

KAPPA V ECHOS

166÷533 kW

Cod. 102160A02

Water chiller

KAPPA V ECHOS

Reversible heat pump

KAPPA V ECHOS/HP

Water chiller with storage tank
and pumps

KAPPA V ECHOS/ST

Chiller with heat recovery
condenser

KAPPA V ECHOS/DC

Chiller with desuperheaters

KAPPA V ECHOS/DS

Low noise chiller

KAPPA V ECHOS/LN

Super low noise unit

KAPPA V ECHOS/SLN



CE
1370

R407C

Water chiller

Air / Water

Axial fans and Screw
compressors

BLUE BOX
c o n d i z i o n a m e n t o

Technical catalogue

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R407C

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TECHNICAL FEATURES

KAPPA V ECHOS water chiller

Air-cooled water chiller with semi-hermetic screw compressors and brazed plate evaporators.
The features of the standard units are as follows:

UNIT FRAME

Modular self-supporting frame in galvanised sheet steel with 180°C baked-on polyester powder coating (colour RAL 5014) to provide a durable weatherproof finish. Threaded fasteners in stainless steel.
Condensing coils equipped with impact protection in the form of painted steel grilles.

COMPRESSORS

Semi-hermetic single screw compressors with continuous capacity control from 30% to 100%, making it possible to maximize energy efficiency of the unit in all operating conditions. Unit starts and stops are executed with 12% capacity control active.

The compressor is equipped with a crankcase heater, lubrication ensured by the pressure difference between the discharge and suction sides, and independent refrigerant circuits.

The motor features built-in electronic protection with temperature sensors located directly in the windings and on the discharge pipeline.

“Star-delta” motor starting.

CONDENSERS

Composed of coils with finned core manufactured from copper tubes and high efficiency aluminium fins. The layout of the coils makes it possible to reduce the dimensions of the unit and simultaneously increase the air intake surface, leaving ample space for the positioning of the components of the refrigerant and water circuits.

In the presence of two compressors, the condensing sections of the two circuits operate independently.

FANS

Axial fans, with sickle shaped blades and special bell mouth designed to optimise efficiency and reduce noise, directly coupled to a 6 pole three-phase motor with internal Klixon overload protection. Motor protection category is IP 54. The fan is equipped with a safety grille.

EVAPORATOR

Stainless steel 316 AISI brazed plate type for sizes from 16.1 to 53.2, thermally insulated with closed cell expanded material. 32.2, 36.2 and 40.2 dual compressor models are equipped with a dual circuit exchanger with a single hydraulic connection, while 46.2, 48.1 and 53.2 models are equipped with a double exchanger with hydraulic connections and headers (supplied as standard). The use of plate type heat exchangers makes for:

- Improved COP/EER;
- Reduced refrigerant charge in the circuit;
- Reduced unit weight and dimensions;
- Easier maintenance;

Each evaporator is equipped with a freeze protection temperature probe and a pre-installed flow switch for all models.

REFRIGERANT CIRCUIT

The refrigerant circuit includes: compressor delivery shut-off valve, liquid line shut-off valve, charge connections, liquid line sight glass, filter dryer with interchangeable solid cartridge, thermostatic expansion valve with external pressure equalisation, pressure transducers to relay information on high and low pressure values and relative

condensation and evaporation temperatures for display on the controller, high pressure switches and relief valves.
Device to close the liquid line during compressor stoppages

ELECTRICAL PANEL

The electrical panel includes:

- Main switch;
- Fuses to protect control and power circuits;
- Compressor contactors;
- Fan contactors;
- Microprocessor to control the following functions:
 - Water temperature regulation with measurement of outlet water temperature
 - Freeze protection;
 - Compressor time intervals;
 - Compressor start sequence and automatic lead/lag selection;
 - Alarm signalling;
 - Alarm reset;
 - Capacity step control;
 - Common alarm contact for remote signalling;
 - Forcing of capacity step control due to arrival at pressure limit;
 - Storage of alarms historic data;
 - Display presentation of the following information:
 - Inlet and outlet water temperature;
 - Programmed temperature set-point and differentials;
 - Alarm descriptions;
 - Running hours meter and counter for number of starts for compressors and pumps (if installed);
 - High and low pressure values and relative condensation and evaporation temperature values.
 - Electrical power supply [V/f/Hz]: 400/3~/50 ±5%

CONTROLS AND SAFETY DEVICES

- Dual high pressure switch with manual reset for each compressor;
- Limited trip safety high pressure switch with automatic reset managed by controller;
- Limited trip safety low pressure switch with automatic reset managed by controller;
- High pressure relief valve;
- Freeze protection probe at the outlet of each evaporator;
- Chilled water temperature probe (located at outlet to installation);
- Pre-installed mechanical flow switch;
- Compressor and fan overtemperature protection;
- Compressor cooling device with liquid injection.

TESTING

The units are subjected to a dry run in the factory and supplied complete with oil and refrigerant.

VERSIONS

KAPPA V ECHOS/HP: reversible heat pump

In addition to the components featured on KAPPA V ECHOS, this model includes:

4-way reversing valve, suction line separator, liquid receiver, second thermostatic expansion valve.

Enabling of the microprocessor for summer/winter changeover and automatic defrost, with Blue Box patented logic that makes it possible to optimize the operation and duration of the defrost cycles, controlled independently for each compressor.

HYDRAULIC MODULE OPTIONS

KAPPA V ECHOS/ST 2PS: unit with storage tank and pumps

In addition to the components featured on KAPPA V ECHOS, this model includes:

insulated storage tank, run and standby circulating pumps, with automatic changeover by time and in case of faults. Expansion tank, check valves and gate valves.

Version ST is available in a further three configurations:

-ST 1PS: with 1 pump and tank;

-ST 1P: with 1 pump without tank;

-ST 2P: with 2 pumps without tank;

ACCESSORY VERSIONS

KAPPA V ECHOS/DC: unit with heat recovery condenser

In addition to the components of the KAPPA V ECHOS version, this unit includes a recovery condenser on each refrigerant circuit for 100% recovery of condensation heat for the production of hot water, and a liquid receiver. Brazed plate condenser for 16.1 and 32.2 models and shell and tube condenser for the remainder of the range. The controller manages the activation of heat recovery automatically on the basis of the water temperature, and safety deactivation of the recovery condenser due to high pressure conditions.

To maximize the potential of this accessory it is advisable to install it in conjunction with the fan speed regulator.

The accessory is available for all models.

Not available in the HP version.

KAPPA V ECHOS/DS: unit with desuperheaters

In addition to the components of version KAPPA V ECHOS, this unit includes a 20% heat recovery condenser on each refrigerant circuit, installed in series with the condensing coil. Brazed plate condenser for models from 16.1 to 32.2 and for models 36.2, 40.2, 46.2 and 53.2; models 36.1, 38.1, and 48.1 are equipped with shell and tube condenser.

To maximize the potential of this accessory it is advisable to install it in conjunction with the fan speed regulator.

This version is available also in the HP layout. In this case the installation must include the facility to shut off the recovery water circuit during HP mode operation as indicated in the manual.

KAPPA V ECHOS / LN: low noise unit

In addition to the components of the KAPPA V ECHOS version, this unit features a compressor compartment acoustically insulated with sound absorbing matting and an interposed layer of sound-deadening material, plus a fan speed regulator.

KAPPA V ECHOS / SLN: super low noise unit

In addition to the components of the KAPPA V ECHOS/LN version, this unit features increased surface area coils, reduced speed fans driven by 8-pole motors and fan speed regulator.

ACCESSORIES

REFRIGERANT CIRCUIT ACCESSORIES

- Electronic thermostatic valve;
- Condensing pressure control with fan speed regulator for low ambient temperature operation;
- Dual set point (low/high temperature) with single electronic thermostatic valve. The unit's evaporator is sized on the basis of high temperature operation. The set-point can be changed from the keypad or, when specifically requested at the time of the order, via a digital input;
- High and low pressure gauges available for all models (suction and discharge pressures can be read on the controller display also in the standard unit configuration);
- Liquid receivers (standard for versions HP and DC);

- Shut-off cocks on the compressor suction lines;
- Liquid line solenoid valve (standard equipment anyway includes a device that isolates the liquid line causing the thermostatic expansion valve to close during compressor stoppages).
- Kit for low water temperatures.

HYDRAULIC CIRCUIT ACCESSORIES

- Anti-freeze heater on evaporator (for ST version an anti-freeze electric heater is installed also on the tank and on the piping) and on recovery exchangers if present;
- Water side relief valve (ST version only)

ELECTRICAL ACCESSORIES

- RS485 serial interface supporting Carel, Modbus, Echelon and Bacnet protocols; combinable also with Johnson and Trend supervision;
- Power factor correction $\cos\phi \geq 0.9$ at nominal operating conditions; on the unit exterior panel in IP 55 (electrical power supply to be provided by the installer directly from the main power line) (the accessory is combined with voltage-free contacts for operating status)
- Remote user terminal panel (in addition to the standard terminal);
- Set-point modification with remote signal (0-1V, 0-10V, 0-20mA, 4-20mA);
- Voltage-free contacts for unit operating status;
- Management of alarm criticality on three levels;
- SMS service for management of service calls;
- Limitation of current input;

MISCELLANEOUS ACCESSORIES

- Rubber or spring type anti-vibration mounts;
- Copper/copper condensing coil;
- Copper/tinned copper condensing coil;
- Pre-painted aluminium condensing coil;
- Condensing coil with passivation treatment of the aluminium and polyurethane based coating. The treatment is composed of a double coating the first of which is an aluminium passivating primer while the second is a polyurethane-based top coat. The product features excellent corrosion resistance and is able to withstand almost all adverse weather and atmospheric conditions. For installations in coastal environments subject to salt spray, rural or industrial area and cities;
- Hail guard to protect the finned core;
- Timber crate packing;
- Pallet/skid for container shipment;
- Non-standard "RAL" paint colours

