



CC32-0624

# MODEL CC32 COLD CLIMATE AIR-TO-WATER HEAT PUMP INSTALLATION AND OPERATION MANUAL



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IN CANADA: 7555 TRANMERE DRIVE, MISSISSAUGA, ONTARIO, L5S 1L4 (905) 670-5888

## SECTION 1: INTRODUCTION

### Read Before Proceeding

Product development and continuous improvement are at SpacePak's core. As such, there may be changes or modifications to products, without notice. In addition, the information and specifications presented in this document are provided as is, without guarantee or warranty of any kind, expressed or implied. For the most up-to-date information regarding our products, you may contact our Customer Service group at [custservice@spacepak.com](mailto:custservice@spacepak.com).

### Hazard Definitions

The following terms are used throughout this manual to bring attention to the presence of potential hazards or to important information concerning the product.

**⚠ DANGER** Indicates an imminently hazardous situation, which if not avoided, WILL result in death, serious injury or substantial property damage.

**⚠ WARNING** Indicates an imminently hazardous situation, which if not avoided, COULD result in death, serious injury or substantial property damage.

**⚠ CAUTION** Indicates an imminently hazardous situation, which if not avoided, MAY result in minor injury or property damage.

**NOTICE** Used to notify of special instructions on installation, operation or maintenance, which are important to equipment, but not related to personal injury hazards.

Failure to comply with these recommendations will void the warranty.

**⚠ CAUTION** ALL air-to-water heat pump installations require some level of Propylene Glycol or Ethylene Glycol freeze protection in the hydronic circuit.

Refer to the graphic in Section 3 for the recommended concentration in your region. However, in all cases it is the responsibility of the contractor to ensure that sufficient freeze protection has been installed to prevent freezing under all conditions. Heat exchanger rupture or other component failure due to freezing is not covered under the manufacturer's warranty.

## Benefits and Features

### Low GWP

The CC32 heat pumps employ R32 refrigerant in order to comply with low GWP (Global Warming Potential) guidelines. This is a requirement for all new equipment manufactured.

### Inverter Compressor

CC32 Inverter Extreme Heat Pump uses Inverter technology to precisely match the heating or cooling load.

### Advanced Controls

Unit function is managed by a parametric microprocessor allowing on site adjustment to match specific operating requirements.

### Easy Installation

The monobloc configuration keeps all refrigerant outdoors with no refrigeration connection or handling done on site. Only the water/antifreeze mixture is plumbed indoors.

### Quiet Operation

The insulated housing, advanced fan profile, and variable speed fan and compressor all combine to achieve a low noise level of 41dBA to 46dBA @ 1 meter.

### Efficient Energy Transfer

CC32 Inverter Extreme heat pump is equipped with high efficiency, large surface area energy exchangers for both the air to refrigerant heat transfer and the refrigerant to water energy transfer.

### Low Ambient Temperature Cooling Operation

CC32 heat pump is capable of operating in cooling mode in ambient temperatures as low as 5°F.

### Enhanced Vapor Injection

Compressor and refrigeration system are optimized for efficient and powerful heating performance in ambient temperatures as low as -22°F (-30°C).

### Outdoor Coils

Outdoor coils have been tested in accordance with GB/T 2432.17 salt spray test.

## Specification

		Units	CC32-18	CC32-40	CC32-60
Cooling	Capacity Range	BTU/hr (kW)	8,400 - 22,800 (2.5 - 6.7)	15,600 - 39,600 (4.6 - 11.6)	21,600 - 57,600 (6.3 - 16.9)
	Efficiency Range	EER	8.12 - 8.67	6.82 - 8.98	7.77 - 8.99
	Efficiency	IPLV	16.81	16.75	14.46
	Delivered Water Temp Range	°F (°C)	41 - 77 (5 - 25)		
	Ambient Temp Range	°F (°C)	50 - 109 (10 - 43)		
Heating	Capacity Range	BTU/hr (kW)	3,600 - 23,000 (1.1 - 6.7)	8,000 - 42,000 (2.3 - 12.3)	12,000 - 72,000 (3.5 - 21.1)
	Efficiency Range	COP	0.95 - 8.64	0.99 - 9.09	0.98 - 9
	Delivered Water Temp Range	°F (°C)	95-140		
	Ambient Temp Range	°F (°C)	-22 -110		
CEC Data	Cooling Capacity*	BTU/hr (kW)	17183	35120	52001
	Cooling Efficiency*	EER	10.43	9.9	8.85
	Heating Capacity**	BTU/hr (kW)	18919	35424	62760
	Heating Efficiency**	COP	3.07	2.9	3.13
	Heating Capacity***	BTU/hr (kW)	10189	26222	42700
	Heating Efficiency***	COP	1.52	2.23	2.06
Electrical	Power	V/Ph/Hz	208-230/1/60		
	Fan Motor	A	0.8		2 x 0.8
	Compressor Motor	A	12.2	21	33.5
	MCA	A	17	28	44
	MOPD	A	25	45	70
	SCCR	kA	5kA		
Refrigerant	Type		R32		
	Factory Charge	lbs. (kg)	2.43 (1.1)	3.97 (1.8)	4.41 (2)
Fan	Quantity		1	1	2
	Power Input	W	150	170	75 (x2)
	Type		DC		
	Max Speed	RPM	600		
Sound (@1meters)	Maximum	dBA	41	43	46
	Rated Flow	GPM	4.4	7.5	12.8
Hydronic	Max Water Temp	°F (°C)	140 (60)		
	Piping Connections	inch (cm)	1 (2.54)		
	Rated Pressure Drop	PSI (ft W.C.)	2.9 (6.7)	4.4 (10.2)	6.5 (15)
	Type		Rotary		
Compressor	Speed Range	Hz	30-90		
	Brand		Panasonic		
	Quantity		1		
	Net Dimensions (L x W x H)	inch (cm)	46 x 16 x 32 (117 x 41 x 80)	51 x 18 x 37 (129 x 46 x 93)	50 x 22 x 53 (125 x 54 x 133)
Dimensions	Shipping Dimensions (L x W x H)	inch (cm)	54 x 22 x 39 (138 x 56 x 100)	59 x 24 x 46 (150 x 61 x 117)	58 x 26 x 60 (148 x 67 x 153)
	Net Weight	lbs. (kg)	200 (90)	292 (132)	459 (208)
	Shipping Weight	lbs. (kg)	304 (138)	391 (178)	535 (243)

CEC is California Energy Commission. Data is tested in accordance with AHRI 550/590

\*= 44°F LWT 54°F EWT @3.75 at CC32-18/6.17 at CC32-40/11.45 at CC32-60 GPM & 95°F DB Ambient

\*\*= 120°F LWT 107°F EWT @4.4 at CC32-18/7.5 at CC32-40/12.8 at CC32-60 GPM & 47°F DB Ambient

\*\*\*=120°F LWT 110°F EWT @4.4 at CC32-18/7.5 at CC32-40/12.8 at CC32-60 GPM &17°F DB Ambient

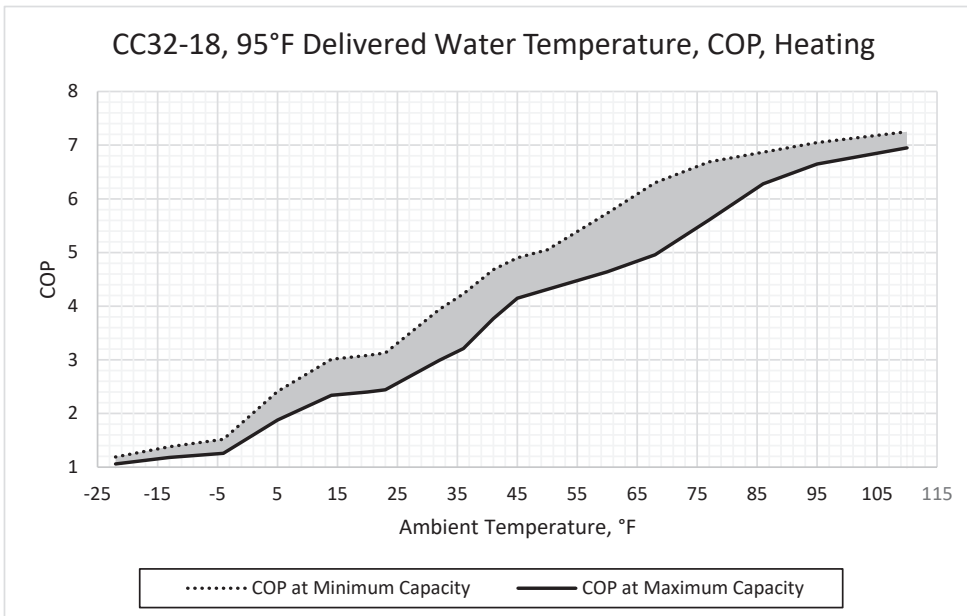
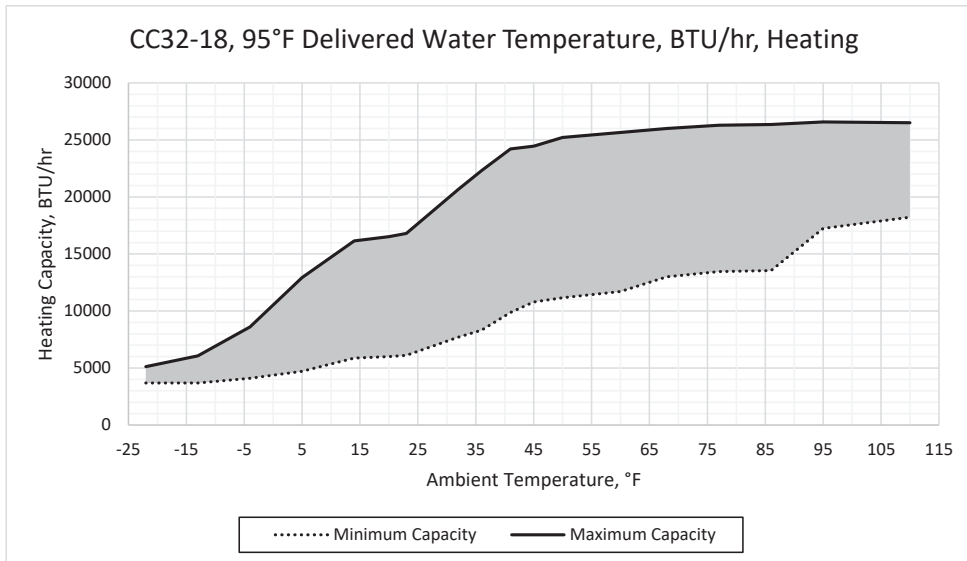
# Performance Data - Heating

## CC32-18

Heating Capacity (BTU/hr)									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	3685 - 5118	4095 - 8599	4709 - 12932	7711 - 20678	10782 - 24450	11158 - 25205	11704 - 25655	13000 - 26010	13444 - 26288
105	2388 - 3344	3753 - 7916	4060 - 11192	7234 - 19347	9554 - 23025	9998 - 23685	11055 - 24255	13000 - 24500	13376 - 25010
113	2150 - 3003	3549 - 7438	3651 - 9998	6893 - 18460	8769 - 22827	9247 - 23255	10782 - 23855	12659 - 24025	12966 - 23855
120	/	2730 - 5767	3242 - 8974	6381 - 10637	8121 - 19927	8428 - 20643	9998 - 22998	11567 - 23850	12420 - 24255
131	/	2457 - 5186	2866 - 7916	5869 - 13819	7473 - 17197	8155 - 18801	9247 - 19825	10544 - 20905	11874 - 21255
140	/	1945 - 3856	2525 - 6551	5391 - 11840	6893 - 14740	7916 - 16450	8530 - 16924	9588 - 18400	11362 - 18855

COP									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	1.06 - 1.19	1.26 - 1.52	1.88 - 2.41	2.99 - 3.94	4.15 - 4.9	4.31 - 5.05	4.64 - 5.73	4.96 - 6.3	5.61 - 6.69
105	1.02 - 1.15	1.15 - 1.38	1.47 - 1.89	2.57 - 3.39	3.31 - 4.47	3.54 - 4.79	4.02 - 5.16	4.49 - 5.91	5.04 - 6.32
113	1.01 - 1.14	1.09 - 1.31	1.20 - 1.54	2.29 - 3.02	2.75 - 3.72	2.93 - 3.97	3.56 - 4.57	4.18 - 5.50	4.66 - 5.84
120	/	1.03 - 1.24	1.14 - 1.46	1.89 - 2.44	2.40 - 3.18	2.59 - 3.43	3.07 - 3.87	3.55 - 4.58	4.00 - 4.93
131	/	1.04 - 1.25	1.07 - 1.37	1.48 - 1.88	2.04 - 2.66	2.25 - 2.92	2.58 - 3.20	2.91 - 3.69	3.35 - 4.06
140	/	0.95 - 1.13	1.01 - 1.27	1.37 - 1.71	1.69 - 2.15	1.90 - 2.42	2.10 - 2.55	2.28 - 2.83	2.69 - 3.21



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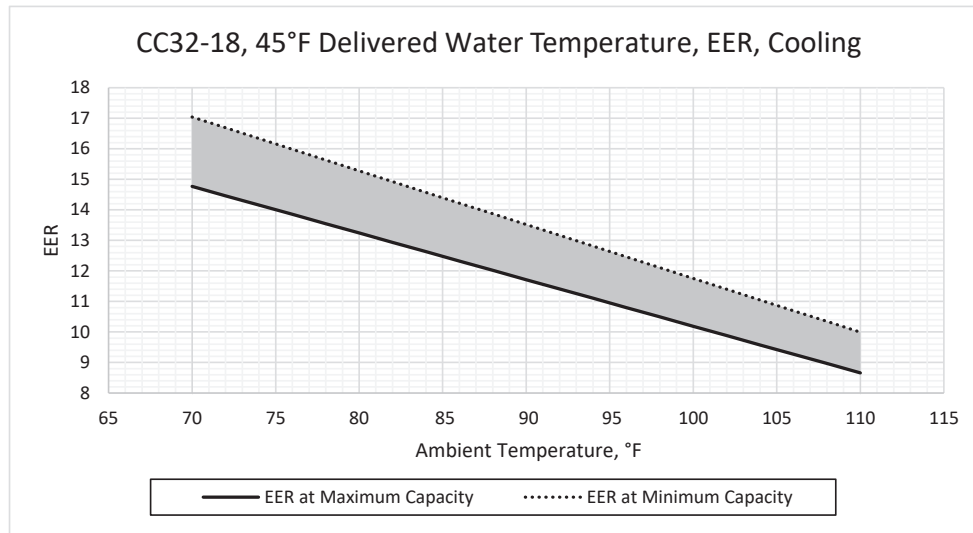
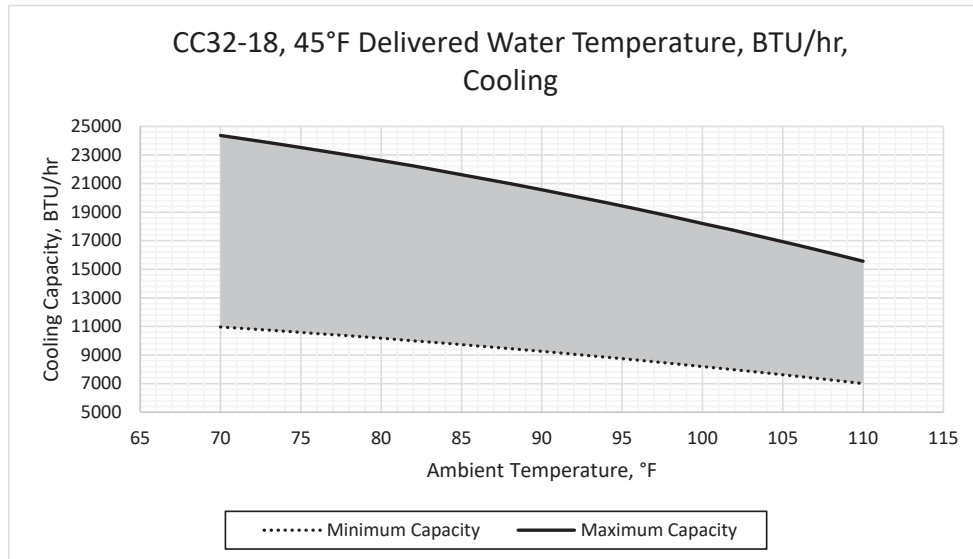
## Performance Data - Cooling

### CC32-18

		Cooling Capacity (BTU/hr)								
		Ambient Temperature (°F)								
Capacity	Leaving Water Temperature (°F)	70	76	80	86	90	96	100	106	110
45	45	10964 - 24365	10508 - 23351	10177 - 22615	9639 - 21421	9254 - 20565	8636 - 19191	8197 - 18215	7497 - 16661	7004 - 15565
48	48	10847 - 24104	10308 - 22908	9915 - 22034	9274 - 20610	8813 - 19584	8069 - 17932	7539 - 16754	6693 - 14874	6095 - 13544
54	54	11037 - 24526	10707 - 23794	10453 - 23230	10020 - 22267	9697 - 21549	9160 - 20355	8767 - 19482	8126 - 18057	7664 - 17030

		EER								
		Ambient Temperature (°F)								
EER	Leaving Water Temperature (°F)	70	76	80	86	90	96	100	106	110
45	45	14.77 - 17.04	13.85 - 15.98	13.24 - 15.28	12.32 - 14.22	11.71 - 13.52	10.80 - 12.46	10.19 - 11.75	9.27 - 10.70	8.66 - 9.99
48	48	13.88 - 16.01	12.95 - 14.94	12.33 - 14.23	11.42 - 13.16	10.79 - 12.45	9.86 - 11.38	9.24 - 10.67	8.32 - 9.60	7.70 - 8.88
54	54	13.84 - 15.97	12.50 - 14.43	11.61 - 13.40	10.27 - 11.85	9.38 - 10.82	8.04 - 9.28	7.15 - 8.25	5.81 - 6.70	4.92 - 5.67



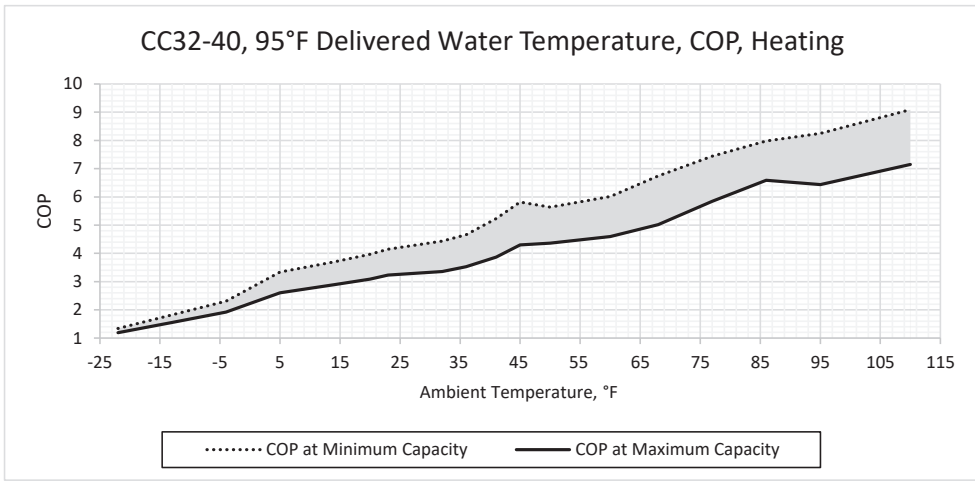
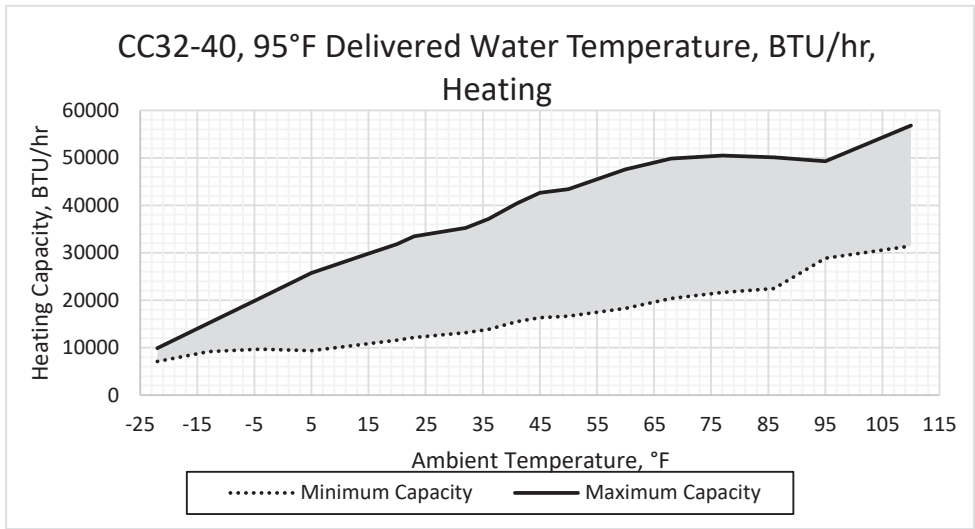
# Performance Data - Heating

## CC32-40

Heating Capacity (BTU/hr)									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	7097 - 9895	9690 - 20439	9349 - 25728	13137 - 35213	16344 - 42652	16651 - 43402	18255 - 47599	20370 - 49850	21667 - 50500
105	4641 - 6483	9247 - 19517	9554 - 26273	12898 - 34565	16003 - 41765	16583 - 43266	18118 - 44460	20268 - 46025	21633 - 46250
113	3003 - 4436	8974 - 18903	9690 - 26649	12761 - 34121	15798 - 41219	16549 - 43198	18118 - 44528	20336 - 44885	21735 - 45025
122	/	7541 - 15901	8121 - 22350	11738 - 29515	15286 - 27534	16242 - 39922	17948 - 41253	20234 - 42225	21599 - 42325
131	/	6108 - 12898	6551 - 18016	10714 - 25250	14775 - 34019	15935 - 36681	17743 - 38011	20098 - 39825	21462 - 39965
140	/	5459 - 10748	5255 - 13580	9793 - 22450	14297 - 30607	15662 - 33541	17538 - 34770	19995 - 35055	21326 - 35150

COP									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	1.19 - 1.34	1.92 - 2.31	2.60 - 3.34	3.36 - 4.43	4.30 - 5.82	5.64 - 4.36	4.60 - 6.01	5.02 - 6.74	5.84 - 7.44
105	1.06 - 1.19	1.61 - 1.94	2.37 - 3.03	2.88 - 3.79	3.61 - 4.88	3.65 - 4.93	4.05 - 5.20	4.46 - 5.87	5.07 - 6.36
113	1.03 - 1.10	1.41 - 1.69	2.21 - 2.83	2.56 - 3.37	3.29 - 4.45	3.30 - 4.47	3.69 - 4.74	4.09 - 5.37	4.44 - 5.45
122	/	1.24 - 1.49	1.76 - 2.25	2.18 - 2.82	2.84 - 3.76	2.93 - 3.88	3.27 - 4.12	3.62 - 4.45	3.88 - 4.68
131	/	1.07 - 1.29	1.30 - 1.67	1.81 - 2.29	2.38 - 3.09	2.56 - 3.32	2.85 - 3.52	3.01 - 3.61	3.20 - 3.82
140	/	1.02 - 1.21	1.08 - 1.36	1.49 - 1.86	2.00 - 2.55	2.23 - 2.84	2.48 - 3.02	2.74 - 3.40	2.95 - 3.51



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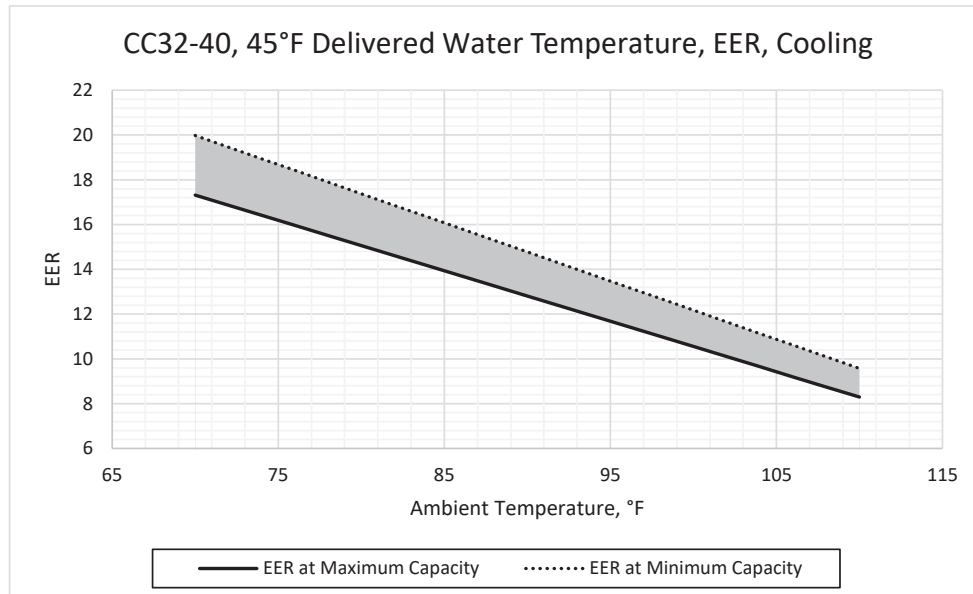
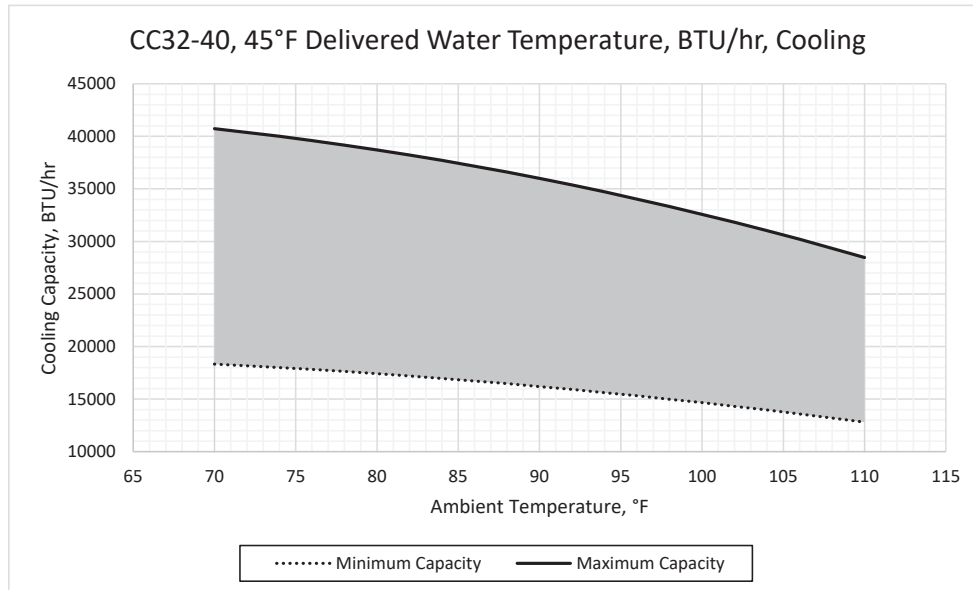
## Performance Data - Cooling

