AQUACIAT LD ILD

Water chillers
Heat pump

Unit with protection grille option

Compact and silent

Scroll compressors
High-efficiency brazed plate heat exchangers
All-aluminium micro-channel condenser
Self-adjusting electronic control

Cooling capacity, LD: 40 to 156 kW
Cooling capacity, ILD: 38 to 148 kW
Heating capacity, ILD: 42 to 150 kW

Cooling only | **Cooling and heating** | **Hydraulic module** | **Heat recovery** | R-410A

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Use

The latest generation of **AQUACIAT** heat pumps and water chillers are the perfect solution for all heating and cooling applications in the Office, Healthcare, Industry, Administration, Shopping Centres and Collective Housing markets.

These units are designed for outdoor installation and require no special protection against adverse weather conditions.

AQUACIAT is optimised to use ozone-friendly HFC R410A refrigerant.

This range guarantees compliance with the most demanding requirements for increased seasonal energy efficiency (SEER, SEPR and SCOP) and CO2 reduction to comply with the various applicable European directives and regulations.

Range

- **AQUACIAT LD series**

Cooling only version.

- **AQUACIAT ILD series**

Reversible heat pump version.

These two versions are optimised to meet the most demanding technical and economic requirements, whilst complying with the new Ecodesign regulations.

DESCRIPTION

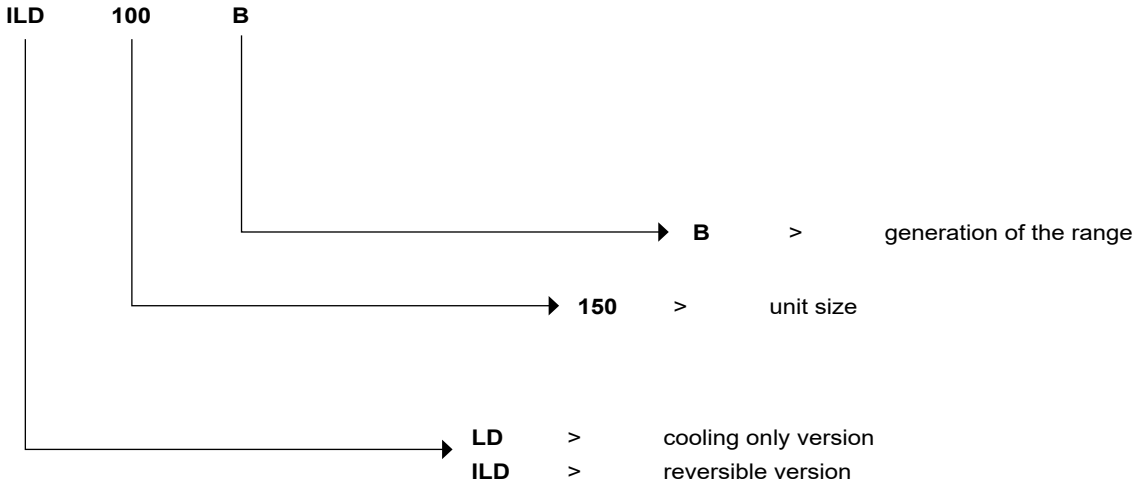
AQUACIAT units are packaged machines supplied as standard with the following components:

- Hermetic SCROLL compressors
- Brazed-plate condenser or evaporator water type heat exchanger
- Air-cooled exchanger with axial fan motor assembly
  - all-aluminium micro-channel coil, cooling only version
  - copper tube coil with aluminium fins, reversible heat pump version
- Electrical power and remote control cabinet:
  - 400 V-3ph-50 Hz (+/-10 %) mains power supply + earth
  - transformer fitted as standard on the machine for supplying the remote control circuit with 24 V
- Connect Touch electronic control module
- Casing for outdoor installation

The entire AQUACIAT range complies with the following EC directives and standards:

- Machinery Directive 2006/42/EC
- Electromagnetic compatibility directive 2014/30/EC
- EMC immunity and emissions EN 61800-3 'C3'
- Low Voltage Directive 2014/35/EU
- RoHS 2011/65/EU
- Pressure Equipment Directive (PED) 2014/68/EU
- Machinery directive EN 60-204 -1
- Refrigeration systems and heat pumps EN 378-2
- Commission Regulations (EU) No. 813/2013 (AQUACIAT ILD) and No. 2016/2281 (AQUACIAT LD) implementing directive 2009/125/EC setting the ecodesign requirements

