Public

REV	01
Date	05/2026
Supersedes	D-EIMHP01910-25_00EN

Installation, Operation and Maintenance Manual
D-EIMHP01910-25_01EN

EWYK-QZ

Original instructions

Contents

List of figures

List of tables

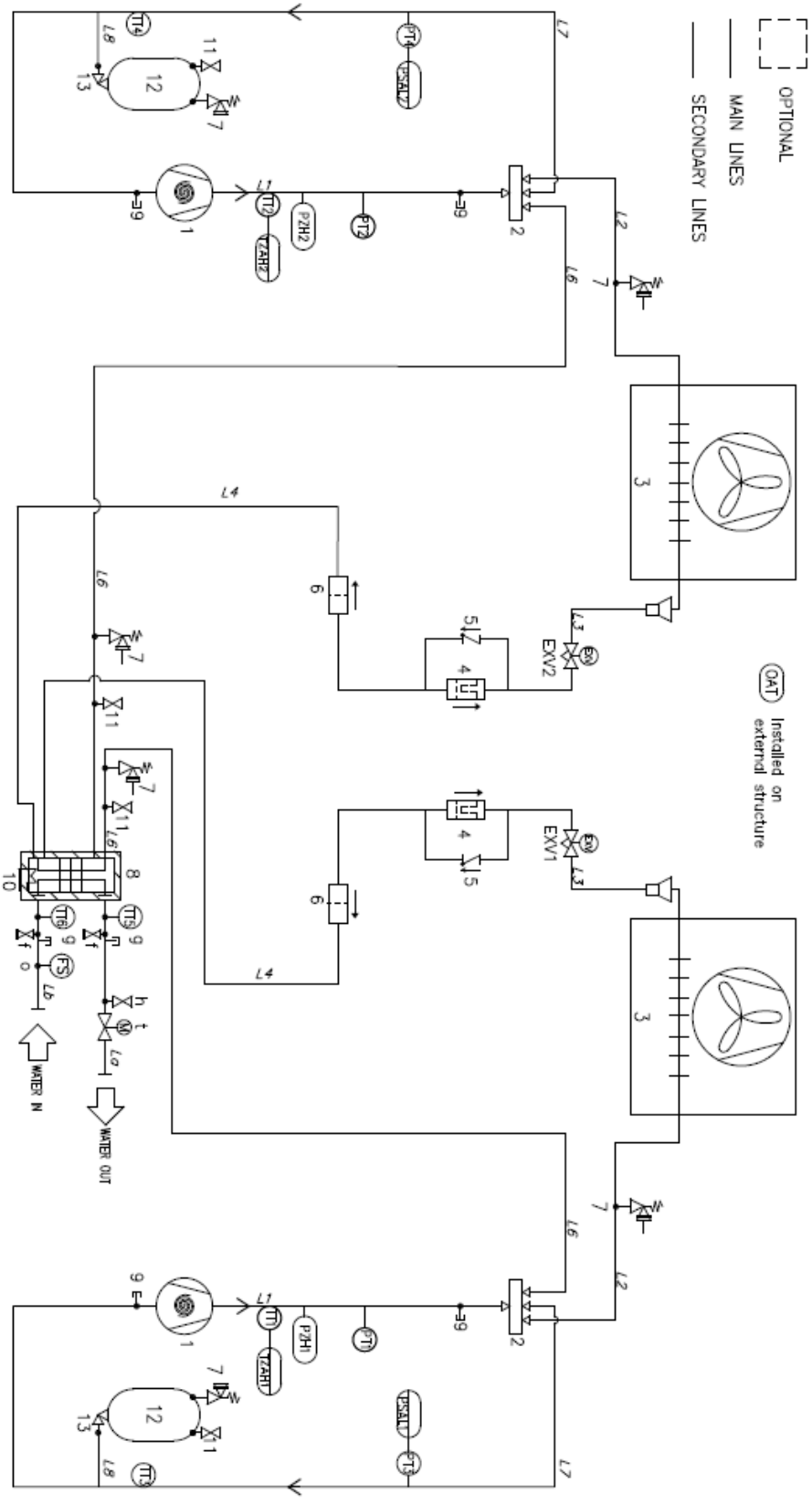


Figure 1– Refrigerant circuit diagram (P&ID)

Optional

EQUIPMENT	
ID	**Description**
1	Scroll compressor
2	4 way vale
3	Tubes & fins heat exchanger (coil)
EXV1	Electronic expansion valve C1
EXV2	Electronic expansion valve C2
4	Dryer filter
5	Check valve
6	Mechanical filter
7	Pressure relief valve 3/8” NPT 38 bar
8	Heat exchanger (BPHE) with thermal insulation
9	Access fitting (¼” sae flare) Charging port with cap
10	Electrical heater
11	Receiver valve 3/8” x 3/8” charging valve
12	Refrigerant tank 9L
13	Receiver valve ¼” x ¼” charging valve
g	Plugged fitting (plugged coupling)¼” NPT
f	Drain ¼” G
h	Automatic air vent ½” G
t	Motor actuated valve

INSTRUMENT	
ID	**Description**
PT1	Pressure transducer C1 discharge
PT2	Pressure transducer C2 discharge
PT3	Pressure transducer C1 suction
PT4	Pressure transducer C2 suction
PZH1	High pressure switch C1 Pset=33,2 (+/- 1) bar
PZH2	High pressure switch C2 Pset=33,2 (+/- 1) bar
PSAL	Low pressure limiter (controller function)
TZAH	High temperature switch (motor thermistor)
TT1	Temperature transducer C1 discharge
TT2	Temperature transducer C2 discharge
TT3	Temperature transducer C1 suction
TT4	Temperature transducer C2 suction
TT5	Temperature transducer ELWT
TT6	Temperature transducer EEWT
OAT	Outside temperature transducer
FS	Flow switch

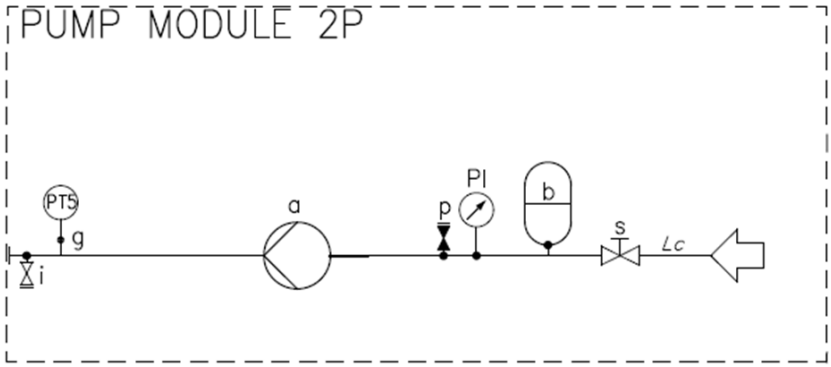


Figure 2 – Pump Module wiring diagram

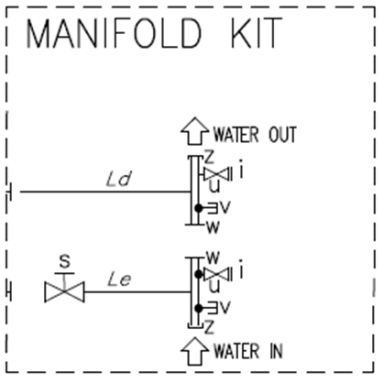


Figure 3 – Manifold kit wiring diagram

Optional

Legend	
ID	**Description**
a	Single pump
b	Expansion vessel 18l
g	Plugged fitting (plugged coupling) ¼" NPT
i	Drain ½" Npt
p	Automatic filling valve fitting ½" G
s	Manual actuated valve
u	Manifold pipe DN 80-DN125 (Victaulic connection)
v	Probe holder ¼"
w	Victaulic joint
z	Victaulic endcap
8	Heat exchanger (BPHE) with thermal insulation
Lc	Steel pipe water IN DN 80-DN 125 thermal insulation 19mm
Ld,e	Steel pipe water IN DN 80 thermal insulation 19mm
PI	Pressure gauge
PT5	EEW pressure transducer

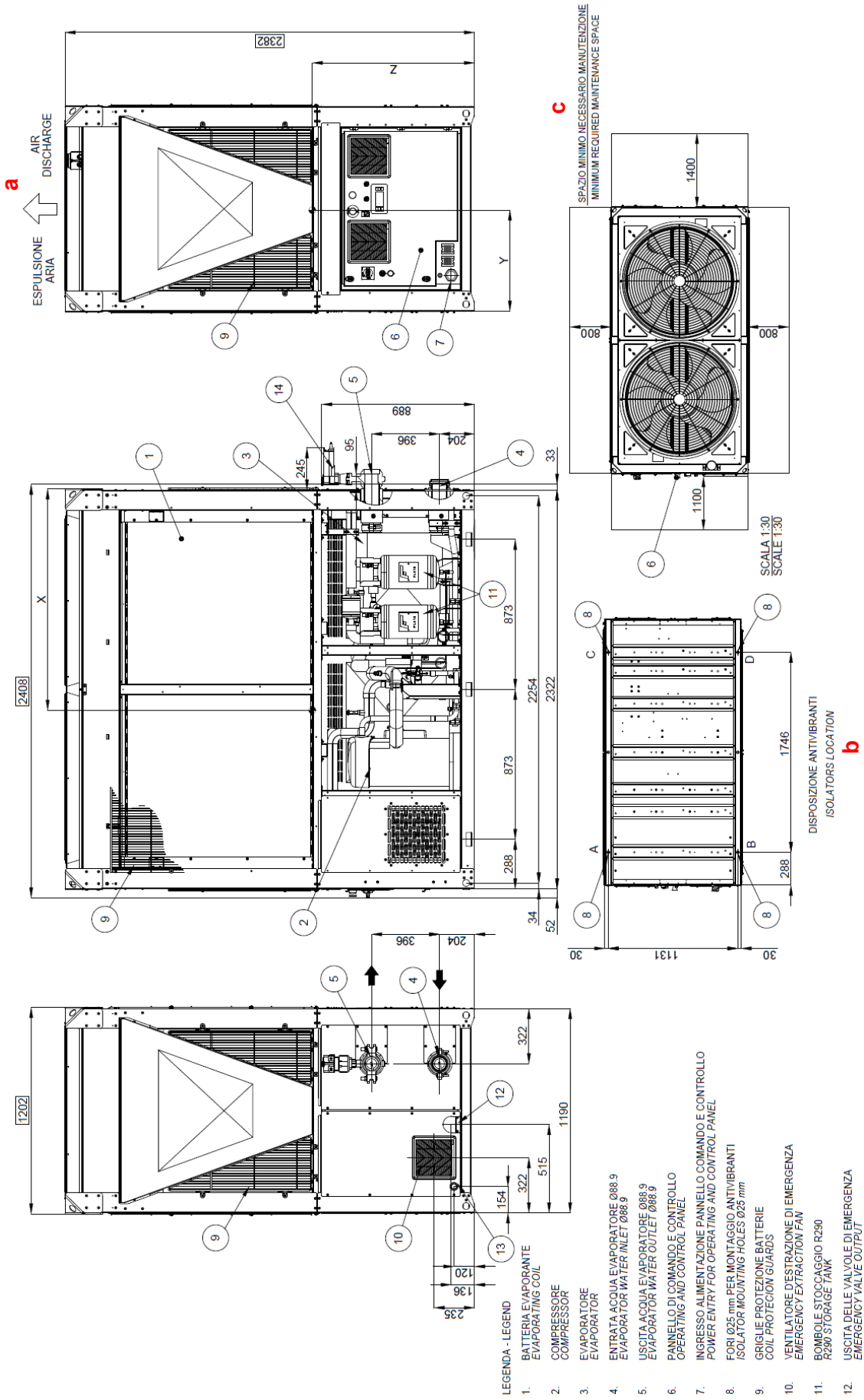


Figure 4 –Dimensional drawing of EWYK100-135ZXS-A2 unit

Legend	
1	Evaporating coil
2	Compressor
3	Evaporator
4	Evaporator water inlet Ø88.9mm
5	Evaporator water outlet Ø 88.9mm
6	Operating and control panel
7	Power entry for operating and control panel
8	Isolator mounting holes Ø 25mm
9	Coil protection guards
10	Emergency extraction fan
11	R290 storage tank
12	Emergency valve output
13	Condensation tank water drain
14	Electro-actuated safety valve (shipped loose)
a	Air discharge
b	Isolator location
c	Minimum required maintenance space

Version	Weight Kg		Isolator loads Kg				Center of gravity		
	Shipping	Operating	A	B	C	D	x	y	z
EWYK100-135ZXS-A2	1240	1272	338	357	281	296	1242	580	925
Spring isolators	EKSPRAVM	Type (Q.ty)	91232 (4 Pz)						
Rubber isolators	EKRUBAVM	Type (Q.ty)	91264 (4 Pz)						

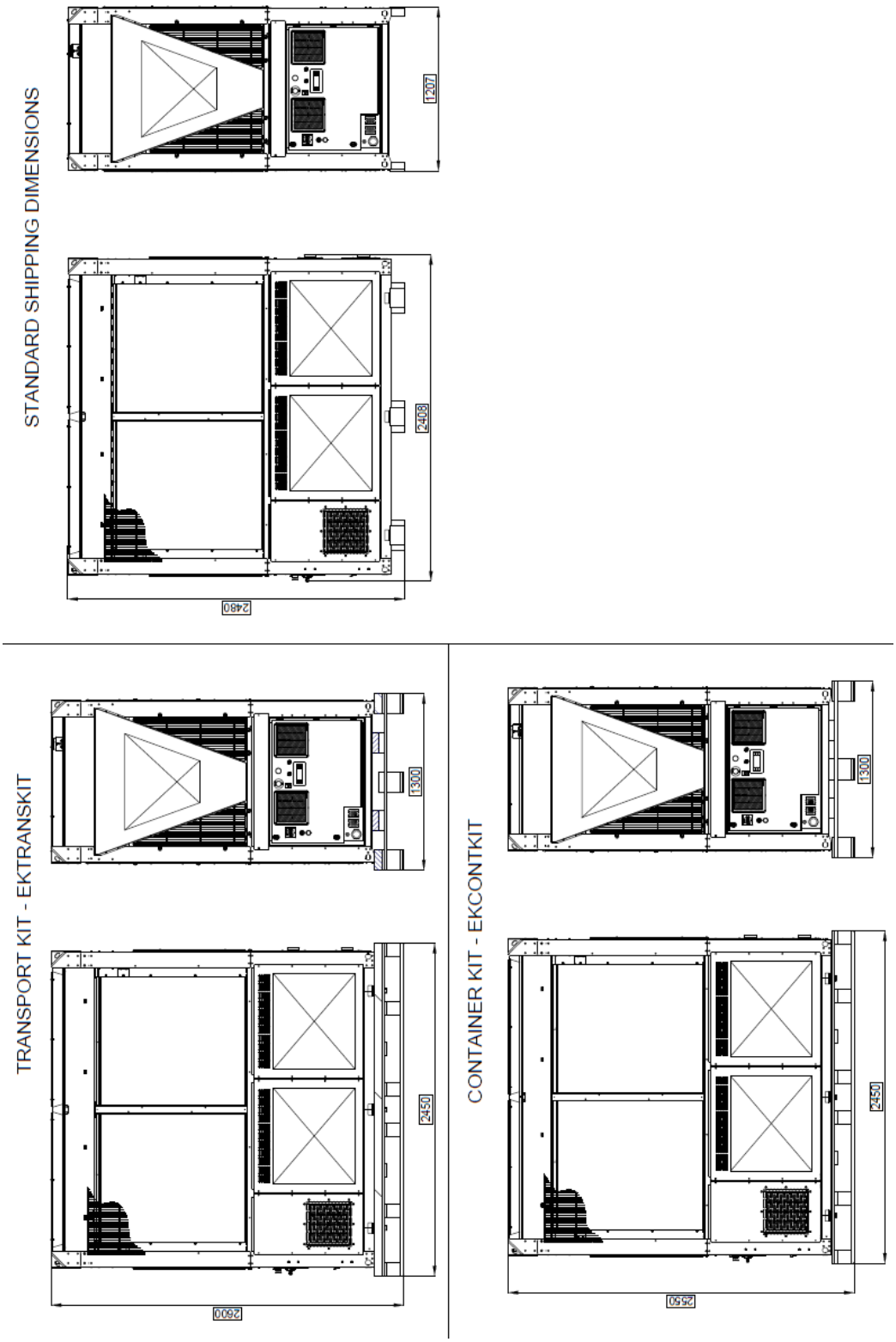
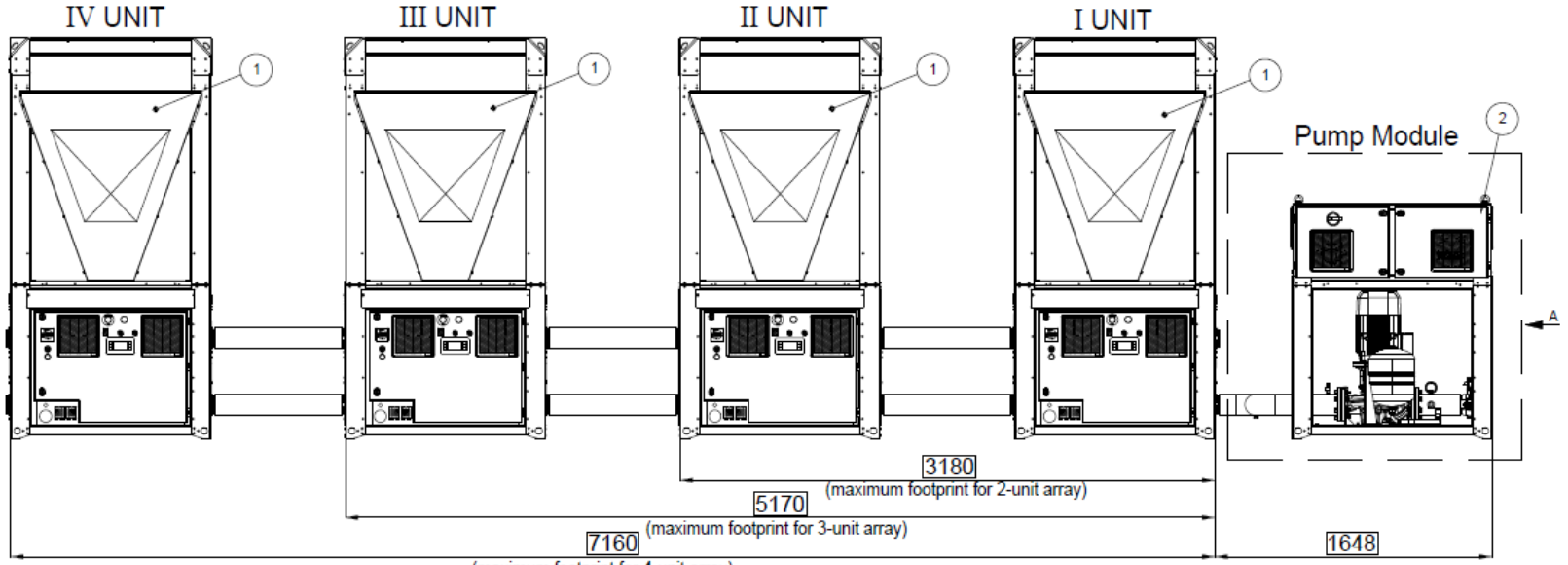


Figure 5 – Transport Kit, Container Kit and Shipping dimensions dimensional drawing



LEGENDA - LEGEND

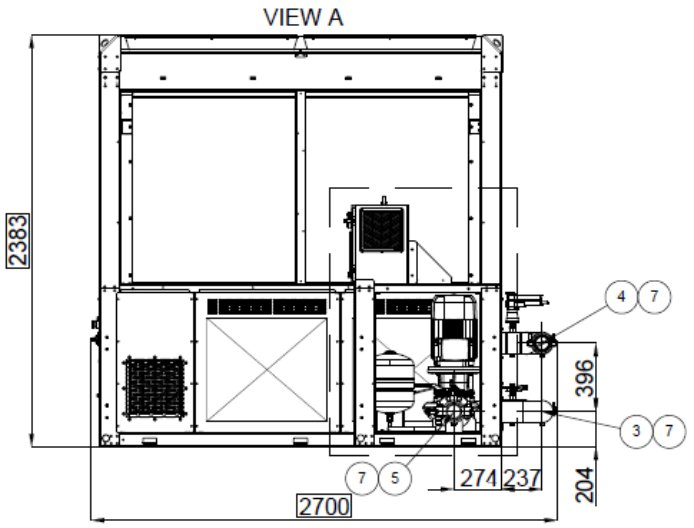
1. UNITA' EWYK135QZXSA2
   UNIT EWYK135QZXSA2
2. MODULO POMPA
   PUMP MODULE
3. ENTRATA ACQUA ARRAY Ø88.9 / 3"
   ARRAY WATER INLET Ø88.9 / 3"
4. USCITA ACQUA ARRAY Ø88.9 / 3"
   ARRAY WATER OUTLET Ø88.9 / 3"
5. ENTRATA ACQUA ARRAY CON MODULO POMPA Ø88.9 / 3"
   ARRAY WATER INLET WITH PUMP MODULE Ø88.9 / 3"
6. TAPPO VICTAULIC Ø88.9 / 3"
   VICTAULIC CAP Ø88.9 / 3"
7. CONNESSIONE VICTAULIC Ø88.9 / 3"
   VICTAULIC CONNECTION Ø88.9 / 3"
8. MODULO MANIFOLD Ø88.9 / 3" - EKMNFLD3
   MANIFOLD MODULE Ø88.9 / 3" - EKMNFLD3
9. KIT CONNESSIONI PARALLELE Ø88.9 / 3" - EKMODPAR3
   PARALLEL CONNECTION KIT Ø88.9 / 3" - EKMODPAR3
10. KIT CONNESSIONE MODULO POMPA Ø88.9 / 3" - EKCONNPMP3
    PUMP CONNECTION KIT Ø88.9 / 3" - EKCONNPMP3

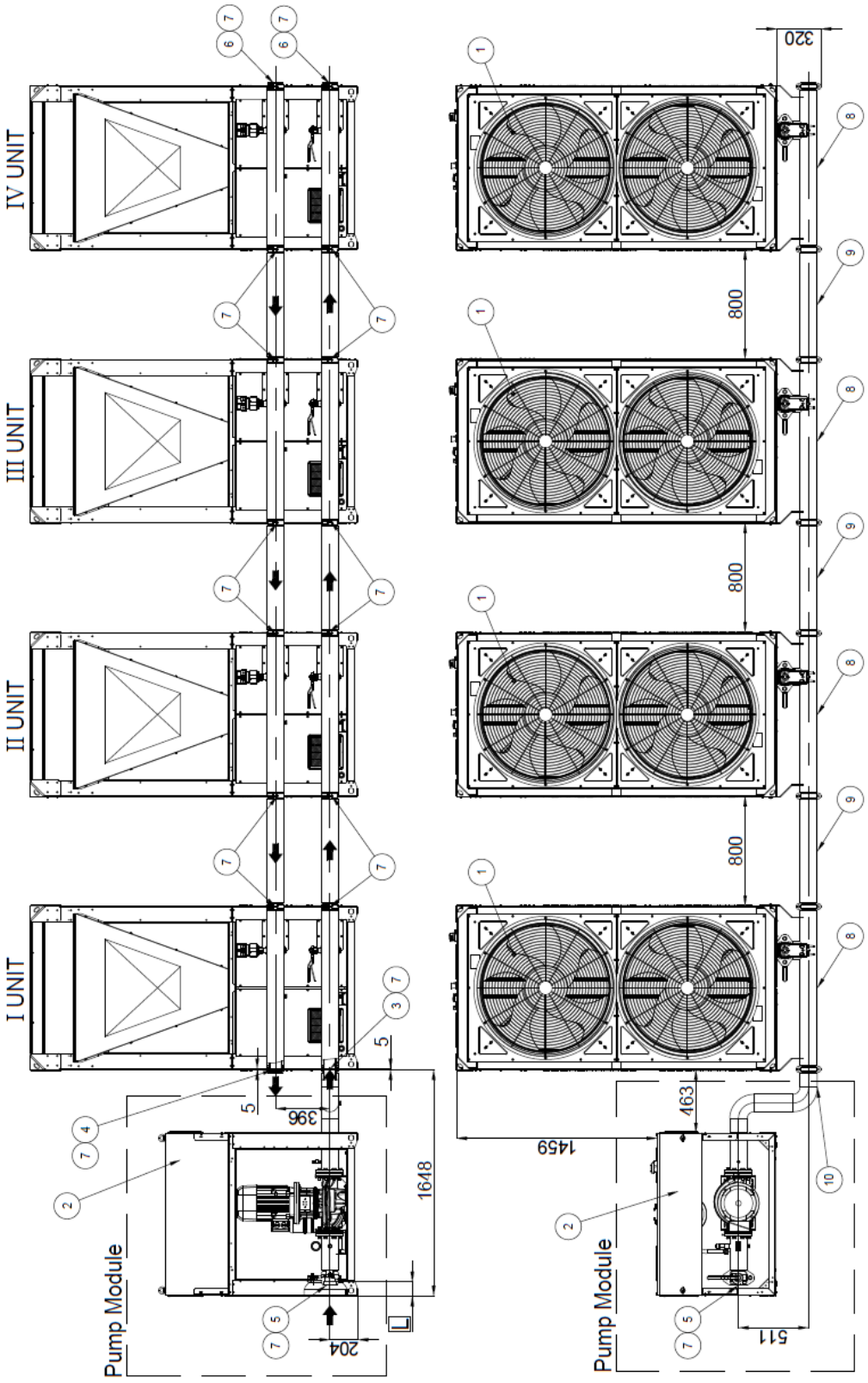
PER CALCOLO PESO TOTALE DELL'ARRAY
SOMMARE IL PESO DELLE TUBAZIONI TABELLATO
AL PESO DELLE SINGOLE UNITA' PRESENTE NEL
DISEGNO D'INGOMBRO (UNITA' & MODULO POMPA)
TO CALCULATE THE TOTAL WEIGHT OF THE ARRAY,
ADD THE WEIGHT OF THE PIPES SHOWN IN THE TABLE
TO THE WEIGHT OF THE INDIVIDUAL UNITS SHOWN IN THE
OVERALL DIMENSION DRAWING (UNIT & PUMP MODULE)

Cod. MODULO POMPA Cod. PUMP MODULE	L
EKPMPLOW1	162
EKPMPLOW2	221
EKPMPLOW3	221
EKPMPLOW4	161
EKPMPHGH1	102
EKPMPHGH2	161
EKPMPHGH3	161
EKPMPHGH4	161
EKPMPHGH5	102

a

PESO TUBAZIONI ACQUA WATER PIPING WEIGHT (POS. 8 + 9 + 10 IN LEGEND)	PESO / WEIGHT KG	
	SPEDIZIONE SHIPPING	FUNZIONAMENTO OPERATING
n.1-UNIT ARRAY	39	59
n.2-UNIT ARRAY	83	126
n.3-UNIT ARRAY	127	194
n.4-UNIT ARRAY	170	261




IV UNIT
III UNIT
II UNIT
I UNIT
Pump Module
Pump Module
320
800
800
800
1459
463
396
5
5
1648
204
511

