Databook

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EWWD~H-	R2.3.8

Water cooled screw chillers

ECOLOGICAL HFC 134a REFRIGERANT

EWWD~H-

XS (High Efficiency - Standard Noise) - Cooling Capacity from 369 to 1215 kW
XS (High Temperature - Standard Noise) - Cooling Capacity from 369 to 1215 kW

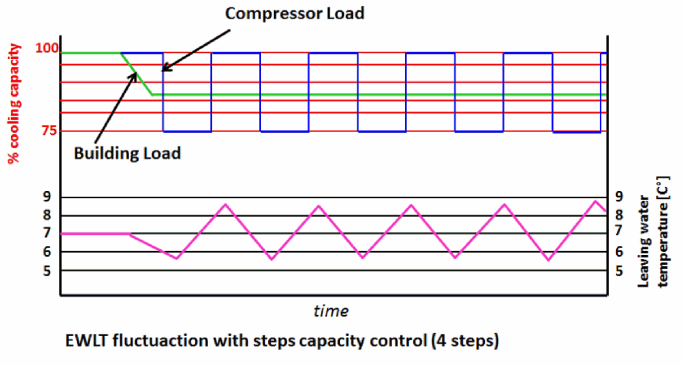
CE

DAIKIN

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 and evaporator heat exchangers for maximum heat transfer and low discharge pressure, advanced technology evaporator and condenser 'shell&tube' type with low refrigerant pressure drops.

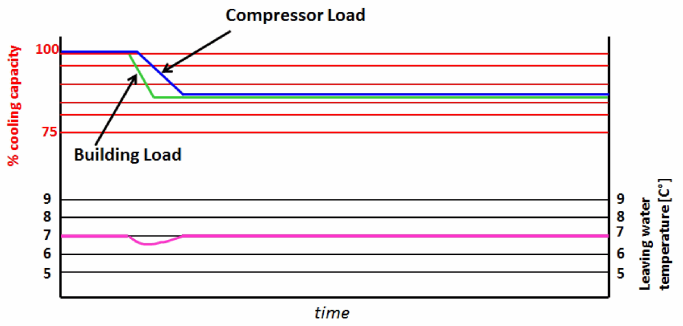
Infinite capacity control Cooling capacity control is infinitely variable by means of a single screw asymmetric compressor controlled by microprocessor system. Each unit has infinitely variable capacity control from 100% down to 25%, down to 12.5% (two compressors unit). This modulation allows the compressor 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.

Application flexibility This series boasts a wide operating range thanks to the use of the electronic expansion valve. This makes possible condenser leaving water temperatures (CLWT) of 50°C. In addition a high temperature configuration available as option allows CLWT's up to 65°C.
A heat pump version is also available for supplying hot water, and is well suited to geothermal applications.

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 in High Efficiency version:

HIGH EFFICIENCY
11 sizes, covering a cooling capacity range from 370 up to 1,215 kW, EER up to 6.17 and ESEER up to 7.43.

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	30°C	26°C	22°C	18°C

K = Coefficient; T = Water inlet condenser temperature.

Sound configurations Standard sound configurations available as follows:

STANDARD SOUND

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 (Symmetric Single Screw) The compressor is semi-hermetic, single-screw type with gate-rotors made of carbon impregnated engineered composite material. The compressor has two slides managed by the unit microprocessor for infinitely modulating the capacity between 100% to 25%. An external 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 - Flooded) The unit is equipped with flooded shell & tube evaporator with water flowing inside the tubes and refrigerant boiling outside. The tubes are enhanced for maximum heat transfer and rolled into steel tube sheet and sealed. The tubes are individually replaceable. The evaporators are designed according to the 97/23/EC directive (PED). The water side is designed for 10 bar of maximum operating pressure; vents and drain are provided. Water connections are designed with Victaulic system.

Condenser (Shell&Tube) The unit is equipped with shell & tube condenser with water flowing inside the tubes and refrigerant condensing outside. The bottom of the condenser is provided with subcooler section for better refrigerant capacity. The tubes are enhanced for maximum heat transfer and rolled into steel tube sheet and sealed. The tubes are individually replaceable. The condensers are designed according to the 97/23/EC directive (PED). The water side is designed for 10 bar of maximum operating pressure; vents and drain are provided.

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 1 refrigerant circuits and includes:

- One or two compressors with external oil separator
- Refrigerant
- Evaporator
- Water Cooled Condenser
- Electronic expansion valve
- Discharge line shut off valve
- Liquid line shut off valve
- Sight glass with moisture indicator
- Charging valves
- High pressure switch
- High pressure transducers
- Low pressure transducers
- Oil pressure transducer
- Suction temperature sensor

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

Power Section

The power section includes compressors protection devices, compressors 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, programmable values, set-points. A sophisticated software with predictive logic, selects the most energy efficient combination of compressors and EEXV to keep stable operating conditions to maximise chiller energy efficiency and reliability.

MicroTech III is able to protect critical components based on external signs from its system (such as motor temperatures, refrigerant gas and oil pressures, correct phase sequence, pressure switches and evaporator). The input coming from the high pressure switch cuts all digital output from the controller in less than 50ms, this is an additional security for the equipment.

Fast program cycle (200ms) for a precise monitoring of the system. Floating point calculations supported for increased accuracy in Pressure / Temperature conversions.

Control section - main features

Control Section has the following feature.

- Management of the compressor stepless capacity.
- Chiller enabled to work in partial failure condition.
- Full routine operation at condition of:
  - high thermal load
  - high evaporator entering water temperature (start-up)
- Display of evaporator entering/leaving water 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).
- 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.
- 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 victaulic kit - Hydraulic joint with gasket for an easy and quick water connection.

Evaporator water side design pressure (10 Bar)

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

Condenser victaulic kit

Condenser water side design pressure (10 Bar)

Condenser 2 passes (ΔT 4-8 °C)

Electronic expansion valve

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

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.

Main switch interlock door

Emergency stop

Evaporator 2 passes

Options (on request)

MECHANICAL

Heat pump version

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

Evaporator marine waterbox victaulic (2 passes)

Evaporator marine waterbox victaulic (1 pass)

Evaporator marine waterbox flanged (2 passes)

Evaporator marine waterbox flanged (1 pass)

Condenser double flanges kit

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

Condenser marine waterbox victaulic (2 passes)

Condenser marine waterbox victaulic (1 pass)

Condenser marine waterbox victaulic (3 passes)

Condenser marine waterbox flanged (2 passes)

Condenser marine waterbox flanged (1 pass)

Condenser marine waterbox flanged (3 passes)

Cu-Ni 90-10 condenser tubes

Condenser 1 pass (ΔT 4-8 °C)

Condenser 3 passes

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

Sound proof system (integral) Made of sheet metal and internally insulated, the cabinet is "integral kind" (around the whole chiller, not only around the compressors) to reach the best performance in noise reduction.

Double pressure relief valve with diverter

Evaporator 1 pass

Evaporator 3 passes

Evaporator double flange kit

High temperature kit

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

Water pressure differential switch on condenser

Water pressure differential switch on evaporator

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

Condenser flow switch - Supplied separately to be wired and installed on the condenser 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.

INSTALLATION

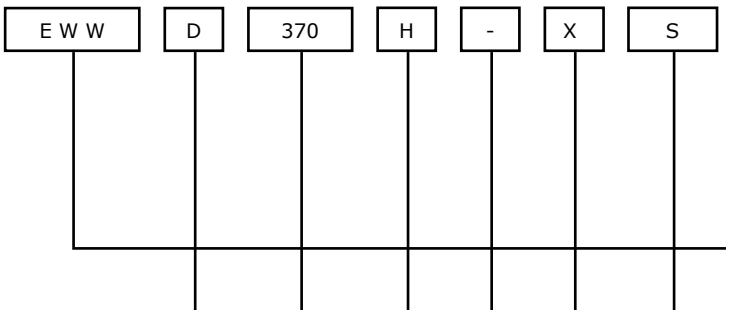
Rubber anti vibration mounts - Supplied separately, these are positioned under the base of the unit during installation. Ideal to reduce the vibrations when the unit is floor mounted.

OTHER

Container Kit

Witness test

Transport kit



Machine type

EWW = Water cooled chiller cooling only

Refrigerant

D = R-134a

Capacity class in kW (Cooling)

Always 3-digit code

Model series

A, B, ….. ... major modification

Inverter

- = Non inverter

Efficiency level

X = High Efficiency
H = High Temperature

Sound level

S = Standard sound

EWWD H-XS

MODEL		370	450	530	610	750	830	930	980
Capacity - Cooling (1)	kW	369	445	521	608	748	827	932	978
Capacity control - Type	---	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Capacity control - Minimum capacity	%	25.0	25.0	25.0	25.0	12.5	12.5	12.5	12.5
Unit power input - Cooling (1)	kW	62.8	75.4	87.0	101	125	138	151	163
EER (1)	---	5.88	5.90	5.99	6.02	5.98	5.99	6.17	6.00
ESEER	---	6.09	6.08	6.16	6.19	6.82	6.84	6.90	6.94
IPLV	---	6.93	7.00	7.09	7.10	7.72	7.81	7.89	7.96
CASING									
Colour	---	IW	IW	IW	IW	IW	IW	IW	IW
Material (2)	---	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS									
Height	mm	2121	2121	2121	2048	2048	2048	2048	2048
Width	mm	1353	1353	1353	1384	1689	1689	1711	1711
Length	mm	3341	3341	3419	3417	3609	3609	3609	3609
WEIGHT									
Unit Weight	kg	3089	3370	3603	3781	5289	5375	5654	5707
Operating Weight	kg	3250	3588	3870	4163	5694	5835	6174	6262
HEAT EXCHANGER - EVAPORATOR									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	78	107	134	160	172	201	261	272
Nominal water flow rate	l/s	17.6	21.2	24.9	29.0	35.7	39.5	44.5	46.7
Nominal Water pressure drop	kPa	40	33	33	40	47	38	35	36
Insulation material (4)		CC	CC	CC	CC	CC	CC	CC	CC
HEAT EXCHANGER - CONDENSER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	83	111	133	222	233	259	259	283
Nominal water flow rate	l/s	20.8	25.1	29.3	34.2	42.1	46.5	52.2	55.0
Nominal Water pressure drop	kPa	31	26	28	23	30	28	33	31
COMPRESSOR									
Type	---	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw
Oil charge	l	30	30	30	30	60	60	60	60
Quantity	No.	1	1	1	1	2	2	2	2
SOUND LEVEL									
Sound Power - Cooling	dB(A)	97	98	99	99	100	101	101	102
Sound Pressure - Cooling (5)	dB(A)	78	79	80	80	81	82	82	83
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg	180	210	230	250	270	270	270	270
N. of circuits	No.	1	1	1	1	1	1	1	1
PIPING CONNECTIONS									
Evaporator water inlet/outlet		168.3mm	168.3mm	219.1mm	219.1mm	219.1mm	219.1mm	219.1mm	219.1mm
Condenser water inlet/outlet		6 "	6 "	6 "	8 "	8 "	8 "	8 "	8 "

