Installation, operating and maintenance

ARIA

• • • Providing indoor climate comfort

ARIA-IOM-0909-E

GENERAL INFORMATION

Foreword

This installation and maintenance manual is destined for users of the ARIA range units. It describes all the operations to ensure a long product life and reliability. The warnings shown in this manual are aimed at guaranteeing the safety of persons working on these units and must be respected.

Guarantee

This is subject to LENNOX's general terms and conditions of sale and delivery. Any repairs or modifications made to the equipment without LENNOX's approval will render the grantee void. The guarantee does not cover any damage due to negligence, poor maintenance or non-respect of the recommendations and prescriptions. The guarantee and the manufacturer's obligations may be declared invalid if the user fails to respect the recommendations given in this manual. The manufacturer declines all responsibility for installations or maintenance operations carried out by unqualified personnel.

Receiving equipment

Check the condition of the equipment and report any transport damage to the transporters by recorded delivery letter within 24 hours; with a copy to the sales office. Do not unpack the equipment until just before installation, and make sure they are as close as possible to the installation area; respect the storage precautions marked on the packaging.

Installation conditions

Respect the Local safety in force. Make sure that the electrical supply is compatible with the characteristics of the ARIA to be installed. Never handle units by using the water pipe connections, flexibles, valves, cables.

Disconnect the power supply to the unit before carrying out any work on parts of the unit identified by the sign 

Any work carried out must be in accordance with the local regulations in force, where eye protection, work gloves, no-inflammable clothes when welding, provide a fire extinguisher nearby.
The units are not designed for installation in explosive, acid or alkaline environments. The Copper/aluminium coils and other internal components would risk irreversible damage.

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1. INTRODUCTION

ARIA unit is a compact air conditioning module for conditioning rooms from 12 to 50 m².
ARIA range has been designed for very low noise performance in order to meet today's new comfort standards. This module is ideal for commercial buildings air conditioning. The overall height of 233 mm of ARIA allows an integration of very weak false ceiling voids met in buildings in restoration or buildings of which the overall height is of primary importance.

ARIA units supply and return air spigots positions may be adapted to specific building requirements. The installation of this unit will be generally made with the top of the false ceiling of space conditioning, near the supply and retunr air diffusers whose connection will be carried out by thermally and acoustically (if necessary) insulate flexible ducts.

The available static pressure and staged fan speeds, provide for multiple installation possibilities; simplified and reduced maintenance, ease of access to all components, are essential attributes for an intelligent air conditioning system.
In the standard version, l'ARIA is provided with a multi speed fan allowing the fan speed to be set appropriately to the specific thermal loads in each space; the wall thermostat or user interface of a communicating controller complements the system.

ARIA range is available in all the configurations demanded by the market, i.e. 2 Pipe Change/Over, 2 Pipe/2Wire and 4 Pipes. The On/Off type water flow control valves associated with electronic controls, offer a perfect control of the space temperature. The electric heaters used in the 2P/2W application, are equipped as standard with a manual reset thermostat, reset by switching off the power, and thermo fusible link.

2. CHARACTERISTICS

2.1 Physical and electrical data

ARIA		Size 10	Size 20	Size 30	Size 40
Nominal air flow	L/sec	139	130	222	228
Available static pressure	Pa	50	50	50	50
Total cooling capacity (1)	kW	1,94	3,11	4,77	5,68
Sensible cooling capacity (1)	kW	1,64	2,4	3,74	4,26
Heating capacity (2)	kW	2,36	3,52	5,44	6,16
Electrical supply		Single phase – 50 Hz – 230V +/- 10%			

Fan		Forward action simple wheel	Forward action double wheel	Forward action double wheel	Forward action double wheel
Air flow at maximum speed	L/sec	160	155	340	345
Available static pressure	Pa	80	65	75	80
Fan number		1	1	2	2

Motor		Asynchronus type 230V-1-50 2 poles with internal overload protection, permanent capacitor Winding insulation class B, varnish class F, IP20			
Maximum absorbed power	W	197	196	403	407
Nominal current	A	0,90	0,90	1,85	1,90
Starting current	A	1,1	1,1	2,2	2,3

Water coil					
3/8 " copper tubes – Aluminium fins		2 rows / 1 pipe	4 rows / 2 pipes	4 rows / 3 pipes	4 rows / 4 pipes
Water content	L	0,5	0,94	1,6	2,25
Operating pressure	kPa	16	16	16	16
Test pressure	kPa	24	24	24	24

Electric heater					
Electrical supply		"UDH" bare wire resistive type, single phase – 50 Hz – 230 V +/- 10%			
Protections		Manual reset thermostat (reset by switching off the power) Trigger temperature 75°C thermo fusible link; breaks at 152 °C			
Power (+5% / -10%) not including fan	W	500	500	500	500
		800	800	800	800
		1200	1200	1200	1200
		1500	1500	1500	1500
				2 x 800	2 x 800
				2 x 1500	2 x 1500
Minimum air flow	L/sec	92	92	92 / fan	92 / fan

Air filter		95% gravimetric efficiency (G3 following EN 779) throwaway type M1 fire rating, metal wire frame			
Dimensions	mm	415 x 225 x 10	415 x 225 x 10	715 x 225 x 10	1015 x 225 x 10

Weight and dimensions					
Length x width x height (3)	mm	886 x 428 x 233	886 x 428 x 233	886 x 728 x 233	886 x 1028 x 233
Weight	Kg	16	16	28	35

(1) :Based on water entering temperature of 7 °C and a water temperature difference of 5 °C at nominal conditions, air at 27 °C dry bulb, 50 % relative humidity

(2) : Based on water entering temperature of 50°C and a water temperature difference of 10° at nominal conditions, air at 20°C

(3) : Dimensions refer to a unit with return and supply spigots without condensate drain tray.

