DAIKIN

DAIKIN APPLIED (UK) LTD

Technically better...

EWAD-CF

Air cooled screw chillers with free cooling

Product manual

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

Refrigerant: R134a

Code	CSS - Rev. 9.1
Date	July 2014
EWAD-CF	R3.7.0

Table of content

EWAD-CF

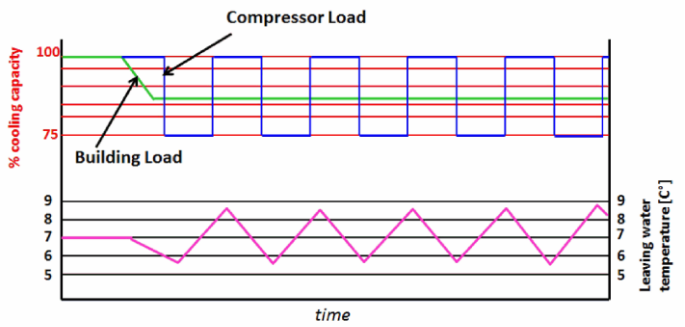
Low operating cost and extended operating life This chiller range is the result of careful design, aimed to optimize the energy efficiency of the chillers, with the objective of bringing down operating costs and improving installation profitability, effectiveness and economical management.
The chillers 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.

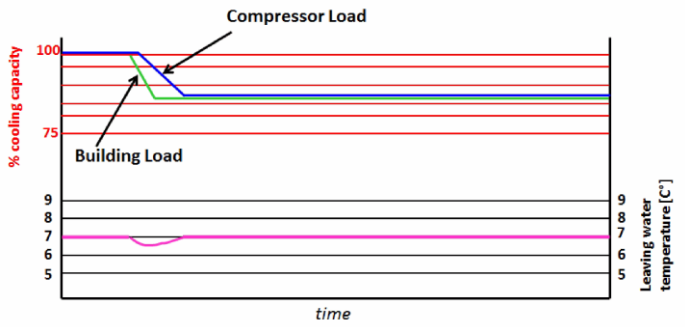
Infinite capacity control Cooling capacity control is infinitely variable by means of a single screw asymmetric compressor controlled by microprocessor system. Each unit has infinitely variable capacity control from 100% down to 12.5%. This modulation allows the compressor capacity to exactly match the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

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.



EWLT fluctuaction 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.



EWLT fluctuaction with stepless capacity control

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 range is available as high efficiency version:

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
K	0.03 (3%)	0.33 (33%)	0.41 (41%)	0.23 (23%)
T	35°C	30°C	25°C	20°C

K = Coefficient; T = Air inlet condenser temperature.

Sound configurations Standard, low and reduced sound configurations available as follows:

STANDARD SOUND
Condenser fan rotating at 920 rpm, rubber antivibration under compressor

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

REDUCED 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 refrigerant evaporating inside the tubes and water flowing outside. The tubes are enhanced for maximum heat transfer and rolled into steel tube sheet and sealed.
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 water side is designed for 10 bar of maximum operating pressure and is provided with vents and drain.
The external shell is covered with a 20mm closed cell insulation material and the evaporator water connections are provided with victaulic kit (as standard). Each evaporator has 2 circuits, one for each compressor and is manufactured in accordance to 97/23/EC directive (PED). Flow switch on evaporator available as option (shipped loose). Water filter not available.

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
- Refrigerant
- Evaporator
- Air Cooled Condenser
- Electronic expansion valve
- Discharge line shut off valve
- Liquid line shut off valve
- Sight glass with moisture indicator
- Filter drier
- Charging valves
- High pressure switch
- High pressure transducers
- Low pressure transducers
- Oil pressure transducer
- Suction temperature sensor

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)

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 against possible accidental contact with live parts. The main panel is fitted with a main switch interlocked door that shuts off power supply when opening.

Power Section

The power section includes compressors and fans protection devices, compressors and fans starters and control circuit power supply.

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 signals 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 Pressure / Temperature conversions.

Control section - main features

Control Section has the following feature.
- 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

The following devices / logics are available.
- 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

The following securities are available.
- 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 communication

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.

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 - Device that monitors input voltage and stops the chiller in case of phase loss or wrong phase sequence.

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 - Setpoint Reset: The leaving water temperature set-point can be overwritten with an external 4-20mA, through the ambient temperature, or through the evaporator water temperature ΔT. Demand Limit: Chiller capacity can be limited through an external 4-20mA signal or via network. Alarm from external device: The unit controller is able to receive an external alarm signal. The user can decide whether this alarm signal will stop the unit or not.

Fans circuit breakers - Safety devices that, added to the standard protection devices, protect fan motors against overload and overcurrent.

Main switch interlock door

Emergency stop

Fans speed regulation (+ fan silent mode) - Continuous fan speed regulation of all fans (VFD driven) for improved sound level of the unit during low ambient temperature operation. At very low temperatures, all fans except the first are switched off thus allowing unit operation down to -18°C.

Options (on request)

MECHANICAL

Brine version - Allows the unit to operate down to -8°C leaving liquid temperature (antifreeze required). Reccomended below +4°C

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.

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

One centrifugal pump (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.

One centrifugal pump (high 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 (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.

Two centrifugal pump (high 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

Evaporator right water connections

Optimized free cooling (VFD fans regulation) - 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).

ELECTRICAL / CONTROL

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

Compressor thermal overload relays - Safety electronic devices that, added to the standard protection devices, protect compressor motors against overload and current unbalance.

Under / Over voltage control - Electronic device that monitors and displays input voltage, and stops the chiller in case of phase loss, wrong phase sequence, or voltage exceeding minimum and maximum allowed values.

Energy meter - Device installed inside the control box that displays all chiller electrical power parameters at line input such as line voltage and phase current, input active and reactive power, active and reactive energy. An integrated RS485 module allows a Modbus communication to an external BMS.

Capacitors for power factor correction - Devices that increase the power factor of the unit. The capacitors are "dry" self-regenerating type with over pressure disconnecting safety device insulated with a no toxic dielectric mix without PCB or PCT.

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

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

Compressors circuit breakers Safety devices that include in a single device all safety functions otherwise provided by standard fuses and optional thermal relays, such as protection against overcurrent, overload, current unbalance.

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).

INSTALLATION

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.

OTHER

Transport kit

Machine type

EWA	= Air cooled chiller cool. 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

A, B, …..

