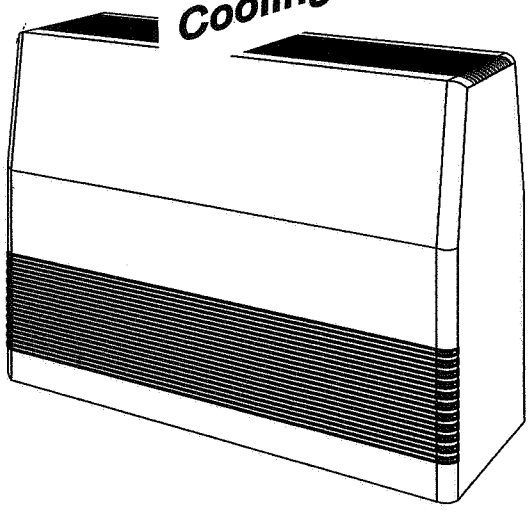
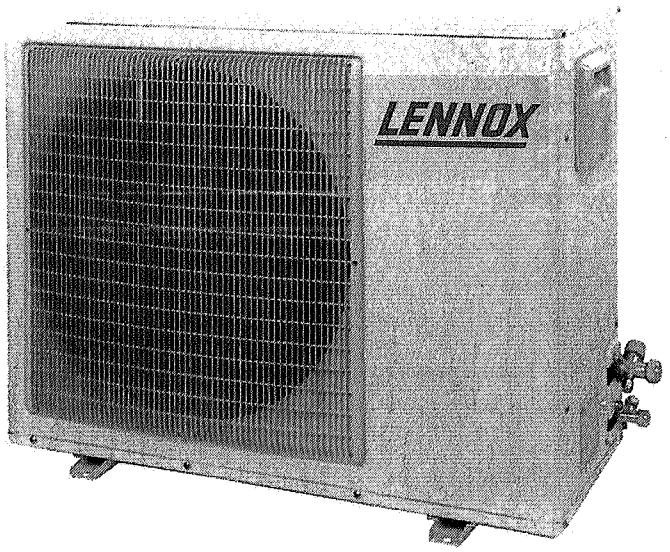
LENNOX

Floor mounted split system

WITH REFRIGERANT R-407C

Cooling only AGR K





OPERATION SERVICE AND INSTALLATION MANUAL

Congratulations you have made a wise choice with the purchase of your Lennox air conditioned unit. This product has been designed, assembled and supplied in one of our world class manufacturing facilities and we feel sure that it will meet your expectations.
Lennox an international organisation with world wide distribution takes pride in supplying you with this product.

TABLE OF CONTENTS

PRODUCT RANGE

COOLING ONLY

MODEL	OUTDOOR UNIT	INDOOR UNIT	V / Ph / 50 Hz	NOMINAL CAPACITY W	POWER INPUT KW
				COOLING	COOLING
AGR 2K	KGF 2K	LNS 2	230 V - 1Ph	4.77	1.87
			400 V - 3Ph		
AGR 2,5K	KGF 2,5K	LNS 2,5	230 V - 1Ph	6.06	2.58
			400 V - 3Ph		
AGR 2,8K	KGF 2,8K	LNS 2,8	230 V - 1Ph	7.10	2.80
			400 V - 3Ph		

This model is prepared only and exclusively to work with refrigerant R407-C. Not to use any other refrigerants

The refrigerant R407-C is a mixture of other three refrigerants that behave as pure compounds. This fact makes that the operations of installation; service and maintenance must be special, for the next operations:

SYSTEM EVACUATION
Evacuating the system is critical for proper operation of the unit, vacuum must be done until the absolute pressure does not rise above 0,3 mbar, since the compressor oil high hygroscopic degree can cause corrosion in some metallic materials.

REFRIGERANT CHARGING
To maintain the mixture composition, the refrigerant must be charged always in liquid phase. For what it is necessary to have special caution when it is little quantity of refrigerant in the bottle.

LEAKS
If a leak takes place in the system that has produced an important evacuation of the refrigerant charge, instead of recharging the system, it is convenient to eliminate the whole charge completely, the system must be evacuated and charged again or to introduce the charge according to an specified value.

COMPRESSOR OIL
With HCF refrigerant like in the case of R407-C, compressors are used that incorporate ester oil instead of the mineral oil used in compressors that work with HCFC refrigerant, like it is the case of R22.

OPERATION
On a system operated with refrigerant R407-C, during the evaporation phase at constant pressure the temperature increase; and during the condensation phase at constant pressure the temperature decrease a certain value. Consequently the terms "evaporation temperature" and "condensation temperature" should be redefined

GENERAL INFORMATION

The floor mounted SPLIT air conditioner, is air cooled condensed units. The indoor unit cools, dehumidifies, cleans and filters the air. The option of easily incorporating an electric heater to be able to work as heating. With a wide range of cooling outputs which vary from 4700 W to 7100 W

CABINET

The outdoor unit chassis is made of electrozinced steel with epoxy painted finish, able to work outdoors under the worst conditions. The unit is completed with handles, which assists easy installation. Its compact dimensions and features allow the unit to be positioned in almost any location.
The indoor unit is made in decorative plastic, with a smooth finish. Internal insulation prevents condensation from forming.

