R410A

ECO COOLER

Modular Air Cooled chiller

70 kW – 2000 kW

2022

ECO COOLER
AIR CONDITIONER

MULTI STAGE EVAPORATIVE COOLING

INTRODUCTION

ECO GROUP has started its activity in Heating, Ventilation and Air Conditioning since 2000. Besides executing illustrious HVAC projects for hotels, shopping malls, sports complexes, this group has started the production of HVAC systemsunder the brand Eco Cooler with the aim of energy-saving and promoting comfort since 2015. Eco Cooler offers a varietyof choices for HVAC systems from hygienic HVAC units to modern systems such as various energy recoveries and multi-stage indirect evaporative cooling (M-cycle) to satisfy every customer's needs and help develop a green and clean world. Furthermore, Eco Cooler provides a unique service that ensures your system operates at optimized efficiency, in both energy management and in system performance.


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INTRODUCTION

The fast-changing world's need for more energy saving and users' concerns about expanding the HVAC system capacity for their future developments motivate us to design a new concept of air-cooled chillers called Modular air-cooled chillers. Less energy consumption, thanks to partial operation technique, Easy Servicing, quick maintenance, easy transportation, and running all time without downtime are the benefits of the EMCHA.

Eco Cooler's Air Cooled Modular Chiller, Model EMACH, is available in capacity 20, and 37 Nominal TR (70 kW and 128 kW) and can be configured to provide project turndown and capacity requirements from 20 to 500 nominal TR. By simply adding modules, the EACHM can satisfy future incremental growth needs. This model is a quiet, serviceable, and extremely efficient system that will provide years of reliable operation.

Efficient and environment-friendly

Using a microchannel coil with 40% less zero ODP R410A refrigerant charge brings you the highest capacity and efficiency

Easy and Quick servicing

Isolated electrical and Water connection for each modular allows the user to service every module quickly and easily. Just unplug the electrical connection and close the water isolation valves!

Easy installation and use

EMCHA is designed in compact dimensions to easily transport and increase structural strength. The modules are joined easily in a site via embedded connections for each module. EMCHA fits nearly all applications as they support temperature operation range of -10 °C to 52 °C

Advanced control system

EMCHA control systems are configured to optimize the COP of all modules. It can be connected to BMS via the Modbus protocol

FEATURES AND BENEFITS

- Single R410A refrigeration circuit on each chiller module
- Hermetic scroll compressor on each refrigeration circuit with sigh glass, inter-connected oil port to balance compressor oil level.
- single circuit, Dx shell, and tube evaporator in each chiller module.
- Microchannel condenser technology.
- Refrigeration pressure-controlled
- Sigh glass with moisture indicator and replaceable filter drier
- Fan speed controller available
- Single point power supply to a load distribution panel containing a circuit breaker for each chiller module for electrical service isolation and branch circuit overload protection.
- Phase monitor on the power supply to protect against low voltage, phase unbalance, phase loss, and phase reversal conditions.
- 25 mm Insulation on each evaporator, refrigeration piping.
- Galvanized sheet metal frames, electrostatic powder-coated.
- Primary microprocessor controller provides current alarm status, alarm logging of the previous 200 alarms, fluid temperatures for each module, and refrigeration pressure on each refrigeration circuit.
- Distributed the secondary microprocessor controller on each secondary module to allow continued operation should the primary microprocessor controller fail. (Only applicable when one or more secondary modules are required.
- Direct drive vertical discharge condenser fans. improved acoustic performance due to optimized blade-design external rotor motors complies with protection class IP54. The winding insulation corresponds to insulation class F.

