

NORTHERN HEATPUMP

*NorthStar*Series 



Specification Manual Ground Source Heat Pumps



www.northernheatpump.com

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NorthStar Series Features & Benefits

ALL MODELS

- 100% stainless steel insulated cabinet
- Removable side panels
- Warranty
 - Cabinet = Lifetime
 - Refrigeration = 10 years parts and 5 years labor
 - Controls = 3 years parts and labor
- 24/7 on-call emergency technical support
- Compressor sound suppression blanket
- Dual isolated compressor mounting
- Desuperheater with integrated circulating pump
- R-410A refrigerant
- 208V/230V single phase
- ETL listed
- AHRI Certified

WATER TO AIR

- Field convertible for left or right return connections (left return is standard)
- Exclusive EZGEO Control Module
 - Dual fuel control (load control)
 - 4-wire conventional thermostat connections
 - Status indicator lights
 - Energy control selector switch (for systems with gas backup)
- ECM blower motor
- Optional features
 - Integrated or field installable strip heat; 5 to 20kW available (with built-in circuit breakers)
 - 208V three-phase
 - CuproNickel source heat exchanger
 - 2-stage compressor
- Energy Star (up to and including 5-ton rated models)

WATER TO WATER

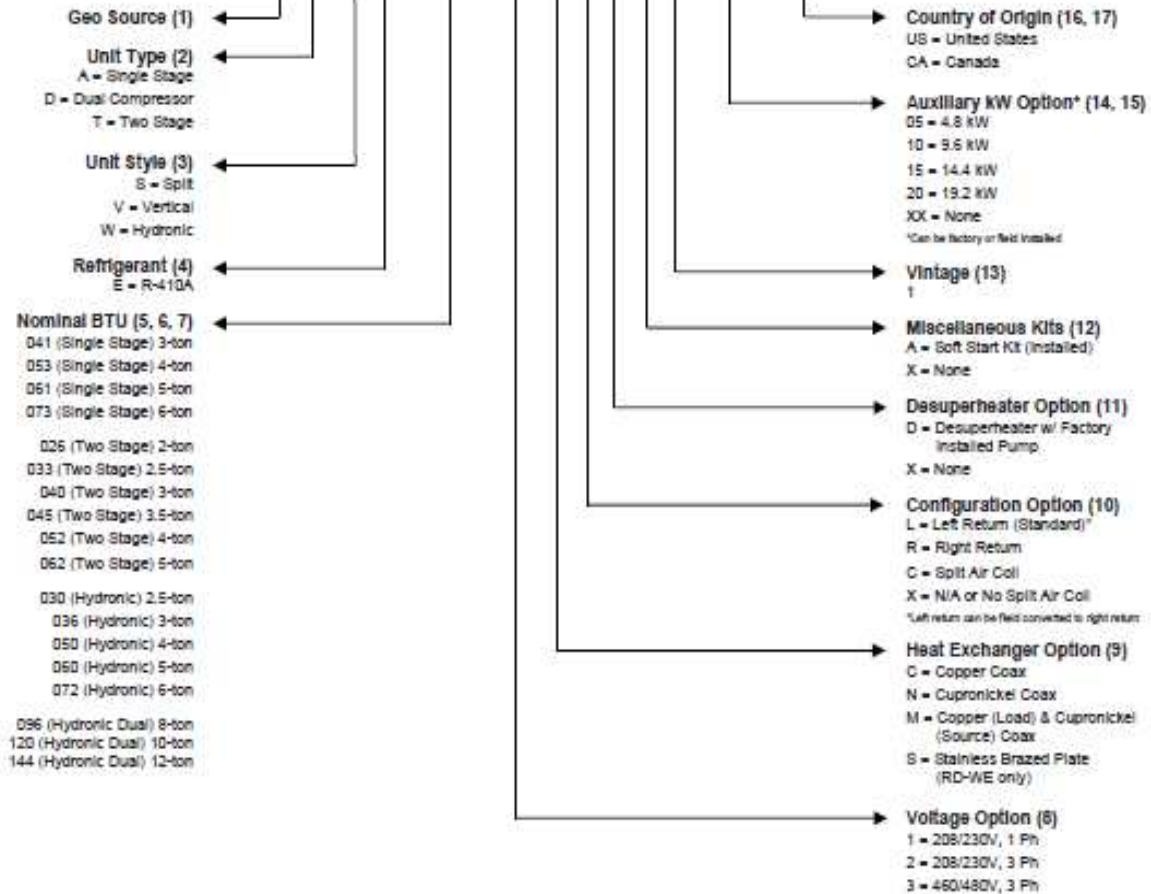
- Optional features
 - CuproNickel source and/or load heat exchangers (up to and including 6-ton rated models)
 - 208V three-phase
- Dual Compressors on 8 to 12-ton rated models with stainless steel heat exchangers
- Energy Star (up to and including 10-ton rated models)

Northern Heat Pump Configurator

R A - V E - 0 2 8 - 1 - C L D X 1 - X X - U S

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Model Number Digits																

RA-VE-028-1-CLDX1-XX-US



Single-Stage Vertical Packaged

Mechanical Specifications – R410A Single-Stage Compressor

MODEL	RA-VE-041 (3 ton)	RA-VE-053 (4 ton)	RA-VE-061 (5 ton)
Coax & Piping Water Volume – gal	.65	1.1	1.1
Source Temperature °F (min/max)	20°/120°	20°/120°	20°/120°
Nominal source differential* °F (H/C)	9/11°	6/11°	6/10°
Factory Charge R410A	4 lbs. 8 oz.	6 lbs. 4 oz.	6 lbs. 4 oz.
Static Pressure – Nominal	0.3	0.3	0.3
Static Pressure – Design	0.5	0.5	0.5
Air Filter	7/8 X 28 7/8 X 27 1/2	7/8 X 27 1/2 X 37 7/8	7/8 X 27 1/2 X 37 7/8
Weight– Packaged (lbs)	460	480	503

HEAT EXCHANGER PRESSURE DROP TABLE

Water-to-Air (Source Side, Pure Water @ 68° F)								
Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID
3-ton	6	1.8 (ref)	4-ton	8	1.3	5-ton	10	1.9
	9	2.4 (ref)		12	2.5		15	3.6
	12	4.3 (ref)		16	4.0		20	5.8
	15	6.7 (ref)		20	5.8		25	8.5

PRESSURE DROP MULTIPLIERS

	Freeze Point (° F)	20° F	25° F	30° F	35° F	40° F
Pure Water Multiplier	32.0	1.00	1.00	1.00	1.00	1.00
Methanol 12.5%* Multiplier	16.2	–	1.25	1.21	1.18	1.15
Propylene Glycol 20%* Multiplier	18.4	1.39	1.35	1.31	1.28	1.24
Ethanol 20%* Multiplier	18.1	1.56	1.47	1.42	1.36	1.31

