







Installation, operating and maintenance **MINIAIR +**



- Providing indoor climate comfort



SYMBOLOLOGY	
	ATTENTION
	DANGER
	HIGH RISK OF ELECTRIC SHOCK
	ATTENTION: AUTHORIZED PERSONNEL ONLY

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1 - Introduction

Dear Customer,
the heat recovery units are designed and developed for residential and commercial applications and allow the room air renewal with a sure energy saving.

In fact, where the room air renewal is needed, the unit transfers heat between the fresh air and the room air, otherwise would be lost.

In their basic working principle, they consist in (see **figure 1**) :

- 1 – fans (supply and exhaust air)
- 2 – crossflow heat recovery
- 3 – filter sections (on fresh air and return air intakes)
- 4 – electrical board

These units may be integrated with traditional heating and cooling systems, but they can operate also autonomously if equipped with the proper accessories.

This instruction manual supplies the necessary information for the transportation, the installation, operation and maintenance of the unit, under safety working conditions.

Lack of observation of the details found within this manual, and an inadequate installation of the unit may cause the withdrawal of the warranty supplied with the equipment.

Furthermore, the Supplier will not respond to any eventual damage, whether direct or indirect, caused by the incorrect installation, or for damages caused by the installation being effectuated by inexperienced or unauthorised personnel.

Verify, upon acquisition, that the apparatus is complete and supplied as described.

Any eventual disputes must be presented in writing within 8 days from the reception of the goods.

Each unit is provided with identification plate listing the following:

- Address of Constructor
- "CE" Mark
- Model
- Serial Number
- Maximum current in "A"
- Power supply voltage in "V"
- Power supply frequency in "Hz"
- Number of phases indicated with "Ph"
- Date of fabrication
- Gross weight in "kg"

2 – DIMENSIONS AND WEIGHTS

Packing dimensions

The following table, referred to the **figure 2**, shows the characteristic dimensions of the series; where different from horizontal version, within brackets dimensions of vertical one.

	03	06	10	14	19	25	30	40	50	60
A (mm)	990	990	1150	1350	1450	1700	1700	1700	1700	1900
B (mm)	750	750	860	900	900	1230	1230	1230	1350	1450
C (mm)	270	270	385	410	470	490	530	630	705	755
L (mm)	162	162	240	240	240	306	339	339	339 (297)	403 (350)
H (mm)	100	100	218	270	270	270	297	297	297 (339)	350 (403)
L1 (mm)	275	275	330	337	337	502	502	502	555	615
H1 (mm)	153	153	267	267	327	347	387	487	555	615
D (mm)	-	-	230	230	280	305	305	405	480	530
E (mm)	195	195	225	241	230	323	308	308	353 (229)	379 (256)
F (mm)	170	170	238	224	284	290	331	377	477 (353)	501 (379)
G (mm)	197	197	225	241	241	323	323	323	353	379
M (mm)	-- (119)	-- (119)	-- (81)	-- (81)	-- (81)	-- (131)	-- (101)	-- (101)	-- (101)	-- (101)
(kg)	39	41	68	91	99	140	155	179	235	273

3 – INSTALLATION CONFIGURATIONS

Possible positioning

According to the air duct lay-out, it is possible to rotate adequately the RKE unit air inlets and outlets to give the following combinations, each of them is a specific unit orientation to be specified when ordering.

Horizontal configuration

Configurations shown on the **figure 3** are possible.
(1 = fresh air, 2 = return air, 3 = supply air, 4 = exhaust air)

Vertical configuration (with reheating system only “B” o “C”)

Configurations shown on the **figure 4** are possible.
(1 = fresh air, 2 = return air, 3 = supply air, 4 = exhaust air)

To modify the position of the suction inlets it is sufficient to exchange two panels each other, as shown on the **figure 5**.

4 – TRANSPORTATION



Packaging

Each unit is put on bench and protected with cellophane film; the protection must remain intact until the moment of installation.

The materials that are not mounted for technical motives are supplied in fitted packing fixed externally or internally to the unit.



