Planner Manual

AEROTOP EVO / AEROTOP EVO PLUS

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General Information

Features and benefits

AEROTOP EVO is the new air cooled and heat pump, equipped with Full DC Inverter technology and R-32 refrigerant with low environmental impact, designed for outdoor installation. It is available from 24 kW up to 94 kW in two different versions the AEROTOP EVO and AEROTOP EVO PLUS. The heat pumps are most effective and valuable solution both in terms of capital investment and running costs.

Energy Efficiency
SCOP up to 4,54 (EVO PLUS), which reaches the A+++ class according to EU Regulation 811/2013 (ErP) with low water temperature (LWT 35°C).
SEER up to 4,81 which makes it extremely competitive even compared to the cooling only units.
Capacity modulation from 30% to 100%.

Functionality
- Management and production of domestic hot water up to 60 °C
- Climate compensation with outdoor temperature
- Double set point adjustable
- Additional heating source management
- SG Ready
- EVU lock ready (remote on/off)
- Demand limit

Silent mode:
- speed reduction of compressors and fans

Application Versatility
All the main system components are integrated in the unit, assuring the best reliability and an easy installation:
- Hydronic assembly with 1 inverter pump
- Drain-tray with electric heater at AEROTOP EVO PLUS

Wide operating range
Outdoor air temperature max / min
AEROTOP EVO
heating mode < 44 °C / > -15 °C
domestic hot water mode < 44 °C / -15 °C
cooling mode < 48 °C / -10 °C
AEROTOP EVO PLUS
heating mode < 44 °C / > -20 °C
domestic hot water mode < 44 °C / -20 °C
cooling mode < 48 °C / -10 °C

Flow water temperature max /min
AEROTOP EVO
heating mode < 55 °C / > 25 °C
domestic hot water mode < 55 °C / > 25 °C
cooling mode < 20 °C / 0 °C
AEROTOP EVO PLUS
heating mode < 60 °C / > 25 °C
domestic hot water mode < 60 °C / > 25 °C
cooling mode < 20 °C / 0 °C

Cascade management
AEROTOP EVO has been designed for modularity. It is possible to connect up to 16 units in a local network, reaching a maximum capacity of 1470 kW. The combinations can also take place with different capacity units. The modular system, obtained by combining several modules, preserves the strengths of the single module, but multiplies the advantages:
- Increased system efficiency
- Higher reliability
- Simplified handling and installation
- Quick and easy maintenance
- Scalability

Technology
The technical solutions adopted place AEROTOP EVO on top of its category
- DC inverter technology on compressors and fans
- Electronic expansion valve
- Flow switch
- Hydrophilic battery

Tax credit
Due to its high efficiency, AEROTOP EVO may be eligible for heat pump subsidies in Your Country.

Standard unit technical specifications

Compressor
AEROTOP EVO 24 – 65
Inverter controlled rotary-type hermetic compressor equipped with a motor protection device for overheating, overcurrents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. The compressor is wrapped in a sound-absorbing hood, that reduces its sound emissions.
its sound emissions. A crankcase heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

AEROTOP EVO 79 – 105
Inverter controlled scroll-type hermetic compressor equipped with a motor protection device for overheating, over-currents and excessive temperatures of the supply gas. It is installed on anti-vibration mounts and it is equipped with oil charge. The compressor is wrapped in a sound-absorbing hood, that reduces its sound emissions and it thermally insulates it. A crankcase heater, which starts automatically, keeps the oil from being diluted by the refrigerant when the compressor stops.

Structure
Structure and base made entirely of sturdy sheet steel, thickness of 12/10, hot dip galvanized and painted, for the parts in view, with polyester powder RAL 9001 that guarantees excellent mechanical characteristics and high corrosion strength over time.

Paneling
External paneling made of sheet steel, thickness 12/10, hot dip galvanized and painted with polyester powder RAL 9001 that guarantees excellent mechanical characteristics and high corrosion strength over time. The panels can be easily removed to fully access internal components.

Internal exchanger
Direct expansion heat exchanger, braze-welded AISI 316 stainless steel plates, in pack without seals using copper as the brazing material, with low refrigerant charge and large exchange surface, complete with:
external thermal insulation no-condensation, thickness 17 mm, in expanded polypropylene (EPP);
antifreeze heater to protect the water side exchanger, preventing the formation of frost if the water temperature falls below a set value.

The water connections of the exchanger are quick-release with splined joint (Victaulic).

External exchanger
Direct expansion finned coil exchanger made with copper pipes placed on staggered rows mechanically expanded to better adhere to the fin collar. The fins are made from aluminium with hydrophilic treatment. They are appropriately distanced to ensure the maximum heat exchange efficiency. A particular refrigerant circuit prevents the formation of frost on the base of the exchanger during winter operation.

Fan
Axial fans with sickle profile blades terminating ABS ASG-20 resin reinforced with 20% glass fibre, directly coupled to the electronic controlled motor (IP23), driven by the magnetic switching of the stator. The brushless technology and the special supply increase both the life expectancy and the efficiency. As a result the electric consumption is reduced up to 50%. Fans are housed in aerodynamically shaped structures to increase efficiency and reduce noise level. The assembly is protected by accident prevention guards. Both fans and prevention guards are designed with CFD technology. Supplied with variable speed control.

Water circuit
- safety valve 6 bar
- flow switch
- antifreeze heaters to protect the water side exchanger to prevent ice from forming if the water temperature drops below the pre-set value
- drain valve
- Temperature sensors
- relief valve

Refrigeration circuit
The refrigeration circuit is complete with:
- electronic expansion valve;
- 4-way reverse cycle valve;
- High pressure safety pressure switch
- Low pressure safety switch
- liquid receiver;
- liquid separator;
- oil separator;
- High pressure transducer
- safety thermostat against compressor drain overheating;
- Temperature sensors
- Low pressure safety valve
- Economizer exchanger (only for size 79 – 105)

Electrical panel
The Power Section includes:
- general protection fuses;
- main disconnecting switch;
- Auxiliary components protection fuse
- AC filter on power supply
- Power supply phase sequence protection
- Protection for compressor overload
- Sensor malfunction protection
- EMC residential compliancy
- phase monitor (size 79 - 105).

The control section includes:
- compressor timing and protection
- Relay for remote cumulative fault signal
- Defrosting cycle optimization
- Condenser control
- Potential-free contact for remote on-off control
- dry contact for remote HEAT/COOL mode control
- dry contact for auxiliary generator management

- The control keypad includes:
- wired controller with dot-matrix display;
- Multifunction keys for ON/OFF control
- Cold, hot and auto operation mode
- Display and alarm reset
- Daily or weekly schedule
- separated power adaptor for remote use;
- Serial port with Modbus (RS485) output for remote communication

Test
Unit subjected to factory-tested in specific steps and test pressure of the piping of the refrigerant circuit (with nitrogen and hydrogen), before shipping them.

General Information

Refrigerant Information

Refrigerant Information
This product contains fluorinated greenhouse gases covered by the Kyoto protocol. Do not discharge gas into air.
Refrigerant type: R32

Characteristics of R32 refrigerant:

- minimum environmental impact thanks to the low Global Warming Potential GWP
- low flammability, class A2L according to ISO 817
- low combustion speed
- low toxicity
  The refrigerant quantity is indicated on the unit plate
  Quantity factory-loaded refrigerant and equivalent CO2 tons:

AEROTOP EVO	Refrigerant (kg)	Equivalent CO_2 tons
24 – 27 – 32	7,9	5,33
48 – 54 – 65	14	9,45
79 – 88 – 105	17,5	11,8

AEROTOP EVO PLUS	Refrigerant (kg)	Equivalent CO_2 tons
24 – 27 – 32	7,9	5,33
48 – 54– 65	14	9,45
79 – 88	17,5	11,8

Physical characteristics of the R32 refrigerant		
Safety class (ISO	A2L	
GWP	675	
LFL Low flammability limit	0,307	Kg/m^3 @ 60°C
BV Burning velocity	6,7	cm/s
Boiling point	-52	°C
GWP	675	100 yr ITH
GWP	677	ARS 100 yr ITH
Self-ignition temperature	648	°C

General Information

Built-in options

Scope delivery	Description
Additional board for advanced functions management	Multifunction board installed in the electrical panel of the unit for the advanced functions management. The available digital contacts allow the following remote functions: • remote on/off • heat/cool (summer/winter switch) • DHW production • Double set-point management • Sgready function • EVUlock function • Demand limit • Activation of super-silenced acoustic version (selectable on the user interface) The additional board does not allow the simultaneous use of digital inputs and Modbus signal.
User side hydronic group with 1 inverter pump	Hydronic unit made of a centrifugal electric pump, adjusted by way of inverter, body and propeller made in AISI 304 steel. The electric pump is equipped with three-phase electric motor with IP55 protection and complete with heat formed insulating casing. The water connection are Victaulic 1 1/2“, resp. 2” Victaulic.
Steel mesh strainer on the water side	The device stops the exchanger from being clogged by any impurities which are in the hydraulic circuit. The mechanical steel mesh strainer must be placed on the water input line. It can be easily dismantled for periodical maintenance and cleaning.
Copper/aluminum condenser coil with acrylic lining (only AEROTOP EVO PLUS)	Coils with copper pipes and aluminium fins with acrylic coating. They can be used in environments containing airborne concentrations of salt and other moderately aggressive agents. The treatment entails: Cooling capacity variation -2.7%. Compressor power input variation +4.2%. Operating range reduction -2.1°C.
Finned coil protection grilles	The grilles protect the external coil from accidental contact with objects or persons. Ideal for installation in places where persons can pass from, such as car parks, terraces, etc.
Anti-vibration mount support	The rubber ant vibration mounts are attached in special housing on the support frame and serve to smooth the vibrations produced by the unit thus reducing the noise transmitted to the support structure.
Drain tray with electric heater (only AEROTOP EVO PLUS)	The drain tray made of steel AISI 316 allows the collection and discharge of the condensate The two trays, located under the coils, are equipped with Mylar antifreeze electric heaters applied to the bottom and a drain located on the rear part, on the water connection side. The electric heaters are thermostatically controlled and are activated according to the external air temperature (Ta < +5°C).

Built-in options	AEROTOP EVO	AEROTOP EVO PLUS
Additional board for advanced functions management	X	X
User side hydronic group with 1 inverter pump	X	X
Steel mesh strainer on the water side	X	X
Copper/aluminum condenser coil with acrylic lining	-	X
Finned coil protection grilles	X	X
Anti-vibration mount support	X	X
Drain tray with electric heater	-	X

Technical data

Performances

AEROTOP EVO	Notes		24	27	32	48
Heating						
Heating capacity (EN 14511:2018) (A7/W35)	1,8	kW	27,9	32,3	38,0	54,4
COP (EN 14511:2018)	2	-	4,36	4,01	3,70	4,30
ErP Space Heating Energy Class - AVERAGE Climate - W35	7	-	A++	A++	A++	A++
Water flow-rate		l/s	1.34	1.55	1.82	2.61
Water flow-rate		m3/h	4.82	5.58	6.57	9.41
SCOP - MEDIUM Climate - W35	9	-	4,29	4,23	4,11	4,22
ηs,h - MEDIUM climate - W35	10	%	169	166	161	166
Heating capacity (EN 14511:2018) (A7/W45)	3	kW	27,0	29,8	35,7	52,5
COP (EN 14511:2018)	2	-	3,21	3,20	3,15	3,33
Cooling						
Cooling capacity (EN 14511:2018) (A35/W18)	4,8	kW	33,2	37,2	41,9	63,7
EER (EN 14511:2018)	5	-	3,89	3,68	3,39	3,93
Water flow-rate	4	l/s	1,59	1,78	2,01	3,05
User side exchanger pressure drops	4	kPa	53,1	64,1	78,3	48,9
Cooling capacity (EN 14511:2018) (A35/W7)	6	kW	25,2	27,6	32,2	45,7
EER (EN 14511:2018)	5	-	3,03	2,75	2,74	2,96
SEER	9	-	4,50	4,40	4,24	4,04
ηs,c	11	%	177	173	167	159
Water flow-rate	6	l/s	1,20	1,32	1,53	2,17
User side exchanger pressure drops	6	kPa	33,3	38,7	50,0	28,0

Technical data

Performances

The Product is compliant with the ErP (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 811/2013 (rated heat output ≤ 70 kW at specified reference conditions) and the Commission delegated Regulation (EU) No 813/2013 (rated heat output ≤ 400 kW at specified reference conditions)
Contains fluorinated greenhouse gases (GWP 675)

1. Entering/leaving water temperature user side 30/35 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
2. COP (EN 14511:2018) Heating performance coefficient. Ratio between delivered heating capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculed by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + thepower absorbed by the auxiliary electrical circuit.
3. Entering/leaving water temperature user side 40/45 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
4. Entering/leaving water temperature user side 23/18 °C, Entering external exchanger air temperature 35 °C
5. EER (EN 14511:2018) cooling performance coefficient. Ratio between delivered coolimg capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculated by adding the power absorbed by the compressor + the powerabsorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome presure drop outside + thepower absorbed by the auxiliary electrical circuit.
6. Entering/leaving water temperature user side 12/7 °C, Entering external exchanger air temperature 35 °C
7. Seasonal Space Heating Energy Efficiency Class according to Commission delegated Regulation (EU) No 811/2013. W = Water outlet temperature (°C)
8. Data referred to unit operation with inverter frequency optimized for this application.
9. Data calculated in compliance with EN 14825:2018.
10. Seasonal energy efficiency in heating EN 14825:2018.
11. Seasonal energy efficiency in cooling EN 14825:2018.
12. Entering/leaving water temperature user side 50/55 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)

Technical data

Performances

AEROTOP EVO	Notes		54	65	79	88	105
Heating							
Heating capacity (EN 14511:2018) (A7/W35)	1,8	kW	58,7	67,1	84,8	94,2	101
COP (EN 14511:2018)	2	-	4,06	3,98	4,01	3,67	3,64
ErP Space Heating Energy Class - AVERAGE Climate - W35	7	-	A++	A++	A++	A++	A++
Water flow-rate		l/s	2.82	3.22	4.07	4.52	4.83
Water flow-rate		m3/h	10.1	11.6	14.7	16.3	17.4
SCOP - MEDIUM Climate - W35	9	-	4,19	4,17	4,12	4,08	4,13
ηs,h - MEDIUM climate - W35	10	%	165	164	162	160	162
Heating capacity (EN 14511:2018) (A7/W45)	3	kW	57,9	66,6	78,5	91,2	102
COP (EN 14511:2018)	2	-	3,29	3,14	3,34	3,05	2,88
Cooling							
Cooling capacity (EN 14511:2018) (A35/W18)	4,8	kW	70,0	79,8	98,4	111	117
EER (EN 14511:2018)	5	-	3,66	3,38	3,78	3,47	3,35
Water flow-rate	4	l/s	3,35	3,83	4,72	5,31	5,59
User side exchanger pressure drops	4	kPa	57,1	70,9	59,2	73,0	80,2
Cooling capacity (EN 14511:2018) (A35/W7)	6	kW	52,1	60,7	74,3	86,2	94,2
EER (EN 14511:2018)	5	-	2,88	2,75	2,91	2,73	2,63
SEER	9	-	4,09	4,07	3,96	3,91	3,87
ηs,c	11	%	161	160	155	153	152
Water flow-rate	6	l/s	2,48	2,89	3,54	4,10	4,49
User side exchanger pressure drops	6	kPa	34,8	44,7	35,4	46,2	54,2

Technical data

Performances

The Product is compliant with the ErP (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 811/2013 (rated heat output ≤ 70 kW at specified reference conditions) and the Commission delegated Regulation (EU) No 813/2013 (rated heat output ≤ 400 kW at specified reference conditions)
Contains fluorinated greenhouse gases (GWP 675)

1. Entering/leaving water temperature user side 30/35 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
2. COP (EN 14511:2018) Heating performance coefficient. Ratio between delivered heating capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculed by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + thepower absorbed by the auxiliary electrical circuit.
3. Entering/leaving water temperature user side 40/45 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
4. Entering/leaving water temperature user side 23/18 °C, Entering external exchanger air temperature 35 °C
5. EER (EN 14511:2018) cooling performance coefficient. Ratio between delivered coolimg capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculated by adding the power absorbed by the compressor + the powerabsorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome presure drop outside + thepower absorbed by the auxiliary electrical circuit.
6. Entering/leaving water temperature user side 12/7 °C, Entering external exchanger air temperature 35 °C
7. Seasonal Space Heating Energy Efficiency Class according to Commission delegated Regulation (EU) No 811/2013. W = Water outlet temperature (°C)
8. Data referred to unit operation with inverter frequency optimized for this application.
9. Data calculated in compliance with EN 14825:2018.
10. Seasonal energy efficiency in heating EN 14825:2018.
11. Seasonal energy efficiency in cooling EN 14825:2018.
12. Entering/leaving water temperature user side 50/55 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)

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Performances

AEROTOP EVO PLUS	Notes		24	27	32	48
Heating						
Heating capacity (EN 14511:2018) (A7/W35)	1,8	kW	26,1	30,5	37,0	51,5
COP (EN 14511:2018)	2	-	4,48	4,33	4,22	4,54
ErP Space Heating Energy Class - AVERAGE Climate - W35	7	-	A+++	A+++	A+++	A+++
Water flow-rate		l/s	1.25	1.46	1.77	2.47
Water flow-rate		m3/h	4.51	5.27	6.38	8.9
SCOP - MEDIUM Climate - W35	9	-	4,54	4,49	4,44	4,46
ηs,h - MEDIUM climate - W35	10	%	179	177	175	175
Heating capacity (EN 14511:2018) (A7/W45)	3	kW	24,3	28,8	34,2	50,5
COP (EN 14511:2018)	2	-	3,33	3,27	3,20	3,55
Heating capacity (EN 14511:2018) (A7/W55)	12	kW	23,0	27,7	32,6	46,5
COP (EN 14511:2018)	2	-	2,54	2,40	2,33	2,71
ErP Space Heating Energy Class - AVERAGE Climate - W55	7	-	A++	A++	A++	A++
SCOP - MEDIUM Climate - W55	9	-	3,24	3,22	3,19	3,24
ηs,h - MEDIUM Climate - W55	10	%	127	126	125	127
Cooling						
Cooling capacity (EN 14511:2018) (A35/W18)	4,8	kW	29,9	34,6	38,9	59,1
EER (EN 14511:2018)	5	-	4,31	3,97	3,63	4,11
Water flow-rate	4	l/s	1,43	1,66	1,87	2,83
User side exchanger pressure drops	4	kPa	44,6	56,8	69,3	43,3
Cooling capacity (EN 14511:2018) (A35/W7)	6	kW	24,1	26,6	30,3	43,8
EER (EN 14511:2018)	5	-	3,21	2,93	2,87	3,10
SEER	9	-	4,81	4,65	4,53	4,32
ηs,c	11	%	189	183	178	170
Water flow-rate	6	l/s	1,14	1,27	1,44	2,09
User side exchanger pressure drops	6	kPa	30,7	36,4	45,2	26,2

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Performances

The Product is compliant with the ErP (Energy Related Products) European Directive. It includes the Commission delegated Regulation (EU) No 811/2013 (rated heat output ≤ 70 kW at specified reference conditions) and the Commission delegated Regulation (EU) No 813/2013 (rated heat output ≤ 400 kW at specified reference conditions)
Contains fluorinated greenhouse gases (GWP 675)

1. Entering/leaving water temperature user side 30/35 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
2. COP (EN 14511:2018) Heating performance coefficient. Ratio between delivered heating capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculed by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + thepower absorbed by the auxiliary electrical circuit.
3. Entering/leaving water temperature user side 40/45 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
4. Entering/leaving water temperature user side 23/18 °C, Entering external exchanger air temperature 35 °C
5. EER (EN 14511:2018) cooling performance coefficient. Ratio between delivered coolimg capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculated by adding the power absorbed by the compressor + the powerabsorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome presure drop outside + thepower absorbed by the auxiliary electrical circuit.
6. Entering/leaving water temperature user side 12/7 °C, Entering external exchanger air temperature 35 °C
7. Seasonal Space Heating Energy Efficiency Class according to Commission delegated Regulation (EU) No 811/2013. W = Water outlet temperature (°C)
8. Data referred to unit operation with inverter frequency optimized for this application.
9. Data calculated in compliance with EN 14825:2018.
10. Seasonal energy efficiency in heating EN 14825:2018.
11. Seasonal energy efficiency in cooling EN 14825:2018.
12. Entering/leaving water temperature user side 50/55 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)

Technical data

Performances

AEROTOP EVO PLUS	Notes		54	65	79	88
Heating						
Heating capacity (EN 14511:2018) (A7/W35)	1,8	kW	55,5	64,1	78,6	87,5
COP (EN 14511:2018)	2	-	4,33	4,15	4,31	3,95
ErP Space Heating Energy Class - AVERAGE Climate - W35	7	-	A+++	A++	A++	A++
Water flow-rate		l/s	2.67	3.08	3.77	4.2
Water flow-rate		m3/h	9.6	11.1	13.6	15.1
SCOP - MEDIUM Climate - W35	9	-	4,46	4,41	4,33	4,29
ηs,h - MEDIUM climate - W35	10	%	175	173	170	169
Heating capacity (EN 14511:2018) (A7/W45)	3	kW	54,7	63,4	74,9	85,2
COP (EN 14511:2018)	2	-	3,51	3,32	3,48	3,23
Heating capacity (EN 14511:2018) (A7/W55)	12	kW	51,9	56,7	75,7	86,1
COP (EN 14511:2018)	2	-	2,68	2,70	2,54	2,44
ErP Space Heating Energy Class - AVERAGE Climate - W55	7	-	A++	A++	A++	A+
SCOP - MEDIUM Climate - W55	9	-	3,21	3,19	3,20	3,16
ηs,h - MEDIUM Climate - W55	10	%	125	125	125	123
Cooling						
Cooling capacity (EN 14511:2018) (A35/W18)	4,8	kW	65,8	77,7	95,0	103
EER (EN 14511:2018)	5	-	3,68	3,36	4,03	3,61
Water flow-rate	4	l/s	3,15	3,73	4,55	4,94
User side exchanger pressure drops	4	kPa	51,6	67,9	55,6	64,4
Cooling capacity (EN 14511:2018) (A35/W7)	6	kW	49,7	56,8	70,1	80,2
EER (EN 14511:2018)	5	-	3,03	2,85	3,06	2,86
SEER	9	-	4,32	4,25	4,24	4,23
ηs,c	11	%	170	167	167	166
Water flow-rate	6	l/s	2,36	2,70	3,34	3,82
User side exchanger pressure drops	6	kPa	32,1	40,1	31,9	40,6

