Technical
Bulletin
BT05L001GB-13

ELFOFresh Large

Make-up unit, full fresh air,
reversible heat pump

R-410A

Series CPAN-U 17-51

- Ideal air exchange rates in shops and offices
- Cooling,heating and humidification of outdoor air with only minimal energy consumption thanks to Free-Cooling and an exclusive Active Thermodynamic Hest Recovery that recovers heat from extracted air and returns it to the incoming fresh air
- Electronic filtration control for guaranteed purity of incoming fresh air and effective removal of airborne dust (optional)

Operation Principles

The unit is designed to manage primary air in the room which is as similar as possible in terms or temperature and humidity to the air already in the room. In order to do this, the ELFOFRESH Large unit uses as the main resource a direct expansion circuit. This circuit is reversible in heat pump mode in the winter. T

he unit is equipped with a thermostat to be placed in the room which can be used to control the machine and to ensure that the primary air that enters the room helps reach the environmental conditions desired by the user.

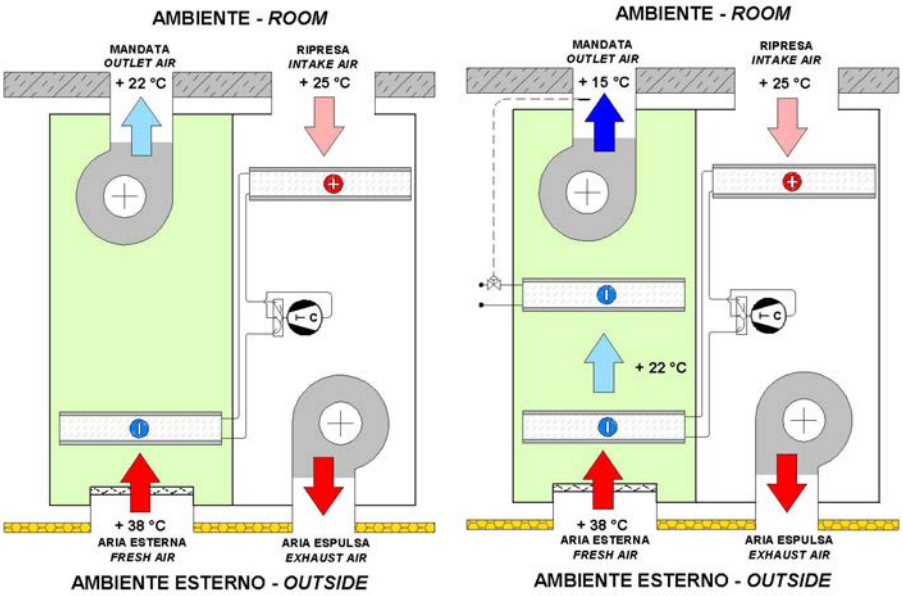
Energy consumption is reduced thanks to the exclusive active recovery circuit that draws energy from the expelled air and releases it into the refresh air.

When operating conditions would exceed the direct expansion performance, the unit can be equipped with suitable accessories to increase the total unit capacity, first of all the water coil.

Operating diagrams

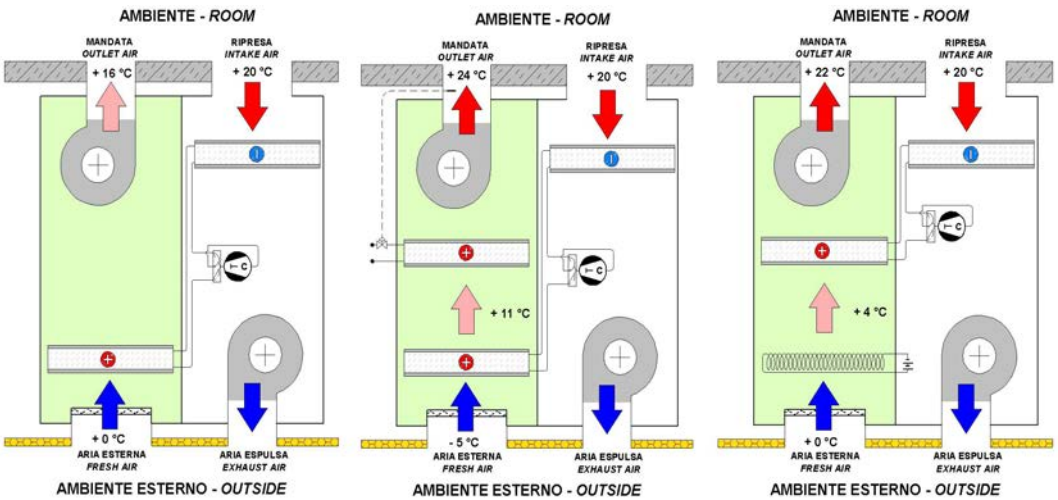
Summer operation

The functional diagrams refer to unit operation in cooling mode and represent in order the standard configuration and the configuration with additional cold water coil (optional).



Winter operation

The functional diagrams refer to unit operation in heat pump mode and represent in order the standard configuration and the configuration with additional hot water coil (optional), and the configuration with auxiliary heating element (optional).



Energy recovery

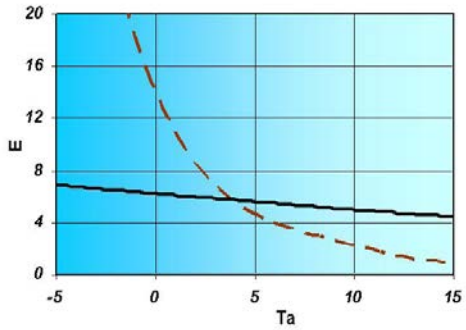
The traditional systems for heat recovery, mostly static, do not enable to adapt the system efficiency to the extremely changing weather conditions and to the differentials between external and internal temperatures of the served rooms; the new active recovery system by Clivet allows energy to be efficiently saved in every period of the year without contaminating the two flows of external air intake and exhaust.

The outlet temperature of the dynamic recuperator is always much closer to the set point than the outlet temperature of the static recuperator.

Therefore, in intermediate seasons, there is often the possibility of meeting the thermal loads of the served rooms exclusively with the unit Elfofresh-Large, keeping the terminal units in stand-by. In the diagrams, the spent energy considers the necessary integration to a unit with static recuperator to obtain an outlet temperature equal to the one of the dynamic recuperator.

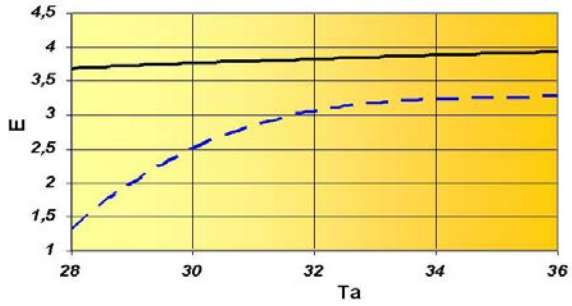
The efficiency of the dynamic recuperator is basically independent of the external temperature. The outward superiority of the static recovery system under winter conditions can be detected in very short periods of actual unit operation, while the dynamic recovery is more efficient for most of the year.

Winter operation



E = recovery power/spent power
Ta = Outside air temperature (°C)

Summer operation



Continuous line = Elfofresh Large heat recovery
Broken line = crossflow heat recovery

Updated electronic control

The remote room thermostat HID-P1,supplied as standard, allows the unit operation in a complete way and with a simple interface; through this terminal it can be immediately defined:

- Unit On/Off
- set-point
- operating status (heat or cool)
- operation with only ventilation
- clean operation
- visualization of principal unit information through simple icons

The thermostat includes also the heat regulation probe.

Management and control of the unit take place via the CLIVET TALK COMPACT integrated system.

Refrigerant Gas R-410A

The R-410A refrigerant used in these units is a gas of the latest generation which reduces environmental impact thanks to complete respect of the ozone layer. If compared with other refrigerant gases, R-410A is characterized by a high overall heat exchange coefficient, low viscosity and higher operating pressures.

Global coefficient of heat exchange (W/m²·K)

R-410A	R-407C	R-134a
10,8	9,74	8,87

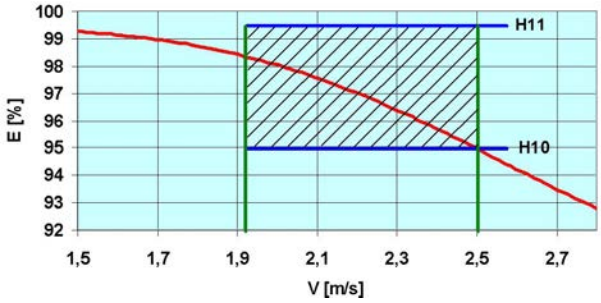
Electric filters (optional)

High efficiency electronic filters additional section
The use of electronic filters with efficiency of min. H10 enables to abate particulate matter as well as some type of bacteria and viruses with very low load losses, mainly due to the metal pre-filter G2, and following energy saving for the ventilation. The efficiency is steady all the operating cycle long, while the cell life equals the machine life.