*By volume Feet of Head = PSI x 2.31

HEATING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
		50° F		68° F		32° F		68° F	
		Capacity Btu/h	Blower CFM	Temp Rise	COP	Capacity Btu/h	Blower CFM	Temp Rise	COP
RA-VE-041	10	42600	1200	34	4.28	32700	1200	27	3.66
RA-VE-053	13	57300	1500	35	4.10	45200	1500	27	3.60
RA-VE-061	15	63500	1875	35	4.10	50700	1875	28	3.60

COOLING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
		59° F		80.6° F		77° F		80.6° F	
		Capacity Btu/h	Blower CFM	Temp Drop	EER	Capacity Btu/h	Blower CFM	Temp Drop	EER
RA-VE-041	10	42000	1250	23	22.9	38100	1250	21	17.5
RA-VE-053	12	55400	1600	24	22.2	52600	1600	23	17.1
RA-VE-061	15	65000	2000	23	21.4	61800	2000	23	17.1

1. Capacities are based on temperatures shown in heading, source is left group, return air is right group.
2. Stated Btu/h is the ISO 13256-1 formula adjusted, actual HP supply energy delivered is 2% greater.
3. Temp rise is based on sensible only.
4. All ratings based upon operation at lower voltage of dual voltage rated models.
5. Ground Loop Heat Pump ratings based on 15% antifreeze solution.

Single-Stage Vertical Packaged (cont)

Electrical Data – Single-Phase

Model	Voltage	Compressor		Blower	Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
041	208/230-1	17.9	112	6.1	.15	4.4	28.6	33.0	50
053	208/230-1	26.4	134	6.1	.15	4.4	37.5	43.5	70
061	208/230-1	28.3	178	7.3	.15	4.4	40.2	47.2	70

Electrical Data – Three-Phase

Model	Voltage	Compressor		Blower	Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
041	200/230-3	13.5	88	6.1	.15	4.4	24.2	27.5	40
053	200/230-3	17.6	123	6.1	.15	4.4	31.1	36.2	50
061	200/230-3	20.5	155	7.3	.15	4.4	32.4	37.5	50

Single-Stage Vertical Packaged (cont)

Mechanical Dimensions

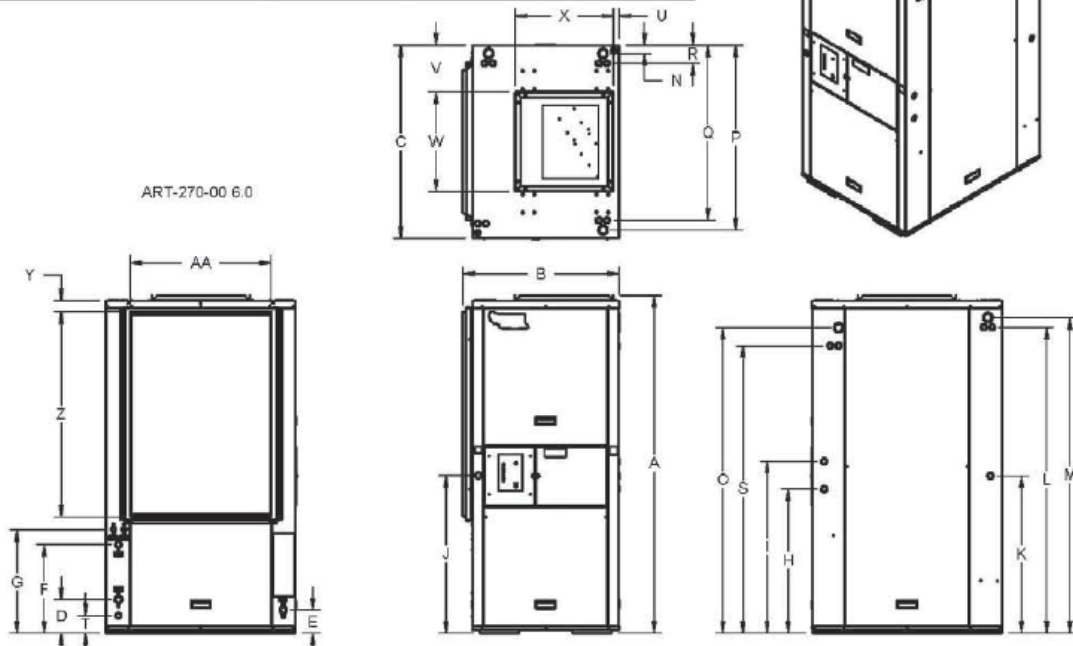
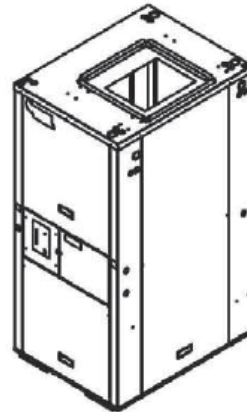
	Cabinet Dimensions			Supply Connections				Return Connections		
	A (Height)	B (Width)	C (Depth)	U	V	W	X	Y	Z	AA
RT-VE-026 RT-VE-033	60 5/8"	28 5/8"	34 7/8"	1 1/8"	8 3/8"	18"	18"	2"	20 7/8"	25 7/8"
RT-VE-040 RA-VE-041 RT-VE-045									27 7/8"	
RT-VE-052 RA-VE-053 RA-VE-061 RT-VE-062									36 7/8"	

Electrical Connections

H	I	J	K	L	M	N	O	P	Q	R	S	T
25 3/4"	30 3/4"	28 1/4"	28 1/8"	54 7/8"	56 5/8"	1 1/2"	54 3/4"	33 3/8"	31 5/8"	3 1/4"	51 1/2"	3 1/4"
ϕ 1 1/8" X ϕ 7/8" Double Knockout				ϕ 1 3/4" X ϕ 1 3/8" Double Knockout				ϕ 1 1/8" X ϕ 7/8" Double Knockout				

Water Connections

Source		Drain	Desuperheater	
In	Out		In	Out
D	E	F	G	
6 1/8"	4 1/4"	15 3/4"	18 1/2"	
Connection Size 1" FPT		3/4" FPT	Connection Size 1/2" FPT	