Fluid: Water
(1) Cooling capacity, unit power input and EER are based on the following conditions: evaporator 12.0/7.0°C; condenser 30.0/35.0 °C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) The values are according to ISO 3744 and are referred to: evaporator 12.0/7.0°C, condenser 30.0/35.0 °C, full load operation.

EWWD H-XS

MODEL		C10	C11	C12					
Capacity - Cooling (1)	kW	1050	1133	1215					
Capacity control - Type	---	Stepless	Stepless	Stepless					
Capacity control - Minimum capacity	%	12.5	12.5	12.5					
Unit power input - Cooling (1)	kW	174	188	201					
EER (1)	---	6.03	6.03	6.04					
ESEER	---	6.95	6.98	6.96					
IPLV	---	7.99	8.02	8.01					
CASING									
Colour	---	IW	IW	IW					
Material (2)	---	GPSS	GPSS	GPSS					
DIMENSIONS									
Height	mm	2161	2161	2161					
Width	mm	1711	1711	1711					
Length	mm	3509	3509	3509					
WEIGHT									
Unit Weight	kg	6066	6105	6156					
Operating Weight	kg	6709	6773	6859					
HEAT EXCHANGER - EVAPORATOR									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	295	310	327					
Nominal water flow rate	l/s	50.1	54.1	58.0					
Nominal Water pressure drop	kPa	33	32	32					
Insulation material (4)		CC	CC	CC					
HEAT EXCHANGER - CONDENSER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	348	358	376					
Nominal water flow rate	l/s	59.0	63.7	68.3					
Nominal Water pressure drop	kPa	29	30	30					
COMPRESSOR									
Type	---	Single Screw	Single Screw	Single Screw					
Oil charge	l	60	60	60					
Quantity	No.	2	2	2					
SOUND LEVEL									
Sound Power - Cooling	dB(A)	102	103	103					
Sound Pressure - Cooling (5)	dB(A)	83	84	84					
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a					
Refrigerant charge	kg	300	300	320					
N. of circuits	No.	1	1	1					
PIPING CONNECTIONS									
Evaporator water inlet/outlet		219.1mm	219.1mm	219.1mm					
Condenser water inlet/outlet		8 "	8 "	8 "					

Fluid: Water
(1) Cooling capacity, unit power input and EER are based on the following conditions: evaporator 12.0/7.0°C; condenser 30.0/35.0 °C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) The values are according to ISO 3744 and are referred to: evaporator 12.0/7.0°C, condenser 30.0/35.0 °C, full load operation.

EWWD H-HS

MODEL		370	450	530	610	750	830	930	980
Capacity - Cooling (1)	kW	369	445	521	608	748	827	932	979
Capacity control - Type	---	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless	Stepless
Capacity control - Minimum capacity	%	25.0	25.0	25.0	25.0	12.5	12.5	12.5	12.5
Unit power input - Cooling (1)	kW	69.8	84.6	97.6	114	131	145	160	172
EER (1)	---	5.29	5.26	5.34	5.35	5.72	5.69	5.83	5.69
ESEER	---	5.95	5.53	5.54	5.40	6.60	6.55	6.22	6.21
IPLV	---	6.38	5.88	5.90	5.76	6.98	7.46	6.58	6.65
CASING									
Colour	---	IW	IW	IW	IW	IW	IW	IW	IW
Material (2)	---	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS									
Height	mm	2121	2121	2121	2048	2048	2048	2048	2048
Width	mm	1353	1353	1353	1384	1689	1689	1711	1711
Length	mm	3341	3341	3419	3417	3609	3609	3609	3609
WEIGHT									
Unit Weight	kg	3089	3370	3603	3781	5289	5375	5654	5707
Operating Weight	kg	3250	3588	3870	4163	5694	5835	6174	6262
HEAT EXCHANGER - EVAPORATOR									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	78	107	134	160	172	201	261	272
Nominal water flow rate	l/s	17.6	21.2	24.9	29.0	35.7	39.5	44.5	46.7
Nominal Water pressure drop	kPa	42	35	35	44	50	40	37	38
Insulation material (4)		CC	CC	CC	CC	CC	CC	CC	CC
HEAT EXCHANGER - CONDENSER									
Type (3)	---	S&T	S&T	S&T	S&T	S&T	S&T	S&T	S&T
Water Volume	l	83	111	133	222	233	259	259	283
Nominal water flow rate	l/s	21.1	25.5	29.8	34.8	42.4	46.9	52.6	55.5
Nominal Water pressure drop	kPa	33	28	30	26	32	30	35	33
COMPRESSOR									
Type	---	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw	Single Screw
Oil charge	l	30	30	30	30	60	60	60	60
Quantity	No.	1	1	1	1	2	2	2	2
SOUND LEVEL									
Sound Power - Cooling	dB(A)	97	98	99	99	100	101	101	102
Sound Pressure - Cooling (5)	dB(A)	78	79	80	80	81	82	82	83
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a	R134a	R134a	R134a	R134a	R134a
Refrigerant charge	kg	210	190	180	210	220	250	300	300
N. of circuits	No.	1	1	1	1	1	1	1	1
PIPING CONNECTIONS									
Evaporator water inlet/outlet		168.3mm	168.3mm	219.1mm	219.1mm	219.1mm	219.1mm	219.1mm	219.1mm
Condenser water inlet/outlet		6 "	6 "	6 "	8 "	8 "	8 "	8 "	8 "

Fluid: Water
(1) Cooling capacity, unit power input and EER are based on the following conditions: evaporator 12.0/7.0°C; condenser 30.0/35.0 °C, unit at full load operation;
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EWWD H-HS

MODEL		C10	C11	C12					
Capacity - Cooling (1)	kW	1051	1133	1215					
Capacity control - Type	---	Stepless	Stepless	Stepless					
Capacity control - Minimum capacity	%	12.5	12.5	12.5					
Unit power input - Cooling (1)	kW	184	199	214					
EER (1)	---	5.71	5.70	5.69					
ESEER	---	6.19	6.24	6.06					
IPLV	---	6.45	6.55	6.33					
CASING									
Colour	---	IW	IW	IW					
Material (2)	---	GPSS	GPSS	GPSS					
DIMENSIONS									
Height	mm	2161	2161	2161					
Width	mm	1711	1711	1711					
Length	mm	3509	3509	3509					
WEIGHT									
Unit Weight	kg	6066	6105	6156					
Operating Weight	kg	6709	6773	6859					
HEAT EXCHANGER - EVAPORATOR									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	295	310	327					
Nominal water flow rate	l/s	50.1	54.1	58.0					
Nominal Water pressure drop	kPa	34	35	35					
Insulation material (4)		CC	CC	CC					
HEAT EXCHANGER - CONDENSER									
Type (3)	---	S&T	S&T	S&T					
Water Volume	l	348	358	376					
Nominal water flow rate	l/s	59.5	64.2	68.8					
Nominal Water pressure drop	kPa	31	33	34					
COMPRESSOR									
Type	---	Single Screw	Single Screw	Single Screw					
Oil charge	l	60	60	60					
Quantity	No.	2	2	2					
SOUND LEVEL									
Sound Power - Cooling	dB(A)	102	103	103					
Sound Pressure - Cooling (5)	dB(A)	83	84	84					
REFRIGERANT CIRCUIT									
Refrigerant type	---	R134a	R134a	R134a					
Refrigerant charge	kg	300	330	330					
N. of circuits	No.	1	1	1					
PIPING CONNECTIONS									
Evaporator water inlet/outlet		219.1mm	219.1mm	219.1mm					
Condenser water inlet/outlet		8 "	8 "	8 "					

Fluid: Water
(1) Cooling capacity, unit power input and EER are based on the following conditions: evaporator 12.0/7.0°C; condenser 30.0/35.0 °C, unit at full load operation;
(2) GPSS: Galvanized and Painted Steel Sheet; (3) PHE: Plate Heat Exchanger --- S&T: Single Pass Shell & Tube
(4) CC: Closed Cell; (5) The values are according to ISO 3744 and are referred to: evaporator 12.0/7.0°C, condenser 30.0/35.0 °C, full load operation.

