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# APPLICATION GUIDE INSTALLATION, OPERATING AND MAINTENANCE MANUAL

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PROVIDING **GLOBAL SYSTEM** SOLUTIONS

**SECONAIR  
SNCK / SNHK**

**Congratulations you have made a wise choice. 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.**

WARNING: Read this manual before installation, reparation o maintenance works.

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Lennox have been providing environmental solutions since 1895, our range of SNCK / SNHK continues to meet the standards that have made LENNOX a household name. Flexible design solutions to meet YOUR needs and uncompromising attention to detail. Engineered to last, simple to maintain and Quality that comes as standard. Information on local contacts at [www.lennox europe.com](http://www.lennox europe.com).

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## PRODUCT RANGE

### COOLING ONLY UNITS

MODEL	V / Ph / 50 Hz	NOMINAL CAPACITY kW		NOMINAL POWER INPUT kW	
		COOLING	HEATING	COOLING	HEATING
SNCK 08	230 V - 1Ph	8,4		2,17	
SNCK 10	230 V - 1Ph	10,5		2,57	
	230 V - 3Ph				
	400 V - 3Ph				
SNCK 12	230 V - 3Ph	11,8		3,14	
	400 V - 3Ph				

### HEAT PUMP UNITS

MODEL	V / Ph / 50 Hz	NOMINAL CAPACITY kW		NOMINAL POWER INPUT kW	
		COOLING	HEATING	COOLING	HEATING
SNHK 08	230 V - 1Ph	8,4	10,4	2,17	2,51
SNHK 10	230 V - 1Ph	10,5	12,7	2,57	2,97
	230 V - 3Ph				
	400 V - 3Ph				
SNHK 12	230 V - 3Ph	11,8	13,7	3,14	3,55
	400 V - 3Ph				

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## GENERAL DESCRIPTION

The air conditioner, vertical compact, water condensed type SNCK/CNHK, are specially designed for small and average installation, office, house, etc.

On standard version the unit cleans, filters, cools and dehumidifies the air (SNCK), and in addition heats if it is heat pump unit (SNHK). You are able to incorporate option elements such as electrical heater or hot water coil.

## CABINET

The cabinet is made of galvanised steel with epoxy painted finish and finished on polyester powder. Its compact dimensions and features allow the unit to be positioned in almost any location.

Internally the unit incorporates thermal acoustic insulation to reduce sound level.

## AIR EXCHANGER

Made of copper tubing with aluminum swirl fins, they are designed and specially dimensioned to obtain the maximum output.

## COMPRESSOR

The units include Scroll compressor with internal thermic protection. It is mounted on vibration-absorbent blocks both on the inside and outside, statically and dynamically balanced.

## FAN

The units include a centrifugal three speed motor fan, with a motor directly fitted, with high performance on air flow.

## WATER EXCHANGER

The unit includes an exchanger plate, compact and resistant made on stainless steel, specially selected for this type of unit.

## COOLING/HEATING CIRCUIT

Made of welded dehumidifying copper tube with access connections.

### Cooling only units (SNCK):

They include dehydrator filter, liquid recipient, and expansion system, high and low pressure switches for all models

### Heat pump units (SNHK):

They include thermostatic valve as expansion system, high and low pressure switches for all models. In addition they includes a security thermostat for low water temperatures, 4 ways valve and liquid recipient. To work properly in heating mode, the unit includes check valve, restrictor and filter drier.

**The unit leaves the factory with R407C refrigerant.**

## WATER CIRCUIT

It includes water threaded connections H-G.

Heat pump units include a differential water switch in order to stop the unit without water flow.

## AIR FILTER

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

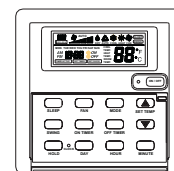
## ELECTRIC CIRCUIT

The electrical box includes all the components and terminal blocks needed for the installation. It includes a printed board, starting timer and reversible working mode in heat pump units. In addition alarm, ON/OFF remote and dry contact for water pump are available too.

The wired remote control manages the unit.

## REMOTE CONTROL

The unit includes a wired remote control with LCD display.



**OLT-1X Controller**

### Basic characteristics for the controller:

- 3 fan speeds (High/Medium/Low).
- Different modes of working: Cool, Heat, Auto, Fan and Dry.
- Sleep mode.
- 7 days programmable timers.
- Real time clock
- Keyblock function
- Alarms display
- Temperature indication °C ó °F.

## OPTIONS

- Electrical heater mounted on fan discharge.
- Hot water coil (for cooling only units).
- Pressostatic valve regulating water flow for cooling only models.
- Flow switch.
- Water filter.
- compressor acoustic jacket.
- Three phase protection (three phase units).

## PHYSICAL DATA

MODEL			SNCK / SNHK 08	SNCK / SNHK 10	SNCK / SNHK 12
Total cooling capacity	kW (*)		8,4	10,5	11,8
Total heating capacity	kW (**)		10,4	12,7	13,7
Nominal absorbed power Cooling	kW (*)		2,17	2,57	3,14
Nominal absorbed power Heating	kW (**)		2,51	2,97	3,55
Air flow (max./min.)	m <sup>3</sup> /h		1800/950	2050/1100	2050/1450
Max. available static pressure (1)	Pa		120	100	80
Nominal water flow	l/h		1505	1883	2131
Water pressure drop	kPa		83	48	62
Net weight	Cooling / heating	Kg	102/103	109/111	117/120
Sound pressure level (LP) (2) dB(A)	Cooling (low / high) speed		49,5/52	41/50	40/49
	Heating (low / high) speed		49,5/52	47,5/50	46,5/49
Dimensions	Height	(mm)	1125	1125	1125
	Width	(mm)	635	635	635
	Depth	(mm)	515	515	515
Hydraulic connections			3/4" G	3/4" G	1" G

(\*) Exchanger air inlet temperature: 27°C DB / 19°C WB.  
Exchanger water inlet temperature: 30°C.

