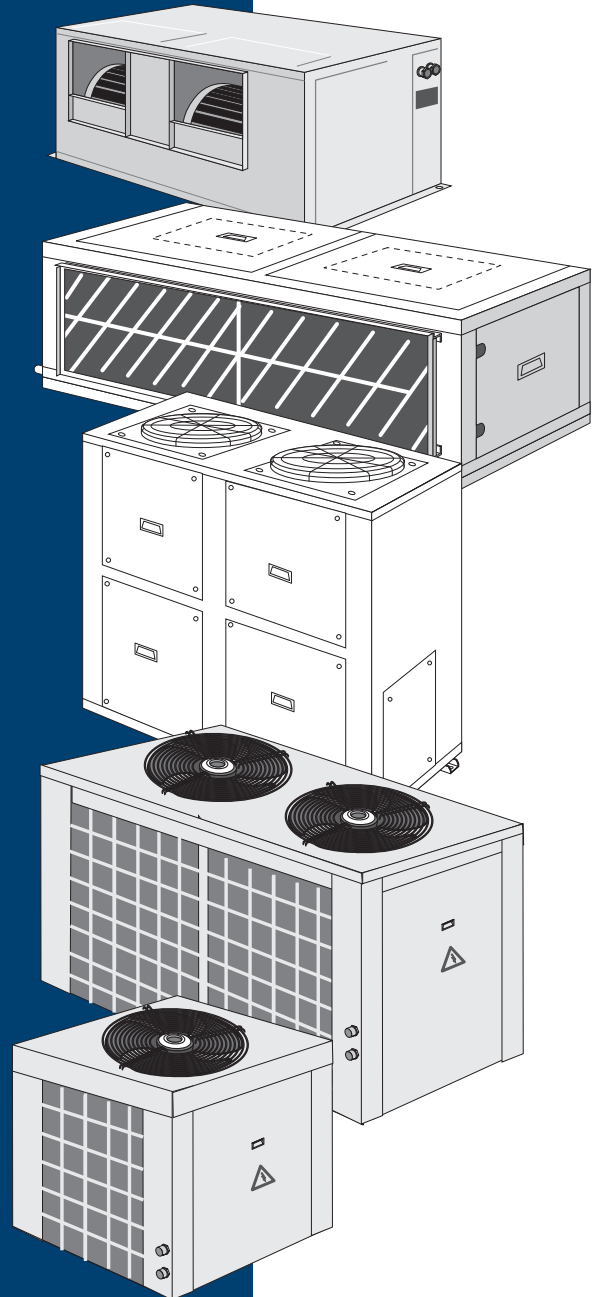


INSTALLATION-OPERATION
&
MAINTENANCE MANUAL



PROVIDING **GLOBAL SYSTEM SOLUTIONS**

AIRCOOLAIR

Congratulations you have made a wise choice with the purchase of your Lennox are conditioning set.

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.

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PRODUCT RANGE

COOLING ONLY R-407 C

| MODEL | OUTDOOR UNIT | INDOOR UNIT | V / Ph / 50 Hz | NOMINAL CAPACITY W | POWER INPUT KW |
|-----------|--------------|-------------|----------------|--------------------|----------------|
| | | | | COOLING | COOLING |
| ANA 5EK | KNA 5EK | LNA 5EK | 230-400V/3Ph | 14.500 | 6,5 |
| ANA 7EK | KNA 7EK | LNA 7EK | 230-400V/3Ph | 18.900 | 8,2 |
| ANA 8EK | KNA 8EK | LNA 8EK | 230-400V/3Ph | 22.300 | 9,4 |
| ANA 10EK | KNA 10EK | LNA 10EK | 230-400V/3Ph | 28.900 | 12,6 |
| ANA 15EK | KNA 15EK | LNA 15EK | 230-400V/3Ph | 36.000 | 16,3 |
| ANA 15DK | KNA 15DK | LFE 15DK | 230-400V/3Ph | 36.500 | 15,8 |
| ANA 17DK | KNA 17DK | LFE 17DK | 230-400V/3Ph | 44.000 | 18,6 |
| ANA 20DK | KNA 20DK | LFE 20DK | 230-400V/3Ph | 56.200 | 24,4 |
| ANA 30DK | KNA 30DK | LFE 30DK | 230-400V/3Ph | 69.000 | 30,2 |
| ANA 35 DK | KNA 35DK | LFE 35DK | 230-400V/3Ph | 83.300 | 32,0 |
| ANA 40 DK | KNA 40DK | LFE 40DK | 230-400V/3Ph | 97.400 | 39,0 |

HEAT PUMP R-22

| MODEL | OUTDOOR UNIT | INDOOR UNIT | V / Ph / 50 Hz | NOMINAL CAPACITY W | | POWER INPUT KW | |
|---------|--------------|-------------|----------------|--------------------|---------|----------------|------|
| | | | | COOLING | HEAT | COOLING | HEAT |
| HAB 5E | KAB 5E | LHB 5E | 230-400V/3 Ph | 15.000 | 16.000 | 6,7 | 7,2 |
| VAB 5E | KAB 5E | LVB 5E | 230-400V/3 Ph | 15.000 | 16.000 | 6,7 | 7,2 |
| HAB 7E | KAB 7E | LHB 7E | 230-400V/3 Ph | 19.000 | 20.000 | 8,2 | 8,9 |
| VAB 7E | KAB 7E | LVB 7E | 230-400V/3 Ph | 19.000 | 20.000 | 8,2 | 8,9 |
| HAB 8E | KAB 8E | LHB 8E | 230-400V/3 Ph | 22.300 | 23.400 | 9,4 | 10,0 |
| HAB 10E | KAB 10E | LHB 10E | 230-400V/3 Ph | 28.900 | 31.000 | 12,6 | 13,6 |
| HAB 15E | KAB 15E | LHB 15E | 230-400V/3 Ph | 36.000 | 38.000 | 16,3 | 17,3 |
| HAB 15D | KAB 15D | LHX 15D | 230-400V/3 Ph | 36.500 | 40.150 | 15,8 | 13,1 |
| HAB 17D | KAB 17D | LHX 17D | 230-400V/3 Ph | 44.000 | 48.800 | 18,6 | 15,8 |
| HAB 20D | KAB 20D | LHX 20D | 230-400V/3 Ph | 56.200 | 62.700 | 24,4 | 20,7 |
| HAB 30D | KAB 30D | LHX 30D | 230-400V/3 Ph | 69.000 | 78.200 | 30,2 | 25,4 |
| HAB 35D | KAB 35D | LHX 35D | 230-400V/3 Ph | 83.300 | 91.450 | 32,0 | 29,0 |
| HAB 40D | KAB 40D | LHX 40D | 230-400V/3 Ph | 97.400 | 107.000 | 39,0 | 34,0 |

GENERAL DESCRIPTION

The vertical air conditioning units, range Aircoolair cooling only or heat pump are air conditioning unit, of the air to air type, designed for small and medium shopping center and housing.

The unit consists on an outdoor unit and an indoor unit.

It is also possible supply the outdoor unit alone, to match with other type of indoor unit that customer needs. A wide range of optionals, completed-factory assembled are also available.

FURNITURE

Made of galvanized steel sheeting with epoxy painted finish, weather proofed with high resistant to corrosion. The units are provided with metal profiles (depends on models), capable of withstanding the unit and able as well of installing the unit mounted on the floor.

HEAT EXCHANGERS

Made of copper tubing with aluminum swirl fins, they are designed and specially dimensioned to obtain the maximum output so as to prevent ice forming in the outer heater, extending the operating cycles to a maximum obtaining maximum output and exchange on reducing the frequency of defrosting.

COMPRESSORS

All units are provided with hermetically sealed compressors, reciprocating and scroll type in model 35D, cooled by exhaust gas, with internal thermal protection.

The compressor is fitted on vibration mountings both inside and outside.

In heat pump units the compressors are provided as standard with a crankcase heater an is an option for cooling only units, to assist evaporation of the coolant retained by the oil in the compressor so that a suitable lubricate can take place.

FANS

Outer units are supplied with axial fan type. Inner unit are supplied with two centrifugal fans, fans are fitted with a common axle activated through an adjustable and variable pulley belt pulley with one activating motor except for models 5E-7E. which are centrifugal type with built-in motor.

AIR FILTER

The indoor units are provided with air filters easily washable.

COOLING CIRCUIT

Made of welded dehydrated copper pipe with connection on the suction and liquid lines. For units models "D" with cut off service valves, on outdoor units, a muffler in the compressor discharge line eliminates noise and pulsation of the discharge line.

The unit includes filter dryer and expansion system. High and low pressostat which protect the unit, the low pressostat is automatic reset and the high is manual one.

The units have unidirectional and reversing valves of 4 pipes for unit in heat pump.

ELECTRICAL BOX

Designed for easily to reach for installation, with protective contactors with internal protection for compressors and fans.

Defrosting timer thermostat and system of reversing on heat pump units.

The unit includes a printed board, which controls the operating of the unit.

OPCIONALES

- Electrical heater
- Hot water coil.
- CPC ON/OFF.
- Proportional condensing control.
- Kit remote signals.
- Kit hot gas by pass.
- Main switch.
- Control using a programmable controller.
- Kit free-cooling (depends on models).

SPECIFICATIONS (COOLING ONLY)

R - 407C

| MODEL | | ANA 5EK | ANA 7EK | ANA 8EK | ANA 10EK | ANA 10EK | |
|------------------------------|--------------------|-----------|--------------|---------|---------------|----------|-------|
| Nominal cooling capacity (*) | W | 14.500 | 18.900 | 22.300 | 28.900 | 36.000 | |
| OUTDOOR UNIT | | KNA 5EK | KNA 7EK | KNA 8EK | KNA 10EK | KNA 15EK | |
| COMPRESSOR | Nº / Type | 1 / Alt | 1 / Alt | 1 / Alt | 1 / Alt | 1 / Alt | |
| COIL | | | | | | | |
| Face area | m ² | 2x0,42 | 2x0,42 | 2x0,84 | 2x0,84 | 2x0,84 | |
| Rows / fin per inch | | 3/14 | 4/14 | 2/14 | 3/14 | 4/14 | |
| FAN | | | | | | | |
| Air flow | m ³ /h. | 4.500 | 5.200 | 9.500 | 9.000 | 10.400 | |
| WEIGHT | | Kg | 135 | 145 | 210 | 230 | 260 |
| DIMENSIONS | | | | | | | |
| Height | mm. | 870 | 870 | 895 | 895 | 895 | |
| Length | mm. | 800 | 800 | 1.600 | 1.600 | 1.600 | |
| Width | mm. | 800 | 800 | 800 | 800 | 800 | |
| PACKING DIMENSIONS | | mm. | 1020x950x845 | | 1070x1685x880 | | |
| REFRIGERANT COUPLING | | | | | | | |
| Liquid pipe | | 5/8" | 5/8" | 5/8" | 5/8" | 3/4" | |
| Gas pipe | | 3/4" | 7/8" | 1-1/8" | 1-3/8" | 1-3/8" | |
| INDOOR UNIT | | LNA 5EK | LNA 7EK | LNA 8EK | LNA 10EK | LNA 15EK | |
| COIL | | | | | | | |
| Face area | m ² | 0,72 | 0,72 | 1,10 | 1,01 | 1,01 | |
| Rows / fin per inch | | 3/12 | 4/12 | 5/12 | 4/14 | 5/14 | |
| FAN | | | | | | | |
| Air flow | m ³ /h. | Max. | 4.200 | 5.000 | 5.700 | 8.400 | 8.400 |
| | | Min. | 3.400 | 3.800 | 4.200 | 5.600 | 5.600 |
| Available pressure | max (1) | Pa. | 180 | 180 | 230 | 230 | 370 |
| WEIGHT | | Kg | 90 | 100 | 100 | 180 | 200 |
| DIMENSIONS | | | | | | | |
| Height | mm. | 440 | 440 | 512 | 660 | 660 | |
| Length | mm. | 1.010 | 1.010 | 1.285 | 1.555 | 1.555 | |
| Width | mm. | 650 | 650 | 720 | 805 | 805 | |
| REFRIGERANT COUPLING | | | | | | | |
| Liquid pipe | | 5/8" | 5/8" | 5/8" | 5/8" | 3/4" | |
| Gas pipe | | 3/4" | 7/8" | 1-1/8" | 1-3/8" | 1-3/8" | |

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

(*) Air intake temperature outdoor interchange: 35 °C DB.

DB.- Dry bulb
WB.- Wet bulb

(1) With minimum admissible flow volumes.

SPECIFICATIONS (COOLING ONLY)

R - 407C

| MODEL | | ANA 15DK | ANA 17DK | ANA 20DK | ANA 30DK | ANA 35DK | ANA 40DK |
|------------------------------|-------------------------|----------------|--------------|----------------|--------------|--------------------|--------------------|
| Nominal cooling capacity (*) | W | 36.500 | 44.000 | 56.200 | 69.000 | 83.300 | 97.400 |
| OUTDOOR UNIT | | KNA 15DK | KNA 17DK | KNA 20DK | KNA 30DK | KNA 35DK | KNA 40DK |
| COMPRESSOR | Nº / Type | 2 / Alt | 2 / Alt | 2 / Alt | 2 / Alt | 2 / Scroll | 2 / Alt |
| COIL | | | | | | | |
| Face area | m² | 2x0,88 | 2x0,88 | 2x1,28 | 2x1,28 | 4x0,88 | 4x1,28 |
| Rows / fin per inch | | 3/14 | 4/14 | 3/14 | 4/14 | 4/14 | 3/14 |
| FAN | | | | | | | |
| Air flow | m³/h. | 14.400 | 14.200 | 20.000 | 19.200 | 2x14.200 | 2x20.000 |
| WEIGHT | Kg | 305 | 350 | 405 | 455 | 2x430 | 2x475 |
| DIMENSIONS | | | | | | | |
| Height | mm. | 1330 | 1330 | 1830 | 1830 | 2x1330 | 2x1830 |
| Length | mm. | 2000 | 2000 | 2000 | 2000 | 2x2000 | 2x2000 |
| Width | mm. | 1000 | 1000 | 1000 | 1000 | 2x1000 | 2x1000 |
| PACKING DIMENSIONS | mm. | 1450x2140x1230 | | 1950x2140x1230 | | 2x(1450x2140x1230) | 2x(1950x2140x1230) |
| REFRIGERANT COUPLING | | | | | | | |
| Liquid pipe | | 2x5/8" | 2x5/8" | 2x5/8" | 2x3/4" | 2x7/8" | 2x7/8" |
| Gas pipe | | 2x7/8" | 2x1-1/8" | 2x1-1/8" | 2x1-3/8" | 2x1-5/8" | 2x1-5/8" |
| INDOOR UNIT | | LFE 15DK | LFE 17DK | LFE 20DK | LFE 30DK | LFE 35DK | LFE 40DK |
| COIL | | | | | | | |
| Face area | m² | 2x0,37 | 2x0,58 | 2x0,58 | 2x0,66 | 2x0,84 | 2x0,84 |
| Rows / fin per inch | | 4/12 | 3/12 | 4/12 | 4/12 | 4/14 | 5/14 |
| FAN | | | | | | | |
| Air flow | m³/h. | Max. | 8.200 | 11.400 | 13.600 | 14.800 | 17.000 |
| | | Min. | 6.600 | 9.200 | 9.100 | 10.100 | 12.500 |
| Available pressure | max (1) Pa. | 200 | 190 | 290 | 240 | 300 | 280 |
| WEIGHT | Kg | 150 | 210 | 230 | 235 | 270 | 295 |
| DIMENSIONS | | | | | | | |
| Height | mm. | 590 | 640 | 640 | 640 | 665 | 665 |
| Length | mm. | 1660 | 2250 | 2250 | 2500 | 3140 | 3140 |
| Width | mm. | 650 | 750 | 750 | 750 | 750 | 750 |
| PACKING DIMENSIONS | mm. | 750x1800x900 | 800x2360x950 | | 800x2650x950 | 800x3300x920 | |
| REFRIGERANT COUPLING | | | | | | | |
| Liquid pipe | | 2x5/8" | 2x5/8" | 2x5/8" | 2x3/4" | 2x7/8" | 2x7/8" |
| Gas pipe | | 2x7/8" | 2x1-1/8" | 2x1-1/8" | 2x1-3/8" | 2x1-5/8" | 2x1-5/8" |

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

DB.- Dry bulb
 WB.- Wet bulb

(1) With minimum admissible flow volumes.