Two-Stage Vertical Packaged

Mechanical Specifications – R410A Two-Stage Compressor

MODEL	RT-VE-026 (2 ton)	RT-VE-040 (3 ton)	RT-VE-045 (3.5 ton)	RT-VE-052 (4 ton)	RT-VE-062 (5 ton)
Coax & Piping Water Volume – gal	.43	.65	.77	1.1	1.1
Source Temperature °F (min/max)	20°/120°	20°/120°	20°/120°	20°/120°	20°/120°
Nominal source differential* °F (H/C)	3/12°	9/11°	10/11°	6/11°	6/10°
Factory Charge R410A	3 lbs. 3 oz.	4 lbs. 8 oz.	4 lbs. 8 oz.	6 lbs. 4 oz.	6 lbs. 4 oz.
Static Pressure – Nominal	0.3	0.3	0.3	0.3	0.3
Static Pressure – Design	0.5	0.5	0.5	0.5	0.5
Air Filter	7/8 X 21 7/8 X 27 1/2	7/8 X 28 7/8 X 27 1/2	7/8 X 28 7/8 X 27 1/2	7/8 X 27 1/2 X 37 7/8	7/8 X 27 1/2 X 37 7/8
Weight– Packaged (lbs)	440	480	490	503	530

HEAT EXCHANGER PRESSURE DROP TABLE

Water-to-Air (Source Side, Pure Water @ 68° F)								
Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID
2-ton	4	1.2 (ref)	3-ton	6	1.8 (ref)	4-ton	8	1.3
	6	2.7 (ref)		9	2.4 (ref)		12	2.5
	8	3.6 (ref)		12	4.3 (ref)		16	4.0
	10	5.6 (ref)		15	6.7 (ref)		20	5.8
3.5-ton			3.5-ton	7	2.5	5-ton	10	1.9
				10.5	4.5		15	3.6
				14	7.0		20	5.8
				17	9.5		25	8.5

PRESSURE DROP MULTIPLIERS

	Freeze Point (° F)	20° F	25° F	30° F	35° F	40° F
Pure Water Multiplier	32.0	1.00	1.00	1.00	1.00	1.00
Methanol 12.5%* Multiplier	16.2	–	1.25	1.21	1.18	1.15
Propylene Glycol 20%* Multiplier	18.4	1.39	1.35	1.31	1.28	1.24
Ethanol 20%* Multiplier	18.1	1.56	1.47	1.42	1.36	1.31

*By volume Feet of Head = PSI x 2.31

HEATING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Stage	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
			50° F		68° F		32° F/41° F		68° F	
			Capacity Btu/h	Blower CFM	Temp Rise	COP	Capacity Btu/h	Blower CFM	Temp Rise	COP
RT-VE-026	FL	10	30300	850	32	4.01	24100	850	26	3.66
RT-VE-026	PL	10	23000	725	29	4.20	19900	725	26	3.84
RT-VE-040	FL	9	41800	1200	32	4.05	32800	1200	27	3.70
RT-VE-040	PL	9	29600	1000	28	4.19	27000	1000	26	3.85
RT-VE-045	FL	10.5	44600	1312	32	4.07	35600	1312	26	3.59
RT-VE-045	PL	10.5	31500	1100	27	4.21	28400	1100	25	3.76
RT-VE-052	FL	12	55700	1500	34	4.06	44400	1500	29	3.55
RT-VE-052	PL	12	37300	1200	29	4.20	33400	1200	27	3.67
RT-VE-062	FL	15	66800	1875	33	4.02	54500	1875	28	3.55
RT-VE-062	PL	15	49100	1480	31	4.20	44500	1480	29	3.66

1. Capacities are based on temperatures shown in heading, source is left group return air is right group.
2. Stated Btu/h is the ISO 13256-1 formula adjusted, actual HP supply energy delivered is 2% greater.
3. Temp rise is based on sensible only.
4. All ratings based upon operation at lower voltage or dual voltage rated models.
5. Ground Loop Heat Pump ratings based on 15% antifreeze solution.

COOLING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Stage	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
			59° F		80.6° F		77° F/68° F		80.6° F	
			Capacity Btu/h	Blower CFM	Temp Drop	EER	Capacity Btu/h	Blower CFM	Temp Drop	EER
RT-VE-026	FL	10	36500	950	22	19.7	32700	950	20	16.1
RT-VE-026	PL	10	28400	825	21	24.1	26400	825	22	19.8
RT-VE-040	FL	9	47000	1250	23	20.1	43200	1250	22	15.9
RT-VE-040	PL	9	35100	1050	22	23.4	30700	1050	21	19.3
RT-VE-045	FL	10.5	49300	1400	22	19.3	47600	1400	21	14.9
RT-VE-045	PL	10.5	36400	1150	21	24.1	34600	1150	20	19.9
RT-VE-052	FL	12	64200	1600	23	19.1	58300	1600	22	15.0
RT-VE-052	PL	12	47700	1275	22	23.7	46100	1275	22	19.2
RT-VE-062	FL	15	71500	2000	23	18.9	66100	2000	23	14.7
RT-VE-062	PL	15	55500	1650	21	23.3	50100	1650	22	19.6

Two-Stage Vertical Packaged (cont)

Electrical Data – Single-Phase

Model	Voltage	Compressor		Blower	Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
026	208/230-1	13.1	73	4.5	.15	4.4	22.1	25.4	30
040	208/230-1	17.9	96	6.1	.15	4.4	28.6	33.0	50
045	208/230-1	21.2	104	6.1	.15	4.4	31.9	37.2	50
052	208/230-1	27.1	153	6.1	.15	4.4	37.8	44.4	70
062	208/230-1	29.7	179	7.3	.15	4.4	41.6	49.0	70

Electrical Data – Three-Phase

Model	Voltage	Compressor		Blower	Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
040	200/230-3	14.2	88	6.1	.15	4.4	24.9	28.3	40
045	200/230-3	14.0	93	6.1	.15	4.4	24.7	25.8	40
052	200/230-3	16.5	110	6.1	.15	4.4	27.2	31.1	40
062	200/230-3	17.6	136	6.1	.15	4.4	28.3	32.5	50

Two-Stage Vertical Packaged (cont)

Mechanical Dimensions

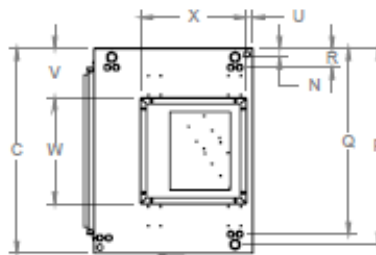
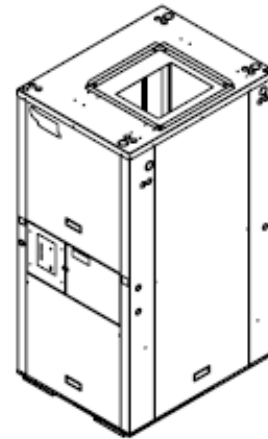
	Cabinet Dimensions			Supply Connections				Return Connections		
	A (Height)	B (Width)	C (Depth)	U	V	W	X	Y	Z	AA
RT-VE-026 RT-VE-033	60 5/8"	28 5/8"	34 7/8"	1 1/8"	8 3/8"	18"	18"	2"	20 7/8"	25 7/8"
RT-VE-040 RA-VE-041 RT-VE-045									27 7/8"	
RT-VE-052 RA-VE-053 RA-VE-061 RT-VE-062									36 7/8"	

