DAIKIN

Applied Systems

Technical Data

Water cooled chiller, high efficiency

EEDEN13-418

EWWD-G-XS

TABLE OF CONTENTS

EWWD-G-XS

1 Features

- High efficiency
- All models are PED pressure vessel approved
- Stepless single-screw compressor
- Optimised for use with R-134a
- 1-2 truly independent refrigerant circuits
- Standard electronic expansion valve
- DX shell and tube evaporator – one pass refrigerant side for easy oil circulation and return
- Partial and total heat recovery option available
- MicroTech III controller

2 Specifications

2-1 Technical Specifications					EWWD190G-XS	EWWD230G-XS	EWWD280G-XS	EWWD320G-XS	EWWD380G-XS	EWWD400G-XS	EWWD460G-XS	EWWD500G-XS	EWWD550G-XS	EWWD650G-XS
Cooling capacity	Nom.			kW	185 (1)	222 (1)	276 (1)	306 (1)	365 (1)	407 (1)	443 (1)	495 (1)	539 (1)	602 (1)
Heating capacity	Nom.			kW	226 (2)	272 (2)	337 (2)	379 (2)	446 (2)	496 (2)	540 (2)	602 (2)	657 (2)	743 (2)
Capacity control	Method				Stepless									
	Minimum capacity			%	25				13					
Power input	Cooling	Min.		kW	40.6 (1)	49.4 (1)	61.0 (1)	73.3 (1)	81.1 (1)	89.0 (1)	97.0 (1)	107.3 (1)	117.4 (1)	141 (1)
	Heating	Nom.		kW	40.6 (2)	49.4 (2)	61.0 (2)	73.3 (2)	81.1 (2)	89.0 (2)	97 (2)	107 (2)	117 (2)	141 (2)
EER					4.57 (1)	4.50 (1)	4.53 (1)	4.17 (1)	4.50 (1)	4.58 (1)	4.57 (1)	4.61 (1)	4.59 (1)	4.26 (1)
ESEER					5.53	5.43	5.46	5.02	5.69	5.82	5.81	5.83	5.80	5.36
COP					5.57 (2)	5.50 (2)	5.53 (2)	5.17 (2)	5.50 (2)	5.58 (2)	5.57 (2)	5.61 (2)	5.59 (2)	5.26 (2)
IPLV					6.45	6.36	6.35	5.80	6.47	6.57	6.55	6.65	6.64	6.17
Casing	Colour				Ivory white									
	Material				Galvanized and painted steel sheet									
Dimensions	Unit	Height		mm	1,860				1,880					
		Width		mm	920				860					
		Depth		mm	3,435				4,305					
Weight	Unit			kg	1,650	1,665	1,680		2,800	2,945	2,955	2,975	2,990	
	Operation weight			kg	1,800	1,810	1,820		3,020	3,280	3,290	3,315	3,340	
Water heat exchanger - evaporator	Type				Single pass shell and tube									
	Water volume			l	125	120	110		170	285		280		
	Water flow rate	Nom.		l/s	8.9	10.6	13.2	14.6	17.5	19.5	21.2	23.7	25.8	28.8
	Nominal water pressure drop	Cooling	Total	kPa	23	31	30	37	28	21	24	33	39	47
	Insulation material				Closed cell									
Water heat exchanger - condenser	Type				Single pass shell and tube									
	Water flow rate	Nom.		l/s	10.9	13.1	16.2	18.2	10.7	10.9	13.0	13.2	15.8	17.9
	Nominal water pressure drop	Cooling		kPa	16	18	22	27	15				14	17
	Nominal water pressure drop 2	Cooling		kPa	-				15			14		17
	Insulation material				Closed cell									
	Model	Quantity			1				2					
Sound power level	Cooling	Nom.		dBA	88				90					
Sound pressure level	Cooling	Nom.		dBA	70				72					
Compressor	Type				Semi-hermetic single screw compressor									
	Quantity				1				2					
	Oil	Charged volume		l	16				32					
Operation range	Evaporator	Cooling	Min.	ºCDB	-8									
			Max.	ºCDB	15									
	Condenser	Cooling	Min.	ºCDB	20									
			Max.	ºCDB	55									
Refrigerant	Type				R-134a									
	Charge			kg	55				110	105	100			
	Control				Electronic expansion valve									
	Circuits	Quantity			1				2					
Piping connections	Evaporator water inlet/outlet (OD)				114.3				139.7	168.3mm				
	Condenser water inlet/outlet (OD)				5"									

2 Specifications

2-1 Technical Specifications			EWWD190G-XS	EWWD230G-XS	EWWD280G-XS	EWWD320G-XS	EWWD380G-XS	EWWD400G-XS	EWWD460G-XS	EWWD500G-XS	EWWD550G-XS	EWWD650G-XS
Safety devices	Item	01	High discharge pressure (pressure switch)									
		02	High discharge pressure (pressure transducer)									
		03	Low suction pressure (pressure transducer)									
		04	Compressor motor protection									
		05	High discharge temperature									
		06	Refrigerant in oil sump									
		07	Low oil pressure									
		08	Low pressure ratio									
		09	High oil filter pressure drop									
		10	Phase monitor									
		11	Flowswitch									
		12	Emergency stop									
		13	Water freeze protection controller									

2-2 Electrical Specifications				EWWD190G-XS	EWWD230G-XS	EWWD280G-XS	EWWD320G-XS	EWWD380G-XS	EWWD400G-XS	EWWD460G-XS	EWWD500G-XS	EWWD550G-XS	EWWD650G-XS
Compressor	Phase			3~									
	Voltage		V	400									
	Voltage range	Min.	%	-10									
		Max.	%	10									
	Maximum running current		A	112	134	161	182	112		134		161	182
	Starting method			Wye-delta									
Compressor 2	Maximum running current		A	-				112	134		161	182	
Power supply	Phase			3~									
	Frequency		Hz	50									
	Voltage		V	400									
	Voltage range	Min.	%	-10									
		Max.	%	10									
Unit	Maximum starting current		A	288				378	395		417	434	
	Nominal running current (RLA)	Cooling	A	79	89	103	124	157	167	175	188	201	238
	Maximum running current		A	112	134	161	182	224	246	268	295	343	364
	Max unit current for wires sizing		A	123	147	177	200	246	271	295	325	377	400

Notes

(1) Cooling: entering evaporator water temp. 12ºC; leaving evaporator water temp. 7ºC; entering condenser water temp. 30ºC; leaving condenser water temp. 35ºC; full load operation.

(2) Heating capacity, unit power input and COP are based on the following conditions: evaporator 15/10ºC; condensor 40/45ºC, unit at full load operation

(3) Sound level data are measured at entering evaporator water temp. 12ºC; leaving evaporator water temp. 7ºC; entering condenser water temp. 30ºC; leaving condenser water temp. 35ºC; full load operation; standard: ISO3744

(4) Allowed voltage tolerance ± 10%. Voltage unbalance between phases must be within ± 3%.

(5) Maximum starting current: starting current of biggest compressor + current of the other compressor at 75 % of maximum load

(6) Nominal current in cooling mode: entering evaporator water temp. 12ºC; leaving evaporator water temp. 7ºC; entering condenser water temp. 30ºC; leaving condenser water temp. 35ºC; compressors.

(7) Maximum running current is based on max compressor absorbed current in its envelope

(8) Maximum unit current for wires sizing is based on minimum allowed voltage.

(9) Maximum current for wires sizing: (compressors full load ampere + fans current) x 1.1

3 Features and advantages

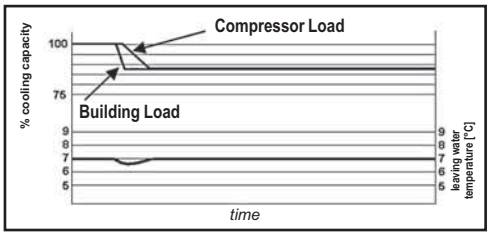
3 - 1 Features and Advantages

Features and advantages

The water cooled screw chillers EWWD~G- are equipped with single screw compressors.
They are manufactured to satisfy the requirements of the consultants and the end user. Units are designed to minimise energy costs while maximising the refrigeration capacities.
Daikin's chiller design experience combined with outstanding features makes the EWWD~G- chiller unmatched in the industry.

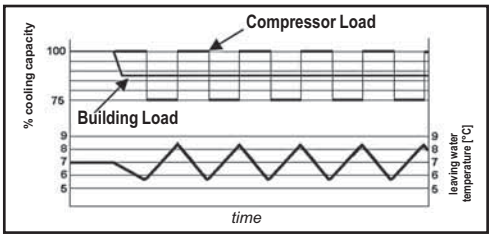
Seasonal quietness
The compressor design with a single screw and twin rotors allows a constant gas flow. This compression process completely eliminates gas pulsations. The oil injection also results in significant mechanical noise reduction.
The twin gas compressor discharge chambers are designed to act as attenuators, based on the harmonic wave principle with destructive interference, thus always resulting equal to zero. The extremely low noise compressor performance affords the use of EWWD~G- chiller for all applications.
The reduced number of vibrations produced from the EWWD~G- chiller offers a surprisingly quiet operation eliminating the noise transmission through the structure and the chilled water piping system.

Infinitely capacity control
Cooling capacity control is infinitely variable by means of a screw compressor controlled by microprocessor system. Each unit has infinitely variable capacity control from 100% down to 25% (one compressor unit), down to 12.5% (two compressors units). 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 only with a stepless control.



ELWT fluctuation with stepless capacity control

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



ELWT fluctuation with steps capacity control (4 steps)

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

Unmatched serviceability
Field serviceability has not been sacrificed. Inspection covers allows visual inspection of the main screw and gaterotors.

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3 Features and advantages

3 - 1 Features and Advantages

Outstanding reliability features

Unsurpassed Efficiency

• Zero clearance fit between the two gaterotors and main screw rotor virtually eliminates leakage between the high and low-pressure sides during compression. Special gaterotor material made from an advanced composite, temperature stable material makes a zero clearance design possible.

• The chiller is equipped with the most advanced means of refrigerant flow control available. An electronic expansion valve coupled with the MicroTech II C Plus controller's control logic provides excellent operating efficiencies both at full and part load operation.

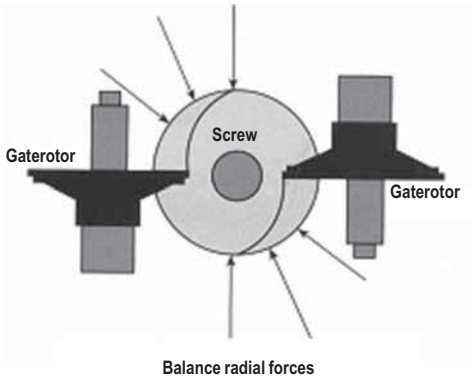
• Infinite unloading matches compressor capacity to load.

• Full factory testing of the unit with water hookups helps provides a trouble-free start-up. Extensive quality control checks during testing means that each equipment protection and operating control is properly adjusted and operates correctly before it leaves the factory. Factory-installed options minimize field expenses and startup labor.

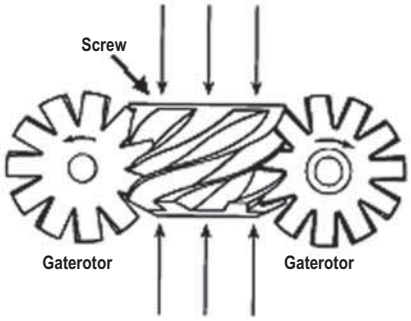
• The rugged design of the single-screw compressor allows it to be tolerant of liquid slugging.

• Very low loading enhances the bearing and compressor reliability. Due to symmetrical compression taking place on both sides of the main screw rotor, balanced forces result in the elimination of the large radial force loads inherent in twin-screw compressors.

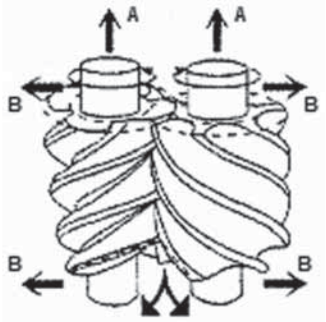
• Integral to the basic design of the single-screw compressor, the main screw rotor shaft and the gaterotor shafts cross at right angles in the compressor. The result is ample space to locate heavy duty bearings and increase compressor reliability since no limitations are placed on bearing design as found in twin-screw compressors.



Balance radial forces



Balanced axial forces



High Axial and Radial thrusts in TwinScrew Compressor

Code requirements – Safety and observant of laws/directives

All water cooled 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

All units manufactured 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.).

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3 Features and advantages

3 - 1 Features and Advantages

Versions

EWWD~G- is available in two different Efficiency Versions:

S: Standard Efficiency

10 sizes to cover a range from 166 up to 556 kW with an EER up to 4.00 and an ESEER up to 5.33

X: High Efficiency

10 sizes to cover a range from 186 up to 604 kW with an EER up to 4.73 and an ESEER up to 6.31

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 water inlet condenser temperature.

$ESEER = A \times EER_{100\%} + B \times EER_{75\%} + C \times EER_{50\%} + D \times EER_{25\%}$

	A	B	C	D
Coefficient	0.03 (3%)	0.33 (33%)	0.41 (41%)	0.23 (23%)
Condenser water inlet temperature (°C)	30	26	22	18

Sound Configuration

EWWD~G- is available in Standard sound level configurations:

S: Standard Noise

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4 General Characteristics

4 - 1 General characteristics

General characteristics

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 eye-hook for lifting 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.