DESCRIPTION



CONFIGURATION

LD-ILD	Standard
LD-ILD, XLN option	Standard Xtra Low Noise

TECHNICAL CHARACTERISTICS - REVERSIBLE HEAT PUMP

AQUACIAT ILD				150	180	200	240	260	300	302	360	390	450	520	600
Heating															
Standard unit Full load performances*	HA1	Nominal capacity	kW	42·3	46,4	53,2	61,2	68,0	77,6	81,7	92,2	100	116	135	155
		COP	kW/kW	3,69	3,69	3,76	3,72	3,64	3,46	3,78	3,80	3,76	3,68	3,61	3,47
	HA2	Nominal capacity	kW	41,5	46,3	51,7	59,3	65,9	75,0	78,9	89,5	97,4	112	130	150
		COP	kW/kW	3,05	3,02	3,01	3,01	2,98	2,85	3,11	3,05	3,06	3,00	2,94	2,86
Standard unit Seasonal energy efficiency**	HA1	**$SCOP_{30/35°C}$**	**kW/kW**	**3,32**	**3,39**	**3,53**	**3,40**	**3,40**	**3,28**	**3,51**	**3,50**	**3,57**	**3,54**	**3,44**	**3,42**
		$\eta s\ heat_{30/35°C}$	**%**	**130**	**133**	**138**	**133**	**133**	**128**	**137**	**137**	**140**	**139**	**135**	**134**
		P_{rated}	kW	35,5	31,6	36,3	43,8	50,1	55,7	56,8	81,5	72,3	84,2	99,4	111
		Energy labelling		A+	A+	A+	A+	A+	A+	A+	-	-	-	-	-
Cooling															
Standard unit Full load performances*	CA1	Nominal capacity	kW	37,7	43,1	49,4	58,0	63,1	70,2	77,0	84,9	95,1	112,4	130,5	148,2
		EER	kW/kW	2,80	2,66	2,61	2,72	2,66	2,43	2,75	2,66	2,66	2,65	2,73	2,54
	CA2	Nominal capacity	kW	47,1	53,9	62,7	70,7	78,2	88,5	96,5	106,9	116,6	141,9	161,6	185,2
		EER	kW/kW	3,23	3,11	3,04	3,08	3,04	2,81	3,14	3,09	3,05	3,05	3,12	2,88
Standard unit Seasonal energy efficiency**		SEER $_{12/7°C}$ Comfort low temp.	kWh/kWh	3,64	3,67	3,70	3,53	3,49	3,37	3,83	3,70	3,76	4,00	3,65	3,62
		SEPR $_{12/7°C}$ Process high temp.	kWh/kWh	4,92	4,95	4,74	4,53	4,44	4,72	5,16	4,67	4,62	5,15	4,59	4,95
Unit with low-temperature brine solution option Seasonal energy efficiency**		SEPR $_{-2/-8°C}$ Process medium temp.	kWh/kWh	2,58	2,58	2,61	2,96	2,98	2,86	2,70	2,86	3,04	2,94	2,80	2,68
Part Load integrated values		IPLV.SI	kW/kW	4,464	4,447	4,409	4,127	4,102	4,033	4,475	4,314	4,378	4,795	4,246	4,295
Sound levels															
Standard unit															
Sound power(1)			dB(A)	80	81	81	86	87	87	84	84	84	84	90	90
Sound pressure at 10 m(2)			dB(A)	49	49	49	55	55	55	52	52	52	52	58	58
Unit + Xtra Low Noise option															
Sound power(1)			dB(A)	79	80	80	80	80	80	83	83	83	83	83	83
Sound pressure at 10 m(2)			dB(A)	48	48	48	48	48	48	51	51	51	51	51	51
Dimensions															
Length			mm	1090	1090	1090	1090	1090	1090	2270	2270	2270	2270	2270	2270
Width			mm	2109	2109	2109	2109	2109	2109	2123	2123	2123	2123	2123	2123
Height			mm	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330	1330
Height with Buffer Tank Module			mm	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930	1930
Operating weight(3)															
Standard unit			kg	497	506	543	549	559	564	777	896	905	979	1053	1057
Unit + High pressure single pump option			kg	539	548	585	591	601	606	844	963	972	1050	1127	1131
Unit + High pressure dual pump option			kg	565	574	611	617	627	632	889	1008	1017	1098	1164	1168
Unit + high pressure single pump + Water buffer tank module option			kg	935	943	981	986	996	1001	1276	1395	1404	1482	1560	1563
Unit + high pressure dual-pump + Water buffer tank module option			kg	961	969	1006	1012	1022	1027	1321	1440	1449	1531	1597	1600

* In accordance with standard EN14511-3:2013.

** In accordance with standard EN14825:2016, average climate conditions.

HA1 Conditions in heating mode: water type heat exchanger water outlet/inlet temperature 30 °C/35 °C, outside air temperature tdb/twb = 7 °C db/6 °C wb, evaporator fouling factor 0 m^2. k/W

HA2 Conditions in heating mode: water type heat exchanger water outlet/inlet temperature 40 °C/45 °C, outside air temperature tdb/twb = 7 °C db/6 °C wb, evaporator fouling factor 0 m^2. k/W

CA1 Cooling mode conditions: evaporator water inlet/outlet temperature 12 °C/7 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m^2. k/W

CA2 Cooling mode conditions: evaporator water inlet/outlet temperature 23 °C/18 °C, outdoor air temperature 35 °C, evaporator fouling factor 0 m^2. k/W

$\eta s\ heat_{30/35°C}$ & $SCOP_{30/35°C}$ Values in bold comply with Ecodesign Regulation (EU) No. 813/2013 for heating application

SEER $_{12/7°C}$ & SEPR $_{12/7°C}$ Values calculated according to EN14825:2016

SEPR $_{-2/-8°C}$ Values calculated according to EN14825:2016

IPLV.SI Calculated as per AHRI standard 551-591 (SI).

(1) in dB ref=10^{-12} W, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Measured in accordance with ISO 9614-1 and certified by EUROVENT

(2) In dB ref 20 µPa, 'A' weighted. Declared dual-number noise emission values in accordance with ISO 4871 (with an associated uncertainty of +/-3dB(A)). Value calculated from the sound power level Lw(A).

(3) Weights given as a guide. Refer to the unit name plate.

