Appendix 3. VWART calculations

Low temperature VWART calculations with keep warm function active

Low temperature VWART Calculation for Uponor with keep warm active
Test carried out by RISE in November 2019
Manufacturer: Uponor; Model: Combi Port PRO XU ; Serial number: D-10-0244263; Year of manufacture: 2019
VWART calculation prepared by Henrik Persson of RISE on 06 December 2019

	VWART	Volume
DHW	20,2	34,19
Standby	48,3	128,68
Space Heating	35,2	56,16

Period	VWART	% Time
No Heating	42,4	93%
Heating	36,4	7%
Overall	**42**	

	DHW Draw test results			Post DHW Draw (60 seconds)	
	Power (W)	Primary flow (m3/hr)	Return Temp(°C)	Primary flow (m3/hr)	Avg Return Temp(°C)
Low	10283	0,227	20,5	0,020	20,4
Medium	16110	0,349	20,1	0,018	19,9
High	21202	0,453	19,8	0,022	19,6

DHW Draw Volumes per annum		
kWh	Hours	Volume pa (m3)
729	70,89	16,093
297	18,44	6,434
444	20,94	9,486

Post DWH Draw Volumes per annum		
Events	Average duration (secs)	Volume pa (m3)
10000	30	1,667
660	75	0,248
300	145	0,266

	Standy test results	
	Primary flow (m3/hr)	Return Temp(°C)
Standby	0,016	48,3

Standby Volumes pa	
Hours	Volume pa (m3)
8 043	128,68

	Space Heating test results		
	Power (W)	Primary flow (m3/hr)	Return Temp(°C)
1kWp	1025	0,066	34,9
2kWp	2144	0,080	35,2
4kWp	3916	0,142	35,2

Space Heating Volumes pa		
kWh pa	Hours	Volume pa (m3)
98	95,61	6,310
787	367,07	29,366
565	144,28	20,488