

EWLQ-KB

Hydrocube
condenserless chillers

Product manual

Nominal capacity range: 14 - 64 kW
Best performances at full load and part loads
Designed for wide application range and compact footprint
Eurovent certified

Refrigerant: R 410A
Performance according to EN14511-1

CODE	WEB CSS - Rev.10.8
Date	June 2018
waterchiller_c	R1.0.0

Table of content

EWLQ-KB

Features and benefits		2
General characteristics		3
Nomenclature		4
Options		5
Technical specifications performance data		6
Electrical specifications		7
Operating limits		
Operating envelope		8
Water quality		9
Installation notes		10
Piping diagram		13
Technical specification		15

Features and benefits

Daikin condenserless chiller with hermetic scroll compressor and R - 410A refrigerant The Hydrocube range is designed to optimize the energy efficiency, to bring down the operating costs and to reduce its environmental impact. It features high efficiency scroll compressors and plate to plate evaporator heat exchanger with reduced pressure drops and low refrigerant charge.

Flexibility Hydrocube water cooled series meets all the possible request in terms of plant needs for comfort and process applications. Condenserless units are available for chilled water production and expand the flexibility of the series to cope with remote condenser applications.

Wide capacity range The condenserless series covers a wide range of cooling capacities from 14kW up to 64 kW.

Wide operating range The extended operating range allows the unit to work in a wide range operating temperatures (up to 60°C remote condenser temperature). Suitable to brine operation down to -10°C evaporator leaving water temperature (brine option required).

Additional information related to F - GAS Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16th April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006

	Unit model	Refrigerant type	Refrigerant GWP [TCO2/kg]	N. of circuits	Refrigerant Charge per circuit
Single module	EWLQ014KBW1N	R410A	2087,5	1	0,0 kg
	EWLQ025KBW1N	R410A	2087,5	1	0,0 kg
	EWLQ033KBW1N	R410A	2087,5	1	0,0 kg
	EWLQ049KBW1N	R410A	2087,5	2	0,0 kg
	EWLQ064KBW1N	R410A	2087,5	2	0,0 kg

Note: unit functioning relies on fluorinated greenhouse gases

General Characteristics

General construction Compact, modular design condenserless chiller for indoor installation IP20 – manufactured according to the ISO9001 quality standard. The EWLQ - KBW1N range has been designed for both air conditioning and process cooling applications.

Casing / colour The unit casing is made of powder coated galvanised steel plate. Fully factory assembled on a base frame. External case colour ivory is white (±RAL7044) / Munsell code 5Y7.5/1

Number of cooling circuits Sizes 014-033 are single circuit, sizes 049-064 are twin circuit.

Compressor The units are equipped with one R-410A optimised fully hermetically sealed Daikin scroll type compressor per refrigerant circuit. As a design requirement, this compressor characteristically offers extremely smooth performance, efficiency and operational reliability. Each compressor is mounted in the unit with vibration isolation and fitted with compressor motor overcurrent protection.

Evaporator R-410A optimised counter flow plate heat exchanger made of stainless steel plates brazed gastight with copper, for water and glycol mixtures. A special refrigerant distribution system has been incorporated into the plate duct to optimize the heat transmission surface, leading to efficiency gains and stable control behaviour in the heat exchanger. The plate heat exchanger is heat insulated to ensure it is diffusion-proof to prevent any heat loss. Flow switch and water filter are supplied as standard. The water pressure may not exceed the maximum permissible operating pressure of 10bar.

Piping Consists of copper pipes with all the necessary cooling fittings.

Safety and control devices Each refrigerant circuit is fitted with the following safety devices:

High and low-pressure switch, hot gas temperature monitoring, overload relay.

Each refrigerant circuit is fitted with the following control devices:

Electronic temperature monitoring, thermal expansion valve, phase-sequence relay, frost protection.

Switching and control device In addition to the fully automated -Chiller digital controller, the control cabinet is in accordance with the valid EN directives (CE) and contains all the required switching and control components such as: Main switch, auxiliary and control cut-outs, transformers, control fuses, relay and auxiliary relay, sensors.

The electronics have an automatic restart after power failure and have the following digital inputs and outputs hard-wired to terminals:

Digital inputs:

- Pump contact
- Remote on/off

Digital outputs:

- General alarm message
- Unit operation message
- Individual compressor operation message
- Evaporator water pump drive