The clogging of the electronic filter is signalled by a sensor enabling to schedule the routine maintenance, that the user can easily do by simply washing in water with a cleanser not aggressive for aluminum. The filtering elements are drawer-installed to ease such operation.

As the traditional bag filters cannot be regenerated, and thanks to the practically endless life of the electronic filters, the initial cost of the latter is recovered in an extremely short time.

The dashed area refers to the field of units operation ELFOFresh Large
E = efficiency (%)
V=air-crossing speed (m/s)



Exhaust air filter G4 (optional)

The class G4 air filters are located in expulsion. They trap the impurities in the intake air so as to keep the finned surfaces of the coil clean thus ensuring the utmost efficiency in heat exchange.

Steam humidifier with plunged electrodes (optional)

The steam humidifier with immerged electrodes permits to modulate the steam input in order to obtain the best thermo hygrometer rooms conditions. The humidity control level is made thank to one additional probe that can be fixed either in the unit intake or in the room thermostat.

3 ways-valve (optional)

The electronically controlled modulating three-way valve allows control of the chilled/heated water that flows through the additional coil. In this way it is possible to effectively monitor the thermal yield of the additional coil without interrupting water circulation in the system.

RS485 remote communication serial port (optional)

With the optional converter TTL/RS485 you can set up remote supervision of the machine with standard Modbus protocol. With a single supervision system you can control up to 127 units. Connection to a PC must take place via an RS485/RS232 converter. The maximum acceptable length for the connection to the RS485 serial is 1000 metres.

Standard unit technical specifications

Compressor

- From size 17 to 31:

hermetic rotary compressor. Fitted on rubber antivibration mounts and complete with oil charge and suction filter

- From size 41 to 51:

hermetic orbiting scroll compressor complete with motor over-temperature and over-current devices and protection against excessive gas discharge temperature. Fitted on rubber antivibration mounts and complete with oil charge.

Structure

Self supporting panel structure in steel sheet protected by oven-dried polyster paint. The panels are easy to remove for complete accessibility to the internal components and are internally coated with a thermo-acoustic insulation.

The unit is furnished with condensate tray.

Internal exchanger

- Recovery section

direct expansion finned exchanger, made from copper pipes in staggered rows and mechanically expanded to the fin collars. The fins are made from aluminium with a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

External exchanger

- Recovery section

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 a corrugated surface and adequately distanced to ensure the maximum heat exchange efficiency.

Fan

- Supply fan

dual intake centrifugal fan with forward blades for maximum efficiency and low noise. Statically- and dynamically-balanced according to the ISO 1940 standards, section 6.3. The scroll, the rotor and the frame are made from galvanized steel plate (semdzimir).

Directly coupled to the electric motor.

- Exhaust fan

dual intake centrifugal fan with forward blades for maximum efficiency and low noise. Statically- and dynamically-balanced according to the ISO 1940 standards, section 6.3. The scroll, the rotor and the frame are made from galvanized steel plate (semdzimir).

Directly coupled to the electric motor

Refrigeration circuit

- refrigeration circuit with:
- refrigerant charge
- high pressure safety pressure switch
- low pressure safety switch
- filter dryer
- thermostatic expansion valve
- 4-way reverse cycle valve
- liquid receiver

Filtration

- Outdoor air intake side

Pleated filter for greater filtering surface, made of a galvanized sheet frame with a galvanized and electric-welded protective mesh, and regenerable filtering media made from polyester fibre sized with synthetic resins. G4 efficiency according to CEN-EN 779 standard (Eurovent classification EU4/5 - separation average 90.1% ASHRAE 52-76 Atm). Self-extinguishing type (flame resistant class 1 - DIN 53438).

Drain pan

Drain pan made of thermoformed, equipped with drain sleeves.

Electrical panel

The Capacity Section includes:

- auxiliary circuit fuse
- compressor and fan fuses

The control section includes:

- signal led unit in ON
- signal led compressor state
- selected function signal LED
- signal led ventilation state
- temperature set point selection
- energy optimization of compressor operation
- compressor overload protection and timer
- automatic regulation of operating mode (heating, FREE-COOLING, cooling)
- self-diagnosis system with immediate display of the error code
- display of the set values and the error codes
- display of the parameter index
- CLEAN function activation for a fixed time
- unit operation or ventilation only selection button
- COOL/HEAT button for the operating mode change, activation only fan mode and active mode signal
- On/Off button
- UP and DOWN buttons to increase and decrease the values
- alarm button to display the list of alarms
- status button to display the status list
- ENTER button for programming
- SET button to set operating inputs

Accessories

- immersed electrode steam humidifier with electronic controller featuring proportional control fitted with humidity probe on the air intake and steam distributor.
- heating elements
- High efficiency electronic filters additional section
- G4 class air filters in expulsion
- modulating three-way valve
- RS485 serial communication module kit
- differential pressure switch for dirty air filters

Test

Unit manufactured according to the ISO 9001 quality standards and subject to functional testing at the end of the production line

General technical data

Size			17	21	25	31	41	51
Cooling								
Cooling capacity	1	kW	6.2	7.6	8.6	10.9	12.4	15.9
Sensible capacity	1	kW	5	5.8	7	8.6	9.5	12.5
Compressor power input	1	kW	1.7	2.1	2.2	2.9	2.8	3.8
Heating								
Heating capacity	2	kW	6.8	8.3	9.2	11.9	13.2	16.9
Compressor power input	2	kW	1.3	1.7	1.8	2.2	2	2.8
Compressor								
Type of compressors	3		Rot	Rot	Rot	Rot	Scroll	Scroll
No. of compressors		No	1	1	1	1	1	1
Std Capacity control steps		No	1	1	1	1	1	1
Refrigeration circuits		No	1	1	1	1	1	1
Air Handling Section Fans (Supply)								
Type of supply fan	4		CFG	CFG	CFG	CFG	CFG	CFG
Number of supply fans		No	1	1	1	1	1	1
Supply airflow		l/s	330	390	470	610	690	920
Installed unit power		kW	0.3	0.3	0.4	0.4	0.6	0.6
Max. static pressure supply fan	5	Pa	190	175	300	180	270	340
Fans (Exhaust)								
Type of exhaust fan			CFG	CFG	CFG	CFG	CFG	CFG
Number of exhaust fans		No	1	1	1	1	1	1
Exhaust airflow		l/s	300	360	440	550	640	860
Installed unit power		kW	0.3	0.3	0.4	0.4	0.6	0.6
Max. exhaust static pressure		Pa	180	165	290	210	250	360
Dimensions								
Length		mm	1503	1503	1503	1503	1503	1503
Depth		mm	950	950	950	950	950	950
Height		mm	442	442	442	442	442	442

1. air inlet temperature extract heat exchange coil 27°CD.B. - 19°CW.B. outdoor air temperature 35°C B.S. - 24°CB.U.
2. exhaust coil inlet air temperature 20° CB.S. - 12°CB.U.outdoor air temperature 7°C DB - 6°CWB
3. SCROLL = scroll compressor. ROT = rotary compressor
4. CFG = centrifugal fan
5. Static pressure available on standard unit

Electrical input of optional components

To obtain the electrical input of the unit including accessories, add the standard data in Electrical Data table to those for the selected accessories.

Size			17	21	25	31	41	51
F.L.A. Full load current								
F.L.A. EHP9 2k W pre-heating electric heaters		A	8.7	8.7	-	-	-	-
F.L.A. EHP7 3k W pre-heating electric heaters		A	-	-	4.3	4.3	-	-
F.L.I. EHP14 4.5k W pre-heating electric heaters		A	-	-	-	-	6.5	6.5
F.L.A. HSE3 - Immersed electrodes steam humidifier of 3 kg/h		A	9.8	9.8	-	-	-	-
F.L.A. HSE5 - Immersed electrodes steam humidifier of 5 kg/h		A	-	-	5.4	5.4	-	-
F.L.A. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		A	-	-	-	-	8.7	8.7
F.L.I. Power consumption:								
F.L.I. EHP9 2k W pre-heating electric heaters		kW	2.0	2.0	-	-	-	-
F.L.I. EHP7 3k W pre-heating electric heaters		kW	-	-	3.0	3.0	-	-
F.L.A. EHP14 4.5k W pre-heating electric heaters		kW	-	-	-	-	4.5	4.5
F.L.I. HSE3 - Immersed electrodes steam humidifier of 3 kg/h		kW	2.25	2.25	-	-	-	-
F.L.I. HSE5 - Immersed electrodes steam humidifier of 5 kg/h		kW	-	-	3.75	3.75	-	-
F.L.I. HSE8 - Immersed electrodes steam humidifier of 8 kg/h		kW	-	-	-	-	6.0	6.0

