Installation
Operation
Maintenance

ODYSSEY

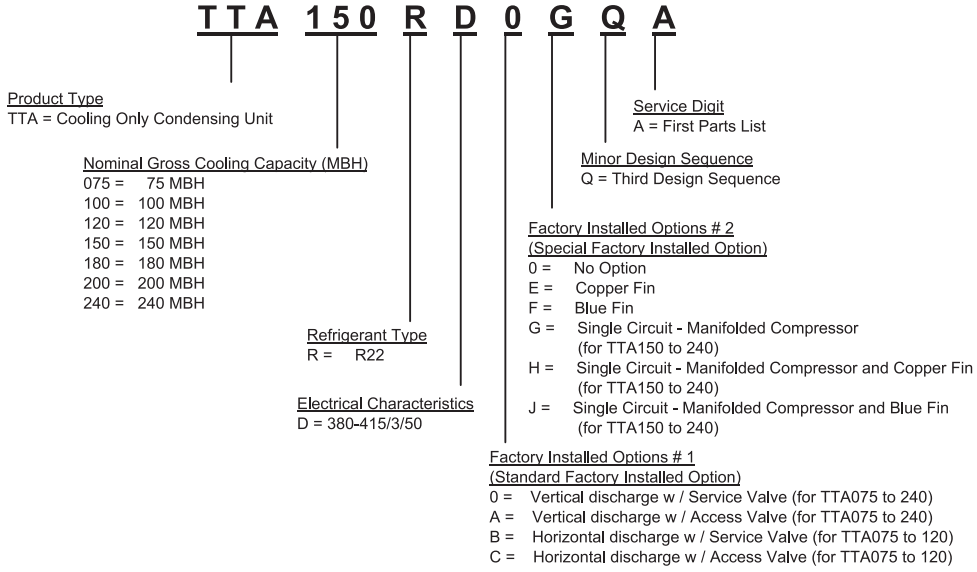
Light Commercial
Split System 5-20 Tons
TTA Model 50 Hz

Single Circuit;	Dual Circuit;	Manifolded Compr.;
TTA 075 RD	TTA 150 RD	TTA 150 RD0G
TTA 100 RD	TTA 180 RD	TTA 180 RD0G
TTA 120 RD	TTA 200 RD	TTA 200 RD0G
	TTA 240 RD	TTA 240 RD0G

January 2010 **TTA-IOM-EN0110**

Model Nomenclature

Air-Cooled Condensing Unit Model Nomenclature



Contents

General Information

This manual covers the installation of the **TTA075, TTA100 and TTA120 (Single Circuit), TTA150, TTA180, TTA200 and TTA240 (Dual Circuit and Manifolded Compressor)** system outdoor units. Installation procedures should be performed in the sequence that they appear in this manual. **Do not destroy or remove the manual from the unit.** The manual should remain weather-protected with the unit until all installation procedures are complete.

Note: It is not the intention of this manual to cover all possible variations in systems that may occur or to provide comprehensive information concerning every possible contingency that may be encountered during an installation. If additional information is required or if specific problems arise that are not fully discussed in this manual, contact your local Sales office.

Note: "Warnings" and "Cautions" appear at appropriate places in this manual. Your personal safety and the proper operation of this machine require that you follow them carefully. The Company assumes no liability for installations or servicing performed by unqualified personnel.

Installation Checklist

An "Installation Checklist" is provided at the end of the installation section of this manual. Use the checklist to verify that all necessary installation procedures have been completed. Do not use the checklist as a substitute for reading the information contained in the manual. Read the entire manual before beginning installation procedures.

Unit Inspection

Inspect material carefully for any shipping damage. If damaged, it must be reported to, and claims made against the transportation company. Compare the information that appears on the unit nameplate with ordering and submittal data to insure the proper unit was shipped. Available power supply must be compatible with electrical characteristics specified on component nameplates. Replace damaged parts with authorized parts only.

Inspection Checklist

To protect against loss due to damage incurred in transit, complete the following checklist upon receipt of the unit.

- Inspect individual pieces of the shipment before accepting the unit. Check for obvious damage to the unit or packing material.
- Inspect the unit for concealed damage before it is stored and as soon as possible after delivery. Concealed damage must be reported within 15 days. If con sealed damage is discovered, stop unpacking the shipment. Do not remove damaged material from the receiving location. Take photos of the damage if possible. The owner must provide reasonable evidence that the damage did not occur after delivery.
- Notify the carrier's terminal of damage immediately by phone and by mail. Request an immediate joint inspection of the damage by the carrier and the consignee.
- Notify the sales representative and arrange for repair. Do not repair the unit until the damage is inspected by the carrier's representative.

Table 1 - Total Unit Weight and Corner Weight

Model	Shipping Maximum		Net Maximum		Corner Weight							
					#1		#2		#3		#4	
	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb	kg	lb
TTA 075 RD	171	377.0	164	361.6	66.2	145.9	27.8	61.3	42.8	94.4	27.2	60.0
TTA 100 RD	201	443.1	189	416.7	75.8	167.1	32.4	71.4	49.2	108.5	31.6	69.7
TTA 120 RD	259	571.0	240	529.1	95.6	210.8	34.7	76.5	85.6	188.7	24.1	53.1
TTA 150 RD	396	873.0	382	842.2	96.5	212.7	96.5	212.7	94.5	208.3	94.5	208.3
TTA 180 RD	444	978.9	420	925.9	106.0	233.7	106.0	233.7	104.0	229.3	104.0	229.3
TTA 200 RD	456	1005.3	432	952.4	109.0	240.3	109.0	240.3	107.0	235.9	107.0	235.9
TTA 240 RD	500	1102.3	462	1018.5	116.5	256.8	116.5	256.8	114.5	252.4	114.5	252.4

Note: see corner weight position at Dimensional Data **on page 18-20**

Warning: open and lock unit disconnect to prevent injury or death from

electric shock or contact with moving parts before attempting any installation or maintenance.

Installation

Lifting Recommendations

Before preparing the unit for lifting, estimate the approximate center of gravity for lifting safety. Because of placement of internal components, the unit weight may be unevenly distributed. Approximate unit weights are given in Table 1.

Warning: On-sight lifting equipment must be capable of lifting the unit weight with an adequate safety factor. The use of under-capacity lifting devices may result in severe personal injury or death and can seriously damage the unit.

The crated unit can be moved using a forklift of suitable capacity. For lifting the unit, attach lifting straps or slings securely to the lifting holes at each corner. Use spreader bars to protect the unit casing from damage. Test lift the unit to determine proper balance and stability.

Caution: Use spreader bars to prevent lifting straps from damaging the unit. Install bars between lifting straps. This will prevent the straps from crushing the unit cabinet or damaging the unit finish.

Clearances

Provide enough space around the unit to allow unrestricted access to all service points. Refer to unit dimensional data for minimum required service and free air clearances. Observe the following points to insure proper unit operation.

A. Do not install the unit under a low overhang. Condenser discharge clearance is not less than 2.5 mm.

Important: Do not obstruct condenser discharge air. This can result in warm air recirculation through the coil.

B. Do not locate the unit in a position where runoff water can fall into the fan discharge openings.

C. Condenser intake air is supplied from three sides of the unit. Adhere to the minimum required clearances given in dimensional data.

Unit Mounting

“For ground level installation, the unit base should be adequately supported and hold the unit near level. The installation must meet the guidelines set forth in local codes.” The support should extend two inches beyond the unit base channels at all points. The unit and support must be isolated from any adjacent structure to prevent possible noise or vibration problems. Any ground level location must comply with required clearances given in dimensional data.

Refrigerant Piping Guidelines

Refrigerant Piping

To ensure the return of oil in the refrigerant lines, it is necessary to follow these recommendations:

1. Select the tube lengths with care and try to avoid having a final few meters of tube to use up. Refer to table 2 for tube sizes.
2. Pitch all horizontal suction lines down towards the unit to assist gravity oil drainage back to the compressor.
3. Avoid creating large oil traps in horizontal suction lines as this will reduce oil circulating in the system and may eventually lead to failure of the compressor.
4. A small oil trap at the end of a horizontal suction line before a long vertical riser (of more that 2.5 metres) has the advantage of assisting the high velocity gas to carry the oil up the vertical pipe.
5. Liquid lines require no special installation techniques as the liquid refrigerant R-22 and the oil mix. The densities of the refrigerant and oil are near enough the same so any movement of liquid refrigerant will carry oil with it.
6. The installation of a liquid line sight is recommended. It is very useful during the maintenance procedures.

