Airwell

# Service Manual

## K DCI Inverter series

| Indoor Units | Outdoor Units |
|---|---|
| K 9 DCI INV | GC9 DCI INV |
| K 12 DCI INV | GC12 DCI INV |
| | |
| K 18 DCI INV | GC18 DCI INV |

| REFRIGERANT | |
|---|---|
| R410A | HEAT PUMP |

TM KDCI-A-1-GB DECEMBER 2004

## LIST OF EFFECTIVE PAGES

**Note:** Changes in the pages are indicated by a “Revision#” in the footer of each effected page (when none indicates no changes in the relevant page). All pages in the following list represent effected/ non effected pages divided by chapters.

Dates of issue for original and changed pages are:

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# 1. INTRODUCTION

## 1.1 General

The new **K DCI INVERTERS** split Cassette range comprise the following RC (heat pump) models:

- **K 9 DCI INV**
- **K 12 DCI INV**
- **K 18 DCI INV**

The New DCI K units can be easily fitted to residential and commercial applications featuring esthetic design, compact dimensions, and low noise operation.

## 1.2 Main Features

The K DCI INV series benefits from the most advanced innovations, namely:

- DC Inverter technology
- R410A
- High COP (level A)
- Lego Concept
- Pre-Charged units up to the max' allowing tubing distance
- Networking system connectivity
- Base heater connection
- Cooling operation at outdoor temperature down to -10ºC
- Heating operation at outdoor temperature down to -15ºC
- Bended indoor coil with treated aluminum fins and coating for improved efficiency.
- Easy access to the interconnecting tubing and wiring connections.
- Automatic treated air sweep.
- Low indoor and outdoor noise levels.
- Easy installation and service.

## 1.3 Filtration

The K DCI INV series presents several types of air filters:

- Easily accessible, and re-usable pre-filters (mesh)
- Pre-charged electrostatic filter (disposable)
- Active carbon filter (disposable)

## 1.4 Control

The microprocessor indoor and outdoor controllers, and an infrared remote control, supplied as standard, provide complete operating function and programming.
Remote controllers: RC-2/3/4/5/7, RCW, µBMS
Networking system AircoNet version 4.2 and up, MIU SW version H8 and up
For further details please refer to the Operation Manual.

## 1.5 Outdoor Unit

The K DCI INV outdoor units can be installed as floor or wall mounted units by using a wall supporting bracket. The metal sheets are protected by anti- corrosion paint work allowing long life resistance. All outdoor units are pre-charged. For further information please refer to the Product Data Sheet, Chapter 2.

• GC 9 DCI

• GC 12 DCI

• GC 18

**Outdoor Unit Features**:

| **Features** | **GC 9,12, 18, DCI** |
|---|---|
| Display | 3 LED's |
| Base Heater | Optional |
| Outdoor Fan | Variable Speed DC Inverter |
| M2L cable Port | No |

## 1.6 Tubing Connections

Flare type interconnecting tubing to be produced on site.
For further details please refer to the Installation Manual.

## 1.7 Accessories

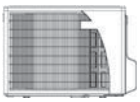
- MIU (K) MODBUS Interface Unit
- Base heater
- M2L cable

## 1.8 Inbox Documentation

Each unit is supplied with its own installation and operation manuals.

## 1.9 Matching Table

### 1.9.1 R410A

| OUTDOOR UNITS | | | INDOOR UNITS | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | |  | |  | | | |
| | MODEL | REF. | FLO9DCI | FLO12 DCI | K9 DCI | K12 DCI | K18 DC | |
|  | GC 9 DCI | R410A | √ | | √ | | | |
| | GC 12 DCI | R410A | | √ | | √ | | |
| | GC 18 DCI | R410A | | | | | √ | |

The above table lists outdoor units and K indoor units which can be matched together. In addition the listed outdoor units can be matched with other types of indoor units such as wall mounted,

# 2. PRODUCT DATA SHEET

## 2.1 K9 DCI

| | | | | | | |
|---|---|---|---|---|---|---|
| Model Indoor Unit | | | | **K9 DCI** | | |
| Model Outdoor Unit | | | | **GC9 DCI** | | |
| Installation Method | | | | Flare | | |
| **Characteristics** | | | **Units** | **Cooling** | **Heating** | |
| Capacity[1] | | | Btu/hr | 8530 (5120-12970) | 11600 (5120-17060) | |
| | | | W | 2500 (1500 - 3800) | 3400 (1500 - 5000) | |
| Power Input[1] | | | W | 590 (420-1000) | 915 (400-1500) | |
| COP[1] | | | W/W | 4.24 | 3.72 | |
| Energy Efficiency Class | | | | A | A | |
| Power Supply | | | V/Ph/Hz | 220-240V / 1Ph / 50Hz | | |
| Rated Current | | | A | 2.7 | 4.2 | |
| Starting Current | | | A | *10.50* | | |
| Circuit Breaker Rating | | | A | 16 | | |
| INDOOR | Fan Type & Quantity | | | Centrifugal*1 | | |
| | Airflow[2] | H/M/L | $m^3/hr$ | 570-500-435 | 600-530-450 | |
| | External Static Pressure | Min-Max | Pa | N/A | | |
| | Sound Power Level[3] | H/L | dB (A) | 42-48 | 42-47 | |
| | Sound Pressure Level[4] | H/L | dB (A) | 32-38 | 32-37 | |
| | Moisture Removal | | L/hr | 1.0 | | |
| | Condensate Drain Tube I.D. | | mm | 16 | | |
| | Dimensions | W/H/D | mm | 571 | 287 | 571 |
| | Weight | | kg | 22.7 | | |
| | Package Dimensions | W/H/D | mm | 685 | 415 | 685 |
| | Units per Pallet | | Units | 10 | | |
| | Stacking Height | | Units | 5 | | |
| OUTDOOR | Refrigerant Control | | | Electronic Expansion Valve | | |
| | Compressor Type, Model | | | Single Rotary DC Inverter Panasonic 5RS102XAB | | |
| | Fan Type & Quantity | | | Axial *1 | | |
| | Airflow | H | $m^3/hr$ | 1780 | | |
| | Sound Power Level | H | dB (A) | 60 | 61 | |
| | Sound Pressure Level[4] | H | dB (A) | 50 | 51 | |
| | Dimensions | W/H/D | mm | 795 | 610 | 290 |
| | Weight | | kg | 38 | | |
| | Package Dimensions | W/H/D | mm | 945 | 655 | 395 |
| | Units per Pallet | | Units | 9 | | |
| | Stacking Height | | Units | 3 | | |
| | Refrigerant Type | | | R410A | | |
| | Refrigerant Chargeless Distance | | g | 1100 | | |
| | Additional Charge Per 1 Meter | | g/m | No Need | | |
| | Connections Between Units | Liquid Line | (mm)In | (6.35) ¼" | | |
| | | Suction Line | (mm)In | (9.53) ⅜" | | |
| | | Max. Tubing Length | m | 20 | | |
| | | Max. Height Difference | m | 10 | | |
| Operation Control Type | | | | IR Remote Control | | |

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

## 2.2 K12 DCI

| | | | | | | |
|---|---|---|---|---|---|---|
| Model Indoor Unit | | | | **K12 DCI** | | |
| Model Outdoor Unit | | | | **GC12 DCI** | | |
| Installation Method | | | | Flare | | |
| **Characteristics** | | | **Units** | **Cooling** | **Heating** | |
| Capacity[1] | | | Btu/hr | 11940 (5100 - 14960) | 14620 (5100 - 18700) | |
| | | | W | 3500 (1500 - 4400) | 4300 (1500 - 5500) | |
| Power Input[1] | | | W | 950 (420-1250) | 1330 (400-1850) | |
| COP[1] | | | W/W | 3.68 | 3.23 | |
| Energy Efficiency Class | | | | A | A | |
| Power Supply | | | V/Ph/Hz | 220-240V / 1Ph / 50Hz | | |
| Rated Current | | | A | 4.1 | 5.6 | |
| Starting Current | | | A | 10.50 | | |
| Circuit Breaker Rating | | | A | 16 | | |
| INDOOR | Fan Type & Quantity | | | Centrifugal*1 | | |
| | Airflow[2] | H/M/L | $m^3$/hr | 580-510-435 | 620-560-450 | |
| | External Static Pressure | Min-Max | Pa | N/A | | |
| | Sound Power Level[3] | H/L | dB (A) | 42-48 | 42-47 | |
| | Sound Pressure Level [4] | H/L | dB (A) | 32-38 | 32-37 | |
| | Moisture Removal | | L/hr | 1.5 | | |
| | Condensate Drain Tube I.D. | | mm | 16 | | |
| | Dimensions | W/H/D | mm | 571 | 287 | 571 |
| | Weight | | kg | 24.4 | | |
| | Package Dimensions | W/H/D | mm | 685 | 415 | 685 |
| | Units per Pallet | | Units | 10 | | |
| | Stacking Height | | Units | 5 | | |
| OUTDOOR | Refrigerant Control | | | Electronic Expansion Valve | | |
| | Compressor Type, Model | | | Single Rotary DC Inverter Panasonic 5RS102XAB | | |
| | Fan Type & Quantity | | | Axial *1 | | |
| | Airflow | H | $m^3$/hr | 1780 | | |
| | Sound Power Level | H | dB (A) | 62 | 62 | |
| | Sound Pressure Level [4] | H | dB (A) | 52 | 52 | |
| | Dimensions | W/H/D | mm | 795 | 610 | 290 |
| | Weight | | kg | 38 | | |
| | Package Dimensions | W/H/D | mm | 945 | 655 | 395 |
| | Units per Pallet | | Units | 9 | | |
| | Stacking Height | | Units | 3 | | |
| | Refrigerant Type | | | R410A | | |
| | Refrigerant Chargeless Distance | | g | 1200 | | |
| | Additional Charge Per 1 Meter | | g/m | No Need | | |
| | Connections Between Units | Liquid Line | (mm)In | (6.35) 1/4" | | |
| | | Suction Line | (mm)In | (9.53) 3/8" | | |
| | | Max. Tubing Length | m | 20 | | |
| | | Max. Height Difference | m | 10 | | |
| Operation Control Type | | | | IR Remote Control | | |

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

## 2.4 K18 DCI

| | | | | | | |
|---|---|---|---|---|---|---|
| Model Indoor Unit | | | | **K18 DCI** | | |
| Model Outdoor Unit | | | | **GC18 DCI** | | |
| Installation Method | | | | Flare | | |
| **Characteristics** | | | **Units** | **Cooling** | | **Heating** |
| Capacity[1] | | | Btu/hr | 17060 (4610 – 21840) | | 21500 (4610 - 25590) |
| | | | W | 5000 (1350 – 6400) | | 6300 (1350 – 7500) |
| Power Input[1] | | | W | 1550 (530 – 2000) | | 1740 (350 – 2080) |
| COP[1] | | | W/W | 3.23 | | 3.62 |
| Energy Efficiency Class | | | | A | | A |
| Power Supply | | | V/Ph/Hz | 220-240V / 1Ph / 50Hz | | |
| Rated Current | | | A | 7.1 | | 8.0 |
| Starting Current | | | A | *10.50* | | |
| Circuit Breaker Rating | | | A | 16 | | |
| INDOOR | Fan Type & Quantity | | | Centrifugal*1 | | |
| | Airflow[2] | H/M/L | $m^3$/hr | 730-630-510 | | |
| | External Static Pressure | Min-Max | Pa | N/A | | |
| | Sound Power Level[3] | H/M/L | dB (A) | 46 – 55 - 59 | | |
| | Sound Pressure Level [4] | H/M/L | dB (A) | 36 – 44 - 48.5 | | |
| | Moisture Removal | | L/hr | 2 | | |
| | Condensate Drain Tube I.D. | | mm | 16 | | |
| | Dimensions | W/H/D | mm | 571 | 287 | 571 |
| | Weight | | kg | 28 | | |
| | Package Dimensions | W/H/D | mm | 685 | 415 | 685 |
| | Units per Pallet | | Units | 10 | | |
| | Stacking Height | | Units | 5 | | |
| OUTDOOR | Refrigerant Control | | | Electronic Expansion Valve | | |
| | Compressor Type, Model | | | SCROLL Panasonic 5CS130XCC03 | | |
| | Fan Type & Quantity | | | Axial *1 | | |
| | Airflow | H | $m^3$/hr | 2160 | | |
| | Sound Power Level | H | dB (A) | 62 | | 63 |
| | Sound Pressure Level [4] | H | dB (A) | 52 | | 53 |
| | Dimensions | W/H/D | mm | 795 | 610 | 290 |
| | Weight | | kg | 43 | | |
| | Package Dimensions | W/H/D | mm | 945 | 655 | 395 |
| | Units per Pallet | | Units | 9 | | |
| | Stacking Height | | Units | 3 | | |
| | Refrigerant Type | | | R410A | | |
| | Refrigerant Chargeless Distance | | g | 1500 | | |
| | Additional Charge Per 1 Meter | | g/m | No Need | | |
| | Connections Between Units | Liquid Line | (mm)In | (6.35) ¼" | | |
| | | Suction Line | (mm)In | (12.7) ½" | | |
| | | Max. Tubing Length | m | 30 | | |
| | | Max. Height Difference | m | 10 | | |
| Operation Control Type | | | | IR Remote Control | | |

(1) Rating conditions in accordance with ISO 5151 and ISO 13253 (for ducted units) and EN14511.
(2) Airflow in ducted units; at nominal external static pressure.
(3) Sound power in ducted units is measured at air discharge.
(4) Sound pressure level measured at 1 meter distance from unit.

# 3. RATING CONDITIONS

Standard conditions in accordance with ISO 5151, ISO 13253 (for ducted units) and EN 14511.

**Cooling:**
Indoor: 27°C DB 19°C WB
Outdoor: 35 °C DB

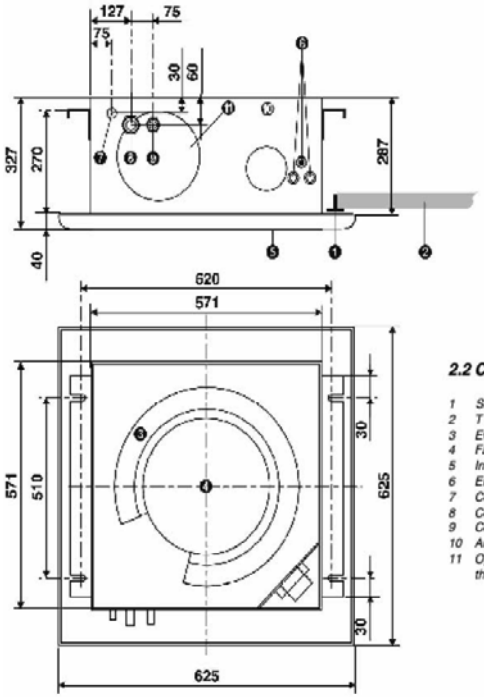
**Heating:**
Indoor: 20°C DB
Outdoor: 7°C DB 6°C WB

## 3.1 Operating Limits

| | | Indoor | Outdoor |
|---|---|---|---|
| **Cooling** | Upper limit | 32°C DB 23°C WB | 46°C DB |
| | Lower limit | 21°C DB 15°C WB | -10°C DB |
| **Heating** | Upper limit | 27°C DB | 24°C DB 18°C WB |
| | Lower limit | 10°C DB | -15°C DB -16°C WB |
| **Voltage** | 1PH | 198 – 264 V | |
| | 3PH | N/A | |

# 4. OUTLINE DIMENSIONS

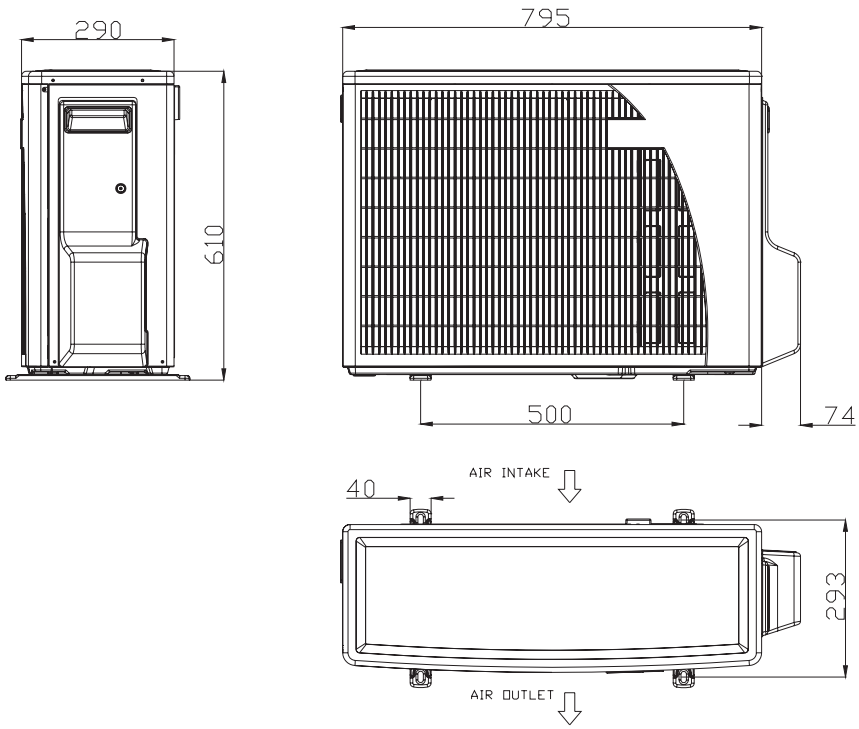
## 4.1 Indoor Unit: K 9, 12, 18 DCI




**2.2 CASSETTE DIMENSIONS**

1 Suspended ceiling
2 T bar (suspended ceiling)
3 Evaporator
4 Fan
5 Intake grille
6 Electrical connection
7 Condensate evacuation Ø 15
8 Connection GAS
9 Connection LIQUID
10 Air inlet
11 Opening for ducted air distribution into the adjacent room (ready to punch out)