DB.- Dry bulb temperature  
WB.- Wet bulb temperature

(\*\*) Exchanger air inlet temperature: 20°C DB.  
Exchanger water inlet temperature: 20°C.

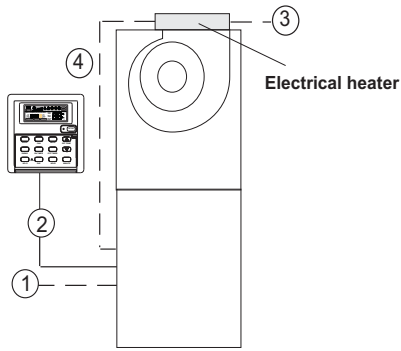
(1) With admissible minimum air flow.

(2) Sound pressure level has been tested at a distance of 2 m from the unit, with duct in aspiration and air discharge, normal absorption in accordance with room size and unit capacity.

## ELECTRICAL SPECIFICATIONS

			SNCK / SNHK 08	SNCK / SNHK 10	SNCK / SNHK 12
VOLTAGE	230V /1Ph				
	230V / 400V 3Ph				
MAXIMUM ABSORBED POWER					
Compressor	kW.		3,40	4,05	4,70
Indoor fan	kW.		0,33	0,46	0,46
TOTAL	kW.		3,73	4,51	5,16
MAXIMUM RUNNING CURRENT					
Maximum running current	A	18,9	20,8		
		18,9 / 9,4		21,5 / 10,9	
Starting current	A	77,6	97,2		
		93,2 / 48,2		100,2 / 52,2	

## ELECTRICAL CONNECTIONS



- ① Power supply
- ② Thermostat connection
- ③ Electrical heater power supply
- ④ Connection Electrical heater - control.

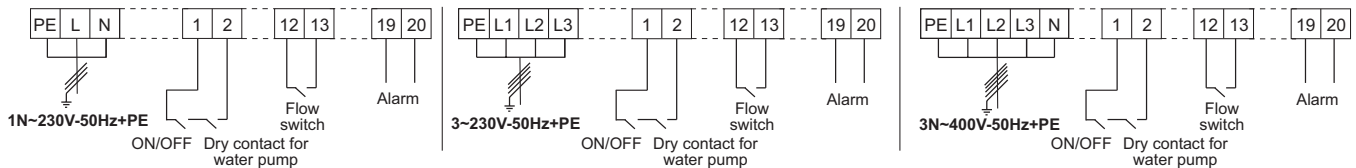
FOR ELECTRICAL CONNECTION REFER TO WIRING DIAGRAM IN THE UNIT.  
PLEASE, CHECK ELECTRICAL DATA IN ORDER TO SELECT THE FUSES.

MODEL	VOLTAGE 50Hz	N° OF WIRES X SECTION			
		①	③	②	④
SNCK/SNHK 08	230 V / 1Ph	3 X 4mm <sup>2</sup>	3 X 4mm <sup>2</sup>	4x1mm <sup>2</sup> (supplied with the unit) Length 15m.	3x1mm <sup>2</sup>
SNCK/SNHK 10	230 V / 1Ph	3 X 4mm <sup>2</sup>	3 X 4mm <sup>2</sup>		
	230 V / 3Ph	4 X 4mm <sup>2</sup>	4 X 2,5mm <sup>2</sup>		
SNCK/SNHK 12	400 V / 3Ph	5 X 2,5mm <sup>2</sup>	4 X 2,5mm <sup>2</sup>		
	230 V / 3Ph	4 X 4mm <sup>2</sup>	4 X 2,5mm <sup>2</sup>		
SNCK/SNHK 12	400 V / 3Ph	5 X 2,5mm <sup>2</sup>	4 X 2,5mm <sup>2</sup>		



Local and national legislation has to be taken into account when the unit will be installed.

### ELECTRICAL CONNECTIONS: Power supply, remote ON/OFF, alarm and dry contact for water pump.



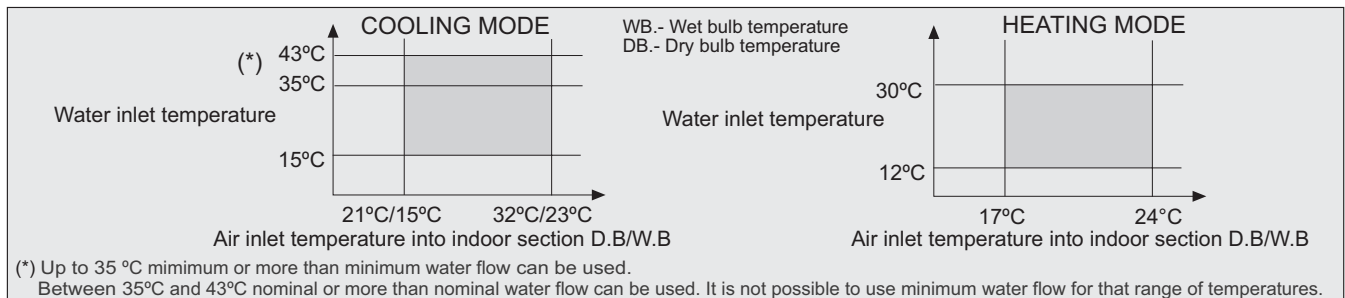
NOTE: Remote ON/OFF and dry contact for water pump. Can support 3A for AC3.