Refrigerant Piping Guidelines

A. Maximum recommended line lengths: (per circuit)
   Maximum linear length 200 Ft. (W/o accumulator)
   Maximum suction line lift 60 Ft.
   Maximum liquid line lift 60 Ft.

B. Maximum allowable pressure drops (R-22):
   Suction line 6 psi.
   Liquid line 35 psi. (without subcooler)
   Route refrigerant piping for minimum linear length, minimum number of bends and fittings (no reducers) and minimum amount of line exposed to outdoor ambients.

C. Recommended line sizes:
   TTA075RD (Single Circuit)
   TTA150RD (Dual Circuit)
   Suction line
   1 1/8 inch sealed type L refrigerant tubing.
   Liquid line
   1/2 inch sealed type L refrigerant tubing.

D. Recommended line sizes:
   TTA100RD and TTA120RD (Single Circuit)
   TTA180RD, TTA200RD and TTA240RD (Dual Circuit)
   Suction line
   1 3/8 inch sealed type L refrigerant tubing.
   Liquid line
   1/2 inch sealed type L refrigerant tubing.

E. Recommended line sizes:
   TTA150RD0G, TTA180RD0G, TTA200RD0G and TTA240RD0G (Manifolded Compressor)
   Suction line
   1 5/8 inch sealed type L refrigerant tubing.
   Liquid line
   5/8 inch sealed type L refrigerant tubing.

Note: Insulate all refrigerant piping and connections.

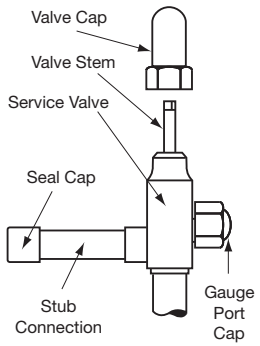


Figure 1

Table 2 - Recommended Interconnecting Lines

Model	Length of Interconnecting Line (feet)							
	0-20		21-40		41-60		61-80	
	Liq.	Suct.	Liq.	Suct.	Liq.	Suct.	Liq.	Suct.
TTA 075 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8
TTA 100 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 3/8
TTA 120 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 3/8
TTA 150 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8
TTA 180 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 3/8
TTA 200 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 3/8
TTA 240 RD	1/2	1 1/8	1/2	1 1/8	1/2	1 1/8	1/2	1 3/8
TTA 150 RD0G	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8
TTA 180 RD0G	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8
TTA 200 RD0G	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8
TTA 240 RD0G	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8	5/8	1 5/8

Notes: 1. Two line sets are required for dual circuits units.
2. For line lengths over 80 linear feet and 15 feet liquid line riser, consult your local Trane representative.

Refrigerant Piping Guidelines

Refrigerant Piping Procedures (Outdoor units)

Each TTA unit ships with a R-22 holding charge. Due to this minimal amount, we recommend that it be removed and the entire system evacuated (at the proper time) to avoid possible contamination.

1. Remove the compressor service access panel.
2. Locate the liquid and suction line service valves. Check that the piping connection stubs on the valves (Figure 1) line up properly with the holes in the unit cabinet.
3. Front-seat (close) both of the service valves must be closed before the system is opened.

Caution: Fully close the liquid and suction line service valves before puncturing the seal caps on the connection stubs. If the seal caps are punctured with the valves open, the refrigerant contained in each circuit will be lost.

Warning: Do not heat the seal caps unless they have been punctured. If caps are intact, application of heat may generate excessive pressure in the connection stub, causing personal injury or death due to rupturing of components and damage to the service valve.

4. Heat and remove the seal caps.

Caution: Do not remove the seal caps from refrigerant connections unit prepared to braze refrigerant lines to the connections. Excessive exposure to atmosphere may allow moisture or dirt to contaminate the system, damaging valve seats and causing ice formation in system components.

5. Cut, fit and braze tubing, starting at the outdoor unit and work toward the indoor unit.

Note: Use long radius ells for all 90 degree bends.

All brazing should be done using 2 to 8 psig dry nitrogen purge flowing through the pipe being brazed 9 (Figure 2).

Caution: Install a regulating valve between the nitrogen source and the gauge manifold (Figure 2). Unregulated pressures can damage system components.

Caution: Wet-wrap all valves and protect painted surfaces from excessive heat. Heat can damage system components and the unit finish.

6. Shut off nitrogen supply.
7. Shut off the manifold valve for the line that is connected to the suction line service valve. Disconnect the line from the gauge port on the value.

Refrigerant Piping Procedure (Indoor Unit)

Once liquid and suction lines are complete to the refrigerant connections on the indoor unit, heat and remove the seal caps on the indoor unit connection stubs to release the dry nitrogen charge.

1. Remove both seal caps from the indoor unit connection stubs.

Caution: Do not remove seal caps until prepared to braze refrigerant lines to the connections. Extended exposure to atmosphere may allow moisture or dirt to contaminate the system, damaging system components.

2. Turn nitrogen supply on. Nitrogen enters through the liquid line gauge port.
3. Braze the liquid line connections.
4. Open the gauge port on the suction line and then braze suction line to the connection stub. Nitrogen will bleed out the open gauge port on the suction line.
5. Shut off nitrogen supply.

Leak Check

After the brazing operation of refrigerant lines to both the outdoor and indoor unit is completed, the field brazed connections must be checked for leaks. Pressurize the system through the service valve with dry nitrogen to 200 psi. Use soap bubbles or other leak-checking methods to ensure that all field joints are leak free. If not, release pressure, repair and repeat leak test.

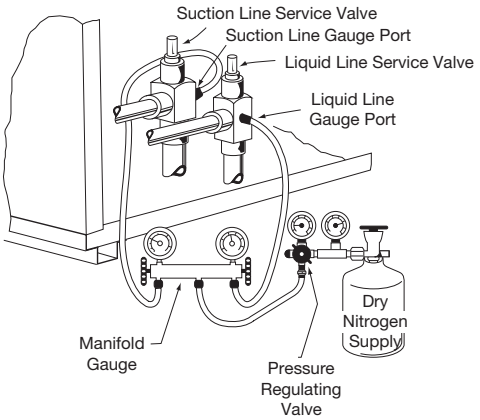


Figure 2

Refrigerant Charging and Evacuation

System Evacuation

1. After completion of leak check, evacuate the system.
2. Attach appropriate hoses from manifold gauge to gas and liquid line pressure taps.

Note: Unnecessary switching of hoses can be avoided and complete evacuation of all lines leading to sealed system can be accomplished with manifold center hose and connecting branch hose to a cylinder of R-22 and vacuum pump.

3. Attach center hose of manifold gauges to vacuum pump.
4. Evacuate the system to hold a 350 micron vacuum.
5. Close off valve to vacuum pump and observe the micron gauge. If gauge pressure rised above 500 microns in one (1) minute, then evacuation is incomplete or the system has a leak.
6. If vacuum gauge does not rise above 500 microns in one (1) minute, the evacuation should be complete.
7. Remove vacuum pump. Attach center hose of manifold gauge to R-22 cylinder, purge the charging line, open valve on R-22 cylinder and allow refrigerant pressure to build up to about 40 psig.
8. Close valve on the R-22 supply cylinder and close valves on manifold gauge.
9. Leak test the entire system. Using proper procedures and caution, repair any leaks found and repeat the leak test.

Caution: Do not connect a dual-circuit outdoor unit to a single circuit evaporating unit. (blower)

Table 3 - Recommended Refrigerant Charge (R-22)

Model	Refrigerant Charge (per circuit)[1]	
	kg	lb
TTA 075 RD	5.40	11.90
TTA 100 RD	6.30	13.89
TTA 120 RD	6.75	14.88
TTA 150 RD	5.40	11.90
TTA 180 RD	6.10	13.45
TTA 200 RD	6.30	13.89
TTA 240 RD	6.75	14.88
TTA 150 RD0G	10.80	23.81
TTA 180 RD0G	12.20	26.90
TTA 200 RD0G	12.60	27.78
TTA 240 RD0G	13.50	29.76

[1] Sufficient operating charge for outdoor unit and 25 feet of nominally sized refrigerant piping.