Electrical Connections

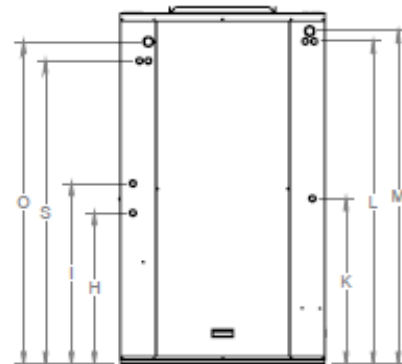
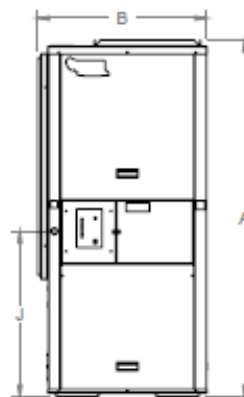
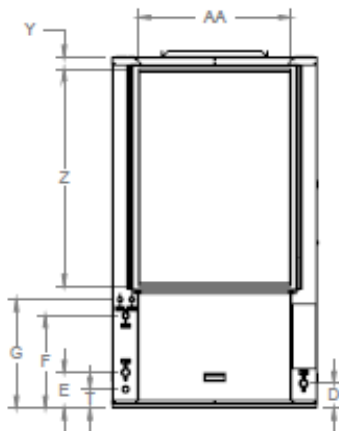
H	I	J	K	L	M	N	O	P	Q	R	S	T
25 3/4"	30 3/4"	28 1/4"	28 1/8"	54 7/8"	56 5/8"	1 1/2"	54 3/4"	33 3/8"	31 5/8"	3 1/4"	51 1/2"	3 1/4"
ϕ 1 1/8" X ϕ 7/8" Double Knockout				ϕ 1 3/4" X ϕ 1 3/8" Double Knockout				ϕ 1 1/8" X ϕ 7/8" Double Knockout				

Water Connections

Source		Drain	Desuperheater	
In	Out		In	Out
D	E	F	G	
4 1/4"	6 1/8"	15 3/4"	18 1/2"	
Connection Size 1" FPT		3/4" FPT	Connection Size 1/2" FPT	



ART-270-00_07



Two-Stage Split

Mechanical Specifications – R410A Two-Stage Compressor

MODEL	RT-SE-040 (3 ton)	RT-SE-052 (4 ton)	RT-SE-062 (5 ton)
Coax & Piping Water Volume – gal	.65	1.1	1.1
Source Temperature °F (min/max)	20°/120°	20°/120°	20°/120°
Nominal source differential* °F (H/C)	9/11°	6/11°	6/10°
Factory Charge R410A	6 lbs. 1 oz.	7 lbs. 2 oz.	7 lbs. 2 oz.
Static Pressure – Nominal	0.3	0.3	0.3
Static Pressure – Design	0.5	0.5	0.5
Air Filter	7/8 X 28 7/8 X 27 1/2	7/8 X 27 1/2 X 37 7/8	7/8 X 27 1/2 X 37 7/8
Weight– Base Unit Only (lbs)	275	320	320

HEAT EXCHANGER PRESSURE DROP TABLE

Water-to-Air (Source Side, Pure Water @ 68° F)								
Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID
3-ton	6	1.8 (ref)	4-ton	8	1.3	5-ton	10	1.9
	9	2.4 (ref)		12	2.5		15	3.6
	12	4.3 (ref)		16	4.0		20	5.8
	15	6.7 (ref)		20	5.8		25	8.5

PRESSURE DROP MULTIPLIERS

	Freeze Point (° F)	20° F	25° F	30° F	35° F	40° F
Pure Water Multiplier	32.0	1.00	1.00	1.00	1.00	1.00
Methanol 12.5%* Multiplier	16.2	–	1.25	1.21	1.18	1.15
Propylene Glycol 20%* Multiplier	18.4	1.39	1.35	1.31	1.28	1.24
Ethanol 20%* Multiplier	18.1	1.56	1.47	1.42	1.36	1.31

*By volume Feet of Head = PSI x 2.31

HEATING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Stage	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
			50° F		68° F		32° F/41° F		68° F	
			Capacity Btu/h	Blower CFM	Temp Rise	COP	Capacity Btu/h	Blower CFM	Temp Rise	COP
RT-SE-040	FL	10	41800	1200	32	4.05	32800	1200	27	3.70
RT-SE-040	PL	10	29600	1000	28	4.19	27000	1000	26	3.85
RT-SE-052	FL	12	55700	1500	34	4.06	44400	1500	29	3.55
RT-SE-052	PL	12	37300	1200	29	4.20	33400	1200	27	3.67
RT-SE-062	FL	15	66800	1875	33	4.02	54500	1875	28	3.55
RT-SE-062	PL	15	49100	1480	31	4.20	44500	1480	29	3.66

6. Capacities are based on temperatures shown in heading, source is left group return air is right group.
7. Stated Btu/h is the ISO 13256-1 formula adjusted, actual HP supply energy delivered is 2% greater.
8. Temp rise is based on sensible only.
9. All ratings based upon operation at lower voltage or dual voltage rated models.
10. Ground Loop Heat Pump ratings based on 15% antifreeze solution.