Technical data

Performances

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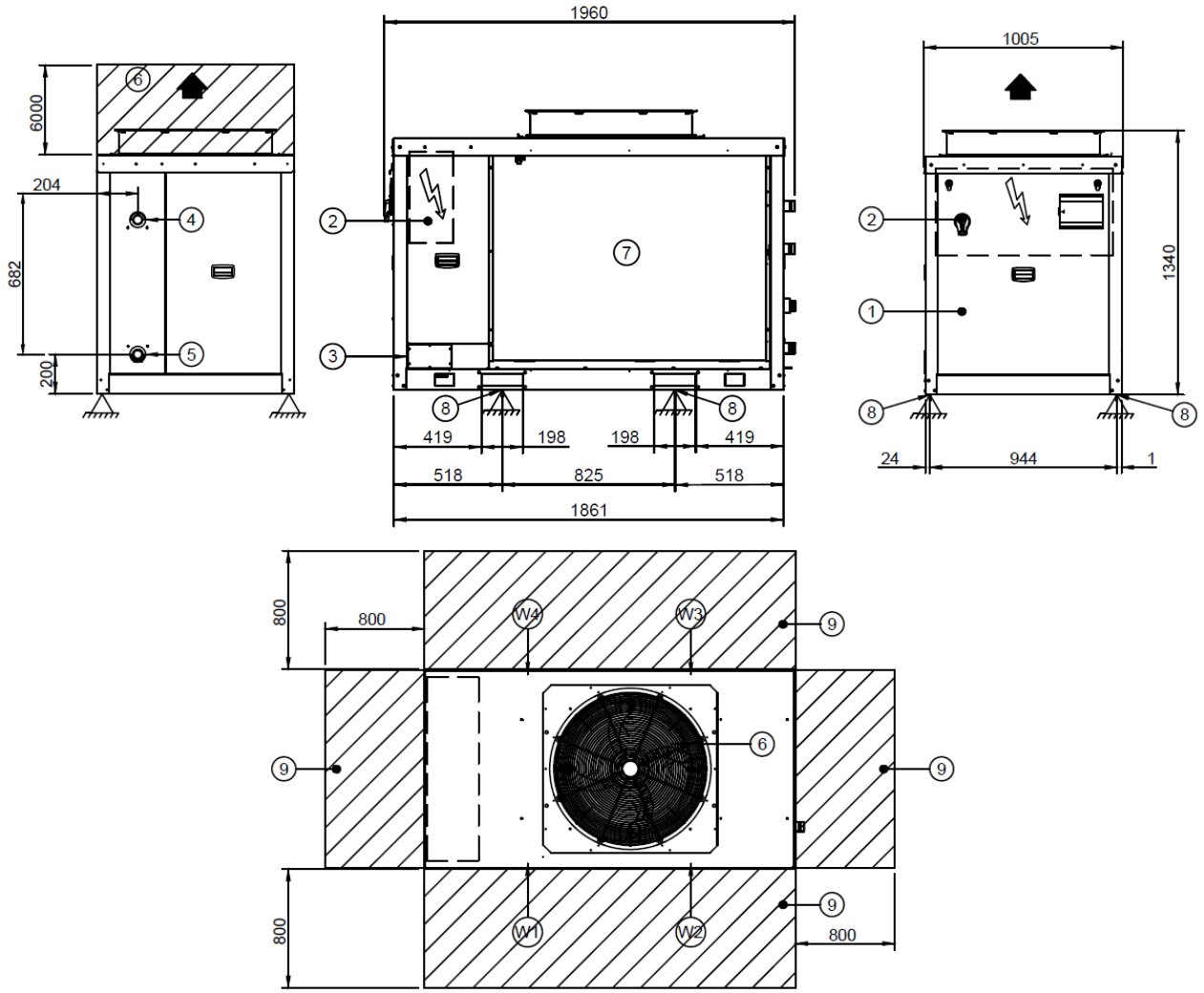
Contains fluorinated greenhouse gases (GWP 675)

1. Entering/leaving water temperature user side 30/35 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
2. COP (EN 14511:2018) Heating performance coefficient. Ratio between delivered heating capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculed by adding the power absorbed by the compressor + the power absorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome pressure drop outside + thepower absorbed by the auxiliary electrical circuit.
3. Entering/leaving water temperature user side 40/45 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)
4. Entering/leaving water temperature user side 23/18 °C, Entering external exchanger air temperature 35 °C
5. EER (EN 14511:2018) cooling performance coefficient. Ratio between delivered coolimg capacitu and power input in compliance with EN 14511:2018. The overall power absorbed is calculated by adding the power absorbed by the compressor + the powerabsorbed by the fan - the percentage value of the fan to overcome external pressure drop + the power absorbed by the pump - the percentage value of the pump to overcome presure drop outside + thepower absorbed by the auxiliary electrical circuit.
6. Entering/leaving water temperature user side 12/7 °C, Entering external exchanger air temperature 35 °C
7. Seasonal Space Heating Energy Efficiency Class according to Commission delegated Regulation (EU) No 811/2013. W = Water outlet temperature (°C)
8. Data referred to unit operation with inverter frequency optimized for this application.
9. Data calculated in compliance with EN 14825:2018.
10. Seasonal energy efficiency in heating EN 14825:2018.
11. Seasonal energy efficiency in cooling EN 14825:2018.
12. Entering/leaving water temperature user side 50/55 °C, Entering external exchanger air temperature 7 °C (R.H. = 85%)

Technical Data

Dimensional drawings

AEROTOP EVO 24 - 27 - 32
AEROTOP EVO PLUS 24 - 27 - 32



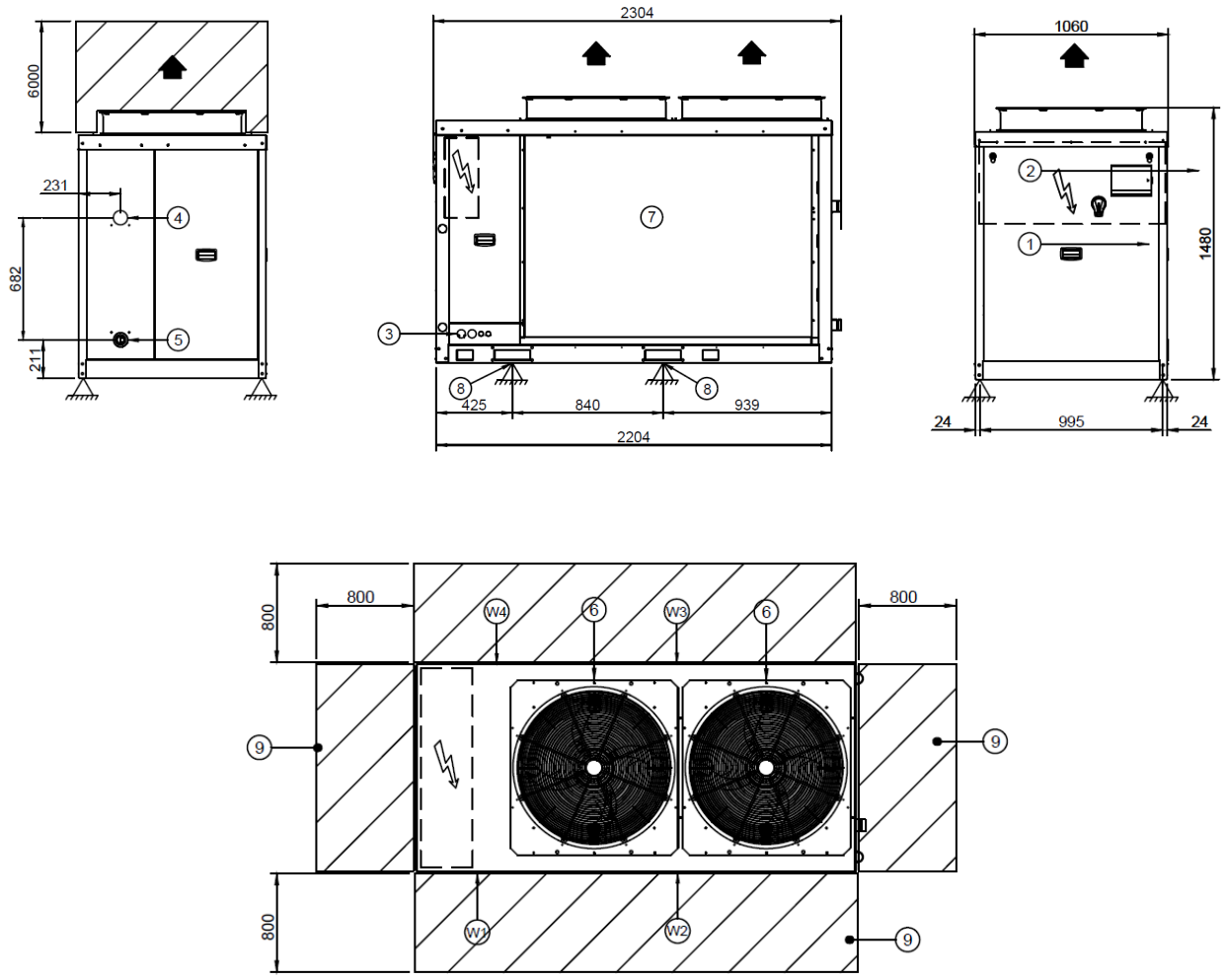
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Inlet water connection Victaulic 1" 1/2
5. Outlet water connection Victaulic 1” 1/2
6. Electrical fan
7. External exchanger
8. Unit fixing holes
9. Functional spaces

AEROTOP EVO AEROTOP EVO PLUS	**24 - 27 - 32**	
Length	mm	1960
Depth	mm	1005
Height	mm	1340
W1 Support point	kg	98
W2 Support point	kg	78
W3 Support point	kg	98
W4 Support point	kg	78
Operation weight	kg	323
Shipping weight	kg	333

Technical Data

Dimensional drawings

AEROTOP EVO 48 - 54 - 65
AEROTOP EVO PLUS 48 - 54 - 65



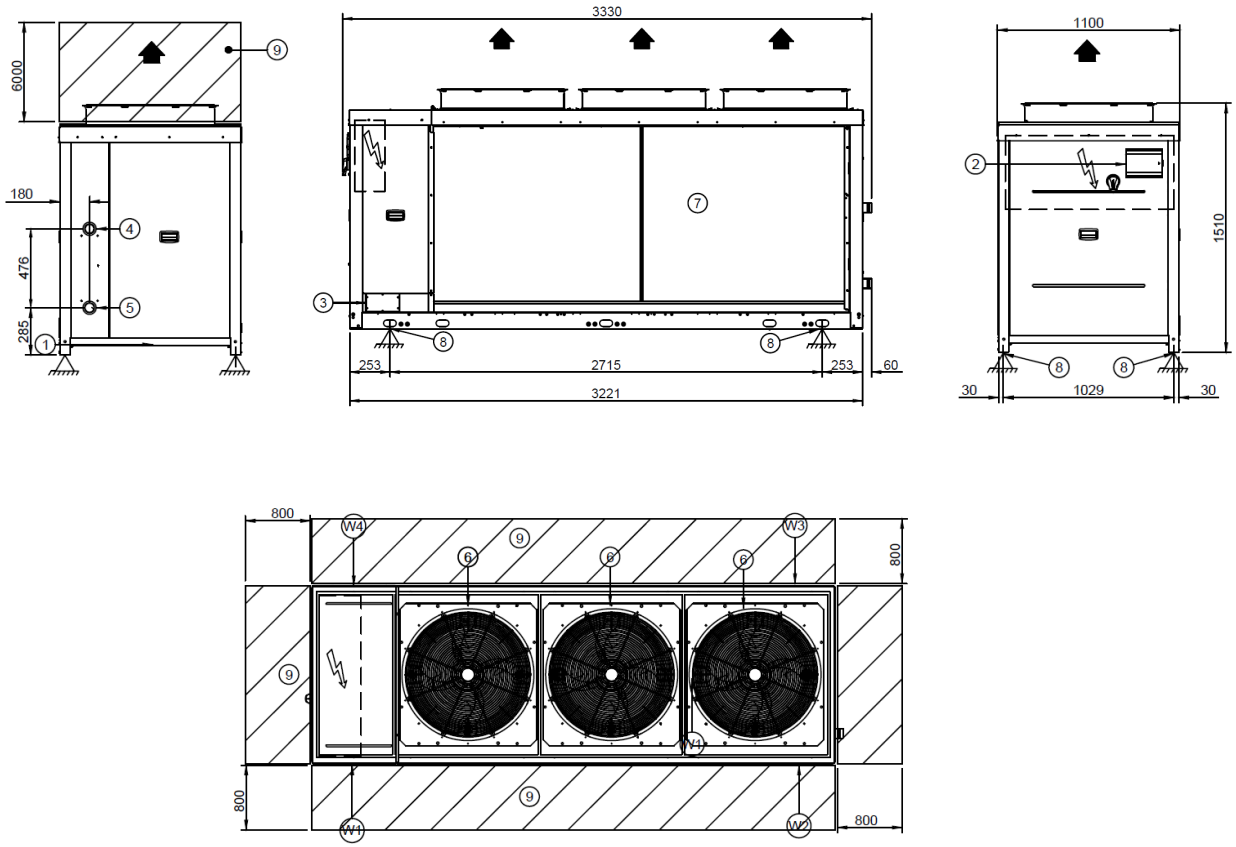
1. Compressor enclosure
2. Electrical panel
3. Power input
4. Inlet water connection Victaulic 2"
5. Outlet water connection Victaulic 2”
6. Electrical fan
7. External exchanger
8. Unit fixing holes
9. Functional spaces

AEROTOP EVO AEROTOP EVO PLUS	**48 - 54 - 65**	
Length	mm	2304
Depth	mm	1060
Height	mm	1480
W1 Support point	kg	184
W2 Support point	kg	102
W3 Support point	kg	177
W4 Support point	kg	95
Operation weight	kg	500
Shipping weight	kg	513

Technical Data

Dimensional drawings

AEROTOP EVO 79 - 88 - 105*
AEROTOP EVO PLUS 79 - 88



1. Compressor enclosure
2. Electrical panel
3. Power input
4. Inlet water connection Victaulic "
5. Outlet water connection Victaulic 2”
6. Electrical fan
7. External exchanger
8. Unit fixing holes
9. Functional spaces

AEROTOP EVO AEROTOP EVO PLUS	79 - 88 - 105* 79 - 88	
Length	mm	3330
Depth	mm	1100
Height	mm	1510
W1 Support point	kg	280
W2 Support point	kg	135
W3 Support point	kg	135
W4 Support point	kg	280
Operation weight	kg	830
Shipping weight	kg	830

* only AEROTOP EVO

Technical data

Construction

AEROTOP EVO AEROTOP EVO PLUS		24	27	32	48	54	65
Compressor							
Compressor type		Rotary Inverter					
Refrigerant		R32					
N° compressor	Nr	1			2		
Oil charge	l	2,3			4,6		
Refrigerant charge	kg	7,9			14,0		
N° circuits	Nr	1					
User side exchanger							
Type of internal exchanger		plate heat exchanger					
Water content	l	2,44			5,17		
External exchanger							
Type of external exchanger		Copper / aluminum condenser coil with hydrophilic treatment					
Number of coils		2					
External Section Fans							
Type of fans		axial					
N° fans	Nr	1			2		
Standard air-flow EVO	m^3/h	13500	13500	14760	27000	27000	29520
Standard air-flow EVO PLUS	m^3/h	11520	13500	13500	23040	27000	27000
Installed unit power	kW	0,9	0,9	0,9	0,9	0,9	0,9
Water circuit							
Water fittings		Victaulic 1” 1/2			Victaulic 2”		
Maximum water side pressure	kpa	1000					
Minimum circuit water volume in heating	l	200			400		
Minimum circuit water volume in cooling	l	80			150		

* only AEROTOP EVO

Technical data

Construction

AEROTOP EVO AEROTOP EVO PLUS		79	88	105*
Compressor				
Compressor type		Scroll Inverter		
Refrigerant		R32		
N° compressor	Nr	2		
Oil charge	l	6,0		
Refrigerant charge	kg	17,5		
N° circuits	Nr	1		
User side exchanger				
Type of internal exchanger		plate heat exchanger		
Water content	l	7,80		
External exchanger				
Type of external exchanger		Copper / aluminium condenser coil with hydrophilic treatment		
Number of coils		2		
External Section Fans				
Type of fans		axial		
N° fans	Nr	3		
Standard air-flow EVO	m^3/h	40500	40500	32400
Standard air-flow EVO PLUS	m^3/h	34560	40500	n.a.
Installed unit power	kW	0,9	0,9	0,9
Water circuit				
Water fittings		Victaulic 2”		
Maximum water side pressure	kpa	1000		
Minimum circuit water volume in heating	l	650		
Minimum circuit water volume in cooling	l	200		

* only AEROTOP EVO

Technical data

Electrical data

Supply voltage 400/3/50+N

AEROTOP EVO AEROTOP EVO PLUS		24	27	32	48	54	65	79	88	105*
F.L.A. - Full load current at max admissible conditions										
F.L.A. - Total	A	18,5	19,0	20,0	37,5	38,5	40,5	57,0	59,0	62,0
F.L.I. - Full load power input at max admissible conditions										
F.L.I. - Total	kW	12,0	12,4	13,0	24,4	25,1	26,4	37,1	38,4	40,4
M.I.C. - Full load power input at max admissible										
M.I.C. - Total	A	10,0	10,0	10,0	20,3	20,3	20,3	31,0	31,0	31,0

M.I.C.=Maximum unit starting current. The M.I.C. value is obtained adding the max. compressor starting current of the highest size to the power input at max. admissible condi-tions (F.L.A.) of the remaining electric components.

Power supply 400/3/50 (+ NEUTRAL) +/- 10%. Maximum Phase Unbalance: 2%.
For non standard voltage please contact ELCO technical office

* only AEROTOP EVO

Wiring cross sections and fuse protection

AEROTOP EVO AEROTOP EVO PLUS	Remote ON - OFF External power supply			
	Power supply	Switch manual	fuses	Wiring (Lmax = 20 mt)
24 - 32	380-415V 3N~ 50Hz	50A	32A	$10mm^2$ X 5
48 - 65	380-415V 3N~ 50Hz	100A	63A	$16mm^2$ X 5
79 - 105*	380-415V 3N~ 50Hz	100A	80A	$25mm^2$ X 5

Deviating connection lengths and electrical fuses must be calculated according to the country-specific regulations.

* only AEROTOP EVO

Technical data

Electrical data

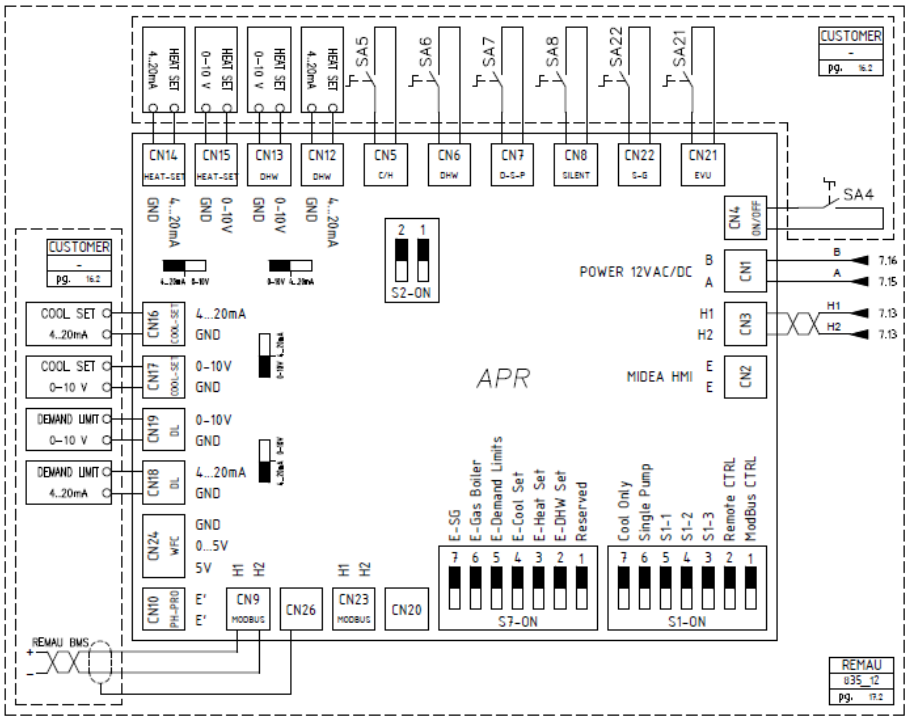
EVU-Lock
Special tariffs with reduced electricity prices are available from many energy supply companies (EVU) for the operation of heat pumps. In return, the utility company is allowed to shut down the heat pump at certain times and the building cannot be reheated by the heat pump for this period. Coverage is then usually provided by a buffer storage tank. In solidly built houses, especially in connection with underfloor heating, blocking periods can be bridged by the storage mass. A buffer tank or second heat generator is then not required. If a second heat generator (bivalent parallel operation) is available, the blocking time can be neglected for the dimensioning of the heat pump.

There are some country-specific differences for blocking periods:
Tariffs in Germany are regulated according to the Federal Tariff Ordinance (Federal tariff regulation heat pumps) on Heat Pumps. Shutdown can occur up to 3 times per day for two hours each. Shutdown can be time-controlled, demand-controlled (balancing of load peaks) or not at all. A distinction is made between hard and soft shutdown. In the case of hard shutdown, the main power supply (compressor current) is interrupted. Alternatively, many utilities offer shutdown via a ripple control signal. Additional electric heating inserts mounted outside the heat pump (e.g. in the storage tank) may continue to be operated up to a maximum output of 2kW.

In practice, the following surcharge factors have proven effective, since never all rooms are heated and the standard outside temperature is rarely reached.

Sum of blocking times per day [h]	Factor for additional heating power
2	1,05
4	1,1
6	1,15

Remote Interface PCB



Technical data

Electrical data

SG-ready
The heat pumps are equipped with logic for connection to devices that balance the loads connected to the electric grid and optimize general electricity consumption. The connection is optional, the function can be enabled from the remote interface PCB and is linked to the ON/OFF SG input, which receives a status signal from the electrical network.
With the E_SG ON the SG function is enabled.
The unit is also set up to store free thermal energy in the DHW tank. The function is activated by the remote interface PCB enabling the Smart Grid function and is linked to the ON/OFF EVU input, which receives a signal from the energy meter which indicates to the heat pump when free energy overproduction is available.

The regulation logic of the two contacts:

SG Contact	EVU Contact	System	DHW
ON	OFF	Standard	Standard
OFF	OFF	Standard	Standard
OFF	ON	OFF forced	OFF forced
ON	ON	DHW forced	Forced DHW operation with set point T5S = 60°C Once the DHW set-point is reached, the Heat Pump returns to work on the system

Technical data

Sound levels

AEROTOP EVO

Standard mode

AEROTOP EVO	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
24	63	64	64	71	72	67	62	52	59	75
27	60	63	67	70	74	68	61	52	60	76
32	56	63	68	71	75	69	62	51	61	77
48	78	77	72	73	75	67	62	52	60	77
54	79	78	73	74	76	68	63	53	61	78
65	78	77	70	74	78	71	64	54	63	80
79	61	73	73	76	76	72	71	63	62	80
88	61	69	72	77	81	75	70	62	65	83
105	61	69	72	77	81	75	70	62	65	83

AEROTOP EVO

super-silenced mode

AEROTOP EVO	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
24	49	63	63	68	69	64	59	51	56	72
27	61	62	62	69	70	65	60	50	57	73
32	61	62	62	69	70	65	60	50	57	73
48	52	64	69	69	71	64	59	50	57	73
54	52	64	69	69	71	64	59	50	57	73
65	75	74	69	70	72	64	59	50	57	73
79	57	70	70	73	70	68	68	60	58	76
88	58	70	70	73	73	69	68	60	59	77
105	59	71	71	74	74	70	69	61	60	78

Sound levels refer to units with nominal conditions.
The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2).

Data referred to the following conditions in Heating:
- internal exchanger water = 30/35° C
- ambient temperature 7/6° C

Data referred to the following conditions in cooling:
- internal exchanger water = 12/7° C
- ambient temperature 35° C

Technical data

Sound levels

AEROTOP EVO PLUS

Standard mode

AEROTOP EVO PLUS	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
24	61	62	62	69	70	65	60	50	57	73
27	58	61	65	68	72	66	59	50	58	74
32	54	61	66	69	73	67	60	49	59	75
48	76	75	70	71	73	65	60	50	58	75
54	52	63	65	72	73	66	59	50	58	76
65	76	75	68	72	76	69	62	52	61	78
79	59	71	71	74	74	70	69	61	60	78
88	59	67	70	75	79	73	68	60	63	81

AEROTOP EVO PLUS

super-silenced mode

AEROTOP EVO PLUS	Sound power level								Sound pressure level	Sound power level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
24	46	60	60	65	66	61	56	48	53	69
27	59	60	60	67	68	63	58	48	55	71
32	56	59	63	66	70	64	57	48	56	72
48	50	62	67	67	69	62	57	48	54	71
54	50	62	67	67	69	62	57	48	54	71
65	73	72	67	68	70	62	57	47	55	72
79	54	67	67	70	67	65	65	57	55	73
88	56	69	69	72	69	67	57	59	57	75

Sound levels refer to units with nominal conditions.
The sound pressure level refers to a distance of 1 meter from the outer surface of the unit operating in open field.
Noise levels are determined using the tensiometric method (UNI EN ISO 9614-2).

