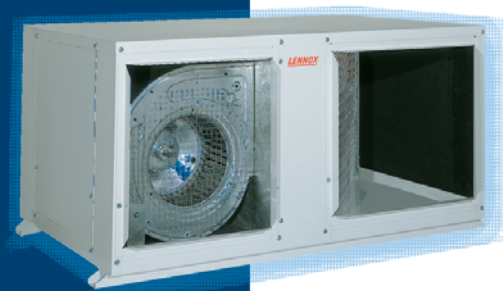


**APPLICATION GUIDE
INSTALLATION, OPERATING
AND MAINTENANCE MANUAL**



PROVIDING **GLOBAL SYSTEM** SOLUTIONS

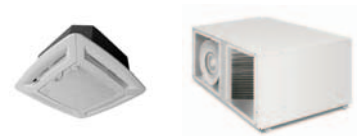
**CASSETTE
COMFORT PLUS
CXCK / CXHK**

**Congratulations you have made a wise choice with the purchase of your Lennox
air conditioning 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 organization with world wide distribution takes pride in supplying you with this
product.**

1.- UNIT SELECTION	
1.1.- PRODUCT RANGE	2
1.2.- GENERAL DESCRIPTION	3
1.3.- SPECIFICATIONS	4
1.4.- TECHNICAL DATA	5
1.5.- ELECTRICAL DATA	5
1.6.- OUTDOOR MOTOR FAN CHARACTERISTICS	6
1.7.- OPERATING LIMITS	6
1.8.- CAPACITY TABLES	7-8
1.9.- UNIT DIMENSIONS	9-10
1.10.- UNIT DESCRIPTION	11
1.11.- ENTRANCE STANDARD/ OPTIONAL OUTDOOR UNIT	11
1.12.- OPTIONS	12
2.- INSTALLATION	
2.1.- POINTS TO KEEP IN MIND	13
2.2.- INSTALLATION GUIDELINES	14
2.3.- UNIT RECEPTION	14
2.4.- INSTALLATION CLEARANCES	14
2.5.- OPTIONAL TASK PRIOR TO UNIT INSTALLATION: CHANGING THE POSITION OF BLOWERS AND AIR INTAKE	15
2.6.- DUCT INSTALLATION	15
2.7.- DRAINS	16
2.8.- SETTING UP TEMPLATES OF OUTDOOR UNITS	16
2.9.- LOCATION AND SETTING UP TEMPLATES OF INDOOR UNITS	17
2.10.- SYSTEM CONFIGURATION	18
2.11.- ELECTRICAL CONNECTIONS	19-21
2.12.- INSTALLATION OF DIFFUSER AND INLET GRILLE	22
2.13.- REFRIGERANT CONNECTIONS	23-24
3.- COMMISSIONING AND OPERATION	
3.1.- DATA PAGE FOR UNIT COMMISSIONING	25
3.2.- PRELIMINARY CHECKS	26
3.3.- STEPS TO FOLLOW FOR COMMISSIONING THE UNIT	27
4.- MAINTENANCE	
4.1.- PREVENTIVE MAINTENANCE	28
4.2.- CORRECTIVE MAINTENANCE	29-30
4.3.- FAILURE DIAGNOSIS	30

1.- UNIT SELECTION

1.1.- PRODUCT RANGE



COOLING ONLY

MODEL	OUTDOOR UNIT	INDOOR UNIT	V / Ph / 50 Hz	NOMINAL CAPACITY W		POWER INPUT kW	
				COOLING		COOLING	
CXCK 018	KCCK 018	LCXO 024	230 V-1Ph	5500		2,00	
CXCK 024	KCCK 024	LCXO 024	230 V-1Ph	6500		2,50	
CXCK 036	KCCK 036	LCXO 048	230 V-1Ph	9600		3,78	
CXCK 036	KCCK 036		230 V - 3Ph				
CXCK 036	KCCK 036		400 V - 3Ph				
CXCK 048	KCCK 048	LCXO 048	230 V -3Ph	11300		4,42	
CXCK 048	KCCK 048		400 V - 3Ph				

HEAT PUMP

MODEL	OUTDOOR UNIT	INDOOR UNIT	V / Ph / 50 Hz	NOMINAL CAPACITY W		POWER INPUT kW	
				COOLING	HEATING	COOLING	HEATING
CXHK 018	KCHK 018	LCXO 024	230 V-1Ph	5500	5300	2,00	1,87
CXHK 024	KCHK 024	LCXO 024	230 V-1Ph	6500	6800	2,50	2,56
CXHK 036	KCHK 036	LCXO 048	230 V-1Ph	9600		3,78	
CXHK 036	KCHK 036		230 V - 3Ph				
CXHK 036	KCHK 036		400 V - 3Ph				
CXHK 048	KCHK 048	LCXO 048	230 V -3Ph	11300		4,42	
CXHK 048	KCHK 048		400 V - 3Ph				

NOTE: The units at 230V-3Ph power supply are special. Ask for availability.

1.- UNIT SELECTION

1.2.- GENERAL DESCRIPTION

The CASSETTE air conditioning split on version cooling only and heat pump, are units condensed by air, designed for small shopping center and housing. The indoor unit, cools, heats, dehumidifies, and cleans air of the sites. The units are able to work in cooling, and heating mode, with a wide range of cooling and heating outputs. The indoor unit is supplied with outdoor units provided with centrifugal fan (KCCK/KCHK) for installation inside buildings. A wide range of options, completed-factory assembled are also available, for easier installation.

CABINET

The outdoor unit chassis is made of electrozincated steel with epoxy painted finished, able to work with outdoors under the worst conditions. Its compact dimensions and features allow the unit to be positioned in almost any location. Inside the unit, thermal acoustic insulation reduces sound level.

The indoor unit chassis is made of galvanized steel and is fully insulated inside.

DIFFUSER

Made in decorative plastic, with a smooth finish. Internal insulation prevents condensation from forming, provided with louvres to ensure air distribution.

HEAT EXCHANGE

Made-up with copper pipes and aluminium wings, designed to get a high heating transfer. Their dimensions and design of the circuits have been specially worked to obtain the maximum performance of the exchanger increasing the power of the unit and reducing the consumption.

COMPRESSOR

All units are provided with scroll compressor, cooling by a suction gas with thermic protection inside the engine, so no other additional protection is required. It is mounted on anti-vibration devices both external and internal. The 400V-III units are supplied with a three phase detector which avoids the unit starts, unless the phase connections are right.

In heat pump units, the compressors are provided with a crankcase heater to heat the oil in the compressor so that a suitable lubrication can take place; this is an option for cooling only units.

FAN

The outdoor units include high static pressure centrifugal fan, with exceptional performance for air flow volumes. The indoor units are supplied with a 3 speed centrifugal fan. The impeller blades have been specifically designed for this type of units, ensuring exceptional air flow volumes and low sound levels. The motor is protected with internal thermal protection.

AIR FILTER

Polypropylene air filter, high efficiency filtrate, washable and easy to install.

AIR SWEEP

The indoor unit has an automatic device to distribute horizontal air flow.

INTERNAL COMPONENTS

Both the outdoor and indoor units are designed with serviceability in mind, and all components are easily accessible. The indoor unit includes a drip tray to collect condensate, which is removed by means of a condensate pump, which is float switch controlled.

REFRIGERANT PIPING

Made of welded dehydrated copper pipe with service port on the suction and liquid lines.

Coupling valves on outdoor unit and flare connection on indoor unit to make easier the refrigerant connections. The expansion system for cooling and heating takes place on outdoor unit. Heat pump units are equipped as well with unidirectional and four way reversing valves.

ELECTRIC CIRCUIT

The electrical panel includes a printed board, which controls the operating of the unit, defrosting timer thermostat and system of reversing on heat pump cycle. The heat pump outdoor unit includes a printed board with a defrosting timer, for safety device.

CONTROL

The indoor units are supplied with a wireless thermostat for unit mode selection, 3 speed, and programmable (see manual supplied with the thermostat for details)



Control ORL-1X

OPTIONS

INDOOR UNIT

- Fresh air kit.
- Discharge of air to an adjacent room kit.

OUTDOOR UNIT

- ON/OFF Condensation pressure control.
- Proportional condensing pressure control.
- Main switch (depends on models).
- Compressor acoustic jacket.

1.- UNIT SELECTION

1.3.- SPECIFICATIONS

MODEL			CXCK 018 CXHK 018	CXCK 024 CXHK 024	CXCK 036 CXHK 036	CXCK 048 CXHK 048
Cooling capacity	(*)	W	5500	6500	9600	11300
Heating capacity CXHK	(**)	W	5300	6800	9000	11100
OUTDOOR UNIT			KCCK 018 KCHK 018	KCCK 024 KCHK 024	KCCK 036 KCHK 036	KCCK 048 KCHK 048
COMPRESSOR Nr / Type			1 / SCROLL	1 / SCROLL	1 / SCROLL	1 / SCROLL
FAN						
Air flow	m ³ /h	Max.	2600	2500	3100	3400
		Min.	1800	1750	2000	2400
Available static pressure		Pa (2)	70	90	100	90
EXPANSION			Capillary	Capillary	Restrictor	Restrictor
NET WEIGHT	Cooling only units	Kg	73	76	87	135
	Heat pump units	Kg	78	81	92	140
DIMENSIONS						
Height	(H)	mm	485	485	505	495
Width	(W)	mm	975	975	1050	1250
Depth	(D)	mm	625	625	750	820
PACKING DIMENSIONS (HxWxD) mm			655x1059x725		675x1140x870	625x1350x919
REFRIGERANT COUPLING						
Liquid pipe			1/4"	1/4"	3/8"	3/8"
Gas pipe			1/2"	5/8"	3/4"	3/4"
INDOOR UNIT			LCXO 024	LCXO 024	LCXO 048	LCXO 048
FAN						
Air flow	m ³ /h	Max.	920	920	1650	1650
		Min.	650	650	1200	1200
NET WEIGHT	Diffuser	Kg	3	3	5	5
	Cassette	Kg	24	24	45	45
DIMENSIONS						
Diffuser	(HxWxD)	mm	48x720x720		48x1320x720	
Cassette	(HxWxD)	mm	298x575x575		298x1175x575	
PACKING DIMENSIONS						
Diffuser	(HxWxD)	mm	120x780x775		120x1380x775	
Cassette	(HxWxD)	mm	340x665x665		340x1265x665	
REFRIGERANT COUPLING						
Liquid pipe			1/4"	1/4"	3/8"	3/8"
Gas pipe			5/8" (1)	5/8"	3/4"	3/4"

(*) Air entry temperature into the indoor unit 27°C DB/19 °C WB
Air entry temperature into the outdoor unit 35°C DB

(**) Air entry temperature into the indoor unit 20°C DB/12 °C WB
Air entry temperature into the outdoor unit 7°C DB/6°CWB

(1) Use the coupling fittings included in indoor unit for refrigerant connection with outdoor unit

(2) With minimum admissible flow volumes

DB.- Dry Bulb
WB.- Wet Bulb

1.- UNIT SELECTION



1.4.- TECHNICAL DATA

SOUND LEVELS				018	024	036	048
Sound pressure level	Indoor unit (1)	Low speed	dBA	39	39	42	42
		High speed	dBA	48	48	51	51
	Outdoor unit (2)		dBA	40	40	41	43

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

(2) Sound level measured to a distance of 10 m from the unit, free space, with discharge and inlet duct installed.

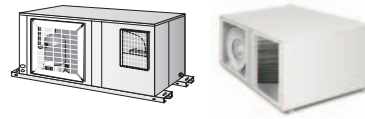
1.5.- ELECTRICAL DATA

MODEL		CXCK 018 CXHK 018	CXCK 024 CXHK 024	CXCK 036 CXHK 036	CXCK 048 CXHK 048		
Voltage	V/f (50 Hz)	230V / 1 Ph			230V-400V / 3 Ph		
		Total input power cooling capacity	Kw	2,00	2,50	3,78	4,42
Total input power heat pump CXHK	Kw	1,87	2,56	3,17	4,10		
Maximum current	A	13,60		17		22,70	
						20,80 / 11,30	
Starting current	A	47		61		95	
						91 / 46	
OUTDOOR UNIT							
		KCCK 018 KCHK 018	KCCK 024 KCHK 024	KCCK 036 KCHK 036	KCCK 048 KCHK 048		
Voltage	V/f (50 Hz)	230V / 1 Ph			230V-400V / 3 Ph		
		Total input power cooling capacity	Kw	1,90	2,40	3,58	4,22
Total input power heat pump	Kw	1,77	2,46	2,97	3,90		
Maximum current	A	13,10		16,50		21,70	
						19,80 / 10,30	
Starting current	A	47		61		95	
						91 / 46	
INDOOR UNIT							
		LCXO 024	LCXO 024	LCXO 048	LCXO 048		
Voltage	V/f (50 Hz)	230V / 1 Ph					
Nominal total input power cooling capacity	Kw	0,10	0,10	0,20	0,20		
Maximum current	A	0,5	0,5	1,0	1,0		
Starting current	A	2,0	2,0	4,0	4,0		

1.- UNIT SELECTION

1.6.- OUTDOOR UNIT MOTOR-FAN CHARACTERISTICS

OUTDOOR UNIT WITH CENTRIFUGAL FAN



MODELS		AIRFLOW m ³ /h			
		KCCK 018 KCHK 018	KCCK 024 KCHK 024	KCCK 036 KCHK 036	KCCK 048 KCHK 048
AVAILABLE STATIC PRESSURE Pa	0	2600	2500	3100	3400
	10	2500	2400	2900	3325
	20	2400	2350	2800	3160
	30	2350	2300	2700	3075
	40	2300	2200	2600	2980
	50	2200	2150	2500	2890
	60	2150	2050	2400	2790
	70	1800	1950	2300	2690
	80	---	1870	2200	2580
	90	---	1750	2100	2400
	100	---	---	2000	---
110	---	---	---	---	

NOMINAL FLOW

1.7.- OPERATING LIMITS

OPERATING LIMITS FOR (COOLING ONLY) UNITS

		MAXIMUM TEMPERATURES	MINIMUM TEMPERATURES
COOLING CYCLE OPERATION	INDOOR TEMPERATURE	32° C DB / 23° C WB	21° C DB / 15° C WB
	OUTDOOR TEMPERATURE	DEPENDING ON MODEL (see Tables for cooling capacities)	+ 19° C STANDARD UNIT +15° C WITH MINIMUM INDOOR TEMPERATURES 24° C DB/ 18° C WB 0° C WITH OPTIONAL ON/OFF CPC -10° C WITH OPTIONAL PROPOR. CPC

OPERATING LIMITS FOR (HEATING PUMP) UNITS

		MAXIMUM TEMPERATURES	MINIMUM TEMPERATURES
COOLING CYCLE OPERATION	INDOOR TEMPERATURE	32° C DB / 23° C WB	21° C DB / 15° C WB
	OUTDOOR TEMPERATURE	DEPENDING ON MODEL (see Tables for cooling capacities)	+ 19° C STANDARD UNIT +15° C WITH MINIMUM INDOOR TEMPERATURES 24° C DB/ 18° C WB 0° C WITH OPTIONAL ON/OFF CPC -10° C WITH OPTIONAL PROPOR. CPC
HEATING CYCLE OPERATION	INDOOR TEMPERATURE	27° C DB	15° C DB
	OUTDOOR TEMPERATURE	DEPENDING ON MODEL (see Tables for heating capacities)	-10° C DB / -11° C WB