EWWD H-XS

MODEL		370	450	530	610	750	830	930	980
Power supply									
Phases	---	3	3	3	3	3	3	3	3
Frequency	Hz	50	50	50	50	50	50	50	50
Voltage	V	400	400	400	400	400	400	400	400
Voltage tollerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tollerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Unit									
Maximum starting current	A	330	330	330	464	448	471	471	492
Nominal running current cooling	A	107	124	141	166	213	231	249	266
Maximum running current	A	148	176	202	228	296	323	351	378
Maximum current for wires sizing	A	163	193	222	251	325	356	386	415
Compressors									
Phases	No.	3	3	3	3	3	3	3	3
Voltage	V	400	400	400	400	400	400	400	400
Voltage tollerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tollerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Maximum running current	A	148	176	202	228	148 148	148 176	176 176	176 202
Starting method	---	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ

EWWD H-XS

MODEL		C10	C11	C12					
Power supply									
Phases	---	3	3	3					
Frequency	Hz	50	50	50					
Voltage	V	400	400	400					
Voltage tollerance Minimum	%	-10%	-10%	-10%					
Voltage tollerance Maximum	%	+10%	+10%	+10%					
Unit									
Maximum starting current	A	492	626	646					
Nominal running current cooling	A	283	307	330					
Maximum running current	A	404	430	456					
Maximum current for wires sizing	A	444	473	502					
Compressors									
Phases	No.	3	3	3					
Voltage	V	400	400	400					
Voltage tollerance Minimum	%	-10%	-10%	-10%					
Voltage tollerance Maximum	%	+10%	+10%	+10%					
Maximum running current	A	202 202	202 228	228 228					
Starting method	---	Y-Δ	Y-Δ	Y-Δ					

Fluid: Water
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
Nominal current in cooling mode is referred to the following conditions: evaporator 12/7°C; condenser 30/35°C; compressors current
Maximum running current is based on max compressor absorbed current in its envelope
Maximum unit current for wires sizing is based on minimum allowed voltage
Maximum current for wires sizing: (compressors full load ampere) x 1,1.

EWWD H-HS

MODEL		370	450	530	610	750	830	930	980
Power supply									
Phases	---	3	3	3	3	3	3	3	3
Frequency	Hz	50	50	50	50	50	50	50	50
Voltage	V	400	400	400	400	400	400	400	400
Voltage tollerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tollerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Unit									
Maximum starting current	A	330	464	464	464	492	626	650	681
Nominal running current cooling	A	116	143	161	184	221	247	273	290
Maximum running current	A	202	232	271	303	404	435	465	503
Maximum current for wires sizing	A	222	256	298	333	445	478	511	554
Compressors									
Phases	No.	3	3	3	3	3	3	3	3
Voltage	V	400	400	400	400	400	400	400	400
Voltage tollerance Minimum	%	-10%	-10%	-10%	-10%	-10%	-10%	-10%	-10%
Voltage tollerance Maximum	%	+10%	+10%	+10%	+10%	+10%	+10%	+10%	+10%
Maximum running current	A	202	232	271	303	202 202	202 232	232 232	232 271
Starting method	---	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ	Y-Δ

EWWD H-HS

MODEL		C10	C11	C12					
Power supply									
Phases	---	3	3	3					
Frequency	Hz	50	50	50					
Voltage	V	400	400	400					
Voltage tollerance Minimum	%	-10%	-10%	-10%					
Voltage tollerance Maximum	%	+10%	+10%	+10%					
Unit									
Maximum starting current	A	681	706	706					
Nominal running current cooling	A	306	327	348					
Maximum running current	A	542	574	605					
Maximum current for wires sizing	A	596	631	666					
Compressors									
Phases	No.	3	3	3					
Voltage	V	400	400	400					
Voltage tollerance Minimum	%	-10%	-10%	-10%					
Voltage tollerance Maximum	%	+10%	+10%	+10%					
Maximum running current	A	271 271	271 303	303 303					
Starting method	---	Y-Δ	Y-Δ	Y-Δ					

Fluid: Water
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
Nominal current in cooling mode is referred to the following conditions: evaporator 12/7°C; condenser 30/35°C; compressors current
Maximum running current is based on max compressor absorbed current in its envelope
Maximum unit current for wires sizing is based on minimum allowed voltage
Maximum current for wires sizing: (compressors full load ampere) x 1,1.

EWWD H-HS

	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)
370	63.5	70.5	80.0	74.5	74.0	68.5	60.5	50.5	78.0	96.7
450	64.5	71.5	81.0	75.5	75.0	69.5	61.5	51.5	79.0	97.7
530	65.5	72.5	82.0	76.5	76.0	70.5	62.5	52.5	80.0	98.7
610	65.5	72.5	82.0	76.5	76.0	70.5	62.5	52.5	80.0	99.1
750	66.5	73.5	83.0	77.5	77.0	71.5	63.5	53.5	81.0	100.2
830	67.0	74.0	83.5	78.0	77.5	72.0	64.0	54.0	81.5	100.7
930	67.5	74.5	84.0	78.5	78.0	72.5	64.5	54.5	82.0	101.2
980	68.0	75.0	84.5	79.0	78.5	73.0	65.0	55.0	82.5	101.7
C10	68.5	75.5	85.0	79.5	79.0	73.5	65.5	55.5	83.0	102.2
C11	69.0	76.0	85.5	80.0	79.5	74.0	66.0	56.0	83.5	102.7
C12	69.0	76.0	85.5	80.0	79.5	74.0	66.0	56.0	83.5	102.7

EWWD H-XS

	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)
370	63.5	70.5	80.0	74.5	74.0	68.5	60.5	50.5	78.0	96.7
450	64.5	71.5	81.0	75.5	75.0	69.5	61.5	51.5	79.0	97.7
530	65.5	72.5	82.0	76.5	76.0	70.5	62.5	52.5	80.0	98.7
610	65.5	72.5	82.0	76.5	76.0	70.5	62.5	52.5	80.0	99.1
750	66.5	73.5	83.0	77.5	77.0	71.5	63.5	53.5	81.0	100.2
830	67.0	74.0	83.5	78.0	77.5	72.0	64.0	54.0	81.5	100.7
930	67.5	74.5	84.0	78.5	78.0	72.5	64.5	54.5	82.0	101.2
980	68.0	75.0	84.5	79.0	78.5	73.0	65.0	55.0	82.5	101.7
C10	68.5	75.5	85.0	79.5	79.0	73.5	65.5	55.5	83.0	102.2
C11	69.0	76.0	85.5	80.0	79.5	74.0	66.0	56.0	83.5	102.7
C12	69.0	76.0	85.5	80.0	79.5	74.0	66.0	56.0	83.5	102.7

EWWD H-HS

	DISTANCE						
MODEL	1 m	5 m	10 m	15 m	20 m	25 m	50 m
370	78.0	69.6	64.6	61.5	59.1	57.3	51.6
450	79.0	70.6	65.6	62.5	60.1	58.3	52.6
530	80.0	71.6	66.6	63.5	61.2	59.4	53.6
610	80.0	71.6	66.6	63.4	61.1	59.3	53.5
750	81.0	72.8	67.8	64.7	62.4	60.6	54.8
830	81.5	73.3	68.3	65.2	62.9	61.1	55.3
930	82.0	73.8	68.8	65.7	63.4	61.6	55.9
980	82.5	74.3	69.3	66.2	63.9	62.1	56.4
C10	83.0	74.8	69.9	66.8	64.5	62.7	56.9
C11	83.5	75.3	70.4	67.3	65.0	63.2	57.4
C12	83.5	75.3	70.4	67.3	65.0	63.2	57.4

