Envi Group

FOUR ECRH

Rooftop Air Conditioner

GENERAL SPECIFICATIONS

Roof type (ROOFTOP) package air conditioners, which operate either only cooling or reversible with the direct expansion refrigerant system providing the conditioning of the air indoor through ducts, which will meet the fresh air requirement needed and can perform all heating, cooling and ventilation processes in a compact unit. FOUR ECRH is designed for climates that need cooling only or reversible. Various capacity options available according to the size of the environment to be air-conditioned.

Main applications are business centers, airports, cinema and theatre halls, conference halls, industrial buildings, shopping malls, restaurants etc. Optimized heat recovery, fully automated system, economizer damper and free-cooling configurations available according to the needs of the place which will be conditioned efficiently with low energy consumption. Four ECRH ranges are fully automated with several options – options differ depending on the working scenarios-. Thanks to its Plug&Play feature and design, installation and commissioning time is short.

FOUR ECRH / Rooftop Air Conditioner

COMPONENTS

EC PLUG FANS

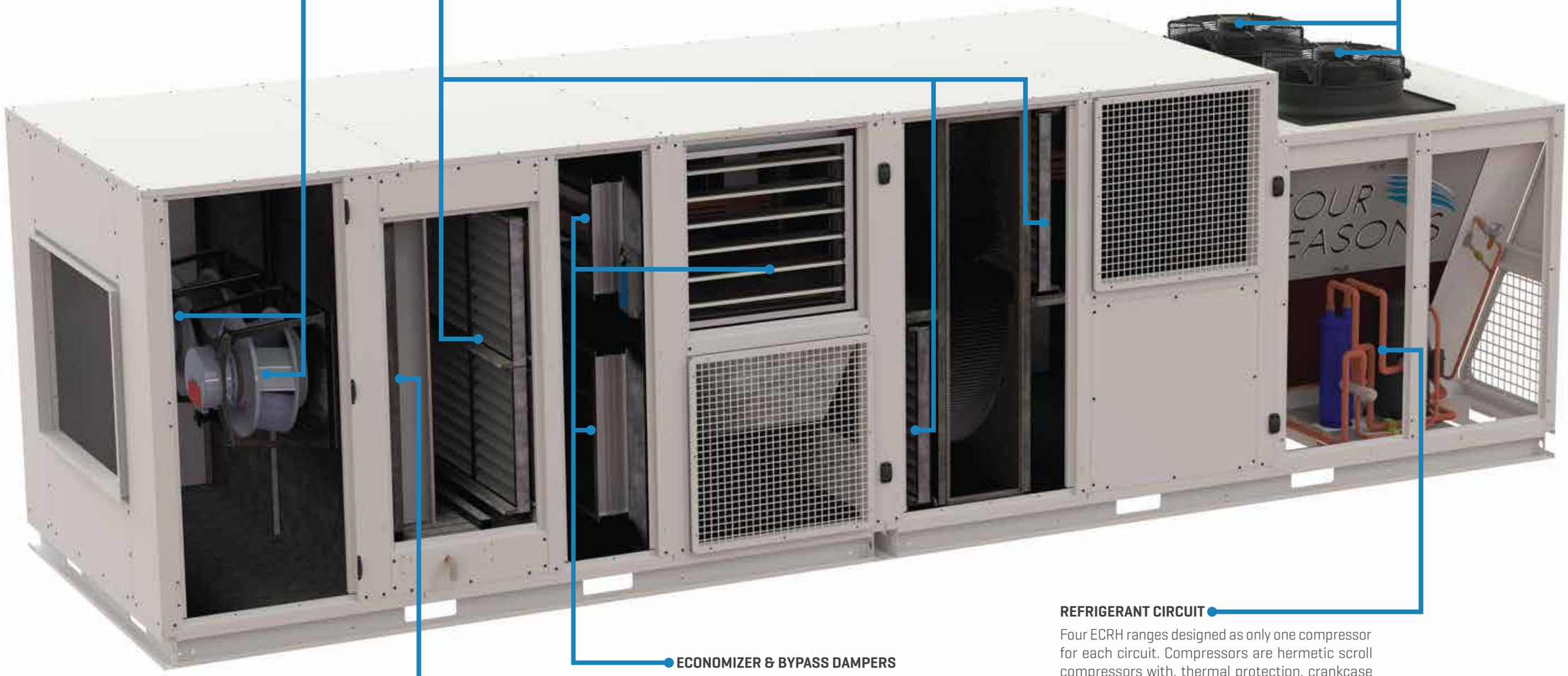
High efficient EC Plug Fans are used for supply side optionally. Economical AC plug fans might be used conditionally.

