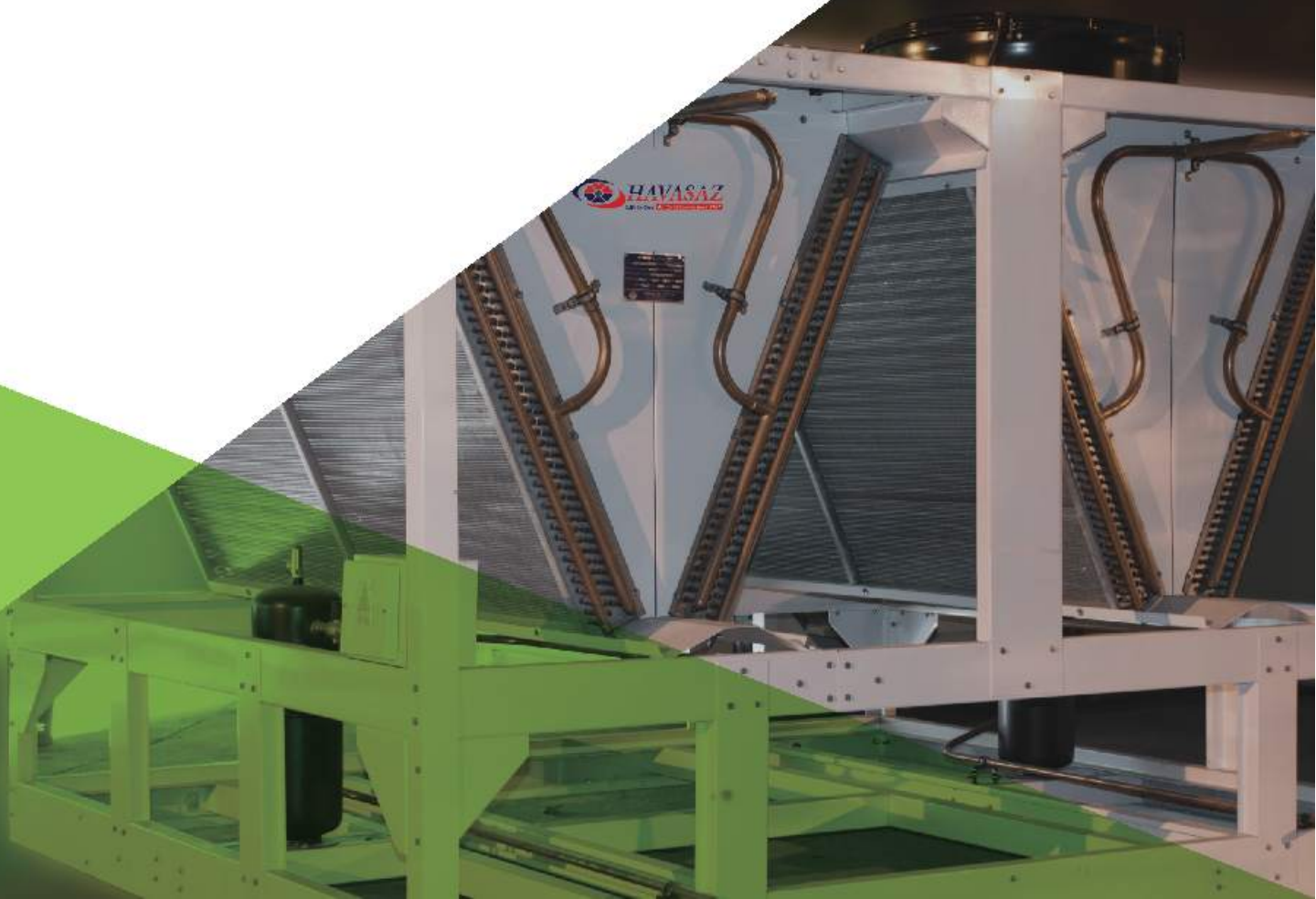
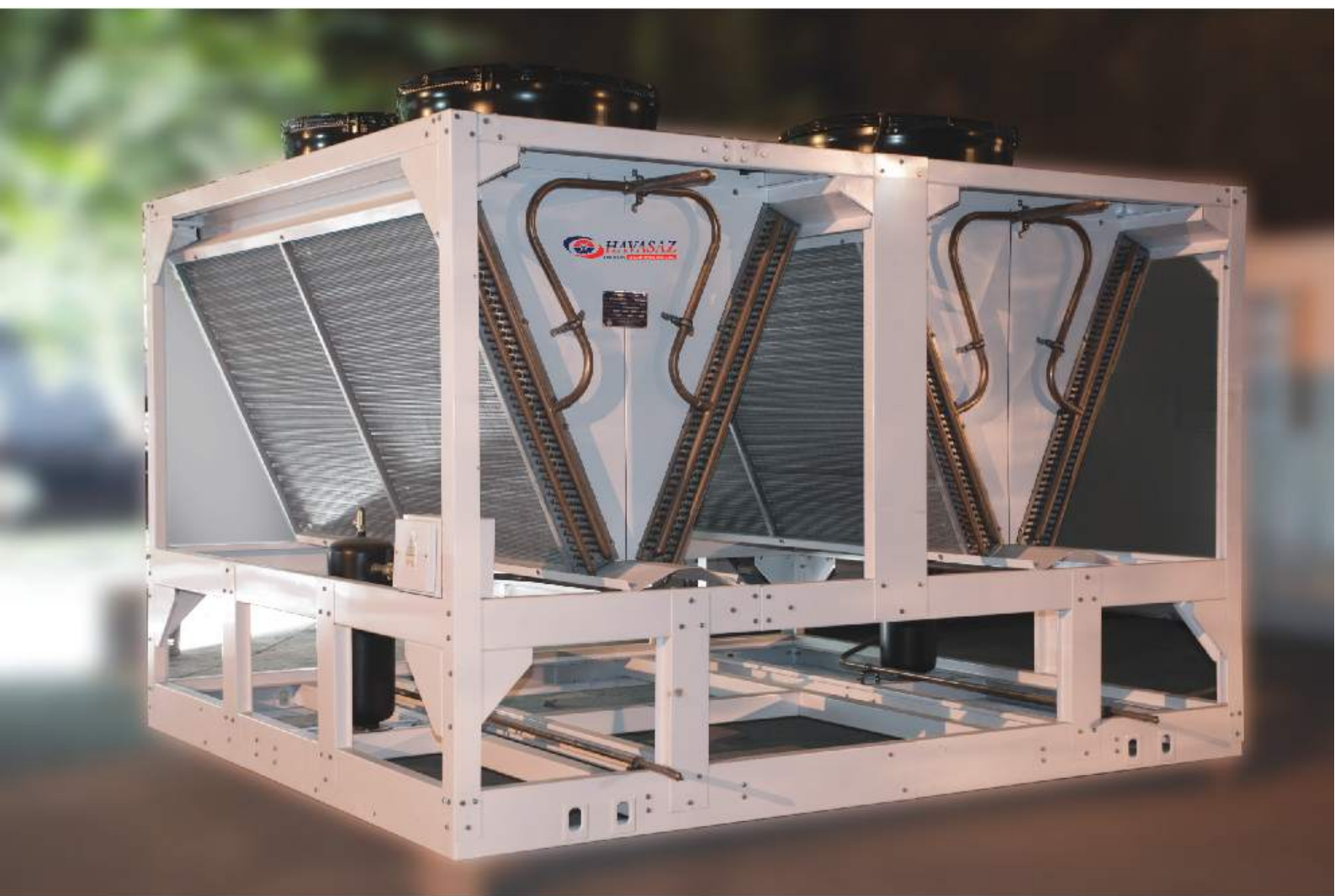




