TAHVIEH
AIR CONDITIONING SYSTEMS

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ISO 9001
Registered Firm
IMQ

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AIR COOLEDCONDENSING UNIT (5th generation)

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Tahvieh History and activity

Tahvieh Company was established in 1964 and successfully paved its way in the air conditioning industry by utilizing technology of Air temp & Trane companies. This company later managed to receive manufacturing permit under the license of two U.S. companies of Chrysler and Air temp.

During 80's, Tahvieh started to design and manufacture a new generation of air conditioning system relying on its rich technical knowledge and great capability of its manpower. As one of the largest private companies in designing and manufacturing air conditioning equipment, it has managed to become a pioneer of this industry in Iran.

In 2013, we began the second half-century of our glorious presence in air conditioning industry and in addition to the previous products, Tahvieh initiated manufacturing of new products and by the end of the first half of 2016, we managed to manufacture and supply mini-chillers, various types of split air condition systems (floor standing, wall mounted and ducted), electrical enclosure air condition, precision air condition, ice cream makers and air conditioning systems for automotive and rail industry.

Leadership, the ability to meet all consumer demands in designing and manufacturing of superior quality products and extensive and fast aftersales services have enabled us to become a premium brand in Iran. Unique customer care has been assigned as the main strategy of Tahvieh and this company has always been loyal to its customers.

Tahvieh Co., In 2016 being a member of International Institute of Refrigeration (IIR). Today, Tahvieh, as one of the largest manufacturers of air conditioning systems and as a top brand in Iran, is one of the reliable sources of supplying the strategic and important industries of the country such as oil, gas, petrochemical, refining, power plants, telecommunications, steel making, train & automobiles, healthcare, Development and other industries of the country.

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Introduction

TAHVEH (Model:HAR-5) 15 to 120 Ton Air Cooled Scroll Condensing Units are the perfect refrigeration components for all air conditioning applications that use DX central station air handling. They are designed for outdoor (ROOF or Ground level) installation. Each unit includes two separated refrigerant circuit with multiple hermetic scroll compressors. All mechanical & electrical major equipment are supplied abroad. All Tahvieh Co. production are designed, produced and tested at company, to achieve to high quality we assembly production at company.

Nomenclature

Air Cooled Condensing Unit

Item	Description			Symbol
1	Company	Tahvieh		T
2-3	Production	Condensing Unit-Welding Chassis		CO
		Condensing Unit-Screw & Nut Chassis		SO
		Condensing Unit-Modular Chassis		HO
4	Climate Conditions	Tropical		S
		Non-Tropical		R
5	Condenser Coil Type	Fin-Tube	V type	V
			W type	W
			Flat type	F
		Micro-Chanel	Flat type	I
			V type	X
			W type	Z
6	Compressor No.	Qty		Number
7	Compressor Type	Screw	R22	W
			R134a	S
			R407C	R
		Scroll	R22	T
			R134a	G
			R407C	L
			R410a	K
		Reciprocating	R22	V
			R134a	M
			R407C	E
			R410a	N
8,9,10	Nominal Capacity	Ton		Number

Example: T-CO-R-W-2-K-120 ⟶ TCORW2K120

Structure and function of Equipment

General Specification

The HAR new generation models are shipped complete from factory ready for installation. The unit is pressure tested, evacuated and given with nitrogen pre charged. After assembly, an additional refrigerant value due to calculated line (Suction & Liquid) and evaporator should be added.

Compressors

Scroll tandem compressors are used. These rugged hermetic compressors are constructed with an integral cast iron frame, cast iron scrolls, three Teflon impregnated bearings, and three oil filtration devices for each compressor.

Using DANFOSS's performer scroll tandem compressors provides two, four steps of capacity modulation depending on model size. One compressor can run alone, depending on the load of the system, resulting in excellent part-load efficiency. Each refrigerant circuit has specially designed oil and gas equalization lines to control oil migration.

This well protected compressor includes a solid-state motor protection module, 4 individual motor-winding sensors, a patented internal discharge temperature probe, and a patented shutdown feature that prevents reverse rotation. An internal discharge check valve helps prevent shutdown noise.

Condenser Coils

The condenser coils are constructed with seamless copper tubes arranged in a staggered row pattern and mechanically expanded into aluminum fins to ensure optimum heat exchange capability. The fins have full drawn collars to completely cover the copper tube for protection against atmospheric corrosion and provide excellent heat transfer. Copper fin condenser coils are available as an option on all models. For protecting the condenser in corrosive environment such as coastlines and etc. and extending equipment life Thermoguard coated option is provided. Condenser coil is designed according to sub-cooling more than 5.6 °C for better function of expansion valve. The Leakage test is done for all condenser coils at 470 psi.

Condenser Fans

Aluminum guarded axial fans are used for HAR Fifth generation series condensing units. These systems designed for four steps or inverter control capacity.

Electrical System

Electrical panel have safety device such as , over load & short circuit protection , high & low pressure protection for compressor and , under or over-voltage and phase failure and phase unbalancing protection for all consumption.

Condenser fans will be turn on/off according to discharge pressure which is sense by a pressure transducer. Condenser fan also protected against over load and over current.

There is a display which shows the status of equipment, faults, temperature.

The system is equipped with a controller in order to control the process and load and unloading the capacity of unit.

Structure & Chassis

Aluminum profiles and hot dip galvanized sheets is used for structure and body. To reach more strength, body and structure coated by epoxy dye. Chassis made by strong steel to dividing the weight of condensing unit.

Features and Benefits

Scroll Compressor has more reliability and efficiency than reciprocating compressor. The single orbiting scroll eliminates the need for pistons, connecting rods, wrist pins and valves. Fewer parts lead to increased reliability. Fewer moving parts, less rotating mass and less internal friction means greater efficiency then reciprocating compressors. TAHVIEH uses Performer scroll compressor, the compression is performed by two scroll elements located in the upper part of the compressor above the motor. Suction gas enters the compressor at the suction connection. The gas then flows around the motor and enters at the bottom side through the openings.
Oil droplets separate from suction gas and fall into the oil sump. All of the suction gas passes through the electrical motor, thus ensuring motor cooling in all applications. After exciting the electrical motor, the gas enters the scroll elements where compression takes place. A check valve is located directly above the fixed scroll discharge port; this feature prevents the compressor from running backwards once the power has been switched off. Ultimately, the discharge gas leaves the compressor at the discharge connection.

Versatility

HAR Fifth generation series condensing units feature up to 6 compressors and 2 refrigerant circuits, and can be matched with a variety of air-handling units. All condensing units' circuits can be supply a single air handler or 2 separate air handlers. Unit is designed for proper operation in ambient temperature of 85°F (30°C) to 125°F (52°C).
Fulfilling the customer's request, the unit is designing in a way to work with HCFC (R-22) and HFC(R-134a, R-407c, R-410a) gases.