### CC32-40

Cooling Capacity (BTU/hr)										
Capacity	Ambient Temperature (°F)									
Leaving Water Temperature (°F)	70	76	80	86	90	96	100	106	110	
45	18328 - 40729	17820 - 39601	17419 - 38710	16724 - 37164	16197 - 35994	15313 - 34030	14661 - 32581	13589 - 30199	12812 - 28471	
48	19748 - 43884	19135 - 42522	18647 - 41437	17795 - 39545	17148 - 38107	16059 - 35686	15253 - 33895	13925 - 30944	12960 - 28801	
54	20500 - 45556	19693 - 43763	19060 - 42356	17967 - 39927	17143 - 38097	15765 - 35033	14750 - 32778	13085 - 29078	11880 - 26400	

EER										
	Ambient Temperature (°F)									
Leaving Water Temperature (°F)	70	76	80	86	90	96	100	106	110	
45	17.31 - 19.98	15.96 - 18.42	15.06 - 17.38	13.71 - 15.82	12.81 - 14.78	11.45 - 13.22	10.55 - 12.18	9.20 - 10.61	8.30 - 9.57	
48	15.91 - 18.36	14.68 - 16.93	13.85 - 15.98	12.62 - 14.56	11.79 - 13.61	10.56 - 12.18	9.73 - 11.23	8.50 - 9.80	7.67 - 8.85	
54	13.77 - 15.89	12.70 - 14.66	11.99 - 13.83	10.92 - 12.60	10.21 - 11.78	9.14 - 10.54	8.42 - 9.72	7.35 - 8.48	6.64 - 7.66	



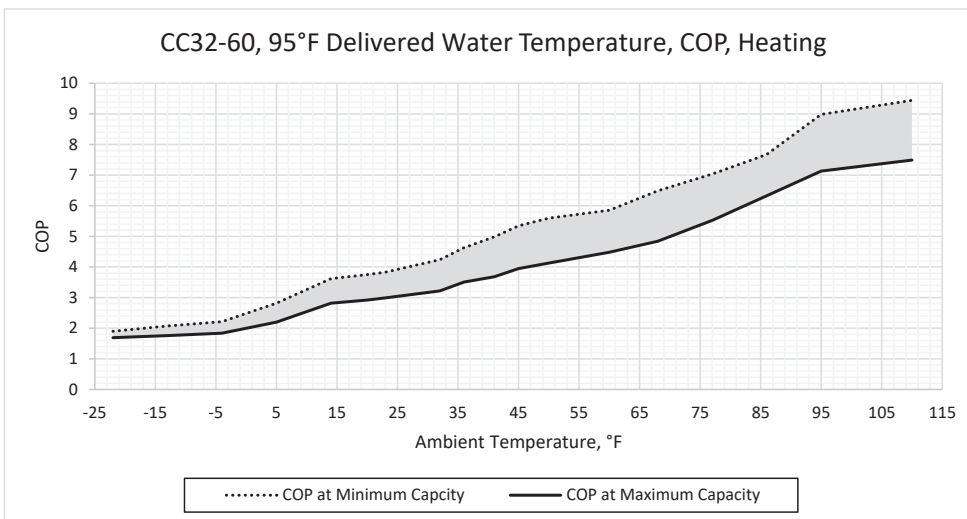
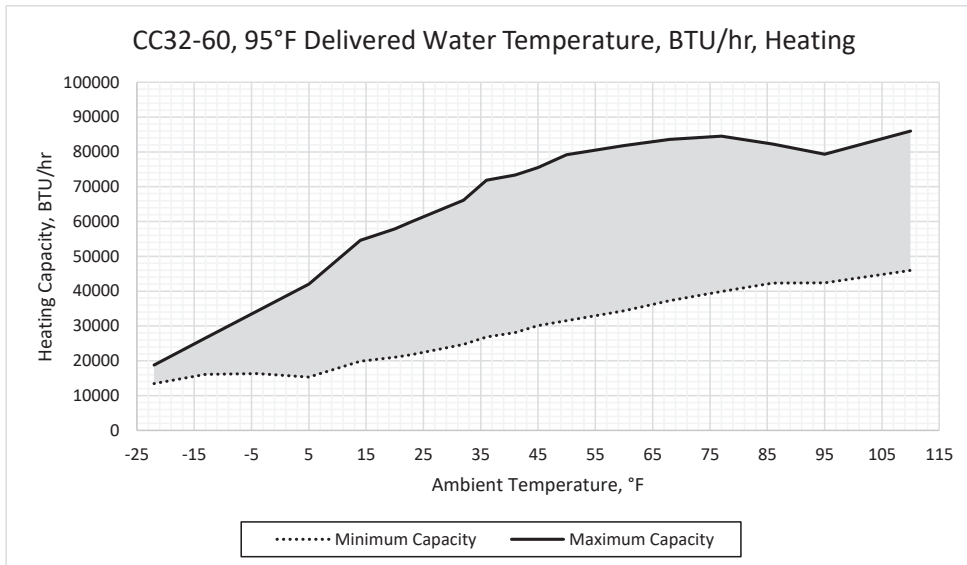
# Performance Data - Heating

## CC32-60

Heating Capacity (BTU/hr)									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	13444 - 18767	16276 - 34258	15286 - 42038	24670 - 66093	30095 - 75492	31494 - 79209	34360 - 81796	37261 - 83610	39888 - 84536
105	11431 - 15935	16071 - 33883	15559 - 42822	24260 - 64967	28218 - 73600	29413 - 76773	32518 - 79912	35725 - 82002	37841 - 84528
113	10066 - 14058	15935 - 33610	15286 - 42038	22350 - 59849	27024 - 70461	28116 - 73361	32040 - 76495	35316 - 77507	34156 - 76841
122	/	13546 - 28560	13341 - 36681	20541 - 51694	25386 - 62374	26342 - 64694	31904 - 68203	36646 - 68995	32791 - 68823
131	/	11158 - 23544	12045 - 33132	19654 - 46269	24602 - 56642	26035 - 59883	30470 - 62799	33678 - 64399	28833 - 56027
140	/	9179 - 18118	11089 - 28662	18903 - 41389	23987 - 51421	26751 - 57290	29276 - 58041	31255 - 60770	33268 - 59405

COP									
Ambient Temperature (°F)									
Water Outlet (°F)	-22	-4	5	32	45	50	60	68	77
95	1.69 - 1.90	1.84 - 2.21	2.20 - 2.82	3.22 - 4.24	3.95 - 5.34	4.13 - 5.59	4.48 - 5.85	4.84 - 6.49	5.52 - 7.04
105	1.54 - 1.73	1.67 - 2.01	2.00 - 2.56	2.88 - 3.80	3.39 - 4.59	3.53 - 4.78	4.02 - 5.16	4.53 - 5.96	5.08 - 6.36
113	1.44 - 1.62	1.56 - 1.88	1.87 - 2.39	2.66 - 3.50	3.15 - 4.27	3.28 - 4.44	3.80 - 4.88	4.42 - 5.81	4.89 - 6.13
122	/	1.30 - 1.57	1.63 - 2.09	2.30 - 2.97	2.77 - 3.67	2.87 - 3.81	3.26 - 4.11	3.65 - 4.71	4.04 - 4.99
131	/	1.13 - 1.36	1.47 - 1.89	2.05 - 2.61	2.51 - 3.27	2.66 - 3.45	2.90 - 3.59	3.14 - 3.97	3.48 - 4.22
140	/	0.98 - 1.17	1.27 - 1.60	1.84 - 2.29	2.28 - 2.91	2.54 - 3.24	2.58 - 3.14	2.70 - 3.35	3.00 - 3.57



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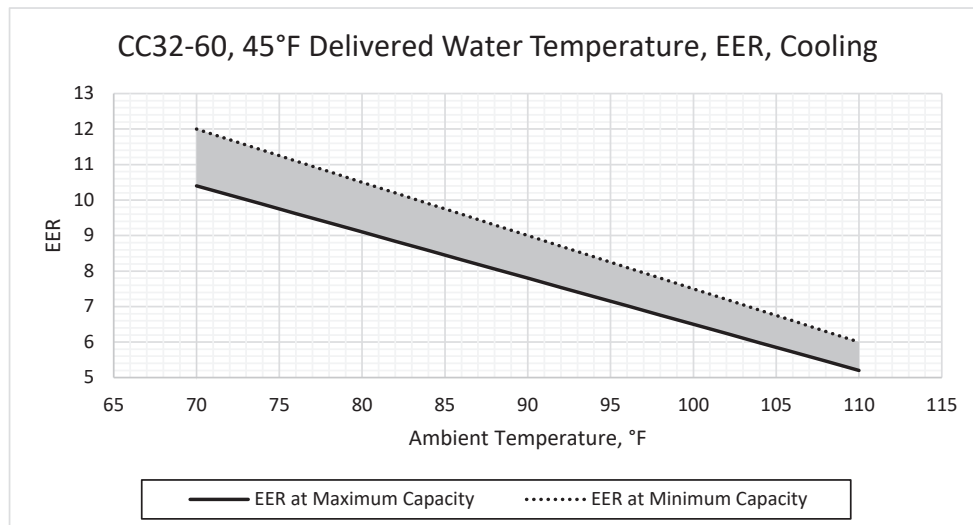
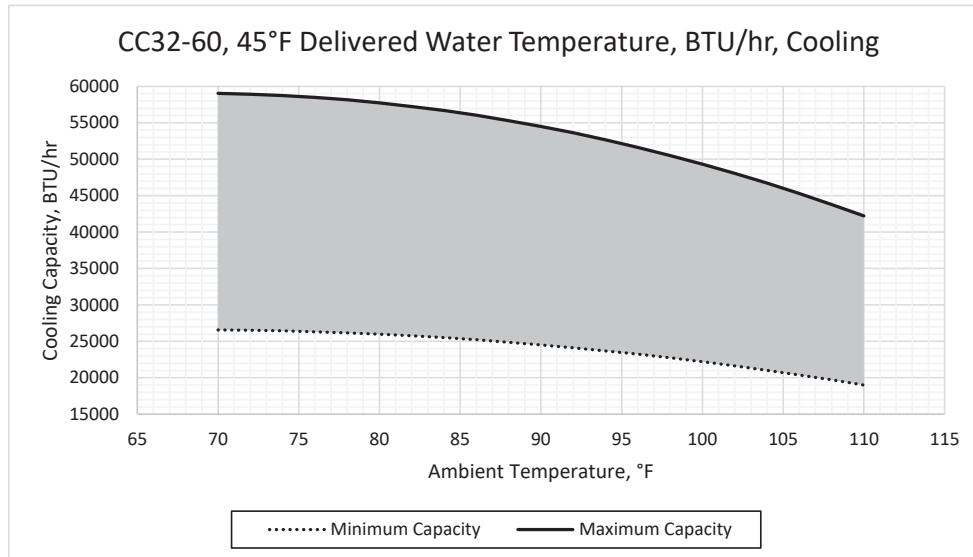
## Performance Data - Cooling

### CC32-60

		Cooling Capacity (BTU/hr)								
Capacity		Ambient Temperature (°F)								
Leaving Water Temperature (°F)		70	76	80	86	90	96	100	106	110
45	26572 - 59048	26324 - 58497	25984 - 57743	25214 - 56032	24527 - 54504	23235 - 51632	22199 - 49331	20384 - 45299	19001 - 42224	
48	27405 - 60899	27386 - 60858	27157 - 60349	26488 - 58863	25826 - 57391	24507 - 54460	23411 - 52025	21442 - 47650	19913 - 44251	
54	28109 - 62465	28155 - 62567	27963 - 62140	27341 - 60757	26703 - 59341	25413 - 56474	24331 - 54068	22373 - 49717	20844 - 46321	

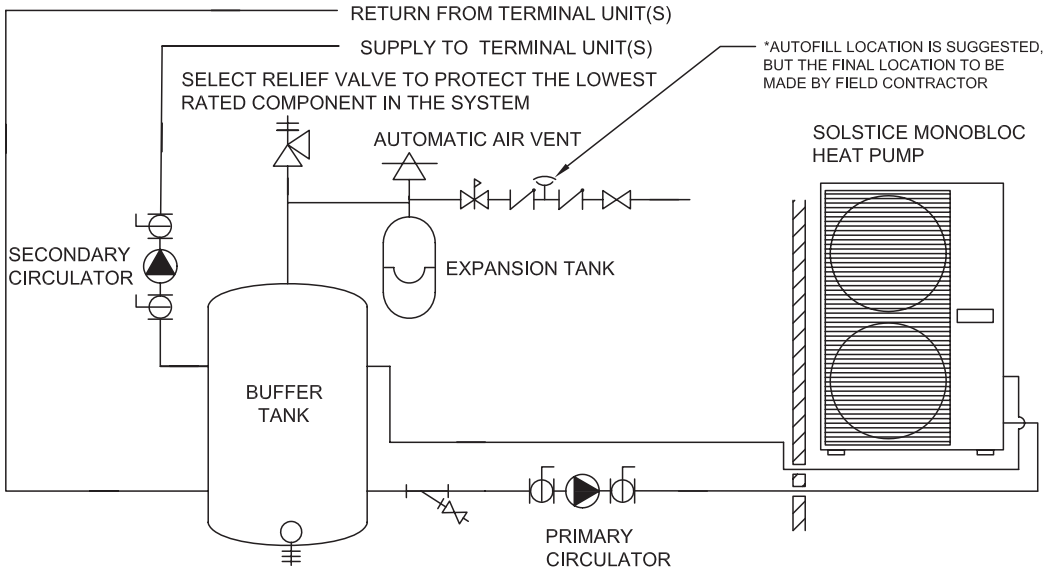
  

		EER								
EER		Ambient Temperature (°F)								
Leaving Water Temperature (°F)		70	76	80	86	90	96	100	106	110
45	10.40 - 12.00	9.62 - 11.10	9.10 - 10.50	8.32 - 9.60	7.80 - 9.00	7.02 - 8.10	6.50 - 7.50	5.72 - 6.60	5.20 - 6.00	
48	11.40 - 13.15	10.62 - 12.25	10.10 - 11.65	9.32 - 10.75	8.80 - 10.15	8.02 - 9.25	7.50 - 8.65	6.72 - 7.75	6.20 - 7.15	
54	12.40 - 14.31	11.62 - 13.41	11.10 - 12.81	10.32 - 11.91	9.80 - 11.31	9.02 - 10.41	8.50 - 9.81	7.72 - 8.91	7.20 - 8.31	

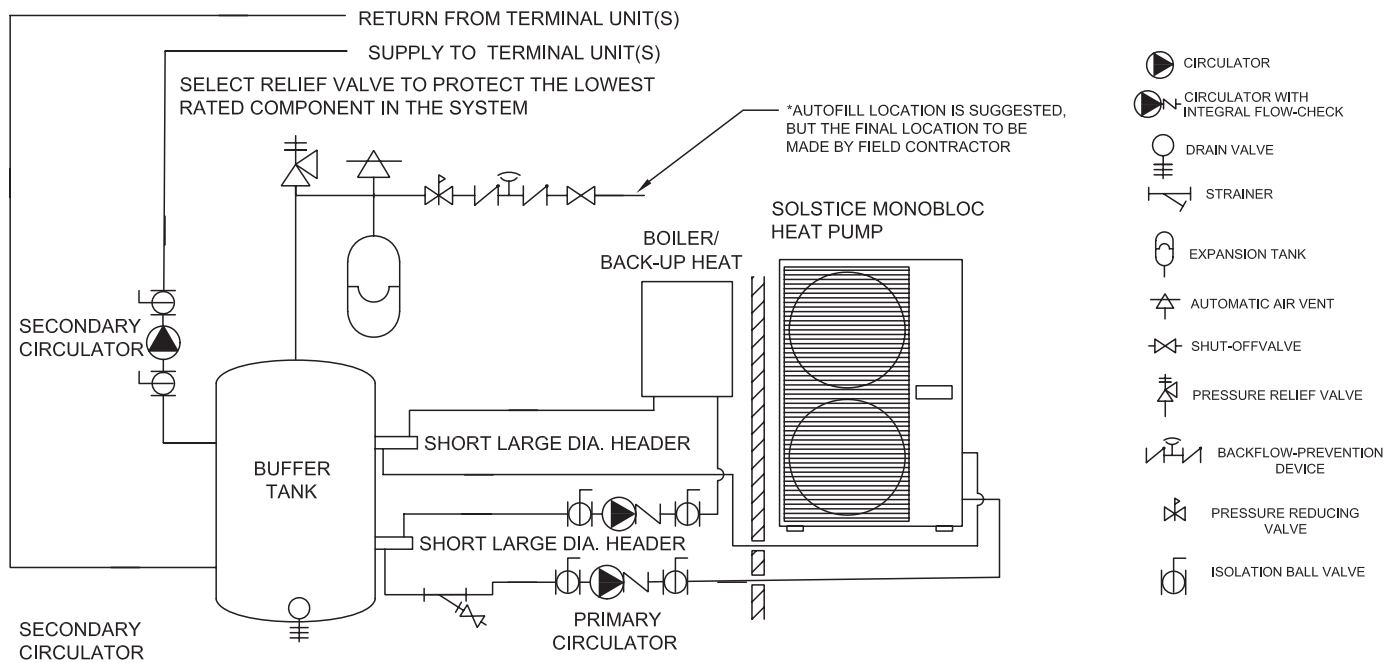


# Typical System Diagram

## Basic Heat Pump Installation



## Heat Pump Installation with Auxiliary Back-Up Heat



- CIRCULATOR
- CIRCULATOR WITH INTEGRAL FLOW-CHECK
- DRAIN VALVE
- STRAINER
- EXPANSION TANK
- AUTOMATIC AIR VENT
- SHUT-OFF VALVE
- PRESSURE RELIEF VALVE
- BACKFLOW-PREVENTION DEVICE
- PRESSURE REDUCING VALVE
- ISOLATION BALL VALVE

**\*Autofill system is suggested but not required by SpacePak. If such installation is desired or required by local code, the Autofill MUST draw from a reservoir of pre-mixed glycol/water solution. Filling directly from a well or municipal water source may introduce contaminants and will dilute the glycol solution in the event of a system leak. This may impact warranty coverage.**

## SECTION 2: INSTALLATION

### Choose the Correct Heat Pump

Perform appropriate load calculation to determine required heating or cooling load for the project. Refer to specifications in this manual to determine proper size heat pump.

#### Installation Location

- CC32 heat pump must be installed outdoors, in a location capable of supporting the full weight, plus any potential snow load. The outdoor unit must be secured to the support with sufficient hardware to withstand any potential wind or seismic conditions without shifting or tipping. Additionally, the outdoor unit should be installed with enough clearance to allow for condensate roll-off during the defrost cycle. This will prevent freezing under the unit during defrost.
- The heat pump should be located away from sources of heat or moisture such as combustion vents, dryer vents, building exhausts, etc.
- Because the CC32 uses ambient air as a heat source or sink, the performance is affected by the altitude of the installation. Refer to the table below for the approximate multiplier to apply to the capacity and efficiency due to the altitude.

Elevation above Sea Level		Effect on Cooling		Effect on Heating	
Feet	Meters	Capacity	EER or COP	Capacity	EER or COP
0	0	1.00	1.00	1.00	1.00
500	152	1.00	0.99	0.99	1.00
1000	305	0.99	0.98	0.98	0.99
2000	610	0.98	0.95	0.96	0.98
3000	914	0.97	0.93	0.94	0.97
4000	1219	0.96	0.90	0.91	0.96
5000	1524	0.95	0.88	0.89	0.95
6000	1829	0.95	0.86	0.87	0.95
7000	2134	0.94	0.84	0.86	0.94
8000	2438	0.93	0.82	0.84	0.93
9000	2743	0.92	0.80	0.82	0.92
10000	3048	0.91	0.78	0.80	0.91
11000	3353	0.90	0.76	0.78	0.90
12000	3658	0.89	0.74	0.77	0.89
13000	3962	0.89	0.72	0.75	0.89
14000	4267	0.88	0.70	0.73	0.88

- Proper clearances shown on following pages must be respected.

#### Water Loop Connection

Please read below for water piping instructions:

- The piping must be clean and free from dirt. Prior to insulating the pipe, it is suggested that a leak test be performed to ensure no water leaks are present.
- The system must be supplied with a pump sized to provide the minimum flow rate specified in the Glycol/Water System Design section of this manual. Pump selection must consider the pressure loss through the plumbing system and its components, plus the pressure loss through the heat pump's internal heat exchanger. The pump must be rated for the full range of heated or chilled water temperatures, as well as any anti-freeze or corrosion inhibitor additives.
- The piping system should have a wye strainer installed, on the inlet side, that is sized properly for the anticipated flow rate and pressure drop for the application. This will help protect internal components of the heat pump against sediments, contaminants and fouling that could damage the unit
- Do Not use the heat pump for DIRECT heating of potable water. The heat exchanger and internal components are not suitable for this application.

- Do not use the heat pump to DIRECTLY heat or chill pool water, open process water, untreated well or municipal water, or any working fluid other than aqueous Ethylene Glycol or Propylene Glycol solution circulating in a sealed, pressurized, and oxygen free system.

**⚠ WARNING** Never expose the CC32 hydronic circuit to pressures in excess of 30 PSI. Loss of coolant, property damage, or equipment damage may result.

- The total system must be protected with a Pressure Relief Valve or valves sized to protect the system component with the lowest pressure rating. In no instance shall this exceed 30PSI.

**⚠ CAUTION** It is the responsibility of the installing contractor to ensure that sufficient Propylene Glycol concentration is maintained in the hydronic circuit to provide freeze protection in all foreseeable conditions. Failure to do so voids the warranty and damage caused by freezing is not covered.

#### Electrical Connections

CC32 heat pump must be connected to an individual 230V (220V-240V) circuit, sized and protected according to the Minimum Circuit Ampacity and Max Overload Protection ratings specified on the rating label affixed to the exterior of the unit.

The power connection must include a Protective Earth Ground and a properly sized Neutral as two separate conductors in accordance with National Electric Code and all local codes.

When using the CC32 as a single standalone heat pump called on by external inputs, (Thermostat, SSIC, Zoning controller etc.) the voltage free wiring should be connected according to the Field Wiring Diagram, to the terminals listed below.

#### Control Input connections

**Important:** All of the inputs are for voltage free relay contacts. No voltage should ever be introduced to these inputs. Doing so will immediately destroy the control and such damage will not be covered under warranty.

**Remote On/Off** is a master unit enable. This must be closed for all unit operation. This connection is located at the power input panel at the front of the unit.

**Heat/Cool On/Off** is the input for space conditioning. This must be closed for operation in either Heating or Cooling mode. This connection at the power input panel at the front of the unit.

**Remote Heat/Cool** is the space conditioning mode selection. Open results in Cooling operation, Closed results in Heating operation. This connection is located at the power input panel at the front of the unit.

**DHW On/Off** enables the Domestic Hot Water mode. When the contacts are closed, the CC32 Control monitors the (potable) Domestic Water temperature and automatically changes over to maintain the DHW temperature according to the parameters selected. This connection is located in the electrical compartment under the top cover.

**TT** input is from a 10kW thermistor sensor monitoring the DHW Tank Temperature. This connection is located in the electrical compartment under the top cover.

## Control Output Connections

**Circulation Pump** provides line to neutral power (110-120VAC) or Line to Line (220-240V) of up to five amps to operate the primary circulator between the heat pump and the buffer tank. This is switched by the CC32 control according to the selected parameters. This connection is located at the power input side access panel.

The electrical loads given in the Specification Table, allow for a pump load of no more than 5 amps and 110 VAC (2.5 amps at 230 VAC). If the pump load exceeds this, provide a separate power source to the pump. DO NOT feed power to the pump from the SpacePak air handler panel.

If the circuit is turned on remotely, it must still have the ability to operate for the unit's freeze protection or the warranty will be void.

**CAUTION** If the circulator is controlled by an external source, it must still respond to a call from the heat pump, in order to allow to operate for the unit's freeze protection. Disabling this will void the unit warranty.

**110V/60 Hz Three-way Valve** provides line to neutral power (110-120VAC) of up to five amps to operate a three-way valve. This is energized when the CC32 control changes over to DHW operation. This connection is located in the electrical compartment under the top cover.

**110V/60 Hz Hot Water Pump** provides line to neutral power (110-120VAC) of up to five amps to operate the circulator on the Secondary (Potable) side of the DHW heat exchanger. This is energized when the DHW operation is active. This connection is located in the electrical compartment under the top cover.

**AUX Output** provides two staged relay contacts capable of switching 24 to 240VAC at a low current to operate a contactor which engages electric, or any supplemental heat source, according the selected parameters. This connection is located at the power input side access panel. The staging logic is controlled by Parameters H18 and R35.

**AUX Heat Outputs** AUX HEAT 1 & 2 are 230V signal outputs intended to actuate a contactor or relay. They do not supply

current to power any heating device. Any attempt to connect a heating element directly to these points will immediately render the heat pump inoperative and may cause permanent damage to the primary control board.

**Alarm Output** This sends a 230V signal to the ALARM OUT terminals when any fault or condition causes the heat pump to shut down, or prevents it from starting. This can be connected to a visual or audible device to alert a custodian that the heat pump requires immediate attention.

**Communication Connections** RS485 connections are provided for two-way serial communication via Modbus protocol to external Building Management and Monitoring equipment.

