

# INSTALLATION, OPERATION AND MAINTENANCE



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# DUCTABLE FAN COIL UNIT

# 2581 - 27851 W 381 - 5668 m³⁄h



INALTO-IOM-1809-E



# INALTO

# INSTALLATION, OPERATION AND MAINTENANCE

Ref: INALTO-IOM-1809-E

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#### INTRODUCTION

This installation and maintenance booklet should always accompany the air treatment unit for ready consultation by the installer or user if necessary. The unit should be installed in compliance with the regulations in force in each country and according to the manufacturer's or qualified person's instructions. The manufacturer cannot be held liable for any damage to property or injury to persons and animals caused by incorrect installation of the unit. Only qualified persons should install the unit and connect it to the mains electricity supply. Before carrying out any work on the unit, ensure that it is disconnected from the electricity supply. Read this instruction booklet prior to installation.

#### RECOMMENDATIONS

This unit is easy to use, but it is important to read all the contents of this guide before using it for the first time. This will help you to:

- use the unit in all safety
- obtain best performance
- avoid incorrect actions
- respect the environment
- Do not allow children or unassisted handicapped persons to use the unit.
- Do not touch the unit with wet parts of the body or if barefoot.
- Do not tug, pull or twist electrical cables attached to the unit, even when disconnected from the electricity supply.
- Do not open the flaps giving access to the internal parts of the unit without having first put the system on-off switch to "off".
- Do not introduce sharp pointed objects through the air intake and outlet grilles.
- Do not leave packing material (boards, staples, plastic bags, etc.) within reach of children since they could be a source of danger. Dispose of correctly.
- Do not spray or throw water directly on the unit.
- Do not use the unit in places with suspended dust/powder or in potentially explosive atmospheres, in very damp environments or in the presence of oil in suspension or in particularly aggressive atmospheres.
- Do not cover the unit with objects or drapes that even partially obstruct the air flow.

The unit works by electricity at mains voltage (230 Vac, 50 Hz). Always bear in mind that mains voltage is potentially dangerous and any appliance connectedto it should be used with caution. Before carrying out any work on the unit, disconnect it from the electricity supply (by pulling out the plug from the mains socket or isolating the supply line by putting the on-of switch OFF. If the unit is not be used for long periods, make sure that the controls are in the position 0 (off). If the unit is not going to be used in winter when temperatures are near to freezing, drain the system and ensure that the unit heat exchanger has no water in it in order to prevent the formation of ice and consequent breakage. To make the unit inoperable, disconnect it totally from the electricity supply. It is unsafe to alter or try to alter the characteristics of this product. Any tampering or alteration in any case makes the warranty null and void. In the event of malfunction or failure, do not try to repair the unit yourself; contact a gualified technician. Repairs carried out by incompetent persons could cause damage or accidents. Always keep the unit clean. In particular clean the air filter periodically (at least once a month).

FAILURE TO COMPLY WITH THE ASSEMBLY INSTRUCTIONS GIVEN IN THIS GUIDE RELIEVES THE PRODUCER OF ALL AND ANY LIABIL-ITY. INCORRECT INSTALLATION COULD CAUSE MALFUNCTIONING OR FAILURE OF THE UNIT. IT COULD ALSO REPRESENT A HAZARD FOR THE USER.

#### **IDENTIFICATION OF THE UNIT**

The air treatment units come with a rating plate, which shows :

- The manufacturer's address;
- "CE" marking;
- Model;
- Lot number;
- Date of production;
- Rated absorbed current in "A";
- Input in "W";

- Supply voltage in "V";
- Supply frequency in "Hz";
- Number of phases, indicated with "Ph":
- Total cooling capacity in "W";
- Sensible cooling capacity in "W";
- Heating capacity

#### TRANSPORTATION, RECEIVING, HANDLING

The units and their accessories are enclosed in cardboard boxes up to size 50, while the other sizes are palletised. The packs should be kept intact until positioned in the final place of installation. Use suitable handling equipment according to the weight of the unit, as provided for by directive 89/391/EEC and subsequent amendments. The weight of each single machine is given in this guide (table 2). Upon receiving the unit, check all the parts for any damage caused in transit. Any damage should be reported to the carrier by affixing an accepted with reservation on the accompanying note, specifying the type of damage. In the event of prolonged storage, keep the units protected against dust and far from sources of vibration or heat. The number of units that may be positioned on one pallet are given in the table (table 1).

THE PRODUCER CANNOT BE HELD LIABLE FOR DAMAGE DUE TO INCORRECT HANDLING OR LACK OF PROTECTION AGAINST THE ELEMENTS.

#### SAFETY INSTRUCTIONS

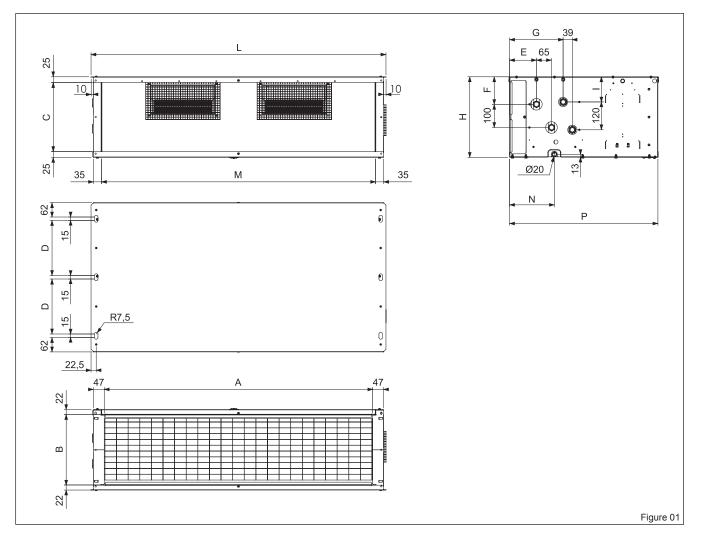


Secure packs during transportation. Do not expose to the elements. Do not tread on packs.



Protect hands with work gloves when dismantling the unit. Work in PAIRS if the appliance weighs more than 25 kg.

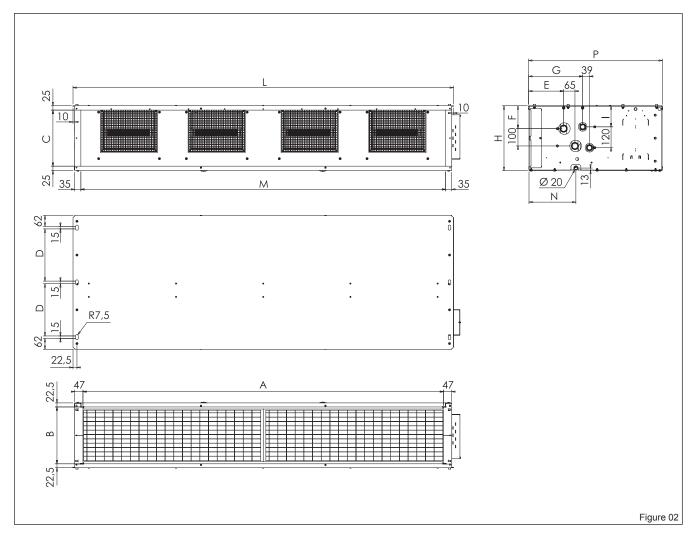
# DIMENSIONS - UNIT 05 to 28



# TECHNICAL DATA - UNIT 05 to 28

	SIZE		05	11	15	25	28
L			770	1070	1270	1420	1520
Н			297	297	347	372	397
Р			643	643	643	770	770
А			656	956	1156	1306	1406
В			253	253	303	328	353
М			680	980	1180	1330	1430
С		mm	247	247	297	322	347
D			237	237	237	300,5	300,5
E			118	118	118	195	195
F			93,5	3,5 93,5 118,5		131	143,5
G			233	233	233	310	310
I			83,5	83,5	108,5	121	133,5
N			193	193	193	270	270
	2 rows coil		1/2"	1/2"	3/4"	3/4"	1"
Fittings (male)	4 rows coil	Ø	1/2"	3/4"	3/4"	1"	1"
	6 rows coil		3/4"	3/4"	1"	1"	1" 1/4
Net weight		kg	28	38	49	62	

