

Packaged monoblock heat pump for domestic hot water production

AQUA PLUS SWAN-2 190-190S-300-300S RANGE

FECHNICAL BULLE











SIZE	190	300	1905	300S
HEATING CAPACITY KW	2,31	3,25	2,31	3,25

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Features and benefits

System Description

AQUA Plus is a specialised heat pump system for producing domestic hot water.

AQUA Plus reduces costs connected with the production of domestic hot water. Using heat pump technology, AQUA Plus is able to transform renewable energy contained in the air into heat, which it then uses to raise the temperature of water contained in the storage tank. The consumption of electrical power in this sequence is reduced to a minimum. AQUA Plus is 4 times more efficient than a traditional electrical boiler, which in economic terms means a 75% reduction in cost for electricity for the same amount of thermal power produced.

TOP Efficiency

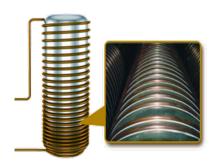
AQUA Plus reaches the highest levels of efficiency present at this moment on the market. Thanks to the careful design of the cooling circuit, it has been placed in the class A+ according to the FrP Directive

The high values of COP allow for significant savings in energy and operating costs, in addition to an increased in the use of renewable energy.



Enamel Steel Tank with heat exchanger wrapped around the tank

The innovative active electronic anode and the enamelled steel tank guarantee a high level of protection against corrosion. The exchanger (condenser) consists of an ALUMINIUM coil wrapped around the outside of the domestic hot water storage tank. This feature guarantees maximum safety because it prevents any possible contamination between the refrigerant and the water. Before the Aluminium condenser is wrapped around the tank, it is shaped to obtain an innovative profile designed to maximize the surface in contact with the tank and improve thermal exchange.



Full Operating Limits

The use of the most advanced technologies, both in terms of components and in relation to regulating logic, allow AQUA to be used in extreme temperatures. AQUA can function within the air temperature range of -20°C to +43°C in combined operation (heat pump + electrical heating element) and even in the range of -7°C to +43°C with only the heat pump .

Moreover, it is possible to reach hot water temperatures exceeding 65°C using only the heat pump.



Advanced control options

AQUA Plus has a **Modbus** connection port for integration with third-party home automation systems.

The unit is also compatible with **ELFOControl³ EVO**, the Clivet supervision system that optimises operation of resistance systems. AQUA Plus can be integrated with **photovoltaic panels** thanks to its dedicated input, and is also set up for **Smart Grid** management

It is also possible to control AQUA Plus through a **user-friendly App**: the **Wi-Fi** function is supplied as standard with the unit so that the users can display and set the main unit parameters on their smartphone.



User Interface

To control AQUA, it is possible to use the control panel mounted on the unit.

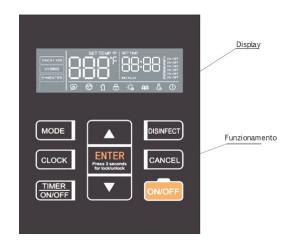
The control system was designed to be quick and intuitive for the user. All parameters are easily accessible with the 9 central buttons.

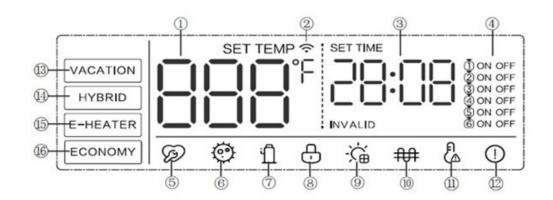
The control panel allows the user to view:

- current water temperature
- unit operating status
- the operating status of the compressor and the electric heating element
- any possible malfunction

and to set:

- the SET temperature of the accumulator
- the unit's schedule, up to six activation or deactivation times
- manual activation of the electric heating element
- manual activation of the anti-legionella disinfection cycle
- switching the unit on and off