| MODEL | | HAB 5E | VAB 5E | HAB 7E | VAB 7E | HAB 8E | HAB 10E | HAB 15E |
|-------------------------------|--------------------|--------------|--------|--------|--------|---------------|---------|---------|
| Nominal cooling capacity (*) | W | 15.000 | 15.000 | 19.000 | 19.000 | 22.300 | 28.900 | 36.000 |
| Nominal heating capacity (**) | W | 16.000 | 16.000 | 20.000 | 20.000 | 23.400 | 31.000 | 38.000 |
| OUTDOOR UNIT | | KAB 5E | KAB 5E | KAB 7E | KAB 7E | KAB 8E | KAB 10E | KAB 15E |
| COMPRESSOR | Nº / Type | 1/Alt | 1/Alt | 1/Alt | 1/Alt | 1/Alt | 1/Alt | 1/Alt |
| COIL | | | | | | | | |
| Face area | m ² | 2x0,42 | 2x0,42 | 2x0,42 | 2x0,42 | 2x0,84 | 2x0,84 | 2x0,84 |
| Rows / fin per inch | | 3/14 | 3/14 | 4/14 | 4/14 | 2/14 | 3/14 | 4/14 |
| FAN | | | | | | | | |
| Air flow | m ³ /h. | 4.500 | 4.500 | 5.200 | 5.200 | 9.500 | 9.000 | 10.400 |
| WEIGHT | Kg | 140 | 140 | 150 | 150 | 215 | 235 | 265 |
| DIMENSIONS | | | | | | | | |
| Height | mm. | 870 | 870 | 870 | 870 | 895 | 895 | 895 |
| Length | mm. | 800 | 800 | 800 | 800 | 1600 | 1600 | 1600 |
| Width | mm. | 800 | 800 | 800 | 800 | 800 | 800 | 800 |
| PACKING DIMENSIONS | mm. | 1020x950x845 | | | | 1070x1685x880 | | |
| REFRIGERANT COUPLING | | | | | | | | |
| Liquid pipe | | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 3/4" |
| Gas pipe | | 3/4" | 3/4" | 7/8" | 7/8" | 1 1/8" | 1 3/8" | 1 3/8" |
| INDOOR UNIT | | LHB 5E | LVB 5E | LHB 7E | LVB 7E | LHB 8E | LHB 10E | LHB 15E |
| COIL | | | | | | | | |
| Face area | m ² | 0,72 | 0,72 | 0,72 | 0,72 | 1,10 | 1,01 | 1,01 |
| Rows / fin per inch | | 3/12 | 3/12 | 4/12 | 4/12 | 5/12 | 4/14 | 5/14 |
| FAN | | | | | | | | |
| Air flow | m ³ /h. | Max. | 4.300 | 4.300 | 5.500 | 5.500 | 5.700 | 8.400 |
| | | Min. | 3.400 | 3.400 | 3.800 | 3.800 | 4.200 | 5.600 |
| Available pressure | max (1) | Pa. | 200 | 200 | 230 | 230 | 230 | 370 |
| WEIGHT | Kg | 106 | 106 | 106 | 106 | 100 | 150 | 200 |
| DIMENSIONS | | | | | | | | |
| Height | mm. | 485 | 996 | 485 | 996 | 512 | 660 | 660 |
| Length | mm. | 1015 | 1015 | 1015 | 1015 | 1285 | 1555 | 1555 |
| Width | mm. | 966 | 485 | 966 | 485 | 720 | 805 | 805 |
| REFRIGERANT COUPLING | | | | | | | | |
| Liquid pipe | | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 5/8" | 3/4" |
| Gas pipe | | 3/4" | 3/4" | 7/8" | 7/8" | 1 1/8" | 1 3/8" | 1 3/8" |

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

(*) Air intake temperature outdoor interchange: 35 °C DB.

(*) Air intake temperature indoor interchange: 20°C DB / 12°C WB.

(*) Air intake temperature outdoor interchange: 7°C DB / 6°C WB.

DB.- Dry bulb
WB.- Wet bulb

(1) With minimum admissible flow volumes.

SPECIFICATIONS (HEAT PUMP)

R - 22

| MODEL | | HAB 15D | HAB 17D | HAB 20D | HAB 30D | HAB 35D | HAB 30D | |
|-------------------------------|--------------------|-------------|----------------|----------------|----------------|--------------------|--------------------|--------|
| Nominal cooling capacity (*) | W | 36.500 | 44,00 | 56.200 | 69.000 | 83.300 | 97.400 | |
| Nominal heating capacity (**) | W | 40.150 | 48.800 | 62.700 | 78.200 | 91.450 | 107.000 | |
| OUTDOOR UNIT | | KAB 15D | KAB 17D | KAB 20D | KAB 30D | KAB 35D | KAB 40D | |
| COMPRESSOR | Nº / Type | 2 / Alt | 2 / Alt | 2 / Alt | 2 / Alt | 2 / Scroll | 2 / Alt | |
| COIL | | | | | | | | |
| Face area | m ² | 2x0,88 | 2x0,88 | 2x1,28 | 2x1,28 | 2x0,88 | 2x1,28 | |
| Rows / fin per inch | | 3/14 | 4/14 | 3/14 | 4/14 | 4/14 | 3/14 | |
| FAN | | | | | | | | |
| Air flow | m ³ /h. | 14.400 | 14.200 | 20.000 | 19.200 | 2x14.200 | 2x20.000 | |
| WEIGHT | | Kg | 312 | 357 | 415 | 470 | 2x430 | 2x475 |
| DIMENSIONS | | | | | | | | |
| Height | mm. | 1330 | 1330 | 1830 | 1830 | 1330 | 1830 | |
| Length | mm. | 2000 | 2000 | 2000 | 2000 | 2000 | 2000 | |
| Width | mm. | 1000 | 1000 | 1000 | 1000 | 1000 | 1000 | |
| PACKING DIMENSIONS | | mm. | 1450x2140x1230 | 1950x2140x1230 | 1950x2140x1230 | 2x(1450x2140x1230) | 2x(1950x2140x1230) | |
| REFRIGERANT COUPLING | | | | | | | | |
| Liquid pipe | | 2x5/8" | 2x5/8" | 2x5/8" | 2x3/4" | 2x7/8" | 2x7/8" | |
| Gas pipe | | 2x7/8" | 2x1-1/8" | 2x1-1/8" | 2x1-3/8" | 2x1-5/8" | 2x1-5/8" | |
| INDOOR UNIT | | LHX 15D | LHX 17D | LHX 20D | LHX 30D | LHX 35D | LHX 40D | |
| COIL | | | | | | | | |
| Face area | m ² | 2x0,37 | 2x0,58 | 2x0,58 | 2x0,66 | 2x0,84 | 2x0,84 | |
| Rows / fin per inch | | 4/12 | 3/12 | 4/12 | 4/12 | 4/14 | 5/14 | |
| FAN | | | | | | | | |
| Air flow | m ³ /h. | Max. | 8.200 | 11.400 | 13.600 | 14.800 | 17.000 | 18.300 |
| | | Min. | 6.600 | 9.200 | 9.100 | 10.100 | 12.500 | 15.000 |
| Available pressure | max (1) | Pa. | 200 | 190 | 290 | 240 | 300 | 280 |
| WEIGHT | | Kg | 150 | 210 | 230 | 235 | 270 | 295 |
| DIMENSIONS | | | | | | | | |
| Height | mm. | 590 | 640 | 640 | 640 | 665 | 665 | |
| Length | mm. | 1660 | 2250 | 2250 | 2500 | 3140 | 3140 | |
| Width | mm. | 650 | 750 | 750 | 750 | 750 | 750 | |
| PACKING DIMENSIONS | | mm. | 750x1800x900 | 800x2360x950 | 800x2650x950 | 800x3300x920 | | |
| REFRIGERANT COUPLING | | | | | | | | |
| Liquid pipe | | 2x5/8" | 2x5/8" | 2x5/8" | 2x3/4" | 2x7/8" | 2x7/8" | |
| Gas pipe | | 2x7/8" | 2x1-1/8" | 2x1-1/8" | 2x1-3/8" | 2x1-5/8" | 2x1-5/8" | |

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

(*) Air intake temperature outdoor interchange: 35 °C DB.

(*) Air intake temperature indoor interchange: 20°C DB / 12°C WB.

(*) Air intake temperature outdoor interchange: 7°C DB / 6°C WB.

DB.- Dry bulb
WB.- Wet bulb

(1)With minimum admissible flow volumes.

SPECIFICATIONS

MODELS

| MODEL | | ANA 5EK | HAB 5E VAB 5E | ANA 7EK | HAB 7E VAB 7E | ANA 8EK HAB 8E | ANA 10EK HAB 10E | ANA 15EK HAB 15E |
|---|-------------|----------------|------------------|-----------|------------------|-------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230/400V - 3Ph | | | | | | |
| Nominal total input power cooling capacity | Kw | 6,5 | 6,7 | 8,2 | 8,2 | 9,4 | 12,6 | 16,3 |
| Nominal total input power heat pump | Kw | - | 7,2 | - | 8,9 | 10,0 | 13,6 | 17,3 |
| Max. current | A | 29,0/18,9 | 29,4/19,3 | 35,1/24,1 | 35,1/24,1 | 37,6/22,8 | 48,2/28,6 | 61,8/37,8 |
| Starting current | A | 122,2/65,2 | 122,2/65,2 | 141/73 | 141/73 | 180,8/81,3 | 176,4/108,7 | 217,4/135,4 |

| OUTDOOR UNIT | | KNA 5EK | KAB 5E | KNA 7EK | KAB 7E | KNA 8EK KAB 8E | KNA 10EK KAB 10E | KNA 15EK KAB 15E |
|---|-------------|----------------|-----------|-----------|-----------|-------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230/400V - 3Ph | | | | | | |
| Nominal total input power cooling capacity | Kw | 5,76 | 5,96 | 7,2 | 7,2 | 8,3 | 11,1 | 14,1 |
| Nominal total input power heat pump | Kw | - | 6,46 | - | 7,9 | 8,9 | 12,1 | 15,1 |
| Max. current | A | 23,8/13,7 | 24,2/14,1 | 29,1/18,1 | 29,1/18,1 | 32,8/20,0 | 41,8/24,9 | 52,4/32,4 |
| Starting current | A | 117/60 | 135/67 | 135/67 | 135/67 | 176/78,5 | 170/105 | 208/130 |

| INDOOR UNIT | | LNA 5EK | LHB 5E LVB 5E | LNA 7EK | LHB 7E LVB 7E | LNA 8EK LHB 8E | LNA 10EK LHB 10E | LNA 15EK LHB 15E |
|------------------|-------------|--------------|------------------|---------|------------------|----------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230 V - 1 Ph | | | | 230 V / 400 V - 3 Ph | | |
| Input power | Kw | 0,74 | 0,74 | 1,00 | 1,00 | 1,1 | 1,5 | 2,2 |
| Max. current | A | 5,2 | 5,2 | 6,0 | 6,0 | 4,8/2,8 | 6,4/3,7 | 9,4/5,4 |
| Starting current | A | 15,6 | 15,6 | 18 | 18 | 14,4/8,4 | 19,2/1,1 | 28,2/16,1 |

SPECIFICATIONS

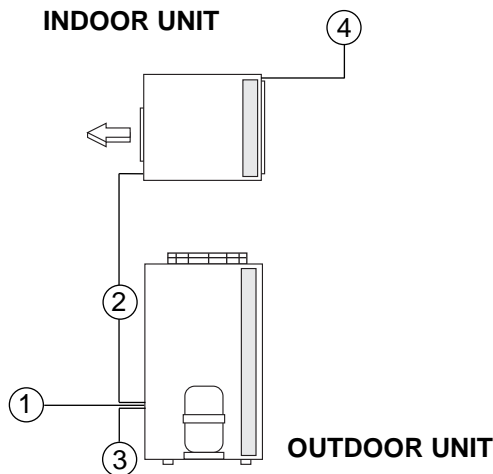
MODELS

| MODEL | | ANA 15DK HAB 15D | ANA 17DK HAB 17D | ANA 20DK HAB 20D | ANA 30DK HAB 30D | ANA 35DK HAB 35D | ANA 40DK HAB 40D |
|---|-------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230/400V - 3Ph | | | | | |
| Nominal total input power cooling capacity | Kw | 15,8 | 18,6 | 24,4 | 30,2 | 32 | 39 |
| Nominal total input power heat pump | Kw | 13,1 | 15,8 | 20,7 | 25,4 | 29 | 34 |
| Max. current | A | 63,76 / 38,66 | 75,96 / 45,36 | 94,4 / 55,6 | 112,4 / 67,4 | 148,8 / 74,8 | 184,8 / 92,6 |
| Starting current | A | 163/84 | 187/98 | 211/129 | 260/160 | 500 / 226 | 410 / 196 |

| OUTDOOR UNIT | | KNA 15DK KAB 15D | KNA 17DK KAB 17D | KNA 20DK KAB 20D | KNA 30DK KAB 30D | KNA 35DK KAB 35D | KNA 40DK KAB 40D |
|---|-------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230/400V - 3Ph | | | | | |
| Nominal total input power cooling capacity | Kw | 14,2 | 16,2 | 21,0 | 26,8 | 27,5 | 33,5 |
| Nominal total input power heat pump | Kw | 11,5 | 13,4 | 17,3 | 22,0 | 24,5 | 28,5 |
| Max. current | A | 56,36 / 34,36 | 63,96 / 38,36 | 82,4 / 48,6 | 100,4 / 60,4 | 127,5 / 63,3 | 161,5 / 79,1 |
| Starting current | A | 163/84 | 187/98 | 211/129 | 260/160 | 500 / 226 | 410 / 196 |

| INDOOR UNIT | | LFE 15DK LHX 15D | LFE 17DK LHX 17D | LFE 20DK LHX 20D | LFE 30DK LHX 30D | LFE 35DK LHX 35D | LFE 40DK LHX 40D |
|------------------|-------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| Voltage | V/f (50 Hz) | 230/400V - 3 Ph | | | | | |
| Input power | Kw | 1,6 | 2,4 | 3,4 | 3,4 | 4,5 | 5,5 |
| Max. current | A | 7,4 / 4,3 | 12,0 / 7,0 | 12,0 / 7,0 | 12,0 / 7,0 | 21,3 / 11,5 | 23,3 / 13,5 |
| Starting current | A | 22,2 / 12,9 | 36,1 / 21,1 | 36,1 / 21,1 | 36,1 / 21,1 | 132 / 71 | 144 / 84 |

ELECTRICAL CONNECTIONS



ELECTRICAL WIRING DIAGRAM
for electrical connection refer to
wiring diagram in the unit.

- ① Power supply.
- ② Indoor unit / Outdoor unit connection.
- ③ Thermostat connection.
- ④ Electrical heater connection (optional).