EUROVENT CERTIFIED PERFORMANCE www.eurovent-certification.com

Eurovent certified values

TECHNICAL CHARACTERISTICS - REVERSIBLE HEAT PUMP

AQUACIAT ILD		150	180	200	240	260	300	302	360	390	450	520	600
Operating weight(3)													
Unit + high pressure single pump option + Water buffer tank module with extra heaters (16 kW)	kg	1018	1026	1064	1069	1079	1084						
Unit + high pressure dual pump option + Water buffer tank module with extra heaters (16 kW)	kg	1044	1052	1089	1095	1105	1110						
Unit + high pressure single pump option + Water buffer tank module with extra heaters (31 kW and 45 kW)	kg	1022	1030	1068	1073	1083	1088						
Unit + high pressure dual pump option + Water buffer tank module with extra heaters (31 kW and 45 kW)	kg	1048	1056	1093	1099	1109	1114						
Compressors		Hermetic Scroll 48.3 r/s											
Circuit A	Qty	2	2	2	2	2	2	2	3	3	3	2	2
Circuit B	Qty	-	-	-	-	-	-	-	-	-	-	2	2
No. of power stages	Qty	2	2	2	2	2	2	2	3	3	3	4	4
Refrigerant (3)		R-410A GWP=2088 following ARI4											
Circuit A	kg	12.5	13,5	16,5	17,5	18	16,5	21,5	27,5	28,5	33	19	18,5
	tCO_2e	26.1	28,2	34,5	36,5	37,6	34,5	44,9	57,4	59,5	68,9	39,7	38,6
Circuit B	kg	-	-	-	-	-	-	-	-	-	-	19	18,5
	tCO_2e	-	-	-	-	-	-	-	-	-	-	39,7	38,6
Oil charge		POE SZ160 (EMKARATE RL 32-3MAF).											
Circuit A	l	5.8	7,2	7,2	7,2	7,0	7,0	7,2	7,0	7,0	7,0	7,0	7,0
Circuit B	l	-	-	-	-	-	-	-	-	-	-	7,0	7,0
Power control		Connect Touch Control											
Minimum capacity	%	50	50	50	50	50	50	50	33	33	33	25	25
Air heat exchanger		Grooved copper tube and aluminium fins											
Fans													
Quantity	1	1	1	1	1	1	1	2	2	2	2	2	2
Maximum total air flow	l/s	3694	3694	3889	5278	5278	5278	7778	7389	7389	7778	10556	10556
Maximum rotation speed	r/s	12	12	12	16	16	16	12	12	12	12	16	16
Water heat exchanger		Direct expansion, plate heat exchanger											
Water volume	l	2.6	3	4	4,8	4,8	5,6	8,7	8,7	9,9	11,3	12,4	14,7
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Hydraulic module (option)													
Single or dual pump (as selected)		Pump, victaulic screen filter, relief valve, vent valves (water and air), pressure sensors											
Expansion vessel volume (option)	l	12	12	12	12	12	12	12	35	35	35	35	35
Expansion vessel pressure(4)	bar	1	1	1	1	1	1	1	1,5	1,5	1,5	1,5	1,5
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water buffer tank module (option)													
Single or dual pump (as selected)		Pump, victaulic screen filter, relief valve, vent valves (water and air), pressure sensors											
Water volume	l	250	250	250	250	250	250	250	250	250	250	250	250
Expansion vessel volume (option)	l	18	18	18	18	18	18	18	35	35	35	35	35
Expansion vessel pressure(4)	bar	1	1	1	1	1	1	1	1,5	1,5	1,5	1,5	1,5
Max. water-side operating pressure with hydraulic module	kPa	400	400	400	400	400	400	400	400	400	400	400	400
Water buffer tank module with extra heaters (option)													
Single or dual pump (as selected)		Pump, victaulic screen filter, relief valve, vent valves (water and air), pressure sensors, vent at the top of the tank											
16 kW extra heaters in the tank	kW	2 x 8 kW	2 x 8 kW	2 x 8 kW	2 x 8 kW	2 x 8 kW	2 x 8 kW						
31 kW extra heaters in the tank	kW	2 x 8 kW + 1 x 15 kW	2 x 8 kW + 1 x 15 kW	2 x 8 kW + 1 x 15 kW	2 x 8 kW + 1 x 15 kW	2 x 8 kW + 1 x 15 kW	2 x 8 kW + 1 x 15 kW						
45 kW extra heaters in the tank	kW	3 x 15 kW	3 x 15 kW	3 x 15 kW	3 x 15 kW	3 x 15 kW	2 x 8 kW						
Water connections with or without hydraulic module		Victaulic											
Connections	inch	2	2	2	2	2	2	2	2	2	2	2	2
External diameter	mm	60.3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3	60,3
Casing paint		Colour code RAL 7035 and RAL 7024											

(3) Weights given as a guide. Refer to the unit name plate.
(4) Upon delivery, the standard preinflation of the vessels is not necessarily at the optimum value for the installation. In order to enable free variation of the water volume, adjust the inflation pressure to a pressure close to that corresponding to the static head of the installation. Fill the installation with water (bleeding out any air) at a pressure 10 to 20 kPa higher than that of the vessel.

ELECTRICAL DATA

LD / ILD Standard unit (without hydraulic module)		150	180	200	240	260	300	302	360	390	450	520	600
Power circuit													
Nominal voltage	V-ph-Hz	400-3-50											
Voltage range	V	360-440											
Control circuit supply		24 V, via internal transformer											
Rated unit current draw(3)													
Circuit A&B	A	25,6	29	33	36	42,4	52,8	53,4	55,4	61,7	77,3	84,8	105,6
Maximum unit power input(2)													
Circuit A&B	kW	19,5	22,3	24,5	27,9	31,2	35,8	35,6	42,3	45,6	52,5	62,4	71,6
Unit power factor at maximum capacity(2)		0,83	0,81	0,81	0,83	0,81	0,78	0,78	0,83	0,81	0,79	0,81	0,78
Unit max. operating current (Un-10%)(5)													
Circuit A&B	A	38	49,2	51,4	58,4	74,8	79,6	80,2	89	110,3	117,5	149,6	159,2
Maximum current draw (Un)(4)													
Circuit A&B - Standard unit	A	34,8	44,8	46,8	52,8	67	73	73,6	80,6	98,6	107,6	134	146
Maximum start-up current, standard unit (Un)(1)													
Circuit A&B	A	113,8	134,8	142,8	145,8	176	213	213,6	173,6	207,6	247,6	243	286
Maximum start-up current, unit with soft start (Un)(1)													
Circuit A&B	A	74,7	86,5	93,8	96,2	114,4	139,8	139,8	130,4	155,4	181,4	186,4	215,4

(1) Maximum instantaneous starting current (maximum operating current of the smallest compressor(s) + fan current(s) + locked rotor current of the largest compressor).
(2) Power input, at the unit's permanent operating limits (indication given on the unit's name plate).
(3) Standardised EUROVENT conditions, water type heat exchanger input/output = 12°C/7°C, outdoor air temperature = 35°C.
(4) Maximum unit current at 400V, during non-permanent operation (indication given on the unit's name plate)
(5) Maximum unit current at 360V, during non-permanent operation

Short circuit current withstand capability (TN system(1))

AQUACIAT LD / ILD		150	180	200	240	260	300	302	360	390	450	520	600
Value without upstream protection													
Short time assigned current (1s) - Icw	kA eff	3,36	3,36	3,36	3,36	3,36	3,36	3,36	5,62	5,62	5,62	5,62	5,62
Allowable peak assigned current - Ipk	kA pk	20	20	20	20	20	15	15	20	20	15	20	15
Value with upstream protection													
Conditional short circuit assigned current Icc	kA eff	40	40	40	40	40	40	40	40	40	40	30	30
Associated Schneider circuit breaker - Compact type range(2)		NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS100H	NS160H	NS160H	NS250H	NS250H

(1) Type of system earthing
(2) If another current limiting protection device is used, its time-current trip and I^2t thermal stress characteristics must be at least equivalent to those of the recommended Schneider circuit breaker.
The short-circuit withstand values given above were determined for the TN system.

