Enertek International

International Consultants in Product
Research, Design, Development
& Certification

BESA HIU Test Report

ModuSat XR ECO TP 70-10A

Modules Tested: 1 & 7

Client: Evinox

Project Number: E5273 Report Issue: 2

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CONTENTS

List of Figures

List of Tables

1 EXECUTIVE SUMMARY

1.1.1 The ModuSat XR ECO TP 70-10A HIU underwent testing to the BESA Technical Standard for UK HIU Test Regime, V3-Rev002 March 2026. Modules 1 & 7 were tested. Summary tables can be seen below, with further technical data shown in each respective test module chapter of this report. VWART calculations can be found within APPENDIX A.

1.1.2 It should be noted that all VWART figures are to within ±2°C tolerance.

Table 1 - Appliance Details and Modules Tested

Manufacturer:	Evinox
Model:	ModuSat XR ECO TP 70-10A
Modules:	1 & 7

Table 2 - Modules Tested Pass or Fail Summary

Module 1:	Pass
Module 7:	Pass

Table 3 - Modules 1 & 7 VWART Information

	VWART (°C)	Volume (m^3)
DHW	12	22.3
Standby	38	18.3
Space Heating	36	34.5

	VWART (°C)
Summer	24
Winter	29
Overall	26

2 BRIEF

2.1.1 Enertek International Limited (EIL), were contracted to receive, install and commission a production sample of the ModuSat XR ECO TP 70-10A.

2.1.2 To perform the tasks required for assessing the efficiency of Domestic Hot Water (DHW) and Space Heating (SH) as per the BESA Technical Standard for UK HIU Test Regime, V3-Rev002 March 2026, a publicly available online test regime. This is here-on referred to as the Test Regime throughout this document.

2.1.3 To provide a report detailing the tests carried out and generated results in accordance with the Test Regime criteria, including calculations for Volume Weighted Average Return Temperatures (VWART).

3 DEFINITIONS

3.1.1 The following definitions and abbreviations which have been used within this report can be found in Table 4 below.

Table 4 - Definitions and Abbreviations

Symbol	Description
t_{10}	Temperature, primary source
t_{11}	Temperature, primary side flow connection
t_{12}	Temperature, primary side return connection
t_{21}	Temperature, space heating system return connection
t_{22}	Temperature, space heating system flow connection
t_{31}	Temperature, cold water supply
t_{32}	Temperature, domestic hot water flow from HIU
t_{b1}	Temperature, primary side bypass flow (for non-keep warm configuration)
t_{b2}	Temperature, primary side bypass return (for non-keep warm configuration)
q_1	Volume flow, primary side
q_2	Volume flow, space heating system
q_3	Volume flow, domestic hot water
P_{11}	Static pressure, primary side flow connection
P_{12}	Static pressure, primary side return connection
P_{21}	Static pressure, space heating system return connection
P_{22}	Static pressure, space heating system flow connection
P_{31}	Static pressure, cold water supply
P_{32}	Static pressure, domestic hot water flow from HIU
dP_1	Differential pressure, primary system across HIU
dP_2	Differential pressure, space heating system across HIU
dP_3	Differential pressure, domestic hot water across HIU
Q_{DHW}	Estimated annual energy demand per year for hot water
Q_{SH}	Estimated annual energy demand per year for space heating
n_{DHW}	Number of DHW events per year

H_1	Arithmetic mean of primary side power recorded during test
H_2	Arithmetic mean of space heating power recorded during test
H_3	Arithmetic mean of DHW power recorded during test
h_{DHW}	Annual hours that HIU is producing DHW
h_{SH}	Annual hours that HIU is producing space heating
h_{KWM}	Annual hours that HIU is in keep warm mode
h_{NKWM}	Annual hours that HIU is in non-keep warm mode
V_{DHW}	Volume of primary water recorded during and post-DHW test
V_{SH}	Volume of primary water recorded during space heating tests
V_{KWM}	Volume of primary water recorded during keep warm test
V_{NKWM}	Volume of primary water recorded during non-keep warm test
$Prop_{Summer}$	Proportion of year HIU is operating in “summer” mode
$Prop_{Winter}$	Proportion of year HIU is operating in “winter” mode
$VWART_{DHW}$	DHW Volume Weighted Average Return Temperature
$VWART_{SH}$	Space Heating Volume Weighted Average Return Temperature
$VWART_{KWM}$	Keep Warm Volume Weighted Average Return Temperature
$VWART_{NKWM}$	Non-Keep Warm Volume Weighted Average Return Temperature
$VWART_{WINTER}$	Annual Volume Weighted Average Return Temperature for Heating Period
$VWART_{SUMMER}$	Annual Volume Weighted Average Return Temperature for Non-Heating Period
$VWART_{HIU}$	Total Annual Volume Weighted Average Return Temperature
$W_{thermal}$	Thermal energy use
$W_{electrical}$	Electrical energy use
SH_{PROP}	Annual heating period
NSH_{PROP}	Annual non-space heating period
TMV	Thermostatic mixing valve
TRV	Temperature regulating valve
UFH	Underfloor heating
DHW	Domestic hot water
HIU	Heat interface unit

DPCV	Differential pressure control valve
DRV	Double regulating valve
SH	Space heating
UKAS	United Kingdom Accreditation Service
EIL	Enertek International Limited

4 INTRODUCTION

4.1 Installation of Appliance

4.1.1 The appliance was installed and commissioned (as received) and as defined in the product literature provided. Testing was carried out without further adjustment other than disabling the internal space heating pump and adjusting the setting of the SH and DHW set points through the user interface on the HIU controller to suit the conditions of the HIU test rig.

4.1.2 The HIU rig schematic is shown within Figure 1.

4.1.3 The HIU was commissioned in accordance with the technical manual / installation guide provided by Evinox**.** The location of which can be found within the references section of this report.

4.2 Appliance Details

4.2.1 Details of the ModuSat XR ECO TP 70-10A HIU appliance are given in Table 5. Photographs of the installed appliance are given in Figure 11, Figure 12 and Figure 13.

4.2.2 The UK declaration of conformity (CE or UKCA or equivalent) and water regulation 4 certificate can be found within APPENDIX C.

Table 5 - Appliance Details

Item	Description
Manufacturer	Evinox
Model	ModuSat XR ECO TP 70-10A
Serial Number	HTPE2H4325A43
Year of Manufacture	22/10/2025
DHW Priority	Yes
EUT Number	EUT 0957
Date Test Item Received	27/03/2026

4.3 Appliance Design Pressures and Temperatures

4.3.1 The maximum design pressures and temperatures of the ModuSat XR ECO TP 70-10A appliance for the primary side and the secondary side for both Space Heating and DHW are given in Table 6.

Table 6 - Appliance Design Pressures and Temperatures

Item	Pressure (bar)	Temperature (°C)	Differential Pressure (bar)
Primary Side	16	85	6
Secondary Side Space Heating	3	85	0.7
Secondary Side DHW	10	85	10

5 TEST METHOD

5.1 Test Regime

5.1.1 The testing described in this report was carried out in accordance with the test regime. The test regime outlines a series of static and dynamic tests to determine the performance of a HIU's DHW and SH functions. The test regime outlines the test method including the reporting of the results, the performance requirements and the VWART calculations.

5.1.2 Testing was carried out in accordance with Test Module 01.

5.1.3 Testing was carried out in accordance with Test Module 07.

5.2 Measurement & Uncertainties

5.2.1 All measurements and uncertainties adhere to the requirements stipulated in the BESA Test Regime. All measurements were sampled at a rate of 1 Hz for all tests.

5.2.2 The BESA uncertainties of measurement requirements are as follows:

- Differential Pressure, ± 1.0 kPa
- Temperature, ± 0.1 °C
- Volume Flow (≥ 0.06 l/s) ± 1.5 %
- Volume Flow (< 0.06 l/s), ± 3.0 %

Note: the time constant for the temperature sensors is less than 1.5 s. The time constant for the differential pressure sensors is less than 5s.

5.2.3 EIL's reported uncertainty is based on a standard uncertainty by a coverage factor K=2, providing a level of confidence of approximately 95%. The uncertainty evaluation has been carried out in accordance with UKAS requirements. The EIL equipment list and uncertainties are given in shown within chapter 9.

