

TRANQUILITY OA (TO) SERIES



COMMERCIAL HORIZONTAL DEDICATED OUTDOOR AIR PACKAGED WATER-SOURCE HEAT PUMPS

INSTALLATION, OPERATION & MAINTENANCE

97B0053N01

Revised: 09 November, 2012

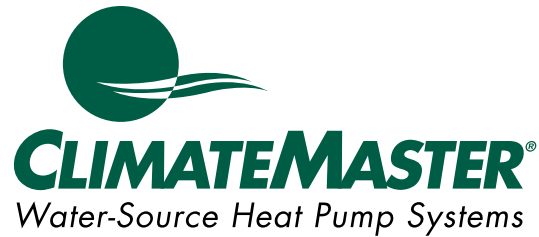


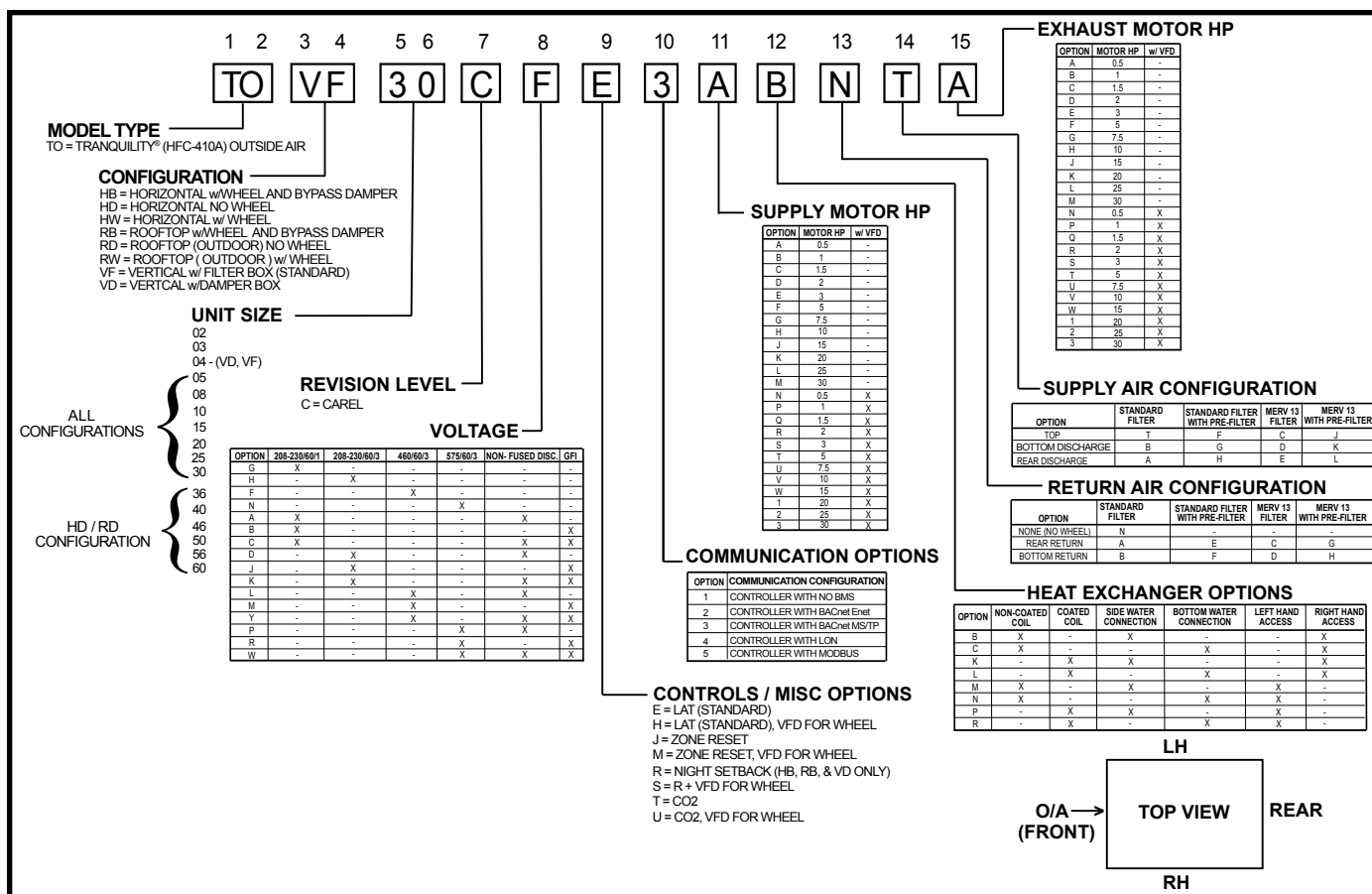
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Horizontal DOAS

Rev.: 11/09/12

Model Nomenclature



NOTE: Above model nomenclature is a general reference. Consult individual specification catalogs for detailed information.

Air Limits	HD/RD Models		HW/RW Models	
	Cooling/Dehumid Mode	Heating Mode	Cooling/Dehumid Mode	Heating Mode
Minimum Ambient Air*	40°F [4.4°C]	40°F [4.4°C]	40°F [4.4°C]	-10°F [-23.3°C]
Maximum Ambient Air*	100°F [37.8°C]	100°F [37.8°C]	100°F [37.8°C]	100°F [37.8°C]
Minimum Entering Air	50°F [10.0°C]	15°F [-9.4°C]	50°F [10.0°C]	-10°F [-23.3°C]
Maximum Entering Air	110°F [43°C]	80°F [26.7°C]	110°F [43°C]	80°F [26.7°C]
Water Limits				
Minimum Entering Water	35°F [1.7°C]	35°F [1.7°C]	35°F [1.7°C]	35°F [1.7°C]
Maximum Entering Water	105°F [1.7°C]	90°F [32.2°C]	105°F [1.7°C]	90°F [32.2°C]

*Does not apply to rooftop models.

General Information

Safety

Warnings, cautions, and notices appear throughout this manual. Read these items carefully before attempting any installation, service, or troubleshooting of the equipment.

DANGER: Indicates an immediate hazardous situation, which if not avoided will result in death or serious injury. DANGER labels on unit access panels must be observed.

WARNING: Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

⚠ WARNING! ⚠

WARNING! The EarthPure® Application and Service Manual should be read and understood before attempting to service refrigerant circuits with HFC-410A.

⚠ WARNING! ⚠

WARNING! To avoid the release of refrigerant into the atmosphere, the refrigerant circuit of this unit must be serviced only by technicians who meet local, state, and federal proficiency requirements.

CAUTION: Indicates a potentially hazardous situation or an unsafe practice, which if not avoided could result in minor or moderate injury or product or property damage.

NOTICE: Notification of installation, operation, or maintenance information, which is important, but which is not hazard-related.

⚠ WARNING! ⚠

WARNING! All refrigerant discharged from this unit must be recovered WITHOUT EXCEPTION. Technicians must follow industry accepted guidelines and all local, state, and federal statutes for the recovery and disposal of refrigerants. If a compressor is removed from this unit, refrigerant circuit oil will remain in the compressor. To avoid leakage of compressor oil, refrigerant lines of the compressor must be sealed after it is removed.

⚠ CAUTION! ⚠

CAUTION! To avoid equipment damage, DO NOT use these units as a source of heating or cooling during the construction process. The mechanical components and filters will quickly become clogged with construction dirt and debris, which may cause system damage.

⚠ WARNING! ⚠

WARNING! The installation of water-source heat pumps and all associated components, parts, and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations.

Horizontal DOAS

Rev.: 11/09/12

Inspection - ClimateMaster DOAS units are not designed to support the weight of a person on all portions of the unit roof. Personnel should avoid stepping on the top of the unit. However, if it is necessary to stand on the roof, stay within 18" of the cabinet perimeter.

ClimateMaster inspects and tests each DOAS unit before it leaves the factory so that you receive a quality piece of equipment. However, the DOAS unit may have been damaged in transit. Check the equipment thoroughly for both visible and concealed damage before you sign the receiving papers. Pay particular attention to the roof of the unit on outdoor units. Document any damage in writing on the carrier's bill of lading to ensure that damage claims are handled promptly. If the unit has been damaged, obtain a claim form from the carrier. Promptly fill out and return the form, and notify ClimateMaster of any damage. **DAMAGE CLAIMS OR SHORTAGES MUST BE FILED WITH THE FREIGHT CARRIER WITHIN 5 WORKING DAYS OF RECEIPT OF EQUIPMENT.**

Storage - Equipment should be stored in its original packaging in a clean, dry area. Store units in an upright position at all times. Do not stack units or any other equipment on any DOAS unit.

Unit Protection - Cover units on the job site with either the original packaging or an equivalent protective covering. Cap the open ends of pipes stored on the job site. In areas where painting, plastering, and/or spraying has not been completed, all due precautions must be taken to avoid physical damage to the units and contamination by foreign material. Physical damage and contamination may prevent proper start-up and may result in costly equipment cleanup.

Examine all pipes, fittings, and valves before installing any of the system components. Remove any dirt or debris found in or on these components.

Pre-Installation - ClimateMaster 100% outdoor air DOAS units designed for indoor installations are configured to allow single-side access to regularly maintained components. This means you can make your service connections and perform routine maintenance even when you must install one side of the DOAS unit against a wall or other restriction. The "service side" is determined when the order is placed at the factory. Note that the service side cannot be changed in the field. It is recommended that clearance be provided on all sides to allow for ease of servicing in the event large components require replacement.

Allow a minimum of 36 inches of clearance around the service side of the DOAS unit for piping, electrical connections, and service access. Install the unit on a sturdy, level mounting base or platform that will prevent vibration and sound transmission. Never install the DOAS unit on a wooden platform. Do not install the unit near occupied rooms such as offices or guestrooms. Do not attempt to conserve installation space by fabricating restrictive ductwork with abrupt bends. You may reduce the operating efficiency and the moisture removal capacity of the DOAS unit. See duct system installation section for detailed duct installation instructions.

NOTICE! - YOU MUST NOT INSTALL AN INDOOR-RATED DOAS UNIT IN AN OUTDOOR OR A WET ENVIRONMENT. If you must install the DOAS unit outside you must use an outdoor-rated DOAS unit. ClimateMaster seals and weatherproofs outdoor DOAS units to help prevent water infiltration. You can determine whether your DOAS unit is outdoor-rated by inspecting the unit rating plate (see Section 4.1 for details).

Prepare units for installation as follows:

1. Compare the electrical data on the unit nameplate with ordering and shipping information to verify that the correct unit has been shipped.
2. Keep the cabinet covered with the original packaging until installation is complete and all plastering, painting, etc. is finished.
3. Verify refrigerant tubing is free of kinks or dents and that it does not touch other unit components.
4. Inspect all electrical connections. Connections must be clean and tight at the terminals.
5. Some accessory items such as sensor(s), interface module, etc may be shipped packed in the compressor compartment.

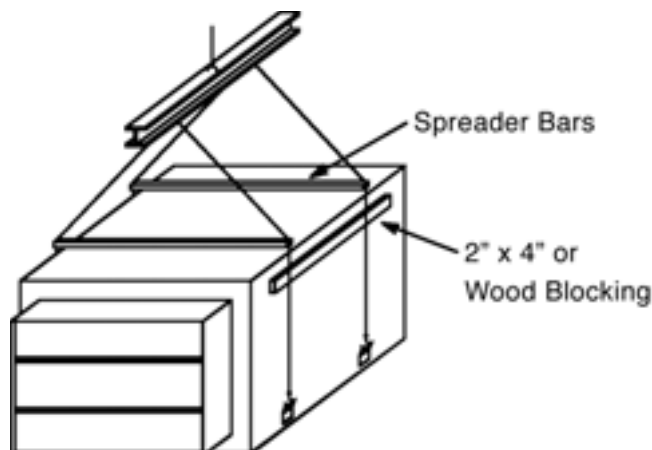
Rigging - ClimateMaster DOAS units are solidly built and can be very heavy. Avoid personal injury and damaged equipment by planning the installation carefully. Use moving equipment whenever possible.

Certain ClimateMaster DOAS units are equipped with four or more lifting points. Use spreader bars and safety straps when you rig this equipment.

- Utilize all of the lifting points provided when hoisting unit.
- Test-lift the DOAS unit to verify that it is properly balanced.
- Do not lift the DOAS unit in high winds or above people.

Failure to observe these instructions may lead to equipment damage, personal injury, or death.

Figure 1: Typical Rigging



⚠ CAUTION! ⚠

CAUTION! Do not tip the DOAS unit on its side. Avoid dropping the unit down stairways or subjecting it to severe mechanical shock. You may seriously damage the DOAS unit.

⚠ CAUTION! ⚠

CAUTION! All three phase scroll compressors must have direction of rotation verified at start-up. Verification is achieved by checking compressor Amp draw. Amp draw will be substantially lower compared to nameplate values. Additionally, reverse rotation results in an elevated sound level compared to correct rotation. Reverse rotation will result in compressor internal overload trip within several minutes. Verify compressor type before proceeding.

⚠ CAUTION! ⚠

CAUTION! DO NOT store or install units in corrosive environments or in locations subject to temperature or humidity extremes (e.g., attics, garages, rooftops, etc.). Corrosive conditions and high temperature or humidity can significantly reduce performance, reliability, and service life. Always move and store units in an upright position. Tilting units on their sides may cause equipment damage.

⚠ CAUTION! ⚠

CAUTION! CUT HAZARD - Failure to follow this caution may result in personal injury. Sheet metal parts may have sharp edges or burrs. Use care and wear appropriate protective clothing, safety glasses and gloves when handling parts and servicing heat pumps.

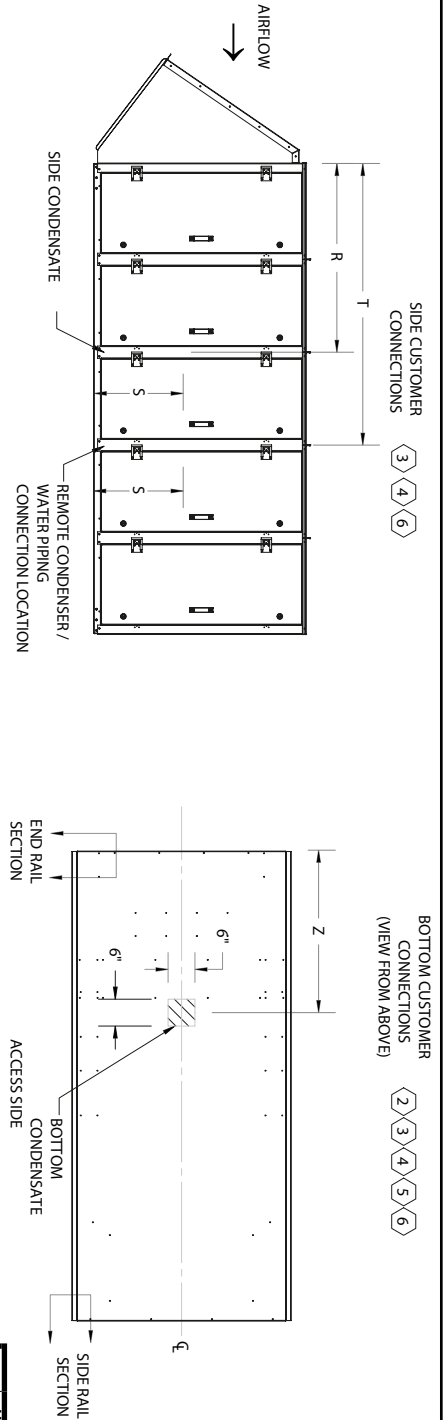
⚠ WARNING! ⚠

WARNING! The installation of water-source heat pumps and all associated components, parts, and accessories which make up the installation shall be in accordance with the regulations of ALL authorities having jurisdiction and MUST conform to all applicable codes. It is the responsibility of the installing contractor to determine and comply with ALL applicable codes and regulations.

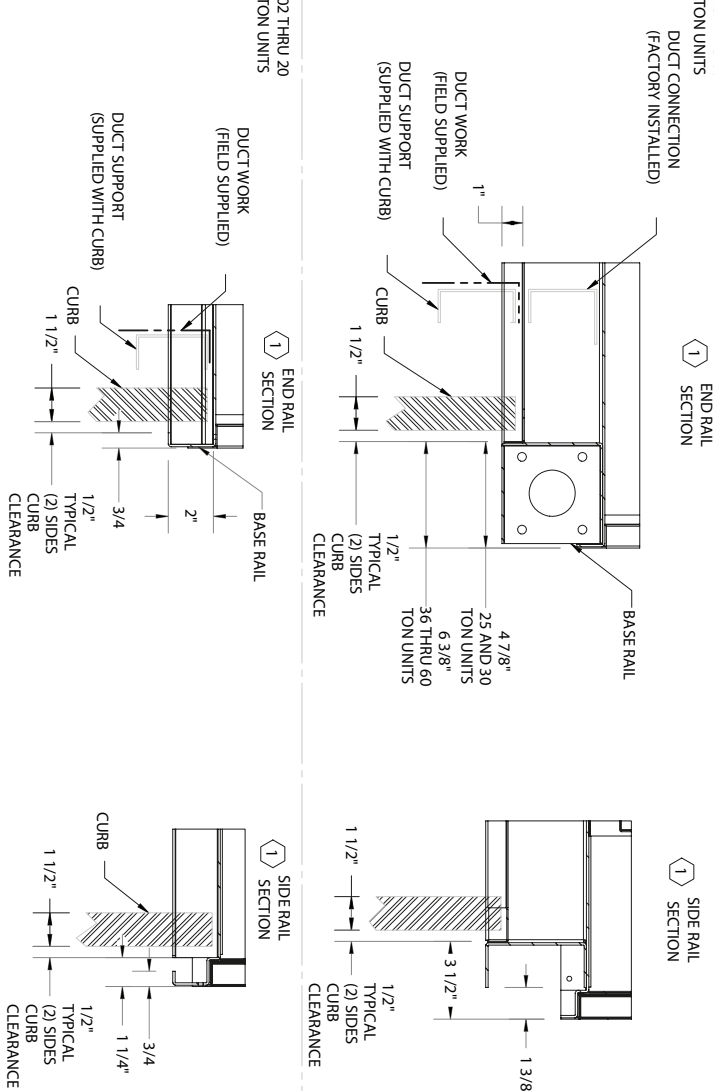
NOTICE! Failure to remove shipping brackets from spring-mounted compressors will cause excessive noise, and could cause component failure due to added vibration.

Horizontal DOAS

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NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES.