Note: Each TTA unit ships with R-22 holding charge.

Table 4 - Additional Required Refrigerant

Tubing Sizes		Additional	Additional		See
Suction	Liquid	Tubing Length	Refrigerant		Note
1 1/8"	3/8"	15 ft.	0 lb.	11.5 oz.	(1)
1 1/8"	3/8"	25 ft.	1 lb.	3.0 oz.	(1)
1 1/8"	3/8"	32 ft.	1 lb.	8.0 oz.	(1)
1 1/8"	3/8"	40 ft.	1 lb.	14.0 oz.	(1)
1 3/8"	1/2"	15 ft.	1 lb.	4.0 oz.	(2)
1 3/8"	1/2"	25 ft.	2 lb.	1.0 oz.	(2)
1 3/8"	1/2"	32 ft.	2 lb.	11.0 oz.	(2)
1 3/8"	1/2"	40 ft.	3 lb.	5.0 oz.	(2)
1 5/8"	5/8"	15 ft.	1 lb.	15.5 oz.	(3)
1 5/8"	5/8"	25 ft.	3 lb.	5.5 oz.	(3)
1 5/8"	5/8"	32 ft.	4 lb.	3.2 oz.	(3)
1 5/8"	5/8"	40 ft.	5 lb.	4.0 oz.	(3)

[1] Amounts shown are based on .75 ounces of refrigerant per foot of 1 1/8" and 3/8" lines.
[2] Amounts shown are based on 1.33 ounces of refrigerant per foot of 1 3/8" and 1/2" lines.
[3] Amounts shown are based on 2.1 ounces of refrigerant per foot of 1 5/8" and 5/8" lines.

Note: for tubing over 40 ft. calculate the additional refrigerant needed, based on notes above.

Refrigerant Charging and Evacuation

Liquid Charging
After the refrigerant pipework system has been pressure tested and evacuated, the refrigerant may be charged as follows.

1. Weigh the refrigerant cylinder on weighing scale.
2. Attach the charging line from the center hose of manifold gauge to R-22 cylinder.
3. Open valve on R-22 cylinder and purge the charging line.
4. Invert the refrigerant cylinder, open the liquid line service valve. Open manifold valve so that only liquid will enter the system. The sufficient operating charge is recommended in Table 3.

Gaseous Charging
This procedure is accomplished with the unit operating. Electrical connections must be complete. Do not proceed until the system is ready to operate.

Procedure

1. Open liquid valve that refrigerant go through air handler unit and open suction valve.
2. Turn on power to the unit. Allow the system to run for five to ten minutes to stabilize operating conditions.
3. Measure airflow across the indoor coil. Compare the measurements with the fan performance data in the Data/Submittal or Service Facts. Once proper airflow is established, observe the suction and head pressure gauges on the gauge manifold. Pressure reading should fall approximately at the points shown by the pressure curves in Service Facts. Add or remove refrigerant (gas only) as required to obtain correct head and suction pressure. Check suction line superheat and condenser sub-cooling to ensure the unit is operating properly.
4. Disconnect all power to the unit.
5. Remove the charging system from the unit and close the opening in the bottom of the control box with the pivotal cover before attempting to replace access panel.
6. Replace all panels.

Additional Charge
Refrigerant suitable for a tube length of 12 to 25 feet is recommended in Table 3. When the tube is longer than 25 feet, additional charging is necessary. For the additional amount, using the table 4 for recommended amounts:

Caution

- Freon Gas “R22” only.
- Always evacuate air from the tubing before adding refrigerant.
- Add refrigerant through the charging port of liquid line valve after the completion of evacuation.
- The refrigerant provided by the manufacturer meets all the requirements of our units. When using recycled or reprocessed refrigerant, it is advisable to ensure its quality is equivalent to that of a new refrigerant. For this, it is necessary to have a precise analysis made by a specialized laboratory. If this condition is not respected, the manufacturer’s warranty could be cancelled.

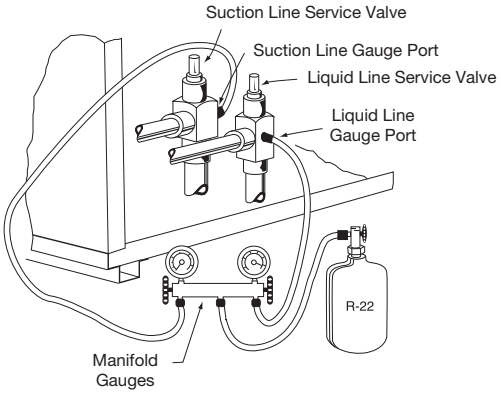


Figure 3

General Data

Outdoor Unit - Single Circuit - 50Hz

UNIT MODELS		TTA075RD	TTA100RD	TTA120RD
POWER CONNECTION	V/ph/Hz	380-415/3/50	380-415/3/50	380-415/3/50
MCA[1]	A	18.06	27.29	29.95
SYSTEM DATA				
Refrigerant Type		R22	R22	R22
Refrigerant Connection Type		BRAZE	BRAZE	BRAZE
Refrigerant Charge	lb (kg)		Holding Charge	
Single Circuit.				
Suction Line OD	in (mm)	1 1/8 (28.6)	1 3/8 (34.9)	1 3/8 (34.9)
Liquid line OD	in (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
Dual Circuit.				
Suction Line OD	in (mm)	-	-	-
Liquid line OD	in (mm)	-	-	-
CASING				
Material			Galvanized & Electro-galvanized Steel	
Color			Light Gray	
Type of Insulation			-	
COMPRESSOR				
Compressor Type			Hermetic Scroll	
No. Used		1	1	1
V/ph/Hz		380/3/50	380/3/50	380/3/50
RLA/LRA		13.6 / 98	20.7 / 130	22.9 / 145
COIL				
Face Area	sq ft (m^2)	15.0 (1.40)	16.0 (1.48)	20.0 (1.86)
Tube Size OD	in (mm)	3/8 (9.53)	3/8 (9.53)	3/8 (9.53)
Tube Type		Plain	Inner groove	Inner groove
Rows		2	2	2
Fin Type			Uncoated Corrugate	
Fins per inch		16	16	16
Refrigerant Flow Control		-	-	-
FAN				
Fan Type		Propeller	Propeller	Propeller
No. used		1	1	1
Diameter	in (mm)	28 (711)	28 (711)	28 (711)
No. of Blade		4	4	4
Pitch Angle	degree	29	29	29
Drive Type		Direct	Direct	Direct
Nominal Airflow[2]	cfm (cmh)	4885 (8300)	5768 (9800)	6828 (11600)
MOTOR				
Motor Type			Three Phase Induction Motor	
No. of Motor		1	1	1
Motor Output	Watt	290	420	300
No. of Speed		1	1	1
Motor Speed	rpm	750	830	875
V/ph/Hz		380/3/50	380/3/50	380/3/50
RLA/LRA		1.06 / 2.27	1.41 / 3.53	1.32 / 2.80
DIMENSION (HxWxD)				
Crated (Shipping)	mm	1180 x 1040 x 1150	1180 x 1040 x 1150	1180 x 1040 x 1150
Uncrated (Net)	mm	1050 x 950 x 1060	1050 x 950 x 1060	1050 x 950 x 1060
WEIGHT				
Crated (Shipping)	kg	170	186	199
Uncrated (Net)	kg	164	180	192

[1] MCA - Minimum Circuit Ampacity

[2] CFM is rated with standard air-dry coil.