# DIMENSIONS - UNIT 49 & 57



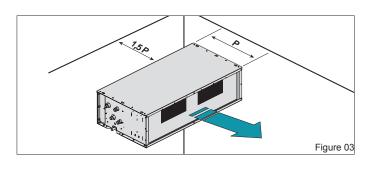
# TECHNICAL DATA - UNIT 49 & 57

		SIZE	49	57
L			2190	2190
н			373	398
Р			770	770
A			2076	2076
В			328	353
М			2100	2100
С		mm	323	348
D			300,5	300,5
E			201,5	201,5
F			131,5	144
G			311	311
I			121,5	134
N			270	270
	2 rows coil		1"	1"
Fittings (male)	4 rows coil	Ø	1" 1/4	1" 1/2
(	6 rows coil		1" 1/2	1" 1/2
Net weight	·	kg		

# **RECOMMENDATIONS FOR INSTALLATION**

Before installing the unit, ensure that:

- The place of installation has sufficient space for carrying out installation as well as routine and extraordinary maintenance work (see Figure 03). If the unit is installed behind a suspended ceiling, an access should be provided;
- 2) There are no obstructions for air intake and delivery;
- The water fittings are of the sizes, in the position and spaced apart as required by the unit;
- The system pressure does not exceed 8 bar for the water-filled versions;
- The electricity supply corresponds to the data on the unit rating plate and that there is a circuit breaker switch readily accessible to the user to cut off the power supply whenever necessary;
- The circuit breaker is in the OFF position so that there is no voltage on the unit supply line.



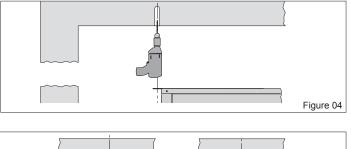
# INSTALLATION OF THE AIR TREATMENT UNIT

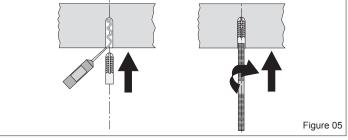
#### PRELIMINARY OPERATIONS

- check that the various unit components are perfectly intact;
- check that the installation accessories and documentation are in the pack;
- place the packed section as close as possible to the place of installation;
- do not place tools or weights of any kind on the packed unit.

Drill the holes in line with the relative slots for the 6 unit screw anchors (Figure 4).

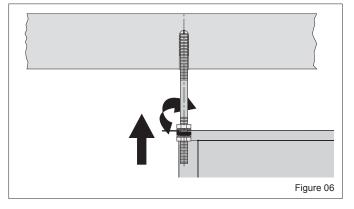
Inject thermosetting resin into the holes and then insert the screw anchors (Figure 5).





Fix the threaded rods of the correct length to the screw anchors (Pic. 5) and insert them into the relative slots (Pic. 6). After having created a slope (max. 3 cm/m) in the direction of the condensate outlet, lock the threaded rod with a nut and check nut. To prevent possible noise being created by vibrations from the unit, it is advisable to insert a vibration-damping joint.

Note: the screw anchors, threaded rods and whatever else is necessary for accomplishing the installation are NOT included in the supply of the air treatment unit.

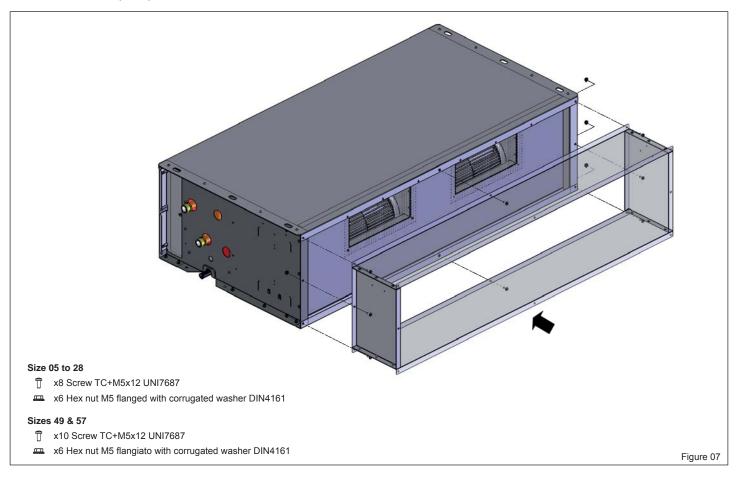


# EXAMPLE OF ACCESSORIES USE AND COMPATIBILITY

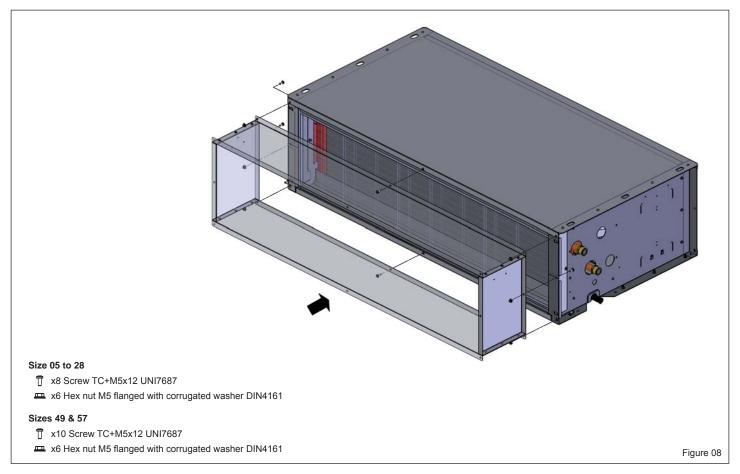
UNIT								
РАМ					• • • • • • • • • •	· 43	Ę	ji tutuntu
RAM					• • • • • • • • • • • •		Ę	<b>HERRICA</b>
GAM	M				<ul> <li>€ €.</li> <li>.</li> <li>.<th></th><th></th><th></th></li></ul>			
SRE				• @ • • • • • • • • •				
SRA				• • • • • • • • • • • • • • • • • • •				
USG	• • · · • • • · • • •					Ę		
SSP				Ę				
Aluminium damper								
BAM	Ę		• • • • • • • • • • • •					
Air intake grill								
Air supply grill	areasonarea.							

Depending on the requirements, the air filter can have a thickness of 12/25/48 mm

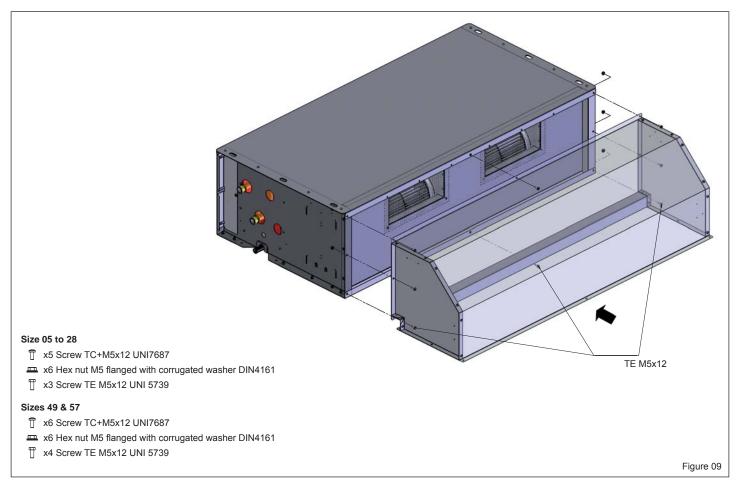
## SUPPLY PLENUM (PAM)



