



**DUNNAIR**  
(Aust) Pty Ltd

**PHE160**

*Economy Cycle Rooftop Packaged*

R410A Refrigerant

**PERFORMANCE DATA**

INDOOR COIL ENTERING AIR TEMP °C		OUTDOOR COIL ENTERING TEMPERATURE °C											
		30°C			35°C			40°C			45°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
DB °C	WB °C												
21	17	153.1	94.6	10.9	145.3	91.4	11.2	136.9	87.8	11.6	131.1	87.8	11.8
	18	158.6	85.4	11.5	150.4	81.9	12.3	141.5	78.1	12.6	136.0	75.7	12.9
	19	164.3	75.7	13.2	155.9	72.3	13.5	146.8	68.4	13.9	141.1	66.2	14.1
	20	170.6	65.6	14.1	161.7	61.9	14.5	152.1	58.0	14.9	146.8	55.7	15.2
23	17	153.8	113.1	10.8	145.9	109.9	11.2	137.5	106.2	11.5	131.7	103.9	11.8
	18	158.6	103.7	11.9	150.4	100.2	12.2	141.5	96.4	12.6	136	93.9	12.9
	19	164.3	93.9	13	155.7	90.6	13.4	146.6	86.9	13.8	141.1	84.5	14.1
	20	170.4	83.9	14.1	161.7	80.2	14.5	152.1	76.3	14.9	146.6	74	15.1
	21	177	73.8	15.1	167.7	70.1	15.5	157.7	66	15.9	152.3	63.6	16.2
25	17	155.3	130.1	10.7	147.3	126.4	11.0	139.0	122.6	11.4	137.3	120.0	11.7
	18	159.0	125.8	12.0	150.8	119.3	12.3	142.0	115.5	12.7	136.4	113.1	13.0
	19	164.1	119.8	13.0	155.7	108.8	13.4	146.6	105.2	13.8	140.9	102.8	14.0
	20	170.4	112.9	14.1	161.5	98.7	14.5	151.9	94.6	14.9	146.6	92.5	15.1
	21	176.6	105.4	15.1	167.7	82.1	15.5	157.7	84.3	15.9	152.3	82.1	16.1
27	17	162.0	144.3	10.6	150.6	140.0	10.9	142.4	135.1	11.3	137.3	132.0	11.6
	18	163.5	141.1	11.8	152.3	137.6	12.1	143.5	133.8	12.5	139.5	131.4	12.7
	19	165.8	130.9	12.8	156.2	127.5	13.2	146.9	123.7	13.6	141.5	121.3	13.8
	20	170.6	121.7	14.0	161.5	118.1	14.3	151.9	114.2	14.7	146.6	112.1	14.9
	21	176.6	110.3	15.1	167.5	106.6	15.5	157.5	102.6	15.9	152.1	100.4	16.1
29	17	162.0	149.1	10.5	154.6	151.2	10.9	146.6	145.1	11.3	141.5	141.5	11.5
	18	163.5	146.6	11.7	155.5	148.8	12.1	146.9	144.3	12.5	141.5	141.5	12.7
	19	165.8	144.0	12.9	157.5	147.1	13.2	148.2	143.2	13.6	141.5	135.2	13.9
	20	170.6	139.6	14.0	161.7	135.9	14.3	152.1	131.6	14.8	146.8	129.7	15.0
	21	176.6	128.6	15.1	167.5	124.9	15.5	157.5	120.9	15.9	152.1	118.7	16.1
31	17	167.1	166.7	10.2	160.0	160.0	10.5	152.1	152.0	10.9	147.5	147.5	11.1
	18	168.0	164.7	11.5	160.2	159.6	11.8	152.1	152.0	12.2	147.5	147.5	12.5
	19	168.8	163.0	12.7	160.6	159.0	13.1	152.1	151.7	13.5	147.5	147.5	13.7
	20	171.7	158.7	13.9	163.0	155.2	14.3	150.8	149.8	14.7	148.0	147.1	15.0
	21	176.8	148.2	15.1	167.7	144.5	15.5	140.1	139.7	15.9	152.3	138.3	16.2

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



## Technical Specification PH160 Rooftop Packaged Model

Total Cooling Capacity (kW)*	156.2	Number of Compressors	2
Sensible Cooling Capacity (kW)*	127.5	Power Requirements (Volt /Phase)	415 / 3
Heating Capacity (kW)**	152.5	Normal Max. Current (Amps /Phase)	128.9
Nominal Evaporator Air Flow (L/S)	8500	Power Input (kW)	59.5
*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 8500 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)	119.2	131.6	152.5	167.6	201.6
Heating cap. Is based on 21 °C DB. Frost formation will have greatest effect at amb. 4-6 °C. Above 8 °C defrost is unlikely & a factor of 1 may be used.					

