LENNOX®

APPLICATION GUIDE

PROVIDING GLOBAL SYSTEM SOLUTIONS

ECOLEAN
EAR / EAC

CONTENTS

The specifications and technical characteristics in this booklet are given for information purposes. The manufacturer reserves the right to modify them without prior notice or obligation to modify in a similar manner, the equipments previously supplied.

INTRODUCTION - DESCRIPTION OF COMPONENTS

In order to meet the final conformity of finished product with the customers' order and the perfect refrigeration and electrical operation of the unit as well, the ECOLEAN chillers are systematically tested in the test station before shipping.

With low dimensions and quiet operation, the ECOLEAN chillers make use of the finest in technology to satisfy the strictest reliability and safety requirements.
ECOLEAN units are equipped with hermetic scroll type compressors . They operate with refrigerant R407C and can be used with R22.

COMPRESSOR
- Scroll type
- Suction gas cooled integral motor
- Crankcase heater
- Direct on line start
- Mounted on high efficiency cellular polyurethane vibration absorbers

PLATE EXCHANGER
- Stainless steel plate brazed.
- Thermal insulation by top grade 10 mm plastic foam

CONDENSER
- Expanded cupper tubes and high efficiency fins
- Axial fans 900 rpm
- Direct coupling

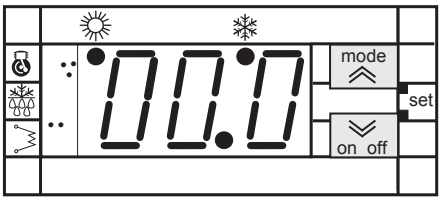
REFRIGERATION CIRCUITS ACCESSORIES
Welded and hermetically sealed and included the following components
– Expansion valve
– Filter drier
– High pressure pressostat with automatic reset
– Low pressure pressostat with automatic reset, heat pump unit incorporates two of them, one for cooling only cycle and other for heat pump.
– Four-way valve (heat pump units only)
– Liquid device (heat pump units only)

ELECTRICAL PANEL
- Unit wiring in compliance with standard EN 60204-1.
- IP 54 water protection.
- Protection fuses for compressor, fan and water pump.
- Compressor, fan and water pump working contactors
- Crankcase heater
- Terminal block and wiring for power supply to the unit.

INTRODUCTION - DESCRIPTION OF COMPONENTS

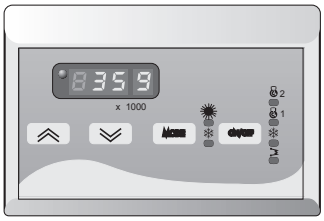
CHASSIS
- Rigid, hot dipped galvanised chassis
- Polyester paint - Colour RAL 9002
- Unit lifting and handling via the base frame

DISPLAY (STANDARD)
(Incorporated in the unit)



CONTROL
- Control and check by microprocessor
- Reading of water and refrigerant temperatures
- Alarm signalling
- Diagnostic per circuit
- Adjustment of temperature setpoints and parameters adapted for operating conditions
- Hour counter and daily balance of operating time for each compressor by "first in/first out" permutation (units with two compressors)
- Remote alarm signal
- Remote control (option)
- Antifreeze protection
- Fan speed control

REMOTE CONTROL (OPTION)



REFRIGERATING OPTIONS
- R22 refrigerant (out of E.E.C., only for EAR, according to european regulation nr 2037/2000)
- HP & LP refrigerant gauges.

SAFETY OPTIONS
1.- Pack Chilled water flow switch + water filter
2.- Pack evaporator antifreeze heater + coil guard (Necessary for ambient temperatures below +5 ºC, water cooler operation)
3.- Hot gas injection valve (Advise for ambient temperatures below +5 ºC, water cooler operation)

HYDRAULIC OPTIONS
- Water single pump only in chiller.
- Isolation valves.

ELECTRICAL OPTIONS
- Door interlocked main switch.
- Three phases protection
- Remote control panel for microprocessor controler
- Serial interface for remote PC

LOW NOISE OPTION
- Compressor noise insulation by sound-proofing foam

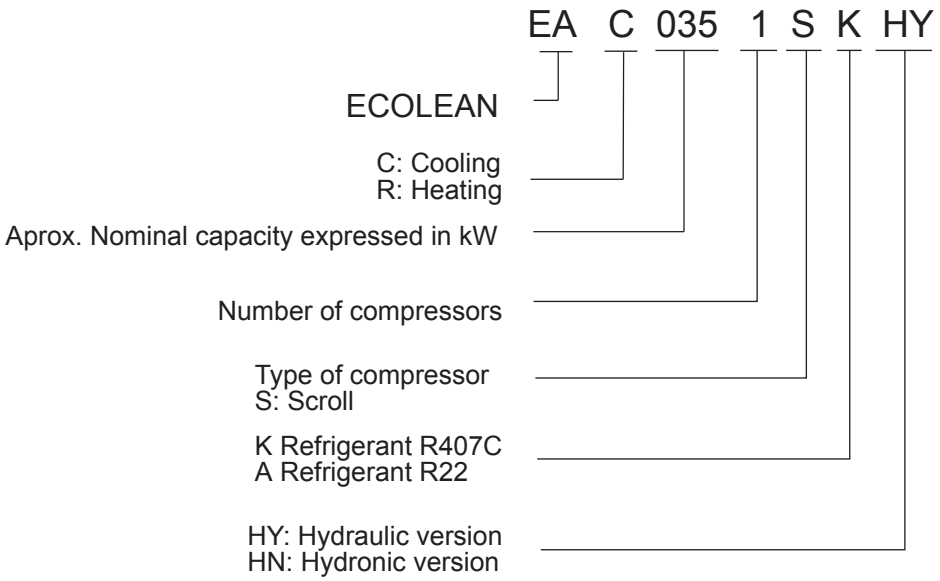
COATING OPTIONS
- Condenser coil with coated aluminium fins

UNIT VERSIONS

- HYDRONIC MODULE ON ECOLEAN UNITS
- Water tank
- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch
- Water tank heater (in option)

- HYDRAULIC MODULE ON ECOLEAN UNITS
- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch

EXAMPLES OF UNITS RANGES DESIGNATIONS



PERFORMANCE TABLES - COOLING MODE

R-407C

TYPES	ºC Water outlet Temperature	Air inlet temperature											
		28°C		30°C		32°C		35°C		40°C		45 °C	
		Qo	P	Qo	P	Qo	P	Qo	P	Qo	P	Qo	P
EAC 0091SK EAR 0091SK	6	8,45	3,07	8,69	3,08	8,44	3,13	8,20	3,18	7,54	3,51	7,01	3,87
	7	8,80	3,11	9,00	3,12	8,75	3,18	8,50	3,23	7,86	3,57	7,35	3,93
	9	9,50	3,19	9,62	3,22	9,36	3,28	9,10	3,34	8,49	3,69	8,03	4,05
	11	10,20	3,27	10,24	3,31	9,97	3,38	9,70	3,44	9,12	3,80	8,72	4,17
EAC 0111SK EAR 0111SK	6	10,44	3,69	10,73	3,70	10,43	3,76	10,13	3,83	9,32	4,23	8,66	4,65
	7	10,87	3,74	11,11	3,76	10,81	3,82	10,50	3,89	9,71	4,30	9,08	4,72
	9	11,73	3,84	11,88	3,88	11,56	3,95	11,24	4,02	10,49	4,44	9,92	4,87
	11	12,60	3,94	12,65	3,99	12,32	4,07	11,98	4,15	11,27	4,58	10,77	5,02
EAC 0151SK EAR 0151SK	6	12,42	4,49	12,77	4,51	12,42	4,58	12,06	4,66	11,09	5,15	10,31	5,67
	7	12,94	4,55	13,23	4,58	12,87	4,66	12,50	4,73	11,56	5,23	10,81	5,75
	9	13,97	4,67	14,15	4,71	13,76	4,80	13,38	4,89	12,49	5,40	11,82	5,93
	11	14,99	4,79	15,06	4,86	14,66	4,95	14,27	5,04	13,42	5,57	12,82	6,10
EAC 0191SK EAR 0191SK	6	16,90	5,80	17,37	5,82	16,88	5,92	16,40	6,01	15,08	6,64	14,02	7,31
	7	17,60	5,88	17,99	5,91	17,50	6,01	17,00	6,11	15,72	6,75	14,70	7,42
	9	18,99	6,04	19,24	6,10	18,72	6,21	18,20	6,32	16,98	6,98	16,07	7,66
	11	20,39	6,20	20,48	6,29	19,94	6,41	19,40	6,53	18,25	7,20	17,44	7,89
EAC 0211SK EAR 0211SK	6	18,39	6,53	18,90	6,54	18,38	6,66	17,85	6,77	16,42	7,48	15,25	8,23
	7	19,15	6,61	19,58	6,65	19,04	6,76	18,50	6,87	17,10	7,60	16,00	8.35
	9	20,67	6,78	20,94	6,85	20,37	6,98	19,81	7,10	18,48	7,84	17,49	8,61
	11	22,19	6,96	22,29	7,06	21,70	7,19	21,12	7,33	19,86	8,09	18,98	8,87
EAC 0251SK EAR 0251SK	6	22,36	8,75	22,99	8,77	22,35	8,92	21,70	9,07	19,96	10,02	18,55	11,03
	7	23,29	8,87	23,81	8,91	23,16	9,07	22,50	9,24	20,80	10,19	19,46	11,20
	9	25,14	9,10	25,46	9,19	24,78	9,36	24,09	9,53	22,48	10,52	21,27	11,55
	11	26,99	9,35	27,11	9,48	26,40	9,66	25,68	9,84	24,15	10,86	23,08	11,90
EAC 0291SK EAR 0291SK	6	25,84	10,11	26,57	10,14	25,82	10,31	25,08	10,48	23,07	11,58	21,44	12,74
	7	26,91	10,24	27,52	10,30	26,76	10,48	26,00	10,66	24,04	11,77	22,48	12,94
	9	29,05	10,52	29,43	10,62	28,63	10,81	27,84	11,01	25,97	12,16	24,58	13,34
	11	31,19	10,79	31,33	10,94	30,50	11,15	29,68	11,36	27,91	12,54	26,67	13,75
EAC 0351SK EAR 0351SK	6	31,81	12,10	32,70	12,13	31,78	12,34	30,87	12,55	28,39	13,86	26,38	15,26
	7	33,12	12,26	33,87	12,32	32,94	12,53	32,00	12,77	29,58	10,09	27,67	15,49
	9	35,75	12,57	36,21	12,69	35,24	12,93	34,26	13,16	31,97	14,54	30,25	15,96
	11	38,39	12,89	38,56	13,07	37,54	13,32	36,52	13,57	34,35	14,99	32,82	16,43
EAC 0431SK EAR 0431SK	6	38,27	15,16	39,34	15,20	38,24	15,46	37,14	15,72	34,16	17,37	31,74	19,12
	7	39,85	15,36	40,75	15,44	39,62	15,50	38,50	15,59	35,59	17,65	33,29	19,41
	9	43,02	15,75	43,57	15,90	42,40	16,19	41,22	16,48	38,46	18,21	36,39	20,00
	11	46,18	16,14	46,39	16,37	45,17	16,68	43,94	16,99	41,32	18,78	39,49	20,58

Qo : Net cooling capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - COOLING MODE