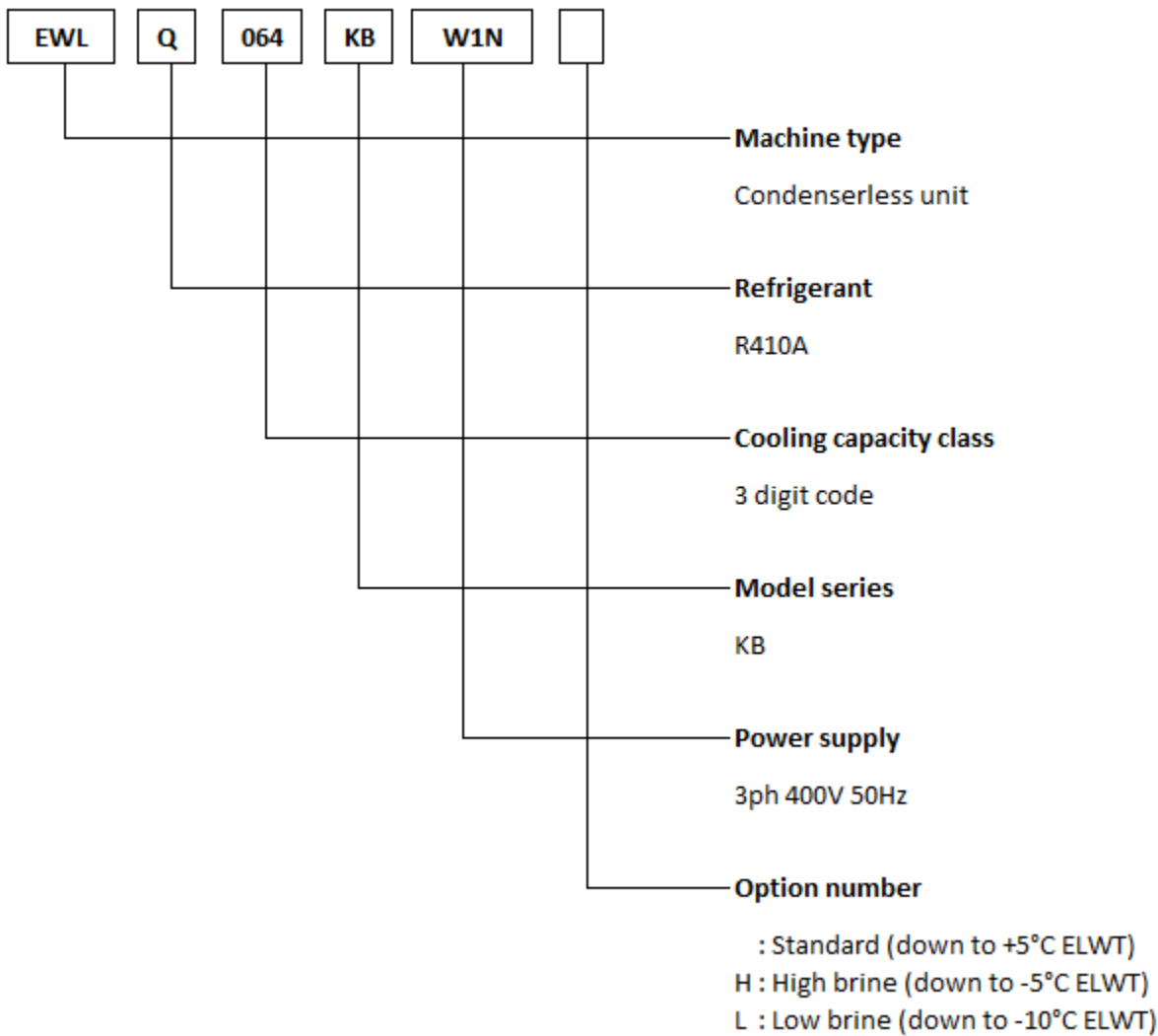
Chiller digital controller The EWLQ-KBW1N units are fitted with a digital controller which allows the user to configure, operate and service the unit in a user-friendly manner. The -Chiller digital controller consists of a numerical display, 4 control keys and 4 LEDs.

The following functions are supported by the electronics, among the others:

- Allocation of the setpoint and the desired switching hysteresis
- Cold water return controller (cooling mode)
- Hot water return controller (heating mode)
- Allocation of pump lead times / overrun times
- Allocation of service intervals
- Displaying the current operating parameters such as flow and return temperatures
- Recording operating hours (compressor / pump)
- Fault code query
- Password protection

As an option this chiller can be equipped with an interface for integrating it into a MODbus Building Management System (BMS).

Nomenclature



Options on request

Factory mounted option

ZH - Glycol application chilled water temperature down to -5°C

ZL - Glycol application chilled water temperature down to -10°C

Factory mounted options modify the model ordering product name. In case one of these two options is required, the product name has an additional digit. For example, ordering string for EWLQ064KBW1N suitable to operate down to -5°C ELWT (opt ZH), is EWLQ064KBW1NH.

Available kits (shipped loose)

EKAC10C - Address card for connection to BMS or Remote user interface

EKRUMCA - Remote installed user interface

EKLS2 - Low noise operation on EWLQ*(25~64) KBW1N (1pc per compressor should be ordered)

Standard input/output contacts *

** - additional details in the wiring diagram available on Daikin Business Portal*

Switch for remote start/stop

Switch for dual setpoint

Reverse valve of water circuit

Pump contactor

Indication lamp – General operation, compressors operation, alarm

EWLQ~KB

MODEL		EWLQ014K BW1N	EWLQ025K BW1N	EWLQ033K BW1N	EWLQ049K BW1N	EWLQ064K BW1N
COOLING PERFORMANCE						
Capacity - Cooling	kW	12	22	28	43	57
Capacity control - Type		On/Off	On/Off	On/Off	On/Off	On/Off
Capacity control - Minimum capacity	%	100	100	100	50	50
Unit power input - Cooling	kW	3.5	6.4	8.3	12.7	16.2
EER		3.40	3.41	3.39	3.41	3.50
CASING						
Colour *		IW	IW	IW	IW	IW
Material *		GPSS	GPSS	GPSS	GPSS	GPSS
DIMENSIONS						
Height	mm	600	600	600	600	600
Width	mm	600	600	600	600	600
Length	mm	600	600	600	1200	1200
WEIGHT						
Unit Weight	kg	104	138	149	252	274
Operating Weight	kg	105	140	152	257	280
HEAT EXCHANGER - EVAPORATOR						
Type *		Brazed plate	Brazed plate	Brazed plate	Brazed plate	Brazed plate
Fluid		Water	Water	Water	Water	Water
Fouling Factor	m ² °C /W	0	0	0	0	0
Water Volume	l	1	2	3	5	6
Water temperature in	°C	12	12	12	12	12
Water temperature out	°C	7	7	7	7	7
Water flow rate	l/s	.6	1.1	1.3	2.1	2.7
Water pressure drop	kPa	16.5	24.2	22.0	20.9	22.1
Insulation material *		CC	CC	CC	CC	CC
REMOTE CONDENSER						
Condensing Temperature		45	45	45	45	45
COMPRESSOR						
Type		Scroll	Scroll	Scroll	Scroll	Scroll
Oil charge	l	1.50	3.00	3.00	6.00	6.00
Quantity	No.	1	1	1	2	2
SOUND LEVEL**						
Sound Power - Cooling	dB(A)	64	64	71	67	74
Sound Pressure level@1m distance - Cooling	dB(A)	50.31	50.31	57.31	52.71	59.71
REFRIGERANT CIRCUIT						
Refrigerant type		R410A	R410A	R410A	R410A	R410A
Refrigerant charge	kg	0	0	0	0	0
N. of circuits	No.	1	1	1	2	2
PIPING CONNECTIONS						
Evaporator water inlet/outlet	mm	G1"	G1"	G1"	G1" 1/2	G1" 1/2
Outlet gas discharge connections	inch	G1"	G1"	G1"	G1" 1/2	G1" 1/2