## 4.2 Outdoor Unit: GC 9, 12, 18 DCI



# 5. PERFORMANCE DATA

## 5.1 K9 DCI

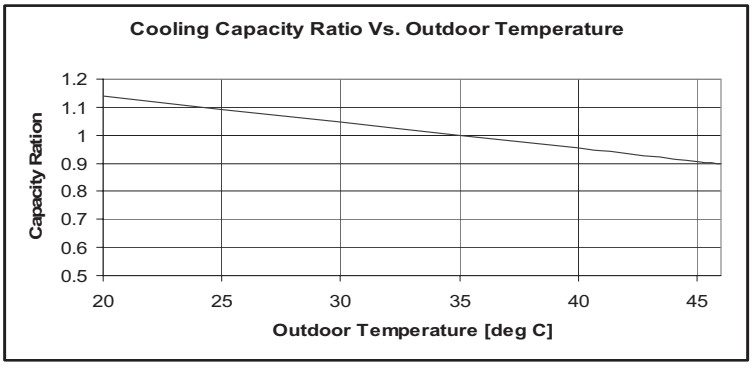
### 5.1.1 Cooling Capacity (kW) - Run Mode

| OD COIL ENTERING AIR DB TEMPERATURE [C⁰] | DATA | ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC] | | | | |
|---|---|---|---|---|---|---|
| | | 22/15 | 24/17 | 27/19 | 29/21 | 32/23 |
| -10 - 20 (protection range) | TC | 80 - 110 % of nominal | | | | |
| | SC | 80 - 105 % of nominal | | | | |
| | PI | 25 - 50 % of nominal | | | | |
| 25 | TC | 2.42 | 2.57 | 2.73 | 2.89 | 3.05 |
| | SC | 2.09 | 2.13 | 2.18 | 2.22 | 2.26 |
| | PI | 0.46 | 0.47 | 0.48 | 0.49 | 0.50 |
| 30 | TC | 2.30 | 2.46 | 2.62 | 2.77 | 2.93 |
| | SC | 2.04 | 2.08 | 2.12 | 2.17 | 2.21 |
| | PI | 0.52 | 0.53 | 0.54 | 0.54 | 0.55 |
| 35 | TC | 2.18 | 2.34 | **2.50** | 2.66 | 2.82 |
| | SC | 1.98 | 2.03 | **2.07** | 2.11 | 2.16 |
| | PI | 0.57 | 0.58 | **0.59** | 0.60 | 0.61 |
| 40 | TC | 2.07 | 2.23 | 2.38 | 2.54 | 2.70 |
| | SC | 1.93 | 1.97 | 2.02 | 2.06 | 2.10 |
| | PI | 0.63 | 0.64 | 0.64 | 0.65 | 0.66 |
| 46 | TC | 1.93 | 2.09 | 2.24 | 2.40 | 2.56 |
| | SC | 1.87 | 1.91 | 1.95 | 2.00 | 2.04 |
| | PI | 0.69 | 0.70 | 0.71 | 0.72 | 0.73 |

**LEGEND**

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

### 5.1.2 Capacity Correction Factors



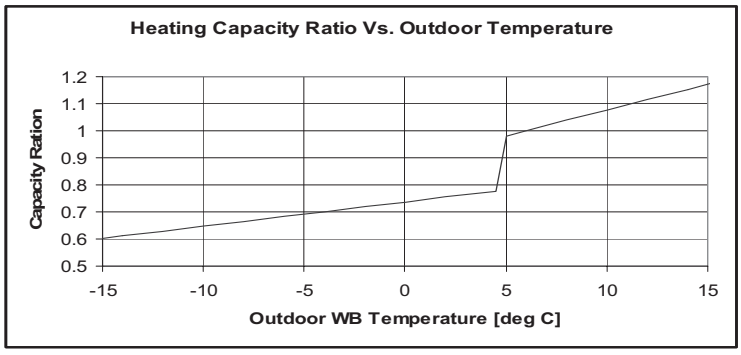
### 5.1.3 Heating Capacity (kW) - Run Mode

| | | ID COIL ENTERING AIR DB TEMPERATURE [ºC] | | |
|---|---|---|---|---|
| **OD COIL ENTERING AIR DB/ WB TEMPERATURE [ºC]** | **DATA** | **15** | **20** | **25** |
| **-15/-16** | TC | 2.16 | 2.01 | 1.86 |
| | PI | 0.55 | 0.60 | 0.66 |
| **-10/-12** | TC | 2.41 | 2.26 | 2.11 |
| | PI | 0.66 | 0.72 | 0.77 |
| **-7/-8** | TC | 2.59 | 2.44 | 2.29 |
| | PI | 0.75 | 0.80 | 0.86 |
| **-1/-2** | TC | 2.68 | 2.53 | 2.38 |
| | PI | 0.79 | 0.84 | 0.90 |
| **2/1** | TC | 2.75 | 2.59 | 2.44 |
| | PI | 0.82 | 0.87 | 0.93 |
| **7/6** | TC | 3.55 | **3.40** | 3.25 |
| | PI | 0.86 | **0.92** | 0.97 |
| **10/9** | TC | 3.75 | 3.60 | 3.44 |
| | PI | 0.91 | 0.97 | 1.02 |
| **15/12** | TC | 3.94 | 3.79 | 3.64 |
| | PI | 0.96 | 1.02 | 1.07 |
| **15-24 (Protection Range)** | TC | 85 - 105 % of nominal | | |
| | PI | 80 - 120 % of nominal | | |

**LEGEND**

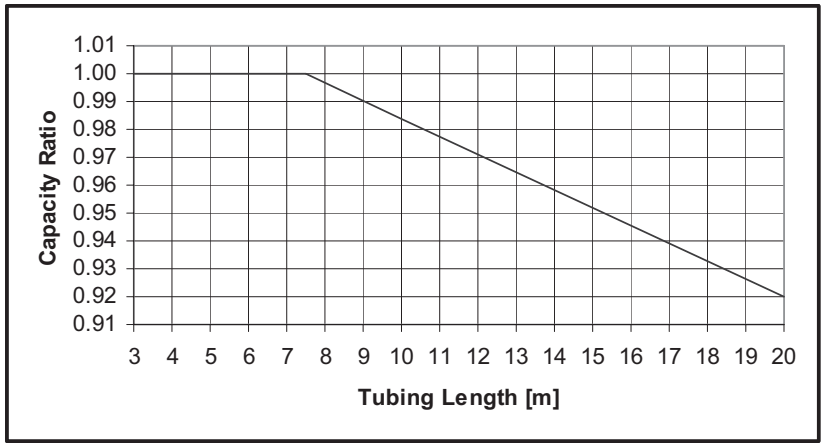
TC – Total Cooling Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (°C)
DB – Dry Bulb Temp., (°C)
ID – Indoor
OD – Outdoor

### 5.1.4 Capacity Correction Factors

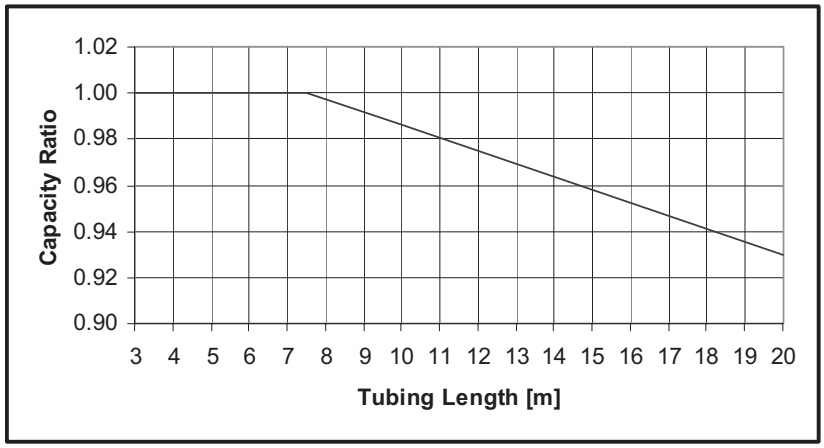


## 5.2 Capacity Correction Factor Due to Tubing Length

### 5.2.1 Cooling




### 5.2.2 Heating



## 5.3 K12 DCI

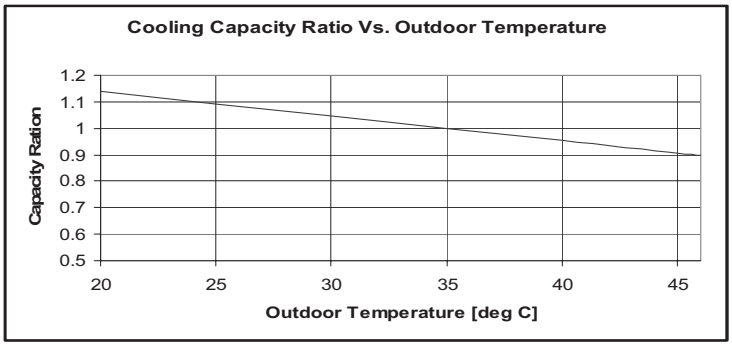
### 5.3.1 Cooling Capacity (kW) - Run Mode

| OD COIL ENTERING AIR DB TEMPERATURE [ºC] | DATA | ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC] | | | | |
|---|---|---|---|---|---|---|
| | | 22/15 | 24/17 | 27/19 | 29/21 | 32/23 |
| -10 - 20 (protection range) | TC | 80 - 110 % of nominal | | | | |
| | SC | 80 - 105 % of nominal | | | | |
| | PI | 25 - 50 % of nominal | | | | |
| 25 | TC | 3.38 | 3.60 | 3.83 | 4.05 | 4.27 |
| | SC | 2.65 | 2.70 | 2.75 | 2.81 | 2.86 |
| | PI | 0.75 | 0.76 | 0.78 | 0.79 | 0.80 |
| 30 | TC | 3.22 | 3.44 | 3.66 | 3.88 | 4.11 |
| | SC | 2.58 | 2.63 | 2.69 | 2.74 | 2.79 |
| | PI | 0.83 | 0.85 | 0.86 | 0.88 | 0.89 |
| 35 | TC | 3.06 | 3.28 | **3.50** | 3.72 | 3.94 |
| | SC | 2.51 | 2.57 | **2.62** | 2.67 | 2.73 |
| | PI | 0.92 | 0.94 | **0.95** | 0.96 | 0.98 |
| 40 | TC | 2.89 | 3.12 | 3.34 | 3.56 | 3.78 |
| | SC | 2.45 | 2.50 | 2.55 | 2.61 | 2.66 |
| | PI | 1.01 | 1.02 | 1.04 | 1.05 | 1.07 |
| 46 | TC | 2.70 | 2.92 | 3.14 | 3.36 | 3.58 |
| | SC | 2.37 | 2.42 | 2.47 | 2.53 | 2.58 |
| | PI | 1.11 | 1.13 | 1.14 | 1.16 | 1.17 |

**LEGEND**

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (ºC)
DB – Dry Bulb Temp., (ºC)
ID – Indoor

### 5.3.2 Capacity Correction Factors



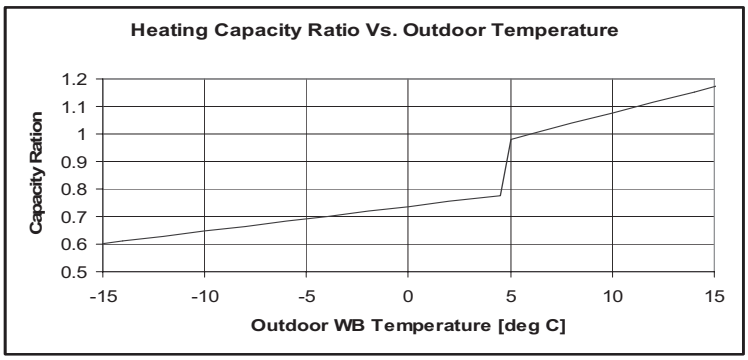
### 5.3.3 Heating Capacity (kW) - Run Mode

| OD COIL ENTERING AIR DB/ WB TEMPERATURE [ºC] | DATA | ID COIL ENTERING AIR DB TEMPERATURE [ºC] | | |
|---|---|---|---|---|
| | | 15 | 20 | 25 |
| -15/-16 | TC | 2.74 | 2.55 | 2.35 |
| | PI | 0.80 | 0.88 | 0.96 |
| -10/-12 | TC | 3.05 | 2.86 | 2.66 |
| | PI | 0.96 | 1.04 | 1.12 |
| -7/-8 | TC | 3.28 | 3.09 | 2.90 |
| | PI | 1.09 | 1.17 | 1.25 |
| -1/-2 | TC | 3.39 | 3.20 | 3.01 |
| | PI | 1.15 | 1.23 | 1.31 |
| 2/1 | TC | 3.47 | 3.28 | 3.09 |
| | PI | 1.19 | 1.27 | 1.35 |
| 7/6 | TC | 4.49 | **4.30** | 4.11 |
| | PI | 1.25 | **1.33** | 1.41 |
| 10/9 | TC | 4.74 | 4.55 | 4.36 |
| | PI | 1.32 | 1.40 | 1.49 |
| 15/12 | TC | 4.99 | 4.80 | 4.60 |
| | PI | 1.40 | 1.48 | 1.56 |
| 15-24 (Protection Range) | TC | 85 - 105 % of nominal | | |
| | PI | 80 - 120 % of nominal | | |

**LEGEND**

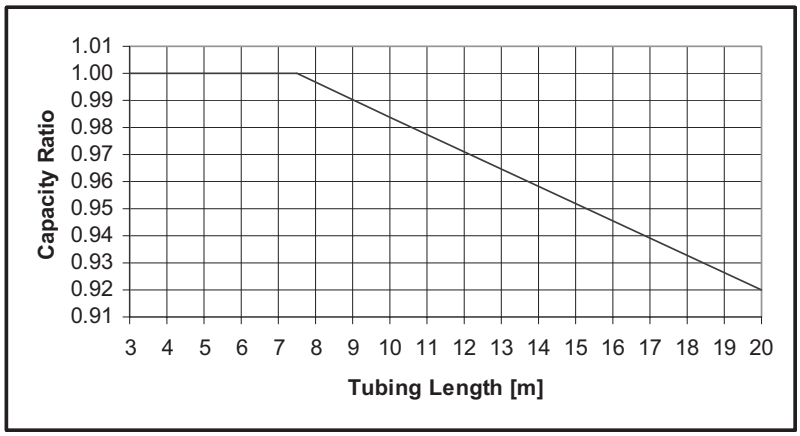
TC – Total Cooling Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (ºC)
DB – Dry Bulb Temp., (ºC)
ID – Indoor
OD – Outdoor

### 5.3.4 Capacity Correction Factors

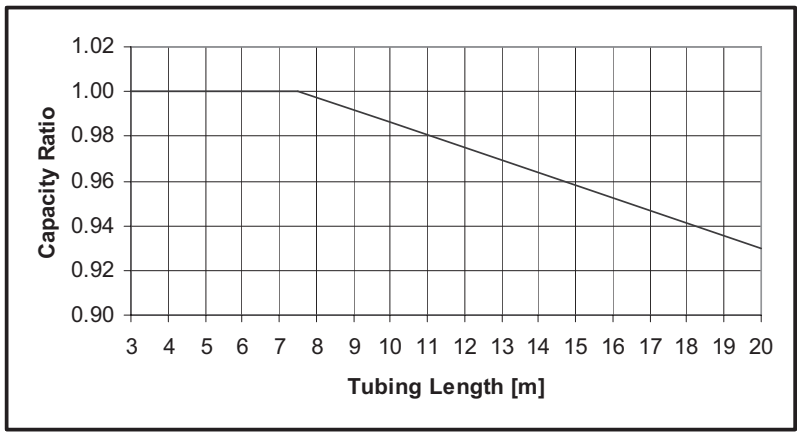


## 5.4 Capacity Correction Factor Due to Tubing Length

### 5.4.1 Cooling




### 5.4.2 Heating



# 5.7 K18 DCI

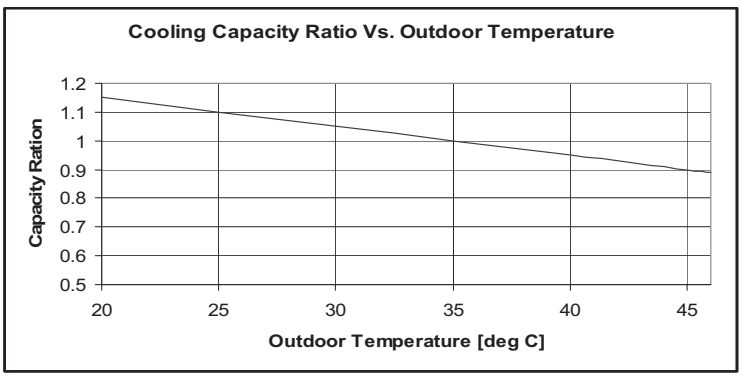
## 5.7.1 Cooling Capacity (kW) - Run Mode

| OD COIL ENTERING AIR DB TEMPERATURE [ºC] | DATA | ID COIL ENTERING AIR DB/WB TEMPERATURE [ºC] 22/15 | 24/17 | 27/19 | 29/21 | 32/23 |
|---|---|---|---|---|---|---|
| **-10 - 20 (protection range)** | TC | 80 - 110 % of nominal | | | | |
| | SC | 80 - 105 % of nominal | | | | |
| | PI | 25 - 50 % of nominal | | | | |
| **25** | TC | 4.85 | 5.13 | 5.42 | 5.70 | 5.99 |
| | SC | 3.30 | 3.35 | 3.40 | 3.45 | 3.50 |
| | PI | 1.20 | 1.23 | 1.26 | 1.28 | 1.31 |
| **30** | TC | 4.60 | 4.88 | 5.17 | 5.45 | 5.74 |
| | SC | 3.17 | 3.22 | 3.27 | 3.32 | 3.37 |
| | PI | 1.37 | 1.40 | 1.42 | 1.45 | 1.48 |
| **35** | TC | 4.35 | 4.63 | **4.92** | 5.20 | 5.49 |
| | SC | 3.04 | 3.09 | **3.14** | 3.19 | 3.24 |
| | PI | 1.54 | 1.56 | **1.59** | 1.62 | 1.64 |
| **40** | TC | 4.10 | 4.39 | 4.67 | 4.96 | 5.24 |
| | SC | 2.91 | 2.96 | 3.01 | 3.06 | 3.11 |
| | PI | 1.70 | 1.73 | 1.76 | 1.78 | 1.81 |
| **46** | TC | 3.80 | 4.09 | 4.37 | 4.66 | 4.94 |
| | SC | 2.76 | 2.81 | 2.86 | 2.91 | 2.95 |
| | PI | 1.90 | 1.93 | 1.96 | 1.98 | 2.01 |