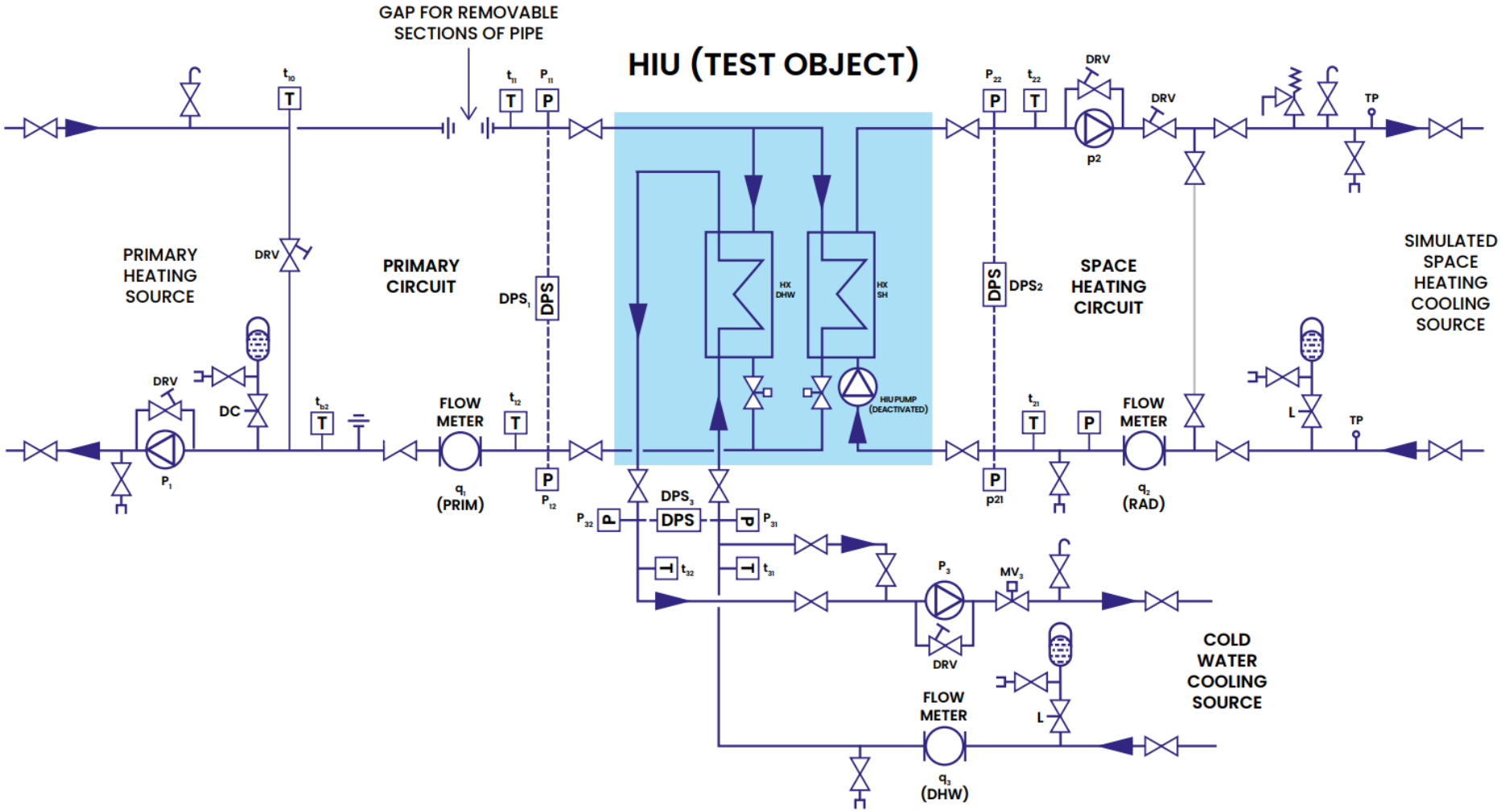

Figure 1 - EIL's HIU Test Rig Schematic which is taken from Appendix B, Figure 4, of Technical Standard for UK HIU Test Regime Version 3.1: 2026

6 TEST MODULE 1 – SPACE HEATING, HIGH TEMPERATURE, DH70 INDIRECT

6.1 Test Module 1 Information

6.1.1 Objective: Perform static testing to investigate the performance characteristics of the HIU when indirectly meeting a space-heating load given a 55°C/35°C tertiary heating circuit and 70°C primary flow temperature.

6.1.2 The following set of tests are from Test Module 1 - Space Heating, High Temperature, Indirect Heating Module 1 - DH70 Indirect – V1-Rev002:2026.

Table 7 - Module 1 Tests

Module 1 Tests	
01a	DH/70C, Space Heating Indirect 0.5 kW, 55/35°C tertiary, 50 kPa
01b	DH/70C, Space Heating Indirect 1 kW, 55/35°C tertiary, 200 kPa
01c	DH/70C, Space Heating Indirect 4 kW, 55/35°C tertiary, 50 kPa

6.2 Test Module 1 Results

6.2.1 Performance criteria results can be seen in Table 8, test result data can be seen in Table 10 and key metrics can be found in Figure 2, Figure 3 and Figure 4. Best practice criteria can be found in Table 9.

Table 8 - Module 1 Performance Criteria

Module 1 Tests Performance Criteria	
Performance Criteria, Fail if:	**PASS/FAIL**
VWART is above 37°C (to one decimal point)	PASS
Space heating flow temperature, t22, is not maintained at 55°C ± 5.0°C (to one decimal place) for more than one second	PASS
Average space heating flow temperature, t22, across the test is not 55°C ±0.5°C (to one decimal place) (01c only)	PASS
Average space heating flow temperature, t22, across the test is not 55°C -0.5°C / +2.0°C (to one decimal place) (01a and 01b)	PASS

Table 9 - Module 1 Best Practice

Module 1 – Best Practice Criteria	
Best Practice Criteria if:	**Best Practice**
VWART is less than or equal to 36°C (to one decimal point)	Achieved
Average space heating flow temperature, t22, across all three tests is within 55°C ±0.5°C	Achieved

Table 10 - Module 1 Test Results

Module 1 Test Results				
Parameter	**Symbol**	**01a (0.5kW)**	**01b (1kW)**	**01c (4kW)**
Temperature, primary side flow connection	t_{11} (°C)	69.8	69.6	69.7
Temperature, primary side return connection	t_{12} (°C)	34.4	35.6	36.3
Volume flow, primary side	q_1 (l/s)	0.0030	0.0067	0.027
Differential pressure, primary system across HIU	dP_1 (kPa)	48	195	47
Arithmetic mean of primary side power recorded during test	H_1 (W)	438.2	956.0	3729.9
Temperature, space heating system return connection	t_{21} (°C)	35.0	35.2	35.2
Temperature, space heating system flow connection	t_{22} (°C)	55.0	54.8	55.2
Volume flow, space heating system	q_2 (l/s)	0.0059	0.013	0.047
Differential pressure, space heating system across HIU	dP_2 (kPa)	8	9	4
Arithmetic mean of space heating power during test	H_2 (W)	492.1	1025.8	3946.1
Volume Weighted Avg. Return Temp	VWART (°C)	34	36	36
Overall VWART (°C)		36		

