the hybrid system are carried out via the T300-HY remote control, which, when properly programmed, can also be used as a room thermostat for the area in which it is installed.

FEATURES

- The BERETTA HARMONY HYBRID and HYBRID HYDRAULIC KIT, in combination with HI, COMFORT T300-HY, and a combined model from the CIAO X range, constitute Bertetta's factory-built multi-energy residential system that meets the needs for heating, cooling (hydronic), and domestic hot water production in a single system for year-round home comfort.
- The system achieves energy efficiency class A++ / A+ for heating (under average climatic conditions, at 55°C and 35°C, respectively) and energy efficiency class A for domestic hot water.
- A compact and versatile solution designed to adapt to a wide range of system requirements while minimizing space requirements both inside and outside the home:
 - a compact hydronic kit that can be easily installed either below or next to the boiler, up to a maximum distance of 15m;
 - a compact heat pump that can be installed either on the floor or mounted on the wall using appropriate mounting brackets, up to a maximum distance of 25m in length and a 10m height difference from the indoor unit.
- Plug&Play technology for simple, fast, and flexible installation.
- Proprietary system intelligence integrated into the system interface and manageable remotely via the Hi, Comfort app.
- Focus on user needs and the option to choose between "Economy" mode—for lower utility bills—or "Eco" mode—to help reduce CO₂ emissions.

Outdoor unit components

- Pre-painted sheet metal cover
- ABS air outlet grille
- Electric fan unit consisting of an axial fan and a variable-speed motor
- Heat exchanger consisting of copper tubes and aluminum fins with a turbulent flow design. The heat exchangers are treated against salt corrosion with two coatings: a layer of acrylic resin and a second layer of hydrophilic material
- GMCC (Guangdong Meizhi Compressor Ltd) R32 rotary compressor mounted on anti-vibration mounts and housed in a dedicated compartment
- Axial flow fan
- Microprocessor-based control board with a PWM + PAM DC inverter control system.
- Bidirectional electronic expansion valve
- Extended operating range: -15 to +24°C for heating and 10 to 50°C for cooling
- Outdoor unit complete with connection covers

Indoor unit components

- Casing made of white pre-painted sheet metal
- Pre-cut side panels to facilitate refrigerant pipe connections
- Hydraulic connections: supply to the system, supply from the boiler, return to the boiler, return from the system
- Condensate drain pipe for condensate that may form during cooling
- Flow switch
- Gas-water plate heat exchanger

- Electrical connection box
- 7m circulator with PWM control system
- System water drain valve
- Temperature sensors: heat pump supply, refrigerant gas, system return, refrigerant liquid, gas-to-water heat exchanger, and supply

Boiler

CIAO X is a Type C wall-mounted condensing boiler designed for heating and domestic hot water production: depending on the flue gas exhaust accessory used, it is classified into the following categories: B23P; B53P; C13, C13x; C33, C33x; C43, C43x; C53, C53x; C83, C83x; C93, C93x. Wall-hung condensing boilers with an AISI 441 stainless steel primary heat exchanger and a pneumatic combustion system that ensures reliability, efficiency, and low emissions under all conditions.

1:8 modulation across the entire range

They are equipped with:

- Pneumatic combustion system that guarantees reliability, efficiency, and low emissions under all conditions; designed to operate with mixtures of natural gas and up to 20% hydrogen. The 25 and 30 kW models are also certified for operation with propane-enriched air
- Maximum heat output adjustable to the system's heating demand, for operation in the boiler's own heating mode. Once the desired power setting (maximum heating) is set, record the value and, for subsequent checks, refer to the new value
- High-efficiency on/off circulator, already connected hydraulically and electrically, factory-set with a 6-meter head curve; a 7-meter circulator is available as an accessory
- Anti-lockout system that initiates an operating cycle every 24 hours of inactivity, with the function selector in any position
- Main circular heat exchanger made of AISI 441 stainless steel
- Low-emission premix burner (Class 6 NO_x, per UNI EN 15502-1), fan, highly modulating mixer, and gas diaphragm. Available as an accessory kit with a check valve (clapet) for connection to positive-pressure flue systems.
- Available as an accessory kit: an air filtration system integrated into the boiler, consisting of a filter made of elastic, tear-resistant polyolefin fibers
- Hydraulic connections with DIN-type connection sequences and specific accessories for replacement of older boilers
- Fill valve, bleed valve
- Siphon with safety ball within the boiler's overall dimensions
- Drain valve
- Pressure transducer
- Safety valve
- Return sensor, flue gas sensor, and supply sensor
- Automatic antifreeze system, which activates when the primary circuit water temperature drops below 5°C. This system is always active and ensures the boiler is protected down to an ambient temperature of 0°C at the installation site
- Limit thermostat
- Flame detection electrode
- Ignition transformer
- Equipped with a flue gas analysis port cap
- 8-liter expansion tank
- Hydraulic three-way valve (stepper)
- High-efficiency brazed-plate domestic hot water heat exchanger, designed and manufactured in our facilities, which allows for the production of domestic hot water in condensing mode with maximum stability
- Manual fill valve
- Water meter
- Lower air vent valve
- Touchscreen control panel with machine interface functionality, displaying system settings and providing access to parameters. The main screen displays the domestic hot water sensor temperature in the center, unless a heat demand is in progress; in that case, it displays the boiler flow temperature, the water pressure in the system, information regarding the current date and time, and, if available, the measured outdoor temperature
- Standard OT+ Input

Control panel

The unit's user interface, called Hi, Comfort T300-Hy, can be operated remotely. This interface can be installed at a maximum distance of 30 m.

It is connected to the control unit via a 3 x 0.35 mm² shielded cable. It is an extremely simple and intuitive interface designed for use by the system operator to set the operating temperatures of the heating and air conditioning systems and the domestic hot water storage tank.

BERETTA HARMONY HYBRID complies with the following directives:

- LVD: 2014/35/EU Low Voltage Directive
- EMC: 2014/30/EU Electromagnetic Compatibility Directive
- ErP: 2009/125/EC: Ecodesign Directive for Energy-Related Products
- PED: 2014/68/EU: Pressure Equipment Directive (PED)
- REACH: 1907/2006: Regulation on the Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH = Registration, Evaluation, Authorization of Chemicals)

- RoHS: 2011/65/EU: Regulations governing the use of hazardous substances in electrical and electronic equipment (RoHS = Restriction of Hazardous Substances)
- RED 2014/53/EU: Radio Equipment Directive
- GAR 2016/426/EU: European Regulation on Gas-Fired Appliances.

HEAT PUMP TECHNICAL DATA

TECHNICAL SPECIFICATIONS COMMON TO ALL MODELS

- Energy efficiency class for heating (low temperature): A++
- Energy class for heating (medium temperature): A+

BERETTA HARMONY HYBRID 3.5

Cooling performance [A35 / W7]

- Nominal capacity: 3.20 kW
- Power consumption: 1,10 kW
- EER: 2,90

Heating performance [A7 / W35]

- Capacity: 3,50 kW
- Power consumption: 0,88 kW
- COP: 4,0

BERETTA HARMONY HYBRID 5.0

Cooling performance [A35 / W7]

- Nominal capacity: 5,00 kW
- Power consumption: 1,79 kW
- EER: 2,80

Heating performance [A7 / W35]

- Capacity: 5,00 kW
- Power consumption: 1,19 kW
- COP: 4,20

BOILER TECHNICAL DATA

TECHNICAL SPECIFICATIONS COMMON TO ALL MODELS

- NOx Class: Class 6 according to European Standard UNI EN 15502
- Seasonal energy efficiency class for heating according to EU Regulation 811/2013: A
- Operating pressure: 3 bar