**LEGEND**

TC – Total Cooling Capacity, kW
SC – Sensible Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (ºC)
DB – Dry Bulb Temp., (ºC)
ID – Indoor
OD – Outdoor

## 5.7.2 Capacity Correction Factors



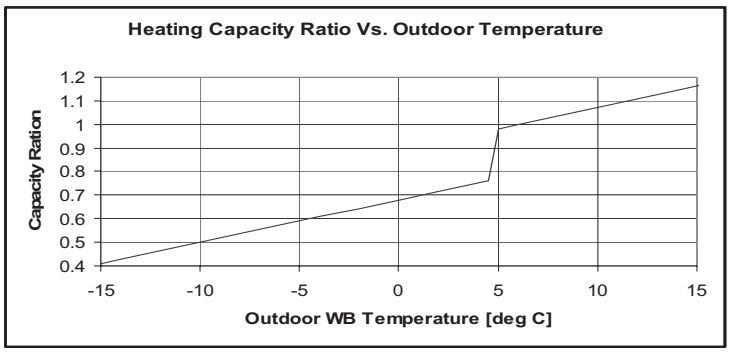
### 5.7.3 Heating Capacity (kW) - Run Mode

| OD COIL ENTERING AIR DB/WB TEMPERATURE [ºC] | DATA | ID COIL ENTERING AIR DB TEMPERATURE [ºC] | | |
|---|---|---|---|---|
| | | 15 | 20 | 25 |
| -15/-16 | TC | 2.66 | 2.28 | 1.90 |
| | PI | 1.15 | 1.23 | 1.31 |
| -10/-12 | TC | 3.52 | 3.13 | 2.75 |
| | PI | 1.30 | 1.38 | 1.46 |
| -7/-8 | TC | 4.16 | 3.77 | 3.39 |
| | PI | 1.41 | 1.49 | 1.57 |
| -1/-2 | TC | 4.47 | 4.09 | 3.71 |
| | PI | 1.46 | 1.55 | 1.63 |
| 2/1 | TC | 4.69 | 4.30 | 3.92 |
| | PI | 1.50 | 1.58 | 1.66 |
| 7/6 | TC | 6.24 | **5.85** | 5.47 |
| | PI | 1.56 | **1.64** | 1.72 |
| 10/9 | TC | 6.56 | 6.18 | 5.79 |
| | PI | 1.59 | 1.67 | 1.75 |
| 15/12 | TC | 6.88 | 6.50 | 6.12 |
| | PI | 1.62 | 1.70 | 1.78 |
| 15-24 (Protection Range) | TC | 85 - 105 % of nominal | | |
| | PI | 80 - 120 % of nominal | | |

**LEGEND**

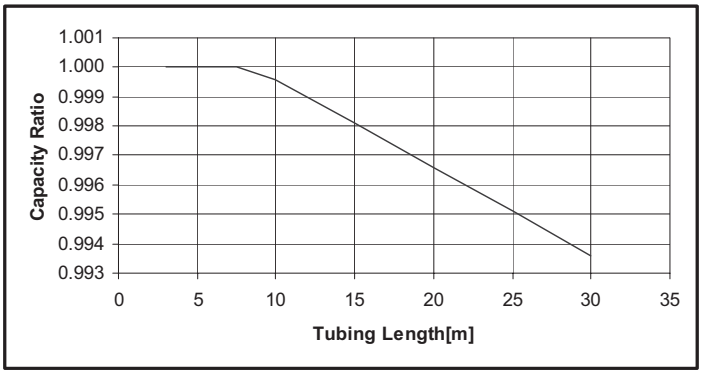
TC – Total Cooling Capacity, kW
PI – Power Input, kW
WB – Wet Bulb Temp., (ºC)
DB – Dry Bulb Temp., (ºC)
ID – Indoor
OD – Outdoor