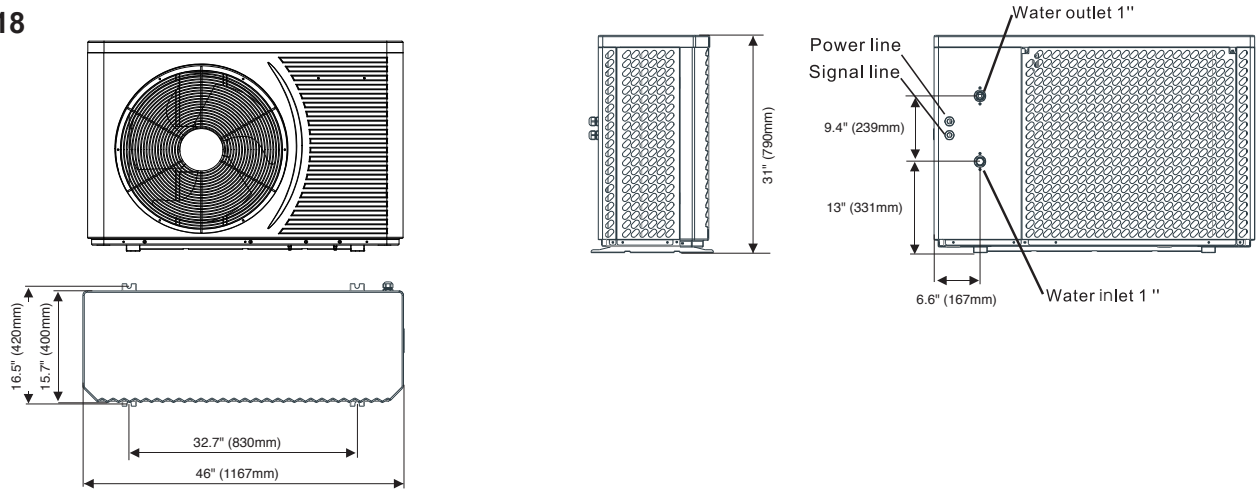
**DI07 to GND** on the CC32 control board must be connected to a Normally Closed over temp safety switch located at the supplemental heat source. The switch must open if the safe maximum temperature is exceeded, and this will immediately open the AUX Output contacts. This feature must be employed when any supplemental heat source is used. This connection is located in the electrical compartment under the top cover.

The **Remote Display** output is a pigtail with a five-conductor female plug located inside the top compartment. The Display has a short connector that can be plugged directly into this pigtail for commissioning, and a 66 ft (20m) connection cable is provided to mount the display permanently in a suitable interior mechanical space. This cable can be extended up to 600 ft by using 24 AWG shielded five-conductor cable and splicing it into the connection cable.

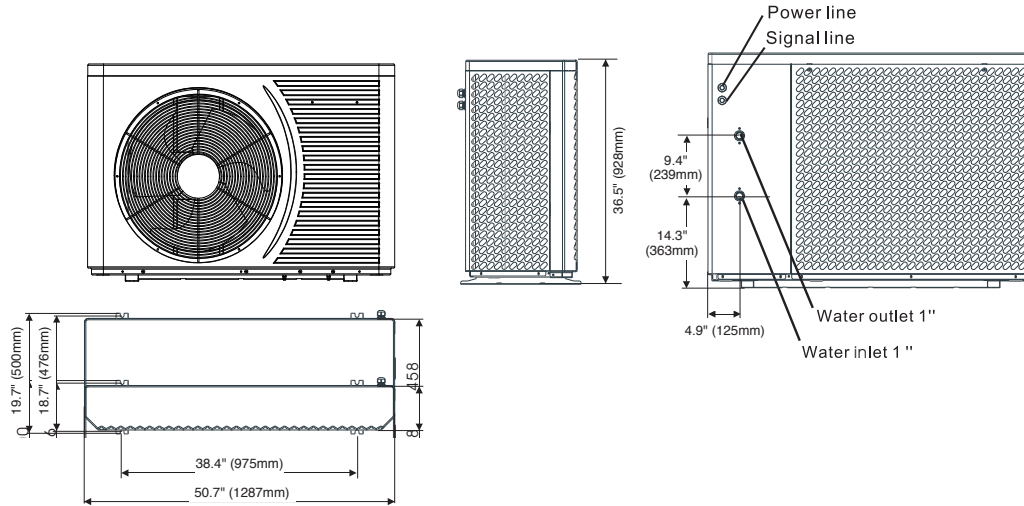
## Dimensions

### Unit Dimensions (inch (mm))

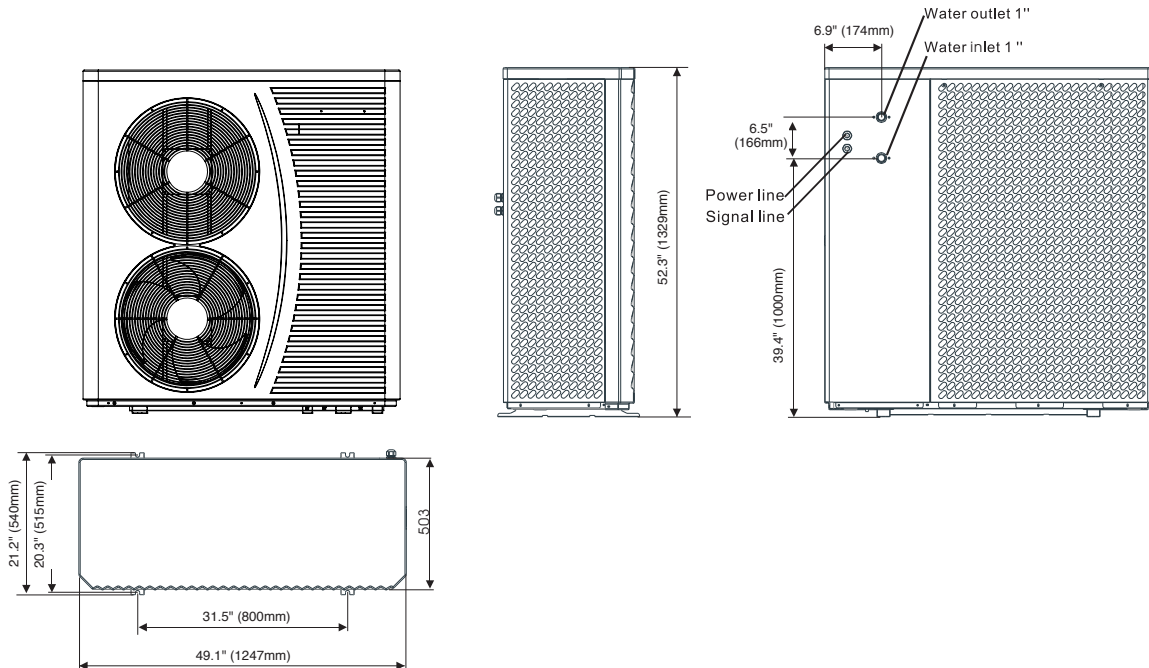
#### CC32-18



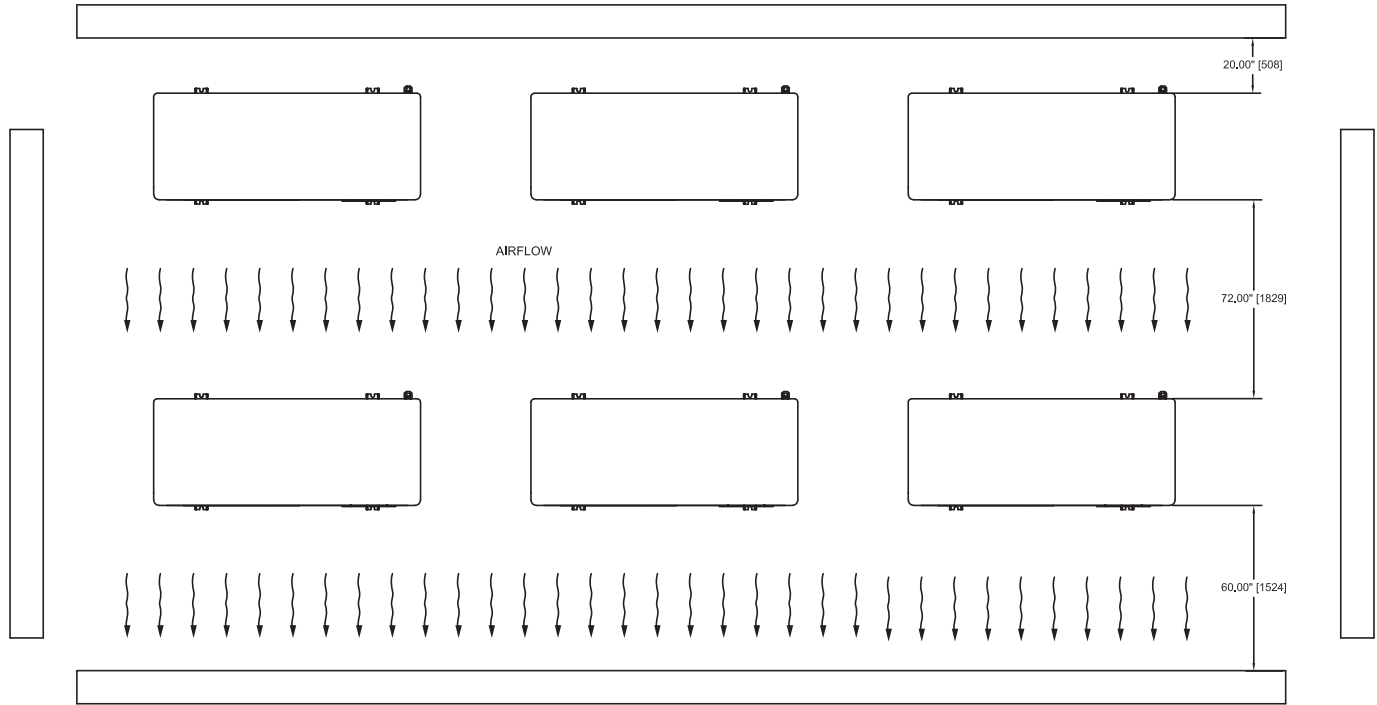
#### CC32-40



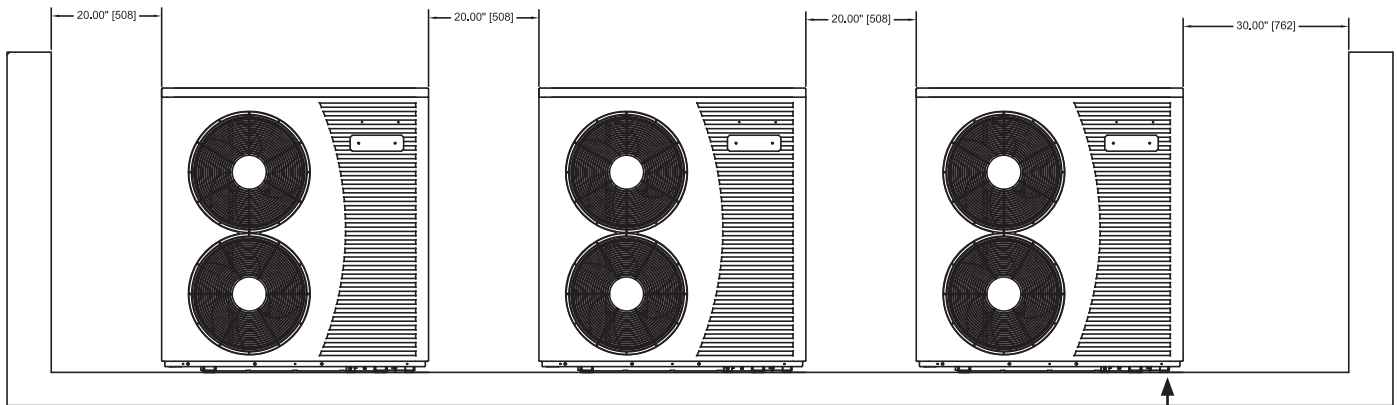
#### CC32-60



## Required Clearances



CLEARANCES SHOWN ARE ASSUMING NO WALL EXTENDS MORE THAN 6" ABOVE THE TOP OF THE HEAT PUMPS, THERE IS NO OVERHEAD ROOF, AND THERE ARE NOT MORE THAN TWO BARRIER WALLS ADJACENT TO THE UNITS. ALL DIMENSIONS ARE IN INCH\*[mm] AND CLEARANCES APPLY TO ALL UNIT SIZES



Unit shall be mounted per local codes and high enough off ground to allow for proper condensate drainage and snow clearance.

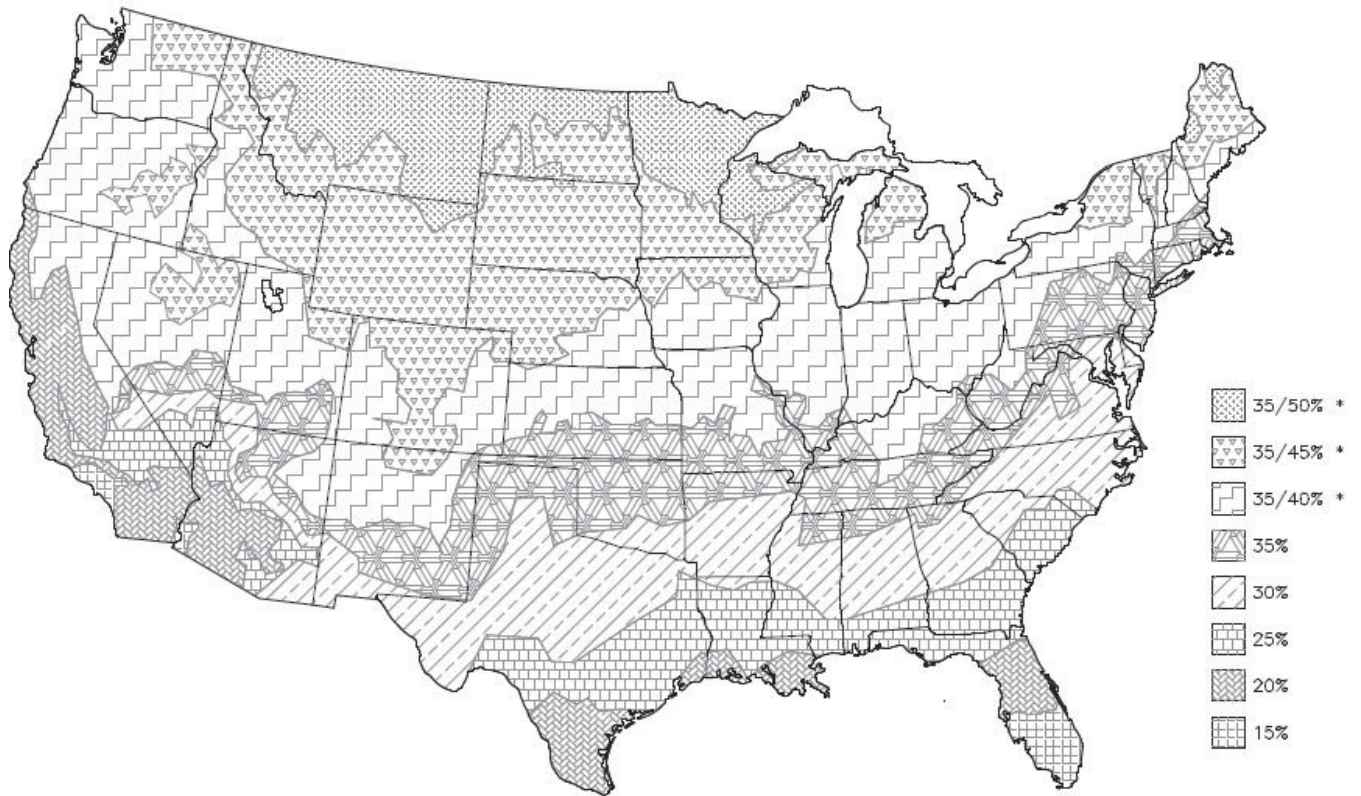
### SECTION 3: GLYCOL/WATER SYSTEM

**Table 1** CC32 Glycol Concentrations (10% Minimum, 50% Maximum)

Ethylene Glycol %	10	20	30	40	50
Min. Ambient Temp for Operation	23°F/-5°C	14°F/-10°C	2°F/-17°C	-13°F/-25°C	-36°F/-38°C
SpacePak Capacity Multiplier	0.98	0.96	0.93	0.91	0.89
Pressure Drop Multiplier (Cooling)	1.06	1.12	1.16	1.25	1.36
Pressure Drop Multiplier (Heating)	1.06	1.12	1.16	1.22	1.28
Minimum Expansion Volume / System Volume					
Heating and Cooling (Gallons)	1 gallon expansion per 15 gallons system volume				
Heating only, HP only (Gallons)	1 gallon expansion per 20 gallons system volume				
Heating Only, with Boiler (Gallons)	1 gallon expansion per 15 gallons system volume				
Propylene Glycol %	10	20	30	40	50
Min. Ambient Temp for Operation	26°F/-3°C	18°F/-8°C	8°F/-13°C	-7°F/-22°C	-29°F/-34°C
SpacePak Capacity Multiplier	0.99	0.98	0.96	0.93	0.88
Pressure Drop Multiplier (Cooling)	1.10	1.20	1.34	1.5	1.65
Pressure Drop Multiplier (Heating)	1.10	1.20	1.34	1.46	1.5
Minimum Expansion Volume / System Volume					
Heating and Cooling	1 gallon expansion per 15 gallons system volume				
Heating only, HP only	1 gallon expansion per 20 gallons system volume				
Heating only, with Boiler	1 gallon expansion per 15 gallons system volume				

Failure to use propylene or ethylene glycol will void warranty.

This information is provided as a general guideline only, and is not intended to cover all possible conditions. It is ultimately the responsibility of the installer to ensure that proper freeze protection is provided.



\* A 35% concentration will prevent solid freezing, and protect from bursting, in all conditions. However, this solution will become a thick sludge at extremely low temperatures, possibly resulting in pump overloading, pump damage, or high pressures. Therefore this concentration should only be used in systems that will remain inactive during the winter. Use the higher value shown for systems that must start and run at the coldest temperatures.

## Glycol/Water System Design

The CC32 has a recommended flow that should be maintained during all operation. This information can be found in the specifications table on page 3. These head loss values are based upon pure water, see Table 1 for multipliers to correct for various concentrations of anti-freeze solution. Head Loss values shown are for the heat pump only, the selected circulator must be capable of overcoming the entire system head loss.

Note: these are the recommended flow values. Should the flow drop significantly below this value, the heat pump will shut down. This is not an indication of a fault in the heat pump, but rather points to insufficient pump or plumbing capacity, or air trapped within the system.

## Glycol/Water Mixture

**CAUTION** Automotive glycol is not suitable for use in the CC32 system. Over time it may leave deposits which will degrade the performance and damage pumps or other devices in the system. Use only ethylene glycol or propylene glycol mixtures specifically labeled for boiler or HVAC use.

Obtain all components specified in the Typical System Diagram. Make sure all components and piping comply with applicable local codes.

**DO NOT** use galvanized pipe anywhere in the system. Galvanizing will react with the glycol and can cause glycol degradation and sludge in the system.

- Confirm charge of expansion tank is 12-15 PSIG (with no water or pressure in the system).
- Install the system piping. DO NOT connect the heat pump unit to the system piping until the system has been cleaned as required below.

**The CC32 must NOT be connected to the system during this process.**

1. Connect a hose from a fresh water supply to the system fill hose bib. Note the drain port can be used for this purpose. The hose bib purge/drain valve should be located low in the system and close to the CC32 return connection.
2. Open the high point purge valve, (not shown in illustration, as it may be inside the air handler) while slowly filling the system. Close the valve when air is removed from the system and water begins to flow out of the valve.
3. Fill the system with fresh water and run water until the system has been thoroughly flushed clean.

Automatic Fill – When an automatic fill system is installed, the cooling fluid (Glycol/water) must be inspected at least every 3 months, or whenever a leak is detected to ensure the proper glycol concentration is maintained.

## System Volume and Expansion Volume

To ensure smooth temperature control and minimize cycling of refrigeration system, all installations must have total circulating volumes equal to or greater than 7.5 gallons per nominal ton of the unit performance at minimum capacity (The greater of either heating or cooling produced). In other words, in the case of a five ton heat pump with 3 to 1 turndown (0.33x rated capacity) the minimum total system volume is  $5 \times 0.33 \times 7.5 = 12.5$  gal. Multiple heat pump installations that are operating in a staged configuration follow the same rule, so that only a single heat pump tonnage needs to be considered. Additionally, the system requires an expansion volume (air) to compensate for the change in volume of the glycol mixture as it heats and cools, see Table 1 for expansion volume. A typical multiple heat pump installation may actually have a volume far greater than the minimum required, and it is this entire volume that must be considered when sizing the expansion tank. Note that the nominal expansion tank volume is not the same as the expansion volume. If the actual air volume is not published, consider it to be no more than half the nominal volume. As an example, a five ton nominal heat pump operating down to 33% capacity, used for both heating and cooling, requires a minimum of 12.5 gallons of circulated system volume. In this case, a 13 gallon buffer tank is selected to maintain minimum requirements. When the system installation is complete, the total volume including the heat pump, buffer tank, and all plumbing is 18 gallons. (Note: the expansion tank, no matter how large, is not considered circulated volume). According to the chart above, the minimum acceptance volume of the expansion tank must be at least 18/15, or 1.2 gallons. If the acceptance volume is not specified, assume it is no greater than 50% of the total tank volume. Therefore in the case of this example, the system would require a minimum tank size of 2.4 gallons. As it is unlikely to find this specific size. Always be sure to round up, so a tank of 3 gallons total volume, or larger, would be appropriate.

## Air Separator

Locate at least one high efficiency air separator as shown in the piping to remove any air from the system.

## Pressure Test The System

1. Add water to the system as needed to raise the pressure to 25 PSIG (verify that all system components are suitable for this pressure). Verify that the pressure remains constant for at least one hour. Locate and correct any leaks.
2. After successfully testing, drain the system and remove the fresh water hose.

## Insulate The Piping

For systems used in cooling applications, the plumbing should be insulated using a vapor barrier to prevent sweating of the pipes and possible damage of the insulation or structure due to water accumulation.



## SECTION 4: WIRING

### CC32 Control Wiring Connection

The SpacePak CC32 requires a dry contact (relay) signal to enable and select between heating and cooling modes. They will not operate on the 24V signals from typical thermostats or air handlers. Connecting 24V to either of these points will result in significant component damage and void factory warranty.

- Connect multiple zone system to heat pump using SpacePak SSIC Control Module and instructions included with it. Refer to manual supplied with SSIC Control Module for connection and operational details.
- See wiring diagram for heat pump electrical diagram.

### Terminal Block Screwdriver

Prior to connecting wiring to unit, please ensure to use a properly sized tool to insert wires into terminal blocks. See below figure for dimensions. Failure to do so can result in damage to the terminal blocks or wires. Note: Dimensional drawing is in mm.

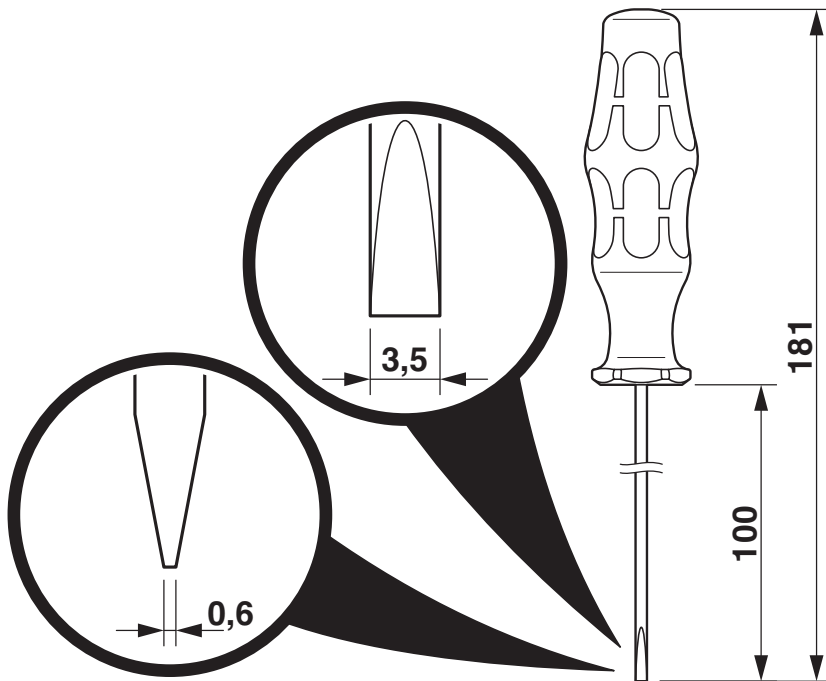
**Note:** Like with all electronic devices, it is important to separate low voltage communication wiring from line voltage power wiring to avoid interference.

When alternating current flows through a conductor, it can induce voltage in another conductor that is placed nearby. This is the same principal that a transformer operates upon.

When 230VAC, 120VAC, or sometimes even 24VAC wires are run near any wires connected to the Remote On/Off, Remote Heat/Cool, Heat/Cool On/Off or ModBUS wiring, it can create interference that may cause erratic operation, or prevent normal operation of the heat pump.

Alternating current and communication wiring should always be separated by a minimum of 6" throughout the length of the wires.

