Databook

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EWAD~CF (Standard Glycol)

Free Cooling
Air cooled screw chillers

ECOLOGICAL HFC 134a REFRIGERANT

EWAD~CF (Standard Glycol)

XS FC-SG (High Efficiency - Standard Noise) - Cooling Capacity from 640 to 1555 kW
XL FC-SG (High Efficiency - Low Noise) - Cooling Capacity from 640 to 1555 kW
XR FC-SG (High Efficiency - Extra Low Noise) - Cooling Capacity from 602 to 1476 kW

CE

DAIKIN

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Low operating cost and extended operating life

This chiller range is the result of careful design, aimed to optimize the energy efficiency of the chillers, with the objective of bringing down operating costs and improving installation profitability, effectiveness and economical management.
The chillers feature a high efficiency single screw compressor design, large condenser coil surface area for maximum heat transfer and low discharge pressure, advanced technology condenser fans and a 'shell&tube' evaporator with low refrigerant pressure drops.
The free cooling chillers make use of an additional free cooling section to cool the building water loop directly with the outside ambient air, thus reducing the load on the compressors and considerably decreasing operating costs during the cold season.
Free cooling takes advantage of the temperature difference between the outside air and the return water to cool the water before returning it at a lower temperature to be chilled. And when outside temperatures are cold enough the chillers compressors are fully shut down and cooling is practically free. Moreover, cutting compressor usage also extends the chiller's operating life, further minimising the overall cost of an installation.

Low operating sound levels

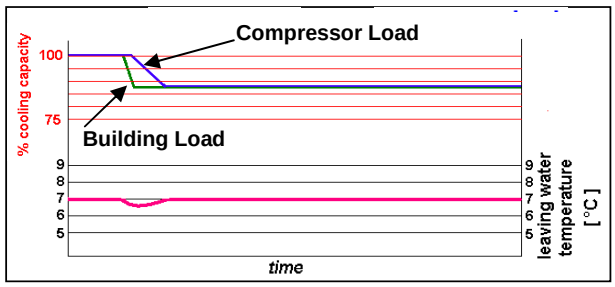
Very low sound levels both at full load and part load conditions are achieved by the latest compressor design and by a unique new fan that moves large volume of air at exceptionally low sound levels and by the virtually vibration-free operation.

Outstanding reliability

The chillers have two truly independent refrigerant circuits, in order to assure maximum safety for any maintenance, whether planned or not. They are equipped with a rugged compressor design with advanced composite compressor gaterotors material, a proactive control logic and are full factory-run-tested to optimized trouble-free operation.

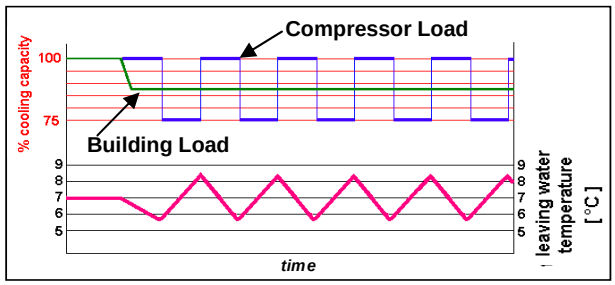
Infinite capacity control

Cooling capacity control is infinitely variable by means of a single screw asymmetric compressor controlled by microprocessor system. Each unit has infinitely variable capacity control from 100% down to 12.5%. This modulation allows the compressor capacity to exactly match the building cooling load without any leaving evaporator water temperature fluctuation. This chilled water temperature fluctuation is avoided with a stepless control.



ELWT fluctuation with stepless capacity control

With a compressor load step control in fact, the compressor capacity, at partial loads, will be too high or too low compared to the building cooling load. The result is an increase in chiller energy costs, particularly at the part-load conditions at which the chiller operates most of the time.



ELWT fluctuation with steps capacity control (4 steps)

Units with stepless regulation offer benefits that the units with step regulation are unable to match. The ability to follow the system energy demand at any time and the possibility to provide steady outlet water temperature without deviations from the set-point, are the two points that allow you to understand how the optimum operating conditions of a system can be met through the use of a unit with stepless regulation.

Superior control logic

The new MicroTech III controller provides an easy to use control environmental. The control logic is designed to provide maximum efficiency, to continue operation in unusual operating conditions and to provide a history of unit operation. One of the greatest benefits is the easy interface with LonWorks, Bacnet, Ethernet TCP/IP or Modbus communications.

Code requirements – Safety and observant of laws/directives

Units are designed and manufactured in accordance with applicable selections of the following:

Construction of pressure vessel	97/23/EC (PED)
Machinery Directive	2006/42/EC
Low Voltage	2006/95/EC
Electromagnetic Compatibility	2004/108/EC
Electrical & Safety codes	EN 60204–1 / EN 60335-2-40
Manufacturing Quality Stds	UNI – EN ISO 9001:2004

Certifications

Units are CE marked, complying with European directives in force, concerning manufacturing and safety. On request units can be produced complying with laws in force in non European countries (ASME, GOST, etc.), and with other applications, such as naval (RINA, etc.).

Versions

This unit is available as high efficiency version:

X: High Efficiency

11 sizes to cover a range from 640 up to 1555 kW with an EER up to 3.19 and an ESEER up to 4.01 (data referred to Standard Noise)

The EER (Energy Efficiency Ratio) is the ratio of the Cooling Capacity to the Power Input of the unit. The Power Input includes: the power input for operation of the compressor, the power input of all control and safety devices, the power input for fans.

The ESEER (European Seasonal Energy Efficiency Ratio) is a weighed formula enabling to take into account the variation of EER with the load rate and the variation of air inlet condenser temperature.

ESEER = A x EER100% + B x EER75% + C x EER50% + D x EER25%

	A	B	C	D
Coefficient	0.03 (3%)	0.33 (33%)	0.41 (41%)	0.23 (23%)
Air inlet condenser temperature	35°C	30°C	25°C	20°C

Sound configurations

Standard, low and extra low sound configurations available as follows:

XS: Standard Sound

Condenser fan rotating at 920 rpm, rubber antivibration under compressor

XL: Low Sound

Condenser fan rotating at 920 rpm, rubber antivibration under compressor, compressor sound enclosure.

XR: Extra Low Sound

Condenser fan rotating at 715 rpm, rubber antivibration under compressor, compressor sound enclosure.

Cabinet and structure

The cabinet is made of galvanized steel sheet and painted to provide a high resistance to corrosion. Colour Ivory White (Munsell code 5Y7.5/1) (±RAL7044).The base frame has an eye-hook to lift the unit with ropes for an easy installation. The weight is uniformly distributed along the profiles of the base and this facilitates the arrangement of the unit.

Compressor (Asymmetric Single Screw)

The compressor is semi-hermetic, single-screw type with gate-rotor made with the latest high-strength fibre reinforced star material. The compressor has an asymmetric slide regulation managed by the unit controller for infinitely modulating capacity from 100% to 25%. An integrated high efficiency oil separator maximizes the oil separation and standard start is Wye-delta (Y-Δ) type.

Refrigerant

The compressors have been designed to operate with R-134a, ecological refrigerant with zero ODP (Ozone Depletion Potential) and very low GWP (Global Warming Potential), resulting in low TEWI (Total Equivalent Warming Impact).

Evaporator (Shell&Tube)

The unit is equipped with a direct expansion shell&tube evaporator with copper tubes rolled into steel tubesheets. The evaporators are single-pass on both the refrigerant and water sides for pure counter-flow heat exchange and low refrigerant pressure drops. Both attributes contribute to the heat exchanger effectiveness and total unit's outstanding efficiency.
The external shell is covered with a 20mm closed cell insulation material and the evaporator water outlet connections are provided with flange kit (as standard). Each evaporator has 2 circuits, one for each compressor and is manufactured in accordance to PED approval.

Condenser (Air – Refrigerant heat exchanger)

The condenser is manufactured with internally enhanced seamless copper tubes arranged in a staggered row pattern and mechanically expanded into lanced and rippled aluminum condenser fins with full fin collars. An integral sub-cooler circuit provides sub-cooling to effectively eliminate liquid flashing and increase cooling capacity without increasing the power input.

Free Cooling (Air – Water heat exchanger)

The Free Cooling heat exchanger is manufactured with internally enhanced seamless copper tubes arranged in a staggered row pattern and mechanically expanded into lanced and rippled aluminum condenser fins with full fin collars.

Condenser fans (ø 800)

The condenser fans are propeller type with high efficiency design blades to maximize performances. The material of the blades is glass reinforced resin and each fan is protected by a guard. Fan motors are protected by circuit breakers (installed inside the electrical panel as a standard) and are IP54. Fan speed regulation is standard available (Option 99)

Electronic expansion valve

The unit is equipped with the most advanced electronic expansion valves to achieve precise control of refrigerant mass flow. As today's system requires improved energy efficiency, tighter temperature control, wider range of operating conditions and incorporate features like remote monitoring and diagnostics, the application of electronic expansion valves becomes mandatory.
Electronic expansion valves possess unique features: short opening and closing time, high resolution, positive shut-off function to eliminate use of additional solenoid valve, continuous modulation of mass flow without stress in the refrigerant circuit and corrosion resistance stainless steel body.
Electronic expansion valves are typically working with lower ΔP between high and low pressure side, than a thermostatic expansion valve. The electronic expansion valve allows the system to work with low condenser pressure (winter time) without any refrigerant flow problems and with a perfect chilled water leaving temperature control.

Refrigerant circuit

Each unit has 2 independent refrigerant circuits and each one includes:
- Compressor with integrated oil separator
- Air Cooled Condenser
- Electronic expansion valve
- Evaporator
- Discharge line shut off valve
- Liquid line shut off valve
- Suction line shut off valve (optional)
- Sight glass with moisture indicator
- Filter drier
- Charging valves
- High pressure switch
- High and low pressure transducers

Electrical control panel

Power and control are located in the main panel that is manufactured to ensure protection against all weather conditions. The electrical panel is IP54 and (when opening the doors) internally protected with plexiglas panel against possible accidental contact with electrical components (IP20). The main panel is fitted with a main switch interlocked door.

Power Section

The power section includes compressors fuses, fan circuit breaker, fan contactors and control circuit transformer.

MicroTech III controller

MicroTech III controller is installed as standard; it can be used to modify unit set-points and check control parameters. A built-in display shows chiller operating status plus temperatures and pressures of water, refrigerant and air, programmable values, set-points. A sophisticated software with predictive logic, selects the most energy efficient combination of compressors, EEXV and condenser fans to keep stable operating conditions to maximise chiller energy efficiency and reliability.
MicroTech III is able to protect critical components based on external signs from its system (such as motor temperatures, refrigerant gas and oil pressures, correct phase sequence, pressure switches and evaporator). The input coming from the high pressure switch cuts all digital output from the controller in less than 50ms, this is an additional security for the equipment.
Fast program cycle (200ms) for a precise monitoring of the system. Floating point calculations supported for increased accuracy in P/T conversions.

Control section - main features

- Management of the compressor stepless capacity and fans modulation.
- Chiller enabled to work in partial failure condition.
- Full routine operation at condition of:
  - high ambient temperature value
  - high thermal load
  - high evaporator entering water temperature (start-up)
- Display of evaporator entering/leaving water temperature.
- Display of Outdoor Ambient Temperature.
- Display of condensing-evaporating temperature and pressure, suction and discharge superheat for each circuit.
- Leaving water evaporator temperature regulation (temperature tolerance = 0,1°C).
- Compressor and evaporator pumps hours counter.
- Display of Status Safety Devices.
- Number of starts and compressor working hours.
- Optimized management of compressor load.
- Fan management according to condensing pressure.
- Re-start in case of power failure (automatic / manual).
- Soft Load (optimized management of the compressor load during the start-up).
- Start at high evaporator water temperature.
- Return Reset (Set Point Reset based on return water temperature).
- OAT (Outside Ambient temperature) Reset.
- Set point Reset (optional).
- Application and system upgrade with commercial SD cards.
- Ethernet port for remote or local servicing using standard web browsers.
- Two different sets of default parameters could be stored for easy restore.

Safety device / logic for each refrigerant circuit

- High pressure (pressure switch).
- High pressure (transducer).
- Low pressure (transducer).
- Fans circuit breaker.
- High compressor discharge temperature.
- High motor winding temperature.
- Phase Monitor.
- Low pressure ratio.
- High oil pressure drop.
- Low oil pressure.
- No pressure change at start.

System security

- Phase monitor.
- Low Ambient temperature lock-out.
- Freeze protection.

Regulation type

Proportional + integral + derivative regulation on the evaporator leaving water output probe.

MicroTech III

MicroTech III built-in terminal has the following features.
- 164x44 dots liquid crystal display with white back lighting. Supports Unicode fonts for multi-lingual.
- Key-pad consisting of 3 keys.
- Push'n'Roll control for an increased usability.
- Memory to protect the data.
- General faults alarm relays.
- Password access to modify the setting.
- Application security to prevent application tampering or hardware usability with third party applications.
- Service report displaying all running hours and general conditions.
- Alarm history memory to allow an easy fault analysis.

Supervising systems (on request)

MicroTech III remote control

MicroTech III is able to communicate to BMS (Building Management System) based on the most common protocols as:
- ModbusRTU
- LonWorks, now also based on the international 8040 Standard Chiller Profile and LonMark Technology.
- BacNet BTP certifief over IP and MS/TP (class 4) (Native).
- Ethernet TCP/IP.

Free Cooling Water Circuit

"Standard Glycol" Free Cooling

The principal hydraulic circuit is connected directly (through a three way valve) with the free cooling section, creating a circuit with a water-glycol mixture. The free cooling section includes:
- Air-water heat exchanger
- Three way valve (as standard)

Standard options (supplied on basic unit)

Wye-Delta compressor starter (Y-D)- For low inrush current and reduced starting torque

Double setpoint- Dual leaving water temperature setpoints.

Phase monitor- The phase monitor controls that phases sequence is correct and controls phase loss.

Evaporator flange kit

20mm evaporator insulation- The external shell is covered with a 20mm closed cell insulation material.

Evaporator electric heater- Electric heater (controlled by a thermostat) to protect the evaporator from freezing down to -28°C ambient temperature, providing the power supply is on.

Electronic expansion valve

Discharge line shut-off valve - Installed on the discharge port of the compressor to facilitate maintenance operation.

Ambient outside temperature sensor and setpoint reset

Hour run meter

General fault contactor

Setpoint reset, Demand limit and Alarm from external device - (Set-point reset) The leaving water temperature set-point can be overwritten with the following options: 4-20mA from external source (by user); outside ambient temperature; evaporator water temperature Δt. - (Demand limit) User can limit the load of the unit by 4-20mA signal or by network system - (Alarm from external device) Microprocessor is able to receive an alarm signal from an external device (eg. pump, etc…). User can decide if this alarm signal will stop or not the unit."

Fans circuit breakers- Safety device against motor overloading and short circuit

Main switch interlock door

Emergency stop

Fans speed regulation (+ fan silent mode) - To control the fan speed revolution for smooth operating control of the unit. This option improves the sound level of the unit during low ambient temperature operation.

Options (on request)

Soft starter - Electronic starting device to reduce the mechanical stress during compressor start-up

Brine version - Allows the unit to operate down to -8°C leaving liquid temperature (antifreeze required).

Compressor thermal overload relays - Safety devices against compressor motor overloading. This device together with internal motor protection (standard) guarantee the best safety system for compressor motor.

Under / Over voltage control - This device control the voltage value of power supply and stop the chiller if the value exceeds the allowed operating limits.

Energy meter - Device installed inside the control box showing ampere and volt values

Capacitors for power factor correction - To increase the operating power factor of the unit at nominal operating conditions. The capacitors are "dry" self-regenerating type with over pressure disconnecting safety device insulated with a no toxic dielectric mix with no PCB or PCT.

Current limit - To limit maximum absorbed current of the unit whenever is required

Condenser coil guards

Evaporator area guards

Cu-Cu condenser coil - To give better protection against corrosion by aggressive environments.

Cu-Cu-Sn condenser coil - To give better protection against corrosion in aggressive environments and by salty air.

Alucoat fins coil - Fins are protected by a special acrylic paint with a high resistance to corrosion.

Evaporator flow switch - Supplied separately to be wired and installed on the evaporator water piping (by the customer).