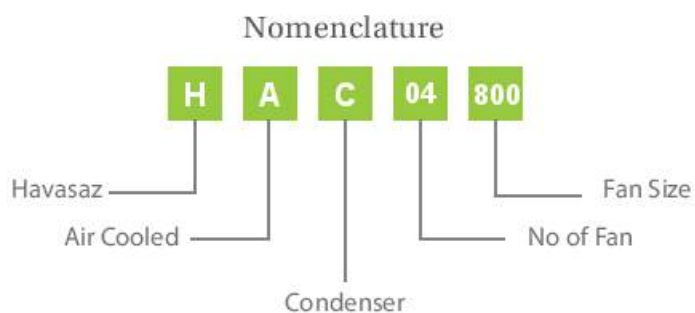
AIR COOLED CONDENSER







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INTRODUCTION

Havasaz design and construction of air cooled condenser according to the final data and standard international of ASHRAE and standard of carrier company.

The capacity of heat rejection in air cooled condenser is 73000 btu/hr to 2757000 btu/hr ,the capacity selected by difference of condensing temperature and ambient temperature.

Air cooled condenser is working outside the place with the external air.The hot gas compressed by the compressors is condensed at the condensers.

CASING

The casing constructed of galvanized steel sheet with proper thickness.

After fabrication these are degreased and painted with air- dried epoxy.

This fully automatic process ensures full protection against corrosion under the most aggressive ambient conditions.

COILS

Condenser coils consist copper tubes and aluminium corrugated fins. It has the necessary surface area to condense the Freon gas. The fins for the high efficiency made from type of flat fin plate with turbulator according to the

CONTARDO factories European.

FANS

The fans are of self motor axial type .These are run efficient, quiet with aerodynamic blade and suitable for outdoor installation.

They are working silent liquidize Freon gas and deliver the later to the evaporator.

MOTOR

The fan motor assembly has a protective grid against accident contact with moving parts which is designed according to ISO regulation.

Fan motors are of external rotor type, aerodynamically shaped so as not to interfere with the air flow, and permanently lubricated bearings that do not require service.

Other components and safety devices;that ensure trouble free,unit operation

- Automatic high pressure control
- Install the receiver
- Safety valve
- Sight glass
- Service valve
- Charging valve

CAPACITIES

CONDENSER CAPACITIES-ALUMINUM FIN 3ROW 10FPI OD 3/8"

REFRIGERANT R-134a

Model	TOTAL HEAT REJECTION MBH(KW)				
	td°F(°C)				
	10(5.5)	15(8.3)	20(11.1)	25(13.8)	30(16.6)
1800	73 (21.4)	111(32.4)	148(43.4)	185(54.2)	223(65.4)
2800	146 (42.8)	221(64.8)	296(86.8)	370(108.4)	446(130.8)
3800	219(64.2)	332(97.2)	444(130.2)	555(162.6)	669(196.2)
2800	136(39.8)	207(60.6)	278(81.4)	347(101.6)	420(123)
4800	272(79.6)	414(121.2)	555(162.8)	693(203.2)	839(246)
6800	407(119.4)	620(181.8)	833(244.2)	1040(304.8)	1259(369)
8800	543(159.2)	827(242.4)	1111(325.6)	1387(406.4)	1679(492)
10800	679(199)	1034(303)	1389(407)	1733(508)	2098(615)

CONDENSER CAPACITIES-ALUMINUM FIN3ROW-12FPI/OD 3/8"