### 5.7.4 Capacity Correction Factors

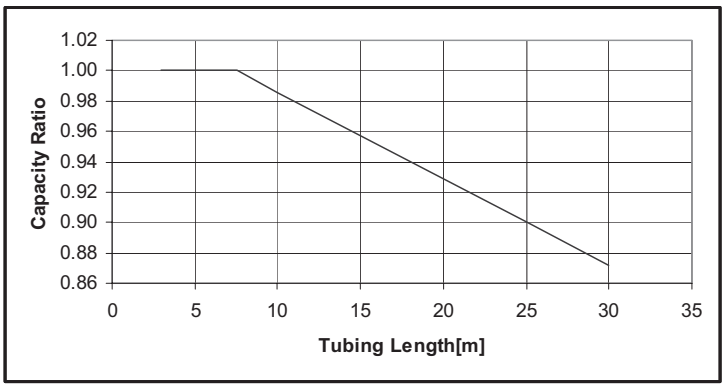


# 5.8 Capacity Correction Factor Due to Tubing Length

## 5.8.1 Cooling



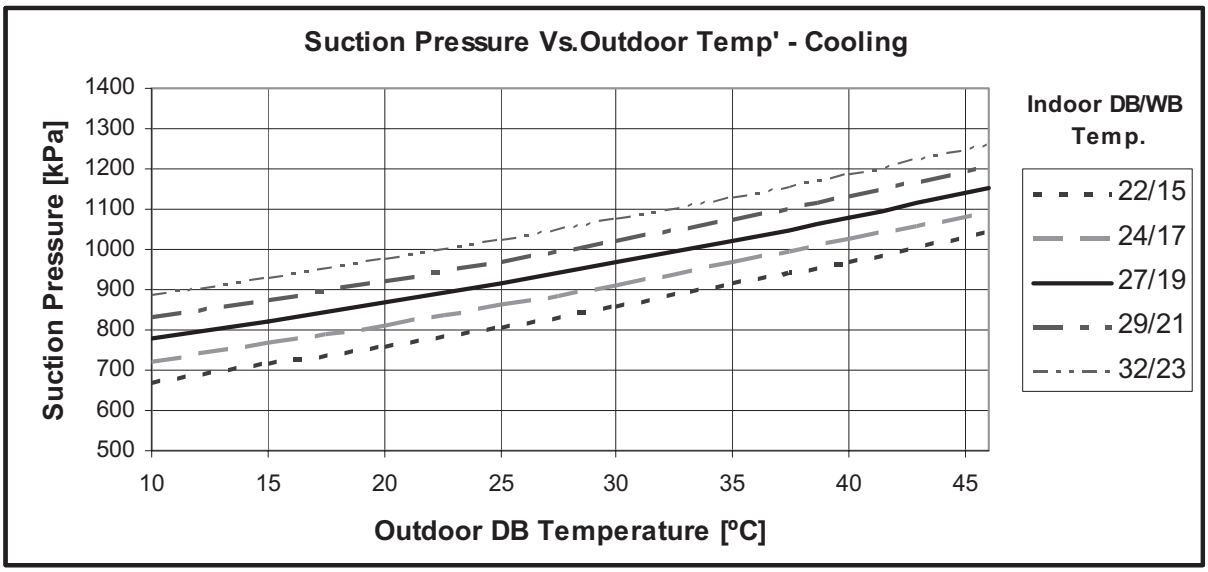

## 5.8.2 Heating

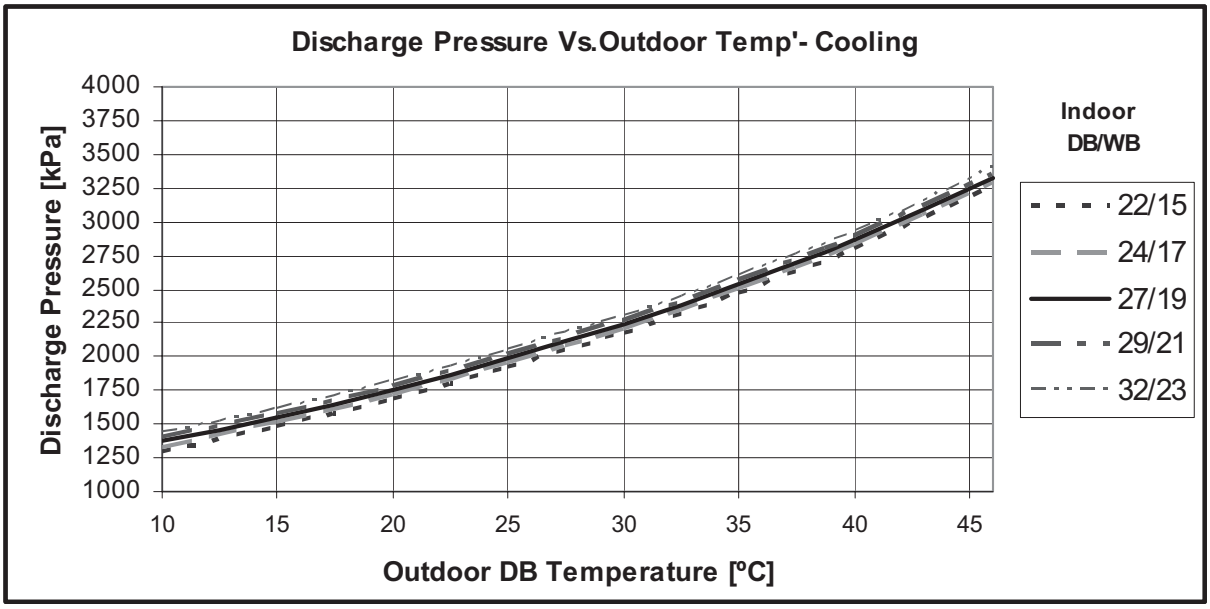


# 6. PRESSURE CURVES

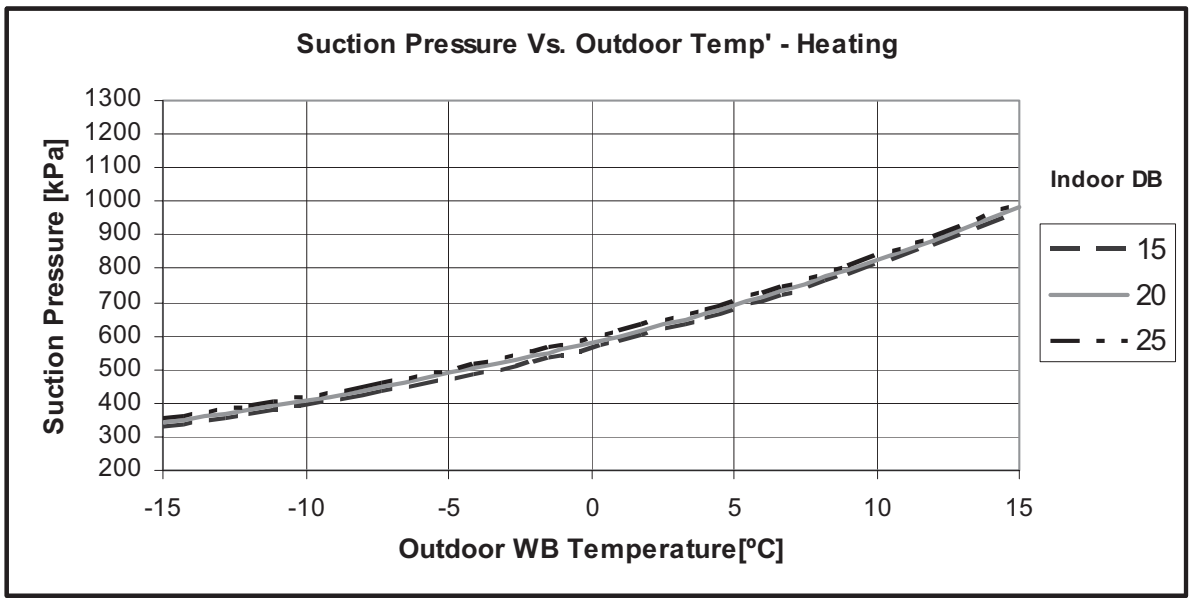
## 6.1 Model: K 9 DCI

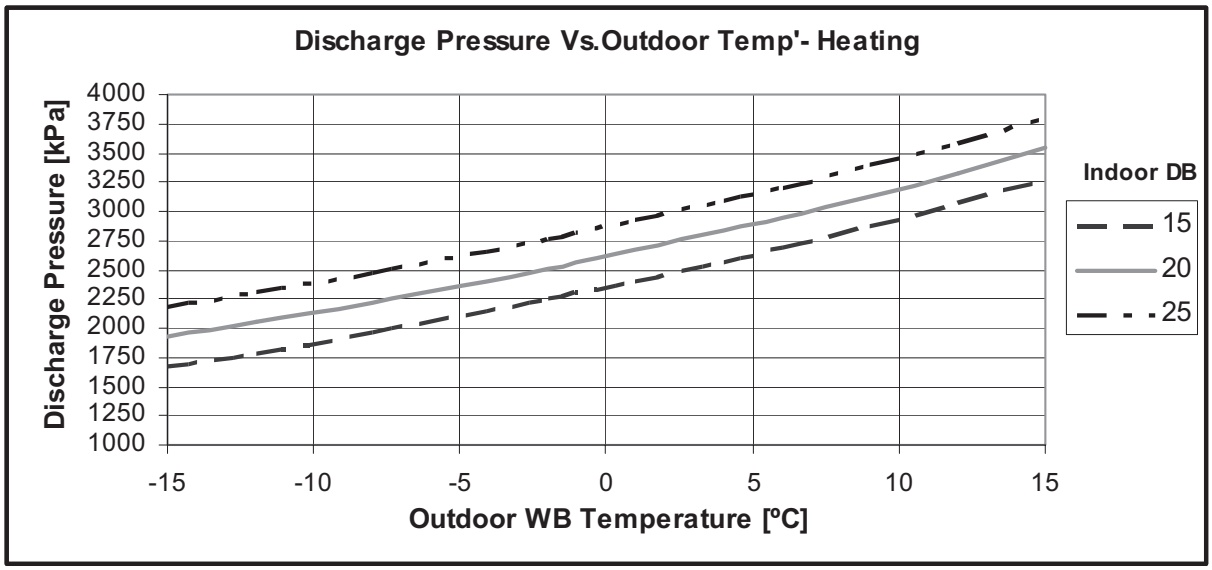
### 6.1.1 Cooling – Test Mode



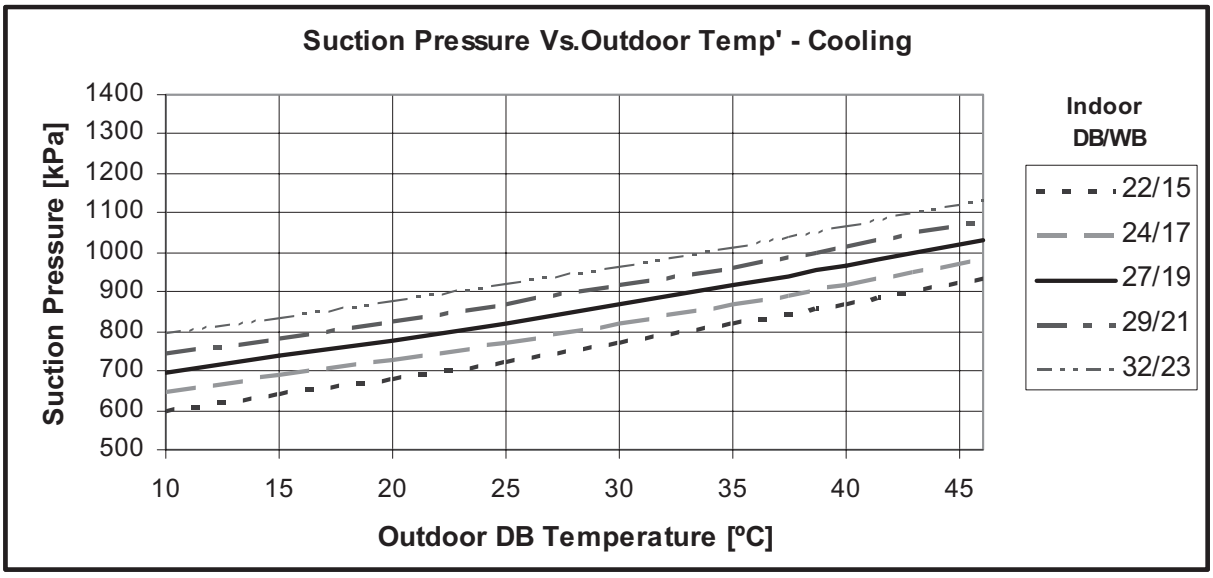
### 6.1.2 Heading – Test Mode

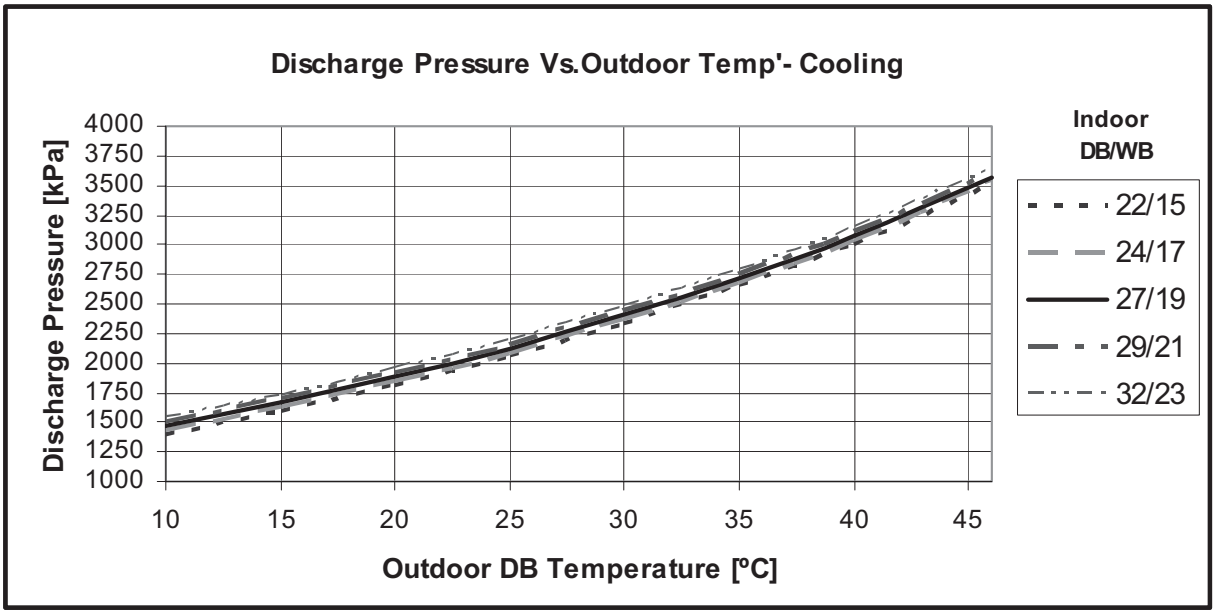


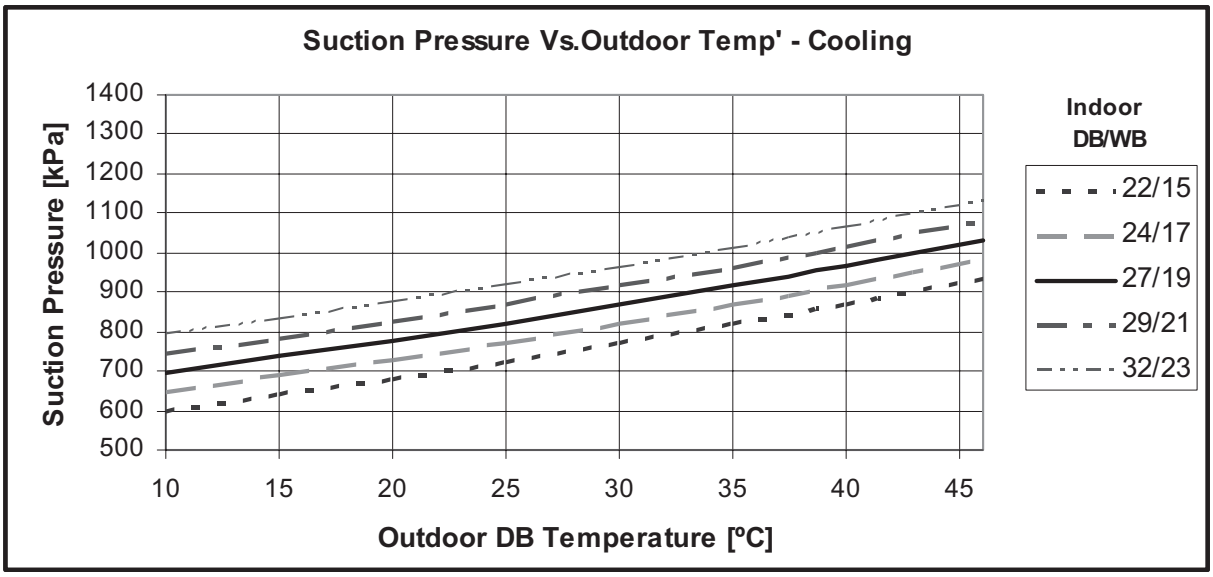
## 6.2 Model: K 12 DCI

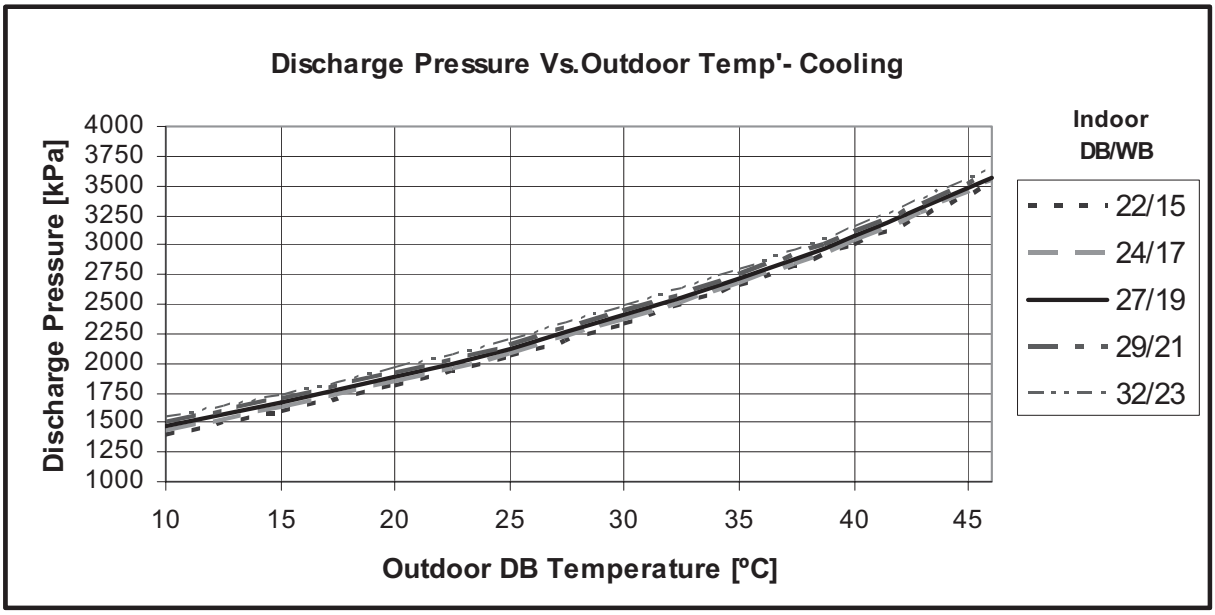
### 6.2.1 Cooling – Test Mode



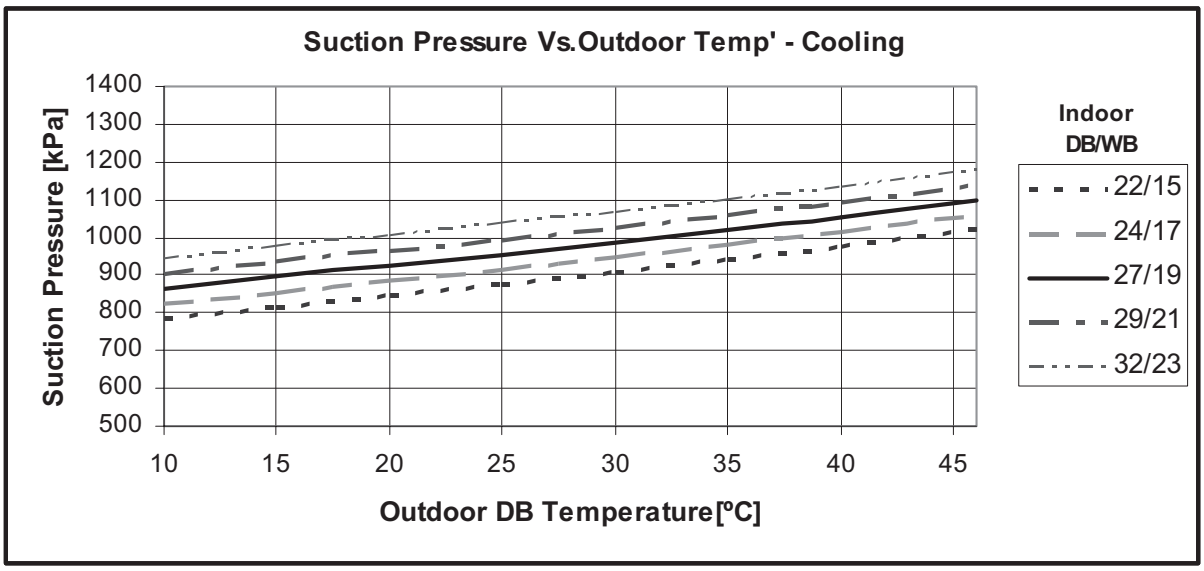
### 6.2.2 Heating – Test Mode

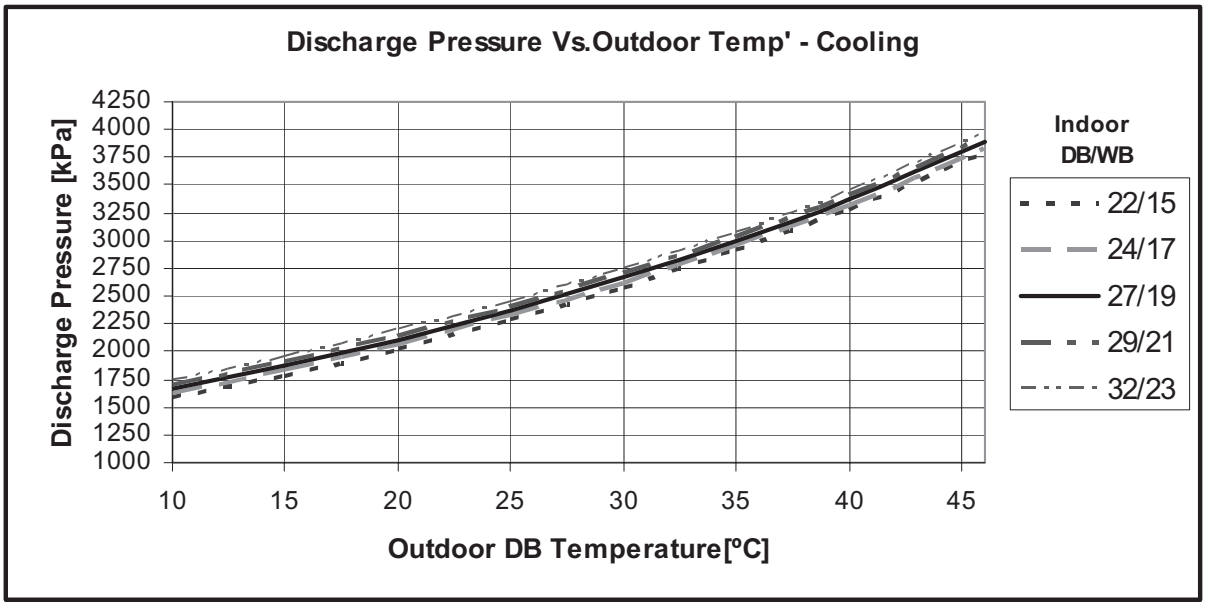


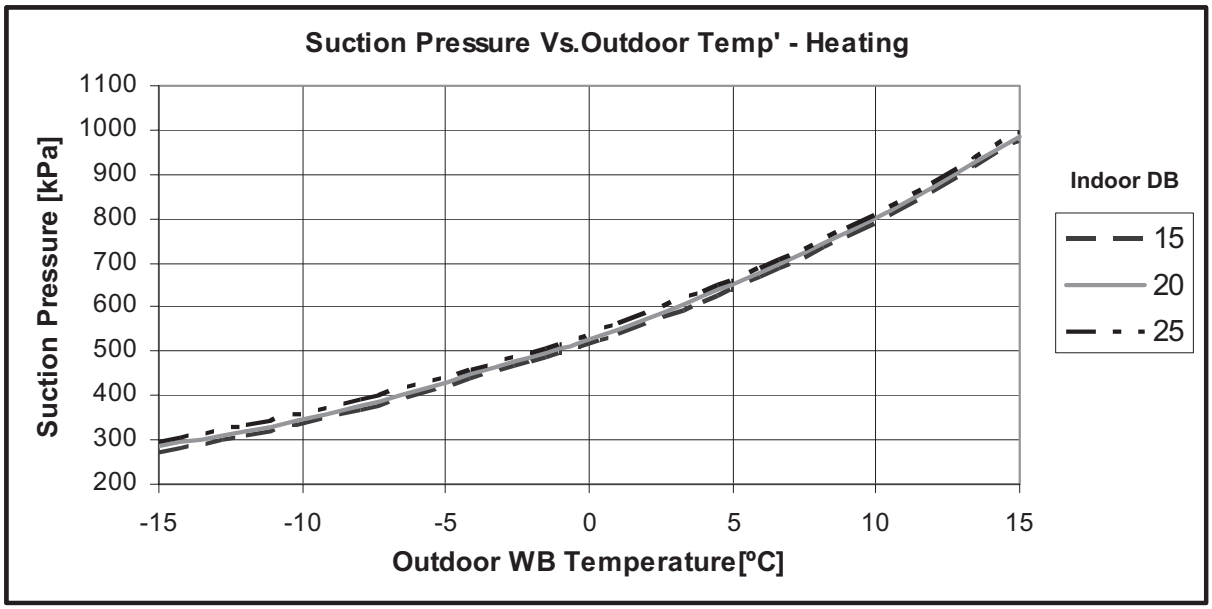
## 6.4 Model: K 18 DCI

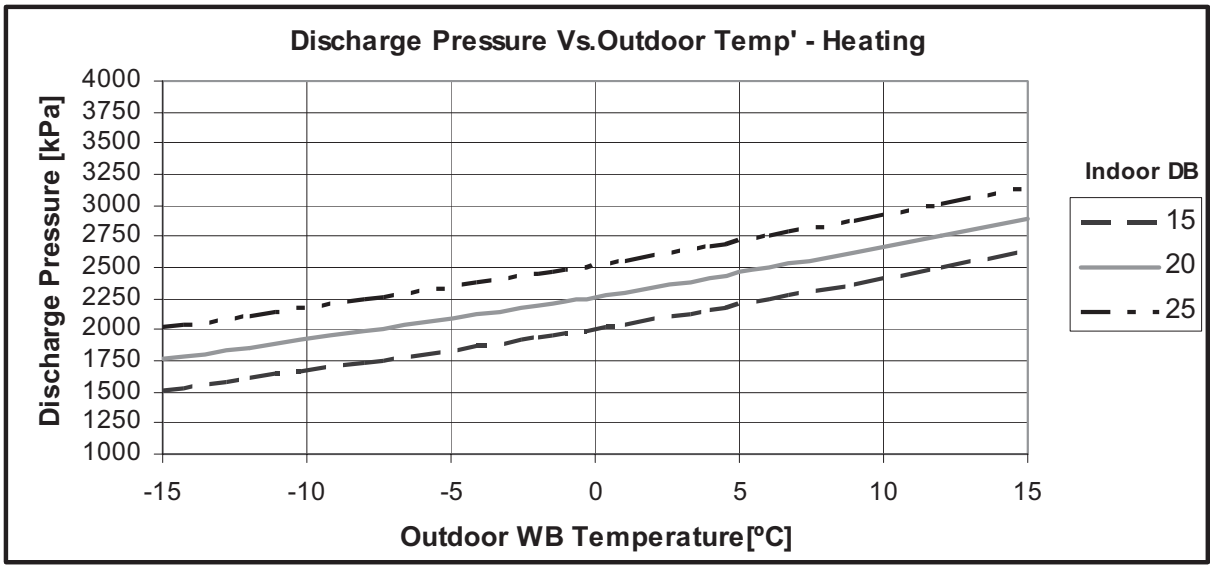
### 6.4.1 Cooling – Test Mode



### 6.4.2 Cooling – Test Mode



# 7. ELECTRICAL DATA

## 7.1 Single Phase Units

| Model | K 9 DCI | K 12 DCI | K 18 DCI |
|---|---|---|---|
| **Power Supply** | 1 PH, 220-240 VAC, 50Hz | | |
| **Connected to** | Indoor | | |
| **Maximum Current** | 10 A | | 12 A |
| **Inrush Current** (a) | 35 A | | |
| **Starting Current** (b) | 10 A | | 10.5 A |
| **Circuit breaker** | 16 A | | 20 A |
| **Power supply wiring no. x cross section** | 3 X 1.5 $mm^2$ | | 3 X 2.5 $mm^2$ |
| **Interconnecting cable no. x cross section** | 4 X 1.5 $mm^2$ | | 4 X 2.5 $mm^2$ |