Screw compressors

The single-screw compressor has a well balanced compression mechanism which cancels the screw rotor load in both the radial and axial directions. Inherent to the basic single-screw compressor design is the virtually load-free operation that gives main bearing design life of 3-4 times greater than twin-screws, and eliminates expensive and complicated thrust balancing schemes. The two exactly opposed gate rotors create two exactly opposed compression cycles. Compression is made at the lower and upper parts of the screw rotor at the same time, thus cancelling the radial loads. Also, both ends of the screw rotor are subjected to suction pressure only, which cancels the axial loads and eliminates the huge thrust loads inherent in twin-screw compressors.

Oil injection is used for these compressors in order to get EER at high condensing pressure. The units are provided with a high efficiency oil separator to maximise oil extraction.

Compressors have an infinitely variable capacity control down to 25% of its total capacity. This control is made by means of capacity slides controlled by microprocessors.

Standard start is star-delta type; soft start type is available as option.

Ecological R-134a 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) that means low TEWI (Total Equivalent Warming Impact).

Evaporator

The units are equipped with a Direct Expansion shell&tube evaporator with copper tubes rolled into steel tubesheets. The evaporators are single-pass on both the refrigerant and water sides for pure counter-flow heat exchange and low refrigerant pressure drops. Both attributes contribute to the heat exchanger effectiveness and total unit's outstanding efficiency.

The external shell is covered with a 10mm closed cell insulation material. Each evaporator has 1 circuit for each compressor and is manufactured in accordance to PED approval. The evaporator water outlet connections are provided with Victaulic Kit (as standard).

Condensers

The units are equipped with Direct Expansion shell&tube condensers, with copper tubes rolled into steel tubesheets. The unit has independent condensers, one per circuit. The condenser is manufactured in accordance to PED approval.

Condensers are provided with liquid shut-off valve and spring loaded relief valve.

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 valve proposes features that make it unique: short opening and closing time, high resolution, positive shut-off function to eliminate use of additional solenoid valve, highly linear flow capacity, continuous modulation of mass flow without stress in the refrigerant circuit and corrosion resistance stainless steel body.

EEXV strength point is the capacity to work 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 independent refrigerant circuits and each one includes:

- Single screw compressor with external cyclonic oil separator
- (Common) Evaporator

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4 General Characteristics

4 - 1 General characteristics

- Condenser
- Oil pressure transducer
- High pressure switches
- High pressure transducer
- Low pressure transducer
- Moisture liquid indicator
- High efficiency oil separator
- Replaceable core filter-drier
- Electronic expansion valve

Electrical control panel

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

Power Section

The power section includes compressors fuses and control circuit transformer.

MicroTech III controller

MicroTech III controller is installed as standard; it can be used to modify unit set-points and check control parameters. A built-in display shows chiller operating status plus temperatures and pressures of water, refrigerant, 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 P/T conversions.

Control section - main features

- Management of the compressor stepless capacity.
- 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 temperatures.
- Display of condensing-evaporating temperatures and pressures, suction and discharge superheat for each circuit.
- Leaving water evaporator temperature regulation. Temperature tolerance = 0.1°C.
- Compressor and evaporator pumps hour counters.
- Display of Status Safety Devices.
- Number of starts and compressor working hours.
- Optimized management of compressor load.
- 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).
- Set point Reset (optional).
- Application and system upgrade with commercial SD cards.
- Ethernet port for remote or local servicing using standard web browsers

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4 General Characteristics

4 - 1 General characteristics

- Two different sets of default parameters could be stored for easy restore.

Safety device / logic for each refrigerant circuit

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

System security

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

Regulation type

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

MicroTech III

MicroTech III built-in terminal has the following features.

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

Supervising systems (on request)

MicroTech III remote control

MicroTech III is able to communicate to BMS (Building Management System) based on the most common protocols as:

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

Chiller Sequencing

MicroTech III controller allows an easy plug-in sequencing technology based on digital or serial panel

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4 General Characteristics

4 - 1 General characteristics

Digital Sequencing Panel
This panel is basically a step inserter that switches ON/OFF up to 11 units (chillers or heat pumps operating in the same cooling/heating mode) depending on the selected set point; the units are connected with the panel through standard cables and no serial card is requested.

Serial Sequencing Panel
Basically this panel sequences a chiller plant by switching on/off the units (up to 7 chillers) taking into account their running hours and the requested plant load, in order to optimise the number of working units for each condition; serial cards and shielded cables are requested to connect the panel with the units and, if installed, a BMS.

Standard accessories (supplied on basic unit)

Evaporator Victaulic Kit - Hydraulic joint with gasket for an easy and quick water connection.
Evaporator Water side design pressure 10 bar
Condenser Water side design pressure 16 bar
Electronic Expansion Device
Suction line shut off valve - Suction shut-off valve installed on the suction of the compressor to facilitate maintenance operation.
Y-D starter - Star Delta starter is the standard type
Double set-point - Dual leaving water temperature set-points.
Phase monitor - The phase monitor controls that phases sequence is correct and controls phase loss.
High Pressure Side Manometers
Hour Run meter - Digital compressors hour run meter
General fault contactor - Contactor for alarm warning.
Set-point reset, demand limit and alarm from external device - The leaving water temperature set-point can be overwritten with the following options: 4-20mA from external source (by user); outside ambient temperature; evaporator water temperature Δt. Moreover the device allow the user to limit the load of the unit by 4-20mA signal or by network system and the microprocessor is able to receive an alarm signal from an external device (pump etc… - user can decide if this alarm signal will stop the unit or not).

Options (on request)

100% total heat recovery - Produced with tube bundle placed in a single shell with the water condensers. Heat exchangers heads are provided with 2 connections for entering/leaving heat recovery water and 2 separate connections for condensing water.
Partial heat recovery - Produced with plate to plate heat exchangers installed on discharge side of compressor hot gas. These allow hot water to be produced up to a maximum temperature of +50°C.
Heat pump version
Brine version - Allows the unit to operate down to -8°C leaving liquid temperature (antifreeze required).
Condenser double flanges kit
20mm Evaporator/ Condenser Insulation
Condenser Victaulic Kit
Cu-Ni 90-10 exchangers - to work with sea water the heat exchangers are fitted with Cu-Ni tubes and special protection inside the end covers.
Sound proof system - 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.
Dual pressure relief valve on evaporator
Soft start - Electronic starting device to reduce the mechanical stress during compressor start-up
Compressor thermal overload relays - Safety devices against compressor motor overloading in addition to the normal protection envisaged by the electrical windings.

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4 General Characteristics

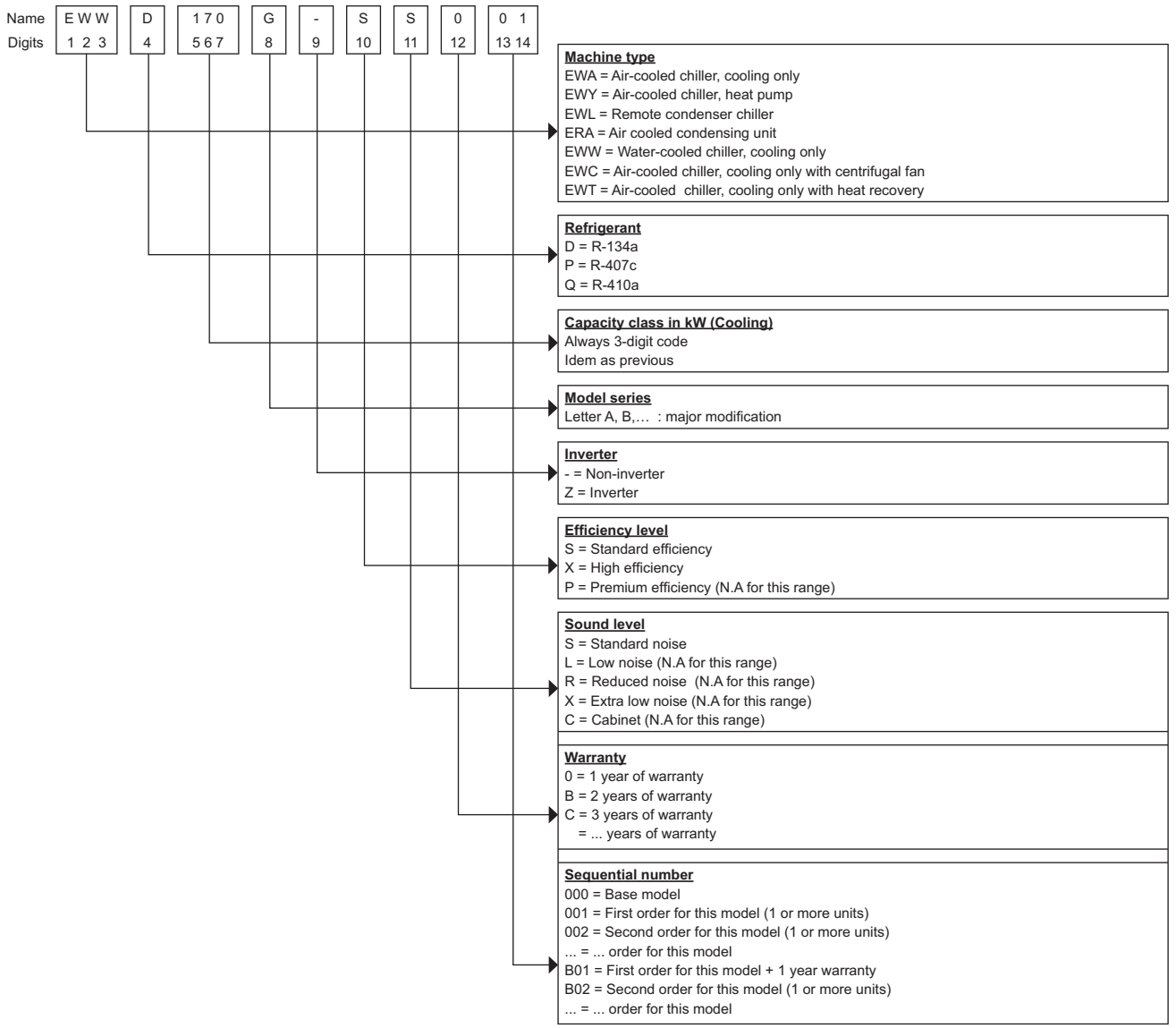
4 - 1 General characteristics

Under/Over Voltage - This device control the voltage value of power supply and stop the chiller if the value exceeds the allowed operating limits.
Energy Meter - This device allows to measure the energy absorbed by the chiller during its life. It is installed inside the control box mounted on a DIN rail and show on a digital display: Line-to-Line Voltage, Phase and Average Current, Active and Reactive Power, Active Energy, Frequency.
Capacitors Cosfi 0.9 - Installed on the electrical control panel to ensure it conforms to the plant rules (advise: maximum 0,9).
Current Limit - To limit maximum absorbed current of the unit whenever is required.
Evaporator / Condenser flow switch for the water piping
Rubber type antivibration 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.
Forklift kit
Witness test - Every unit is always tested at the test bench prior to the shipment. On request, a second test can be carried out, at customer's presence, in accordance with the procedures indicated on the test form. (Not available for units with glycol mixtures).
Acoustic test

GNC_1-2-3-4-5_Rev.00_5

5 Nomenclature

5 - 1 Nomenclature



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6 Capacity tables

6 - 1 Capacity Table Legend

English - English - αγγλικά - Inglés	Deutsch	Ελληνικά	Español
Ta: Condenser inlet air temperature	Ta: Verflüssiger-Einlasslufttemperatur	Ta: Θερμοκρασία αέρα εισαγωγής συμπυκνωτή	Ta: temperatura del aire de entrada al condensador
Twout: Evaporator leaving water temperature (Δt 5°C)	Twout: Verdampfer-Austrittswassertemperatur (Δt = 5 K)	Twout: Θερμοκρασία νερού εξόδου στον εξατμιστή (Δt 5°C)	Twout: temperatura de agua de salida del evaporador (Δt 5 °C)
CC: Cooling capacity	CC: Kühlleistung	CC: Απόδοση ψύξης	CC: capacidad de refrigeración
qw: Fluid flow rate	qw: Fluidvolumenstrom	qw: Ταχύτητα ροής υγρού	qw: caudal de líquido
dpw: Fluid pressure drop	dpw: Fluiddruckabfall	dpw: Πτώση πίεσης υγρού	dpw: caída de presión de líquido
Size	Größe	Μέγεθος	Tamaño
qwe: Fluid flow rate at evaporator	qwe: Fluidvolumenstrom am Verdampfer	qwe: Ταχύτητα ροής υγρού στον εξατμιστή	qwe: caudal de líquido en el evaporador
dpwe: Fluid pressure drop at evaporator	dpwe: Fluiddruckabfall am Verdampfer	dpwe: Πτώση πίεσης υγρού στον εξατμιστή	dpwe: caída de presión de líquido en el evaporador
Twc: Condenser leaving water temperature (Δt 5°C)	Twc: Verflüssiger-Austrittswassertemperatur (Δt = 5 K)	Twc: Θερμοκρασία νερού εξόδου στο συμπυκνωτή (Δt 5°C)	Twc: temperatura de agua de salida del condensador (Δt 5 °C)
Twe: Evaporator leaving water temperature (Δt 5°C)	Twe: Verdampfer-Austrittswassertemperatur (Δt = 5 K)	Twe: Θερμοκρασία νερού εξόδου στον εξατμιστή (Δt 5°C)	Twe: temperatura de agua de salida del evaporador (Δt 5 °C)
HC: Heat capacity at condenser	HC: Heizleistung am Verflüssiger	HC: Θερμαντική ικανότητα στο συμπυκνωτή	HC: capacidad de calefacción en el condensador
qwc: Fluid flow rate at condenser	qwc: Fluidvolumenstrom am Verdampfer	qwc: Ταχύτητα ροής υγρού στο συμπυκνωτή	qwc: caudal de líquido en el condensador
dpwc: Fluid pressure drop at condenser	dpwc: Fluiddruckabfall am Verflüssiger	dpwc: Πτώση πίεσης υγρού στο συμπυκνωτή	dpwc: caída de presión de líquido en el condensador