TECHNICAL DATA

UNIT SIZE		16.1	20.1	27.1	32.2	36.1	36.2
COOLING (*)							
Nominal capacity	kW	165.6	198.3	266.4	328.3	359.1	358.1
Evaporator water flow	l/h	28434	34085	45762	56388	61680	61523
Basic version pressure drop	kPa	46.9	40.2	40.2	37.3	36.1	30.2
HEATING (**)							
Nominal capacity	kW	172.4	208.7	288.1	345.8	379.5	384.1
Condenser water flow	l/h	29958	36276	50067	60093	65957	66761
Cond. pressure drop	kPa	48.7	42.7	45.1	39.7	38.8	33.4
COMPRESSORS	type	Vite					
Quantity	n	1	1	1	2	1	2
Refrigerant circuits	n	1	1	1	2	1	2
Power consumption in cooling (*)	kW	57.8	74.3	96.1	115.2	119.5	131.4
Absorbed power heating (**)	kW	58.4	71.7	93.9	112.5	115.2	123.7
Capacity steps	%	Continue	Continue	Continue	Continue	Continue	Continue
FANS	type	Axial					
Air flow	m ³ /h	63000	61200	84000	126000	122400	124200
VERSION ST 2PS							
External available pressure	kPa	186	155	189	189	171	177
Tank capacity	l	450	450	585	740	740	740
BASIC UNIT SIZES AND WEIGHTS							
Length	mm	4246	4246	3246	4252	4246	4252
Width	mm	1246	1246	2316	2284	2316	2284
Height	mm	2368	2368	2368	2368	2368	2368
Functional weight	kg	1590	1658	2126	2978	2666	3080

UNIT SIZE		38.1	40.2	46.2	48.1	53.2	
COOLING (*)							
Nominal capacity	kW	374.6	397.6	473.2	503.3	532.5	
Evaporator water flow	l/h	64353	68331	81288	86441	91476	
Basic version pressure drop	kPa	32.2	37.1	44.3	43.4	48.5	
HEATING (**)							
Nominal capacity	kW	413.8	421.6	499.4	517.0	571.1	
Condenser water flow	l/h	71920	73273	52581	89845	99255	
Cond. pressure drop	kPa	37.6	40.1	61.1	36.3	44.3	
COMPRESSORS	type	Vite					
Quantity	n	1	2	2	1	2	
Refrigerant circuits	n	1	2	2	1	2	
Power consumption in cooling (*)	kW	141.4	148.8	166.3	175.1	192.4	
Absorbed power heating (**)	kW	134.6	137.1	165.7	168.6	187.5	
Capacity steps	%	Continue	Continue	Continue	Continue	Continue	
FANS	type	Axial					
Air flow	m ³ /h	122400	122400	169000	168000	168000	
VERSION ST 2PS							
External available pressure	kPa	233	221	211	203	187	
Tank capacity	l	740	740	740	740	740	
BASIC UNIT SIZES AND WEIGHTS							
Length	mm	4246	4252	5752	5746	5752	
Width	mm	2316	2284	2284	2316	2284	
Height	mm	2368	2368	2368	2368	2368	
Functional weight	kg	2858	3182	3818	3472	4084	

(*) ambient air temperature 35 °C; evaporator inlet-outlet temperature 12-7 °C.

(**) ambient air temperature 8 °C DB, 70% RH; condenser water inlet - outlet temperature 40-45 °C

ELECTRICAL DATA

ELECTRIC CHARACTERISTICS		16.1	20.1	27.1	32.2	36.1	36.2	38.1	40.2
Maximum absorbed power (1)	kW	74.9	92.2	120.8	149.8	157.5	167.1	177.9	184.4
		(77.9)	(95.2)	(126.3)	(155.3)	(163)	(172.6)	(187.1)	(193.6)
Maximum starting current	A	246	354	398	379	482	487	585	518
		(252.4)	(360.4)	(409.3)	(390.3)	(493.3)	(498.3)	(604)	(537)
Full load current (2)	A	133	164	222	266	286	297	321	328
		(139.4)	(170.4)	(233.3)	(277.3)	(297.3)	(308.3)	(340)	(347)
Fan motor nominal power	n x kW	3 x 2	3 x 2	4 x 2	6 x 2	6 x 2	6 x 2	6 x 2	6 x 2
Fan motor nominal absorbed current	n x A	3 x 4	3 x 4	4 x 4	6 x 4	6 x 4	6 x 4	6 x 4	6 x 4
Pump motor nominal power	kW	(1 x 3)	(1 x 3)	(1 x 5.5)	(1 x 5.5)	(1 x 5.5)	(1 x 5.5)	(1 x 9.2)	(1 x 9.2)
Pump motor nominal current	A	(1 x 6.37)	(1 x 6.37)	(1 x 11.3)	(1 x 11.3)	(1 x 11.3)	(1 x 11.3)	(1 x 19)	(1 x 19)
Power supply	V/f/Hz	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%
Control power supply	V/f/Hz	230/~ /50	230/~ /50	230/~ /50	230/~ /50	230/~ /50	230/~ /50	230/~ /50	230/~ /50

ELECTRIC CHARACTERISTICS		46.2	48.1	53.2					
Maximum absorbed power (1)	kW	215.0	226.0	241.6					
		(224.2)	(235.2)	(250.8)					
Maximum starting current	A	566	676	620					
		(585)	(695)	(639)					
Full load current (2)	A	390	404	444					
		(409)	(423)	(463)					
Fan motor nominal power	n x kW	8 x 2	8 x 2	8 x 2					
Fan motor nominal absorbed current	n x A	8 x 4	8 x 4	8 x 4					
Pump motor nominal power	kW	(1 x 9.2)	(1 x 9.2)	(1 x 9.2)					
Pump motor nominal current	A	(1 x 19)	(1 x 19)	(1 x 19)					
Power supply	V/f/Hz	400/3~/50 ±5%	400/3~/50 ±5%	400/3~/50 ±5%					
Control power supply	V/f/Hz	230/~ /50	230/~ /50	230/~ /50					

(1) mains power supply to allow unit operation

(2) maximum current before safety cut-outs stop the unit. This value is never exceeded and must be used to size the electrical supply cables and relevant safety devices (refer to electrical wiring diagram supplied with the unit).

Values in brackets refer to ST version units (units with storage tank and pumps or units with exclusively pumps)

COOLING CAPACITY



MODEL	T0	Ambient air temperature [°C]									
		27		32		35		40		43	
	[°C]	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
16.1	4	167.8	47.7	158.6	53.0	152.9	56.4	142.6	62.4	136.3	66.2
	6	176.4	48.8	167.0	54.0	161.3	57.3	151.0	63.1	-	-
	7	180.4	49.3	171.4	54.5	165.6	57.8	155.2	63.5	-	-
	8	184.8	49.8	175.7	55.0	169.8	58.3	159.4	64.0	-	-
	9	188.8	50.3	179.7	55.5	174.0	58.8	163.6	64.5	-	-
	10	193.1	50.8	183.9	56.0	178.0	59.3	167.8	65.1	-	-
20.1	4	202.9	62.8	191.1	68.6	183.3	72.3	169.2	78.6	159.9	82.5
	6	212.8	64.4	201.1	70.1	193.3	73.6	179.0	79.7	-	-
	7	217.5	65.1	206.1	70.8	198.3	74.3	184.1	80.3	-	-
	8	222.4	65.9	211.1	71.6	203.4	75.0	189.1	81.0	-	-
	9	227.4	66.7	216.1	72.3	208.4	75.8	194.1	81.7	-	-
	10	232.3	67.4	220.8	73.0	213.3	76.6	199.1	82.6	-	-
27.1	4	271.3	80.3	256.4	88.5	247.4	93.8	231.5	103.0	221.3	108.6
	6	284.1	82.2	269.3	90.2	260.1	95.3	244.1	104.1	-	-
	7	289.9	83.0	275.6	91.1	266.4	96.1	250.1	104.8	-	-
	8	295.8	83.8	281.9	91.9	272.7	96.9	256.5	105.5	-	-
	9	302.0	84.7	288.2	92.7	279.0	97.7	262.8	106.3	-	-
	10	308.2	85.5	294.3	93.6	285.2	98.6	269.1	107.2	-	-
32.2	4	332.8	95.0	315.4	105.7	304.5	112.6	284.5	124.8	272.2	132.4
	6	349.0	97.0	331.1	107.6	320.7	114.4	300.8	126.1	-	-
	7	357.0	98.0	339.5	108.6	328.3	115.2	308.9	126.9	-	-
	8	364.9	99.0	347.5	109.5	336.4	116.2	316.9	127.7	-	-
	9	372.9	100.0	355.5	110.5	344.4	117.1	324.9	128.7	-	-
	10	380.6	101.0	363.5	111.5	352.4	118.1	332.6	129.7	-	-
36.1	4	359.5	100.0	343.2	109.8	333.6	116.3	315.2	127.5	303.3	134.6
	6	376.7	102.5	360.4	112.1	350.5	118.4	332.6	129.3	-	-
	7	385.1	103.7	369.0	113.3	359.1	119.5	340.8	130.2	-	-
	8	393.5	104.9	377.4	114.4	367.7	120.6	349.5	131.2	-	-
	9	401.1	105.9	386.2	115.6	376.2	121.7	358.1	132.2	-	-
	10	409.3	107.1	394.6	116.8	384.6	122.8	366.6	133.4	-	-
36.2	4	364.4	109.6	345.3	121.0	332.6	128.3	309.2	140.9	294.3	148.7
	6	381.5	112.1	362.2	123.3	349.9	130.4	326.7	142.5	-	-
	7	390.0	113.3	370.8	124.5	358.1	131.4	335.5	143.5	-	-
	8	398.4	114.5	379.3	125.6	366.7	132.5	344.1	144.5	-	-
	9	406.7	115.7	387.8	126.8	375.3	133.7	352.3	145.5	-	-
	10	414.1	116.8	396.2	127.9	383.7	134.8	360.9	146.8	-	-
38.1	4	379.0	117.2	359.8	130.1	348.6	138.4	326.8	152.7	312.7	161.5
	6	396.3	119.5	377.8	132.3	365.8	140.4	344.7	154.2	-	-
	7	404.9	120.7	386.5	133.4	374.6	141.4	353.1	154.9	-	-
	8	412.4	121.7	395.1	134.5	383.3	142.4	362.0	155.8	-	-
	9	420.9	122.8	403.6	135.6	391.9	143.4	370.8	156.7	-	-
	10	429.1	123.9	412.0	136.6	400.5	144.4	379.5	157.8	-	-
40.2	4	406.6	125.7	383.4	137.4	367.9	144.8	340.0	157.4	321.7	165.1
	6	425.5	128.7	403.1	140.3	387.7	147.4	359.9	159.6	-	-
	7	435.2	130.3	412.9	141.7	397.6	148.8	369.4	160.8	-	-
	8	444.8	131.8	422.1	143.1	407.4	150.2	379.3	162.1	-	-
	9	454.3	133.3	431.8	144.6	416.6	151.5	389.2	163.6	-	-
	10	463.7	134.7	441.5	146.1	426.3	153.1	399.0	165.4	-	-

kWf : cooling capacity [kW]

kWe : compressors power input [kW]

T0 : evaporator water outlet temperature [°C]