Inverter

F	= Free Cooling (Std Glycol)

Efficiency level

X	= High Efficiency

Sound level

S	= Standard sound
L	= Low sound
R	= Reduced sound

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	---	3,86	4,03	4,10	4,05	4,00	3,95	4,36	4,25
CASING									
Colour (2)	---	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	8515	9100	9705	9705	11169	11429	13276	13276
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	741	771	808	808	1012	1012	1372	1372
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	50368	60441	70515	70515	80588	80588	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	14,8	17,0	18,1	19,8	21,7	23,7	23,7	25,9
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) IW: Ivory White; 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: Inverter --- 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	3,96	3,85					
IPLV	---	4,36	4,35	4,26					
CASING									
Colour (2)	---	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	14516	14596	14646					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	1965	1965	1965					
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	25,9	28,3	29,6					
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) IW: Ivory White; 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: Inverter --- 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		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	---	3,86	4,03	4,10	4,05	4,00	3,95	4,36	4,25
CASING									
Colour (2)	---	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	8795	9390	9995	9995	11459	11719	13566	13566
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	741	771	808	808	1012	1012	1372	1372
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	50368	60441	70515	70515	80588	80588	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	14,8	17,0	18,1	19,8	21,7	23,7	23,7	25,9
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) IW: Ivory White; 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: Inverter --- 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	3,96	3,85					
IPLV	---	4,36	4,35	4,26					
CASING									
Colour (2)	---	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	14806	14886	14936					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	1965	1965	1965					
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	25,9	28,3	29,6					
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) IW: Ivory White; 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: Inverter --- 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	---	4,09	4,15	4,16	4,20	4,10	4,08	4,42	4,37
CASING									
Colour (2)	---	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	8795	9390	9995	9995	11459	11719	13566	13566
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	741	771	808	808	1012	1012	1372	1372
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	38935	46722	54508	54508	62295	62295	73011	73011
Quantity	No.	10	12	14	14	16	16	20	20
Speed	rpm	715	715	715	715	715	715	715	715
Motor input	kW	7,6	9,1	9,7	10,6	11,6	12,5	12,7	13,9
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) IW: Ivory White; 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: Inverter --- 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	---	4,42	4,42	4,28					
CASING									
Colour (2)	---	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	14806	14886	14936					
WATER HEAT EXCHANGER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	1965	1965	1965					
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	73011	73011	73011					
Quantity	No.	20	20	20					
Speed	rpm	715	715	715					
Motor input	kW	14,5	15,2	15,7					
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)	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) IW: Ivory White; 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: Inverter --- 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	415	510	583	612	701	734	902	957
Mechanincal capacity	kW	225	262	269	290	325	355	366	392
Unit power input - Cooling	kW	53,7	62,0	64,7	69,8	75,7	83,4	86,4	92,8
EER	---	11,91	12,44	13,17	12,93	13,56	13,05	14,68	14,55
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	963	1013	1039
Mechanincal capacity	kW	472	480	517
Unit power input - Cooling	kW	101	109	115
EER	---	14,21	13,72	13,50
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	415	510	583	612	701	734	902	957
Mechanincal capacity	kW	225	262	269	290	325	355	366	392
Unit power input - Cooling	kW	53,7	62,0	64,7	69,8	75,7	83,4	86,4	92,8
EER	---	11,91	12,44	13,17	12,93	13,56	13,05	14,68	14,55
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	963	1013	1039
Mechanincal capacity	kW	472	480	517
Unit power input - Cooling	kW	101	109	115
EER	---	14,21	13,72	13,50
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	374	468	539	562	644	670	825	866
Mechanincal capacity	kW	228	271	282	304	337	364	404	435
Unit power input - Cooling	kW	46,6	56,2	58,5	63,1	68,5	74,4	80,0	87,5
EER	---	12,91	13,17	14,04	13,71	14,33	13,89	15,36	14,87
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	889	909	929					
Mechanincal capacity	kW	486	515	547					
Unit power input - Cooling	kW	93,4	103	109					
EER	---	14,72	13,85	13,56					
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	Nr	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
Mximum 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	Nr	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	Nr	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
Mximum 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	Nr	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 12/7°C; ambient 35°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	Nr	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
Mximum 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	Nr	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	Nr	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
Mximum 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	Nr	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 12/7°C; ambient 35°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	Nr	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
Mximum 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	Nr	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 CFXR

MODEL		C13	C14	C15
POWER SUPPLY				
Phases	Nr	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
Mximum 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	Nr	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 12/7°C; ambient 35°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

	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 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 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

EWAD CFXL

	SOUND PRESSURE LEVEL FOR DIFFERENT DISTANCES (dB(A))						
MODEL	1 m	5 m	10 m	15 m	20 m	25 m	50 m
640	75,5	68,5	64,0	61,0	58,8	57,0	51,4
770	76,3	69,5	65,0	62,1	59,9	58,1	52,5
850	76,5	69,8	65,4	62,5	60,3	58,6	53,0
900	76,5	69,8	65,4	62,5	60,3	58,6	53,0
C10	76,9	70,4	66,0	63,1	61,0	59,2	53,7
C11	77,1	70,6	66,2	63,3	61,2	59,4	53,9
C12	76,7	70,4	66,2	63,3	61,2	59,5	54,0
C13	76,8	70,5	66,3	63,4	61,3	59,6	54,1
C14	76,8	70,5	66,3	63,4	61,3	59,6	54,1
C15	76,8	70,5	66,3	63,4	61,3	59,6	54,1
C16	76,8	70,5	66,3	63,4	61,3	59,6	54,1

