DUNNAIR (Aust) Pty Ltd

R410a Refrigerant

# PHS25

*Rooftop Packaged*

## PERFORMANCE DATA

| INDOOR COIL ENTERING AIR TEMP $^0$c | | OUTDOOR COIL ENTERING TEMPERATURE $^0$C | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30°C | | | 35°C | | | 40°C | | | 45°C | | |
| DB °C | WB °C | Tot. Cap KW | Sens.Cap KW | LWB °C | Tot. Cap KW | Sens.Cap KW | LWB °C | Tot. Cap KW | Sens.Cap KW | LWB °C | Tot. Cap KW | Sens.Cap KW | LWB °C |
| 21 | 17 | 23.4 | 13.8 | 11.6 | 22.2 | 13.4 | 11.9 | 21.1 | 12.9 | 12.2 | 19.9 | 12.9 | 12.5 |
| | 18 | 24.2 | 12.4 | 12.0 | 23.0 | 12.0 | 13.0 | 21.8 | 11.5 | 13.3 | 20.7 | 11.1 | 13.5 |
| | 19 | 24.9 | 11.1 | 13.8 | 23.7 | 10.6 | 14.1 | 22.6 | 10.2 | 14.4 | 21.4 | 9.8 | 14.6 |
| | 20 | 25.8 | 9.7 | 14.9 | 24.5 | 9.2 | 15.2 | 23.3 | 8.7 | 15.5 | 22.2 | 8.3 | 15.8 |
| 23 | 17 | 23.4 | 16.4 | 11.6 | 22.2 | 15.9 | 11.9 | 21.1 | 15.5 | 12.2 | 19.9 | 15.0 | 12.5 |
| | 18 | 24.2 | 15.1 | 12.7 | 23.0 | 14.6 | 13.0 | 21.9 | 14.1 | 13.3 | 20.7 | 13.6 | 13.5 |
| | 19 | 24.9 | 13.6 | 13.7 | 23.7 | 13.2 | 14.0 | 22.6 | 12.7 | 14.2 | 21.4 | 12.3 | 14.5 |
| | 20 | 25.7 | 12.2 | 14.9 | 24.5 | 11.8 | 15.2 | 23.3 | 11.3 | 15.5 | 22.1 | 10.9 | 15.8 |
| | 21 | 26.6 | 10.9 | 16.0 | 25.3 | 10.4 | 16.2 | 24.1 | 10.0 | 16.5 | 22.9 | 9.6 | 16.8 |
| 25 | 17 | 23.5 | 18.8 | 11.6 | 22.3 | 18.3 | 11.9 | 21.3 | 17.8 | 12.1 | 20.1 | 17.3 | 12.4 |
| | 18 | 24.1 | 18.2 | 12.7 | 23.0 | 17.1 | 13.0 | 21.8 | 16.7 | 13.3 | 20.7 | 16.2 | 13.5 |
| | 19 | 24.9 | 17.5 | 13.7 | 23.7 | 15.7 | 14.0 | 22.6 | 15.3 | 14.2 | 21.4 | 14.8 | 14.5 |
| | 20 | 25.7 | 1.9 | 14.8 | 24.5 | 14.5 | 15.1 | 23.3 | 14.1 | 15.3 | 22.1 | 13.6 | 15.6 |
| | 21 | 26.5 | 16.2 | 15.9 | 25.3 | 13.0 | 16.2 | 24.1 | 12.6 | 16.5 | 22.9 | 12.1 | 16.8 |
| 27 | 17 | 23.7 | 20.9 | 11.5 | 22.7 | 20.3 | 11.8 | 21.6 | 19.7 | 12.0 | 21.0 | 19.1 | 12.3 |
| | 18 | 24.2 | 20.2 | 12.7 | 23.1 | 19.7 | 12.9 | 22.0 | 19.2 | 13.2 | 21.0 | 18.7 | 13.5 |
| | 19 | 24.9 | 18.7 | 13.6 | 23.8 | 19.1 | 13.7 | 22.5 | 17.9 | 14.2 | 22.0 | 17.4 | 14.5 |
| | 20 | 25.7 | 17.5 | 14.8 | 24.1 | 16.9 | 15.1 | 23.3 | 16.6 | 15.3 | 22.2 | 16.1 | 15.6 |
| | 21 | 26.5 | 16.0 | 16.0 | 24.9 | 15.6 | 16.2 | 24.1 | 15.1 | 16.5 | 22.9 | 14.7 | 16.8 |
| 29 | 17 | 24.1 | 22.9 | 11.4 | 23.1 | 22.1 | 11.6 | 22.1 | 21.4 | 11.9 | 21.1 | 21.1 | 12.1 |
| | 18 | 24.6 | 22.1 | 12.6 | 23.4 | 21.5 | 12.9 | 22.4 | 20.9 | 13.1 | 21.3 | 20.9 | 13.4 |
| | 19 | 25.0 | 21.4 | 13.7 | 23.8 | 20.9 | 14.0 | 22.7 | 20.5 | 14.3 | 21.5 | 20.0 | 14.5 |
| | 20 | 25.7 | 20.0 | 14.8 | 24.5 | 19.6 | 15.0 | 23.3 | 19.2 | 15.3 | 22.1 | 18.7 | 15.6 |
| | 21 | 26.5 | 18.6 | 15.9 | 25.3 | 18.1 | 16.2 | 24.0 | 17.7 | 16.5 | 22.9 | 17.2 | 16.8 |
| 31 | 17 | 24.7 | 24.7 | 11.2 | 23.7 | 23.7 | 11.5 | 22.8 | 22.8 | 11.7 | 21.9 | 21.9 | 12.0 |
| | 18 | 25.0 | 23.9 | 12.4 | 24.0 | 23.2 | 12.7 | 22.8 | 22.8 | 12.9 | 21.9 | 21.9 | 13.2 |
| | 19 | 25.4 | 23.3 | 13.5 | 24.3 | 22.7 | 13.8 | 22.8 | 22.8 | 14.0 | 21.9 | 21.9 | 14.3 |
| | 20 | 25.8 | 22.5 | 14.7 | 24.6 | 22.0 | 15.0 | 23.4 | 21.6 | 15.2 | 22.3 | 21.2 | 15.5 |
| | 21 | 26.5 | 21.2 | 15.9 | 25.2 | 20.7 | 16.2 | 24.0 | 20.2 | 16.5 | 22.9 | 19.8 | 16.7 |