R-407C

TYPES	ºC Water outlet Temperature	Air inlet temperature											
		28°C		30°C		32°C		35°C		40°C		45 °C	
		Qo	P	Qo	P	Qo	P	Qo	P	Qo	P	Qo	P
EAC 0472SK EAR 0472SK	6	43,73	17,40	44,96	17,45	43,70	17,74	42,45	18,04	39,04	19,93	36,28	21,93
	7	45,54	17,63	46,57	17,72	45,29	18,03	44,00	18,31	40,68	20,26	38,05	22,27
	9	49,16	18,08	49,79	18,26	48,45	18,59	47,11	18,93	43,95	20,91	41,59	22,95
	11	52,78	18,55	53,02	18,81	51,62	19,17	50,22	19,53	47,23	21,57	45,13	23,64
EAC 0552SK EAR 0552SK	6	50,69	20,08	52,11	20,14	50,65	20,44	49,20	20,82	45,25	23,00	42,05	25,31
	7	52,79	20,34	53,98	20,45	52,49	20,80	51,00	21,12	47,15	23,38	44,10	25,70
	9	56,98	20,88	57,72	21,08	56,16	21,46	54,60	21,85	50,95	24,13	48,21	26,49
	11	61,18	21,41	61,45	21,71	59,83	22,13	58,21	22,54	54,74	24,90	52,31	27,28
EAC 0672SK EAR 0672SK	6	62,12	24,01	63,86	24,08	62,08	24,49	60,29	24,90	55,46	27,50	51,53	30,26
	7	64,69	24,33	66,15	24,45	64,33	24,88	62,50	25,30	57,78	27,95	54,05	30,73
	9	69,83	24,97	70,73	25,21	68,82	25,67	66,92	26,13	62,43	28,86	59,08	31,68
	11	74,97	25,62	75,31	25,97	73,32	26,47	71,33	26,96	67,09	29,78	64,11	32,63
EAC 0812SK EAR 0812SK	6	74,55	29,28	76,63	29,36	74,49	29,86	72,35	30,36	66,55	33,54	61,84	36,91
	7	77,63	29,66	79,38	29,81	77,19	30,33	75,00	30,88	69,34	34,09	64,85	37,48
	9	83,80	30,43	84,88	30,73	82,59	31,29	80,30	31,85	74,92	35,19	70,89	38,62
	11	89,97	31,22	90,37	31,66	87,99	32,26	85,60	32,86	80,50	36,30	76,93	39,78

Nominal conditions

Qo : Net cooling capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - COOLING MODE

R-22

TYPES	ºC Water outlet Temperature	Air inlet temperature											
		28°C		30°C		32°C		35°C		40°C		45 °C	
		Qo	P	Qo	P	Qo	P	Qo	P	Qo	P	Qo	P
EAR 0091SA	6	8,45	2,80	8,69	2,81	8,44	2,86	8,20	2,91	7,54	3,21	7,01	3,53
	7	8,80	2,84	9,00	2,85	8,75	2,90	8,50	2,95	7,86	3,26	7,35	3,58
	9	9,50	2,91	9,62	2,94	9,36	2,99	9,10	3,05	8,49	3,36	8,03	3,69
	11	10,20	2,98	10,24	3,03	9,97	3,08	9,70	3,14	9,12	3,47	8,72	3,80
EAR 0111SA	6	10,44	3,38	10,73	3,39	10,43	3,45	10,13	3,51	9,32	3,87	8,66	4,25
	7	10,87	3,43	11,11	3,44	10,81	3,50	10,50	3,57	9,71	3,93	9,08	4,32
	9	11,73	3,52	11,88	3,55	11,56	3,61	11,24	3,68	10,49	4,06	9,92	4,45
	11	12,60	3,61	12,65	3,66	12,32	3,73	11,98	3,80	11,27	4,19	10,77	4,59
EAR 0151SA	6	12,42	4,11	12,77	4,13	12,42	4,20	12,06	4,27	11,09	4,71	10,31	5,18
	7	12,94	4,17	13,23	4,19	12,87	4,26	12,50	4,34	11,56	4,79	10,81	5,26
	9	13,97	4,27	14,15	4,32	13,76	4,39	13,38	4,47	12,49	4,94	11,82	5,42
	11	14,99	4,38	15,06	4,44	14,66	4,53	14,27	4,61	13,42	5,09	12,82	5,58
EAR 0191SA	6	16,90	5,30	17,37	5,32	16,88	5,41	16,40	5,49	15,08	6,07	14,02	6,67
	7	17,60	5,37	17,99	5,40	17,50	5,49	17,00	5,59	15,72	6,17	14,70	6,78
	9	18,99	5,52	19,24	5,57	18,72	5,67	18,20	5,77	16,98	6,37	16,07	6,99
	11	20,39	5,66	20,48	5,74	19,94	5,85	19,40	5,96	18,25	6,58	17,44	7,20
EAR 0211SA	6	18,39	5,96	18,90	5,97	18,38	6,08	17,85	6,18	16,42	6,82	15,25	7,50
	7	19,15	6,04	19,58	6,07	19,04	6,17	18,50	6,28	17,10	6,93	16,00	7,62
	9	20,67	6,19	20,94	6,25	20,37	6,37	19,81	6,48	18,48	7,16	17,49	7,85
	11	22,19	6,35	22,29	6,44	21,70	6,56	21,12	6,69	19,86	7,38	18,98	8,09
EAR 0251SA	6	22,36	8,02	22,99	8,04	22,35	8,18	21,70	8,32	19,96	9,18	18,55	10,09
	7	23,29	8,13	23,81	8,17	23,16	8,31	22,50	8,48	20,80	9,33	19,46	10,25
	9	25,14	8,34	25,46	8,42	24,78	8,58	24,09	8,73	22,48	9,63	21,27	10,56
	11	26,99	8,56	27,11	8,68	26,40	8,85	25,68	9,01	24,15	9,94	23,08	10,89
EAR 0291SA	6	25,84	9,27	26,57	9,30	25,82	9,46	25,08	9,61	23,07	10,61	21,44	11,67
	7	26,91	9,39	27,52	9,44	26,76	9,61	26,00	9,79	24,04	10,78	22,48	11,85
	9	29,05	9,64	29,43	9,73	28,63	9,91	27,84	10,09	25,97	11,13	24,58	12,21
	11	31,19	9,89	31,33	10,03	30,50	10,22	29,68	10,41	27,91	11,49	26,67	12,58
EAR 0351SA	6	31,81	11,08	32,70	11,11	31,78	11,30	30,87	11,48	28,39	12,68	26,38	13,95
	7	33,12	11,22	33,87	11,28	32,94	11,47	32,00	11,71	29,58	12,88	27,67	14,16
	9	35,75	11,51	36,21	11,62	35,24	11,83	34,26	12,04	31,97	13,29	30,25	14,59
	11	38,39	11,80	38,56	11,96	37,54	12,19	36,52	12,41	34,35	13,71	32,82	15,02
EAR 0431SA	6	38,27	13,86	39,34	13,90	38,24	14,13	37,14	14,37	34,16	15,87	31,74	17,46
	7	39,85	14,03	40,75	14,11	39,62	14,35	38,50	14,27	35,59	16,12	33,29	17,72
	9	43,02	14,39	43,57	14,53	42,40	14,80	41,22	15,06	38,46	16,63	36,39	18,25
	11	46,18	14,75	46,39	14,96	45,17	15,24	43,94	15,53	41,32	17,15	39,49	18,79

Qo : Net cooling capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - COOLING MODE

R-22

TYPES	ºC Water outlet Temperature	Air inlet temperature											
		28°C		30°C		32°C		35°C		40°C		45 °C	
		Qo	P	Qo	P	Qo	P	Qo	P	Qo	P	Qo	P
EAR 0472SA	6	43,73	15,95	44,96	16,00	43,70	16,27	42,45	16,54	39,04	18,26	36,28	20,08
	7	45,54	16,16	46,57	16,24	45,29	16,52	44,00	16,81	40,68	18,55	38,05	30,38
	9	49,16	16,58	49,79	16,74	48,45	17,04	47,11	17,34	43,95	19,14	41,59	21,00
	11	52,78	17,00	53,02	17,24	51,62	17,56	50,22	17,89	47,23	19,74	45,13	21,60
EAR 0552SA	6	50,69	18,42	52,11	18,47	50,65	18,78	49,20	19,09	45,25	21,08	42,05	23,18
	7	52,79	18,66	53,98	18,75	52,49	19,08	51,00	19,09	47,15	21,42	44,10	23,53
	9	56,98	19,14	57,72	19,32	56,16	19,67	54,60	20,03	50,95	22,10	48,21	24,25
	11	61,18	19,63	61,45	19,90	59,83	20,28	58,21	20,66	54,74	22,80	52,31	24,97
EAR 0672SA	6	62,12	21,98	63,86	22,04	62,08	22,41	60,29	22,79	55,46	25,16	51,53	27,67
	7	64,69	22,27	66,15	22,38	64,33	22,77	62,50	23,19	57,78	25,57	54,05	28,09
	9	69,83	22,85	70,73	23,07	68,82	23,49	66,92	23,91	62,43	26,39	59,08	28,95
	11	74,97	23,44	75,31	23,77	73,32	24,22	71,33	24,67	67,09	27,23	64,11	29,82
EAR 0812SA	6	74,55	26,76	76,63	26,84	74,49	27,29	72,35	27,75	66,55	30,64	61,84	33,70
	7	77,63	27,11	79,38	27,25	77,19	27,73	75,00	28,28	69,34	31,14	64,85	34,22
	9	83,80	27,82	84,88	28,09	82,59	28,60	80,30	29,11	74,92	32,14	70,89	35,26
	11	89,97	28,53	90,37	28,93	87,99	29,48	85,60	30,03	80,50	33,15	76,93	36,31

Qo : Net cooling capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Units are tested and rated in accordance with Eurovent standards