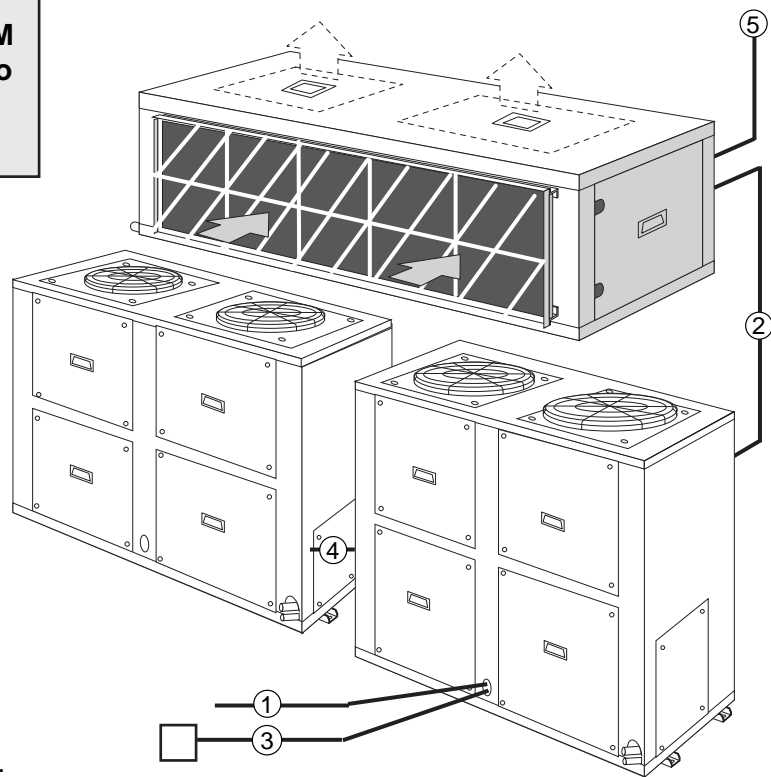
| MODEL | VOLTAGE | NUMBER OF WIRES X SECTION | | | | |
|-----------|-------------|---------------------------|--|--|----------------------|--|
| | | ① | ② | | ③ | ④ |
| | | | COOLING ONLY | HEAT PUMP | | |
| MODEL 5E | 230 V / 3Ph | 4x6mm ² | 4x1,5mm ² +3x1,5mm ² | 6x1,5mm ² +2x1,5mm ² | 6x1mm ² | DEPENDS ON ELECTRICAL HEATER SELECTED |
| | 400 V / 3Ph | 5x4mm ² | 4x1,5mm ² +3x1,5mm ² | 6x1,5mm ² +2x1,5mm ² | 6x1mm ² | |
| MODEL 7E | 230 V / 3Ph | 4x10mm ² | 4x1,5mm ² +3x1,5mm ² | 6x1,5mm ² +2x1,5mm ² | 6x1mm ² | |
| | 400 V / 3Ph | 5x6mm ² | 4x1,5mm ² +3x1,5mm ² | 6x1,5mm ² +2x1,5mm ² | 6x1mm ² | |
| MODEL 8E | 230 V / 3Ph | 4x10mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| | 400 V / 3Ph | 5x6mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| MODEL 10E | 230 V / 3Ph | 4x10mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| | 400 V / 3Ph | 5x6mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| MODEL 15E | 230 V / 3Ph | 4x16mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| | 400 V / 3Ph | 5x10mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 6x1mm ² | |
| MODEL 15D | 230 V / 3Ph | 4x25mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| | 400 V / 3Ph | 5x10mm ² | 4x1,5mm ² +3x1,5mm ² | 4x1,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| MODEL 17D | 230 V / 3Ph | 4x25mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| | 400 V / 3Ph | 5x10mm ² | 4x1,5mm ² +3x1,5mm ² | 4x1,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| MODEL 20D | 230 V / 3Ph | 4x35mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| | 400 V / 3Ph | 5x16mm ² | 4x1,5mm ² +3x1,5mm ² | 4x1,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| MODEL 30D | 230 V / 3Ph | 4x50mm ² | 4x2,5mm ² +3x1,5mm ² | 4x2,5mm ² +2x1,5mm ² | 7x1,5mm ² | |
| | 400 V / 3Ph | 5x25mm ² | 4x1,5mm ² +3x1,5mm ² | 4x1,5mm ² +2x1,5mm ² | 7x1,5mm ² | |

NOTE: The sections has been calculated to a distance longer than 50m and a low supply of 10V.

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.

ELECTRICAL CONNECTIONS

ELECTRICAL WIRING DIAGRAM
for electrical connection refer to
wiring diagram in the unit.



- ① Power supply.
- ② Indoor unit / Outdoor unit connection.
- ③ Thermostat connection.
- ④ Connection between outdoor unit.
- ⑤ Electrical heater connection (optional).

MODELS

| MODEL | VOLTAGE | NUMBER OF WIRES X SECTION | | | | |
|---------------------|-------------|---------------------------|---|---|------------------------|--|
| | | ① | ② | | ③ | ④ |
| | | | COOLING ONLY | HEAT PUMP | | |
| MODELS 35D / 40D | 230 V / 3Ph | 4 x 70mm ² | 4 x 4 mm ² + 3 x 1,5mm ² | 4 x 4mm ² + 2 x 1,5mm ² | 7 x 1,5mm ² | 4 x 25 mm ² + 19 x 1mm ² |
| | 400 V / 3Ph | 5 x 2,5mm ² | 4 x 2,5mm ² + 3 x 1,5mm ² | 4 x 2,5mm ² + 2 x 1,5mm ² | 7 x 1,5mm ² | 4 x 10mm ² + 19 x 1mm ² |

NOTE: The sections has been calculated to a distance longer than 50m and a low supply of 10V.

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.

In the models 35D 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 (the correct direction of rotation can be checked when the pressure on the suction side decreases and the pressure on the discharge side increases when the compressor is activated). If the connection is wrong, the rotation will be reversed causing a high noise level and a reduction in the amount of current consumed. If this occurs, the compressor's internal protection system will kick in shutting down the unit. The solution is to disconnect, switch the wires between two of the phases and connect again).

INDOOR UNIT FAN CHARACTERISTICS

| | LNA 5 | | | | LNA 7 | | | |
|------------------------------|-------|------|------|------|-------|------|------|------|
| AIR FLOW M ³ /H | 3400 | 3700 | 4050 | 4200 | 3800 | 4300 | 4800 | 5000 |
| STATIC PRESSURE AVAILABLE Pa | 180 | 130 | 50 | 0 | 180 | 140 | 50 | 0 |

| | LHB 5/LVB 5 | | | | LHB 7/LVB 7 | | | |
|------------------------------|-------------|------|------|------|-------------|------|------|------|
| AIR FLOW M ³ /H | 3400 | 3800 | 4150 | 4300 | 3800 | 4500 | 5200 | 5500 |
| STATIC PRESSURE AVAILABLE Pa | 200 | 130 | 50 | 0 | 230 | 170 | 50 | 0 |

| | | LNA 8E/LHB 8E | | | |
|-----------------|-------------------|---------------|-------|-------|------|
| AIR FLOW | m ³ /h | 4.200 | 5.000 | 5.700 | |
| PULLEY POSITION | PULLEY CLOSED | 1.125 R.P.M. | 230* | 200* | 150* |
| | 1 TURN | 1.055 R.P.M. | 195* | 155* | 100* |
| | 2 TURN | 985 R.P.M. | 160* | 115* | 60* |
| | 3 TURNS | 915 R.P.M. | 120* | 80* | 20* |

| | | LNA 10E/LHB 10E | | | |
|-----------------|-------------------|-----------------|-------|-------|------|
| AIR FLOW | m ³ /h | 5.600 | 7.000 | 8.400 | |
| PULLEY POSITION | PULLEY CLOSED | 930 R.P.M. | 230* | 190* | ● |
| | 1 TURN | 870 R.P.M. | 190* | 150* | 100* |
| | 2 TURN | 810 R.P.M. | 150* | 100* | 50* |
| | 3 TURNS | 750 R.P.M. | 110* | 60* | 0* |

| | | LNA 15E/LHB 15E | | | |
|-----------------|-------------------|-----------------|-------|-------|------|
| AIR FLOW | m ³ /h | 5.600 | 7.000 | 8.400 | |
| PULLEY POSITION | PULLEY CLOSED | 1.125 R.P.M. | 370* | 310* | ● |
| | 1 TURN | 1.055 R.P.M. | 310* | 250* | 180* |
| | 2 TURN | 985 R.P.M. | 250* | 190* | 120* |
| | 3 TURNS | 915 R.P.M. | 200* | 140* | 60* |

NOTE: The unit leaves factory with pulley 1 1/2 turns opened.

 NOMINAL AIR FLOW

• Wrong status on account of motor power limit.

* Static pressure available Pa.

INDOOR UNIT FAN CHARACTERISTICS

LFE 15DK / LHX 15D

| AIR FLOW | m^3/h | | 6.600 | 7.125 | 7.650 | 8.200 |
|-----------------|---------------|--------------|-------|-------|-------|-------|
| PULLEY POSITION | PULLEY CLOSED | 1.140 R.P.M. | 200* | 180* | 160* | ● |
| | 1 TURN | 1.080 R.P.M. | 165* | 145* | 115* | 85* |
| | 2 TURN | 1.020 R.P.M. | 120* | 100* | 70* | 40* |
| | 3 TURNS | 960 R.P.M. | 95* | 75* | 45* | 15* |

LFE 17DK / LHX 17D

| AIR FLOW | m^3/h | | 9.200 | 9.900 | 10.600 | 11.400 |
|-----------------|---------------|------------|-------|-------|--------|--------|
| PULLEY POSITION | PULLEY CLOSED | 890 R.P.M. | 190* | 170* | 150* | 120* |
| | 1 TURN | 840 R.P.M. | 170* | 140* | 120* | 90* |
| | 2 TURN | 790 R.P.M. | 140* | 110* | 80* | 50* |
| | 3 TURNS | 740 R.P.M. | 110* | 85* | 60* | 30* |

LFE 20DK / LHX 20D

| AIR FLOW | m^3/h | | 9.100 | 10.600 | 12.100 | 13.600 |
|-----------------|---------------|-------------|-------|--------|--------|--------|
| PULLEY POSITION | PULLEY CLOSED | 1010 R.P.M. | 290* | 250* | 190* | ● |
| | 1 TURN | 955 R.P.M. | 270* | 230* | 170* | ● |
| | 2 TURN | 900 R.P.M. | 240* | 190* | 140* | 60* |
| | 3 TURNS | 845 R.P.M. | 210* | 160* | 100* | 20* |

LFE 30DK / LHX 30D

| AIR FLOW | m^3/h | | 10.100 | 11.700 | 13.300 | 14.800 |
|-----------------|---------------|-------------|--------|--------|--------|--------|
| PULLEY POSITION | PULLEY CLOSED | 1010 R.P.M. | 240* | 200* | 140* | ● |
| | 1 TURN | 955 R.P.M. | 210* | 170* | 110* | ● |
| | 2 TURN | 900 R.P.M. | 170* | 140* | 80* | 20* |
| | 3 TURNS | 845 R.P.M. | 150* | 120* | 50* | 0* |

LFE 35DK / LHX 35D

| AIR FLOW | m^3/h | | 12.500 | 14.000 | 15.500 | 17.000 |
|-----------------|---------------|-------------|--------|--------|--------|--------|
| PULLEY POSITION | PULLEY CLOSED | 1055 R.P.M. | 300* | 250* | 190* | 120* |
| | 1 TURN | 1010 R.P.M. | 260* | 210* | 150* | 80* |
| | 2 TURN | 965 R.P.M. | 220* | 170* | 110* | 40* |
| | 3 TURNS | 920 R.P.M. | 190* | 130* | 70* | 0* |

LFE 40DK / LHX 40D

| AIR FLOW | m^3/h | | 15.000 | 16.100 | 17.200 | 18.300 |
|-----------------|---------------|-------------|--------|--------|--------|--------|
| PULLEY POSITION | PULLEY CLOSED | 1120 R.P.M. | 280* | 240* | 190* | ● |
| | 1 TURN | 1080 R.P.M. | 230* | 185* | 140* | ● |
| | 2 TURN | 1030 R.P.M. | 190* | 140* | 100* | 50* |
| | 3 TURNS | 980 R.P.M. | 140* | 100* | 50* | 0* |

NOTE: The unit leaves factory with pulley 1 1/2 turns opened.



NOMINAL AIR FLOW

- Wrong status on account of motor power limit.
- * Static pressure available Pa.

CAPACITY TABLE

COOLING CAPACITY IN KW

| AIR INLET TEMPERATURE INDOOR UNIT | | | ANA 5EK | | | | | ANA 7EK | | | | | | |
|-----------------------------------|----|----------|----------------|-------|--|-------|-------|---------|-------|--|-------|-------|-------|-------|
| | | | CAPACITY 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 | 13,53 | 13,06 | 12,58 | 12,10 | 11,62 | 17,85 | 17,20 | 16,54 | 15,88 | 15,22 | | |
| 15 °C | WB | SENSIBLE | 10,53 | 10,31 | 10,09 | 9,88 | 9,66 | 14,01 | 13,71 | 13,41 | 13,12 | 12,82 | | |
| 24 °C | DB | TOTAL | 14,53 | 14,02 | 13,51 | 13,00 | 12,48 | 19,10 | 18,40 | 17,70 | 16,99 | 16,27 | | |
| 17 °C | WB | SENSIBLE | 11,37 | 11,15 | 10,93 | 10,72 | 10,50 | 15,11 | 14,81 | 14,51 | 14,02 | 13,91 | | |
| 27 °C | DB | TOTAL | 15,57 | 15,03 | 14,50 | 13,94 | 13,38 | 20,40 | 19,65 | 18,90 | 18,14 | 17,37 | | |
| 19 °C | WB | SENSIBLE | 12,15 | 11,93 | 11,71 | 11,49 | 11,28 | 16,13 | 15,83 | 15,53 | 15,23 | 14,93 | | |
| 29 °C | DB | TOTAL | 16,67 | 16,11 | 15,52 | 14,94 | 14,35 | 21,77 | 20,98 | 20,17 | 19,35 | 18,53 | | |
| 21 °C | WB | SENSIBLE | 12,09 | 11,87 | 11,65 | 11,43 | 11,21 | 16,01 | 15,71 | 15,41 | 15,11 | 14,80 | | |
| 32 °C | DB | TOTAL | 17,87 | 17,25 | 16,63 | 16,00 | 15,36 | 23,23 | 22,37 | 21,50 | 20,62 | 19,74 | | |
| 23 °C | WB | SENSIBLE | 12,85 | 12,63 | 12,41 | 12,19 | 11,97 | 17,00 | 16,70 | 16,40 | 16,09 | 15,79 | | |

| AIR INLET TEMPERATURE INDOOR UNIT | | | HAB 5E / VAB 5 | | | | | HAB 7E / VAB 7 | | | | | | |
|-----------------------------------|----|----------|----------------|-------|--|-------|-------|----------------|-------|--|-------|-------|-------|-------|
| | | | CAPACITY 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 | 14,04 | 13,53 | 13,01 | 12,50 | 11,98 | 18,07 | 17,38 | 16,69 | 15,99 | 15,29 | | |
| 15 °C | WB | SENSIBLE | 10,80 | 10,57 | 10,33 | 10,10 | 9,87 | 14,18 | 13,86 | 13,55 | 13,24 | 12,93 | | |
| 24 °C | DB | TOTAL | 15,05 | 14,51 | 13,96 | 13,41 | 12,86 | 19,30 | 18,57 | 17,83 | 17,08 | 16,32 | | |
| 17 °C | WB | SENSIBLE | 11,65 | 11,41 | 11,17 | 10,94 | 10,71 | 15,28 | 14,97 | 14,65 | 14,33 | 14,02 | | |
| 27 °C | DB | TOTAL | 16,12 | 15,53 | 15,00 | 14,36 | 13,77 | 20,58 | 19,80 | 19,00 | 18,20 | 17,40 | | |
| 19 °C | WB | SENSIBLE | 12,43 | 12,19 | 11,96 | 11,72 | 11,49 | 16,30 | 15,98 | 15,67 | 15,35 | 15,04 | | |
| 29 °C | DB | TOTAL | 17,24 | 16,62 | 16,00 | 15,37 | 14,74 | 21,94 | 21,09 | 20,25 | 19,39 | 18,52 | | |
| 21 °C | WB | SENSIBLE | 12,36 | 12,12 | 11,88 | 11,65 | 11,41 | 16,16 | 15,85 | 15,53 | 15,21 | 14,90 | | |
| 32 °C | DB | TOTAL | 18,44 | 17,78 | 17,11 | 16,44 | 15,76 | 23,35 | 22,45 | 21,54 | 20,62 | 19,70 | | |
| 23 °C | WB | SENSIBLE | 13,11 | 12,87 | 12,64 | 12,40 | 12,17 | 17,15 | 16,83 | 16,51 | 16,19 | 15,88 | | |

Data based on the following nominal indoor fan air flow:

DB - Dry bulb
WB - wet bulb

CALCULATION OF COOLING CAPACITY DEPENDING ON AIR FLOW

| CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF THE DIFFERENT INDOOR AIR FLOW | | | |
|--|---------|---------|---------|
| Air flow volume | minimum | nominal | maximum |
| Cooling capacity | 0,97 | 1,00 | 1,01 |
| Sensible capacity | 0,89 | 1,00 | 1,04 |

CAPACITY TABLE

COOLING CAPACITY IN KW

| AIR INLET TEMPERATURE INDOOR UNIT | | CAPACITY IN KW | ANA 8EK / HAB 8E | | | | | ANA 10EK / HAB 10E | | | | |
|-----------------------------------|----------|----------------|--|-------|-------|-------|-------|--|-------|-------|-------|-------|
| | | | 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 | 21,18 | 20,29 | 19,42 | 18,57 | 17,76 | 27,54 | 26,43 | 25,31 | 24,19 | 23,08 | |
| 15 °C WB | SENSIBLE | 15,45 | 15,02 | 14,61 | 14,22 | 13,84 | 20,15 | 19,62 | 19,09 | 18,57 | 18,06 | |
| 24 °C DB | TOTAL | 22,70 | 21,76 | 20,84 | 19,94 | 19,07 | 29,45 | 28,29 | 27,11 | 25,92 | 24,74 | |
| 17 °C WB | SENSIBLE | 16,56 | 16,14 | 15,73 | 15,33 | 14,95 | 21,59 | 21,07 | 20,54 | 20,01 | 19,50 | |
| 27 °C DB | TOTAL | 24,31 | 23,31 | 22,30 | 21,39 | 20,45 | 31,50 | 30,26 | 28,90 | 27,75 | 26,50 | |
| 19 °C WB | SENSIBLE | 17,59 | 17,17 | 16,76 | 16,37 | 15,99 | 22,92 | 22,39 | 21,87 | 21,35 | 20,84 | |
| 29 °C DB | TOTAL | 26,02 | 24,98 | 23,95 | 22,94 | 21,95 | 33,66 | 32,34 | 31,01 | 29,69 | 28,36 | |
| 21 °C WB | SENSIBLE | 17,50 | 17,09 | 16,69 | 16,29 | 15,92 | 22,77 | 22,25 | 21,73 | 21,22 | 20,72 | |
| 32 °C DB | TOTAL | 27,85 | 26,75 | 25,66 | 24,59 | 23,54 | 35,95 | 34,56 | 33,15 | 31,74 | 30,34 | |
| 23 °C WB | SENSIBLE | 18,50 | 18,09 | 17,69 | 17,31 | 16,93 | 24,06 | 23,54 | 23,02 | 22,51 | 22,01 | |