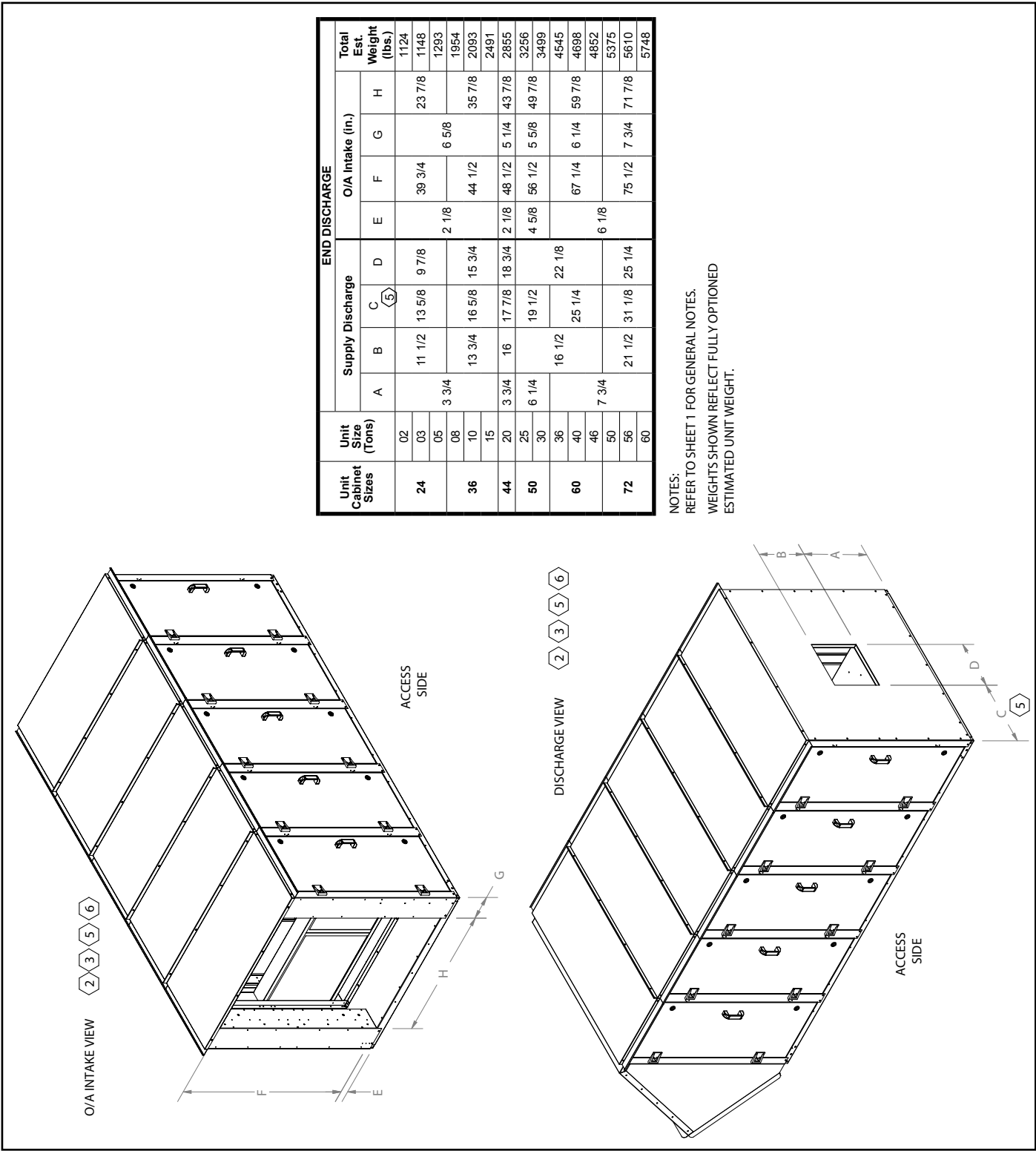
CUSTOMER CONNECTION LINE SIZE SUMMARY (in.)													
Unit Size	2 Tons	3 Tons	5 Tons	8 Tons	10 Tons	15 Tons	20 Tons	25 Tons	30 Tons	36 Tons	40 Tons	46 Tons	50 Tons
RC Discharge	1/2	5/8	3/4	7/8	7/8	1 1/8	1 1/8	1 1/8	1 3/8	1 1/8	1 1/8	1 1/8	1 1/8
RC Return	3/8	1/2	1/2	5/8	5/8	3/4	3/4	7/8	3/4	3/4	7/8	7/8	7/8
Water Inlet	7/8	7/8	1 1/8	1 3/8	1 3/8	1 5/8	2 5/8	2 5/8	2 5/8	3 1/8	3 1/8	3 1/8	3 5/8
Condensate													

Air Flow	Unit Cabinet Size (Tons)	R	T	S	Z
24	02	27 1/8	27 1/8	16	30 1/4
36	03	42 3/8	63 1/8	18	42 3/8
44	05	45	67	20	44 7/8
50	08	45 3/4	68 5/8	25	45 3/4
60	10	46 7/8	70 1/2	38	47
72	15	50 1/8	75 3/8	40	50 1/4
24	02	27 1/8	27 1/8	16	30 1/4
36	03	42 3/8	63 1/8	18	42 3/8
44	05	45	67	20	44 7/8
50	08	45 3/4	68 5/8	25	45 3/4
60	10	46 7/8	70 1/2	38	47
72	15	50 1/8	75 3/8	40	50 1/4
24	02	27 1/8	27 1/8	16	30 1/4
36	03	42 3/8	63 1/8	18	42 3/8
44	05	45	67	20	44 7/8
50	08	45 3/4	68 5/8	25	45 3/4
60	10	46 7/8	70 1/2	38	47
72	15	50 1/8	75 3/8	40	50 1/4
24	02	27 1/8	27 1/8	16	30 1/4
36	03	42 3/8	63 1/8	18	42 3/8
44	05	45	67	20	44 7/8
50	08	45 3/4	68 5/8	25	45 3/4
60	10	46 7/8	70 1/2	38	47
72	15	50 1/8	75 3/8	40	50 1/4

Horizontal DOAS

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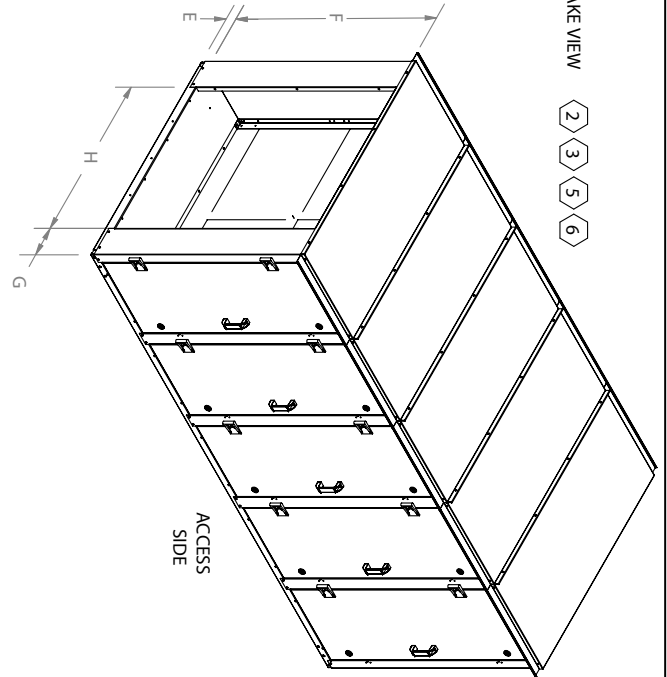
Horizontal Non-Wheeled Dimensional Data - End Discharge



Horizontal Non-Wheeled Dimensional Data - Down Discharge

O/A INTAKE VIEW

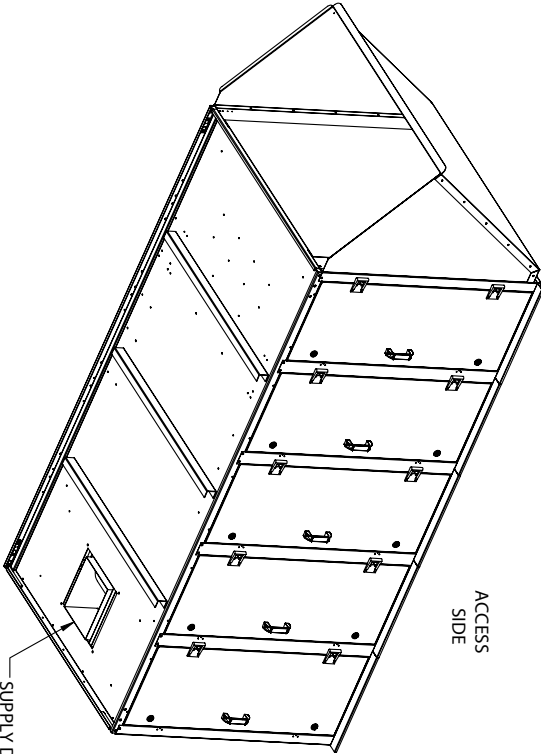
2 3 5 6



ACCESS
SIDE

DISCHARGE VIEW

2 3 5 6



ACCESS
SIDE

SUPPLY DISCHARGE
(REFER TO CURB
DETAILS GA SHEET
FOR DIMENSIONS)

Unit Cabinet Sizes	Unit Size (Tons)	DOWN DISCHARGE				Total Est. Weight (lbs.)
		E	F	G	H	
24	02					1124
	03		39 3/4		23 7/8	1148
	05					1293
36	08	2 1/8		6 5/8		1954
	10		44 1/2		36 7/8	2093
	15					2491
44	20	2 1/8	48 1/2	5 1/4	43 7/8	2855
	25		56 1/2	5 5/8	49 7/8	3256
	30	4 5/8				3499
50	36					4545
	40		67 1/4	6 1/4	59 7/8	4698
	46					4852
60	50	6 1/8				5375
	56		75 1/2	7 3/4	71 7/8	5610
	60					5748

NOTES:

REFER TO SHEET 1 FOR GENERAL NOTES.

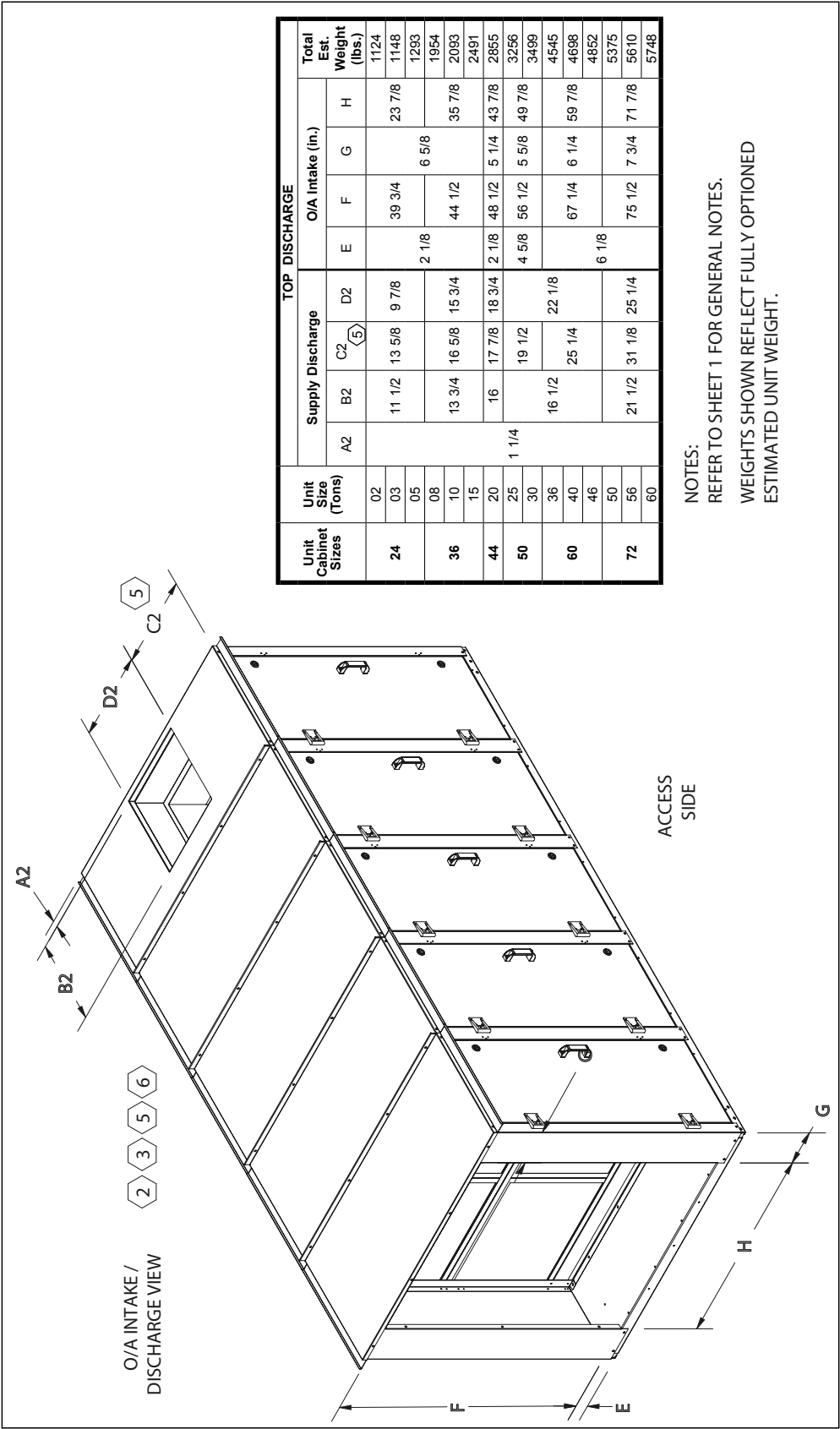
WEIGHTS SHOWN REFLECT FULLY OPTIONED
ESTIMATED UNIT WEIGHT.

REFER TO CURB DETAILS GA SHEET FOR SUPPLY
DUCT DIMENSION AND LOCATIONS.

Horizontal DOAS

Rev.: 11/09/12

Horizontal Non-Wheeled Dimensional Data - Top Discharge



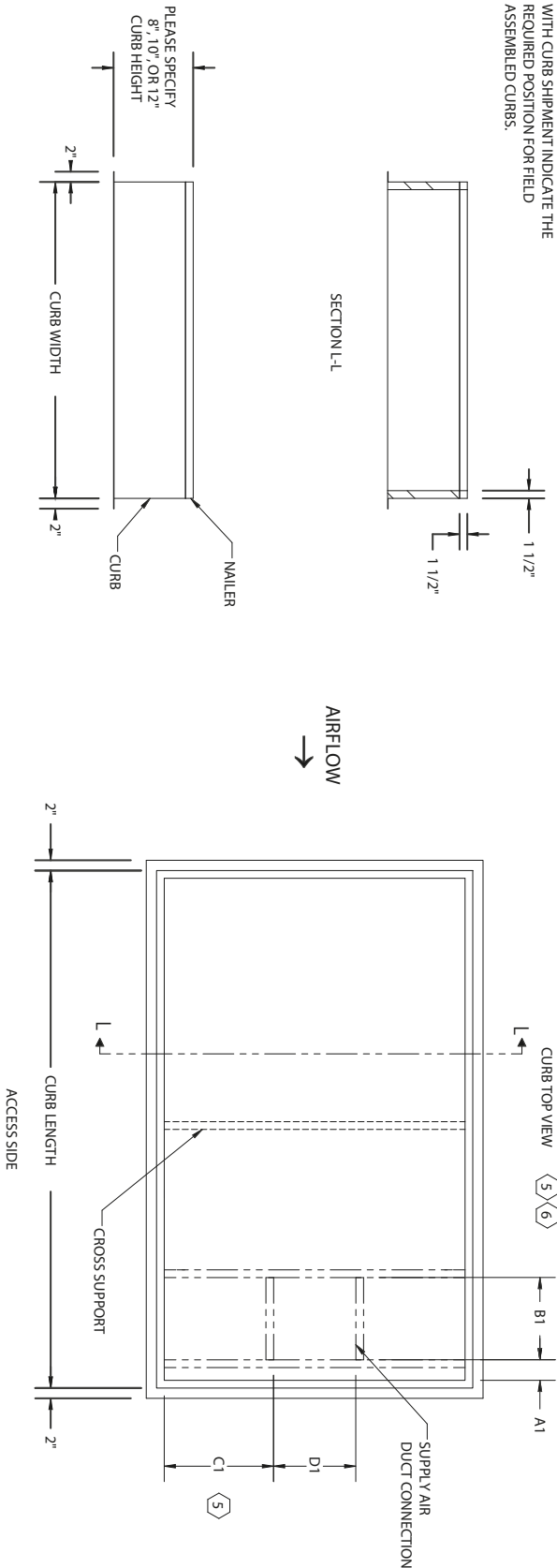
Horizontal Non-Wheeled Dimensional Data - Curb Details

Unit Cabinet Sizes	Unit Size (Tons)	END FLOW ROOFCURB DIM S			TOP FLOW ROOFCURB DIM S			DOWN FLOW ROOFCURB DIM S							
		Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Supply Discharge (in.)				
											A1	B1	C1	D1	
24	02	CB02NNAN03-XX			CB02NNBN03-XX			CB02NNCN03-XX							
	03	CB03NNAN03-XX	33 1/2	77 3/4	CB03NNBN03-XX	33 1/2	77 3/4	CB03NNCN03-XX	33 1/2	77 3/4	11 1/2	10 3/8	9 7/8		
	05	CB05NNAN03-XX			CB05NNBN03-XX			CB05NNCN03-XX							
36	08	CB08NNAN05-XX			CB08NNBN05-XX			CB08NNCN05-XX							
	10	CB10NNAN05-XX	45 1/2	102 3/4	CB10NNBN05-XX	45 1/2	102 3/4	CB10NNCN05-XX	45 1/2	102 3/4	13 3/4	13 3/8	15 3/4		
	15	CB15NNAN05-XX			CB15NNBN05-XX			CB15NNCN05-XX							
44	20	CB20NNAN05-XX	50 7/8	109 1/4	CB20NNBN05-XX	50 7/8	109 1/4	CB20NNCN05-XX	50 7/8	109 1/4		16	14 5/8	18 3/4	
	25	CB25NNAN05-XX	53 1/8		CB25NNBN05-XX	53 1/8		CB25NNCN05-XX	53 1/8			14			
	30	CB30NNAN05-XX			CB30NNBN05-XX			CB30NNCN05-XX							
60	36	CB36NNAN05-XX		103 5/8	CB36NNBN05-XX		103 5/8	CB36NNCN05-XX		103 5/8	16 1/2	19 3/4	22 1/8		
	40	CB40NNAN05-XX	64 1/2		CB40NNBN05-XX	64 1/2		CB40NNCN05-XX	64 1/2						
	46	CB46NNAN05-XX			CB46NNBN05-XX			CB46NNCN05-XX							
72	50	CB50NNAN05-XX			CB50NNBN05-XX			CB50NNCN05-XX							
	56	CB56NNAN05-XX	79 1/2	111 5/8	CB56NNBN05-XX	79 1/2	111 5/8	CB56NNCN05-XX	79 1/2	111 5/8	21 1/2	25 5/8	25 1/4		
	60	CB60NNAN05-XX			CB60NNBN05-XX			CB60NNCN05-XX							

NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES.
CURBS 120" AND LESS ARE SHIPPED AS COMPLETE CURBS. GREATER THAN 120" ARE SHIPPED KNOCKED DOWN.
NUMBER AND LOCATION OF CROSS SUPPORT(S) IS DEPENDANT UPON THE GAUGE OF MATERIAL USED TO CONSTRUCT THE CURB, DUCT SUPPORT CONFIGURATION, LENGTH OF CURB, AND WIDTH OF CURB. INSTALLATION INSTRUCTIONS INCLUDED WITH CURB SHIPMENT INDICATE THE REQUIRED POSITION FOR FIELD ASSEMBLED CURBS.