2.2 Codification

Exemple : **ARIA 20 4R 1R SX**

ARIA 20	4R	1R	SX
ARIA size 20 4 pipes	4 row heating coil	1 row cooling coil	SX hydraulic connection (left side)

			CODIFICATION									
Motor fan wiring	COLOUR	SPEED	A	B	C	D	E	F	G	H	I	J
	RED	1	1	1	1	1	1	1				
	BLUE	2	2	2	2				2	2	2	
	WHITE	3	3			3	3		3	3		3
	BROWN	4		4		4		4	4		4	4
	BLACK	5			5		5	5		5	5	5

NOTE : spigot configuration is defined when viewing ARIA unit looking in the direction of the air flow inside the unit

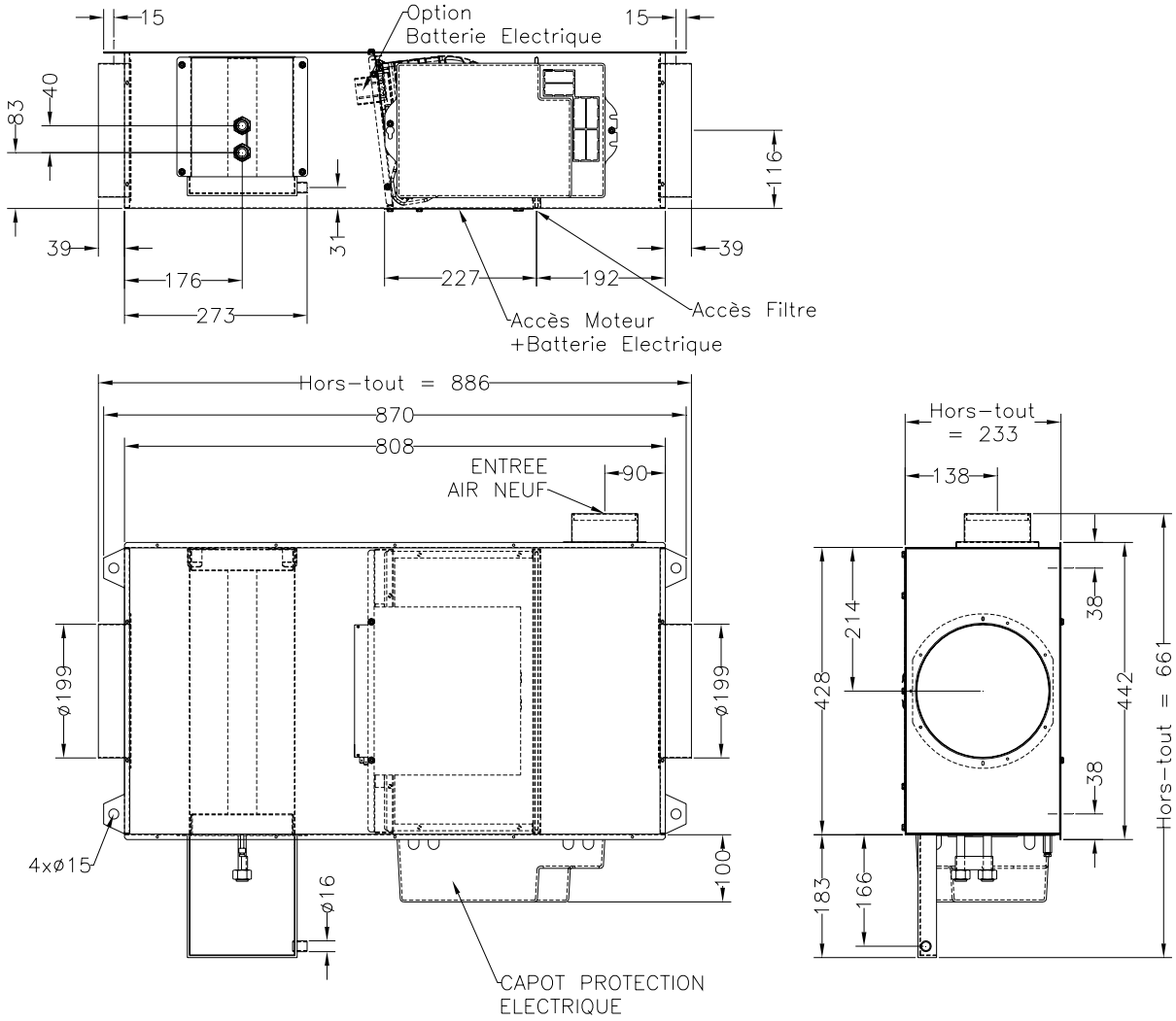
2.3 Packaging

ARIA units are packed on palettes in multiples of 12 units, film-wrapped; a maintenance and storage precautions notice is fixed to each palette.
The palette dimensions are as follows :

