

APPLICATION GUIDE



PROVIDING **GLOBAL SYSTEM** SOLUTIONS

ECOLEAN
EAC/EAR

CONTENTS

Preface	2
Introduction and description of the components	3
Available options	5
Performance tables for the units without air ducts:	
Axial fan units	8
Performance tables for the units with air ducts:	
Axial fan units	16
High static pressure units	16
Performance units with low water temperature kit	18
Technical data	19
Electrical data	21
Water pressure drop	22
Dimensional data	23
Dimensional data, weight and service areas	25
Noise levels	26
Operating limits	28
Unit installation inside	30
Hydraulic equipment	31
Draft specifications	40

Our company is a member of the Eurovent Certification Programme. The Ecolean™ range of Lennox chillers are tested and rated in accordance with the Eurovent certification program.



Our company's products comply with European standards.



The manufacturing of Ecolean™ answers to ISO9001 control quality system.




Lennox have been providing environmental solutions since 1895, our range of air cooled chillers continues to meet the standards that have made LENNOX a household name. Flexible design solutions to meet YOUR needs and uncompromising attention to detail. Engineered to last, simple to maintain and Quality that comes as standard.

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.

Please read this operating manual prior to commissioning the ECOLEAN™ chiller. Familiarize yourself with the operation and control of the ECOLEAN™ chiller and closely follow the instructions.

We would like to stress the importance of training with respect to the correct handling of the chiller. Please consult Lennox on the options available in this field. It is important that this manual be stored in a permanent location in the vicinity of the ECOLEAN™ chiller. For the sake of clarity, important items in this manual are shown as follows:

Text	Important general instructions
	Danger of damage to the chiller

This manual contains important instructions regarding the commissioning of the ECOLEAN™ chiller. It also includes important instructions to prevent personal injury and damage to the machine during operation. Furthermore, in order to promote fault-free operation of the chiller, maintenance information has been included.

Please do not hesitate to contact one of our employees should you require further information on specific chiller subjects.

Order related documentation will be forwarded under separate cover. This documentation consists of:

- CE declaration
- Operating manual for control system
- Installation Operating manual
- Wiring diagram
- Unit detail are given on unit nameplate

FOR NETHERLAND: the STEK logbook, including the required certificates will be handed over by the installation technician or left with the machine following commissioning by Lennox. The data published in this manual is based on the most recent information available. It is supplied conditional to later modifications. We reserve the right to modify the construction and/or design of our ECOLEAN™ chillers, at any time, without prior notification or obligation to adapt previous supplies accordingly.

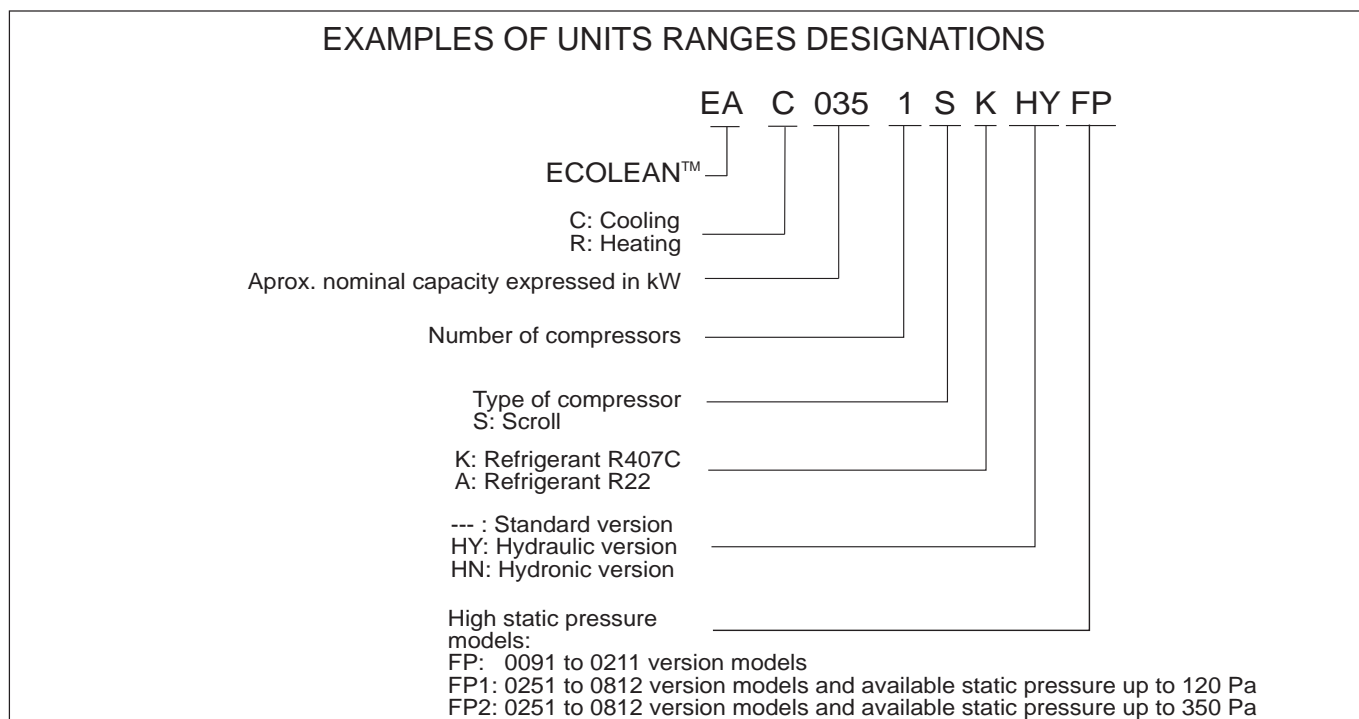
Any work on the Chiller should be carried out by trained and licensed competent technician. The following risks are present on the unit:

- risk of electrical shock
- risk of injury from rotating parts
- risk of injury from sharp edges and heavy weight
- risk of injury from high pressure gas
- risk of injury from high and low temperatures 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, 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.



PIPING ACCESSORIES FOR THE VARIOUS VERSIONS

- STANDARD VERSION UNIT

- Piping and inlet/outlet connections

- HYDRAULIC VERSION UNIT

- Piping and inlet/outlet connections
- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch

- HYDRONIC VERSION UNIT

- Piping and inlet/outlet connections
- Water pump
- Expansion vessel
- Collapsible water filter
- Safety valve
- Manometer
- Flow switch
- Water tank

AVAILABLE FAN STATIC PRESSURES

- STANDARD VERSION UNIT (all models)

- Available static pressure up to 50 Pa

- FP VERSION UNIT (0091 to 0211 models)

- Available static pressure up to 200 Pa

- FP1 VERSION UNIT (0251 to 0812 models)

- Available static pressure up to 120 Pa

- FP2 VERSION UNIT (0251 to 0812 models)

- Available static pressure up to 350 Pa

CHASSIS

- Rigid, hot dipped galvanized chassis
- Polyester paint - Color RAL 9002
- Unit lifting and handling via the base frame

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

OUTDOOR EXCHANGER

- Expanded copper tubes and high efficiency fins

FANS

- Standard version: axial fans 900 rpm, direct coupling
- FP version: centrifugal fans 1450 rpm, direct coupling
- FP1 version: axial fans 1450 rpm, direct coupling
- FP2 version: axial fans "short case" 1450 rpm, direct coupling

REFRIGERATION CIRCUITS ACCESSORIES

Welded and hermetically sealed and including the following components:

- Expansion valve
- Filter drier
- High-pressure pressostat with automatic reset
- Low-pressure pressostat with automatic reset (Heat pump units incorporate two of them, one for cooling only cycle and other for heat pump cycle).
- 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.

CONTROL

- Control and check by microprocessor
- Reading of water and refrigerant temperatures
- Alarm signaling
- Diagnostic per circuit
- Adjustment of temperature set points 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)
- Possibility of remote alarm signals (extra kit for some models)
- Antifreeze protection
- Fan speed control

DISPLAY (STANDARD)
(Incorporated in the unit)



REFRIGERATING OPTIONS

- R22 refrigerant, only for EAR, according to European regulation nr 2037/2000)
- HP & LP refrigerant gauges
- Operating with low water temperature (outlet water 0°C / -5°C / -10°C)
- Heating low ambient (-15°C) kit. The reverse unit can operate in heating mode up to an ambient temperature of -15°C (Standard unit up to -10°C).
- Cooling low ambient kit. The cooling only unit can operate up to an ambient temperature of -15°C (Standard unit up to -5°C).

SAFETY OPTIONS

- Chilled water flow switch (standard version unit only)
- Water filter (standard version unit only)
- Evaporator anti freeze heater (necessary for ambient temperatures below +5°C under cooler operation)
- Coil guard
- Hot gas injection valve (advisable for ambient temperatures below +5 °C under water cooler operation)

HYDRAULIC OPTIONS

- Water single pump (standard version unit only)
- Isolation valves
- Twin pumps (models from 025 to 081 only)

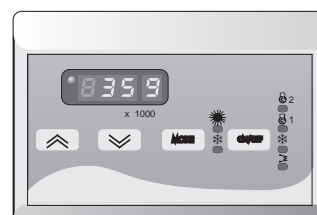
LOW NOISE OPTION

- Compressor noise insulation by sound-proofing jacket

ELECTRICAL OPTIONS

- Door interlocked main switch
- Three phase protection
- Remote control panel for microprocessor controller
- Water tank electrical heater (only for hydronic version units)
- Soft starter (3N~400V units)

REMOTE CONTROL (OPTION)



OTHER OPTIONS

- Condenser coil with coated aluminium fins
- Rubber antivibration mounts, for unit installation
- Kit air intake plenum, for 0251 to 0812 model units only
- Kit air discharge plenum, available for high static pressure units only (models from 0251 to 0812)

	Standard version unit	Hydraulic version unit	Hydronic (1) version unit
Main switch	X	X	X
Flow switch	X	included	included
Water filter	X	included	included
Evaporator anti freeze heater	X	X	X
Condenser coil guard	X	X	X
Hot gas injection valve	X	X	X
Phase protection	X	X	X
Gauges	X	X	X
Precoated coil	X	X	X
Remote controller	X	X	X
Water isolation valves	X	X	X
Rubber antivibration mounts	X	X	X
Kit low noise	X	X	X
"Soft starter" only 3N~400V units	X	X	X
Air intake plenum	X	X	X
Discharge plenum (2)	X	X	X
Operating unit with low water temperature	X	X	X
Water pump	X	included	included
Twin pumps	not available	X	X
Water tank electrical heater	not available	not available	X
Heating low ambient kit (-15°C)	X	X	X
Cooling low ambient kit (-15°C)	X	X	X

X Optional element
 (1) Water tank included
 (2) Only versions FP1/FP2



NOTE: All the options will be supplied and mounted in the unit, except the water filter, water isolation valves, rubber antivibration mounts, remote controller and air intake plenum supplied to mount in the moment of installation.

MAIN SWITCH

Located at the electrical box of the unit.

FLOW SWITCH (included on hydraulic and hydronic versions)

The flow switch stops the unit if water flow is lower than the minimum.

WATER FILTER (included on hydraulic and hydronic versions)

The water filter must be fitted in the inlet water of the unit, it protects the unit against particles (greater than 1 mm) getting inside the water circuit, and prevents the water interchanger gets dirty.

EVAPORATOR ANTI FREEZE HEATER

The evaporator anti freeze heater prevents the water exchange from low temperatures.

CONDENSER COIL GUARD

The condenser coil protection grill prevents light damage to the coil when shipping and when installed. It cannot protect against very heavy impacts.

HOT GAS INJECTION VALVE

Supplies hot gas which is injected into the evaporator gas to increase the suction pressure if the chilled water temperature falls to low. It can be used to allow the unit to operate at reduced capacity, if the water temperature falls below the set point (5°C). It is controlled via the microprocessor controller ON at (5°C) and OFF (6°C) for example. This option is NOT available for units selected with low water temperature option (example only).

THREE PHASE PROTECTION

Located at the electrical box of the unit, it assures that unit will not begin operation if connection phases of compressor are not correct. Should this occur, then just switch two phase connections.

GAUGES

Visualize the high and low pressures of the refrigerant circuit.

PRECOATED COIL

Special protection of the aluminium condenser coil fins, to protect it from aggressive external environmental conditions.

REMOTE CONTROLLER

Controls and visualizes the unit's operating, it may be installed until 50 m from the unit.

WATER ISOLATION VALVES

To fit at inlet and outlet water of the unit. Isolating the unit from water circuit, so service and maintenance of the unit will be easier.

RUBBER ANTIVIBRATION MOUNTS

To install under the unit, to avoid transmission of vibrations, to the floor where unit is installed, while unit is operating.

COMPRESSOR ACOUSTIC JACKET

Each compressor is fitted with a compressor acoustic jacket this provides attenuation of the compressor noise that radiates from the unit when in operation.

WATER PUMP (included on hydraulic and hydronic versions)

TWIN PUMPS KIT (models from 0251 to 0812 only)

It is formed by two-water pump mounted on parallel and with same characteristics as the single one. Only one pump is working the other remains on stand by. When the water pump, which is operating cuts out, and the pump turns off, starting automatically the water pump on stand by.

It is possible to select which one of the pumps we want to be working through an external switch supplied with the kit.

With the twin pumps, the available static pressure will decrease 5% from the available static pressure with one water pump only.

SOFT STARTER (for 3N-400V units only)

It is an electronic element, which reduces the peak compressor starting current up to 40%.

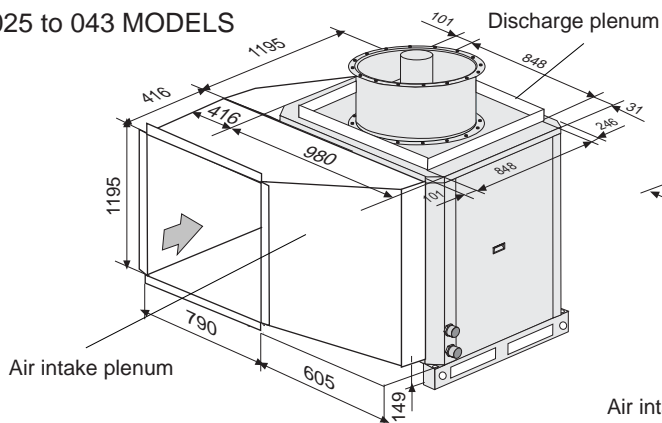
AIR INTAKE PLENUM (models from 0251 to 0812 only)

It is a accessory for adapting the condenser air intake to accept a duct.