EWAD CFXS

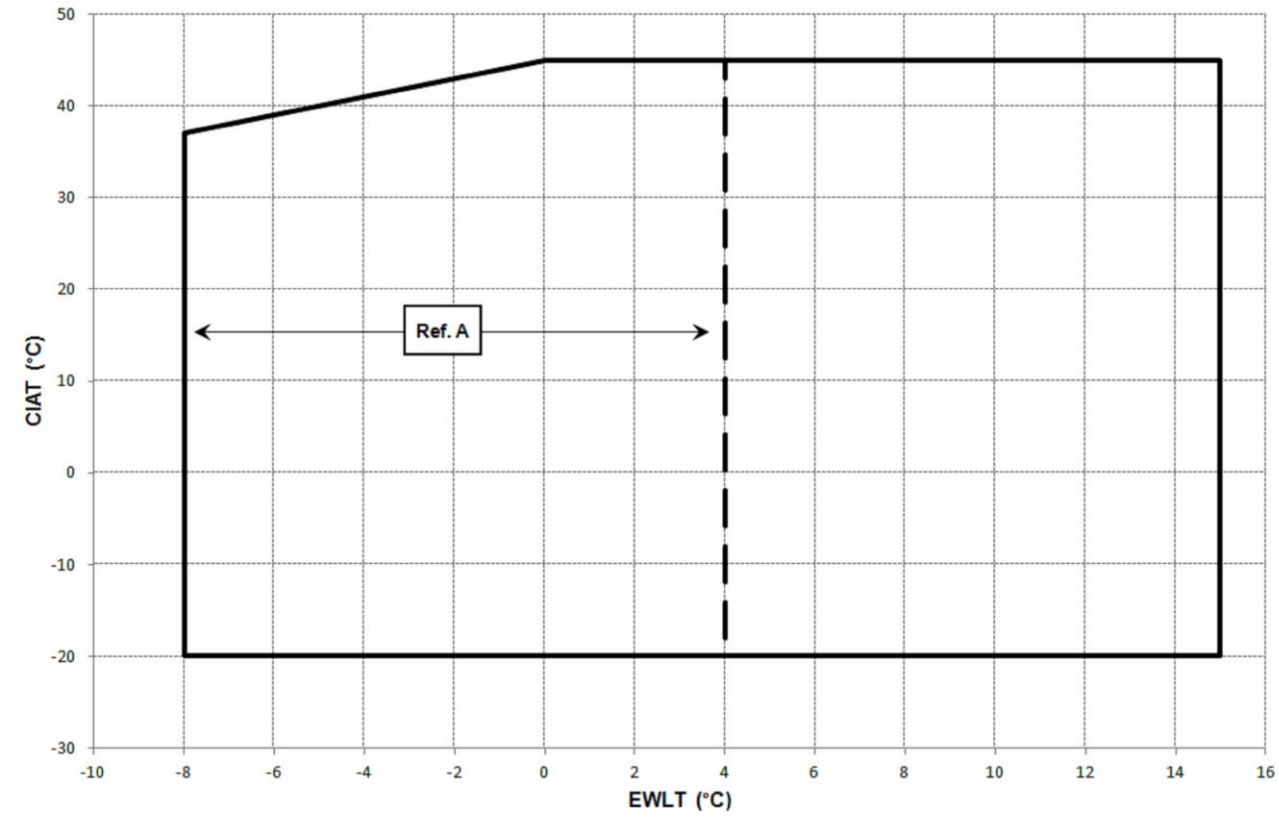
	SOUND PRESSURE LEVEL FOR DIFFERENT DISTANCES (dB(A))						
MODEL	1 m	5 m	10 m	15 m	20 m	25 m	50 m
640	79,0	72,0	67,5	64,5	62,3	60,5	54,9
770	79,7	72,9	68,4	65,5	63,3	61,5	55,9
850	79,7	73,0	68,6	65,7	63,5	61,8	56,2
900	79,7	73,0	68,6	65,7	63,5	61,8	56,2
C10	80,2	73,7	69,3	66,4	64,3	62,5	57,0
C11	80,7	74,2	69,8	66,9	64,8	63,0	57,5
C12	80,3	74,0	69,8	66,9	64,8	63,1	57,6
C13	80,4	74,1	69,9	67,0	64,9	63,2	57,7
C14	80,4	74,1	69,9	67,0	64,9	63,2	57,7
C15	80,4	74,1	69,9	67,0	64,9	63,2	57,7
C16	80,4	74,1	69,9	67,0	64,9	63,2	57,7

EWAD CFXR

	SOUND PRESSURE LEVEL FOR DIFFERENT DISTANCES (dB(A))						
MODEL	1 m	5 m	10 m	15 m	20 m	25 m	50 m
600	71,0	64,0	59,5	56,5	54,3	52,5	46,9
740	71,5	64,7	60,2	57,3	55,1	53,3	47,7
820	71,5	64,8	60,4	57,5	55,3	53,6	48,0
870	71,5	64,8	60,4	57,5	55,3	53,6	48,0
980	72,3	65,8	61,4	58,5	56,4	54,6	49,1
C10	72,5	66,0	61,6	58,7	56,6	54,8	49,3
C11	72,2	65,9	61,7	58,8	56,7	55,0	49,5
C12	72,3	66,0	61,8	58,9	56,8	55,1	49,6
C13	72,3	66,0	61,8	58,9	56,8	55,1	49,6
C14	72,5	66,2	62,0	59,1	57,0	55,3	49,8
C15	72,5	66,2	62,0	59,1	57,0	55,3	49,8

Fluid: Ethylene Glycol 30%
Note: The values are according to ISO 3744 and are referred to: evaporator 12/7° C, air ambient 35°C, full load operation

Operating Limits



Note
The above graphic represents a guidelines about the operating limits of the range. Please refer to Chiller Selection Software (CSS) for real operating limits working conditions for each size.

Legend:
ELWT = Evaporator Leaving Water Temperature (°C)
CIAT = Condenser Inlet Air Temperature (°C)

Ref.:
A = Operation with Glycol (below 4°C Evap LWT)

Table 1 - Water heat exchanger - Minimum and maximum water Δt

A - Δt	**°C**	**8**
B - Δt	**°C**	**4**

Legend:
A = Max evaporator water Δt
B = Min evaporator water Δt

Table 2 - Water heat exchanger - Fouling factors

A	B	C	D
0.0176	1.000	1.000	1.000
0.0440	0.978	0.986	0.992
0.0880	0.957	0.974	0.983
0.1320	0.938	0.962	0.975

Legend:
A = Fouling factors (m2 °C / kW)
B = Cooling capacity correction factor
C = Power input correction factor
D = EER correction factor

Table 3 - Air heat exchanger - Altitude correction factors

A	0	300	600	900	1200	1500	1800
B	1013	977	942	908	875	843	812
C	1.000	0.993	0.986	0.979	0.973	0.967	0.960
D	1.000	1.005	1.009	1.015	1.021	1.026	1.031

Legend:
A = Elevation above sea level (m)
B = Barometric pressure (mbar)
C = Cooling capacity correction factor
D = Power input correction factor

- Maximum operating altitude is 2000 m above sea level
- Contact factory in case the unit has to be installed at altitudes between 1000 and 2000 m above sea level

Table 4 - Minimum glycol percentage for low air ambient temperature

AAT (2)	-3	-8	-15	-20
A (1)	10%	20%	30%	40%
AAT (2)	-3	-7	-12	-20
B (1)	10%	20%	30%	40%

Legend:

AAT = Air Ambient Temperature (°C) (2)
A = Ethylene glycol (%) (1)
B = Propylene glycol (%) (1)

(1) Minimum glycol percentage to prevent freezing of water circuit at indicated air ambient temperature

(2) Air ambient temperature do exceed the operating limits of the unit, a protection of water circuit may be needed in winter season at non-working conditions.

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, have been 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 NT(°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.