COOLING CAPACITY



MODEL	T0 [°C]	Ambient air temperature [°C]									
		27		32		35		40		43	
		kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe	kWf	kWe
46.2	4	480.9	139.6	455.0	153.2	438.7	162.0	409.5	177.3	390.4	186.7
	6	503.5	142.8	477.8	156.3	461.7	164.9	432.3	179.6	-	-
	7	514.9	144.5	489.7	157.9	473.2	166.3	443.6	180.8	-	-
	8	525.7	146.0	500.8	159.4	484.7	167.8	455.1	182.1	-	-
	9	537.5	147.7	512.2	160.9	496.1	169.3	466.6	183.6	-	-
	10	547.8	149.1	523.0	162.4	507.2	170.8	478.1	185.3	-	-
48.1	4	505.1	147.7	480.0	161.0	464.3	169.5	436.1	184.4	418.8	193.7
	6	531.6	151.9	505.8	164.9	490.7	173.3	462.5	187.6	-	-
	7	544.8	154.0	519.0	166.9	503.3	175.1	475.8	189.3	-	-
	8	557.9	156.1	532.1	168.9	516.6	177.1	489.0	191.2	-	-
	9	571.4	158.2	545.8	171.0	529.8	179.1	501.6	193.1	-	-
	10	583.5	160.1	558.9	173.1	543.0	181.2	514.9	195.4	-	-
53.2	4	542.2	160.9	512.6	177.2	494.7	187.7	463.0	206.0	442.6	217.3
	6	567.6	164.6	538.3	180.6	519.9	190.8	488.1	208.3	-	-
	7	579.2	166.2	550.9	182.3	532.5	192.4	500.1	209.6	-	-
	8	591.1	167.9	563.4	184.0	545.1	194.0	512.7	211.1	-	-
	9	603.5	169.7	575.9	185.7	557.6	195.6	525.3	212.7	-	-
	10	615.7	171.4	588.2	187.4	570.1	197.4	537.9	214.6	-	-

kWf : cooling capacity [kW]

kWe : compressors power input [kW]

T0 : evaporator water outlet temperature [°C]

HEATING CAPACITY

MODEL	Ta	RH	Condenser water inlet / outlet temperature [°C]							
	[°C]	%	30 / 35		35 / 40		40 / 45		42 / 47	
			kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
16.1	-5	90	129.1	43.9	128.1	48.8	-	-	-	-
	0	90	147.6	44.2	145.9	49.9	145.3	56.7	-	-
	5	80	165.9	45.0	164.1	51.0	162.9	58.0	162.4	61.1
	8	70	176.2	45.6	174.1	51.6	172.4	58.4	171.7	61.5
	10	70	185.6	46.2	183.0	52.0	180.6	58.7	179.7	61.6
	15	70	210.8	47.7	207.3	53.2	203.5	59.3	201.9	61.8
20.1	-5	90	160.5	54.7	157.0	60.0	-	-	-	-
	0	90	182.8	55.2	179.2	61.5	174.9	69.0	-	-
	5	80	205.1	56.6	201.2	63.2	196.8	70.9	194.9	74.3
	8	70	217.8	57.6	213.6	64.2	208.7	71.7	206.5	75.0
	10	70	229.6	58.6	224.8	65.0	219.2	72.3	216.8	75.4
	15	70	261.6	61.3	255.8	67.3	248.7	73.7	245.5	76.4
27.1	-5	90	222.3	72.3	219.4	79.5	-	-	-	-
	0	90	251.9	72.5	247.7	80.9	245.0	90.9	-	-
	5	80	281.2	74.0	276.6	82.7	272.9	93.0	271.6	97.6
	8	70	297.9	75.1	292.6	83.8	288.1	93.9	286.3	98.3
	10	70	313.3	76.1	307.2	84.7	301.6	94.5	299.5	98.7
	15	70	356.2	79.2	348.1	87.2	339.9	96.0	336.6	99.6
32.2	-5	90	258.7	85.6	256.7	95.3	-	-	-	-
	0	90	295.7	85.6	292.2	96.6	290.8	109.6	-	-
	5	80	332.9	86.9	329.2	98.3	326.4	111.8	325.5	117.8
	8	70	353.9	87.9	349.5	99.3	345.8	112.5	344.4	118.4
	10	70	372.9	88.9	367.6	100.1	362.7	113.1	360.9	118.7
	15	70	424.1	91.8	417.1	102.4	409.7	114.2	406.6	119.2
36.1	-5	90	283.3	86.7	281.0	96.1	-	-	-	-
	0	90	324.4	88.4	320.2	98.9	317.7	111.2	-	-
	5	80	366.2	91.0	361.5	101.6	357.4	114.1	356.0	119.5
	8	70	390.2	92.7	384.6	103.1	379.5	115.2	377.5	120.5
	10	70	411.9	94.4	405.3	104.5	399.2	116.1	396.7	121.2
	15	70	472.7	99.0	463.8	108.3	454.6	118.7	450.9	123.1
36.2	-5	90	290.8	95.2	286.8	105.3	-	-	-	-
	0	90	332.1	95.3	327.2	106.7	321.7	120.1	-	-
	5	80	373.4	97.0	367.7	108.7	362.1	122.6	359.8	128.8
	8	70	397.1	98.3	390.6	109.9	384.1	123.7	381.4	129.7
	10	70	418.6	99.7	411.3	111.1	403.7	124.5	400.4	130.3
	15	70	477.0	103.6	468.1	114.4	458.1	126.6	453.6	131.7
38.1	-5	90	310.5	104.5	307.3	115.5	-	-	-	-
	0	90	355.4	104.2	351.2	116.7	347.4	131.2	-	-
	5	80	399.4	105.7	394.5	118.5	390.4	133.6	388.9	140.3
	8	70	424.3	106.8	418.8	119.7	413.8	134.6	411.9	141.1
	10	70	447.2	108.1	440.7	120.7	434.5	135.3	432.0	141.6
	15	70	509.4	111.6	501.1	123.7	492.2	137.0	488.4	142.6
40.2	-5	90	323.1	106.0	316.4	116.6	-	-	-	-
	0	90	367.7	106.3	361.4	118.4	352.6	132.5	-	-
	5	80	413.1	108.7	405.5	121.0	397.1	135.7	393.4	142.2
	8	70	439.7	110.5	430.8	122.6	421.6	137.1	417.5	143.4
	10	70	463.0	112.2	453.8	124.2	443.4	138.2	438.7	144.3
	15	70	528.2	117.3	517.4	128.6	504.6	141.2	498.5	146.5

kWt : heating capacity [kW]

kWe : compressors power input [kW]

Ta : evaporator inlet air temperature dry bulb [°C]

RH : evaporator inlet air relative humidity [%]

HEATING CAPACITY

MODEL	Ta	RH	Condenser water inlet / outlet temperature [°C]							
	[°C]	%	30 / 35		35 / 40		40 / 45		42 / 47	
			kWt	kWe	kWt	kWe	kWt	kWe	kWt	kWe
46.2	-5	90	384.0	126.9	377.7	139.5	-	-	-	-
	0	90	435.7	127.8	427.9	142.5	421.5	160.0	-	-
	5	80	487.9	130.7	479.7	146.1	471.7	164.1	468.5	172.0
	8	70	518.1	132.8	508.8	148.0	499.4	165.7	495.4	173.3
	10	70	545.1	134.9	534.5	149.8	523.6	166.9	519.0	174.2
	15	70	545.6	134.9	606.4	154.6	591.3	169.7	584.9	176.1
48.1	-5	90	383.8	128.1	379.7	141.4	-	-	-	-
	0	90	439.9	129.7	434.9	144.5	431.3	162.1	-	-
	5	80	498.9	133.7	492.0	148.8	486.4	166.5	484.5	174.4
	8	70	532.4	136.4	524.4	151.3	517.0	168.6	514.2	176.1
	10	70	562.2	139.1	552.8	153.6	544.0	170.2	540.6	177.4
	15	70	645.9	146.8	633.1	160.2	620.1	174.9	614.8	181.0
53.2	-5	90	441.7	144.8	435.4	158.8	-	-	-	-
	0	90	497.5	144.9	491.7	161.7	485.7	181.3	-	-
	5	80	554.8	147.5	547.0	165.1	540.8	185.8	538.8	194.9
	8	70	588.2	149.7	578.7	167.2	571.1	187.5	568.3	196.5
	10	70	617.8	151.7	607.2	168.9	597.7	188.8	594.0	197.3
	15	70	699.8	157.5	686.3	173.8	672.2	191.6	666.4	199.1

kWt : heating capacity [kW]

kWe : compressors power input [kW]

Ta : evaporator inlet air temperature dry bulb [°C]

RH : evaporator inlet air relative humidity [%]