HEAT EXCHANGE

Made of copper tubes and aluminium fins. Coils have been designed and manufactured to ensure maximum efficiency.
The L-shaped outside unit heat exchanger makes this unit compact and highly efficient.

COMPRESSOR

A scroll compressor with internal thermal protection. It is mounted on vibration-absorbent blocks both on the inside and outside, statically and dynamically balanced. In all cases the compressors are acoustically isolated, resulting in silent operation.

FAN

The outdoor units include axial fan with exceptional performance for air flow volumes and sound levels, The indoor units are supplied with a 3 speed centrifugal fan.

AIR FILTER

A polypropylene washable air filter is incorporated in the unit it is easily accessible for maintenance.

COOLING CIRCUIT

Made of welded dehydrated copper pipe with pressure intakes on the suction and liquid lines. Connection valves to facilitate the refrigerant connection circuit between the units. The unit includes drier filter, expansion system, high and low pressure switch (depend on models).

ELECTRIC CIRCUIT

The indoor unit electrical panel includes a printed circuit board, which controls the operation of the unit. The outdoor unit includes standard low ambient control and crankcase heater to work in low temperature conditions.

OPTIONS

Outdoor unit:
-Supporting unit brackets.
Indoor unit:
-Electric heater

SPECIFICATIONS (COOLING ONLY)

MODEL		AGR 2K	AGR 2,5K	AGR 2,8K
Nominal cooling capacity (*)	W	4.77	6.06	7.10
OUTDOOR UNIT		**KGF 2K**	**KGF 2,5K**	**KGF 2,8K**
COMPRESSOR Nª / Type		1 / Scroll	1 / Scroll	1 / Scroll
COIL Face Area	m²	0,43	0,43	0,43
Rows/ fin per inch		2/14	2/14	2/16
FAN Air flow	m³/h.	1.700	2.800	3.100
REFRIGERANT Type / **R-407C**	gr.	1550	1525	1600
EXPANSIÓN		Capillary	Capillary	Capillary
WEIGHT	Kg	58	61	64
DIMENSIONS	HxWxL (mm)	635x800x333	635x800x333	635x800x333
PACKING DIMENSIONS	HxWxL (mm)	674 x 890 x 375		
REFRIGERANT COUPLING Liquid pipe		1/4"	1/4"	3/8"
Gas pipe		1/2"	5/8"	5/8"

OUTDOOR UNIT			LNS 2	LNS 2,5	LNS 2,8
COIL Face Area		m²	0,23	0.21	0.21
Rows/fin per inch			2/14	3/14	3/14
FAN Air flow	m³/h.	Max.	900	1000	1100
		Min.	550	750	825
WEIGHT		Kg	46	48	48
DIMENSIONS		HxWxL (mm)	550 x 110 x 235		
PACKING DIMENSIONS		HxWxL (mm)	590 x 1140 x 270		
REFRIGERANT COUPLING Liquid pipe			1/4"	1/4"	3/8"
Gas pipe			1/2"	5/8"	5/8"

(*) Air intake temperature indoor interchange: 27°C DB/19 °C WB
(*) Air intake temperature outdoor interchange: 35 ºC DB

DB.- Dry Bulb
WB.- Wet Bulb

SPECIFICATIONS

INDOOR UNIT

SOUND PRESSURE LEVEL (Lp) (1)		2	2,5	2,8
Fan high speed	dBA	52	58	59
Fan low speed	dBA	42	46	49

(1) Sound level measured to a distance of 2 m from the unit, normal absorption, room size according to unit capacity.

OUTDOOR UNIT		2	2,5	2,8
SOUND PRESSURE LEVEL (Lp) (2)	dBA	43	49	50

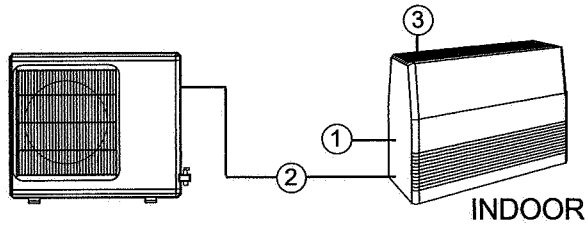
(2) Sound level measured to a distance of 5 m, free space.

