

Condensing unit type EPSILON-ECHOS LE



Technical information manual

Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

- > **EPSILON ECHOS**
Water chiller
- > **EPSILON ECHOS /HP**
Reversible heat pump
- > **EPSILON ECHOS /ST**
Water chiller with storage tank and pumps
- > **EPSILON ECHOS /LE**
Condensing unit
- > **EPSILON ECHOS /LE /HP**
Reversible condensing unit

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TECHNICAL CHARACTERISTICS

EPSILON ECHOS water chiller

Water chillers and air/water heat pumps with axial fans.

EPSILON ECHOS\LE water chiller

Condensing unit and reversible condensing unit with axial fans.

UNIT FRAME

Galvanized sheet structure with baked-on polyester-powder coating (colour RAL 7035) for excellent weather resistance. Easily removable panels allowing full access to interior components.

COMPRESSOR

Sizes 6 and 8 with rotary vane compressors supplied with thermal circuitbreakers in motor windings and rubber anti-vibration mounts.

Sizes 10 to 41 with hermetic scroll compressors supplied with thermal circuitbreakers in motor windings, casing heater and rubber anti-vibration mounts.

CONDENSER

Aluminium-finned copper-tube coil with large heat-exchange surface. Finned coils protected by wire mesh.

FANS

Propeller fans directly coupled to external-rotor 6-pole electric motor, protection rating IP 54. Fans housed in shaped nozzles equipped with safety grids complying with UNI EN 294.

EVAPORATOR *(On Epsilon Echos only)*

Braze-welded AISI 316 stainless-steel plate evaporator, wrapped in closed-cell foam insulation.

Exchanger equipped with temperature probe for antifreeze protection and supplied with a vane-operated flow switch.

REFRIGERANT CIRCUIT

On Epsilon Echos includes: charge connection on the liquid and suction lines, liquid sight-glass, filter/dryer, thermostatic-expansion valve with external pressure equalization, pressure transducer, high and low pressure gauges and safety valve (except on sizes 6, 8, 10).

On Epsilon Echos/LE includes: charge intake on the liquid and suction lines, liquid sight-glass, filter/dryer, pressure transducer, high and low pressure gauges and safety valve (except on sizes 6, 8, 10).

POWER PANEL

With master switch, circuit-breakers for power and auxiliary circuits, contactors for compressors. Microprocessor-based unit control, with main functions shown on display.

The power panel includes:

- Automatic circuit breakers protecting the auxiliary circuits and power circuits (sizes 6 and 10)
- Master switch and fuses protecting the auxiliary circuits and power circuits (sizes 14 to 41)
- Contactor for compressor
- Fan-speed governor for controlling condensation
- Pump relay or motor protector and contactor (sizes 16 to 34, versions ST1P– ST1PS)
- Potential-free contacts for general alarm

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- A microprocessor controlling the following functions:
 - Regulation of inlet water temperature
 - Antifreeze protection
 - Compressor timing
 - High-pressure warning (prevents unit blockage in many situations)
 - Alarm messages
 - Alarm reset
 - Self-adjusting regulation for ideal operation when running low on water
 - Digital input for external ON-OFF signal
- Information shown on display:
 - Discharge water temperature
 - Condensation temperature
 - Temperature and differential settings
 - Explanation of alarm messages
 - Compressor and pump working hours counter

Power supply 230V/1~/50Hz for sizes 6 and 8, 400V/3N~/50Hz for sizes 10 to 41

CONTROLS AND SAFETY DEVICES

- Chilled water temperature probe (at evaporator inlet)
- Antifreeze sensor at evaporator outlet connected to antifreeze alarm (automatic reset, with limited thresholds)
- High-pressure gauge (manual reset)
- Low-pressure gauge (automatic reset, with limited thresholds)
- Mechanical vane-operated flow switch supplied
- Condensation pressure controlled by fan-speed governor for working in low outdoor temperature
- High-pressure safety valve (except sizes 6, 8, 10)
- Compressor overtemperature protection

TESTING

Epsilon Echos units are factory-tested and supplied complete with oil and refrigerant charge.

Epsilon Echos/LE units are factory-tested and supplied with the refrigerant circuit filled with nitrogen.

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VERSIONS

EPSILON ECHOS /HP:

Reversible heat pump

In addition to the features on the standard version, this unit includes:

4-way reversing valve, liquid receiver, check valves, additional thermostatic valve. Microprocessor enabled for: summer/winter switching, automatic defrosting, digital input for remote summer/winter switching.

EPSILON ECHOS /LE /HP:

Reversible condensing unit (heat pump)

In addition to the features on the standard version, this unit includes:

4-way reversing valve, liquid receiver, check valves, thermostatic valve. Microprocessor enabled for: summer/winter switching, automatic defrosting, digital input for remote summer/winter switching.

HYDRAULIC MODULE OPTIONS

EPSILON ECHOS /ST 1P:

Pump-equipped unit

This unit is equipped with a circulator (sizes 6 to 18) or a circulation pump (sizes 20 to 41), an expansion tank, a water circuit drainage valve and a safety valve set at 6 bars (maximum allowable operating pressure).

EPSILON ECHOS /ST 1PS:

Unit equipped with pump and tank

In addition to the features on the /ST 1P version, this unit includes an insulated storage tank.

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ACCESSORIES

MAIN ACCESSORIES

- Electronic thermostatic valve
- Filling unit with pressure gauge (ST version only)
- Antifreeze heater
- Additional heaters
- Electronic modulation of water flow rate
- RS485 serial interface
- Remote user terminal (in addition to terminal on unit)
- Rubber anti-vibration mounts

REFRIGERANT CIRCUIT ACCESSORIES

- Liquid-line valve
- Solenoid valve on liquid line (supplied with electronic thermostatic valve)
- Electronic thermostatic valve

HYDRAULIC CIRCUIT ACCESSORIES

- Filling unit with pressure gauge (ST version only)
- Antifreeze heater

Includes:

Standard version: Electric heater on evaporator

ST1P version: Electric heater on evaporator + heating cable on pipes

ST1PS version: Electric heater on evaporator + heating cable on pipes + immersion heater in tank

- Additional heaters (for HP/ST 1PS versions)
- Electronic modulation of water flow rate

ELECTRICAL ACCESSORIES

- Power supply 230/1/50 (for size 10)
- Power supply 400/3/50+N (for sizes 6, 8)
- RS485 serial interface
- Remote user terminal (in addition to terminal on unit)
- User interface
- Set point compensation according on outdoor air temperature

OTHER ACCESSORIES

- Rubber anti-vibration mounts
- Wooden crate packing
- Drip tray (for sizes 21 to 41; on sizes 6 to 18 the condensate gathers in the unit's base)

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Technical data standard unit

UNIT SIZE			6	8	10	14	16	18
Cooling								
Nominal cooling capacity	(1)	kW	5,71	7,06	8,79	12,96	14,87	17,72
Cooling power input	(1)	kW	2,07	2,78	3,54	4,62	5,60	6,48
EER	(1)		2,76	2,54	2,48	2,81	2,66	2,73
ESEER			0,00	0,00	0,00	0,00	0,00	0,00
Heating								
Nominal heating capacity	(1)	kW	6,49	8,03	10,04	14,10	16,41	19,50
Heating power	(1)	kW	2,31	2,81	3,49	4,66	5,52	6,41
COP			2,81	2,86	2,88	3,03	2,97	3,04
Compressors								
Type			Rotary			Scroll		
Quantity/Refrigerant circuits		n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Capacity steps		n°	100	100	100	100	100	100
Cooling power input		kg	1,87	2,58	3,34	4,22	5,20	6,08
Heating power		kg	2,11	2,81	3,29	4,26	5,12	6,01
Fans								
Type			Axial					
Quantity/Refrigerant circuits		n°	1	1	1	2	2	2
Air flow		m³/h	4.000	4.000	3.800	8.000	8.000	7.600
Air flow - /SLN Version		m³/h	2.500	2.500	5.000	5.000	5.000	9.600
Evaporator								
Type			Plates					
Quantity			1	1	1	1	1	1
Water flow rate		l/h	982	1.214	1.512	2.229	2.557	3.047
Pressure drop		kPa	5,0	7,0	6,0	46,0	46,0	46,0
Hydraulic module								
Available pump pressure		kPa	55	51	50	44	42	40
Storage tank capacity		l	40	40	40	70	70	70
Expansion vessel		l	2	2	2	5	5	5
Sound level								
Sound power value	(4)	dB(A)	63	65	66	68	70	70
Sound pressure value	(5)	dB(A)	35	37	38	40	42	42
Sound power value - /SLN Version	(4)	dB(A)	58	60	62	63	65	66
Sound pressure value - /SLN Version	(5)	dB(A)	27	29	31	32	34	35
Basic unit size and weights								
Width		mm	925	925	925	925	925	925
Depth		mm	375	375	375	375	375	375
Height		mm	700	700	700	1.350	1.350	1.350
Operating weight		kg	74	82	89	118	135	147

(1) Ambient air temperature 35°C; evaporator inlet/outlet water temperature 12-7 °C

(2) Total power input is sum of compressors and fans power input

(3) Ambient air temperature 7°C DB, 6°C WB; condenser inlet/outlet water temperature 40-45 °C

(4) Sound power values in free field conditions are calculated in accordance with ISO 3744; nominal working conditions.

(5) Sound pressure values measured at 10 meters distance from the unit in free field and at nominal working conditions,

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in compliance with ISO 3744

This datasheet gives the characteristic data of the basic and standard versions of the series; for details refer to the specific documentation.

Technical data standard unit

UNIT SIZE			21	25	28	31	37	41
Cooling								
Nominal cooling capacity	(1)	kW	19,03	23,65	27,13	30,19	35,58	40,06
Cooling power input	(1)	kW	6,15	8,31	9,56	10,66	12,11	13,62
EER	(1)		3,09	2,85	2,84	2,83	2,94	2,94
ESEER			0,00	0,00	0,00	0,00	0,00	0,00
Heating								
Nominal heating capacity	(1)	kW	20,51	26,25	30,50	33,52	38,14	43,57
Heating power	(1)	kW	6,43	8,04	9,16	10,56	11,90	13,45
COP			3,19	3,26	3,33	3,17	3,21	3,24
Compressors								
Type			Scroll					
Quantity/Refrigerant circuits		n°/n°	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
Capacity steps		n°	100	100	100	100	100	100
Cooling power input		kg	5,55	7,71	8,96	9,56	11,01	12,52
Heating power		kg	5,83	7,44	8,56	9,46	10,80	12,35
Fans								
Type			Axial					
Quantity/Refrigerant circuits		n°	2	2	2	2	2	2
Air flow		m³/h	14.000	14.000	13.200	19.000	19.000	17.800
Portata aria - Versione /SLN		m³/h	9.600	9.600	13.000	13.000	13.000	-
Evaporator								
Type			Plates					
Quantity			1	1	1	1	1	1
Water flow rate		l/h	3.273	4.067	4.666	5.192	6.119	6.889
Pressure drop		kPa	32,0	47,0	46,0	44,0	45,0	56,0
Hydraulic module								
Available pump pressure		kPa	153	108	93	76	135	104
Storage tank capacity		l	85	85	85	140	140	140
Expansion vessel		l	8	8	8	8	8	8
Sound level								
Sound power value	(4)	dB(A)	72	73	73	74	75	75
Sound pressure value	(5)	dB(A)	41	42	42	42	43	43
Sound power value - /SLN Version	(4)	dB(A)	67	68	68	69	70	-
Sound pressure value - /SLN Version	(5)	dB(A)	38	37	37	37	38	-
Basic unit size and weights								
Width		mm	1.105	1.105	1.105	1.305	1.305	1.305
Depth		mm	505	505	505	505	505	505
Height		mm	1.385	1.385	1.385	1.585	1.585	1.585
Operating weight		kg	178	190	224	324	326	337

(1) Ambient air temperature 35°C; evaporator inlet/outlet water temperature 12-7 °C

(2) Total power input is sum of compressors and fans power input

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(3) Ambient air temperature 7°C DB, 6°C WB; condenser inlet/outlet water temperature 40-45 °C

(4) Sound power values in free field conditions are calculated in accordance with ISO 3744; nominal working conditions.

(5) Sound pressure values measured at 10 meters distance from the unit in free field and at nominal working conditions, in compliance with ISO 3744

This datasheet gives the characteristic data of the basic and standard versions of the series; for details refer to the specific documentation.