Durable Construction

All HAR units have weatherized cabinets constructed of heavy-duty galvanized steel pre-painted with air dry paint finish.

High Efficiency Full Load Operation

Utilizing the new scroll compressor technology, high efficiency condenser coil and low sound fan motors made the HAR condensing units have full load efficiency.

Excellent Part Load Performance

By using either two, four or six compressor on each condensing unit, unloading characteristics and part load performance are outstanding.

Compact Design with Small Footprint

Again, Tahvieh HAR series condensing units have the reputation for a compact design and small footprint. A small footprint saves the installation costs by minimizing the size of the concrete mounting pas or reduces the amount of structural steel if the unit is mounted on the roof.

Quiet Operation

The HAR condensing units are designed with quiet scroll compressors. Fans are selected for good performance and lower sound levels. The attention to details with sound mind is critical in the design. Paying attention to small issues such as refrigerant piping, supports for piping, securing of component to the structure are all important to making a quiet product.

Option and Accessories

- Hot gas by-pass-permits continuous
- Copper fin condenser coil
- Post coated condenser coil
- Anti-vibration and adjustable basis
- Compressor acoustic sound
- Low sound fans
- Oil separator kit
- Low ambient control

Effect of Altitude on Capacity

Condensing unit capacities given in the performance data tables are at sea level. At elevations substantially above sea level, the decreased air density will decrease condenser capacity and, therefore, unit capacity and efficiency. The adjustment factors in table A can be applied directly to the catalog performance data to determine the unit's adjusted performance.

Table 1: Altitude Correction Coefficients

Elevation above sea level (m)	0	300	600	900	1200	1500	1800
Barometric pressure (bar)	1.013	0.977	0.942	0.908	0.875	0.843	0.812
Cooling capacity correction factor	1.000	0.993	0.986	0.979	0.973	0.966	0.960
Power input correction factor	1.000	1.005	1.009	1.015	1.021	1.026	1.031

Selection procedure

Example:

Select an Air-Cooled Condensing Unit with below Requirements:

Capacity: 140kw (40T.R)

Saturation Suction Temperature: 7.2° c

Ambient Air Temperature: (43.3°C) 110° F

Altitude of Installation: 1200 m

Refrigerant: R22

Required properties:

Select Suitable Air-Cooled Condensing Unit

Selection:

Altitude correction factor for 1200 m from Table 1

(A= 0.973)

Corrected Cooling Capacity =140 / (A) = 143.8 KW

See performance rating tables (Saturation Suction Temperature: 7.2°C, Ambient Air Temperature: 43.3°C) and nearest model is TCORV4T050.

Table 2: Specification of Air Cooled Condensing Units / R-22

Model			TCORV2T 015	TCORV2T 020	TCORV4T 030	TCORV4T 040	TCORV4T 050	TCORV4T 060	TCORV4T 070	TCORV4T 080	TCORV4T 100	TCORV6T 120
General Specification	Cooling Capacity	Ton	14.6	18.4	27.9	36.6	44.7	55.9	64.7	74.4	83.0	110.7
		Kw	51.2	64.7	98.1	128.8	157.1	196.5	227.6	261.6	291.9	389.3
	EER	w/w	3.5	3.6	3.7	3.6	3.7	3.8	3.6	3.7	3.7	3.66
	Capacity Control	%	50-100		25-100							17-100
	No Of Cycle	No.	2									
	Power Supply	V/Ph/Hz	380 / 3 / 50									
	Total Power Input	Kw	14.4	17.8	26.8	35.9	42.3	51.5	63.9	71.1	79.9	106.24
Compressor Data	Compressor Type	-	Scroll									
	No. Of Compressor	No.	2	2	4	4	4	4	4	4	4	6
	Oil Volume	Lit	2 × 3	2 × 3.25	2 × 6.6	2 × 6.6	2 × 7.2	2 × 12.4	2 × 6.2 + 2 × 8	2 × 16	2 × 8 + 2 × 8	2 × 24
	Power Input	Kw	2 × 5.6	2 × 7.3	2 × 5.9	2 × 7.4	2 × 9.0	2 × 11.3	2 × 11.2 + 2 × 15.5	2 × 15.4	2 × 15.3 + 2 × 19.4	2 × 15.6
	Nominal Current	A	2 × 11.1	2 × 14.4	2 × 11.5	2 × 14.5	2 × 16.8	2 × 21.6	2 × 21.43 + 2 × 27.49	2 × 27.4	2 × 27.32 + 2 × 34.84	2 × 27.7
	Consumption Current	A	2 × 98	2 × 130	2 × 98	2 × 130	2 × 145	2 × 175	2 × 175 + 2 × 215	2 × 215	2 × 270 + 2 × 215	2 × 215
	Max Consumption	A	2 × 19	2 × 29	2 × 19	2 × 29	2 × 32	2 × 35	2 × 50 + 2 × 35	2 × 50	2 × 50 + 2 × 69	2 × 50
Condenser Data	Coil Type	-	V Type									
	Coil Material	-	Cupper Pipe / AL Fins									
	Fan Type	-	Axial									
	No. Of Fan	No.	2	2	2	4	4	4	6	6	6	8
	Nominal Consumption	A	2 × 3.4	2 × 3.4	2 × 3.4	4 × 3.4	4 × 3.4	4 × 3.4	6 × 3.4	6 × 3.4	6 × 3.4	8 × 3.4
	Power Input	Kw	2 × 1.58	2 × 1.58	2 × 1.58	4 × 1.58	4 × 1.58	4 × 1.58	6 × 1.58	6 × 1.58	6 × 1.58	8 × 1.58
Dimension Data	Length	mm	2000	2000	2600	3200	4000	4600	4800	5000	5600	6000
	Width	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
	Height	mm	2200	2200	2200	2200	2220	2220	2220	2220	2220	2220
Weight Data	Net	Kg	1309	1332	1656	1951	2364	2586	2805	3124	3352	3646
	Wet	Kg	1440	1465	1822	2146	2600	2845	3086	3436	3687	4011
Connection Data	Gas Line	mm	28.5	28.5	34.9	34.9	34.9	41.3	41.3	41.3	54	54
	Liquid Line	mm	15.9	15.9	22.2	22.2	22.2	22.2	28.5	28.5	28.5	34.9

*Total Power: Compressor Power Input + Condenser Fan Power Input

Capacities are based on the following conditions:

Cooling: Indoor Temperature 35 °C DB / 24 °C WB

Saturation Evaporator Temperature: 7.2 °C

Altitude: Sea Level

Table 3: Rating Capacity & Power Input in different conditions / R-22

Model	Saturation Suction Temperature (°C)	30		32		35		38		40		43		46		49		52	
		CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW
TCORV2T 015	1.7	44.4	9.9	43.3	10.5	42.2	11.1	41.0	11.8	39.8	12.5	38.6	13.2	37.3	14.0	35.9	14.9	34.5	15.8
	4.4	48.9	10.0	47.7	10.6	46.5	11.2	45.2	11.9	43.9	12.6	42.6	13.3	41.2	14.1	39.7	14.9	38.2	15.8
	7.2	53.8	10.1	52.5	10.7	51.2	11.3	49.8	11.9	48.4	12.6	47.0	13.4	45.5	14.1	43.9	15.0	42.3	15.8
	10.0	59.0	10.2	57.6	10.8	56.2	11.4	54.7	12.0	53.1	12.7	51.6	13.4	50.0	14.2	48.3	15.0	46.6	15.9
TCORV2T 020	1.7	56.8	12.7	55.3	13.5	53.8	14.3	52.3	15.2	50.7	16.1	49.1	17.1	47.5	18.1	45.8	19.2	44.1	20.4
	4.4	62.3	12.9	60.7	13.6	59.0	14.5	57.3	15.4	55.6	16.3	54.0	17.2	52.2	18.3	50.4	19.4	48.5	20.6
	7.2	68.2	13.0	66.5	13.8	64.7	14.6	62.9	15.5	61.0	16.5	59.2	17.4	57.3	18.5	55.3	19.6	53.4	20.8
	10.0	74.5	13.2	72.6	14.0	70.7	14.8	68.7	15.7	66.7	16.6	64.8	17.6	62.7	18.7	60.6	19.8	58.4	20.9
TCORV4T 030	1.7	85.9	20.6	83.7	21.8	81.4	23.0	79.0	24.4	76.6	25.8	74.2	27.2	71.7	28.8	69.1	30.4	66.4	32.2
	4.4	94.2	20.9	91.8	22.1	89.3	23.4	86.8	24.7	84.2	26.1	81.6	27.6	78.8	29.1	76.0	30.8	73.1	32.5
	7.2	103.4	21.2	100.8	22.4	98.1	23.7	95.3	25.0	92.4	26.5	89.6	27.9	86.6	29.5	83.6	31.2	80.5	32.9
	10.0	113.1	21.6	110.2	22.8	107.3	24.1	104.3	25.5	101.2	26.9	98.1	28.4	94.9	30.0	91.6	31.7	88.2	33.4
TCORV4T 040	1.7	113.1	25.7	110.2	27.3	107.1	29.0	104.0	30.7	100.8	32.6	97.7	34.5	94.4	36.6	91.1	38.8	87.7	41.2
	4.4	124.0	26.0	120.8	27.6	117.5	29.3	114.1	31.0	110.7	32.9	107.3	34.8	103.8	36.9	100.2	39.2	96.5	41.5
	7.2	135.8	26.3	132.3	27.9	128.8	29.6	125.2	31.4	121.5	33.3	117.8	35.2	114.0	37.3	110.1	39.5	106.1	41.9
	10.0	148.3	26.7	144.5	28.3	140.7	29.9	136.8	31.7	132.8	33.6	128.8	35.6	124.7	37.7	120.5	39.9	116.2	42.3
TCORV4T 050	1.7	137.5	31.3	134.1	33.1	130.6	35.1	127.1	37.1	123.4	39.3	119.8	41.5	116.1	44.0	112.2	46.6	108.3	49.4
	4.4	150.7	31.8	147.0	33.6	143.2	35.6	139.3	37.7	135.4	39.9	131.5	42.1	127.5	44.6	123.3	47.2	119.1	50.0
	7.2	165.1	32.3	161.1	34.2	157.0	36.2	152.8	38.2	148.6	40.5	144.4	42.7	140.0	45.2	135.5	47.8	131.0	50.6
	10.0	180.5	32.9	176.1	34.8	171.7	36.8	167.2	38.9	162.6	41.1	158.1	43.4	153.3	45.9	148.5	48.5	143.6	51.3
TCORV4T 060	1.7	171.9	39.1	167.7	41.3	163.6	43.7	159.3	46.1	155.0	48.8	150.7	51.4	146.2	54.3	141.5	57.3	136.8	60.7
	4.4	188.5	39.8	183.9	42.1	179.3	44.5	174.6	47.0	169.8	49.6	165.2	52.2	160.2	55.2	155.2	58.2	150.1	61.5
	7.2	206.7	40.7	201.6	43.0	196.5	45.4	191.3	47.9	186.1	50.5	180.9	53.2	175.5	56.1	170.0	59.2	164.5	62.4
	10.0	225.8	41.7	220.2	44.0	214.6	46.4	208.9	48.9	203.1	51.6	197.5	54.2	191.6	57.2	185.6	60.2	179.6	63.5
TCORV4T 070	1.7	200.1	46.2	195.8	48.8	191.5	51.5	187.2	54.3	182.8	57.3	178.6	60.3	174.1	63.7	169.6	67.3	165.1	71.1
	4.4	217.9	47.1	213.3	49.7	208.6	52.4	203.9	55.2	199.2	58.2	194.6	61.3	189.8	64.7	184.9	68.3	180.0	72.1
	7.2	237.7	48.2	232.6	50.8	227.5	53.5	222.4	56.3	217.3	59.3	212.3	62.5	207.1	65.9	201.8	69.5	196.5	73.3
	10.0	258.7	49.3	253.2	51.9	247.7	54.6	242.1	57.5	236.5	60.6	231.1	63.7	225.5	67.1	219.7	70.7	214.0	74.6
TCORV4T 080	1.7	229.8	53.5	223.8	56.3	217.8	59.2	211.6	62.3	205.4	65.6	199.2	69.0	192.8	72.7	186.3	76.6	179.7	80.8
	4.4	251.7	54.7	245.2	57.5	238.6	60.5	231.9	63.6	225.1	66.9	218.5	70.3	211.4	74.0	204.4	78.0	197.2	82.2
	7.2	275.8	56.0	268.8	58.9	261.6	61.9	254.3	65.0	246.9	68.4	239.6	71.8	232.0	75.5	224.3	79.5	216.5	83.8
	10.0	301.4	57.5	293.7	60.3	285.9	63.4	278.0	66.5	269.9	69.9	262.0	73.4	253.8	77.1	245.4	81.2	236.9	85.5
TCORV4T 100	1.7	257.2	60.0	251.6	63.1	246.0	66.3	240.3	69.7	234.6	73.3	229.1	77.0	223.3	81.1	217.5	85.4	211.6	90.1
	4.4	280.0	61.5	273.9	64.6	267.8	67.9	261.7	71.3	255.5	75.0	249.5	78.7	243.2	82.8	236.9	87.2	230.5	91.9
	7.2	305.1	63.3	298.5	66.4	291.9	69.7	285.2	73.1	278.5	76.8	272.0	80.6	265.2	84.8	258.3	89.2	251.3	93.9
	10.0	331.9	65.2	324.8	68.3	317.5	71.6	310.3	75.1	303.0	78.9	295.9	82.7	288.5	86.9	281.0	91.3	273.5	96.1
TCORV6T 120	1.7	343.0	81.0	334.1	85.2	325.0	89.7	315.7	94.4	306.4	99.3	297.2	104.3	287.6	109.9	277.9	115.8	268.1	122.0
	4.4	375.2	83.0	365.5	87.3	355.6	91.8	345.6	96.5	335.4	101.5	325.5	106.6	315.0	112.2	304.5	118.1	293.9	124.4
	7.2	410.7	85.2	400.1	89.5	389.3	94.0	378.4	98.8	367.3	103.9	356.5	109.0	345.1	114.7	333.7	120.7	322.1	127.1
	10.0	448.3	87.5	436.7	91.9	425.0	96.5	413.0	101.3	401.0	106.5	389.2	111.7	376.9	117.4	364.5	123.5	352.0	129.9

