Application Description

Ventilation, Air Conditioning and Cold Water

Ventilation, Air Conditioning

Summary

This document is a part of the HVAC Application Interworking Standard. It describes the specific Functional Blocks for ventilation and air conditioning applications.

Version 01.03.01 is a KNX Approved Standard.

This document is part of the KNX Specifications v2.1.

Document updates

Version	Date	Modifications
0.1	2001.05.21	Document split (ventilation and air conditioning)
0.2	2001.08.20	Update demand transformers
0.3	2001.12.05	Update AHUC
0.4	2002.02.08	Finish document as draft for TFI
0.5	2002.03.05	Release for TFI assessment
1.0	2002.03.28	TFI approved
1.1	2002.12.17	Update handbook v1.1 - Emergency Bit at DPT: 207.104, 210.100 - "read only" for diagnopstic data 2.6.4.6 and 2.7.4.6
1.2	2006.01.09	- DHWLegioReq at DPT: 210.100
1.2	2009.06.18	Update in view of publication in the KNX Specifications v2.0.
1.3.00	2010.11.24	• SATC: Removed Parameters TempSupplyAirSetpMin and TempSupplyAirSetpMax. • Editorial corrections (references).
01.03.01	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

[01] Chapter 3/7/2 "Datapoint Types"
[02] Part 7/10 "HVAC General Functional Blocks"
[03] Chapter 7/10/10 "Interface Object Type Identifier"
[04] Chapter 7/11/1 "HWH Production"
[05] Chapter 7/11/2 "HWH Distribution"
[06] Chapter 7/11/3 "HWH Domestic Hot Water Control"
[07] Chapter 7/11/4 "HWH Room Heating Control"
[08] Chapter 7/11/5 "HWH Load Management"
[09] Chapter 7/11/9 "HWH Property Identifiers"
[10] Part 7/12 "Direct Electric Heating"
[11] Part 7/13 "Terminal Unit Functional Blocks"
[12] Chapter 7/14/1 "VAC Ventilation, Air Conditioning"
[13] Chapter 7/14/2 "VAC Cold Water"
[14] Chapter 7/14/9 "VAC Property Identifiers"
[15] Part 10/1 "Logical Tag Extended"

Contents

1 Introduction

1.1 Scope

This document contains the specification of the specific Functional Blocks used for HVAC ventilation, air conditioning (VAC) applications, mainly for (European) residential and small commercial markets.
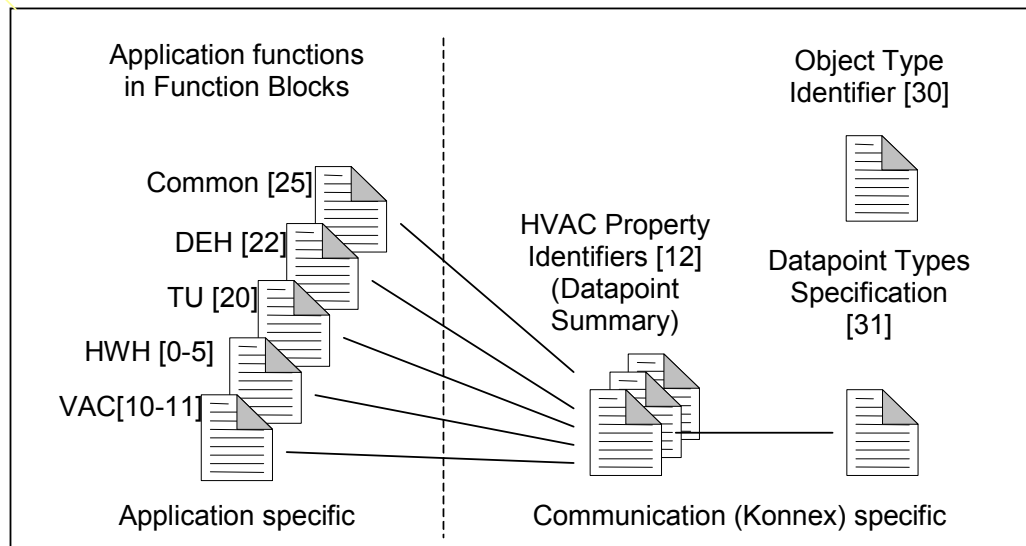
Functional Blocks specification for applications like hot water heating (HWH) [0-5], cold water (VAC) (this document), terminal units (TU) [11] and direct electric heating (DEH) [10] are described in separate documents.

General purpose Functional Blocks used for HVAC applications such as sensors, actuators, HMI and some common HVAC Functional Blocks are described in a separate document (HVAC Specification Functional Blocks, Sensors, HMI, Actuators, Common Controller Functions [02]).

All these documents are part of the KNX HVAC-Application Interworking Standard.

This part of the KNX HVAC specification is mainly but not completely independent of the underlying protocol since specific mechanisms for 'easy configuration' and runtime data distribution must be available on the network.

Completely protocol dependent parts of the HVAC VAC specification such as data encoding and datapoint-types, object address tables, group address tables etc. are not part of this specification. This is described in HVAC Interface Object Type Identifier [03] and HVAC Specifications Datapoint Types [01].

1.2 Objectives

This document includes the information necessary to build interoperable HVAC products using the KNX system.

The focus is runtime process interworking between HVAC control-devices at the application level.

In addition, this document specifies the specific mechanisms for zoning and runtime process data distribution used in HVAC for an 'easy installation' system (LTE-HEE Mode [15]).

This is a technical specification with informative material provided as needed to convey key concepts. The approach taken here is a top-down view of interoperability. The HVAC system model is based on the decomposition of the distributed HVAC application by means of Functional Blocks i.e. black-box description of Functional Blocks including data-interface and relationship to other Functional Blocks.

Every Functional Block may be part of a complex device (e.g. a chiller and cold water controller) containing more than one Functional Block.

Because of this modular approach, there is no attempt in this specification to describe or dictate the internal construction of a Functional Block or to describe specific device types.

This document only includes details of the transport protocol as needed to specify interoperability and easy installation mechanisms.

The document does not specifically cover implementation aspects, but guidelines are included where appropriate.

This document does not describe the general HVAC-VAC application field and application requirements and it does also not contain the description of typical application examples (scenarios) and application profiles.

1.3   Dependence on Configuration Modes

The main focus of this document is the specification of the **Basic Functional Blocks** and the **LTE specific parts**.

The document provides all necessary information needed:
- for a complete implementation of the Functional Blocks in LTE mode
- for the implementation of mandatory objects used for runtime interworking in Standard Mode (Basic Functional Block)

1.3.1   Runtime Interworking

Mode dependent (S, LT-R, LT-S, Ctrl, Pb, A) implementation of optional runtime interworking objects is not specified in this document, e.g. "easy channel" definitions.

The following table (example) shows the mode dependencies concerning runtime interworking

		Basic FB	S-Mode	STANDARD MODE / Standard Mode Interface	EXTENDED MODE / LTE-Mode
Inputs	Inp1	**NA**	NA	NA	M
	Inp2	**NA**	NA	NA	O
	Inp3	**(GO$_b$)**		(GO)	O
Outputs	Outp1	**NA**	NA	NA	M
	- Outp1-1	**GO$_b$**	GO	GO	NA
	- Outp1-2	**GO$_b$**	GO	GO	NA

Inp1:   is mandatory M in LTE Mode but the information is not available NA in the Basic FB and all other modes because the datapoint type (DPT) is <u>today</u> not available in Standard Mode and there are no products on the market with this functionality.

Inp2: is optional O in LTE Mode but the information is not available NA in the Basic FB and all other modes because the DPT is <u>today</u> not available in Standard Mode and there are no products on the market with this functionality.

Inp3: is optional O in LTE Mode and an optional Group Object in the Basic FB (GO$_b$). The datapoint is optionally supports as Group Object in the LTE Standard Mode Interface (GO).
For all other modes the implementation is not defined. This is indicated by an empty field.

Outp1: is mandatory M in LTE Mode and has a structured DPT or a DPT with extended features, which is today not available in Standard Mode. In the Basic FB the information of Outp1 is split up into Outp1-1 and Outp1-2 (separate datapoints with standard DPT).
Outp1-1 and Outp1-2 are mandatory Group Objects GO in the Basic FB and are therefore mandatory in all modes.

1.3.2 Parameters and Diagnostic Data

LTE implementation:
- Parameters and Diagnostic Data of a Functional Block shall be implemented as Properties of the corresponding Interface Object, which are accessed using individual addressing.
- These Properties are addressed via the standard Interface Object Type (IO Type) for this Functional Block. This IO Type is also used for datapoint addressing in the LTE runtime interworking model
- <u>Standard DPT or HVAC specific DPT with extended features</u> are used where appropriate.

Other modes:
- Parameters and Diagnostic Data can in principle be implemented as memory mapped datapoints or Group Objects or Properties of an Interface Object. This document does not lay down how to implement Parameters and Diagnostic Data in S, LT-R, LT-S, Ctrl, Pb and A-Mode.

- In case of **Memory Mapped** datapoints the DPT may be manufacturer specific

- In case of **Group Objects** standard DPT shall be used instead of HVAC specific (extended) DPT. The description of these Group Objects shall be part of the mode-dependent specification (e.g. Channel definition).

- In case of **Properties**, the implementation of HVAC specific DPT with extended features may be a problem (depending on the available microcontroller resources). The manufacturer has the choice:
  ⇨ to use the LTE style Property implementation as specified in this document (with the DPT and IO Type for LTE implementations)

  ⇨ to implement these Properties using standard DPT only.
  In this case, the same Property ID but a different IO Type[b] shall be used since the DPT of a Property shall be unambiguous for each IO Type.

     Simple IOT mapping rule: **IO Type^b = IO Type^{LTE} + 10000d**
     (e.g. BUC^{LTE} = 128 => BUC^b = 10128)

  ⇨ It is allowed to implement in a device both Interface Object Types IO Type$^{HVAC-LTE}$ and IO Type^{standardDPT}. The implementation of parameters and diagnostic data of one given Functional Block shall however be complete. It is thus not allowed to implement part of the datapoints of a Functional Block in IO Type^{standardDPT} and the remaining in IO Type^{HVACLTE}.

Implementation of Parameter and Diagnostic Data				
	Property based		Group Object	Memory mapped
	LTE style	Standard DPT		
IO Type	IO Type^{LTE} e.g. BUC=128	IO Type^{LTE} + 10000 e.g. BUC=10128		
Property ID	Property ID x	Property ID x		
DPT	standard DPT	=> same standard DPT	=> same standard DPT	manufacturer specific
	HVAC specific*) e.g. 205.100	=> mapped standard DPT, e.g. 9.001	=> mapped standard DPT, e.g. 9.001	

In this document only the **LTE style** of Parameters and Diagnostic Data is specified.

In the FB datapoint overview those Parameters and Diagnostic Data with HVAC specific (extended) DPT are marked " ***)** "
The mapping of HVAC specific DPT to standard DPT is generic and described in the document **[01]** – HVAC Datapoint Types; Supplement 11 (TFI 18)

1.4 Abbreviations of Functional Blocks

This clause shows an overview of Functional Blocks, which are used in this document.

Ventilation, Air Conditioning, and Cold Water (VAC)

Abbreviation	Description
AHUC	Air Handling Unit Controller
CC	Chiller Control
CDAUX	Auxiliary Cooling Demand
CDAUXPER	Auxiliary Cooling Demand Percent
CDTAHU	Cooling Demand Transformer Air Handling Unit
CFDM	Cooling Flow Demand Manager
CPM	Cold Water Production Manager
CRC	Re-Cooling Controller
CZC	Cooling Zone Controller
HDAUXPER	Auxiliary Heating Demand Percent
HDTAHU	Heating Demand Transformer Air Handling Unit
SATC	Supply Air Temperature Controller

Hot Water Heating (HWH) [04]-[08]

Abbreviation	Description
BUC	Burner Controller
BOC	Boiler Controller
HPM	Heat Production Manager
BST	Buffer Storage Tank
HFDM	Heating Flow Demand Manager
FTC	Flow Temperature Controller
HPM	Heat Production Manager
HZC	Heating Zone Controller
HIRC	Heating Individual Room Controller
HRDM	Heating Room Demand Manager
HDAUX	Auxiliary Heating Demand
HDTACT	Heat Demand Transformer Actuator Position

HDTRT	Heat Demand Transformer Room Temperature
DHWC	Domestic Hot Water Controller
DHWS	Domestic Hot Water Scheduler
DHWCPS	Domestic Hot Water Circulation Pump Scheduler
SDHWC	Solar Domestic Hot Water Controller
DHWSM	Domestic Hot Water Setpoint Manager
DHWCPC	Domestic Hot Water Circulation Pump Controller
UDHWSET	DHW User Settings

Terminal Units (TU) [11]

Abbreviation	Description
ACDTTU	Air Cooler Energy Demand Transformer Terminal Unit
AHDTTU	Air Heater Energy Demand Transformer Terminal Unit
CCDTTU	Chilled Ceiling Energy Demand Transformer Terminal Unit
FCC	Fan Coil Unit Controller
RCC	Radiator and Chilled Ceiling Control
RHDTTU	Radiator Heating Energy Demand Transformer Terminal Unit
SPUC	Split Unit Control
VAVC	Variable Air Volume Control
VDTTU	Ventilation Demand Transformer Terminal Unit
WHPC	Water Heat Pump Control

Sensor, HMI, Actuators - Common Controller Functions [02]

Abbreviation	Description
CFWTS	Condenser Flow Temperature Sensor
CRNWTS	Condenser Return Water Temperature Sensor
DPS	Dew Point Status Sensor
FWTS	Flow Water Temperature Sensor
HVA	HVAC Valve
HVACOPT	HVAC Optimiser
HVACEMS	HVAC Emergency Source
OAD	Outside Air Damper
ORHS	Outside Relative Humidity Sensor
OAQS	Outside Air Quality Sensor
OTS	Outside Air Temperature Sensor
PRD	Presence Detector
RRHS	Room Relative Humidity Sensor
RAQS	Room Air Quality Sensor
RNARHS	Return Air Relative Humidity Sensor
RNAQS	Return Air Quality Sensor
RNATS	Return Air Temperature Sensor
RNWTS	Return Water Temperature Sensor
RSMHD	Room Setpoint Manager HVAC-Mode Driven
RSMTD	Room Setpoint Manager Temperature Driven
RTS	Room Temperature Sensor
SARHS	Supply Air Relative Humidity Sensor
SAQS	Supply Air Quality Sensor
SATS	Supply Air Temperature Sensor
SIS	Sun Intensity Sensor
SMAQ	Setpoint Manager Air Quality
SMRH	Setpoint Manager relative Humidity
UAQSS	Air Quality Setpoint Setting
URHSS	Air Relative Humidity Setpoint Setting

UHRS	User HVAC Room Setting
UHD	User HVAC Display
WCOS	Water Change over Status Sensor
WOS	Window Switch
WSS	Wind Speed Sensor

General

Abbreviation	Description
cs	Company Specific
DPT	Datapoint Type
FB	Functional Block
GO	Group Object
IO	Interface Object
IR	LTE-Service InfoReport
LTE	Logical Tag Extended Mode, see [15] Volume 10, LTE Specification
NA	not available
M	Mandatory
W	LTE-Service Write

2 Functional Blocks: Ventilation and Air Conditioning

2.1 Overview

There are two different types of air handler unit controllers:

a) Independent air handling units controllers AHUC, stand-alone air handler unit controllers

b) Demand controlled air handlers SATC, supply air temperature controllers in connection with terminal unit functional block VDTTU

2.2   Functional Block: Air Handling Unit Controller (AHUC)

2.2.1   Description

The Functional Block AHUC controlls a stand-alone air handling unit. This may be a cascade control, direct room control with or without supply air temperature limitation or a supply air temperature control with room influence.

One of the following Room Setpoint Managers RSMHD (HVAC-Mode driven) or RSMTD (temperature driven) provides the room setpoints, and depending on the manager HVACMode and HVACModeNext. Optionally there is the controller mode ContrMode provided from a management station to ensure extended functions especially on manual controlling of the AHUC.

Supply air temperature control (without room influence) is also solved with the Air Handling Unit Controller AHUC Functional Block. Supply air temperature setpoints are internal parameters. The Room Setpoint Manager Block is only used for the HVACMode. Due to this the RSMHD temperature inputs are optional inputs. The Room Setpoint Manager RSMTD is not supported for this application.

The temperature control of the Air Handling Unit Controller AHUC is company-specific and not part of this specification. Heating valves, cooling valves, fans, dampers, energy recovery, electric heaters, are directly connected to the Air Handling Unit Controller AHUC via hardwiring or via optional communication signals (Bind. Grp.: Apartment). The controller may be configured to select between different control strategies.

Output signals from the Air Handling Unit Controller AHUC are the demand signals for hot water EnergyDemHeatAHUC and cold water EnergyDemCoolAHUC. This is the link to the air handler Heating Demand Transformers HDTAHU and air handler Cooling Demand Transformers CDTAHU, which collect the demand signals (n signals in percent) and convert them into hot water and cold water flow temperature signals. These signals are only optional because not each air handling unit requires hot water heating and cold water cooling. There are air handler without heating and cooling, or heating only, or cooling only or both.

Some Air Handling Units may have different heating coils (preheater, reheater) on different hot water header. Due to this the Air Handler Unit Controller may produce two different EnergyDemHeatAHUC signals in different Hot Water Distribution Segment. This addition is company specific and not described in this document.

Force and Lock signals of the hot and cold water producer and distribution are transferred to the air handler unit to ensure the functionality of the temperature control. Important: Neither forcing nor locking signals must have an influence on the calculation of the demand signals EnergyDemHeatAHUC and EnergyDemCoolAHUC. Otherwise the system may oscillate!

Forcing or enabling the Air Handling Unit Controller to a special controller mode (Night_Purge, Fan_only,…) may be done via the optional ContrMode input signal.

Fire and SmokeClearance signals are normally hardwired to the AHUC. This emergency functions are company-specific and not part of this specification. Never less in more sophisticated systems, the optional EmergMode (Pressurisation, Fire,..) may be sent via bus from a HVAC fire/smoke device (HVACEMS).

The Air Handling Unit Controller AHUC supports relative humidity control (optional). This may be a reference room humidity control with supply air humidity limits, return air humidity control with supply air humidity limits or a simple supply air humidity control. The algorithm is company-specific and not part of this description. The humidity setpoint HumRelSetpHumEff and HumRelSetpDehumEff is a set of humidification / dehumidification setpoints and are only valid during operation of the air handling unit. These setpoints may be internal parameter (in percent) within the Air Handling Unit Controller AHUC or set via communication (Bind.Grp.: Apartment) with the Functional Block Setpoint Manager Humidity SMRH.

Absolute humidity control may be supported within the Functional Unit Block and not part of this description.

The Air Handling Unit Controller AHUC supports air quality control (optional). This may be a reference room air quality control, return air quality control or a supply air quality control. It is possible to connect an air quality sensor via communication (Bind. Grp.: Apartment) to the Air Handling Unit Controller AHUC. The air quality setpoint AQSetpEff is set as an internal parameter (in ppm, mixing gas is converted in a representative ppm-value) within the Air Handling Unit Controller AHUC or via communication (Bind. Grp.: Apartment) with the Functional Block Setpoint Manager Air Quality SMAQ. The algorithm is company-specific and not part of this description.

Air quantity (fan speed) for Air Handling Unit Controller AHUC may be controlled via independent pressure loops or in conjunction with air quality control. The algorithm is company-specific and not part of this description.

Room Units (HMI) like Room Temperature Setpoint Absolute Setting, Room Temperature Setpoint Relative Setting, Air Quality Setpoint Setting or Air Humidity Setpoint Setting are specified in HVAC Specifications – Functional Blocks Sensors, HMI, Actuators, Common Controller Functions [02] and linked to the appropriate Room Setpoint Manager.

Additionally to the already shown sensors there may be other devices connected to the air handling unit controller AHUC. For example room air quality / humidity sensors or return air temperature / air quality / humidity sensors or outside air quality / humidity sensors. The same applies to additional actuators or HMI-displays. It may be also possible to add in the near future sensor, displays or actuators to the AHUC.

2.2.1.1   LTE Zoning for the AHUC: usage of Room Level 'R' and SubZone 'S'

In normal systems with air handling unit controllers, the support of the Room and Subzone tags not relevant. A mix of AHUC and Terminal Unit Controllers [11] **within one Apartment** (Geographical-Tag) shall be not possible. The AHUC is therefore always communicating with explicit **A.1.1** zoning information (unambiguous zoning information, no wildcard on Room or Subzone).

For further information on geographical LTE zones see also [15]

2.2.1.2   External HVAC Optimiser

Overview only: for more details see [02].

In more advanced systems the Air Handling Unit Controller AHUC may incorporate a local optimiser (company specific functions: morning boost, start and stop optimisation etc).

In addition the AHUC may provide optional inputs for an external (central) "HVAC Optimiser" which may be located in a central unit or management station etc.