Suction line shut-off valve - Installed on the suction port of the compressor to facilitate maintenance operation.

High pressure side manometers

Low pressure side manometers

Rubber anti vibration mounts - Supplied separately, these are positioned under the base of the unit during installation. Ideal to reduce the vibrations when the unit is floor mounted.

Spring anti vibration mounts - Supplied separately, these are positioned under the base of the unit during installation. Ideal for dampening vibrations for installation on roofs and metallic structures.

One centrifugal pump (high and low lift) - Hydronic kit consists of: single direct driven centrifugal pump, water filling system with pressure gauge, safety valve, drain valve. The motor pump is protected by a circuit breaker installed in control panel. The kit is assembled and wired to the control panel. The pipe and pump are protected from freezing with an additional electrical heater.

Two centrifugal pump (high and low lift) - Hydronic kit consists of: twin direct driven centrifugal pumps, water filling system with pressure gauge, safety valve, drain valve. The motor pump is protected by a circuit breaker installed in control panel. The kit is assembled and wired to the control panel. The pipe and pumps are protected from freezing with an additional electrical heater.

Double pressure relief valve with diverter

Compressors circuit breakers

Evaporator right water connections

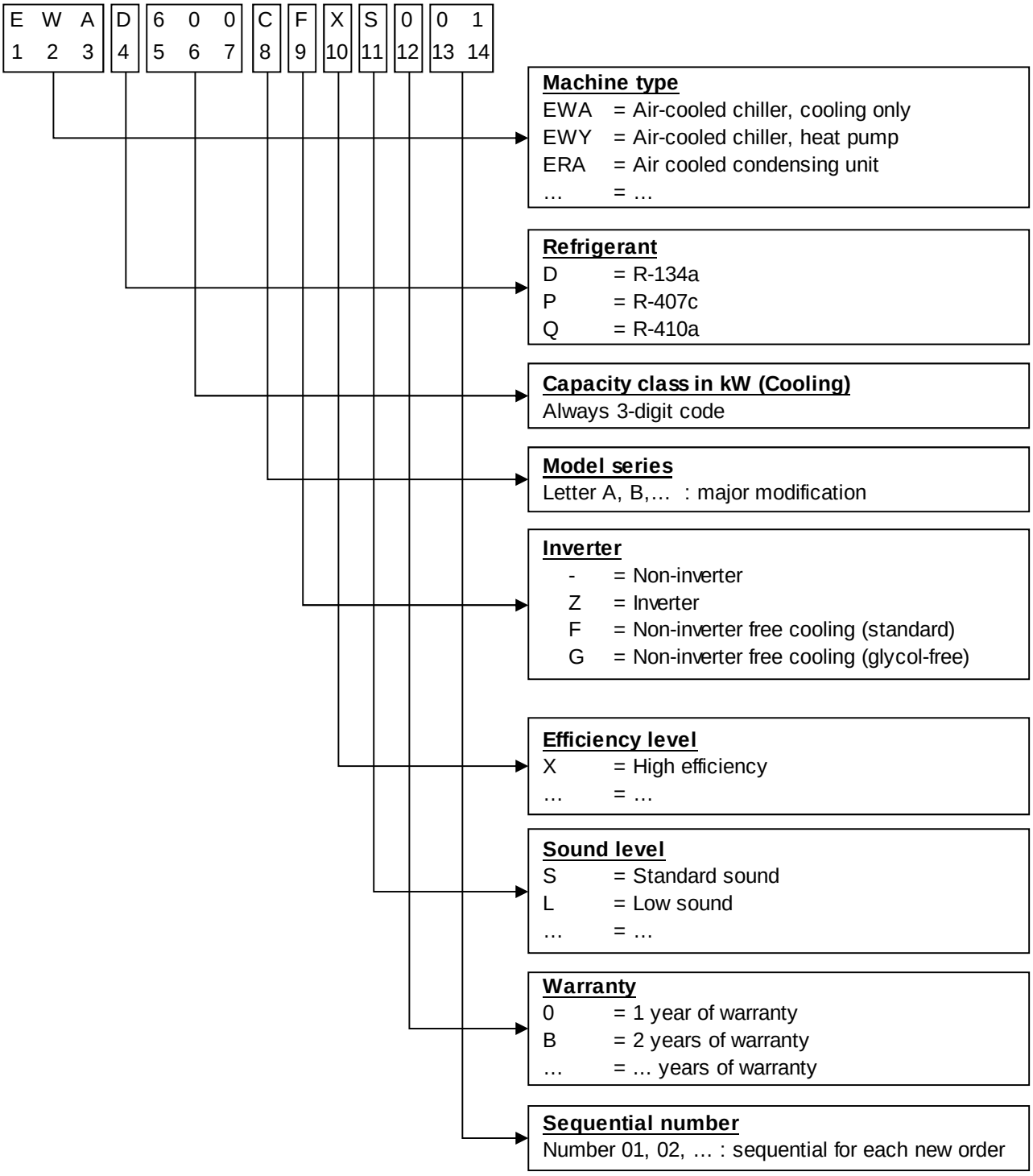
Ground fault relay - To shut down the entire unit if a ground fault condition is detected.

Rapid restart - It allows the unit to start as fast as 30 seconds after power is restored (in case of power failure).

Optimized free cooling (Fan speed regulation)

Optimized free cooling (VFD fans) – This option allows the unit having better performances (better efficiency) in the range of temperatures between Starting Free Cooling (starting free cooling is when the outside temperature is one degree below entering water temperature at the free cooling unit) and Free Cooling 100% (free cooling 100% is when the total load of the installation is satisfied by the free cooling).

Optimized free cooling (On/Off fans) - **)** – This option allows the unit having better performances (better efficiency) in the range of temperatures between Starting Free Cooling (starting free cooling is when the outside temperature is one degree below entering water temperature at the free cooling unit) and Free Cooling 100% (free cooling 100% is when the total load of the installation is satisfied by the free cooling).


E W A D 6 0 0 C F X S 0 0 1
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Machine type
EWA = Air-cooled chiller, cooling only
EWY = Air-cooled chiller, heat pump
ERA = Air cooled condensing unit
... = ...
Refrigerant
D = R-134a
P = R-407c
Q = R-410a
Capacity class in kW (Cooling)
Always 3-digit code
Model series
Letter A, B,... : major modification
Inverter
- = Non-inverter
Z = Inverter
F = Non-inverter free cooling (standard)
G = Non-inverter free cooling (glycol-free)
Efficiency level
X = High efficiency
... = ...
Sound level
S = Standard sound
L = Low sound
... = ...
Warranty
0 = 1 year of warranty
B = 2 years of warranty
... = ... years of warranty
Sequential number
Number 01, 02, ... : sequential for each new order

EWAD CFXS

MODEL		640	770	850	900	C10	C11	C12	C13
Capacity - Cooling (1)	kW	640	772	852	902	1027	1089	1269	1349
Capacity control - Type	---	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Capacity control - Minimum capacity	%	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Unit power input - Cooling (1)	kW	257	272	293	324	360	399	397	439
EER (1)	---	2.49	2.84	2.90	2.78	2.85	2.73	3.19	3.08
ESEER	---	3.44	3.52	3.78	3.50	3.74	3.54	3.88	3.78
IPLV	---	3.87	4.03	4.07	4.05	4.00	3.93	4.36	4.25
CASING									
Colour	---	IW	IW	IW	IW	IW	IW	IW	IW
Material (2)	---	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS									
Height	mm	2565	2565	2565	2565	2565	2565	2565	2565
Width	mm	2480	2480	2480	2480	2480	2480	2480	2480
Length	mm	6185	7085	7985	7985	8885	8885	10685	10685
WEIGHT									
Unit Weight	kg	7760	8340	8900	8900	10160	10420	11900	11900
Operating Weight	kg	8040	8580	9140	9140	10560	10820	12290	12290
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	266	251	243	243	403	403	386	386
Nominal water flow rate - Cooling	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6
Nominal Water pressure drop - Cooling	kPa	85	105	90	101	111	124	98	110
Insulation material (4)		CC	CC	CC	CC	CC	CC	CC	CC
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP	HFP	HFP	HFP	HFP	HFP
FAN									
Type (6)	---	DPT	DPT	DPT	DPT	DPT	DPT	DPT	DPT
Drive (7)	---	VFD	VFD	VFD	VFD	VFD	VFD	VFD	VFD
Diameter	mm	800	800	800	800	800	800	800	800
Nominal air flow	l/s	50367	60440	70513	70513	80587	80587	95253	95253
Quantity	No.	10	12	14	14	16	16	20	20
Speed	rpm	920	920	920	920	920	920	920	920
Motor input	kW	5.2	6.3	6.8	7.3	8.4	9.2	14.1	18.1
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw
Oil charge	l	38	38	38	38	44	50	50	50
Quantity	No.	2	2	2	2	2	2	2	2
SOUND LEVEL									
Sound Power - Cooling	dB(A)	100	100	101	101	101	102	102	103
Sound Pressure - Cooling (8)	dB(A)	79	80	80	80	80	81	80	80
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg	128	146	162	162	182	182	214	214
N. of circuits	No.	2	2	2	2	2	2	2	2
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.

EWAD CFXS

MODEL		C14	C15	C16					
Capacity - Cooling (1)	kW	1435	1493	1555					
Capacity control - Type	---	Stepless	Stepless	Stepless					
Capacity control - Minimum capacity	%	12.5	12.5	12.5					
Unit power input - Cooling (1)	kW	454	492	530					
EER (1)	---	3.16	3.04	2.93					
ESEER	---	4.01	3.95	3.85					
IPLV	---	4.36	4.35	4.24					
CASING									
Colour	---	IW	IW	IW					
Material (2)	---	GPSS	GPSS	GPSS					
DIMENSIONS									
Height	mm	2565	2565	2565					
Width	mm	2480	2480	2480					
Length	mm	10685	10685	10685					
WEIGHT									
Unit Weight	kg	12540	12620	12670					
Operating Weight	kg	13530	13610	13660					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	979	979	979					
Nominal water flow rate - Cooling	l/s	62.4	64.9	67.6					
Nominal Water pressure drop - Cooling	kPa	139	150	162					
Insulation material (4)		CC	CC	CC					
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP					
FAN									
Type (6)	---	DPT	DPT	DPT					
Drive (7)	---	VFD	VFD	VFD					
Diameter	mm	800	800	800					
Nominal air flow	l/s	95253	95253	95253					
Quantity	No.	20	20	20					
Speed	rpm	920	920	920					
Motor input	kW	10.8	18.1	12.7					
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw					
Oil charge	l	50	50	50					
Quantity	No.	2	2	2					
SOUND LEVEL									
Sound Power - Cooling	dB(A)	103	103	103					
Sound Pressure - Cooling (8)	dB(A)	80	80	80					
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a					
Refrigerant charge	kg	225	248	248					
N. of circuits	No.	2	2	2					
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN250 PN16 (273)	DN250 PN16 (273)	DN250 PN16 (273)					

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.
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EWAD CFXL

MODEL		640	770	850	900	C10	C11	C12	C13
Capacity - Cooling (1)	kW	640	772	852	902	1027	1089	1269	1349
Capacity control - Type	---	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Capacity control - Minimum capacity	%	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Unit power input - Cooling (1)	kW	257	272	293	324	360	399	397	439
EER (1)	---	2.49	2.84	2.90	2.78	2.85	2.73	3.19	3.08
ESEER	---	3.44	3.52	3.78	3.50	3.74	3.54	3.88	3.78
IPLV	---	3.87	4.03	4.07	4.05	4.00	3.93	4.36	4.25
CASING									
Colour	---	IW	IW	IW	IW	IW	IW	IW	IW
Material (2)	---	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS									
Height	mm	2565	2565	2565	2565	2565	2565	2565	2565
Width	mm	2480	2480	2480	2480	2480	2480	2480	2480
Length	mm	6185	7085	7985	7985	8885	8885	10685	10685
WEIGHT									
Unit Weight	kg	8050	8620	9190	9190	10450	10710	12190	12190
Operating Weight	kg	8320	8870	9430	9430	10850	11110	12580	12580
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	266	251	243	243	403	403	386	386
Nominal water flow rate - Cooling	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6
Nominal Water pressure drop - Cooling	kPa	85	105	90	101	111	124	98	110
Insulation material (4)		CC	CC	CC	CC	CC	CC	CC	CC
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP	HFP	HFP	HFP	HFP	HFP
FAN									
Type (6)	---	DPT	DPT	DPT	DPT	DPT	DPT	DPT	DPT
Drive (7)	---	VFD	VFD	VFD	VFD	VFD	VFD	VFD	VFD
Diameter	mm	800	800	800	800	800	800	800	800
Nominal air flow	l/s	50367	60440	70513	70513	80587	80587	95253	95253
Quantity	No.	10	12	14	14	16	16	20	20
Speed	rpm	920	920	920	920	920	920	920	920
Motor input	kW	5.2	6.3	6.8	7.3	8.4	9.2	14.1	18.1
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw
Oil charge	l	38	38	38	38	44	50	50	50
Quantity	No.	2	2	2	2	2	2	2	2
SOUND LEVEL									
Sound Power - Cooling	dB(A)	96	97	97	97	98	98	99	99
Sound Pressure - Cooling (8)	dB(A)	76	76	77	77	77	77	77	77
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg	128	146	162	162	182	182	214	214
N. of circuits	No.	2	2	2	2	2	2	2	2
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.

EWAD CFXL

MODEL		C14	C15	C16					
Capacity - Cooling (1)	kW	1435	1493	1555					
Capacity control - Type	---	Stepless	Stepless	Stepless					
Capacity control - Minimum capacity	%	12.5	12.5	12.5					
Unit power input - Cooling (1)	kW	454	492	530					
EER (1)	---	3.16	3.04	2.93					
ESEER	---	4.01	3.95	3.85					
IPLV	---	4.36	4.35	4.24					
CASING									
Colour	---	IW	IW	IW					
Material (2)	---	GPSS	GPSS	GPSS					
DIMENSIONS									
Height	mm	2565	2565	2565					
Width	mm	2480	2480	2480					
Length	mm	10685	10685	10685					
WEIGHT									
Unit Weight	kg	12830	12910	12960					
Operating Weight	kg	13820	13900	13950					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	979	979	979					
Nominal water flow rate - Cooling	l/s	62.4	64.9	67.6					
Nominal Water pressure drop - Cooling	kPa	139	150	162					
Insulation material (4)		CC	CC	CC					
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP					
FAN									
Type (6)	---	DPT	DPT	DPT					
Drive (7)	---	VFD	VFD	VFD					
Diameter	mm	800	800	800					
Nominal air flow	l/s	95253	95253	95253					
Quantity	No.	20	20	20					
Speed	rpm	920	920	920					
Motor input	kW	10.8	18.1	12.7					
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw					
Oil charge	l	50	50	50					
Quantity	No.	2	2	2					
SOUND LEVEL									
Sound Power - Cooling	dB(A)	99	99	99					
Sound Pressure - Cooling (8)	dB(A)	77	77	77					
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a					
Refrigerant charge	kg	225	248	248					
N. of circuits	No.	2	2	2					
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN250 PN16 (273)	DN250 PN16 (273)	DN250 PN16 (273)					

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.