OPTIONAL FEATURES

- Water flow switch: Paddle type field adjustable flow switch for water cooler circuits, Interlock into safety circuits so that the unit will remain off unit water flow is determined.
- Unit mounting spring isolator: These housed spring assemblies have a neoprene friction pad on the bottom to prevent vibration transmission.
- compressor silencer box reduces the compressor operating noise and keeps the compressor clean.
- Fin-tube condenser coil: with and without a coating of fin suitable for the seashore or acid corrosive environments.
- Building Management (BMS): MODBUS, BACNET, and CANBUS protocol
- Evaporator heat trace: Prevent freezing up of water on low ambient.
- Ground current protection: Additional protection for a compressor in the case of abnormal current leakage.
- Plate Brazed evaporator: In case of a more compact evaporator
- Electronic Expansion Valve: for more precise control of load

TECHNICAL DATA

PERFORMANCE SPECIFICATIONS			
UNIT MODEL (EMACH)		**20**	**40**
Cooling capacity*	RT	20	37
	kW	70	128.4
Total input power (kW)		23.1	39.8
Total EER (W/W)		3.1	3.2
COMPRESSOR DATA			
Type		Hermetic Scroll	
Quantity (No.)		2	3
Capacity control step		2	3
Refrigeration circuits (No.)		1	1
CONDENSER DATA			
Type		Microchannel	
Quantity (No.)		2	2
Total face area(m^2)		1	2
Refrigerant		R410A	
Refrigerant charge (kg)		8	15
CONDENSER FAN DATA			
Type		Axial	
Quantity (No.)		1	2
Size (cm)		80	80
Speed (RPM)		890	890
Air flow rate(m^3/h)		22,800	45,600
Motor power (kW)		1.9	3.8
EVAPORATOR DATA			
Type		Direct Expansion Shell & Tube	
Quantity (No.)		1	1
Watyer flow rate (m^3/h)		10.9	19
Water Volume (Liter)		15.3	8.9
Water connection size (In /Out) Diameter (mm)			
EXPANSION VALVE DATA			
Type		Thermostatic	
ELECTRICAL DATA			
Power supply		400V/3PH/50Hz	
Maximum overcurrent permitted by the protection device		**65**	**95**
LRA		**200**	**200**
DIMENSION			
Empty weight (kg)		753	528
Operating weight (kg)		769	537
Height (cm)		240	240
Width (cm)		105	105
Length(cm)		220	130

*Capacity rating are based on Standard ARI-550/590 conditions of: 35 °C (95 °F) ambient/ 7 °C (44.6 °F) Leaving Chilled Water Temperature / 5 °C (9 °F) Inlet-Outlet Water Temperature Difference/ 0.018 m^2.°C/kW (0.0001 ft^2. h.°F /Btu) Fouling Factor

EMACH-20 - Temperature Datasheet

Ambient Temperature (°C)	Capacity (kW)	Input power (kW)	Total EER
30	135.6	35.9	3.8
31	134.1	36.5	3.7
32	132.9	37.1	3.6
33	131.4	37.7	3.5
34	129.9	38.5	3.4
35	128.4	39.8	3.2
36	127.2	39.7	3.2
37	126.0	40.4	3.1
38	124.2	41.2	3.0
39	122.7	41.8	2.9
40	121.2	42.7	2.8
41	119.7	43.4	2.8
42	117.9	44.2	2.7
43	116.4	44.9	2.6
44	114.9	45.8	2.5
45	113.1	46.6	2.4
46	111.3	47.5	2.3
47	109.5	48.4	2.3
48	108.0	49.3	2.2
49	105.9	50.3	2.1
50	104.1	51.2	2.0
51	102.3	52.1	2.0
52	100.5	53.2	1.9

1- ECHA Chillers are rated based on Standard ARI-550/590-98 conditions of: 5 ℃ (9 ℉) Inlet/Outlet Water Temperature Difference and 0.018 m^2.℃/kW (0.0001 ft^2. h.℉ /Btu) Fouling Factor

2- Direct interpolation is permissible. Do not extrapolate.

3- Energy Efficiency Ratio (EER) is for the overall unit, refer to electrical data for fan power input.