ELECTRICAL DATA

MODEL		AGR 2K	AGR 2,5K	AGR 2,8K
Voltage	V/f (50 Hz)	230V/1 Ph 400V/3 Ph		
Nominal total input power	Kw	1.87	2.58	2.80
Rated current	A	11.45 / 4.55	14.89 / 6.09	16.78 / 6.98
Starting current	A	47.5 / 24.5	61.6 / 32.6	76.7 / 40.7
OUTDOOR UNIT		**KGF 2K**	**KGF 2,5K**	**KGF 2,8K**
Voltage	V/f (50 Hz)	230V/1 Ph 400V/3 Ph		
Nominal total input power	Kw	1.77	2.45	2.65
Rated current	A	11.0 / 4.1	14.3 / 5.5	16.1 / 6.3
Starting current	A	47 / 24	61 / 32	76 / 40
INDOOR UNIT		**LNS 2**	**LNS 2,5**	**LNS 2,8**
Voltage	V/f (50 Hz)	230V/1 Ph		
Nominal total input power	Kw	0.10	0.13	0.15
Rated current	A	0.45	0.59	0.68
Starting current	A	1.35	1.78	2.06

ELECTRICAL CONNECTIONS

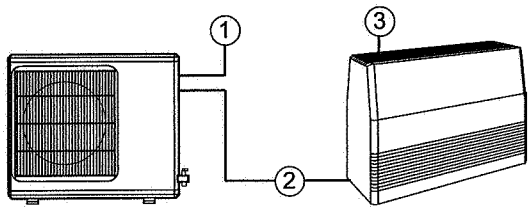
MODELS KGF 2K - 2.5K 230V / 1Ph



INDOOR UNIT

MODELS KGF 2.8K 230V / 1Ph

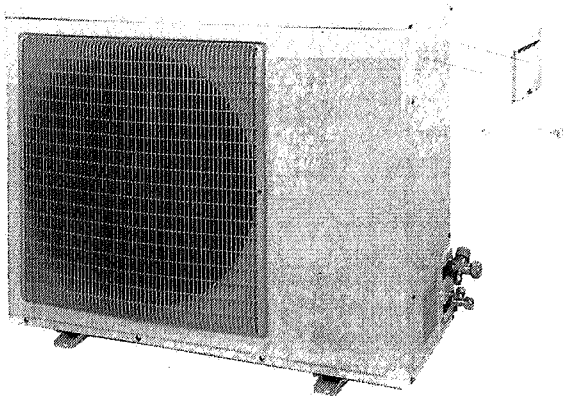
MODELS KGF 2K - 2.5K-2,8K 400V / 3Ph



INDOOR UNIT

POWER SUPPLY WIRING
This equipment must be installed in accordance with national regulations. A suitable means of disconnecting all supply poles must be provided in the power supply wiring. The power supply must incorporate suitably rated fused or circuit breaker protection.

ELECTRIC WIRING DIAGRAM
For electrical connection refer to wiring diagram in the unit.



To do the electrical connection:
1.- Remove the electrical cover panel screws, and take out the panel as shown in the figure.
2.- Connect the wires to the electrical terminal board, following the wiring diagram.
3.- Place the cover panel again.

MODELO	VOLTAGE 50Hz	NUMBER OF CABLE x SECTION		
		COOLING ONLY		
		①	②	③
2	230 V / 1Ph	3 X 2,5mm^2	4 X 2,5mm^2	**Wire is included with the remote controller**
	400 V / 3Ph	5 X 1,5mm^2	4 X 1,5mm^2	
2,5	230 V / 1Ph	3 X 4mm^2	4 X 4mm^2	
	400 V / 3Ph	5 X 1,5mm^2	4 X 1,5mm^2	
2,8	230 V / 1Ph	3 X 4 mm^2	4 X 1,5mm^2	
	400 V / 3Ph	5 X 2,5mm^2	4 X 1,5mm^2	

① Power supply
② Connection indoor unit with outdoor unit
③ Control connection

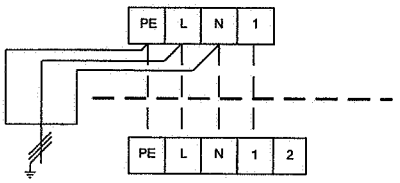
Operating voltage limits

230V-1Ph: min. 198 Vmáx.264 V
400V-3Ph: min. 342V, máx. 440V

IMPORTANT
Three-phase scroll compressors must be phased sequentially to ensure correct compressor rotation and operation.
At compressor start-up, a rise in discharge and drop in suction pressures indicate proper compressor phasing and operation. If discharge and suctions pressures do not perform normally, follow the steps below to correctly phase in the unit.
1.- Disconnect power to the unit.
2.- Reverse any two field power leads to the unit.
3.- Reapply power to the unit.
Discharge and suction pressures should operate at their normal start-up ranges.
NOTE: Compressor noise level will be significantly higher when phasing is incorrect and the unit will not provide cooling when compressor is operating backwards. Continued backward operation will cause the compressor to cycle on internal protector.