Moving & transportation

For the lifting and transportation of the unit, use adequate equipment, according to the 89/391/CEE regulations and further modifications.

Each individual unit weight is listed in this manual.

While moving, try to avoid rotation without control.

Checklist

Upon reception of the unit, we suggest that a complete control is carried out, to verify that the unit is intact and complete, and no damage has been sustained during transport. Any eventual damage revealed must be communicated to the carrier, demonstrating the reserve clause within the transport documents, specifying the type of damage.

Storing

In case of long term storage, the apparatus must be kept free from dust, and away from areas susceptible to heat and vibration.

The Manufacturer declines any responsibility for any damage as a result of negligence or lack of protection from atmospheric agents.

5 – INSTALLATION & CONNECTION



Definitions

CUSTOMER – The Customer is the person, activity or the society, that has bought or hired the unit, and intends to utilise the machinery for its intended use.

USER / OPERATOR – The User or Operator is the actual person that has been authorised by the Customer to utilise the unit.

QUALIFIED PERSONNEL - Defined as the person who has followed a relevant specific course of study, and so is able to understand the dangers derived from the use of the machinery, and in turn, due to this, are capable of solving major dilemmas.



Safety regulations

The Manufacturer declines any responsibility for failure to respect the Safety Regulations and the prevention as described below.

Furthermore, the Manufacturer declines any responsibility for damage caused by the improper use of the unit and/or modifications carried out without proper authorisation.

- **Qualified personnel must carry out the installation.**
- During the installation operation, use protective clothing, for example: glasses, gloves, etc. as indicated by 686/89/CEE and successive regulations.
- During the installation operate in absolute security, pollution free air and in an area free of obstructions.
- Respect the regulations in force in the country in which the apparatus is being installed. Specifically relative to its use, and to the disposal of packing and products used for the cleaning and maintenance of the unit. Respect the recommendations given by the producers of such products.
- Before placing in function the unit, check the perfect connection of the various components and the internal parts of the system.
- Avoid at all costs human contact with moving parts and contact with the parts themselves.
- **Do not commence with servicing or cleaning of the unit, before the unit has been disconnected from the main supply.**
- The maintenance and the substitution of damaged or consumed parts must be carried out only by specialised personnel, following the indications found within this manual.
- Spare parts must correspond to the requirements specified by Manufacturer.
- In case of dismantling of the unit, respect the anti-pollution regulations in force.

N.B. The installer and the user of the apparatus must take into account, and solve problems, connected with any other type of risk that may occur to the unit. For example, risks derived from the entrance of foreign bodies, or risks due to the presence of flammable or toxic gas.



Preliminary operations

- Check the perfect condition of the various components of the unit.
- Control that contained within the packing, there are the installation accessories, and documentation.
- Transport the packed section as close as is possible to the intended place of installation.
- Do not place tools or weight on top of the packed unit.



Choosing place of installation

- Position the unit on a solid structure, that will not vibrate, and is capable supporting the weight of the machine.
- Position the unit in a point where the condensation discharge may occur easily.
- Do not position the unit in an area in which flammable gases, acidic or corrosive substances are present. They may damage various components in an irreparable manner.
- Allow a minimum amount of free space as indicated in the **figure 6**. This permits ease of installation and maintenance.

Machine positioning

The unit is equipped with anti-vibration support plates.

With referement to the **figure 7**, the following are instructions to fix the unit to its supports :

1. Carry out the drilling of the ceiling, and fit the four M8 threaded bolts (1).
2. Position the unit on the four bolts using the supplied fixing plates (6).
3. Insert anvibrator (2), washer (3) and screw nut (4) and lock nut (5) without blocking.
4. Install the unit with 3 mm inclination towards the condensate outlet to aid the condensation going out.
5. Block the unit tightening the fixing bolts.

Air duct connections



IMPORTANT: IT IS IMPORTANT NOT TO PLACE IN OPERATION THE UNIT IF THE FAN OUTLETS ARE NOT DUCTED OR NOT PROTECTED BY A SAFETY NET ACCORDING TO THE ACTAUL REGULATION.