Electrical data standard unit

UNIT SIZE			6	8	10	14
Max. absorbed power	(1),(3)	kW	3,10 (3,301)	3,90 (4,101)	4,97 (5,171)	6,61 (6,95)
Max. absorbed current	(2),(3)	A	16,75 (17,71)	19,75 (20,71)	9,05 (10,01)	11,90 (13,92)
Max. starting current	(4)	A	61,75 (62,71)	82,75 (83,71)	67,75 (68,71)	67,50 (69,52)
Fan rated power		n° x kW	1 x 0,2	1 x 0,2	1 x 0,2	2 x 0,2
Fan rated current		n° x A	1 x 0,75	1 x 0,75	1 x 0,75	2 x 0,75
Fan rated power /SLN		kW	1 x 0,13	1 x 0,13	2 x 0,13	2 x 0,13
Fan rated current /SLN		n° x A	1 x 0,84	1 x 0,84	2 x 0,84	2 x 0,84
Pump rated power		kW	0,201	0,201	0,201	0,34
Pump rated current		A	0,96	0,96	0,96	2,02
Electric power supply		V/ph/Hz	230/1~/50		400/3N~/50	
Control power supply		V/ph/Hz	230/1~/50			

UNIT SIZE			16	18	21	25
Max. absorbed power	(1),(3)	kW	8,04 (8,38)	9,33 (9,67)	9,53 (10,15)	11,60 (12,22)
Max. absorbed current	(2),(3)	A	14,10 (16,12)	16,40 (18,42)	18,30 (21,07)	21,50 (24,27)
Max. starting current	(4)	A	68,50 (70,52)	74,50 (76,52)	76,40 (79,17)	99,40 (102,17)
Fan rated power		n° x kW	2 x 0,2	2 x 0,2	2 x 0,3	2 x 0,3
Fan rated current		n° x A	2 x 0,75	2 x 0,75	2 x 1,7	2 x 1,7
Fan rated power /SLN		kW	2 x 0,13	2 x 0,24	2 x 0,24	2 x 0,24
Fan rated current /SLN		n° x A	2 x 0,84	2 x 1,2	2 x 1,2	2 x 1,2
Pump rated power		kW	0,34	0,34	0,62	0,62
Pump rated current		A	2,02	2,02	2,77	2,77
Electric power supply		V/ph/Hz	400/3N~/50			
Control power supply		V/ph/Hz	230/1~/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)



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

(4) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps, fans)

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Electrical data standard unit

UNIT SIZE			28	31	37	41
Max. absorbed power	(1),(3)	kW	13,10 (13,72)	15,10 (15,72)	16,65 (17,73)	18,68 (19,76)
Max. absorbed current	(2),(3)	A	24,40 (27,17)	28,00 (30,77)	40,00 (42,39)	41,00 (43,39)
Max. starting current	(4)	A	99,40 (102,17)	101,00 (103,77)	163,00 (165,39)	165,00 (167,39)
Fan rated power		n° x kW	2 x 0,3	2 x 0,55	2 x 0,55	2 x 0,55
Fan rated current		n° x A	2 x 1,7	2 x 2,5	2 x 2,5	2 x 2,5
Fan rated power /SLN		kW	2 x 0,36	2 x 0,36	2 x 0,36	-
Fan rated current /SLN		n° x A	2 x 1,65	2 x 1,65	2 x 1,65	-
Pump rated power		kW	0,62	0,62	1,08	1,08
Pump rated current		A	2,77	2,77	2,39	2,39
Electric power supply		V/ph/Hz	400/3N~/50			
Control power supply		V/ph/Hz	230/1~/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)

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

(4) Maximum starting current calculated considering the bigger size compressor starting current plus the maximum absorbed power of the other electrical devices (pumps, fans)

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Cooling Capacity

Model	AMBIENT AIR TEMPERATURE [°C]										
	To [°C]	25		30		35		40		43	
		Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe
6	5	6,05	1,44	5,72	1,64	5,37	1,86	4,99	2,11	4,59	2,39
	6	6,24	1,45	5,90	1,64	5,54	1,86	5,16	2,12	4,74	2,40
	7	6,44	1,45	6,09	1,65	5,71	1,87	5,32	2,12	4,89	2,40
	8	6,63	1,46	6,28	1,65	5,89	1,87	5,48	2,12	--	--
	9	6,83	1,46	6,47	1,66	6,07	1,88	5,65	2,13	--	--
	10	7,04	1,47	6,66	1,66	6,25	1,88	5,82	2,13	--	--
8	5	7,52	1,96	7,09	2,24	6,64	2,56	6,16	2,93	5,64	3,35
	6	7,75	1,97	7,32	2,25	6,85	2,57	6,36	2,94	5,83	3,35
	7	7,99	1,97	7,54	2,26	7,06	2,58	6,55	2,95	6,00	3,36
	8	8,23	1,98	7,77	2,27	7,28	2,59	6,75	2,95	--	--
	9	8,47	1,99	8,00	2,28	7,49	2,60	6,95	2,96	--	--
	10	8,71	2,00	8,23	2,29	7,71	2,61	7,16	2,97	--	--
10	5	9,41	2,68	8,81	2,97	8,22	3,30	7,65	3,68	7,10	4,12
	6	9,73	2,69	9,11	2,98	8,51	3,32	7,92	3,70	7,35	4,14
	7	10,05	2,71	9,41	3,00	8,79	3,34	8,19	3,72	7,60	4,16
	8	10,38	2,72	9,73	3,01	9,09	3,35	8,46	3,74	--	--
	9	10,72	2,74	10,05	3,03	9,39	3,37	8,75	3,76	--	--
	10	11,07	2,75	10,37	3,05	9,70	3,39	9,03	3,78	--	--
14	5	13,96	3,38	13,03	3,75	12,15	4,17	11,30	4,65	10,48	5,19
	6	14,39	3,40	13,45	3,77	12,55	4,19	11,68	4,68	10,85	5,22
	7	14,85	3,42	13,88	3,79	12,96	4,22	12,07	4,70	11,20	5,25
	8	15,30	3,44	14,33	3,81	13,38	4,24	12,47	4,73	--	--
	9	15,77	3,47	14,78	3,84	13,81	4,27	12,88	4,76	--	--
	10	16,25	3,49	15,24	3,86	14,25	4,30	13,30	4,79	--	--
16	5	16,13	4,12	15,02	4,59	13,95	5,13	12,92	5,76	11,94	6,46
	6	16,62	4,15	15,50	4,62	14,41	5,17	13,36	5,79	12,36	6,50
	7	17,15	4,18	15,98	4,65	14,87	5,20	13,79	5,83	12,75	6,54
	8	17,66	4,21	16,49	4,68	15,35	5,24	14,25	5,86	--	--
	9	18,20	4,24	17,00	4,72	15,84	5,27	14,71	5,90	--	--
	10	18,74	4,27	17,52	4,75	16,33	5,31	15,18	5,94	--	--
18	5	19,22	4,82	17,90	5,36	16,62	6,00	15,39	6,74	14,21	7,58
	6	19,81	4,86	18,47	5,40	17,17	6,04	15,92	6,78	14,71	7,62
	7	20,43	4,89	19,05	5,44	17,72	6,08	16,43	6,82	15,18	7,66
	8	21,05	4,92	19,65	5,47	18,29	6,12	16,97	6,86	--	--
	9	21,69	4,96	20,26	5,51	18,87	6,16	17,52	6,91	--	--
	10	22,34	4,99	20,88	5,55	19,46	6,21	18,08	6,96	--	--

All data are referred to the basic versions

Pf: cooling capacity [kW]

Pe: compressors power input [kW]

To: evaporator water outlet temperature [°C]

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Cooling Capacity

Model	AMBIENT AIR TEMPERATURE [°C]										
	To [°C]	25		30		35		40		43	
		Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe
21	5	20,58	4,45	19,17	4,93	17,81	5,50	16,51	6,16	15,27	6,92
	6	21,26	4,47	19,82	4,95	18,42	5,52	17,08	6,19	15,80	6,95
	7	21,93	4,49	20,45	4,97	19,03	5,55	17,67	6,22	16,36	6,97
	8	22,63	4,51	21,12	5,00	19,67	5,57	18,27	6,24	--	--
	9	23,34	4,53	21,80	5,02	20,32	5,60	18,89	6,27	--	--
	10	24,07	4,55	22,50	5,05	20,98	5,63	19,52	6,30	--	--
25	5	24,84	6,18	23,57	6,84	22,33	7,61	21,13	8,47	19,95	9,43
	6	25,56	6,20	24,27	6,88	22,99	7,66	21,75	8,54	20,53	9,51
	7	26,31	6,23	24,96	6,93	23,65	7,71	22,37	8,60	21,10	9,58
	8	27,07	6,27	25,69	6,97	24,33	7,77	23,00	8,66	--	--
	9	27,85	6,31	26,42	7,02	25,03	7,83	23,65	8,73	--	--
	10	28,63	6,35	27,17	7,07	25,73	7,88	24,31	8,79	--	--
28	5	28,51	7,17	27,05	7,94	25,62	8,83	24,23	9,84	22,86	10,97
	6	29,34	7,20	27,85	7,99	26,38	8,89	24,94	9,92	23,53	11,06
	7	30,18	7,24	28,64	8,04	27,13	8,96	25,64	9,99	24,17	11,15
	8	31,05	7,28	29,46	8,09	27,90	9,02	26,37	10,07	--	--
	9	31,93	7,33	30,30	8,15	28,69	9,09	27,10	10,15	--	--
	10	32,82	7,38	31,14	8,22	29,49	9,16	27,85	10,23	--	--
31	5	31,69	7,67	30,07	8,50	28,49	9,45	26,96	10,52	25,46	11,71
	6	32,62	7,70	30,96	8,54	29,34	9,50	27,76	10,59	26,21	11,80
	7	33,58	7,73	31,87	8,59	30,19	9,56	28,56	10,66	26,94	11,88
	8	34,56	7,77	32,80	8,64	31,07	9,63	29,38	10,74	--	--
	9	35,56	7,82	33,75	8,70	31,96	9,69	30,22	10,81	--	--
	10	36,57	7,86	34,70	8,75	32,87	9,76	31,07	10,89	--	--
37	5	37,71	8,90	35,70	9,80	33,54	10,83	31,20	12,02	28,70	13,37
	6	38,84	8,97	36,78	9,88	34,56	10,92	32,18	12,10	29,62	13,46
	7	39,99	9,05	37,87	9,97	35,58	11,01	33,12	12,19	30,49	13,55
	8	41,17	9,14	38,99	10,05	36,64	11,10	34,10	12,28	--	--
	9	42,36	9,22	40,12	10,14	37,69	11,19	35,09	12,38	--	--
	10	43,56	9,30	41,25	10,23	38,76	11,28	36,09	12,48	--	--
41	5	42,47	10,12	40,15	11,17	37,70	12,35	35,09	13,70	32,31	15,22
	6	43,76	10,19	41,39	11,25	38,88	12,44	36,22	13,78	33,40	15,31
	7	45,07	10,27	42,64	11,33	40,06	12,52	37,32	13,87	34,41	15,39
	8	46,42	10,34	43,92	11,41	41,28	12,61	38,46	13,96	--	--
	9	47,77	10,42	45,21	11,49	42,50	12,70	39,62	14,05	--	--
	10	49,14	10,50	46,52	11,58	43,73	12,79	40,78	14,15	--	--

All data are referred to the basic versions

Pf: cooling capacity [kW]

Pe: compressors power input [kW]

Technical information manual EPSILON-ECHOS

REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

To: evaporator water outlet temperature [°C]

Heating Capacity (HP version)