REF	ICON	DESCRIPTION	REF	ICON	DESCRIPTION
1	888*	On: screen locked	10	₩	Electric heater in operation
2	$\hat{\mathbf{x}}$	On: WiFi connected; Off: WiFi not connected; Flashing: WiFi setting up	11	FI _A	High temperature alarm Water temperature above 50°C
3	20:08	Indicates the time	12	1	Unit in error/protection
4	TON OFF ON OFF ON OFF ON OFF ON OFF ON OFF ON OFF	6 programs can be set	13	VACATION	Unit works in VACATION mode
5	B	Reserved	14	HYBRID	Unit in HYBRID mode
6	©	Unit in disinfection cycle (antilegionella)	15	E-HEATER	Unit in E-HEATER mode
7	П	Compressor in operation		INVALID	An invalid button was pressed
8	0	Buttons locked		SET TEMP	On: water temperature setting
9	- 💢	Unit connected to the solar signal or to the solar water pump		SET TIME	On: time setting

Standard unit technical specifications

AQUA

Fan

Centrifugal fan with plastic profile blades, housed in aerodynamically shaped nozzle to increase efficiency and minimize sound level.

Evaporator

Evaporator coil with large surface which improves heat transfer and reduces defrost time in order to increase the seasonal efficiency.

Anodo

Electronic anode to ensure maximum protection and durability over time

Handles

Lifting handles for easy installation and transportation.

Condenser

Condenser with aluminum coil, wrapped around the tank and thus avoid the possibility of water contamination for any leaks of refrigerant. The coil is suitably shaped to maximize the contact area with the fuel tank, it is also interposed with a conductive paste to improve heat exchange between the capacitor and the accumulation.

Compressor

Rotary ON/OFF Compressor using R134a on vibration rubber to minimize the transmission of vibration and noise.

Safety thermostats

- Automatic temperature reset thermostat (ATCO auto temperature cut off)
- Manual reset thermostat (TCO temperature cut off)

Modbus protocol

Allows serial connection to supervision systems, using Modbus as a communication protocol. Gives access to the entire list of operation variables, controls and alarms.

Electric heater

1,5kW electrical element can be used for heating when the temperatures is below -7° C and/or to integrade with rigid air temperatures and high set temperatures.

Integration exchanger

Integration exchanger vitrified steel coil of 1.1m^2 on 190 L and 1.3m^2 on 300 L with well for probe for regulation.

Tank

Steel storage tank for 280/180 liters of water, internally vitrified to completely isolate water from the metal to avoid corrosion problems.

Insulation

External insulation in polyurethane (thickness 50mm).



Appearance



SIZE 190



SIZE 300



SIZE 190S



SIZE 300S

Accessories separately supplied

VENX Additional fan

Additional high-efficiency radial fan that extends the unit's operating range by providing extra available pressure. Installation is only recommended in those systems where the extension of the air ducts is particularly far-reaching and complex.

SIZE			190	300	190S	300S
Power and Efficiency (f	an included)					
Tout 15/12 °C (DB/WB),	Heating capacity	kW	1,62	2,3	1,62	2,3
Tw,in 15 °C Tw.out 45°C	Total absorbed power	kW	0,469	0,606	0,469	0,606
TW,001 45 C	COP		3,45	3,8	3,45	3,8
Tout 43/26 °C (DB/WB),	Heating capacity	kW	2,31	3,25	2,31	3,25
Tw,in 10 °C Tw,out 70°C> 190	Total absorbed power	kW	0,595	0,703	0,595	0,703
Tw.out 65°C> 300	COP		3,88	4,62	3,88	4,62
Sound pressure level (1m)		dB(A)	37,6	39,2	37,6	39,2
Sound power level (LWA)		dB(A)	52	54	52	54
Additional ventilation						
Type of fan			Radiale	Radiale	Radiale	Radiale
Pressure head with addition	al ventilation	Pa	200	240	200	240

Electical data

SIZE			190	300	1905	300S
Standard power input	(1)	V	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
F.L.A Current absorbed at the maximum allowed conditions	_	Α	0,25	0,41	0,25	0,41
F.L.I Power absorbed at full load (at the maximum allowed conditions)	_	W	50	80	50	80
M.I.C - Maximum inrush current	_	Α	0,32	0,78	0,32	0,78

(1) Power supply 220-240/1/50 For non-standard power supply voltages,

contact the Clivet Technical Office

Units are compliant with provisions set forth in the European standards CEI $\ensuremath{\mathsf{EN}}$

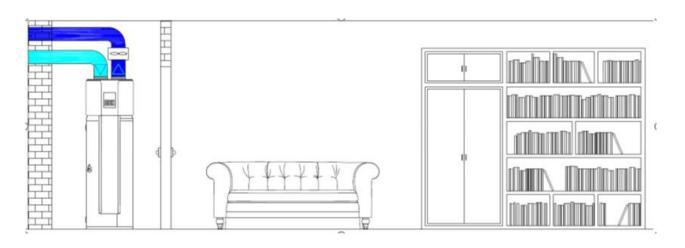
60204 and CEI EN 60335

Data refers to the additional fan only, to be added to the total data of the unit.

