



FairHeat

Low Temperature VWART Calculation for SAV HIU

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

Test carried out by RISE in May 2017, Test Reference 7P03675B

Manufacturer: Germina Termix A/S.; Model: VVX-I-R FI 1-1 UFH; Serial number: L7020418; Year of manufacture: 2017

VWART calculation prepared by Tom Naughton of FairHeat Ltd on 14 July 2017

| | VWART (°C) | Volume (m ³) |
|---------------|------------|--------------------------|
| DHW | 18.4 | 31.68 |
| Keep warm | 41.3 | 40.96 |
| Space heating | 35.9 | 55.44 |

| VWART with keep warm active | | |
|-----------------------------|-------------|--------|
| Period | VWART (°C) | % Time |
| No heating | 31.3 | 93% |
| Heating | 35.5 | 7% |
| Overall | 31.6 | |

| VWART with keep warm inactive | | |
|-------------------------------|------------|--------|
| Period | VWART (°C) | % Time |
| No heating | N/A | N/A |
| Heating | N/A | N/A |
| Overall | N/A | |

| | DHW draw test results | | | Post DHW draw (60 seconds) | |
|--------|-----------------------|-----------------------------------|------------------|-----------------------------------|------------------|
| | Power (W) | Primary flow (m ³ /hr) | Return temp (°C) | Primary flow (m ³ /hr) | Return temp (°C) |
| Low | 9825 | 0.204 | 18.4 | 0.012 | 18.6 |
| Medium | 13882 | 0.285 | 18.3 | 0.012 | 18.6 |
| High | 20478 | 0.416 | 18.2 | 0.017 | 19.0 |

| DHW draw volumes per annum | | |
|----------------------------|--------------|--------------------------|
| Energy (kWh) | Time (hours) | Volume (m ³) |
| 729 | 74.20 | 15.157 |
| 297 | 21.39 | 6.089 |
| 444 | 21.68 | 9.018 |

| Post DHW draw volumes per annum | | |
|---------------------------------|------------------------|--------------------------|
| Events | Avg duration (seconds) | Volume (m ³) |
| 10000 | 30 | 1.041 |
| 660 | 75 | 0.170 |
| 300 | 145 | 0.201 |

Standby

| Keep warm test results | |
|-----------------------------------|------------------|
| Primary flow (m ³ /hr) | Return temp (°C) |
| 0.005 | 41.3 |

| Keep warm volumes per annum | |
|-----------------------------|--------------------------|
| Time (hours) | Volume (m ³) |
| 8009 | 40.960 |

| | Space heating test results | | |
|------|----------------------------|-----------------------------------|------------------|
| | Power (W) | Primary flow (m ³ /hr) | Return temp (°C) |
| 1kWp | 977 | 0.039 | 35.9 |
| 2kWp | 1986 | 0.077 | 35.8 |
| 4kWp | 4110 | 0.154 | 36.0 |

| Space heating volumes per annum | | |
|---------------------------------|--------------|--------------------------|
| Energy (kWh) | Time (hours) | Volume (m ³) |
| 98 | 100.29 | 3.879 |
| 787 | 396.23 | 30.371 |
| 565 | 137.47 | 21.186 |