FILTERS

Easy clean and reusable filters. As standard EU ISO Course 55% (ISO 16890 – EN779 for G4). Filters are placed in front of the supply coil, at return air side and fresh air side of the rotary wheel. 2-stage filtration used as optionally with F class panel filters. Filters comply with EN779 and EN16890 standards. Filter impurities can be monitored from the control panel with the differential pressure switch.

EC AXIAL FANS

Four ECRH units are equipped with self-coupled electric motors with low consumption and suitable for outdoor conditions. EC axial fans with high efficiency and low energy consumption are used. In this way opportunity to control air flow provided without any additional electronic components according to weather conditions and operation capacity. Economical AC axial fans might be used conditionally.



INDOOR HEAT EXCHANGER COIL

Coils are made of copper pipes-aluminum fins. The design criteria of the coils are selected according to air and fluid side, pressure drop, air velocity, unit capacity, air flow rate and energy efficiency. In double circuit systems, custom made coils used. Optionally the fins might be coated with epoxy and hydrophilic. The drain pans of the coils are made of stainless steel and cleanable.

ECONOMIZER & BYPASS DAMPERS

Economizer is used to proportionally adjust the fresh air demand needed between 0-100% with a return fan. This adjustment is made automatically by control system with the sensors, located on the supply side in addition, it provides an opportunity of free cooling when outdoor and indoor conditions are suitable. Bypass damper, on the other hand, direct air mixture provided by stopping heat recovery where heat recovery is not possible (like mid seasons) between outdoor air and indoor air, direct air mixture can be made by stopping the heat recovery system with bypass damper.

REFRIGERANT CIRCUIT

Four ECRH ranges designed as only one compressor for each circuit. Compressors are hermetic scroll compressors with. thermal protection, crankcase heater and compressors suitable for R410A as refrigerant fluid type. Thermostatic expansion valves used for each inlet of coil. And dryer, inspection glass, check valves, 4-way valve and accumulator used for each independent circuit. Safe operation of refrigeration cycle is ensured by low pressure and high-pressure sensors.