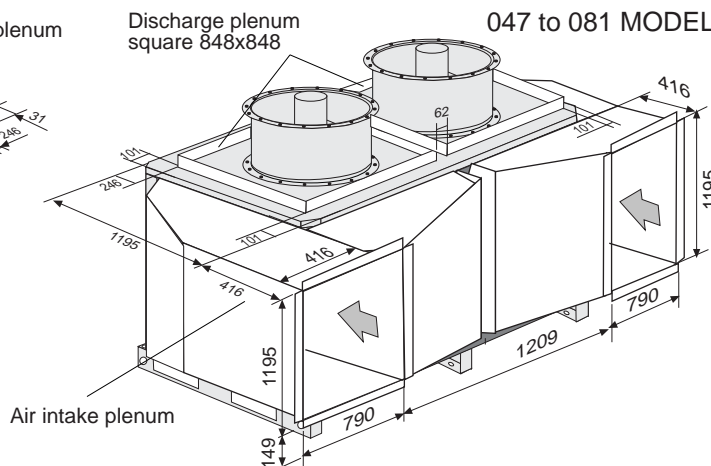
AIR DISCHARGE PLENUM (FP1 and FP2 unit versions and models from 0251 to 0812 only)

It is formed by 1 or 2 square frames, for adapting discharge air from the unit to a square duct.

025 to 043 MODELS



047 to 081 MODELS



LOW WATER TEMPERATURE

Necessary for outlet water temperatures below +5°C
 There are three different kits, which depend for selecting on the outlet water temperature desired, as the following table shows:

Denomination	Application duty on the outlet water temperature
KIT LOW WATER TEMPERATURE 0°C	For water temperatures below 5°C to 0°C
KIT LOW WATER TEMPERATURE -5°C	For water temperatures below 0°C to -5°C
KIT LOW WATER TEMPERATURE -10°C	For water temperatures below -5°C to -10°C

ANTI-FREEZE HEATER AND SUPPLEMENTARY (available only for hydronic version)

An immersion heater can be supplied complete with safety thermostat and pressostat fitted in the buffer tank, or an anti-freeze and supplementary heater (heat pump units only).

Anti-freeze and supplementary heater (heat pump units only): the heater works as anti-freeze heater as explained before and as supplementary heater, when inlet warm water reaches a temperature below a value selected (example: 30 °C) through an independent thermostat included.

Anti-freeze heater: cooling only and heat pump units. It starts when water temperature in the buffer tank is lower than + 5°C (Not for units with low water temperature kit).

The power input is:

Models	009/021	025/043	047/081
Voltage	1N~230V		
	3~230V - 3N~400V		
Anti-freeze heater	2,25	2,25	2,25
Anti-freeze and supplementary heater* kW	6	9	12

(* Heat pump units only)

AXIAL FAN UNITS

COOLING MODE

R-407C

MODELS	°C 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	14,09	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

Nominal conditions

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

Fouling factor: 0,44 m²C/kW

Water ΔT = 5 °C

Units are tested and rated in accordance with Eurovent standards

AXIAL FAN UNITS

COOLING MODE

R-407C

MODELS	°C 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

Qo : Net cooling capacity in kW

 Nominal conditions

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

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 °C

Units are tested and rated in accordance with Eurovent standards

AXIAL FAN UNITS

COOLING MODE

R-22

MODELS	°C 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 °C

 Nominal conditions

Units are tested and rated in accordance with Eurovent standards

AXIAL FAN UNITS

COOLING MODE

R-22

MODELS	°C 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

 Nominal conditions

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

Fouling factor : 0,44 m²C/kW

Water ΔT = 5 °C

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - UNITS WITHOUT AIR DUCT



AXIAL FAN UNITS

HEATING MODE R-407

MODELS	°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	18,58	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

Note: with the optional heating low ambient kit (-15°C), it is possible the unit operation up to a hot water outlet temperature of 50°C, and an ambient temperature of -15°C. To calculate the capacity at -15°C, it is necessary to extrapolate figures on the table and then apply a reduction of a 15%.

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - UNITS WITHOUT AIR DUCT



AXIAL FAN UNITS

HEATING MODE

R-407

MODELS	°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 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	---	---	---	---

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

Note: with the optional heating low ambient kit (-15°C), it is possible the unit operation up to a hot water outlet temperature of 50°C, and an ambient temperature of -15°C. To calculate the capacity at -15°C, it is necessary to extrapolate figures on the table and then apply a reduction of a 15%.

Units are tested and rated in accordance with Eurovent standards

AXIAL FAN UNITS

HEATING MODE

R-22

MODELS	°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 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 °C

Note: with the optional heating low ambient kit (-15°C), it is possible the unit operation up to a hot water outlet temperature of 50°C, and an ambient temperature of -15°C. To calculate the capacity at -15°C, it is necessary to extrapolate figures on the table and then apply a reduction of a 15%.

Nominal conditions

Units are tested and rated in accordance with Eurovent standards

PERFORMANCE TABLES - UNITS WITHOUT AIR DUCT



AXIAL FAN UNITS

HEATING MODE

R-22

MODELS	°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 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 °C

Nominal conditions

Note: with the optional heating low ambient kit (-15°C), it is possible the unit operation up to a hot water outlet temperature of 50°C, and an ambient temperature of -15°C. To calculate the capacity at -15°C, it is necessary to extrapolate figures on the table and then apply a reduction of a 15%.

Units are tested and rated in accordance with Eurovent standards

COOLING MODE

To find out the performances for units installed with air ducts, apply the following coefficients for capacity and consumption, over the performance tables of axial fan units without ducts (see pages 8 to 11):

STANDARD AXIAL FAN UNITS

AVAILABLE STATIC PRESSURE UP TO 50 Pa

(0091 to 0812 models)

	0091 to 0211S		0251 to 0812S		0091 to 0211S		0251 to 0812S	
	R407C models				R22 models			
Available static pressure Pa	30	50	30	50	30	50	30	50
Maximum ambient temperature °C	43	40	42	38	46	44	45	43
Correction Coefficient Cooling Capacity	0,95	0,91	0,95	0,89	0,97	0,94	0,96	0,93
Correction Coefficient Consumption	1,06	1,12	1,06	1,16	1,04	1,08	1,06	1,10

HIGH STATIC PRESSURE UNITS

AVAILABLE STATIC PRESSURE UP TO 200 Pa

(0091 to 0211-FP models only)

FP CENTRIFUGAL FAN VERSION

	091 to 0211S-FP MODEL UNITS							
	R407C models				R22 models			
Available static pressure Pa	50	100	150	200	50	100	150	200
Maximum ambient temperature °C	46	45	41	38	48	47	44	42
Correction Coefficient Cooling Capacity	1	0,98	0,93	0,91	1	0,98	0,95	0,94
Correction Coefficient Consumption (1)	1	1,01	1,09	1,14	1	1,01	1,07	1,1

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption:

MODELS	Available static pressure Pa			
	50	100	150	200
0091FP	0,75 KW	0,65 KW	0,60 KW	0,55 KW
0111 to 0211 FP	1,55 KW	1,40 KW	1,25 KW	1,10 KW

AVAILABLE STATIC PRESSURE UP TO 120 Pa

(0251 to 0812-FP1 models only)

FP1 AXIAL FAN VERSION

	0251 to 0812S-FP1 MODEL UNITS									
	R407C models					R22 models				
Available static pressure Pa	50	75	100	125	150	50	75	100	125	150
Maximum ambient temperature °C	46	43	39	35	---	50	48	45	43	40
Correction Coefficient Cooling Capacity	1	0,947	0,923	0,878	---	1,028	1	0,96	0,935	0,9
Correction Coefficient Consumption (1)	1	1,078	1,122	1,22	---	1,057	1	1,057	1,099	1,17

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption:

MODELS	Extra power consumption
0251 to 0431S-FP1	0,85 KW
0472 to 0812S-FP1	1,7 KW

AVAILABLE STATIC PRESSURE UP TO 350 Pa

(0251 to 0812-FP2 models only)

FP2 SHORT CASED AXIAL FAN VERSION

	0251 to 0812S-FP2 MODEL UNITS									
	R407C models					R22 models				
Available static pressure Pa	150	200	250	300	350	150	200	250	300	350
Maximum ambient temperature °C	47	44	41	38	35	50	48	46	44	42
Correction Coefficient Cooling Capacity	1,01	0,97	0,94	0,90	0,87	1,07	1	0,973	0,946	0,923
Correction Coefficient Consumption (1)	0,98	1,037	1,099	1,17	1,22	0,916	1	1,037	1,078	1,12

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption:

MODELS	Extra power consumption
0251 to 0431S-FP2	1,5 KW
0472 to 0812S-FP2	3 KW

Units are tested and rated in accordance with Eurovent standards

HEATING MODE

To find out the performances for units installed with air ducts, apply the following coefficients for capacity and consumption, over the performance tables of axial fan units without ducts (see pages 12 to 15):

STANDARD AXIAL FAN UNITS

**AVAILABLE STATIC PRESSURE UP TO 50 Pa
(0091 to 0812 models)**

	0091 to 0211S		0251 to 0812S		0091 to 0211S		0251 to 0812S	
	R407C models				R22 models			
Available static pressure Pa	30	50	30	50	30	50	30	50
Minimum ambient temperature °C (2)	-8	-6	-8	-6	-8	-6	-8	-6
Correction Coefficient Heating Capacity	0,94	0,89	0,94	0,89	0,94	0,89	0,94	0,89
Correction Coefficient Consumption	1,01	1,03	1,02	1,03	1,01	1,03	1,02	1,03

HIGH STATIC PRESSURE UNITS

**AVAILABLE STATIC PRESSURE UP TO 200 Pa
(0091 to 0211-FP models only)**

FP CENTRIFUGAL FAN VERSION

	091 to 0211S-FP MODEL UNITS							
	R407C models				R22 models			
Available static pressure Pa	50	100	150	200	50	100	150	200
Minimum ambient temperature °C (2)	-10	-10	-8	-6	-10	-10	-8	-6
Correction Coefficient Heating Capacity	1	1	0,94	0,89	1	1	0,94	0,89
Correction Coefficient Consumption (1)	1	1	1,01	1,03	1	1	1,01	1,03

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption:

MODELS	Available static pressure Pa			
	50	100	150	200
0091FP	0,75 KW	0,65 KW	0,60 KW	0,55 KW
0111 to 0211 FP	1,55 KW	1,40 KW	1,25 KW	1,10 KW

**AVAILABLE STATIC PRESSURE UP TO 120 Pa
(0251 to 0812-FP1 models only)**

FP1 AXIAL FAN VERSION

	0251 to 0812S-FP1 MODEL UNITS									
	R407C models					R22 models				
Available static pressure Pa	50	75	100	125	150	50	75	100	125	150
Minimum ambient temperature °C (2)	-10	-8	-6	-5	---	-10	-10	-8	-6	-5
Correction Coefficient Heating Capacity	1	0,94	0,89	0,87	---	1,028	1	0,94	0,89	0,87
Correction Coefficient Consumption (1)	1	1,02	1,03	1,04	---	0,99	1	1,02	1,03	1,04

MODELS	Extra power consumption
0251 to 0431S-FP1	0,85 KW
0472 to 0812S-FP1	1,7 KW

**AVAILABLE STATIC PRESSURE UP TO 350 Pa
(0251 to 0812-FP2 models only)**

FP2 SHORT CASED AXIAL FAN VERSION

	0251 to 0812S-FP2 MODEL UNITS									
	R407C models					R22 models				
Available static pressure Pa	150	200	250	300	350	150	200	250	300	350
Minimum ambient temperature °C (2)	-10	-10	-8	-6	-5	-10	-11	-10	-8	-6
Correction Coefficient Heating Capacity	1,01	1	0,94	0,89	0,87	1,02	1,01	1	0,94	0,89
Correction Coefficient Consumption (1)	0,99	1	1,02	1,03	1,04	0,96	0,99	1	1,02	1,03

(1) After applying correction coefficient consumption is needed to add the following power input to get total power consumption:

MODELS	Extra power consumption
0251 to 0431S-FP2	1,5 KW
0472 to 0812S-FP2	3 KW

(2) With the optional heating low ambient kit, it is possible the unit operation up to -15°C.

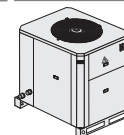
Units are tested and rated in accordance with Eurovent standards

COMPRESSORS AND REFRIGERANT CIRCUITS

MODELS			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	Cooling only	R-407C	3,0	3,0	3,4	4,0	5,5	6,0	6,5
		R-407C	3,1	3,1	3,9	5,0	6,5	6,2	7,0
	Heat pump	R-22	3,3	3,3	4,3	5,3	6,3	7,1	7,8
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
MODELS			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	Cooling only	R-407C	8,2	9,5	12,0	14,0	17,6	20,5	
		R-407C	9,0	10,5	2 x 6,2	2 x 7,0	2 x 9,0	2 x 10,5	
	Heat pump	R-22	9,5	12,8	2 x 7,1	2 x 7,8	2 x 9,5	2 x 12,0	
Oil charge per compressor l			4	4,1	4	4	4	4,1	
Crankcase heater per compressor W			70	70	70	70	70	70	

PLATE HEAT EXCHANGERS

MODELS			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	
Max. operating pressure Bar	Water		4	4	4	4	4	4	4	
	Refrigerant		28	28	28	28	28	28	28	
MODELS			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		
Max. operating pressure Bar	Water		4	4	4	4	4	4		
	Refrigerant		28	28	28	28	28	28		

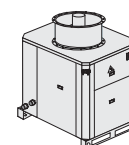


STANDARD AXIAL FAN UNITS

MODELS	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Fan type	Axial - Direct coupling 900 rpm 1N~230V												
Fan number	1	2				1				2			
Air flow rate m ³ /h	3500	6500	6700	6500	6300	9500	11500	11000	10500	19000	23000	22000	21000
Power Input kW	0,15	0,30	0,32	0,30	0,28	0,75	0,90	0,85	0,83	1,50	1,80	1,70	1,66

HIGH STATIC PRESSURE UNITS

AVAILABLE STATIC PRESSURE UP TO 200 Pa - FP VERSION



MODELS	0091S-FP		0111S-FP		0151S-FP		0191S-FP		0211S-FP	
Fan type	Centrifugal - Direct coupling 1450 rpm 1N~230V									
Fan number	1		2							
Available static pressure Pa	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW
50	3500	0,9	6500	1,9	6700	1,95	6500	1,9	6300	1,85
100	2700	0,8	5700	1,75	5900	1,8	5700	1,75	5500	1,7
150	2500	0,75	5200	1,6	5400	1,65	5200	1,6	5000	1,55
200	2200	0,7	4700	1,45	4900	1,5	4700	1,45	4500	1,4