Data referred to the following conditions in Heating:
- internal exchanger water = 30/35° C
- ambient temperature 7/6° C

Data referred to the following conditions in cooling:
- internal exchanger water = 12/7° C
- ambient temperature 35° C

Technical data

Fouling and glycol use correction factors

Correction factors for ethylene glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	No.	0,997	0,994	0,99	0,986	0,981	0,976	0,97	0,964	0,957	0,95
Compressor power input Factor	No.	0,999	0,999	0,998	0,997	0,996	0,996	0,995	0,994	0,993	0,993
Internal exchanger pressure drop factor	No.	1,016	1,035	1,056	1,08	1,106	1,135	1,166	1,2	1,236	1,275

Correction factors for propylene glycol use

% ethylene glycol by weight		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3,9	-6,5	-8,9	-11,8	-15,6	-19	-23,4	-27,8	-32,7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23,8	-29,4
Cooling Capacity Factor	No.	0,995	0,99	0,983	0,976	0,968	0,96	0,95	0,939	0,928	0,916
Compressor power input Factor	No.	0,999	0,997	0,995	0,993	0,991	0,988	0,986	0,983	0,98	0,977
Internal exchanger pressure drop factor	No.	1,027	1,058	1,093	1,133	1,176	1,224	1,276	1,332	1,393	1,457

The correction factors shown refer to water and glycol ethylene mixes used to prevent the formation of frost on the exchangers in the water circuit during inactivity in winter.

Fouling correction factors

	Internal exchanger	
M2C/W	F1	FK1
0,44x10 (-4)	1	1
0,88x10 (-4)	0,96	0,99
1,76x10 (-4)	0,93	0,98

The cooling performance values provided in the tables are based on the external exchanger having clean plates (fouling factor 1). For different fouling factor values, multiply the performance by the coefficients shown in the table.
F1 = Cooling capacity correction factors
FK1 = Compressor power input correction factor

Exchanger operating range

		Internal exchanger	
		DPR	DPW
Plate exchanger	PED (CE)	4500	1000

DPr = Maximum operating pressure on refrigerant side in kPa
DPw = Maximum operating pressure on water side in kPa

Technical data

Overload and control device calibrations

Correction factors for ethylene glycol use

Refrigerant side		Open	Close	Value
High pressure safety pressure switch	kPa	4200	3200	-
Low pressure safety pressure switch	kPa	140	300	-
Gas-liquid separator safety valve	kPa	-	-	3000
Safety thermostat against compressor drain overheating	°C	75	115	-
Water side				
Antifreeze protection	°C	8	4	-
High pressure safety valve	kPa	-	-	1000

The value entered refers to units supplied with a hydronic group installed on board.

Technical data

Operating ranges

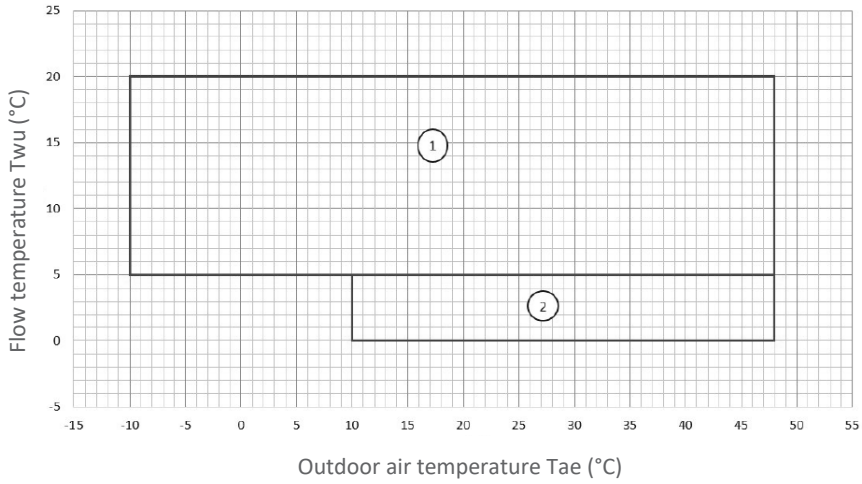
AEROTOP EVO

Operating Limits
The diagrams on the left show the operating limits of the AEROTOP L heat pumps. The temperature differ-ence at the condenser must fall be-tween 5°C and 8°C.
In order to prevent a reduction of the operating limits:

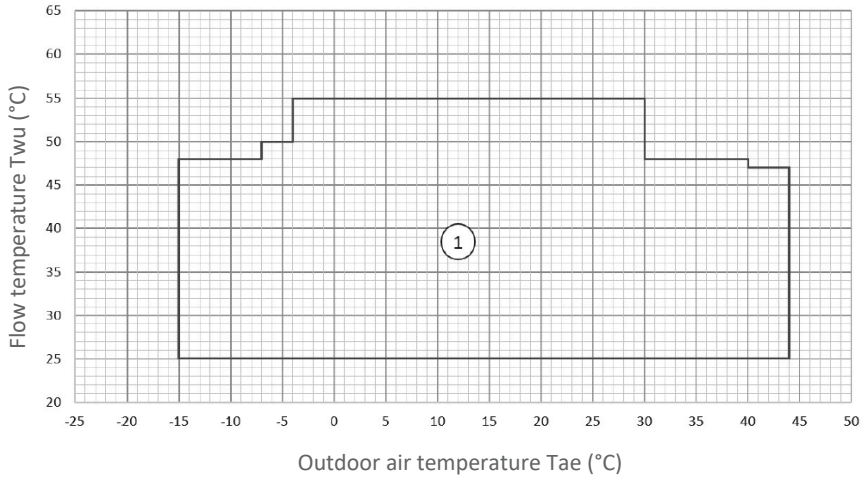
- The minimum flow values referred to the condenser must not be exceed-ed towards the minimum to ensure correct performance and trouble-free operation.
- The pipes must be kept as short as possible to reduce loss of head, and their insulation must be according national standards to minimize heat losses. Incorrectly sized pipes can cause faults and breakdowns, re-sulting in damages to the heat pump in addition to a drop in performance.

Twu [°C] = Leaving exchanger water temperature
Tae [°C] = External exchanger return air temperature
1 Normal operating range
2 Operating range where the use of ethylene glycol is mandatory in relation to the temperature of the water at the flow of the user side exchanger.

Operating range - Cooling



Operating range - Heating / DHW production



Technical data

Operating ranges

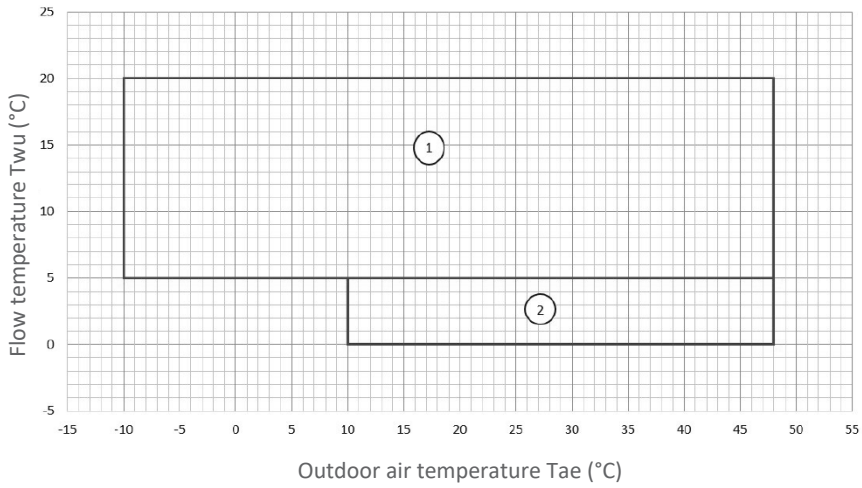
AEROTOP EVO PLUS

Operating Limits
The diagrams on the left show the operating limits of the AEROTOP L heat pumps. The temperature differ-ence at the condenser must fall be-tween 5°C and 8°C.
In order to prevent a reduction of the operating limits:

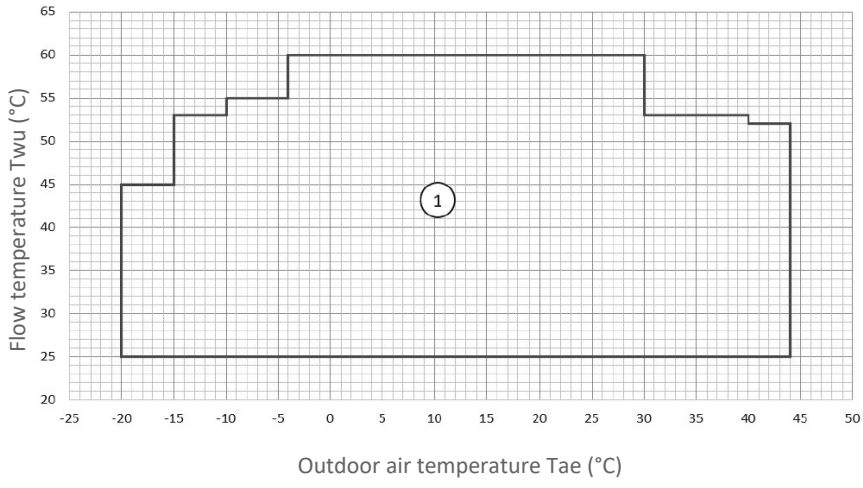
- The minimum flow values referred to the condenser must not be exceed-ed towards the minimum to ensure correct performance and trouble-free operation.
- The pipes must be kept as short as possible to reduce loss of head, and their insulation must be according national standards to minimize heat losses. Incorrectly sized pipes can cause faults and breakdowns, re-sulting in damages to the heat pump in addition to a drop in performance.

Twu [°C] = Leaving exchanger water temperature
Tae [°C] = External exchanger return air temperature
1 Normal operating range
2 Operating range where the use of ethylene glycol is mandatory in relation to the temperature of the water at the flow of the user side exchanger.

Operating range - Cooling



Operating range - Heating / DHW production

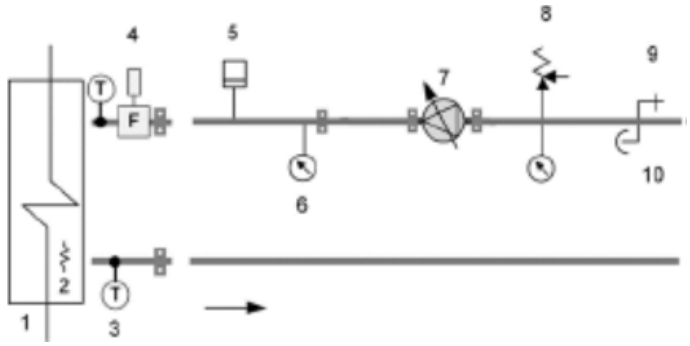


Hydronic assembly

Internal exchanger pressure drop and Admissible water flow rates

Heat Pump Integral Components

1. Heat pump internal ecxchanger
2. Antifreeze heater
3. Water temperature probe
4. Flow Switch
5. System load safety switch
6. Pressure gauge
7. Inverter pump
8. Safety valvel
9. Discharge
10. Vent

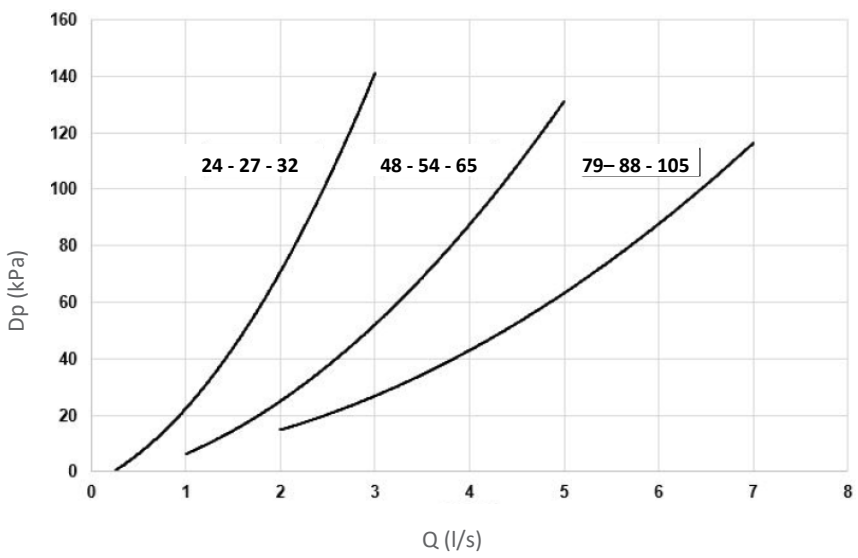


Internal exchanger pressure drop
Water fittings at
AEROTOP EVO and AEROTOP EVO PLUS 24, 27 and 32 are Victaulic 1 1/2".
AEROTOP EVO and AEROTOP EVO PLUS 48 - 105 are Victaulic. 2”

The pressure drops on the water side are calculated by considering an average water temperature at 7°C.
Q = Water flow rate [l/s]
DP = Pressure drops [kPa]
The water flow rate must be calculated with the following formula:
Q [l/s] = kWf / (4,186 x DT)
kWf = Cooling capacity in kW
DT = Temperature difference between entering / leaving water

To the internal exchanger pressure drops must be added the pressure drops of the steel mesh mechanical filter that must be placed on the water input line. It is a device compulsory for the correct unit operation.

Internal exchanger pressure drop curves



Admissible water flow rates

Min. (Qmin) and max. (Qmax) water flow-rates admissibles for the correct unit operation

AEROTOP EVO AEROTOP EVO PLUS		24	27	32	48	54	65	79	88	105*
Minimum flow-rate	l/s	0,9	0,9	0,9	1,8	1,8	1,8	2,9	2,9	2,9
Maximum flow-rate	l/s	2,6	2,6	2,6	5	5	5	6,4	6,4	6,4

* only AEROTOP EVO

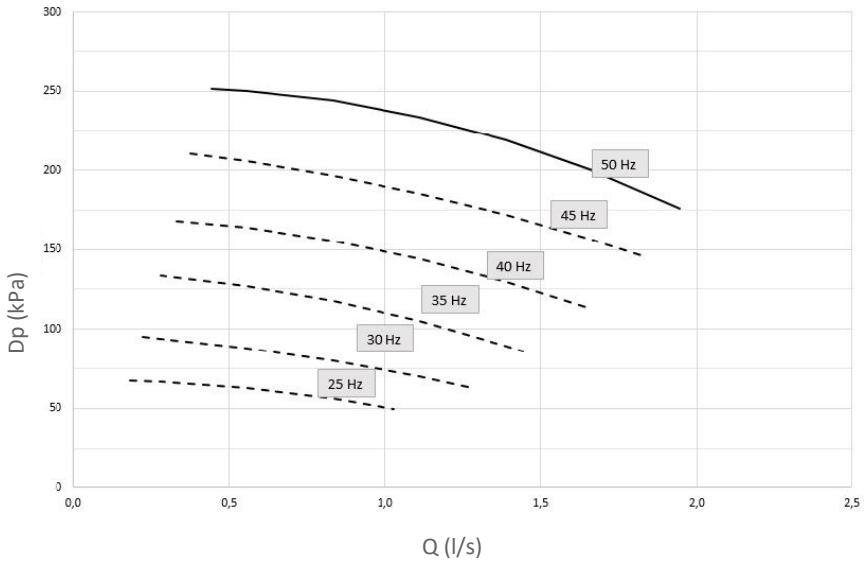
Hydronic assembly

Inverter pump

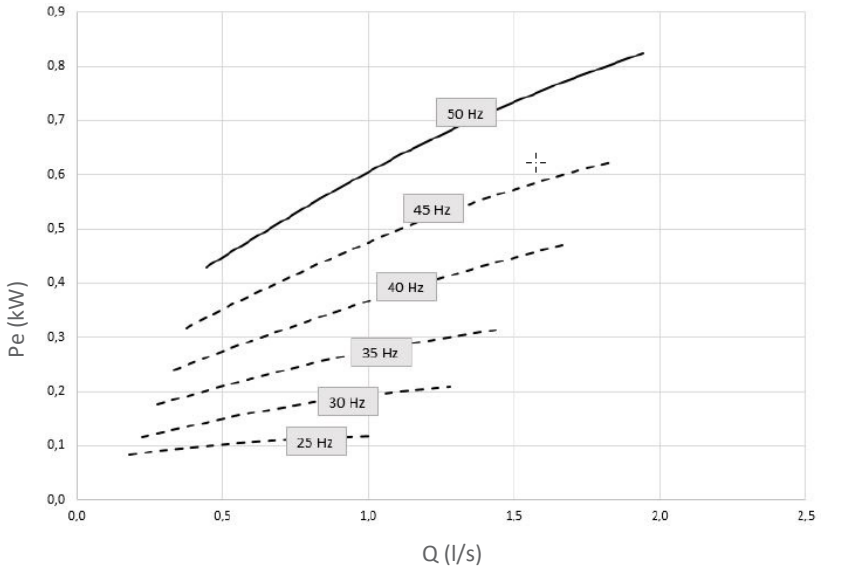
Internal exchanger pressure drop
Configuration with 1 centrifugal electric pump, with housing and impeller made with AISI 304. The electric pump is equipped with three-phase electric motor with IP55-protection and complete with thermoformed insulated casing.
During the installation phase, it is possible to choose the head curve most suited to the needs of the system by setting the frequency of the inverter.
The pump will always operate at a fixed flow rate.

Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
• User side exchanger pressure drops
• IFVX accessory –Steel mesh filter on the water side (where applicable)

Pump available pressure AEROTOP EVO, AEROTOP EVO PLUS 24, 27, 32



Pump absorption AEROTOP EVO, AEROTOP EVO PLUS 24, 27, 32



Electrical data

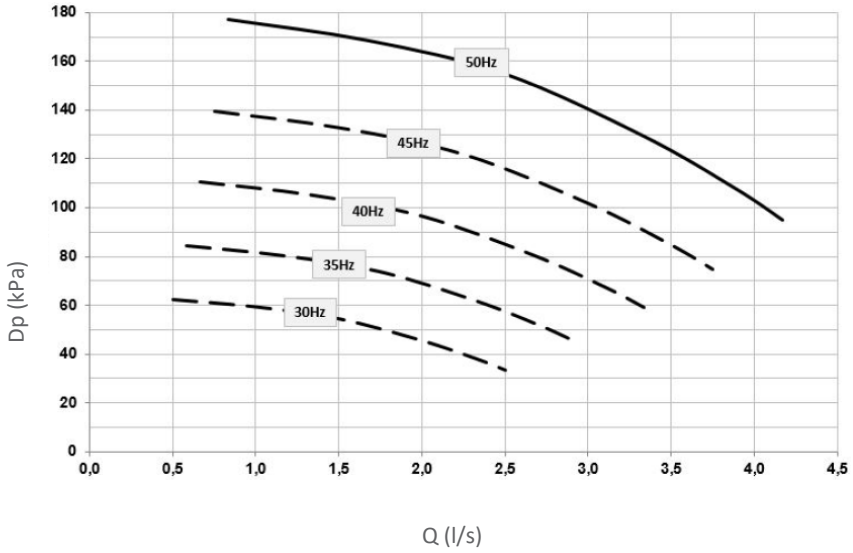
AEROTOP EVO AEROTOP EVO PLUS		24	27	32
F.L.A	A	2,2	2,2	2,2
F.L.I	kW	1,1	1,1	1,1

Hydronic assembly

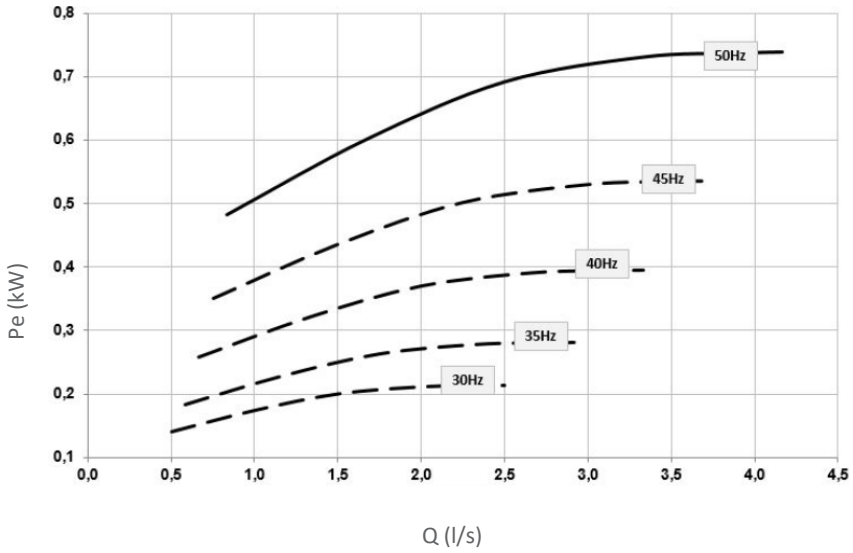
Inverter pump

Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
• User side exchanger pressure drops
• IFVX accessory –Steel mesh filter on the water side (where applicable)

Pump available pressure AEROTOP EVO, AEROTOP EVO PLUS 48, 54, 65



Pump absorption AEROTOP EVO, AEROTOP EVO PLUS 48, 54, 65



Electrical data

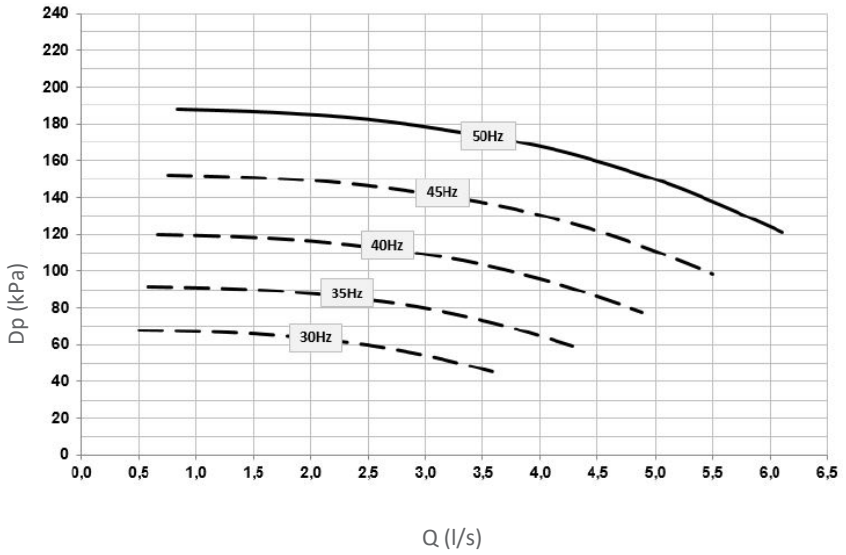
AEROTOP EVO AEROTOP EVO PLUS		48	54	65
F.L.A	A	4,6	4,6	4,6
F.L.I	kW	2,2	2,2	2,2

Hydronic assembly

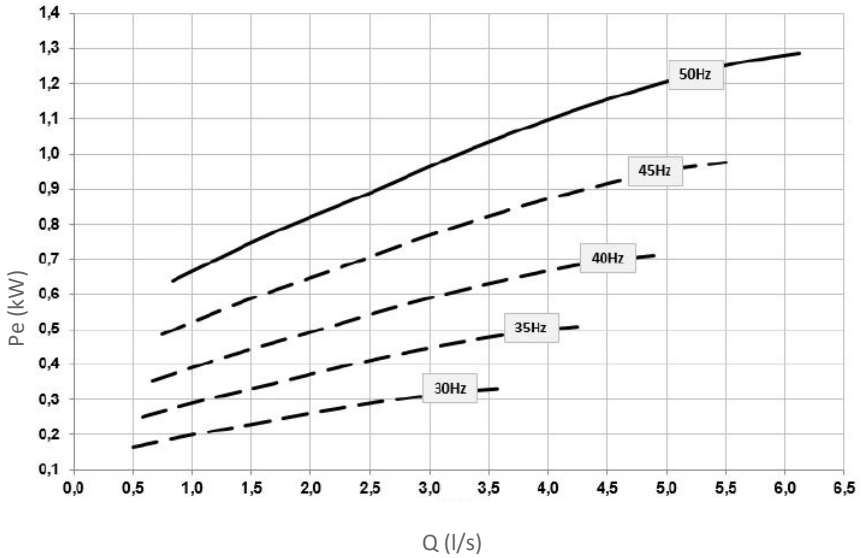
Inverter pump

Caution: to obtain the available pressure values, you need to subtract the following from the head values represented in these diagrams:
• User side exchanger pressure drops
• IFVX accessory –Steel mesh filter on the water side (where applicable)

Pump available pressure AEROTOP EVO, AEROTOP EVO PLUS 79, 88, 105



Pump absorption AEROTOP EVO, AEROTOP EVO PLUS 79, 88, 105



Electrical data

AEROTOP EVO AEROTOP EVO PLUS		79	88	105*
F.L.A	A	4,6	4,6	4,6
F.L.I	kW	2,2	2,2	2,2

* only AEROTOP EVO

Performances

Notes

Cooling
To = Internal exchanger outlet water temperature (°C)
Tae [°C] = External exchanger inlet air temperature
Performances calculated with inlet/outlet water temperature differential = 5°C*
*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

Heating
To = Internal exchanger outlet water temperature (°C)
Tae [°C] = External exchanger inlet air temperature
Performances calculated with inlet/outlet water temperature differential = 5°C*
*Always check the actual temperature differential in the configurator as this is related to the minimum or maximum flow rate limits of the exchanger

Integrated heating capacities
Heating capacity multiplication coefficient 0,93
The integrated heating capacity is the actual heating capacity, including the impact of any defrosting cycles.
To obtain the integrated heating capacity multiply the heating performance value in kWt (shown in the heating performance tables) by the coefficients indicated in the table.
In case of below zero outdoor air temperature with a long period of heat pump operating mode it is necessary to help the evacuation of the water produced during the defrost cycle this to avoid the formation of ice in the unit basement. Pay attention that the evacuation will not create inconveniences to things or persons.