- The ducts must be the correct dimension based on the functions of system and the air diffusion characteristics of the unit fans.
- To prevent the formation of condensation and cut down the sound level it is advised to use internally lined ducts.
- To avoid the transmission of unit vibrations into the environment, it is advised to fit an antivibrating joint between the fans and ducts. The electrical continuity must be guaranteed between the ducts and the apparatus via an earth cable.



Water connections

The installation and connecting of the piping is an operation that must be done correctly, otherwise it may compromise the performance of the system. At worst it may cause irreversible damage to the machine. These operations are to be effectuated by **qualified personnel**.

Condensation outlet connection

- The system of drainage must provide an adequate trap able to allow the condensation run off on underpressure conditions.
- The trap must be designed as shown on the **figure 8**
- The trap must have a tap for correct cleaning of the lower part, and must allow an easy disassembly.
- The path of the condensation drainage tube must always have a gradient toward external.
- Insure that the condensation run-off tube does not interfere with discharge of the unit.

Water coil connection (LXMAP-SKW/LXMAP-SAF)

- The water heating or cooling coil (LXMAP-SKW or LXMAP-SAF) is supplied with GAS “male” threaded headers.
- The tightening must be carried out with extreme care to avoid damage to the copper collectors of the coil.
- The path of the tubes must be studied in a way to avoid obstacles should it be necessary to extract the unit coil.
- Inlet and outlet water must consent the thermal exchange against the current. Follow instructions found on the WATER INLET and WATER OUTLET plate.
- Provide an air valve at the top of the unit, and a water discharge valve at the bottom.
- Reinforce sufficiently the units external tubes to avoid offloading the weight onto the coil.
- Once connection has been effectuated, fix the external seal flush against the control panel, in this way avoiding the passing of air.
- The insulation must not rest against the panelling, as this may provoke burning.
- For control purposes, organize the interception of the tube side coil when the fan is off, to avoid internal overheating and possible damage to internal components.
- Provide an anti-freeze system.
- Provide a cut out switch to isolate the coil from the rest of the circuit in case of extensive maintenance needs.
- Should the unit be installed in particularly cold areas, drain completely before plant shut-off long periods.



Electrical connections

**Before starting any operation, insure that the general power supply has been isolated.
All the electrical connections must be protected at the source by the installer.**

- Qualified personnel according to the supplied schemes must carry out the electrical connections at the control panel.
- Insure that the voltage and the frequency shown on the technical plate correspond to the connecting power supply.

Follow the connection of the unit and its accessories using adequate cabling for the power used, and respecting the country regulations. The dimensions of the cabling must be sufficient to support a voltage drop in start up phase inferior to 3% of the nominal.

- For the general power supply of the unit, and its accessories, the use of adapters, multiple plugs and extension leads is to be avoided.
- **It is the responsibility of the installer to insure that the installation of the unit is as close as possible to the mains power supply, or sufficiently close to protect the electrical parts.**
- Connect the unit to an efficient power point, using the correct screws as supplied with the unit.
- In the unit with relay board the screws of the connectors must be screwed with tork equal to 0,5 Nm

6 – WIRING DIAGRAMS



Direct connection for model 03 up to 25

Follow diagram on the **figure 9**.

Direct connection for model 30

Follow diagram on the **figure 10**.

Direct connection for model 40 up to 60

Follow diagram on the **figure 11**.

TO CONNECT CONTROL ACCESSORIES (CVU, PCR, RQU) CHECK THE SPECIFIC INFORMATION SUPPLIED WITH RKE MANUAL.

Notes

In the wiring diagrams, direct connections to the low fan speed are indicated; for medium or high speed connection, connect the neutral to the clamp 2 (medium) or 3 (high) (models 40, 50 and 60 excluded; for high speed, connect the phase to the clamp V2).

“A” is a possible remote On-Off (by Others).