AVAILABLE STATIC PRESSURE UP TO 120 Pa - FP1 VERSION

MODELS	0251S-FP1		0291S-FP1		0351S-FP1		0431S-FP1		0472S-FP1		0552S-FP1		0672S-FP1		0812S-FP1	
Fan type	Axial - Direct coupling 1450 rpm 1N~230V															
Fan number	1								2							
Available static pressure Pa	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW
50	11500	1,7	11500	1,7	11000	1,65	10500	1,65	23000	3,4	23000	3,4	22000	3,3	21000	3,3
75	9600	1,65	9600	1,65	9200	1,6	8800	1,6	19200	3,3	19200	3,3	18400	3,2	17600	3,2
100	8500	1,6	8500	1,6	8100	1,55	7700	1,55	17000	3,2	17000	3,2	16200	3,1	15400	3,1
125	7200	1,55	7200	1,55	6900	1,5	6600	1,5	14400	3,1	14400	3,1	13800	3	13200	3
150	6400	1,5	6400	1,5	6100	1,5	5800	1,5	12800	3	12800	3	12200	3	11600	3

AVAILABLE STATIC PRESSURE UP TO 350 Pa - FP2 VERSION

MODELS	0251S-FP2		0291S-FP2		0351S-FP2		0431S-FP2		0472S-FP2		0552S-FP2		0672S-FP2		0812S-FP2	
Fan type	Axial "short case" - Direct coupling 1450 rpm 3~230V-3N~400V															
Fan number	1								2							
Available static pressure Pa	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW	Air flow rate m ³ /h	Power input kW
150	12400	2,45	12400	2,45	11900	2,4	11500	2,35	24800	4,9	24800	4,9	23800	4,8	23000	4,7
200	10800	2,3	10800	2,3	10400	2,3	10000	2,25	21600	4,6	21600	4,6	20800	4,6	20000	4,5
250	9200	2,3	9200	2,3	8800	2,3	8500	2,3	18400	4,6	18400	4,6	17600	4,6	17000	4,6
300	7800	2,4	7800	2,4	7500	2,4	7250	2,45	15600	4,8	15600	4,8	15000	4,8	14500	4,9
350	6800	2,45	6800	2,45	6500	2,45	6250	2,5	13600	4,9	13600	4,9	13000	4,9	12500	5

STANDARD AXIAL FAN UNITS

R-407C / R-22

MODELS	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Maximum 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
Maximum current (A)	1N~230V	23,9	---	---	---	---	---	---	---	---	---	---	---
	3~230V	12,9	18,9	23,1	29,3	27,8	34,2	39,4	47,8	55,1	68,4	78,7	110,2
	3N~400V	7,8	11,6	14,0	17,6	16,7	21,0	24,2	29,1	33,3	42,0	48,4	66,6
LRC (A)	1N~230V	95,8	---	---	---	---	---	---	---	---	---	---	---
	3~230V	91,8	99,6	134,6	179,6	167,6	213,0	227,5	282,5	333,5	243,7	262,7	324,1
	3N~400V	44,3	51,6	63,6	97,4	95,6	119,0	130,5	161,5	192,5	138,0	152,3	187,0
Starting current (A) (*)	1N~230V	81,5	---	---	---	---	---	---	---	---	---	---	---
	3~230V	78,2	84,9	114,7	152,9	142,7	181,5	193,9	240,7	284,0	212,2	229,1	282,2
	3N~400V	37,8	44,1	54,3	83,0	81,5	101,6	111,5	137,8	164,1	120,6	133,2	163,3

Not included water pump consumptions of the hydronic or hydraulic version (see page 35)
 Maximum power calculated for compressor operation at +12,5/65°C
 (*) Starting current 2 cycles later from compressor starts (4 msec)

HIGH STATIC PRESSURE UNITS

FP / FP1 VERSIONS

R-407C / R-22

MODELS	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Maximum power (kW)	5,0	6,6	7,7	9,5	10,5	12,9	14,6	17,2	21,4	25,5	28,9	34,2	41,4
Maximum current (A)	1N~230V	27,1	---	---	---	---	---	---	---	---	---	---	---
	3~230V	16,1	25,3	29,5	35,7	34,2	39,2	43,9	52,3	59,6	78,4	87,7	104,7
	3N~400V	11,0	18,0	20,4	24,0	23,1	26,0	28,7	33,6	37,8	52,0	57,4	67,2
LRC (A)	1N~230V	99,0	---	---	---	---	---	---	---	---	---	---	---
	3~230V	95,0	106,0	141,0	186,0	174,0	218,0	232,0	287,0	338,0	253,7	271,7	333,1
	3N~400V	47,5	58,0	70,0	103,8	102,0	124,0	135,0	166,0	197,0	148,0	161,3	196,0
Starting current (A) (*)	1N~230V	84,8	---	---	---	---	---	---	---	---	---	---	---
	3~230V	81,4	91,3	121,1	159,3	149,1	186,5	198,4	245,2	288,5	222,2	238,1	291,2
	3N~400V	41,0	50,5	60,7	89,4	87,9	106,6	116,0	142,3	168,7	130,6	142,3	172,3

Not included water pump consumptions of the hydronic or hydraulic version (see page 35)
 Maximum power calculated for compressor operation at +12,5/65°C
 (*) Starting current 2 cycles later from compressor starts (4 msec)

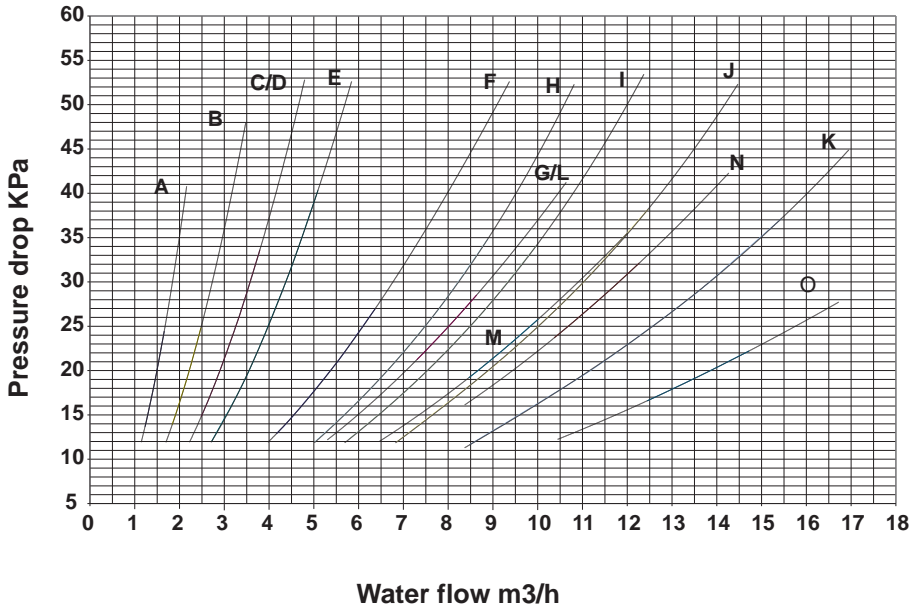
FP2 VERSIONS

R-407C / R-22

MODELS	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Maximum power (kW)	13,6	15,4	18,0	22,1	27,0	30,4	35,7	42,8
Maximum current (A)	3~230V	39,2	43,9	52,3	59,6	78,4	87,7	104,7
	3N~400V	22,5	25,2	30,1	34,3	45,0	50,4	60,2
LRC (A)	3~230V	218,0	232,0	287,0	338,0	253,7	271,7	333,1
	3N~400V	120,5	131,5	162,5	193,5	141,0	154,3	189,0
Starting current (A) (*)	3~230V	186,5	198,4	245,2	288,5	222,2	238,1	291,2
	3N~400V	103,1	112,5	138,8	165,2	123,6	135,3	165,3

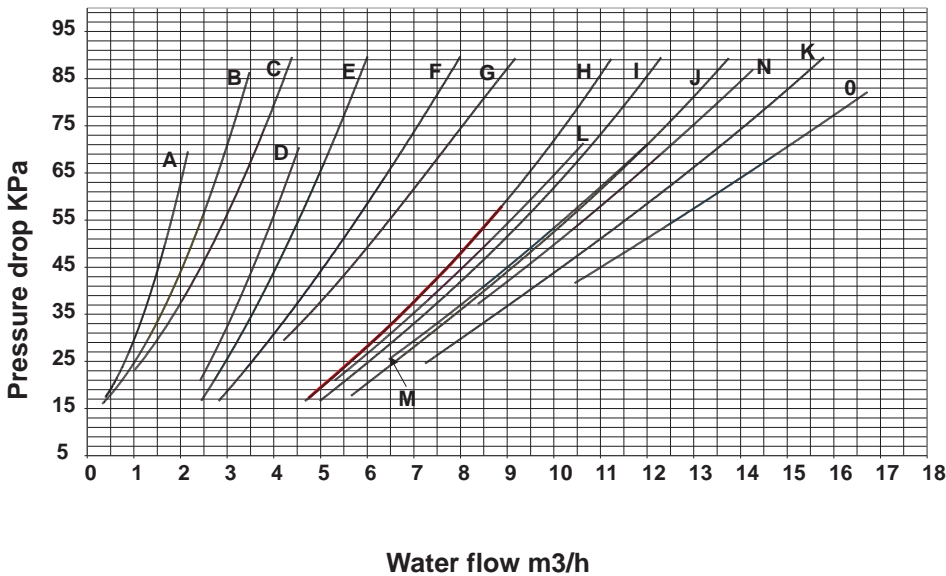
Not included water pump consumptions of the hydronic or hydraulic version (see page 35)
 Maximum power calculated for compressor operation at +12,5/65°C
 (*) Starting current 2 cycles later from compressor starts (4 msec)

**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	D
EAC/EAR 0291S	E
EAC/EAR 0351S	F
EAC/EAR 0431S	G
EAC 0472S	L
EAR 0472S	H
EAC 0552S	M
EAR 0552S	I
EAC 0672S	N
EAR 0672S	J
EAC 0812S	O
EAR 0812S	K

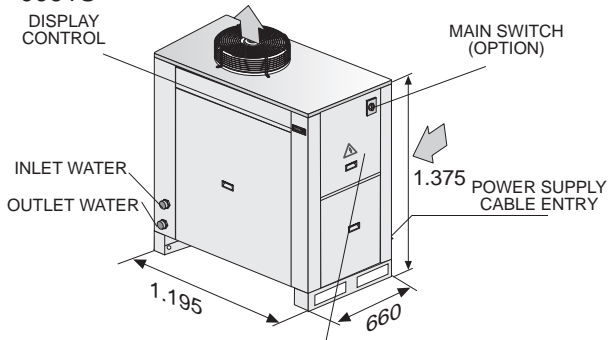
**PRESSURE DROP
WATER EXCHANGER+WATER FILTER
(*)**



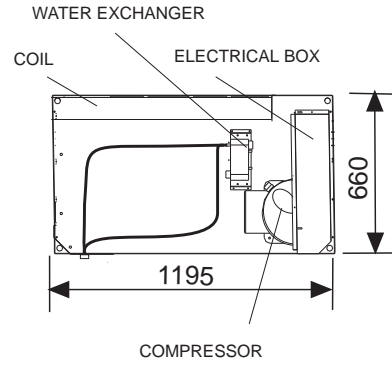
INSTALLATION ADVISE
The units **MUST** be fitted with a water filter at the inlet to the unit (trapping any particles with a diameter greater than 1 mm.)

(*) Optional on standard version and standard in hydronic and hydraulic version.

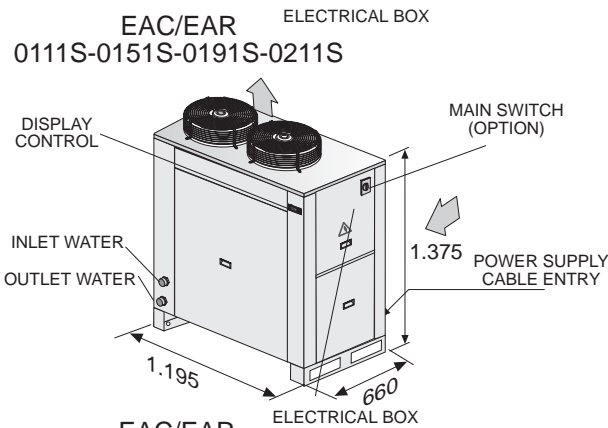
1 EAC/EAR 0091S



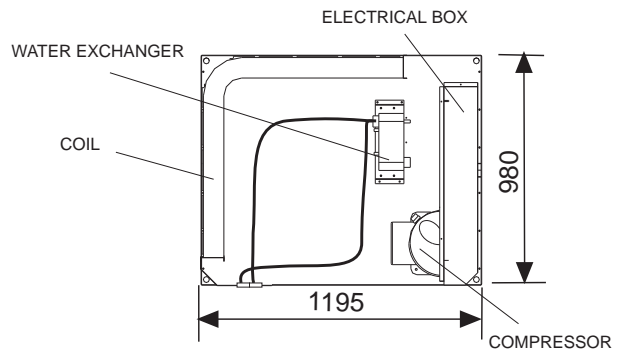
1/2 COMPONENT POSITION STANDARD VERSION UNIT



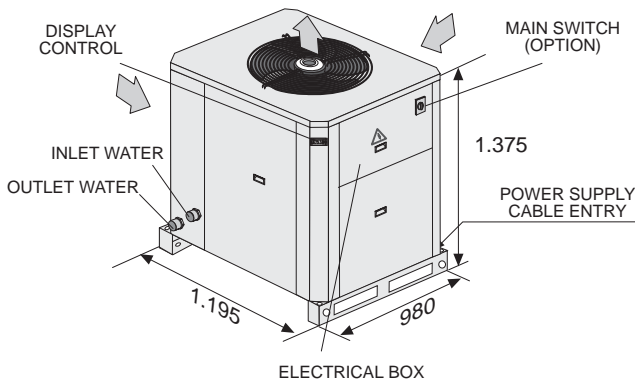
2 EAC/EAR 0111S-0151S-0191S-0211S



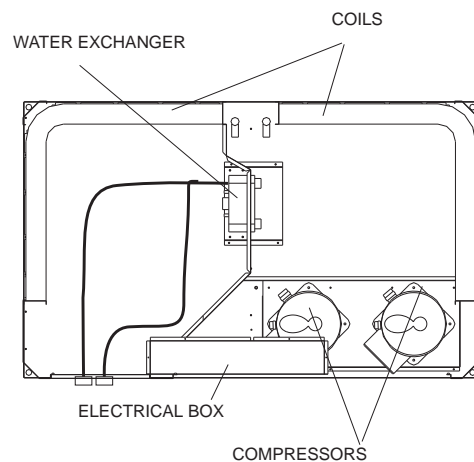
3 COMPONENT POSITION STANDARD VERSION UNIT