Capacity multipliers should be applied to the above capacities to adjust for reduced or increased air flow.

## Technical Specification PHS25 Rooftop Packaged Model

| | | | |
|---|---|---|---|
| Total Cooling Capacity (kW)* | 23.8 | Number of Compressors | 1 |
| Sensible Cooling Capacity (kW)* | 19.1 | Power Requirements (Volt /Phase) | 415 / 3 |
| Heating Capacity (kW)** | 24.2 | Normal Max. Current (Amps /Phase) | 22.4 |
| Nominal Evaporator Air Flow (L/S) | 1390 | Power Input (kW) | 10.1 |
| *Entering air @ 27/19 °C and ambient 35°C | | ** Entering air @ 21 °C DB and 7°C ambient | |

## Cooling Performance Correction

| Capacity | % Rated Air Quantity - Nominal 1390 l/s | | | | |
|---|---|---|---|---|---|
| | 80 | 90 | 100 | 110 | 120 |
| Total Cooling | 0.95 | 0.98 | 1.00 | 1.02 | 1.04 |
| Sensible Cooling | 0.89 | 0.95 | 1.00 | 1.05 | 1.09 |

## Heating Performance Data

| Outdoor Coil Entering DB temperature °C | | | | | |
|---|---|---|---|---|---|
| | 0 | 4 | 8 | 12 | 18 |
| Heating Capacity (kW) | 20.4 | 22.0 | 25.2 | 26.5 | 30.0 |

## Heating Performance Correction

| % Rated Air Quantity | Multiplier | Return Air Temp °C | Multiplier | Outdoor Air Temp °C | Approx. Defrost Factor |
|---|---|---|---|---|---|
| 80 | 0.93 | 15 | 1.05 | 0 | 0.80 |
| 90 | 0.97 | 18 | 1.03 | 2 | 0.78 |
| 100 | 1.00 | 21 | 1.00 | 4 - 6 | 0.75 |
| 110 | 1.03 | 24 | 0.97 | 7 | 0.87 |
| 120 | 1.05 | 27 | 0.95 | 8 | 1.00 |

## Compressor

| | |
|---|---|
| Number Per Unit | 1 |
| Type | Scroll |
| RPM (Nom) | 2900 |
| Normal Max Current (Amps /Phase) | 18.0 |
| Locked Rotor Current (Amps /Phase) | 96 |
| Displacement ($m^3/h$) | 17.6 |