7 – STANDARD MAINTENANCE



BEFORE FOLLOWING ANY TYPE OF MAINTENANCE OPERATION, BE CERTAIN THAT THE UNIT MAY NOT CASUALLY OR ACCIDENTALLY BE CONNECTED TO THE ELECTRICAL MAINS SUPPLY. THEREFORE IT IS NECESSARY TO SHUTDOWN THE UNIT'S POWER SUPPLY PRIOR TO MAINTENANCE.

- It is the responsibility of the User to carry out all types of maintenance operations.
- Only personnel previously trained and qualified may carry out maintenance operations.
- Should the unit require disassembly, hand protection is required

Monthly maintenance

Air filters

Filter section can be entered through side removable panel as well as bottom turnable panel; following the **figure 12**, in the first case, filter removal is done by dismounting the side filter frame 1, in the second case, by dismounting the bottom filter frame 2.

For the cleaning, utilize a vacuum cleaner or wash with normal detergent and warm water, allow to dry well. Remember to assemble the filter before operating the unit; replace a new filter after max 3 cleaning cycles. In case of soft bag filter (option), replace it when dirty.

Condensation discharge

Remove side panel and clean, if necessary, the dirt and impurities that have formed in the condensation tray. Also check the efficiency of the trap.

Water coil

Check that the coil exchanger (optional) is clean and in perfect state to guarantee the normal levels of performance.

Yearly maintenance

Check that all the electrical equipment, in particular the fixing of the electrical connections.

Check the tightness of all nut, bolts, flanges and hydraulic connections that the vibrations of the machine may have loosened.

8 – TROUBLESHOOTING



Failure searching and problem solving schedule

Founded failure	Probable cause	Possible solution
Fans are not running	<ul style="list-style-type: none">• Power supply is switched off• No signal from control panel• Wrong or loose electrical connections• Motors on thermal protection mode	<ul style="list-style-type: none">• Switch on the power supply• Push the correct buttons of the control panel• Restore the right connections• Check motor current
Fans are running wrongly (in case of model 40)	<ul style="list-style-type: none">• The phase connection is not correct	<ul style="list-style-type: none">• Restore the right phase connection
Some fan speeds are not working	<ul style="list-style-type: none">• Relais board failure	<ul style="list-style-type: none">• Replace the relais board
Air performance decreasing	<ul style="list-style-type: none">• Air filter dirty• Air duct blocked	<ul style="list-style-type: none">• Clean or replace filter• Check air plant (are dampers open ?)
Condensate water stays inside the unit	<ul style="list-style-type: none">• Condensate drainage blocked• Lacking or not adequate trap	<ul style="list-style-type: none">• Clean or free the drainage• Install a right trap

