Heat Network Technical Assurance Scheme – New Build Technical Specification – Consumer Heat System

Overview

HNTAS-NB-TS-CH-P0

Version History

Revision	Notes	Date
V0.4	Draft issue alongside consultation	10/04/25

Disclaimer

The following technical document has been prepared for issue ahead of the Heat Networks Technical Standards consultation and is published in a draft format. This document is intended to provide background context to the structure, style and contents of HNTAS draft Code documents, as they currently exist. The information in this document has been developed to facilitate understanding of the scheme.

DESNZ is not currently seeking views on specific individual technical requirements in the draft Code documents due to their large number and technical complexity.

Draft Code documents, including Technical Specifications and Assessment Procedures, have been reviewed and consulted on through a series of technical workshops with participation from a range of experts from across the heat network industry. We are seeking views on individual requirements through further, facilitated workshops with sector technical experts and through our pilot programme. The content of this document is therefore still in development and is subject to change. Requirements should not be considered as fixed at this stage.

You can sign up to receive updates and provide views on future detailed draft technical documents as they are published by contacting: heatnetworks@energysecurity.gov.uk.

Please be advised that this document references other HNTAS draft Code documents which have not yet been published. These referenced documents will be published at a later date. References to the Heat Networks Code of Practice (CP1) 2020 found within this document will also be subject to change following the publication of updated standards.

Contents

Foreword

This Technical Specification forms part of the UK Government's Heat Network Technical Assurance Scheme (HNTAS, the Scheme) delivered by the Department of Energy Security and Net Zero, in partnership with the Scottish Government and Ofgem. The Department of Energy Security and Net Zero appointed FairHeat as technical author for this document.

The Scheme has been designed and developed in consultation with a range of experts across the heat network industry, culminating in a series of Technical Specifications and Assessment Procedures to facilitate the validation and verification of performance outcomes of elements within a heat network.

This document provides an overview of the series of Technical Specifications for the Consumer Heat System element.

This document sits within a series of Technical Specifications and supplementary specifications for the Consumer Heat System as outlined in Table 1 and Table 2 below.

This Technical Specification – Consumer Heat System: Overview is current and valid as of [XX/XX/XX].

For further information on the Heat Network Technical Assurance Scheme please refer to Heat Network Technical Assurance Scheme – Scheme Rules – New Build Heat Networks: Assessment Regime (HNTAS-SR-NB-AS).

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Normative document structure

Technical Specifications

Document type	Element	Part/phase					
		Overview	Phase 1: Feasibility	Phase 2: Design	Phase 3: Construction	Phase 4: Operation (initial)	Phase 5: Operation (ongoing)
		P0	P1	P2	P3	P4	P5
Technical Specifications (TS)	Energy Centre (EC)	HNTAS-TS-EC-P0	HNTAS-TS-EC-P1	HNTAS-TS-EC-P2	HNTAS-TS-EC-P3	HNTAS-TS-EC-P4	HNTAS-TS-EC-P5
	District Distribution Network (DD)	HNTAS-TS-DD-P0	HNTAS-TS-DD-P1	HNTAS-TS-DD-P2	HNTAS-TS-DD-P3	HNTAS-TS-DD-P4	HNTAS-TS-DD-P5
	Substation (SS)	HNTAS-TS-SS-P0	HNTAS-TS-SS-P1	HNTAS-TS-SS-P2	HNTAS-TS-SS-P3	HNTAS-TS-SS-P4	HNTAS-TS-SS-P5
	Communal Distribution Network (CD)	HNTAS-TS-CD-P0	HNTAS-TS-CD-P1	HNTAS-TS-CD-P2	HNTAS-TS-CD-P3	HNTAS-TS-CD-P4	HNTAS-TS-CD-P5
	Consumer Connection (CC)	HNTAS-TS-CC-P0	HNTAS-TS-CC-P1	HNTAS-TS-CC-P2	HNTAS-TS-CC-P3	HNTAS-TS-CC-P4	HNTAS-TS-CC-P5
	Consumer Heat System (CH)	HNTAS-TS-CH-P0	HNTAS-TS-CH-P1	HNTAS-TS-CH-P2	HNTAS-TS-CH-P3		

Table 1: Technical Specification structure

Supplementary specifications

Document type	Element		Reference
Acceptance Testing specification (AT)	Energy Centre	EC	HNTAS-AT-EC
	District Distribution Network	DD	HNTAS-AT-DD
	Substation	SS	HNTAS-AT-SS
	Communal Distribution Network	CD	HNTAS-AT-CD
	Consumer Systems - Consumer Connection and Consumer Heat System	CS	HNTAS-AT-CS

Table 2: Supplementary specifications structure

Introduction

HNTAS is a performance-based assurance scheme, which contains impartial assessment and independent certification, to ensure that heat network performance outcomes are achieved, and maintained.