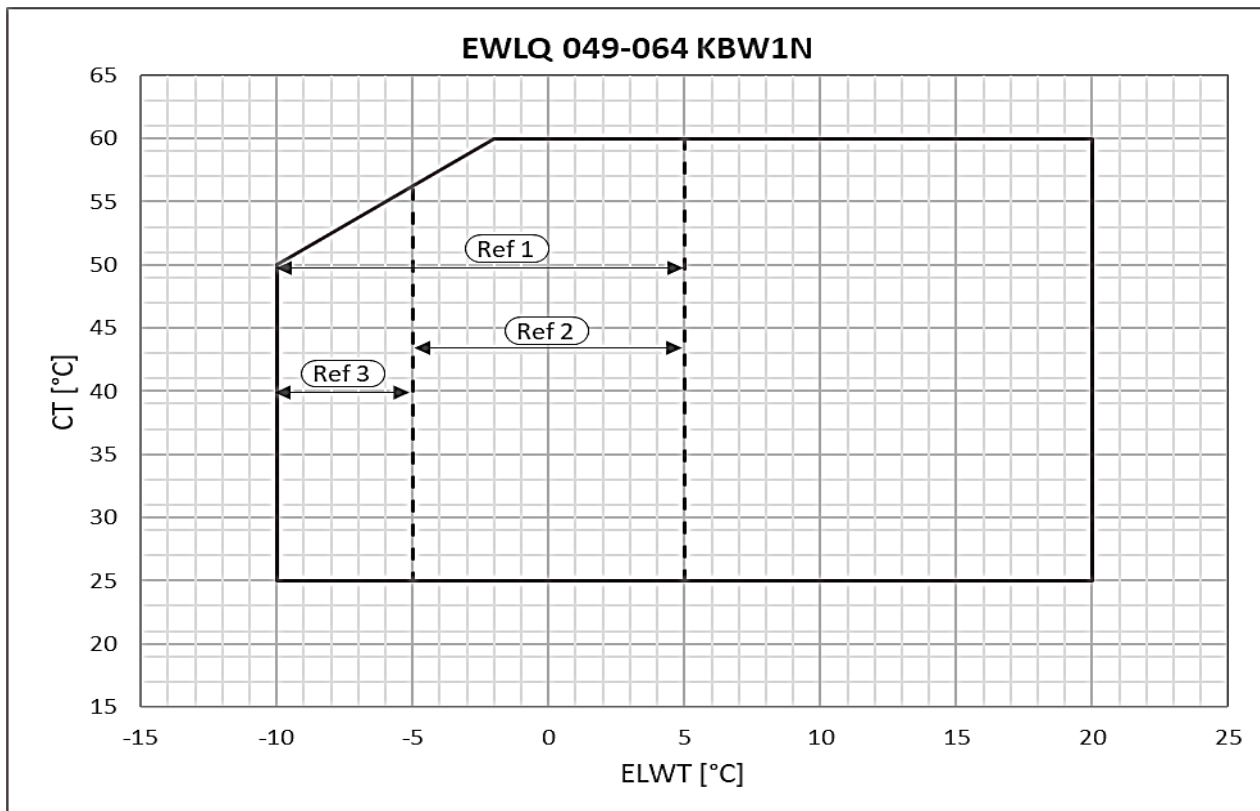
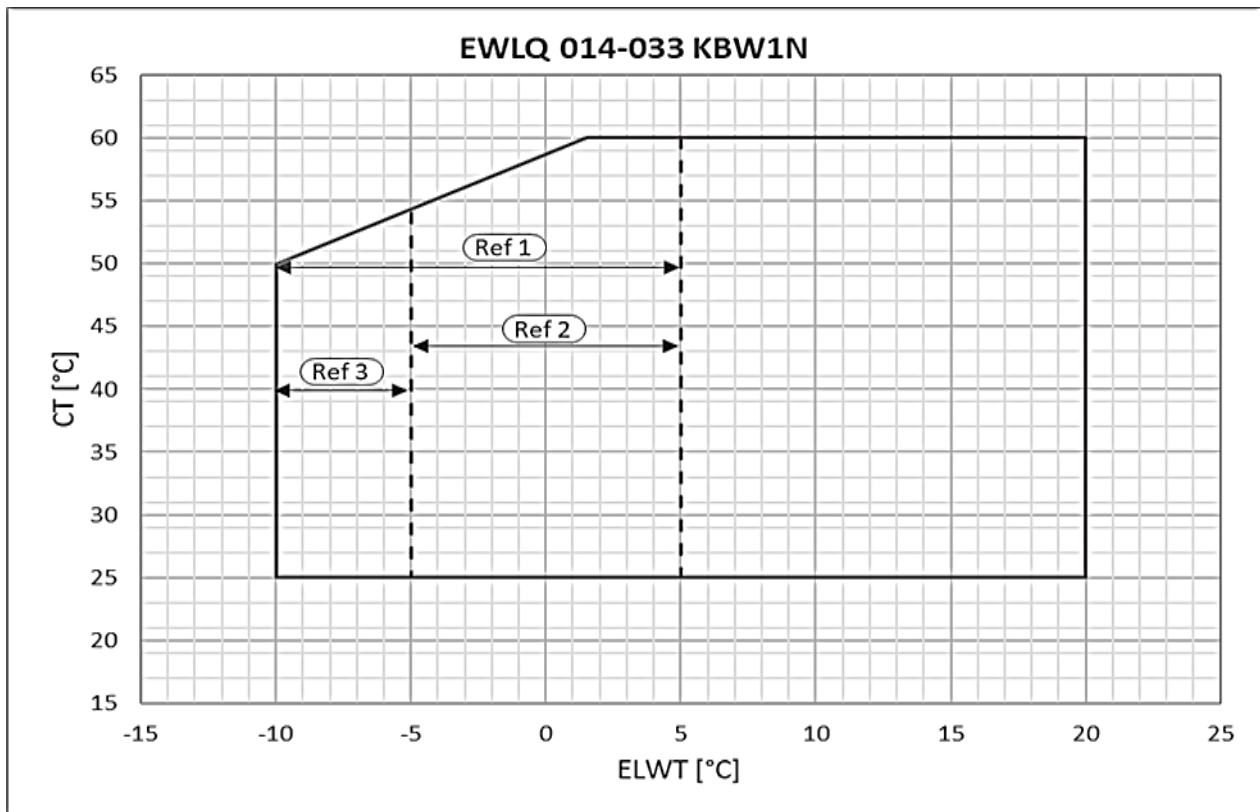
All the performances (Cooling capacity, unit power input and EER) are based on the following conditions: evaporator 12.0/7.0°C; condenser 30.0/35.0°C, unit at full load operation; operating fluid: Water; fouling factor = 0. (*) IW: Ivory White; GPSS: Galvanized and Painted Steel Sheet; S&T: Single Pass Shell & Tube; CC: Closed Cell; (**) The values are according to ISO 3744 and are referred to: evaporator 12/7° C, condenser 30/35° C, full load operation.