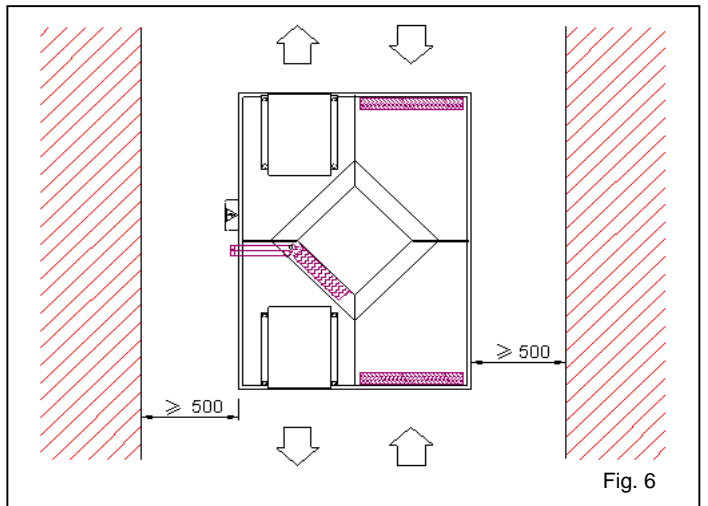
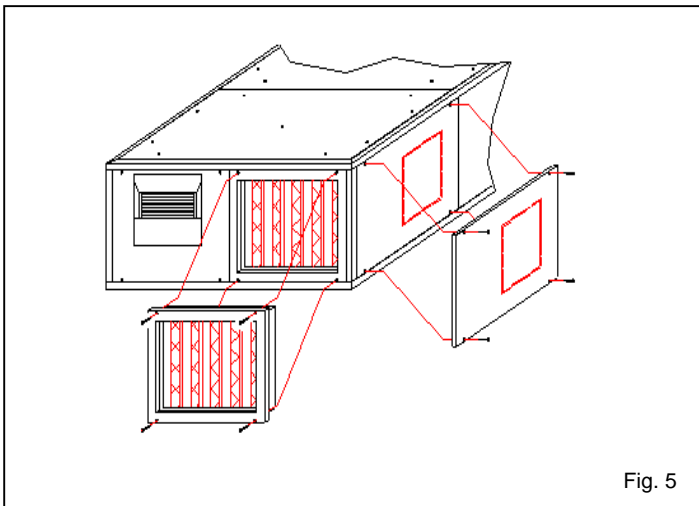
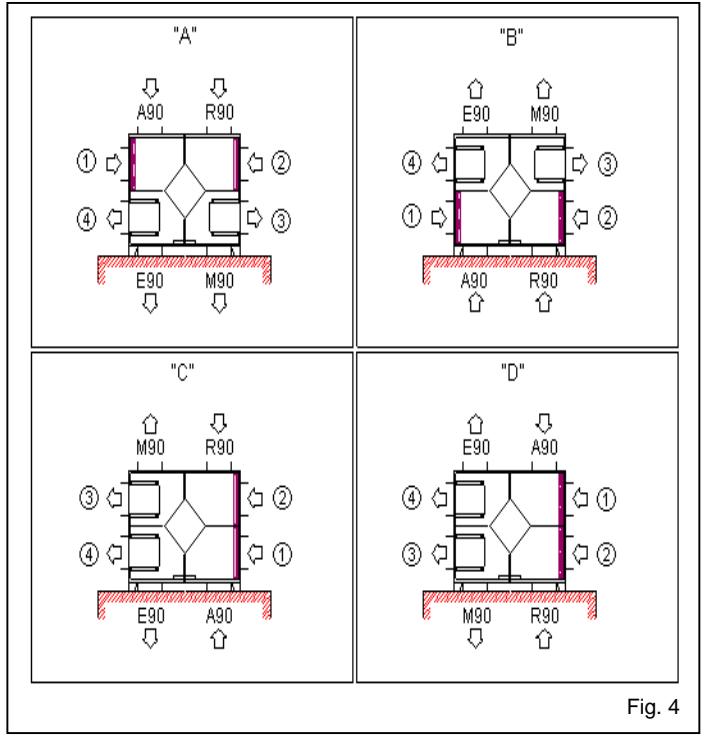
