



FRIEDRICH

Ductless Air Conditioning System Service Check List

PROJECT SITE INFORMATION		<input type="checkbox"/> Start-up Report	<input type="checkbox"/> Service Report
Date: _____ Start-Up Date: _____ Initial Date of Issue: _____ Last Service Date: _____ System Reference: _____ Time: _____ Weather: <input type="checkbox"/> Sunny <input type="checkbox"/> Rain <input type="checkbox"/> Snow <input type="checkbox"/> Partly Cloudy <input type="checkbox"/> Wind Gusts <input type="checkbox"/> Other _____ Ambient Temp _____ DB°F _____ WB°F	Owner: _____ Site Address: _____ Site Address: _____ City: _____ State: _____ Zip: _____ Cnty: _____ Phone: _____ Mobile: _____ Type of Application: <input type="checkbox"/> Residence <input type="checkbox"/> Commercial <input type="checkbox"/> Retail <input type="checkbox"/> Server Room <input type="checkbox"/> School <input type="checkbox"/> Other _____	Contractor: _____ Tech: _____ Tech: _____ Phone: _____ Equipment Purchased From: _____ _____ Error Code: <input type="checkbox"/> None	

Before initial test run of the system check of the following points:
<ol style="list-style-type: none"> 1. <input type="checkbox"/> Refrigerant system pressure tested. 2. <input type="checkbox"/> Refrigeration system <u>triple evacuated</u>. 3. <input type="checkbox"/> Outdoor Unit grounded <input type="checkbox"/> Main panel grounded properly. <i>(Do not assume it is)</i> 4. <input type="checkbox"/> Correct refrigeration charge has been added. 5. <input type="checkbox"/> Service valves open and cap replaced 6. <input type="checkbox"/> Pipes and cables labeled or numbered 7. <input type="checkbox"/> All units, and remote controllers in the system have been electrically connected prior to turning on power to the outdoor unit. 8. <input type="checkbox"/> Power supply to outdoor +/- 10% of name plate line voltage. Once the unit has been switched on, the crankcase heater must be left on for a 6-hour period prior to start-up. 9. <input type="checkbox"/> All condensate drain pipe work tested, condensate pumps primed. <i>(Note: Internal condensate lift is 27.5 inches starting at the bottom of the drain pan)</i> 10. <input type="checkbox"/> Equipment panels have been replaced. 11. <input type="checkbox"/> Penetrations into building and equipment panels sealed. 12. <input type="checkbox"/> Air Filter installed <input type="checkbox"/> Duct Work complete <input type="checkbox"/> Vents opened 13. <input type="checkbox"/> Outdoor unit clear of debris. 14. <input type="checkbox"/> Before Test Run, wait for 15 minutes prior to taking measurements.

LEAK CHECK AND EVACUATION DETAILS	
Pressure Test Details	Evacuation Details
Test Pressure: _____	Vacuum Achieved: _____
Test Period: _____	Pressure Rise Test: _____

PROJECT NOTES

Technician's Signature: _____



FRIEDRICH

Ductless Air Conditioning System Service Check List

SYSTEM:				
NO.	SYSTEM AND INSTALLATION STATUS			REMARKS
1	Installation Location	Outdoor Unit	<input type="checkbox"/> Rooftop <input type="checkbox"/> Wall <input type="checkbox"/> Ground Level <input type="checkbox"/> Other Location	
2	Maintenance Accessibility	Outdoor Unit	<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Fail <input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Fail	
3	Combination Ratio (Btu IDU / Btu ODU)		_____ %	
4	Heat Pump – Both Pipes Insulated		<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Fail	
5	Pipe Diameter		<input type="checkbox"/> Good <input type="checkbox"/> Fail	
6	Height Difference (Multiple Only)		Outdoor to Indoor: _____ Ft. Indoor to Indoor: _____ Ft.	
7	Vertical and Horizontal Pipe Length (Multi-zone, per IDU, notate each IDU)	Refer to installation manual	Total _____ Ft Longest _____ Ft calculation piping length - small pipe, one-way	
8	Ground/Earth Leakage	Outdoor Unit	<input type="checkbox"/> Good <input type="checkbox"/> Fail	
9	Standard of Electrical Insulation		<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Fail	
10	Access to Remove Electrical Covers		<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Fail	
11	IDU Control Method		<input type="checkbox"/> Wired <input type="checkbox"/> Wireless	
12	Remote Controller	Fan / Dry Cool / Heat Automatic	<input type="checkbox"/> Pass <input type="checkbox"/> Fail	
13	External Condensate Pumps Primed/Operational		<input type="checkbox"/> Yes <input type="checkbox"/> No	
14	Connection of Control System Indoor – RC		<input type="checkbox"/> Good <input type="checkbox"/> Poor	