EWLQ~KB

MODEL		EWLQ014K BW1N	EWLQ025K BW1N	EWLQ033K BW1N	EWLQ049K BW1N	EWLQ064K BW1N
POWER SUPPLY						
Phases	No.	3	3	3	3	3
Frequency	Hz	50	50	50	50	50
Voltage	V	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	10%	10%	10%	10%	10%
UNIT						
Maximum inrush current	A	61.8	101.9	137.9	117.55	158.63
Nominal running current cooling	A	6.57	10.46	14.06	20.93	28.08
Maximum running current	A	9.47	15.65	20.73	31.31	41.46
Maximum current for wires sizing	A	10.41	17.22	22.8	34.44	45.6
COMPRESSORS						
Phases	No.	3	3	3	3	3
Voltage	V	400	400	400	400	400
Voltage tolerance Minimum	%	-10%	-10%	-10%	-10%	-10%
Voltage tolerance Maximum	%	10%	10%	10%	10%	10%
Maximum running current	A	0	0	0	0	0
Starting method		DOL	DOL	DOL	DOL	DOL

Allowed voltage tolerance $\pm 10\%$. Voltage unbalance between phases must be within $\pm 3\%$. In case of inverter driven units, no inrush current at start up is experienced. Nominal running current in cooling is referred to the following conditions: evaporator 12/7°C; condenser 30/35°C. Maximum running current is based on max compressor absorbed current in its envelope. Maximum current for wires sizing is based on minimum allowed voltage. Maximum current for wires sizing: compressors full load ampere x 1,1. The data are referred to the standard unit without options. All data are subject to change without notice. Please refer to unit nameplate data.

Operating Limits



Legend

ELWT Evaporator leaving water temperature

CT Condensing temperature

Ref 1 Glycol required for operation below 5°C ELWT

Ref 2 Operation between 5°C and - 5°C ELWT requires option ZH

Ref 3 Operation between - 5°C and - 10°C ELWT requires option ZL

Water charge flow and quality

Water quality limits

Items to be controlled		Evaporator water		Tendency if out of criteria
		Circulating water	Supply water	
		[<20°C]		
pH at 25°C		6.8~8.0	6.8~8.0	A + B
Electrical conductivity	[mS/m] at 25°C	<40	<30	A + B
Chloride ion	[mg Cl-/l]	<50	<50	A
Sulfate ion	[mg SO42-/l]	<50	<50	A
M-alkalinity (pH 4.8)	[mg CaCO3/l]	<50	<50	B
Total hardness	[mg CaCO3/l]	<70	<70	B
Calcium hardness	[mg CaCO3/l]	<50	<50	B
Silica ion	[mg SiO2/l]	<30	<30	B
Items to be referred to				
Iron	[mg Fe/l]	<1.0	<0.3	A + B
Copper	[mg Cu/l]	<1.0	<0.1	A
Sulfide ion	[mg S2-/l]		not detectable	A
Ammonium ion	[mg NH4+/l]	<1.0	<0.1	A
Remaining chloride	[mg Cl/l]	<0.3	<0.3	A
Free carbide	[mg CO2/l]	<4.0	<4.0	A
Stability index		-	-	A + B