Nominal conditions

PERFORMANCE TABLES - HEATING MODE

R-407C

TYPES	°C Ambient air Temperature	Hot water outlet temperature									
		30°C		35°C		40°C		45°C		50°C	
		Qc	P	Qc	P	Qc	P	Qc	P	Qc	P
EAR 0091SK	11	10,18	2,41	9,90	2,64	9,80	2,89	9,65	3,16	9,35	3,42
	7	9,23	2,37	8,98	2,59	8,84	2,82	8,70	3,08	8,38	3,33
	5	8,77	2,35	8,53	2,56	8,37	2,79	8,22	3,05	7,88	3,28
	-1	7,76	2,29	7,55	2,50	7,34	2,72	7,15	2,97	6,74	3,19
	-5	6,99	2,26	6,79	2,45	6,54	2,67	6,31	2,92	---	---
	-10	5,89	2,22	5,69	2,41	5,39	2,63	---	---	---	---
EAR 0111SK	11	12,52	3,04	12,18	3,33	12,05	3,65	11,86	3,99	11,50	4,32
	7	11,35	2,99	11,04	3,26	10,87	3,56	10,70	3,89	10,30	4,20
	5	10,78	2,96	10,49	3,23	10,30	3,52	10,11	3,84	9,69	4,14
	-1	9,55	2,89	9,28	3,15	9,03	3,42	8,79	3,74	8,29	4,02
	-5	8,60	2,85	8,35	3,09	8,04	3,36	7,76	3,68	---	---
	-10	7,25	2,80	7,00	3,03	6,63	3,31	---	---	---	---
EAR 0151SK	11	15,21	3,62	14,80	3,96	14,64	4,34	14,41	4,74	13,98	5,13
	7	13,79	3,55	13,42	3,88	13,21	4,24	13,00	4,62	12,52	4,99
	5	13,10	3,52	12,75	3,84	12,51	4,19	12,29	4,57	11,77	4,92
	-1	11,60	3,44	11,28	3,74	10,97	4,07	10,68	4,45	10,07	4,78
	-5	10,45	3,39	10,15	3,67	9,77	4,00	9,43	4,37	---	---
	-10	8,81	3,33	8,51	3,61	8,05	3,94	---	---	---	---
EAR 0191SK	11	20,60	4,74	20,03	5,17	19,82	5,66	19,52	6.19	18,92	6,69
	7	18,67	4,64	18,17	5,06	17,88	5,52	17,60	6.03	16,95	6,50
	5	17,74	4,59	17,26	5,00	16,94	5,45	16,64	5,95	15,94	6,40
	-1	15,70	4,48	15,27	4,87	14,85	5,30	14,46	5,78	13,64	6,21
	-5	14,15	4,41	13,74	4,78	13,23	5,20	12,77	5,68	---	---
	-10	11,92	4,33	11,52	4,68	10,90	5,12	---	---	---	---
EAR 0211SK	11	23,29	5,35	22,65	5,82	22,41	6,38	22,07	6,97	21,39	7,54
	7	21,11	5,23	20,54	5,70	20,22	6,22	19,90	6,79	19,16	7,33
	5	20,06	5,17	19,51	5,64	19,15	6,14	18,81	6,70	18,02	7,22
	-1	17,76	5,05	17,27	5,49	16,79	5,97	16,35	6,52	15,42	7,01
	-5	16,00	4,97	15,54	5,39	14,96	5,87	14,43	6,41	---	---
	-10	13,48	4,88	13,02	5,28	12,32	5,77	---	---	---	---
EAR 0251SK	11	27,85	6,93	27,09	7,56	26,80	8,27	26,39	9,02	25,59	9,46
	7	25,25	6,78	24,56	7,38	24,18	8,05	23,80	8,78	22,91	9,32
	5	23,99	6,70	23,34	7,29	22,90	7,94	22,49	8,66	21,55	9,03
	-1	21,24	6,53	20,65	7,09	20,08	7,71	19,55	8,41	18,44	8,87
	-5	19,13	6,41	15,58	6,95	17,89	7,56	17,26	8,26	---	---
	-10	16,12	6,29	15,57	6,80	14,74	7,43	---	---	---	---
EAR 0291SK	11	31,25	7,74	30,39	8,44	30,07	9,24	29,61	10,09	28,70	10,90
	7	28,33	7,57	27,56	8,25	27,13	9,00	26,70	9,80	25,71	10,58
	5	26,91	7,49	26,18	8,15	25,69	8,88	25,24	9,68	24,17	10,42
	-1	23,82	7,30	23,17	7,92	22,52	8,62	21,93	9,40	20,28	10,10
	-5	21,47	7,17	20,84	7,77	20,07	8,46	19,37	9,23	---	---
	-10	18,08	7,04	17,47	7,61	16,53	8,31	---	---	---	---

Qc : Net heating capacity in kW
P : Total power input in kW (compressor and fan motor)
Fouling factor : 0,44 m²C/kW
Water ΔT = 5 °C

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - HEATING MODE

R-407C

TYPES	ºC Ambient air Temperature	Hot water outlet temperature									
		30°C		35°C		40°C		45°C		50°C	
		Qc	P	Qc	P	Qc	P	Qc	P	Qc	P
EAR 0351SK	11	39,09	9,39	38,02	10,24	37,62	11,21	37,04	12,25	35,91	13,24
	7	35,44	9,19	34,47	10,02	33,94	10,93	33,40	11,92	32,16	12,86
	5	33,66	9,09	32,75	9,90	32,14	10,79	31,57	11,77	30,24	12,67
	-1	29,80	8,87	28,98	9,63	28,17	10,18	27,43	11,43	25,88	12,29
	-5	26,85	8,72	26,07	9,45	25,11	10,29	24,22	11,09	---	---
	-10	22,62	8,56	21,86	9,26	20,68	10,12	---	---	---	---
EAR 0431SK	11	48,33	11,70	47,01	12,77	46,51	13,97	45,80	15,26	44,40	16,49
	7	43,82	11,46	42,63	12,48	41,97	13,62	41,30	14,83	39,76	16,01
	5	41,63	11,33	40,49	12,33	39,74	13,44	39,03	14,65	37,39	15,77
	-1	36,85	11,05	35,84	12,00	34,84	13,05	33,92	14,23	32,00	15,30
	-5	33,20	10,86	32,24	11,76	31,04	12,80	29,95	13,98	---	---
	-10	27,97	10,66	27,03	11,52	25,57	12,59	---	---	---	---
EAR 0472SK	11	54,53	13,80	53,04	15,02	52,48	16,41	51,67	17,90	50,10	19,31
	7	49,44	13,46	48,10	14,64	47,35	15,95	46,60	17,40	44,87	18,71
	5	46,97	13,29	45,69	14,44	44,84	15,72	44,04	17,13	42,19	18,42
	-1	41,58	12,92	40,43	14,02	39,31	15,23	38,28	16,60	36,10	17,83
	-5	37,47	12,68	36,38	13,73	35,03	14,93	33,80	16,29	---	---
	-10	31,56	12,42	30,49	13,42	28,86	14,66	---	---	---	---
EAR 0552SK	11	61,20	15,46	59,53	16,82	58,90	18,37	57,99	20,03	56,22	21,60
	7	55,49	15,07	53,58	16,38	53,14	17,84	52,30	19,42	50,35	20,92
	5	52,71	14,87	51,28	16,16	50,32	17,58	49,43	19,15	47,35	20,59
	-1	46,67	14,45	45,38	15,67	44,12	17,03	42,96	18,56	40,52	19,92
	-5	42,05	14,17	40,83	15,34	39,31	16,68	37,93	18,21	---	---
	-10	35,42	13,88	34,22	15,00	32,39	16,38	---	---	---	---
EAR 0672SK	11	76,54	18,93	74,44	20,54	73,65	22,40	72,52	24,38	70,31	26,26
	7	69,39	18,38	67,50	19,94	66,45	21,69	65,40	23,62	62,97	25,37
	5	65,92	18,11	64,12	19,64	62,93	21,35	61,81	23,23	59,21	24,94
	-1	58,36	17,54	56,75	19,00	55,17	20,63	53,72	22,46	50,67	23,60
	-5	52,58	17,17	51,06	18,57	49,16	20,18	47,43	22,21	---	---
	-10	44,30	16,78	42,80	18,12	40,50	19,78	---	---	---	---
EAR 0812SK	11	94,79	23,65	92,19	25,62	91,22	27,91	89,82	30,35	87,08	32,65
	7	85,94	22,90	83,60	24,82	82,31	26,98	81,00	29,38	77,89	31,50
	5	81,64	22,55	79,42	24,43	77,94	26,53	76,56	28,85	73,34	30,95
	-1	72,28	21,80	70,28	23,59	68,33	25,59	66,53	27,85	62,75	29,85
	-5	65,12	21,30	63,23	23,03	60,89	25,01	58,75	27,26	---	---
	-10	54,86	20,79	53,00	22,44	50,16	24,48	---	---	---	---

Nominal conditions

Qc : Net heating capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - HEATING MODE

R-22

TYPES	ºC Ambient air Temperature	Hot water outlet temperature									
		30°C		35°C		40°C		45°C		50°C	
		Qc	P	Qc	P	Qc	P	Qc	P	Qc	P
EAR 0091SA	11	10,49	2,39	10,20	2,44	10,09	2,68	9,94	2,93	9,63	3,17
	7	9,51	2,20	9,25	2,40	9,11	2,62	9,00	2,86	8,63	3,09
	5	9,03	2,18	8,79	2,37	8,62	2,59	8,47	2,82	8,11	3,04
	-1	8,00	2,13	7,78	2,31	7,56	2,52	7,36	2,75	6,94	2,96
	-5	7,20	2,10	7,00	2,27	6,74	2,48	6,50	2,71	---	---
	-10	6,07	2,06	5,86	2,23	5,55	2,44	---	---	---	---
EAR 0111SA	11	12,90	2,83	12,54	3,10	12,41	3,39	12,22	3,70	11,85	4,01
	7	11,69	2,78	11,37	3,03	11,20	3,31	11,00	3,61	10,61	3,90
	5	11,11	2,76	10,81	3,00	10,60	3,27	10,42	3,57	9,98	3,84
	-1	9,83	2,69	9,56	2,93	9,30	3,18	9,05	3,47	8,54	3,73
	-5	8,86	2,65	8,60	2,87	8,28	3,13	7,99	3,42	---	---
	-10	7,47	2,61	7,21	2,82	6,82	3,08	---	---	---	---
EAR 0151SA	11	15,67	3,36	15,24	3,68	15,08	4,03	14,85	4,08	14,39	4,76
	7	14,21	3,31	13,82	3,60	13,61	3,94	13,40	3,97	12,89	4,63
	5	13,50	3,27	13,13	3,57	12,88	3,89	12,66	3,92	12,12	4,57
	-1	11,95	3,20	11,62	3,48	1,130	3,78	11,00	3,81	10,37	4,44
	-5	10,77	3,15	10,45	3,42	10,07	3,72	9,71	4,06	---	---
	-10	9,07	3,10	8,76	3,35	8,29	3,66	---	---	---	---
EAR 0191SA	11	21,22	4,40	20,63	4,80	20,42	5,25	20,10	5,73	19,49	6,20
	7	19,23	4,31	18,71	4,69	18,42	5,12	18,10	5,59	17,45	6,02
	5	18,27	4,26	17,78	4,64	17,44	5,06	17,13	5,51	16,41	5,93
	-1	16,18	4,16	15,73	4,52	15,29	4,91	14,89	5,36	14,04	5,76
	-5	14,57	4,09	14,15	4,43	13,63	4,82	13,15	4,27	---	---
	-10	12,28	4,02	11,86	4,34	11,23	4,75	---	---	---	---
EAR 0211SA	11	23,99	4,94	23,33	5,40	23,08	5,91	22,73	6,45	22,03	6,98
	7	21,75	4,85	21,16	5,28	20,83	5,77	20,50	6,29	19,73	6,78
	5	20,66	4,80	20,10	5,22	19,72	5,69	19,37	6,21	18,56	6,69
	-1	18,29	4,68	17,79	5,09	17,29	5,53	16,84	6,04	15,88	6,49
	-5	16,48	4,61	16,00	4,99	15,41	5,43	14,87	5,94	---	---
	-10	13,88	4,53	13,41	4,90	12,69	5,35	---	---	---	---
EAR 0251SA	11	28,69	6,46	27,90	7,03	27,61	7,69	27,18	8,39	26,35	9,06
	7	26,01	6,31	25,30	6,87	24,91	7,49	24,50	8,16	23,60	8,79
	5	24,71	6,24	24,04	6,79	23,59	7,39	23,17	8,05	22,20	8,66
	-1	21,87	6,08	21,27	6,60	20,68	7,17	20,14	7,82	18,99	8,40
	-5	19,71	5,98	19,14	6,47	18,43	7,04	17,78	7,68	---	---
	-10	16,60	5,87	16,04	6,34	15,18	6,92	---	---	---	---
EAR 0291SA	11	32,18	7,22	31,30	7,86	30,97	8,59	30,49	9,38	29,56	10,13
	7	29,18	7,06	28,38	7,68	27,94	8,38	27,50	9,11	26,48	9,83
	5	27,72	6,98	26,96	7,59	26,46	8,26	25,99	9,00	24,90	9,69
	-1	24,54	6,81	23,86	7,38	23,20	8,02	22,59	8,74	21,31	9,39
	-5	22,11	6,69	21,47	7,24	20,67	7,87	19,95	8,59	---	---
	-10	18,63	6,56	18,00	7,09	17,03	7,74	---	---	---	---