SECTION L-L

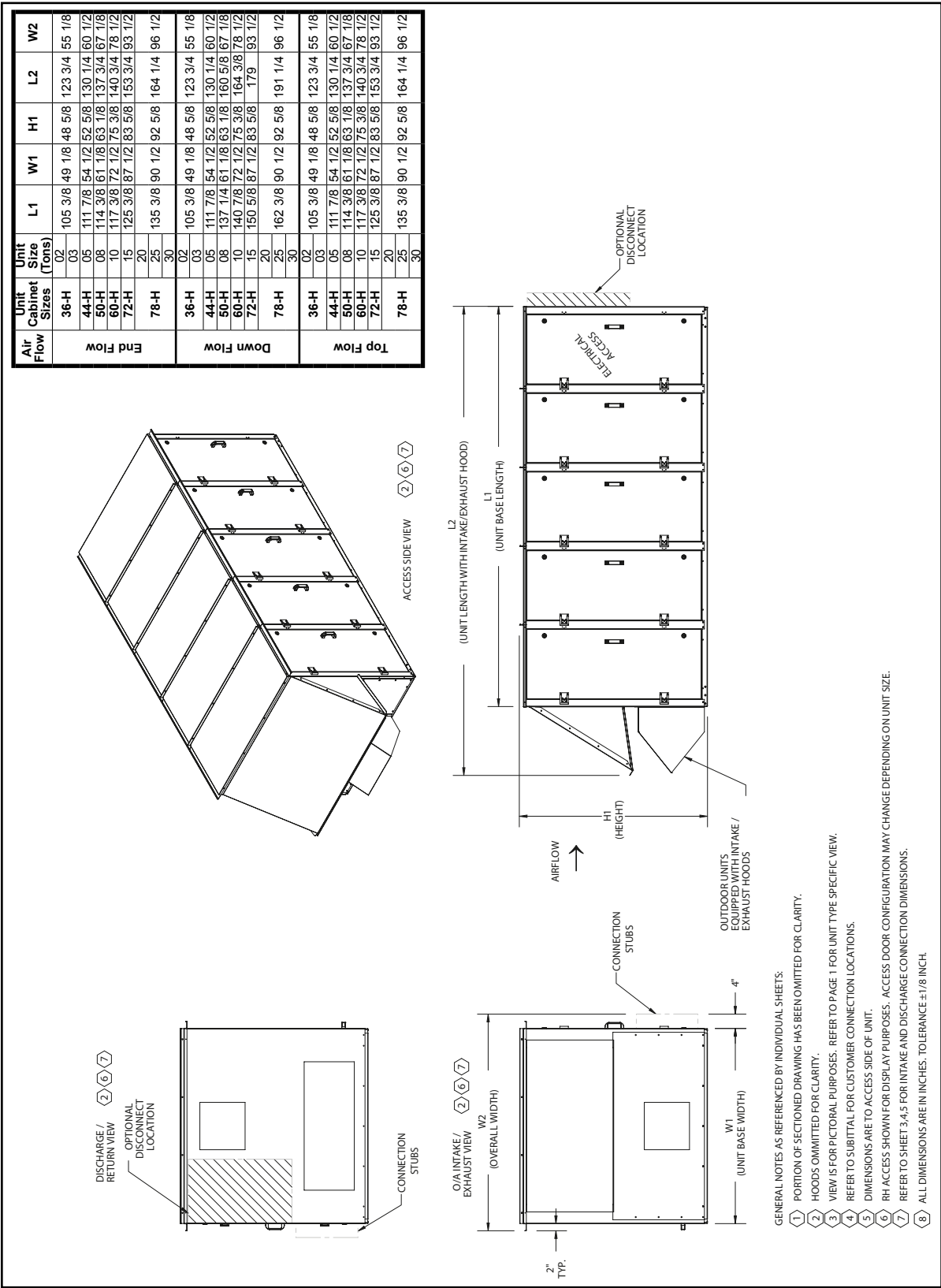
AIRFLOW
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Horizontal DOAS

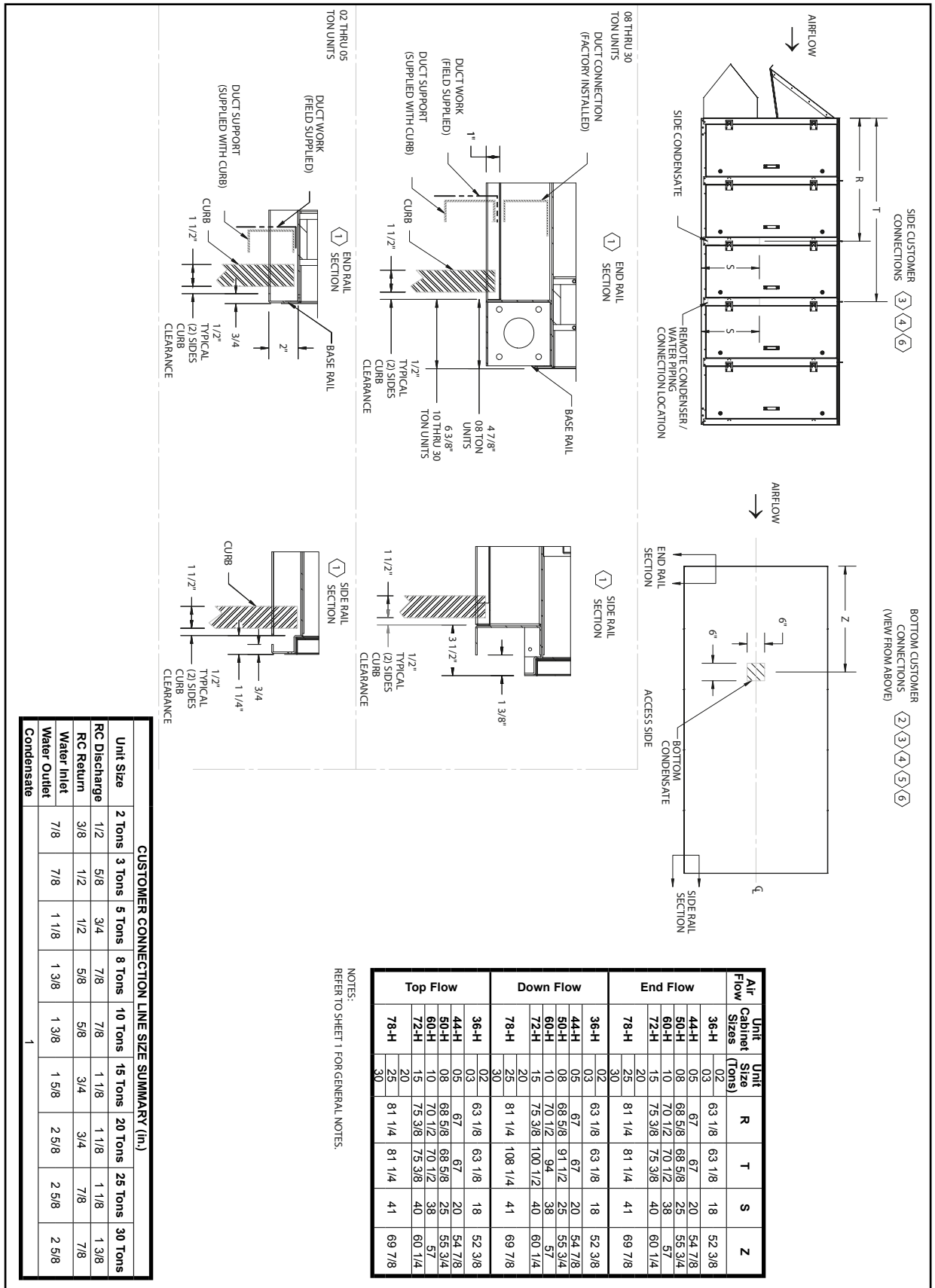
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Horizontal Wheeled Dimensional Data



Horizontal DOAS

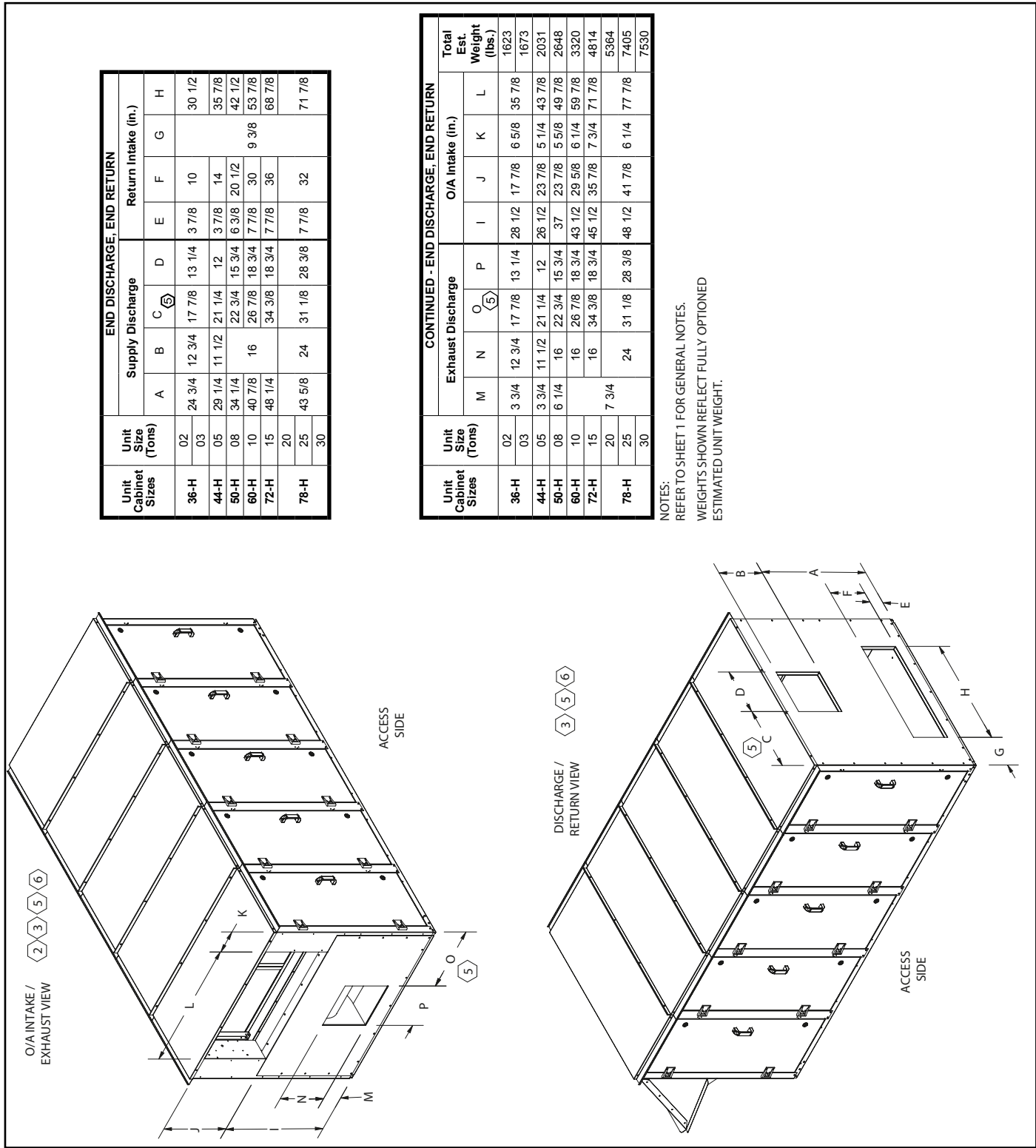
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Horizontal DOAS

Rev.: 11/09/12

Horizontal Wheeled Dimensional Data - End Discharge



NOTES:

REFER TO SHEET 1 FOR GENERAL NOTES.

WEIGHTS SHOWN REFLECT FULLY OPTIONED ESTIMATED UNIT WEIGHT.

O/A INTAKE / EXHAUST VIEW

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ACCESS SIDE

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DISCHARGE / RETURN VIEW

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ACCESS SIDE

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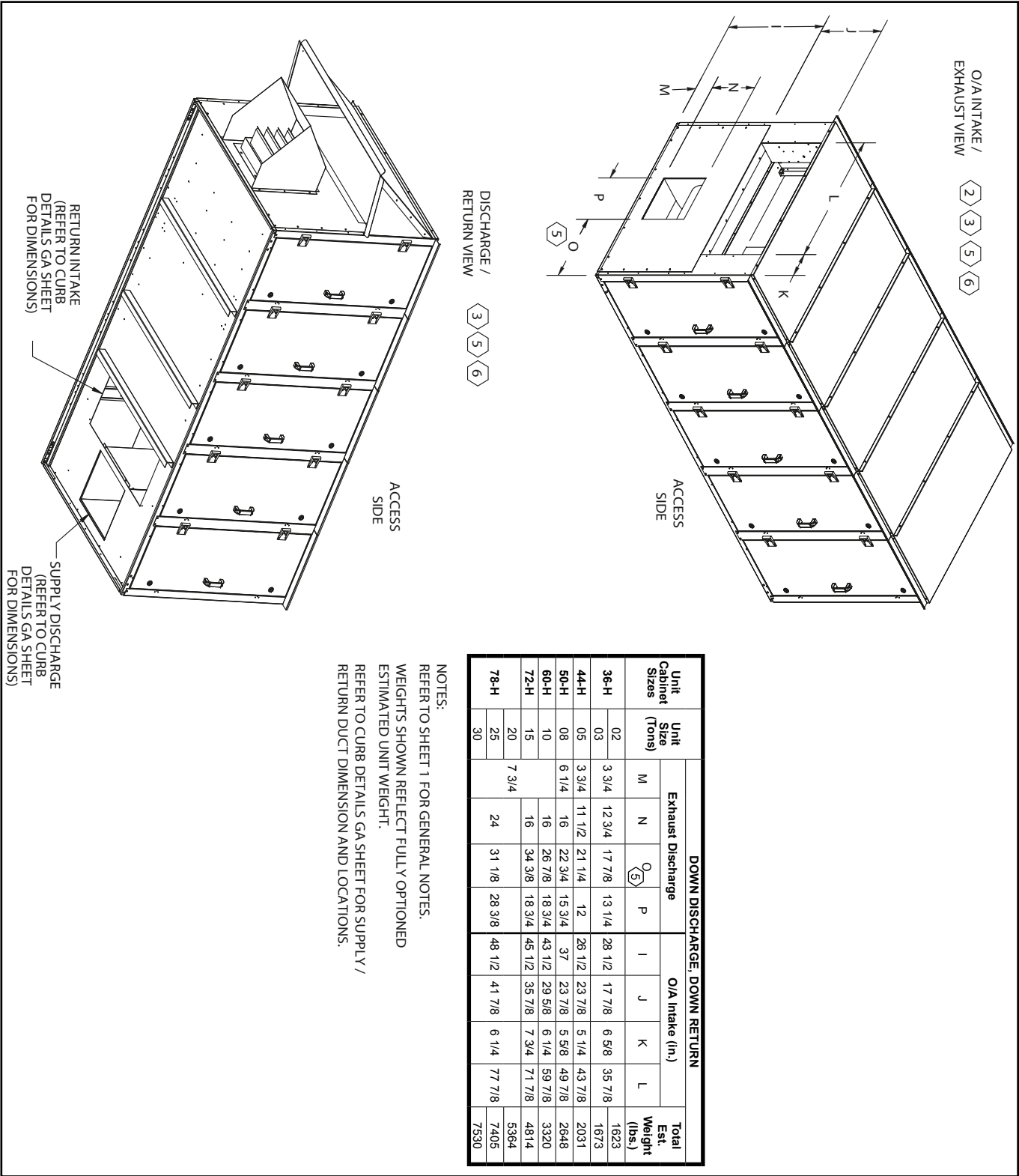
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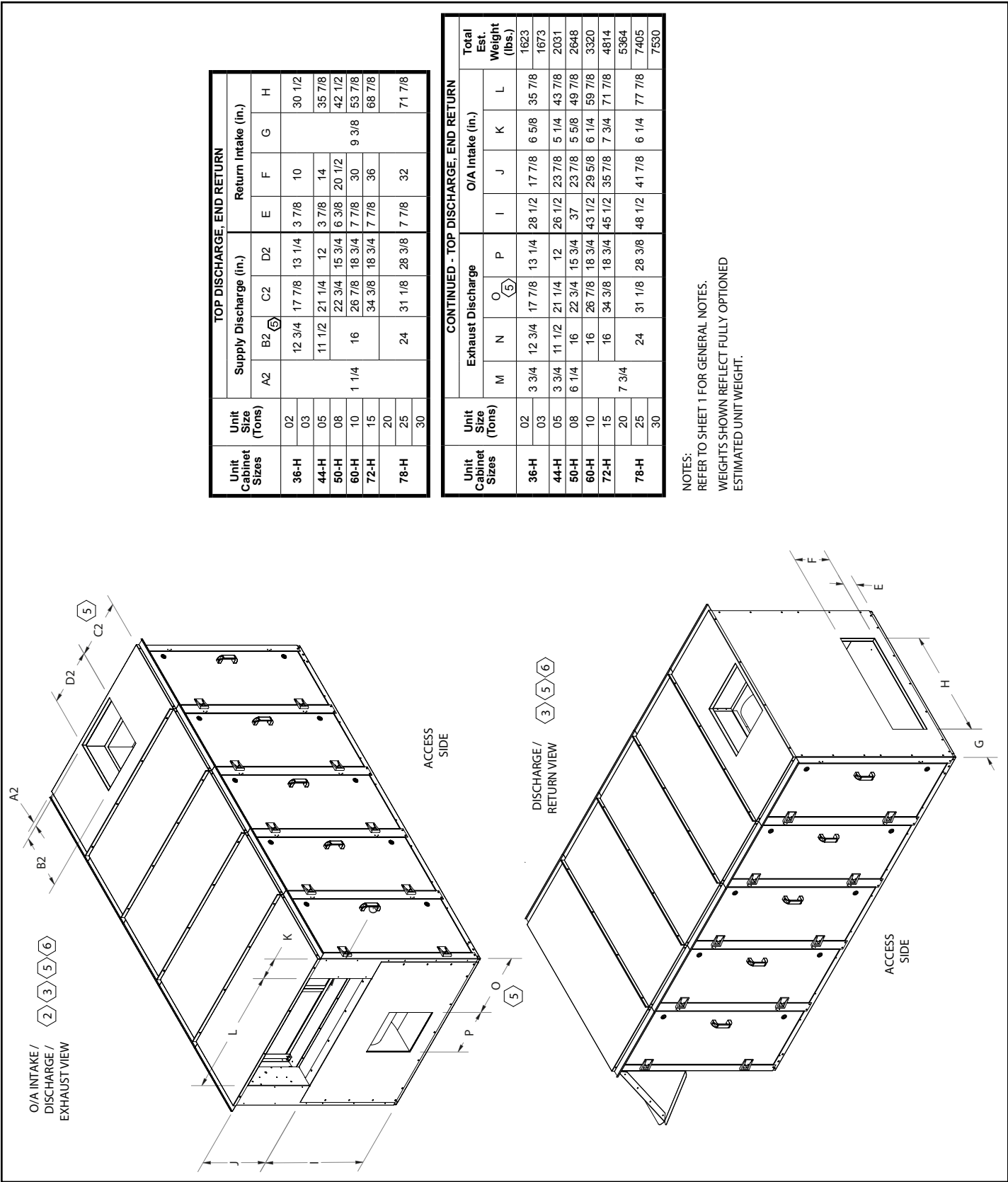
Horizontal Wheeled Dimensional Data - Down Discharge