TOTAL HEAT RECOVERY CAPACITY

MODEL	T0	Condenser water inlet / outlet temperature [°C]											
	[°C]	30 / 35			35 / 40			40 / 45			45 / 50		
		kWf	kWe	kWr	kWf	kWe	kWr	kWf	kWe	kWr	kWf	kWe	kWr
16.1	4	172.2	47.2	219.4	162.2	52.3	214.4	151.5	57.8	209.3	140.4	63.7	204.0
	7	187.2	48.4	235.5	177.0	53.3	230.3	166.3	58.6	224.9	154.9	64.3	219.2
	10	202.6	49.5	252.1	192.2	54.4	246.6	181.2	59.8	240.9	169.9	65.7	235.5
20.1	4	206.1	57.9	263.9	195.7	63.1	258.8	183.5	69.0	252.5	169.6	75.4	245.0
	7	222.1	59.4	281.5	212.2	64.6	276.8	200.2	70.2	270.4	186.6	76.2	262.9
	10	238.1	60.9	299.1	228.2	66.0	294.1	216.3	71.5	287.9	203.6	77.6	281.1
27.1	4	268.4	77.4	345.8	254.4	85.2	339.6	239.5	93.7	333.3	223.5	102.9	326.4
	7	288.4	79.3	367.6	274.5	86.8	361.3	259.7	95.0	354.7	243.3	103.7	347.1
	10	307.5	81.0	388.5	293.7	88.5	382.2	279.8	96.6	376.4	263.6	105.3	368.9
32.2	4	326.4	93.0	419.4	309.5	103.5	413.1	290.8	115.0	405.8	271.3	127.2	398.5
	7	351.8	95.0	446.8	334.7	105.2	439.9	316.5	116.2	432.7	296.9	127.8	424.7
	10	375.9	96.9	472.8	359.8	107.0	466.8	342.1	117.8	459.9	322.2	129.4	451.7
36.1	4	343.1	103.7	446.8	327.2	113.7	440.9	309.5	124.7	434.3	289.7	136.6	426.3
	7	369.3	106.6	475.9	353.4	116.3	469.8	335.6	126.8	462.4	316.0	138.1	454.1
	10	393.8	109.5	503.3	379.2	119.2	498.4	361.7	129.5	491.2	341.9	140.7	482.6
36.2	4	367.9	101.1	469.0	350.5	111.4	461.8	331.0	122.9	453.9	308.1	135.3	443.4
	7	395.4	103.4	498.7	378.4	113.4	491.8	358.9	124.5	483.3	336.9	136.3	473.2
	10	421.2	105.4	526.6	404.7	115.3	520.0	386.6	126.2	512.8	365.7	137.9	503.6
38.1	4	362.0	121.4	483.3	343.6	134.5	478.1	322.4	148.5	470.9	298.9	163.2	462.2
	7	388.4	124.1	512.5	370.1	136.8	506.8	349.1	150.1	499.3	326.2	164.1	490.3
	10	413.1	126.7	539.8	396.3	139.2	535.5	375.9	152.4	528.2	352.7	166.4	519.2
40.2	4	390.6	113.6	504.2	372.8	124.7	497.4	351.3	137.0	488.4	327.3	150.4	477.7
	7	417.0	116.2	533.2	400.6	127.1	527.6	380.0	139.0	518.9	356.6	151.6	508.2
	10	443.1	118.7	561.8	426.6	129.4	556.0	406.9	140.9	547.8	385.7	153.3	539.0
46.2	4	475.2	134.8	610.0	450.8	147.8	598.6	423.5	162.3	585.8	393.0	177.8	570.8
	7	511.2	138.2	649.4	487.3	150.9	638.2	460.1	164.7	624.8	430.4	179.4	609.8
	10	546.4	141.4	687.8	522.6	154.0	676.5	497.1	167.6	664.7	467.7	182.2	649.9
48.1	4	459.6	163.6	623.1	432.9	178.0	610.8	403.9	193.4	597.3	371.9	209.8	581.7
	7	497.8	169.5	667.3	471.0	183.3	654.4	441.2	197.9	639.2	409.2	213.5	622.7
	10	536.0	175.8	711.8	508.4	189.7	698.1	478.8	205.0	683.8	445.5	222.0	667.5
53.2	4	536.8	154.8	691.6	508.8	170.4	679.2	479.1	187.5	666.6	446.9	205.9	652.8
	7	576.7	158.5	735.2	548.9	173.7	722.6	519.4	190.1	709.5	486.7	207.4	694.1
	10	615.0	162.0	776.9	587.5	177.0	764.4	559.6	193.2	752.8	527.2	210.5	737.8

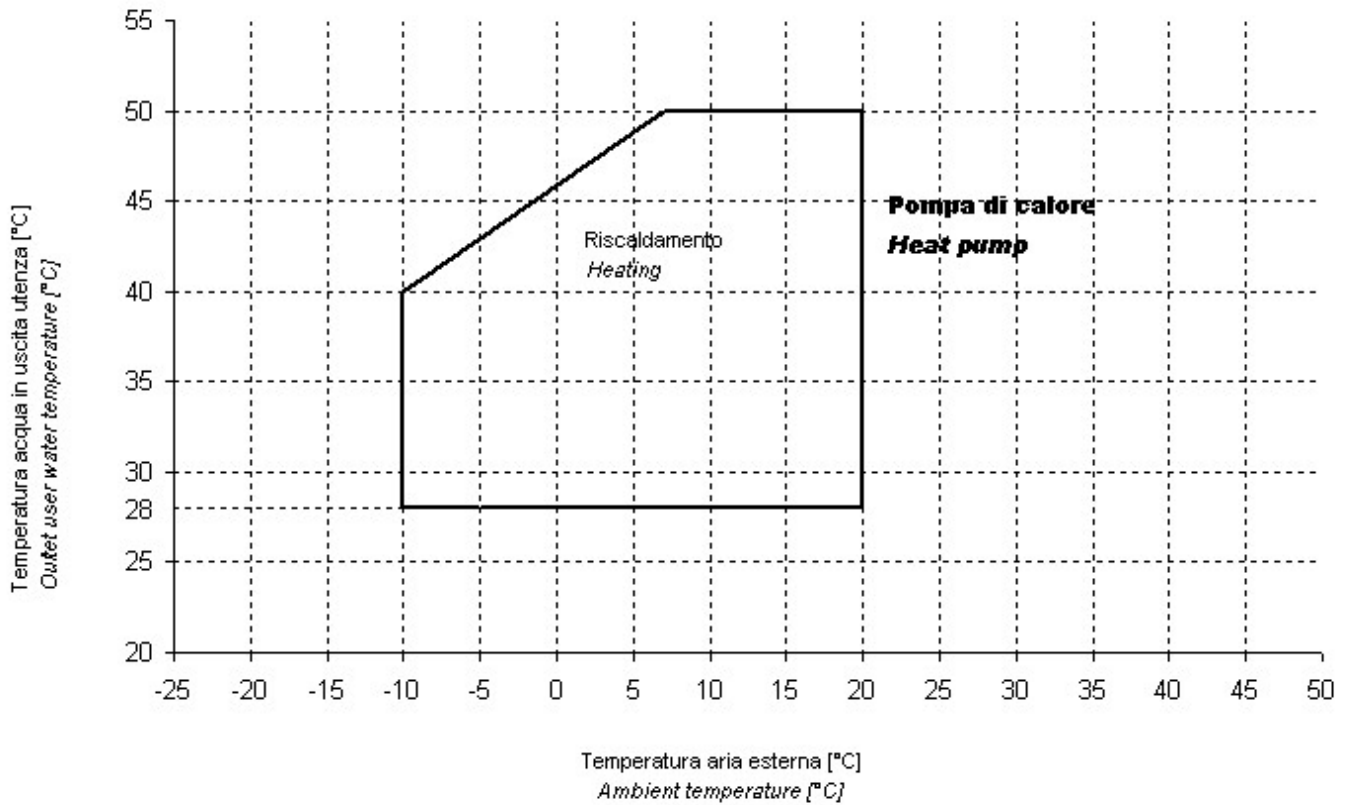
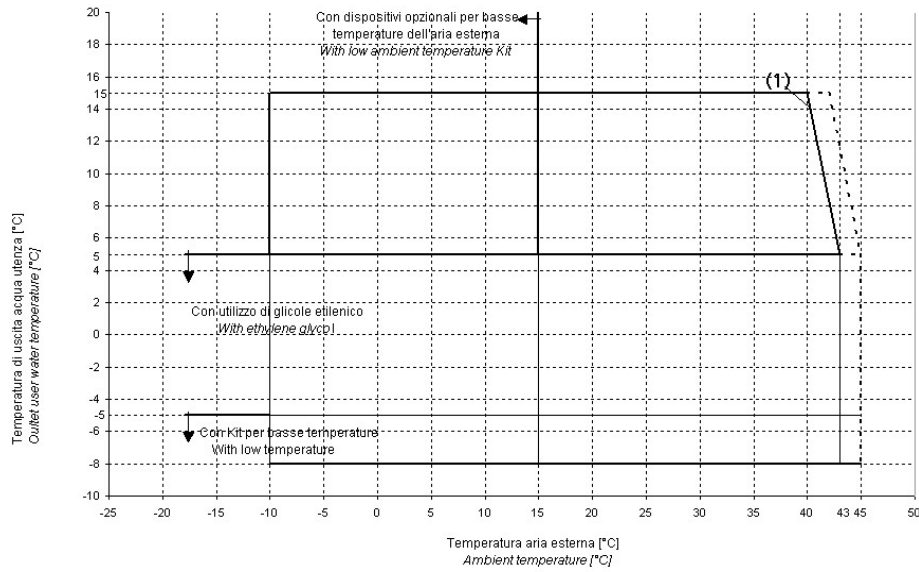
kWf : cooling capacity [kW]

kWe : compressors power input [kW]

kWr : total recovery heating capacity [kW]

T0 : evaporator water outlet temperature [°C]

OPERATING LIMITS

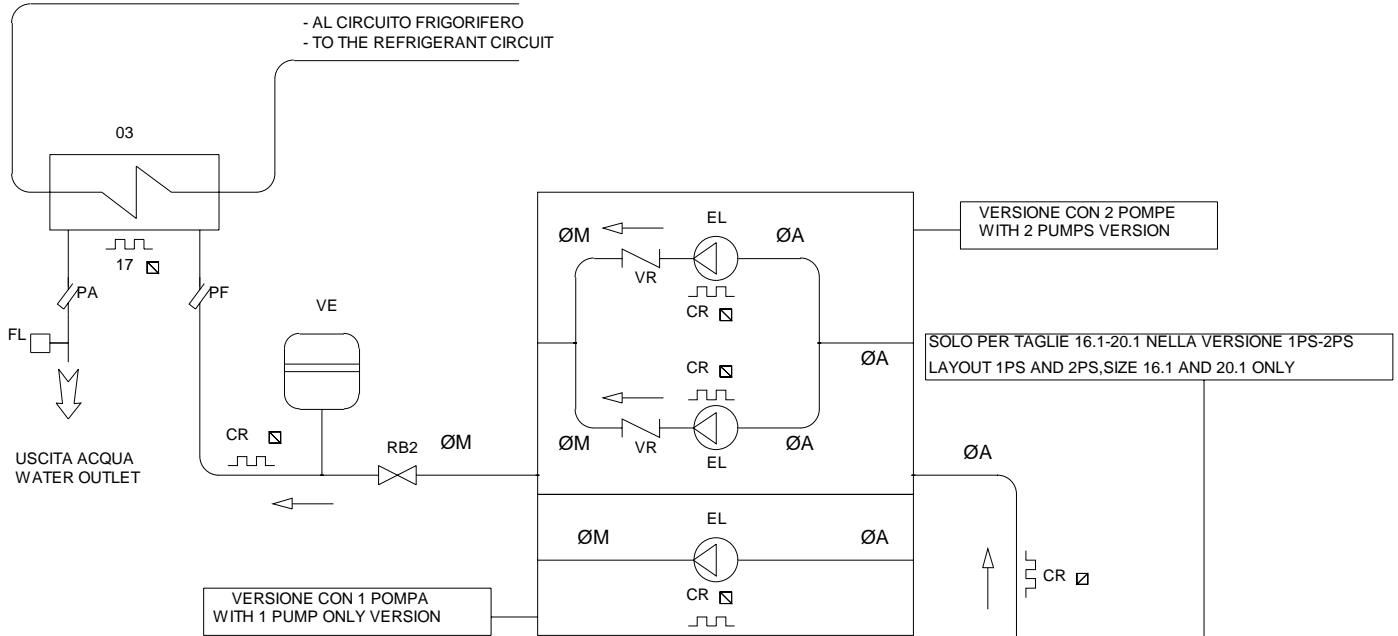


- (1) Limite di funzionamento con parzializzazione forzata
- (1) Working limit in case of forced capacity control