ELECTRICAL CONNECTIONS

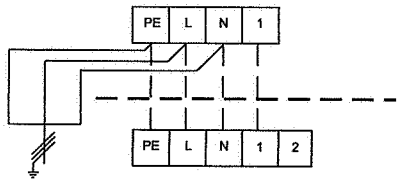
TERMINAL PLATE BETWEEN OUTDOOR UNIT AND INDOOR UNIT



LNS 2

KGF 2K

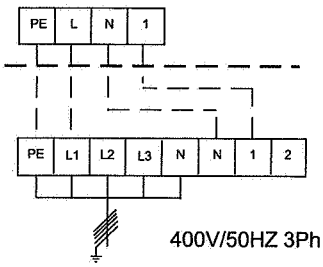
230V/50HZ 1Ph + N



LNS 2.5

KGF 2.5K

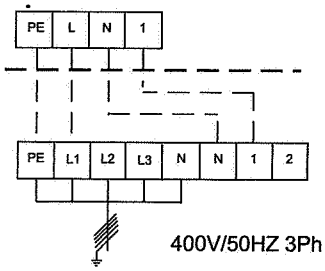
230V/50HZ 1Ph + N



LNS 2

KGF 2K

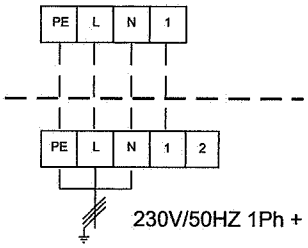
400V/50HZ 3Ph + N



LNS 2.5

KGF 2.5K

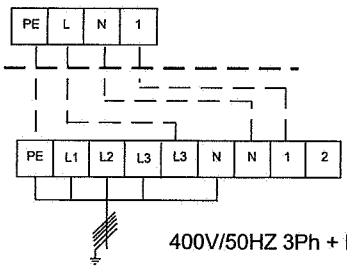
400V/50HZ 3Ph + N



LNS 2.8

KGF 2.8K

230V/50HZ 1Ph + N



LNS 2.8

KGF 2.8K

400V/50HZ 3Ph + N

ELECTRIC WIRING DIAGRAM
For electrical connection refer to wiring diagram in the unit.

OPERATING LIMITS

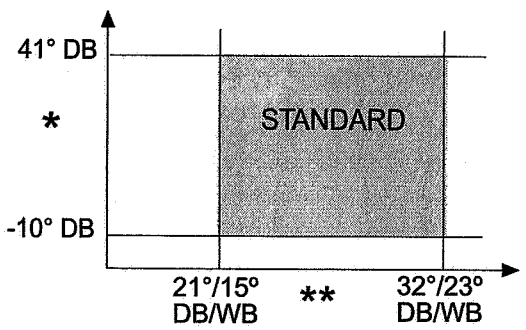
OPERATING LIMITS

* SUPPLY AIR TEMPERATURE INTO THE OUTDOOR UNIT (ºC).

** SUPPLY AIR TEMPERATURE INTO THE INDOOR UNIT (ºC)

DB- Dry bulb
WB-Wet bulb

The outdoor unit includes standard low ambient control and crankacase heater to work in low temperature conditions.

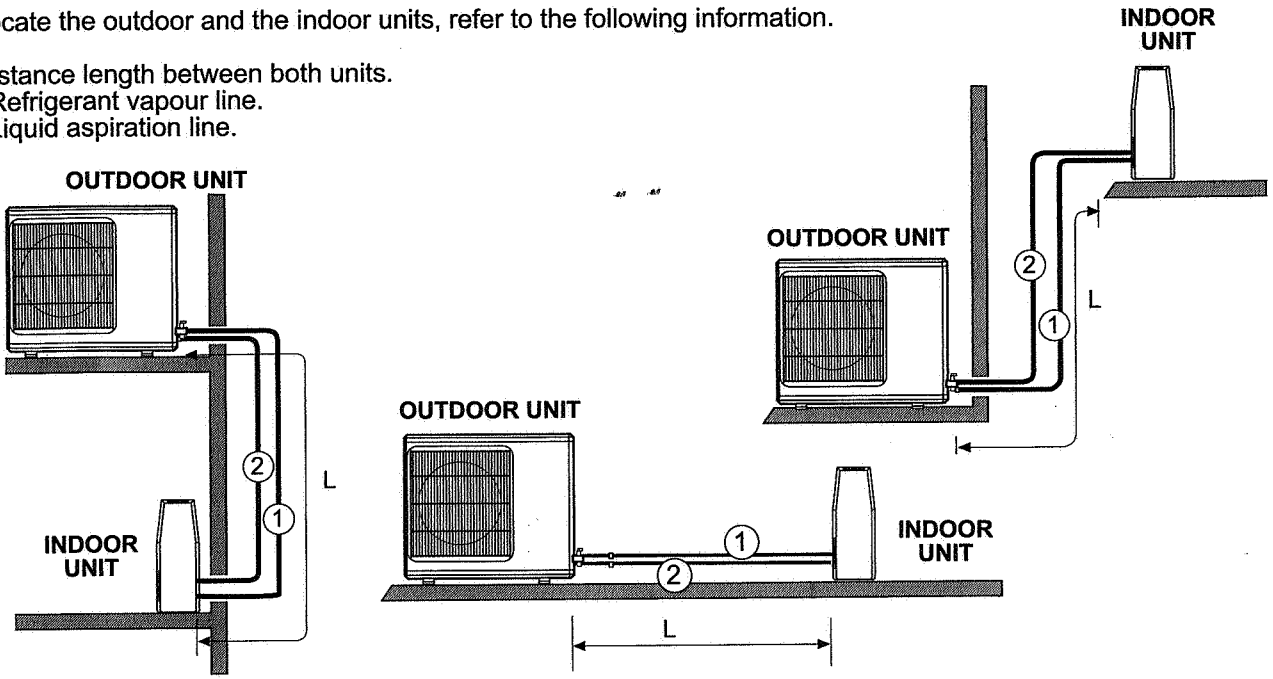


REFRIGERANT CONNECTIONS

DISTANCES BETWEEN UNITS

To locate the outdoor and the indoor units, refer to the following information.