OUTDOOR UNIT:					
NO.	OUTDOOR UNIT OPERATION STATUS				REMARKS
15	Outdoor Unit Details	Model No: _____		Serial No: _____	
16	Compressor Details	Model No: _____		Serial No: _____	
17	Line Voltage (System OFF)	L1 - N	L2 - N	L1 - L2	Amps
		V	V	V	_____
18	Vibration / Noise	Compressor	<input type="checkbox"/> Good <input type="checkbox"/> Poor <input type="checkbox"/> Good <input type="checkbox"/> Poor		
19	Additional Refrigerant Charge (if applicable)			_____ oz.	Total Charge _____ oz.
20	Wind Baffle		<input type="checkbox"/> Yes <input type="checkbox"/> No		
21	Extended Line Dip Switch (Multi-zone only)		<input type="checkbox"/> Yes <input type="checkbox"/> No		
22	Friedrich Service Tool Data (DWTST)		<input type="checkbox"/> Yes <input type="checkbox"/> No		
23	Outdoor Coil Inlet Air Temperature	_____ DB°F _____ WB°F	Coil Condition	<input type="checkbox"/> Good <input type="checkbox"/> Poor	
24	Outdoor Coil Discharge Air Temperature	_____ DB°F _____ WB°F	Cooling Btus _____	Heating Btus _____	
25	ODU Clearance	Front	Side	Rear	Access
26	Wire AWG	Line Voltage	Control Wiring		
27	Outdoor Unit Properly Grounded		<input type="checkbox"/> Yes <input type="checkbox"/> No		

REMARKS:



FRIEDRICH

Ductless Air Conditioning System Service Check List

		INDOOR UNIT # 1		REMARKS
Model No.		Tag Number:		Dip Switch Settings
Serial No.		Location:		
Line & Control Voltage	L1 _____ L2 _____ VAC	L2-L3 _____ VDC		Test on High Speed
Test Fan Speed	<input type="checkbox"/> Low <input type="checkbox"/> Med <input type="checkbox"/> High	E.S.P. _____		Air Filter Clean <input type="checkbox"/> Yes <input type="checkbox"/> No
Return Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Cooling Btus _____	
Discharge Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Heating Btus _____	

		INDOOR UNIT # 2		REMARKS
Model No.		Tag Number:		Dip Switch Settings
Serial No.		Location:		
Line & Control Voltage	L1 _____ L2 _____ VAC	L2-L3 _____ VDC		Test on High Speed
Test Fan Speed	<input type="checkbox"/> Low <input type="checkbox"/> Med <input type="checkbox"/> High	E.S.P. _____		Air Filter Clean <input type="checkbox"/> Yes <input type="checkbox"/> No
Return Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Cooling Btus _____	
Discharge Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Heating Btus _____	

		INDOOR UNIT # 3		REMARKS
Model No.		Tag Number:		Dip Switch Settings
Serial No.		Location:		
Line & Control Voltage	L1 _____ L2 _____ VAC	L2-L3 _____ VDC		Test on High Speed
Test Fan Speed	<input type="checkbox"/> Low <input type="checkbox"/> Med <input type="checkbox"/> High	E.S.P. _____		Air Filter Clean <input type="checkbox"/> Yes <input type="checkbox"/> No
Return Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Cooling Btus _____	
Discharge Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Heating Btus _____	

		INDOOR UNIT # 4		REMARKS
Model No.		Tag Number:		Dip Switch Settings
Serial No.		Location:		
Line & Control Voltage	L1 _____ L2 _____ VAC	L2-L3 _____ VDC		Test on High Speed
Test Fan Speeds	<input type="checkbox"/> Low <input type="checkbox"/> Med <input type="checkbox"/> High	E.S.P. _____		Air Filter Clean <input type="checkbox"/> Yes <input type="checkbox"/> No
Return Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Cooling Btus _____	
Discharge Air Temperature	Cooling: _____ DB°F _____ WB°F	Heating: _____ DB°F	Heating Btus _____	

Cooling Btus = 4.5 x cfm x Delta h (Use attached chart to determine enthalpy (h) delta.)