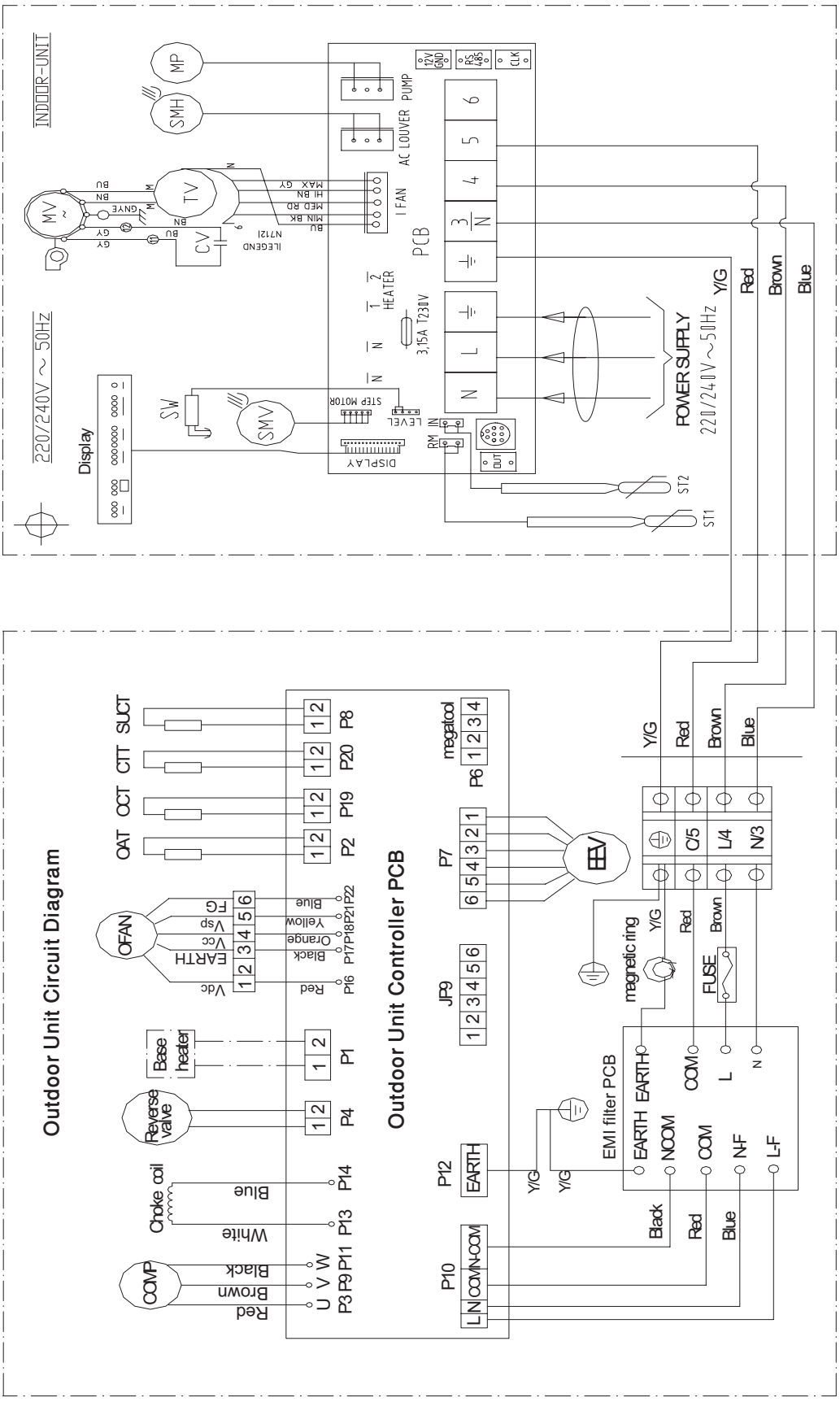
(a) Inrush current is the current when power is up (charging the DC capacitors at outdoor unit controller).
(b) Starting current is the current when starting the compressor.

***NOTE***

***Power wiring cord should comply with local lows and electrical regulations requirements***

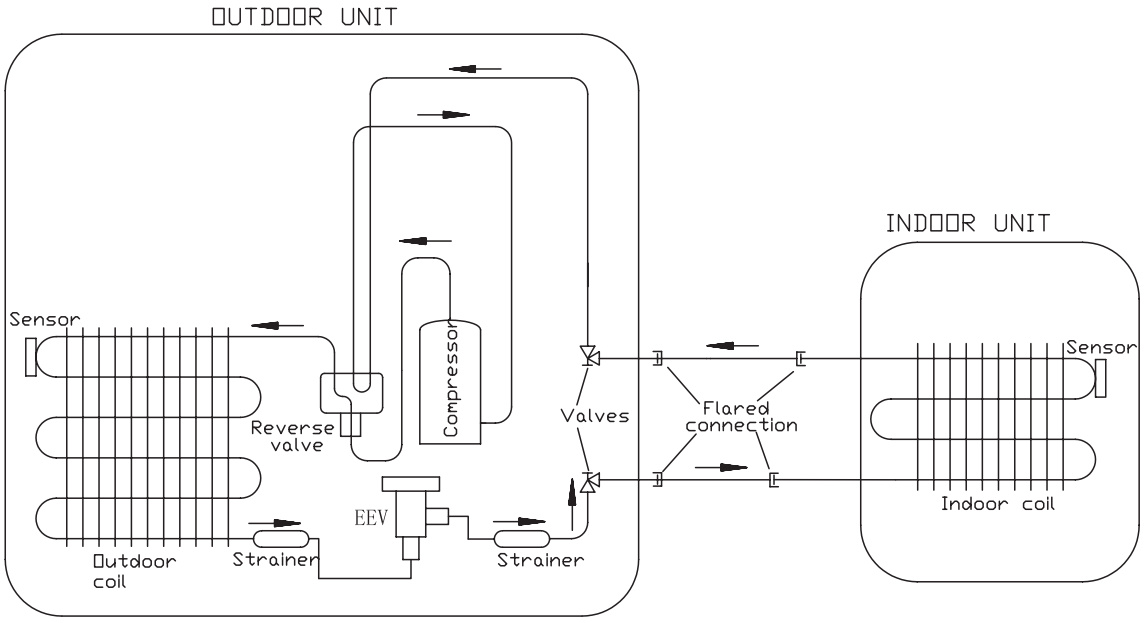
# 8. WIRING DIAGRAMS

## 8.1 K9, 12, 18 DCI

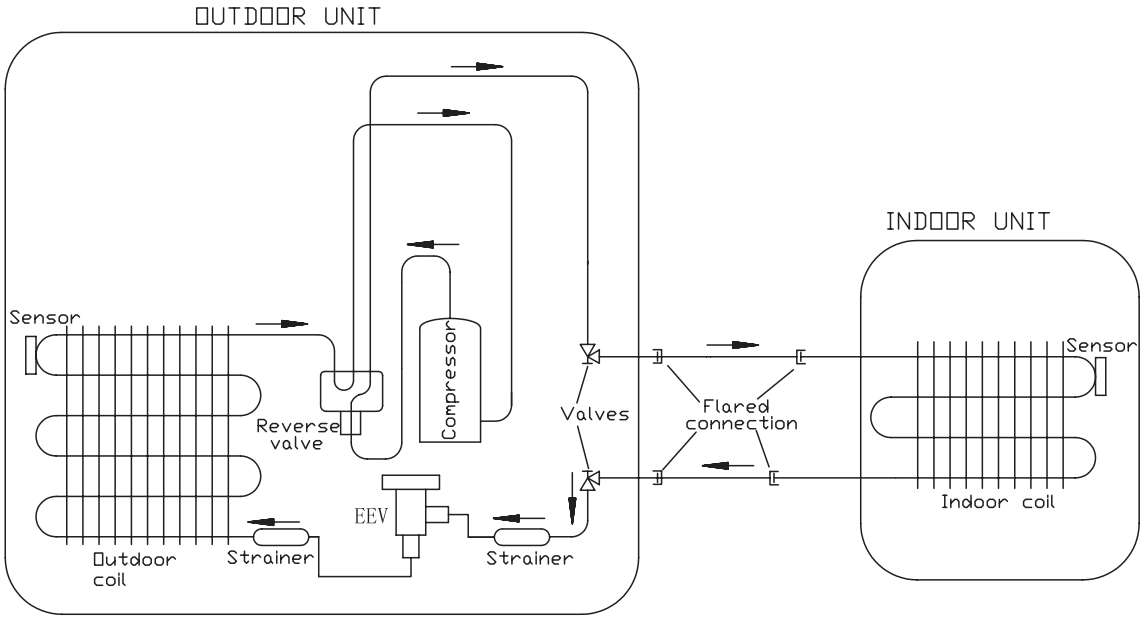


# 9. REFRIGERATION DIAGRAMS

## 9.1 K 9, 12,18 DCI

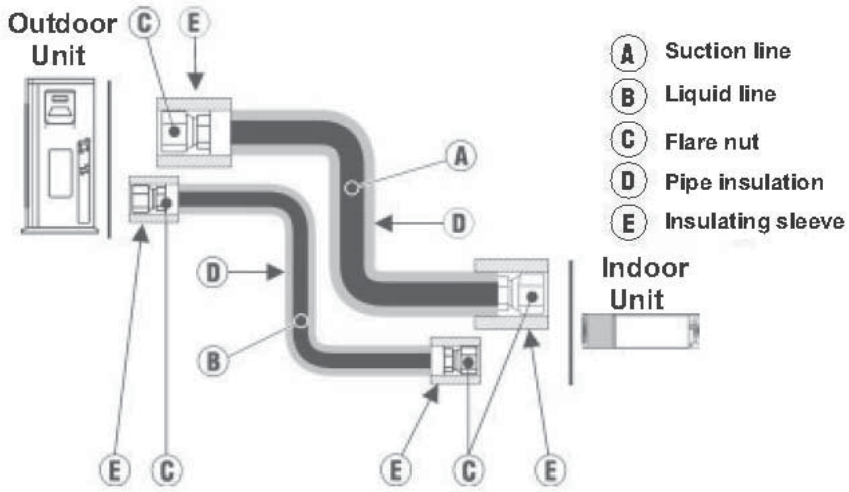


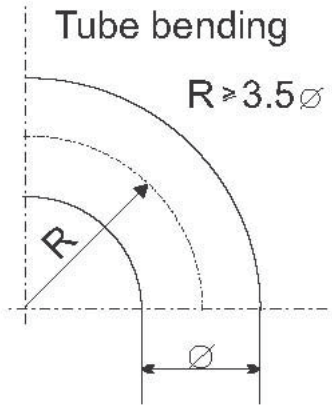

COOLING & DRY MODE

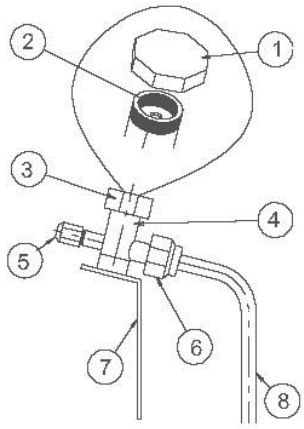



HEATING MODE

# 10. TUBING CONNECTIONS



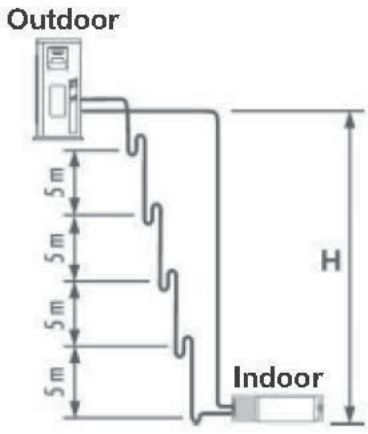




| TUBE (Inch) / TORQUE (Nm) | 1/4" | 3/8" | 1/2" | 5/8" | 3/4" |
|---|---|---|---|---|---|
| **Flare Nuts** | 11-13 | 40-45 | 60-65 | 70-75 | 80-85 |
| **Valve Cap** | 13-20 | 13-20 | 18-25 | 18-25 | 40-50 |
| **Service Port Cap** | 11-13 | 11-13 | 11-13 | 11-13 | 11-13 |

1. Valve Protection Cap-end
2. Refrigerant Valve Port (use Allen wrench to open/close)
3. Valve Protection Cap
4. Refrigerant Valve
5. Service Port Cap
6. Flare Nut
7. Unit Back Side
8. Copper Tube

When the outdoor unit is installed above the indoor unit an oil trap is required every 5m along the suction line at the lowest point of the riser. Incase the indoor unit is installed above the outdoor, no trap is required.



# 11. CONTROL SYSTEM

## 11.1 General Functions and Operating Rules

The DCI software is fully parametric.
All the model dependent parameters are shown in Blue color and with Italic style [*parameter*].
The parameters values are given in the last section of this control logic chapter of the service manual.

### 11.1.1 System Operation Concept

The control function is divided between indoor and outdoor unit controllers. Indoor unit is the System 'Master', requesting the outdoor unit for cooling/heating capacity supply. The outdoor unit is the system 'Slave' and it must supply the required capacity nless it enters into a protection mode avoiding it from supplying the requested capacity.
The capacity request is transferred via indoor to outdoor communication, and is represented by a parameter called 'NLOAD'. NLOAD is an integer number with values between 0 and 127, and it represents the heat or cool load felt by the indoor unit.

### 11.1.2 Compressor Frequency Control

#### 11.1.2.1 NLOAD setting

The NLOAD setting is done by the indoor unit controller, based on a PI control scheme.
The actual NLOAD to be sent to the outdoor unit controller is based on the preliminary LOAD calculation, the indoor fan speed, and the power shedding function.

NLOAD limits as a function of indoor fan speed:

| Indoor Fan Speed | Maximum NLOAD Cooling | Maximum NLOAD Heating |
|---|---|---|
| Low | *Max NLOADIF1C* | 127 |
| Medium | *Max NLOADIF2C* | 127 |
| High | *Max NLOADIF3C* | 127 |
| Turbo | *Max NLOADIF4C* | 127 |
| Auto | *Max NLOADIF5C* | 127 |

NLOAD limits as a function of power shedding:

| Mode | Power Shedding OFF | Power Shedding ON |
|---|---|---|
| Cool | No limit | Nominal Cooling |
| Heat | No limit | Nominal Heating |

### 11.1.3 Target Frequency Setting

The compressor target frequency is a function of the NLOAD number sent from the indoor controller and the outdoor air temperature.
Basic Target Frequency Setting:

| NLOAD | Target Frequency |
|---|---|
| 127 | *Maximum frequency* |
| 10 < NLOAD < 127 | Interpolated value between minimum and maximum frequency |
| 10 | *Minimum frequency* |
| 0 | Compressor is stopped |

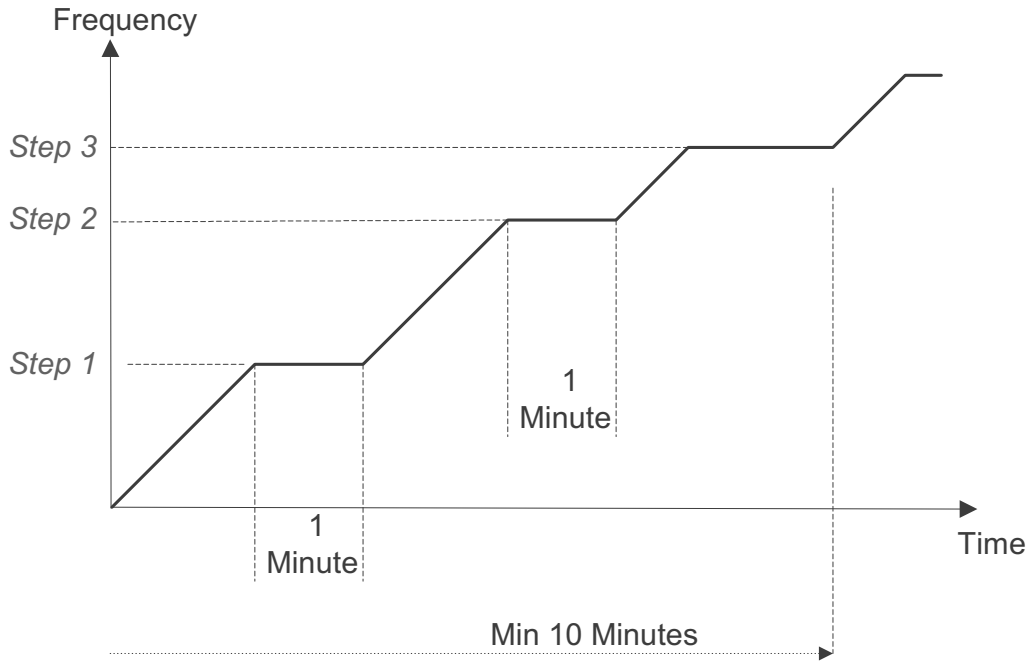
Target frequency limits as a function of outdoor air temperature )OAT(:

| OAT Range | Cool mode limits | Heat mode limits |
|---|---|---|
| OAT < 6 | *MaxFreqAsOATC* | No limit |
| 6 ≤ OAT < 15 | | *MaxFreqAsOAT1H* |
| 15 ≤ OAT < 24 | | *MaxFreqAsOAT2H* |
| 24 ≤ OAT | No limit | |

### 11.1.4 Frequency Changes Control

Frequency change rate is 1 Hz/sec.