#### INSTALLATION GUIDE FOR CONTROL CABLE (TO AVOID INTERFERENCES):

- Use the screened 15 m cable supplied with terminal (3 wires + screen).
  - Wire the cable separated from electrical power wiring by a physical distance of 500 mm.
  - Wire the cable separated from halogen lamps/fluorescent tube lighting... by a physical distance of 500 mm.
  - Wire the cable separated from radio frequency sources such as radio transmitter... at least 500 mm.
- NEVER WIND THE REMAINING CABLE AROUND, CUT THE CABLE BY THE TERMINAL END.

## OPERATING LIMITS



## FANS SPECIFICATIONS

SNCK / SNHK 08		AVAILABLE STATIC PRESSURE Pa.							
		0	20	40	60	80	100	120	140
AIR FLOW	m <sup>3</sup> /h								
	HIGH SPEED	1800	1650	1550	1425	1300	1150	975	---
	MEDIUM SPEED	1250	1225	1200	1150	1075	950	---	---
	LOW SPEED	---	---	---	---	---	---	---	---

Unit leaves the factory with HIGH and MEDIUM speeds connected (the unit can not work in LOW speed)

SNCK / SNHK 10		AVAILABLE STATIC PRESSURE Pa.							
		0	20	40	60	80	100	120	140
AIR FLOW	m <sup>3</sup> /h								
	HIGH SPEED	2050	1925	1775	1625	1450	1250	---	---
	MEDIUM SPEED	2000	1850	1700	1550	1375	1100	---	---
	LOW SPEED	1840	1700	1575	1375	1275	---	---	---

Cooling only units leave the factory with three speeds connected. Heat pump units leave the factory with HIGH and MEDIUM speeds connected.

SNCK / SNHK 12		AVAILABLE STATIC PRESSURE Pa.							
		0	20	40	60	80	100	120	140
AIR FLOW	m <sup>3</sup> /h								
	HIGH SPEED	2050	1925	1775	1625	1450	---	---	---
	MEDIUM SPEED	2000	1850	1700	1550	---	---	---	---
	LOW SPEED	1840	1700	1575	---	---	---	---	---

Cooling only units leave the factory with three speeds connected. Heat pump units leave the factory with HIGH and MEDIUM speeds connected.

## CAPACITY TABLES

### SNCK/SNHK 08-Nominal air flow 1550 m<sup>3</sup>/h

Water inlet temperature °C	Water flow l/h		Water pressure drop kPa	COOLING CAPACITY SNCK/SNHK			HEATING CAPACITY SNHK	
				Total capacity kW	Sensible capacity kW	Total power input kW	Total capacity kW	Total power input kW
12°C	Minimum	-----	-----	-----	-----	-----	9,19	2,37
	Nominal	-----	-----	-----	-----	-----	9,36	2,40
	Maximum	-----	-----	-----	-----	-----	9,55	2,43
15°C	Minimum	1204	51	10,34	6,68	1,78	9,50	2,41
	Nominal	1505	83	10,39	6,69	1,75	9,67	2,43
	Maximum	1806	124	10,44	6,73	1,72	9,84	2,45
20°C	Minimum	1204	51	9,82	6,55	1,93	10,23	2,49
	Nominal	1505	83	9,87	6,58	1,89	10,40	2,51
	Maximum	1806	124	9,92	6,60	1,85	10,57	2,54
25°C	Minimum	1204	51	9,13	6,32	2,08	10,86	2,55
	Nominal	1505	83	9,18	6,35	2,03	11,04	2,57
	Maximum	1806	124	9,23	6,37	1,99	11,25	2,61
30°C	Minimum	1204	51	8,35	6,10	2,22	11,32	2,59
	Nominal	1505	83	8,40	6,12	2,17	11,49	2,62
	Maximum	1806	124	8,45	6,14	2,12	11,71	2,66
35°C	Minimum	1204	51	7,57	5,87	2,36	-----	-----
	Nominal	1505	83	7,62	5,89	2,31	-----	-----
	Maximum	1806	124	7,67	5,92	2,26	-----	-----
40°C	Minimum	-----	-----	-----	-----	-----	-----	-----
	Nominal	1505	83	6,93	5,63	2,46	-----	-----
	Maximum	1806	124	6,98	5,64	2,40	-----	-----