PARTIAL RECOVERY WITH DESUPERHEATER

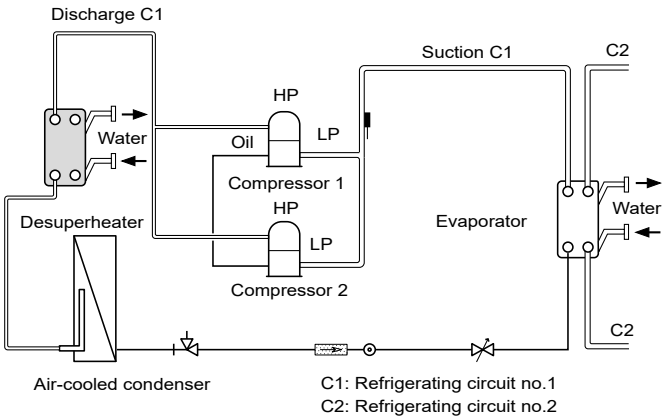
The AQUACIAT range may be equipped as an option with an energy recovery function using a desuperheater

Heat from gases released by the compressors is recovered directly by a type of heat exchanger called a desuperheater located on the unit to produce free, additional hot water.

This optional configuration requires assembly in our factories and is by order only

Refrigerant circuit schematic diagram

This refrigeration diagram illustrates a unit with a desuperheater on each refrigerating circuit. For heat recovery to be possible, the unit must be operating. For the same cooling capacity, the desuperheater provides a source of free hot water and lowers the unit's electrical power consumption.



Hydraulic connections: configuration and precautions

The hydraulic supply for each desuperheater is delivered in parallel. In order to ensure that the unit can start and operate under the correct conditions, the desuperheater circuit water loop must be as short as possible and be able to increase quickly in temperature. The minimum desuperheater water inlet temperature must be 25°C. It may require the use of a three-way valve with its controller and a sensor controlling the minimum water inlet temperature.

Note:
The water loop for the desuperheater circuit must include an expansion vessel and a valve. Special attention should be paid when selecting the expansion vessel as the recovery water circuit can reach 120°C if the pump is turned off or if no hot water is consumed.

Operating limits

Operating mode		COOLING		HEATING	
Desuperheater		**Minimum**	**Maximum**	**Minimum**	**Maximum**
Water inlet temperature at start-up	°C	25	60	25	60
Water outlet temperature during operation	°C	30	65	30	65
Air heat exchanger		**Minimum**	**Maximum**	**Minimum**	**Maximum**
Outdoor air temperature during operation	°C	-10*	46	-10	48

* With winter operation option

PARTIAL RECOVERY WITH DESUPERHEATER

Technical characteristics

LD partial heat recovery mode		150	180	200	240	260	300	360	390	450	520	600
Standard unit	kg	436	445	454	470	468	490	785	796	827	867	899
Unit + High pressure single pump option	kg	478	486	496	512	510	532	852	863	898	941	973
Unit + High pressure dual pump option	kg	504	512	522	537	536	558	897	908	947	978	1010
Unit + high pressure single pump + Water buffer tank module option	kg	874	882	892	908	906	928	1285	1296	1331	1374	1406
Unit + high pressure dual pump + Water buffer tank module option	kg	900	908	918	933	932	954	1330	1341	1380	1411	1443
Refrigerant with MCHE coils		R410A GWP=2088 following ARI4										
Circuit A	kg	4,7	5,3	5,9	6,7	6,2	7,3	10,7	10,8	11,4	6,5	7,4
Circuit B	kg	-	-	-	-	-	-	-	-	-	6,5	7,4
Air heat exchanger		"Micro Channel Heat Exchanger" (Micro-Channel) coils made entirely from aluminium										
Desuperheater on circuits A and B		Plate heat exchanger										
Water volume	l	0,549	0,549	0,549	0,549	0,732	0,732	0,976	0,976	0,976	0,732	0,732
Water volume	l	-	-	-	-	-	-	-	-	-	0,732	0,732
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Cylindrical male gas thread										
Connections	inch	1	1	1	1	1	1	1	1	1	1	1
External diameter	mm	42	42	42	42	42	42	42	42	42	42	42

ILD partial heat recovery mode		150	180	200	240	260	300	302	360	390	450	520	600
Standard unit	kg	506	515	552	558	569	574	787	907	916	990	1068	1072
Unit + High pressure single pump option	kg	548	557	594	600	611	616	854	974	983	1061	1142	1146
Unit + High pressure dual pump option	kg	574	583	620	626	637	642	899	1019	1028	1109	1179	1183
Unit + high pressure single pump + Water buffer tank module option	kg	944	952	990	995	1006	1011	1286	1406	1415	1493	1575	1578
Unit + high pressure dual pump + Water buffer tank module option	kg	970	978	1015	1021	1032	1037	1331	1451	1460	1542	1612	1615
Refrigerant with copper tube coils/aluminium fins(1)		R410A GWP=2088 following ARI4											
Circuit A	kg	12,5	13,5	16,5	17,5	18	16,5	21,5	27,5	28,5	33	19	18,5
Circuit B	kg	-	-	-	-	-	-	-	-	-	-	19	18,5
Air heat exchanger		Grooved copper tube and aluminium fins											
Desuperheater on circuits A and B		Plate heat exchanger											
Water volume	l	0,549	0,549	0,549	0,732	0,732	0,732	0,732	0,976	0,976	0,976	0,732	0,732
Water volume	l	-	-	-	-	-	-	-	-	-	-	0,732	0,732
Max. water-side operating pressure without hydraulic module	kPa	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Water connections		Cylindrical male gas thread											
Connections	inch	1	1	1	1	1	1	1	1	1	1	1	1
External diameter	mm	42	42	42	42	42	42	42	42	42	42	42	42

(1) Weights given as a guide.