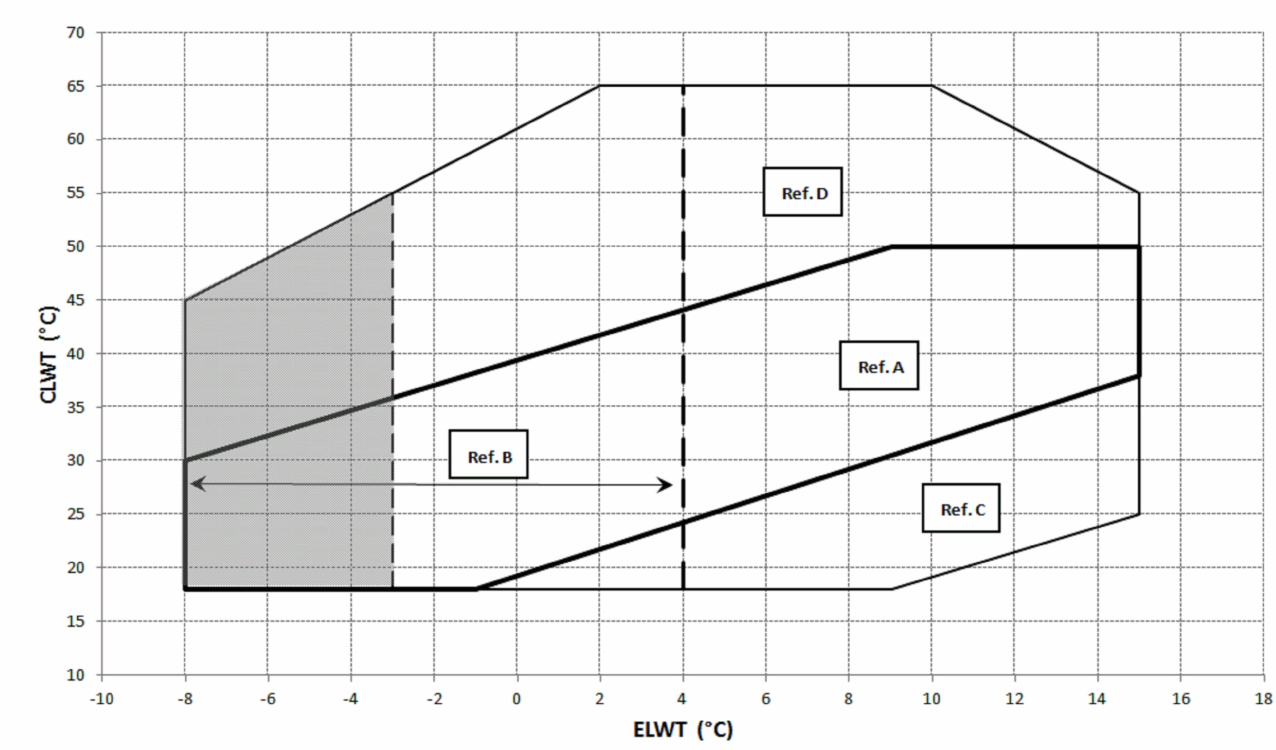
EWWD H-XS

	DISTANCE						
MODEL	1 m	5 m	10 m	15 m	20 m	25 m	50 m
370	78.0	69.6	64.6	61.5	59.1	57.3	51.6
450	79.0	70.6	65.6	62.5	60.1	58.3	52.6
530	80.0	71.6	66.6	63.5	61.2	59.4	53.6
610	80.0	71.6	66.6	63.4	61.1	59.3	53.5
750	81.0	72.8	67.8	64.7	62.4	60.6	54.8
830	81.5	73.3	68.3	65.2	62.9	61.1	55.3
930	82.0	73.8	68.8	65.7	63.4	61.6	55.9
980	82.5	74.3	69.3	66.2	63.9	62.1	56.4
C10	83.0	74.8	69.9	66.8	64.5	62.7	56.9
C11	83.5	75.3	70.4	67.3	65.0	63.2	57.4
C12	83.5	75.3	70.4	67.3	65.0	63.2	57.4

Fluid: Water

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)
CLWT = Condenser Leaving Water Temperature (°C)

Ref.:

A = Standard unit
B = Operation with Glycol (below 4°C Evap LWT)
C = Part load operation only
D = Unit with option 'High Temperature' at condenser
Shaded area: unit can not reach the minimum capacity when working in part load conditions

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

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

Legend:

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

Table 2 - Water heat exchanger - Evaporator 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

Table 2 - Water heat exchanger - Condenser Fouling factors

A	B	C	D
0.0176	1.006	0.989	1.016
0.0440	1.000	1.000	1.000
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

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 1 compressor unit
M (liters) = (0.94 x ΔT(°C) + 5.87) x P(kW)

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.

EWWD H-XS

			370						450					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	359	344	328	311			434	415	395	375		
	PI	kW	55	62.1	70	78.6	78.6		65.5	74.8	84.5	95	95	
	qwe	l/s	17.1	16.4	15.6	14.8			20.7	19.8	18.8	17.9		
	dpwe	kPa	38	35	32	29			32	29	27	24		
	HC	kW	414	406	398	390	78.6		499	489	480	470	95	
	qwc	l/s	19.9	19.6	19.2	18.9	18.9		24.0	23.6	23.2	22.7	22.7	
	dpwc	kPa	29	28	27	26	26		24	23	23	22	22	
7	CC	kW	385	369	352	335			465	445	424	403		
	PI	kW	55.6	62.8	70.6	79.2	79.2		66.1	75.4	85.2	95.6	95.6	
	qwe	l/s	18.4	17.6	16.8	16.0			22.2	21.2	20.2	19.2		
	dpwe	kPa	43.0	40.0	36.0	33.0			36.0	33.0	31.0	28.0		
	HC	kW	440	432	423	414	79.2		531	520	510	499	95.6	
	qwc	l/s	21	21	20	20	20		26	25	25	24	24	
	dpwc	kPa	32	31	30	29	29		27	26	25	24	24	
9	CC	kW	411	395	377	359	340		498	477	455	433	410	
	PI	kW	56.1	63.3	71.1	79.7	89.2	89.2	66.6	76.1	85.9	96.2	108	108
	qwe	l/s	19.6	18.9	18.0	17.1	16.2		23.8	22.8	21.7	20.7	19.6	
	dpwe	kPa	48	45	41	38	34		41	38	35	32	29	
	HC	kW	468	458	448	439	429	89.2	564	553	541	529	517	108
	qwc	l/s	22.5	22.1	21.7	21.2	20.8	20.8	27.1	26.6	26.1	25.6	25.1	25.1
	dpwc	kPa	35	34	33	32	31	31	30	29	28	27	26	26
11	CC	kW	439	422	403	384	364		532	510	487	464	440	
	PI	kW	56.5	63.7	71.5	80.1	89.6	89.6	67	76.6	86.5	96.9	108	108
	qwe	l/s	21.0	20.2	19.3	18.4	17.4		25.4	24.4	23.3	22.2	21.0	
	dpwe	kPa	54	51	47	43	39		46	43	39	36	33	
	HC	kW	495	485	475	464	454	89.6	599	586	574	561	548	108
	qwc	l/s	23.8	23.4	22.9	22.5	22.0	22.0	28.8	28.3	27.7	27.1	26.6	26.6
	dpwc	kPa	39	38	37	35	34	34	34	32	31	30	29	29
13	CC	kW	468	449	430	410	390		537	544	521	496	471	
	PI	kW	56.6	63.8	71.7	80.3	89.8	89.8	64.8	77.1	87	97.5	109	109
	qwe	l/s	22.4	21.5	20.6	19.6	18.6		25.7	26.0	24.9	23.7	22.5	
	dpwe	kPa	61	57	52	48	44		47	48	45	41	37	
	HC	kW	524	513	502	491	479	89.8	602	621	608	594	580	109
	qwc	l/s	25.2	24.7	24.2	23.7	23.2	23.2	29.0	29.9	29.3	28.7	28.1	28.1
	dpwc	kPa	44	42	40	39	37	37	34	36	35	33	32	32
15	CC	kW		478										
	PI	kW		63.7	0.06									
	qwe	l/s		22.9										
	dpwe	kPa		64										
	HC	kW		542	0.06									
	qwc	l/s		26.1	0.0									
	dpwc	kPa		46	0									

EWWD H-XS

			530						610					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	508	486	463	439			593	566	539	511		
	PI	kW	76	86.3	97	109	109		88.2	100	113	127	127	
	qwe	l/s	24.2	23.1	22.0	20.9			28.2	27.0	25.7	24.4		
	dpwe	kPa	32	29	27	25			38	35	32	29		
	HC	kW	584	572	560	548	109		681	666	652	638	127	
	qwc	l/s	28.1	27.6	27.0	26.5	26.5		32.8	32.1	31.5	30.9	30.9	
	dpwc	kPa	26	25	24	23	23		21	20	20	19	19	
7	CC	kW	544	521	497	472			636	608	580	551		
	PI	kW	76.4	87	97.9	110	110		88.4	101	114	128	128	
	qwe	l/s	26.0	24.9	23.7	22.5			30.3	29.0	27.7	26.3		
	dpwe	kPa	36.0	33.0	31.0	28.0			43.0	40.0	37.0	33.0		
	HC	kW	621	608	595	582	110		724	709	694	678	128	
	qwc	l/s	30	29	29	28	28		35	34	34	33	33	
	dpwc	kPa	29	28	27	26	26		23	23	22	21	21	
9	CC	kW	582	558	533	507	480		681	652	622	592	560	
	PI	kW	76.6	87.6	98.8	111	123	123	88.4	101	115	129	143	143
	qwe	l/s	27.8	26.7	25.5	24.2	22.9		32.5	31.1	29.7	28.3	26.8	
	dpwe	kPa	41	38	35	32	29		49	45	42	38	35	
	HC	kW	659	646	632	618	604	123	769	753	737	720	704	143
	qwc	l/s	31.7	31.1	30.5	29.9	29.3	29.3	37.0	36.3	35.6	34.8	34.1	34.1
	dpwc	kPa	32	31	30	29	28	28	26	25	24	23	22	22
11	CC	kW	622	597	570	543	515		728	698	667	635	602	
	PI	kW	76.5	88.1	99.6	112	124	124	88	102	115	130	145	145
	qwe	l/s	29.7	28.5	27.3	26.0	24.6		34.8	33.4	31.9	30.3	28.8	
	dpwe	kPa	46	43	39	36	33		55	51	47	43	39	
	HC	kW	699	685	670	655	640	124	816	800	782	764	747	145
	qwc	l/s	33.6	33.0	32.3	31.7	31.0	31.0	39.3	38.5	37.8	37.0	36.2	36.2
	dpwc	kPa	36	35	33	32	31	31	29	28	27	26	25	25
13	CC	kW	640	637	609	581	552		649	746	713	680	645	
	PI	kW	74.3	88.4	100	113	125	125	77.1	102	116	130	146	146
	qwe	l/s	30.6	30.5	29.1	27.8	26.4		31.0	35.7	34.1	32.5	30.9	
	dpwe	kPa	49	48	44	41	37		45	58	53	49	45	
	HC	kW	714	725	710	693	677	125	726	848	829	810	791	146
	qwc	l/s	34.4	34.9	34.3	33.5	32.8	32.8	34.9	40.9	40.0	39.2	38.3	38.3
	dpwc	kPa	37	39	37	36	34	34	24	31	30	29	28	28
15	CC	kW												
	PI	kW												
	qwe	l/s												
	dpwe	kPa												
	HC	kW												
	qwc	l/s												
	dpwc	kPa												