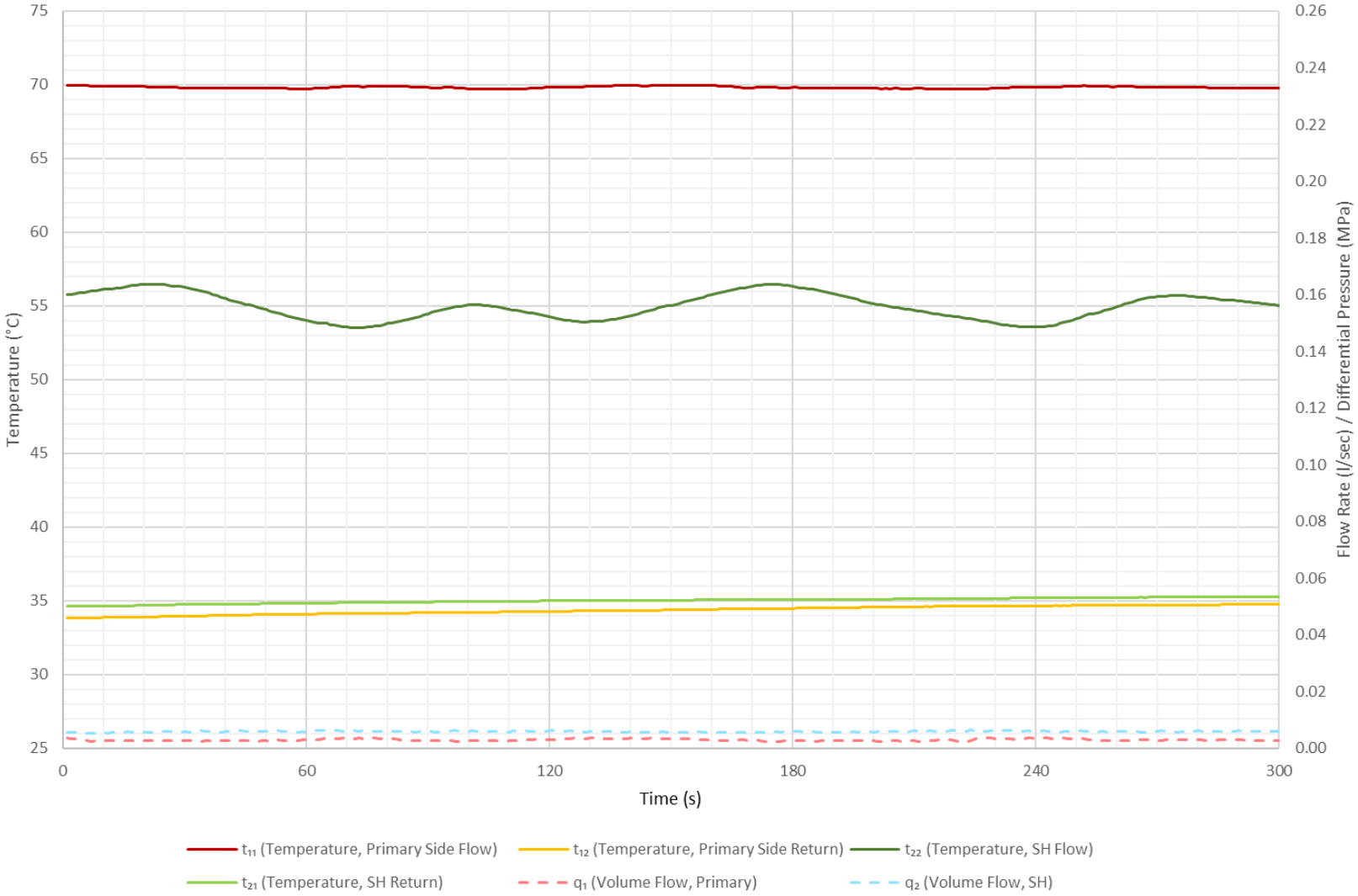

Figure 2 - Test 01a Key Metrics

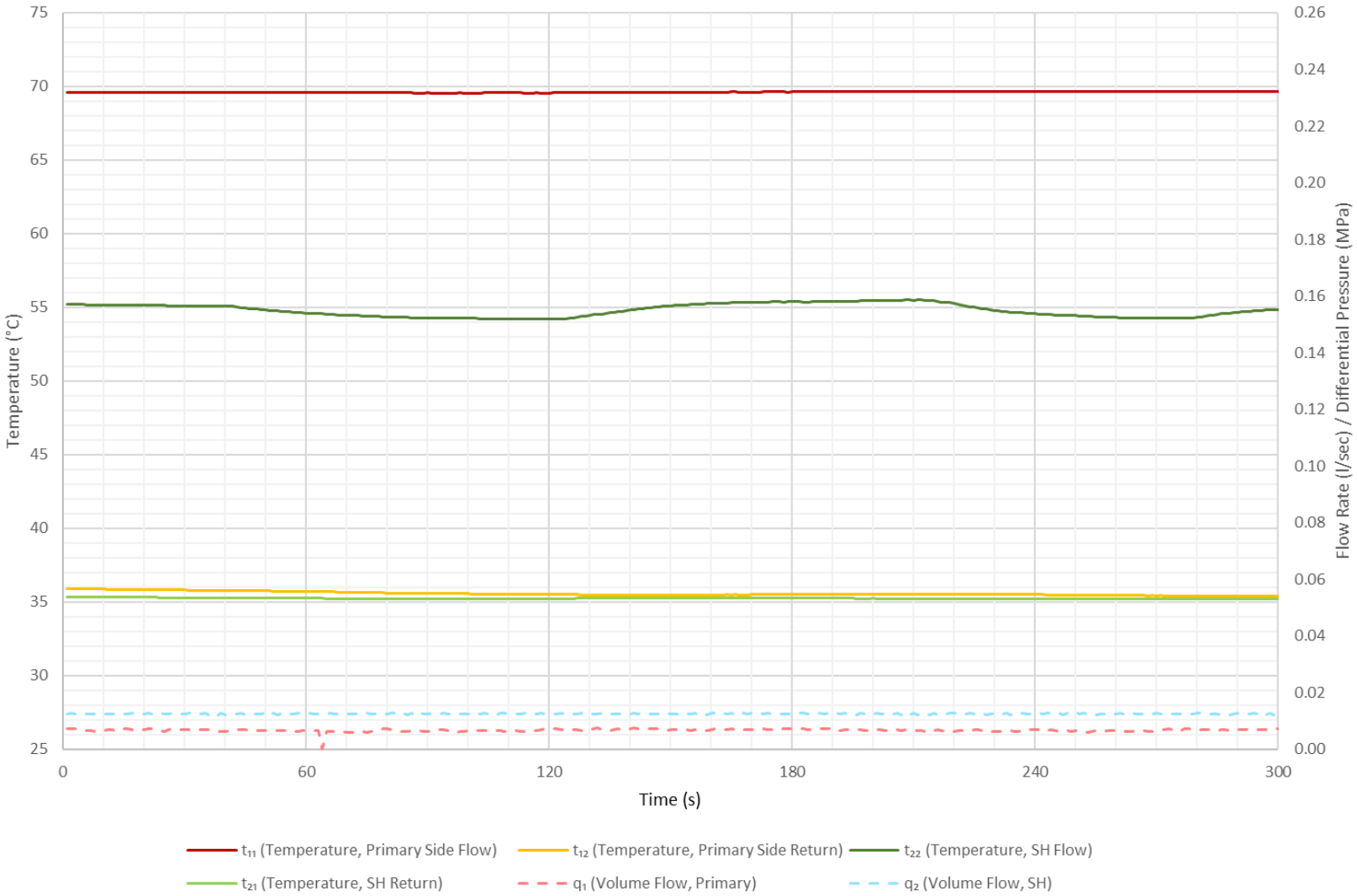

Figure 3 - Test 01b Key Metrics

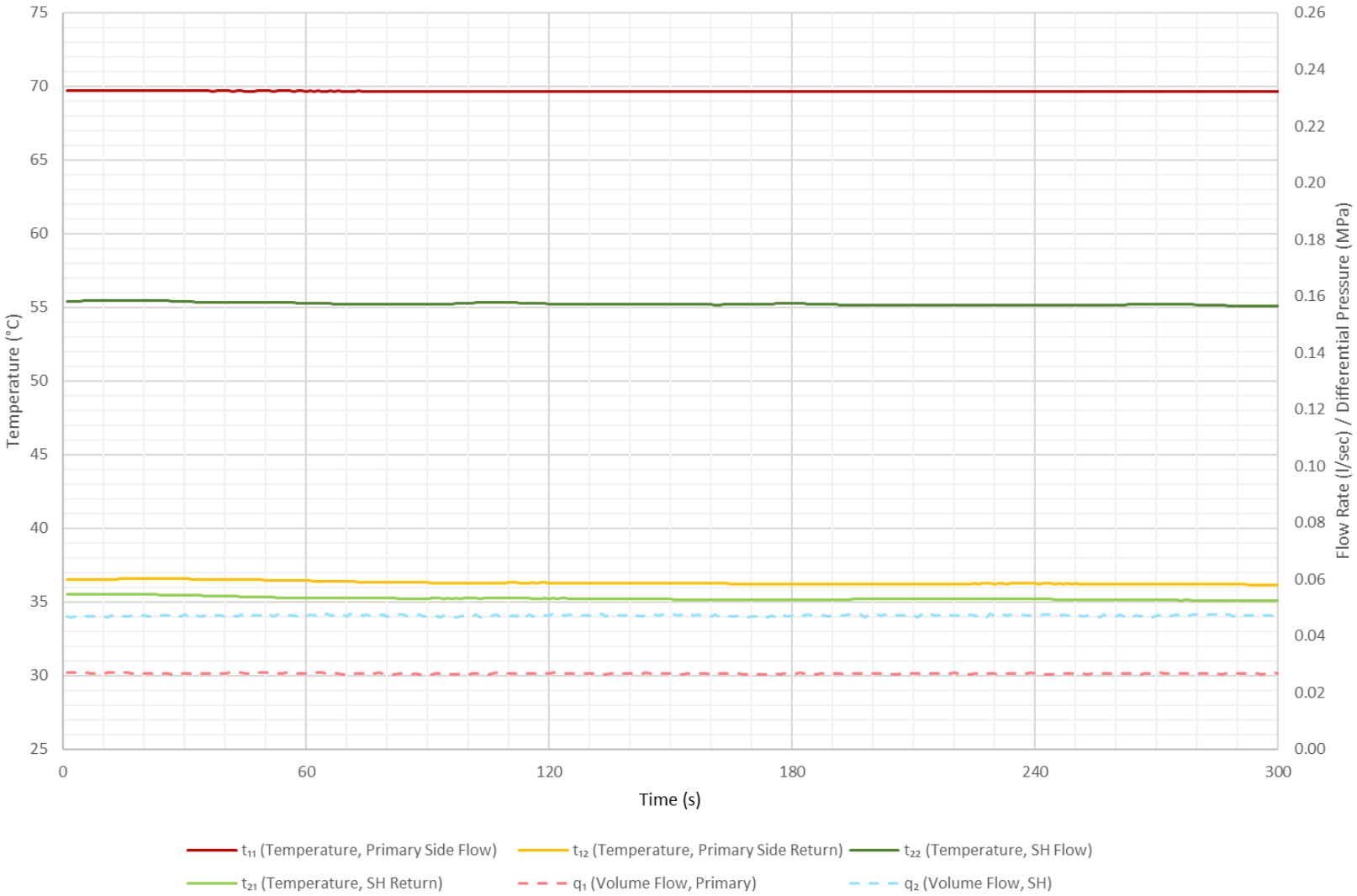

Figure 4 - Test 01c Key Metrics

7 TEST MODULE 7 – DHW, HIGH TEMPERATURE, DH70-KWARM

7.1 Test Module 7 Information

7.1.1 Objective: To explore the performance of the HIU under changing loads, as would be the case in practical operation. Key performance criteria are speed and consistency of DHW delivery to the customer; DHW staying at a safe temperature at all times and the volume weighted average return temperature when supplying space heating or DHW.

7.1.2 The following set of tests are from Test Module 7 - Domestic Hot Water, High Temperature, Keep Warm Hot Water Module 7 - DH70 – KWarm - V1-Rev002: 2026.

Table 11 - Module 7 Tests

Module 7 Tests	
11a	DH/70C, DHW only, 50°C DHW, Variable dP
12a	DH/70C, DHW Low Flow, 50°C DHW, 50kPa
12c	DH/70C, DHW Low Flow, 50°C DHW, 200kPa
13a	DH/70C, DHW Load Test, 50°C DHW
21a	DH/70C, DHW Keep Warm, 50°C DHW
22a	DH/70C, DHW Keep Warm Response Time, 50°C DHW

7.2 Test 11a Information

7.2.1 Objective: To investigate the performance of the HIU when delivering DHW, at a range of flow rates and differential pressures, given a 70°C primary flow temperature. The test investigates HIU operation in terms of DHW delivery and impacts on primary heat network return temperatures.

7.3 Test 11a Results

7.3.1 Performance criteria results can be seen in Table 13, test result data can be seen in Table 12 and key metrics can be found in Figure 5. Best practice criteria can be found in Table 14.