An impartial assessment is to be made with regards to claims made by a Responsible Party as to whether Technical Standards have been fulfilled, and Key Performance Indicators (KPIs) will be achieved (validation) or have been achieved (verification), for identifiable elements of a heat network.

The Technical Standards to be fulfilled are contained within Technical Specifications.

The Technical Standards consist of the following technical obligations:

- The Technical Requirements to be met
- The Performance Monitoring Requirements to be met
- The Key Failures to be avoided at each stage
- The Evidence Requirements to be provided, to demonstrate conformity with the Technical Standards and avoidance of Key Failures

The Technical Standards also contain the KPIs for each element, to be achieved and maintained in operation. The fundamental principle of the Scheme is to ensure throughout all the HNTAS Stages, that the KPIs will be achieved (design, installation) or have been achieved (commissioning, operation), to ensure performance outcomes.

There are separate Technical Specifications for each heat network element, at each phase of a heat network development and operation.

This document specifically provides an overview of the series of Technical Specifications for the Consumer Heat System element. It contains the following:

- A description of the Scope of the Consumer Heat System
- An outline of the structure of the series of Technical Specification and of each individual Technical Specification document
- A description of the KPIs specific to the Consumer Heat System, including the minimum monitoring points required to calculate KPIs

More information on HNTAS assessment can be found within Heat Network Technical Assurance Scheme – Scheme Rules – New Build Heat Networks: Assessment Regime (HNTAS-SR-NB-AS).

1. Scope

This document specifies Technical Standards for a Consumer Heat System.

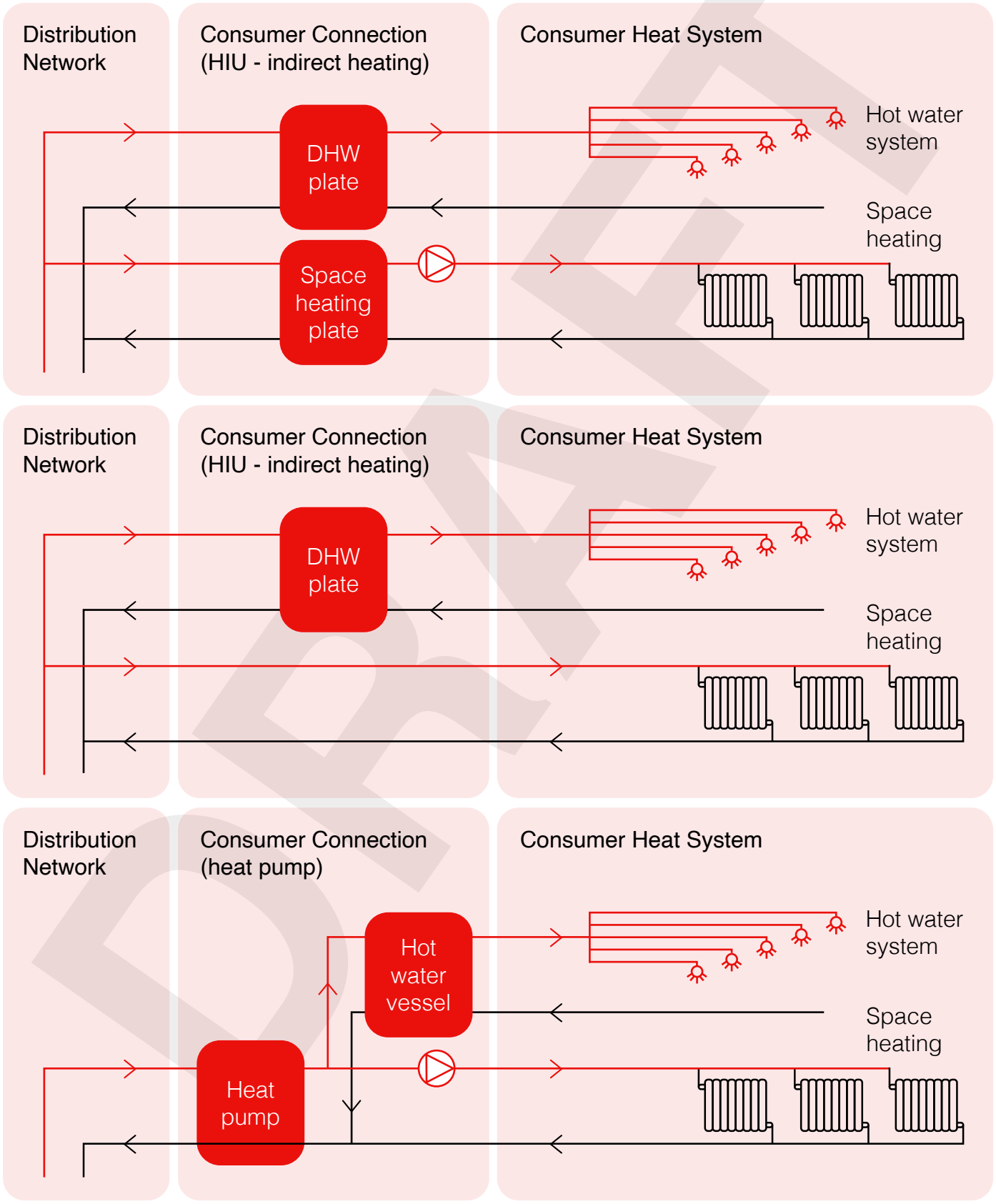
It is applicable to a Consumer Heat System, which is defined as the heating and/or cooling, and hot water systems on the consumer side of a Consumer Connection or Substation.