Electrical data

Power supply 230/1/50

Size			17	21
F.L.A. - Full load current at max admissible conditions				
F.L.A. - Compressor 1		A	10.3	13.3
F.L.A. - Single supply fan		A	2.4	2.4
F.L.A. - Single exhaust air fan		A	2.4	2.4
F.L.A. - Total		A	15.1	18.1
L.R.A. - Locked rotor amperes				
L.R.A. - Compressor 1		A	43	62
L.R.A. - Single supply fan		A	12	12
F.L.I. - Full load power input at max admissible conditions				
F.L.I. - Compressor 1		kW	2.2	2.8
F.L.I. - Single supply fan		kW	0.3	0.3
F.L.I. – Single exhaust air fan		kW	0.3	0.3
F.L.I. - Total		kW	2.8	3.4
M.I.C. Maximum inrush current				
M.I.C. - Value		A	48.8	67.8

Power supply: 230/1/50 Hz. Voltage variation: max. +/-10%
Values not including accessories

Power supply 400/3/50+N

Size			25	31	41	51
F.L.A. - Full load current at max admissible conditions						
F.L.A. - Compressor 1		A	14	6.9	8	10.3
F.L.A. - Single supply fan		A	4.6	4.6	4.6	7.7
F.L.A. - Single exhaust air fan		A	4.6	4.6	4.6	7.7
F.L.A. - Total	1	A	23.2	16.1	17.2	25.7
L.R.A. - Locked rotor amperes						
L.R.A. - Compressor 1		A	62	43	48	64
L.R.A. - Single supply fan		A	25	25	29.5	34
L.R.A. - Single Return fan		A	25	25	29.5	34
F.L.I. - Full load power input at max admissible conditions						
F.L.I. - Compressor 1		kW	2.5	3.1	4.3	6.1
F.L.I. - Single supply fan		kW	0.4	0.4	0.6	0.6
F.L.I. – Single exhaust air fan		kW	0.4	0.4	0.6	0.6
F.L.I. - Total	2	kW	3.3	3.9	5.5	7.3
M.I.C. Maximum inrush current						
M.I.C. - Value		A	71.2	52.2	57.2	79.4

Power supply: 400/3/50 Hz. Voltage variation: max. +/-10%
Voltage unbalance between phases: max 2 %
Values not including accessories

Performances of supply air fans

Standard airflow

Static available pressure (Pa)			150	180	210	240	270	300	330	360	390
17	Airflow	l/s	490	390	250	-	-	-	-	-	-
21	Airflow	l/s	470	360	-	-	-	-	-	-	-
31	Airflow	l/s	-	610	560	540	500	-	-	-	-
41	Airflow	l/s	-	-	-	760	690	580	-	-	-
25	Airflow	l/s	-	-	-	-	530	470	-	-	-
51	Airflow	l/s	-	-	-	-	-	950	930	890	830

Performances of return air fans

Intake air flow: Standard airflow

Static available pressure (Pa)			120	150	180	210	240	270	300	330	360
21	Airflow	l/s	500	420	250	-	-	-	-	-	-
17	Airflow	l/s	-	460	300	190	-	-	-	-	-
25	Airflow	l/s	-	-	580	570	540	500	420	-	-
31	Airflow	l/s	-	-	-	550	530	440	-	-	-
41	Airflow	l/s	-	-	-	760	670	580	-	-	-
51	Airflow	l/s	-	-	-	-	-	-	940	900	860

Sound levels

Size	Sound power level (dB)								Sound power level	Sound pressure level
	Octave band (Hz)									
	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(A)
17	77	75	70	65	62	57	47	35	68	53
21	79	77	72	67	64	59	49	37	70	55
25	80	79	74	69	66	61	52	41	72	57
31	85	81	76	71	68	63	54	43	74	59
41	83	82	77	74	70	65	56	45	76	61
51	88	85	79	75	71	66	57	46	77	62

The sound levels are referred to unit operating at full load in nominal conditions. The sound pressure level is referred at a distance of 1 m. from the ducted unit surface operating in free field conditions. External static pressure 50 Pa.

Performances in cooling

Size	Ta (°C) DB/WB	Exhaust air temperature (°C)																	
		22			25			27			28			30			32		
		kWf	kWs	kWe	kWf	kWs	kWe	kWf	kWs	kWe	kWf	kWs	kWe	kWf	kWs	kWe	kWf	kWs	kWe
17	22 / 16	5.24	3.82	1.46	5.12	3.74	1.54	5.03	3.69	1.59	4.99	3.66	1.62	4.89	3.61	1.67	4.79	3.55	1.73
	25 / 18	5.54	4.15	1.47	5.45	4.07	1.54	5.34	4.02	1.60	5.28	4.00	1.64	5.12	3.94	1.73	4.92	3.89	1.84
	28 / 20	5.86	4.41	1.49	5.76	4.33	1.56	5.64	4.28	1.63	5.56	4.26	1.67	5.39	4.21	1.77	5.17	4.16	1.89
	32 / 22	6.20	4.90	1.51	6.04	4.83	1.60	5.92	4.78	1.67	5.85	4.76	1.71	5.70	4.71	1.80	5.53	4.66	1.90
	35 / 24	6.55	5.09	1.52	6.31	5.03	1.66	6.18	4.98	1.74	6.13	4.96	1.77	6.06	4.92	1.82	6.01	4.87	1.85
	38 / 25.5	6.83	5.46	1.53	6.49	5.40	1.72	6.37	5.36	1.80	-	-	-	-	-	-	-	-	-
21	22 / 16	6.20	4.60	1.86	6.05	4.51	1.95	5.95	4.45	2.01	5.90	4.42	2.04	5.81	4.35	2.11	5.73	4.29	2.18
	25 / 18	6.61	4.86	1.88	6.45	4.77	1.98	6.34	4.71	2.04	6.29	4.68	2.07	6.18	4.62	2.14	6.08	4.56	2.21
	28 / 20	7.03	5.12	1.91	6.87	5.03	2.01	6.75	4.98	2.07	6.69	4.95	2.11	6.56	4.89	2.18	6.43	4.83	2.25
	32 / 22	7.46	5.70	1.94	7.30	5.62	2.03	7.18	5.56	2.10	7.11	5.53	2.14	6.95	5.47	2.23	6.78	5.42	2.32
	35 / 24	7.90	5.96	1.97	7.76	5.88	2.06	7.62	5.82	2.14	7.54	5.80	2.18	7.35	5.74	2.29	7.13	5.69	2.41
	38 / 25.5	8.24	6.39	1.99	8.11	6.31	2.07	7.96	6.26	2.16	7.87	6.23	2.21	7.66	6.18	2.34	-	-	-
25	22 / 16	7.13	5.48	1.94	6.92	5.39	2.04	6.79	5.33	2.10	6.73	5.30	2.14	6.63	5.24	2.20	6.54	5.18	2.26
	25 / 18	7.53	5.72	1.97	7.36	5.63	2.06	7.25	5.57	2.12	7.19	5.54	2.16	7.07	5.47	2.23	6.96	5.41	2.30
	28 / 20	7.96	6.04	2.00	7.82	5.94	2.08	7.71	5.88	2.15	7.65	5.85	2.18	7.52	5.79	2.26	7.38	5.72	2.34
	32 / 22	8.42	6.79	2.01	8.28	6.70	2.10	8.17	6.64	2.17	8.11	6.60	2.21	7.98	6.54	2.28	7.83	6.48	2.37
	35 / 24	8.91	7.13	2.02	8.76	7.03	2.13	8.64	6.97	2.20	8.58	6.94	2.24	8.44	6.88	2.31	8.28	6.82	2.40
	38 / 25.5	9.30	7.64	2.02	9.12	7.55	2.14	8.99	7.49	2.22	8.93	7.46	2.26	8.79	7.40	2.34	-	-	-
31	22 / 16	9.08	6.76	2.49	8.83	6.59	2.63	8.68	6.48	2.72	8.60	6.43	2.76	8.45	6.32	2.85	8.31	6.21	2.94
	25 / 18	9.66	7.25	2.54	9.40	7.11	2.68	9.23	7.02	2.77	9.15	6.98	2.81	8.99	6.89	2.90	8.84	6.80	2.98
	28 / 20	10.3	7.63	2.58	9.97	7.51	2.72	9.79	7.43	2.81	9.71	7.39	2.86	9.54	7.32	2.94	9.38	7.24	3.02
	32 / 22	10.9	8.45	2.62	10.6	8.34	2.77	10.4	8.26	2.86	10.3	8.22	2.90	10.1	8.15	2.98	9.94	8.08	3.06
	35 / 24	11.5	8.79	2.66	11.1	8.68	2.80	10.9	8.60	2.89	10.8	8.56	2.94	10.7	8.49	3.02	10.5	8.41	3.11
	38 / 25.5	11.9	9.45	2.68	11.6	9.33	2.83	11.4	9.24	2.92	11.3	9.20	2.97	11.1	9.12	3.06	11.0	9.04	3.14
41	22 / 16	10.2	7.51	2.34	9.90	7.39	2.51	9.73	7.31	2.63	9.64	7.27	2.68	9.49	7.19	2.79	9.34	7.11	2.89
	25 / 18	10.8	7.90	2.38	10.5	7.76	2.54	10.3	7.66	2.65	10.3	7.62	2.71	10.1	7.53	2.82	9.90	7.43	2.93
	28 / 20	11.4	8.33	2.43	11.2	8.18	2.58	11.0	8.08	2.68	10.9	8.03	2.74	10.7	7.93	2.85	10.5	7.83	2.97
	32 / 22	12.1	9.30	2.48	11.9	9.15	2.62	11.7	9.05	2.72	11.6	9.00	2.78	11.4	8.90	2.89	11.1	8.80	3.01
	35 / 24	12.8	9.70	2.53	12.6	9.55	2.67	12.4	9.45	2.77	12.3	9.40	2.82	12.0	9.30	2.93	11.8	9.20	3.05
	38 / 25.5	13.4	10.3	2.58	13.1	10.2	2.71	12.9	10.1	2.81	-	-	-	-	-	-	-	-	-
51	22 / 16	13.3	9.56	3.15	12.9	9.38	3.39	12.7	9.26	3.55	12.6	9.20	3.64	12.4	9.08	3.81	12.2	8.96	3.99
	25 / 18	14.2	10.6	3.21	13.8	10.5	3.45	13.5	10.4	3.62	13.4	10.3	3.70	13.2	10.2	3.87	12.9	10.1	4.04
	28 / 20	15.0	11.2	3.29	14.6	11.1	3.52	14.3	11.0	3.69	14.2	10.9	3.77	14.0	10.9	3.93	13.7	10.8	4.10
	32 / 22	15.8	12.3	3.37	15.4	12.2	3.60	15.1	12.1	3.76	15.0	12.0	3.84	14.7	12.0	4.00	14.5	11.9	4.16
	35 / 24	16.6	12.7	3.45	16.2	12.5	3.68	15.9	12.5	3.84	15.8	12.4	3.91	15.5	12.3	4.07	15.2	12.2	4.23
	38 / 25.5	17.3	13.6	3.52	16.8	13.5	3.74	16.5	13.4	3.90	-	-	-	-	-	-	-	-	-