Aeraulic Connections

DUCTED INTAKE AND EXHAUST (recommended)

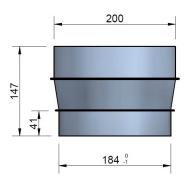
Install the additional fan on the exhaust ducting close to the unit.



Accessories separately supplied

CA200X Air duct adapter

Adapter to connect a Ø200 mm air duct to a Ø190 mm connection. The kit includes n° 1 sealing gasket and n° 1 reduction (for a full kit order 2 pieces).



COPX Accessory connection cables

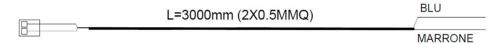
The accessory includes cables to facilitate connection to the circuit board for use of the following functions:

- Solar input (only for 190S and 300S): 220-240° signal input for the solar control unit
- On/off input: contact for switching on/off the unit by external signal
- Modbus: connection for RS486 Modbus supervisory system protocol or ELFOControl3 EVO

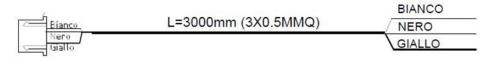
Solar input (only for 190S and 300S)



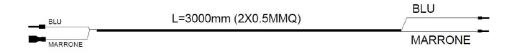
On/off input



Modbus



(PUMP + XT2)



General technical data

SIZE				190	300	190S	3005
Power and Efficiency							
Tout 15/12 °C (DB/WB), Tw,in 15 °C	Heating capacity		_kW	1,62	2,30	1,62	2,30
Tw,out 45°C	Total power absorbed		_kW	0,42	0,53	0,42	0,53
	СОР			3,86	4,34	3,86	4,34
Tout 43/26 °C (DB/WB), Tw,in 10 °C Tw,out 70°C> 190	Heating capacity		kW	2,31	3,25	2,31	3,25
	Total power absorbed		kW	0,546	0,627	0,546	0,627
Tw,out 65°C> 300	СОР			4,23	5,18	4,23	5,18
Riscaldatore elettrico			kW	1,50	1,50	1,50	1,50
Standard power input			V	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
Heating time ACS		(1)	h/min	3/53	4/22	3/53	4/22
Maximum temperature ACS		(6)	°C	70	70	70	70
Sound pressure level (1m)		(5)	dB(A)	36,6	38,2	36,6	38,2
Sound power level (L _{wn})			dB(A)	51	53	51	53
ERP							
	Energy class of generator			A+	A+	A+	Д+
	DHW profile				XL		XL
Clima Average	η_{wh}		%	115%	123%	115%	123%
Heat pumps Water Heater	Annual consumption AEC		kWh	890	1356	890	1356
(2)	Daily consumption		kWh	4,22	6,34	4,22	6,34
	COP EN 16147			2,76	3,01	2,76	3,01
	DHW profile				XL	L	XL
	<u> </u>			125%	143%	125%	143%
Clima Warmer	η _{wh}						
Heat pumps Water Heater (3)	Annual consumption AEC		kWh	819	1173	819	1173
(0)	Daily consumption		kWh	3,86	5,49	3,86	5,49
	COP EN 16147			3,13	3,59	3,13	3,59
	DHW profile			L	XL	L	XL
Clima Colder	η_{wh}			99%	91%	99%	91%
Heat pumps Water Heater	Annual consumption AEC		kWh	1034	1845	1034	1845
(4)	Daily consumption		kWh	4,90	8,56	4,90	8,56
	COP EN 16147			2,36	2,32	2,36	2,32
DHW tank							
DHW volume				176	284	168	272
Material of tank				Acciaio Vetrificato	Acciaio Vetrificato	Acciaio Vetrificato	Acciaio Vetrificato
Insulation Material				Poliuretano Espanso	Poliuretano Espanso	Poliuretano Espanso	Poliuretano Espanso
Heat losses			W/K	0,91	0,94	0,91	0,94
Maximum operating pressure			bar	10	10	10	10
Insulation Thickness			mm	50	50	50	50
Refrigerant Circuit							
Compressor type				Rotativo	Rotativo	Rotativo	Rotativo
Refrigerant				R134a	R134a	R134a	R134a
Quantity of refrigerant			kg	1,10	1,40	1,10	1,40
GWP			t	1430	1430	1430	1430
Tonne of CO2 equivalents *			t _{co2}	1,57	2,00	1,57	2,00
Oil quantity			ml	350	350	350	350
Type of expansion valve				Elettronica	Elettronica	Elettronica	Elettronica
Fan							_
Type of fan				Centrifugo	Centrifugo	Centrifugo	Centrifugo
Air flow			m³/h	270	414	270	414
Available pressure head			Pa	25	45	25	45
Integration							
Integration coil surface			m ²			1,10	1,30
Integration coil material						Acciaio Vetrificato	Acciaio Vetrificato
Maximum operating pressure			bar			10	10