Table 12 - Module 7 Test 11a Results

Module 7 - Test 11a Results			
Parameter	**Symbol**	**Result**	
Maximum and minimum values of t_{32} when there is DHW flow	t_{32} (°C)	54.4	43.0
Number of consecutive seconds where t_{32} > 55°C	(s)	0	
Volume Weighted Avg. Return Temp	VWART (°C)	12	

Table 13 - Module 7 Test 11a Performance Criteria

Module 7 - Test 11a Performance Criteria	
Performance Criteria, Fail if:	**PASS/FAIL**
DHW temperature (t_{32}) exceeds 60.0°C (to one decimal place) for more than 1 second, as this poses a scalding risk	PASS
Primary return temperature (t_{12}) exceeds 55.0°C (to one decimal place) at any point, as this poses a scaling risk	PASS
VWART is above 20°C (to one decimal place)	PASS
Average DHW temperature (t_{32}) is not 50.0°C ±1°C (to one decimal place) for the final 150 seconds of each of the 180 second DHW flow periods	PASS
DHW temperature (t_{32}) is not being maintained at 50.0°C ±3°C (to one decimal place) for >150 seconds of each of the DHW flow periods	PASS
DHW temperature (t_{32}) drops below 45.0°C (to one decimal place) for more than 5 consecutive seconds, as this would impact resident comfort	PASS

Table 14 - Module 7 Test 11a Best Practice

Module 7 – Test 11a – Best Practice Criteria	
Best Practice Criteria if:	**Best Practice**
VWART is less than or equal to 15°C (to one decimal place)	Achieved
DHW temperature (t_{32}) is being maintained at 50.0°C ±2°C throughout periods of DHW flow	Not Achieved
DHW temperature (t_{32}) doesn't drop below 45.0°C (to one decimal place) for more than 2 consecutive seconds	Not Achieved

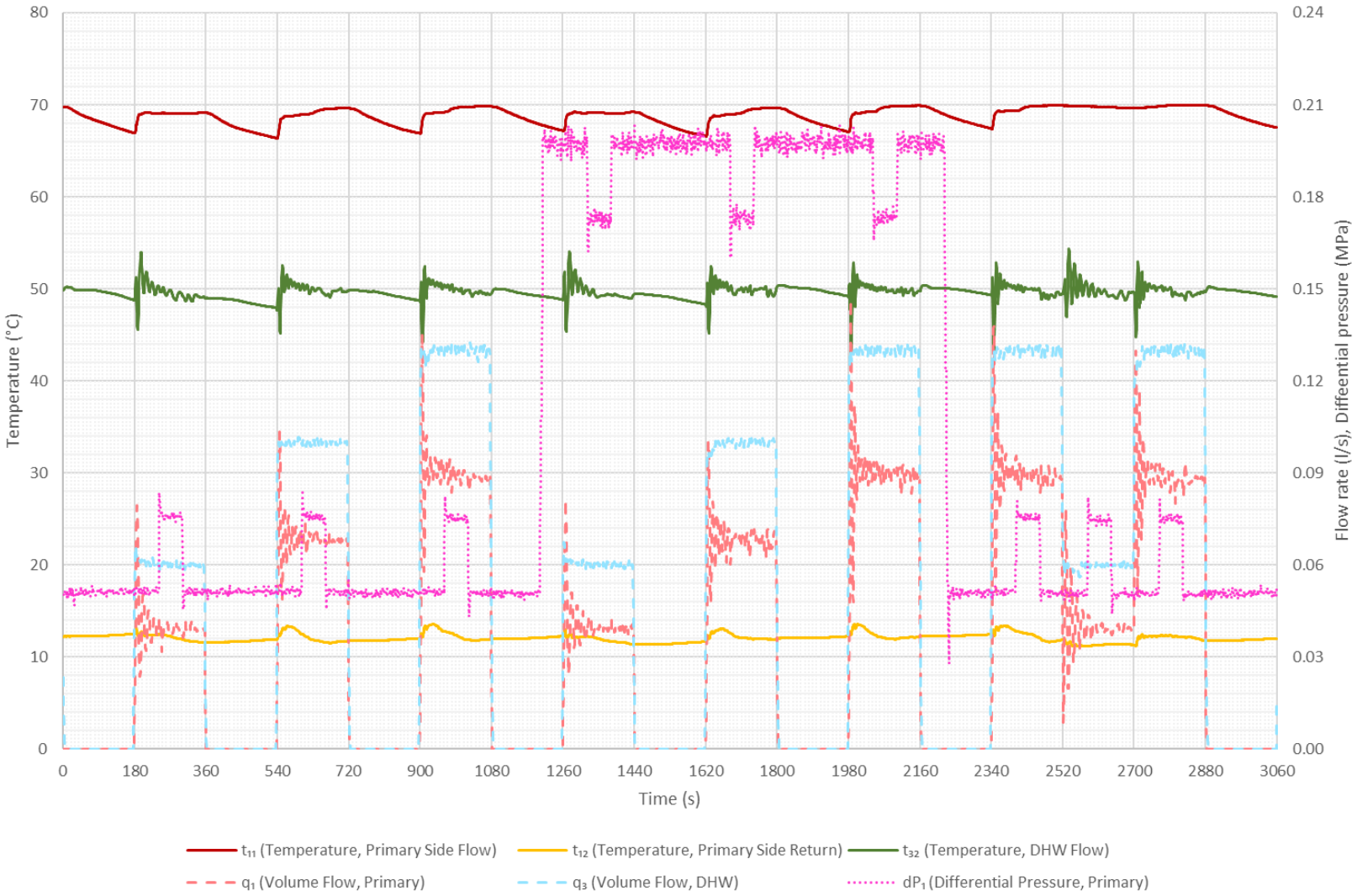

Figure 5 - Test 11a Key Metrics

7.4 Test 12a / 12c Information

7.4.1 Objective: To investigate the stability of DHW temperature at low flow rates. During operation, domestic hot water is sometimes drawn off at extremely low flow rates. Test 12 investigates the ability of the system to meet this condition by measuring the temperature at test point t_{32} at a flow rate of 0.02 l/s.

7.4.2 Test 12a performs the low flow test at 50kPa differential pressure.

7.4.3 Test 12c performs the low flow test at 200kPa differential pressure.

7.5 Test 12a / 12c Results

7.5.1 The HIU was able to deliver DHW at low flow rate above 45.0°C at the end of the 180 second period of low flow DHW.

7.5.2 The HIU was able to deliver stable DHW flow temperature (at t_{32}), defined as ability to maintain 50.0 ±3.0°C (1 decimal place) during the last 60 seconds of the test.

7.5.3 Performance criteria results can be seen in Table 16, test result data can be seen in Table 15 and key metrics can be found in Figure 6 and Figure 7. Best practice criteria can be found in Table 17.

Table 15 - Module 7 Test 12 Results

Module 7 - Test 12 Results					
Parameter	**Symbol**	**12a Result**		**12c Result**	
Maximum and minimum values of t_{32} when there is low DHW flow	t_{32} (°C)	52.0	46.1	51.7	47.0
Number of consecutive seconds where t_{32} > 55°C	(s)	0		0	

Table 16 - Module 7 Test 12 Performance Criteria

Module 7 - Test 12 Performance Criteria	
Performance Criteria, Fail if:	**PASS/FAIL**
DHW temperature (t_{32}) exceeds 60.0°C (to one decimal place) for more than 1 second, as this poses a scalding risk	PASS
Primary return temperature (t_{12}) exceeds 55.0°C (to one decimal place) at any point, as this poses a scaling risk	PASS
DHW temperature (t_{32}) is not maintained at 50°C ±3°C (to one decimal place) for more than 60 seconds	PASS

Table 17 - Module 7 Test 12 Best Practice

Module 7 – Test 12 – Best Practice Criteria	
Best Practice Criteria if:	**Best Practice**
DHW temperature (t32) is maintained at 50°C ±2°C (to one decimal place) throughout the test for both test 12a and 12c.	Not Achieved