General Data

Outdoor Unit - Dual Circuit and Manifolded Circuit - 50Hz

UNIT MODELS		TTA150RD	TTA180RD	TTA200RD	TTA240RD
POWER CONNECTION	V/ph/Hz	380-415/3/50	380-415/3/50	380-415/3/50	380-415/3/50
MCA[1]	A	32.72	35.00	49.22	54.17
SYSTEM DATA					
Refrigerant Type		R22	R22	R22	R22
Refrigerant Connection Type		BRAZE	BRAZE	BRAZE	BRAZE
Refrigerant Charge	lb (kg)			Holding Charge	
Single Circuit (Manifolded Circuit) .					
Suction Line OD	in (mm)	1 5/8 (41.3)	1 5/8 (41.3)	1 5/8 (41.3)	1 5/8 (41.3)
Liquid line OD	in (mm)	5/8 (15.9)	5/8 (15.9)	5/8 (15.9)	5/8 (15.9)
Dual Circuit.					
Suction Line OD	in (mm)	1 1/8 (28.6)	1 3/8 (34.9)	1 3/8 (34.9)	1 3/8 (34.9)
Liquid line OD	in (mm)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
CASING					
Material				Galvanized & Electro-galvanized Steel	
Color				Light Gray	
Type of Insulation				-	
COMPRESSOR					
Compressor Type				Hermetic Scroll	
No. Used		2	2	2	2
V/ph/Hz		380/3/50	380/3/50	380/3/50	380/3/50
RLA/LRA		13.6 / 98	14.3 / 130	20.7 / 130	22.9 / 145
COIL					
Face Area	sq ft (m^2)	30.0 (2.78)	30.0 (2.78)	32.0 (2.97)	42.5 (3.95)
Tube Size OD	in (mm)	3/8 (9.53)	3/8 (9.53)	3/8 (9.53)	3/8 (9.53)
Tube Type		Plain	Inner groove	Inner groove	Plain
Rows		2	2	2	2
Fin Type				Uncoated Corrugate	
Fins per inch		16	16	16	16
Refrigerant Flow Control		-	-	-	-
FAN					
Fan Type		Propeller	Propeller	Propeller	Propeller
No. used		2	2	2	2
Diameter	in (mm)	28 (711)	28 (711)	28 (711)	28 (711)
No. of Blade		4	4	4	4
Pitch Angle	degree	29	29	29	29
Drive Type		Direct	Direct	Direct	Direct
Nominal Airflow[2]	cfm (cmh)	9770 (16600)	11536 (19600)	13537 (23000)	13537 (23000)
MOTOR					
Motor Type				Three Phase Induction Motor	
No. of Motor		2	2	2	2
Motor Output	Watt	290	420	300	300
No. of Speed		1	1	1	1
Motor Speed	rpm	750	830	875	875
V/ph/Hz		380/3/50	380/3/50	380/3/50	380/3/50
RLA/LRA		1.06 / 2.27	1.41 / 3.53	1.32 / 2.80	1.32 / 2.80
DIMENSION (HxWxD)					
Crated (Shipping)	mm	1180 x 2290 x 1140	1180 x 2290 x 1140	1180 x 2290 x 1140	1180 x 2290 x 1140
Uncrated (Net)	mm	1050 x 2200 x 1050	1050 x 2200 x 1050	1050 x 2200 x 1050	1050 x 2200 x 1050
WEIGHT					
Crated (Shipping)	kg	393	426	439	474
Uncrated (Net)	kg	382	415	428	462

[1] MCA - Minimum Circuit Ampacity

[2] CFM is rated with standard air-dry coil.

Electrical Wiring

Electrical Wiring
TTA field wiring consists of providing power supply to the unit, installing the system indoor thermostat. Access to electrical connection locations is shown in dimensional data.

Unit Power Supply
The installer must provide line voltage circuit (s) to the unit main power terminals as shown by the unit wiring diagrams in wiring. Power supply must include a disconnect switch in a location convenient to the unit.

Ground the unit according to local codes and provide flexible conduit if codes require and/or if vibration transmission may cause noise problems.

Important: All wiring must comply with applicable local and national (NEC) codes. Type and location of disconnect switches must comply with all applicable codes.

Caution: Use copper conductors only. Unit terminals are not designed for use with aluminum conductors. Use of improper wiring materials can result in equipment damage.

Warning: Open the electrical disconnect switch and lock in open position to prevent accidental power application. Failure to do so may result in personal injury or death due to electrical shock.

Determine proper wire sizes and unit protective fusing requirements by referring to the unit nameplate and/or in Table 5 Field wiring diagrams for accessories are shipped with the accessory.

Refrigerant Circuit
TTA075-120RD
(Single Circuit)
TTA150-240RD
(Dual Circuit)

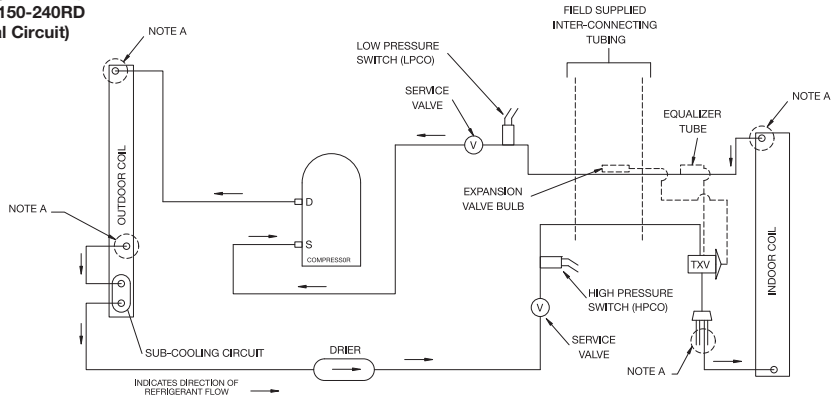


Figure 4

Electrical Wiring

Refrigerant Circuit
TTA150-240RD0G
(Manifolded Compressor)

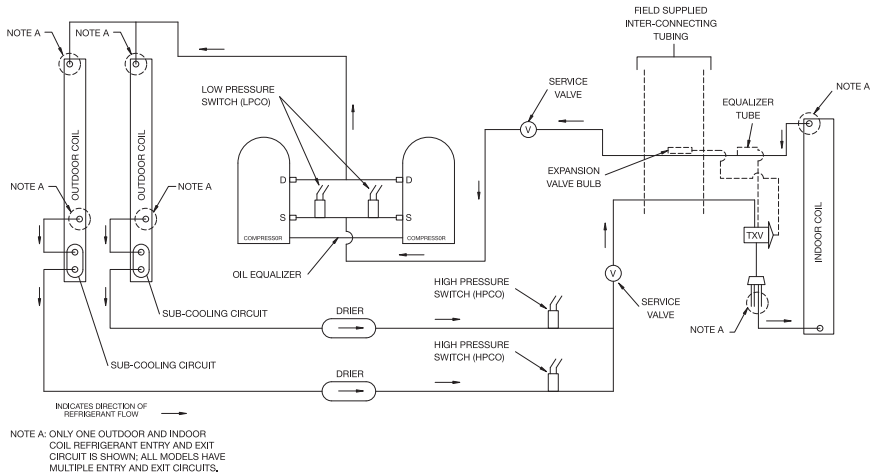


Figure 5

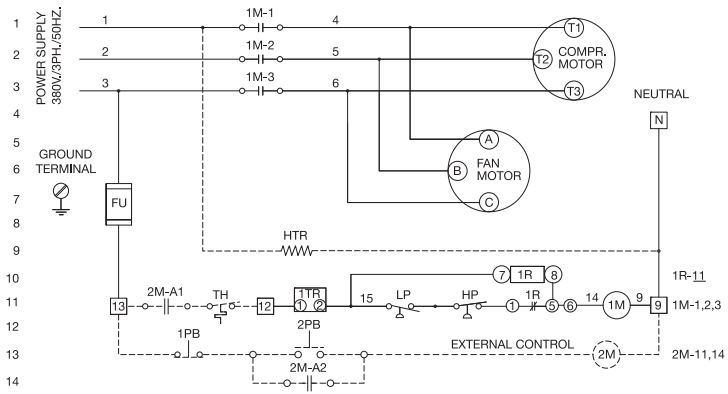
Table 5 - Electrical Data

Model	Electrical Characteristics (Volt/Phase/Hz)	Allowable Voltage Range (Volt)	Minimum Circuit Ampacity (Amp.)	Maximum Fuse Size (Amp.)	Compressor		Fan Motor	
					Qty.	RLA / LRA	Qty.	RLA / LRA
TTA 075 RD	380-415/3/50	342-440	18.06	30	1	13.6 / 98	1	1.06 / 2.27
TTA 100 RD	380-415/3/50	342-440	27.29	30	1	20.7 / 130	1	1.41 / 3.53
TTA 120 RD	380-415/3/50	342-440	29.83	30	1	22.9 / 145	1	1.20 / 2.80
TTA 150 RD/RD0G	380-415/3/50	342-440	32.72	30	2	13.6 / 98	2	1.06 / 2.27
TTA 180 RD/RD0G	380-415/3/50	342-440	35.00	30	2	14.3 / 130	2	1.41 / 3.53
TTA 200 RD/RD0G	380-415/3/50	342-440	49.40	30	2	20.7 / 130	2	1.41 / 3.53
TTA 240 RD/RD0G	380-415/3/50	342-440	53.93	30	2	22.9 / 145	2	1.20 / 2.80