HVAC Optimiser provides an optimised HVAC Mode (HVACModeOptim) and a delta room temperature setpoint values, which allows shift the current room temperature setpoint, e.g. for morning boost (TempRoomSetpOptimHeatShift) respective TempRoomSetpOptimCoolShift. The Air Handling Unit Controller consumes these values.
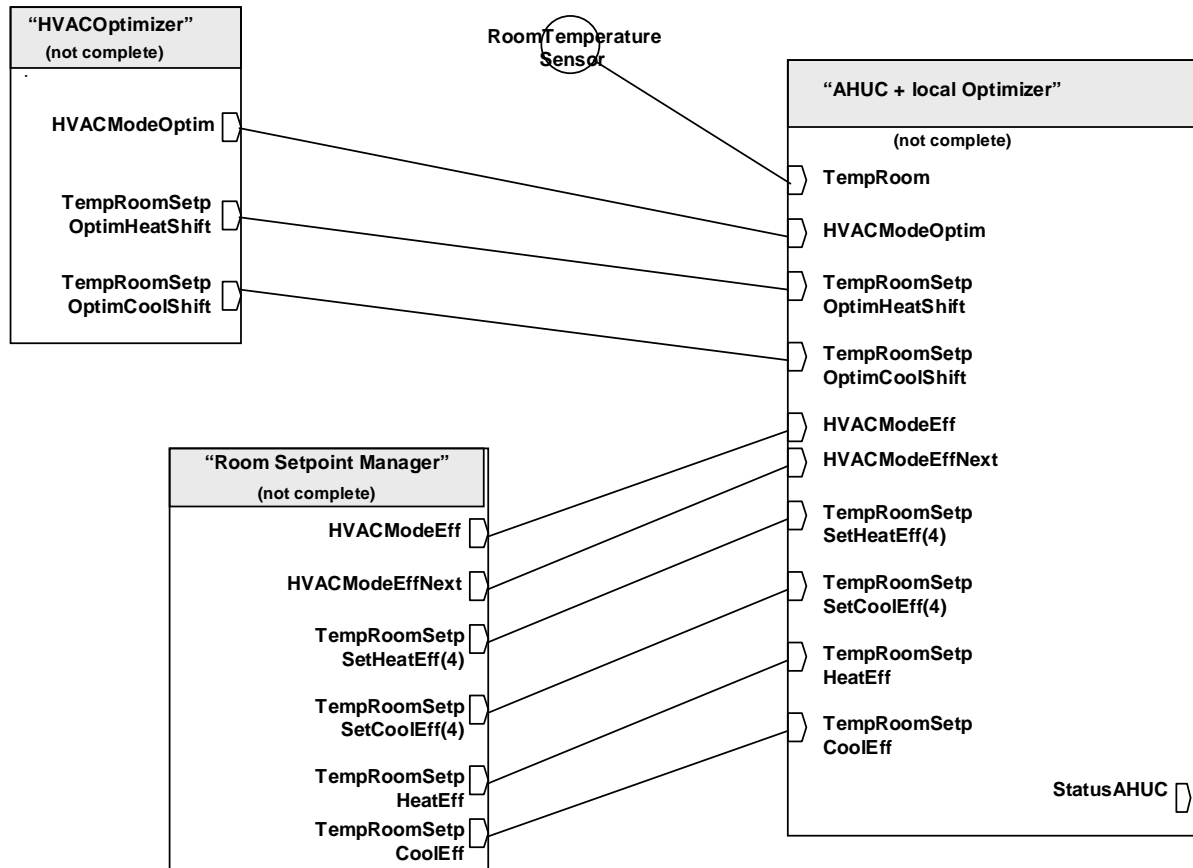
2.2.2 Constraints

IMPORTANT: reporting of the hot and cold water demand signals may be implemented in the Standard Mode but can today not be routed via demand transformers (HDTAHU, CDTAHU) to the hot or cold water distribution segment because the necessary compound HVAC DPT for runtime-interworking is not yet available in Standard Mode.

Therefore for the time being only LTE implementations offer a link to a demand dependent hot and cold water distribution and production system.

In air handling units the location of room sensors may be a problem due to architectural or design reasons. Therefore some installers install return air sensors instead of a room sensors. The downside of this implementation is a "wrong" reading whenever the airflow in the ductwork stops. Features like, controlled start by low or high temperatures, low or high humidity or bad air quality in HVACMode Economy may be not accurate.

Never less to simplify the Functional Block:

- Return air temperature is equal to room temperature
- Return air humidity sensor is equal to room humidity sensor
- Return air quality is equal to room air quality.

In the Standard Model all outside sensors are located in the same LTE Outside Sensor Zone (only one zoning parameter). Manufacturer specific parameters shall be used if different Outside Sensor Zones for the outside temperature, wind speed or sun intensity have to be supported.

2.2.3 Functional Block diagram

Air Handling Unit Controller AHUC

Binding Grp.: DistrSegmH (link to "left-hand" HDTAHU & HFDM)

IR	StatusHPM
IR	ForceSignHPM
IR	LockSignHPM
IR	ForceSignHFDM
IR	LockSignHFDM

EnergyDemHeatAHUC   IR

Binding Grp.: DistrSegmC (link to "left-hand" CDTAHU & CFDM)

IR	StatusCPM
IR	ForceSignCPM
IR	LockSignCPM
IR	ForceSignCFDM
IR	LockSignCFDM

EnergyDemCoolAHUC   IR

Binding Grp.: Apartment (link to "right-hand" RSM and misc FB's)

IR	HVACModeEff
IR	HVACModeEffNext
IR	TempRoomSetpSetHeatEff (4)
IR	TempRoomSetpSetCoolEff (4)
IR	TempRoomSetpHeatEff (1)
IR	TempRoomSetpCoolEff (1)
IR	HVACModeOptim
IR	TempRoomSetpOptimHeatShift
IR	TempRoomSetpOptimCoolShift
IR	ContrMode
IR	EmergMode
IR	AQSetpEff
IR	HumRelSetpHumEff
IR	HumRelSetpDehumEff
IR	TempRoom
IR	AQRoom
IR	HumRelRoom
IR	TempSupplyAir
IR	AQSupplyAir
IR	HumRelSupplyAir

StatusAHUC
- Fault
- FanActive   IR

HVACModeAct

TempRoomSetpAct

+ | *) from RSMHD

+ | *) from RSMTD

*) either or implementation

ActPosSetpHeatStageA
ActPosSetpCoolStageA
ActPosSetpHeatStageB
ActPosSetpCoolStageB
ActPosSetpFreshAir

Future actuators:
- pumps
- fans
- ...
according Functional Blocks
actuators

Binding Grp.: OutsideSensorZone_x

TempOutside
HumRelOutside
WindSpeed
SunIntensity

Local hardware I/O's
- fans
- pumps
- valves
- sensors
- ...

Parameter
- Apartment
- DistrSegmH
- DistrSegmC
- OutsideSensorZone
- TempSupplyAirSetpMin
- TempSupplyAirSetpMax

Diagnostic Data
- TempRoomAct
- TempOutsideAct
- TempSupplyAirSetpHeat
- TempSupplyAirSetpCool
- Fault
- FanActive

2.2.4   Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
EnergyDemHeatAHUC	Air handler unit hot water demand in percent (LTE and S-interface)	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
EnergyDemCoolAHUC	Air handler unit cold water demand in percent (LTE and S-interface)	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
StatusAHUC	Status information of the air handling unit controller	DPT_StatusAHU	21.106
- Fault	Failure, some error in the AHUC (S-interface)	DPT_Bool	1.002
- FanActive	Supply and/or exhaust air fans are operating (S-interface)	DPT_Bool	1.002
HVACModeAct	Actual active HVAC mode (LTE and S-interface)	DPT_HVACMode_Z DPT_HVACMode	201.100 20.102
TempRoomSetpAct	Actual room temperature setpoint (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
ActPosSetpHeatStageA	Actuator position setpoint air handler heating valve stage A to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpHeatStageB	Actuator position setpoint air handler heating valve stage B to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpCoolStageA	Actuator position setpoint air handler cooling valve stage A to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpCoolStageB	Actuator position setpoint air handler cooling valve stage B to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpFreshAir	Actuator position setpoint air handler outside air damper to be written to the air damper actuator ADA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
	Future actuators (fans, pumps,..) under discussion	t.b.d. probably complex datapoints	?
Inputs			
StatusHPM	Status information from Hot Water Production Manager	DPT_StatusHPM	209.100
ForceSignHPM	Forcing signal from Hot Water Production Manager, to force consumer to consume more energy	DPT_ForceSign	21.100

Datapoint	Description	Datapoint Type	DPT_ID
LockSignHPM	Locking signal from Hot Water Production Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
ForceSignHFDM	Forcing signal from Heating Flow Demand Manager, to force consumer to consume more energy	DPT_ForceSign	21.100
LockSignHFDM	Locking signal from Heating Flow Demand Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
StatusCPM	Status information from Cold Water Production Manager	DPT_StatusCPM	209.102
ForceSignCPM	Forcing signal from CPM due to danger of freezing, to force consumer to consume more energy	DPT_ForceSignCool	21.101
LockSignCPM	Locking signal from CPM due to chiller overload, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
ForceSignCFDM	Forcing signal from CFDM in the Cold Water Distribution Segment	DPT_ForceSignCool	21.101
LockSignCFDM	Locking signal from CFDM in the Cold Water Distribution Segment	DPT_LockSign	207.101
HVACModeEff	Present/active 'HVAC Mode' from Room Setpoint Manager RSMHD, may depend on automatic time schedule, local user operation, presence detection, widow status, comfort prolongation, etc 1)	DPT_HVACMode_Z	201.100
HVACModeEffNext	Next HVAC mode and time to next HVAC mode from RSMHD 1)	DPT_HVACModeNext	206.100
TempRoomSetpSetHeatEff (4)	Set of 4 effective temperature setpoints for heating 'Comfort', 'Standby', 'Economy' and 'Building Protection' 1)	DPT_TempRoomSetpSet [4]	213.100
TempRoomSetpSetCoolEff (4)	Set of 4 effective temperature setpoints for cooling 'Comfort', 'Standby', 'Economy' and 'Building Protection' 1)	DPT_TempRoomSetpSet [4]	213.100
TempRoomSetpHeatEff (1)	Effective temperature setpoint for heating from RSMTD (LTE and S-interface) 1)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
TempRoomSetpCoolEff (1)	Effective temperature setpoint for cooling from RSMTD (LTE and S-interface) 1)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
HVACModeOptim	Optimised HVAC mode from external HVAC mode optimiser	DPT_HVACMode_Z	201.100

Datapoint	Description	Datapoint Type	DPT_ID
TempRoomSetpOptim HeatShift	Room temperature setpoint shift heat from external HVAC mode optimiser (LTE and S-interface)	DPT_TempHVACRel_Z DPT_Value_Tempd	205.101 9.002
TempRoomSetpOptim CoolShift	Room temperature setpoint shift cool from external HVAC mode optimiser (LTE and S-interface)	DPT_TempHVACRel_Z DPT_Value_Tempd	205.101 9.002
ContrMode	Controller mode from management station. To enable or force the AHUC into a special application mode (LTE and S-interface)	DPT_HVACContrMode_Z DPT_HVACContrMode	201.104 20.105
EmergMode	Emergency mode from management station. To force the AHUC into fire or smoke clearance. (LTE and S-interface)	DPT_HVACEmergMode_Z DPT_HVACEmergMode	201.109 20.106
AQSetpEff	The effective air quality setpoint (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008
HumRelSetpHumEff	Relative air humidity setpoint for humidification (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
HumRelSetpDehumEff	Relative air humidity setpoint for dehumidification (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
TempRoom	Current room temperature value (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
AQRoom	Current room air quality value (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008
HumRelRoom	Current relative room humidity value (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
TempSupplyAir	Current supply air temperature sensor value (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
AQSupplyAir	Current supply air quality sensor value (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008
HumRelSupplyAir	Current relative supply air humidity sensor value (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
TempOutside	Current outside air temperature sensor (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
HumRelOutside	Current relative outside air humidity sensor (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
WindSpeed	Current wind speed value (LTE and S-interface)	DPT_WindSpeed_Z DPT_Value_Wsp	203.101 9.005
SunIntensity	Current sun intensity value W/m^2 (LTE and S-interface)	DPT_SunIntensity_Z DPT_PowerDensity	203.102 9.022
Parameters			
Apartment	LTE zoning number Geographical Tag Apartment	DPT_UCountValue8_Z	202.002

Datapoint	Description	Datapoint Type	DPT_ID
DistrSegmH	LTE zoning number Hot Water Distribution Segment	DPT_UCountValue8_Z	202.002
DistrSegmC	LTE zoning number Cold Water Distribution Segment	DPT_UCountValue8_Z	202.002
OutsideSensorZone	LTE zoning number Outside Sensor Zone	DPT_UCountValue8_Z	202.002
TempSupplyAirSetpMin	Minimum supply air temperature setting to ensure no condensation	DPT_TempHAVCAbs_Z	205.100 *)
TempSupplyAirSetpMax	Maximum supply air temperature setting to ensure no heat dumping or smell	DPT_TempHAVCAbs_Z	205.100 *)
Diagnostic Data			
TempRoomAct	Actual room temperature used by the AHUC	DPT_TempHAVCAbs_Z	205.100 *)
TempOutsideAct	Actual outside temperature used by the AHUC	DPT_TempHAVCAbs_Z	205.100 *)
TempSupplyAirSetpHeat	Actual supply air temperature setpoint for heating	DPT_TempHAVCAbs_Z	205.100 *)
TempSupplyAirSetpCool	Actual supply air temperature setpoint for cooling	DPT_TempHAVCAbs_Z	205.100 *)
Fault	Failure, some error in the AHUC	DPT_Bool	1.002
FanActive	Supply and/or exhaust air fans are operating	DPT_Bool	1.002

*) Implementation of Properties using standard DPT see clause 1.3.2

		Basic FB	STANDARD MODE	EXTENDED MODE	
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Outputs	EnergyDemHeatAHUC	(GO_b)		(GO)	O
	EnergyDemCoolAHUC	(GO_b)		(GO)	O
	StatusAHUC	NA[1])	NA	NA	O
	- Fault	(GO_b)		(GO)	NA
	- FanActive	(GO_b)		(GO)	NA
	HVACModeAct	(GO_b)		(GO)	O
	TempRoomSetpAct	(GO_b)		(GO)	O
	ActPosSetpHeatStageA	(GO_b)		(GO)	O
	ActPosSetpHeatStageB	(GO_b)		(GO)	O
	ActPosSetpCoolStageA	(GO_b)		(GO)	O
	ActPosSetpCoolStageB	(GO_b)		(GO)	O
	ActPosSetpFreshAir	(GO_b)		(GO)	O
Inputs	StatusHPM	NA[1])	NA	NA	O
	ForceSignHPM	NA[1])	NA	NA	O
	LockSignHPM	NA[1])	NA	NA	O
	ForceSignHFDM	NA[1])	NA	NA	O
	LockSignHFDM	NA[1])	NA	NA	O
	StatusCPM	NA[1])	NA	NA	O
	ForceSignCPM	NA[1])	NA	NA	O
	LockSignCPM	NA[1])	NA	NA	O
	ForceSignCFDM	NA[1])	NA	NA	O
	LockSignCFDM	NA[1])	NA	NA	O
	HVACModeEff	NA[3])	NA	NA	M [2])
	HVACModeEffNext	NA[1])	NA	NA	O [2])
	TempRoomSetpSet HeatEff(4)	NA[2])	NA	NA	M [2])
	TempRoomSetpSet CoolEff(4)	NA[2])	NA	NA	M [2])
	TempRoomSetpHeatEff(1)	GO_b	GO	GO	M [2])
	TempRoomSetpCoolEff(1)	GO_b	GO	GO	M [2])
	HVACModeOptim	NA[3])	NA	NA	O
	TempRoomSetpOptim HeatShift	(GO_b)		(GO)	O
	TempRoomSetpOptim CoolShift	(GO_b)		(GO)	O
	ContrMode	(GO_b)		(GO)	O

	EmergMode	**(GO_b)**		(GO)	O
	AQSetpEff	**(GO_b)**		(GO)	O
	HumRelSetpHumEff	**(GO_b)**		(GO)	O
	HumRelSetpDehumEff	**(GO_b)**		(GO)	O
	TempRoom	**(GO_b)**		(GO)	O
	AQRoom	**(GO_b)**		(GO)	O
	HumRelRoom	**(GO_b)**		(GO)	O
	TempSupplyAir	**(GO_b)**		(GO)	O
	AQSupplyAir	**(GO_b)**		(GO)	O
	HumRelSupplyAir	**(GO_b)**		(GO)	O
	TempOutside	**(GO_b)**		(GO)	O
	HumRelOutside	**(GO_b)**		(GO)	O
	WindSpeed	**(GO_b)**		(GO)	O
	SunIntensity	**(GO_b)**		(GO)	O

[1] *the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency*
[2] *Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4], TempRoomSetpSetCoolEff[4]} or {TempRoomSetpHeatEff, TempRoomSetpCoolEff}*
[3] *Implementation of HVACModeEff or HVACModeOptim inputs only without TempRoomSetpSetHeatEff [4] or TempRoomSetpSetCoolEff [4] does not make sense*

Table 1: AHUC Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	Apartment	M
	DistrSegmH	O
	DistrSegmC	O
	OutsideSensorZone	O

Table 2: AHUC LTE specific Properties

		Support
Parameter	TempSupplyAirSetpMin	O
	TempSupplyAirSetpMax	O
Diagnostic Data	TempRoomAct	O
	TempOutsideAct	O
	TempSupplyAirSetpHeat	O
	TempSupplyAirSetpCool	O
	Fault	O
	FanActive	O

Table 3: AHUC Standard Properties of Interface Objects (or memory mapped DP)

2.2.4.1　Output signal: EnergyDemHeatAHUC

Standard Mode

DP Name:	EnergyDemHeatAHUC	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☐

Description
See LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.

Datapoint Type						
DPT_Name:	DPT_Percent_U8					
DPT Format:	U_8			DPT_ID:	5.004	
Field	Description			Supp.	Range	Unit	Default
		see LTE-HEE mode				

Access Type						
♦　Output						
this → M	☐		this → 1	☒		
Spontaneous	☒	COV:	☒	Δ-Value:	10%	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min	
Request	☒					

Communication Type			
♦　Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics					
Power down:	Save:		☐		
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Server Output Name: **EnergyDemHeatAHUC**		Mandatory ☐
				Optional ☒

Description:
This output process signal contains the heating demand (in percent) and the attributes validity, load priorities and emergency demand to be sent to the air handler Heating Demand Transformer HDTAHU. The demand signal may be the heating valve position or a company-specific demand calculation.

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8		
Field		Description		Sup.	Range	Unit	COV	Default	
ActPosDemAbs		Calculated heating demand (100% = max. demand)		O	0..100	%	10	0	
Attributes									
– DemValid		Validity of heating demand		M	true/false	bool	Y	false	
– AbsLoadPriority		Absolute load priority requested by AHUC		O	true/false	bool	Y	false	
– ShiftLoadPriority		Shift load priority requested by AHUC		O	true/false	bool	Y	false	
– EmergDem		Emergency heat demand for room frost protection		O	true/false	bool	Y	false	

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☐			
Application Specific ☒	DistrSegmH		1
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID): 240 (AHUC)	Property ID: 51	
LTE-Services (event):	COV ☒ MinRepTime: 10 sec	Heartbeat: 15 min	
InfoReport ☒	Output per default communicating ☐	Binding Group Wildcard allowed ☐	
	Tx Prio: High ☐	Normal ☒ Low ☐	
(LTE Read-Response polling of the output shall always be supported)	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):	Read only ☒	Read/Write ☐	

Exception Handling:		Save at Powerdown ☐

Special Features:		

2.2.4.2 Output signal: EnergyDemCoolAHUC

Standard Mode

DP Name:	EnergyDemCoolAHUC	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☐
Description						
See LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.						
Datapoint Type						
DPT_Name:	DPT_Percent_U8					
DPT Format:	U$_8$			DPT_ID:	5.004	
Field	Description			Supp.	Range	Unit	Default
	see LTE-HEE mode						

Access Type

♦ Output						
this → M	☐	this → 1	☒			
Spontaneous	☒	COV:	☒	Δ-Value:	10%	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒						

Communication Type

♦ Group Object Datapoint				Mandatory:	☒
Default Group Address:		--			

Dynamics

Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Server Output Name:	**EnergyDemCoolAHUC**	Mandatory ☐ Optional ☒

Description:
This output process signal contains the cooling demand (in percent) and the attributes validity, load priorities and emergency demand to be sent to the air handler Cooling Demand Transformer CDTAHU. The demand signal may be the cooling valve position or a company-specific demand calculation.