### SNCK/SNHK 10-Nominal air flow 1700 m<sup>3</sup>/h

Water inlet temperature °C	Water flow l/h		Water pressure drop kPa	COOLING CAPACITY SNCK/SNHK			HEATING CAPACITY SNHK	
				Total capacity kW	Sensible capacity kW	Total power input kW	Total capacity kW	Total power input kW
12°C	Minimum	-----	-----	-----	-----	-----	11,22	2,80
	Nominal	-----	-----	-----	-----	-----	11,43	2,84
	Maximum	-----	-----	-----	-----	-----	11,67	2,87
15°C	Minimum	1506	31	12,92	8,41	2,11	11,61	2,85
	Nominal	1883	48	12,99	8,42	2,07	11,81	2,87
	Maximum	2259	70	13,06	8,46	2,03	12,01	2,90
20°C	Minimum	1506	31	12,27	8,24	2,28	12,50	2,94
	Nominal	1883	48	12,34	8,27	2,24	12,70	2,97
	Maximum	2259	70	12,41	8,30	2,19	12,90	3,01
25°C	Minimum	1506	31	11,41	7,96	2,46	13,26	3,02
	Nominal	1883	48	11,47	7,99	2,40	13,48	3,05
	Maximum	2259	70	11,54	8,02	2,35	13,74	3,09
30°C	Minimum	1506	31	10,43	7,67	2,63	13,82	3,07
	Nominal	1883	48	10,50	7,70	2,57	14,04	3,10
	Maximum	2259	70	10,57	7,73	2,51	14,29	3,14
35°C	Minimum	1506	31	9,46	7,38	2,80	-----	-----
	Nominal	1883	48	9,53	7,41	2,74	-----	-----
	Maximum	2259	70	9,59	7,44	2,68	-----	-----
40°C	Minimum	-----	-----	-----	-----	-----	-----	-----
	Nominal	1883	48	8,66	7,08	2,91	-----	-----
	Maximum	2259	70	8,73	7,09	2,85	-----	-----

### SNCK/SNHK 12-Nominal air flow 1700 m<sup>3</sup>/h

Water inlet temperature °C	Water flow l/h		Water pressure drop kPa	COOLING CAPACITY SNCK/SNHK			HEATING CAPACITY SNHK	
				Total capacity kW	Sensible capacity kW	Total power input kW	Total capacity kW	Total power input kW
12°C	Minimum	-----	-----	-----	-----	-----	12,10	3,35
	Nominal	-----	-----	-----	-----	-----	12,33	3,39
	Maximum	-----	-----	-----	-----	-----	12,58	3,43
15°C	Minimum	1705	39	14,52	9,09	2,58	12,52	3,40
	Nominal	2131	62	14,60	9,11	2,53	12,74	3,43
	Maximum	2557	90	14,67	9,16	2,48	12,96	3,47
20°C	Minimum	1705	39	13,79	8,92	2,79	13,48	3,51
	Nominal	2131	62	13,87	8,95	2,73	13,70	3,55
	Maximum	2557	90	13,94	8,98	2,68	13,92	3,59
25°C	Minimum	1705	39	12,82	8,61	3,00	14,31	3,60
	Nominal	2131	62	12,89	8,64	2,94	14,54	3,64
	Maximum	2557	90	12,97	8,67	2,87	14,82	3,69
30°C	Minimum	1705	39	11,73	8,30	3,21	14,91	3,67
	Nominal	2131	62	11,80	8,33	3,14	15,14	3,70
	Maximum	2557	90	11,87	8,36	3,07	15,42	3,76
35°C	Minimum	1705	39	10,63	7,99	3,42	-----	-----
	Nominal	2131	62	10,71	8,02	3,34	-----	-----
	Maximum	2557	90	10,78	8,05	3,27	-----	-----
40°C	Minimum	-----	-----	-----	-----	-----	-----	-----
	Nominal	2131	62	9,73	7,66	3,56	-----	-----
	Maximum	2557	90	9,81	7,67	3,48	-----	-----

Nominal capacity conditions: Exchanger air inlet temperature: 27°C DB/19°C WB for cooling y 20°C WB for heating mode  
For another working conditions use correction factor tables.

DB.- Dry bulb.  
WB.- Wet bulb.

#### Dissipated heat for cooling mode:

The heat to dissipate in the water exchanger for cooling mode is near to: Total capacity + total power input.

#### Absorbed heat for heating mode:

The heat absorbed in the water exchanger for heating mode is near to: Total capacity - total power input.

## CORRECTION FACTORS

### AIR FLOW

The data in the capacity tables, have been calculated for nominal air flow; with maximum/minimum air flows use these correction factors:

AIR FLOW		SNCK/SNHK 08			SNCK/SNHK 10			SNCK/SNHK 12		
		Maximum 1800	Nominal 1550	Minimum 950	Maximum 2050	Nominal 1700	Minimum 1100	Maximum 2050	Nominal 1700	Minimum 1450
Cooling	TOTAL CAPACITY	1,020	1,000	0,905	1,029	1,000	0,914	1,030	1,000	0,970
	SENSIBLE CAPACITY	1,052	1,000	0,832	1,077	1,000	0,839	1,071	1,000	0,942
	TOTAL POWER INPUT	1,023	1,000	0,991	1,019	1,000	0,981	1,006	1,000	0,990
Heating	TOTAL CAPACITY	1,01	1,00	0,95	1,02	1,00	0,96	1,02	1,00	0,98
	TOTAL POWER INPUT	0,99	1,00	1,09	0,99	1,00	1,07	0,99	1,00	1,02

### AIR INLET

The data in the capacity tables has been calculated for air inlet temperature: 27°C DB and 19°C WB. For another conditions use these correction factors.