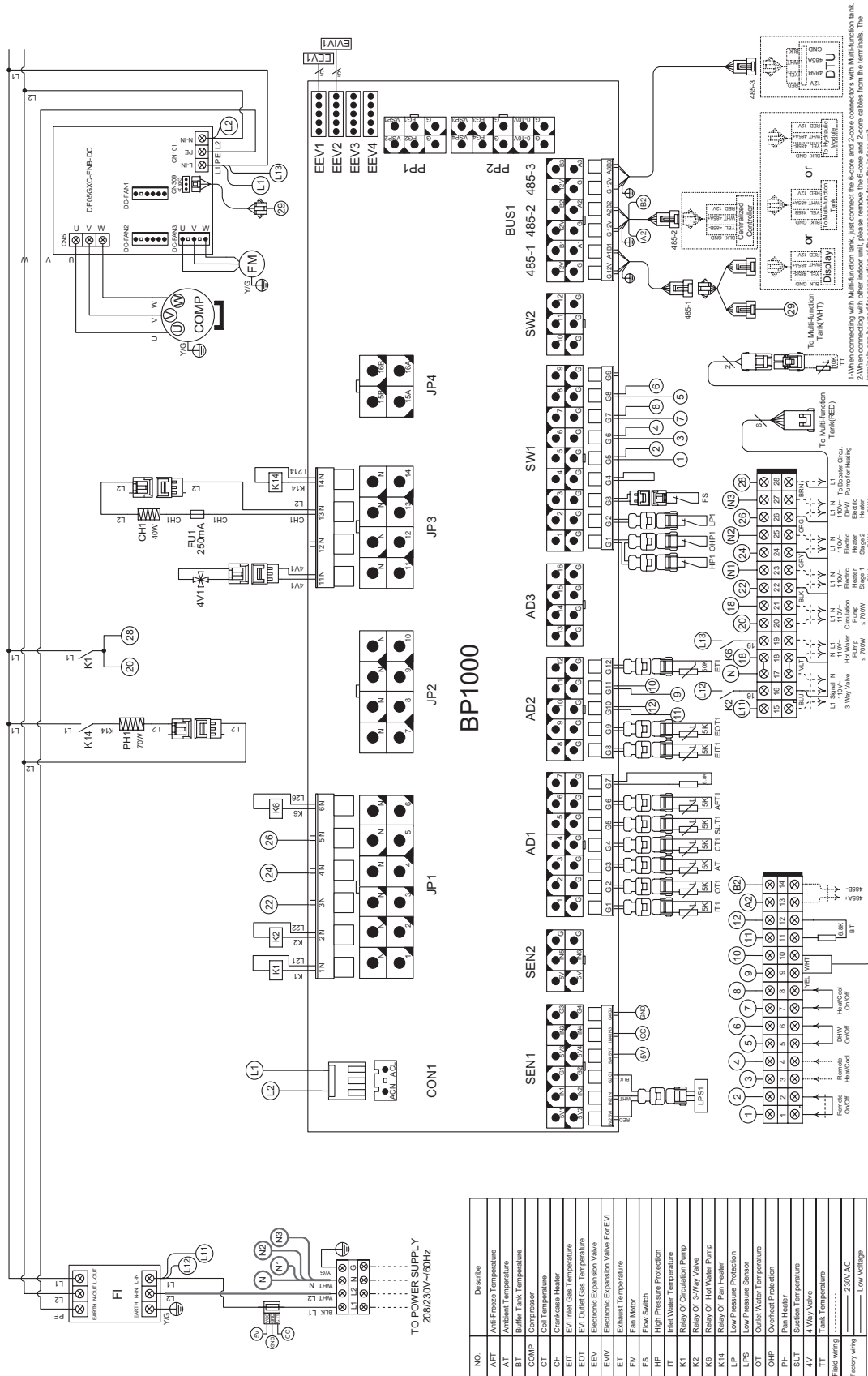
If it is unavoidable to run these wires with the proper separation, the use of shielded multi-conductor cabling for communication may provide sufficient protection to avoid interference. However this should be kept to a minimum length, and the system observed to verify normal operation.





# Wiring Diagrams and Definitions: Internal Wiring

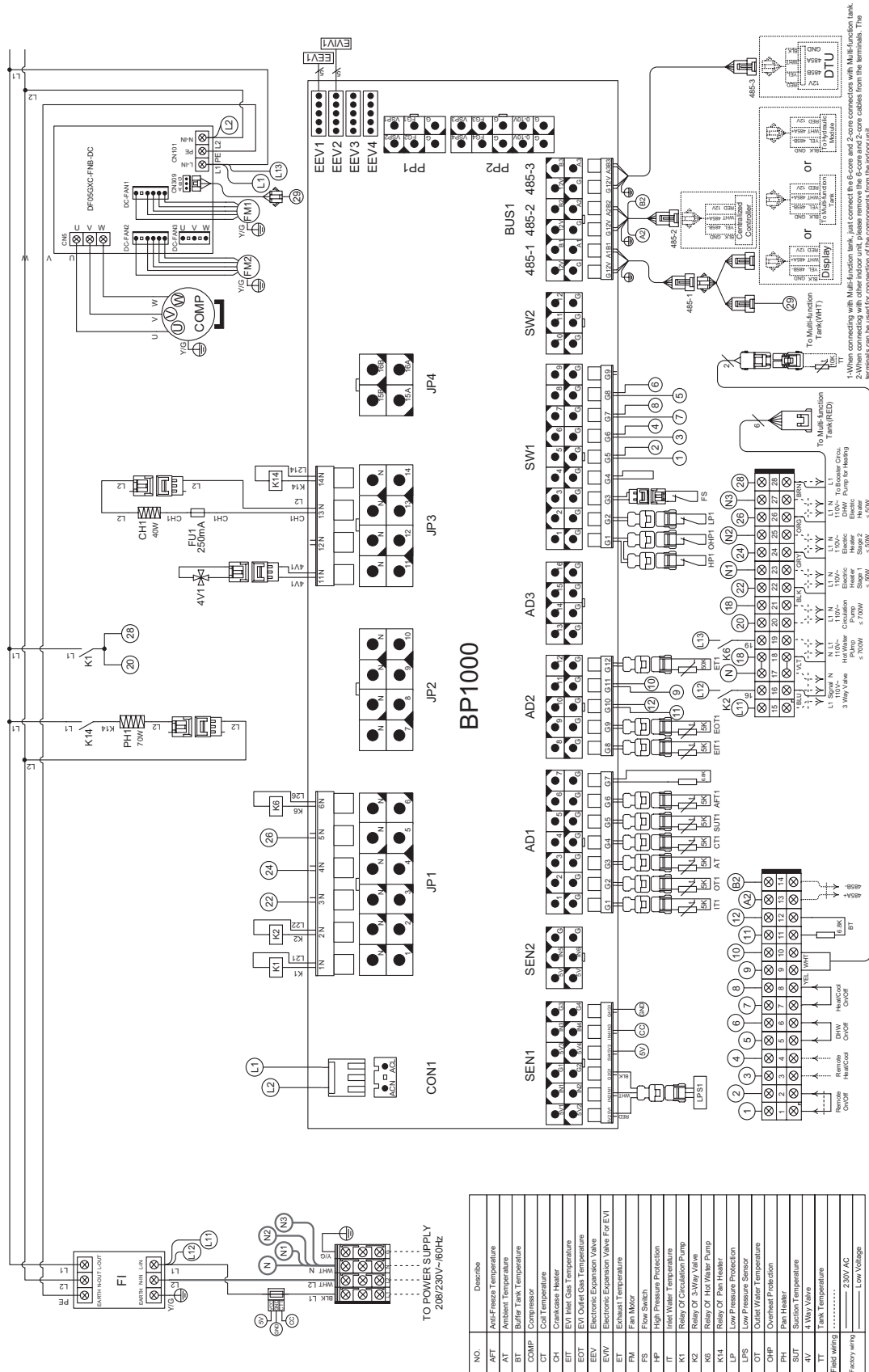
**CAUTION** The remote On/Off, Remote Heat/Cool, Heat/Cool On/Off, and DHW Enable inputs are for voltage-free relay contacts only. Any voltage introduced to the controls at these points will immediately destroy the primary unit control.



CC32-40

# Wiring Diagrams and Definitions: Internal Wiring

**CAUTION** The remote On/Off, Remote Heat/Cool, Heat/Cool On/Off, and DHW Enable inputs are for voltage-free relay contacts only. Any voltage introduced to the controls at these points will immediately destroy the primary unit control.



1: When connecting with Multi-function tank, just connect the 6-core and 2-core connectors with Multi-function tank.  
2: When connecting with other indoor unit, please remove the 6-core and 2-core cables from the terminals. The terminals can be used for connection of the components from the indoor unit.

CC32-60

### ***AUX Heat Overtemp Switch***

When any auxiliary heating device, regardless of the source, is employed and controlled by the heat pump, a Normally Closed thermal switch or fuse must be wired between AI/DI 15 & GND, and installed in thermal contact with the water surrounding or within the heat source. The device must open, or fail open, if the water temperature exceeds a predetermined value sufficient to protect all associated equipment from excess temperature or pressure. In no case shall this value be greater than 201°F/94°C

**⚠ CAUTION** The remote On/Off, Remote Heat/Cool, Heat/Cool On/Off, and DHW Enable inputs are for voltage-free relay contacts only. Any voltage introduced to the controls at these points will immediately destroy the primary unit control.

## SECTION 5: REMOTE TOUCHSCREEN DISPLAY

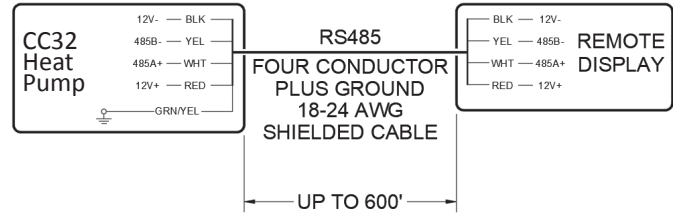
### Overview of the Remote Touchscreen Display

The remote touchscreen display is the Operation and Service interface to the CC32 control.

The full-color screen displays current water inlet and outlet temperatures, outdoor ambient temperature, and DHW tank temperature (if this feature is enabled).

It also allows the user to query the operating status of multiple system characteristics, as well as providing the ability to view and adjust operating parameters through various menu screens.

### Remote Display Connection Diagram



#### Function of the Ports

Port No.	Name	Terminals No.	Function
CN2	Signal port	485A/485B	Communicate with PC8002
	Power input	+12V/GND	Power supply of wire controller, 12V DC

### Display Windows and Functions

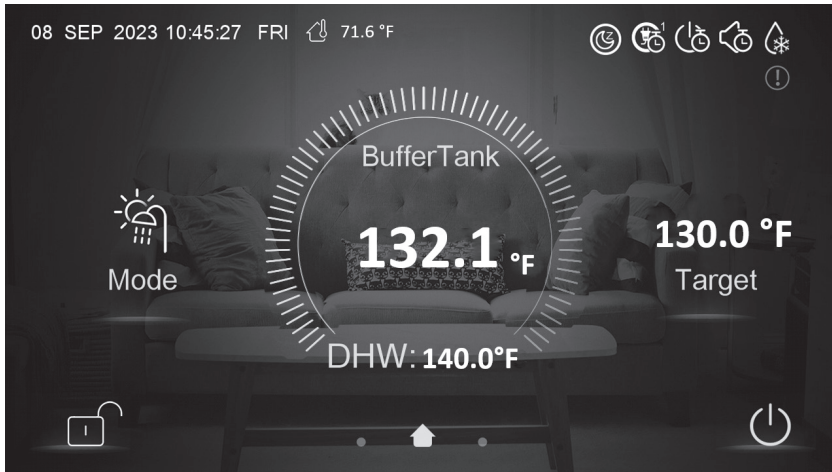
If the display screen is not touched in 30 seconds the screen will dim. The screen will go to sleep after 2 minutes of no operation. Touching the screen will "wake" up the controller again. If the units selected is deg F, the date and time will be displayed as MM/DD/YY, Hr/Min/Wk. If the units selected is deg C, the display date and time will be displayed as DD/MM/YYYY and Hr/Min/Wk.

#### Power on Display Window

The display will show controller and display versions after several seconds at start up. The top number, after the upper-case V, is the Control Software version, the bottom number, after the lower-case v, is the Display Software version. These will be displayed for about 4 seconds, then show the Home Screen.

If communication fails, the version numbers won't be displayed and the Home Screen will appear after 15 seconds. In this case, the home screen will show all zeros, or inaccurate default values.

### Main Display Window



#### Contents and Buttons on Main Display Window

On the startup interface, contents and buttons on main display are illustrated above.

##### On/Off Key



The “on/off” key or power button allows a use to turn the unit on or off regardless of the status of the unit. This will shut down the entire unit, but the unit will still have power going to it. The main display will then turn grey.

##### Return Key

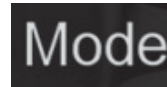


In each sub-menu (not the main interface) the user can use the “return key” to return to the previous screen. This is located in the upper left-hand corner of each menu and submenu.

#### Animation on Main Display Window

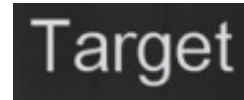
1. When the unit is in defrosting mode, the defrosting icon will show until the defrosting is completed.
2. When the unit is shutdown, the main display will turn black.
3. When the unit is shutdown, if the timing switch function is activated, the color of the button for ‘timer on/off key’ will be green, if not, the button will be white.

##### Mode Key



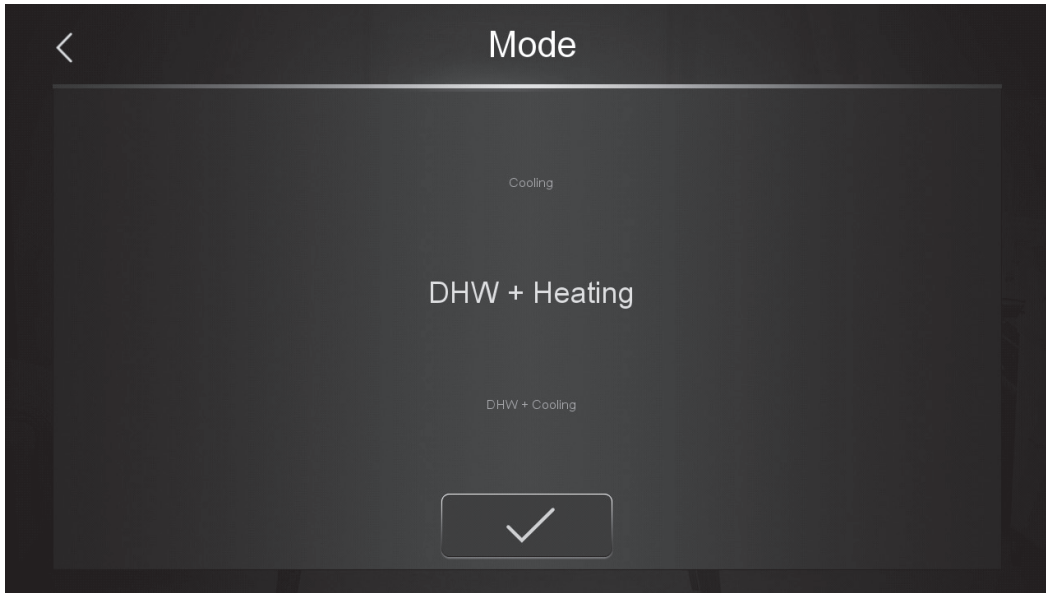
By pressing the “Mode” key the user can now choose which mode they would like the heat pump to run in. Once the mode has been selected, the screen will automatically return to the main screen and the appropriate mode symbol will be displayed on the main screen. Heating = sun, cooling = snowflake etc...

##### Target Temp Set Key






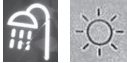
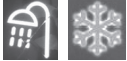
This key is used to set the target set point the heat pump will work to achieve.

## Mode Selection and Target Temperature Setting



### Mode Selection

On main display window, press 'M' button, it will show five modes. After having chosen one mode, It will return to main display automatically.

1. When choosing Hot Water mode, the display will show 'hot water' 
2. When choosing Heating mode, the display will show 'heating' 
3. When choosing Cooling mode, the display will show 'cooling' 
4. When choosing Hot Water + Heating mode, the display will show 'hot water' and 'heating'. 
5. When choosing Hot Water + Cooling mode, the display will show 'hot water' and 'cooling'. 

### Other Selections

#### Mode Selection Under Member Mode

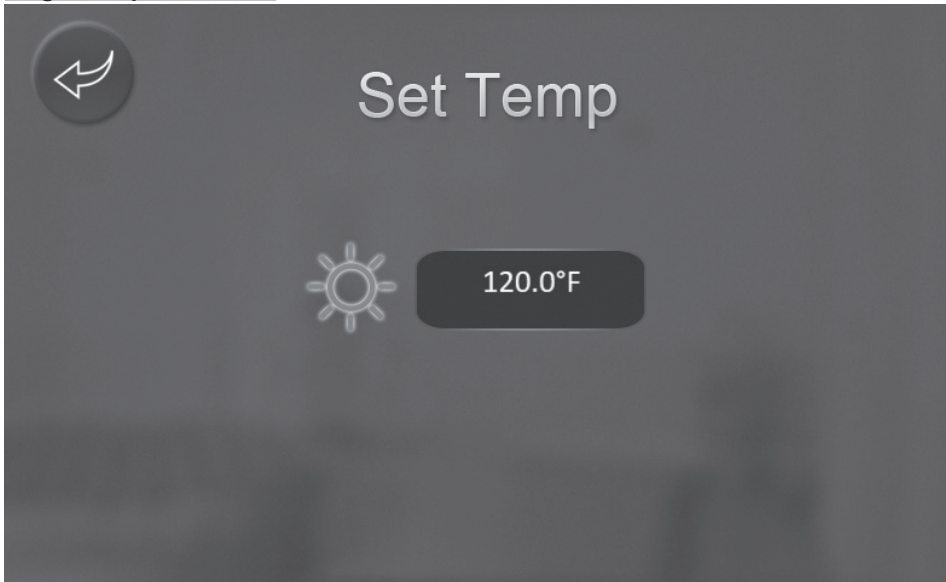
When choosing member mode H02=1, the color of the buttons on the display will turn grey and are not clickable.

#### Target Temperature Setting Under Current Mode

The different modes have different target temperature settings interface. For example, when choosing Cooling mode, The target temperature setting interface will show cooling set point.



**Target Temp Set Screen**



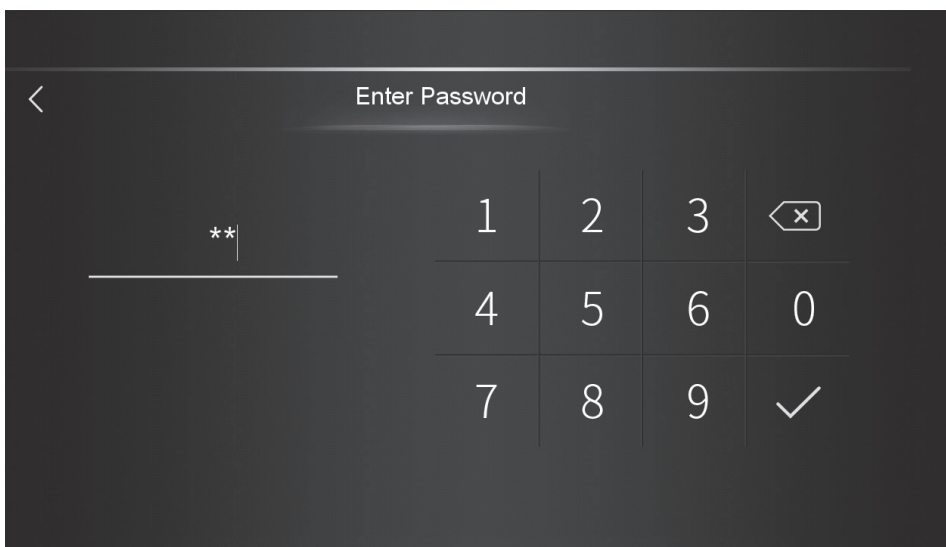
This can be adjusted by pressing the temp (on the screen) which opens a new screen and then entering in a numeric value within specified parameters in the control (see parameter chart for min and max settings). Once a target is set, the user will need to press “enter” to save the set point. This should return the user to the target set screen where they will see the new setpoint has been saved. Press the return key to return to the main interface.

**Lock Key**



The lock key button will allow a user to lock the screen and prevent un-wanted or accidental touches on the screen.

**Lock Key Passcode Screen**



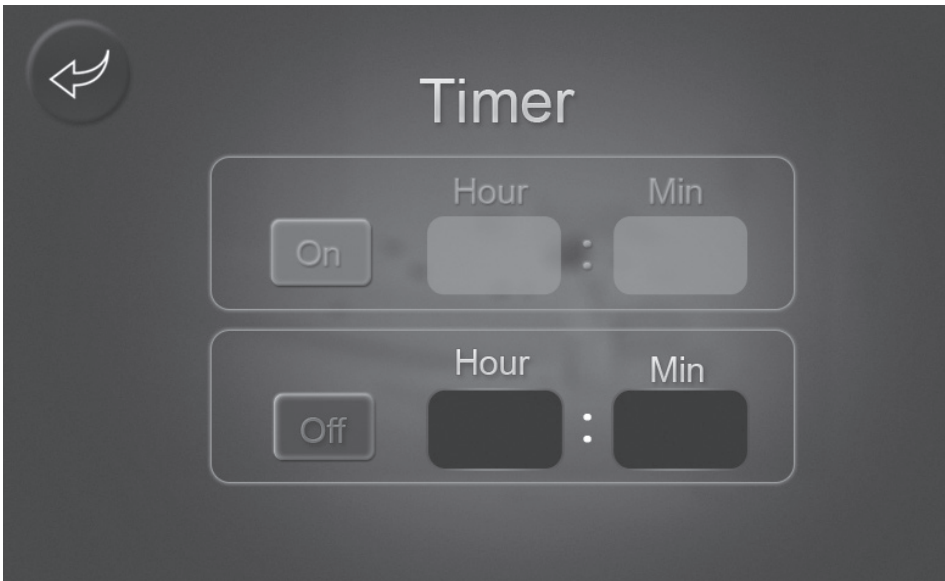
To unlock, simply press the lock key again and enter the code “22” when prompted. Press enter and the screen will be unlocked again.

### Timer Key



The timer key allows the user to set a schedule to not allow the unit to operate through timers regardless of set points.

### Timer Key Screen

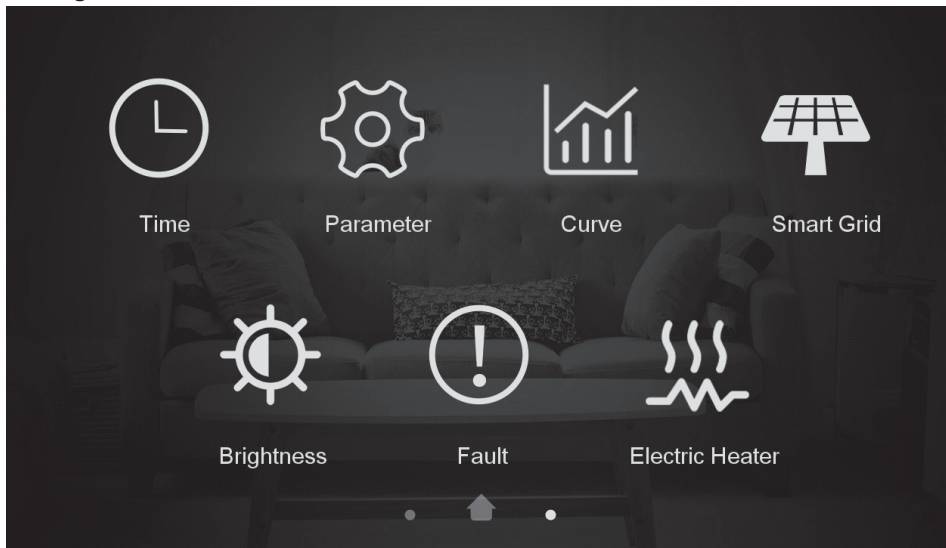


The user can use the day schedule on the bottom row to select the day they want to set the unit to be off. Once the day is selected, the user will need to select the appropriate times (AM or PM) that the unit will not need to be run. For example: If a user does not want the unit to run on Monday from 11 AM – 2PM. Select “Mon” at the bottom (red arrow should be under the day). Select “AM” and press the clock on the 11-12 block and the 1-2 block. This should highlight the blocks in green. Once the schedule has been set, the user will need to ensure the “on/off” toggle is set to “on” by pressing it if it set to “off”. Once confirmed, press the “return” key which will bring you back to the main interface. During normal operation, the unit will run normally. During the scheduled “off” time the main interface will now be grey and the “timer key” will be illuminated in green.

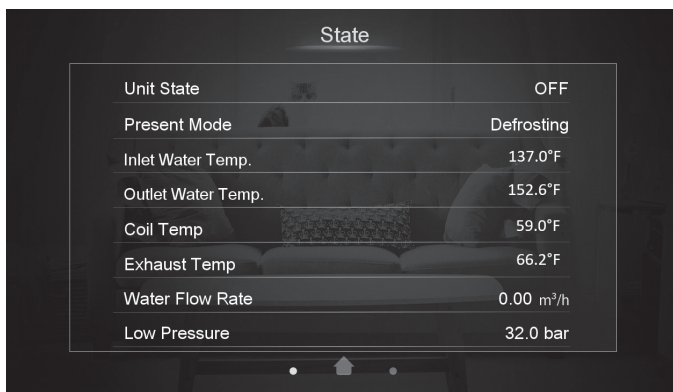
### Settings Key

Swipe right to access settings.

**Settings Screen**



**Settings > Status**

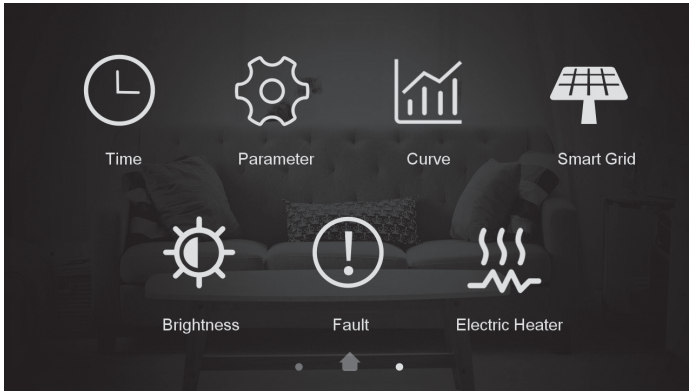


Under the status menu, the user can view the following status' of the unit during real time operation

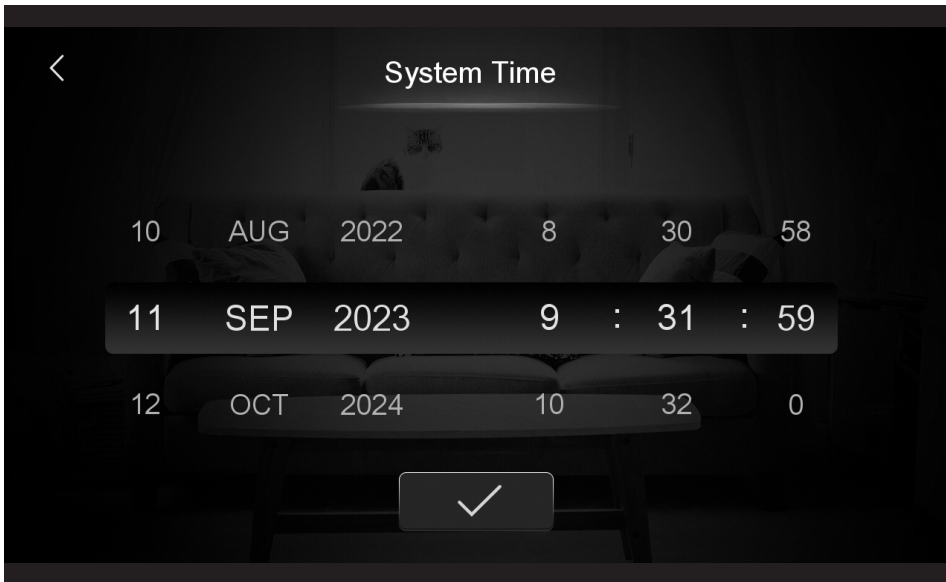
1. Unit Status (on/off). Whether the unit is operating or not
2. Present Mode: Displays the mode that the unit is running in (heating, cooling etc..)
3. Inlet Water Temp: Displays the current inlet water temperature being measured
4. Outlet Water Temp: Displays the current outlet water temperature being measured
5. Coil Temp: Will display the current coil temperature being measure on the surface of the finned coil.
6. Exhaust temp: Will display the current discharge refrigerant temperature.
7. Water Flow Rate: Not Available
8. Low Pressure: Current suction pressure.