Water charge, flow and quality

Water charge, flow and quality

Items (1) (6)			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°C]	Supply water (4)	Circulating water [20°C ~ 60°C]	Supply water (4)	Circulating water [60°C ~ 80°C]	Supply water (4)	
Items to be controlled:	pH	at 25°C	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°C	Below 80	Below 30	Below 40	Below 80	Below 80	Below 30	Below 30	Below 30	Below 30	Corrosion + Scale
		(μS/cm) at 25°C	(Below 800)	(Below 300)	(Below 400)	(Below 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°C), corrosion 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 CFXS

			640						770					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	629	597	583	560	536	519	730	708	697	680	659	643
	PI	kW	205	220	226	236	246	253	214	232	239	251	263	272
	qw	l/s	27,4	26,0	25,4	24,4	23,4	22,6	31,8	30,8	30,4	29,6	28,7	28,0
	dpw	kPa	83	75	72	67	62	58	95	90	88	84	79	76
7	CC	kW	664	631	616	592	566	548	769	746	735	717	694	678
	PI	kW	212	228	234	244	255	262	221	239	247	259	272	281
	qw	l/s	28,9	27,4	26,8	25,8	24,6	23,9	33,5	32,5	32,0	31,2	30,2	29,5
	dpw	kPa	91	83	79	74	68	64	105	99	96	92	87	83
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
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
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
15	CC	kW	808	767	749	721	681	629	932	902	888	864	838	780
	PI	kW	244	262	269	281	286	272	251	272	280	294	308	297
	qw	l/s	35,1	33,3	32,5	31,3	29,5	27,3	40,4	39,1	38,5	37,5	36,3	33,8
	dpw	kPa	130	118	113	105	94	82	148	139	135	129	121	106

			850						900					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	802	779	768	750	728	712	858	832	819	798	773	754
	PI	kW	232	251	259	272	285	294	256	277	286	300	315	325
	qw	l/s	34,9	33,9	33,4	32,6	31,7	31,0	37,4	36,2	35,7	34,7	33,7	32,9
	dpw	kPa	82	77	75	72	68	65	93	87	85	81	76	73
7	CC	kW	845	821	810	791	768	751	900	875	863	841	814	795
	PI	kW	239	259	267	280	294	304	263	286	295	310	325	336
	qw	l/s	36,7	35,7	35,3	34,4	33,4	32,7	39,2	38,1	37,6	36,6	35,4	34,6
	dpw	kPa	90	85	83	79	75	72	101	96	93	89	84	80
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
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
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
15	CC	kW	1017	989	975	953	927	885	1074	1042	1027	1002	972	905
	PI	kW	268	291	301	316	332	329	296	321	332	349	367	352
	qw	l/s	44,1	42,9	42,3	41,3	40,2	38,4	46,6	45,2	44,5	43,4	42,2	39,2
	dpw	kPa	125	119	116	111	105	96	139	131	127	122	115	101

EWAD CFXS

			C10						C11					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	970	939	924	900	872	851	1039	1004	987	959	926	902
	PI	kW	283	306	316	331	347	359	313	339	349	367	385	397
	qw	l/s	42,2	40,9	40,3	39,2	38,0	37,1	45,2	43,7	43,0	41,8	40,3	39,3
	dpw	kPa	101	95	92	88	83	79	115	108	104	99	93	88
7	CC	kW	1024	992	977	950	920	898	1095	1058	1041	1011	976	950
	PI	kW	292	316	327	342	359	370	323	350	362	379	398	411
	qw	l/s	44,6	43,1	42,5	41,4	40,0	39,1	47,6	46,0	45,3	44,0	42,5	41,3
	dpw	kPa	111	105	102	97	91	87	126	119	115	109	102	97
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
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
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
15	CC	kW	1249	1207	1188	1155	1091	1037	1326	1278	1255	1218	1122	1037
	PI	kW	334	361	373	390	394	389	370	401	414	434	424	402
	qw	l/s	54,2	52,4	51,5	50,1	47,3	45,0	57,5	55,4	54,4	52,8	48,7	45,0
	dpw	kPa	160	150	145	138	124	113	179	167	161	152	131	113

			C12						C13					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1177	1147	1133	1110	1084	1064	1259	1226	1211	1186	1156	1133
	PI	kW	314	341	353	370	388	401	346	376	388	408	428	442
	qw	l/s	51,3	49,9	49,3	48,4	47,2	46,3	54,8	53,4	52,7	51,6	50,3	49,4
	dpw	kPa	86	82	80	77	74	71	98	93	91	87	83	80
7	CC	kW	1243	1211	1197	1173	1145	1124	1328	1293	1277	1251	1219	1195
	PI	kW	323	351	363	381	399	412	356	387	400	420	441	456
	qw	l/s	54,1	52,7	52,1	51,0	49,8	48,9	57,8	56,3	55,6	54,4	53,1	52,0
	dpw	kPa	95	90	88	85	81	79	108	102	100	96	92	88
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
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
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
15	CC	kW	1522	1482	1464	1433	1399	1373	1619	1574	1554	1520	1480	1451
	PI	kW	363	394	407	427	448	462	401	436	450	472	495	512
	qw	l/s	66,0	64,3	63,5	62,2	60,7	59,5	70,2	68,3	67,4	65,9	64,2	62,9
	dpw	kPa	137	130	127	123	117	113	154	146	143	137	130	125

EWAD CFXS

			C14						C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1337	1297	1280	1249	1214	1188	1402	1360	1341	1308	1270	1241
	PI	kW	357	387	399	419	439	453	385	418	432	454	477	493
	qw	l/s	58,2	56,5	55,7	54,4	52,9	51,7	61,1	59,2	58,4	57,0	55,3	54,0
	dpw	kPa	123	116	113	108	102	98	134	127	123	118	111	107
7	CC	kW	1416	1374	1355	1323	1286	1258	1482	1437	1417	1382	1341	1310
	PI	kW	369	400	413	432	453	468	397	432	446	469	492	509
	qw	l/s	61,6	59,8	58,9	57,5	55,9	54,7	64,5	62,5	61,6	60,1	58,3	57,0
	dpw	kPa	136	129	125	120	113	109	148	140	136	130	123	118
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
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
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
15	CC	kW	1751	1696	1671	1629	1582	1547	1809	1752	1725	1681	1631	1550
	PI	kW	422	456	471	493	516	532	452	491	507	532	559	553
	qw	l/s	75,9	73,6	72,5	70,7	68,6	67,1	78,4	76,0	74,8	72,9	70,7	67,2
	dpw	kPa	200	188	183	175	165	159	213	200	195	185	175	159

			C16					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1471	1424	1403	1367	1325	1293
	PI	kW	413	450	465	489	515	533
	qw	l/s	64,0	62,0	61,1	59,5	57,7	56,3
	dpw	kPa	147	138	134	128	121	115
7	CC	kW	1551	1504	1481	1442	1397	1363
	PI	kW	426	464	480	505	532	550
	qw	l/s	67,5	65,4	64,5	62,8	60,8	59,3
	dpw	kPa	162	152	148	141	133	127
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
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
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
15	CC	kW	1886	1823	1794	1745	1690	1561
	PI	kW	485	528	546	574	604	575
	qw	l/s	81,8	79,1	77,8	75,7	73,3	67,7
	dpw	kPa	230	216	209	199	187	161