EWWD H-XS

			750						830					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	728	697	664	630			805	770	733	695		
	PI	kW	110	124	140	157	157		120	137	155	174	174	
	qwe	l/s	34.7	33.2	31.6	30.0			38.4	36.7	35.0	33.1		
	dpwe	kPa	45	42	38	35			36	34	31	28		
	HC	kW	838	821	804	787	157		926	907	888	869	174	
	qwc	l/s	40.3	39.6	38.8	38.0	38.0		44.5	43.7	42.9	42.0	42.0	
	dpwc	kPa	28	27	26	25	25		26	25	24	23	23	
7	CC	kW	781	748	714	678			864	827	788	749		
	PI	kW	111	125	141	158	158		122	138	156	175	175	
	qwe	l/s	37.3	35.7	34.0	32.3			41.2	39.5	37.6	35.7		
	dpwe	kPa	51.0	47.0	44.0	40.0			41.0	38.0	35.0	32.0		
	HC	kW	892	873	854	836	158		985	965	944	923	175	
	qwc	l/s	43	42	41	40	40		47	47	46	45	45	
	dpwc	kPa	31	30	29	28	28		29	28	27	26	26	
9	CC	kW	836	802	765	728	689		926	887	846	804	761	
	PI	kW	112	126	142	159	178	178	122	139	157	176	196	196
	qwe	l/s	39.9	38.3	36.6	34.8	32.9		44.2	42.3	40.4	38.4	36.4	
	dpwe	kPa	58	54	49	45	41		47	43	40	36	33	
	HC	kW	948	927	907	887	867	178	1048	1026	1003	980	958	196
	qwc	l/s	45.6	44.7	43.8	42.9	42.0	42.0	50.4	49.4	48.4	47.4	46.4	46.4
	dpwc	kPa	35	33	32	31	30	30	32	31	30	29	28	28
11	CC	kW	894	858	820	780	739		990	949	907	863	818	
	PI	kW	112	126	142	159	178	178	123	140	158	177	197	197
	qwe	l/s	42.7	41.0	39.2	37.3	35.3		47.3	45.4	43.3	41.2	39.1	
	dpwe	kPa	65	61	56	51	47		53	49	45	41	38	
	HC	kW	1006	984	962	939	917	178	1113	1089	1064	1039	1015	197
	qwc	l/s	48.4	47.4	46.4	45.4	44.5	44.5	53.6	52.5	51.4	50.3	49.2	49.2
	dpwc	kPa	38	37	36	34	33	33	36	35	33	32	31	31
13	CC	kW	850	915	876	834	791		903	1014	970	924	876	
	PI	kW	104	126	142	159	178	178	110	140	158	177	198	198
	qwe	l/s	40.7	43.8	41.9	39.9	37.9		43.2	48.5	46.4	44.2	41.9	
	dpwe	kPa	60	68	63	58	53		45	55	51	47	43	
	HC	kW	954	1042	1018	994	970	178	1013	1154	1128	1101	1074	198
	qwc	l/s	45.9	50.2	49.1	48.1	47.0	47.0	48.7	55.6	54.5	53.2	52.1	52.1
	dpwc	kPa	35	41	39	38	36	36	30	39	37	35	34	34
15	CC	kW												
	PI	kW												
	qwe	l/s												
	dpwe	kPa												
	HC	kW												
	qwc	l/s												
	dpwc	kPa												

EWWD H-XS

			930						980					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	908	868	826	783			953	911	867	822		
	PI	kW	131	150	169	190	190		142	162	182	205	205	
	qwe	l/s	43.3	41.4	39.4	37.3			45.4	43.4	41.3	39.2		
	dpwe	kPa	33	31	28	25			34	31	29	26		
	HC	kW	1039	1018	995	973	190		1095	1072	1049	1027	205	
	qwc	l/s	50.0	49.0	48.1	47.1	47.1		52.7	51.7	50.7	49.7	49.7	
	dpwc	kPa	30	29	28	27	27		29	28	27	26	26	
7	CC	kW	974	932	888	843			1022	978	932	885		
	PI	kW	132	151	171	191	191		143	163	184	206	206	
	qwe	l/s	46.5	44.5	42.4	40.2			48.8	46.7	44.5	42.2		
	dpwe	kPa	38.0	35.0	32.0	29.0			39.0	36.0	33.0	30.0		
	HC	kW	1107	1083	1059	1035	191		1165	1141	1116	1091	206	
	qwc	l/s	53	52	51	50	50		56	55	54	53	53	
	dpwc	kPa	34	33	32	30	30		32	31	30	29	29	
9	CC	kW	1044	999	953	906	858		1095	1048	1001	951	901	
	PI	kW	133	152	172	193	215	215	143	164	185	208	232	232
	qwe	l/s	49.8	47.7	45.5	43.3	41.0		52.3	50.1	47.8	45.4	43.0	
	dpwe	kPa	43	39	36	33	30		44	41	37	34	31	
	HC	kW	1177	1152	1125	1099	1073	215	1238	1213	1186	1159	1132	232
	qwc	l/s	56.6	55.5	54.3	53.1	52.0	52.0	59.6	58.4	57.3	56.1	54.9	54.9
	dpwc	kPa	38	37	35	34	33	33	36	35	33	32	31	31
11	CC	kW	1117	1070	1022	972	921		1171	1122	1072	1020	967	
	PI	kW	134	153	173	194	216	216	144	165	187	209	233	233
	qwe	l/s	53.4	51.1	48.8	46.5	44.0		56.0	53.6	51.2	48.8	46.2	
	dpwe	kPa	48	45	41	38	34		50	46	42	39	35	
	HC	kW	1251	1223	1195	1166	1137	216	1315	1287	1259	1230	1201	233
	qwc	l/s	60.2	59.0	57.7	56.4	55.1	55.1	63.3	62.0	60.8	59.5	58.2	58.2
	dpwc	kPa	42	41	39	38	36	36	40	38	37	35	34	34
13	CC	kW	1019	1144	1093	1041	988		1068	1199	1147	1093	1037	
	PI	kW	121	154	174	195	217	217	128	166	188	211	235	235
	qwe	l/s	48.7	54.7	52.3	49.8	47.3		51.1	57.4	54.9	52.3	49.6	
	dpwe	kPa	41	50	47	43	39		42	52	48	44	40	
	HC	kW	1139	1298	1268	1236	1205	217	1196	1365	1335	1303	1272	235
	qwc	l/s	54.8	62.6	61.2	59.8	58.4	58.4	57.6	65.8	64.4	63.0	61.6	61.6
	dpwc	kPa	36	45	44	42	40	40	34	43	41	39	38	38
15	CC	kW												
	PI	kW												
	qwe	l/s												
	dpwe	kPa												
	HC	kW												
	qwc	l/s												
	dpwc	kPa												

EWWD H-XS

			C10						C11					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	1023	978	931	883			1104	1055	1004	952		
	PI	kW	152	173	195	218	218		164	187	210	235	235	
	qwe	l/s	48.8	46.6	44.4	42.1			52.6	50.3	47.9	45.4		
	dpwe	kPa	31	29	26	24			31	28	26	24		
	HC	kW	1175	1150	1125	1101	218		1268	1241	1214	1188	235	
	qwc	l/s	56.6	55.4	54.3	53.2	53.2		61.0	59.8	58.6	57.4	57.4	
	dpwc	kPa	27	26	25	24	24		28	27	26	25	25	
7	CC	kW	1098	1050	1001	951			1185	1133	1080	1026		
	PI	kW	153	174	196	220	220		165	188	212	237	237	
	qwe	l/s	52.4	50.1	47.8	45.4			56.5	54.1	51.5	48.9		
	dpwe	kPa	35.0	33.0	30.0	27.0			35.0	32.0	30.0	27.0		
	HC	kW	1250	1224	1197	1170	220		1349	1321	1292	1263	237	
	qwc	l/s	60	59	58	57	57		65	64	62	61	61	
	dpwc	kPa	30	29	28	27	27		31	30	29	28	28	
9	CC	kW	1176	1126	1075	1022	967		1269	1215	1160	1103	1044	
	PI	kW	153	175	198	222	247	247	165	189	213	239	267	267
	qwe	l/s	56.1	53.8	51.3	48.8	46.2		60.6	58.0	55.4	52.7	49.9	
	dpwe	kPa	40	37	34	31	28		40	37	34	31	28	
	HC	kW	1328	1301	1272	1243	1215	247	1433	1404	1373	1342	1311	267
	qwc	l/s	63.9	62.7	61.4	60.1	58.9	58.9	69.0	67.7	66.3	64.9	63.5	63.5
	dpwc	kPa	33	32	31	30	29	29	35	33	32	31	30	30
11	CC	kW	1257	1205	1151	1096	1039		1357	1300	1242	1183	1121	
	PI	kW	152	176	199	223	249	249	164	190	215	241	269	269
	qwe	l/s	60.1	57.6	55.0	52.4	49.7		64.9	62.2	59.4	56.5	53.6	
	dpwe	kPa	45	42	38	35	32		45	42	38	35	32	
	HC	kW	1410	1381	1351	1320	1288	249	1521	1490	1457	1424	1390	269
	qwc	l/s	67.8	66.6	65.2	63.8	62.4	62.4	73.2	71.8	70.4	68.9	67.4	67.4
	dpwc	kPa	37	36	34	33	32	32	39	37	36	34	33	33
13	CC	kW	1146	1288	1232	1173	1113		1236	1390	1329	1266	1201	
	PI	kW	135	176	200	225	251	251	146	190	216	243	271	271
	qwe	l/s	54.8	61.6	58.9	56.1	53.3		59.1	66.5	63.6	60.6	57.5	
	dpwe	kPa	38	47	43	40	36		38	47	43	40	36	
	HC	kW	1281	1464	1432	1399	1365	251	1382	1580	1545	1509	1472	271
	qwc	l/s	61.6	70.6	69.1	67.6	66.1	66.1	66.5	76.1	74.6	73.0	71.4	71.4
	dpwc	kPa	31	40	38	37	35	35	32	41	40	38	37	37
15	CC	kW												
	PI	kW												
	qwe	l/s												
	dpwe	kPa												
	HC	kW												
	qwc	l/s												
	dpwc	kPa												