English - Anglais - Inglese - Engels	Français	Italiano	Nederlands
Ta: Condenser inlet air temperature	Ta : Température de l'air d'admission du condenseur	Ta: Temperatura aria in ingresso nel condensatore	Ta: Luchtinlaattemperatuur condensor
Twout: Evaporator leaving water temperature (Δt 5°C)	Twout : Température de l'eau à la sortie de l'évaporateur (Δt 5°C)	Twout: Temperatura acqua in uscita dall'evaporatore (Δt 5°C)	Twout: Wateruittredetemperatuur verdamper (Δt 5°C)
CC: Cooling capacity	CC : Puissance frigorifique	CC: Capacità di raffrescamento	CC: Koelcapaciteit
qw: Fluid flow rate	qw : Débit du liquide	qw: Portata fluido	qw: Vloeistofdebiet
dpw: Fluid pressure drop	dpw : Chute de pression du liquide	dpw: Perdita di carico del fluido	dpw: Vloeistofdrukverlies
Size	Dimension	Dimensione	Afmeting
qwe: Fluid flow rate at evaporator	qwe : Débit du liquide au niveau de l'évaporateur	qwe: Portata fluido all'evaporatore	qwe: Vloeistofdebiet bij verdamper
dpwe: Fluid pressure drop at evaporator	dpwe : Chute de pression du liquide au niveau de l'évaporateur	dpwe: Perdita di carico del fluido all'evaporatore	dpwe: Vloeistofdrukverlies bij verdamper
Twc: Condenser leaving water temperature (Δt 5°C)	Twc : Température de l'eau à la sortie du condenseur (Δt 5°C)	Twc: Temperatura acqua in uscita dal condensatore (ΔT 5°C)	Twc: Wateruittredetemperatuur condensor (Δt 5°C)
Twe: Evaporator leaving water temperature (Δt 5°C)	Twe : Température de l'eau à la sortie de l'évaporateur (Δt 5°C)	Twe: Temperatura acqua in uscita dall'evaporatore (Δt 5°C)	Twe: Wateruittredetemperatuur verdamper (Δt 5°C)
HC: Heat capacity at condenser	HC : Capacité calorifique au niveau du condenseur	HC: Capacità termica al condensatore	HC: Warmtecapaciteit bij condensor
qwc: Fluid flow rate at condenser	qwc : Débit du liquide au niveau du condenseur	qwc: Portata fluido al condensatore	qwc: Vloeistofdebiet bij condensor
dpwc: Fluid pressure drop at condenser	dpwc : Chute de pression du liquide au niveau du condenseur	dpwc: Perdita di carico del fluido al condensatore	dpwc: Vloeistofdrukverlies bij condensor

English - английский	Русский
Ta: Condenser inlet air temperature	Ta: Температура воздуха на входе конденсатора
Twout: Evaporator leaving water temperature (Δt 5°C)	Twout: Температура воды на выходе испарителя (Δt 5°C)
CC: Cooling capacity	CC: Производительность по охлаждению
qw: Fluid flow rate	qw: Скорость потока жидкости
dpw: Fluid pressure drop	dpw: Падение давления жидкости
Size	Размер
qwe: Fluid flow rate at evaporator	qwe: Скорость потока жидкости в испарителе
dpwe: Fluid pressure drop at evaporator	dpwe: Падение давления жидкости в испарителе
Twc: Condenser leaving water temperature (Δt 5°C)	Twc: Температура воды на выходе конденсатора (Δt 5°C)
Twe: Evaporator leaving water temperature (Δt 5°C)	Twe: Температура воды на выходе испарителя (Δt 5°C)
HC: Heat capacity at condenser	HC: Теплоемкость конденсатора
qwc: Fluid flow rate at condenser	qwc: Скорость потока жидкости в конденсаторе
dpwc: Fluid pressure drop at condenser	dpwc: Падение давления жидкости в конденсаторе

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6 Capacity tables

6 - 2 Cooling/Heating Capacity Tables

EWWD190-380G-XS

Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C)
qwe: Fluid flow rate at evaporator; dpwe: Fluid pressure drop at evaporator
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser

	Condenser inlet air temperature	Twout																						
		5							7							9								
		CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc
Size	Ta	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa
190	30	181	35.5	8.7	22	216	10.4	14	193	35.9	9.3	25	229	11	16	206	36.3	9.9	28	242	11.6	18
	35	174	40.1	8.3	20	213	10.3	14	185	40.6	8.9	23	226	10.9	16	198	41.1	9.5	26	238	11.5	17
	40	166	45	7.9	19	210	10.2	14	177	45.5	8.5	21	222	10.7	15	189	46.1	9.1	24	235	11.3	17
	45	158	50.2	7.5	17	208	10	14	169	50.8	8.1	19	219	10.6	15	180	51.4	8.6	22	231	11.2	16
	50	149	55.9	7.1	15	205	9.9	13	160	56.5	7.7	18	216	10.5	15	171	57.1	8.2	20	228	11.1	16
	55	141	62.1	6.7	14	203	9.8	13	151	62.7	7.2	16	213	10.4	14	162	63.3	7.8	18	225	10.9	16
230	30	217	43.3	10.4	30	260	12.5	17	232	43.8	11.1	33	275	13.2	19	247	44.4	11.9	38	291	14	21
	35	208	48.7	10.0	28	257	12.4	16	222	49.4	10.6	31	271	13.1	18	237	50	11.4	35	286	13.8	20
	40	199	54.6	9.5	25	253	12.2	16	213	55.3	10.2	29	267	12.9	18	227	56	10.9	32	282	13.6	20
	45	189	61	9.1	23	250	12.1	16	203	61.7	9.7	26	264	12.8	17	216	62.5	10.4	30	278	13.5	19
	50	179	67.9	8.6	21	247	12	16	192	68.6	9.2	24	260	12.6	17	205	69.4	9.8	27	274	13.3	19
	55	169	75.2	8.1	19	243	11.8	15	181	76	8.7	21	256	12.4	17	194	76.8	9.3	24	270	13.1	18
280	30	270	53.5	12.9	29	323	15.5	21	288	54.3	13.8	33	342	16.4	23	308	55	14.8	37	362	17.4	25
	35	259	60.2	12.4	27	318	15.4	20	276	61	13.2	30	336	16.2	22	295	61.9	14.1	34	356	17.2	25
	40	248	67.5	11.8	25	314	15.2	20	264	68.4	12.6	28	332	16	22	282	69.3	13.5	32	350	16.9	24
	45	236	75.3	11.3	23	310	15	19	252	76.2	12.0	26	327	15.8	21	269	77.2	12.9	29	345	16.7	23
	50	223	83.7	10.7	21	306	14.8	19	239	84.7	11.4	23	323	15.6	21	255	85.7	12.2	26	340	16.5	23
	55	210	92.8	10.0	19	302	14.7	19	225	93.8	10.8	21	318	15.4	20	241	94.8	11.5	24	335	16.2	22
320	30	299	64.3	14.3	35	362	17.4	25	319	65.3	15.3	40	384	18.5	28	340	66.4	16.3	45	406	19.5	31
	35	286	72.3	13.7	33	358	17.2	25	306	73.4	14.6	37	378	18.2	27	327	74.6	15.6	41	400	19.3	30
	40	273	80.9	13.1	30	353	17.1	24	292	82.1	14.0	34	373	18	27	312	83.3	15.0	38	394	19	29
	45	260	90.2	12.4	27	349	16.9	24	278	91.4	13.3	31	368	17.8	26	297	92.7	14.2	35	389	18.8	29
	50	246	100	11.8	25	346	16.8	23	263	101	12.6	28	364	17.6	25	281	103	13.5	32	383	18.5	28
	55	232	111	11.1	22	342	16.6	23	248	112	11.9	25	359	17.4	25	265	114	12.7	28	377	18.3	27
380	30	357	71	17.0	26	427	10.3 10.3	14 14	381	71.8	18.2	30	452	10.9 10.9	15 15	407	72.7	19.5	34	479	11.5 11.5	17 17
	35	342	80.1	16.3	25	421	10.2 10.2	13 13	365	81.1	17.5	28	445	10.7 10.7	15 15	390	82	18.7	31	471	11.4 11.4	16 16
	40	327	89.9	15.6	23	416	10.0 10.0	13 13	349	90.9	16.7	25	439	10.6 10.6	14 14	373	92	17.9	29	464	11.2 11.2	16 16
	45	311	100	14.9	21	411	9.9 9.9	13 13	333	102	15.9	23	433	10.5 10.5	14 14	355	103	17.0	26	457	11.1 11.1	16 16
	50	295	112	14.1	19	406	9.9 9.9	13 13	316	113	15.1	21	428	10.4 10.4	14 14	338	114	16.2	24	451	10.9 10.9	15 15
	55	279	124	13.3	17	402	9.8 9.8	12 12	299	125	14.3	19	423	10.3 10.3	14 14	319	127	15.3	22	445	10.8 10.8	15 15

NOTES - ANMERKUNGEN - Σημειώσεις - NOTAS - REMARQUES - NOTE - OPMERKINGEN - примечания

1 Fluid: Water
Fluid: Wasser
Υγρό: Νερό
Líquido: agua
Liquide: Eau
Fluido: Acqua
Vloeistof: Water
Жидкость: Вода

2 For working conditions where dpw values are in italic, please contact factory.
Für Arbeitsbedingungen mit kursiv gedruckten dpw-Werten, wenden Sie sich bitte an den Hersteller.
Για τις συνθήκες εργασίας όπου οι τιμές dpw είναι σε πλάγια γραφή, παρακαλούμε επικοινωνήστε με το εργοστάσιο.
Para las condiciones de funcionamiento en las que los valores dpw están en cursiva, póngase en contacto con la fábrica.
Pour les conditions de travail lorsque les valeurs dpw sont en italique, veuillez contacter l'usine.
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6 Capacity tables

6 - 2 Cooling/Heating Capacity Tables

EWWD190-380G-XS

Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C)
qwe: Fluid flow rate at evaporator; dpwe: Fluid pressure drop at evaporator
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser

	Condenser inlet air temperature	Twout																						
		11							13							15								
		CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc		
Size	Ta	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa		
190	30	220	36.7	10.5	31	256	12.3	19	234	37.1	11.2	35	270	13	21	249	37.6	12.0	39	286	13.8	24		
	35	211	41.6	10.1	29	252	12.1	19	224	42.1	10.8	32	266	12.8	21	239	42.6	11.5	36	281	13.5	23		
	40	202	46.6	9.7	27	248	12	18	215	47.2	10.3	30	262	12.6	20	229	47.8	11.0	33	276	13.3	22		
	45	193	52	9.2	24	244	11.8	18	205	52.7	9.9	28	257	12.5	20	219	53.4	10.5	31	271	13.1	22		
	50	183	57.8	8.8	22	240	11.7	18	195	58.5	9.4	25	253	12.3	19	208	59.3	10.0	28	267	12.9	21		
	55																							
230	30	264	45	12.7	42	308	14.8	23	281	45.6	13.5	48	326	15.7	25	299	46.2	14.4	53	344	16.6	28		
	35	253	50.7	12.1	39	303	14.6	22	270	51.4	13.0	44	320	15.4	24	287	52.1	13.8	49	338	16.3	27		
	40	242	56.8	11.6	36	298	14.4	22	258	57.6	12.4	41	315	15.2	24	275	58.4	13.2	46	332	16.1	26		
	45	230	63.3	11.0	33	293	14.2	21	246	64.1	11.8	37	309	15	23	262	65.1	12.6	42	326	15.8	25		
	50	219	70.2	10.5	30	289	14	20	233	71.1	11.2	34	304	14.7	22	249	72.1	12.0	38	320	15.5	25		
	55																							
280	30	328	55.8	15.7	42	383	18.4	28	349	56.7	16.8	47	405	19.5	31	371	57.6	17.8	52	427	20.6	34		
	35	315	62.8	15.1	39	377	18.2	27	335	63.8	16.1	43	398	19.2	30	356	64.9	17.1	48	420	20.2	33		
	40	301	70.3	14.4	36	370	17.9	26	321	71.4	15.4	40	391	18.9	29	341	72.6	16.4	45	413	19.9	32		
	45	287	78.3	13.7	33	364	17.6	26	306	79.4	14.7	37	384	18.6	28	326	80.6	15.7	41	405	19.6	31		
	50	272	86.8	13.0	30	358	17.3	25	290	87.9	13.9	33	377	18.3	27	309	89.2	14.9	37	397	19.3	30		
	55																							
320	30	362	67.6	17.4	50	428	20.6	34	385	68.8	18.5	56	453	21.8	37	409	70.1	19.7	63	478	23	41		
	35	348	75.9	16.7	46	422	20.4	33	370	77.2	17.8	52	446	21.5	36	393	78.7	18.9	58	470	22.7	40		
	40	333	84.7	16.0	43	416	20.1	32	354	86.2	17.0	48	439	21.2	35	376	87.7	18.1	54	462	22.3	39		
	45	317	94.1	15.2	39	410	19.8	31	337	95.7	16.2	44	432	20.9	35	359	97.3	17.2	49	455	22	38		
	50	300	104	14.4	36	403	19.6	31	320	106	15.4	40	425	20.6	34	341	108	16.4	45	447	21.7	37		
	55																							
380	30	434	73.5	20.8	38	507	12.2 12.2	18 18	462	74.4	22.2	42	535	12.9 12.9	20 20	492	75.3	23.6	48	566	13.6 13.6	22 22		
	35	417	83.1	20.0	35	499	12.0 12.0	18 18	444	84.1	21.3	39	527	12.7 12.7	20 20	472	85.2	22.7	44	556	13.4 13.4	22 22		
	40	398	93.2	19.1	32	490	11.8 11.8	18 18	425	94.4	20.4	36	518	12.5 12.5	19 19	452	95.7	21.7	41	547	13.2 13.2	21 21		
	45	380	104	18.2	30	482	11.7 11.7	17 17	405	105	19.4	34	510	12.3 12.3	19 19	432	107	20.8	38	538	13.0 13.0	21 21		
	50	360	116	17.3	27	475	11.5 11.5	17 17	385	117	18.5	31	501	12.1 12.1	18 18	411	118	19.7	34	529	12.8 12.8	20 20		
	55																							