Performances

AEROTOP EVO 24

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	30.0	17.7	5.76	7.01
	20	28.9	17.0	4.94	5.98
	25	27.7	16.3	4.25	5.10
	30	26.5	15.5	3.68	4.38
	35	25.3	14.7	3.06	3.71
	40	23.5	13.8	2.72	3.20
	44	15.9	12.8	2.62	2.84
10	15	32.8	19.3	6.31	7.65
	20	31.6	18.5	5.37	6.51
	25	30.4	17.7	4.61	5.53
	30	29.1	16.9	3.98	4.72
	35	27.7	16.0	3.43	3.99
	40	25.8	15.0	2.93	3.45
	44	17.4	13.9	2.82	3.05
12	15	34.7	20.3	6.67	8.11
	20	33.5	19.6	5.67	6.88
	25	32.2	18.5	4.85	5.74
	30	30.8	17.9	4.18	4.96
	35	28.3	17.3	3.47	4.28
	40	27.4	15.9	3.08	3.62
	44	18.4	14.7	2.96	3.20
15	15	38.7	22.4	6.82	8.34
	20	37.1	21.4	5.74	6.98
	25	35.6	20.4	4.89	5.84
	30	33.9	19.4	4.16	4.93
	35	29.4	19.3	3.26	4.39
	40	28.4	18.4	2.88	3.90
	44	21.4	16.8	3.05	3.30
18	15	42.0	24.2	7.44	9.19
	20	40.4	23.2	6.24	7.64
	25	39.1	21.9	5.48	6.19
	30	36.9	20.9	4.50	5.35
	35	33.3	20.9	3.99	4.64
	40	30.6	20.6	3.07	4.39
	44	22.1	20.1	3.13	3.94
20	15	44.3	25.4	7.87	9.80
	20	42.6	24.3	6.59	8.10
	25	40.8	23.2	5.59	6.81
	30	38.9	22.0	4.73	5.63
	35	36.9	20.7	4.03	4.70
	40	34.5	19.4	3.45	4.15
	44	23.2	18.2	3.29	3.58

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	9.16	5.35	1.56	1.35
	-10	16.1	7.42	2.76	2.42
	-7	17.8	9.62	3.07	3.59
	2	24.0	13.1	3.94	4.57
	7	27.8	15.1	4.43	5.08
	10	29.5	16.5	4.72	5.58
	18	34.8	18.9	5.83	6.81
40	-15	8.97	5.23	1.43	1.21
	-10	15.8	7.23	2.48	2.12
	-7	17.5	9.31	2.71	3.40
	2	23.5	12.9	3.52	4.02
	7	27.2	14.0	3.80	4.22
	10	28.1	15.3	4.09	4.59
	18	34.1	18.3	5.09	5.81
45	-15	8.82	5.07	1.36	1.16
	-10	15.6	7.09	2.34	2.08
	-7	17.3	9.07	2.51	2.76
	2	23.2	12.5	3.14	3.56
	7	26.9	13.6	3.24	3.68
	10	27.2	14.9	3.63	3.97
	18	33.4	17.7	4.47	5.06
50	-7	14.7	8.82	2.30	2.51
	2	22.5	12.2	2.83	3.12
	7	24.2	12.7	2.92	3.26
	10	26.3	14.2	3.17	3.62
	18	32.6	17.0	3.90	4.28
55	2	22.0	11.8	2.54	2.81
	7	23.7	12.4	2.59	2.92
	10	25.6	13.7	2.82	3.21
	18	31.7	16.3	3.39	3.80

Performances

AEROTOP EVO 27

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	33.5	19.5	5.33	6.38
	20	32.3	18.7	4.55	5.43
	25	30.9	17.9	3.89	4.63
	30	29.6	17.1	3.36	3.98
	35	27.7	16.2	2.78	3.38
	40	26.2	15.2	2.48	3.01
	44	17.3	14.2	2.44	2.69
10	15	36.7	21.2	5.79	6.93
	20	35.3	20.4	4.93	5.88
	25	34.0	19.5	4.24	5.00
	30	32.5	18.6	3.63	4.26
	35	30.9	17.6	3.13	3.62
	40	28.8	16.7	2.67	3.26
	44	18.9	15.6	2.63	2.91
12	15	38.8	22.4	6.11	7.33
	20	37.4	21.5	5.18	6.19
	25	36.0	20.6	4.45	5.24
	30	34.4	19.7	3.80	4.47
	35	31.7	18.6	3.17	3.80
	40	30.5	17.6	2.80	3.43
	44	20.0	16.4	2.76	3.06
15	15	43.5	25.0	6.52	7.84
	20	41.7	23.9	5.47	6.56
	25	39.9	22.8	4.66	5.52
	30	38.2	21.7	3.98	4.69
	35	34.2	20.6	3.23	3.97
	40	32.8	19.8	2.83	3.66
	44	22.2	18.2	2.89	3.13
18	15	47.2	27.0	7.07	8.60
	20	45.3	25.8	5.92	7.14
	25	43.4	24.6	5.02	5.97
	30	41.3	23.4	4.27	5.03
	35	37.3	22.0	3.79	4.23
	40	34.6	21.7	2.94	4.01
	44	24.1	20.0	3.11	3.43
20	15	49.8	28.4	7.44	9.10
	20	47.8	27.1	6.22	7.54
	25	45.7	26.0	5.27	6.43
	30	43.6	24.5	4.47	5.29
	35	41.3	23.1	3.82	4.44
	40	38.7	22.1	3.27	4.08
	44	25.4	20.7	3.26	3.84

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Mini	Max	Min
35	-15	11.4	5.40	1.50	1.30
	-10	19.5	7.42	2.70	2.42
	-7	21.3	9.62	2.99	3.57
	2	27.2	13.1	3.65	4.55
	7	32.2	15.1	4.09	5.04
	10	33.5	16.2	4.26	5.57
	18	42.7	18.9	5.42	6.68
40	-15	10.0	5.34	1.35	1.18
	-10	17.9	7.23	2.43	2.12
	-7	20.0	9.31	2.57	3.40
	2	26.8	12.9	3.24	4.01
	7	30.2	14.1	3.57	4.15
	10	32.1	15.0	3.79	4.49
	18	41.3	18.3	4.69	5.73
45	-15	9.81	5.22	1.29	1.12
	-10	17.3	7.09	2.27	2.06
	-7	18.7	9.07	2.25	2.76
	2	26.5	12.5	2.93	3.48
	7	29.7	13.6	3.24	3.68
	10	30.8	14.6	3.27	3.89
	18	40.2	17.6	4.17	4.90
50	-7	15.0	8.82	2.08	2.49
	2	25.9	12.1	2.65	3.08
	7	27.9	12.6	2.86	3.21
	10	29.2	13.9	2.89	3.57
	18	38.5	16.9	3.57	4.24
55	2	25.4	11.8	2.38	2.73
	7	26.8	12.3	2.51	2.89
	10	28.2	13.5	2.62	3.18
	18	37.2	16.1	3.09	3.73

Performances

AEROTOP EVO 32

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	38.7	19.7	5.20	6.59
	20	37.2	18.9	4.41	5.62
	25	35.6	18.1	3.79	4.80
	30	34.0	17.2	3.25	4.12
	35	32.3	16.4	2.79	3.51
	40	29.9	15.6	2.39	3.33
	44	18.9	14.6	2.48	2.92
10	15	42.3	21.4	5.61	7.18
	20	40.6	20.6	4.75	6.09
	25	39.0	19.7	4.07	5.17
	30	37.2	18.8	3.48	4.42
	35	35.5	17.9	3.00	3.76
	40	32.8	17.1	2.56	3.62
	44	20.7	16.0	2.67	3.17
12	15	44.7	22.6	5.87	7.57
	20	43.0	21.7	4.96	6.41
	25	41.2	20.8	4.25	5.44
	30	39.4	19.8	3.64	4.64
	35	37.5	18.9	3.13	3.94
	40	34.7	18.1	2.67	3.83
	44	21.9	17.0	2.79	3.34
15	15	49.8	25.1	5.88	7.67
	20	47.6	24.0	4.93	6.41
	25	45.5	22.8	4.19	5.39
	30	42.7	21.8	3.52	4.58
	35	39.8	20.7	2.96	3.89
	40	37.4	20.3	2.55	3.91
	44	24.2	18.7	2.76	3.33
18	15	54.1	27.1	6.32	8.38
	20	51.9	25.9	5.33	6.98
	25	49.5	24.7	4.48	5.83
	30	47.0	23.5	3.81	4.91
	35	42.1	22.2	3.51	4.13
	40	40.5	21.5	2.72	4.14
	44	26.3	20.2	2.96	3.61
20	15	57.0	28.5	6.61	8.90
	20	54.7	27.3	5.56	7.38
	25	52.2	26.1	4.68	6.28
	30	49.6	24.6	3.98	5.16
	35	45.9	23.3	3.32	4.34
	40	43.8	22.6	2.91	4.38
	44	27.6	21.3	3.10	3.80

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	14.1	6.56	1.49	1.23
	-10	23.4	9.35	2.79	2.50
	-7	25.0	10.6	3.00	3.39
	2	34.7	15.2	3.42	4.16
	7	37.9	17.1	3.78	4.70
	10	40.1	18.5	4.34	5.28
	18	50.4	23.1	5.22	6.34
40	-15	11.5	-	6.43	1.15
	-10	19.3	9.25	9.25	2.17
	-7	24.8	10.4	2.65	3.15
	2	34.1	14.9	3.08	3.71
	7	36.4	16.0	3.54	4.08
	10	38.9	17.2	3.69	4.31
	18	48.5	21.4	4.45	5.41
45	-15	11.2	-	6.34	1.10
	-10	18.7	9.13	9.13	2.12
	-7	24.3	10.3	2.25	2.76
	2	33.5	14.6	2.76	3.29
	7	35.6	15.9	3.21	3.63
	10	37.5	16.5	3.17	3.81
	18	46.8	20.5	3.93	4.81
50	-7	17.7	10.1	2.10	2.48
	2	32.6	14.2	2.48	2.89
	7	34.2	13.7	2.71	3.03
	10	36.2	14.9	2.75	3.19
	18	44.9	18.0	3.37	3.73
55	2	31.7	13.8	2.20	2.64
	7	33.1	13.0	2.29	2.68
	10	35.3	14.0	2.52	3.00
	18	44.9	17.6	2.88	3.32

Performances

AEROTOP EVO 48

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	54.0	30.9	5.43	6.83
	20	52.1	29.6	4.69	5.82
	25	50.2	28.3	4.06	4.93
	30	48.1	26.9	3.52	4.17
	35	45.8	25.3	3.00	3.52
	40	42.9	23.4	2.63	2.93
	44	24.8	21.7	2.52	2.52
10	15	59.3	33.7	6.00	7.54
	20	57.2	32.3	5.15	6.37
	25	55.1	30.9	4.44	5.38
	30	52.9	29.3	3.84	4.54
	35	50.5	27.7	3.32	3.82
	40	47.3	25.5	2.85	3.17
	44	27.2	23.7	2.72	2.72
12	15	62.8	35.5	6.38	8.02
	20	60.7	34.1	5.47	6.76
	25	58.4	32.6	4.70	5.69
	30	56.2	31.0	4.08	4.79
	35	53.6	29.2	3.51	4.02
	40	50.1	26.9	3.01	3.33
	44	28.7	25.0	2.85	2.85
15	15	69.9	37.4	6.47	7.91
	20	67.2	35.6	5.46	6.54
	25	64.3	33.7	4.64	5.40
	30	62.4	32.6	4.03	4.59
	35	60.2	31.6	3.50	3.94
	40	56.5	29.2	3.00	3.25
	44	31.8	27.1	2.80	2.78
18	15	74.3	40.7	6.96	8.89
	20	71.4	38.7	5.85	7.28
	25	69.3	37.7	5.02	6.15
	30	67.1	36.6	4.33	5.21
	35	63.9	35.3	4.02	4.42
	40	58.6	31.6	3.09	3.53
	44	34.5	29.3	3.03	3.01
20	15	79.7	43.9	7.55	9.84
	20	76.6	41.9	6.32	8.03
	25	74.4	40.7	5.40	6.74
	30	72.1	39.5	4.66	5.69
	35	68.4	38.1	4.10	4.81
	40	64.2	34.3	3.38	3.85
	44	37.4	31.9	3.27	3.28

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	25.3	11.9	2.44	2.24
	-10	30.7	15.6	2.82	2.77
	-7	34.3	18.4	3.02	3.37
	2	45.6	25.5	3.72	4.27
	7	54.3	30.3	4.37	5.07
	10	57.2	32.1	4.69	5.38
	18	66.7	37.2	5.45	6.29
40	-15	24.5	11.1	2.20	1.98
	-10	29.9	14.9	2.54	2.42
	-7	33.5	18.1	2.71	3.02
	2	44.5	24.8	3.30	3.69
	7	53.2	29.4	3.94	4.38
	10	55.8	31.0	4.12	4.61
	18	65.0	35.8	4.74	5.33
45	-15	24.1	12.9	1.99	1.78
	-10	29.5	14.4	2.29	2.12
	-7	33.0	18.0	2.44	2.69
	2	43.7	24.3	2.93	3.21
	7	52.4	28.4	3.36	3.75
	10	54.7	30.1	3.62	3.95
	18	63.5	34.6	4.13	4.53
50	-7	30.1	17.0	2.05	2.30
	2	39.7	21.9	2.48	2.65
	7	46.3	25.3	2.98	3.15
	10	48.8	26.6	3.10	3.30
	18	56.4	30.5	3.50	3.75
55	2	38.9	21.4	2.23	2.34
	7	48.6	24.5	2.62	2.75
	10	47.6	25.7	2.75	2.86
	18	54.8	29.3	3.08	3.23

Performances

AEROTOP EVO 54

Cooling Performance

To	Tae	Coling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	57.0	32.0	4.98	6.18
	20	55.0	30.8	4.28	5.27
	25	52.9	29.4	3.69	4.47
	30	52.5	28.9	3.31	3.92
	35	52.2	28.3	2.92	3.43
	40	48.6	26.4	2.56	2.90
	44	28.0	24.6	2.50	2.50
10	15	62.5	35.0	5.48	6.79
	20	60.3	33.6	4.69	5.75
	25	58.1	32.1	4.03	4.86
	30	56.8	30.9	3.55	4.15
	35	56.4	30.9	3.18	3.71
	40	53.5	28.8	2.77	3.12
	44	30.7	26.8	2.70	2.70
12	15	66.2	36.9	5.82	7.20
	20	63.9	35.4	4.96	6.08
	25	61.6	33.9	4.26	5.13
	30	60.3	32.6	3.74	4.37
	35	59.8	32.7	3.35	3.90
	40	56.8	30.4	2.92	3.28
	44	32.5	28.3	2.83	2.82
15	15	74.3	41.1	5.86	7.23
	20	71.5	39.4	4.94	6.03
	25	68.7	37.5	4.20	5.03
	30	67.2	36.1	3.66	4.25
	35	64.2	36.2	3.13	3.76
	40	61.9	33.6	2.77	3.15
	44	35.4	31.2	2.69	2.72
18	15	81.0	44.5	6.44	8.00
	20	77.9	42.6	5.41	6.61
	25	74.8	40.6	4.58	5.49
	30	73.0	38.8	3.98	4.62
	35	70.2	38.7	3.75	4.06
	40	68.8	36.1	3.07	3.40
	44	38.3	33.8	2.89	2.93
20	15	85.5	46.7	6.86	8.56
	20	82.3	44.8	5.73	7.05
	25	79.0	42.6	4.84	5.81
	30	77.1	40.8	4.20	4.87
	35	74.0	40.7	3.61	4.28
	40	72.7	37.9	3.23	3.58
	44	40.2	35.5	3.02	3.08

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	28.4	10.7	2.41	2.07
	-10	34.0	14.2	2.75	2.51
	-7	37.7	18.4	2.98	3.35
	2	51.3	25.8	3.69	4.26
	7	58.5	30.6	4.13	5.07
	10	62.3	32.4	4.47	5.37
	18	72.4	37.6	5.16	6.28
40	-15	27.5	9.9	2.18	1.82
	-10	33.2	13.5	2.49	2.28
	-7	36.9	18.1	2.69	3.05
	2	49.9	25.1	3.28	3.72
	7	58.6	29.8	3.82	4.41
	10	61.0	31.4	3.96	4.64
	18	70.8	36.3	4.53	5.38
45	-15	26.7	12.0	1.96	1.69
	-10	32.5	12.8	2.25	1.97
	-7	36.3	18.0	2.43	2.72
	2	48.6	24.5	2.88	3.22
	7	57.8	28.9	3.33	3.76
	10	59.7	30.4	3.47	3.97
	18	69.1	35.0	3.96	4.57
50	-7	33.3	17.0	2.03	2.32
	2	43.7	22.1	2.46	2.66
	7	52.6	25.5	3.02	3.16
	10	55.4	26.8	3.15	3.32
	18	64.0	30.7	3.54	3.76
55	2	42.9	21.6	2.21	2.35
	7	54.2	24.7	2.58	2.76
	10	54.1	25.9	2.80	2.87
	18	62.3	29.6	3.13	3.24

Performances

AEROTOP EVO 65

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	69.2	36.1	5.00	6.72
	20	67.6	35.0	4.33	5.77
	25	65.7	33.4	3.76	4.90
	30	61.0	31.1	3.14	4.06
	35	60.8	29.5	2.80	3.46
	40	56.7	27.2	2.44	2.89
	44	32.6	25.4	2.45	2.49
10	15	73.1	36.1	5.28	6.77
	20	70.7	34.7	4.50	5.73
	25	68.0	33.2	3.85	4.85
	30	65.2	31.6	3.32	4.10
	35	67.1	32.3	3.08	3.74
	40	62.5	29.8	2.63	3.11
	44	35.8	27.7	2.63	2.68
12	15	77.5	38.1	5.60	7.19
	20	74.8	36.6	4.75	6.06
	25	72.1	35.0	4.06	5.11
	30	69.2	33.4	3.49	4.31
	35	71.2	34.1	3.24	3.92
	40	66.3	31.4	2.77	3.26
	44	37.9	29.2	2.78	2.81
15	15	85.8	41.9	5.76	7.38
	20	81.7	39.9	4.78	6.12
	25	78.7	38.0	4.06	5.10
	30	75.6	36.3	3.48	4.31
	35	77.9	37.0	3.23	3.88
	40	72.6	34.1	2.75	3.22
	44	39.9	31.7	2.66	2.72
18	15	93.5	45.3	6.29	8.18
	20	89.5	43.2	5.22	6.71
	25	85.4	41.0	4.39	5.54
	30	83.0	38.7	3.79	4.60
	35	80.1	39.2	3.48	4.12
	40	78.0	36.3	2.92	3.42
	44	43.0	34.1	2.84	2.96
20	15	98.8	47.6	6.66	8.74
	20	94.6	45.4	5.52	7.15
	25	90.4	43.0	4.65	5.88
	30	85.9	40.6	3.91	4.86
	35	88.0	41.2	3.59	4.34
	40	82.4	38.1	3.06	3.60
	44	45.2	35.8	2.98	3.11

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	34.6	13.3	2.53	2.15
	-10	40.9	17.2	2.78	2.75
	-7	45.7	21.3	2.95	3.38
	2	60.4	28.8	3.55	4.20
	7	66.9	34.3	4.06	5.02
	10	71.8	36.3	4.35	5.32
	18	83.3	42.3	4.97	6.23
40	-15	33.2	12.6	2.25	1.86
	-10	39.0	16.5	2.50	2.33
	-7	44.1	20.9	2.74	2.98
	2	58.1	28.0	3.23	3.66
	7	67.1	33.3	3.67	4.35
	10	70.1	35.2	3.81	4.58
	18	81.2	40.8	4.32	5.31
45	-15	32.0	11.6	2.01	1.57
	-10	37.9	15.6	2.24	2.02
	-7	42.4	20.2	2.41	2.60
	2	56.4	27.3	2.84	3.18
	7	66.4	32.3	3.19	3.76
	10	68.4	34.0	3.29	3.94
	18	79.0	39.3	3.74	4.52
50	-7	38.7	19.5	2.01	2.27
	2	50.4	24.9	2.39	2.66
	7	61.8	28.9	2.98	3.18
	10	64.9	30.4	3.10	3.33
	18	74.9	34.9	3.48	3.78
55	2	49.2	24.2	2.15	2.36
	7	59.4	27.9	2.63	2.79
	10	63.2	29.3	2.76	2.91
	18	72.9	33.4	3.11	3.26

Performances

AEROTOP EVO 79

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	81.6	48.9	5.11	6.23
	20	79.8	47.4	4.37	5.40
	25	78.3	45.7	3.86	4.72
	30	76.3	43.9	3.38	4.03
	35	74.4	42.0	2.95	3.39
	40	70.0	39.4	2.53	2.82
	44	47.0	36.3	2.53	2.50
10	15	88.8	52.9	5.47	6.74
	20	86.8	51.4	4.68	5.83
	25	84.4	49.5	4.11	5.09
	30	81.6	47.4	3.58	4.35
	35	78.8	45.3	3.11	3.67
	40	75.1	42.8	2.69	3.06
	44	51.5	39.8	2.76	2.72
12	15	93.8	55.7	5.73	7.11
	20	91.8	54.1	4.90	6.15
	25	88.9	52.0	4.30	5.36
	30	86.0	49.9	3.76	4.60
	35	83.1	47.7	3.27	3.87
	40	79.3	45.2	2.84	3.24
	44	54.8	42.3	2.93	2.89
15	15	102	60.2	6.13	7.77
	20	99.1	58.3	5.23	6.67
	25	96.3	56.1	4.60	5.79
	30	93.2	53.9	4.02	4.96
	35	90.2	51.7	3.51	4.19
	40	86.3	49.1	3.06	3.51
	44	51.6	46.3	3.21	3.16
18	15	110	65.0	6.57	8.47
	20	107	62.8	5.63	7.33
	25	104	60.5	4.96	6.36
	30	101	58.3	4.34	5.42
	35	98.7	56.1	3.88	4.57
	40	93.9	53.4	3.33	3.85
	44	56.5	50.8	3.60	3.50
20	15	116	68.4	6.91	8.99
	20	113	65.6	5.93	7.72
	25	110	63.9	5.23	6.81
	30	107	61.6	4.60	5.81
	35	104	59.4	4.02	4.90
	40	99.5	56.7	3.54	4.13
	44	60.0	54.0	3.88	3.76