Heat systems consist of distribution pipework and ancillary equipment (such as distribution manifolds) connected to heat emitters which may include radiators, air handling units (AHUs), fan coil units (FCUs) or underfloor heating (UFH).

Hot water systems consist of hot water distribution pipework and ancillary equipment connected to outlets and may contain de-centralised storage and/or re-circulation systems. The physical boundary of the Consumer Heat System, for where the Technical Requirements apply, will be with the Consumer Connection and will be determined by physical barriers (for example equipment boundary or isolation valves) or contractual relationships.

Figure 1 illustrates Consumer Heat System boundaries with different examples of Consumer Connection.

Figure 1: Illustrative drawing of Consumer Heat System examples – indirect space heating (top), direct space heating (middle), heat pump system (bottom)



1.1 Equipment in scope of element

The following equipment is within scope of the Consumer Heat System element:

- Heating/cooling emitters (radiators, underfloor heating, FCUs)
- Heating/cooling pipework (including manifolds)
- Control and field equipment (valves)
- Ancillary equipment
  - Valves, test points, drain points, air vents
- DWH pipework (including manifolds)

2. Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

i. Heat Network Technical Assurance Scheme – Scheme Rules – New Build Heat Networks: Assessment Regime (HNTAS-SR-NB-AS).

3. Terms and definitions

For the purposes of this document, the terms and definitions given in Heat Network Technical Assurance Scheme – Terms and Definitions (HNTAS-TD) and the following table apply.

Term	Definition
Construction Phase	The third phase of a heat network development. This phase covers the construction of a heat network. This phase contains Construction Design (Stage 4), Installation (Stage 5) and Commissioning (Stage 6) Stages.
Consumer Heat System	The heating and/or cooling, and hot water systems on the consumer side of a Consumer Connection or Substation. Heat systems consist of distribution pipework and ancillary equipment (such as distribution manifolds) connected to heat emitters which may include radiators, air handling units (AHUs), fan coil units (FCUs) or underfloor heating (UFH). Hot water systems consist of hot water distribution pipework and ancillary equipment connected to outlets and may contain de-centralised storage and/or re-circulation systems.
Evidence Requirements	Lists of evidence items, with descriptions and requirements, expected to be provided to demonstrate conformity with the Technical Requirements, Performance Monitoring Requirements and avoidance of Key Failures.
Key Failures	Key Failures are identified failures which occur frequently within the industry and lead to poor performance outcomes.
Key Performance Indicators (KPIs)	A quantifiable metric used to measure the performance of a heat network. Key Performance Indicator values and thresholds are to be defined during the design stages, and the heat network shall be designed to ensure KPIs can be achieved in operation.
Performance Monitoring Requirements	Requirements of a technical nature which relate to the performance monitoring of the heat network, using KPIs, and the Metering and Monitoring systems that facilitate performance monitoring.
Stage 1: Concept Design	Stage 1 is the first HNTAS Stage. This stage corresponds to RIBA Stage 2. This will likely align with pre-planning applications and will be prior to the progression of design, with potential handover of design to additional parties.