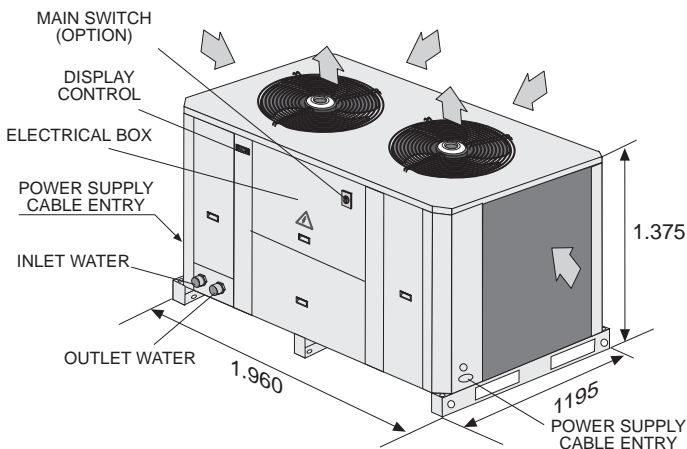
3 EAC/EAR 0251S-0291S-0351S-0431S



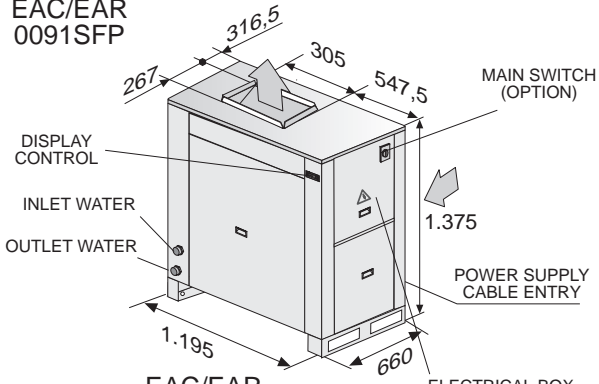
4 COMPONENT POSITION STANDARD VERSION UNIT



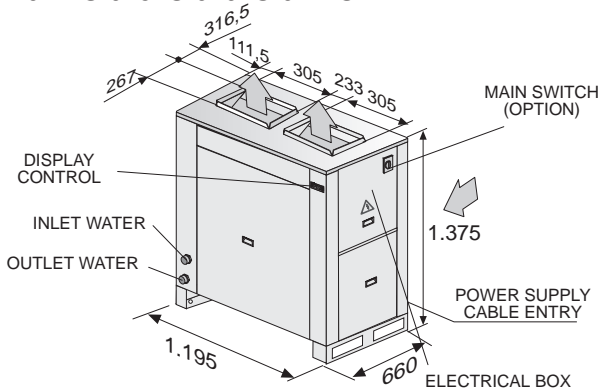
4 EAC/EAR 0472S-0552S-0672S-0812S



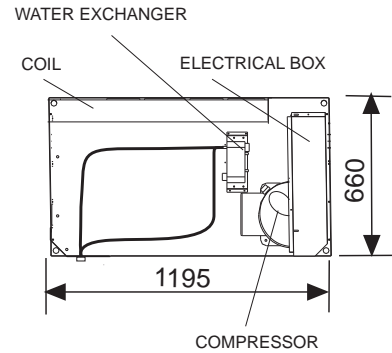
1 EAC/EAR 0091SFP



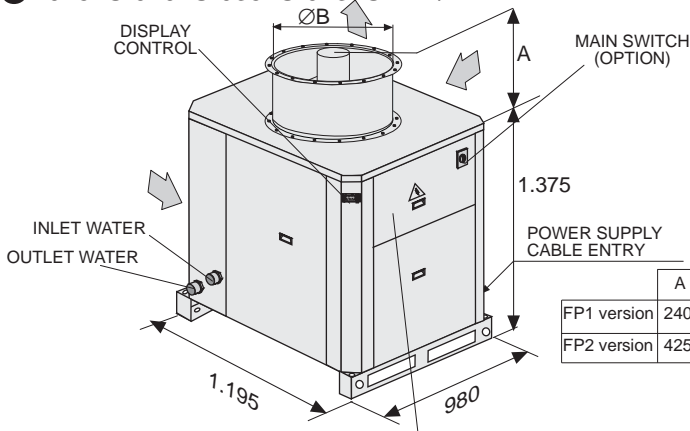
2 EAC/EAR 0111S-0151S-0191S-0211S FP



1/2 COMPONENT POSITION STANDARD VERSION UNIT

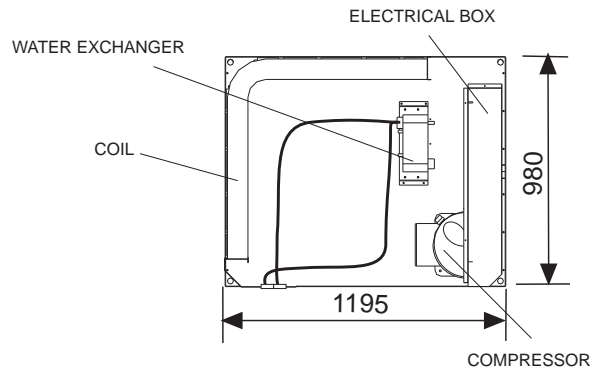


3 EAC/EAR 0251S-0291S-0351S-0431S FP1/FP2

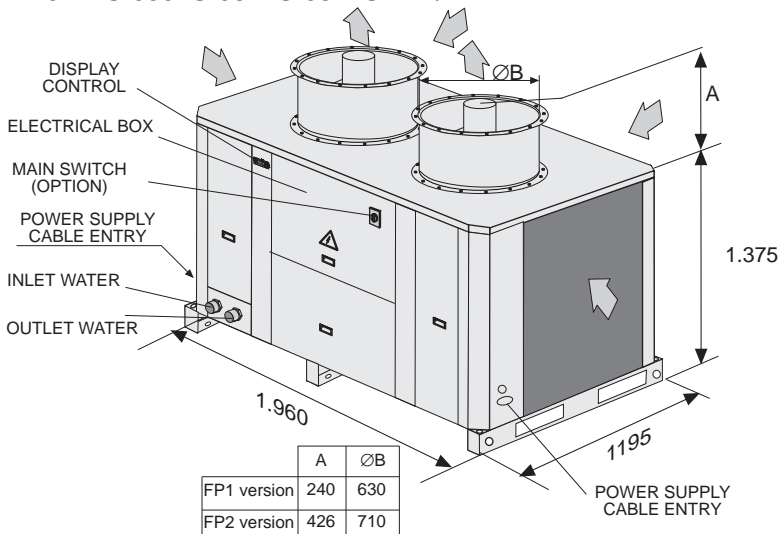


	A	ØB
FP1 version	240	630
FP2 version	425	710

3 COMPONENT POSITION STANDARD VERSION UNIT

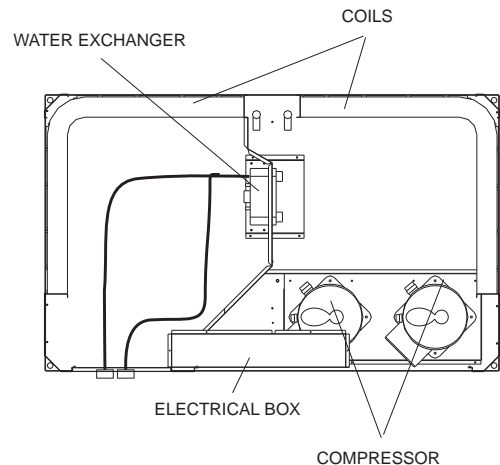


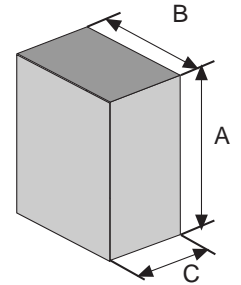
4 EAC/EAR 0472S-0552S-0672S-0812S FP1/FP2



	A	ØB
FP1 version	240	630
FP2 version	426	710

4 COMPONENT POSITION STANDARD VERSION UNIT





STANDARD AXIAL FAN UNITS

MODELS	EAC / EAR	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
A - Height	mm	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375	1375
B - Width	mm	1195	1195	1195	1195	1195	1195	1195	1195	1195	1960	1960	1960	1960
C - Depth	mm	660	660	660	660	660	980	980	980	980	1195	1195	1195	1195
Operating weight (*) kg	EAC	147	155	168	181	245	272	281	309	345	540	551	596	670
	EAR	150	158	172	185	250	277	285	317	353	549	561	612	685

(*) Not included hydronic or hydraulic version (see page 32)

HIGH STATIC PRESSURE UNITS

MODELS	EAC / EAR	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S	
A - Height	FP/FP1	1375	1375	1375	1375	1375	1615	1615	1615	1615	1615	1615	1615	1615	
	FP2	-	-	-	-	-	1800	1800	1800	1800	1800	1800	1800	1800	
B - Width	mm	1195	1195	1195	1195	1195	1195	1195	1195	1195	1960	1960	1960	1960	
C - Depth	mm	660	660	660	660	660	980	980	980	980	1195	1195	1195	1195	
Operating weight (*) kg	EAC	FP/FP1	156	173	186	199	263	297	296	324	360	590	581	626	700
		FP2	-	-	-	-	-	317	316	344	380	630	621	666	740
	EAR	FP/FP1	159	176	190	204	268	302	301	332	368	599	592	642	716
		FP2	-	-	-	-	-	322	321	352	388	639	632	682	756

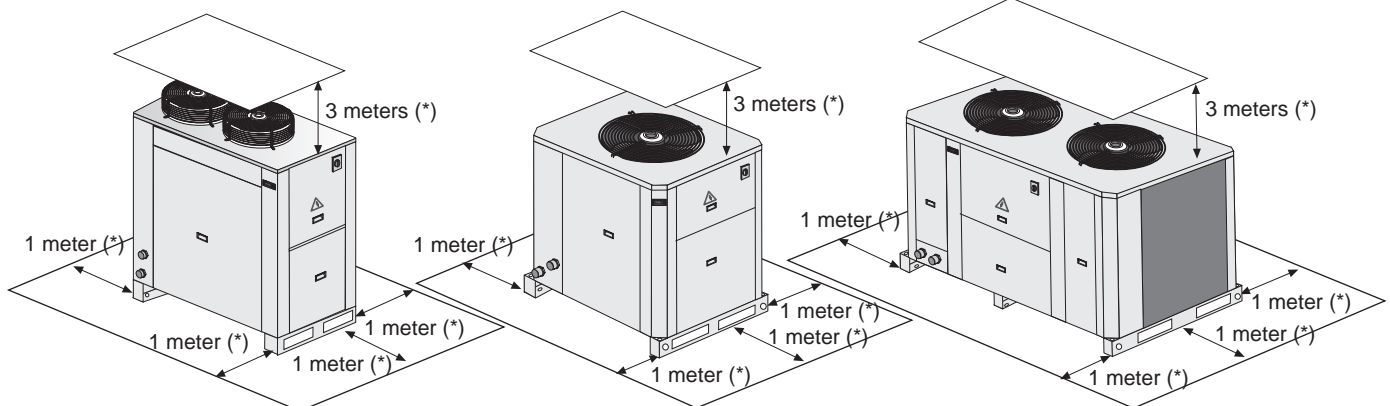
(*) Not included hydronic or hydraulic version (see page 32)

SERVICE AREAS

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

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

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



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

STANDARD AXIAL FAN UNITS

EAC EAR	Spectrum per octave band (dBA)								Global sound power Lw dB(A)	Sound pressure at 10m. (dBA)	
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz			8000 Hz
0091S	(1)	74,6	61,8	57,6	58,8	57,8	57,1	60,7	54,8	65,5	37,5
	(2)	74,6	61,8	57,6	58,3	56,8	54,9	56,9	54,8	63,5	35,5
0111S	(1)	77,6	64,8	60,6	63,0	62,9	59,5	63,0	57,8	68,7	40,7
	(2)	77,6	64,8	60,6	62,1	60,9	57,6	59,2	57,8	66,7	38,7
0151S	(1)	77,6	64,8	60,7	63,8	65,1	62,1	61,0	57,8	69,5	41,5
	(2)	77,6	64,8	60,7	62,5	62,2	58,9	57,3	57,8	67,0	39,0
0191S	(1)	77,6	64,8	60,6	63,6	66,7	66,9	64,9	57,8	72,3	44,3
	(2)	77,6	64,8	60,6	62,8	64,4	63,8	62,0	57,8	69,8	41,8
0211S	(1)	77,6	64,8	61,2	70,4	68,8	70,5	66,3	58,5	75,3	47,3
	(2)	77,6	64,8	61,1	68,2	65,5	66,1	62,4	58,1	71,8	43,8
0251S	(1)	81,7	72,6	68,9	71,5	72,6	71,7	66,2	60,2	77,2	49,2
	(2)	81,7	68,9	64,8	69,4	66,5	69,1	64,2	53,0	73,7	45,7
0291S	(1)	78,08	78,7	70,8	72,8	76,5	75,7	67,7	62,4	80,6	52,6
	(2)	78,1	75,4	67,4	72,5	71,7	72,1	65,0	57,6	77,1	49,1
0351S	(1)	78,08	78,5	70,6	73,6	75,6	76,5	71,6	62,5	81,1	53,1
	(2)	78,1	75,4	67,4	70,8	71,6	72,9	68,8	59,2	77,6	49,6
0431S	(1)	78,08	78,6	70,8	75,9	76,6	78,9	71,6	62,8	82,8	54,8
	(2)	78,1	75,4	67,5	72,8	71,7	74,2	67,4	58,4	78,3	50,3
0472S	(1)	84,7	75,1	71,1	75,1	73,3	75,8	70,5	59,3	80,2	52,2
	(2)	84,7	71,9	67,8	72,4	69,5	72,1	67,2	54,9	76,7	48,7
0552S	(1)	81,08	81,5	73,6	77,9	78,6	78,8	71,3	64,3	83,6	55,6
	(2)	81,1	78,4	70,4	75,5	74,7	75,1	68,0	60,3	80,1	52,1
0672S	(1)	81,08	81,5	73,6	76,7	78,6	79,5	74,6	64,3	84,1	56,1
	(2)	81,1	78,4	70,4	73,8	74,6	75,9	71,8	60,3	80,6	52,6
0812S	(1)	81,08	81,6	73,8	78,9	79,6	82,0	74,6	65,0	85,8	57,8
	(2)	81,1	78,4	70,5	75,8	74,7	77,2	70,4	60,3	81,3	53,3

- (1) The above data shows noise levels **without** isolation for compressor
- (2) The above data shows noise levels **with** isolation for compressor (optional)

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

Sound pressure in dB(A) calculated at 10 m, in a free field on a reflecting surface, is given as a guide only and with a directivity of +/- 3 dBA.