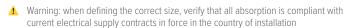
- Inlet water temperature 15 °C, accumulator set 45 °C, air on source side 15 °C D.B /12 °C W.B.
- The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated Regulation N. 814/2013, Average Climate, Heat Pump Water Heater
- The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated
- Regulation N. 814/2013, Warmer Climate, Heat Pump Water Heater
- The product complies with the European Directive ErP, which includes the Commission Delegated Regulation (EU) N. 812/2013 and the Commission Delegated Regulation N. 814/2013, Colder Climate, Heat Pump Water Heater
- Data referred to completely ducted unit.
- 6. Maximum temperature that can be reached during anti-legionella mode (Disinfect)
- * It contains fluorinated greenhouse gases

Electrical data

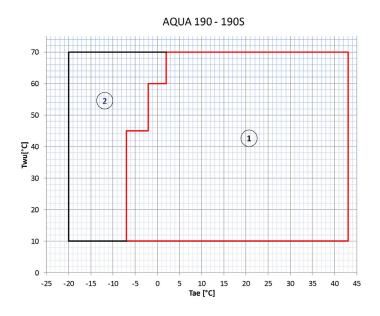
SIZE			190	300	190S	300S
Power input	(1)	V	220-240/1/50	220-240/1/50	220-240/1/50	220-240/1/50
F.L.A Current absorbed at the maximum allowed conditions		А	9,10	9,80	9,10	9,80
F.L.I Power absorbed at full load (at the maximum allowed conditions)		kW	2,10	2,25	2,10	2,25
M.I.C - Maximum inrush current	_	Α	22,2	33,7	22,2	33,7

⁽¹⁾ Power supply 220-240/1/50

For non-standard power supply voltages, contact the Clivet Technical Office Units are compliant with provisions set forth in the European standards CEI EN 60204 and CEI EN 60335

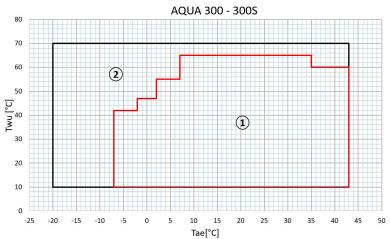


Operating limits



Twu [°C] = temperatura acqua accumulo Tae [°C] = temperatura aria ingresso scambiatore

- 1. Use range of the heat pump
- 2 Use range of the electrical heating element



Twu [°C] = temperatura acqua accumulo Tae [°C]: temperatura aria ingresso scambiatore

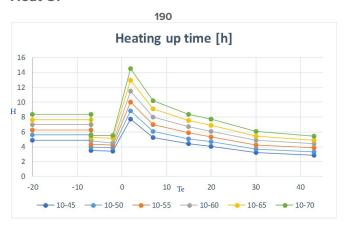
- 1. Use range of the heat pump
- 2. Use range of the electrical heating element

General technical data

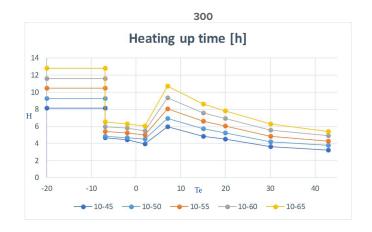
Performances Curve

The following curves were obtained from performance tests carried out under dynamic mode. The inlet water temperature, which coincides with the initial status 0, is temperature 10°C. The different curves represent the specific parameter (heating time, heating capacity, COP) with different set temperature (45° C-50° C-65° C-60° C-65° C to 70° C)