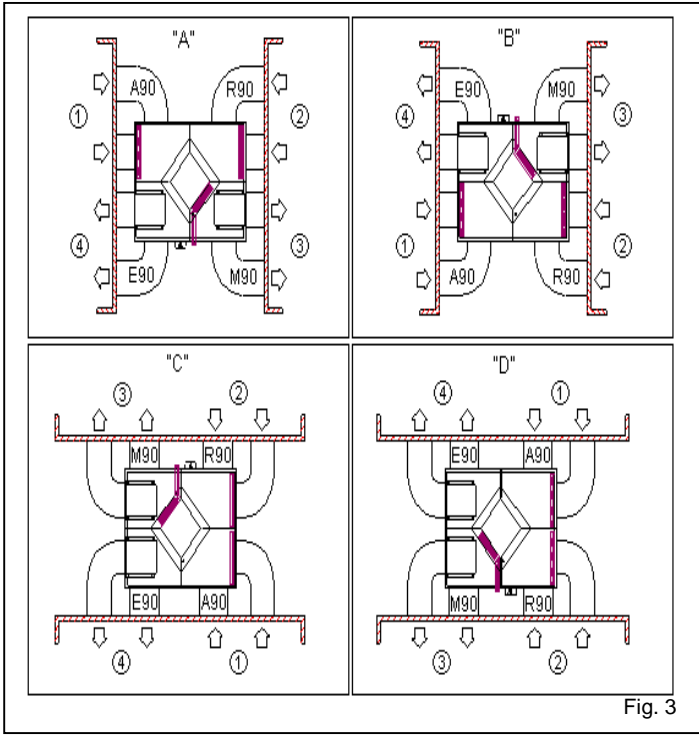
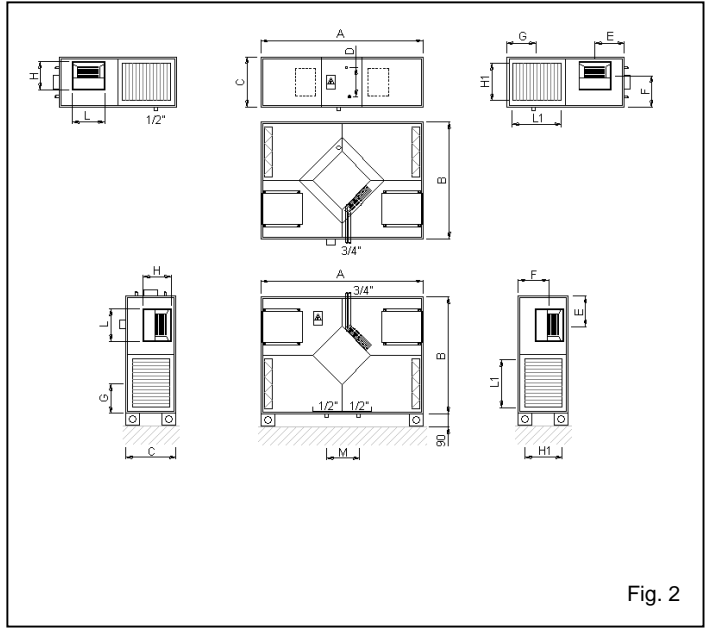
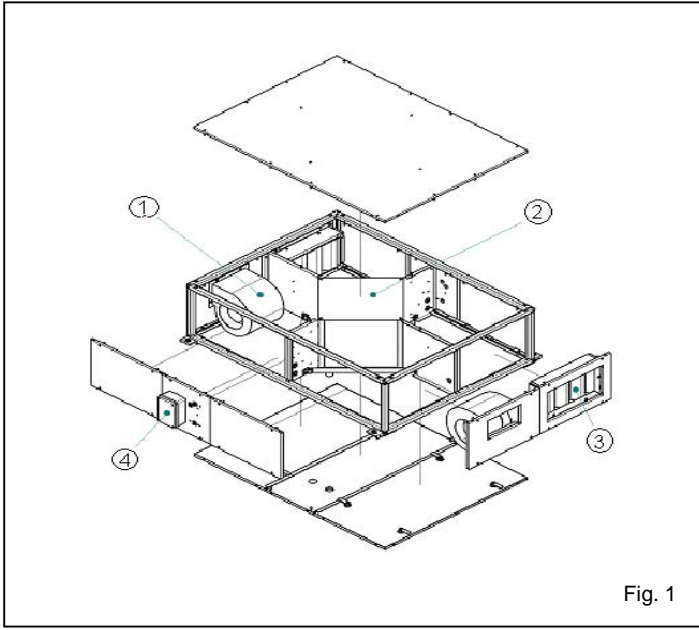
9 – MATERIAL DISPOSAL



