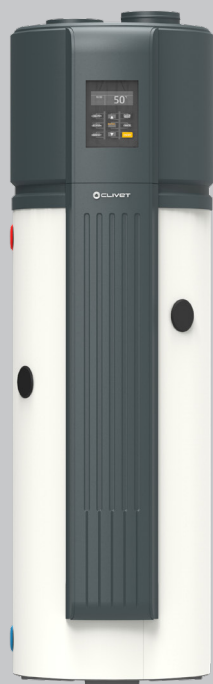




Packaged monoblock heat pump for domestic hot water production

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



TECHNICAL BULLETIN



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

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3	Features and benefits
5	Standard unit technical specifications
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Clivet is taking part in the EUROVENT certification programme up to 1.500 kW. The products concerned appear in the certified products list of the EUROVENT www.eurovent-certification.com site.

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 ErP Directive.

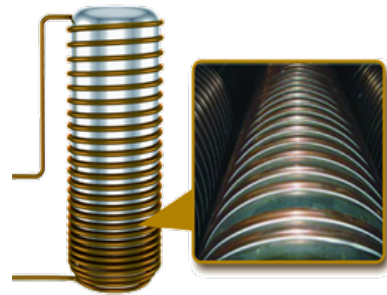
The high values of COP allow for significant savings in energy and operating costs, in addition to an increased use of renewable energy.



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 copper 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.



User Interface

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

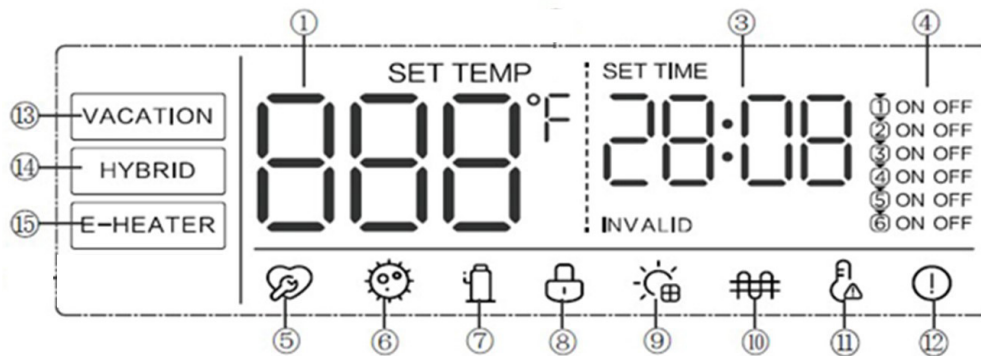
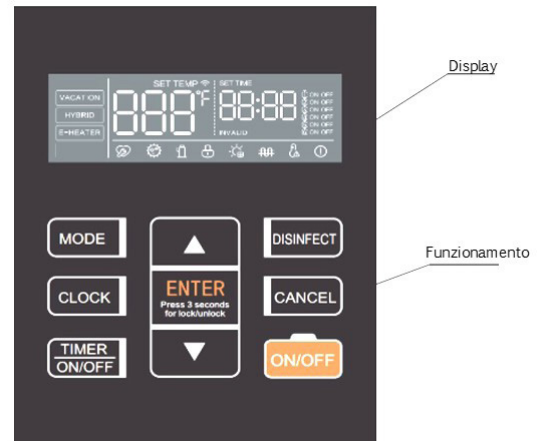
The control system was designed to be quick and intuitive for the user. All parameters are easily accessible with the 9 central buttons.

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	000°F	On: screen locked	11	🔔	High temperature alarm Water temperature above 50°C
3	20:00	Indicates the time	12	⚠️	Unit in error/protection
4	ON OFF ON OFF ON OFF ON OFF	6 programs can be set	13	VACATION	Unit works in VACATION mode
5	👉	Reserved	14	HYBRID	Unit in HYBRID mode
6	☀️⚙️	Unit in disinfection cycle (antilegionella)	15	E-HEATER	Unit in E-HEATER mode
7	🚰	Compressor in operation		INVALID	An invalid button was pressed
8	🔒	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
10	🔌	Electric heater in operation			

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 temperature is below -7°C and/or to integrate with rigid air temperatures and high set temperatures.

Integration exchanger

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

Tank

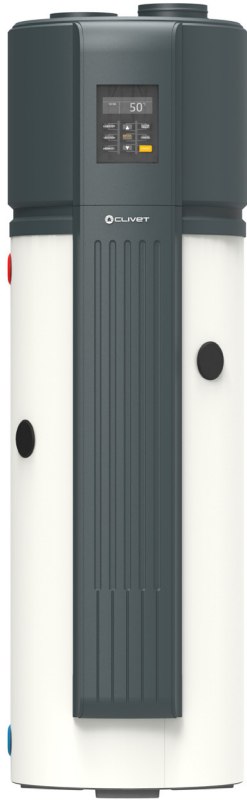
Steel storage tank for 280/180 liters of water, internally vitrified to completely isolate water from the metal to avoid corrosion problems.

Insulation

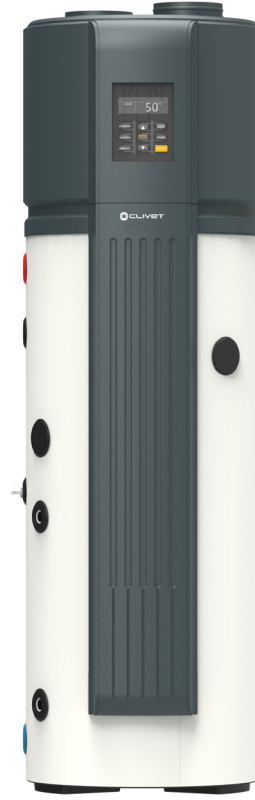
External insulation in polyurethane (thickness 50mm).



Appearance



SIZE 190



SIZE 190S



SIZE 300



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 (fan included)						
Tout 15/12 °C (DB/WB),	Heating capacity	kW	1,62	2,3	1,62	2,3
Tw,in 15 °C	Total absorbed power	kW	0,469	0,606	0,469	0,606
Tw,out 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	Total absorbed power	kW	0,595	0,703	0,595	0,703
Tw,out 70°C--> 190	COP		3,88	4,62	3,88	4,62
Tw,out 65°C--> 300						
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 additional ventilation		Pa	200	240	200	240

Electical data

SIZE		190	300	190S	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	A	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	A	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