NOTES - ANMERKUNGEN - Σημειώσεις - NOTAS - REMARQUES - NOTE - OPMERKINGEN - примечания

1 Fluid: Water
Fluid: Wasser
Υγρό: Νερό
Líquido: agua
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SRC_1-2_Rev.01_2_(2-4)

6 Capacity tables

6 - 2 Cooling/Heating Capacity Tables

EWWD400-650G-XS

Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C)
qwe: Fluid flow rate at evaporator; dpwe: Fluid pressure drop at evaporator
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser

	Condenser inlet air temperature	Twout																						
		5							7							9								
		CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc
Size	Ta	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa
400	30	398	77.9	19.0	20	475	10.4 12.4	14 14	425	78.8	20.3	23	503	11.0 13.2	15 15	453	79.7	21.7	25	532	11.7 13.9	17 17
	35	381	88	18.2	19	468	10.3 12.3	14 14	407	89	19.5	21	495	10.9 13.0	15 15	435	90.1	20.8	24	524	11.5 13.7	17 17
	40	364	98.7	17.4	17	462	10.2 12.1	13 13	389	99.9	18.6	19	488	10.8 12.8	15 15	416	101	19.9	22	516	11.4 13.5	16 16
	45	347	110	16.5	16	456	10.1 12.0	13 13	370	112	17.7	18	481	10.6 12.6	15 14	396	113	18.9	20	508	11.2 13.4	16 16
	50	328	123	15.7	14	451	10.0 11.9	13 13	352	124	16.8	16	475	10.5 12.5	14 14	376	126	18.0	18	500	11.1 13.2	16 16
	55	309	137	14.8	13	445	9.9 11.7	13 13	332	138	15.9	14	469	10.4 12.4	14 14	355	139	17.0	16	493	10.9 13.0	15 15
460	30	432	85	20.7	23	517	12.4 12.4	14 14	463	86	22.1	26	547	13.2 13.2	15 15	494	87.1	23.6	30	580	13.9 13.9	17 17
	35	414	95.9	19.8	22	509	12.3 12.3	14 14	443	97	21.2	24	539	13.0 13.0	15 15	473	98.3	22.7	28	571	13.8 13.8	17 17
	40	396	108	18.9	20	502	12.1 12.1	13 13	423	109	20.2	22	531	12.8 12.8	15 15	452	110	21.7	25	562	13.6 13.6	16 16
	45	377	120	18.0	18	496	12.0 12.0	13 13	403	122	19.2	20	523	12.7 12.7	14 14	431	123	20.6	23	553	13.4 13.4	16 16
	50	357	134	17.0	16	490	11.9 11.9	13 13	382	135	18.3	19	517	12.5 12.5	14 14	408	137	19.5	21	544	13.2 13.2	16 16
	55	336	149	16.0	15	484	11.8 11.8	13 13	360	150	17.2	17	509	12.4 12.4	14 14	385	152	18.4	19	536	13.0 13.0	15 15
500	30	483	94	23.1	32	576	12.6 15.1	14 13	516	95.1	24.7	36	610	13.3 16.0	15 14	551	96.3	26.4	40	646	14.1 17.0	17 15
	35	463	106	22.1	29	568	12.4 14.9	14 12	495	107	23.7	33	601	13.2 15.8	15 14	528	109	25.3	37	636	13.9 16.7	17 15
	40	442	119	21.1	27	560	12.3 14.8	13 12	473	120	22.6	30	592	13.0 15.6	15 13	505	122	24.2	34	626	13.7 16.5	16 15
	45	421	133	20.1	25	553	12.2 14.6	13 12	450	134	21.5	28	584	12.8 15.4	14 13	481	136	23.1	32	616	13.5 16.3	16 14
	50	399	148	19.0	22	546	12.0 14.4	13 12	427	150	20.4	25	576	12.7 15.2	14 13	457	151	21.9	29	607	13.3 16.1	16 14
	55	375	164	17.9	20	539	11.9 14.3	13 11	402	166	19.2	23	567	12.5 15.0	14 13	431	167	20.6	26	598	13.2 15.9	15 14
550	30	527	103	25.2	37	629	15.1 15.1	13 13	562	104	26.9	42	665	16.0 16.0	14 14	600	105	28.8	47	704	16.9 16.9	15 15
	35	505	116	24.1	34	620	14.9 14.9	12 12	539	117	25.8	39	656	15.8 15.8	14 14	576	119	27.6	44	694	16.7 16.7	15 15
	40	483	130	23.1	32	612	14.8 14.8	12 12	516	132	24.7	36	647	15.6 15.6	13 13	551	133	26.4	40	683	16.5 16.5	15 15
	45	459	145	21.9	29	604	14.6 14.6	12 12	492	147	23.5	33	638	15.4 15.4	13 13	526	149	25.2	37	673	16.3 16.3	14 14
	50	435	162	20.8	26	596	14.4 14.4	12 12	466	164	22.3	30	629	15.2 15.2	13 13	499	165	23.9	34	663	16.1 16.1	14 14
	55	409	180	19.5	23	588	14.3 14.3	11 12	439	181	21.0	27	619	15.0 15.0	13 13	471	183	22.5	30	653	15.9 15.9	14 14
650	30	588	124	28.1	45	710	17.1 17.1	15 15	627	125	30.1	50	751	18.1 18.1	17 17	669	127	32.1	57	794	19.1 19.1	19 19
	35	563	139	26.9	41	701	16.9 16.9	15 15	602	141	28.8	47	742	17.9 17.9	17 17	642	143	30.8	53	784	18.9 18.9	18 18
	40	538	156	25.7	38	693	16.7 16.7	15 15	575	158	27.5	43	732	17.7 17.7	16 16	614	160	29.5	49	773	18.7 18.7	18 18
	45	512	174	24.5	35	686	16.6 16.6	15 15	548	176	26.2	39	723	17.5 17.5	16 16	586	179	28.1	44	763	18.5 18.5	18 18
	50	485	194	23.2	32	678	16.4 16.4	14 14	520	196	24.9	36	715	17.3 17.3	16 16	556	198	26.6	40	753	18.2 18.2	17 17
	55	456	216	21.8	28	671	16.3 16.3	14 14	490	218	23.4	32	706	17.1 17.1	15 15	524	220	25.1	36	742	18.0 18.0	17 17

NOTES - ANMERKUNGEN - Σημειώσεις - NOTAS - REMARQUES - NOTE - OPMERKINGEN - примечания

1 Fluid: Water
Fluid: Wasser
Υγρό: Νερό
Líquido: agua
Liquide: Eau
Fluido: Acqua
Vloeistof: Water
Жидкость: Вода

2 For working conditions where dpw values are in italic, please contact factory.
Für Arbeitsbedingungen mit kursiv gedruckten dpw-Werten, wenden Sie sich bitte an den Hersteller.
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SRC_1-2_Rev.01_2_(3-4)

6 Capacity tables

6 - 2 Cooling/Heating Capacity Tables

EWWD400-650G-XS

Twe: Evaporator leaving water temperature (Δt 5°C); Twc: Condenser leaving water temperature (Δt 5°C)
qwe: Fluid flow rate at evaporator; dpwe: Fluid pressure drop at evaporator
HC: Heat capacity at condenser; qwc: Fluid flow rate at condenser; dpwc: Fluid pressure drop at condenser

	Condenser inlet air temperature	Twout																						
		11							13							15								
		CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc	CC	PI	qwe	dpwe	HC	qwc	dpwc		
Size	Ta	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa	kW	kW	l/s	kPa	kW	l/s	kPa		
400	30	483	80.6	23.1	29	562	12.3 14.7	19 19	515	81.5	24.7	32	595	13.1 15.6	21 21	548	82.4	26.3	36	629	13.8 16.5	23 23		
	35	463	91.1	22.2	27	553	12.2 14.5	18 18	494	92.2	23.7	30	585	12.9 15.3	20 20	526	93.4	25.2	33	618	13.6 16.2	22 22		
	40	443	102	21.2	24	545	12.0 14.3	18 18	473	104	22.7	28	575	12.7 15.1	20 20	504	105	24.2	31	607	13.4 15.9	22 22		
	45	423	114	20.3	22	536	11.8 14.1	18 18	451	116	21.6	25	565	12.5 14.9	19 19	481	117	23.1	28	596	13.2 15.7	21 21		
	50	402	127	19.2	20	527	11.7 13.9	17 17	429	128	20.6	23	556	12.3 14.7	19 19	457	130	21.9	26	586	12.9 15.4	21 21		
	55																							
460	30	526	88.1	25.2	33	613	14.7 14.7	19 19	560	89.1	26.9	37	648	15.6 15.6	21 21	596	90.1	28.6	42	684	16.5 16.5	23 23		
	35	505	99.5	24.2	31	603	14.5 14.5	18 18	537	101	25.8	35	637	15.3 15.3	20 20	572	102	27.5	39	673	16.2 16.2	22 22		
	40	483	112	23.1	29	594	14.3 14.3	18 18	515	113	24.7	32	626	15.1 15.1	20 20	548	115	26.3	36	661	16.0 16.0	22 22		
	45	460	125	22.1	26	584	14.1 14.1	18 18	491	126	23.6	29	616	14.9 14.9	19 19	523	128	25.1	33	649	15.7 15.7	21 21		
	50	437	138	20.9	24	574	13.9 13.9	17 17	467	140	22.4	27	605	14.7 14.7	19 19	497	142	23.9	30	638	15.5 15.5	21 21		
	55																							
500	30	587	97.5	28.1	45	683	14.9 17.9	19 17	624	98.7	30.0	51	722	15.8 18.9	21 19	664	99.8	31.9	56	762	16.7 20.0	23 21		
	35	563	110	27.0	42	672	14.7 17.7	18 17	600	111	28.8	47	710	15.5 18.7	20 18	638	113	30.7	53	749	16.4 19.7	22 20		
	40	539	123	25.9	39	662	14.5 17.4	18 16	575	125	27.6	43	698	15.3 18.4	20 18	612	127	29.4	49	737	16.2 19.4	22 20		
	45	514	138	24.7	36	651	14.3 17.2	18 16	549	139	26.3	40	687	15.1 18.1	19 17	584	141	28.1	45	724	15.9 19.1	21 19		
	50	488	153	23.4	32	640	14.1 16.9	17 15	521	155	25.0	36	675	14.8 17.9	19 17	556	157	26.7	41	711	15.6 18.8	21 19		
	55																							
550	30	639	107	30.7	53	745	17.9 17.9	17 17	680	108	32.7	59	787	18.9 18.9	19 19	723	109	34.8	66	830	20.0 20.0	21 21		
	35	614	120	29.5	49	733	17.7 17.7	17 17	654	122	31.4	55	774	18.7 18.7	18 18	695	124	33.4	61	817	19.7 19.7	20 20		
	40	588	135	28.2	45	722	17.4 17.4	16 16	627	137	30.1	51	762	18.4 18.4	18 18	667	139	32.1	57	804	19.4 19.4	20 20		
	45	561	151	26.9	42	710	17.2 17.2	16 16	598	152	28.7	47	749	18.1 18.1	17 17	637	154	30.6	53	790	19.1 19.1	19 19		
	50	533	167	25.5	38	699	16.9 16.9	15 15	569	169	27.3	43	737	17.8 17.8	17 17	606	171	29.1	48	776	18.8 18.8	19 19		
	55																							
650	30	712	129	34.2	63	839	20.2 20.2	21 21	756	131	36.4	71	885	21.3 21.3	23 23	803	132	38.6	79	933	22.4 22.4	25 25		
	35	684	145	32.8	59	827	19.9 19.9	20 20	727	147	35.0	66	873	21.0 21.0	22 22	772	149	37.2	74	919	22.2 22.2	24 24		
	40	655	162	31.4	55	816	19.7 19.7	20 20	697	165	33.5	61	860	20.8 20.8	22 22	741	167	35.7	68	906	21.9 21.9	24 24		
	45	625	181	30.0	50	804	19.5 19.5	19 19	666	183	32.0	56	848	20.5 20.5	21 21	708	186	34.1	63	892	21.6 21.6	23 23		
	50	594	201	28.5	46	793	19.2 19.2	19 19	633	203	30.4	51	835	20.2 20.2	21 21	674	206	32.4	58	878	21.3 21.3	23 23		
	55																							

NOTES - ANMERKUNGEN - Σημειώσεις - NOTAS - REMARQUES - NOTE - OPMERKINGEN - примечания

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SRC_1-2_Rev.01_2_(4-4)