Heat UP



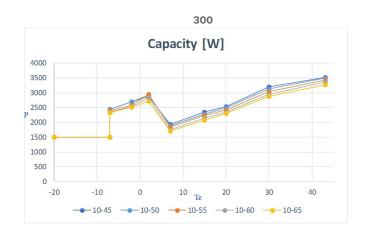




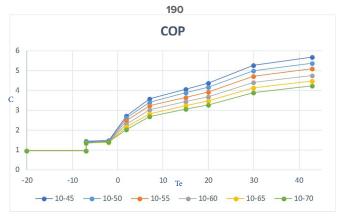
Heating capacity



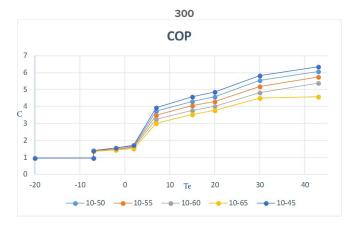
Te =Outdoor Air Temperature°C P = Heating Capacity (W)



COP



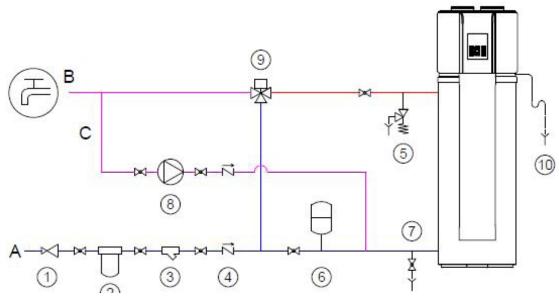
Te =Outdoor Air Temperature°C C = COP



Hydraulic connections

Below are some diagrams that give an idea of the hydraulic connections in the two versions of AQUA. The connection and design of the system must be done in conformity with national regulations that are currently in force.

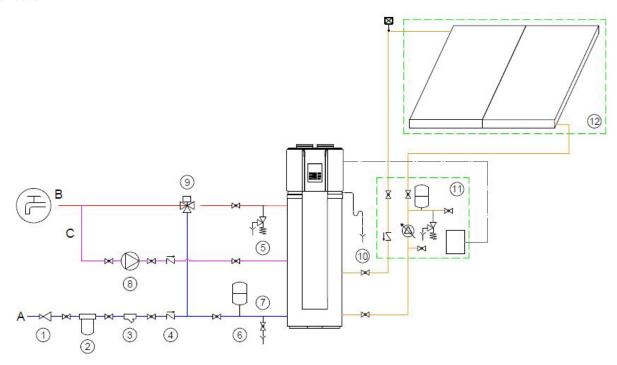
Size 190 - 300



- sure reducing valve
- Water treatment devices (water softener, etc.)
- Non-return valve
- 5. Domestic hot water safety valve with discharge
- 6.
- Storage drain

- Hot water circulator (recirculation) with check valve
- Mixing valve thermostatic
- Condensate drain
- A Aqueduct inlet
- B DHW
- DHW expansion vessel C - DHW recirculation

Size 190S - 300S



- Pressure reducing valve
- Water treatment devices (water softener, etc.)
- Non-return valve
- 5. Domestic hot water safety valve with discharge
- 6. DHW expansion vessel
- Storage drain
- Hot water circulator (recirculation) with check valve

- Mixing valve thermostatic
- Condensate drain
- Solar circulation unit (not supplied)
- Solar panels (not supplied)
- A Aqueduct inlet
- B DHW
- C DHW recirculation

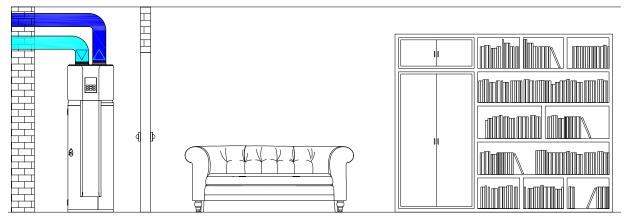
Aeraulic connections

The unit must be installed inside the building, preferably in a technical room or a laundry room or a garage. At any rate, it is always preferable to avoid installing the unit near bedrooms or in rooms that must be protected from noise.

Outdoor installation is prohibited, as well as installation in places subject to external weather.