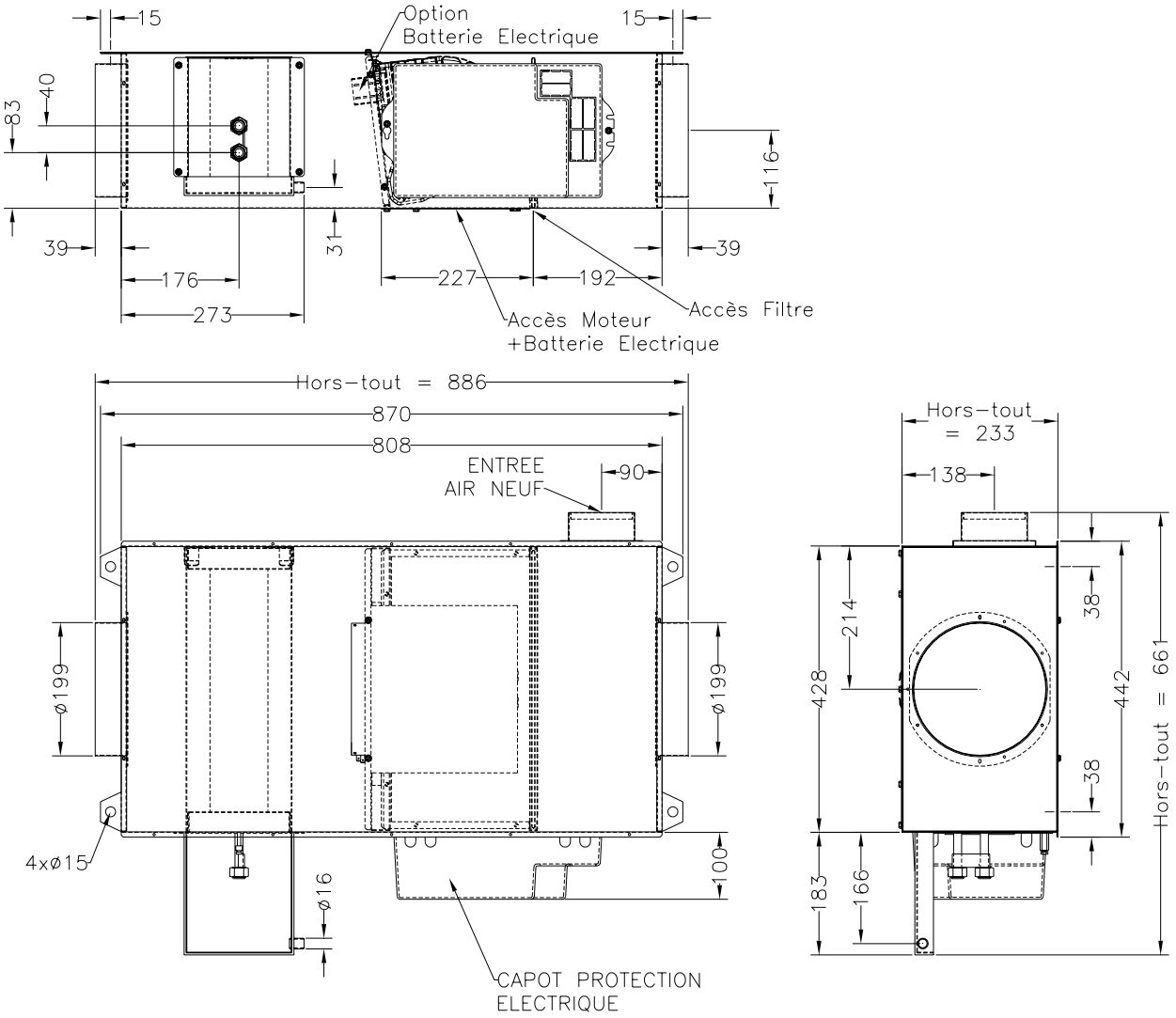
- Length 1500 mm
- Width 1200 mm
- Height 1500 mm

2.4 Dimensional data

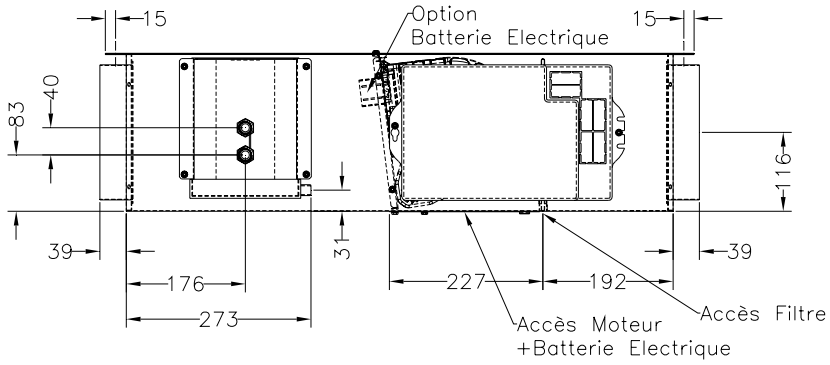
2.4.1 ARIA 10 with 2 rows coil - Left hand configuration