DB.- Dry Bulb Temperature
WB.- Wet Bulb Temperature

1.- UNIT SELECTION

1.8.- COOLING CAPACITIES

CXCK 018 / CXHK 018

CXCK 024 / CXHK 024

AIR INLET TEMPERATURE INDOOR UNIT		CAPACITY POWER INPUT IN KW	AIR INLET TEMPERATURE OUTDOOR UNIT °C DRY BULB					AIR INLET TEMPERATURE OUTDOOR UNIT °C DRY BULB				
			25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
21°C	DB	TOTAL CAPACITY	5,15	4,97	4,77	4,57	4,34	6,09	5,88	5,66	5,42	5,15
	WB	SENSIBLE CAP.	3,84	3,75	3,66	3,56	3,44	4,32	4,21	4,10	3,98	3,84
15°C	WB	POWER INPUT	1,65	1,80	1,97	2,17	2,40	2,03	2,22	2,45	2,71	3,02
		TOTAL CAPACITY	5,52	5,33	5,12	4,90	4,65	6,53	6,31	6,07	5,82	5,53
24°C	DB	SENSIBLE CAP.	4,10	4,01	3,92	3,81	3,70	4,59	4,48	4,36	4,24	4,11
	WB	POWER INPUT	1,66	1,81	1,99	2,19	2,43	2,05	2,24	2,47	2,74	3,06
27°C	DB	TOTAL CAPACITY	5,91	5,71	5,50	5,25	4,99	7,00	6,76	6,50	6,24	5,93
	WB	SENSIBLE CAP.	4,35	4,26	4,15	4,06	3,95	4,84	4,74	4,60	4,50	4,36
19°C	WB	POWER INPUT	1,68	1,83	2,00	2,21	2,45	2,07	2,27	2,50	2,77	3,09
		TOTAL CAPACITY	6,34	6,12	5,89	5,63	---	7,50	7,25	6,99	6,69	---
29°C	DB	SENSIBLE CAP.	4,34	4,25	4,16	4,05	---	4,84	4,73	4,62	4,49	---
	WB	POWER INPUT	1,70	1,85	2,03	2,24	---	2,09	2,30	2,53	2,81	---
32°C	DB	TOTAL CAPACITY	6,79	6,56	6,30	6,03	---	8,05	7,78	7,49	7,17	---
		SENSIBLE CAP.	4,58	4,49	4,39	4,29	---	5,08	4,97	4,86	4,73	---
23°C	WB	POWER INPUT	1,71	1,87	2,05	2,27	---	2,12	2,33	2,57	2,85	---

CXCK 036 / CXHK 036

CXCK 048 / CXHK 048

AIR INLET TEMPERATURE INDOOR UNIT		CAPACITY POWER INPUT IN KW	AIR INLET TEMPERATURE OUTDOOR UNIT °C DRY BULB					AIR INLET TEMPERATURE OUTDOOR UNIT °C DRY BULB				
			25°C	30°C	35°C	40°C	45°C	25°C	30°C	35°C	40°C	45°C
21°C	DB	TOTAL CAPACITY	9,03	8,71	8,36	7,98	7,54	10,56	10,20	9,81	9,38	8,89
	WB	SENSIBLE CAP.	6,75	6,59	6,42	6,24	6,03	7,53	7,34	7,15	6,93	6,68
15°C	WB	POWER INPUT	3,04	3,33	3,67	4,03	4,44	3,59	3,92	4,29	4,72	5,21
		TOTAL CAPACITY	9,67	9,33	8,96	8,55	8,08	11,31	10,93	10,51	10,05	9,52
24°C	DB	SENSIBLE CAP.	7,21	7,05	6,88	6,69	6,47	7,99	7,81	7,60	7,38	7,13
	WB	POWER INPUT	3,08	3,38	3,72	4,09	4,50	3,63	3,97	4,35	4,78	5,29
27°C	DB	TOTAL CAPACITY	10,36	10,00	9,60	9,15	8,64	12,11	11,70	11,30	10,75	10,18
	WB	SENSIBLE CAP.	7,64	7,48	7,30	7,12	6,90	8,44	8,25	8,10	7,82	7,56
19°C	WB	POWER INPUT	3,13	3,44	3,78	4,15	4,56	3,68	4,02	4,42	4,85	5,37
		TOTAL CAPACITY	11,09	10,70	10,27	9,79	---	12,97	12,53	12,05	11,51	---
29°C	DB	SENSIBLE CAP.	7,62	7,46	7,29	7,09	---	8,42	8,23	8,03	7,80	---
	WB	POWER INPUT	3,18	3,49	3,84	4,21	---	3,72	4,07	4,47	4,93	---
32°C	DB	TOTAL CAPACITY	11,86	11,44	10,98	10,45	---	13,88	13,41	12,89	12,31	---
		SENSIBLE CAP.	8,03	7,87	7,69	7,50	---	8,84	8,65	8,44	8,21	---
23°C	WB	POWER INPUT	3,24	3,55	3,90	4,28	---	3,77	4,13	4,54	5,01	---

Nominal capacities

DB - Dry bulb
WB - Wet bulb

CALCULATION OF COOLING CAPACITY DEPENDING ON AIR FLOW

Data based on the following nominal indoor fan air flow:

MODELS	024	048
INDOOR AIR FLOW M ³ /H	920	1650

Data based on the following nominal outdoor fan air flow:

MODELS	024	048
OUTDOOR AIR FLOW M ³ /H	2150	2890

CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF DIFFERENT INDOOR AIR FLOW

	% NOMINAL AIR FLOW			
	70%	80%	90%	100%
Total capacity	0,96	0,97	0,98	1
Sensible capacity	0,9	0,93	0,96	1
Power input	0,98	0,99	1	1

CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF DIFFERENT OUTDOOR AIR FLOW

	% NOMINAL AIR FLOW		
	80%	90%	100%
Total capacity	0,97	0,98	1
Sensible capacity	0,93	0,96	1
Power input	0,99	1	1

1.- UNIT SELECTION

1.8.- HEATING CAPACITIES

CXHK 018

CXHK 024

AIR INLET TEMPERATURE INDOOR UNIT	Kw	AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB							AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB						
		-10°C	-5°C	0°C	6°C	10°C	14°C	18°C	-10°C	-5°C	0°C	6°C	10°C	14°C	18°C
15°C DB	TOTAL CAPACITY	3,48	3,97	4,56	5,37	5,99	6,68	7,44	4,47	5,11	5,83	6,84	7,60	8,44	9,36
	POWER INPUT	1,51	1,56	1,63	1,72	1,80	1,89	2,00	1,94	2,04	2,15	2,33	2,47	2,65	2,86
18°C DB	TOTAL CAPACITY	3,48	3,98	4,54	5,34	5,95	6,63	7,38	4,48	5,11	5,82	6,81	7,56	8,39	9,28
	POWER INPUT	1,59	1,64	1,71	1,81	1,89	1,99	2,11	2,05	2,15	2,28	2,47	2,62	2,81	3,04
20°C DB	TOTAL CAPACITY	3,48	3,97	4,54	5,30	5,93	6,60	7,34	4,49	5,11	5,82	6,80	7,54	8,35	---
	POWER INPUT	1,64	1,70	1,77	1,87	1,96	2,06	2,18	2,13	2,23	2,37	2,56	2,73	2,93	---
24°C DB	TOTAL CAPACITY	3,49	3,97	4,52	5,30	5,88	6,54	---	4,51	5,13	5,82	6,78	7,50	---	---
	POWER INPUT	1,76	1,82	1,90	2,01	2,11	2,22	---	2,30	2,42	2,57	2,79	2,97	---	---
27°C DB	TOTAL CAPACITY	3,50	3,98	4,52	5,28	---	---	---	4,54	5,15	5,83	6,77	---	---	---
	POWER INPUT	1,86	1,92	2,01	2,13	---	---	---	2,45	2,58	2,74	2,97	---	---	---

CXHK 036

CXHK 048

AIR INLET TEMPERATURE INDOOR UNIT	Kw	AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB							AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB						
		-10°C	-5°C	0°C	6°C	10°C	14°C	18°C	-10°C	-5°C	0°C	6°C	10°C	14°C	18°C
15°C DB	TOTAL CAPACITY	5,83	6,65	7,63	9,05	10,15	11,39	12,75	7,27	8,32	9,50	11,14	12,40	13,79	15,32
	POWER INPUT	2,52	2,61	2,73	2,90	3,04	3,21	3,41	3,20	3,36	3,54	3,79	3,99	4,23	4,50
18°C DB	TOTAL CAPACITY	5,84	6,66	7,63	9,03	10,12	11,33	12,67	7,28	8,31	9,48	11,11	12,34	13,71	15,20
	POWER INPUT	2,66	2,76	2,88	3,06	3,21	3,39	3,59	3,37	3,53	3,72	3,99	4,20	4,45	4,75
20°C DB	TOTAL CAPACITY	5,85	6,66	7,63	9,00	10,09	11,29	12,61	7,28	8,31	9,48	11,10	12,30	13,65	---
	POWER INPUT	2,75	2,86	2,98	3,17	3,33	3,51	3,73	3,48	3,65	3,85	4,10	4,35	4,62	---
24°C DB	TOTAL CAPACITY	5,87	6,68	7,63	9,00	10,05	11,22	---	7,31	8,32	9,47	11,04	12,23	---	---
	POWER INPUT	2,96	3,08	3,21	3,42	3,59	3,78	---	3,73	3,91	4,12	4,43	4,68	---	---
27°C DB	TOTAL CAPACITY	5,90	6,70	7,65	8,99	10,02	---	---	7,34	8,34	9,47	11,02	---	---	---
	POWER INPUT	3,13	3,25	3,40	3,62	3,79	---	---	3,93	4,13	4,35	4,68	---	---	---

Nominal capacities

DB - Dry bulb
WB - Wet bulb

CALCULATION OF HEATING CAPACITY DEPENDING ON AIR FLOW

Data based on the following nominal indoor fan air flow:

MODELS	024	048
INDOOR AIR FLOW M ³ /H	920	1650

Data based on the following nominal outdoor fan air flow:

MODELS	024	048
OUTDOOR AIR FLOW M ³ /H	2150	2890

CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF DIFFERENT INDOOR AIR FLOW

	% NOMINAL AIR FLOW			
	70%	80%	90%	100%
Total capacity	0,96	0,97	0,98	1
Sensible capacity	0,9	0,93	0,96	1
Power input	0,98	0,99	1	1

CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF DIFFERENT OUTDOOR AIR FLOW

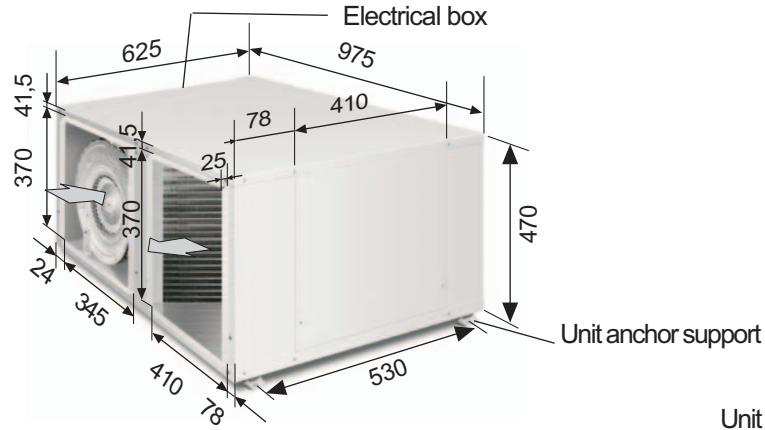
	% NOMINAL AIR FLOW		
	80%	90%	100%
Total capacity	0,97	0,98	1
Sensible capacity	0,93	0,96	1
Power input	0,99	1	1

1.- UNIT SELECTION

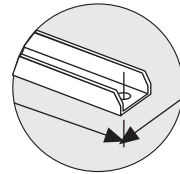
1.9.- OUTDOOR UNIT DIMENSIONS (mm)

OUTDOOR UNIT MODELS KCCK-KCHK

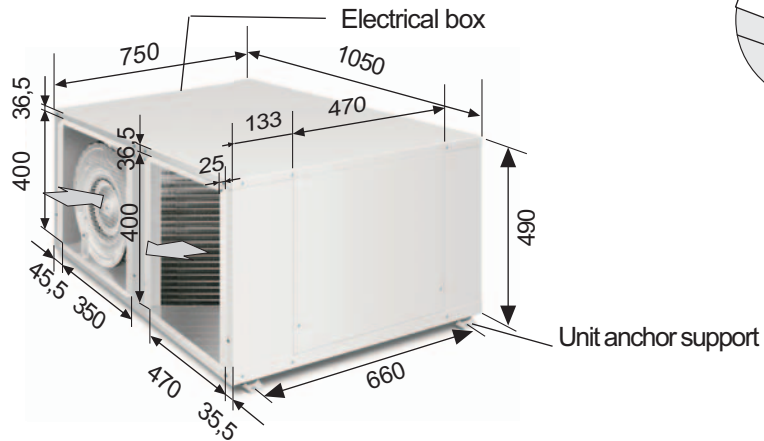
MODELS
KCCK 018-024
KCHK 018-024



Unit anchor support

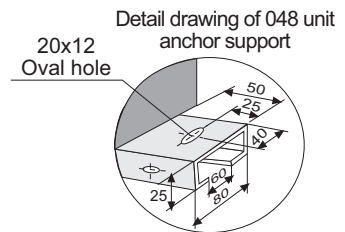
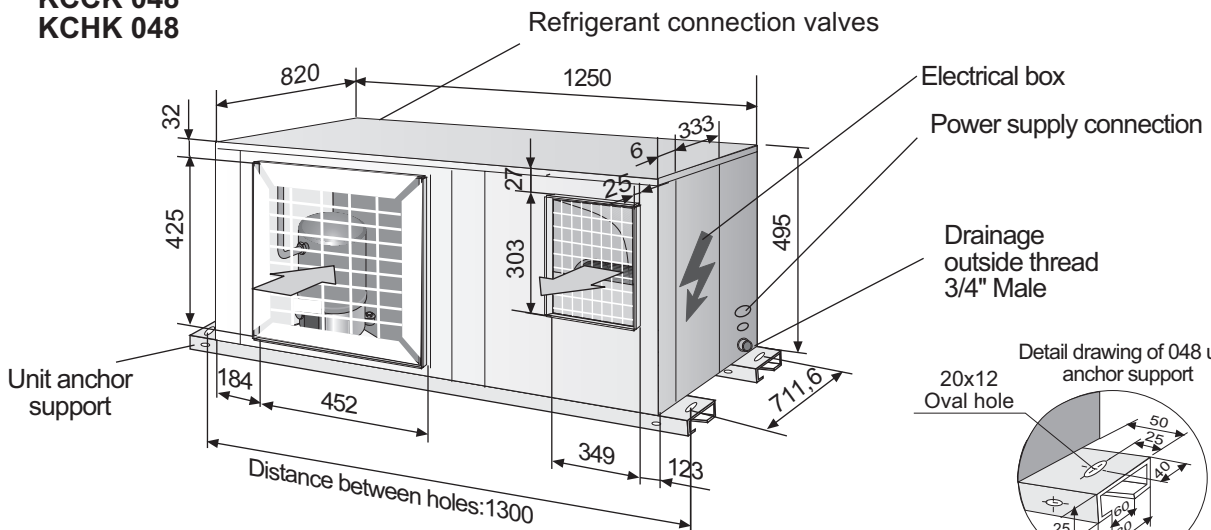