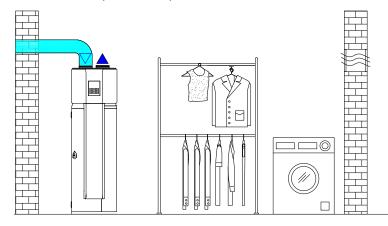
Examples below refer to the AQUA 190 version. For the AQUA 300 version, the expulsion and intake connections are inverted.

INTAKE AND EXPULSION DUCTS (recommended)



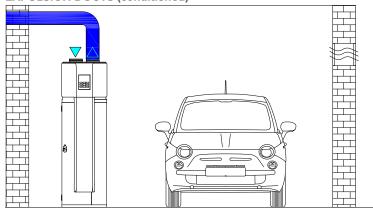
Channelling the intake and expulsion through ducts allows the unit to function with air taken from outside the house. Heat is extracted from the outdoor air, and used as a source for the heat pump. Later this same air is expelled outside the building. Therefore, unit operation does not cause an increase in heating requirements in the home. It is necessary to fit the system with correctly sized pipes in relation to the available pressure head supplied by the unit.

INTAKE DUCTS (conditioned)



Installation with an intake duct and free expulsion is recommended if there is a desire to use the air expelled by the unit, cold dehumidified air (5-10°C colder than the intake air), to cool the room. The unit must be installed preferably in a room that does not require heating, because the unit releases cold air into the environment and it would increase the cost of heating that room. The unit must be installed in a room with a minimum volume greater than 15 m2. The expulsion air flow must be guaranteed and cannot be blocked. It is necessary that the vents be correctly sized.

EXPULSION DUCTS (conditioned)



In this particular type of installation, the unit takes in air from the room where it is installed, extracts the heat and then expels that air outside the house. The unit must be installed in a room with suitable openings to allow the correct flow of air into the unit, which would prevent the air pressure in the room from falling. The unit must be installed in a room with a minimum volume greater than 15 m².

Data for the UNI/TS 11300 calculation

Clivet S.p.A. declares that the data to be used for the calculation pursuant to UNI/TS 11300 part 4 of the efficiency of their heat pump are given in the following tables.

The data given in this document may be updated without advance notice by the manufacturer when upgrading his product range.

UNI/TS 11300 Part 4

AQUA

DHW Data Capacity	and COP full load			T	е	
	Te	Tm	7	15	20	35
400	P. Heat $\Phi_{H,HP \text{ out}}$ (W)	55°C	1362	1609	1755	2254
190	COP	55°C	3,22	3,66	3,93	4,86
200	P. Heat $\Phi_{H,HP \text{ out}}$ (W)	55°C	1814	2185	2365	3006
300	COP	55°C	3,49	4,04	4,30	5,03

Terms and definitions
Tm = Supply Temperature
Te = Outdoor Air Temperature

SMART GRID management - Photovoltaic

The unit is Smart Grid Ready certified and is equipped with logic for connection to devices that balance loads connected to the power grid and optimise overall power consumption.

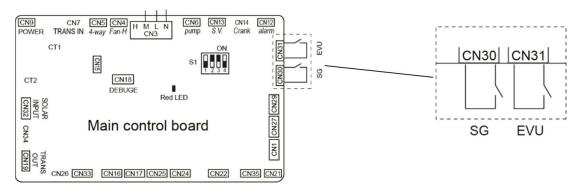
Connection is optional and the function can be enabled at the keyboard and is linked to the SG ON/OFF input, which receives a status signal from the mains.

The unit is also able to automatically consume the excess energy produced by a photovoltaic system, using it to store free thermal energy in the DHW tank.

The function is enabled by default, it does not require any keyboard settings and is tied to the ON/OFF EVU input, which receives a signal from the energy meter indicating when excess free energy is available to the unit

The control logic of the two contacts is:

ENERGY GOST	CONTACT		OPERATION		
ENERGY COST	SG	EVU	The set point is forced to TS = 70 °C		
Free	ON	ON	The electric heater switches on if T5U < 65 $^{\circ}$ C and switches off if T5U \geq 70 $^{\circ}$ C		
Economical	OFF	ON			
Standard	OFF	OFF	Standard		
Expensive	ON	OFF	Forced OFF The antilegionella cycle will be performed according to the mode setting		