ANA 15EK / HAB 15E

| AIR INLET TEMPERATURE INDOOR UNIT | | CAPACITY IN KW | AIR INLET TEMPERATURE OUTDOOR UNIT °C DRY BULB | | | | |
|-----------------------------------|----------|----------------|--|-------|-------|-------|-------|
| | | | 25 °C | 30 °C | 35 °C | 40 °C | 45 °C |
| 21 °C DB | TOTAL | 33,89 | 32,55 | 31,17 | 29,74 | 28,27 | |
| 15 °C WB | SENSIBLE | 24,35 | 23,70 | 23,04 | 22,37 | 21,68 | |
| 24 °C DB | TOTAL | 36,34 | 34,90 | 33,41 | 31,87 | 30,29 | |
| 17 °C WB | SENSIBLE | 26,07 | 25,41 | 24,74 | 24,05 | 23,36 | |
| 27 °C DB | TOTAL | 38,91 | 37,36 | 36,00 | 34,11 | 32,42 | |
| 19 °C WB | SENSIBLE | 27,65 | 26,98 | 26,31 | 25,62 | 24,92 | |
| 29 °C DB | TOTAL | 41,64 | 39,97 | 38,26 | 36,49 | 34,68 | |
| 21 °C WB | SENSIBLE | 27,51 | 26,84 | 26,16 | 25,47 | 24,76 | |
| 32 °C DB | TOTAL | 44,54 | 42,74 | 40,90 | 39,00 | 37,05 | |
| 23 °C WB | SENSIBLE | 29,03 | 28,36 | 27,67 | 26,97 | 26,27 | |

DB - Dry bulb
WB - wet bulb

Data based on the following nominal indoor fan air flow:

CALCULATION OF COOLING CAPACITY DEPENDING ON AIR FLOW

| CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF THE DIFFERENT INDOOR AIR FLOW | | | |
|--|---------|---------|---------|
| Air flow volume | minimum | nominal | maximum |
| Cooling capacity | 0,97 | 1,00 | 1,01 |
| Sensible capacity | 0,89 | 1,00 | 1,04 |

CAPACITY TABLE

COOLING CAPACITY IN KW

| | | | ANA 15DK / HAB 15D | | | | | ANA 17DK/ HAB 17D | | | | |
|-----------------------------------|----------------|----------|--|-------|-------|-------|-------|--|-------|-------|-------|-------|
| AIR INLET TEMPERATURE INDOOR UNIT | CAPACITY 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 | 34,30 | 33,01 | 31,70 | 30,38 | 29,04 | 41,76 | 39,86 | 38,00 | 36,18 | 34,40 |
| 15°C | WB | SENSIBLE | 25,61 | 24,97 | 24,33 | 23,69 | 23,05 | 34,23 | 33,34 | 32,48 | 31,65 | 30,84 |
| 24°C | DB | TOTAL | 36,82 | 35,43 | 34,04 | 32,63 | 31,18 | 44,86 | 42,87 | 40,92 | 39,00 | 37,11 |
| 17°C | WB | SENSIBLE | 27,37 | 26,72 | 26,07 | 25,43 | 24,77 | 36,91 | 36,03 | 35,18 | 34,35 | 33,55 |
| 27°C | DB | TOTAL | 39,48 | 38,00 | 36,50 | 34,98 | 33,44 | 48,14 | 46,06 | 44,00 | 41,98 | 39,99 |
| 19°C | WB | SENSIBLE | 29,05 | 28,40 | 27,74 | 27,08 | 26,43 | 39,49 | 38,63 | 37,79 | 36,97 | 36,17 |
| 29°C | DB | TOTAL | 42,30 | 40,71 | 39,10 | 37,47 | 35,82 | 51,63 | 49,44 | 47,28 | 45,15 | 43,05 |
| 21°C | WB | SENSIBLE | 28,98 | 28,33 | 27,67 | 27,01 | 26,35 | 39,39 | 38,54 | 37,71 | 36,90 | 36,11 |
| 32°C | DB | TOTAL | 45,26 | 43,56 | 41,83 | 40,07 | 38,29 | 55,30 | 53,00 | 50,72 | 48,47 | 46,25 |
| 23°C | WB | SENSIBLE | 30,54 | 29,88 | 29,22 | 28,56 | 27,90 | 41,82 | 40,99 | 40,18 | 39,38 | 38,60 |

| | | | ANA 20DK/ HAB 20D | | | | | ANA 30DK / HAB 30D | | | | |
|-----------------------------------|----------------|----------|--|-------|-------|-------|-------|--|-------|-------|-------|-------|
| AIR INLET TEMPERATURE INDOOR UNIT | CAPACITY 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 | 53,56 | 51,19 | 48,82 | 46,45 | 44,08 | 65,24 | 62,55 | 59,75 | 56,86 | 53,84 |
| 15°C | WB | SENSIBLE | 44,12 | 43,00 | 41,91 | 40,82 | 39,75 | 50,72 | 49,43 | 48,10 | 46,74 | 45,33 |
| 24°C | DB | TOTAL | 57,42 | 54,91 | 52,41 | 49,91 | 47,41 | 70,13 | 67,24 | 64,25 | 61,14 | 57,91 |
| 17°C | WB | SENSIBLE | 47,53 | 46,43 | 45,34 | 44,26 | 43,20 | 54,47 | 53,16 | 51,81 | 50,43 | 48,98 |
| 27°C | DB | TOTAL | 61,48 | 58,84 | 56,20 | 53,55 | 50,92 | 75,32 | 72,21 | 69,00 | 65,66 | 62,21 |
| 19°C | WB | SENSIBLE | 50,81 | 49,73 | 48,65 | 47,59 | 46,53 | 58,07 | 56,73 | 55,38 | 53,99 | 52,55 |
| 29°C | DB | TOTAL | 65,77 | 62,99 | 60,21 | 57,42 | 54,64 | 80,84 | 77,50 | 74,05 | 70,47 | 66,75 |
| 21°C | WB | SENSIBLE | 50,62 | 49,54 | 48,48 | 47,43 | 46,38 | 57,96 | 56,63 | 55,26 | 53,86 | 52,42 |
| 32°C | DB | TOTAL | 70,27 | 67,33 | 64,40 | 61,46 | 58,54 | 86,64 | 83,05 | 79,33 | 75,49 | 71,49 |
| 23°C | WB | SENSIBLE | 53,71 | 52,65 | 51,61 | 50,57 | 49,54 | 61,33 | 59,99 | 58,62 | 57,21 | 55,77 |

| | | | ANA 35DK/HAB 35D | | | | | ANA 40DK/HAB 40D | | | | |
|-----------------------------------|----------------|----------|--|-------|-------|-------|-------|--|--------|--------|--------|--------|
| AIR INLET TEMPERATURE INDOOR UNIT | CAPACITY 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 | 77,09 | 74,88 | 72,50 | 69,92 | 67,06 | 92,34 | 88,22 | 83,91 | 79,38 | 74,60 |
| 15°C | WB | SENSIBLE | 59,90 | 58,84 | 57,70 | 56,47 | 55,13 | 70,67 | 68,67 | 66,60 | 64,45 | 62,21 |
| 24°C | DB | TOTAL | 82,65 | 80,27 | 77,73 | 74,98 | 71,96 | 99,41 | 95,04 | 90,48 | 85,68 | 80,61 |
| 17°C | WB | SENSIBLE | 64,22 | 63,14 | 61,99 | 60,76 | 59,42 | 75,84 | 73,84 | 71,77 | 69,62 | 67,38 |
| 27°C | DB | TOTAL | 88,58 | 86,02 | 83,30 | 80,36 | 77,17 | 106,90 | 102,26 | 97,40 | 92,30 | 86,90 |
| 19°C | WB | SENSIBLE | 68,38 | 67,29 | 66,13 | 64,90 | 63,57 | 80,80 | 78,80 | 76,72 | 74,57 | 72,33 |
| 29°C | DB | TOTAL | 94,93 | 92,18 | 89,26 | 86,13 | 82,74 | 114,86 | 109,91 | 104,73 | 99,28 | 93,51 |
| 21°C | WB | SENSIBLE | 68,20 | 67,10 | 65,94 | 64,71 | 63,39 | 80,73 | 78,72 | 76,65 | 74,49 | 72,25 |
| 32°C | DB | TOTAL | 101,66 | 98,70 | 95,57 | 92,22 | 88,63 | 123,21 | 117,91 | 112,36 | 106,52 | 100,35 |
| 23°C | WB | SENSIBLE | 72,15 | 71,04 | 69,88 | 68,65 | 67,34 | 85,36 | 83,34 | 81,26 | 79,11 | 76,85 |

DB - Dry bulb
WB - wet bulb

Data based on the following nominal indoor fan air flow:

CALCULATION OF COOLING CAPACITY DEPENDING ON AIR FLOW

| CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF THE DIFFERENT INDOOR AIR FLOW | | | |
|--|---------|---------|---------|
| Air flow volume | minimum | nominal | maximum |
| Cooling capacity | 0,97 | 1,00 | 1,02 |
| Sensible capacity | 0,94 | 1,00 | 1,03 |

CAPACITY TABLE

HEATING PUMP IN KW

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 5E / VAB 5E | | | | | | HAB 7E / VAB 7E | | | | | |
|---|----|----------------|--|-------|-------|-------|-------|-------|--|-------|-------|-------|-------|-------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | |
| | | | -8 °C | -4 °C | 0 °C | 6 °C | 12 °C | 18 °C | -8 °C | -4 °C | 0 °C | 6 °C | 12 °C | 18 °C |
| 15 °C | DB | Capacity total | 10,10 | 11,64 | 13,43 | 16,33 | 19,72 | 23,56 | 12,50 | 14,42 | 16,60 | 20,14 | 24,26 | 28,93 |
| 18 °C | DB | Capacity total | 10,05 | 11,57 | 13,34 | 16,20 | 19,54 | 23,01 | 12,46 | 14,35 | 16,50 | 19,97 | 24,02 | 28,57 |
| 20 °C | DB | Capacity total | 9,99 | 11,50 | 13,22 | 16,00 | 19,33 | 23,00 | 12,40 | 14,27 | 16,38 | 20,00 | 23,76 | 28,21 |
| 24 °C | DB | Capacity total | 9,90 | 11,39 | 13,11 | 15,88 | 19,10 | 22,70 | 12,33 | 14,17 | 16,26 | 19,61 | 23,49 | 27,83 |

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 8E | | | | | | HAB 10E | | | | | |
|---|----|----------------|--|-------|-------|-------|-------|-------|--|-------|-------|-------|-------|-------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | |
| | | | -8 °C | -4 °C | 0 °C | 6 °C | 12 °C | 18 °C | -8 °C | -4 °C | 0 °C | 6 °C | 12 °C | 18 °C |
| 15 °C | DB | Capacity total | 15,91 | 18,00 | 20,39 | 24,31 | 28,92 | 34,18 | 20,30 | 23,23 | 26,52 | 31,82 | 37,95 | 44,87 |
| 18 °C | DB | Capacity total | 15,51 | 17,59 | 19,98 | 23,87 | 28,46 | 33,68 | 20,06 | 22,94 | 26,19 | 31,40 | 37,45 | 44,25 |
| 20 °C | DB | Capacity total | 15,13 | 17,20 | 19,58 | 23,40 | 28,02 | 33,20 | 19,80 | 22,64 | 25,83 | 31,00 | 36,93 | 43,63 |
| 24 °C | DB | Capacity total | 14,76 | 16,83 | 19,20 | 23,06 | 27,60 | 32,74 | 19,54 | 22,32 | 25,47 | 30,52 | 36,39 | 42,98 |

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 15E | | | | | |
|---|----|----------------|--|-------|-------|-------|-------|-------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | |
| | | | -8 °C | -4 °C | 0 °C | 6 °C | 12 °C | 18 °C |
| 15 °C | DB | Capacity total | 25,22 | 28,63 | 32,56 | 39,11 | 46,74 | 55,30 |
| 18 °C | DB | Capacity total | 24,92 | 28,29 | 32,20 | 39,60 | 46,09 | 54,47 |
| 20 °C | DB | Capacity total | 24,62 | 27,93 | 31,78 | 38,00 | 45,42 | 53,61 |
| 24 °C | DB | Capacity total | 24,28 | 27,55 | 31,34 | 37,51 | 44,73 | 52,73 |

DB - Dry bulb
WB - wet bulb

Data based on the following nominal indoor fan air flow:

CALCULATION OF HEATING CAPACITY DEPENDING ON AIR FLOW

| CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF THE DIFFERENT INDOOR AIR FLOW | | | |
|--|---------|---------|---------|
| Air flow volume | minimum | nominal | maximum |
| Heating capacity | 0,98 | 1,00 | 1,01 |

CAPACITY TABLE

HEATING PUMP IN KW

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 15D | | | | | | HAB 17D | | | | | |
|---|----|----------------|--|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|-------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | | | | | | | |
| | | | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C |
| 15 °C | DB | Capacity total | 26,36 | 30,00 | 34,03 | 40,81 | 48,40 | 56,56 | 33,86 | 37,82 | 42,34 | 50,22 | 59,44 | 69,86 |
| 18 °C | DB | Capacity total | 26,22 | 29,81 | 33,77 | 40,42 | 47,84 | 55,81 | 32,98 | 36,98 | 41,50 | 49,35 | 58,51 | 68,84 |
| 20 °C | DB | Capacity total | 26,07 | 29,59 | 33,49 | 40,15 | 47,26 | 55,03 | 32,17 | 36,17 | 40,70 | 48,80 | 57,62 | 67,86 |
| 24 °C | DB | Capacity total | 25,89 | 29,36 | 33,18 | 39,57 | 46,65 | 54,22 | 31,44 | 35,44 | 39,94 | 47,73 | 56,77 | 66,94 |

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 20D | | | | | | HAB 30D | | | | | |
|---|----|----------------|--|-------|-------|-------|-------|-------|---------|-------|-------|-------|-------|--------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | | | | | | | |
| | | | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C |
| 15 °C | DB | Capacity total | 41,98 | 47,50 | 53,62 | 64,04 | 76,02 | 89,41 | 52,72 | 59,31 | 66,84 | 79,90 | 94,95 | 111,51 |
| 18 °C | DB | Capacity total | 41,51 | 46,95 | 52,98 | 63,26 | 75,05 | 88,23 | 52,11 | 58,63 | 66,06 | 78,90 | 93,65 | 109,85 |
| 20 °C | DB | Capacity total | 41,02 | 46,38 | 52,33 | 62,70 | 74,06 | 87,04 | 51,48 | 57,91 | 65,23 | 78,20 | 92,32 | 108,15 |
| 24 °C | DB | Capacity total | 40,51 | 45,79 | 51,66 | 61,62 | 73,06 | 85,82 | 50,80 | 57,14 | 64,35 | 76,75 | 90,92 | 106,39 |

| AIR INLET TEMPERATURE INDOOR UNIT KW | | | HAB 35D | | | | | | HAB 40D | | | | | |
|---|----|----------------|--|-------|-------|-------|--------|--------|---------|-------|-------|--------|--------|--------|
| | | | AIR INLET TEMPERATURE OUTDOOR UNIT °C WET BULB | | | | | | | | | | | |
| | | | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C | -8°C | -4°C | 0°C | 6°C | 12°C | 18°C |
| 15 °C | DB | Capacity total | 63,53 | 70,71 | 78,63 | 92,11 | 107,73 | 125,65 | 72,59 | 82,11 | 92,63 | 110,44 | 130,88 | 153,96 |
| 18 °C | DB | Capacity total | 63,51 | 70,63 | 78,45 | 91,72 | 107,06 | 124,65 | 70,95 | 80,40 | 90,80 | 108,39 | 128,52 | 151,15 |
| 20 °C | DB | Capacity total | 63,50 | 70,57 | 78,32 | 91,45 | 106,61 | 123,99 | 69,83 | 79,23 | 89,56 | 107,00 | 126,91 | 149,26 |
| 24 °C | DB | Capacity total | 63,45 | 70,43 | 78,06 | 90,92 | 105,72 | 122,69 | 67,53 | 76,81 | 87,00 | 104,14 | 123,62 | 145,40 |

DB - Dry bulb
WB - wet bulb

Data based on the following nominal indoor fan air flow:

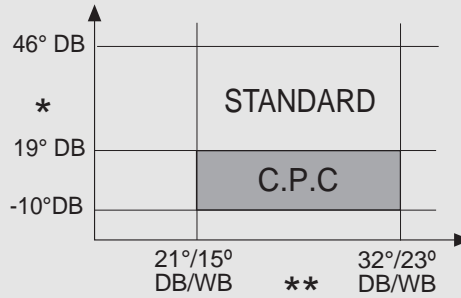
CALCULATION OF HEATING CAPACITY DEPENDING ON AIR FLOW

| CORRECTION COEFFICIENT TO FIX TO THE CAPACITY OF THE DIFFERENT INDOOR AIR FLOW | | | |
|--|---------|---------|---------|
| Air flow volume | minimum | nominal | maximum |
| Heating capacity | 0,98 | 1,00 | 1,01 |

OPERATION LIMITS

OPERATION LIMITS ANA K COOLING ONLY UNITS

- * Supply air temperature into the outdoor unit °C.
- ** Supply air temperature into the indoor unit °C.