MODELS
KCCK 036
KCHK 036



Unit anchor support

MODELS
KCCK 048
KCHK 048

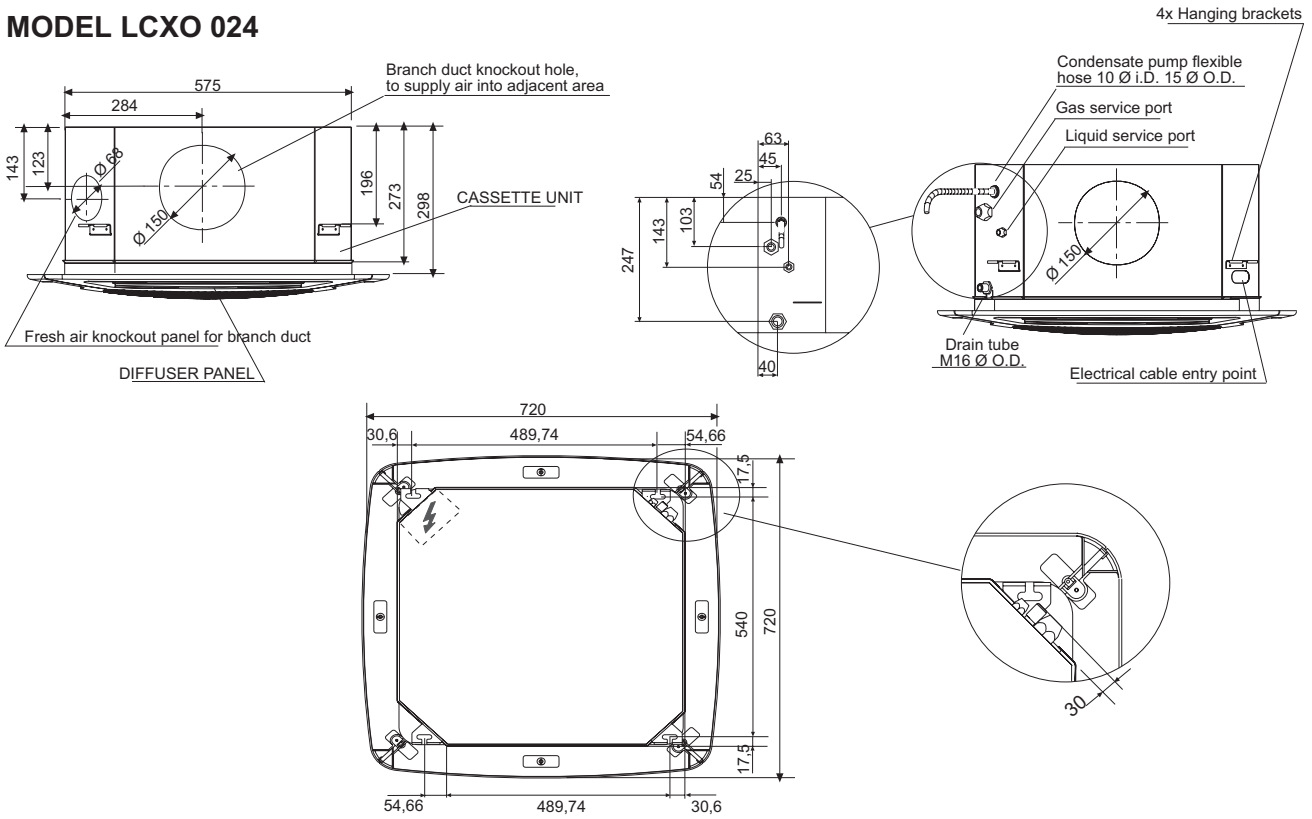


1.- UNIT SELECTION

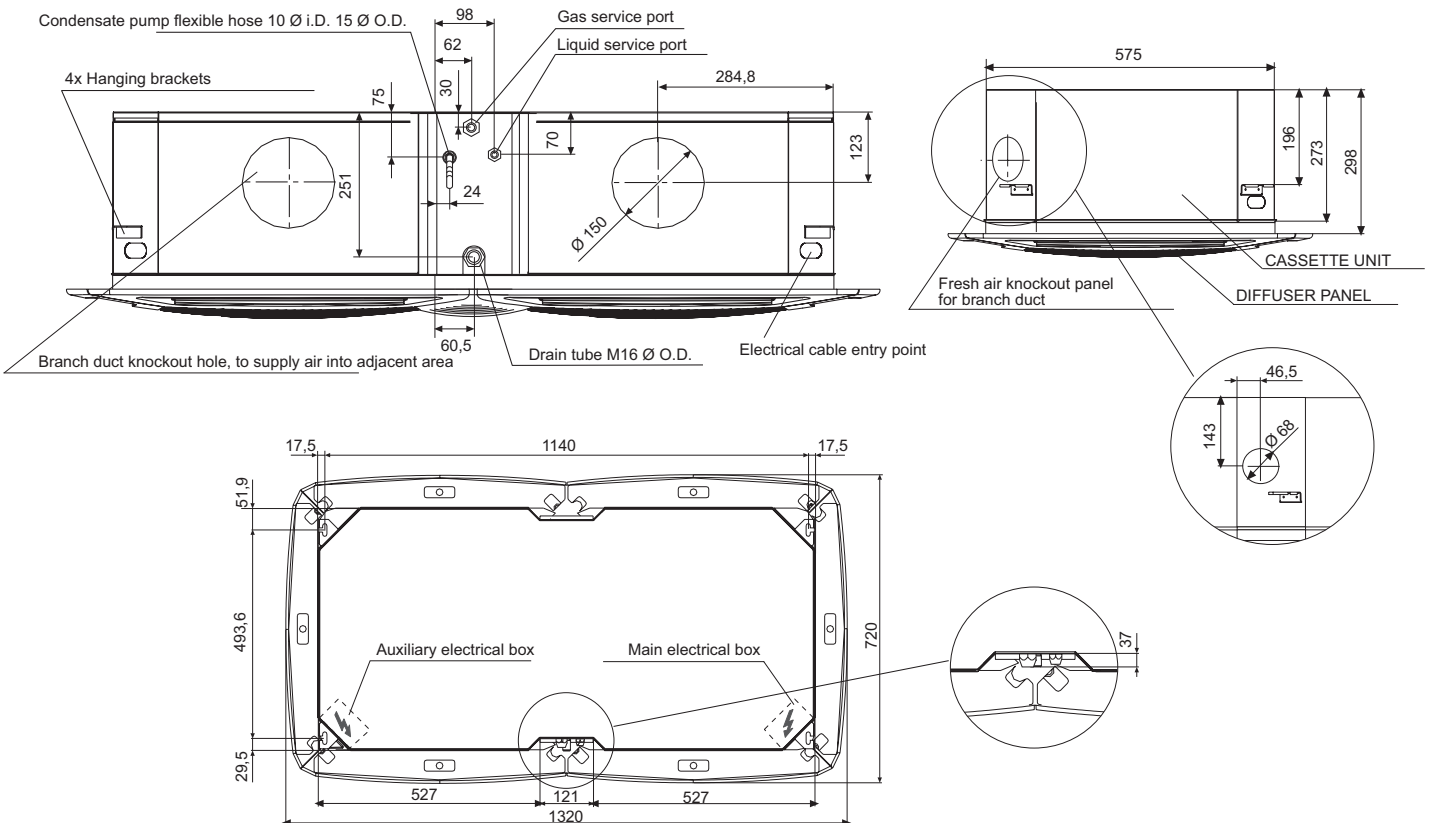
1.9.- INDOOR UNIT DIMENSIONS (mm)

INDOOR UNIT LCXO

MODEL LCXO 024



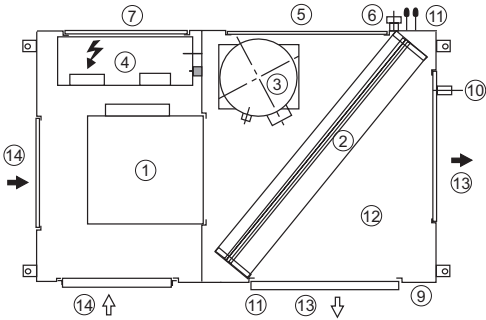
MODEL LCXO 048



1.- UNIT SELECTION

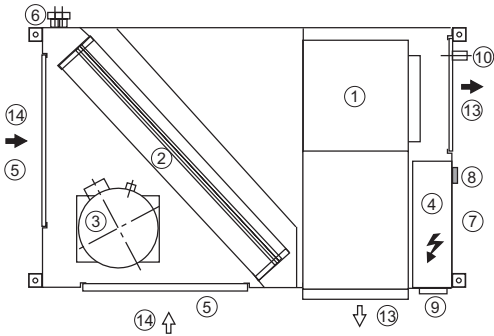
1.10.- UNIT DESCRIPTION

OUTDOOR UNITS KCCK/ KCHK 018-024-036



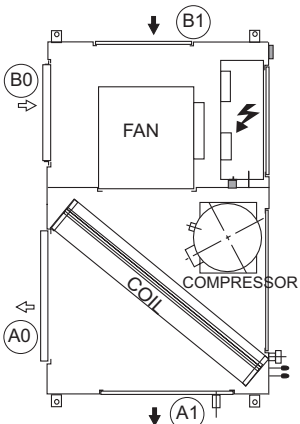
- ① FAN
- ② EXCHANGER
- ③ COMPRESSOR
- ④ ELECTRICAL BOX
- ⑤ ACCESS PANEL TO COMPRESSOR AND PIPE COMPONENTS
- ⑥ CONNECTION PIPE
- ⑦ ACCESS PANEL TO ELECTRICAL BOX
- ⑧ MAIN SWITCH (OPTIONAL, depending on model)
- ⑨ POWER SUPPLY ENTRY
- ⑩ DRAINAGE Models 018-024-036: Ø16 EXTERNAL
Models 048: OUTSIDE THREAD 3/4" MALE
- ⑪ INTAKE PRESSURE (MOD.036)
- ⑫ CONDENSATE PUMP
- ⑬ AIR OUT

OUTDOOR UNITS KCCK/ KCHK 048

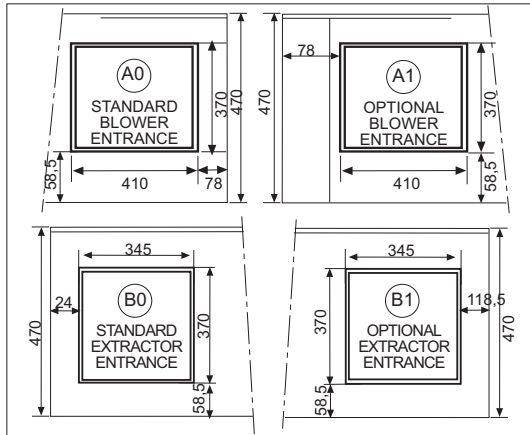


- ⑬ AIR OUT
 - ⑭ AIR IN
- STANDARD POSITION (factory setting)
 OPTIONAL POSITION (factory setting)

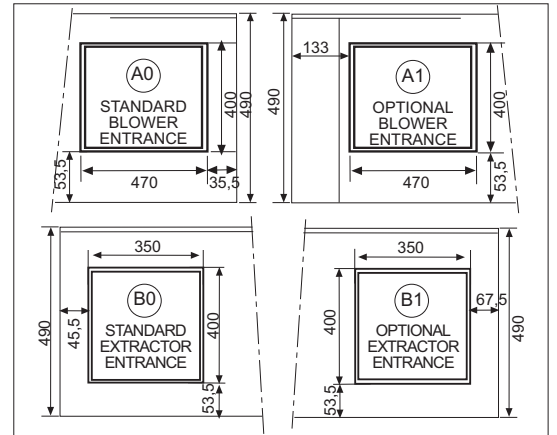
1.11.- STANDARD/ OPTIONAL ENTRANCE OF OUTDOOR UNIT KCCK / KCHK (to be made by the installer)



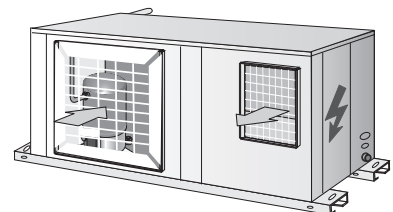
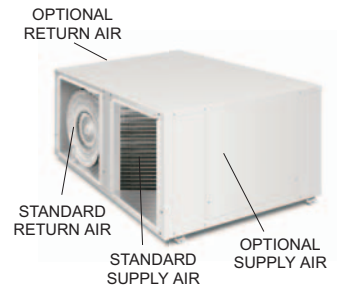
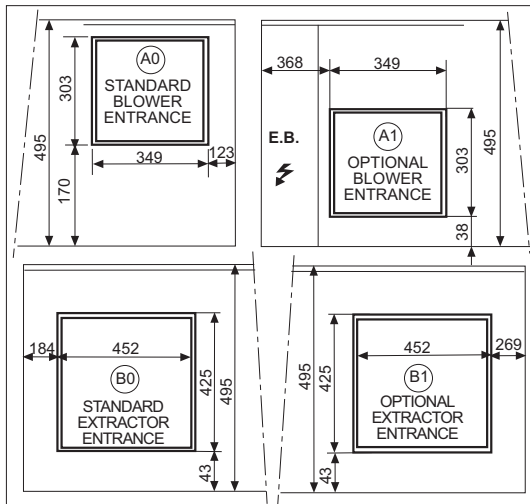
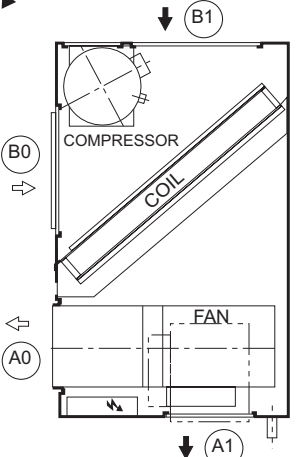
MODELS 018-024



MODELS 036



MODELS 048



- ↔ STANDARD CONFIGURATION
- ↔↔↔ OPTIONAL CONFIGURATION
- ⚡ ELECTRICAL BOX

1.- UNIT SELECTION

1.12.- OPTIONS

OUTDOOR UNIT

ON/OFF CONDENSATION PRESSURE CONTROL (outdoor unit)

The condensation pressure control consists of one pressure switch, which starts and stops the outdoor fan, regulating the condensation temperature; thus the unit will be able to operate in the cooling cycle when the outdoor temperature is below 19°C (until 0°C).

It includes crankcase heater for cooling only units. The purpose of the heater is to keep the oil in the compressor at the correct temperature while the compressor is stopped, so that it can be properly lubricated when starts again. When the unit is operating at low outdoor temperatures (below 19°C), it is advisable to fit a crankcase heater.

PROPORTIONAL CONDENSING PRESSURE CONTROL (outdoor unit)

It is an element that regulates outdoor fan speed, in order to control condensation temperature. Thus, the unit will be able to operate in the cooling cycles when the outdoor temperature is below 19°C. This kit includes crankcase heater for cooling only units.