A = corrosion B = scale

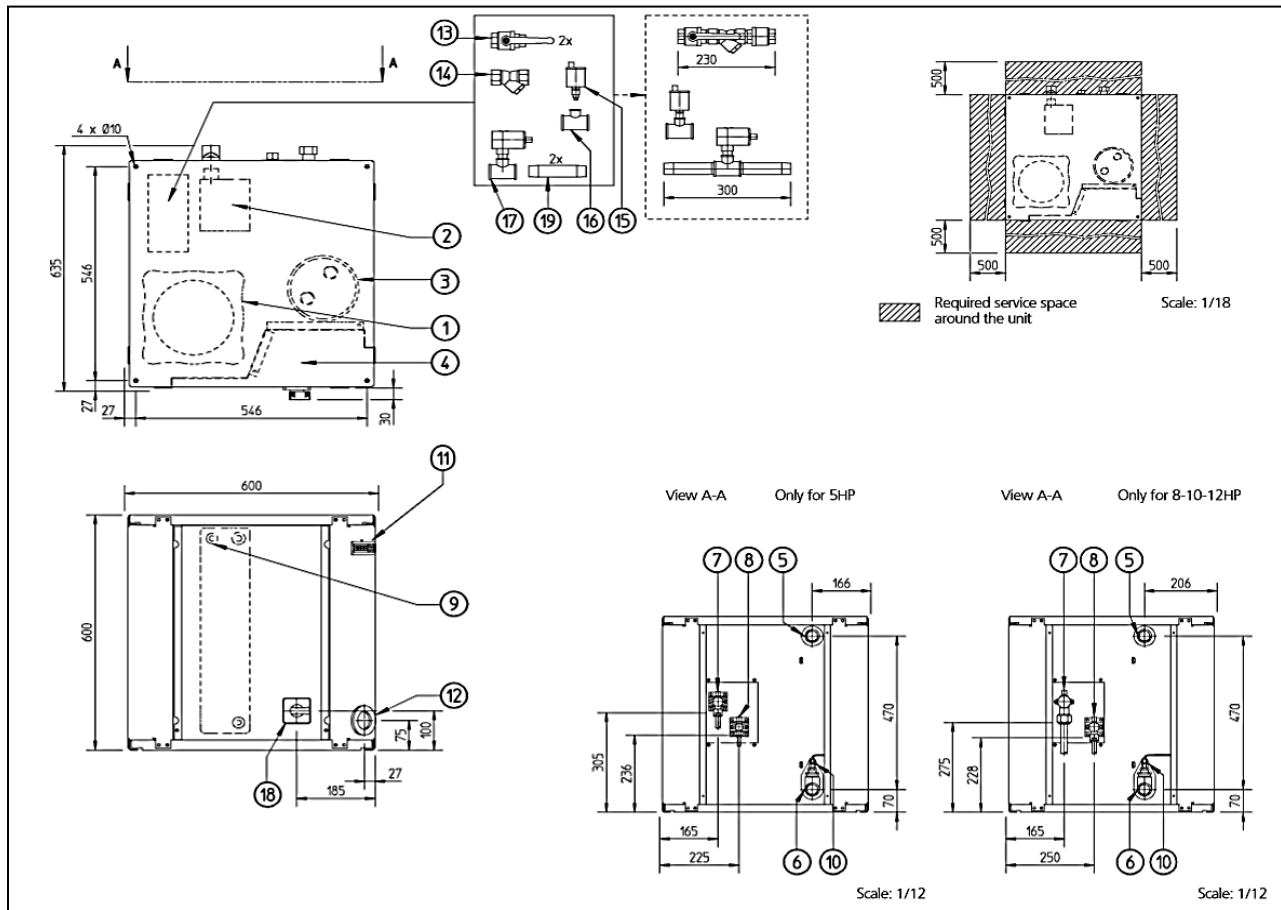
Water flow and plant water content limits

To assure proper operation of the unit a minimum water volume is required in the system and the water flow must be within the operation range as specified in the table below.

	Evaporator		
	Minimum water volume [l]	Minimum water flow [l/s]	Maximum water flow [l/s]
EWLQ014	62	0,5	1,3
EWLQ025	134	0,9	2,1
EWLQ033	155	1,3	3,1
EWLQ049	205	1,7	4,1
EWLQ064	311	2,5	6,2

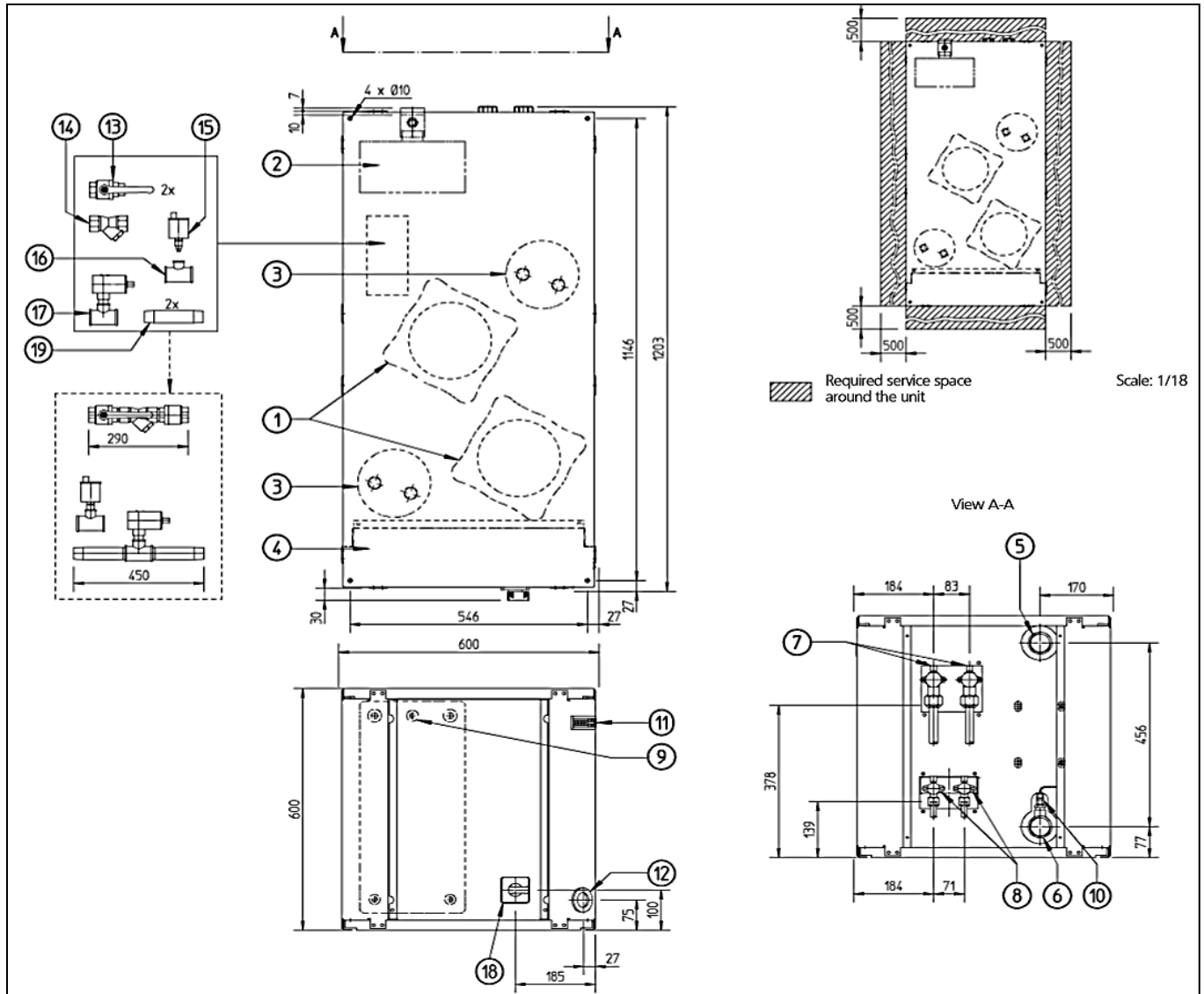
Dimensional drawings

EWLQ 014-033 KBW1N



- | | |
|---|--------------------------------|
| 1. Compressor | 11. Digital display controller |
| 2. Evaporator | 12. Power supply intake (J48) |
| 3. Accumulator | 13. Ballvalve |
| 4. Switchbox | 14. Water filter |
| 5. Chilled water in | 15. Air purge |
| 6. Chilled water out | 16. T- joint for air purge |
| 7. Discharge stop valve | 17. Flow switch |
| 8. Liquid stop valve | 18. Main switch |
| 9. Evaporator entering water temperature sensor | 19. Flow switch pipe |
| 10. Freeze up sensor | |