Horizontal DOAS

Rev.: 11/09/12

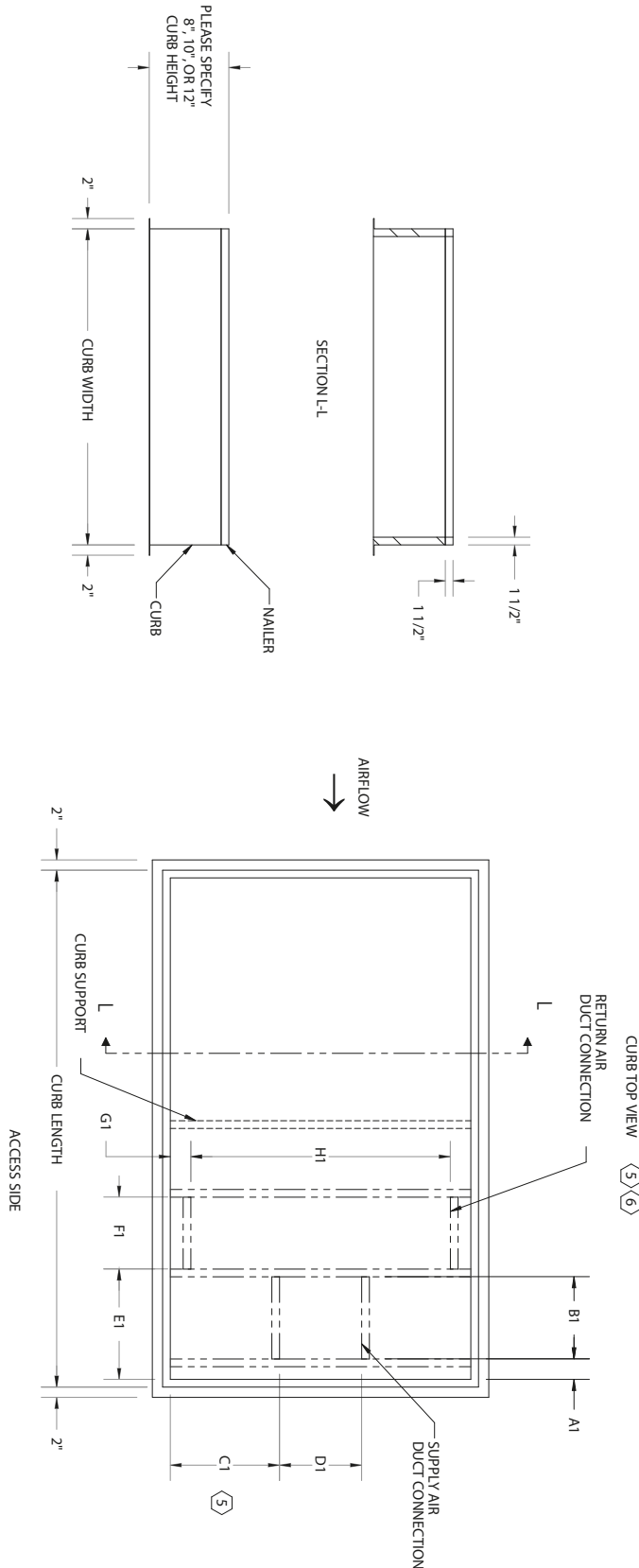
Horizontal Wheeled Dimensional Data - Top Discharge



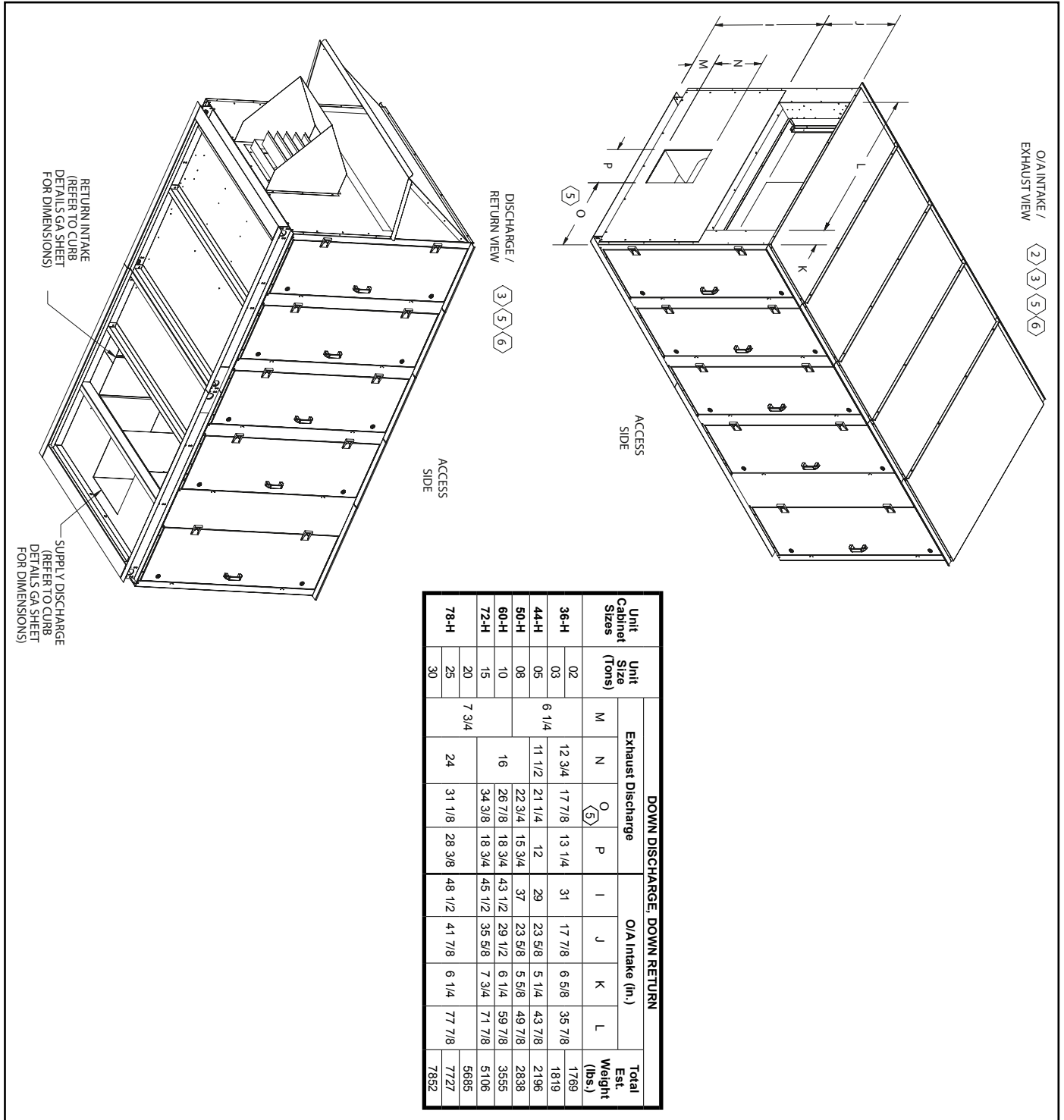
Horizontal Wheeled Dimensional Data - Curb Details

Unit Cabinet Sizes	END/END FLOW ROOFCURB DIM S				TOP/END FLOW ROOFCURB DIM S				DOWN FLOW ROOFCURB DIM S									
	Unit Size (Tons)	Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Supply Discharge (in.)				Return Intake (in.)			
											A1	B1	C1	D1	E1	F1	G1	H1
36-H	02	CB02WVNB05-XX	45 1/2	102 3/4	CB02VNB05-XX	45 1/2	102 3/4	CB02WVNCN05-XX	45 1/2	102 3/4								
	03	CB03WVNB05-XX	50 7/8	109 1/4	CB03VNB05-XX	50 7/8	109 1/4	CB03WVNCN05-XX	50 7/8	109 1/4	12 3/4	14 5/8	13 1/4	14 1/4	13	5 3/4	31	
44-H	05	CB05WVNB05-XX	53 1/8	109 1/4	CB05VNB05-XX	53 7/8	109 1/4	CB05WVNCN05-XX	50 7/8	109 1/4								
	08	CB08WVNB05-XX	53 1/8	103 5/8	CB08VNB05-XX	53 1/8	103 5/8	CB08WVNCN05-XX	53 1/8	103 5/8	11 1/2	18	15 3/4	13	17	6	36	
60-H	10	CB10WVNB05-XX	64 1/2	103 5/8	CB10VNB05-XX	64 1/2	103 5/8	CB10WVNCN05-XX	64 1/2	128 1/2								
	15	CB15WVNB05-XX	79 1/2	111 5/8	CB15VNB05-XX	79 1/2	111 5/8	CB15WVNCN05-XX	64 1/2	127 1/8	16	21 3/8	18 3/4	17 1/2	30	3 5/8	43	
72-H	20	CB20WVNB05-XX	82 1/2	111 5/8	CB20VNB05-XX	79 1/2	111 5/8	CB20WVNCN05-XX	79 1/2	136 7/8								
	25	CB25WVNB05-XX	82 1/2	121 5/8	CB25VNB05-XX	82 1/2	121 5/8	CB25WVNCN05-XX	82 1/2	148 5/8	24	25 5/8	28 3/8	25 1/2	32	3 3/4	69	
78-H	30	CB30WVNB05-XX			CB30VNB05-XX			CB30WVNCN05-XX										

NOTES:
REFER TO SHEET 1 FOR GENERAL NOTES.
CURBS 120" AND LESS ARE SHIPPED AS COMPLETE CURBS. GREATER THAN 120" ARE SHIPPED KNOCKED DOWN.
NUMBER AND LOCATION OF CROSS SUPPORT(S) IS DEPENDANT UPON THE GLAZE OF MATERIAL USED TO CONSTRUCT THE CURB. DUCT SUPPORT CONFIGURATION, LENGTH OF CURB, AND WIDTH OF CURB. INSTALLATION INSTRUCTIONS INCLUDED WITH CURB SHIPMENT INDICATE THE REQUIRED POSITION FOR FIELD ASSEMBLED CURBS.



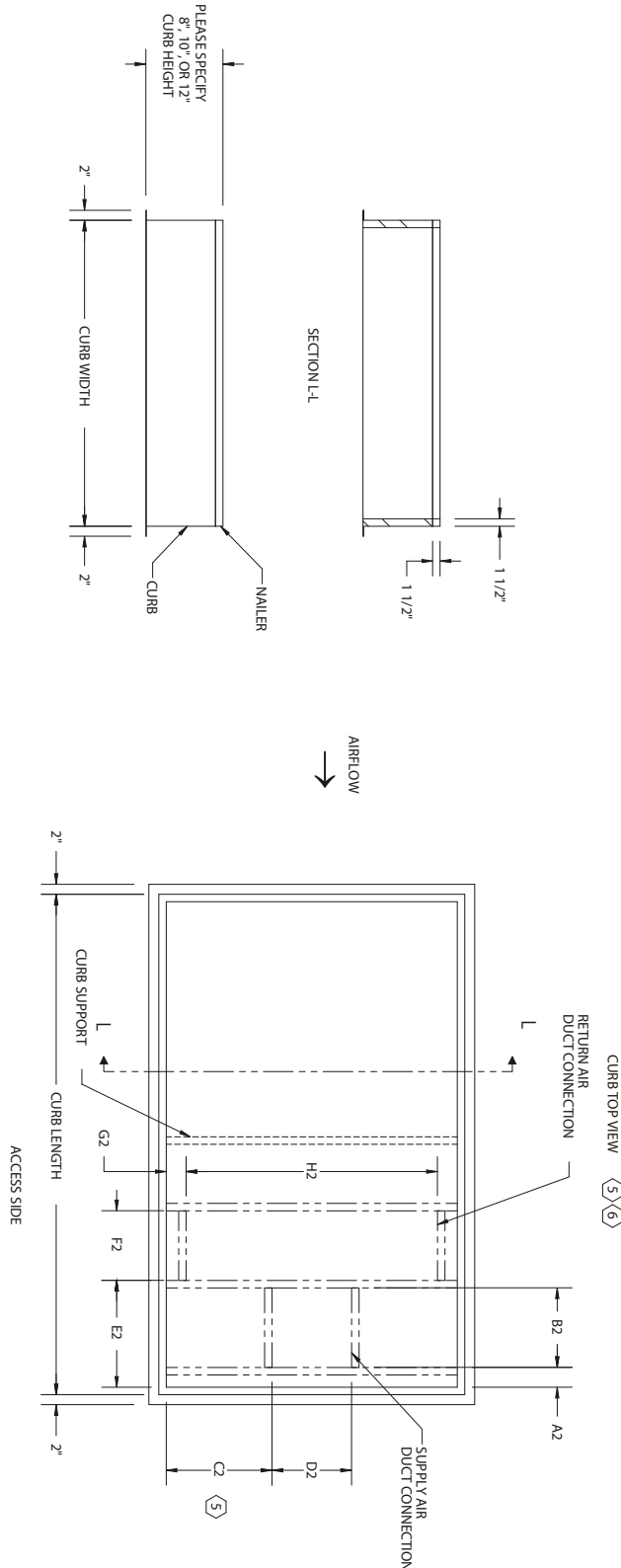
Horizontal Wheeled with Bypass Damper Dimensional Data - Down Discharge



Horizontal Wheeled with Bypass Damper Dimensional Data - Curb Details

Unit Cabinet Sizes	Unit Size (Tons)	END/END FLOW ROOFCURB DIM S			TOP/END FLOW ROOFCURB DIM S			DOWN/DOWN FLOW ROOFCURB DIM S									
		Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Curb P/N	Width (in.)	Length (in.)	Supply Discharge (in.)			Return Intake (in.)			
36-H	02	CB02WVNDN06-XX	41 1/8	115 3/8	CB02WVNFN06-XX	41 1/8	115 3/8	CB02WVNFN06-XX	41 1/8	115 3/8	A2	B2	C2	D2	E2	F2	G2
	03	CB03WVNDN06-XX	46 1/2	123 1/8	CB03WVNFN06-XX	46 1/2	123 1/8	CB03WVNFN06-XX	46 1/2	123 1/8	12 3/4	12 3/8	13 1/4	14 1/4	13	3 5/8	31
44-H	05	CB05WVNDN06-XX	53 1/8	126 1/2	CB05WVNFN06-XX	53 1/8	126 1/2	CB05WVNFN06-XX	53 1/8	126 1/2	11 1/2	15 3/4	12	13	17	3 3/4	36
50-H	08	CB08WVNDN06-XX	64 1/2	127 1/8	CB08WVNFN06-XX	64 1/2	127 1/8	CB08WVNFN06-XX	64 1/2	127 1/8	17 1/4	15 3/4	12	13	17	3 5/8	43
60-H	10	CB10WVNDN06-XX	79 1/2	136 7/8	CB10WVNFN06-XX	79 1/2	136 7/8	CB10WVNFN06-XX	79 1/2	136 7/8	21 3/8	18 3/4	17 1/2	30		54	
72-H	15	CB15WVNDN06-XX	82 1/2	148 5/8	CB15WVNFN06-XX	82 1/2	148 5/8	CB15WVNFN06-XX	82 1/2	148 5/8	28 7/8	18 3/4		31		69	
	20	CB20WVNDN06-XX			CB20WVNFN06-XX			CB20WVNFN06-XX									
	25	CB25WVNDN06-XX			CB25WVNFN06-XX			CB25WVNFN06-XX									
78-H	30	CB30WVNDN06-XX			CB30WVNFN06-XX			CB30WVNFN06-XX			24	25 5/8	28 3/8	25 1/2	32		72

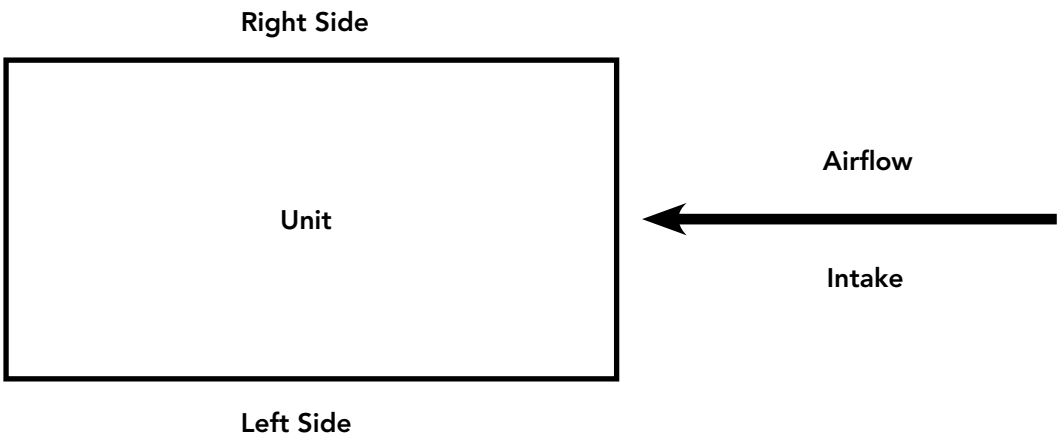
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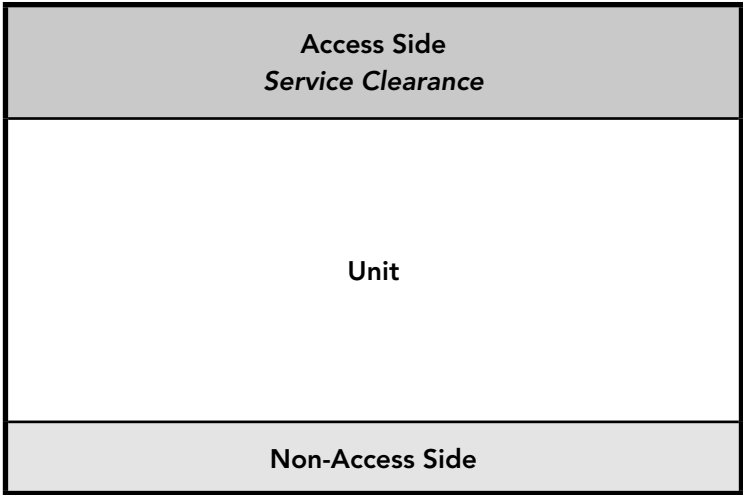
Horizontal DOAS

Rev.: 11/09/12

Unit Connections and Service Clearances



Note: Units with side water connections will have connection on the same side as access side except 20 ton units.



Access Side Clearance
Minimum = 3 ft. (Ideal = Unit Width + 1 ft.)

Non-Access Side
Minimum = 6 in. (Ideal = 3 ft.)

