Thermal Integration The Data HIU Test: VWART Calculation

May 2016

1 Introduction

The Thermal Integration The DATA HIU was tested according to FairHeat's "*Modified Swedish Test UK HIU Test Regime V1-Rev-010*" by SP Swedish Technical Institute during May 2016.

This document sets out the calculated Volume Weighted Return Temperatures (VWART) for the Thermal Integration The DATA and should be considered a companion document to the "*6P04381 -Thermal Integration 160627*" document produced by SP Swedish Technical Institute, which is published at www.sp.se and www.fairheat.com.

The methodology for calculating the different Volume Weighted Return Temperature metrics is set out in the "*Modified Swedish Test UK HIU Test Regime V1-Rev-010*" document.

In order to assess overall performance of HIUs tested according to the UK HIU Test Regime Technical Specification published by FairHeat, a number of derived results were calculated from the output from the tests, assuming 'standard' UK operating conditions of:

- 75°C primary flow temperature
- 55°C Domestic Hot Water (DHW) set point
- 70°C/40°C space heating flow and return temperatures
- Standby/Keep-hot function operational and continuous
- 0.5 bar differential pressure across the HIU

2 Volume Weighted Average Return Temperature Performance

The table below sets out the VWART metrics for the Thermal Integration The DATA.

VWART Calculation	Nomenclature	VWART (°C)	Volume(m^3 pa)
DHW	$VWART_{DHW}$	19.5	22.8
Space Heating	$VWART_{SH}$	48.7	50.8
Standby / Keep-hot	$VWART_{SBY}$	24.2	3.8
Heating Period (including space heating)	$VWART_{HEAT}$	47.1	53.7
Non-Heating Period (not including space heating)	$VWART_{NONHEAT}$	20.2	23.7
Overall	$VWART_{HIU}$	**23.2**	**77.4**

3 Observations

The space heating output from the HIU varied between the following approximate ranges during testing (i.e. heat output from the HIU varied over the testing period):

- 1 kW (test 1a): 1.6 kW (max); 0.2 kW (min); 0.9 kW (mean)
- 2 kW (test 1b): 2.2 kW (max); 0.3 kW (min); 1.1 kW (mean)
- 4 kW (test 1c): consistent output achieved

4 Disclaimer

While the Swedish District Heating Association's Technical Regulations, F:103-7e, have been produced with the purpose of certifying district heating substations as 'fit for purpose' prior to connection to district heating systems, the test regime set out within the technical specification is **not** for use for certification and in no way are the results to be interpreted as "certifying" or "not certifying" HIUs as being fit for connection to Heat Networks in the UK (or elsewhere).



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