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

The data table above, are calculated for units operating on cooling or heating mode (with ambient temperatures higher than + 35 °C), and at maximum fan speed.

For ambient temperatures lower than +35 °C and unit working on cooling mode, the fan, speed regulating, and produce an attenuation of noise level as follow:

Sound pressure level attenuation calculated at 10 m (dBA) shows in the table below, (minimum speed when ambient temperatures lower than + 20 °C).

MODELS EAC / EAR	0091S	0111S/0211S	0251S/0431S	0471S/0811S
Noise level attenuation, because of fan speed regulation	-1 dBA	-2 dBA	-3 dBA	-3 dBA

HIGH STATIC PRESSURE UNITS (WITHOUT AIR DUCT)

	EAC EAR		Spectrum per octave band (dBA)								Global sound power Lw dB(A)
			63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	
FP VERSION	0091S	(1)	48	58	67	69,6	72,5	73,6	70,9	62	78,4
		(2)	48	58	67	69,5	72,5	73,5	70,7	62	78,3
	0111S	(1)	51	61	69,5	72,7	75,6	76,5	73,8	65	81,4
		(2)	51	61	69,5	72,6	75,6	76,5	73,6	65	81,3
	0151S	(1)	51	61	69,5	72,8	75,8	76,6	73,7	65	81,5
		(2)	51	61	69,5	72,7	75,6	76,5	73,6	65	81,4
	0191S	(1)	51	61	69,5	72,8	75,9	76,9	74	65	81,7
		(2)	51	61	69,5	72,7	75,7	76,7	73,8	65	81,5
	0211S	(1)	51	61	69,6	74,4	76,3	77,4	74,2	65,1	82,2
		(2)	51	61	69,6	73,7	75,8	76,8	73,8	65,1	81,7
FP1 VERSION	0251S	(1)	46	70,6	71,1	78,7	82,4	80,6	75,5	67,7	86,1
		(2)	46	60	69	78,4	82,1	80,3	75,3	67	85,8
	0291S	(1)	46	76,1	71,7	78,8	82,8	81,1	75,6	67,9	86,5
		(2)	46	60	69	78,7	82,1	80,3	75,2	67	85,9
	0351S	(1)	46	75,8	71,5	79	82,6	81,3	76,5	68	86,7
		(2)	46	60	69,1	78,3	82,1	80,4	75,8	67,2	85,9
	0431S	(1)	46	76	71,7	79,8	82,8	82,3	76,5	68	87,2
		(2)	46	60	69,1	78,8	82,1	80,7	75,5	67,1	86
	0472S	(1)	49	72,8	73,6	81,8	85,2	83,7	78,7	70,2	89,1
		(2)	49	63	72	81,4	85,1	83,3	78,3	70	88,8
0552S	(1)	49	78,8	74,5	82,4	85,6	84,1	78,7	70,6	89,5	
	(2)	49	63	72	81,7	85,1	83,3	78,2	70	88,9	
0672S	(1)	49	78,8	74,5	82	85,6	84,3	79,5	70,7	89,7	
	(2)	49	63	72,1	81,3	85,1	83,4	78,8	70	88,9	
0812S	(1)	49	79	74,7	82,8	85,8	85,3	79,5	70,8	90,2	
	(2)	49	63	72,1	81,8	85,1	83,7	78,5	70	89	
FP2 VERSION	0251S	(1)	52	74,2	79,3	84,2	86,2	83,3	78,2	70,4	89,7
		(2)	52	72	79	84,1	86	83,1	78,1	70	89,5
	0291S	(1)	52	77,4	79,4	84,2	86,3	83,6	78,3	70,5	89,8
		(2)	52	72	79	84,2	86	83,2	78,1	70	89,5
	0351S	(1)	52	77,2	79,3	84,3	86,3	83,7	78,8	70,5	89,9
		(2)	52	72	79	84,1	86	83,2	78,4	70,1	89,6
	0431S	(1)	52	77,4	79,4	84,5	86,3	84,3	78,8	70,6	90,2
		(2)	52	72	79	84,2	86	83,4	78,3	70,1	89,6
	0472S	(1)	55	76,9	82,2	87,2	89,1	86,4	81,3	73,1	92,7
		(2)	55	75	82	87,1	89	86,1	81,1	73	92,5
0552S	(1)	55	80,2	82,3	87,4	89,3	86,6	81,3	73,3	92,8	
	(2)	55	75	82	87,2	89	86,2	81,1	73	92,5	
0672S	(1)	55	80,2	82,3	87,3	89,3	86,7	81,8	73,3	92,9	
	(2)	55	75	82	87,1	89	86,2	81,4	73	92,6	
0812S	(1)	55	80,4	82,4	87,5	89,3	87,3	81,8	73,4	93,2	
	(2)	55	75	82	87,2	89	86,4	81,3	73	92,6	

- 1) The above data shows noise levels **without** isolation for compressor, and unit mounted without air duct
- 2) The above data shows noise levels **with** isolation for compressor (optional), and unit mounted without air duct

- Global sound power level measured in compliance with ISO standard 3744 and under Eurovent certification program.
- The data table above, are calculated for units operating on cooling or heating mode (with ambient temperatures higher than + 35 °C), and at maximum fan speed.
- The above data shows sound power level data (Lw) calculated **without air ducts** on the installation.

The final sound pressure level for the installation, will be decreased, once the ducts will be installed, and depends on material and dimensions of them.

STANDARD AXIAL FAN UNITS WITHOUT AIR DUCTS

COOLING MODE

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

NOTE: With outdoor temperatures below +5°C, add glycol

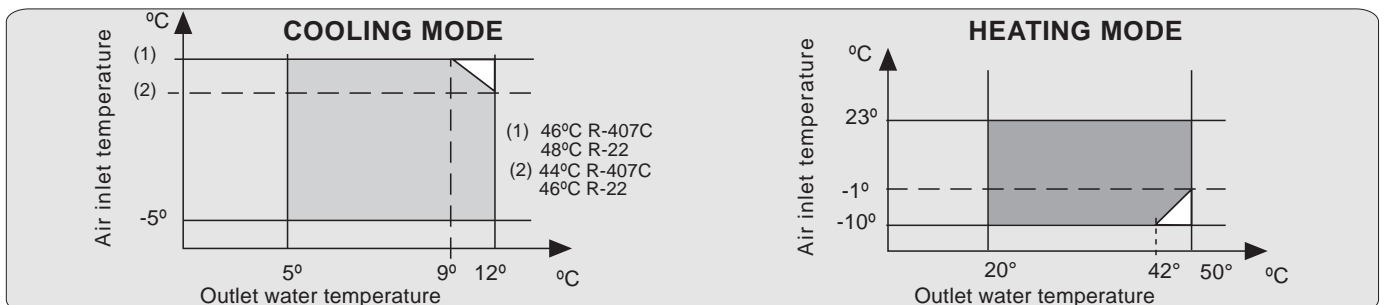
(1) With the optional cooling low ambient kit (-5° to -15°C), it is possible the unit operation up to -15°C

HEATING MODE

MODELS	EAR	0091S	0111S	0151S	0191S	0211S	0251S	0291S	0351S	0431S	0472S	0552S	0672S	0812S
Hot water outlet temperature (operation)		Minimum : +20°C Maximum : +50°C												
Hot water inlet temperature (start)		Minimum : +10 °C Maximum : +43°C												
Difference hot water inlet/outlet		Minimum : +3°C Maximum : +8°C												
Air inlet temperature		Minimum : -10°C (2) Maximum : +23°C												

OUTSIDE THESE VALUES, PLEASE CONSULT US

(2) With the optional heating low ambient kit (-15°C), it is possible the unit operation up to -15°C



NOTE: With outdoor temperatures below +5°C, add glycol. The unit incorporates as standard a fan speed control in cooling mode, which allows the unit to operate at very low outside temperatures, until -5°C. If it is used the cooling low ambient kit (-5° to -15°C), it is possible the unit operation up to -15°C.

STANDARD AXIAL FAN UNITS WITH AIR DUCTS

COOLING MODE

AVAILABLE PRESSURE UP TO 50 Pa	0091 to 0211S		0251 to 0812S		0091 to 0211S		0251 to 0812S	
	R407C models				R22 models			
Available static pressure Pa	30	50	30	50	30	50	30	50
Maximum ambient temperature °C	43	40	42	38	46	44	45	43

HEATING MODE

AVAILABLE PRESSURE UP TO 50 Pa	0091 to 0211S		0251 to 0812S		0091 to 0211S		0251 to 0812S	
	R407C models				R22 models			
Available static pressure Pa	30	50	30	50	30	50	30	50
Minimum ambient temperature °C (1)	-8	-6	-8	-6	-8	-6	-8	-6

(1) With the optional heating low ambient kit (-15°C), it is possible the unit operation up to -15°C

HIGH STATIC PRESSURE UNITS

COOLING MODE

AVAILABLE PRESSURE UP TO 200 Pa FP VERSION	0091 to 0211S-FP MODEL UNITS							
	R407C models				R22 models			
	50	100	150	200	50	100	150	200
Available static pressure Pa	50	100	150	200	50	100	150	200
Maximum ambient temperature °C	46	45	41	38	48	47	44	42

AVAILABLE PRESSURE UP TO 120 Pa FP1 VERSION	00251 to 0812S-FP MODEL UNITS									
	R407C models					R22 models				
	50	75	100	125	150	50	75	100	125	150
Available static pressure Pa	50	75	100	125	150	50	75	100	125	150
Maximum ambient temperature °C	46	43	39	35	---	50	48	45	43	40

AVAILABLE PRESSURE UP TO 350 Pa FP2 VERSION	00251 to 0812S-FP MODEL UNITS									
	R407C models					R22 models				
	150	200	250	300	350	150	200	250	300	350
Available static pressure Pa	150	200	250	300	350	150	200	250	300	350
Maximum ambient temperature °C	47	44	41	38	35	50	48	46	44	42

HEATING MODE

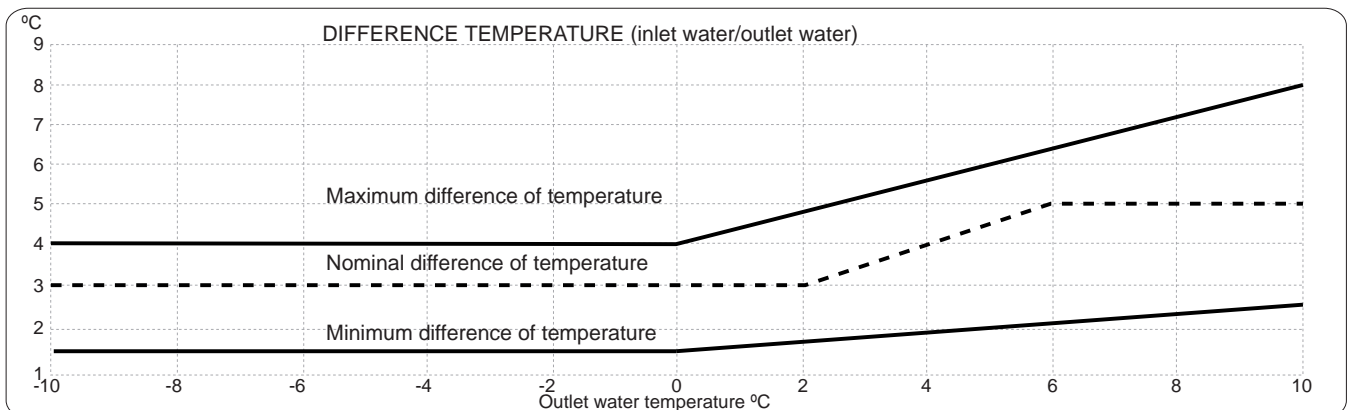
AVAILABLE PRESSURE UP TO 200 Pa FP VERSION	0091 to 0211S-FP MODEL UNITS							
	R407C models				R22 models			
	50	100	150	200	50	100	150	200
Available static pressure Pa	50	100	150	200	50	100	150	200
Minimum ambient temperature °C (1)	-10	-10	-8	-6	-10	-10	-8	-6

AVAILABLE PRESSURE UP TO 120 Pa FP1 VERSION	00251 to 0812S-FP MODEL UNITS									
	R407C models					R22 models				
	50	75	100	125	150	50	75	100	125	150
Available static pressure Pa	50	75	100	125	150	50	75	100	125	150
Minimum ambient temperature °C (1)	-10	-8	-6	-5	---	-10	-10	-8	-6	-5

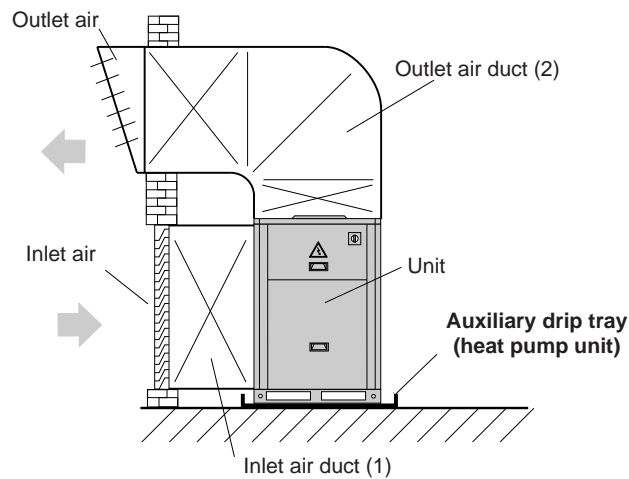
AVAILABLE PRESSURE UP TO 350 Pa FP2 VERSION	00251 to 0812S-FP MODEL UNITS									
	R407C models					R22 models				
	150	200	250	300	350	150	200	250	300	350
Available static pressure Pa	150	200	250	300	350	150	200	250	300	350
Minimum ambient temperature °C (1)	-10	-10	-8	-6	-5	-10	-11	-10	-8	-6

(1) With the optional heating low ambient kit (-15°C), it is possible the unit operation up to -15°C

UNITS WITH LOW WATER TEMPERATURE KIT (OPTION)



LOCATION INSIDE



For location inside, keep in mind following advice:

-In heat pump units during defrost cycle, the units produce a great amount of water melting the ice off coils. If you wish to drain the water, an auxiliary drip tray, should to be installed behind the unit to collect and carry out water where desired.

-Air duct installation:

If air duct has been installed, the operating limits get reduced (see operation limits section in this manual).

(1) The air intake plenum (option) available for models from 0251 to 0812 makes easier the installation of the air intake duct (see page 7).

(2) The discharge plenum (option) lets the installation of a square discharge duct for the high static pressure units FP1 and FP2 (see page 7).