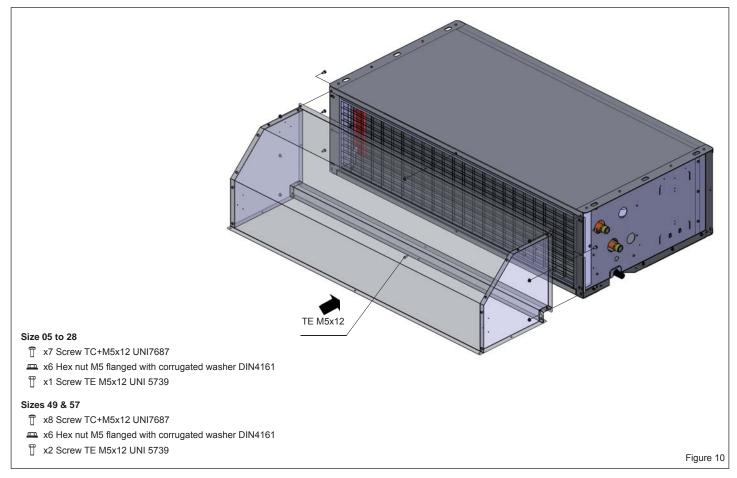
## **INTAKE PLENUM (PAM)**



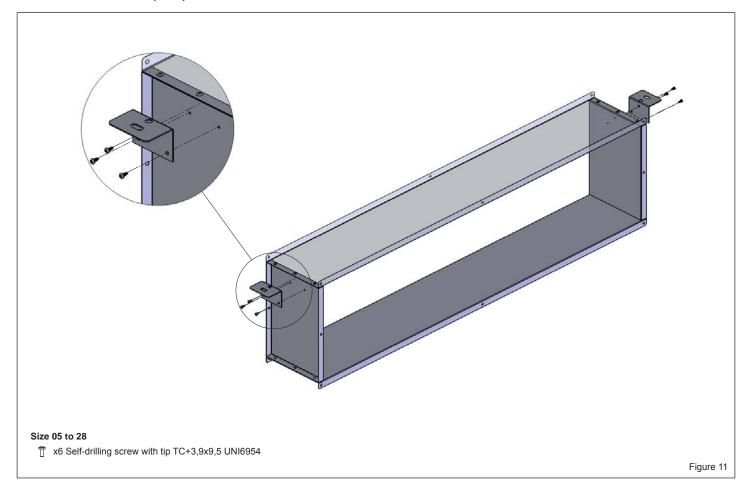
# SUPPLY PLENUM (RAM)



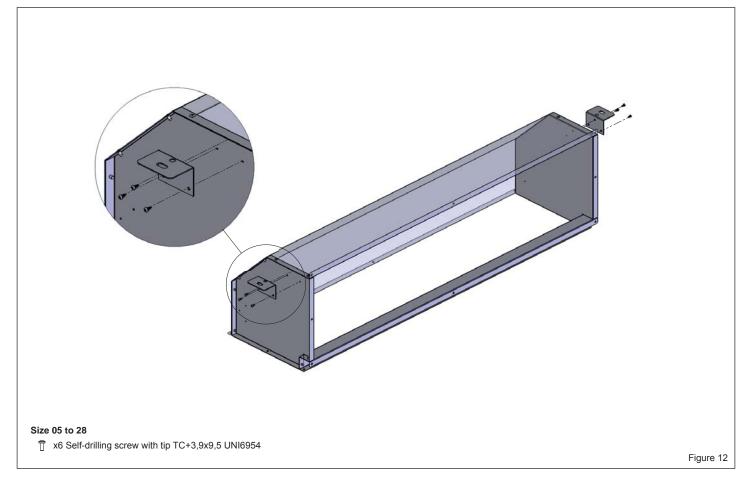
# **INTAKE PLENUM (RAM)**

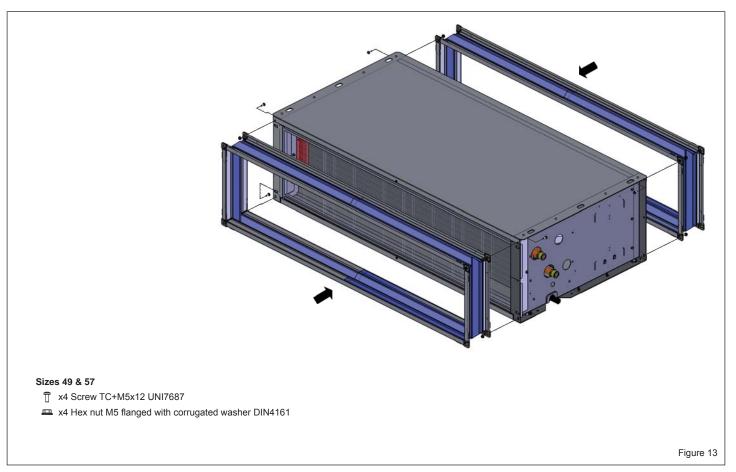


# **MOUNTING BRACKET (PAM)**

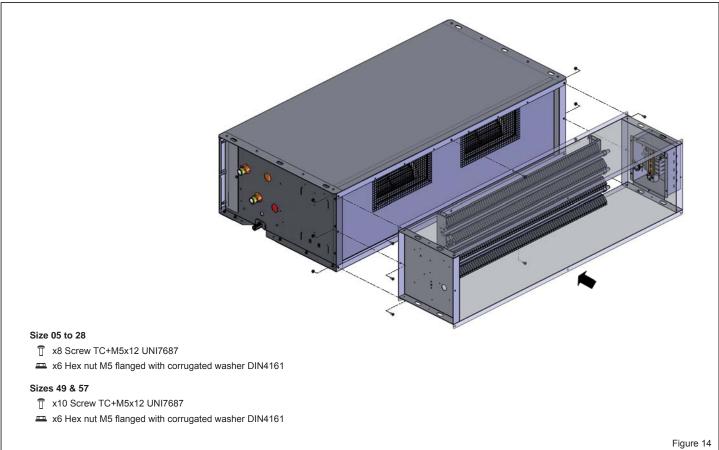


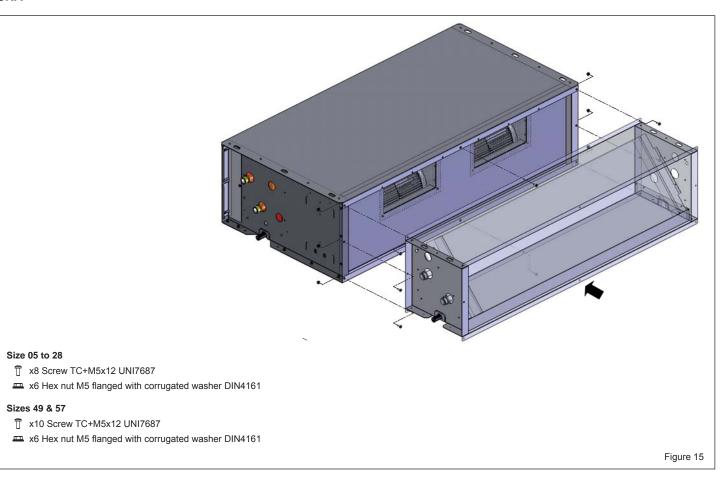
# MOUNTING BRACKET (RAM)