Ta = Outside air temperature (°C)
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
kWe = Compressor power input in kW
DB = Dry bulb
WB = Wet bulb
The cooling capacities have not accounted for the heat dissipation of the centrifugal fan motors.

Performance in Heating

Size	Ta (°c)	Exhaust air temperature (°C)													
		16		17		18		19		20		21		22	
		kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
17	-5 / -5.4	6,43	1,05	6,55	1,05	6,67	1,05	6,79	1,05	6,91	1,04	7,03	1,04	7,16	1,04
	0 / -0.6	6,39	1,13	6,51	1,13	6,62	1,13	6,74	1,13	6,86	1,14	6,98	1,14	7,10	1,14
	7 / 6.1	6,3	1,28	6,41	1,29	6,52	1,29	6,64	1,30	6,75	1,30	6,87	1,31	6,98	1,32
	10 / 8.2	6,27	1,34	6,37	1,34	6,48	1,35	6,59	1,36	6,71	1,36	6,82	1,37	6,94	1,38
	15 / 12.5	6,18	1,46	6,28	1,47	6,39	1,48	6,5	1,49	6,61	1,50	6,72	1,51	6,84	1,53
	20 / 17	6,07	1,61	6,17	1,62	6,27	1,64	6,38	1,65	6,49	1,67	6,60	1,68	6,73	1,70
21	-5 / -5.4	8,00	1,39	8,14	1,39	8,29	1,39	8,44	1,39	8,6	1,40	8,76	1,40	8,93	1,40
	0 / -0.6	7,86	1,47	8,01	1,47	8,16	1,48	8,31	1,48	8,46	1,49	8,62	1,5	8,78	1,5
	7 / 6.1	7,67	1,64	7,81	1,65	7,96	1,66	8,11	1,67	8,26	1,68	8,41	1,70	8,56	1,71
	10 / 8.2	7,61	1,71	7,75	1,72	7,89	1,73	8,04	1,75	8,19	1,76	8,33	1,77	8,48	1,79
	15 / 12.5	7,49	1,87	7,62	1,88	7,76	1,90	7,90	1,92	8,04	1,94	8,18	1,95	8,33	1,97
	20 / 17	7,37	2,07	7,49	2,09	7,61	2,11	7,74	2,13	7,87	2,15	8,01	2,17	8,15	2,20
25	-5 / -5.4	8,93	1,48	9,10	1,48	9,27	1,48	9,44	1,48	9,61	1,48	9,78	1,48	9,95	1,48
	0 / -0.6	8,78	1,56	8,94	1,56	9,10	1,56	9,27	1,57	9,43	1,57	9,61	1,57	9,78	1,58
	7 / 6.1	8,58	1,73	8,72	1,73	8,87	1,74	9,03	1,75	9,19	1,76	9,36	1,77	9,53	1,77
	10 / 8.2	8,51	1,79	8,65	1,80	8,80	1,81	8,95	1,82	9,11	1,83	9,28	1,84	9,45	1,85
	15 / 12.5	8,39	1,95	8,52	1,96	8,66	1,98	8,80	1,99	8,96	2,00	9,11	2,02	9,28	2,03
	20 / 17	8,27	2,15	8,39	2,16	8,51	2,18	8,65	2,20	8,79	2,21	8,94	2,23	9,09	2,25
31	-5 / -5.4	11,2	1,54	11,4	1,56	11,6	1,58	11,8	1,61	12,0	1,63	12,2	1,67	12,5	1,70
	0 / -0.6	11,1	1,77	11,4	1,79	11,6	1,82	11,8	1,84	12,0	1,87	12,3	1,90	12,5	1,93
	7 / 6.1	11,0	2,13	11,2	2,15	11,4	2,18	11,6	2,20	11,9	2,23	12,1	2,25	12,3	2,28
	10 / 8.2	10,9	2,25	11,1	2,27	11,3	2,3	11,6	2,32	11,8	2,35	12,0	2,37	12,2	2,40
	15 / 12.5	10,7	2,50	10,9	2,53	11,1	2,55	11,3	2,58	11,5	2,60	11,7	2,62	12,0	2,65
	20 / 17	10,5	2,79	10,7	2,81	10,8	2,83	11,0	2,85	11,2	2,88	11,4	2,90	11,6	2,93
41	-5 / -5.4	12,7	1,48	13,1	1,49	13,4	1,51	13,6	1,52	13,8	1,52	13,9	1,53	14,0	1,53
	0 / -0.6	12,5	1,64	12,8	1,65	13,1	1,67	13,3	1,68	13,5	1,70	13,7	1,71	13,9	1,72
	7 / 6.1	12,2	1,96	12,4	1,98	12,7	2,00	12,9	2,02	13,2	2,04	13,4	2,06	13,7	2,08
	10 / 8.2	12,1	2,08	12,3	2,10	12,5	2,12	12,8	2,14	13,0	2,16	13,3	2,19	13,6	2,21
	15 / 12.5	11,9	2,37	12,1	2,39	12,3	2,42	12,5	2,44	12,8	2,46	13,0	2,49	13,3	2,51
	20 / 17	11,7	2,73	11,9	2,75	12,1	2,77	12,3	2,80	12,5	2,82	12,7	2,85	12,9	2,87
51	-5 / -5.4	16,2	2,02	16,6	2,04	16,9	2,05	17,3	2,07	17,6	2,08	17,9	2,10	18,3	2,12
	0 / -0.6	15,9	2,21	16,3	2,24	16,6	2,26	17,0	2,29	17,3	2,31	17,7	2,34	18,0	2,37
	7 / 6.1	15,6	2,66	16,0	2,69	16,3	2,72	16,6	2,75	16,9	2,79	17,2	2,82	17,6	2,85
	10 / 8.2	15,6	2,84	15,9	2,87	16,2	2,9	16,5	2,94	16,8	2,97	17,1	3,01	17,4	3,04
	15 / 12.5	15,5	3,28	15,7	3,31	16,0	3,34	16,2	3,37	16,5	3,41	16,8	3,44	17,1	3,48
	20 / 17	15,4	3,83	15,6	3,85	15,8	3,88	16,0	3,91	16,3	3,94	16,5	3,98	16,8	4,01