COOLING – ISO 13256-1 SPECIFICATION – ENERGY STAR

Model	Stage	Source GPM	GWHP – Ground Water				GLHP – Ground Loop			
			59° F		80.6° F		77° F/68° F		80.6° F	
			Capacity Btu/h	Blower CFM	Temp Drop	EER	Capacity Btu/h	Blower CFM	Temp Drop	EER
RT-SE-040	FL	10	47000	1250	23	20.1	43200	1250	22	15.9
RT-SE-040	PL	10	35100	1050	22	23.4	30700	1050	21	19.3
RT-SE-052	FL	12	64200	1600	23	19.1	58300	1600	22	15.0
RT-SE-052	PL	12	47700	1275	22	23.7	46100	1275	22	19.2
RT-SE-062	FL	15	71500	2000	23	18.9	66100	2000	23	14.7
RT-SE-062	PL	15	55500	1650	21	23.3	50100	1650	22	19.6

Two-Stage Split (cont)

Electrical Data – Single-Phase

Model	Voltage	Compressor		Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	Ampac.	
040	208/230-1	17.9	96	.15	4.4	22.5	26.9	40
052	208/230-1	27.1	153	.15	4.4	31.5	38.2	60
062	208/230-1	29.7	179	.15	4.4	34.3	41.7	70

Electrical Data – Three-Phase

Model	Voltage	Compressor		Desup. Pump	Loop Pump (Ext)	Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	Ampac.	
040	200/230-3	14.2	88	.15	4.4	18.6	22.1	30
052	200/230-3	16.5	110	.15	4.4	20.9	25.0	40

Two-Stage Split (cont)

Mechanical Dimensions

	SPLIT UNITS					
	RT-SE-062	RT-SE-052	RT-SE-045	RT-SE-040	RT-SE-033	RT-SE-026
A (Height)	29 5/8"					
B (Width)	26 15/16"					
C (Depth)	34 13/16"					

Water Connections

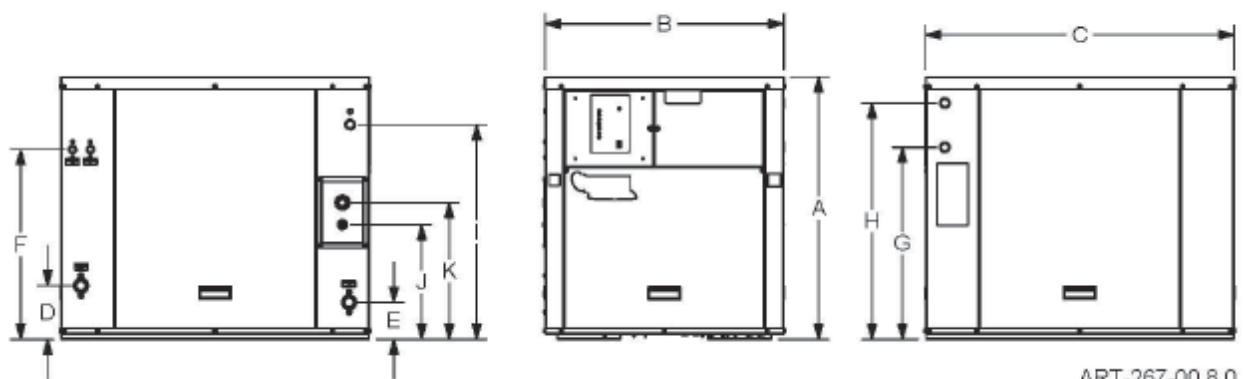
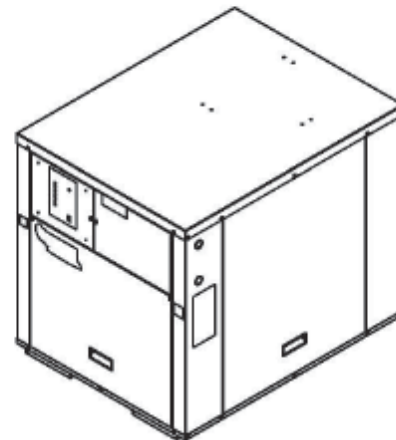
Source		Desuperheater	
In	Out	In	Out
D	E	F	
6 1/16"	4 3/16"	21 7/16"	
Connection Size 1" FPT		Connection Size 1/2" FPT	

Electrical Connections

G	H	I
21 11/16"	26 11/16"	24 1/4"
ϕ 1 1/8" X ϕ 7/8" Double Knockout		

Line Set Connections

Liquid	Suction
J	K
12 15/16"	15 7/16"
ϕ 7/8" Hole	ϕ 1 3/8" Hole



ART-267-00 8.0

Water to Water

RA-WE Mechanical Specifications – R410A Single-Stage Compressor

MODEL	RA-WE-036 (3 ton)	RA-WE-050 (4 ton)	RA-WE-060 (5 ton)	RA-WE-072 (6 ton)
Source & Load GPM – Heating	12	16	15	18
Source & Load GPM – Cooling	12	16	15	20
Factory Charge R410A	3 lbs. 14 oz.	4 lbs. 8 oz.	6 lbs. 6 oz.	7 lbs. 8 oz.
Source Temperature °F (min/max)	20°/120°	20°/120°	20°/120°	20°/120°
Water Connection (NPT – female)	1”	1”	1-¼”	1-¼”
Heat Exchanger Type	Coax	Coax	Coax	Coax
Loop Coil & Piping Water Volume (gal)	.77	1.1	1.38	2.3
Load Coil Water Volume (gal)	.98	.98	1.38	2.3
Desuperheater Connection (NPT – female)	½”	½”	½”	½”
Weight– Packaged (lbs)	340	345	525	575
Width of Cabinet (inches)	27	27	25	25
Height (Inches)	29	29	49	49
Depth (Inches)	35	35	32	32

HEAT EXCHANGER PRESSURE DROP TABLE

Water-to-Water (Source Side and Load Side, Pure Water @ 68° F)											
Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID
3-ton	6	2.0	4-ton	8	1.3	5-ton	12	1.84	6-ton	16	1.80
	9	3.6		12	2.5		14	2.24		18	2.34
	12	5.5		16	4.0		15	2.44		20	2.86
	15	7.8		20	5.8		17	3.03		23	3.80

PRESSURE DROP MULTIPLIERS

	Freeze Point (° F)	20° F	25° F	30° F	35° F	40° F
Pure Water Multiplier	32.0	1.00	1.00	1.00	1.00	1.00
Methanol 12.5%* Multiplier	16.2	–	1.25	1.21	1.18	1.15
Propylene Glycol 20%* Multiplier	18.4	1.39	1.35	1.31	1.28	1.24
Ethanol 20%* Multiplier	18.1	1.56	1.47	1.42	1.36	1.31

*By volume

Feet of Head = PSI x 2.31

ISO 13256-2 Performance – Energy Star

Model	Source / Load GPM	Ground Water Heat Pump				Ground Loop Heat Pump			
		Cooling 59°F		Heating 50° F		Cooling 77°F		Heating 32°F	
		BTUh	EER	BTUh	COP	BTUh	EER	BTUh	COP
RA-WE-036	12 / 12	40100	20.7	43900	3.7	36600	16.1	32300	3.1
RA-WE-050	16 / 16	55100	20.1	60100	3.6	54200	16.1	45200	3.1
RA-WE-060	15 / 15	65000	20.4	68000	3.7	58200	16.1	52000	3.1
RA-WE-072	18 / 18	75000	20.1	80500	3.7	71900	16.1	62900	3.1

Heating capacities based upon 104°F hydronic return water.