Term	Definition
Stage 2: Developed Design	Stage 2 is the second HNTAS Stage. This stage corresponds to RIBA Stage 3 design. Assessment at this stage is optional. This stage occurs prior to progression of design in RIBA Stage 4. This will likely align with submission of planning applications and may have potential handover of design to additional parties.
Stage 3: Technical Design	Stage 3 is the third HNTAS Stage. This stage corresponds to pre-construction activities at RIBA Stage 4 design, prior to design sign off and procurement and construction commencing.
Stage 4: Construction Design	Stage 4 is the fourth HNTAS Stage. This stage corresponds to RIBA Stage 4/5 design items that occur within the Construction Phase.
Stage 5: Installation	Stage 5 is the fifth HNTAS Stage. This stage corresponds to the installation activities of a heat network.
Stage 6: Commissioning	Stage 6 is the sixth HNTAS Stage. This stage corresponds to the commissioning activities of a heat network, prior to commissioning sign off, practical completion and handover to the heat network operator.
Technical Requirements	Requirements of a technical nature which relate to the generation and delivery of heat, specific to an element and stage, which are to be fulfilled. The Technical Requirements are predominantly based on existing industry requirements (from codes, guidance and other standards). Where existing industry requirements could not be identified, these have been developed.
Technical standards	Technical Standards consist of all the types of technical obligations under HNTAS. These include: • Conformity with the Technical Requirement • Conformity with Performance Monitoring Requirements • Avoidance of Key Failures • Submission of evidence

Table 3: Terms and definitions

4. Technical Specification structure

4.1 Structure of Technical Specification: series

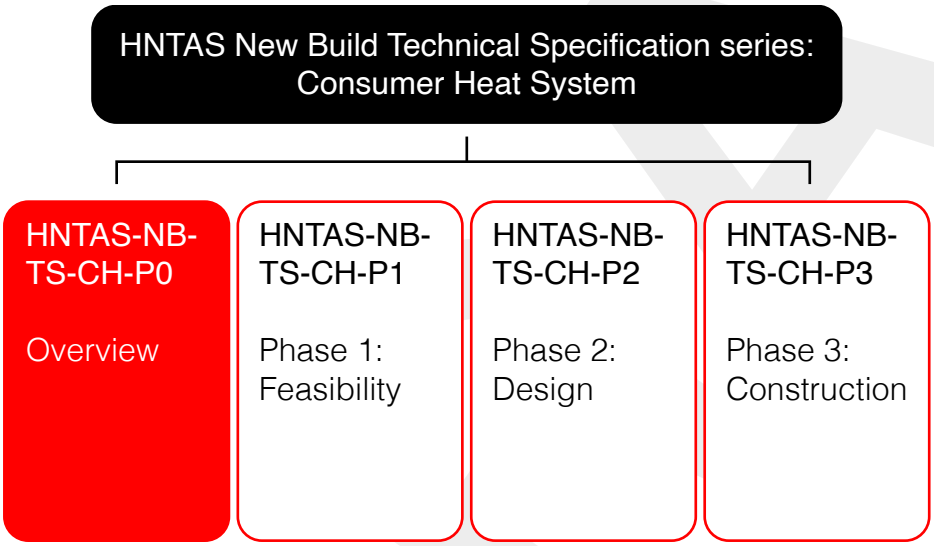
This document provides an overview of the Technical Specification for the Consumer Heat System element.

This document sits within a series of Technical Specifications for the Consumer Heat System.

The series contains three separate documents for each HNTAS phase, which contains the specific Technical Standards for the Consumer Heat System at each stage. It should be noted here that the Consumer Heat System element is not assessed during the operation phases (phase 4 and phase 5). The final assessment stage is Phase 3: Construction.

Figure 2 illustrates the Technical Specification series for an element. Table 1 outlines this series of Consumer Heat System Technical Specifications alongside the other HNTAS elements

Figure 2: Illustration of the Technical Specification series



4.2 Structure of Technical Specifications: individual phase documents

The Technical Specifications for each phase are split into sections for each HNTAS Stage.