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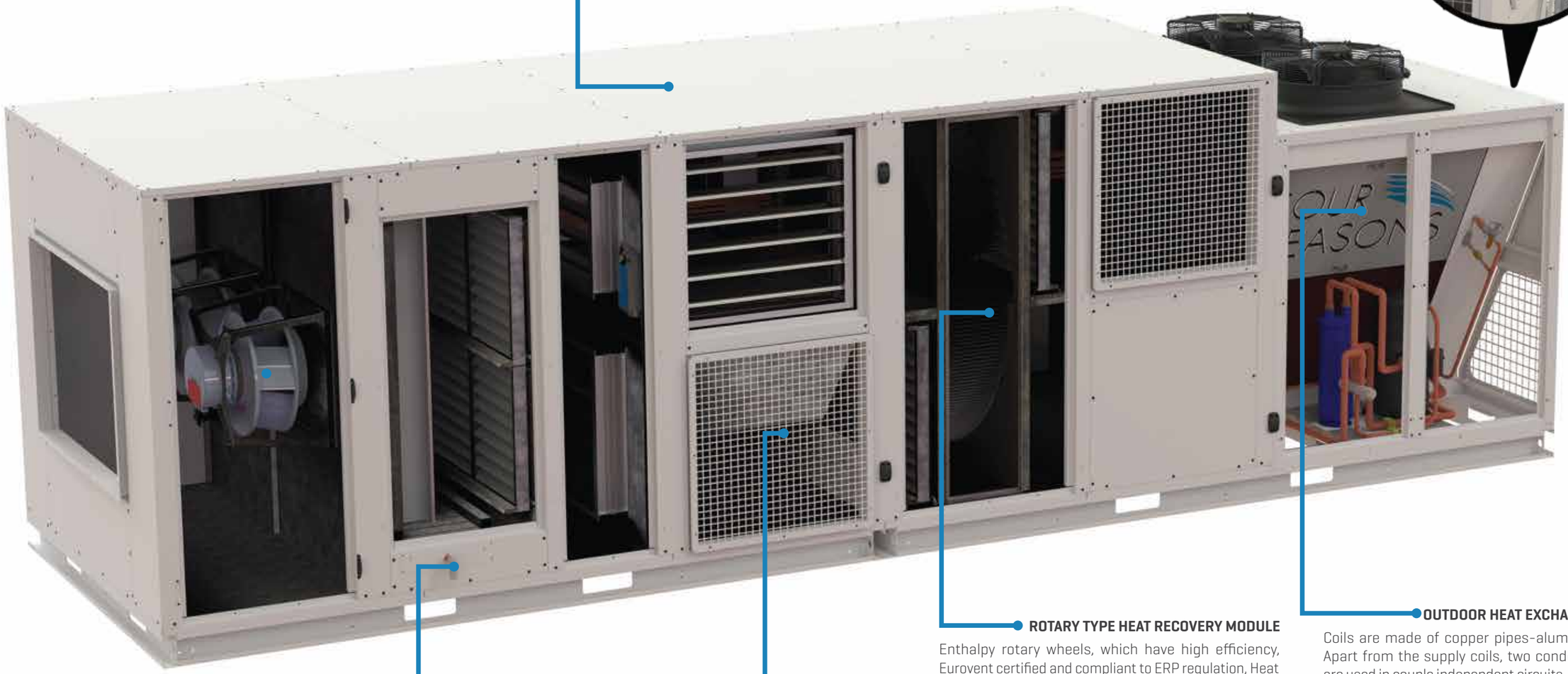
FOUR ECRH / Rooftop Air Conditioner

CASING

Double skin insulation with 50 mm rockwool, density 70 kg/m3, frameless structure and without roofcurb. The inner surface of the Four ECRH ranges is made of aluzinc material which has resistance for corrosion and atmospheric oxidation. Outer surface is made of electro static powder coated galvanized steel. Condensation drain stainless steel condensation drain pans are used. Inspection doors are installed to base for easy maintenance and installation.

CONTROL PANEL

Standard Four ECRH ranges equipped with microprocessor based with indoor monitored control system. it is compatible with ModBus protocol to comply with the building automation systems. Besides, different compatible protocols such as, BACnet, LonWorks, BMS available. As a feature of the Plug&Play, Four ECRH ranges can operate without any external module. All system could work (cooling, heating, air conditioning included) at once and automatically. Properties such as (CO2 sensors, smoke detector, differential pressure switch etc.) optionally available.



DRAIN PAN

The drain pan of evaporator is used to take out the condensation that will occur in the evaporator. It is made of stainless steel and cleanable.

RETURN FAN

EC Plug Fan as option for return air side. If the return fan is used, thermodynamic heat recovery feature is also added. Some of the air taken from the indoor environment is passed over the condenser coil with return fan. Thus, thermodynamic heat recovery is provided. In models with return fan, energy consumption is reduced while increasing the compressor efficiency with thermodynamic heat recovery.

ROTARY TYPE HEAT RECOVERY MODULE

Enthalpy rotary wheels, which have high efficiency, Eurovent certified and compliant to ERP regulation, Heat and moisture transfer are made between the fresh and exhaust air by means of rotary wheels. Optionally high efficient sorption or economical condensation rotary wheel. Filters on fresh and exhaust air sides used to prevent pollution in the Rotary wheel.