## Electrical Controls and Safeties

| | | | |
|---|---|---|---|
| High Pressure Switch (Setting kPa) | 4000 | Defrost | |
| Low Pressure Switch (Setting kPa) | 300 | Initiation Temperature (°C) | -2 |
| Indoor Fan Overload | Internal | Termination Temperature (°C) | 18 |
| Outdoor Fan Overload | Internal | Min. Period Between De-Ice (min) | 30 |
| Compressor Delay Timer | 300 sec | Max De-Ice Period (min) | 10 |

## Standard Features

| | |
|---|---|
| Auto reset high pressure and auto reset low pressure cutouts | |
| Thermal overload protection on all motors | Suction line accumulator |
| Compressor crankcase heater | Automatic de-ice system |
| Limit start timer (anti short cycling) | Thermally insulated indoor unit |

## Evaporator Coil

| | |
|---|---|
| Type | Copper Tube / Aluminium Fins |
| Face Area ($m^2$) | 0.61 |
| Air Quantity (l/s) | 1390 |

## Evaporator Fan

| | |
|---|---|
| Number of Fans | 1 |
| Type | Centrifugal |
| Drive | Direct |
| Motor Voltage /Phase /Frequency | 415 /3 /50 |
| Motor Power (kW) | 1.1 |
| Maximum Fan Speed (rpm) | 1147 |

## Electrical

| | |
|---|---|
| Power Requirements | 3 Phase /415V /50Hz |
| Normal Max. Current (Amps /Phase) | 22.4 |

## Condenser Coil

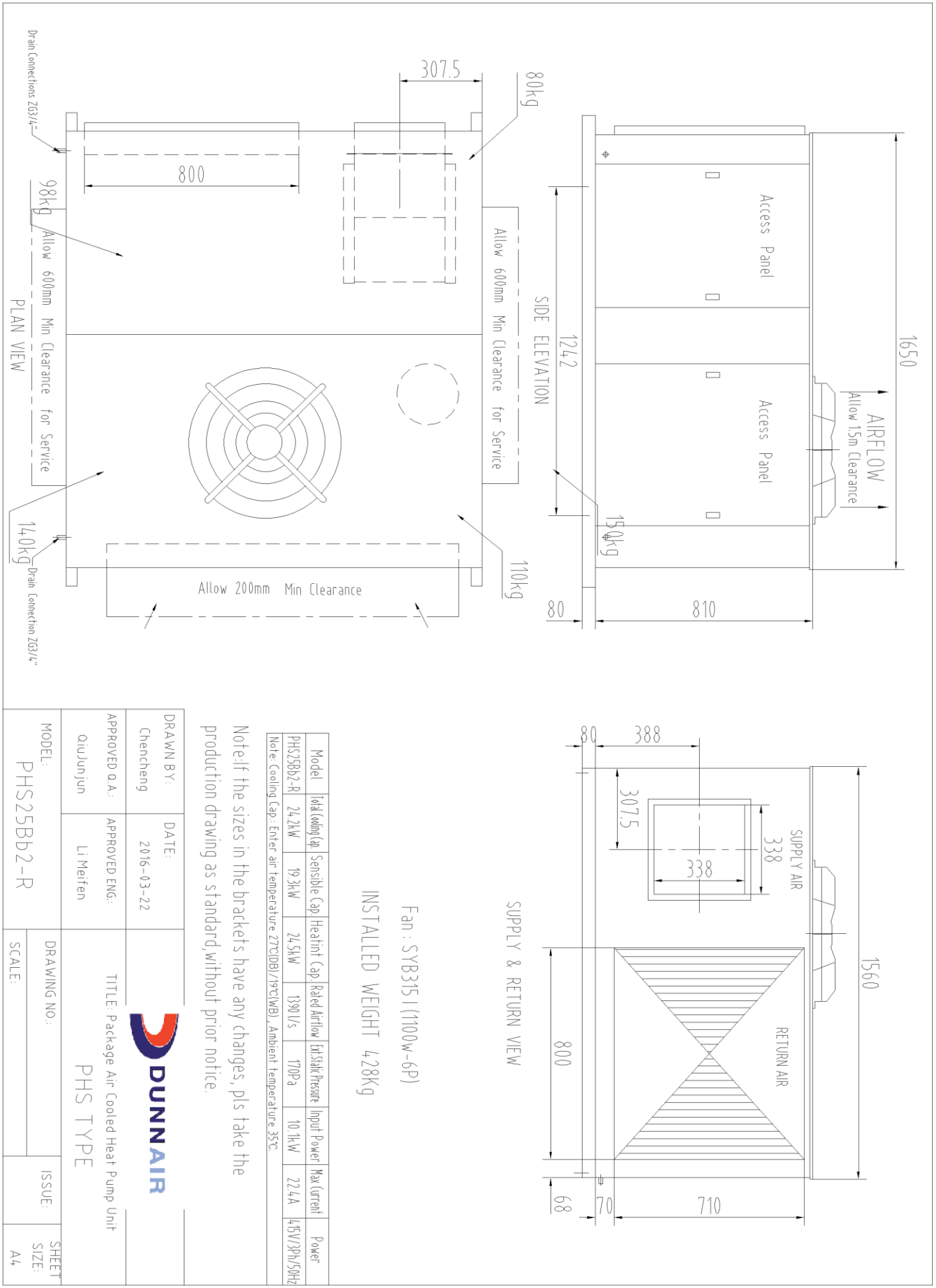
| | |
|---|---|
| Type | Copper Tube /Aluminium Fins |
| Face Area($m^2$) | 1.0 |