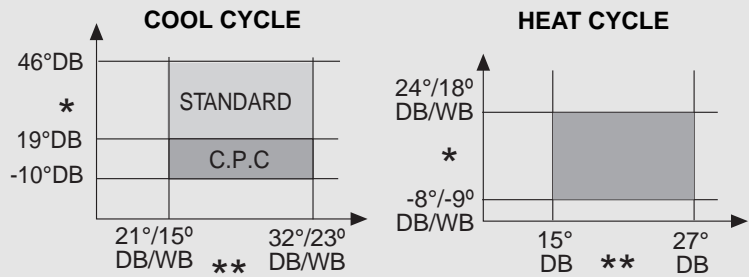
DB.- Dry bulb.
WB.- Wet bulb.

THE LOW AMBIENT CONTROL IS STANDARD

OPERATION LIMITS HAB HEAT PUMP UNITS.

- * Supply air temperature into the outdoor unit °C.
- ** Supply air temperature into the indoor unit °C.

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



THE LOW AMBIENT CONTROL IS OPTIONAL

REFRIGERANT CONNECTIONS

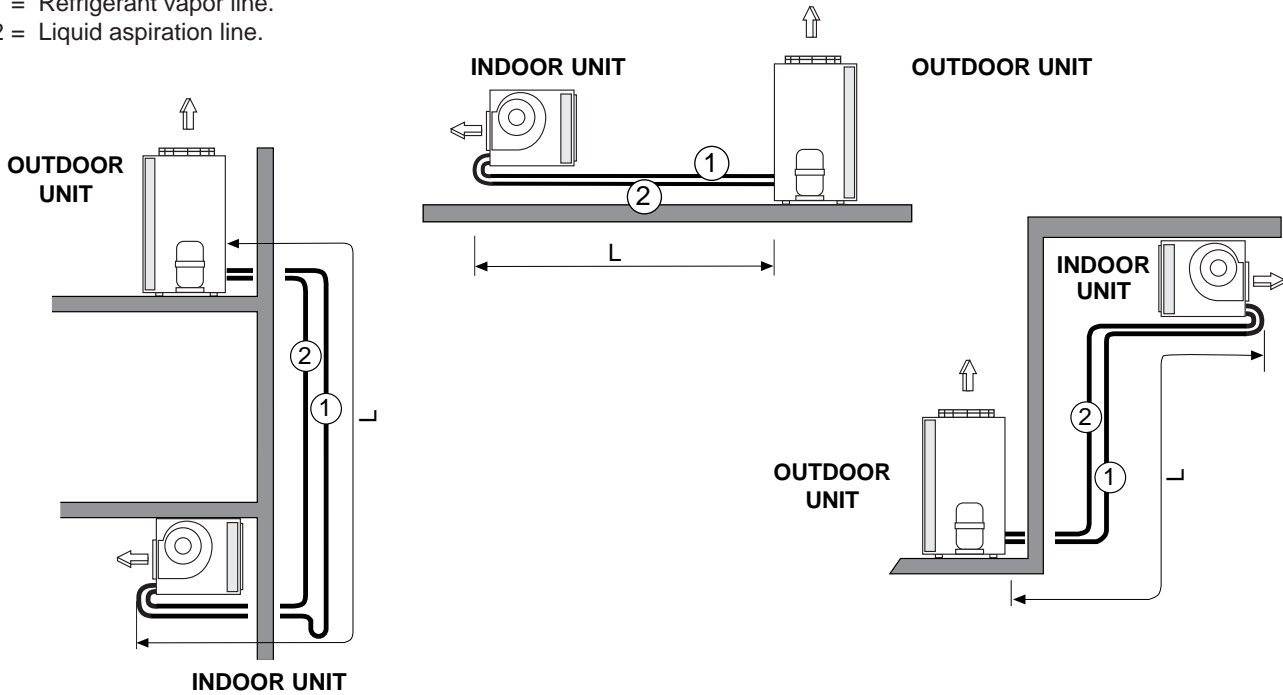
DISTANCES BETWEEN UNITS

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

L : Distance length between both units.

1 = Refrigerant vapor line.

2 = Liquid aspiration line.



| | | MODEL | | | | |
|--------------------------|-----------------------------|-------|------|--------|--------|--------|
| | | 5E | 7E | 8E | 10E | 15E |
| Pipe size (*) | Liquid line | 5/8" | 5/8" | 5/8" | 5/8" | 3/4" |
| | Suction gas line | 3/4" | 7/8" | 1 1/8" | 1 3/8" | 1 3/8" |
| Refrigerant line sizes | Max. Vertical | 9 | 9 | 15 | 15 | 15 |
| Refrigerant line sizes L | Total vertical + Horizontal | 15 | 20 | 25 | 25 | 25 |
| Max. number of bends | maximum | 12 | 12 | 12 | 12 | 12 |

(*) Model 5 incorporated coupling connections.

| | | MODEL | | | | | |
|--------------------------|-----------------------------|--------|----------|----------|----------|----------|----------|
| | | 15D | 17D | 20D | 30D | 35D | 40D |
| Pipe size | Liquid line | 2x5/8" | 2x5/8" | 2x5/8" | 2x3/4" | 2x7/8" | 2x7/8" |
| | Suction gas line | 2x7/8" | 2x1-1/8" | 2x1-1/8" | 2x1-3/8" | 2x1-5/8" | 2x1-5/8" |
| Refrigerant line sizes | Max. Vertical | 15 | 15 | 15 | 15 | 15 | 15 |
| Refrigerant line sizes L | Total vertical + Horizontal | 25 | 25 | 25 | 25 | 25 | 25 |
| Max. number of bends | | 12 | 12 | 12 | 12 | 12 | 12 |

NOTE: THE REFRIGERANT LINE GAS, MUST BE INSULATED.

For other positions and longer lengths, consult the Lennox Technical Support Department for application assistance.

The following data will be obtained from that estimation:

- Pipe dimensions.
- Siphon suction.
- Insulation.
- Refrigerant charge.

PLUMBING ONLY UNITS 15D-17D-20D-30D

Braze the pipes to the liquid and vapor connection to the indoor unit, and connect to the couplings on outdoor service valves.

Place service ports on pipes, where can be easily accessed.

Brazing connections:

1. - The ends of the refrigerant pipes must have clean ends, without bents, burrs or damaged surface.
2. - Torch flame must have blue colour with violet colour on the end. Introduce nitrogen inside of the pipe to avoid pipe oxidizing and decaling. First the inside of the pipe must be warmed up with short pass in right angle and carry on with the outside. Move the flame along the coupling and place the welding rod on the joining point. Place the welding rod first on top, carry on wit both sides and finish with the bottom. With the right temperature the alloy will flow along the coupling.
3. - Wrap a wet cloth around the liquid and vapor valve body to protect from heat damage during brazing.

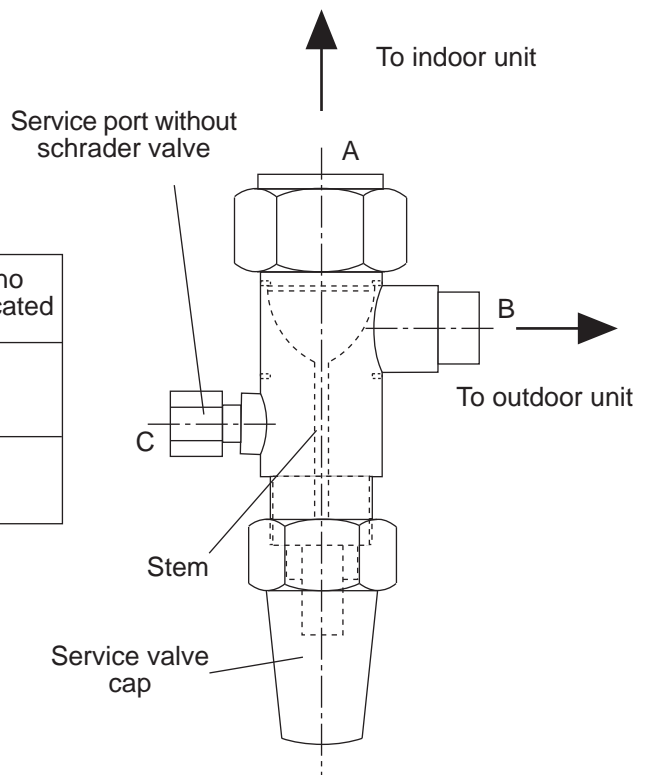
LIQUID & VAPOR LINE SERVICE VALVES

The liquid line and vapor line service valves and service ports are accessible inside of the outdoor unit. With these valves the refrigerant circuit can be isolated, the indoor unit from the outdoor unit.

To open/close liquid or vapor line service valves:

- Remove cap.
- Use an adjustable wrench, to open it turn stem out counterclockwise, to close it turn stem clockwise.
- Service valve operation:

| Service valve position | Stem position | Circuit communicated | Circuit no communicated |
|------------------------|----------------------|----------------------|-------------------------|
| Closed | Inside service valve | B-C | A-B |
| Opened | Out service valve | A-B | B-C |



Leak testing

After the refrigerant pipes has been connected to the indoor and outdoor unit, the line set connections and indoor unit must be checked for leaks.

1. - Liquid and vapor lines must be closed.
2. - Connect a cylinder of nitrogen with a pressure regulating valve to a service port.
3. - Apply soapy water in all joints for leak testing.

REFRIGERANT CONNECTIONS

Evacuation and refrigerant charge

1. - Remove the pressure cap from service port on indoor unit.
2. - Connect the manometers to the service port and the vacuum pump.
3. - Open the manometers valves to communicate service port and the vacuum pump.
4. - Evacuate until to an absolute pressure of 0.5 mmHg; close the vacuum pump valve and check the absolute pressure after 20 minutes. Disconnect the vacuum pump and connect a bottle of refrigerant.
5. - Use a metering to charge of refrigerant to the corresponding load (see charge table), and check for leaks.

The unit is factory charged with refrigerant and is able for 0 meters of pipe line between indoor and outdoor unit, and is specified on unit plate.

The charge of refrigerant to add by meter/line is as follow on table bellow.

| MODEL | | 5E | 7E | 8E | 10E | 15E | 15D | 17D | 20D | 30D | 35D | 40D |
|------------------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| ANA / HAB | (gr./m) | 1x190 | 1x190 | 1x200 | 1x200 | 1x200 | 2x190 | 2x195 | 2x195 | 2x295 | 2x375 | 2x375 |

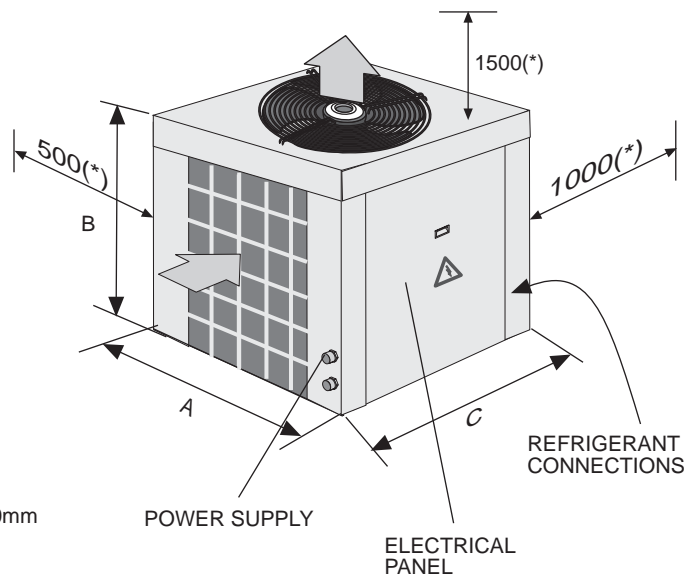
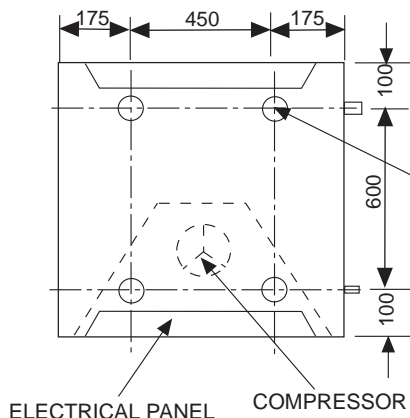
6. - Remove manometers and replace the pressure cap.
7. - Open the two sectioning valves on the outdoor unit, which are placed inside of the unit, and replace their caps.

OUTDOOR UNIT DIMENSIONS (mm)