A description of HNTAS phases and stages is provided in Heat Network Technical Assurance Scheme – Scheme Rules – New Build Heat Networks: Assessment Regime (HNTAS-SR-NB-AS). Each section contains the Technical Standards for each HNTAS Stage, this consists of the following:

- The Technical Requirements to be met
- The Performance Monitoring Requirements
- The Key Failures to be avoided at each stage
- The Evidence Requirements to be provided, to demonstrate conformity with the Technical Standards and avoidance of Key Failures

4.2.1 Technical Requirements section

Within each Technical Requirements section, a table is presented which contains a list of the HNTAS Technical Requirements and any applicable referenceable Technical Standards that must be achieved to meet the requirement. For each HNTAS Technical Requirement a reference to the expected evidence item has been outlined.

All Technical Requirements are based on current industry documentation. The predominant Technical Standard referenced is the Heat Network Technical Standard (HTS1). For topics which were not present in any reference industry documentation, additional Technical Requirements have been added to address these gaps.

4.2.2 Performance Monitoring Requirements section

Within this section, the requirements in relation to Key Performance Indicators and the Metering and Monitoring System are outlined.

It is expected that the Metering and Monitoring System for the Consumer Heat System will also cover multiple other elements within a heat network. For example, it would be likely that the Metering and Monitoring System for a Consumer Heat System is provided by monitoring points within other elements, such as Energy Centre and Consumer Heat Systems. As a result, the evidence provided for the Metering and Monitoring System will likely contain multiple elements.

Whilst the evidence can be provided which covers multiple elements, all KPIs are to be assessed on an element basis.

4.2.3 Key Failures section

Within each Key Failures section, a table is presented which contains a list of Key Failures, the outcome to avoid, and a reference to the expected evidence item to demonstrate that the Key Failure is or has been avoided.

4.2.4 Evidence Requirements section

Within each Evidence Requirements section, the expected evidence item, which is referred to within Key Failures and Technical Requirements sections for each stage, is detailed.

A table is presented which contains a description and the requirements of each evidence item to provide clarity as to what evidence is expected to prove fulfilment of the Technical Standards.

The evidence is expected to be appropriate for the scale of heat network and project specifics.

It is understood that the evidence items referenced in each table may be presented in different formats or multiple Evidence Requirements may be contained together within larger reports.

It is also expected that evidence items may be applicable to multiple elements across the heat network. Therefore, evidence does not need to be provided on an element-specific basis where it covers multiple elements.

Further evidence may be required by the Assessor to demonstrate fulfilment with the Technical Standards.

5. Note on applicability

The applicability of the Technical Standards within the Technical Specifications for Consumer Heat System will depend on the specific heat network characteristics. This includes the typology of heat network and materials selection.

At each stage a Statement of Applicability shall be produced, which determines the applicable Technical Standards for the specific heat network.

Further requirements on the Statement of Applicability are outlined in Heat Network Technical Assurance Scheme – Scheme Rules – New Build Heat Networks: Assessment Regime (HNTAS-SR-NB-AS).

6. Key Performance Indicators

Table 4 contains the Key Performance Indicators for the Consumer Heat System.

Unlike other heat network elements, the Operation and Maintenance phase is not in scope for the Consumer Heat System. As a result, there are no ongoing KPI requirements.

The only KPI requirements which exist are during commissioning, which are demonstrated through the Acceptance Testing process.

KPI ID	KPI	KPI description	KPI measurement methodology	Assessed KPI or reported metric	KPI target	Time period
CHS-KPI-01	DHW delivery time at kitchen tap *Note only applicable to domestic Consumer Heat Systems.*	The time taken from opening the kitchen DHW tap to deliver 45 °C DHW.	Delivery time (s) = time taken from opening the kitchen DHW tap to deliver 45 °C DHW.	Assessed KPI (assessed on an individual Consumer Heat System basis)	Commissioning: ≤ 45 seconds.	N/A Measured at commissioning stage only
CHS-KPI-02	Space heating circuit return temperature	Return temperature from space heating circuit during steady state space heating operation.	Space Heating return temperature (°C) = space heating circuit return temperature measured during steady state operation of the space heating system.	Assessed KPI (assessed on an individual Consumer Heat System basis)	Commissioning: ≤ [Design Consumer Heat System return temperature limit]. Note the design return temperature limit shall allow for a tolerance of no more than + 3 °C on the expected return temperature and be adjusted for ambient temperature.	N/A Measured at commissioning stage only

Table 4: Key Performance Indicators for Consumer Heat System