Model	CONDENSER WATER INLET TEMPERATURE [°C]									
	Ta [°C]	RH %	30/35		35/40		40/45		45/50	
			Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe
6	-10	95	4,50	1,71	4,58	1,95	--	--	--	--
	-5	90	5,01	1,69	5,07	1,92	5,16	2,19	--	--
	0	90	5,61	1,66	5,65	1,89	5,70	2,16	5,77	2,45
	5	80	6,17	1,64	6,19	1,87	6,23	2,13	6,25	2,42
	8	70	6,47	1,64	6,48	1,86	6,49	2,11	6,50	2,40
	10	70	6,73	1,63	6,73	1,85	6,73	2,10	6,75	2,39
8	-10	95	5,55	2,07	5,67	2,38	--	--	--	--
	-5	90	6,17	2,05	6,27	2,35	6,39	2,70	--	--
	0	90	6,90	2,02	6,97	2,32	7,06	2,66	7,17	3,05
	5	80	7,59	2,00	7,63	2,29	7,69	2,62	7,77	3,00
	8	70	7,97	1,99	7,99	2,28	8,03	2,61	8,08	2,98
	10	70	8,28	1,98	8,29	2,27	8,32	2,60	8,36	2,97
10	-10	95	7,01	1,60	7,01	2,89	--	--	--	--
	-5	90	7,82	2,62	7,82	2,91	7,89	3,26	--	--
	0	90	8,79	2,64	8,75	2,94	8,74	3,28	8,84	3,66
	5	80	9,67	2,66	9,60	2,95	9,59	3,29	9,64	3,67
	8	70	10,18	2,66	10,08	2,95	10,04	3,29	10,06	3,67
	10	70	10,61	2,66	10,50	2,95	10,44	3,29	10,45	3,67
14	-10	95	10,04	3,35	9,94	3,74	--	--	--	--
	-5	90	11,19	3,37	11,08	3,77	11,07	4,23	--	--
	0	90	12,52	3,40	12,35	3,79	12,28	4,24	12,30	4,75
	5	80	13,78	3,41	13,58	3,80	13,46	4,25	13,41	4,76
	8	70	14,50	3,42	14,26	3,81	14,10	4,26	13,98	4,77
	10	70	15,10	3,43	14,83	3,82	14,66	4,26	14,57	4,77
16	-10	95	11,69	4,00	11,6	4,49	--	--	--	--
	-5	90	13,03	4,02	12,93	4,51	12,95	5,09	--	--
	0	90	14,61	4,04	14,38	4,53	14,33	5,10	14,39	5,75
	5	80	16,00	4,06	15,78	4,55	15,68	5,12	15,68	5,76
	8	70	16,83	4,07	16,57	4,56	16,41	5,12	16,37	5,77
	10	70	17,52	4,08	17,22	4,56	17,05	5,13	16,98	5,77
18	-10	95	13,89	4,70	13,74	5,28	--	--	--	--
	-5	90	15,49	4,72	15,32	5,30	15,32	5,97	--	--
	0	90	17,35	4,75	17,12	5,32	16,98	5,99	17,02	6,76
	5	80	19,05	4,77	18,77	5,34	18,62	6,01	18,58	6,76
	8	70	20,06	4,78	19,71	5,35	19,50	6,01	19,41	6,77
	10	70	20,89	4,79	20,52	5,36	20,29	6,02	20,17	6,77

All data are referred to the basic versions

Pt: heating capacity [kW]

Pe: compressors power input [kW]

Technical information manual EPSILON-ECHOS

REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

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

RH : evaporator inlet air relative humidity [%]

Heating Capacity (HP Version)

Model	CONDENSER WATER INLET TEMPERATURE [°C]									
	Ta [°C]	RH %	30/35		35/40		40/45		45/50	
			Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe
21	-10	95	14,67	4,59	14,35	5,17	--	--	--	--
	-5	90	16,36	4,61	16,00	5,17	15,88	5,82	--	--
	0	90	18,39	4,63	18,01	5,18	17,72	5,83	17,62	6,57
	5	80	20,36	4,64	19,87	5,19	19,53	5,83	19,34	6,56
	8	70	21,37	4,65	20,87	5,19	20,51	5,83	20,28	6,56
	10	70	22,44	4,65	21,90	5,19	21,49	5,83	21,20	6,56
25	-10	95	19,23	6,89	19,00	7,11	--	--	--	--
	-5	90	21,44	6,64	21,18	6,98	21,08	7,44	--	--
	0	90	23,41	6,39	23,20	6,85	23,13	7,42	23,20	8,10
	5	80	25,41	6,23	25,21	6,78	25,15	7,43	25,22	8,19
	8	70	26,58	6,17	26,35	6,75	26,25	7,44	26,28	8,23
	10	70	27,53	6,14	27,30	6,74	27,20	7,45	27,22	8,27
28	-10	95	22,27	7,91	21,96	8,18	--	--	--	--
	-5	90	24,83	7,61	24,48	8,02	24,35	8,56	--	--
	0	90	27,24	7,31	26,97	7,86	26,76	8,53	26,82	9,33
	5	80	29,57	7,15	29,30	7,79	29,19	8,55	29,22	9,43
	8	70	30,94	7,08	30,64	7,76	30,50	8,56	30,48	9,48
	10	70	32,11	7,04	31,80	7,75	31,64	8,58	31,62	9,52
31	-10	95	24,51	8,71	24,22	9,03	--	--	--	--
	-5	90	27,33	8,40	27,00	8,86	26,86	9,46	--	--
	0	90	29,90	8,09	29,61	8,69	29,51	9,43	29,58	10,31
	5	80	32,52	7,90	32,24	8,60	32,15	9,44	32,18	10,42
	8	70	34,02	7,83	33,71	8,57	33,52	9,46	33,45	10,47
	10	70	35,27	7,78	34,95	8,56	34,79	9,47	34,78	10,52
37	-10	95	26,20	8,51	26,28	9,53	--	--	--	--
	-5	90	29,44	8,55	29,40	9,55	29,40	10,69	--	--
	0	90	33,24	8,63	33,07	9,60	32,91	10,72	32,79	12,02
	5	80	36,87	8,70	36,58	9,67	36,30	10,77	36,04	12,05
	8	70	38,92	8,75	38,53	9,71	38,14	10,80	37,71	12,07
	10	70	40,55	8,79	40,12	9,74	39,68	10,84	39,24	12,10
41	-10	95	29,93	10,06	29,92	11,23	--	--	--	--
	-5	90	33,71	10,02	33,48	11,15	33,40	12,44	--	--
	0	90	38,17	10,00	37,83	11,11	37,42	12,38	37,21	13,82
	5	80	42,29	10,01	41,84	11,11	41,42	12,35	41,00	13,77
	8	70	44,67	10,02	44,11	11,12	43,57	12,35	43,00	13,76
	10	70	46,62	10,03	46,01	11,13	45,41	12,36	44,84	13,76

All data are referred to the basic versions

Pt: heating capacity [kW]

Pe: compressors power input [kW]

Technical information manual EPSILON-ECHOS

REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

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

RH : evaporator inlet air relative humidity [%]

Cooling Capacity (LE Version)

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

All data are referred to the basic versions

Pf: cooling capacity [kW]

Pe: compressors power input [kW]

Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Tev: evaporating temperature [°C]

Cooling Capacity (LE Version)

Model	AMBIENT AIR TEMPERATURE [°C]										
	Tev [°C]	25		30		35		40		45	
		Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe	Pf	Pe
21	0	19,40	4,41	17,92	4,88	16,52	5,45	15,19	6,10	13,93	6,86
	2,5	21,10	4,46	19,53	4,94	18,04	5,51	16,61	6,17	15,26	6,92
	5	22,94	4,52	21,28	5,00	19,69	5,57	18,17	6,24	16,72	6,99
	7,5	24,91	4,58	23,16	5,07	21,47	5,65	19,85	6,32	--	--
	10	27,04	4,64	25,19	5,14	23,40	5,73	21,67	6,40	--	--
25	0	23,86	6,15	22,53	6,79	21,26	7,53	20,04	8,36	18,85	9,29
	2,5	25,76	6,21	24,33	6,89	22,94	7,66	21,60	8,52	20,29	9,48
	5	27,78	6,30	26,23	7,01	24,73	7,80	23,26	8,69	21,83	9,66
	7,5	29,93	6,43	28,26	7,15	26,63	7,96	25,03	8,86	--	--
	10	32,20	6,57	30,40	7,30	28,64	8,12	26,91	9,03	--	--
28	0	27,38	7,13	25,87	7,88	24,40	8,73	22,99	9,71	21,61	10,80
	2,5	29,55	7,21	27,91	7,99	26,32	8,89	24,77	9,90	23,25	11,02
	5	31,86	7,32	30,09	8,14	28,36	9,06	26,66	10,10	25,00	11,25
	7,5	34,31	7,47	32,39	8,31	30,52	9,26	28,67	10,31	--	--
	10	36,89	7,65	34,83	8,50	32,80	9,46	30,80	10,52	--	--
31	0	30,43	7,65	28,74	8,44	27,12	9,36	25,56	10,39	24,05	11,55
	2,5	32,87	7,71	31,05	8,55	29,29	9,50	27,58	10,57	25,92	11,77
	5	35,48	7,81	33,51	8,68	31,59	9,67	29,73	10,77	27,90	11,98
	7,5	38,25	7,95	36,12	8,84	34,05	9,85	32,01	10,97	--	--
	10	41,18	8,12	38,89	9,03	36,65	10,04	34,44	11,17	--	--
37	0	36,20	8,79	34,10	9,68	31,85	10,70	29,44	11,86	26,88	13,20
	2,5	39,19	9,00	36,92	9,90	34,49	10,91	31,90	12,08	29,15	13,41
	5	42,32	9,22	39,88	10,12	37,26	11,15	34,48	12,32	31,52	13,66
	7,5	45,59	9,45	42,96	10,37	40,15	11,40	37,16	12,58	--	--
	10	49,00	9,69	46,17	10,63	43,15	11,68	39,95	12,86	--	--
41	0	40,75	10,02	38,31	11,06	35,74	12,22	33,03	13,55	30,17	15,05
	2,5	44,16	10,21	41,55	11,26	38,80	12,43	35,90	13,76	32,84	15,26
	5	47,74	10,42	44,95	11,48	42,01	12,66	38,91	13,99	35,64	15,50
	7,5	51,48	10,65	48,50	11,72	45,35	12,91	42,04	14,26	--	--
	10	55,39	10,89	52,20	11,98	48,84	13,19	45,31	14,55	--	--

All data are referred to the basic versions

Pf: cooling capacity [kW]

Pe: compressors power input [kW]

Tev: evaporating temperature [°C]

Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Heating Capacity (LE- HP Versions)

Model	CONDENSER WATER INLET TEMPERATURE [°C]											
	Ta [°C]	RH %	40		45		50		55		60	
			Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe
6	-10	95	4,53	1,79		--		--		--		--
	-5	90	5,03	1,76	5,1	2		--		--		--
	0	90	5,62	1,72	5,66	1,96	5,72	2,23		--		--
	5	80	6,18	1,69	6,2	1,92	6,23	2,18	6,26	2,49		--
	8	70	6,47	1,67	6,48	1,9	6,49	2,16	6,5	2,46	6,55	2,8
	10	70	6,73	1,66	6,73	1,89	6,74	2,15	6,75	2,44	6,78	2,77
8	-10	95	5,59	2,19		--		--		--		--
	-5	90	6,2	2,15	6,3	2,46		--		--		--
	0	90	6,92	2,1	6,99	2,41	7,08	2,76		--		--
	5	80	7,59	2,06	7,64	2,36	7,71	2,71	7,79	3,1		--
	8	70	7,97	2,04	8	2,34	8,04	2,68	8,09	3,07	8,14	3,51
	10	70	8,28	2,02	8,29	2,32	8,32	2,66	8,37	3,04	8,43	3,48
10	-10	95	6,99	2,71		--		--		--		--
	-5	90	7,8	2,71	7,82	3,03		--		--		--
	0	90	8,75	2,72	8,73	3,03	8,74	3,38		--		--
	5	80	9,62	2,71	9,57	3,02	9,58	3,37	9,64	3,77		--
	8	70	10,13	2,71	10,04	3,01	10,02	3,36	10,05	3,76	10,13	4,21
	10	70	10,55	2,7	10,46	3,01	10,42	3,36	10,43	3,75	10,51	4,2
14	-10	95	9,92	3,48		--		--		--		--
	-5	90	11,14	3,48	11,06	3,9		--		--		--
	0	90	12,47	3,48	12,32	3,89	12,28	4,37		--		--
	5	80	13,74	3,48	13,55	3,89	13,46	4,36	13,41	4,89		--
	8	70	14,45	3,47	14,22	3,88	14,08	4,35	13,97	4,88	14,01	5,47
	10	70	15,05	3,47	14,81	3,88	14,64	4,34	14,56	4,87	14,57	5,46
16	-10	95	11,58	4,16		--		--		--		--
	-5	90	12,99	4,16	12,92	4,68		--		--		--
	0	90	14,54	4,16	14,35	4,67	14,33	5,27		--		--
	5	80	15,95	4,15	15,75	4,66	15,67	5,25	15,7	5,93		--
	8	70	16,78	4,15	16,53	4,65	16,39	5,24	16,36	5,91	16,4	6,66
	10	70	17,46	4,14	17,19	4,65	17,03	5,24	16,98	5,9	17,04	6,65
18	-10	95	13,75	4,88		--		--		--		--
	-5	90	15,44	4,88	15,3	5,5		--		--		--
	0	90	17,28	4,88	17,08	5,48	16,97	6,19		--		--
	5	80	18,99	4,87	18,73	5,47	18,6	6,16	18,59	6,95		--
	8	70	19,98	4,86	19,66	5,46	19,47	6,15	19,4	6,94	19,44	7,82
	10	70	20,82	4,86	20,47	5,45	20,26	6,14	20,17	6,93	20,2	7,8

