

# COMBINED HYDRONIC SPACE AND WATER HEATING

# DHW-5

Project Title: \_\_\_\_\_

Date: \_\_\_\_\_

## Storage Gas

- |                                  |       |          |  |
|----------------------------------|-------|----------|--|
| 1. Recovery Efficiency/AFUE      | _____ | unitless | From manufacturer's literature or appliance database |
| 2. Average Hourly Pipe Heat Loss | _____ | kBtu/hr  | From Pipe Heat Loss Worksheet below                  |
| 3. Rated Input                   | _____ | kBtu/hr  | From manufacturer's literature or appliance database |
| 4. Effective AFUE                | _____ | unitless | Line 1 - (Line 2 ÷ Line 3)                           |

## Storage Electric

- |                                  |       |          |  |
|----------------------------------|-------|----------|--|
| 1. Average Hourly Pipe Heat Loss | _____ | kBtu/hr  | From Pipe Heat Loss Worksheet below                  |
| 2. Rated Input                   | _____ | kW       | From manufacturer's literature or appliance database |
| 3. Pump Watts                    | _____ | watt     | From manufacturers literature                        |
| 4. Term A                        | _____ | unitless | 1 - [Line 1 ÷ (3.413 x Linw 1)]                      |
| 5. Term B                        | _____ | unitless | 1 + [Line 3 ÷ (1000 x Line 2)]                       |
| 6. Effective HSPF (no fan)       | _____ | Btu/watt | 3.413 x (Line 4 ÷ Line 5)                            |
| 7. Effective HSPF (with fan)     | _____ | Btu/watt | 1.017 ÷ [(1 ÷ Line 6) + 0.005]                       |

## Heat Pump

- |                                  |       |          |   |
|----------------------------------|-------|----------|---|
| 1. Energy Factor                 | _____ | unitless | From manufacturer's literature or appliance database    |
| 2. Average Hourly Pipe Heat Loss | _____ | kBtu/hr  | From Pipe Heat Loss Worksheet below                     |
| 3. Rated Input                   | _____ | kW       | From manufacturer's literature or appliance database    |
| 4. Recovery Efficiency           | _____ | unitless | 1 ÷ [(1 ÷ Line) - 0.1175]                               |
| 5. Climate Zone Adjustment       | _____ | unitless | From table below  |
| 6. Effective HSPF (no fan)       | _____ | Btu/watt | 3.413 x [(Line 4 ÷ Line 5) - Line 2 ÷ (3.413 x Line 3)] |
| 7. Effective HSPF (with fan)     | _____ | Btu/watt | 1.017 ÷ [(1 ÷ Line 6) + 0.005]                          |

### Climate Zone Adjustment

Climate Zone	Adjustment
1, 14	1.04
2, 3	0.99
4, 5, 12	1.07
6-11, 13, 15	0.92
16	1.50

### Pipe Heat Loss Rate Table

Pipe Nominal Diameter (inches)	Insulation Thickness (inches)		
	0.5	0.75	1.0
0.50	71.6	60.9	54.2
0.75	91.1	75.8	66.6
1.00	109.9	90.1	78.8
1.50	146.7	117.5	100.3
2.00	182.9	144.3	121.7

## Pipe Heat Loss Worksheet

(Complete this section when more than 10 feet of pipe is in unconditioned space.)

1. Description of Pipe Size and Insulation Condition	2. Pipe Heat Loss Rate <sub>1</sub> (kBtu/yr•ft)	3. Pipe Length (ft)	4. Total Pipe Heat Loss
_____	_____	x _____	= _____
_____	_____	x _____	= _____
_____	_____	x _____	= _____
_____	_____	x _____	= _____
_____	_____	x _____	= _____
5. Sum			= _____
6. Average Hourly Pipe Heat Loss (kBtu/hr) = Sum ÷ 8760 = _____			

1. From Pipe Heat Loss Rate Table.<sup>1</sup>