REFRIGERANT R-134a

Model	TOTAL HET REJECTION MBH(KW)				
	td°F(°C)				
	10(5.5)	15(8.3)	20(11.1)	25(13.8)	30(16.6)
1800	82(24)	124(36.4)	334(49)	208(61)	252(73.8)
2800	164(48)	248(72.8)	502(98)	416(122)	504(147.6)
3800	246(72)	373(109.2)	319(147)	624(183)	755(221.4)
2800	156(45.8)	237(69.4)	637(93.4)	398(116.6)	480(140.8)
4800	313(91.6)	474(138.8)	596(186.8)	796(233.2)	961(281.6)
6800	469(137.4)	710(208.2)	956(280.2)	1194(349.8)	1441(422.4)
8800	625(183.2)	947(277.6)	1275(373.6)	1591(466.4)	1922(563.2)
10800	781(229)	1184(347)	1593(467)	1989(583)	2402(704)

CONDENSER CAPACITIES-ALUMINUM FIN 4ROW-10FPI/OD 3/8"
REFRIGERANT R-134a

Model	TOTAL HEAT REJECTION MBH(KW)				
	td°F(°C)				
	10(5.5)	15(8.3)	20(11.1)	25(13.8)	30(16.6)
1800	86(25.2)	130(38)	174(51)	217(63.6)	261(76.6)
2800	172(50.4)	259(76)	348(102)	434(127.2)	523(153.2)
3800	258(75.6)	389(114)	522(153)	651(190.8)	784(229.8)
2800	154(45)	233(68.2)	311(91)	390(114.4)	471(138)
4800	307(90)	465(136.4)	621(182)	781(228.8)	942(276)
6800	461(135)	698(204.6)	932(273)	1171(343.2)	1413(414)
8800	614(180)	931(272.8)	1242(364)	1561(457.6)	1884(552)
10800	768(225)	1164(341)	1553(455)	1952(572)	2354(690)

CONDENSER CAPACITIES-ALUMINUM FIN4ROW-12FPI/OD 3/8"
REFRIGERANT R-134a

Model	TOTAL HEAT REJECTION MBH(KW)				
	td°F(°C)				
	10(5.5)	15(8.3)	20(11.1)	25(13.8)	30(16.6)
1800	93(27.2)	141(41.4)	190(55.6)	237(69.6)	286(83.8)
2800	186(54.4)	283(82.8)	379(111.2)	475(139.2)	572(167.6)
3800	278(81.6)	424(124.2)	569(166.8)	712(208.8)	858(251.4)
2800	179(52.6)	272(79.6)	366(107.2)	457(133.8)	551(161.6)
4800	359(105.2)	543(159.2)	732(214.4)	913(267.6)	1103(323.2)
6800	538(157.8)	815(238.8)	1097(321.6)	1370(401.4)	1654(484.8)
8800	718(210.4)	1086(318.4)	1463(428.8)	1826(535.2)	2206(646.4)
10800	897(263)	1358(398)	1829(536)	2283(669)	2757(808)

CORRECTION FACTORS CONDENSING

fin material c.f	al	cu
	1	1.03

refrigerant c.f	r404a	r22	r407	r502	r134a
	0.97	0.99	0.99	1.03	1

altitude		c.f	altitude		c.f
feet	meters		feet	meters	
0	0	1	5500	1720	1.224
500	156	1.018	6000	1875	1.248
1000	315	1.042	6500	2031	1.272
1500	469	1.056	7000	2190	1.295
2000	625	1.075	7500	2344	1.321
2500	781	1.095	8000	2500	1.346
3000	940	1.116	8500	2656	1.372
3500	1094	1.136	9000	2813	1.399
4000	1250	1.157	9500	2970	1.427
4500	1400	1.179	10000	3125	1.472
5000	1560	1.202	10500	3282	1.507

EVAPORATING TEMP (F)	CONDENSING TEMP(F)					
	90	100	110	120	130	140
45	1.12	1.19	1.22	1.25	1.28	1.32
40	1.18	1.21	1.24	1.27	1.31	1.35
30	1.22	1.25	1.28	1.32	1.37	1.42
20	1.26	1.29	1.33	1.37	1.43	1.49
10	1.31	1.34	1.38	1.43	1.49	1.55
0	1.36	1.4	1.44	1.5	1.56	1.62

Coating Correction Factor: 1.05

GENERAL DATA

Model	propeller fan performance				coil	
	no	diameter(mm)	rpm	cfm	no	face area
1800	1	800	870	13530	2	24.56
2800	2	800	870	27060	4	49.12
3800	3	800	870	40590	6	73.68
2800	2	800	870	26000	2	21.48
4800	4	800	870	52000	4	42.96
6800	6	800	870	78000	6	64.44
8800	8	800	870	104000	8	85.92
10800	10	800	870	130000	10	107.4

COIL CONNECTIONS

Model	Connection Size		
		100%	50%
1800	gas	1 1/8	1 1/8
	liquid	5/8	5/8
2800	gas	1 1/8	1 1/8
	liquid	7/8	7/8
3800	gas	1 3/8	1 3/8
	liquid	7/8	7/8
2800	gas	1 3/8	1 3/8
	liquid	7/8	7/8
4800	gas	1 5/8	1 3/8
	liquid	1 1/8	7/8
6800	gas	2 5/8	1 7/8
	liquid	1 5/8	1 3/8
8800	gas	2 5/8	1 7/8
	liquid	1 5/8	1 3/8
10800	gas	3 1/8	2 5/8
	liquid	1 7/8	1 5/8