Wi-Fi function and App control

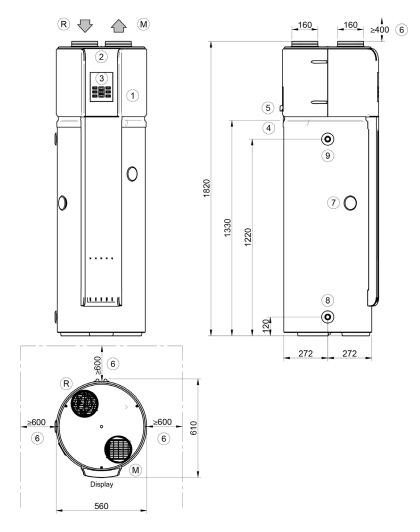
The App MSmartLife is available for free for iOS and Android. The user is able to perform the following operations remotely:

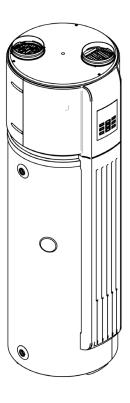
- Turn the unit ON/OFF
- · Set and display tank temperature
- Activate Boost function (E-Heater) for fast hot water production
- Schedule (daily, weekly, holiday mode)
- Activate anti-legionella function (Disinfect)
- Display smart grid connection

Dimensional drawings

SWAN-2 190

DAASE0001_00 DATA/DATE 25/01/2021





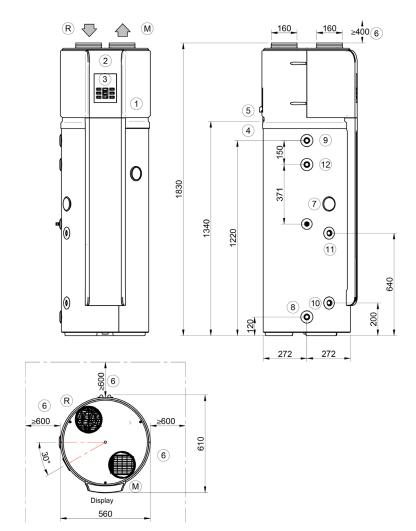
- 1. Compressor enclosure
- Electrical panel
 Control kovpad
- 3. Control keypad
- 4. Power input
- 5. Condensate drain
- 6. Functional spaces

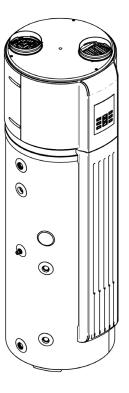
- 7. Anode rod
- 8. Water inlet 3/4"F
- 9. Water outlet 3/4"F
- (R) Air inlet
- (M) Air supply

WEIGHT DISTRIBUTION		
Operation weight	Kg	287
Shipping weight	Kg	126

SWAN-2 190S

DAASE0001_S_00 DATA/DATE 25/01/2021





- Compressor enclosure
- Electrical panel
- Control keypad
- Power input
- Condensate drain
- Functional spaces
- Anode rod

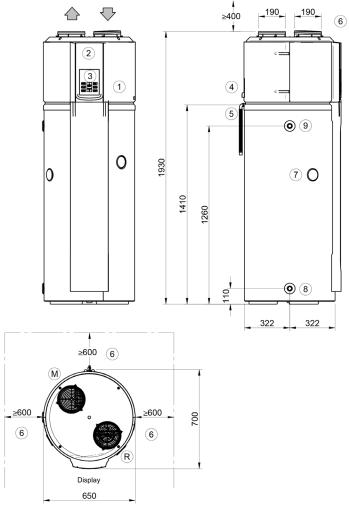
- Water inlet 3/4"F
- Water outlet 3/4"F
- Solar inlet 3/4"F
- 11. Solar outlet 3/4"F 12. DHW recovery 3/4"F
- (R) Air inlet (M) Air supply

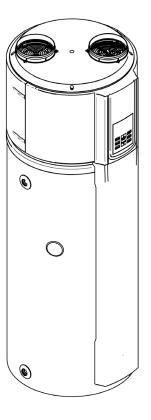
WEIGHT DISTRIBUTION		
Operation weight	Kg	310
Shipping weight	Kg	140