Cooling capacities based upon 53.6 F hydronic return water.

Ground Loop Heat Pump ratings based on 15% antifreeze solution.

All ratings based upon operation at lower voltage of dual voltage rated models.

Water to Water (cont)

RD-WE Mechanical Specifications – R410A Dual Compressor

MODEL	RD-WE-096 (8 ton)	RD-WE-120 (10 ton)	RD-WE-144 (12 ton)
Source & Load GPM – Heating	16	20	24
Source & Load GPM – Cooling	16	20	24
Factory Charge R410A*	4 lbs. 2 oz. x (2*)	4 lbs. 2 oz. x (2*)	4 lbs. 2 oz. x (2*)
Source Temperature °F (min/max)	20°/120°	20°/120°	20°/120°
Water Connection (NPT – male)	1-½”	1-½”	1-½”
Heat Exchanger Type	Brazed plate	Brazed plate	Brazed plate
Loop Coil & Piping Water Volume (gal)	1.62	1.62	1.62
Load Coil Water Volume (gal)	1.62	1.62	1.62
Weight– Packaged (lbs)	510	525	535

*Dual compressor models contain dual refrigeration circuits, amount shown is for each circuit.

HEAT EXCHANGER PRESSURE DROP TABLE

Water-to-Water (Source Side and Load Side, Pure Water @ 68° F)								
Model	GPM	PSID	Model	GPM	PSID	Model	GPM	PSID
8-ton	12	0.79	10-ton	15	1.10	12-ton	16	1.21
	14	0.99		16	1.21		17	1.33
	15	1.10		17	1.33		18	1.45
	16	1.21		18	1.45		20	1.71
	17	1.33		20	1.71		22	2.00
	18	1.45		22	2.00		23	2.14
	20	1.71		23	2.14		24	2.30
	22	2.00		24	2.30		25	2.46
	23	2.14		25	2.46		26	2.62
	24	2.30		26	2.62		27	2.79
	25	2.46		27	2.79		28	2.96
	26	2.62		28	2.96		30	3.32
	27	2.79		30	3.32		32	3.98
28	2.96	32	3.98	34	4.02			
30	3.32	34	4.02	36	4.53			

PRESSURE DROP MULTIPLIERS

	Freeze Point (° F)	20° F	25° F	30° F	35° F	40° F
Pure Water Multiplier	32.0	1.00	1.00	1.00	1.00	1.00
Methanol 12.5%* Multiplier	16.2	–	1.25	1.21	1.18	1.15
Propylene Glycol 20%* Multiplier	18.4	1.39	1.35	1.31	1.28	1.24
Ethanol 20%* Multiplier	18.1	1.56	1.47	1.42	1.36	1.31

*By volume

Feet of Head = PSI x 2.31

ISO 13256-2 Performance – Energy Star

Model	Source / Load GPM	Stage	Ground Water Heat Pump				Ground Loop Heat Pump			
			Cooling 59°F		Heating 50°F		Cooling Full Load 77°F/68°F		Heating Full Load 32°F/41°F	
			BTUh	EER	BTUh	COP	BTUh	EER	BTUh	COP
RD-WE-096	16 / 16	FL	103000	19.7	110200	3.5	95700	15.7	86900	2.9
		PL	55100	21.5	58200	3.8	53100	18.3	52200	3.5
RD-WE-120	20 / 20	FL	120000	19.5	128000	3.5	103200	15.6	99900	2.8
		PL	64000	21.0	71500	3.8	57000	18.1	55500	3.5
RD-WE-144*	24 / 24	FL	137500	19.0	147600	3.4	126000	14.4	121000	2.7
		PL	73500	20.2	78500	3.7	70000	18.0	68500	3.3

Heating capacities based upon 104°F hydronic return water.

Cooling capacities based upon 53.6°F hydronic return water.

Ground Loop Heat Pump ratings based on 15% antifreeze solution.

All ratings based upon operation at lower voltage of dual voltage rated models.

*RD-WE-144 is outside the scope of AHRI and Energy Star.

Water to Water (cont)

RA-WE Electrical Data – Single-Phase

Model	Voltage	Compressor		Load Pump	Desup. Pump	Source Pump	Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
RA-WE-036	208/230-1	17.9	112	1.8	.15	4.4	24.3	28.7	40
RA-WE-050	208/230-1	26.4	134	1.8	.15	4.4	33.3	39.2	60
RA-WE-060	208/230-1	28.3	178	1.8	.15	4.4	34.7	41.7	60
RA-WE-072	208/230-1	36.9	185	1.8	.15	4.4	43.3	52.5	80

RD-WE – Electrical Data – Single-Phase

Model	Voltage	Compressor		Load Pump	Desup. Pump	Source Pump	Total	Min.	Max. Fuse/ HACR
	(60 Hz)	RLA	LRA	FLA	FLA	FLA	FLA	Ampac.	
RD-WE-096	208/230-1	26.4 x 2	134 x 2	1.8	.15	4.4	33.3 x 2	39.2 x 2	60 x 2
RD-WE-120	208/230-1	28.3 x 2	178 x 2	1.8	.15	4.4	34.7 x 2	41.7 x 2	60 x 2
RD-WE-144	208/230-1	36.9 x 2	185 x 2	1.8	.15	4.4	43.3 x 2	52.5 x 2	80 x 2

Note: Dual compressor models contain dual power circuits for the compressors. Amperages shown are for each circuit. Refer to NI704 for 3-phase models.

Water to Water (cont)

RA-WE Electrical Data – Three-Phase, 208V

Model	Voltage	Compressor		Total	Min. Ampacity	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA		
RA-WE-036	208/230-3	13.5	88	13.5	16.8	30
RA-WE-050	208/230-3	17.6	123	17.6	22.0	30
RA-WE-060	208/230-3	20.5	155	20.5	25.6	40
RA-WE-072	208/230-3	23.2	164	23.2	29.0	50
Control box*	120V-1			10.8	12.6	20

RD-WE Electrical Data – Three-Phase, 208V

Model	Voltage	Compressor		Total	Min. Ampacity	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA		
RD-WE-096	208/230-3	17.6 x 2	123 x 2	17.6 x 2	22.0 x 2	30 x 2
RD-WE-120	208/230-3	20.5 x 2	155 x 2	20.5 x 2	25.6 x 2	40 x 2
RD-WE-144	208/230-3	23.2 x 2	164 x 2	23.2 x 2	29.0 x 2	50 x 2
Control box*	120V-1			10.8	12.6	20