EWAD CFXR

MODEL		600	740	820	870	980	C10	C11	C12
Capacity - Cooling (1)	kW	602	739	821	866	981	1034	1229	1302
Capacity control - Type	---	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Capacity control - Minimum capacity	%	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
Unit power input - Cooling (1)	kW	263	278	299	334	368	412	403	450
EER (1)	---	2.29	2.66	2.75	2.59	2.67	2.51	3.05	2.90
ESEER	---	3.59	3.66	3.89	3.62	3.83	3.63	4.13	3.89
IPLV	---	4.08	4.11	4.16	4.18	4.10	4.09	4.40	4.35
CASING									
Colour	---	IW	IW	IW	IW	IW	IW	IW	IW
Material (2)	---	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS									
Height	mm	2565	2565	2565	2565	2565	2565	2565	2565
Width	mm	2480	2480	2480	2480	2480	2480	2480	2480
Length	mm	6185	7085	7985	7985	8885	8885	10685	10685
WEIGHT									
Unit Weight	kg	8050	8620	9190	9190	10450	10710	12190	12190
Operating Weight	kg	8320	8870	9430	9430	10850	11110	12580	12580
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	266	251	243	243	403	403	386	386
Nominal water flow rate - Cooling	l/s	26.2	32.1	35.7	37.6	42.6	44.9	53.4	56.6
Nominal Water pressure drop - Cooling	kPa	76	97	84	93	102	113	92	103
Insulation material (4)		CC	CC	CC	CC	CC	CC	CC	CC
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP	HFP	HFP	HFP	HFP	HFP
FAN									
Type (6)	---	DPT	DPT	DPT	DPT	DPT	DPT	DPT	DPT
Drive (7)	---	VFD	VFD	VFD	VFD	VFD	VFD	VFD	VFD
Diameter	mm	800	800	800	800	800	800	800	800
Nominal air flow	l/s	38934	46721	54508	54508	62294	62294	73010	73010
Quantity	No.	10	12	14	14	16	16	20	20
Speed	rpm	715	715	715	715	715	715	715	715
Motor input	kW	3.0	3.6	4.0	4.6	4.9	5.6	8.3	6.0
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw
Oil charge	l	38	38	38	38	44	50	50	50
Quantity	No.	2	2	2	2	2	2	2	2
SOUND LEVEL									
Sound Power - Cooling	dB(A)	92	92	92	92	94	94	94	95
Sound Pressure - Cooling (8)	dB(A)	71	72	72	72	72	73	72	72
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg	128	146	162	162	182	182	214	214
N. of circuits	No.	2	2	2	2	2	2	2	2
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN150 PN16 (168,3)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)	DN200 PN16 (219,1)

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.

EWAD CFXR

MODEL		C13	C14	C15					
Capacity - Cooling (1)	kW	1374	1424	1476					
Capacity control - Type	---	Stepless	Stepless	Stepless					
Capacity control - Minimum capacity	%	12.5	12.5	12.5					
Unit power input - Cooling (1)	kW	466	511	556					
EER (1)	---	2.95	2.79	2.66					
ESEER	---	4.09	4.02	3.92					
IPLV	---	4.39	4.37	4.25					
CASING									
Colour	---	IW	IW	IW					
Material (2)	---	GPSS	GPSS	GPSS					
DIMENSIONS									
Height	mm	2565	2565	2565					
Width	mm	2480	2480	2480					
Length	mm	10685	10685	10685					
WEIGHT									
Unit Weight	kg	12830	12910	12960					
Operating Weight	kg	13820	13900	13950					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	979	979	979					
Nominal water flow rate - Cooling	l/s	59.7	61.9	64.1					
Nominal Water pressure drop - Cooling	kPa	128	137	146					
Insulation material (4)		CC	CC	CC					
AIR HEAT EXCHANGER									
Type (5)	---	HFP	HFP	HFP					
FAN									
Type (6)	---	DPT	DPT	DPT					
Drive (7)	---	VFD	VFD	VFD					
Diameter	mm	800	800	800					
Nominal air flow	l/s	73010	73010	73010					
Quantity	No.	20	20	20					
Speed	rpm	715	715	715					
Motor input	kW	6.6	7.2	7.5					
COMPRESSOR									
Type	---	Asymm Single Screw	Asymm Single Screw	Asymm Single Screw					
Oil charge	l	50	50	50					
Quantity	No.	2	2	2					
SOUND LEVEL									
Sound Power - Cooling	dB(A)	95	95	95					
Sound Pressure - Cooling (8)	dB(A)	72	73	73					
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a					
Refrigerant charge	kg	225	248	248					
N. of circuits	No.	2	2	2					
PIPING CONNECTIONS									
Evaporator water inlet/outlet		DN250 PN16 (273)	DN250 PN16 (273)	DN250 PN16 (273)					

Fluid: Ethylene Glycol 30%
(1) Cooling capacity, unit power input in cooling and EER are based on the following conditions: evaporator 16.0/10.0°C; ambient 35.0°C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) HFP: High efficiency fin and tube type with integral subcooler
(6) DPT: Direct Propeller Type; (7) VDF: Variable Frequency Driver --- SPD: Speedtroll
(8) The values are according to ISO 3744 and are referred to: evaporator 16/10°C, ambient 35°C, full load operation.

EWAD CFXS

MODEL		640	770	850	900	C10	C11	C12	C13
Unit capacity - Cooling	kW	640	772	852	902	1027	1089	1269	1349
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	295	365	413	434	502	524	594	652
Mechanincal capacity	kW	345	407	439	468	524	565	675	697
Unit power input - Cooling	kW	74.3	87.9	90.7	99.8	109	118	131	143
EER	---	8.62	8.78	9.40	9.04	9.43	9.19	9.67	9.45
Air Temperature	°C	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Water temperature - inlet	°C	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Water flow rate - Cooling	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6
Water pressure drop - Cooling	kPa	128	172	178	198	245	272	232	259
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	-0.8	-0.1	1.2	0.4	0.9	0.1	2.9	2.1

EWAD CFXS

MODEL		C14	C15	C16					
Unit capacity - Cooling	kW	1435	1493	1555					
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	663	659	722					
Mechanincal capacity	kW	772	834	834					
Unit power input - Cooling	kW	152	160	170					
EER	---	9.42	9.33	9.16					
Air Temperature	°C	5.0	5.0	5.0					
Water temperature - inlet	°C	16.0	16.0	16.0					
Water flow rate - Cooling	l/s	62.4	64.9	67.6					
Water pressure drop - Cooling	kPa	305	328	354					
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	1.3	0.7	0.1					

EWAD CFXL

MODEL		640	770	850	900	C10	C11	C12	C13
Unit capacity - Cooling	kW	640	772	852	902	1027	1089	1269	1349
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	295	365	413	434	502	524	594	652
Mechanincal capacity	kW	345	407	439	468	524	565	675	697
Unit power input - Cooling	kW	74.3	87.9	90.7	99.8	109	118	131	143
EER	---	8.62	8.78	9.40	9.04	9.43	9.19	9.67	9.45
Air Temperature	°C	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Water temperature - inlet	°C	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Water flow rate - Cooling	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6
Water pressure drop - Cooling	kPa	128	172	178	198	245	272	232	259
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	-0.8	-0.1	1.2	0.4	0.9	0.1	2.9	2.1

EWAD CFXL

MODEL		C14	C15	C16					
Unit capacity - Cooling	kW	1435	1493	1555					
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	663	659	722					
Mechanincal capacity	kW	772	834	834					
Unit power input - Cooling	kW	152	160	170					
EER	---	9.42	9.33	9.16					
Air Temperature	°C	5.0	5.0	5.0					
Water temperature - inlet	°C	16.0	16.0	16.0					
Water flow rate - Cooling	l/s	62.4	64.9	67.6					
Water pressure drop - Cooling	kPa	305	328	354					
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	1.3	0.7	0.1					

EWAD CFXR

MODEL		600	740	820	870	980	C10	C11	C12
Unit capacity - Cooling	kW	602	739	821	866	981	1034	1229	1302
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	270	334	379	409	459	492	562	598
Mechanincal capacity	kW	332	405	442	457	523	542	667	704
Unit power input - Cooling	kW	70.3	84.3	88.4	95.9	106	112	127	141
EER	---	8.56	8.77	9.29	9.03	9.27	9.21	9.67	9.22
Air Temperature	°C	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Water temperature - inlet	°C	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0
Water flow rate - Cooling	l/s	26.2	32.1	35.7	37.6	42.6	44.9	53.4	56.6
Water pressure drop - Cooling	kPa	115	159	167	184	225	248	219	243
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	-2.3	-1.9	-0.6	-1.5	-0.9	-1.7	0.7	-0.2

EWAD CFXR

MODEL		C13	C14	C15					
Unit capacity - Cooling	kW	1374	1424	1476					
DATA WITH AIR TEMPERATURE 5°C									
Free cooling capacity	kW	619	640	668					
Mechanincal capacity	kW	756	784	809					
Unit power input - Cooling	kW	146	154	161					
EER	---	9.40	9.26	9.15					
Air Temperature	°C	5.0	5.0	5.0					
Water temperature - inlet	°C	16.0	16.0	16.0					
Water flow rate - Cooling	l/s	59.7	61.9	64.1					
Water pressure drop - Cooling	kPa	282	301	321					
FREE COOLING 100%									
Air Temperature for Free Cooling 100%	°C	-1.1	-1.6	-2.3					

EWAD CFXS

MODEL		640	770	850	900	C10	C11	C12	C13
Power supply									
Phases	---	3	3	3	3	3	3	3	3
Frequency	Hz	50	50	50	50	50	50	50	50
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Unit									
Maximum starting current	A	605	619	658	658	924	971	1030	1030
Nominal running current cooling	A	404	430	467	515	568	628	636	701
Maximum running current	A	476	510	561	605	672	731	811	875
Maximum current for wires sizing	A	520	556	612	660	733	797	884	955
Fans									
Nominal running current cooling	A	40	48	56	56	64	64	80	80
Compressors									
Phases	No.	3	3	3	3	3	3	3	3
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Maximum running current	A	218 218	231 231	231 274	274 274	274 333	333 333	333 398	398 398
Starting method	---	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ

EWAD CFXS

MODEL		C14	C15	C16					
Power supply									
Phases	---	3	3	3					
Frequency	Hz	50	50	50					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Unit									
Maximum starting current	A	1030	1073	1086					
Nominal running current cooling	A	720	773	825					
Maximum running current	A	875	929	982					
Maximum current for wires sizing	A	955	1013	1072					
Fans									
Nominal running current cooling	A	80	80	80					
Compressors									
Phases	No.	3	3	3					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Maximum running current	A	398 398	398 451	451 451					
Starting method	---	Y-Δ	Y-Δ	Y-Δ					

Fluid: Ethylene Glycol 30%
Allowed voltage tolerance ± 10%. Voltage unbalance between phases must be within ± 3%.
Maximum starting current: starting current of biggest compressor + current of the compressor at 75% maximum load + fans current for the circuit at 75%.
Nominal current in cooling mode is referred to the following conditions: evaporator 12.0/7.0°C; ambient 35.0°C; compressors + fans current.
Maximum running current is based on max compressor absorbed current in its envelope and max fans absorbed current
Maximum unit current for wires sizing is based on minimum allowed voltage
Maximum current for wires sizing: (compressors full load ampere + fans current) x 1,1.

EWAD CFXL

MODEL		640	770	850	900	C10	C11	C12	C13
Power supply									
Phases	---	3	3	3	3	3	3	3	3
Frequency	Hz	50	50	50	50	50	50	50	50
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Unit									
Maximum starting current	A	605	619	658	658	924	971	1030	1030
Nominal running current cooling	A	404	430	467	515	568	628	636	701
Maximum running current	A	476	510	561	605	672	731	811	875
Maximum current for wires sizing	A	520	556	612	660	733	797	884	955
Fans									
Nominal running current cooling	A	40	48	56	56	64	64	80	80
Compressors									
Phases	No.	3	3	3	3	3	3	3	3
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Maximum running current	A	218 218	231 231	231 274	274 274	274 333	333 333	333 398	398 398
Starting method	---	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ

EWAD CFXL

MODEL		C14	C15	C16					
Power supply									
Phases	---	3	3	3					
Frequency	Hz	50	50	50					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Unit									
Maximum starting current	A	1030	1073	1086					
Nominal running current cooling	A	720	773	825					
Maximum running current	A	875	929	982					
Maximum current for wires sizing	A	955	1013	1072					
Fans									
Nominal running current cooling	A	80	80	80					
Compressors									
Phases	No.	3	3	3					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Maximum running current	A	398 398	398 451	451 451					
Starting method	---	Y-Δ	Y-Δ	Y-Δ					

Fluid: Ethylene Glycol 30%
Allowed voltage tolerance ± 10%. Voltage unbalance between phases must be within ± 3%.
Maximum starting current: starting current of biggest compressor + current of the compressor at 75% maximum load + fans current for the circuit at 75%.
Nominal current in cooling mode is referred to the following conditions: evaporator 12.0/7.0°C; ambient 35.0°C; compressors + fans current.
Maximum running current is based on max compressor absorbed current in its envelope and max fans absorbed current
Maximum unit current for wires sizing is based on minimum allowed voltage
Maximum current for wires sizing: (compressors full load ampere + fans current) x 1,1.

EWAD CFXR

MODEL		600	740	820	870	980	C10	C11	C12
Power supply									
Phases	---	3	3	3	3	3	3	3	3
Frequency	Hz	50	50	50	50	50	50	50	50
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Unit									
Maximum starting current	A	598	611	648	648	912	960	1016	1016
Nominal running current cooling	A	411	439	473	526	580	647	645	717
Maximum running current	A	462	493	542	585	649	708	783	847
Maximum current for wires sizing	A	506	540	592	640	710	775	856	927
Fans									
Nominal running current cooling	A	26	31	36	36	42	42	52	52
Compressors									
Phases	No.	3	3	3	3	3	3	3	3
Voltage	V	400	400	400	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Maximum running current	A	218	231	231	274	274	333	333	398
		218	231	274	274	333	333	398	398
Starting method	---	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ

EWAD CFXR

MODEL		C13	C14	C15					
Power supply									
Phases	---	3	3	3					
Frequency	Hz	50	50	50					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Unit									
Maximum starting current	A	1016	1059	1072					
Nominal running current cooling	A	738	800	862					
Maximum running current	A	847	901	954					
Maximum current for wires sizing	A	927	985	1044					
Fans									
Nominal running current cooling	A	52	52	52					
Compressors									
Phases	No.	3	3	3					
Voltage	V	400	400	400					
Voltage tolerance Minimum	%	-10%	-10%	-10%					
Voltage tolerance Maximum	%	+10%	+10%	+10%					
Maximum running current	A	398	398	451					
		398	451	451					
Starting method	---	Y-Δ	Y-Δ	Y-Δ					

Fluid: Ethylene Glycol 30%
Allowed voltage tolerance ± 10%. Voltage unbalance between phases must be within ± 3%.
Maximum starting current: starting current of biggest compressor + current of the compressor at 75% maximum load + fans current for the circuit at 75%.
Nominal current in cooling mode is referred to the following conditions: evaporator 12.0/7.0°C; ambient 35.0°C; compressors + fans current.
Maximum running current is based on max compressor absorbed current in its envelope and max fans absorbed current
Maximum unit current for wires sizing is based on minimum allowed voltage
Maximum current for wires sizing: (compressors full load ampere + fans current) x 1,1.