EWWD H-XS

			C12						
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	
5	CC	kW	1184	1131	1077	1021			
	PI	kW	176	200	225	252	252		
	qwe	l/s	56.4	53.9	51.3	48.7			
	dpwe	kPa	30	28	26	23			
	HC	kW	1360	1331	1301	1273	252		
	qwc	l/s	65.4	64.1	62.8	61.6	61.6		
	dpwc	kPa	28	27	25	25	25		
7	CC	kW	1270	1215	1158	1100			
	PI	kW	176	201	227	254	254		
	qwe	l/s	60.6	58.0	55.3	52.5			
	dpwe	kPa	34.0	32.0	29.0	27.0			
	HC	kW	1446	1416	1385	1354	254		
	qwc	l/s	70	68	67	66	66		
	dpwc	kPa	31	30	29	27	27		
9	CC	kW	1361	1303	1244	1182	1119		
	PI	kW	176	202	229	256	286	286	
	qwe	l/s	65.0	62.2	59.4	56.5	53.4		
	dpwe	kPa	39	36	33	30	28		
	HC	kW	1537	1505	1472	1438	1405	286	
	qwc	l/s	73.9	72.5	71.1	69.6	68.1	68.1	
	dpwc	kPa	34	33	32	31	29	29	
11	CC	kW	1455	1395	1332	1268	1202		
	PI	kW	176	203	230	258	288	288	
	qwe	l/s	69.6	66.7	63.7	60.6	57.5		
	dpwe	kPa	44	41	38	34	31		
	HC	kW	1631	1598	1563	1526	1490	288	
	qwc	l/s	78.5	77.0	75.4	73.8	72.2	72.2	
	dpwc	kPa	38	37	35	34	33	33	
13	CC	kW	1326	1490	1425	1358	1288		
	PI	kW	156	203	232	260	290	290	
	qwe	l/s	63.4	71.3	68.2	65.0	61.6		
	dpwe	kPa	37	46	43	39	36		
	HC	kW	1482	1694	1657	1618	1579	290	
	qwc	l/s	71.3	81.6	80.0	78.3	76.5	76.5	
	dpwc	kPa	32	41	39	38	36	36	
15	CC	kW							
	PI	kW							
	qwe	l/s							
	dpwe	kPa							
	HC	kW							
	qwc	l/s							
	dpwc	kPa							

Fluid: Water
Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C);
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser
qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser
** For working condition where dpw value is "Italic-Red Color" please contac factory*

EWWD H-HS

			370						450					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	360	345	329	312	295	278	434	415	396	376	355	334
	PI	kW	62	68.4	75.3	83	91.9	102	75.4	82.7	90.7	99.4	109	120
	qwe	l/s	17.2	16.4	15.7	14.9	14.1	13.2	20.7	19.8	18.9	17.9	16.9	15.9
	dpwe	kPa	40	37	34	31	28	25	34	31	28	26	23	21
	HC	kW	422	413	404	395	387	380	509	498	486	475	464	454
	qwc	l/s	20.3	19.9	19.5	19.1	18.8	18.4	24.5	24.0	23.5	23.0	22.5	22.1
	dpwc	kPa	30	29	28	27	26	25	26	25	24	23	22	21
7	CC	kW	385	369	352	335	317	299	465	445	425	404	382	360
	PI	kW	63.3	69.8	76.7	84.4	93	103	77.2	84.6	92.5	101	111	122
	qwe	l/s	18.4	17.6	16.8	16.0	15.1	14.3	22.2	21.2	20.3	19.3	18.2	17.2
	dpwe	kPa	45.0	42.0	38.0	35.0	32.0	29.0	38.0	35.0	32.0	30.0	27.0	24.0
	HC	kW	448	439	429	420	410	402	542	530	517	505	493	482
	qwc	l/s	22	21	21	20	20	20	26	26	25	24	24	23
	dpwc	kPa	34	33	31	30	29	28	29	28	27	26	25	23
9	CC	kW	411	394	377	359	341	321	497	476	455	433	410	387
	PI	kW	64.6	71.2	78.2	85.8	94.3	104	79.1	86.6	94.5	103	113	123
	qwe	l/s	19.6	18.8	18.0	17.2	16.3	15.3	23.7	22.7	21.7	20.7	19.6	18.5
	dpwe	kPa	51	47	43	40	36	33	43	40	37	34	30	27
	HC	kW	476	466	455	445	435	425	576	563	550	536	523	510
	qwc	l/s	22.9	22.4	22.0	21.5	21.1	20.7	27.7	27.1	26.5	25.9	25.4	24.8
	dpwc	kPa	38	36	35	34	32	31	32	31	30	29	27	26
11	CC	kW	439	421	403	384	365	345	530	509	487	464	440	416
	PI	kW	65.9	72.7	79.7	87.4	95.8	105	81	88.6	96.6	105	115	125
	qwe	l/s	21.0	20.1	19.3	18.4	17.4	16.5	25.3	24.3	23.3	22.2	21.0	19.9
	dpwe	kPa	57	53	49	45	41	37	48	45	41	38	35	31
	HC	kW	504	494	483	472	461	450	611	597	583	569	555	541
	qwc	l/s	24.3	23.8	23.3	22.8	22.3	21.8	29.4	28.8	28.2	27.5	26.9	26.3
	dpwc	kPa	42	40	39	37	36	34	36	35	33	32	30	29
13	CC	kW	467	449	430	410	390	369	555	543	520	496	471	445
	PI	kW	67.1	74.2	81.4	89	97.4	107	82	90.6	98.7	107	117	127
	qwe	l/s	22.3	21.5	20.6	19.6	18.7	17.7	26.6	26.0	24.9	23.7	22.5	21.3
	dpwe	kPa	64	59	55	51	46	42	53	50	47	43	39	35
	HC	kW	534	523	511	499	487	476	637	633	618	603	588	573
	qwc	l/s	25.7	25.2	24.7	24.2	23.6	23.1	30.7	30.5	29.9	29.2	28.5	27.8
	dpwc	kPa	47	45	43	41	40	38	39	39	37	35	34	32
15	CC	kW		478										
	PI	kW	0.11	75.7	0.08				0.13					
	qwe	l/s		22.9										
	dpwe	kPa		67										
	HC	kW	0.11	553	0.08				0.13					
	qwc	l/s	0.0	26.7	0.0				0.0					
	dpwc	kPa	0	50	0				0					

EWWD H-HS

			530						610					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	508	486	463	440	416	391	592	567	540	513	484	455
	PI	kW	87	95.4	104	115	126	139	101	111	122	133	144	156
	qwe	l/s	24.2	23.2	22.1	21.0	19.8	18.6	28.2	27.0	25.7	24.4	23.1	21.7
	dpwe	kPa	34	31	28	26	23	21	42	39	35	32	29	26
	HC	kW	595	581	568	555	542	529	693	678	662	646	629	611
	qwc	l/s	28.6	28.0	27.4	26.8	26.3	25.7	33.4	32.7	32.0	31.2	30.5	29.7
	dpwc	kPa	28	27	26	25	24	23	24	23	22	21	20	19
7	CC	kW	544	521	497	473	447	421	635	608	580	551	522	491
	PI	kW	89.1	97.6	107	117	128	140	103	114	125	136	148	160
	qwe	l/s	26.0	24.9	23.7	22.6	21.3	20.1	30.3	29.0	27.7	26.3	24.9	23.4
	dpwe	kPa	38.0	35.0	32.0	30.0	27.0	24.0	47.0	44.0	40.0	37.0	33.0	30.0
	HC	kW	633	619	604	589	575	561	738	722	705	687	669	650
	qwc	l/s	31	30	29	29	28	27	36	35	34	33	32	32
	dpwc	kPa	31	30	29	28	26	25	27	26	25	23	22	21
9	CC	kW	582	558	533	507	480	453	680	651	622	592	561	528
	PI	kW	91.2	99.8	109	119	130	142	105	116	127	139	151	163
	qwe	l/s	27.8	26.6	25.4	24.2	22.9	21.6	32.5	31.1	29.7	28.3	26.8	25.2
	dpwe	kPa	43	40	37	34	30	27	54	50	46	42	38	34
	HC	kW	673	657	642	626	610	595	785	767	749	731	711	692
	qwc	l/s	32.4	31.7	31.0	30.3	29.6	28.9	37.8	37.0	36.2	35.3	34.5	33.6
	dpwc	kPa	35	34	32	31	29	28	30	29	27	26	25	24
11	CC	kW	621	596	570	543	515	486	727	697	666	634	602	568
	PI	kW	93.4	102	111	121	132	144	107	118	130	142	154	167
	qwe	l/s	29.7	28.5	27.2	26.0	24.6	23.2	34.7	33.3	31.8	30.3	28.8	27.2
	dpwe	kPa	48	45	41	38	35	31	61	56	52	47	43	39
	HC	kW	714	698	681	664	647	631	834	815	796	776	756	735
	qwc	l/s	34.4	33.6	32.9	32.1	31.4	30.6	40.1	39.3	38.4	37.5	36.6	35.7
	dpwc	kPa	39	37	36	34	33	31	33	32	31	29	28	27
13	CC	kW	662	636	608	580	551	521	677	744	712	679	645	609
	PI	kW	95.7	105	114	124	135	147	100	121	132	144	157	170
	qwe	l/s	31.7	30.4	29.1	27.8	26.4	24.9	32.4	35.6	34.1	32.5	30.8	29.2
	dpwe	kPa	54	51	47	43	39	35	53	63	58	54	49	44
	HC	kW	757	740	722	704	686	668	777	865	845	823	802	779
	qwc	l/s	36.4	35.7	34.9	34.1	33.3	32.4	37.4	41.7	40.8	39.8	38.9	37.9
	dpwc	kPa	43	42	40	38	36	35	29	35	34	33	31	30
15	CC	kW												
	PI	kW	0.14						0.16					
	qwe	l/s												
	dpwe	kPa												
	HC	kW	0.14						0.16					
	qwc	l/s	0.0						0.0					
	dpwc	kPa	0						0					