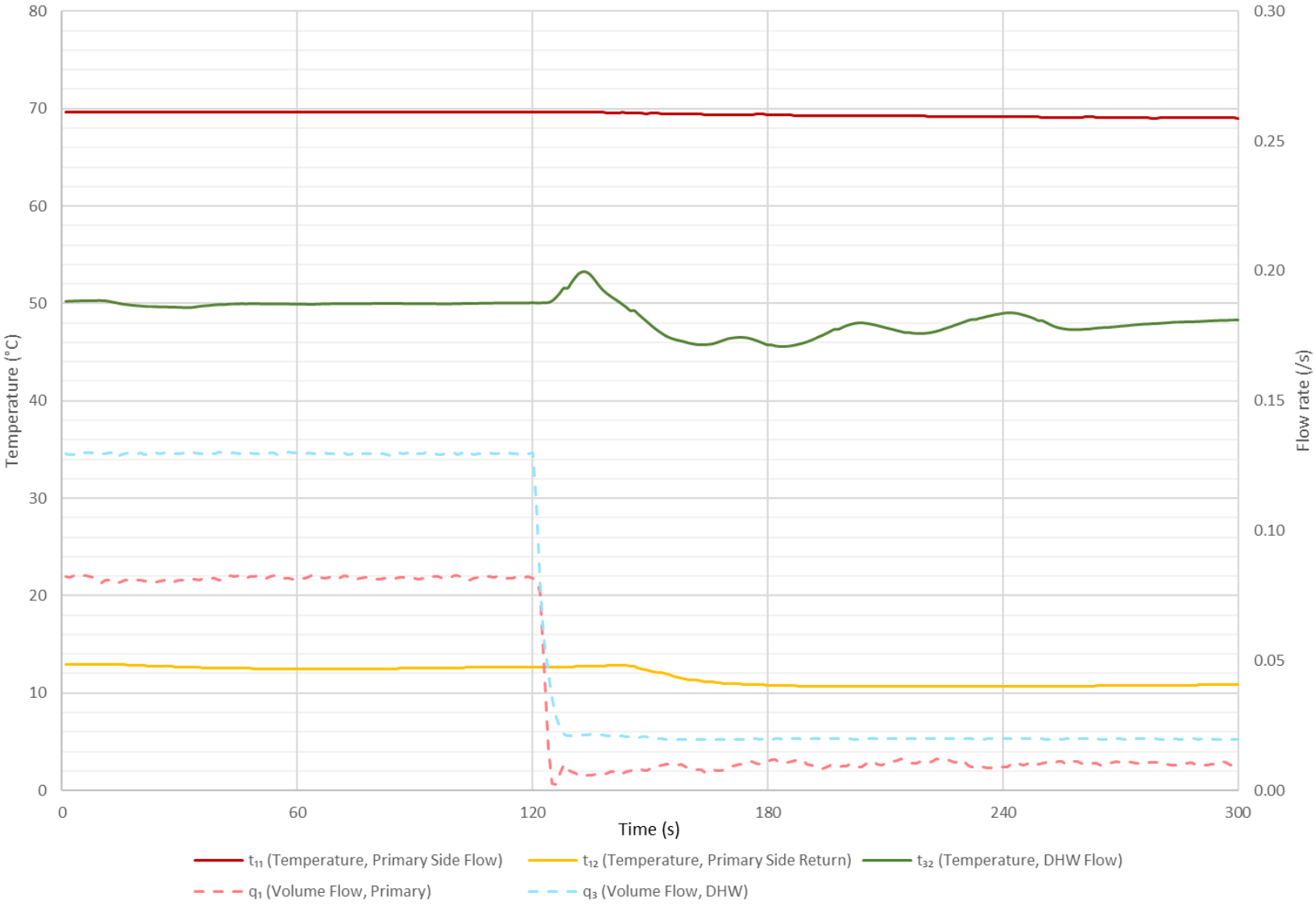

Figure 6 - Test 12a Key Metrics

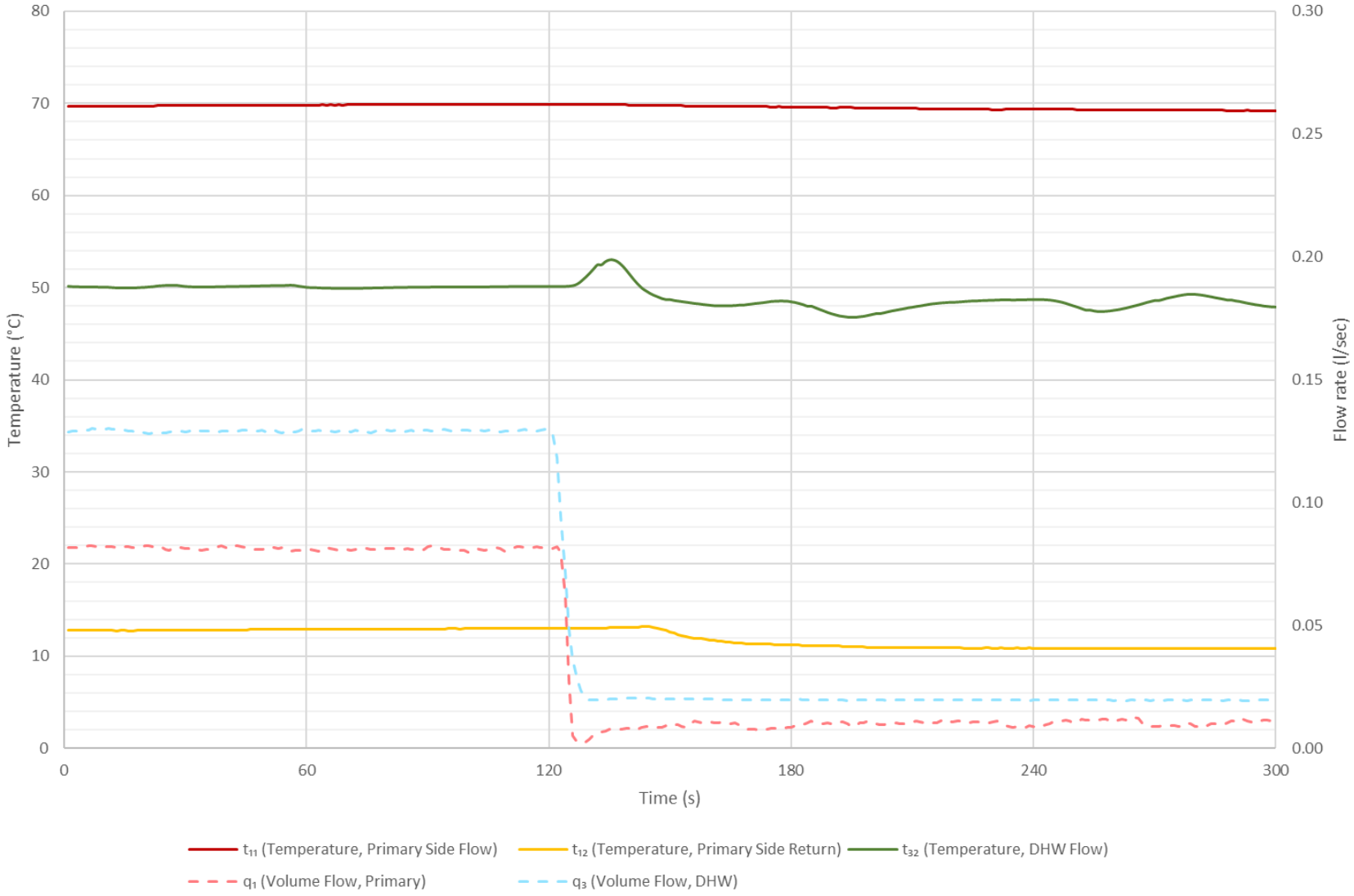

Figure 7 - Test 12c Key Metrics

7.6 Test 13a Information

7.6.1 Objective: To measure the maximum heat output (kW) and flow (l/sec) DHW output that can be delivered from the HIU. The HIU shall be set to deliver 50°C and the maximum DHW power output shall be measured with a flow step change and the peak value recorded when the DHW flow temperature is above 45°C.

7.7 Test 13a Results

7.7.1 The maximum DHW heat output was recorded as 47.4 kW, with a measured flow rate of 0.300 l/s, when producing minimum DHW at 45°C or above (Temperature achieved at final step 47.7 °C).

7.7.2 The recorded DHW line pressure drop across the HIU was 67 kPa.

7.7.3 The number of consecutive seconds where t_{32} > 55°C was 0 seconds.

7.7.4 Performance criteria results can be seen in Table 18, test result data can be seen in Table 19 and key metrics can be found in Figure 8.

Table 18 - Module 7 Test 13a Performance Criteria

Module 7 - Test 13a Performance Criteria	
Performance Criteria, Fail if:	**PASS / FAIL**
DHW (at t_{32}) is less than 50°C ±1.0°C (to one decimal place) at 0.13 l/s flow rate, as the HIU must be able to produce DHW to the target temperature at a moderate load	PASS
DHW temperature (t_{32}) exceeds 60.0°C (to one decimal place) for more than 1 second, as this poses a scalding risk	PASS
Primary return temperature (t_{12}) exceeds 55.0°C (to one decimal place) at any point, as this poses a scaling risk	PASS

Table 19 - Module 7 Test 13a Results

Module 7 - Test 13a Results – Mean Average of Last 10 Seconds											
Parameter	**Symbol**	**0.15 l/s (25kW)**	**0.18 l/s (30kW)**	**0.21 l/s (35kW)**	**0.24 l/s (40kW)**	**0.27 l/s (45kW)**	**0.30 l/s (50kW)**	**0.33 l/s (55kW)**	**0.36 l/s (60kW)**	**0.39 l/s (65kW)**	**0.42 l/s (70kW)**
Temperature, primary side flow connection	t_{11} (°C)	69.3	69.5	69.6	69.6	69.7	**69.7**	69.7	-	-	-
Temperature, primary side return connection	t_{12} (°C)	12.5	12.8	13.3	13.1	13.5	**13.5**	12.4	-	-	-
Volume flow, primary side	q_1 (l/s)	0.105	0.125	0.146	0.169	0.187	**0.201**	0.202	-	-	-
Arithmetic mean of primary side power recorded during test	H_1 (kW)	24.9	29.6	34.3	40.0	43.8	**47.2**	48.3	-	-	-
Temperature, cold water supply	t_{31} (°C)	9.9	10.0	10.2	9.5	9.8	**9.9**	9.4	-	-	-
Temperature, domestic hot water flow from HIU	t_{32} (°C)	50.0	49.5	49.4	49.4	48.7	**47.7**	44.6	-	-	-
Volume flow, domestic hot water	q_3 (l/s)	0.150	0.180	0.210	0.241	0.271	**0.300**	0.331	-	-	-
Differential pressure, domestic hot water across HIU	dP_3 (kPa)	22	28	36	45	56	**67**	78	-	-	-
Arithmetic mean of DHW power recorded during test	H_3 (kW)	25.2	29.8	34.5	40.2	44.1	**47.4**	48.8	-	-	-