EWAD CFXS

	Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								Power
MODEL	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)	dB(A)
640	73.9	76.0	78.8	78.0	73.9	69.4	59.8	50.7	79.0	99.5
770	74.6	76.7	79.5	78.7	74.6	70.1	60.5	51.4	79.7	100.2
850	74.6	76.7	79.5	78.7	74.6	70.1	60.5	51.4	79.7	100.5
900	74.6	76.7	79.5	78.7	74.6	70.1	60.5	51.4	79.7	100.5
C10	75.1	77.2	80.0	79.2	75.1	70.6	61.0	51.9	80.2	101.4
C11	75.6	77.7	80.5	79.7	75.6	71.1	61.5	52.4	80.7	101.9
C12	75.2	77.3	80.1	79.3	75.2	70.7	61.1	52.0	80.3	102.4
C13	75.3	77.4	80.2	79.4	75.3	70.8	61.2	52.1	80.4	102.5
C14	75.3	77.4	80.2	79.4	75.3	70.8	61.2	52.1	80.4	102.5
C15	75.3	77.4	80.2	79.4	75.3	70.8	61.2	52.1	80.4	102.5
C16	75.3	77.4	80.2	79.4	75.3	70.8	61.2	52.1	80.4	102.5

EWAD CFXL

	Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								Power
MODEL	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)	dB(A)
640	70.4	72.5	75.3	74.5	70.4	65.9	56.3	47.2	75.5	96.0
770	71.2	73.3	76.1	75.3	71.2	66.7	57.1	48.0	76.3	96.8
850	71.4	73.5	76.3	75.5	71.4	66.9	57.3	48.2	76.5	97.4
900	71.4	73.5	76.3	75.5	71.4	66.9	57.3	48.2	76.5	97.4
C10	71.8	73.9	76.7	75.9	71.8	67.3	57.7	48.6	76.9	98.0
C11	72.0	74.1	76.9	76.1	72.0	67.5	57.9	48.8	77.1	98.2
C12	71.6	73.7	76.5	75.7	71.6	67.1	57.5	48.4	76.7	98.8
C13	71.7	73.8	76.6	75.8	71.7	67.2	57.6	48.5	76.8	98.9
C14	71.7	73.8	76.6	75.8	71.7	67.2	57.6	48.5	76.8	98.9
C15	71.7	73.8	76.6	75.8	71.7	67.2	57.6	48.5	76.8	98.9
C16	71.7	73.8	76.6	75.8	71.7	67.2	57.6	48.5	76.8	98.9

EWAD CFXR

	Sound pressure level at 1 m from the unit (rif. 2 x 10-5 Pa)								Power
MODEL	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)	dB(A)
600	67.6	60.8	67.9	73.1	60.5	56.9	48.6	36.0	71.0	91.5
740	68.1	61.3	68.4	73.6	61.0	57.4	49.1	36.5	71.5	92.0
820	68.1	61.3	68.4	73.6	61.0	57.4	49.1	36.5	71.5	92.3
870	68.1	61.3	68.4	73.6	61.0	57.4	49.1	36.5	71.5	92.3
980	68.9	62.1	69.2	74.4	61.8	58.2	49.9	37.3	72.3	93.5
C10	69.1	62.3	69.4	74.6	62.0	58.4	50.1	37.5	72.5	93.7
C11	68.8	62.0	69.1	74.3	61.7	58.1	49.8	37.2	72.2	94.3
C12	68.9	62.1	69.2	74.4	61.8	58.2	49.9	37.3	72.3	94.5
C13	68.9	62.1	69.2	74.4	61.8	58.2	49.9	37.3	72.3	94.5
C14	69.1	62.3	69.4	74.6	62.0	58.4	50.1	37.5	72.5	94.6
C15	69.1	62.3	69.4	74.6	62.0	58.4	50.1	37.5	72.5	94.6

Fluid: Ethylene Glycol 30%
Note: The values are according to ISO 3744 and are referred to: evaporator 16.0/10.0° C, air ambient 35.0°C, full load operation

EWAD CFXS

			640						770					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	682	648	632	608	582	563	789	765	754	735	712	695
	PI	kW	216	232	238	248	259	267	224	243	251	263	276	285
	qw	l/s	29.7	28.2	27.5	26.4	25.3	24.5	34.3	33.3	32.8	32.0	31.0	30.2
	dpw	kPa	96	87	83	77	71	67	110	104	101	96	91	87
9	CC	kW	700	664	649	624	597	578	809	785	773	753	730	713
	PI	kW	219	236	242	253	264	271	228	247	255	268	281	290
	qw	l/s	30.4	28.9	28.2	27.1	26.0	25.1	35.2	34.1	33.6	32.7	31.8	31.0
	dpw	kPa	100	91	87	81	75	71	115	108	105	101	95	91
10	CC	kW	717	681	665	640	613	593	829	804	792	772	748	731
	PI	kW	223	240	247	257	269	276	232	251	259	272	285	295
	qw	l/s	31.2	29.6	28.9	27.8	26.6	25.8	36.0	34.9	34.4	33.5	32.5	31.7
	dpw	kPa	105	95	91	85	78	74	120	113	110	105	99	95
11	CC	kW	735	698	682	656	628	608	849	823	811	790	766	748
	PI	kW	227	244	251	262	273	281	235	255	263	276	290	299
	qw	l/s	31.9	30.3	29.6	28.5	27.3	26.4	36.9	35.8	35.2	34.3	33.3	32.5
	dpw	kPa	109	99	95	89	82	77	125	118	115	110	103	99
12	CC	kW	753	715	699	672	644	617	870	843	830	809	784	765
	PI	kW	231	248	255	267	278	282	239	259	267	281	294	304
	qw	l/s	32.7	31.0	30.3	29.2	28.0	26.8	37.8	36.6	36.0	35.1	34.0	33.2
	dpw	kPa	114	104	99	93	86	79	131	123	120	114	108	103
13	CC	kW	772	732	715	688	660	619	890	862	849	827	802	774
	PI	kW	235	253	260	271	283	278	243	263	272	285	299	304
	qw	l/s	33.5	31.8	31.0	29.9	28.6	26.9	38.6	37.4	36.9	35.9	34.8	33.6
	dpw	kPa	119	108	104	97	89	80	136	128	125	119	112	105

			850						900					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	866	842	831	812	788	770	922	896	883	863	835	815
	PI	kW	242	263	271	285	299	308	267	290	300	315	331	341
	qw	l/s	37.7	36.6	36.1	35.3	34.3	33.5	40.1	39.0	38.4	37.5	36.3	35.4
	dpw	kPa	94	89	87	83	79	75	105	100	97	93	88	84
9	CC	kW	888	863	851	832	809	790	943	916	904	882	857	835
	PI	kW	246	267	275	289	303	313	271	294	304	320	336	347
	qw	l/s	38.6	37.5	37.0	36.2	35.1	34.4	41.0	39.8	39.3	38.3	37.2	36.3
	dpw	kPa	98	93	91	87	82	79	110	104	101	97	92	87
10	CC	kW	910	884	872	852	828	810	965	937	924	902	876	856
	PI	kW	250	271	279	293	308	318	275	299	309	324	341	353
	qw	l/s	39.6	38.4	37.9	37.0	36.0	35.2	41.9	40.7	40.2	39.2	38.1	37.2
	dpw	kPa	102	97	95	90	86	82	114	108	105	101	95	91
11	CC	kW	932	906	893	872	848	830	986	958	944	922	895	875
	PI	kW	253	275	284	298	312	323	279	303	313	329	346	358
	qw	l/s	40.5	39.3	38.8	37.9	36.8	36.0	42.8	41.6	41.0	40.0	38.9	38.0
	dpw	kPa	107	101	99	94	90	86	119	112	110	105	99	95
12	CC	kW	953	927	914	893	868	849	1008	979	965	941	914	894
	PI	kW	257	279	288	302	317	328	283	308	318	334	351	363
	qw	l/s	41.4	40.2	39.7	38.8	37.7	36.9	43.8	42.5	41.9	40.9	39.7	38.8
	dpw	kPa	111	106	103	98	93	90	124	117	114	109	103	99
13	CC	kW	974	947	935	913	888	861	1030	1000	986	961	934	898
	PI	kW	261	283	292	307	322	329	288	312	322	339	356	361
	qw	l/s	42.3	41.1	40.6	39.6	38.5	37.4	44.7	43.4	42.8	41.7	40.5	39.0
	dpw	kPa	116	110	107	103	97	92	128	121	118	113	107	99

EWAD CFXS

			C10						C11					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1052	1018	1002	976	945	922	1123	1085	1068	1037	1001	974
	PI	kW	297	322	332	348	365	377	329	356	368	386	405	418
	qw	l/s	45.7	44.3	43.6	42.4	41.1	40.1	48.9	47.2	46.4	45.1	43.5	42.4
	dpw	kPa	117	110	107	102	96	91	132	124	120	114	107	101
9	CC	kW	1080	1045	1029	1001	969	945	1152	1113	1094	1063	1026	999
	PI	kW	302	327	338	354	371	383	335	362	374	393	412	425
	qw	l/s	46.9	45.4	44.7	43.5	42.1	41.1	50.1	48.4	47.6	46.2	44.6	43.4
	dpw	kPa	123	115	112	106	100	96	139	130	126	119	112	106
10	CC	kW	1108	1072	1055	1027	994	963	1180	1140	1121	1089	1052	1011
	PI	kW	307	333	343	360	377	386	340	369	380	399	419	426
	qw	l/s	48.1	46.6	45.8	44.6	43.2	41.9	51.3	49.5	48.7	47.3	45.7	43.9
	dpw	kPa	128	121	117	111	105	99	145	136	131	124	117	108
11	CC	kW	1136	1099	1082	1052	1019	978	1209	1167	1148	1114	1076	1016
	PI	kW	312	338	349	366	383	387	346	375	387	406	426	422
	qw	l/s	49.3	47.7	47.0	45.7	44.2	42.5	52.5	50.7	49.9	48.4	46.8	44.1
	dpw	kPa	134	126	123	116	110	101	151	142	137	130	122	109
12	CC	kW	1164	1126	1108	1078	1043	992	1238	1195	1175	1140	1101	1021
	PI	kW	318	344	355	372	390	387	352	381	393	413	433	417
	qw	l/s	50.5	48.9	48.1	46.8	45.3	43.1	53.7	51.9	51.0	49.5	47.8	44.3
	dpw	kPa	140	132	128	122	114	104	158	148	143	135	127	110
13	CC	kW	1192	1153	1135	1104	1062	1006	1267	1222	1201	1166	1113	1025
	PI	kW	323	349	361	378	393	387	358	388	400	420	433	411
	qw	l/s	51.7	50.0	49.2	47.9	46.1	43.7	55.0	53.0	52.1	50.6	48.3	44.5
	dpw	kPa	147	138	134	127	118	107	165	154	149	141	129	110

			C12						C13					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1277	1244	1229	1205	1176	1155	1363	1327	1311	1283	1251	1227
	PI	kW	328	356	368	386	405	418	362	393	406	426	447	462
	qw	l/s	55.5	54.1	53.5	52.4	51.2	50.2	59.3	57.7	57.0	55.8	54.4	53.4
	dpw	kPa	100	95	93	89	85	82	113	107	105	101	96	93
9	CC	kW	1311	1277	1262	1237	1207	1185	1398	1361	1345	1316	1283	1258
	PI	kW	332	361	373	392	411	424	367	399	412	432	454	469
	qw	l/s	57.0	55.5	54.9	53.8	52.5	51.5	60.8	59.2	58.4	57.2	55.8	54.7
	dpw	kPa	105	100	97	94	90	87	118	112	110	105	101	97
10	CC	kW	1345	1310	1295	1269	1239	1216	1434	1396	1379	1349	1315	1290
	PI	kW	337	367	379	397	417	430	372	404	418	439	460	476
	qw	l/s	58.4	56.9	56.3	55.1	53.8	52.8	62.3	60.7	59.9	58.6	57.2	56.0
	dpw	kPa	110	104	102	98	94	91	124	118	115	110	105	101
11	CC	kW	1380	1344	1328	1301	1270	1247	1470	1431	1413	1383	1348	1321
	PI	kW	342	372	384	403	423	437	378	410	424	445	467	483
	qw	l/s	59.9	58.4	57.7	56.5	55.2	54.2	63.9	62.2	61.4	60.1	58.5	57.4
	dpw	kPa	115	109	107	103	98	95	130	123	120	115	110	106
12	CC	kW	1415	1378	1361	1334	1302	1278	1507	1466	1448	1417	1381	1353
	PI	kW	347	377	390	409	429	443	384	417	430	452	474	490
	qw	l/s	61.4	59.8	59.1	57.9	56.5	55.5	65.4	63.7	62.9	61.5	59.9	58.8
	dpw	kPa	120	114	112	108	103	99	135	129	126	121	115	111
13	CC	kW	1450	1412	1395	1367	1334	1310	1544	1502	1483	1451	1414	1386
	PI	kW	352	383	395	415	435	449	389	423	437	458	481	497
	qw	l/s	62.9	61.3	60.5	59.3	57.9	56.8	67.0	65.2	64.4	63.0	61.3	60.1
	dpw	kPa	126	120	117	112	107	104	142	134	131	126	120	115

EWAD CFXS

			C14						C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1457	1413	1393	1360	1321	1293	1522	1476	1455	1419	1377	1345
	PI	kW	375	406	419	440	461	475	404	439	454	476	500	517
	qw	l/s	63.3	61.4	60.6	59.1	57.5	56.2	66.2	64.2	63.3	61.7	59.9	58.5
	dpw	kPa	143	135	132	126	119	114	156	147	143	136	129	123
9	CC	kW	1498	1453	1432	1397	1358	1328	1562	1515	1493	1456	1413	1381
	PI	kW	381	413	426	447	468	483	410	446	461	484	508	525
	qw	l/s	65.1	63.1	62.2	60.7	59.0	57.7	67.9	65.9	64.9	63.3	61.4	60.0
	dpw	kPa	151	142	138	132	125	120	163	154	150	143	135	129
10	CC	kW	1540	1493	1471	1435	1394	1364	1602	1554	1532	1493	1450	1416
	PI	kW	388	420	433	454	476	491	417	453	468	492	517	534
	qw	l/s	66.9	64.9	63.9	62.4	60.6	59.3	69.6	67.5	66.5	64.9	63.0	61.5
	dpw	kPa	158	149	145	139	131	126	171	161	157	150	142	136
11	CC	kW	1581	1533	1511	1474	1431	1400	1643	1593	1570	1531	1486	1452
	PI	kW	394	427	441	462	484	499	424	460	476	500	525	542
	qw	l/s	68.7	66.6	65.6	64.0	62.2	60.8	71.4	69.2	68.2	66.5	64.5	63.1
	dpw	kPa	166	157	153	146	138	132	179	169	164	157	148	142
12	CC	kW	1623	1573	1551	1513	1469	1436	1684	1632	1608	1569	1522	1488
	PI	kW	401	434	448	469	492	507	430	468	483	508	533	551
	qw	l/s	70.5	68.3	67.3	65.7	63.8	62.3	73.1	70.9	69.8	68.1	66.1	64.6
	dpw	kPa	174	164	160	153	144	138	187	176	172	164	155	148
13	CC	kW	1665	1614	1591	1552	1506	1473	1725	1672	1647	1606	1559	1509
	PI	kW	408	442	456	477	500	515	437	475	491	516	542	552
	qw	l/s	72.3	70.0	69.0	67.3	65.4	63.9	74.9	72.5	71.5	69.7	67.7	65.5
	dpw	kPa	183	172	168	160	151	145	195	184	179	171	161	152

			C16					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1591	1542	1520	1481	1434	1399
	PI	kW	433	472	488	514	540	559
	qw	l/s	69.2	67.1	66.1	64.4	62.4	60.9
	dpw	kPa	169	160	155	148	139	133
9	CC	kW	1632	1581	1558	1518	1471	1435
	PI	kW	440	479	496	522	549	568
	qw	l/s	71.0	68.7	67.7	66.0	64.0	62.4
	dpw	kPa	177	167	162	155	146	139
10	CC	kW	1674	1621	1596	1555	1508	1472
	PI	kW	447	487	504	530	558	577
	qw	l/s	72.7	70.4	69.4	67.6	65.5	64.0
	dpw	kPa	185	175	170	162	152	146
11	CC	kW	1715	1661	1635	1593	1544	1508
	PI	kW	454	495	512	539	567	586
	qw	l/s	74.5	72.1	71.0	69.2	67.1	65.5
	dpw	kPa	194	182	177	169	159	152
12	CC	kW	1758	1701	1675	1630	1580	1543
	PI	kW	462	503	520	547	576	596
	qw	l/s	76.3	73.8	72.7	70.8	68.6	67.0
	dpw	kPa	203	190	185	176	166	159
13	CC	kW	1800	1741	1714	1668	1617	1550
	PI	kW	469	511	529	556	585	590
	qw	l/s	78.1	75.6	74.4	72.4	70.2	67.3
	dpw	kPa	212	199	193	183	173	160

Fluid: Ethylene Glycol 30%
Ta: Condenser inlet air temperature; Twout: Evaporator leaving water temperature (Δt 6°C)
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop
** For working condition where dpw value is "Italic-Red Color" please contac factory*