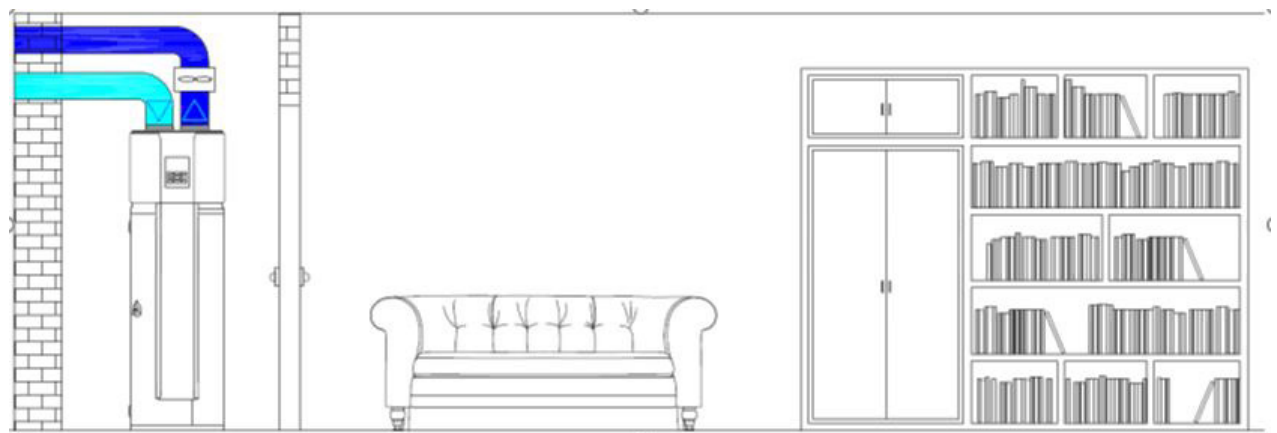
Units are compliant with provisions set forth in the European standards CEI EN 60204 and CEI EN 60335

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.



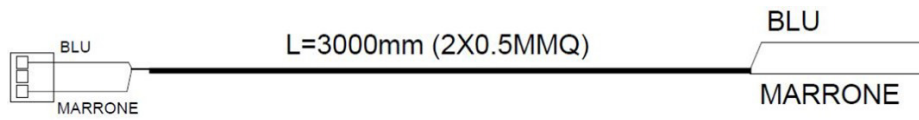
COPX

Accessory connection cables

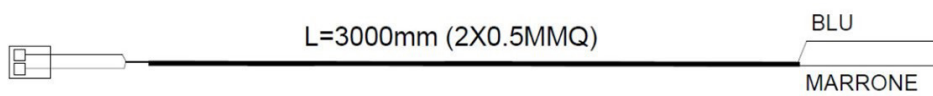
The accessory includes cables to facilitate connection to the circuit board for use of the following functions:

- Solar input (only for 190S and 300S): 220-240V 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

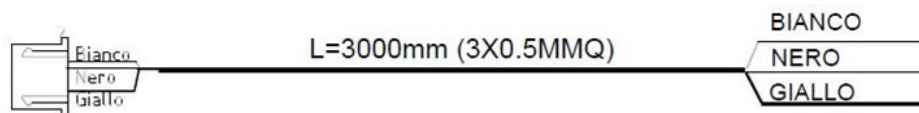
Solar input (only for 190S and 300S)



On/off input



Modbus



General technical data

SIZE			190	300	190S	300S
Power and Efficiency						
Tout 15/12 °C (DB/WB), Tw,in 15 °C Tw,out 45°C	Heating capacity	kW	1,62	2,30	1,62	2,30
	Total power absorbed	kW	0,42	0,53	0,42	0,53
	COP		3,86	4,34	3,86	4,34
Tout 43/26 °C (DB/WB), Tw,in 10 °C Tw,out 70°C--> 190 Tw,out 65°C--> 300	Heating capacity	kW	2,31	3,25	2,31	3,25
	Total power absorbed	kW	0,546	0,627	0,546	0,627
	COP		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 _{WA})		dB(A)	51	53	51	53
ERP						
Clima Average Heat pumps Water Heater (2)	Energy class of generator		A+	A+	A+	A+
	DHW profile		L	XL	L	XL
	η_{wh}	%	115%	123%	115%	123%
	Annual consumption AEC	kWh	890	1361	890	1361
	Daily consumption	kWh	4,24	6,40	4,24	6,40
Clima Warmer Heat pumps Water Heater (3)	DHW profile		L	XL	L	XL
	η_{wh}	%	130%	148%	130%	148%
	Annual consumption AEC	kWh	785	1131	785	1131
	Daily consumption	kWh	3,72	5,32	3,72	5,32
	COP EN 16147		3,13	3,59	3,13	3,59
Clima Colder Heat pumps Water Heater (4)	DHW profile		L	XL	L	XL
	η_{wh}	%	99%	95%	99%	95%
	Annual consumption AEC	kWh	1032	1756	1032	1756
	Daily consumption	kWh	4,93	8,24	4,93	8,24
	COP EN 16147		2,36	2,32	2,36	2,32
DHW tank						
DHW volume	l		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
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	m ³ /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 Com-

- mission 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.
 - 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	A	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	A	22,2	33,7	22,2	33,7

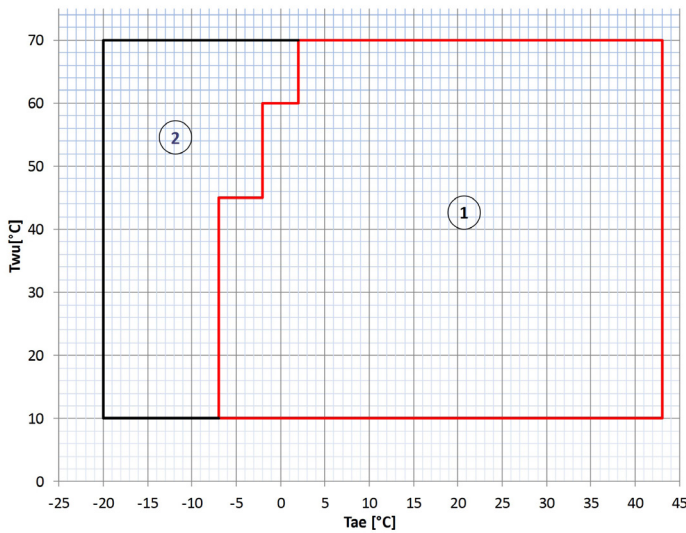
(1) Power supply 220-240/1/50

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

⚠ Warning: when defining the correct size, verify that all absorption is compliant with current electrical supply contracts in force in the country of installation

Operating limits

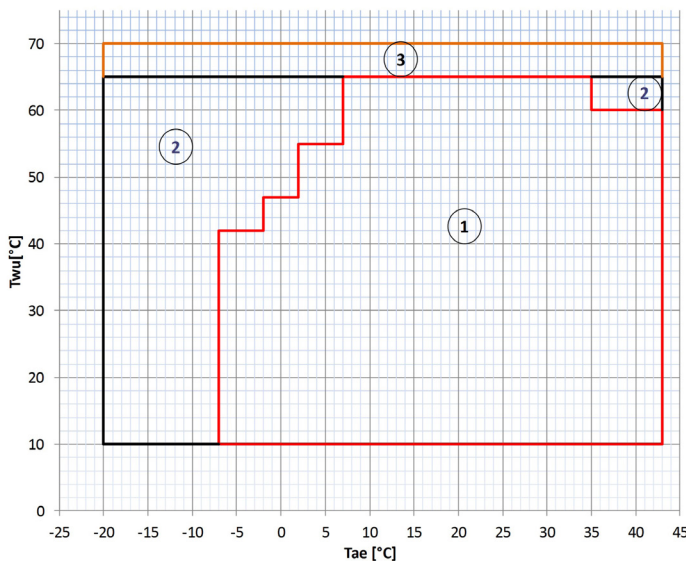
AQUA 190 - 190S



T_{wu} [°C] = temperatura acqua accumulato
T_{ae} [°C] = temperatura aria ingresso scambiatore