### 11.1.5 Compressor Starting Control




### 11.1.6 Minimum On and Off Time

3 minutes.

### 11.1.7 Indoor Fan Control

10 Indoor fan speeds are determined for each model. 5 speeds for cool/dry/fan modes and 5 speeds for heat mode.
When user sets the indoor fan speed to a fixed speed )Low/ Medium/ High(, unit will operate constantly at set speed.
When Auto Fan is selected, indoor unit controller can operate in all speeds. The actual speed is set according to the cool/heat load.

#### 11.1.7.1 Turbo Speed

The Turbo speed is activated during the first 30 minutes of unit operation when auto fan speed is selected and under the following conditions:
Difference between set point and actual room temperature is bigger then 3 degrees.
Room temperature > 22 for cooling, or < 25 for heating.

### 11.1.8 Heating Element Control

Heating element can be started if LOAD > 0.8* MaximumNLOAD AND Indoor Coil temperature <45.
The heating element will be stopped when LOAD < 0.5* MaximumNLOAD OR if Indoor Coil Temperature > 50.

### 11.1.9 Outdoor Fan Control

7 outdoor fan speeds are determined for each model. 3 speeds for cool and dry modes, and 3 speeds for heat mode, and a very low speed.
Outdoor fan speed is a function of compressor frequency and outdoor air temperature (OAT).
4 routines for fan control are determined. The control routine selection depends on operation mode, compressor speed, outdoor air temperature (OAT) and heat sink temperature (HST).

| Routine | Conditions |
|---|---|
| A | Heating with OAT < $15^0$C<br>or<br>Cooling with OAT > $20^0$C, or HST > $50^0$C<br>or<br>Faulty OAT |
| B | Cooling with $20^0$C > OAT > $50^0$C |
| C | Cooling with $7^0$C > OAT |
| D | Heating with OAT > $15^0$C |

| | Outdoor Fan Speed | | | |
|---|---|---|---|---|
| Compressor Frequency (CF) | Routine A | Routine B | Routine C | Routine D |
| CF= 0 | OFF | OFF | OFF | OFF |
| 10 ≤ CF < *OFLowFreq* | Low | Low | Very Low | Low |
| 10 ≤ CF < *OFMedFreq* | Medium | Low | Very Low | Low |
| *OFMedFreq* ≤ CF | High | Low | Low | Medium |

When compressor is switched to OFF and the heat sink temperature is above 55 degrees, the outdoor fan will remain ON in low speed for up to 3 minutes.

### 11.1.10 EEV (electronic Expansion valve) Control

EEV opening is defined as EEV = $EEV_{OL}$ + $EEV_{CV}$
$EEV_{OL}$ is the initial EEV opening as a function of the compressor frequency, operation mode, unit model and capacity.
$EEV_{CV}$ is a correction value for the EEV opening that is based on the compressor temperature.
During the first 10 minutes of compressor operation $EEV_{CV}$ = 0.
Once the first 10 minutes are over, the correction value is calculated as follow: $EEV_{CV}(n) = EEV_{CV}(N-1) + EEV_{CTT}$
$EEV_{CTT}$ is the correction based on the compressor temperature. A target compressor temperature is set depending on frequency and outdoor air temperature, and the actual compressor temperature is compared to the target temperature to set the required correction to the EEV opening.

### 11.1.11 Reversing Valve (RV) Control

Reversing valve is on in heat mode.
Switching of RV state is done only after compressor is off for over 3 minutes.

### 11.1.12 Ioniser Control

Ioniser is on when unit is on AND indoor fan is on AND Ioniser power switch (on Ioniser) is on.

### 11.1.13 Electro Static Filter )ESF( Control

ESF is on when ESF switch is on, Safety switch is pressed, unit is on, AND indoor fan is on.

### 11.1.14 Base Heater Control

When OAT is connected, Base Heater will be on when unit is in heating and OAT<2$^0$C.
When OAT is disconnected, Base Heater will be on when unit is in heating.

## 11.2 Fan Mode

In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.
In AutoFan user setting, fan speed will be adjusting automatically according to the difference between actual room temperature and user set point temperature.

## 11.3 Cool Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.
In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.
In AutoFan user setting, fan speed will be ad8usted automatically according to the calculated NLOAD.

## 11.4 Heat Mode

NLOAD is calculated according to the difference between actual room temperature and user set point temperature by PI control.
In high/ medium/ low indoor fan user setting, unit will operate fan in selected speed.
In AutoFan user setting, fan speed will be adng to the calculated
NLOAD.

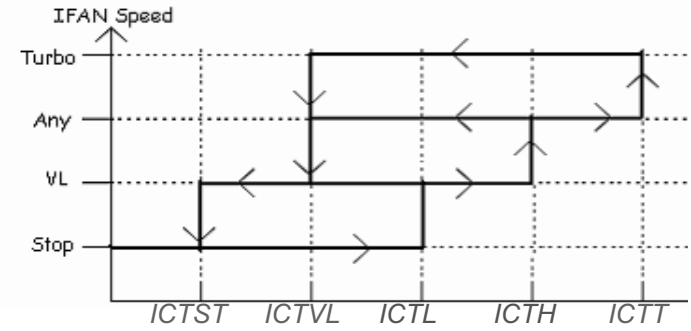
### 11.4.1 Temperature Compensation

In wall mounted, ducted, and cassette models, 3 degrees are reduced from room temperature reading (except when in I-Feel mode), to compensate for temperature difference between high and low areas in the heated room, and for coil heat radiation on room thermistor.
The temperature compensation can be enabled/disabled by shortening of J2 on the indoor unit controller.

| Model | J2 Shorted | J2 Opened |
|---|---|---|
| Wall mounted | Compensation Disabled | Compensation Enabled |
| Cassette | Compensation Enabled | Compensation Disabled |
| Ducted | Compensation Enabled | Compensation Disabled |
| Floor/Ceiling | Compensation Disabled | Compensation Enabled |

### 11.4.2 Indoor Fan Control in Heat Mode

Indoor fan speed depends on the indoor coil temperature:




## 11.5 Auto Cool/Heat Mode

When in auto cool heat mode unit will automatically select between cool and heat mode according to the difference between actual room temperature and user set point temperature )ΔT(.
Unit will switch from cool to heat when compressor is off for 3 minutes, and ΔT < -3.
Unit will switch from heat to cool when compressor is off for 5 minutes, and ΔT < -3.

## 11.6 Dry Mode

As long as room temperature is higher then the set point, indoor fan will work in low speed and compressor will work between 0 and *MaxNLOADIF1C* Hz.
When the room temperature is lower than the set point, compressor will be switched OFF and indoor fan will cycle 3 minutes OFF, 1 minute ON.

## 11.7 Protections

There are 5 protection codes.
Normal (Norm) – unit operate normally.
Stop Rise (SR) – compressor frequency can not be raised but does not have to be decreased.
HzDown1 (D1) – Compressor frequency is reduced by 2 to 5 Hz per minute.
HzDown2 (D2) – Compressor frequency is reduced by 5 to 10 Hz per minute.
Stop Compressor (SC) – Compressor is stopped.

### 11.7.1 Indoor Coil Defrost Protection

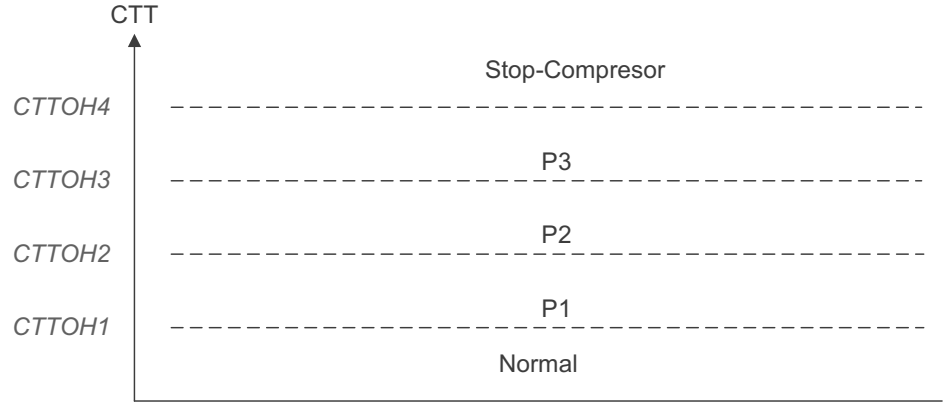
| ICT | ICT Trend | | | | |
|---|---|---|---|---|---|
| | Fast Increasing | Increasing | No change | Decreasing | Fast Decreasing |
| ICT < -2 | SC | SC | SC | SC | SC |
| -2 ≤ ICT < 0 | D1 | D1 | D2 | D2 | D2 |
| 0 ≤ ICT < 2 | SR | SR | D1 | D2 | D2 |
| 2 ≤ ICT < 4 | SR | SR | SR | D1 | D2 |
| 4 ≤ ICT < 6 | Norm | Norm | SR | SR | D1 |
| 6 ≤ ICT < 8 | Norm | Norm | Norm | SR | SR |
| 8 ≤ ICT | Normal | | | | |

### 11.7.2 Indoor Coil over Heating Protection

| ICT | ICT Trend | | | | |
|---|---|---|---|---|---|
| | Fast Decreasing | Decreasing | No Change | Increasing | Fast Increasing |
| ICT> 55 | SC | SC | SC | SC | SC |
| 53 <ICT ≤ 55 | D1 | D1 | D2 | D2 | D2 |
| 49 < ICT ≤ 53 | SR | SR | D1 | D2 | D2 |
| 47 < ICT ≤ 49 | SR | SR | SR | D1 | D2 |
| 45 < ICT ≤ 47 | Norm | Norm | SR | SR | D1 |
| 43 < ICT ≤ 45 | Norm | Norm | Norm | SR | SR |
| ICT ≤ 43 | Normal | | | | |

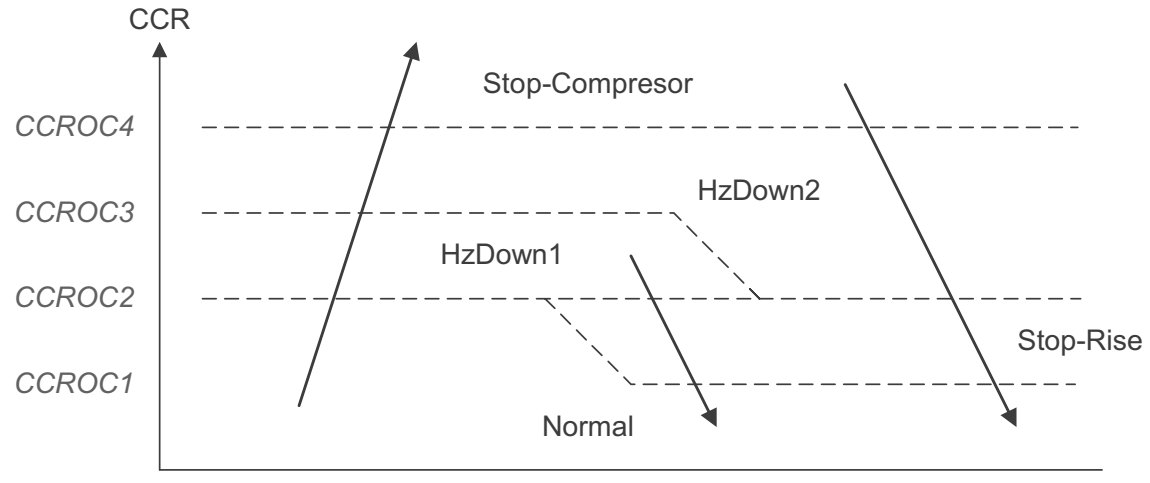
### 11.7.3 Compressor over Heating Protection

Compressor temperature can be in one of 5 control zones )4 in protection, and 1 normal(, according to the following chart.




| Control Status | Compressor Temperature Increases | Else |
|---|---|---|
| P1 | Norm | SR |
| P2 | D1 | SR |
| P3 | D2 | D1 |
| Stop Compressor | SC | |

### 11.7.4 Compressor over Current Protection



### 11.7.5 Heat Sink Over Heating Protection (NA for DCI 25 and 35)

| HST | HST Trend | | |
|---|---|---|---|
| | Decreasing | No Change | Increasing |
| HST > 90 | SC | SC | SC |
| 85 < HST ≤ 90 | D1 | D2 | D2 |
| 82 < HST ≤ 85 | SR | D1 | D2 |
| 80 < HST ≤ 82 | SR | SR | D1 |
| 78 < HST ≤ 80 | Norm | Norm | SR |
| HST ≤ 78 | Normal | | |

### 11.7.6 Outdoor Coil Deicing Protection

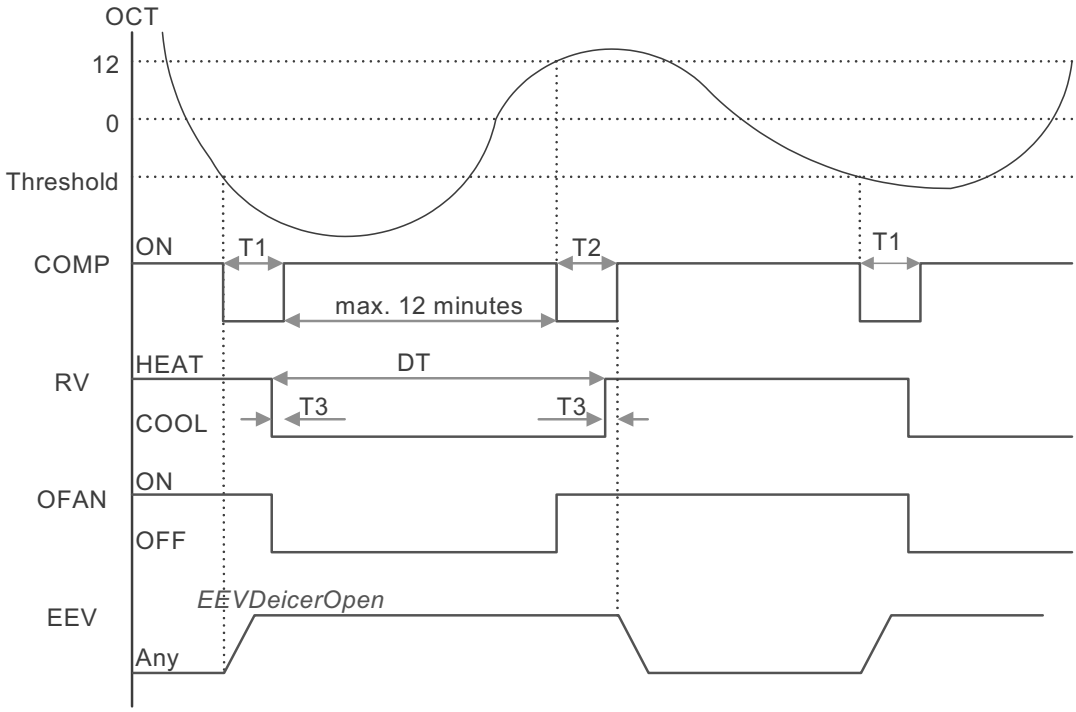
*11.7.6.1 Deicing Starting Conditions*

Deicing operation will start when either one of the following conditions exist:
Case 1: OCT < OAT – 8 AND TLD > DI
Case 2: OCT < OAT – 12 AND TLD > 30 minutes.
Case 3: OCT is Invalid AND TLD > DI
Case 4: Unit is just switched to STBY AND OCT < OAT - 8
Case 5: NLOAD = 0 AND OCT < OAT -8

OCT – Outdoor Coil Temperature
OAT – Outdoor Air Temperature
TLD – Time from Last Deicing
DI – Deicing Interval (Time Interval Between Two Deicing)

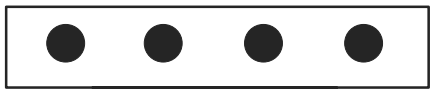
Deicing interval time when compressor is first started in heat mode, is 10 minutes if OCT < -2, and is 40 minutes in other cases.
Deicing interval time is changed (increased/ decreased in 10 minutes steps) as a function of deicing time. If deicing time is shorter then former deicing time, the deicing interval time will be increased. If deicing time is longer then former deicing time, the deicing interval time will be decreased.