OUTDOOR HEAT EXCHANGER COIL

Coils are made of copper pipes-aluminum-fins. Apart from the supply coils, two condenser coils are used in couple independent circuits. The design criteria of the coils are selected according to air and fluid side, pressure drop, air velocity, unit capacity, air flow rate and energy efficiency... Optionally the fins might be coated with epoxy and hydrophilic.

FOUR ECRH - 030~180

- High Energy Efficient Packaged Air Conditioners
- Eco-Friendly R410A Refrigerant Gas
- Operating with 100% Fresh Air
- High Seasonal Efficiency
- Thermodynamic Heat Recovery
- 3 Stage (Asymmetric) Cooling
- Independent Dual Circuit Cooling
- Advanced Microprocessor Control
- High Installation Flexibility and Easy Commissioning
- Wide and Versatile Range (3 casings, 8 sizes)

3 Different Ranges: Bsc, Eco and Energy

Four ECRH – BSC: The heating and cooling for rooms ensured by BSC ranges, which operates with %100 return air, high efficiency and low energy consumption.

Four ECRH – ECO: Units with economizer dampers in fresh air inlet, return air and exhaust outlet. The economic operation of the unit is provided by adjusting the fresh air rate up to %30. This rate can be up to %100 according to the external weather conditions with free-cooling. Economizer dampers are controlled with the sensitive sensors on fresh and return air side.

Four ECRH – ENERGY: Units with economizer dampers and rotary type heat exchanger. Designed for areas, which requires high fresh air. With heat exchangers that have high efficiency and low pressure drop, sensible and latent heat transfer is made between exhaust and fresh air.

Model	Air Flow	Cooling & Heating Capacities	EER	COP	SEER	SCOP
ECRH-030	5500 m³/h	28.5 / 28.7	3,19	3,77	3,31	2,99
ECRH-045	8000 m³/h	42.4 / 42.7	3,44	3,99	3,62	3,15
ECRH-060	11000 m³/h	57.3 / 57.6	3,29	3,58	3,55	3,14
ECRH-075	14000 m³/h	75.6 / 74.8	3,43	3,65	3,58	3,22
ECRH-095	18000 m³/h	93 / 91.4	3,41	3,61	3,66	3,15
ECRH-125	22000 m³/h	122.6 / 123.2	3,23	3,84	3,49	3,06
ECRH-155	27000 m³/h	155.4 / 158	3,24	3,61	3,42	3,24
ECRH-180	32000 m³/h	178 / 175.5	3,27	3,61	3,48	3,14