CONTENTS

Introduction and description of the components.....	32
Technical data.....	32
Single pump	32
Operation principles	33
Available static pressure water pump.....	34
Glycol solution unit.....	34
Water flow volume.....	35
Heater water tank (in option).....	35
Hydraulic version unit equipment and dimensional data	36
Hydronic version unit equipment and dimensional data	38

DESCRIPTION

- All hydraulic accessories are integrated in the standard unit casing

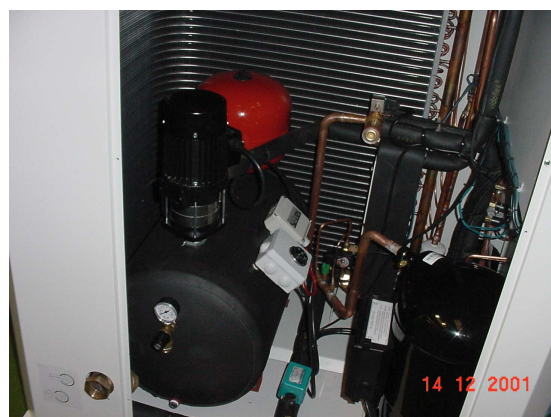
COMPONENTS:

HYDRONIC VERSION:

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

HYDRAULIC VERSION:

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



TECHNICAL DATA

MODELS		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)	Hydronic version	Kg	44	44	44	44	45	47	47
	Hydraulic version	Kg	14	14	14	14	15	16	16
Hydraulic connections	inches	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	
MODELS		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)	Hydronic version	Kg	48	48	55	55	57	57	
	Hydraulic version	Kg	17	17	23	23	24	24	
Hydraulic connections	inches	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 for units with hydronic version

SINGLE PUMP

MODELS		0091S	0111S	0151S	0191S	0211S	0251S	0291S
Pump								
Type		Horizontal multistage centrifugal pump						
Voltage	V.	1N-230V			3~230V-3N~400V			
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
MODELS		0351S	0431S	0472S	0552S	0672S	0812S	
Pump								
Type		Horizontal multistage centrifugal pump						
Voltage	V.	3~230V-3N~400V						
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 series of hydraulic accessories obtaining the hydraulic or hydronic version.

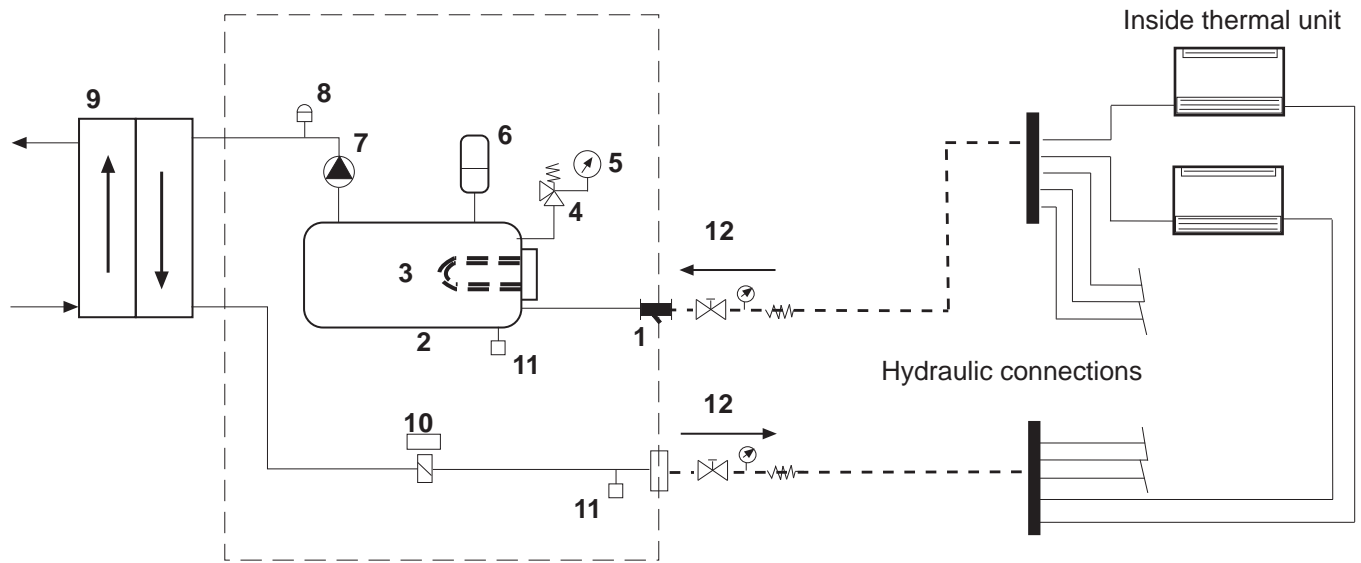
COMPONENTS:

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

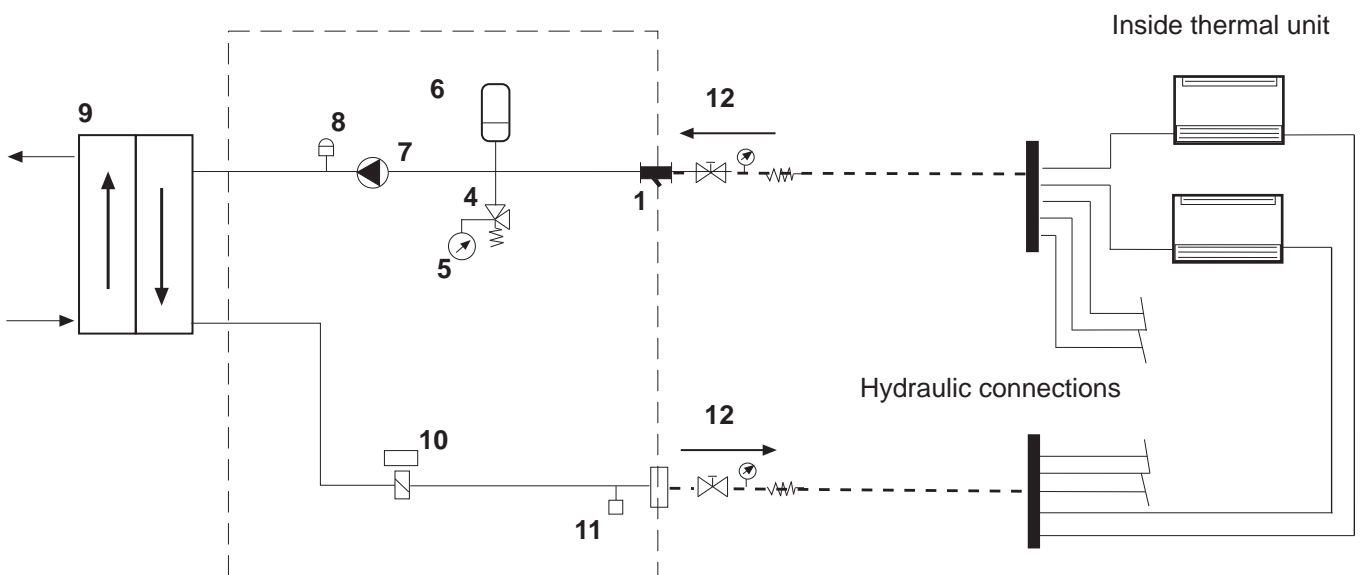
HYDRAULIC VERSION: 1,4,5,6,7,8,9,10,11

- | | |
|-----------------------------------|--|
| 1.- Detachable water filter | 7.- Water pump |
| 2.- Water tank | 8.- Air purge valve |
| 3.- Water tank heater (in option) | 9.- Plate exchanger |
| 4.- Safety valve | 10.- Flow switch |
| 5.- Manometer | 11.- Drain valve |
| 6.- Expansion vessel | 12.- Water isolation valves (in option) |

HYDRONIC VERSION



HYDRAULIC VERSION



AVAILABLE STATIC PRESSURE OF THE UNIT

WATER FLOW AND AVAILABLE STATIC PRESSURE (included water pump and filter factory setting)

	MODEL	EAC / EAR 009 1S K-A					EAC / EAR 01911S 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
	m ³ /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	222	215	208	193	182	204	193	178	166	153	200	186	181	170	140

	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
	m ³ /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	181	175	168	160	139	184	176	165	155	128	182	162	143	132	115

	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
	m ³ /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	168	155	139	120	102	208	192	178	148	108	167	141	135	119	25

	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
	m ³ /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	164	149	138	123	113	151	141	132	116	97	227	213	192	169	119

	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
	m ³ /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	199	185	169	139	42	166	151	140	130	118	154	145	137	119	108

	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
	m ³ /h	8,86	9,57	10,28	10,99	12,89	10,62	11,33	12,04	12,75	15,48
Available static pressure	kPa	229	214	195	173	126	205	192	177	148	55

NOTE: The flow data indicated in table are between a minimum and a maximum water flow. With the twin pumps kit, the available static pressure will decrease 5% from the data shown above.

Unit conversion:
 Pressure 1kPa = 1/9,8 m.c.a. = 0,01 bar
 1 bar = 10 m.c.a. = 100 kPa

GLYCOL SOLUTION UNIT



If the outside temperature where the system is to be installed or the outlet water temperature is likely to drop below 5°C, it is very important to use glycol anti-freeze.

The amount of anti-freeze required will vary depending on the minimum ambient temperature or the outlet water 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 OR OUTLET WATER TEMPERATURE	ETHYLENE GLYCOL %	PRESSURE DROP	WATER FLOW	CAPACITIES	
				COOL	HEAT
FROM +5°C TO 0°C	10 %	1,05	1,02	0,99	0,994
FROM 0°C TO -5°C	20 %	1,10	1,05	0,98	0,993
FROM -5°C TO -10°C	30 %	1,15	1,08	0,97	0,99
FROM -10°C TO -15°C	40 %	1,20	1,11	0,96	0,987

Example: 10 % glycol in EAC0091SKHN
 Minimum flow: 1,19 m³/h x 1.02
 Pressure drop x 1.07
 System capacity x 0.99

MINIMUM WATER FLOW

The installation never must operate with less than the minimum water flow (see table), since this can cause:

- i. - Freezing the water heat exchanger
- ii. -The water exchanger gets dirty.

MAXIMUM WATER FLOW

See maximum water flow, indicated in table. Always assure a minimal delta T to the exchanger of 3K..

MAXIMUM WATER VOLUME IN THE INSTALLATION.

The units with hydronic or hydraulic version include an expansion vessel.

The table below details the maximum water volume in the system.

Models	009/021	025/043	047/081
Solution	Water volume in liters		
Water	225	550	850
Water + 10% gyt	175	400	650
Water + 20% gyt	150	350	575
Water + 30% gyt	125	300	450
Water + 40% gyt	90	165	220

If the water volume in the system is greater than that detailed in the table it will be necessary to add additional expansion vessel(s).

WATER TANK HEATER (AN OPTION)

The option for Antifreeze protection on the buffer tank includes on cooling only units a immersion heater with safety thermostat.

On heat pump units only when fitted with a buffer tank it is possible to have anti freeze plus supplemental water heater this includes immersion heater with safety thermostat and a adjustable heater thermostat.

Anti-freeze heater: cooling only and heat pump units. It starts when water temperature in the buffer tank is lower than + 5 °C. (for units without low water temperature kit).

Anti-freeze and supplementary heater: heat pump units only. The heater works as anti-freeze heater as explained before and as supplementary heater, when inlet warm water reaches a temperature below a value selected (example: 30 °C) through an independent thermostat included.

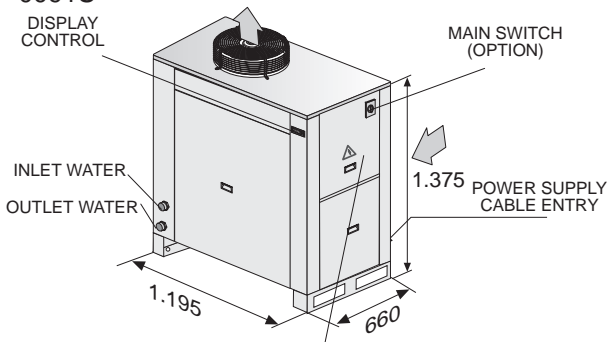
Power consumption is:

Type		009/021	025/043	047/081
Voltage	v.	1N~230V		
		3~230V-3N~400V		
Anti-freeze heater	kW.	2,25	2,25	2,25
Anti-freeze and supplementary heater*	kW.	6	9	12

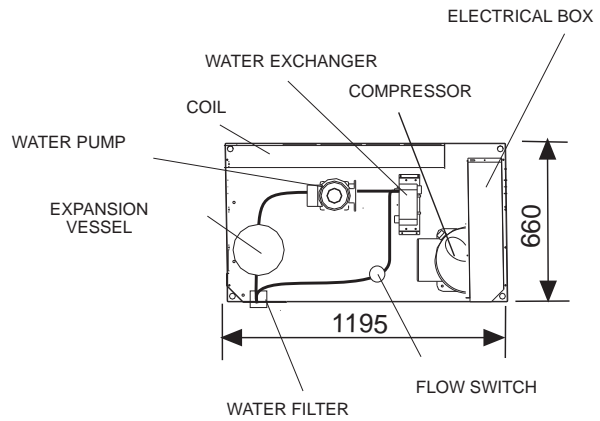
(*) Heat pump units only

(HYDRAULIC VERSION)

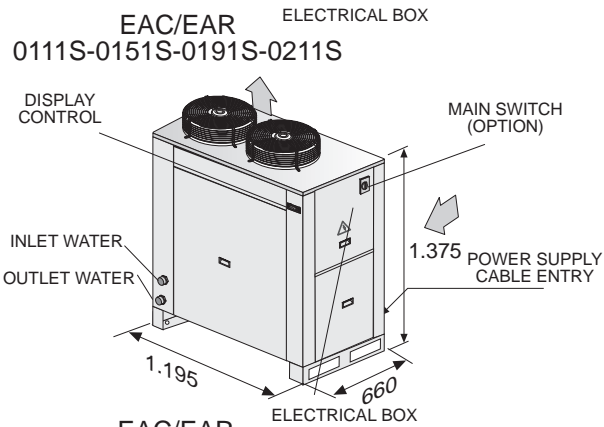
1 EAC/EAR 0091S



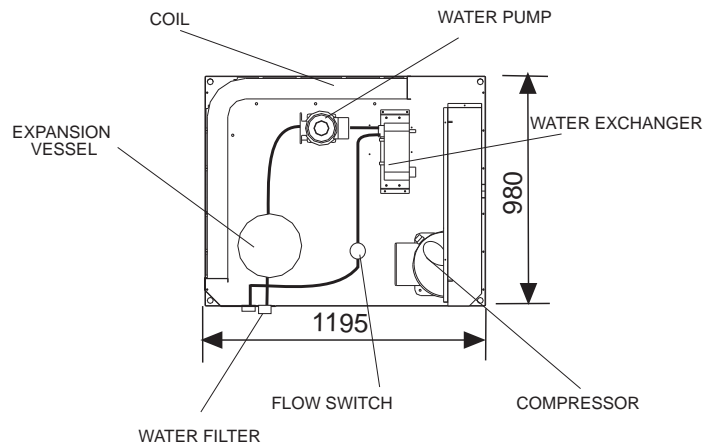
1/2 COMPONENT POSITION HYDRAULIC VERSION UNIT