TO HD/RD Physical Data Table

Model Size	2	3	5	8	10	15
Fan Motor Available HP*	0.5/1.0	0.5/1.5	0.5/1.5	0.5/1.5	0.5/1.0/3.0	1.0/1.5/5.0
Blower Wheel Size*	"7-7"	"90-4"	"10-07"	"11-10"	"11-10"	"12-12"
Compressor Type/Qty	Scroll, 1 each			Scroll (tandem), 2 each		
Number of Refrigerant Circuits	1 Circuit					
Factory Charge lb/unit	5	8	15	20	26	40
Water Connection Size " O.D.	7/8"	7/8"	1 1/8"	1 3/8"	1 3/8"	1 5/8"
Water Flow Rate GPM	7	11	19	26	34	49
Water Pressure Drop PSI/Ft	3.6/8.3	4.1/9.45	4.0/9.23	5.4/12.46	6.6/15.22	9.4/1.68
Condensate Connection Size	1"	1"	1"	1"	1"	1"
Filter Qty/Size	(2) 18X24X4	(2) 18X24X4	(2) 18X24X4	(4) 20X24X4	(4) 20X24X4	(4) 20X24X4
Operating Weight	1124	1148	1293	1954	2093	2491
Shipping Weight	1165	1189	1350	2030	2190	2643

Model Size	20	25	30	36	40	46
Fan Motor Available HP*	1.5/2.0/5.0	2.0/3.0/7.5	3.0/5.0/10.0	3.0/5.0/10.0	3.0/5.0/10.0	3.0/5.0/15.0
Blower Wheel Size*	"15-12"	"15-15"	"15-15"	"15-15"	918	920
Compressor Type/Qty	Scroll (tandem), 2 each			Scroll (2 each tandem), 4 each		
Number of Refrigerant Circuits	1 Circuit			2 Circuits		
Factory Charge lb/unit	62	73	87	110	130	150
Water Connection Size " O.D.	2 5/8"	2 5/8"	2 5/8"	2 5/8"	3 1/8"	3 1/8"
Water Flow Rate GPM	69	84	102	118	137	153
Water Pressure Drop PSI/Ft	6.2/14.30	6.2/14.30	7.1/16.38	7.1/16.38	7.8/18.00	8.2/18.91
Condensate Connection Size	1"	1"	1"	1"	1"	1"
Filter Qty/Size	(6) 18X24X4	(4) 28X30X4	(4) 28X30X4	(9) 20X24X4	(9) 20X24X4	(9) 20X24X4
Operating Weight	2855	3256	3499	4545	4698	4852
Shipping Weight	3042	3478	3753	4846	5033	5247

Model Size	50	56	60
Fan Motor Available HP*	5.0/7.5/15	5.0/7.5/15	5.0/7.5/20
Blower Wheel Size*	920	920	922
Compressor Type/Qty	Scroll (2 each tandem), 4 each		
Number of Refrigerant Circuits	2 Circuits		
Factory Charge lb/unit	8	8	15
Water Connection Size " O.D.	7/8"	7/8"	1 1/8"
Water Flow Rate GPM	11	11	19
Water Pressure Drop PSI/Ft	10.4/24.00	12.6/29.06	13.3/30.68
Condensate Connection Size	1"	1"	1"
Filter Qty/Size	(9) 25X29X4	(9) 25X29X4	(9) 25X29X4
Operating Weight	5375	5610	5748
Shipping Weight	5768	6072	6210

Horizontal DOAS

Rev.: 11/09/12

TOHW/RW Physical Data

Model Size	2	3	5	8	10
Fan Motor Available HP*	0.5/1.0/1.5	0.5/1.0/2.0	1.0/1.5/5.0	3.0/7.5	2.0/3.0/7.5
Blower Wheel Size*	ATLI 7-7F	ATLI 7-7F	ATLI 10-7F	ATZAF 12-12 T1	150-9R BD
Compressor Type/Qty	Scroll, 1 each			Scroll (tandem), 2 each	
Number of Refrigerant Circuits	1 Circuit				
Factory Charge lb/unit	CF	11	18	23	29
Water Connection Size “ O.D.	7/8"	7/8"	1 1/8"	1 3/8"	1 3/8"
Water Flow Rate GPM	7	11	19	26	34
Water Pressure Drop PSI/Ft	3.6/8.3	4.1/9.45	4.0/9.23	5.4/12.46	6.6/15.22
Condensate Connection Size	1"	1"	1"	1"	1"
Filter Qty/Size (Supply)	(2) 20X24X4	(2) 20X24X4	(3) 18X24X4	(2) 28X30X4	(3) 24X24X4
Filter Qty/Size (Return)	(2) 20X24X4	(2) 20X24X4	(3) 18X24X4	(2) 28X30X4	(3) 24X24X4
Operating Weight	2016	2064	2468	2888	3635
Shipping Weight	2073	2105	2525	2963	3733

Model Size	15	20	25	30
Fan Motor Available HP*	3.0/5.0/10.0	5.0/7.5/15.0	5.0/10.0/20.0	5.0/10.0/20.0
Blower Wheel Size*	ATLI 15-11R	ATLI 15-11R	ATZAF 20-20 T1	ATZAF 20-20 T1
Compressor Type/Qty	Scroll (tandem), 2 each			
Number of Refrigerant Circuits	1 Circuit			
Factory Charge lb/unit	48	70	CF	118
Water Connection Size " O.D.	1 5/8"	2 5/8"	2 5/8"	2 5/8"
Water Flow Rate GPM	49	69	84	102
Water Pressure Drop PSI/Ft	9.4/1.68	6.2/14.30	6.2/14.30	7.1/16.38
Condensate Connection Size	1"	1"	1"	1"
Filter Qty/Size (Supply)	(3) 25X29X4	(3) 28X30X4	(3) 28X30X4	(3) 28X30X4
Filter Qty/Size (Return)	(3) 25X29X4	(3) 28X30X4	(3) 28X30X4	(3) 28X30X4
Operating Weight	5180	5886	6277	6468
Shipping Weight	5332	6073	6498	6722

NOTE 1: A strainer is required on the ENTERING WATER connection to the DOAS unit.

The strainer must be provided and installed by others.

The strainer must be 60 mesh (250 Micron) or finer.

Failure to install a properly sized strainer can lead to premature fouling and possible failure of a brazed plate heat exchanger.

DOAS units installed and operated without a properly sized strainer will not qualify for warranty coverage.

NOTE 2: A dedicated 115 VAC, 15 Amp circuit (by others) is required on all DOAS units for operation of the factory installed evaporator heat tape(s). Failure to connect heat tape(s) to a proper power supply may lead to freezing of the water in the heat exchanger. Failure of, and/or damage caused by the failure of a heat exchanger due to freezing will be exempt from warranty coverage if the heat tapes are not properly connected and working at the time of the failure.

Horizontal Installation

Condensate Piping – Horizontal Units - The condensate drain connection may be on the side or on the bottom of the DOAS unit, depending on the size and style of cabinet used. Use concrete block or steel dunnage to raise the DOAS unit high enough above the floor to provide clearance for the field-supplied condensate drain trap. Pitch the drainpipe a minimum of 1/4" per linear foot, and support it at least every 5 feet. If the drain runs through an unconditioned space, you must install heat tracing to prevent the moisture in the drain from freezing.

NOTE: While its supply blower runs, the inside of the DOAS unit operates at a negative pressure. You must trap the drain to prevent condensate from being drawn into the cabinet of the DOAS unit. The depth of the trap must be at least equal in inches to the E.S.P. in inches WG. For example, if the unit E.S.P. is 2" WG, the trap must retain at minimum 2" of water to insure a proper seal.

⚠ CAUTION! ⚠

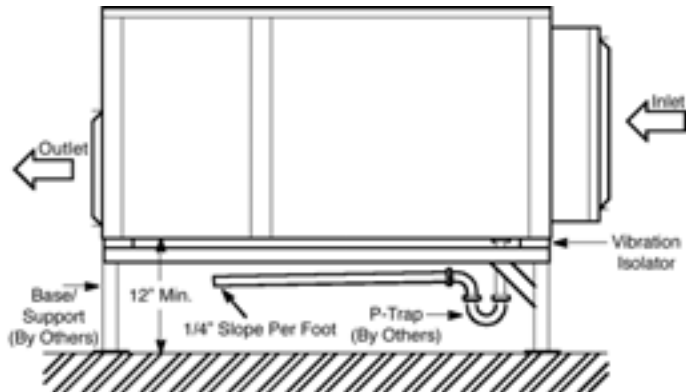
CAUTION! Ensure condensate line is pitched toward drain 1/8 inch per ft [11mm per m] of run.

Duct System Installation - Duct design and installations should conform to the latest ASHRAE and SMACNA low velocity duct standards. Undersized or restrictive ductwork with abrupt turns or transitions can decrease the efficiency and the moisture removal capacity of your DOAS unit. Size the ductwork for an acceptable air pressure drop at the airflow volume of your DOAS unit. Use neoprene flex connectors when you attach ductwork to the DOAS unit to prevent transmission of excess vibration and noise.

Select the grilles, registers and diffusers for low static pressure loss, required throw distance, and the specified CFM rating. You can find this information in most grille manufacturer's catalogs. If you are installing the grilles in a corrosive environment, choose components made from anodized aluminum.

If you must install ductwork in an unconditioned area, use fiberglass duct wrap with vapor barrier facing. You must install the outdoor air intake away from any sources of airborne contamination such as exhaust fans or plumbing vents. You can use galvanized sheet metal ducts for most applications. However, you should use aluminum or stainless steel ducts for extreme applications such as chemical-laden environments.

Figure 2: Condensate Piping



Unit Air Flow - Each ClimateMaster DOAS unit is designed to operate at a specified air flow rate. System air flow must be checked prior to troubleshooting the refrigeration circuit to assure that such problems are not actually caused by improper unit air flow.

Problems with excessive airflow include:

- Reduction in moisture removal capacity.
- High amperage draw by the blower motor.
- Water carry over from evaporator coil.
- Excessive unit noise levels.

Problems with inadequate airflow include:

- Violation of ventilation codes.
- Risk of evaporator coil freezing.
- Possibility of premature compressor failure.

Horizontal DOAS

Rev.: 11/09/12

Duct System Installation

Determining System Air Flow - The total air flow of a ClimateMaster Tranquility DOAS should be checked by measuring the air pressure drop across the evaporator coil. A Magnehelic® or inclined manometer with a range of 0.0-1.0 inch water column will work well for this. The Tranquility DOAS units feature an adjustable blower sheave to simplify air balancing. Utilize the following procedure to determine system airflow:

1. Check the condition of the air filters and coils. Assure that they are clean.
2. Check for any obvious restrictions in the ductwork.
3. Drive the outdoor air damper open, start the supply air blower, and energize the field-installed exhaust air blower by turning on the "occupied" switch.
4. Use a Magnehelic® or inclined manometer to measure the air pressure drop across the evaporator (ports #2 and 3 in Figure 3). Compare this value to the value printed on the airflow label on the side of the DOAS unit.
5. Change the airflow, if necessary, by adjusting the motor pulley or any balancing dampers in the field-installed ductwork.

Always measure the current draw of the blower motor after you make any changes to the airflow quantity. If the motor draws more than its FLA rating but the total airflow is still low, check the resistance of the ductwork. Verify that all grilles and dampers have been opened and that there are no sudden turns or restrictions in the ductwork.

Recommended Duct Designs - You must use proper duct design to ensure that the DOAS unit operates efficiently and without problems. Undersized or restrictive ducts reduce the system air flow which can cause premature compressor failure. Use the preceding diagrams as a guide when you design the duct system.

Determining System Air Flow - Change the blower speed by adjusting the motor pulley. To adjust the variable pitch pulley, first loosen the set screw. To slow down the blower, turn the outer pulley face counterclockwise (to decrease its pitch diameter). To speed up the blower, turn the outer pulley face clockwise (to increase its pitch diameter).

After every adjustment be sure to:

- Tighten the set screw against the flat spot on the pulley hub so you don't damage any threads.
- Adjust the belt tension if needed.
- Check to assure that the blower motor current draw does not exceed the rating printed on the rating plate.

If the blower motor current draw exceeds its rating but your airflow is still too low, the static pressure losses in the ductwork and grilles may be higher than the unit was designed for. If this happens, consult the ClimateMaster Service Department. Please be prepared with system serial and model number.

⚠ WARNING! ⚠

WARNING! - Disconnect power before adjusting blower. Failure to disconnect power could result in death or serious injury.

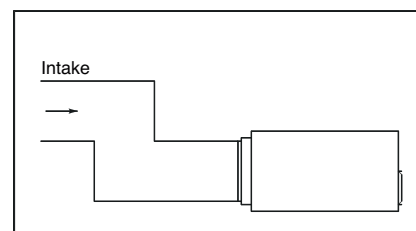
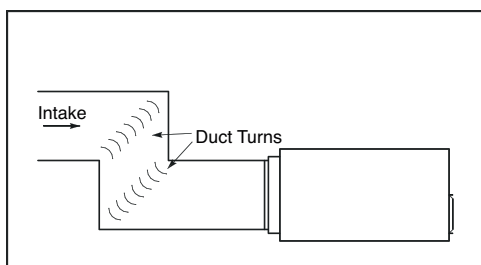
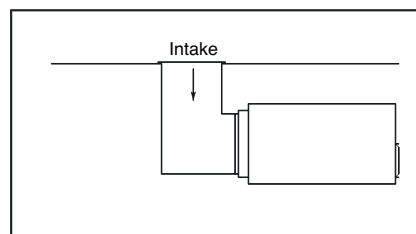
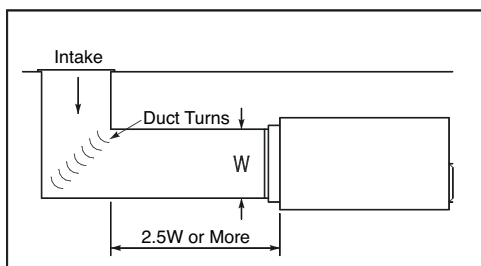
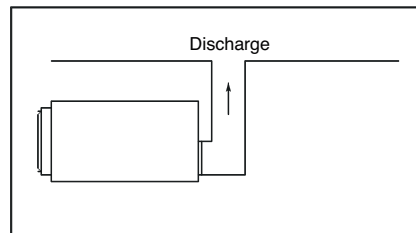
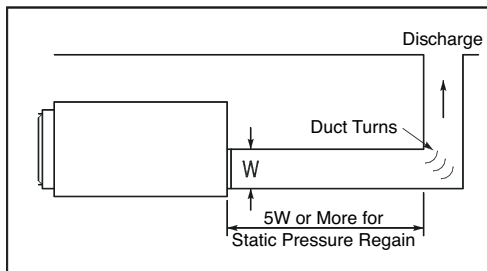
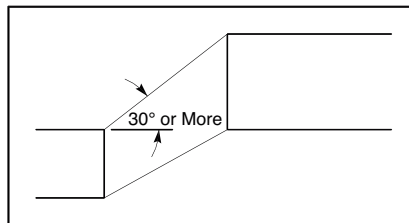
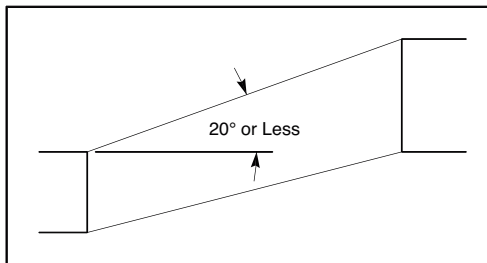
Figure 3: DOAS Side View & Location of Air Balance Points



Figure 4: Recommended Duct Design for DOAS Units

Recommended

Not Recommended



Horizontal DOAS

Rev.: 11/09/12

Piping Installation

⚠ WARNING! ⚠

WARNING! Polyolester Oil, commonly known as POE oil, is a synthetic oil used in many refrigeration systems including those with HFC-410A refrigerant. POE oil, if it ever comes in contact with PVC or CPVC piping, may cause failure of the PVC/CPVC. PVC/CPVC piping should never be used as supply or return water piping with water source heat pump products containing HFC-410A as system failures and property damage may result.

⚠ CAUTION! ⚠

CAUTION! Corrosive system water requires corrosion resistant fittings and hoses, and may require water treatment.

⚠ CAUTION! ⚠

CAUTION! Do not bend or kink supply lines or hoses.

NOTICE! Do not allow hoses to rest against structural building components. Compressor vibration may be transmitted through the hoses to the structure, causing unnecessary noise complaints.

⚠ CAUTION! ⚠

CAUTION! Piping must comply with all applicable codes.

Water Piping Installation - Your DOAS unit is equipped with connections for a WSHP or geothermal loop. Use standard piping practices when connecting to the DOAS unit. A 60 mesh [250 micron] or finer strainer must be installed in the water inlet line. Install an air eliminator at any high points in the water piping. Air trapped in the water circuit of the dehumidifier can lead to elevated operating pressures, unexpected service calls and decreased equipment life. Flush field-installed piping thoroughly before you first put the dehumidifier into service.

To prevent premature failure of the heat exchanger, maintain the water at a pH of 7.4, but never below 6.0. Do not use water with high concentrations of sulfur, chlorine, or sodium chloride.

A dedicated circulating pump must be used unless the main pump can develop enough head to overcome the combined resistance of the water condenser and the piping connected to it. If the water system is connected to a variable frequency drive or to water loops with multiple units, flow regulating valves should be installed.

The flow rate and antifreeze concentration (if used) will depend on your application. Standard water heat exchangers are designed for the following entering fluid conditions; 35 - 105°F with 0 - 30% glycol concentrations. Standard flow rates and pressures for these conditions are listed in Table 1a. Units with custom flow rates, head pressures, entering water temperatures and/or glycol concentrations that deviate from the listed standards should reference the custom water flow label affixed to the exterior cabinet of the dehumidifier next to the water connections. It is a good practice and recommended to always first refer to the flow rate and head pressure shown on the label on the exterior of the unit.

⚠ WARNING! ⚠

WARNING! Excessive flow rates will erode the water heat exchanger(s) and piping!

Table 1: Loop Flow Rates and Pressure Drop

Unit Size Nominal Tons	Building or Geothermal Loop	
	GPM	Pressure Drop in PSI
02	7	3.6
03	11	4.1
05	19	4.0
08	26	5.4
10	34	6.6
15	49	9.4
20	69	6.2
25	84	6.2
30	102	7.1
36	118	7.1
40	137	7.8
46	153	8.2
50	168	10.4
56	186	12.6
60	203	13.3
80	N/A	N/A
99	N/A	N/A

Notes:

- All pressures in PSI/FT HD
- Building loop temperature range must be pure water between 55°F and 95°F. Geothermal loop temperature range must be 30% glycol between 35°F and 105°F.
- Consult factory for applications outside of these conditions.
- Install an air eliminator at any high points in the water piping. Air trapped in the water circuit of the DOAS unit can lead to elevated operating pressures, unexpected service calls, and decreased equipment life.
- **ClimateMaster strongly recommends all piping connections, both internal and external to the unit, be pressure tested for leakage by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. ClimateMaster will not be responsible or liable for damages from water leaks due to inadequate or a lack of pressurized leak testing during installation.**

Water Quality Standards

Table 2: Water Quality Standards

Water Quality Parameter	HX Material	Closed Recirculating	Open Loop and Recirculating Well		
Scaling Potential - Primary Measurement					
Above the given limits, scaling is likely to occur. Scaling indexes should be calculated using the limits below.					
pH/Calcium Hardness Method	All	-	pH < 7.5 and Ca Hardness <100ppm		
Index Limits for Probable Scaling Situations - (Operation outside these limits is not recommended)					
Scaling indexes should be calculated at 150°F for direct use and HWG applications, and at 90°F for indirect HX use. A monitoring plan should be implemented.					
Ryznar Stability Index	All	-	6.0 - 7.5 If >7.5 minimize steel pipe use.		
Langelier Saturation Index	All	-	-0.5 to +0.5 If <-0.5 minimize steel pipe use. Based upon 150 °F HWG and Direct well, 85°F Indirect Well HX		
Iron Fouling					
Iron Fe ²⁺ (Ferrous) (Bacterial Iron potential)	All	-	<0.2 ppm (Ferrous) If Fe ²⁺ (ferrous)>0.2 ppm with pH 6 - 8, O2<5 ppm check for iron bacteria		
Iron Fouling	All	-	<0.5 ppm of Oxygen Above this level deposition will occur.		
Corrosion Prevention					
pH	All	6 - 8.5 Monitor/treat as needed	6 - 8.5 Minimize steel pipe below 7 and no open tanks with pH <8		
Hydrogen Sulfide (H2S)	All	-	<0.5 ppm At H2S>0.2 ppm, avoid use of copper and copper nickel piping or HX's. Rotten egg smell appears at 0.5 ppm level. Copper alloy (bronze or brass) cast components are OK to <0.5 ppm.		
Ammonia ion as hydroxide, chloride, nitrate and sulfate compounds	All	-	<0.5 ppm		
Maximum Chloride Levels			Maximum Allowable at maximum water temperature.		
			50°F (10°C)	75°F (24°C)	100°F (38°C)
	Copper	-	<20ppm	NR	NR
	CuproNickel	-	<150 ppm	NR	NR
	304 SS	-	<400 ppm	<250 ppm	<150 ppm
	316 SS	-	<1000 ppm	<550 ppm	< 375 ppm
	Titanium	-	>1000 ppm	>550 ppm	>375 ppm
Erosion and Clogging					
Particulate Size and Erosion	All	<10 ppm of particles and a maximum velocity of 6 fps. Filtered for maximum 250 micron size.	<10 ppm (<1 ppm "sandfree" for reinjection) of particles and a maximum velocity of 6 fps. Filtered for maximum 250 micron size. Any particulate that is not removed can potentially clog components.		