### 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	2
Type	Hermetic Scroll
RPM (Nom)	2900
Normal Max Current (Amps /Phase)	2 x 46.6
Locked Rotor Current (Amps /Phase)	2 x 260
Displacement (m³/h)	2 x 49.7

### Electrical Controls and Safeties

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

### Standard Features

Auto reset high pressure and 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)	25 mm insulation to indoor unit
240 Volt Control	Sight Glass

### Evaporator (Coil)

Type	Copper Tube / Aluminium Fins
Face Area (m²)	2 x 1.38
Air Quantity (l/s)	8500

### Evaporator (Fan Motor) #

Number of Fans	1
Type	Centrifugal
Drive	Belt
Motor Voltage /Phase /Frequency	415 /3 /50
Motor Power (kW)	11.0
Maximum Fan Speed (rpm)	660

### Electrical

Power Requirements	3 Phase /415V /50Hz
Normal Max. Current (Amps /Phase)	128.9

### Condenser (Coil)

Type	Copper Tube /Aluminium Fins
Face Area(m²)	2 x 2.51

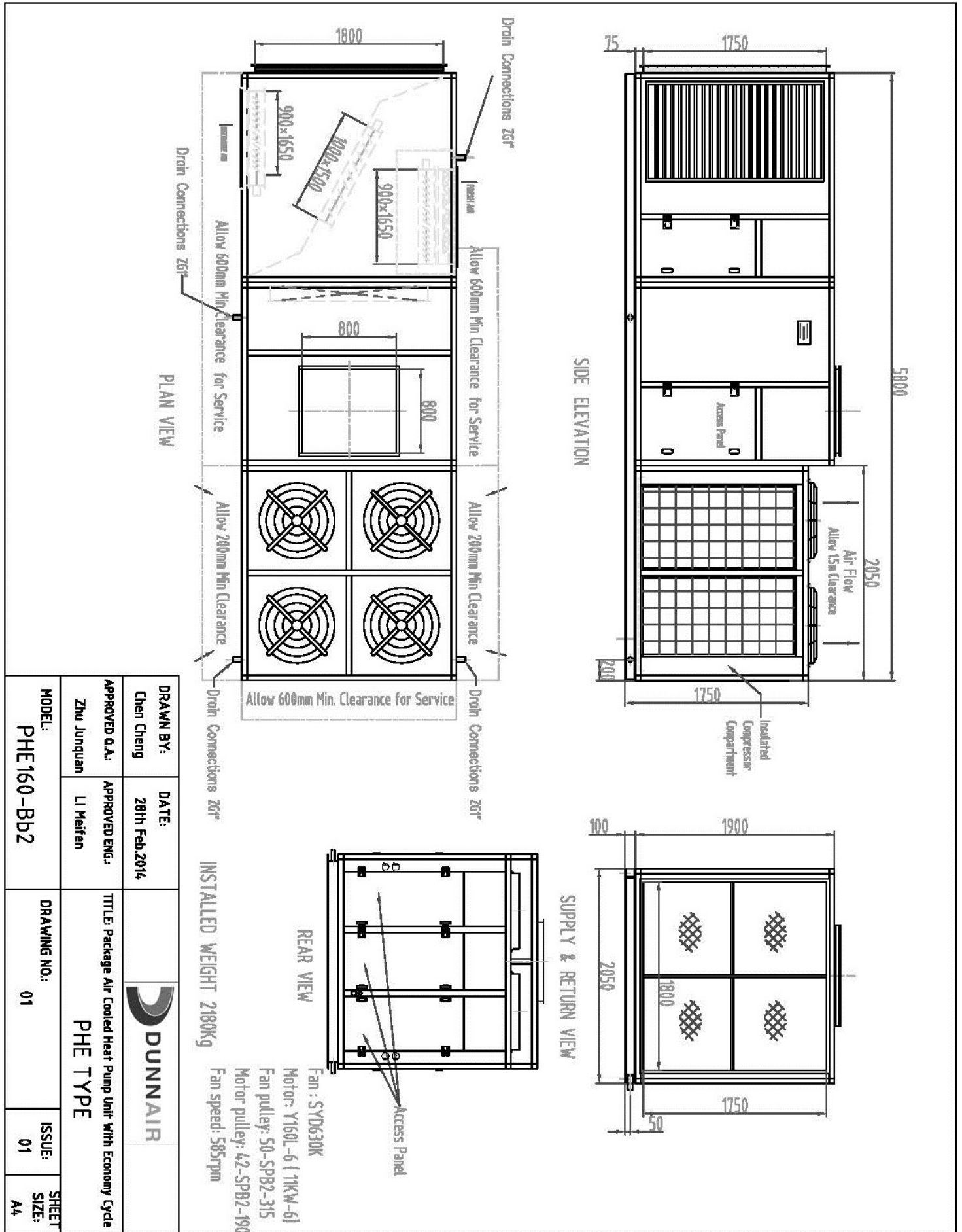
### Condenser (Fan Motor)