6 Capacity tables

6 - 3 Partial Heat Recovery Capacity tables

Partial Heat Recovery Ratings

EWWD~G-SS	EWWD~G-XS	Leaving desuper-heater water temp.°C	Leaving Condenser Water Temperature (°C)				
			35	40	45	50	55
			Hc (kW)	Hc (kW)	Hc (kW)	Hc (kW)	Hc (kW)
170	190	**45**	21.0	22.0	23.0	24.0	25.0
		50	10.0	18.0	22.0	23.0	24.0
		55	6.00	11.0	17.0	20.0	21.0
210	230	**45**	22.0	29.0	30.0	31.0	32.0
		50	17.0	23.0	28.0	29.0	30.0
		55	10.0	16.0	24.0	26.0	27.0
260	280	**45**	35.0	36.0	37.0	38.0	39.0
		50	28.0	34.0	35.0	36.0	37.0
		55	19.0	30.0	31.0	32.0	33.0
300	320	**45**	48.0	43.0	44.0	45.0	46.0
		50	39.0	45.0	42.0	43.0	44.0
		55	28.0	44.0	38.0	38.0	39.0
320	380	**45**	42.0	44.0	46.0	48.0	50.0
		50	20.0	36.0	44.0	46.0	48.0
		55	12.0	22.0	34.0	40.0	42.0
380	400	**45**	43.0	51.0	53.0	55.0	57.0
		50	27.0	41.0	50.0	52.0	54.0
		55	16.0	27.0	41.0	46.0	48.0
420	460	**45**	44.0	58.0	60.0	62.0	64.0
		50	34.0	46.0	56.0	58.0	60.0
		55	20.0	32.0	48.0	52.0	54.0
460	500	**45**	57.0	65.0	67.0	69.0	71.0
		50	45.0	57.0	63.0	65.0	67.0
		55	29.0	46.0	55.0	58.0	60.0
500	550	**45**	70.0	72.0	74.0	76.0	78.0
		50	56.0	68.0	70.0	72.0	74.0
		55	38.0	60.0	62.0	64.0	66.0
600	650	**45**	96.0	86.0	88.0	90.0	92.0
		50	78.0	90.0	84.0	86.0	88.0
		55	56.0	88.0	76.0	76.0	78.0

NOTES

Leaving Evaporator Water Temperature 7°C. ΔT 5°C; ΔT Condenser Water Temperature 5°C
Hc (heating heat recovery capacity)

OPT_1-2-3-4-5-6_Rev.00_3

6 Capacity tables

6 - 4 Total Heat Recovery Capacity Tables

Total Heat Recovery Ratings
EWWD190~380G-XS

Size	ELWT (°C)	Heat Recovery Water Temperature (°C)											
		30/35			35/40			40/45			45/50		
		Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)
190	4	167	37.1	204	160	41.9	202	152	47.0	199	144	52.6	197
	5	173	37.2	210	165	42.0	207	157	47.2	205	149	52.8	202
	6	179	37.3	216	171	42.2	213	163	47.4	210	155	53.0	208
	7	185	37.4	222	177	42.3	219	169	47.5	216	160	53.1	213
	8	191	37.5	229	183	42.5	225	174	47.7	222	166	53.3	219
	9	197	37.6	235	189	42.6	232	180	47.9	228	172	53.5	225
230	4	201	44.6	245	192	50.4	242	183	56.6	239	173	63.2	236
	5	208	44.8	253	199	50.6	249	189	56.8	246	180	63.4	243
	6	215	44.9	260	206	50.7	256	196	57.0	253	186	63.7	250
	7	222	45.1	267	212	50.9	263	203	57.2	260	192	63.9	256
	8	229	45.2	274	220	51.1	271	210	57.4	267	199	64.1	263
	9	237	45.3	282	227	51.3	278	217	57.6	274	206	64.4	270
280	4	249	54.7	304	238	61.7	300	227	69.3	296	215	77.4	292
	5	257	54.9	312	246	62.0	308	235	69.5	304	222	77.7	300
	6	266	55.1	321	255	62.2	317	243	69.8	313	230	78.0	308
	7	275	55.3	330	263	62.5	326	251	70.1	321	238	78.3	317
	8	284	55.5	340	272	62.7	335	260	70.4	330	247	78.6	325
	9	293	55.7	349	281	63.0	344	268	70.7	339	255	78.9	334
320	4	287	64.6	352	275	70.1	345	262	76.3	338	248	83.4	332
	5	297	65.5	362	284	71.0	355	271	77.1	348	257	84.1	341
	6	307	66.5	373	294	71.8	365	280	78.0	358	266	84.9	351
	7	317	67.5	384	303	72.8	376	289	78.8	368	275	85.7	361
	8	327	68.5	395	313	73.7	387	299	79.7	379	284	86.6	371
	9	337	69.5	407	323	74.7	398	309	80.7	390	294	87.5	381
380	4	328	74.1	403	314	83.7	398	299	93.9	393	284	105	389
	5	340	74.3	414	325	83.9	409	310	94.3	404	294	105	399
	6	351	74.5	426	336	84.2	420	320	94.6	415	304	106	410
	7	363	74.7	438	347	84.5	432	331	94.9	426	315	106	421
	8	375	74.9	450	359	84.8	444	343	95.2	438	326	107	432
	9	387	75.1	462	371	85.0	456	354	95.6	450	337	107	444

NOTES

Nominal cooling capacity and power input are based on ΔT = 5°C entering/leaving evaporator and heat recovery condenser water temperature; evaporator fouling factor = 0.0176 m² °C/kW; condenser fouling factor = 0.0440 m² °C/kW
Cc (cooling capacity
Pi (unit power input)
Hc (heating heat recovery capacity)

OPT_1-2-3-4-5-6_Rev.00_2 (1-2)

6 Capacity tables

6 - 4 Total Heat Recovery Capacity Tables

Total Heat Recovery Ratings
EWWD400~650G-XS

Size	ELWT (°C)	Heat Recovery Water Temperature (°C)											
		30/35			35/40			40/45			45/50		
		Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)	Cc (kW)	Pi (kW)	Hc (kW)
400	4	366	81.5	448	350	92.0	442	333	103	437	316	116	431
	5	379	81.8	460	362	92.3	454	345	104	449	327	116	443
	6	391	82.0	473	375	92.7	467	357	104	461	339	116	455
	7	404	82.2	487	387	93.0	480	369	104	474	351	117	468
	8	418	82.5	500	400	93.3	494	382	105	487	363	117	480
	9	431	82.7	514	413	93.6	507	395	105	500	376	118	493
460	4	398	88.8	487	381	100	481	363	113	475	344	126	470
	5	412	89.1	501	394	101	494	376	113	489	356	126	483
	6	425	89.4	515	407	101	508	389	113	502	369	127	496
	7	439	89.6	529	421	101	522	402	114	516	382	127	509
	8	454	89.8	544	435	102	536	415	114	529	395	128	522
	9	468	90.1	558	449	102	551	429	115	544	408	128	536
500	4	445	98.1	543	426	111	536	406	124	530	385	139	524
	5	460	98.4	558	440	111	551	420	125	545	398	140	538
	6	475	98.7	574	455	112	567	434	125	560	413	140	553
	7	491	99.0	590	470	112	582	449	126	575	427	141	567
	8	507	99.2	606	486	112	598	464	126	590	442	141	583
	9	523	99.5	623	502	113	615	480	127	606	457	142	598
550	4	485	107	592	464	121	585	443	136	579	420	152	572
	5	501	108	609	480	122	601	458	137	595	435	153	588
	6	518	108	626	496	122	618	474	137	611	450	153	603
	7	535	108	643	513	122	635	490	137	627	466	154	619
	8	552	109	660	529	123	652	506	138	644	482	154	636
	9	569	109	678	546	123	670	523	138	661	498	155	652
650	4	561	126	687	537	137	674	512	149	662	486	163	650
	5	580	128	708	555	139	694	530	151	681	503	165	668
	6	600	130	730	574	140	714	548	152	700	521	166	687
	7	621	132	753	594	142	736	566	154	720	538	168	706
	8	642	134	775	614	144	758	585	156	741	556	169	726
	9	663	136	799	635	146	781	606	157	763	575	171	745

NOTES

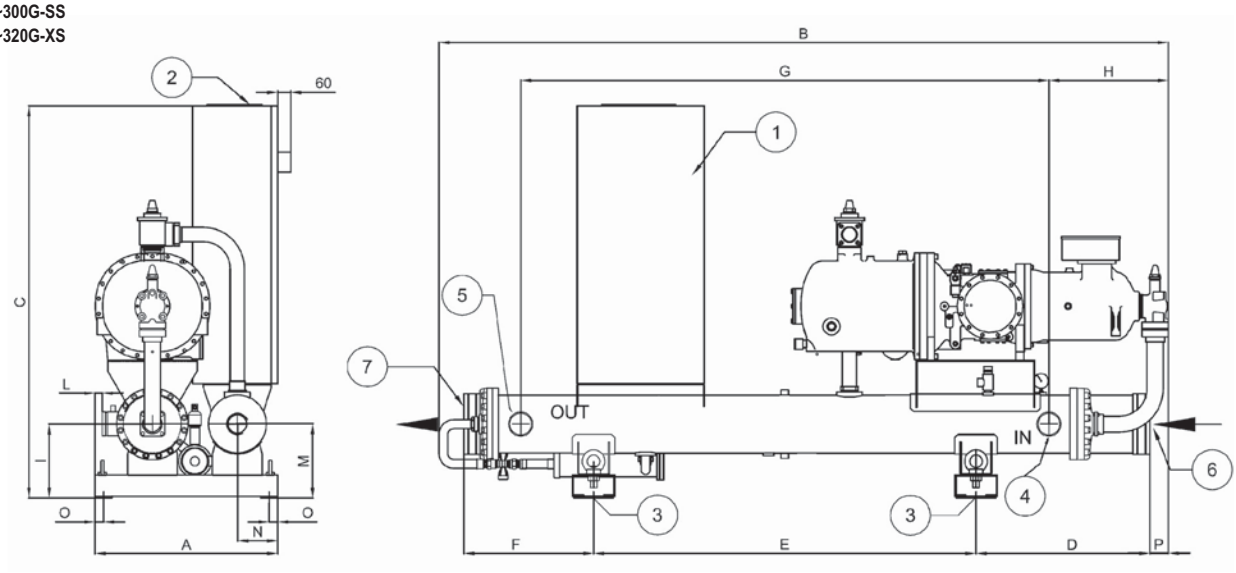
Nominal cooling capacity and power input are based on ΔT = 5°C entering/leaving evaporator and heat recovery condenser water temperature; evaporator fouling factor = 0.0176 m² °C/kW; condenser fouling factor = 0.0440 m² °C/kW
Cc (cooling capacity
Pi (unit power input)
Hc (heating heat recovery capacity)

OPT_1-2-3-4-5-6_Rev.00_2 (2-2)

7 Dimensional drawings

7 - 1 Dimensional Drawings

EWWD170~300G-SS
EWWD190~320G-XS



	Dimensions													
EWWD~G-	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**L**	**M**	**N**	**O**	**P**
170-210G-SS	860	3435	1860	818	1800	610	2526	564	350	77	350	190	40	87
260-300G-SS	860	3435	1860	818	1800	610	2486	564	350	33	350	190	40	87
190-320G-XS	860	3435	1860	850	1800	580	2486	564	350	33	350	190	40	87

LEGEND

1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

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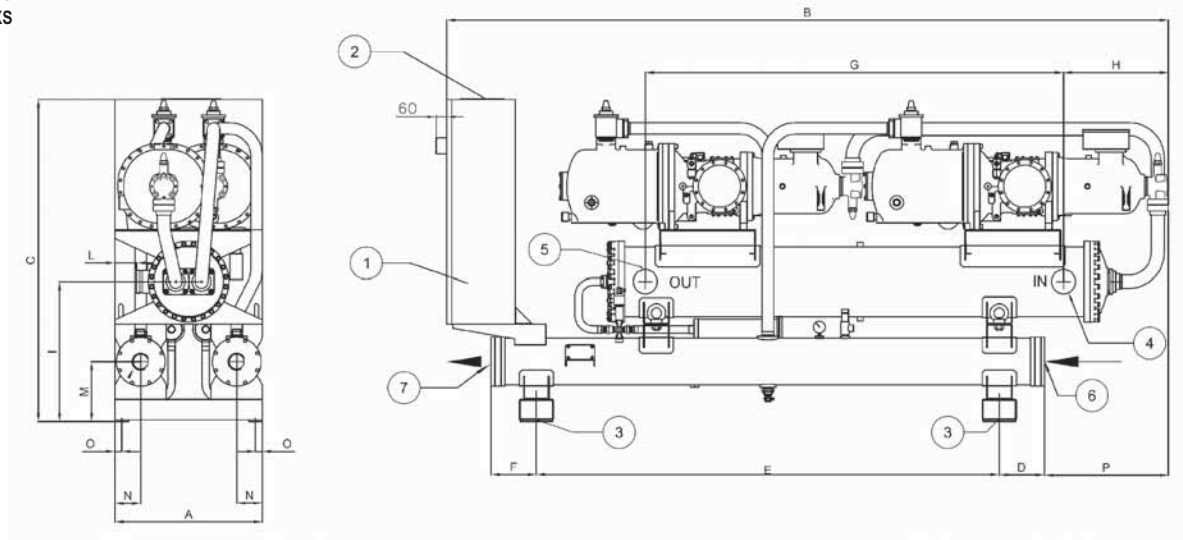
EWWD320~600G-SS
EWWD380~650G-XS



	Dimensions													
EWWD~G-	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**L**	**M**	**N**	**O**	**P**
320-420G-SS	860	4245	1880	264	2700	264	2486	564	815	127	350	190	40	723
460-600G-SS, 380G-XS	860	4245	1880	264	2700	264	2450	582	815	122	350	190	40	723
400-460G-XS	860	4245	1880	264	2700	264	2412	601	815	122	350	190	40	723
500-650G-XS	860	4245	1880	264	2700	264	2412	601	815	110	350	190	40	723