MAIN SWITCH (only MODELS 048)

The main switch is located on the access panel to the electrical box, in such a way that the unit is disconnected when the panel is opened, for the models KCCK / KCHK.

(Refer to the size diagram on page 14 to see the position of the electrical box access panel)

COMPRESSOR ACOUSTIC JACKET (outdoor unit)

Each compressor is fitted with a compressor acoustic jacket this provides attenuation of the compressor noise that radiates from the unit when in operation.

INDOOR UNIT

FRESH AIR INLET DUCT; EXTERNAL AIR: INSTALLATION (FIG. 1)

- Remove the 68 mm insulation material and cut out the prepunched side knockouts.
- Secure the duct connection flange to the unit. Ducts can be of flexible polyester type or corrugate aluminium, externally covered with anti-condensate material.
- Install a supplementary fresh air fan for the introduction of fresh air into the unit. The fan motor must be controlled by an ON-OFF switch.
- Fresh air flow must be less than 10% of the total air flow, to avoid operating problems. A speed controller should be installed in the supplementary fan motor, for adjusting the air flow.

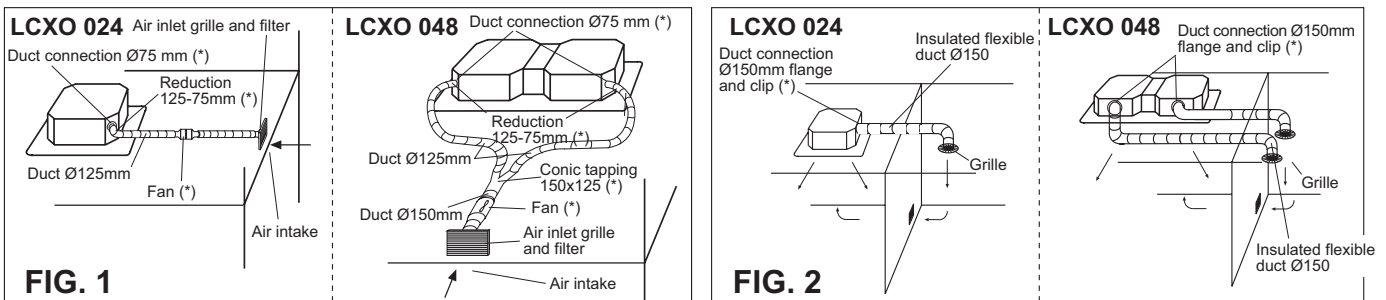
AIR SUPPLY TO AN ADJACENT ROOM: INSTALLATION (FIG. 2)

- Remove the 150 mm insulation material and cut out the prepunched side knockouts. The side panels with knockouts, can not be used at the same time to supply air to an adjacent room for units LCXO 024. The air from both ducts should not be discharge by the same fan for units LCXO 048.
- Cut away and remove the polystyrene around the inside edge of the opened panel.
- Use a duct connection flange and a suitable duct.
- Air supply to an adjacent room requires that outlet corresponding with the duct, is closed.
- An air inlet grille must be fitted (if possible near the floor) between the air conditioned room (where the unit is located) and the adjacent room.
- Ducts can be of flexible polyester type or corrugate aluminium, externally covered with anti-condensate material.

The duct length can be calculated by taking into account the pressure drop through the unit, using the table below.

Air flow supplied to an adjacent room in m³/h, fresh air fan at high speed:

UNIT / MODELS		024	048
Air flow	m ³ /h	250 125 25	400 200 50
Available pressure	Pa	0 20 30	0 10 20



(*) Elements included in optional kit

2.- INSTALLATION

2.1.- POINTS TO KEEP IN MIND

DANGER AND WARNING SIGNS



Abrasive surfaces



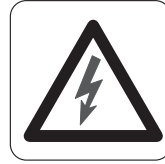
Low temperatures



High temperatures



Risk of injury with moving objects



Electrical voltage



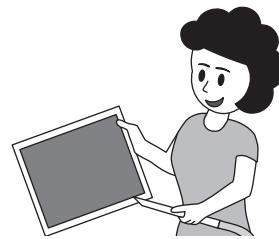
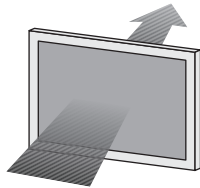
Risk of injury with rotating objects

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.

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

All technical data contained in these operating instructions including the diagrams and technical description remains the property of Lennox Refac and may not be used (except for the purpose of familiarising the user with the equipment), reproduced, photocopied, transferred or transmitted to third parties without prior written authorisation from Lennox Refac.

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.

2.- INSTALLATION

2.2.- INSTALLATION GUIDELINES



All INSTALLATION, SERVICE and MAINTENANCE operations must be carried out by QUALIFIED PERSONNEL.

The unit must be transported in a HORIZONTAL POSITION; any other position may cause serious damage to the machine.

When the unit is received, it should be checked to assure that there are no bumps or other damage, following the instructions on the packaging. If there is damage, the unit may be rejected by notifying the LENNOX Distribution Department and reporting why the machine is unacceptable on the transport agent's delivery notice. Any later complaint or claim made to the LENNOX Distribution Department, for this type of anomaly, cannot be considered under the Guarantee.

Sufficient space must be allowed to facilitate placement of the unit.



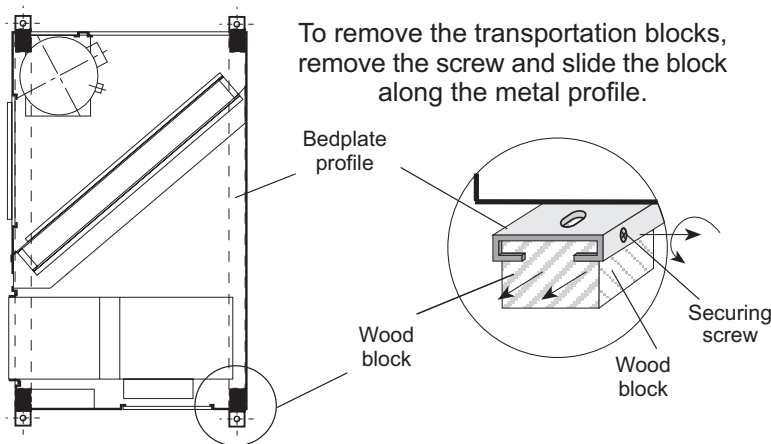
When positioning the unit, be sure that the Rating Plate will always be visible since this data will be necessary to assure proper maintenance.

The indoor and outdoor units KCCK-KCHK are designed to be installed with ducts, calculated by qualified technical staff. The joints to be used between ducts and the openings to the unit should be Elastic Joints. Avoid the use of BYPASS joints between the extraction air and input air in both the outdoor and indoor sections. The structure where the unit is placed must be able to support the weight of the unit during operation.

2.3.- UNIT RECEPTION

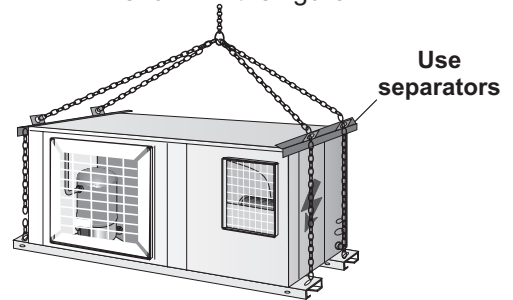
The units KCCK-KCHK 048 have Metal Bedplate Profiles and Wooden Blocks for transportation. These wooden blocks must be removed when positioning the unit in its final position.

PLACEMENT OF THE BEDPLATE AND TRANSPORTATION BLOCKS



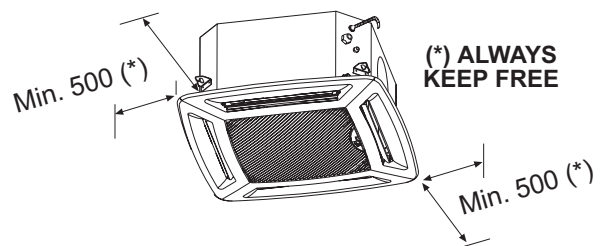
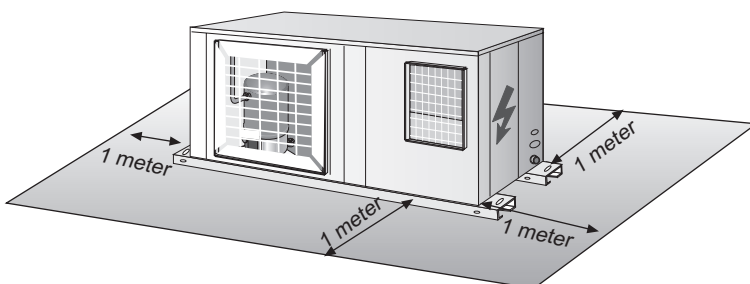
How to hoist the unit

If unloading and placement require the use of a crane, then secure the suspension cables as shown in the figure.



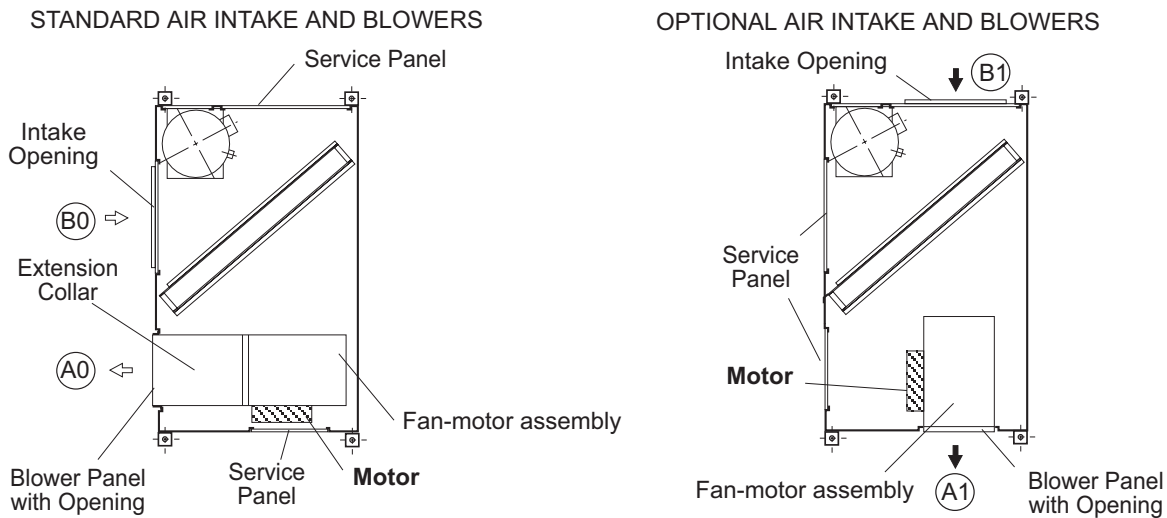
2.4.- INSTALLATION CLEARANCES

Clearance around the unit for service and maintenance.



2.- INSTALLATION

2.5.- OPTIONAL OPERATIONS PRIOR TO UNIT INSTALLATION: CHANGING THE POSITION OF BLOWERS AND AIR INTAKE FOR OUTDOOR UNITS **KCKK-KCHK 048**



BLOWER:

From the position (A0) to the position (A1)

- 1) Remove the ceiling of the unit, the Blower Panel with Opening and the Service Panel.
- 2) Remove the motor-fan assembly from the unit unscrewing the supports from the base, and throwing away the extension collar, if there is one.
- 3) Unscrew the supports that have been left on the fan-motor assembly.
- 4) Turn the fan-motor assembly to its new position 90° horizontally and 180° on its shaft. The motor should now be accessible from the Service Panel in this new position.
- 5) Screw down the fan-motor assembly in its new position using the supports.
- 6) Assemble the Blower Panel with Opening and the Service Panel in its new position, taking special care with the weather striping.

INLET:

From the position (B0) to the position (B1)

- 1) Remove the Intake Opening and the Service Panel.
- 2) Switch the position of the Opening and Service Panels.



SEE LOCATIONS AND SIZES FOR THE OPENINGS IN THEIR STANDARD AND OPTIONAL POSITIONS ON THE GENERAL MEASUREMENT DRAWINGS.

2.6.- DUCT INSTALLATION



Duct calculation and design must be effected by a qualified technician.

The ductwork dimensions should be determined in accordance with the air flow circulating through it and with the available static pressure of the unit. This data appears in the corresponding Technical Documentation.

Various suggestions are made here below, regarding the layout and design of the said ductwork:

- 1- Whatever type of duct is used, it should not be made of materials which are flammable, or which give off toxic gases in the event of a fire. The internal surfaces should be smooth, and not contaminate the air which passes through. It is advisable to use isolated sheet metal duct in order to avoid condensations and thermic charges.
- 2- At the points where the duct joins with the unit, it is advisable to use a flexible connection which absorbs vibration and prevents the transmission of noise inside the ductwork and allows unit access.
- 3- Bends should be avoided as much as possible near the unit outlet. If unavoidable, they should be as slight as possible, and internal deflectors should be used when the duct is of large dimensions.

2.- INSTALLATION

2.7.- DRAINS

GENERAL RECOMMENDATIONS:

For drain piping, it is advisable to use PVC copper and steel tube.

For drain tube, use a sealing material.

Slightly tip the unit toward the drainage side as the following pictures shows:

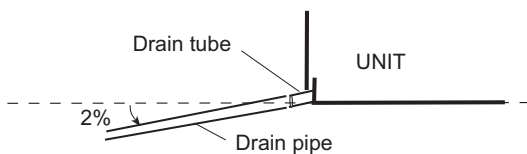
OUTDOOR UNITS KCCK/KCHK:

Unit models 018-024-036 are provided with a steel 16mm outdoor diameter drain tube welded to the unit base; for this application a siphon is not necessary.

Unit models 048 are provided with a 3/4" male steel threaded welded to the drip tray; for this application a siphon must be installed. Connect the siphon to the drain pipe of the unit, and mount the drain pipe with at least a 2% incline from the siphon.

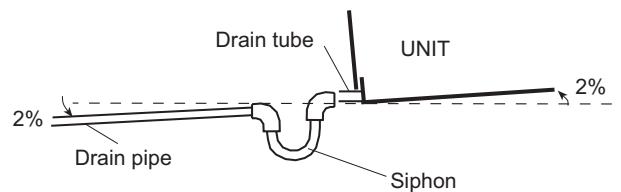
Slightly tip the unit (2%) toward the drainage tube and check that the drip tray is clean and free from dirt and other debris from the works, and that the water drains correctly.

UNITS KCHK 018-024-036

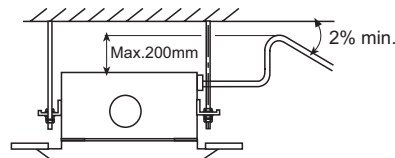
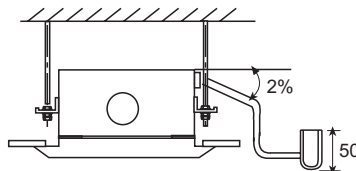


It is not necessary to install a siphon to evacuate water from the unit, but it is advisable to install it to avoid offensive odor.