The ClimateMaster Water Quality Table provides water quality requirements for ClimateMaster coaxial heat exchangers. When water properties are outside of those requirements, an external secondary heat exchanger must be used to isolate the heat pump heat exchanger from the unsuitable water. Failure to do so will void the warranty for the coaxial heat exchanger.

Notes:

- Closed Recirculating system is identified by a closed pressurized piping system. Recirculating open wells should observe the open recirculating design considerations.
- NR - Application not recommended.
- "-" No design Maximum.

Horizontal DOAS

Rev.: 11/09/12

Electrical Wiring - Line Voltage

⚠ WARNING! ⚠

WARNING! To avoid possible injury or death due to electrical shock, open the power supply disconnect switch and secure it in an open position during installation.

⚠ CAUTION! ⚠

CAUTION! Use only copper conductors for field installed electrical wiring. Unit terminals are not designed to accept other types of conductors.

Wire and Fuse Sizing - The field-installed power supply wires and overcurrent devices must be sized to handle the minimum ampacity of the DOAS unit without exceeding the maximum fuse size rating. Both the minimum ampacity and the maximum fuse size are printed on the unit rating plate.

High Voltage Connections - On single phase units the power supply must have 3 connections (2 power, 1 ground). On three phase units the power supply must have 4 connections (3 power, 1 ground). Connect the power supply wires to the main power block located in the upper section of the electrical compartment.

Electrical - Line Voltage - All field installed wiring, including electrical ground, must comply with the National Electrical Code as well as all applicable local codes. Refer to the unit electrical data for fuse sizes. Consult wiring diagram for field connections that must be made by the installing (or electrical) contractor. All final electrical connections must be made with a length of flexible conduit to minimize vibration and sound transmission to the building.

General Line Voltage Wiring - Be sure the available power is the same voltage and phase shown on the unit serial plate. Line and low voltage wiring must be done in accordance with local codes or the National Electric Code, whichever is applicable.

Auxiliary Line Voltage Wiring - A dedicated 115 VAC, 15 Amp circuit (by others) is required on all DOAS units for operation of the factory installed Heating Evaporator heat tape(s). Failure to connect heat tape(s) to a power supply may lead to freezing and possibly failure of the heat exchanger. Failure of, and/or damage caused by the failure of a heat exchanger due to freezing will be exempt from warranty coverage if the heat tapes are not properly connected at the time of the failure.

Figure 5: Single Phase Wiring

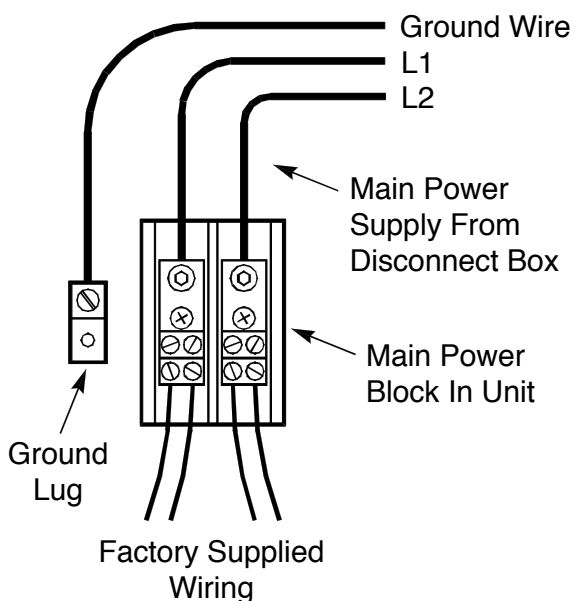
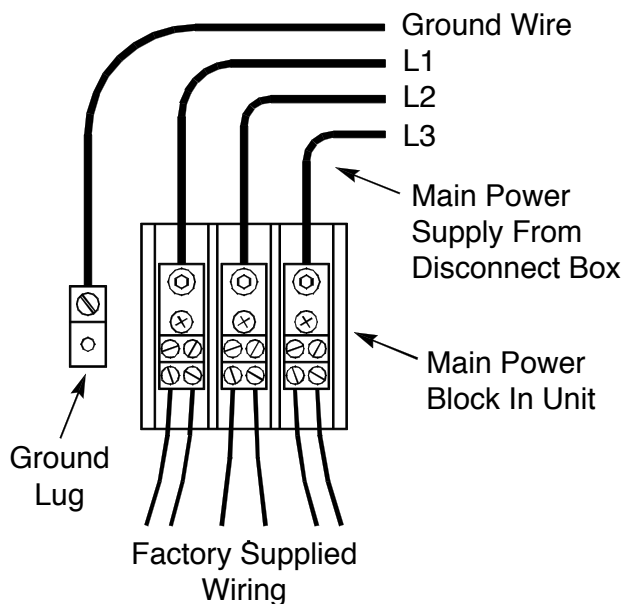


Figure 6: Three Phase Wiring



Electrical Wiring - Low Voltage

Controls Wiring - Many of the controls and sensors in the ClimateMaster Tranquility DOAS units have been factory-installed and wired. However, you will have to make certain connections in the field.

Occupancy Contact - ClimateMaster makeup air DOAS units as standard are pre-wired to work with a field-provided occupancy timer, switch, or dry contact closure from a building management system, which will start the supply blower during periods of occupancy. Whether this switch is manually activated or a relay activated by a building energy management system, its contacts must be rated for at least 10 VA at 24 VAC.

Intake Damper Actuator - Tranquility DOAS units ordered for outdoor or roof-curb installation are supplied with a factory-installed outdoor air intake hood package. This option includes filters, dampers, and a motorized spring-return actuator.

The outdoor air intake louvers, dampers and actuators must be field-provided for indoor DOAS units. The actuator (by others) must be a 24 VAC, spring-return device with on-off floating control and a normally-open end switch. The end switch will energize the supply blower of the DOAS unit once the damper has opened completely. This helps minimize the required actuator torque and reduces static pressure related issues in the ductwork. See the wiring schematic for connection details.

Exhaust Blower Contact - Unless ordered with the optional energy recovery wheel, ClimateMaster makeup air DOAS units are equipped with a single-pole dry contact that you can interlock with a field-provided exhaust blower. This dry contact, which is rated for 10A at 24 or 240 VAC, will close to start the exhaust fan whenever the supply blower of the DOAS unit is running. See the wiring schematic for connection details.

System Air Temperature Sensors - All Tranquility DOAS units are provided with at least one field-installed air temperature sensor, depending on the controls sequence chosen.

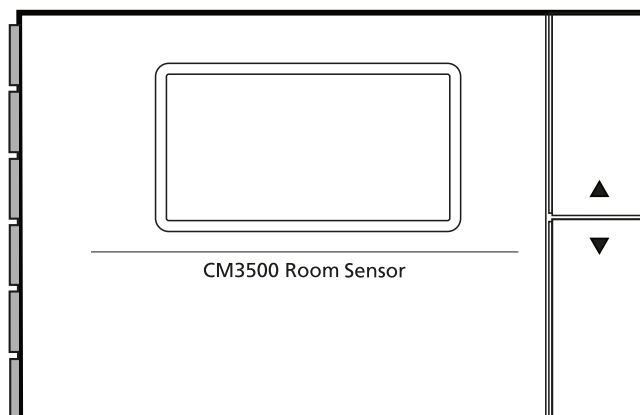
Sensor Installation - Your controller is provided with a duct-mount supply air temperature sensor. It may also come with one or multiple remote room sensors depending on what option was selected when the equipment was ordered.

Duct-Mount Sensor - A duct-mount sensor is normally used when continuous blower operation is desired or required. A duct-mount sensor helps ensure consistent temperature and humidity levels throughout the space. One drawback of this sensor is that it relies on a continuous stream of air moving past it. Using a duct-mount sensor with a non-continuous blower may lead to short-cycling of the refrigeration compressor.

Install the duct-mount sensor in the supply air duct downstream from an auxiliary heater (if used). Do not mount the sensor in a section of duct where false readings may occur due to dead air regions, solar heat gain or thermal losses in winter. Do not mount the sensor where water is likely to drip on it. Liquid moisture may damage the humidity sensing element in the sensor. Run two, 18 gauge (0-500 feet) or two, 24 gauge (0-100 feet) wires from the sensor to the labeled terminal strip in the control panel of the DOAS unit. See your wiring schematic for connection details. Note that undersized wiring will cause inaccurate sensor readings. Do not run sensor wiring adjacent to or in the same conduit as wires carrying more than 24 VAC.

Remote Room Sensor(s) - ClimateMaster DOAS units ordered with the room reset of supply air temperature (RRSAT) option are supplied with a remote room sensor. Up to four of these sensors may be wired to the system. This wall-mountable display is an IP30 rated device. Ambient conditions must be between 32.0°F and 120.0°F and less than 85% RH. The controller's RS485 serial interface communicates via three-way plug-in terminals. Use a twisted pair plus shielded cable, 20-22 AWG.

Figure 7: Remote Room Sensor



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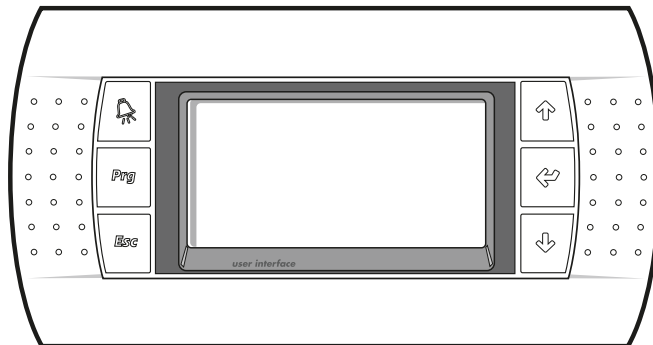
Total length of the network must not exceed 1,500 feet. The capacitance between the wires must not exceed 90 pF/M. See your wiring schematic for connection details. Note that undersized wiring will cause inaccurate sensor readings.

These remote devices require a separate 24Vac 50/60HZ 1.5VA power connection. Provide a dedicated 250mA T fuse for each sensor. Use a class 2 safety transformer with a minimum rating of 4VA. If the sensor is wired to F1 and F2 of the DOAS unit control panel terminal, G0 must be connected to F2.

Do not run sensor wiring adjacent to, or in the same conduit as wires carrying more than 24 VAC.

Mounting the Remote Terminal - The remote terminal must be located in a dry, non-corrosive environment. Operating conditions must be between 0.0°F and 140.0°F and less than 90% RH. Moisture or chemicals can damage the circuitry of the display. The display can either be affixed directly to the DOAS unit (indoor models only) or located up to 20 feet away using the cable that came with the display.

Installing the Remote Terminal - The remote terminal is an IP40 device and is powered through the cable provided. If a longer length is required, a standard 24 AWG, 6 conductor phone cable may be used up to 150 feet. For location of the sensor up to 1,500 feet, use 22

Figure 8: Remote Terminal

AWG, 3 twisted pair cable. See your wiring schematic for connection details. Pull the cord and connector through the hole in the back of the mounting bracket. Attach the bracket to the wall. After plugging the cord into the back of the remote display, feed any extra wiring back into the hole of the mounting bracket and gently snap the remote display into the bracket.

⚠ CAUTION! ⚠

CAUTION! Do not run the remote terminal wiring in the same conduit as, or adjacent to wires carrying over 30 volts!

Unit Start-Up and Operating Conditions

Table 3: Operating Limits

Air Limits	HD/RD Models		HW/RW Models	
	Cooling/Dehumid Mode	Heating Mode	Cooling/Dehumid Mode	Heating Mode
Minimum Ambient Air*	40°F [4.4°C]	40°F [4.4°C]	40°F [4.4°C]	-10°F [-23.3°C]
Maximum Ambient Air*	100°F [37.8°C]	100°F [37.8°C]	100°F [37.8°C]	100°F [37.8°C]
Minimum Entering Air	50°F [10.0°C]	15°F [-9.4°C]	50°F [10.0°C]	-10°F [-23.3°C]
Maximum Entering Air	110°F [43°C]	80°F [26.7°C]	110°F [43°C]	80°F [26.7°C]
Water Limits				
Minimum Entering Water	35°F [1.7°C]	35°F [1.7°C]	35°F [1.7°C]	35°F [1.7°C]
Maximum Entering Water	105°F [1.7°C]	90°F [32.2°C]	105°F [1.7°C]	90°F [32.2°C]

*Does not apply to rooftop models.

Note: The manufacturer strongly recommends all piping connections, both internal and external to the unit, be pressure tested by an appropriate method prior to any finishing of the interior space or before access to all connections is limited. Test pressure may not exceed the maximum allowable pressure for the unit and all components within the water system. The manufacturer will not be responsible or liable for damages from water leaks due to inadequate or lack of a pressurized leak test, or damages caused by exceeding the maximum pressure rating during installation.

Prior to Start-up - A proper startup will minimize operational problems and expensive callbacks. Read this section thoroughly before attempting to commission the ClimateMaster DOAS unit. Always disconnect the power before servicing the equipment!

Note: For information regarding the required factory-supervised start-up with your system, refer to the Service Bulletin towards the later part of this manual.

1. LEAK TEST ALL FIELD AND FACTORY PIPING.
Shipping and handling may have caused refrigerant leaks inside the DOAS unit.
2. Check the rating plate for power requirements. The available power supply voltage must be within $\pm 5\%$ of the voltage printed on the rating plate.
3. Verify that all field wiring matches the ClimateMaster wiring schematics. Inspect and tighten all field and factory wiring.
4. Check and adjust the belt tension for a ½ -inch deflection at the mid-point of the blower belt(s) when approximately 5 pounds of pressure is applied.
5. Check the drain pan and the condensate piping. Test the drain and prime the p-trap by pouring water into the drain pan.

6. Verify that all service valves in the refrigeration lines are fully open.
7. Inspect the air filters and coils to assure they are clean. If necessary, clean the coils and install new air filters.
8. Purge any air, dirt, and debris from water lines to avoid clogging the internal passages of optional heating coils or water side heat exchangers.
9. Make sure that the unit is level and securely mounted so that it cannot shift or transmit vibration to the building.

Start-up Procedure - First, read and understand the "Start-Up Report" which was shipped with the DOAS unit. ClimateMaster uses the start-up report to verify the integrity of each installation. A thorough start-up can reduce callbacks and can help increase customer satisfaction. Carefully follow the process detailed in the start-up report. Mail or fax the completed start-up report back to ClimateMaster to validate your unit's warranty. Be sure to keep a copy for future reference. If you do not have a start-up report, call the ClimateMaster Service Department at (405) 745-6000 for a new copy. Please be prepared with the model and serial number of the DOAS unit. **THE START-UP REPORT IS REQUIRED FOR WARRANTY VALIDATION.**

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System Start-up Report - A copy of the system start up report can be found in the back of this manual. This report needs to be filled out thoroughly by a qualified service technician and returned to ClimateMaster for warranty validation. Please ensure that the model and serial number of the unit is noted on this form. The model and serial number can be found on the systems rating plate located on or near the electrical compartment service door. Failure to complete and return this form will void the units warranty. These reports are also helpful when trying to correct existing problems. Should you need system diagnosis help, fax the completed worksheet to the ClimateMaster Service Department using the number provided. Be sure to include your name and a telephone number where you can be reached.

Start-up Supervision Supplemental Information

(Optional) - A ClimateMaster factory startup is included in the purchase of the equipment. A factory startup includes several key services:

- The expertise of an accomplished, factory-trained mechanic who will supervise the commissioning of the equipment.
- This ClimateMaster representative will assist the installing contractor with filling out the Startup Report.
- He will also inspect the installation to make sure that the DOAS unit has been properly integrated with the rest of the equipment on the jobsite.
- Finally, he can train the maintenance personnel to operate and service the equipment if necessary.

A factory start up does not include installation assistance. The installing contractor is responsible for ensuring that the system is ready for startup when the ClimateMaster representative arrives.

When the installing contractor is confident the system will be ready, he should contact the ClimateMaster Sales representative to schedule the startup. Please submit a startup request at least three weeks before the desired startup date to help prevent scheduling conflicts.

Refrigeration System Operating Pressures - Many factors affect the operating pressures on a given day. Such factors include ambient temperature, air flow volume, and relative humidity. The following ranges are typical:

Tranquility Models:

- HFC-410A Normal suction pressure range: 85 to 150 psig
- HFC-410A Normal discharge pressure range: 300 to 500 psig

NOTE: Always check the system air flow before you troubleshoot the refrigeration circuit.

Sequence of Operation

Sensor Control Definitions and Location

Unit Temperature and Humidity Sensors:

A temperature and humidity sensor will be located before the evaporator coil. The sensors feed back to the unit microprocessor the dry bulb temperature and relative humidity entering the evaporator.

Leaving Air Temperature Sensor:

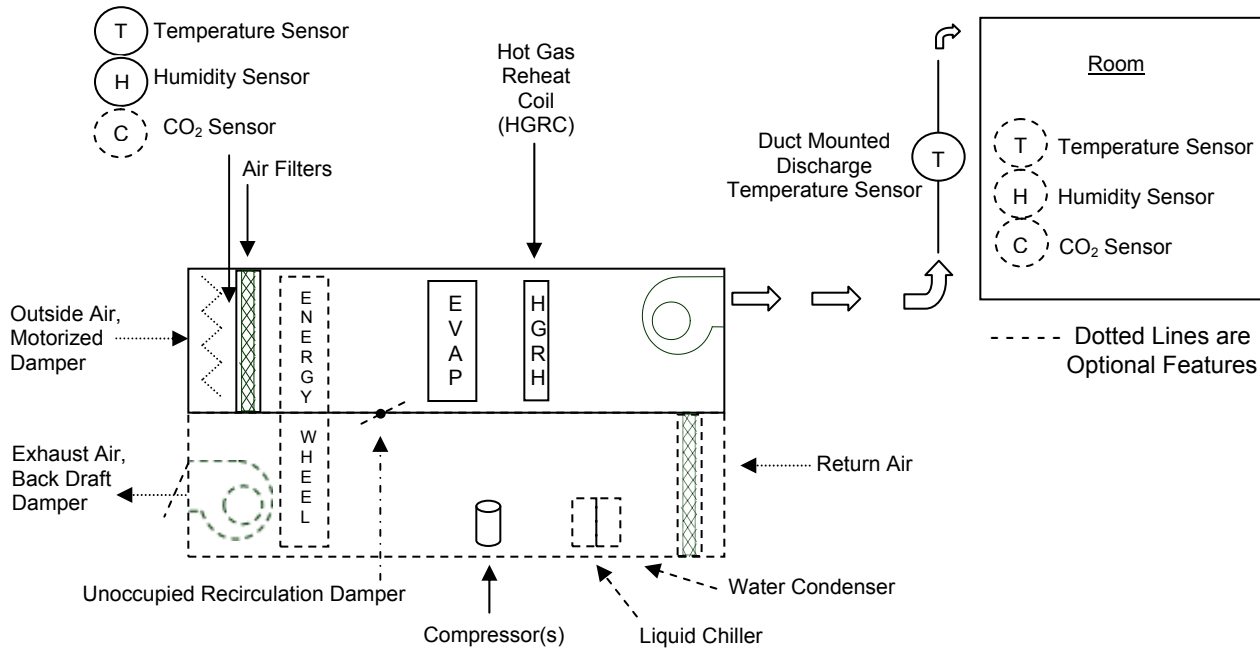
The supply air sensor will be located in the supply air ductwork. The sensor feeds back to the unit microprocessor the discharge air dry bulb temperature.

