

# ECL ECL-H 020-202



CHILLERS  
REVERSIBLE HEAT PUMPS  
CONDENSING UNITS

- EXTERNAL UNITS
- HIGH EFFICIENCY
- HOT WATER PRODUCTION UP TO 50 °C

## INSTALLATION MANUAL



FM00542

EMS52086



Dear Customer,

Thank you for choosing an Airedale product. This product is the result of many years of experience and in-depth research, and it is built using top quality material and advanced technologies.

Moreover, the CE mark guarantees that our appliances fully comply with the requirements of the European Machinery Directive in terms of safety. We constantly monitor the quality level of our products, and as a result they are synonymous with Safety, Quality, and Reliability.

Product data may be subject to modifications deemed necessary for improving the product without obligation to give prior notice.

Thank you again.

Airedale

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Airedale reserves the right to make all modification deemed necessary for improving the product at any time with any modification of technical data.



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## Customer Services

### Warranty, Commissioning & Maintenance

As standard, Airedale guarantees all non consumable parts only for a period of 12 months, variations tailored to suit product and application are also available; please contact Airedale for full terms and details.

To further protect your investment in Airedale products, Airedale can provide full commissioning services, comprehensive maintenance packages and service cover 24 hours a day, 365 days a year (UK mainland).

For a free quotation contact Airedale or your local Sales Engineer.

All Airedale products are designed in accordance with EU Directives regarding prevention of build up of water, associated with the risk of contaminants such as legionella.

For effective prevention of such risk it is necessary that the equipment is maintained in accordance with Airedale recommendations.

### ChillerGuard

In addition to commissioning, a 24 hour, 7 days a week on-call service is available throughout the year to UK mainland sites. This service will enable customers to contact a duty engineer outside normal working hours and receive assistance over the telephone. The duty engineer can, if necessary, attend site, usually within 24 hours or less.

Full details will be forwarded on acceptance of the maintenance agreement.

### CAUTION ⚠

Warranty cover is not a substitute for maintenance. Warranty cover is conditional to maintenance being carried out in accordance with the recommendations provided during the warranty period. Failure to have the maintenance procedures carried out will invalidate the warranty and any liabilities by Airedale International Air Conditioning Ltd.

### Spares

A spares list for 1, 3 and 5 years will be supplied with every unit and is also available from our Spares department on request.

### Training

As well as our comprehensive range of products, Airedale offers a modular range of Refrigeration and Air Conditioning Training courses, for further information please contact Airedale.

### Customer Services

For further assistance, please e-mail: [enquiries@airedale.com](mailto:enquiries@airedale.com) or telephone:

UK Sales Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:enquiries@airedale.com">enquiries@airedale.com</a>
International Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:enquiries@airedale.com">enquiries@airedale.com</a>
Spares Hot Line	+ 44 (0) 113 238 7878	<a href="mailto:spares@airedale.com">spares@airedale.com</a>
Airedale Service	+ 44 (0) 113 239 1000	<a href="mailto:service@airedale.com">service@airedale.com</a>
Technical Support	+ 44 (0) 113 239 1000	<a href="mailto:tech.support@airedale.com">tech.support@airedale.com</a>
Training Enquiries	+ 44 (0) 113 239 1000	<a href="mailto:training@airedale.com">training@airedale.com</a>

For information, visit us at our web site: [www.airedale.com](http://www.airedale.com)

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## Health and Safety

### IMPORTANT

The information contained in this manual is critical to the correct operation and maintenance of the unit and should be read by all persons responsible for the installation, commissioning and maintenance of this Airedale unit.

### Safety

The equipment has been designed and manufactured to meet international safety standards but, like any mechanical/ electrical equipment, care must be taken if you are to obtain the best results.

### CAUTION ⚠

When working with any air conditioning units ensure that the electrical isolator is switched off prior to servicing or repair work and that there is no power to any part of the equipment. Also ensure that there are no other power feeds to the unit such as fire alarm circuits, BMS circuits etc.

Electrical installation commissioning and maintenance work on this equipment should be undertaken by competent and trained personnel in accordance with local relevant standards and codes of practice.

A full hazard data sheet in accordance with COSHH regulations is available should this be required.

### Personal Protective Equipment

Airedale recommends that personal protective equipment is used whilst installing, maintaining and commissioning equipment.

### Manual Handling

Some operations when servicing or maintaining the unit may require additional assistance with regard to manual handling. This requirement is down to the discretion of the engineer.

Remember do not perform a lift that exceeds your ability.

### Refrigerant Warning

The Airedale unit uses R410A refrigerant which requires careful attention to proper storage and handling procedures.

Use only manifold gauge sets designed for use with R410A refrigerant. Use only refrigerant recovery units and cylinders designed for high pressure refrigerants.

R410A must only be charged in the liquid state to ensure correct blend makeup.

The refrigerant must be stored in a clean, dry area away from sunlight. The refrigerant must never be stored above 50°C.

### Pressure Equipment Directive (2014/68/EU)

### Minimum and Maximum Operation Temperature (Ts) and Pressure (Ps)

#### Refrigeration

Allowable Temperature Range (Ts) Ts = Min -20°C\* to Max 120°C\*\*

Maximum Allowable Pressure (Ps) Ps = High Side 42 Barg Low side 25 Barg

\*Based on the refrigerant temperature in the unit off state in the lowest permitted ambient temperature.

\*\*Based on the maximum allowable super heated refrigerant temperature.

### Pressure System Safety Regulations 2000

Refrigeration assemblies/systems may constitute a Pressure System as defined in the Pressure System Safety Regulations 2000.

### Waterside

Allowable Temperature Range (Ts) Ts = Min -16°C\* to Max 45°C\*\*

Maximum Allowable Pressure (Ps) Ps = 10 Barg

\*Based on the refrigerant temperature in the unit off state in the lowest permitted ambient temperature.

\*\*Based on the waterside temperature in the unit off state in the highest permitted ambient temperature.

### Global Warming Potential

The R410A refrigerant has a GWP of 2088 (based on EN378-1:2016, 100 year life)

### Ecodesign Directive 2009/125/EC

The product range within this document is designed in accordance to the European Ecodesign Directive 2009/125/EC.

The appendix at the rear section of the manual gives the product compliancy metrics. Products sold outside of the EU are exempt from this directive.



Environmental Considerations

**Units with supply water temperatures below +5°C**

- Glycol is recommended when a supply water temperature of +5°C or below is required or when static water can be exposed to freezing temperatures.

**Units subject to ambient temperatures lower than 0°C**

- Glycol of an appropriate concentration (1) must be used within the system to ensure adequate freeze protection. Please ensure that the concentration is capable of protection to at least 3K lower than ambient.
- Water / glycol solution should be constantly circulated through all waterside pipework and coils to avoid static water from freezing.
- Ensure that pumps are started and running even during shut down periods, when the ambient is within 3K of the solution freeze point (1) (i.e. if the solution freezes at 0°C, the pump must be operating at 3°C ambient).
- Additional trace heating is provided for interconnecting pipework.

(1) Refer to your glycol supplier for details.

Environmental Policy

It is our policy to:

- Take a proactive approach to resolve environmental issues and ensure compliance with regulatory requirements.
- Train personnel in sound environmental practices.
- Pursue opportunities to conserve resources, prevent pollution and eliminate waste.
- Manufacture products in a responsible manner with minimum impact on the environment.
- Reduce our use of chemicals and minimise their release to the environment.
- Measure, control and verify environmental performance through internal and external audits.
- Continually improve our environmental performance.

CE Directive

The equipment detailed in this manual conforms with the following EC Directives.

Electromagnetic Compatibility Directive (EMC)	2014/30/EU
Machinery Directive (MD)	89/392/EEC version 2006/42/EC
Pressure Equipment Directive (PED)	2014/68/EU
Ecodesign	2009/125/EC

To comply with these directives appropriate national & harmonised standards have been applied.

CEI EN 60335-2-40: 2005	CEI EN 61000-6-1: 2007	UNI EN 378-2: 2017
CEI EN 60335-2-40/A1: 2007	CEI EN 61000-6-3: 2007	UNI EN 12735-1: 2016
CEI EN 60335-2-40/A2: 2009	CEI EN 55014-1: 2017	
CEI EN 60335-2-40/A13: 2012	CEI EN 55014-2: 2016	



## 1. GENERAL INSTRUCTIONS FOR THE INSTALLER

The Airedale ECL units are manufactured in accordance with recognised technical and safety standards. They are designed for air conditioning and production of domestic hot water (DHW) and must be used in a manner compatible with their performance characteristics. All contractual and extra-contractual liabilities causing damage to persons, animals or objects or through errors of installation, control or maintenance or from improper use are excluded by the Company. Any uses not expressly indicated in this manual are not permitted.

### 1.1. CONSERVATION OF DOCUMENTATION

1. Submit the manual with all supplementary documentation to the system user who will be responsible for the conservation of documents so that they can be available when needed.
2. Read this manual fully: all works must be carried out by qualified personnel, in accordance with any applicable current local regulations.
3. The unit must be installed in a manner to render possible maintenance and/or repair operations.
4. The equipment warranty does not cover any costs associated with lifting or access equipment necessary for warranty procedures.
5. Do not modify or tamper with the equipment as this could result in accidents for which the manufacturer will not be held responsible. The warranty will be voided if the above mentioned warnings are not respected.

### 1.1. SAFETY INSTRUCTIONS AND INSTALLATION STANDARDS

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1. The equipment must be installed by a competent and qualified technician, in compliance with the applicable national legislation of the country of destination. Airedale assumes no responsibility for any losses incurred by not observing these instructions.
2. Before commencing any works it is necessary to **CAREFULLY READ THE INSTRUCTIONS AND MINIMISE ANY RISKS BY TAKING APPROPRIATE SAFETY PRECAUTIONS**. All relevant personnel must be made aware of the procedures and possible risks that may arise at the time of installation of the unit.



## 2. SELECTION AND POSITION OF INSTALLATION

Before proceeding with the installation of the equipment agree the location with the client, taking into account the following points:

1. The base must be able to support the weight of the unit.
2. The safe distances between the unit and other equipment or structures must be strictly respected to ensure the intake and outlet air is free to circulate.
3. The equipment must be installed by a competent and qualified technician, in compliance with the applicable national legislation of the country of destination, respecting the required minimum maintenance access spaces.

### 3.0.1. POSITIONING

Before lifting the unit verify the lifting capability of the equipment being used, taking into account the information provided with the packaging.

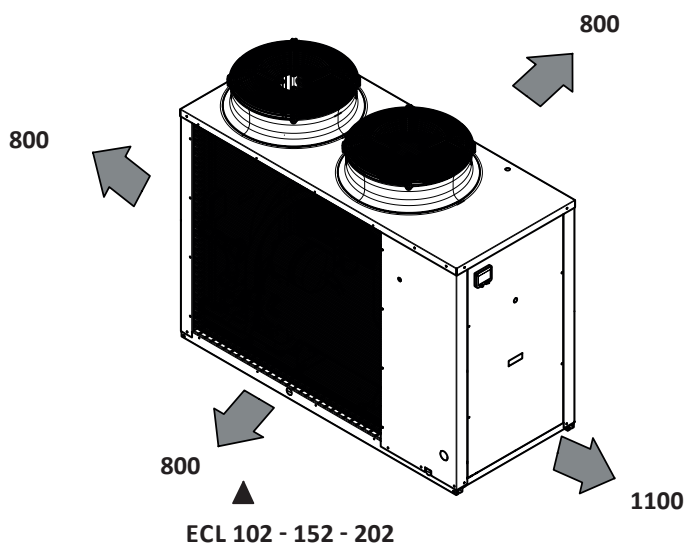
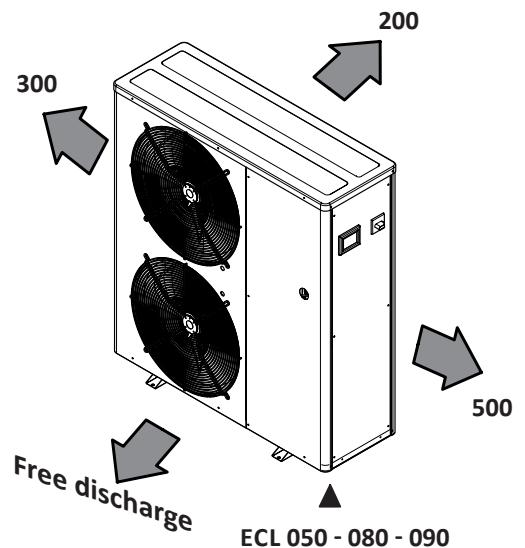
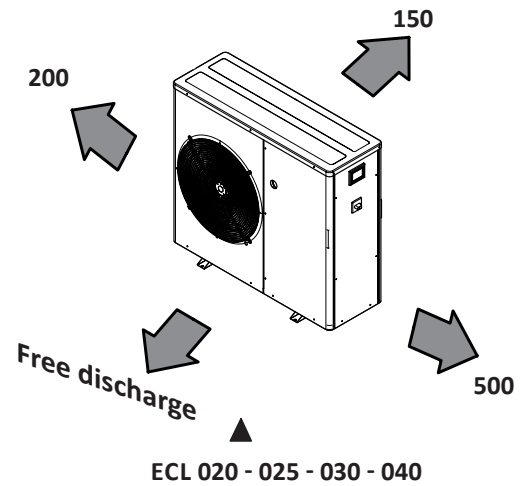
To move units (ECL 020-090) over horizontal planes use forklifts or similar in the most appropriate manner taking into account the weight distribution of the unit. When lifting (ECL 102-202) insert through the unit's base holes lifting bars (NOT PROVIDED) of sufficient length to locate the lifting chains and safety lugs. Position the unit in the place indicated by the client, inserting between the unit's base and the base support a rubber pad (minimum 10 mm thick) or feet anti-vibration mounts (ACCESSORY). For further information refer to the dimensional tables.