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8
Field		Description	Sup.	Range	Unit	COV	Default
ActPosDemAbs		Calculated cooling demand (100% = max. demand)	O	0..100	%	10	0
Attributes – DemValid		Validity of cooling demand	M	true/false	bool	Y	false
– AbsLoadPriority		Absolute load priority requested by AHUC	O	true/false	bool	Y	false
– ShiftLoadPriority		Shift load priority requested by AHUC	O	true/false	bool	Y	false
– EmergDem		Emergency cooling demand	O	true/false	bool	Y	false

Communication:

Binding Group:		
Class	Type	Default
Geographical ☐		
Application Specific ☒	DistrSegmC	1
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID): 240 (AHUC) Property ID: 52		
LTE-Services (event): InfoReport ☒	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
	Output per default communicating ☐	Binding Group Wildcard allowed ☐	
	Tx Prio: High ☐ Normal ☒ Low ☐		
(LTE Read-Response polling of the output shall always be supported)	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):	Read only ☒ Read/Write ☐		

Exception Handling:	Save at Powerdown ☐

Special Features:

2.2.4.3 Output signal: StausAHUC

Standard Mode

Separate datapoints Fault, FanActive

LTE-HEE Mode

FB:	AHUC	LTE Server Output Name: **StatusAHUC**		Mandatory ☐ Optional ☒

Description:
Information provided by the AHUC mainly for visualization & monitoring e.g. on an end-user HMI (e.g. room unit).

DPT:	Name	DPT_StatusAHU		DPT ID	21.106	Datatype format	B_8

Field	Description	Sup.	Range	Unit	COV	Default
- Fault	AHUC has a failure	M	true/false	bool	Y	false
- FanActive	Supply and/or exhaust air fans are operating	O	true/false	bool	Y	false
- Heat	Ventilation Controller is in heating mode	O	true/false	bool	Y	false
- Cool	Ventilation Controller is in cooling mode	O	true/false	bool	Y	false

Communication:		
Binding Group:		
Class	Type	Default
Geographical ☒	Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	
DP Address:	IO Type(ID): 240 (AHUC)	Property ID: 53
LTE-Services (event):	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min	
InfoReport ☒ (LTE Read-Response polling of the output shall always be supported)	Output per default communicating ☒	Binding Group Wildcard allowed ☐
	Tx Prio: High ☐ Normal ☒ Low ☐	
	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐	
Property-Service (individual access):	Read only ☒ Read/Write ☐	
Exception Handling:		Save at Powerdown ☐

Special Features:		

2.2.4.4 Output Fault

Standard Mode

DP Name:	Fault	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒

Description						
Reports a failure in the AHUC, mainly used for visualisation

Datapoint Type						
DPT_Name:	DPT_Bool					
DPT Format:	B$_1$			DPT_ID:	1.002	
Field	Description			Supp.	Range	Unit	Default
							false

Access Type						
♦ Output							
this → M	☒		this → 1	☐		
Spontaneous	☒	COV:	☐	Δ-Value:	--	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒					

Communication Type						
♦ Group Object Datapoint				Mandatory:	☒	
Default Group Address:		---				

Dynamics						
Power down:	Save:	☐				
Power up:	Value:	No initialisation:	☐	Default value:	☒	
		Saved value:	☐	Actual value (not for input):	☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐	

Exception Handling

Special Features

LTE-HEE Mode

Not applicable.

2.2.4.5 Output FanActive

Standard Mode

DP Name:	FanActive		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Supply and/or exhaust air fans are operating, mainly used for visualisation							
Datapoint Type							
DP_Name:	DPT_Bool						
DPT Format:	B$_1$				DPT_ID:	1.002	

Field	Description			Supp.	Range	Unit	Default
							false

Access Type

♦ Output						
this → M	☒		this → 1	☐		
Spontaneous	☒	COV:	☐	Δ-Value:	--	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒						

Communication Type

♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics

Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

Not applicable.

2.2.4.6 Output signal: HVACModeAct

Standard Mode

DP Name:	HVACModeAct			Abbr.:	---		Mandatory	☐
FB Name:	AHUC						Can be internal	☒
Description								
This output contains the actual HVAC Mode of the air handling unit.								
Datapoint Type								
DPT_Name:	DPT_HVACMode							
DPT Format:	N_8				DPT_ID:	20.102		
Field	Description				Supp.	Range	Unit	Default
						1..4 [1]	--	cs

Access Type

♦	Output							
	this → M	☒		this → 1	☐			
	Spontaneous	☒	COV:	☒	Δ-Value:		Min repetition period:	10sec
			Cyclic	☒	Period:	15min		
	Request	☒						

Communication Type

♦	Group Object Datapoint			Mandatory:	☒
	Default Group Address:	---			

Dynamics

Power down:	Save:		☐		
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value:	☒
	Transmit on bus:		☐		☐

Exception Handling

Special Features

[1] value 0='Auto' is not allowed

LTE-HEE Mode

FB:	AHUC	LTE Server Output Name: HVACModeAct				Mandatory ☐ Optional ☒

Description:
Actual HVAC Mode of the air handling unit (which may also depend on internal optimiser functions in the AHUC).

DPT:	Name	DPT_HVACMode_Z		DPT ID	201.100	Datatype format	N_8Z_8
Field		**Description**	**Sup.**	**Range**	**Unit**	**COV**	**Default**
HVACMode		Actual HVAC Mode	M	[1..4] [1]	enum.	Y	cs
Status - Overridden - all other flags		 HVAC mode overridden true / false not supported	 O	 true/false	bitset bool	 Y	 true
Command - Override & Release - all other commands		(write only) override and release setpoint not supported	 O NA				

Communication:

Binding Group:				
Class		Type		Default
Geographical	☒	Apartment.		1 (A.1.1, refer 2.2.1.1)
Application Specific	☐			
Unassigned	☐	Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 240 (AHUC)	Property ID: 54	
LTE-Services (event):		COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
InfoReport ☒		Output per default communicating ☒	Binding Group Wildcard allowed ☐	
(LTE Read-Response polling of the output shall always be supported)		Tx Prio: High ☐ Normal ☒ Low ☐		
		Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):		Read only ☐ Read/Write ☒ [2]		

Exception Handling:		Save at Powerdown ☐

Special Features:
[1] value 'Auto' is not allowed
[2] write access is optional; for Override / Release function only: if 'Overridden' the AHUC uses the override value for room temperature control

2.2.4.7 Output signal: TempRoomSetpAct

Standard Mode

DP Name:	TempRoomSetpAct	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒

Description						
Actual room temperature of the air handling unit.						

Datapoint Type							
DPT_Name:	DPT_Value_Temp						
DPT Format:	F_{16}			DPT_ID:	9.001		
Field	Description			Supp.	Range	Unit	Default
					full range	°C	cs

Access Type						
♦ Output						
this → M	☒		this → 1	☐		
Spontaneous	☒	COV:	☒	Δ-Value:	0.2 K	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request		☒				

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics						
Power down:	Save:		☐			
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Server Output Name:	**TempRoomSetpAct**				Mandatory ☐ Optional ☒
Description:							
Actual room temperature setpoint of the air handling unit controller.							

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		**Description**		**Sup.**	**Range**	**Unit**	**COV**	**Default**

Field	Description	Sup.	Range	Unit	COV	Default
Temp	Room temperature setpoint	M	full range	°C	0.2	cs
Status - OutOfService - Overridden - all other flags	 Void value: setpoint not available Setpoint overridden not supported	 M O	bitset true/false true/false	 bool bool	 Y Y	 false false
Command - Override & Release - all other commands	(write only) Override and release setpoint not supported	 O NA				

Communication:				
Binding Group:				
Class		Type		Default
Geographical	☒	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific	☐			
Unassigned	☐	Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 240 (AHUC)	Property ID: 55	
LTE-Services (event):		COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
InfoReport ☒		Output per default communicating ☒	Binding Group Wildcard allowed ☐	
(LTE Read-Response polling of the output		Tx Prio: High ☐ Normal ☒ Low ☐		
shall always be supported)		Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):		Read only ☐ Read/Write ☒ [1]		
Exception Handling:			Save at Powerdown ☐	

Special Features:				
[1] write access is optional; for AlarmAck function only				

2.2.4.8 Output signal: ActPosSetpHeatStageA

Standard Mode

DP Name:	ActPosSetpHeatStageA	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒

Description						
This datapoint contains the percent setpoint value for the actuator position. (Note: consistensy with existing valves and ObIS)						

Datapoint Type						
DPT_Name:	DPT_Scaling					
DPT Format:	U_8			DPT_ID:	5.001	
Field	Description			Supp.	Range	Unit	Default
					0..100[2]	%	cs

Access Type						
♦ Output						
this → M	☒ [1]		this → 1	☐		
Spontaneous	☒	COV:	☒	Δ-Value:	5%	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒					

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics						
Power down:	Save:	☐				
Power up:	Value:	No initialisation:	☐	Default value:	☐	
		Saved value:	☐	Actual value (not for input):	☒	
	Transmit on bus (only for output):		☐	Read from bus (only for input):		☐

Exception Handling

Special Features
[1] one or multiple valves can be controlled in parallel
[2] The encoding of the actuator setpoint value is: 0% ⇒ 0, 100% ⇒ 255

LTE-HEE Mode

FB:	AHUC	LTE Client Output Name:	**ActPosSetpHeatStageA**		Mandatory ☐ Optional ☒

Description:							
This output signal contains the actuator position setpoint, which is sent by the AHUC to the valve(s). Calculation of the valve position setpoint: method is company specific.							
DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8
Field		Description		Sup.	Range	Unit	COV	Default
RelValue		Actuator position setpoint %		M	0..100	%	5	cs
COMMAND					enum			
- NormalWrite				M				
- all other commands		not allowed		NA				

Communication:

Binding Group:			
Class		Type	Default
Geographical	☒	Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific	☐		
Unassigned	☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	352 (HVA)	Property ID:	51	
LTE-Services (event):	COV ☒	MinRepTime:	10 sec	Heartbeat:	15 min
Write ☒	Output per default communicating ☐		Binding Group Wildcard allowed ☒		
	Tx Prio:	High ☐	Normal ☒		Low ☐
	Transm after Power-up: Stored Value ☐ Act Value ☒ Default Value ☐				

Exception Handling:	Save at Powerdown ☐

Special Features:	

2.2.4.9 Output signal: ActPosSetpHeatStageB
Standard Mode/ LTE-HEE Mode

Refer to ActPosSetpHeatStageA. LTE: IO Type(ID): 352 (HVA)   Property ID: 52

2.2.4.10 Output signal: ActPosSetpCoolStageA
Standard Mode/ LTE-HEE Mode

Refer to ActPosSetpHeatStageA. LTE: IO Type(ID): 352 (HVA)   Property ID: 53

2.2.4.11 Output signal: ActPosSetpCoolStageB
Standard Mode/ LTE-HEE Mode

Refer to ActPosSetpHeatStageA. LTE: IO Type(ID): 352 (HVA)   Property ID: 54

2.2.4.12 Output signal: ActPosSetpFreshAir

Standard Mode

DP Name:	ActPosSetpFreshAir	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒

Description
This datapoint contains the percent setpoint value for the actuator position. Only ActPosSetpFreshAir percent value without command field (Note: consistensy with existing valves and ObIS)

Datapoint Type						
DPT_Name:	DPT_Scaling					
DPT Format:	U_8			DPT_ID:	5.001	
Field	Description			Supp.	Range	Unit	Default
					0..100	%	cs

Access Type						
♦ Output						
this → M	☒ ¹⁾	this → 1	☐			
Spontaneous	☒	COV:	☒	Δ-Value:	5%	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒					

Communication Type		
♦ Group Object Datapoint	Mandatory:	☒
Default Group Address:	--	

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features
¹⁾ one or multiple dampers can be controlled in parallel
²⁾ The encoding of the actuator setpoint value is: 0% ⇒ 0, 100% ⇒ 255

LTE-HEE Mode

FB:	AHUC	LTE Client Output Name:	ActPosSetpFreshAir			Mandatory ☐ Optional ☒

Description:							
This output signal contains the damper actuator position setpoint, which is sent by the AHUC to the fresh air damper(s). Calculation of the damper position setpoint: method is company specific.							
DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8
Field		Description		Sup.	Range	Unit	COV	Default
RelValue		Actuator position setpoint %		M	0..100	%	5	cs
COMMAND - NormalWrite - all other commands		not allowed		M NA	enum			
Communication:							
Binding Group:							
Class		Type			Default		
Geographical ☒		Apartment			1 (A.1.1, refer 2.2.1.1)		
Application Specific ☐							
Unassigned ☐		Broadcast ☐ Configurable ☐					
DP Address:		IO Type(ID): 362 (ADA)		Property ID: 51			
LTE-Services (event): Write ☒		COV ☒ MinRepTime: 10 sec Heartbeat: 15 min					
		Output per default communicating ☐	Binding Group Wildcard allowed ☒				
		Tx Prio: High ☐ Normal ☒ Low ☐					
		Transm after Power-up: Stored Value ☐ Act Value ☒ Default Value ☐					
Exception Handling:					Save at Powerdown ☐		

Special Features:							

2.2.4.13 Input signal: StatusHPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**StatusHPM**			Mandatory ☐ Optional ☒	
Description:							
This signal contains various status information of the heat production. StatusHPM may also used for local control functions in the AHUC (company specific solution).							
DPT:	Name	DPT_StatusHPM		DPT ID	209.100	Datatype format	$V_{16}B_8$
Field		Description				Sup.	Unit	Default
TempFlowProdSegmH		Common flow temperature of heat production segment				M	°C	cs
Attributes - TempFlowValid		Validity of TempFlowProdSegmH				M	bool	false
- Fault		One or more boiler(s) have a failure (mainly for monitoring); manufacturer specific reaction in the HZC				M	bool	false
- SummerMode		Boiler / boiler sequence switched off due to local summer/winter mode (mainly for monitoring)				O	bool	false
- OffPerm		Boilers are permanently off (manual switch or failure)				O	bool	false
- NoHeatAvailable		Boiler / boiler sequence is temporary not producing heat				O	bool	false
Communication:							
Binding Group:							
Class		Type		Default			
Geographical ☐							
Application Specific ☒		DistrSegmH		1			
Unassigned ☐		Broadcast ☐ Configurable ☐					
DP Address:		IO Type(ID): 136 (HPM)		Property ID: 51			
LTE-Service (event):		InfoReport Sniffer on Binding Group: --					
InfoReport ☒		Timeout: 7 Min					
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --					
Value after Powerup:		Default Value ☒				Stored Value ☐	
Exception Handling:				Save at Powerdown ☐			

Special Features:							

2.2.4.14 Input signal: ForceSignHPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	ForceSignHPM			Mandatory ☐ Optional ☒		
Description:								
Forcing signal from Hot Water Production Manager, to force consumer to consume more energy. Refer to [08].								
DPT:	Name	DPT_ForceSign		DPT ID	21.100	Datatype format		B_8
Field		Description				Sup.	Unit	Default
Attributes - ForceRequest		Bitset containing status info indicates overheat condition in the HPM (validity of remaining attributes)				M	bool	false
- Protection		indicates that overheat is critical, too high boiler temp				M	bool	false
- Oversupply		indicates that overheat is uncritical but supply temp is much higher than requested by heat demand				M	bool	false
- Overrun		indicates that remaining energy is available in the boiler(s) after load shutdown				M	bool	false
- DHWNorm [2]		Load DHW to 'Normal' Level in case of overheat ('Protection' or 'Oversupply')				O	bool	false
- DHWLegio [2]		Load DHW to 'LegioProtect' Level in case of overheat ('Protection' or 'Oversupply')				O	bool	false
- RoomHComf [2]		Load Room Heating to 'Comfort' Level in case of overheat ('Protection' or 'Oversupply')				O	bool	false
- RoomHMax [2]		Load Room Heating with maximum flow temperature in case of overheat ('Protection' or 'Oversupply')				O	bool	false
Communication:								
Binding Group:								
Class		Type			Default			
Geographical ☐								
Application Specific ☒		DistrSegmH			1			
Unassigned ☐		Broadcast ☐	Configurable ☐					
DP Address:		IO Type(ID):	136 (HPM)		Property ID:	53		
LTE-Service (event): InfoReport ☒		InfoReport Sniffer on Binding Group: Timeout: [1]		-- 7 Min				
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --						
Value after Powerup:		Default Value ☒				Stored Value ☐		
Exception Handling:					Save at Powerdown		☐	

Special Features:								
[1] The signal is received on event and periodically (if no COV occurred) as long as the ForceRequest attribute is true. When the forcing condition in the HPM disappears, the ForceRequest attribute changes to false. [2] HPM's with higher functionality may indicate whether DHW or Heating should be activated in case of oversupply. This flags is not considered in the AHUC								

2.2.4.15 Input signal: LockSignHPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**LockSignHPM**			Mandatory ☐ Optional ☒		
Description:								
Locking signal from Hot Water Production Manager, to force the consumer to reduce energy consumption. Refer to [08].								
DPT:	Name	DPT_LockSign		DPT ID	207.101	Datatype format	U_8B_8	
Field		Description				Sup.	Unit	Default
PwrReduction		Requested power-consumption reduction – 0 % no reduction – 100% max. reduction				M	%	cs
Attributes – LockRequest		Indicates if power reduction is necessary (validity of PwrReduction)				M	bool	false
– Type		Type of overload critical/uncritical; value is only meaningful if LockRequest=true				M	bool	uncritical
Communication:								
Binding Group:								
Class		Type			Default			
Geographical ☐								
Application Specific ☒		DistrSegmH			1			
Unassigned ☐		Broadcast ☐ Configurable ☐						
DP Address:		IO Type(ID):	136 (HPM)		Property ID:	54		
LTE-Service (event): InfoReport ☒		InfoReport Sniffer on Binding Group:			--			
		Timeout: [1]			7 Min			
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:			--			
Value after Powerup:		Default Value ☒					Stored Value ☐	
Exception Handling:						Save at Powerdown ☐		

Special Features:								
[1] The signal is received on event and periodically (if no COV occurred) as long as the LockRequest attribute is true. When the overload condition in the HPM disappears, the LockRequest attribute changes to false.								

2.2.4.16 Input signal: ForceSignHFDM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**ForceSignHFDM**			Mandatory ☐ Optional ☒	
Description:							
Forcing signal from Heating Flow Demand Manager, to force consumer to consume more energy. Refer to [08].							
DPT:	Name	DPT_ForceSign		DPT ID	21.100	Datatype format	B_8

Field	Description	Sup.	Unit	Default
Attributes - ForceRequest	indicates if forced power consumption is necessary (validity of the remaining attrib)	M	bool	false
- Protection	indicates that overheat is critical	M	bool	false
- Oversupply	indicates that overheat is uncritical	M	bool	false
- Overrun	indicates that remaining energy is available in the heat-exchanger after load shutdown	M	bool	false
- DHWNorm [2]	Load DHW to 'Normal' Level in case of overheat ('Protection' or 'Oversupply')	O	bool	false
- DHWLegio [2]	Load DHW to 'LegioProtect' Level in case of overheat ('Protection' or 'Oversupply')	O	bool	false
- RoomHComf [2]	Load Room Heating to 'Comfort' Level in case of overheat ('Protection' or 'Oversupply')	O	bool	false
- RoomHMax [2]	Load Room Heating with maximum flow temperature in case of overheat ('Protection' or 'Oversupply')	O	bool	false

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☐				
Application Specific ☒	DistrSegmH		1	
Unassigned ☐	Broadcast ☐ Configurable ☐			
DP Address:	IO Type(ID): 144 (HFDM)		Property ID: 53	
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout: [1]	7 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --			
Value after Powerup:	Default Value ☒			Stored Value ☐
Exception Handling:			Save at Powerdown	☐

Special Features:				
[1] The signal is received on event and periodically (if no COV occurred) as long as the ForceRequest attribute is true. When the forcing condition in the HFDM disappears, the ForceRequest attribute changes to false) [2] This flag is not considered in the AHUC				

2.2.4.17 Input signal: LockSignHFDM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	LockSignHFDM		Mandatory ☐ Optional ☒
Description:					
Locking signal from Heating Flow Demand Manager, to force the consumer to reduce energy consumption. Refer to [08].					

DPT:	Name	DPT_LockSign		DPT ID	207.101	Datatype format	U_8B_8

Field	Description	Sup.	Unit	Default
PwrReduction	Requested power-consumption reduction – 0 % no reduction – 100% max. reduction	M	%	cs
Attributes – LockRequest	Indicates if power reduction is necessary (validity of PwrReduction)	M	bool	false
– Type	Type of overload; not used in LockSignHFDM	NA	bool	uncritical

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☐				
Application Specific ☒	DistrSegmH		1	
Unassigned ☐	Broadcast ☐	Configurable ☐		
DP Address:	IO Type(ID):	144 (HFDM)	Property ID:	52
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout: [1]		7 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--		
Value after Powerup:	Default Value ☒		Stored Value ☐	
Exception Handling:			Save at Powerdown ☐	

Special Features:				
[1] The signal is received on event and periodically (if no COV occurred) as long as the LockRequest attribute is true. If LockRequest attribute changes to false.				

2.2.4.18 Input signal: StatusCPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	**AHUC**	LTE Client Input Name:	**StatusCPM**		Mandatory ☐ Optional ☒
Description:					
This input signal contains status information of the Cold Water Production Manager CPM, like the current chilled water flow temperature of the production segment, fault, permanent off and no cooling available indication.					

