DUNNAIR (Aust) Pty Ltd

R407c Refrigerant

PHE90

Economy Cycle Rooftop Package

Performance Data

INDOOR COIL ENTERING AIR TEMP °C		OUTDOOR COIL ENTERING AIR TEMPERATURE °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	86.7	67.3	12.3	82.3	65.5	12.4	77.5	63.7	12.4	74.6	61.9	12.6
	18	90.0	61.2	13.2	85.7	59.6	13.3	80.9	57.8	13.5	77.8	56.2	13.8
	19	92.5	55.1	14.4	88.5	53.4	14.4	83.1	51.5	14.7	80.3	49.6	14.9
	20	94.8	48.7	15.3	90.6	47.1	15.6	85.4	45.4	15.6	82.9	43.8	15.7
23	17	87.1	73.2	12.1	82.6	71.4	12.4	78.0	69.6	12.6	74.6	67.8	12.9
	18	90.0	67.1	13.1	85.8	65.5	13.4	81.1	63.7	13.6	77.9	62.1	13.8
	19	92.9	61.0	14.2	88.5	59.3	14.4	83.2	57.4	14.7	80.4	55.6	15.0
	20	95.3	54.6	15.2	90.9	53.1	15.5	85.8	51.1	15.8	83.1	49.4	16.1
	21	98.3	48.4	16.3	93.1	46.7	16.6	88.0	44.8	16.8	84.5	43.1	17.2
25	17	87.4	79.1	12.0	82.9	77.3	12.3	78.0	75.4	12.5	74.9	73.3	12.9
	18	90.1	73.0	13.3	86.0	71.4	13.3	81.2	69.5	13.6	78.0	67.7	13.9
	19	93.2	66.8	14.2	88.5	65.2	14.4	83.0	63.2	14.5	80.4	61.4	14.8
	20	95.3	60.5	15.1	90.8	58.8	15.5	86.1	57.0	15.7	83.2	55.2	15.9
	21	98.6	54.2	16.3	93.4	52.5	16.5	88.2	50.7	16.8	84.8	49.1	17.1
27	17	88.1	84.9	11.9	83.6	82.6	12.2	79.1	78.0	12.5	75.1	73.7	12.8
	18	90.8	78.8	13.7	86.7	77.3	13.7	81.0	75.4	13.4	78.4	72.9	13.9
	19	94.1	72.8	14.0	88.5	71.0	14.4	84.2	69.1	14.4	80.9	67.3	14.9
	20	96.0	66.3	15.1	91.4	64.7	15.6	86.9	62.9	15.6	83.5	61.2	16.0
	21	99.2	60.1	16.6	94.2	58.4	16.9	89.3	56.6	16.5	86.0	54.8	17.0
29	17	89.4	88.1	11.8	84.9	82.6	12.1	80.4	78.5	12.5	76.1	74.1	12.7
	18	91.4	84.7	13.6	87.1	78.1	13.6	82.2	76.3	13.4	78.7	74.1	13.8
	19	94.1	78.5	14.1	88.7	76.9	14.4	85.3	75.0	14.5	81.4	73.2	14.8
	20	96.2	72.2	15.0	91.4	70.6	15.5	88.1	68.8	15.6	83.9	66.9	15.9
	21	99.3	66.0	16.5	94.3	64.3	16.8	90.4	62.5	16.5	87.1	60.5	16.8
31	17	91.8	91.6	11.6	87.4	86.6	11.9	83.7	82.8	12.1	78.7	78.1	12.4
	18	93.5	90.2	13.4	89.3	85.1	13.4	85.6	84.9	13.2	81.5	80.8	13.5
	19	96.4	89.8	14.0	92.9	84.7	14.3	89.2	83.2	14.3	84.2	80.4	14.6
	20	98.6	84.1	14.8	94.1	78.8	15.5	90.8	76.4	15.5	85.9	73.9	15.8
	21	101.5	77.8	16.3	96.5	76.2	16.6	93.1	73.5	16.5	89.3	70.5	16.7

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

Technical Specification PHE90 Economy Cycle Rooftop Package

Total Cooling Capacity (kW)*	88.5	Number of Compressors	2
Sensible Cooling Capacity (kW)*	71.0	Power Requirements (Volt / Phase)	415 / 3
Heating Capacity (kW)**	85.0	Normal Max. Current (Amps / Phase)	72.6
Nominal Evaporator Air Flow (l/s)	4800		