Example 4.5 x 390 x 8 = 14,040 Total Btus (Sensible & Latent Energy)

Heating Btus = 1.08 x cfm x Delta T

Example 1.08 x 240 x 50 = 12,960 Sensible Btus

**WET BULB
TEMPER-
ATURE**

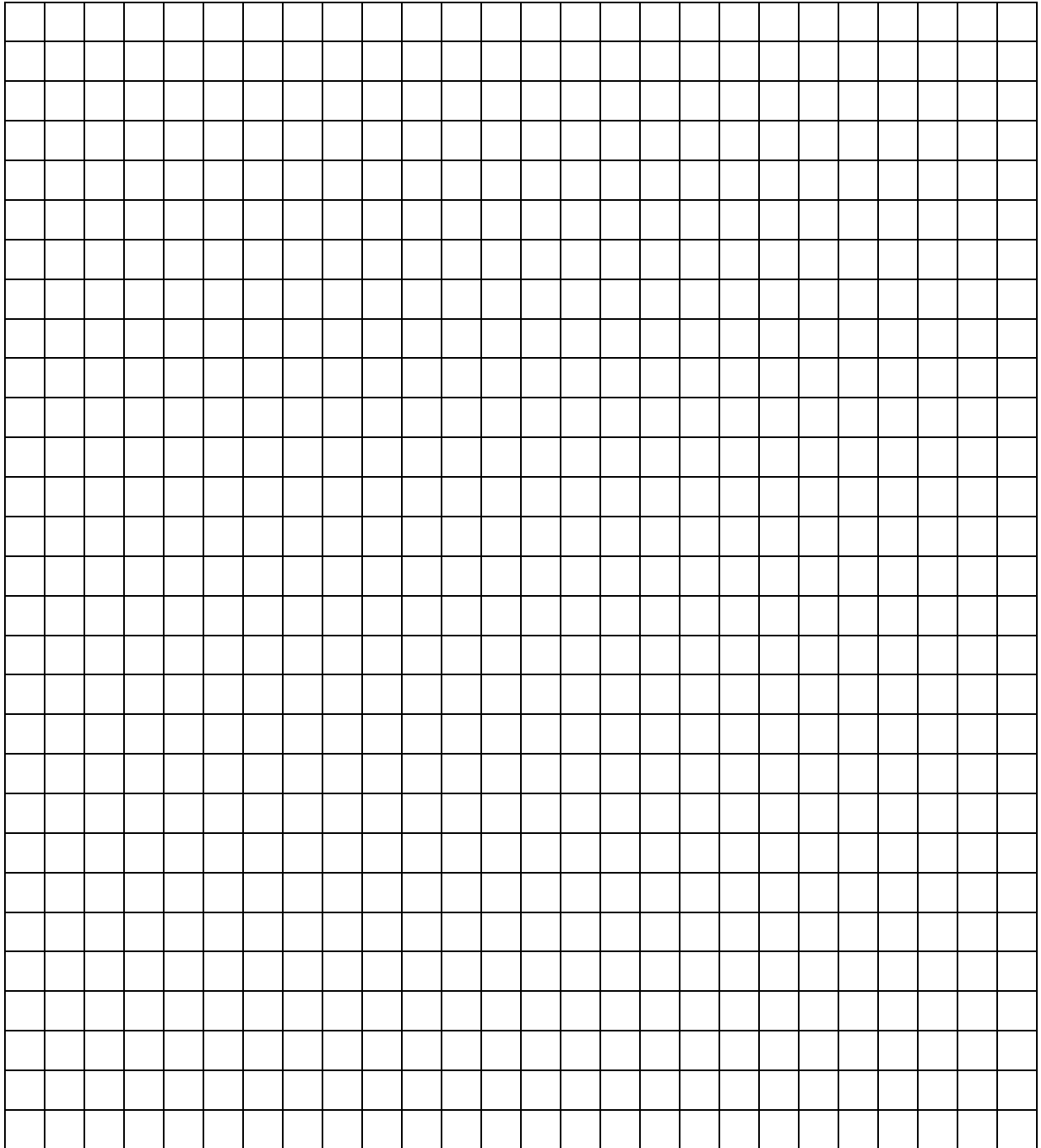
ENTHALPY CHART

WET BULB TO ENTHALPY CONVERSION

Wet bulb temperature in tenths of a degree Fahrenheit

	.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9
35	12.97	13.01	13.05	13.10	13.14	13.18	13.23	13.27	13.31	13.36
36	13.40	13.45	13.49	13.53	13.58	13.62	13.67	13.71	13.76	13.80
37	13.85	13.89	13.93	13.98	14.02	14.07	14.11	14.16	14.20	14.25
38	14.30	14.34	14.39	14.43	14.48	14.52	14.57	14.61	14.66	14.71
39	14.75	14.80	14.84	14.89	14.94	14.98	15.03	15.08	15.12	15.17
40	15.21	15.26	15.31	15.36	15.40	15.45	15.50	15.54	15.59	15.64
41	15.69	15.73	15.78	15.83	15.88	15.92	15.97	16.02	16.07	16.12
42	16.16	16.21	16.26	16.31	16.36	16.41	16.45	16.50	16.55	16.60
43	16.65	16.70	16.75	16.80	16.85	16.90	16.95	17.00	17.04	17.09
44	17.14	17.19	17.24	17.29	17.34	17.39	17.45	17.50	17.55	17.60
45	17.65	17.70	17.75	17.80	17.85	17.90	17.95	18.00	18.06	18.11
46	18.16	18.21	18.26	18.31	18.37	18.42	18.47	18.52	18.58	18.63
47	18.68	18.73	18.79	18.84	18.89	18.94	19.00	19.05	19.10	19.16
48	19.21	19.26	19.32	19.37	19.43	19.48	19.53	19.59	19.64	19.70
49	19.75	19.81	19.86	19.92	19.97	20.03	20.08	20.14	20.19	20.25
50	20.30	20.36	20.41	20.47	20.53	20.58	20.64	20.69	20.75	20.81
51	20.86	20.92	20.98	21.04	21.09	21.15	21.21	21.26	21.32	21.38
52	21.44	21.49	21.55	21.60	21.66	21.72	21.78	21.83	21.89	21.95
53	22.02	22.06	22.12	22.09	22.24	22.30	22.36	22.43	22.49	22.55
54	22.62	22.68	22.74	22.80	22.86	22.92	22.98	23.04	23.11	23.16
55	23.22	23.28	23.34	23.40	23.46	23.52	23.58	23.64	23.71	23.77
56	23.84	23.90	23.96	24.03	24.09	24.15	24.21	24.28	24.34	24.40
57	24.48	24.53	24.59	24.66	24.72	24.79	24.85	24.92	24.99	25.05
58	25.12	25.18	25.25	25.32	25.38	25.45	25.51	25.58	25.65	25.71
59	25.78	25.85	25.91	25.99	26.06	26.12	26.19	26.26	26.33	26.39
60	26.46	26.53	26.60	26.67	26.74	26.81	26.88	26.94	27.01	27.08