RA-WE Electrical Data – Three-Phase, 480V

Model	Voltage	Compressor		Total	Min. Ampacity	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA		
RA-WE-036	460-3	6.0	44	6.0	7.5	15
RA-WE-050	460-3	7.8	52	7.8	9.8	15
RA-WE-060	460-3	8.7	66	8.7	10.8	15
RA-WE-072	460-3	11.2	75	11.2	14.0	20
Control box*	120V-1			10.8	12.6	20

RD-WE Electrical Data – Three-Phase, 480V

Model	Voltage	Compressor		Total	Min. Ampacity	Max. Fuse/HACR
	(60 Hz)	RLA	LRA	FLA		
RD-WE-096	460-3	7.8 x 2	52 x 2	7.8 x 2	9.8 x 2	15 x 2
RD-WE-120	460-3	8.7 x 2	66 x 2	8.7 x 2	10.8 x 2	15 x 2
RD-WE-144	460-3	11.2 x 2	75 x 2	11.2 x 2	14.0 x 2	20 x 2
Control box*	120V-1			10.8	12.6	20

Note: Dual compressor models contain dual power circuits for the compressors. Amperages shown are for each circuit. Refer to NI704 for 3-phase models.

* All three-phase models use a separate single-phase, 120V 20A, circuit to power the controls, source and load pumps, and the desuperheater.

Water to Water (cont)

Mechanical Dimensions

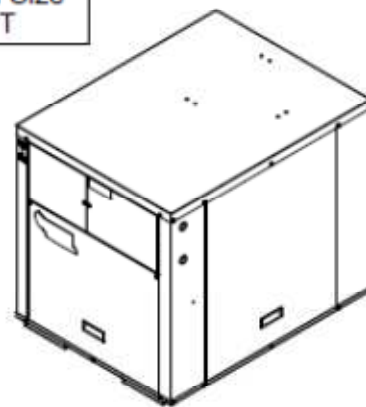
	Cabinet Dimensions		
	A (Height)	B (Width)	C (Depth)
RA-WE-036	29 5/8"	26 15/16"	34 13/16"
RA-WE-050			

Water Connections

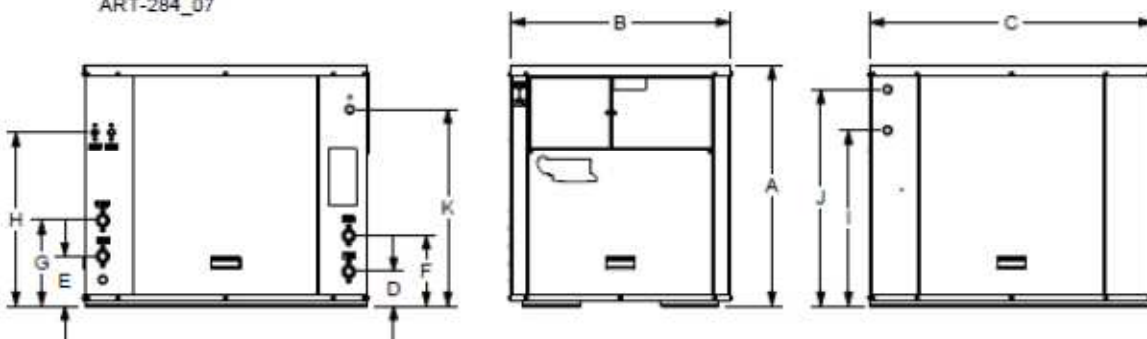
Source		Hydronic		Desuperheater	
In	Out	In	Out	In	Out
D	E	F	G	H	
4 3/16"	6 1/16"	8 11/16"	10 9/16"	21 7/16"	
Connection Size 1" FPT				Connection Size 1/2" FPT	

Electrical Connections

I	J	K
21 11/16"	26 11/16"	24 1/4"
ϕ 1.125 X ϕ .875 Double Knockout		



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Water to Water (cont)

Mechanical Dimensions

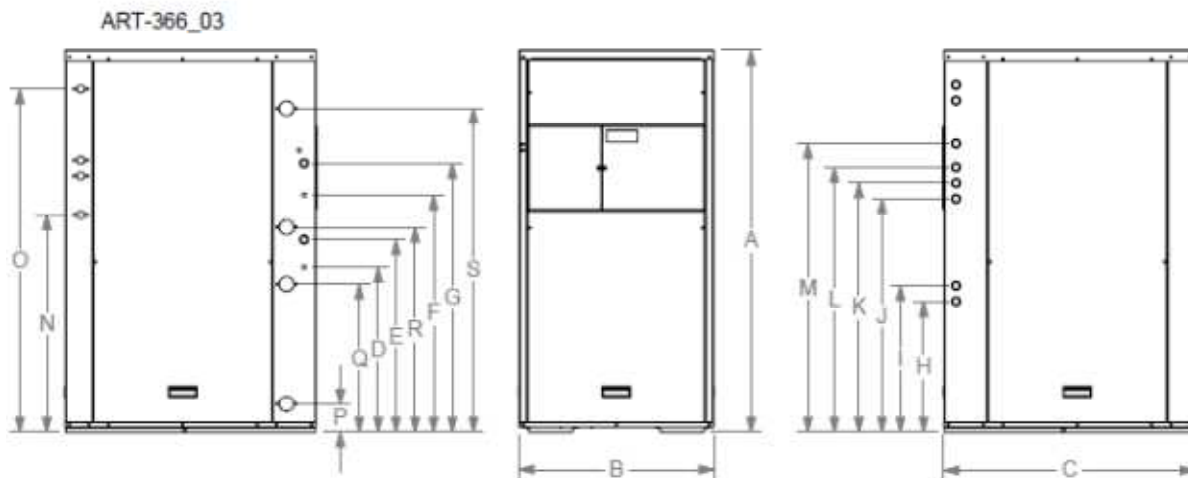
	Cabinet Dimensions		
	A (Height)	B (Width)	C (Depth)
RA-WE-060	48 11/16"	24 7/8"	32 1/16"
RA-WE-072			

Electrical Connections

D	E	F	G	H	I	J	K	L	M
21"	24 1/2"	30 1/4"	34 1/4"	16 11/16"	18 11/16"	29 3/4"	31 3/4"	33 3/4"	36 3/4"
∅ .500 Hole		∅ 1.125 X ∅ .875 Double Knockout							

Water Connections

	Desuperheater		Source		Load	
	In	Out	In	Out	In	Out
	N	O	P	Q	R	S
RA-WE-060	27 11/16"	43 13/16"	3 5/8"	18 7/8"	26 1/16"	41 5/16"
RA-WE-072	27 11/16"	43 13/16"	3 5/8"	22 7/8"	26 1/16"	45 5/16"
	Connection Size 1/2" FPT		Connection Size 1 1/4" FPT			



Water to Water (cont)