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	44.5	28.1	2.05	2.44
	-10	53.4	33.3	2.49	2.93
	-7	60.5	36.5	2.82	3.38
	2	73.6	43.9	3.32	3.94
	7	84.6	50.1	4.07	4.78
	10	88.1	52.3	4.17	5.04
	18	101	59.6	4.75	5.82
40	-15	43.5	27.1	1.79	2.09
	-10	52.2	31.9	2.18	2.55
	-7	57.8	34.7	2.41	2.81
	2	71.5	41.9	2.97	3.44
	7	80.7	47.9	3.60	4.20
	10	85.2	50.6	3.74	4.47
	18	99.0	57.8	4.31	5.15
45	-15	42.5	26.1	1.59	1.81
	-10	50.6	30.8	1.92	2.21
	-7	56.3	33.2	2.15	2.40
	2	69.7	39.9	2.65	2.93
	7	78.3	46.0	3.38	3.62
	10	82.9	48.9	3.32	3.86
	18	96.8	56.0	3.85	4.47
50	-7	55.1	32.2	1.87	2.03
	2	68.8	39.0	2.33	2.50
	7	76.5	44.6	2.69	2.97
	10	81.9	47.9	2.85	3.20
	18	94.7	54.6	3.26	3.69
55	2	68.0	38.0	2.05	2.11
	7	79.1	43.4	2.45	2.51
	10	80.9	46.7	2.50	2.70
	18	93.4	53.3	2.85	3.12

Performances

AEROTOP EVO 88

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	94.4	55.1	4.73	5.77
	20	92.8	53.7	4.08	5.12
	25	90.6	51.8	3.60	4.53
	30	88.3	49.8	3.16	3.92
	35	86.4	47.8	2.78	3.35
	40	81.1	45.0	2.38	2.82
	44	47.7	41.0	2.49	2.49
10	15	103	59.7	5.06	6.26
	20	101	58.2	4.38	5.55
	25	98.3	56.2	3.84	4.91
	30	95.4	54.2	3.36	4.25
	35	92.5	52.1	2.93	3.64
	40	87.8	49.1	2.55	3.07
	44	52.3	45.2	2.72	2.74
12	15	108	62.9	5.29	6.62
	20	107	61.5	4.58	5.86
	25	104	59.4	4.03	5.19
	30	101	57.3	3.53	4.50
	35	98.1	55.2	3.09	3.85
	40	93.2	52.1	2.69	3.26
	44	55.6	46.7	2.88	2.82
15	15	113	65.8	5.55	6.85
	20	111	63.8	4.86	6.35
	25	108	61.8	4.29	5.61
	30	105	59.7	3.78	4.88
	35	102	57.7	3.31	4.18
	40	97.7	54.6	2.90	3.54
	44	57.0	48.9	3.02	3.01
18	15	123	73.0	5.94	7.58
	20	121	69.0	5.22	6.99
	25	118	67.1	4.63	6.19
	30	115	65.0	4.09	5.38
	35	111	62.8	3.57	4.60
	40	107	59.7	3.17	3.92
	44	63.1	55.0	3.41	3.51
20	15	130	74.9	6.28	7.78
	20	128	73.8	5.49	7.63
	25	125	70.8	4.88	6.63
	30	122	68.7	4.33	5.78
	35	118	66.5	3.81	4.94
	40	113	63.0	3.37	4.19
	44	65.4	57.5	3.56	3.71

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	48.3	29.4	1.92	2.28
	-10	58.6	35.0	2.38	2.74
	-7	67.1	39.1	2.77	3.26
	2	81.3	46.9	3.13	3.80
	7	93.9	54.1	3.74	4.46
	10	98.8	56.7	3.87	4.71
	18	113	64.6	4.40	5.43
40	-15	46.6	27.3	1.65	1.90
	-10	57.3	33.7	2.03	2.40
	-7	63.3	35.9	2.23	2.56
	2	79.5	45.9	2.83	3.38
	7	92.3	53.0	3.33	3.96
	10	97.7	55.4	3.50	4.18
	18	112	63.6	3.98	4.86
45	-15	45.0	26.4	1.42	1.63
	-10	56.3	32.5	1.79	2.06
	-7	62.0	33.5	1.97	2.14
	2	77.4	44.3	2.49	2.91
	7	90.9	52.1	3.09	3.48
	10	97.3	54.6	3.15	3.67
	18	111	62.8	3.57	4.28
50	-7	58.7	31.8	1.69	1.81
	2	74.2	42.1	2.16	2.46
	7	90.1	49.9	2.59	2.91
	10	94.3	52.5	2.69	3.06
	18	107	60.5	3.04	3.58
55	2	71.8	40.2	1.89	2.08
	7	88.8	48.2	2.32	2.48
	10	92.4	50.7	2.37	2.61
	18	105	58.7	2.65	3.04

Performances

AEROTOP EVO 105

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	100	58.4	4.54	5.53
	20	98.8	57.2	3.93	4.93
	25	97.4	55.7	3.47	4.37
	30	95.8	54.1	3.05	3.78
	35	94.5	52.3	2.68	3.23
	40	88.0	48.8	2.30	2.72
	44	48.4	41.7	2.46	2.45
10	15	108	62.6	4.85	6.00
	20	107	61.5	4.22	5.34
	25	105	59.9	3.70	4.73
	30	103	58.3	3.24	4.10
	35	100	56.6	2.83	3.51
	40	94.4	52.8	2.46	2.96
	44	53.0	45.9	2.68	2.70
12	15	113	65.7	5.10	6.38
	20	112	64.2	4.41	5.65
	25	110	62.7	3.88	5.00
	30	108	61.0	3.41	4.34
	35	105	59.4	2.98	3.71
	40	99.3	55.5	2.59	3.14
	44	56.4	47.4	2.84	2.78
15	15	116	67.8	5.35	6.60
	20	115	66.1	4.70	6.14
	25	113	64.6	4.15	5.43
	30	111	63.0	3.66	4.72
	35	109	61.4	3.21	4.05
	40	103	57.6	2.81	3.43
	44	57.8	49.7	2.98	2.96
18	15	126	74.8	5.71	7.29
	20	124	71.0	5.05	6.76
	25	122	69.4	4.48	5.98
	30	120	67.9	3.96	5.21
	35	117	66.1	3.45	4.45
	40	111	62.4	3.06	3.80
	44	64.1	55.8	3.36	3.46
20	15	133	76.8	6.04	7.48
	20	131	76.0	5.31	7.38
	25	129	73.3	4.72	6.42
	30	127	71.8	4.19	5.59
	35	125	70.1	3.69	4.78
	40	118	65.8	3.26	4.05
	44	66.4	58.4	3.51	3.66

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-15	49.0	29.8	1.89	2.25
	-10	60.9	36.4	2.33	2.68
	-7	70.1	40.8	2.71	3.19
	2	85.7	49.4	3.06	3.71
	7	100	57.7	3.71	4.37
	10	104	59.8	3.78	4.60
	18	118	67.5	4.29	5.30
40	-15	47.3	27.7	1.63	1.88
	-10	60.2	35.4	1.94	2.29
	-7	67.1	38.0	2.13	2.45
	2	84.2	48.7	2.70	3.23
	7	102	58.3	3.19	3.78
	10	104	58.7	3.28	3.92
	18	117	66.5	3.75	4.58
45	-15	45.7	26.8	1.40	1.61
	-10	59.2	34.2	1.67	1.91
	-7	65.7	35.5	1.83	1.99
	2	82.1	47.0	2.27	2.66
	7	102	58.4	2.93	3.29
	10	103	57.9	2.88	3.36
	18	116	65.6	3.33	4.00
50	-7	59.6	32.3	1.69	1.80
	2	75.3	42.7	2.15	2.45
	7	91.4	50.6	2.58	2.90
	10	95.7	53.3	2.68	3.05
	2	72.9	40.8	1.88	2.07
55	7	90.2	48.9	2.31	2.47
	10	93.7	51.5	2.36	2.60
	18	107	59.6	2.64	3.02
	18	105	58.7	2.65	3.04

Performances

AEROTOP EVO PLUS 24

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	32.6	18.9	5.57	6.66
	20	31.2	18.1	4.74	5.66
	25	29.7	17.2	4.06	4.83
	30	28.3	16.3	3.51	4.15
	35	26.7	15.4	2.97	3.53
	40	25.1	14.6	2.59	3.14
	44	16.6	13.7	2.55	2.81
10	15	35.6	20.6	6.05	7.23
	20	34.1	19.7	5.14	6.14
	25	32.7	18.8	4.42	5.21
	30	31.1	17.8	3.79	4.44
	35	29.4	16.8	3.26	3.78
	40	27.5	15.9	2.79	3.40
	44	18.2	15.0	2.75	3.03
12	15	37.7	21.7	6.37	7.65
	20	36.1	20.8	5.40	6.45
	25	34.6	19.8	4.64	5.47
	30	32.9	18.8	3.97	4.67
	35	30.2	17.7	3.30	3.96
	40	29.2	16.9	2.92	3.58
	44	19.3	15.8	2.88	3.19
15	15	42.2	24.2	6.81	8.19
	20	40.3	23.1	5.71	6.85
	25	38.4	21.9	4.86	5.76
	30	36.5	20.8	4.16	4.89
	35	32.6	19.6	3.37	4.14
	40	31.4	18.9	2.95	3.82
	44	21.4	17.5	3.01	3.27
18	15	45.9	26.2	7.37	8.97
	20	43.8	25.0	6.18	7.45
	25	41.7	23.7	5.23	6.23
	30	39.5	22.4	4.45	5.25
	35	34.7	21.0	4.08	4.41
	40	33.1	20.8	3.07	4.19
	44	23.2	19.3	3.24	3.58
20	15	48.4	27.5	7.77	9.49
	20	46.2	26.2	6.49	7.87
	25	44.0	25.0	5.50	6.71
	30	41.7	23.5	4.66	5.51
	35	39.4	22.0	3.98	4.63
	40	37.0	21.1	3.41	4.25
	44	24.4	19.9	3.40	4.01

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	7.51	3.75	1.49	1.26
	-15	9.16	5.35	1.56	1.35
	-10	15.9	7.31	2.88	2.53
	-7	17.5	9.43	3.19	3.73
	2	23.3	12.7	4.06	4.70
	7	26.0	14.5	4.55	5.34
	10	28.0	15.7	4.85	5.76
	18	33.8	18.4	5.89	6.91
40	-20	7.29	3.68	1.35	1.16
	-15	8.97	5.23	1.43	1.21
	-10	15.6	7.16	2.60	2.22
	-7	17.2	9.17	2.83	3.55
	2	23.0	12.6	3.62	4.14
	7	24.6	13.5	3.92	4.33
	10	26.9	14.7	4.22	4.64
	18	33.2	17.8	5.16	5.93
45	-20	7.13	3.58	1.28	1.13
	-15	8.82	5.07	1.36	1.16
	-10	15.4	7.02	2.41	2.15
	-7	17.1	8.93	2.61	2.87
	2	22.7	12.2	3.24	3.60
	7	24.2	13.2	3.36	3.77
	10	26.1	14.3	3.72	4.03
	18	32.6	17.3	4.54	5.07
50	-15	8.10	4.86	1.26	1.11
	-10	14.3	6.82	2.12	1.89
	-7	15.8	8.73	2.37	2.58
	2	22.1	11.9	2.91	3.19
	7	22.7	12.3	3.01	3.29
	10	25.4	13.7	3.26	3.67
	18	31.8	16.6	3.96	4.38
55	-10	11.9	6.63	1.96	1.81
	-7	14.4	8.55	2.24	2.38
	2	21.7	11.6	2.62	2.83
	7	23.0	12.1	2.56	2.96
	10	24.8	13.3	2.88	3.29
	18	30.9	15.9	3.45	3.86
60	2	14.7	11.4	2.47	2.55
	7	15.1	11.9	2.48	2.57
	10	16.9	12.8	2.80	2.86
	18	20.3	15.2	3.25	3.34

Performances

AEROTOP EVO PLUS 27

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	29.1	17.2	6.02	7.32
	20	27.9	16.4	5.16	6.24
	25	26.6	15.6	4.43	5.32
	30	25.4	14.9	3.84	4.57
	35	24.1	14.0	3.24	3.87
	40	22.5	13.2	2.83	3.34
	44	15.3	12.3	2.73	2.97
10	15	31.9	18.7	6.58	7.99
	20	30.6	17.9	5.61	6.80
	25	29.2	17.1	4.80	5.77
	30	27.9	16.2	4.15	4.92
	35	26.4	15.3	3.58	4.16
	40	24.7	14.4	3.06	3.60
	44	16.7	13.4	2.94	3.19
12	15	33.7	19.7	6.96	8.46
	20	32.3	18.9	5.92	7.18
	25	30.9	17.7	5.06	5.99
	30	29.5	17.1	4.36	5.17
	35	27.0	16.4	3.62	4.46
	40	26.2	15.2	3.21	3.78
	44	17.7	14.1	3.08	3.34
15	15	37.6	21.8	7.11	8.71
	20	35.9	20.7	5.99	7.28
	25	34.2	19.6	5.11	6.09
	30	32.4	18.6	4.34	5.15
	35	28.1	18.4	3.40	4.57
	40	27.2	17.6	3.00	4.07
	44	19.6	16.2	3.03	3.44
18	15	40.8	23.5	7.76	9.59
	20	39.0	22.4	6.51	7.97
	25	37.6	21.1	5.72	6.46
	30	35.3	20.0	4.69	5.58
	35	30.0	19.9	4.41	4.98
	40	29.3	19.8	3.20	4.57
	44	21.3	19.3	3.26	4.11
20	15	43.1	24.7	8.22	10.2
	20	41.1	23.5	6.88	8.46
	25	39.2	22.4	5.83	7.10
	30	37.2	21.0	4.93	5.87
	35	35.1	19.7	4.20	4.91
	40	33.0	18.6	3.60	4.32
	44	22.4	17.5	3.43	3.74

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	9.81	3.75	1.44	1.25
	-15	11.4	5.40	1.50	1.30
	-10	19.2	7.31	2.82	2.53
	-7	20.9	9.43	3.12	3.73
	2	26.4	12.7	3.77	4.70
	7	30.4	14.5	4.42	5.34
	10	32.5	15.7	4.40	5.76
	18	41.4	18.4	5.60	6.91
40	-20	8.30	3.70	1.28	1.15
	-15	11.1	5.34	1.38	1.18
	-10	17.7	7.16	2.54	2.22
	-7	19.7	9.17	2.68	3.55
	2	26.2	12.6	3.35	4.15
	7	29.1	13.5	3.72	4.33
	10	31.4	14.7	3.92	4.64
	18	40.3	17.8	4.85	5.93
45	-20	7.87	3.63	1.23	1.11
	-15	10.9	5.22	1.32	1.13
	-10	17.2	7.02	2.28	2.00
	-7	18.4	8.93	2.34	2.87
	2	25.9	12.2	3.03	3.60
	7	28.7	13.2	3.31	3.77
	10	30.2	14.3	3.38	4.03
	18	39.4	17.3	4.31	5.07
50	-15	8.28	4.84	1.17	1.09
	-10	15.4	6.82	1.99	1.85
	-7	16.7	8.73	2.14	2.58
	2	25.5	11.9	2.74	3.19
	7	27.2	12.3	2.93	3.29
	10	28.8	13.7	2.99	3.70
	18	37.9	16.6	3.69	4.38
55	-10	12.0	6.63	1.89	1.81
	-7	14.7	8.55	2.01	2.38
	2	25.1	11.6	2.46	2.83
	7	27.6	12.1	2.42	2.96
	10	27.8	13.3	2.71	3.29
	18	36.7	15.9	3.19	3.86
60	2	15.6	11.4	2.40	2.55
	7	15.7	11.9	2.43	2.57
	10	17.1	12.8	2.60	2.86
	18	20.5	15.2	3.03	3.34

Performances

AEROTOP EVO PLUS 32

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	37.2	18.9	5.43	6.88
	20	35.6	18.1	4.60	5.87
	25	33.9	17.2	3.96	5.00
	30	32.2	16.3	3.39	4.29
	35	30.4	15.4	2.92	3.65
	40	28.3	14.8	2.49	3.47
	44	18.0	13.9	2.58	3.05
10	15	40.7	20.6	5.85	7.49
	20	38.9	19.7	4.95	6.35
	25	37.1	18.8	4.24	5.39
	30	35.3	17.8	3.63	4.60
	35	33.4	16.8	3.13	3.92
	40	31.1	16.2	2.67	3.78
	44	19.7	15.3	2.78	3.31
12	15	43.0	21.7	6.13	7.90
	20	41.1	20.8	5.18	6.68
	25	39.3	19.8	4.43	5.68
	30	37.3	18.8	3.79	4.83
	35	35.3	17.7	3.26	4.10
	40	32.9	17.1	2.78	3.99
	44	20.9	16.2	2.91	3.48
15	15	47.9	24.1	6.14	8.01
	20	45.6	23.0	5.14	6.69
	25	43.4	21.8	4.37	5.62
	30	40.5	20.7	3.67	4.77
	35	37.5	19.5	3.08	4.05
	40	35.4	19.3	2.66	4.07
	44	23.0	17.8	2.88	3.48
18	15	52.0	26.1	6.59	8.74
	20	49.7	24.8	5.56	7.28
	25	47.1	23.5	4.67	6.08
	30	44.6	22.2	3.97	5.12
	35	39.1	20.9	3.74	4.30
	40	38.4	20.4	2.84	4.31
	44	25.0	19.3	3.09	3.77
20	15	54.8	27.4	6.90	9.28
	20	52.3	26.1	5.80	7.69
	25	49.7	24.9	4.88	6.55
	30	47.0	23.4	4.15	5.38
	35	43.2	21.9	3.46	4.52
	40	41.6	21.4	3.04	4.56
	44	26.3	20.3	3.24	3.96

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	12.9	4.75	1.44	1.15
	-15	14.1	6.56	1.49	1.23
	-10	23.4	9.35	2.79	2.50
	-7	25.0	10.6	3.00	3.39
	2	33.7	14.8	3.54	4.31
	7	36.8	16.6	4.33	5.09
	10	39.0	18.0	4.49	5.46
	18	49.0	22.5	5.44	6.60
40	-20	9.40	4.45	1.22	1.11
	-15	11.5	6.43	1.31	1.15
	-10	19.3	9.25	2.47	2.17
	-7	24.8	10.4	2.65	3.15
	2	33.3	14.5	3.19	3.84
	7	35.0	15.5	3.71	4.26
	10	37.9	16.8	3.81	4.46
	18	47.3	20.9	4.69	5.70
45	-20	9.13	4.30	1.17	1.08
	-15	11.2	6.34	1.24	1.10
	-10	18.7	9.13	2.18	1.95
	-7	24.3	10.3	2.25	2.76
	2	32.8	14.3	2.86	3.40
	7	34.0	15.2	3.25	3.67
	10	36.8	16.2	3.28	3.94
	18	45.9	20.1	4.07	4.98
50	-15	9.14	6.22	1.15	1.08
	-10	16.1	8.96	1.94	1.82
	-7	17.7	10.1	2.10	2.48
	2	32.3	14.1	2.56	2.99
	7	33.5	13.4	2.80	3.14
	10	35.8	14.7	2.85	3.30
	18	44.5	17.9	3.49	3.86
55	-10	13.5	8.80	1.84	1.76
	-7	16.3	9.90	2.02	2.20
	2	31.7	13.8	2.30	2.69
	7	32.5	13.0	2.35	2.83
	10	35.3	14.0	2.52	3.00
	18	43.1	16.9	2.99	3.44
60	2	16.9	13.2	2.33	2.40
	7	15.9	12.6	2.41	2.48
	10	17.2	13.5	2.54	2.62
	18	20.6	16.2	3.59	3.06

Performances

AEROTOP EVO PLUS 48

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	52.7	30.2	5.68	7.15
	20	50.6	28.8	4.91	6.08
	25	48.5	27.3	4.24	5.15
	30	46.2	25.8	3.68	4.36
	35	43.9	24.3	3.14	3.68
	40	41.2	22.5	2.74	3.07
	44	24.0	21.0	2.63	2.63
10	15	57.8	32.9	6.27	7.88
	20	55.6	31.4	5.39	6.66
	25	53.3	29.8	4.64	5.63
	30	50.9	28.2	4.01	4.74
	35	48.4	26.5	3.48	4.00
	40	45.4	24.5	2.98	3.32
	44	26.2	22.9	2.84	2.84
12	15	61.2	34.7	6.67	8.39
	20	58.9	33.1	5.72	7.07
	25	56.5	31.5	4.91	5.95
	30	54.0	29.8	4.26	5.00
	35	51.4	28.0	3.67	4.21
	40	48.2	25.9	3.14	3.48
	44	27.7	24.1	2.98	2.98
15	15	68.2	36.5	6.77	8.28
	20	65.2	34.6	5.71	6.84
	25	62.1	32.5	4.85	5.65
	30	60.0	31.3	4.22	4.80
	35	57.7	30.3	3.66	4.12
	40	54.4	28.0	3.14	3.40
	44	30.8	26.2	2.92	2.91
18	15	72.5	39.7	7.28	9.30
	20	69.3	37.6	6.12	7.61
	25	67.0	36.4	5.24	6.43
	30	64.6	35.2	4.53	5.44
	35	59.3	33.8	4.20	4.63
	40	56.4	30.4	3.23	3.69
	44	33.4	28.3	3.16	3.15
20	15	77.8	42.8	7.90	10.3
	20	74.4	40.7	6.60	8.40
	25	71.9	39.4	5.65	7.04
	30	69.3	38.0	4.87	5.95
	35	65.6	36.5	4.14	5.03
	40	61.7	32.9	3.53	4.02
	44	36.1	30.8	3.42	3.43

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	100	Min	100	Min
35	-20	19.8	5.79	2.14	1.23
	-15	24.4	11.5	2.51	2.31
	-10	29.5	15.0	2.90	2.84
	-7	32.8	17.6	3.11	3.46
	2	43.4	24.3	3.82	4.38
	7	54.3	28.8	4.37	5.21
	10	54.5	30.5	4.82	5.52
	18	63.9	35.6	5.60	6.46
40	-20	19.0	7.96	1.97	1.35
	-15	23.9	10.9	2.29	2.06
	-10	29.0	14.4	2.64	2.52
	-7	32.3	17.4	2.82	3.15
	2	42.7	23.8	3.44	3.85
	7	50.8	28.1	4.10	4.56
	10	53.6	29.7	4.29	4.80
	18	62.7	34.5	4.94	5.55
45	-20	18.3	6.86	1.74	1.07
	-15	23.5	12.6	2.09	1.88
	-10	28.6	14.0	2.41	2.23
	-7	31.9	17.4	2.57	2.83
	2	42.1	23.3	3.09	3.38
	7	52.4	27.4	3.36	3.97
	10	52.6	28.9	3.81	4.16
	18	61.4	33.4	4.35	4.77
50	-15	21.1	12.2	1.70	1.65
	-10	25.7	13.3	1.96	1.97
	-7	29.0	16.4	2.14	2.40
	2	38.1	21.0	2.59	2.76
	7	44.2	24.2	3.10	3.28
	10	46.8	25.5	3.23	3.44
	18	54.4	29.4	3.65	3.91
55	-10	21.7	12.5	1.77	1.62
	-7	28.4	16.1	1.93	2.03
	2	37.4	20.5	2.33	2.44
	7	46.4	23.4	2.73	2.86
	10	45.7	24.6	2.87	2.98
	18	52.8	28.3	3.20	3.36
60	2	25.7	19.9	2.16	2.13
	7	29.3	22.3	2.52	2.46
	10	31.0	23.5	2.64	2.56
	18	35.6	27.0	2.94	2.88

Performances

AEROTOP EVO PLUS 54

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	55.6	31.3	5.22	6.49
	20	53.4	29.9	4.48	5.52
	25	51.1	28.4	3.87	4.69
	30	50.5	27.8	3.47	4.11
	35	49.8	27.1	3.06	3.59
	40	46.7	25.3	2.68	3.03
	44	27.1	23.7	2.62	2.62
10	15	60.9	34.1	5.74	7.12
	20	58.6	32.6	4.91	6.03
	25	56.1	31.1	4.22	5.10
	30	54.6	29.7	3.72	4.35
	35	53.9	29.6	3.33	3.89
	40	51.5	27.7	2.91	3.27
	44	29.7	25.9	2.83	2.83
12	15	64.6	36.0	6.10	7.56
	20	62.1	34.4	5.20	6.37
	25	59.5	32.8	4.46	5.37
	30	57.9	31.4	3.92	4.58
	35	57.2	31.2	3.51	4.08
	40	54.6	29.2	3.06	3.44
	44	31.4	27.3	2.97	2.96
15	15	72.5	40.1	6.15	7.59
	20	69.4	38.2	5.18	6.32
	25	66.3	36.2	4.41	5.27
	30	64.7	34.7	3.84	4.46
	35	61.4	34.6	3.28	3.93
	40	59.5	32.3	2.90	3.31
	44	34.2	30.2	2.82	2.86
18	15	79.0	43.4	6.76	8.40
	20	75.7	41.3	5.67	6.94
	25	72.3	39.2	4.80	5.76
	30	70.2	37.3	4.17	4.84
	35	66.0	37.0	3.77	4.26
	40	66.2	34.7	3.22	3.57
	44	37.0	32.6	3.03	3.07
20	15	83.4	45.6	7.19	8.98
	20	79.9	43.4	6.01	7.39
	25	76.3	41.2	5.07	6.09
	30	74.1	39.2	4.40	5.10
	35	72.7	38.9	3.88	4.48
	40	69.9	36.5	3.39	3.75
	44	38.8	34.3	3.17	3.23