TECHNICAL DATA

FOUR ECRH		030	045	060	075
FANS					
Indoor Fan Type		EC Plug Fan			
Outdoor Fan Type		EC Axial Fan			
Number of Outdoor Fan	pcs.	1	1	2	2
Min Air Flow	m^3/h	4400	6400	8800	11200
Nominal Air Flow	m^3/h	5500	8000	11000	14000
Max Air Flow	m^3/h	6050	8800	12100	15400
Nominal ESP	Pa	200	200	200	200
NOMINAL THERMAL PERFORMANCES - COOLING MODE					
(1)Cooling Capacity	kW	28,5	42,4	57,3	75,6
(1)EER		3,19	3,44	3,29	3,43
(1)Total Installed Power	kW	15,63	18,77	28,39	32,92
Eurovent Energy Class		A	A	A	A
NOMINAL THERMAL PERFORMANCES - HEATING MODE					
(1)Heating Capacity	kW	28,7	42,7	57,6	74,8
(1)COP		3,77	3,99	3,58	3,65
Eurovent Energy Class		A	A	A	A
SEASONAL EFFICIENCIES					
(2)Seasonal Energy Efficiency Ratio(SEER)		3,31	3,62	3,55	3,58
(2)Seasonal Energy Efficiency ηs,c	%	129,58	141,85	138,95	144,4
(2)Seasonal Coefficient of Performance SCOP		2,99	3,15	3,14	3,22
(2)Seasonal Energy Efficiency ηs,h	%	116,62	122,91	122,26	125,6
COMPRESSOR					
Refrigerant Type		R410a			
Number of Compressor	pcs.	1	1	2	2
Compressor Type		Scroll			
Cooling Circuit	pcs.	1	1	2	2
Capacity Control		1	1	3	3
Total Compressor Power	kW	7,65	10,58	14,79	19,02
Current (Nominal)	A	14,8	18,62	27,52	34,31
OPTIONAL NATURAL GAS HEATER					
Capacity(Min-Max)	kW	7,6-34,85	12,4-65	12,4-65	16,4-82
Burner Pressure	Pa	90	120	120	120
Supply Voltage	V	230 V-50 Hz Monophase			
Power Input(Min-Max)	kW	0,011-0,074	0,015-0,097	0,015-0,097	0,02-0,123
OPTIONAL ELECTRIC HEATER					
Capacity (ΔT=10 °C)	kW	20	30	40	50
Capacity (ΔT=20 °C)	kW	40	60	80	100
OPTIONAL WATER HEATER					
Capacity	kW	82	117	135	210
Water Fluctuation	°C	80/60			
SOUND DATA					
Sound Level Power	dBA	75	76	78	80
Sound Pressure (1 m)	dBA	66	68	71	72
Sound Pressure (5 m)	dBA	52	54	57	57

NOTES:
(1) According to Eurovent conditions:
Cooling: · Outdoor temperature = 35°C DB · Entering coil temperature 27°C DB / 19°C WB
Heating: · Outdoor temperature = 7°C DB / 6°C WB · Indoor temperature = 20°C DB
(2) According to EN 14825

FOUR ECRH		095	125	155	180
FANS					
Indoor Fan Type		EC Plug Fan			
Outdoor Fan Type		EC Axial Fan			
Number of Outdoor Fan	pcs.	2	2	2	2
Min Air Flow	m³/h	14400	17600	21600	25600
Nominal Air Flow	m³/h	18000	22000	27000	32000
Max Air Flow	m³/h	19800	24200	29700	35200
Nominal ESP	Pa	200	200	200	200

NOMINAL THERMAL PERFORMANCES - COOLING MODE					
(1)Cooling Capacity	kW	93	122,6	155,4	178
(1)EER		3,41	3,23	3,24	3,27
(1)Total Installed Power	kW	38,37	54,76	65,19	71,27
Eurovent Energy Class		A	A	A	A

NOMINAL THERMAL PERFORMANCES - HEATING MODE					
(1)Heating Capacity	kW	91,4	123,2	158	175,5
(1)COP		3,61	3,84	3,61	3,61
Eurovent Energy Class		A	A	A	A

SEASONAL EFFICIENCIES					
(2)Seasonal Energy Efficiency Ratio(SEER)		3,66	3,49	3,42	3,48
(2)Seasonal Energy Efficiency ηs,c	%	143,43	136,48	133,61	136,14
(2)Seasonal Coefficient of Performance SCOP		3,15	3,06	3,24	3,14
(2)Seasonal Energy Efficiency ηs,h	%	122,95	119,37	126,64	122,68

COMPRESSOR					
Refrigerant Type		R410a			
Number of Compressor	pcs.	2	2	2	2
Compressor Type		Scroll			
Cooling Circuit	pcs.	2	2	2	2
Capacity Control		3	3	3	3
Total Compressor Power	kW	22,89	33,46	42,39	45,07
Current (Nominal)	A	41,26	59,15	73,45	79,03

OPTIONAL NATURAL GAS HEATER					
Capacity(Min-Max)	kW	21-100	12,4-130	16,4-164	21-200
Burner Pressure	Pa	120	120	120	120
Supply Voltage	V	230 V-50 Hz Monophase			
Power Input(Min-Max)	kW	0,02-0,130	0,015-0,194	0,02-0,246	0,02-0,26