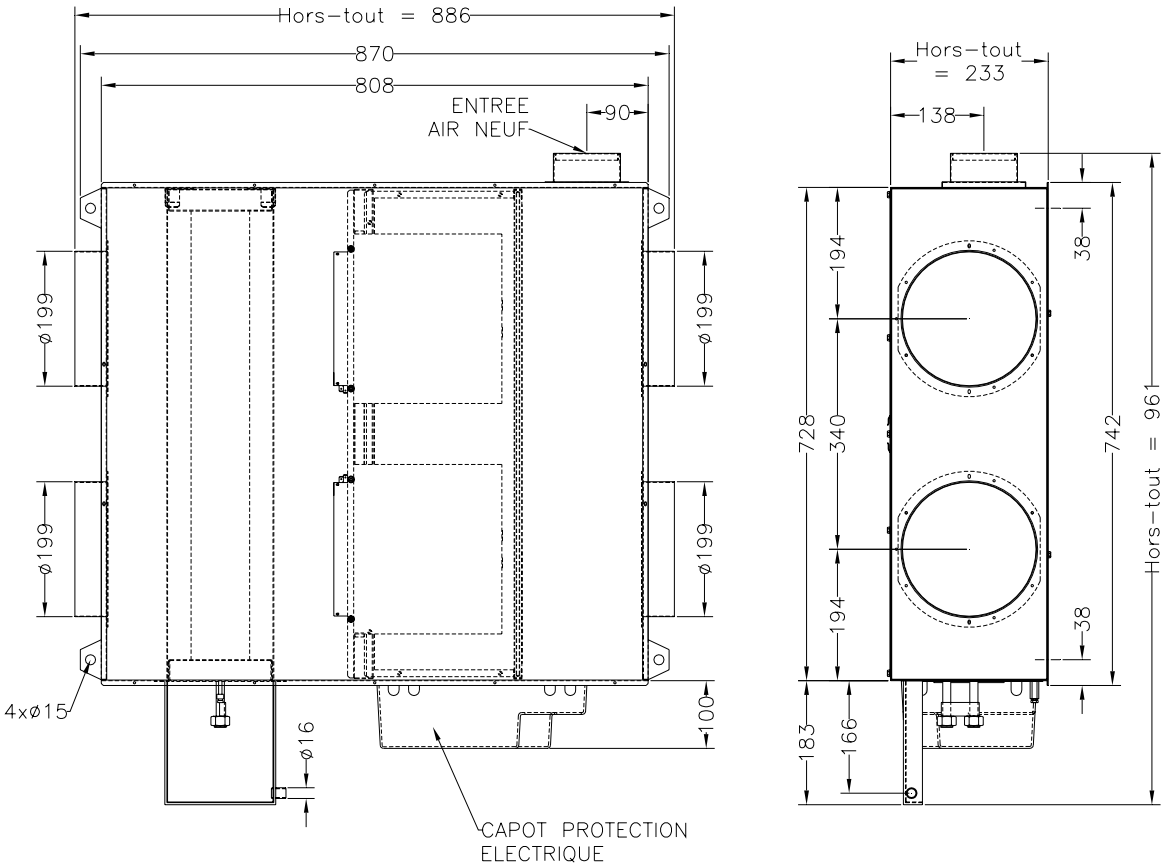


2.4.2 ARIA 20 with 4 rows coil - Left hand configuration

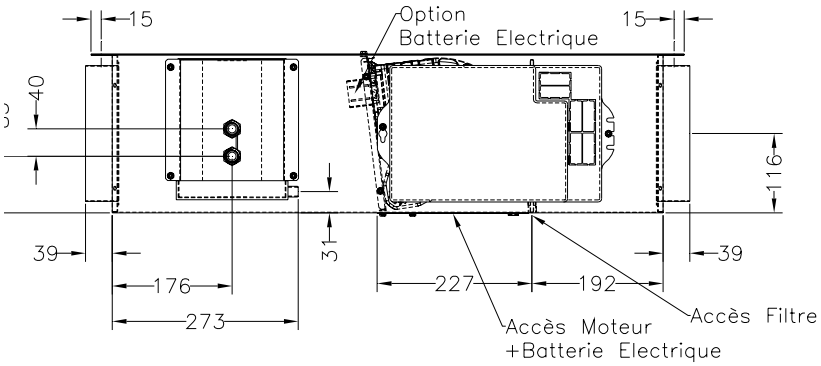


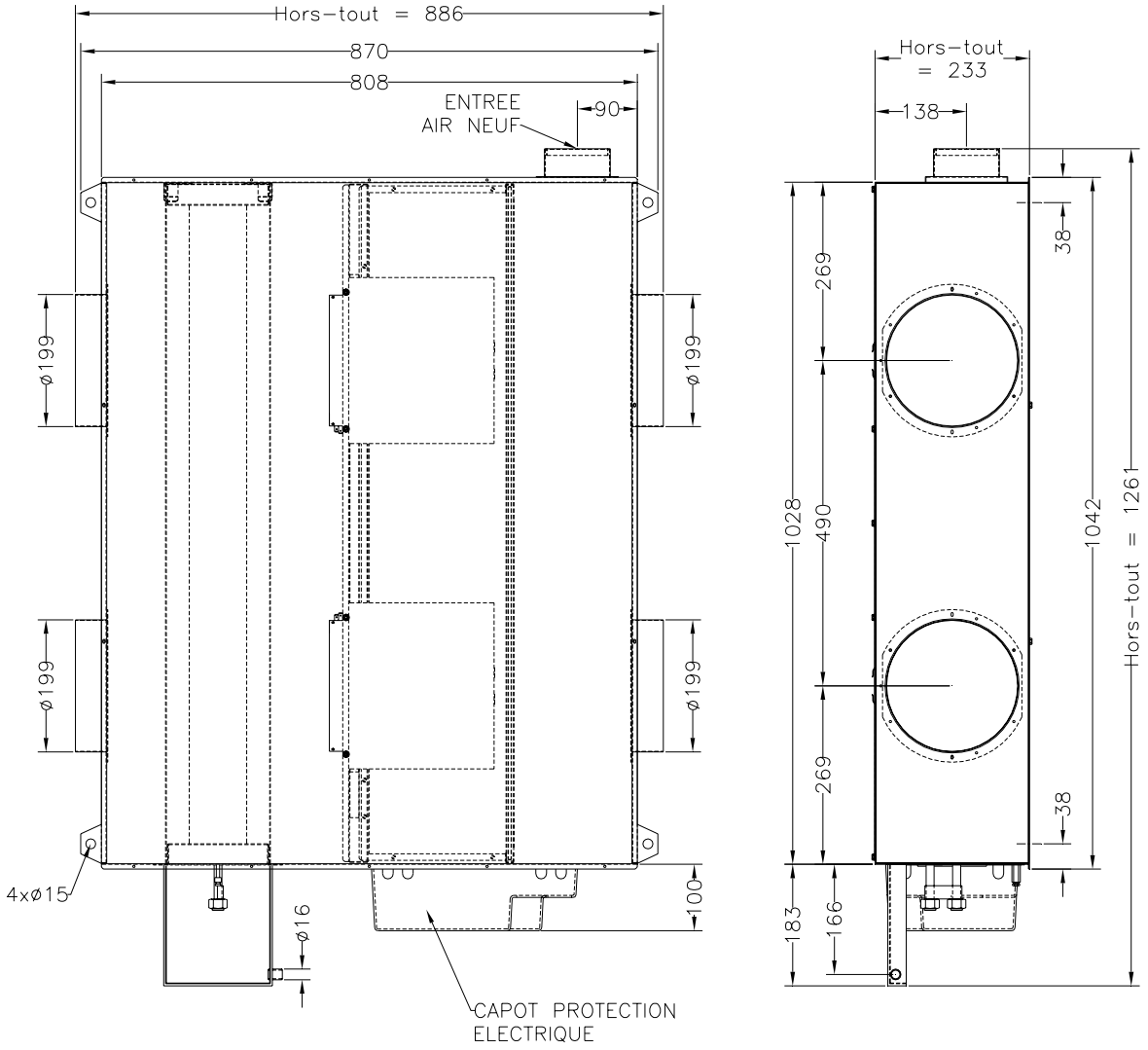
2.4.3. ARIA 30 with 4 rows coil - Left hand configuration