COOLING MODE SNCK/SNHK															
Air inlet temperature °C-D.B.	21°C			24°C			27°C			29°C			32°C		
Air inlet temperature °C-W.B.	TC kW	SC kW	Power input kW	TC kW	SC kW	Power input kW	TC kW	SC kW	Power input kW	TC kW	SC kW	Power input kW	TC kW	SC kW	Power input kW
15°C	0,908	0,883	0,984	0,908	1,124	0,984	0,908	1,211	0,984	0,908	*	0,984	0,908	*	0,984
17°C	0,956	0,722	0,993	0,956	0,949	0,993	0,956	1,145	0,993	0,956	1,259	0,993	0,956	*	0,993
19°C	1,008	0,576	1,002	1,008	0,787	1,002	1,000	1,000	1,000	1,000	1,143	1,000	1,000	*	1,000
21°C	-----	-----	-----	1,066	0,662	1,011	1,066	0,885	1,011	1,066	1,029	1,011	1,066	1,239	1,011
23°C	-----	-----	-----	-----	-----	-----	1,128	0,669	1,019	1,128	0,805	1,019	1,128	1,010	1,019

NOTE: Highlight values: total capacity and sensible capacity are the same value.

TC: Total capacity  
SC: Sensible capacity  
D.B.: Dry bulb  
W.B.: Wet bulb

The data in the capacity tables has been calculated for air inlet temperature: 20°C DB. For another conditions use these correction factors.

HEATING MODE SNHK		
Air inlet temperature °C-D.B.	TC kW	Total power input kW
15°C	1,008	0,920
17°C	1,005	0,955
20°C	1,000	1,000
22°C	0,996	1,030
24°C	0,993	1,062

Water pressure drop has been calculated without water filter an option. With this option, the water pressure drop (kPa) is:

WATER PRESSURE DROP WITH WATER FILTER SNCK/SNHK				
MODELS		08	10	12
Water flow l/h	Minimum	72	52	61
	Nominal	105	70	83
	Maximum	145	91	111





## INSTALLATION

### PRE-INSTALLATION

Prior to install the equipment, make sure of the following points:

- Leave enough space for access to air supply, water section, power supply and condensed outlet.
- The water section must have the correspondent valves.
- Easy extraction of the air filter.
- Easy access to lateral panel for easy accessibility to all services of the unit.
- Unit must be mounted with antivibration.
- The electrical section must be done following legal normative
- Check that the tension is the same as installation place.
- Keep in mind power supply for maximum consumption for each unit.
- Check water quality, across analysis according to local normative. If quality of water is not good, it may be necessary to install a device to decalcify.
- Corrosion resistance of plates exchanger: The resistance guide below is an attempt of give a picture of the corrosion resistance of the stainless steel of the type AISI 316 and pure copper in the water, to a number of important chemical factors. The actual corrosion is however a very complex process influenced by many factors in combination. This table is therefore a considerable simplification and should not be overvalued.

WATER CONTAINING	CONCENTRATION mg/l or ppm	AISI 316	COPPER
Alcanity (HCNO <sub>3</sub> )	<70	+	0
	70-300	+	+
	>300	+	0
Sulfate (SO <sub>4</sub> <sup>2-</sup> )	<70	+	+
	70-300	+	-
	>300	0	-
HCO <sub>3</sub> / SO <sub>4</sub> <sup>2-</sup>	>1.0	+	+
	<1.0	+	-
Electrical conductivity	<10 μS/cm	+	0
	10-500 μS/cm	+	+
	>500 μS/cm	+	0
pH	<6.0	0	0
	6.0-7.5	0/+	0
	7.5-9.0	+	+
	>9.0	+	0
Ammonium (NH <sub>3</sub> )	<2	+	+
	2-20	+	0
	>20	+	-
Chloroides (Cl <sup>-</sup> )	<50	+	+
	>50	0	0
Free chlorine (Cl <sub>2</sub> )	<1	+	+
	1-5	+	0
	>5	0/+	-
Hydrogen sulfide (H <sub>2</sub> S)	<0.05	+	+
	>0.05	+	-
Free (aggressive) Carbon Dioxide (CO <sub>2</sub> )	<5	+	+
	5-20	+	0
	>20	+	-
Total hardness (°dH)	4.0-8.5	+	+
Nitrate (NO <sub>3</sub> )	<100	+	+
	>100	+	0
Iron (Fe)	<0.2	+	+
	>0.2	+	0
Aluminum (Al)	<0.2	+	+
	>0.2	+	0
Manganese (Mn)	<0.1	+	+
	>0.1	+	0

#### Explanations:

- + Good resistance under normal conditions.
- 0 Corrosion problems can occur especially when the factors are valued as 0.
- Use is not recommended

- Keep in mind water inlet temperature to the unit. If this temperature is below 15°C for cooling only units (SNCK), you will need to install a water regulation pressostatic valve (as an option element) to keep condensation temperature value between 40 and 45°C.



It is very important that the unit works with water flows between maximum and minimum values according to the tables. You have to calculate water pump and install regulation valve if they are needed, in order to be sure that the unit works with water flow values indicated in the tables. Specially for heat pump units SNHK in heating mode, if the unit works with water flow below specified values, the unit can be seriously damaged, water exchanger can be frozen.

Flow switch can be asked as an option. It stops the unit if there no water flow or if the water flow is below minimum value.

- Be sure that air flow is according to the ducts installation.

## INSTALLATION

- All installation must be carried out by qualified personnel.



**Make sure to disconnect power supply before carrying out any type of work on the unit.**

### Hydraulic circuit:

- Make sure that water connections are correct, **water inlet (upper side), water outlet (down side)**.



**Water filter in the inlet water connection has to be used. The step of the mesh should be less than  $\text{\AA}$  0.5 mm which avoids welded and dirty get to the unit.**

Lennox offers this element as an option.