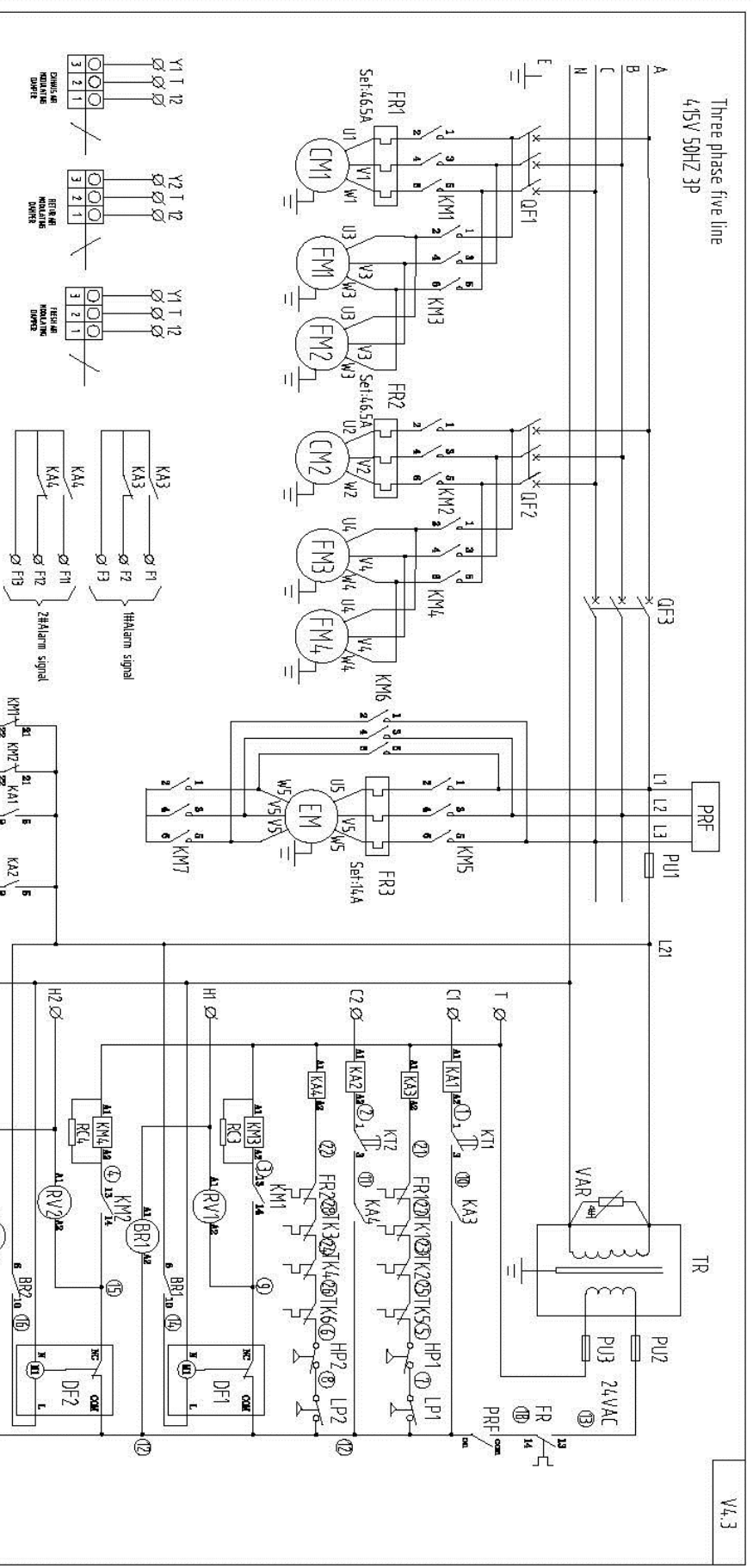
Number of Fans	4
Type	Axial
Drive	Direct
Motor Type	Enclosed
Motor Power (kW)	4 x 0.75
Motor Voltage /Phase /Frequency	415 / 3 / 50