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**
5	CC	kW	629	597	583	560	536	519	730	708	697	680	659	643
	PI	kW	205	220	226	236	246	253	214	232	239	251	263	272
	qw	l/s	27,4	26,0	25,4	24,4	23,4	22,6	31,8	30,8	30,4	29,6	28,7	28,0
	dpw	kPa	83	75	72	67	62	58	95	90	88	84	79	76
7	CC	kW	664	631	616	592	566	548	769	746	735	717	694	678
	PI	kW	212	228	234	244	255	262	221	239	247	259	272	281
	qw	l/s	28,9	27,4	26,8	25,8	24,6	23,9	33,5	32,5	32,0	31,2	30,2	29,5
	dpw	kPa	91	83	79	74	68	64	105	99	96	92	87	83
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
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
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
15	CC	kW	808	767	749	721	681	629	932	902	888	864	838	780
	PI	kW	244	262	269	281	286	272	251	272	280	294	308	297
	qw	l/s	35,1	33,3	32,5	31,3	29,5	27,3	40,4	39,1	38,5	37,5	36,3	33,8
	dpw	kPa	130	118	113	105	94	82	148	139	135	129	121	106

			850						900					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	802	779	768	750	728	712	858	832	819	798	773	754
	PI	kW	232	251	259	272	285	294	256	277	286	300	315	325
	qw	l/s	34,9	33,9	33,4	32,6	31,7	31,0	37,4	36,2	35,7	34,7	33,7	32,9
	dpw	kPa	82	77	75	72	68	65	93	87	85	81	76	73
7	CC	kW	845	821	810	791	768	751	900	875	863	841	814	795
	PI	kW	239	259	267	280	294	304	263	286	295	310	325	336
	qw	l/s	36,7	35,7	35,3	34,4	33,4	32,7	39,2	38,1	37,6	36,6	35,4	34,6
	dpw	kPa	90	85	83	79	75	72	101	96	93	89	84	80
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
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
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
15	CC	kW	1017	989	975	953	927	885	1074	1042	1027	1002	972	905
	PI	kW	268	291	301	316	332	329	296	321	332	349	367	352
	qw	l/s	44,1	42,9	42,3	41,3	40,2	38,4	46,6	45,2	44,5	43,4	42,2	39,2
	dpw	kPa	125	119	116	111	105	96	139	131	127	122	115	101

EWAD CFXL

			C10						C11					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	970	939	924	900	872	851	1039	1004	987	959	926	902
	PI	kW	283	306	316	331	347	359	313	339	349	367	385	397
	qw	l/s	42,2	40,9	40,3	39,2	38,0	37,1	45,2	43,7	43,0	41,8	40,3	39,3
	dpw	kPa	101	95	92	88	83	79	115	108	104	99	93	88
7	CC	kW	1024	992	977	950	920	898	1095	1058	1041	1011	976	950
	PI	kW	292	316	327	342	359	370	323	350	362	379	398	411
	qw	l/s	44,6	43,1	42,5	41,4	40,0	39,1	47,6	46,0	45,3	44,0	42,5	41,3
	dpw	kPa	111	105	102	97	91	87	126	119	115	109	102	97
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
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
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
15	CC	kW	1249	1207	1188	1155	1091	1037	1326	1278	1255	1218	1122	1037
	PI	kW	334	361	373	390	394	389	370	401	414	434	424	402
	qw	l/s	54,2	52,4	51,5	50,1	47,3	45,0	57,5	55,4	54,4	52,8	48,7	45,0
	dpw	kPa	160	150	145	138	124	113	179	167	161	152	131	113

			C12						C13					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1177	1147	1133	1110	1084	1064	1259	1226	1211	1186	1156	1133
	PI	kW	314	341	353	370	388	401	346	376	388	408	428	442
	qw	l/s	51,3	49,9	49,3	48,4	47,2	46,3	54,8	53,4	52,7	51,6	50,3	49,4
	dpw	kPa	86	82	80	77	74	71	98	93	91	87	83	80
7	CC	kW	1243	1211	1197	1173	1145	1124	1328	1293	1277	1251	1219	1195
	PI	kW	323	351	363	381	399	412	356	387	400	420	441	456
	qw	l/s	54,1	52,7	52,1	51,0	49,8	48,9	57,8	56,3	55,6	54,4	53,1	52,0
	dpw	kPa	95	90	88	85	81	79	108	102	100	96	92	88
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
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
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
15	CC	kW	1522	1482	1464	1433	1399	1373	1619	1574	1554	1520	1480	1451
	PI	kW	363	394	407	427	448	462	401	436	450	472	495	512
	qw	l/s	66,0	64,3	63,5	62,2	60,7	59,5	70,2	68,3	67,4	65,9	64,2	62,9
	dpw	kPa	137	130	127	123	117	113	154	146	143	137	130	125

EWAD CFXL

			C14						C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1337	1297	1280	1249	1214	1188	1402	1360	1341	1308	1270	1241
	PI	kW	357	387	399	419	439	453	385	418	432	454	477	493
	qw	l/s	58,2	56,5	55,7	54,4	52,9	51,7	61,1	59,2	58,4	57,0	55,3	54,0
	dpw	kPa	123	116	113	108	102	98	134	127	123	118	111	107
7	CC	kW	1416	1374	1355	1323	1286	1258	1482	1437	1417	1382	1341	1310
	PI	kW	369	400	413	432	453	468	397	432	446	469	492	509
	qw	l/s	61,6	59,8	58,9	57,5	55,9	54,7	64,5	62,5	61,6	60,1	58,3	57,0
	dpw	kPa	136	129	125	120	113	109	148	140	136	130	123	118
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
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
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
15	CC	kW	1751	1696	1671	1629	1582	1547	1809	1752	1725	1681	1631	1550
	PI	kW	422	456	471	493	516	532	452	491	507	532	559	553
	qw	l/s	75,9	73,6	72,5	70,7	68,6	67,1	78,4	76,0	74,8	72,9	70,7	67,2
	dpw	kPa	200	188	183	175	165	159	213	200	195	185	175	159

			C16					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1471	1424	1403	1367	1325	1293
	PI	kW	413	450	465	489	515	533
	qw	l/s	64,0	62,0	61,1	59,5	57,7	56,3
	dpw	kPa	147	138	134	128	121	115
7	CC	kW	1551	1504	1481	1442	1397	1363
	PI	kW	426	464	480	505	532	550
	qw	l/s	67,5	65,4	64,5	62,8	60,8	59,3
	dpw	kPa	162	152	148	141	133	127
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
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
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
15	CC	kW	1886	1823	1794	1745	1690	1561
	PI	kW	485	528	546	574	604	575
	qw	l/s	81,8	79,1	77,8	75,7	73,3	67,7
	dpw	kPa	230	216	209	199	187	161