EWAD CFXL

			640						770					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	682	648	632	608	582	563	789	765	754	735	712	695
	PI	kW	216	232	238	248	259	267	224	243	251	263	276	285
	qw	l/s	29.7	28.2	27.5	26.4	25.3	24.5	34.3	33.3	32.8	32.0	31.0	30.2
	dpw	kPa	96	87	83	77	71	67	110	104	101	96	91	87
9	CC	kW	700	664	649	624	597	578	809	785	773	753	730	713
	PI	kW	219	236	242	253	264	271	228	247	255	268	281	290
	qw	l/s	30.4	28.9	28.2	27.1	26.0	25.1	35.2	34.1	33.6	32.7	31.8	31.0
	dpw	kPa	100	91	87	81	75	71	115	108	105	101	95	91
10	CC	kW	717	681	665	640	613	593	829	804	792	772	748	731
	PI	kW	223	240	247	257	269	276	232	251	259	272	285	295
	qw	l/s	31.2	29.6	28.9	27.8	26.6	25.8	36.0	34.9	34.4	33.5	32.5	31.7
	dpw	kPa	105	95	91	85	78	74	120	113	110	105	99	95
11	CC	kW	735	698	682	656	628	608	849	823	811	790	766	748
	PI	kW	227	244	251	262	273	281	235	255	263	276	290	299
	qw	l/s	31.9	30.3	29.6	28.5	27.3	26.4	36.9	35.8	35.2	34.3	33.3	32.5
	dpw	kPa	109	99	95	89	82	77	125	118	115	110	103	99
12	CC	kW	753	715	699	672	644	617	870	843	830	809	784	765
	PI	kW	231	248	255	267	278	282	239	259	267	281	294	304
	qw	l/s	32.7	31.0	30.3	29.2	28.0	26.8	37.8	36.6	36.0	35.1	34.0	33.2
	dpw	kPa	114	104	99	93	86	79	131	123	120	114	108	103
13	CC	kW	772	732	715	688	660	619	890	862	849	827	802	774
	PI	kW	235	253	260	271	283	278	243	263	272	285	299	304
	qw	l/s	33.5	31.8	31.0	29.9	28.6	26.9	38.6	37.4	36.9	35.9	34.8	33.6
	dpw	kPa	119	108	104	97	89	80	136	128	125	119	112	105

			850						900					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	866	842	831	812	788	770	922	896	883	863	835	815
	PI	kW	242	263	271	285	299	308	267	290	300	315	331	341
	qw	l/s	37.7	36.6	36.1	35.3	34.3	33.5	40.1	39.0	38.4	37.5	36.3	35.4
	dpw	kPa	94	89	87	83	79	75	105	100	97	93	88	84
9	CC	kW	888	863	851	832	809	790	943	916	904	882	857	835
	PI	kW	246	267	275	289	303	313	271	294	304	320	336	347
	qw	l/s	38.6	37.5	37.0	36.2	35.1	34.4	41.0	39.8	39.3	38.3	37.2	36.3
	dpw	kPa	98	93	91	87	82	79	110	104	101	97	92	87
10	CC	kW	910	884	872	852	828	810	965	937	924	902	876	856
	PI	kW	250	271	279	293	308	318	275	299	309	324	341	353
	qw	l/s	39.6	38.4	37.9	37.0	36.0	35.2	41.9	40.7	40.2	39.2	38.1	37.2
	dpw	kPa	102	97	95	90	86	82	114	108	105	101	95	91
11	CC	kW	932	906	893	872	848	830	986	958	944	922	895	875
	PI	kW	253	275	284	298	312	323	279	303	313	329	346	358
	qw	l/s	40.5	39.3	38.8	37.9	36.8	36.0	42.8	41.6	41.0	40.0	38.9	38.0
	dpw	kPa	107	101	99	94	90	86	119	112	110	105	99	95
12	CC	kW	953	927	914	893	868	849	1008	979	965	941	914	894
	PI	kW	257	279	288	302	317	328	283	308	318	334	351	363
	qw	l/s	41.4	40.2	39.7	38.8	37.7	36.9	43.8	42.5	41.9	40.9	39.7	38.8
	dpw	kPa	111	106	103	98	93	90	124	117	114	109	103	99
13	CC	kW	974	947	935	913	888	861	1030	1000	986	961	934	898
	PI	kW	261	283	292	307	322	329	288	312	322	339	356	361
	qw	l/s	42.3	41.1	40.6	39.6	38.5	37.4	44.7	43.4	42.8	41.7	40.5	39.0
	dpw	kPa	116	110	107	103	97	92	128	121	118	113	107	99

EWAD CFXL

			C10						C11					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1052	1018	1002	976	945	922	1123	1085	1068	1037	1001	974
	PI	kW	297	322	332	348	365	377	329	356	368	386	405	418
	qw	l/s	45.7	44.3	43.6	42.4	41.1	40.1	48.9	47.2	46.4	45.1	43.5	42.4
	dpw	kPa	117	110	107	102	96	91	132	124	120	114	107	101
9	CC	kW	1080	1045	1029	1001	969	945	1152	1113	1094	1063	1026	999
	PI	kW	302	327	338	354	371	383	335	362	374	393	412	425
	qw	l/s	46.9	45.4	44.7	43.5	42.1	41.1	50.1	48.4	47.6	46.2	44.6	43.4
	dpw	kPa	123	115	112	106	100	96	139	130	126	119	112	106
10	CC	kW	1108	1072	1055	1027	994	963	1180	1140	1121	1089	1052	1011
	PI	kW	307	333	343	360	377	386	340	369	380	399	419	426
	qw	l/s	48.1	46.6	45.8	44.6	43.2	41.9	51.3	49.5	48.7	47.3	45.7	43.9
	dpw	kPa	128	121	117	111	105	99	145	136	131	124	117	108
11	CC	kW	1136	1099	1082	1052	1019	978	1209	1167	1148	1114	1076	1016
	PI	kW	312	338	349	366	383	387	346	375	387	406	426	422
	qw	l/s	49.3	47.7	47.0	45.7	44.2	42.5	52.5	50.7	49.9	48.4	46.8	44.1
	dpw	kPa	134	126	123	116	110	101	151	142	137	130	122	109
12	CC	kW	1164	1126	1108	1078	1043	992	1238	1195	1175	1140	1101	1021
	PI	kW	318	344	355	372	390	387	352	381	393	413	433	417
	qw	l/s	50.5	48.9	48.1	46.8	45.3	43.1	53.7	51.9	51.0	49.5	47.8	44.3
	dpw	kPa	140	132	128	122	114	104	158	148	143	135	127	110
13	CC	kW	1192	1153	1135	1104	1062	1006	1267	1222	1201	1166	1113	1025
	PI	kW	323	349	361	378	393	387	358	388	400	420	433	411
	qw	l/s	51.7	50.0	49.2	47.9	46.1	43.7	55.0	53.0	52.1	50.6	48.3	44.5
	dpw	kPa	147	138	134	127	118	107	165	154	149	141	129	110

			C12						C13					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1277	1244	1229	1205	1176	1155	1363	1327	1311	1283	1251	1227
	PI	kW	328	356	368	386	405	418	362	393	406	426	447	462
	qw	l/s	55.5	54.1	53.5	52.4	51.2	50.2	59.3	57.7	57.0	55.8	54.4	53.4
	dpw	kPa	100	95	93	89	85	82	113	107	105	101	96	93
9	CC	kW	1311	1277	1262	1237	1207	1185	1398	1361	1345	1316	1283	1258
	PI	kW	332	361	373	392	411	424	367	399	412	432	454	469
	qw	l/s	57.0	55.5	54.9	53.8	52.5	51.5	60.8	59.2	58.4	57.2	55.8	54.7
	dpw	kPa	105	100	97	94	90	87	118	112	110	105	101	97
10	CC	kW	1345	1310	1295	1269	1239	1216	1434	1396	1379	1349	1315	1290
	PI	kW	337	367	379	397	417	430	372	404	418	439	460	476
	qw	l/s	58.4	56.9	56.3	55.1	53.8	52.8	62.3	60.7	59.9	58.6	57.2	56.0
	dpw	kPa	110	104	102	98	94	91	124	118	115	110	105	101
11	CC	kW	1380	1344	1328	1301	1270	1247	1470	1431	1413	1383	1348	1321
	PI	kW	342	372	384	403	423	437	378	410	424	445	467	483
	qw	l/s	59.9	58.4	57.7	56.5	55.2	54.2	63.9	62.2	61.4	60.1	58.5	57.4
	dpw	kPa	115	109	107	103	98	95	130	123	120	115	110	106
12	CC	kW	1415	1378	1361	1334	1302	1278	1507	1466	1448	1417	1381	1353
	PI	kW	347	377	390	409	429	443	384	417	430	452	474	490
	qw	l/s	61.4	59.8	59.1	57.9	56.5	55.5	65.4	63.7	62.9	61.5	59.9	58.8
	dpw	kPa	120	114	112	108	103	99	135	129	126	121	115	111
13	CC	kW	1450	1412	1395	1367	1334	1310	1544	1502	1483	1451	1414	1386
	PI	kW	352	383	395	415	435	449	389	423	437	458	481	497
	qw	l/s	62.9	61.3	60.5	59.3	57.9	56.8	67.0	65.2	64.4	63.0	61.3	60.1
	dpw	kPa	126	120	117	112	107	104	142	134	131	126	120	115

EWAD CFXL

			C14						C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1457	1413	1393	1360	1321	1293	1522	1476	1455	1419	1377	1345
	PI	kW	375	406	419	440	461	475	404	439	454	476	500	517
	qw	l/s	63.3	61.4	60.6	59.1	57.5	56.2	66.2	64.2	63.3	61.7	59.9	58.5
	dpw	kPa	143	135	132	126	119	114	156	147	143	136	129	123
9	CC	kW	1498	1453	1432	1397	1358	1328	1562	1515	1493	1456	1413	1381
	PI	kW	381	413	426	447	468	483	410	446	461	484	508	525
	qw	l/s	65.1	63.1	62.2	60.7	59.0	57.7	67.9	65.9	64.9	63.3	61.4	60.0
	dpw	kPa	151	142	138	132	125	120	163	154	150	143	135	129
10	CC	kW	1540	1493	1471	1435	1394	1364	1602	1554	1532	1493	1450	1416
	PI	kW	388	420	433	454	476	491	417	453	468	492	517	534
	qw	l/s	66.9	64.9	63.9	62.4	60.6	59.3	69.6	67.5	66.5	64.9	63.0	61.5
	dpw	kPa	158	149	145	139	131	126	171	161	157	150	142	136
11	CC	kW	1581	1533	1511	1474	1431	1400	1643	1593	1570	1531	1486	1452
	PI	kW	394	427	441	462	484	499	424	460	476	500	525	542
	qw	l/s	68.7	66.6	65.6	64.0	62.2	60.8	71.4	69.2	68.2	66.5	64.5	63.1
	dpw	kPa	166	157	153	146	138	132	179	169	164	157	148	142
12	CC	kW	1623	1573	1551	1513	1469	1436	1684	1632	1608	1569	1522	1488
	PI	kW	401	434	448	469	492	507	430	468	483	508	533	551
	qw	l/s	70.5	68.3	67.3	65.7	63.8	62.3	73.1	70.9	69.8	68.1	66.1	64.6
	dpw	kPa	174	164	160	153	144	138	187	176	172	164	155	148
13	CC	kW	1665	1614	1591	1552	1506	1473	1725	1672	1647	1606	1559	1509
	PI	kW	408	442	456	477	500	515	437	475	491	516	542	552
	qw	l/s	72.3	70.0	69.0	67.3	65.4	63.9	74.9	72.5	71.5	69.7	67.7	65.5
	dpw	kPa	183	172	168	160	151	145	195	184	179	171	161	152

			C16					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1591	1542	1520	1481	1434	1399
	PI	kW	433	472	488	514	540	559
	qw	l/s	69.2	67.1	66.1	64.4	62.4	60.9
	dpw	kPa	169	160	155	148	139	133
9	CC	kW	1632	1581	1558	1518	1471	1435
	PI	kW	440	479	496	522	549	568
	qw	l/s	71.0	68.7	67.7	66.0	64.0	62.4
	dpw	kPa	177	167	162	155	146	139
10	CC	kW	1674	1621	1596	1555	1508	1472
	PI	kW	447	487	504	530	558	577
	qw	l/s	72.7	70.4	69.4	67.6	65.5	64.0
	dpw	kPa	185	175	170	162	152	146
11	CC	kW	1715	1661	1635	1593	1544	1508
	PI	kW	454	495	512	539	567	586
	qw	l/s	74.5	72.1	71.0	69.2	67.1	65.5
	dpw	kPa	194	182	177	169	159	152
12	CC	kW	1758	1701	1675	1630	1580	1543
	PI	kW	462	503	520	547	576	596
	qw	l/s	76.3	73.8	72.7	70.8	68.6	67.0
	dpw	kPa	203	190	185	176	166	159
13	CC	kW	1800	1741	1714	1668	1617	1550
	PI	kW	469	511	529	556	585	590
	qw	l/s	78.1	75.6	74.4	72.4	70.2	67.3
	dpw	kPa	212	199	193	183	173	160

Fluid: Ethylene Glycol 30%
Ta: Condenser inlet air temperature; Twout: Evaporator leaving water temperature (Δt 6°C)
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop
** For working condition where dpw value is "Italic-Red Color" please contac factory*

EWAD CFXR

			600						740					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	654	616	599	573	545	504	771	742	729	705	679	636
	PI	kW	219	236	243	253	264	255	228	247	256	269	282	277
	qw	l/s	28.4	26.8	26.1	24.9	23.7	21.9	33.5	32.3	31.7	30.7	29.5	27.6
	dpw	kPa	89	79	75	70	63	55	105	98	95	89	83	74
9	CC	kW	670	631	614	588	553	509	790	760	746	722	695	639
	PI	kW	224	240	247	258	266	252	232	252	260	273	287	274
	qw	l/s	29.1	27.4	26.7	25.5	24.1	22.1	34.3	33.0	32.4	31.4	30.2	27.8
	dpw	kPa	92	83	79	73	65	56	110	102	99	93	87	74
10	CC	kW	686	647	629	602	559	513	809	778	764	739	699	642
	PI	kW	228	245	252	263	264	249	236	256	265	278	285	270
	qw	l/s	29.8	28.1	27.4	26.2	24.3	22.3	35.1	33.8	33.2	32.1	30.4	27.9
	dpw	kPa	96	87	82	76	66	57	114	107	103	97	87	75
11	CC	kW	702	662	645	616	561	514	828	796	781	756	702	644
	PI	kW	232	250	257	269	259	243	240	261	270	283	282	266
	qw	l/s	30.5	28.8	28.0	26.8	24.4	22.3	35.9	34.6	33.9	32.8	30.5	28.0
	dpw	kPa	101	90	86	79	66	57	119	111	107	101	88	75
12	CC	kW	719	677	660	631	565	521	847	814	799	773	705	651
	PI	kW	237	255	262	274	256	242	245	266	275	289	279	264
	qw	l/s	31.2	29.4	28.6	27.4	24.5	22.6	36.8	35.3	34.7	33.6	30.6	28.2
	dpw	kPa	105	94	89	82	67	58	124	116	112	105	89	76
13	CC	kW	735	693	674	639	570	524	866	832	816	790	708	652
	PI	kW	242	260	267	275	253	237	249	271	280	294	275	259
	qw	l/s	31.9	30.1	29.3	27.7	24.7	22.7	37.6	36.1	35.4	34.3	30.7	28.3
	dpw	kPa	109	98	93	84	68	59	129	120	116	109	89	76

			820						870					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	849	820	806	782	755	717	901	870	855	826	794	735
	PI	kW	244	265	274	288	303	301	272	296	306	322	338	326
	qw	l/s	36.9	35.7	35.1	34.0	32.8	31.2	39.2	37.8	37.2	35.9	34.5	32.0
	dpw	kPa	90	85	82	77	72	66	101	94	91	86	80	69
9	CC	kW	869	840	826	802	771	727	922	889	874	846	808	739
	PI	kW	248	270	279	293	307	302	276	301	312	328	342	322
	qw	l/s	37.8	36.5	35.9	34.9	33.5	31.6	40.1	38.7	38.0	36.8	35.1	32.1
	dpw	kPa	94	88	86	81	75	67	105	98	95	90	82	70
10	CC	kW	890	860	845	821	780	738	942	909	893	866	808	742
	PI	kW	252	275	284	299	306	301	281	306	317	334	336	317
	qw	l/s	38.7	37.4	36.7	35.7	33.9	32.1	40.9	39.5	38.8	37.6	35.1	32.3
	dpw	kPa	98	92	89	84	77	69	109	102	99	93	82	70
11	CC	kW	912	880	865	840	791	750	963	928	911	884	812	750
	PI	kW	257	279	289	304	307	303	286	311	322	339	332	315
	qw	l/s	39.6	38.2	37.6	36.5	34.4	32.6	41.8	40.3	39.6	38.4	35.3	32.6
	dpw	kPa	103	96	93	88	79	71	114	106	103	97	83	71
12	CC	kW	932	900	885	859	802	760	983	947	930	902	816	752
	PI	kW	261	284	294	309	307	302	291	317	328	345	327	309
	qw	l/s	40.5	39.1	38.4	37.3	34.8	33.0	42.7	41.1	40.4	39.2	35.4	32.6
	dpw	kPa	107	100	97	92	81	73	118	110	106	100	83	71
13	CC	kW	952	920	904	878	816	766	1004	967	949	920	824	758
	PI	kW	266	289	299	314	309	300	296	322	333	351	326	307
	qw	l/s	41.3	39.9	39.2	38.1	35.4	33.2	43.6	42.0	41.2	39.9	35.8	32.9
	dpw	kPa	111	104	101	95	83	74	122	114	110	104	85	72