Qc : Net heating capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - HEATING MODE

R-22

TYPES	ºC Ambient air Temperature	Hot water outlet temperature									
		30°C		35°C		40°C		45°C		50°C	
		Qc	P	Qc	P	Qc	P	Qc	P	Qc	P
EAR 0351SA	11	42,26	8,73	39,16	9,52	38,74	10,41	38,15	11,37	36,98	12,28
	7	36,50	8,55	35,51	9,31	34,96	10,16	34,50	11,07	33,12	11,93
	5	34,67	8,46	33,73	9,20	33,10	10,03	32,51	10,93	31,15	17,76
	-1	30,70	8,25	29,85	8,96	29,02	9,74	28,26	10,62	26,65	11,41
	-5	27,66	8,11	26,86	8,79	25,86	9,56	24,95	10,44	---	---
	-10	23,30	7,97	22,51	8,61	21,30	9,41	---	---	---	---
EAR 0431SA	11	49,78	10,87	48,42	11,85	47,91	12,96	47,17	14,15	45,73	15,28
	7	45,13	10,64	43,90	11,58	43,23	12,63	42,50	13,75	40,96	14,84
	5	42,87	10,52	41,71	11,45	40,93	12,47	40,21	13,59	38,51	14,64
	-1	37,96	10,26	36,91	11,14	35,88	12,11	34,94	13,20	32,96	14,18
	-5	34,20	10,08	33,21	10,92	31,98	11,88	30,85	12,97	---	---
	-10	28,81	9,90	27,84	10,70	26,34	11,69	---	---	---	---
EAR 0472SA	11	56,17	12,50	54,63	13,63	54,06	14,91	53,22	16,28	51,60	17,59
	7	50,93	12,19	49,54	13,27	48,77	14,49	48,00	16,17	46,21	17,04
	5	48,38	12,03	47,06	13,10	46,18	14,28	45,37	15,58	43,46	16,77
	-1	42,83	11,69	41,65	12,70	40,49	13,83	39,42	13,94	37,18	16,22
	-5	38,59	11,47	37,47	12,44	36,08	13,55	34,81	15,09	---	---
	-10	32,51	11,23	31,41	12,16	29,72	13,30	---	---	---	---
EAR 0552SA	11	63,040	14,50	61,31	15,75	60,67	17,18	59,73	18,72	57,91	20,17
	7	57,15	14,14	55,60	15,35	54,74	16,70	54,00	18,06	51,86	19,54
	5	54,29	13,96	52,82	15,14	51,83	16,46	50,91	17,91	48,77	19,24
	-1	48,07	13,56	46,74	14,70	45,44	15,95	44,25	17,36	41,73	18,62
	-5	43,31	13,31	42,05	14,39	40,49	15,63	39,07	17,04	---	----
	-10	36,49	13,04	35,25	14,07	33,36	15,35	---	---	---	---
EAR 0672SA	11	78,83	17,60	76,67	19,09	75,86	20,80	74,69	22,64	72,42	24,37
	7	71,47	17,09	69,52	18,53	68,45	20,15	67,50	21,93	64,85	23,55
	5	67,89	16,85	66,05	18,26	64,82	19,84	63,67	21,57	60,99	23,15
	-1	60,11	16,32	58,45	17,67	56,82	19,17	55,33	20,86	52,19	22,37
	-5	54,16	15,98	52,59	17,27	50,64	18,76	48,86	20,44	---	---
	-10	45,63	15,62	44,08	16,86	41,71	18,38	---	---	---	---
EAR 0812SA	11	97,63	21,95	94,96	23,77	93,96	25,89	92,51	28,14	89,69	30,26
	7	88,52	21,27	86,11	23,03	84,78	25,03	83,50	27,24	80,32	29,20
	5	84,09	20,94	81,80	22,67	80,28	24,61	78,85	26,75	75,54	28,69
	-1	74,44	20,25	72,39	21,90	70,38	23,75	68,53	25,83	64,63	27,68
	-5	67,08	19,79	65,13	21,39	62,71	23,21	60,51	25,29	---	---
	-10	56,51	19,32	54,59	20,84	51,66	22,72	---	----	---	---

Qc : Net heating capacity in kW

P : Total power input in kW (compressor and fan motor)

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 ºC

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

TECHNICAL DATA

COMPRESSORS AND REFRIGERANT CIRCUITS

TYPE			0091S	0111S	0151S	0191S	0211S	0251S	0291S
Compressor type			Scroll						
Number of compressors / Number of circuits			1 / 1						
Capacity steps for compressor		%	0-100						
Refrigerant charge per circuit	Kg	R-407C							
		R-22							
Oil charge per compressor		l	1,1	1,1	1,55	1,64	4	4	4
Crankcase heater per compressor		W	40	40	70	70	70	70	70

TYPE			0351S	0431S	0472S	0552S	0672S	0812S
Compressor type			Scroll					
Number of compressors / Number of circuits			1 / 1		2/2 (EAR UNITS) (2/1) (EAC UNITS)			
Capacity steps for each compressor		%	0-100		0-50-100			
Refrigerant charge per circuit	Kg	R-407C						
		R-22						
Oil charge per compressor		l	4	4,1	4	4	4	4,1
Crankcase heater per compressor		W	70	70	70	70	70	70

PLATES EXCHANGERS

TYPE			0091S	0111S	0151S	0191S	0211S	0251S	0291S
Number			1						
Water volume	dm^3	EAC	1,1		1,7		2,2		2,8
		EAR	1,1		1,7		2,2		2,8
Water piping (female - threaded)		inch	1" G					1 1/2" G	
Test pressure - Bar	Water		15	15	15	15	15	15	15
	Refrigerant		32	32	32	32	32	32	32
Operating pressure - Bar	Water		10	10	10	10	10	10	10
	Refrigerant	EAC	17	17	17	17	17	17	17
		EAR	28	28	28	28	28	28	28

TYPE			0351S	0431S	0472S	0552S	0672S	0812S
Number			1					
Water volume	dm^3	EAC	3,5	4,7	4,7	5,9	7,0	9,4
		EAR	3,5	4,7	4,9	5,4	6,8	9
Water piping (female - threaded)		inch	1 1/2" G		2" G			
Test pressure - Bar	Water		15	15	15	15	15	15
	Refrigerant		32	32	32	32	32	32
Operating pressure - Bar	Water		10	10	10	10	10	10
	Refrigerant	EAC	17	17	17	17	17	17
		EAR	28	28	28	28	28	28

TECHNICAL DATA

FANS

TYPE		0091S	0111S	0151S	0191S	0211S	0251S	0291S
Fan type		Axial - Direct coupling 900 rpm						
Fan number		1	2				1	
Air flow rate	m^3/h	3500	6500	6700	6500	6300	9500	11500
Power input	KW.	0,15	0,30	0,32	0,30	0,28	0,75	0,90

TYPE		0351S	0431S	0472S	0552S	0672S	0812S
Fan type		Axial - Direct coupling 900 rpm					
Fan number		1		2			
Air flow rate	m^3/h	11000	10500	19000	23000	22000	21000
Power input	KW.	0,85	0,83	1,50	1,80	1,70	1,66

ELECTRICAL DATA

R-407C / R-22

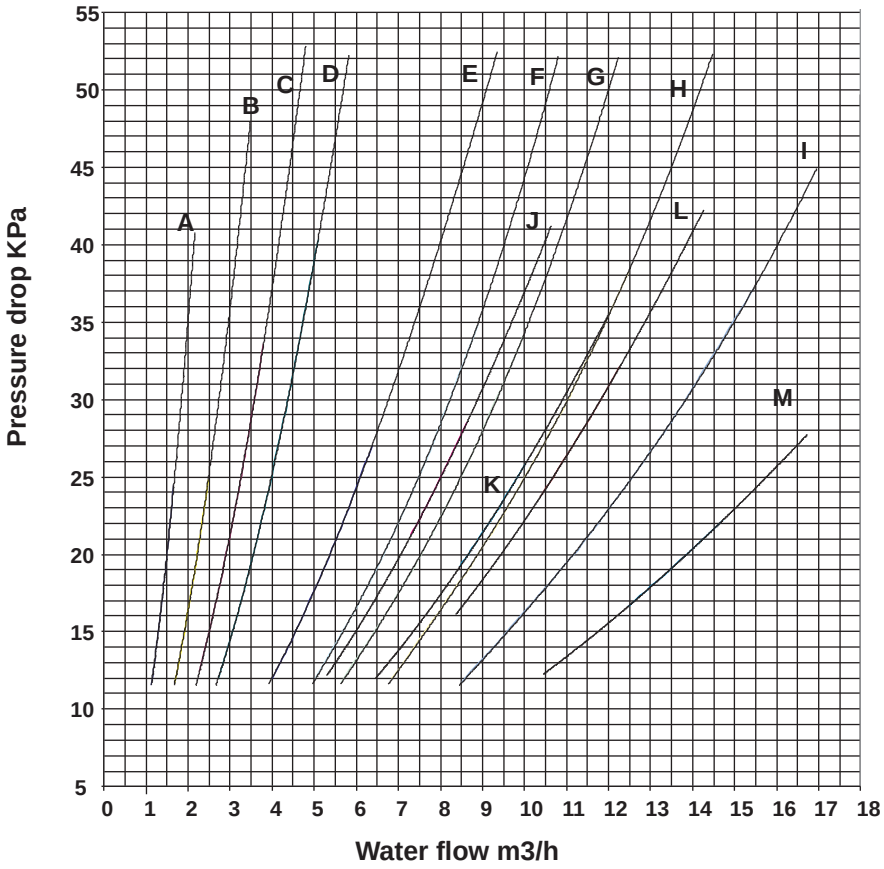
OPERATING RANGES

TYPE		0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0471S	0551S	0671S	0811S
Maxi power (kW)		4,2	5,0	6,1	7,9	8,9	11,9	13,8	16,4	20,6	23,6	27,3	32,6	39,8
Maxi current (A)	230/ I	20,33	---	---	---	---	---	---	---	---	---	---	---	---
	230/ III	13,83	19,76	23,76	28,26	26,36	36,2	41.8	51,2	59,3	71,4	82,6	101,4	117,6
	400/ III	8,63	12,26	14,66	18,26	17,36	23	26,7	31,6	35,8	45	52,4	62,2	70,6
Direct start up current (A)	230/ I	101,63	---	---	---	---	---	---	---	---	---	---	---	---
	230/ III	81,63	89,26	117,26	177,26	176,26	226	241	299	351	261.2	281,8	349,2	409,3
	400/ III	47,63	52,26	68,26	103,26	101,26	128	133	173	204	150	158,7	203,6	238,8

Not incluyed water pump valves of the hydronic or hydraulic module (see page 21)
Maximum power calculated for compressor operation at +12,5/65°C