### Refrigeration System

Refrigerant Type	R410A
Charge(kg)	2 x 18.8
Service Connections	Rotor Lock Valves
Expansion Control - In / Outdoor unit	TX Valve

# Evaporator unit is supplied with a variable speed motor pulley.

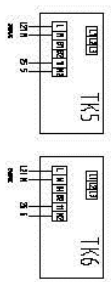




V4.3

QF1/3	Motor Overload Breaker	RC1-7	Filter
KM1-7	Contactors	RV1/RV2	Reversing valve
FR1-3	Thermal Relay	TK1-4	Overload protector
TR	Transformer	TK5-6	Disch temp sensor
PU1/2/3	Fuse	L/HP1-2	HP/LP switch
DF1/DF2	Deice	CM1/CM2	Compressor
VAR	Varistor	FM1-4	Condenser fan
K1-3	Time Relay	EM	Evaporator fan
PRF	Phase protection	SH1-2	Sump heater
KA1-2	Intermediate relay	BR1-2	Bypass Relay
KA3-4	Fault Relay		

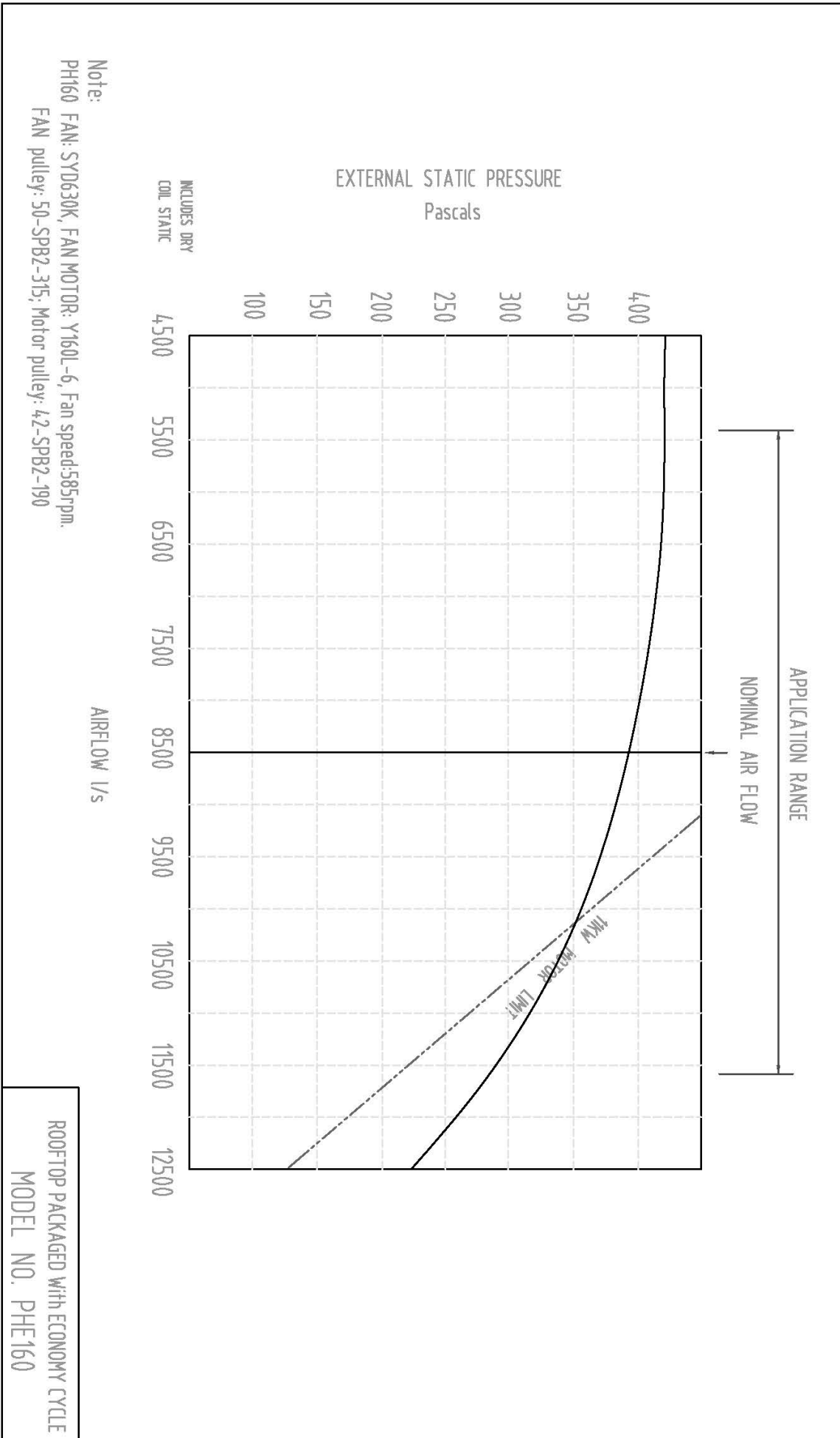
SY300 Overload Protector inner compressor