PARTIAL RECOVERY WITH DESUPERHEATER

Performance

■ Heating capacity recovered by the desuperheaters

LD water chiller

LD 150 - 600	Water inlet temperature on desuperheater, °C								
	45			50			55		
	Qhr	q	Δp	Qhr	q	Δp	Qhr	q	Δp
	kW	l/s	kPa	kW	l/s	kPa	kW	l/s	kPa
150	12,9	0,31	6,1	10,9	0,26	4,4	9,0	0,21	3,1
180	16,5	0,40	9,5	14,3	0,34	7,4	12,0	0,29	5,2
200	18,1	0,43	11,7	15,4	0,37	8,5	12,8	0,31	6,1
240	19,3	0,46	12,9	16,6	0,40	9,8	13,7	0,33	6,9
260	24,3	0,58	11,8	21,0	0,50	9,2	17,5	0,42	6,5
300	28,6	0,68	16,3	24,4	0,58	12,1	20,6	0,49	8,8
360	30,5	0,73	11,4	25,8	0,62	8,2	21,5	0,51	5,8
390	36,4	0,87	16,0	31,9	0,76	12,4	27,0	0,64	8,9
450	43,1	1,03	22,6	37,4	0,89	17,2	31,6	0,75	12,3
520(1)	47,1	1,12	11,3	39,7	0,95	8,3	33,0	0,79	5,9
600(1)	54,0	1,29	15,0	45,6	1,09	10,7	38,3	0,92	7,8

Application data

Water type heat exchanger inlet/outlet temperature: 12/7 °C
Outdoor air temperature: 35°C
Water inlet/outlet difference on desuperheater: 10 K
Evaporator fluid: chilled water
Fouling level coefficient: 0.18 x 10-4 m².K/W

ILD heat pumps

ILD 150 - 600/Cooling Mode	Water inlet temperature on desuperheater, °C								
	45			50			55		
	Qhr	q	Δp	Qhr	q	Δp	Qhr	q	Δp
	kW	l/s	kPa	kW	l/s	kPa	kW	l/s	kPa
150	10,9	0,26	4,4	9,1	0,22	3,1	7,1	0,18	2,1
180	14,4	0,34	7,5	12,2	0,29	5,4	10,0	0,24	3,7
200	17,2	0,41	10,5	14,7	0,35	7,8	12,3	0,29	5,6
240	17,4	0,44	6,6	15,1	0,36	4,6	12,3	0,29	3,0
260	21,4	0,51	9,3	17,9	0,43	6,7	14,7	0,35	4,8
300	26,8	0,64	14,7	22,5	0,54	10,4	18,8	0,45	7,5
302	23,9	0,57	12,1	21,2	0,51	7,8	16,3	0,39	5,8
360	28,1	0,67	9,9	23,9	0,57	7,1	19,7	0,47	5,1
390	33,9	0,81	14,0	28,3	0,68	10,1	23,7	0,57	7,2
450	37,7	0,90	17,5	31,7	0,76	12,4	26,5	0,63	8,9
520(1)	42,9	1,03	9,4	35,5	0,85	6,7	29,1	0,7	4,5
600(1)	52,3	1,25	14,1	44,2	1,06	10,1	36,9	0,88	7,1

Application data

Water type heat exchanger inlet/outlet temperature: 12/7 °C
Outdoor air temperature: 35°C
Water inlet/outlet difference on desuperheater: 10 K
Evaporator fluid: chilled water
Fouling level coefficient: 0.18 x 10-4 m².K/W

ILD 150 - 600/Heating Mode	Water inlet temperature on desuperheater, °C								
	45			50			55		
	Qhr	q	Δp	Qhr	q	Δp	Qhr	q	Δp
	kW	l/s	kPa	kW	l/s	kPa	kW	l/s	kPa
150	10,1	0,24	3,8	8,3	0,20	2,7	6,8	0,16	1,8
180	11,1	0,27	4,6	9,3	0,22	3,3	7,7	0,18	2,3
200	14,0	0,33	7,1	11,8	0,28	5,2	9,9	0,24	3,6
240	14,3	0,34	4,4	11,8	0,28	3,0	9,4	0,22	2,0
260	17,1	0,41	6,3	14,4	0,34	4,5	11,9	0,28	3,1
300	19,1	0,46	7,8	16,0	0,38	5,6	13,2	0,32	3,9
302	17,5	0,42	6,6	14,6	0,35	4,8	11,7	0,28	3,2
360	21,4	0,51	6,0	17,7	0,42	4,1	14,7	0,35	2,8
390	20,6	0,49	5,1	16,5	0,39	3,4	12,7	0,30	2,0
450	23,0	0,55	6,9	18,5	0,44	4,7	14,5	0,35	3,0
520(1)	32,0	0,77	5,5	26,7	0,64	3,8	21,6	0,52	2,6
600(1)	37,5	0,90	7,3	31,2	0,75	5,4	25,4	0,61	3,7

Application data

Water type heat exchanger inlet/outlet temperature: 40/45 °C
Outdoor air temperature: 7°C
Water inlet/outlet difference on desuperheater: 10 K
Evaporator fluid: chilled water
Fouling level coefficient: 0.18 x 10-4 m².K/W

Qhr Total heating capacity reclaimed at the desuperheater(s), kW
q Total water flow rate on the desuperheater loop, l/s
Δp Water pressure drop per desuperheater (kPa)
(1) Sizes 520 and 600 are fitted with 2 desuperheaters, one per circuit.

INTELLIGENTLY-DESIGNED ACOUSTICS

To comply with the various restrictions on integration, the AQUACIAT has two sound finish levels enabling it to be easily integrated into a number of zones without causing disruption to users or their neighbours.

Basic version

The distinguishing feature of the AQUACIAT range is its rigorous design incorporating "noiseless" assembly techniques to reduce vibrations and sources of noise:

- New generation scroll compressors with a continuous scrolling motion to lessen vibrations
- Compressor structure separated from the unit by anti-vibration mounts
- Pipes separated from the unit structure
- Fans made from a synthetic material, with aerodynamic blades offering an optimised profile. Optimised coil-fan combination, the result of many hours of study of the thermal and acoustic properties in our Research and Innovation Centre, to ensure a linear flow of air without turbulence, to limit noise to an acceptable acoustic spectrum.
- The Connect Touch controller automatically adjusts the fan air flow rate according to the outdoor air temperature and the unit's load rate which enables the sound level to be significantly reduced, particularly at night, mid-season, morning and evening, which totals more than 75% of the time the unit is used

Xtra Low Noise option

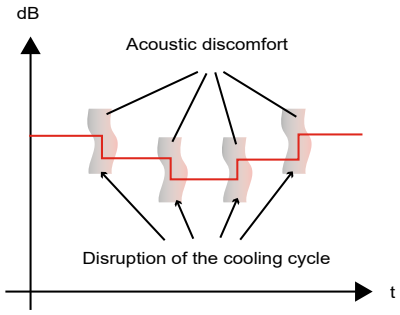
In this version, the compressors are housed in jackets and the fan rotation speed is reduced whilst ensuring the output and thermal performance remain optimised.