All data are referred to the basic versions

Pt: heating capacity [kW]

Pe: compressors power input [kW]

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

RH : evaporator inlet air relative humidity [%]

Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Heating Capacity (LE- HP Versions)

Model	CONDENSER WATER INLET TEMPERATURE [°C]											
	Ta [°C]	RH %	40		45		50		55		60	
			Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe	Pt	Pe
21	-10	95	14,32	4,98		--		--		--		--
	-5	90	16,1	4,98	15,9	5,6		--		--		--
	0	90	18,13	4,97	17,84	5,59	17,63	6,3		--		--
	5	80	20,03	4,96	19,64	5,57	19,4	6,28	19,3	7,08		--
	8	70	21,07	4,96	20,63	5,56	20,35	6,26	20,19	7,06	20,14	7,96
	10	70	22,11	4,95	21,64	5,55	21,31	6,25	21,09	7,05	20,94	7,94
25	-10	95	19,19	6,90		--		--		--		--
	-5	90	21,35	6,73	21,13	7,11		--		--		--
	0	90	23,35	6,49	23,17	6,99	23,13	7,59		--		--
	5	80	25,35	6,33	25,19	6,91	25,15	7,59	25,26	8,39		--
	8	70	26,53	6,27	26,32	6,88	26,25	7,59	26,29	8,42	26,41	9,34
	10	70	27,49	6,23	27,28	6,86	27,2	7,6	27,24	8,44	27,4	9,39
28	-10	95	22,28	8,01		--		--		--		--
	-5	90	24,71	7,72	24,42	8,17		--		--		--
	0	90	27,16	7,44	26,9	8,03	26,76	8,74		--		--
	5	80	29,5	7,27	29,26	7,94	29,19	8,74	29,25	9,66		--
	8	70	30,88	7,2	30,6	7,91	30,49	8,74	30,49	9,7	30,6	10,77
	10	70	32,05	7,15	31,77	7,89	31,62	8,74	31,63	9,72	31,76	10,82
31	-10	95	24,52	8,82		--		--		--		--
	-5	90	27,21	8,52	26,93	9,02		--		--		--
	0	90	29,81	8,22	29,57	8,87	29,51	9,65		--		--
	5	80	32,45	8,03	32,21	8,77	32,16	9,65	32,2	10,67		--
	8	70	33,94	7,95	33,67	8,73	33,49	9,65	33,47	10,71	33,69	11,89
	10	70	35,21	7,9	34,91	8,71	34,78	9,66	34,81	10,74	34,97	11,95
37	-10	95	26,21	8,85		--		--		--		--
	-5	90	29,42	8,84	29,39	9,89		--		--		--
	0	90	33,2	8,85	33,02	9,87	32,87	11,05		--		--
	5	80	36,81	8,88	36,52	9,88	36,24	11,04	35,99	12,38		--
	8	70	38,85	8,9	38,46	9,9	38,06	11,04	37,6	12,37	37,2	13,91
	10	70	40,48	8,92	40,05	9,91	39,6	11,05	39,17	12,37	38,75	13,9
41	-10	95	29,92	10,47		--		--		--		--
	-5	90	33,62	10,35	33,45	11,55		--		--		--
	0	90	38,08	10,27	37,75	11,43	37,35	12,76		--		--
	5	80	42,19	10,22	41,74	11,36	41,33	12,66	40,92	14,15		--
	8	70	44,57	10,2	44,01	11,34	43,49	12,63	42,87	14,1	42,4	15,78
	10	70	46,52	10,19	45,91	11,32	45,31	12,6	44,74	14,06	44,2	15,73

All data are referred to the basic versions

Pt: heating capacity [kW]

Pe: compressors power input [kW]

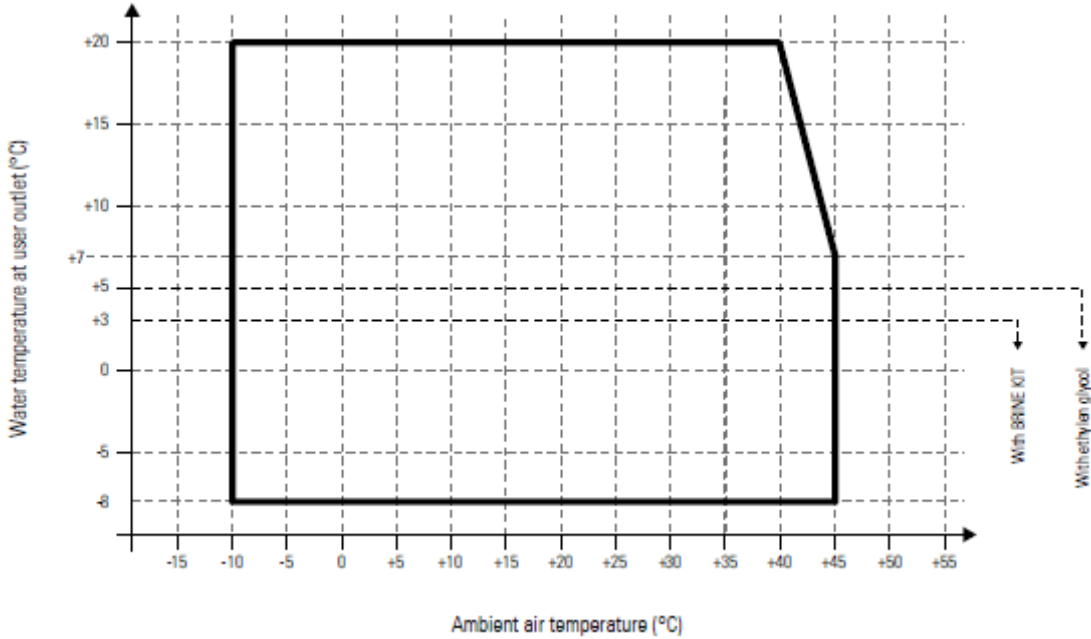
Ta: evaporator inlet air temperature dry bulb [°C]

RH : evaporator inlet air relative humidity [%]

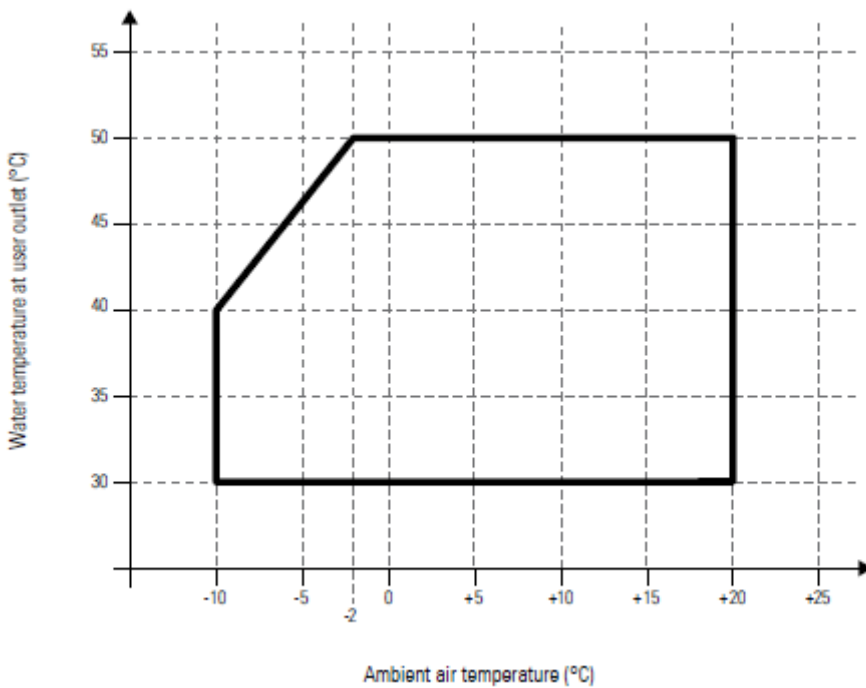
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Operating Limits standard units and HP version

Cooling



Heating

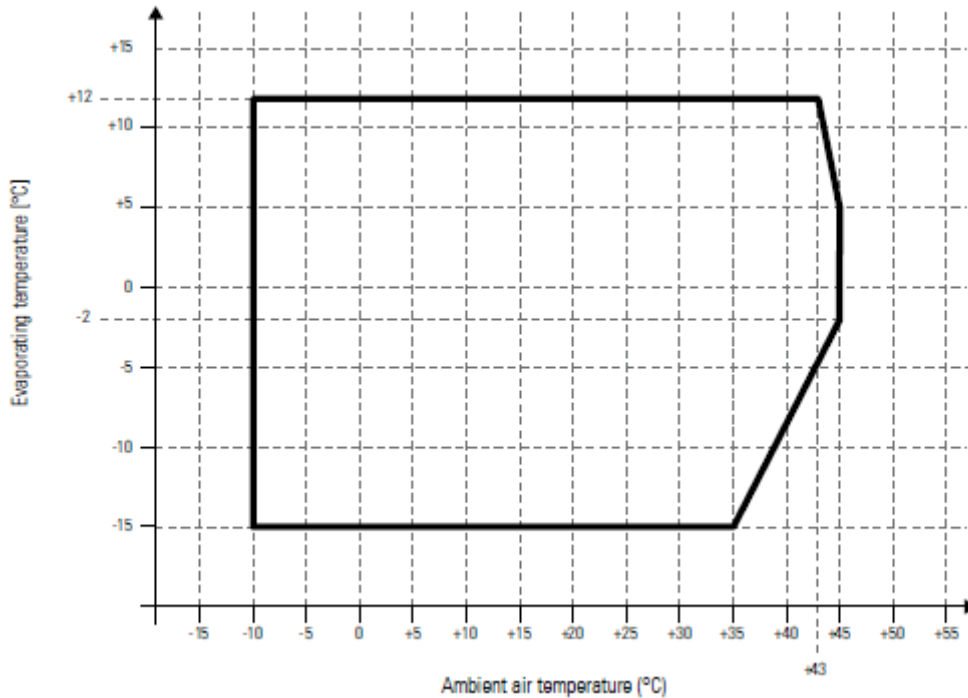


THE WATER TEMPERATURE GRADIENT FOR ALL VERSIONS MUST BE BETWEEN: min:4 °C max: 7°C

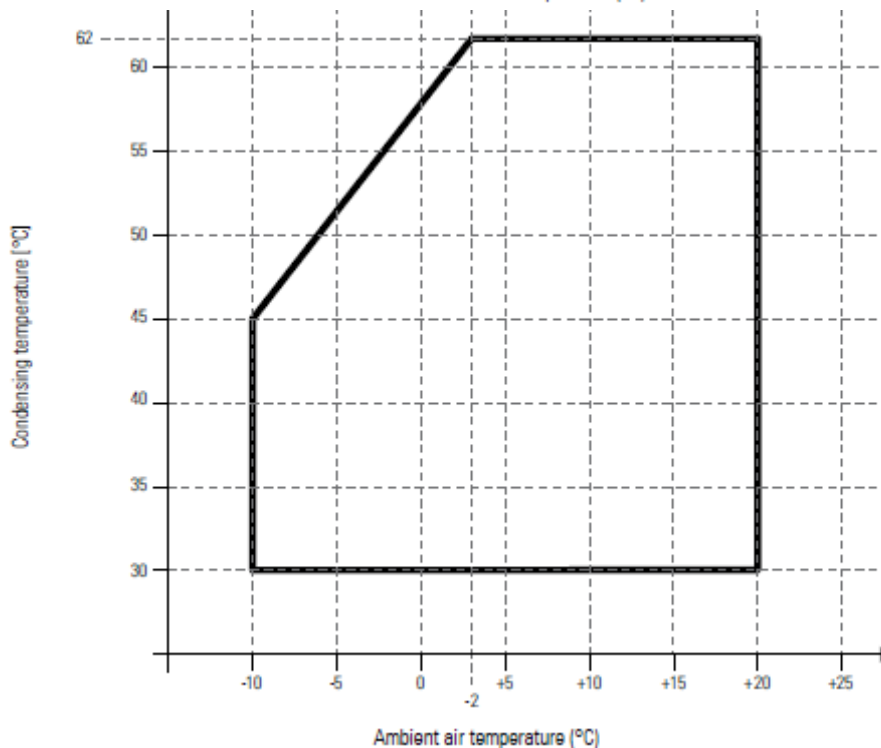
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Operating Limits LE and HP versions