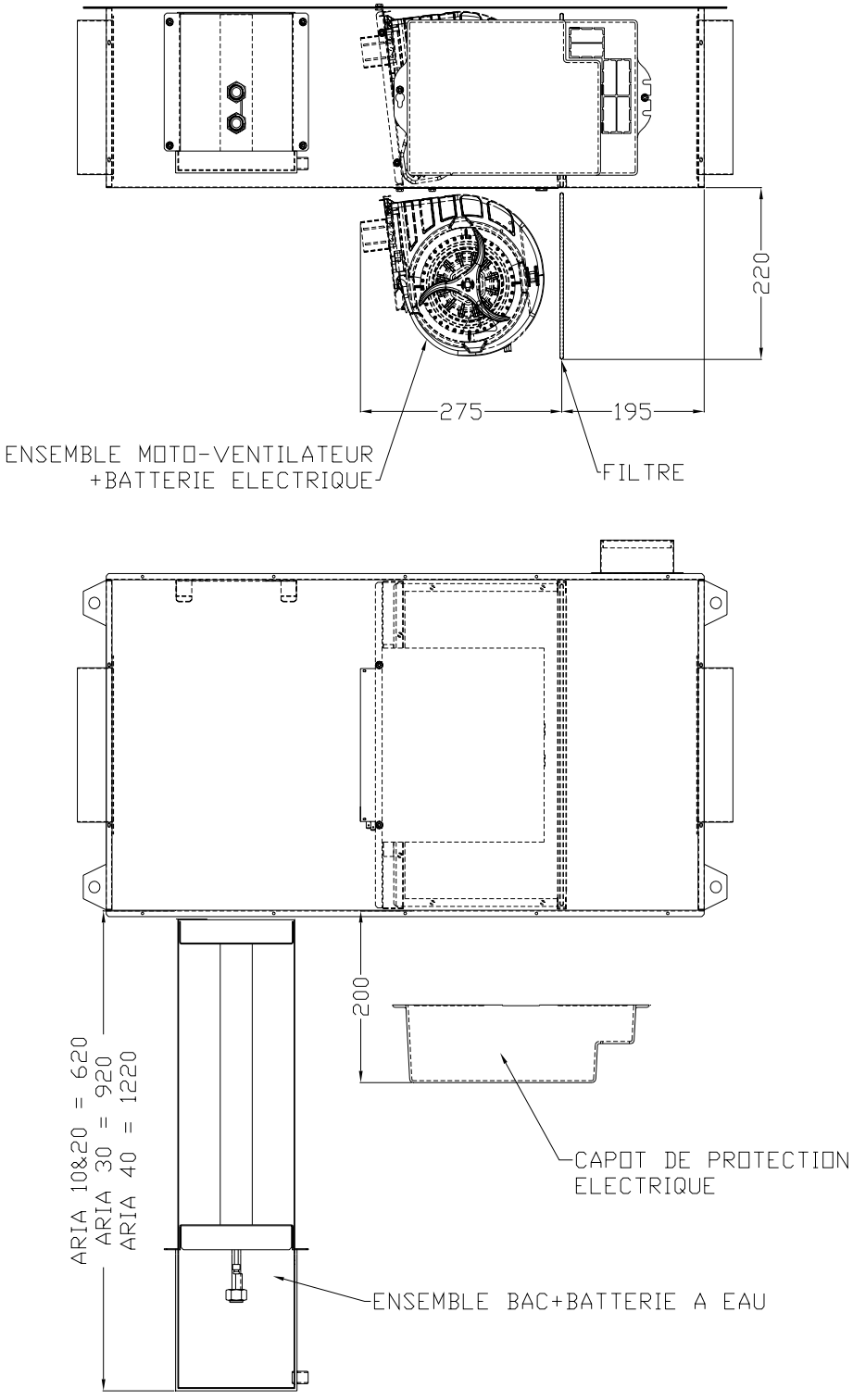


2.4.5. ARIA 40 with 4 rows coil - Left hand configuration

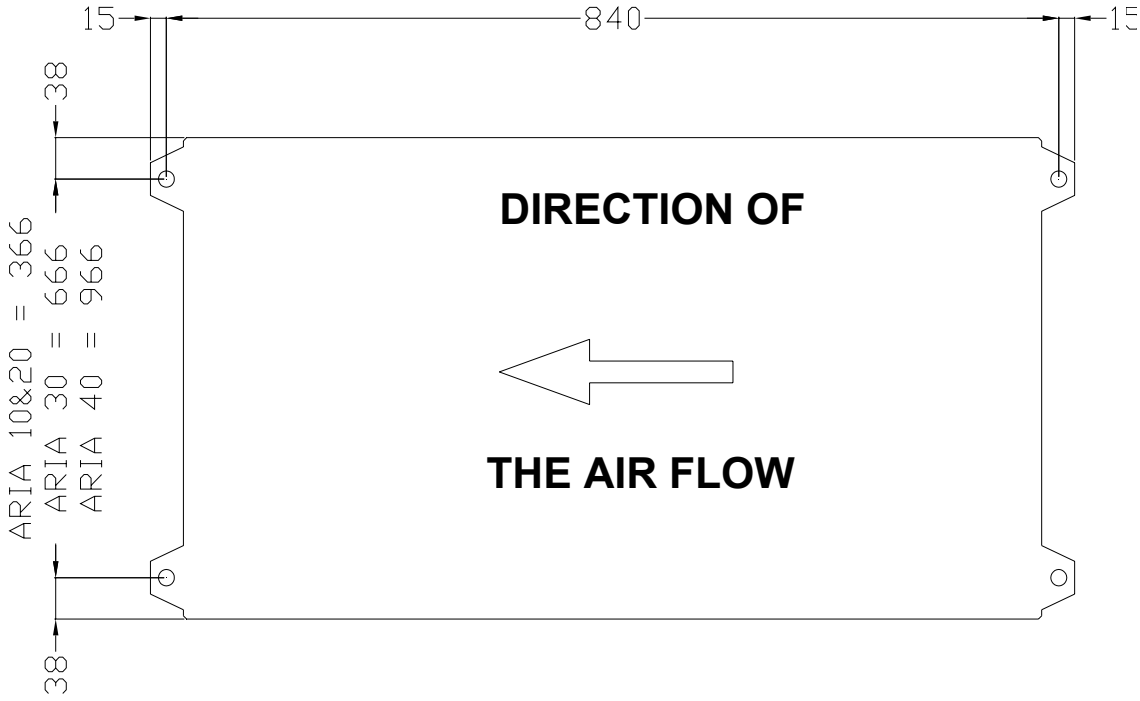




2.5 Maintenance access requirements



2.6 Template for positioning threaded hangers

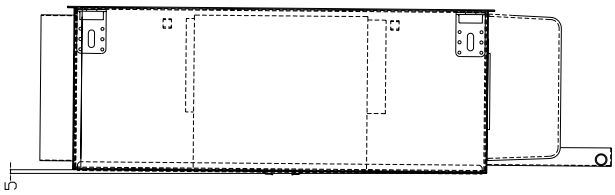


3. METHODE D'INSTALLATION

3.1 Coordination between ARIA unit and its position

Before starting the installation process, it is advisable to study an ARIA prototype to facilitate the mounting of the unit. For the plan, it is recommended a mounting template be obtained, contact your local representative.

ARIA unit has to be installaled according to engineering drawings (location, left or right side, size…)



3.2 Installation procedure

3.2.1 Installation precautions

- During the installation of the unit, make sure all construction debris, that could damage the unit, has been removed from the ducts or equipment.
- Before starting the installation process, fit all the accessories (if necessary) to the unit according to the instructions provided in the kit.
- Determine the false ceiling type in order to define the type of threaded hangers to be used and make sure that the surface can support the weight of the unit.

3.2.2 False ceiling installation

- A lift and ladder will make the task easier.
- Position the unit on the ground under the position where it will be placed in the false ceiling.
- Confirm that the clearances around unit are sufficient to allow for unrestricted maintenance access. Refer to the drawing showing maintenance access requirements on page 8.
- Use the drilling template to mark the ceiling fixing positions.
- Drill 4 holes for the anchor fixings
- Raise the unit, align the threaded hangers with the unit and fit the nuts.
- Incline the unit by 5 mm towards the condensate outlet to ensure that the condensate flow is adequate.