UNITS KCHK 048

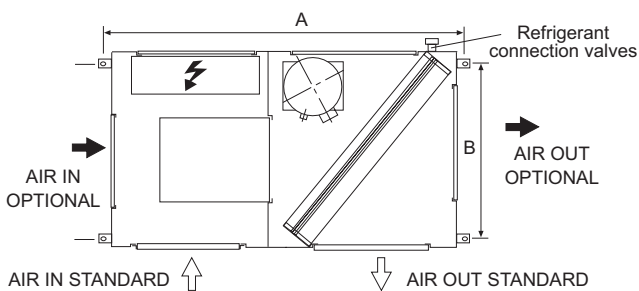


- To ensure that there is condensate flow, the drain tube must be installed with a fall of 2% without obstructions, or without rising sections.
- To avoid any unpleasant odours from the drainage system a trap must be fitted with a trap depth of no less than 50mm.
- The condensate pump has a maximum lift of 200mm. The rising tube must always be vertical.
- On completion the drain line must be insulated.

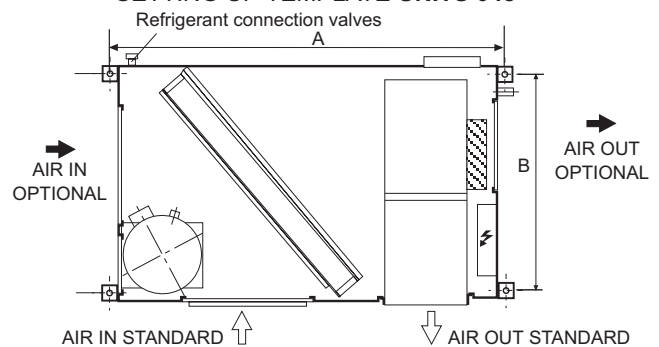


2.8.- SETTING UP TEMPLATES OF OUTDOOR UNIT (mm)

SETTING UP TEMPLATE UNITS 018-024-036



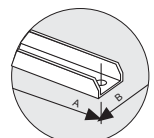
SETTING UP TEMPLATE UNITS 048



Use 4 rod of a diameter of 10mm if the unit is fixed in the roof, or screw M.10 if the unit is fixed on the ground.

	KCCK 018-024 KCHK 018-024	KCCK 036 KCHK 036	KCCK 048 KCHK 048
A	983	1064	1300
B	530	660	711,6

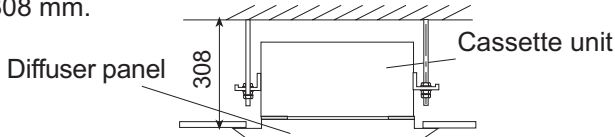
Dimensions recommended on point A and B are referred to the hole of support of the unit.



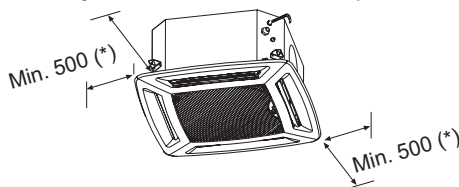
2.- INSTALLATION

2.9.- UNIT LOCATION AND SETTING TEMPLATES OF INDOOR UNIT

1. The unit should be positioned centrally within the room, ensure that the unit is on level. The unit must be installed in a position where there is sufficient strength in the structure to support the weight of the unit. The false ceiling must have at least a height of 308 mm.

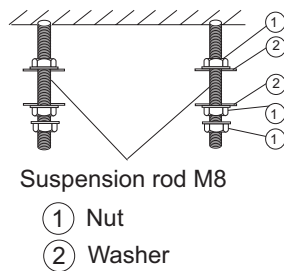


2. Ensure there is sufficient space around the unit to service it. Where there is a false ceiling ensure that there is enough space to provide access. Where there is a false panelled ceiling, ensure that there is sufficient space adjacent to remove the panels.

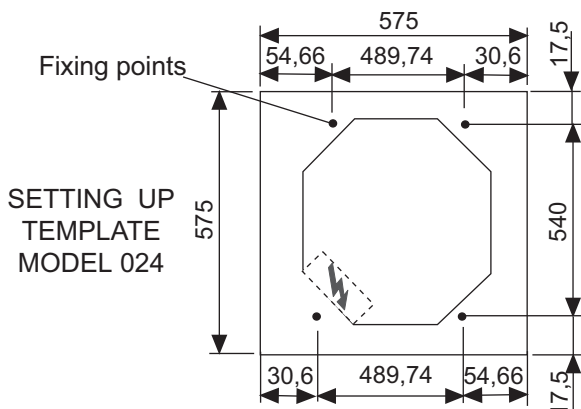


3. **LCXO 024 models:** cut the false ceiling to a maximum dimension of 625x625mm, or remove one panel of 600x600mm for a panelled ceiling. **LCXO 048 models:** cut the false ceiling to a maximum dimension of 625x1225mm, or remove 2 panels of 600x600mm or one of 600x1200mm, for a panelled ceiling.

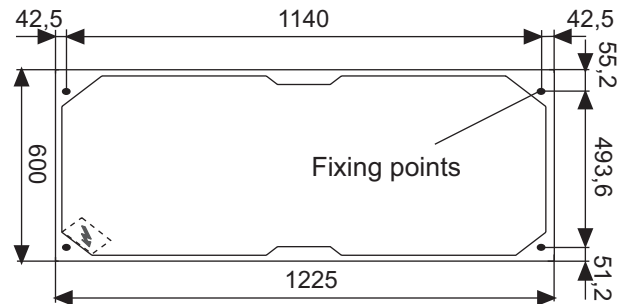
4. Install 4 suspension rods M8 to the ceiling, the rods should have three nuts and two washers, as in next figure. The setting up template supplied with the unit can be used to indicate the position for the suspension rods.



NOTE: Before marking the fixing points to the ceiling, ensure that the unit is positioned in the correct orientation taking into account of where the electrical cabinet and refrigerant connections are required. When the unit is fixed it is not easy to change position.



SETTING UP TEMPLATE MODEL 048

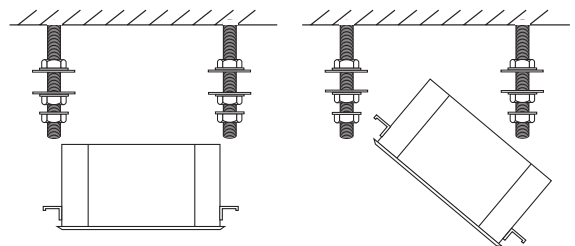


5. The condensate connections should be positioned before the unit is installed.

6. To ease the connection of water pipes and the drain tube (for 024 models), is advisable to disassemble the supporting bracket located on this corner. Once the installation is finished, the bracket must be reassembled.

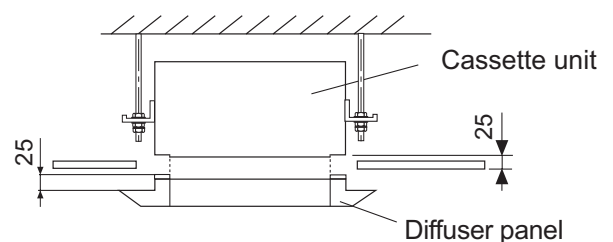
7. When lifting the cassette into position, care should be taken not to lift the unit by the drip tray, refrigerant connection or drain tube; this could damage the unit. The cassette should be lifted by the hanging brackets. The hanging brackets should be insulated with the supplied insulation.

8. The cassette brackets hook over the washer. Tighten the cassette with the lower nuts.



9. Check to ensure the unit is level. The drain will then automatically be lower than the rest of the drip tray.

10. Tighten the nuts on the suspended rods to ensure a distance of 25 mm between the bottom face of the body of the unit and false ceiling.



2.- INSTALLATION

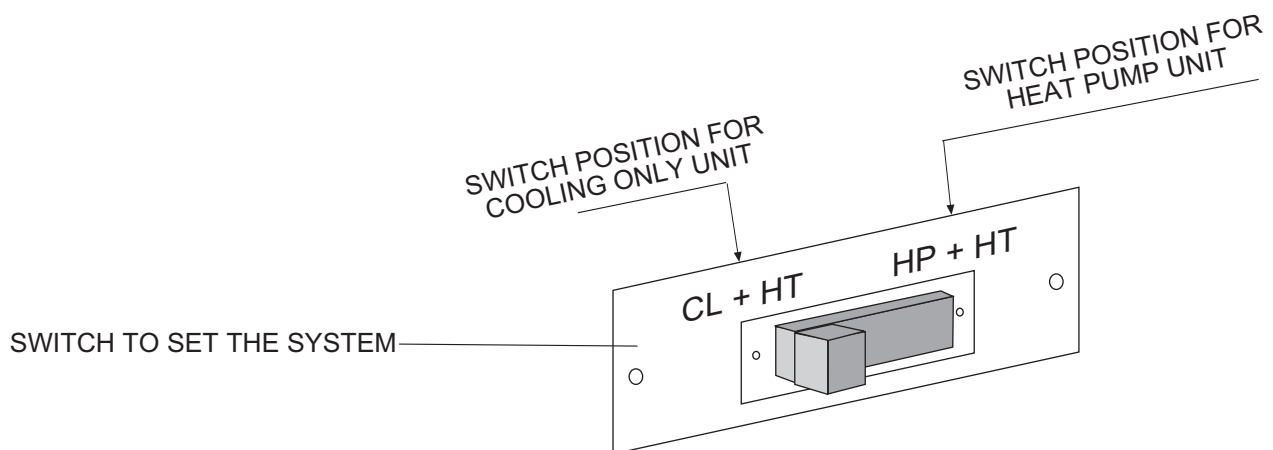
2.10.- SYSTEM CONFIGURATION (INDOOR UNIT)

IMPORTANT

**Prior of making the electrical connections,
set the switch for heat pump unit or for cooling only unit.**

This unit is valid for operating as a cooling only or heat pump application.
The unit should be configured prior to making the electrical connections, by setting the configuration switch as follows:

SYSTEM CONFIGURATION INDOOR UNIT LCXO



Switch in position CL + HT for cooling only application (factory configuration)
Switch in position HP + HT for heating pump application

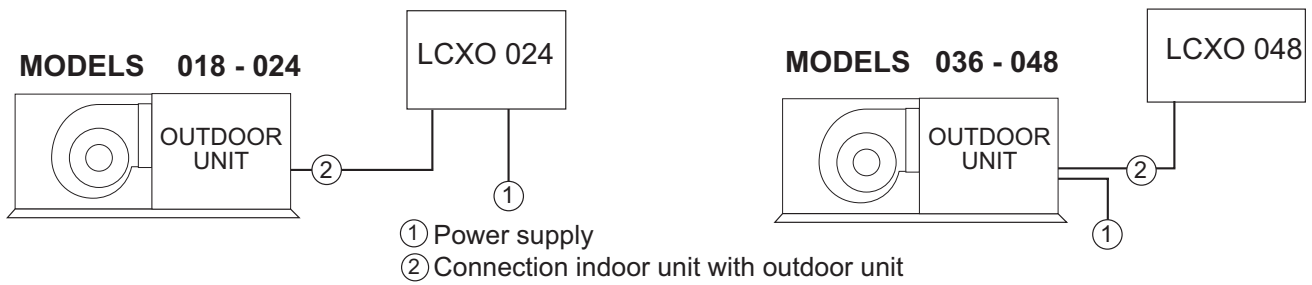
Check page 20 for more information about the situation of this switch.

NOTE:

**If errors are made during the configuration of the system, switch off the main power supply,
set configuration switch in the correct position and then switch the power on.**

2.- INSTALLATION

2.11.- ELECTRICAL CONNECTIONS



VOLTAGE	MODEL	NUMBER OF WIRES X SECTION			
		COOLING ONLY		HEAT PUMP	
		①	②	①	②
POWER SUPPLY 230V SINGLE PHASE UNITS 1N ~ 230V - 50 Hz + PE	018	3 X 2,5 mm ²	4 X 2,5 mm ²	3 X 2,5 mm ²	6 X 2,5 mm ²
	024				
	036	3 X 2,5 mm ²	4 X 1,5 mm ²	3 X 2,5 mm ²	6 X 1,5 mm ²
POWER SUPPLY 230V THREE-PHASE UNITS 3 ~ 230V - 50 Hz + PE	036	4 X 2,5 mm ²	4 X 1,5 mm ²	4 X 2,5 mm ²	6 X 1,5 mm ²
	048	4 X 4 mm ²	4 X 1,5 mm ²	4 X 4 mm ²	6 X 1,5 mm ²
POWER SUPPLY 400V THREE-PHASE UNITS 3N ~ 400V - 50 Hz + PE	036	5 X 1,5 mm ²	4 X 1,5 mm ²	5 X 1,5 mm ²	6 X 1,5 mm ²
	048	5 X 2,5 mm ²	4 X 1,5 mm ²	5 X 2,5 mm ²	6 X 1,5 mm ²

NOTE: The sections have been calculated for a distance no longer than 35m, and a voltage drop of 10V. The regulation must comply with the regulations in force. Make sure the earth cable connection is correct. Indoor units include an infrared remote controller.



IN ORDER TO CARRY OUT THE ELECTRICAL CONNECTIONS, FOLLOW THE ELECTRICAL DIAGRAM SUPPLIED WITH THE UNIT

VOLTAGE OPERATING LIMITS

MODEL	VOLTAGE	LIMIT
018-024-036	230 V-1Ph-50Hz	198-264 V -1Ph- 50Hz
036-048	230 V-3Ph-50Hz	180-242 V -3Ph- 50Hz
	400 V-3Ph-50Hz	342-462 V -3Ph- 50Hz



REMEMBER THAT THE COMPRESSOR IS A SCROLL TYPE COMPRESSOR:

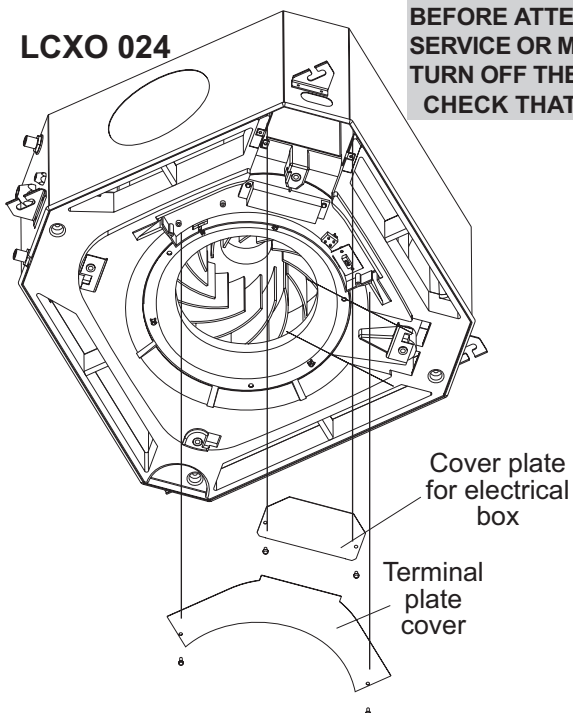
Scroll type compressors only compress in one direction of the rotation. Single phase models are always started up in the proper direction; however, the three phase models, turn in either direction depending on the order of the power supply phases. Therefore, it is essential that the phase connection for scroll-type three-phase compressors be carried out correctly, that is why these three-phase compressors are supplied as standard with a three-phase detector, which avoids the unit starts unless the connections are made on the right way. The direction of the rotation is right when an indicator-light turns ON. If the connection is wrong, this indicator will not light and the rotation will be reversed. If this occurs, the solution is to disconnect, switch the wires between two of the phases and connect again.