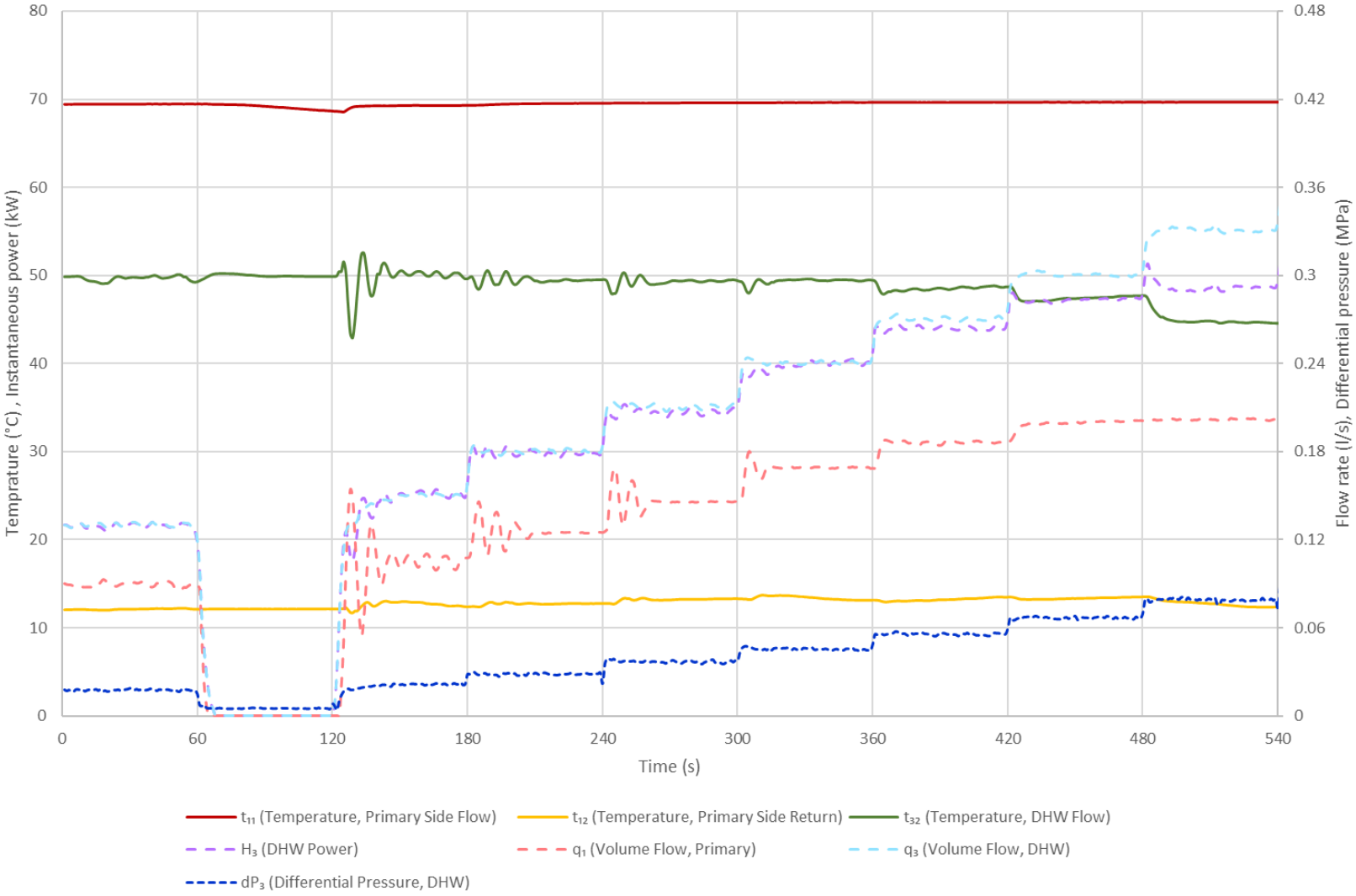

Figure 8 - Test 13a Key Metrics

7.8 Test 21a Information

7.8.1 Objective: To establish HIU performance during periods of no load, when operating in keep warm mode.

7.9 Test 21a Results

7.9.1 The keep warm operation is valid (based on Test 22a response time criteria).

7.9.2 The keep warm does not undergo cycling (i.e. t_{11} varies by more than ±3 °C during the final 3 hours of the test).

7.9.3 Performance criteria results can be seen in Table 21, test result data can be seen in Table 20 and key metrics can be found in Figure 9. Best practice criteria can be found in Table 22.

Table 20 - Module 7 Test 21a Results

Module 7 - Test 21a Results		
Parameter	**Symbol**	**Result**
Mean average volume flow, primary side	q_1 (l/s)	0.0007
Mean average of primary side power recorded during test	H_1 (kW)	0.03
Mean average electrical energy use	$W_{electrical}$ (W)	4.0
Mean average thermal energy use	$W_{thermal}$ (W)	26.7
Overall energy loss per day	(kWh)	0.736
Overall keep warm volume weighted avg. return temp	VWART (°C)	38

Table 21 - Module 7 Test 21a Performance Criteria

Module 7 - Test 21a Performance Criteria	
Performance Criteria, Fail if:	**PASS/FAIL**
VWART is above 44°C (to one decimal place)	PASS
Primary return temperature (t_{12}) exceeds 55.0°C (to one decimal place) at any point, as this poses a scaling risk	PASS
Primary supply temperature to the HIU (t_{11}) drops to below 39°C	PASS
HIU overall energy losses are greater than 1.000 kWh/day (to three decimal places)	PASS
Test 22a DHW temperature response time test fails (i.e. the HIU Keep Warm operation is not a valid Keep Warm)	PASS

Table 22 - Module 7 Test 21a Best Practice

Module 7 – Test 21a – Best Practice Criteria	
Best Practice Criteria if:	**Best Practice**
HIU overall energy losses are less than or equal to 0.700 kWh/day (to three decimal places)	Not Achieved

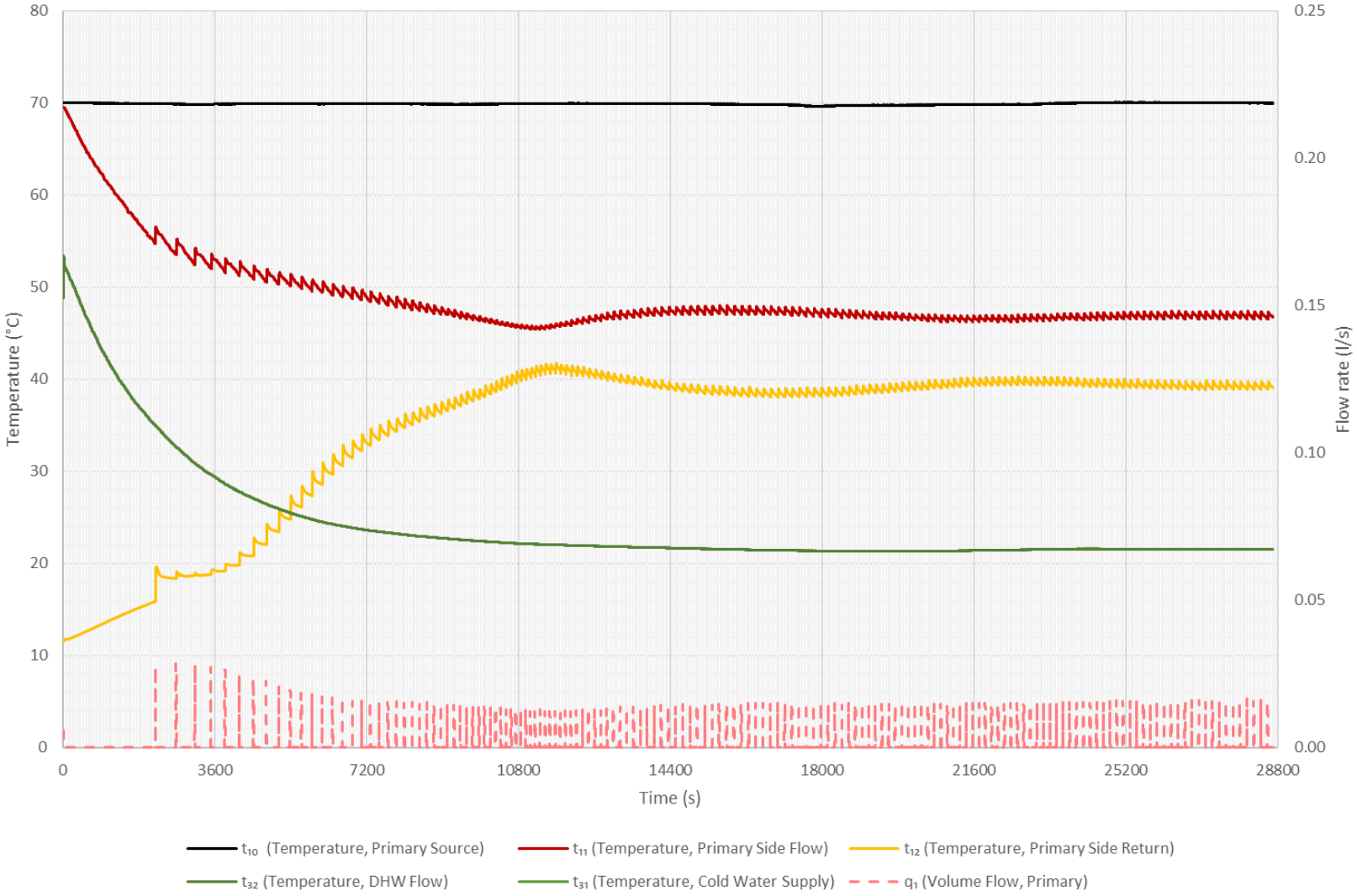

Figure 9 - Test 21a Key Metrics

7.10 Test 22a Information

7.10.1 Objective: To investigate DHW delivery time after a period of at least 8 hours keep warm only operation. This tests if the HIU can supply domestic hot water within an acceptable time of turning on the tap, which is a basic comfort requirement.

7.11 Test 22a Results

7.11.1 The keep warm operation is valid (based on response time criteria shown in Test 22 performance criteria).

7.11.2 Performance criteria results can be seen in Table 24, test result data can be seen in Table 23 and key metrics can be found in Figure 10. Best practice criteria can be found in Table 25.