*11.7.6.2 Deicing Protection Procedure*




T1 = T2 = 36 seconds, T3 = 6 seconds

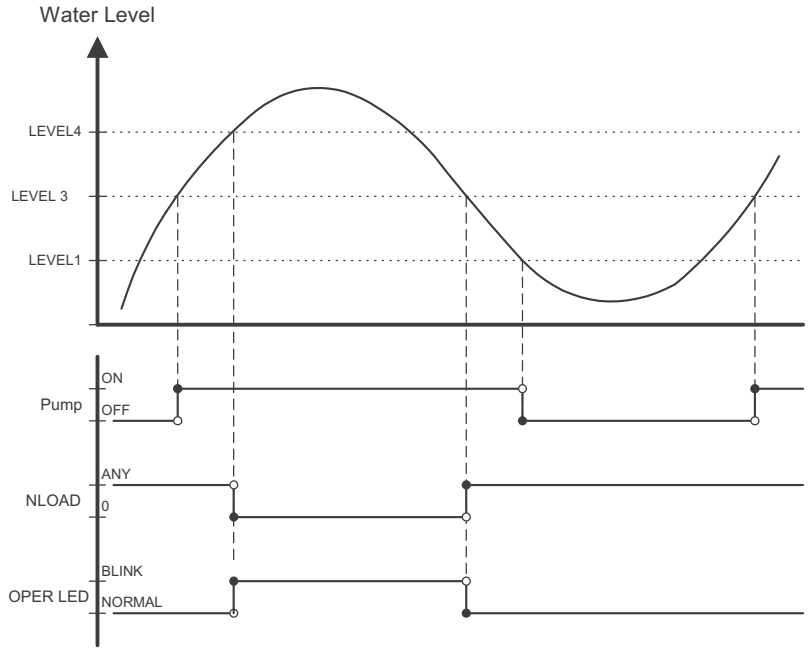
## 11.8 Condensate Water Over Flow Protection



Each of the pins P1, P2, P3 can have two options:
1 – When it is shorted with P4
0 – When it is not shorted to P4

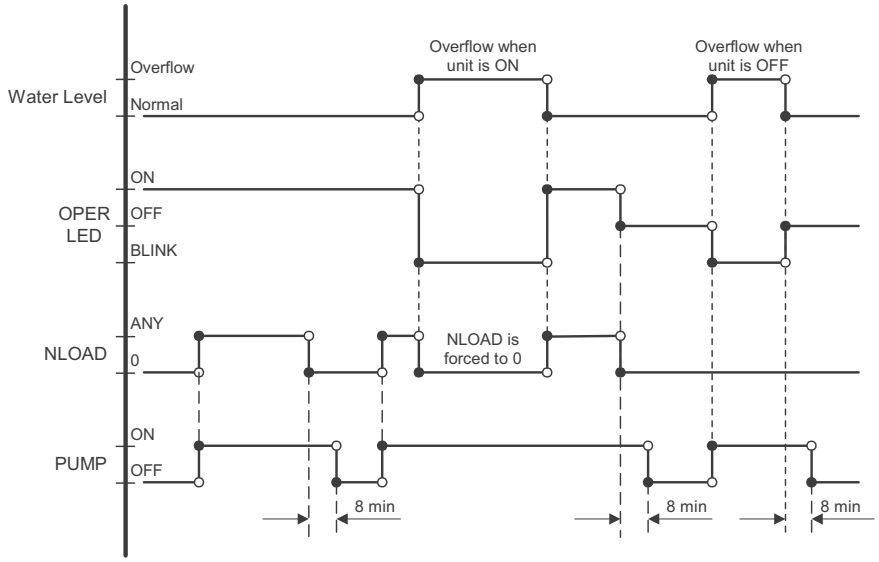
### 11.8.1 3 Levels Logic (used in floor/ceiling models)

| P2 | P3 | Level |
|---|---|---|
| 0 | 0 | L0 |
| 1 | 0 | L1 |
| 1 | 1 | L2&3 |
| 0 | 1 | L4 |




### 11.8.2 1 Level Logic (used in all models except for floor/ceiling models)

| P2 | P3 | Level |
|---|---|---|
| Don`t care | 1 | Normal |
| Don`t care | 0 | Overflow |




## 11.9 Indoor Unit Dry Contact

Indoor unit Dry contact has two alternative functions that are selected by J8.

| | Function | Contact = Open | Contact = Short |
|---|---|---|---|
| J8 = Open | Presence Detector Connection | No Limit | Forced to STBY |
| J8 = Open | Power Shedding Function | No Limit | Limit NLOAD |

## 11.10 Operating the Unit from the Mode Button

Forced operation allows to start, stop and operate in Cooling or Heating, in pre-set temperature according to the following table:

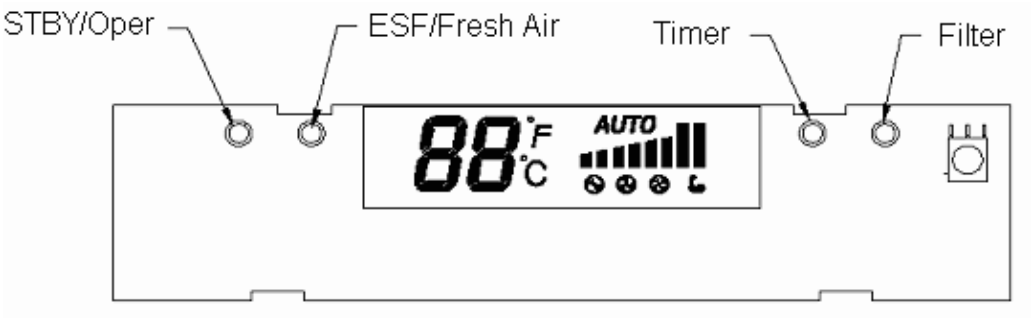
| Forced operation Mode | Pre-set Temperature |
|---|---|
| Cooling | $20^0$C |
| Heating | $28^0$C |

## 11.11 On Unit Controls and Indicators

### 11.11.1 Indoor Unit Controller Controls and Indicators For All Models Except for Floor/Ceiling model

| | |
|---|---|
| STAND BY INDICATOR | Lights up when the Air Conditioner is connected to power and ready to receive the R/C commands |
| OPERATION INDICATOR | Lights up during operation.<br>Blinks for 300 msec., to announce that a R/C infrared signal has been received and stored.<br>Blinks continuously during protections (according to the relevant spec section). |
| TIMER INDICATOR | Lights up during Timer and Sleep operation. |
| FILTER INDICATOR | Lights up when Air Filter needs to be cleaned. |
| COOLING INDICATOR | Lights up when system is switched to Cool Mode by using the Mode Switch on the unit. |
| HEATING INDICATOR | Lights up when system is switched Heat Mode by using the Mode Switch on the unit. |
| Mode SWITCH (COOL/HEAT/OFF) | Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB →<br>In long pressing system enters diagnostic mode. |
| RESET / FILTER SWITCH | For short pressing:<br>When Filter LED is on - turn off the FILTER INDICATOR after a clean filter has been reinstalled.<br>When Filter LED is off able/disable the buzzer announcer, if selected. |

### 11.11.2 Indoor Unit Controls and Indicators for LCD Display




| | STBY | Cool | Heat | Auto | Fan | Dry |
|---|---|---|---|---|---|---|
| 88 | OFF | SPT(1*) | SPT(1*) | SPT(1*) | SPT(1*) | SPT(1*) |
| C | OFF(2*) | ON(2*) | ON(2*) | ON(2*) | ON(2*) | ON(2*) |
| F | OFF(2*) | OFF(2*) | OFF(2*) | OFF(2*) | OFF(2*) | OFF(2*) |
| (Low) | OFF | User setting IFAN speed | User setting IFAN speed | User setting IFAN speed | User setting IFAN speed | User setting IFAN speed |
| (Med) | OFF | | | | | |
| (High) | OFF | | | | | |
| (Turbo) | OFF | | | | | |
| AUTO (Auto) | OFF | | | | | |
| Backlight(red) | OFF | OFF | ON(3*) | ON(3*) | ON(3*) | OFF |
| Backlight(green) | OFF | ON(3*) | OFF | ON(3*) | ON(3*) | ON(3*) |

### 11.11.3 Indoor Unit Controller Controls and Indicators for Floor/Ceiling Model

| | |
|---|---|
| STANDBY INDICATOR | Lights up when the Air Conditioner is connected to power and is ready for operation |
| OPERATE INDICATOR (4) | 1. Lights up during operation.<br>2. Blinks for 300 msec., to announce that a R/C infrared signal has been received and stored.<br>3. Blinks continuously during protections (according to the relevant spec section). |
| TIMER INDICATOR | Lights up during Timer and Sleep operation. |
| FILTER INDICATOR | 1. Lights up when Air Filter needs to be cleaned.<br>2. Blinks during Water Over Flow in PXD models. (Cf. Sect. 7.3) |
| COOLING INDICATOR | Lights up when system is switched to Cool Mode by using the Mode Switch on the unit. |
| HEATING INDICATOR | Lights up when system is switched Heat Mode by using the Mode Switch on the unit. |
| FAN MODE INDICATOR (4) | Lights up in Fan Mode activated by local switches. |
| FAN SPEED INDICATORS | L -- Lights up when IFAN setting is Low.<br>M -- Lights up when IFAN setting is Medium.<br>H -- Lights up when IFAN setting is High.<br>A -- Lights up when IFAN setting is Auto. |
| TEMP. SETTING INDICATORS | Each one of the seven indicators indicates the following SPT: 18, 20, 22, 24, 26, 28, 30 ]°c[. The odd number temperatures are indicated by turning on the two adcent indicators. |
| FAN SPEED BUTTON | Press this button to change the speed of the IFAN. Each pressing change the speed in the sequence of:<br>..... L → M → H → Auto → L → ... |
| TEMP. SETTING UP BUTTON | Pressing this button increases the SPT by 1°C.<br>Note: The Max SPT is 30°C. |
| TEMP. SETTING DOWN BUTTON | Pressing this button decreases the SPT by 1°C.<br>Note: The Min SPT is 18°C. |
| MODE BUTTON | Every short pressing , the next operation mode is selected, in this order : SB → Cool Mode → Heat Mode → SB →<br>In long pressing system enters diagnostic mode. |
| POWER BUTTON | Toggle the unit between OPER & STBY modes. |
| RESET / FILTER BUTTON | For short pressing:<br>When Filter LED is on - turn off the FILTER INDICATOR after a clean filter has been reinstalled.<br>When Filter LED is off able/disable the buzzer announcer, if selected.<br>In long pressing system enters set up mode (if in SB). |

### 11.11.4 Outdoor Unit Controller Indicators

Unit has three LED
SB LED is ON when power is ON (230 VAC, even when no communication).
STATUS LED is ON when COMP is ON, and Blinks according to diagnostics mode definitions when either fault or protection occurs.
FAULT LED Blinks according to diagnostics mode definitions when either fault or protection occurs.

## 11.12 Jumper Setting

### 11.12.1 Indoor Unit Controller

0 = Open Jumper (disconnect jumper).
1 = Close Jumper (connect jumper).
Self test Jumper – J1

| OPERATION | J1 |
|---|---|
| SELF-TEST | 1 |
| NORMAL | 0 |

Compensation Jumper – J2

| Model | J2 (Default) | Compensation |
|---|---|---|
| Wall Mounted | 0 | Activated |
| Floor/Ceiling | 1 | Deactivated |
| Ducted/cassette | 1 | Activated |

Family selection Jumper – J3, J4 and J5

| Family | J5 | J4 | J3 |
|---|---|---|---|
| Reserved | 0 | 0 | 0 |
| Reserved | 0 | 0 | 1 |
| Reserved | 0 | 1 | 0 |
| Wall Mounted (WNG/FLO) | 0 | 1 | 1 |
| Floor/Ceiling (PXD/SX) | 1 | 0 | 0 |
| Reserved | 1 | 0 | 1 |
| Ducted (LS) | 1 | 1 | 0 |
| Cassette (K) | 1 | 1 | 1 |

| IDU Model | Jumper Setting | | | | | |
|---|---|---|---|---|---|---|
| | J8 | J7 | J6 | J5 | J4 | J3 |
| FLO9 | 0 | 0 | 0 | 0 | 1 | 1 |
| FLO12 | 0 | 1 | 0 | 0 | 1 | 1 |
| FLO18 | 0 | 0 | 1 | 0 | 0 | 0 |
| | | | | | | |
| FLO30 | 0 | 0 | 1 | 0 | 0 | 1 |
| SX9 | 0 | 0 | 0 | 1 | 0 | 0 |
| SX12 | 0 | 1 | 0 | 1 | 0 | 0 |
| SX18 | 1 | 0 | 0 | 1 | 0 | 0 |
| K9 | 0 | 0 | 0 | 1 | 1 | 1 |
| K12 | 0 | 1 | 0 | 1 | 1 | 1 |
| K18 | 1 | 0 | 0 | 1 | 1 | 1 |
| LS12 | 0 | 1 | 0 | 1 | 1 | 0 |

For wall mounted units Jumpers j7, j8 can be configured by service. All other jumpers on the above table are factory default (cannot be changed by service).
For unit types as Cassettes, floor ceiling, and ducted, jumpers are set by a model plug.

Model selection Jumper – J7, J8

| Model | J8 | J7 |
|---|---|---|
| A | 0 | 0 |
| B | 0 | 1 |
| C | 1 | 0 |
| D | 1 | 1 |

J9- Presence Detector/Power Shedding

| OPERATION | J9 |
|---|---|
| Presence Detector | 0 |
| Power Shedding | 1 |

Jumper – J10

| OPERATION | J10 |
|---|---|
| WNG DCI LCD | 0 |
| LED | 1 |
| | |

### 11.12.2 Outdoor Unit Controller

JP9 JUMPER LAYOUT

| | | | | |
|---|---|---|---|---|
| **Reserved** *(PIN 9)* | **ODU3** *(PIN 7)* | **ODU2** *(PIN 5)* | **ODU1** *(PIN 3)* | **ODU0** *(PIN 1)* |
| **GND** *(PIN 10)* | **GND** *(PIN 8)* | **GND** *(PIN 6)* | **GND** *(PIN 4)* | **GND** *(PIN 2)* |

ODU MODEL SELECTION

| ODU3 | ODU2 | ODU1 | ODU0 | ODU Model |
|---|---|---|---|---|
| OFF | OFF | OFF | OFF | Reserved |
| OFF | OFF | OFF | ON (PIN1 & PIN2) | A (DCI 25) |
| OFF | OFF | ON (PIN3 & PIN4) | OFF | B (DCI 35) |
| OFF | OFF | ON (PIN3 & PIN4) | ON (PIN1 & PIN2) | C (DCI 50) |
| OFF | ON (PIN5 & PIN6) | OFF | OFF | D |
| OFF | ON (PIN5 & PIN6) | OFF | ON (PIN1 & PIN2) | E (Duo) |
| OFF | ON (PIN5 & PIN6) | ON (PIN3 & PIN4) | OFF | F |
| OFF | ON (PIN5 & PIN6) | ON (PIN3 & PIN4) | ON (PIN1 & PIN2) | G |
| ON (PIN7 & PIN8) | OFF | OFF | OFF | H |
| ON (PIN7 & PIN8) | OFF | OFF | ON (PIN1 & PIN2) | I |
| ON (PIN7 & PIN8) | OFF | ON (PIN3 & PIN4) | OFF | J |
| ON (PIN7 & PIN8) | OFF | ON (PIN3 & PIN4) | ON (PIN1 & PIN2) | K |
| ON (PIN7 & PIN8) | ON (PIN5 & PIN6) | OFF | OFF | L |
| ON (PIN7 & PIN8) | ON (PIN5 & PIN6) | OFF | ON (PIN1 & PIN2) | M |
| ON (PIN7 & PIN8) | ON (PIN5 & PIN6) | ON (PIN3 & PIN4) | OFF | N |
| ON (PIN7 & PIN8) | ON (PIN5 & PIN6) | ON (PIN3 ? PIN4) | ON (PIN1 & PIN2) | O |

## 11.13 Test Mode

### 11.13.1 Entering Test Mode

System can enter Test mode in two ways:
Automatically when the following conditions exists for 30 minutes continuously:
Mode = Cool, Set point =16, Room temperature = 27±1, Outdoor temperature = 35±1
Or
Mode = Heat, Set point = 30, Room temperature = 20±1, Outdoor temperature = 7±1
Manually when entering diagnostics with the following settings:
Mode = Cool, Set point = 16
Mode = Heat, Set point = 30

### 11.13.2 Unit Operation in Test Mode

In test mode, the unit will operate in fixed settings according to the indoor fan speed setting:

| Indoor Fan Speed Setting | Unit Setting |
|---|---|
| Low | Minimum Capacity Setting |
| High | Nominal Capacity Setting |
| Auto | Maximum Capacity Setting |

During test mode, protections are disabled, except for stop compressor status.