Room Temperature Sensors (Optional): (Required with Room Reset of LAT Option)

The room temperature sensor will be located in the conditioned room. The sensor feeds back to the unit microprocessor the room dry bulb temperature.

Room Humidity Sensor (Optional): (Required with Unoccupied Recirculation Damper)

The humidity sensor will be located in the conditioned room. The sensor feeds back to the unit microprocessor the room relative humidity (RH).



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Sequence of Operation

LEAVING AIR TEMPERATURE (LAT) CONTROL SCHEME

LAT control scheme uses a duct-mounted sensor to maintain a constant supply air temperature. The system microprocessor PID loop receives an analog signal from the duct sensor. The controller then outputs a 0 – 10 vdc signal to modulate a hot gas reheat or an auxiliary heater in small incremental changes to provide a constant discharge temperature. During hot gas reheat mode the LAT control tolerance will be $\pm 0.2^{\circ}\text{F}$ from setpoint.

ROOM TEMPERATURE & HUMIDITY

CONTROL OPTIONS

Room Reset of Leaving Air Temperature (LAT) Control Scheme:

In addition to the leaving air temperature sensor used in the LAT control scheme, {1, 2, 3 or 4} room mounted temperature sensor(s) will be required. (If multiple room sensors are applied the sensors will average the room temperature. Room Reset of LAT Control will be accomplished by means of room temperature resetting the LAT setpoint via the controller's PID loop. Warmer or cooler air is provided when the LAT is greater then or less then the room temperature setpoint of 72°F (field adjustable between 65 – 85°F). The controller will maintain room temperature up to the full cooling and heating capabilities as follows:

- When Room Temperature Air = Room Temperature Setpoint: The controller will maintain the current leaving air temperature setpoint.
- When Room Temperature Air > Room Temperature Setpoint: The controller will lower the LAT setpoint to maintain room temperature setpoint. The unit controller will identify new LAT setpoint, resulting in a lower supply temperature to balance the room heat gain; thus, holding the room temperature to the setpoint.
- When Room Temperature Air < Room Temperature Setpoint: The controller will raise the LAT setpoint to maintain room temperature. The unit controller will identify new LAT setpoint, resulting in a higher supply temperature to balance the room heat loss; thus, holding the room temperature to the setpoint.

Unoccupied Room Humidity Control Scheme: (Required with Unoccupied Recirculation Damper)

In addition to the temperature sensors used in the room reset of LAT control scheme, a room humidity sensor is utilized. The sensor will be utilized during the unoccupied mode operation as described in this sequence of operation.

OCCUPIED/UNOCCUPIED MODE SWITCHOVER

The unit will switch between occupied and unoccupied mode through an occupancy contactor provided by a {BMS, Unit DDC Occupancy Timer}

100% Outside Air Dehumidifiers: (Applies to Wheel and Non Wheeled Units)

- Occupied Mode - On contact closure, the unit will go into occupied mode, the outside air damper will signal open. Once the damper is in the open position, the supply fan will be activated for continuous airflow operation. Units provided with an enthalpy wheel, the wheel and exhaust fan will be activated once the outside air damper is in the open position.
- Unoccupied Mode - When the contact opens, the unit will deactivate the fan(s), compressor(s), enthalpy wheel (if applicable), and signal the outside air damper close.

100% Outside Air Dehumidifiers with Recirculation Air Damper controlled by CO2: (Applies to Wheeled Units Only)

- Occupied Mode - On contact closure, the unit will go into occupied mode, the recirculation air damper will signal close and the outside air damper will signal open. The enthalpy wheel and exhaust air fan will be engaged once the outside air damper is in the open position. The unit will operate with 100% outside air and 100% exhaust air. The fans run continuously.
- Room CO2 > Setpoint (Occupied): The bypass damper is closed and 100% outdoor air is introduced into the space. The supply air blower VFD adjusts to an established pressure differential setpoint across the hot gas reheat coil. The pressure drop corresponds to the design supply air volume. Also, the exhaust air blower VFD adjusts to an established pressure differential setpoint across the wheel's exhaust air side to maintain design exhaust air volume.
- Room CO2 < Setpoint (Occupied): The bypass damper opens to allow return air (exhaust air side of the system) to bypass into the supply air. The controller will adjust the mixing amount until the room CO2 setpoint is established or until the minimum amount of OSA is reached. The supply air blower VFD will adjust to maintain the same pressure differential setpoint across the hot gas reheat coil to maintain the specified supply air volume. The exhaust air blower VFD will adjust to a new pressure differential setpoint across the wheel to meet the exhaust air volume that is 10% of the OSA volume.

Sequence of Operation

- **Unoccupied Mode:** When the contact closure opens, the unit will deactivate the enthalpy wheel and exhaust air fan, the outside air damper will signal close and the recirculation damper will signal open to the 100% return airflow position. The supply fan will run continuously or to cycle (programmable option) on a call for room dehumidification, cooling or heating.

AIR DEHUMIDIFICATION AND/OR COOLING MODE

When the refrigeration cooling cycle is activated, the air is cooled and dehumidified to the design dew point or below. Based on the air entering the evaporator, the unit will activate compressor(s) as follows:

Occupied Mode:

- When the dew point is above the system setpoint of 55°F dew point setpoint (field adjustable selections are between 48 - 65°F DP)
- When the air temperature is above 70°F dry bulb, even if the air dew point is below the dew point setpoint.

Unoccupied Mode: (Applies to wheeled units with recirculation air damper only)

Recirculation Damper Systems only will operate as follows during the unoccupied mode:

- A call for cooling only is made when the room is above the unoccupied cooling setpoint of 85°F default (field adjustable). The unit will operate in full cooling mode, reheat off. Cooling will be deactivated once the room temperature falls below setpoint minus the unoccupied cooling differential.
- A call for dehumidification is made when the room RH level exceeds the unoccupied setpoint of 60%RH (field adjustable). The unit will operate as described in the Air Reheat Mode operation. Dehumidification will be deactivated once the room RH levels drops below setpoint minus the unoccupied humidity differential.

AIR REHEAT MODE WITH HOT GAS REFRIGERANT

Air heating is accomplished by means of the hot gas refrigerant discharged off the compressor which feeds a hot gas reheat condenser coil (HGRH) in the air stream. The HGRH coil completely condenses the refrigerant that passes through it, thus extracting energy for air heating. The HGRH control valve is modulated by the unit's microprocessor to control heat output as based on the temperature control option selected.

In addition to the HGRH coil, the system will utilize a water condenser. The second condenser condenses hot gas refrigerant that is diverted around the HGRH. The second condenser will operate in series with the HGRH for simultaneous heat rejection to control heat output as based on the temperature control option selected.

AIR HEATING MODE

When dehumidification and/or cooling are not required the unit will operate an auxiliary heating coil as follows:

Occupied Mode:

- The controller will switch to water source heat pump operation. To activate heat pump mode, the air side evaporator is taken offline by diverting refrigerant flow from the air side evaporator to the liquid chiller enabling heat extraction from the water loop. Air heating is accomplished by means of the hot gas reheat coil and operates as described in Air Reheat Mode with Hot Gas Refrigerant above.

Unoccupied Mode: (Applies to wheeled units with recirculation air damper only)

Recirculation Damper Systems only will operate as follows during the unoccupied mode:

- A call for heating is made when the room is below the unoccupied heating setpoint of 65°F. The unit will operate in full heating mode. Heating will be deactivated once the room temperature rises above setpoint plus the unoccupied heating differential.

EMERGENCY SYSTEM SHUTDOWN

Emergency system shut down will occur when a contactor is opened within a smoke detector or other similar device by others. Once the contactor is opened the units 24v circuit will be broken thus deactivating motors, fans and compressors.

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Service and Maintenance

You can prevent many future problems by adhering to the recommended maintenance schedule shown. If you do discover a problem with the DOAS unit or the installation, refer to the TROUBLESHOOTING GUIDE. IF YOU HAVE EXHAUSTED THE TROUBLESHOOTING GUIDE AND HAVE NOT DISCOVERED THE PROBLEM, CALL THE CLIMATEMASTER SERVICE DEPARTMENT AT (405) 745-6000. BE PREPARED WITH THE MODEL AND SERIAL NUMBER OF YOUR DOAS UNIT.

Routine Maintenance - ClimateMaster DOAS units are designed for years of reliable service. However, like any piece of machinery they require periodic maintenance.

Service Monthly

- Check the air filters and replace them if necessary.
- Check the coils in the DOAS unit. Use compressed air or a commercial coil cleanser if they are dirty or plugged.
- Check the blower belts in the DOAS unit for wear, glazing, and proper tension. Replace the belts if necessary. Adjust the belts for approximately one-inch deflection at their midpoints.

⚠ WARNING! ⚠

WARNING! Disconnect power before tightening terminals. Failure to disconnect power could result in death or serious injury.

Service Semi-Annually

- Tighten all field and factory electrical connections. Mechanical vibration and thermal expansion can loosen wires and terminals, which may lead to erratic operation.

⚠ WARNING! ⚠

WARNING! Disconnect power before adjusting belts. Failure to disconnect power could result in death or serious injury.

- Inspect and clean the condensate drain line(s) if necessary. A clogged drain line can overflow and cause extensive property and equipment damage.

Service Annually

Energy Recovery Wheel (Optional) - DOAS units equipped with the optional energy recovery wheel must be inspected regularly. Check the drive belt and clean the wheel annually using either compressed air or a mixture of mild detergent and water. If you clean the wheel with soapy water, rinse the suds out using clear water. Vacuum or blow out any excess moisture from the wheel, dry off the base pans, and return the equipment to operation. The moving airflow will evaporate any moisture remaining within the wheel.

Note that equipment used to dehumidify smoking areas or dusty industrial environments should be inspected and cleaned every two to three months to ensure high operating efficiency. See the enthalpy wheel instruction manual for more detailed information on maintaining and troubleshooting the wheel.

Compressor Failure - Although some compressors fail because they are mechanically flawed, most failures are due to system-related problems. Compressor failure can be caused by liquid floodback, air or moisture in the refrigerant system, solid contaminants, excessive heat or electrical service malfunctions. To avoid repeated callbacks, you must determine the cause of the failure and then correct it.

If the compressor has failed because its motor has burned out, the refrigerant, oil, and piping may have become severely contaminated. If a burnout has occurred, use the following procedure to replace the compressor and clean the refrigerant system. **YOU MUST CLEAN THE SYSTEM THOROUGHLY TO PREVENT REPEATED COMPRESSOR BURNOUTS!** Use an oil test kit to determine the severity of the burnout. Make sure you use rubber gloves and eye protection, as contaminated refrigerant and oil can cause severe burns!

Mild Burnouts - If the burnout is mild, recover the refrigerant charge or transfer it to an unused portion of the refrigeration circuit such as the receiver. You may need to energize the liquid line solenoid valve to evacuate the circuit completely. On systems equipped with an optional tower water condenser, take care to avoid freezing the condenser during evacuation.

If the compressor is equipped with rotolock valves, you may want to install and evacuate the new compressor, and use it to pump down the charge.

Notice! - Do not attempt this when a severe burnout has occurred!

- Remove the old compressor.
- Install the new compressor. Be careful not to overheat its pipe stubs if it is not equipped with rotolock connections.
- Replace the suction filter with a suction line filter-drier. Sporlan Valve Corporation manufactures special "HH" filter-driers for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. If you install a filter without a tap, solder a tap in the suction line immediately upstream of the filter.
- Remove the old liquid line filter-drier and replace it with a new "HH" type filter one size larger than the original.
- Evacuate the system to purge the moisture and non-condensables from it. You may need to energize the liquid line solenoid to evacuate all portions of the refrigeration circuit.
- Check the compressor contactor for damage or pitted contacts. Some single-phase compressors are equipped with start capacitors, run capacitors, and starting relays. Check these components and replace them if necessary.
- Check the piping and joints for leaks, and recharge the system.
- Run the refrigeration system for an hour while you monitor the pressure drop across the suction filter. If the pressure drop is 3 psig or less after one hour, continue to run the system for 24 hours, then take an oil sample.
- If the oil sample is dirty or acidic, or if the one-hour pressure drop is greater than 3 psi, then recover the system charge and replace both the suction and liquid filter-driers. Repeat the previous step until your oil sample tests negative.

Check the piping and joints for leaks, and recharge the system.

Severe Burnouts

- If the burnout is severe, recover the refrigerant charge or transfer it to an unused portion of the refrigeration circuit such as the receiver. You may need to energize the liquid line solenoid valve to evacuate the circuit completely. On systems equipped with an optional tower water condenser, take care to avoid freezing the condenser during evacuation.
- Verify that the TXV and solenoid valves are not plugged with debris. Clean or replace them if necessary.
- Replace the suction filter with a suction line filter-drier. Sporlan Valve Corporation manufactures special "HH" filter-driers for cleaning system burnouts. These filters are equipped with a tap for measuring the pressure drop across the filter. If you install a filter without a tap, solder a tap in the suction line immediately upstream of the filter.
- Remove the old liquid line filter-drier and replace it with a new "HH" type filter one size larger than the original.
- Remove the old compressor if you have not already done so.
- Install the new compressor. Be careful not to overheat its pipe stubs if it is not equipped with rotolock connections.
- Evacuate the system to purge the moisture and non-condensables from it.

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Troubleshooting

Supply Blower Will Not Run

Possible Cause	Remedy
"Occupied switch in open position	Close "Occupied" switch
Loss of main power	Check for tripped circuit breaker or blown fuse
Damper is stuck or frozen, preventing the actuator end switch from closing	Free the damper or replace the actuator if it is defective
Blower overload has tripped	Correct cause and reset overload
Faulty control wiring	Check for loose or incorrect wires on system and controller

Compressor Will Not Run - Note: When there is a demand for outdoor air (the "occupied" switch is on) and the outdoor air does not need mechanical dehumidification, the compressor and the refrigeration circuit of the unit will be locked out.

Possible Cause	Remedy
Loss of main power	Check for tripped circuit breaker or blown fuses
Blower overload has tripped	Correct cause and reset overload
Faulty wiring	Check for loose or faulty wiring on system and controller
Compressor overload has tripped	Correct cause and reset overload
Compressor failure may have occurred if: A: Compressor draws locked rotor amps B: Compressor starts but does not pump C: Motor windings have shorted	A: Replace compressor (or check fuses on three-phase units) B: Replace compressor C: Replace compressor
Compressor delay-timer	Wait 3 minutes for timer

Head Pressure is Too High: Above 500 psig (HFC-410A)

Possible Cause	Remedy
Lack of adequate water flow	Install flow meter or circuit setter to ensure correct flow rate
Excessive incoming water temperature	If water temperature is above 90°F, consult factory for required flow rates
Excessive air in condenser water lines	Purge lines thoroughly or install an air eliminator in the system piping
A: Overload tripped (3-phase only) B: Contactor faulty C: Blower cycling on internal overload (single phase only)	A: Reduce blower speed and reset overload B: Replace contactor C: Reduce blower speed
Service valves closed or not fully open	Fully open service valves
Non-condensables in refrigeration system	Short-Term: Bleed non-condensables from high-point purge points in system Long-Term: Properly evacuate and recharge refrigeration system

⚠ CAUTION! ⚠

CAUTION! Do not restart units without inspection and remedy of faulting condition. Equipment damage may occur.

Evaporator Coil Ices Up: Suction Pressure Below 85 psig (HFC-410A)

Possible Cause	Remedy
Faulty or improperly set hot-gas bypass valve	1: Set hot-gas valve to maintain 30°F suction (55 psig) 2: Replace if defective
Insufficient evaporator air flow rate	Assure air coil is clean and belts are tight
Lack of refrigerant	Reevaluate system charge
Restricted refrigerant filter-drier	Evaluate filter pressure drop and replace if necessary
Defective expansion valve	Evaluate expansion valve performance and replace if necessary
Restriction in refrigeration piping	1: Check coil for kinks in tubing 2: Check for debris in distributor

Appendix

Figure 9: System Rating Plate


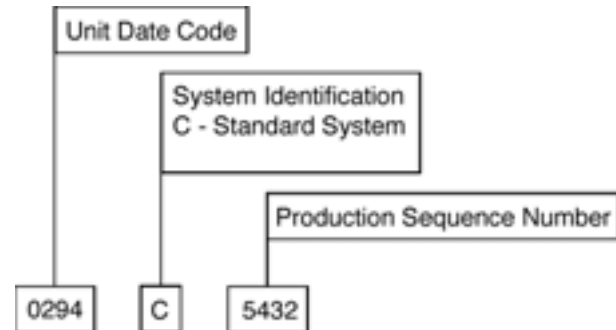
Model No. XXXXXXXXXXXXXXXX																											
Serial No. XXXXXXXXXX																											
Voltage/Phase/Hz XXX/X/60		Control Voltage X																									
Unit Minimum Ampacity X																											
Maximum Overcurrent Protective Device X																											
Compressors <table border="1"> <tr> <th>Mtr #</th> <th>RLA</th> <th>LRA</th> </tr> <tr> <td>2</td> <td>X</td> <td>X</td> </tr> <tr> <td>3</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>4</td> <td>N/A</td> <td>N/A</td> </tr> <tr> <td>5</td> <td>N/A</td> <td>N/A</td> </tr> </table>		Mtr #	RLA	LRA	2	X	X	3	N/A	N/A	4	N/A	N/A	5	N/A	N/A	Blower(s) <table border="1"> <tr> <th>Mtr #</th> <th>HP</th> <th>FLA</th> </tr> <tr> <td>1</td> <td>X</td> <td>X</td> </tr> <tr> <td>10</td> <td>N/A</td> <td>N/A</td> </tr> </table>		Mtr #	HP	FLA	1	X	X	10	N/A	N/A
Mtr #	RLA	LRA																									
2	X	X																									
3	N/A	N/A																									
4	N/A	N/A																									
5	N/A	N/A																									
Mtr #	HP	FLA																									
1	X	X																									
10	N/A	N/A																									
Heat Wheel Motor <table border="1"> <tr> <th>Mtr. #</th> <th>HP</th> <th>FLA</th> </tr> <tr> <td>11</td> <td>N/A</td> <td>N/A</td> </tr> </table>				Mtr. #	HP	FLA	11	N/A	N/A																		
Mtr. #	HP	FLA																									
11	N/A	N/A																									
Factory Charge (lbs.) <table border="1"> <tr> <td>Circuit A</td> <td>X</td> </tr> <tr> <td>Circuit B</td> <td>N/A</td> </tr> </table>				Circuit A	X	Circuit B	N/A																				
Circuit A	X																										
Circuit B	N/A																										
This Unit Is For Indoor Use Only																											
Patent No. 6,055,818; Patent No. 6,666,040 ClimateMaster, Inc.																											