L: Distance length between both units.
1 = Refrigerant vapour line.
2 = Liquid aspiration line.



		MODEL		
		2	2,5	2,8
Piping connection size	Liquid	1/4"	1/4"	3/8"
	Gas	1/2"	5/8"	5/8"
Refrigerant line sizes	Máx.Vertical	15	15	15
Refrigerant line sizes L	Total vertical + Horizontal	25	25	25
Max. number of bends		12	12	12

If the height length is greater than 5 meters, a syphon suction must be installed on the suction line every 5 meters to ensure that oil return to the compressor.

CHARGE OF REFRIGERANT

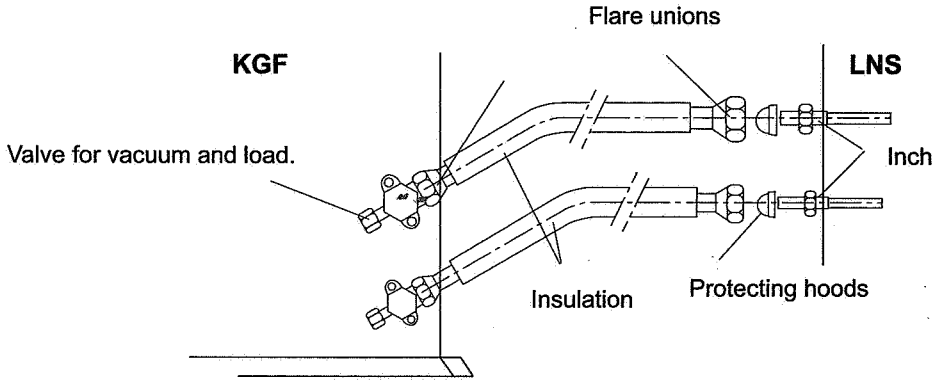
	MODEL	2	2,5	2,8
AGR K	(gr.) (*)	1550	1525	1600
	METER (**)	15	5	5
	(gr.) (***)	20	25	35

(*) Charge of refrigerant R-407C factory charged on outdoor unit.
(**) Charge of refrigerant valid for this legth of the line.
(***)Add or subtract this amount, when the lines are greater or less than the length that the unit has been factory charged.

NOTE: THE REFRIGERANT LINES GAS AND LIQUID, MUST BE INSULATED

For other positions and longer lengths, consult the Lennox Technical Support Department for application assistance.
The following data will be obtained from that estimation:
Pipe dimensions, Syphon suction, Insulation, Refrigerant load

REFRIGERANT CONNECTIONS

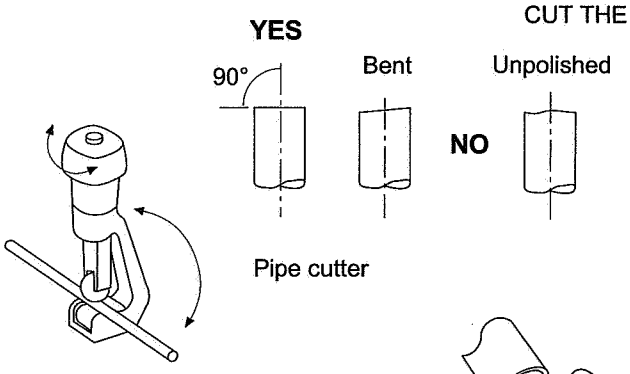


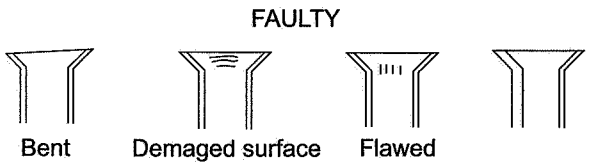
Make the refrigerant connections between the outdoor and the indoor unit, as follows:

- With the valves closed on the outdoor unit, unscrew the flare nuts, removing all the protective hoods.
- Unscrew the flare nuts and the couplings of the indoor unit, removing the protective hoods.
- Introduce the flare nuts in the final corresponding union tubes, previously isolated.
- Make the thread union of the tubes in valves and couplings using the keys, as shown in the picture.
- With the valves on the outdoor unit make the vacuum, connecting the plug of the pump to the service valves 1/4", which contain their own valves until 0.225mmHg pressure will be reached. This way the vacuum will be created in the indoor unit and the union tubes.
- Remove the plugs and open the valves of the outdoor unit. Verify leakage in the thread connections.