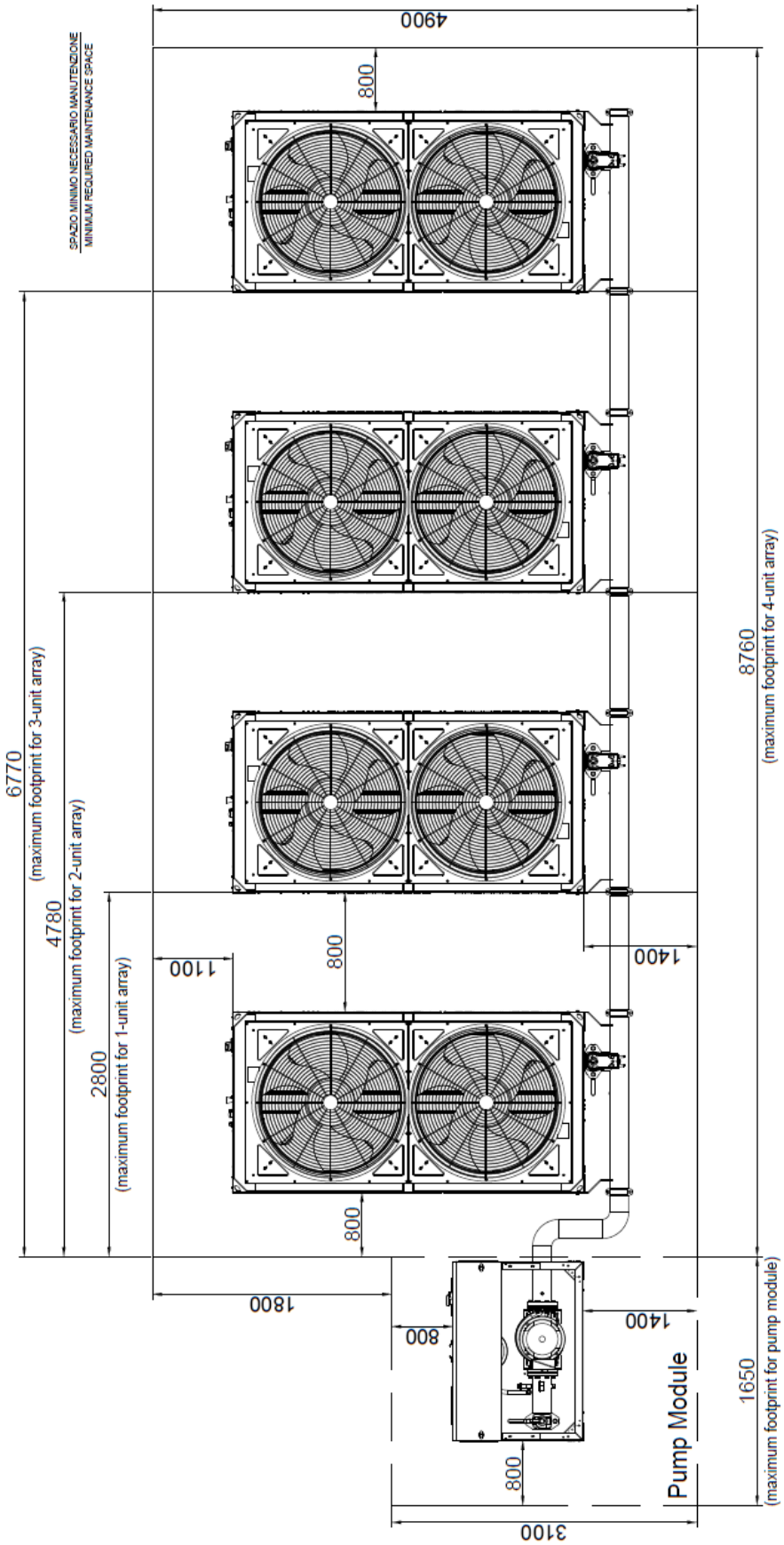
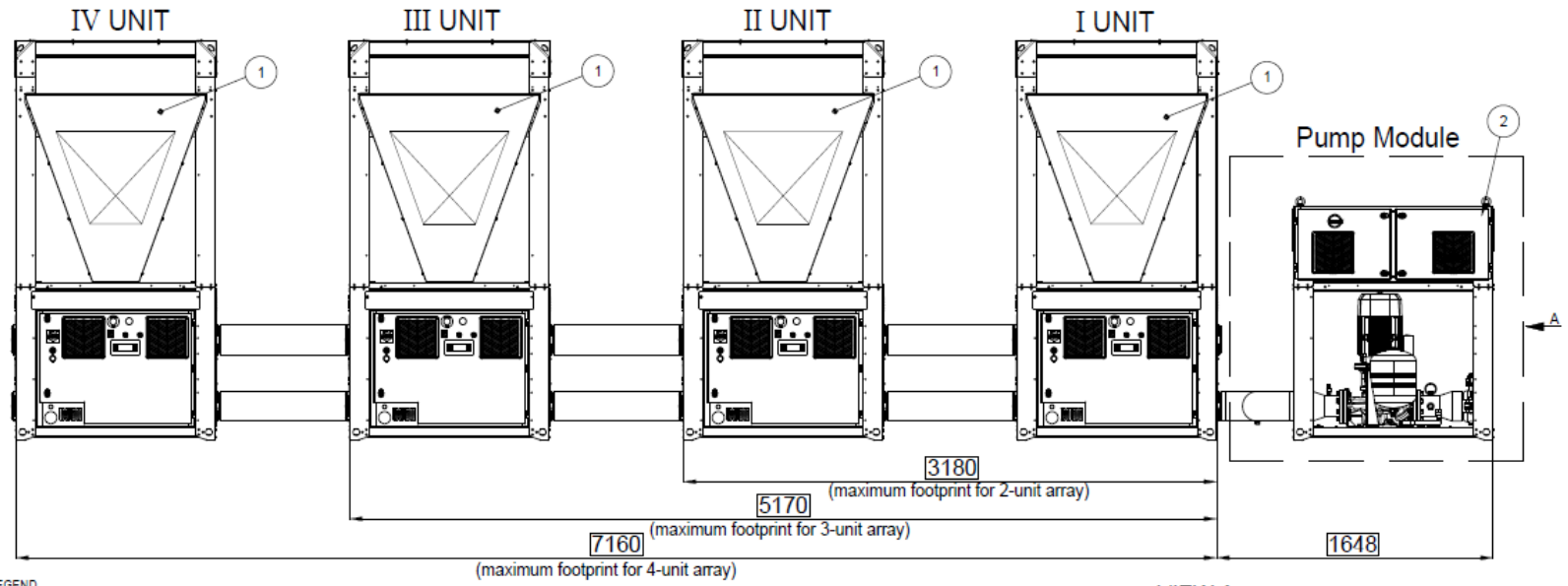


Figure 6 – Dimensional drawings – array installation_PAR3

Legend	
1	Unit EWYK100-135QZXSA2
2	Pump Module
3	Array water inlet Ø88.9
4	Array water outlet Ø88.9
5	Array water inlet with pump module Ø88.9
6	Victaulic cap Ø88.9
7	Victaulic connection Ø88.9
8	Manifold module Ø88.9/ EKMNFLD3
9	Parallel connection kit Ø 88.9/EKMODPAR3
10	Pump connection kit Ø88.9/EKCONNPMP3

a		
Water piping weight* (Legend n.8+9+10)	**Weight**	
	Shipping	**Operating**
n.1 – UNIT ARRAY	39	59
n.2 – UNIT ARRAY	83	126
n.3 – UNIT ARRAY	127	194
n.4 – UNIT ARRAY	170	261

*To calculate the total weight of the array, add the weight of the pipes shown in the table to the weight of the individual units shown in the overall dimension drawing (unit & pump module).



LEGENDA - LEGEND

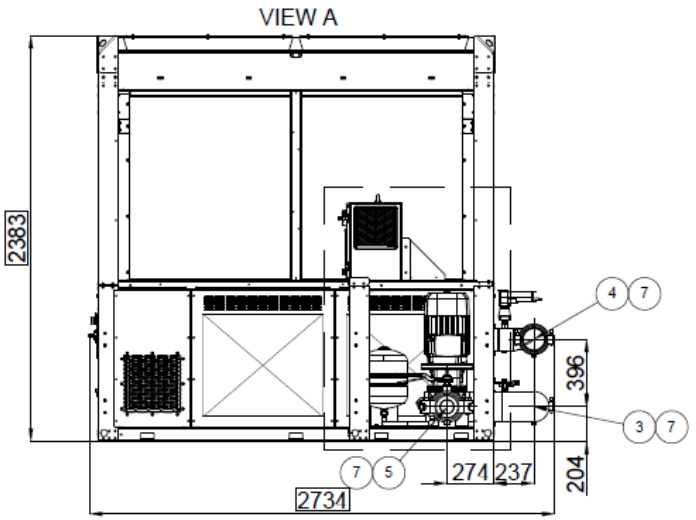
1. UNITA' EWYK135QZXSA2
   UNIT EWYK135QZXSA2
2. MODULO POMPA
   PUMP MODULE
3. ENTRATA ACQUA ARRAY Ø139.7 / 5"
   ARRAY WATER INLET Ø139.7 / 5"
4. USCITA ACQUA ARRAY Ø139.7 / 5"
   ARRAY WATER OUTLET Ø139.7 / 5"
5. ENTRATA ACQUA ARRAY CON MODULO POMPA Ø139.7 / 5"
   ARRAY WATER INLET WITH PUMP MODULE Ø139.7 / 5"
6. TAPPO VICTAULIC Ø139.7 / 5"
   VICTAULIC CAP Ø139.7 / 5"
7. CONNESSIONE VICTAULIC Ø139.7 / 5"
   VICTAULIC CONNECTION Ø139.7 / 5"
8. MODULO MANIFOLD Ø139.7 / 5" - EKMNFLD5
   MANIFOLD MODULE Ø139.7 / 5" - EKMNFLD5
9. KIT CONNESSIONI PARALLELE Ø139.7 / 5" - EKMODPAR5
   PARALLEL CONNECTION KIT Ø139.7 / 5" - EKMODPAR5
10. KIT CONNESSIONE MODULO POMPA Ø139.7 / 5" - EKCONNPMP5
    PUMP CONNECTION KIT Ø139.7 / 5" - EKCONNPMP5

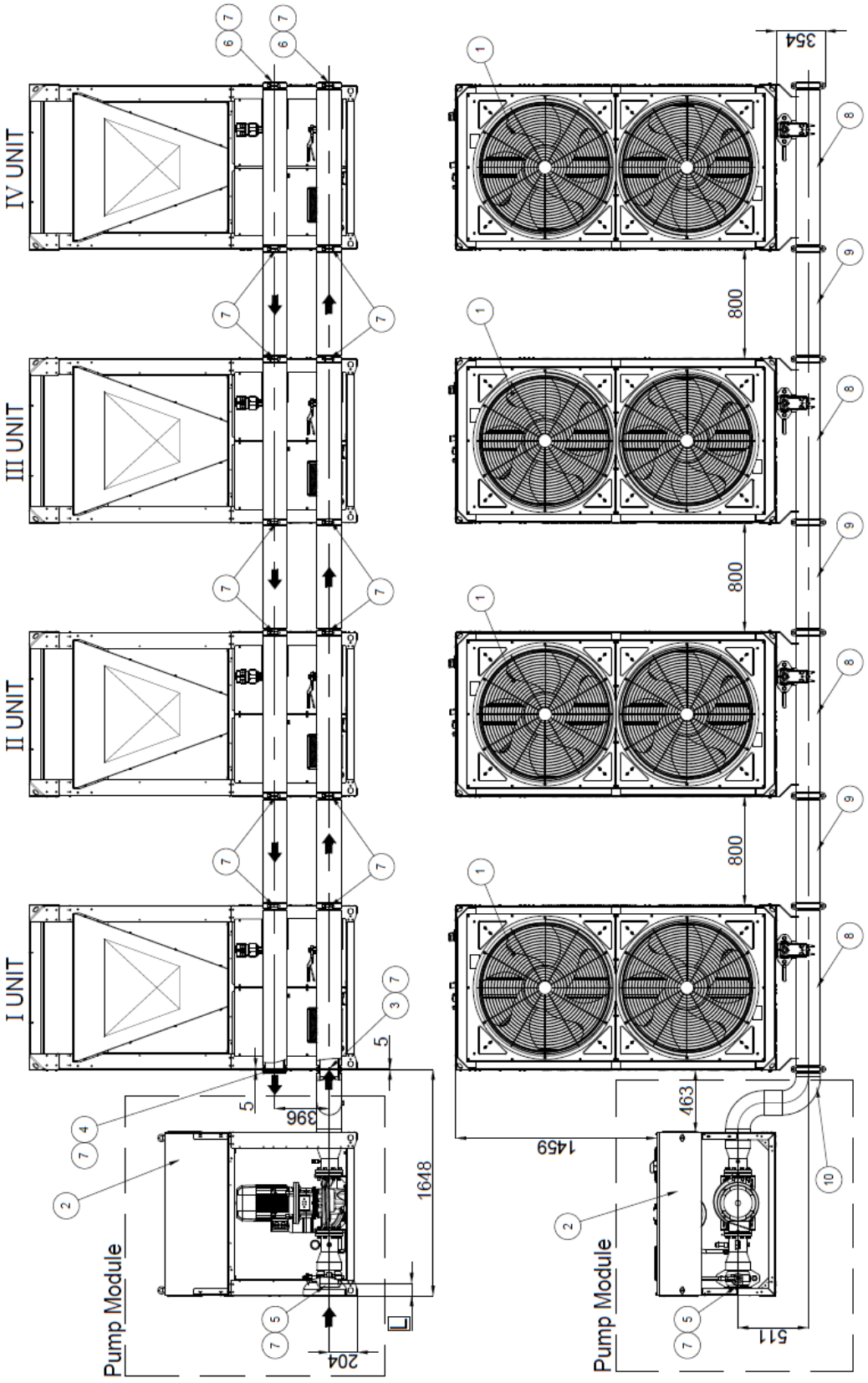
PER CALCOLO PESO TOTALE DELL'ARRAY
SOMMARE IL PESO DELLE TUBAZIONI TABELLATO
AL PESO DELLE SINGOLE UNITA' PRESENTE NEL
DISEGNO D'INGOMBRO (UNITA' & MODULO POMPA)
TO CALCULATE THE TOTAL WEIGHT OF THE ARRAY,
ADD THE WEIGHT OF THE PIPES SHOWN IN THE TABLE
TO THE WEIGHT OF THE INDIVIDUAL UNITS SHOWN IN THE
OVERALL DIMENSION DRAWING (UNIT & PUMP MODULE)

a

Cod. MODULO POMPA Cod. PUMP MODULE	L
EKPMPLOW5	172
EKPMPLOW6	92
EKPMPHGH6	92
EKPMPHGH7	92

PESO TUBAZIONI ACQUA WATER PIPING WEIGHT (POS. 8 + 9 + 10 IN LEGEND)	PESO / WEIGHT KG	
	SPEDIZIONE SHIPPING	FUNZIONAMENTO OPERATING
n.1-UNIT ARRAY	68	115
n.2-UNIT ARRAY	146	251
n.3-UNIT ARRAY	224	387
n.4-UNIT ARRAY	302	523




IV UNIT
III UNIT
II UNIT
I UNIT
Pump Module
Pump Module
800
800
800
354
463
1459
511
396
204
1648
5
5

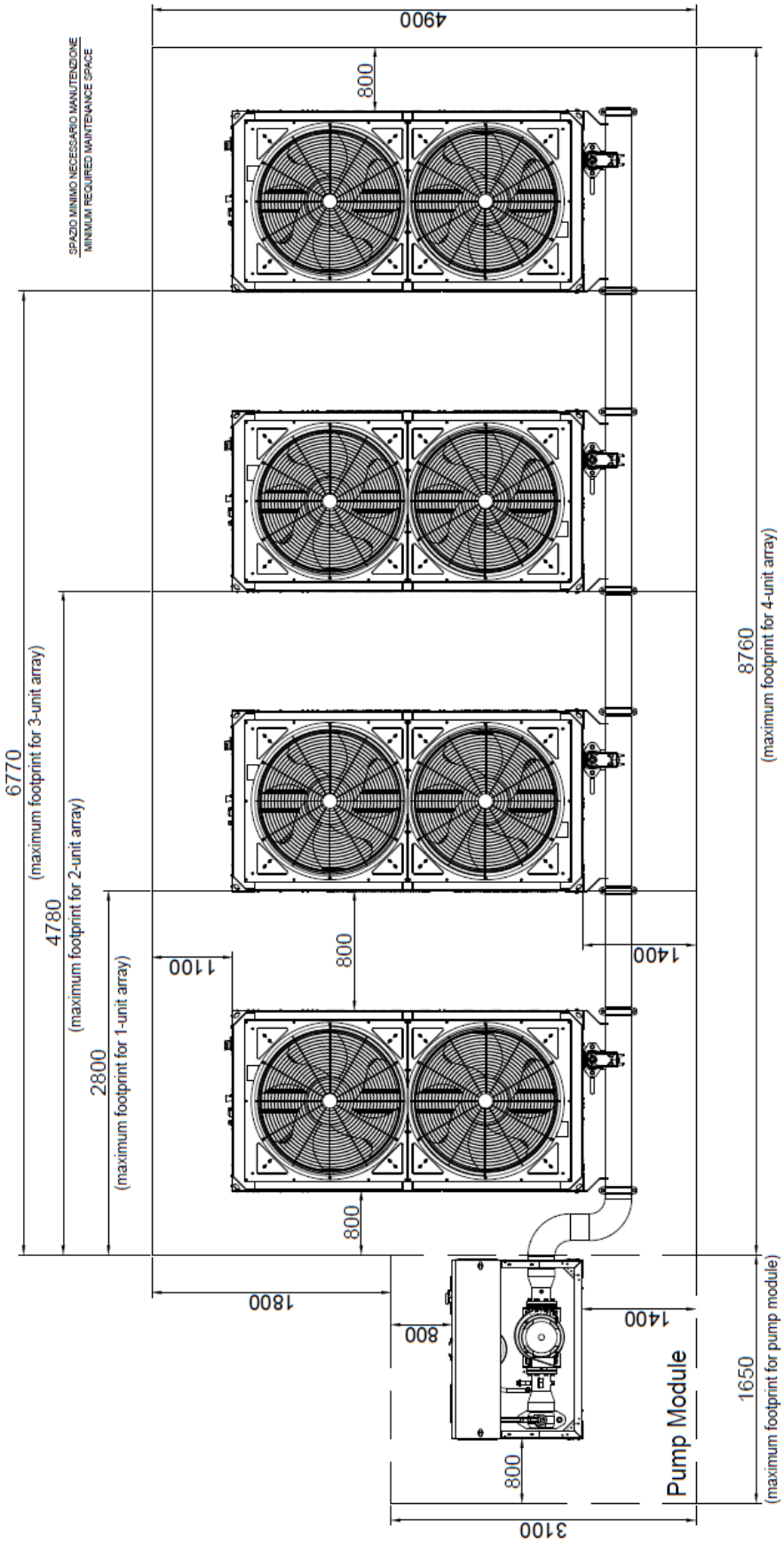
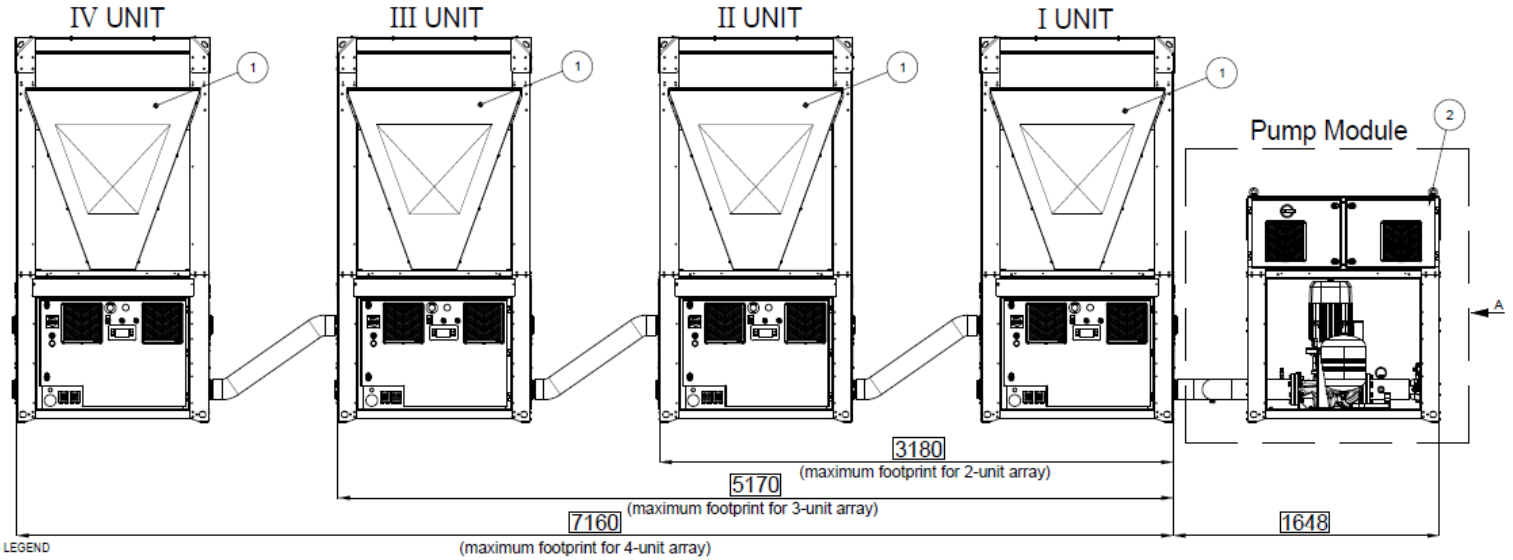


Figure 7 – Dimensional drawings – array installation – PAR5

Legend	
1	Unit EWYK100-135QZXSA2
2	Pump Module
3	Array water inlet Ø139.7
4	Array water outlet Ø139.7
5	Array water inlet with pump module Ø139.7
6	Victaulic cap Ø139.7
7	Victaulic connection Ø139.7
8	Manifold module Ø139.7/ EKMNFLD5
9	Parallel connection kit Ø139.7/EKMODPAR5
10	Pump connection kit Ø139.7/EKCONNPMP5

a		
Water piping weight* (Legend n.8+9+10)	**Weight**	
	Shipping	**Operating**
n.1 – UNIT ARRAY	68	115
n.2 – UNIT ARRAY	146	251
n.3 – UNIT ARRAY	224	387
n.4 – UNIT ARRAY	302	523

*To calculate the total weight of the array, add the weight of the pipes shown in the table to the weight of the individual units shown in the overall dimension drawing (unit & pump module).



LEGENDA - LEGEND

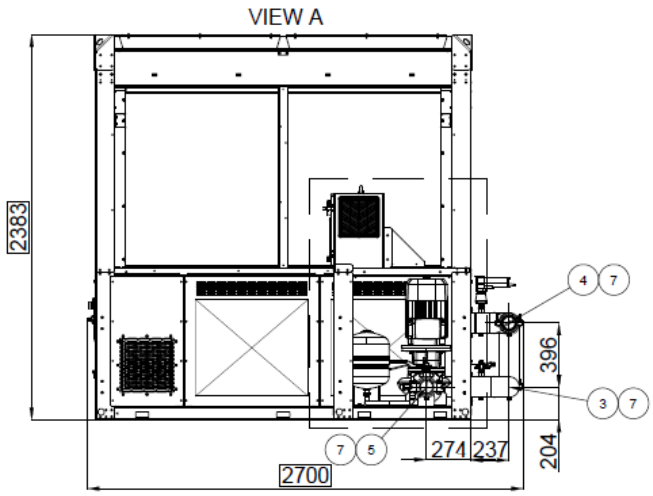
1. UNITA' EWYK135QZXSA2
   UNIT EWYK135QZXSA2
2. MODULO POMPA
   PUMP MODULE
3. ENTRATA ACQUA ARRAY Ø88.9 / 3"
   ARRAY WATER INLET Ø88.9 / 3"
4. USCITA ACQUA ARRAY Ø88.9 / 3"
   ARRAY WATER OUTLET Ø88.9 / 3"
5. ENTRATA ACQUA ARRAY CON MODULO POMPA Ø88.9 / 3"
   ARRAY WATER INLET WITH PUMP MODULE Ø88.9 / 3"
6. TAPPO VICTAULIC Ø88.9 / 3"
   VICTAULIC CAP Ø88.9 / 3"
7. CONNESSIONE VICTAULIC Ø88.9 / 3"
   VICTAULIC CONNECTION Ø88.9 / 3"
8. MODULO MANIFOLD Ø88.9 / 3" - EKMNFLD3
   MANIFOLD MODULE Ø88.9 / 3" - EKMNFLD3
9. KIT CONNESSIONI SERIE Ø88.9 / 3" - EKMODSER3
   SERIES CONNECTION KIT Ø88.9 / 3" - EKMODSER3
10. KIT CONNESSIONE MODULO POMPA Ø88.9 / 3" - EKCONNPMP3
    PUMP CONNECTION KIT Ø88.9 / 3" - EKCONNPMP3

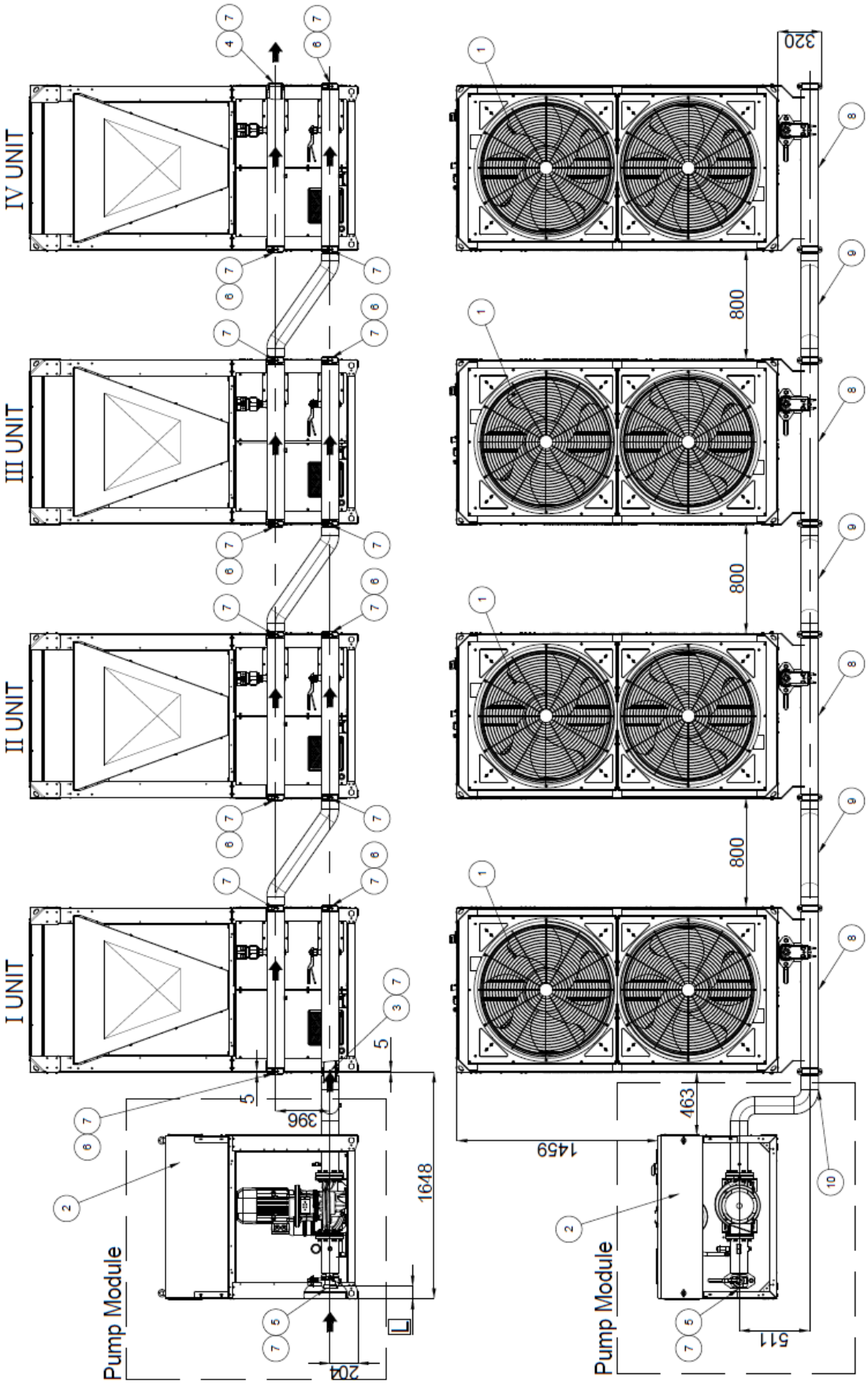
PER CALCOLO PESO TOTALE DELL'ARRAY
SOMMARE IL PESO DELLE TUBAZIONI TABELLATO
AL PESO DELLE SINGOLE UNITA' PRESENTE NEL
DISEGNO D'INGOMBRO (UNITA' & MODULO POMPA)
TO CALCULATE THE TOTAL WEIGHT OF THE ARRAY,
ADD THE WEIGHT OF THE PIPES SHOWN IN THE TABLE
TO THE WEIGHT OF THE INDIVIDUAL UNITS SHOWN IN THE
OVERALL DIMENSION DRAWING (UNIT & PUMP MODULE)

a

Cod. MODULO POMPA Cod. PUMP MODULE	L
EKPMPLOW1	162
EKPMPLOW2	221
EKPMPLOW3	221
EKPMPLOW4	161
EKPMPHGH1	102
EKPMPHGH2	161
EKPMPHGH3	161
EKPMPHGH4	161
EKPMPHGH5	102

PESO TUBAZIONI ACQUA WATER PIPING WEIGHT (POS. 8 + 9 + 10 IN LEGEND)	PESO / WEIGHT KG	
	SPEDIZIONE SHIPPING	FUNZIONAMENTO OPERATING
n.1-UNIT ARRAY	39	59
n.2-UNIT ARRAY	78	118
n.3-UNIT ARRAY	117	177
n.4-UNIT ARRAY	156	235




IV UNIT
III UNIT
II UNIT
I UNIT
Pump Module
Pump Module
800
800
800
320
463
1459
511
396
5
5
1648
204
L

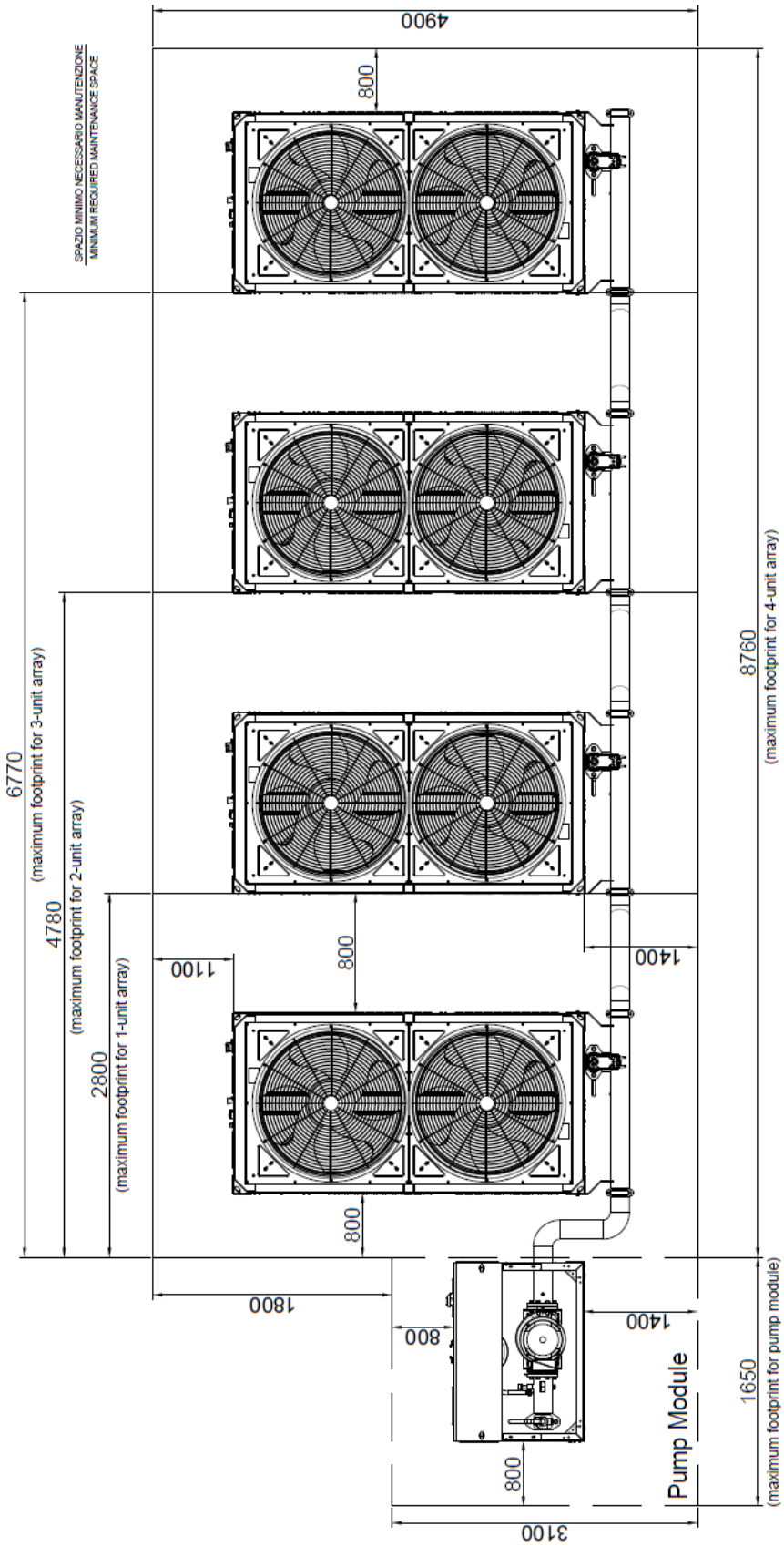


Figure 8 – Dimensional drawings – array installation_SER3

Legend	
1	Unit EWYK100-135QZXSA2
2	Pump Module
3	Array water inlet Ø88.9
4	Array water outlet Ø88.9
5	Array water inlet with pump module Ø88.9
6	Victaulic cap Ø88.9
7	Victaulic connection Ø88.9
8	Manifold module Ø88.9/ EKMNFLD3
9	Parallel connection kit Ø 88.9/EKMODSER3
10	Pump connection kit Ø88.9/EKCONNPMP3

a		
Water piping weight* (Legend n.8+9+10)	**Weight**	
	Shipping	**Operating**
n.1 – UNIT ARRAY	39	59
n.2 – UNIT ARRAY	78	118
n.3 – UNIT ARRAY	117	177
n.4 – UNIT ARRAY	156	235

*To calculate the total weight of the array, add the weight of the pipes shown in the table to the weight of the individual units shown in the overall dimension drawing (unit & pump module).