Thermal difference for all versions min 4 °C; max 7 °C

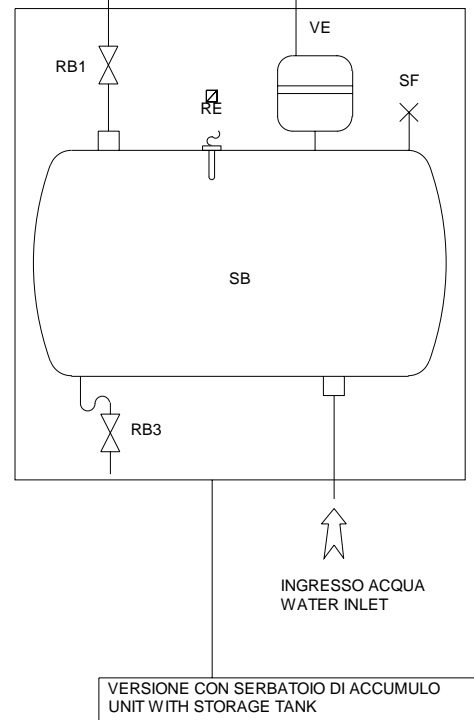
HYDRAULIC CIRCUIT DIAGRAM FOR ST VERSION

R407C



SOLO PER TAGLIE 16.1-20.1 NELLA VERSIONE 1PS-2PS
LAYOUT 1PS AND 2PS, SIZE 16.1 AND 20.1 ONLY

POS.	DESCRIZIONE	DESCRIPTION
03	EVAPORATORE	EVAPORATOR
17	RESISTENZA ELETTRICA	ELECTRIC HEATER
CR	CAVO RISCALDANTE	HEATING ELETTRIC CABLE
EL	ELETTROPOMPA	ELETRIC PUMP
FL	FLUSSOSTATO	FLOW SWITCH
PA	POZZETTO PER Sonda ANTIGELO	LOW WATER TEMPERATURE PROBE POCKET
PF	POZZETTO PER Sonda INGRESSO ACQUA	INLET PROBE POCKET
RB1	RUBINETTO	SHUT-OFF VALVE
RB2	RUBINETTO	SHUT-OFF VALVE
RB3	RUBINETTO	SHUT-OFF VALVE
RE	RESISTENZA ELETTRICA SERBATOIO	TANK ELECTRIC HEATER
SB	SERBATOIO DI ACCUMULO	STORAGE TANK
SF	VALVOLA DI SFIATO	BLEED VALVE
VE	VASO DI ESPANSIONE	EXPANSION VESSEL
VR	VALVOLA DI RITEGNO	CHECK VALVE



KAPPA V ECHOS			
MOD.	ØA	ØM 2P	ØM 1P
16.1	2"1/2	3	3
20.1	2"1/2	3	3
27.1	2"1/2	3	3
32.2	4	4	4
36.2	4	4	4
38.1	4	4	4
40.2	4	4	4
46.2	4	5	5
48.1	4	5	5
53.2	4	5	5

☐ OPZIONALE-OPTIONAL

FOULING FACTOR CORRECTIONS

FOULING FACTORS (M ² °C/W)	Evaporator		Recovery Condenser	
	f1	fp1	f2	fp2
0 Clean Exchanger	1	1	1	1
0,44 x 10 ⁽⁻⁴⁾	0,98	0,99	0,99	1,03
0,88 x 10 ⁽⁻⁴⁾	0,96	0,99	0,98	1,04
1,76 x 10 ⁽⁻⁴⁾	0,93	0,98	0,95	1,06

f1-f2: capacity correction factors

fp1-fp2: compressor power input correction factor

Unit performances reported in the tables are given for the condition of clean exchanger (fouling factor = 1), For different fouling factor values, unit performances should be corrected with the correction factors shown above.

SOUND LEVELS



STANDARD UNIT

MODEL	Octave bands (Hz)																Total	
	63 [db]		125 [db]		250 [db]		500 [db]		1000 [db]		2000 [db]		4000 [db]		8000 [db]		[db (A)]	
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
16.1	88.0	69.0	86.0	67.0	91.0	72.0	90.0	71.0	90.0	71.0	85.0	66.0	79.0	60.0	72.0	53.0	93.0	74.0
20.1	88.0	69.0	86.0	67.0	91.0	72.0	90.0	71.0	90.0	71.0	85.0	66.0	79.0	60.0	72.0	53.0	93.0	74.0
27.1	86.0	67.0	90.0	71.0	91.0	72.0	88.0	69.0	92.0	73.0	88.0	69.0	82.0	63.0	73.0	54.0	95.0	76.0
32.2	91.0	71.0	89.0	69.0	94.0	74.0	93.0	73.0	93.0	73.0	88.0	68.0	82.0	62.0	75.0	55.0	96.0	76.0
36.1	91.0	71.0	89.0	69.0	94.0	74.0	93.0	73.0	93.0	73.0	88.0	68.0	82.0	62.0	75.0	55.0	96.0	76.0
36.2	91.0	71.0	89.0	69.0	94.0	74.0	93.0	73.0	93.0	73.0	88.0	68.0	82.0	62.0	75.0	55.0	96.0	76.0
38.1	91.0	71.0	89.0	69.0	94.0	74.0	93.0	73.0	93.0	73.0	88.0	68.0	82.0	62.0	75.0	55.0	96.0	76.0
40.2	91.0	71.0	89.0	69.0	94.0	74.0	93.0	73.0	93.0	73.0	88.0	68.0	82.0	62.0	75.0	55.0	96.0	76.0
46.2	89.0	69.0	93.0	73.0	94.0	74.0	91.0	71.0	95.0	75.0	91.0	71.0	85.0	64.0	76.0	56.0	98.0	78.0
48.1	89.0	69.0	93.0	73.0	94.0	74.0	91.0	71.0	95.0	75.0	91.0	71.0	85.0	64.0	76.0	56.0	98.0	78.0
53.2	89.0	69.0	93.0	73.0	94.0	74.0	91.0	71.0	95.0	75.0	91.0	71.0	85.0	64.0	76.0	56.0	98.0	78.0

Lw: sound power values in free field conditions are calculated in accordance with ISO 3746

Lp: sound pressure values measured at 1 meter from the unit in free field conditions in compliance with ISO 3746.

VALUES OF THEORETICAL NOISE ATTENUATION IN FUNCTION OF FREE FIELD DISTANCE

Distance	(m)	1	2	3	4	5	6	7	8	9	10
Attenuation	(dB)	0	6	9,5	12	14	15,5	17	18	19	20

SOUND LEVELS



LOW-NOISE UNITS

MODEL	Octave bands (Hz)																Total	
	63 [db]		125 [db]		250 [db]		500 [db]		1000 [db]		2000 [db]		4000 [db]		8000 [db]		[db (A)]	
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
16.1	88.0	69.0	80.0	61.0	87.0	68.0	86.0	67.0	87.0	68.0	80.0	61.0	74.0	55.0	68.0	49.0	90.0	71.0
20.1	89.0	70.0	80.0	61.0	88.0	69.0	86.0	67.0	87.0	68.0	81.0	62.0	75.0	55.0	68.0	49.0	90.0	71.0
27.1	84.0	65.0	88.0	69.0	89.0	70.0	87.0	68.0	88.0	69.0	86.0	67.0	78.0	59.0	72.0	53.0	92.0	73.0
32.2	91.0	72.0	83.0	63.0	90.0	71.0	89.0	69.0	90.0	70.0	83.0	64.0	77.0	58.0	71.0	51.0	93.0	73.0
36.1	92.0	72.0	83.0	63.0	91.0	71.0	89.0	69.0	90.0	70.0	84.0	64.0	78.0	58.0	71.0	51.0	93.0	73.0
36.2	92.0	72.0	83.0	63.0	91.0	71.0	89.0	69.0	90.0	70.0	84.0	64.0	78.0	58.0	71.0	51.0	93.0	73.0
38.1	92.0	72.0	83.0	63.0	91.0	71.0	89.0	69.0	90.0	70.0	84.0	64.0	78.0	58.0	71.0	51.0	93.0	73.0
40.2	92.0	72.0	83.0	63.0	91.0	71.0	89.0	70.0	90.0	70.0	84.0	64.0	78.0	58.0	71.0	51.0	93.0	73.0
46.2	87.0	67.0	91.0	71.0	92.0	72.0	90.0	70.0	91.0	70.0	89.0	69.0	81.0	60.0	75.0	54.0	95.0	75.0
48.1	87.0	67.0	91.0	71.0	92.0	72.0	90.0	70.0	91.0	70.0	89.0	69.0	81.0	60.0	75.0	54.0	95.0	75.0
53.2	87.0	67.0	91.0	71.0	92.0	72.0	90.0	70.0	91.0	70.0	89.0	69.0	81.0	60.0	75.0	54.0	95.0	75.0

Lw: sound power values in free field conditions are calculated in accordance with ISO 3746

Lp: sound pressure values measured at 1 meter from the unit in free field conditions in compliance with ISO 3746.