Dimensional drawings

SWAN-2 300

DAASE0002_00 DATA/DATE 25/01/2021





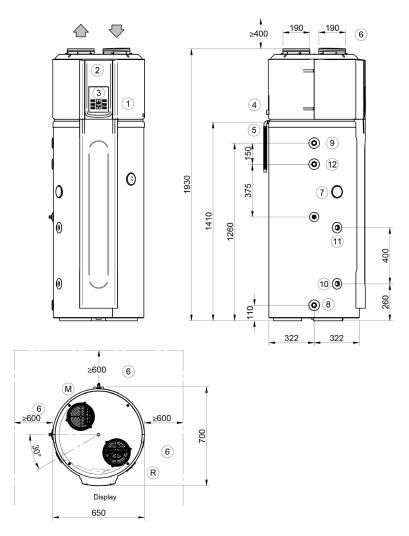
- Compressor enclosure
- Electrical panel
- Control keypad
- Power input
- Condensate drain
- Functional spaces

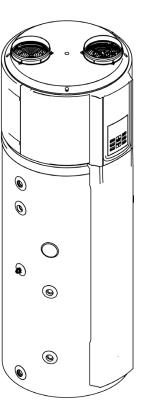
- Anode rod
- Water inlet 3/4"F
- Water outlet 3/4"F
- (R) Air inlet
- (M) Air supply

WEIGHT DISTRIBUTION			
Operation weight	Kg	412	
Shipping weight	Kg	153	

SWAN-2 300S

DAASE0002_S_00 DATA/DATE 25/01/2021





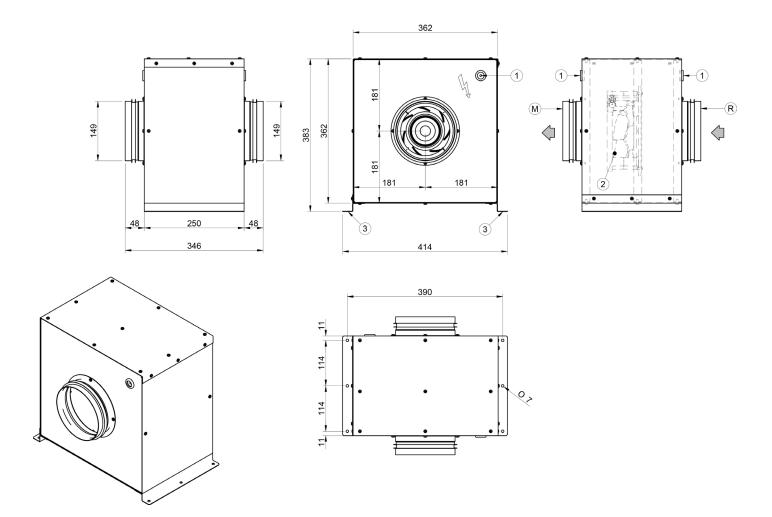
- Compressor enclosure
- Electrical panel Control keypad
- Power input
- Condensate drain
- Functional spaces
- Anode rod

- Water inlet 3/4"F
- Water outlet 3/4"F
- Solar inlet 3/4"F
- 11. Solar outlet 3/4"F 12. DHW recovery 3/4"F
- (R) Air inlet (M) Air supply

WEIGHT DISTRIBUTION		
Operation weight	Kg	434
Shipping weight	Kg	172

Dimensional drawings

SWAN-2 190L - PESE00001_Ventilatore aggiuntivo

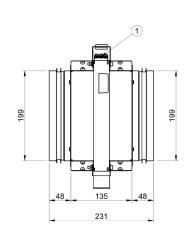


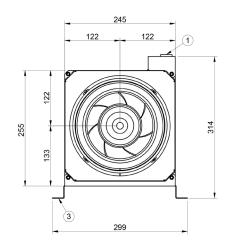
- Power input
 Electric fan (supply-return)
 Lifting bracket (removed)
 Air inlet
 Air supply

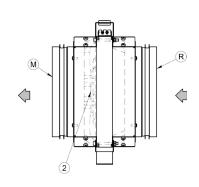
Weight	Kg	7,8
Power input	V	200-240/1/50

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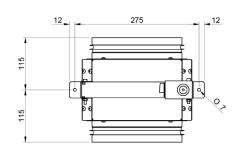
SWAN-2 300L - PESE00002_Ventilatore aggiuntivo











- 2. Electric fan (supply-return)
 3. Lifting bracket (removed)
 (R) Air inlet
 (M) Air supply

Weight	Kg	4,8
Power input		200-240/1/50

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