EMACH-40 - Temperature Datasheet

Ambient Temperature (°C)	Capacity (kW)	Input power (kW)	Total EER
30	74.8	21.1	3.5
31	74.0	21.5	3.4
32	73.3	21.8	3.4
33	72.4	22.2	3.3
34	71.5	22.7	3.2
35	70.6	23.1	3.1
36	69.8	23.6	3.0
37	68.9	24.0	2.9
38	68.1	24.4	2.8
39	67.2	24.9	2.7
40	66.2	25.4	2.6
41	65.3	25.9	2.5
42	64.4	26.3	2.4
43	63.5	26.8	2.4
44	62.4	27.4	2.3
45	61.4	27.9	2.2
46	60.5	28.4	2.1
47	59.5	28.9	2.1
48	58.2	29.5	2.0
49	57.1	30.1	1.9
50	56.1	30.7	1.8
51	54.9	31.3	1.8
52	54.7	31.5	1.7

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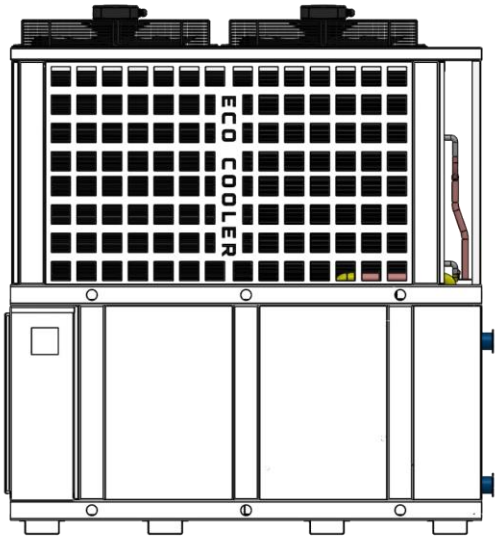
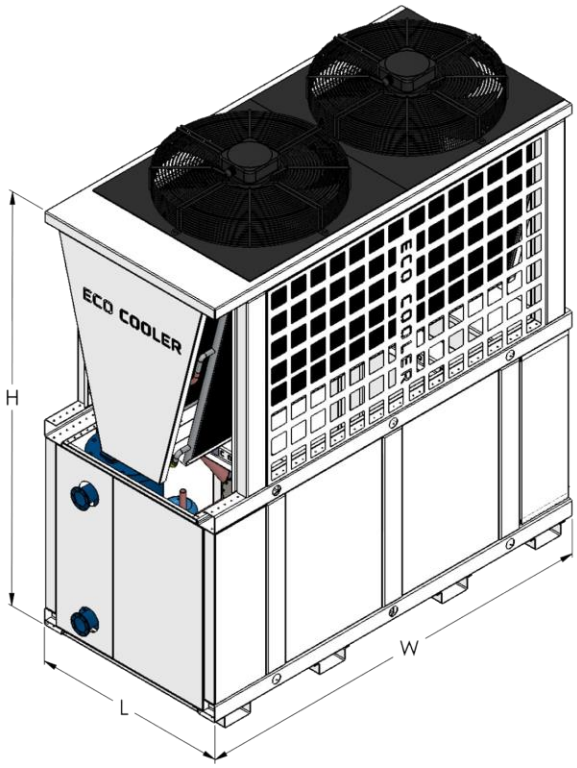
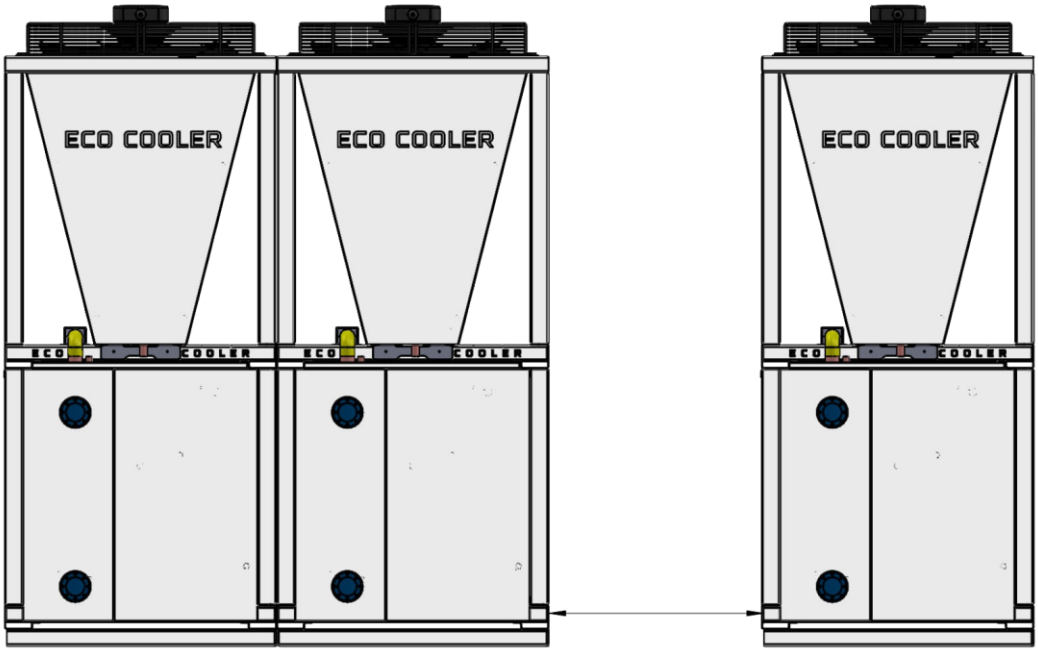
UNIT DIMENSIONS