DPT:	Name	DPT_ StatusCPM		DPT ID	209.102	Datatype format	$V_{16}B_8$	
Field		Description				Sup.	Unit	Default
TempFlowProdSegmC		Chilled water flow temperature in the cooling production segment				M	°C	cs
Attributes								
– TempFlowValid		Validity of TempFlowProdSegmC				M	bool	false
– Fault		Chiller failure				O	bool	false
– OffPerm		Permanently off (manual switch or failure)				O	bool	false
– NoCoolAvailable		Temporary no cooling in the production segment available				O	bool	false

Communication:				
Binding Group:				
Class		Type		Default
Geographical ☐				
Application Specific ☒		DistrSegmC		1
Unassigned ☐		Broadcast ☐	Configurable ☐	
DP Address:		IO Type(ID): 199 (CPM)	Property ID:	51
LTE-Service (event):		InfoReport Sniffer on Binding Group:	--	
InfoReport ☒		Timeout:	31 Min	
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:	--	
Value after Powerup:		Default Value ☒		Stored Value ☐
Exception Handling:			Save at Powerdown	☐

Special Features:				

2.2.4.19 Input signal: ForceSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	ForceSignCPM			Mandatory ☐ Optional ☒	
Description:							
This input signal indicates that the chiller unit has remaining energy to be used by the consumers.							
DPT:	Name	DPT_ ForceSignCool		DPT ID	21.101	Datatype format	B₈

Field	Description	Sup.	Unit	Default
Attributes – ForceRequest	Forced power consumption is necessary	O	bool	false

Communication:				
Binding Group:				
Class	Type		Default	
☐ Geographical				
☒ Application Specific	DistrSegmC		1	
☐ Unassigned	Broadcast ☐	Configurable ☐		
DP Address:	IO Type(ID):	199 (CPM)	Property ID:	53
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--		

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐

Special Features:			

2.2.4.20 Input signal: LockSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	LockSignCPM			Mandatory ☐ Optional ☒		
Description:								
This input signal indicates that the Cold Water Production Managers CPM has detected an overload situation (of the chiller units) and the consumers have to reduce their energy consumption.								
DPT:	Name	DPT_ LockSign		DPT ID	207.101	Datatype format	U_8B_8	
Field		Description				Sup.	Unit	Default
PwrReduction		Requested power reduction (100% = maximum reduction)				M	%	cs
Attributes – LockRequest		Indicates if power reduction is necessary (validity of PwrReduction)				M	bool	false
– Type		Type of overload, value only valid if LockRequest = true				M	bool	uncrit.
Communication:								
Binding Group:								
Class		Type		Default				
Geographical ☐								
Application Specific ☒		DistrSegmC		1				
Unassigned ☐		Broadcast ☐ Configurable ☐						
DP Address:		IO Type(ID): 199 (CPM)		Property ID: 54				
LTE-Service (event): InfoReport ☒		InfoReport Sniffer on Binding Group: --						
		Timeout: 31 Min						
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --						
Value after Powerup:		Default Value ☒				Stored Value ☐		
Exception Handling:					Save at Powerdown ☐			

Special Features:								

2.2.4.21 Input signal: ForceSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	ForceSignCFDM		Mandatory ☐
					Optional ☒

Description:							
This input signal indicates that the Cooling Flow Demand Manager CFDM (Cold Water Distribution Segment) has remaining energy to be used by the consumers.							

DPT:	Name	DPT_ ForceSignCool		DPT ID	21.101	Datatype format	B_8
Field		Description				Sup.	Unit	Default

Field	Description	Sup.	Unit	Default
Attributes – ForceRequest	Forced power consumption is necessary	O	bool	false

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☐			
Application Specific ☒	DistrSegmC		1
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID): 208 (CFDM)		Property ID: 52
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--	
InfoReport ☒	Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Powerup:	Default Value ☒	Stored Value ☐

Exception Handling:		Save at Powerdown ☐

Special Features:

2.2.4.22 Input signal: LockSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:		LockSignCFDM			Mandatory ☐ Optional ☒
Description:							
This input signal indicates that the Cooling Flow Demand Manager CFDM (Cold Water Distribution Segment) is overloaded and the consumers have to reduce their chilled water consumption.							
DPT:	Name	DPT_ LockSign		DPT ID	207.101	Datatype format	U_8B_8
Field		Description			Sup.	Unit	Default
PwrReduction		Requested power reduction (100% = maximum reduction)			M	%	cs
Attributes – LockRequest		Indicates if power reduction is necessary (validity of PwrReduction)			M	bool	false
– Type		Type of overload, value only valid if LockRequest = true			NA	---	---.
Communication:							
Binding Group:							
Class		Type		Default			
Geographical ☐							
Application Specific ☒		DistrSegmC		1			
Unassigned ☐		Broadcast ☐	Configurable ☐				
DP Address:		IO Type(ID):	208 (CFDM)	Property ID:	53		
LTE-Service (event):		InfoReport Sniffer on Binding Group:			--		
InfoReport ☒		Timeout:		31 Min			
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:		--			
Value after Powerup:		Default Value ☒				Stored Value ☐	
Exception Handling:					Save at Powerdown	☐	

Special Features:							

2.2.4.23 Input signal: HVACModeEff

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	HVACModeEff			Mandatory ☒ [1]
						Optional ☐
Description:						
This input is provided by the RSMHD and defines the HVAC operating mode of the air handling unit controller.						
DPT:	Name	DPT_HVACMode_Z		DPT ID	201.100	Datatype format	N_8Z_8
Field		Description			Sup.	Unit	Default
HVACMode		HVAC Mode, range [1..4] [2]			M	enum.	cs
STATUS		Can be ignored by the AHUC			NA		
Communication:						
Binding Group:						
Class		Type		Default		
Geographical ☒		Apartment		1 (A.1.1, refer 2.2.1.1)		
Application Specific ☐						
Unassigned ☐		Broadcast ☐	Configurable ☐			
DP Address:		IO Type(ID):	100 (RSMHD)	Property ID:	51	
LTE-Service (event):		InfoReport Sniffer on Binding Group:		--		
InfoReport ☒		Timeout:	31 Min			
LTE-Service (polling):		Read Wildcard / Resp Sniffer on Binding Group:	--			
Read – Response☐						
Value after Power-up:		Default Value ☒			Stored Value ☐	
Exception Handling:				Save at Powerdown	☐	

Special Features:						
[1] Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4] + TempRoomSetpSetCoolEff [4] (+ HVACModeEffNext)} or { TempRoomSetpHeatEff + TempRoomSetpCoolEff} refer to clause 2.2.3.						
[2] value 0='Auto' is not allowed => to be ignored by the AHUC => use default value						

2.2.4.24 Input signal: HVACModeEffNext

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	**AHUC**	**LTE Client Input Name:**	**HVACModeEffNext**		Mandatory ☐ Optional ☒ [2])
Description:					
This input is provided by the RSMHD and defines the next HVAC operating mode and the delay time to it. If the next mode is not available the time is set to zero (e.g. in case of manually selected HVACModeUser ≠ 'Auto'). This information is used by the AHUC for local optimiser functions, e.g. start/stop optimisation.					

DPT:	Name	DPT_HVACModeNext		DPT ID	206.100	Datatype format	$U_{16}N_8$
Field		Description			Sup.	Unit	Default
Time		Time to next HVAC mode in minutes 0 = no next HVAC Mode available [1])			M	min	0
HVACMode		Next HVAC Mode, range [1..4] and [0] = Mode Undefined [1])			M	enum.	cs

Communication:				
Binding Group:				
Class		Type	Default	
Geographical ☒		Apartment	1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐				
Unassigned ☐		Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 100 (RSMHD)	Property ID: 52	
LTE-Service (event): InfoReport ☒		InfoReport Sniffer on Binding Group: --		
		Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --		
Value after Power-up:	Default Value ☒		Stored Value ☐	
Exception Handling:			Save at Powerdown ☐	

Special Features:				
[1]) encoding of special conditions, see table below				

Interpretation of Time and HVACMode fields

Time	HVACMode	
= 0 (Undefined)	= 0 (Undefined)	the content of the datapoint is void / undefined => no next HVAC Mode available for an undefined time period
= 0 (Undefined)	= {1..4}	defined and valid next HVACMode but the delay time is undefined (unknown) => in case of manually selected HVACModeUser ≠ 'Auto' (i.e. next HVACMode = current HVACModeEff)
> 0	= 0 (Undefined)	undefined (unknown) HVACMode during a defined delay time => in practice this combination is useless and is interpreted like Time=0 / HVACMode=0 (default value)
> 0	= {1..4}	defined and valid HVACMode and delay time

2.2.4.25 Input signal: TempRoomSetpSetHeatEff [4]

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	TempRoomSetpSetHeatEff [4]			Mandatory ⊠ [1]) Optional ☐
Description:						
This input is provided by the RSMHD and contains the four effective (after corrections) heating room temperature setpoints, which are valid for the controller.						
DPT:	Name	DPT_TempRoomSetpSet[4]	DPT ID	213.100	Datatype format	$V_{16}V_{16}V_{16}V_{16}$
Field		Description			Sup.	Unit	Default
TempSetpComf		Comfort setpoint heating			M	°C	cs
TempSetpStdby		Standby setpoint heating			O	°C	cs
TempSetpEco		Economy setpoint heating			M	°C	cs
TempSetpBProt		Building protection setpoint heating			M	°C	cs

Communication:				
Binding Group:				
Class		Type	Default	
Geographical ⊠		Apartment	1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐				
Unassigned ☐		Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 100 (RSMHD)	Property ID:	53
LTE-Service (event):		InfoReport Sniffer on Binding Group:	--	
InfoReport ⊠		Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --		
Value after Power-up:		Default Value ⊠		Stored Value ☐
Exception Handling:			Save at Powerdown	☐

Special Features:				
[1]) Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4] + TempRoomSetpSetCoolEff [4] (+ HVACModeEffNext)} or { TempRoomSetpHeatEff + TempRoomSetpCoolEff} refer to clause 2.2.3.				

2.2.4.26 Input signal: TempRoomSetpSetCoolEff [4]

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	TempRoomSetpSetCoolEff [4]			Mandatory ⊠ [1]) Optional ☐
Description:						
This input is provided by the RSMHD and contains the four effective (after corrections) cooling room temperature setpoints, which are valid for the controller.						

DPT:	Name	DPT_TempRoomSetpSet[4]		DPT ID	213.100	Datatype format	$V_{16}V_{16}V_{16}V_{16}$
Field		Description				Sup.	Unit	Default

Field	Description	Sup.	Unit	Default
TempSetpComf	Comfort setpoint cooling	M	°C	cs
TempSetpStdby	Standby setpoint cooling	O	°C	cs
TempSetpEco	Economy setpoint cooling	M	°C	cs
TempSetpBProt	Building protection setpoint cooling	M	°C	cs

Communication:			
Binding Group:			
Class	Type		Default
Geographical ⊠	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐	Broadcast ☐ Configurable ☐		
DP Address:	IO Type(ID): 100 (RSMHD)	Property ID: 54	
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--	
InfoReport ⊠	Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Power-up:	Default Value ⊠	Stored Value ☐
Exception Handling:		Save at Powerdown ☐

Special Features:
[1]) Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4] + TempRoomSetpSetCoolEff [4] (+ HVACModeEffNext)} or { TempRoomSetpHeatEff + TempRoomSetpCoolEff} refer to clause 2.2.3.

2.2.4.27 Input signal: TempRoomSetpHeatEff

Standard Mode

DP Name:	TempRoomSetpHeatEff	Abbr.:	--		Mandatory	☒
FB Name:	AHUC				Can be internal	☒

Description						
see LTE-HEE mode						

Datapoint Type								
DPT_Name:	DPT_Value_Temp							
DPT Format:	F$_{16}$			DPT_ID:	9.001			
Field	Description			Supp.	Range	Unit	Default	
					full range	°C	cs	

Access Type							
♦ Input							
N → this	☐	1 → this	☒				
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min		
Request	☐	Polling:	☐	Period:			

Communication Type				
♦ Group Object Datapoint			Mandatory:	☒
Default Group Address:	--			

Dynamics						
Power down:	Save:		☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒	
		Saved value:	☐	Actual value (not for input):	☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	TempRoomSetpHeatEff		Mandatory ☒ [1] Optional ☐

Description:
This input is provided by the RSMTD and defines the effective (after corrections) heating setpoint, which is valid for the controller. This information is used for simple applications.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$	
Field			Description			Sup.	Unit	Default
Temperature			Room temperature setpoint value			M	°C	cs
Status - OutOfService - Overridden - all other flags			 Void setpoint value Setpoint value overridden true / false not supported			M M O NA	bitset bool bool bool	 false false

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☒	Apartment		1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐				
Unassigned ☐	Broadcast ☐	Configurable ☐		
DP Address:	IO Type(ID):	100 (RSMHD)	Property ID:	55
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout:		31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --			

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐
In case of missing input data (timeout) or value 'OutOfService' the AHUC will have a company specific behavior.			

Special Features:
[1] Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4] + TempRoomSetpSetCoolEff [4] (+ HVACModeEffNext)} or { TempRoomSetpHeatEff + TempRoomSetpCoolEff} refer to clause 2.2.3. This input can be device-internal.

2.2.4.28 Input signal: TempRoomSetpCoolEff

Standard Mode

DP Name:	TempRoomSetpCoolEff	Abbr.:	--		Mandatory	☒
FB Name:	AHUC				Can be internal	☒

Description						
see LTE-HEE mode						

Datapoint Type						

DPT_Name:	DPT_Value_Temp					
DPT Format:	F_{16}			DPT_ID:	9.001	
Field	Description		Supp.	Range	Unit	Default
				full range	°C	cs

Access Type						
♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
Request	☐	Polling:	☐	Period:		

Communication Type		
♦ Group Object Datapoint	Mandatory:	☒
Default Group Address:	--	

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**TempRoomSetpCoolEff**			Mandatory ☒ [1)] Optional ☐
Description:						
This input is provided by the RSMTD and defines the effective (after corrections) cooling setpoint which is valid for the controller. This information is used for simple applications.						
DPT:	Name	DPT_TempHVACAbs_Z	DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description		Sup.	Unit	Default
Temperature		Room temperature setpoint value		M	°C	cs
Status - OutOfService - all other flags		Void setpoint value not supported		M M NA	bitset bool bool	false
Communication:						
Binding Group:						
Class		Type		Default		
Geographical ☒		Apartment		1 (A.1.1, refer 2.2.1.1)		
Application Specific ☐						
Unassigned ☐		Broadcast ☐ Configurable ☐				
DP Address:		IO Type(ID): 100 (RSMHD)		Property ID: 56		
LTE-Service (event):		InfoReport Sniffer on Binding Group:		--		
InfoReport ☒		Timeout: 31 Min				
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --				
Value after Powerup:		Default Value ☒			Stored Value ☐	
Exception Handling:				Save at Powerdown ☐		
In case of missing input data (timeout) or value 'OutOfService' the AHUC will have a company specific behavior.						
Special Features:						
[1]) Either implementation of {HVACModeEff + TempRoomSetpSetHeatEff[4] + TempRoomSetpSetCoolEff [4] (+ HVACModeEffNext)} or { TempRoomSetpHeatEff + TempRoomSetpCoolEff} refer to clause 2.2.3. This input can be device-internal.						

2.2.4.29 Input signal: HVACModeOptim

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	HVACModeOptim				Mandatory ☐ Optional ☒
Description:							
This input can be provided by an external HVAC Optimiser and defines the optimised HVAC operating mode for the air handling controller.							
DPT:	Name	DPT_HVACMode_Z		DPT ID	201.100	Datatype format	N_8Z_8
Field		Description			Sup.	Unit	Default
HVACMode		Optimised HVAC Mode, range [1..4] or 0 [1]			M	enum.	0
Status - OutOfService - all other flags		 Void value => no optimised HVAC Mode available not supported			M M NA	bitset bool bool	 true
Communication:							
Binding Group:							
Class		Type		Default			
Geographical	☒	Apartment		1 (A.1.1, refer 2.2.1.1)			
Application Specific	☐						
Unassigned	☐	Broadcast ☐ Configurable ☐					
DP Address:		IO Type(ID):	115 (HVACOPT)	Property ID:	51		
LTE-Service (event):		InfoReport Sniffer on Binding Group:		--			
InfoReport	☒	Timeout:		31 Min			
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --					
Value after Power-up:		Default Value ☒			Stored Value ☐		
Exception Handling:				Save at Powerdown	☐		

Special Features:							

[1] HVACMode 0= 'Auto' or Status 'OutOfService' => no optimiser active, AHUC uses HVACModeEff
  1..4: IMPORTANT: if this signal is supported by the AHUC and received from the HVAC Optimiser, the
  AHUC will ignore the signal HVACModeEff from the RSMHD and use the optimised HVAC Mode
  instead if HVACModeOptim is ≠ 'Auto							

2.2.4.30 Input signal: TempRoomSetpOptimHeatShift

Standard Mode

DP Name:	TempRoomSetpOptimHeatShift	Abbr.:	---	Mandatory	☐
FB Name:	AHUC			Can be internal	☒

Description					
This optional input signal from an external HVAC Optimiser contains a correction value to the room temperature heating setpoint. This shift value is used e.g. for morning boost.					

Datapoint Type						
DPT_Name:	DPT_Value_Tempd					
DPT Format:	F_{16}			DPT_ID:	9.002	
Field	Description			Supp.	Range	Unit	Default
					full range	K	0

Access Type						
♦	Input					
	N → this	☐	1 → this	☒		
	Spontaneous	☒	Cyclically:	☒	Time-out:	31min
	Request	☐	Polling:	☐	Period:	

Communication Type		
♦ Group Object Datapoint	Mandatory:	☒
Default Group Address:	---	

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐		☐
			☐	Read from bus:	☐

Exception Handling

Special Features

LTE-HEE Mode Interface:

FB:	AHUC	LTE Client Input Name:		**TempRoomSetpOptimHeatShift**			Mandatory ☐ Optional ☒	
Description:								
This optional input signal from an external HVAC Optimiser contains a correction value to the room temperature heating setpoint. This shift value is used e.g. for morning boost.								
DPT:	Name	DPT_TempHVACRel_Z		DPT ID	205.101	Datatype format	$V_{16}Z_8$	
Field		Description				Sup.	Unit	Default
Temperature		Room temperature setpoint shift value				M	K	0
Status - all flags		not supported, can be ignored				M NA	bitset bool	
Communication:								
Binding Group:								
Class		Type			Default			
Geographical ☒		Apartment			1 (A.1.1, refer 2.2.1.1)			
Application Specific ☐								
Unassigned ☐		Broadcast ☐	Configurable ☐					
DP Address:		IO Type(ID):	115 (HVACOPT)		Property ID:	52		
LTE-Service (event):		InfoReport Sniffer on Binding Group:				--		
InfoReport ☒		Timeout:		31 Min				
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:			--			
Value after Power-up:		Default Value ☒				Stored Value ☐		
Exception Handling:					Save at Powerdown		☐	

Special Features:								

2.2.4.31 Input signal: TempRoomSetpOptimCoolShift

Standard Mode

DP Name:	TempRoomSetpOptimCoolShift	Abbr.:	---	Mandatory	☐
FB Name:	AHUC			Can be internal	☒
Description					
This optional input signal from an external HVAC Optimiser contains a correction value to the room cooling temperature setpoint.					

Datapoint Type							
DPT_Name:	DPT_Value_Tempd						
DPT Format:	F_{16}			DPT_ID:	9.002		
Field	Description			Supp.	Range	Unit	Default
					full range	K	0

Access Type						
♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31min	
Request	☐	Polling:	☐	Period:		

Communication Type				
♦ Group Object Datapoint			Mandatory:	☒
Default Group Address:	---			

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐		☐
			☐	Read from bus:	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**TempRoomSetpOptimCoolShift**			Mandatory ☐ Optional ☒

Description:						
This optional input signal from an external HVAC Optimiser contains a correction value to the room temperature cooling setpoint.						