Table 23 - Module 7 Test 22a Results

Module 7 - Test 22a Results		
Parameter	**Symbol**	**Result**
Time taken for t_{32} to reach 45.0°C and not subsequently drop below 42.0°C	(s)	15
Number of consecutive seconds where t_{32} > 55°C	(s)	0
Mean average volume flow, primary side	q_1 (l/s)	0.094

Table 24 - Module 7 Test 22a Performance Criteria

Module 7 - Test 22a Performance Criteria	
Performance Criteria, Fail if:	**PASS/FAIL**
DHW response time takes more than 15 seconds to reach 45.0°C (to one decimal place) at t_{32} while not dropping below 42.0°C (to one decimal place) thereafter	PASS
DHW temperature (t_{32}) exceeds 60.0°C (to one decimal place) for more than 1 second, as this poses a scalding risk	PASS
Primary return temperature (t_{12}) exceeds 55.0°C (to one decimal place) at any point, as this poses a scaling risk	PASS

Table 25 - Module 7 Test 22a Best Practice

Module 7 – Test 22a – Best Practice Criteria	
Best Practice Criteria if:	**Best Practice**
DHW response time at t32 is less than or equal to 10 seconds	Not Achieved

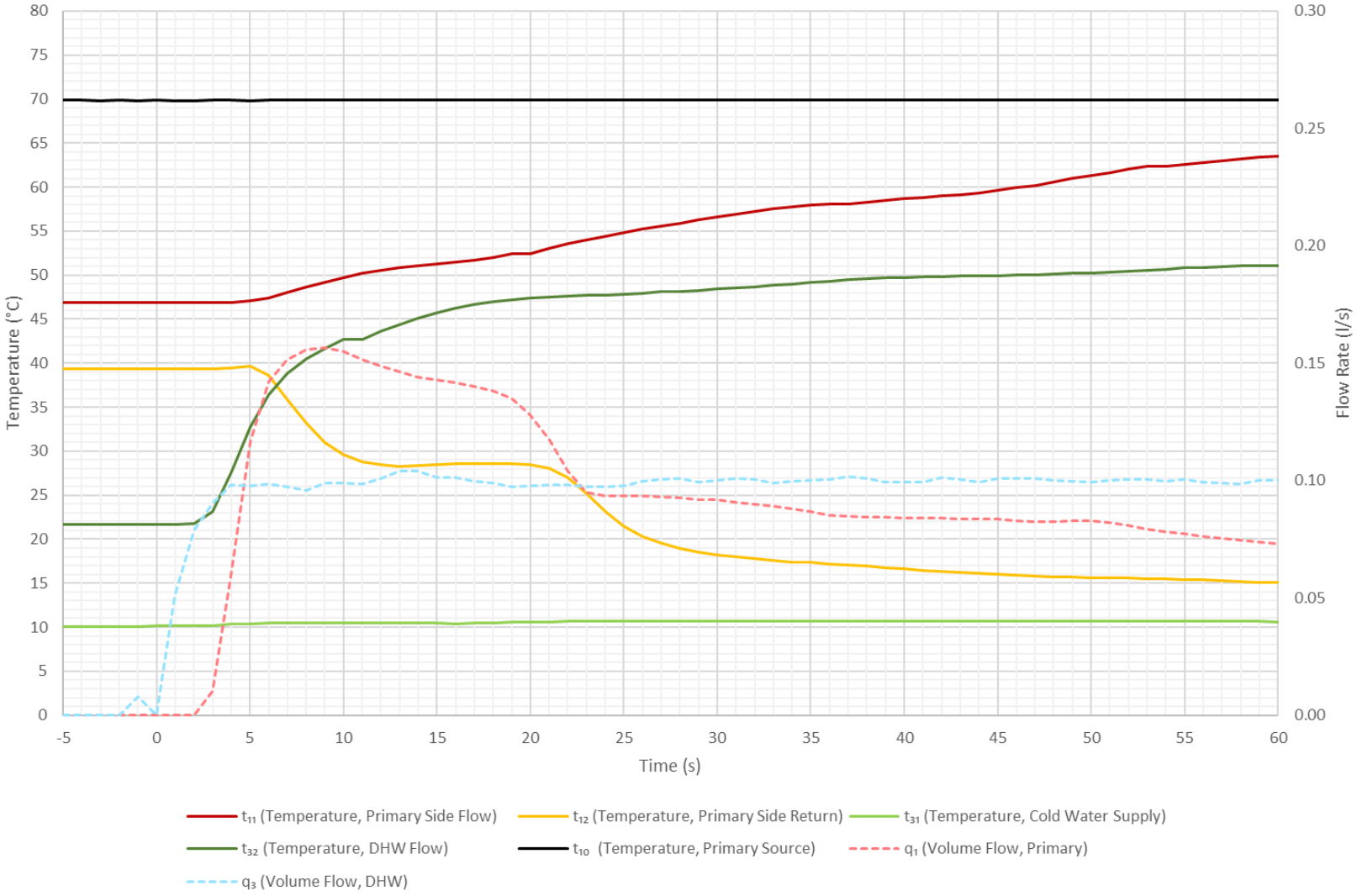

Figure 10 - Test 22a Key Metrics

8 CONCLUSIONS

All conclusions, opinions and interpretations indicated in this report are outside the scope of Enertek's UKAS accreditation.

8.1.1 The HIU has passed the requirements of the BESA Technical Standard for UK HIU Test Regime, V3-Rev002 March 2026 – Modules 1 and 7.

9 EQUIPMENT AND INSTRUMENT LIST

EQUIPMENT NAME	ID NUMBER	CERTIFICATE NUMBER	MEASUREMENT UNCERTAINTY K=2	CALIBRATION DATE	CALIBRATION DUE
Cold Water Supply Probe T_{31}	PRT 6035	CAL-001085	± 0.070 °C	25/09/2025	25/09/2026
DHW Outlet Probe T_{32}	PRT 6036	CAL-001086	± 0.070 °C	25/09/2025	25/09/2026
Primary Inlet Probe T_{11}	PRT 6034	CAL-001084	± 0.070 °C	25/09/2025	25/09/2026
Primary Return Probe T_{12}	PRT 6033	CAL-001083	± 0.070 °C	25/09/2025	25/09/2026
SH Flow Probe T_{22}	PRT 6031	CAL-001080	± 0.070 °C	25/09/2025	25/09/2026
SH Return Probe T_{21}	PRT 6032	CAL-001081	± 0.072 °C	25/09/2025	25/09/2026
Primary Flow T_{10}	PRT 6037	CAL-001161	± 0.072 °C	15/01/2026	15/01/2027
Ambient Temperature	PRT 4607	CAL-000873	± 0.136 °C	25/09/2025	25/09/2026
Flow Meter	FM 601	K59426FW	± 0.0112 l/sec	19/09/2025	19/09/2026
Flow Meter	FM 602	K59425FW	± 0.0132 l/sec	22/09/2025	22/09/2026
Flow Meter	FM 603	K59427FW	± 0.0090 l/sec	22/09/2025	22/09/2026
Flow Meter	FM 605	K59428FW	± 0.0040 l/sec	23/09/2025	23/09/2026
Pressure Transducer	PT 083	K59419P	± 2.7 kPa	18/09/2025	18/09/2026
Pressure Transducer	PT 084	K59420P	± 8.1 kPa	18/09/2025	18/09/2026
Pressure Transducer	PT 085	K59421P	± 3.6 kPa	18/09/2025	18/09/2026
Pressure Transducer	PT 086	K59422P	± 4.0 kPa	18/09/2025	18/09/2026
Pressure Transducer	PT 087	K59423P	± 3.8 kPa	18/09/2025	18/09/2026
Pressure Transducer	PT 088	K59424P	± 4.93 kPa	18/09/2025	18/09/2026
Power Meter	PM 1022	TH120471	± 0.09 W	05/09/2025	05/09/2026
Pipe	PIPE 001	-	-	10/2025	10/2026

The reported expanded uncertainty is based on a standard uncertainty by a coverage factor K = 2, providing a level of confidence of approximately 95 %. The uncertainty evaluation has been carried out in accordance with BS EN ISO/IEC 17025:2017 requirements.

10 APPENDIX A

10.1 VWART Calculations for Modules 1 & 7

	VWART (°C)	Volume (m^3)
DHW	12	22.3
Standby	38	18.3
Space Heating	36	34.5

	VWART (°C)
Summer	24
Winter	29
Overall	26

	DHW Draw Test Results			Post DHW Draw (60 seconds)	
	Power (W)	Primary Flow (m^3/hr)	VWART (°C)	Primary Volume (m^3)	VWART (°C)
Low	9758.6	0.1	12	0.05	12
Medium	16131.1	0.2	12	0.01	12
High	21113.8	0.3	12	0.00	12

DHW Draw Volumes pa		
kWh pa	Hours	Volume pa (m^3)
729	74.70	10.6
297	18.41	4.5
444	21.03	6.7

Post DHW Draw Volumes pa	
Events pa	Volume pa (m^3)
10000	0.508
660	0.007
300	0.001

Standby Test Results	
Primary Flow (m^3/hr)	VWART (°C)
0.002	38

Standby Volumes pa	
Hours	Volume pa (m^3)
7535	18.330

	Space Heating					
	Power (W)	Primary Flow (m^3/hr)	VWART (°C)	kWh pa	Hours	Volume pa (m^3)
0.5kW	492	0.011	34	98	199	2.12
1kW	1026	0.024	36	787	767	18.56
4kW	3946	0.096	36	565	143	13.79