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	22.5	5.51	2.16	1.08
	-15	27.2	10.2	2.48	2.13
	-10	32.3	13.6	2.83	2.58
	-7	35.8	17.4	3.06	3.45
	2	48.4	24.3	3.79	4.38
	7	58.5	28.8	4.13	5.21
	10	58.7	30.5	4.60	5.52
	18	68.6	35.6	5.31	6.46
40	-20	21.8	7.90	1.98	1.27
	-15	26.6	9.61	2.27	1.89
	-10	31.9	13.0	2.59	2.37
	-7	35.3	17.3	2.80	3.16
	2	47.5	23.9	3.40	3.86
	7	55.5	28.2	3.97	4.58
	10	58.1	29.9	4.11	4.82
	18	67.8	34.7	4.71	5.58
45	-20	21.1	7.03	1.80	1.08
	-15	26.0	11.7	2.06	1.78
	-10	31.5	12.5	2.37	2.08
	-7	35.0	17.3	2.56	2.87
	2	46.7	23.6	3.04	3.40
	7	57.8	27.6	3.33	3.97
	10	57.4	29.2	3.66	4.18
	18	66.8	33.8	4.17	4.82
50	-15	24.0	11.7	1.74	1.52
	-10	28.9	11.8	1.98	1.75
	-7	32.1	16.4	2.13	2.43
	2	42.0	21.2	2.58	2.79
	7	50.3	24.4	3.17	3.32
	10	53.3	25.8	3.31	3.48
	18	61.8	29.7	3.71	3.94
55	-10	23.1	11.2	1.79	1.54
	-7	31.1	14.8	1.90	1.89
	2	41.2	20.7	2.32	2.46
	7	51.8	23.7	2.70	2.89
	10	52.0	24.9	2.94	3.01
	18	60.2	28.6	3.28	3.39
60	2	26.0	20.1	2.18	2.15
	7	29.3	22.3	2.52	2.46
	10	31.0	23.5	2.64	2.56
	18	35.6	27.0	2.94	2.88

Performances

AEROTOP EVO PLUS 65

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Mini	Max	Min
7	15	66.2	34.5	5.14	6.91
	20	64.4	33.3	4.45	5.94
	25	62.3	31.7	3.87	5.04
	30	57.5	29.3	3.23	4.17
	35	56.9	27.7	2.89	3.55
	40	53.5	25.7	2.51	2.97
	44	30.9	24.0	2.52	2.57
10	15	70.0	34.6	5.43	6.97
	20	67.3	33.0	4.63	5.89
	25	64.4	31.5	3.96	4.99
	30	61.5	29.8	3.42	4.21
	35	62.9	30.3	3.17	3.83
	40	58.9	28.1	2.71	3.20
	44	33.9	26.3	2.70	2.76
12	15	74.1	36.4	5.76	7.39
	20	71.2	34.9	4.88	6.24
	25	68.3	33.2	4.18	5.26
	30	65.3	31.5	3.59	4.44
	35	66.7	31.9	3.33	4.03
	40	62.6	29.6	2.85	3.35
	44	35.9	27.7	2.86	2.89
15	15	82.5	40.3	5.95	8.05
	20	78.6	38.4	4.96	6.71
	25	75.3	36.4	4.22	5.59
	30	72.0	34.6	3.62	4.72
	35	73.7	35.0	3.34	4.25
	40	69.2	32.4	2.85	3.52
	44	38.2	30.3	2.92	2.98
18	15	89.9	43.6	6.50	8.45
	20	86.1	41.5	5.43	6.97
	25	82.1	39.4	4.58	5.78
	30	79.8	37.2	3.98	4.82
	35	78.0	37.5	3.45	4.31
	40	75.0	34.9	3.06	3.58
	44	41.4	32.8	2.97	3.09
20	15	95.0	45.8	6.88	9.03
	20	90.9	43.6	5.73	7.42
	25	86.9	41.4	4.85	6.14
	30	82.6	39.1	4.10	5.09
	35	84.1	39.4	3.75	4.54
	40	79.3	36.7	3.21	3.77
	44	43.5	34.4	3.11	3.24

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	28.5	8.72	2.34	1.28
	-15	33.1	12.7	2.57	2.19
	-10	38.9	16.4	2.83	2.79
	-7	43.4	20.2	3.00	3.43
	2	57.0	27.2	3.61	4.27
	7	66.9	32.2	4.06	5.10
	10	67.8	34.3	4.42	5.40
	18	78.9	40.1	5.05	6.33
40	-20	27.3	11.8	2.11	1.40
	-15	32.1	12.1	2.33	1.92
	-10	37.5	15.9	2.59	2.41
	-7	42.2	20.0	2.84	3.08
	2	55.3	26.7	3.34	3.78
	7	63.5	31.6	3.78	4.49
	10	66.8	33.5	3.93	4.74
	18	77.7	39.0	4.46	5.49
45	-20	26.2	10.7	1.91	1.20
	-15	31.2	11.3	2.11	1.65
	-10	36.8	15.2	2.35	2.12
	-7	40.9	19.5	2.54	2.73
	2	54.2	26.2	2.98	3.34
	7	66.4	30.9	3.19	3.94
	10	65.8	32.7	3.46	4.14
	18	76.3	37.9	3.93	4.75
50	-15	28.3	10.1	1.76	1.36
	-10	33.6	14.4	1.95	1.84
	-7	37.1	18.7	2.08	2.35
	2	48.0	23.7	2.48	2.76
	7	58.6	27.3	3.09	3.29
	10	61.8	28.9	3.21	3.45
	18	71.7	33.4	3.60	3.91
55	-10	24.6	17.9	1.75	1.70
	-7	36.1	17.7	1.87	2.01
	2	47.1	23.2	2.23	2.45
	7	56.6	26.6	2.73	2.89
	10	60.5	28.0	2.86	3.02
	18	70.1	32.1	3.23	3.38
60	2	26.9	22.5	2.16	2.11
	7	32.3	25.5	2.60	2.50
	10	34.1	26.9	2.71	2.62
	18	39.7	30.8	3.05	2.92

Performances

AEROTOP EVO PLUS 79

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	80.4	48.2	5.19	6.32
	20	77.5	46.1	4.58	5.67
	25	75.3	43.9	4.05	4.94
	30	72.7	41.8	3.54	4.22
	35	70.2	39.7	3.10	3.55
	40	66.7	37.5	2.65	2.96
	44	46.3	35.8	2.57	2.54
10	15	87.5	52.2	5.56	6.83
	20	84.3	49.9	4.91	6.12
	25	81.2	47.6	4.30	5.33
	30	78.1	45.4	3.75	4.56
	35	75.0	43.2	3.26	3.84
	40	71.9	41.0	2.82	3.21
	44	50.8	39.2	2.80	2.76
12	15	92.4	54.9	5.81	7.22
	20	89.2	52.6	5.14	6.45
	25	85.9	50.2	4.51	5.62
	30	82.7	48.0	3.94	4.82
	35	79.5	45.7	3.43	4.06
	40	76.3	43.4	2.98	3.39
	44	54.0	41.7	2.97	2.93
15	15	100	59.3	6.22	7.88
	20	96.7	56.9	5.51	7.03
	25	93.5	54.4	4.86	6.12
	30	90.1	52.1	4.26	5.25
	35	86.7	49.7	3.71	4.43
	40	83.4	47.4	3.24	3.71
	44	50.8	45.6	3.30	3.21
18	15	109	64.0	6.67	8.60
	20	105	61.5	5.94	7.72
	25	102	59.0	5.25	6.73
	30	98.0	56.6	4.61	5.77
	35	95.3	54.2	4.14	4.88
	40	91.2	51.8	3.54	4.09
	44	55.7	50.0	3.66	3.55
20	15	115	67.4	7.01	9.12
	20	111	64.3	6.25	8.14
	25	107	62.3	5.54	7.21
	30	104	59.8	4.89	6.18
	35	100	57.4	4.29	5.22
	40	96.6	55.0	3.76	4.39
	44	59.2	53.2	3.93	3.81

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	34.8	22.8	1.73	2.05
	-15	43.2	27.3	2.19	2.60
	-10	50.8	31.8	2.68	3.15
	-7	57.0	34.4	2.95	3.54
	2	68.8	41.0	3.57	4.24
	7	78.4	46.4	4.38	5.14
	10	82.3	48.9	4.48	5.42
	18	95.2	56.2	5.11	6.26
40	-20	33.7	23.7	1.49	1.68
	-15	42.2	26.3	1.91	2.23
	-10	50.0	30.5	2.30	2.70
	-7	55.1	33.1	2.55	2.97
	2	67.7	39.7	3.14	3.64
	7	76.1	45.2	3.80	4.44
	10	80.7	48.0	3.95	4.72
	18	94.3	55.1	4.55	5.45
45	-20	-	22.2	1.30	1.40
	-15	41.3	25.4	1.66	1.90
	-10	48.9	29.7	2.01	2.31
	-7	54.1	31.9	2.24	2.51
	2	66.7	38.2	2.76	3.06
	7	74.7	43.9	3.52	3.78
	10	79.3	46.8	3.47	4.03
	18	93.0	53.9	4.01	4.66
50	-15	38.4	24.2	1.48	1.58
	-10	45.0	28.9	1.78	1.96
	-7	53.0	30.9	1.95	2.12
	2	65.9	37.3	2.43	2.60
	7	73.0	42.6	2.80	3.10
	10	78.4	45.9	2.97	3.34
	18	91.1	52.5	3.40	3.85
55	-10	38.3	27.9	1.61	1.65
	-7	51.8	29.9	1.70	1.78
	2	65.1	36.4	2.14	2.20
	7	75.5	41.4	2.56	2.62
	10	77.5	44.7	2.61	2.82
	18	89.8	51.3	2.98	3.25
60	2	-	34.7	-	1.82
	7	-	40.6	-	2.22
	10	-	43.9	-	2.40
	18	-	50.4	-	2.77

Performances

AEROTOP EVO PLUS 88

Cooling Performance

To	Tae	Cooling Capacity		EER	
°C	°C	Max	Min	Max	Min
7	15	92.1	53.7	4.85	5.91
	20	88.8	51.4	4.28	5.37
	25	85.9	49.1	3.77	4.74
	30	82.9	46.8	3.31	4.11
	35	80.4	44.5	2.91	3.50
	40	76.1	42.2	2.49	2.95
	44	47.0	40.4	2.53	2.53
10	15	100	58.2	5.18	6.41
	20	96.7	55.7	4.58	5.81
	25	93.1	53.3	4.03	5.14
	30	89.6	50.9	3.52	4.45
	35	86.1	48.5	3.07	3.80
	40	82.5	46.1	2.67	3.21
	44	51.5	44.6	2.76	2.78
12	15	106	61.4	5.42	6.78
	20	102	58.8	4.80	6.15
	25	98.5	56.3	4.22	5.43
	30	94.9	53.8	3.70	4.71
	35	91.2	51.4	3.23	4.03
	40	87.6	49.0	2.82	3.41
	44	54.7	46.0	2.93	2.86
15	15	110	64.2	5.69	7.02
	20	106	61.1	5.05	6.59
	25	103	58.6	4.46	5.83
	30	99.0	56.1	3.92	5.06
	35	95.3	53.7	3.44	4.33
	40	91.8	51.3	3.01	3.68
	44	56.1	48.2	3.07	3.05
18	15	120	71.2	6.08	7.76
	20	116	66.0	5.42	7.26
	25	112	63.6	4.81	6.42
	30	108	61.0	4.25	5.59
	35	104	58.5	3.71	4.79
	40	100	56.1	3.29	4.07
	44	62.2	54.1	3.46	3.56
20	15	126	73.1	6.43	7.97
	20	122	70.6	5.70	7.92
	25	118	67.1	5.07	6.89
	30	114	64.5	4.49	6.00
	35	110	62.0	3.97	5.14
	40	106	59.1	3.50	4.35
	44	64.5	56.7	3.61	3.76

Heating Performance

To	Tae	Heating Capacity		COP	
°C	°C	Max	Min	Max	Min
35	-20	37.7	23.6	1.63	1.92
	-15	46.9	28.5	2.05	2.44
	-10	55.8	33.3	2.56	2.95
	-7	63.3	36.9	2.93	3.45
	2	75.9	43.8	3.36	4.09
	7	87.2	50.3	4.02	4.79
	10	92.3	53.0	4.16	5.06
	18	107	61.0	4.73	5.84
40	-20	36.5	25.0	1.40	1.58
	-15	45.2	26.5	1.77	2.03
	-10	54.6	32.1	2.16	2.55
	-7	59.7	33.8	2.37	2.72
	2	74.6	43.1	3.01	3.60
	7	86.0	49.4	3.55	4.22
	10	91.8	52.0	3.73	4.45
	18	106	60.0	4.22	5.16
45	-20	31.1	23.2	1.22	1.31
	-15	43.7	25.6	1.52	1.74
	-10	53.7	31.0	1.89	2.18
	-7	58.5	31.6	2.07	2.25
	2	72.7	41.6	2.63	3.07
	7	85.0	48.7	3.28	3.68
	10	91.4	51.3	3.33	3.88
	18	105	59.3	3.75	4.51
50	-15	38.7	24.5	1.39	1.47
	-10	46.6	30.0	1.47	1.86
	-7	56.4	30.6	1.79	1.92
	2	71.0	40.3	2.30	2.61
	7	86.2	47.7	2.75	3.09
	10	90.2	50.3	2.86	3.25
	18	103	58.2	3.21	3.79
55	-10	40.9	28.9	1.52	1.57
	-7	54.6	29.7	1.55	1.63
	2	69.4	38.9	2.01	2.21
	7	85.8	46.5	2.47	2.64
	10	89.2	49.0	2.52	2.78
	18	102	57.0	2.83	3.24
60	2	-	38.0	-	1.70
	7	-	45.5	-	2.14
	10	-	48.1	-	2.27
	18	-	55.8	-	2.64

Installation

Safety areas and functional distances

Positioning
Consider these elements during positioning:
- Technical spaces requested by the unit
- Electrical connections
- Water connections
- Functional clearances

Functional clearances
Functional clearances have the purpose of:
- guaranteeing good unit operation
- allowing maintenance operations
- safeguarding authorised operators and exposed persons.
- respecting the functional clearances indicated

Positioning
Units are designed to be installed:
- Outdoors
- in permanent position.
- Units may be installed on the ground or on the roof provided that sufficient ventilation is guaranteed.

If the unit is installed on a roof, the roof must be sturdy enough to withstand the weight of the unit and the weight of maintenance personnel.
Limit the transmission of vibrations:
- use anti-vibration devices or neoprene strips on the unit support points
- install flexible joints on the hydraulic connections
- The unit must be level

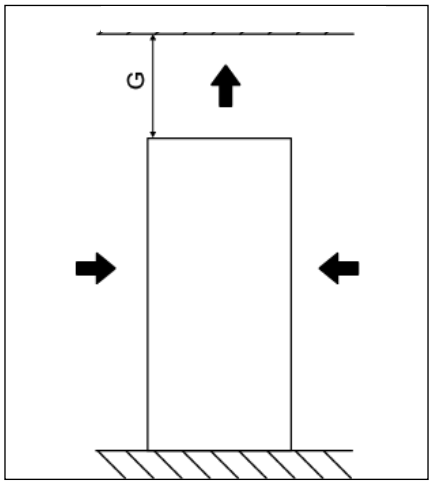
Installation criteria:
- Customer approval
- position accessible safely
- technical spaces requested by the unit
- spaces for the air intake/exhaust
- max. distance allowed by the electrical connections
- install the unit raised from the ground
- verify unit weight and bearing point capacity
- verify that all bearing points are aligned and levelled
- condensate water draining
- consider the maximum possible snow level
- avoid places that can be subject to floods
- Protect the unit with a suitable fence in order to avoid access to unauthorised personnel (children, vandals, etc.)

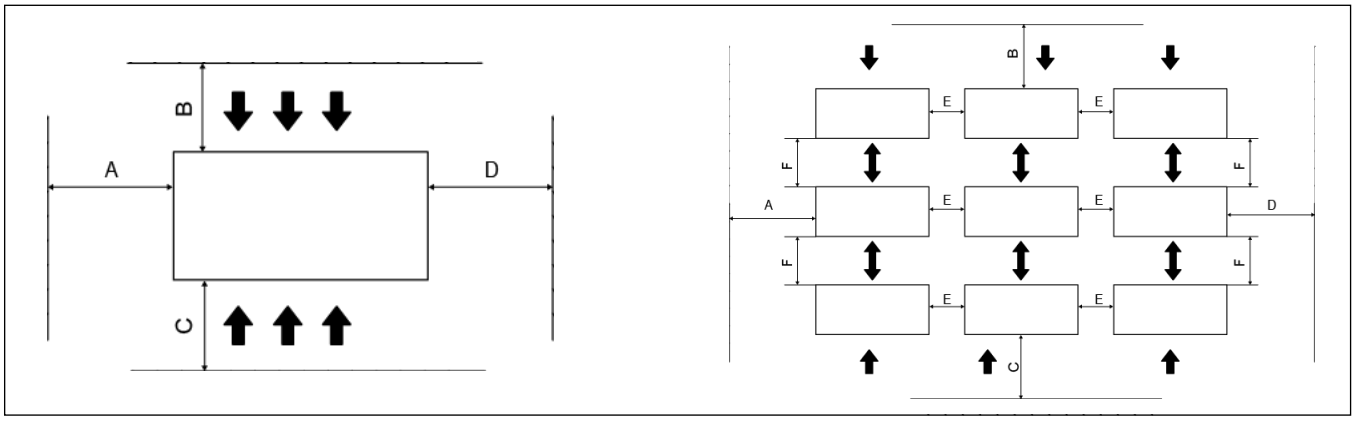
Pressure relief valve gas side
The installer is responsible for evaluating the opportunity of installing drain pipes in compliance with the local regulations in force (EN 378).
If ducted, the valves must be resized according to EN13136

Condensate
When a heat pump is in operation it produces a considerable amount of water due to the defrosting cycles of the external coil. The condensate must be disposed of in order to avoid damaging people and things.

A correct circulation of the air is mandatory to guarantee the good unit operating.
Avoid therefore:
- obstacles to the airflow
- ventilation difficulties
- leaves or other foreign bodies that can obstruct the air coil
- winds that hinder or favour airflow
- sources of heat or pollution close to the unit (chimneys, extractors etc..)
- Stratification (cold air that stagnates at the bottom)
- recirculation (expelled air that is sucked in again)
- positioning below ground level, near very high walls, underneath roofs or in corners, which can give rise to stratification or recirculation phenomena.
- Disregarding the previous indications may affect energy efficiency or lead to blocks due to HIGH PRESSURE (in summer) or LOW PRESSURE (in winter).

A	≥ 800 mm	E	≥ 1600 mm
B	≥ 800mm	F	≥ 1600 mm
C	≥ 800 mm	G	≥ 6000 mm
D	≥ 800 mm	/	/





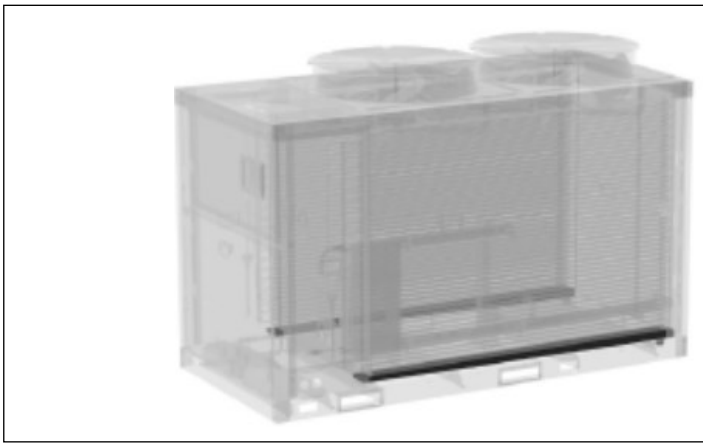
Condensate and antivibration mounts

Condensate water
When a heat pump is running it produces a considerable amount of water due to the defrosting cycles of the external coil. The condensate must be disposed in order to avoid damages to people and things.

Drain pan
Only available for AEROTOP EVO PLUS.
The unit is supplied with drain pans under the coils.
The drain pans are fitted with antifreeze electric heaters.

Diameters of tray connections

AEROTOP EVO PLUS	24 - 32	48 - 65	79 - 88
GAS - Male	1"	1"1/4	1"1/2



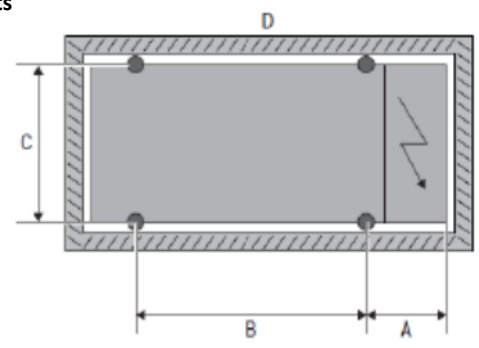
Installation of the anti-vibration mounts
Place the anti-vibration mounts between the unit and the installation base.
Use the holes on the unit frame (15 mm diameter).

Supporting points

AEROTOP EVO AEROTOP EVO PLUS		24 - 32	48 - 65	79 - 105*
A	mm	518	425	253
B	mm	825	840	2715
C	mm	930	995	1029
D		Condensate collection canal		

* only AEROTOP EVO

Supporting points



Installation

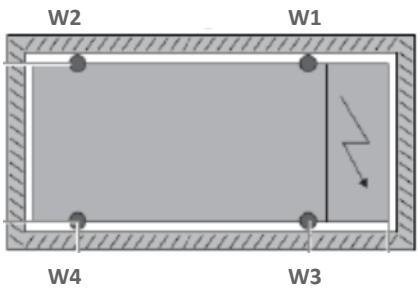
Antivibration mounts

Antivibration mounts

AEROTOP EVO AEROTOP EVO PLUS	24 - 32	48 - 65	79 - 105*
W1	BBS100-45Sh	BBS100-60Sh	RQZ 402-Z108
W2	BBS100-35Sh	BBS100-45Sh	RQZ 403-X102
W3	BBS100-45Sh	BBS100-60Sh	RQZ 403-X102
W4	BBS100-35Sh	BBS100-45Sh	RQZ 402-Z108

* only AEROTOP EVO

Antivibration mounts



Installation

Water quality

Water quality

Circulators function well exclusively with clean and high-quality tap water.
The most frequent factors that can affect circulators and the system are oxygen, limescale, sludge, acidity level and other substances (including chlorides and minerals).
In addition to the quality of water, installation also plays an important role. The heating system must be airtight. Choose materials that are not sensitive to oxygen diffusion (risk of corrosion...).

Characteristics of the water

- compliant with local regulations
- Langelier Index (LI) between 0 and +0.4
- within the limits indicated in the chart
- Water quality must be checked by qualified personnel.

Hardness

If the water is hard, install a system suitable to preserve the unit from harmful deposits and limestone formation.
If necessary, install a water softener to reduce water hardness

Cleanliness

Before connecting the water to the unit, clean the system thoroughly with specific products effective to remove residues or impurities that may affect functioning.
Existing systems must be free from sludge and contaminants and protected against build-ups.

New systems

In case of new installations, it is essential to wash the entire installation (with the circulator uninstalled) before commissioning the central installation. This removes residues of the installation process (welding, waste, joint products...) and preservatives (including mineral oil). The system must then be filled with clean high-quality tap water.