## Condenser Fan

| | |
|---|---|
| Number of Fans | 1 |
| Type | Axial |
| Drive | Direct |
| Motor Watts /rpm | 370 / 950 |
| Motor Voltage /Phase /Frequency | 415 / 3 / 50 |

## Refrigeration System

| | |
|---|---|
| Refrigerant Type | R410A |
| Charge(kg) | 7.2 |
| Service Connections | Rotor Lock Valves |
| Expansion Control - In / Outdoor unit | TX Valve |




| Model | Total cooling Cap. | Sensible Cap. | Heating Cap. | Rated Airflow | Ext.Static Pressure | Input Power | Max Current | Power |
|---|---|---|---|---|---|---|---|---|
| PHS25Bb2-R | 24.2kW | 19.3kW | 24.5kW | 1390 l/s | 170Pa | 10.1kW | 22.4A | 415V/3Ph/50Hz |

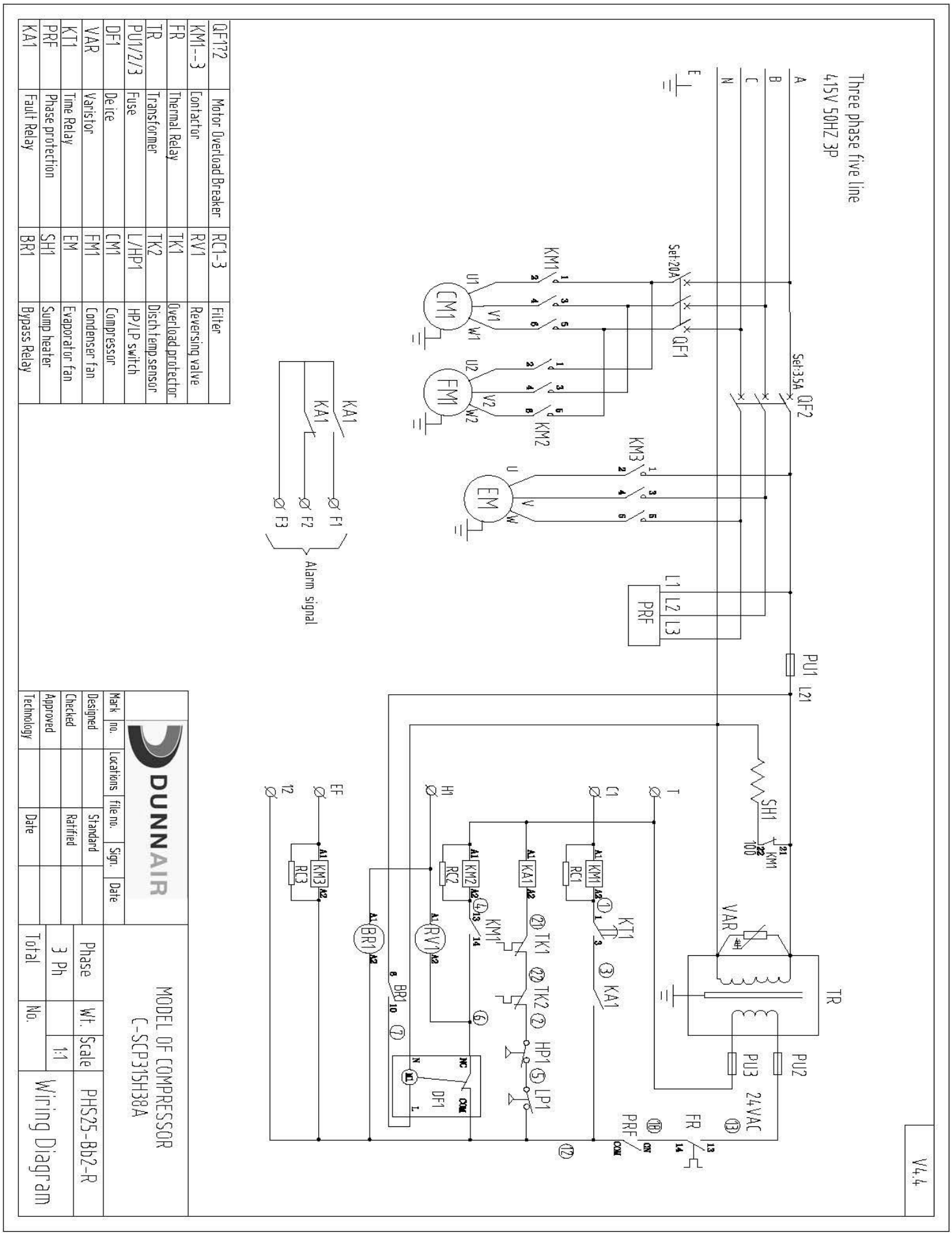
Note: Cooling Cap.: Enter air temperature 27°C(DB)/19°C(WB), Ambient temperature 35°C.