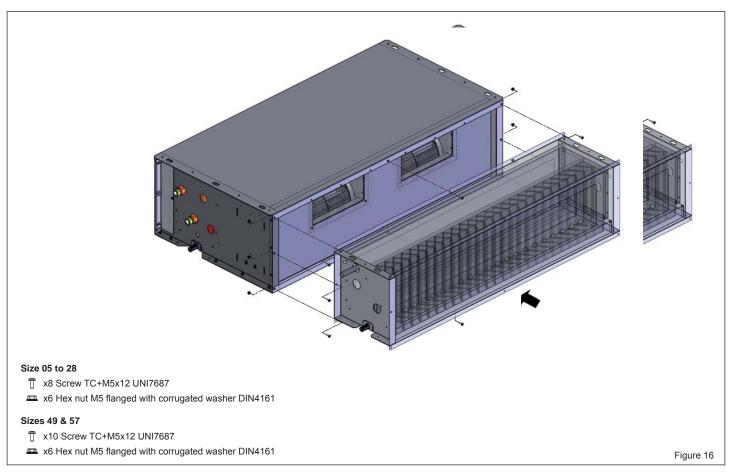


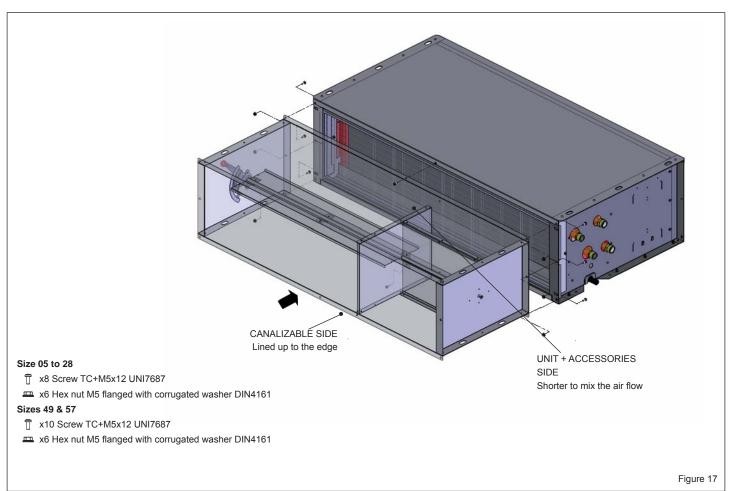
# SRE



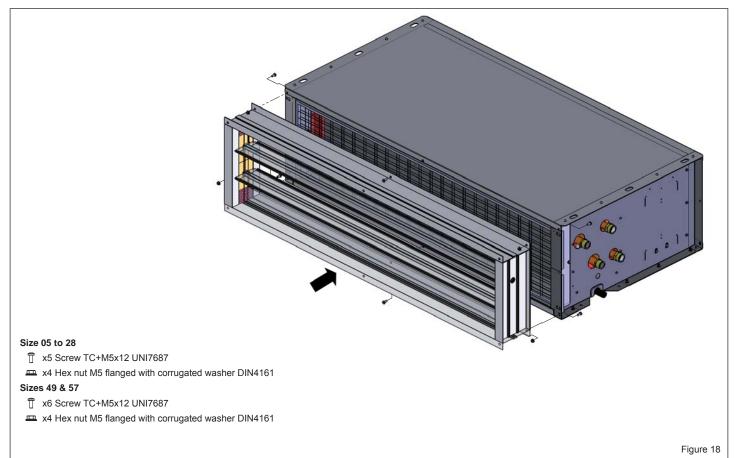


# USG

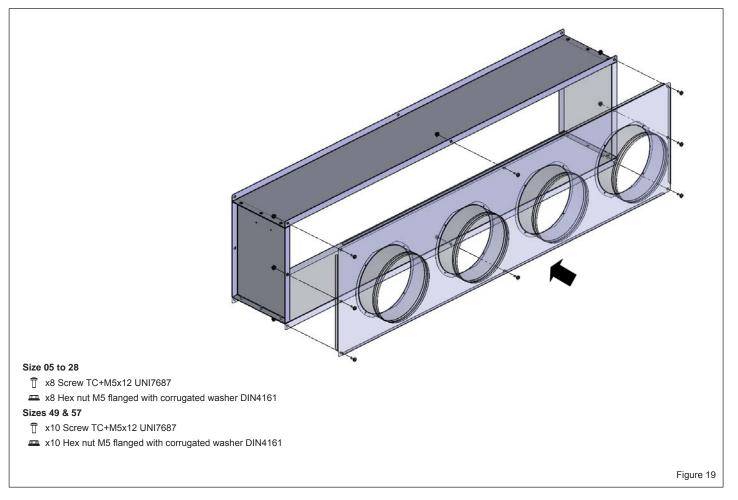




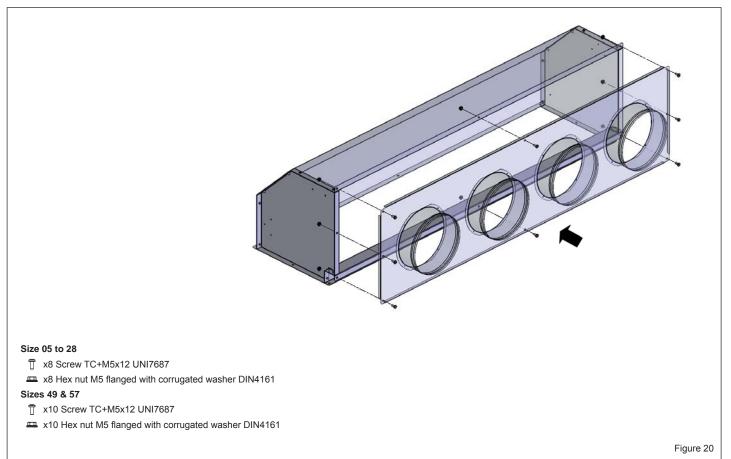
#### **ALUMINIUM DAMPER**



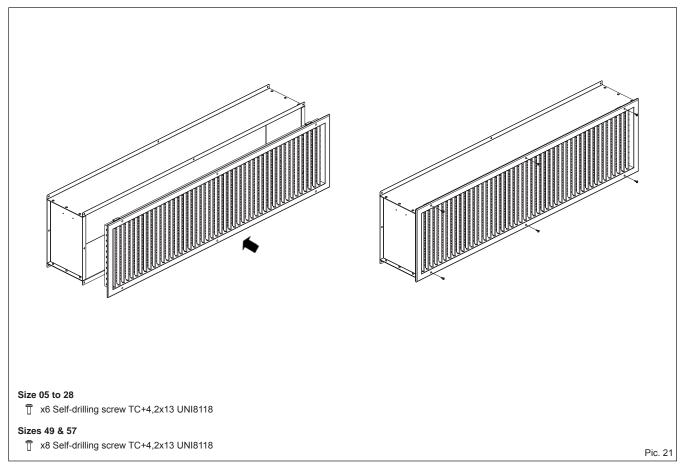
#### **BAM ON PAN**



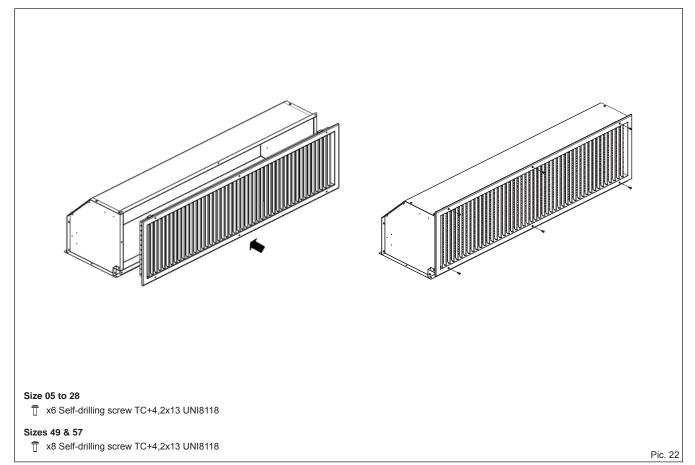
# **BAM ON RAM**



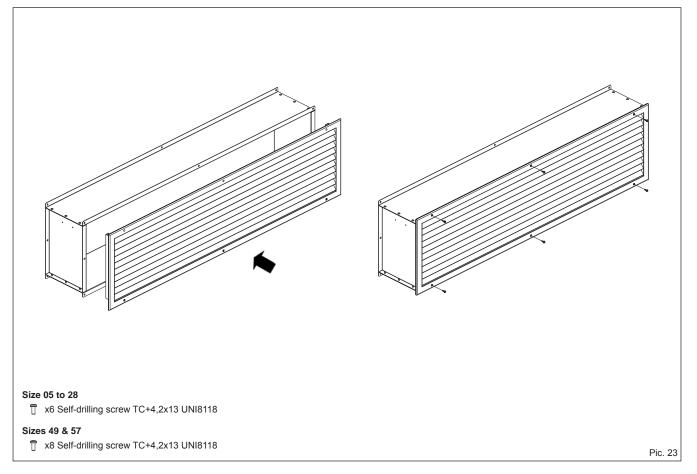
# SUPPLY GRILL ON PAM ASSEMBLY DIAGRAM



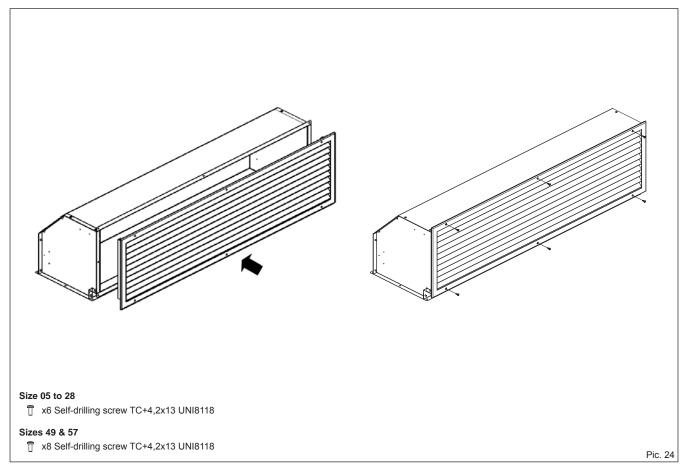
## SUPPLY GRILL ON RAM ASSEMBLY DIAGRAM



# INTAKE GRILL ON PAM ASSEMBLY DIAGRAM



## INTAKE GRILL ON RAM ASSEMBLY DIAGRAM



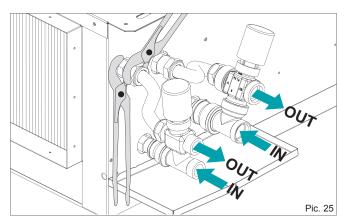
#### MAIN HYDRAULIC CONNECTION

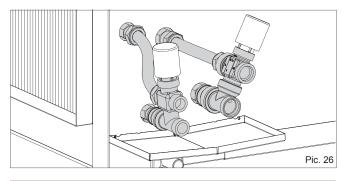
#### **CAUTION !**

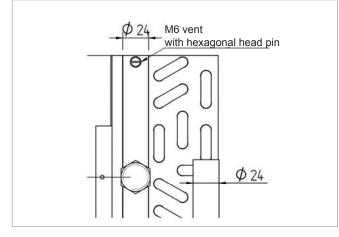
Always use a wrench and counter-wrench for connection of the coil to the pipes (pic. 25). If the valve is installed, suitably insulate the valve body with insulating material (pic. 26).

Connect the water inlet and outlet pipes, observing the indications given on the side of the unit. Correctly insulate the water supply pipes to prevent dripping during the cooling mode of operation. A shutoff valve should be inserted on the water supply pipe and a balancing valve on the outlet pipe. The valve body and balancing valve should also be properly insulated to prevent dripping. It is the installer's responsibility to insulate properly and the manufacturer cannot be held liable for any insulation work.

NOTE: It is always advisable to install the valve. In the heating mode of operation the valve reduces consumption because upon reaching the set temperature the circulation of water is stopped to avoid wasting energy (the fan coil would otherwise continue to heat like a radiator, even with the motor at a standstill). In the cooling mode of operation the valve stops the circulation of water when the set temperature is reached, this stopping the internal exchanger from continuing to condense water with possible undesirable dripping onto the floor. It also reduces chiller operation with consequent energy saving.



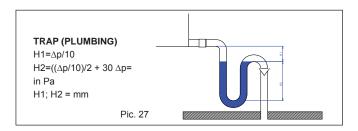


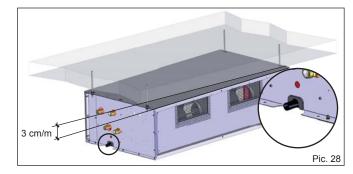