Existing systems

If a new boiler or heat pump is installed on an existing heating system, the system must be rinsed to avoid the presence of particles, sludge and waste. The system must be drained before installing the new unit. Dirt can be removed only with a suitable water flow. Each section must then be washed separately. Particular attention must also be paid to "blind spots" where a lot of dirt can accumulate due to the reduced water flow. The system must then be filled with clean high-quality tap water. If, after rinsing, the quality of the water is still unsuitable, a few measures must be taken to avoid problems. An option to remove pollutants is to install a filter. Various types of filters are available. A mesh filter is designed to catch large dirt particles. This filter is usually placed in the part with the larger flow. A tissue filter is designed to catch the finer particles.

Exclusions

The warranty does not cover damage formed by limestone, deposits and impurities deriving from the water supply and/or by the malfunctioning of the system cleaning system.

Risk of frost

- When the outside temperature gets close to 0°C, the water in the pipes and unit may freeze.
- Frost may determine irreversible damage to the unit.
- Frost damage is not covered by the warranty.

If the unit or hydraulic connections are subject to temperatures close to 0°C:

- mix water with glycol, or
- safeguard the pipes with heating cables placed under the insulation, or
- empty the system in cases of long non-use

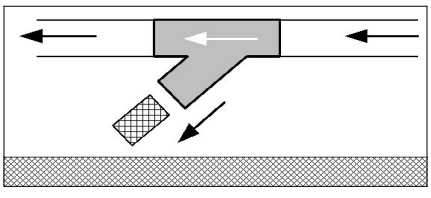
Anti-freeze solutions

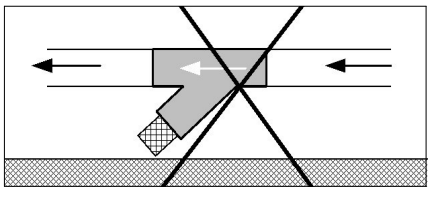
Consider that the use of anti-freeze solution determines an increase in a pressure drop.
Make sure that the glycol type utilized is inhibited (not corrosive) and compatible with the water circuit components.
Do not use different glycol mixture (i.e. ethylene with propylene).

Water filter

Use filter ≥ **30 mesh**

- It must be installed immediately in the water input of the unit, in a position that is easily accessible for cleaning.
- The filter should never be removed, doing so invalidates the warranty.





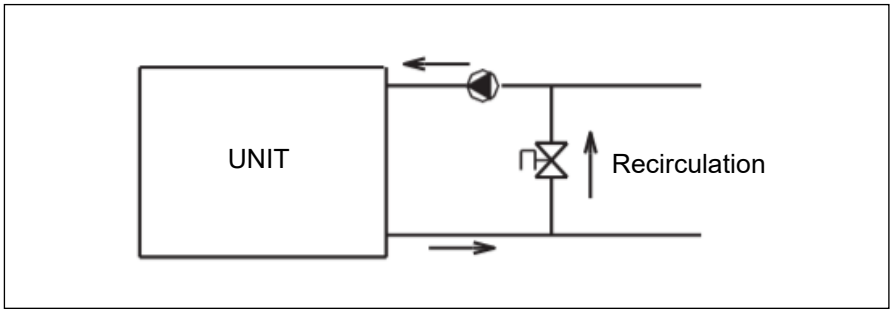
% ETHYLENE GLYCOL BY WEIGHT		5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Freezing temperature	°C	-2	-3.9	-6.5	-8.9	-11.8	-15.6	-19.0	-23.4	-27.8	-32.7
Safety temperature	°C	3	1	-1	-4	-6	-10	-14	-19	-23.8	-29.4

Installation

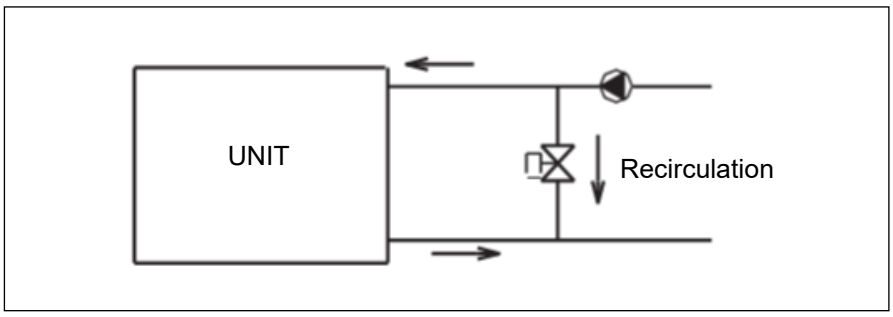
Water quality, Hydraulic connections

Water component for corrosion limit on Copper	
PH	7.5 ÷ 9.0
SO_4^{--}	< 100
HCO_3^- / SO_4^{--}	> 1
Total Hardness	< 5 °fH < 8 °dH
Cl-	< 50 ppm
PO_4^{3-}	< 2.0 ppm
NH_3	< 0.5 ppm
Free Chlorine	< 0.5 ppm
Fe_3^+	< 0.5 ppm
Mn^{++}	< 0.05 ppm
CO_2	< 50 ppm
H_2S	< 50 ppb
Temperature	< 65 °C
Oxygen content	< 0.1 ppm
Sand	10 mg/L0.1 to 0.7mm max diameter
Ferrite hydroxide Fe3O4 (black)	Dose < 7.5 mg/L 50% of mass with diameter < 10 µm
Iron oxide Fe2O3 (red)	Dose < 7.5mg/L Diameter < 1 µm

Minimum capacity of the exchanger
The minimum water flow is indicated in the technical data.
If the system capacity is below the minimum flow, bypass the system as indicated in the diagram.



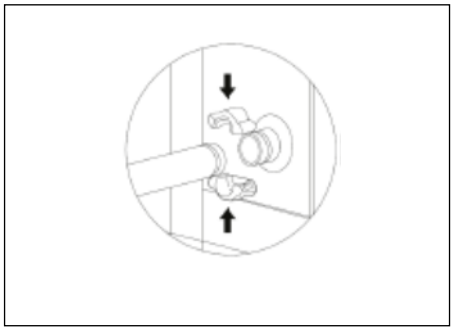
Maximum capacity of the exchanger
The maximum water flow is indicated in the technical data.
If the system capacity exceeds the minimum flow, bypass the system as indicated in the diagram.



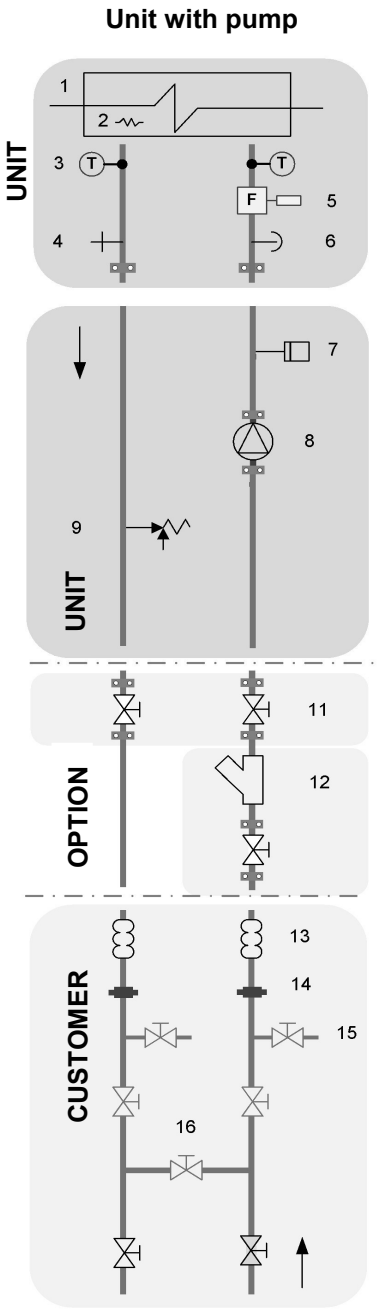
Hydraulic connections

Victaulic fittings
Victaulic connection joint.
Supplied Fittings are to weld to the system pipe.

It is not allowed to weld the system pipe with the Victaulic connection joint attached.
The rubber gaskets might be irreparably damaged



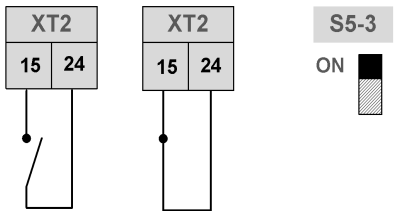
Hydraulically connection schematic



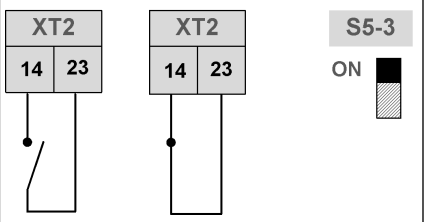
1 heat pump exchanger
2 antifreeze heater
3 water temperature probe
4 drain
5 water flow switch
6 vent
7 system loading safety pressure switch
8 Pump
9 pressure relief valve
10 NA
11 shut-off valves
12 filter
13 flexible couplings
14 piping supports
15 exchanger chemical cleaning by-pass
16 system cleaning bypass

Electric connection

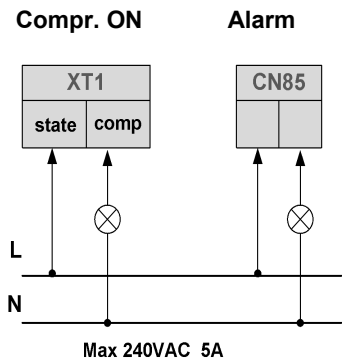
Remote On - Off



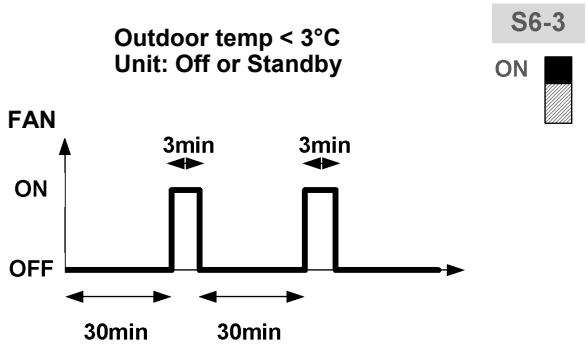
Heat - Cool



Signals

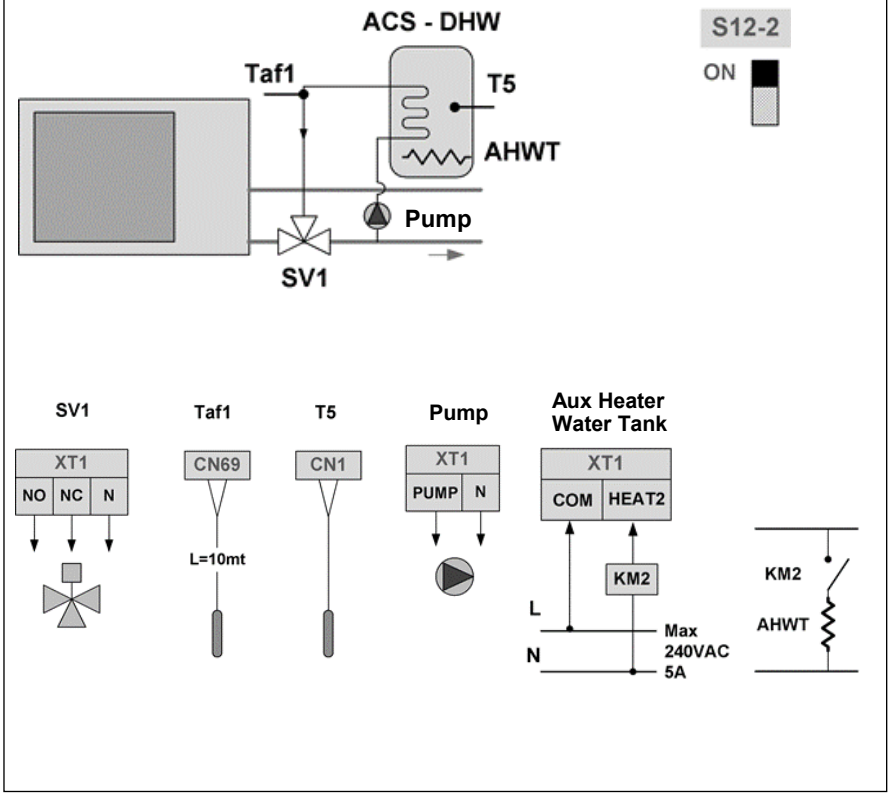


Anti-snow function

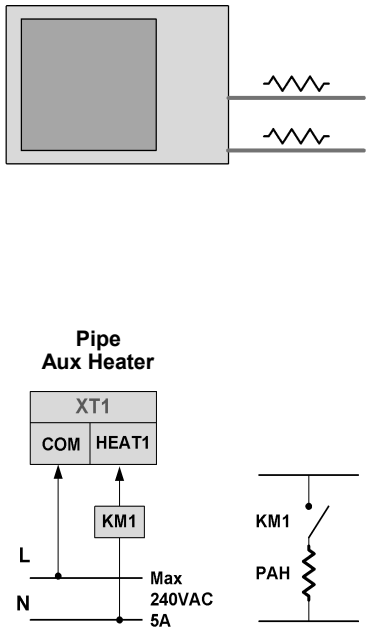


Modbus

Domestic hot water



Antifreeze heater



System configurations

Cascade management

Cascade management

It is possible to connect up to 16 units on a local network, reaching a maximum power of 1400 kW and up to 4 units connected hydraulically. The combinations can also occur with units with different power.
The modular system, obtained by combining multiple modules, preserves the strengths of the individual module, but it multiplies the advantages

Increasing system efficiency:

- the operation of multiple units connect in parallel increases total seasonal efficiency by 3%.

Greater reliability:

- The redundancy of cooling circuits and compressors guarantees full operation even in case of malfunction of a single module, that can be repaired while the system continues to be in operation.

Handling and simplified installation:

- the compact dimensions of an individual module make it easy to pass through doors and elevators. The V design of the coils makes it possible to reduce side clear space. The quick connections allow simple and quick installation.

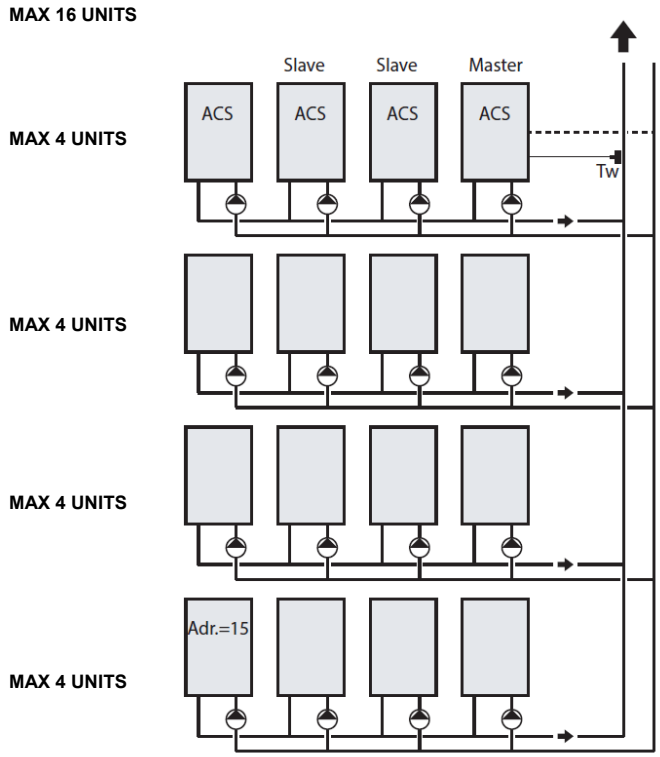
Easy and quick maintenance:

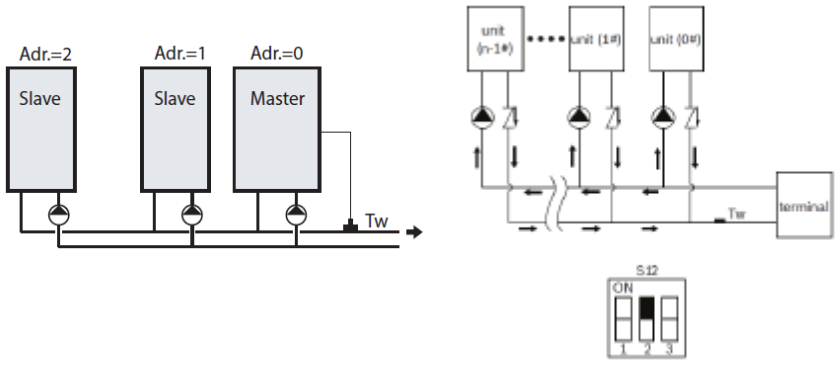
- all of the main components can be reached from the front guaranteeing on-line maintenance of a module, without blocking the adjacent modules. Every unit is equipped with cutoff and
- non return valve in order to isolate the individual unit in case of
- malfunction.

Scalability:

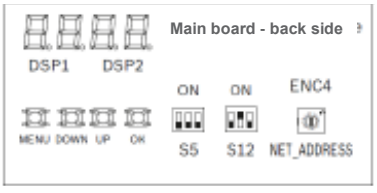
- it is possible to add additional modules, even subsequently, in order to satisfy system load requirements that may have changed

Modular system connection diagram - addressing





Unit addressing



UNIT	1 - MASTER	2 - Slave	3 - Slave	16 - Slave
Addr.	0	1	2	15
ENC4	0	1	2	F

Modularity, operation, protection mode

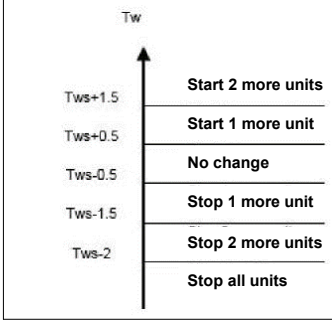
Management of auxiliary heat source
In heating mode, AEROTOP EVO is able to manage (on/off) an auxiliary heating source (eg. a traditional gas boiler), in integra-tion to the heat pomp. Control signal is given through terminals CN19_L and CN19_N, while power supply of auxiliary heater must be independent.
Activation of this auxiliary heater is related to outdoor air temperature and supply water temperature, as follow:

- Outdoor air temperature. Auxiliary heater can be activated when outdoor air temperature is < 13°C. Once in operation, it is deactiva-ted when outdoor air temperature is ≥ 15°C
- Supply water temperature. Values set by default require auxiliary heater to be activated when leaving water temperature is < 25°C, while it is deactivated when it reaches a value ≥ 45 ° C. These values can be set directly on user interface. Auxiliary heater activa-tion/ deactivation temperature cannot be higher of the set-point one.

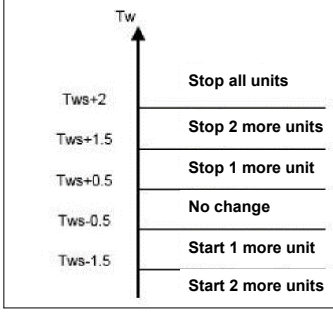
Modularity
Thanks to this functionality, already activated on all AEROTOP EVO without any additional accessory, it is possible to operate with up to 16 units connected in hydraulic parallel.
All the slave units are wired together in series, through dedicated terminals P, Q and E on respective main board, and to the Master unit user interface.
Each connected module is identified with an address, from 0 to 15: Master unit is identified as 0. The system is completely managed by the Master unit (including auxiliary components such as auxiliary heater and external pumping group).

Operation
Master unit calculates the modular combination heating/cooling, based on supply water temperature and set-point temperature. Each
single unit calculates the capacity output based on its own waterflow and return temperature. Activation of Slave follows the logic of
first in first out (the first unit to be activated will be also the first to be deactivated) and it is indicated in the charts below:
Tw = Supply water temperature
Tws = Set-point of Supply water temperature

Cooling mode



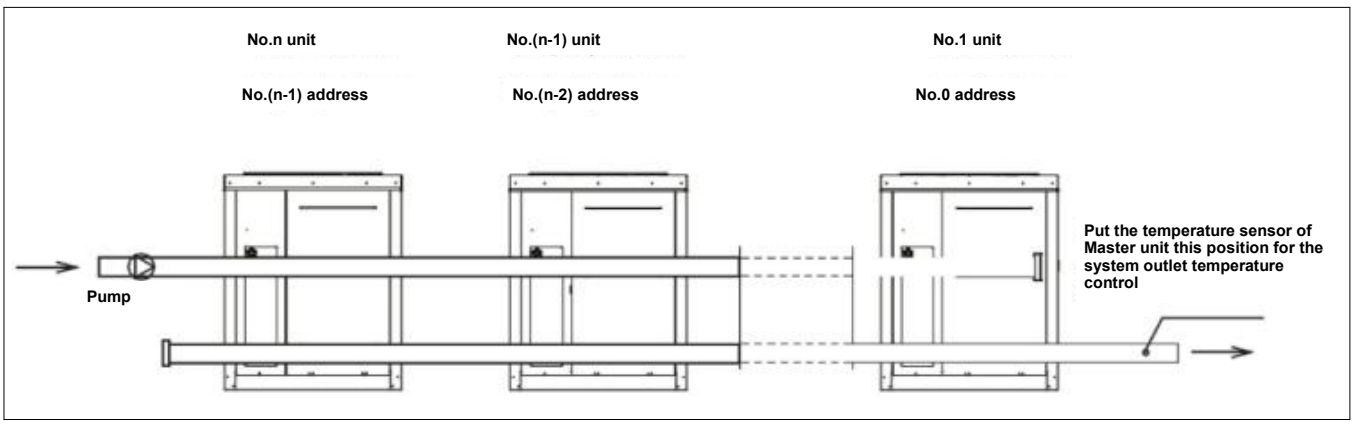
Heating mode



In cooling mode, if Tw≥Tws-10°C 50% of units are activated. In the same way, in heating mode, if Tw≤Tws-10°C 50% of units are activated.

Operation during a fault or in "protection" mode
When Master unit or a Slave unit is in "protection" mode (unit is in stand-by while hydraulic pump continues to run, except the case when
there is no water flow), only the unit in "protection" stops while all the other units continue to operate.
On the other hand, if Master unit fails and then stops, also all the Slave units of the system stop to operate. If a Slave unit fails, all the
other units continue to operate.
Protection mode occurs during one of the following conditions:

- System high pressure or exhaust temperature protection is activated
- System low voltage protection is activated
- Compressor current protection is activated
- Frequency protection of inverter compressor in cooling mode and heating mode is activated
- Condenser high temperature protection is activated
- High temperature difference between return water andflow water protection is activated
- Anti-freezing protection is activated
- Discharge temperature sensor malfunction
- Evaporator low temperature protection is activated (invalid when in standby state)
- Frequency protection is activated
- Inverter compressor malfunction
- DC fan motor protection is activated
- High return water temperature protection in cooling mode is activated
- Low pressure anti-freezing protection is activated
- High temperature of inverter compressor module



System configurations

Modularity, operation, protection mode

Modular system configuration

- Management of the entire system takes place through a unit defined as master. The master unit controller can be set up remotely at a maximum distance of up to 300 m.
- All units must be connected to each other using a shielded cable with three wires (3 x 0.75 mm2 / XYE).
- Each module must be configured with the water connections for modular unit.
- Each module can be equipped with inertial system storage tank
- It's possible to have an external pumping group, sized for the entire capacity of the modular system (responsibility of the Customer). Pumping unit management will take place from the Master unit through a potential free contact and 0-10V signal.
- It is necessary to install a Y filter on the water input of the entire modular system (customer responsibility) with the following characteristics: MESH equal to 30 (0.5 mm)

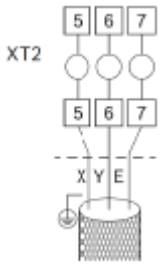
Every module is identified by a specific address.
Complete system management is carried out by the master unit, identified by the address 0.
Thermoregulation takes place on the supply temperature of the entire defined system (Tw)

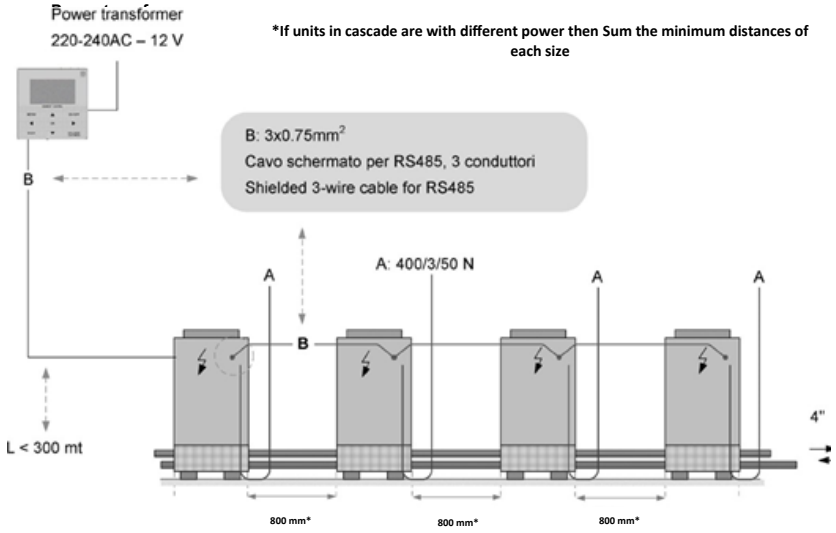
If Tw >= set point + 10°C:
the regulation activates 50% of the resources in sequence based on the defined address. Once a time interval has passed (default: 240
seconds), if the load increases, further resources are activated, if the load decreases, the units are shutoff with the sequence (first start, first stop).