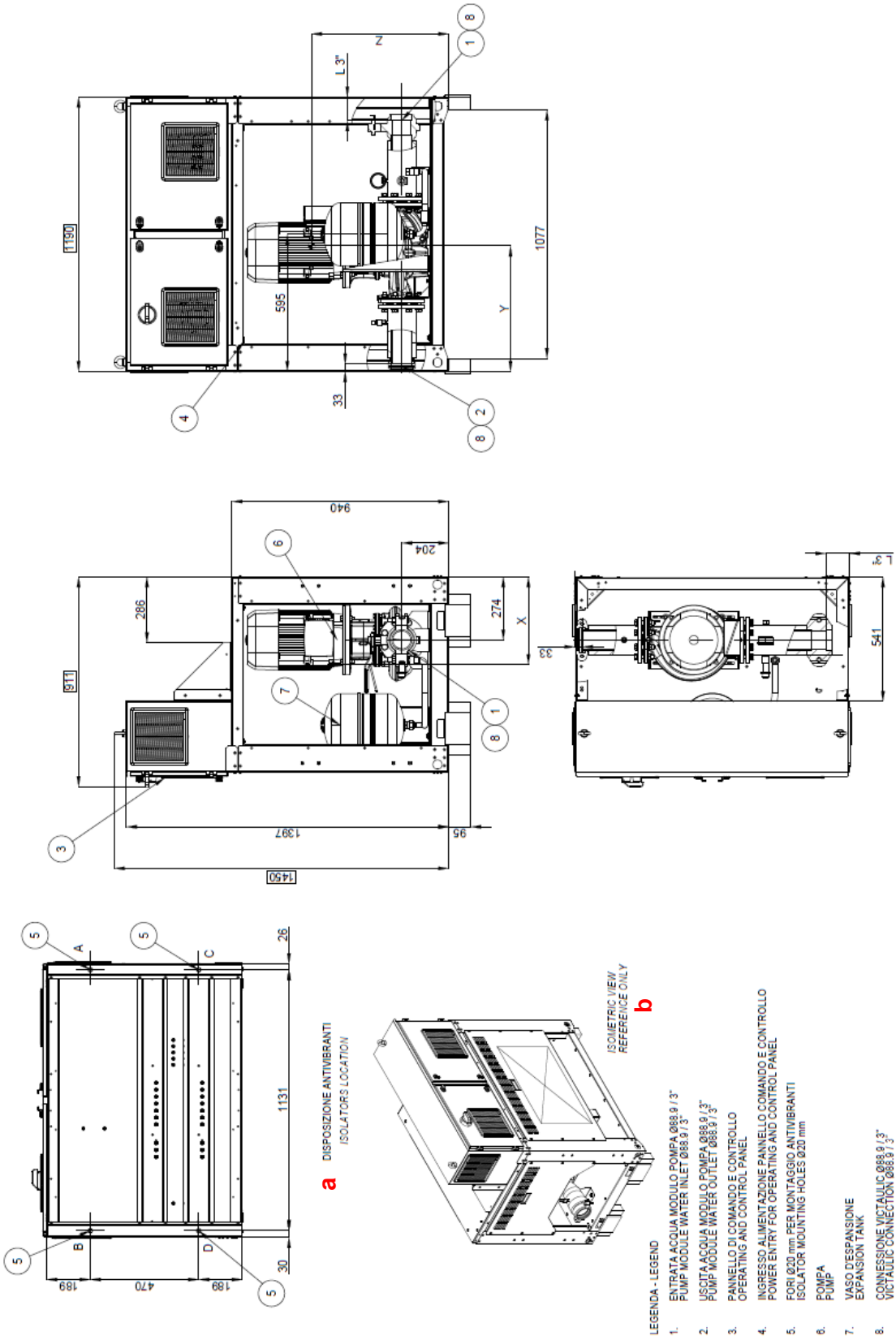


Figure 9 – Dimensional drawings – Pump modules

Legend	
1	Pump module water inlet Ø88.9mm
2	Pump module water outlet Ø88.9mm
3	Operating and control panel
4	Power entry for operating and control panel
5	Isolator mounting holes Ø20mm
6	Pump
7	Expansion tank
8	Victaulic connection Ø88.9mm

Pump Module Code	L-3" [mm]	Weigh Kg		Isolator loads Kg				Center of gravity		
		Shipping	Operating	A	B	C	D	x	y	z
EKPMPLOW 1	162	212	217	58	64	45	50	459	560	547
EKPMPLOW 2	221	221	226	56	66	48	56	447	543	572
EKPMPLOW 3	221	237	242	57	69	53	63	436	538	589
EKPMPLOW 4	161	279	284	62	75	67	80	416	538	610
EKPMPHGH 1	102	219	224	58	65	48	53	451	567	538
EKPMPHGH 2	161	232	237	57	68	52	60	440	546	600
EKPMPHGH 3	161	237	242	57	69	53	63	436	548	600
EKPMPHGH 4	161	279	284	62	75	67	80	416	538	610
EKPMPHGH 5	102	285	290	65	74	71	80	413	559	583
Spring isolators	EKPMPSPRAVM		Type (Q.ty)	91269 (4Pz.)						
Rubber isolators	EKPMPRUBAVM		Type (Q.ty)	91268 (4Pz.)						

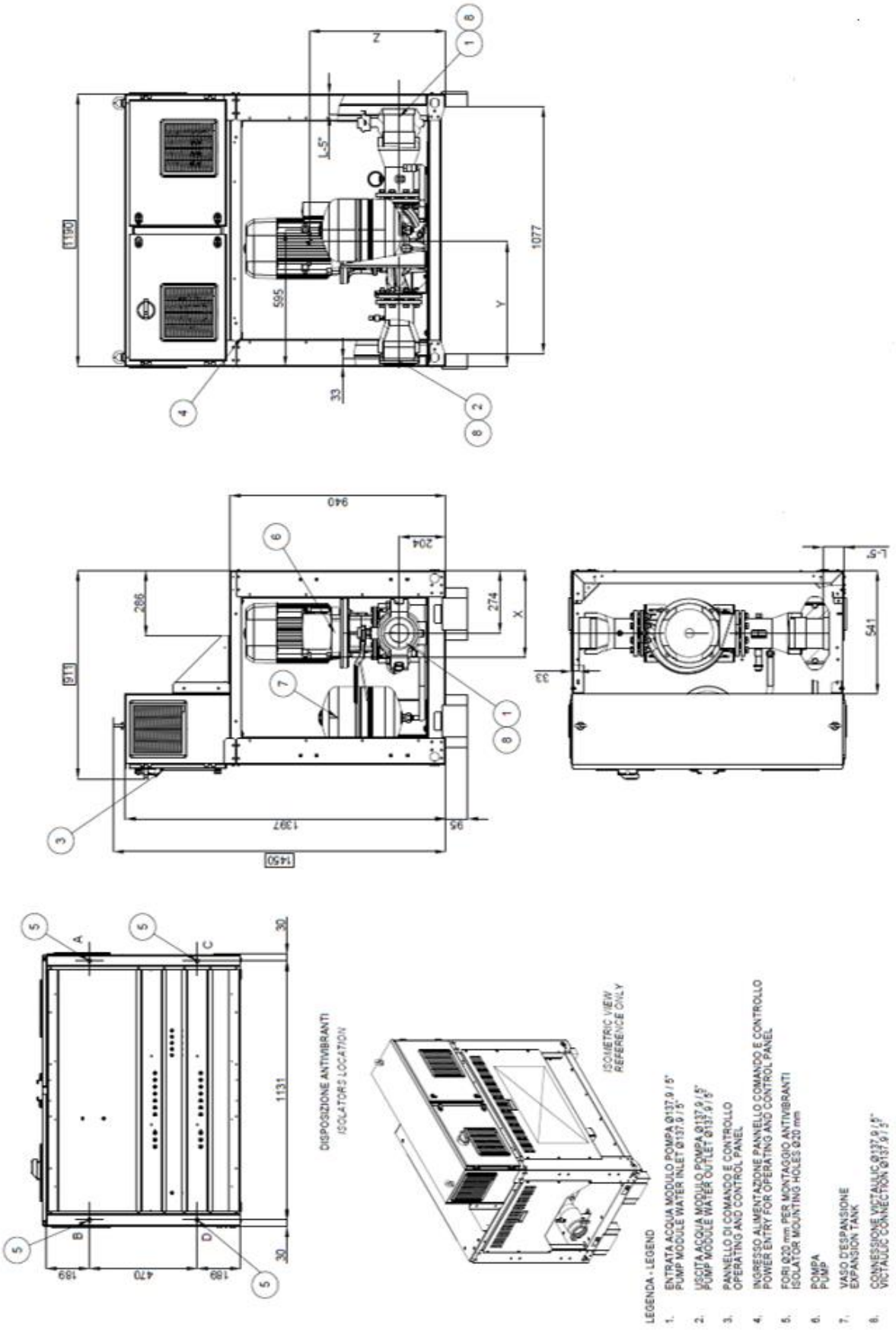


Figure 10 – Dimensional drawings – Pump modules

Legend	
1	Pump module water inlet Ø137.9mm
2	Pump module water outlet Ø137.9mm
3	Operating and control panel
4	Power entry for operating and control panel
5	Isolator mounting holes Ø20mm
6	Pump
7	Expansion tank
8	Victaulic connection Ø137.9mm

Pump Module Code	L-3" [mm]	Weigh Kg		Isolator loads Kg				Center of gravity		
		Shipping	Operating	A	B	C	D	x	y	z
EKPMPLOW 5	161	289	304	67	78	75	84	411	539	581
EKPMPLOW 6	161	296	311	69	78	77	87	407	553	397
EKPMPHGH 6	161	289	304	67	78	75	84	411	538	577
EKPMPHGH 7	102	296	311	69	78	77	87	407	553	397
Spring isolators	EKPMPSPRAVM		Type (Q.ty)	91269 (4Pz.)						
Rubber isolators	EKPMPRUBAVM		Type (Q.ty)	91268 (4Pz.)						

1 INTRODUCTION

1.1 Specific installer safety instructions

This manual is an important supporting document for qualified personnel, but it is not intended to replace such personnel.

	***Read this manual carefully before installing and starting up the unit.*** ***Improper installation could result in electric shock, short-circuit, leaks, fire or other damage to the equipment or injure to people.***
	***The unit must be installed by a professional operator/technician*** ***Unit startup has to be performed by authorized and trained professional*** ***All activities have to be performed according to local laws and regulation.***
	***Unit installation and start up is abosolutely forbidden if all instruction contained in this manual are not clear.*** ***In case of doubt contact the manufacturer representative for advice and information.***
	***RISK OF BURNING/SCALDING***
	***DO NOT PIERCE OR BURN.***
	***LGP (Liquified Petroleum Gas) is not R290. Do NOT charge LGP to this product.***
	***In case of fire, do not approach the unit and immediately notify the fire department. Attempting to estinguish a fire without specialist knowledge can be dangerous and may even cause an explosion.***

1.1.1 Training

	***Before you start the installation, follow the Daikin L1 Safety Training (see QR code). Without this training you cannot install the unit, and you cannot start operation of the unit.***

1.1.2 Personal safety protection tools

	***Make sure suitable tooling and work materials are available.***

1.1.3 Storage and installation location

Respect the installation location guidelines reported in this manual.
Respect the flammable zone around the unit (no ignition sources)
Take a picture of the installed unit and its environment. You will have to upload it during the unlocking procedure f the unit.

The appliance is not accessible to the general public according to EN 60335-2-40.

Follow the 'service space' and 'flammable zone' dimensions in this manual to install the unit correctly.

The appliance shall be stored in an area without ignition sources (neither permanent ignition sources, nor ignition sources for a short period of time) (i.e. open flames, operating gas appliance, operating electric heater).

1.1.4 Hand-over to the user

To avoid injury, do NOT touch the air inlet or aluminium fins of the unit.

Make sure installation, servicing, maintenance and repair comply with the instructions from Daikin and with applicable legislation (for example national gas regulation) and are executed ONLY by authorised personnel.

The refrigerant R290 (Propane) is flammable and must be handled only by qualified and trained personnel under the conditions specified in the safety regulations in force.

Be aware that the refrigerant has no odor.

Daikin shall be contacted to coordinate all disposal-related activities.
Only certified personnel may perform disposal.
Violations are punishable by the law.

1.1.5 Mechanical installation

Field piping MUST be in accordance with the instructions from this manual.

Handling of refrigerant tanks by unauthorised person is prohibited.
Do not stack refrigerant tanks when handling them.
Stacking tanks is extremely dangerous as it may cause them to fall, tip over or damage valve which they lead to refrigerant leakage.

The refrigerant tank is placed inside the product and shipped with refrigerant sealed inside.

Do NOT open the tank receiver valve of the unit's refrigerant tank until instructed by the user interface of the unit.
For safe transportation, all refrigerant is stored in the refrigerant tank of the unit. During commissioning, when performing the unlocking procedure of the unit (via the e-Care app and the user interface) the tank receiver valve of the refrigerant tank must be fully opened (when instructed by the user interface) and remain open.
For more information see the paragraph "Starting up the unit".

1.1.6 Electrical safety

RISK OF ELECTROCUTION
Do NOT leave the unit unattended when any cover is removed.

Electrical wiring must be in accordance with the instructions from this manual.

All wiring must be performed by an authorised electrician and must comply with the national wiring regulations.
Make electrical conncections to the fixed wiring.
All components produced on-site and all electrical constructions must comply with the applicable legislation.

Always use multicore cable for power supply cables.

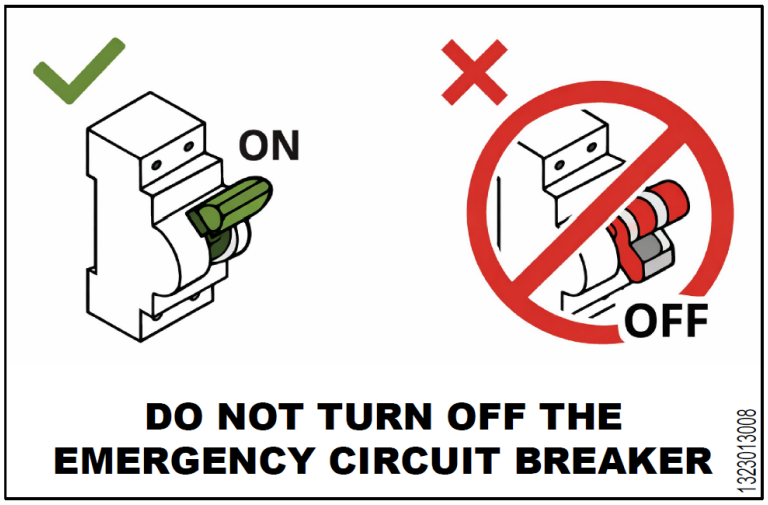
If the supply cord is damaged, it MUST be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid hazard.

Do NOT push or place redundant cable length into the unit.

- *Establish proper earthing. Do NOT earth the unit to a utility pipe, surge absorber, or telephone earth. Incomplete earthing may cause electrical shocks.*
- *Install the required fuses or circuit breakers according to this manual.*
- *Secure the electrical wiring with cable ties so that the cables do NOT come in contact with sharp edges or piping, particularly on the high-pressure side.*
- *Do NOT use taped wires, extension cords, or connections from a star system. They can cause overheating, electrical shocks or fire.*
- *Do NOT install a phase advancing capacitor, because this unit is equipped with an inverter. A phase advancing capacitor will reduce performance and may cause accidents.*

Install 2-pole circuit breaker, Icn (breaking capacity) 10 kA, In (rated current) 16 A, curve C.

After commissioning, do NOT turn OFF the circuit breakers to the units so that the protection remains activated. The label 132301008 (shipped inside the documentation in the Electrical Panel) shall be applied near the circuit breaker.



1.2 Safety checklist before working on R290 units

▪ For a more detailed description of the safety items in this checklist, see “Safety Devices”.
▪ For more information about "Systems using R290 refrigerant", see the dedicated Service Manual ESIE22-02 (available on https://my.daikin.eu).

The unit contains R290 refrigerant. Before starting work on this unit, check the following safety items:

☐	Work permit obtained if required.
☐	All persons involved have been trained and are wearing/ carrying the required personal protective equipment (portable leak detector)
☐	Work zone cordoned off, CAUTION signs installed.
☐	Ignition sources removed ▪ Remove power tools, computers, cell phones and other potential ignition sources that can cause sparks from the work area. ▪ Take protective measures to prevent static discharge, for example, grounding and antistatic clothing.
☐	Suitable tooling and work materials available ▪ Including ATEX tooling (explosion proof), sufficient nitrogen and required spare parts.
☐	Check for the presence of an explosive atmosphere by placing a personal gas monitoring system on the floor near the unit. • Suitable for R290. • Calibrated. • Operation test. • Alarm thresholds. • Battery charge.
☐	Sufficient ventilation • Place a portable ventilation unit to create sufficient ventilation. • The ventilation unit must be explosion proof.
☐	Fire extinguisher at hand • ABC dry power or CO_2 extinguisher, minimal 2 kg.
☐	Disconnect and secure the unit from the power supply. • Place lockout-tagout (LOTO). “If there are no safety measures in place to replace the unit’s own protections, it is necessary to keep the emergency power supply under UPS (230Vac) active.”
☐	Perform a Last Minute Risk Assessment.

1.3 Precautions against residual risks

1. Install the unit according to the instructions set out in this manual
2. Regularly carry out all the maintenance operations foreseen in this manual
3. Wear protective equipment (safety gloves, safety glasses, safety helmet, etc.). Suited to the work in hand; do not wear clothes or accessories that can get caught or sucked in by flows of air; tie back long hair before entering the unit
4. Before opening the machine panelling make sure that it is firmly hinged to the machine
5. The fins on heat exchangers and the edges of metal components and panels can cause cuts
6. Do not remove the guards from mobile components while the unit is operating
7. Make sure that mobile component guards are fitted correctly before restarting the unit
8. The surfaces of the machine and pipes can get very hot or cold and cause the risk of scalding
9. Never exceed the maximum pressure limit (PS) of the water circuit of the unit.
10. Before removing parts on the pressurised water circuits, close the section of the piping concerned and drain the fluid gradually to stabilise the pressure at the atmospheric level
11. Do not use your hands to check possible refrigerant leaks
12. Disable the unit from the mains using the main switch before opening the control panel

The 230 Vac emergency power supply shall always be active

13. Check that the unit has been grounded correctly before starting it
14. Install the machine in a suitable area
15. Do not use cables with inadequate sections nor extension cord connections, even for very short periods or emergencies
16. For units with power correction capacitors, wait 5 minutes after removing the electric power supply before accessing the inside of the switch board
17. The unit contains pressurised refrigerant gas: the pressurised equipment must not be touched except during maintenance, which must be entrusted to qualified and authorised personnel
18. Connect the utilities to the unit following the indications set out in this manual and on the panelling of the unit itself
19. To avoid an environmental risk, make sure that any leaking fluid is collected in suitable devices in accordance with local regulations.
20. If a part needs to be dismantled, make sure it is correctly re-assembled before starting the unit
21. When the rules in force require the installation of fire-fighting systems near the machine, check that these are suitable for extinguishing fires on electrical equipment and on the lubricating oil of the compressor and the refrigerant, as specified on the safety data sheets of these fluids
22. When the unit is equipped with devices for venting overpressure (safety valves): when these valves are triggered, the refrigerant gas is released at a high temperature and speed; prevent the release of gas from harming people or objects and, if necessary, discharge the gas according to the provisions of EN 378-3 and the local regulations in force .(see paragraph “Discharge safety valve manifold”).
23. Keep all the safety devices in good working order and check them periodically according to the regulations in force
24. Keep all lubricants in suitably marked containers
25. Do not store inflammable liquids near the unit
26. Solder or braze only empty pipes after removing all traces of lubricant oil; do not use flames or other heat sources close to pipes containing refrigerant fluid
27. Do not use naked flames near the unit
28. The machinery must be installed in structures protected against atmospheric discharge according to the applicable laws and technical standards
29. Do not bend or hit pipes containing pressurised fluids
30. It is not permitted to walk or rest other objects on the machines
31. The user is responsible for overall evaluation of the risk of fire in the place of installation (for example, calculation of the fire load)
32. During transport, always secure the unit to the bed floor of the vehicle to prevent it from moving about and overturning
33. The machine must be transported according to the regulations in force considering the characteristics of the fluids in the machine and the description of these on the safety data sheet
34. Inappropriate transport can cause damage to the machine and even leaking of the refrigerant fluid. Before start-up, the machine must be checked for leaks and repaired accordingly.
35. The installation must comply with the requirements of this manual in addition to EN 378-3 and the local regulations in force; good ventilation must be guaranteed, and refrigerant detectors must be fitted when necessary.

1.4 Information about the refrigerant

This product contains R290 refrigerant that has a minimal environmental impact, thanks to its low value of Global Warming Potential (GWP). According to ISO 817, R290 refrigerant is classified as A3, which is highly flammable, since the flame propagation rate is high, and non-toxic.

Safety class (ISO 817)	A3
PED Group	1
Practical limit (kg/m^3)	0.008
ATEL/ ODL (kg/m^3)	0.09
LFL (Kg/m^3) @ 23°C	≈ 0.038
Vapour density @25 °C, 101.3 kPa (kg/m^3)	1.87
Molecular mass	44
Boiling point (° C)	-42.1
GWP (100 yr ITH)	0,02
Autoignition temperature (° C)	470

Table 1 - Physical characteristics of R290 refrigerant

1.5 Installation information

The unit must be installed in open air.

According to EN 378-3 it can be considered as “open air”, units which are installed under one these conditions:

1) The unit is installed on the outside of builiding, directly exposed to the outside air where a release of refrigerant cannot stagnate.
2) The unit is installed in a room, where at least one of the longer walls is open to the outside air by means of louvres with 75% free area and covering at least 80% of the wall area where a release of refrigerant cannot stagnate.

Local building codes and safety standards shall be followed; in absence of local codes and standards refer to EN 378-3 / ISO 5149-3 as a guide.

Units sited in the open air shall be positioned to avoid leaked refrigerant flowing into a building or otherwise endangering people and property.

The refrigerant shall not be able to flow into any ventilation fresh air opening, doorway, trap door or similar opening in the event of a leak. Where a shelter is provided for refrigerating equipment sited in the open air it shall have natural or forced ventilation.

The units are designed and qualified for installation in open areas, in accordance with the instructions provided in this manual. However, depending on the characteristics of the installation site, alternative installation arrangements may be required.

If the unit is installed in confined outdoor spaces, covered areas, partially enclosed spaces, or provided with acoustic enclosures, the customer shall ensure that refrigerant accumulation cannot occur.

For units installed outside in a location where a release of refrigerant can stagnate then the installation shall comply with the requirements for gas detection and ventilation of machinery rooms.

The risk assessment related to the installation of the equipment shall in all cases remain the responsibility of the customer.

1.6 Safety devices

This product is equipped with an emergency circuit (leak detector, ventilation fan, and fault indicator lamp with an acoustic indicator) to ensure safety in the event of refrigerant leakage.

The emergency circuit uses a separate power source (230VAC) distinct from the unit's main power supply (400VAC). To ensure power to the emergency circuit even during a power outage, it is mandatory to connect it to a UPS (uninterruptible power supply) or an emergency power circuit.

A UPS must be installed for each unit.

This product is equipped with the following safety devices:

Safety Device	QTY
Leak detector	3
Cooling fans within the electrical panel	2
Extraction fan	1
Alarm lamp with an acoustic indicator	1
Shut-off valve	1

Below is a brief description of the safety components and their operation:

- **Compressor box extraction fan**: provides ventilation and effective dilution in the event of a refrigerant leak.
- **Cooling fans inside the electrical panel**: maintain slight overpressure inside the electrical panel and prevent gas accumulation.
- **Gas leak detectors:** installed inside the compressor box and the electrical panel to ensure early leak detection. The minimum lifetime of the sensor is 15 years, without any calibration performed.
- **Water leak box separator**: in the event of a heat exchanger failure, the system is designed to vent propane into a dedicated leak box, preventing it from reaching the customer side. In this condition, the shut-off valve on the water circuit closes automatically.
- **Visual and audible alarm system**: ensures immediate local warning in the event of detected leakage.

1.6.1 Gas Separation Countermeasure on the Water Side

A dedicated gas vent valve is factory-mounted on the water-side piping and enclosed within the compressor box.

In the event of a leak on the water side, any released gas is vented into the compressor box, where it is detected by the gas leak detector.

If leakage is detected, the compressor box leak detector activates: the extraction fan, and an automatic shut-off valve, which isolates the unit from the water loop.

The shut-off valve is supplied loose; ensure it is correctly installed.
Verify that the shut-off valve seat is in the closed position before powering the actuator.

The gas vent valve is designed to detect leakage when there is no flow through the heat exchanger, i.e. when the water pump is switched off.

This system provides an additional, independent safety layer to detect the presence of propane in the water circuit in the unlikely event of a plate heat exchanger failure (e.g. due to freezing).

The gas vent valve is compatible with glycol-containing fluids.

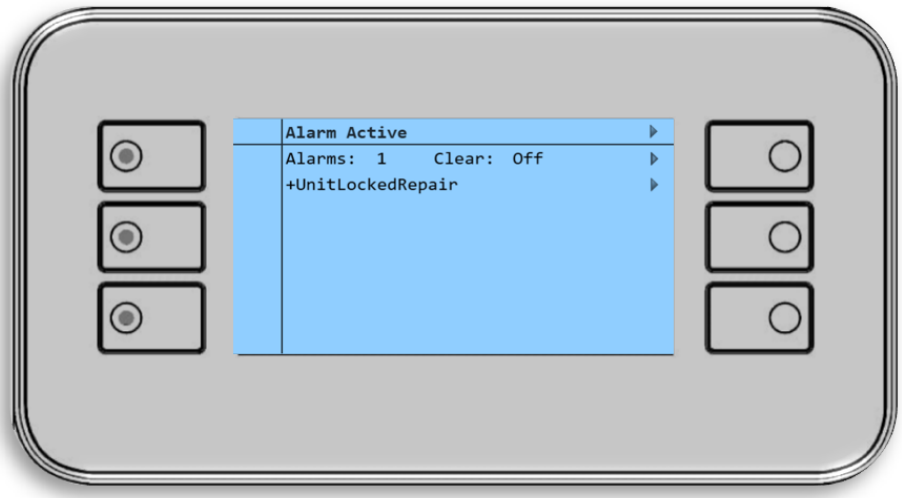
1.6.2 Leak detector

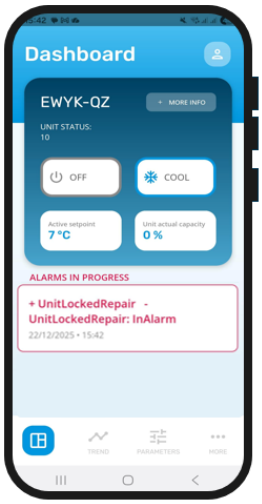
When the leak detector detects a gas leak, the unit's main power supply (400V) of this product will be shutdown while the safety emergency circuit will still be active.

Do NOT enter the flammable zone and contact a qualified technician authorised by Daikin while the fault indicator lamp with an acoustic indicator is active.

Furthermore, the compressor operation will be locked, preventing the compressor from restarting. (After power is shutdown and then restored, the controller displays the error shown below).
To unlock the compressor, contact the Daikin Service Center.

Below a possible error message in case of refrigerant loss:





Under no circumstance shall potential sources of ignition be used in the searching for or detection or refrigerant leaks.

In case of a leak, it is not necessary to replace the leak detector.

2 STORAGE

If it is necessary to store the unit before installation, it is necessary to observe some precautions:

- do not remove the protective plastic;
- protect the unit from dust, bad weather and any rodents;
- do not expose the unit to direct sunlight;
- do not use heat sources and / or open flames near the machine.

The machine is wrapped in antistatic stretch film, it is not intended for long term storage and must be removed and replaced by antistatic tarpaulins or the like, more suitable for a longer period.

Environmental conditions must be within the following limits:

- Minimum ambient temperature: -20 °C
- Maximum ambient temperature +48 °C
- Maximum R.H.: 95% not condensing

Storage at a temperature below the minimum or over the maximum values can cause damage to the components. Storage in a humid atmosphere may damage electrical components.

3 RECEIPT OF THE UNIT

Inspect the unit immediately after delivery. Make sure that the machine is intact in all its parts and that there are no deformations due to impacts. All components described in the delivery note must be inspected and checked.

Should any damage occur upon receipt of the machine, do not remove the damaged material and immediately make a written complaint to the transport company, requesting the inspection of the unit; do not repair until inspection by the transport company representative is carried out.

Immediately report the damage to the manufacturer representative, a set of photographs is helpful in recognizing responsibility. The restitution of the machinery is intended as ex-factory Daikin Applied Europe S.p.A.

Daikin Applied Europe S.p.A. declines all responsibility for any damage that the machinery may suffer during transport to the destination.

Use extreme caution when handling the unit to prevent damage to components. Before installing the unit, check that the model and power supply voltage shown on the nameplate are correct. Responsibility for any damage after acceptance of the unit cannot be attributed to the manufacturer.

Bring the packed unit as close as possible to its final installation position to prevent damage during transport.
Prepare in advance the path along which you want to bring the unit to its final installation position.

4 MECHANICAL INSTALLATION

4.1 Unit installation

4.1.1 Preparing the installation site

The appliance shall be stored in an area without ignition sources (neither permanent ignition sources, nor ignition sources for a short period of time) (example: open flames, operating gas appliance, an operating electric heater).

Make sure installation, servicing, maintenance and repair comply with the instructions from Daikin and with applicable legislation (for example national gas regulation) and are executed ONLY by authorised personnel.

4.2 Safety

Before installation and commissioning of the machinery, the people involved in this activity must have acquired the information necessary to perform these tasks, applying all the information gathered in this manual. In particular:

- the unit must be firmly anchored to the ground when it must not be moved.
- the unit can only be lifted using the lifting points indicated by labels.
- always protect operating personnel with personal protective equipment appropriate to the activities to be performed. The individual devices commonly used are: helmet, glasses, gloves, headphones, safety shoes. Further personal and collective protection devices must be adopted after having carried out an adequate analysis of the specific risks in the relevant area, according to the activities to be carried out.

4.3 Installation site requirements

The unit is designed for outdoor installation only, and for the following ambient temperatures:

Cooling mode	–20~46°C
Heating mode	–20~35°C

Make sure to comply with the following guidelines:
▪ Choose an installation location with sufficient space.
▪ Do NOT install the unit in locations often used as work location.
▪ Do NOT install the unit in locations near a road or parking area where it can be damaged by passing traffic.
▪ Do NOT install the unit in a basement.
▪ Do NOT install the unit in sound sensitive areas (e.g. near a bedroom), so that the operation noise will cause no trouble.
Note: If the sound is measured under actual installation conditions, the measured value might be higher than the sound pressure level mentioned in Sound spectrum in the data book due to environmental noise and sound reflections.
▪ Do NOT install the unit in locations where a mineral oil mist, spray or vapour may be present in the atmosphere. Plastic parts may deteriorate and fall off or cause water leakage.

All restrictions mentioned in this manual apply not only to new installation, but also to relocations and layout changes around this product.

4.3.1 Service space requirements

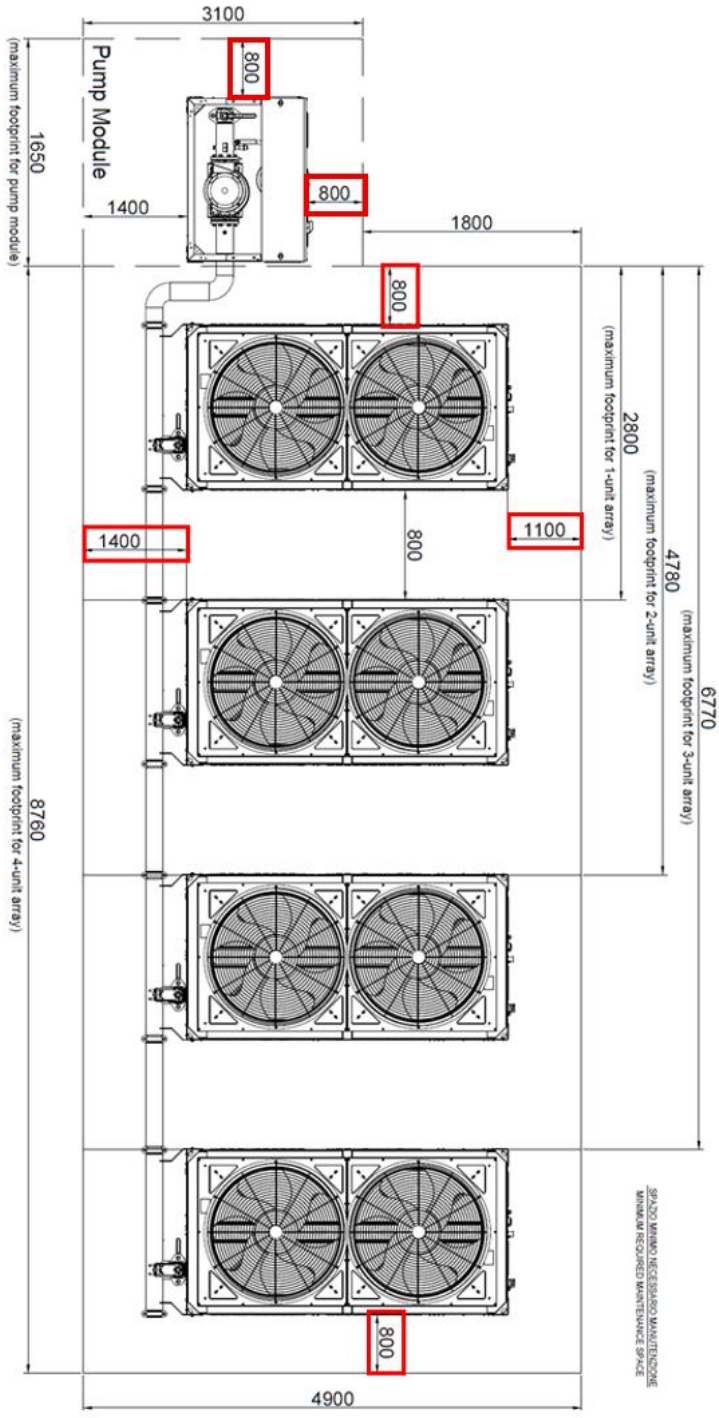


Figure 11 – Service space requirements

For the installation site, considering to left free the minimum required maintenance space as reported in the picture above and as follow:

- **1100 mm** from the Electrical Panel of the unit
- **1400 mm** from the Back of the unit (Water Side)
- **800 mm** laterally from the unit
- **800 mm** between two adjacent modules (in case of modular array installation)
- **800 mm** laterally from the Daikin Pump Module (accessory)

These spaces are suitable for dismantling using a crane, while additional space must be considered for the use of a forklift.

4.3.2 Additional installation site requirements

- When installing, consider strong winds, typhoons or earthquakes, improper installation may result in the unit turning over.
- Take care that in the event of a water leak, water cannot cause any damage to the installation space and surroundings.
- Be sure that the air inlet of the unit is not positioned towards the main wind direction. Frontal wind will disturb the operation of the unit. If necessary, use a screen to block the wind.
- Ensure that water cannot cause any damage to the location by adding water drains to the foundation and prevent water traps in the construction.

Seaside installation Make sure the unit is NOT directly exposed to sea winds. This is to prevent corrosion caused by high levels of salt in the air, which might shorten the life of the unit.

Install the unit away from direct sea winds.

Example: Behind the building (case I).

If the unit is exposed to direct sea winds, install a Windbreaker (case II).

- Height of windbreaker ≥1.5×height of the unit
- Mind the service and safety space requirements when installing the windbreaker

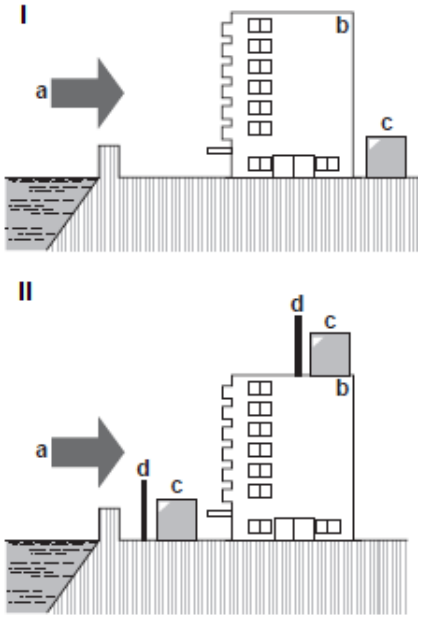


Figure 12 – Seaside installation

Legend:

a. Sea wind
b. Building
c. Unit
d. Windbreaker

When operating the unit in a low ambient temperature, be sure to follow the instructions described below.

To prevent exposure to wind and snow, install a baffle plate on the air side of the unit: In heavy snowfall areas it is very important to select an installation site where the snow will NOT affect the unit. If lateral snowfall is possible, make sure that the heat exchanger coil is NOT affected by the snow. If necessary, install a snow cover or shed and a pedestal.

For instructions on how to install the snow cover, contact your dealer.

When installing the snow cover, do NOT obstruct the air flow of the unit.

4.4 Safety distance from unit requirements

The unit contains R290 refrigerant, which belongs to "Safety class A3" as defined in ISO817 and used in EN378. This means that you must comply with extra installation site requirements (= "flammable zone") to ensure safety in the unlikely event of a refrigerant leak.

Openings such as stairs, doors, roof window, down pipe and ventilation duct must not be located in this area.
Do not install in basements/semi-basements/garages/along driveways.

Required for the flammable zone:

▪ **No openings into habitable areas of the building.**
Example:
- Openable windows
- Doors
- Ventilation openings
- Basement entrances

▪ **No obstacles or stagnation traps**
Example:
- Sidewalks
- Walls
- Holes
- Trapdoors
- Wells
- River Drains
- Underground spaces
- Pebbles

▪ **No ignition sources according to IEC60335-2-40.**
Example:
- Open flames
- Electrical installations, sockets, lamps, light switches
- Electrical house connections
- Sparking tools
- Objects with high surface temperatures (>360°C for R290)

▪ The flammable zone must NOT extend to adjacent buildings or public traffic areas.

Units of a different type, using a different refrigerant, or from another manufacturer are NOT allowed in your unit's flammable zone.

The combined flammable zone of all units is then the overlap of all individual flammable zones.

Install this product in a location inaccessible to general public, or implement protective measures (such as protective fences) to restrict access.

Install warning signs at the entrance that entering by unauthorised persons and bringing potential ignition sources to flammable zones are prohibited.

Do NOT eat or drink in this flammable zone.

No smoking or open flame or another possible ignition source

Equipment with openings located on the roof shall not be placed within flammable zone.

The flammable zone for these units is to be considered starting from the unit and extends for 1500 mm from the electrical panel side and for 2500 mm from the remaining three sides. In addition, it develops 300 mm from the base plane of the unit as shown in the figure below (single unit scenario).

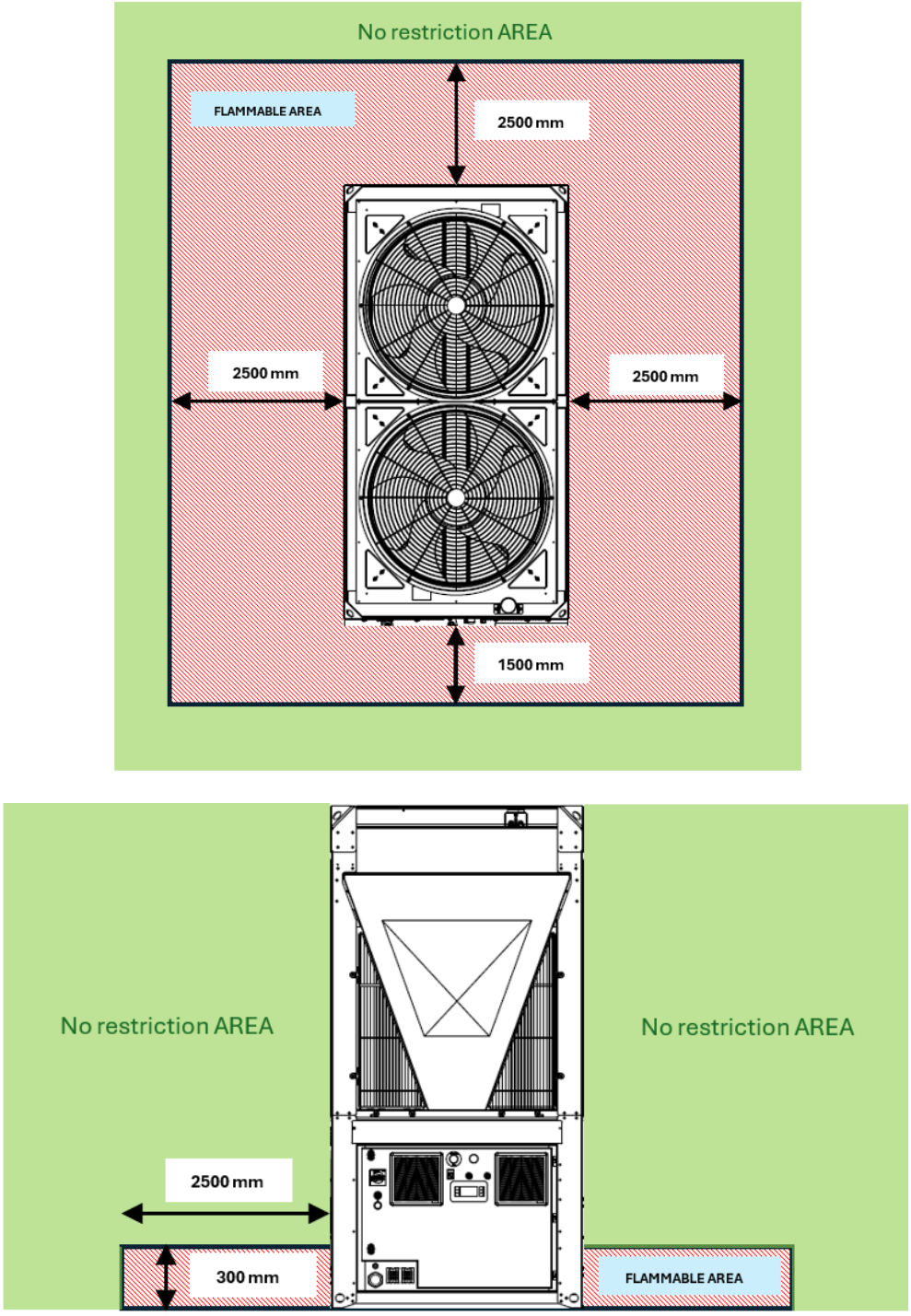


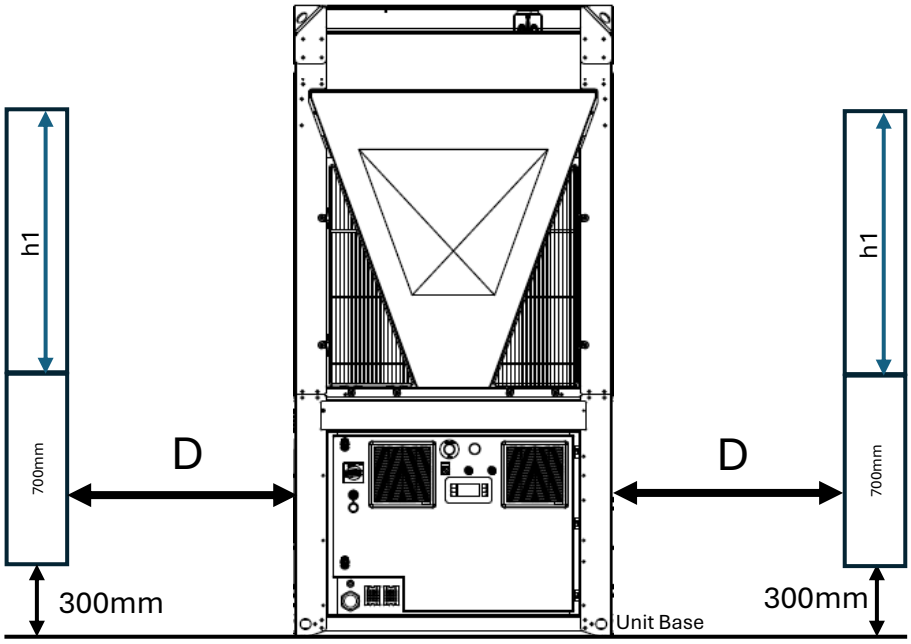
Figure 13 – Flammable area

In the case of walls, guardrails, bulkheads or similar obstacles, these may only be present outside the flammable zone. In case of presence inside the flammable zone (D < 2500 mm) these must be positioned at least 300mm above the unit base plan and must respect the service space.

It is fundamental to respect minimum distances on all units to ensure optimum ventilation to the coils.
When deciding where to position the unit and to ensure proper air flow, the following factors must be taken into consideration:

- avoid any warm air recirculation.
- avoid insufficient air supply to the air-cooled heat exchanger.

Both these conditions can cause a reduction of energy efficiency and refrigerating capacity.



If the obstacle has h1>0 then the distance D must comply with the following formula:

$$If\ h_1 > 0 \rightarrow D > service\ space + \frac{h_1}{2}\ [mm]$$

If the unit is installed in confined outdoor spaces, covered areas, partially enclosed spaces, or provided with acoustic enclosures, the customer shall ensure that refrigerant accumulation cannot occur.

For units installed outside in a location where a release of refrigerant can stagnate then the installation shall comply with the requirements for gas detection and ventilation of machinery rooms.

The risk assessment related to the installation of the equipment shall in all cases remain the responsibility of the customer.

If the unit is installed on a grid platform, the entire area underneath the platform down to the ground is considered a flammable zone.

4.4.1 Flammable zone for single unit

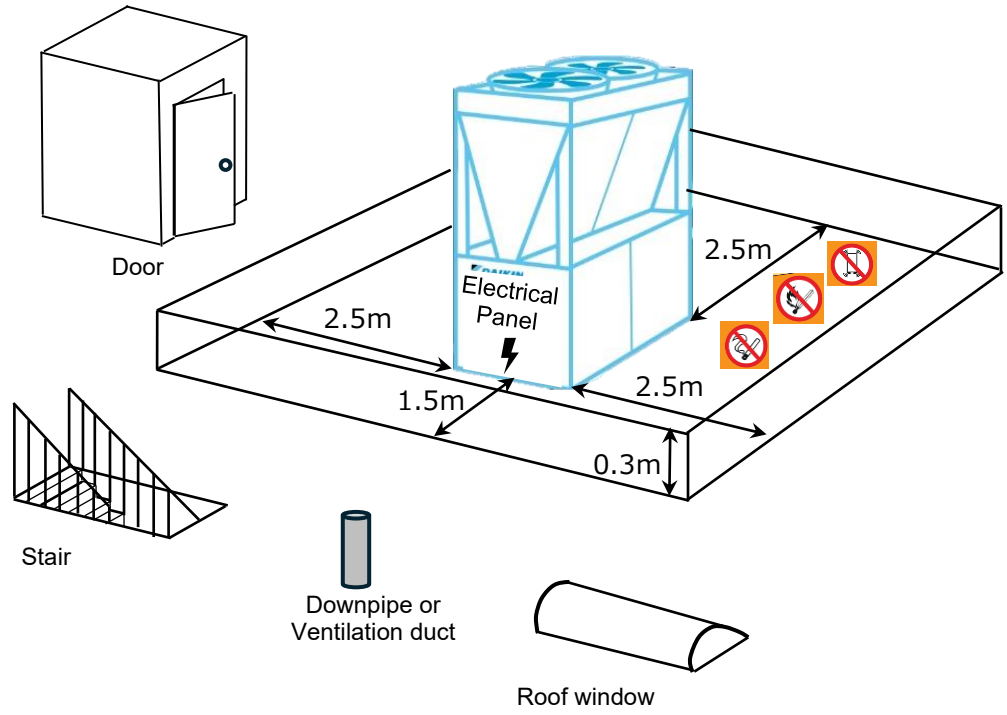


Figure 14 – FLAMMABLE ZONE for single unit

4.4.2 Flammable zone for modular units

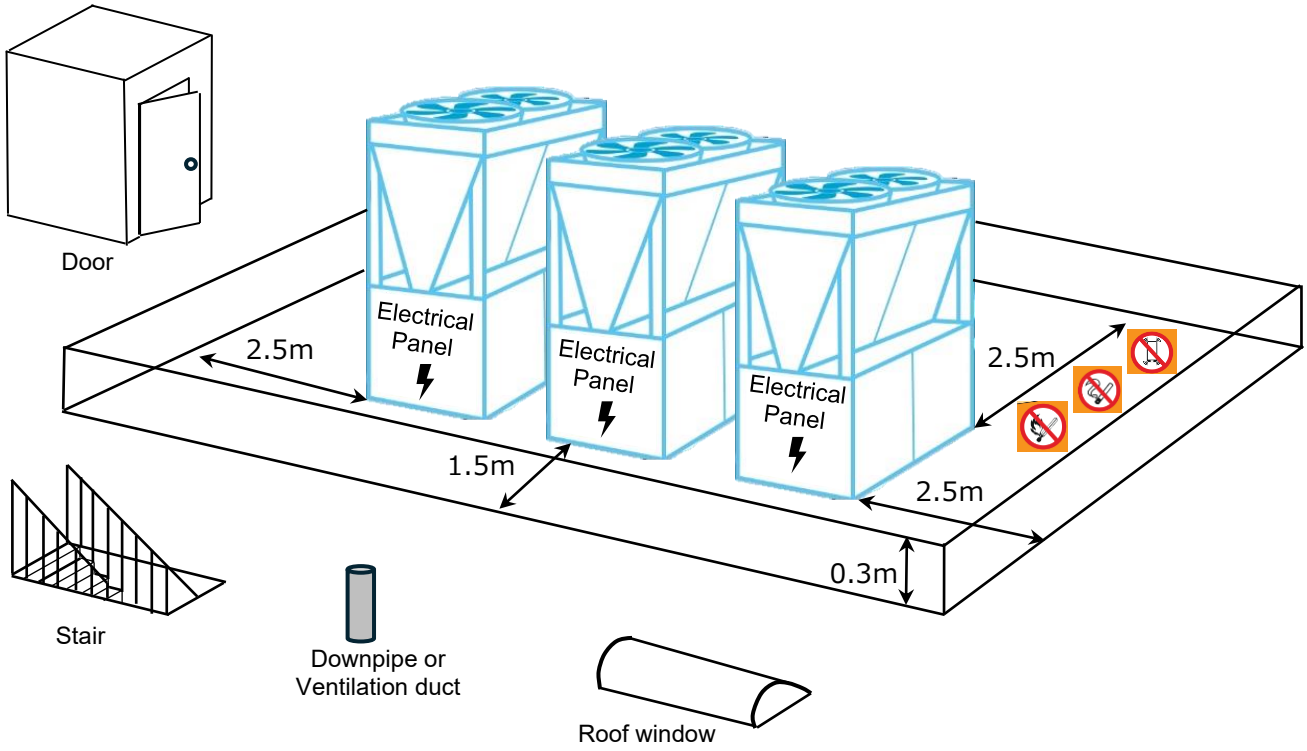


Figure 15 – FLAMMABLE ZONE for modular units

4.4.3 Flammable zone for single unit with Daikin Pump Module

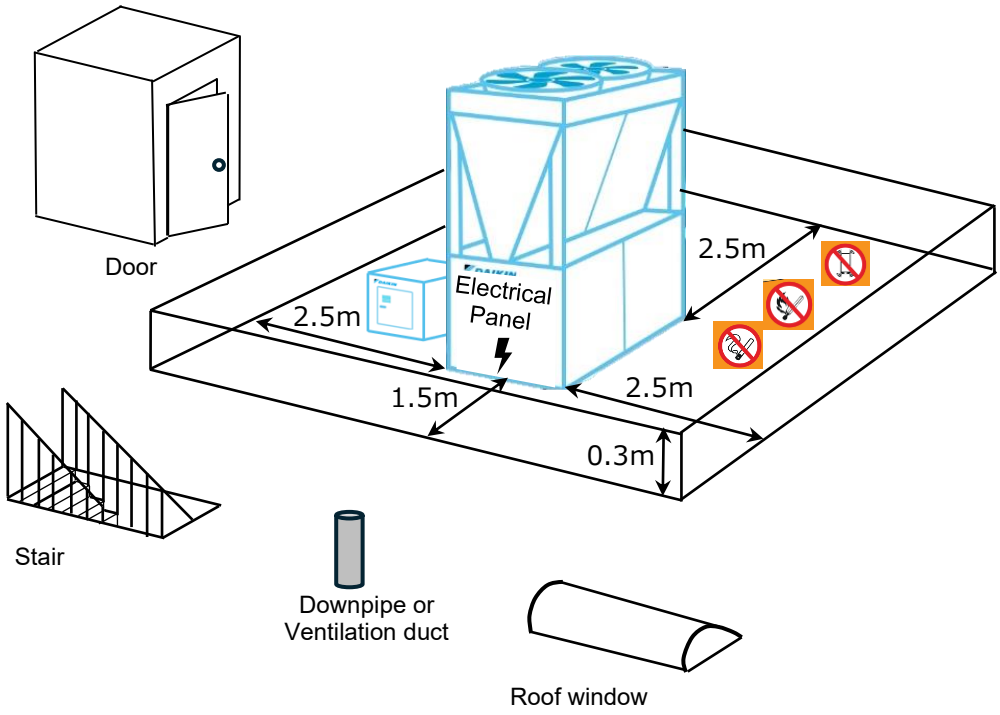


Figure 16 – FLAMMABLE ZONE for single unit with Daikin Pump Module

4.4.4 Flammable zone for modular units with Daikin Pump Module

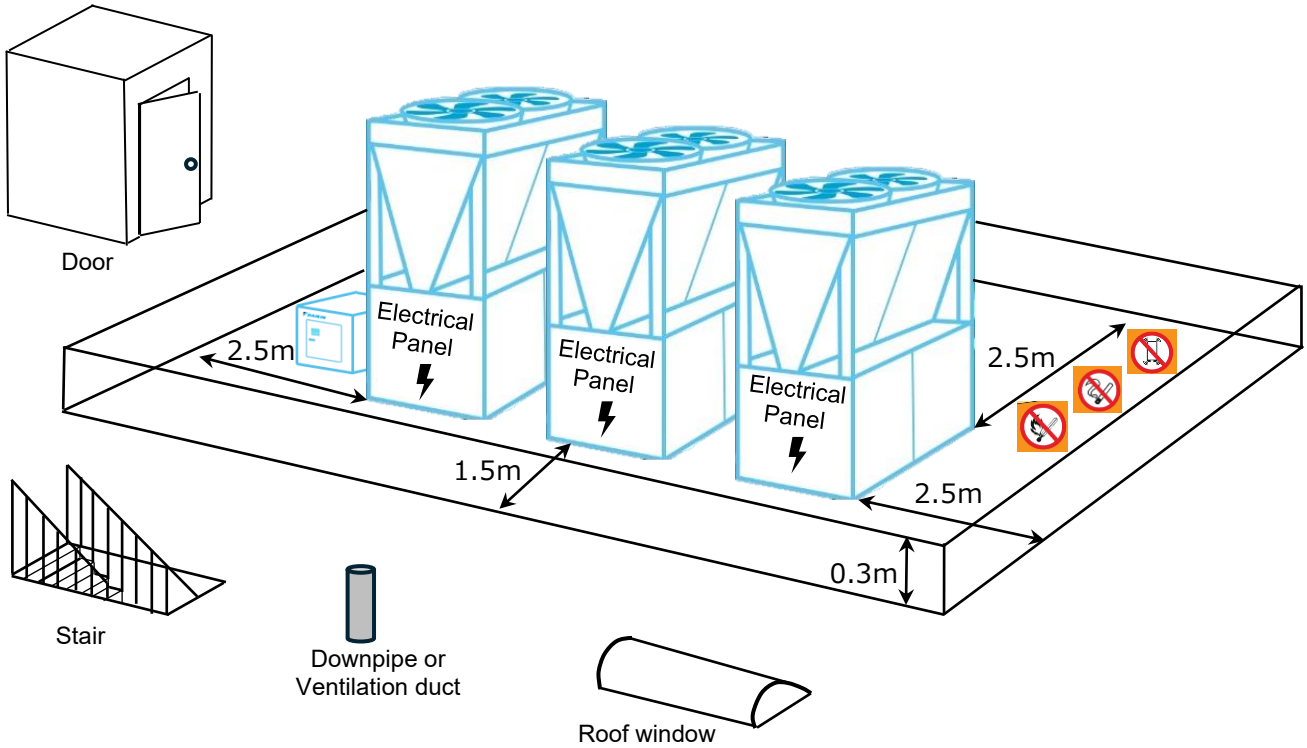


Figure 17 – FLAMMABLE ZONE for modular units with Daikin Pump Module

4.4.5 Multi-array safety distance installation requirements

The combined flammable zone of all units is then the overlap of all individual flammable zones.

In the case of multi-array installation, the reciprocal positions allowed between arrays are shown in the figure below.

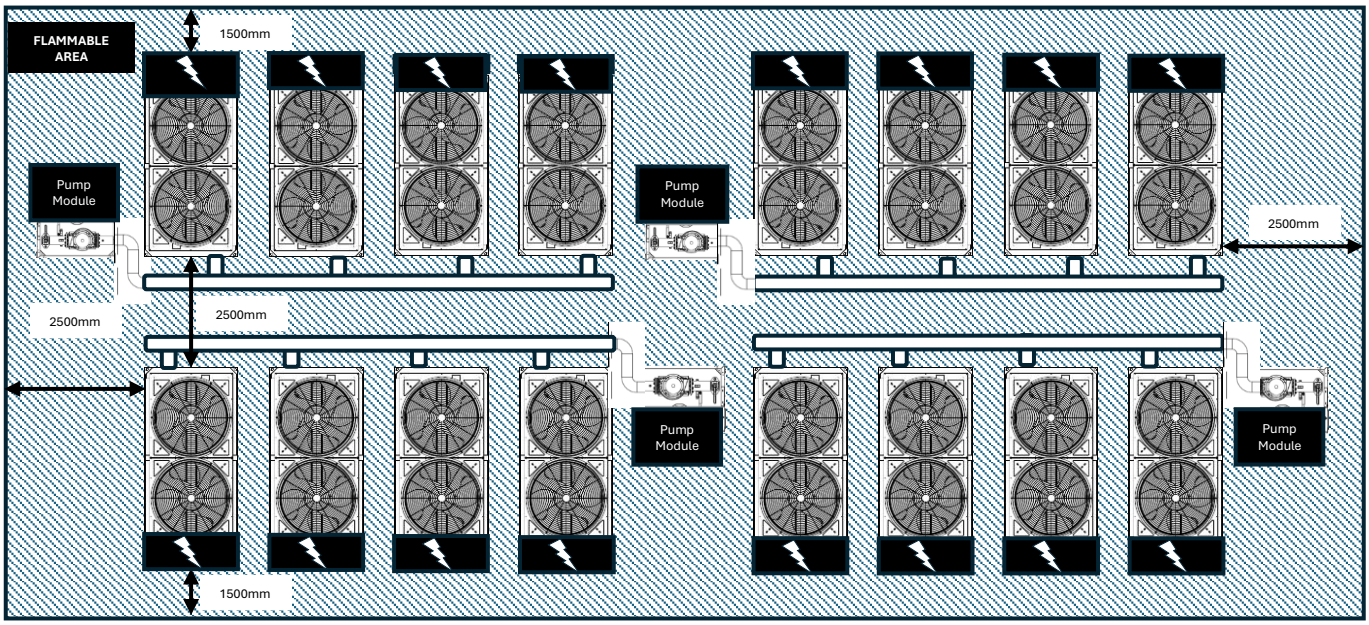


Figure 18 - Multi-array with units placed with water sides facing each other

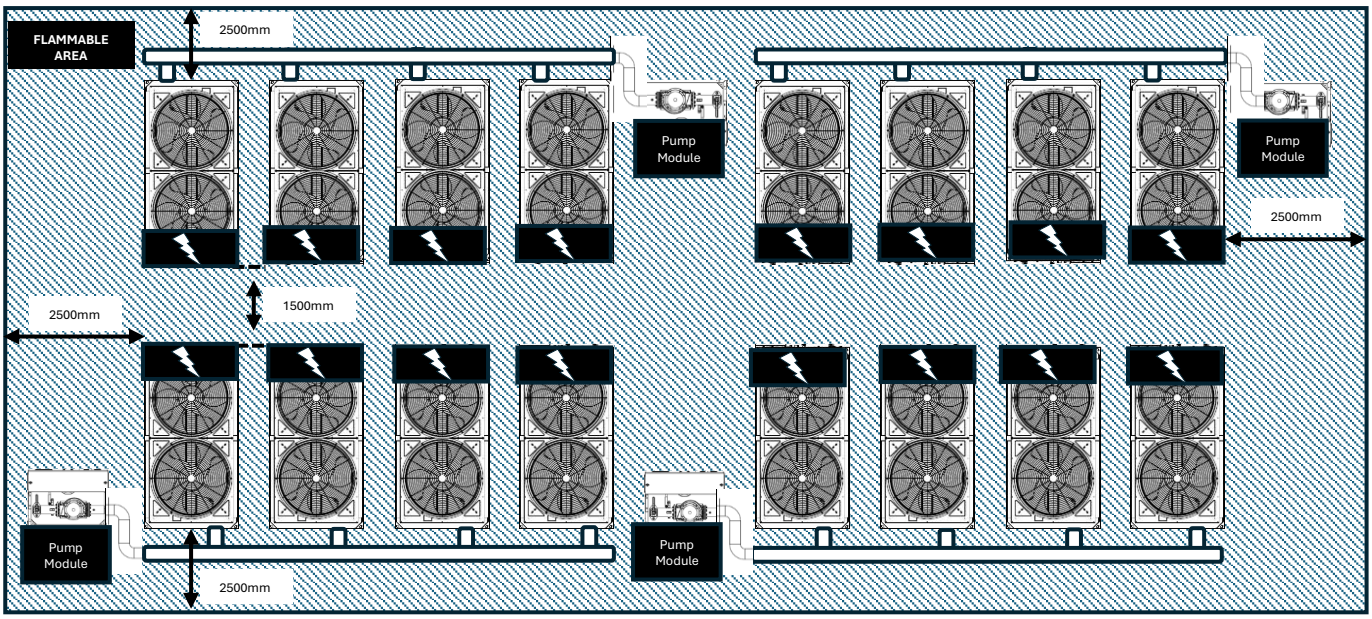
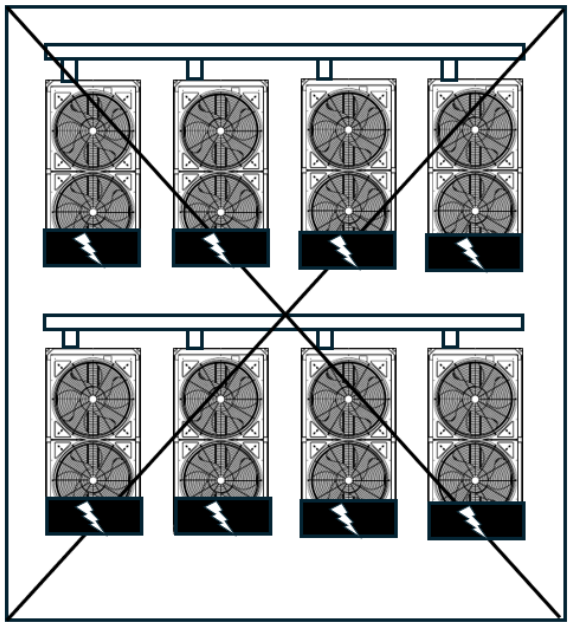


Figure 19 - Multi-array with units placed with electrical panel sides facing each other

Installation with a water side of one unit facing the electrical panel side of another is not allowed as shown in the image below.



4.5 Handling and lifting

The unit must be lifted with the utmost care and attention, following the lifting instructions shows on the label applied to the unit. Lift the unit very slowly, keeping it perfectly levelled.
Avoid bumping and/or shaking the unit during the handling and loading/unloading operations from the transportation vehicle, push or pull the unit only using the base frame. Secure the unit inside the truck to prevent it from moving and causing damages. Do not allow any part of the unit to fall during loading/unloading.
All units can be lifted using the following methods:

- With forklift from unit long-side
- With lower lifting points
- With upper lifting points

Only these points may be used for lifting the unit, as shown in the following figure.
The handling and lifting with a forklift are the only rigging methods using the base frame's holes.

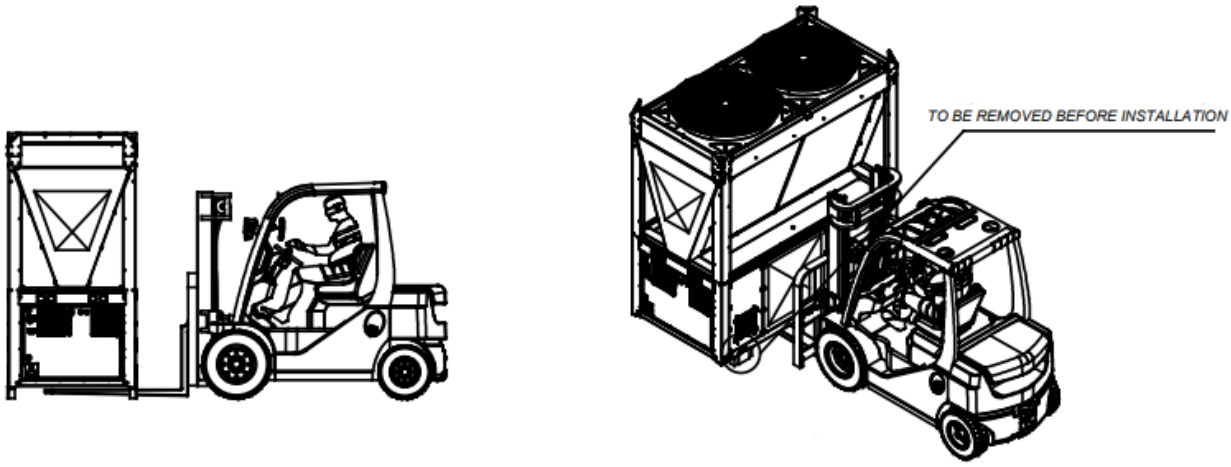


Figure 20 – Lifting instructions with forklift

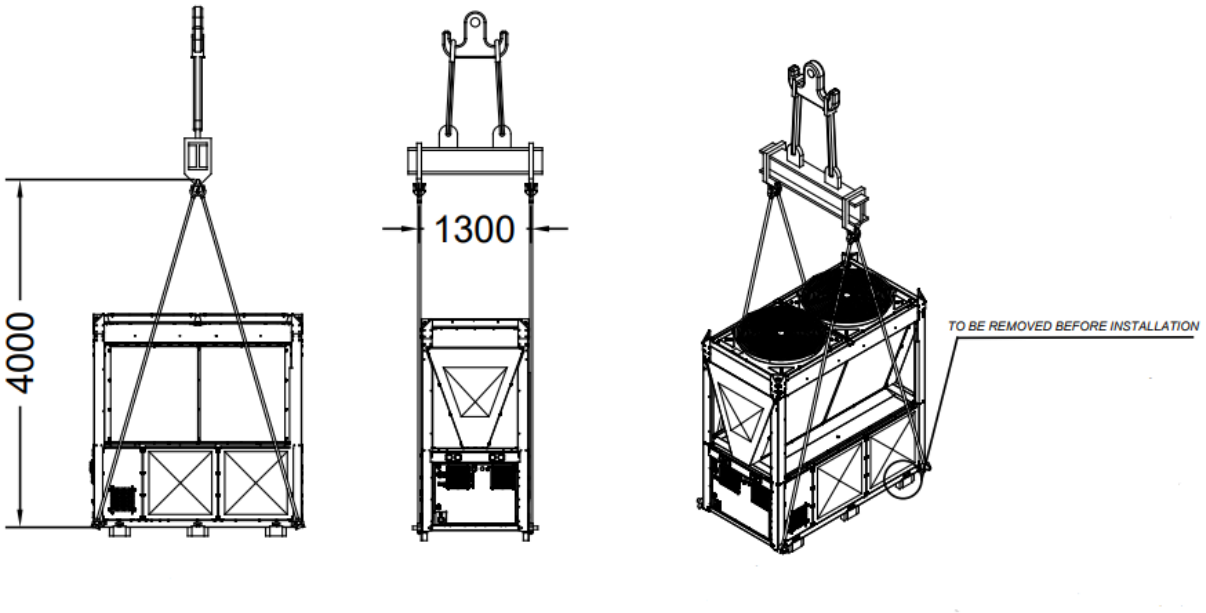


Figure 21 – Lifting instructions with lower lifting points

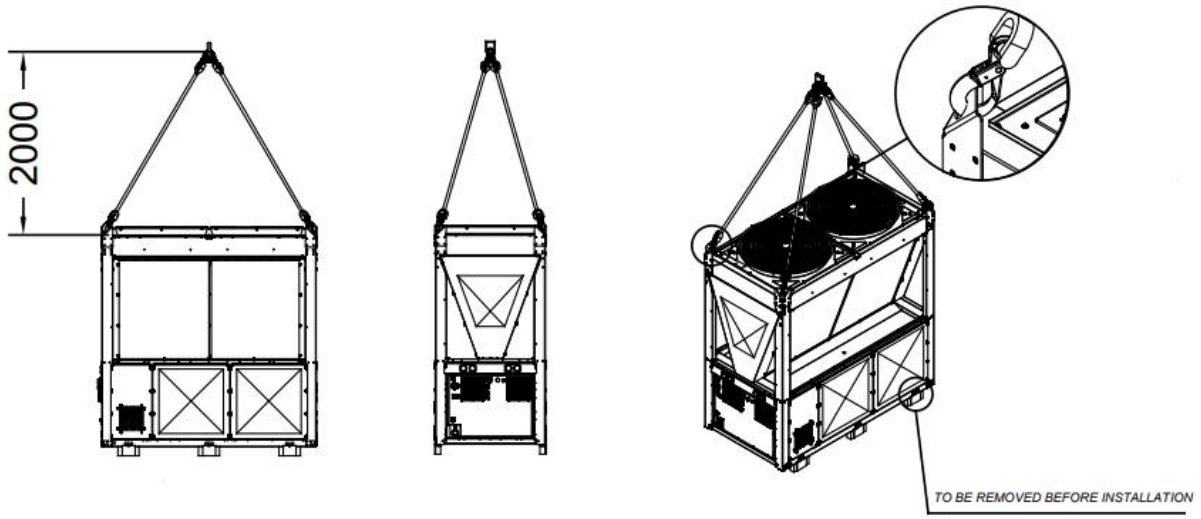


Figure 22 – Lifting instructions with upper lifting point

Consult the dimensional drawing for the hydraulic and electrical connection of the units. See par. Dimensional Drawings.

The equipment, ropes, lifting accessories and handling procedures must comply with local regulations and current regulations.
The hooks must be securely fixed before handling.
The lifting ropes, hooks and spacing bars must be strong enough to support the unit safely. Please check the unit weight on the unit nameplate.
The installer has the responsibility to ensure the selection and correct use of the lifting equipment. However, it is advisable to use ropes with a minimum vertical capacity equal to the total weight of the machine.
The machine must be lifted with the utmost attention and care following lifting label instructions; lift the unit very slowly, keeping it perfectly level.

4.5.1 Safety hook

The characteristics of the hook to be used for lifting the units are as follows (a hook with the same or better characteristics can also be used, the load capacity, in fact, can be greater, but the hook dimensions have to be the same as those shown in the picture below).

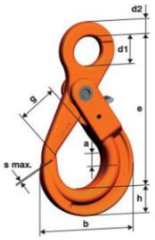
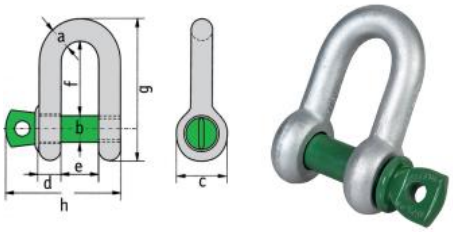
LHW Safety Hook	Model	Load capacity [kg]	e [mm]	h [mm]	a [mm]	b [mm]	d1 [mm]	d2 [mm]	g [mm]	s max. [mm]	weight [kg/pc.]
	LHW10	4,000	168	30	29	107	33	16	45	1	1,57

Figure 23 – Safety hook attachment

4.5.2 Lifting shackles

In the absence of a suitable lifting hook, lifting shackles can be used.

Lift capacity	Size	Dimensions										Weight	
t	inches	a mm	b mm	c mm	d mm	e mm	f mm	g mm	G4151 H mm	G 4153 H Mm	i mm	G 4151 Kg	G 4153 Kg
8,5	1	25	28	59	25	43	85	154	137	150	25	2,08	2,46



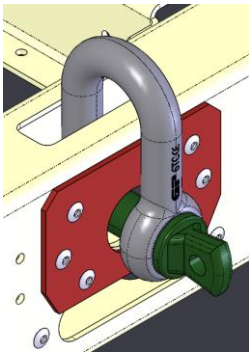


Figure 24 – Lifting shackles fastening

4.6 Positioning and assembly

Make sure the unit is leveled in all directions.

Make sure to remove the wooden logs before placing the unit

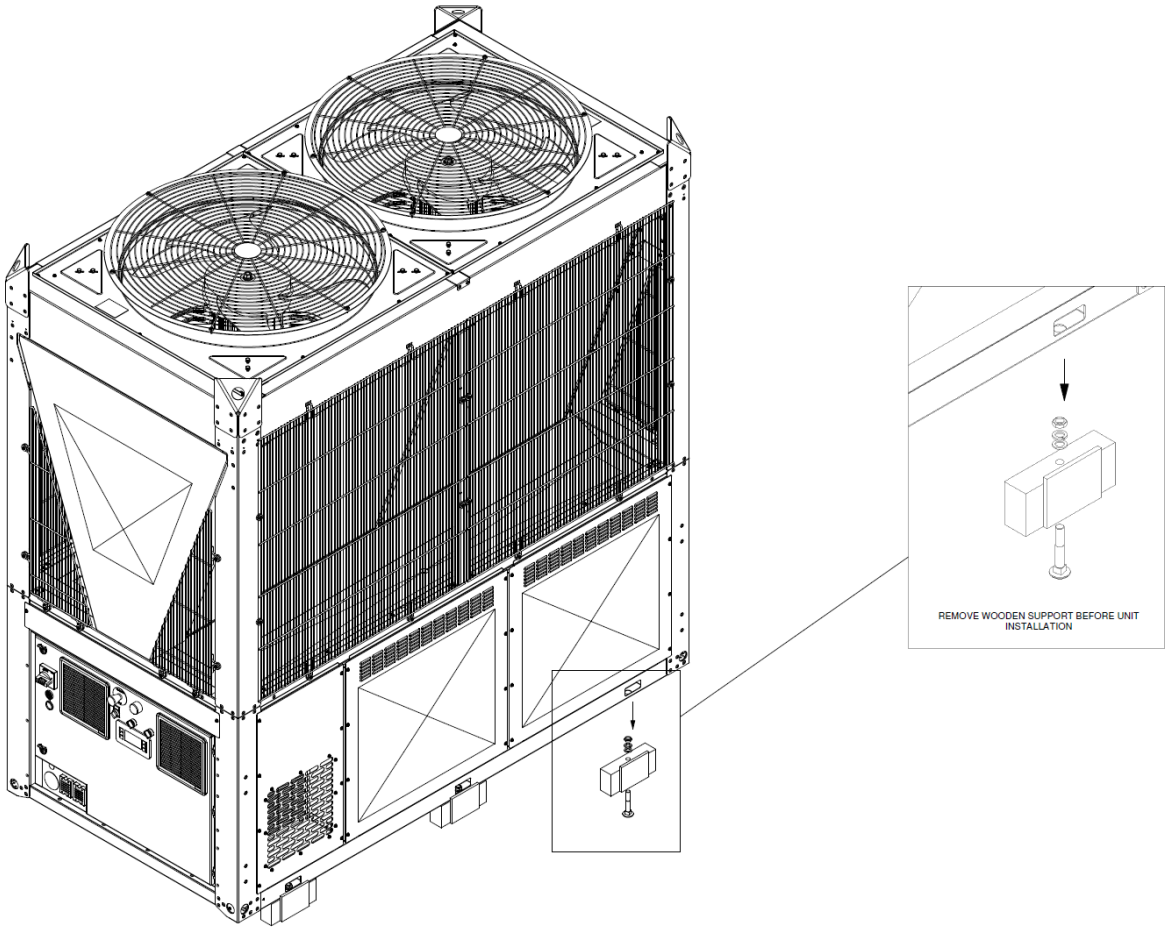


Figure 25 - Remove the wooden support before unit installation

The unit must be installed on a sturdy and perfectly level foundation. For installation on the ground, a resistant concrete base must be created with a width greater than that of the unit. This base must be able to support its weight.
Anti-vibration supports must be installed between the frame of the unit and the concrete base of the steel beams; for their installation follow the dimensional drawing provided with the unit.
The frame of the unit must be perfectly levelled during installation, if necessary, using shims to be inserted under the anti-vibration elements.
Before the first start-up, it is mandatory that the installation be verified as being level and horizontal using a laser level or another suitable instrument.
The error in the levelness and the horizontal position must not be greater than 5 mm.
If the unit is installed in places that are easily accessible to people and animals, we recommend that protection grates be assemble all around to prevent free access.
To guarantee the best performance in the place of installation, the following precautions and instructions must be respected:
- Make sure to provide a strong and solid foundation to reduce noise and vibrations.
- Avoid installing the unit in areas that could be dangerous during maintenance operations, such as platforms without parapets, railings or areas not complying with the requirements to leave a clearance space all the way around it.
For further solutions, please consult manufacturer representative.

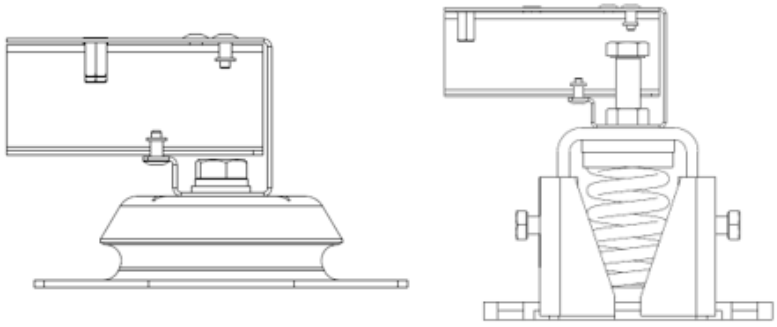


Figure 26 – Isolators

4.7 Daikin Pump Module kit (accessory) and manifold module (accessory) installation

The pump module and the water manifold module are accessories for this series. They are separate from the Heat Pump unit.

4.7.1 Pump Kit Installation

Handling and lifting

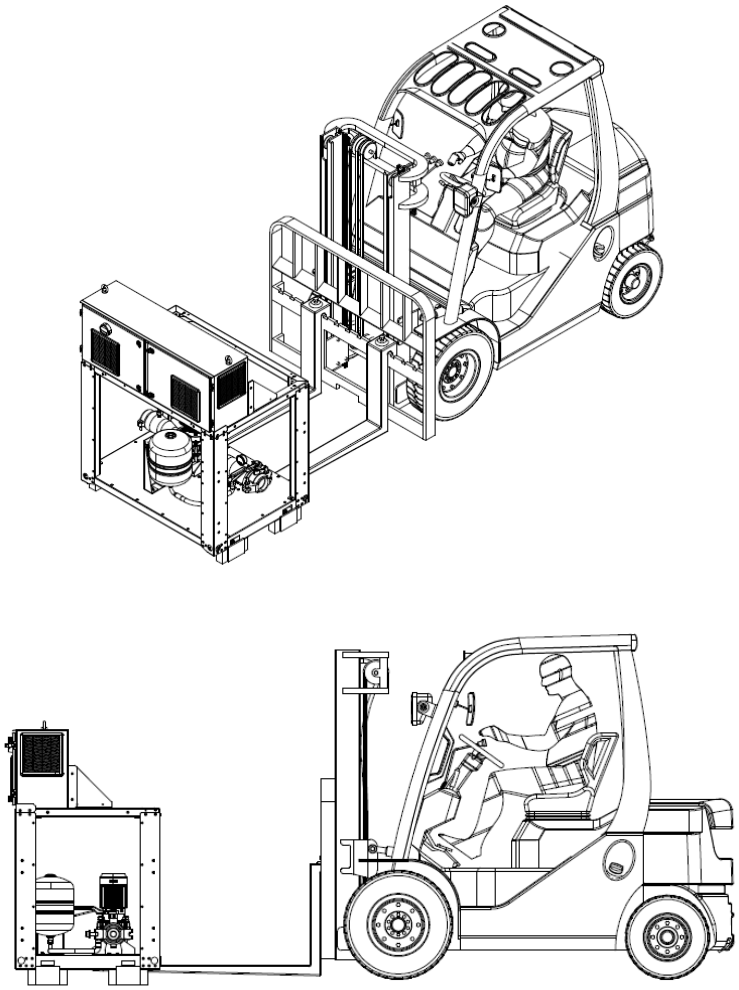


***Figure 27* – Handling with forklift**

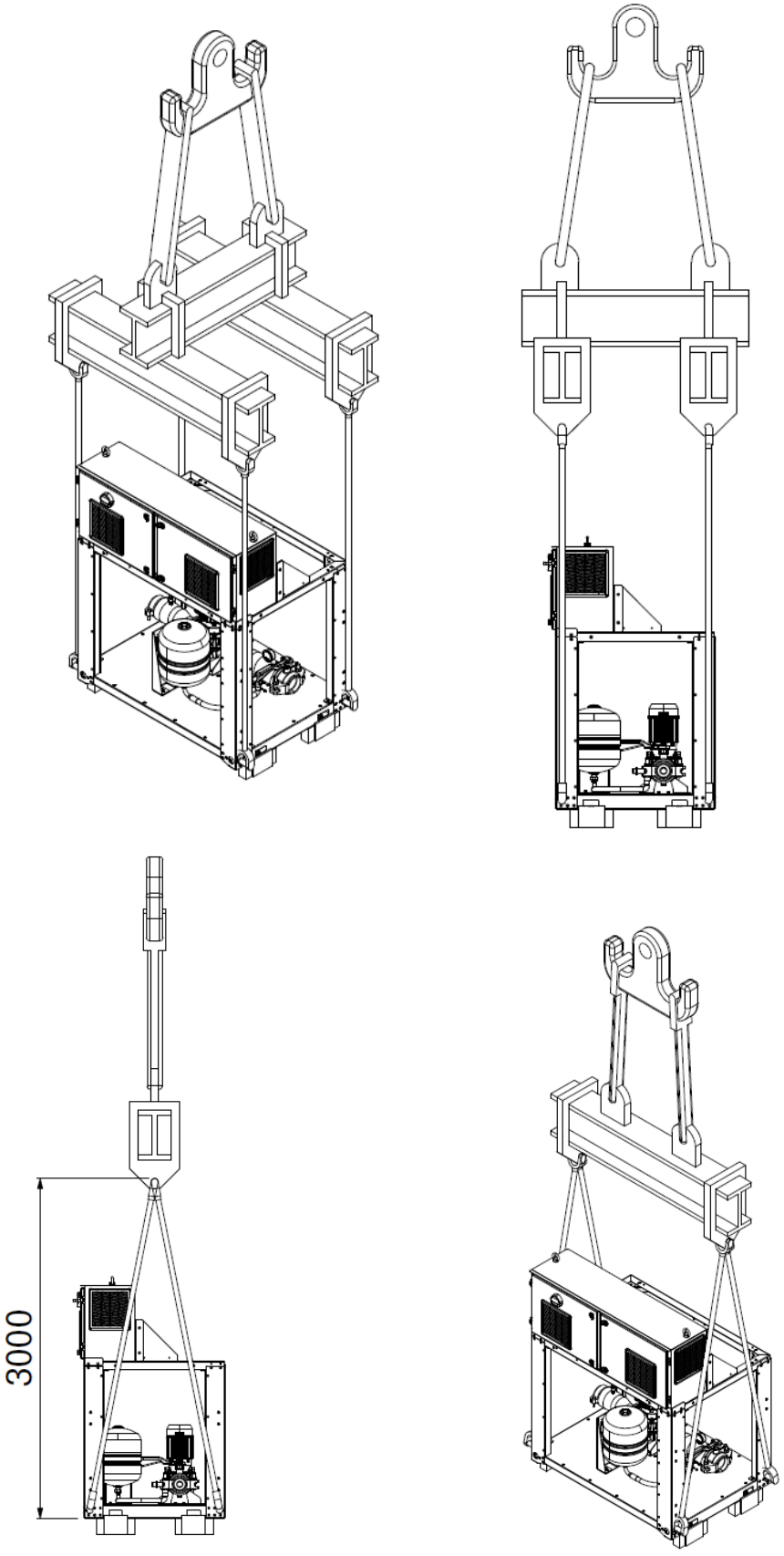


***Figure 28* – Handling with lifting hooks**

Installation

For the pump module installation, refer to the dimensional drawings that define the distance to the nearest unit. Connect the pump module to the manifold using the "connection kit" accessory.