61	27.15	27.21	27.28	27.35	27.42	27.48	27.55	27.62	27.69	27.76
62	27.85	27.92	28.00	28.07	28.14	28.21	28.29	28.36	28.43	28.50
63	28.57	28.65	28.72	28.79	28.86	28.94	29.01	29.08	29.16	29.23
64	29.31	29.38	29.45	29.53	29.60	29.68	29.76	29.83	29.91	29.98
65	30.06	30.13	30.21	30.29	30.37	30.45	30.52	30.60	30.68	30.76
66	30.83	30.92	31.00	31.07	31.15	31.23	31.31	31.39	31.47	31.54
67	31.62	31.70	31.77	31.85	31.93	32.01	32.09	32.17	32.25	32.33
68	32.42	32.51	32.59	32.67	32.76	32.84	32.92	33.01	33.09	33.17
69	33.25	33.34	33.42	33.50	33.59	33.67	33.75	33.84	33.92	34.01
70	34.09	34.17	34.26	34.34	34.43	34.51	34.60	34.69	34.77	34.86
71	34.95	25.04	35.13	35.22	35.31	35.40	35.48	35.57	35.66	35.74
72	35.83	35.92	36.01	36.10	36.19	36.27	36.37	36.46	36.55	36.65
73	36.74	36.83	36.92	37.02	37.11	37.21	37.30	37.39	37.48	37.57
74	37.66	37.76	37.85	37.94	38.04	38.14	38.23	38.33	38.43	38.52
75	38.61	38.71	38.80	38.90	39.00	39.09	39.19	39.28	39.37	39.47
76	39.57	39.67	39.77	39.87	39.97	40.07	40.17	40.27	40.37	40.47
77	40.57	40.68	40.78	40.88	40.98	41.08	41.18	41.28	41.38	41.48
78	41.58	41.69	41.79	41.89	42.00	42.10	42.20	42.31	42.41	42.52
79	42.62	42.73	42.83	42.94	43.05	43.15	43.26	43.37	43.48	43.59
80	43.69	43.81	43.91	44.02	44.13	44.24	44.36	44.46	44.57	44.68
81	44.78	44.89	45.00	45.11	45.23	45.34	45.45	45.57	45.68	45.80
82	45.90	46.02	46.13	46.24	46.35	46.47	46.58	46.69	46.71	46.82
83	47.04	47.16	47.28	47.40	47.52	47.63	47.75	47.87	48.00	48.10
84	48.22	48.34	48.46	48.58	48.70	48.82	48.94	49.06	49.19	49.31
85	49.43	49.56	49.68	49.70	49.92	50.05	50.17	50.29	50.41	50.54

To convert a wet bulb reading to enthalpy, find the wet bulb reading on the left and across the top of the table. The intersection of the degree and tenth of a degree is equivalent *enthalpy*. To find the enthalpy change through an air conditioning system measure the average return and supply grille wet bulb temperatures and convert each to enthalpy. Subtract the enthalpy values to find enthalpy change.



Notes:
