= the auxiliary energy input for water heating during the extra hours period below 65 °F. $\tilde{Q}_{wdh}(T_j)$ = the cyclic heat pump water heating capacity in the dedicated water heating mode during the heating season.

TABLE 1.—TEST SUMMARY—INTEGRATED HEAT PUMP SYSTEM TESTS	BLE 1.—TEST
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Teat	Description	Test type		Air temperatures (F)				Water drow	Data reduc-
Test				ODDB	ODWB	IDDB	IDWB	vvaler draw	tion notes
1	COOLING	STEADY- STATE	REQUIRED	95		80	67		1
2	COOLING + WH.	STEADY- STATE.	REQUIRED	95		80	67	TABLE 2	1,2,3,6
3	WH (COOLING)	CYCLIC	REQUIRED	82		80	67	TABLE 4	1,2,5,6
4	COOLING + WH.	CYCLIC	REQUIRED	82		80	67	TABLE 3	1,2,4,6
5	COOLING	STEADY- STATE.	REQUIRED	82		80	67		1
6	COOLING	STEADY- STATE.	OPTIONAL	82		80	57		1
7	COOLING CY- CLIC.	CYCLIC	OPTIONAL	82		80	57		1
8	WH (HEATING)	CYCLIC	REQUIRED	67	61	70		TABLE 4	1,2,7
9	WH (HEATING)	CYCLIC	REQUIRED	47	43	70		TABLE 4	1,2,7
10	HEATING + WH	CYCLIC	REQUIRED	47	43	70		TABLE 3	1,2,4,6
11	HEATING	STEADY- STATE.	REQUIRED	47	43	70			1
12	HEATING CY- CLIC.	CYCLIC	OPTIONAL	47	43	70			
13	HEATING DE-	STEADY- STATE	REQUIRED	35	33	70			1
14	HEATING + WH	STEADY-	REQUIRED	17	15	70		TABLE 2	1,2,3,6
15	HEATING	STEADY- STATE.	REQUIRED	17	15	70			1

Data Reduction Notes for Table 1

1. Data recorded per ASHRAE Standard 116–83.

2. Water heating capacity is calculated as the net water energy withdrawn plus the tank standby loss during the test duration, divided by the length of time that the water pump and/or auxiliary water heater elements operate and expressed as BTU/hr. Test duration is defined as starting at t=0 and ending at the conclusion of water heating from all sources. Makeup and supply water temperatures are to be recorded every 5 seconds during water draws.

3. The steady-state cooling or heating capacity coincident with water heating is calculated as the total air side capacity delivered during the period of time that the water pump and/or auxiliary water heater elements operate, divided by the length of time that the water pump and/or auxiliary water heater elements operate and expressed as BTU/hr.

4. The cyclic cooling or heating capacity coincident with water heating is calculated as the air side capacity delivered during the period of time that both the water pump and indoor blower and/or both the auxiliary water heater elements and indoor blower operate, divided by the length of time that both the water pump and indoor blower and/ or both the auxiliary water heater elements and indoor blower operate and expressed as Btu/hr.

5. The cyclic cooling capacity associated with dedicated water heating is calculated as the air side capacity delivered during the period of time that the indoor blower operates, divided by the length of time that the indoor blower operates, and expressed as Btu/hr.

6. The power used with the cooling or heating capacity associated with water heating is calculated as the total energy consumed by all components, including the heat pump, water pump, and auxiliary water heater elements, etc., during the length of time that the air side capacity is integrated, divided by the same length of time, and expressed as Watts.

7. The power used with the dedicated water heating capacity is calculated as the total energy consumed by all components, including the heat pump, water pump, and auxiliary water heater elements, etc., during the duration of the test, divided by the period of time used in determining the associated water heating capacity determination.

TABLE 2.—STEADY-STATE COMBINED OPERATION & WATER DRAW SCHEDULE

Sequence	
1	FILL WATER HEATER (or draw until both upper and lower thermostat water temperatures are below their turn on points).
2	RESISTIVE OPERATION TO CONCLUSION.
3	HEAT PUMP OPERATION TO CONCLUSION OF WATER HEATING (heat pump continues to operate in space conditioning
	mode).
4	CONDITION WITH 11 GALLON DRAW.
5	HEAT PUMP AND/OR RESISTIVE OPERATION TO CONCLUSION OF WATER HEATING.
6	HEAT PUMP CONTINUES TO OPERATE IN SPACE CONDITIONING MODE FOR 10 MINUTES.
7	t=0, DRAW 5.4 GALLONS.