Cooling



Heating



Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Sound level Standard unit

Model	OCTAVE BANDS 10m [dB]																TOTAL [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lp	Lp
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
6	67,0	36,0	66,5	35,5	66,0	35,0	61,5	30,5	56,0	25,0	51,5	20,5	45,0	14,0	37,5	6,5	63	32
8	68,0	37,0	68,0	37	67,0	36	64,0	33	56,5	25,5	54,0	23	47,5	16,5	40,0	9	65	34
10	71,5	40,5	69,0	38	69,5	38,5	64,0	33	59,5	28,5	56,0	25	48,5	17,5	42,0	11	66	35
14	71,5	40,5	72,0	41	70,0	39	67,0	36	61,5	30,5	56,0	25	50,5	19,5	41,0	10	68	37
16	73,5	42,5	72,5	41,5	72,5	41,5	68,0	37	62,0	31	58,0	27	52,5	21,5	43,0	12	70	39
18	74,5	43,5	73,5	42,5	73,5	42,5	68,0	37	63,0	32	59,0	28	52,0	21	44,5	13,5	70	39
21	76,5	45,5	75,0	44	75,5	44,5	69,5	38,5	65,5	34,5	61,0	30	53,0	22	47,0	16	72	41
25	77,5	46,5	76,0	45	75,5	44,5	72,0	41	63,5	32,5	61,0	30	56,0	25	47,0	16	73	42
28	78,0	47,0	77,0	46	76,0	45	72,0	41	65,0	34	61,5	30,5	56,5	25,5	48,0	17	73	42
31	78,5	46,5	77,0	45	77,5	45,5	72,0	40	66,5	34,5	63,0	31	56,0	24	49,0	17	74	42
37	79,5	47,5	78,5	46,5	77,0	45	73,5	41,5	67,0	35	62,5	30,5	57,0	25	49,5	17,5	75	43
41	80,0	48,0	80,0	48	78,0	46	74,0	42	68,5	36,5	63,0	31	58,0	26	50,0	18	75	43

Lw: sound power values in free field conditions are calculated in accordance with ISO 3744.

Lp: sound pressure values measured at 10 meter from the unit in free field conditions in compliance with ISO 3744.

Sound level Low Noise unit

Model	OCTAVE BANDS 10m [dB]																TOTAL [dB(A)]	
	63 Hz		125 Hz		250 Hz		500 Hz		1000 Hz		2000 Hz		4000 Hz		8000 Hz		Lp	Lp
	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp	Lw	Lp		
6	61,5	30,5	62	31	61	30	56,5	25,5	52	21	47	16	40	9	31,5	0,5	58	27
8	63,5	32,5	62,5	31,5	62,5	31,5	59	28	51,5	20,5	48,5	17,5	41	10	36	5	60	29
10	66	35	65,5	34,5	65	34	60,5	29,5	55	24	51,5	20,5	44,5	13,5	38,5	7,5	62	31
14	66,5	35,5	67	36	65,5	34,5	62	31	56,5	25,5	51,5	20,5	46	15	37,5	6,5	63	32
16	68,5	37,5	67,5	36,5	68	37	63	32	57,5	26,5	52,5	21,5	48,5	17,5	39,5	8,5	65	34
18	70,5	39,5	69,5	38,5	68,5	37,5	64,5	33,5	58,5	27,5	54,7	23,7	48,5	17,5	39,5	8,5	66	35
21	71,5	40,5	69,5	38,5	70	39	63,6	32,6	60	29	55	24	48,5	17,5	42	11	67	36
25	72,5	41,5	71	40	70,5	39,5	67	36	59	28	56	25	51,5	20,5	42,5	11,5	68	37
28	73	42	71,5	40,5	72	41	66	35	61	30	57,5	26,5	50,5	19,5	44	13	68	37
31	74,5	42,5	73	41	71,5	39,5	68,5	36,5	61,5	29,5	58	26	52,5	20,5	45	13	69	37
37	75	43	73,5	41,5	72,5	40,5	69	37	61,5	29,5	58,5	26,5	52,5	20,5	46	14	70	38
41	80,0	48,0	80,0	48	78,0	46	74,0	42	68,5	36,5	63,0	31	58,0	26	50,0	18	75	43

Lw: sound power values in free field conditions are calculated in accordance with ISO 3744.

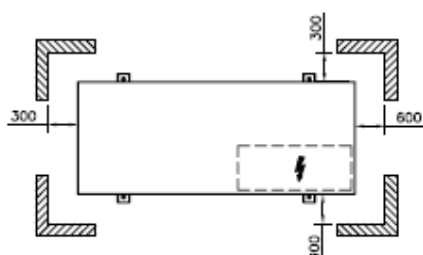
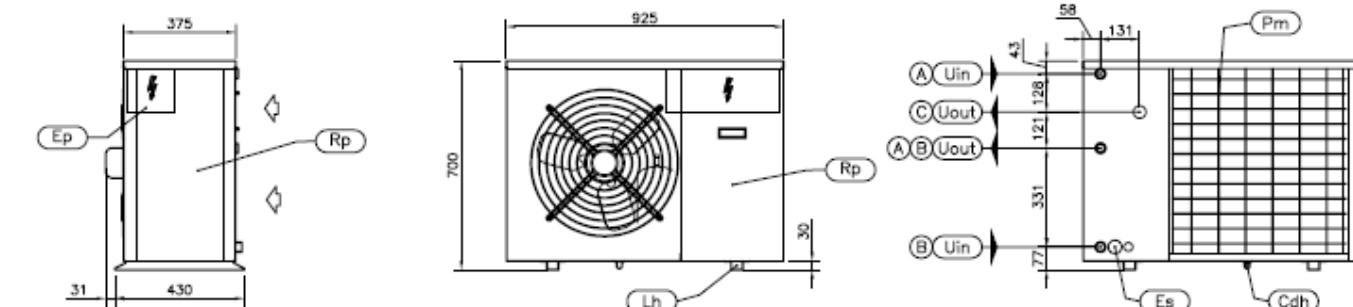
Technical information manual EPSILON-ECHOS

REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

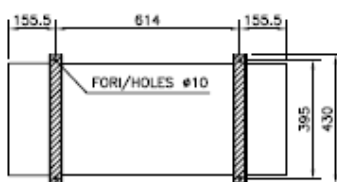
Lp: sound pressure values measured at 10 meter from the unit in free field conditions in compliance with ISO 3744.

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 6-10



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

CONNESSIONI IDRAULICHE/HYDRAULIC CONNECTIONS

- (A) SENZA MODULO IDRAULICO
WITHOUT HYDRAULIC MODULE
- (B) MODULO IDRAULICO ST1P
HYDRAULIC MODULE ST1P
- (C) UNITA' CON RESISTENZA INTEGRATIVA
UNIT WITH INTEGRATION HEATERS

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	700

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH

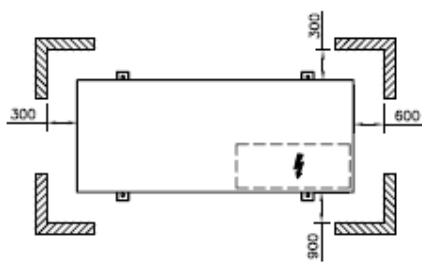
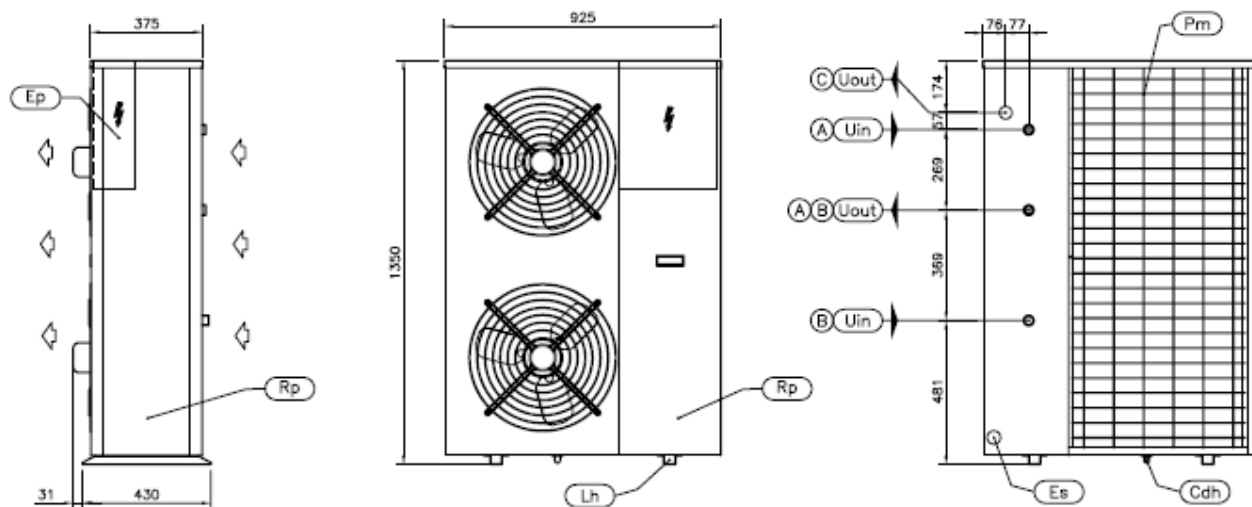
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	
Cdh	SCARICO CONDENSA VERS.HP CONDENSATE DRAIN HP VERSION	Ø18
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" BSPM
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	1" BSPM

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS 6	74	74
EPSILON ECHOS 8	82	82
EPSILON ECHOS 10	89	89
EPSILON ECHOS ST1P 6	83	84
EPSILON ECHOS ST1P 8	91	92
EPSILON ECHOS ST1P 10	98	99
EPSILON ECHOS HP 6	86	86
EPSILON ECHOS HP 8	91	91
EPSILON ECHOS HP 10	95	95
EPSILON ECHOS HP ST1P 6	95	96
EPSILON ECHOS HP ST1P 8	100	101
EPSILON ECHOS HP ST1P 10	104	105

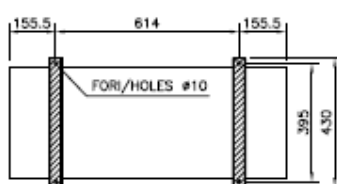
Technical information manual EPSILON-ECHOS
REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 14-18



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

CONNESSIONI IDRAULICHE/HYDRAULIC CONNECTIONS

- (A) SENZA MODULO IDRAULICO
WITHOUT HYDRAULIC MODULE
- (B) MODULO IDRAULICO ST1P
HYDRAULIC MODULE ST1P
- (C) UNITA' CON RESISTENZA INTEGRATIVA
UNIT WITH INTEGRATION HEATERS

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	1350

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH

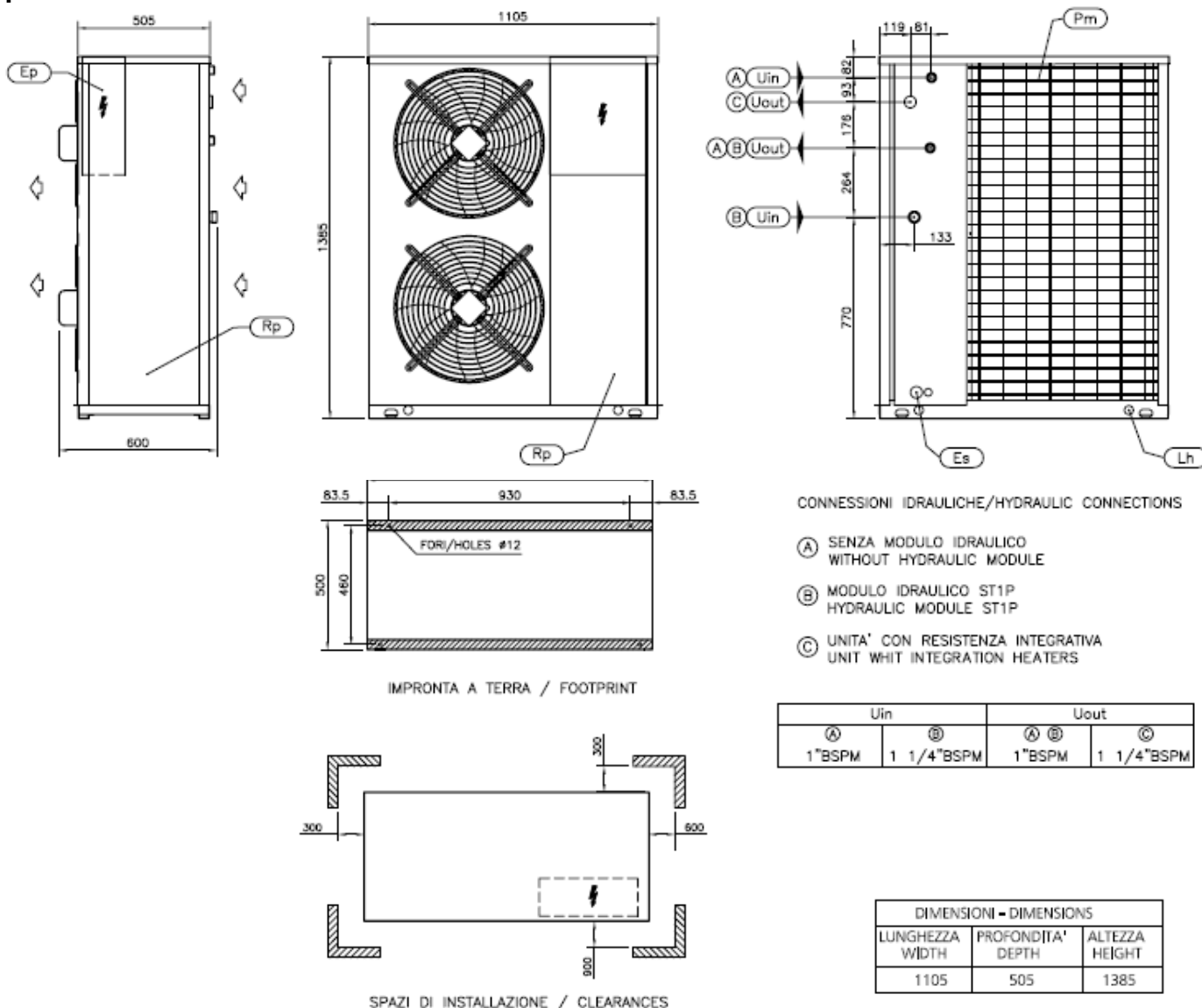
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	
Cdh	SCARICO CONDENSE VERS.HP CONDENSATE DRAIN HP VERSION	Ø18
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" BSPM
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	1" BSPM

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS 14	118	119
EPSILON ECHOS 16	135	136
EPSILON ECHOS 18	147	148
EPSILON ECHOS ST1P 14	133	134
EPSILON ECHOS ST1P 16	150	151
EPSILON ECHOS ST1P 18	162	163
EPSILON ECHOS HP 14	131	132
EPSILON ECHOS HP 16	145	146
EPSILON ECHOS HP 18	161	162
EPSILON ECHOS HP ST1P 14	146	147
EPSILON ECHOS HP ST1P 16	160	161
EPSILON ECHOS HP ST1P 18	176	177

Technical information manual EPSILON-ECHOS
REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 21-28



CONNESSIONI IDRAULICHE/HYDRAULIC CONNECTIONS

- Ⓐ SENZA MODULO IDRAULICO
WITHOUT HYDRAULIC MODULE
- Ⓑ MODULO IDRAULICO ST1P
HYDRAULIC MODULE ST1P
- Ⓒ UNITA' CON RESISTENZA INTEGRATIVA
UNIT WITH INTEGRATION HEATERS

Uin		Uout	
Ⓐ	Ⓑ	Ⓐ Ⓑ	Ⓒ
1" BSPM	1 1/4" BSPM	1" BSPM	1 1/4" BSPM

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1105	505	1385

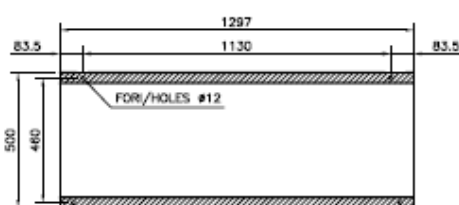
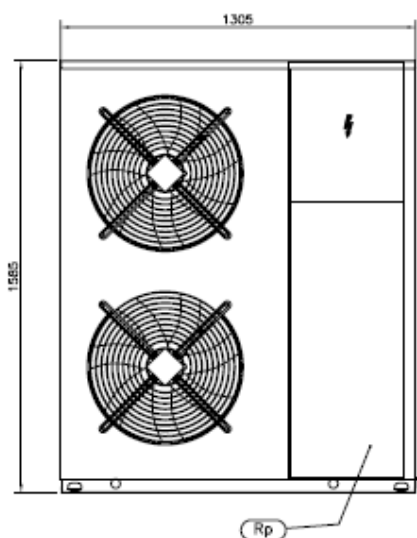
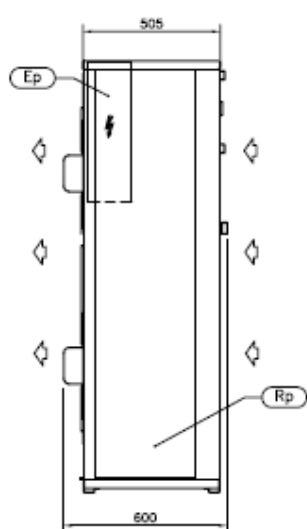
Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	Cdh	SCARICO CONDENSATE VERS.HP CONDENSATE DRAIN HP VERSION $\varnothing 18$
LH	FORI DI SOLLEVAMENTO LIFTING HOLES $\varnothing 34$	Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS 21	178	180
EPSILON ECHOS 25	190	192
EPSILON ECHOS 28	224	226
EPSILON ECHOS ST1P 21	198	200
EPSILON ECHOS ST1P 25	210	212
EPSILON ECHOS ST1P 28	244	246
EPSILON ECHOS HP 21	210	212
EPSILON ECHOS HP 25	218	220
EPSILON ECHOS HP 28	245	247
EPSILON ECHOS HP ST1P 21	230	232
EPSILON ECHOS HP ST1P 25	238	240
EPSILON ECHOS HP ST1P 28	265	267

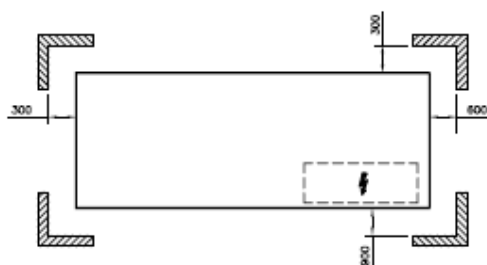
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

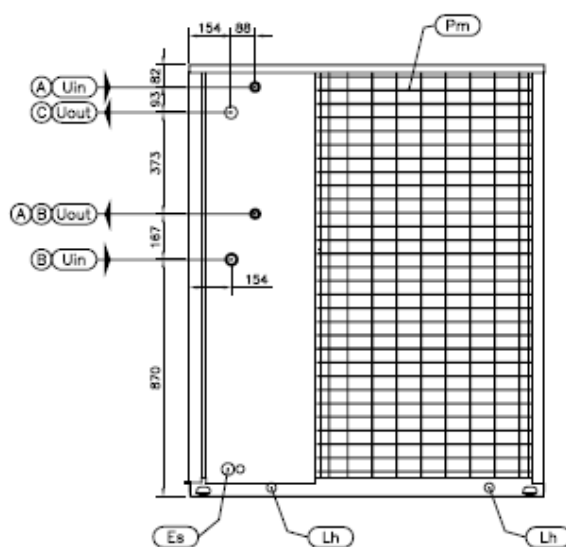
Epsilon Echos 31-41



IMPRONTA A TERRA / FOOTPRINT



SPAZI DI INSTALLAZIONE / CLEARANCES



CONNESSIONI IDRAULICHE/HYDRAULIC CONNECTIONS

- (A) SENZA MODULO IDRAULICO
WITHOUT HYDRAULIC MODULE
- (B) MODULO IDRAULICO ST1P
HYDRAULIC MODULE ST1P
- (C) UNITA' CON RESISTENZA INTEGRATIVA
UNIT WITH INTEGRATION HEATERS

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1305	505	1585

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS 31	324	326
EPSILON ECHOS 37	326	328
EPSILON ECHOS 41	337	339
EPSILON ECHOS ST1P 31	344	346
EPSILON ECHOS ST1P 37	351	353
EPSILON ECHOS ST1P 41	362	364
EPSILON ECHOS HP 31	353	355
EPSILON ECHOS HP 37	358	360
EPSILON ECHOS HP 41	374	376
EPSILON ECHOS HP ST1P 31	373	375
EPSILON ECHOS HP ST1P 37	383	385
EPSILON ECHOS HP ST1P 41	399	401

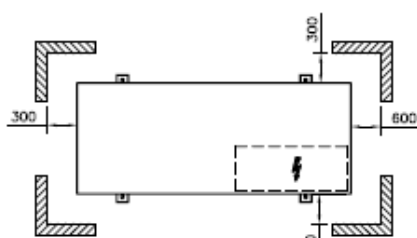
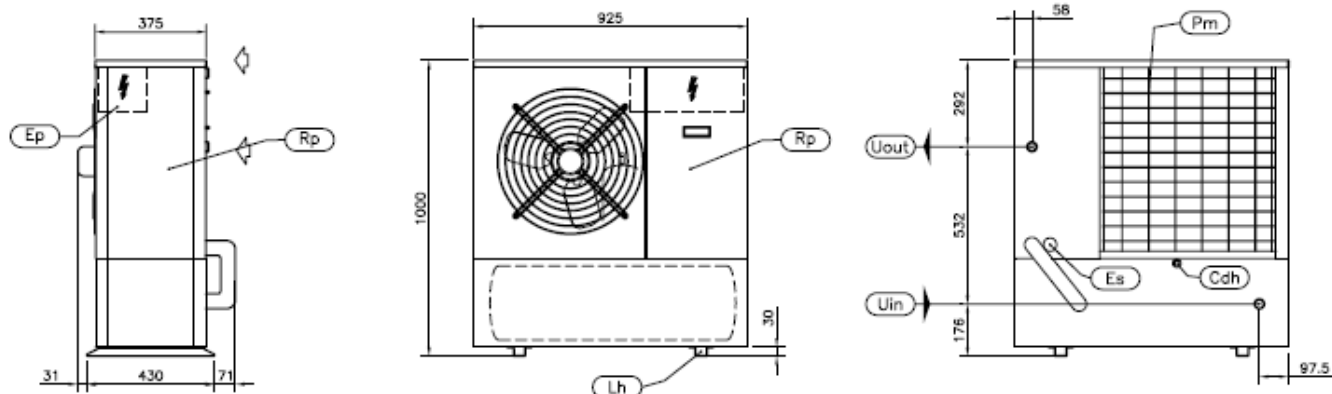
Ep	QUADRO ELETTRICO ELECTRICAL PANEL	
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	
LH	FORI DI SOLLEVAMENTO LIFTING HOLES	Ø34
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	

Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	
Cdh	SCARICO CONDENSA VERS.HP CONDENSATE DRAIN HP VERSION	Ø18
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	
Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET	

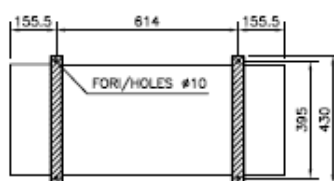
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 6-10 ST1PS (inclusive pump and storage tank)