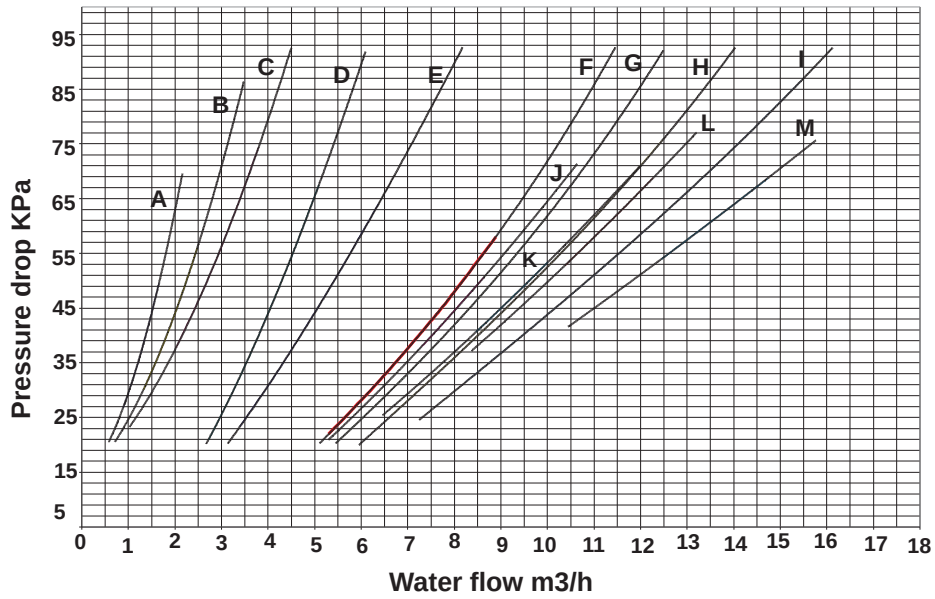
WATER PRESSURE DROP

WATER PRESSURE DROP IN WATER EXCHANGER (STANDARD UNIT)



Unit	Curve
EAC/EAR 0091S	A
EAC/EAR 0111S	A
EAC/EAR 0151S	B
EAC/EAR 0191S	B
EAC/EAR 0211S	C
EAC/EAR 0251S	C
EAC/EAR 0291S	D
EAC/EAR 0351S	E
EAC/EAR 0431S	F
EAC 0472S	J
EAR 0472S	F
EAC 0552S	K
EAR 0552S	G
EAC 0672S	L
EAR 0672S	H
EAC 0812S	M
EAR 0812S	I

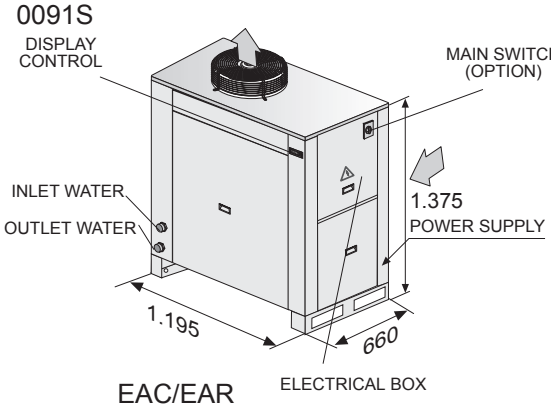
WATER PRESSURE DROP WATER EXCHANGER+WATER FILTER (OPTIONAL)



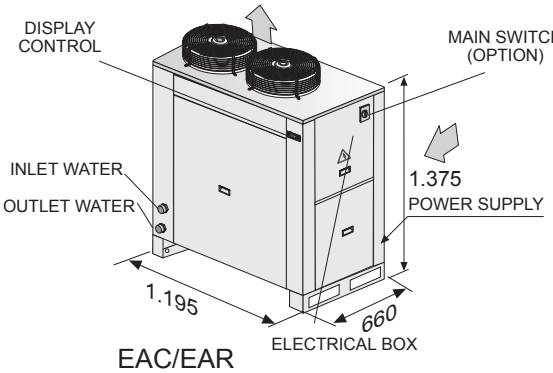
INSTALLATION ADVISE
The units MUST be fitted with a water filter at the inlet to the unit (trapping any particules with a diameter grater than 1 mm.)

DIMENSIONAL DATA

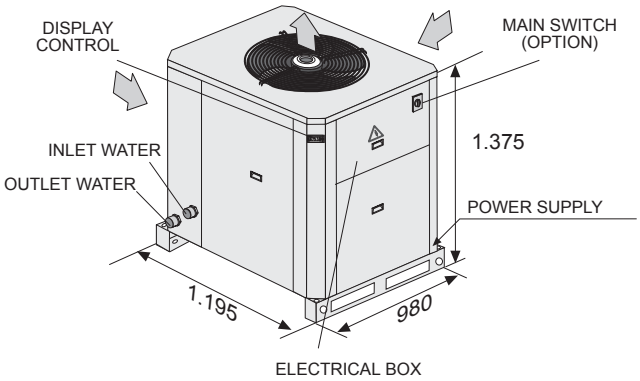
1 EAC/EAR
0091S



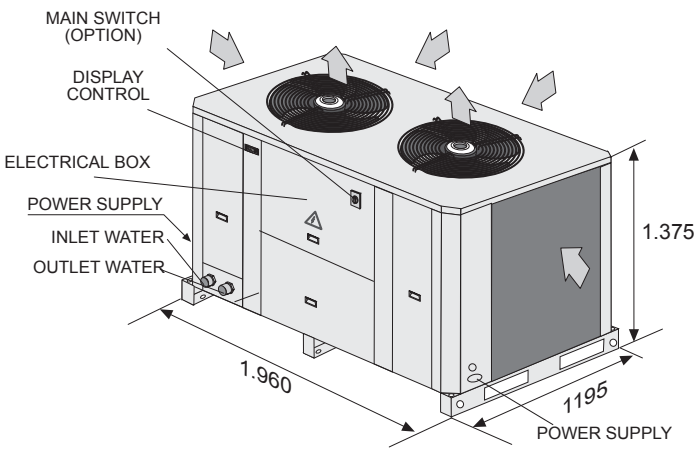
2 EAC/EAR
0111S-0151S-0191S-0211S



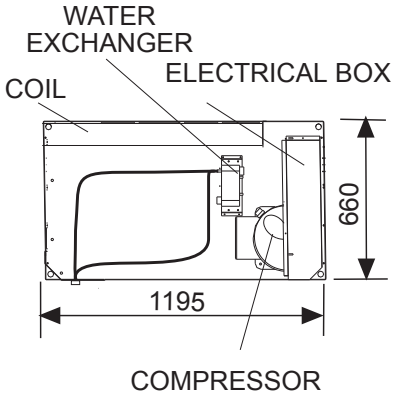
3 EAC/EAR
0251S-0291S-0351S-0431S



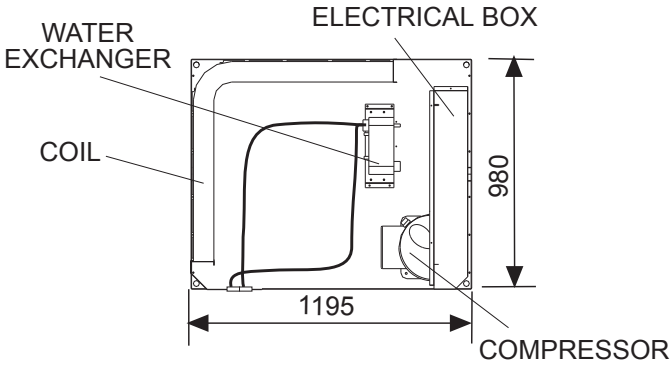
4 EAC/EAR
0472S-0552S-0672S-0812S



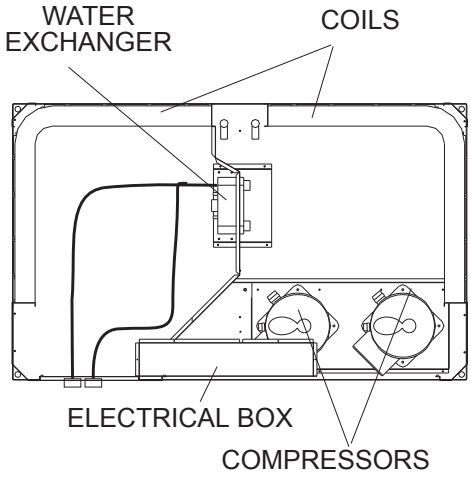
1 / 2 COMPONENT DISPOSITION
(STANDARD UNIT)



3 COMPONENT DISPOSITION
(STANDARD UNIT)



4 COMPONENT DISPOSITION
(STANDARD UNIT)



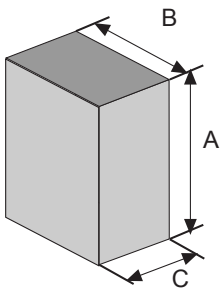
DIMENSIONAL DATA AND WEIGHTS

TYPE	EAC / EAR	0091S	0111S	0151S	0191S	0211S	0251S	0291S
A - Height	mm	1375	1375	1375	1375	1375	1375	1375
B - Width	mm	1195	1195	1195	1195	1195	1195	1195
C - Depth	mm	660	660	660	660	660	980	980
Operating weight (*)	EAC	147	155	168	181	245	272	281
kg	EAR	150	158	172	186	250	277	286

(*) Not incluyed hydraulic or hydronic module (see page 21)

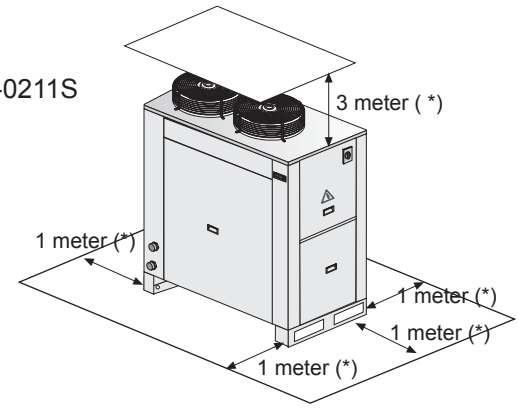
TYPE	EAC / EAR	0351S	0431S	0472S	0552S	0672S	0812S
A - Height	mm	1375	1375	1375	1375	1375	1375
B - Width	mm	1195	1195	1960	1960	1960	1960
C - Depth	mm	980	980	1195	1195	1195	1195
Operating weight (*)	EAC	309	345	540	551	596	670
kg	EAR	317	353	549	562	612	686

(*) Not incluyed hydraulic or hydronic module (see page 21)



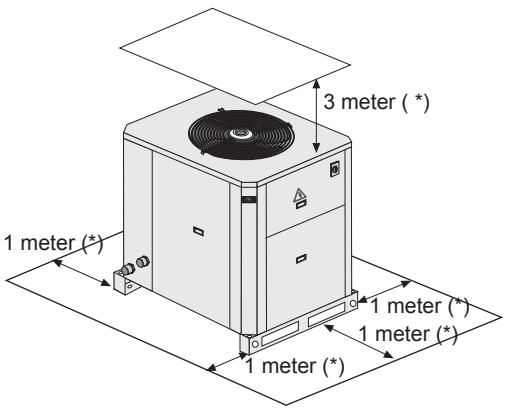
SERVICE AREAS

EAC/EAR
0091S-0111S-0151S-0191S-0211S



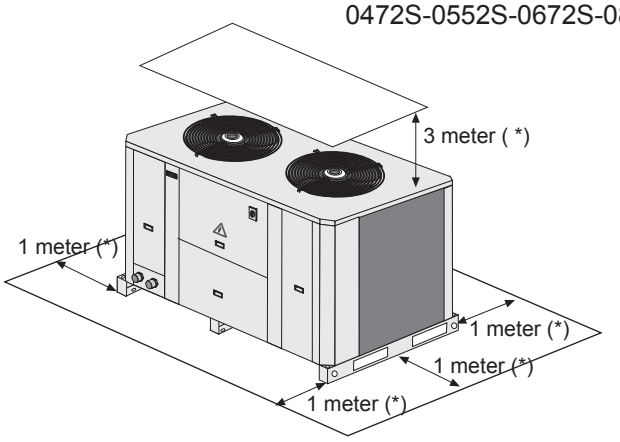
(*) Keep this space free around the unit for installation