Secure the unit and ensure it is level; check that sufficient access is provided for hydraulic and electrical

connections.

In the case of installation where gusts of wind may occur adequately secure the unit using appropriate ties.

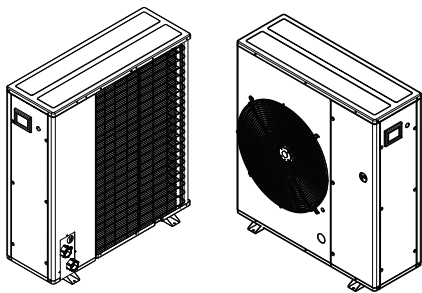
Ensure the installation of the condensate drain tray on units that require it (as ACCESSORY).



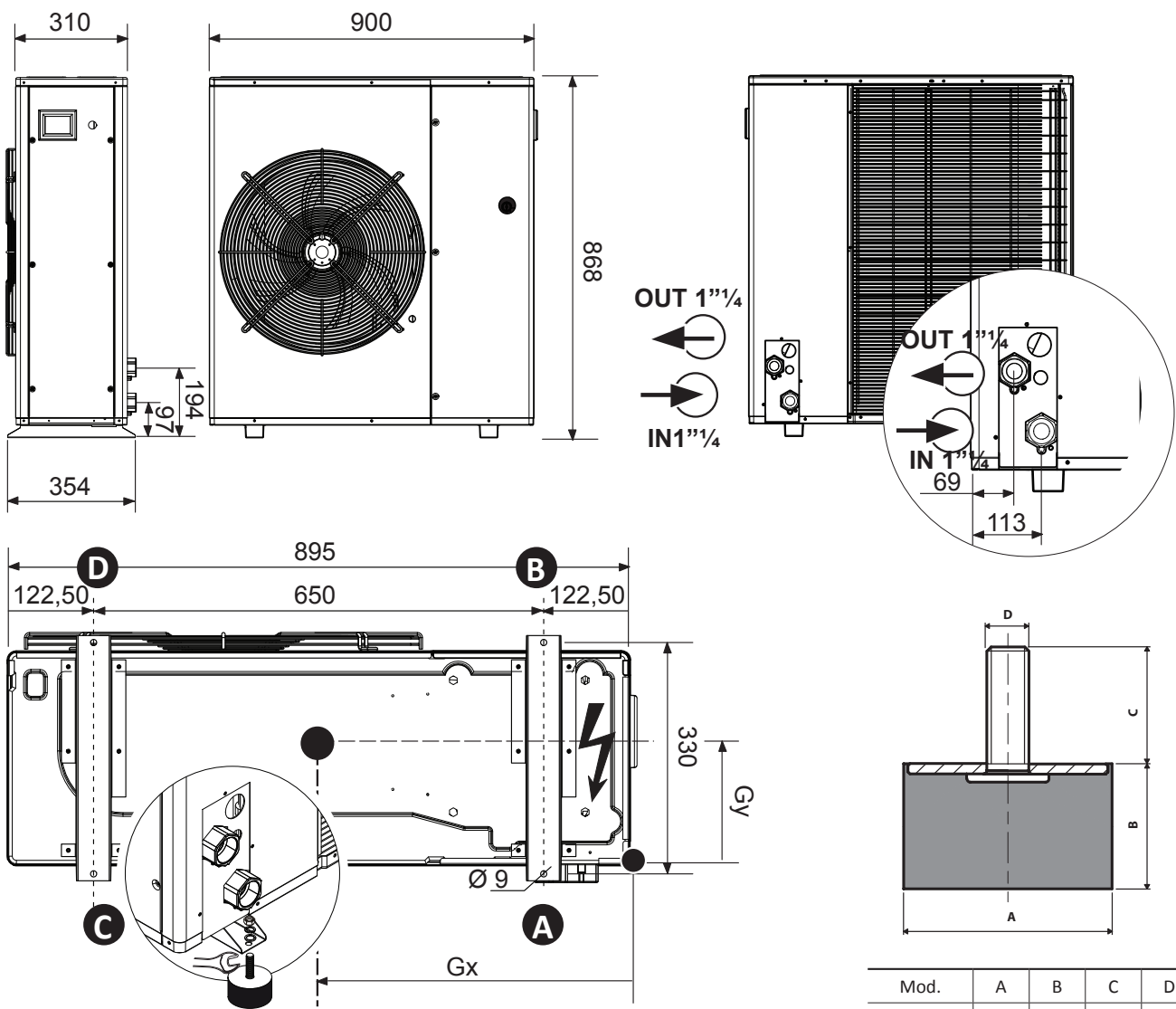


3. DIMENSIONS

3.1. ECL 020 ÷ 025 version °|P|H|HP

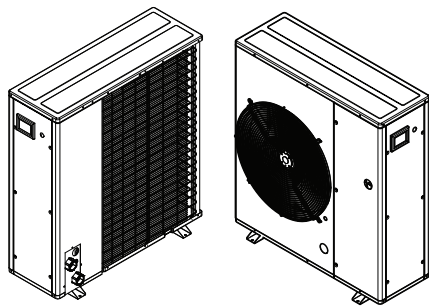


ECL	MOD.	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT
				Gy	Gx	%	%	%	%	VT
020	°/H	°	75	174	325	32,1%	31,8%	18,2%	18,0%	9
020	°/H	P	77	177	326	31,6%	32,2%	17,9%	18,3%	9
025	°/H	°	75	174	325	32,1%	31,8%	18,2%	18,0%	9
025	°/H	P	77	177	326	31,6%	32,2%	17,9%	18,3%	9

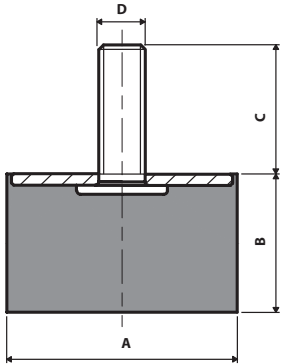
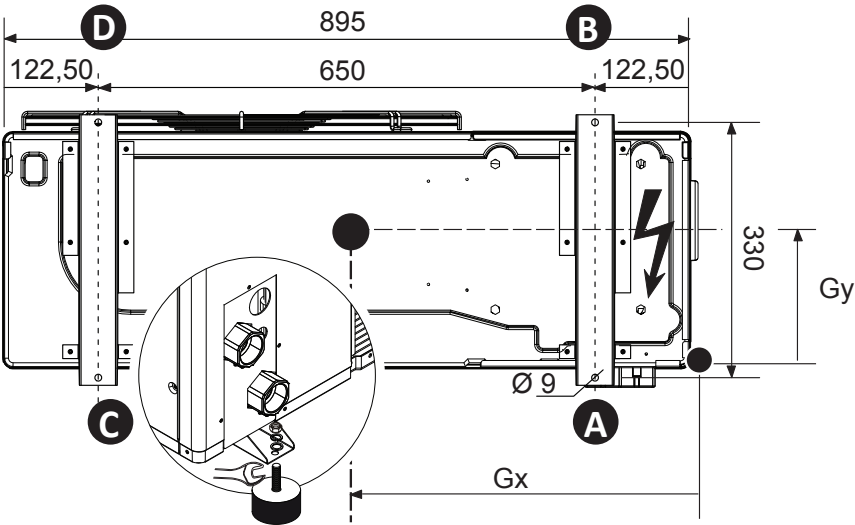
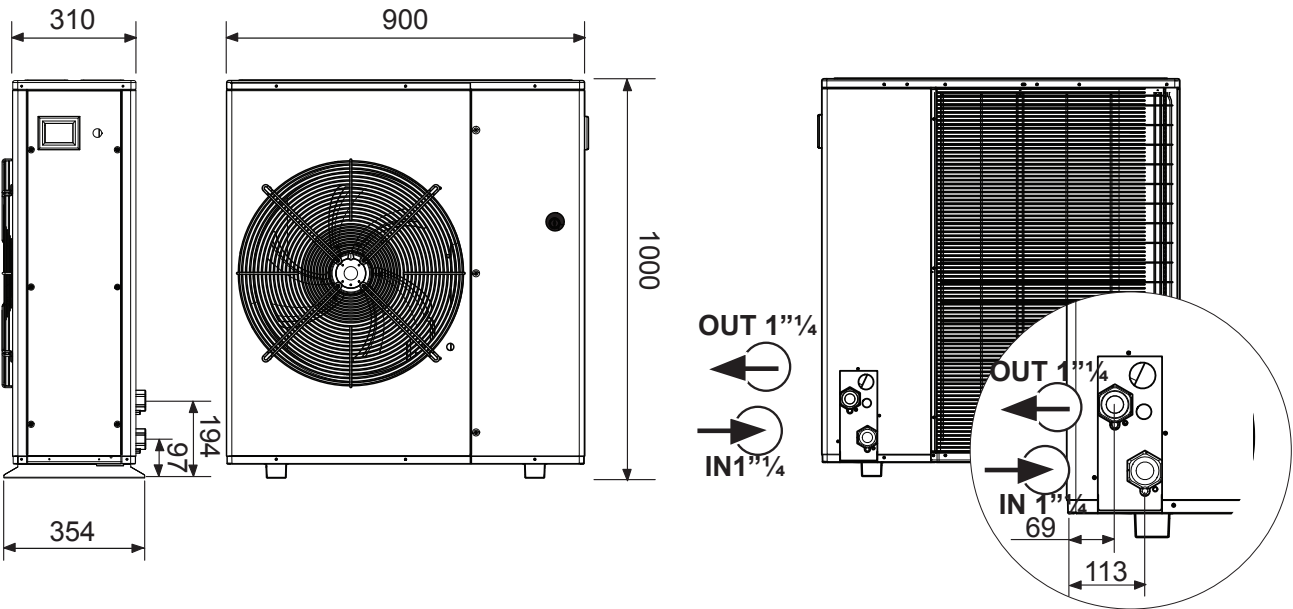




3.2. ECL 030 ÷ 040 version °|P|H|HP



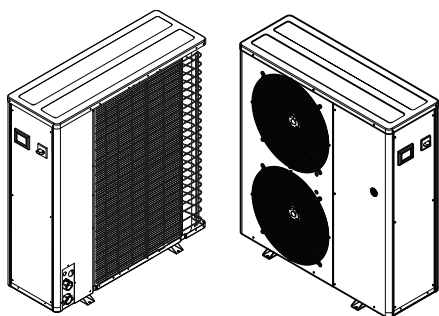
ECL	MOD.	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT
				Gy	Gx	%	%	%	%	
030	°/H	°	86	183	336	30%	33%	18%	19%	9
030	°/H	P	91	180	327	31%	33%	18%	19%	9
040	°/H	°	86	183	336	30%	33%	18%	19%	9
040	°/H	P	91	180	327	31%	33%	18%	19%	9



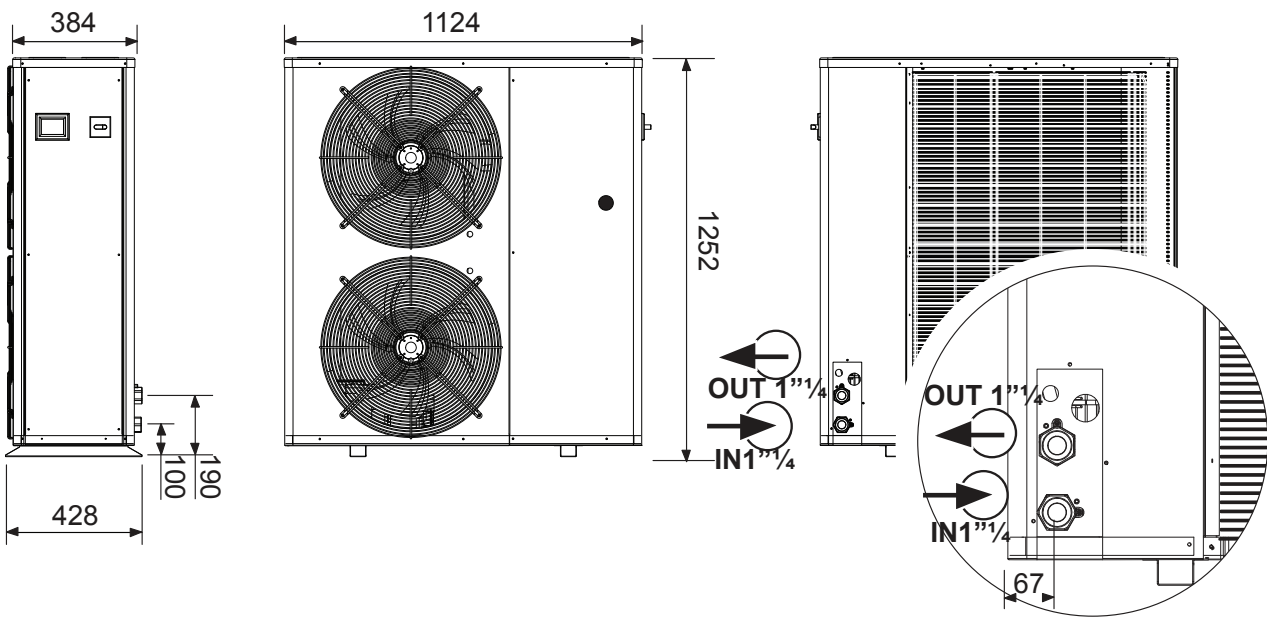
Mod.	A	B	C	D
VT9	40	30	23	M8



3.3. ECL 050 ÷ 090 version °|P|H|HP



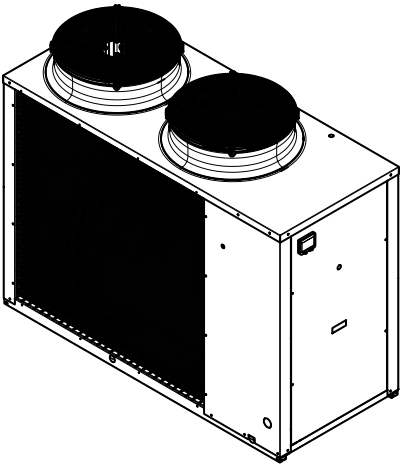
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				Gy	Gx	%	%	%	%	VT
50	°/H	°	120	213	447	30,3%	29,8%	20,1%	19,8%	9
50	°/H	P	127	212	436	31,0%	30,1%	19,8%	19,2%	9
70	°/H	°	120	213	447	30,3%	29,8%	20,1%	19,8%	9
70	°/H	P	127	212	436	31,0%	30,1%	19,8%	19,2%	9
80	°/H	°	156	217	453	30,3%	29,8%	20,1%	19,8%	9
80	°/H	P	163	216	444	31,0%	30,1%	19,8%	19,2%	9
90	°/H	°	156	217	453	29,5%	30,1%	20,0%	20,4%	9
90	°/H	P	163	216	444	30,0%	30,3%	19,8%	19,9%	9



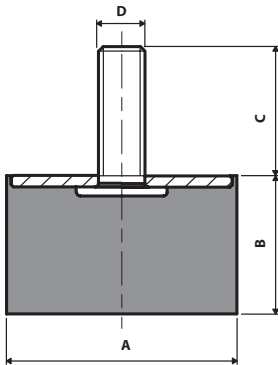
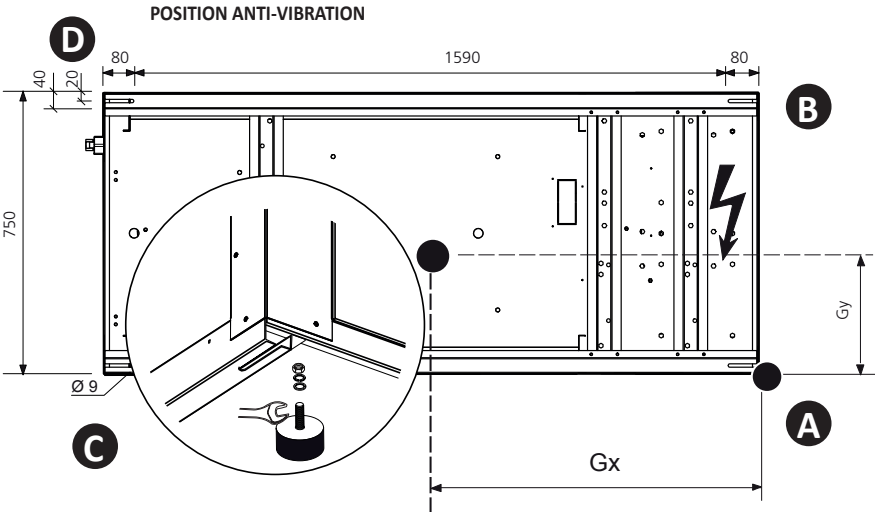
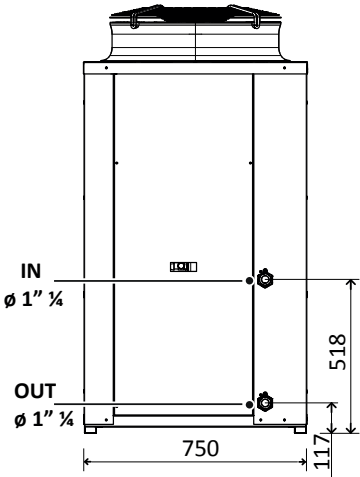
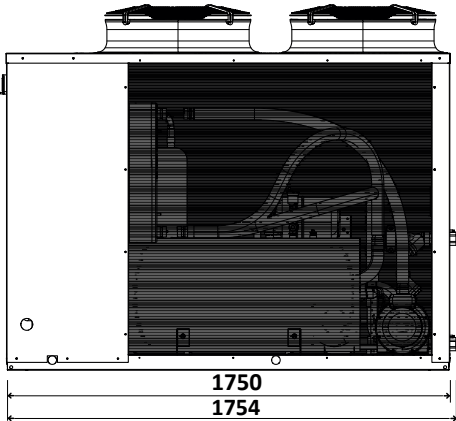
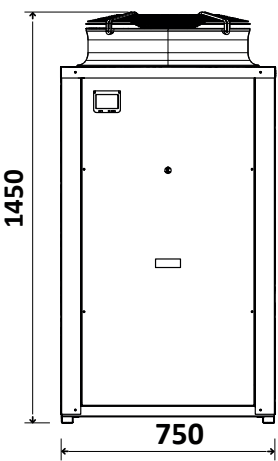
Mod.	A	B	C	D
VT9	40	30	23	M8



3.4. ECL 102 ÷ 202 version °|P|A|N|Q / H|HP|HA|HN|HQ



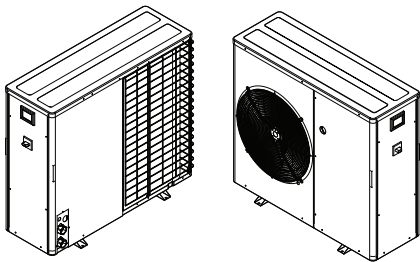
ECL	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT VT
			Gy	Gx	%	%	%	%	
ECL102	°	270	381	620	31,7%	32,8%	17,4%	18,0%	15
	P	288	382	659	30,6%	31,7%	18,5%	19,1%	15
	A	338	382	659	29,5%	30,4%	19,8%	20,4%	15
ECL102H	°	295	381	604	32,2%	33,3%	17,0%	17,5%	15
	P	313	381	640	31,2%	32,2%	18,0%	18,6%	15
	A	363	381	640	30,1%	30,9%	19,2%	19,8%	15
ECL152	°	293	383	650	30,8%	32,1%	18,2%	18,9%	15
	P	314	383	693	29,6%	30,8%	19,4%	20,2%	15
	A	364	383	693	28,7%	29,7%	20,4%	21,2%	15
ECL152H	°	322	382	630	31,4%	32,6%	17,7%	18,3%	15
	P	343	382	671	30,3%	31,4%	18,8%	19,5%	15
	A	393	382	671	29,3%	30,3%	19,9%	20,5%	15
ECL 202	°	329	383	600	32,1%	33,6%	16,8%	17,5%	15
	P	350	383	641	31,0%	32,4%	17,9%	18,7%	15
	A	400	383	641	30,0%	31,2%	19,1%	19,8%	15
ECL 202H	°	358	383	586	32,6%	33,9%	16,4%	17,1%	15
	P	379	383	626	31,5%	32,8%	17,5%	18,2%	15
	A	429	383	626	30,5%	31,6%	18,6%	19,3%	15



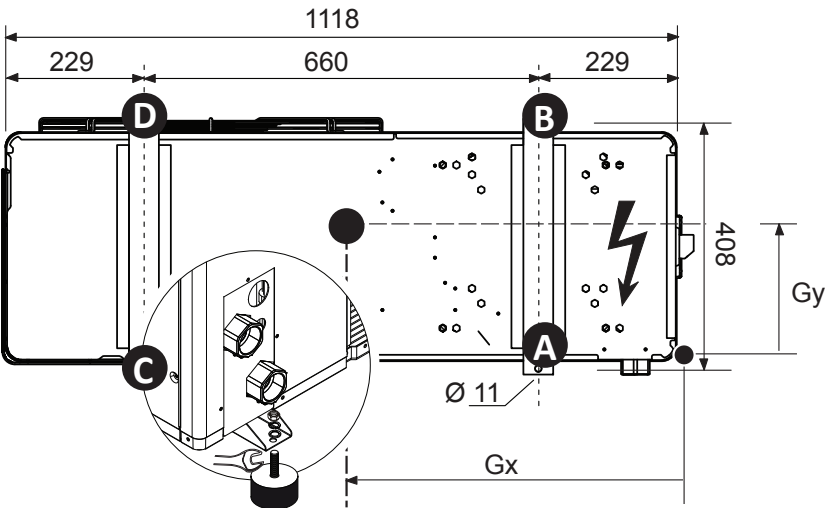
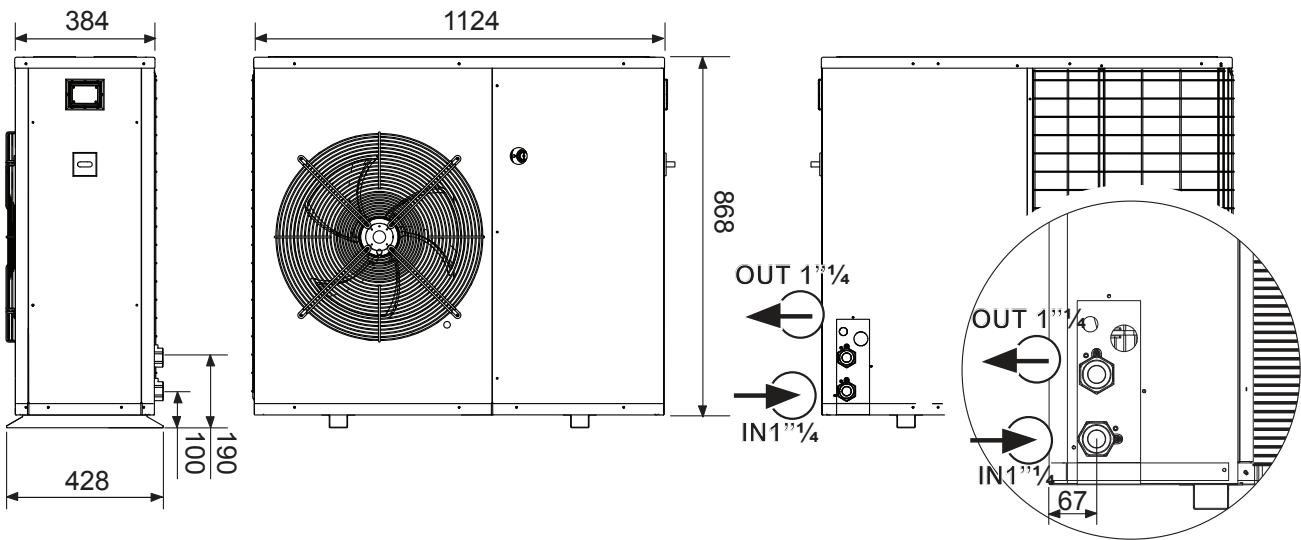
Mod.	A	B	C	D
VT15	50	30	28,5	M10



3.5. ECL 020 ÷ 025 version °A|HA



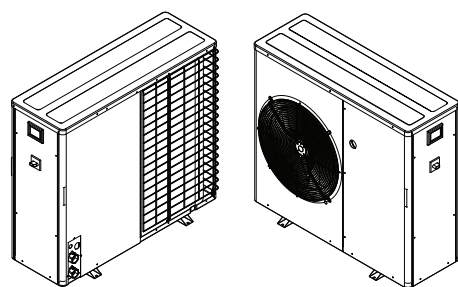
ECL	MOD.	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT
				Gy	Gx	%	%	%	%	VT
020	°/H	A	99	177	326	35,6%	31,5%	17,4%	15,5%	9
025	°/H	A	77	177	326	31,6%	32,2%	17,9%	18,3%	9



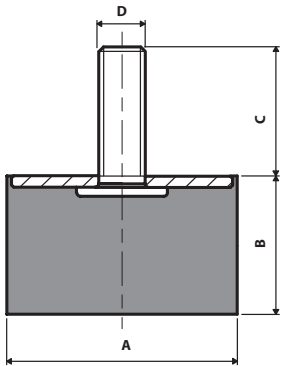
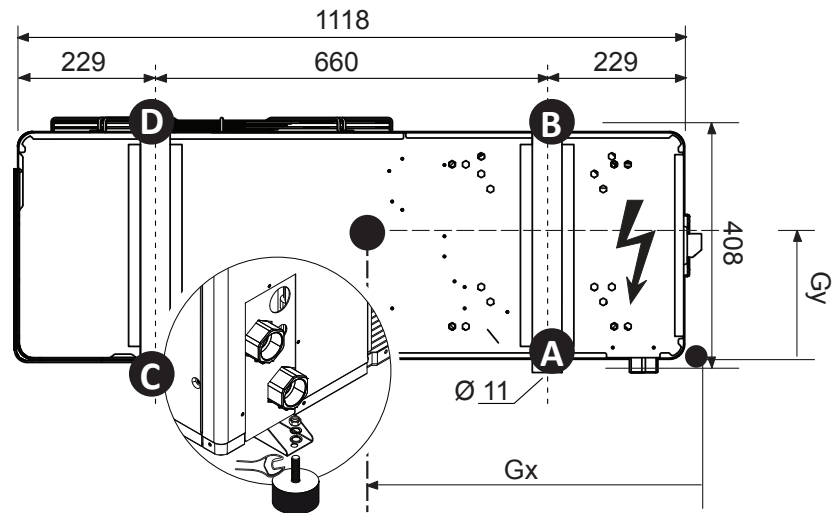
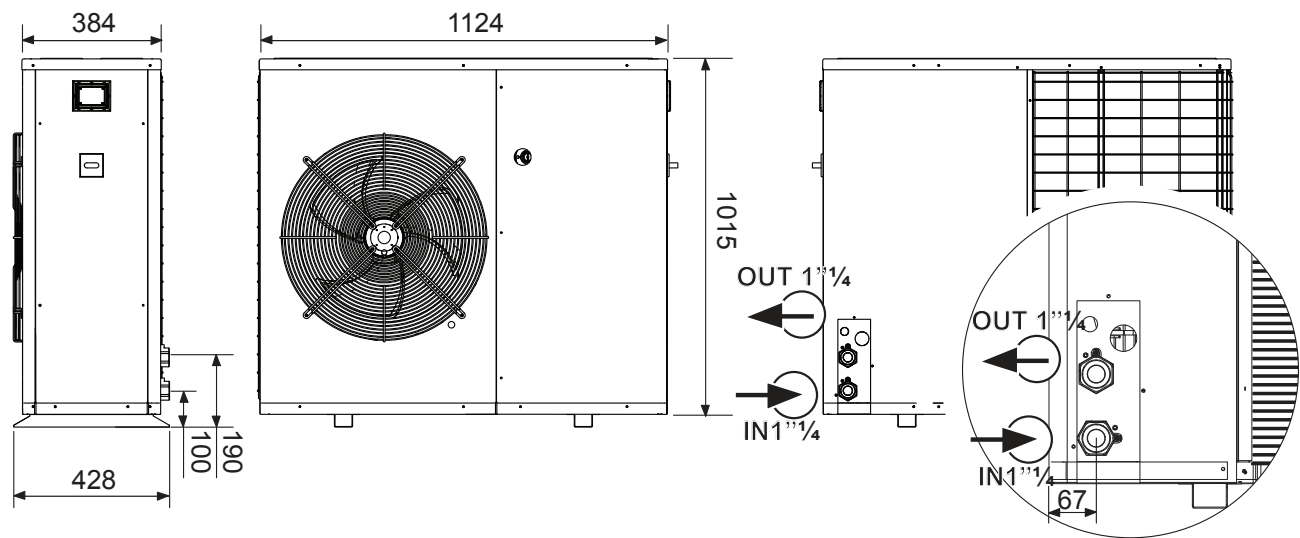
Mod.	A	B	C	D
VT9	40	30	23	M8



3.6. ECL 030 ÷ 040 version °A|HA



ECL	MOD.	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT
				Gy	Gx	%	%	%	%	VT
030	°/H	A	103	180	327	39%	32%	16%	13%	9
040	°/H	A	103	180	327	39%	32%	16%	13%	9

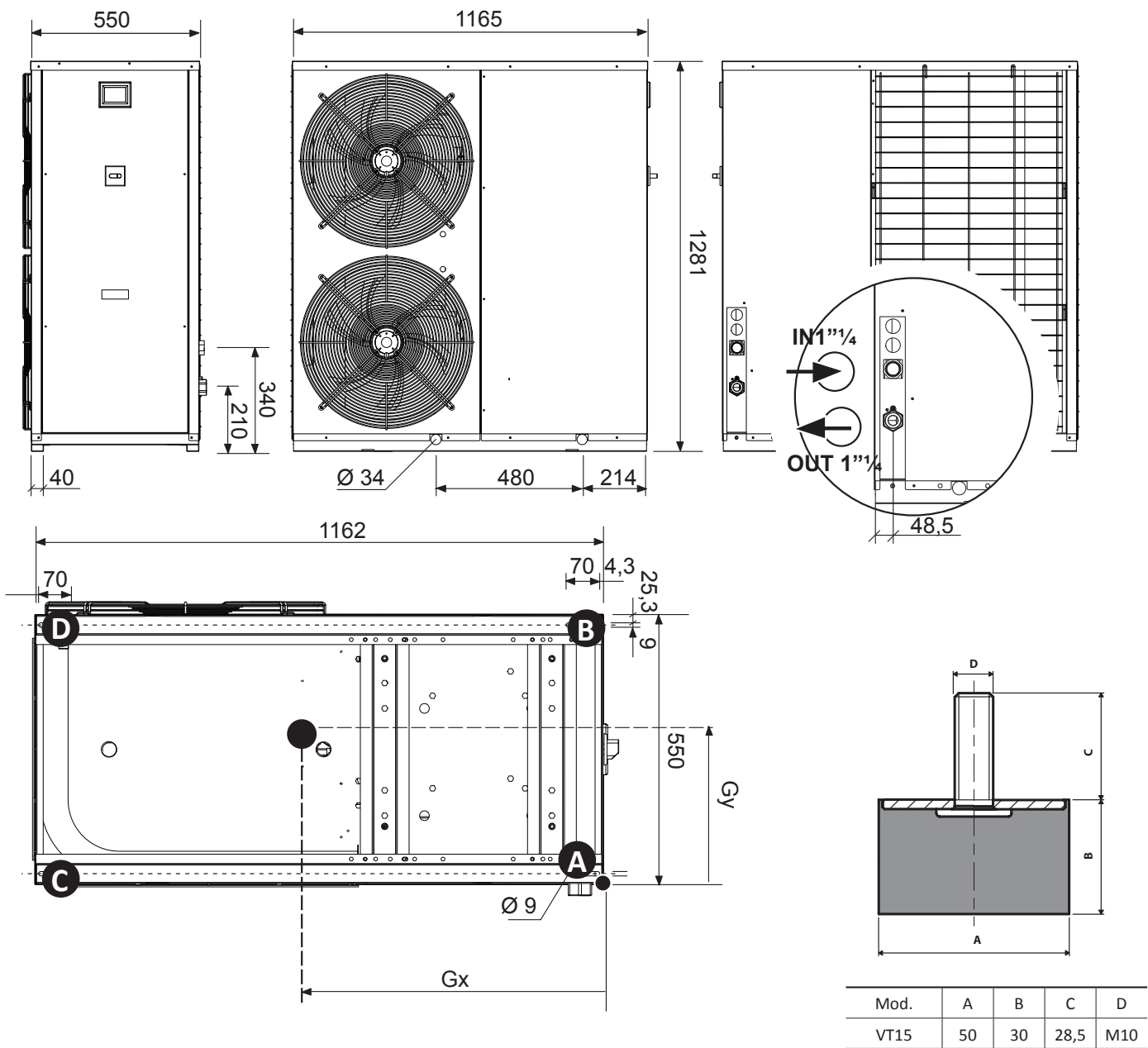
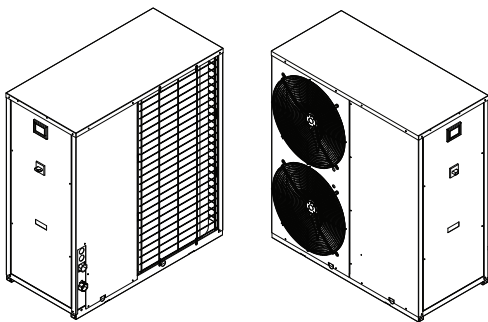


Mod.	A	B	C	D
VT9	40	30	23	M8



3.7. ECL 050 ÷ 090 version °A|°Q |HA |HQ

ECL	MOD.	VERS.	WEIGHTS	C. OF G.		A	B	C	D	KIT
				Gy	Gx	%	%	%	%	VT
50	°/H	A	147	212	436	32,2%	31,3%	18,5%	18,0%	15
70	°/H	A	147	212	436	32,2%	31,3%	18,5%	18,0%	15
80	°/H	A	147	212	436	32,2%	31,3%	18,5%	18,0%	15
90	°/H	A	183	216	444	31,1%	31,3%	18,8%	18,9%	15

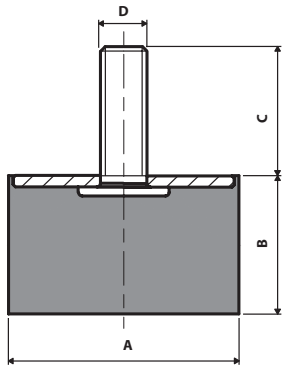
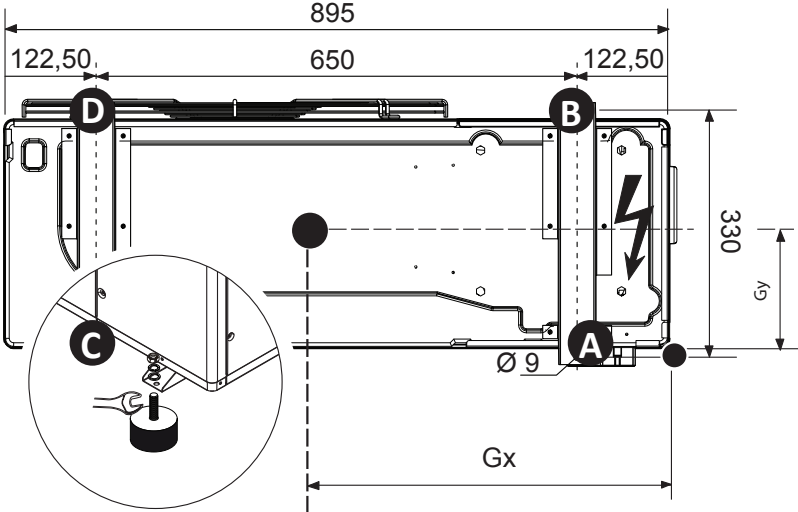
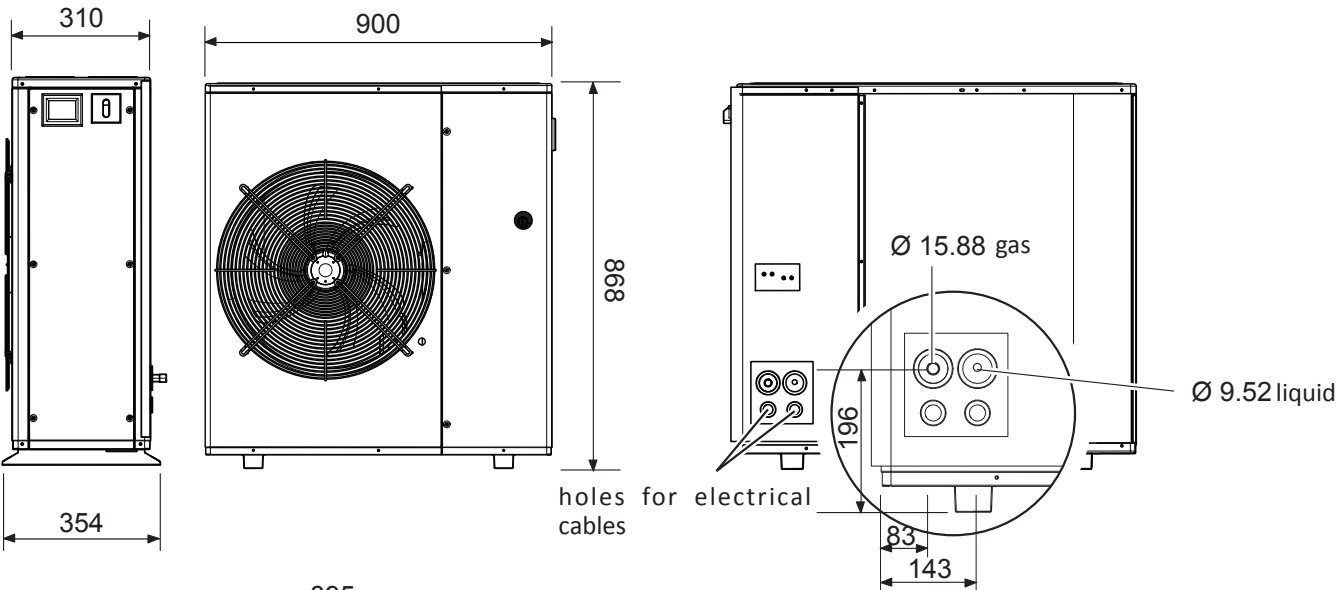
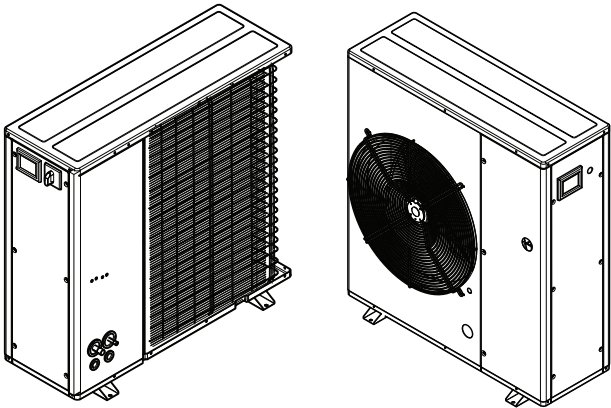




3.8. ECL 020 ÷ 025 version C



**WARNING**  
For the weight distribution refer to versions "° | H"



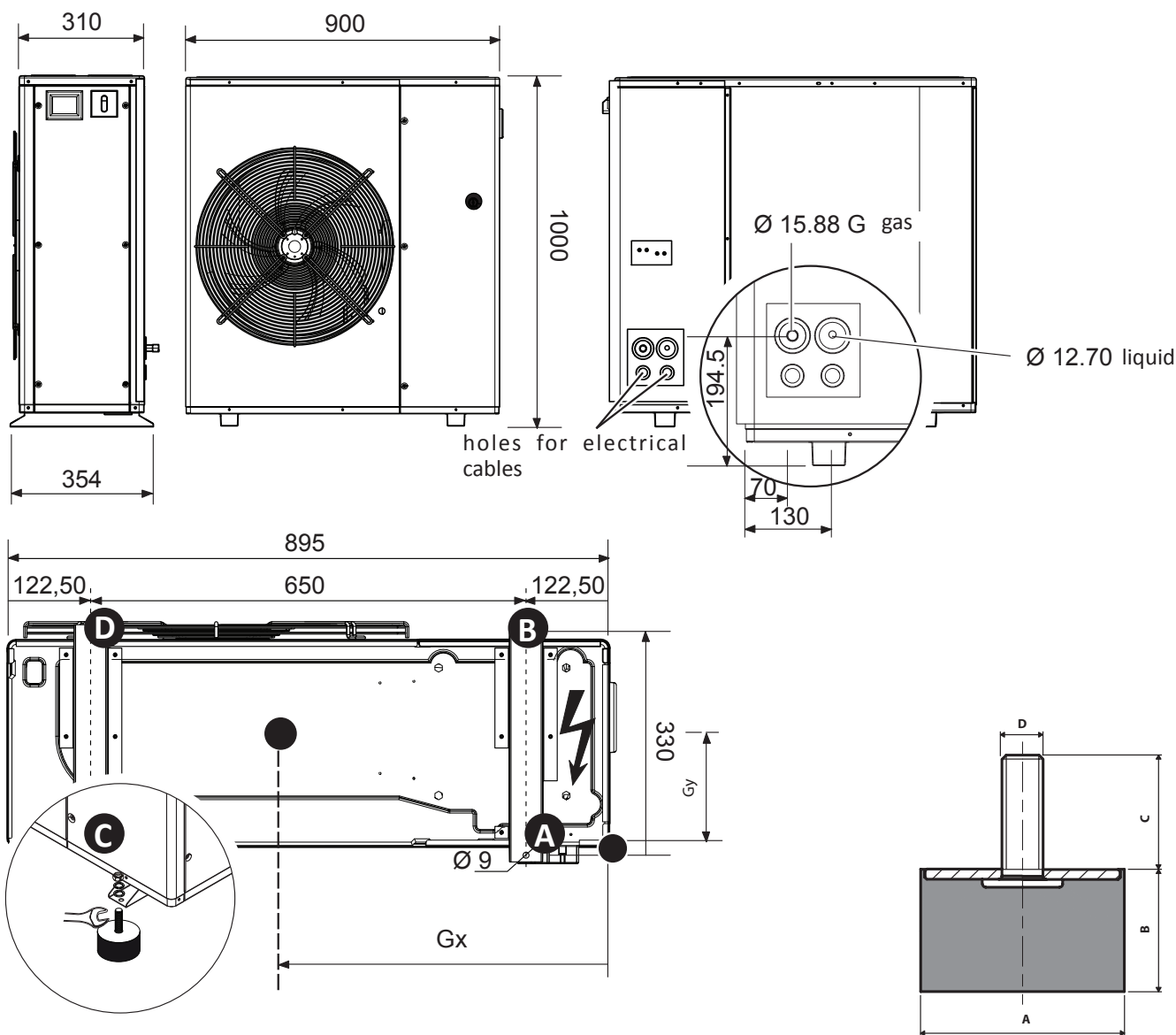
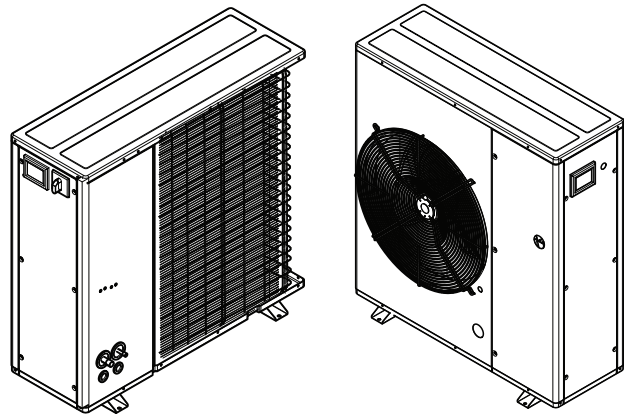
Mod.	A	B	C	D
VT9	40	30	23	M8



3.9. ECL 030 ÷ 040 version C



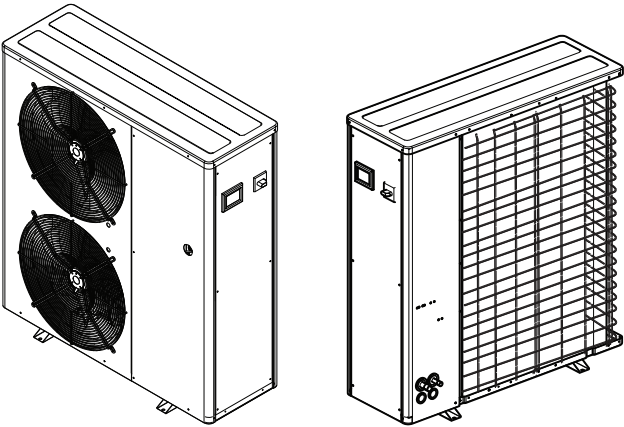
**WARNING**  
For the weight distribution refer to versions "°" | "H"



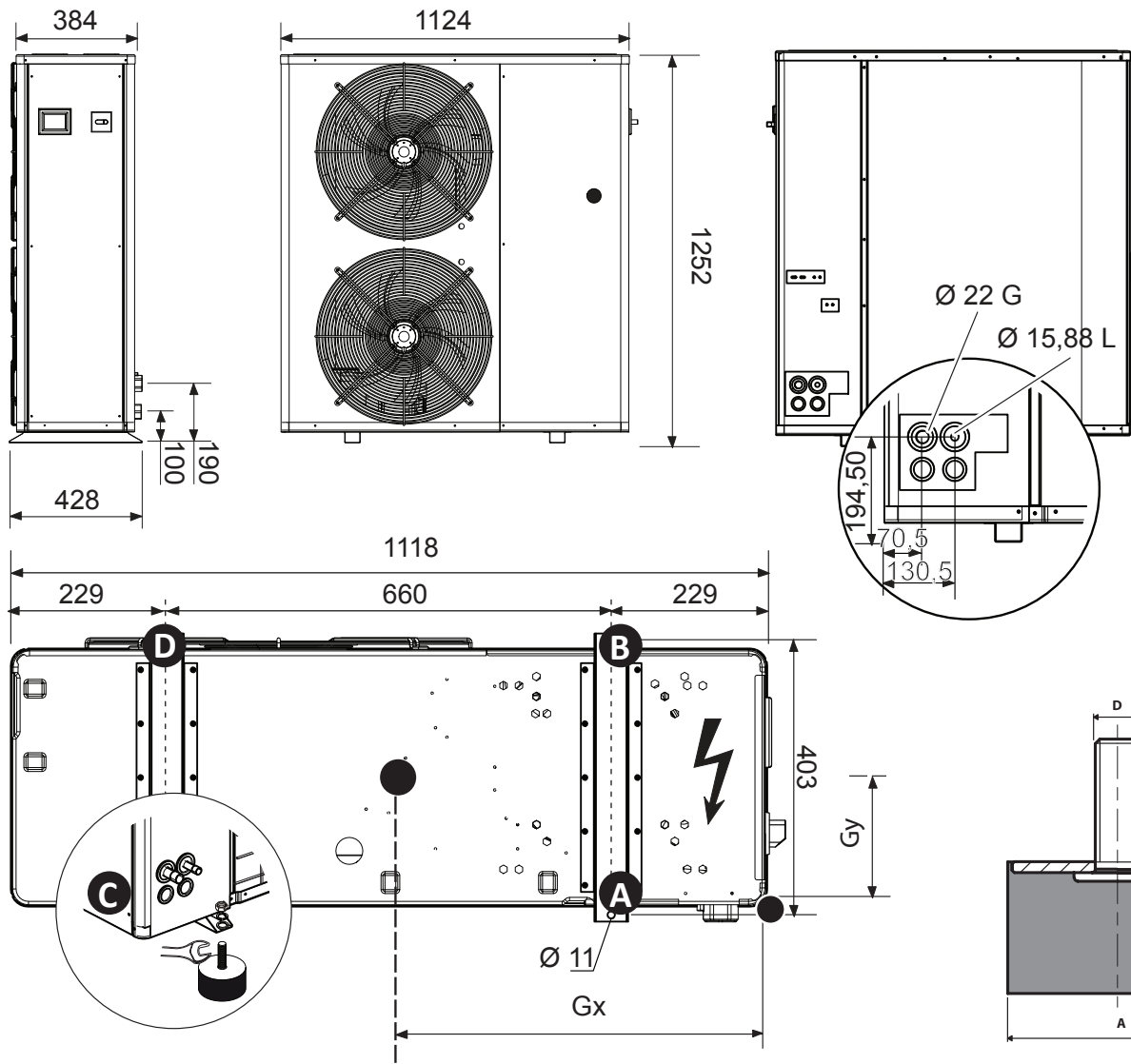
Mod.	A	B	C	D
VT9	40	30	23	M8



3.10. ECL 050 ÷ 090 version C



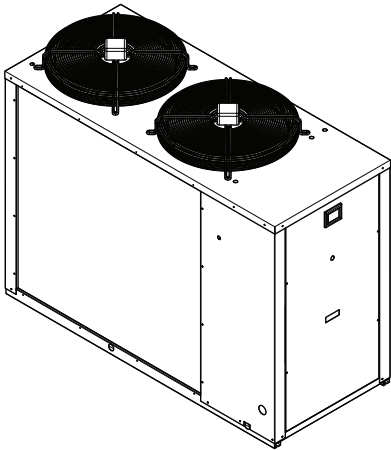
**WARNING**  
For the weight distribution refer to versions "°" | "H"



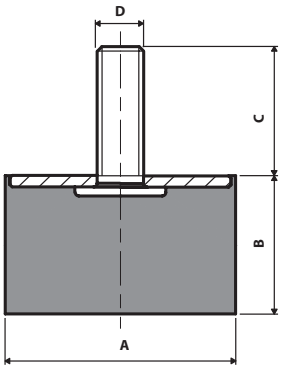
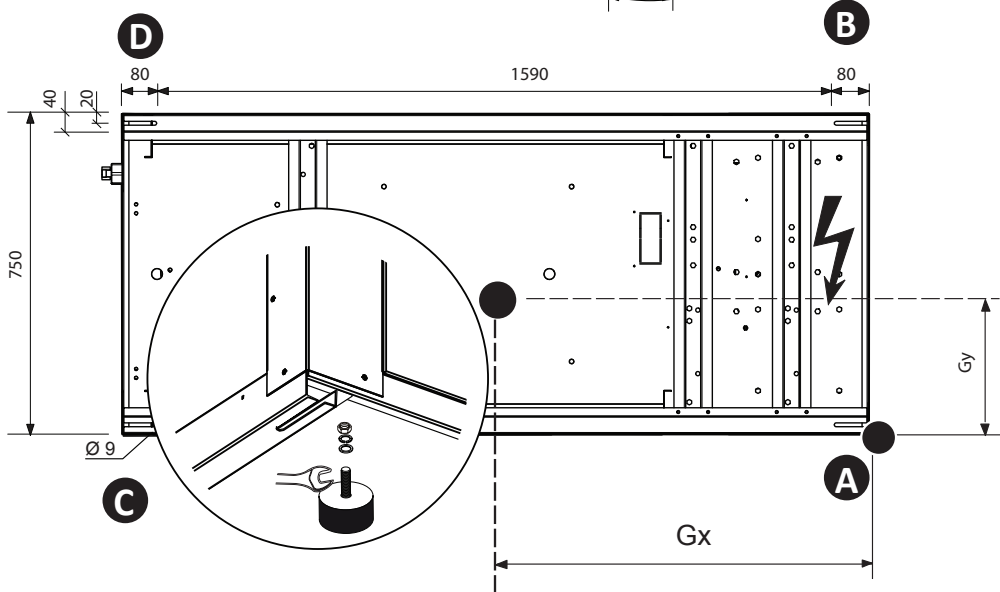
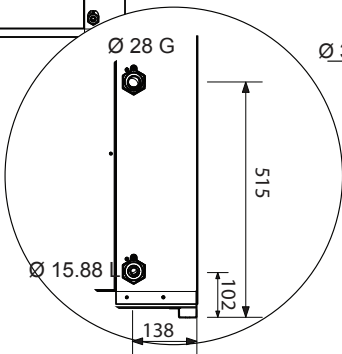
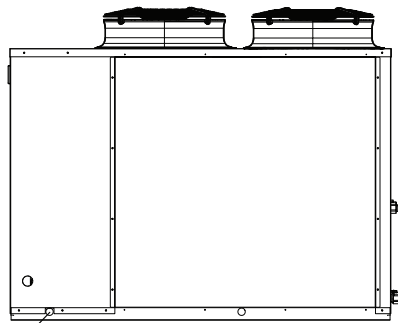
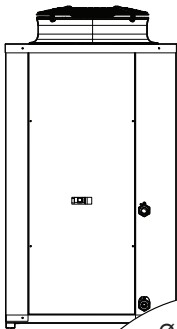
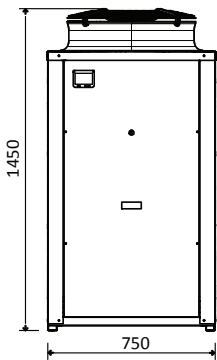
Mod.	A	B	C	D
VT9	40	30	23	M8



3.11. ECL 102 ÷ 202 version C



**WARNING**  
For the weight distribution refer to versions "°" | "H"



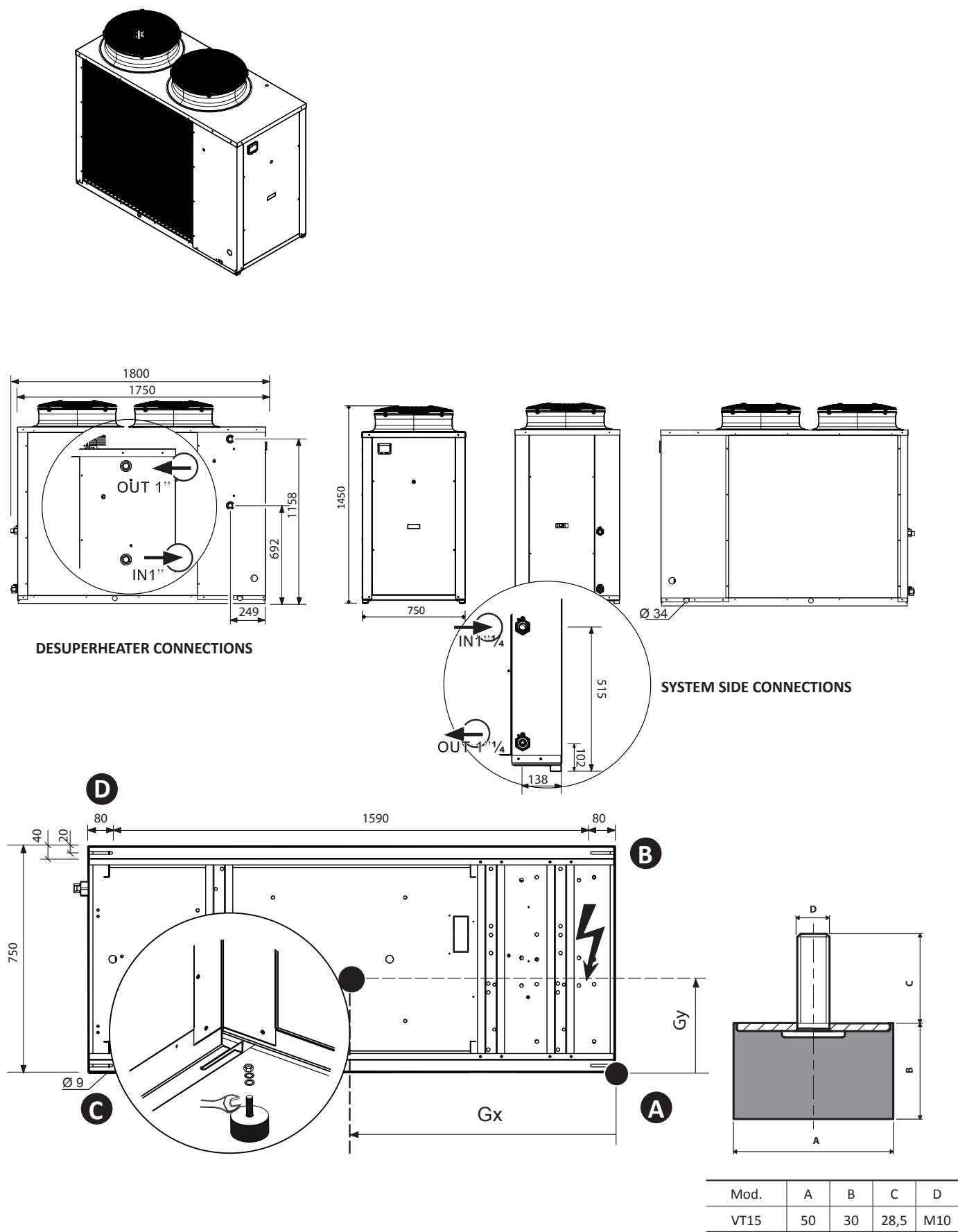
Mod.	A	B	C	D
VT15	50	30	28,5	M10







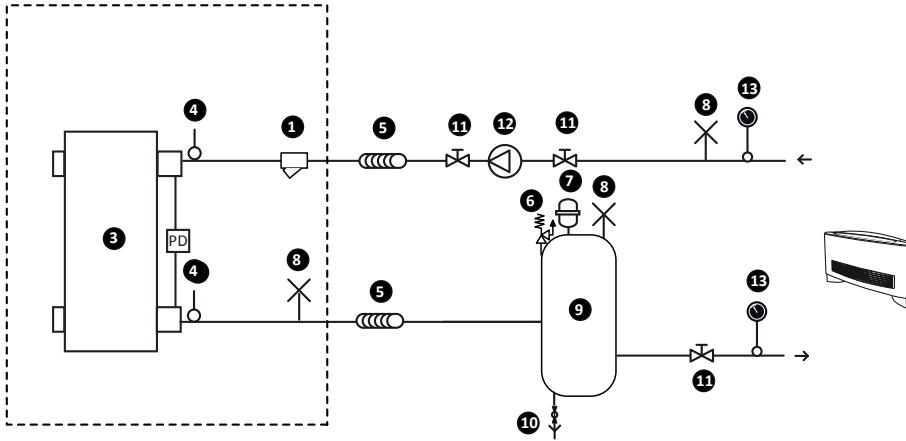
3.13. ECL 102 ÷ 202 version D|DA / HD|HDA





## 4. TYPICAL HYDRAULIC CIRCUITS

## 4.1. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ECL "°" | "H" (standard)

HYDRAULIC  
COMPONENTS ECLHYDRAULIC COMPONENTS  
RECOMMENDED EXTERNAL TO UNIT

## COMPONENTS PROVIDED AS STANDARD

- |   |                                   |
|---|-----------------------------------|
| 1 | Water filter                      |
| 2 | Differential pressure switch      |
| 3 | Plate heat exchanger              |
| 4 | Water temperature sensor (IN/OUT) |
| 8 | Air vent                          |

## COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER

- |    |                       |
|----|-----------------------|
| 5  | Anti-vibration joints |
| 6  | Safety valve          |
| 7  | Expansion tank        |
| 9  | System buffer tank    |
| 10 | Drain valve           |
| 11 | Isolating valve       |
| 12 | Pump                  |
| 13 | Gauge                 |

**WARNING**

The selection and installation of components external to the ECL °|H unit are the responsibility of the installer and must be carried out in accordance with good working practices and applicable standards of the country of destination.

**WARNING**

The hydraulic piping to the unit must be adequately sized for the required flow rate. The water flow rate through the heat exchanger must always be constant.

**WARNING**

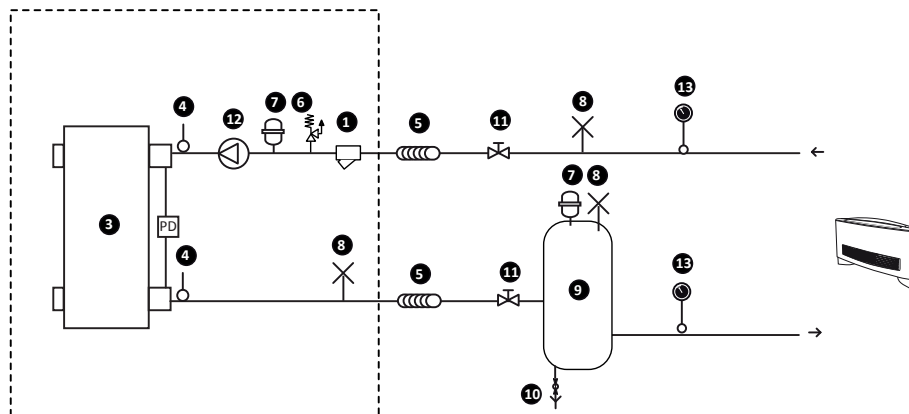
Carefully clean the system prior to connection to the unit. This cleaning eliminates welding slag, dirt, rust or any other impurities from the piping. These impurities may otherwise be deposited within the unit and cause a malfunction. The connecting piping must be adequately supported so as not to impose any weight onto the unit.



## 4.2. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ECL °P|°N" / "HP|HN"

### HYDRAULIC COMPONENTS ECL

### HYDRAULIC COMPONENTS RECOMMENDED EXTERNAL TO UNIT



#### COMPONENTS PROVIDED AS STANDARD

- |    |                                   |
|----|-----------------------------------|
| 1  | Water filter                      |
| 2  | Differential pressure switch      |
| 3  | Plate heat exchanger              |
| 4  | Water temperature sensor (IN/OUT) |
| 6  | Safety valve                      |
| 7  | Expansion tank                    |
| 8  | Air vent                          |
| 12 | Pump                              |

#### COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER

- |    |  |
|----|--|
| 5  | Anti-vibration joints                    |
| 7  | Additional expansion tank (if necessary) |
| 9  | System buffer tank                       |
| 10 | Drain valve                              |
| 11 | Isolating valve                          |
| 13 | Gauge                                    |



#### WARNING

The selection and installation of components external to the ECL°P|N /ECLHP|HN unit are the responsibility of the installer and must be carried out in accordance with good working practices and applicable standards of the country of destination.



#### WARNING

The hydraulic piping to the unit must be adequately sized for the required flow rate. The water flow rate through the heat exchanger must always be constant.

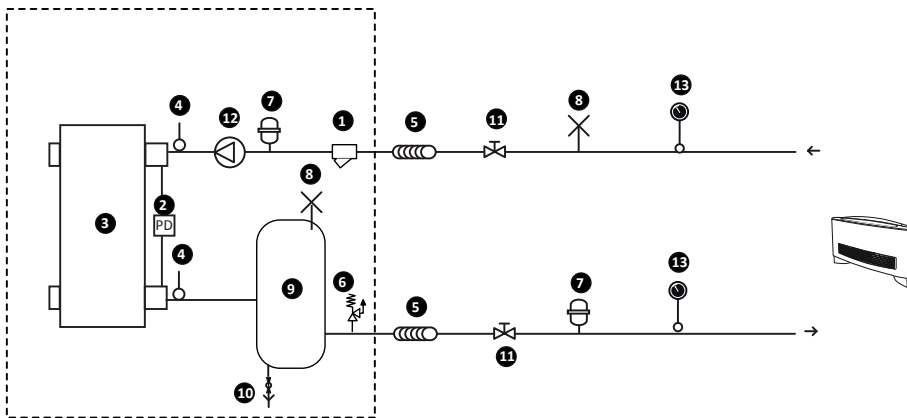


#### WARNING

Carefully clean the system prior to connection to the unit. This cleaning eliminates welding slag, dirt, rust or any other impurities from the piping. These impurities may otherwise be deposited within the unit and cause a malfunction. The connecting piping must be adequately supported so as not to impose any weight onto the unit.



## 4.3. INTERNAL AND EXTERNAL HYDRAULIC CIRCUIT ECL "°A|°Q" / "HA|HQ"

HYDRAULIC  
COMPONENTS ECLHYDRAULIC COMPONENTS  
RECOMMENDED EXTERNAL TO UNIT

## COMPONENTS PROVIDED AS STANDARD ECL STANDARD

1	Water filter
2	Differential pressure switch / Flow switch (ECL°A HA 020...040)
3	Plate heat exchanger
4	Water temperature sensor (IN/OUT)
6	Safety valve
7	Expansion tank
8	Air vent
9	System buffer tank
12	Pump

## COMPONENTS NOT PROVIDED AND RESPONSIBILITY OF THE INSTALLER

5	Anti-vibration joints
7	Additional expansion tank (if necessary)
10	Drain valve
11	Isolating valve
13	Gauge

**WARNING**

The selection and installation of components external to the ECL°A|Q/ECLHA|HQ unit are the responsibility of the installer and must be carried out in accordance with good working practices and applicable standards of the country of destination.

**WARNING**

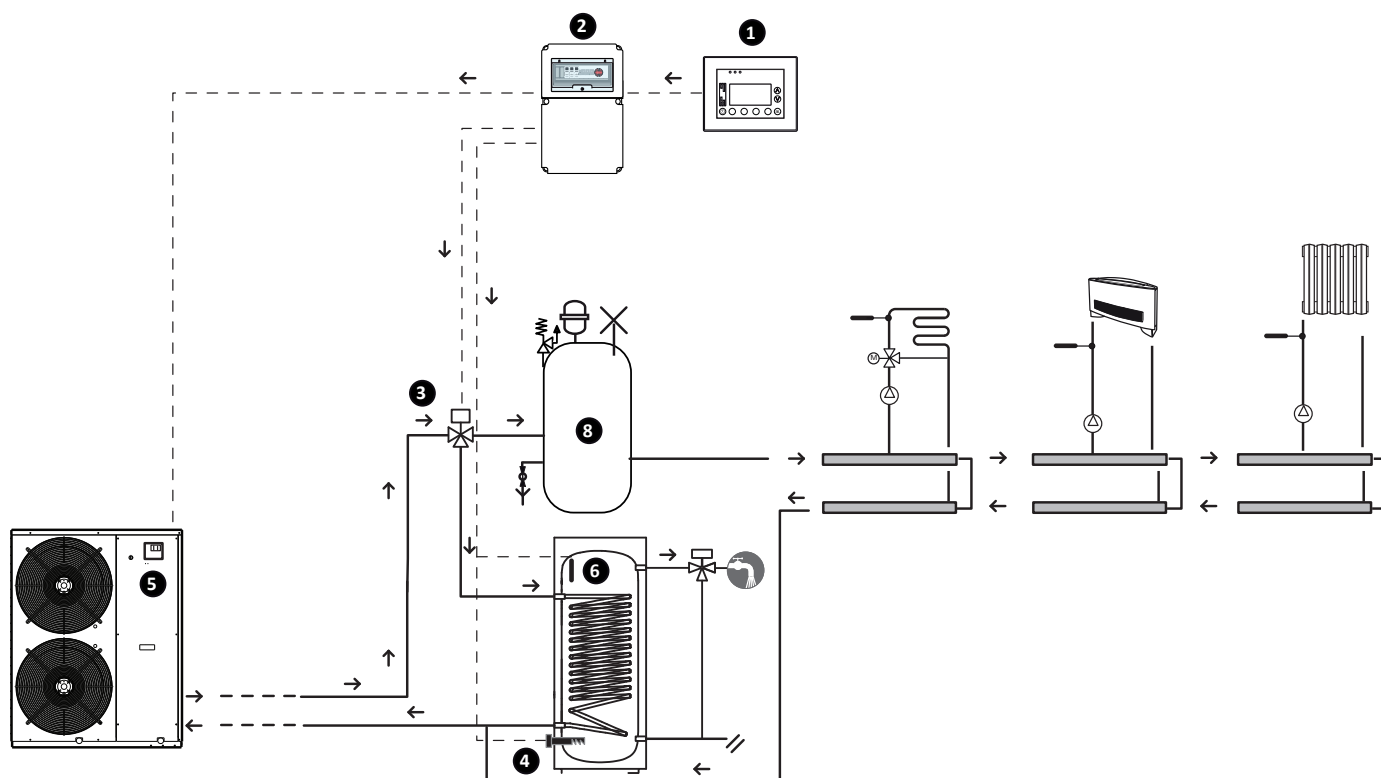
The hydraulic piping to the unit must be adequately sized for the required flow rate. The water flow rate through the heat exchanger must always be constant.