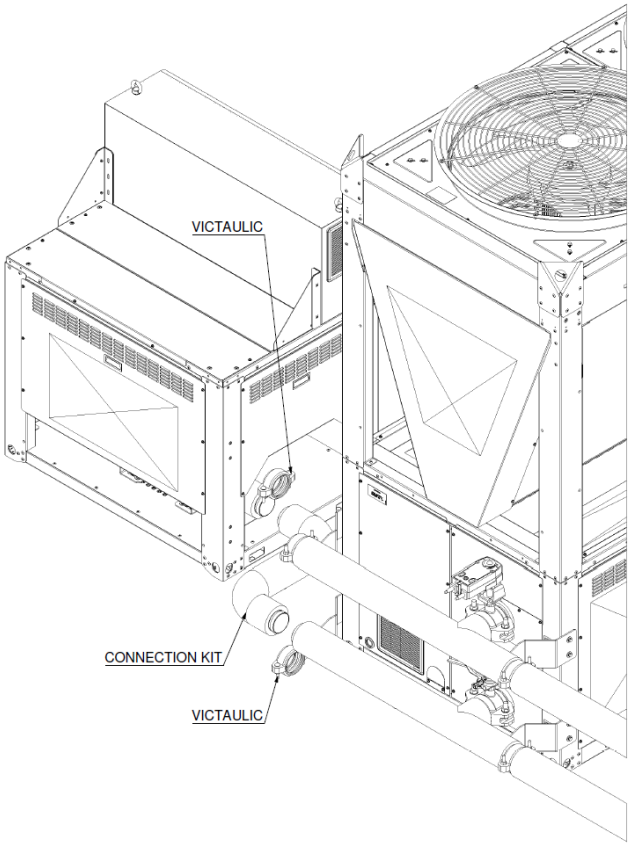


Figure 29 – Pump Module installation

4.7.2 Manifold Module Installation

Fix the manifold module to the unit through the screws figured in the image below

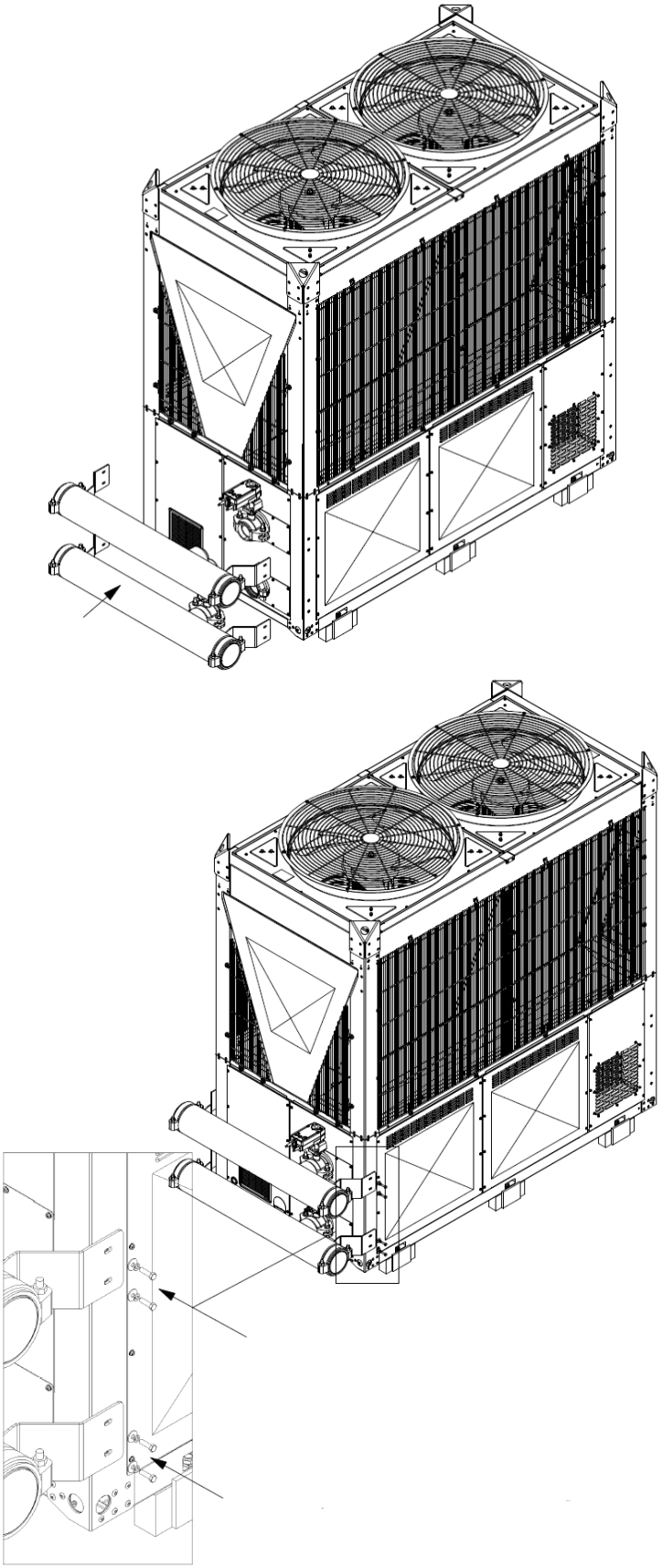


Figure 30 – Manifold module installation

4.8 Additional installation requirements

4.8.1 Condensate collection trays

Be sure to drain the anti-condensation tray outside the compressor box

The coil section of these units is equipped with trays for collecting the condensate that forms on the coils. The condensate that accumulates must be properly drained outside the unit.

The anti-condensation trays are equipped with three holes on the lower side (under the coil section), which are used to drain the water that forms both in the central area (inside the coils) of the coil section and in the lateral areas (outside the coils).

The drain holes are located inside the compressor enclosure. To access them, it is necessary to remove the unit's side panels.
They are equipped with a G1-F connection, allowing the installation of a flexible drain piping system to be routed within the compressor enclosure. Be sure to avoid touching other unit components with the drain pipe line.
The three drain pipes shall be manifolded together and routed outside the unit through the 40 mm diameter opening located to the left of the extraction fan, as highlighted by the figure.

To ensure proper water drainage, it is important to prevent any potential accumulation within the piping.
To prevent the buildup of debris that could lead to clogging of the drain lines, provide filters to be installed at the openings located on the side drain pans.

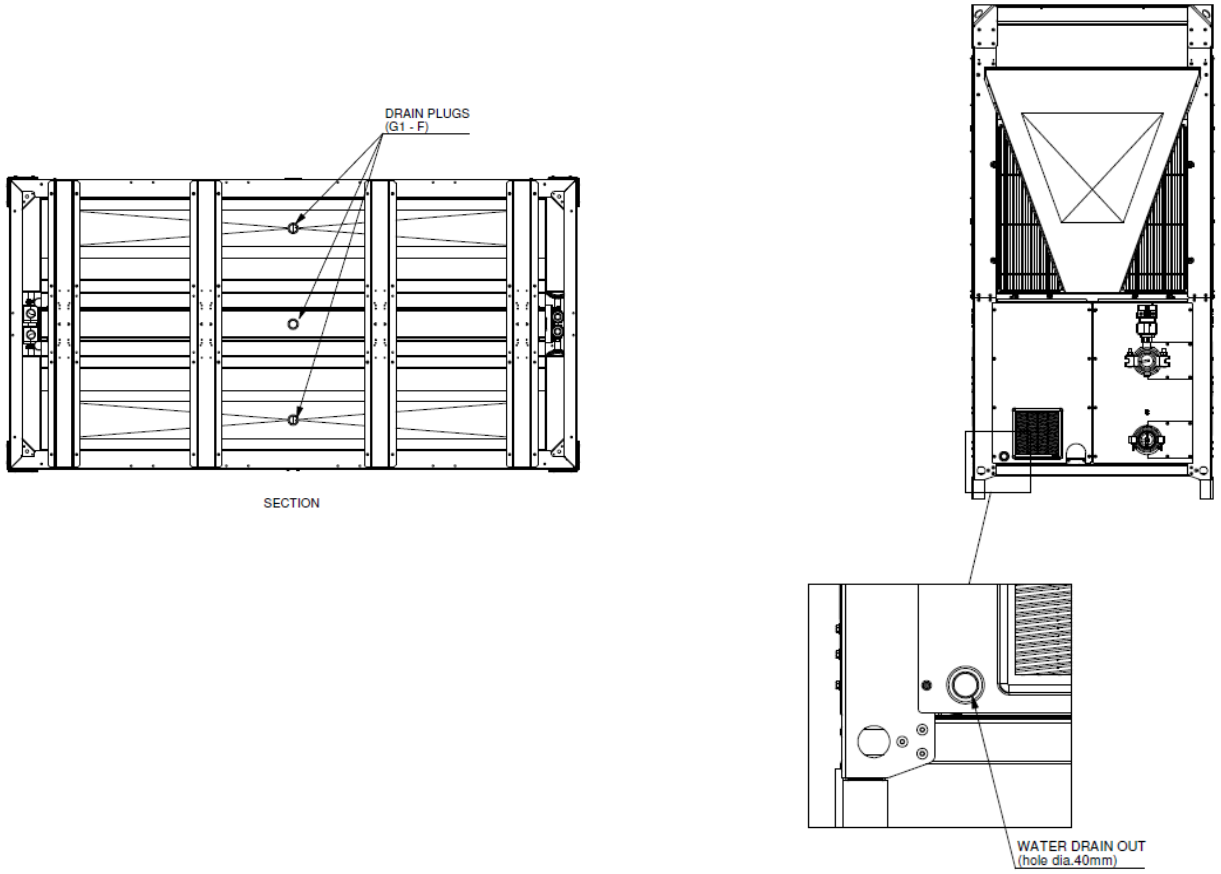


Figure 31 – Condensate collection tray

4.8.2 Discharge refrigerant safety valve

The safety valves installed on the refrigerant circuit of this unit are connected to a single manifold pipe, which must be extended by the customer outside the unit to a safe area. The location of the outlet and the relevant connection details are shown in the unit dimensional drawing.

From the outlet point on the unit, the discharge must be routed to a safe location in compliance with applicable regulations (EN 378-3, or any more restrictive national standards in force in the country of installation), ensuring that it does not pose a risk to people or property. The discharge piping must have a diameter at least equal to that of the manifold outlet (34.9 mm).
In the event of a safety valve opening, the release of refrigerant to the atmosphere may create a potentially hazardous area at the discharge point, which can be classified as “Zone 2”. The extent of this area shall be assessed in accordance with IEC 60079-10-1.

The unit contains safety valves set to 38 barg. The safety valve discharge outlet must be individually connected via a pipe extending above the air heat exchanger.

For the design of safety valve discharge piping, the following simulations have been carried out in accordance with EN 13136.
For each pipe diameter, the maximum allowable number of bends and the corresponding maximum pipe length are indicated; these limits ensure that pressure losses remain within 20% of the discharge pressure, as required by the standard.

Piping Diameter [mm]	Maximum Lenght [mm]	Maximum # bends
34,9 x 1,1	5000	3
34,9 x 1,1	6000	2
34,9 x 1,1	7000	1
41,3x1,5	10000	5
41,3x1,5	13000	2

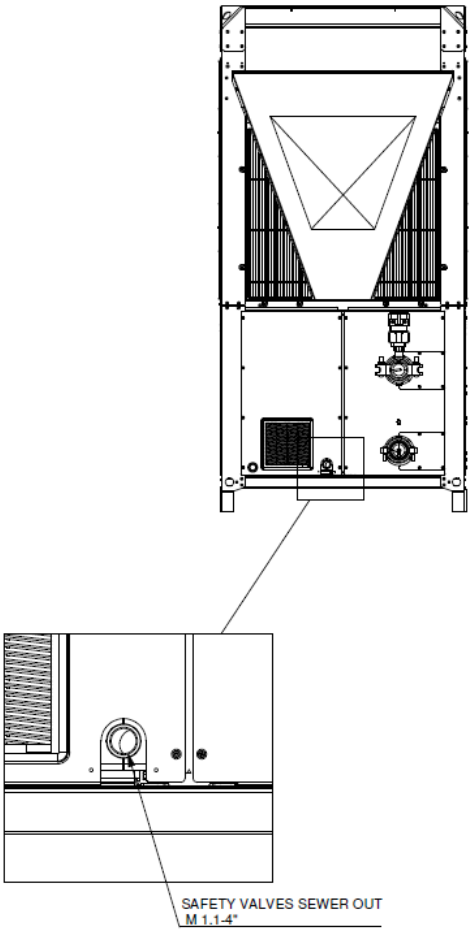


Figure 32 - Safety Valves sewer Out

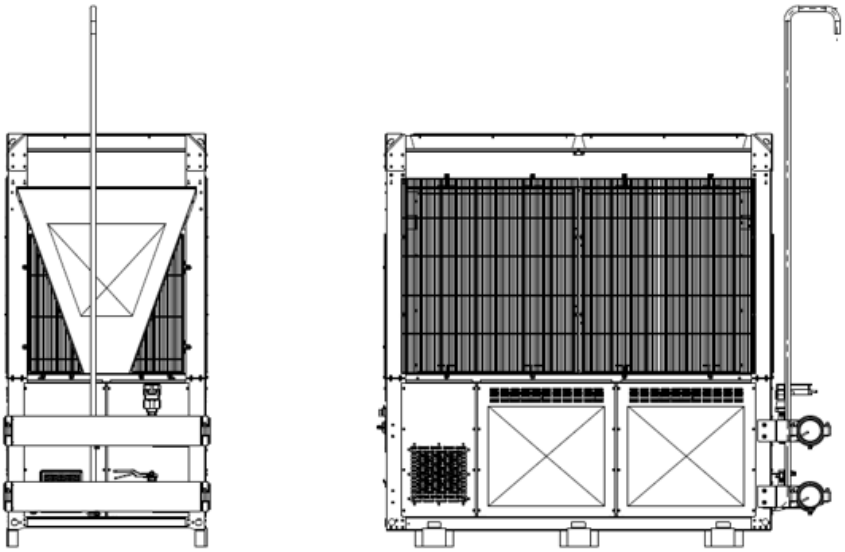


Figure 33 – Example of a safety valves discharge piping

4.9 Water circuit

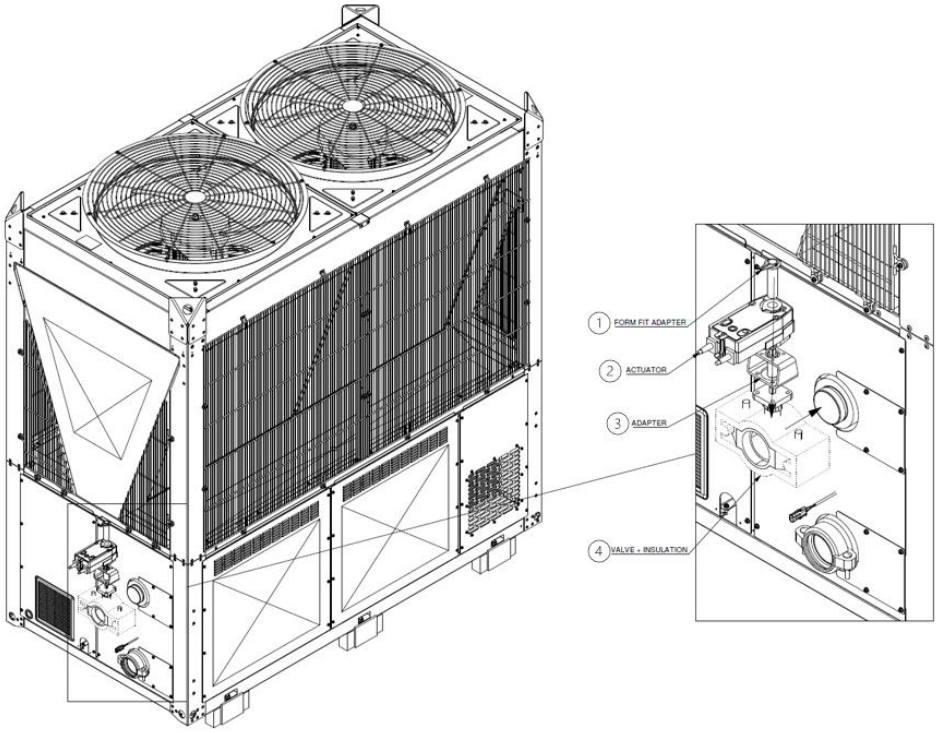
4.9.1 Water piping

Field piping must be in accordance with the instructions from this manual.

Perform electrical wiring before water piping

About the shut-off valve actuated (shipped loose):
The installation of the valve at the water outlet is mandatory before connecting water pipes

Connect the Victaulic Valve Assembly (Valve + Motor shipped as accessory) to the unit water outlet pipe.



Legend	
1	Form fit adapter
2	Actuator
3	Adapter
4	Valve+insulation

1. Connect the cables on the actuator to the corresponding terminals in the unit wiring. You can find the cable connector near the upper evaporator water pipe.

Make sure that the shut-off valve disc is in the fully closed position before connecting the piping.

2. Connect the field piping to the unit water outlet.

Piping must be designed with the lowest number of elbows and the lowest number of vertical changes of direction. In this way, installation costs are reduced considerably, and system performance is improved.

4.9.2 Water circuit requirements

To guarantee the correct functioning of water circuit and prevent problems follow these rules:

1. Isolators to reduce transmission of vibrations to the structures.
2. Isolating valves to isolate the unit from the water system during maintenance.
3. Manual or automatic air venting device at the system highest point and drain device at the system lowest point. The unit BPHE must not be positioned at the system's highest point.
4. A suitable device that can maintain the water system under pressure (expansion vessel, etc.).
5. Water temperature and pressure indicators to assist the operator during service and maintenance.
6. A filter or device that can remove particles from the fluid. The use of a filter extends the life of the BPHE and pump and helps to keep the water system in a better condition. **The water filter must be installed as close as possible to the unit**. If the water filter is installed in another part of the water system, the Installer must guarantee the cleaning of the water pipes between the water filter and the evaporator. Recommended maximum opening for strainer mesh is 1.0 mm.
7. In case of unit substitution, the entire water system must be emptied and cleaned before the new unit is installed. Regular tests and proper chemical treatment of water are recommended before starting up the new unit.
8. Check that the water pressure does not exceed the design pressure of the water side heat exchangers. Install a safety valve on the water pipe downstream of the BPHE.
9. Protection of the water circuit is necessary in the winter season, even with the unit not in operation.
10. All water components and piping/hydraulic devices outside the unit must therefore be protected against freezing. Before insulating water piping check that there are no leaks.
11. When the unit is not in operation, all water components (eg.BPHE) and piping/hydraulic devices must be emptied of water, unless an ethylene/propylene glycol mixture in appropriate percentage is added to the water circuit.
12. The complete hydraulic circuit must be insulated to prevent condensation and reduced refrigeration capacity. Protect the water pipes from frost during winter (using for example a glycol solution or a heating cable).
13. If glycol is added to the water system as antifreeze protection, pay attention to the fact that suction pressure will be lower, the unit performance will be lower and water pressure drops will be greater. All unit protection systems, such as antifreeze, and low-pressure protection will have to be readjusted.

The maximum glycol percentage is 40% for all the unit.
In the following table are illustrated the minimum glycol percentage for low ambient air temperature

AMBIENT T[°C]	-3	-8	-15	-20
ETHYLENE GLYCOL	10%	20%	30%	40%
PROPYLENE GLYCOL	10%	20%	35%	40%

Table 2 - Minimum glycol percentage for low ambient air temperature

4.9.3 Water piping insulation and anti-freeze protection

In accordance with water circuit requirements the piping in the complete water circuit MUST be insulated to prevent condensation during cooling operation, reduction of the heating and cooling capacity and freezing.

Outside piping. Make sure the outside piping is insulated as instructed to protect against hazards.

For piping in free air, it is recommended to use the insulation thickness as shown in below table as a minimum (with λ=0.039 W/ mK).

Piping length (m)	**Minimum insulation thickness (mm)**
<30	32
30~40	40
40~50	50

Frost can damage the system. To prevent the hydraulic components from freezing, the unit is equipped with the following protection system:

- BPHE freeze protection based on the water temperature
- BPHE electric heater logic that prevent the water freeze inside the component
- Pump control logic ensures water circulation through piping in case of frost risk.

However, in case of a power failure, these functions cannot guarantee protection

▪ The software is equipped with special frost protection functions such as BPHE freeze protection based on the water temperature and a BPHE heater logic that prevent the water freeze.

To guarantee water piping from freezing use i.e. one or a combination of these:

- Glycol solution.
- Heating cable along all the piping extension.
- Install a freeze protection valve at all lowest points of the field piping. Insulate these field installed freeze protection valves in a similar way as the water piping, but do NOT insulate the inlet and outlet (release) of these valves.
- Ensure continuous flow in the piping through pump functioning (do not avoid freezing in case of power failure)

Do not use means to accelerate the defrosting process other than those recommended by the manufacturer.

When installing equipment in environments below 0° C (such as during winter), measures to prevent freezing of water systems are required. Freezing can lead to mechanical damage. Take appropriate countermeasures as needed, such as heating with heaters, operating pumps, or draining water.

4.9.4 Flow-switch

Flow switch is a standard component fitted to all units. To ensure sufficient water flow through the plate exchanger, it is essential that a flow switch be installed on the water circuit. It is already installed in the standard supply. The purpose of the flow switch is to stop the unit in the event of interrupted water flow, thus protecting the BPHE from freezing.

The flow switch is set up to intervene when the water flow of the BPHE reaches the minimum value of the flow acceptable (see the table below).

Model	Flow switch Setpoint [l/s]
EWYK100QZXSA2	1.11
EWYK135QZXSA2	1.11

Table 3 - Flow Switch Setpoint

To ensure correct operation of the unit, the value of the water flow in the evaporator must be within the declared range for that unit. A water flow lower than the minimum value shown in the following table (table 4) could cause problems with freezing, fouling and poor control. A water flow rate higher than the maximum value shown in table 4 will result in an unacceptable load loss and excessive erosion of the pipes, with vibrations that can cause breakage.

MODEL	Min. Flow [l/s]	Max. Flow [l/s]
EWYK100QZXSA2	1.36	19.7
EWYK135QZXSA2	1.50	19.7

Table 4 –Operating limits

4.9.5 Preparing and checking the water circuit connection

The units have water inputs and outputs for connecting the heat pump to water circuit of the system. This circuit must be connected to the unit by an authorized technician and must comply with all regulations on the subject.

If dirt penetrates the water circuit, there could be problems.
Therefore, always remember the following when connecting the water circuit:

- ***Only use pipes that are clean inside***
- ***Keep the end of the pipe facing downward when removing any burrs***
- ***Cover the end of the pipe when inserting it through a wall to avoid dust and dirt getting in.***
- ***Clean the pipes of the system located between the filter and the unit, with running water, before connecting it to the system.***

4.9.6 Water pressure

Check whether the water pressure is above 1 bar. If it is lower, add water.
The maximum operating pressure is 8 bar.

5 ELECTRICAL INSTALLATION

RISK OF ELECTROCUTION

ALWAYS use multicore cable for power supply cables.

If the supply cord is damaged, it MUST be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

Do NOT push or place redundant cable length into the unit.

The distance between the high voltage and low voltage cables should be at least 50 mm.

Perform electrical wiring before water piping.
This unit is equipped with safety devices such as a leak detector for safety.
To ensure they remain effective throughout installation, the "Emergency Circuit (230 VAC)" must remain energized at all times.

To ensure operation in the event of a power failure of the Emergency power line, the use of an UPS is mandatory and the minimum requirements to be respected are:
-UPS- input: 230 V AC, output: 230 V AC / 1500 VA (Battery module (device with 2 batteries) 48 V DC, 7 Ah) [covering up to 1 h of shut down]
-UPS- input: 230 V AC, output: 230 V AC / 2500 VA (Battery module (device with 6 batteries) 48 V DC, 7 Ah) [covering up to 5 h of shut down]"

A UPS must be installed for each unit.

Electrical wiring must be in accordance with the instructions from this manual.

The 230VAC emergency power supply shall be provided by a UPS.

5.1 Specifications of standard wiring components

We recommend using solid (single-core) wires. If stranded wires are used, slightly twist the strands to consolidate the end of the conductor for either direct use in the terminal clamp or insertion in a round crimp-style terminal.

Component		Unit Emergency	Unit Power	
Power supply cable	MCA[(a)]	1,15 A	EWYK100QZXSA2	116,55 A
			EWYK135QZXSA2	141,25 A
	Voltage Phase	230 ±10%V	400 ±10%V	
	Frequency	1~ 50/60Hz	3~ 50/60Hz	
	Wire Size	MUST comply with national wiring regulation. Wire size based on the current.		
		3-core cable	4-core cable	

[(a)] MCA=Minimum Circuit Ampacity.

The standard equipment must be used in: TN-S network. For IT or any different networks, please contact factory.

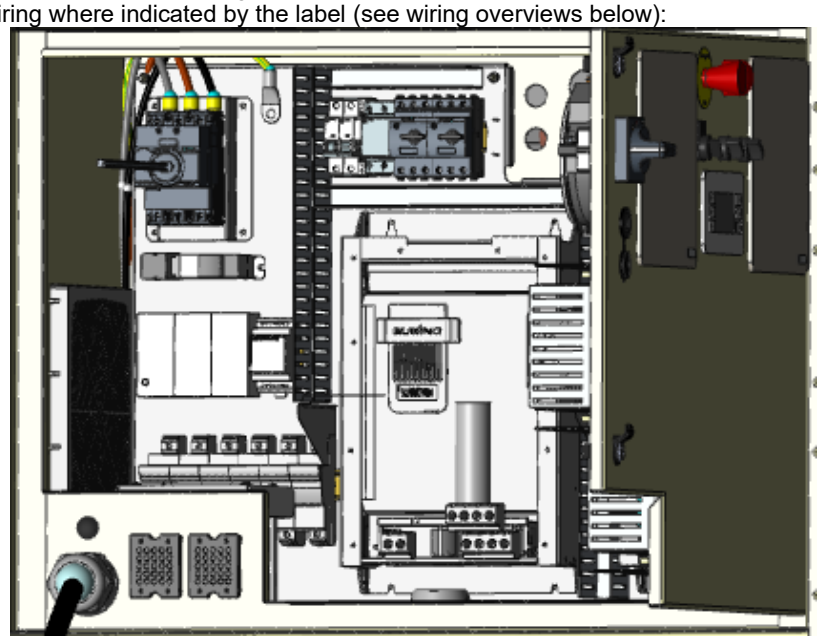
5.2 Guidelines when connecting the electrical wiring

Wiring power unit	Tightening torque (N•m)
3~	8 Nm ±10%
GND	4,5 Nm ±10%

5.2.1 To connect the electrical wiring to the unit (Power supply (3~+GND).

To connect the electrical wiring to the unit:

1. Remove the cap
2. Insert cable glands (IP68-M63)
3. Tighten the locknut behind the cable gland
4. Connect the wiring where indicated by the label (see wiring overviews below):



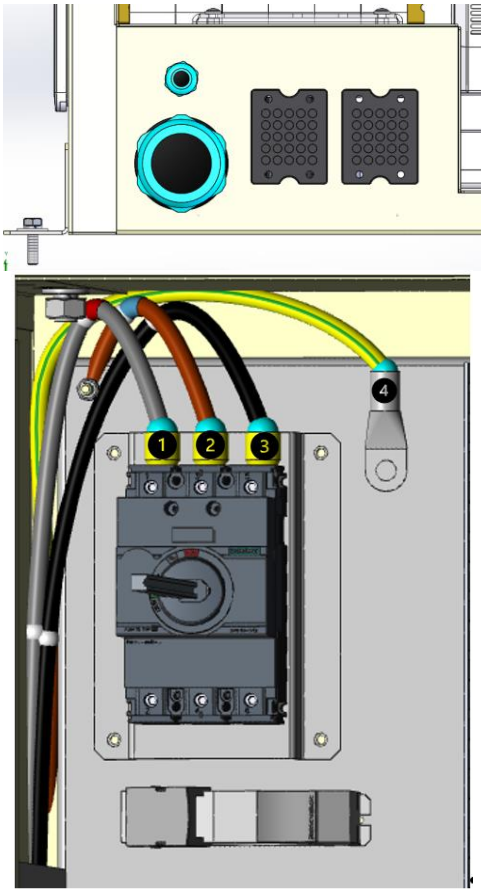


Figure 34 – Electrical wiring connection

Legend	
1	Phase 1
2	Phase 2
3	Phase 3
4	GND

5.2.2 To connect the emergency power supply to the unit (1N + GND)

The connect the emergency power supply to the unit:

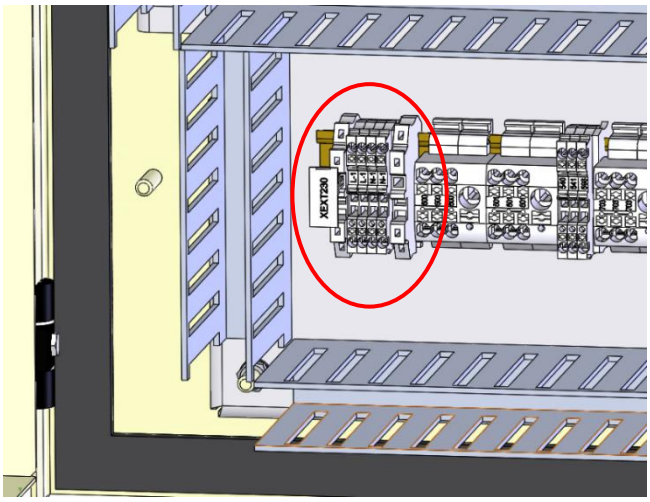
1. Remove the cap
2. Insert cable glands (IP68 - M20)
3. Tighten the locknut behind the cable gland
4. Connect the wiring (see wiring overviews below):

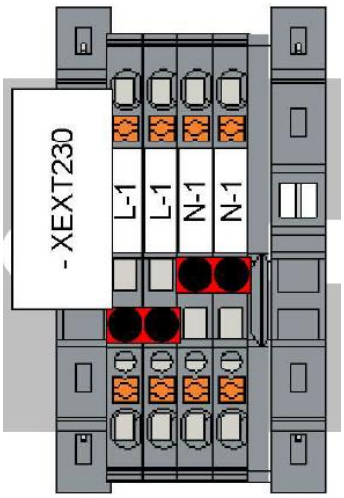
1.5 mm terminal tips must be used for the connection

Phase 1 and Phase 2 must be connected to the lower terminals located on the panel door."

