



**Low Temperature VWART Calculation for Alfa Laval HIU**

Primary flow temperature = 60°C, DHW set point = 50°C, Space heating temperatures = 45°C/35°C

Test carried out by RISE in November 2017, Test Reference 7P05886

Manufacturer: Alfa Laval; Model: Heating substation F3-H2T2-GE7-E-NR-O-9-2,5-0,40-2x110-1x130; Serial number: 738965/4069451; Year of manufacture: 2017

VWART calculation prepared by Freddie Valletta of FairHeat Ltd on 31 January 2018

	VWART (°C)	Volume (m <sup>3</sup> )
DHW	20.5	32.59
Keep warm	46.9	81.37
Space heating	35.0	51.98

VWART with keep warm active		
Period	VWART (°C)	% Time
No heating	39.4	94%
Heating	35.5	6%
<b>Overall</b>	<b>39.1</b>	

	DHW draw test results			Post DHW draw (60 seconds)	
	Power (W)	Primary flow (m <sup>3</sup> /hr)	Return temp (°C)	Primary flow (m <sup>3</sup> /hr)	Return temp (°C)
Low	10077	0.212	19.7	0.005	19.4
Medium	17386	0.391	21.2	0.004	21.3
High	24515	0.546	21.2	0.015	23.5

DHW draw volumes per annum		
Energy (kWh)	Time (hours)	Volume (m <sup>3</sup> )
729	72.34	15.336
297	17.08	6.675
444	18.11	9.889

Post DHW draw volumes per annum		
Events	Avg duration (seconds)	Volume (m <sup>3</sup> )
10000	30	0.458
660	75	0.051
300	145	0.184

Keep warm test results	
Primary flow (m <sup>3</sup> /hr)	Return temp (°C)
0.010	46.9

Keep warm volumes per annum	
Time (hours)	Volume (m <sup>3</sup> )
8104	81.366

	Space heating test results		
	Power (W)	Primary flow (m <sup>3</sup> /hr)	Return temp (°C)
1 kW	1221	0.046	34.6
2 kW	2369	0.088	34.9
4 kW	4148	0.139	35.2

Space heating volumes per annum		
Energy (kWh)	Time (hours)	Volume (m <sup>3</sup> )
98	80.29	3.674
787	332.22	29.390
565	136.21	18.920