**WARNING**

Carefully clean the system prior to connection to the unit. This cleaning eliminates welding slag, dirt, rust or any other impurities from the piping. These impurities may otherwise be deposited within the unit and cause a malfunction. The connecting piping must be adequately supported so as not to impose any weight onto the unit.



## 4.4. SYSTEM EXAMPLE FOR DHW PRODUCTION WITH ECL50H° WITH ACCESSORY VMF-ACS



ECL50H°	
VMF SYSTEM for the CONTROL AND PRODUCTIONS OF DHW (ACCESSORIES) <sup>9</sup>	
1	E5 (white or black)
VMF-ACS3KTN   6KTN   8KTN	
Control of:	
2	- 3 way valve
	- Sensor DHW storage tank
	- Immersion heater DHW storage tank (for integration and anti-legionella cycle)
3	3 way valve (not supplied)
4	Immersion heater DHW storage tank (not supplied) (for integration and anti-legionella cycle)
5	Interface board RS485 (ACCESSORY MODU-485A) <sup>10</sup>
6	DHW storage tank (not supplied)
8	System buffer tank (not supplied)

<sup>9</sup> For further information refer to the specific VMF system documentation available from Airedale.

<sup>10</sup> Accessory required for the unit to communicate with the VMF system



**WARNING**

Confirm the hydraulic integrity of the joints.

**WARNING**

It is recommended to repeat this procedure after the unit has operated for a few hours and to periodically check the system pressure. Charging to be done with unit off (pump OFF).

**1.1. SYSTEM CHARGING**

Before commencing the charging procedure position the main isolator of the unit in the OFF position.

1. Ensure that the system drain valve is closed
2. Open all the system air vents and of the terminal units
3. Open the system isolating valves
4. Start filling slowly opening the system water

5. charging valve external to the unit  
When water exits the terminal units air vents close them and continue charging until the required system operating pressure is reached.

**1.1. SYSTEM DRAINING**

1. Before commencing draining the draining procedure position the main isolator of the unit in the OFF position
2. Ensure the system water charging valve is closed
3. Open the system drain valve external to the unit and all the system air vents and of the terminal units.



## 5. ELECTRICAL CONNECTIONS

The ECL units are fully factory wired and only require connection to the power supply network, downstream of an isolator, in accordance with the applicable wiring standards of the country of installation.

It is recommended to check the following items:

1. The electrical network is capable of meeting the electrical input data shown in the table below.
2. The unit is only powered up on completion of any hydraulic and electrical works.
3. Comply with the indicated phasing and earth requirements.
4. The power supply cable must have the appropriate protection against short circuits, residual current and earth leakage with suitable isolation from other devices.
5. The tolerance on the power supply voltage is  $\pm 10\%$  of the nominal voltage rating of the unit (for three phase units a maximum imbalance of 3% between phases is permitted). If these values are not met please contact the power supply company.
6. For the electrical connections use double insulated cables in accordance with applicable wiring standards.

### MANDATORY REQUIREMENTS

1. A magneto-thermal circuit breaker conforming to IEC-EN standards (contact aperture minimum 3 mm) is required, with adequate protection in accordance with the data provided in the following table, to be installed as close as possible to the unit.
2. An effective earth connection is required. The manufacturer cannot be held responsible for any damages caused by lack of, or inadequate, earthing of the unit.
3. For three phase units check the correct cable phasing.

The cable cross sections shown in the following table are the recommended values based on a maximum 50 m cable length.



All electrical works must be carried out by PERSONNEL WITH THE APPROPRIATE LEGAL QUALIFICATIONS, trained and aware of the risks relating to such works. The design of the cabling and related components must be carried out by PERSONNEL WITH



APPROPRIATE QUALIFICATIONS TO DESIGN ELECTRICAL INSTALLATIONS, following international and national standards of the location the unit is installed, in accordance with current legal requirements.



For installation details refer to the electrical wiring schematics supplied with the unit. The electrical wiring schematic together with the manuals must be conserved with care and MADE AVAILABLE FOR FUTURE REFERENCE.



The weatherproof seals of the equipment must be checked before making electrical connections and the unit must only be powered on completion of all electrical and hydraulic works.

For longer cable lengths or different types of cable installations, the DESIGNER is responsible for correctly sizing the isolator, circuit breaker, earthing protection and cable sizes, based on:

- Length
- Type of cable
- Electrical input of the unit, distance and operating ambients.



**WARNING**  
Using the water piping to earth the unit is not permitted.

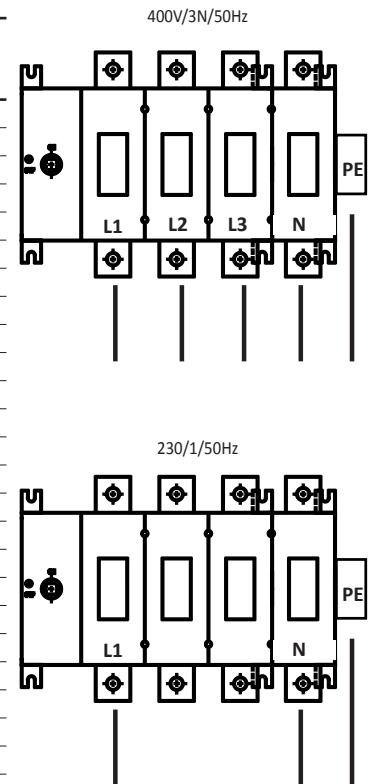


**WARNING**  
Verify that all terminals are tight on power carrying conductors before first start-up and 30 days after putting into service. Afterwards check twice yearly. Loose terminals can result in overheating of cables and components..



## 6. ELECTRICAL DATA

ECL °   H	Power supply	Version	Compressors [n°]	Fans [n°]	TOTAL INPUT		RECOMMENDED CABLE CROSS SECTION						
					L.R.A.	F.L.A.	SEZ. A				SEZ. B	EARTH	IL
					[A]	[A]	phases [n°]	cables per phase [n°]	Cross section [mm²]	Total cables [n°]	[mm²]	[mm²]	[A]
020	230V/1/50Hz	°	1	1	59,5	16,5	1	1	4	2	0,5	4	25
		P	1	1	26,5	17,5	1	1	4	2	0,5	4	25
025	230V/1/50Hz	°	1	1	62,5	16,5	1	1	4	2	0,5	4	25
		P	1	1	63,5	17,5	1	1	4	2	0,5	4	25
030	230V/1/50Hz	°	1	1	83,7	19,7	1	1	6	2	0,5	6	25
		P	1	1	84,7	20,7	1	1	6	2	0,5	6	25
040	230V/1/50Hz	°	1	1	98,7	23,7	1	1	6	2	0,5	6	32
		P	1	1	99,7	24,7	1	1	6	2	0,5	6	32
020	400V/3N/50Hz	°	1	1	26,5	6,0	3+N	1	2,5	4	0,5	2,5	16
		P	1	1	27,5	7,0	3+N	1	2,5	4	0,5	2,5	16
025	400V/3N/50Hz	°	1	1	32,5	6,0	3+N	1	2,5	4	0,5	2,5	16
		P	1	1	33,5	7,0	3+N	1	2,5	4	0,5	2,5	16
030	400V/3N/50Hz	°	1	1	35,7	6,7	3+N	1	2,5	4	0,5	2,5	16
		P	1	1	36,7	7,7	3+N	1	2,5	4	0,5	2,5	16
040	400V/3N/50Hz	°	1	1	48,7	8,7	3+N	1	2,5	4	0,5	2,5	16
		P	1	1	49,7	9,7	3+N	1	2,5	4	0,5	2,5	16
050	400V/3N/50Hz	°	1	2	65,3	11,3	3+N	1	4	4	0,5	4	16
		P	1	2	67,3	13,3	3+N	1	4	4	0,5	4	16
		N Q	1	2	68,0	14,0	3+N	1	4	4	0,5	4	16
070	400V/3N/50Hz	°	1	2	75,3	13,5	3+N	1	4	4	0,5	4	16
		P	1	2	77,3	15,5	3+N	1	4	4	0,5	4	16
		N Q	1	2	78,0	16,2	3+N	1	4	4	0,5	4	16
080	400V/3N/50Hz	°	1	2	102,3	16,3	3+N	1	6	4	0,5	6	25
		P	1	2	104,3	18,3	3+N	1	6	4	0,5	6	25
		N Q	1	2	105,0	19,0	3+N	1	6	4	0,5	6	25
090	400V/3N/50Hz	°	1	2	96,3	17,3	3+N	1	6	4	0,5	6	25
		P	1	2	98,3	19,3	3+N	1	6	4	0,5	6	25
		N Q	1	2	99,0	20,0	3+N	1	6	4	0,5	6	25
100	400V/3N/50Hz	°	2	2	76,0	22,0	3+N	1	10	4	0,5	10	25
		P	2	2	77,4	23,4	3+N	1	10	4	0,5	10	25
		N Q	2	2	78,8	24,8	3+N	1	10	4	0,5	10	25
150	400V/3N/50Hz	°	2	2	87,0	26,0	3+N	1	16	4	0,5	16	45
		P	2	2	89,8	28,8	3+N	1	16	4	0,5	16	45
		N Q	2	2	90,5	29,5	3+N	1	16	4	0,5	16	45
200	400V/3N/50Hz	°	2	2	117,0	34,0	3+N	1	16	4	0,5	16	45
		P	2	2	119,8	36,8	3+N	1	16	4	0,5	16	45
		N Q	2	2	120,5	37,5	3+N	1	16	4	0,5	16	45



## LEGEND

F.L.I.:	Maximum power input
F.L.A.:	Maximum current input
L.R.A.:	Starting current
Sez A:	Power supply connection
3+N:	3 phase + Neutral
Sez B:	Control and safeties connection
EARTH:	Earth connection to the unit
IL:	Main isolator

## 7. ELECTRICAL POWER SUPPLY CONNECTIONS



## WARNING

## CHECKS AND FIRST START-UP

It is reminded that for units of this series, if requested by the Airedale client or the legal owner and only on ITALIAN territory, free start-up is provided by the regional Airedale technical assistance service. The start-up must be previously agreed based on the intended time of completion of installation. Before the start-up all the works (electrical and hydraulic connections, filling and venting of air in the system) must be completed.

- Before making the electrical connections ensure that the isolator is open.
- Open the front control panel.
- Use the holes provided in the lower part of the cabinet for the electrical power supply and for other external wiring connections.
- Enter cables into the control panel only through the apertures provided.
- Avoid direct contact with un-insulated copper tubes and compressors.
- Identify the terminals for electrical connection with reference to the wiring diagram provided loose with the unit.
- Take the power cable into the control panel and connect to terminals U-N and PE with respect to (U) phase, (N) neutral, (PE) earth in the case of single phase units (230V/50Hz), U-V-W for phases, N for neutral and PE for earth in the case of three phase units (400V/3N/50Hz).
- Replace the inspection panels.
- Ensure that all protection removed for the electrical connection are replaced before powering the unit.
- Place the main isolator (external to the unit) to "ON".



## 8. CHECKS AND FIRST START-UP



### WARNING

Before carrying out the following checks ensure the unit is disconnected from the power supply. Ensure that the main isolator is in the OFF position and locked in that position with appropriate warning label attached. Before starting the procedures check for the absence of voltage with a voltmeter or phase checker.

### 1.1. PREPARING FOR FIRST START-UP

It is reminded that for units of this series, if requested by the Airedale client or the legal owner and only on ITALIAN territory, free start-up is provided by the regional Airedale technical assistance service. The start-up must be previously agreed based on the intended time of completion of installation. Before the start-up all the works (electrical and hydraulic connections, filling and venting of air in the system) must be completed.