- Install cut off valves at inlet and outlet water connections, because of in case of repairs, the hydraulic circuit can be independent.



**Use flexible components for the hydraulic connection between the unit and the installation in order to prevent the transmission of vibrations.**

- Install water inlet and water outlet connections with a differential gauge device in order to see the pressure difference between the outlet an inlet connections.
- At the end Install an adequate water pump, and all the necessary elements for the installation.

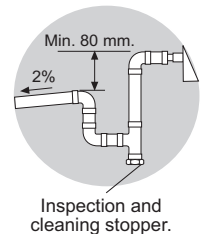
### Air flow:

- All models include three fan speed motor fan.
- Make the motor fan connections for the fan speed required to adequate the air flow needed for the installation.

### Drainage tube:

- Use the flexible tube connected to the drip tray as a drainage tube. Cause a siphon with this tube in order to avoid the inlet of scents from the installation to the unit.

Install a siphon from the drainage tube of the drip tray with a difference in height of 80 mm to prevent from not evacuating due to the negative pressure created by the fans. The pipe will slope down 2% to make it easier for the condensates to drain off.



### Installation:

- After supply the power to the unit and connect inlet/outlet water:
  - Connect the gauges in high pressure and low pressure side.
  - Use a temperature probe in the compressor gas pipe and another ones in the inlet and outlet water pipes.
  - Start water pump.
  - Make sure to close the unit all panels have to be correctly situated.
  - Start the unit and make sure that the thermostat temperature adjustment is correct.
  - Check the correct water flow with a differential gauge device connected between the inlet and outlet water connections in order to know the pressure difference. Check it according to the capacity table values.In addition, you can know the correct water flow with  $\Delta t$  measurement (inlet temperature  $^{\circ}\text{C}$  - outlet temperature  $^{\circ}\text{C}$ ). This value has to be the same as the value calculated with this formula:

a) Cooling mode

$$\Delta t = \frac{[\text{Cooling capacity (kW)} + \text{Total power input (kW)}] \times 860}{\text{Water flow (l/h)}}$$

b) Heating mode

$$\Delta t = \frac{[\text{Heating capacity (kW)} - \text{Total power input (kW)}] \times 860}{\text{Water flow (l/h)}}$$

All the data water flow, cooling / heating capacity and power input are on the capacity tables according to each model and the working conditions.

- After a few minutes, when the unit will be stabilised, you have to verify:
  - High and low pressure values and in addition saturation temperatures according to the correct working mode of the unit.
  - Gas reheating values are below  $12^{\circ}\text{C}$ .If it is not correct, please check expansion system and refrigerant leaks.



**If the compressor noise is very high and in addition, high and low pressure values are similar, it can be possible a wrong phase electrical connection. In this case, please change the connection for two phases.**

- Outlet and inlet water temperature are correct according to the water flow which is between specified values.
- After verify the correct working mode, please stop the unit, disconnect the gauges and temperature probes. and clean water filter.

**The unit can be work properly until next maintenance revision.**


## SERVICE AND MAINTENANCE

- The unit under supply, has rotating objects and generates high temperatures into the pipes.

**Make sure to turn off electrically the unit before to access for maintenance or revision.**

- Air filter: Clean the filter periodically (maximum each 6 months), but the clean of the filter depends on the ambient where the unit is working.
- Water filter: Clean the filter periodically.
- Security elements: The unit includes electrical elements of security (Internal thermal protections on the compressor and motor fan, external thermal protections on the compressor and three-phase motor) and cooling elements of security like high and low pressure switches with electrical reset. Heat pump units include as standard a differential water switch in the water circuit. If unit operating limits are out of working conditions, some protections will be on.

## FAILURE DIAGNOSIS

	PROBLEMS	CAUSES
COOLING MODE (SNCK/SNHK)	<ul style="list-style-type: none"> <li>• Low pressure cut (electrical reset) (*).</li> <li>• Low cooling capacity.</li> <li>• Freeze on coil.</li> </ul>	<ul style="list-style-type: none"> <li>• Very low air inlet temperature.</li> <li>• Low air flow, due to dirty air filter, or wrong design of ducts.</li> <li>• Very low water inlet temperature.</li> <li>• There is not enough refrigerant (Check leaks).</li> </ul>
	<ul style="list-style-type: none"> <li>• High pressure cut (electrical reset) (*).</li> <li>• High consumption.</li> <li>• Thermal compressor protection cut.</li> </ul>	<ul style="list-style-type: none"> <li>• Very high water inlet temperature.</li> <li>• Low water flow or water flow interruption (check water pump selection, water valve regulation or water filter cleaning).</li> <li>• Very high air temperature.</li> <li>• There is a lot of refrigerant.</li> </ul>
HEATING MODE (SNHK)	<ul style="list-style-type: none"> <li>• Low pressure cut (electrical reset) (*).</li> <li>• Low evaporating temperature cut (*).</li> <li>• Flow water cut (*).</li> </ul> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; display: inline-block;">  <b>Risk of evaporator freezing.</b> </div>	<ul style="list-style-type: none"> <li>• Low water flow or water flow interruption (check water pump selection, water valve regulation or water filter cleaning).</li> <li>• Very low water inlet temperature.</li> <li>• There is not enough refrigerant (Check leaks).</li> <li>• Very low air inlet temperature.</li> <li>• Check expansion valve regulation.</li> </ul>
	<ul style="list-style-type: none"> <li>• High pressure cut (electrical reset) (*).</li> <li>• High consumption.</li> <li>• Compressor thermic protection cut.</li> </ul>	<ul style="list-style-type: none"> <li>• Very high water inlet temperature.</li> <li>• Very high air inlet temperature.</li> <li>• Low air flow, due to dirty air filter or wrong design of ducts.</li> <li>• There is a lot of refrigerant.</li> </ul>

(\*). Reset the unit, turning the power off/on after the cause which produced the cut on high/low pressure switch has been repaired.