ELECTRICAL DATA

Model	electrical motor				unit	
	no	kw	rpm	full load amp	full load amp	wire sizing
1800	1	1.93	870	3.9	3.9	2.5
2800	2	1.93	870	3.9	7.8	2.5
3800	3	1.93	870	3.9	11.7	4
2800	2	1.93	870	3.9	7.8	2.5
4800	4	1.93	870	3.9	15.6	4
6800	6	1.93	870	3.9	23.4	6
8800	8	1.93	870	3.9	31.2	10
10800	10	1.93	870	3.9	39	10

SOUND RATING

Model	sound rating
1800	70
2800	70
3800	73
2800	70
4800	73
6800	76.5
8800	77.5
10800	77.5

Sound Rating Correction Factor

distance from condenser		cf	distance from condenser		cf
meter	feet		meter	feet	
5	16.5	11.5	30	98	27
6	20	13	40	131	29.5
8	26	15.5	50	164	31
10	33	17.5	60	196	33
15	49	21	70	230	34.5
20	65	23.5	80	262	35.5

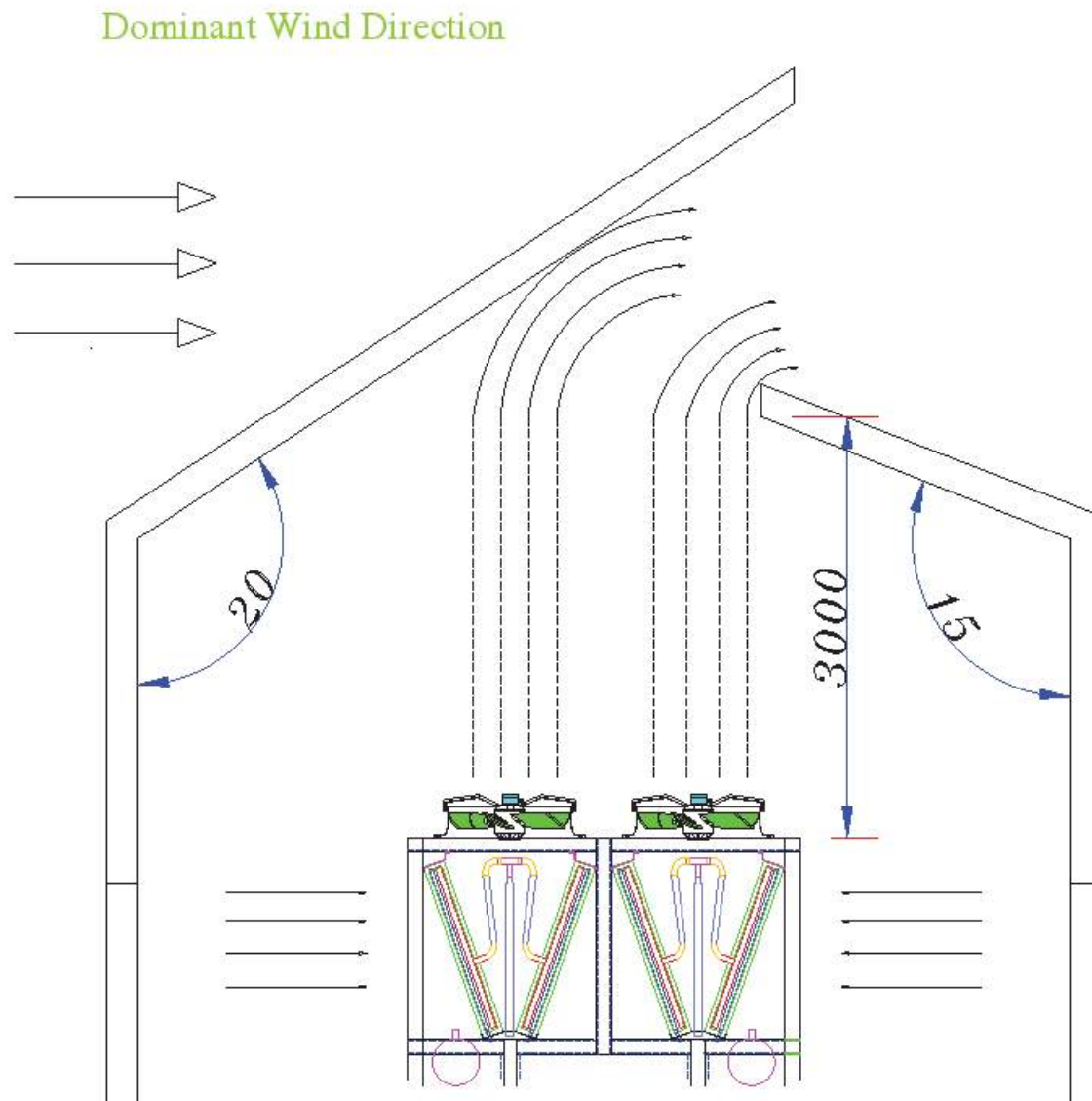
CONDENSER APPROXIMATE WEIGHTS(Kg)

CONDENSER APPROXIMATE WEIGHTS(Kg)						
Model	coil type					
	al			cu		
	8	10	12	8	10	12
1800	314	320	324	366	386	396
2800	478	490	498	582	622	642
3800	642	660	672	798	858	888
2800	542	560	572	698	758	788
4800	724	744	756	908	976	1012
6800	1036	1066	1084	1312	1414	1468
8800	1248	1288	1312	1616	1752	1824
10800	1760	1810	1840	2220	2390	2480

SCHEMATIC DRAWING OF SUGGESTED SHELTER

The following points must be observed:

- 1- The unit is to be installed where adequate amount of fresh air is available for circulation over the unit and the least amount of direct sun exposure and air obstructions are present where necessary a shelter shall be constructed.
- 2 - Sufficient free space must be considered for air intake and air discharge of each installed unit.
- 3 - Adequate space for servicing must also be available.