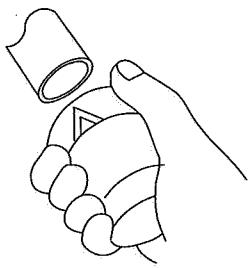
Both the liquid and gas lines should be insulated along their entire legth, including the flare connections and the stub pipes

CUT THE PIPE PROPERLY



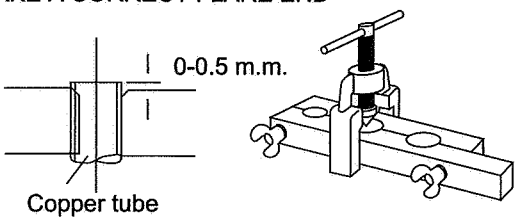


AVOID METALIC DUST FROM ENTERING THE TUBE



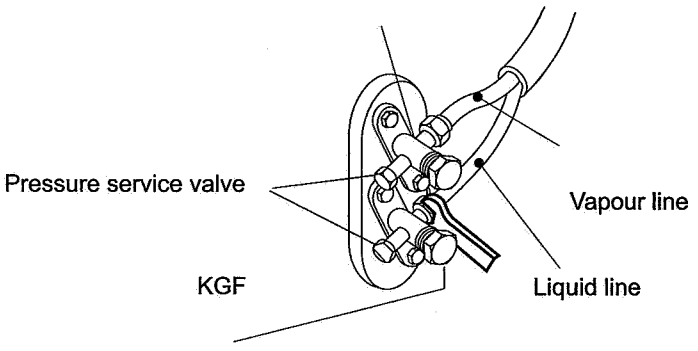
CLEAN THE EDGES

MAKE A CORRECT FLARE END

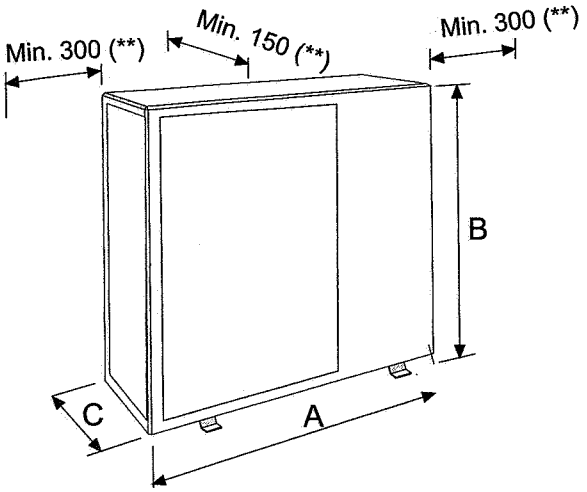


TIGHTENING TORQUE
Apply the tightening torque shown in the table.
Insufficient tightening torque could cause refrigerant leak,
excessive tightening torque will damage the pipe flare.

Tube diameter	Torque
1/4"	15-20 Nm
3/8"	31-35 Nm
1/2"	50-55 Nm
5/8"	50-55 Nm

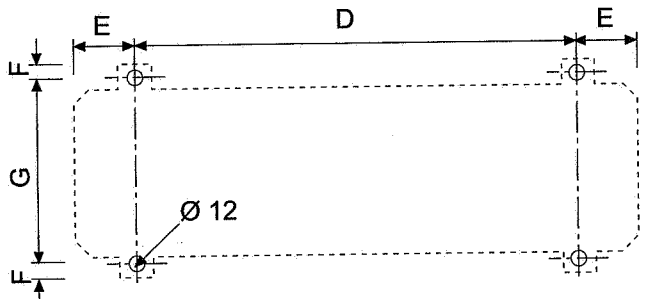


OUTDOOR UNIT DIMENSIONS (mm.)