Below the characteristics of the connection terminal block:

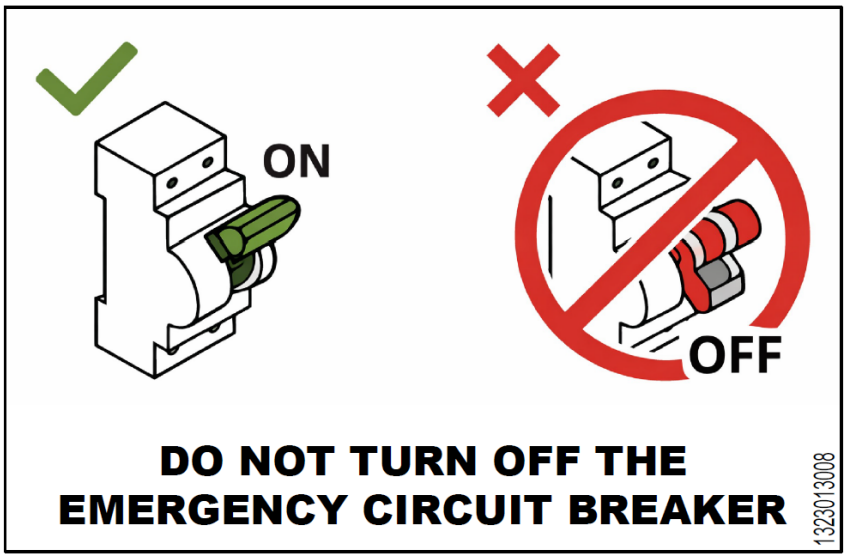
Type	Feed-through terminal block
Nom. Voltage	500V
Nom. current	17.5 A
Number of connections	2
Connection method	Push-in connection
Rated cross-section	1.5 mm^2
Cross section	0.14 mm2 – 1.5mm2
Mounting type	NS 35/7,5 NS 35/15





5.2.3 To fix the “Do NOT turn OFF the circuit breaker” stickers

After commissioning, do NOT turn OFF the circuit breakers to the units so that the protection remains activated. The label 1323013008 (shipped inside the documentation inside the Electrical Panel) shall be applied near the circuit breaker.



5.3 General specifications

Refer to the specific wiring diagram for the unit you have bought. Should the wiring diagram not be on the unit, or should it have been lost, please contact your manufacturer representative, who will send you a copy.
In case of discrepancies between wiring diagram and electrical panel/cables, please contact the manufacturer representative.

All electrical connections to the unit must be carried out in compliance with laws and regulations in force.
All installation, management and maintenance activities must be carried out by qualified personnel. There is a risk of electric shock and burning.

Electrical equipment is capable of operating correctly in the intended ambient air temperature. For very hot/cold environments (refer to “Operation limits”), additional measures are recommended (contact the manufacturer representative).
The electrical equipment is capable of operating correctly when the relative humidity does not exceed 50% at a maximum temperature of +40 °C. Higher relative humidities are permitted at lower temperatures (for example 90% at 20 °C).
The product meets the technical requirements of 60335-2-40.

5.4 Electric connections

Provide an electrical circuit to connect the unit. It must be connected to the copper cables with an adequate section relative to the absorption values and according to the current electrical standards.
Daikin Applied Europe S.p.A. declines all responsibility for an inadequate electrical connection.

The connections to the terminals must be made with copper terminals and cables, otherwise overheating or corrosion may occur at the connection points with the risk of damaging the unit. The electrical connection must be carried out by qualified personnel, in compliance with the laws in force. There is a risk of electric shock.

The power supply to the unit must be set up in such a way that it can be switched on or off independently from that of other system components and other equipment in general, by means of a general switch.

The electrical connection of the panel must be carried out maintaining the correct sequence of the phases. All units require 4 conductor cables (3 phases + neutral) plus a ground conductor. Refer to the specific wiring diagram for the unit you have bought. In case of discrepancy between the wiring diagram and electrical panel/cables, please contact the manufacturer representative.

Do not apply torque, tension or weight to the main switch terminals. Power line cables must be supported by appropriate systems.

To avoid interference, all control wires must be connected separately from the power cables. To do this, use several electrical passage ducts.
Install an earth leakage breaker.
To avoid it from malfunctioning due to harmonics, use an earth leakage breaker that is compatible with harmonics.

Before any electrical connection work to the compressor motor and / or the fans, make sure that the system is switched off and the main switch of the unit is open. Failure to observe this rule could result in serious personal injury.

5.5 Cable requirements

The cables connected to the circuit breaker must respect the insulation distance in the air and the surface isolation distance between the active conductors and the earth, according to IEC 61439-1 table 1 and 2, and to the local national laws.
The cables connected to the main switch must be tightened using a pair of keys and respecting the unified clamping values, relative to the quality of the screws of the washers and nuts used.

Main Switch	Model type	Value
160 A	Siemens 3VA1116-1AA36-0AA0	8Nm ±10%

Table 5 – Main Switch unified clamping values

Connect the earth conductor (yellow / green) to the PE ground terminal.
The equipotential protection conductor (earth conductor) must have a section according to table 1 of EN 60204-1 Point 5.2, shown below.
In any case, the equipotential protection conductor (earth conductor) must have a cross section of at least 10 mm2, in accordance with point 8.2.8 of the same standard.

Section of the copper phase conductors feeding the equipment S [mm2]	Minimum cross section of the external copper protection conductor Sp [mm2]
S ≤ 16 16 < S ≤ 35 S > 35	S 16 S/2

Table 6 - Table 1 of EN602041 Point 5.2

5.5.1 Maximum cable dimension

Maximum cable dimension that can be physically connected to mainswitch of the unit.

Model	Max cable size (mm^2) Model (A) STD-Configuration	
EWYK100QZXSA2	70mm	160
EWYK135QZXSA2	70mm	160

5.6 Phase unbalance

In a three-phase system, the excessive unbalance between the phases is the cause of the engine overheating. The maximum permitted voltage unbalance is 3%, calculated as follows:

Imbalance % = (Vx – Vm) * 100 Vm

Where:
Vx = Phase with greatest imbalance
Vm = Average of the voltages
Example:
The three phases measure 383, 386 and 392 V respectively.
The average is:

383 + 386 + 392 3 = 387 V

The unbalance percentage is:

(392 – 387) * 100 387 = 1,29 %

Less than the maximum allowed (3%).

5.7 Emergency circuit

This product is equipped with safety devices (3 leak detectors, 1 extraction fans, and one fault indicator lamp with acoustic alarm) as an emergency circuit, powered by a separate power supply apart from the unit power supply (400V).To ensure the safety devices function effectively, the “Emergency Circuit (230VAC)” must be continuously energized during service work (replacement other than safety device and maintenance)..

Please note that if leak detector detects a refrigerant leak during repair work, the ventilation fan will activate automatically.

6 STARTING UP THE UNIT

Only authorized DAIKIN personnel should conduct commissioning

The commissioning of the unit is performed through E-Care app by Daikin or its certified partner.

6.1 Checklist before commissioning the unit

	Before starting work, you checked the safety items in "Safety checklist before work on R290 units".
	The-unit is properly mounted.
	Installation of shipped-loose components.
	The unit is installed in a suitable location.
	The "flammable zone" around the unit is respected.
	Check water circuit filling and air bleeding.
	Check the installation of anti-condensation drain pipes and the discharge pipe of refrigerant safety valve
	Check piping completion, and operation of the controls.
	Correct installation of the valve (“t” on P&ID) on the water outlet pipe **(Shipped-loose)**
	Correct installation of the accessory water piping for array connection (see dimensional drawing for the connection) **(Accessory)**
	Check that all water sensors are correctly installed on the heat exchanger (also in case of water sensor accessory for MUSE and iCM).
	Correct installation of accessory water piping for Daikin Pump Module. (see dimensional drawing for the connection).
	Check that all water sensors are correctly installed in the tank of DHW.
	A correct field fuse and earth leakage circuit breaker are installed on the unit's power supply. **Also for auxiliary/emergency power supply**
	Install a main switch upstream of the unit, the main fuses and, where required by the national laws of the country of installation, a ground fault detector.
	The "Do NOT turn OFF the circuit breaker" stickers are fixed in the electrical cabinet.
	Check flowswitch integrity.
	Correct installation and positioning of water filter (see paragraph “Water Circuit Requirements”) even when not supplied.
	Check water filter cleaning.
	Check for external damage.
	Check for leaks through personal gas monitoring system suitable for R290 and make sure it is activated. Place it on the floor near the unit. To be able to detect an explosion hazard, an LEL-detector (lower explosion level) is required.
	Check the correct power cables connection to the main power supply and emergency power supply.
	Check power cables of pump module.
	Check that the electrical connection is in compliance with local electrical regulations

Do NOT open the tank receiver valve of the unit's refrigerant tank until instructed by the user interface of the unit.
For safe transportation, all refrigerant is stored in the refrigerant tank of the r unit. During commissioning, when performing the unlocking procedure (via the e-Care app), the tank receiver valve of the refrigerant tank must be fully opened and remain open.

7 OPERATION

7.1 Operating limits

Operation out of the mentioned limits may damage the unit. In case of any doubt contact the manufacturer representative. In the following figure are illustrated the operation ranges both in cooling and heating mode, in terms of Leaving water temperature (LWT) and Ambient temperature (OAT).

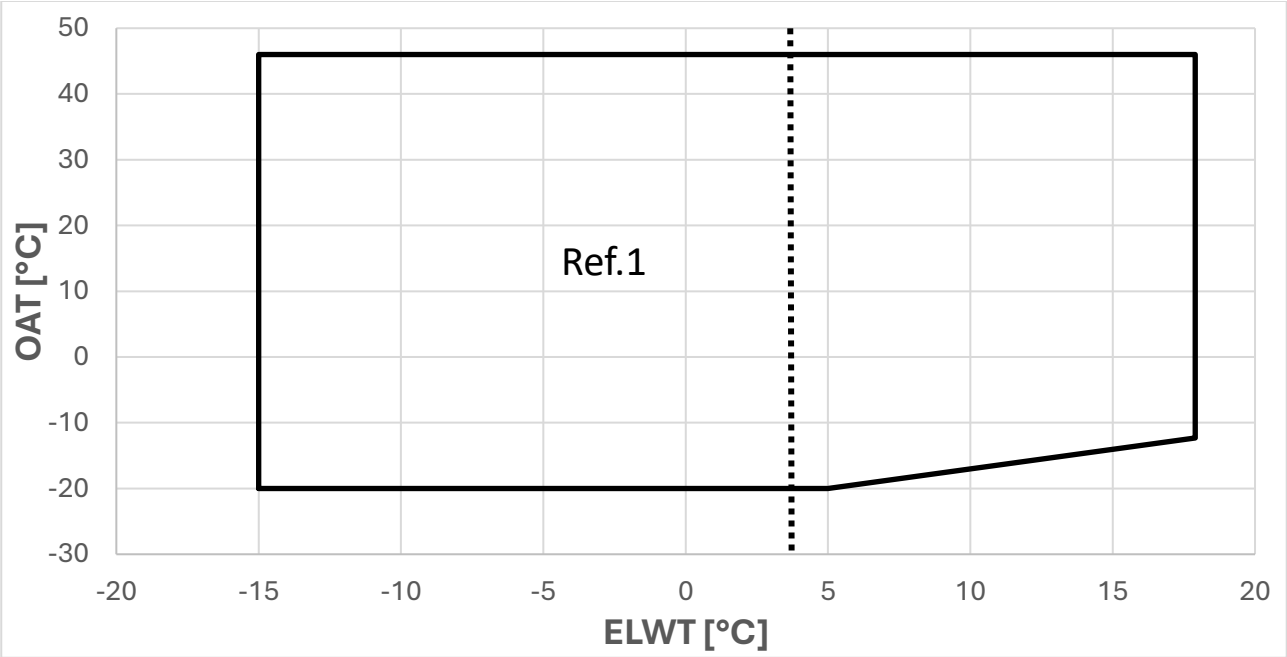


***Figure 35* - Cooling Mode Operating Limits**

OAT	Outside ambient temperature
ELWT	Evaporator Leaving water temperature
Ref. 1	Unit operations in this area require the enabling of the Brine version in the controller and the use of the proper amount of glycol.

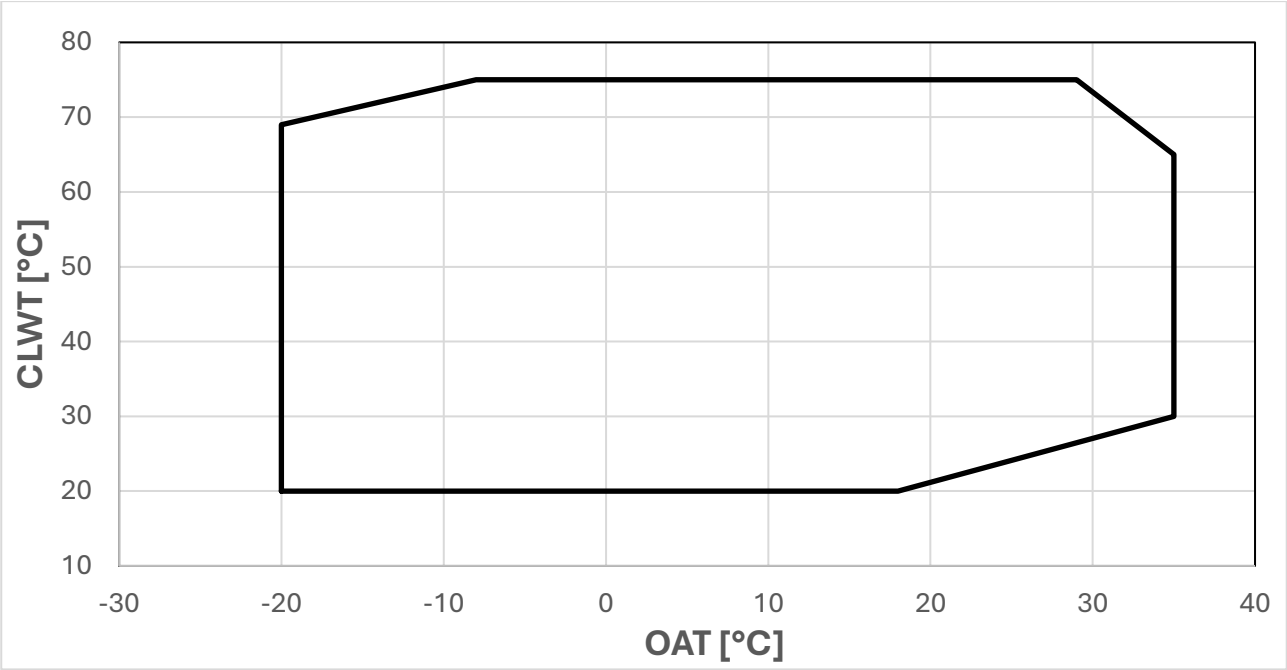


Figure 36 - **Heating Mode Operating Limits**

OAT	Outside ambient temperature
CLWT	Condenser Leaving water temperature

7.2 Water treatment

Before putting the unit into operation, clean the water circuit.

The BPHE must not be exposed to flushing velocities or debris released during flushing. It is recommended that a suitably sized bypass and valve arrangement is installed to allow flushing of the piping system. The bypass can be used during maintenance to isolate the heat exchanger without disrupting flow to other units.

Any damage due to the presence of foreign bodies or debris in the BPHE will not be covered by warranty. Dirt, scales, corrosion debris and other material can accumulate inside the heat exchanger and reduce its heat exchanging capacity. Pressure drop can increase as well, thus reducing water flow. Proper water treatment therefore reduces the risk of corrosion, erosion, scaling, etc. The most appropriate water treatment must be determined locally, according to the type of system and water characteristics.

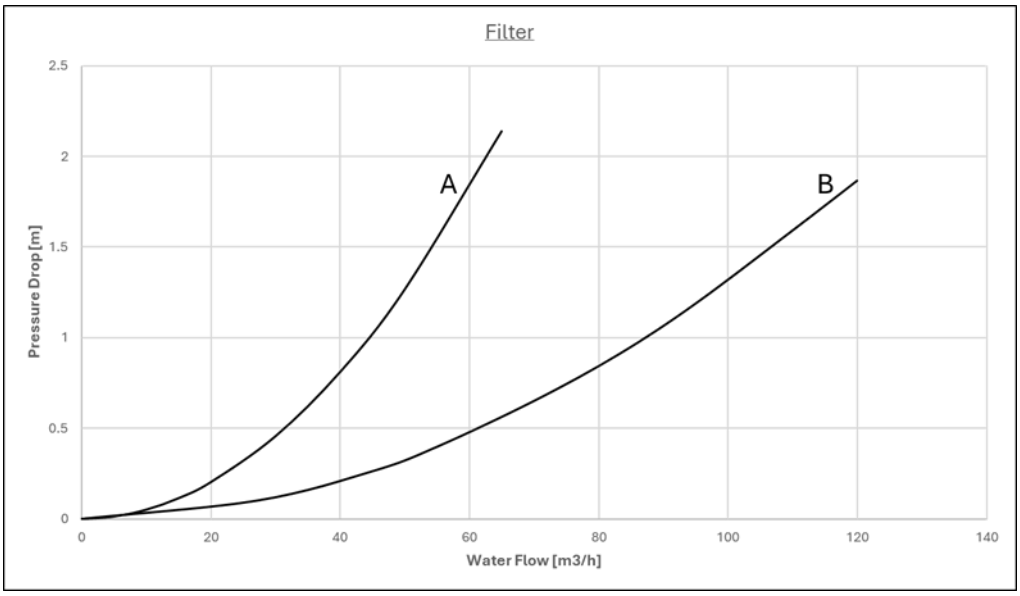
The manufacturer is not responsible for damage to or malfunctioning of equipment caused by failure to treat water or by improperly treated water. In the following table are listed the acceptable water quality limits:

DAE Water quality requirements	BPHE
pH (25°C)	7.5-9.0
Electrical conductivity (25°C)	<500 µS/cm
Chlorine molecular	<1.0mg Cl2/l
Sulphate ion (SO_4^{--}/l)	<100 mg SO_4^{--}/l
Alkalinity	<100 mg $CaCO_3$/l
Total Hardness	80-150 mg $CaCO_3$/l
Iron	< 0.2
Ammonium ion (NH3)	<0.5mg NH_4^+/l
Hydrogen carbonate (HCO---)	60-200 mg HCO3/l
(HCO---)/(SO4--)	>0.5
(Ca+Mg)/(HCO---)	>1.6

Table 7 - Acceptable water quality limits

7.3 Water pressure drops for filters

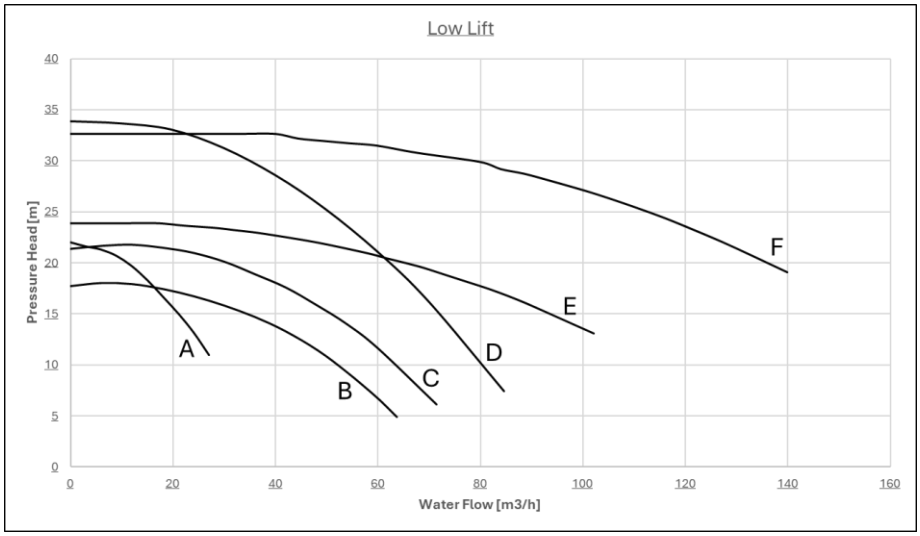
In the following figure the water filter pressure drops are illustrated.

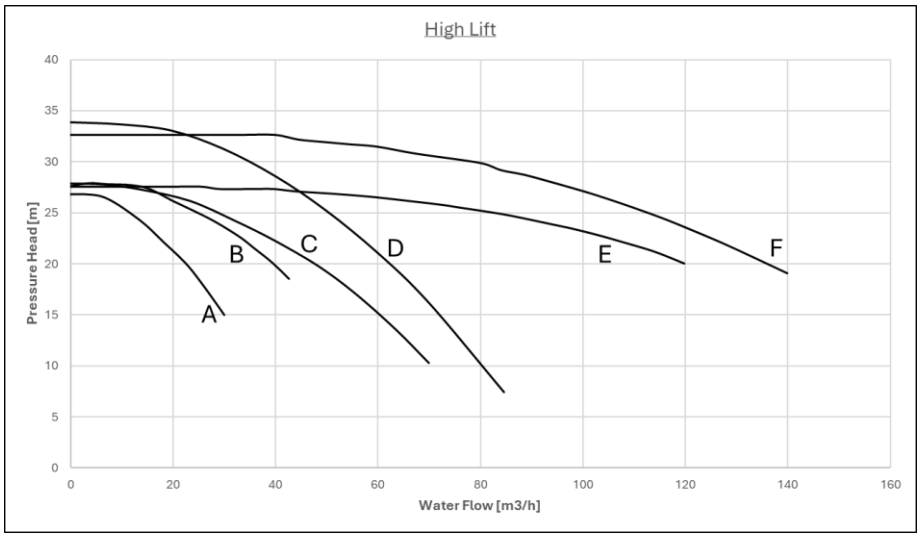


Filter	Curve
EKWTRFLTR3	A
EKWTRFLTR5	B

7.4 Pump Module (Accessory – not mounted on unit)

Before starting up the pump, ensure that the hydraulic circuit is filled correctly with a minimum static pressure of 1 bar as protection from cavitation.
In the following figures are illustrated the External pressure head (m) in case of Low Lift and High Lift Module.





Low Lift		
Pump Module	**Pump Model**	**Curve**
EKPMPLOW1	CP2_32-2200_T_IE3	A
EKPMPLOW2	CP2_50-1800_T_IE3	B
EKPMPLOW3	CP2_50-2100_T_IE3	C
EKPMPLOW4	CP2-G_50-3300_T_IE3	D
EKPMPLOW5	CP-G_80-2400_T_IE3	E
EKPMPLOW6	CP-G_80-3250_T_IE3	F

High Lift		
Pump Module	**Pump Model**	**Curve**
EKPMPHGH1	CP2_32-2700_T_IE3	A
EKPMPHGH2	CP2_40-2800_T_IE3	B
EKPMPHGH3	CP2_50-2800_T_IE3	C
EKPMPHGH4	CP2-G_50-3300_T_IE3	D
EKPMPHGH5	CP-G_80-2770_T_IE3	E
EKPMPHGH6	CP-G_80-2770_T_IE3	E
EKPMPHGH7	CP-G_80-3250_T_IE3	F

7.5 Operating stability and minimum water content in the system

For the correct functioning of the machines, it is important to guarantee a minimum water content inside the system, avoiding an excessive number of compressor startups and stops. In fact, every time the compressor starts working, an excessive amount of oil from the compressor enters the circulation in the refrigerant circuit and at the same time there is an increase in the temperature of the compressor stator, generated by the inrush current of the starting. To prevent damage to the compressor, the control system will therefore permit no more than 10 startups per hour. The plant where the unit is installed must therefore ensure that the overall water content allows constant operation of the unit and consequently also greater environmental comfort.

7.5.1 Cooling Mode

The chilled water content of the systems should have a minimum water amount to avoid excessive stress (start and stops) on the compressors.
Design considerations for water volume are the minimum cooling load, the water temperature setpoint differential and the cycle time for the compressors.
As a general indication, the system water content should not be less than the values deriving from the following formula:

$$\textit{Single circuit Unit} \rightarrow 5\ \frac{lt}{kW\ nominal}$$
$$\textit{Dual circuit Unit} \rightarrow 3{,}5\ \frac{lt}{kW\ nominal}$$

kWnominal = Cooling capacity at 12/7°C OAT=35°C

The above rule of thumb derives from the following formula, as the relative volume of water capable of maintaining the water temperature setpoint differential during the minimum load transient avoiding excessive starts and stops of the compressor itself (which depends on the compressor technology):

$$\boldsymbol{Water\ Volume} = \frac{\boldsymbol{CC}\ [\boldsymbol{W}]\ \boldsymbol{x}\ \boldsymbol{Min\ load}\ \%\ \boldsymbol{x}\ \boldsymbol{DNCS}[\boldsymbol{s}]}{\boldsymbol{FD}\ \left[\frac{\boldsymbol{g}}{\boldsymbol{L}}\right] * \boldsymbol{SH}\left[\frac{\boldsymbol{J}}{\boldsymbol{g°C}}\right] * (\boldsymbol{DT})[°\boldsymbol{C}]}$$

CC = Cooling Capacity
DNCS = Delay to next Compressor Start
FD = Fluid Density
SH = Specific Heat
DT = Water Temperature Setpoint Differential
A properly designed storage tank should be added if the system components do not provide sufficient water volume.
By default, the unit is set to have a water temperature setpoint differential in line with Comfort Cooling application which allows to operate with the minimum volume mentioned in the previous formula.
However, if a smaller temperature differential is set, as in the case of Process Cooling applications where temperature fluctuations must be avoided, a larger minimum water volume will be required.
To ensure proper operation of the unit when changing the value of setting, the minimum water volume must be corrected.

In case of more than one installed unit, the overall capacity of the installation must be considered in the calculation so summing the water content of each unit.

7.5.2 Heating Mode

The heating water content of the systems should have a minimum water amount to avoid excessive decrease of the water setpoint during the defrost cycle to guarantee the proper environmental comfort.
As a general indication the system water content should not be less than the values deriving from the following fomula:

$$\textit{Single circuit Unit} \rightarrow 16 \frac{lt}{kW\ nominal}$$
$$\textit{Dual circuit Unit} \rightarrow 8 \frac{lt}{kW\ nominal}$$

kWnominal = Heating capacity at 40/45°C OAT=7°C

The above rule of thumb derives from the following formula, as the relative volume of water capable of maintaining the system temperature within an acceptable ΔT (which depends on the heating application) during the defrost transient:

$$Water\ Volume = \frac{CC\ [W]\ x\ \mathrm{MDD}[s]}{FD\left[\frac{g}{L}\right] * SH\ \left[\frac{J}{g°C}\right] *\ DT[°C]}$$

CC = Cooling Capacity during defrost operation
MDD = Max Defrost Duration
FD = Fluid Density
SH = Specific Heat
DT = Acceptable Water Temperature Differential

The water temperature difference is considered acceptable for the Comfort Heating application which allows to operate with the minimum volume mentioned in the previous formula.
However, if a smaller water temperature difference is considered acceptable, a larger minimum water volume will be required.
A properly designed storage tank should be added if the system components do not provide sufficient water volume.

In case of more than one installed unit, the overall capacity of the installation must be considered in the calculation so summing the water content of each unit.

Note: The indication is intended as a general guideline and not intended to substitute the evaluation made by qualified technical personnel or by HVAC engineers. For more detailed analysis is better to consider the use of other more detailed approach.
These considerations refer to the water volume always flowing through the unit. If there are bypasses, branch of the system that can be excluded, that parts should not be accounted in the water content calculation.

7.6 Noise and sound protection

The noise generated by the unit is primarily due to the operation of the compressors and fans.
The sound pressure level for each model and size is indicated in the relevant sales documentation.
When the unit is properly installed, operated, and maintained in accordance with this manual, the emitted noise levels do not require the use of special personal protective equipment.
In installations subject to specific acoustic requirements, additional sound attenuation measures may be necessary.
Where stricter noise control is required, particular attention shall be paid to the mechanical isolation of the unit from its supporting structure. **Isolators (supplied as optional) must be installed** between the unit base and the supporting surface.
Flexible joints shall also be installed on the water piping connections to prevent the transmission of vibrations to the hydraulic system.

8 OPERATOR'S REPONSIBILITIES

It is essential that the operator is appropriately trained and becomes familiar with the system before operating the unit. In addition to reading this manual, the operator must study the microprocessor operating manual and the wiring diagram to understand startup sequence, operation, shutdown sequence and operation of all the safety devices.
The operator must keep a record of operating data for every installed unit. Another registration must also be kept for all the periodic maintenance and assistance activities.
If the operator notes abnormal or unusual operating conditions, he is advised to consult the technical service authorized by the manufacturer.

If the unit is switched off, the compressor oil heater cannot be used. Once the unit is reconnected to the mains, leave the compressor oil heater charged for at least 6 hours before restarting the unit. Failure to observe this rule may cause damage to the compressors due to excessive accumulation of liquid inside them.

This unit represents a substantial investment and deserves the attention and care to keep this equipment in good working order.
However, during operation and maintenance it is essential to observe the following instructions:
• Do not allow unauthorized and / or unqualified personnel to access the unit.
•It is forbidden to access the electrical components without having opened the unit main switch and switched off the power supply.
• It is forbidden to access the electrical components without using an insulating platform. Do not access the electrical components if water and/or moisture are present.
• Verify that all operations on the refrigerant circuit and on the components under pressure are carried out exclusively by qualified personnel.
• The replacement of the compressors must be carried out exclusively by qualified personnel.
• Sharp edges and the surface of the condenser section could cause injury. Avoid direct contact and use adequate protection device.
• Do not introduce solid objects into the water pipes while the unit is connected to the system.
• It is absolutely forbidden to remove all protections of moving parts.
In case of sudden stop of the unit, follow the instructions on the Control Panel Operating Manual which is part of the on-board documentation delivered to the end user.
It is strongly recommended to perform installation and maintenance with other people.

Avoid installing the unit in areas that could be dangerous during maintenance operations, such as platforms without parapets or railings or areas not complying with the clearance requirements around the unit.

9 MAINTENANCE

All replacement parts must be approved by the manufacturer.
Contact your local Daikin representative or Daikin factory service for more information.

9.1.1 Instructions for safe operation

- All operators working in the area must be informed of the type of work carried out; all members of staff responsible for maintenance must be trained and qualified and understand the implications of the presence of flammable refrigerant gas; all technicians working with the refrigerant must be qualified and authorized.
- The area should be marked as Temporary Flammable Zone. Local supervisor should be notified of the zone existence. All appropriate signs must be present.
- All the necessary and appropriate equipment and instruments must be available.
- Working in confined spaces must be avoided and at least one escape route clear of obstacles must be guaranteed.
- Make sure there is no source of ignition – flames and sparks- within the flammable zone.
  This includes light and socket switches, heaters, other unsealed electrical switches, lit brazing torches, ecc.
- Use a hydrocarbon gas detector to check if there is HC in the air before and while you work on the HC system.
- Smoking is forbidden in the area.