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

AQUA 300 - 300S



T_{wu} [°C] = temperatura acqua accumulato
T_{ae} [°C]: temperatura aria ingresso scambiatore

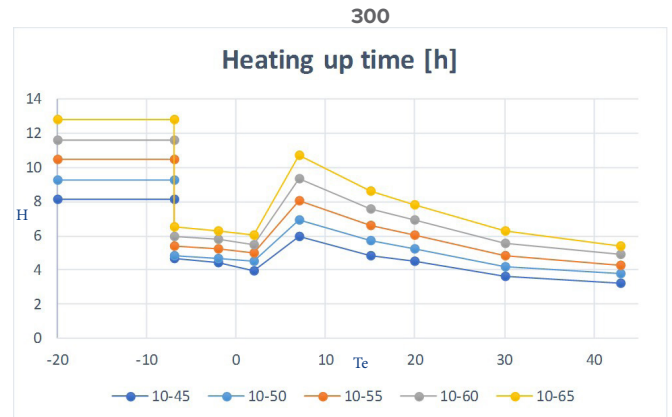
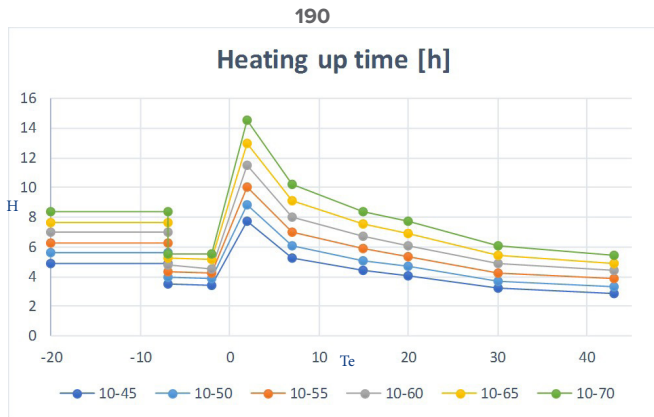
1. Use range of the heat pump
2. Use range of the electrical heating element
3. Use range of the electrical heating element only in Anti-Legionella mode (Disinfect)

General technical data

Performances Curve

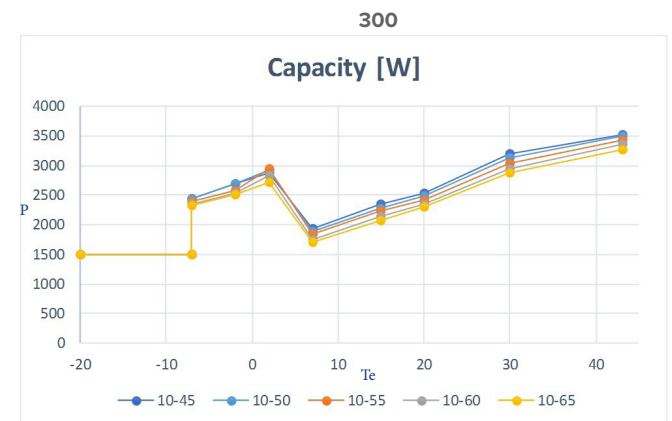
The following curves were obtained from performance tests carried out under dynamic mode. The inlet water temperature, which coincides with the initial status 0, is temperature 10°C. The different curves represent the specific parameter (heating time, heating capacity, COP) with different set temperature (45° C-50° C-55° C-60° C-65° C to 70° C)

Heat UP



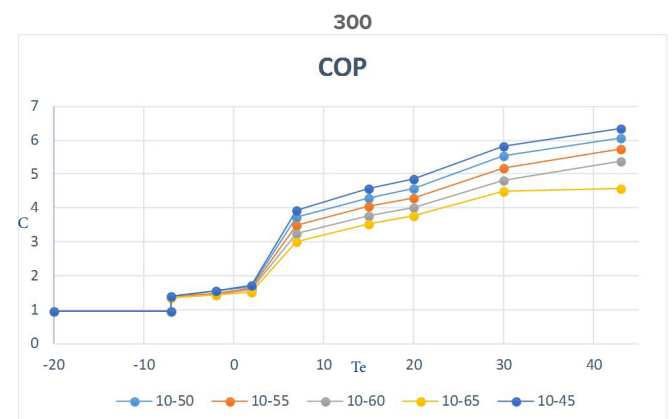
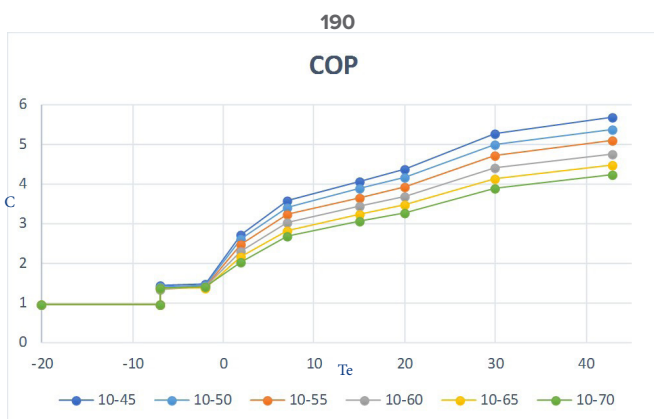
Te = Outdoor Air Temperature°C
H = Heat Up Time (h)