Fan : SYB315 I (1100w-6P)

INSTALLED WEIGHT 428Kg

Note:If the sizes in the brackets have any changes, pls take the production drawing as standard,without prior notice.

| | | | |
|---|---|---|---|
| DRAWN BY: Chencheng | DATE: 2016-03-22 | DUNNAIR | |
| APPROVED Q.A.: QiuJunjun | APPROVED ENG.: Li Meifen | TITLE: Package Air Cooled Heat Pump Unit PHS TYPE | |
| MODEL: PHS25Bb2-R | | DRAWING NO.: | ISSUE: |
| | | SCALE: | SHEET SIZE: A4 |




| | |
|---|---|
| QF1?2 | Motor Overload Breaker |
| KM1--3 | Contactor |
| FR | Thermal Relay |
| TR | Transformer |
| PU1/2/3 | Fuse |
| DF1 | De ice |
| VAR | Varistor |
| KT1 | Time Relay |
| PRF | Phase protection |
| KA1 | Fault Relay |

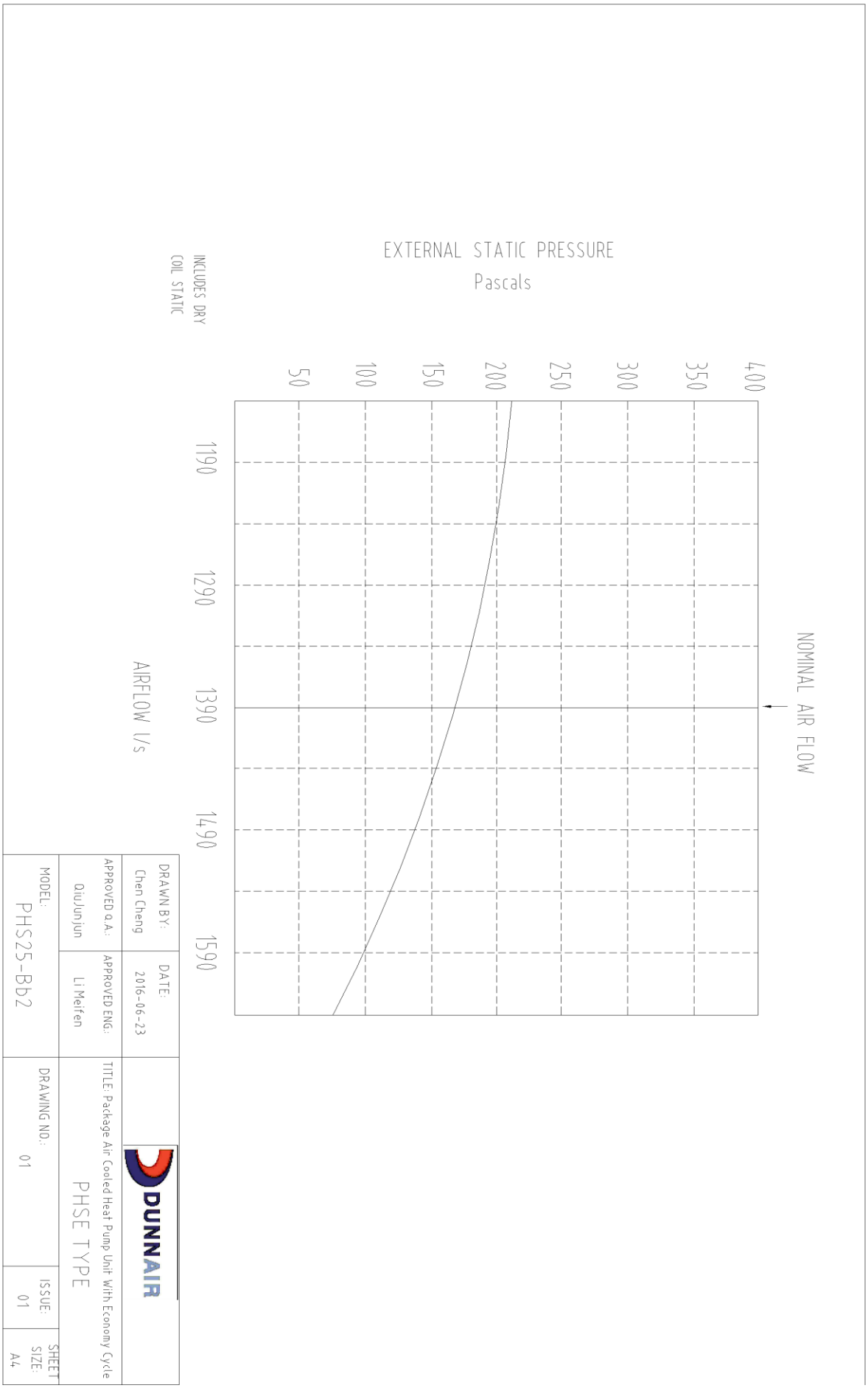
| | |
|---|---|
| RC1-3 | Filter |
| RV1 | Reversing valve |
| TK1 | Overload protector |
| TK2 | Disch.temp.sensor |
| L/HP1 | HP/LP switch |
| CM1 | Compressor |
| FM1 | Condenser fan |
| EM | Evaporator fan |
| SH1 | Sump heater |
| BR1 | Bypass Relay |

| Mark | no. | Locations | file no. | Sign. | Date |
|---|---|---|---|---|---|
| Designed | | | Standard | | |
| Checked | | | Ratified | | |