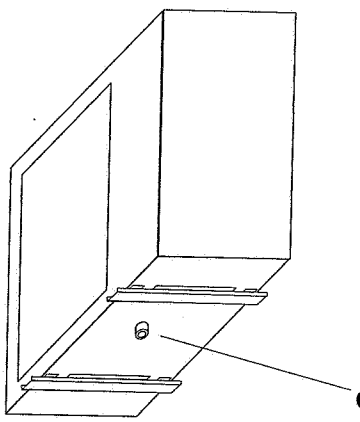


(**)
INSTALLATION CLEARANCES

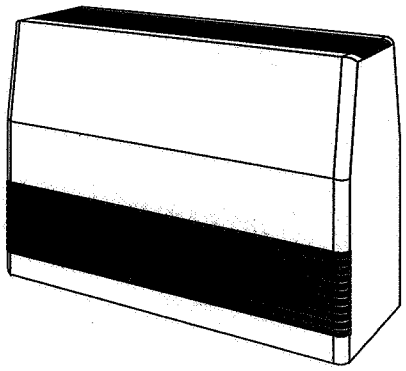
SETTING UP TEMPLATE

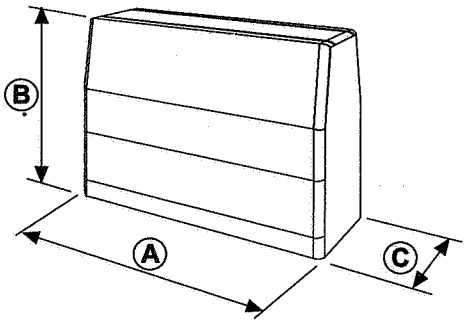


	A	B	C	D	E	F	G
KGF 2K - 2,5K - 2,8K	800	635	333	520	140	10	343,5



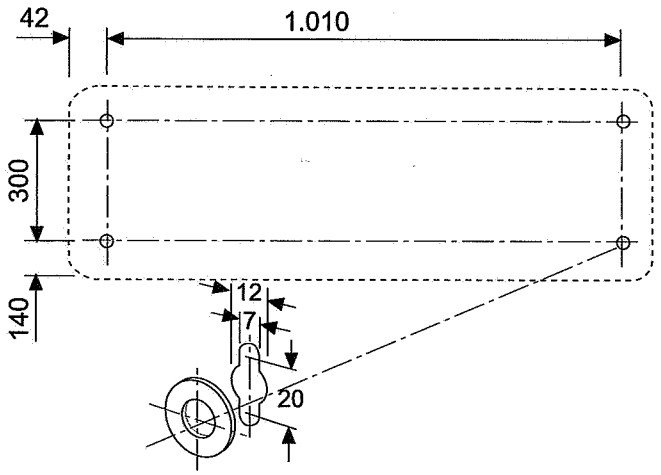
INDOOR UNIT DIMENSIONS (mm.)



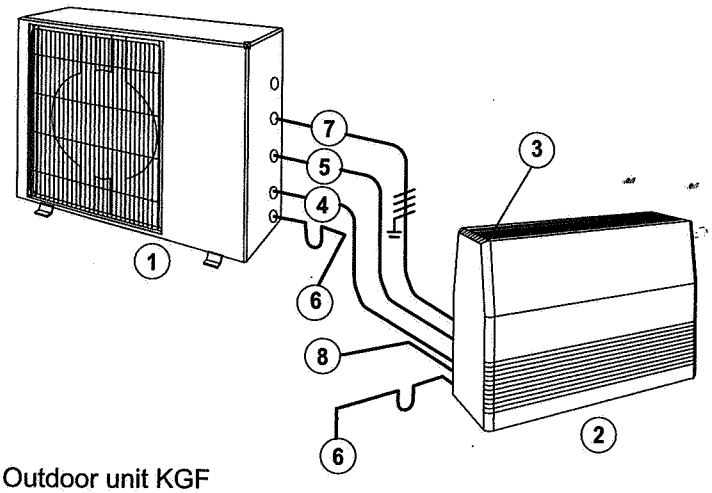


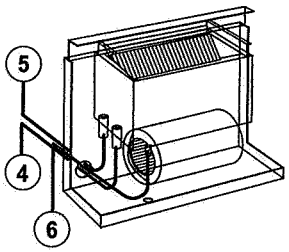
MODELS	A	B	C
2	1100	550	235
2.5	1100	550	235
2.8	1100	550	235

LNS 2 - 2,5 - 2,8



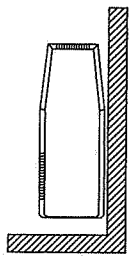
INSTALLATION



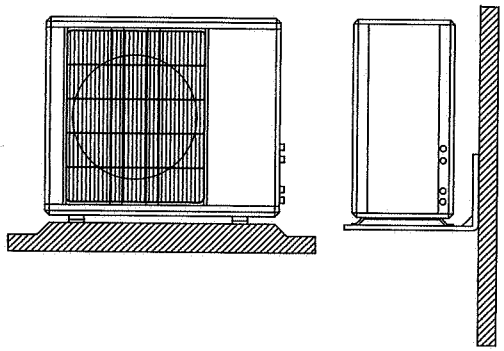


1.- Outdoor unit KGF
2.- Indoor unit LNS
3.- Control
4.- Refrigerant liquid line insulated
5.- Refrigerant suction line insulated
6.- Drain hose
7.- Electric connection cable
8.- Electric supply cable

Wall mounted



Floor mounted



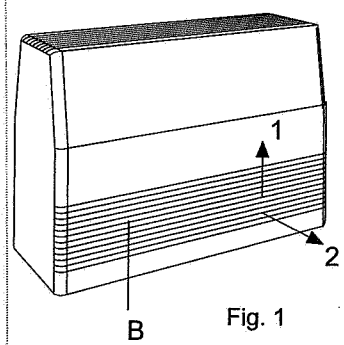


Fig. 1

LNS

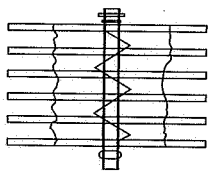


Fig. 2

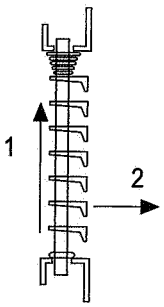


Fig. 3

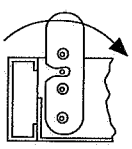


Fig. 5
Clip "E"

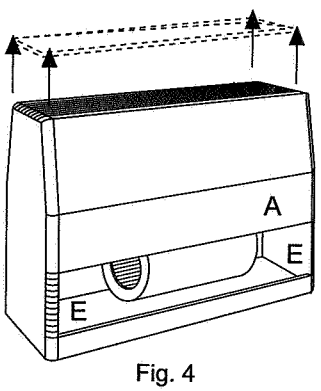
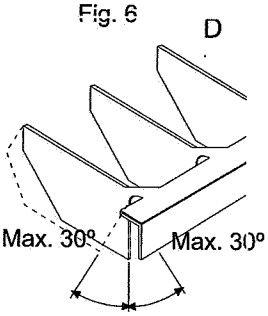


Fig. 4

* Push return airgrill "B" up and pull out. (Fig. 1,2,3).
Push clip "E" backward. (Fig. 5).
Remove panel "A" by lifting it vertically. (Fig. 4).