**Settings > Electric Heating**

All CC32 units have a feature that allows the unit to turn on a relay output “AUX” relay (see wiring section) for an external electric heater. The heater can be controlled by selecting and adjusting the appropriate parameters (see parameter chart) to provide supplemental heat when desired. To turn the feature on, press the electric heating key and choose “on”. To turn off, choose “off”. Once selected, the screen will automatically return to the “settings” screen.

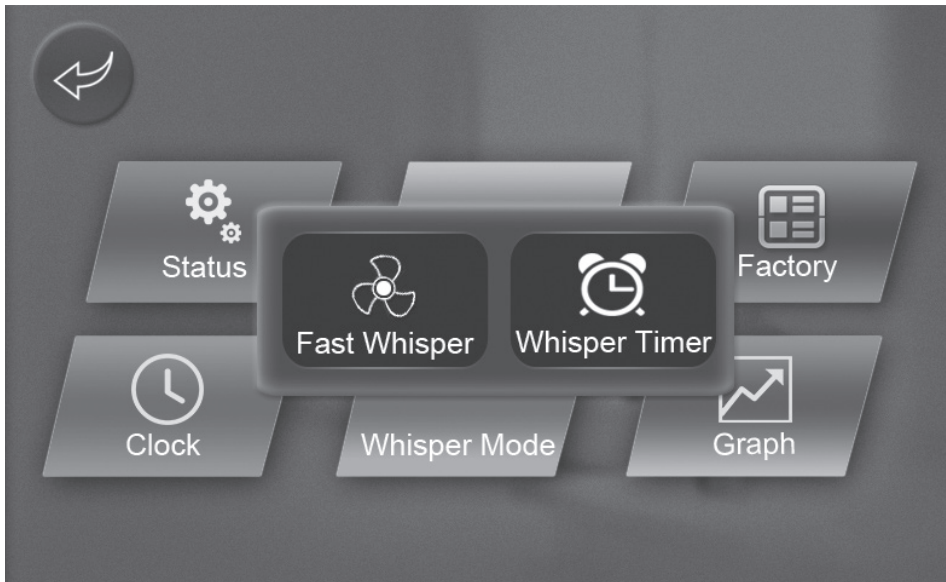


**Settings > Clock**



By pressing the clock menu, the user can set the correct time and date by using the up and down arrows keys. To save the user must press the enter key.

**Settings > Whisper Mode**



Note: Whisper Mode and Whisper Timer are only visible if enabled by parameter H22.

The purpose of the Whisper Key is to silence the fans and unit for a quieter operation. When pressing the Whisper key, the user has two options. "Fast Whisper" or "Whisper Timer". In "Whisper Mode" both the compressor and the fans will be limited.

**Fast Whisper-** To enable the "Fast Whisper" function, press the "Fast Whisper" button, this will slow the fans down to provide a quieter operation. However, the fast whisper will also decrease capacity. Use only when quiet operation is required. To turn off, press "Fast Whisper" again.

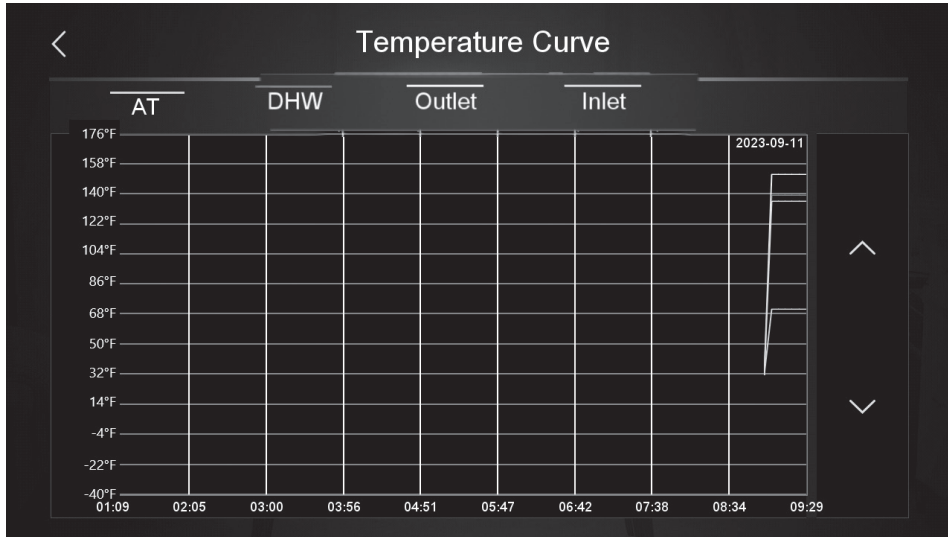
"Fast Whisper" may also be referred to as "Fast Mute" however the functionality will be the same.

**Settings > Whisper Mode > Whisper Timer**



Allows the user to schedule times to quiet the unit. This will slow the fans down to provide a quieter operation during the scheduled times. However, the Whisper timer will also decrease capacity. Use only when quiet operation is required

**Settings > Curve**



The curve key allows a user to visually see (in real time and historical) the operational curves of the inlet water, outlet water and ambient on graph of temperature versus time period.

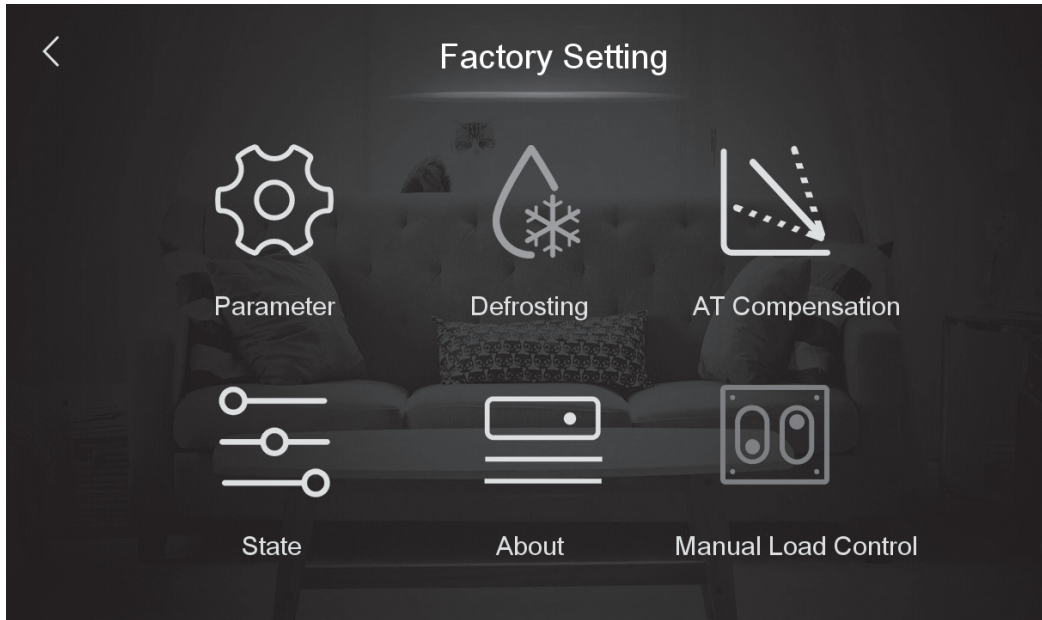
**Settings > Factory**

The figure shows a screen titled "Enter Password" with a back arrow on the top left. On the left side, there is a horizontal line with two asterisks "\*\*" and a vertical cursor. On the right side, there is a numeric keypad with a 3x4 grid of buttons: the first row contains 1, 2, 3, and a delete button (a square with an 'x'); the second row contains 4, 5, 6, and 0; the third row contains 7, 8, 9, and a checkmark button.

The factory key allows the user to enter in a password that will provide certain information based on the password entered. Please see below charts for each menu based on password selection.

**Settings > Factory > Passcode “22”**

Password = “22” the following menu appear:



**Settings > Factory > Passcode “22” > Parameters**

**Parameters Submenu**

Press this key to access certain parameters only meant to be changed by a user. Use the parameter chart from this manual to determine what parameters are accessible with the proper password.

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Protect	A04	Antifreeze Temp.	Deg F	39.2	39.2	39.2	35.6-50	Freeze protection will energize the circulator when the ambient temperature is below 35.6°F and the Inlet Water Temp is below A04. The (Unit) will start in Heating mode when the ambient temperature is below 32°F and the inlet water temperature is below A04.
	A23	Min. Outlet Water Temp. Protect	Deg F	41	41	41	-22-68	The lowest supply temperature allowed. Unit will reduce capacity or shut down to prevent falling below this value
	A27	Temp. Diff. of Limiting Frequency	Deg F	12.6	12.6	12.6	-36-171	If the temperature difference between return and supply are greater than this value, the compressor speed will roll back
	A28	Temp. Diff. Between Outlet and DHW Temp	Deg F	12.6	12.6	12.6	-36-171	If the temperature difference between unit supply and DHW tank temp are greater than this value, the compressor speed will roll back
	A31	Electric Heater on AT	Deg F	44.6	44.6	44.6	-22-140	Electric heat will only engage when the ambient T is below this value
	A32	Electric Heater Delays Comp. On Time	Min	30	30	30	10-999	Minimum compressor run time before electric heaters can engage.
	A33	Electric Heater Opening Temp. Diff	Deg F	3.6	3.6	3.6	0-36	Electric heaters can only come on when the water temperature is this value less than the target temperature
	A34	Crank Preheating Time	Min	0	0	0	0-360	Time the crankcase heater must be energized before the compressor may start
	A35	Electric Heater Off Temp. Diff	Deg F	0	0	0	0-54	Electric heaters will turn off when the water temperature is this value less than the target temperature

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
System	H05	Enable Cooling Function		1	1	1	0-no, 1-yes	If H05 = 0, unit will only operate in heating. If H05=1, unit can operate in both heating and cooling.
	H07	Display Control/Remote Control		1	1	1	0- display control, 1-remote control	When H07 = 0, unit is controlled by remote display, when H07 = 1, unit is controlled by field wired inputs
	H10	Unit Address		1	1	1	1-32	When multiple units are operating from a Modbus signal, H10 is set to the unique address of the individual unit.
	H18	Electric Heater Stage		3	3	3	1- Stage 1, 2- Stage 2, 3- Stage 3	H18 = 1 single stage of electric heat engages after 30 minutes. H18 = 2, stage 1 runs for 30 minutes, then disengages and Stage 2 engages. H18 = 3, Stage 1 runs for 30 minutes, then disengaged and Stage 2 engages and runs for 30 minutes, then Stage 1 and Stage 2 run together
	H20	3-Way Valve Polarity		0	0	0	0- Hot Water -ON, 1- Hot Water - OFF	When H20 = 0, DHW circuit energizes on a DHW call. When H20 = 1, circuit de-energizes on a DHW call.
	H21	Temperature Unit		0	0	0	0-°F, 1-°C	H21 = Degrees Celsius, H21=1 Degrees Fahrenheit
	H22	Enable Silent Mode		1	1	1	0-no, 1-yes	H22 = 0, silent mode disabled, H22 = 1, silent mode enabled
	H25	Temp. Control Selection		0	0	0	0- Outlet Water Temp, 1- Room Temp, 2- Buffer Tank Temp, 3-Inlet Water Temp	Unit controls operation based upon this reading.
	H28	Heating/Cooling and Hot Water Function Enabled		0	0	0	0-no, 1-yes, 2- Only DHW	H28 = 0, DHW is not enabled. H28 = 1, DHW function is enabled. H28=2 Heating/Cooling Disabled. Only DHW
	H30	Enable Hydraulic Module		0	0	0	0-no, 1-yes	Feature is not used in the (Unit)
	H32	Force Switch mode Time	Minute	120	120	120	1-300	This is the maximum continuous time DHW will operate if there is a heating call. After H32 time expires, unit will change over and satisfy the heating call.
	H36	Enable Positive Weather Compensation		0	0	0	0-no, 1-yes	0=Outdoor Temp Reset disabled, 1= Outdoor Temp Reset Enabled
	H37	DHW Temp. Sourcing		0	0	0	0- DHW Tank Sensor, 1-External from Modbus	0= DHW temp read from DHW tank, 1= DHW temp communicated from BMS
	H38	Language		0	0	0	0- English, 1-Polish, 2-German, 3-Dutch, 4-Danish, 5-Espanol, 6-Greek	0= English, this is the only language supported at this time.
	H40	External Pump Selection		0	0	0	0- Hot Water Pump, 1-Warm Water Cir. Pump, 2-Off Signal When Defrosting	Does not apply to this model
H43	Normal/Eco		0	0	0	0-Normal, 1-Eco	Does not apply to this model	



	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Defrost	D03	Interval Time Between Defrosting Cycles	Minutes	45	45	45	10-90	Minimum Start to Start time between two consecutive defrost cycles
	D04	Exhaust Temp. Correction for Defrosting Cycle	Deg F	105	105	105	32-302	Maximum discharge temperature during Defrost cycle, controlled by EEV function
	D17	Coil Temp. of Exit Defrosting	Deg F	55.4	55.4	55.4	-34.6-113	Defrost will end when the coil temp rises above D17
	D19	Max. Defrosting Time	Minutes	8	8	8	0-20	Maximum allowable duration of one defrost cycle
	D24	Defrosting Heating Source in Heating/ DHW Mode	Deg F	2	2	2	0-Stay Current Circuit, 1-DHW Circuit, 2-Heating Circuit	Water is drawn from this source during Def. 1=Current Operating Circuit, 1 DHW Circuit, 2 Heating Water Circuit
	D26	Enable Defrosting Communication in Cascade		0	0	0	0-no, 1-yes	Does not apply to the (unit)
Temperature	R01	DHW Target Temp.	Deg F	131	131	131	59-140	Target temperature of sensor inside potable domestic hot water tank
	R02	Heating Target Temp.	Deg F	113	113	113	59-140	Target temperature of the outlet water supplying the Heating loop
	R03	Cooling Target Temp.	Deg F	44.6	44.6	44.6	37.9-82.4	Target temperature of the outlet water supplying the Cooling loop
	R04	Temp. Diff. for Power-on in Heating	Deg R	5	5	5	0-18	Heating operation will start on a new call when the Outlet water is below R02 - R04
	R05	Temp. Diff. for Standby in Heating	Deg R	1	1	1	0-18	Heating operation will stop when the Outlet water rises to R02 + R05. Then set value of T = Inlet temp at that instant. When Heating call is maintained, operation will resume when Outlet temp falls to T - R04
	R06	Temp. Diff. for Power-On in Cooling	Deg R	5	5	5	0-18	Cooling operation will start on a new call when the Outlet water is above R03 + R06
	R07	Temp. Diff. for Standby in Cooling	Deg R	1.8	1.8	1.8	0-18	Cooling operation will stop when the Outlet water falls to R03 - R06. Then set value of T = Inlet temp at that instant. When Cooling call is maintained, operation will resume when Outlet temp rises to T + R06
	R16	Temp. Diff. for Power-on in DHW	Deg R	5	5	5	0-18	DHW function will start when the DHW Tank temperature is below R01 - R16
	R17	Temp. Diff. for Standby in DHW	Deg R	2	2	2	0-18	DHW function will stop when the DHW Tank temperature reaches R01 + R17
	R35	Location of Electric Heater		0	0	0	0-Not Available, 1-Main Water Circuit, 2-DHW Tank, 3-Buffer Tank	R35 = 0 no electric heater present. R35 = 1 Heater active in Heating Mode, R35 = 2 Heater active in DHW Mode, R35=3 Heater active in Buffer Tank
	R70	Target Room Temp.	Deg F	68	68	68	41-80.6	Control temperature when H25=2
	R71	Room Temp. Diff. for Power-on in Heating	Deg F	1	1	1	0.2-5.4	Room temp Stop differential in heating when H25=2
	R72	Room Temp. Diff. for Standby in Heating	Deg F	1	1	1	0.2-5.4	Room temp Start differential in heating when H25=2
	R73	Room Temp. Diff. For Power-on in Cooling	Deg F	1	1	1	0.2-5.4	Room temp Stop differential in cooling when H25=2
R74	Room Temp. Diff. for Standby in Cooling	Deg F	1	1	1	0.2-5.4	Room temp Start differential in cooling when H25=2	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Pump	P01	Main Circulation Pump Operation Mode		1	1	1	0-Always on, 1-Saving, 2-Interval	P01 = 0 Pump runs whenever Remote On/Off is closed. P01 = 1 Pump runs when when Remote On/Off and Heat/Cool On/Off is closed. P01 = 2, Pump runs on intervals according to P02 and P03
	P05	DHW Pump Operation Mode		0	0	0	0-Always on, 1-Saving, 2-Interval	P05 = 0 DHW Pump runs whenever DHW On/Off is closed. P05 = 1 Pump runs when whenDHW On/Off is closed and TT is below DHW setpoint - R32. P05 = 2, Pump runs on intervals according to P02 and P03
	P06	Main Circulation Pump Manual Control		1	1	1	0-no, 1-yes	0=Internal pump, 1=External pump controlled by Unit
	P09	Circulation Pump Protection Period	Days	0	0	0	0-30	If value is greater than 0, heat pump turns on and exercise pump every P09 days.
Disinfection	G01	Disinfection Water Temp.	Deg F	145.4	145.4	145.4	140-158	Target temperature or Sterilize cycle
	G02	Time Duration of Disinfection	Minutes	0	0	0	0-60	Duration of Sterilize Cycle
	G03	Disinfection Starting Time	Hours	0	0	0	0-23	Time of day (24h) to start Sterilize cycle. 23 = 11:00 PM
	G04	Interval Period of Disinfection	Days	30	30	30	1-30	Number of days between Sterilize cycles
	G05	Enable Disinfection		0	0	0	0-no, 1-yes	G05 = 0 Sterilize Cycle is Dormant G05 = 1 Sterilize Cycle is active

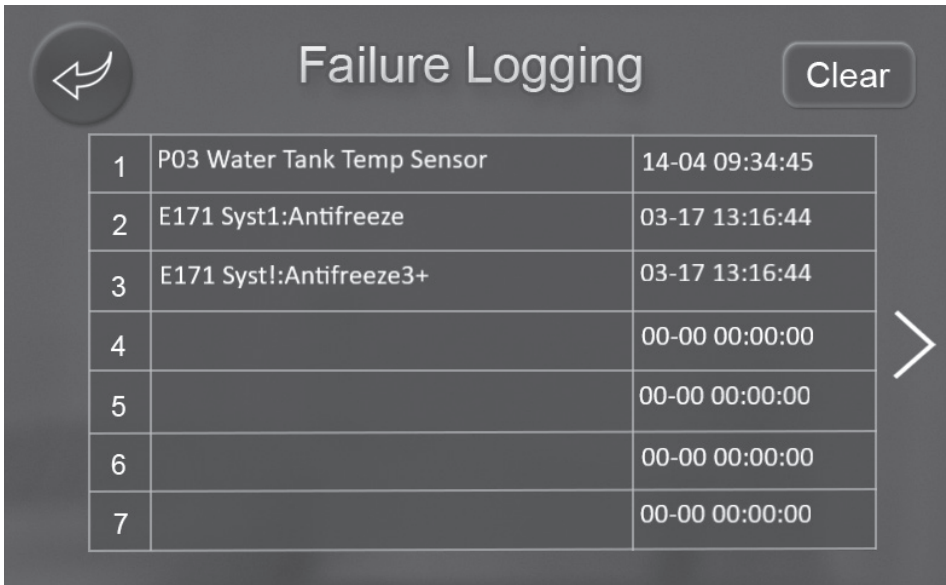
## Parameters

Allows the user to see the current state of certain items. By selecting the appropriate top menu, the user can see how the unit is currently operating. See below chart for each item a user can monitor.

	Parameter Code	Parameter Name	Description
Load Status	O01	Compressor	Compressor enabled
	O05	Main Circulation Pump	Pump enabled
	O06	DHW Pump	DHW Pump enabled
	O07	4-Way Valve	Reversing valve energized
	O08	Electric Heater Stage 1	Stage 1 Aux heat output enabled
	O09	Electric Heater Stage 2	Stage 2 Aux heat output enabled
	O10	Hot Water 3-Way Valve	DHW diverter valve energized
	O11	Alarm	Alarm output energized
	O12	Crankcase Heater	Crankcase heater energized
	O13	Bottom Plate Heater	Condensate pan heater engaged
	O15	EEV Steps	Main Exp Valve steps open
	O17	EVI EEV Steps	EVI Exp Valve steps open
	O21	Heating Circulation Pump	Does not apply to this model
	O22	Electric Heater in Main Circuit in Hydraulic Module	Does not apply to this model
	O23	Electric Heater in DHW Tank in Hydraulic Module	Does not apply to this model
	O24	2-Way valve	Does not apply to this model
O25	DHW Electric Heater	Does not apply to this model	
O26	Cooling 3-Way Valve	Does not apply to this model	
Switch Status	S01	High Pressure Switch	Discharge pressure sw. NC
	S02	Low Pressure Switch	Suction pressure sw. NC
	S03	Flow Switch	Flow prove sw. NC
	S04	Electric Heater Overheat Fault	Aux heat safety NC
	S05	Remote Switch	Remote enable, close to run
	S06	Heating / Cooling Mode Switch	Open=Cooling, Closed=Heating
	S07	DHW Switch	DHW operation when closed
	S10	Heating & Cooling Function Switch	Space Heating or Cooling when closed
Temperature Status	T01	Inlet Water Temp.	Temperature of water returning from the system
	T02	Outlet Water Temp.	Temperature of water being supplied by the heat pump
	T03	Coil Temp.	Outside coil surface temperature
	T04	Ambient Temp. (AT)	Outside Air Temperature
	T05	Suction Temp.	Refrigerant suction temperature
	T06	Antifreeze Temp.	Freeze protection sensor reading
	T07	Buffer Tank Temp.	System buffer tank temp when installed
	T08	DHW Tank Temp.	DHW Water temperature when installed
	T09	Room Temp.	Temperature of the Room sensor when installed and enabled
	T10	EVI Inlet Temp.	Refrigerant Temperature Entering the Vapor Injection HX
	T11	EVI Outlet Temp.	Refrigerant Temperature Leaving the Vapor Injection HX
	T12	Exhaust Temp.	Discharge temperature of the compressor
	T14	Distributor Tube Temp.	Refrigerant Liquid Line Temperature
	T15	Low Pressure Switch	Low pressure safety switch, open on fault (less than .15 Mpa, 22 PSI)
	T27	Speed of Fan Motor 1	Fan motor #1 speed in RPM
	T28	Speed of Fan Motor 2	Fan motor #2 speed in RPM, if applicable
	T29	Target Speed of Fan Motor	Fan speed called for by control
	T30	Compressor Frequency	Compressor speed, in Hz, called for by control
	T31	Operation Frequency of Compressor	Actual measured compressor speed, in Hz
	T32	Max. Frequency from Comp. Driver	Compressor speed limit imposed by Inverter (typically higher than T31)
	T33	IPM High Fault Temp.	Compressor inverter board processor high limit (actual temp read as T38)
	T34	AC Input Voltage	Voltage supplied to the unit
	T35	AC Input Current	Amps drawn by the unit
	T36	Phase Current of Compressor	3 Phase current output of the inverter
	T37	DC Power Bus Voltage	DC voltage of the inverter board
	T38	IPM Temp.	Compressor inverter board processor temperature (limited by T33)
	T39	Water Flow Rate	Not read in this model
	T40	Heating Returning Water Temp.	Not read in this model
	T41	Heating Leaving Water Temp.	Not read in this model
	T42	Mix Tube Outlet Water Temp.	Not read in this model
	T43	DHW Returning Water Temp.	Not read in this model
	T44	DHW Leaving Water Temp.	Not read in this model
T45	High Pressure Switch	High pressure safety switch, open on fault (greater than 4.4 MPa, 638 PSI)	
T46	External Fan Motor Driver IPM Temp.	Fan motor inverter board processor temperature	
T47	External Fan Motor Driver Power	Power consumed by the fan motor circuit (both fans if applicable)	
T48	External Fan Motor Driver Current	EC current output of the inverter	
T49	Evaporation Temp.	Evaporating temperature measured at HX inlet	
T50	Exhaust Superheat	Discharge superheat calculated from discharge temperature and ?	
T51	Suction Superheat	Suction pressure calculated from suction temperature and ?	
T52	Transformer Current 1	Not read in this model	
T53	Transformer Current 2	Not read in this model	
T54	Transformer Current 3	Not read in this model	

**Settings > Factory > Passcode "22" > Failure**

**Failure Log Submenu**

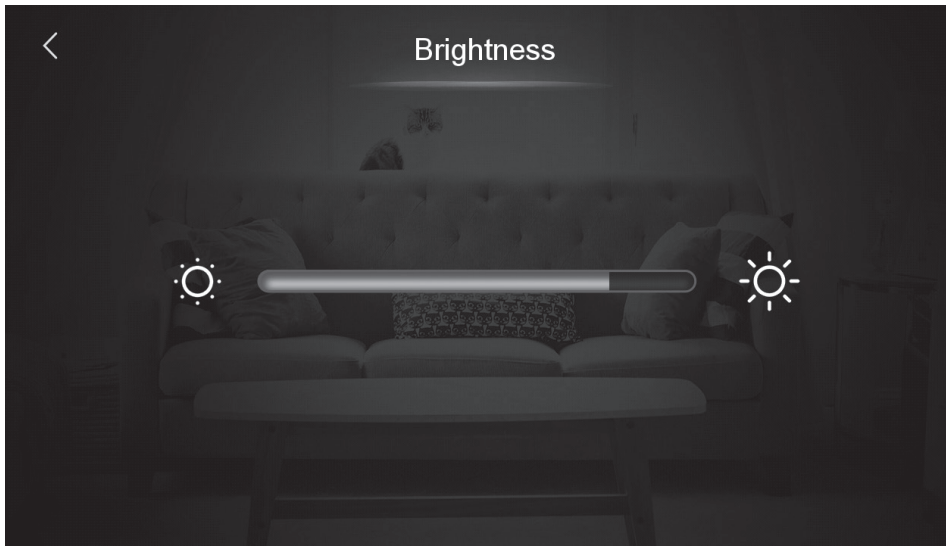


Failure Logging		
1	P03 Water Tank Temp Sensor	14-04 09:34:45
2	E171 Syst1:Antifreeze	03-17 13:16:44
3	E171 Syst!:Antifreeze3+	03-17 13:16:44
4		00-00 00:00:00
5		00-00 00:00:00
6		00-00 00:00:00
7		00-00 00:00:00

Press this key to find the log of the most recent faults the unit has encountered. The fault, the time of the fault and the date of the fault will all be recorded and displayed. The log is capable of holding the most recent 35 faults. The fault log can be cleared by pressing the "Clear" button in the upper right hand corner and then entering in the correct password. The password changes everyday with the day of the month (see instructions how to set up time and date). Example: if the date is 1/5/21 the password will be "5". Press Yes to continue/verify to clear the log.