Heating capacity



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

COP

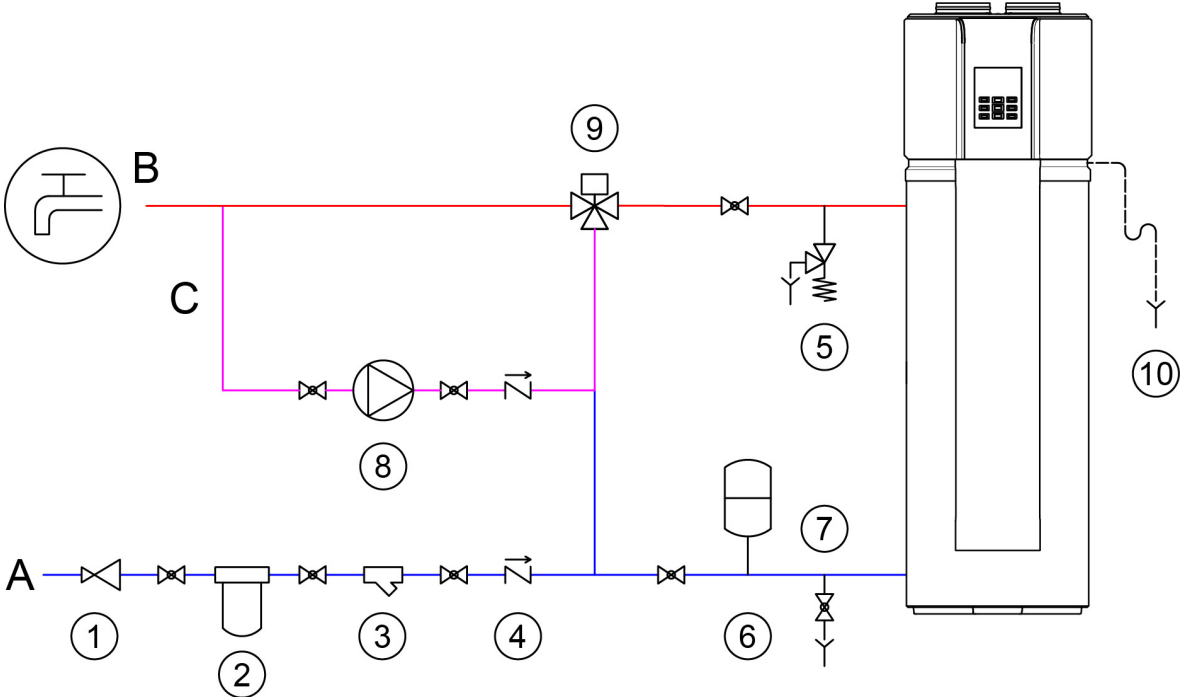


Te = Outdoor Air Temperature°C
C = COP

Hydraulic connections

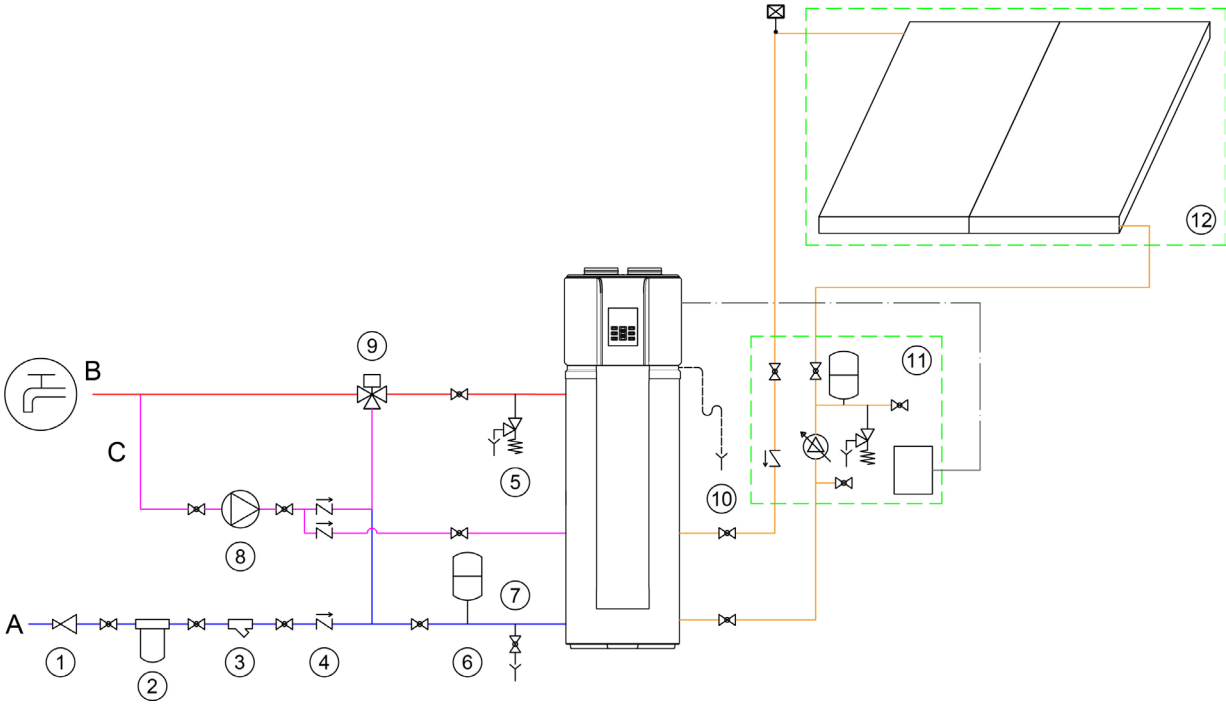
Below are some diagrams that give an idea of the hydraulic connections in the two versions of AQUA. The connection and design of the system must be done in conformity with national regulations that are currently in force.

Size 190 - 190S



- 1. sure reducing valve
- 2. Water treatment devices (water softener, etc.)
- 3. Filter Y
- 4. Non-return valve
- 5. Domestic hot water safety valve with discharge
- 6. DHW expansion vessel
- 7. Storage drain
- 8. Hot water circulator (recirculation) with check valve
- 9. Mixing valve thermostatic
- 10. Condensate drain
- A - Aqueduct inlet
- B - DHW
- C - DHW recirculation

Size 300 - 300S



- 1. Pressure reducing valve
- 2. Water treatment devices (water softener, etc.)
- 3. Filter Y
- 4. Non-return valve
- 5. Domestic hot water safety valve with discharge
- 6. DHW expansion vessel
- 7. Storage drain
- 8. Hot water circulator (recirculation) with check valve
- 9. Mixing valve thermostatic
- 10. Condensate drain
- 11. Solar circulation unit (not supplied)
- 12. Solar panels (not supplied)
- A - Aqueduct inlet
- B - DHW
- C - DHW recirculation

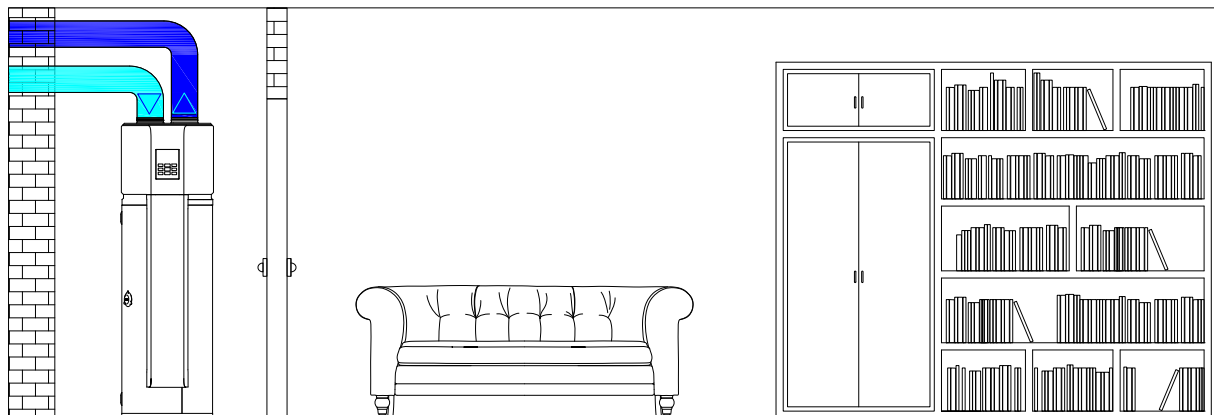
Aeraulic connections

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.