Refrigerant: R-22

CAP : Cooling Capacity

POW: Compressor Power Input

SST: Saturation Suction Temperature

Altitude: Sea Level

Table 4: Specification of Air Cooled Condensing Units / R-134a

Model			TCORV2G 015	TCORV2G 020	TCORV4G 030	TCORV4G [illegible]	TCORV4G 050	TCORV4G 060	TCORV4G [illegible]	TCORV4G 080	TCORV4G 100	TCORV6G 120
General Specification	Cooling Capacity	Ton	10.8	14.0	21.3	28.5	34.5	42.2	48.2	56.5	61.3	82.4
		Kw	34.0	44.3	67.2	90.1	108.8	133.1	152.3	178.3	193.6	260.2
	EER	w/w	3.1	3.3	3.7	3.5	3.5	3.4	3.2	3.5	3.4	3.4
	Capacity Control	%	50-100		25-100							17-100
	No Of Cycle	No.	2									
	Power Supply	V/Ph/Hz	380 / 3 / 50									
	Total Power Input	Kw	10.8	13.4	18.4	25.9	31.1	39.1	47.1	50.7	57.3	76.8
Compressor Data	Compressor Type	-	Scroll									
	No. Of Compressor	No.	2	2	4	4	4	4	4	4	4	6
	Oil Volume	Lit	2 × 3.3	2 × 3. 3	2 × 6.6	2 × 6.6	2 × 7.2	2 × 12.4	2 × 6.2 + 2 × 8	2 × 16	2 × 8 + 2 × 8	2 × 24
	Power Input	Kw	2 × 3.8	2 × 5.1	2 × 3.8	2 × 4.9	2 × 6.2	2 × 7.4	2 × 7.4 + 2 × 10.3	2 × 10.3	2 × 10.4 + 2 × 13	2 × 10.7
	Nominal Current	A	2 × 9.2	2 × 12.1	2 × 9.2	2 × 11.9	2 × 14.1	2 × 16.4	2 × 16.37 + 2 × 20.96	2 × 20.9	2 × 21.12 + 2 × 26.8	2 × 21.4
	Consumption Current	A	2 × 98	2 × 130	2 × 98	2 × 130	2 × 145	2 × 175	2 × 175 + 2 × 215	2 × 215	2 × 270 + 2 × 215	2 × 215
	Max Consumption Current	A	2 × 19	2 × 29	2 × 19	2 × 29	2 × 32	2 × 35	2 × 50 + 2 × 35	2 × 50	2 × 50 + 2 × 69	2 × 50
Condenser Data	Coil Type	-	V Type									
	Coil Material	-	Cupper Pipe / AL Fins									
	Fan Type	-	Axial									
	No. Of Fan	No.	2	2	2	4	4	6	6	6	6	8
	Nominal Consumption Current	A	2 × 3.4	2 × 3.4	2 × 3.4	4 × 3.4	4 × 3.4	4 × 3.4	6 × 3.4	6 × 3.4	6 × 3.4	8 × 3.4
	Power Input	Kw	2 × 1.58	2 × 1.58	2 × 1.58	4 × 1.58	4 × 1.58	4 × 1.58	6 × 1.58	6 × 1.58	6 × 1.58	8 × 1.58
Dimension Data	Length	mm	1700	1900	2100	2700	2800	4200	4400	4800	4800	5400
	Width	mm	2400	2400	2400	2400	2400	2400	2400	2400	2400	2400
	Height	mm	2200	2200	2200	2200	2220	2220	2220	2220	2220	2220
Weight Data	Net	Kg	1198	1262	1505	1823	1998	2489	2643	2899	2920	3479
	Wet	Kg	1318	1388	1656	2005	2198	2738	2907	3189	3212	3827
Connection Data	Gas Line	mm	28.5	28.5	28.5	34.9	34.9	41.3	41.3	41.3	54	54
	Liquid Line	mm	15.9	15.9	15.9	22.2	22.2	22.2	22.2	28.5	28.5	28.5

*Total Power: Compressor Power Input + Condenser Fan Power Input

Capacities are based on the following conditions:

Cooling: Indoor Temperature 35 °C DB / 24 °C WB

Saturation Evaporator Temperature: 7.2 °C

Altitude: Sea Level

Table 5: Rating Capacity & Power Input in different conditions / R-134a

Model	Saturation Suction Temperature (°C)	30		32		35		38		40		43		46		49		52	
		CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW	CAP	POW
TCORV2G 015	1.7	29.4	6.6	28.6	7.1	27.7	7.5	26.9	8.0	26.0	8.5	25.1	9.0	24.2	9.6	23.3	10.1	22.3	10.7
	4.4	32.5	6.7	31.6	7.1	30.7	7.6	29.8	8.1	28.8	8.6	27.9	9.1	26.8	9.7	25.8	10.2	24.7	10.8
	7.2	35.9	6.8	35.0	7.2	34.0	7.7	33.0	8.2	31.9	8.7	30.8	9.2	29.7	9.8	28.6	10.3	27.4	11.0
	10.0	39.6	6.8	38.5	7.3	37.5	7.7	36.3	8.2	35.2	8.7	34.0	9.3	32.8	9.8	31.5	10.4	30.2	11.1
TCORV2G 020	1.7	38.1	8.9	37.0	9.4	36.0	10.0	34.8	10.6	33.7	11.3	32.5	11.9	31.3	12.7	30.1	13.5	28.8	14.3
	4.4	42.3	9.0	41.1	9.5	39.9	10.1	38.7	10.7	37.4	11.4	36.2	12.1	34.8	12.8	33.5	13.6	32.1	14.4
	7.2	46.9	9.1	45.6	9.6	44.3	10.2	43.0	10.8	41.6	11.5	40.2	12.2	38.8	12.9	37.3	13.7	35.8	14.6
	10.0	51.8	9.1	50.4	9.7	49.0	10.3	47.5	11.0	46.0	11.6	44.5	12.3	42.9	13.1	41.3	13.9	39.7	14.7
TCORV4G 030	1.7	58.3	13.3	56.6	14.1	55.0	15.0	53.3	16.0	51.5	17.0	49.8	18.0	47.9	19.1	46.0	20.2	44.1	21.4
	4.4	64.4	13.4	62.6	14.3	60.8	15.2	58.9	16.2	57.0	17.2	55.0	18.2	53.0	19.3	50.9	20.5	48.8	21.7
	7.2	71.1	13.6	69.2	14.5	67.2	15.4	65.1	16.4	63.0	17.4	60.8	18.4	58.6	19.6	56.3	20.8	54.0	22.0
	10.0	78.3	13.7	76.2	14.6	73.9	15.6	71.6	16.6	69.3	17.6	67.0	18.7	64.5	19.8	62.0	21.0	59.5	22.3
TCORV4G 040	1.7	77.1	17.3	75.0	18.3	72.9	19.5	70.6	20.7	68.3	22.0	66.0	23.3	63.6	24.7	61.1	26.3	58.6	27.9
	4.4	85.7	17.4	83.4	18.4	81.1	19.6	78.6	20.8	76.1	22.1	73.6	23.4	71.0	24.9	68.3	26.4	65.5	28.0
	7.2	95.2	17.5	92.7	18.6	90.1	19.7	87.5	20.9	84.7	22.2	82.0	23.6	79.1	25.0	76.2	26.6	73.2	28.2
	10.0	105.4	17.6	102.6	18.7	99.8	19.9	96.9	21.1	93.9	22.4	90.9	23.8	87.8	25.2	84.6	26.8	81.3	28.4
TCORV4G 050	1.7	93.4	21.6	90.6	23.0	87.7	24.4	84.9	25.9	82.1	27.4	79.4	29.0	76.7	30.8	73.9	32.7	71.2	34.7
	4.4	104.0	21.9	100.8	23.2	97.7	24.6	94.6	26.1	91.5	27.7	88.6	29.3	85.5	31.1	82.5	33.0	79.4	35.0
	7.2	115.7	22.2	112.2	23.5	108.8	25.0	105.4	26.5	102.0	28.1	98.7	29.7	95.3	31.5	92.0	33.4	88.6	35.5
	10.0	128.3	22.5	124.5	23.9	120.7	25.4	116.9	26.9	113.2	28.5	109.6	30.2	105.9	32.0	102.2	33.9	98.5	36.0
TCORV4G 060	1.7	114.3	25.9	111.2	27.4	108.0	28.9	104.8	30.5	101.5	32.2	98.2	34.0	94.8	35.9	91.3	38.0	87.8	40.1
	4.4	126.8	26.2	123.4	27.7	119.9	29.2	116.4	30.9	112.8	32.6	109.2	34.4	105.5	36.4	101.7	38.5	97.9	40.6
	7.2	140.6	26.5	136.9	28.0	133.1	29.6	129.2	31.2	125.3	33.0	121.4	34.9	117.3	36.8	113.2	39.0	108.9	41.2
	10.0	155.4	26.8	151.3	28.3	147.2	29.9	143.0	31.6	138.6	33.4	134.4	35.3	129.9	37.3	125.4	39.5	120.8	41.7
TCORV4G 070	1.7	131.7	31.0	128.3	32.7	124.9	34.5	121.4	36.4	117.9	38.4	114.6	40.4	111.1	42.6	107.5	45.0	103.9	47.5
	4.4	145.3	31.4	141.6	33.2	137.8	35.0	134.0	36.9	130.2	38.9	126.5	41.0	122.7	43.2	118.8	45.6	114.9	48.1
	7.2	160.5	31.9	156.4	33.6	152.2	35.5	148.1	37.4	143.9	39.5	139.9	41.6	135.6	43.9	131.4	46.3	127.1	48.9
	10.0	176.8	32.3	172.3	34.1	167.8	36.0	163.3	38.0	158.7	40.1	154.2	42.2	149.6	44.6	144.9	47.0	140.2	49.6
TCORV4G 080	1.7	152.6	36.0	148.2	37.9	143.9	40.0	139.5	42.1	135.1	44.3	130.8	46.6	126.4	49.1	121.8	51.7	117.3	54.4
	4.4	169.8	36.5	164.9	38.5	160.0	40.6	155.1	42.7	150.3	45.0	145.5	47.3	140.6	49.8	135.6	52.5	130.6	55.3
	7.2	189.2	37.1	183.7	39.1	178.2	41.2	172.8	43.4	167.3	45.8	162.1	48.1	156.6	50.7	151.1	53.4	145.5	56.2
	10.0	210.2	37.7	204.1	39.8	198.0	41.9	191.9	44.2	185.9	46.5	180.0	48.9	173.9	51.6	167.8	54.3	161.7	57.2
TCORV4G 100	1.7	167.8	40.7	163.4	43.0	159.0	45.4	154.5	47.9	150.0	50.4	145.7	53.1	141.2	55.9	136.6	58.9	132.0	62.1
	4.4	185.0	41.4	180.2	43.7	175.3	46.2	170.4	48.7	165.5	51.3	160.8	54.0	155.8	56.9	150.8	60.0	145.8	63.2
	7.2	204.2	42.2	198.9	44.5	193.5	47.0	188.2	49.6	182.8	52.3	177.6	55.0	172.2	58.0	166.7	61.1	161.2	64.4
	10.0	224.9	42.9	219.0	45.4	213.2	48.0	207.3	50.6	201.4	53.4	195.7	56.2	189.8	59.2	183.8	62.4	177.8	65.8
TCORV6G 120	1.7	223.9	56.1	217.3	59.1	210.8	62.3	204.2	65.6	197.6	69.0	191.2	72.6	184.4	76.4	177.6	80.4	170.7	84.7
	4.4	248.6	57.0	241.3	60.1	234.0	63.3	226.7	66.7	219.4	70.3	212.3	73.9	204.9	77.8	197.4	81.9	189.8	86.2
	7.2	276.5	58.1	268.3	61.2	260.2	64.5	252.0	68.0	243.9	71.6	236.0	75.3	227.8	79.3	219.5	83.5	211.2	87.9
	10.0	306.6	59.2	297.5	62.4	288.4	65.8	279.4	69.3	270.4	73.1	261.6	76.8	252.5	80.9	243.4	85.2	234.2	89.7