**Settings > Factory > Passcode "22" > Brightness**

**Brightness Submenu**



The brightness key allows the user to adjust the screen brightness. Press the brightness bar to the right to make the display brighter and the left on the brightness bar to make the display less bright.

## SECTION 6: PARAMETERS

### Settings > Factory > Passcode "66"

Password = "66" the following menus appear: Use the Parameter table in this manual to define and determine which parameter are accessible through the "66" pass code.

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Protect	A03	Shutdown Ambient Temp.	Deg F	-25	-25	-25	-40-50	The (Unit) will not start or operate when the ambient temperature is below A03.
	A04	Antifreeze Temp.	Deg F	39.2	39.2	39.2	35.6-50	Freeze protection will energize the circulator when the ambient temperature is below 35.6°F and the Inlet Water Temp is below A04. The (Unit) will start in Heating mode when the ambient temperature is below 32°F and the inlet water temperature is below A04.
	A05	Antifreeze Temp. Difference	Deg Diff	3	3	3	1.8-90	Freeze protection will shut off when the inlet water temperature rises above A04+A05.
	A06	Max. Exhaust Temp.	Deg F	239	239	239	140-266	Compressor will shut off if the discharge temperature reaches A06. It will restart when the temperature falls to A06 - 54°F
	A11	Enable Low Pressure Sensor		1	1	1	0-no, 1-yes	1=Yes, sensor is enabled
	A21	Ambient/Suction/Coil Sensor Type		0	0	0	0-5K, 1-2K	0 = 5k NTC Thermistor, 1 = 2k NTC Thermistor
	A22	Min. Antifreeze Temp.	Deg F	39.2	39.2	39.2	-4-50	The minimum allowable value of A04 is defined as A22
	A23	Min. Outlet Water Temp. Protect	Deg F	41	41	41	-22-68	The lowest supply temperature allowed. Unit will reduce capacity or shut down to prevent falling below this value
	A24	Excess Temp. Diff. Between Inlet and Outlet Temp.	Deg Diff	15	15	15	0-54	Max difference between Supply and Return temps. Init will reduce capacity or shut down to prevent exceeding this
	A25	Minimum Evaporation Temp. of Cooling	Deg F	14	14	14	-58-86	The lowest evaporating temperature allowed. Unit will reduce capacity or shut down to prevent falling below this value
	A26	Refrigerant Type		0	0	0	0-99	0 = R32, 1 = R290
	A27	Temp. Diff. of Limiting Frequency	Deg F	12.6	12.6	12.6	-36-171	If the temperature difference between return and supply are greater than this value, the compressor speed will roll back
	A28	Temp. Diff. Between Outlet and DHW Temp	Deg F	12.6	12.6	12.6	-36-171	If the temperature difference between unit supply and DHW tank temp are greater than this value, the compressor speed will roll back
	A29	Enable High Pressure Sensor		0	0	0	0-no, 1-yes	Not used in this unit
	A30	Min. AT for Cooling	Deg F	5	5	5	-22-140	The minimum Ambient temperature that the unit can operate in Cooling mode
	A31	Electric Heater on AT	Deg F	44.6	44.6	44.6	-22-140	Electric heat will only enage when the ambient T is below this value
	A32	Electric Heater Delays Comp. On Time	Min	30	30	30	10-999	Minimum compressor run time before electric heaters can engage.
	A33	Electric Heater Opening Temp. Diff	Deg F	3.6	3.6	3.6	0-36	Electric heaters can only come on when the water temperature is this value less than the target temperature
	A34	Crank Preheating Time	Min	0	0	0	0-360	Time the crankcase heater must be energized before the compressor may start
	A35	Electric Heater Off Temp. Diff	Deg F	0	0	0	0-54	Electric heaters will trun off when the water temperature is this value less than the target temperature
A38	Low Pressure of Limiting Frequency	bar	0	0	0	0-20	Commprssor speed will roll back if the suction pressure falls below this value	
A39	Max. Current Value	A	0	0	0	0-50	Feature not used in this model	
A40	Rated Water Flow	m^3/h	0	0	0	0-9.99	Feature not used in this model	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
System	H01	Enable Power-Off Memory		1	1	1	0-no, 1-yes	The control will retain the last operating mode when powered down and restarted
	H05	Enable Cooling Function		1	1	1	0-no, 1-yes	If H05 = 0, unit will only operate in heating. If H05=1, unit can operate in both heating and cooling.
	H07	Display Control/Remote Control		1	1	1	0- display control, 1-remote control	When H07 = 0, unit is controlled by remote display, when H07 = 1, unit is controlled by field wired inputs
	H10	Unit Address		1	1	1	1-32	When multiple units are operating from a Modbus signal, H10 is set to the unique address of the individual unit.
	H18	Electric Heater Stage		3	3	3	1- Stage 1, 2- Stage 2, 3- Stage 3	H18 = 1 single stage of electric heat engages after 30 minutes. H18 = 2, stage 1 runs for 30 minutes, then disengages and Stage 2 engages. H18 = 3, Stage 1 runs for 30 minutes, then disengaged and Stage 2 engages and runs for 30 minutes, then Stage 1 and Stage 2 run together
	H20	3-Way Valve Polarity		0	0	0	0- Hot Water -ON, 1- Hot Water - OFF	When H20 = 0, DHW circuit energizes on a DHW call. When H20 = 1, circuit de-energizes on a DHW call.
	H21	Temperature Unit		0	0	0	0-°F, 1-°C	H21 = Degrees Celsius, H21=1 Degrees Fahrenheit
	H22	Enable Silent Mode		1	1	1	0-no, 1-yes	H22 = 0, Silent mode disabled, H22 = 1, Silent mode enabled
	H25	Temp. Control Selection		0	0	0	0- Outlet Water Temp, 1- Room Temp, 2- Buffer Tank Temp, 3-Inlet Water Temp	Unit controls operation based upon this reading.
	H27	Enable EVI		3	3	3	0-No EVI, 1-EVI for Cooling, 2-EVI for Heating, 3-All EVI	H27 = 0 EVI is not active. H27 = 1 EVI is active in cooling only. H27 = 2 EVI is active in heating only. H27 = 3 EVI is active in both heating and cooling
	H28	Heating/Cooling and Hot Water Function Enabled		0	0	0	0-no, 1-yes, 2- Only DHW	H28 = 0, DHW is not enabled. H28 = 1, DHW function is enabled. H28=2 Heating/Cooling Disabled. Only DHW
	H29	Operation Code		0	0	0	0-20	H29 = 0 for all modes of operation. All other values are for factory testing only
	H30	Enable Hydraulic Module		0	0	0	0-no, 1-yes	Feature is not used in the (Unit)
	H31	Circulation Pump Type		0	0	0	0-No Flow Detection, 1-Grundfos (25~75), 2-Grundfos (25~105), 3-Grundfos (25~125), 4-APM25-9-130, 5-APF25-12-130	H31 = 0. No integral water pump is offered
	H32	Force Switch mode Time	Minute	120	120	120	1-300	This is the maximum continuous time DHW will operate if there is a heating call. After H32 time expires, unit will change over and satisfy the heating call.
	H33	Fan Motor Driver and Comp. Driver Integrated		1	1	1	0-no, 1-yes	Does not apply to this model H33 must remain at 1
	H34	NOT LISTED		0	0	0	0	Used for factory testing only. Value MUST remain at 0.
	H36	Enable Positive Weather Compensation		0	0	0	0-no, 1-yes	0=Outdoor Temp Reset disabled, 1= Outdoor Temp Reset Enabled
	H37	DHW Temp. Sourcing		0	0	0	0- DHW Tank Sensor, 1-External from Modbus	0= DHW temp read from DHW tank, 1= DHW temp communicated from BMS
	H38	Language		0	0	0	0- English, 1-Polish, 2-German, 3-Dutch, 4-Danish, 5-Espanol, 6-Greek	0= English, this is the only language supported at this time.
H40	External Pump Selection		0	0	0	0- Hot Water Pump, 1-Warm Water Cir. Pump, 2-Off Signal When Defrosting	Does not apply to this model	
H43	Normal/Eco		0	0	0	0-Normal, 1-Eco	Does not apply to this model	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Compressor	C01	Manual Comp. Frequency	Hz	0	0	0	0-120	This fixes the compressor at a fixed speed, in Hz. If C01 = 0, compressor speed will modulate
	C02	Min. Comp. Frequency	Hz	30	30	30	20-60	The minimum speed, in Hz, that the compressor will modulate to in response to the load
	C03	Max. Comp. Frequency	Hz	90	90	90	30-120	The maximum speed, in Hz, that the compressor will modulate to in response to the load
	C04	Model Selection		7	5	5	0-99	value based on factory components. Do not Change
	C05	Min. Comp. Frequency in Cooling at Low Ambient Temp.	Hz	50	50	50	0-60	The minimum speed, in Hz, that the compressor will modulate to in response to the load when the Ambient temperature is below 23°F
	C07	Resonance Point 1	Hz	0	52	40	0-120	value based on factory components. Do not Change
	C08	Resonance Point 2	Hz	0	0	0	0-120	value based on factory components. Do not Change
	C09	Resonance Point 3	Hz	0	0	0	0-120	value based on factory components. Do not Change
	C10	Min. Comp. Frequency in Heating at Low Ambient Temp.	Hz	40	40	40	0-120	Minimum speed the compressor is allowed to run at when the ambient temp is below (?)
	C11	Max. Comp. Frequency in Cooling at High Ambient Temp.	Hz	66	66	66	0-120	Maximum speed the compressor is allowed to run at when the ambient temp is above (?)
	C12	Max. Comp. Frequency in DHW Mode	Hz	90	90	90	30-90	Maximum speed the compressor is allowed to run at when operating in DHW mode.
	Fan	F01	Fan Motor Type		3	4	3	3-DC, 4-DC with External Driver
F02		Coil Temp. for Max. Fan Speed in Cooling	Deg F	30	30	40	5-140	The fan will run at the maximum speed according to F25 when the Coil temperature is above F02 in Cooling
F03		Coil Temp. for Min. Fan Speed in Cooling	Deg F	10	10	10	5-140	The fan will run at the minimum speed according to F18 when the Coil temperature is below F03 in Cooling
F05		Coil Temp. for Max. Fan Speed in Heating	Deg F	2	2	1	5-140	The fan will run at the maximum speed according to F26 when the Coil temperature is below F05 in Heating
F06		Coil Temp. for Min. Fan Speed in Heating	Deg F	20	20	18	5-140	The fan will run at the minimum speed according to F19 when the Coil temperature is above F06 in Heating
F10		Fan Quantity		0	0	1	0-One Fan, 1-Two Fans	value based on factory components. Do not Change
F18		Min. Fan Speed in Cooling	RPM	220	300	300	10-1300	F18 is the minimum RPM of the fan in Cooling according to coil temp F03
F19		Min. Fan Speed in Heating	RPM	200	300	300	10-1300	F19 is the minimum RPM of the fan in Heating according to coil temp F04
F22		Enable Manual-Control Fan Speed		0	0	0	0-no, 1-yes	F22 = 0, manual fan speed cannot be enabled, F22 = 1, manual fan speed can be enabled
F23		Rated DC Fan Motor Speed	RPM	600	600	600	10-1300	F23 = the manual fan speed if F21 = 1
F25		Max. Fan Speed in Cooling	RPM	600	600	750	10-1300	F25 is the maximum RPM of the fan in Cooling according to coil temp F02
F26		Max. Fan Speed in Heating	RPM	600	600	600	10-1300	F26 is the maximum RPM of the fan in Heating according to coil temp F05
F27		Fan Motor Power Curve		0	0	0	0-100	0
F28		CT to Reduce Two Fans to One in Cooling	Deg F	46.4	46.4	46.4	-22-140	CC32-60 only, one fan will turn off when the ambient temp falls below this point
F29		CT to Stop Single Fan in Cooling	Deg F	42.8	42.8	42.8	-22-140	CC32-18 and CC32-40 only, fan will turn off when the ambient temp falls below this point



	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
EEV	E01	EEV Adjust Mode		1	1	1	0-manual, 1-auto, 2-smart	E01 = 1 EEV is automatically controlled
	E02	Target Superheat for Heating	Deg Diff	3	3	1	-36-36	Target suction superheat of EEV in Heating mode
	E03	EEV Initial Steps for Heating	each	200	200	250	0-500	Initial EEV opening at startup in Heating
	E07	EEV Min. Steps	each	50	60	70	0-500	Minimum opening of EEV during modulation
	E08	EEV Initial Steps for Cooling	each	250	200	480	0-500	Initial EEV opening at startup in Heating
	E09	EVI EEV: Adjustment Mode		1	1	1	0-manual, 1-auto	E09 = 1 EVI EEV is automatically controlled
	E10	Evi EEV: Initial Steps	each	200	250	300	0-500	Initial EVI EEV opening at startup
	E13	Evi EEV Target Superheat Degree	Deg R	5.4	5.4	1.8	-36-36	Target EVI superheat
	E14	EVI EEV Min. Steps	each	50	80	50	0-500	Minimum opening of EVI EEV during modulation
	E17	Defrosting EEV Steps	each	480	480	480	10-500	Main EEV opening during Defrost operation
	E18	Target Superheat for Cooling	Deg R	1.8	1.8	5.4	-18-18	Target suction superheat of EEV in Cooling mode
	E19	EEV Adjustment Range in Smart Mode	%	20	20	20	0-300	Factory Setting, do not alter
	E03-1	Segment 1 of EEV Initial Steps for Heating	N	180	180	180	0-500	Factory Setting, do not alter
	E03-2	Segment 2 of EEV Initial Steps for Heating	N	200	200	200	0-500	Factory Setting, do not alter
	E03-3	Segment 3 of EEV Initial Steps for Heating	N	#N/A	#N/A	#N/A	0-500	Factory Setting, do not alter
	E03-4	Segment 4 of EEV Initial Steps for Heating	N	200	200	200	0-500	Factory Setting, do not alter
	E03-5	Segment 5 of EEV Initial Steps for Heating	N	180	180	180	0-500	Factory Setting, do not alter
	E07-01	Segment 1 of EEV Min. Steps	N	130	130	130	0-500	Factory Setting, do not alter
	E07-02	Segment 2 of EEV Min. Steps	N	120	120	120	0-500	Factory Setting, do not alter
	E07-03	Segment 3 of EEV Min. Steps	N	110	110	110	0-500	Factory Setting, do not alter
E07-04	Segment 4 of EEV Min. Steps	N	100	100	100	0-500	Factory Setting, do not alter	
E07-05	Segment 5 of EEV Min. Steps	N	90	90	90	0-500	Factory Setting, do not alter	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Defrost	D01	Ambient Temp. of Starting Defrosting	Deg F	54.5	54.5	54.5	-34.6-113	Defrost can be enabled when ambient temp is below this value.
	D02	Heating Operation Time Befor Defrosting	Minutes	26	26	26	0-120	(unit) will run this long in heating before defrosting can occur
	D03	Interval Time Between Defrosting Cycles	Minutes	45	45	45	10-90	Minimum Start to Start time between two consecutive defrost cycles
	D04	Exhaust Temp. Correction for Defrosting Cycle	Deg F	105	105	105	32-302	Maximum discharge temperature during Defrost cycle, controlled by EEV function
	D05-1	Defrosting Suction Pressure 1	Bar	2.6	2.6	2.6	0-45	Suction pressure to initiate Defrost 1 (Ambient Temp above 59°F)
	D05-2	Defrosting Suction Pressure 2	Bar	1.7	1.7	1.7	0-45	Suction pressure to initiate Defrost 1 (Ambient Temp below 59°F)
	D06	Defrosting Cycle Time Correction	Minutes	5	5	0	0-120	Time subtracted from D03 value during low ambient temp
	D07	Ambient Temp. of Start Sliding Defrosting	Deg F	43	43	43	-34.6-113	Sliding Defrost is enabled below this ambient temp
	D08	Suction Temp. Of Start Sliding Defrosting	Deg F	24.6	24.6	24.6	-34.6-113	Sliding defrost starts when suciton temperature is below this value
	D09	Ambient Temp. of Stop Sliding Defrosting	Deg F	-15	-15	-15	-34.6-113	Lowest ambient temperature of sliding defrost curve
	D10	Suction Temp. of Stop Sliding Defrosting	Deg F	-18.4	-18.4	-18.4	-34.6-113	Lowest suction temperature of sliding defrost curve
	D11	Min. Inlet Water Temp. of Defrosting	Deg F	73.4	73.4	73.4	39.2-149	Lowest return water temp allowed during defrost
	D12	Suction Pressure of Forced Defrosting	Bar	2	2	1	0-45	Defrost will start immediately if suction pressure falls to this point
	D13	Heating Operation Time Before Forced Defrosting	Minutes	120	120	120	0-360	Minimum operating time before forced defrost is permitted
	D14	Fan Motor Power Ratio to Extend Defrostsing Cycle	Ratio	1.3	1.3	1.3	0-5	Determines defrost cycle based upon fan power change (indicating airflow)
	D15	Fan Motor Power Ratio to Enter Forced Defrosting	Ratio	1.5	1.5	1.5	0-5	Determines defrost cycle based upon fan power change (indicating airflow)
	D16	Max. Fan Motor Power to Enter Forced Defrosting	W	200	200	200	50-1000	Defrost will start If power draw of fan motor exceeds this value.
	D17	Coil Temp. of Exit Defrosting	Deg F	55.4	55.4	55.4	-34.6-113	Defrost will end when the coil temp rises above D17
	D18	Distributor Tube Temp. of Exit Defrosting	Deg F	70	70	70	-34.6-176	Defrost will end when the liquid refrigerant temp rises above D03
	D19	Max. Defrosting Time	Minutes	8	8	8	0-20	Maximum allowable duration of one defrost cycle
	D20	Defrosting Frequency	Hz	80	70	70	30-90	Fixed compressor speed during defrost operation
	D21	Enable Electric Heater During Defrosting		1	1	1	0-no, 1-yes	Energizes Electric heat during Defrost operation
	D22	Water Flow of Defrosting	-	0	0	0	0-50	Does not apply to the (unit)
	D23	Max. Defrosting Cycle by Fan Motor Power	Minutes	120	120	120	0-240	Maximum interval between Defrost cycles when controlled by Fan Power
	D24	Defrosting Heating Source in Heating/DHW Mode	Deg F	2	2	2	0-Stay Current Circuit, 1-DHW Circuit, 2-Heating Circuit	Water is drawn from this source during Def. 1=Current Operating Circuit, 1 DHW circuit, 2 Heating Water Circuit
	D25	Max. Water Temp. Decrease During Defrosting	Deg Diff	7	7	7	3.6-117	Maximum drop in system water temp that Defrost is allowed to make
D26	Enable Defrosting Communication in Cascade		0	0	0	0-no, 1-yes	Does not apply to the (unit)	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Temperature	R01	DHW Target Temp.	Deg F	131	131	131	59-140	Target temperature of sensor inside potable domestic hot water tank
	R02	Heating Target Temp.	Deg F	113	113	113	59-140	Target temperature of the outlet water supplying the Heating loop
	R03	Cooling Target Temp.	Deg F	44.6	44.6	44.6	37.9-82.4	Target temperature of the outlet water supplying the Cooling loop
	R04	Temp. Diff. for Power-on in Heating	Deg R	5	5	5	0-18	Heating operation will start on a new call when the Outlet water is below R02 - R04
	R05	Temp. Diff. for Standby in Heating	Deg R	1	1	1	0-18	Heating operation will stop when the Outlet water rises to R02 + R05. Then set value of T = Inlet temp at that instant. When Heating call is maintained, operation will resume when Outlet temp falls to T - R04
	R06	Temp. Diff. for Power-On in Cooling	Deg R	5	5	5	0-18	Cooling operation will start on a new call when the Outlet water is above R03 + R06
	R07	Temp. Diff. for Standby in Cooling	Deg R	1.8	1.8	1.8	0-18	Cooling operation will stop when the Outlet water falls to R03 - R06. Then set value of T = Inlet temp at that instant. When Cooling call is maintained, operation will resume when Outlet temp rises to T + R06
	R08	Min. Cooling Target Temp.	Deg F	42	42	42	-22-82.4	Minimum allowable Cooling setpoint
	R09	Max. Cooling Target Temp.	Deg F	82.4	82.4	82.4	37.9-176	Maximum allowable Cooling setpoint
	R10	Min. Heating Target Temp.	Deg F	59	59	59	-22-140	Minimum allowable Heating setpoint
	R11	Max. Heating Target Temp.	Deg F	140	140	140	59-210.2	Maximum allowable Heating setpoint
	R15	Temp. Diff. of Exiting Overhigh Outlet Temp.	Deg R	3.6	3.6	3.6	0-27	Differential to reset Outlet water High Temp protection. Unit restarts at Max Outlet T - R15
	R16	Temp. Diff. for Power-on in DHW	Deg R	5	5	5	0-18	DHW function will start when the DHW Tank temperature is below R01 - R16
	R17	Temp. Diff. for Standby in DHW	Deg R	2	2	2	0-18	DHW function will stop when the DHW Tank temperature reaches R01 + R17
	R29	Low AT for Water Temp. Limit ON	Deg F	-10	-15	-15	-13-39.2	Heating Outlet temp roll back begins as ambient falls to R29
	R30	Low AT for Water Temp. Limit OFF	Deg F	-13	-13	-13	-31-5	Heating & DHW Outlet temp roll back ends as ambient falls to R30
	R31	Max. Limit Outlet Water Temp. at Low AT	Deg F	52	55	50	68-185	Heating & DHW Temperature of Outlet Water when Ambient is below R30
	R32	High AT for Water Temp. Limit ON	Deg F	109.4	86	95	50-109.4	DHW Temp roll back starts as Ambient rises above R32
	R33	High AT for Water Temp. Limit OFF	Deg F	109.4	109.4	109.4	109.4-140	DHW Temp roll back ends as Ambient reaches R33
	R34	Max. Limit Outlet Water Temp. at High AT	Deg F	134.6	122	131	68-185	Target Temperature of DHW when Ambient is above R33
	R35	Location of Electric Heater		0	0	0	0-Not Available, 1-Main Water Circuit, 2-DHW Tank, 3-Buffer Tank	R35 = 0 no electric heater present. R35 = 1 Heater active in Heating Mode, R35 = 2 Heater active in DHW Mode, R35=3 Heater active in Buffer Tank
	R36	Min. DHW Target Temp.	Deg F	59	59	59	32-140	Minimum Allowable setpoint for DHW Tank
	R37	Max. DHW Target Temp.	Deg F	131	131	131	59-185	Maximum Allowable setpoint for DHW Tank
	R39	AT for Auto-Start Heating Mode	Deg F	10	10	10	41-68	Outdoor ambient Setpoint when H25 = 1
	R42	Max. Outlet Water Temp. in Heating	Deg F	140	140	150	68-185	Max Outlet water temp during Heating operation.
	R43	Max Limit Target Water Temp. at Low AT in Heating	Deg F	109	122	122	68-185	Temperature of Outlet Water when Ambient is below R30
	R44	Max. Limit Target Water Temp. at High AT in Heating	Deg F	95	131	131	68-185	Temperature of Outlet Water when Ambient is above 68°
	R45	AT to Start Electric Heater without Delay	Deg F	14	14	14	-58-68	Electric heat engages without delay when Ambient Temp is below R45
	R46	Temp. Diff. Between Max. DHW Target Temp. & Max. Outlet Temp.	Deg Diff	7	7	7	0-45	Unit shuts down on High Outlet Temp if outlet water temperature is above R36 + R46
	R60	AT to Start Frequency Limit in Cooling	Deg F	77	77	77	32-140	Max compressor speed begins to roll back when ambient is above this point
	R61	AT to Stop Frequency Limit in Cooling	Deg F	109.4	109.4	109.4	32-140	Max compressor roll back completes when ambient is above this point
	R62	Max. Heat Pump Outlet Water Temp.	Deg F	143.6	143.6	143.6	104-203	max allowable supply water temp under any conditions
	R70	Target Room Temp.	Deg F	68	68	68	41-80.6	Control temperature when H25=2
	R71	Room Temp. Diff. for Power-on in Heating	Deg F	1	1	1	0.2-5.4	Room temp Stop differential in heating when H25=2
R72	Room Temp. Diff. for Standby in Heating	Deg F	1	1	1	0.2-5.4	Room temp Start differential in heating when H25=2	
R73	Room Temp. Diff. For Power-on in Cooling	Deg F	1	1	1	0.2-5.4	Room temp Stop differential in cooling when H25=2	
R74	Room Temp. Diff. for Standby in Cooling	Deg F	1	1	1	0.2-5.4	Room temp Start differential in cooling when H25=2	

	Parameter Code	Parameter Name	Units	CC32-18 Factory Setting	CC32-40 Factory Setting	CC32-60 Factory Setting	Settings Range	Description
Pump	P01	Main Circulation Pump Operation Mode		1	1	1	0-Always on, 1-Saving, 2-Interval	P01 = 0 Pump runs whenever Remote On/Off is closed. P01 = 1 Pump runs when when Remote On/Off and Heat/Cool On/Off is closed. P01 = 2, Pump runs on intervals according to P02 and P03
	P02	Interval Time	Minutes	30	30	30	1-120	Interval between Main Circulator runs when R02 = 2
	P03	Operation Duration Time	Minutes	3	3	3	44956	Run time of Main Circulator when R01 = 2
	P05	DHW Pump Operation Mode		0	0	0	0-Always on, 1-Saving, 2-Interval	P05 = 0 DHW Pump runs whenever DHW On/Off is closed. P05 = 1 Pump runs when when DHW On/Off is closed and TT is below DHW setpoint - R32. P05 = 2, Pump runs on intervals according to P02 and P03
	P06	Main Circulation Pump Manual Control		1	1	1	0-no, 1-yes	0=Internal pump, 1=External pump controlled by Unit
	P08	Main Circulation Pump Rated Power	W	0	0	0	0-2000	Does not apply to this model
	P09	Circulation Pump Protection Period	Days	0	0	0	0-30	If value is greater than 0, heat pump turns on and exercise pump every P09 days.
	P10	Speed of Circulation Pump	%	100	100	100	0-100	Does not apply to this model
Disinfection	G01	Disinfection Water Temp.	Deg F	145.4	145.4	145.4	140-158	Target temperature or Sterilize cycle
	G02	Time Duration of Disinfection	Minutes	0	0	0	0-60	Duration of Sterilize Cycle
	G03	Disinfection Starting Time	Hours	0	0	0	0-23	Time of day (24h) to start Sterilize cycle. 23 = 11:00 PM
	G04	Interval Period of Disinfection	Days	30	30	30	1-30	Number of days between Sterilize cycles
	G05	Enable Disinfection		0	0	0	0-no, 1-yes	G05 = 0 Sterilize Cycle is Dormant G05 = 1 Sterilize Cycle is active

To ensure reliable cold weather operation, the CC32 employs electric heaters in the lower pan, to prevent condensate from freezing and accumulating at the bottom of the outside coil, and a compressor crankcase heater, to prevent refrigerant from dissolving into, and diluting, the compressor oil.