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**
5	CC	kW	605	570	555	531	504	485	714	688	676	655	630	612
	PI	kW	207	222	229	239	249	256	215	234	242	254	267	276
	qw	l/s	26,3	24,8	24,2	23,1	21,9	21,1	31,1	30,0	29,4	28,5	27,4	26,6
	dpw	kPa	77	69	66	61	55	51	92	86	83	78	73	69
7	CC	kW	637	600	584	559	532	501	752	724	711	688	662	632
	PI	kW	215	231	238	248	259	259	223	243	251	264	277	280
	qw	l/s	27,7	26,1	25,4	24,3	23,1	21,8	32,7	31,5	30,9	29,9	28,8	27,5
	dpw	kPa	85	76	72	66	61	54	100	94	91	85	80	73
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
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
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
15	CC	kW	768	724	704	646	576	532	904	868	851	801	716	662
	PI	kW	251	270	278	268	245	230	258	280	290	291	268	254
	qw	l/s	33,3	31,4	30,5	28,0	25,0	23,1	39,2	37,6	36,9	34,7	31,0	28,7
	dpw	kPa	118	106	101	86	70	60	140	130	125	112	91	79

			820						870					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	786	759	747	725	700	681	839	808	793	767	738	717
	PI	kW	231	251	260	273	287	297	258	280	290	305	321	332
	qw	l/s	34,2	33,1	32,5	31,6	30,5	29,7	36,5	35,2	34,5	33,4	32,2	31,2
	dpw	kPa	79	74	71	67	63	60	89	83	80	75	70	66
7	CC	kW	828	800	786	763	736	706	881	850	834	807	775	731
	PI	kW	240	261	269	283	298	301	267	291	301	316	332	330
	qw	l/s	36,0	34,8	34,2	33,2	32,0	30,7	38,3	37,0	36,3	35,1	33,7	31,8
	dpw	kPa	86	81	78	74	69	64	97	91	87	82	76	68
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
11	CC	kW	912	880	865	840	791	751	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
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	306
	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
15	CC	kW	993	958	942	901	840	765	1045	1006	987	928	833	751
	PI	kW	275	299	309	316	310	299	306	333	344	344	318	311
	qw	l/s	43,0	41,6	40,9	39,1	36,4	33,2	45,3	43,6	42,8	40,2	36,1	32,6
	dpw	kPa	119	112	108	100	87	73	132	122	118	105	86	71

EWAD CFXR

			980						C10					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	947	911	895	866	833	796	1012	970	950	916	878	825
	PI	kW	284	309	319	335	352	356	317	345	356	375	394	391
	qw	l/s	41,3	39,7	39,0	37,7	36,3	34,7	44,1	42,2	41,4	39,9	38,2	35,9
	dpw	kPa	97	90	87	82	76	70	109	101	97	91	84	75
7	CC	kW	999	961	942	912	871	823	1065	1020	999	963	912	836
	PI	kW	295	321	331	348	362	357	330	359	371	389	403	381
	qw	l/s	43,5	41,8	41,0	39,7	37,9	35,8	46,3	44,4	43,5	41,9	39,7	36,4
	dpw	kPa	106	99	95	90	82	74	120	111	106	99	90	76
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
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
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
15	CC	kW	1210	1160	1130	1054	958	874	1278	1220	1180	1061	950	858
	PI	kW	344	373	381	373	355	343	385	417	424	391	361	356
	qw	l/s	52,5	50,3	49,0	45,7	41,5	37,9	55,4	52,9	51,2	46,0	41,2	37,2
	dpw	kPa	151	139	132	116	97	82	167	153	144	118	95	79

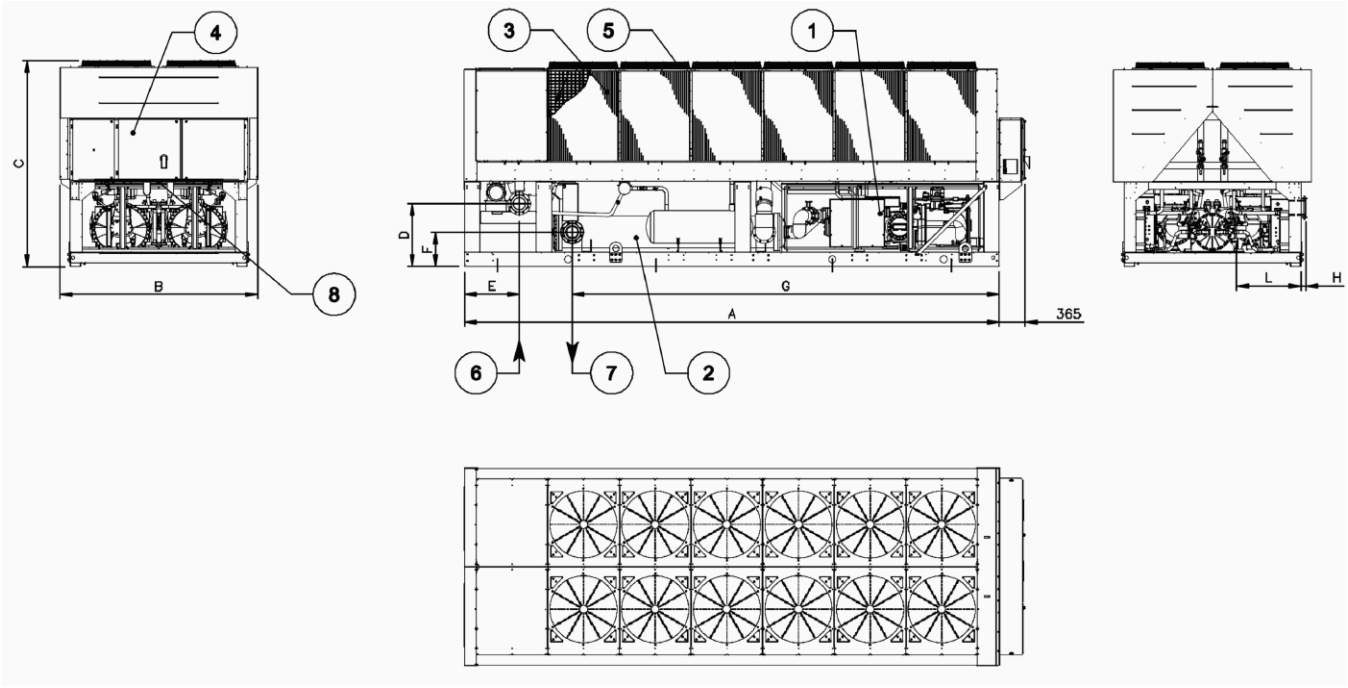
			C11						C12					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1157	1122	1107	1080	1049	1025	1235	1197	1179	1149	1113	1086
	PI	kW	314	341	353	371	391	404	349	380	393	413	435	450
	qw	l/s	50,4	48,9	48,2	47,0	45,7	44,6	53,8	52,1	51,4	50,0	48,5	47,3
	dpw	kPa	83	79	77	73	69	66	94	89	86	82	77	74
7	CC	kW	1220	1184	1168	1139	1106	1081	1301	1261	1242	1210	1172	1143
	PI	kW	324	353	365	384	404	418	361	393	407	428	450	466
	qw	l/s	53,1	51,5	50,8	49,6	48,1	47,0	56,6	54,9	54,1	52,6	51,0	49,7
	dpw	kPa	92	87	84	81	76	73	104	98	95	90	85	81
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
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
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
15	CC	kW	1487	1440	1419	1382	1337	1267	1578	1524	1499	1458	1402	1288
	PI	kW	371	403	417	438	458	450	414	450	465	489	510	480
	qw	l/s	64,5	62,5	61,5	59,9	58,0	54,9	68,4	66,1	65,0	63,2	60,8	55,9
	dpw	kPa	131	124	120	114	107	97	147	138	133	127	118	100