EWWD H-HS

			750						830					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	729	697	665	631	596	560	806	771	734	697	658	618
	PI	kW	116	128	141	156	172	191	129	142	156	172	189	209
	qwe	l/s	34.7	33.2	31.7	30.1	28.4	26.7	38.4	36.7	35.0	33.2	31.4	29.5
	dpwe	kPa	48	44	40	37	33	30	38	35	32	30	27	24
	HC	kW	845	826	806	787	768	751	935	913	891	869	847	827
	qwc	l/s	40.7	39.8	38.9	38.1	37.2	36.5	45.0	44.0	43.0	42.0	41.1	40.2
	dpwc	kPa	30	28	27	26	25	24	28	27	26	24	23	22
7	CC	kW	781	748	714	679	642	604	864	827	789	750	709	667
	PI	kW	119	131	144	158	174	192	132	145	159	175	192	211
	qwe	l/s	37.3	35.7	34.1	32.4	30.6	28.8	41.2	39.5	37.6	35.8	33.8	31.8
	dpwe	kPa	54.0	50.0	46.0	42.0	38.0	34.0	44.0	40.0	37.0	34.0	31.0	27.0
	HC	kW	900	879	858	837	816	796	996	972	948	924	901	878
	qwc	l/s	43	42	41	41	40	39	48	47	46	45	44	43
	dpwc	kPa	33	32	30	29	28	27	31	30	29	27	26	25
9	CC	kW	836	801	765	728	690	650	925	886	846	805	763	719
	PI	kW	121	133	147	161	176	194	135	148	163	178	195	214
	qwe	l/s	39.9	38.3	36.5	34.8	32.9	31.1	44.2	42.3	40.4	38.4	36.4	34.3
	dpwe	kPa	61	56	52	48	43	39	49	46	42	38	35	31
	HC	kW	957	934	912	889	866	844	1060	1034	1009	983	957	932
	qwc	l/s	46.0	45.0	44.0	43.0	42.0	41.0	51.0	49.9	48.7	47.5	46.4	45.3
	dpwc	kPa	37	35	34	33	31	30	35	33	32	30	29	28
11	CC	kW	893	857	819	780	740	699	988	948	906	863	818	772
	PI	kW	123	136	149	164	179	197	138	152	166	181	198	216
	qwe	l/s	42.7	40.9	39.1	37.3	35.4	33.4	47.2	45.3	43.3	41.2	39.1	36.9
	dpwe	kPa	69	64	59	54	49	44	56	52	48	44	40	36
	HC	kW	1016	993	968	944	919	895	1127	1100	1072	1044	1016	989
	qwc	l/s	48.9	47.8	46.8	45.6	44.5	43.5	54.2	53.0	51.8	50.5	49.2	48.0
	dpwc	kPa	41	40	38	36	35	33	39	37	36	34	32	31
13	CC	kW	850	914	875	834	792	749	901	1012	969	923	877	829
	PI	kW	117	139	153	167	182	200	128	155	170	185	202	220
	qwe	l/s	40.7	43.7	41.9	39.9	37.9	35.8	43.1	48.4	46.3	44.2	41.9	39.6
	dpwe	kPa	63	72	66	61	56	50	47	58	54	49	45	41
	HC	kW	967	1053	1028	1001	975	948	1029	1167	1138	1108	1078	1048
	qwc	l/s	46.5	50.8	49.6	48.4	47.2	46.1	49.5	56.3	54.9	53.6	52.2	50.9
	dpwc	kPa	38	44	42	40	38	37	33	41	40	38	36	34
15	CC	kW												
	PI	kW	0.19						0.21					
	qwe	l/s												
	dpwe	kPa												
	HC	kW	0.19						0.21					
	qwc	l/s	0.0						0.0					
	dpwc	kPa	0						0					

EWWD H-HS

			930						980					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	908	869	828	785	742	697	954	912	869	825	779	732
	PI	kW	143	156	171	188	206	227	153	168	184	202	222	244
	qwe	l/s	43.3	41.4	39.4	37.4	35.3	33.2	45.5	43.5	41.4	39.3	37.1	34.9
	dpwe	kPa	35	32	30	27	24	22	36	33	30	28	25	22
	HC	kW	1051	1025	999	973	948	923	1108	1081	1054	1027	1001	976
	qwc	l/s	50.6	49.4	48.2	47.1	45.9	44.8	53.3	52.1	50.9	49.7	48.5	47.4
	dpwc	kPa	33	31	30	29	28	26	31	30	28	27	26	25
7	CC	kW	974	932	889	845	799	752	1023	979	934	888	839	790
	PI	kW	146	160	175	191	209	229	157	172	188	206	225	247
	qwe	l/s	46.5	44.5	42.4	40.3	38.1	35.9	48.8	46.7	44.6	42.3	40.0	37.7
	dpwe	kPa	40.0	37.0	34.0	31.0	28.0	25.0	41.0	38.0	35.0	32.0	29.0	26.0
	HC	kW	1120	1092	1064	1036	1008	981	1180	1151	1122	1093	1065	1037
	qwc	l/s	54	53	51	50	49	48	57	56	54	53	52	50
	dpwc	kPa	37	35	34	32	31	29	35	33	32	30	29	28
9	CC	kW	1042	999	953	907	859	809	1095	1049	1002	953	902	850
	PI	kW	150	164	179	195	213	233	161	176	192	210	229	250
	qwe	l/s	49.8	47.7	45.5	43.3	41.0	38.6	52.3	50.1	47.8	45.5	43.1	40.6
	dpwe	kPa	45	42	38	35	32	28	46	43	39	36	33	29
	HC	kW	1192	1162	1132	1102	1072	1042	1256	1225	1194	1162	1131	1101
	qwc	l/s	57.4	56.0	54.7	53.3	51.9	50.6	60.4	59.0	57.6	56.2	54.8	53.5
	dpwc	kPa	41	39	38	36	34	33	39	37	35	34	32	31
11	CC	kW	1114	1068	1021	972	922	870	1170	1122	1072	1021	968	914
	PI	kW	153	168	183	199	217	236	165	180	196	214	233	254
	qwe	l/s	53.2	51.1	48.8	46.5	44.1	41.6	55.9	53.6	51.3	48.8	46.3	43.7
	dpwe	kPa	51	47	43	40	36	32	52	48	45	41	37	33
	HC	kW	1267	1236	1203	1171	1138	1106	1335	1302	1269	1235	1202	1168
	qwc	l/s	61.0	59.6	58.1	56.6	55.2	53.7	64.2	62.8	61.3	59.7	58.2	56.7
	dpwc	kPa	46	44	42	40	38	36	43	41	40	38	36	34
13	CC	kW	1060	1141	1091	1040	987	933	1113	1198	1146	1093	1037	980
	PI	kW	146	171	187	203	221	240	157	185	201	219	238	259
	qwe	l/s	50.7	54.6	52.2	49.8	47.2	44.6	53.3	57.3	54.8	52.3	49.6	46.9
	dpwe	kPa	46	53	49	45	41	37	48	55	50	46	42	38
	HC	kW	1206	1312	1278	1243	1208	1173	1270	1383	1347	1311	1275	1239
	qwc	l/s	58.0	63.2	61.7	60.1	58.6	57.0	61.1	66.6	65.0	63.4	61.8	60.2
	dpwc	kPa	42	49	47	45	43	40	40	46	44	42	40	38
15	CC	kW												
	PI	kW	0.23						0.24					
	qwe	l/s												
	dpwe	kPa												
	HC	kW	0.23						0.24					
	qwc	l/s	0.0						0.0					
	dpwc	kPa	0						0					