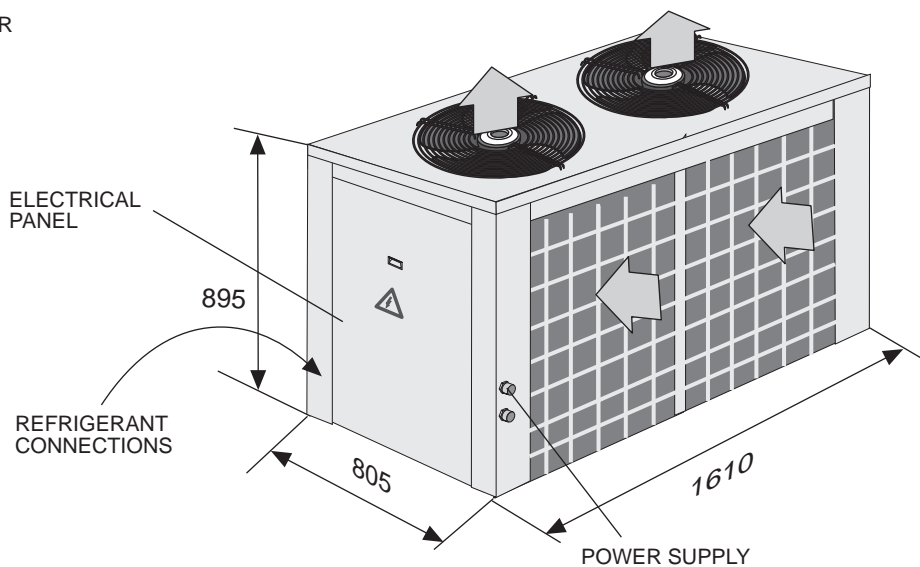
(*) INSTALLATION CLEARANCES

KNA 5K-7K / KAB 5-7

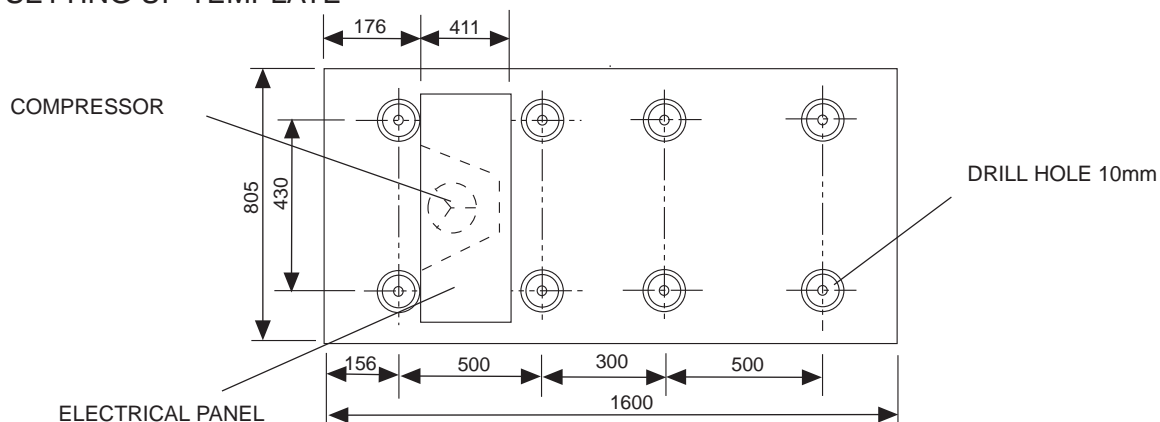
SETTING UP TEMPLATE



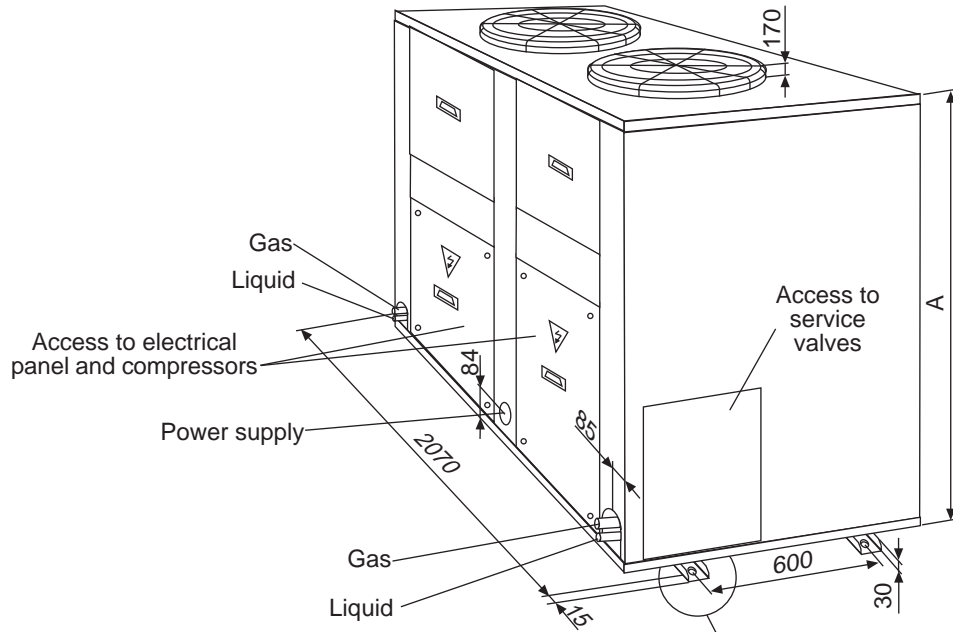
**KNA 8K-10K-15K
KAB 8-10-15**



SETTING UP TEMPLATE



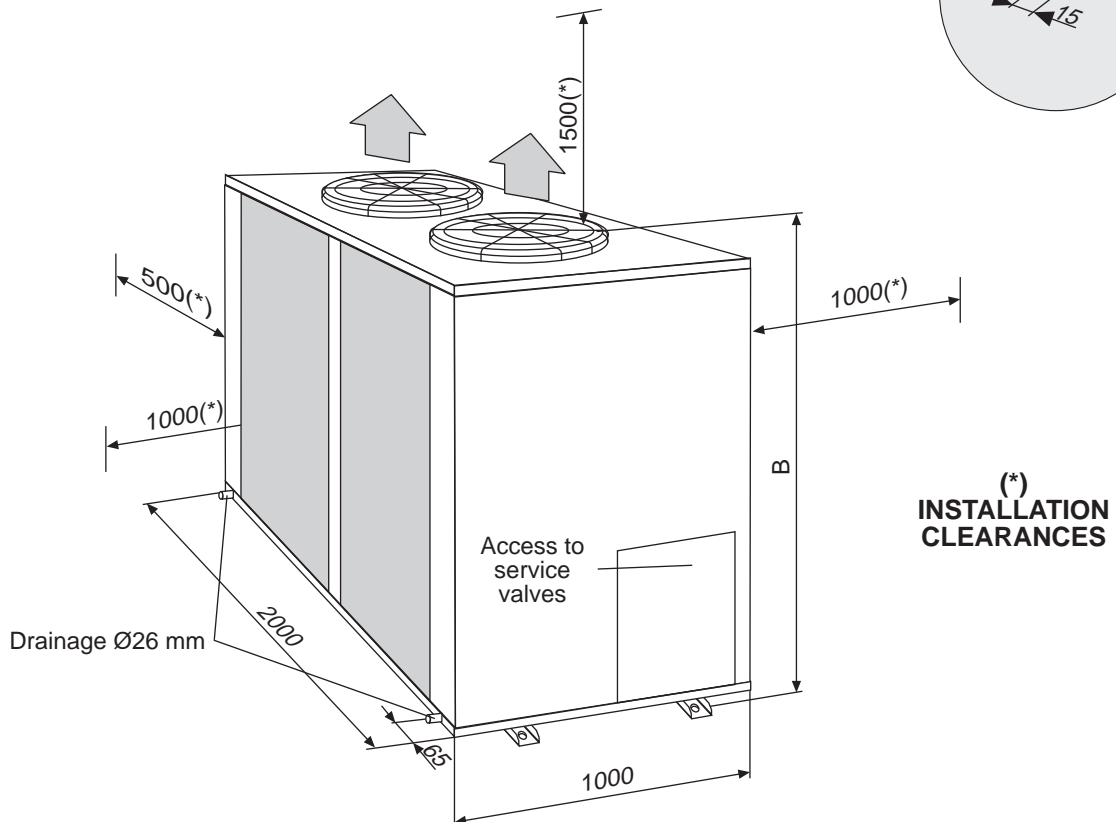
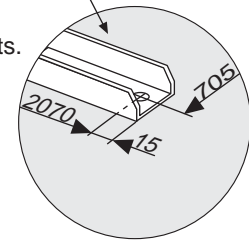
OUTDOOR UNIT DIMENSIONS (mm)



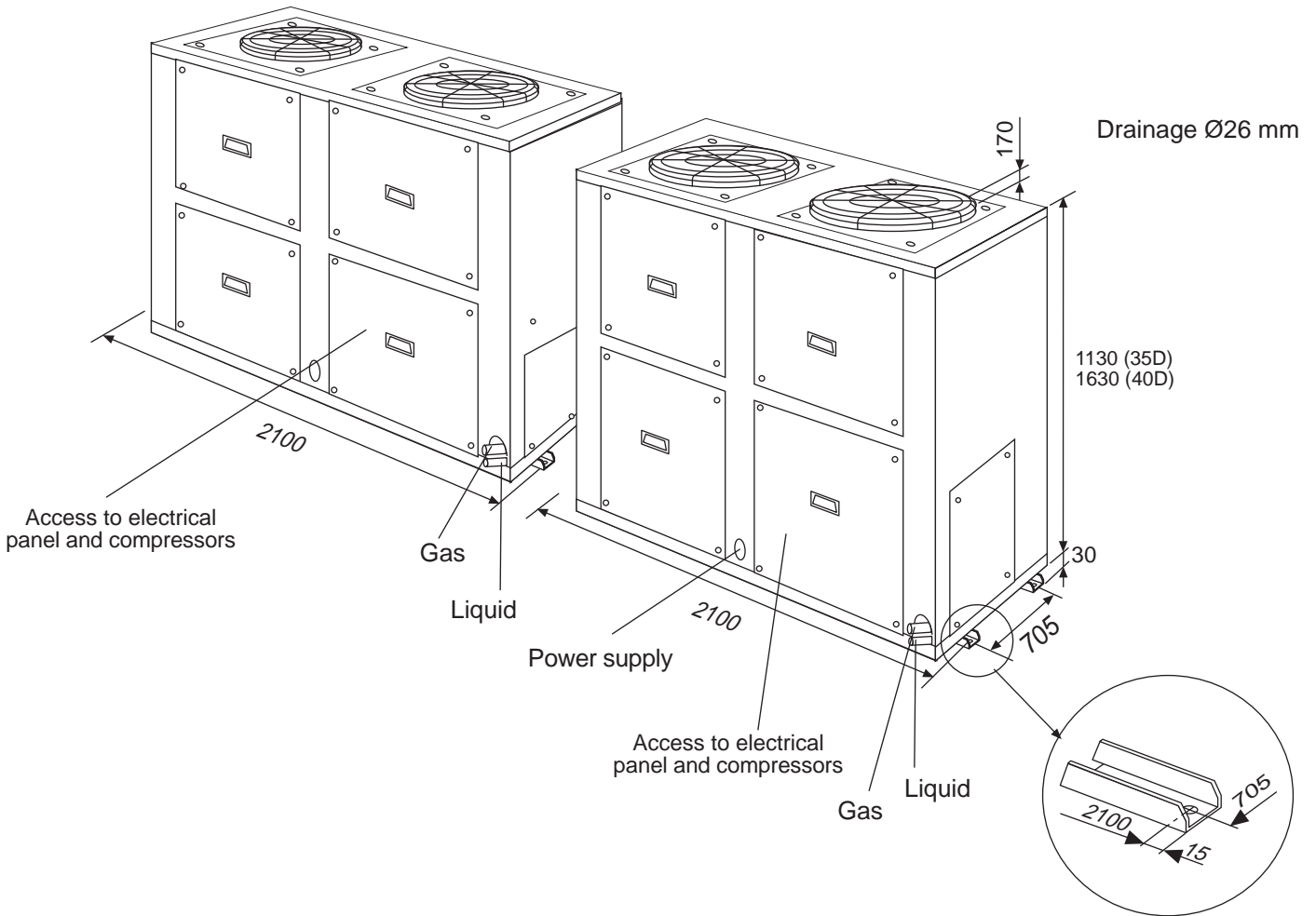
KNA/KAB

| | 15D-17D | 20D-30D |
|---|---------|---------|
| A | 1130 | 1630 |
| B | 1330 | 1830 |

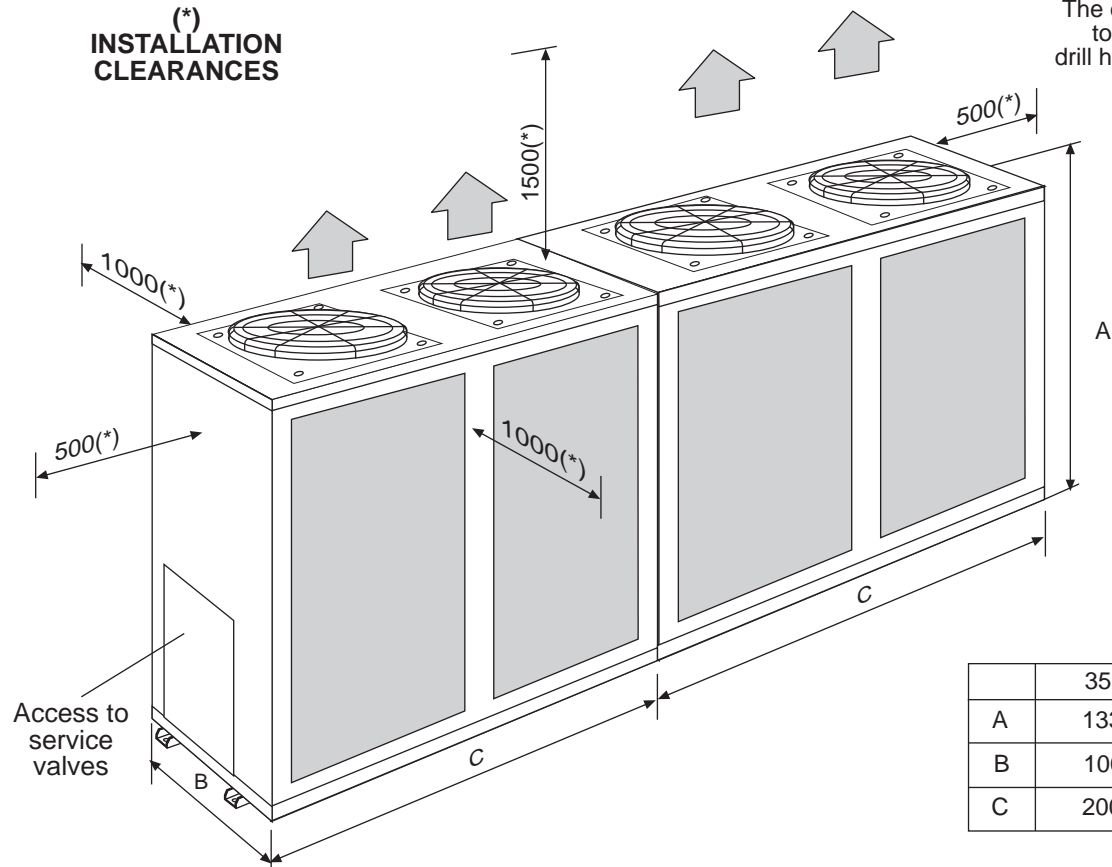
The dimensions referred to the center of the drill holes for the supports.



OUTDOOR UNIT DIMENSIONS (mm)



(*) INSTALLATION CLEARANCES

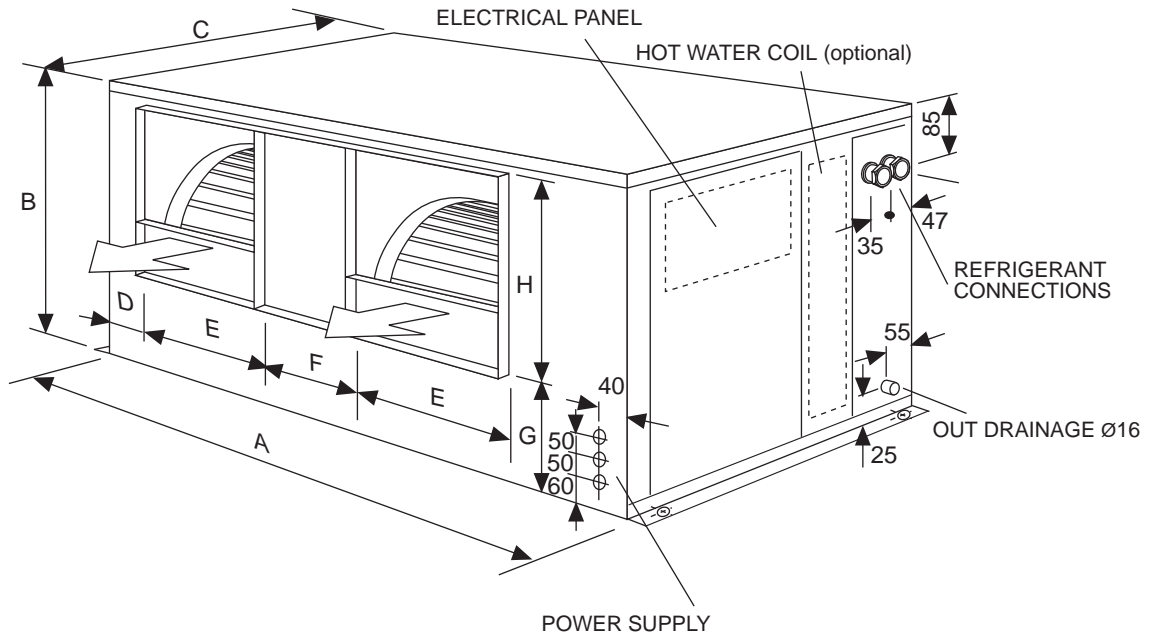


The dimensions referred to the center of the drill holes for the supports.