10.1.1 It should be noted that all VWART figures are to within ±2°C tolerance.

11 APPENDIX B

11.1 Appliance Documentation

11.1.1 The details of the appliance documentation are given in Table 26 below.

Table 26 - Appliance Documentation

#	Component:	Document Submitted (Y/N):	Manufacturer and type:
1	Space Heating Heat Exchanger	Y	Swep E8 LAS x10
2	Domestic Hot Water Heat Exchanger	Y	Swep E8 LAS x70
3	Controller for Space Heating and Hot Water Heating	Y	Evinox 882MS20
4	Control Valve and Actuator for Space Heating	Y	Frese Compact DN15, Danfoss Actuator
5	Space Heating Strainer	-	N/A
6	Control Valve and Actuator for Hot Water Heating	Y	Frese Compact DN20, Danfoss Actuator
7	Temperature Sensors	Y	Tasseron TSF0AX0 NTC 10K MLX CLIP18MM
8	Domestic Hot Water Isolating Valve	Y	INTATEC A00411 (Evinox EVI003-170)
9	Primary Side Strainer	Y	Double-Lin LL5005 (3/4") internal strainer
10	Drain Valves	Y	Ningbo Bucsa 1/4'' robinet golire
11	Vent Valve	Y	Ningbo Beilum EVI_00002
12	Circulation Pump	Y	Wilo YONOS PARA PWM 15/7 4535300
13	Heat Meter	Y	Axioma E4 M-Bus, DN15
14	Domestic Hot Water Flow Sensor	Y	Huba 200
15	Pipes	Y	Lawton Tubes EN1057 Seamless round copper tubes
16	Connections	Y	Hecapo
17	Joints	-	NA
18	Gaskets	-	NA
19	O Rings	-	NA
20	Pressure Sensor	Y	Huba 505
21	Expansion Vessel	Y	Aquasystems VRP220-8

22	Insulation	Y	AFArmaFlexClassORangeUKROI
A1	Commissioning Guide	Y	Evinox Modusat XR TP Installation Manual 2551868AC (1)
A2	Operation Guide	Y	Evinox Modusat XR TP Installation Manual 2551868AC (1)
A3	Declaration of Conformity	Y	Evinox Declaration of Conformity signed by AvH
A4	Full Parameter List	N	Module 1 SH temperature set point 54°C Module 7 DHW temperature setpoint 50°C Module 7 keep warm setpoints 43°C
A5	Maximum Primary Static Operating Differential Pressure	N	16 bar static 6 bar differential
	Software Version	N	11.0.0.20
	Model Name and Type Number	Y	ModuStat XR ECO TP
	Serial Number	Y	HTPE2H4325A43
	Any other components stated by manufacturer	-	-

11.2 Appliance Photographs

Figure 11 - HIU with Outer Case Fitted

Figure 12 - HIU with Outer Case Removed

Figure 13 - Nameplate with Model Details and Serial Number

12 APPENDIX C

12.1 UK Declaration of Conformity

Evinox

Smarter Heat Networks

UKCA Declaration of Conformity

We,
Evinox Energy Ltd.
Unit 37, Barwell Business Park,
Leatherhead Road,
Chessington, Surrey.
KT92NY

Manufacturer's Name \ Address
Evinox Technology HUB SRL
Brasov
Romania

Declare that the Declaration of Conformity is issued under our sole responsibility and belongs to the following products:

- Modusat XR Single Plate DHW Heat Interface Unit.
- Modusat XR Twin Plate Heat Interface Unit.
- Modusat FS Floor Standing DHW Storage Heat Interface Unit.
- Modusat XR Combined Heating, DHW and Cooling Interface.
- Modusat SP Single Plate Cooling Interface.
- Modusat SP Single Plate Heating Interface.
- Modusat SP Single Plate Double Heating Circuit Interface.

The objects of the above declaration described above are in conformity with the relevant union harmonization legislation:

Low Voltage Directive 2014/35/EU
Small Pressure Vessels - Directive 2014/29/EU
Electromagnetic Compatibility – Directive 2014/30/EU

Evinox UK Ltd
Registration Number:
04430598

Unit 37, Barwell Business Park,
Leatherhead Road,
Chessington, Surrey, KT92NY

+44 1372 722 277
sales@evinox.co.uk
evinox.co.uk

Figure 14 - UK Declaration of Conformity – Page 1

Smarter Heat Networks

The following harmonised standards and technical specifications have been applied.

Title:	Reference & Date
Household and similar electrical appliances. Safety. General requirements	EN 60335-1:2012 + A11:2014 + A13:2017 + A1:2019 +A14:2019 + A2:2019
Household and similar electrical appliances. Safety. Particular requirements for storage water heaters	EN 60335-2-21:2003 + A2:2008
Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission	BS EN 55014-1:2017+A11:2020

CE mark was first applied in 2013

Signed for and on behalf of:

Evinox Energy Ltd.
Unit 37, Barwell Business Park,
Leatherhead Road,
Chessington, Surrey.
KT92NY

Date: 24th February 2026

Signature

Andre Van Heerden,
Chief Executive Officer,

Figure 15 – UK Declaration of Conformity – Page 2

12.2 Water Regulation 4 Certificate

CERTIFICATE

Certificate number: 2510776 (1)

Issued *29/10/2025*
Expires *29/10/2030*

Kiwa Regulation 4 (KUKreg4) Certification

Evaluation Guideline – Kiwa UK – EG004 – Regulation 4(1)(a)
Model number(s) – see Appendix

Evinox Energy Limited

Kiwa Watertec declares that legitimate confidence exists in the products specified in this certificate and supplied by the above organisation be relied upon to comply with the Kiwa Evaluation Guideline referred above.

Which verifies the requirements of:

Regulation 4(1)a of the Water Supply (Water Fittings) Regulations 1999 England & Wales: 2009 Northern Ireland and 2014 Byelaws Scotland.

This certificate has been issued in accordance with the Kiwa regulations for product certification.

Signed on behalf of Kiwa Watertec

David Jay, Business Unit Manager – Authorised Signatory
Kiwa Watertec

Publication of this certificate is allowed.
Products are intended to be used in the UK only. For other countries, other (National) requirements will apply.
See https://www.kiwa.com/gb/en/about-kiwa/water-products/ or the QR code below to ensure that the certificate is still valid.

Kiwa Watertec
(A Trading Division of Kiwa Ltd)
26A Rassau Industrial Estate
Ebbw Vale
Gwent
NP23 5SD
United Kingdom
T +44 (0)1495 308185
uk.water@kiwa.com
www.kiwa.co.uk

Certificate Issued to:
Unit 37 Barwell Business Park
Leatherhead Road
Chessington
Surrey
KT9 2NY
United Kingdom

KUKreg4

Figure 16 - Water Reg 4 Certification – Page 1

Product Certificate

Appendix to Certificate number: 2510776

The following products belong to this certificate

PRODUCT DESCRIPTION Range of modular combined heating interface units providing a combination of either hot water, heating or cooling via a plate heat exchanger. ATS3 – Without Production Surveillance.
MODEL(S) ModuSat SPDHW XR-ECO TYPE 1 – DHW ¾" BSP TYPE 2 – DHW 1" BSP ModuSat TP XR ECO TYPE 1 - DHW ¾" BSP, HTG ¾" BSP TYPE 2 - DHW 1" BSP, HTG ¾" BSP ModuSat CHHC XR ECO TYPE 1 - DHW ¾" BSP, HTG ¾" BSP, CLG ¾" BSP TYPE 2 - DHW ¾" BSP, HTG ¾" BSP, CLG 1" BSP TYPE 3 - DHW ¾" BSP, HTG ¾" BSP, CLG 1" BSP TYPE 4 - DHW ¾" BSP, HTG ¾" BSP, CLG 1 ¼" BSP TYPE 5 - DHW 1" BSP, HTG ¾" BSP, CLG ¾" BSP TYPE 6 - DHW 1" BSP, HTG ¾" BSP, CLG 1" BSP TYPE 7 - DHW 1" BSP, HTG ¾" BSP, CLG 1" BSP TYPE 8 - DHW 1" BSP, HTG ¾" BSP, CLG 1 ¼" BSP
SIZE: See model
SCOPE: Primary circuit Manufacturer recommended maximum working pressure 16.0 Bar Secondary circuit Manufacturer recommended maximum working pressure 10.0 Bar Heating and cooling circuit Manufacturer recommended maximum working pressure 3.0 Bar & maximum operating temperature 85°C Hygienic Purposes: Non-metallic materials suitable for continuous use up to 85°C.
MARKING Evinox modusat XR and other technical information on adhesive label on cover. Evinox. Date of manufacture (DD/MM/YYYY) and other technical information on adhesive label on internal panel.
MATERIALS Non-metallic materials assessed (BS6920) to point of discharge.
BACKFLOW PROTECTION NOTES N/A
ADDITIONAL NOTES All water contact & exposed components satisfy opacity requirements

Extra Notes

Page **2** of **2**

Figure 17 - Water Reg 4 Certification – Page 2

13 BIBLIOGRAPHY

[1] *BESA (Building Engineering Services Association) UK HIU (Heat Interface Unit) Test regime Technical Specification*, V3-Rev002 March 2026

[2] *Technical Standard for UK HIU Test Regime - Space Heating, High Temperature, Indirect HEATING MODULE 1-DH70 Indirect*, V1-Rev002: 2026.

[3] *Technical Standard for UK HIU Test Regime - Domestic Hot Water, High Temperature, Keep Warm HOT WATER MODULE 7-DH70-KWarm*, V1-Rev002: 2026.

Report Issue No	Reason for Report Update
1	Original issue
2	Formatting updated. Test 13a final step updated. Test 22a test data updated.

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EUA energy&utilities alliance

HHIC HEATING & HOTWATER INDUSTRY COUNCIL