3.2.3 Condensate drain pipe

It is recommended to use a 16 mm inside diameter transparent tube, preferably reinforced, with a fall of 2 cm/m, over the whole horizontal pipe run. Install a 5 cm (minimum) siphon at the outlet to prevent gas or odours flowing back from the drain.
To facilitate transparent tube installation, please lubricate drain tray evacuation outlet with soapy water
When connecting multiple units to the same collector, use a tube with an inside diameter of 16 mm to connect the drain pan to the collector, a fall of 2 cm/m is recommended.

The condensate drain pipe is fixed to the drain pan using a collar; this is not supplied by Lennox.

Important : In order to avoid the risk of any leaks, pour 1 to 2 litres of water into the auxiliary drain pan and check that it drains correctly. Should the water fail to drain correctly, check the fall of the drain pipe and investigate the potential causes of the problem.

3.2.4 Connection on the flexible water pipes

When the installation is ready, i.e. the ARIA fixed to the ceiling, the water manifolds are in position with stop valves fitted, electrical installation prepared, connect the flexibles water pipes (not supplied by LENNOX).
Each flexible has a ½'' gas screw connecter.

Warning: Don't forget to install the gasket between the screw connecter and the stop valve (gasket not supplied by LENNOX).

3.2.5 Purging the circuits

When all the ARIA units have been installed, check that the control valves are open, pressurize and then purge the circuits.
To purge the coils, using a multi grip pliers or a screwdriver, gently unscrew the bleed screw located on the upper coil header.

3.2.6 Electrical connections

- All the power, control and connection cables must be supplied and fitted by the installer(s).
- Always respect the IEE wiring regulations and also the national regulations during installation of the wiring.
- All wiring must be sized accordingly with the fuses recommended for a given unit.
- If required, install a circuit breaker within reach of the unit inside; always connect the equipment to earth.

Warning: Do not apply power to the unit until all the electrical connections have been made.

3.3 – Removal procedure

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON THE ARIA UNIT.

- Switch off the power supply of the ARIA unit at the isolator provided for this purpose during installation (isolator not supplied by LENNOX).

For special regulations, refer to the documentation attached to this manual or included inside protection box.

- Shut the isolating valves located on the collectors.
- Disconnect the flexible water pipes by unscrewing the connectors (G ½'' gas).
- Disconnect the flexible condensate drain pipe, empty the siphon into a container.
- Gently raise the ARIA unit a little, unscrew the 4 nuts on the threaded hangers then lower the unit.

4. FAN MOTOR ASSEMBLY

4.1 Description

ARIA unit is equipped with one (or two) single wheel double inlet centrifugal forward curved fan.

4.2 Removal procedure

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON ARIA UNIT.

If the fan motor assembly developes a fault, the whole assembly must be removed and replaced.

- Remove the motor cover fixed by 8 mm AF hexagonal head screws.
- The fan motor assembly is fixed to a panel. Release the panel fixed by two 8 mm AF hexagonal head screw.
- If an electric heater has been installed, this is mounted on the panel and is removed at the same time as the fan motor assembly (see « removal of the electric heater »).

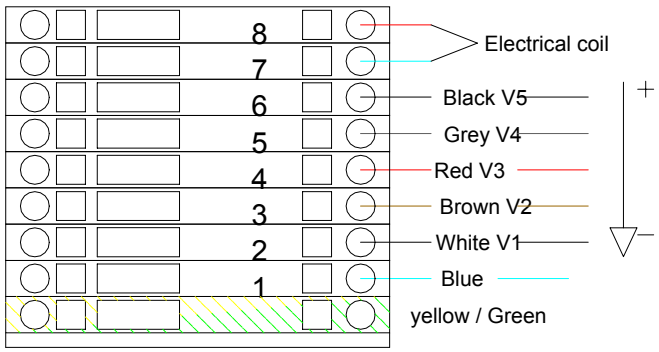
BE CAREFUL TO AVOID CAUSING DAMAGE DURING REMOVAL

- Replace the fan motor assembly and apply the procedure in reverse to complete the installation.

4.3 Motor speed wiring

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON ARIA UNIT.

Le The fan motor has 5 speeds, all are connected the quick connect terminal block.
To wire the speeds, connect the wires for the selected speeds.
The standard speeds are represented in the diagram shown below.



4.4 Capacitor replacement procedure

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON ARIA UNIT.

- Remove the fan motor assembly (see« fan motor removal procedure »).
- Disconnect the capacitor by removing the spade connecters from the back of the capacitor, then using a wrench of 13, to unscrew the nut which maintenance the condenser.
- Replace the capacitor and apply the procedure in reverse to complete the installation.

5. WATER COIL

5.1 Description

The right position of the coil provides a maximum heat exchanger surface for a minimum of space, thus giving to ARIA a very interesting ration height/performance.
Available for 2 pipe or 4 pipe applications, the finned block is common offering an increased heat exchanger surface area.
The aluminium fins are mechanically bonded to 3/8'' diameter copper tubes.
The inlet and outlet connections are each provided with a 1/2'' G internal diameter threaded nut to facilitate the connection of the flat seal valve connection. The purge screws are accessible from the outside and opened with a tool.
The coils are available in the following configurations :

- 2 or 4 rows for 2 pipe/change over or 2 pipe/2 wire application
- 2 or 4 rows cooling and 1 row heating for 4 pipe applications.

5.2 Removal procedure

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON ARIA UNIT.