*Entering air @ 27/19°C and ambient 35°C ** Entering air @ 21°C DB and 7°C ambient

Air Quantity Multiplying Factors

	% Rated Air Quantity-Nominal 4800 l/s				
Capacity	80	90	100	110	120
Total	0.95	0.98	1.00	1.02	1.04
Sensible	0.89	0.95	1.00	1.05	1.09

Heating Performance Data

Outdoor Coil Entering DB temp					
	0	4	8	12	18
Heating Capacity kW	68.9	75.8	87.6	96.1	114

Heating Performance Correction

% Rated Air Quality	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	2
Type	Scroll
RPM (Nom)	2900
Normal Max. Current (Amps / Phase)	2 × 29
Locked Rotor Current (Amps / Phase)	2 × 175
Displacement (m^3/h)	2 × 43.5

Electrical Controls and Safeties

High Pressure Switch (Setting kPa)	2800	Defrost	
Low Pressure Switch (Setting kPa)	100	Initiation Temperature (°C)	-4
Indoor Fan Overload	Internal	Termination Temperature (°C)	10
Outdoor Fan Overload	Internal	Min. Period Between De-Ice (min)	33
Compressor Delay Timer	300 sec	Max. De-Ice Period (min)	4

Standard Features

Manual 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

Type	Copper Tube / Aluminium Fins
Face Area (m^2)	2 × 0.9
Air Quantity (l/s)	4800

Evaporator Unit (Indoor)

Number of Fans	1
Type	Centrifugal
Drive	Belt
Motor Voltage / Phase / Frequency	415 / 3 / 50
Motor (kW) Standard	5.5
Maximum Fan Speed (rpm)	700

Electrical

Power Requirements	3 Phase / 415V / 50Hz
Normal Max. Current (Amps / Phase)	72.6

Condenser

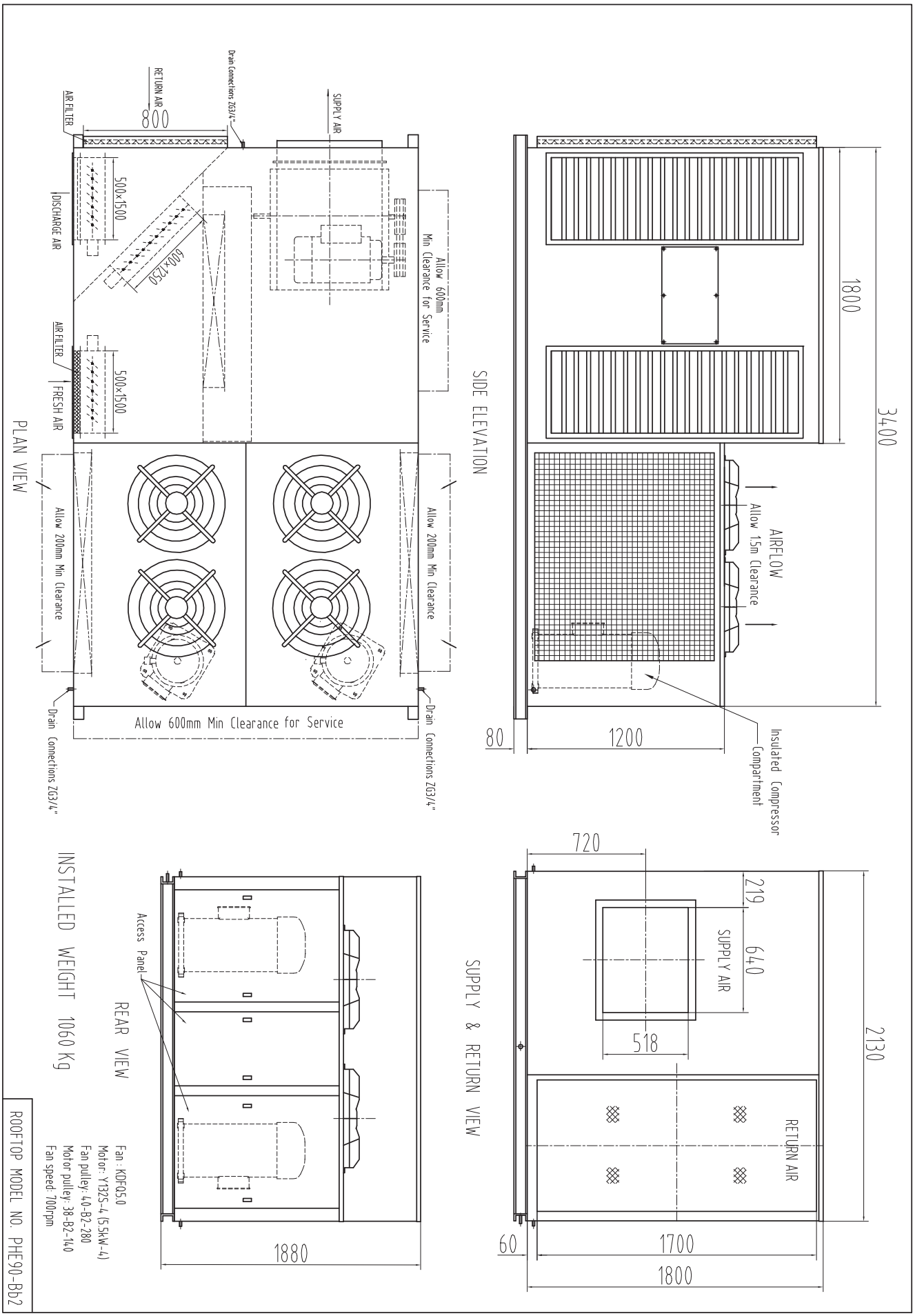
Type	Copper Tube / Aluminium Fins
Face Area (m^2)	2 × 1.36

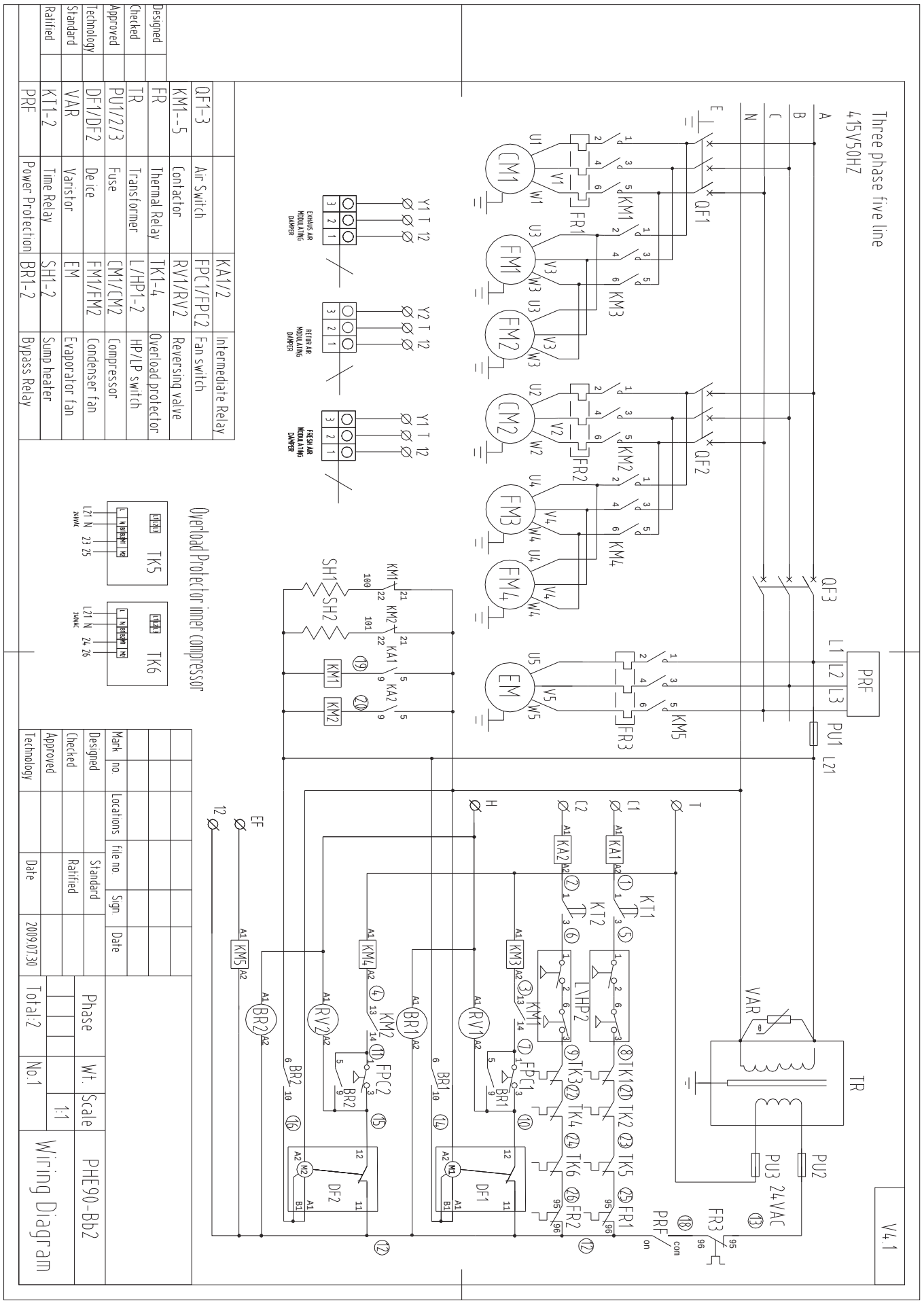
Condenser Unit (Outdoor)

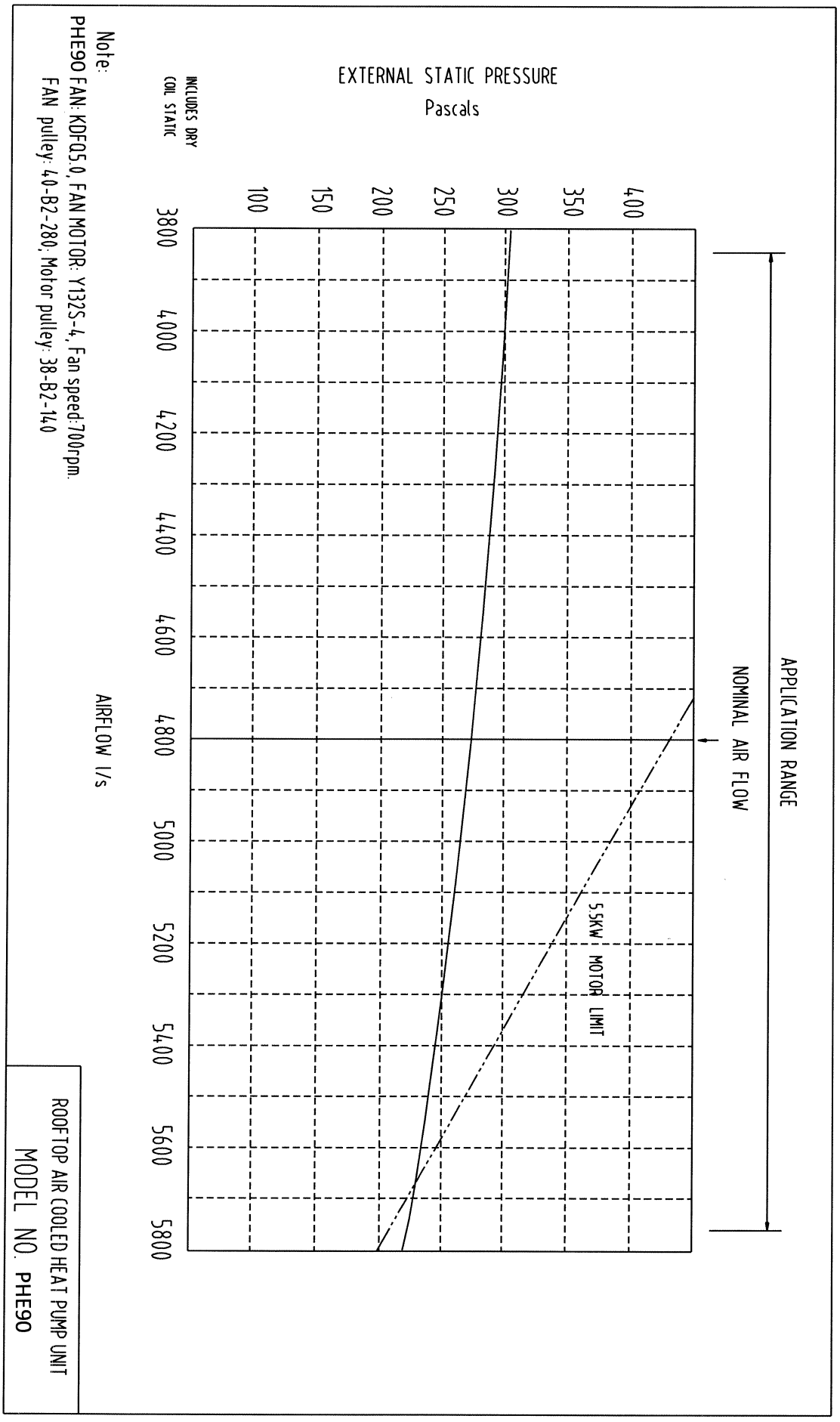
Number of Fans	4
Type	Axial
Drive	Direct
Motor Watts / rpm	300 / 950
Motor Voltage / Phase / Frequency	415 / 3 / 50