## SERVICE AND MAINTENANCE

### PROTECTIONS ADJUSTMENT (SNCK / SNHK)

DESCRIPTION	UNITS		RATED		EFFECT	RESET
	SNHK	SNCK	OFF	ON		
STD high pressure switch. (HP)	X	X	28,7 kg/cm <sup>2</sup>	24 kg/cm <sup>2</sup>	Unit stops	Manual (electric)
High pressure switch (HP) with presostatic valve as option.	N/A	X	24 kg/cm <sup>2</sup>	19 kg/cm <sup>2</sup>	Unit stops	Manual (electric)
Low pressure switch (LP).	X	X	1,8 kg/cm <sup>2</sup>	2,7 kg/cm <sup>2</sup>	Unit stops	Manual (electric)
Thermostat anti-freeze (BT).	X	N/A	+ 5°C	+7,3°C	Unit stops	Manual (electric)
Differential water switch (DFS).	X	N/A	Without regulation		Unit stops	Manual (electric)
Flow switch (FS) option.	X	X	Nominal water flow (see capacity tables)		Unit stops	Manual (electric)
Heat overload sensor (ID).	X	N/A	+ 63°C	+46°C	SNHK unit stops on heating mode	1° automatic reset. 2° Press ON/OFF button in the controller
Coil anti-freeze sensor (ID).	X	X	+ 0°C (**)	+12°C	Cooling only units or heat pump units on cooling mode stop.	Automatic

N/A: Not available.

(\*\*) With 0°C during 1 min. and the compressor working during 10 min.

Manual (electric) reset means electrical reset for the unit turning the power off / on after the cause which produced the cut has been repaired.



**This unit can only work with R-407C Refrigerant.  
Do not use another type of refrigerant.**

#### OPERATION

On a system operated with refrigerant R-407C, during the evaporation phase at constant pressure the temperature increases; and during the condensation phase at constant pressure the temperature decreases a certain value. Consequently, the terms “evaporation temperature” and “condensation temperature” should be redefined.

The refrigerant R-407C 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:

**VACUUM OF THE SYSTEM** (When the unit has loosed refrigerant charge).

Vacuum must be done until 0.225 mm Hg, 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 HFC refrigerants as R-407C, the compressors incorporate ester oil instead of mineral oil used for R22 (HCFC).

## OPTIONS

### PLENUM

#### DISCHARGE PLENUM

Use discharge plenum if you do not use duct on the discharge.  
This plenum includes a grille with adjustable louvres for a correct distribution of the air.

#### INLET PLENUM

Use the inlet plenum if you are going to use an air aspiration duct and/or hot water coil. The superior part is detachable to access and clean air filter of the unit.

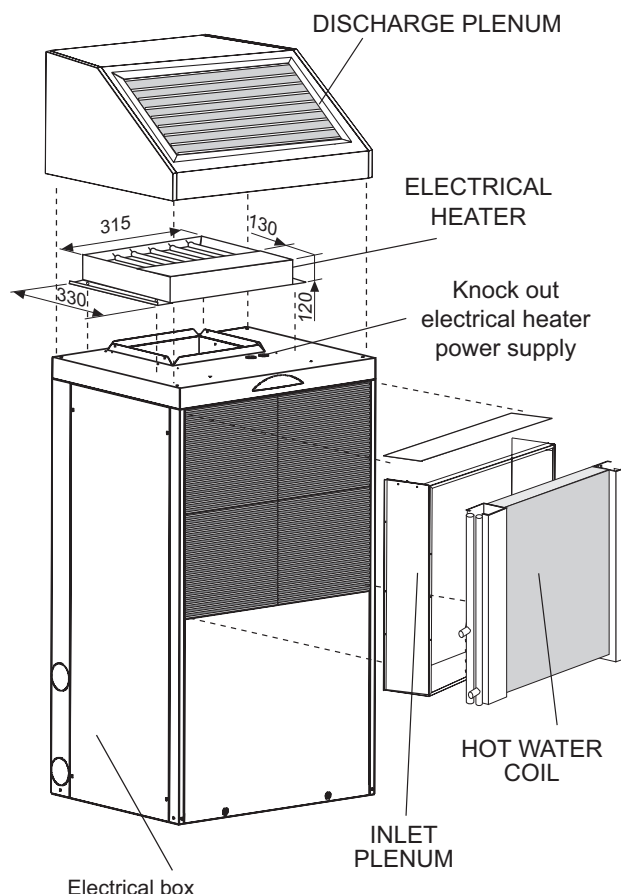
Fix both plenums with the screws supplied.

### ELECTRICAL HEATER

	Power	Voltage
SNCK / SNHK 08-10-12	6 kW 1 Step	230V / 1Ph -50Hz 230 V /400 V 3Ph -50Hz
	7,5 kW 1 Step	230 V /400 V 3Ph -50Hz

#### INSTALLATION

- The electrical heater should be installed into the impulsion fan of the unit.
- Fix the electrical heater to the unit with the screws (see the figure above).
- Take out the knock out, and take the electrical supply of the electrical heater to the electrical box of the unit. There is a different power supply for electrical heater (see page 4).