LEGEND

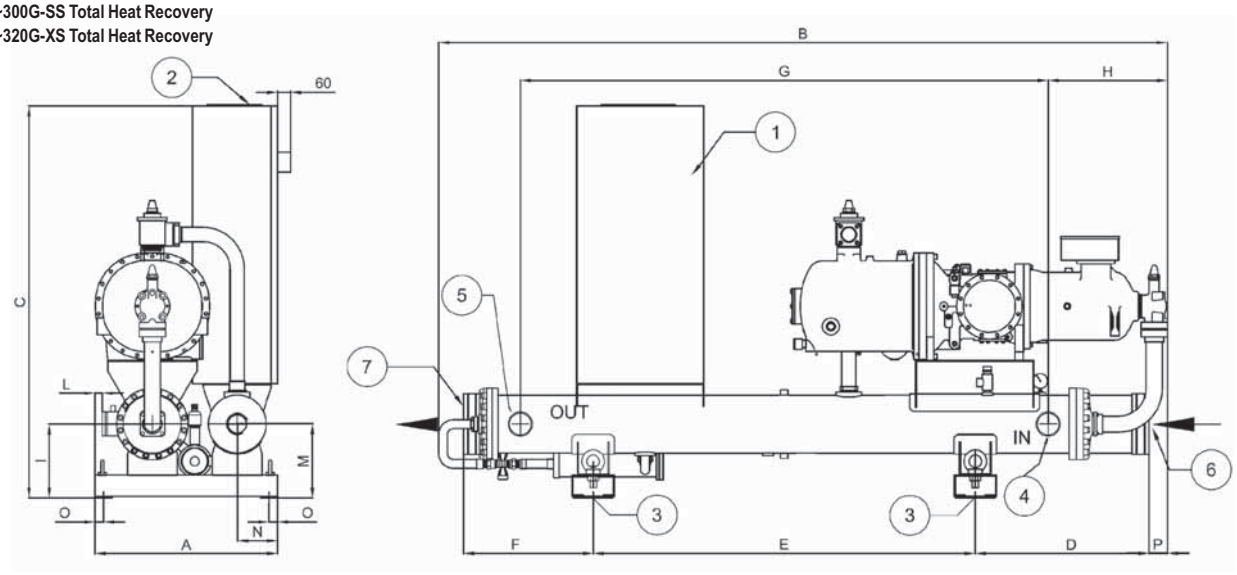
1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

DMN_1-2-3-4-5-6_Rev.00_2

7 Dimensional drawings

7 - 1 Dimensional Drawings

EWWD170~300G-SS Total Heat Recovery
EWWD190~320G-XS Total Heat Recovery



	Dimensions														
EWWD~G-	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
170-210G-SS	860	3435	1860	818	1800	610	2526	554	350	77	350	115	40	87	150
260-300G-SS	860	3435	1860	818	1800	610	2486	554	350	33	350	115	40	87	150
190-320G-XS	860	3435	1860	818	1800	580	2486	554	350	33	350	115	40	87	150

LEGEND

1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

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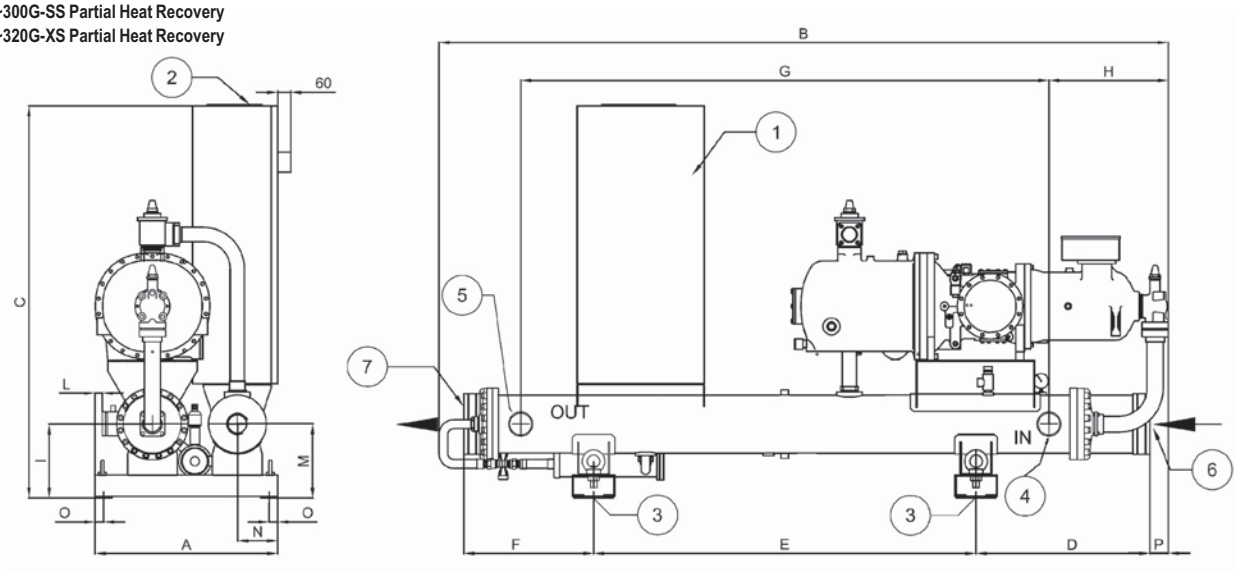
EWWD170~300G-SS Partial Heat Recovery
EWWD190~320G-XS Partial Heat Recovery



	Dimensions													
EWWD~G-	A	B	C	D	E	F	G	H	I	L	M	N	O	P
170-210G-SS	860	3435	1860	818	1800	610	2526	564	350	77	350	190	40	87
260-300G-SS	860	3435	1860	818	1800	610	2486	564	350	33	350	190	40	87
190-320G-XS	860	3435	1860	850	1800	580	2486	564	350	33	350	190	40	57

LEGEND

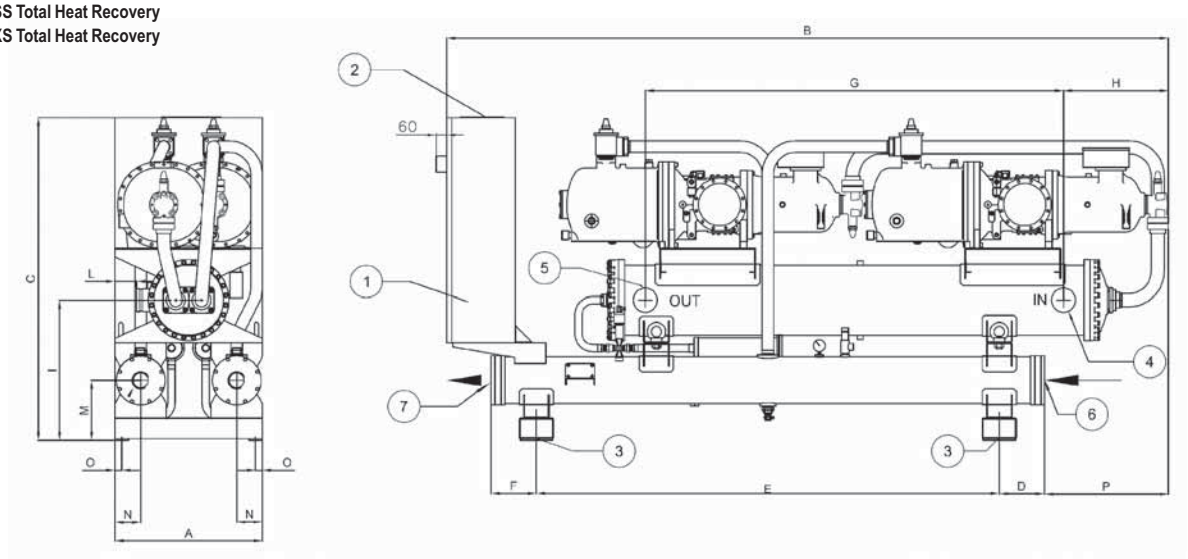
1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

DMN_1-2-3-4-5-6_Rev.00_5

7 Dimensional drawings

7 - 1 Dimensional Drawings

EWWD320~600G-SS Total Heat Recovery
EWWD380~460G-XS Total Heat Recovery



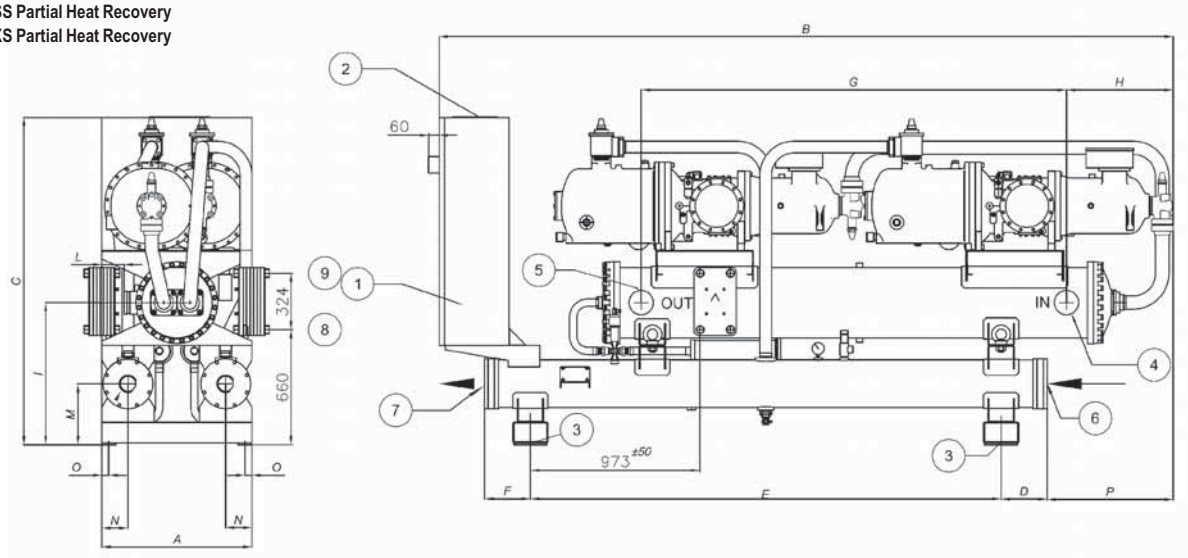
	Dimensions														
EWWD~G-	A	B	C	D	E	F	G	H	I	L	M	N	O	P	Q
320-420G-SS	860	4220	1880	264	2700	264	2486	564	815	127	350	75	40	612	150
460-600G-SS, 380G-XS	860	4220	1880	264	2700	264	2450	582	815	127	350	75	40	612	150
400-460G-XS	1020	4245	1935	264	2700	264	2412	601	815	187	350	110	40	612	200

LEGEND

1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

DMN_1-2-3-4-5-6_Rev.00_4

EWWD320~600G-SS Partial Heat Recovery
EWWD380~650G-XS Partial Heat Recovery



	Dimensions													
EWWD~G-	A	B	C	D	E	F	G	H	I	L	M	N	O	P
320-420G-SS	860	4245	1880	264	2700	264	2486	564	815	127	350	190	40	723
460-600G-SS, 380G-XS	860	4245	1880	264	2700	264	2450	582	815	122	350	190	40	723
400-460G-XS	860	4245	1880	264	2700	264	2412	601	815	122	350	190	40	723
500-650G-XS	860	4245	1880	264	2700	264	2412	601	815	110	350	190	40	723

LEGEND

1 - Electrical Panel
2 - Power connections slot 150x260
3 - Four (4) holes Ø25 for isolator mounting
4 - Evaporator water inlet (Victaulic connection)
5 - Evaporator water outlet (Victaulic connection)
6 - Condenser water inlet connection
7 - Condenser water oulet connection

DMN_1-2-3-4-5-6_Rev.00_6

8 Sound data

8 - 1 Sound Level Data

Noise Level

EWWD~G-SS	EWWD~G-XS	Sound pressure level at 1 m from the unit in semispheric free field (rif. 2 x 10^{-5} Pa)									Power
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)	dB(A)
170	190	58.0	58.0	63.5	68.5	63.0	64.0	53.0	49.5	**69.7**	**87.7**
210	230	58.0	58.0	63.5	68.5	63.0	64.0	53.0	49.5	**69.7**	**87.7**
260	280	58.0	58.0	63.5	68.5	63.0	64.0	53.0	49.5	**69.7**	**87.7**
300	320	58.0	58.0	63.5	68.5	63.0	64.0	53.0	49.5	**69.7**	**87.7**
320	380	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**
380	400	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**
420	460	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**
460	500	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**
500	550	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**
600	650	60.0	60.0	65.5	70.5	65.0	66.0	55.0	51.5	**71.7**	**90.2**

NOTES

Note: The values are according to ISO 3744 and are referred to: evaporator 12/7° C, condenser 30/35° C, full load operation

EWWD~G-SS +OPLN	EWWD~G-XS +OPLN	Sound pressure level at 1 m from the unit in semispheric free field (rif. 2 x 10^{-5} Pa)									Power
		63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz	dB(A)	dB(A)
170	190	55.9	55.2	59.6	63.9	57.7	58.5	47.7	44.2	**64.7**	**82.7**
210	230	55.9	55.2	59.6	63.9	57.7	58.5	47.7	44.2	**64.7**	**82.7**
260	280	55.9	55.2	59.6	63.9	57.7	58.5	47.7	44.2	**64.7**	**82.7**
300	320	55.9	55.2	59.6	63.9	57.7	58.5	47.7	44.2	**64.7**	**82.7**
320	380	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**
380	400	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**
420	460	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**
460	500	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**
500	550	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**
600	650	57.9	57.2	61.6	65.9	59.7	60.5	49.7	46.2	**66.7**	**85.2**

NOTES

Note: The values are according to ISO 3744 and are referred to: evaporator 12/7° C, condenser 30/35° C, full load operation

NSL_1-2_Rev.00_1

8 Sound data

8 - 1 Sound Level Data

Sound pressure reduction values for different distances

EWWD~G-SS	EWWD~G-XS	Distance					
		1m	5m	10m	15m	20m	25m
170	190	0.0	-8.7	-13.7	-16.9	-19.2	-21.1
210	230	0.0	-8.7	-13.7	-16.9	-19.2	-21.1
260	280	0.0	-8.7	-13.7	-16.9	-19.2	-21.1
300	320	0.0	-8.7	-13.7	-16.9	-19.2	-21.1
320	380	0.0	-8.7	-13.7	-16.9	-19.2	-21.1
380	400	0.0	-8.4	-13.4	-16.5	-18.8	-20.6
420	460	0.0	-8.3	-13.3	-16.4	-18.7	-20.5
460	500	0.0	-8.3	-13.3	-16.4	-18.7	-20.5
500	550	0.0	-8.3	-13.3	-16.4	-18.7	-20.5
600	650	0.0	-8.3	-13.3	-16.4	-18.7	-20.5

NOTES

The values are dB(A) (pressure level).