2.- INSTALLATION

2.10.- ELECTRICAL CONNECTIONS

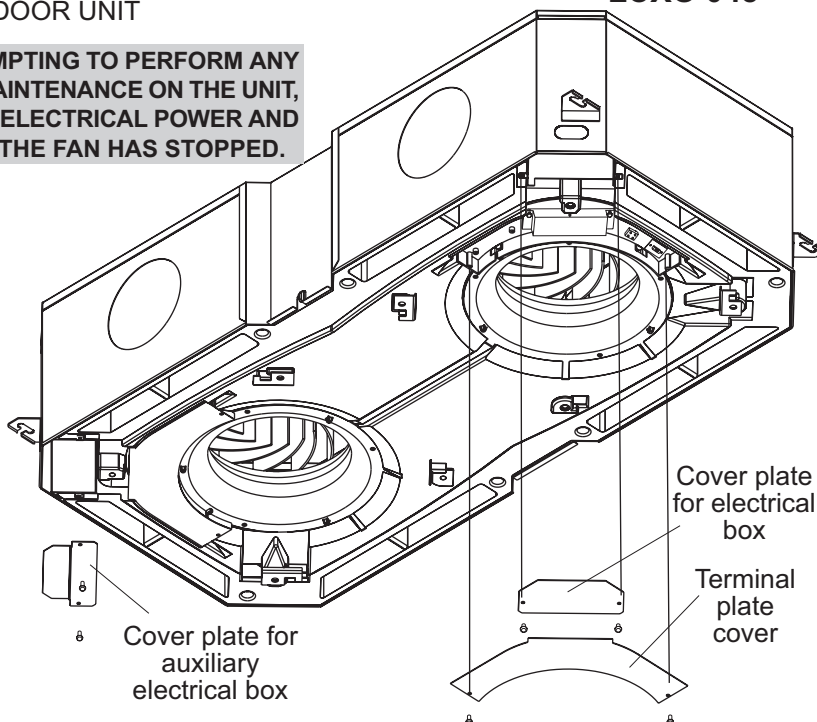
ACCESS TO THE ELECTRICAL BOX OF INDOOR UNIT

LCXO 024



BEFORE ATTEMPTING TO PERFORM ANY SERVICE OR MAINTENANCE ON THE UNIT, TURN OFF THE ELECTRICAL POWER AND CHECK THAT THE FAN HAS STOPPED.

LCXO 048



ACCESS TO THE ELECTRICAL COMPONENTS OF THE UNIT

Removing the corresponding plate cover screws gives access to the electrical box and terminal plate, as indicated on the drawing.

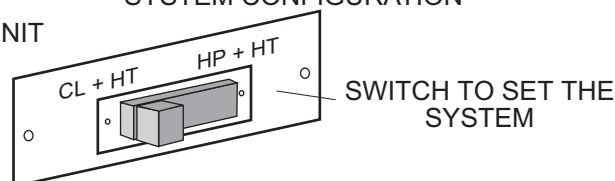
IMPORTANT

Prior of making the electrical connections, set the switch for heat pump unit or for cooling only unit.

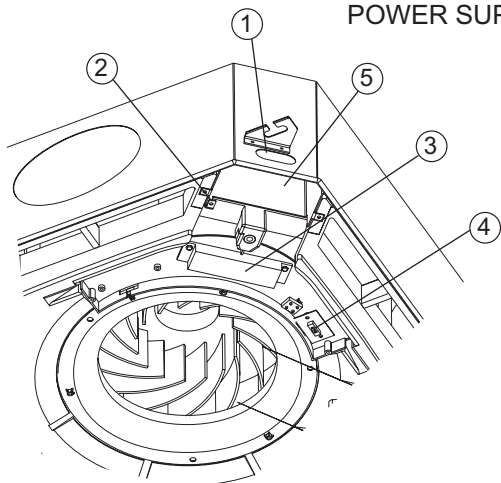
Switch in position CL + HT for cooling only application or switch in position HP + HT for heating pump application.

If errors are made during the configuration of the system, switch off the main power supply, set configuration switch in the correct position and then switch the power on.

SYSTEM CONFIGURATION



POWER SUPPLY AND CONNECTION TO OUTDOOR UNIT



Connect power supply and interconnecting wires to terminal plate of outdoor unit, according to unit wiring diagram.

- ① Electrical inlets, power supply and interconnecting wires, indoor-outdoor unit.
- ② Terminal plate, power supply and connection to outdoor unit.
- ③ Terminal plate, sensor outdoor unit (Heat Pump only).
- ④ Configuration switch.
- ⑤ PCB

2.- INSTALLATION

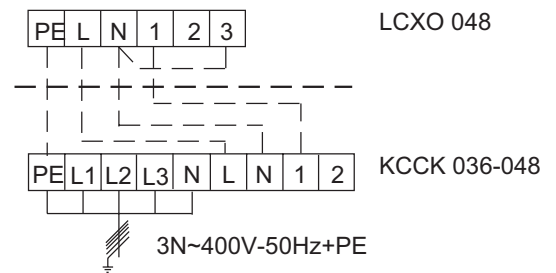
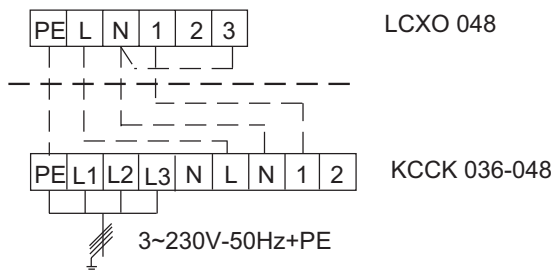
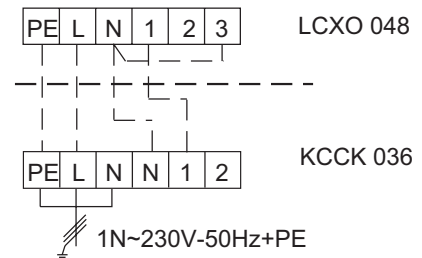
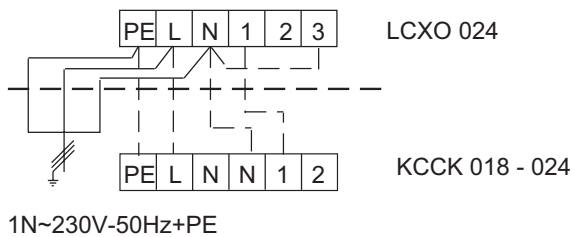
2.10.- ELECTRICAL CONNECTIONS

TERMINAL PLATE BETWEEN INDOOR UNIT AND OUTDOOR UNIT

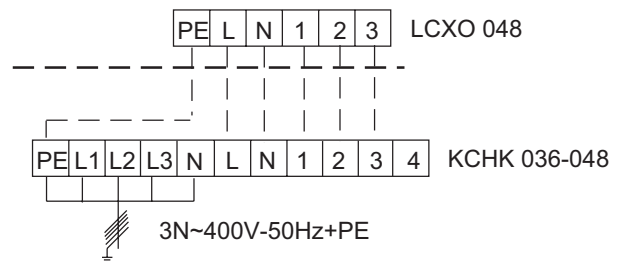
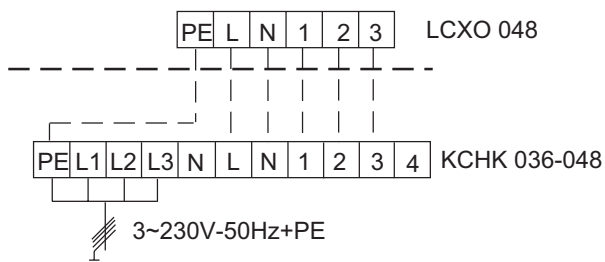
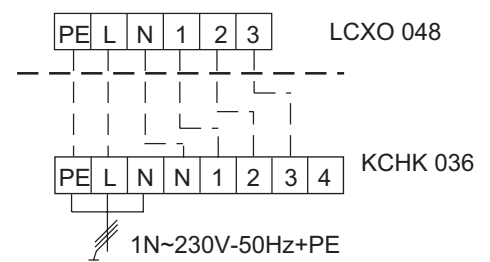
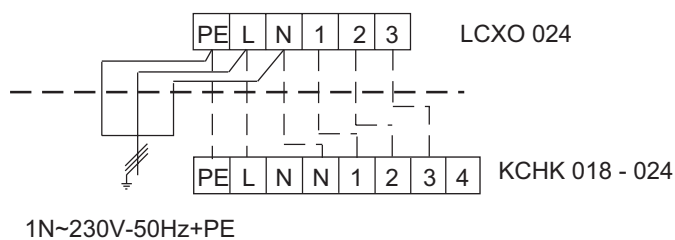


IN ORDER TO CARRY OUT THE ELECTRICAL CONNECTIONS, FOLLOW THE ELECTRICAL DIAGRAM SUPPLIED WITH THE UNIT

COOLING ONLY UNITS



HEAT PUMP UNITS



2.- INSTALLATION

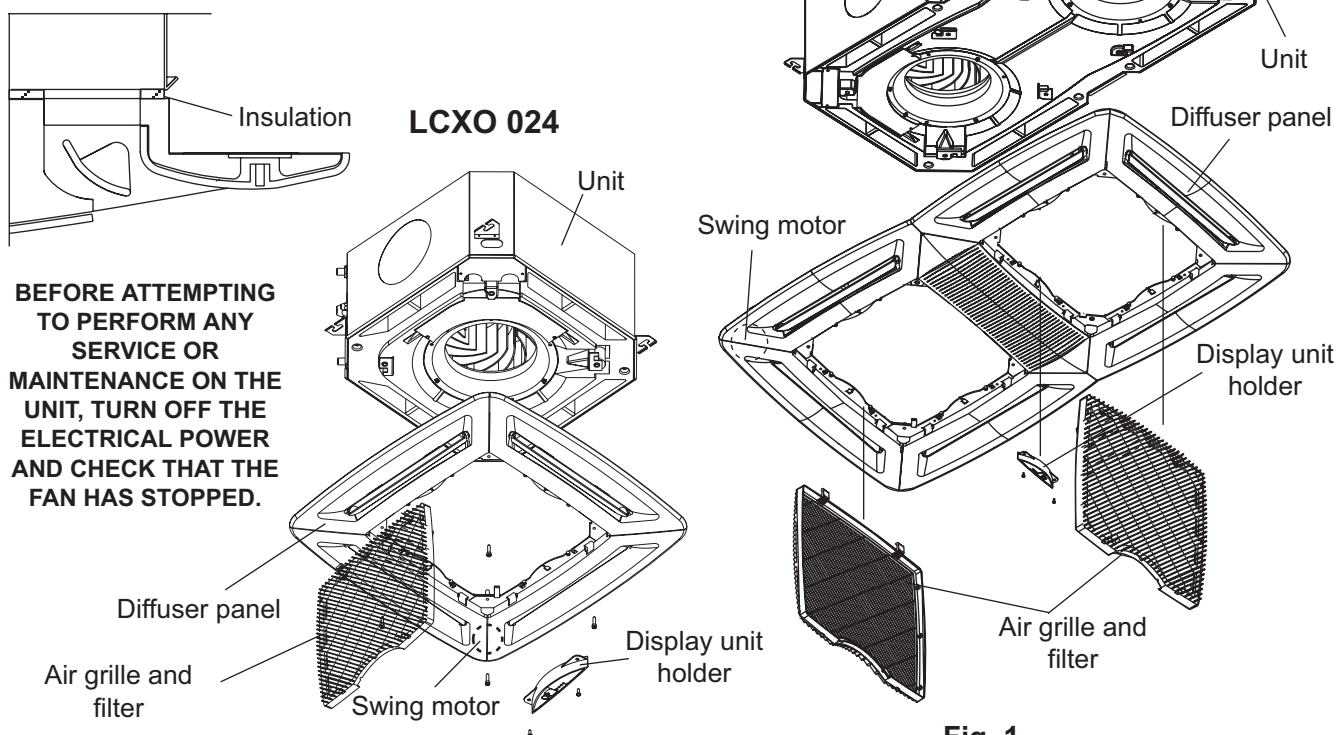
2.11.- INSTALLATION OF DIFFUSER AND INLET GRILLE

MOUNTING THE DIFFUSER PANEL TO THE UNIT

Check that the position in which the diffuser is mounted is the right one.

1. - Release the air intake grille.
2. - The diffuser panel can then be provisionally positioned on the cassette using the fixing clips.
3. - The diffuser is fastened with the bolts supplied.
4. - Make sure that the frame has not been deformed in the installation, by an excessive tighten of the bolts. There must be no recirculation of air between intake and outlet air paths.

The diffuser panel is sealed with insulation to avoid air gaps between the unit and the air panel. The insulation can be compressed from 8 mm to 3 mm, allowing the panel to be tightened to the cassette by up to 5 mm.



INSTALLATION OF DISPLAY UNIT HOLDER/ UNIT OPERATION INDICATORS AND POWER SUPPLY TO THE SWING MOTOR

The display holder includes the infrared receiver (when the remote controller is of this type) and unit operation indicators. (Refer to the corresponding infrared controller manual). The infrared receiver panel is connected to the electrical board by means of wires.

1. - The display unit holder is mounted by two screws, on any side of the diffuser panel (LCXO 024) (Fig. 1).
2. - The swing motor should now be connected with the power supply wires.

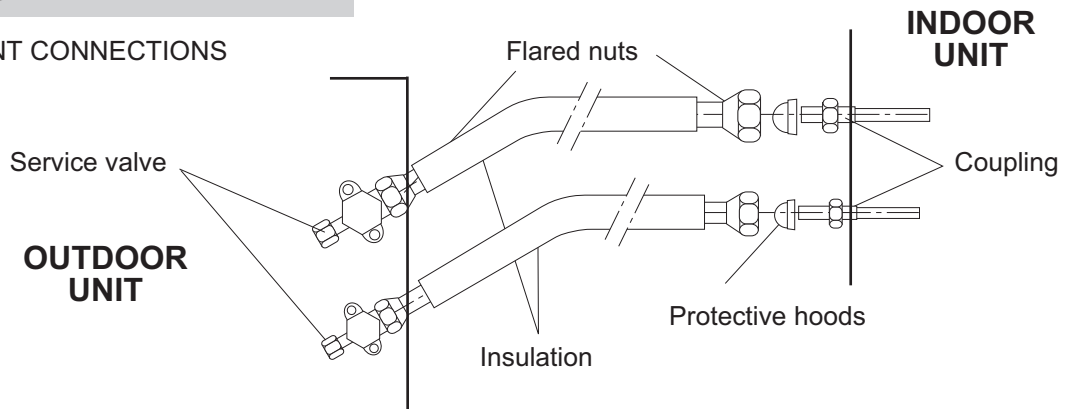
MOUNTING THE AIR INTAKE GRILLE AND FILTER ASSEMBLY

The position in which the grill is mounted depends on the position of the display unit holder (LCXO 024).

- 1.- The grill fixing hooks should be fitted into the holes provided.
- 2.- The stays need to be placed between the diffuser and the inlet grille.
- 3.- The grille is mounted on the diffuser via two hand triggers. Initially pull off the hand triggers, then insert the grille into the diffuser and release the hand triggers. When this operation is completed the grille is attached to the diffuser.