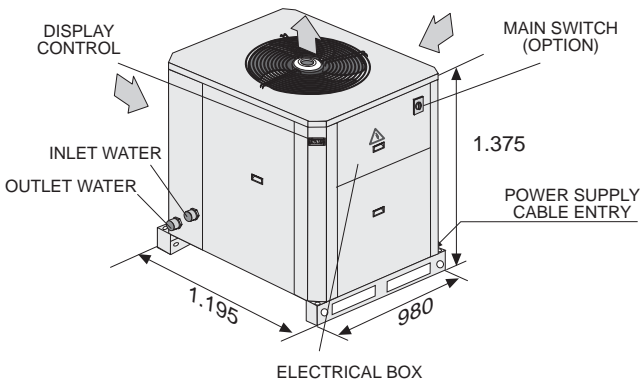
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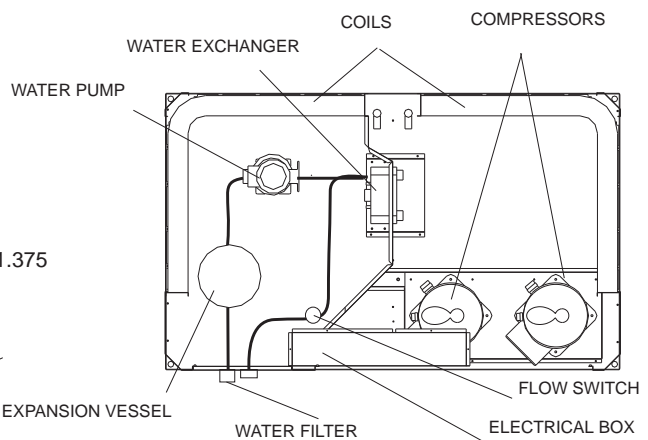
3 COMPONENT POSITION HYDRAULIC VERSION UNIT



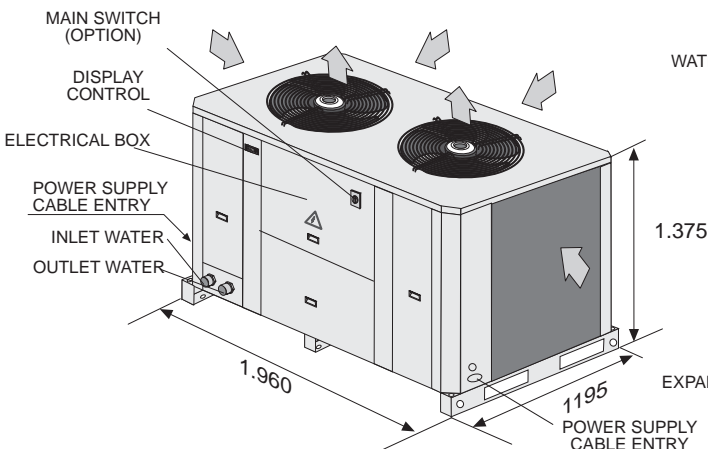
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4 COMPONENT POSITION HYDRAULIC VERSION UNIT

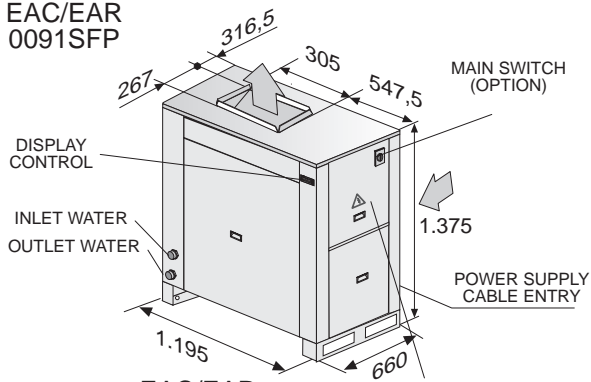


4 EAC/EAR 0472S-0552S-0672S-0812S

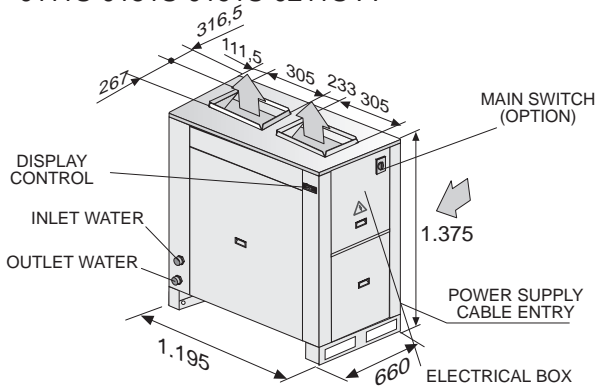


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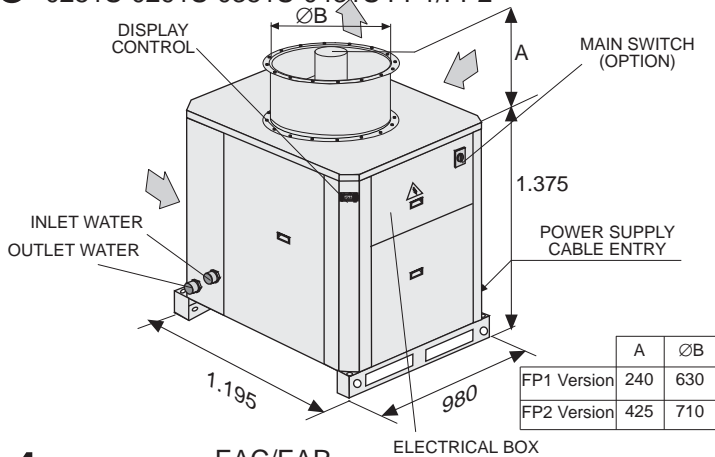
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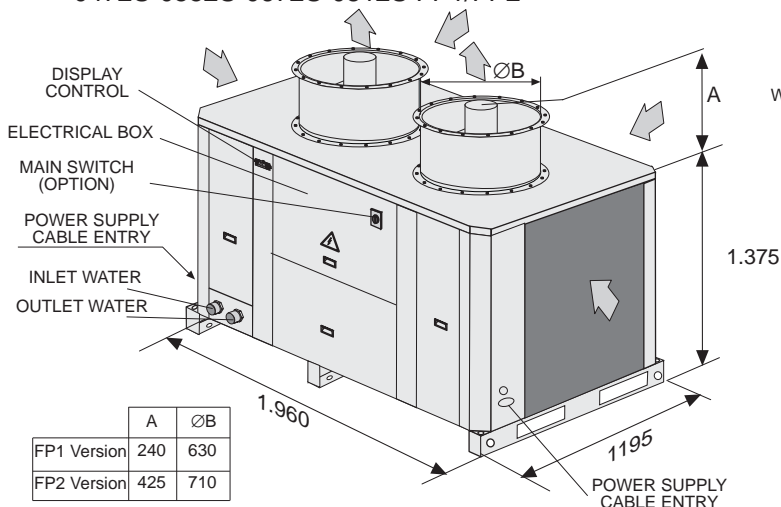
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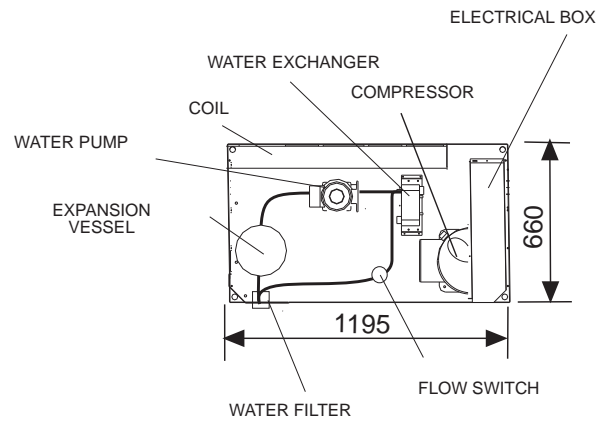
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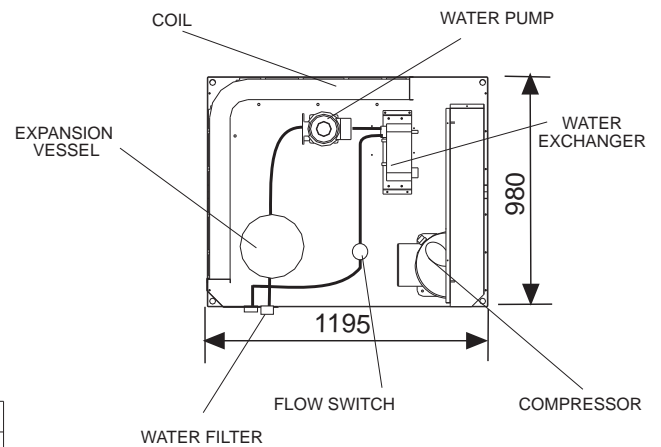
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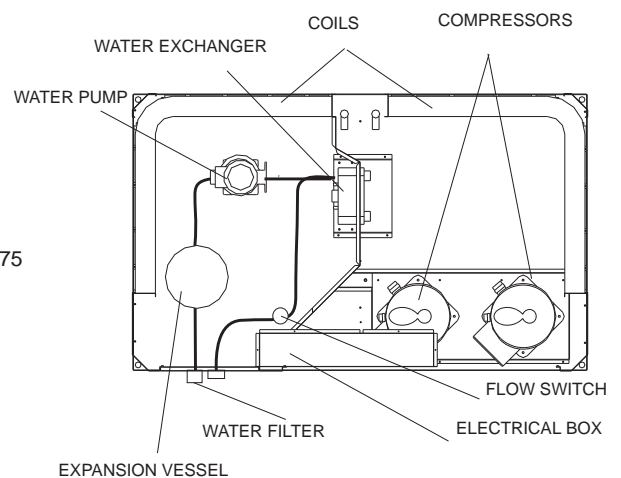
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3 COMPONENT POSITION HYDRAULIC VERSION UNIT

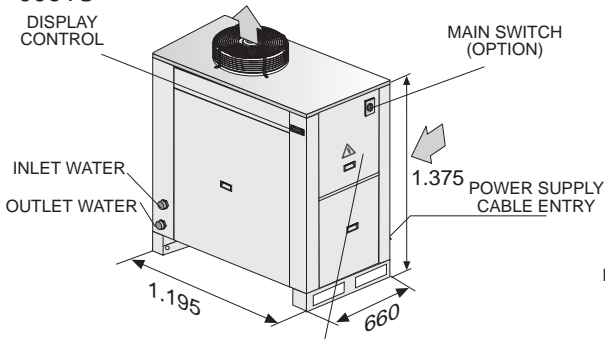


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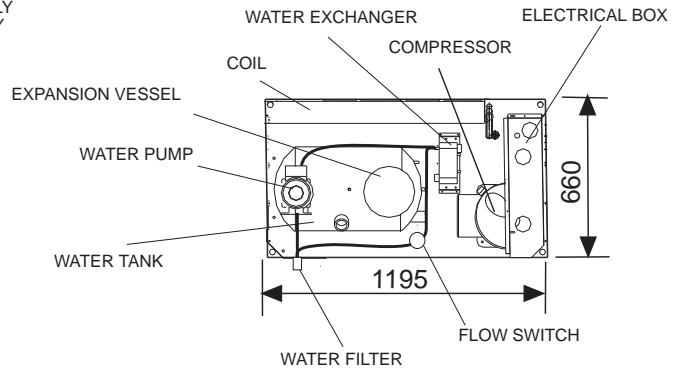


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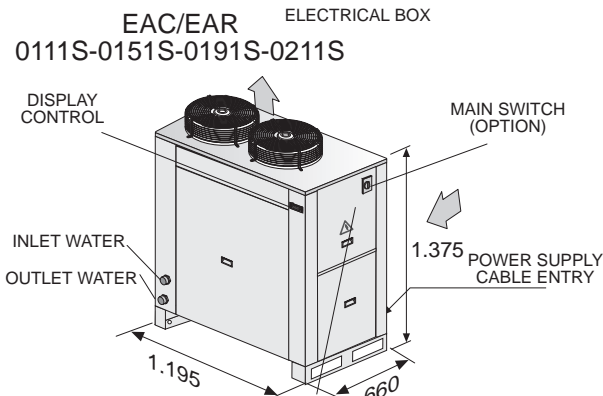
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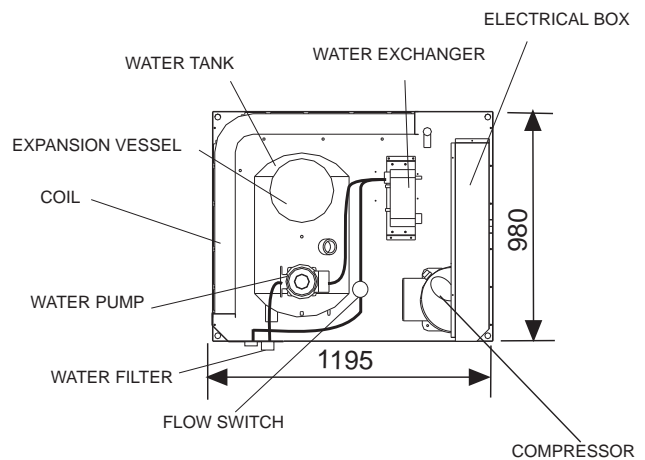
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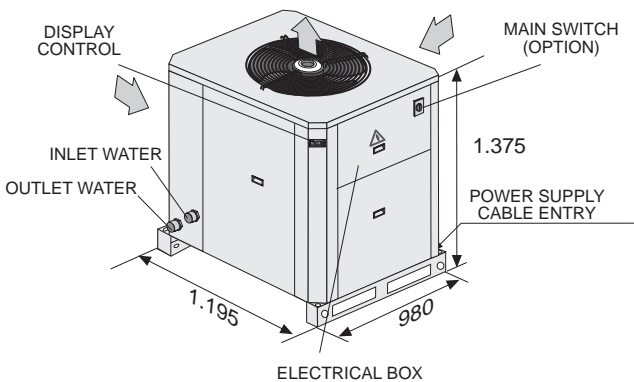
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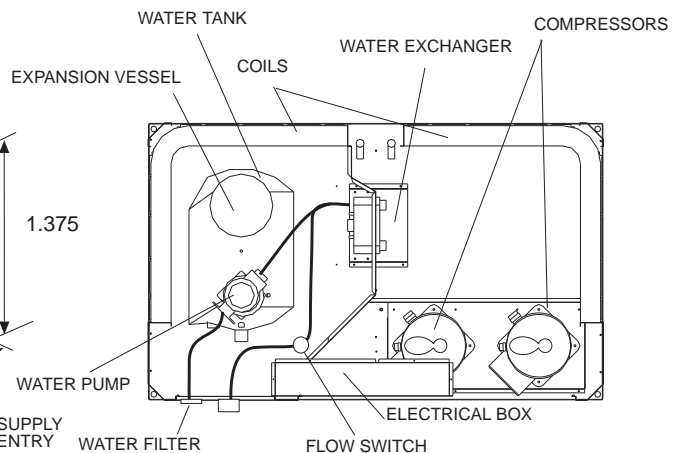
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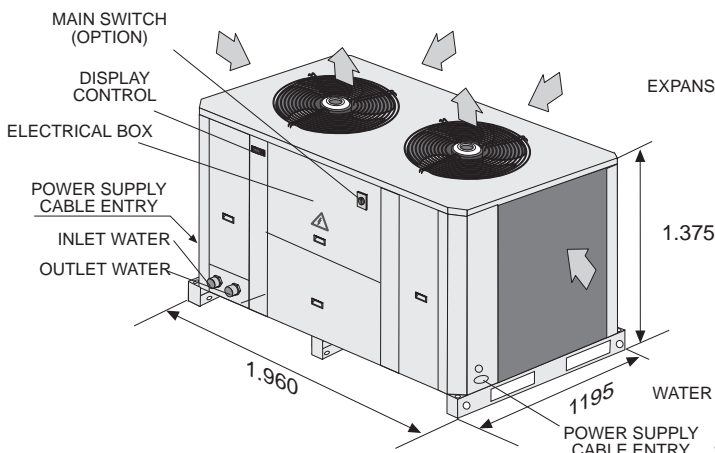
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4 COMPONENT POSITION HYDRONIC VERSION UNIT