NSL_1-2_Rev.00_2

9 Installation

9 - 1 Installation Method

Installation notes

Warning

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

Handling

The chiller is mounted on heavy wooden skids to protect the unit from accidental damage and to permit easy handling and moving. It is recommended that all moving and handling be performed with the skids under the unit when possible and that the skids not be removed until the unit is in the final location.

If the unit must be hoisted, it is necessary to lift the unit by attaching cables or chains at the lifting holes in the evaporator tube sheets. Spreader bars must be used to protect the control cabinet and the other areas of the chiller.

Location

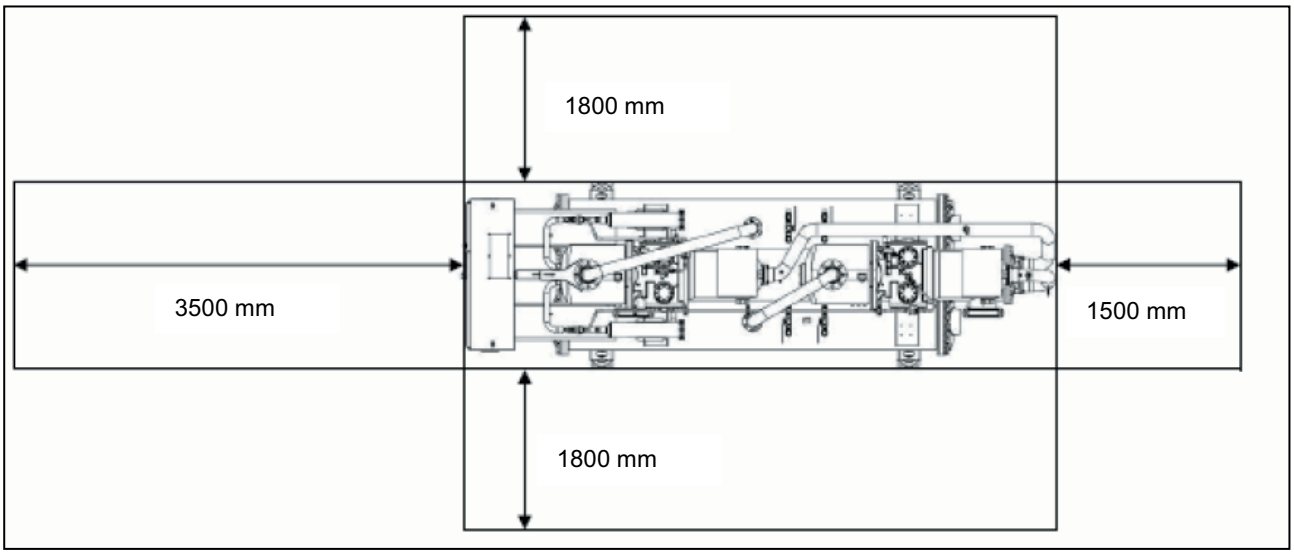
A leveled and sufficiently strong floor is required. If necessary, additional structural members should be provided to transfer the weight of the unit to the nearest beams.

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.

Minimum 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.

Minimum clearance requirements for machine maintenance

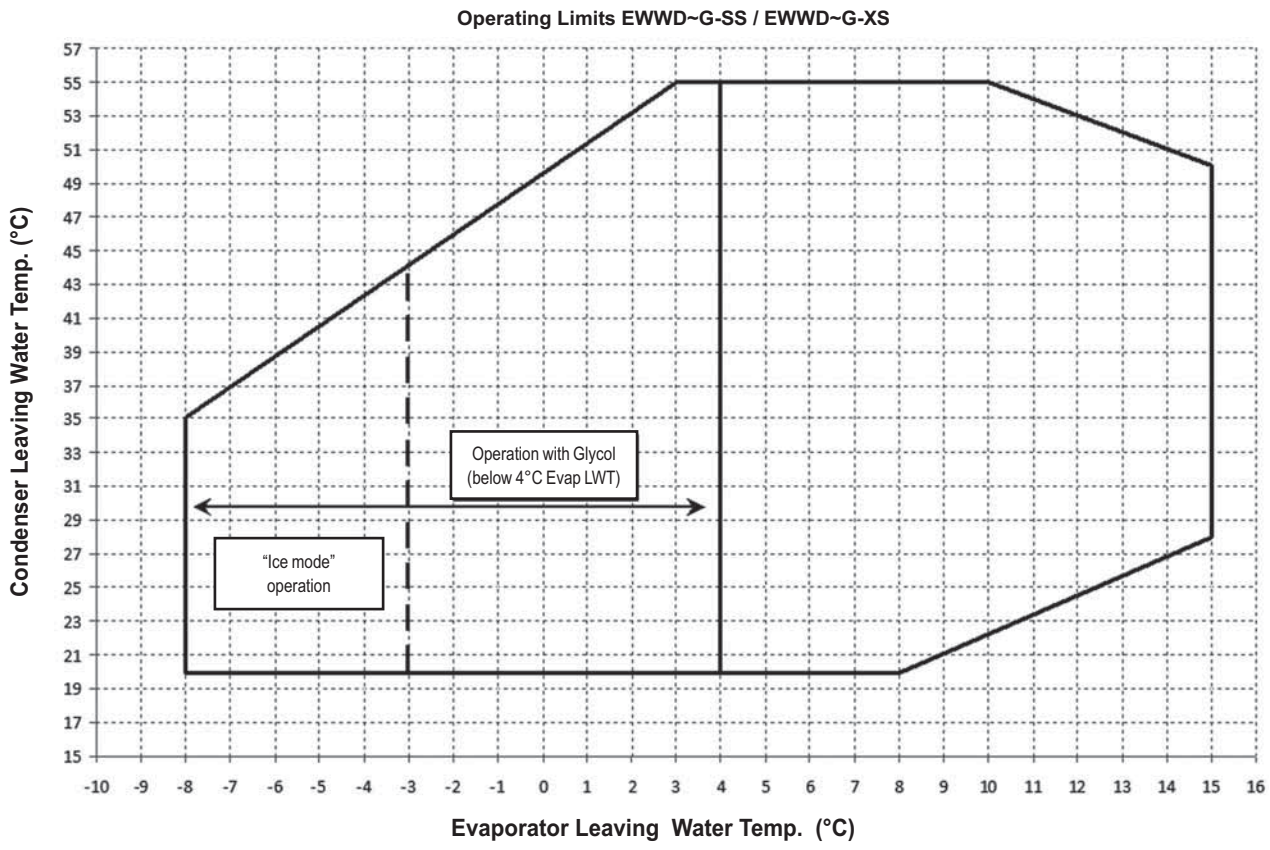


INN_1_Rev.00_1

10 Operation range

10 - 1 Operation Range

EWWD~G-SS / XS



OPL_1-2-3-4-5_Rev.00_1

10 Operation range

10 - 1 Operation Range

Table 1 - Evaporator minimum and maximum water Δt

Max evaporator water Δt	°C	8
Min evaporator water Δt	°C	4
Min condenser water Δt (1 pass, 2 passes, Δt 4÷8°C)	°C	4
Max condenser water Δt (1 pass, 2 passes, Δt 4÷8°C)	°C	8

Table 2 - Evaporator fouling factors

Fouling factors m² °C / kW	Cooling capacity correction factor	Power input correction factor	EER correction factor
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 3 - Condenser fouling factors

Fouling factors m² °C / kW	Cooling capacity correction factor	Power input correction factor	EER correction factor
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 4.1 - Minimum glycol percentage for low water temperature

Evaporator Leaving Water Temperature (°C)	2	0	-2	-4	-6	-8
Ethylene glycol (%)	10	20	20	20	30	30
Propylene glycol (%)	10	20	20	30	30	30

Note: Minimum glycol percentage to be used with evaporator leaving water temperature below 4°C to prevent freezing of water circuit.

Table 4.2 Minimum glycol percentage for low air ambient temperature

Air Ambient Temperature (°C) (2)	-3	-8	-15	-23	-35
Ethylene glycol (%) (1)	10%	20%	30%	40%	50%
Air Ambient Temperature (°C) (2)	-3	-7	-12	-20	-32
Propylene glycol (%) (1)	10%	20%	30%	40%	50%

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

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

Table 5 - Correction factors for low evaporator leaving water temperature

Evaporator Leaving Water Temperature (°C)	2	0	-2	-4	-6	-8
Cooling Capacity	0.842	0.785	0.725	0.670	0.613	0.562
Compressor Power Input	0.950	0.940	0.920	0.890	0.870	0.840

Note: Correction factors have to be applied at working conditions: evaporator leaving water temperature 7°C.

Table 6 - Correction factors for water and glycol mixture

	Ethylene Glycol (%)	10%	20%	30%	40%	50%
Ethylene Glycol	Cooling Capacity	0.991	0.982	0.972	0.961	0.946
	Compressor Power Input	0.996	0.992	0.986	0.976	0.966
	Flow Rate (Δt)	1.013	1.04	1.074	1.121	1.178
	Evaporator Pressure Drop	1.070	1.129	1.181	1.263	1.308
Propylene Glycol	Cooling Capacity	0.985	0.964	0.932	0.889	0.846
	Compressor Power Input	0.993	0.983	0.969	0.948	0.929
	Flow Rate (Δt)	1.017	1.032	1.056	1.092	1.139
	Evaporator Pressure Drop	1.120	1.272	1.496	1.792	2.128

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10 Operation range

10 - 1 Operation Range

How to use the Correction factors proposed in the previous tables

A) Mixture Water and Glycol --- Evaporator leaving water temperature > 4°C

- depending from the type and percentage (%) of glycol filled in the circuit (see table 4.2 and 6)
- multiply the Cooling Capacity, the Compressor Power Input by the Correction factor of Table 6
- starting from this new value of Cooling Capacity, calculate the Flow Rate (l/s) and the Evaporator Pressure Drop (kPa)
- now multiply the new Flow Rate and the new Evaporator Pressure Drop by the Correction Factors of Table 6

Example

Unit Size:	**EWWD170G-SS**
Mixture:	Water
Working condition:	ELWT 12/7°C – CLWT30/35°C
- Cooling capacity:	166 kW
- Power input:	42 kW
- Flow rate (Δt 5°C):	7.91 l/s
- Evaporator pressure drop:	48 kPa
Mixture:	Water + Ethylene Glycol 30% (for a winter air temperature up to -15°C)
Working condition:	ELWT 12/7°C – CLWT 30/35°C
- Cooling capacity:	166 x 0.972 = 161 kW
- Power input:	42 x 0.986 = 41.4 kW
- Flow rate (Δt 5°C):	7.69 (referred to 161 kW) x 1.074 = 8.25 l/s
- Evaporator pressure drop:	52 (referred to 8.25 l/s) x 1.181 =61 kPa

B) Mixture Water and Glycol --- Evaporator leaving water temperature < 4°C

- depending from the type and percentage (%) of glycol filled in the circuit (see table 4.1 and 4.2 and table 6)
- depending from the evaporator leaving water temperature (see table 5)
- multiply the Cooling Capacity, the Compressor Power Input by the Correction factor of Table 5 and Table 6
- starting from this new value of Cooling Capacity, calculate the Flow Rate (l/s) and the Evaporator Pressure Drop (kPa)
- now multiply the new Flow Rate and the new Evaporator Pressure Drop by the Correction Factors of Table 6

Example

Unit Size:	**EWWD170G-SS**
Mixture:	Water
Standard working condition	ELWT 12/7°C – CLWT 35/40°C
- Cooling capacity:	158 kW
- Power input:	47 kW
- Flow rate (Δt 5°C):	7.57 l/s
- Evaporator pressure drop:	44
Mixture:	Water + Glycol 30% (for a low evaporator leaving temperature of -1/-6°C)
Working condition:	ELWT 0/-5°C – CLWT 35/40°C
- Cooling capacity:	158 x 0.670 x 0.972 = 103 kW
- Power input:	47 x 0.890 x 0.986 = 41.2 kW
- Flow rate (Δt 5°C):	4.92 l/s (referred to103 kW) x 1.074 = 5.29 l/s
- Evaporator pressure drop:	23 kPa (referred to 5.29 l/s) x 1.181 = 27kPa

OPL_1-2-3-4-5_Rev.00_3

10 Operation range

10 - 1 Operation Range

Water charge, flow and quality

Items (1) (5)			Cooling Water			Cooled Water		Heated water (2)				Tendency if out of criteria
			Circulating System		Once Flow			Low temperature		High temperature		
			Circulating water	Supply water (4)	Flowing water	Circulating water [Below 20°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	6.0 ~ 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 40	Below 30	Below 30	Below 30	Below 30	Below 30	Corrosion + Scale
		(µS/cm) at 25°C	(Below 800)	(Below 300)	(Below 400)	(Below 400)	(Below 300)	(Below 300)	(Below 300)	(Below 300)	(Below 300)	Corrosion + Scale
	Chloride ion	[mgCl^{2}-/l]	Below 200	Below 50	Below 50	Below 50	Below 50	Below 50	Below 50	Below 30	Below 30	Corrosion
	Sulfate ion	[mgSO^{2}-4/l]	Below 200	Below 50	Below 50	Below 50	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 50	Below 50	Below 50	Below 50	Below 50	Below 50	Scale
	Total hardness	[mg$CaCO_3$/l]	Below 200	Below 70	Below 70	Below 70	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
Items to be referred to	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	[mg$NH+_4$/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

NOTES

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.