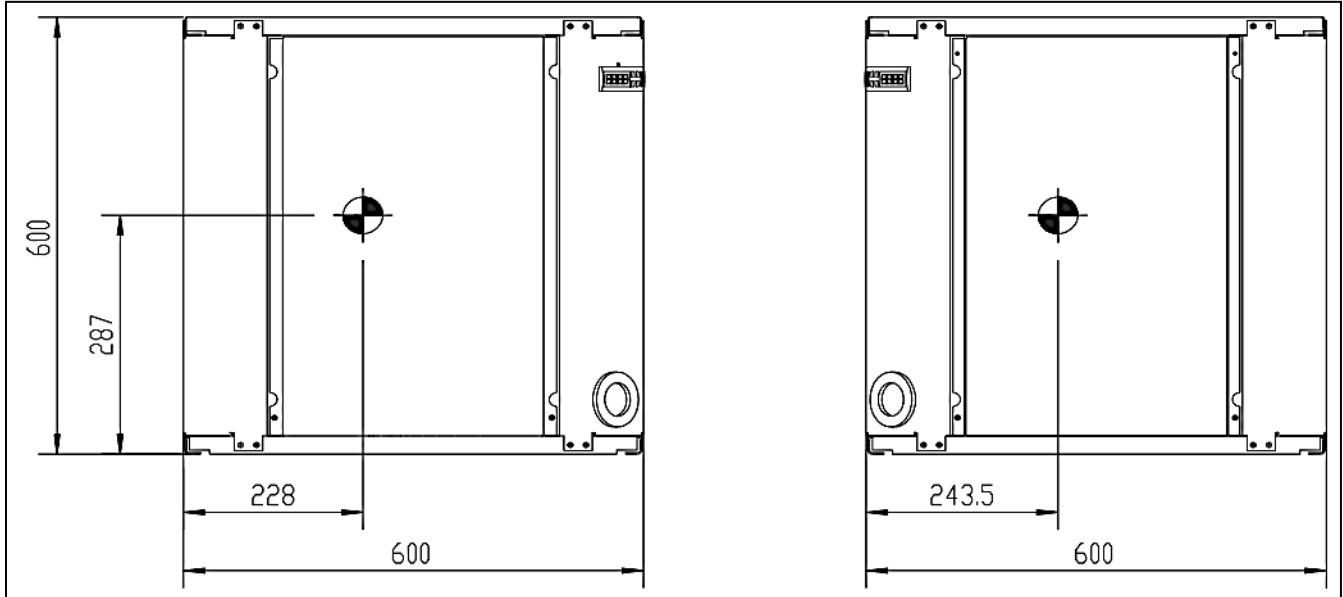
EWLQ 049-064 KBW1N



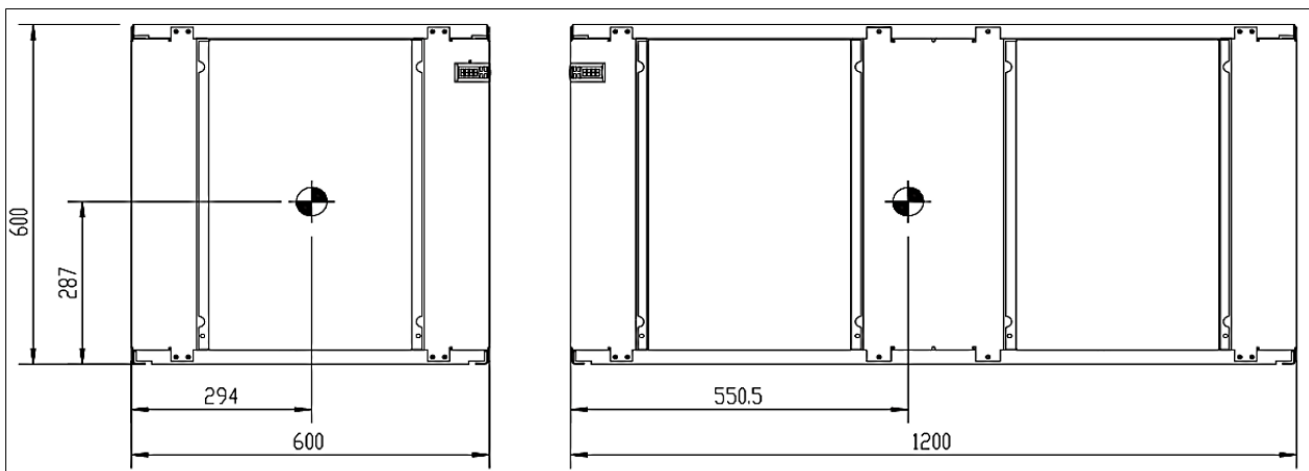
- | | |
|---|--------------------------------|
| 1. Compressor | 11. Digital display controller |
| 2. Evaporator | 12. Power supply intake (J 48) |
| 3. Accumulator | 13. Ballvalve |
| 4. Switchbox | 14. Water filter |
| 5. Chilled water in | 15. Air purge |
| 6. Chilled water out | 16. T-joint for air purge |
| 7. Discharge stop valve | 17. Flow switch |
| 8. Liquid stop valve | 18. Main switch |
| 9. Evaporator entering water temperature sensor | 19. Flow switch pipe |
| 10. Freeze up sensor | |