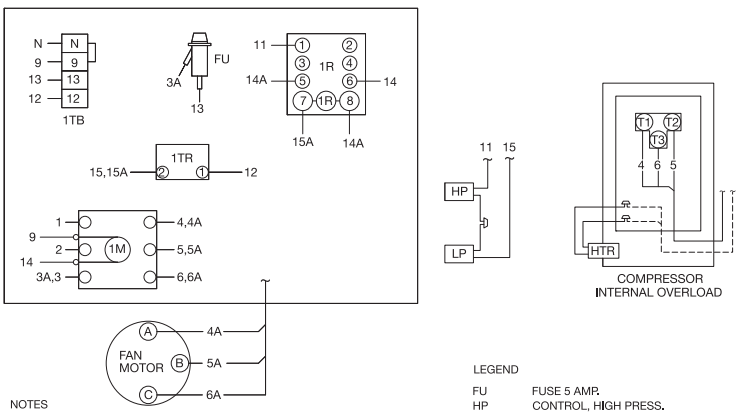
Electrical Wiring

TTA 075, 100, 120 RD

ELEMENTARY DIAGRAM



CONNECTION DIAGRAM



NOTES

1 ALL FIELD WIRING TO BE IN ACCORDANCE WITH NATIONAL ELECTRIC CODE (N.E.C.) CANADIAN ELECTRIC CODE AND/OR LOCAL STATE AND CITY CODES. PROVIDE DISCONNECTS FOR ALL POWER SUPPLIES.
2 DRAWING PRACTICES AND SYMBOLS ARE IN ACCORDANCE WITH AIR CONDITIONING & REFRIGERATION INSTITUTE (ARI) GRAPHIC ELECTRICAL STANDARDS.
3 NUMBERS ALONG LEFT SIDE OF ELEMENTARY DIAGRAM DESIGNATE LINE IDENTIFICATION. NUMBERS ALONG RIGHT SIDE ARE LOCATIONS OF RELAY CONTACTS.
4 COMPONENT TERMINAL MARKINGS ARE INDICATED BY ENCIRCLED NUMBERS AND/OR LETTERS.
5 NUMBERS ON VERTICAL & HORIZONTAL LINE ARE CIRCUIT IDENTIFICATION.
6 MOTORS ARE INHERENTLY PROTECTED.
7 THIS UNIT TO BE USED WITH EVAPORATORS OPERATING WITH IN A TEMPERATURE RANGE OF 32°F TO 53,5°F.

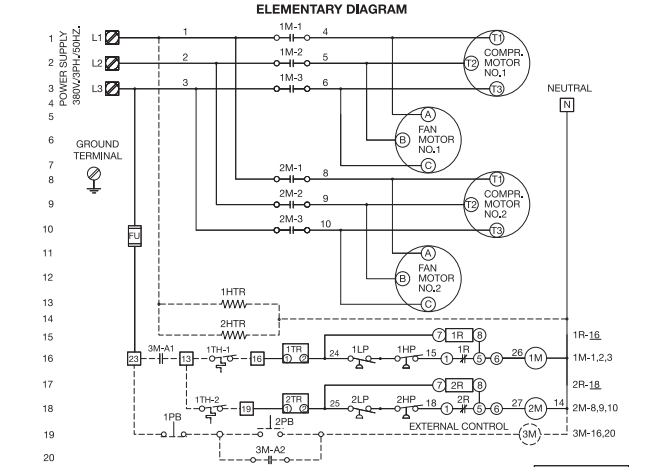
LEGEND

FU	FUSE 5 AMP.
HP	CONTROL, HIGH PRESS. (OPEN : 398 PSIG, CLOSE : 313 PSIG)
LP	CONTROL, LOW PRESS. (OPEN : 27 PSIG, CLOSE : 46 PSIG)
1M	CONTACTOR, COMPRESSOR
1R	RELAY, CONTROL LOCKOUT
HTR	HEATER, CRANKCASE.
2M	CONTACTOR, EVAP. BLOWER MOTOR
TH	THERMOSTAT
□	1TB-TERMINAL BLOCK CONTROL CIRCUIT
———	FACTORY WIRING & DEVICES BY MFR.
- - - - -	FIELD WIRING (OPTION)
1TR	RELAY, TIME DELAY 3 MIN.
1PB, 2PB	SWITCH PUSH BOTTON
A1, A2	AUXILIARY CONTACT(N.O.) OF 2M

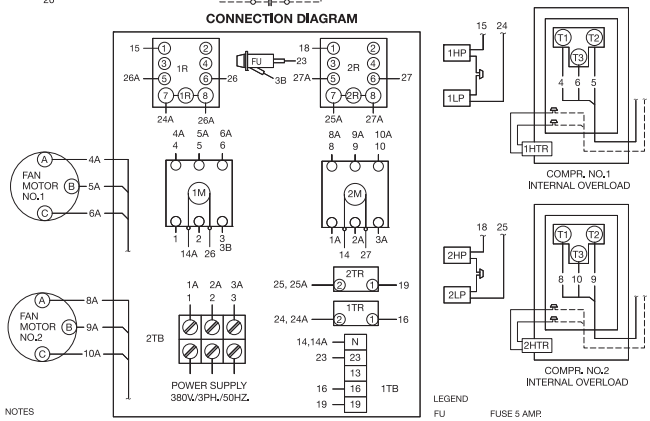
Electrical Wiring

TTA 150, 180, 200, 240 RD

ELEMENTARY DIAGRAM



CONNECTION DIAGRAM



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5 NUMBERS ON VERTICAL & HORIZONTAL LINE ARE CIRCUIT IDENTIFICATION.
6 MOTORS ARE INHERENTLY PROTECTED.
7 THIS UNIT TO BE USED WITH EVAPORATORS OPERATING WITH IN A TEMPERATURE RANGE OF 32°F TO 53.5°F.

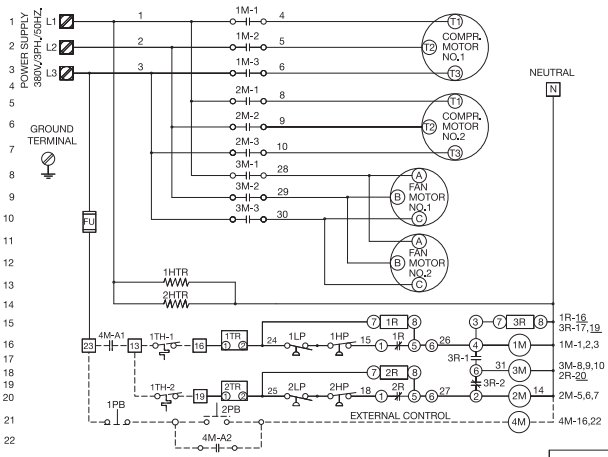
LEGEND

FU	FUSE 5 AMP.
1HP, 2HP	CONTROL, HIGH PRESS. (OPEN : 398 PSIG, CLOSE : 313 PSIG)
1LP, 2LP	CONTROL, LOW PRESS. (OPEN : 27 PSIG, CLOSE : 46 PSIG)
1M, 2M	CONTACTOR, COMPRESSOR
1R, 2R	RELAY, CONTROL LOCKOUT
1HTR, 2HTR	HEATER, CRANKCASE.
1TR	RELAY, TIME DELAY 3 MIN.
2TR	RELAY, TIME DELAY 4.5 MIN.
3M	CONTACTOR, EVAP. BLOWER MOTOR
1PB, 2PB	SWITCH PUSH BOTTON
1TH	THERMOSTAT 2 STAGES.
□	1TB-TERMINAL BLOCK CONTROL CIRCUIT
⊠	2TB-TERMINAL BLOCK HIGH VOLTAGE
———	FACTORY WIRING & DEVICES BY MFR.
- - - -	FIELD WIRING (OPTION)
A1, A2	AUXILIARY CONTACT(N.O.) OF 3M