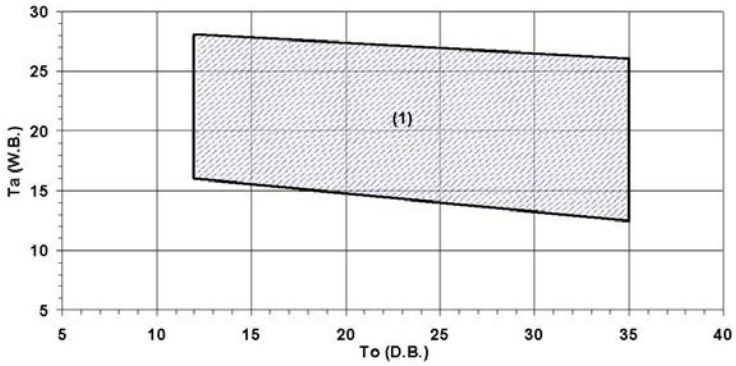
Ta = Outside air temperature (°C)
kWt = Provided heating capacity (kW)
kWe = Compressor power input in kW
DB = Dry bulb
WB = Wet bulb

Electric heaters

Size	17	21	25	31	41	51
2 kW	X	X	–	–	–	–
3 kW	–	–	X	X	–	–
4 kw	–	–	–	–	X	X

Connections marked with the symbol "x" are possible
Electric heaters type ON/OFF

Operating Range (Cooling)



The limits are meant as a guide. Please note that they have been calculated by considering:

- general and non specific sizes
- Standard airflow
- Non-critical positioning and correct use of the unit

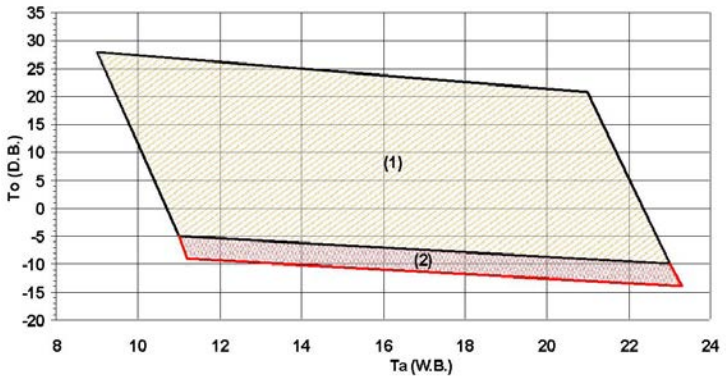
operation at full load

Ta = outdoor air temperature/treatment coil inlet (°C) W.B.
WB = wet bulb

To = exhaust coil inlet air temperature (°C)
DB = dry bulb

1. The operating area of the standard unit is identified inside the outlined zone
2. Operation field extension with preheating heaters

Operating Range (Heating)



The limits are meant as a guide. Please note that they have been calculated by considering:

- general and non specific sizes
- Standard airflow
- Non-critical positioning and correct use of the unit
- operation at full load

TA = exhaust coil inlet air temperature (°C)
WB = wet bulb

To = outdoor air temperature/handling coil inlet (°C)
DB = dry bulb

1. The operating area of the standard unit is identified inside the outlined zone
2. Operation field extension with preheating heaters

Weight distribution

Size			17	21	25	31	41	51
Dimensional dwg. no.			1	1	2	2	3	4
Shipping weight		KG	135	145	175	185	215	225

Weight referred to standard unit; according to the considered accessories unit weight can noticeably change.

Accessories

Water integration coil: Cooling Performance

Size	Ta (°C) DB/WB	Ti/To (°C)														
		5,0°C/10,0°C			6,0°C/11,0°C			7,0°C/12,0°C			9,0°C/14,0°C			10,0°C/15,0°C		
		kWf	kWs	DP(kPa)	kWf	kWs	DP(kPa)	kWf	kWs	DP(kPa)	kWf	kWs	DP(kPa)	kWf	kWs	DP(kPa)
17	16,0 / 14,0	3,5	2,1	4,2	2,8	1,8	2,8	2,1	1,5	1,6	1,0	1,0	0,5	0,6	0,6	0,2
	20,0 / 17,0	6,0	3,4	11,2	5,3	3,1	9,0	4,6	2,8	6,9	3,1	2,2	3,3	2,4	1,9	2,1
	25,0 / 19,0	7,7	4,9	17,8	7,0	4,6	15,0	6,3	4,3	12,4	4,9	3,7	7,8	4,3	3,5	6,0
	30,0 / 21,0	9,5	6,4	26,2	8,9	6,1	22,9	8,2	5,8	19,7	6,8	5,2	13,9	6,1	5,0	11,4
	35,0 / 24,0	12,5	7,8	43,1	11,9	7,5	38,9	11,2	7,2	34,7	9,8	6,7	26,8	9,0	6,4	23,0
21	16,0 / 14,0	3,8	2,4	5,1	3,0	2,0	3,3	2,3	1,7	2,0	1,1	1,1	0,5	0,7	0,7	0,2
	20,0 / 17,0	6,6	3,8	13,6	5,9	3,4	10,8	5,1	3,1	8,3	3,4	2,4	4,0	2,7	2,1	2,6
	25,0 / 19,0	8,6	5,5	21,8	7,8	5,2	18,3	7,0	4,9	15,0	5,5	4,2	9,4	4,8	3,9	7,2
	30,0 / 21,0	10,6	7,2	32,1	9,9	6,9	28,0	9,1	6,6	23,9	7,5	5,9	16,8	6,8	5,6	13,9
	35,0 / 24,0	14,0	8,8	53,0	13,3	8,5	47,6	12,5	8,2	42,5	10,9	7,5	32,6	10,0	7,2	28,0
25	16,0 / 14,0	4,9	3,0	5,4	3,9	2,5	3,5	2,9	2,1	2,1	1,4	1,4	0,6	0,8	0,8	0,2
	20,0 / 17,0	8,4	4,7	14,8	7,4	4,3	11,6	6,4	3,9	8,9	4,3	3,0	4,3	3,4	2,6	2,7
	25,0 / 19,0	10,8	6,9	23,4	9,9	6,5	19,7	8,9	6,1	16,2	6,9	5,3	10,0	6,0	4,9	7,7
	30,0 / 21,0	13,4	9,0	34,7	12,4	8,6	30,2	11,5	8,2	25,9	9,5	7,4	18,3	8,6	7,0	15,0
	35,0 / 24,0	17,6	11,1	57,7	16,7	10,6	51,9	15,7	10,2	46,3	13,7	9,4	35,6	12,6	9,0	30,5
31	16,0 / 14,0	5,7	3,6	7,2	4,5	3,0	4,7	3,4	2,6	2,8	1,7	1,6	0,7	1,0	1,0	0,3
	20,0 / 17,0	9,9	5,7	20,0	8,7	5,2	15,8	7,5	4,7	12,0	5,1	3,7	5,7	4,0	3,2	3,7
	25,0 / 19,0	12,9	8,3	32,3	11,7	7,9	27,0	10,5	7,4	22,0	8,2	6,4	13,7	7,1	5,9	10,6
	30,0 / 21,0	16,0	10,9	48,2	14,8	10,5	41,8	13,6	10,0	35,6	11,3	9,0	25,0	10,2	8,6	20,7
	35,0 / 24,0	21,1	13,3	80,4	19,9	12,9	72,2	18,7	12,4	64,1	16,3	11,4	49,0	15,0	11,0	41,9
41	16,0 / 14,0	6,8	4,2	7,4	5,4	3,6	48,0	4,1	3,0	2,9	2,0	1,9	0,8	1,2	1,2	0,3
	20,0 / 17,0	11,7	6,6	19,3	10,4	6,0	15,5	9,0	5,5	11,9	6,1	4,3	5,8	4,7	3,7	3,7
	25,0 / 19,0	16,1	9,7	30,6	13,8	9,1	25,8	12,4	8,5	21,3	9,6	7,4	13,4	8,4	6,8	10,3
	30,0 / 21,0	18,6	12,6	44,9	17,3	12,1	39,2	16,0	11,5	33,6	13,3	10,4	23,8	11,9	9,8	19,6
	35,0 / 24,0	24,5	15,3	73,7	23,2	14,8	50,5	21,8	14,3	45,2	19,0	13,2	35,0	17,5	12,6	30,2
51	16,0 / 14,0	8,1	5,1	10,0	6,4	4,4	6,5	4,8	3,7	3,9	2,4	2,3	1,1	1,4	1,4	0,4
	20,0 / 17,0	14,0	8,0	26,7	12,3	7,3	21,2	10,7	6,6	16,2	7,2	5,2	7,9	5,6	4,5	5,1
	25,0 / 19,0	18,1	11,8	42,6	16,5	11,1	35,7	14,8	10,5	29,3	11,5	9,1	18,4	10,0	8,4	14,3
	30,0 / 21,0	22,4	15,5	62,8	20,8	14,8	54,6	19,1	14,1	46,6	15,9	12,8	32,9	14,4	12,2	27,3
	35,0 / 24,0	29,6	18,9	103,5	27,9	18,2	70,0	26,3	17,6	62,4	22,8	16,2	48,0	21,0	15,6	41,3