- Close the isolating valves located on the headers.
- Disconnect the flexible water pipes by unscrewing the connectors (G ½'' gas).
- Remove the valve motor(s) being careful not to damage them.
- Remove the body of the water control valve(s). Depending on the ARIA configuration, do not remove the coupling associated with the valve.
- Disconnect the flexible condensate drain pipe.
- Remove the water coil / condensate drain pan assembly, this assembly is fixed by four 8mm AF hexagonal head screws, by pulling the assembly to the side of the ARIA unit.
- Free the coil from the condensate drain pan.
- Replace the water coil and apply the procedure in reverse to complete the installation.
- Ensure that all the gasket joints are correctly remade.
- Purge the new water coil when it is refilled with water.

5.3 Water coil maintenance

For optimum performance of the water coil, the air filter should be replaced regularly. This maintenance avoids the accumulation of dust between the fins, which would significantly reduce the performance of the coil.

It is also recommended that the water coil is removed and cleaned using a compressed air jet between the fins to remove any possible accumulation of dust.

6. ELECTRIC HEATER

6.1 Description

The electric heater is of the bare wire resistive type installed in the fan discharge air stream, assuring optimum coverage and maximum heat exchange.
Available as standard with a 500, 800, 1000, 1200 or 1500 Watts capacity, the 230 V/1/50 Hz power supply is provided directly from the regulator or via a relay and a fuse.
The heater is provided with 2 levels of safety :

A manual reset thermostat, which is reset by switching off the power, and has a trigger temperature 75°C; whilst this is off a PTC coefficient resistance with a separate supply prevents the automatic reset of the coil whilst it remains under voltage.
This safety thermostat protects the unit from over heating due to the absence of airflow.

A fusible link, rated at a temperature of 152 °C (± 16 °C). Replacement of heater assembly will be required if this blows, after establishing the cause of the fault.

6.2 Replacement

DISCONNECT THE POWER SUPPLY BEFORE CARRYING OUT ANY WORK ON ARIA UNIT.

- Remove the complete fan motor assembly (see« removal of the fan motor assembly »).
- Withdraw the electric heater from its support by tilting it to facilitate its removal.
- Replace the electric heater and apply the procedure in reverse to complete the installation.

7. AIR FILTER

7.1 Description

ARIA unit is available as standard with a G3 efficiency throwaway filter, 10 mm thick, which is accessible from the underside of the unit
Fire classification M1.

Dimensions of the filter are given in the table page 4.

7.2 Filter replacement

It is important that the filter is changed regularly. The filter life depends upon the clogging rate, which varies with the environmental conditions.

If the filter is not changed or cleaned, its pressure drop will increase and dust particles may be may introduced into the fan and the water coil and degrade the performance of the ARIA.

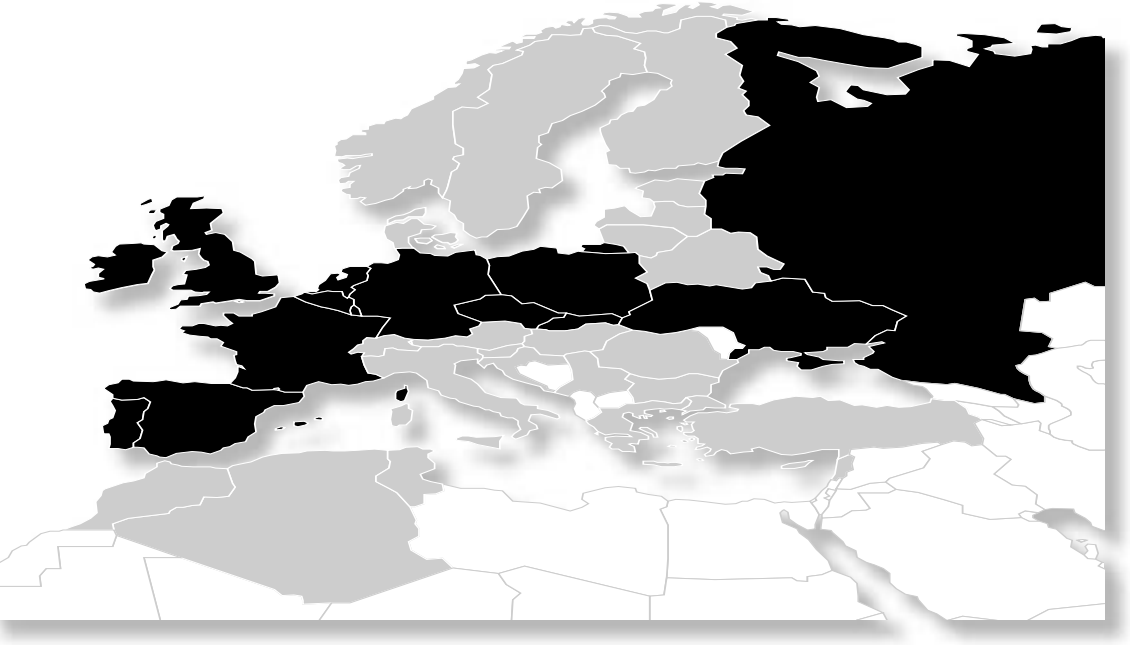
To access the filter, move the latches towards the interior to release them from the holding catches, the clip should be left suspended from the unit

Remove the filter by pulling on the tab, replacement is the procedure in reverse.

8. REPLACEMENT PARTS

If a replacement part is required for a ARIA unit, contact your local representative or Lennox to obtain a detailed and coded list of the following components :

➔ Fan motor assembly
➔ Water coil
➔ Electric heater
➔ Air filter



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