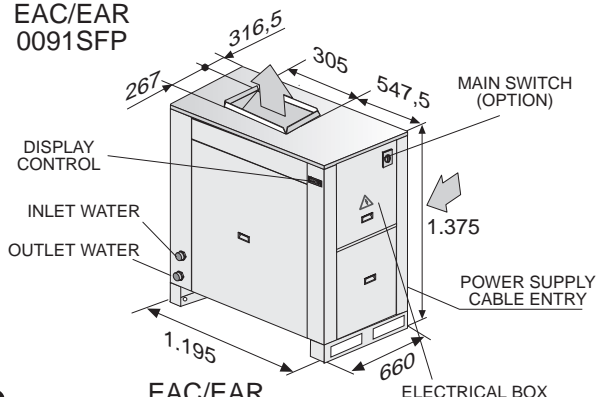


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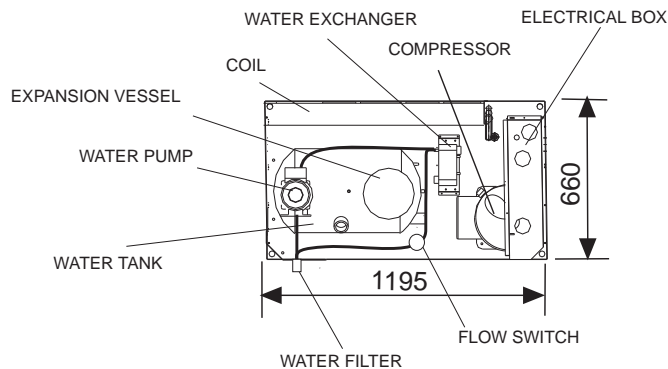


(HIDRONIC VERSION)

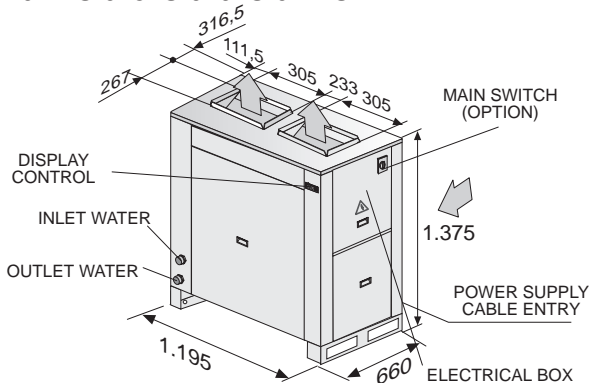
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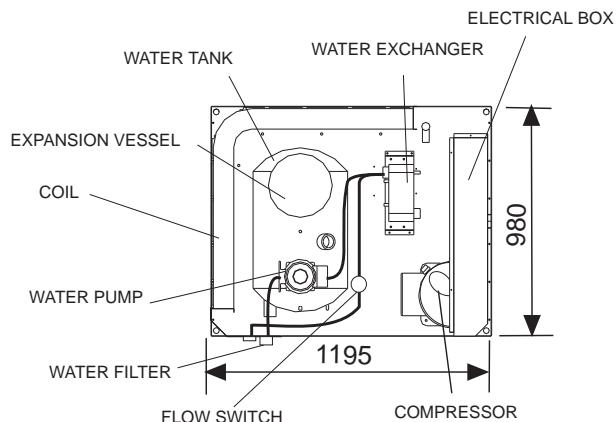
1 / 2 COMPONENT POSITION HYDRONIC VERSION UNIT



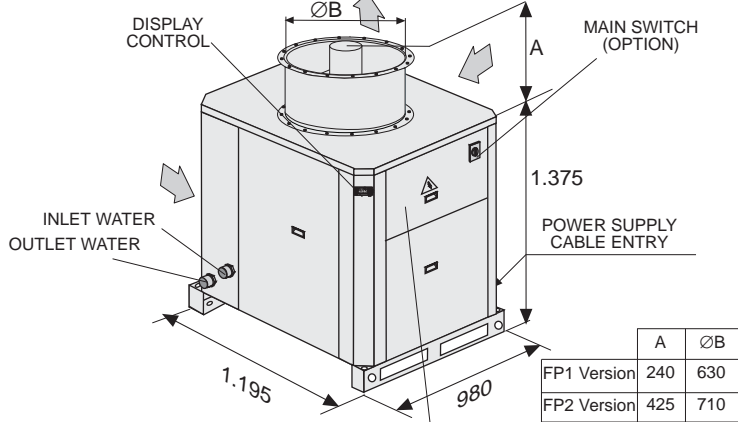
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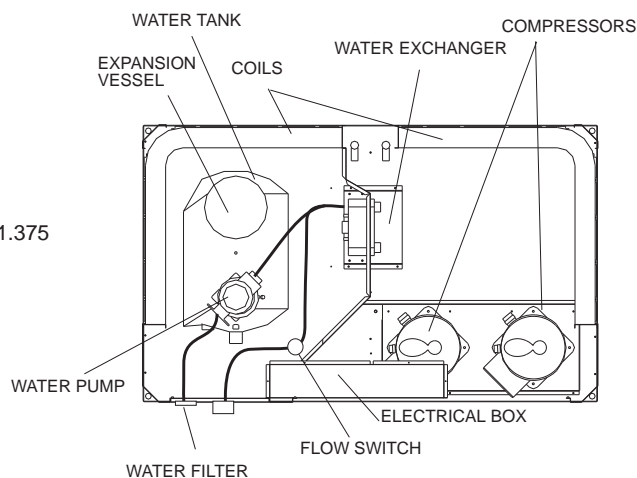
3 COMPONENT POSITION HYDRONIC VERSION UNIT



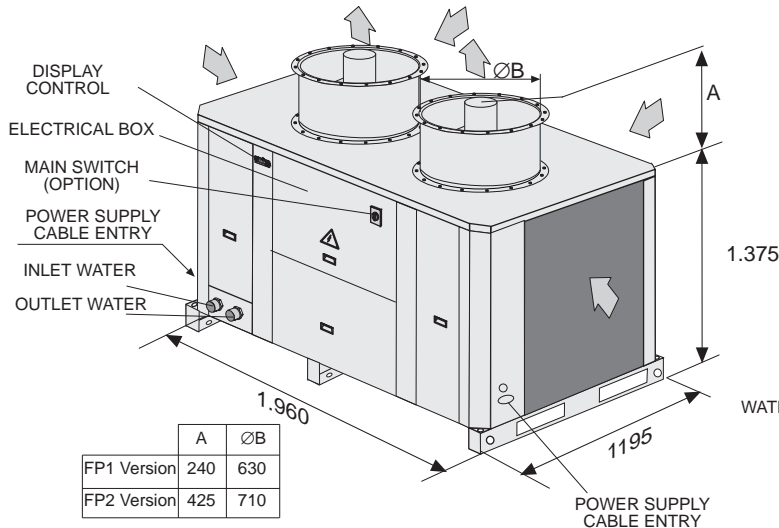
3 EAC/EAR 0251S-0291S-0351S-0431S FP1/FP2



4 COMPONENT POSITION HYDRONIC VERSION UNIT



4 EAC/EAR 0472S-0552S-0672S-0812S FP1/FP2



Ecolean™ Technical specification

To supply and install, where specified in the project n° unit(s) air-cooled water chiller with cooling capacity of kW, to cool m³/sec. of water from °C to working with °C ambient temperature. The unit should work with electricity at V. 3ph. 50Hz. The electrical power absorbed should not overcome kW. The units COP will be at least at the working conditions of the project. Part load COP will be at least at the working conditions of the project. For the units with 1 or 2 compressors, the chillers will have (1) or (2) independent refrigerant circuits, with the respective electronic microprocessor will allow the starting of the compressors and the control of the chiller. Each chiller will be factory assembled on a robust base frame made of coated steel. The panels will be coated steel panels protected by an epoxy coated paint. The unit will be tested at full load in the factory at the nominal working conditions and water temperatures. Before shipment a full refrigerant leak test will be held to avoid any losses, and the units will be filled with oil and refrigerant.

General

Units are leak and pressure-tested at 27 bars (400 psi) high side and 16.5 bars (200 psi) low side, and then evacuated and charged. Packaged units ship with a full operating charge of oil and refrigerant. Unit panels, structural elements, and control boxes are constructed of 1.5 to 3 mm (11 to 16 gauge) galvanized sheet metal. The chiller is constructed on a solid rugged base frame constructed of steel beams welded together to form a ridged base. The base is structurally able to carry the unit weight and is torsion ally ridged with no vibrating sections. The base is hot dipped galvanised for corrosion protection. The chiller is lifted, moved and mounted via the base frame that contains mounting and lifting points as standard. Unit panels, control boxes and the structural-steel base are finished with baked-on powder paint. The unit is painted to RAL 9002 as standard. The units must be constructed to meet European norms and standards specifically EN 60204-1, NR 2037/2000, ISO9001, & Eurovent certification performance standards.

Compressors

All units will have direct driven hermetic Scroll compressors. The scroll compressor axial seal will be achieved by floating tip seals the radial seal is achieved via a micro cushion of oil. The scroll components will be able to disengage in the event of liquid carry over. The compressor motors will be suction gas cooled and have thermal overload device. The operating limits of the compressor motors will allow for +/- 10% of the nameplate voltage. The compressors are mounted on vibration isolation pads to reduce noise transmission.

Evaporator

The evaporator is brazed plate type designed, tested, and stamped in accordance with the appropriate pressure-vessel code approval. The evaporator is designed for a waterside working pressure of 10 bars (146psi) and refrigerant side 30 bars (450psi). Water connections are grooved stubs for simple site connection. The evaporator includes an automatic air vent, a drain, and fittings for temperature control sensors, and is insulated with 13 mm (1/2 inch) (K-0.26). Optional evaporator heaters are provided to protect the evaporator from freezing at ambient temperatures down to -20°C (-6°F). The evaporator is designed to operate with a flow detection device. Options are for a paddle type switch. The evaporator will have independent refrigerant circuits. The evaporator should be protected from debris and a water filter is available as an option for standard version, included as standard for hydraulic and hydronic versions.

Condenser coil

The condenser coils are constructed with internally enhanced seamless copper tubes having a "L" configuration and making this unit compact and highly efficiency.

Condenser fans

The condenser fans are direct drive vertical discharge helical type with multiple aerofoil blades for higher efficiencies and lower noise. The fan blade will be of the sickle end type mounted in a bell mouth orifice, except for FP versions which are centrifugal ones. The air discharge is vertical and each fan will be coupled to the electrical motor, supplied as standard to IP54/IP55 class "F" insulation with 6 poles except for FP unit versions which is 4 poles and capable to work to ambient temperatures of -40°C to +70°C max humidity 80%. The fans are direct driven via a single phase motor except for FP2 unit version driven via a three phase motor with permanently lubricated ball bearings. The motors are designed for external operation with the possibility with regulation speed via unit control.

Control panel

Field power connection, controls interlock terminals, and unit control system shall be centrally located in a weatherproof cabinet accessible through a lockable door. All 3-phase connections shall be fully shrouded to prevent accidental contact. Power and starting controls shall include lockable individual fuses and contactors for each compressor winding and fan motors. Operating and safety controls shall be via a microprocessor controller plus thermal protection for compressor and fan motors; high and low pressure cut-out switch (for each refrigerant circuit). Standard single point power connections include main three-phase power plus neutral to the compressors, condenser fans and control power transformer. All internal cables must be mounted on cable tray and tied. The chillers will have full earth bonding between isolated metal parts.

Control & capacity regulation**Standard Controller**

The standard control module is a weatherproof digital display. The display shows up to 4 numeric or letter sequences. In addition to the digital display there are functional LEDs to denote unit operation. Control interface will be via push button and menu screens for simple use. All alarms and faults are shown via the display

Functions:

- Remote stop start (remote connection by others)
- Flow switch (remote connection by others)
- Heat or cool operation selection
- Compressor overload Alarm
- High pressure Alarm
- Low pressure Alarm
- Operating hours compressors
- Operating hours Pump
- Compressor sequencing to match operating hours
- Condenser fan control
- Chilled water pump
- Freeze protection
- Chilled water set point control
- Alarm counter to go from auto reset to manual reset
- Self-diagnostic
- Password protection of settings
- Remote display option
- Hours run

Refrigerant piping

Each refrigerant circuit shall include a factory insulated suction line, a refrigerant filter drier, sensor indicator, liquid line, and thermostatic valve. All refrigerant pipework are clamped to prevent vibration. The refrigerant lines should contain independent Schrader valve test points for maintenance.

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