Refrigerant : R-134a

CAP : Cooling Capacity

POW : Compressor Power Input

Altitude : Sea Level

SST : Saturation Suction Temperature

Table 6: Sound Data of Air Cooled Condensing Units

Model	Octave Band Center Frequency (Hz)							Sound Pressure Level dB(A)	Sound Power Level dB(A)
	63	125	250	500	1000	2000	4000		
TCORV2T/G 015	67.9	59.8	63.1	70.8	72.2	70.5	65.3	69.0	76.9
TCORV2T/G 020	70.0	67.9	70.8	76.0	75.7	75.7	68.9	72.4	80.4
TCORV4T/G 030	73.5	69.9	71.0	74.2	76.0	73.9	69.5	72.5	80.5
TCORV4T/G 040	72.8	71.8	73.8	78.7	78.4	78.5	71.8	76.0	83.9
TCORV4T/G 050	77.0	71.1	72.6	80.5	81.0	79.4	76.5	77.6	85.6
TCORV4T/G 060	74.8	73.5	76.7	83.0	81.8	82.1	79.0	79.5	87.5
TCORV4T/G 070	76.9	74.2	77.2	85.3	83.4	82.1	80.1	81.0	88.9
TCORV4T/G 080	78.2	74.8	77.6	86.8	84.6	82.1	81.0	82.0	89.9
TCORV4T/G 100	75.3	60.9	73.4	87.8	84.5	81.5	80.3	82.2	90.2
TCORV6T/G 120	79.0	62.8	73.1	88.4	86.0	83.5	82.6	83.6	91.6

*Sound level is based on the ARI test conditions.

*The sound pressure level measured at 1 meter distance from working equipment and maximum capacity.

Capacities are based on the following conditions:

Cooling : Indoor Temperature 35 °C DB / 24 °C WB

Saturation Evaporator Temperature: 7.2 °C

Altitude: Sea Level

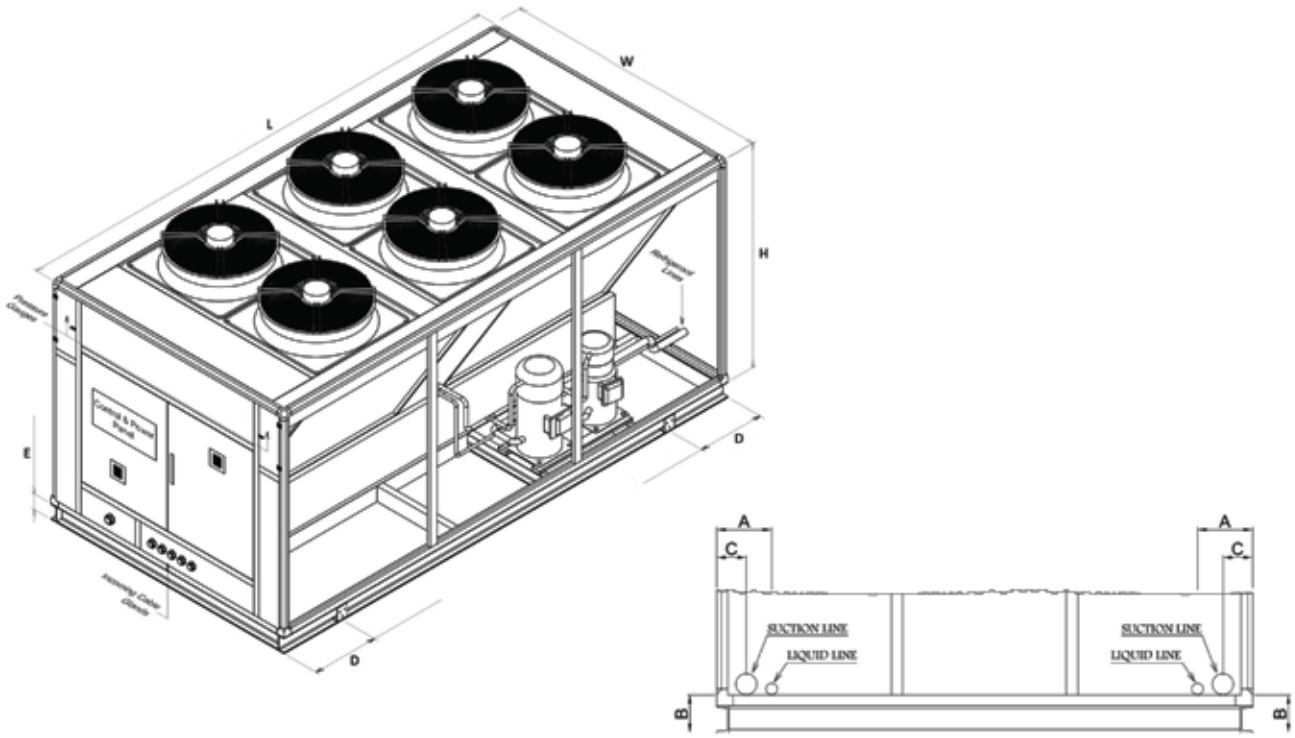
Table 7-1: Electrical Specification of Air Cooled Condensing Units / R-22

Model	No. Of Compressor	No. Of Fans	Electrical Data V/Ph/Hz	Power Input (kw)		Total Power Input (Kw)	Current (A)		Total Current (A)	Max Current (A)		Max Total Current (A)
				Each Compressor	Each Fan		Each Compressor	Each Fan		Each Compressor	Each Fan	
TCORV2T 015	2	2	400-3-50	5.6	1.58	14.4	11.1	3.4	29.1	19.0	3.9	45.8
TCORV2T 020	2	2	400-3-50	7.3	1.58	17.8	14.4	3.4	35.5	29.0	3.9	65.8
TCORV4T 030	4	2	400-3-50	5.9	1.58	26.8	11.5	3.4	52.6	19.0	3.9	83.8
TCORV4T 040	4	4	400-3-50	7.4	1.58	35.9	14.5	3.4	71.4	29.0	3.9	131.6
TCORV4T 050	4	4	400-3-50	9.0	1.58	42.3	16.8	3.4	80.7	32.0	3.9	143.6
TCORV4T 060	4	4	400-3-50	1.3	1.58	51.5	21.6	3.4	100.0	35.0	3.9	155.6
TCORV4T 070	4	6	400-3-50	11.215.5+	1.58	62.8	21.4327+ .49	3.4	118.2	5035+	3.9	193.4
TCORV4T 080	4	6	400-3-50	15.4	1.58	71.1	27.4	3.4	130.0	50.0	3.9	223.4
TCORV4T 100	4	6	400-3-50	15.319.4+	1.58	78.9	27.3234+ .84	3.4	144.7	5069+	3.9	261.4
TCORV6T 120	6	8	400-3-50	15.6	1.58	106.2	27.7	3.4	193.3	50.0	3.9	331.2