KNA/KAB

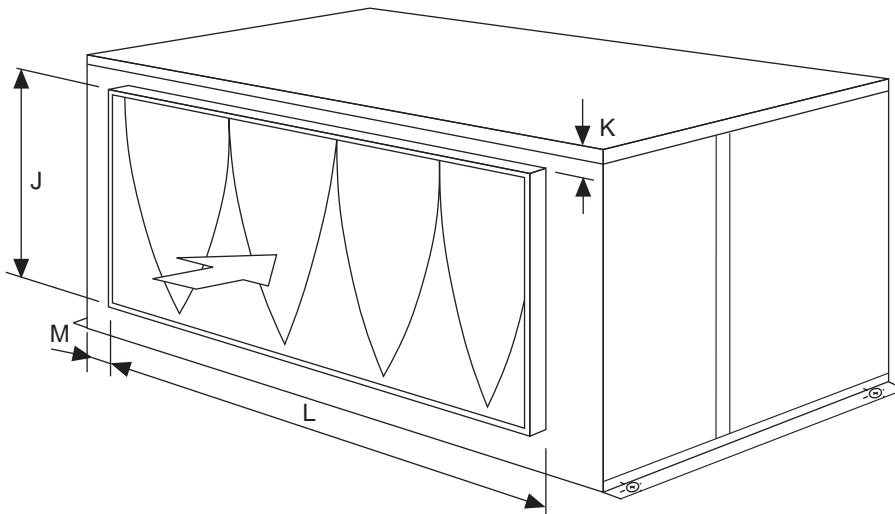
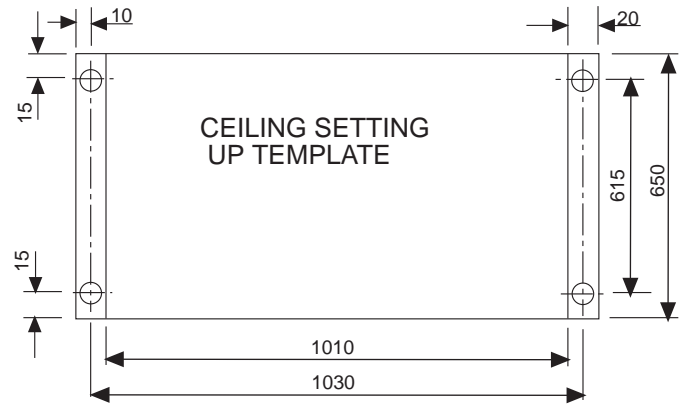
| | 35D | 40D |
|---|------|------|
| A | 1330 | 1830 |
| B | 1000 | 1000 |
| C | 2000 | 2000 |

INDOOR UNIT DIMENSIONS (mm)

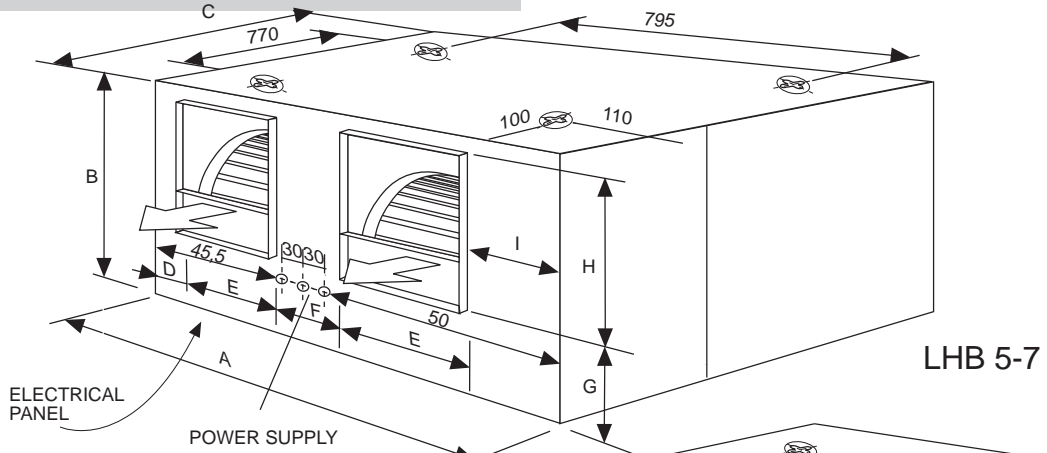


LNA 5-7

| | | | |
|---|------|---|-----|
| A | 1010 | G | 140 |
| B | 440 | H | 260 |
| C | 650 | I | 380 |
| D | 101 | J | 380 |
| E | 300 | K | 900 |
| F | 200 | L | 90 |



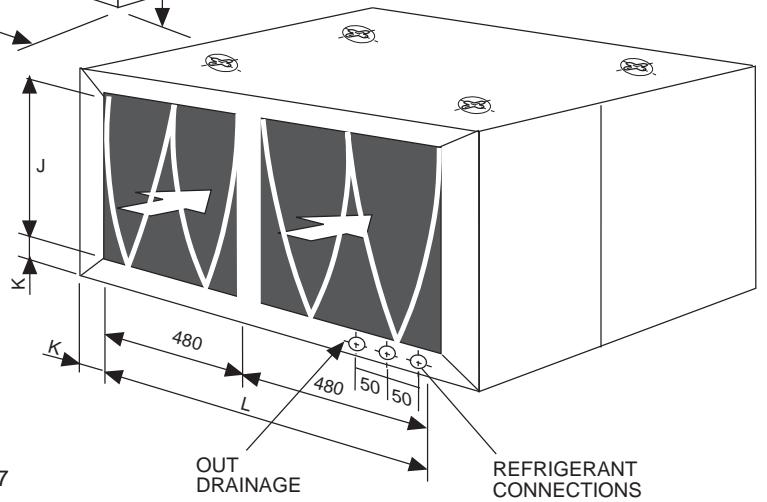
INDOOR UNIT DIMENSIONS (mm)



LHB 5-7

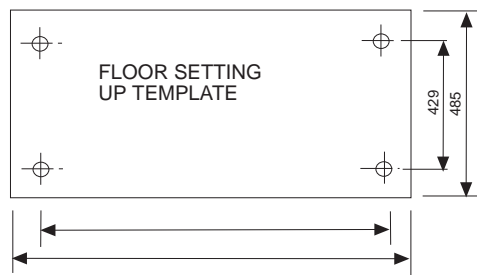
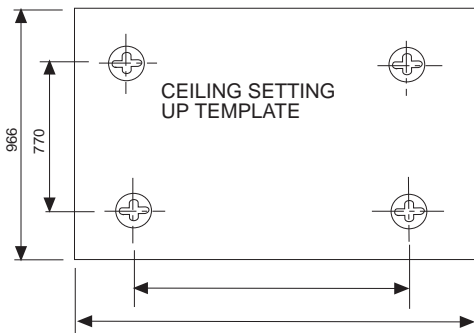
LHB / LVB 5-7

| | | | |
|---|------|---|-----|
| A | 1015 | G | 198 |
| B | 485 | H | 265 |
| C | 966 | I | 92 |
| D | 92 | J | 380 |
| E | 300 | K | 60 |
| F | 200 | L | 90 |

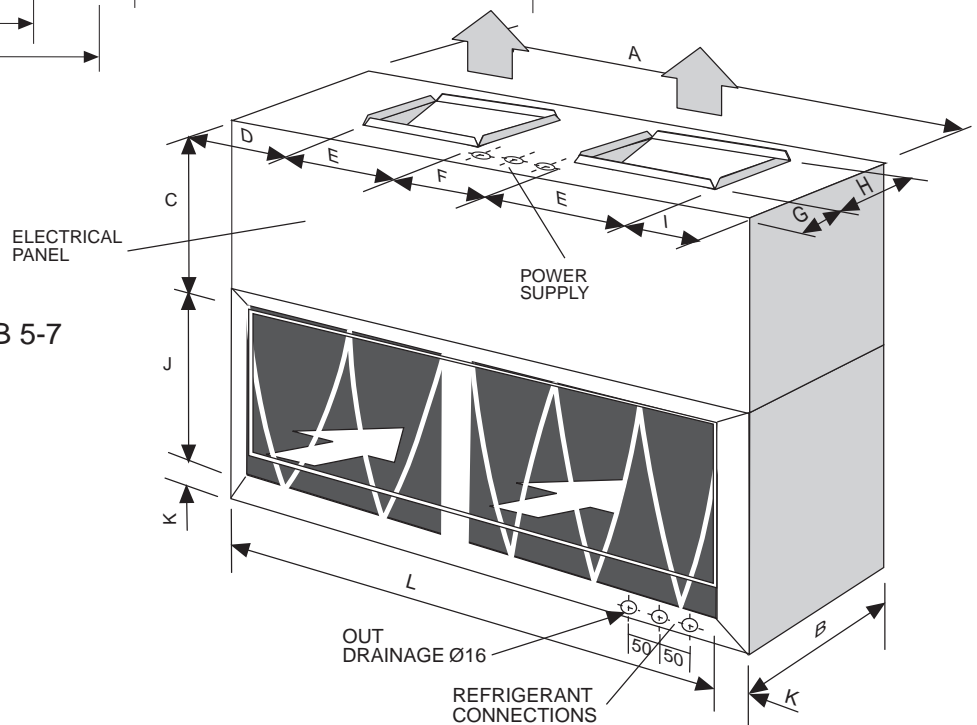


LHB 5-7

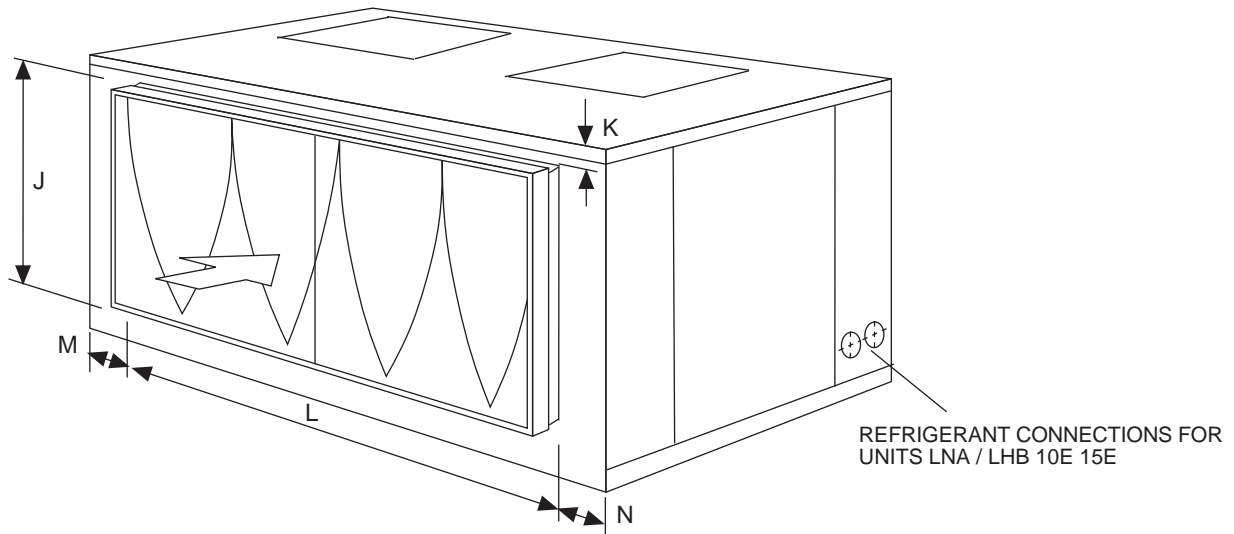
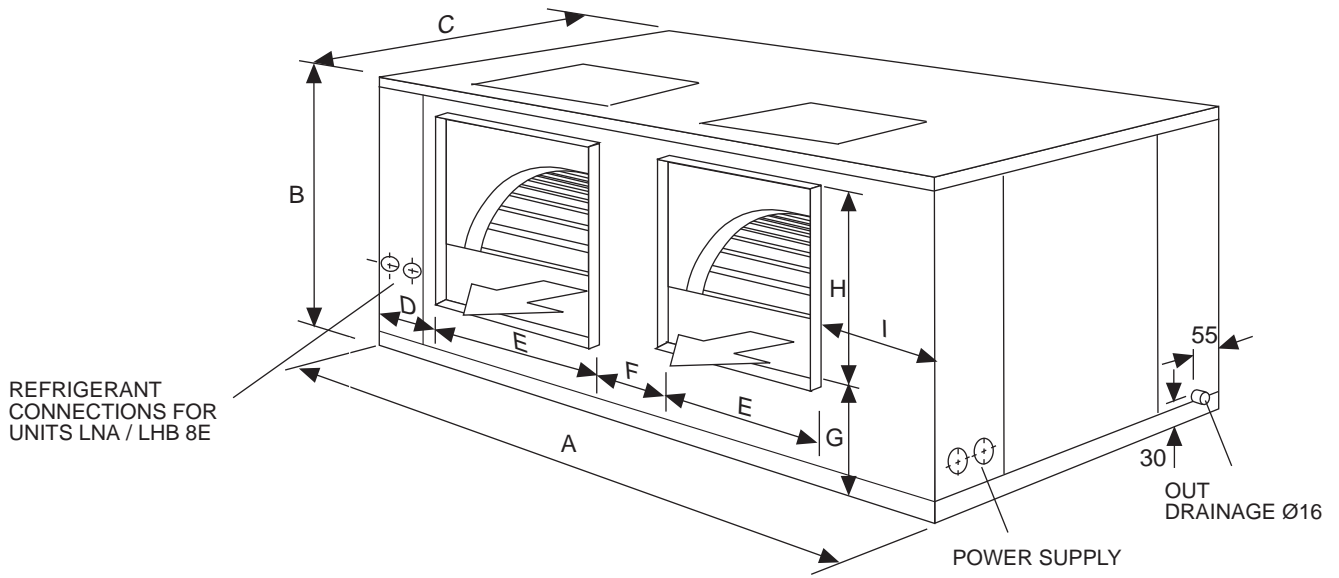
LVB 5-7



LVB 5-7



INDOOR UNIT DIMENSIONS (mm)



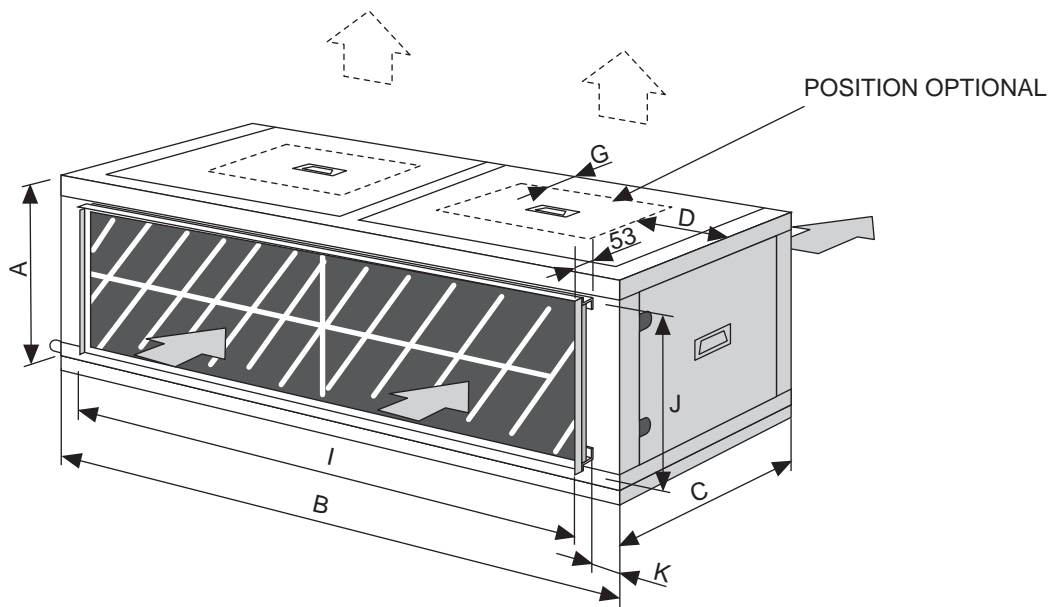
LNA - LHB 8E

| | | | |
|---|------|---|------|
| A | 1285 | H | 330 |
| B | 512 | I | 383 |
| C | 720 | J | 480 |
| D | 101 | K | 15 |
| E | 310 | L | 1082 |
| F | 170 | M | 70 |
| G | 128 | N | 134 |

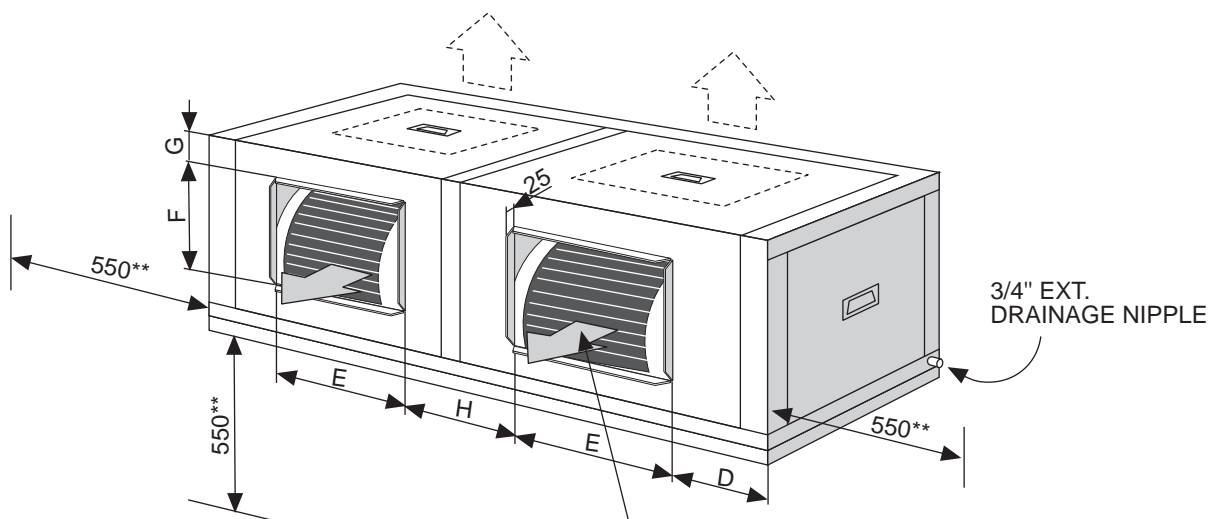
LNA - LHB 10E-15E

| | | | |
|---|------|---|------|
| A | 1555 | H | 382 |
| B | 660 | I | 462 |
| C | 805 | J | 625 |
| D | 185 | K | 112 |
| E | 350 | L | 1340 |
| F | 200 | M | 78 |
| G | 432 | N | 132 |