EAC/EAR
0251S-0291S-0351S-0431S



(*) Keep this space free around the unit for installation

EAC/EAR
0472S-0552S-0672S-0812S



(*) Keep this space free around the unit for installation

NOISE LEVELS

Standard units

EAC EAR	Spectrum per octave band (dBA)								Global sound power dB(A)	Sound pressure at 10 m.(dBA)
	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz		
0091S	74,6	61,8	57,6	58,3	56,8	54,9	56,9	54,8	63,5	35,5
0111S	77,6	64,8	60,6	62,1	60,9	57,6	59,2	57,8	66,7	38,7
0151S	77,6	64,8	60,7	62,5	62,2	58,9	57,3	57,8	67,0	39,0
0191S	77,6	64,8	60,6	62,8	64,4	63,8	62,0	57,8	69,8	41,8
0211S	77,6	64,8	61,1	68,2	65,5	66,1	62,4	58,1	71,8	43,8
0251S	81,7	68,9	64,8	69,4	66,5	69,1	62,4	53,0	73,7	45,7
0291S	78,1	75,4	67,4	72,5	71,7	72,1	65,0	57,6	77,1	49,1
0351S	78,1	75,4	67,4	70,8	71,6	72,9	68,8	59,2	77,6	49,6
0431S	78,1	75,4	67,5	72,8	71,7	74,2	67,4	58,4	78,3	50,3
0472S	84,7	71,9	67,8	72,4	69,5	72,1	67,2	54,9	76,7	48,7
0552S	81,1	78,4	70,4	75,5	75,7	75,1	68,0	60,3	80,1	52,1
0672S	81,1	78,4	70,4	73,8	74,6	75,9	71,8	60,3	80,6	52,6
0812S	81,1	78,4	70,5	75,8	74,7	77,2	70,4	60,3	81,3	53,3

Global sound power level measured in compliance with ISO standard 3744 and under Eurovent certification programm

Sound pressure in dB(A) calculated at 10 m, in a free field on a reflecting surface, is given as a guide only.

Only the sound power spectrum and the global sound power value are used in determining pressure characteristics on site.

OPERATION LIMITS

COOLING OPERATION

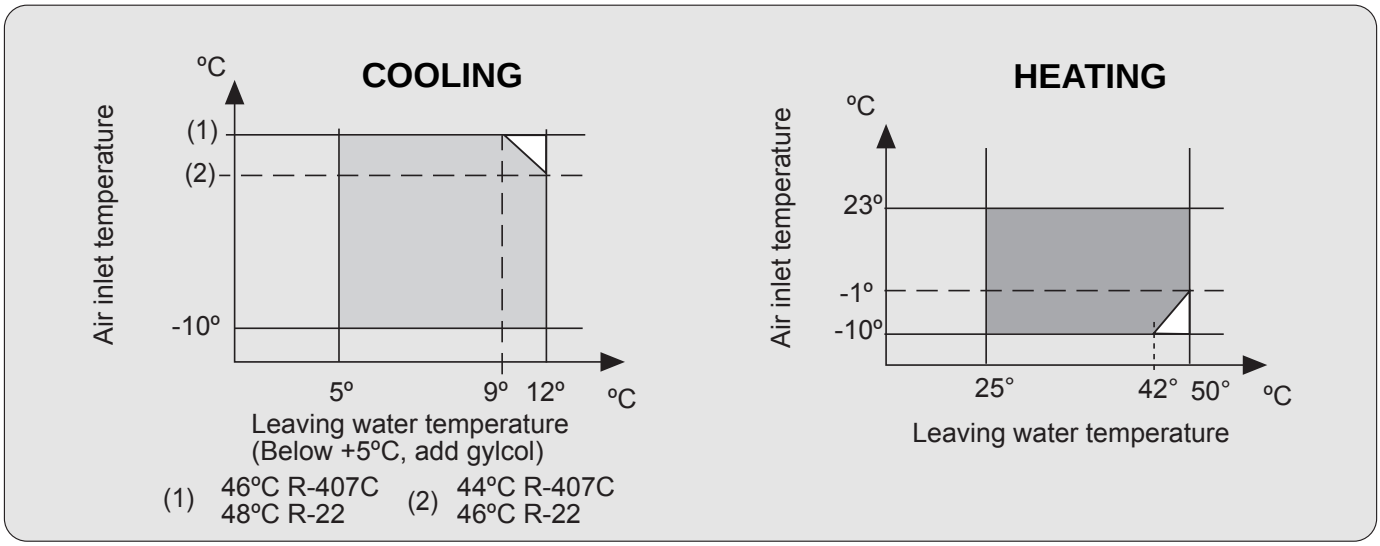
TYPE EAC / EAR		0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Leaving chilled water temperature (1)		Minimum : +5°C Maximum : +12°C												
Chilled water entering temperature		Minimum : +10 °C Maximum : +17°C												
Air inlet temperature	R-407C	Minimum : -10°C Maximum : +46°C												
	R-22	Minimum : -10°C Maximum : +48°C												

(1) : Below +5°C, add glycol to the cooling fluid.

HEATING OPERATION

TYPE EAR	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Hot water leaving temperature (operation)	Minimum : +25°C Maximum : +50°C												
Hot water entering temperature (start)	Minimum : +10 °C Maximum : +43°C												
Differenced hot water inlet/outlet	Minimum :+3°C Maximum : +8°C												
Air inlet temperature	Minimum : -10°C Maximum : +23°C												

OUTSIDE THESE VALUES, PLEASE CONSULT US.



CONTENTS

INTRODUCTION - DESCRIPTION OF THE COMPONENTS

DESCRIPTION

- All accesories hydraulic are integrated in the standard unit caising
- Packaged, galvanized welded profile base frame
- Piping from pump outlet to evaporator inlet located inside the unit

AVAILABLE EQUIPMENTS FOR.

HYDRONIC MODULE:

- Water tank
- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch

HYDRAULIC MODULE:

- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch

TECHNICAL DATA

TYPE		0091S	0111S	0151S	0191S	0211S	0251S	0291S
Expansion vessel								
Capacity	l	5	5	5	5	5	12	12
Max.pressure	bar	4						
Pressure available (nominal air flow)	KPa	208	178	177	157	153	152	136
Water flow rate	l/s.	0,41	0,50	0,60	0,81	0,88	1,08	1,24
Net weight (add to the unit weight)	Kg	44	44	44	45	45	47	47
Hydraulic connections		1"G	1"G	1"G	1"G	1"G	1 1/2"G	1 1/2"G
Water tank (1)	l	50	50	50	50	50	75	75

TYPE		0351S	0431S	0472S	0552S	0672S	0812S
Expansion vessel							
Capacity	l	12	12	18	18	18	18
Max.pressure	bar	4					
Pressure available (nominal air flow)	KPa	159	118	140	133	185	143
Water flow rate	l/s.	1,53	1,84	2,10	2,44	2,99	3,58
Net weight (add to the unit weight)	Kg	48	48	55	55	57	57
Hydraulic connections		1 1/2"G	1 1/2"G	2"G	2"G	2"G	2"G
Water tank (1)	l	75	75	100	100	100	100

(1) Only in units with hydronic module

SINGLE PUMP

TYPE		0091S	0111S	0151S	0191S	0211S	0251S	0291S
Pump								
Type		Horizontal multistage cetrifugal pump						
Voltage	V.	230/I			230-400/III			
Power	kW	0,49	0,49	0,49	0,72	0,72	0,72	0,72
Maxi current	A	2,3	2,3	2,3	2,4-1,4	2,4-1,4	2,4-1,4	2,4-1,4

TYPE		0351S	0431S	0472S	0552S	0672S	0812S
Pump							
Type		Horizontal multistage cetrifugal pump					
Voltage	V.	230-400/III					
Power	kW	1	1	1,17	1,17	1,55	1,55
Maxi current	A	3,0-1,7	3,0-1,7	3,0-2,1	3,0-2,1	4,8-2,8	4,8-2,8

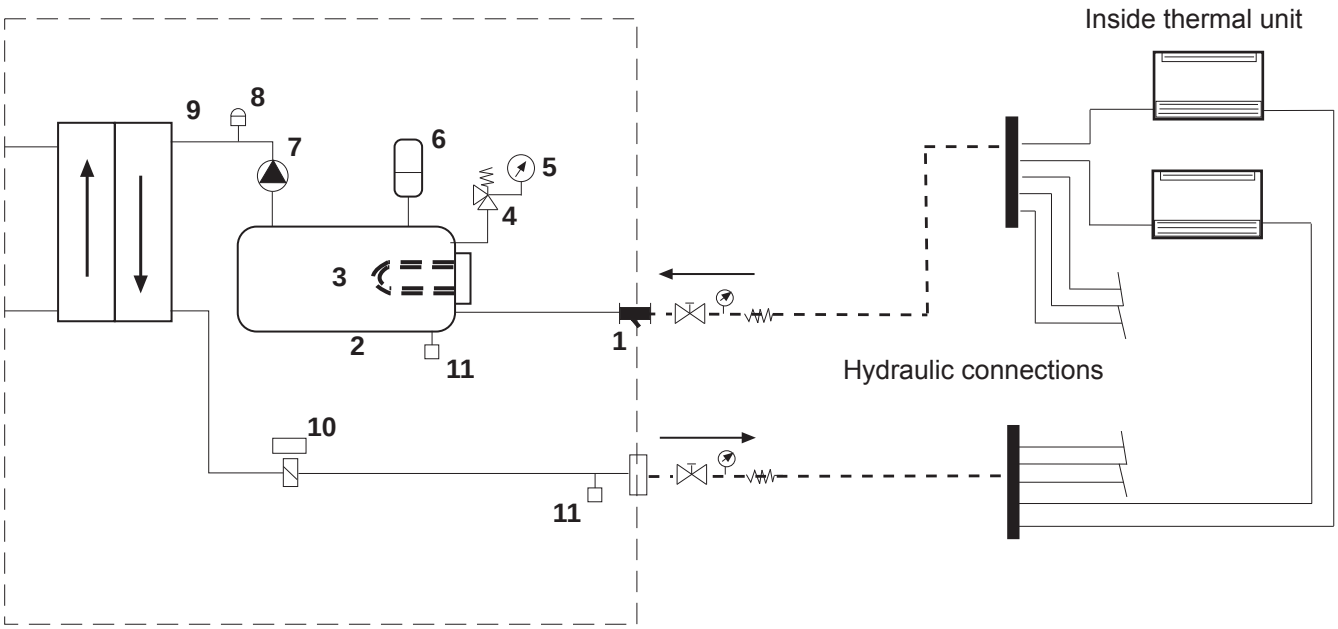
OPERATING PRINCIPLES

The Ecolean system comprises a water cooler or air/water pump combined with a Hydronic or Hydraulic module. The Hydronic and Hydraulic module contains the components which provide a multi-zone air conditioning system; these are as follows:

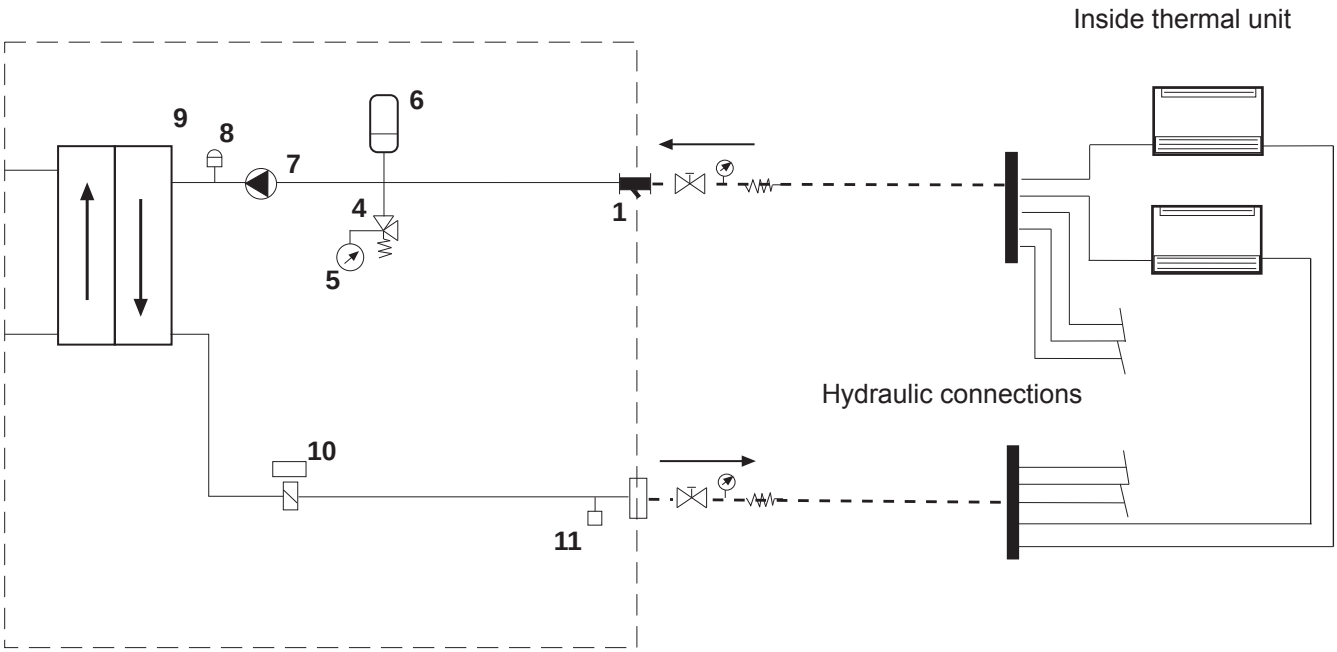
HYDRONIC module: 1,2,3,4,5,6,7,8,9,10, 11
HYDRAULIC module: 1,4,5,6,7,8,9,10,11

1.- Detachable water filter □
2.- Water tank□
3.- Water tank heater (in option)□
4.- Safety valve □
5.- Manometer□
6.- Expansion vessel
7.- Water pump
8.- Air purge valve
9.- Plate exchanger
10.- Flow switch
11.- Drain valve

HYDRONIC module



HYDRAULIC module



AVAILABLE STATIC PRESSURE WATER PUMP

	MODEL	EAC / EAR 009 1S K-A					EAC / EAR 011 1S K-A					EAC / EAR 015 1S K-A				
Water flow	l/s	0,33	0,37	0,41	0,45	0,49	0,41	0,45	0,49	0,53	0,60	0,49	0,53	0,57	0,61	0,72
	m3/h	1,19	1,33	1,48	1,62	1,76	1,48	1,62	1,76	1,91	2,16	1,76	1,91	2,05	2,20	2,59
Available static pressure	kPa	233	233	232	232	231	216	215	215	214	213	207	207	206	206	204

	MODEL	EAC / EAR 019 1S K-A					EAC / EAR 021 1S K-A					EAC / EAR 025 1S K-A				
Water flow	l/s	0,67	0,71	0,75	0,79	0,97	0,73	0,77	0,81	0,85	1,06	0,89	0,99	1,09	1,19	1,29
	m3/h	2,41	2,56	2,70	2,84	3,49	2,63	2,77	2,92	3,06	3,82	3,20	3,56	3,92	4,28	4,64
Available static pressure	kPa	205	204	204	203	201	195	195	195	194	191	207	206	205	204	202

	MODEL	EAC / EAR 029 1S K-A					EAC / EAR 035 1S K-A					EAC / EAR 043 1S K-A				
Water flow	l/s	1,02	1,12	1,22	1,32	1,49	1,26	1,36	1,46	1,56	1,83	1,52	1,62	1,72	1,82	2,21
	m3/h	3,67	4,03	4,39	4,75	5,36	4,54	4,90	5,26	5,62	6,59	5,57	5,83	6,19	6,55	7,96
Available static pressure	kPa	192	191	190	189	187	210	209	208	207	204	170	169	169	168	164

	MODEL	EAR 047 2S K-A					EAR 055 2S K-A					EAR 067 2S K-A				
Water flow	l/s	1,73	1,93	2,13	2,32	2,52	2,01	2,21	2,41	2,60	2,92	2,46	2,66	2,86	3,05	3,58
	m3/h	6,23	6,94	7,65	8,36	9,07	7,24	7,95	8,66	9,37	10,51	8,86	9,57	10,28	10,99	12,89
Available static pressure	kPa	183	182	181	180	179	177	176	175	174	172	242	241	239	238	238

	MODEL	EAR 081 2S K-A					EAC 047 2S K					EAC 055 2S K				
Water flow	l/s	2,95	3,15	3,35	3,54	4,30	1,73	1,93	2,13	2,32	2,52	2,01	2,21	2,41	2,60	2,92
	m3/h	10,62	11,33	12,04	12,75	15,48	6,23	6,94	7,65	8,36	9,07	7,24	7,95	8,66	9,37	10,51
Available static pressure	kPa	200	199	198	197	193	194	193	191	189	187	187	185	184	182	180

	MODEL	EAC 067 2S K					EAC 081 2S K				
Water flow	l/s	2,46	2,66	2,86	3,05	3,58	2,95	3,15	3,35	3,54	4,30
	m3/h	8,86	9,57	10,28	10,99	12,89	10,62	11,33	12,04	12,75	15,48
Avialable static pressure	kPa	254	252	250	249	244	207	206	205	203	199

NOTE: The flow data indicated in table are between a minimum and a maximum water flow.

Unit conversion

Pressure 1KPa = 1/9,8 m.c.a. = 0,01 bar

GLYCOL SOLUTION UNIT

If the outside temperature in the area where the system, cooling unit or heating pump is to be installed is likely to drop below 5 ºC, it is very important to use glycol anti -freeze. The amount of antifreeze required will vary depending on the minimum ambient temperature.

When the percentage of glycol increases the standard pump flow decreases, the pressure drop increases and the cooling and thermal capacities drop. As a result the minimum flow must be multiplied by the coefficient shown in the table.

MINIMUM AMBIENT TEMPERATURE	ETHYLENE GLYCOL %	PRESSURE DROP	WATER FLOW	CAPACITY
-5 ºC	10 %	x 1,07	x 1,02	x 0,97
-10 ºC	20 %	x 1,12	x 1,05	x 0,95
-16 ºC	30 %	x 1,20	x 1,08	x 0,93

Example: 10 % glycol in EAC0091SKHN

Min. flow 1,19 m^3/h x 1.02

Pressure drop x 1.07

System capacity x 0.97

WATER FLOW VOLUME

MINIMUM WATER FLOW

The installation never must operate with less than the minumum water flow to the minimal (see table). since this can cause:

i. - Ice at the water exchanger

ii. -The water exchanger gets dirty.

MAXIMUM WATER FLOW

See maximum water flow, indicated in table. Furthermore always it must assure a minimal ΔT to the exchanger of 3K..

MAXIMUM WATER VOLUME IN THE INSTALLATION.

The units with hydronic or hydraulic module include a expansion vessel, which limit the volume in the installation. The table indicate, maximun water volume.

Type	009/021	025/043	047/081
Solution	Water volume in liters	Water volume in liters	Water volume in liters
Water	200	400	750
Water + 10% gyt	150	300	575
Water + 10% gyt	130	275	500
Water + 10% gyt	110	220	410

MINIMUM WATER VOLUME IN THE INSTALLATION.

The minimal water content of the installation is defined by the formula:

Volume (in liters) = Cooling capacity (Kw.) x Coefficient:

Type	009/043	047/081
Coefficient	x 3,5	x 2,0

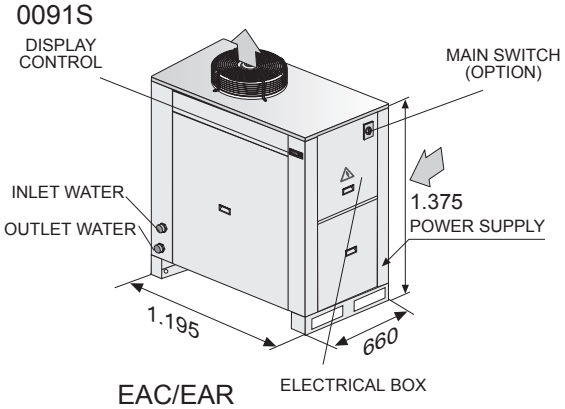
WATER TANK HEATER (AN OPTION)

- Only for units with hydronic module is possible incorporate a heater in the water tank.
- For cooling only units the heater operate like antifreeze protection, and the power input is 2,25 kW. (230/I, 230/III, 400/III)
- For reverse units the heater operate like antifreeze protection, and like auxiliary heater when the hot water inlet is below a selecting value (i.e. 30º C). The power input is:

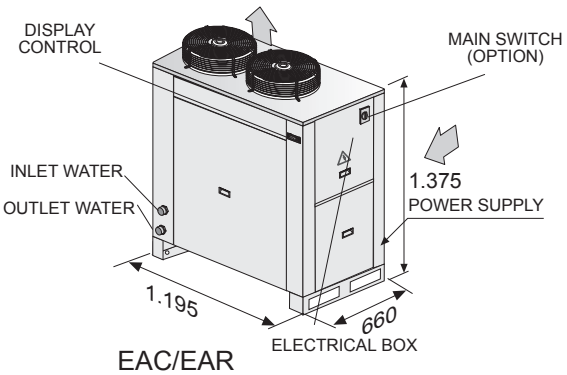
Type		009/021	025/043	047/081
Power input	kW.	6	9	12
Voltage	v.	230/I		
		230/III - 400/III		