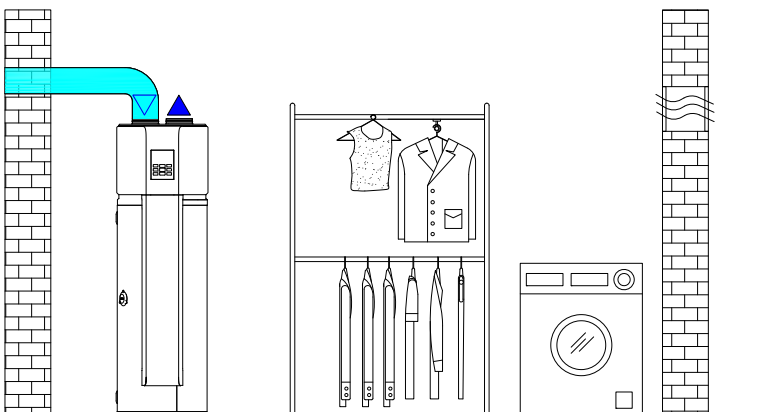
Examples below refer to the AQUA 190 version. For the AQUA 300 version, the expulsion and intake connections are inverted.

INTAKE AND EXPULSION DUCTS (recommended)



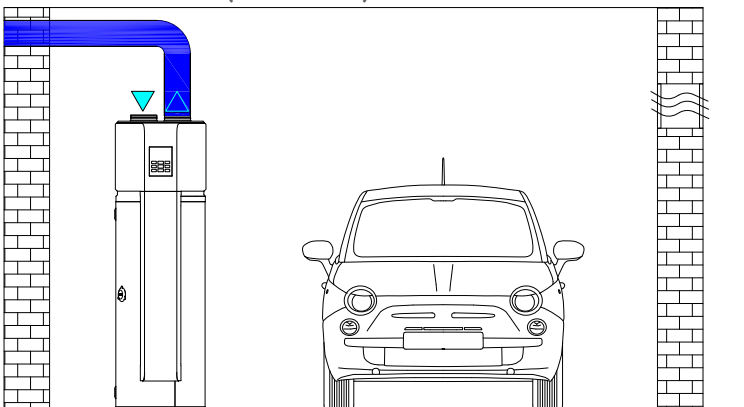
Channelling the intake and expulsion through ducts allows the unit to function with air taken from outside the house. Heat is extracted from the outdoor air, and used as a source for the heat pump. Later this same air is expelled outside the building. Therefore, unit operation does not cause an increase 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		Te				
	Te	Tm	7	15	20	35
190	P. Heat $\Phi_{H,HP\ out}$ (W)	55°C	1362	1609	1755	2254
	COP	55°C	3,22	3,66	3,93	4,86
300	P. Heat $\Phi_{H,HP\ out}$ (W)	55°C	1814	2185	2365	3006
	COP	55°C	3,49	4,04	4,30	5,03

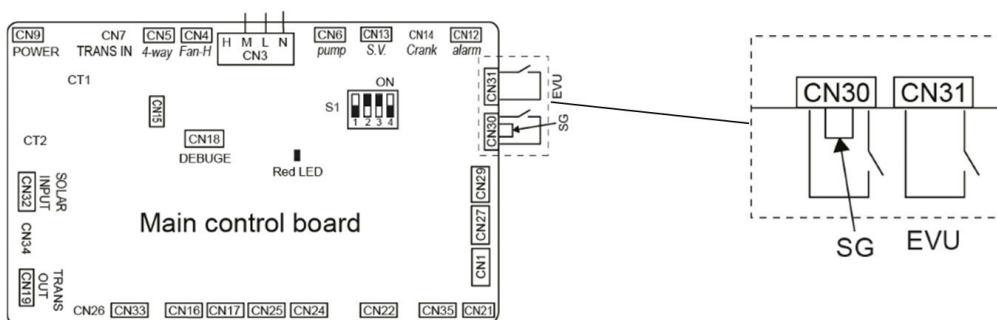
Terms and definitions

Tm = Supply Temperature

Te = Outdoor Air Temperature

SMART GRID management - Photovoltaic

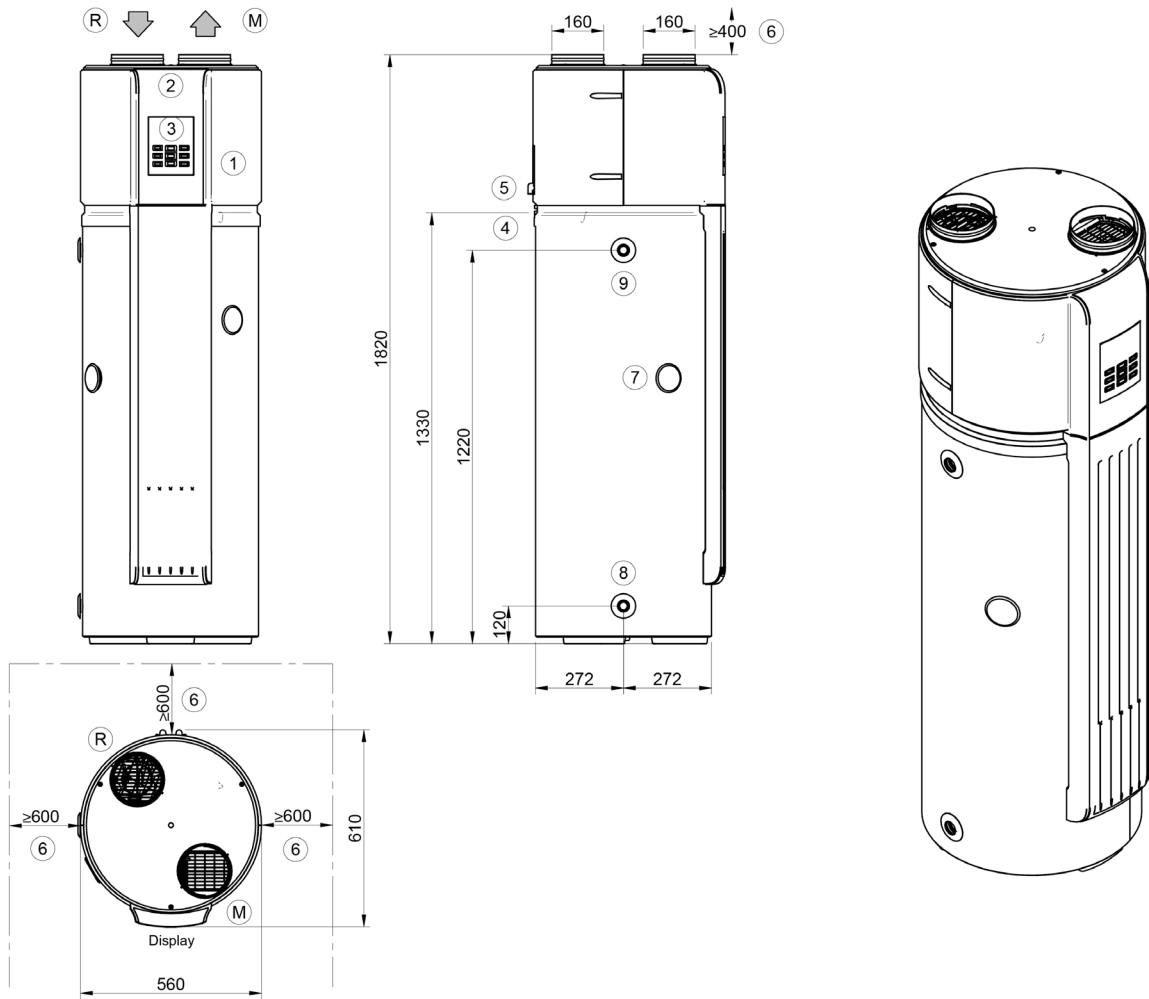
	EVO Photovoltaic signal	SG Smart grid
Unit works normally	OFF	ON
Unit is turned off	OFF	OFF
Forced unit in DHW, even if it was off, with temperature increased to 70 °C	ON	ON o OFF