INDOOR UNIT DIMENSIONS (mm)



| | LFE 15DK LHX 15D | LFE 17DK-20DK LHX 17D-20D | LFE 30DK LHX 30D | LFE 35DK-40DK LHX 35D-40D |
|---|---------------------|------------------------------|---------------------|------------------------------|
| A | 590 | 640 | 640 | 665 |
| B | 1.660 | 2.250 | 2.500 | 3.140 |
| C | 650 | 750 | 750 | 750 |
| D | 365 | 692 | 691 | 872 |
| E | 334 | 313 | 398 | 398 |
| F | 290 | 343 | 344 | 343 |
| G | 169 | 192 | 192 | 191 |
| H | 261 | 240 | 321 | 600 |
| I | 1.420 | 2.010 | 2.260 | 2.825 |
| J | 550 | 600 | 600 | 565 |
| K | 120 | 120 | 120 | 115 |



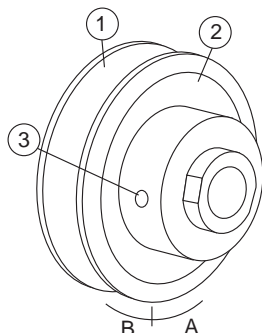
POSITION STANDARD

(**) INSTALLATION CLEARANCES

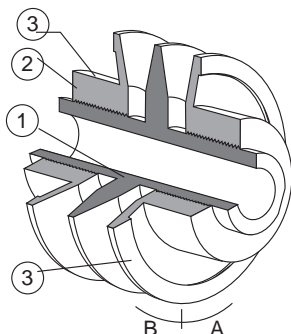
FLOW REGULATION IN THE FANS

The fan the indoors units LNA/LHB 8-10-15 and LHX 15D-17D-20D- and 30D have a variable pulley incorporated into the activating motor, by which it is possible to vary the air flow of the unit.

SIMPLE PULLEY



DOUBLE PULLEY

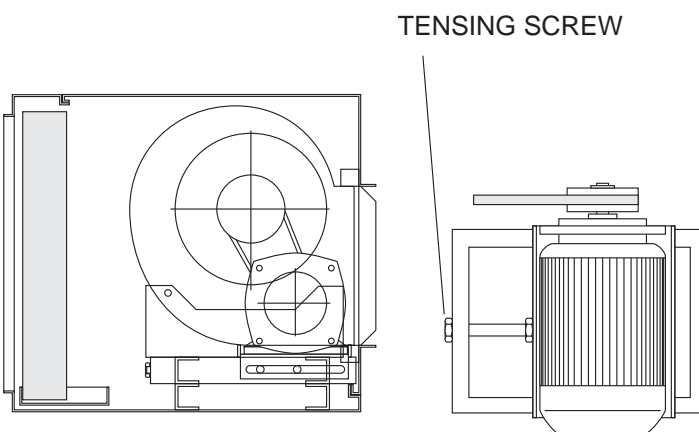


1. Fixer part.
2. Mobil part.
3. fixing screw.

To increase the fan flow, turn the mobil part in direction "B".
To reduce the flow, turn in direction "A".

TENSION OF BELTS

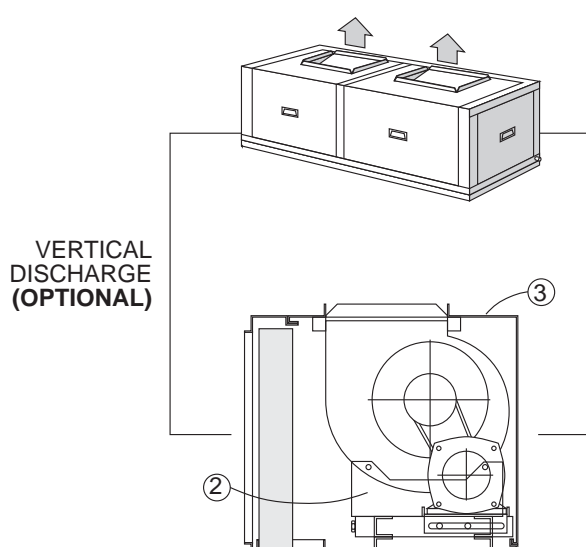
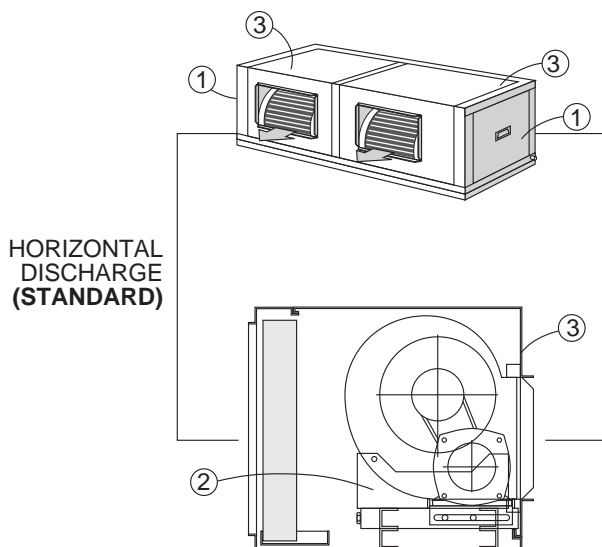
The belts can be easily tensioned through the tensing screw incorporated into the bases of the motor of the transmitting units which also enables a good servicing to be carried out.



TRANSFORMATION OF HORIZONTAL DISCHARGE TO VERTICAL

LHX 15D-17D-20D-30D / LFE 15DK-17DK-20DK-30DK

- 1 Check that unit is electrically disconnected.
- 2 Unscrew and remove side covers (1) and (3).
- 3 Loosen the transmission belts and disassemble them.
- 4 Remove the pulley from the fan axle.
- 5 Remove the dams and their supports (2).
- 6 Turn the dams until vertical discharge position is reached.
- 7 Replace the sans on the supports (2) which should not moved.
- 8 Place the pulley on the fan axle on the side which coincides with the motor: assemble the belts and ailing them.
- 9 Tense the belts correctly.
- 10 Replace the upper and lateral covers and screw them down.



OPTIONALS

CONDENSATION PRESSURE CONTROL (Heat pump units only).

The control may be ON/OFF through a pressostat or proportional.

The condensation pressure control consists of one or two pressures 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).

KIT REMOTE SIGNALS

In both unit versions through the voltage free contacts supplied on, lets you to obtain the following functions:

- To obtain the alarm signal of the units such as, fan OFF, compressor OFF...
- To know the unit function MODE; Unit running on fan, cooling or heating mode, compressor ON...

HOT GAS BYPASS VALVE

The purpose of the BYPASS valve is to make it possible for the unit to operate at low outdoor temperatures (under -10°C), to be used in cooling-only and head-pump units.

It regulates the capacity of the compressor by injecting hot gas from the compressor discharge side to the coil.

MAIN SWITCH

The main switch is located on the access panel to the electrical box of the outdoor unit.

The main switch is endowed with a clutch gadget, which allows open the panel of the electrical box, when it is on OFF position.



ATTENTION! WITH MAIN SWITCH ON. DO NOT REMOVE THE PANEL

Check to make sure that the main switch is large enough to handle the current for the unit if electric heaters are installed.

KIT FREE-COOLING (MODELS ONLY 15D-17D-20D-30D-35D-40D)

FREE-COOLING is a saving system in the Cold cycle, this makes the unit take air from the outside to take advantage of its energy, this system acting as a first cold stage.

It is a saving energy system that's why many countries regulations recommended and others put under an obligation to install a freecooling system with the unit.

The main components are:

- Electronic control and accessories: Their function is to detect the outside and indoor air conditions through the probes, to solve when freecooling should operate
- The servomotor and system transmission: They manage open and close the dampers
- Adjustable dampers.
- Mixing section: Where outside and return air are mixed.

Also an extra fan is available, which applied an additional static pressure on the suction and return air duct.

The control compares the values of temperature/enthalpy between outside air and room air through the probes, if it is a negative difference and the security elements allows (discharge temperature probes) then the control acts over the servomotor, which produces the opening of the outside damper and close the return one, entering cool outside air to the room.

The damper regulation is proportional.

If indoor air demand is not great, could be enough only the freecooling to aconditioned the room, if the air demand is greater it is possible need the freecooling working and the unit working on different cooling mode stages.

If an extra static pressure is required on the return air duct, the freecooling should add an extra fan section.

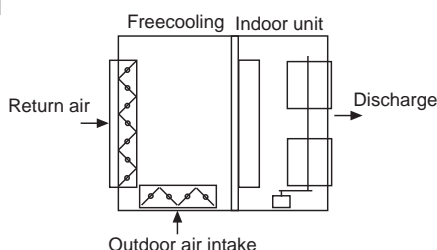
This extra fan section, include a discharge damper.

The operation dampers for this freecooling with extra fan is as follow:

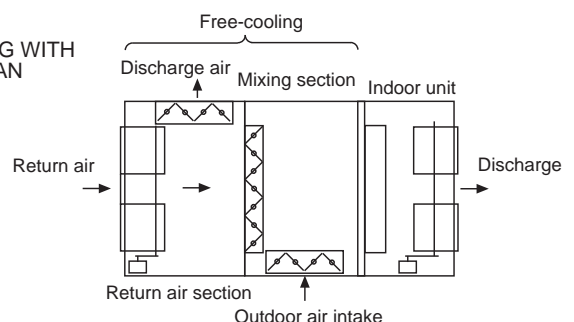
As much as the air intake damper opens, that much the by-pass damper closes and the discharge air damper opens, for the air return suction (see drawing).

This means that at the same time reach a free cooled of the room, the discharge or return air and the air of the room gets removable.

FREE-COOLING WITHOUT EXTRA FAN



FREE-COOLING WITH EXTRA FAN



OPTIONALS

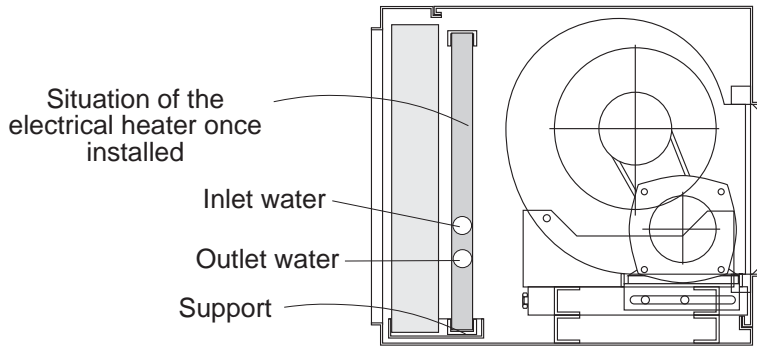
ELECTRICAL HEATER AND HOT WATER COIL UNITS LHX 15D-17D-20D-30D-35D-40D

ELECTRICAL HEATER

Made of align shielded elements, supplied mounted on the unit as drawing shows.

The electrical heater must be supply on from the unit's electrical box.

An small case on the electrical heater protects contactors and electrical connections.



| INDOOR UNIT | | COOLING ONLY | HEAT PUMP |
|-------------------|------------|----------------------------------|----------------------------------|
| MODEL 5E-7E | 400V - 3Ph | 12Kw 1 stage 15Kw 2 stages | 9Kw 1 stage |
| MODEL 8E | 400V - 3Ph | 12Kw 1 stage 15Kw 2 stages | 9Kw 1 stage |
| MODEL 10E-15E | 400V - 3Ph | 18Kw 2 stages | 12Kw 1 stage |
| MODEL 15D | 400V - 3Ph | 11,5Kw 1 stage | 17,5Kw 1 stage 11,5Kw 1 stage |
| MODEL 17D-20D-30D | 400V - 3Ph | 22,5Kw 2 stages 30Kw 2 stages | 15Kw 1 stage 20Kw 1 stage |
| MODEL 35D-40D | 400V - 3Ph | 22,5Kw 2 stages 30Kw 2 stages | 15Kw 1 stage 22,5Kw 1 stage |

HOT WATER COIL

Base on a refrigerating coil. made of copper tubing with aluminum swirl fins with inlet and outlet water connections.

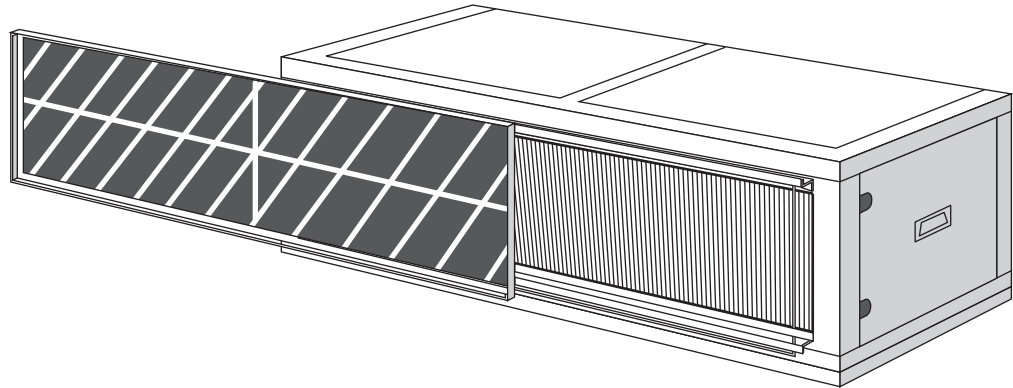
It is supply mounted inside the unit as picture shows.

| | DIFFERENCE IN TEMPERATURE BETWEEN HOT WATER INTAKE AND THE AIR WHICH ENTERS THE BATTERY | | | | WATER AIR FLOW L/H | DROP PRESSURE WATER SIDE Kpa |
|--------------|---|--------|--------|---------|--------------------------|---------------------------------------|
| | 40°C | 50°C | 60°C | 70°C | | |
| | CAPACITY IN W | | | | | |
| LNA 5-7 | 15.000 | 19.000 | 23.000 | - | 1.500 | 2 |
| LNA 8 | 20.000 | 26.000 | 32.000 | - | 2.000 | 2,5 |
| LNA 10 | 32.000 | 40.000 | 48.000 | - | 2.500 | 2,5 |
| LNA 15 | 32.000 | 40.000 | 48.000 | - | 2.500 | 2,5 |
| LHX 15D | - | 46.000 | 56.000 | 66.000 | 4.000 | 8 |
| LHX 17 D-20D | - | 66.000 | 80.000 | 94.000 | 5.000 | 10 |
| LHX 30D | - | 80.000 | 96.000 | 112.000 | 6.000 | 20 |

(*) Nominal air flow.

CONTROL USING A PROGRAMMABLE CONTROLLER:

With the programmable controller option, the desired temperature can be programmed in the area 24 hours a day, 7 days a week.



AIR FILTER CLEANING

The air filter can be removed for cleaning through the side by sliding it over the rail or down. (See figure).

ACCESS TO INSIDE COMPONENTS

The whole unit will be accessed, without disassembling the ducts, through the cover located at one side of the unit, this allows:

- To carry out an inspection, checking or replacing any internal component of the unit.
- Cleaning the coil and drip tray.

POINTS TO KEEP IN MIND



Abrasive surfaces



Low temperatures



High temperatures



Risk of injury with moving objects



Electrical voltage



Risk of injury with rotating objects

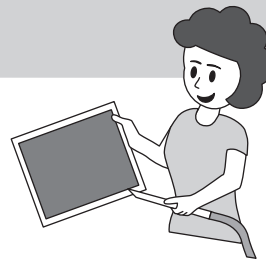
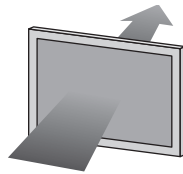
WARNING

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

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

FILTER CLEANING

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



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

Standard Guidelines to Lennox equipment

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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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