Table 7-2: Electrical Specification Of Air Cooled Condensing Units / R-134a

Model	No. Of Compressor	No. Of Fans	Electrica l Data V/Ph/Hz	Power Input (kw)		Total Power Input (Kw)	Current (A)		Total Current (A)	Max Current (A)		Max Total Current (A)
				Each Compressor	Each Fan		Each Compressor	Each Fan		Each Compressor	Each Fan	
TCORV2G 015	2	2	400-3-50	3.8	1.58	10.8	9.2	3.4	25.2	19.0	3.9	45.8
TCORV2G 020	2	2	400-3-50	5.1	1.58	13.4	12.1	3.4	31.0	29.0	3.9	65.8
TCORV4G 030	4	2	400-3-50	3.8	1.58	18.4	9.2	3.4	43.7	19.0	3.9	83.8
TCORV4G 040	4	4	400-3-50	4.9	1.58	25.9	11.9	3.4	61.3	29.0	3.9	131.6
TCORV4G 050	4	4	400-3-50	6.2	1.58	31.1	14.1	3.4	69.9	32.0	3.9	143.6
TCORV4G 060	4	4	400-3-50	7.4	1.58	39.1	16.4	3.4	85.8	35.0	3.9	163.4
TCORV4G 070	4	6	400-3-50	7.410.3+	1.58	47.1	16.3720+ .96	3.4	95.0	5035+	3.9	193.4
TCORV4G 080	4	6	400-3-50	10.3	1.58	50.7	20.9	3.4	104.1	50	3.9	223.4
TCORV4G 100	4	6	400-3-50	10.413+	1.58	57.3	21.1226+ .79	3.4	116.2	5069+	3.9	261.4
TCORV6G 120	6	8	400-3-50	10.7	1.58	76.8	21.4	3.4	155.7	50.0	3.9	331.2

Dimension Data



Dimension Table

Model	L (R-22) (mm)	L (R-134a) (mm)	W (mm)	H (mm)	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)
TCORV2T/G 015	2000	1700	2400	2200	180	150	120	150	100
TCORV2T/G 020	2000	1900	2400	2200	180	150	120	150	100
TCORV4T/G 030	2600	2100	2400	2200	180	150	150	150	100
TCORV4T/G 040	3200	2700	2400	2200	200	150	150	150	100
TCORV4T/G 050	4000	2800	2400	2220	200	195	150	600	120
TCORV4T/G 060	4600	4200	2400	2220	210	195	160	600	120
TCORV4T/G 070	4800	4400	2400	2220	210	195	160	600	120
TCORV4T/G 080	5000	4800	2400	2220	215	195	160	600	120
TCORV4T/G 100	5600	4800	2400	2220	215	195	170	850	120
TCORV6T/G 120	6000	5400	2400	2220	215	195	170	1000	120

Lifting

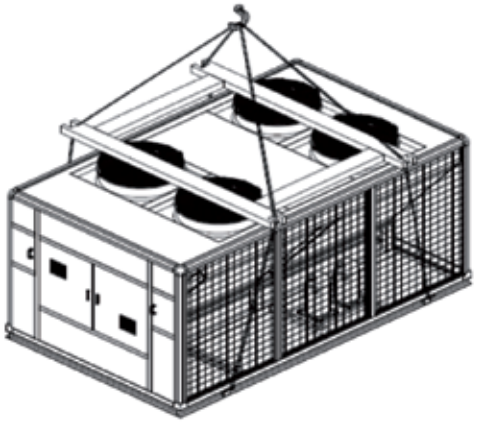
Installation and maintenance of the devices should be carried out by qualified and experienced personnel. Devices must be installed in such a way that repair and maintenance operations can be easily implemented

Hooking rigging sling thru holes in base rail , as shown below.

Center of gravity is not unit center line. Ensure center of gravity aligns with the main lifting point before lifting.

Use spreader bar when rigging, to prevent the slings from damaging the unit.

All panels should be in place when rigging. Care must be taken to avoid damage to the coils during handing. Insert packing material between coils and slings as necessary.