Dimensional drawings

SWAN-2 190

DAASE0001_00
DATA/DATE 25/01/2021



1. Compressor enclosure
2. Electrical panel
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

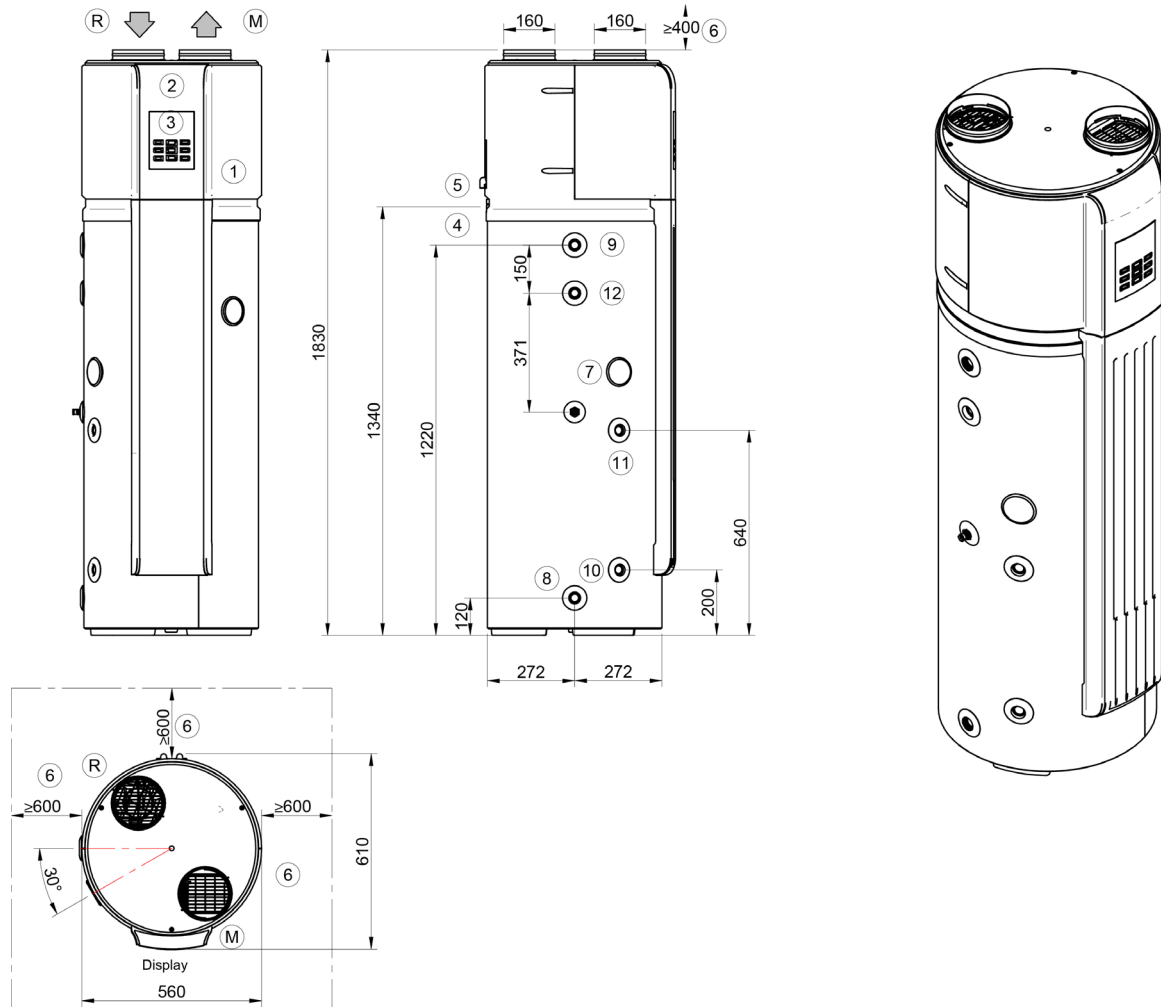
WEIGHT DISTRIBUTION

Operation weight	Kg	287
Shipping weight	Kg	126

Optional accessories may result in a substantial variation of the weight show in table

SWAN-2 190S

DAASE0001_S_00
DATA/DATE 25/01/2021



- | | |
|-------------------------|-------------------------|
| 1. Compressor enclosure | 8. Water inlet 3/4" F |
| 2. Electrical panel | 9. Water outlet 3/4" F |
| 3. Control keypad | 10. Solar inlet 3/4" F |
| 4. Power input | 11. Solar outlet 3/4" F |
| 5. Condensate drain | 12. DHW recovery 3/4" F |
| 6. Functional spaces | (R) Air inlet |
| 7. Anode rod | (M) Air supply |