2.- INSTALLATION

2.12.- REFRIGERANT CONNECTIONS



REFRIGERANT CONNECTION FOR UNITS WITH COUPLINGS AND SERVICE VALVES

NOTE: BOTH GAS AND LIQUID REFRIGERANT LINES MUST BE INSULATED.

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

- With the valves closed of the outdoor unit, unscrew the flare nuts, removing all the protective hoods.
- Unscrew the flare nuts and the coupling of the indoor unit, removing the protective hoods.
- Introduce the flare nuts in the corresponding union tubes, previously isolated.
- Make the thread union of the tubes in valves and coupling using the keys.
- To do vacuum, first close the valves on the outdoor unit, second connect the plug of the vacuum pump to the suction valves service port 1/4", do vacuum to get a absolute pressure of 0.5 mm Hg. This way the vacuum will be created in the indoor unit and the union pipes.
- Remove the plugs and open the valves of the outdoor unit.
- Verify leakage in the couplings.
- Insulate the pipes and the service ports.

CUT THE PIPE PROPERLY

YES Bent Unpolished **NO**

MAKE A CORRECT FLARE

FAULTY

Bent Damaged surface Flawed Irregular

AVOID FROM METALLIC DUST ENTERING INTO THE PIPE
CLEAN THE BURRS

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
5/8"	50-55 Nm
3/4"	65-70 Nm

0-0.5 mm.

Copper pipe

Service port Gas line Liquid line Wrenches

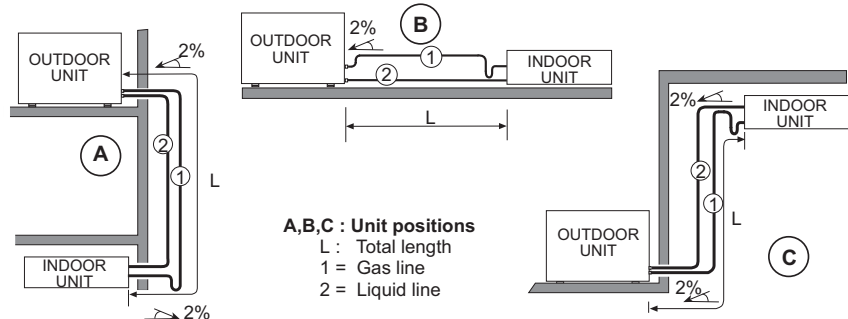
2.- INSTALLATION

2.12.- REFRIGERANT CONNECTIONS

DISTANCES BETWEEN UNITS

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

SYPHONS: Install syphons on the installation as the picture shows, on the upper and lower position of the suction line. No other syphons are necessary. The indoor units LNXO 070-080 are supplied with welded connections.



REFRIGERANT LINES SELECTION

REFRIGERANT LINES		UNIT - MODEL			
		018	024	036	048
Unit connections	Ø Liquid	1/4"	1/4"	3/8"	3/8"
	Ø Gas	1/2"	5/8"	3/4"	3/4"
Maximum vertical line length (m)		15	15	15	15
Maximum vertical line length + horizontal (m)		25	25	25	25
Maximum number of bends		12	12	12	12

NOTE: BOTH GAS AND LIQUID REFRIGERANT LINES MUST BE INSULATED.



For other positions and longer distances, consult the Lennox Technical Support Department for application assistance. The following data will be obtained from that estimation: pipe dimensions, suction traps, isolation, refrigerant charge.

REFRIGERANT CHARGE

The outdoor unit is supplied with refrigerant R-407C factory precharged, for the set indoor+outdoor unit and for a line of 7 meter long. When the line length exceeds 7m, add the following amount of refrigerant per meter line:

COOLING ONLY UNIT MODELS

MODEL	018	024	036	048
Refrigerant charge R-407C per meter (gr.)	10	10	20	20

HEAT PUMP UNIT MODELS

MODEL	018	024	036	048
Refrigerant charge R-407C per meter (gr.)	20	20	45	45

3.- COMMISSIONING AND OPERATION

3.1.- DATA PAGE FOR UNIT COMMISSIONING

UNIT: _____ SERIAL No.: _____

CONTROL PANEL IDENTIFICATION CODE _____

INSTALLATION ADDRESS: _____

INSTALLER: _____ INSTALLER TEL.: _____

INSTALLER ADDRESS: _____

DATE OF COMMISSIONING: _____

CHECKS:

SUPPLY VOLTAGE: _____ RATED VOLTAGE OF THE UNIT: _____

	YES	NO
UNIT ON SHOCK ABSORBERS	<input type="checkbox"/>	<input type="checkbox"/>
DRAINAGE WITH TRAP	<input type="checkbox"/>	<input type="checkbox"/>
GENERAL POWER SUPPLY CONNECTION	<input type="checkbox"/>	<input type="checkbox"/>
CONTROL PANEL CONNECTION	<input type="checkbox"/>	<input type="checkbox"/>
COMPRESSOR OIL LEVEL INDICATOR	<input type="checkbox"/>	<input type="checkbox"/>

DATA INPUT:

COOLING CYCLE

Air Intake Temperature to the coil: _____ °C

Air Output Temperature to the Coil: _____ °C

High Pressure: _____

Low Pressure: _____

HEATING CYCLE

Air Intake Temperature to the coil: _____ °C

Air Output Temperature to the Coil: _____ °C

High Pressure: _____

Low Pressure: _____

ELECTRIC POWER CONSUMPTION (Amps)

Compressor _____ / _____ / _____

Fan _____ / _____ / _____

Compressor _____ / _____ / _____

Fan _____ / _____ / _____

Options Installed: _____

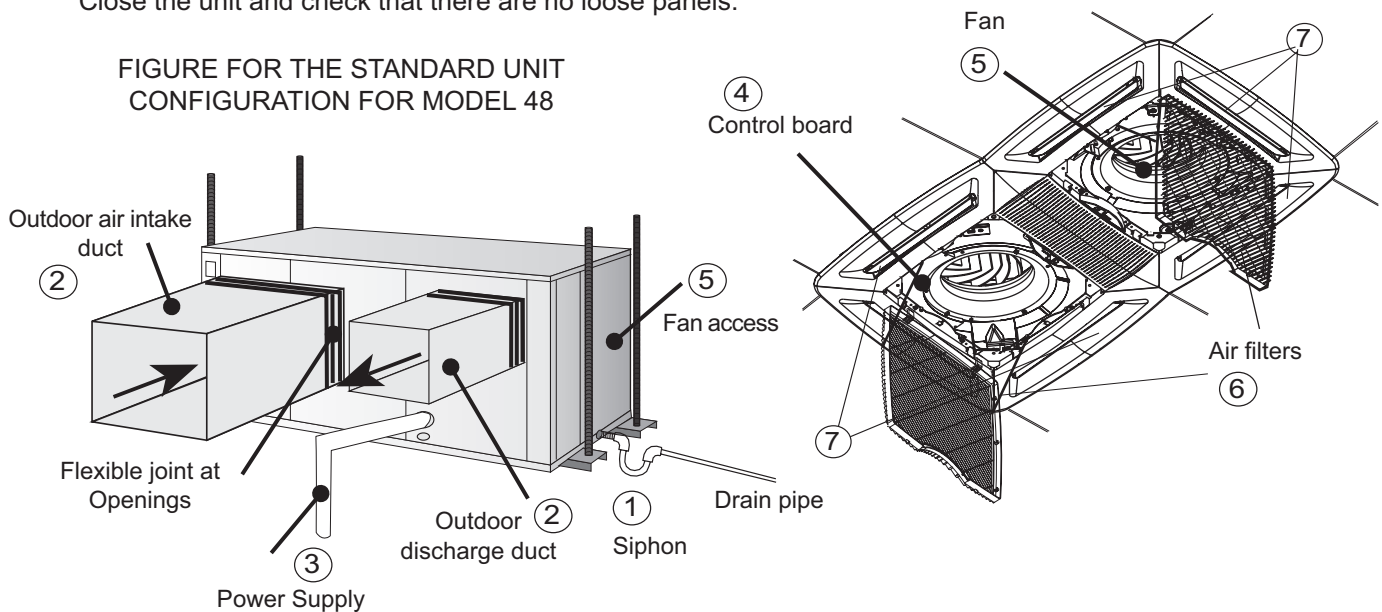
Comments: _____

3.- COMMISSIONING AND OPERATION

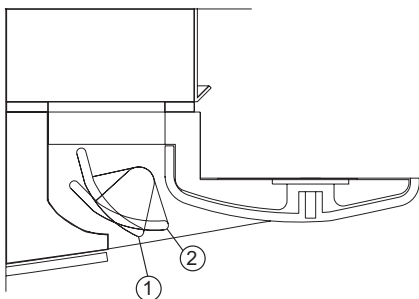
3.2.- PRELIMINARY CHECKS

- ① Check that drain pipe connections and their fixtures are secure and that the level of the unit is tipped toward the drain.
- ② Inspect the state of the ducts and grilles (clean and open grilles, no breaks in the duct, etc.).
- ③ Check that the power supply is the same as stated on the Rating Plate which is in agreement with the electrical diagram for the unit and that cable sizes are correct.
Check that tightness of the electrical connections to their terminals and to ground.
- ④ Check the control panel connections.
(If the connection is wrong, the unit will not operate and the control panel display will not light).
- ⑤ Check **with your hand** that the fans turn freely.
- ⑥ Check the air filter is installed.
- ⑦ Check the louvres position.
Close the unit and check that there are no loose panels.

FIGURE FOR THE STANDARD UNIT CONFIGURATION FOR MODEL 48



AIR DISTRIBUTION



- ① Louvre position for correct air flow in heat pump mode.
- ② Louvre position for correct air flow in cooling only mode.

IMPORTANT:
Do not try to move the louvres when they are connected to a motor.

Louvres change position to distribute air according to heating or cooling operation.

- In **cooling only mode**, the louvres are positioned to distribute air outwards from the discharge, which allows airflow close to the ceiling.
- In **heat pump mode**, the louvres are repositioned to blow air in a downward direction. The air should flow towards the floor to prevent layers or stationary hot air forming in the upper part of the room.

Louvres can be placed on intermediate positions by using the remote control; as well the louvres may be set to move continuously, sweep mode. (For more information, see the remote control manual.)

3.- COMMISSIONING AND OPERATION

3.3.- STEPS TO FOLLOW FOR COMMISSIONING THE UNITS

- On heat pump units, the compressor has a single phase electric heating element to assure a separation between the refrigerant and the oil in the housing. This heater is activated when the compressor is off and stops working when the compressor is on. About eight hours before start up or after a long shutdown period, voltage should be supplied to the unit so that this heater will be activated.
- To start the unit, follow the instructions given in the Control Panel Manual supplied with the unit (requesting operation in any of the modes, cooling, heating, or automatic). After a time lapse, the unit will start.
- With unit operating, check that the fans are turning freely and in the proper direction.



REMEMBER THAT THE COMPRESSOR IS A SCROLL TYPE COMPRESSOR:

Scroll type compressors only compress in one direction of the rotation. Single phase models are always started up in the proper direction; however, the three phase models, turn in either direction depending on the order of the power supply phases. Therefore, it is essential that the phase connection for scroll-type three-phase compressors be carried out correctly, that is why these three-phase compressors are supplied as standard with a three-phase detector, which avoids the unit starts unless the connections are made on the right way. The direction of the rotation is right when an indicator-light turns ON. If the connection is wrong, this indicator will not light and the rotation will be reversed. If this occurs, the solution is to disconnect, switch the wires between two of the phases and connect again.

- Connect high and low pressure gauges and check that operating pressure values are normal.
- Measure electrical consumption for the unit and check that it is near what is indicated on the Rating Plate.
- Check the electrical consumption of the compressor and the fans with what is specified in the physical data sheets.
- In the case of a Heat Pump unit, make a cycle change on the Control Panel checking that the 4-way valves make the change correctly. Check the pressure values in the new cycle.

- UNIT PROTECTIONS:

1.- Electrical protections:

- ◇ Compressor start temporize 3 minutes. Avoid continued compressor starts.
- ◇ Thermal compressor protection (three phase models). Protects from a high compressor absorbed power. To reset this protection, push the thermal protection button (located at the outdoor unit electrical box).
- ◇ Three phase detector (three phase models). Explained before.
- ◇ Protection fuses outdoor-indoor unit connection.

2.- Refrigerant protections:

- ◇ Pressostats:

DESCRIPTION	UNITS	RATED (kg/cm ²)		EFFECT	RESET
		OFF	ON		
Low pressure (LP)	030 to 080	0,5	1,5	Unit stops	Automatic/ Manual (electric) (1)
High pressure (HP)	030 to 080	27,5	22	Unit stops on cooling mode	Manual (electric)
Low ambient control (HPC)	Heat pump units	26,5	22	Outdoor fan stops on heating mode	Automatic

(1) For heat pump units, when the unit is working during an hour, the 2 first resets are automatic, the third one is manual (electric). For cooling only units, the reset is always manual (electric). For electrical resets, disconnect power supply from the unit.

Indication for pressostat alarms:

For heat pump units, the PCB (located at the outdoor unit electrical box) has 2 indicators, HP and LP, which are low pressure and high pressure indicators. If any of those are lighted, indicates that the protection is activated; if any indicator is flashed, indicates that the protection has been reset, and it is waiting for disconnecting power supply.

- ◇ Probes:

- Anti-freeze protection: it comes on through the indoor unit coil probe (ID), avoids ice forms on cooling mode when temperature measures 0°C, the unit stops. This protection has an automatic reset.
- Overload heating mode protection: it comes on through the indoor unit coil probe (ID), avoids the unit works on heating mode with high condenser temperatures, when temperature measures 63°C, the unit stops. This protection has an automatic reset.

3.- Defrost cycle:

For heat pump units during the heating mode, it is possible the unit goes on to the defrost cycle. During this cycle, it is necessary to melt the ice on the outdoor coil, for that the unit will start working on cooling mode, and outdoor and indoor fans will stop.

Function: the defrost cycle is controlled through the PCB (outdoor unit) and the temperature probe (TS) located on the outdoor coil. The defrost cycle begins when TS < -2°C during 45 min. (not necessary on and on). This period can be changed through jumpers JMP5 and JMP6 from PCB. The defrost cycle ends when TS > +18°C or because the defrost cycle has exceeded 12 min.

Time needed for defrost	JMP5	JMP6
30 min	○○	○○
45 min (2)	○○	⊗⊗
60 min	⊗⊗	○○
75 min	⊗⊗	⊗⊗

(2) Factory setting

4.- MAINTENANCE

4.1.- PREVENTIVE MAINTENANCE



IMPORTANT: MAKE SURE THE UNIT IS COMPLETELY DISCONNECTED FROM THE POWER SUPPLY WHEN CARRYING OUT ANY TYPE OF WORK ON THE MACHINE. ALL MAINTENANCE SERVICE ON THE UNIT MUST BE CARRIED OUT BY QUALIFIED PEOPLE. ONLY COIL CLEANING AND FILTER REPLACEMENT CAN BE DONE BY NON-QUALIFIED PEOPLE.

-GENERAL STATE OF THE CASING :

Furniture, paint, deterioration due to bumps, rust spots, leveling and supporting, state of the shock absorbers, if installed, screwed panels, etc.

- ELECTRICAL CONNECTIONS :

State of hoses, tightness of screws, grounding, current draw of the compressor and fans and checking that the unit is receiving the correct voltage.