OPTIONAL ELECTRIC HEATER					
Capacity (ΔT=10 °C)	kW	65	80	100	120
Capacity (ΔT=20 °C)	kW	130	165	190	230

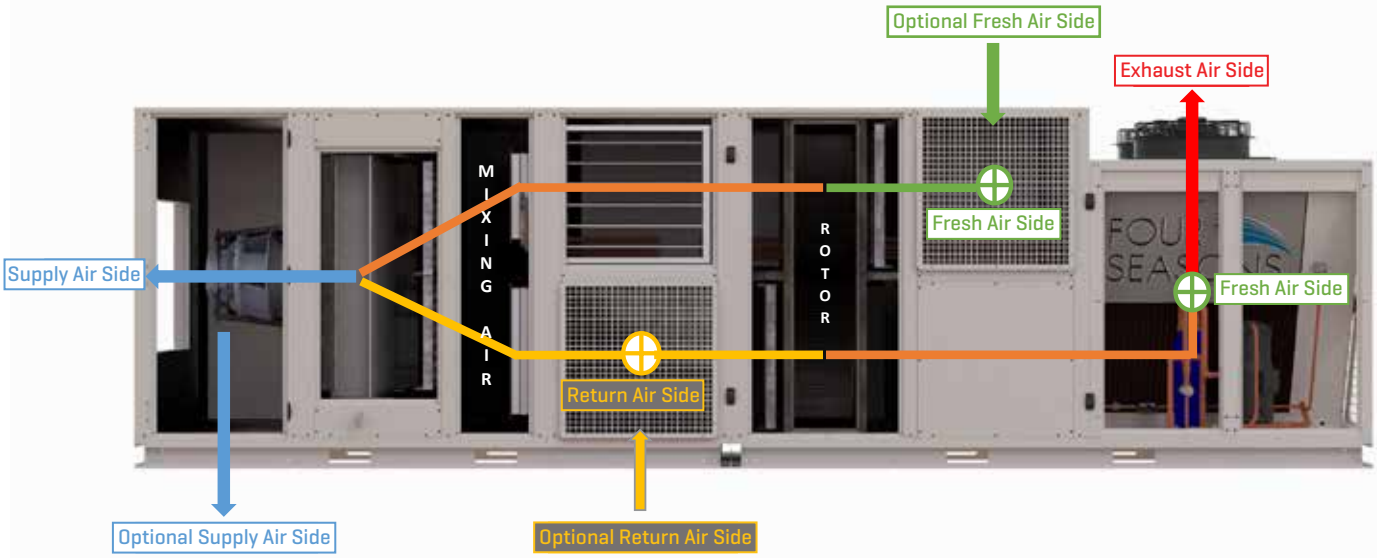
OPTIONAL WATER HEATER					
Capacity	kW	258	318	405	465
Water Fluctuation	°C	80/60			

SOUND DATA					
Sound Level Power	dBA	79	81	81	84
Sound Pressure (1 m)	dBA	72	73	73	76
Sound Pressure (5 m)	dBA	58	59	60	62

NOTES:
(1) According to Eurovent conditions:
Cooling: · Outdoor temperature = 35°C DB · Entering coil temperature 27°C DB / 19°C WB
Heating: · Outdoor temperature = 7°C DB / 6°C WB · Indoor temperature = 20°C DB
(2) According to EN 14825