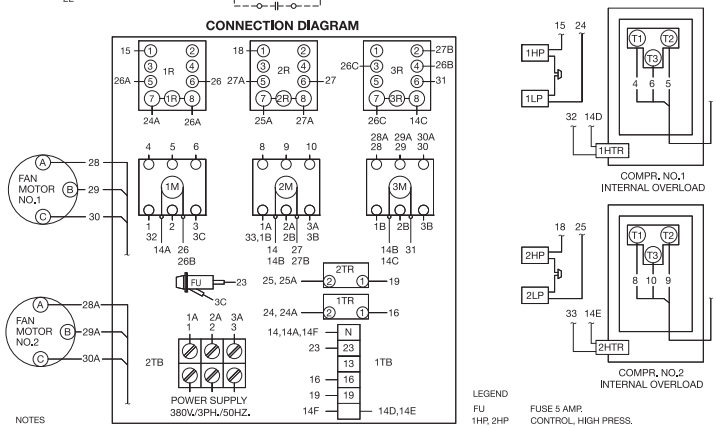
Electrical Wiring

TTA 150, 180, 200, 240 RD0G

ELEMENTARY DIAGRAM



CONNECTION DIAGRAM



NOTES

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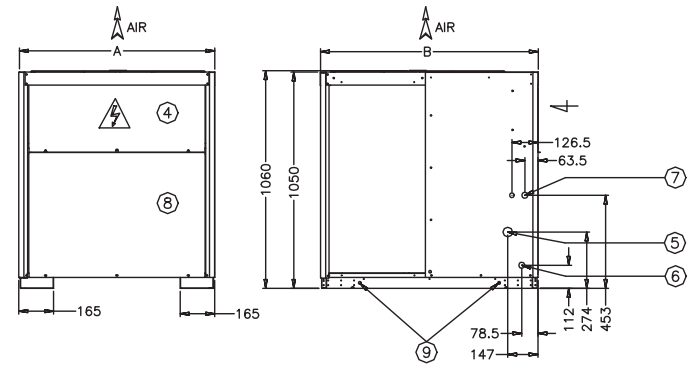
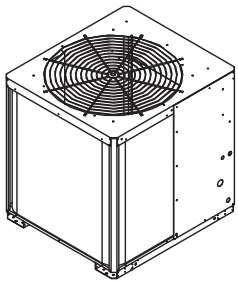
LEGEND

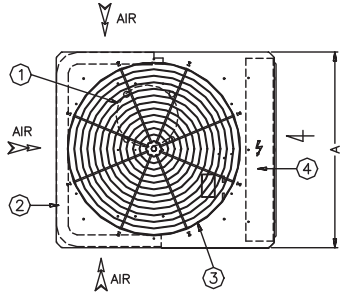
FU	FUSE 5 AMP.
1HP, 2HP	CONTROL, HIGH PRESS. (OPEN : 398 PSIG, CLOSE : 313 PSIG)
1LP, 2LP	CONTROL, LOW PRESS. (OPEN : 27 PSIG, CLOSE : 46 PSIG)
1M, 2M	CONTACTOR, COMPRESSOR
3M	CONTACTOR, FAN MOTOR
1R, 2R, 3R	RELAY, CONTROL LOCKOUT
1HTR, 2HTR	HEATER, CRANKCASE.
1TR	RELAY, TIME DELAY 3 MIN.
2TR	RELAY, TIME DELAY 4.5 MIN.
4M	CONTACTOR, EVAP. BLOWER MOTOR
1PB, 2PB	SWITCH PUSH BOTTON
1TH	THERMOSTAT 2 STAGES.
□	1TB-TERMINAL BLOCK CONTROL CIRCUIT
▨	2TB-TERMINAL BLOCK HIGH VOLTAGE
———	FACTORY WIRING & DEVICES BY MFR.
– – – –	FIELD WIRING (OPTION)
A1, A2	AUXILIARY CONTACT(N.O.) OF 4M

Dimensional Data

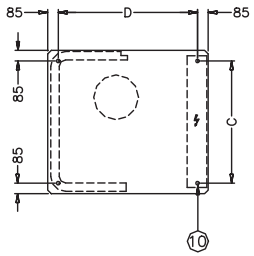
TTA075/100/120RD
VERTICAL DISCHARGE

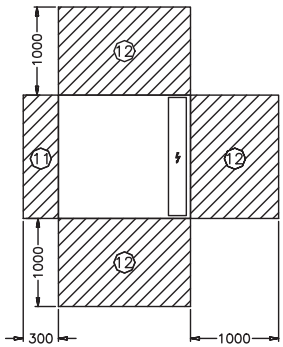






1 COMPRESSOR
2 AIR HEAT EXCHANGER
3 FAN
4 ELECTRICAL BOX
5 GAS LINE CONNECTION FEMALE BRAZED
6 LIQUID LINE CONNECTION FEMALE BRAZED
7 ELECTRIC WIRING OUTLET
8 ACCESS PANEL
9 HOLE FOR LIFTING BAR ø 22.5
10 MOUNTING HOLES ø 12.8
11 MINIMUM CLEARANCE AIR INLET
12 MINIMUM CLEARANCE FOR MAINTENANCE
AIR AIR INTAKE / AIR EXHAUST
ELECTRICAL PANEL ACCESS

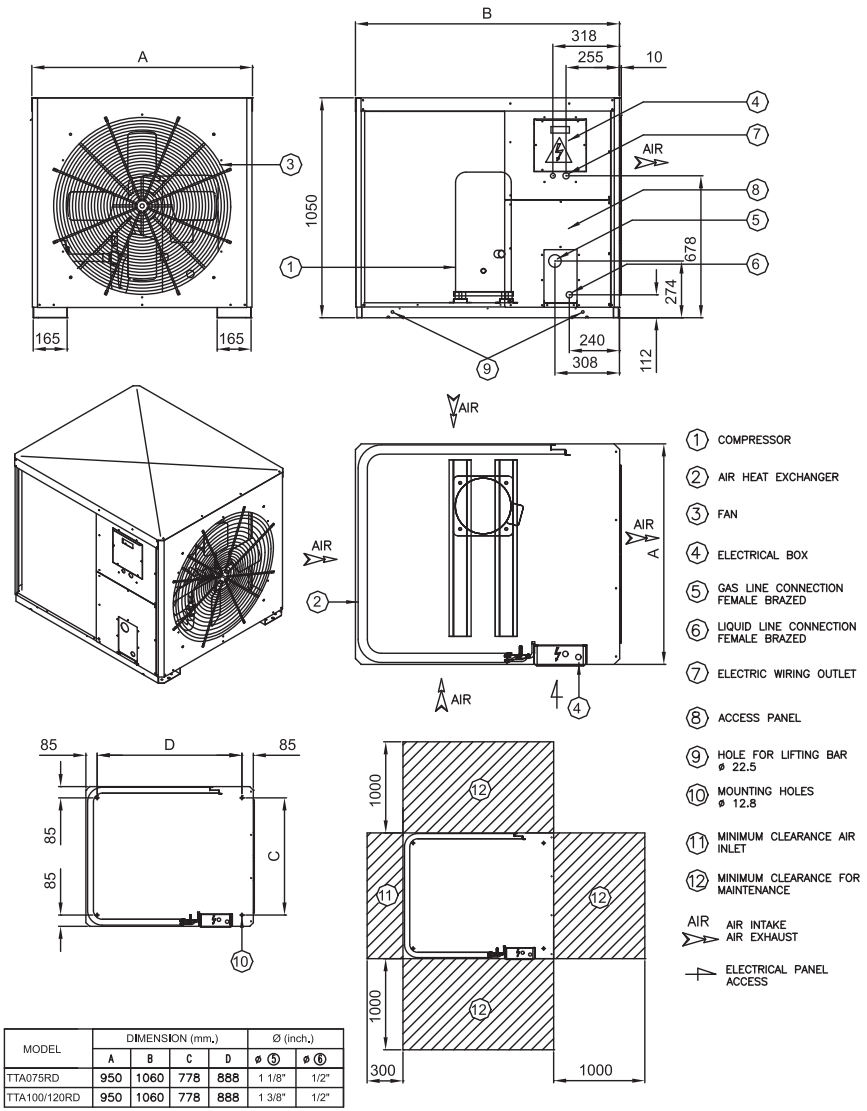




MODEL	DIMENSION (mm.)				Ø (inch.)	
	A	B	C	D	ø ⑤	ø ⑥
TTA075RD	950	1060	778	888	1 1/8"	1/2"
TTA100/120RD	950	1060	778	888	1 3/8"	1/2"