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	1000

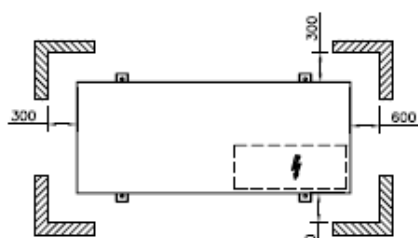
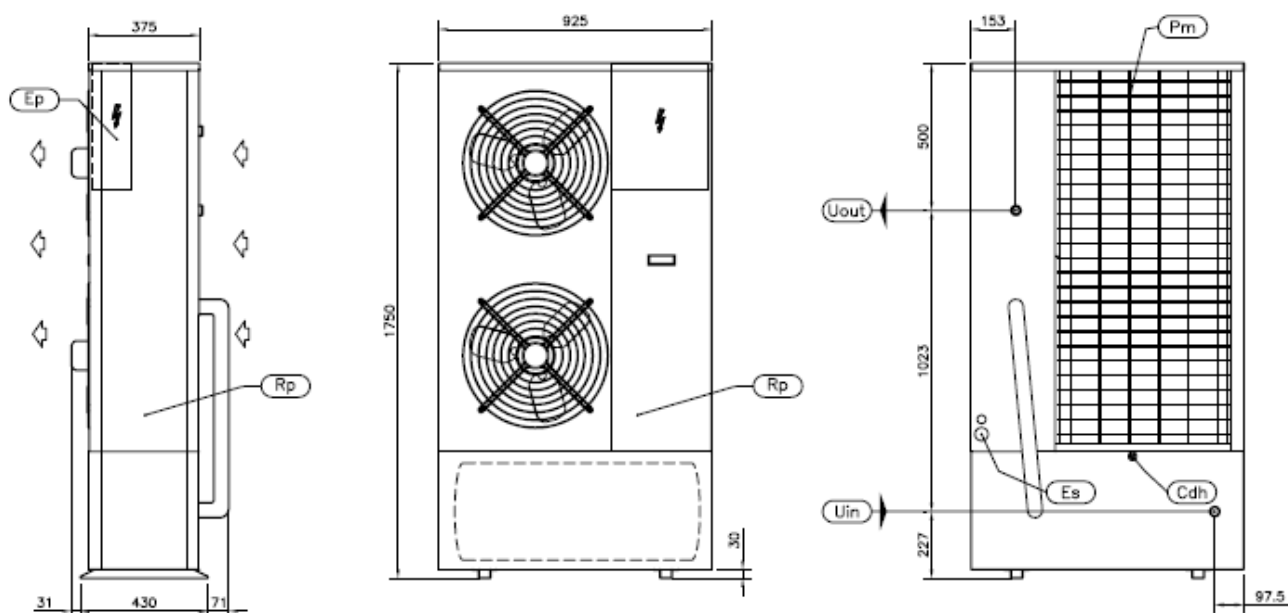
Ep	QUADRO ELETTRICO ELECTRICAL PANEL	Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET	Cdh	SCARICO CONDENSA CONDENSATE DRAIN
Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Ø28	
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" BSPM	
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH	Uout	USCITA ACQUA UTILIZZO USER WATER OUTLET
			1" BSPM

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS ST1PS 6	123	158
EPSILON ECHOS ST1PS 8	131	166
EPSILON ECHOS ST1PS 10	138	173
EPSILON ECHOS HP ST1PS 6	135	170
EPSILON ECHOS HP ST1PS 8	140	175
EPSILON ECHOS HP ST1PS 10	144	179

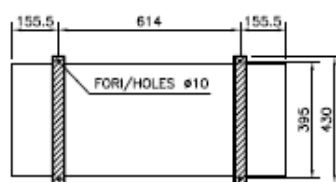
Technical information manual EPSILON-ECHOS
REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 14-18 ST1PS (inclusive pump and storage tank)



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

DIMENSIONI - DIMENSIONS

LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	1750

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
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Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
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Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
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Cdh	SCARICO CONDENSA CONDENSATE DRAIN	Ø18
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Lh	FORI DI SOLLEVAMENTO LIFTING HOLES	Ø28
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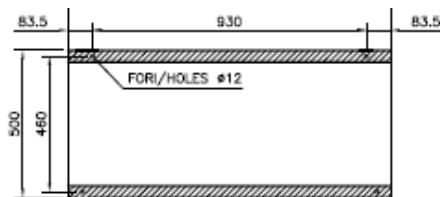
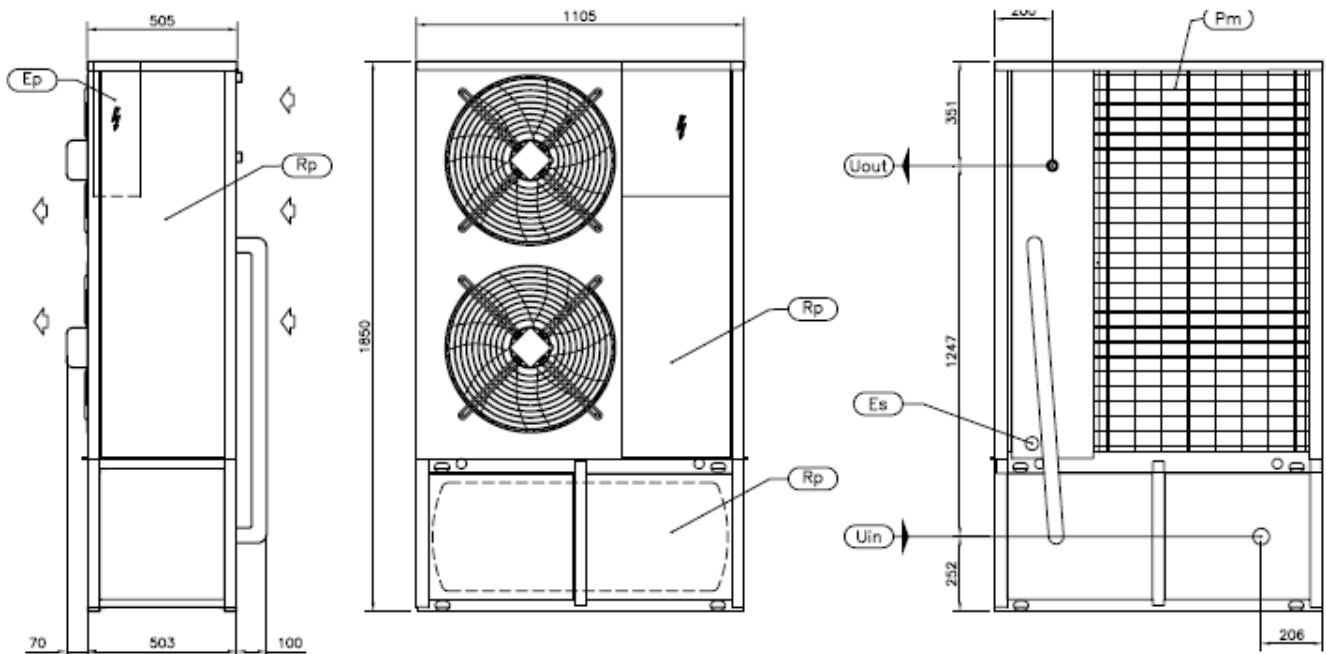
Uin	INGRESSO ACQUA UTILIZZO USER WATER INLET	1" BSPM
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MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS ST1PS 14	183	253
EPSILON ECHOS ST1PS 16	200	270
EPSILON ECHOS ST1PS 18	212	282
EPSILON ECHOS HP ST1PS 14	196	266

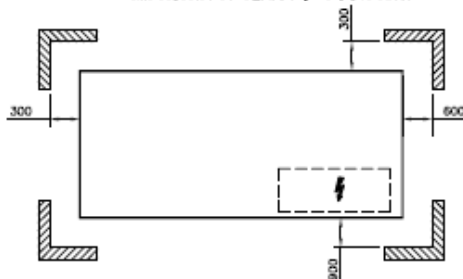
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 21-28 ST1PS (inclusive pump and storage tank)



IMPRONTA A TERRA / FOOTPRINT



SPAZI DI INSTALLAZIONE / CLEARANCES

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1105	505	1850

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET

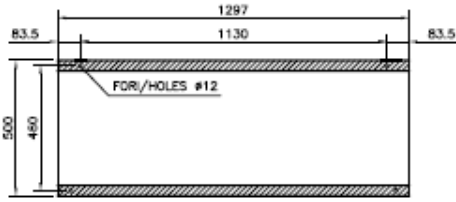
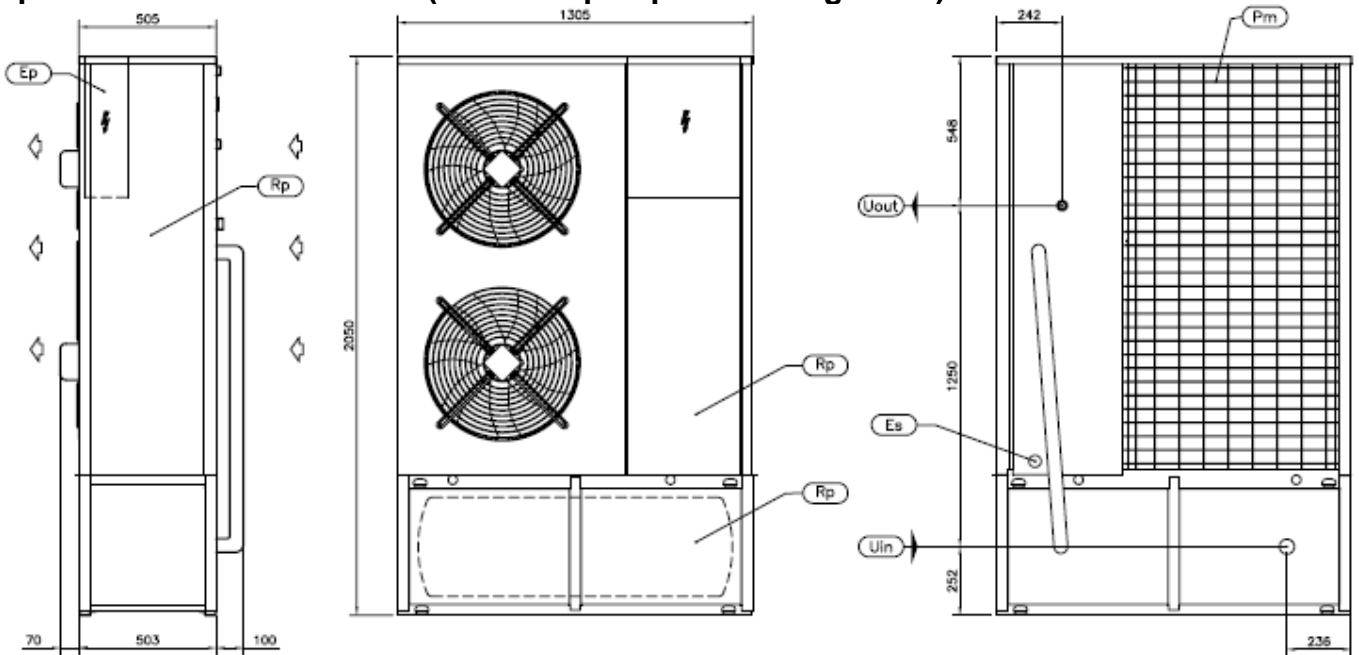
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL	
Cdh	SCARICO CONDENSA CONDENSATE DRAIN	ø18

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS ST 1PS 21	263	378
EPSILON ECHOS ET 1PS 28	325	390

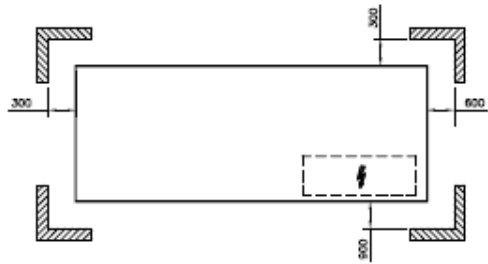
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos 31-41 ST1PS (inclusive pump and storage tank)



IMPRONTA A TERRA / FOOTPRINT



SPAZI DI INSTALLAZIONE / CLEARANCES

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1305	505	2050

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
	INGRESSO ALIMENTAZIONE ELETTRICA

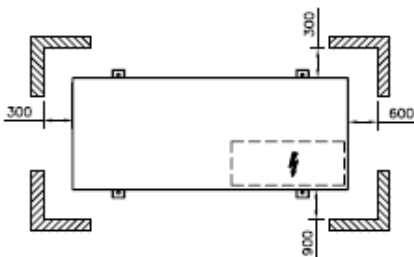
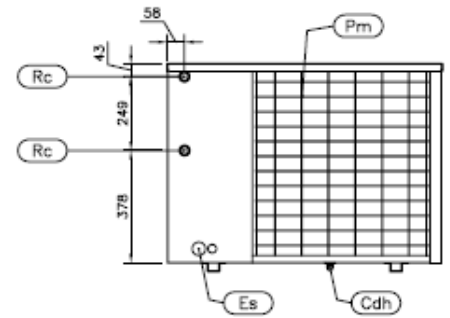
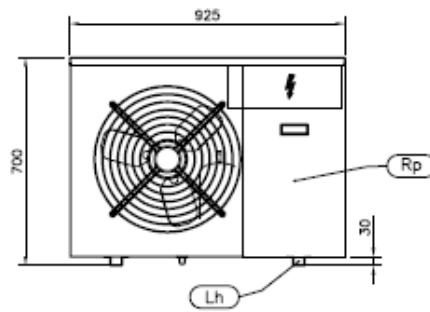
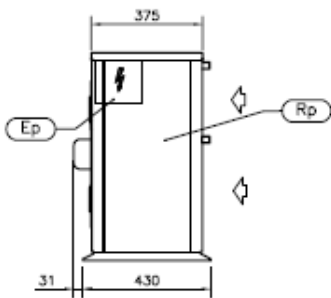
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
	SCARICO CONDENZA