#### CONDENSATE WATER DRAINAGE

The condensate drain pipe should slope downwards by at least 3 cm/m and should not have ascending or throttled sections in order to ensure a regular flow of water. It is advisable for a trap to be fitted. The condensate drain pipe should be connected to a rainwater drainage system. Do not use sewage systems to avoid possible rising of odours in the event of evaporation of the water in the trap. Upon completion of work, check that the condensate flows out properly by pouring water into the tray. The condensate water drainage system should be fabricated in a workmanlike manner and should be periodically checked.

The manufacturer cannot be held liable for any damage caused by dripping in the absence of a valve or of periodic maintenance of the drainage system.





#### **ELECTRICAL CONNECTIONS**

#### **RECOMMENDATIONS!**

Before carrying out electrical connections, ensure that the electricity supply to the supply line has been cut off, checking that the on-off switch is in the OFF position.

- Only qualified electricians should carry out the electrical connections.
- Check that the mains supply is single-phase 230 Vac/1/50 Hz (± 10%).
- Operating the unit with voltages outside the above limits could cause malfunction and renders the warranty null and void.
- The power supply line should be fitted with at least a switch isolator in conformity with European standard EN60947-3.
- Make sure that the electrical system is suitable for providing not only the working current required by the unit, but also the necessary current for powering household and other electrical appliances already in use. Any electrical and mechanical alterations or tampering render the warranty null and void.

The cables should be sufficiently long so that they are not permanently taut or create throttling or compression on metal parts.

The power cables should be sufficiently long so that in the event of accidental tugging the active wires are subjected to stress before the earth wire. Connect the earth wire to the relative terminal marked with the symbol  $\frac{1}{2}$ . Comply with the safety regulations in force in the country of installation.

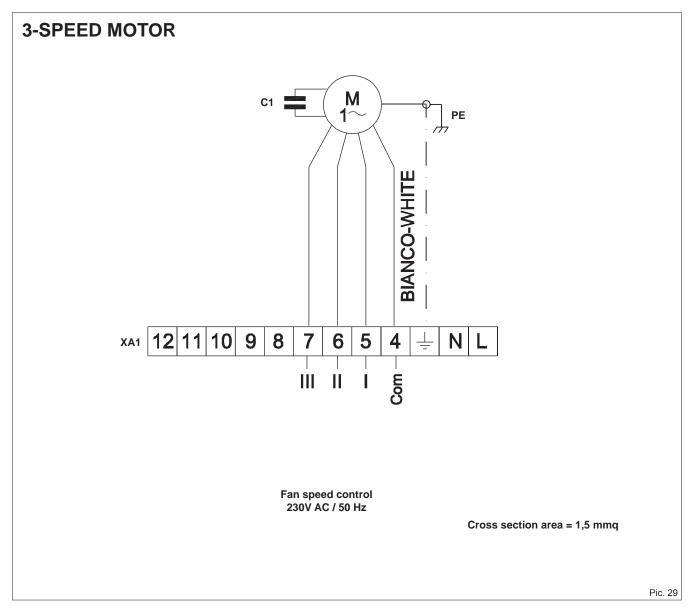
#### CONNECTIONS TO THE TERMINAL BOARD

The electrical connections should be made to the terminal boards on the side of the appliance. Each terminal is identified by the label to be found on the terminal boards.

#### CAUTION !

FAILURE TO COMPLY WITH THE INDICATED CONNECTIONS MAY CAUSE MOTOR BURNOUT!

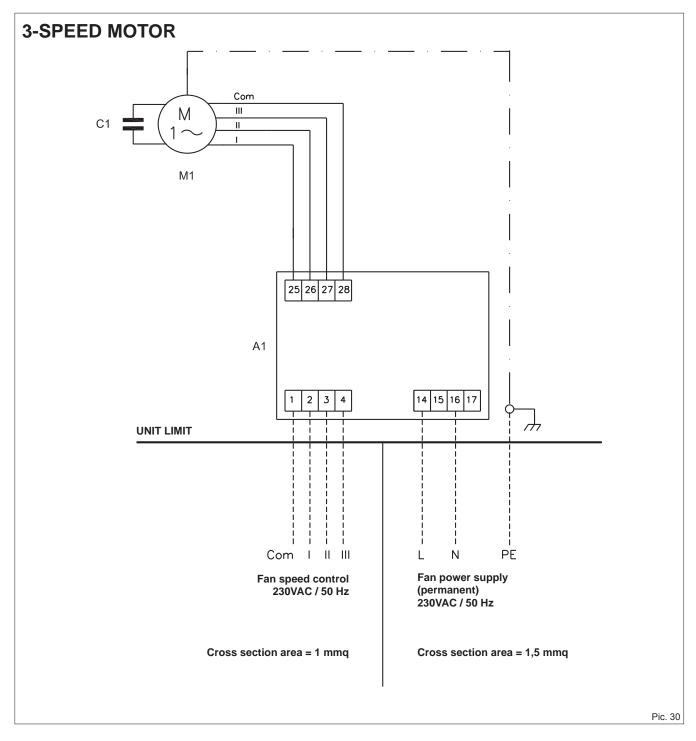
# Size 05 to 15



#### LEGEND:

PE	Earth (yellow/green)	
Com	Common	
I	Minimum speed	
II	Medium speed	
III	Maximum speed	
C1	Capacitor	
M1	Motor	
XA1	Electric box with terminal board for fan speed control M1	

