



**High Temperature VVART Calculation for Alfa Laval HIU**

Primary flow temperature = 70°C, DHW set point = 55°C, Space heating temperatures = 60°C/40°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

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

	VVART (°C)	Volume (m <sup>3</sup> )
DHW	17.9	24.77
Keep warm	47.5	53.95
Space heating	41.3	46.21

VVART with keep warm active		
Period	VVART (°C)	% Time
No heating	38.2	93%
Heating	40.9	7%
<b>Overall</b>	<b>38.4</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	10988	0.181	17.0	0.002	16.8
Medium	19007	0.324	18.6	0.001	18.6
High	26875	0.454	18.9	0.005	19.1

DHW draw volumes per annum		
Energy (kWh)	Time (hours)	Volume (m <sup>3</sup> )
729	66.35	12.010
297	15.63	5.058
444	16.52	7.507

Post DHW draw volumes per annum		
Events	Avg duration (seconds)	Volume (m <sup>3</sup> )
10000	30	0.126
660	75	0.014
300	145	0.055

Keep warm test results	
Primary flow (m <sup>3</sup> /hr)	Return temp (°C)
0.007	47.5

Keep warm volumes per annum	
Time (hours)	Volume (m <sup>3</sup> )
8068	53.951

	Space heating test results		
	Power (W)	Primary flow (m <sup>3</sup> /hr)	Return temp (°C)
1 kW	1226	0.041	41.0
2 kW	2103	0.068	40.8
4 kW	4041	0.124	41.9

Space heating volumes per annum		
Energy (kWh)	Time (hours)	Volume (m <sup>3</sup> )
98	79.94	3.312
787	374.16	25.529
565	139.83	17.370