UNIT+HYDRAULIC MODULE DIMENSIONAL DATA

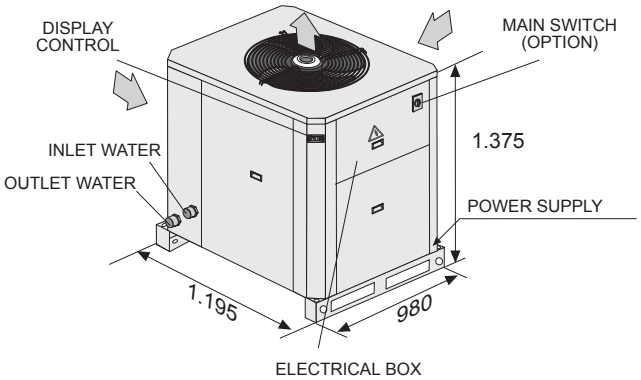
1 EAC/EAR 0091S



2 EAC/EAR 0111S-0151S-0191S-0211S



3 EAC/EAR 0251S-0291S-0351S-0431S



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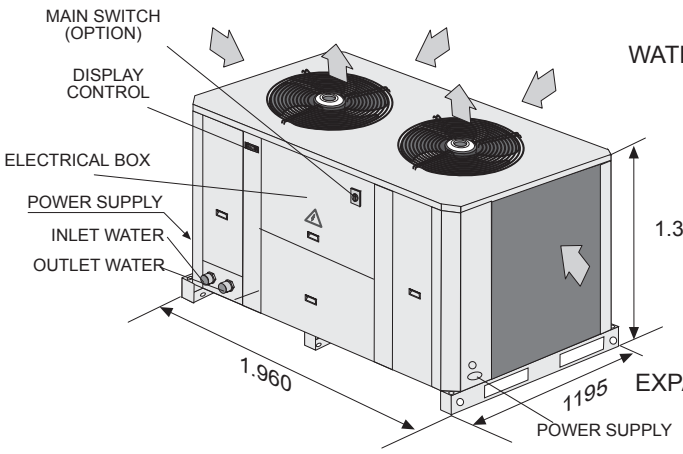
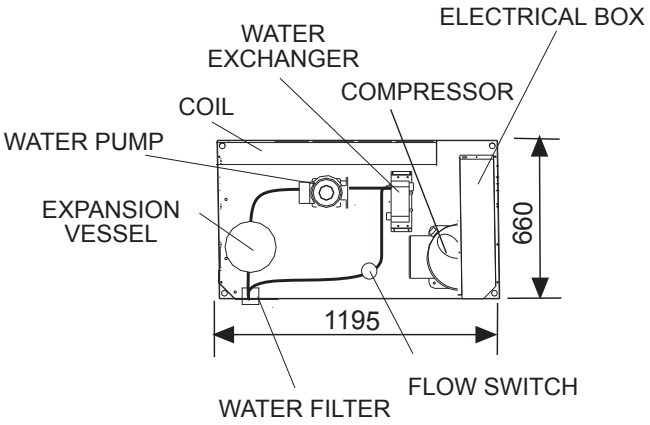


1 / 2 COMPONENT DISPOSITION UNIT+HYDRAULIC MODULE



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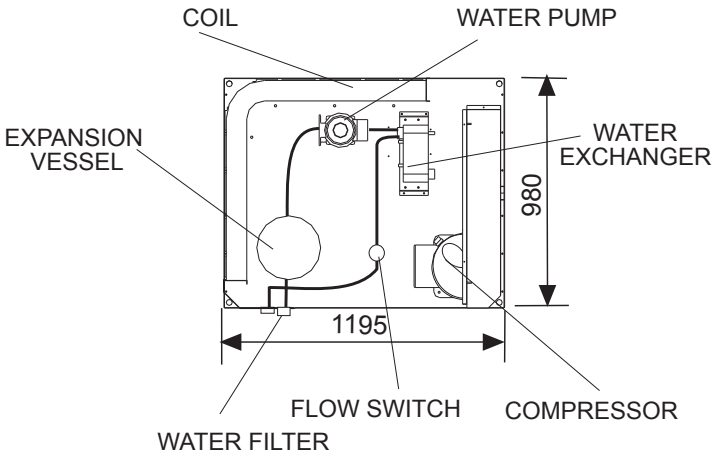

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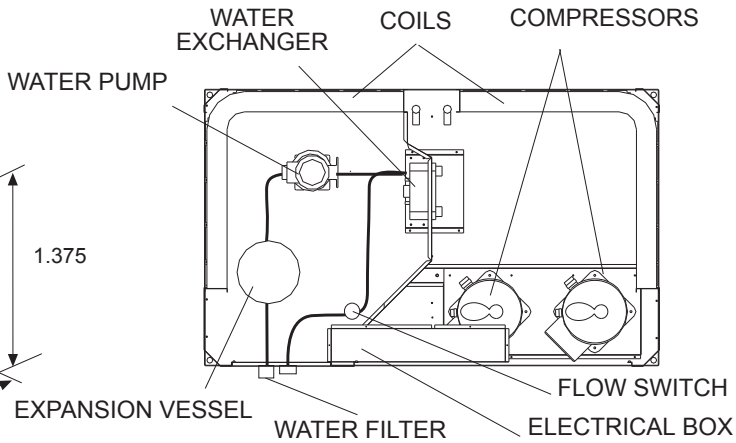
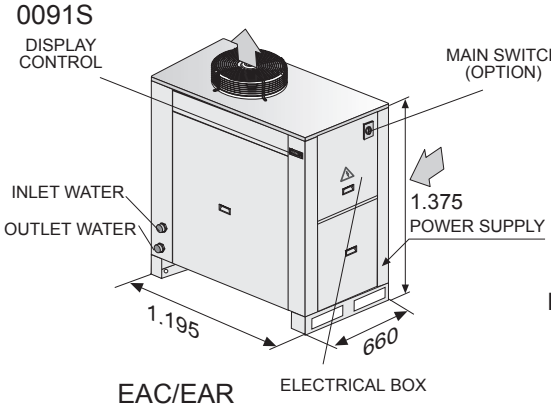


UNIT+ HYDRONIC MODULE DIMENSIONAL DATA

1 EAC/EAR 0091S



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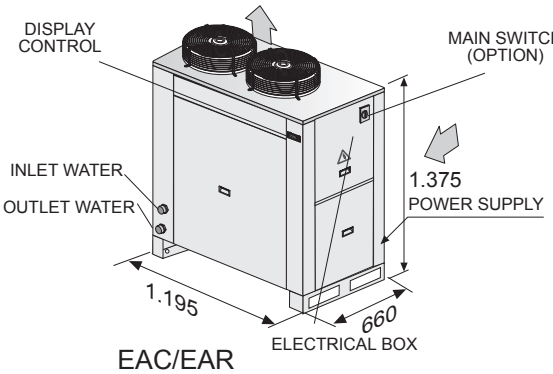

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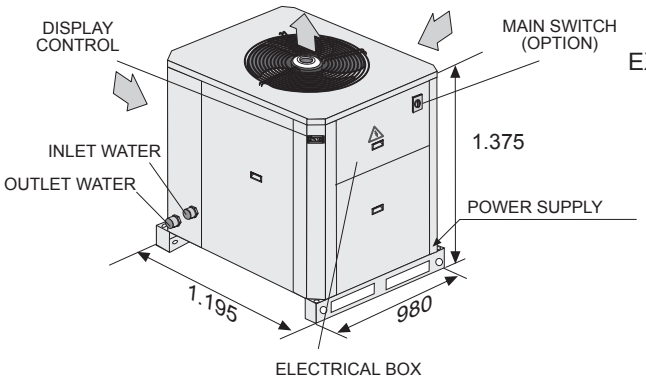

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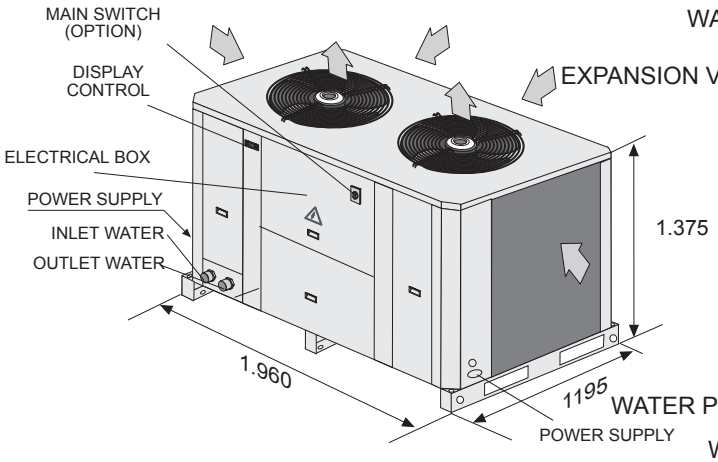

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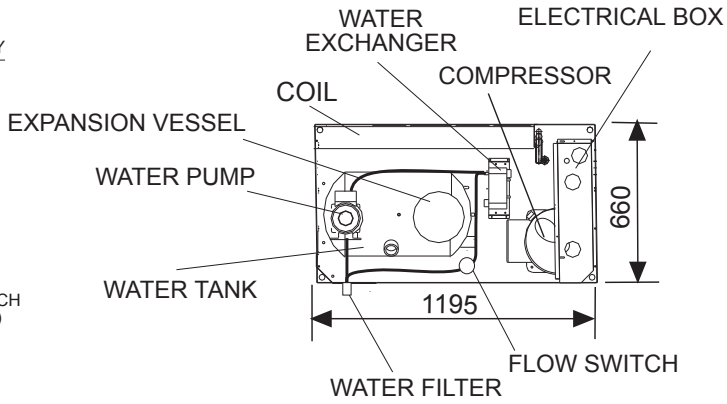

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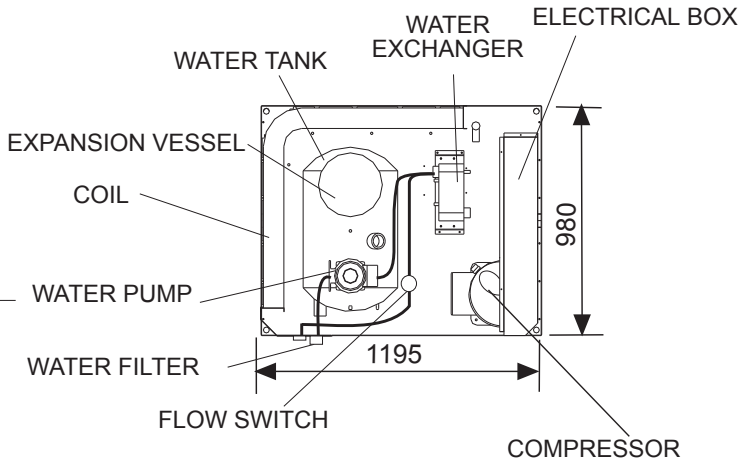

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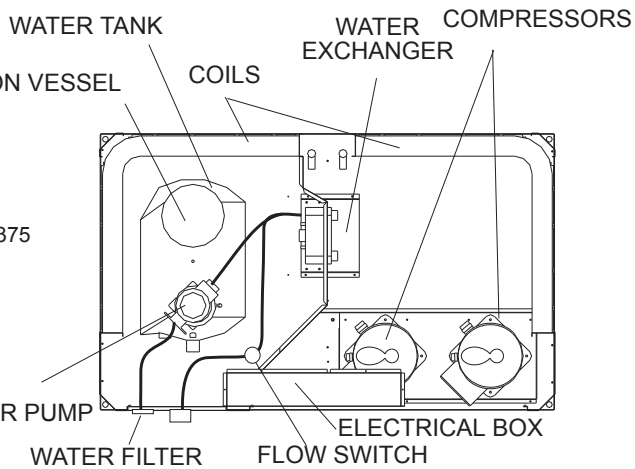

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