#### Sizes 25 & 28

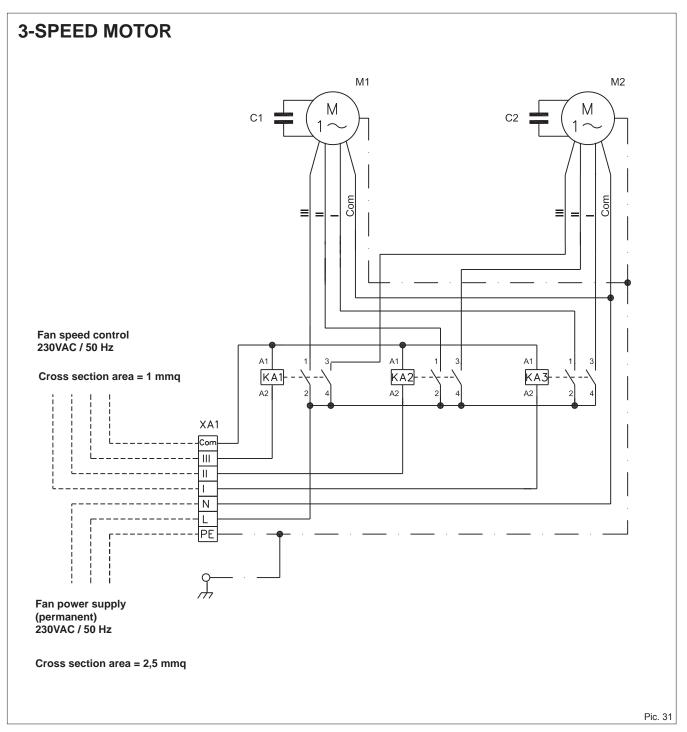


LEGEND	
--------	--

PE	Earth (yellow/green)			
L	Phase			
N	Neutral			
Com	Common			
I	Minimum speed			
Ш	Medium speed			
Ш	Maximum speed			
A1	Power chart			
C1	Capacitor			
M1	Motor			

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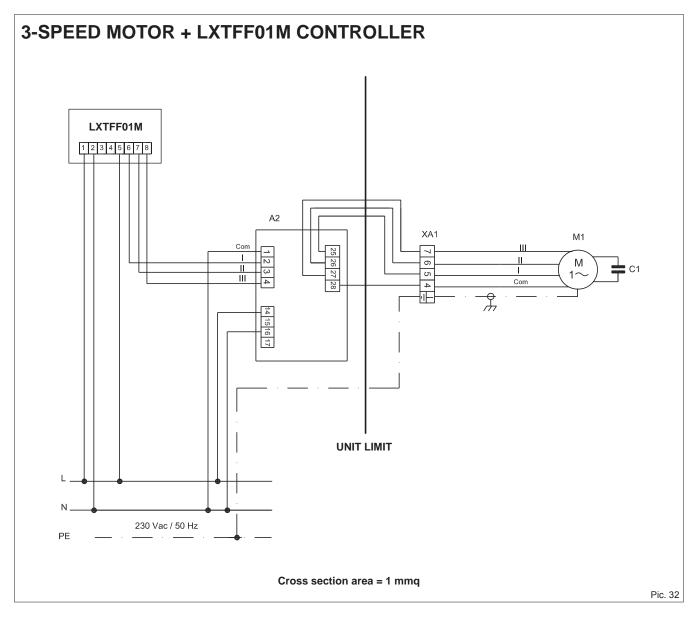
#### Sizes 49 & 57



LEGEND:

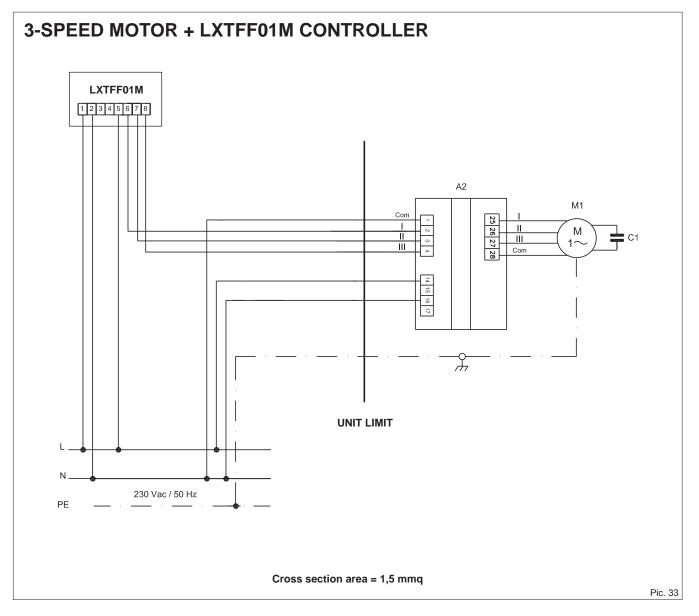
PE	Earth (yellow/green)	KA1	Maximum speed relay
L	Phase	KA2	Medium speed relay
Ν	Neutral	KA3	Minimum speed relay
Com	Common	M1	Fan motor
I	Minimum speed	M2	Fan motor
II	Medium speed	XA1	Terminal board for fan speed control M1
III	Maximum speed		
C1	Capacitor		
C2	Capacitor		

# Size 05 to 15



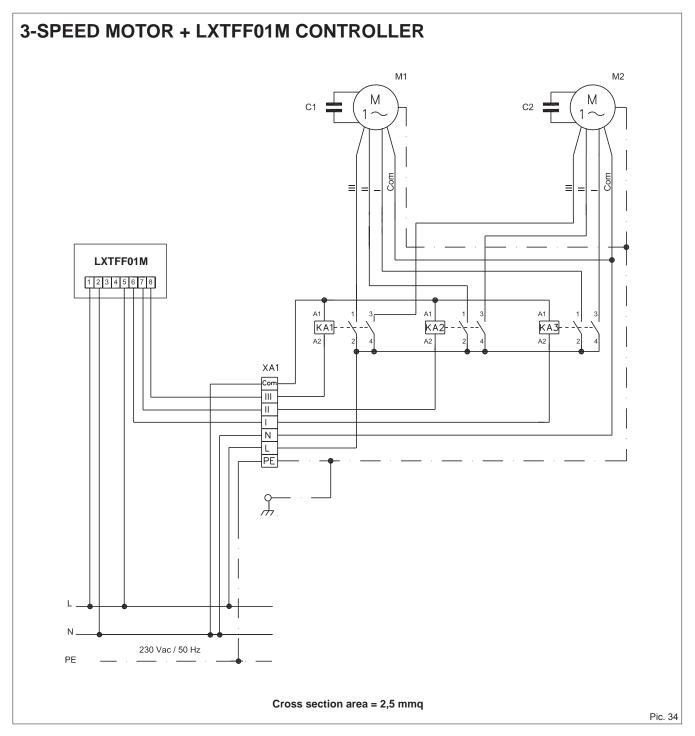
LEGEN	LEGEND:						
PE	Earth (yellow/green)						
Com	Common						
I	Minimum speed						
II	Medium speed						
III	Maximum speed						
A2	SDP power chart (ACCESSORY NECESSARY)						
C1	Capacitor						
M1	Motor						
XA1	Terminal board for fan speed control M1						

# Sizes 25 & 28



LEGENI	LEGEND:					
PE	Earth (yellow/green)					
L	Phase					
N	Neutral					
Com	Common					
I	Minimum speed					
II	Medium speed					
III	Maximum speed					
A2	SDP power chart					
C1	Capacitor					
M1	Motor					