Mechanical Dimensions

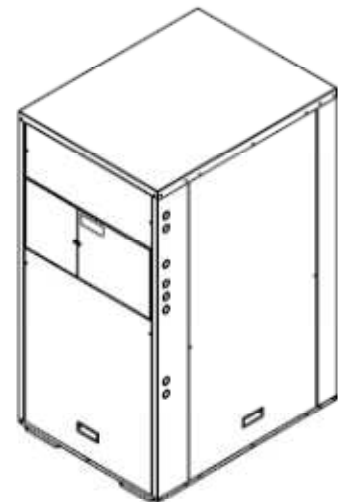
	Cabinet Dimensions		
	A (Height)	B (Width)	C (Depth)
RD-WE-096	48 11/16"	24 7/8"	32 1/16"
RD-WE-120			
RD-WE-144			

Electrical Connections

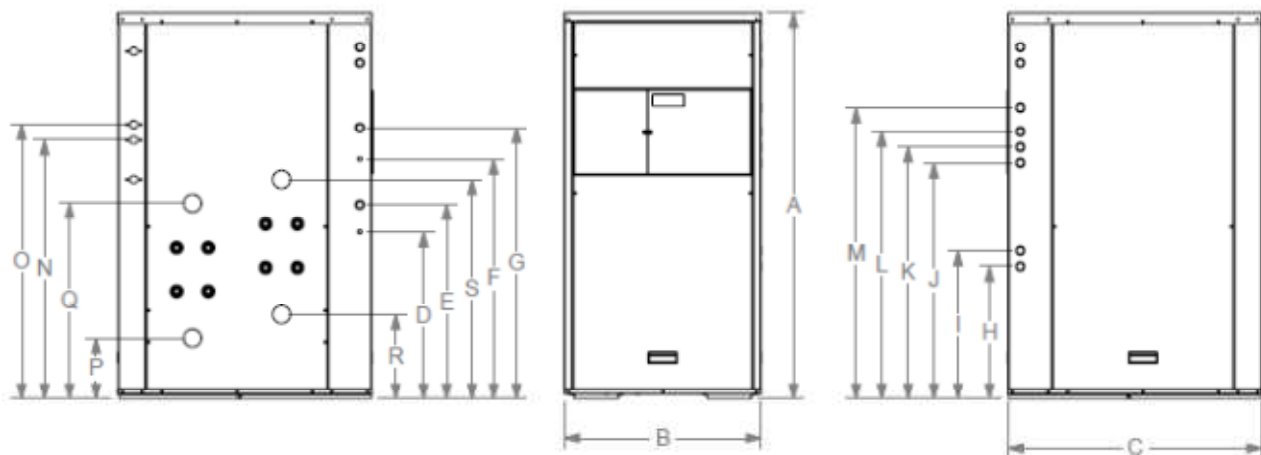
D	E	F	G	H	I	J	K	L	M
21"	24 1/2"	30 1/4"	34 1/4"	16 11/16"	18 11/16"	29 3/4"	31 3/4"	33 3/4"	36 3/4"
∅ .500 Hole		∅ 1.125 X ∅ .875 Double Knockout							

Water Connections

Desuperheater		Source		Load	
In	Out	In	Out	In	Out
N	O	P	Q	R	S
32 11/16"	34 11/16"	7 11/16"	24 11/16"	10 11/16"	27 11/16"
Connection Size 1/2" FPT		Connection Size 1 1/2" MPT			



ART-367_03



Accessory Specifications



INTERNAL AUXILIARY STRIP HEAT

Model	kW	Btu/h	Amps	Fuses	Phase	Voltage	Source CB	Shipping Weight	Minimum CFM*
KN-05-1-*	4.8	16,380	20	N/A	1-60	240	30	15	300
KN-10-1-*	9.6	32,760	40	N/A	1-60	240	50	16	600
KN-10-2-*	10.8	36,860	30	40	3-60	208	40	18	600
KN-15-1-*	14.4	49,150	60	50 + 30	1-60	240	80	18	900
KN-20-1-*	19.6	65,530	80	50 + 50	1-60	240	100	19	1200

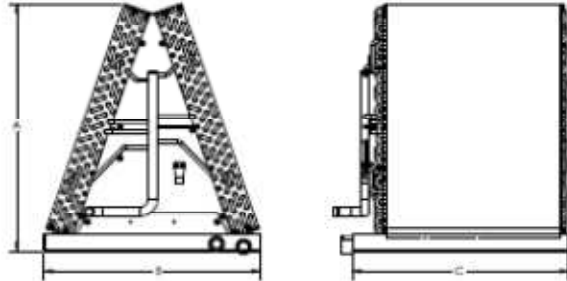
*Relates to this auxiliary strip heat module only, Geo heat pump CFM will typically be much higher, which is acceptable.

Two-Stage Split Matched Air Coil

UNCASED AIR COIL DIMENSIONS

RT-SE-026	16 - 1/4	20	20
RT-SE-033	16 - 1/4	20	20
RT-SE-040	23	20	20
RT-SE-052	22-1/4	23 - 1/2	23 - 3/4
RT-SE-062	22-1/4	23 - 1/2	23 - 3/4

- Includes TXV
- 3/4" MPT primary and secondary drain connections
- Liquid line connect = 3/8"
- Suction line connections (at heat pump): 1.5 to 3.0 ton = 3/4"
4.0 to 5.0 ton = 7/8"



LINE SET SIZE INFORMATION

Model Number	10 Feet		20 Feet		30 Feet	
	Suction	Liquid	Suction	Liquid	Suction	Liquid
020	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"
026	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"
033	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"
040	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"
052	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"
062	3/4"	3/8"	3/4"	3/8"	3/4"	3/8"

See specification chart or unit nameplate for factory charge. The factory charge furnishes enough refrigerant for the air coil and 10-foot line set.

OPTIONAL CABINETS



MATCHED AIR COIL
This cabinet can be configured between the Air Handler inlet and the filter cabinet.

AIR FILTER, HE-IF-21
This cabinet includes a standard 4" x 20" x 20" pleated filter. The cabinet has adjustable filter rails to accommodate filters that vary in thickness.

SPECIFICATIONS

Model	kW	Btu/h	Motor	Amps	Volts	Breakers
HE-(H,A)-10-21	10	31,000	1/2 HP	42	240	60
HE-(H,A)-15-21	15	51,000	3/4 HP	63	240	60, 30
HE-(H,A)-20-21	20	68,000	1 HP	83	240	60, 60
HE-N-00-21	N/A	N/A	1/2 HP	8 (max.)	120	N/A

- 21" W x 32" H x 21" D
- 100 lbs.
- 1/2 HP GE ECM motor
- 700-1200 CFM