Dimensional Data

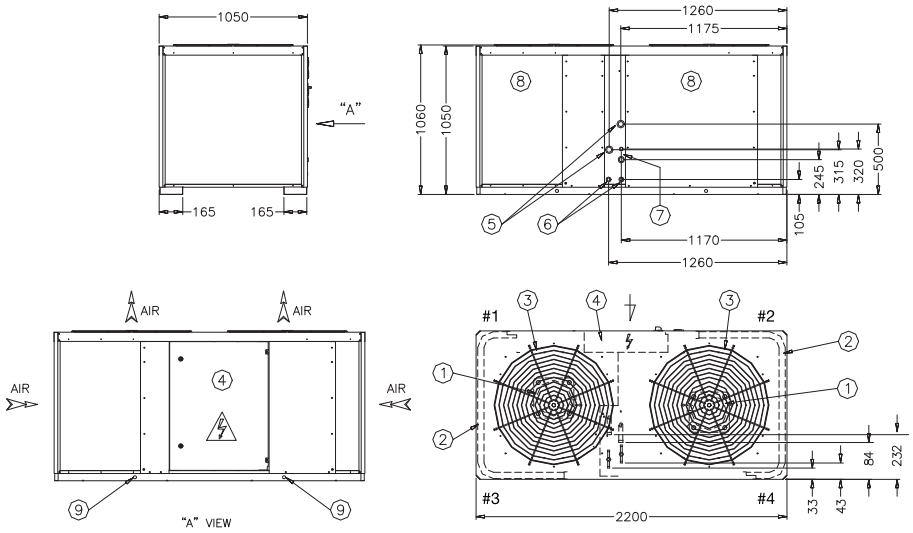
TTA075/100/120RD
HORIZONTAL DISCHARGE

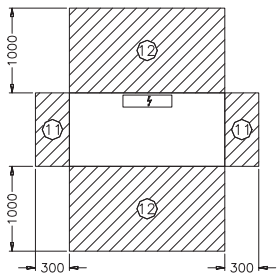


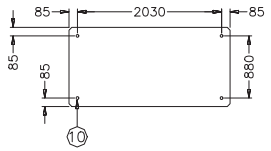
MODEL	DIMENSION (mm.)				Ø (inch.)	
	A	B	C	D	ø ⑤	ø ⑥
TTA075RD	950	1060	778	888	1 1/8"	1/2"
TTA100/120RD	950	1060	778	888	1 3/8"	1/2"

Dimensional Data

TTA150/180/200/240RD







MODEL	ø (inch.)	
	ø ⑤	ø ⑥
TTA150RD	1 1/8"	1/2"
TTA180RD	1 3/8"	1/2"
TTA200RD	1 3/8"	1/2"
TTA240RD	1 3/8"	1/2"

AIR — AIR INTAKE / AIR EXHAUST

ELECTRICAL PANEL ACCESS

① COMPRESSOR

② AIR HEAT EXCHANGER

③ FAN

④ ELECTRICAL BOX

⑤ GAS LINE CONNECTION FEMALE BRAZED

⑥ LIQUID LINE CONNECTION FEMALE BRAZED

⑦ ELECTRIC WIRING OUTLET

⑧ ACCESS PANEL

⑨ HOLE FOR LIFTING BAR ø 22.5

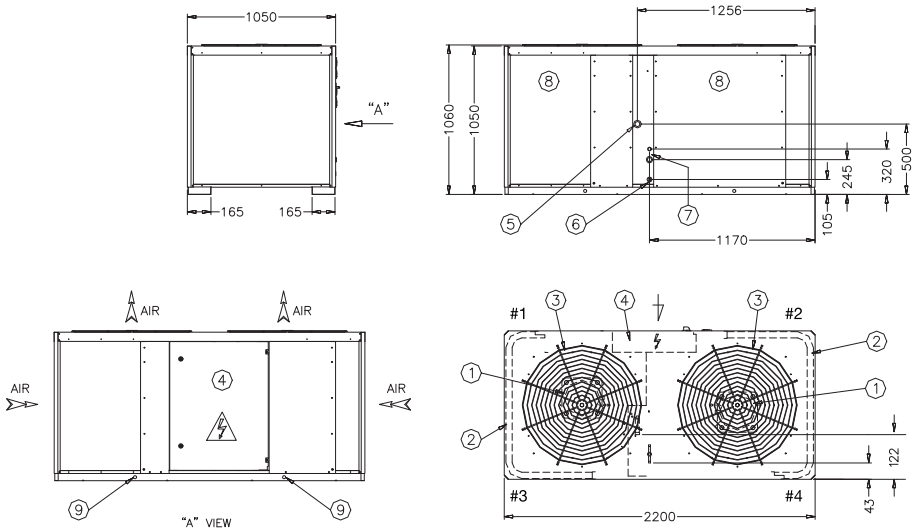
⑩ MOUNTING HOLES ø 12.8

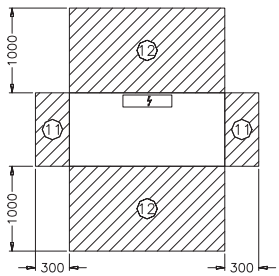
⑪ MINIMUM CLEARANCE AIR INLET

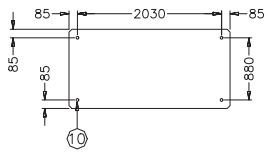
⑫ MINIMUM CLEARANCE FO MAINTENANCE

Dimensional Data

TTA150/180/200/240RD0G







MODEL	ø (inch.)	
	ø ⑤	ø ⑥
TTA150RD0G	1 5/8"	5/8"
TTA180RD0G	1 5/8"	5/8"
TTA200RD0G	1 5/8"	5/8"
TTA240RD0G	1 5/8"	5/8"

AIR — AIR INTAKE / AIR EXHAUST

ELECTRICAL PANEL ACCESS

① COMPRESSOR
② AIR HEAT EXCHANGER
③ FAN
④ ELECTRICAL BOX
⑤ GAS LINE CONNECTION FEMALE BRAZED
⑥ LIQUID LINE CONNECTION FEMALE BRAZED
⑦ ELECTRIC WIRING OUTLET
⑧ ACCESS PANEL
⑨ HOLE FOR LIFTING BAR ø 22.5
⑩ MOUNTING HOLES ø 12.8
⑪ MINIMUM CLEARANCE AIR INLET
⑫ MINIMUM CLEARANCE FO MAINTENANCE

Operation

Sequence of Operation

General
Operation of the system cooling cycles is controlled by the position of the system switch on the room thermostat.

Evaporator Fan (Indoor Supply Air)
The evaporator fan is controlled by an ON/AUTO switch on the room thermostat. With the switch positioned at AUTO and the system operating in the cooling mode, fan operation coincides with the cooling run cycles. When the fan switch is positioned at ON, fan operation is continuous.

Cooling Mode
With the disconnect switch in the "ON" position, current is supplied to the compressor crankcase heater (s) and control transformer. The crankcase heater (s) supplies heat to the compressor (s) during the "OFF" cycle. With the room thermostat system switch positioned at COOL and the fan switch at AUTO, the compressor contactor energizes on a call for cooling. When the contacts of the compressor contactor energizes on a call for cooling. When the contacts of the compressor contactor close, operation of the compressor and condenser fan begins.
The evaporator fan contactor also energizes on a call for cooling and initiates evaporator fan operation.

On dual circuit units, when second stage cooling is required, Y2 from the indoor thermostat will energize 2nd compressor.

Note: With the thermostat fan switch in the ON position, the evaporator fan will operate continuously, regardless of compressor or condenser fan operation.