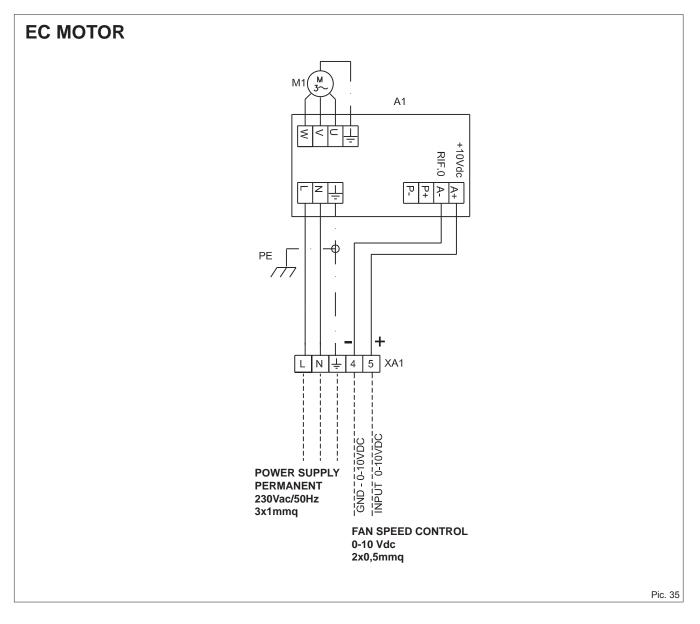




LEGEND:

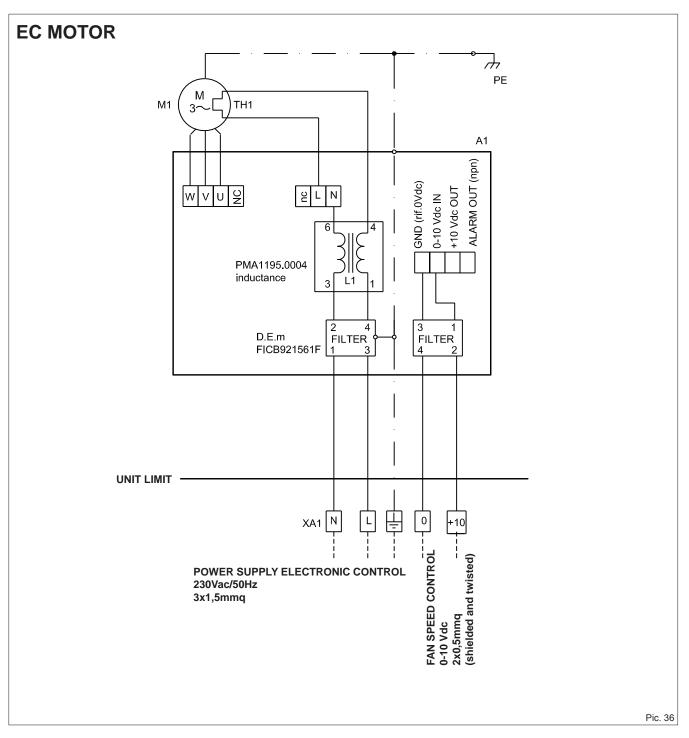
PE	Earth (yellow/green)	KA1	Maximum speed relay
L	Phase	KA2	Medium speed relay
Ν	Neutral	KA3	Minimum speed relay
Com	Common	M1	Fan motor
I	Minimum speed	M2	Fan motor
Ш	Medium speed	XA1	Terminal board for fan speed control M1
III	Maximum speed		
C1	Capacitor		
C2	Capacitor		

# Size 05 to 15



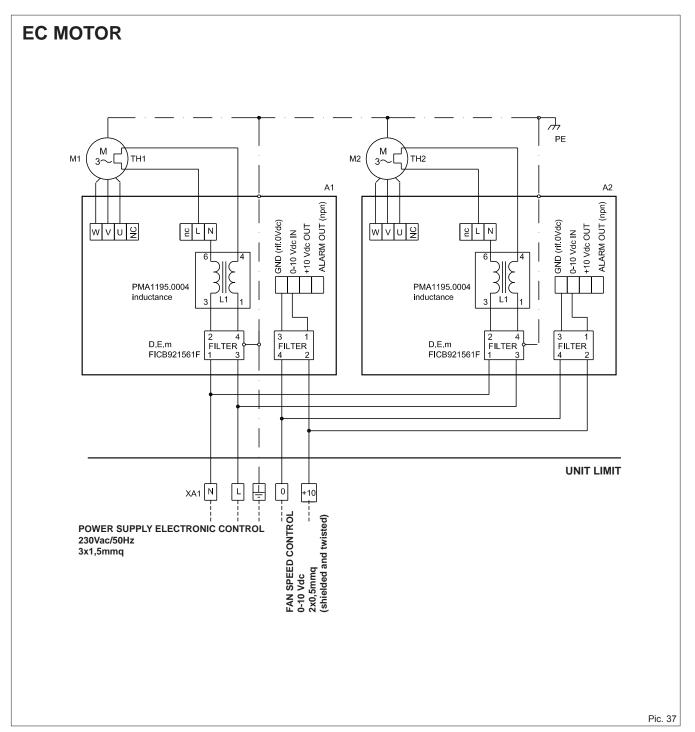
LEGE	LEGEND:				
PE	Earth (yellow/green)				
A1	Electronic control				
M1	Motor				
XA1	Terminal board				

# Sizes 25 & 28



#### LEGEND:

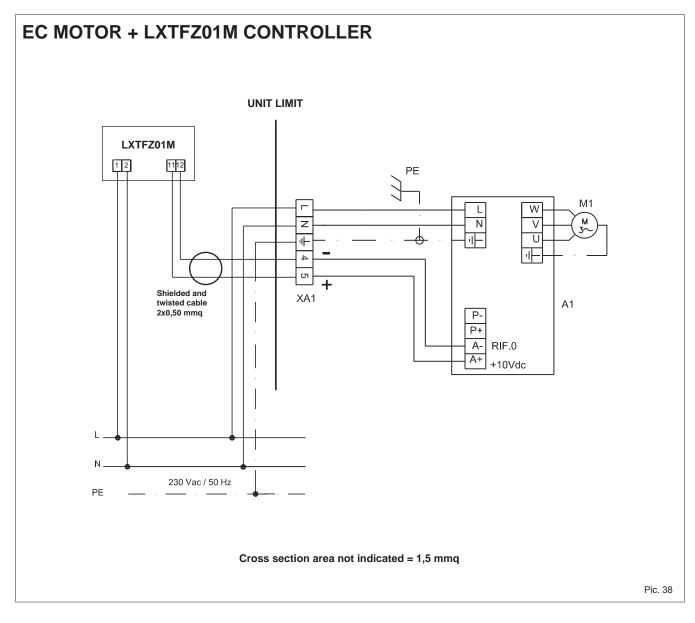
PE	Earth (yellow/green)	
L	Phase	
N	Neutral	
A1	Electronic control	
M1	Motor	
XA1	Terminal board	
TH1	Thermal protector	



#### LEGEND:

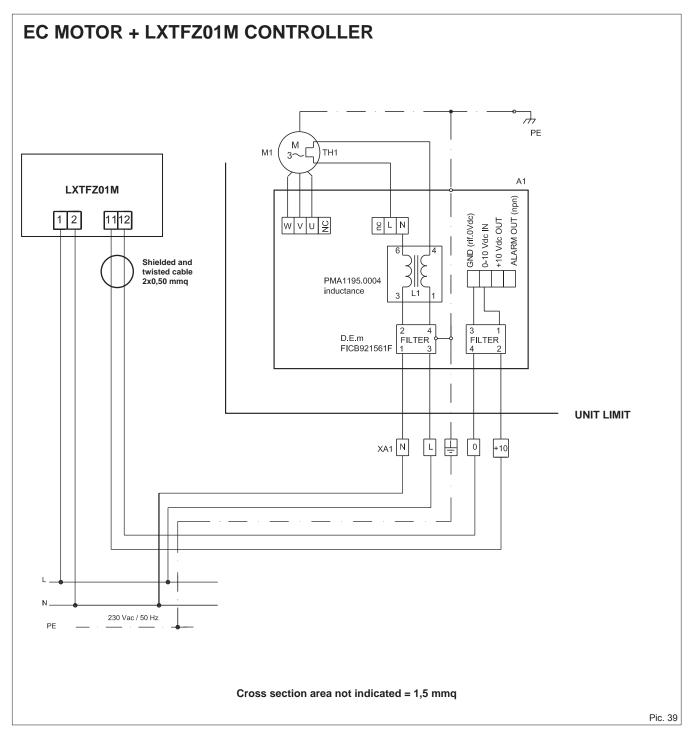
PE	Earth (yellow/green)
L	Phase
N	Neutral
A1	Electronic control
A2	Electronic control
M1	Motor
M2	Motor
XA1	Terminal board
TH1	Thermal protector
TH2	Thermal protector