EWWD H-HS

			C10						C11					
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	**30**	**35**	**40**	**45**	**50**	**55**
5	CC	kW	1024	979	933	885	836	785	1104	1056	1006	955	902	847
	PI	kW	164	180	197	216	237	261	177	195	213	233	254	277
	qwe	l/s	48.8	46.7	44.5	42.2	39.8	37.4	52.6	50.3	47.9	45.5	43.0	40.3
	dpwe	kPa	33	30	28	25	23	20	33	31	28	26	23	21
	HC	kW	1188	1159	1130	1101	1073	1046	1281	1250	1219	1187	1155	1124
	qwc	l/s	57.2	55.9	54.6	53.3	52.0	50.8	61.6	60.3	58.9	57.4	56.0	54.6
	dpwc	kPa	29	28	26	25	24	23	31	30	28	27	26	25
7	CC	kW	1098	1051	1003	953	901	847	1184	1133	1081	1027	971	914
	PI	kW	168	184	201	220	241	264	181	199	218	237	259	282
	qwe	l/s	52.4	50.1	47.8	45.4	43.0	40.4	56.5	54.1	51.6	49.0	46.3	43.6
	dpwe	kPa	37.0	34.0	31.0	29.0	26.0	23.0	38.0	35.0	32.0	29.0	26.0	24.0
	HC	kW	1266	1235	1204	1173	1142	1112	1365	1332	1298	1264	1230	1195
	qwc	l/s	61	60	58	57	55	54	66	64	63	61	60	58
	dpwc	kPa	32	31	30	28	27	26	34	33	32	30	29	28
9	CC	kW	1176	1126	1075	1023	969	913	1267	1214	1159	1103	1044	984
	PI	kW	172	188	206	224	245	268	185	203	222	242	264	287
	qwe	l/s	56.1	53.8	51.4	48.9	46.3	43.6	60.5	58.0	55.4	52.7	49.9	47.0
	dpwe	kPa	42	39	36	33	30	27	43	40	36	33	30	27
	HC	kW	1348	1314	1281	1247	1214	1181	1452	1417	1381	1345	1308	1271
	qwc	l/s	64.8	63.3	61.8	60.3	58.8	57.3	69.9	68.3	66.7	65.1	63.4	61.7
	dpwc	kPa	36	35	33	32	30	29	39	37	35	34	32	31
11	CC	kW	1257	1205	1152	1097	1040	981	1354	1299	1241	1182	1121	1058
	PI	kW	176	193	210	229	249	272	189	208	227	247	269	292
	qwe	l/s	60.1	57.6	55.0	52.4	49.7	46.9	64.7	62.1	59.3	56.5	53.6	50.5
	dpwe	kPa	47	44	40	37	34	30	48	45	41	38	34	31
	HC	kW	1433	1398	1362	1325	1289	1253	1544	1506	1468	1429	1390	1350
	qwc	l/s	68.9	67.4	65.7	64.1	62.5	60.9	74.3	72.6	70.9	69.1	67.4	65.6
	dpwc	kPa	40	39	37	35	34	32	43	41	40	38	36	34
13	CC	kW	1146	1287	1231	1174	1114	1053	1289	1387	1327	1265	1201	1135
	PI	kW	163	197	215	234	254	277	180	212	232	253	275	298
	qwe	l/s	54.8	61.6	58.9	56.1	53.3	50.4	61.6	66.4	63.5	60.5	57.4	54.3
	dpwe	kPa	40	50	46	42	38	35	44	50	47	43	39	35
	HC	kW	1309	1484	1446	1407	1368	1330	1468	1599	1559	1518	1475	1433
	qwc	l/s	63.0	71.5	69.8	68.1	66.3	64.6	70.6	77.1	75.3	73.4	71.5	69.6
	dpwc	kPa	34	43	41	39	37	36	39	46	44	42	40	38
15	CC	kW												
	PI	kW	0.26						0.27					
	qwe	l/s												
	dpwe	kPa												
	HC	kW	0.26						0.27					
	qwc	l/s	0.0						0.0					
	dpwc	kPa	0						0					

EWWD H-HS

			C12						
Twe		**Twc**	**30**	**35**	**40**	**45**	**50**	**55**	
5	CC	kW	1184	1132	1079	1024	967	908	
	PI	kW	190	209	229	250	271	293	
	qwe	l/s	56.4	54.0	51.4	48.8	46.1	43.3	
	dpwe	kPa	33	31	28	26	23	21	
	HC	kW	1374	1341	1308	1273	1238	1201	
	qwc	l/s	66.1	64.6	63.1	61.6	60.0	58.3	
	dpwc	kPa	31	30	29	27	26	25	
7	CC	kW	1269	1215	1159	1101	1041	980	
	PI	kW	194	214	234	255	277	299	
	qwe	l/s	60.6	58.0	55.3	52.5	49.7	46.7	
	dpwe	kPa	38.0	35.0	32.0	29.0	26.0	24.0	
	HC	kW	1463	1429	1393	1356	1318	1279	
	qwc	l/s	70	69	67	66	64	62	
	dpwc	kPa	35	34	32	31	29	28	
9	CC	kW	1359	1302	1243	1182	1120	1055	
	PI	kW	198	218	239	261	283	306	
	qwe	l/s	64.9	62.2	59.4	56.5	53.5	50.4	
	dpwe	kPa	43	40	36	33	30	27	
	HC	kW	1557	1520	1482	1443	1403	1361	
	qwc	l/s	74.9	73.2	71.5	69.8	68.0	66.1	
	dpwc	kPa	39	37	36	34	33	31	
11	CC	kW	1453	1393	1331	1267	1202	1134	
	PI	kW	202	223	244	266	289	313	
	qwe	l/s	69.4	66.6	63.6	60.6	57.4	54.2	
	dpwe	kPa	48	45	41	38	34	31	
	HC	kW	1654	1615	1575	1533	1491	1447	
	qwc	l/s	79.6	77.8	76.0	74.2	72.2	70.3	
	dpwc	kPa	43	42	40	38	36	35	
13	CC	kW	1382	1487	1423	1356	1288	1217	
	PI	kW	191	227	249	272	295	319	
	qwe	l/s	66.1	71.2	68.1	64.9	61.6	58.2	
	dpwe	kPa	44	50	47	43	39	35	
	HC	kW	1573	1714	1672	1628	1583	1536	
	qwc	l/s	75.7	82.6	80.7	78.7	76.7	74.6	
	dpwc	kPa	40	46	45	43	41	39	
15	CC	kW							
	PI	kW	0.29						
	qwe	l/s							
	dpwe	kPa							
	HC	kW	0.29						
	qwc	l/s	0.0						
	dpwc	kPa	0						

Fluid: Water
Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C);
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser
qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser
** For working condition where dpw value is "Italic-Red Color" please contac factory*

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.

Location A leveled and sufficiently strong floor is required. If necessary, additional structural members should be provided to transfer the weight of the unit to the nearest beams.
Rubber-in-shear isolators can be furnished and field placed under each corner of the package. A rubber anti–skid pad should be used under isolators if hold-down bolts are not used. Vibration isolator in all water piping connected to the chiller is recommended to avoid straining the piping and transmitting vibration and noise.

Space requirements Every side of the machine must be accessible for all post-installation maintenance activities. The minimum space required is shown on the following drawing:

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

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

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

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

The unit will be able to start up and operate (as standard) at full load with:
- evaporator leaving fluid temperature between ..... °C and ..... °C
- condenser 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
- Evaporator heat exchanger entering water temperature in cooling mode : …… °C
- Evaporator heat exchanger leaving water temperature in cooling mode : …… °C
- Evaporator heat exchanger water flow : …… l/s
- Condenser heat exchanger entering water temperature in cooling mode : …… °C
- Condenser heat exchanger leaving water temperature in cooling mode : …… °C
- Condenser heat exchanger water flow : …… l/s

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: one refrigerant circuit, two semi-hermetic type rotary single screw compressors, electronic expansion device (EEXV), refrigerant flooded 'shell&tube' evaporator, water-cooled 'shell&tube' heat exchanger condenser section, R134a refrigerant, lubrication system, motor starting components, discharge line shut-off valve, control system and all components necessary for safe and stable unit operation.
Chiller will be factory assembled on a robust base-frame made of galvanized steel, protected by an epoxy paint.

Sound level and vibrations Sound pressure level at 1 meter distance in free field, semispheric conditions, shall not exceed ……dB(A). The sound pressure levels must be rated in accordance to ISO 3744 (other types of rating 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 The unit shall be equipped with:

- Semi-hermetic, single-screw type with one main helical rotor meshing with gaterotors. The gaterotors will be constructed of a carbon impregnated engineered composite material. The gaterotor supports will be constructed of cast iron.
- 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.
- Refrigerant system differential pressure shall provide oil flow throught service replaceble, 0.5 micron, full flow, cartridge type oil filter internal to compressor.
- Refrigerant system differential pressure shall provide oil injection on all moving compressor parts to correctly lubricate them. Electrical oil pump lubricating system is not acceptable.
- The compressor's oil cooling must be realized, when necessary, by refrigerant liquid injection. External dedicated heat exchanger and additional piping to carry the oil from the compressor to heat exchanger and viceversa will be not accepted.
- The compressor shall be provided with an external high efficiency oil separator and with built-in oil filter, cartridge type.
- The compressor shall be direct electrical driven, without gear transmission between the screw and the electrical motor.
- Shall be present two thermal protection realized by a thermistor for high temperature protection: one temperature sensor to protect electrical motor and another sensor to protect unit and lubricating oil from high discharge gas temperature.
- The compressor shall be equipped with an electric oil-crankcase heater.
- Compressor shall be fully field serviceable. Compressor that must be removed and returned to the factory for service shall be unacceptable.

Evaporator The units shall be equipped with a flooded shell & tube evaporator with water flowing inside the tubes and refrigerant boiling outside. The tubes are enhanced for maximum heat transfer and rolled into steel tube sheet and sealed. The tubes are individually replaceable.

- The external shell shall be insulated with flexible, closed cell polyurethane insulation material (20-mm thick).
- 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.

Refrigerant circuit The unit shall have one refrigerant circuit.

- The circuit shall include as standard: electronic expansion device piloted by unit's microprocessor control, compressor discharge shut-off valve, liquid line shut-off valve, sight glass with moisture indicator, replaceable filter drier, charging valves, high pressure switch, high and low pressure transducers, oil pressure transducer and insulated suction line.

Condensation control 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.

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 with plexiglas panel against possible accidental contact with electrical components (IP20).
- The main panel shall be fitted with a main switch interlocked door.
- The power section will include compressors protection devices, compressors 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, programmable values, set-points.
- A sophisticated software with predictive logic, will select the most energy efficient combination of compressors, EEXV to keep stable operating conditions to maximize chiller energy efficiency and reliability.
- The controller will be able to protect critical components based on external signs from its system (such as motor temperatures, refrigerant gas and oil pressures, correct phase sequence, pressure switches and evaporator). The input coming from the high pressure switch cuts all digital output from the controller in less than 50ms, this 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.
- Chiller enabled to work in partial failure condition.
- Full routine operation at condition of:
  - high thermal load
  - high evaporator entering water temperature (start-up)
- Display of evaporator entering/leaving water 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.

In all of us,
a green heart

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

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