EWAD CFXR

			980						C10					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1026	986	967	935	885	835	1092	1046	1024	986	918	840
	PI	kW	301	327	338	354	363	357	337	366	378	397	399	376
	qw	l/s	44.6	42.9	42.0	40.7	38.5	36.3	47.5	45.5	44.5	42.9	39.9	36.5
	dpw	kPa	111	104	100	94	85	76	125	116	111	104	90	77
9	CC	kW	1052	1010	991	958	896	847	1118	1071	1048	1010	917	843
	PI	kW	307	333	344	361	362	357	343	373	385	404	390	369
	qw	l/s	45.7	43.9	43.1	41.6	38.9	36.8	48.6	46.5	45.6	43.9	39.9	36.7
	dpw	kPa	117	108	104	98	86	78	131	121	116	108	90	77
10	CC	kW	1078	1035	1015	981	912	860	1145	1096	1072	1034	927	852
	PI	kW	313	339	351	368	364	358	350	380	392	412	389	367
	qw	l/s	46.9	45.0	44.1	42.6	39.6	37.4	49.8	47.6	46.6	44.9	40.3	37.0
	dpw	kPa	122	113	109	102	89	80	137	126	121	113	92	78
11	CC	kW	1105	1060	1039	999	925	863	1172	1121	1097	1045	931	854
	PI	kW	319	346	357	371	364	352	357	387	400	413	383	359
	qw	l/s	48.0	46.1	45.1	43.4	40.2	37.5	50.9	48.7	47.6	45.4	40.4	37.1
	dpw	kPa	128	118	114	106	91	80	143	131	126	115	92	79
12	CC	kW	1131	1085	1064	1013	937	869	1198	1146	1121	1050	933	861
	PI	kW	325	352	364	372	364	348	364	395	408	409	376	355
	qw	l/s	49.1	47.1	46.2	44.0	40.7	37.7	52.0	49.7	48.7	45.6	40.5	37.4
	dpw	kPa	133	123	119	108	94	81	148	136	131	116	93	80
13	CC	kW	1157	1110	1088	1027	950	863	1225	1170	1145	1055	942	847
	PI	kW	331	359	371	373	365	352	371	402	415	404	373	367
	qw	l/s	50.2	48.2	47.2	44.6	41.2	37.5	53.2	50.8	49.7	45.8	40.9	36.8
	dpw	kPa	139	128	124	111	96	80	154	142	136	117	94	77

			C11						C12					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1253	1216	1198	1169	1135	1109	1335	1293	1274	1240	1201	1172
	PI	kW	330	359	371	390	410	424	367	400	413	435	458	473
	qw	l/s	54.5	52.9	52.1	50.8	49.4	48.2	58.1	56.2	55.4	53.9	52.2	51.0
	dpw	kPa	96	91	88	84	80	76	109	102	99	94	89	85
9	CC	kW	1285	1247	1229	1199	1164	1137	1369	1326	1305	1271	1231	1201
	PI	kW	335	365	377	397	417	431	373	406	420	442	465	481
	qw	l/s	55.9	54.2	53.4	52.1	50.6	49.4	59.5	57.6	56.7	55.2	53.5	52.2
	dpw	kPa	101	95	93	88	84	80	114	107	104	99	93	89
10	CC	kW	1318	1279	1260	1229	1193	1166	1403	1358	1337	1302	1261	1230
	PI	kW	341	371	384	403	424	439	380	413	427	450	473	489
	qw	l/s	57.3	55.6	54.8	53.4	51.8	50.7	61.0	59.0	58.1	56.6	54.8	53.4
	dpw	kPa	106	100	97	92	87	84	119	112	108	103	97	93
11	CC	kW	1352	1311	1292	1259	1222	1195	1437	1391	1369	1332	1290	1259
	PI	kW	347	377	390	410	431	446	386	420	435	457	481	497
	qw	l/s	58.7	56.9	56.1	54.7	53.1	51.9	62.4	60.4	59.5	57.9	56.0	54.7
	dpw	kPa	110	104	101	97	91	88	124	117	113	108	101	97
12	CC	kW	1385	1343	1323	1290	1252	1216	1472	1424	1401	1363	1320	1273
	PI	kW	352	383	396	417	438	449	393	427	442	465	489	498
	qw	l/s	60.1	58.3	57.4	56.0	54.3	52.8	63.9	61.8	60.8	59.2	57.3	55.3
	dpw	kPa	115	109	106	101	95	90	130	122	118	112	105	99
13	CC	kW	1419	1375	1355	1321	1281	1233	1507	1457	1434	1395	1350	1279
	PI	kW	358	390	403	424	445	450	400	435	450	473	497	493
	qw	l/s	61.6	59.7	58.8	57.3	55.6	53.5	65.4	63.2	62.2	60.5	58.6	55.5
	dpw	kPa	121	114	111	105	100	93	135	127	123	117	110	99

EWAD CFXR

			C13						C14					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1420	1369	1346	1306	1260	1226	1481	1426	1400	1356	1305	1229
	PI	kW	382	415	428	449	472	487	416	453	468	492	518	509
	qw	l/s	61.8	59.5	58.5	56.8	54.8	53.3	64.4	62.0	60.9	59.0	56.8	53.5
	dpw	kPa	137	127	123	117	109	104	148	138	133	125	117	104
9	CC	kW	1459	1406	1381	1340	1293	1258	1519	1462	1435	1390	1321	1252
	PI	kW	390	423	436	458	480	496	424	461	477	501	517	512
	qw	l/s	63.4	61.1	60.0	58.2	56.2	54.7	66.0	63.6	62.4	60.4	57.4	54.4
	dpw	kPa	143	134	129	122	114	109	155	144	139	131	119	108
10	CC	kW	1498	1443	1417	1374	1326	1273	1557	1498	1471	1424	1341	1262
	PI	kW	397	431	445	466	489	497	432	470	486	511	518	508
	qw	l/s	65.1	62.7	61.6	59.7	57.6	55.3	67.7	65.1	63.9	61.9	58.3	54.8
	dpw	kPa	150	140	136	128	120	111	162	151	145	137	122	109
11	CC	kW	1538	1480	1454	1409	1359	1280	1595	1535	1506	1458	1360	1266
	PI	kW	405	439	453	475	498	492	440	478	495	520	518	500
	qw	l/s	66.8	64.3	63.1	61.2	59.0	55.6	69.3	66.7	65.4	63.3	59.1	55.0
	dpw	kPa	158	147	142	134	125	112	169	157	152	143	125	110
12	CC	kW	1577	1518	1490	1444	1392	1286	1633	1571	1541	1492	1384	1275
	PI	kW	413	447	462	484	507	486	448	487	504	530	522	495
	qw	l/s	68.5	65.9	64.7	62.7	60.4	55.8	70.9	68.2	66.9	64.8	60.1	55.4
	dpw	kPa	165	154	148	140	131	112	177	164	158	149	129	111
13	CC	kW	1616	1556	1527	1479	1408	1290	1671	1606	1576	1513	1393	1282
	PI	kW	421	456	470	493	508	479	456	496	513	532	517	489
	qw	l/s	70.2	67.5	66.3	64.2	61.1	56.0	72.5	69.7	68.4	65.7	60.5	55.7
	dpw	kPa	173	161	155	146	133	113	184	171	165	153	131	112

			C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
8	CC	kW	1546	1486	1457	1407	1351	1232
	PI	kW	450	491	508	535	564	530
	qw	l/s	67.2	64.6	63.3	61.2	58.8	53.6
	dpw	kPa	160	149	143	134	124	105
9	CC	kW	1584	1522	1493	1442	1351	1246
	PI	kW	458	500	518	545	554	528
	qw	l/s	68.9	66.2	64.9	62.7	58.7	54.2
	dpw	kPa	167	155	150	140	124	107
10	CC	kW	1622	1557	1527	1476	1358	1251
	PI	kW	467	509	527	556	547	518
	qw	l/s	70.5	67.7	66.4	64.1	59.0	54.3
	dpw	kPa	175	162	156	146	125	107
11	CC	kW	1661	1593	1562	1510	1364	1254
	PI	kW	476	519	537	566	539	508
	qw	l/s	72.1	69.2	67.9	65.6	59.2	54.5
	dpw	kPa	182	169	163	153	126	108
12	CC	kW	1699	1629	1597	1543	1378	1265
	PI	kW	485	528	547	576	536	504
	qw	l/s	73.8	70.7	69.3	67.0	59.8	54.9
	dpw	kPa	190	176	169	159	128	109
13	CC	kW	1738	1666	1632	1551	1382	1276
	PI	kW	494	538	557	571	527	499
	qw	l/s	75.4	72.3	70.8	67.3	60.0	55.4
	dpw	kPa	198	183	176	160	129	111

Fluid: Ethylene Glycol 30%
Ta: Condenser inlet air temperature; Twout: Evaporator leaving water temperature (Δt 6°C)
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop
** For working condition where dpw value is "Italic-Red Color" please contac factory*

EWAD CFXS

Twout			640	770	850	900	C10	C11	C12	C13	C14	C15	C16
8	TFC	°C	-2.1	-1.4	-0.2	-1.0	-0.4	-1.2	1.6	0.8	0.0	-0.5	-1.2
	CC	kW	608	735	812	863	976	1037	1205	1283	1360	1419	1481
	PI	kW	19.1	22.7	26.2	26.2	29.9	30.0	37.1	37.0	36.8	37.1	36.8
	qw	l/s	26.4	32.0	35.3	37.5	42.4	45.1	52.4	55.8	59.1	61.7	64.4
	Dpw	kPa	117	158	164	183	224	250	212	238	278	300	324
9	TFC	°C	-1.5	-0.8	0.5	-0.3	0.2	-0.6	2.2	1.5	0.7	0.1	-0.5
	CC	kW	624	753	832	882	1001	1063	1237	1316	1397	1456	1518
	PI	kW	19.0	22.6	26.2	26.2	29.7	29.8	36.8	37.1	37.1	37.0	37.0
	qw	l/s	27.1	32.7	36.2	38.3	43.5	46.2	53.8	57.2	60.7	63.3	66.0
	Dpw	kPa	123	165	171	190	234	261	222	248	291	314	339
10	TFC	°C	-0.8	-0.1	1.2	0.4	0.9	0.1	2.9	2.1	1.3	0.7	0.1
	CC	kW	640	772	852	902	1027	1089	1269	1349	1435	1493	1555
	PI	kW	19.1	22.6	26.3	26.2	29.8	29.9	36.8	36.8	37.0	36.9	36.9
	qw	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6	62.4	64.9	67.6
	Dpw	kPa	128	172	178	198	245	272	232	259	305	328	354
11	TFC	°C	-0.1	0.6	1.9	1.1	1.5	0.7	3.6	2.8	1.9	1.4	0.7
	CC	kW	656	790	872	922	1052	1114	1301	1383	1474	1531	1593
	PI	kW	19.2	22.7	26.3	26.2	29.7	29.8	36.9	37.0	36.9	37.1	36.8
	qw	l/s	28.5	34.3	37.9	40.0	45.7	48.4	56.5	60.1	64.0	66.5	69.2
	Dpw	kPa	134	179	186	205	255	284	242	271	320	343	369
12	TFC	°C	0.5	1.3	2.6	1.8	2.2	1.4	4.3	3.5	2.5	2.0	1.4
	CC	kW	672	809	893	941	1078	1140	1334	1417	1513	1569	1630
	PI	kW	19.1	22.7	26.3	26.2	29.8	29.9	37.0	37.1	36.9	37.0	37.1
	qw	l/s	29.2	35.1	38.8	40.9	46.8	49.5	57.9	61.5	65.7	68.1	70.8
	Dpw	kPa	140	186	193	213	267	295	253	282	335	358	384
13	TFC	°C	1.2	2.0	3.3	2.5	2.9	2.0	5.0	4.1	3.1	2.6	2.0
	CC	kW	688	827	913	961	1104	1166	1367	1451	1552	1606	1668
	PI	kW	19.1	22.8	26.4	26.2	29.9	29.8	37.1	36.8	36.8	36.9	37.0
	qw	l/s	29.9	35.9	39.6	41.7	47.9	50.6	59.3	63.0	67.3	69.7	72.4
	Dpw	kPa	146	194	201	221	278	307	264	294	350	373	400

Fluid: Ethylene Glycol 30%
Twout: Unit leaving water temperature (Δt 6°C); TFC: Air temperature for free cooling 100%;
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop

EWAD CFXL

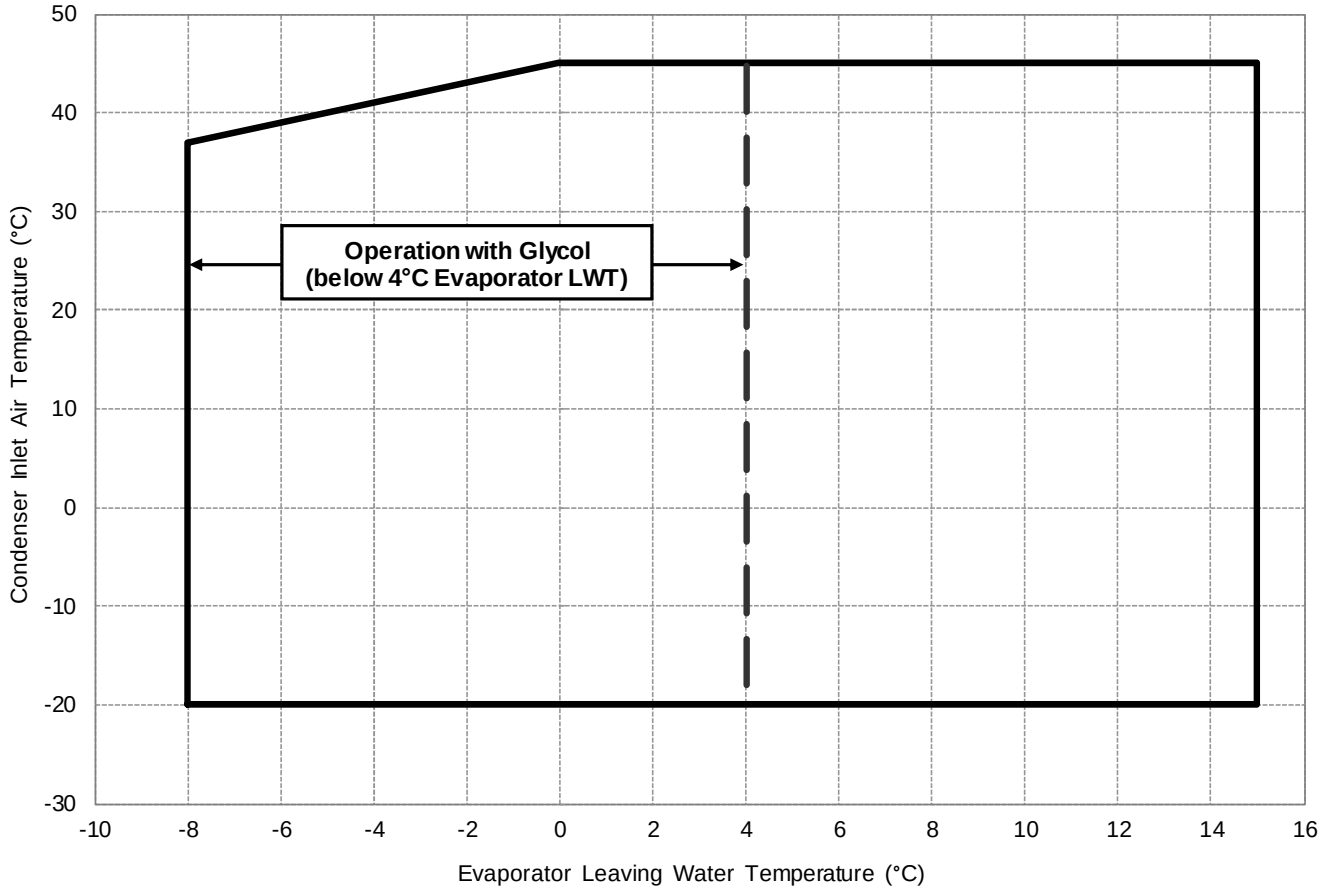
Twout			640	770	850	900	C10	C11	C12	C13	C14	C15	C16
8	TFC	°C	-2.1	-1.4	-0.2	-1.0	-0.4	-1.2	1.6	0.8	0.0	-0.5	-1.2
	CC	kW	608	735	812	863	976	1037	1205	1283	1360	1419	1481
	PI	kW	19.1	22.7	26.2	26.2	29.9	30.0	37.1	37.0	36.8	37.1	36.8
	qw	l/s	26.4	32.0	35.3	37.5	42.4	45.1	52.4	55.8	59.1	61.7	64.4
	Dpw	kPa	117	158	164	183	224	250	212	238	278	300	324
9	TFC	°C	-1.5	-0.8	0.5	-0.3	0.2	-0.6	2.2	1.5	0.7	0.1	-0.5
	CC	kW	624	753	832	882	1001	1063	1237	1316	1397	1456	1518
	PI	kW	19.0	22.6	26.2	26.2	29.7	29.8	36.8	37.1	37.1	37.0	37.0
	qw	l/s	27.1	32.7	36.2	38.3	43.5	46.2	53.8	57.2	60.7	63.3	66.0
	Dpw	kPa	123	165	171	190	234	261	222	248	291	314	339
10	TFC	°C	-0.8	-0.1	1.2	0.4	0.9	0.1	2.9	2.1	1.3	0.7	0.1
	CC	kW	640	772	852	902	1027	1089	1269	1349	1435	1493	1555
	PI	kW	19.1	22.6	26.3	26.2	29.8	29.9	36.8	36.8	37.0	36.9	36.9
	qw	l/s	27.8	33.5	37.0	39.2	44.6	47.3	55.1	58.6	62.4	64.9	67.6
	Dpw	kPa	128	172	178	198	245	272	232	259	305	328	354
11	TFC	°C	-0.1	0.6	1.9	1.1	1.5	0.7	3.6	2.8	1.9	1.4	0.7
	CC	kW	656	790	872	922	1052	1114	1301	1383	1474	1531	1593
	PI	kW	19.2	22.7	26.3	26.2	29.7	29.8	36.9	37.0	36.9	37.1	36.8
	qw	l/s	28.5	34.3	37.9	40.0	45.7	48.4	56.5	60.1	64.0	66.5	69.2
	Dpw	kPa	134	179	186	205	255	284	242	271	320	343	369
12	TFC	°C	0.5	1.3	2.6	1.8	2.2	1.4	4.3	3.5	2.5	2.0	1.4
	CC	kW	672	809	893	941	1078	1140	1334	1417	1513	1569	1630
	PI	kW	19.1	22.7	26.3	26.2	29.8	29.9	37.0	37.1	36.9	37.0	37.1
	qw	l/s	29.2	35.1	38.8	40.9	46.8	49.5	57.9	61.5	65.7	68.1	70.8
	Dpw	kPa	140	186	193	213	267	295	253	282	335	358	384
13	TFC	°C	1.2	2.0	3.3	2.5	2.9	2.0	5.0	4.1	3.1	2.6	2.0
	CC	kW	688	827	913	961	1104	1166	1367	1451	1552	1606	1668
	PI	kW	19.1	22.8	26.4	26.2	29.9	29.8	37.1	36.8	36.8	36.9	37.0
	qw	l/s	29.9	35.9	39.6	41.7	47.9	50.6	59.3	63.0	67.3	69.7	72.4
	Dpw	kPa	146	194	201	221	278	307	264	294	350	373	400

Fluid: Ethylene Glycol 30%
Twout: Unit leaving water temperature (Δt 6°C); TFC: Air temperature for free cooling 100%;
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop

EWAD CFXR

Twout			60	740	820	870	980	C10	C11	C12	C13	C14	C15
8	TFC	°C	-3.6	-3.2	-2.0	-2.7	-2.2	-3.0	-0.6	-1.5	-2.2	-2.8	-3.4
	CC	kW	573	705	782	826	935	986	1169	1240	1306	1356	1407
	PI	kW	9.4	11.0	12.5	12.6	14.2	14.2	17.4	17.3	17.5	17.5	17.5
	qw	l/s	24.9	30.7	34.0	35.9	40.7	42.9	50.8	53.9	56.8	59.0	61.2
	Dpw	kPa	105	147	153	169	207	228	201	224	258	276	296
9	TFC	°C	-3.0	-2.6	-1.3	-2.1	-1.6	-2.4	0.0	-0.8	-1.7	-2.2	-2.9
	CC	kW	588	722	802	846	958	1010	1199	1271	1340	1390	1442
	PI	kW	9.4	11.0	12.6	12.6	14.1	14.2	17.3	17.4	17.3	17.5	17.4
	qw	l/s	25.5	31.4	34.9	36.8	41.6	43.9	52.1	55.2	58.2	60.4	62.7
	Dpw	kPa	110	153	160	176	216	238	210	233	270	288	308
10	TFC	°C	-2.3	-1.9	-0.6	-1.5	-0.9	-1.7	0.7	-0.2	-1.1	-1.6	-2.3
	CC	kW	602	739	821	866	981	1034	1229	1302	1374	1424	1476
	PI	kW	9.4	11.0	12.6	12.5	14.2	14.2	17.4	17.4	17.4	17.5	17.4
	qw	l/s	26.2	32.1	35.7	37.6	42.6	44.9	53.4	56.6	59.7	61.9	64.1
	Dpw	kPa	115	159	167	184	225	248	219	243	282	301	321
11	TFC	°C	-1.7	-1.3	0.0	-0.8	-0.2	-0.9	1.3	0.4	-0.5	-1.1	-1.7
	CC	kW	616	756	840	884	999	1045	1259	1332	1409	1458	1510
	PI	kW	9.4	11.0	12.6	12.6	14.2	14.2	17.4	17.3	17.4	17.3	17.4
	qw	l/s	26.8	32.8	36.5	38.4	43.4	45.4	54.7	57.9	61.2	63.3	65.6
	Dpw	kPa	120	165	173	190	232	252	228	253	294	314	334
12	TFC	°C	-1.1	-0.6	0.7	-0.1	0.6	0.0	2.0	1.1	0.1	-0.5	-1.1
	CC	kW	631	773	859	902	1013	1050	1290	1363	1444	1492	1543
	PI	kW	9.4	11.0	12.6	12.6	14.2	14.2	17.5	17.5	17.4	17.4	17.4
	qw	l/s	27.4	33.6	37.3	39.2	44.0	45.6	56.0	59.2	62.7	64.8	67.0
	Dpw	kPa	124	172	180	197	238	254	238	263	307	326	347
13	TFC	°C	-0.3	0.0	1.3	0.6	1.4	0.9	2.6	1.7	0.7	0.3	-0.2
	CC	kW	639	790	878	920	1027	1055	1321	1395	1479	1513	1551
	PI	kW	9.4	11.0	12.6	12.6	14.2	14.2	17.4	17.4	17.4	17.4	17.4
	qw	l/s	27.7	34.3	38.1	39.9	44.6	45.8	57.3	60.5	64.2	65.7	67.3
	Dpw	kPa	127	178	187	204	244	256	248	274	321	334	350

Fluid: Ethylene Glycol 30%
Twout: Unit leaving water temperature (Δt 6°C); TFC: Air temperature for free cooling 100%;
CC: Cooling capacity; PI: Power input; qw: Fluid flow rate; dpw: Fluid pressure drop



Water content in cooling circuits

The cooled water distribution circuits should have minimum water content to avoid excessive compressors start and stop.

In fact, each time the compressor starts up, an excessive quantity of oil goes from the compressor sump and simultaneously there is a rise in the temperature of the compressor motor's stator due to the inrush current during the start-up. To prevent damage to the compressors, Daikin has envisaged the application of a device to limit frequent stops and restarts.

During the span of one hour there will be no more than 6 starts of the compressor. The plant side should therefore ensure that the overall water content allows a more constant functioning of the unit and consequently greater environmental comfort. The minimum water content per unit should be calculated with a certain approximation using this simplified formula:

For 2 compressors unit
M (liters) = (0.1595 x ΔT(°C) + 3.0825) x P(kW)

where:
M= minimum water content per unit expressed in litres
P= cooling capacity of the unit expressed in kW
ΔT= evaporator entering / leaving water temperature difference expressed in °C

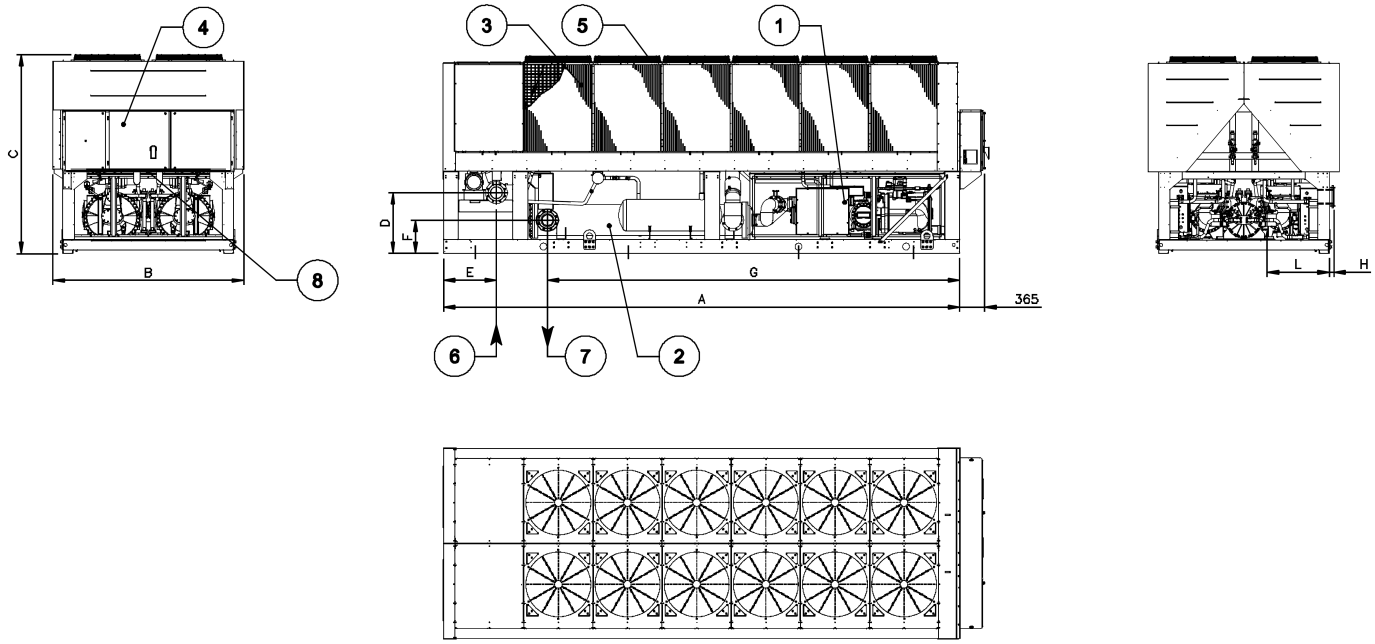
This formula is valid for standard microprocessor parameters

For more accurate determination of quantity of water, it is advisable to contact the designer of the plant.

Items (1) (5)			Cooling Water			Cooled Water		Heated water (2)				Tendency if out of criteria
			Circulating System		Once Flow			Low temperature		High temperature		
			Circulating water	Supply water (4)	Flowing water	Circulating water [Below 20℃]	Supply water (4)	Circulating water [20℃ ~ 60℃]	Supply water (4)	Circulating water [60℃ ~ 80℃]	Supply water (4)	
Items to be controlled:	pH	at 25℃	6.5 ~ 8.2	6.0 ~ 8.0	6.0 ~ 8.0	6.8 - 8.0	6.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	7.0 ~ 8.0	Corrosion + Scale
	Electrical conductivity	[mS/m] at 25℃	Below 80	Below 30	Below 40	Below 80	Below 80	Below 30	Below 30	Below 30	Below 30	Corrosion + Scale
		(μS/cm) at 25℃	(Below 800)	(Below 300)	(Below 400)	(Be low 800)	(Below 800)	(Below 300)	(Below 300)	(Below 300)	(Below 300)	Corrosion + Scale
	Chloride ion	[mgCl^{2-}/l]	Below 200	Below 50	Below 50	Below 200	Below 50	Below 50	Below 50	Below 30	Below 30	Corrosion
	Sulfate ion	[mgSO^{2-}_4/l]	Below 200	Below 50	Below 50	Below 200	Below 50	Below 50	Below 50	Below 30	Below 30	Corrosion
	M-alkalinity (pH4.8)	[mg$CaCO_3$/l]	Below 100	Below 50	Below 50	Below 100	Below 50	Below 50	Below 50	Below 50	Below 50	Scale
	Total hardness	[mg$CaCO_3$/l]	Below 200	Below 70	Below 70	Below 200	Below 70	Below 70	Below 70	Below 70	Below 70	Scale
	Calcium harness	[mg$CaCO_3$/l]	Below 150	Below 50	Below 50	Below 50	Below 50	Below 50	Below 50	Below 50	Below 50	Scale
	Silca ion	[mgSiO_2/l]	Below 50	Below 30	Below 30	Below 30	Below 30	Below 30	Below 30	Below 30	Below 30	Scale
	Oxygen	(mg O2 /l)	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Corrosion
	Particole size	(mm)	Below 0.5	Below 0.5	Below 0.5	Below 0.5	Below 0.6	Below 0.5	Below 0.6	Below 0.5	Below 0.6	Erosion
	Total dissolved solids	(mg / l)	Below 1000	Below 1000	Below 1000	Below 1000	Below 1001	Below 1000	Below 1001	Below 1000	Below 1001	Erosion
	Ethykene, Propylene Glycol (weight conc.)		Below 60%	Below 60%	---	Below 60%	Below 60%	Below 60%	Below 60%	Below 60%	Below 60%	--
Items to be referred to:	Nitrate ion	(mg NO3- /l)	Below 100	Below 100	Below 100	Below 100	Below 101	Below 100	Below 101	Below 100	Below 101	Corrosion
	TOC Total organic carbon	(mg /l)	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Scale
	Iron	[mgFe/l]	Below 1.0	Below 0.3	Below 1.0	Below 1.0	Below 0.3	Below 1.0	Below 0.3	Below 1.0	Below 0.3	Corrosion + Scale
	Copper	[mgCu/l]	Below 0.3	Below 0.1	Below 1.0	Below 1.0	Below 1.0	Below 1.0	Below 0.1	Below 1.0	Below 0.1	Corrosion
	Sulfite ion	[mgS^{2-}/l]	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable	Not detectable	Corrosion
	Ammonium ion	[mgNH^{+}_4/l]	Below 1.0	Below 0.1	Below 1.0	Below 1.0	Below 0.1	Below 0.3	Below 0.1	Below 0.1	Below 0.1	Corrosion
	Remaining chloride	[mgCL/l]	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.3	Below 0.25	Below 0.3	Below 0.1	Below 0.3	Corrosion
	Free carbide	[mgCO_2/l]	Below 4.0	Below 4.0	Below 4.0	Below 4.0	Below 4.0	Below 0.4	Below 4.0	Below 0.4	Below 4.0	Corrosion
	Stability index		6.0 ~ 7.0	---	---	---	---	---	---	---	---	Corrosion + Scale

1 Names, definitions and units are according to JIS K 0101. Units and figures between brackets are old units published as reference only.
2 In case of using heated water (more than 40℃), co rrosion is generally noticeable.
Especially when the iron materials is in direct contact with water without any protection shields, it is desireable to give the valid measure for corrosion. E.g. chemical measure
3 In the cooling water using hermetic cooling tower, close circuit water is according to heated water standard, and scattered water is according to cooling water standard.
4 Supply water is considered drink water, industrial water and ground water except for genuine water, neutral water and soft water.
5 The above mentioned items are representable items in corrosion and scale cases.
6 The limits above have to be considered as a general prescription and con not totallu assure the absence of corrossion and erosion.
Some particular combinations of elements or the presence of components not listed in the table or factors not considered may trigger corrosion phenomena.