Refrigeration System

Refrigerant Type	R407c
Charge (kg)	2 × 10.8
Service Connections	Rotor Lock Valves
Expansion Control – in outdoor unit	TX Valve


PLAN VIEW
RETURN AIR
800
AIR FILTER
Drain Connections ZG3/4"
SUPPLY AIR
DISCHARGE AIR
500x1500
600x1250
AIR FILTER
FRESH AIR
500x1500
Allow 600mm Min Clearance for Service
Allow 200mm Min Clearance
Allow 200mm Min Clearance
Drain Connections ZG3/4"
Drain Connections ZG3/4"
Allow 600mm Min Clearance for Service
SIDE ELEVATION
1800
3400
AIRFLOW
Allow 1.5m Clearance
80
1200
Insulated Compressor Compartment
SUPPLY & RETURN VIEW
720
219
640
SUPPLY AIR
518
2130
RETURN AIR
60
1700
1800
REAR VIEW
Access Panel
1880
INSTALLED WEIGHT 1060 Kg
Fan : KDF05.0
Motor: Y132S-4 (5.5kW-4)
Fan pulley: 40-B2-280
Motor pulley: 38-B2-140
Fan speed: 700rpm
ROOFTOP MODEL NO. PHE90-Bb2


Three phase five line
415V50HZ
V4.1
Overload Protector inner compressor
Wiring Diagram
PHE90-Bb2
Total:2
No.1
Phase
Wt.
Scale
1:1
2009.07.30
Date
Sign.
File no.
Locations
No.
Mark
Designed
Checked
Approved
Technology
Standard
Ratified
QF1-3 Air Switch
KM1--5 Contactor
FR Thermal Relay
TR Transformer
PU1/2/3 Fuse
DF1/DF2 De ice
VAR Varistor
KT1-2 Time Relay
PRF Power Protection
KA1/2 Intermediate Relay
FPC1/FPC2 Fan switch
RV1/RV2 Reversing valve
TK1-4 Overload protector
L/HP1-2 HP/LP switch
CM1/CM2 Compressor
FM1/FM2 Condenser fan
EM Evaporator fan
SH1-2 Sump heater
BR1-2 Bypass Relay
EXHAUS AIR MODULATING DAMPER
RETUR AIR MODULATING DAMPER
FRESH AIR MODULATING DAMPER
PRF com on


EXTERNAL STATIC PRESSURE
Pascals
INCLUDES DRY COIL STATIC
100
150
200
250
300
350
400
3800
4000
4200
4400
4600
4800
5000
5200
5400
5600
5800
AIRFLOW l/s
APPLICATION RANGE
NOMINAL AIR FLOW
5.5KW MOTOR LIMIT
Note:
PHE90 FAN: KDF05.0, FAN MOTOR: Y132S-4, Fan speed:700rpm.
FAN pulley: 40-B2-280; Motor pulley: 38-B2-140
ROOFTOP AIR COOLED HEAT PUMP UNIT
MODEL NO. PHE90

PHE90 Noise rate analysing chart

A Class: 79.9dB

Hz	dB
64Hz	85.8
125Hz	76.8
250Hz	76.2
500Hz	77.8
1000Hz	76.3
2000Hz	70.6
4000Hz	64.6
8000Hz	54.5

Noise rate analysing chart (A Class: 79.9dB) dB