### HOT WATER COIL 1 ROW TECHNICAL DATA

(for cooling only units).

DIFFERENCES BETWEEN WATER INLET  
TEMPERATURE AND COIL AIR INLET  
TEMPERATURE (°C)

SNCK / SNHK 08-10-12		
60	50	40
9,90	8,25	6,60

CAPACITY IN KW FOR WATER FLOW OF 500 L/H.

PRESSURE AIR DROP = 10 Pa.

PRESSURE WATER DROP = 15kPa.

DATA CALCULATED FOR AIR FLOW = 1700 m<sup>3</sup>/h

#### INSTALLATION

This option kit includes a hot water coil and an inlet plenum.

- Install the inlet plenum with the screws supplied at the inlet duct of the unit.
- Screw the hot water coil to the inlet plenum as figure shows.

The hot water coil is symmetrical, therefore, the water connections could be located to the right or to the left.

## OPTIONS

### PRESOSTATIC VALVE (Cooling only units)

This option is supplied loose.

If water inlet temperature is below 15°C use a pressostatic valve to keep adequate condensation temperature levels (40° to 45°C).

The maximum inlet water temperature with this option is 35°C.

#### OPERATION

The pressostatic valve keeps the condensation pressure values regulating the inlet water flow in the condenser.

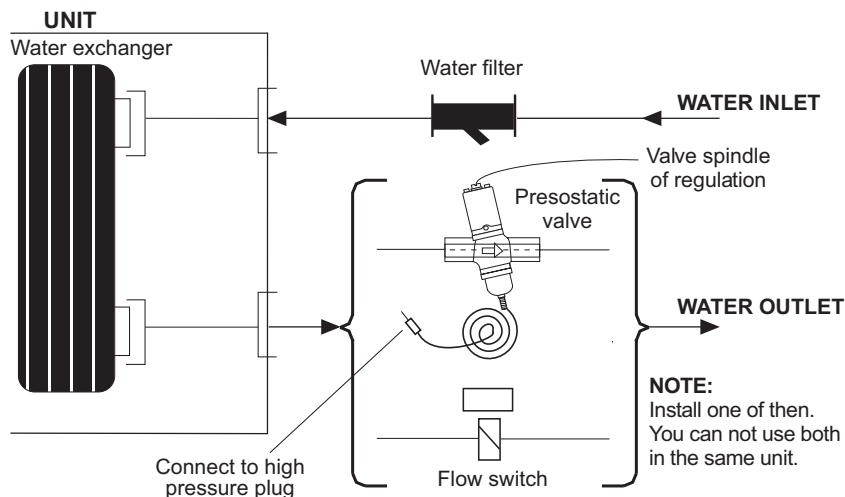
When the condensation pressure is up, the valve will be opened, and more water is entered. And when the pressure is low the valve will be closed.

#### INSTALLATION

- Install the kit at the water outlet side of the condenser.
- Keep in mind the row direction indicated in the valve.
- Connect the capillary tube of the valve to the plug of high pressure in the pipe of the unit.

#### PRESSOSTATIC VALVES REGULATION

- Connect a manometer of high pressure (30 bar) in the refrigerant circuit.
- Turn over the spindle in the head of the valve (turn right: the valve is opened; turn left: the valve is closed) regulating the water flow which enters into the unit.
- You must leave the unit working at least 10 minutes and see the indication of the manometer. If the condensation pressure temperature is approximately 45°C, the valve is correctly regulated. If not, restart the regulation as described before.



### WATER FILTER

This option is supplied loose. The water filter must be fitted in the water inlet of the unit, it protects the unit against particles (greater than 1 mm) getting inside the water circuit, and prevents the water interchanger gets dirty. With water filter water pressure drop has a different value (see table page 6).

### FLOW SWITCH

This option is supplied loose. It should be used for heat pump units (SNHK). The flow switch stops the unit if water flow is lower than the nominal. Electrical reset.

### THREE PHASE PROTECTION (THREE PHASE UNITS)

Located at the electrical box of the unit, it assures that unit will not begin operation if connection phases of compressor are not correct. Should this occur, then just switch two phase connections.

### COMPRESSOR ACOUSTIC JACKET

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

## POINTS TO KEEP IN MIND

### DANGER AND WARNING SIGNS



Abrasive surfaces



Low temperature



High temperature



Risk of injury with moving objects



Electrical voltage



Risk of injury with rotating objects

### ELECTRICAL CONNECTIONS



Make sure to open the power off switch before to install, repair or make maintenance works in the unit, in order to prevent serious electrical injuries.

To install the unit, keep in mind local and national legislation.

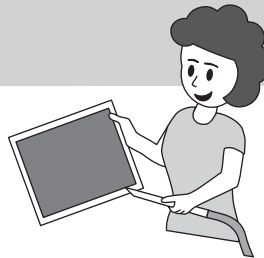
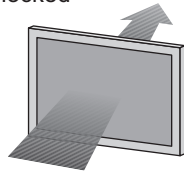
### ATTENTION - WARNING

Electrical shock hazard can cause injury or death. Before attempting to perform any service or maintenance on the unit, turn OFF the electrical power.

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 neutral soap and water, drying it in the shade before inserting it in the unit

### STANDARD GUIDELINES TO LENNOX 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 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, familiarize 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.



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