EWAD CFX- (Standard Glycol)



The drawing is for illustration only. Please refer to the table below for unit dimensions.

Models		Dimensions (mm)									
EWAD CFXS/XL	**EWAD CFXR**	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**Fans**
640	**600**	5820	2480	2565	795	690	435	5370	75	800	10
770	**740**	6720	2480	2565	795	690	435	5370	75	800	12
850	**820**	7620	2480	2565	795	690	435	5370	75	800	14
900	**870**	7620	2480	2565	795	690	435	5370	75	800	14
C10	**980**	8520	2480	2565	795	690	540	5355	75	748	16
C11	**C10**	8520	2480	2565	795	690	540	5355	75	748	16
C12	**C11**	10320	2480	2565	795	690	540	5355	75	748	20
C13	**C12**	10320	2480	2565	795	690	540	5355	75	748	20
C14	**C13**	10320	2480	2565	795	690	540	5355	75	670	20
C15	**C14**	10320	2480	2565	795	690	540	5355	75	670	20
C16	**C15**	10320	2480	2565	795	690	540	5355	75	670	20

LEGEND
1. Compressor
2. Evaporator
3. Condenser coil
4. Electrical panel
5. Fan
6. Evaporator water inlet
7. Evaporator water outlet
8. Power connections slot

Warning

Installation and maintenance of the unit must to be performed only by qualified personnel who have knowledge with local codes and regulations, and experience with this type of equipment. Must be avoided the unit installation in places that could be considered dangerous for all the maintenance operations.

Handling

Care should be taken to avoid rough handling or shock due to dropping the unit. Do not push or pull the unit from anything other than the base frame. Never allow the unit to fall during unloading or moving as this may result in serious damage. To lift the unit, rings are provided in the base frame of the unit. Spreader bar and cables should be arranged to prevent damage to the condenser coil or unit cabinet.

Location

The units are produced for outside installation on roofs, floors or below ground level on condition that the area is free from obstacles for the passage of the condenser air. The unit should be positioned on solid foundations and perfectly level; in the case of installation on roofs or floors, it may be advisable to arrange the use of suitable weight distribution beams. When the units are installed on the ground, a concrete base at least 250 mm wider and longer than the unit's footprint should be laid. Furthermore, this base should withstand the unit weight mentioned in the technical data table.

Space requirements

The units are air-cooled, then it is important to respect the minimum distances which guarantee the best ventilation of the condenser coils. Limitations of space reducing the air flow could cause significant reductions in cooling capacity and an increase in electricity consumption.
To determinate unit placement, careful consideration must be given to assure a sufficient air flow across the condenser heat transfer surface. Two conditions must be avoided to achieve the best performance: warm air recirculation and coil starvation.
Both these conditions cause an increase of condensing pressures that results in reductions in unit efficiency and capacity.
Moreover the unique microprocessor has the ability to calculate the operating environment of the air cooled chiller and the capacity to optimize its performance staying on-line during abnormal conditions.
Each side of the unit must be accessible after installation for periodic service. Fig.1 shows you minimum recommended clearance requirements.
Vertical condenser air discharge must be unobstructed because the unit would have its capacity and efficiency significantly reduced.
If the units are positioned in places surrounded by walls or obstacles of the same height as the units, the units should be at least 2500 mm from obstacles (fig.2). In the event the obstacles are higher than the units, the units should be at least 3000 mm from the obstacle (fig.4). Units installed closer than the minimum recommended distance to a wall or other vertical riser may experience a combination of coil starvation and warm air recirculation, thus causing reduction in unit capacity and efficiency reductions. The microprocessor control is proactive in response "of design condition". In the case of single or compounded influences restricting airflow to the unit, the microprocessor will act to keep the compressor(s) running (at reduced capacity) rather than allowing a shut-off on high discharge pressure.
When two or more units are positioned side by side it is recommended that the condenser coils are at least 3600 mm distance from one another (fig.3); strong wind could be the cause of air warm recirculation.
For other installation solutions, consult our technicians.

The above recommended information are representative of general installation. A specific evaluation should be done by contractor depending on the case.

Fig.1

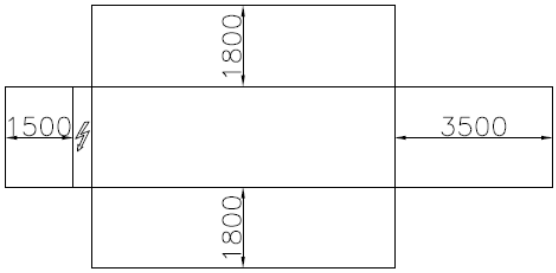


Fig. 2

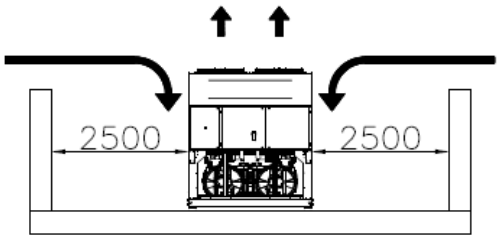


Fig. 3

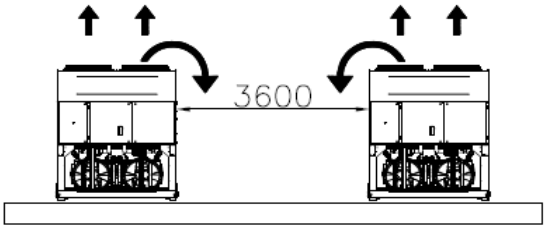
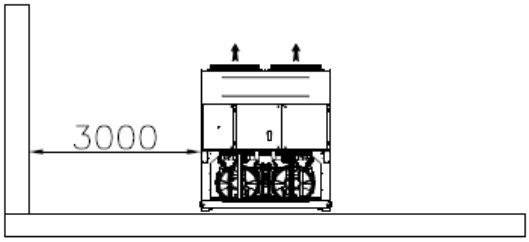


Fig. 4



Acoustic protection

When sound level must meet special requirements, it is necessary to pay the maximum attention to ensure the perfect insulation of the unit from the support base by applying appropriate vibration-dampening devices on the unit, on the water pipes and on the electrical connections.

Storage

The environment conditions have to be in the following limits:

Minimum ambient temperature:	-20°C
Maximum ambient temperature:	+57°C
Maximum R.H.:	95% not condensing

General

The chiller will be designed and manufactured in accordance with the following European directives:

Construction of pressure vessel	97/23/EC (PED)
Machinery Directive	2006/42/EC
Low Voltage	2006/95/EC
Electromagnetic Compatibility	2004/108/EC
Electrical & Safety codes	EN 60204–1 / EN 60335-2-40
Manufacturing Quality Standards	UNI – EN ISO 9001:2004

To avoid any losses, the unit will be tested at full load in the factory (at the nominal working conditions and water temperatures). The chiller will be delivered to the job site completely assembled and charged with refrigerant and oil. The installation of the chiller must comply with the manufacturer's instructions for rigging and handling equipment.

The unit will be able to start up and operate (as standard) at full load with:
- outside air temperature from ..... °C to..... °C
- evaporator leaving fluid temperature between ..... °C and..... °C

Refrigerant

Only HFC 134a can be used.

Performance

- ✓ Number of chiller(s): ..... unit(s)
- ✓ Cooling capacity for single chiller: ..... kW
- ✓ Power input for single chiller in cooling mode: ..... kW
- ✓ Heat exchanger entering water temperature in cooling mode: ..... °C
- ✓ Heat exchanger leaving water temperature in cooling mode: ..... °C
- ✓ Heat exchanger water flow: ..... l/s
- ✓ Nominal outside working ambient temperature in cooling mode: ..... °C
- ✓ Operating voltage range should be 400V ±10%, 3ph, 50Hz, voltage unbalance maximum 3%, without neutral conductor and shall only have one power connection point.

Unit description

Chiller shall include as standard not less than: two independent refrigerant circuits, semi-hermetic asymmetric type rotary single screw compressors, electronic expansion device (EEXV), refrigerant direct expansion shell & tube heat exchanger, air-cooled condenser section, R134a refrigerant, lubrication system, motor starting components, discharge line shut-off valve, control system and all components necessary for safe and stable unit operation.

Chiller will be factory assembled on a robust base-frame made of galvanized steel, protected by an epoxy paint.

Sound level and vibrations

Sound pressure level at 1 meter distance in free field, semispheric conditions, shall not exceed ……dB(A). The sound pressure levels must be rated in accordance to ISO 3744. Other types of rating unacceptable. Vibration on the base frame should not exceed 2 mm/s.

Dimensions

Unit dimensions shall not exceed following indications:

- Unit length..... mm
- Unit width..... mm
- Unit height..... mm

Chiller components

Compressors

- ✓ Semi-hermetic, single-screw asymmetric type with one main helical rotor meshing with two diametrical opposed gaterotors. The gaterotors' contact elements shall be constructed of composite material designed for extended life. Electrical motor shall be 2-pole, semi-hermetic, squirrel-cage induction type and cooled by suction gas.
- ✓ The oil injection shall be used in order to get high EER (Energy Efficiency Ratio) also at high condensing pressure and low sound pressure levels in each load condition.
- ✓ The compressor shall be provided with a built in, high efficiency, mesh type oil separator and oil filter
- ✓ Refrigerant system differential pressure shall provide oil injection on all moving compressor parts to correctly lubricate them. Electrical oil pump lubricating system is not acceptable.
- ✓ Compressor cooling must be done by refrigerant liquid injection. External dedicated heat exchanger and additional piping to carry the oil from the compressor to heat exchanger and viceversa will be not accepted.
- ✓ The compressor shall be direct electrical driven, without gear transmission between the screw and the electrical motor.
- ✓ The compressor casing shall be provided with ports to realize economized refrigerant cycles.
- ✓ Compressor must be protected by temperature sensor for high discharge temperature and electrical motor thermistor for high winding temperature.
- ✓ The compressor shall be equipped with an electric oil heater.
- ✓ Compressor shall be fully field serviceable. Compressor that must be removed and returned to the factory for service shall be unacceptable.

Cooling capacity control system

- ✓ Each chiller will have a microprocessor for the control of compressor slide valve position.
- ✓ The unit capacity control shall be infinitely modulating, from 100% down to 25% for each circuit (from 100% down to 12,5% of full load for unit with 2 compressors. The chiller shall be capable of stable operation to a minimum of 12,5% of full load without hot gas bypass.
- ✓ The system shall control the unit based on the leaving evaporator water temperature that shall be controlled by a PID (Proportional Integral Derivative) logic.
- ✓ Unit control logic shall manage the compressor slides to exactly match plant load request in order to keep constant the set point for delivered chilled water temperature.
- ✓ The microprocessor unit control shall detect conditions that approach protective limits and take self-corrective action prior to an alarm occurring. The system shall automatically reduce chiller capacity when any of the following parameters are outside their normal operating range:
  - o High condenser pressure
  - o Low evaporation refrigerant temperature

Evaporator

- ✓ The units shall be equipped with a Direct Expansion shell&tube evaporator with copper tubes rolled into steel tubesheets. The evaporator shall be single-pass on both the refrigerant and water sides for pure counter-flow heat exchange and low refrigerant pressure drops.
- ✓ The external shell shall be linked with an electrical heater to prevent freezing down to -28°C ambient temperature, controlled by a thermostat and shall be insulated with flexible, closed cell polyurethane insulation material (20-mm thick).
- ✓ The evaporator will have 2, one for each compressor and shall be single refrigerant pass.
- ✓ The water connections shall be FLANGED type connections as standard to ensure quick mechanical disconnection between the unit and the hydronic network.
- ✓ Evaporator is manufactured in accordance to PED approval.

Condenser coil

- ✓ The condenser coils are constructed with internally finned seamless copper tubes having a "W" configuration and arranged in a staggered row pattern and mechanically expanded into lanced and rippled aluminium fins with full fin collars for higher efficiencies. The space between the fins are given by a collar that will increase the surface area in connection with the tubes, protecting them from ambient corrosion.
- ✓ The coils will have an integral subcooler circuit that provides sufficient subcooling to effectively eliminate the possibility of liquid flashing and increase the unit's efficiency of 5-7% without increasing in energy consumption.
- ✓ The condenser coil shall be leak-tested and submitted to a pressure test with dry air.

Condenser fans

- ✓ The fans used in conjunction with the condenser coils, shall be propeller type with glass reinforced resin blades for higher efficiencies and lower noise. Each fan shall be protected by a fan guard.
- ✓ The air discharge shall be vertical and each fan must be coupled to the electrical motor, supplied as standard to IP54 and capable to work to ambient temperatures of - 20°C to + 65°C.
- ✓ They shall have as a standard a thermally protection by internal therma motor protection and protected by ciurcuit braker installed inside the electrical panel as a standard.

Refrigerant circuit

- ✓ The unit must have multiple independent refrigerant circuits.
- ✓ Each circuit shall include as standard: electronic expansion device piloted by unit’s microprocessor control, compressor discharge shut-off valve, replaceable core filter-drier, sight glass with moisture indicator and insulated suction line.

Condensation control

- ✓ The units will be provided with an automatic control for condensing pressure which ensures the working at low external temperatures down to - °C, to maintain condensing pressure.
- ✓ Compressor automatically unloads when abnormal high condensing pressure is detected to prevent the shutdown of the refrigerant circuit (shutdown of the unit) due to a high-pressure fault.

Low sound unit options (on request)

- ✓ The unit compressors shall be connected with unit’s metal base frame by rubber antivibration supports to prevent the transmission of vibrations to all metal unit structure and so to control the unit noise.
- ✓ The chiller shall be provided with an acoustically compressor enclosure. This enclosure shall be realized with a light, corrosion resisting aluminium structure and metal panels. The compressors sound-proof enclosure shall be internally fitted with flexible, multi layer, high density materials.

Hydronic kit options (on request)

- ✓ The hydronic module shall be integrated in the chiller chassis without increasing its dimensions and include the following elements: centrifugal water pump with three-phase motor equipped with internal over-temperature protection, safety relief valve, filling kit.
- ✓ The water piping shall be protected against corrosion and equipped with drain and purge plugs. The customer connections shall be Victaulic connections. The piping shall be fully insulated to prevent condensation (pump insulation using polyurethane foam).
- ✓ A choice of two pump types shall be available on unit with 2 compressors:
  - o in-line single pump
  - o in-line twin pumps

Control panel

- ✓ Field power connection, control interlock terminals, and unit control system should be centrally located in an electric panel (IP 54). Power and starting controls should be separate from safety and operating controls in different compartments of the same panel.
- ✓ Starting will be Wye-Delta type (Y-Δ).
- ✓ Operating and safety controls should include energy saving control; emergency stop switch; overload protection for compressor motor; high and low pressure cut-out switch (for each refrigerant circuit); anti-freeze thermostat; cut-out switch for each compressor.

All of the information regarding the unit will be reported on a display and with the internal built-in calendar and clock that will switch the unit ON/OFF during day time all year long.

✓ The following features and functions shall be included:

- leaving water temperature reset by controlling the water temperature Δt, by a remote 4-20mA DC signal or by controlling the external ambient temperature;
- soft load function to prevent the system from operating at full load during the chilled fluid pulldown period;
- password protection of critical parameters of control;
- start-to-start and stop-to-start timers to provide minimum compressor off-time with maximum motor protection;
- communication capability with a PC or remote monitoring;
- discharge pressure control through intelligent cycling of condenser fans;
- lead-lag selection by manual or automatically by circuit run hours;
- double set point for brine unit version;
- scheduling via internal time clock to allow programming of a yearly start-stop schedule accommodating weekends and holidays.

Optional High Level Communications Interface

Chiller must be able to communicate to BMS (Building Management System) based on the most common protocols as:

- ModbusRTU
- LonWorks, now also based on the international 8040 Standard Chiller Profile and LonMark Technology
- BacNet BTP certifief over IP and MS/TP (class 4) (Native)
- Ethernet TCP/IP.

In all of us,
a green heart

Daikin's unique position as a manufacturer of air conditioning equipment, compressors and refrigerants has led to its close involvement in environmental issues. For several years Daikin has had the intention to become a leader in the provision of products that have limited impact on the environment. This challenge demands the eco design and development of a wide range of products and an energy management system, resulting in energy conservation and a reduction of waste.

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