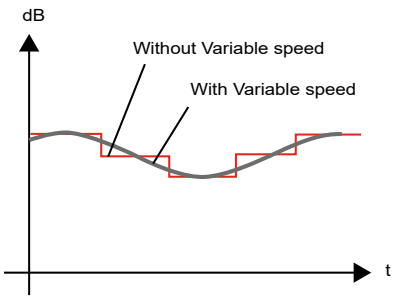
Night mode

The AQUACIAT has a Night Mode enabling the sound level to be limited at night or when the building is unoccupied (according to the user programming) by controlling the output and the fan rotation speed.

Acoustic signature

As important as the sound power level, the acoustic signature reflects the noise disturbance generated by the unit.





The AQUACIAT can be equipped as an option with a variable speed motor, enabling the fan to start gradually (all-season operation).

It avoids the increases in noise linked to the on/off sequences, thereby improving the unit's acoustic signature.

Similarly, the installation of a variable-speed pump enables the sound level of the pump function to be reduced by adjusting the pump speed to what is strictly necessary. The soft start improves the signature and reduces nuisance noise.

With all these benefits and its two acoustic finish levels (Standard and Xtra Low Noise), the AQUACIAT can be integrated into any site, ensuring any constraints in terms of the sound environment can be met.

SOUND LEVELS

ILD Standard, XTRA LOW NOISE version

■ Sound power level ref 10^{-12} W ±3 dB (Lw)

At nominal EN 14511-3: 2013 operating conditions – Cooling mode

AQUACIAT ILD	SOUND POWER LEVEL SPECTRUM (dB)						Overall power level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150	77	79	78	75	70	63	79
180	77	79	79	75	70	63	80
200	77	79	79	75	70	63	80
240	77	79	78	75	70	64	80
260	77	79	79	75	71	66	80
300	77	79	79	75	71	64	80
302	80	82	82	78	73	65	83
360	80	82	81	78	73	66	83
390	80	82	82	78	73	68	83
450	80	82	82	78	74	67	83
520	80	82	82	78	74	69	83
600	80	82	82	78	74	67	83

■ Sound pressure levels ref $2x10^{-5}$ Pa ±3 dB (Lp)

Measurement conditions: free field, 10 metres from machine, 1.50 metres above floor level, directivity 2

AQUACIAT ILD	SOUND PRESSURE SPECTRUM (dB)						Overall pressure level dB(A)
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	
150	45	47	47	43	38	31	48
180	45	47	47	43	38	31	48
200	45	47	47	43	38	31	48
240	45	47	47	43	39	32	48
260	45	47	47	43	39	35	48
300	45	47	47	43	39	33	48
302	48	50	50	46	41	34	51
360	48	50	50	46	41	34	51
390	48	50	50	46	41	37	51
450	48	50	50	46	42	35	51
520	48	50	50	46	42	37	51
600	48	50	50	46	42	36	51

NB: Sound pressure levels depend on the installation conditions of each system. As such, the levels listed here are given for information only. Only the sound power levels are comparable and certified.

SYSTEM WATER VOLUME - EVAPORATOR WATER FLOW RATE

The Connect Touch controller is equipped with anticipation logic making it highly flexible in adjusting operation to parameter drift, particularly on hydraulic systems with low water volumes. By adjusting compressor running times, it prevents short-cycle protection cycles from starting and, in most cases, eliminates the need for a buffer tank.

NOTE: The minimum volumes of chilled water are calculated for EUROVENT rated conditions:

Cooling mode, LD version
- Chilled water temperature = 12 °C/7 °C
- Condenser air inlet temperature = 35 °C

Heating mode, ILD version
- Hot water temperature = 40 °C/45 °C
- Outdoor air temperature = 7 °C

This value is applicable for most air conditioning applications (unit with fan coil units)

Note: For installations running with a low volume of water (unit with air handling unit) or for industrial processes, the buffer tank is essential.

Minimum system water volume and water type heat exchanger flow rate

AQUACIAT LD		150	180	200	240	260	300	360	390	450	520	600
Minimum system water volume, air conditioning application (litres)		121	140	164	182	207	243	181	205	240	204	240
Minimum system water volume, industrial process application (litres)		304	351	410	454	518	608	452	513	601	510	601
Min/max water type heat exchanger flow rate without hydraulic module(1) (l/s)		0.9 / 3	0.9 / 3.4	0.9 / 4.2	0.9 / 5	1 / 5	1.2 / 5.5	1.3 / 6.8	1.5 / 7.7	1.7 / 8.5	2 / 10.6	2.3 / 11.2
Water type heat exchanger maximum flow rate Dual pump (l/s) (2)	Low pressure (3)	2,9	3,2	3,7	4,1	4,1	4,4	5,1	6,3	6,5	7,9	8,2
	High pressure (3)	3,4	3,8	4,4	5	5	5,2	6,2	6,5	8	8,7	8,9

(1) Maximum flow rate for a pressure drop of 100 kPa in the water exchanger
(2) Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure pumps) or 50 kPa (high pressure).
(3) Maximum flow rate with single pump 2 to 4% higher, depending on the size.