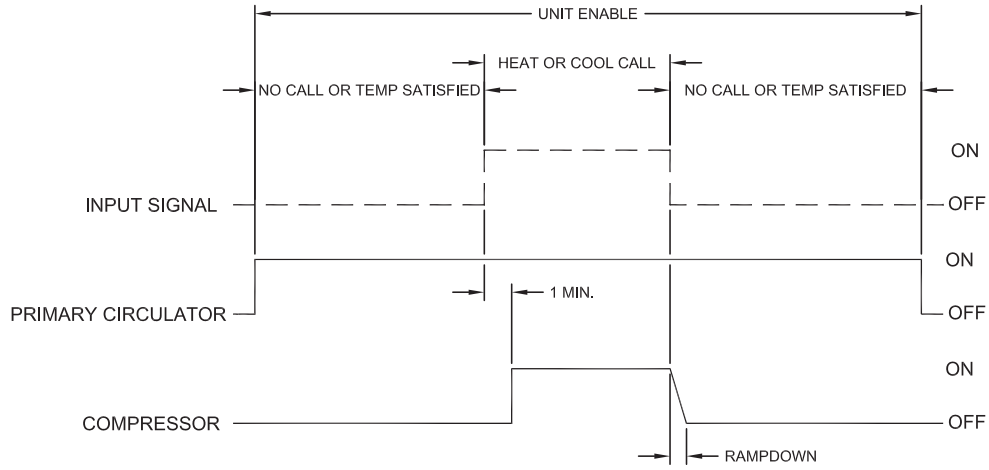
The control board provides line voltage outputs and logic to operate these heaters.

The heaters are powered directly by Relay Outputs. RO10 to the pan heater turns on as the temp falls to 39°F (4°C) and turns off as the temp rises to 43°F (6°C)

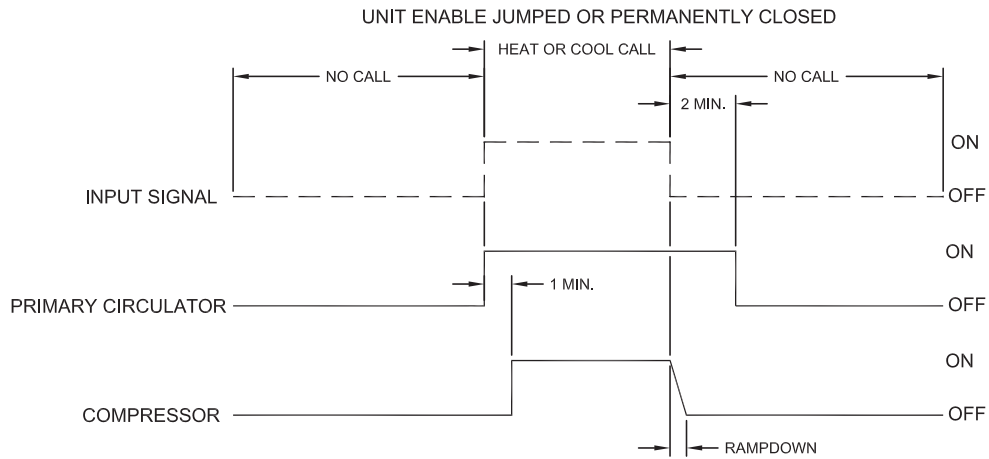
When the compressor is off, RO11 turns on the crankcase heater whenever the ambient temp falls to 46°F (8°C) and turns off when the temp rises to 50°F (10°C) The CC heater is off any time the compressor is running. These actuation points are not adjustable.

**Parameter P (Pump Parameter)**

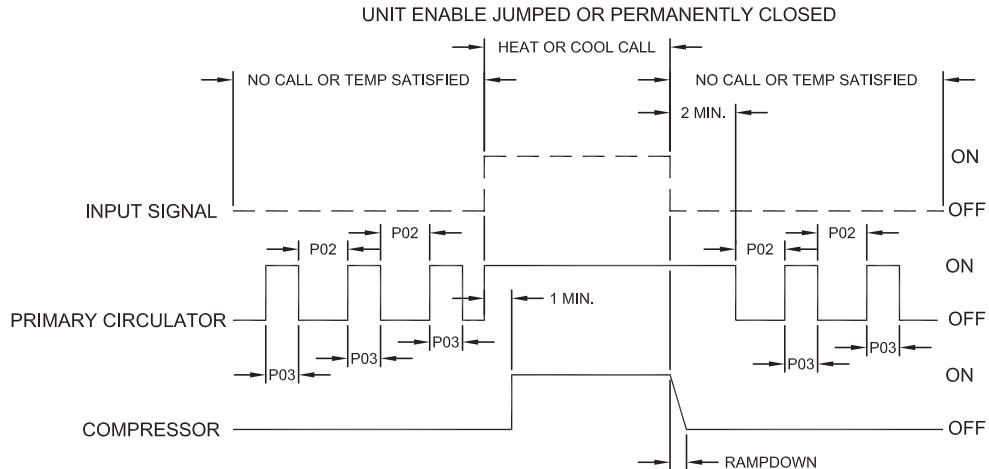
**P01=0**



**P01=1**



**P01=2**



HEAT/COOL CALL FROM TOUCHSCREEN INPUT IF H07=0  
HEAT/COOL CALL FROM WIRED INPUT IF H07=1

### Compressor Short Cycle Protection

In order to protect the compressor from short cycling and ensure proper oil circulation and return, the compressor will remain running at startup for a minimum of three minutes, and remain off for minimum of three minutes at shut-off, regardless of whether the temperature setpoint has been satisfied.

The compressor can be restarted after 3 minutes when switch OFF. It is applicable to all conditions.

## Modbus RTU Protocol



## SECTION 7: TROUBLESHOOTING

### CC32 Error Codes

Protect/Fault	Fault Display	Reason	Elimination Methods
IPM Overcurrent Fault	F00	IPM Input current is large	Check and adjust the current measurement
Comp. Driver Fault	F01	Lack of phase, step or drive hardware damage	Check the measuring voltage check frequency conversion board hardware
Pre-Charge Failure	F03	The PFC circuit protection	Check the PFC switch tube short circuit or not
DC Power Bus Overvoltage Fault	F05	DC bus voltage > Dc bus Overload-voltage protection value	Check the input voltage measurement
DC Power Bus Undervoltage	F06	DC bus voltage < Dc bus Underload - voltage protection value	Check the input voltage measurement
AC Power Undervoltage Fault	F07	The input voltage is low, causing the input current is low	Check the input voltage measurement
AC Power Overcurrent Fault	F08	The input voltage is too high, more than outage protection current RMS	Check the input voltage measurement
Input Power Voltage Sampling Fault	F09	The input voltage sampling fault	Check and adjust the current measurement
DSP and PFC Communication Fault	F12	DSP and PFC Connect fault	Check the communication connection
DSP and Comp. Driver Communication Fault	F11	DSP and Inverter board communication failure	Check the communication connection
Comp. Driver and PCB Communication Fault	F151	DSP and Mainboard communication failure	Check the communication connection
IPM Overcurrent Fault	F13	The IPM module is overheat	Check and adjust the current measurement
Comp. Overcurrent Fault	E051	The compressor is overload	Check whether the system of the compressor running normally
Input Power Lacking Phase Fault	F15	The input voltage lost phase	Check and adjust the current measurement
IPM Current Sampling Fault	F18	IPM sampling electricity is fault	Check and adjust the current measurement
Comp. Driver Temp. Sensor Fault	F17	The transducer is overheat	Check and adjust the current measurement
IGBT Power Device Overheat Alarm	F20	The IGBT is overheat	Check and adjust the current measurement
Comp. Weak Magnetic Alarm	F16	Compressor magnetic force is not enough	Check and adjust the current measurement
AC Input Current Frequency Decrease Alarm	F22	Input Current is too large	Check and adjust the current measurement
EEPROM Alarm	F23	MCU error	Check whether the chip is damaged. Replace the Chip
Destroyed EEPROM & No Activated Fault	F24	MCU error	Check whether the chip is damaged. Replace the Chip
Input Power Current Sampling Fault	F25	The V15V is overload or undervoltage	Check the V15V input voltage in range 13.5V~16.5V or not
IGBT Overheat Fault	F26	The IGBT is overheat	Check and adjust the current measurement
Comp. Current Frequency Decrease Alarm	F33	The compressor current frequency reduction	Check and adjust the current measurement

Protect/Fault	Fault Display	Reason	Elimination Methods
Inlet Water Temp. Sensor Fault	P01	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Outlet Water Temp. Sensor Fault	P02	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Tank Sensor Fault	P03	The temp. sensor is broken or short circuit	Check or change the temp. sensor
AT Sensor Fault	P04	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Suction Temp. Sensor Fault	P17	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heating Returning Water Temp. Sensor Fault	P013	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Returning Water Temp. Sensor Fault	P018	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heating Leavint Water Temp. Sensor Fault	P023	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Leaving Water Temp. Sensor Fault	P028	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Room Temp. Sensor Fault	P42	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Inlet Sensor Fault	P101	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Outlet Sensor Fault	P102	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Distributor Tube Temp. Sensor Fault	P152	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Coil Temp. Sensor Fault	P153	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Exhaust Temp. Sensor Fault	P181	The temp. sensor is broken or short circuit	Check or change the temp. Sensor
Overhigh Exhaust Temp.	P182	The compressor is overload	Check whether they system of the compressor running normally
Anti-freezing Temp. Sensor Fault	P191	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Mix Tube Outlet Water Temp. Sensor Fault	P02a	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Buffer Tank Temp. Sensor Fault	P03a	The sensor is broken or short circuit	Check or change the temp. sensor
Pressure Sensor Fault	PP11	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
High Pressure Sensor Fault	PP12	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
Low AT Protection	TP	The ambient temp. is low	Check the ambient temp value
No Cooling at Low AT Protection	TC	The temp. sensor is incorrectly-detected or the twmp. Sensor is lower-than the set value A30	Check or charge the temp. sensor
Electric Heater Overheat Fault	E04	The electric-heater protection switch is broken	Check whether the electric heater runs at the temperature above 150°C for a long time

Protect/Fault	Fault Display	Reason	Elimination Methods
AC Power Overvoltage Fault	F10	Input voltage>Input Overload-voltage protection value	Check whether the input voltage is higher than 265V
Compressor Lacking Phase Fault	F14	The compressor lost phase	Check whether compressor cables are connected properly and reliably
EEPROM Fault	F29	Failed to read the memory chip	Check the frequency conversion board
Overspeed Fault	F21	The compressor is running abnormally	Check whether the compressor cable is normal and whether the compressor is blocked
Driver (Fan) Temp. Sensor Fault	F120	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Driver (Fan) IPM Overheat Fault	F106	The fan IPM drive plate has poor heat dissipation	Check heat dissipation conditions
Driver (Fan) External Overcurrent Fault	F105	The fan IPM Hardware running current is too large	Check whether the fan is blocked
Driver (Fan) Power Lacking Phase Fault	F101	The fan lost phase	Check whether fan cables are connected properly and reliably
Driver (Fan) Current Sampling Fault	F112	Fan Sampling electricity is fault	Check whether the fan drive plate is abnormal
Driver (Fan) Start Fault	F102	The fan fails to start	Check whether the fan is blocked
Driver (Fan) Internal Overcurrent Fault)	F113	The fan software running current is too large	Check whether the fan is blocked
Driver (Fan) Overspeed Fault)	F109	The fan speed is too high	Check whether the fan drive board is abnormal

Protect/Fault	Fault Display	Reason	Elimination Methods
Excess Temp. Diff. Between Inlet & Outlet	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
Communication Fault	E08	Communication failure between wire controller and mainboard	Check the wire connection between remote wire controller and main board
Primary Anti-freezing Fault	E19	The ambient temp. is low	Check the ambient temp value
Secondary Anti-freezing fault	E29	The ambient temp. is low	Check the ambient temp value
Insufficient Defrosting Water Flow Alarm	E030	The unit flow rate is less than the minimum flow value of the unit.	Check or change waterway systems to provide unit flow
Flow Switch Fault	E032	No water/little water in water system	Check the pipe water flow and water pump
Overhigh Outlet Water Temp.	E065	No water/little water in water system	Check the pipe water flow and water pump
Low Outlet Water Temp. Temp. Fault	E071	No water/little water in water system	Check the pipe water flow and water pump
Fan Motor 1 and PCB Communication Fault	E081	Speed control module and main board communication fail	Check the communication Connection
Fan Motor 2 and PCB Communication Fault	E082	Speed control module and main board communication fail	Check the communication connection
Display and PCB Communication Fault	E084	The wire controller software is not match the mainboard software	Check the wire control software number and the mainboard software number
Communication Fault with Hydraulic Module	E08c	Hydraulic Module and mainboard communication fail	Check the communication connection
Hp Fault	E11	The high-pressure switch is broken	Check the pressure switch and cold circuit
LP Fault	E12	The low-pressure switch is broken	Check the pressure switch and cold circuit
Anti-freezing Fault	E171	Use side water system temp. is low	1. Check the water temp. or change the temp. sensor 2. Check the pipe water flow and whether water system is jammed or not
Fan Motor 1 Fault	F031	1. Motor is in locked-rotor state 2. The wire connection between DC-fan motor module and fan motor is in bad contact	1. Change a new fan motor 2. Check the wire connection and make sure they are in good contact
Fan Motor 2 Fault	F032	1. Motor is in locked-rotor state 2. The wire connection between DC-fan motor module and fan motor is in bad contact	1. Change a new fan motor 2. Check the wire connection and make sure they are in good contact



## Maintenance for Air-to-Water Heat Pumps

Like all mechanical equipment, air-to-water heat pumps require maintenance to maintain peak performance and reliability. Refer to the following table for maintenance and inspection schedules.

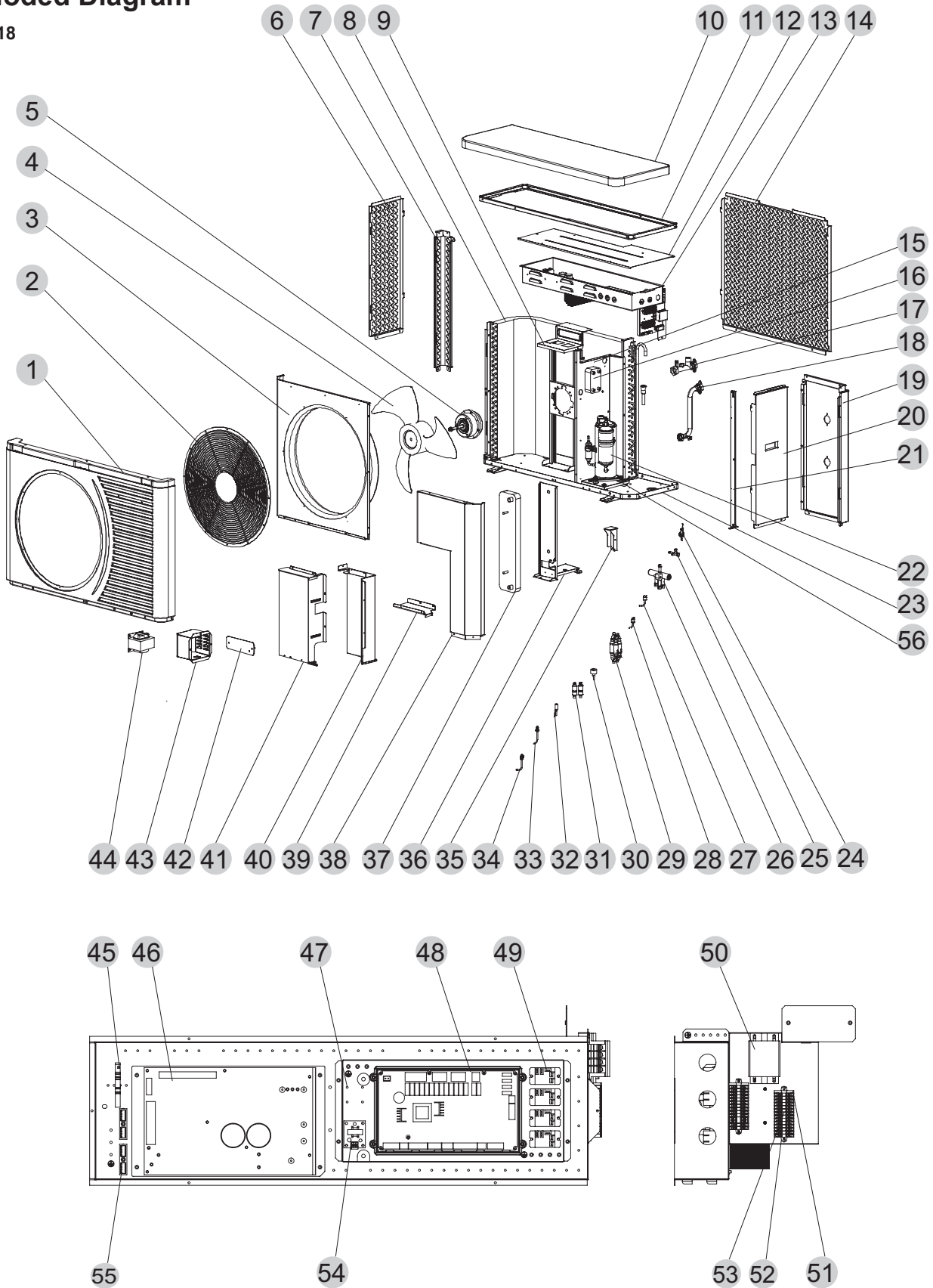
Time Period	Task	Description
Annually	Maintain Glycol %	Over time the % of glycol will degrade leaving the fluid in the system vulnerable to freezing and contaminants. Once a year the fluid should be tested using approved test strips for glycol %. If glycol % is below the minimum required for your system design (see install manual for specific % required) the appropriate amount (based on volume) of proper glycol should be added to bring the system back to the minimum. If necessary, the system should be flushed completely, and fresh glycol/water mix should fill the system. If an autofill system is installed, it must be filled with the appropriate concentration.
Seasonally*	Clean coil	Once a season the exposed coil at the outdoor unit should be cleaned using appropriate and approved HVAC coil cleaning solvents ONLY. Use of non-approved solvents can severely damage the system and can impact warranty eligibility.
	Check for loose wires	Verify all wires are still intact and are not making loose connections. Repair as needed
	Clear condensate	Under the outdoor coil there are drain holes for condensate run off. Ensure the path is clear of obstructions that could cause a backup of condensate and potential freezing in freezing conditions.
As Needed	Clear debris	The heat pump should be clear of all debris around the unit to ensure proper air flow
	Rodent damage	Inspect all wiring cabinets, compressor cabinets and panels for any rodent damage. Repair/replace as needed and make provisions to keep rodents out of heat pump cabinets.

\*Seasonally is defined at the end of the equipment's operating season. If the unit is used for cooling only, then inspections should be done prior to startup of next season. If unit is used for heating and cooling applications, then inspections/tasks should be completed during the in between time when unit is ready to change from cooling to heating and heating to cooling.

## SECTION 8: REPLACEMENT PARTS

### Exploded Diagram

CC32-18



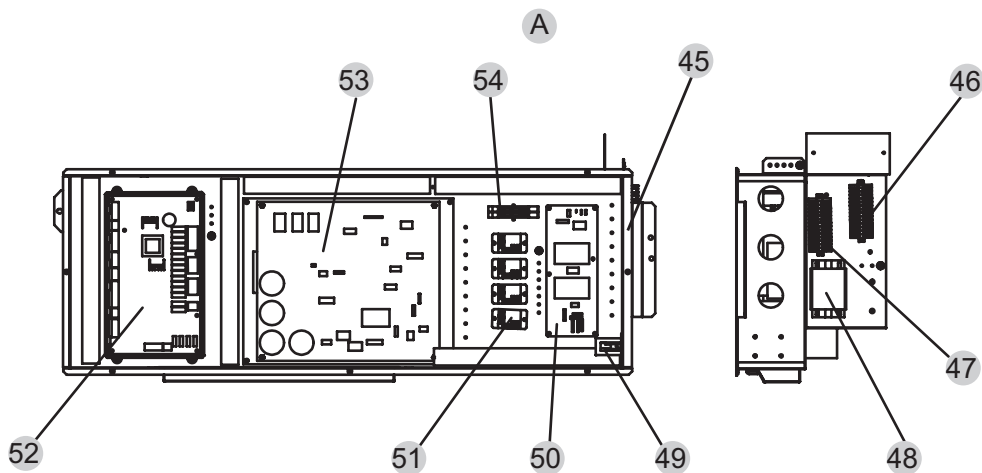
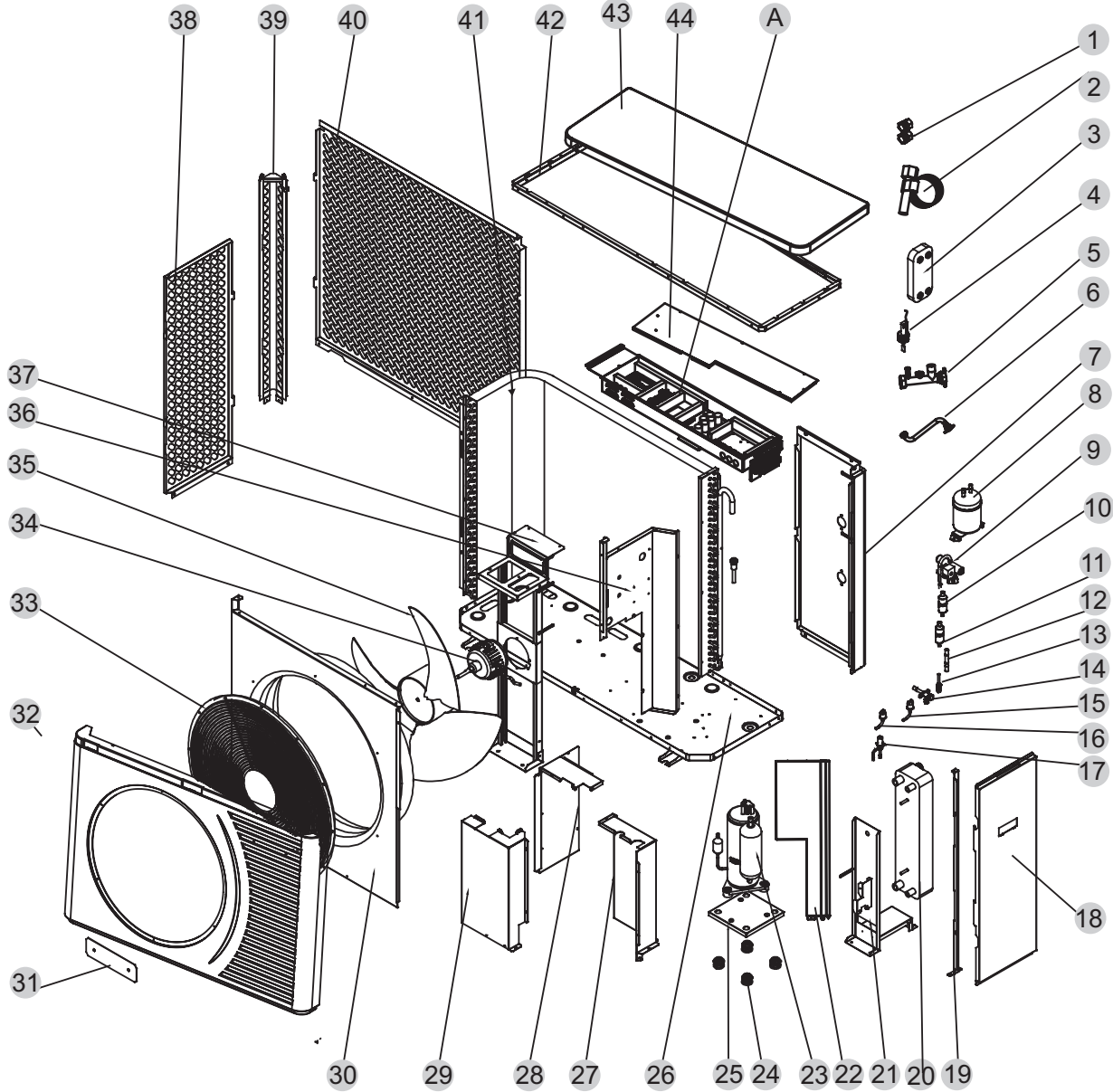
## CC32 Exploded View Parts List