WEIGHT DISTRIBUTION

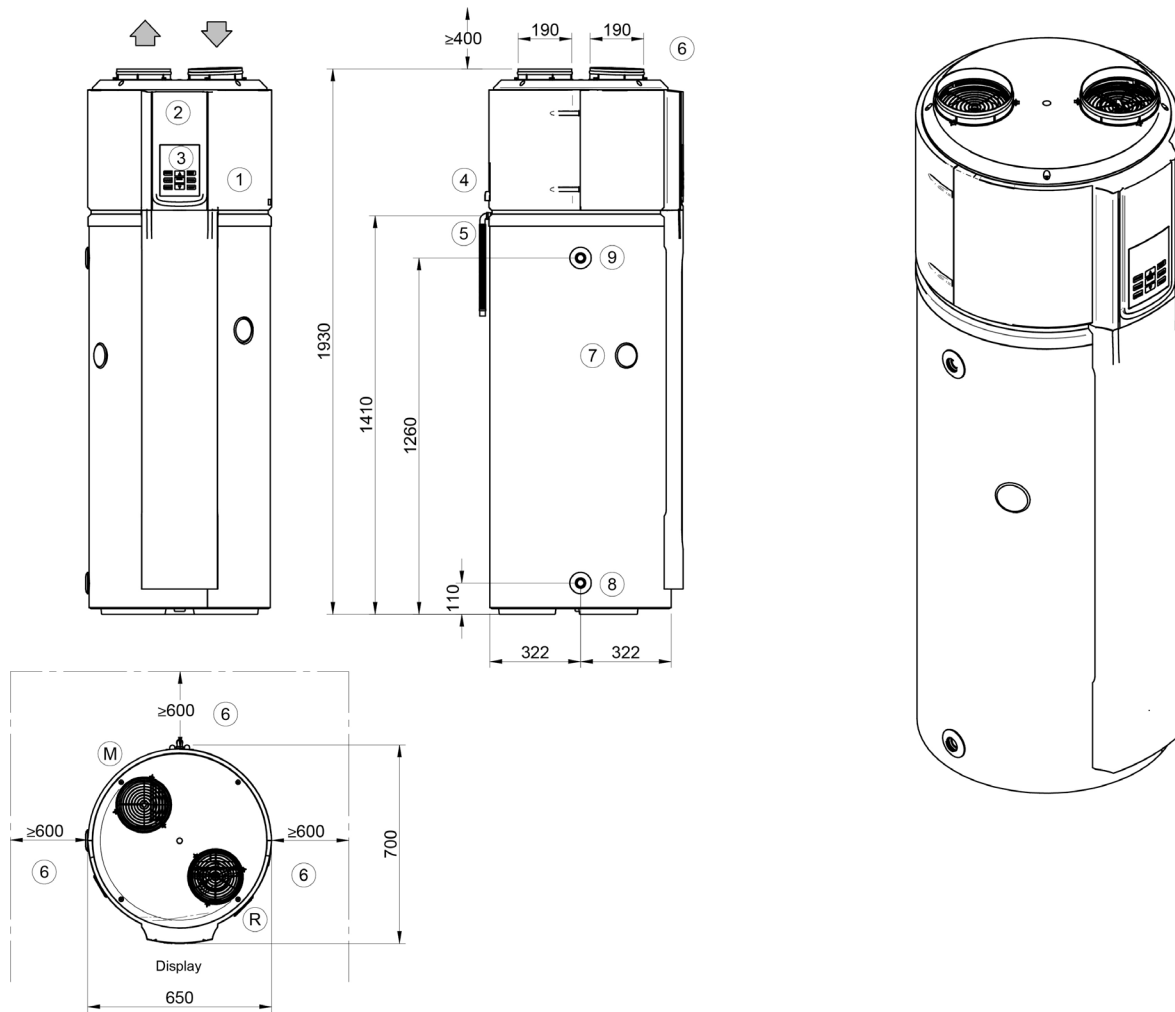
Operation weight	Kg	310
Shipping weight	Kg	140

Optional accessories may result in a substantial variation of the weight show in table

Dimensional drawings

SWAN-2 190

DAASE0002_00
DATA/DATE 25/01/2021



- | | |
|-------------------------|------------------------|
| 1. Compressor enclosure | 7. Anode rod |
| 2. Electrical panel | 8. Water inlet 3/4" F |
| 3. Control keypad | 9. Water outlet 3/4" F |
| 4. Power input | (R) Air inlet |
| 5. Condensate drain | (M) Air supply |
| 6. Functional spaces | |

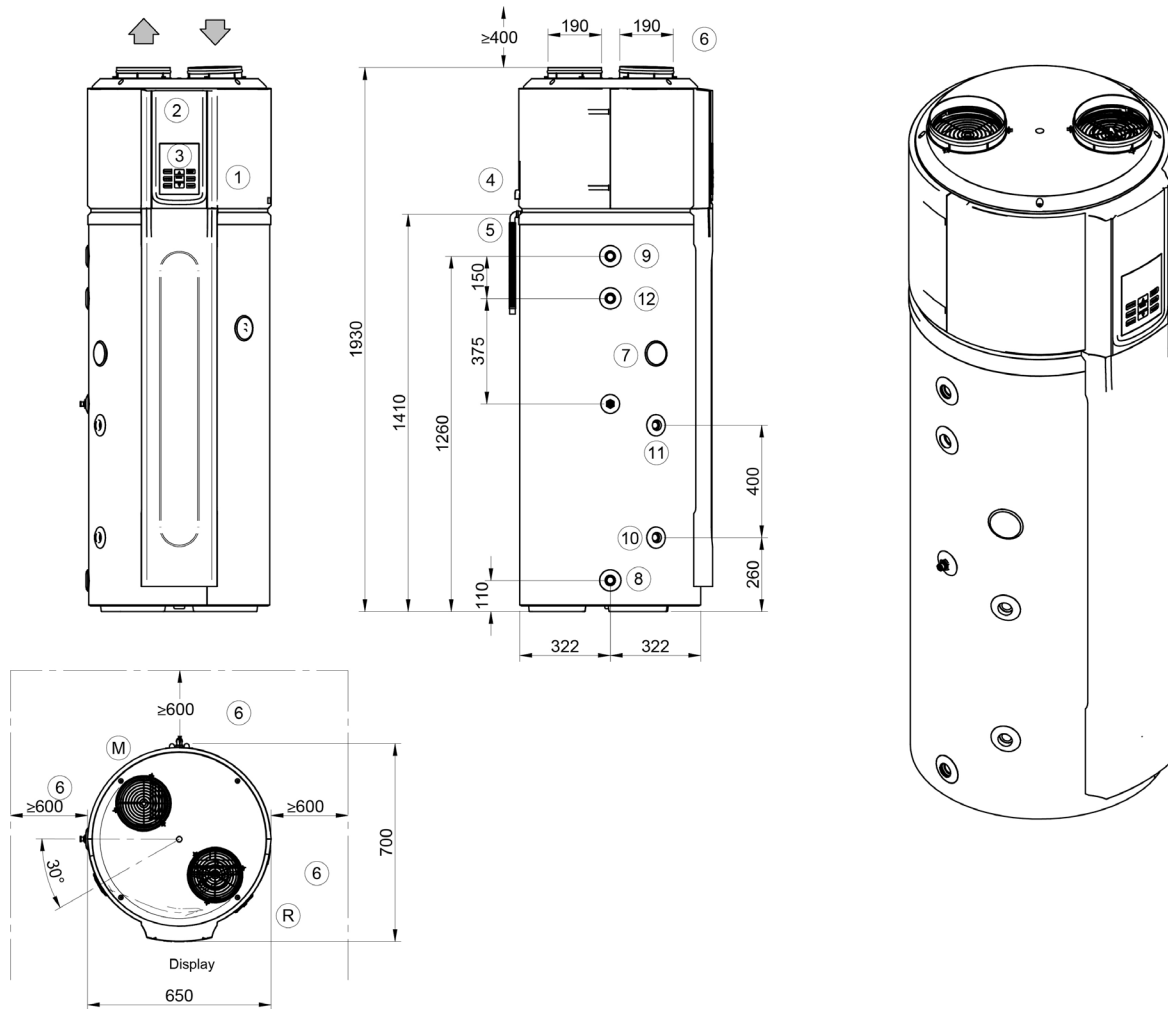
WEIGHT DISTRIBUTION

Operation weight	Kg	412
Shipping weight	Kg	153

Optional accessories may result in a substantial variation of the weight show in table

SWAN-2 190S

DAASE0002_S_00
DATA/DATE 25/01/2021



- | | |
|-------------------------|-------------------------|
| 1. Compressor enclosure | 8. Water inlet 3/4" F |
| 2. Electrical panel | 9. Water outlet 3/4" F |
| 3. Control keypad | 10. Solar inlet 3/4" F |
| 4. Power input | 11. Solar outlet 3/4" F |
| 5. Condensate drain | 12. DHW recovery 3/4" F |
| 6. Functional spaces | (R) Air inlet |
| 7. Anode rod | (M) Air supply |