NOTE: For the Buffer Tank Module option, the volume of the tank must be taken into account: 250 litres

AQUACIAT ILD		150	180	200	240	260	300	302	360	390	450	520	600
Minimum system water volume, air conditioning application (litres)		202	234	274	303	346	405	405	301	342	400	340	401
Minimum system water volume, industrial process application (litres)		304	351	410	454	518	608	608	452	513	601	510	601
Min/max water type heat exchanger flow rate without hydraulic module(1) (l/s)		0.9 / 3	0.9 / 3.4	0.9 / 4.2	0.9 / 5	1 / 5	1.2 / 5.5	1.2 / 6.8	1.3 / 6.8	1.5 / 7.7	1.7 / 8.5	2 / 10.6	2.3 / 11.2
Water type heat exchanger maximum flow rate Dual pump (l/s) (2)	Low pressure (3)	2,9	3,2	3,7	4,1	4,1	4,4	5,1	5,1	6,3	6,5	7,9	8,2
	High pressure (3)	3,4	3,8	4,4	5	5	5,2	6,2	6,2	6,5	8	8,7	8,9

(1) Maximum flow rate for a pressure drop of 100 kPa in the water exchanger
(2) Maximum flow rate for an available pressure of 20 kPa (unit with low-pressure pumps) or 50 kPa (high pressure).
(3) Maximum flow rate with single pump 2 to 4% higher, depending on the size.

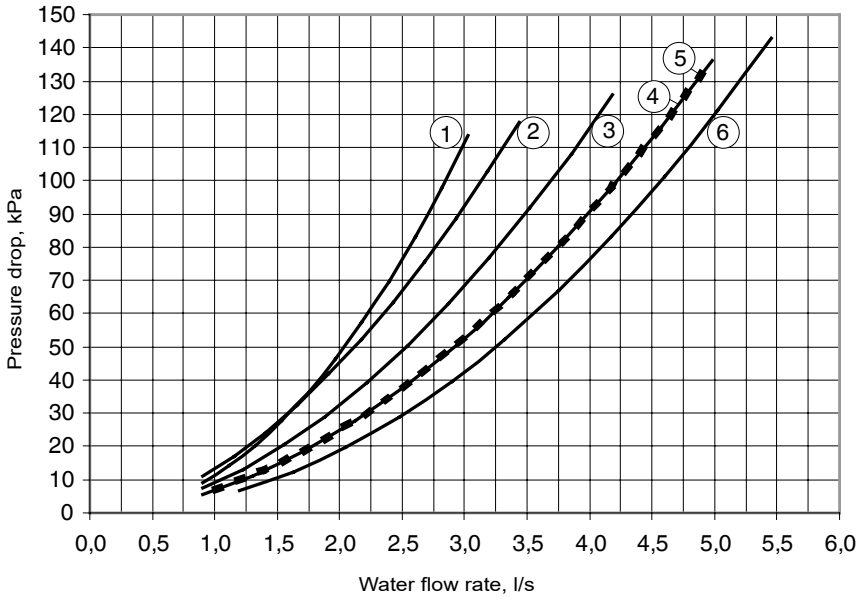
NOTE: For the Buffer Tank Module option, the volume of the tank must be taken into account: 250 litres