EMACH-20

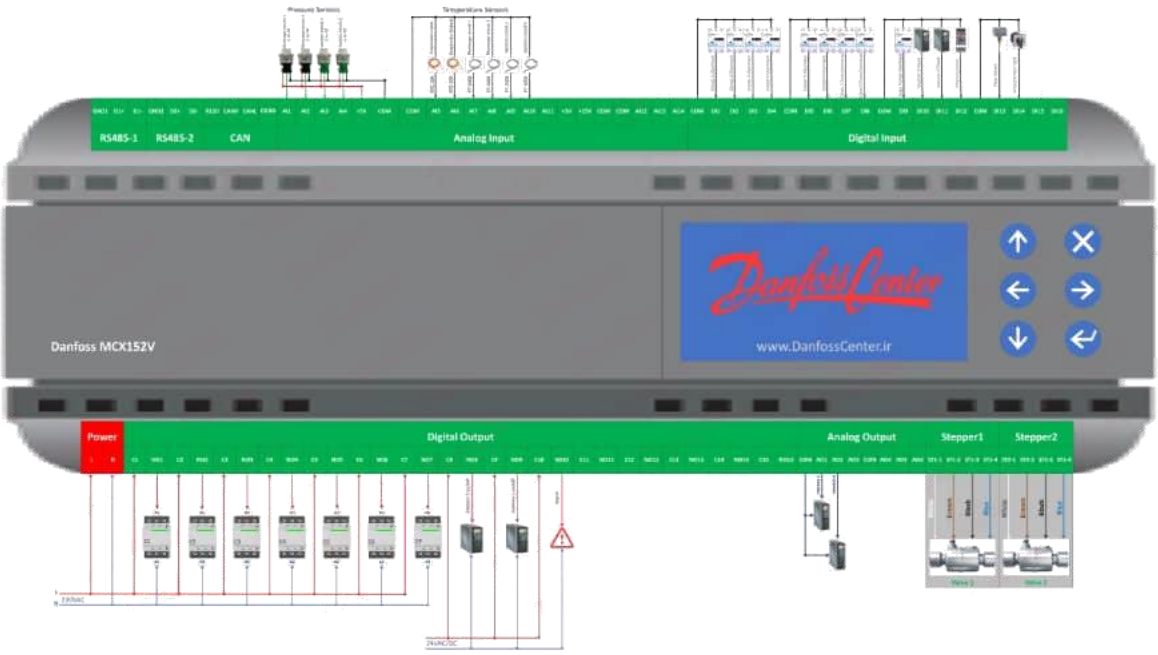




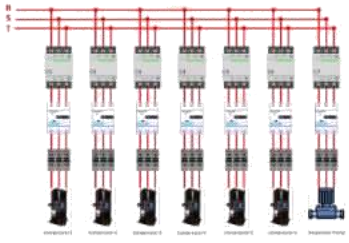


TYPICAL WIRING DIAGRAM

Control Circuit



Power Circuit



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