Safety Controls
Note: All of these controls may not be installed on your unit, check electrical schematic.

Low Pressure Cut-Out (LPCO)
This control's sensor is located in the suction (gas line, near the compressor). This control will stop the compressor and the outdoor fans in suction pressure drops below the Low Pressure Cut-Out setting.

High Pressure Cut-Out (HPCO)
This control's sensor is located in the liquid line. This device will shut off the compressor and the outdoor fan (s) if the discharge pressure exceeds the High Pressure Cut-Out's setting.

Internal Overload Protector (IOL)
This device is a current/thermal actuated warp switch, imbedded in the compressor motor windings. If will shut off the compressor if the temperature or current of the compressor motor windings exceeds its design trip temperature.

Note: The IOL will put the compressor back in operation once the compressor motor heat has dropped below the trip setting; however, a check of the refrigerant and electrical systems should be made to determine the cause and be corrected.

Installation Checklist

Complete this checklist once the unit is installed to verify that all recommended procedures have been accomplished before starting the system. Do not operate the system until all items covered by this checklist are complete.

- ❑ Inspect unit location for proper required service clearances.
- ❑ Inspect unit location for proper free air clearances.
- ❑ Inspect unit location for secure. Level mounting position.

Refrigerant Piping
- ❑ Performed initial leak test?
- ❑ Connected properly sized and constructed liquid and suction lines to the connection stubs at both the indoor and outdoor units?
- ❑ Insulated the entire suction line?
- ❑ Insulated portions of liquid line exposed to extremes in temperature?
- ❑ Evacuated each refrigerant circuit to 350 microns?
- ❑ Charge each circuit with proper amount of R-22?

Electrical Wiring
- ❑ Provided unit power wiring (with disconnect) to proper terminals in the unit control Section?
- ❑ Installed system indoor thermostat?
- ❑ Installed system low voltage interconnecting wiring to proper terminals of outdoor unit, indoor unit and system thermostat?

Unit Start-Up

Once the unit is properly installed and pre-start procedures are complete, start the unit by turning the System Switch on the indoor thermostat to either COOL or AUTO. The system should operate normally.

Caution: Ensure the disconnect for the indoor air handler is closed before operating the system. Operating the outdoor unit without the indoor fan energized, can cause unit trip-out on high pressure control and/or liquid flood-back to the compressors.

Maintenance

Maintenance
Perform all of the indicated maintenance procedures at the intervals scheduled. This will prolong the life of the unit and reduce the possibility of costly equipment failure.

Monthly
Conduct the following maintenance inspections once per month.

Warning: Open and lock unit disconnect to prevent injury or death from electrical shock or contact with moving parts.

- Inspect air filters and clean if necessary.
- Check unit wiring to ensure all connections are tight and that the wiring insulation is intact.
- Check drain pans and condensate piping to insure they are free of obstacles.
- Manually rotate the outdoor fan to insure proper operation. Inspect the fan mounting hardware for tightness.
- Inspect the evaporator and condenser coils for dirt and debris. If the coils appear dirty, clean them.
- With the unit operating in the cooling mode, check the suction and discharge pressures and compare them with the values provided in “Pressure Curves”. Record these readings on the “Maintenance Log”.
- Observe indoor fan operation and correct any unusual or excessive vibration. Clean blower wheels as needed.

Annually (Cooling Season)
The following maintenance procedures must be performed at the beginning of each cooling season to insure efficient unit operation.

- Perform all of the monthly maintenance inspections.
- With the unit operating, check unit superheat and record the reading in the “Maintenance Log”.
- Remove any accumulation of dust and/or dirt from the unit casing.
- Remove any accumulation of dust and/or dirt from the unit casing.
- Remove corrosion from any surface and re-paint. Check the gasket around the control panel door to insure it fits correctly and is in good condition to prevent water leakage.
- Remove corrosion from any surface and re-paint. Check the gasket around the control panel door to insure it fits correctly and is in good condition to prevent water leakage.
- Inspect the evaporator fan belt. If it is worn or frayed, replace it.
- Inspect the control panel wiring to insure that all connections are tight and that the insulation is intact.

Lubricate the indoor fan motor bearings with a non-detergent, 20-weight oil. (To insure good bearing lubrication, condenser fan motor bearings should be lubricated once every six months).

Note: Some motors are permanently lubricated.

- Check refrigerant piping and fittings for leaks.

Maintenance Log[1]

Date	Ambient Temp (F)	Evaporator Entering air Dry Bulb	Evaporator Entering air Wet Bulb	Compressor Suction Pressure	Compressor Discharge pressure	Superheat Circuit No. 1 (1)	Subcooling Circuit No. 1 (F)

Notes:
1. Perform each inspection once per month (during cooling season) while unit is operating.

Trouble Shooting

Table 9: Troubleshooting Chart

Refrigerant Circuit	Power Supply	High Voltage Wiring	Compressor Internal Overload	Run Capacitor	Start Capacitor	Start relay	Contactor contacts	Low Voltage Wiring	Control Transformer	Thermostat	Contactor Coil	Low Voltage Fuse	Stuck Compressor	Inefficient Compressor	Refrigerant Undercharge	Refrigerant Overcharge	Excessive Evaporator Load	Non Condensable	Restricted Outside Airflow	Outside Air Recirculates	Expansion Valve Stuck Open	Superheat	Restricted Inside Airflow	Refrigerant circulation Restrictions	Change Over Valve Leak	Change Over Valve Coil Defect	Check Valve leaking	Defrost Relay Defect	Defrost Time Switch Defect	Defrost Control Defect
Head Pressure Too High																P		S	P	S				S						
Head Pressure Too Low														S	P						S	S		S			P			
Suction pressure too high														S		P	P				S	S			S		P			
Suction pressure too low															P							S	P	S						
Liquid overfeeding (expansion valve)																					P						P			
Liquid overfeeding (cap tube)																P			S	S		S	P							
Inside coil frosting															P				S	S										
Compress. runs-inadequate or no cooling/heating														S	P		S	S				S	P	S	S	S	S			

Electrical																														
Compressor and outside fan won't start	P	P						S	P	S	P	P																		
Compressor will not start but outside fan runs		P	S	P	P	S	S						P																	
Outside fan won't start		P		P			S																							
Compressor hums but won't start				P	P	S	S						P																	
Compressor cycles on internal overload		P	S	P	S	S	S						P	S	P	P	S		S			S	P		S					
Inside fan won't start	P	P						S	P	S		S																		

P : primary cause
S : secondary cause

Trouble Shooting

Safety recommendations
To avoid accidents and damage, the following recommendations should be observed during maintenance and service visits:

1. The maximum allowable pressures for system leak testing on low and high pressure side are given in the chapter “Installation”. Always provide a pressure regulator.
2. Disconnect the main supply before any servicing on the unit.
3. Service work on the refrigeration system and the electrical system should be carried out only by qualified and experienced personnel.

Maintenance contract
It is strongly recommended that you sign a maintenance contract with your local Service Agency. This contract provides regular maintenance of your installation by a specialist in our equipment. Regular maintenance ensures that any malfunction is detected and corrected in good time and minimizes the possibility that serious damage will occur. Finally, regular maintenance ensures the maximum operating life of your equipment. We would remind you that failure to respect these installation and maintenance instructions may result in immediate cancellation of the warranty.

Training
The equipment described in this manual is the result of many years of research and continuous development. To assist you in obtaining the best use of it, and maintaining it in perfect operating condition over a long period of time, the constructor has at your disposal a refrigeration and air conditioning service school. The principal aim of this is to give operators and maintenance technicians a better knowledge of the equipment they are using, or that is under their charge. Emphasis is particularly given to the importance of periodic checks on the unit operating parameters as well as on preventive maintenance, which reduces the cost of owning the unit by avoiding serious and costly breakdown.

Note

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TRANE®

เทรน (ประเทศไทย)
เลขที่ 1126/2 อาคารวานิช 2 ชั้น 30-31 ถนนเพชรบุรีตัดใหม่
แขวงมักกะสัน เขตราชเทวี กรุงเทพฯ 10400
Trane
www.trane.com
For more information, contact your local district office

Literature Order Number:	TTA-IOM-EN0110
Date:	Jan 2010
Supersedes:	Sep 2009
Stocking Location:	Bangkok, Thailand

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