HYDRAULIC SPECIFICATIONS

■ Water pressure drop in the evaporator

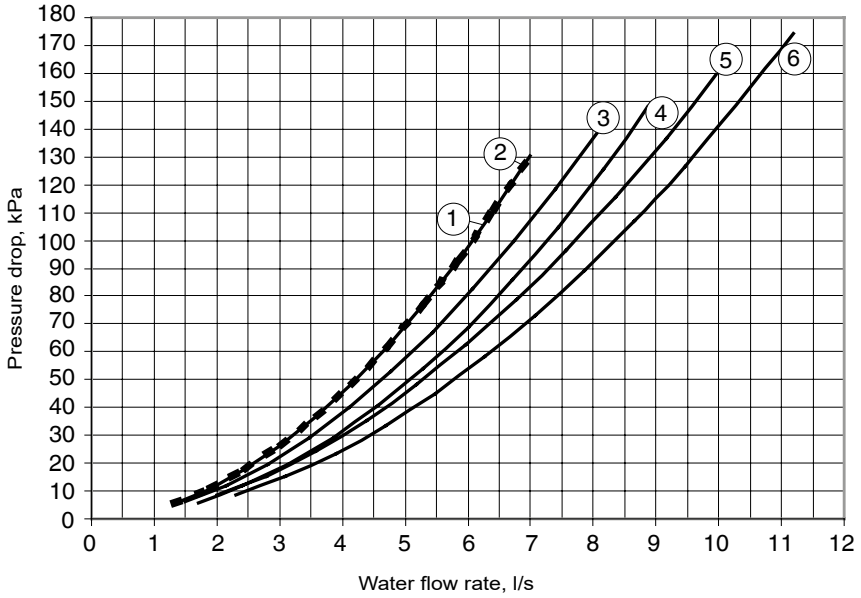
Data applicable for pure water at 20°C

LD/ILD sizes 150-300



B	LD/ILD 150	E	LD/ILD 240
C	LD/ILD 180	F	LD/ILD 260
D	LD/ILD 200	G	LD/ILD 300

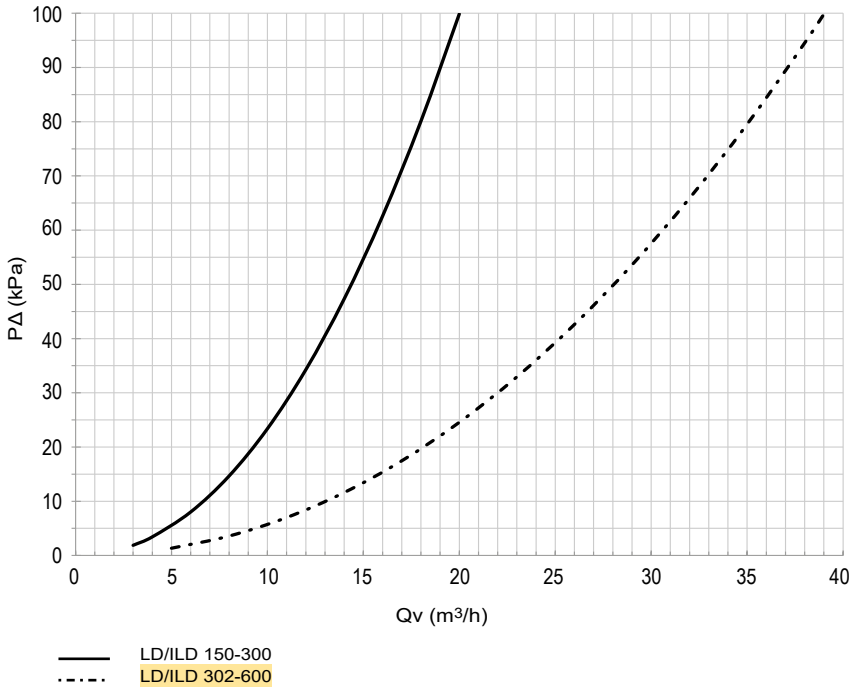
LD/ILD sizes 302-600



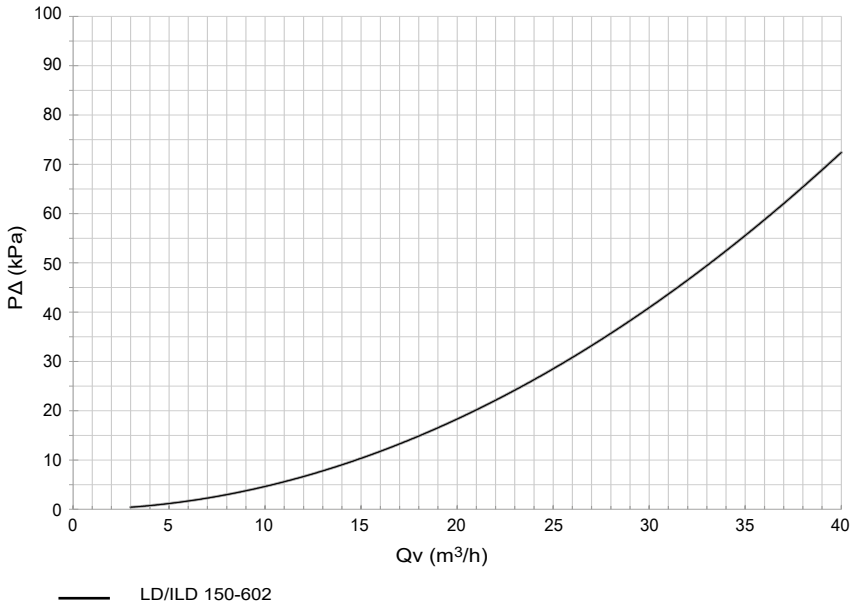
B	ILD 302	E	LD/ILD 450
C	LD/ILD 360	F	LD/ILD 520
D	LD/ILD 390	G	LD/ILD 600

HYDRAULIC SPECIFICATIONS

Water pressure drop in the filter

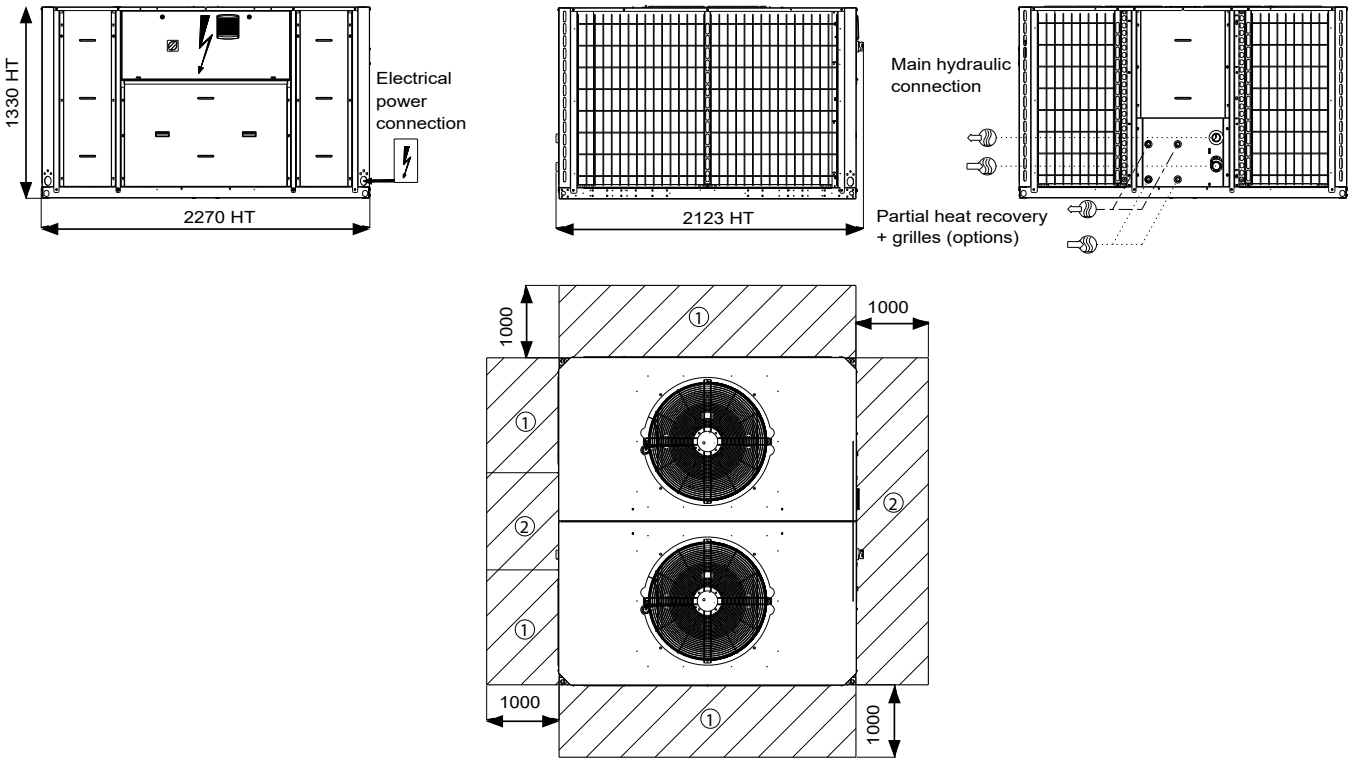


Water pressure drop in the buffer tank



DIMENSIONS

■ AQUACIAT LD-ILD 302 to 600 Without buffer tank



Key
All dimensions in mm

- (1) Clearance required for maintenance and air flow
- (2) Clearance recommended for coil removal
- Water inlet
- Water outlet
- Air outlet, do not obstruct
- Electrical cabinet

NOTES:

Non-contractual drawings.

When designing a system, refer to the certified dimensional drawings provided with the unit or available on request.

Please refer to the certified dimensional drawings for the positioning of the fixing points, weight distribution points and centre of gravity coordinates.