SUPER LOW NOISE UNIT

MODEL	Octave bands (Hz)																Total	
	63 [db]		125 [db]		250 [db]		500 [db]		1000 [db]		2000 [db]		4000 [db]		8000 [db]		[db (A)]	
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp
16.1	89.0	70.0	77.0	58.0	85.0	65.0	85.0	65.0	85.0	66.0	77.0	58.0	71.0	52.0	65.0	46.0	88.0	68.0
20.1	90.0	71.0	77.0	58.0	85.0	66.0	85.0	66.0	85.0	66.0	78.0	59.0	71.0	52.0	95.0	45.0	88.0	69.0
27.1	82.0	63.0	83.0	64.0	84.0	65.0	83.0	64.0	86.0	66.0	85.0	65.0	78.0	59.0	70.0	51.0	90.0	71.0
32.2	92.0	73.0	80.0	60.0	88.0	68.0	88.0	68.0	88.0	68.0	80.0	61.0	74.0	54.0	68.0	48.0	91.0	71.0
36.1	93.0	73.0	80.0	60.0	88.0	68.0	88.0	68.0	88.0	68.0	81.0	61.0	74.0	55.0	68.0	49.0	91.0	71.0
36.2	93.0	73.0	80.0	60.0	88.0	68.0	88.0	68.0	88.0	68.0	81.0	61.0	74.0	55.0	68.0	49.0	91.0	71.0
38.1	93.0	73.0	80.0	60.0	88.0	68.0	88.0	68.0	88.0	68.0	81.0	61.0	74.0	55.0	68.0	49.0	91.0	71.0
40.2	93.0	73.0	80.0	60.0	88.0	68.0	88.0	68.0	88.0	68.0	81.0	61.0	74.0	55.0	68.0	49.0	91.0	71.0
46.2	85.0	64.0	86.0	65.0	87.0	66.0	86.0	65.0	89.0	68.0	88.0	67.0	81.0	60.0	73.0	53.0	93.0	72.0
48.1	85.0	64.0	86.0	65.0	87.0	66.0	86.0	65.0	89.0	68.0	88.0	67.0	81.0	60.0	73.0	53.0	93.0	72.0
53.2	85.0	64.0	86.0	65.0	87.0	66.0	86.0	65.0	89.0	68.0	88.0	67.0	81.0	60.0	73.0	53.0	93.0	72.0

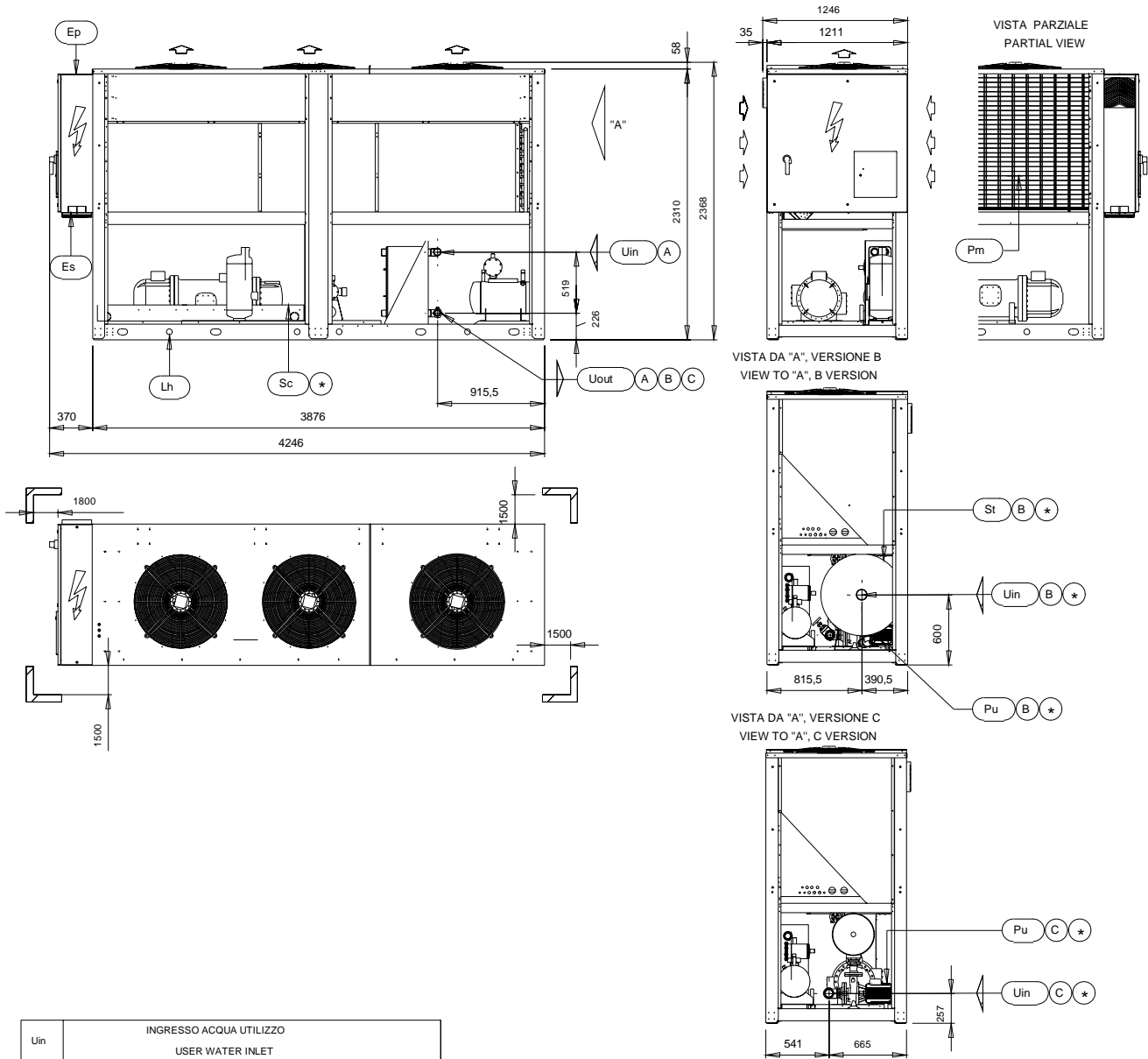
Lw: sound power values in free field conditions are calculated in accordance with ISO 3746

Lp: sound pressure values measured at 1 meter from the unit in free field conditions in compliance with ISO 3746.

OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 16.1

KAPPA V ECHOS/HP; 16.1



Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET

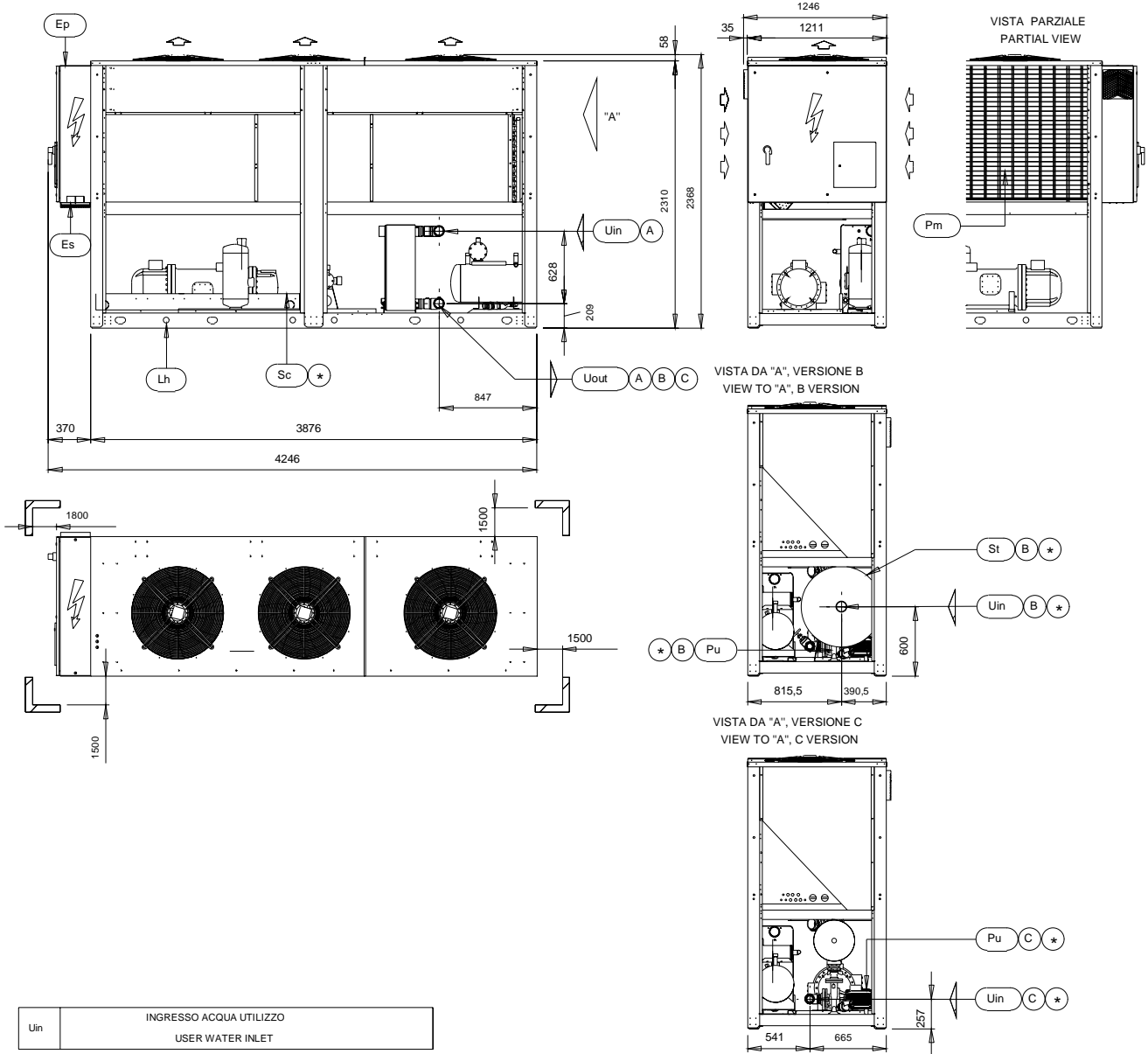
	FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
St	SERBATOIO DI ACCUMULO STORAGE TANK
Pu	POMPA PUMP
	SPAZI DI INSTALLAZIONE CLEARANCES

*	OPTIONAL
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OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 20.1

KAPPA V ECHOS/HP; 20.1



Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET

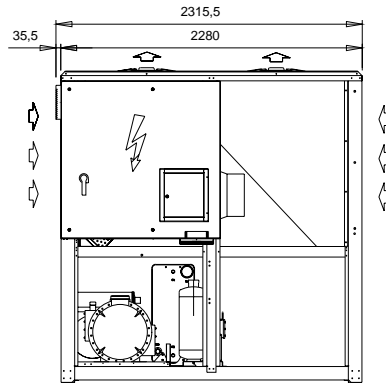
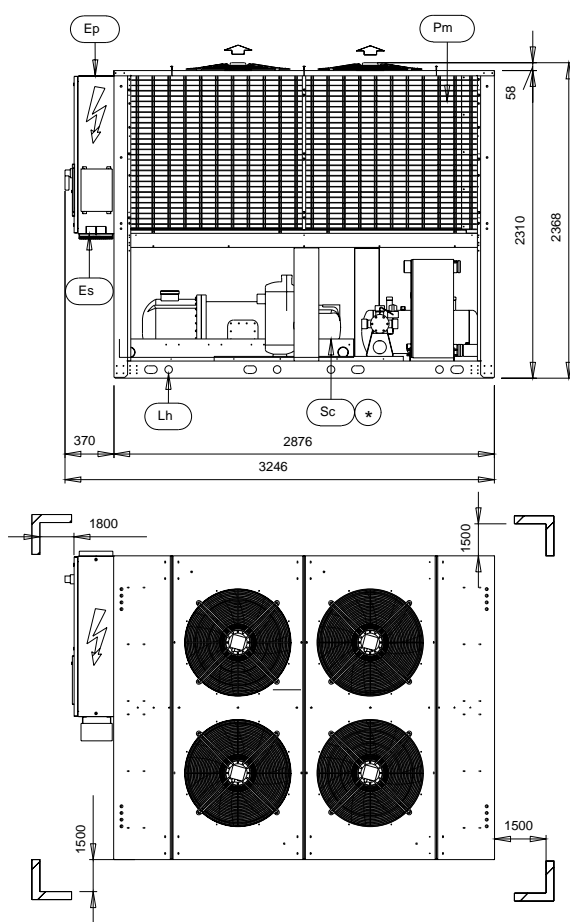
	FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
St	SERBATOIO DI ACCUMULO STORAGE TANK
Pu	POMPA PUMP
	SPAZI DI INSTALLAZIONE CLEARANCES