Center of gravity

EWLQ 014-033 KBW1N

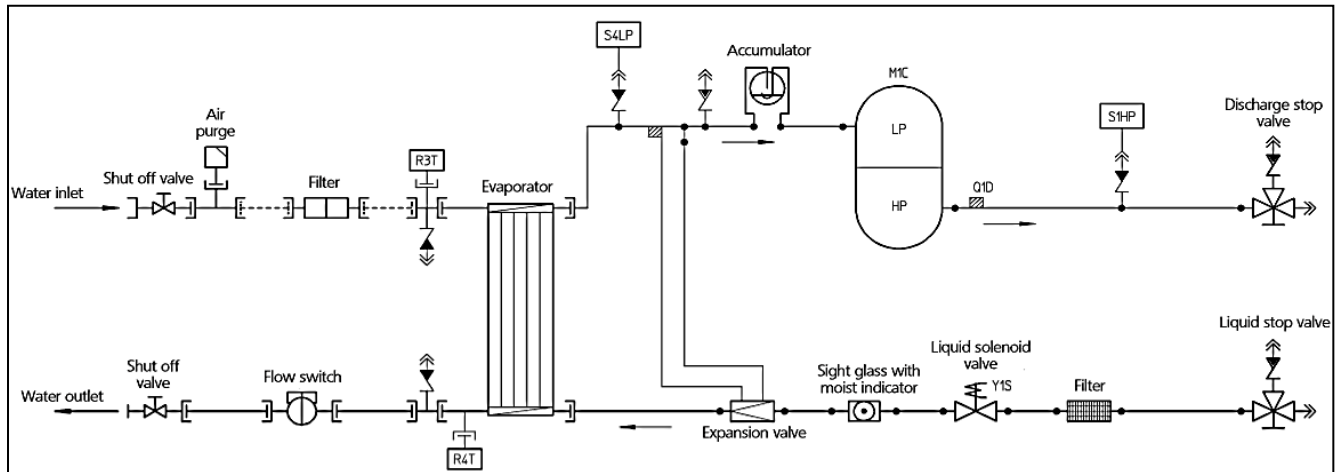


EWLQ 049-064 KBW1N



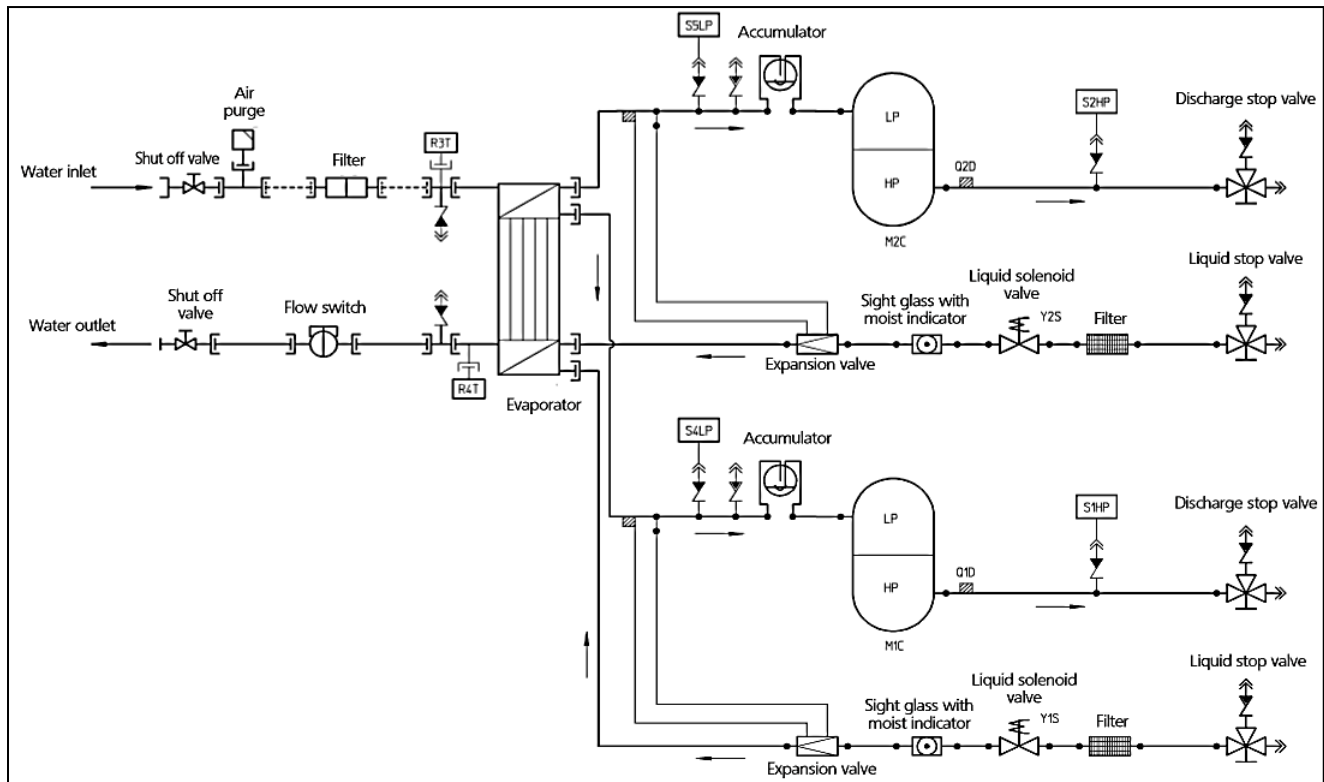
Piping diagram

EWLQ 014-033 KBW1N



Y1S Liquid solenoid valve
M1 Compressor motor 1
R3T Inlet water evap. temp. sensor
S1HP High pressure switch
S4LP Low pressure switch
R4T Freeze - up protection
Q1 Discharge temperature controller

EWLQ 049-064 KBW1N



Y1S Liquid solenoid valve
 Y2S Liquid solenoid valve
 M - 2C Compressor motor
 R4T Freeze - up protection
 R5T Inlet water cond. temp. sensor
 S1HP High pressure switch
 S2HP High pressure switch
 S4LP Low pressure switch
 S5LP Low pressure switch

R3T Inlet water evap. temp. sensor
 Q1D Discharge temperature controller
 Q2D Discharge temperature controller

Technical Specifications

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

DIRECTIVE 2014/35/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of electrical equipment designed for use within certain voltage limits.