- COOLING CIRCUIT :

Check that pressure values are correct and that there are no leaks. Check that there is no damage to the pipe insulation, that the state of the batteries is correct and that there are no chips or clogs retained by the air flow, etc.

- COMPRESSOR :

Inspect the oil level, if sight glass is present.

Inspect the state of the silent block fixtures.

- DRAINS :

Check that water drains correctly and that the drain trays are clean.

- FANS :

Check that fans turn freely and in the correct direction without excessive noises.

- CONTROL :

Check Set Points and normal operation.

- AIR FILTER:

Detachable for cleaning. The filter should be cleaned with a vacuum cleaner or washed in soapy water.

The frequency for cleaning or changing the air filters will depend on the quality air in the area (fumes, vapors, suspended dust particles, etc.).

1.- Open the air intake grille on the unit.

Open the grille by way of two hand triggers, which are close to the display unit holder. The grille will swing down supported by the stays and the hooks.

2.- Release the air intake grille from de unit.

To release the grille, pull it down until the stays can be unlocked from the diffuser, then pull it back to an angle greater of 90° and lift it lightly, finally the grille hooks will come away from the diffuser.

3.- Remove the air filter once the air intake grille has been released.

Clean the air filter depending on the operation conditions and working time, (approximately once every 6 months). Use a vacuum cleaner to clean dust off. If the filter is too dirty, wash it with water and neutral detergent. Dry the filter before re-fitting.

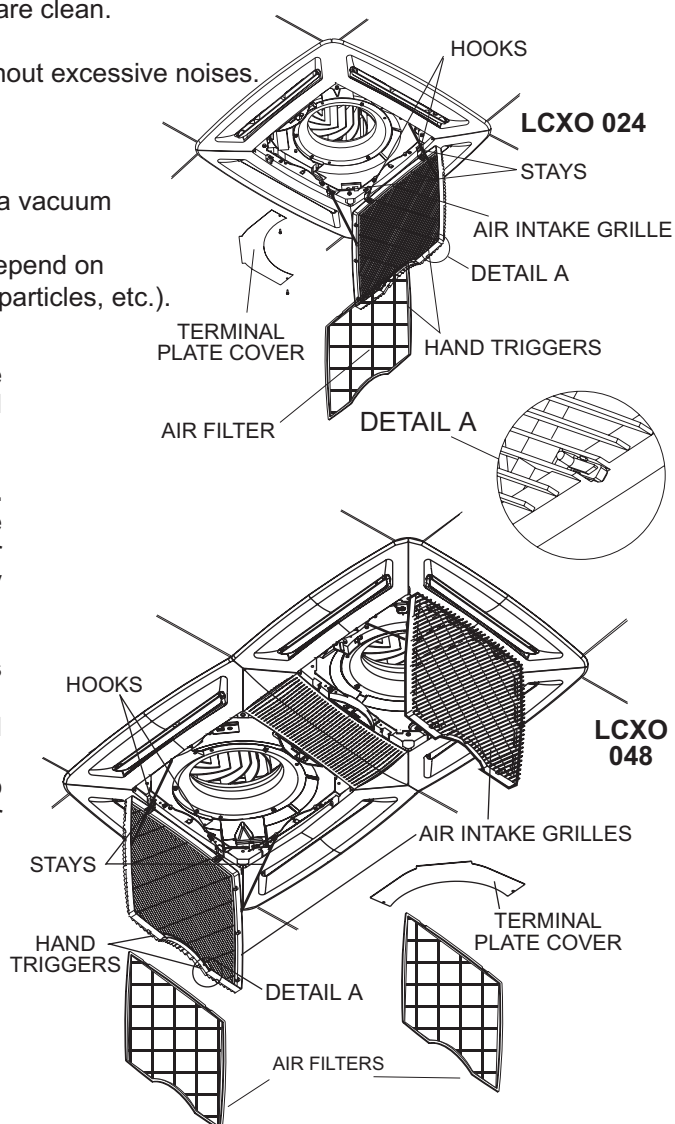
4.- Replace the filter in the right position.

5.- Close the air intake grille.

Place the hand triggers on position again.

ALWAYS INSTALL THE FILTER

If the unit operates without the filter, there is a risk of damaging the unit through dust contamination.



4.- MAINTENANCE

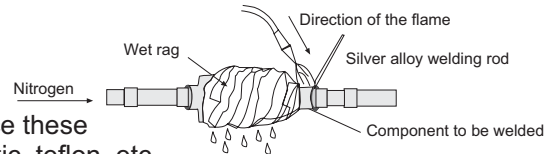
4.2.- CORRECTIVE MAINTENANCE



IMPORTANT: MAKE SURE THAT THE UNIT IS COMPLETELY DISCONNECTED FROM THE POWER SUPPLY WHEN CARRYING OUT ANY TYPE OF WORK ON THE MACHINE

If some component in the cooling circuit must be replaced, follow these recommendations:

- Always use original replacement parts.
- Remove the entire refrigerant charge from the unit from through the schrader valves located in the outdoor section. Create a slight vacuum as a safety measure.
- Regulation prohibits the release on the refrigerant into the atmosphere.
- If cuts must be made in the pipework, use pipe cutters. Do not use saws or any other tools that produce filings.
- All brazing must be carried out in a nitrogen atmosphere to prevent corrosion from forming.
- Use silver alloy brazing rod.
- Take special care that the flame from the torch is aimed in the opposite direction from the component to be welded and is covered with a wet rag in order to avoid overheating.
- Take very special care if 4-way check valves are to be replaced since these have internal components that are very heat-sensitive such as plastic, teflon, etc.
- If a compressor must be replaced, disconnect it electrically and un-braze the suction and discharge lines. Remove the securing screws and replace the old compressor with the new one. Check that the new compressor has the correct oil charge, screw it to the base and connect the lines and electrical connections.
- Carry out the vacuum above and below through the schrader valves of the outdoor unit until -750 mm Hg is reached. Once this level of vacuum has been reached, keep the pump in operation for at least one hour.



DO NOT USE THE COMPRESSOR AS A VACUUM PUMP.

- Charge the unit with refrigerant according to the data on the Rating Plate for the unit and **check that there are no leaks.**



PRECAUTIONS TO BE TAKEN IN THE USE OF R-407C Refrigerant:

R-407C Refrigerant is used in the unit; therefore, the following precautions characteristic of this gas should be taken:

- The Vacuum Pump must have a Check Valve or Solenoid Valve.
- Pressure Gauges and Hoses for the exclusive use with R-407C Refrigerant should be used.
- The charge should be carried out in the Liquid Phase.
- Always use scales to weight-in charge - Use the Leak Detector exclusive for R-407C Refrigerant.
- Do not use mineral oil, only synthetic oil to ream, expand or make connections.
- Keep pipes closed before using them and be very thorough about any possible dirt (dust, filings, burrs, etc.).
- When there is a leak, gather what is left of the charge, create a vacuum in the unit and completely recharge with new R-407C Refrigerant.
- Brazing should always be carried out in a nitrogen atmosphere.
- Reamers should always be well sharpened.

ACCESS TO ELECTRICAL COMPONENTS

Access to terminal plate

The terminal plate can be accessed by removing the air intake grille and unscrewing the terminal cover.

Access to electrical panel

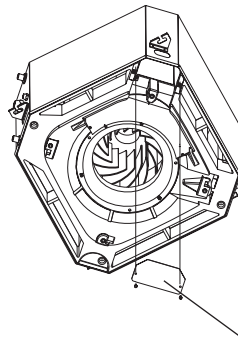
To gain access to the electrical board follow these instructions:

- 1.- Disconnect the infrared receiver display unit (if fitted), and the swing motor wire.
- 2.- Disassemble the diffuser panel by removing the screws that attaches it to the unit.
- 3.- Remove the cover of the electrical panel, where is the PCB.

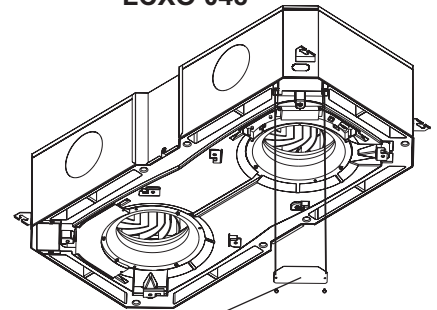
ACCESS TO INTERNAL COMPONENTS

When checking or replacing any internal component of the unit, e.g. coil, fan motor, condensate pump or float switch, the drip tray and volute must be removed (see next page).

LCXO 024



LCXO 048



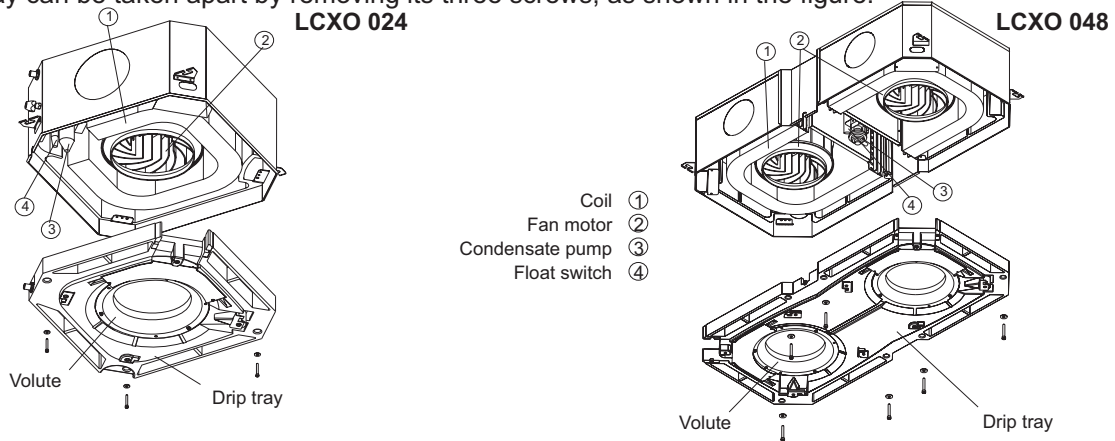
ELECTRICAL
PANEL COVER

4.- MAINTENANCE

4.2.- CORRECTIVE MAINTENANCE

DISASSEMBLING DRIP TRAY

- Remove the air intake grille and filter.
- Disconnect the infrared receiver display unit, and the swing motor wire.
- Disassemble the diffuser panel by removing the four screws that attach it to the unit.
- Detach the volute by removing its three screws, and the electrical panel cover.
- The drip tray can be taken apart by removing its three screws, as shown in the figure.



4.3.- FAILURE DIAGNOSIS

PROBLEM	SOLUTION
1.-Unit is not operating.	<ul style="list-style-type: none"> • Check power is available at unit. • Check wiring. • Check remote control is functioning and set properly.
2.- Indoor unit fan is running too fast without apparent speed change.	<ul style="list-style-type: none"> • Check that indoor unit filter is clean. • Check wiring. • If problem persists, then motor may be faulty.
3.- Noise from refrigerant system. NOTE: Some noise is normal when the system starts and stops.	<ul style="list-style-type: none"> • Check refrigerant charge is correct. • Was the system properly evacuated? • Check indoor temperature, it could be too low.
4.- Condensate overflowing.	<ul style="list-style-type: none"> • Check drip tray for blockage, and condensate drains away. • Check unit is level. • Check condensate pump is working. • Check service drain pipework.
5.- Indoor coil freezes up frequently.	<ul style="list-style-type: none"> • Check indoor unit air filter. • Check refrigerant level and leaks. • Check for air flow restrictions or recirculation. • If ice persisted, expansion device may be restricted. • Is indoor temperature below 21° C? • Check indoor temperature sensor.
6.- System operates satisfactorily in cooling mode, but does not produce heat in heating mode.	<ul style="list-style-type: none"> • Check for appropriate system configuration. • Check reversing valve. • Check for output from control PCB to reversing valve solenoid.
7.- Fan fails to start.	<ul style="list-style-type: none"> • Check loose connections. • Check motor. • Check condenser. • Check that the unit is not on defrost cycle (heat pump units).
8.-Too high pressure (cooling only mode).	<ul style="list-style-type: none"> • Check that indoor/outdoor coils are not blocked or dirty. • Check neither air nor condensate gas are in the refrigerant circuit. • Check fan. • Check refrigerant charge is correct.
9.-Too low pressure (cooling only mode).	<ul style="list-style-type: none"> • Check refrigerant charge is correct. • Check expansion system and coil/pipe work for obstructions. • Check air filter is not dirty or fan malfunction.
10.-Too high pressure (heat pump mode).	<ul style="list-style-type: none"> • Check refrigerant charge is correct. • Check reverse valve solenoid. • Check retention valve situation.
11.-Too low pressure (heat pump mode).	<ul style="list-style-type: none"> • Check refrigerant charge is correct. • Check expansion system for obstructions. • Check outdoor unit fan. • Check defrost control.

BELGIUM :
LUXEMBOURG :

LENNOX BENELUX N.V./S.A.
tél. : + 32 3 633 30 45
fax : + 32 3 633 00 89
e-mail : info.be@lennoxbenelux.com

CZECH REPUBLIC :

JANKA LENNOX a.s.
tél. : + 420 2 510 88 111
fax : + 420 2 579 10 393
e-mail : janka@janka.cz

FRANCE :

LENNOX FRANCE
tél. : + 33 1 64 76 23 23
fax : + 33 1 64 76 35 75
e-mail : marketing.france@lennoxfrance.com

GERMANY:

LENNOX DEUTSCHLAND GmbH
tél. : + 49 69 42 09 79 0
fax : + 49 69 42 09 79 40
e-mail : info.de@lennoxdeutschland.com

NETHERLANDS :

LENNOX BENELUX B.V.
tél. : + 31 33 2471 800
fax : + 31 33 2459 220
e-mail : info@lennoxbenelux.com

POLAND :

LENNOX POLSKA Sp. z o.o.
tél. : + 48 22 832 26 61
fax : + 48 22 832 26 62
e-mail : info@lennoxpolka.pl

PORTUGAL :

LENNOX PORTUGAL LDA.
tél. : + 351 22 998 33 70
fax : + 351 22 998 33 79
e-mail : info@lennoxportugal.com

RUSSIA :

LENNOX DISTRIBUTION MOSCOW
tél. : + 7 095 933 29 55
fax : + 7 095 926 56 50
e-mail : lennox.dist.moscow@co.ru

SLOVAKIA :

LENNOX SLOVENSKO s.r.o.
tél. : + 421 7 44 87 19 27
fax : + 421 7 44 88 64 72
email : lennox.slovensko@lennox.sk

SPAIN:

LENNOX REFAC S.A.
tél. : + 34 915 40 18 10
fax : + 34 915 42 84 04
e-mail : marketing@lennox-refac.com

UKRAINE :

LENNOX DISTRIBUTION KIEV
tél. : + 380 44 461 87 75
fax : + 380 44 461 87 75
e-mail : lennoxua@i.kiev.ua

**UNITED KINGDOM,
IRELAND:**

LENNOX INDUSTRIES Ltd
tél. : + 44 1604 669100
fax : + 44 1604 669150
e-mail : ukmarketing@lennoxind.com

**OTHER EUROPEAN COUNTRIES,
AFRICA,
MIDDLE-EAST :**

LENNOX DISTRIBUTION
tél. : + 33 4 72 23 20 14
fax : + 33 4 72 23 20 28
e-mail : marketing@lennoxdist.com



LENNOX®

www.lennox europe.com