*	OPTIONAL
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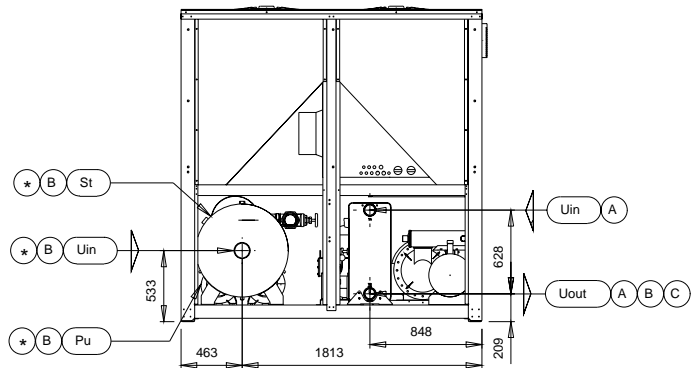
OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 27.1

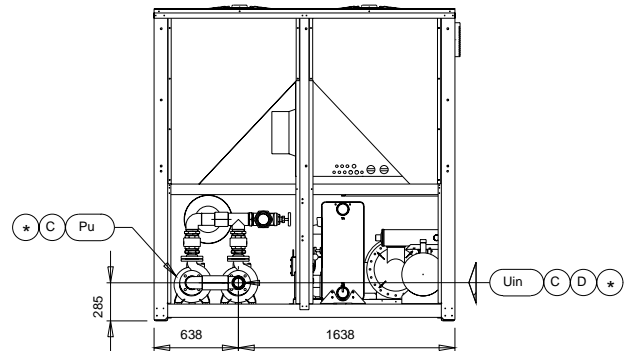
KAPPA V ECHOS/HP; 27.1



VISTA DA "A", VERSIONE B
VIEW TO "A", B VERSION



VISTA DA "A", VERSIONE C
VIEW TO "A", C VERSION



Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET

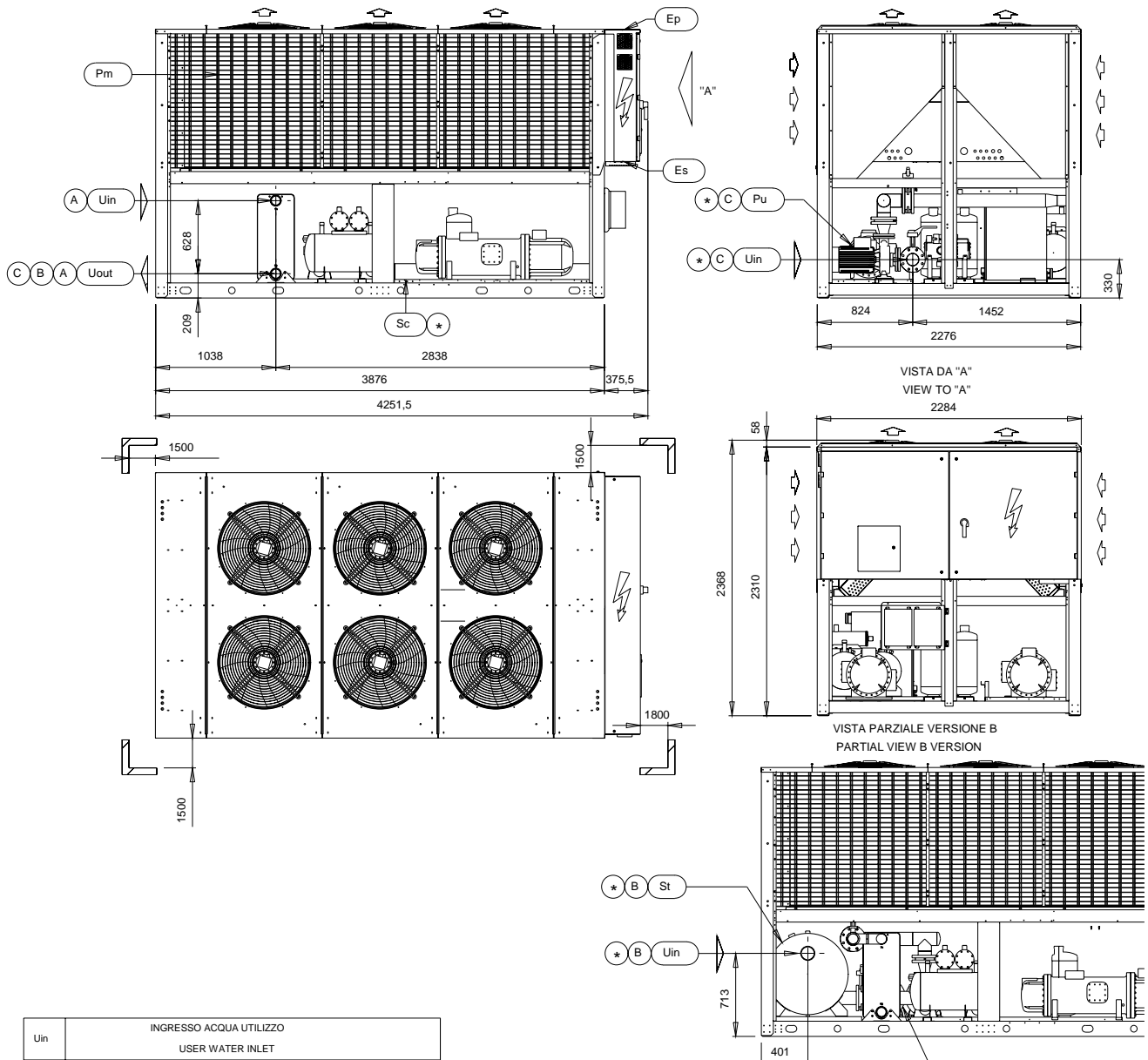
	FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
St	SERBATOIO DI ACCUMULO STORAGE TANK
Pu	POMPA PUMP
	SPAZI DI INSTALLAZIONE CLEARANCES

*	OPTIONAL
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OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 32.2 - 36.2 - 40.2

KAPPA V ECHOS/HP; 32.2 - 36.2 - 40.2

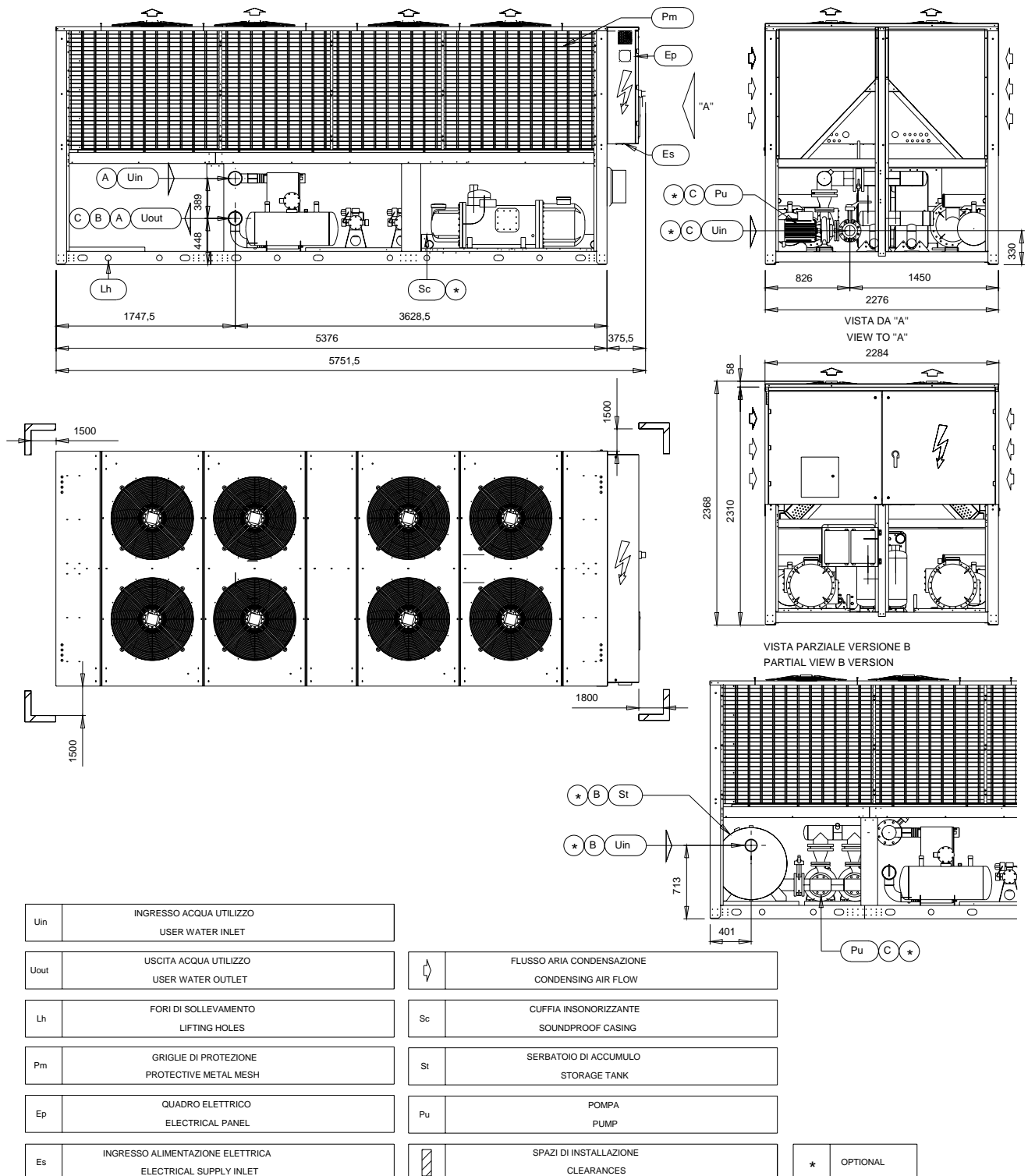


Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET		
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET		FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	St	SERBATOIO DI ACCUMULO STORAGE TANK
Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Pu	POMPA PUMP
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET		SPAZI DI INSTALLAZIONE CLEARANCES
		*	OPTIONAL

OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 46.2 - 53.2

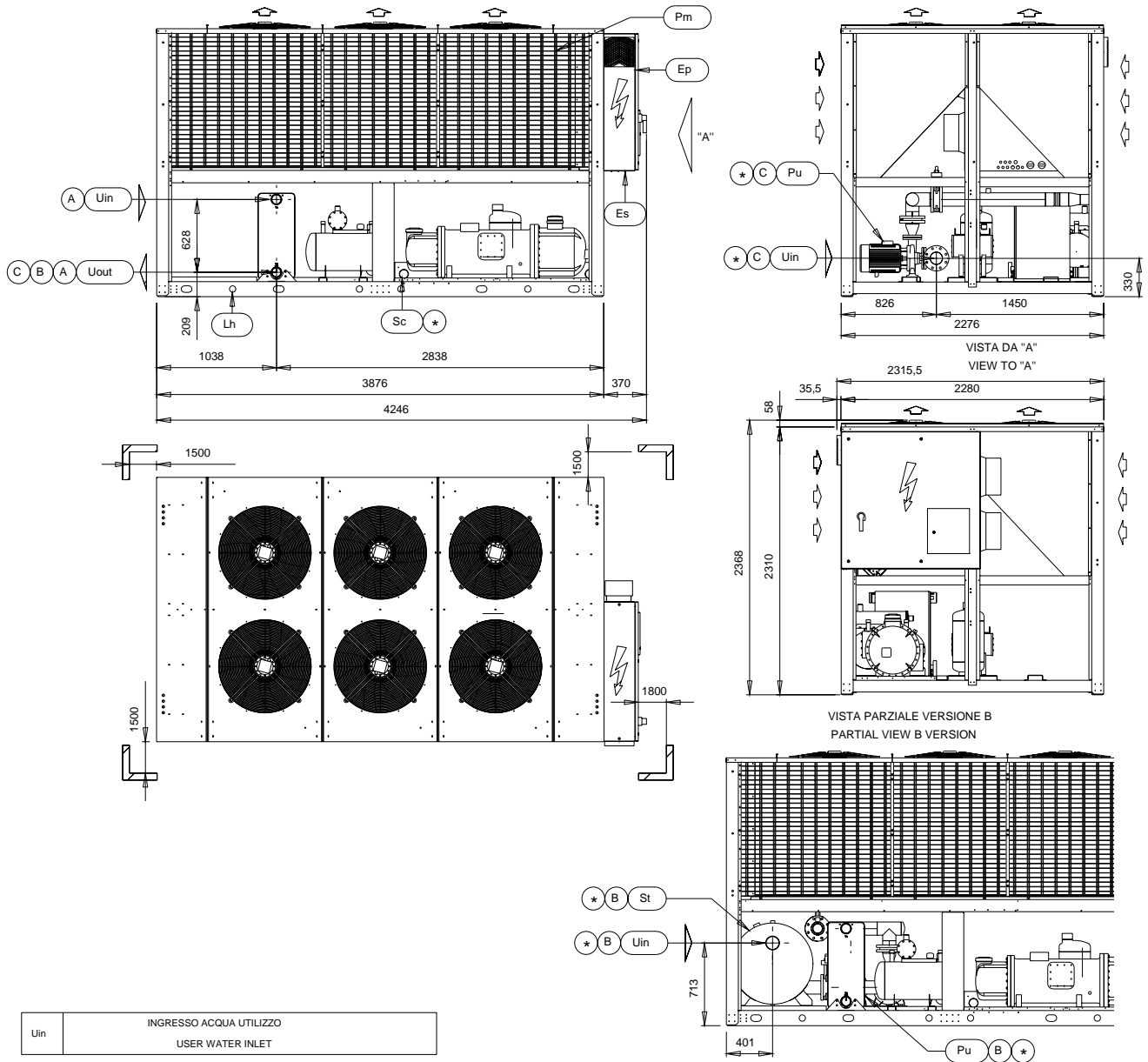
KAPPA V ECHOS/HP; 46.2 - 53.2



OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 36.1 - 38.1

KAPPA V ECHOS/HP; 36.1 - 38.1

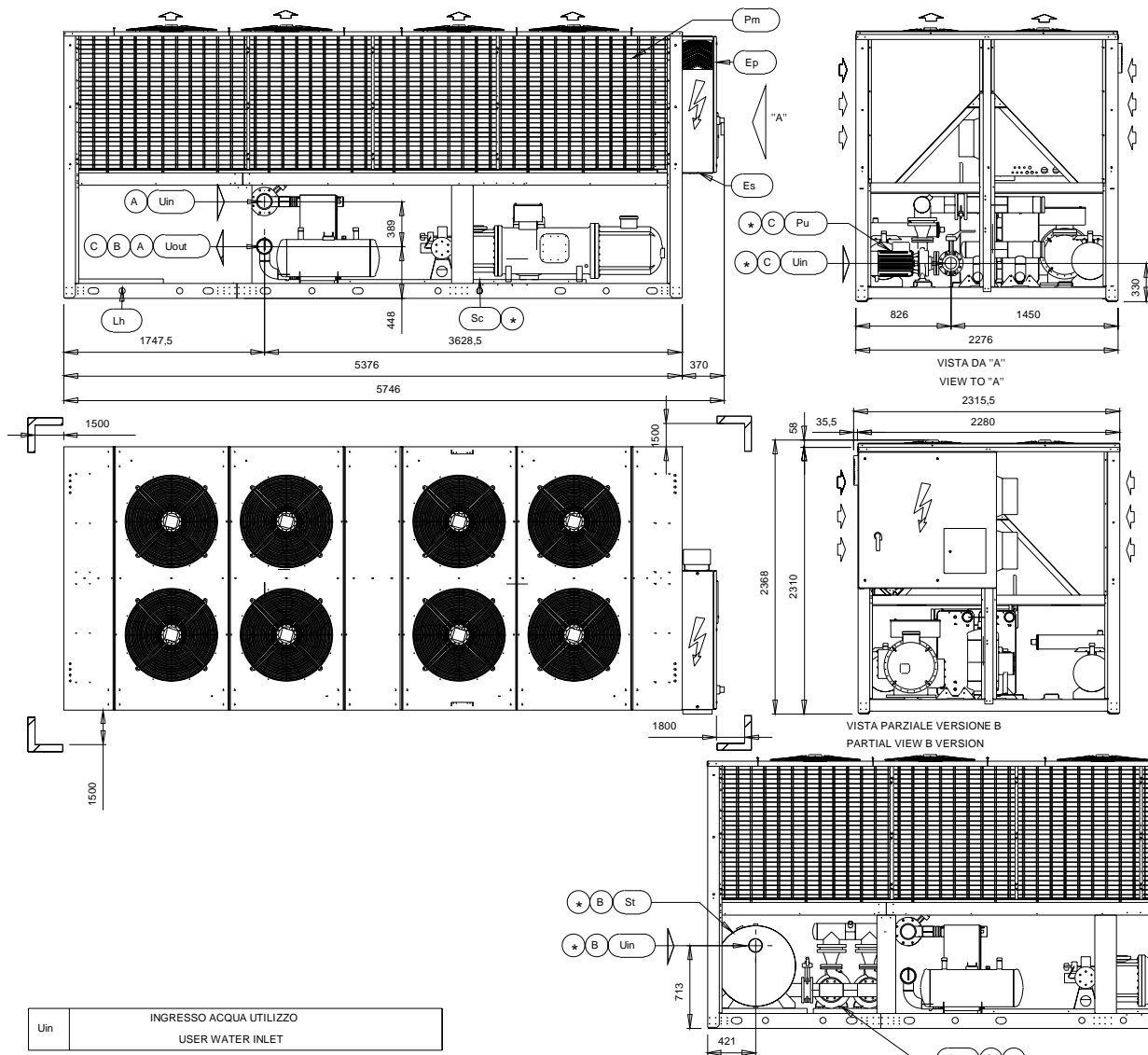


Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET		
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET		FLUSSO ARIA CONDENSAZIONE CONDENSING AIR FLOW
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	St	SERBATOIO DI ACCUMULO STORAGE TANK
Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Pu	POMPA PUMP
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET		SPAZI DI INSTALLAZIONE CLEARANCES
		*	OPTIONAL

OVERALL DIMENSIONS, WEIGHTS, CLEARANCES, AND HYDRAULIC CONNECTIONS

KAPPA V ECHOS; 48.1

KAPPA V ECHOS/HP; 48.1



Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET

	FLUSSO ARIA CONDENSANZIONE CONDENSING AIR FLOW
Sc	CUFFIA INSONORIZZANTE SOUNDPROOF CASING
St	SERBATOIO DI ACCUMULO STORAGE TANK
Pu	POMPA PUMP
	SPAZI DI INSTALLAZIONE CLEARANCES

*	OPTIONAL
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INSTALLATION RECOMMENDATIONS

Location

- Strictly allow clearances as indicated in the catalogue.
- Locate the unit in order to be compatible with environmental requirements (sound level, integration into the site, etc.)

Electrical connections

- Check the wiring diagram enclosed with the unit, in which are always present all the instructions necessary to the electrical connections.
- Supply the unit at least 12 hours before start-up, in order to turn crankcase heaters on. Do not disconnect electrical supply during temporary stop periods (i.e. weekends).
- Before opening the main switch, stop the unit by acting on the suitable running switches or, if lacking, on the remote control.
- Before servicing the inner components, disconnect electrical supply by opening the main switch.
- The electric supply line must be equipped with an automatic circuit breaker (to be provided by the installer).

Hydraulic connections

- Carefully vent the system, with pump turned off, by acting on the vent valves. This procedure is fundamental: little air bubbles can freeze the evaporator causing the general failure of the system.
- Drain the system during seasonal stops (wintertime) or use proper mixtures with low freezing point. In case of temporary stop periods an electric heater should be installed on the evaporator and hydraulic circuit.
- Install the hydraulic circuit including all the components indicated in the recommended hydraulic circuit diagrams (expansion vessel, flow switch, strainer, storage tank, vent valves, shut off valves, flexible connections, etc.)
- Connect the flow switch, which is furnished on all units, not fitted. Follow the instructions enclosed with the units.

Start up and maintenance operations

- Strictly follow what reported in use and maintenance manual. All these operations must be carried on by trained personnel only.



BLUE BOX Conditioning
AIR BLUE Air Conditioning
BLUE FROST Refrigeration

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BLUE BOX GROUP

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ISO 9001 – Cert. N.0201



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The technical data may be changed without notice.

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