### CC32-18

No.	Description	SpacePak P/N	QTY
1	PANEL, UNIT FRONT	45W41-WG1599-01	1
2	GUARD, FAN	45W32-WG1600-01	1
3	PANEL, VENTURI	45W41-WG1601-01	1
4	IMPELLER, AXIAL FAN	45W34-WG1602-01	1
5	MOTOR, FAN	45W31-WG1603-01	1
6	COIL GUARD, LEFT END	45W41-WG1604-01	1
7	COIL GUARD, CORNER	45W41-WG1605-01	1
8	COIL, FINNED TUBE	45W50-WG1606-01	1
9	BRACKET, FAN MOTOR	45W41-WG1607-01	1
10	COVER, UNIT TOP	45W41-WG1608-01	1
11	SUPPORT, TOP COVER	45W41-WG1609-01	1
12	COVER, ELECTRICAL ENCLOSURE	45W41-WG1610-01	1
13	ENCLOSURE, ELECTRICAL COMPONENTS	45W41-WG1611-01	1
14	COIL GUARD, REAR	45W41-WG1612-01	1
15	CENTER SUPPORT	45W41-WG1613-01	1
16	HX, REFRIGERANT TO WATER	45W50-WG1614-01	1
17	MANIFOLD, WATER SUPPLY	45W40-WG1615-01	1
18	MANIFOLD, WATER RETURN	45W40-WG1616-01	1
19	PANEL, PLUMBING CONNECTION	45W41-WG1617-01	1
20	PANEL, RIGHT END	45W41-WG1618-01	1
21	PANEL, CORNER SUPPORT	45W41-WG1619-01	1
22	COMPRESSOR, EVI	45W33-WG1620-01	1
23	BASE PLATE	45W41-WG1621-01	1
24	FLOW SWITCH	45W40-WG1571-01	1
25	SERVICE VALVE, SUCTION	45W28-WG1572-01	1
26	REVERSING VALVE	45W28-WG1622-01	1
27	PRESSURE SWITCH, HIGH LIMIT	45W11-WG1218-02	1
28	LIMIT SWITCH, LOW PRESSURE	45W11-WG1347-01	1
29	CHECK VALVE	45W28-WG1383-01	4
30	EEV, EVI	45W28-WG1352-01	1
31	FILTER, REFRIGERANT	45W27-WG1387-01	2
32	EEV, PRIMARY	45W28-WG1623-01	1
33	ACCESS VALVE, SAE 1/4"	45W40-WG1215-01	1
34	ACCESS VALVE, SAE 5/16"	45W40-WG1215-02	1
36	BRACKET, PRIMARY HX	45W41-WG1624-01	1
37	HEAT EXCHANGER, EVI	45W50-WG1625-01	1
38	COVER, HEAT EXCHANGER	45W41-WG1626-01	1
39	SUPPORT, COMPRESSOR GUARD	45W41-WG1627-01	1
40	GUARD, COMPRESSOR REAR	45W41-WG1628-01	1
41	GUARD, COMPRESSOR FRONT	45W41-WG1629-01	1
42	PLATE, LOGO LABEL	45W41-WG1587-01	1
43	COVER, REACTOR	45W41-WG1630-01	1
44	REACTOR	45W09-WG1631-01	1
45	FUSE, 250 mA	45W09-WG1592-01	1
46	INVERTER BOARD, COMPRESSOR & FAN	45W41-WG1590-01	1
47	BRACKET, CONTROL BOARD	45W41-WG1632-01	1
48	CONTROL BOARD, BP1000-G	45W09-WG1589-01	1
49	RELAY, SPDT	45W09-WG1593-01	4
50	TERMINAL, FOUR POLE	45W09-WG1225-01	1
51	CAP, TERMINAL END	45W09-WG1409-01	1
52	TERMINAL, FEED THROUGH, 2 POLE	45W09-WG1408-01	1
53	TERMINAL, FEED THROUGH, 1 POLE	45W09-WG1358-01	24
54	CURRENT TRANSFORMER	45W09-WG1594-01	1
55	TERMINAL, TWO POLE	45W09-WG1224-01	2
56	SUPPORT, COMPRESSOR	45W41-WG1633-01	1
57	DISPLAY, REMOTE TOUCHSCREEN	45W09-WG1598-01	1

# Exploded Diagram

CC32-40



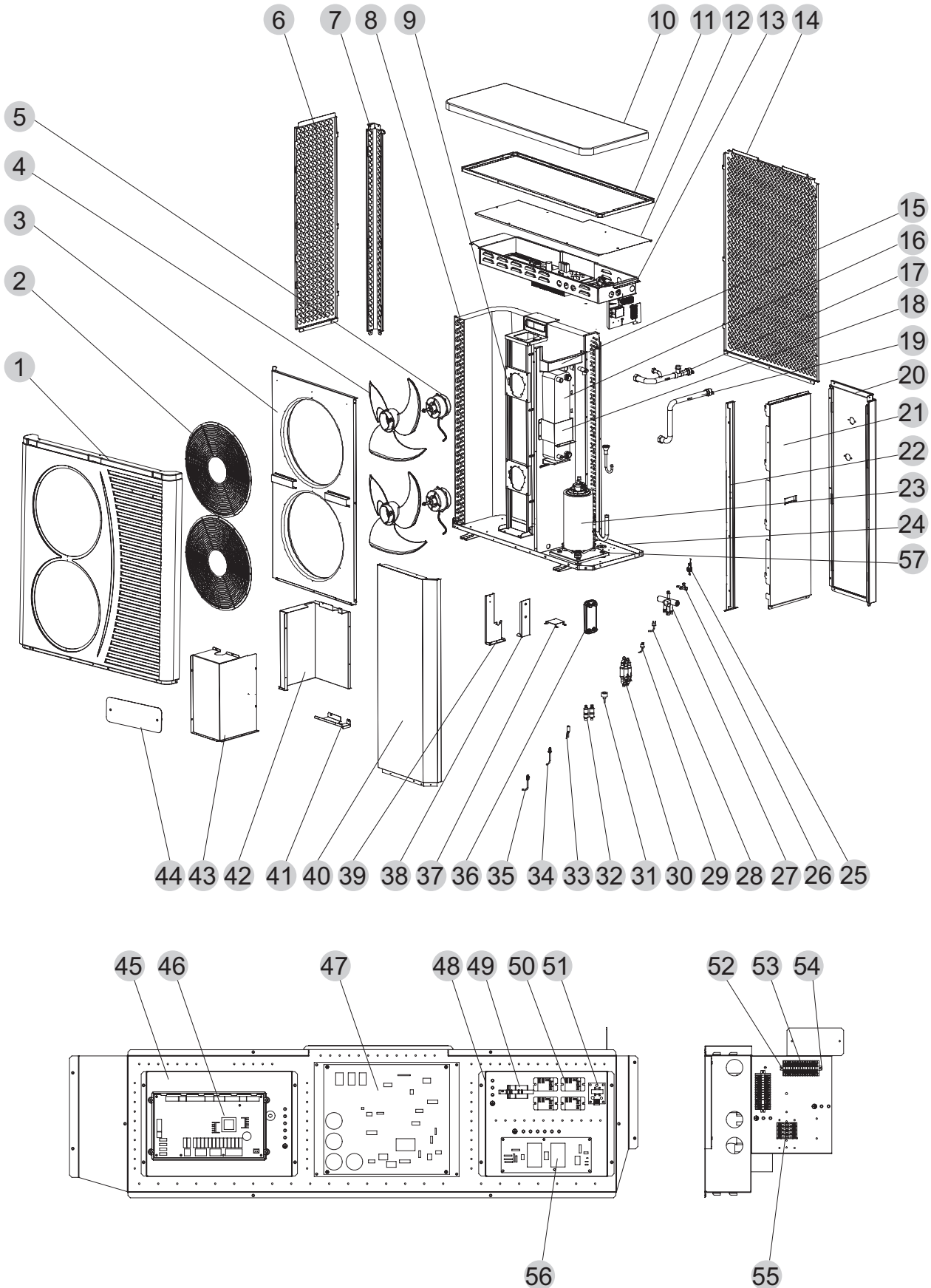
## CC32 Exploded View Parts List

### CC32-40

No.	Description	SpacePak P/N	QTY
1	PANEL, UNIT FRONT	45W41-WG1634-01	1
2	GUARD, FAN	45W32-WG1635-01	1
3	PANEL, VENTURI	45W41-WG1636-01	1
4	IMPELLER, AXIAL FAN	45W34-WG1637-01	1
5	MOTOR, FAN	45W31-WG1638-01	1
6	COIL GUARD, LEFT END	45W41-WG1639-01	1
7	COIL GUARD, CORNER	45W41-WG1640-01	1
8	COIL, FINNED TUBE	45W50-WG1641-01	1
9	BRACKET, FAN MOTOR	45W41-WG1642-01	1
10	COVER, UNIT TOP	45W41-WG1643-01	1
11	SUPPORT, TOP COVER	45W41-WG1644-01	1
12	COVER, ELECTRICAL ENCLOSURE	45W41-WG1645-01	1
13	ENCLOSURE, ELECTRICAL COMPONENTS	45W41-WG1646-01	1
14	COIL GUARD, REAR	45W41-WG1647-01	1
15	CENTER SUPPORT	45W40-WG1648-01	1
16	HX, REFRIGERANT TO WATER	45W50-WG1649-01	1
17	MANIFOLD, WATER SUPPLY	45W40-WG1650-01	1
18	MANIFOLD, WATER RETURN	45W41-WG1651-01	1
19	PANEL, PLUMBING CONNECTION	45W41-WG1652-01	1
20	PANEL, RIGHT END	45W41-WG1653-01	1
21	PANEL, CORNER SUPPORT	45W41-WG1654-01	1
22	COMPRESSOR, EVI	45W33-WG1655-01	1
23	SUPPORT, COMPRESSOR	45W41-WG1656-01	1
24	FLOW SWITCH	45W09-WG1657-01	1
25	SERVICE VALVE, SUCTION	45W28-WG1572-01	1
26	VALVE, REVERSING	45W28-WG1220-01	1
27	LIMIT SWITCH, HIGH PRESSURE	45W11-WG1348-01	1
28	LIMIT SWITCH, LOW PRESSURE	45W11-WG1347-01	1
29	CHECK VALVE	45W28-WG1383-01	1
30	LIQUID SEPARATOR	45W28-WG1658-01	1
31	FILTER, REFRIGERANT	45W27-WG1387-01	1
32	ELECTRONIC EXPANSION VALVE	45W28-WG1659-01	1
33	FILTER, REFRIGERANT	45W28-WG1660-01	1
34	ACCESS VALVE, SAE 5/16"	45W40-WG1215-02	1
35	ISOLATOR, COMPRESSOR (SET OF 4)	45W05-WG1661-01	1
36	SUPPORT, COMPRESSOR GUARD	45W41-WG1662-01	1
37	HEAT EXCHANGER, EVI	45W50-WG1663-01	1
38	PANEL, COMPRESSOR COMPARTMENT	45W41-WG1664-01	1
39	SUPPORT, COMPRESSOR GUARD	45W41-WG1665-01	1
40	GUARD, COMPRESSOR REAR	45W41-WG1666-01	1
41	GUARD, COMPRESSOR FRONT	45W41-WG1667-01	1
42	PLATE, LOGO LABEL	45W41-WG1587-01	1
43	BASE PLATE	45W41-WG1668-01	1
44	TERMINAL, 3 POLE	45W09-WG1669-01	1
45	FUSE, 250 mA	45W09-WG1592-01	1
46	INVERTER BOARD	45W09-WG1670-01	1
47	RELAY, SPDT	45W09-WG1593-01	4
48	CONTROL BOARD, BP1000-G	45W09-WG1589-01	1
49	CURRENT TRANSFORMER	45W09-WG1594-01	1
50	FILTER, EMI	45W09-WG0671-01	1
51	TERMINAL, FEED THROUGH, 2 POLE	45W09-WG1408-01	2
52	TERMINAL, FEED THROUGH, 1 POLE	45W09-WG1358-01	28
53	CAP, TERMINAL END	45W09-WG1409-01	2
54	BUSHING, WIRE OUTLET	45W11-WG1672-01	1
55	CLAMP, WIRE RETAINER	45W11-WG1673-01	1
56	DISPLAY, REMOTE TOUCHSCREEN	45W09-WG1598-01	1

# Exploded Diagram

CC32-60



## CC32 Exploded View Parts List

### CC32-60

No.	Description	SpacePak P/N	QTY
1	PANEL, UNIT FRONT	45W41-WG1547-01	1
2	GUARD, FAN	45W32-WG1548-01	2
3	PANEL, VENTURI	45W41-WG1549-01	1
4	IMPELLER, AXIAL FAN	45W34-WG1550-01	2
5	MOTOR, FAN	45W31-WG1551-01	2
6	COIL GUARD, LEFT END	45W41-WG1552-01	1
7	COIL GUARD, CORNER	45W41-WG1553-01	1
8	COIL, FINNED TUBE	45W50-WG1554-01	1
9	BRACKET, FAN MOTOR	45W41-WG1555-01	1
10	COVER, UNIT TOP	45W41-WG1556-01	1
11	SUPPORT, TOP COVER	45W41-WG1557-01	1
12	COVER, ELECTRICAL ENCLOSURE	45W41-WG1558-01	1
13	ENCLOSURE, ELECTRICAL COMPONENTS	45W41-WG1559-01	1
14	COIL GUARD, REAR	45W41-WG1560-01	1
15	CENTER SUPPORT	45W41-WG1561-01	1
16	HX, REFRIGERANT TO WATER	45W50-WG1562-01	1
17	MANIFOLD, WATER SUPPLY	45W40-WG1563-01	1
18	BRACKET, PRIMARY HX	45W41-WG1564-01	1
19	MANIFOLD, WATER RETURN	45W40-WG1565-01	1
20	PANEL, PLUMBING CONNECTION	45W41-WG1566-01	1
21	PANEL, RIGHT END	45W41-WG1567-01	1
22	PANEL, CORNER SUPPORT	45W33-WG1568-01	1
23	COMPRESSOR, EVI	45W33-WG1569-01	1
24	BASE PLATE	45W41-WG1570-01	1
25	FLOW SWITCH	45W09-WG1571-01	1
26	SERVICE VALVE, SUCTION	45W28-WG1572-01	1
27	REVERSING VALVE	45W28-WG1575-01	1
28	LIMIT SWITCH, HIGHPRESSURE	45W11-WG1348-01	1
29	LIMIT SWITCH, LOW PRESSURE	45W11-WG1347-01	1
30	CHECK VALVE ASSEMBLY	45W28-WG1341-01	4
31	EEV, PRIMARY	45W28-WG1574-01	1
32	FILTER, REFRIGERANT	45W27-WG1214-01	2
33	EEV, VAPOR INJECTION	45W28-WG1577-01	1
34	ACCESS VALVE, SAE 1/4"	45W40-WG1215-01	1
35	SERVICE PORT, 3/8"	45W40-WG1578-01	1
36	HEAT EXCHANGER, EVI	45W50-WG1579-01	1
37	SUPPORT, HX BRACKET	45W41-WG1580-01	1
38	BRACKET, EVI HX	45W41-WG1581-01	1
39	BRACKET, CENTER PANEL	45W41-WG1582-01	1
40	PANEL, COMPRESSOR COMPARTMENT	45W41-WG1583-01	1
41	SUPPORT, COMPRESSOR GUARD	45W41-WG1584-01	1
42	GUARD, COMPRESSOR REAR	45W41-WG1585-01	1
43	GUARD, COMPRESSOR FRONT	45W41-WG1586-01	1
44	PLATE, LOGO LABEL	45W41-WG1587-01	1
45	BRACKET, CONTROL BOARD	45W41-WG1588-01	1
46	CONTROL BOARD, BP1000-G	45W09-WG1589-01	1
47	INVERTER BOARD	45W41-WG1590-01	1
48	BRACKET, RELAY BOARD	45W41-WG1591-01	1
49	FUSE, 250 mA	45W09-WG1592-01	1
50	RELAY, SPDT	45W09-WG1593-01	4
51	CURRENT TRANSFORMER	45W09-WG1594-01	1
52	TERMINAL, FEED THROUGH, 2 POLE	45W09-WG1408-01	2
53	TERMINAL, FEED THROUGH, 1 POLE	45W09-WG1358-01	24
54	CAP, TERMINAL END	45W09-WG1409-01	2
55	TERMINAL	45W09-WG1595-01	4
56	FILTER, EMI	45W09-WG1596-01	1
57	SUPPORT, COMPRESSOR	45W41-WG1597-01	1
58	DISPLAY, REMOTE TOUCHSCREEN	45W09-WG1598-01	1

# IMPORTANT NOTICE

## PRODUCT REGISTRATION & EXTENDED WARRANTY

### Extended Warranty Requirements

- Project/Equipment Registration
- Active SpacePak Certified Contractor Status at Time of Installation

To visit the **Product Registration Page**, click or scan the QR code.



### Are You Certified?

Check our **Contractor Locator** map to find out.

### Benefits of Becoming a SpacePak Certified Contractor:

- Local Leads
- Listed on SpacePak Website
- Sales & Marketing Support
- Pre-Sale Application Support & Load Calculations
- Extended Warranty

### SpacePak Offers Factory Authorized Training for Certification On:

- Small Duct High Velocity Equipment
- Air-to-Water Heat Pump & Hydronic Equipment

### Available Training Certification - Methods Include:

- Online Webinar Training
- Local Field Training
- Corporate Headquarter Factory Training

**For All Training Inquiries, Contact Your Local SpacePak Manufacturers Representative:**

<https://www.spacepak.com/RepLocator>



### Limited Warranty Statement

#### SpacePak “Solstice Inverter”<sup>™</sup>\* Series Air to Water Heat Pumps

Subject to the terms and conditions of this Limited Warranty Statement (the “Limited Warranty”), SpacePak warrants to the original purchaser of the “Solstice Inverter” Series that:

- 1) The parts are warranted for a period of two (2) years to the original owner of the System (as such term is defined in part (4) below). If any parts should prove defective due to improper workmanship and/or material for a period of two (2) years from the date of installation, SpacePak will replace any defective part without charge for that part. Replacement parts are warranted for the remainder of the original 2-year warranty period. Parts used as replacement may be of like kind and quality and may be new or remanufactured. Defective parts must be available for SpacePak in exchange for the replacement parts and become the property of SpacePak.
- 2) The compressor is warranted for a period of five (5) years to the original owner of the System. If the compressor should prove defective due to improper workmanship and/or material for a period of five (5) years from the date of installation, SpacePak will replace the defective compressor without charge for the compressor. Replacement compressors are warranted for the remainder of the original 5-year warranty period. Compressors used for replacement may be of like kind and quality and may be new or remanufactured. Defective compressors must be made available to SpacePak in exchange for the replacement compressor and become the property of SpacePak.
- 3) **Notwithstanding the foregoing, if the System is installed in a residential single-family home by a SPACEPAK CERTIFIED CONTRACTOR the parts will be warranted for five (5) years and compressor will be warranted for a period of ten (10) years, to the original owner, so long as the original owner resides in the home.** Specifically, if any parts and/or the compressor should prove defective due to improper workmanship and/or material for the period listed above from the date of installation, SpacePak will replace any defective parts or compressor without charge for the part or compressor. The replacement parts and/or compressor are warranted for the remainder of the original warranty period. Parts and/or compressors used for replacement may be of like kind and quality and may be new or remanufactured. Defective parts and/or compressors must be made available to SpacePak in exchange for the replacement parts and become the property of SpacePak.
- 4) For purposes of this Solstice Inverter” Series Limited Warranty, as used herein, the term “System” shall mean the Solstice Inverter outdoor and indoor components connected via refrigerant piping and electrical wiring purchased on or after February 1, 2021, (i) sold from a licensed HVAC representative of SpacePak (and not an unauthorized third party) to the original owner, (ii) installed by such contractor in accordance to local and National regulations in the continental U.S., Alaska, Hawaii, and Canada; and (iii) registered on SpacePak’s website located at [www.SpacePak.com/warranty](http://www.SpacePak.com/warranty)

\*For any Solstice equipment that is non-inverter, please refer to warranty located in the equipment original installation manual.

#### SpacePak Small Duct High Velocity Air Handlers and Hydronic Fan Coils

Subject to the terms and conditions of this Limited Warranty Statement (the “Limited Warranty”), SpacePak warrants to the original purchaser of the Small Duct High Velocity Air Handlers and hydronic fan coils that:

- 1) The parts are warranted for a period of one (1) year to the original owner of the System (as such term is defined in part (3) below). If any parts should prove defective due to improper workmanship and/or material for a period of one (1) year from the date of installation, SpacePak will replace any defective part without charge for that part. Replacement parts are warranted for the remainder of the original 1-year warranty period. Parts used as replacement may be of like kind and quality and may be new or remanufactured. Defective parts must be available for SpacePak in exchange for the replacement parts and become the property of SpacePak.
- 2) Notwithstanding the foregoing, if the System is installed in a residential single-family home by a SPACEPAK CERTIFIED CONTRACTOR the parts will be warranted for five (5) years, to the original owner, so long as the original owner resides in the home. Specifically, if any parts should prove defective due to improper workmanship and/or material for the period listed above from the date of installation, SpacePak will replace any defective parts or compressor without charge for the part or compressor. The replacement parts are warranted for the remainder of the original warranty period. Parts used for replacement may be of like kind and quality and may be new or remanufactured. Defective parts must be made available to SpacePak in exchange for the replacement parts and become the property of SpacePak.
- 3) For purposes of this Small Duct High Velocity Air Handlers and hydronic fan coils limited warranty, as used herein, the term “System” shall mean the “SpacePak Small Duct High Velocity Air Handlers, hydronic fan coils purchased on or after February 1, 2021, (i) sold from a licensed HVAC representative of SpacePak (and not an unauthorized third party) to the original owner, (ii) installed by such contractor in accordance to local and National regulations in the continental U.S., Alaska, Hawaii, and Canada; (iii) registered on SpacePak’s website located at [www.SpacePak.com/warranty](http://www.SpacePak.com/warranty); and (iv) comprised of SpacePak original components or SpacePak certified components. TO THE EXTENT THAT NON-SPACEPAK OR NON-SPACEPAK CERTIFIED COMPONENTS ARE UTILIZED IN THE SYSTEM, ALL WARRANTIES SHALL NOT BE APPLICABLE.

### SpacePak Buffer Tanks

The “Manufacturer” warrants to the original owner at the original installation site that the Hydronic Buffer Tanks (the “Product”) will be free from defects in material or workmanship for a period not to exceed ten (10) years from the startup, provided the product is installed in accordance with the manufacturers installation instructions. If upon examination by the Manufacturer the Product is shown to have a defect in material or workmanship during the warranty period, the Manufacturer will repair or replace, at its option, that part of the Product which is shown to be defective.

#### The following items apply to each Limited Warranty offered by SpacePak.

- 4) **NO LABOR.** Each Limited Warranty offered by SpacePak does NOT include labor or any other costs incurred for service, maintenance, repair, removing, replacing, installing, complying with local building and electric codes, shipping or handling, or replacement of the System/Products, compressors or any other parts. For items that are designed to be maintained or replaced by the original owner, the original owner is solely responsible for all labor and other costs of maintaining, installing, replacing, disconnecting or dismantling the System/ Products and parts in connection with owner-required maintenance. Please consult the applicable technical documentation for regularly suggested maintenance procedures.
- 5) **PROPER INSTALLATION.** This Limited Warranty applies only to Systems/Products that are sold by SpacePak HVAC representatives, installed by contractors who are licensed for HVAC installation under applicable local and state law, and who install the Systems/Products in accordance with (i) all applicable building codes and permits: (ii) SpacePak’s installation and operation instructions: and (iii) good trade practices.
- 6) **BEFORE REQUESTING SERVICE,** please review the applicable technical documentation to insure proper installation and correct customer control adjustment for the System/Products. If the problem persists, please arrange for warranty service.
  - a. **TO OBTAIN WARRANTY SERVICE:**
    - i. Contact the licensed contractor who installed the System/Products or the nearest licensed contractor, dealer, or distributor (whose name and address may be obtained on our website at [www.SpacePak.com](http://www.SpacePak.com)) of any defect within the applicable warranty time period.
    - ii. Proof of the installation date by a licensed contractor is required when requesting warranty service. Present the sales receipt, building permit or other document which establishes proof and date of installation. In the absence of acceptable proof, this Limited Warranty shall be deemed to begin one hundred twenty (120) days after the date of manufacture stamped on the System/Products.
    - iii. This Limited Warranty applies only to System/Products purchased on or after February 1, 2021 only while the System/Products remains at the site of the original installation, and only to locations within the continental United States, Alaska, Hawaii and Canada.
    - iv. Shipment, to the Manufacturer, of that part of the Product thought to be defective. Goods can only be returned with prior written approval from the Manufacturer. All returns must be freight prepaid. Determination, in the reasonable opinion of the Manufacturer, that there exists a defect in material or workmanship.
  - b. **THIS LIMITED WARRANTY DOES NOT COVER:** property damages, malfunction or failure of the System/ Products, or personal injury caused by or resulting from: (a) accident, abuse, negligence or misuse; (b) operating the System/Products in a corrosive or wet environment, including those containing chlorine, fluorine or any other hazardous or harmful chemicals or environmental factors, including sea- or salt-water; (c) installation, alteration, repair or service by anyone other than a licensed contractor or other than pursuant to the manufacturer’s instructions; (d) improper matching of System/Products components; (e) improper sizing of the System/Products; (f) improper or deferred maintenance contrary to the manufacturer’s instructions; (g) physical abuse to or misuse of the System/Products (including failure to perform any maintenance as described in the Operation manual, or any System/ Products damaged by excessive physical or electrical stress; (h) System/Products that have had a serial number or any part thereof altered, defaced or removed; (i) System/Products used in any manner contrary to the Operation Manual; (j) freight damage; or (k) events of force majeure or damage caused by other external factors such as lightning, power surges, fluctuations in or interruptions of electrical power, rodents, vermin, insects, or other animal- or pest-related issues.
  - c. **THIS LIMITED WARRANTY ALSO EXCLUDES:** (a) SERVICE CALLS WHERE NO DEFECT IN THE SYSTEM/ PRODUCTS COVERED UNDER THIS WARRANTY IS FOUND: (b) System/Products installation or set-ups; (c) Adjustments of user controls; (d) System/Products purchased or installed outside the continental United States, Alaska, Hawaii and Canada; or (e) System/Products purchased or installed prior to **February 1, 2021**. Consult the operating instructions for information regarding user controls.



**SPACE PAK®**

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