DPT:	Name	DPT_TempHVACRel_Z		DPT ID	205.101	Datatype format	$V_{16}Z_8$
Field		Description			Sup.	Unit	Default
Temperature		Room temperature setpoint shift value			M	K	0
Status - all flags		not supported, can be ignored			M NA	bitset bool	

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☒	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID):	115 (HVACOPT)	Property ID: 55
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--
InfoReport ☒	Timeout:	31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Power-up:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐

Special Features:			

2.2.4.32 Input signal: ContrMode

Standard Mode

DP Name:	ContrMode		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current HVAC Controller Mode of a management station, refer to LTE description.							
Datapoint Type							
DPT_Name:	DPT_HVACContrMode						
DPT Format:	N$_8$				DPT_ID:	20.105	
Field	Description				Supp.	Range	Unit	Default
						0..20	--	cs

Access Type

♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min
Request	☐	Polling:	☐	Period:	

Communication Type

♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics

Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
	Transmit on bus (only for output):	☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**ContrMode**		Mandatory ☐
					Optional ☒
Description:					
This input is provided by a management station and enables or forces the internal application mode of the air handling unit controller.					
DPT:	Name	DPT_HVACContrMode_Z	DPT ID	201.104	Datatype format	N$_8$Z$_8$
Field		Description		Sup.	Unit	Default
HVACContrMode		HVAC Controller Mode, range [0..20]		M	enum.	cs
STATUS		May be ignored by the AHUC		NA		

Communication:

Binding Group:			
Class	Type		Default
Geographical ☒	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID):	115 (HVACOPT)	Property ID:	56
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--
InfoReport ☒	Timeout:	31 Min	
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group: --		
Read – Response ☐			
Value after Power-up:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐

Special Features:			

2.2.4.33 Input signal: EmergMode

Standard Mode

DP Name:	EmergMode		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current HVAC Emergency Mode of a management station, refer to LTE description.							
Datapoint Type							
DPT_Name:	DPT_HVACEmergMode						
DPT Format:	N$_8$				DPT_ID:	20.106	
Field	Description				Supp.	Range	Unit	Default
						0..5	--	cs

Access Type						
♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
Request	☐	Polling:	☐	Period:		

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	EmergMode		Mandatory ☐
					Optional ☒
Description:					
This input is provided by an fire / smoke control device forces the internal emergency mode (fire / smoke clearance control) of the air handling unit controller.					
DPT:	Name	DPT_HVACEmergMode_Z	DPT ID	201.109	Datatype format	N$_8$Z$_8$
Field		Description		Sup.	Unit	Default
HVACEmergMode		HVAC Emergency Mode, range [0..5]		M	enum.	cs
STATUS		May be ignored by the AHUC		NA		

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☒	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID):	108 (HVACEMS)	Property ID:	51.
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--
InfoReport ☒	Timeout:	31 Min	
LTE-Service (polling):	Read Wildcard / Resp Sniffer on Binding Group:	--	
Read – Response ☐			

Value after Power-up:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐

Special Features:			

2.2.4.34 Input signal: AQSetpEff

Standard Mode

DP Name:	AQSetpEff		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Air quality setpoint, refer to LTE description.							
Datapoint Type							
DPT_Name:	DPT_Value_AirQuality						
DPT Format:	F_{16}				DPT_ID:	9.008	
Field	Description				Supp.	Range	Unit	Default
						full range	ppm	cs

Access Type

♦ Input

N → this	☐		1 → this	☒			
Spontaneous	☒		Cyclically:	☒		Time-out:	31 min
Request	☐		Polling:	☐		Period:	

Communication Type

♦ Group Object Datapoint ... Mandatory: ☒

Default Group Address:	--

Dynamics

Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	AQSetpEff		Mandatory ☐ Optional ☒

Description:						
This input is provided by the SMAQ and defines the air quailty setpoint which is valid for the controller.						

DPT:	Name	DPT_HVACAirQual_Z		DPT ID	203.100	Datatype format	$U_{16}Z_8$

Field	Description	Sup.	Unit	Default
Air Quality	Room air quality setpoint value	M	ppm	cs
Status		M	bitset	
- OutOfService	Void setpoint value	M	bool	false
- Overridden	Setpoint value overridden true / false	O	bool	false
- all other flags	not supported	NA	bool	

Communication:					
Binding Group:					
Class		Type		Default	
Geographical ☒		Apartment		1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐					
Unassigned ☐		Broadcast ☐	Configurable ☐		
DP Address:		IO Type(ID):	102 (SMAQ)	Property ID:	51
LTE-Service (event):		InfoReport Sniffer on Binding Group:		--	
InfoReport ☒		Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --			

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown ☐	
In case of missing input data (timeout) or value 'OutOfService' the AHUC will have a company specific behavior.			
Special Features:			

2.2.4.35 Input signal: HumRelSetpHumEff

Standard Mode

DP Name:	HumRelSetpHumEff	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒
Description						
Room humidity setpoint for humidification, refer to LTE description.						
Datapoint Type						
DPT_Name:	DPT_Value_Humidity					
DPT Format:	F_{16}			DPT_ID:	9.007	
Field	Description			Supp.	Range	Unit	Default
					full range	%	cs

Access Type

♦	Input						
	N → this	☐	1 → this	☒			
	Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
	Request	☐	Polling:	☐	Period:		

Communication Type

♦	Group Object Datapoint		Mandatory:	☒
	Default Group Address:	--		

Dynamics

Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**HumRelSetpHumEff**		Mandatory ☐ Optional ☒

Description:						
This input is provided by the SMRH and defines the humiditification setpoint which is valid for the controller.						

DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U$_8$Z$_8$
Field		Description			Sup.	Unit	Default
Humidity		Room humidification setpoint value			M	%	cs
Status					M	bitset	
- OutOfService		Void setpoint value			M	bool	false
- Overridden		Setpoint value overridden true / false			O	bool	false
- all other flags		not supported			NA	bool	

Communication:			
Binding Group:			
Class		Type	Default
Geographical ☒		Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐		Broadcast ☐ Configurable ☐	
DP Address:		IO Type(ID): 103 (SMRH)	Property ID: 51
LTE-Service (event):		InfoReport Sniffer on Binding Group: --	
InfoReport ☒		Timeout: 31 Min	
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --	

Value after Powerup:	Default Value ☒	Stored Value ☐
Exception Handling:		Save at Powerdown ☐
In case of missing input data (timeout) or value 'OutOfService' the AHUC will have a company specific behavior.		
Special Features:		

2.2.4.36 Input signal: HumRelSetpDehumEff

Standard Mode

DP Name:	HumRelSetpDehumEff	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒

Description						
Room humidity setpoint for dehumidification, refer to LTE description.						

Datapoint Type							
DPT_Name:	DPT_Value_Humidity						
DPT Format:	F_{16}			DPT_ID:	9.007		
Field	Description			Supp.	Range	Unit	Default
					full range	%	cs

Access Type						
♦　Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
Request	☐	Polling:	☐	Period:		

Communication Type				
♦　Group Object Datapoint			Mandatory:	☒
Default Group Address:	--			

Dynamics						
Power down:	Save:	☐				
Power up:	Value:	No initialisation:	☐	Default value:	☒	
		Saved value:	☐	Actual value (not for input):	☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐	

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**HumRelSetpDehumEff**		Mandatory ☐ Optional ☒
Description:					
This input is provided by the SMRH and defines the dehumidification setpoint, which is valid for the controller.					

DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8

Field	Description	Sup.	Unit	Default
Humidity	Room dehumidification setpoint value	M	%	cs
Status		M	bitset	
- OutOfService	Void setpoint value	M	bool	false
- Overridden	Setpoint value overridden true / false	O	bool	false
- all other flags	not supported	NA	bool	

Communication:			
Binding Group:			
Class	Type	Default	
Geographical ☒	Apartment	1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐			
Unassigned ☐	Broadcast ☐ Configurable ☐		
DP Address:	IO Type(ID): 103 (SMRH)	Property ID: 52	
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--	
InfoReport ☒	Timeout: 31	Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown ☐	
In case of missing input data (timeout) or value 'OutOfService' the AHUC will have a company specific behavior.			
Special Features:			

2.2.4.37 Input signal: TempRoom

Standard Mode

DP Name:	TempRoom		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒

Description
Current room temperature value.

Datapoint Type							
DP_Name:	DPT_Value_Temp						
DPT Format:	F_{16}			DPT_ID:	9.001		
Field	Description			Supp.	Range	Unit	Default
					full range	°C	cs

Access Type						
♦ Input						
N → this	☐		1 → this	☒		
Spontaneous	☒		Cyclically:	☒	Time-out:	31 min
Request	☐		Polling:	☐	Period:	

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics						
Power down:	Save:		☐			
Power up:	Value:	No initialisation:	☐	Default value:		☒
		Saved value:	☐	Actual value (not for input):		☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	TempRoom			Mandatory ☐ Optional ☒	
Description:							
This process signal from a room temperature sensor RTS contains the room temperature value.							
DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description			Sup.	Unit	Default
TempRoom		Room temperature value			M	°C	cs
Status					M	bitset	
- OutOfService		Void sensor value true / false			M	bool	false
- Fault		Sensor failure true / false			M	bool	false
- Overridden		Sensor value overridden true / false			O	bool	false
- InAlarm		Sensor value alarm true /false			O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack			O	bool	unack
- all other flags		not supported			NA	bool	
Communication:							
Binding Group:							
Class		Type		Default			
Geographical ☒		Apartment		1 (A.1.1, refer 2.2.1.1)			
Application Specific ☐							
Unassigned ☐		Broadcast ☐ Configurable ☐					
DP Address:		IO Type(ID):	321 (RTS)	Property ID:		51	
LTE-Service (event):		InfoReport Sniffer on Binding Group:			--		
InfoReport ☒		Timeout:		31 Min			
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:			--		
Value after Powerup:		Default Value ☒				Stored Value ☐	
Exception Handling:				Save at Powerdown		☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.							
Special Features:							

2.2.4.38 Input signal: AQRoom

Standard Mode

DP Name:	AQRoom		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒

Description							
Current room air quality value.							

Datapoint Type							
DPT_Name:	DPT_Value_AirQuality						
DPT Format:	F_{16}			DPT_ID:	9.008		
Field	Description			Supp.	Range	Unit	Default
					full range	ppm	cs

Access Type							
♦ Input							
N → this	☐		1 → this	☒			
Spontaneous	☒		Cyclically:	☒		Time-out:	31 min
Request	☐		Polling:	☐		Period:	

Communication Type				
♦ Group Object Datapoint			Mandatory:	☒
	Default Group Address:	--		

Dynamics						
Power down:	Save:		☐			
Power up:	Value:	No initialisation:	☐	Default value:		☒
		Saved value:	☐	Actual value (not for input):		☐
		Transmit on bus (only for output):	☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	AQRoom			Mandatory ☐ Optional ☒

Description:						
This process signal from a room air quality sensor RAQS contains the room air value.						

DPT:	Name	DPT_HVACAirQual_Z		DPT ID	203.100	Datatype format	$U_{16}Z_8$

Field	Description	Sup.	Unit	Default
AQRoom	Room air quality value	M	ppm	cs
Status		M	bitset	
- OutOfService	Void sensor value true / false	M	bool	false
- Fault	Sensor failure true / false	M	bool	false
- Overridden	Sensor value overridden true / false	O	bool	false
- InAlarm	Sensor value alarm true /false	O	bool	false
- AlarmUnAck	Alarm acknowledgement status ack / unack	O	bool	unack
- all other flags	not supported	NA	bool	

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☒	Apartment		1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID):	331 (RAQS)	Property ID: 51
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--
InfoReport ☒	Timeout:		31 Min
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:		--

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown ☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.			
Special Features:			

2.2.4.39 Input signal: HumRelRoom

Standard Mode

DP Name:	HumRelRoom		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current room humidity value.							
Datapoint Type							
DPT_Name:	DPT_Value_Humidity						
DPT Format:	F_{16}			DPT_ID:	9.007		
Field	Description			Supp.	Range	Unit	Default
					full range	%	cs
Access Type							
♦ Input							
N → this	☐		1 → this	☒			
Spontaneous	☒		Cyclically:	☒		Time-out:	31 min
Request	☐		Polling:	☐		Period:	
Communication Type							
♦ Group Object Datapoint						Mandatory:	☒
	Default Group Address:	--					
Dynamics							
Power down:	Save:		☐				
Power up:	Value:	No initialisation:	☐		Default value:		☒
		Saved value:	☐		Actual value (not for input):		☐
		Transmit on bus (only for output):		☐	Read from bus (only for input):		☐
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**HumRelRoom**		Mandatory ☐ Optional ☒

Description:							
This process signal from a room air humidity sensor RRHS contains the room air humidity value.							
DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8
Field		Description			Sup.	Unit	Default
AirHumidityRoom		Room air humidity value			M	%	cs
Status					M	bitset	
- OutOfService		Void sensor value true / false			M	bool	false
- Fault		Sensor failure true / false			M	bool	false
- Overridden		Sensor value overridden true / false			O	bool	false
- InAlarm		Sensor value alarm true /false			O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack			O	bool	unack
- all other flags		not supported			NA	bool	

Communication:			
Binding Group:			
Class		Type	Default
Geographical ☒		Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific ☐			
Unassigned ☐		Broadcast ☐ Configurable ☐	
DP Address:	IO Type(ID):	337 (RRHS)	Property ID: 51
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--
InfoReport ☒	Timeout:	31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--	

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.			
Special Features:			

2.2.4.40 Input signal: TempSupplyAir

Standard Mode

DP Name:	TempSupplyAir		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒

Description
Current supply air temperature value.

Datapoint Type							
DP_Name:	DPT_Value_Temp						
DPT Format:	F$_{16}$				DPT_ID:	9.001	
Field	Description				Supp.	Range	Unit	Default
						full range	°C	cs

Access Type						
♦ Input						
N → this	☐		1 → this	☒		
Spontaneous	☒		Cyclically:	☒	Time-out:	31 min
Request	☐		Polling:	☐	Period:	

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics					
Power down:	Save:		☐		
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):	☐

Exception Handling

Special Features

2.2.4.40 Input signal: TempSupplyAir

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**TempSupplyAir**		Mandatory ☐ Optional ☒

Description:
This process signal from a supply air temperature sensor SATS contains the supply air temperature value.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$

Field	Description	Sup.	Unit	Default
TempSupplyAir	Supply air temperature value	M	°C	cs
Status		M	bitset	
- OutOfService	Void sensor value true / false	M	bool	false
- Fault	Sensor failure true / false	M	bool	false
- Overridden	Sensor value overridden true / false	O	bool	false
- InAlarm	Sensor value alarm true /false	O	bool	false
- AlarmUnAck	Alarm acknowledgement status ack / unack	O	bool	unack
- all other flags	not supported	NA	bool	

Communication:		
Binding Group:		
Class	Type	Default
Geographical ☒	Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific ☐		
Unassigned ☐	Broadcast ☐ Configurable ☐	
DP Address:	IO Type(ID): 322 (SATS)	Property ID: 51
LTE-Service (event):	InfoReport Sniffer on Binding Group: --	
InfoReport ☒	Timeout: 31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --	

Value after Powerup:	Default Value ☒	Stored Value ☐

Exception Handling:		Save at Powerdown ☐
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.		

Special Features:

2.2.4.41 Input signal: AQSupplyAir

Standard Mode

DP Name:	AQSupplyAir	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒
Description						
Current supply air quality value.						
Datapoint Type						
DPT_Name:	DPT_Value_AirQuality					
DPT Format:	F_{16}			DPT_ID:	9.008	
Field	Description			Supp.	Range	Unit	Default
					full range	ppm	cs

Access Type						
♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
Request	☐	Polling:	☐	Period:		

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics						
Power down:	Save:	☐				
Power up:	Value:	No initialisation:	☐	Default value:	☒	
		Saved value:	☐	Actual value (not for input):	☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐	

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**AQSupplyAir**			Mandatory ☐ Optional ☒	
Description:							
This process signal from a supply air quality sensor SAQS contains the supply air quality value.							
DPT:	Name	DPT_HVACAirQual_Z		DPT ID	203.100	Datatype format	$U_{16}Z_8$
Field		Description			Sup.	Unit	Default
AQSupplyAir		Supply air quality value			M	ppm	cs
Status					M	bitset	
- OutOfService		Void sensor value true / false			M	bool	false
- Fault		Sensor failure true / false			M	bool	false
- Overridden		Sensor value overridden true / false			O	bool	false
- InAlarm		Sensor value alarm true /false			O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack			O	bool	unack
- all other flags		not supported			NA	bool	

Communication:

Binding Group:

Class		Type	Default
Geographical	☒	Apartment	1 (A.1.1, refer 2.2.1.1)
Application Specific	☐		
Unassigned	☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID):	332 (SAQS)	Property ID:	51
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --			

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown ☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.			
Special Features:			

2.2.4.42 Input signal: HumRelSupplyAir

Standard Mode

DP Name:	HumRelSupplyAir	Abbr.:	--		Mandatory	☐
FB Name:	AHUC				Can be internal	☒
Description						
Current supply air humidity value.						
Datapoint Type						
DPT_Name:	DPT_Value_Humidity					
DPT Format:	F_{16}			DPT_ID:	9.007	
Field	Description			Supp.	Range	Unit	Default
					full range	%	cs

Access Type						
♦ Input						
N → this	☐	1 → this	☒			
Spontaneous	☒	Cyclically:	☒	Time-out:	31 min	
Request	☐	Polling:	☐	Period:		

Communication Type				
♦ Group Object Datapoint			Mandatory:	☒
Default Group Address:	--			

Dynamics					
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☒
		Saved value:	☐	Actual value (not for input):	☐
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**HumRelSupplyAir**		Mandatory ☐ Optional ☒

Description:						
This process signal from a supply air humidity sensor SARHS contains the supply air humidity value.						
DPT:	Name	DPT_RelValue_Z	DPT ID	202.001	Datatype format	U_8Z_8
Field		Description		Sup.	Unit	Default
HumRelSupplyAir		Supply air humidity value		M	%	cs
Status				M	bitset	
- OutOfService		Void sensor value true / false		M	bool	false
- Fault		Sensor failure true / false		M	bool	false
- Overridden		Sensor value overridden true / false		O	bool	false
- InAlarm		Sensor value alarm true /false		O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack		O	bool	unack
- all other flags		not supported		NA	bool	

Communication:				
Binding Group:				
Class		Type	Default	
Geographical ☒		Apartment	1 (A.1.1, refer 2.2.1.1)	
Application Specific ☐				
Unassigned ☐		Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 338 (SARHS)	Property ID: 51	
LTE-Service (event):		InfoReport Sniffer on Binding Group:	--	
InfoReport ☒		Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --		
Value after Powerup:		Default Value ☒		Stored Value ☐
Exception Handling:			Save at Powerdown ☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.				
Special Features:				

2.2.4.43 Input signal: TempOutside

Standard Mode

DP Name:	TempOutside		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current outside air temperature.							
Datapoint Type							
DPT_Name:	DPT_Value_Temp						
DPT Format:	F_{16}			DPT_ID:	9.001		
Field	Description			Supp.	Range	Unit	Default
					full range	°C	cs
Access Type							
♦ Input							
N → this	☐	1 → this	☒				
Spontaneous	☒	Cyclically:	☒		Time-out:	31 min	
Request	☐	Polling:	☐		Period:		
Communication Type							
♦ Group Object Datapoint					Mandatory:	☒	
	Default Group Address:	--					
Dynamics							
Power down:	Save:	☐					
Power up:	Value:	No initialisation:	☐	Default value:		☒	
		Saved value:	☐	Actual value (not for input):		☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):		☐	
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	TempOutside		Mandatory ☐ Optional ☒

Description:
Outside temperature from a remote outside temperature sensor can be used for local control strategy and frost protection.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$

Field	Description	Sup.	Unit	Default
TempOutside	Temperature value	M	°C	cs
Status		M	bitset	
- OutOfService	Void sensor value true / false	M	bool	false
- Fault	Sensor failure true / false	M	bool	false
- Overridden	Sensor value overridden true / false	O	bool	false
- InAlarm	Sensor value alarm true /false	O	bool	false
- AlarmUnAck	Alarm acknowledgement status ack / unack	O	bool	unack
- all other flags	not supported	NA	bool	

Communication:		
Binding Group:		
Class	Type	Default
Geographical ☐		
Application Specific ☒	OutsideSensorZone	1
Unassigned ☐	Broadcast ☐ Configurable ☐	
DP Address:	IO Type(ID): 320 (OTS)	Property ID: 51
LTE-Service (event):	InfoReport Sniffer on Binding Group: --	
InfoReport ☒	Timeout: 31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --	

Value after Powerup:	Default Value ☒	Stored Value ☐

Exception Handling:		Save at Powerdown ☐
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received. The outside temperature value from another OTS (different zone) may also be used (company specific behavior)		

Special Features:

2.2.4.44 Input signal: HumRelOutside

Standard Mode

DP Name:	HumRelOutside		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current outside air humidity value.							
Datapoint Type							
DPT_Name:	DPT_Value_Humidity						
DPT Format:	F_{16}				DPT_ID:	9.007	
Field	Description				Supp.	Range	Unit	Default
						full range	%	cs

Access Type

♦ Input							
N → this	☐		1 → this	☒			
Spontaneous	☒		Cyclically:	☒		Time-out:	31 min
Request	☐		Polling:	☐		Period:	

Communication Type

♦ Group Object Datapoint				Mandatory:	☒
Default Group Address:	--				

Dynamics

Power down:	Save:		☐			
Power up:	Value:	No initialisation:	☐	Default value:		☒
		Saved value:	☐	Actual value (not for input):		☐
	Transmit on bus (only for output):		☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	**HumRelOutside**		Mandatory ☐ Optional ☒

Description:							
Outside air humidity from a remote outside air humidity sensor can be used for local control strategy.							
DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8
Field		Description				Sup.	Unit	Default
HumRelOutside		Outside air humidity value				M	%	cs
Status						M	bitset	
- OutOfService		Void sensor value true / false				M	bool	false
- Fault		Sensor failure true / false				M	bool	false
- Overridden		Sensor value overridden true / false				O	bool	false
- InAlarm		Sensor value alarm true /false				O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack				O	bool	unack
- all other flags		not supported				NA	bool	

Communication:				
Binding Group:				
Class		Type		Default
Geographical	☐			
Application Specific	☒	OutsideSensorZone		1
Unassigned	☐	Broadcast ☐	Configurable ☐	
DP Address:		IO Type(ID):	336 (ORHS)	Property ID:	51
LTE-Service (event):		InfoReport Sniffer on Binding Group:		--	
InfoReport	☒	Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:	--		
Value after Powerup:		Default Value ☒		Stored Value ☐	
Exception Handling:				Save at Powerdown ☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received. The outside air humidity value from another ORHS (different zone) may also be used (company specific behavior).					
Special Features:					

2.2.4.45 Input signal: WindSpeed

Standard Mode

DP Name:	WindSpeed		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current wind speed value.							
Datapoint Type							
DPT_Name:	DPT_Value_Wsp						
DPT Format:	U$_{16}$			DPT_ID:	9.005		
Field	Description			Supp.	Range	Unit	Default
					full range	m/s	cs
Access Type							
♦ Input							
N → this	☐		1 → this	☒			
Spontaneous	☒		Cyclically:	☒		Time-out:	31 min
Request	☐		Polling:	☐		Period:	
Communication Type							
♦ Group Object Datapoint						Mandatory:	☒
	Default Group Address:	--					
Dynamics							
Power down:	Save:	☐					
Power up:	Value:	No initialisation:	☐	Default value:		☒	
		Saved value:	☐	Actual value (not for input):		☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):			☐
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	WindSpeed			Mandatory ☐ Optional ☒

Description:						
This process signal from a wind speed sensor WSS contains the current wind speed information.						