| Approved | | | | | |
| Technology | | | Date | | |

DUNNAIR

MODEL OF COMPRESSOR
C-SCP315H38A

| Phase | Wt. | Scale | PHS25-Bb2-R |
|---|---|---|---|
| 3 Ph | | 1:1 | |
| Total | No. | | Wiring Diagram |


EXTERNAL STATIC PRESSURE
Pascals
50
100
150
200
250
300
350
400
NOMINAL AIR FLOW
INCLUDES DRY COIL STATIC
1190
1290
1390
1490
1590
AIRFLOW l/s
DRAWN BY: Chen Cheng
DATE: 2016-06-23
APPROVED Q.A.: QiuJunjun
APPROVED ENG: Li Meifen
DUNNAIR
TITLE: Package Air Cooled Heat Pump Unit With Economy Cycle
PHSE TYPE
MODEL: PHS25-Bb2
DRAWING NO.: 01
ISSUE: 01
SHEET SIZE: A4

## PHS25 Sound Pressure Curve

### A Class: 73.9dB

| Hz | dB |
|---|---|
| 64Hz | 77.1 |
| 125Hz | 72.1 |
| 250Hz | 71.3 |
| 500Hz | 70.0 |
| 1000Hz | 69.0 |
| 2000Hz | 68.2 |
| 4000Hz | 57.3 |
| 8000Hz | 50.3 |


Note: Occupant at least 1.0m from sound source.

| | | | | |
|---|---|---|---|---|
| DRAWN BY: Chen Cheng | DATE: 2016-06-25 | DUNNAIR | | |
| APPROVED Q.A.: QiuJunjun | APPROVED ENG.: Li Meifen | TITLE: Packaged Air Cooled Heat Pump Unit PHS TYPE | | |
| MODEL: PHS25 | | DRAWING NO.: 01 | ISSUE: 01 | SHEET SIZE: A4 |