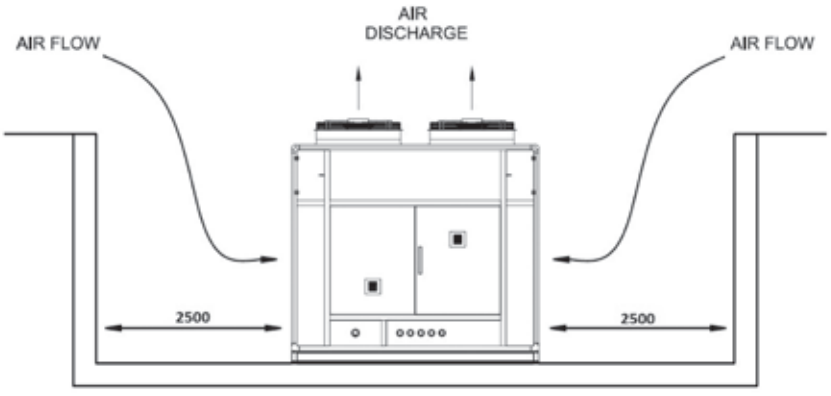


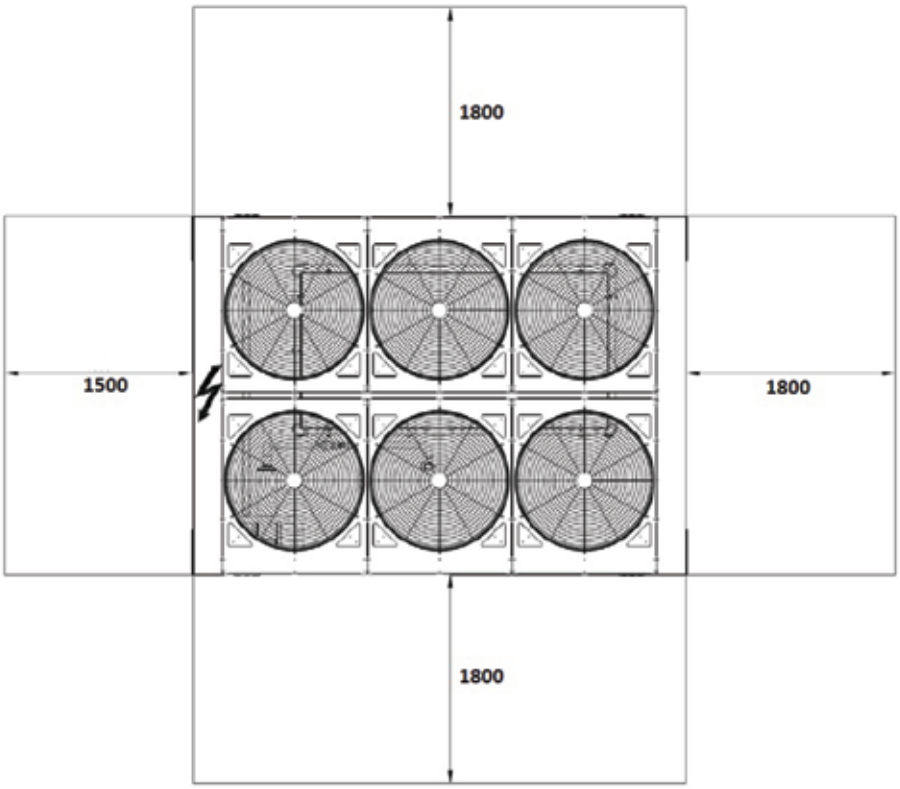
Lifting schematic drawing

Layout

The most important consideration about location of air cooled condensing is the ambient air flow is supplied to the condenser and removes the heated air from condenser coil. The minimum space is recommended in below. Reducing the declared distance causes a loss of air flow on the coil condenser, thus, the energy consumption is increased and the cooling capacity is reduced. It was necessary to prevent the reheating of hot air and covering the coil area.

Air cooled condensing unit must not be located in the vicinity of steam or hot air of exhausts. Avoid installing the channel on the entrance and exit paths.

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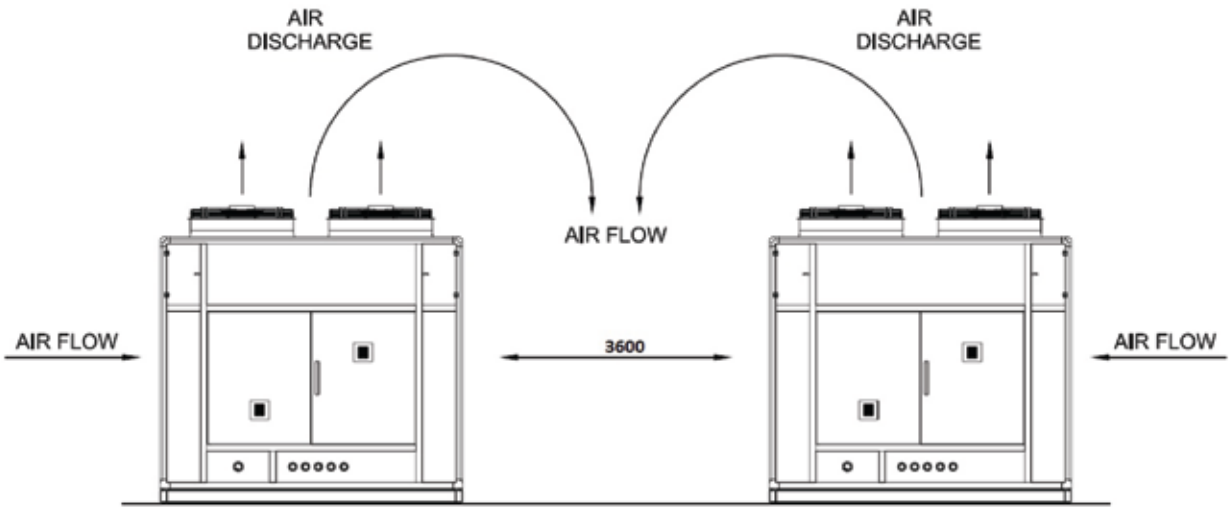
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DISCHARGE
AIR
DISCHARGE
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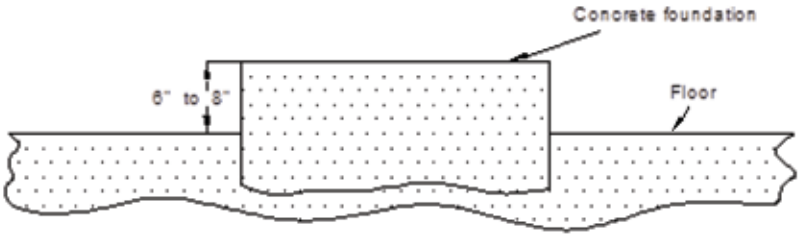
AIR FLOW

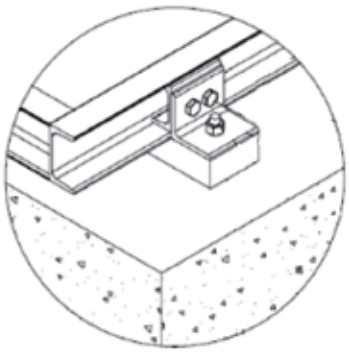
Installation on concrete floor

For roof mounted applications, install the unit on a steel channel or I-beam frame to support the unit above the roof. For ground level applications, install the unit on a substantial base that will not settle. A one piece concrete slab with footing extended below the frost line is recommended. Be sure the foundation is level within ½" (13mm) over its length and width. The foundation must be strong to support the weights listed in physical data tables.
In case the unit is installed on the floor, it should be placed on a concrete foundation 6 to 8 inches higher than the floor surface.

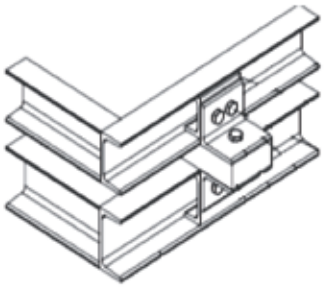


The required foundation for chiller installation on any of the floors

Installation detail



On the foundation



On the skid

Clearances

Do not block the flow of air to and from the condenser coil. Restricting airflow or allowing air recirculation will result in a decrease in unit performance and efficiency because the unit discharge pressure is increased. There must be no obstruction above the unit that would deflect discharge air downward where it could be recirculated back to the inlet of the condenser coil. The condenser fans are propeller type and will not operate with ductwork. Install the unit with the enough side clearance for air entrance to the coil and for servicing. Provide service access to the evaporator, compressor, electrical control panel and piping components. Do not allow debris to accumulate near the unit where it could be drawn into the condenser coil. Keep condenser coils and fans discharge free of snow or other obstructions to permit adequate airflow for proper operation.

If hail and wind guards are used, care must be taken when considering air flow clearances. The guards add 20 inches to the width of each side of the unit and essentially increase the total unit width by that amount. Wall spacing in the following discussions must be taken from outside of the guards, i.e. 20 inches from the side of unit.

The clearances required for design-life operation of HAR air-cooled condensing units are described in the previous section. Occasionally, these cannot be maintained due to site restrictions such as units begin too close together or a fence or wall restricting airflow, or both. Fortunately, the Tahvieh HAR condensing units have several features that can mitigate the penalties attributable to restricted airflow.