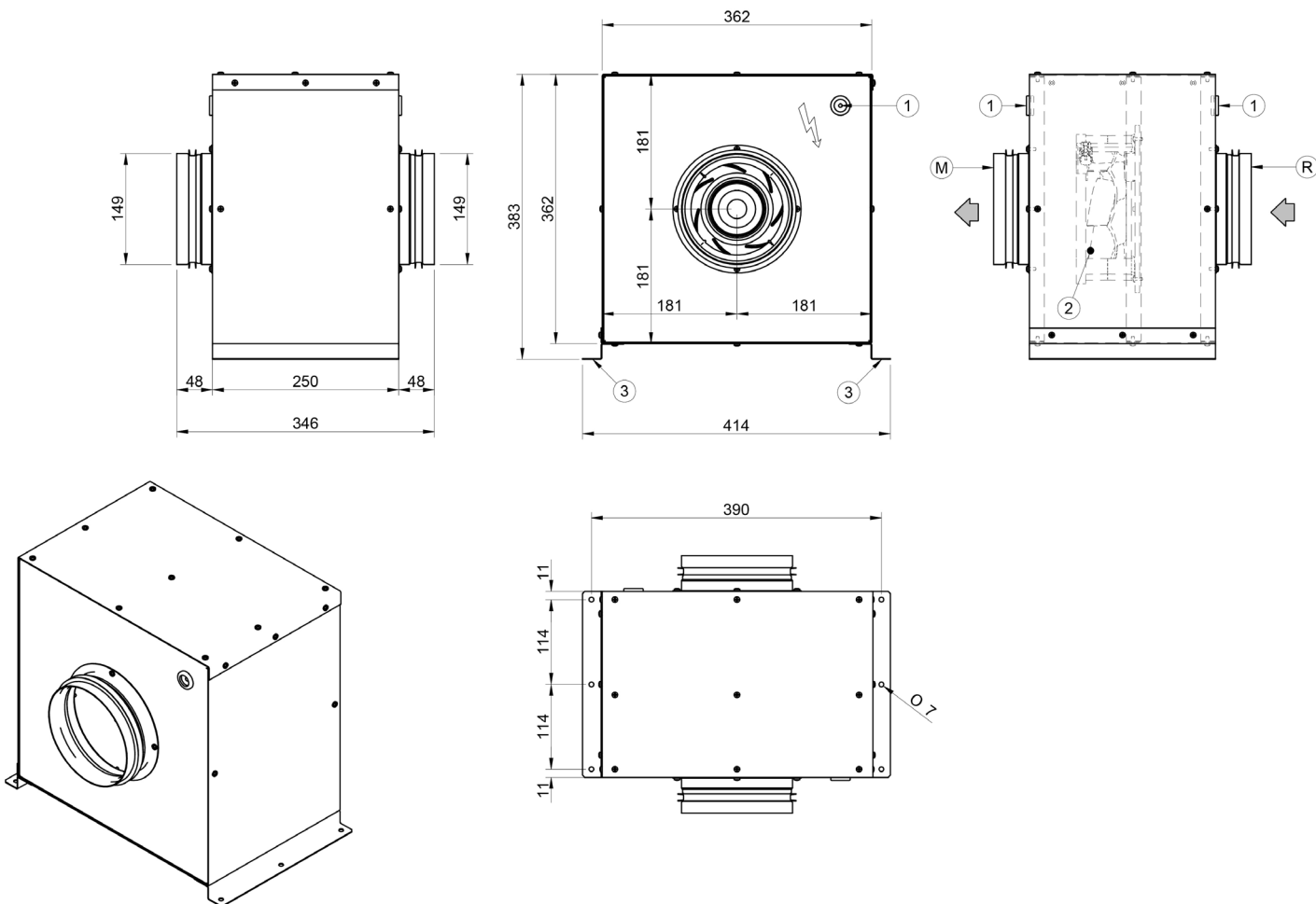
WEIGHT DISTRIBUTION

Operation weight	Kg	434
Shipping weight	Kg	172

Optional accessories may result in a substantial variation of the weight show in table

Dimensional drawings

SWAN-2 190L - PESE00001_Ventilatore aggiuntivo

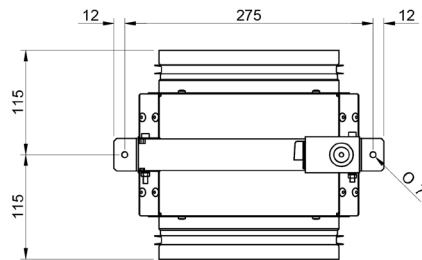
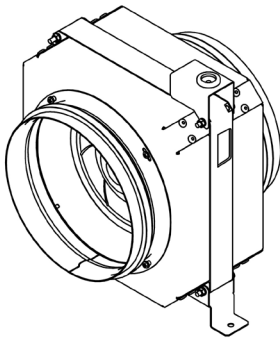
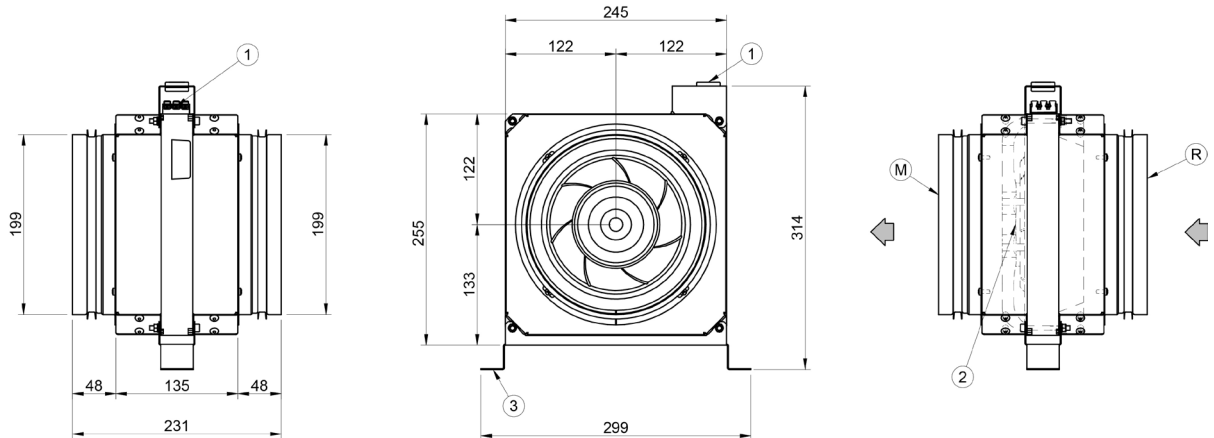


- 1. Power input
- 2. Electric fan (supply-return)
- 3. Lifting bracket (removed)
- (R) Air inlet
- (M) Air supply

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

Pagina intenzionalmente bianca

SWAN-2 300L - PESE00002_Ventilatore aggiuntivo



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

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

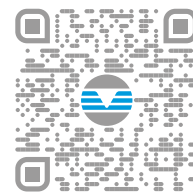
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