- Equipment for extinguishing flames (CO_2 or dry type) must be available and serviceable in the surrounding area.
- If possible do not switch off the emergency circuit power supply.

If the safety requirements cannot be met, do not operate.

Personnel working on the electrical or the refrigeration components must be authorized, trained and fully qualified. Maintenance and repair requiring the assistance of other skilled personnel should be carried out under the supervision of the person competent in the use of flammable refrigerants. Any person conducting servicing or maintenance on a system, or associated parts of the equipment should be competent according to EN 13313.
Persons working on refrigerating systems with flammable refrigerants should have competence in safety aspects of flammable refrigerant handling supported by evidence of appropriate training.
No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.
Always protect the operating personnel with personal protective equipment appropriate for the tasks to be performed. Common individual devices are: Helmet, goggles, gloves, caps, safety shoes. Additional individual and group protective equipment should be adopted after an adequate analysis of the specific risks in the area of relevance, according to the activities to be performed.

Leak detection equipment shall be set at a percentage of the ***LFL*** of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

Electrical components	Never work on electrical components until the machine's main power supply has been cut off with the main switch on the electrical panel. Wait 10 minutes after cutting off the machine's power supply before opening the electrical panel, to prevent the risk of high voltage due to firing of the capacitors. Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include: – that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking; – that no live electrical components and wiring are exposed while charging, recovering or purging the system; – that there is continuity of earth bonding. Electrical components that can arc or spark, which are not considered ignition sources due to compliance with EN 60335-2-40, 22.116.1 points b), c), d), or f) shall only be replaced with parts specified by the appliance manufacturer. Replacement with other parts may result in the ignition of refrigerant in the event of a leak; Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
Refrigeranting system	The following precautions should be taken before working on the refrigerant circuit: • obtain permit for hot work (if required). • ensure that no flammable materials are stored in the work area and that no ignition sources are present anywhere in the work area. • ensure that suitable fire extinguishing equipment is available. • ensure that the work area is properly ventilated before working on the refrigerant circuit or before welding, brazing or soldering work. • ensure that the leak detection equipment being used is no sparking, adequately sealed or intrinsically safe. • ensure that all maintenance staff have been instructed • perform the following procedure before working on the refrigerant circuit: • remove refrigerant (specifying residual pressure). • purge circuit with inert gas (e.g. nitrogen). • evacuate at a pressure of 0.3 bar (ass.) (Or 0.03 MPa); • purge circuit with inert gas (e.g. nitrogen) again. • open the circuit. If compressors or compressor oils are to be removed, it should be ensured that it has been evacuated to an acceptable level to ensure that there is no flammable refrigerant remaining within the lubricant. Only refrigerant recovery equipment designed for use with flammable refrigerants should be employed. If the national rules or regulations permit the refrigerant to be drained, this should be done safely, using a hose, for example, through which the refrigerant is discharged into the outside atmosphere in a safe area. It should be ensured that an inflammable explosive refrigerant concentration cannot occur near an ignition source or penetrate a building under any circumstance. In the case of refrigerating systems with an indirect system, the heat transfer fluid should be checked for the possible presence of refrigerant. After any repair work, the safety devices, for example refrigerant detectors and mechanical ventilation systems, should be checked and the results recorded. It should be ensured that any missing or illegible label on components of the refrigerant circuit is replaced. Sources of ignition should not be used when searching for a refrigerant leak.

9.2 Pressure / temperature table

°C	Bar	°C	Bar	°C	Bar	°C	Bar
-70	0.24	-34	1.43	2	5.04	38	13.07
-68	0.27	-32	1.55	4	5.35	40	13.69
-66	0.31	-30	1.68	6	5.67	42	14.34
-64	0.34	-28	1.81	8	6.01	44	15.00
-62	0.38	-26	1.96	10	6.37	46	15.69
-60	0.43	-24	2.11	12	6.73	48	16.40
-58	0.47	-22	2.27	14	7.12	50	17.13
-56	0.53	-20	2.45	16	7.52	52	17.89
-54	0.58	-18	2.63	18	7.93	54	18.67
-52	0.64	-16	2.82	20	8.36	56	19.48
-50	0.71	-14	3.02	22	8.81	58	20.31
-48	0.78	-12	3.23	24	9.28	60	21.17
-46	0.85	-10	3.45	26	9.77	62	22.05
-44	0.93	-8	3.69	28	10.27	67	22.96
-42	1.02	-6	3.93	30	10.79	66	23.90
-40	1.11	-4	4.19	32	11.33	68	24.87
-38	1.21	-2	4.46	34	11.89	70	25.87
-36	1.32	0	4.74	36	12.47		

Table 8 – R290 Pressure/Temperature

9.3 Routine maintenance

This unit must be maintained by qualified and authorized technicians. Before beginning any work on the system, the personnel shall assure that all security precautions have been taken.
Neglecting unit maintenance could degrade all parts of the units (coils, compressors, frames, pipes, etc.) with negative effect on performances and functionality.
There are two different levels of maintenance, which can be chosen according to the type of application (critical/noncritical) or to the installation environment (highly aggressive).
Examples of critical applications are process cooling, data centres, etc.
Highly Aggressive Environments can be defined as the follows:
• Industrial environment (with possible concentration of fumes result of combustion and chemical process);
• Coastal environment.
• Highly polluted urban environment.
• Rural environment close to animal excrement and fertilizers, and high concentration of exhaust gas from diesel generators.
• Desert areas with risk of sandstorms.
• Combinations of the above.
Table 10 lists all Maintenance activities for standard applications and standard environment.
Table 11 lists all Maintenance activities for critical applications or highly aggressive environment.

List of activities	Weekly	Monthly	Half Yearly	Yearly / Seasonal
General				
Reading of operating data and alarm log (Note 3)	X			
Visual inspection of unit for any damage and/or loosening		X(Quarterly)		
Verification of thermal insulation integrity		X(Quarterly)		
Cleaning (wash frame and covers)		X(Quarterly)		
Paint where necessary and threat corrosion		X(Quarterly)		
Check probes and transducers calibration				X
Verify maintenace spaces access				X
Check for (temporary) flammable material or potential source ignition		X(Quarterly)		
Verify status of panels and protection grills		X(Quarterly)		
Electrical Installation:				
Verification of control sequence and functions				X
Verify contactor wear – Replace if necessary				X
Visual inspection and verify that all electrical terminals are tight – Tighten if necessary			X	
Clean inside the electrical control board				X
Visual inspection of components for any signs of overheating		X		
Integrity and insulation of cables				X
Verify operation of compressor and electrical resistance (current absorption measurement)		X		
Clean intake air filters			X	
Verify unit protection devices			X	
Check of flow switch operation		X		
Electrical Installation - Emergencies				
UPS checks for emergency power supply			X	
Emergency circuit breaker inspection			X	
Verify that all electrical terminals are tight – Tighten if necessary		X(Quarterly)		
Extraction and Cooling fans - inspection and functioning		X(Quarterly)		
Leak Detector - inspection and functioning		X(Quarterly)		
Refrigeration circuit:				
Check for any refrigerant leakage (leak test)		X		
Analyse compressor vibrations (verify at different speed)				X
Verify rust and corrosion (correct if necessary) on refrigeration circuit		X(Quarterly)		
Check for any refrigerant leak on safety valves and piping (oil traces)		X(Quarterly)		
Check for any obstruction in safety valve discharge pipe		X(Quarterly)		
Verify integrity of safety valve (replace if necessary)				X
Verify mechanical high pressure switch				X

Hydraulic circuit:				
Check the shut off valve correct positioning		X		
Inspect water separator valve		X		
Check for any water leakage		X		
Check hydraulic connections		X		
Check the pressure at the pump inlet		X		
Clean the water filter				X
Analysis of water (Note 4)			X	
Check the glycol concentration				X
Check the water flow rate		X		
Check the safety valve				X
Check hydraulic circuit components (drains, vent, pump, etc..)		X(Quarterly)		
Bleed the air from the hydraulic circuit			X	
Coil section:				
Check the cleaning of coils (Note 5)				X
Verify the coil fins				X
Verify that fans are well tightened and blades free to run				X
BPHE:				
Check the cleaning of the BPHE			X	
Check BPHE Electrical heater			X	
Verify BPHE water pressure drop		X(Quarterly)		
Optional and Accessories				
Power Supply Panel-Verify that all electrical terminals are tight – Tighten if necessary		X(Quarterly)		
Power Supply Panel - Visual inspection of components for any signs of overheating		X(Quarterly)		
Pump skid - Verify the pressure at the pump inlet			X	
Pump skid - verify the expansion tank				X
Pump skid (electrical panel) - Verify that all electrical terminals are tight – Tighten if necessary		X(Quarterly)		
Pump skid (electrical panel) - Visual inspection of components for any signs of overheating		X(Quarterly)		
MUSE and ICM probes inspection and calibration				X
Manifold kit - check connections and water leakages		X		
DHW probe and tank				X

Table 9 - Standard Routine Maintenance Plan

Notes:
1. Monthly activities include all the weekly ones.
2. The annual (or early season) activities include all weekly and monthly activities.
3. Daily reading of the operating values of the unit allows maintaining high observational standards.
4. Check for any dissolved metals.
5. Check that the cap and the seal have not been tampered with. Check that the drainage connection of the safety valves is not accidentally occluded by foreign objects, rust or ice. Check the manufacturing date on the safety valve and replace it, if necessary, in compliance with the national laws in force.
6. Units placed or stored in a Highly Aggressive Environment for long time without operation are still subject to those routine maintenance steps.
7. The protective paint layer must be applied on: all brazing and joints of copper refrigerant pipes; drier filter plate; Rotalock valves and flanges of refrigerant circuit; all BPHE not insulated.

List of activities	Weekly	Monthly	Half Yearly	Yearly / Seasonal
General				
Reading of operating data and alarm log (Note 3)	X			
Visual inspection of unit for any damage and/or loosening		X		
Verification of thermal insulation integrity		X		
Cleaning		X		
Paint where necessary		X		
Check probes and transducers calibration				X
Verify maintenace spaces access				X
Check for (temporary) flammable material or potential source ignition.		X(Quarterly)		
Verify status of panels and protection grillsr		X(Quarterly)		
Electrical Installation:				
Verification of control sequence and functions				X
Verify contactor wear – Replace if necessary				X
Visual inspection and Verify that all electrical terminals are tight – Tighten if necessary			X	
Clean inside the electrical control board				X
Visual inspection of components for any signs of overheating		X		
Integrity and insulation of cables				x
Verify operation of compressor and electrical resistance (current absorption measurement)		X		
Clean intake air filters			X	
Verify unit protection devices			X	
Check of flow switch operation		X		
Electrical Installation - Emergencies				
UPS check for emergency power supply			X	
Emergency circuit breaker inspection			x	
Verify that all electrical terminals are tight – Tighten if necessary		X(Quarterly)		
Exctaction and Cooling fans - inspection and functioning		X(Quarterly)		
Leak Detector - inspection and functioning		X(Quarterly)		
Refrigeration circuit:				
Check for any refrigerant leakage (leak test)		X		
Analyse compressor vibrations (verify at different speed)				X
Verify rust and corrosion (correct if necessary) on refrigeration circuit		X(Quarterly)		
Check for any refrigerant leak on safety valves and piping (oil traces)		X(Quarterly)		
Check for any obstruction in safety valve discharge pipe		X(Quarterly)		
Verify integrity of safety valve (replace if necessary)				X
Verify mechanical high-pressure switch				X
Hydraulic circuit:X				
Check the shut off valve correct positioning		X		
Inspect water separator valve		X		
Check for any water leakage		X		
Check hydraulic connections		X		
Check the pressure at the pump inlet		X		
Clean the water filter				X
Analysis of water (4)			X	
Check the glycol concentration				X
Check the water flow rate		X		
Check the safety valve				X
Check hydraulic circuit components (drains, vent, pump, etc..)		X(Quarterly)		
Bleed the air from the hydraulic circuit			X	
Coil section:				
Check the cleaning of coils (Note 5)		X		

Verify the coil fins				X
Verify that fans are well tightened and blades free to run				X
BPHE:				
Check the cleaning of the BPHE			X	
Check BPHE Electrical heater			X	
Verify BPHE water pressure drop		X (Quarterly)		
Optional and Accessories				
Power Supply Panel- Verify that all electrical terminals are tight – Tighten if necessary		X (Quarterly)		
Power Supply Panel - Visual inspection of components for any signs of overheating		X (Quarterly)		
Pump skid - Verify the pressure at the pump inlet			X	
Pump skid - verify the expansion tank				X
Pump skid (electrical panel) - Verify that all electrical terminals are tight – Tighten if necessary		X (Quarterly)		
Pump skid (electrical panel) - Visual inspection of components for any signs of overheating		X (Quarterly)		
MUSE and ICM probes inspection and calibration				X
Manifold kit - check connections and water leakages		X		
DHW probe and tank				X

Table 10 – Routine Maintenance Plan for Critical Application and/or Highly Aggressive Environment

Notes:
1. Monthly activities include all the weekly ones.
2. The annual (or early season) activities include all weekly and monthly activities.
3. Daily reading of the operating values of the unit allows maintaining high observational standards.
4. Check for any dissolved metals.
5. Check that the cap and the seal have not been tampered with. Check that the drainage connection of the safety valves is not accidentally occluded by foreign objects, rust, or ice. Check the manufacturing date on the safety valve and replace it, if necessary, in compliance with the national laws in force.
6. Units placed or stored in a Highly Aggressive Environment for long time without operation are still subject to those routine maintenance steps.
7. The protective paint layer must be applied on:all brazing and joints of copper refrigerant pipes; drier filter plate; Rotalock valves and flanges of refrigerant circuit; all BPHE not insulated.

9.4 Unit Maintenance and cleaning

Unit exposed to a highly aggressive environment can face corrosion in a shorter time than ones installed on a standard environment. Corrosion causes a rapid rusting of the frame core, consequently decreases unit structure life time. To avoid that, it is necessary to wash periodically the frame surfaces with water and suitable detergents.
In case of part of unit frame paint came off, it is important to stop its progressive deterioration by repainting the exposed parts using proper products. Please contact factory to get the required products specifications.
Note: in case of just salt deposits are present, it is enough to rinse the parts with fresh water.

Note Do not use means to clean other than those recommended by the manufacturer.

9.4.1 Fins and tubes coil maintenance

The operating environment of the units can affect life of Fins and tubes coil. In order to maintain the efficiency of the unit over time and its duration, it is necessary to do a frequent cleaning of Fins and tubes coils.
Dust, pollution, etc...can create obstructions between the fins of the coils. These obstructions can be removed by washing periodically under pressure.

The following maintenance and cleaning procedures are recommended as part of the routine maintenance activities. Before operating:

1. Disconnect the unit from the main power supply.
2. Wait for the fans to stop completely;
3. Make sure that the fan blades cannot move for any reason (for example: wind).
4. Remove coil guards
5. Before using a water jet on coils, remove bigger dirt, such as leaves and fibres, with a vacuum cleaner (preferably with a brush or other soft attachment rather than a metal tube), compressed air blown from the inside out (if possible), and/or a soft bristle (not wire!) brush. Do not impact or scrape the coil with the vacuum tube, air nozzle, etc.
6. Clean the **condenser coil** from the top, by removing fans grid.

Note: Use of a water stream, such as a garden hose, against a surface loaded coil will drive the fibres and dirt into the coil. This will make cleaning efforts more difficult. Surface loaded fibres must be completely removed prior to using low velocity clean water rinse.

7. Rinse only. If needed use suggested coil cleaners only (ask Daikin factory service for more information).
8. It is possible to clean a coil with a high-pressure washer (max 7 barg) only if a flat shape of the water spray is used and direction of the spray is kept perpendicular to the fin edge. **If this direction is not respected the coil may be destroyed** if using a pressure washer so we do not recommend their use.

Note: A monthly clean water rinse is recommended for coils that are applied in coastal or industrial environments to help to remove chlorides, dirt and debris. It is very important when rinsing, to water temperature is less than 54 °C. An elevated water temperature will reduce surface tension. Pressure shall not exceed 7 barg.

3. Quarterly cleaning is essential to extend the life of a E-coated coil and is required to maintain warranty coverage. Failure to clean a E-coated coil will void the warranty and may result in reduced efficiency and durability in the environment. For routine quarterly cleaning, first clean the coil with an approved coil cleaner. After cleaning the coils with the approved cleaning agent, use the approved chloride remover to remove soluble salts and revitalize the unit.

Harsh chemicals, household bleach or acid cleaners should not be used to clean coils. These cleaners can be very difficult to rinse out of the coil and can accelerate corrosion. If needed use suggested coil cleaners only (ask Daikin factoy service for more information)

Galvanic corrosion of the connection Fins and tubes can occur under the plastic protection; during the maintenance operations or periodic cleaning, check the aspect of the plastic protection of the Fins and tubes connection. If it is inflated, damaged, or took off, contact the manufacturer representative for advice and information.

9.4.2 Electrical Maintenance

All electrical maintenance activities must be followed by qualified and authorised personnel. Make sure the system is switched off and the main switch of the unit open (emergency power supply shall always be active). Failure to observe this rule could result in serious personal injury. When the unit is turned off, but the disconnection switch is in the closed position, the unused circuits will still be active.

The 230 Vac emergency power supply shall always be active.

The maintenance of the electrical system consists of the application of some general rules as follows:
1. the current absorbed by the compressor must be compared to the rated value. Normally the value of the absorbed current is lower than the rated value that corresponds to the absorption of the full load compressor at the maximum operating conditions.
2. at least once every six months all the security checks must be made to verify their functionality. Each appliance, with aging, can change its point of operation and this must be monitored to adjust it or replace it. The pump interlocks and flow switches must be checked to make sure that they interrupt the control circuit if they intervene.

9.4.3 Service and limited warranty

All units are factory tested and guaranteed for 12 months as of the first startup or 18 months as of delivery.
These units have been developed and constructed according to high quality standards ensuring years of failure free operation. However, the unit requires maintenance even during the warranty period, from the time of installation and not just from the commissioning date. We strongly advise stipulating a maintenance contract with a service authorized by the manufacturer to ensure efficient and problem free service, thanks to the expertise and experience of our personnel.
Operating the unit in an inappropriate manner, beyond its operating limits or not performing proper maintenance according to this manual can void the warranty.
Observe the following points, to conform to warranty limits:

1. The unit cannot function beyond the specified limits.
2. The electrical power supply must be within the voltage limits and without voltage harmonics or sudden changes.
3. The three phase power supply must not have an unbalance between phases exceeding 3%. The unit must stay turned off until the electrical problem has been solved.
4. No safety device, either mechanical, electrical or electronic must be disabled or overridden.
5. The water used for filling the water circuit must be clean and suitably treated. A mechanical filter must be installed at the point closest to the BPHE inlet.
6. The value of the BPHE water flow must be included in the declared range for the unit considered, refer to table “operating limits” in paragraph “Flowswitch”.

10 REPLACEMENTS

- **10.1 Replacement of Components**

The replacement of components shall be carried out only after a careful technical assessment of the operations to be performed and of the associated risks.
Given the technological complexity of the unit, replacement activities shall be performed exclusively by qualified and authorised personnel with proven expertise and in-depth knowledge of the equipment and of the fluids handled.
In particular:

- Mechanical maintenance technicians shall carry out operations involving hydraulic components.
- Qualified refrigeration technicians shall carry out operations on the refrigerant circuit.
- Electrical maintenance technicians shall carry out operations on electrical and electronic equipment.

Personnel performing the intervention shall be fully familiar with the functional logic of the system and with the specific equipment involved.
In case of doubt, the Manufacturer's authorised service centres shall be contacted. Only service centres authorised by the Manufacturer are permitted to carry out interventions on the equipment.
Original spare parts shall be used exclusively in order to ensure full compatibility, safety, and performance. The Manufacturer provides the official spare parts list for the supplied equipment.

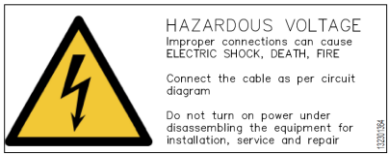
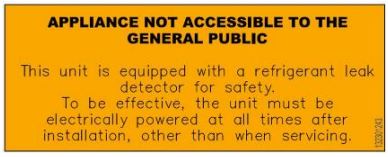
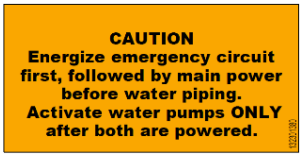
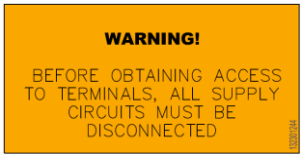
- **10.2 Replacement of the Unit**

The complete replacement of the unit shall be subject to a dedicated engineering assessment, equivalent to that required for a new installation.
Prior to replacement, it shall be verified that:

- The original design conditions and user requirements remain unchanged;
- The installation site and operating conditions continue to comply with the technical specifications of the unit;
- The installation perimeter and safety conditions can be guaranteed in accordance with the original design criteria.

If a significant period has elapsed since the original supply, it shall be verified whether the unit model is still in production and whether technical updates or improvements have been introduced, including but not limited to mechanical, hydraulic, refrigeration, electrical, and electronic modifications.
At the time of replacement, compliance with all applicable regulations and standards in force shall be verified. The installation shall be carried out in full conformity with current legal requirements to ensure the safe and compliant operation of the plant.

11 LIST OF THE LABELS APPLIED TO THE UNIT

	Label	Description	Location
1		Lifting instructions	2 on the unit and 2 on the packaging
2		Water inlet	1 on the unit - water side
3		Water outlet	1 on the unit - water side
4		Water drain warning	1 on the unit – water side
5		Refrigerant R290	1 on the electrical panel 1 on the unit – water side
6		Label Guarantee Seal	1 on the unit – outside the electrical panel
7	DAIKIN	Manufacturer’s logo	1 on the electrical panel
9		Hazardous voltage warning	1 on the electric panel
10		A3 symbol	2 on the unit and 2 on the packaging
11		Not accessible to the general public	1 on the electrical panel
12		Energize emergency circuit first, followed by main power	1 on the electrical panel and 1 on the unit – water side
13		Warning 7.2 60335-2-40	1 on the unit – outside the electrical panel
14		Disposal of unit R290	1 inside the electrical panel and 1 on the unit – water side

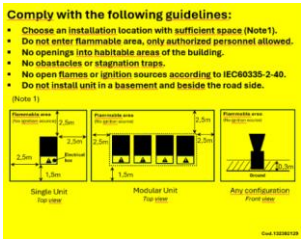
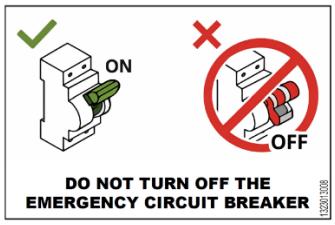
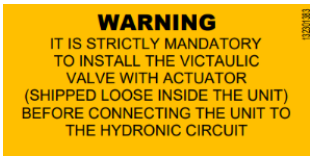
18		Safety distance	1 on the unit 1 on the packaging
19		Do NOT turn OFF the circuit breaker	1Inside the accessory bag
20		Unit data label	1 on the unit
22		Install the actuated valve water side	1 on the unit

Table 11 - Labels applied to the Unit

With the exception of the unit's identification plate, which is always in the same position, the other plates may be located in different positions depending on the model and the options present on the unit.

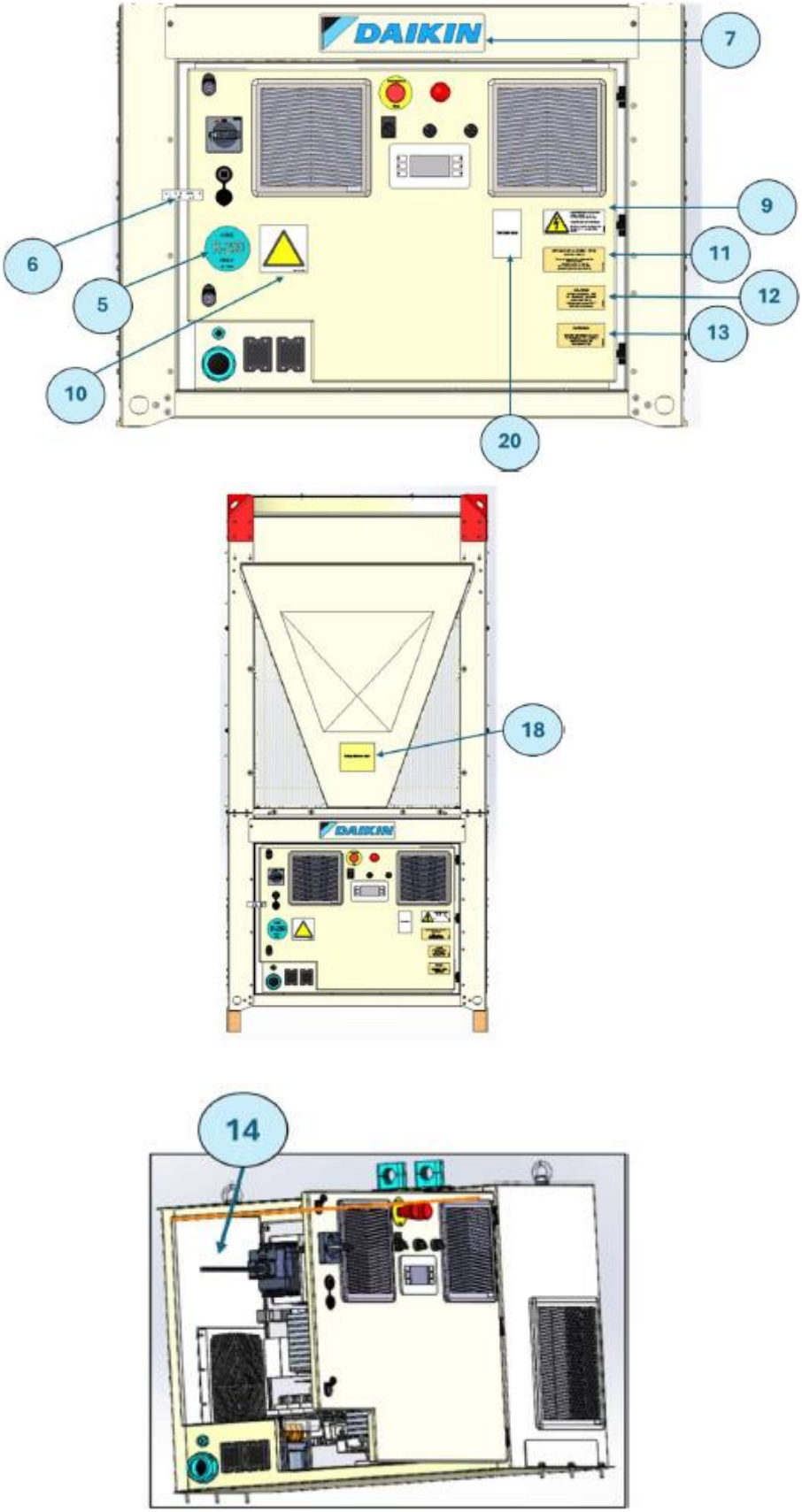


Figure 37 - Labels on the unit

12 DECOMMISSIONING AND DISPOSAL

To dismantle the unit, contact a Daikin certified technician. Do NOT dispose the unit yourself.

The dismantling of the system and the handling of refrigerant, lubricating oil, and any other components MUST be performed in full compliance with all applicable regulatory requirements. The units MUST be processed exclusively at authorized treatment facilities equipped for compliant reuse, recycling, and recovery operations.

The unit is made of metal, plastic and electronic parts. All these components must be disposed of in accordance with local disposal laws and if in scope with the national laws implementing the Directive 2012/19/EU (RAEE).
Lead batteries must be collected and sent to specific waste collection centres.
Avoid the escape of refrigerant gases into the environment by using suitable pressure tanks and tools for transferring the fluids under pressure. This operation must be carried out by competent personnel in refrigeration systems and in compliance with the laws in force in the country of installation.

The following instructions are a general guide for decommissioning:

- Disconnect the electrical connections and hydraulic connections of the cooling system.
- Recover the refrigerant.
- Disposing of the refrigerant shall comply with the applicable regulations to protect environment and ensure safety.
- For the proper disposal of the unit contact Daikin.

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing **flammable refrigerants**, ensure that there are labels on the equipment stating the equipment contains **flammable refrigerant**.

12.1 Refrigerant Disposal

The refrigerant in the circuit must be collected in specific containers suitable for R290 and disposed of at autorised sites. Empty recovery tanks are evacuated and, if possible, cooled before recovery occurs. The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the **flammable refrigerant**. Container(s) must be clearly identified and marked by a colour code or otherwise as being intended to hold the refrigerant involved. (National regulations sometimes give a specific colour for recovery tanks. AHRI Guideline N provides information on colour coding). Consult manufacturer if in doubt.
In the case of transport, it is the responsibility of the person recovering the refrigerant to ensure that the recovery tank complies with the ADR legislation (European Agreement Concerning the International Carriage of Dangerous Goods by Road).

In any case, the dismissioning of the Heat Pump must be performed only by authorised and qualified personnel and in accordance with applicable standards and regulations (see EN378-4:2016):

- Recovery and recycling equipment must comply with IEC 60335-2-104.
- The recovery equipment must be operated in such a way as to minimise the risk of emission of refrigerants or oil to the environment.
- Other components of the refrigerating system containing refrigerant or oil must be disposed of appropriately.

DAIKIN APPLIED EUROPE S.p.A.
Via Piani di Santa Maria, 72 - 00072 Ariccia (Roma) - Italy
Tel: (+39) 06 93 73 11 - Fax: (+39) 06 93 74 014
http://www.daikinapplied.eu