DIRECTIVE 2014/30/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 26 February 2014 on the harmonisation of the laws of the Member States relating to electromagnetic compatibility.

DIRECTIVE 2006/42/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 17 May 2006 on machinery, and amending Directive 95/16/EC.

DIRECTIVE 2014/68/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 May 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of pressure equipment.

DIRECTIVE 2009/125/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 October 2009 establishing a framework for the setting of ecodesign requirements for energy-related products.

And to the following harmonized standards/specifications (used in part or whole as described in the technical construction file):

EN 60204-1:2006 A1:2009 Safety of machinery

EN 60335-2-40 Household and similar electrical appliances - Safety: Particular requirements for electrical heat pumps, air conditioners and dehumidifier

EN 378-1:2016, EN 378-2:2016, EN 378-4:2016 Safety and environmental requirements; design, construction, testing, marking and documentation

The chiller will be delivered to the job site completely assembled and charged with 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 R-410A can be used.

Performance The unit shall supply the following performances:

Number : unit(s)

Cooling capacity for single unit : 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

Operating voltage range should be 400V ±10%, 3N ph, 50Hz.

Unit description The unit shall include as standard: one or two independent refrigerant circuit per module, each of them equipped with an hermetic type rotary scroll compressors, thermal expansion device, direct expansion plate to plate heat exchangers, motor starting components, control system and all components necessary for a safe and stable unit operation. The chiller will be factory assembled on a robust base frame made of galvanized steel and protected by epoxy paint.

Sound level and vibrations Sound pressure level at 1 meter distance in free field, hemispheric conditions, shall not exceeddB(A). The sound pressure levels must be rated in accordance to ISO 3744

Dimensions Unit dimensions shall not exceed following indications:

Unit length mm

Unit width mm

Unit height mm

Compressors The units shall be equipped with:

High performance hermetic scroll compressors optimized to work with R-410A, with reduced vibration and sound emissions.

• High efficiency values shall be guaranteed by:

- High volumetric efficiency in the whole range of application, through the continuous contact between the fixed and the orbiting scroll deleting the dead space and the re-expansion of the refrigerant gas;
- Low pressure drops due to the absence of inlet and discharge valves and to the uniform compression cycle;
- Reduction of the heat exchange between the gas during suction and discharge due to the separation of gas flows;

• The reduced noise shall be obtained by:

- The absence of the inlet and discharge valves
- The uniform compression cycles
- The absence of pistons which ensures reduced vibration and pulsation of the refrigerant

- The engine shall be cooled by the suction refrigerant fluid.
- Shall be present a thermal protection for the three phases complete with sensors on the stator windings to avoid overheating caused by lack of phase, insufficient cooling, mechanical locks, power supply out of tolerance;
- The compressors shall be one on each independent refrigerating circuit.
- The compressors shall be fitted on rubber antivibration mounts.
- The compressors shall be provided complete with oil charge.

Evaporator (PHE) The units shall be equipped with a direct expansion plate to plate type evaporator. The evaporator will be made of stainless steel brazed plates closed cell with thermal insulation material.

- The evaporator will have 1 or 2 refrigerant circuit.
- The evaporator will be manufactured in accordance to PED approval.
- Flow switch must be installed on plant.
- Water filter must be installed on plant.

Refrigerant circuit The unit shall have one or two refrigerant circuits per module according to the capacity.

- The circuits shall include as standard the following safety devices: High and low pressure switch, hot gas temperature monitoring, overload relay.

Electrical control panel Power and control Power and control sections shall be located into the main electrical panel. The power section shall include Main switch, auxiliary and control cut-outs, transformers, control fuses, relay and auxiliary relay, sensors, -Chiller digital controller. The main panel doors shall be interlocked to the main switch to guarantee safe operations when the doors are open.

Controller Units controllers shall fit a digital controller which allows the user to configure, operate and service the unit in a user-friendly manner. The -Chiller digital controller shall consist of a numerical display, 4 control keys and 4 LEDs.

The following functions shall be supported:

- Allocation of the setpoint and the desired switching hysteresis
- Cold water return controller (cooling mode)
- Hot water return controller (heating mode)
- Allocation of pump lead times / overrun times
- Allocation of service intervals
- Displaying the current operating parameters such as flow and return temperatures
- Recording operating hours (compressor / pump)
- Fault code query
- Password protection

High level communication As an option, the chiller can be fitted with an interface for integrating it into a Modbus Building Management System (BMS)

For Product, Service & Maintenance,
Rental and Spares enquiries:



0345 565 2700



www.daikinapplied.uk



www.daikinrentalsolutions.uk



Follow us:
[www.linkedin.com/company/
daikin-applied-uk-ltd/](https://www.linkedin.com/company/daikin-applied-uk-ltd/)



The present publication is drawn up by way of information only and does not constitute an offer binding upon Daikin Applied (UK). Daikin Applied (UK) Ltd has compiled the content of this publication to the best of its knowledge. No express or implied warranty is given for the completeness, accuracy, reliability or fitness for particular purpose of its content and the products and services presented therein. Specifications are subject to change without prior notice. Daikin Applied (UK) Ltd explicitly rejects any liability for any direct or indirect damage, in the broadest sense, arising from or related to the use and/or interpretation of this publication.

Daikin Europe N.V. participates in the Eurovent Certified Performance programme for Fan Coil Units and Variable Refrigerant Flow systems. Daikin Applied Europe S.p.A participates in the Eurovent Certified performance programme for Liquid Chilling Packages, Hydronic Heat Pumps and Air handling Units. Check ongoing validity of certificate: www.eurovent-certification.com



Daikin Applied (UK) Ltd is certified to ISO 9001 Quality Management System (QMS),
ISO 14001 Environmental Management System (EMS), and
ISO 45001 Occupational Health and Safety (OH&S) management systems.
For the latest certificates, visit: www.daikinapplied.uk/documents-download