* ADJUSTMENT OF THE DEFLECTOR
Adjustment of the air flow direction can be done by bending the vanes of deflector "D" in to the desired position. (Fig.6)

Fig. 6



OPTIONS

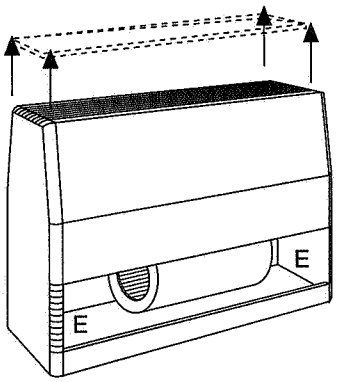
ELECTRIC HEATER RANGE

UNIT/MODELS	2	2,5	2,8
230V-1Ph-50Hz	3 Kw 4 Kw	3 Kw 4 Kw	3 Kw 4 Kw

INSTALLATION OF ELECTRIC HEATER

1.- Remove decorative panel (Fig. 1).
2.- Remove the distance profile "A". (Fig. 2).
3.- Install electric heater.
4.- Connect electric heater wires on the terminal strip as shown.
5.- Fit decorative panel.

Fig. 1



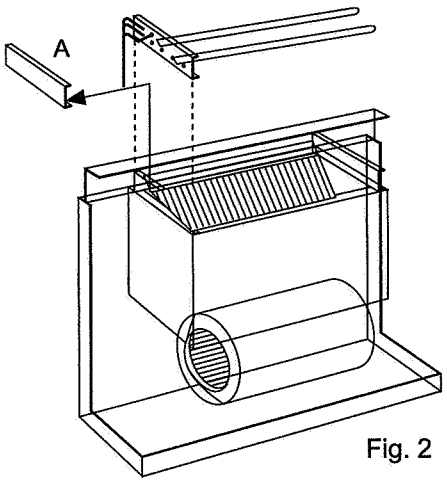


Fig. 2

ELECTRIC HEATER DOES NOT FUNCTION

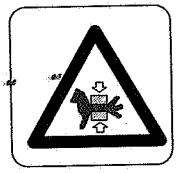
* Heater switched off on safety thermostat.
  Check the passage of free air over the supply grill.
  Check air filter.
  When trouble occurs frequently advice your installer.

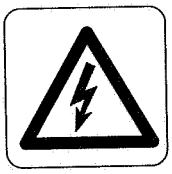
POINTS TO KEEP IN MIND


Abrasive surfaces


Low temperatures


High temperatures


Risk of injury with moving objects

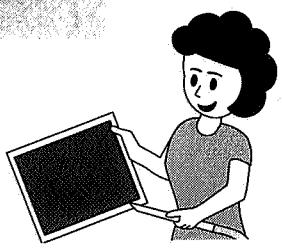

Electrical voltage

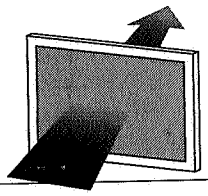

Risk of injury with rotating objects

WARNING
Electric shock hazard can cause injury or death. Before attempting to perform any service or maintenance on the unit, turn OFF the electrical power, and check that the fan has stopped.

The air filter cleaning operations do not require technical service; however when an electrical or mechanical operation is required call an Engineer.

FILTER CLEANING
Check the air filter and make sure it is not blocked with dust or dirt.





If the filter is dirty, wash it in a bowl with neutral soap and water, drying it in the shade before inserting it in the unit.

Standard Guidelines to Lennox Refac equipment

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The data published in the operating instructions is based on the latest information available. We reserve the right to make modifications without notice.

We reserve the right to modify our products without notice without obligation to modify previously supplied goods.

These operating instructions contain useful and important information for the smooth operation and maintenance of your equipment.

The instructions also include guidelines on how to avoid accidents and serious damage before commissioning the equipment and during its operation and how to ensure smooth and fault-free operation. Read the operating instructions carefully before starting the equipment, familiarise yourself with the equipment and handling of the installation and carefully follow the instructions. It is very important to be properly trained in handling the equipment. These operating instructions must be kept in a safe place near the equipment.

Like most equipment, the unit requires regular maintenance. This section concerns the maintenance personnel and management.
If you have any queries or would like to receive further information on any aspect relating to your equipment, do not hesitate to contact us.

Subject to change without notice

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