At the end of unit's lifetime, its components must be dismantled and disposed of respecting the operational regulations present in its country of installation.

The materials that the unit is constructed of are:

- Precoated sheet metal
- Zinc-plated sheet metal
- Aluminium
- Copper
- Polyester
- Polyethylene
- Mineral wool
- Stainless steel
- Plastic.



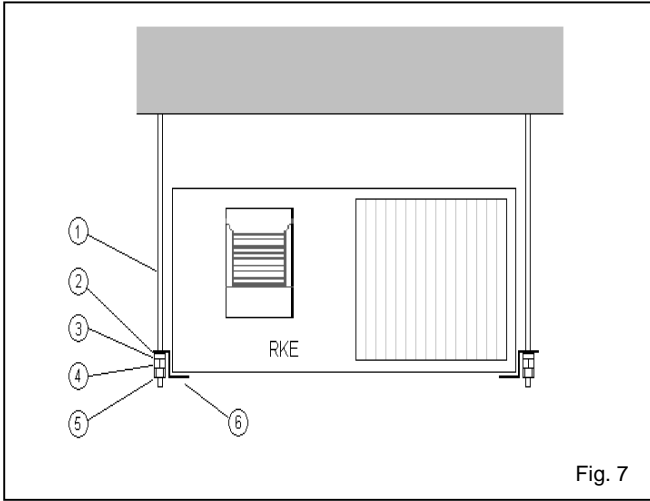


Fig. 7

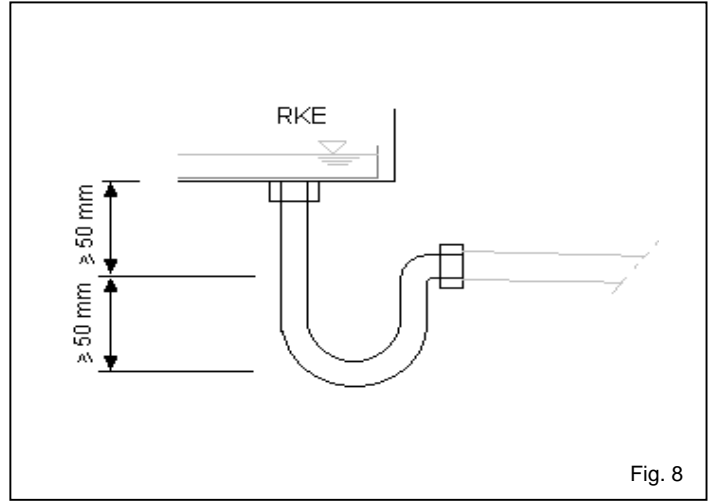


Fig. 8