## 11.14 SW Parameters

### 11.14.1 Indoor Units SW Parameters

General Parameters for All Models:

**Parameters defining the indoor fan speed as a function of Indoor Coil temperature in heat mode (ICT):**

| | | |
|---|---|---|
| ICTST Speed | ICT to stop indoor fan | 25 |
| ICTVLSpeed | ICT to go down to very low speed | 28 |
| ICTLSpeed | ICT to start in very low speed | 30 |
| ICTHSpeed | ICT to start in increase speed from very low | 32 |
| ICTTSpeed | ICT to enable Turbo fan speed | 40 |

Model Depended Parameters:

| Parameter name | Wall Mounted Models | |
|---|---|---|
| | DCI 9 | DCI 12 |
| **NLOAD limits as a function of selected indoor fan speed** | | |
| MaxNLOADIF1C | 40 | 40 |
| MaxNLOADIF2C | 53 | 53 |
| MaxNLOADIF3C | 120 | 120 |
| MaxNLOADIF4C | 127 | 127 |
| MaxNLOADIF5C | 127 | 127 |
| **Indoor Fan speeds** | | |
| IFVLOWC | 700 | 700 |
| IFLOWC | 800 | 800 |
| IFMEDC | 900 | 950 |
| IFHIGHC | 1050 | 1100 |
| IFTURBOC | 1150 | 1200 |
| IFVLOWH | 700 | 700 |
| IFLOWH | 800 | 850 |
| IFMEDH | 950 | 1000 |
| IFHIGHH | 1100 | 1150 |
| IFTURBOH | 1200 | 1250 |
| **Nominal Compressor Frequency** | | |
| NomLoadC | 40 | 62 |
| NomLoadH | 55 | 67 |

| Parameter Name | Cassette Models | | | |
|---|---|---|---|---|
| | K 9 | K 12 | K 35S | K 18 |
| **NLOAD limits as a function of selected indoor fan speed** | | | | |
| MaxNLOADIF1C | 40 | 40 | 40 | 40 |
| MaxNLOADIF2C | 53 | 56 | 56 | 60 |
| MaxNLOADIF3C | 120 | 90 | 90 | 90 |
| MaxNLOADIF4C | 127 | 90 | 90 | 90 |
| MaxNLOADIF5C | 127 | 90 | 90 | 90 |
| **Nominal Compressor Frequency** | | | | |
| NomLoadC | 40 | 60 | 56 | 63 |
| NomLoadH | 55 | 69 | 73 | 80 |

### 11.14.2 Outdoor Units SW Parameters

| Parameter Name | DCI9 | DCI12 | DCI18 | DCI50 DUO |
|---|---|---|---|---|
| **Compressor Parameters** | | | | |
| MinFreqC | 30 | 33 | 20 | 20 |
| MaxFreqC | 64 | 80 | 85 | 97 |
| MinFreqH | 30 | 35 | 20 | 26 |
| MaxFreqH | 81 | 93 | 99 | 106 |
| Step1Freq | 60 | 60 | 60 | 60 |
| Step2Freq | 70 | 70 | 70 | 80 |
| Step3Freq | 90 | 90 | 90 | 90 |
| **Frequency limits as a function of outdoor air temperature** | | | | |
| MaxFreqAsOATC | 50 | 50 | 64 | 62 |
| MaxFreqAsOAT1H | 65 | 75 | 85 | 85 |
| MaxFreqAsOAT2H | 60 | 60 | 60 | 60 |
| **Compressor Over Heating Protection** | | | | |
| CTTOH1 | 94 | 94 | 94 | 90 |
| CTTOH2 | 98 | 98 | 98 | 95 |
| CTTOH3 | 102 | 102 | 102 | 102 |
| CTTOH4 | 105 | 105 | 105 | 105 |
| **Compressor Over Current Protection [A]** | | | | |
| CCR01 | 7.1 | 7.1 | 10 | 10 |
| CCR02 | 7.5 | 7.5 | 10.5 | 10.5 |
| CCR03 | 7.9 | 7.9 | 10.8 | 10.8 |
| CCR04 | 8.3 | 8.3 | 11.2 | 11.2 |
| **Outdoor Fan Speed (RPM)** | | | | |
| VL | 200 | 200 | 200 | 200 |
| OFLOWC | 550 | 550 | 600 | 600 |
| OFMEDC | 700 | 700 | 760 | 830 |
| OFMAXC | 830 | 830 | 920 | 920 |
| OFLOWH | 550 | 550 | 600 | 600 |
| OFMEDH | 700 | 700 | 830 | 920 |
| OFMAXH | 830 | 830 | 1000 | 1000 |
| **Outdoor Fan Limit Control** | | | | |
| OFLowFreq | 45 | 45 | 40 | 40 |
| OFMedFreq | 57 | 57 | 70 | 70 |

# 12. TROUBLESHOOTING

Warning

When Power Up – the whole outdoor unit controller, including the wiring, is under HIGH VOLTAGE

Never open the Outdoor unit before turning off the PowerHIG

When turned off, the system is still charged (400V)yle

It takes about 4 Min. to discharge the system.

Touching the controller before discharging may cause an electrical shock

**For safe handling of the controller please refer to section 12.6 below.**

## 12.1 Single Split system failures and corrective actions

| No | SYMPTOM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|---|
| 1 | Power supply indicator (Red LED) does not light up. | No power supply | Check power supply. If power supply is OK, check display and display wiring. if OK, replace controller. |
| 2 | Unit does not respond to remote control message | Remote control message not reached the indoor unit | Check remote control batteries, if batteries are OK, check display and display wiring, if OK, replace display PCB.<br>If still not OK replace controller. |
| 3 | Unit responds to remote control message but Operate indicator (Green LED) does not light up | Problem with display PCB | Replace display PCB.<br>If still not OK replace controller. |
| 4 | Indoor fan does not start (louvers are opened and Green LED does light up) | Unit in heat mode and coil is still not warm. | Change to cool mode and check. |
| | | Problem with PCB or capacitor | Change to high speed and Check power supply to motor is higher than 130VAC (for triack controlled motor) or higher than 220VAC for fixed speed motors, if OK replace capacitor, if not OK replace controller |
| 5 | Indoor fan works when unit is OFF, and indoor fan speed is not changed by remote control command. | PCB problem | Replace controller |
| 6 | Compressor does not start | Electronics control problem or protection | Perform diagnostics (See 12.3 below), and follow the actions described. |
| 7 | Compressor stops during operation and Green LED remains on | Electronic control or power supply problem | Perform diagnostics (See 12.3 below), and follow the actions described. |

| No | SYMPTOM | PROBABLE CAUSE | CORRECTIVE ACTION |
|---|---|---|---|
| 8 | Compressor is on but outdoor fan does not work | Problem with outdoor electronics or outdoor fan | Check outdoor fan motor according to the procedure in section 12.5.3 below, if not OK replace controller |
| 9 | Unit works in wrong mode )cool instead of heat or heat instead of cool( | Electronics or power connection to RV | Check RV power connections, if OK, Check RV operation with direct 230VAC power supply, if OK, Replace outdoor controller. |
| 10 | All components are operating properly but no cooling or no heating | Refrigerant leak | Check refrigeration system. |
| 11 | Compressor is over heated and unit does not generate capacity | EEV problem | Check EEV |
| 12 | Units goes into protections and compressor is stopped with no clear reason | Control problem or refrigeration system problem | Perform diagnostics )See 12.3 below(, and follow the actions described. |
| 13 | Compressor motor is generating noise and no suction occurs | Phase order to compressor is wrong | Check compressor phase order. |
| 14 | Water leakage from indoor unit | Indoor unit drainage tube is blocked | Check and open drainage tube. |
| 15 | Freezing of outdoor unit in heat mode and outdoor unit base is blocked with ice | | Connect base heater. |
| 16 | Unit operates with wrong fan speeds or wrong frequency | Wrong jumper settings | Perform diagnostics (See 12.3 below), and check if units is operating by EEPROM parameters. |

## 12.2 Checking the refrigeration system

Checking system pressures and other thermodynamic measures should be done when system is in Test Mode (in Test mode, system operates in fixed settings). The performance curves given in this manual are given for unit performance in test mode when high indoor fan speed is selected.

Entering test mode:

Set unit to Cool/16 degrees/High indoor fan speed, or Heat/30 degrees/High indoor fan speed, and enter diagnostics.

## 12.3 Judgment by Indoor/Outdoor Unit Diagnostics

Enter diagnostics mode - press for five seconds Mode button in any operation mode. Acknowledgment is by 3 short beeps and lights of COOL and HEAT LEDs. Then, every short pressing of Mode button will scroll between Indoor and Outdoor unit diagnostic modes by the acknowledgment of 3 short beeps and lighting of COOL and HEAT LED's.
During the Outdoor unit diagnostics all four Indoor LED's, (STBY, Operate, Filter and Timer) are blinking. When Indoor diagnostics is displayed, all four LED's (STBY, Operate, Filter and Timer) are ON.
When system enters diagnostics mode, only one fault code is shown. Order of priority is from the lower to the higher number. Diagnostics is continuously ON as long as power is ON. The current system operation mode will not be changed.
If no fault occurred in the system, no fault code will be displayed during normal operation mode. The last fault code will be displayed even if the system has recovered from that fault. The last fault will be deleted from the EEPROM after the system has exit diagnostics mode.
In diagnostics mode, system fault / status will be indicated by blinking of Heat d Cool LEDs. The coding method will be as follows:
Heat LED will blink 5 times in 5 seconds, and then will be shut off for the next 5 seconds. Cool LED will blink during the same 5 seconds according to the following Indoor / Outdoor unit tables:
Note: 0 – OFF, 1-ON

### 12.3.1 Indoor unit Diagnostics

| No | Problem | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | RT-1 is disconnected | 0 | 0 | 0 | 0 | 1 |
| 2 | RT-1 is shorted | 0 | 0 | 0 | 1 | 0 |
| 3 | RT-2 is disconnected | 0 | 0 | 0 | 1 | 1 |
| 4 | RT-2 is shorted | 0 | 0 | 1 | 0 | 0 |
| 5 | Reserved | 0 | 0 | 1 | 0 | 1 |
| 7 | Communication mismatch | 0 | 0 | 1 | 1 | 1 |
| 8 | No Communication | 0 | 1 | 0 | 0 | 0 |
| 9 | No Encoder | 0 | 1 | 0 | 0 | 1 |
| 10 | Reserved | 0 | 1 | 0 | 1 | 0 |
| 11 | Outdoor Unit Fault | 0 | 1 | 0 | 1 | 1 |
| ... | Reserved | | | | | |
| 17 | Defrost protection | 1 | 0 | 0 | 0 | 1 |
| 18 | Deicing Protection | 1 | 0 | 0 | 1 | 0 |
| 19 | Outdoor Unit Protection | 1 | 0 | 0 | 1 | 1 |
| 20 | Indoor Coil HP Protection | 1 | 0 | 1 | 0 | 0 |
| 21 | Overflow Protection | 1 | 0 | 1 | 0 | 1 |
| 22 | Reserved | | | | | |
| 24 | EEPROM Not Updated | 1 | 1 | 0 | 0 | 0 |
| 25 | Bad EEPROM | 1 | 1 | 0 | 0 | 1 |
| 26 | Bad Communication | 1 | 1 | 0 | 1 | 0 |
| 27 | Using EEPROM data | 1 | 1 | 0 | 1 | 1 |
| 28 | Model A | 1 | 1 | 1 | 0 | 0 |
| 29 | Model B | 1 | 1 | 1 | 0 | 1 |
| 30 | Model C | 1 | 1 | 1 | 1 | 0 |
| 31 | Model D | 1 | 1 | 1 | 1 | 1 |

### 12.3.2 Indoor unit diagnosis and corrective actions

| No. | Fault | Probable Cause | Corrective Action |
|---|---|---|---|
| 1 | Sensor failures of all types | | Check sensor connections or replace sensor. |
| 2 | Communication mismatch | Indoor and Outdoor controllers are with different Versions. | Replace Indoor controller. |
| 3 | No Communication | Communication or grounding wiring is not good. | Check Indoor to Outdoor wiring and grounding. |
| 4 | No Encoder | Indoor electronics or motor. | Checkmotorwiring,ifok, replace motor, if still not ok, replace Indoor controller. |
| 5 | Outdoor Unit Fault | Outdoor controller problem. | Switch to Outdoor diagnostics. |
| 6 | EEPROM Not Updated | System is using ROM parameters and not EEPROM parameters. | No action, unless special parameters are required for unit operation. |
| 7 | Bad EEPROM | | No action, unless special parameters are required for unit operation. |
| 8 | Bad Communication | Communication quality is low Reliability. | Check Indoor to Outdoor wiring and grounding. |
| 9 | Using EEPROM data | No problem. System is using EEPROM parameters. | |

### 12.3.3 Outdoor Unit Diagnostics

| No | Problem | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|---|
| 1 | OCT is disconnected | 0 | 0 | 0 | 0 | 1 |
| 2 | OCT is shorted | 0 | 0 | 0 | 1 | 0 |
| 3 | CTT is disconnected | 0 | 0 | 0 | 1 | 1 |
| 4 | CTT is shorted | 0 | 0 | 1 | 0 | 0 |
| 5 | HST is disconnected (when enabled) | 0 | 0 | 1 | 0 | 1 |
| 6 | HST is shorted (when enabled) | 0 | 0 | 1 | 1 | 0 |
| 7 | OAT is disconnected (when enabled) | 0 | 0 | 1 | 1 | 1 |
| 8 | OAT is shorted (when enabled) | 0 | 1 | 0 | 0 | 0 |
| 9 | TSUC is disconnected (when enabled) | 0 | 1 | 0 | 0 | 1 |
| 10 | TSUC is shorted (when enabled) | 0 | 1 | 0 | 1 | 0 |
| 11 | IPM Fault | 0 | 1 | 0 | 1 | 1 |
| 12 | Bad EEPROM | 0 | 1 | 1 | 0 | 0 |
| 13 | DC under voltage | 0 | 1 | 1 | 0 | 1 |
| 14 | DC over voltage | 0 | 1 | 1 | 1 | 0 |
| 15 | AC under voltage | 0 | 1 | 1 | 1 | 1 |
| 16 | IDU/ODU Communication mismatch | 1 | 0 | 0 | 0 | 0 |
| 17 | No Communication | 1 | 0 | 0 | 0 | 1 |
| 18 | Reserved | 1 | 0 | 0 | 1 | 0 |
| 20 | Heat sink Over Heating | 1 | 0 | 1 | 0 | 0 |
| 21 | Deicing | 1 | 0 | 1 | 0 | 1 |
| 22 | Compressor Over Heating | 1 | 0 | 1 | 1 | 0 |
| 23 | Compressor Over Current | 1 | 0 | 1 | 1 | 1 |
| 24 | No OFAN Feedback | 1 | 1 | 0 | 0 | 0 |
| 25 | OFAN locked | 1 | 1 | 0 | 0 | 1 |
| 26 | Compressor Lock | 1 | 1 | 0 | 1 | 0 |
| 27 | Bad Communication | 1 | 1 | 0 | 1 | 1 |

1 - ON, 0 - OFF

Only one code is shown. Order of priorety is 1-24. Diagnostics is continuously ON as long power is on.

### 12.3.4 Outdoor unit diagnosis and corrective actions

| o. | Fault | Probable Cause | Corrective Action |
|---|---|---|---|
| | Sensors failures of all types | | Check sensors connections or replace sensors. |
| | IPM Fault | Electronics HW problem | Check all wiring and umper settings, if OK, replace electronics. |
| | Bad EEPROM | | No action, unless special parameters are required for unit operation. |
| | DC under/over Voltage | Electronics HW problem | Check outdoor unit power supply voltage |
| | AC under Voltage | | Check outdoor unit power supply voltage |
| | Indoor / Outdoor unit Communication mismatch | Indoor and Outdoor controllers are with different versions | Replace Indoor controller |
| | No Communication | Communication or grounding wiring is not good. | Check Indoor to Outdoor wiring and grounding |
| | Compressor Lock | | Switch unit to STBY and restart |
| | Bad Communication | Communication quality is low reliability | Check Indoor to Outdoor wiring and grounding |

## 12.4 Judgment by MegaTool

MegaTool is a special tool to monitor the system states.
Using MegaTool requires:

- A computer with RS232C port.
- A connection wire for MegaTool.
- A special MegaTool software.

Use MegaTool according to following procedure:

- Setup MegaTool software: copy the software to the computer.
- Connect RS232C port in computer with MegaTool port in Indoor/Outdoor unit controller by the connection wire.
- Run the software and choose the COM port, you can monitor the A/C system state in monitor tab.

## 12.5 Simple procedures for checking the Main Parts

### 12.5.1 Checking Mains Voltage.

Confirm that the Mains voltage is between 198 and 264 VAC. If Mains voltage is out of this range, abnormal operation of the system is *expected.* If in range check the Power (Circuit) Breaker and look for broken or loosed cable lugs or wiring mistake(s).

### 12.5.2 Checking Power Input.

If Indoor unit power LED is unlighted, power down the system and check the fuse of the Indoor unit. If the fuse is OK replace the Indoor unit controller. If the fuse has blown, replace the fuse and power up again.
Checking Power Input procedure for the Outdoor unit is the same as with the Indoor unit.

### 12.5.3 Checking the Outdoor Fan Motor.

Enter Test Mode (where the OFAN speed is high)
Check the voltage between lead wires according to the normal value as following:

- Between red wire and black wire: 310VDC +/- 20V
- Between orange wire and black wire: 15VDC +/- 1V
- Between yellow wire and black wire: 2-6VDC

### 12.5.4 Checking the Compressor.

The compressor is brushless permanence magnetic DC motor. Three coil resistance is same. Check the resistance between three poles. The normal value should be below 0.5 ohm (TBD).

### 12.5.5 Checking the Reverse Valve (RV).

Running in heating mode, check the voltage between two pins of reverse valve connector, normal voltage is 220VAC.

### 12.5.6 Checking the electrical expansion valve (EEV).

The EEV has two parts, drive part and valve. The drive part is a step motor the valve. Check the drive voltage (12VDC). When Outdoor unit is power on, EEV shall run and have click and vibration.

## 12.6 Precaution, Advise and Notice Items

### 12.6.1 High voltage in Outdoor unit controller.

Whole controller, including the wires that are connected to the Outdoor unit controller may have the potential hazard voltage when power is on. Touching the Outdoor unit controller may cause an electrical shock.
**Advise:** Don't touch the naked lead wire and don't insert finger, conductor or anything else into the controller when power is on.

### 12.6.2 Charged Capacitors

Three large-capacity electrolytic capacitors are used in the Outdoor unit controller. Therefore, charging voltage (380VDC) remains after power down. Discharging takes about four minutes after power is off. Touching the Outdoor unit controller before discharging may cause an electrical shock.

### 12.6.3 Additional advises

- When disassemble the controller or the front panel, turn off the power supply.
- When connecting or disconnecting the connectors on the PCB, hold the whole housing, dont pull the wire.
- There are sharp fringes and sting on shell. Use gloves when disassemble the A/C units.

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