DPT:	Name	DPT_WindSpeed_Z		DPT ID	203.101	Datatype format	$U_{16}Z_8$

Field	Description	Sup.	Unit	Default
WindSpeed	Current wind speed value	M	m/s	cs
Status		M	bitset	
- OutOfService	Void sensor value true / false	M	bool	false
- Fault	Sensor failure true / false	M	bool	false
- Overridden	Sensor value overridden true / false	O	bool	false
- InAlarm	Sensor value alarm true /false	O	bool	false
- AlarmUnAck	Alarm acknowledgement status ack / unack	O	bool	unack
- all other flags	not supported	NA	bool	

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☐			
Application Specific ☒	OutsideSensorZone		1
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID): 347 (WSS)	Property ID:	51
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--	
InfoReport ☒	Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--	

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.			
Special Features:			

2.2.4.46 Input signal: SunIntensity

Standard Mode

DP Name:	SunIntensity		Abbr.:	--		Mandatory	☐
FB Name:	AHUC					Can be internal	☒
Description							
Current sun intensity value.							
Datapoint Type							
DPT_Name:	DPT_PowerDensity						
DPT Format:	U_{16}			DPT_ID:	9.022		
Field	Description			Supp.	Range	Unit	Default
					full range	W/m^2	cs
Access Type							
♦ Input							
N → this	☐	1 → this	☒				
Spontaneous	☒	Cyclically:	☒		Time-out:	31 min	
Request	☐	Polling:	☐		Period:		
Communication Type							
♦ Group Object Datapoint					Mandatory:	☒	
Default Group Address:	--						
Dynamics							
Power down:	Save:	☐					
Power up:	Value:	No initialisation:	☐	Default value:		☒	
		Saved value:	☐	Actual value (not for input):		☐	
		Transmit on bus (only for output):	☐	Read from bus (only for input):		☐	
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	AHUC	LTE Client Input Name:	SunIntensity		Mandatory ☐ Optional ☒	
Description:						
This process signal from a sun intensity sensor SIS contains the current sun intensity information in W/m^2 => not to be confused with Light sensor which provides Lux information.						

DPT:	Name	DPT_SunIntensity_Z		DPT ID	203.102	Datatype format	$U_{16}Z_8$
Field		Description			Sup.	Unit	Default
SunIntensity		Current sun intensity value			M	W/m^2	cs
Status					M	bitset	
- OutOfService		Void sensor value true / false			M	bool	false
- Fault		Sensor failure true / false			M	bool	false
- Overridden		Sensor value overridden true / false			O	bool	false
- InAlarm		Sensor value alarm true /false			O	bool	false
- AlarmUnAck		Alarm acknowledgement status ack / unack			O	bool	unack
- all other flags		not supported			NA	bool	

Communication:				
Binding Group:				
Class		Type		Default
Geographical ☐				
Application Specific ☒		OutsideSensorZone		1
Unassigned ☐		Broadcast ☐ Configurable ☐		
DP Address:		IO Type(ID): 348 (SIS)	Property ID: 51	
LTE-Service (event):		InfoReport Sniffer on Binding Group:	--	
InfoReport ☒		Timeout: 31 Min		
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown ☐	
The AHUC will use a company specific default value after power-up or in case of communication failure, if no sensor data is received.			
Special Features:			

2.2.4.47 Parameter: Apartment

FB:	AHUC	Property Name (Server): Apartment					Mandatory ☒ Optional ☐

Description:							
LTE zone: Apartment number.							

DPT:	Name	DPT_UCountValue8_Z		DPT ID	202.002	Datatype format	U$_8$Z$_8$
Field		Description		Sup.	Range	Unit	Default
CounterValue		Apartment number		M	1..126	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	

Communication:						
DP Address: (in the server)	IO Type(ID): Start-Index:	240 (AHUC) 1		Property ID: N° of elements	101 1	
Property access:	Read only	☐	Read/Write	☒		
Protection	Read level	--	Write level	--		
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		

Special Features:
Relevant AHUC DP's are not LTE communicating if zone is 'OutOfService'.

2.2.4.48 Parameter: DistrSegmH

FB:	AHUC	Property Name (Server): DistrSegmH					Mandatory ☐ Optional ☒

Description:							
LTE zoning information Hot Water Distribution Segment.							

DPT:	Name	DPT_UCountValue8_Z		DPT ID	202.002	Datatype format	U$_8$Z$_8$
Field		Description		Sup.	Range	Unit	Default
CounterValue		Hot Water Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	

Communication:						
DP Address: (in the server)	IO Type(ID): Start-Index:	240 (AHUC) 1		Property ID: N° of elements	102 1	
Property access:	Read only	☐	Read/Write	☒		
Protection	Read level	--	Write level	--		
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		

Special Features:
Relevant AHUC DP's are not LTE communicating if zone is 'OutOfService'.

2.2.4.49 Parameter: DistrSegmC

FB:	AHUC	Property Name (**Server**):	DistrSegmC			Mandatory ☐ Optional ☒

Description:						
LTE zoning information Cold Water Distribution Segment.						

DPT:	Name	DPT_UCountValue8_Z		DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Cold Water Distribution Segment number	M	1..31	--	1
Status - OutOfService - all other flags	 Zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 Set zone inactive / active not supported	 M O NA		enum	

Communication:				
DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	103 1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐

Special Features:
Relevant AHUC DP's are not LTE communicating if zone is 'OutOfService'.

2.2.4.50 Parameter: OutsideSensorZone

FB:	AHUC	Property Name (**Server**):	OutsideSensorZone			Mandatory ☐ Optional ☒

Description:						
LTE zoning number for the link with an Outside Temperature Sensor						

DPT:	Name	DPT_UcountValue8_Z		DPT ID	202.002	Datatype format	U_8Z_8

Field	Description	Sup.	Range	Unit	Default
CounterValue	Outside sensor zone number	M	1..31	--	1
Status - OutOfService - all other flags	 Zone active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 Set zone inactive / active not supported	 M O NA		enum	

Communication:				
DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	104 1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐

Special Features:
AHUC is not using an external outside sensor(s) (OTS, OAQS, ORHS, WSS, SIS) if zone is 'OutOfService'

2.2.4.51 Parameter: TempSupplyAirSetpMin

FB:	AHUC	Property Name (<u>Server</u>): TempSupplyAirSetpMin		Mandatory ☐ Optional ☒

Description:

Min supply air temperature limitation in the air handling unit controller. Supply air temperature shall not be below this limit.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$

Field	Description	Sup.	Range	Unit	Default
Temp	Temperature value	M	full range	° C	cs
Status - OutOfService - all other flags	 Limitation active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 Set limitation parameter inactive / active not supported	 M O NA		enum	

Communication:

DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	110 1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐
--				
Special Features:				
Limitation function is activated or deactivated by the 'OutOfService' Status				

2.2.4.52 Parameter: TempSupplyAirSetpMax

FB:	AHUC	Property Name (<u>Server</u>): TempSupplyAirSetpMax		Mandatory ☐ Optional ☒

Description:

Max supply air temperature limitation in the air handling unit controller. Supply air temperature shall not be above this limit.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$

Field	Description	Sup.	Range	Unit	Default
Temp	Temperature value	M	full range	° C	cs
Status - OutOfService - all other flags	 Limitation active /inactive not supported, fixed to '0'	 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands	 Set limitation parameter inactive / active not supported	 M O NA		enum	

Communication:

DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	111 1
Property access:	Read only ☐		Read/Write ☒	
Protection	Read level	--	Write level	--
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐
--				
Special Features:				
Limitation function is activated or deactivated by the 'OutOfService' Status				

2.2.4.53 Diagnostic data: TempRoomAct

FB:	AHUC	Property Name (**Server**):	TempRoomAct		Mandatory ☐ Optional ☒

Description:
Actual room temperature value used by the AHUC for room temperature control loop. This is the local image of the TempRoom input or of a hardwired sensor, which may be overridden by a tool for service functions.

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100		Datatype format	$V_{16}Z_8$

Field	Description	Sup.	Range	Unit	Default
Temp	Temperature value	M	full range	° C	cs
Status - OutOfService - Overridden - Fault - InAlarm - AlarmUnAck - all other flags	 TempRoomAct is not available Override of the temperature value Temperature corrupted, sensor failure Critical limit is reached Alarm acknowledgement status not supported, fixed to '0'	 O O M O O NA	 true/false true/false true/false true/false ack/unack	bitset	 false false false false unack
Command - Override & Release - AlarmAck - all other commands	Standard Command field Override and release temperature value Alarm acknowledge not supported	 O O NA		enum	

Communication:				
DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	112 1
Property access:	Read only ☐		Read/Write ☒ [1]	
Protection	Read level	--	Write level	--

Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐

Special Features:
[1] optional Write access for Alarm acknowledgement only

2.2.4.54 Diagnostic data: TempOutsideAct

FB:	AHUC	Property Name (<u>Server</u>):	TempOutsideAct			Mandatory ☐ Optional ☒	

Description:							
Actual outside temperature value may be used by the AHUC for room temperature control loop. This is the local image of the TempOutside input or a hard-wired sensor which may be overridden by a tool for service functions.							

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description		Sup.	Range	Unit	Default
Temp		Temperature value		M	full range	° C	cs
Status						bitset	
- OutOfService		TempOutsideAct is not available		O	true/false		cs
- Overridden		Override of the temperature value		O	true/false		false
- Fault		Temperature corrupted, sensor failure		M	true/false		false
- InAlarm		Critical limit is reached		O	true/false		false
- AlarmUnAck		Alarm acknowledgement status		O	ack/unack		unack
- all other flags		not supported, fixed to '0'		NA			
Command		standard Command field				enum	
- Override & Release		override and release temperature value		O			
- AlarmAck		alarm acknowledge		O			
- all other commands		not supported		NA			

Communication:						
DP Address:	IO Type(ID):	240 (AHUC)		Property ID:	113	
(in the server)	Start-Index:	1		N° of elements	1	
Property access:	Read only	☐	Read/Write	☒ [1]		
Protection	Read level	--		Write level	--	
Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐		

Special Features:						
[1] optional Write access for Alarm acknowledgement only						

2.2.4.55 Diagnostic data: TempSupplyAirSetpHeat

FB:	AHUC	Property Name (<u>Server</u>):	TempSupplyAirSetpHeat			Mandatory ☐ Optional ☒	

Description:							
Actual supply air heating temperature <u>setpoint</u> of the AHUC.							

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description		Sup.	Range	Unit	Default
Temp		Temperature value		M	full range	° C	cs
Status						bitset	
- OutOfService		=> no setpoint (e.g. heating is off)		O	true/false		false
- Overridden		External override of the setpoint		O	true/false		false
- all other flags		not supported, fixed to '0'		NA			
Command		Standard Command field				enum	
- Override & Release		Override and release setpoint		O			
- all other commands		not supported		NA			

Communication:						
DP Address:	IO Type(ID):	240 (AHUC)		Property ID:	114	
(in the server)	Start-Index:	1		N° of elements	1	
Property access:	Read only	☐	Read/Write	☒ [1]		
Protection	Read level	--		Write level	--	
Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐		

Special Features:						
[1] optional Write access for Override / Release function only						

2.2.4.56 Diagnostic data: TempSupplyAirSetpCool

FB:	AHUC	Property Name (<u>Server</u>):	TempSupplyAirSetpCool				Mandatory ☐ Optional ☒

Description:							
Actual supply air cooling temperature <u>setpoint</u> of the AHUC.							

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description		Sup.	Range	Unit	Default
Temp		Temperature value		M	full range	° C	cs
Status - OutOfService - Overridden - all other flags		 => no setpoint (e.g. cooling is off) External override of the setpoint not supported, fixed to '0'		 O O NA	 true/false true/false	bitset	 false false
Command - Override & Release - all other commands		Standard Command field Override and release setpoint not supported		 O NA		enum	

Communication:						
DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1		Property ID: N° of elements	115 1	
Property access:	Read only	☐	Read/Write	☒ ¹⁾		
Protection	Read level	--	Write level	--		
Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐		

Special Features:						
¹⁾ optional Write access for Override / Release function only						

2.2.4.57 Diagnostic data: Fault

FB:	AHUC	Property Name (<u>Server</u>):	Fault				Mandatory ☐ Optional ☒

Description:							
Some error in the AHUC.							

DPT:	Name	DPT_Bool		DPT ID	1.002	Datatype format	B_1
Field		Description		Sup.	Range	Unit	Default
					true/false	bool	false

Communication:						
DP Address: **(in the server)**	IO Type(ID): Start-Index:	240 (AHUC) 1		Property ID: N° of elements	116 1	
Property access:	Read only	☒	Read/Write	☐		
Protection	Read level	--	Write level	--		
Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐		

Special Features:						

2.2.4.58 Diagnostic data: FanActive

FB:	AHUC	Property Name (Server):	FanActive				Mandatory ☐ Optional ☒

Description:

Supply and/or exhaust air fans are operating.

DPT:	Name	DPT_Bool		DPT ID	1.002	Datatype format	B₁

Field		Description			Sup.	Range	Unit	Default
						true/false	bool	false

Communication:

DP Address: (in the server)	IO Type(ID): Start-Index:	240 (AHUC) 1	Property ID: N° of elements	117 1
Property access:	Read only ☒		Read/Write ☐	
Protection	Read level	--	Write level	--

Exception Handling:	Value after Powerup:	Stored Value ☐	Act Value ☒	Default Value ☐

Special Features:

2.3   Functional Block: Supply Air Temperature Controller (SATC)

2.3.1   Description

The Functional Block Supply Air Temperature Controller SATC is controlling an air handling unit in connection with terminal unit blocks. Terminal unit blocks may be Fan Coil Unit Controllers FCC, Water Heat Pumps WHPC, Split Unit Control SPUC or Variable Air Volume units VAVC. For an overview, please refer to clause 2.1.

The Ventilation Demand Transformer VDTTU (refer HVAC-TU document [11]) transforms via a company-specific algorithm the EnergyDemAir out of the Terminal Units into two supply air temperature setpoints for heating and cooling TempSupplyAirSetpSet (2), as well as controller mode and emergency mode attributes. (Controller mode of Terminal Units: Heat, Cool, NoDem, Night_Purge, Fan_only,…Emergency mode of Terminal Units: Normal, Pressurisation, Fire,..) Some Terminal Units may have also requirements for (fresh) outside air, these values are calculated in the ValueFreshAirSetp.

Between the Ventilation Demand Transformer VDTTU and the Supply Air Temperature Controller SATC is a 1:1 connection (refer to Overview, Clause 2.1). It is even recommended to combine the two Functional Blocks in one device.

The temperature control of the Supply Air Temperature Controller SATC is company-specific and not part of this specification. Heating valves, cooling valves, fans, dampers, energy recovery, electric heaters, are directly connected to the Supply Air Temperature Controller SATC via hardwiring or via optional communication signals (GenPeripheral-tag 1:1 link). The controller may be configured to select between different control strategies.

Output signals from the Supply Air Temperature Controller SATC are the demand signals for hot water EnergyDemHeatSATC and cold water EnergyDemCoolSATC. This is the link to the air handler Heating Demand Transformers HDTAHU and air handler Cooling Demand Transformers CDTAHU, which collect the demand signals (n signals in percent) and convert them into hot water and cold water flow temperature signals. These signals are only optional because not each supply air handling unit requires hot water heating and cold water cooling. There are supply air handler without heating and cooling, or heating only, or cooling only or both.

Some supply air handling units may have different heating coils (preheater, reheater) on different hot water header. Due to this the Air Handler Unit Controller may produce two different EnergyDemHeatSATC signals in different Hot Water Distribution Segment. This addition is company specific and not described in this document.

Force and Lock signals of the hot and cold water producer and distribution are transferred to the Supply Air Temperature Controller SATC to ensure functions of the temperature control. Important: Neither forcing nor locking signals must have an influence on the calculation of the demand signals EnergyDemHeatSATC and EnergyDemCoolSATC. Otherwise the system may oscillate!

Forcing or enabling the Supply Air Temperature Controller to a special controller mode (Night_Purge, Fan_only,…) may be done via the optional ContrMode input signal.

Fire and SmokeClearance signals are normally hardwired to the SATC. This emergency functions are company-specific and not part of this specification. Never less in more sophisticated systems, the optional EmergMode (Pressurisation, Fire,..) may be sent via bus from a HVAC fire/smoke device (HVACEMS).

The Supply Air Temperature Controller SATC supports relative humidity control (optional). This may be a reference room humidity control with supply air humidity limits, return air humidity control with supply air humidity limits or a simple supply air humidity control. The algorithm is company-specific and not part of this description. The humidity setpoint HumRelSetpHumEff and HumRelSetpDehumEff is a set of humidification / dehumidification setpoints and are only valid during operation of the supply air handling unit. These setpoints may be internal parameter (in percent) within the Supply Air Temperature Controller SATC or set via communication (Bind.Grp.: GenPeripheral-tag 1:1 link) with the Functional Block Setpoint Manager Humidity SMRH. Humidity control via humidity demand signals from Terminal Units is not supported (refer HVAC-TU Specifications [11]).

Absolute humidity control may be supported within the Functional Unit Block and not part of this description.

The Supply Air Temperature Controller SATC supports air quality control (optional). This may be a reference room air quality control, return air quality control or a supply air quality control. It is possible to connect an air quality sensor via communication (GenPeripheral-tag 1:1 link) to the Supply Air Temperature Controller SATC. The air quality setpoint AQSetpEff is set as an internal parameter (in ppm, mixing gas is converted in a representative ppm-value) within the Supply Air Temperature Controller SATC or via communication (GenPeripheral-tag 1:1 link) with the Functional Block Setpoint Manager Air Quality SMAQ. The algorithm is company-specific and not part of this description.

Air quality may be also controlled within Terminal Units blocks (VAV, FCC, …) via ValueFreshAirDem, respectively ValueFreshAirSetp. Refer to the description above.

Air quantity (fan speed) for Supply Air Temperature Controller SATC may be controlled via independent pressure loops or in conjunction with air quality control. The algorithm is company-specific and not part of this description.

Room Units (HMI) like Room Temperature Setpoint Absolute Setting, Room Temperature Setpoint Relative Setting, Air Quality Setpoint Setting or Air Humidity Setpoint Setting are specified in HVAC Specifications – Functional Blocks Sensors, HMI, Actuators, Common Controller Functions [02] and linked to the appropriate Room Setpoint Manager.

Additionally to the already shown sensors there may be other devices connected to the Supply Air Temperature Controller SATC. For example room air quality / humidity sensors or return air temperature / air quality / humidity sensors or outside air quality / humidity sensors. The same applies to additional actuators or HMI-displays. It may be also possible to add in the near future sensor, displays or actuators to the SATC.

2.3.2   Constraints

IMPORTANT: reporting of the hot and cold water demand signals may be implemented in the **Standard Mode** but can today not be routed via demand transformers (HDTAHU, CDTAHU) to the hot or cold water distribution segment because the necessary compound HVAC DPT for runtime-interworking is not yet available in **Standard Mode**.

Therefore for the time being only LTE implementations offer a link to a demand dependent hot and cold water distribution and production system.

In air handling units the location of reference room sensors may be a problem due to architectural or design reasons. Therefore some installers install return air sensors instead of a room sensors. The downside of this implementation is a "wrong" reading whenever the airflow in the ductwork stops. Features like, controlled start by low or high humidity or bad air quality in HVACMode Economy may be not accurate.

Neverless to simplify the Functional Block:
- Return air humidity sensor is equal to room humidity sensor
- Return air quality is equal to room air quality.

In the Standard Model all outside sensors are located in the same LTE Outside Sensor Zone (only one zoning parameter). Manufacturer specific parameters shall be used if different Outside Sensor Zones for the outside temperature, wind speed or sun intensity have to be supported.

External optimiser can not be interlinked with the Supply Air Temperature Controller SATC. In systems where optimizer are required, these have to be connected to the appropriate Terminal Units and will send their ventilation demand via Ventilation Demand Transformer VDTTU to the SATC.