CIAO X 25 C

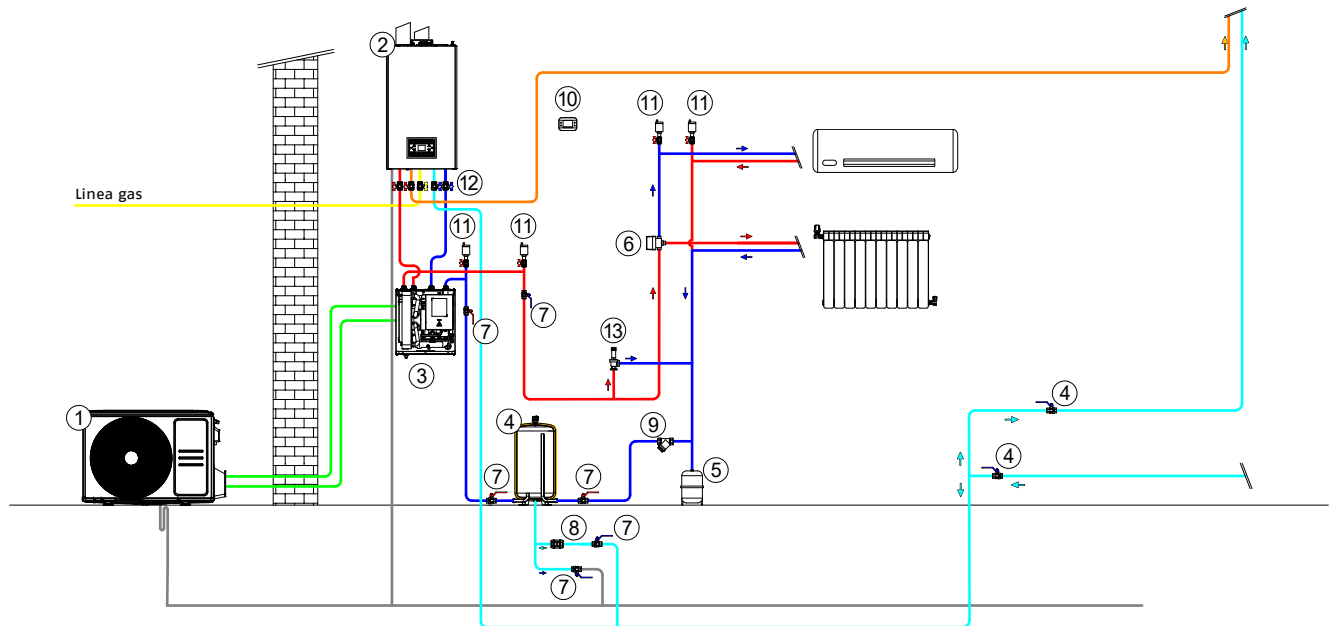
- Max. ÷ min. nominal heat output (PCI): 20 ÷ 3,1 kW (G20)
- Max. ÷ min. nominal heat output at 80–60°C: 19,4 ÷ 2,9 kW (G20)
- Max. to min. nominal heat output at 50–30°C: 20,9 to 3,0 kW (G20)
- Modulation ratio: 1 : 8 (DHW)
- Indoor module dimensions (HxWxD): 700 x 400 x approx. 275,5 mm

CIAO X 30 C

- Nominal heat output max ÷ min (PCI): 25 ÷ 3,9 kW (G20)
- Max. ÷ min. nominal heat output at 80–60°C: 24,4 ÷ 3,8 kW (G20)
- Max. to min. nominal heat output at 50–30°C: 26,8 to 4,1 kW (G20)
- Modulation ratio: 1 : 8 (DHW)
- Indoor module dimensions (HxWxD): 700 x 400 x approx. 275,5 mm

Example of a system with a wall-hung hybrid system

HEATING, COOLING, AND DHW PRODUCTION SYSTEM WITH HEAT PUMP, HYDRAULIC KIT, AND COMBINATION BOILER



- (1) Heat pump outdoor unit
- (2) Boiler with circulator and vessel
- (3) Heat pump indoor unit
- (4) Inertial storage
- (5) Expansion vessel
- (6) Summer-winter diverter valve (*)
- (7) Globe valve

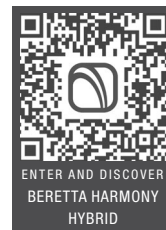
- (8) Non-return valve
- (9) Filter
- (10) Control panel T300-Hy
- (11) Deaerator
- (12) Under-boiler cock kit
- (13) Adjustable bypass valve

(*) The responsibility of the installer

[illegible]



RIELLO S.p.A.
Via Ing. Pilade Riello, 7
37045 Legnago (VR) - Italy
tel. +39 0442 630111
www.berettaheating.com



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