Standard airflow
kWf = Cooling capacity in kW
kWs = Sensible cooling capacity (kW)
Ta = Water integrative coil entering air temperature (°C)
Ti/To = Water temperature inlet/outlet (°C)
DP[kPa] =Water pressure drops of coil and three-way valve
WB = Wet bulb
DB = Dry bulb

Water integration coil: Heating Performance

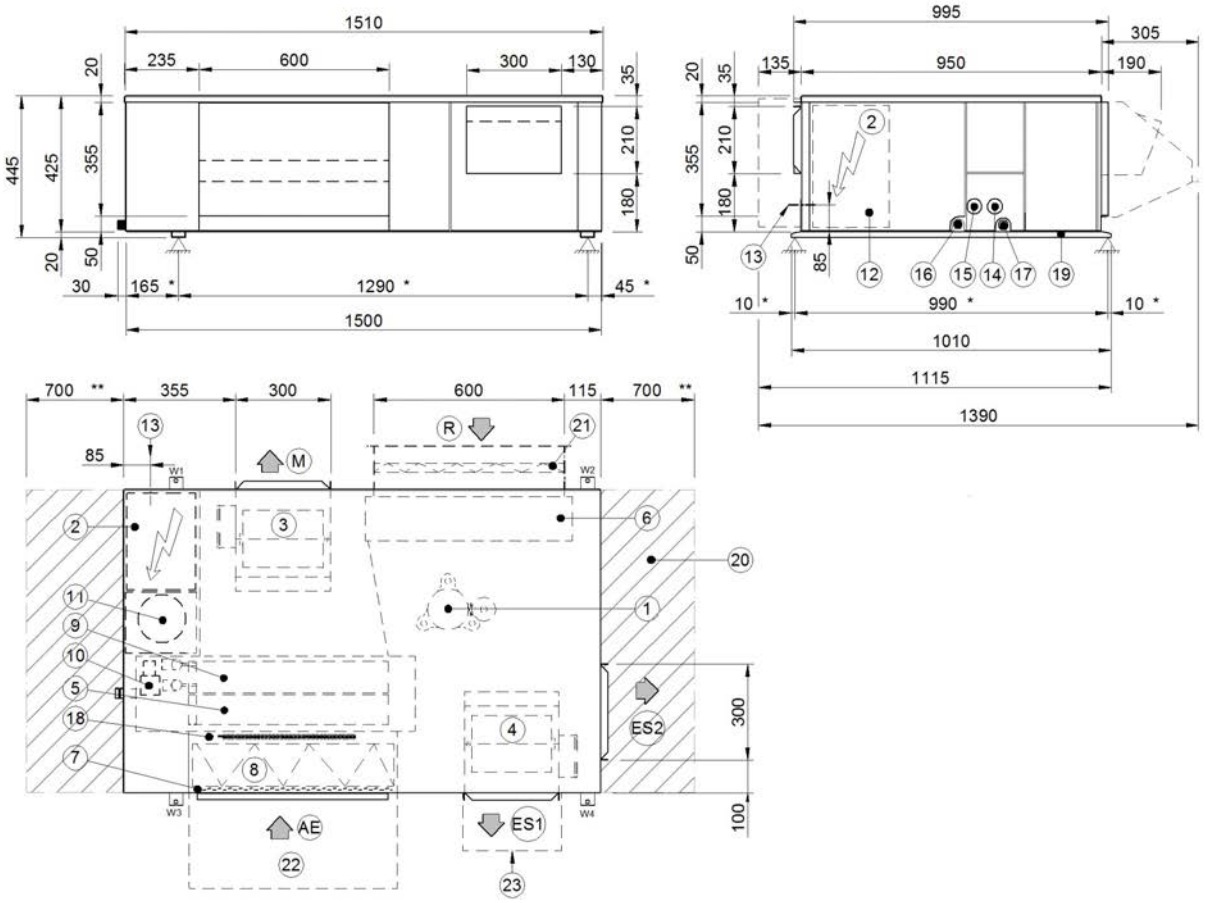
Size	Ta (°C)	Ti/To (°C)									
		16,0/14,0		60,0°C / 50,0°C		70,0°C / 60,0°C		80,0°C / 65,0°C		80,0°C / 70,0°C	
		kWt	DP(kPa)	kWt	DP(kPa)	kWt	DP(kPa)	kWt	DP(kPa)	kWt	DP(kPa)
17	-10	18,1	73,4	22,5	29,6	26,1	37,9	28,8	21,2	29,7	47,1
	-5	16,1	59,5	20,5	24,9	24,0	32,6	26,7	18,5	27,6	41,1
	0	14,2	47,3	18,5	20,7	22,0	27,8	24,6	16,0	25,5	35,6
	5	12,4	36,7	16,6	17,0	20,1	23,4	22,6	13,7	23,5	30,6
	10	10,6	27,5	14,7	13,7	18,1	19,5	20,7	11,6	21,6	26,1
	15	8,8	19,8	12,9	10,8	16,3	16,0	18,8	9,7	19,7	22,1
21	-10	20,5	92,6	25,5	37,2	29,6	47,8	32,6	26,7	33,7	59,4
	-5	18,3	75,1	23,2	31,3	27,3	41,1	30,2	23,2	31,3	51,9
	0	16,2	59,7	21,0	26,1	25,0	35,0	27,9	20,1	29,0	45,0
	5	14,1	46,3	18,8	21,4	22,8	29,5	25,7	17,2	26,7	38,7
	10	12,0	34,7	16,7	17,2	20,6	24,6	23,5	14,6	24,5	33,0
	15	10,0	24,9	14,7	13,5	18,5	20,2	21,3	12,2	22,3	27,9
25	-10	25,6	103,1	31,8	41,2	36,9	53,4	40,7	29,6	42,0	66,9
	-5	22,8	83,3	28,9	34,6	34,0	45,8	37,7	25,7	39,0	58,2
	0	20,1	65,9	26,2	28,7	31,1	38,9	34,8	22,2	36,1	50,4
	5	17,5	50,9	23,5	23,4	28,4	32,6	32,0	18,9	33,3	43,2
	10	15,0	38,0	20,8	18,8	25,7	27,1	29,3	15,0	30,5	36,7
	15	12,5	27,1	18,3	14,7	23,0	22,2	26,6	13,4	27,8	30,9
31	-10	31,4	150,8	38,9	60,0	45,2	77,9	49,7	43,1	51,5	97,9
	-5	28,0	121,8	35,4	50,4	41,6	66,9	46,1	37,4	47,8	52,2
	0	24,7	96,5	32,0	41,7	38,1	56,8	42,6	32,2	44,3	73,7
	5	21,5	74,4	28,7	34,1	34,8	47,7	39,1	27,5	40,8	63,3
	10	18,4	55,5	25,5	27,3	31,4	39,6	35,8	23,3	37,4	53,8
	15	15,3	39,6	22,3	21,4	28,2	32,4	32,5	19,5	34,1	45,3
41	-10	35,7	126,1	44,3	50,9	51,5	65,1	56,7	36,4	58,6	80,6
	-5	31,9	102,4	40,4	42,9	47,4	56,0	52,6	31,7	54,5	70,4
	0	28,1	81,6	36,5	35,8	43,5	47,8	48,6	27,4	50,4	61,2
	5	24,5	63,4	32,8	29,4	39,6	40,4	44,7	23,6	46,5	52,7
	10	20,9	47,7	29,1	23,7	35,9	33,7	40,8	20,0	42,6	45,1
	15	17,5	34,3	25,5	18,7	32,2	27,7	37,1	16,8	38,9	38,1
51	-10	44,2	186,2	54,8	75,0	63,7	96,0	70,1	53,6	72,6	119,2
	-5	39,5	151,4	49,9	63,2	58,7	82,7	65,0	46,7	67,5	104,3
	0	34,9	120,7	45,2	52,7	53,8	70,6	60,1	40,4	62,5	90,6
	5	30,4	93,7	40,5	43,2	49,1	59,7	55,2	34,7	57,6	78,1
	10	26,0	70,5	36,0	34,8	44,4	49,8	50,5	29,5	52,9	66,7
	15	21,6	50,7	31,6	27,4	39,9	40,9	45,9	24,7	48,3	56,5

Standard airflow
kWt = Provided heating capacity (kW)
Ta = Water integrative coil entering air temperature (°C)
Ti/To = Water temperature inlet/outlet (°C)
DP[kPa] = Water pressure drops of coil and three-way valve