2.3.3   Functional Block diagram

2.3.4   Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
EnergyDemHeatSATC	Air handler unit hot water demand in percent (LTE and S-interface)	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
EnergyDemCoolSATC	Air handler unit cold water demand in percent (LTE and S-interface)	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
StatusSATC	Status information of the air handling unit controller	DPT_StatusAHU	21.106
- Fault	Failure, some error in the SATC (S-interface)	DPT_Bool	1.002
- FanActive	Supply and/or exhaust air fans are operating (S-interface)	DPT_Bool	1.002
TempSupplyAirSATC	Actual supply air temperature of the SATC (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
ActPosSetpHeatStageA	Actuator position setpoint air handler heating valve stage A to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpCoolStageA	Actuator position setpoint air handler cooling valve stage A to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpHeatStageB	Actuator position setpoint air handler heating valve stage B to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpCoolStageB	Actuator position setpoint air handler cooling valve stage B to be written to the connected valve(s) HVA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
ActPosSetpFreshAir	Actuator position setpoint air handler outside air damper to be written to the air damper actuator ADA. (LTE and S-interface)	DPT_RelValue_Z DPT_Scaling	202.001 5.001
	Future actuators (fans, pumps,..) under discussion	t.b.d. probably complex datapoints	?
Inputs			
StatusHPM	Status information from Hot Water Production Manager	DPT_StatusHPM	209.100
ForceSignHPM	Forcing signal from Hot Water Production Manager, to force consumer to consume more energy	DPT_ForceSign	21.100
LockSignHPM	Locking signal from Hot Water Production Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101

Datapoint	Description	Datapoint Type	DPT_ID
ForceSignHFDM	Forcing signal from Heating Flow Demand Manager, to force consumer to consume more energy	DPT_ForceSign	21.100
LockSignHFDM	Locking signal from Heating Flow Demand Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
StatusCPM	Status information from Cold Water Production Manager	DPT_StatusCPM	209.102
ForceSignCPM	Forcing signal from CPM due to danger of freezing, to force consumer to consume more energy	DPT_ForceSignCool	21.101
LockSignCPM	Locking signal from CPM due to chiller overload, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
ForceSignCFDM	Forcing signal from CFDM in the Cold Water Distribution Segment	DPT_ForceSignCool	21.101
LockSignCFDM	Locking signal from CFDM in the Cold Water Distribution Segment	DPT_LockSign	207.101
TempSupplyAirSetp Set(2)	Supply temperature setpoints for heating and cooling, controller and emergency mode	DPT_TempSupplyAir SetpSet	224.100
ValueFreshAirSetp	Fresh air (outside air) demand setpoint	DPT_RelValue_Z	202.001
ContrMode	Controller mode from management station. To enable or force the SATC into a special application mode (LTE and S-interface)	DPT_HVACContrMode_Z DPT_HVACContrMode	201.104 20.105
EmergMode	Emergency mode from management station. To force the SATC into fire or smoke clearance. (LTE and S-interface)	DPT_HVACEmergMode_Z DPT_HVACEmergMode	201.109 20.106
AQSetpEff	The effective air quality setpoint (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008
HumRelSetpHumEff	Relative air humidity setpoint for humidification (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
HumRelSetpDehumEff	Relative air humidity setpoint for dehumidification (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
AQRoom	Current room air quality value (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008
HumRelRoom	Current relative room humidity value (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
TempSupplyAir	Current supply air temperature sensor value (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
AQSupplyAir	Current supply air quality sensor value (LTE and S-interface)	DPT_HVACAirQual_Z DPT_Value_AirQuality	203.100 9.008

Datapoint	Description	Datapoint Type	DPT_ID
HumRelSupplyAir	Current relative supply air humidity sensor value (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
TempOutside	Current outside air temperature sensor (LTE and S-interface)	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
HumRelOutside	Current relative outside air humidity sensor (LTE and S-interface)	DPT_RelValue_Z DPT_Value_Humidity	202.001 9.007
Parameters			
DistrSegmV	LTE zoning number Ventilation Distribution Segment	DPT_UCountValue8_Z	202.002
DistrSegmH	LTE zoning number Hot Water Distribution Segment	DPT_UCountValue8_Z	202.002
DistrSegmC	LTE zoning number Cold Water Distribution Segment	DPT_UCountValue8_Z	202.002
OutsideSensorZone	LTE zoning number Outside Sensor Zone	DPT_UCountValue8_Z	202.002
Gen_Peripheral	LTE zoning number General Peripheral	DPT_UCountValue16_Z	203.012
Diagnostic Data			
TempOutsideAct	Actual outside temperature used by the SATC	DPT_TempHAVCAbs_Z	205.100 *)
Fault	Failure, some error in the SATC	DPT_Bool	1.002
FanActive	Supply and/or exhaust air fans are operating	DPT_Bool	1.002

*) Implementation of Properties using standard DPT see clause 1.3.2

| | | Basic FB | STANDARD MODE | EXTENDED MODE | |
			S-Mode	Standard Mode Interface	LTE-Mode
Outputs	EnergyDemHeatSATC	**(GO_b)**		(GO)	O
	EnergyDemCoolSATC	**(GO_b)**		(GO)	O
	StatusSATC	**NA[1])**	NA	NA	O
	- Fault	**(GO_b)**		(GO)	NA
	- FanActive	**(GO_b)**		(GO)	NA
	TempSupplyAirSATC	**(GO_b)**		(GO)	O
	ActPosSetpHeatStageA	**(GO_b)**		(GO)	O
	ActPosSetpHeatStageB	**(GO_b)**		(GO)	O
	ActPosSetpCoolStageA	**(GO_b)**		(GO)	O
	ActPosSetpCoolStageB	**(GO_b)**		(GO)	O
	ActPosSetpFreshAir	**(GO_b)**		(GO)	O
Inputs	StatusHPM	**NA[1])**	NA	NA	O
	ForceSignHPM	**NA[1])**	NA	NA	O
	LockSignHPM	**NA[1])**	NA	NA	O
	ForceSignHFDM	**NA[1])**	NA	NA	O
	LockSignHFDM	**NA[1])**	NA	NA	O
	StatusCPM	**NA[1])**	NA	NA	O
	ForceSignCPM	**NA[1])**	NA	NA	O
	LockSignCPM	**NA[1])**	NA	NA	O
	ForceSignCFDM	**NA[1])**	NA	NA	O
	LockSignCFDM	**NA[1])**	NA	NA	O
	TempSupplyAirSetpSet	**NA[1])**	NA	NA	M
	ValueFreshAirSetp	**NA[1])**	NA	NA	O
	ContrMode	**(GO_b)**		(GO)	O
	EmergMode	**(GO_b)**		(GO)	O
	AQSetpEff	**(GO_b)**		(GO)	O
	HumRelSetpHumEff	**(GO_b)**		(GO)	O
	HumRelSetpDehumEff	**(GO_b)**		(GO)	O
	AQRoom	**(GO_b)**		(GO)	O
	HumRelRoom	**(GO_b)**		(GO)	O
	TempSupplyAir	**(GO_b)**		(GO)	O
	AQSupplyAir	**(GO_b)**		(GO)	O

| | | Basic FB | STANDARD MODE | EXTENDED MODE |
			S-Mode	Standard Mode Interface	LTE-Mode
	HumRelSupplyAir	(GO$_b$)		(GO)	O
	TempOutside	(GO$_b$)		(GO)	O
	HumRelOutside	(GO$_b$)		(GO)	O

[1] *the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency*

Table 4: SATC Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	DistSegmV	M
	DistrSegmH	O
	DistrSegmC	O
	OutsideSensorZone	O
	GenPeripheral	O

Table 5: SATC LTE specific Properties

		Support
Diagnostic Data	TempOutsideAct	O
	Fault	O
	FanActive	O

Table 6: SATC Standard Properties of Interface Objects (or memory mapped DP)

2.3.4.1 Output signal: EnergyDemHeatSATC
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC as EnergyDemHeatAHUC. Only the signal name and FB Name are changed to …SATC. In the LTE–HEE mode the IO Type (ID) is set to 241 (SATC).

For further info please refer to clause 2.2.4.1.

2.3.4.2 Output signal: EnergyDemCoolSATC

Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC as EnergyDemCoolAHUC. Only the signal name and FB Name are changed to …SATC. In the LTE–HEE mode the IO Type (ID) is set to 241 (SATC).

For further info please refer to clause 2.2.4.2.

2.3.4.3 Output signal: StatusSATC

Standard Mode

Separate datapoints Fault, FanActive

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC as StatusAHUC. Only the signal name and FB Name are changed to SATC. In the LTE–HEE mode the IO Type (ID) is set to 241 (SATC) and sent in the Ventilation Distribution Segment.

For further info please refer to clause 2.2.4.3.

2.3.4.4 Output Fault

Standard Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.4.

LTE-HEE Mode

Not applicable.

2.3.4.5 FanActive

Standard Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.3.4.5.

LTE-HEE Mode

Not applicable.

2.3.4.6 Output TempSupplyAirSATC

Standard Mode

DP Name:	TempSupplyAirSATC	Abbr.:	--		Mandatory	☐
FB Name:	SATC				Can be internal	☒

Description						
Actual supply air temperature in the Ventilation Distribution Segment.						

Datapoint Type							
DPT_Name:	DPT_Value_Temp						
DPT Format:	F_{16}			DPT_ID:	9.001		
Field	Description			Supp.	Range	Unit	Default
					full range	°C	cs

Access Type							
♦ Output							
this → M	☒		this → 1	☐			
Spontaneous	☒	COV:	☒	Δ-Value:	0.2 K	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request		☒					

Communication Type				
♦ Group Object Datapoint			Mandatory:	☒
Default Group Address:		--		

Dynamics					
Power down:	Save:		☐		
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
		Transmit on bus (only for output):	☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	SATC	LTE Server Output Name: **TempSupplyAirSATC**		Mandatory ☐ Optional ☒

Description:							
Actual supply air temperature in the Ventilation Distribution Segment.							

DPT:	Name	DPT_TempHVACAbs_Z		DPT ID	205.100	Datatype format	$V_{16}Z_8$
Field		Description		Sup.	Range	Unit	COV	Default

Field	Description	Sup.	Range	Unit	COV	Default
Temp	Supply air temperature	M	full range	°C	0.2	cs
Status - Fault - InAlarm - AlarmUnAck - all other flags	 Sensor failure true / false Sensor value alarm true /false Alarm acknowledgement status ack / unack not supported	 M O O	bitset true/false true/false ack/unack	 bool bool bool	 Y Y Y	 false false unack
Command - AlarmAck - all other commands	(write only) Alarm acknowledge not supported	 O NA				

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☒			
Application Specific ☐	DistrSegmV		1
Unassigned ☐	Broadcast ☐ Configurable ☐		
DP Address:	IO Type(ID): 241 (SATC)	Property ID: 54	
LTE-Services (event): InfoReport ☒ (LTE Read-Response polling of the output shall always be supported)	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
	Output per default communicating ☒ Binding Group Wildcard allowed ☐		
	Tx Prio: High ☐ Normal ☒ Low ☐		
	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):	Read only ☐ Read/Write ☒ [1]		
Exception Handling:		Save at Powerdown ☐	

Special Features:			
[1] write access is optional; for AlarmAck function only			

2.3.4.7 Output signal: ActPosSetpHeatStageA
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. Only the FB Name is changed to SATC.

For further info please refer to clause 2.2.4.8.

2.3.4.8 Output signal: ActPosSetpHeatStageB
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. Only the FB Name is changed to SATC.

For further info please refer to clause 2.2.4.9.

2.3.4.9 Output signal: ActPosSetpCoolStageA
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. Only the FB Name is changed to SATC.

For further info please refer to clause 2.2.4.10.

2.3.4.10 Output signal: ActPosSetpCoolStageB
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. Only the FB Name is changed to SATC.

For further info please refer to clause 2.2.4.11.

2.3.4.11 Output signal: ActPosSetpFreshAir
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. Only the FB Name is changed to SATC.

For further info please refer to clause 2.2.4.12.

2.3.4.12 Input signal: StatusHPM
Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.13.

2.3.4.13 Input signal: ForceSignHPM
Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.14.

2.3.4.14 Input signal: LockSignHPM
Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.15.

2.3.4.15 Input signal: ForceSignHFDM
Standard Mode

Not applicable.

LTE-HEE Mode
This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.16.

2.3.4.16 Input signal: LockSignHFDM
Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.17.

2.3.4.17 Input signal: StatusCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.18.

2.3.4.18 Input signal: ForceSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.19.

2.3.4.19 Input signal: LockSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.20.

2.3.4.20 Input signal: ForceSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.21.

2.3.4.21 Input signal: LockSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.22.

2.3.4.22 Input signal: TempSupplyAirSetpSet (2)

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	SATC	LTE Client Input Name:	TempSupplyAirSetpSet (2)			Mandatory ☒ Optional ☐	
Description:							
This input is provided by the VDTTU and defines the calculated heating and cooling setpoints, controller and emergency mode, which is valid for the SATC controller.							
DPT:	Name	DPT_TempSupplyAirSetpSet	DPT ID	224.100	Datatype format	$V_{16}V_{16}N_8N_8$	
Field		Description			Sup.	Unit	Default
Temperature		Supply air temperature cooling setpoint			Y	°C	cs
Temperature		Supply air temperature heating setpoint			Y	°C	cs
ContrMode		HVAC Controller Mode, range [0..20]			Y	enum.	cs
EmergMode		HVAC Emergency Mode, range [0..5]			Y	enum.	cs
Communication:							
Binding Group:							
Class		Type		Default			
Geographical　　　　☒							
Application Specific ☐		DistrSegmV		1			
Unassigned　　　　　☐		Broadcast ☐　　Configurable ☐					
DP Address:		IO Type(ID):　　　248 (VDTTU)		Property ID:　　　51			
LTE-Service (event): InfoReport　　　☒		InfoReport　Sniffer　on Binding Group:　　　--					
		Timeout:　　　　　　　　　　31　Min					
LTE-Service (polling): Read – Response ☐		Read Wildcard / Resp Sniffer on Binding Group:　--					
Value after Powerup:		Default Value ☒				Stored Value ☐	
Exception Handling:				Save at Powerdown　　　☐			
In case of missing input data (timeout) the SATC will have a company specific behavior.							
Special Features:							

2.3.4.23 Input signal: ValueFreshAirSetp

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	SATC	LTE Client Input Name:	**ValueFreshAirSetp**		Mandatory ☐ Optional ☒

Description:

This input is provided by the VDTTU and defines the fresh (outside) air setpoint in percent, which is valid for the SATC controller.

DPT:	Name	DPT_RelValue_Z		DPT ID	202.001	Datatype format	U_8Z_8	

Field	Description	Sup.	Unit	Default
Percent	Value fresh air setpoint	M	%	cs
Status		M	bitset	
- OutOfService	Void setpoint value	M	bool	false
- Overridden	Setpoint value overridden true / false	O	bool	false
- all other flags	not supported	NA	bool	

Communication:

Binding Group:			
Class	Type	Default	
Geographical ☒			
Application Specific ☐	DistrSegmV	1	
Unassigned ☐	Broadcast ☐	Configurable ☐	
DP Address:	IO Type(ID):	248 (VDTTU)	Property ID:	52
LTE-Service (event):	InfoReport Sniffer on Binding Group:	--	
InfoReport ☒	Timeout:	31 Min	
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --		

Value after Powerup:	Default Value ☒		Stored Value ☐

Exception Handling:		Save at Powerdown ☐

In case of missing input data (timeout) or value 'OutOfService' the SATC will have a company specific behavior.

Special Features:

2.3.4.24 Input signal: ContrMode

Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Ventilation Distribution Segment. For further info please refer to clause 2.2.4.32.

2.3.4.25 Input signal: EmergMode

Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Ventilation Distribution Segment. For further info please refer to clause 2.2.4.33.

2.3.4.26 Input signal: AQSetpEff

Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.34.

2.3.4.27 Input signal: HumRelSetpHumEff
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.35.

2.3.4.28 Input signal: HumRelSetpDehumEff
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.36.

2.3.4.29 Input signal: AQRoom
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.38.

2.3.4.30 Input signal: HumRelRoom
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.39.

2.3.4.31 Input signal: TempSupplyAir
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.40.

2.3.4.32 Input signal: AQSupplyAir
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.41.

2.3.4.33 Input signal: HumRelSupplyAir
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC but connected to the Gen_Peripheral_Tag. For further info please refer to clause 2.2.4.42.

2.3.4.34 Input signal: TempOutside
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.43

2.3.4.35 Input signal: HumRelOutside
Standard Mode / LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.44.

2.3.4.36 Parameter: DistrSegmV

FB:	SATC	Property Name (<u>Server</u>): DistrSegmV		Mandatory ☒ Optional ☐

Description:							
LTE zoning information Ventilation Distribution Segment.							
DPT:	Name	DPT_UCountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8	
Field		Description		Sup.	Range	Unit	Default
CounterValue		Ventilation Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		Zone active /inactive not supported, fixed to '0'		O NA	true/false	bitset	false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		Set zone inactive / active not supported		M O NA		enum	

Communication:					
DP Address: **(in the server)**	IO Type(ID): Start-Index:	241 (SATC) 1	Property ID: N° of elements	101 1	
Property access:	Read only ☐		Read/Write ☒		
Protection	Read level	--	Write level	--	
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐	

Special Features:					
SATC DP's are not LTE communicating if zone is 'OutOfService'.					

2.3.4.37 Parameter: DistrSegmH

Same as in AHUC, refer to clause 2.2.4.48.

2.3.4.38 Parameter: DistrSegmC

Same as in AHUC, refer to clause 2.2.4.49.

2.3.4.39 Parameter: OutsideSensorZone

Same as in AHUC, refer to clause 2.2.4.50.

2.3.4.40 Parameter: GenPeripheral

FB:	SATC	Property Name (**Server**):	**Gen_Peripheral**			Mandatory ☐ Optional ☒		

Description:								
LTE zoning number General Peripheral.								

DPT:	Name	DPT_UCountValue16_Z		DPT ID	203.012	Datatype format	$U_{16}Z_8$	
Field		Description			Sup.	Range	Unit	Default
CounterValue		peripheral link number			M	full range	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'			 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported			 M O NA		enum	

Communication:						
DP Address: **(in the server)**	IO Type(ID): Start-Index:	241 (SATC) 1		Property ID: N° of elements	105 1	
Property access:	Read only	☐	Read/Write		☒	
Protection	Read level	--	Write level		--	
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		

Special Features:						
SATC DP's are not LTE communicating if zone is 'OutOfService'.						

2.3.4.41 Diagnostic data: TempOutsideAct

Same as in AHUC, but Property ID 112, refer to clause 2.2.4.54.

2.3.4.42 Diagnostic data: Fault

Same as in AHUC, but Property ID 113, refer to clause 2.2.4.57.

2.3.4.43 Diagnostic data: FanActive

Same as in AHUC, but Property ID 114, refer to clause 2.2.4.58.

2.4   Functional Block: Auxiliary Heating Demand Percent (HDAUXPER)

The HDAUXPER represents an auxiliary "multi-purpose" control sequence of a hot water consumer and connects to the hot water distribution system. The HDAUXPER can be used to model very specific / "exotic" hot water consumers in connection with heating coils which do not belong to the category "Heating Zone Controller" (e.g. pre-heater etc.).
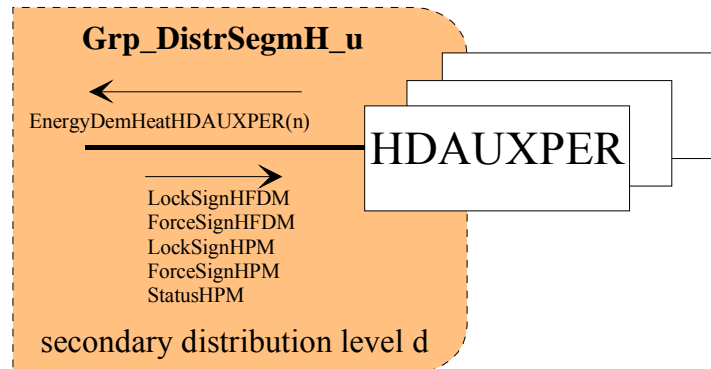
2.4.1   Description

The Auxiliary Heating Demand Percent HDAUXPER represents the EnergyDemHeat in the Hot Water Distribution Segment.

Calculation of the EnergyDemHeat (and any control loop mechanism) is company specific and not part of this specification.

The Auxiliary Heating Demand Percent HDAUXPER connects via HDTAHU to the HFDM.

For an overview please refer to clause 2.6.

2.4.2   Constraints

IMPORTANT: reporting of the hot water demand signal EnergyDemHeatHDAUXPER by the HDAUXPER can today not be implemented in Standard Mode because the necessary compound HVAC DPT for runtime-interworking is not yet available in Standard Mode

Therefore for the time being only LTE implementations of the HDAUXPER functional block offer a link to a demand dependent hot water distribution via Hot Water Demand Transformer Air Handling Unit (HDTAHU).

HDAUXPER implementations in Standard Mode are currently not meaningful.