**MODEL OF COMPRESSOR**  
SY300-4

Mark. no.	Locations	File no.	Sign.	Date
Designed		Standard		
Checked		Ratified		
Approved				
Technology				

Phase	3 Ph	Scale	PHE160-Bb2-C
Total	No.	Wiring Diagram	

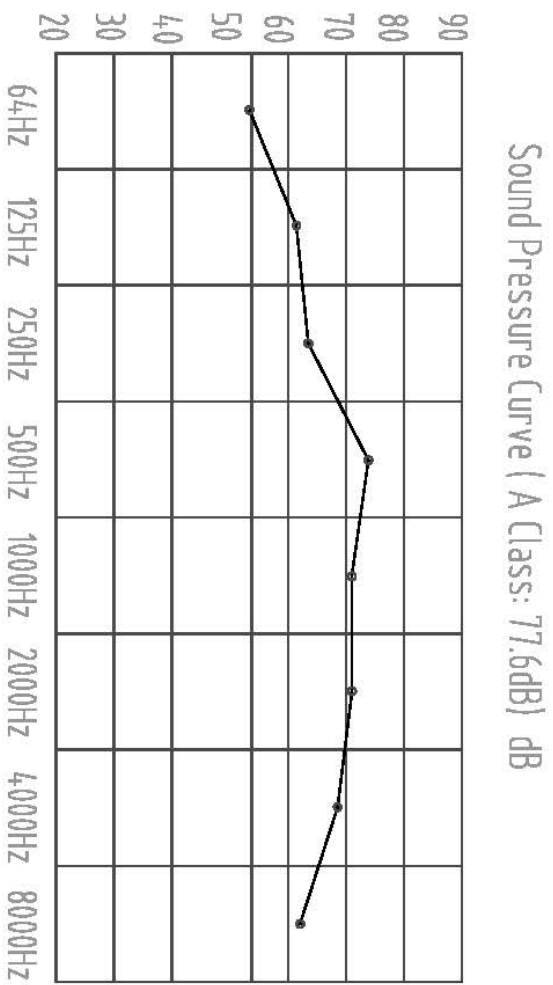



PHE160 Sound Pressure Curve

A Class: 77.6dB

Hz	dB
64Hz	51
125Hz	62
250Hz	64
500Hz	74
1000Hz	71
2000Hz	72
4000Hz	69
8000Hz	62

Note: Occupant at least 1.0m from sound source.



<b>DRAWN BY:</b> Chen Cheng	<b>DATE:</b> 13th, Feb 2014	
<b>APPROVED O.A.:</b> Zhu Junquan	<b>APPROVED ENG.:</b> Li Melfen	
<b>MODEL:</b> PHE160	<b>DRAWING NO.:</b> 01	<b>TITLE:</b> Packaged Rooftop With Economy Cycle <b>PHE TYPE</b>
	<b>ISSUE:</b> 01	<b>SHEET SIZE:</b> A4