EWAD CFXR

			C13						C14					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1306	1261	1240	1204	1162	1131	1368	1318	1295	1255	1209	1175
	PI	kW	361	392	405	425	446	461	393	428	443	466	491	508
	qw	l/s	56,9	54,9	54,0	52,4	50,6	49,3	59,6	57,4	56,4	54,6	52,7	51,2
	dpw	kPa	117	110	106	101	94	90	128	119	115	109	102	96
7	CC	kW	1382	1333	1310	1272	1227	1194	1443	1390	1365	1322	1273	1210
	PI	kW	375	407	420	441	463	478	408	444	460	483	508	508
	qw	l/s	60,1	58,0	57,0	55,3	53,4	52,0	62,8	60,5	59,4	57,5	55,4	52,7
	dpw	kPa	130	121	118	111	104	99	141	131	127	120	111	101
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
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
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
15	CC	kW	1696	1630	1600	1550	1418	1305	1749	1679	1646	1552	1405	1287
	PI	kW	437	473	488	512	496	468	473	515	532	533	503	487
	qw	l/s	73,6	70,7	69,4	67,2	61,5	56,6	75,8	72,8	71,4	67,3	60,9	55,8
	dpw	kPa	188	175	169	159	135	115	200	185	178	160	132	112

			C15					
Twout		**Ta**	**25**	**30**	**32**	**35**	**38**	**40**
5	CC	kW	1431	1375	1349	1305	1254	1216
	PI	kW	425	464	481	507	534	553
	qw	l/s	62,3	59,9	58,8	56,8	54,6	53,0
	dpw	kPa	139	129	125	117	109	103
7	CC	kW	1508	1449	1421	1373	1319	1225
	PI	kW	442	482	499	526	554	538
	qw	l/s	65,6	63,0	61,8	59,7	57,4	53,3
	dpw	kPa	153	142	137	128	119	104
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
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
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
15	CC	kW	1816	1738	1703	1562	1395	1271
	PI	kW	513	558	578	555	511	506
	qw	l/s	78,8	75,4	73,8	67,7	60,5	55,1
	dpw	kPa	214	198	190	161	131	110

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*



LEGEND

1: Compressor
2: Evaporator
3: Condenser coil
4: Electrical panel
5: Fan
6: Evaporator water inlet
7: Evaporator water outlet
8: Slot for power and control panel connection

	A	B	C	D	E	F	G	H	I	L	M
EWAD640CFXS	5820	2480	2565	795	690	435	5370	75	800		
EWAD770CFXS	6720	2480	2565	795	690	435	5370	75	800		
EWAD850CFXS	7620	2480	2565	795	690	435	5370	75	800		
EWAD900CFXS	7620	2480	2565	795	690	435	5370	75	800		
EWADC10CFXS	8520	2480	2565	795	690	540	5355	75	748		
EWADC11CFXS	8520	2480	2565	795	690	540	5355	75	748		
EWADC12CFXS	10320	2480	2565	795	690	540	5355	75	748		
EWADC13CFXS	10320	2480	2565	795	690	540	5355	75	748		
EWADC14CFXS	10320	2480	2565	795	690	540	5355	75	670		
EWADC15CFXS	10320	2480	2565	795	690	540	5355	75	670		
EWADC16CFXS	10320	2480	2565	795	690	540	5355	75	670		
EWAD640CFXL	5820	2480	2565	795	690	435	5370	75	800		
EWAD770CFXL	6720	2480	2565	795	690	435	5370	75	800		
EWAD850CFXL	7620	2480	2565	795	690	435	5370	75	800		
EWAD900CFXL	7620	2480	2565	795	690	435	5370	75	800		
EWADC10CFXL	8520	2480	2565	795	690	540	5355	75	748		
EWADC11CFXL	8520	2480	2565	795	690	540	5355	75	748		
EWADC12CFXL	10320	2480	2565	795	690	540	5355	75	748		
EWADC13CFXL	10320	2480	2565	795	690	540	5355	75	748		
EWADC14CFXL	10320	2480	2565	795	690	540	5355	75	670		
EWADC15CFXL	10320	2480	2565	795	690	540	5355	75	670		
EWADC16CFXL	10320	2480	2565	795	690	540	5355	75	670		
EWAD600CFXR	5820	2480	2565	795	690	435	5370	75	800		
EWAD740CFXR	6720	2480	2565	795	690	435	5370	75	800		
EWAD820CFXR	7620	2480	2565	795	690	435	5370	75	800		
EWAD870CFXR	7620	2480	2565	795	690	435	5370	75	800		
EWAD980CFXR	8520	2480	2565	795	690	540	5355	75	748		
EWADC10CFXR	8520	2480	2565	795	690	540	5355	75	748		
EWADC11CFXR	10320	2480	2565	795	690	540	5355	75	748		
EWADC12CFXR	10320	2480	2565	795	690	540	5355	75	748		
EWADC13CFXR	10320	2480	2565	795	690	540	5355	75	670		
EWADC14CFXR	10320	2480	2565	795	690	540	5355	75	670		
EWADC15CFXR	10320	2480	2565	795	690	540	5355	75	670		

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 follow the minimum recommended clearance requirements shown in 'Fig.2'. In the event the obstacles are higher than the units, the minimum recommended clearance requirements are shown in 'Fig.3'. 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 a minimum distance from one another as shown in 'Fig.4'; 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.