If Tw < set point + 10°C:
The adjustment on activates the master unit. Once a time interval has passed (default: 240 seconds), if the load increases, in sequence
further resources will activate based on the defined address, if the load decreases the master unit will shut-off.

Modular system connection diagram

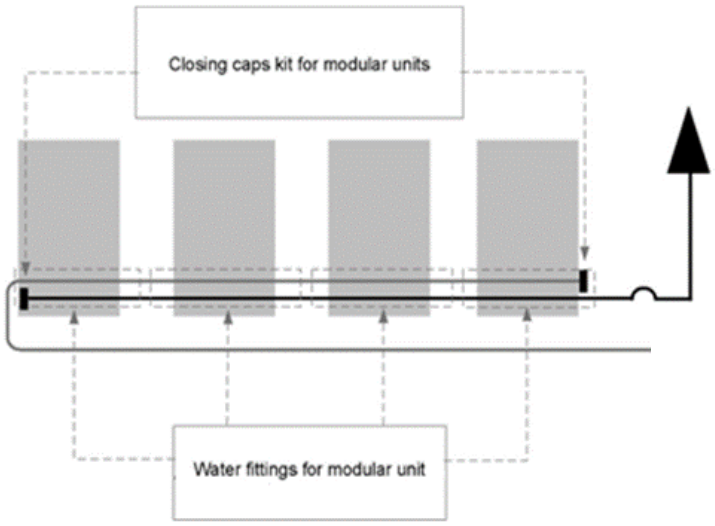
- Clearance values
- Power supply
- Connection





Options for modular system connection:

- Water fitting for modular unit
- Closing caps kit



System configurations

Domestic hot water management

Domestic hot water management in the modular system
Every module of the system can produce domestic hot water.

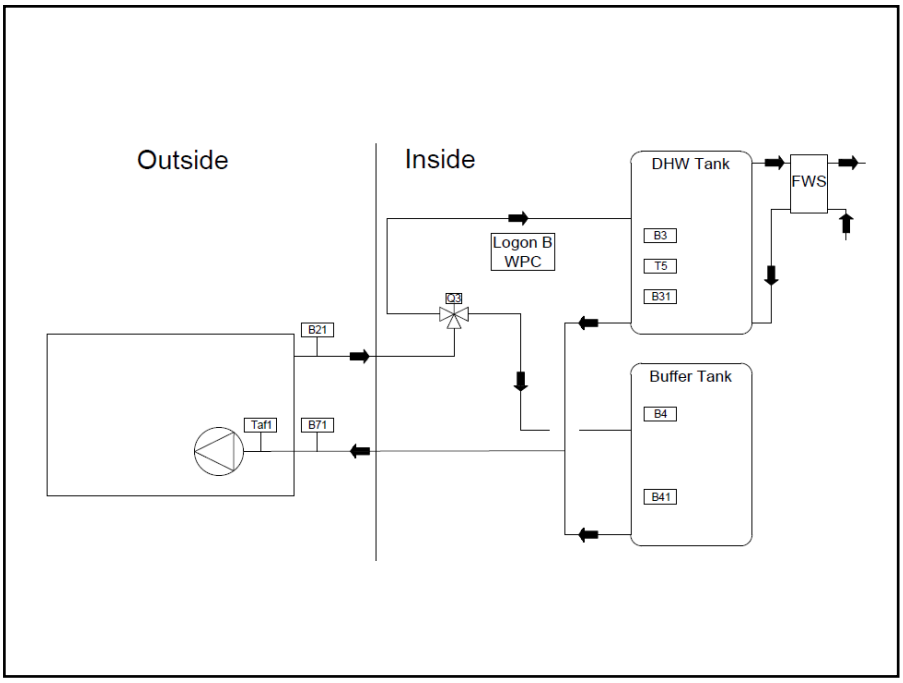
- It is necessary for each module dedicated to producing DHW to be equipped with 3 -way valve installed as an accessory.
- Every module must have its own circulation pump and its own domestic hot water storage (responsibility of the Customer).
- The DHW pumping unit will be managed directly by the unit dedicated to DHW using a free contact.
- DHW production only takes place if the DHW storage temperature is above a minimum threshold (See diagram). The minimum temperature threshold varies based on the external temperature. In order to avoid that it falls under the minimum temperature, it is best to install a backup electric heater on the DHW storage

Domestic hot water management is of priority compared to the system.

If the system is satisfied (unit off):
When the temperature probe (T5), supplied by ELCO and positioned inside the storage calls for production of DHW, the unit dedicated to DHW activates, changing the set-point from set system to set DHW and diverts the water flow through the 3-way valve. The unit will remain active until the DHW set-point has been satisfied, then it will shut-off.

If the system has a request (unit is on):
When the temperature probe (T5) sends a request for production of DHW, the unit dedicated to DHW, which is already active for the system stops, the cycle changes and if producing cooled water, the set-point changes from set system to set DHW and diverts the water flow through the built-in 3-way valve. The unit will remain active until the DHW set-point has been satisfied, then it will return to producing the system

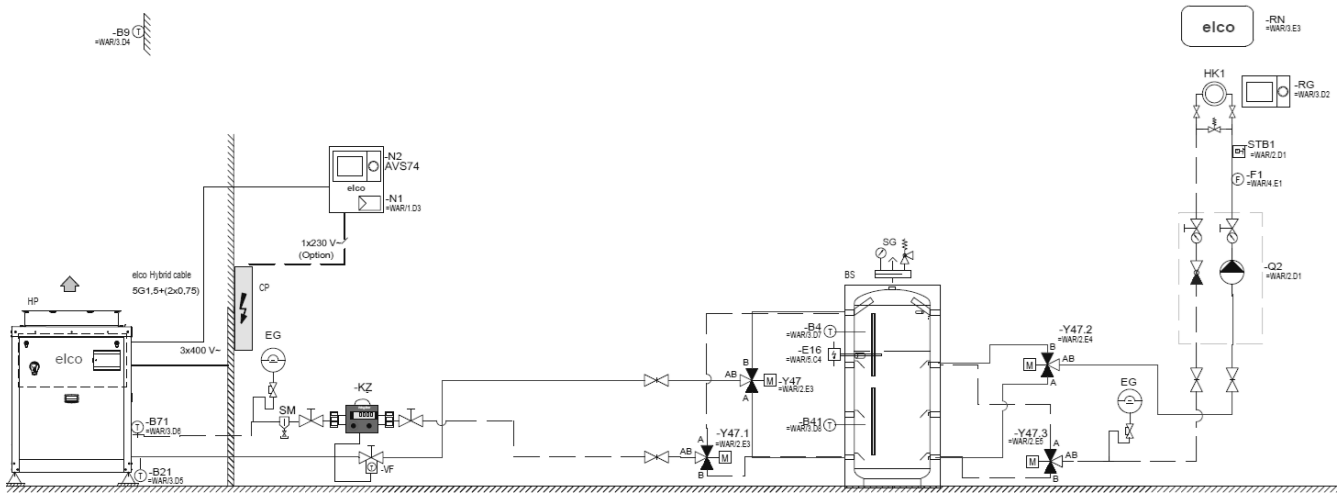
Connection diagram for connecting the individual module for producing domestic hot water



to outdoor	t5 DHW storage	compressor	backup heater
24°C < t.o ≤ 30°C	< 15°C	OFF	ON
24°C < t.o ≤ 30°C	≥ 15°C	ON	OFF
t.o > 30°C	< 20°C	OFF	ON
t.o > 30°C	≥ 20°C	ON	OFF

System configurations

System solution
Heating cooling with 1 Zone direct



This schematic is for general guidance and is not to be considered a construction drawing.

Additional documents with hydraulic diagrams, circuit diagrams and parameter lists for controller settings are available for the following system examples. The illustrations do not claim to be complete. For practical implementation, the relevant technical rules apply..
Note: The standards can be obtained free of charge. The specified connection diagrams and parameters for controller setting simplify the installation and commissioning work.
For systems that deviate from the standards, an electrical diagram is required. This can be obtained from ELCO as a service.

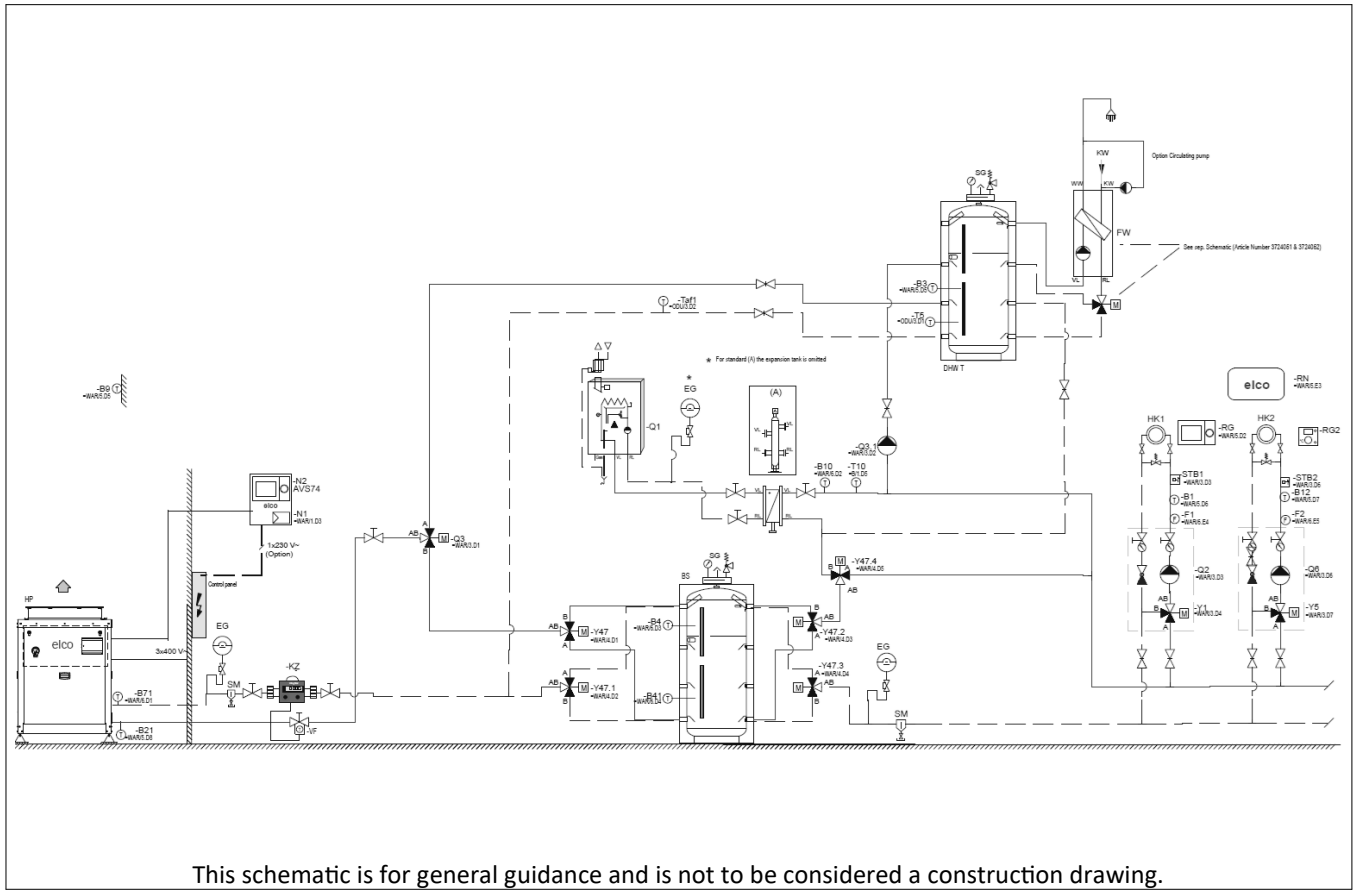
Legend:

-- --Return
------Flow

B1	Flow sensor
B9	Outside sensor
B4	Buffer storage sensor top
B41	Bottom storage tank sensor (Option)
B21	Flow sensor WP
B71	Return sensor WP
EG	Expansion tank
E16	Buffer storage tank electric heating element (Option)
F1	Dew point monitor
HK1	Heating circuit
KZ	Heat / cooling meter (Return sensor integrated) (Option)
N1	Heat pump controller
N2	Operator interface
Q2	Heating zone pump
RG1	Room unit (Option)
RIM	Remote Interface Modul
RN	Remocon NET B (Option)
SG	Safety group
SM	Skimmer
STB1	Safety limit thermostat of floor heating (Option)
VF	Immersion flow sensor (Option)
HP	Heat pump
CP	Control panel
BS	Buffer Storage

System configurations

System solution
Bivalent system heating cooling with 2 mixed zone
DHW with FWS



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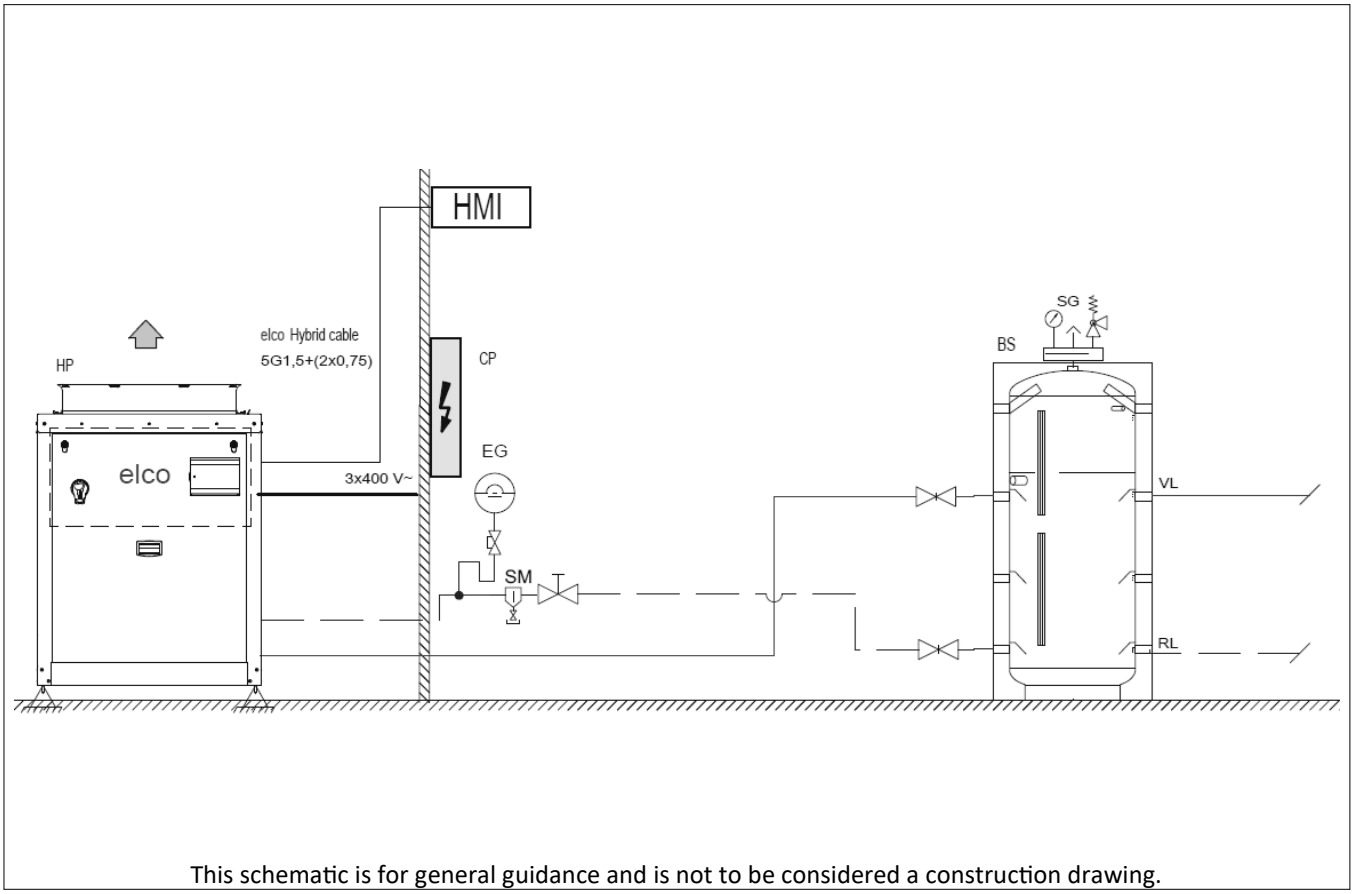
Legend:

-- --Return
------Flow

B1/B21	Flow sensor
B9	Outside sensor
B10	Header supply line sensor
B4	Buffer storage sensor top
B41	Bottom storage tank sensor (Option)
B3	Hot water sensor top
B21	Flow sensor WP
B71	Return sensor WP
EG	Expansion tank
F1/F2	Dew point monitor
FWS	Fresh water station
HK1/HK2	Heating circuit
KZ	Heat / cooling meter (Return sensor integrated) (Option)
N1	Heat pump controller
N2	Operator interface
Q2/Q6	Heating zone pump
Q1	Boiler bypass pump
Q3.1	Heat transfer pump
Q3	Reversing valve
RG1/RG2	Room unit (Option)
RIM	Remote Interface Modul
RN	Remocon NET B (Option)
SG	Safety group
SM	Skimmer
STB1/STB2	Safety limit thermostat of floor heating (option)
Taf1	Domestic hot water Return sensor AEROTOP
T5	Domestic hot water sensor AEROTOP
T10	Flow sensor Boiler
VF	Immersion flow sensor (Option)
Y1/Y5	Mixing valve
Y47	Buffer reversing valve Y47
HP	Heat pump
CP	Control panel
BS	Buffer Storage
DHW T	Domestic hot water tank

System configurations

System solution
Stand alone



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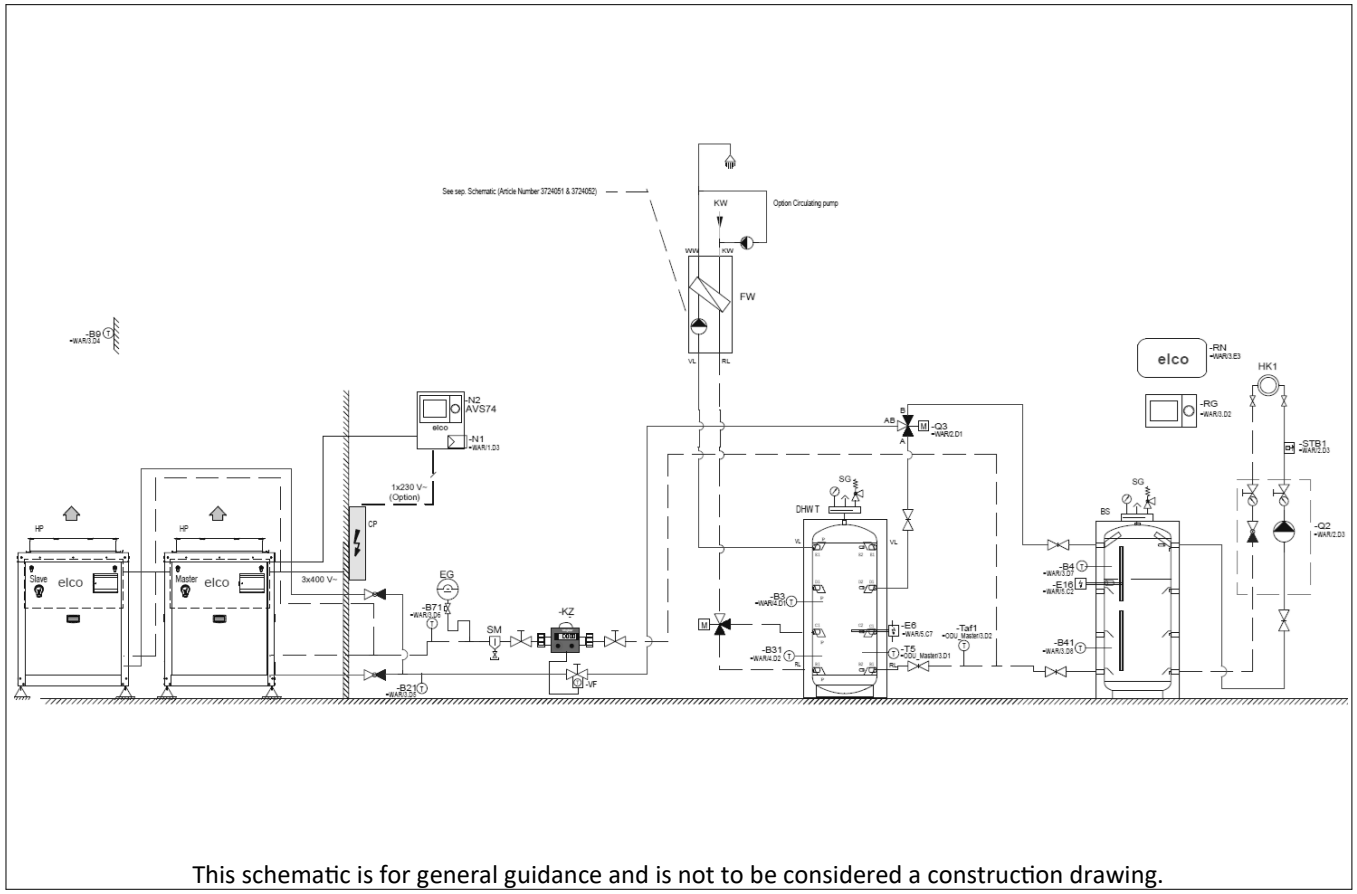
Legend:

-- --Return
------Flow

EG	Expansion tank
SG	Safety group
SM	Skimmer
HP	Heat pump
CP	Control panel
BS	Buffer Storage

System configurations

System solution
Cascade heating and DHW with CYL



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For systems that deviate from the standards, an electrical diagram is required. This can be obtained from ELCO as a service.

Legend:

-- --Return
------Flow

B4	Buffer storage sensor top
B9	Outside sensor
B41	Bottom storage tank sensor (Option)
B21	Flow sensor WP
B71	Return sensor WP
B3	Hot water sensor top
B31	hot water sensor bottom (Option)
EG	Expansion tank
E16	Buffer storage tank electric heating element (Option)
E6	Domestic hot water electric heating element (Option)
FWS	Fresh water station
HK1	Heating circuit
KZ	Heat / cooling meter (Return sensor integrated) (Option)
N1	Heat pump controller
N2	Operator interface
Q2	Heating zone pump
Q3	Reversing valve
RG	Room unit (Option)
RIM	Remote Interface Modul
RN	Remocon NET B (Option)
SG	Safety group
SM	Skimmer
STB	Safety limit thermostat of floor heating (Option)
Taf1	Domestic hot water Return sensor AEROTOP
T5	Domestic hot water sensor AEROTOP
VF	Immersion flow sensor (Option)
HP	Heat pump
CP	Control panel
BS	Buffer Storage
DHW T	Domestic hot water tank

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