Dimensional drawings

Size 17-21

DAA5E0600_04 REV04
Data/Date 06/03/2018



1. Compressor
2. Electrical panel
3. Supply electric fan
4. Exhaust electric fan
5. Internal exchanger
6. Exhaust air recovery coil
7. G4 air filter (standard)
8. Air filter/electrostatic filter (optional)
9. H2O Heating coil (optional)
10. Three-way valve (optional)
11. Humidifier (optional)
12. Removable panel for access to the technical compartment
13. Power input
14. H2O heating coil output Ø 3/4" gas
15. Coil water inlet Ø 3/4"
16. Humidifier water inlet Ø 1/2" Gas
17. Condensate discharge
18. Electric heaters (optional)
19. Lifting bracket (removable)
20. Functional clearances
21. G4 air filter return/exhaust (optional)
22. Outdoor air return cap (optional)
23. Outdoor air exhaust cap (optional)

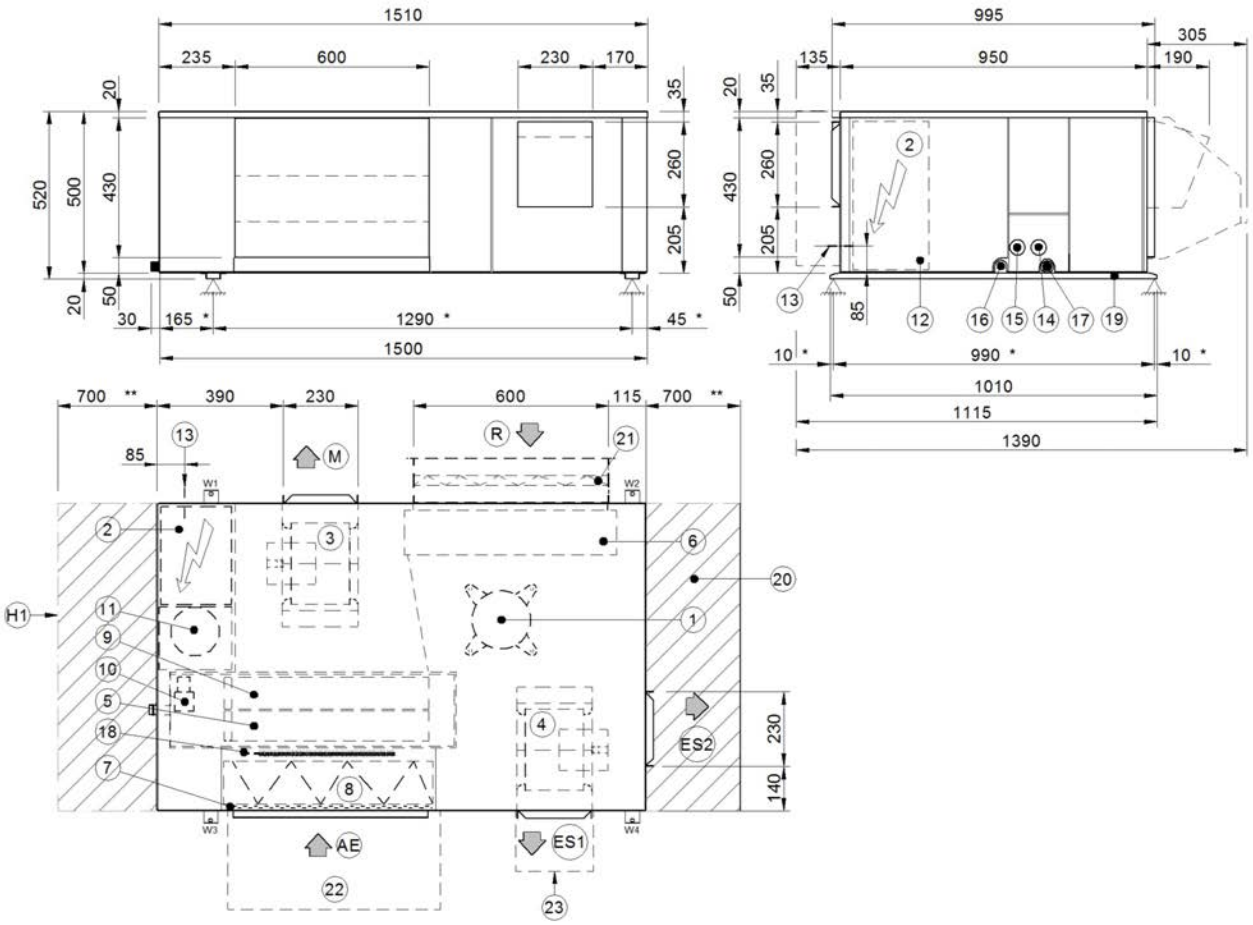
(*) Vibration mounts position

(**) Suggested clearances
R = Air return
M = Air supply
AE = Outdoor air return
ES = Air exhaust standard

Size			17	21
Length		mm	1510	1510
Depth		mm	950	950
Height		mm	445	445

Size 25-31

DAA5E0900_04 REV04
Data/Date 06/03/2018



1. Compressor
2. Electrical panel
3. Supply electric fan
4. Exhaust electric fan
5. Internal exchanger
6. Exhaust air recovery coil
7. G4 air filter (standard)
8. Air filter/electrostatic filter (optional)
9. H2O Heating coil (optional)
10. Three-way valve (optional)
11. Humidifier (optional)
12. Removable panel for access to the technical compartment
13. Power input
14. H2O heating coil output Ø 3/4" gas
15. Coil water inlet Ø 3/4"
16. Humidifier water inlet Ø 1/2" Gas
17. Condensate discharge
18. Electric heaters (optional)
19. Lifting bracket (removable)
20. Functional clearances
21. G4 air filter return/exhaust (optional)
22. Outdoor air return cap (optional)
23. Outdoor air exhaust cap (optional)

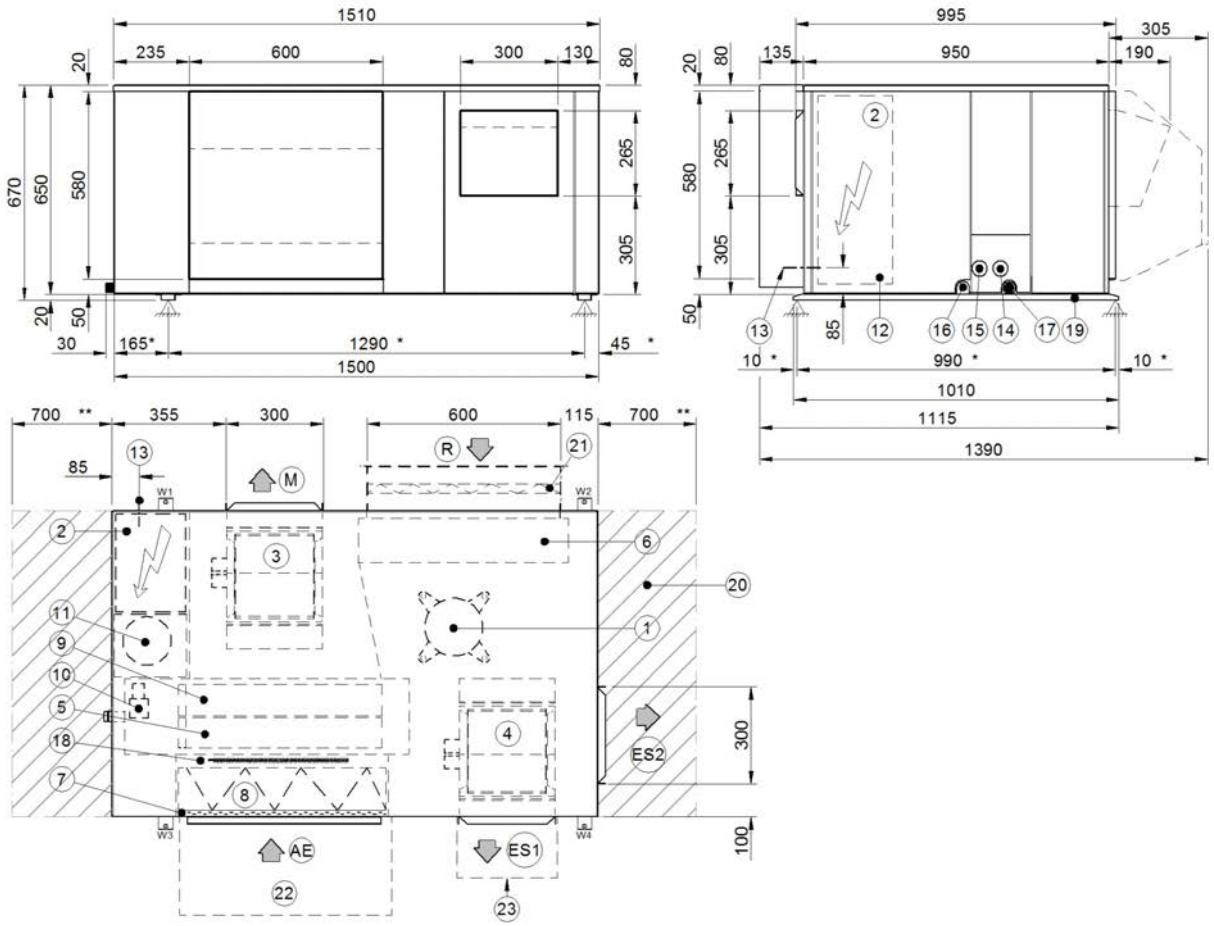
(*) Vibration mounts position

(**) Suggested clearances
R = Air return
M = Air supply
AE = Outdoor air return
ES = Air exhaust standard