UNIT LOCATION

Air cooled condenser are designed for outdoor installation. when selecting a site for installation, the following guidelines should be followed:

1. The outdoor location of the unit should have minimum sun exposure and an adequate supply of fresh air without any obstructions.
2. Do not install units beneath windows or between structures where normal operating sounds may be objectionable.
3. Units can be installed either on a roof or on ground level.
4. The condenser fans are the propeller type, and are selected for free air discharge.

CLEARANCES

The unit must be installed with enough clearances for entering air to the

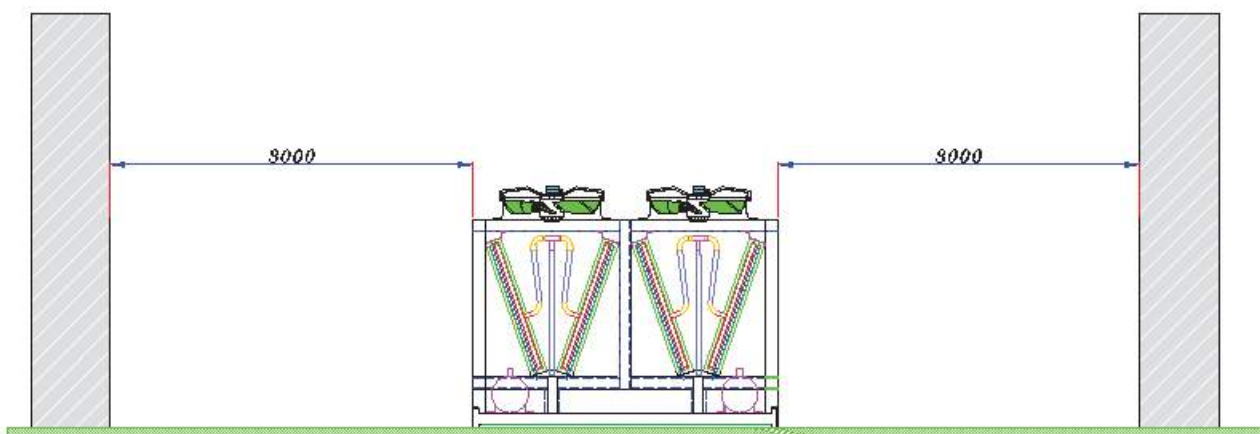
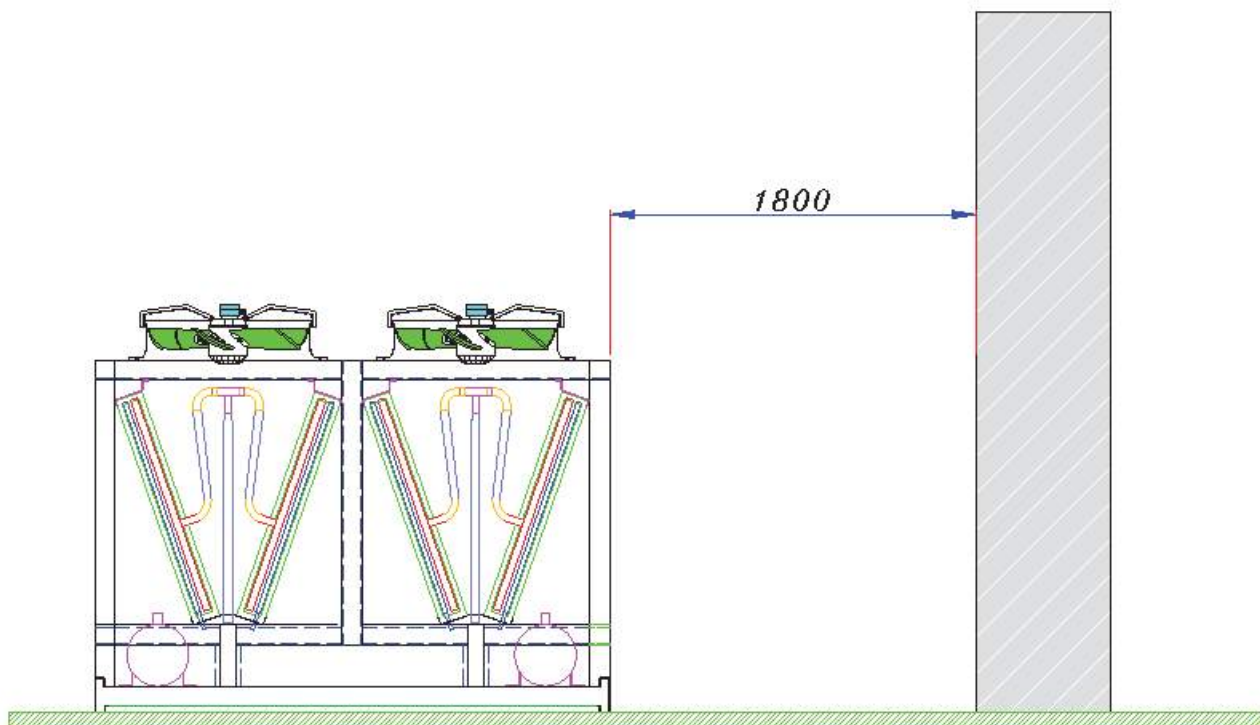
coils. At locations where winter operation is intended and snow accumulation are expected, unit installed closer than the minimum recommended distance to a wall or other vertical riser may experience a combination of coil starvation and warm air recirculation resulting in unit capacity and efficiency reductions, as well as possible excessive head pressures.