Figure 10: Model Numbering Matrix



The system rating plate is attached to the outside of the electrical box door. You will need rating plate information when you install and service the DOAS unit.

Horizontal DOAS

Rev.: 11/09/12

Service Bulletin

DEDICATED OUTDOOR AIR SYSTEM (DOAS)**Factory Pre-Commissioning Form, Pg. 1**

Factory Commissioning of the DOAS system is required and is included in the sale of all DOAS units. Commissioning requires a ClimateMaster Service Dept. Technician to visit the installation site and provide supervisory experience to installing/commissioning contractor(s) as they perform the required procedures as outlined in our warranty activation commissioning report. The company technician may also present an educational review of the DOAS unit operating and maintenance requirements. As an option, and at the company's discretion, a **Certified Service Technician (CST) Commissioning** may be performed. A CST Commissioning is performed by a local Certified Service Technician who has been trained by the manufacturer. The CST will perform all of the duties of the factory technician including commissioning supervision and maintenance and operation training.

To schedule a factory supervised commissioning this Pre-commissioning Form must be completed in its entirety and returned to the ClimateMaster Technical Service Dept. Travel arrangements for commissioning will not be made until Pre-commissioning forms are signed, returned to, and approved by the ClimateMaster Technical Service Dept. Allow three (3) weeks for site visit scheduling.

The DOAS unit must be operable on the scheduled commissioning date. If, on the scheduled date, commissioning cannot be completed and a return trip must be scheduled a Purchase Order for the second trip must be issued to ClimateMaster. Delays and/or changes to a scheduled commissioning less than five (5) business days in advance may result in additional charges. Commissioning delays on-site of more than 4 hours during commissioning may result in additional charges.

The ClimateMaster Technical Service Dept. will advise contractors of their responsibilities and coordinate all site visits. The responsible contractor will be advised if a factory technician or a CST will perform the commissioning.

The following list of items will apply to all DOAS unit commissioning and are the responsibility of the installing contractor. In the event any of the following equipment cannot be furnished for the commissioning contact the ClimateMaster Technical Service Dept. at (405) 745-6000 prior to signing/submitting this document.

Items required for commissioning:

- ☐ Equipped service vehicle and qualified service technician. Tech will be trained by factory tech/CST.
- ☐ Refrigerant manifold gauges. (2-sets, R410A or R22 as needed)
- ☐ Air balancing equipment (magnehelic or manometer differential pressure gauge).
- ☐ DMM and Amperage meters.
- ☐ Digital thermometer with sensors.
- ☐ 50# of refrigerant (see unit type) & refrigerant scales.
- ☐ Hand refrigerant oil pump.

- ☐ Ensure DOAS unit is installed in accordance with IOM requirements.
- ☐ Condensate drain line with P-trap is installed.
- ☐ All electrical terminations properly connected and tightened.
- ☐ All field installed controls and sensors are installed and properly connected. Field installed controls and sensors include the user interface, S/A sensor, and possibly room Temp/RH sensors.
- ☐ Inspect all water lines for leaks and purge all air from DOAS unit heat exchangers.
- ☐ Verify water-piping connections are correct and leak free.
- ☐ Verify water flow valve is installed and rated for correct GPM flow rate. See unit labeling for GPM requirement and details.
- ☐ Verify strainer (60 mesh or finer) is installed in **supply water** line.
- ☐ Verify water temperature is within unit specifications.

Items to be completed prior to commissioning:

- ☐ Open all access panels and inspect unit for concealed shipping damage. Contact ClimateMaster immediately if damage is noted. Do not repair damage without consulting factory. Photograph all damage.
- ☐ Leak check DOAS unit with a hand-held refrigerant leak detector. Check and record refrigerant pressure of all refrigerant circuits. Check and record ambient temperature where unit is located.

A MINIMUM THREE (3) WEEK LEAD TIME IS REQUIRED TO SCHEDULE A DOAS UNIT COMMISSIONING.

**Submit forms to: Attn: ClimateMaster Technical Service Dept. Fax (405) 745-6058
ClimateMaster 7300 S.W. 44th Street Oklahoma City, OK, 73179 (405) 745-6000**

Pre-Commissioning Form, Pg. 2

Complete one (1) each this page for each DOAS unit

Unit Information **Model #** _____

Serial # _____

Refrigerant pressure (standing): Circuit A _____ Circuit B _____

Ambient Temperature (degree F @ unit): _____

Contractor information

Company Name: _____

Address: _____

Contact Phone: _____ Fax: _____

Jobsite Information

Jobsite Address: _____

Contact Name: _____ Cell Ph: _____

Signature, Job Site Supervisor: _____ Date: _____

Water Test & Balance

Company Name: _____

T & B Technician Name (print): _____ Phone: _____

T & B Completion Date: _____

ClimateMaster Sales Representative

Company Name: _____

Contact/Salesman Name: _____

A MINIMUM THREE (3) WEEK LEAD TIME IS REQUIRED TO SCHEDULE A DOAS UNIT COMMISSIONING.

Submit forms to: Attn: ClimateMaster Technical Service Dept. Fax (405) 745-6058
ClimateMaster 7300 S.W. 44th Street Oklahoma City, OK, 73179 (405) 745-6000

Horizontal DOAS

Rev.: 11/09/12

Start-Up Report

DEDICATED OUTDOOR AIR SYSTEM (DOAS)

Commissioning Report, Tranquility and Genesis Series Heat Pumps, Pg. 1

IMPORTANT: For warranty validation and activation a copy of this form must be completed for each ClimateMaster DOAS unit and form must be returned to ClimateMaster Technical Service Dept. immediately after completion of commissioning. Warranty shall not be considered valid or active without verification from the ClimateMaster Technical Service Dept. For warranty status contact:

ClimateMaster Inc.
C/O Service and Warranty Dept.
7300 S.W. 44th Street
Oklahoma City, OK, 73179
(405) 745-6000

INSTRUCTIONS

- Prior to Commissioning read and become familiar with the DOAS unit Installation and Operation Manual (IOM) and the CM3500 Controller Application and Operation Manual (AOM). If you do not fully understand the manuals or require additional information contact the ClimateMaster Technical Service Dept. Be prepared to quote unit model number(s) and serial number(s).
- Use one (1) each Commissioning Report per unit. One report will be required for each DOAS unit. Clearly print all required information. Additional comments or pages may be attached as needed.

⚠ WARNING! ⚠

ONLY TRAINED, QUALIFIED PERSONNEL SHOULD INSTALL AND/OR SERVICE CLIMATEMASTER EQUIPMENT. SERIOUS INJURY, PROPERTY DAMAGE, AND/OR DEATH CAN RESULT FROM IMPROPER INSTALLATION AND/OR SERVICE OF THIS EQUIPMENT. HIGH VOLTAGE ELECTRICAL COMPONENTS, MOVING PARTS, AND HIGH REFRIGERANT PRESSURES ARE PRESENT.

Location and Unit Information

Job Name: _____	
Installation Address: _____	
ClimateMaster Sales Representative: _____	
Unit Model #: _____	Serial #: _____
Form Completed by (print): _____	Signature: _____
Company Name: _____	Date: _____
Company Address: _____	
Phone #: _____	Fax #: _____

Commissioning Report, Tranquility and Genesis Series Heat Pumps, Pg. 2

INSTALLATION CHECK LIST

- ☐ Installation Manual Read & Understood
- ☐ DOAS Unit Properly Installed
- ☐ Condensate Drain Installed, Trapped, Primed
- ☐ Verify Power Supply Matches Unit Data Plate

- ☐ Tighten/Check all Field & Factory Wiring Connections
- ☐ Check Blower Belt Tension
- ☐ Check Blower rotation (3 ph Units Only)
- ☐ Open ALL Manual Refrigerant Valves

- ☐ Leak Check Unit With Hand-Held Leak
- ☐ Check for Internal Damage
- ☐ Leak Check Unit With Hand-Held Leak Detector
- ☐ Verify Water Flow & GPM
- ☐ Verify Air Filters Installed & Clean

POWER SUPPLY		BLOWER(S) OPERATION		
Check voltage <u>without</u> motors operating		Check with motors operating		
		Supply Fan		Return Fan
Voltage @ Power Dist. Block	L1-L2	Voltage @ Design Airflow	L1-L2	L1-L2
	L1-L3		L1-L3	L1-L3
	L2-L3		L2-L3	L2-L3
Voltage @ Main Transformer	Line Volt	Amperage @ Design Airflow	L1	L1
	Low Volt		L2	L2
			L3	L3

WATER SYSTEM				
Water Piping Size (O.D.)		Loop Type		
Pressure Drop	PSI / ft	Antifreeze in Loop	Type / %	
MWV Installed	Y / N	Strainer Installed	Y / N	Mesh Size
AFR Installed	Y / N	Heat Tape Installed/Operable		Y / N
Temperature and Relative Humidity				
Space Temperature	°F	Outdoor Air Temperature		°F
Space Relative Humidity	%RH	Outdoor Air Temperature		%RH
Reheat Condenser Static Pressure	“wc	Enthalpy Wheel Supply Static Pressure		“wc
Supply Duct Static Pressure	“wc	Enthalpy Wheel Exhaust Static Pressure		“wc
Return Duct Static Pressure	“wc	Enthalpy Wheel Amps		A

Continued on Next Page

Horizontal DOAS

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Commissioning Report, Tranquility and Genesis Series Heat Pumps

Pg. 3

DOAS units have warm weather and cold weather modes of operation. Each mode **MUST** be tested and documented for warranty Validation. For additional information contact ClimateMaster Technical Service Dept. @ (800) 299-9747.

WARM WEATHER OPERATION (COOLING MODE)				
	Circuit A		Circuit B	
Voltage @ Compressor Contactor (Compressor Operating)	T1-T2	T1-T2	T1-T2	T1-T2
	T1-T3	T1-T3	T1-T3	T1-T3
	T2-T3	T2-T3	T2-T3	T2-T3
Compressor Amperage	L1	L1	L1	L1
	L2	L2	L2	L2
	L3	L3	L3	L3
Refrigerant Discharge Pressure	Psig		Psig	
Refrigerant Liquid Line Temperature	°F		°F	
Subcooling	°F		°F	
Refrigerant Suction Pressure	Psig		Psig	
Suction Temperature	°F		°F	
Superheat	°F		°F	
EWT / LWT / Td	°F		°F	

COLD WEATHER OPERATION (HEATING MODE)				
	Circuit A		Circuit B	
Voltage @ Compressor Contactor (Compressor Operating)	T1-T2	T1-T2	T1-T2	T1-T2
	T1-T3	T1-T3	T1-T3	T1-T3
	T2-T3	T2-T3	T2-T3	T2-T3
Compressor Amperage	L1	L1	L1	L1
	L2	L2	L2	L2
	L3	L3	L3	L3
Refrigerant Discharge Pressure	Psig		Psig	
Refrigerant Liquid Line Temperature	°F		°F	
Subcooling	°F		°F	
Refrigerant Suction Pressure	Psig		Psig	
Suction Temperature	°F		°F	
EWT / LWT / Td	°F		°F	

Additional Comments:_____

Horizontal DOAS

Rev.: 11/09/12

Warranty



CLIMATE MASTER, INC. LIMITED EXPRESS WARRANTY/ LIMITATION OF REMEDIES AND LIABILITY FOR TRANQUILITY OA (TO) SERIES AND GENESIS OA (GO) SERIES PRODUCTS

It is expressly understood that unless a statement is specifically identified as a warranty, statements made by Climate Master, Inc., a Delaware corporation, ("CM") or its representatives, relating to CM's products, whether oral, written or in any site, are neither a warranty nor an express or implied warranty. CM's products are sold as-is, with no warranty, express or implied, and do not form a part of the basis of the purchase of CM's products. **EXCEPT AS SPECIFICALLY SET FORTH HEREIN, THERE IS NO EXPRESS WARRANTY AS TO THE QUALITY OF CM'S PRODUCTS. CM MAKES NO WARRANTY AGAINST LATENT DEFECTS. CM MAKES NO WARRANTY OF MERCHANTABILITY OF THE GOODS OR OF THE FITNESS OF THE GOODS FOR ANY PARTICULAR PURPOSE.**

GRANT OF LIMITED EXPRESS WARRANTY

CM warrants only to its original purchaser all CM Tranquility OA (TO) Series and Genesis OA (GO) Series units purchased and retained in the United States of America and Canada to be free from defects in material and workmanship under normal use and maintenance as follows: (1) All complete units built or sold by CM for twenty-four (24) months from date of shipment (from factory); (2) Repair and replacement parts, which are not supplied under warranty, for ninety (90) days from date of shipment (from factory). All parts must be returned to CM's factory in Oklahoma City, Oklahoma, freight prepaid, no later than sixty (60) days after the date of the failure of the part. If CM determines the part to be defective and within CM's Limited Express Warranty, CM shall, when such part has been either replaced or repaired, return such part to a factory recognized dealer, contractor or service organization. **NOTE:** CM's factory, Oklahoma City, Oklahoma, freight prepaid. The warranty on any part repaired or replaced under warranty expires at the end of the original warranty period. In order for this warranty to be valid, a START-UP REPORT in the form contained in CM's Installation, Operation and Maintenance Instructions (the "START-UP REPORT") must be properly completed and timely returned to CM immediately after unit start-up, but in no event later than one (1) week after unit start-up.

This warranty does not cover and does not apply to: (1) Air filters, fuses, refrigerant fluids, oil; (2) Products relocated after initial installation; (3) Any portion or component of any system that is not supplied by CM, regardless of the cause of the failure of such portion or component; (4) Products on which the unit identification tags or labels have been removed or defaced; (5) Products on which payment to CM is or has been in default; (6) Products which have defects or damage which result from improper installation, wiring, electrical imbalance characteristics or maintenance; or are caused by accident, misuse or abuse, fire, flood, alteration or misapplication of the product; (7) Products which have been subjected to corrosion or abrasion, including, without limitation, any corrosion due to improperly balanced pool chemistry or any other corrosive air quality; (8) Mold, fungus or bacteria damages; (9) Products which have been subjected to misuse, negligence or accidents; (10) Products which have been installed and/or operated in a manner contrary to CM's printed instructions; (11) Products which have been subjected to insufficient or incorrect system design or the improper application of CM's products; (12) Products for which a START-UP REPORT has not been properly completed and timely returned to CM; or (13) Products that may have been altered or repaired in any way outside of the factory in such a manner so as to affect, in CM's sole judgment, the stability of functionality of the Product.

CM is not responsible for: (1) The costs of any fluids, refrigerant or other system components, or associated labor to repair or replace the same, which is incurred as a result of a defective part covered by CM's Limited Express Warranty; (2) The costs of labor, refrigerant, materials or service incurred in diagnosing the problem, removal of the defective part, or in obtaining and replacing the new or repaired part; or, (3) Transportation costs of the defective part from the installation site to CM or of the return of any part not covered by CM's Limited Express Warranty.

Limitation: This Limited Express Warranty is given in lieu of all other warranties. If, notwithstanding the disclaimers contained herein, it is determined that other warranties exist, any such express warranty, including without limitation any express warranties or any implied warranties of fitness for particular purpose and merchantability shall be limited to the duration of the Limited Express Warranty.

LIMITATION OF REMEDIES

In the event of a breach of the Limited Express Warranty, CM will only be obligated at CM's option to repair the failed part or unit or to furnish a new or rebuilt part or unit in exchange for the part or unit which has failed. If, after written notice to CM's factory in Oklahoma City, Oklahoma, of each defect, malfunction or other failure and a reasonable number of attempts by CM to correct the defect, malfunction or other failure and the remedy fails, of its essential purpose, CM shall refund the purchase price paid to CM in exchange for the return of the sold goods. Said refund shall be the maximum liability of CM. **THIS REMEDY IS THE SOLE AND EXCLUSIVE REMEDY OF THE BUYER AGAINST CM FOR THE BREACH OF CONTRACT, FOR THE BREACH OF ANY WARRANTY OR FOR CM'S NEGLIGENCE OR IN STRICT LIABILITY.**

LIMITATION OF LIABILITY

CM shall have no liability for any damages if CM's performance is delayed for any reason or is prevented to any extent by any event such as, but not limited to any war, civil unrest, government restrictions or restraints, strikes or work stoppages, fire, flood, accident, shortages of transportation, fuel, material, or labor, acts of God or any other reason beyond the sole control of CM. **CM EXPRESSLY DISCLAIMS AND EXCLUDES ANY LIABILITY FOR CONSEQUENTIAL OR INCIDENTAL DAMAGE IN CONTRACT, FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY, OR IN TORT, WHETHER FOR CM'S NEGLIGENCE OR AS STRICT LIABILITY.**

OBTAINING WARRANTY PERFORMANCE

Normally, the contractor or service organization who installed the products will provide warranty performance for the owner. Should the installer be unavailable, contact any CM recognized dealer, contractor or service organization. If assistance is required in obtaining warranty performance, write or call:

Climate Master, Inc. • Customer Service • 7300 S.W. 44th Street • Oklahoma City, Oklahoma 73179 (405) 745 6000

NOTE: Some states or Canadian provinces do not allow limitations on how long an implied warranty lasts, or the limitation or exclusions of consequential or incidental damages, so the foregoing exclusions and limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and from Canadian province to Canadian province.

Please refer to the CM Installation, Operation and Maintenance Instruction for installation, operating and maintenance instructions.

Rev.: 10/06



LC395

Notes:

Horizontal DOAS

Rev.: 11/09/12

Revision History

Date:	Item:	Action:
11/09/12	POE Oil Warning	Added
	Water Quality Table	Updated
06/21/12	Model Nomenclature	Updated
05/10/11	Model Nomenclature	Updated
03/21/11	Service Bulletin & Start-Up Report	Updated
01/03/11	Format all Pages	Updated
07/26/10	Dimensional Data	Updated
06/11/10	GO (R22) Units	Removed
02/06/09	Dimensional Data	Note Added
09/09/08	Pressure Testing Language	Updated
05/21/08	Pressure Testing Language	Added to Unit Start-Up and Operating Conditions
05/16/07	System Operation Modes	Updated
05/16/07	Operating Limits Table	Added
05/16/07	Physical Data Tables	Added
05/16/07	Decoder	Updated
01/01/07	First Published	



97B0053N01



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Phone: 405-745-6000
Fax: 405-745-6058
climatemaster.com

ClimateMaster works continually to improve its products. As a result, the design and specifications of each product at the time for order may be changed without notice and may not be as described herein. Please contact ClimateMaster's Customer Service Department at 1-405-745-6000 for specific information on the current design and specifications. Statements and other information contained herein are not express warranties and do not form the basis of any bargain between the parties, but are merely ClimateMaster's opinion or commendation of its products.

ClimateMaster is a proud supporter of the Geothermal Exchange Organization - GEO. For more information visit geoexchange.org.

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