Size			25	31
Length		mm	1510	1510
Depth		mm	950	950
Height		mm	520	520

Size 41

DAA5E1500_02 REV02
Data/Date 06/03/2018



1. Compressor
2. Electrical panel
3. Supply electric fan
4. Exhaust electric fan
5. Internal exchanger
6. Exhaust air recovery coil
7. G4 air filter (standard)
8. Air filter/electrostatic filter (optional)
9. H2O Heating coil (optional)
10. Three-way valve (optional)
11. Humidifier (optional)
12. Removable panel for access to the technical compartment
13. Power input
14. H2O heating coil output Ø 3/4" gas
15. Coil water inlet Ø 3/4"
16. Humidifier water inlet Ø 1/2" Gas
17. Condensate discharge
18. Electric heaters (optional)
19. Lifting bracket (removable)
20. Functional clearances
21. G4 air filter return/exhaust (optional)
22. Outdoor air return cap (optional)
23. Outdoor air exhaust cap (optional)

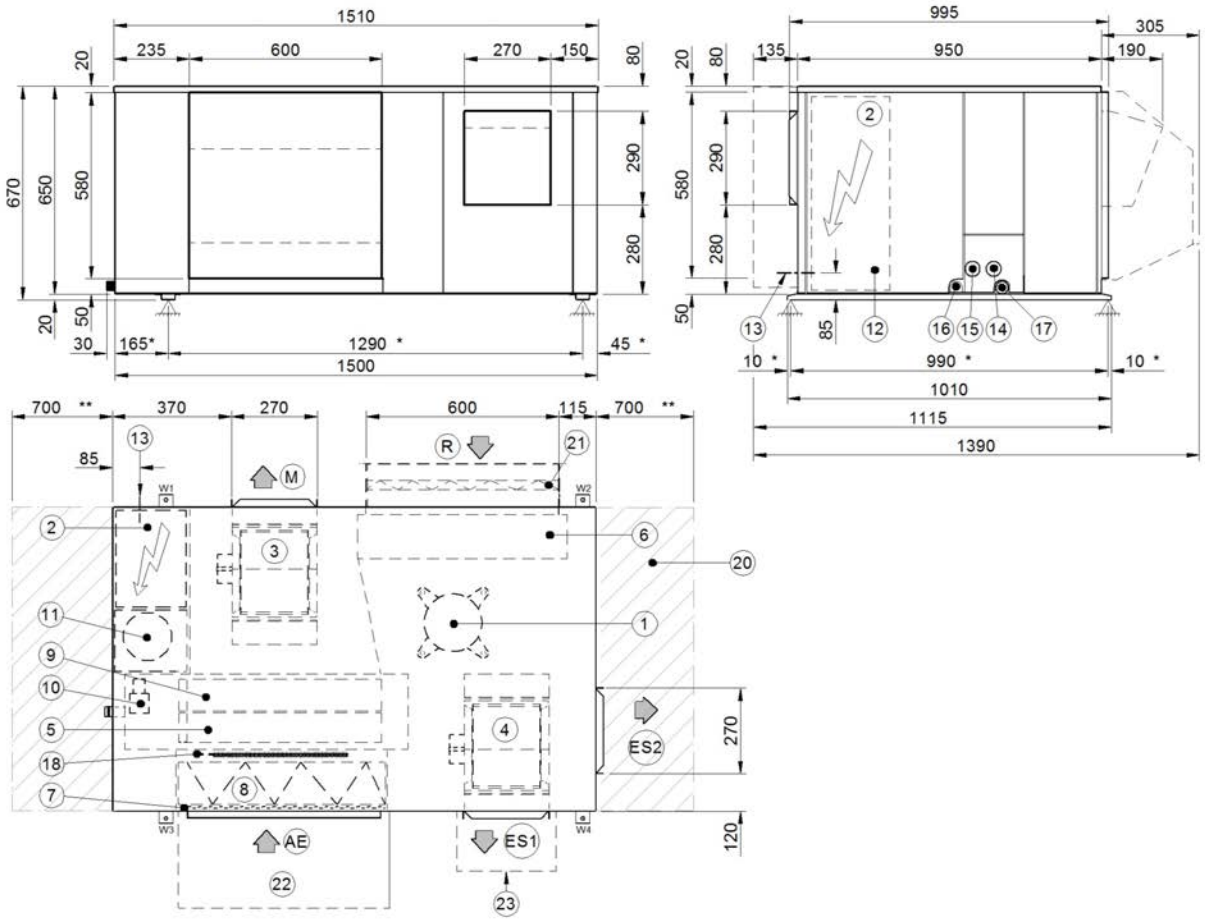
(*) Vibration mounts position

(**) Suggested clearances
R = Air return
M = Air supply
AE = Outdoor air return
ES = Air exhaust standard

Size			41
Length		mm	1510
Depth		mm	950
Height		mm	670

Size 51

DAA5E1700_04 REV04
Data/Date 06/03/2018



1. Compressor
2. Electrical panel
3. Supply electric fan
4. Exhaust electric fan
5. Internal exchanger
6. Exhaust air recovery coil
7. G4 air filter (standard)
8. Air filter/electrostatic filter (optional)
9. H2O Heating coil (optional)
10. Three-way valve (optional)
11. Humidifier (optional)
12. Removable panel for access to the technical compartment
13. Power input
14. H2O heating coil output Ø 3/4" gas
15. Coil water inlet Ø 3/4"
16. Humidifier water inlet Ø 1/2" Gas
17. Condensate discharge
18. Electric heaters (optional)
19. Lifting bracket (removable)
20. Functional clearances
21. G4 air filter return/exhaust (optional)
22. Outdoor air return cap (optional)
23. Outdoor air exhaust cap (optional)

(*) Vibration mounts position

(**) Suggested clearances
R = Air return
M = Air supply
AE = Outdoor air return
ES = Air exhaust standard

Size			51
Length		mm	1510
Depth		mm	950
Height		mm	670

Index of contents

CLIVET SPA
Via Camp Lonc 25, Z.I. Villapaiera - 32032 Feltre (BL) - Italy
Tel. + 39 0439 3131 - Fax + 39 0439 313300 - info@clivet.it

CLIVET GROUP UK Limited
4 Kingdom Close, Segensworth East - Fareham, Hampshire - PO15 5TJ - United Kingdom
Tel. + 44 (0) 1489 572238 - Fax + 44 (0) 1489 573033 - enquiries@clivetgroup.co.uk

CLIVET GROUP UK Limited (Operations)
Units F5&F6 Railway Triangle Ind Est, Walton Road - Portsmouth, Hampshire - PO6 1TG - United Kingdom
Tel. +44 (0) 2392 381235 - Fax. +44 (0) 2392 381243 - service@clivetgroup.co.uk

CLIVET ESPAÑA S.A.U.
C/ Bac de Roda, 36 - 08019 Barcelona - España
Tel: +34 93 8606248 - Fax +34 93 8855392 - info@clivet.es

Av.Manoteras Nº 38, Oficina C303 - 28050 Madrid - España
Tel. +34 91 6658280 - Fax +34 91 6657806 - info@clivet.es

CLIVET GmbH
Hummelsbütteler Steindamm 84, 22851 Norderstedt - Germany
Tel. + 49 (0) 40 32 59 57-0 - Fax + 49 (0) 40 32 59 57-194 - info.de@clivet.com

CLIVET RUSSIA
Elektrozavodskaya st. 24, office 509 - 107023, Moscow, Russia
Tel. + 74956462009 - Fax + 74956462009 - info.ru@clivet.com

CLIVET MIDEAST FZCO
Dubai Silicon Oasis (DSO), High Bay Complex, Office N. 20, PO BOX 342009, Dubai, UAE
Tel. + 9714 3208499 - Fax + 9714 3208216 - info@clivet.ae

CLIVET AIRCONDITIONING SYSTEMS PRIVATE LIMITED
501/502, Commercial-1, Kohinoor City, Old Premier Compound, Kirol Road, Off L B S Marg, Kurla West - Mumbai 400 070 - India
info.in@clivet.com

www.clivet.com
www.clivetlive.com

A Group Company of
Midea