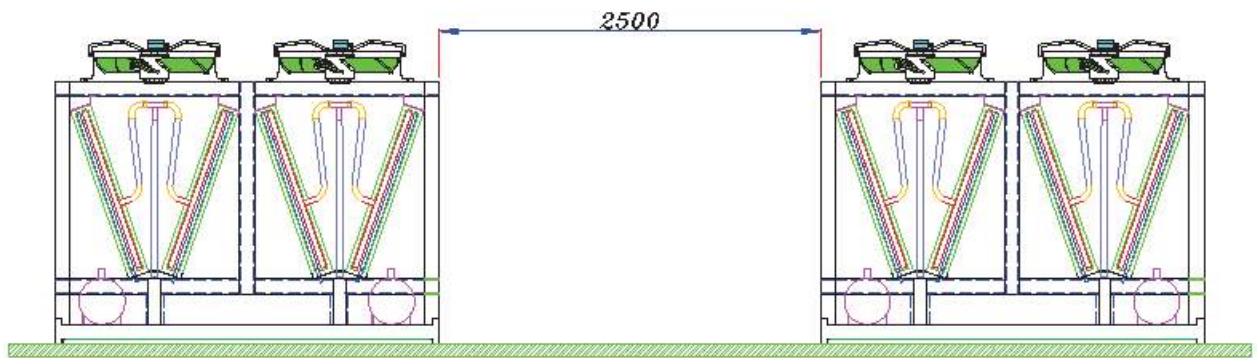
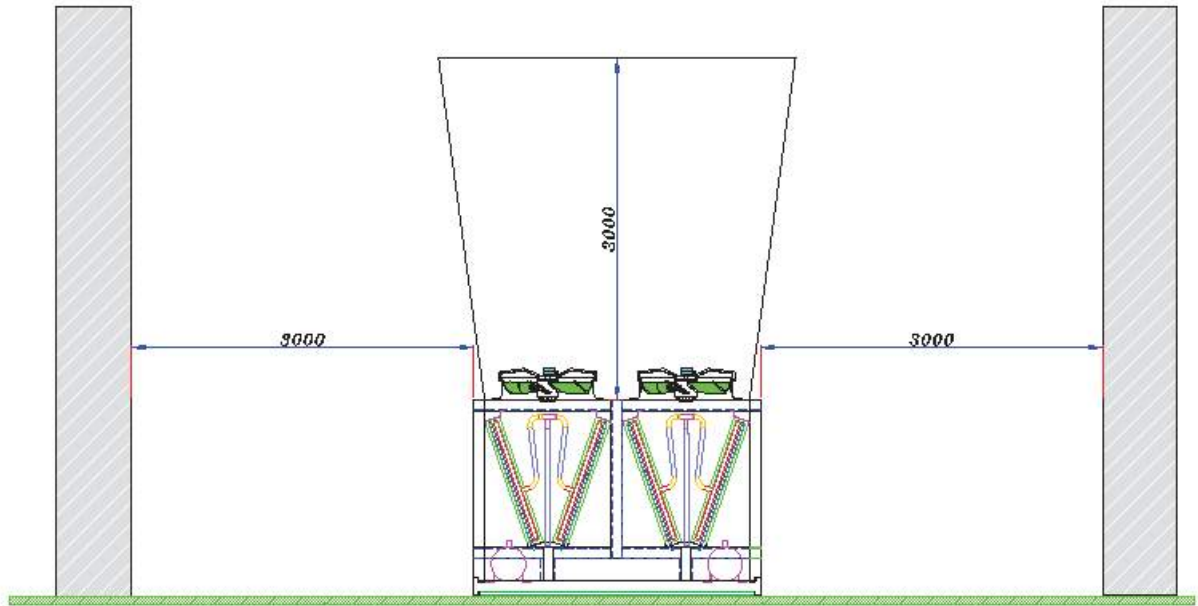
FOUNDATION

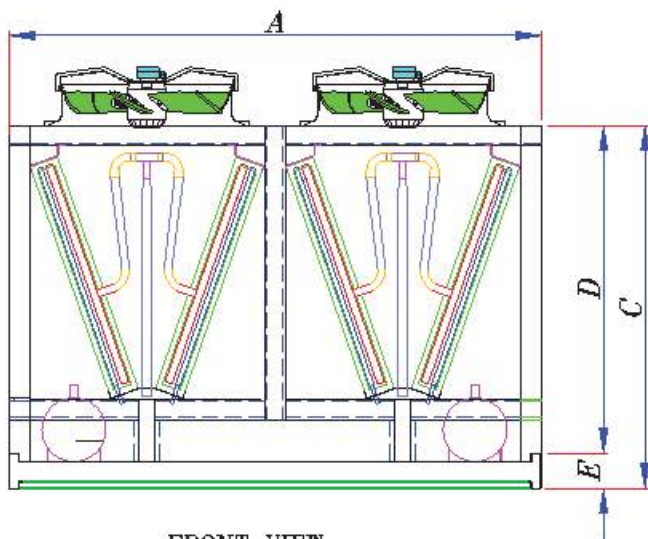
The unit shall be mounted on a flat and level foundation, ground or roof, capable of supporting the entire operating weight of the equipment.