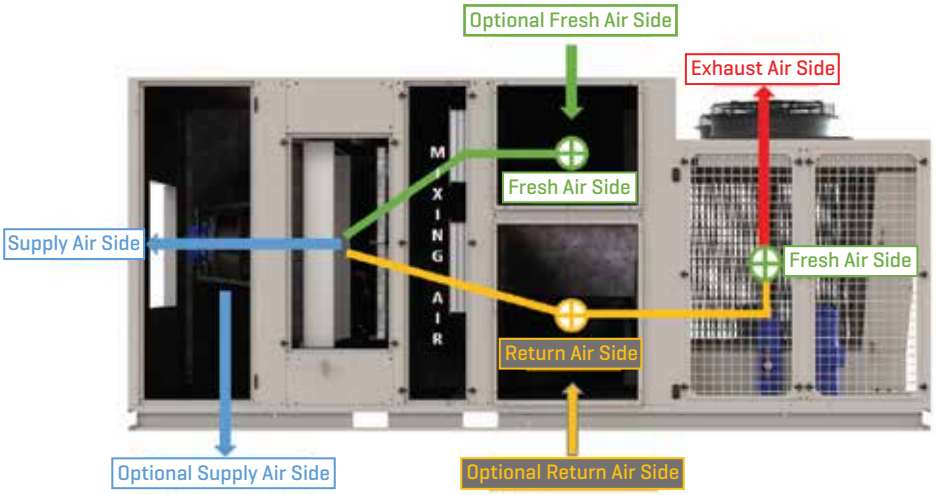
AIR CONFIGURATIONS

Four ECRH – Energy Series:



In ECRH ENERGY with heat recovery and economizer dampers, heat recovery and thermodynamics heat recovery are performed by the return fan. Some of the exhaust air is passed through the rotary type heat recovery unit according to the mixing ratio. Then, the heat transferred air is passed over the condenser coil directly. In this way, energy saving is achieved by thermodynamics heat recovery.

Four ECRH – ECO Series



In ECRH ECO with economizer dampers, thermodynamics heat recovery is performed by the return fan. Some of the exhaust air is mixed according to the mixing ratio. Then, the rest of the exhaust air is passed directly over the condenser coil.

AIR CONFIGURATIONS

Four ECRH – ECO Series:

Models	030	045	060	075	095	125	155	180
W	1300	1500	1900	2100	2100	2270	2600	2700
L	3770	3970	4570	4770	5250	5750	6350	6650
H	1605	1805	2005	2175	2425	2575	2785	3075

All dimensions are in mm.

Four ECRH – ENERGY Series

Models	030	045	060	075	095	125	155	180
W	1300	1500	1900	2100	2100	2270	2600	2700
L	5350	5650	6370	6570	7350	8010	8750	9170
H	1605	1805	2005	2175	2425	2575	2785	3075

All dimensions are in mm.

STANDARDS & OPTIONS	SERIES		
	BSC	ECO	ENERGY
Cooling Only	O	O	O
Reversible (Heating/Cooling)	S	S	S
EC plug fan for supply side	S	S	S
Plug fan for supply side	O	O	O
EC axial fan for condenser side	S	S	S
AC axial fan for condenser side	O	O	O
Roofcurb	O	O	O
Economizer	X	X	X
Bypass damper	X	X	X
Thermodynamics heat recovery	X	X	X
Rotary type heat exchanger	X	X	X
Return Fan for exhaust side	O	O	O
Operation with %100 return air	S	S	S
Operation with partial fresh air (up to %30)	X	X	X
Operation with %100 fresh air	X	X	X
Free-Cooling	X	X	X
Electronix expansion valve	O	O	O
Low and high electric heater	O	O	O
Natural gas heater	O	O	O
Hot Water Heater	O	O	O
ISO Course filter (G Class)	S	S	S
ePM1 filter (F Class)	O	O	O
ISO Course + ePM1 filters	O	O	O
Coil coating	O	O	O
Control with room temperature sensor	S	S	S
Differencial pressure switch (Dirty filter alarm)	O	O	O
CO2 sensor	O	O	O
Enthalpy control	O	O	O
Smoke dedector and fire alarm	O	O	O
Fire alarm	O	O	O
Touch Panel	O	O	O
ModBus	S	S	S
Bacnet MSTP	O	O	O
LonWorks FTT	O	O	O

S : Standard

O : Options

X : Not Available

NOTES

NOTES


We make the difference with
140 different types of products.

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