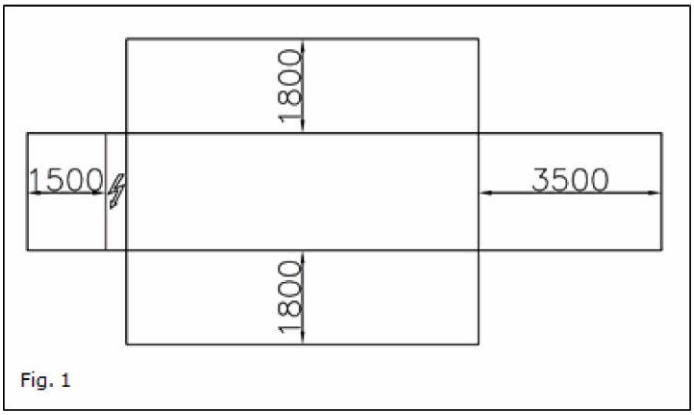


Fig. 1

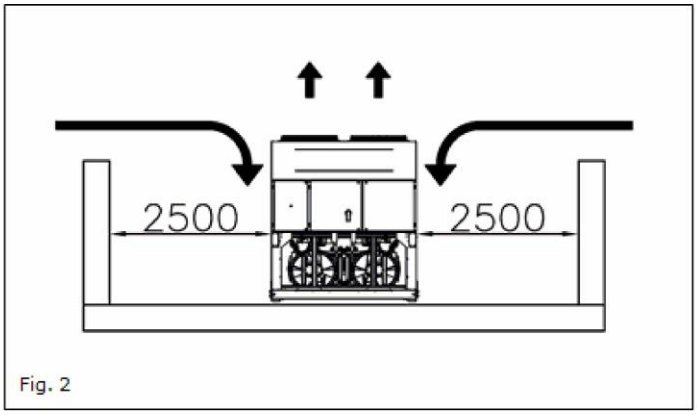


Fig. 2

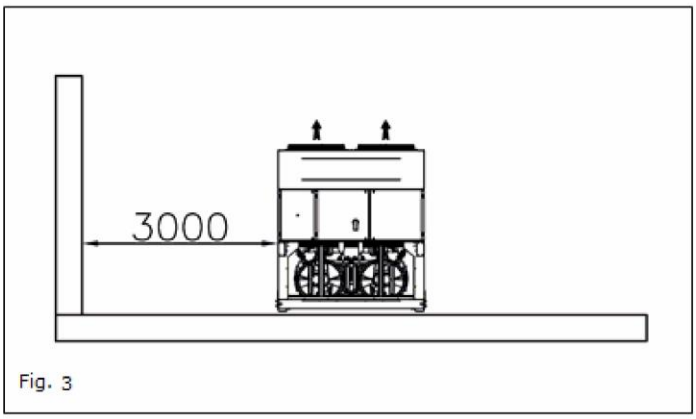


Fig. 3

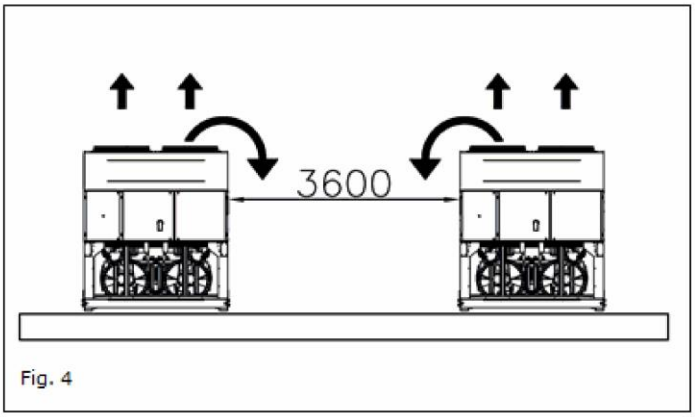


Fig. 4

Acoustic protection When noise 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: Maximum ambient temperature: Maximum R.H.:	-20°C +57°C 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 Chiller shall supply the following performances:
- 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, R-134a refrigerant, lubrication system, motor starting components, discharge line shut-off valve, control system and all components necessary for a safe and stable unit operation.
The 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 can not be used).
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

Compressors (Asymmetric) The unit shall be equipped with:
- 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 allowed.
- Compressor cooling must be done by refrigerant liquid injection. An external dedicated heat exchanger and additional piping to carry the oil from compressor to heat exchanger and viceversa is not allowed.
- 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.
- The compressor must be protected by a temperature sensor for high discharge temperature and an electrical motor thermistor for high winding temperature.
- The compressor shall be equipped with an electric oil heater.
- The compressor shall be fully field serviceable. Compressor that must be removed and returned to the factory for service shall be unacceptable.

Evaporator (S&T) 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 circuits, one for each compressor and shall be single refrigerant pass.
• The water connections shall be VICTAULIC type connections as standard to ensure quick mechanical disconnection between the unit and the hydronic network.
• The evaporator will be manufactured in accordance to PED approval.
• Flow switch on evaporator available as option (shipped loose).
• Water filter not available.

Condenser coil The unit shall be equipped with condenser coils constructed with internally finned seamless copper tubes and arranged in a staggered row pattern and mechanically expanded into lanced and rippled aluminum fins with full fin collars for higher efficiencies. The space between the fins is given by a collar that will increase the surface area in connection with the tubes, protecting them from ambient corrosion.
• The condenser 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 with 5% to 7% without increasing in energy consumption.
• The condenser coils shall be leak-tested and submitted to a pressure test with dry air.

Condenser fans The condenser fans used in conjunction with the condenser coils, shall be propeller type with glass reinforced resin blades for higher efficiencies and lower sound. 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.
• The condenser fans shall have as a standard a thermally protection by internal thermal motor protection and protected by circuit braker installed inside the electrical panel as a standard.

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.
• The compressor automatically unloads when abnormal high condensing pressure is detected. This to prevent the shutdown of the refrigerant circuit (shutdown of the unit) due to a high-pressure fault.

Low sound unit configurations (on request) The unit compressor shall be connected with unit's metal base frame by rubber antivibration supports to prevent the transmission of vibrations to all metal unit structure, in order to control the unit sound.
• The chiller shall be provided with an acoustical compressor enclosure. This enclosure shall be realized with a light, corrosion resisting aluminum structure and metal panels. The compressor 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 includes the following elements: centrifugal pump with motor protected by a circuit breaker installed in control panel, water filling system with pressure gauge, safety valve, drain valve.
• The hydronic module shall be assembled and wired to the control panel.
• The water piping shall be protected against corrosion and freezing and insulated to prevent condensation.
• A choice of two pump types shall be available:
- in-line single pump
- in-line twin pumps.

Electrical control panel Power and control shall be located in the main panel that will be manufactured to ensure protection against all weather conditions.
• The electrical panel shall be IP54 and (when opening the doors) internally protected against possible accidental contact with live parts.
• The main panel shall be fitted with a main switch interlocked door that shuts off power supply when opening.
• The power section will include compressors and funs protection devices, compressors and fans starters and control circuit power supply.

Controller The controller will be installed as standard and it will be used to modify unit set-points and check control parameters.
• A built-in display will shows chiller operating status plus temperatures and pressures of water, refrigerant and air, programmable values, set-points.
• A sophisticated software with predictive logic, will select the most energy efficient combination of compressors, EEXV and condenser fans to keep stable operating conditions to maximize chiller energy efficiency and reliability.
• The controller will be able to protect critical components based on external signals 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 will be 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.

Controller main features Controller shall be garantee following minimu functions:
- 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.

High Level Communications Interface (on request) The chiller shall 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.

For more information email **info@daikinapplied.uk** or visit **www.daikinapplied.uk**

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