### 1.2. START-UP

#### 1.2.1. PRELIMINARY CHECKS BEFORE POWERING UP

Check:

1. All safety precautions have been followed.
2. The unit has been appropriately fixed to the support base.
3. Minimum clearance spaces have been observed.
4. Power supply cables are correctly sized and capable of supporting the electrical requirements of the unit (see section on electrical data) and that the unit is correctly earthed.
5. All electrical connections are correctly terminated and tightened.

#### 5.2.1. CHECKS TO BE DONE WHEN POWERED UP

1. Apply power to the unit by turning the main isolator to the ON position. The display will power up after several seconds after applying power, check that the operating status is on OFF (OFF BY KEYB on the lower part of the display).
2. Check with a tester that the power supply voltages on the phases U-V-W are 400V  $\pm 10\%$ , check that the phase imbalance is not greater than 3%.
3. Check that the connections made by the installer comply with the documentation.
4. Check that the compressor crankcase heater(s)



are operating by measuring the increase of oil sump temperature. The heater(s) must be in operation for at least 12 hours before starting the compressor, and in all cases the sump oil temperature must be 10-15 K above ambient temperature.

### HYDRAULIC CIRCUIT

1. Check that all hydraulic connections have been correctly installed, that the instructions on the labels have been followed, and that a mechanical filter has been installed on the inlet to the evaporator. (Mandatory component otherwise the warranty will be voided).
2. Confirm that the pump(s) are operating and that the flow rate is sufficient to make the contact on the flow switch.
3. Check the water flow rate by measuring the differential pressure across the evaporator inlet and outlet and calculating the flow from the evaporator pressure drop diagram provided in the documentation.
4. Check the correct functioning of any flow switch installed; close the isolating valve on the evaporator outlet and observe the result on the unit display panel; open the valve and reset the flow trip alarm.

### 4.1. FIRST START-UP

After having rigorously followed the above checks it is possible to start the unit:

1. Close the electrical panel.
2. Turn the main isolator to ON.
3. Press the key ON  for 3 seconds to start the unit.  
Pressing the key ON  displays the water temperature and the operating mode of the unit. Check the operating setpoint parameters and reset any alarms present. After a few minutes the unit will start.

#### 3.1.1. CHECKS WITH THE UNIT RUNNING

### REFRIGERANT CIRCUIT

#### CHECK:

- That the compressor input current of the compressors is less than that indicated in the table of electrical data.
- That in three phase models the compressor noise is not abnormal, indicating a reverse rotation. In this case reverse one of the phases.
- That the voltage values are within the determined limits and that the phase imbalance (three phase power) is less than 3%.
- Presence of any refrigerant leaks, in particular from connections to gauges, pressure transducers and pressostats. (Vibrations during transportation

may have loosened connections).

- Superheat  
Compare the compressor suction temperature with a contact temperature sensor reading with the temperature of the low pressure gauge (saturated suction temperature corresponding to the evaporating pressure). The difference between these two temperatures is the superheat value. The optimal values are between 4 and 8 K.
- Discharge temperature  
If the values of sub-cooling and superheat are normal the temperature measured in the discharge line from the compressor must be 30/40 K above the condensing temperature.








### SAFETY AND CONTROL DEVICES

#### CHECK:

- The manual high pressure pressostat, which stops the compressor and generates an alarm when the discharge pressure exceeds the preset value. The correct operation is checked by closing the refrigerant isolating valve to the heat exchanger (in cooling mode) and keeping a check on the high pressure gauge, verify the operation corresponds to the rated value. Warning: in the event the pressostat does not operate at the rated value immediately stop the compressor and investigate the cause. Reset is manual but can only be done when the pressure drops below the differential setting. (For the values of the trip and differential setting refer to the technical manual).
- Anti-freeze protection  
The electronic control of the anti-freeze protection is from the water temperature sensor leaving the evaporator prevents freezing of water when the temperature is too low. The operation of the anti-freeze protection can be checked by increasing the setpoint value until it is above the temperature of leaving water and checking the water temperature with a high precision sensor. Confirm that the unit stops and generates the responding alarm. After this check reset the anti-freeze setpoint to the original value.

### 3.1. CHANGE OF SEASON

#### 3.2. CHANGE OF SEASON FROM UNIT CIRCUIT BOARD





Access the **USER SET** menu with the key  and confirm the password 000 pressing key . Using the arrow key  display the parameter **STA** index 0 of the menu and select pressing the key . Using the arrow keys  select the value for either: **VALUE 0** cooling mode operation, or, **VALUE 1** heating mode operation. Confirm the selection pressing key  and exit the menu with the key .



### 3.3. CHANGE OF SEASON FROM PR3 REMOTE PANEL (ACCESSORY)

If the PR3 remote panel (accessory) is installed it must be enabled after making the electrical connections.

#### 3.3.1. REMOTE PANEL ENABLING

Access the **INSTALLER SET** menu with the key  and insert the menu access password: **password installer 030**. Using the arrow keys  display the parameter **PAN** index 9 of the menu and select pressing the key . Using the arrow keys  select from the desired values of:

##### VALUE 1:

- **SEASON CHANGE** from the unit circuit board
- **ON/OFF CONTROL** from the PR3

##### VALUE 2:

- **SEASON CHANGE** controlled from the PR3
- **ON/OFF CONTROL** from the unit

##### VALUE 3:

- **SEASON CHANGE** controlled from the PR3
- **ON/OFF CONTROL** from the PR3

Confirm the selection pressing key  and exit the menu with the key .

Once the PR3 remote panel is enabled the change of season selection can be made directly from the switch (fig.1). The unit will automatically switch on and off with the selected operating mode.

For further information refer to the USER manual.



(fig.1)

## 9. OPERATING CHARACTERISTICS

### 1.1. COOLING SETPOINT

(Factory default) = 7°C,  $\Delta t = 5$  K.

### 1.2. HEATING SETPOINT

(Factory default) = 45°C,  $\Delta t = 5$  K.

In the event of a momentary power interruption the selected operating mode will be retained in memory.

### 1.3. COMPRESSOR DELAY TIMERS

To avoid excessive compressor starts two functions are provided:

- Minimum time from last stop 60 seconds in cooling mode.
- Minimum time from last start 300 seconds in heating mode.

### 1.4. CIRCULATING PUMPS

The wiring schematic provides outputs to control the circulating pumps. The system side pump starts immediately and after 30 seconds of operation, when the water flow is stabilised, the pressure differential/flow switch control function is enabled. If no alarms are present the unit will start.

### 1.5. ANTI-FREEZE ALARM

The alarm <sup>11</sup> is always active even in standby mode. To prevent damage to the plate heat exchanger by freezing of the water within the unit is stopped and an alarm raised if the water temperature drops below the minimum anti-freeze setpoint of 3°C. The unit can only re-start after a manual reset and if the anti-freeze sensor reads a water temperature above 4°C <sup>12</sup>. With the unit in off mode and with a water temperature below 4°C the factory standard fitted electric heaters on the heat exchanger are turned on, and turned off when the water temperature exceeds 5°C. The water pump always remains active.

### 1.6. WATER FLOW ALARM

The unit has a low water flow rate alarm using a factory fitted differential pressure switch or flow switch. This safety activates after the first 30 seconds of pump operation if the water flow rate is not sufficient. The operation of this alarm stops the compressors and the pump.



#### WARNING

<sup>11</sup> The anti-freeze setpoint can only be adjusted by an authorised service centre and only after verifying that the hydraulic circuit has the correct % of anti-freeze solution.

<sup>12</sup> If this alarm occurs immediately call the authorised technical service assistance.



#### WARNING

##### FOR 230V/1/50Hz UNITS:

The unit is provided with a compressor soft starter. This device contains capacitors that could overheat through repeated quick starts. If power supply is removed wait at least 3 minutes before powering up.



**WARNING**

For 230V/1/50Hz units with soft-start, if power is removed for reasons of fault or maintenance, it is required to wait 5 minutes before re-applying power to the unit to ensure proper operation.

**WARNING**

We recommend a service log book is provided for the unit (responsibility of the user) to keep records of any works on the unit, which will aid maintenance and repair works. Note in the service log book date, type of works (routine maintenance, inspection or repair), describing the event and the measures taken.

**WARNING**

It is **FORBIDDEN** to charge with refrigerant circuit with a refrigerant type different to that indicated. Using a different refrigerant can cause serious damage to the unit.

## 10. ROUTINE MAINTENANCE

It is forbidden to carry out any cleaning operation before isolating from the power supply <sup>1</sup>. Confirm no voltage is present before commencing works.

Periodic maintenance is a fundamental requirement to ensure efficient unit operation both in terms of operation and energy efficiency.

The fundamental required annual checks are:

### 1.1. HYDRAULIC CIRCUIT

**CHECK:**

1. Water circuit is filled.
2. Water filter is clean.
3. Operation of the differential pressure or flow switch.
4. Absence of air in the system (vent).
5. Water flow rate is always constant through the evaporator.
6. Condition of the hydraulic piping insulation.
7. The percentage of anti-freeze liquid, as may be required.

### 7.1. ELECTRIC CIRCUIT

**CHECK:**

1. Operation of safeties.
2. Power supply voltage.
3. Electrical power input.
4. Tightness of connections and terminals.
5. Operation of the compressor crankcase heater.

### 5.1. REFRIGERANT CIRCUIT

**CHECK:**

1. State of compressors.
2. Efficiency of the plate heat exchanger.
3. Operating pressures.
4. Leaks to confirm the correct operating refrigerant charge.
5. Operation of the high and low pressure presostats
6. Efficient operation of the filter drier.

## 6.1. MECHANICAL CHECKS

**CHECK:**

1. **Tightness of screws**, of compressors and electrical panel and external panelling of the unit. Poor fixings cause noise and abnormal vibrations.
2. The state of the unit structure.  
Treat any parts showing signs of corrosion with the appropriate paints to reduce or eliminate rust.

## 11. SPECIAL MAINTENANCE

The ECL units are factory charged with R410A and tested. In normal operation they therefore do not require any intervention from the technical assistance service in relation to the refrigerant charge. Over time some small leaks can appear, resulting in refrigerant discharges of the circuit and causing a malfunction of the unit. In this case the leaks have to be found and repaired and the unit recharged in accordance, and as required, under current legislation and good working practices.

## 12. DISPOSAL

Ensure that the disposal of the unit is carried out in accordance with the current legal requirements.












### 13. PROCEDURE FOR SELECTION OF SYSTEM TYPE

Several parameters of the MODU CONTROL board have to be set, based on the type of system the unit is installed.

These changes of parameters are summarised in the table below to permit the installer to make the appropriate selections of the unit's electronic circuit board.

#### 1.1. HOW TO MODIFY A USER MENU PARAMETER

To access the **USER** setting press the key  and confirm the password 000 pressing the key . The display will show the parameters of the **USER** index as three identifying characters; the index remains displayed for a second and then is replaced by the value of the parameter it relates to.

To move to the following parameter use the arrow keys  . To modify a parameter press the key  , modify the value using the arrow keys   and confirm the modification pressing the key . To exit the menu press the key .

#### 1.2. HOW TO MODIFY AN INSTALLER MENU PARAMETER

To enter and modify the **INSTALLER** menu follow the same procedure as the **USER** menu above.

**Password INSTALLER menu: 030**

QUESTION	ANSWER	WHAT TO DO
(1) What type of terminals are installed in the heating circuit?	• The unit is a cooling only model	• Go to question 2
	• Radiant panels	• Enter in parameter <b>StC</b> (index 3 menu <b>USER</b> ) with the value of 35 °C
	• Fan coil units or low temperature radiators	• Enter in parameter <b>StC</b> (index 3 menu <b>USER</b> ) with the value of 45 °C (default value)
	• Other applications	• Enter in parameter <b>StC</b> (index 3 menu <b>USER</b> ) with the value of 55 °C
(2) Is the remote control accessory panel installed (PR3)?	• Not installed	• Go to question 3
	• Installed	• Enter in parameter <b>PAN</b> (index 9 menu <b>INSTALLER</b> ) with the appropriate value: <b>Value (1):</b> • Season selection controlled from the unit circuit board • ON/OFF control from the PR3 <b>Value (2):</b> • Season selection controlled from the PR3 • ON/OFF control from the unit circuit board <b>Value (3):</b> • Season selection controlled from the PR3 • ON/OFF control from the PR3
(3) Is domestic hot water production present?	• Not present	• Go to question 5
	• Present	• Enter in parameter <b>ASA</b> (menu <b>INSTALLER</b> ) with the value (1)
(4) In the domestic hot water circuit is a three way diverting valve present?	• Not present	• Go to question 5
	• Present	• Enter in parameter <b>AAS</b> (index C menu <b>INSTALLER</b> ) with the appropriate value (in seconds): this parameter shows the reversing time for the three way diverting valve in the circuit for the production of domestic hot water
(5) Is an ambient thermostat present?	• Not present	• No function
	• Present	• This parameter enables a digital contact <b>ID</b> (shown on the electrical schematic with the reference <b>TRA</b> ) onto which to connect an ambient thermostat with which to disable the compressors and electric heaters. Enter in parameter <b>trA</b> (index D menu <b>INSTALLER</b> ), with the appropriate value selecting from: <b>1. Value (1 or 2): ENABLED</b> <b>2. Value (0 or 3): DISABLED</b> <b>3. It is reminded that the OPEN state of the contact represents:</b> • stops compressors and heaters if the parameter value is set to 1 • stops compressors, pump and heaters if the parameter value is set to 2 • pump alarm (as in the previous software version), if the parameter value is set to 3



#### WARNING

For more information refer to the **USER manual** provided with the unit and available on the website [www.Airedale.com](http://www.Airedale.com)









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