ISOLATION AND SOUND EMISSION

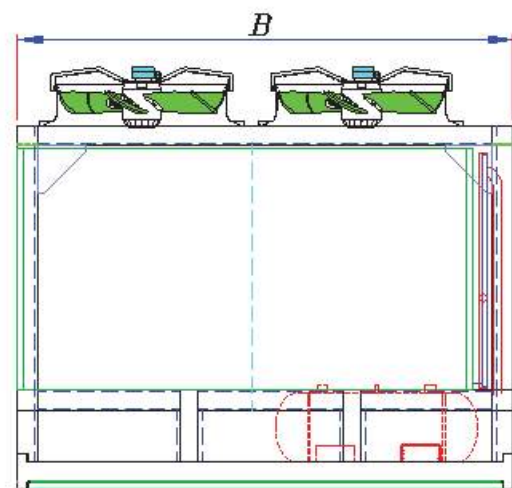
Unit shall be placed away from, noise sensitive areas structurally transmitted noise can be reduced with the use of spring isolators and they are recommended for acoustically sensitive applications.







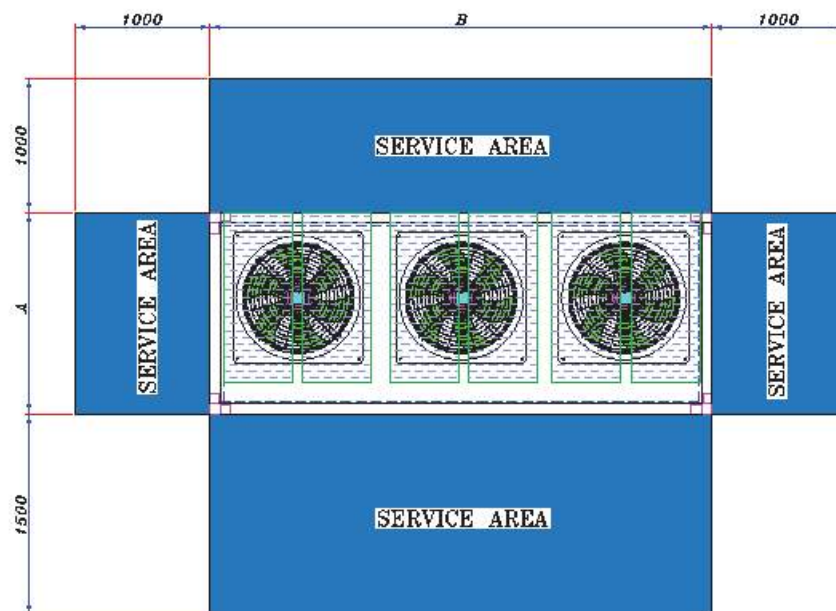
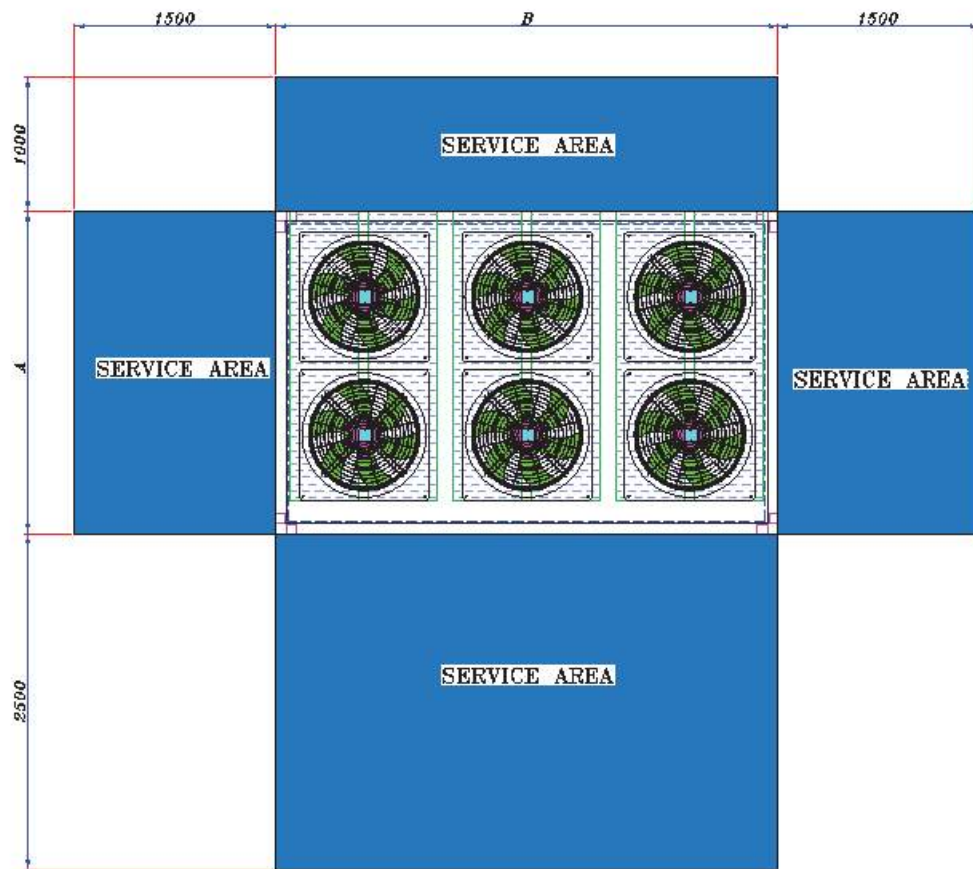
FRONT VIEW