OPL_1-2-3-4-5_Rev.00_4

10 Operation range

10 - 1 Operation Range

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, it has 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 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 ΔT(°C) + 3.0825) x P(kW)

For 3 compressors unit
M (liters) = (0.0443 x ΔT(°C) + 1.6202) 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.

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11 Hydraulic performance

11 - 1 Water Pressure Drop Curve Evaporator/Condenser

Evaporating Pressure Drops

EWWD~G-SS

Size	170	210	260	300	320	380	420	460	500	600
Cooling Capacity (kW)	166	201	253	280	334	372	403	448	494	556
Water Flow (l/s) - Evaporator	7.93	9.60	12.1	13.4	16.0	17.8	19.3	21.4	23.6	26.6
Evaporator Pressure Drops (kPa)	48	69	43	53	64	63	72	54	54	68
Water Flow (l/s) - Condenser	9.95	12.0	15.2	17.0	20.0	22.2	24.1	26.9	29.8	33.7
Condenser Pressure Drops (kPa)	39	41	63	77	40	41	41	50	60	75

Water flow and pressure drop referred to nominal condition: evaporator water in/out: 12/7°C – condenser water in/out: 30/35°C

EWWD~G-XS

Size	190	230	280	320	380	400	460	500	550	650
Cooling Capacity (kW)	186	223	277	307	366	408	444	496	541	604
Water Flow (l/s) - Evaporator	8.89	10.7	13.2	14.7	17.5	19.5	21.2	23.7	25.8	28.9
Evaporator Pressure Drops (kPa)	25	35	35	44	30	24	28	39	46	57
Water Flow (l/s) - Condenser	10.8	13.0	16.1	18.1	21.3	23.7	25.8	28.7	31.3	35.4
Condenser Pressure Drops (kPa)	17	20	25	28	17	17	17	16	15	19

Water flow and pressure drop referred to nominal condition: evaporator water in/out: 12/7°C – condenser water in/out: 30/35°C

EPD_1-2_Rev.00_1

Evaporator and Condenser Pressure Drops

To determinate the evaporator or condenser pressure drop for different versions or at different working condition, please refer to the following formula:

$$PD_2\ (kPa) = PD_1\ (kPa) \times \left(\frac{Q_2\ (l/s)}{Q_1\ (l/s)} \right)^{1.8}$$

where:

PD_2 Pressure drop to be determinated (kPa)
PD_1 Pressure drop at nominal condition (kPa)
Q_2 water flow at new working condition (l/s)
Q_1 water flow at nominal condition (l/s)

How to use the formula: Example (evaporator)

The unit EWWD170G-SS has been selected for working at the following conditions:
- evaporator water in/out: 11/6°C
- condenser water in/out: 28/33°C

The cooling capacity at these working conditions is: 163 kW
The water flow at these working conditions is: 9.71 l/s

The unit EWWD170G-SS at nominal working conditions has the following data:
- evaporator water in/out: 12/7°C
- condenser water in/out: 30/35°C

The cooling capacity at these working conditions is: 166 kW
The water flow at these working conditions is: 7.90 l/s
The pressure drop at these working conditions is: 48 kPa

The evaporator pressure drop at the selected working condition will be:

$$PD_2\ (kPa) = 48\ (kPa) \times \left(\frac{7.80\ (l/s)}{7.91\ (l/s)} \right)^{1.8}$$

$$PD_2\ (kPa) = 47\ (kPa)$$

NOTE - Important
If the calculated evaporator water pressure drop is below 10 kPa or above 100 kPa please contact the factory for dedicated evaporator.

EPD_1-2_Rev.00_2

11 Hydraulic performance

11 - 2 Partial Heat Recovery Pressure Drop

Partial Heat Recovery pressure drops

EWWD~G-SS	170	200	250	280	330	370	400	450	490	560
EWWD~G-XS	**190**	**220**	**280**	**310**	**370**	**410**	**440**	**500**	**540**	**600**
Heating Capacity (kW)	21	22	35	48	42	43	44	57	70	96
Water Flow (l/s)	1.00	1.05	1.7	2.3	2.0	2.1	2.1	2.7	3.3	4.6
Heat Recovery Pressure Drops (kPa)	2	1	2	3	2	1	1	1	2	3

NOTES

Water flow and pressure drop referred to nominal codition: evaporator water in/out: 12/7°C – condenser water in/out:30/35°C – water heat recovery in/out 40/45°C

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11 Hydraulic performance

11 - 3 Total Heat Recovery Pressure Drop

Total Heat Recovery pressure drops

EWWD~G-SS

EWWD~G-SS	170	200	250	280	330	370	400	450	490	560
Heating Capacity (kW)	201	244	307	351	404	450	487	545	603	691
Water Flow (l/s)	9.58	11.63	14.7	16.8	19.3	21.5	23.3	26.0	28.8	33.0
Heat Recovery Pressure Drops (kPa)	36	39	59	76	37	39	38	47	56	72

NOTES

Water flow and pressure drop referred to nominal codition: evaporator water in/out: 12/7°C – condenser water in/out:30/35°C – water heat recovery in/out 40/45°C

EWWD~G-XS

EWWD~G-XS	190	220	280	310	370	410	440	500	540	600
Heating Capacity (kW)	216	260	321	368	426	474	516	575	627	720
Water Flow (l/s)	10.32	12.4	15.4	17.6	20.4	22.6	24.6	27.5	30.0	34.4
Heat Recovery Pressure Drops (kPa)	16	18	23	29	15	16	15	15	14	18

NOTES

Water flow and pressure drop referred to nominal codition: evaporator water in/out: 12/7°C – condenser water in/out:30/35°C – water heat recovery in/out 40/45°C

OPT_1-2-3-4-5-6_Rev.00_4

Total and Partial Heat Recovery Pressure Drops

To determinate the pressure drop for different versions or at different working condition, please refer to the following formula:

$$PD_2\ (kPa) = PD_1\ (kPa) \times \left(\frac{Q_2\ (l/s)}{Q_1\ (l/s)} \right)^{1.80}$$

where:

PD_2 Pressure drop to be determinate (kPa)
PD_1 Pressure drop at nominal condition (kPa)
Q_2 water flow at new working condition (l/s)
Q_1 water flow at nominal condition (l/s)

How to use the formula: Example

The unit EWWD170G-SS has been selected for working at the following conditions:
- evaporator water in/out: 12/7°C
- condenser water in/out: 30/35°C
- Partial heat recovery leaving water temperature 45/50°C

The heating capacity at these working conditions is: 10 kW
The water flow at these working conditions is: 0.48 l/s

The unit EWWD170G-SS at nominal working conditions has the following data:
- evaporator water in/out: 12/7°C
- condenser water in/out: 30/35°C
- Partial heat recovery leaving water temperature 40/45°C

The heating capacity at these working conditions is: 21 kW
The water flow at these working conditions is: 1.00 l/s
The pressure drop at these working conditions is: 2 kPa

The pressure drop at the selected working condition will be:

$$PD_2\ (kPa) = 2\ (kPa) \times \left(\frac{0.48\ (l/s)}{1.0\ (l/s)} \right)^{1.80}$$

$$PD_2\ (kPa) = 1\ (kPa)$$

OPT_1-2-3-4-5-6_Rev.00_6

12 Specification text

12 - 1 Specification Text

Technical Specification for Water Cooled Screw Chiller

GENERAL

The water cooled screw chiller will be designed and manufactured in accordance with 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 Stds	UNI – EN ISO 9001:2004

The unit will be tested at full load in the factory at the nominal working conditions and water temperatures. Before shipment a full test will be held to avoid any losses.

Chiller will be delivered to the job site completely assembled and charged with right refrigerant and oil quantity.
Comply with the manufacturer instructions for rigging and handling equipment.

The unit will be able to start up and operate as standard at full load and condenser entering fluid temperature from …. °C to …. °C with an evaporator leaving fluid temperature between …. °C and …. °C.

All units published performances have to be certified by **Eurovent**.

REFRIGERANT

Only R-134a will be accepted.

PERFORMANCE

- ✓ Number of water cooled screw chiller: .....
- ✓ Cooling capacity for single water cooled screw chiller: ..... kW
- ✓ Power input for single water cooled screw chiller in cooling mode: ..... kW
- ✓ Shell & tube evaporator entering water temperature in cooling mode: ..... °C
- ✓ Shell & tube evaporator leaving water temperature in cooling mode: ..... °C
- ✓ Shell & tube evaporator water flow: ..... l/s
- ✓ Shell & tube condenser entering water temperature in cooling mode: ..... °C
- ✓ Shell & tube condenser leaving water temperature in cooling mode: ..... °C
- ✓ Shell & tube condenser water flow: ..... l/s
- ✓ The unit should work with electricity in range 400V ±10%, 3ph, 50Hz without neutral and shall only have one power connection point.

UNIT DESCRIPTION

Chiller shall include as standard: 1 or 2 independent refrigerant circuits, semi-hermetic rotary single screw compressors, refrigerant direct expansion shell & tube heat exchangers, R-134a refrigerant, lubrication system, motor starting components, control system and all components necessary for safe and stable unit operation.

NOISE LEVEL AND VIBRATIONS

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

DIMENSIONS

Unit dimensions shall not exceed following indications:

- ✓ unit length ..... mm,
- ✓ unit width ..... mm,
- ✓ unit height ..... mm.

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12 Specification text

12 - 1 Specification Text

CHILLER COMPONENTS

Compressors

- ✓ Semi-hermetic, single-screw type with one main helical rotor meshing with gaterotor. The gaterotor 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, cyclonic type 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.
- ✓ Compressor shall be fully field serviceable. Compressor that must be removed and returned to the factory for service shall be unacceptable.

Cooling capacity control system

- ✓ Each unit will have a microprocessor for the control of compressor slide valve's position and the instantaneous RPM value of the motor.
- ✓ The unit capacity control shall be infinitely modulating, from 100% down to 25% for each circuit (from 100% down to 12.5% of full load for unit with 2 compressors). The chiller shall be capable of stable operation to a minimum of 12.5% of full load without hot gas bypass.
- ✓ Step unloading unacceptable because of evaporator leaving water temperature fluctuation and low unit efficiency at partial load.
- ✓ The system shall stage the unit based on the leaving evaporator water temperature that shall be controlled by a PID (Proportional Integral Derivative) loop.
- ✓ Unit control logic shall to manage frequency level of the compressor electric motor to exactly match plant load request in order to keep constant the set point for delivered chilled water temperature. In this operating condition unit control logic shall modulate electrical frequency level in a range lower and upper the nominal electrical network value fixed at 50 Hz.
- ✓ The microprocessor unit control shall detect conditions that approach protective limits and take self-corrective action prior to an alarm occurring. The system shall automatically reduce chiller capacity when any of the following parameters are outside their normal operating range:
    - o High condenser pressure
    - o Low evaporation refrigerant temperature
    - o High compressor motor amps

Evaporator

- ✓ The units shall be supplied with shell and tubes counter-flow heat exchanger with single refrigerant pass. It will be refrigerant direct expansion type with refrigerant inside the tubes and water outside (shell side). It will include carbon steel tube sheets, with straight copper tubes internally wound for higher efficiencies, expanded on the tube plates.
- ✓ 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.
- ✓ Evaporator is manufactured in accordance to PED approval.

SPC_1-2-3_Rev.00_2

12 Specification text

12 - 1 Specification Text

Condensers

- ✓ Condensers will be shell and cleanable, through-tube type.
- ✓ The unit will have one condenser per circuit.
- ✓ Each condenser shall have a carbon steel and seamless, integrally finned high efficiency copper tubes, roll expanded into heavy carbon steel tube sheets.
- ✓ Water heads shall be removable and include vent and drain plugs.
- ✓ Condensers will come complete with liquid shut-off valve, spring loaded relief valve.

Refrigerant circuit

Each circuit shall include as standard: electronic expansion device piloted by unit's microprocessor control, suction line shut-off valve, replaceable core filter-drier, sight glass with moisture indicator and insulated suction line.

Control panel

- ✓ Field power connection, control interlock terminals, and unit control system should be centrally located in an electric panel (IP 54). Power and starting controls should be separate from safety and operating controls in different compartments of the same panel.
- ✓ Starting shall be Wye-Delta type as standard.
- ✓ Operating and safety controls should include energy saving control; emergency stop switch; overload protection for compressor motor; high and low pressure cut-out switch (for each refrigerant circuit); anti-freeze thermostat; cut-out switch for each compressor.
- ✓ All of the information regarding the unit will be reported on a display and with the internal built-in calendar and clock that will switch the unit ON/OFF during day time all year long.
- ✓ The following features and functions shall be included:

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

Optional High Level Communications Interface

The controller as a minimum shall be capable of providing the data shown in the above list, using the following options:

- RS485 Serial card
- RS232 Serial card
- LonWorks interface to FTT10A Transceiver.
- Bacnet Compatible
- Use of Compass Points (manufactured by North Communications) to allow communications with such as Honeywell, Satchwell, Johnson Controls, Trend etc.

SPC_1-2-3_Rev.00_3

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.

Daikin Europe N.V. participates in the Eurovent Certification programme for Air conditioners (AC), Liquid Chilling Packages (LCP) and Fan coil units (FCU). Check ongoing validity of certificate online: www.eurovent-certification.com or using: www.certiflash.com"

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