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
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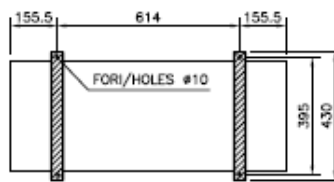
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos LE 6-10



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	700

Ep	QUADRO ELETTRICO ELECTRICAL PANEL
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Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
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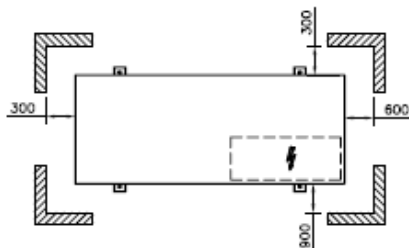
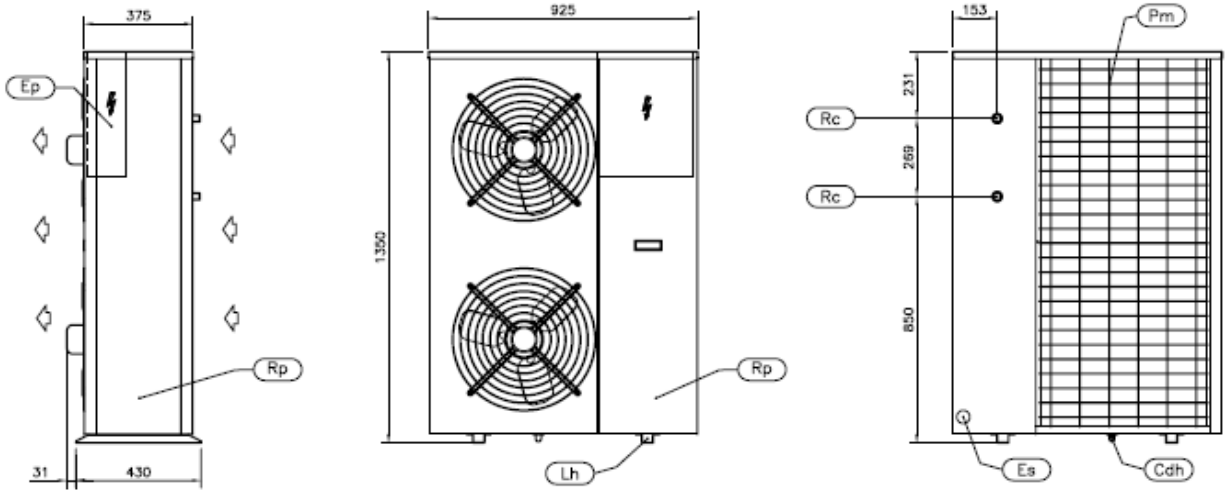
Rc	CONNESSIONI REFRIGERANTE REFRIGERANT CONNECTIONS
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MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS LE 6	71	71

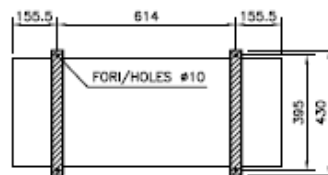
Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos LE 14-18



SPAZI DI INSTALLAZIONE / CLEARANCES



IMPRONTA A TERRA / FOOTPRINT

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
925	375	1350

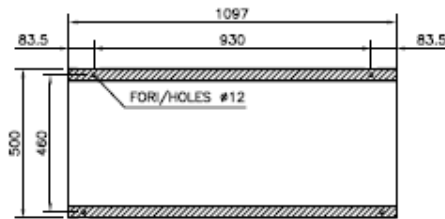
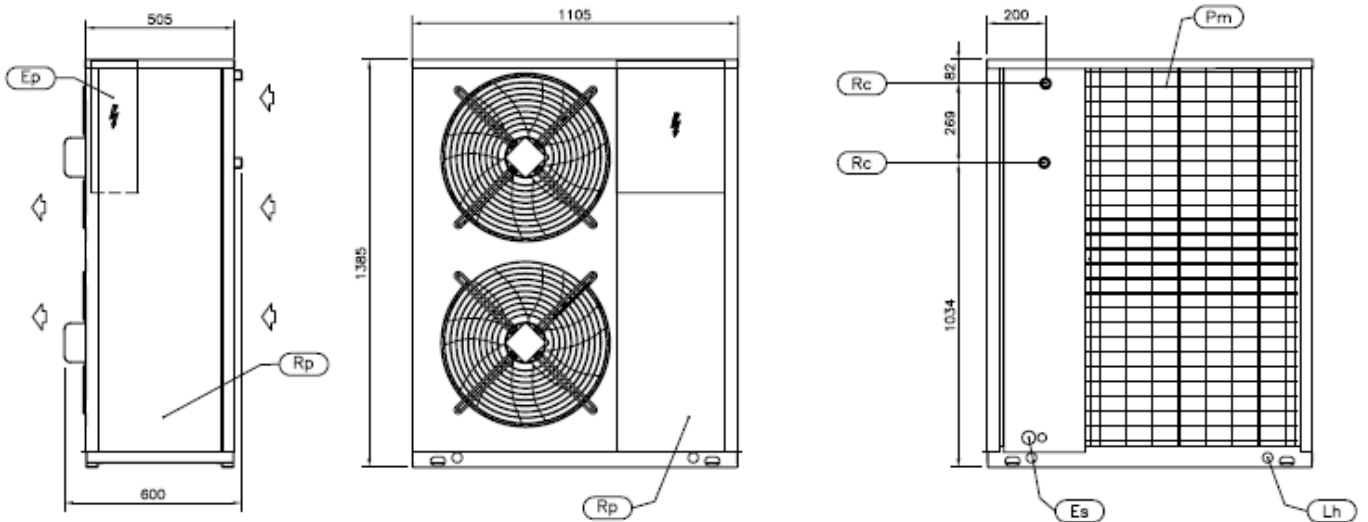
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
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MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
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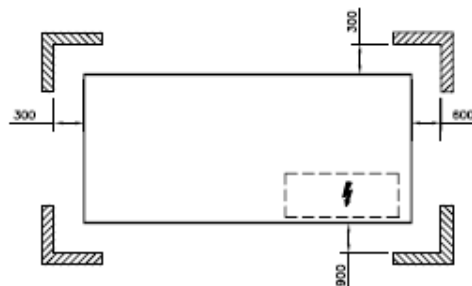
Technical information manual EPSILON-ECHOS
REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos LE 21-28



IMPRONTA A TERRA / FOOTPRINT



SPAZI DI INSTALLAZIONE / CLEARANCES

Technical information manual EPSILON-ECHOS
REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1105	505	1385

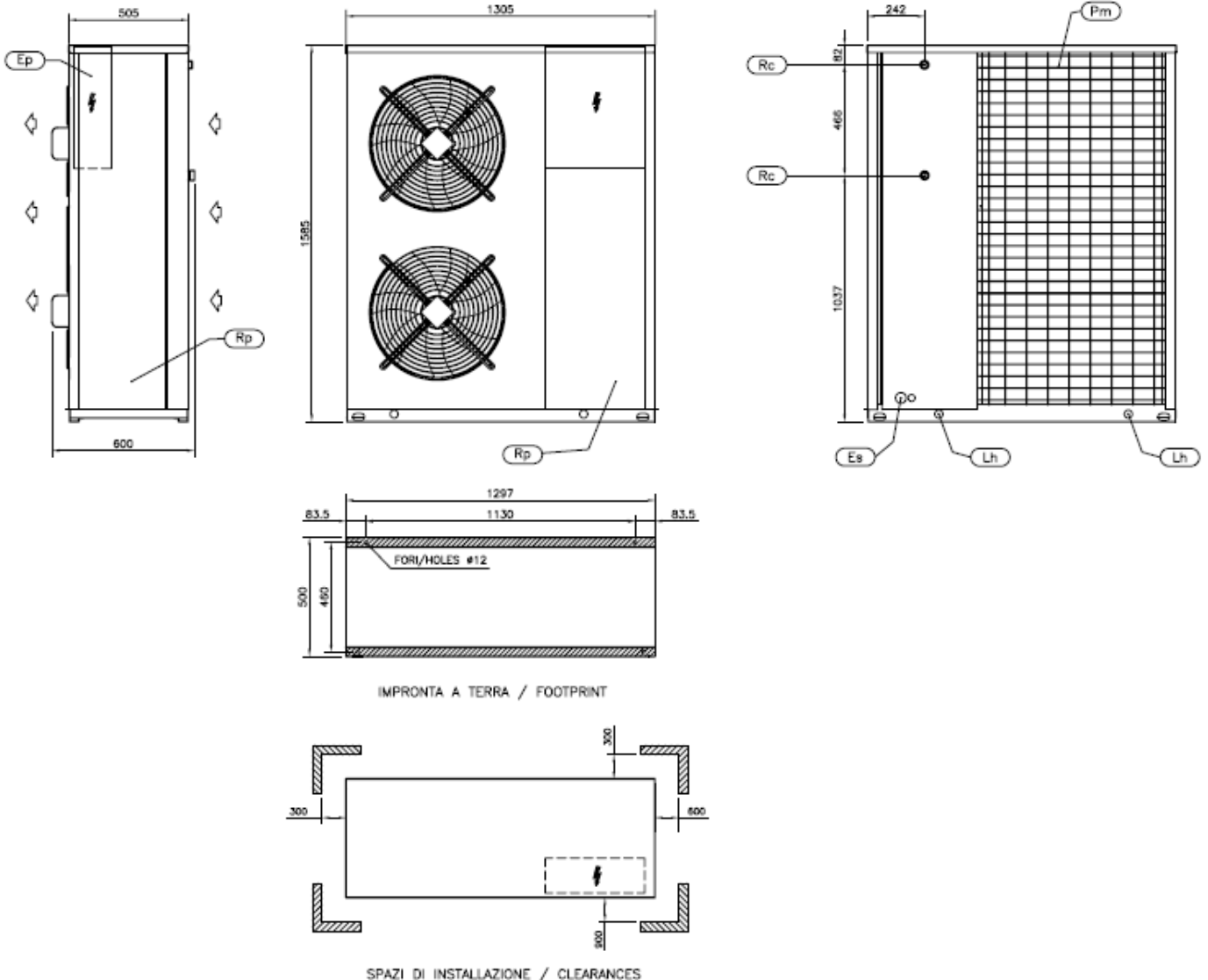
Ep	QUADRO ELETTRICO ELECTRICAL PANEL
Es	INGRESSO ALIMENTAZIONE ELETTRICA ELECTRICAL SUPPLY INLET
LH	FORI DI SOLLEVAMENTO LIFTING HOLES Ø34
Pm	GRIGLIE DI PROTEZIONE PROTECTIVE METAL MESH

Rc	CONNESSIONI REFRIGERANTE REFRIGERANT CONNECTIONS
Rp	PANNELLO ASPORTABILE REMOVABLE PANEL
Cdh	SCARICO CONDENZA VERS.HP CONDENSATE DRAIN HP VERSION Ø18

MODELLO MODEL	PESO WEIGHT (Kg)	PESO IN FUNZIONE OPERATING WEIGHT (Kg)
EPSILON ECHOS LE 21	171	171
EPSILON ECHOS LE 25	183	183
EPSILON ECHOS LE 28	216	216
EPSILON ECHOS LE/HP 21	203	203
EPSILON ECHOS LE/HP 25	211	211
EPSILON ECHOS LE/HP 28	237	237

Overall dimensions, weights, clearances and hydraulic connections

Epsilon Echos LE 31-41



DIMENSIONI - DIMENSIONS		
LUNGHEZZA WIDTH	PROFONDITA' DEPTH	ALTEZZA HEIGHT
1305	505	1585

Technical information manual EPSILON-ECHOS
 REF. EPSILON-ECHOS-10212000302_04.09/EPSILON_ECHOS_2011.DOC

INSTALLATIONS RECOMMENDATIONS

LOCATION

- Strictly allow clearances as indicated in the catalogue.
- Please check that there isn't any obstructions on the suction of the finned coil and on the discharge of the fans
- 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.