SIDE VIEW

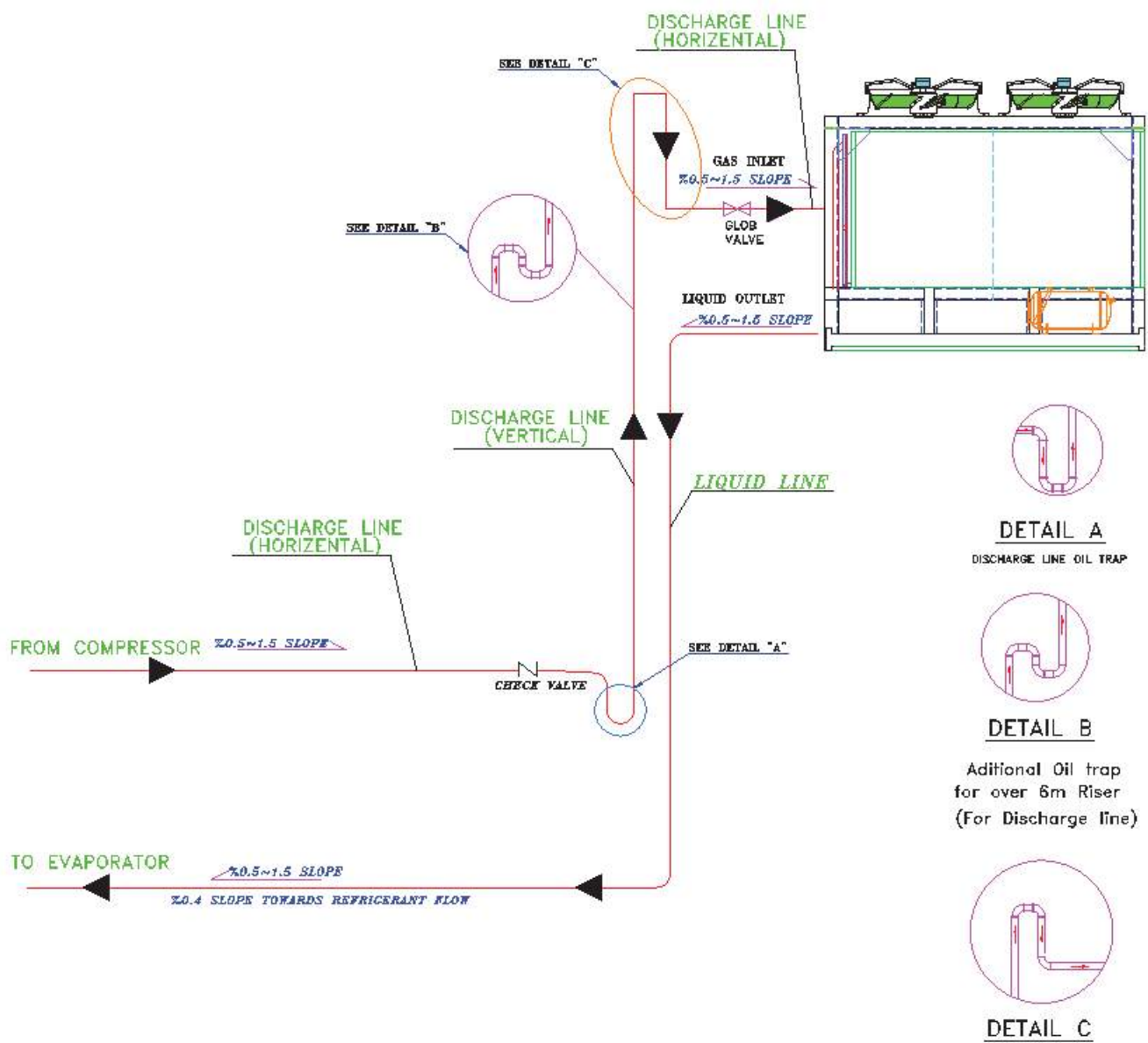
MODEL	A	B	C	D	E
1800	1310	1300	1719	1550	169
2800	2520	1300	1719	1550	169
3800	3735	1300	1719	1550	169
2800	1310	2400	1719	1550	169
4800	2520	2400	1719	1550	169
6800	3735	2400	1719	1550	169
8800	4945	2400	1719	1550	169
10800	6255	2400	1719	1550	169

SERVICE AREA



A=LENGTH OF EQUIOMENT

B=WITH OF EQUIOMENT





NOTES:

1. All piping must follow standard piping techniques (Refer to carrier system Manual, Carrier E-2011 software Refrigerant piping, or appropriate ASHRAE handbook)
2. Hot gas lines should rise above refrigerant level in condenser circuit.
3. Trap should be installed on hot gas lines to prevent condenser oil and refrigerant vapor migration from accumulating on compressor heads during off cycle. (insert extra oil traps when vertical life exceeds 6 meters)
4. Pitch all horizontal lines downward in the direction of refrigerant flow.
5. For piping lengths greater than 50 ft, provide support to liquids and gas lines near the connections the condenser coil.
6. Double riser may be required (for compressors with unloader), check compressor minimum capacity.



شرکت هواساز همیشه سعی بر آن دارد با استفاده از قطعات و متريال مرغوب نیاز مشتریان خود را برآورده سازد که در ذیل به معرفی برخی از مشارکت کنندگان در تامین قطعات این شرکت می پردازیم :

انواع کویل های **Cu/Cu , Cu/hydrophilic Al Heresite Coating**
کمپرسورهای **Frasscold,bitzer, copeland , Carrier,refcomp** از نوع **Scroll , Screw , Reciprocating**
مبدل های **Shell & Tube** مارک رادیوران و **Compact Plate Heat Exchanger** مارک **Danfoss**





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