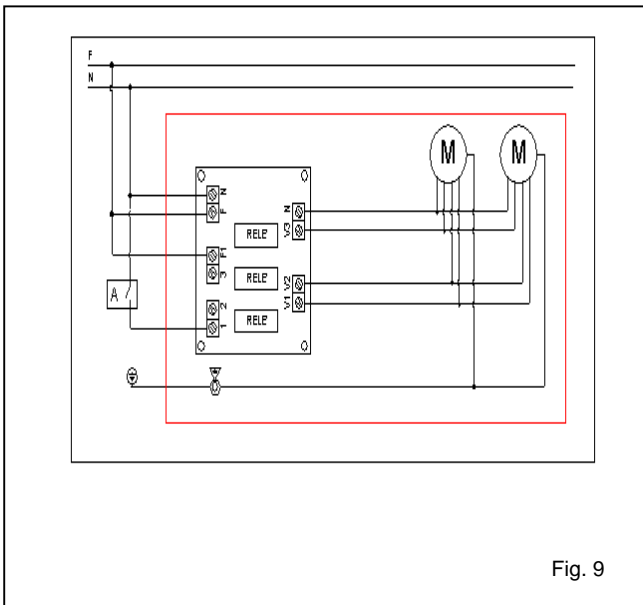


Fig. 9

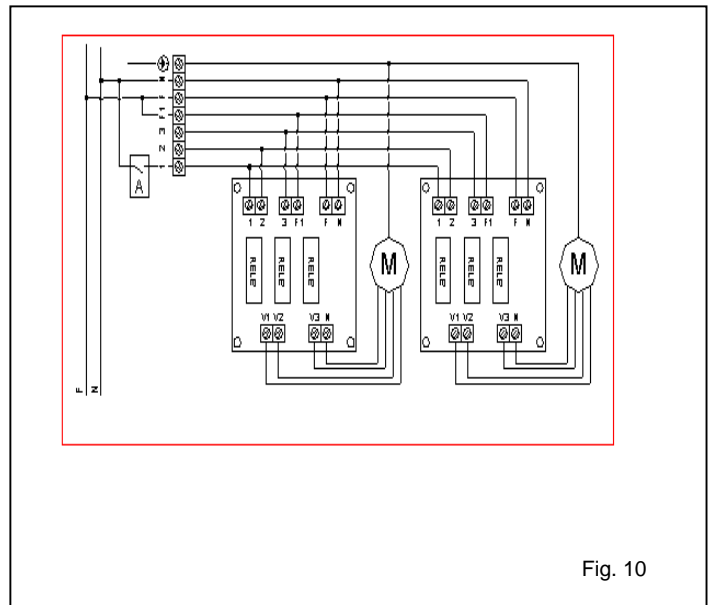


Fig. 10

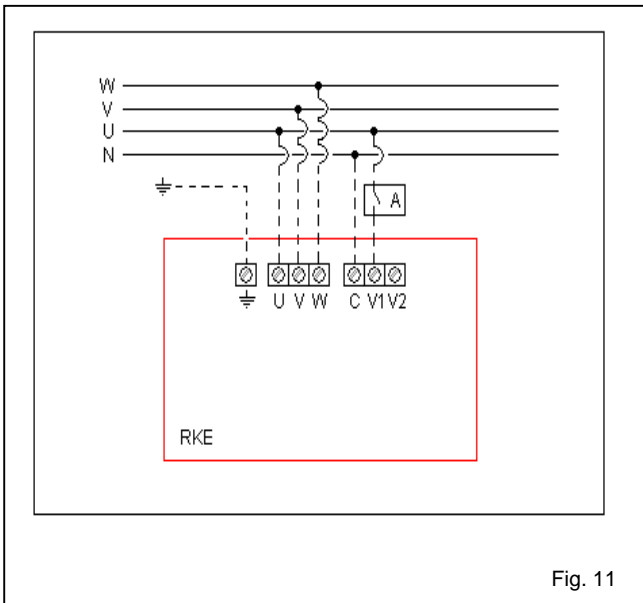


Fig. 11

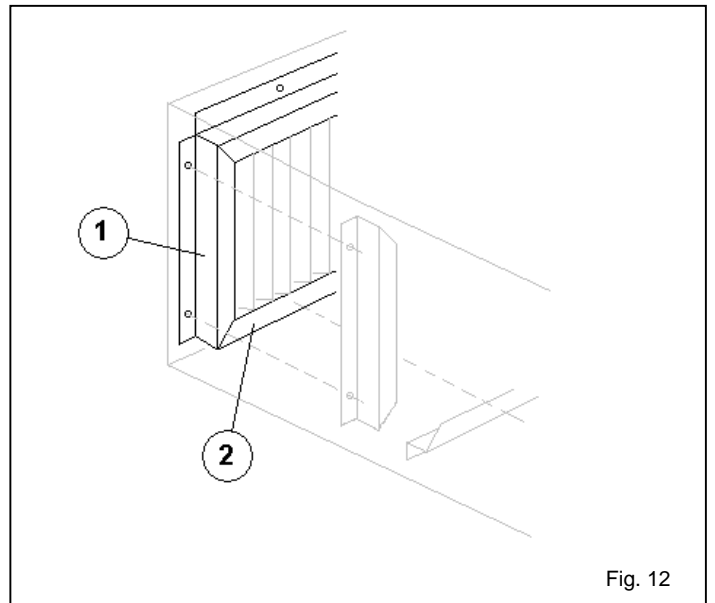


Fig. 12



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Improper installation, adjustment, alteration, service or maintenance can cause property damage or personal injury.

Installation and service must be performed by a qualified installer and servicing agency