# Size 05 to 15



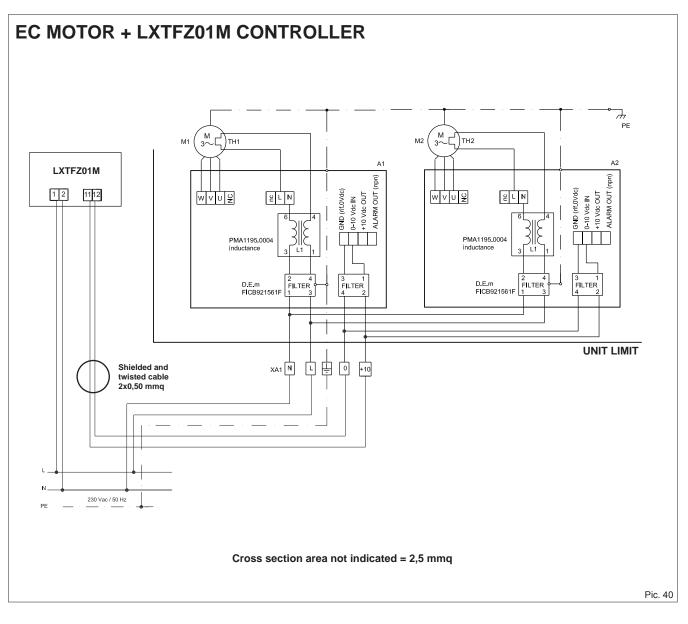
LEGEND:		
PE	Earth (yellow/green)	
A1	Electronic control	
M1	Motor	
XA1	Terminal board	

# Sizes 25 & 28



LEGEND:		
PE	Earth (yellow/green)	
L	Phase	
N	Neutral	
Com	Common	
I	Minimum speed	
II	Medium speed	
III	Maximum speed	
A1	Power chart	
C1	Capacitor	
M1	Motor	

# Sizes 49 & 57



#### LEGEND:

PE	Earth (yellow/green)
L	Phase
N	Neutral
A1	Electronic control
A2	Electronic control
M1	Motor
M2	Motor
XA1	Terminal board
TH1	Thermal protector
TH2	Thermal protector

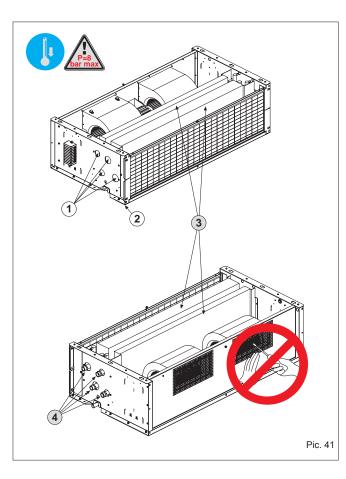
# **TURNING THE COIL**

#### CAUTION

The fan wheels may reach the speed of 1,000 rpm. Do not insert objects into the electric fan and certainly not hands. The motor becomes hot during operation; wait for it to cool before touching it. During the heating mode of operation the exchanger and the connecting pipes may become very hot (80°C). Wait for the exchanger to cool before touching it or protect hands with suitable gloves. The heat exchange water coils are suitable for working up to a maximum pressure of 8 bar.

To turn the coil, proceed as follows:

- 1. Disconnect the terminal board (6) from the side of the unit.
- 2. Remove the condensate collecting tray (2).
- 3. Remove the coil fixing screws (5).
- 4. Take out the coil (3), being careful not to be cut by the fins and not to damage them.
- 5. Remove the knockouts (1) on the opposite side of the unit (using a screwdriver) to allow the coil connections to pass through.
- 6. Position the coil, turning it without tipping it upside down, so that the fittings are in line with the holes left by the knockouts.
- 7. Fix the coil using the previously removed screws (5).
- 8. Shift the terminal board (fixing it to the side opposite the water fittings) and the motor cables, fixing them with their clamps. Ensure that the cables pass through the hole in the side of the unit, protecting them with the relative grommet. If it proves easier to carry out this operation by separating the wires from the terminal board, mark the positions of the wires to avoid making mistakes when reconnecting.
- 9. Reconnect the wires to the relative terminal board (6), taking care that they are correctly positioned.
- 10. Replace the condensate collecting tray (2).



# **CLEANING AND MAINTENANCE**

#### CAUTION

Before carrying out any cleaning or maintenance work, disconnect the unit from the mains electricity supply!

#### **ROUTINE MAINTENANCE**

The user is duty bound to have all maintenance operations carried out by trained and qualified personnel only. If the unit has to be dismantled, protect hands with work gloves.

#### Monthly checks:

- Ensure that the fan impellers are clean. If they are dirty, clean them by suction so as not to damage them.
- Check the whole of the electrical part and in particular that the electrical connections are tight.

#### Yearly checks:

- Check the whole of the electrical part and in particular that the electrical connections are tight.
- Check the tightness of all the bolts, nuts and whatever else may be loosened by the constant vibrations of the unit.
- Check the motor for dust, dirt or other impurities. Periodically check that the motor works without unusual vibrations or noise and that the fan inlet is not obstructed, which could otherwise leading to overheating of the windings.
- Check the fans for dirt or any foreign matter.

#### **CLEANING THE AIR FILTER**

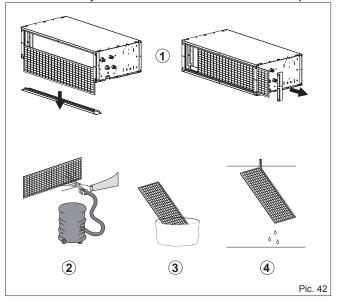
The unit is fitted with an air filter on the fan inlet. During normal operation the filter holds back impurities in the air.

The filter should be cleaned periodically to keep its filtering properties and the airflow to the fan unchanged.

It is advisable to clean the filter at least once a month, proceeding as follows.

- 1. Take out the filter.
- 2. Place the filter on a flat, dry surface and remove the accumulated dust with a vacuum cleaner.
- 3. Wash the filter with water and detergent (no solvents).
- 4. Leave the filter to dry in a ventilated place in the sun.
- 5. Replace the filter when it is perfectly dry.

Please clean the air filter every working season of the unit or more frequently considering the unit activity.



NOTE: the filter may also be taken out from the side or from the top.

# WHAT TO DO IF ...

#### There is little outflowing air

Possible cause:	incorrect speed setting on the control panel
Possible remedy:	select the right speed
Possible cause:	clogged filter
Possible remedy:	clean the filter
Possible cause:	obstruction of the airflow on the intake or delivery line
Possible remedy:	remove obstruction

#### The motor does not turn? Check that...

 the power supply is switched on
 the switches or thermostats are in the correct operating position
 there is no foreign matter jamming the rotation of the fan

#### The unit does not heat/cool as before? Check that...

- ... the filter and the coil are clean
- no air has entered the water circuit by blee-  $\stackrel{\rm \cdots}{}$  ding from the relative valve
- ... the installation is correctly balanced
- ... the boiler/chiller is in proper working order

#### **DISMANTLING THE UNIT**

This unit is made to last for many years. Qualified personnel are needed to dismantle it in all safety. The first operation to be carried out before dismantling the unit is to disconnect it once and for all from the electricity supply. This unit has been made using recyclable materials (copper, aluminium, brass, plastic) and assembled by screws and push-fits to make separation of the parts easy.

Contact a firm specialised in differentiated waste disposal; it is the only way to be certain of correct recycling and thereby contribute to protection of the environment.





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Given the continued commitment of Lennox in producing quality products, specifications, features and dimensions are subject to change without notice and any liability is declined. Improper operations of installation, adjustment, modification, repair or maintenance could cause damage personal injury or product. Installation and repair should be performed by a qualified technician.

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