2.4.3 Functional Block diagram
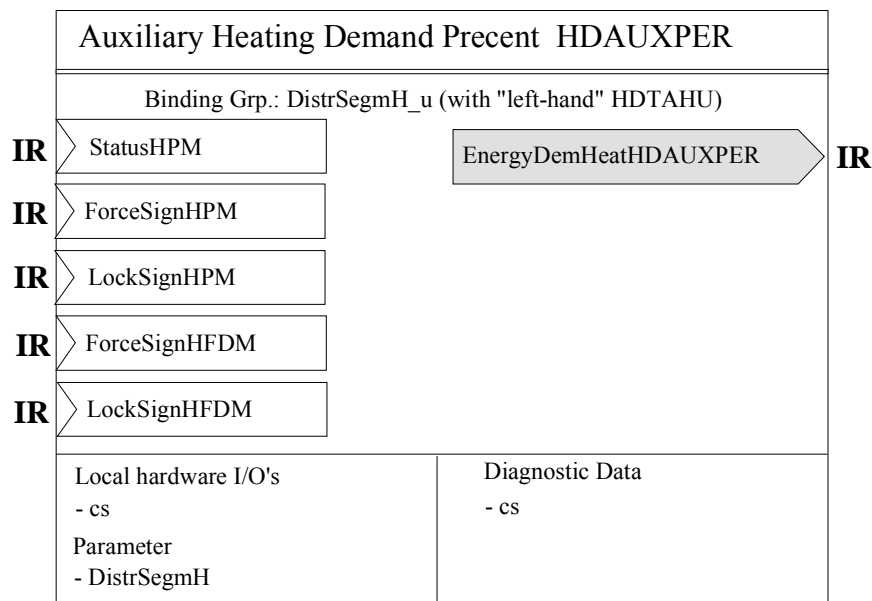
2.4.4 Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
EnergyDemHeat HDAUXPER	Hot water demand in percent to be sent to the HDTAHU	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
Inputs			
StatusHPM	Status information from Hot Water Production Manager	DPT_StatusHPM	209.100
ForceSignHPM	Forcing signal from Hot Water Production Manager, to force consumer to consume more energy	DPT_ForceSign	21.100
LockSignHPM	Locking signal from Hot Water Production Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
ForceSignHFDM	Forcing signal from Heating Flow Demand Manager, to force consumer to consume more energy	DPT_ForceSign	21.100
LockSignHFDM	Locking signal from Heating Flow Demand Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
Parameters			
DistrSegmH	LTE zoning number Hot Water Distribution Segment	DPT_UCountValue8_Z	202.002
Diagnostic Data			

| | | Basic FB | STANDARD MODE | EXTENDED MODE | |
			S-Mode	Standard Mode Interface	LTE-Mode
Outputs	EnergyDemHeat HDAUXPER	GO_b	GO	GO	M
Inputs	StatusHPM	$NA^{1)}$	NA	NA	O
	ForceSignHPM	$NA^{1)}$	NA	NA	O
	LockSignHPM	$NA^{1)}$	NA	NA	O
	ForceSignHFDM	$NA^{1)}$	NA	NA	O
	LockSignHFDM	$NA^{1)}$	NA	NA	O

[1] the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency

Table 7: HDAUXPER Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	DistrSegmH	M
	---	---

Table 8: HDAUXPER LTE specific Properties

		Support
Parameter	---	---
Diagnostic Data	---	---
	---	---

Table 9: HDAUXPER Standard Properties of Interface Objects (or memory mapped DP)

2.4.4.1 Output EnergyDemHeatHDAUXPER

Standard Mode

DP Name:	EnergyDemHeat HDAUXPER	Abbr.:	--		Mandatory	☒
FB Name:	HDAUXPER				Can be internal	☐
Description						
see LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.						
Datapoint Type						
DPT_Name:	DPT_Percent_U8					
DPT Format:	U$_8$			DPT_ID:	5.004	
Field	Description			Supp.	Range	Unit	Default
see LTE-HEE mode						

Access Type

♦	Output						
	this → M	☐		this → 1	☒		
	Spontaneous	☒	COV:	☒	Δ-Value:	10%	Min repetition period:	10s
			Cyclic	☒	Period:	15 Min		
	Request	☒					

Communication Type

♦	Group Object Datapoint			Mandatory:	☒
	Default Group Address:	--			

Dynamics

Power down:	Save:		☐			
Power up:	Value:	No initialisation:		☐	Default value:		☐
		Saved value:		☐	Actual value (not for input):		☒
	Transmit on bus (only for output):		☐	Read from bus (only for input):		☐

Exception Handling

Special Features

LTE-HEE Mode

FB: HDAUXPER	LTE Server Output Name:	EnergyDemHeatHDAUXPER				Mandatory ☒ Optional ☐
Description:						
This output signal contains the heating demand (in percent) of the HDAUXPER. It is sent via the HDTAHU to the HFDM in the corresponding Hot Water Distribution Segment.						

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8
Field		Description	Sup.	Range	Unit	COV	Default
ActPosDemAbs		Calculated heating demand (100% = max. demand)	O	0..100	%	10	0
Attributes							
– DemValid		Validity of heating demand	M	true/false	bool	Y	false
– AbsLoadPriority		Absolute load priority requested by HDAUXPER	O	true/false	bool	Y	false
– ShiftLoadPriority		Shift load priority requested by HDAUXPER	O	true/false	bool	Y	false
– EmergDem		Emergency heat demand for plant / room protection	O	true/false	bool	Y	false

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☐				
Application Specific ☒	DistrSegmH		1	
Unassigned ☐	Broadcast ☐	Configurable ☐		
DP Address:	IO Type(ID):	146 (HDAUXPER)	Property ID:	51
LTE-Services (event):	COV ☒	MinRepTime: 10 sec	Heartbeat: 15 min	
InfoReport ☒	Output per default communicating ☐	Binding Group Wildcard allowed ☐		
(LTE Read-Response polling of the output shall always be supported)	Tx Prio: High ☐	Normal ☒	Low ☐	
	Transm after Powerup: Stored Value ☐	Act Value ☒	Default Value ☐	
Property-Service (individual access):	Read only ☒	Read/Write ☐		
Exception Handling:			Save at Powerdown ☐	

Special Features:				

2.4.4.2   Input signal: StatusHPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.13.

2.4.4.3   Input signal: ForceSignHPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.14.

2.4.4.4 Input signal: LockSignHPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.15.

2.4.4.5 Input signal: ForceSignHFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.16.

2.4.4.6 Input signal: LockSignHFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.17.

2.4.4.7 Parameter: DistrSegmH

FB: HDAUXPER	Property Name (<u>Server</u>): DistrSegmH					Mandatory ☒ Optional ☐	
Description:							
LTE zoning information Hot Water Distribution Segment.							
DPT:	Name	DPT_UCountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8	
Field		Description		Sup.	Range	Unit	Default
CounterValue		Hot Water Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	
Communication:							
DP Address: **(in the server)**		IO Type(ID): Start-Index:	146 (HDAUXPER) 1	Property ID: N° of elements	101 1		
Property access:		Read only	☐	Read/Write	☒		
Protection		Read level	--	Write level	--		
Exception Handling:		Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		

Special Features:							
HDAUXPER DP's are not LTE communicating if zone is 'OutOfService'.							

2.5 Functional Block: Auxiliary Cooling Demand Percent (CDAUXPER)

The CDAUXPER represents an auxiliary "multi-purpose" control sequence of a cold water consumer and connects to the cold water distribution system. The CDAUXPER can be used to model very specific / "exotic" cold water consumers in connection with cooling coils which do not belong to the category "Cooling Zone Controller" (e.g. cooling of a sole etc.).
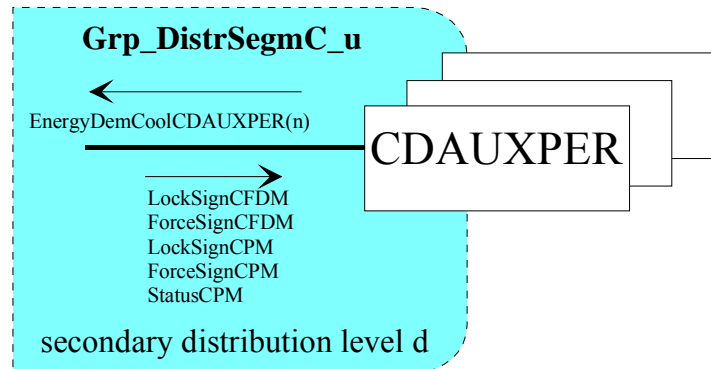
2.5.1 Description

The Auxiliary Cooling Demand Percent CDAUXPER represents the EnergyDemCool in the Cold Water Distribution Segment.

Calculation of the EnergyDemCool (and any control loop mechanism) is company specific and not part of this specification.

The Auxiliary Cooling Demand Percent CDAUXPER connects via CDTAHU to the CFDM.

For an overview please refer to clause 2.7.

2.5.2 Constraints

IMPORTANT: reporting of the cold water demand signal EnergyDemCoolCDAUXPER by the CDAUXPER can today not be implemented in Standard Mode because the necessary compound HVAC DPT for runtime-interworking is not yet available in Standard Mode

Therefore for the time being only LTE implementations of the CDAUXPER functional block offer a link to a demand dependent cold water distribution via Cold Water Demand Transformer Air Handling Unit (CDTAHU).

CDAUXPER implementations in Standard Mode are currently not meaningful.

2.5.3   Functional Block diagram

```
┌──────────────────────────────────────────────────────────────────────┐
│  Auxiliary Cooling Demand Precent  CDAUXPER                            │
├──────────────────────────────────────────────────────────────────────┤
│         Binding Grp.: DistrSegmC_u (with "left-hand" CDTAHU)           │
│  ┌────────────────────────┐          ┌────────────────────────────┐   │
│  │ StatusCPM              >│          │ EnergyDemCoolCDAUXPER      >│ IR│
│  └────────────────────────┘          └────────────────────────────┘   │
│  ┌────────────────────────┐                                           │
│  │ ForceSignCPM          >│                                           │
│  └────────────────────────┘                                           │
│  ┌────────────────────────┐                                           │
│  │ LockSignCPM           >│                                           │
│  └────────────────────────┘                                           │
│  ┌────────────────────────┐                                           │
│  │ ForceSignCFDM         >│                                           │
│  └────────────────────────┘                                           │
│  ┌────────────────────────┐                                           │
│  │ LockSignCFDM          >│                                           │
│  └────────────────────────┘                                           │
├────────────────────────────────────┬─────────────────────────────────┤
│  Local hardware I/O's               │  Diagnostic Data                │
│  - cs                               │  - cs                           │
│  Parameter                          │                                 │
│  - DistrSegmC                       │                                 │
└────────────────────────────────────┴─────────────────────────────────┘
```
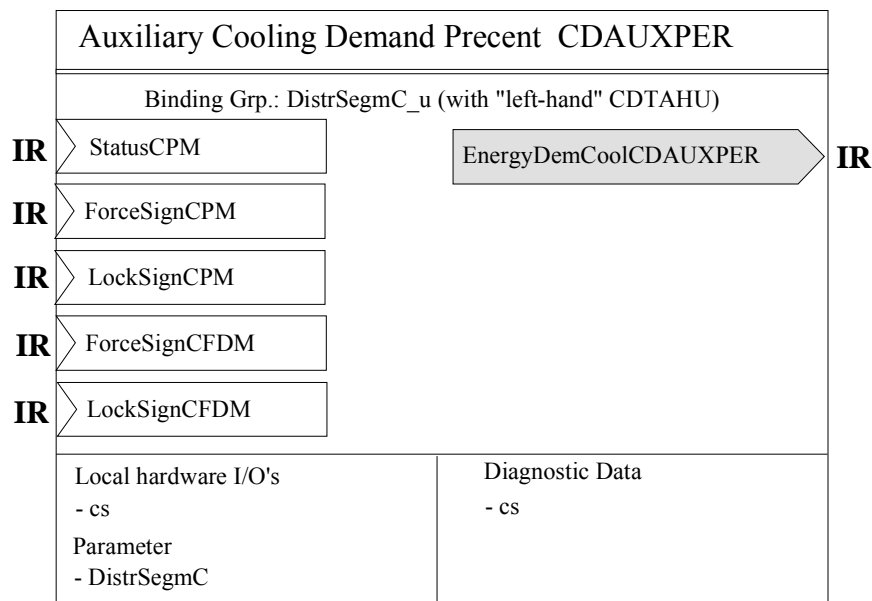
2.5.4   Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
EnergyDemCool CDAUXPER	Cold water demand in percent to be sent to the CDTAHU	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
Inputs			
StatusCPM	Status information from Cold Water Production Manager	DPT_StatusCPM	209.102
ForceSignCPM	Forcing signal from Cold Water Production Manager, to force consumer to consume more energy	DPT_ForceSignCool	21.101
LockSignCPM	Locking signal from Cold Water Production Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
ForceSignCFDM	Forcing signal from Cooling Flow Demand Manager, to force consumer to consume more energy	DPT_ForceSignCool	21.101
LockSignCFDM	Locking signal from Cooling Flow Demand Manager, to force the consumer to reduce energy consumption	DPT_LockSign	207.101
Parameters			
DistrSegmC	LTE zoning number Cold Water Distribution Segment	DPT_UCountValue8_Z	202.002
Diagnostic Data			

| | | STANDARD MODE | EXTENDED MODE | |
		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
Outputs	EnergyDemCool CDAUXPER	GO$_b$	GO	GO	M
Inputs	StatusCPM	NA^1)	NA	NA	O
	ForceSignCPM	NA^1)	NA	NA	O
	LockSignCPM	NA^1)	NA	NA	O
	ForceSignCFDM	NA^1)	NA	NA	O
	LockSignCFDM	NA^1)	NA	NA	O

^{1}) *the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency*

Table 10: CDAUXPER Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	DistrSegmC	M
	---	---

Table 11: CDAUXPER LTE specific Properties

		Support
Parameter	---	---
Diagnostic Data	---	---
	---	---

Table 12: CDAUXPER Standard Properties of Interface Objects (or memory mapped DP)

2.5.4.1 Output EnergyDemCoolCDAUXPER

Standard Mode

DP Name:	EnergyDemCool CDAUXPER	Abbr.:	--		Mandatory	☒
FB Name:	CDAUXPER				Can be internal	☐

Description
see LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.

Datapoint Type						
DPT_Name:	DPT_Percent_U8					
DPT Format:	U8			DPT_ID:	5.004	
Field	Description			Supp.	Range	Unit	Default
				see LTE-HEE mode			

Access Type							
♦ Output							
this → M	☐		this → 1	☒			
Spontaneous	☒	COV:	☒	Δ-Value:	10%	Min repetition period:	10s
		Cyclic	☒	Period:	15 Min		
Request	☒						

Communication Type			
♦ Group Object Datapoint		Mandatory:	☒
Default Group Address:	--		

Dynamics						
Power down:	Save:	☐			
Power up:	Value:	No initialisation:	☐	Default value:	☐
		Saved value:	☐	Actual value (not for input):	☒
	Transmit on bus (only for output):		☐	Read from bus (only for input):	☐

Exception Handling

Special Features

LTE-HEE Mode

FB:	CDAUXPER	LTE Server Output Name:	**EnergyDemCoolCDAUXPER**		Mandatory ☒ Optional ☐
Description:					
This output signal contains the cooling demand (in percent) of the CDAUXPER. It is sent via the CDTAHU to the CFDM in the corresponding Cold Water Distribution Segment.					

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8
Field		Description		Sup.	Range	Unit	COV	Default

Field	Description	Sup.	Range	Unit	COV	Default
ActPosDemAbs	Calculated cooling demand (100% = max. demand)	O	0..100	%	10	0
Attributes						
– DemValid	Validity of cooling demand	M	true/false	bool	Y	false
– AbsLoadPriority	Absolute load priority requested by CDAUXPER	O	true/false	bool	Y	false
– ShiftLoadPriority	Shift load priority requested by CDAUXPER	O	true/false	bool	Y	false
– EmergDem	Emergency cooling demand for plant / room protection	O	true/false	bool	Y	false

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☐				
Application Specific ☒	DistrSegmC		1	
Unassigned ☐	Broadcast ☐ Configurable ☐			
DP Address:	IO Type(ID):	210 (CDAUXPER)	Property ID:	52 [1)]
LTE-Services (event):	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min			
InfoReport ☒	Output per default communicating ☐	Binding Group Wildcard allowed ☐		
(LTE Read-Response polling of the output shall always be supported)	Tx Prio: High ☐ Normal ☒ Low ☐			
	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐			
Property-Service (individual access):	Read only ☒ Read/Write ☐			
Exception Handling:			Save at Powerdown ☐	

Special Features:				
[1)] Consistency to all EnergyDemCool… signals as Property Identifier 52				

2.5.4.2 Input signal: StatusCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.18.

2.5.4.3 Input signal: ForceSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.19.

2.5.4.4 Input signal: LockSignCPM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.20.

2.5.4.5 Input signal: ForceSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.21.

2.5.4.6 Input signal: LockSignCFDM

Standard Mode

Not applicable.

LTE-HEE Mode

This optional signal is described in the Functional Block AHUC. For further info please refer to clause 2.2.4.22.

2.5.4.7 Parameter: DistrSegmC

| FB: CDAUXPER	Property Name (<u>Server</u>): DistrSegmC					Mandatory ☒ Optional ☐
Description:						
LTE zoning information Cold Water Distribution Segment.						
DPT:	Name	DPT_UCountValue8_Z	DPT ID	202.002	Datatype format	U_8Z_8
Field		Description		Sup.	Range	Unit	Default
CounterValue		Cold Water Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	
Communication:							
DP Address: **(in the server)**		IO Type(ID): Start-Index:	210 (CDAUXPER) 1	Property ID: N° of elements	101 1		
Property access:		Read only ☐		Read/Write ☒			
Protection		Read level	--	Write level	--		
Exception Handling:		Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		

Special Features:							
CDAUXPER DP's are not LTE communicating if zone is 'OutOfService'.							

2.6 Functional Block: Heating Demand Transformer for air handling units (HDTAHU)

2.6.1 Description

The Functional Block HDTAHU is converting the heating demand signals of the air handling unit controllers (SATC or AHUC) and from Auxiliary Heating Demand Percent (HDAUXPER) into a heating flow temperature for the Heating Flow Demand Manager HFDM. It may be a demand compensated curve with minimum and maximum values, which is additionally outside air temperature compensated. This convert algorithm is company specific and not part of this description.

There may be several Supply Air Temperature Controllers SATC, Air Handling unit Controllers AHUC or Auxiliary Heating Demand Percent HDAUXPER in the same distribution segment, but there is a 1: 1 connection between the Heating Demand Transformer HDTAHU and the Heating Flow Demand Manager HFDM. (Refer also clause 2.1 Overview)
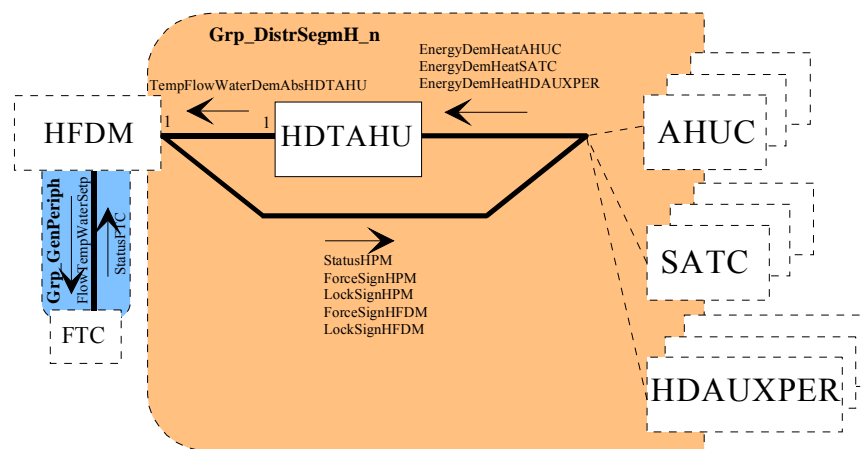
The Heating Demand Transformer HDTAHU does not have to know which and how many consumers (SATC, AHUC, or HDAUXPER) are allocated in the Distribution Segment. So the HDTAHU has no list of all the SATC, AHUC, or HDAUXPER connected to it. Therefore adding or removing of air handler (heat consumers) is simple. It is not necessary to store all the EnergyDemHeat… signals from all connected air handlers in the Heating Demand Transformer HDTAHU. Due to the heartbeat reception of the SATC, AHUC, or HDAUXPER demand signals, it is sufficient to have a dynamic process of the most relevant demands. The optional diagnostic value ValueEnergyDemHeatAct represents the value of this calculation. This algorithm is company specific and not part of this description.

The calculation of the resulting flow temperature demand output depending on heat demand signal inputs is not part of the KNX certification.

To insure interworking to following section describes a **recommended procedure** to calculate the resulting hot water flow temperature demand (TempFlowWaterDemAbsHDTAHU). The mechanism is complex and may also depend on company specific needs and parameter settings.

Plug & Play mechanism in the LTE-HEE implementation:

Remark: This mechanism is only possible in LTE-HEE implementations.

HDTAHU functionality can today not be implemented in Standard Mode since the necessary DPT are not available in Standard Mode.
If DPT_TempFlowWaterDemAbs would be available in the Standard Mode in the future, there would be still some restrictions concerning the implementation.
Reason:
In the shared variable model (e.g. S-mode) implementation all "partners" of the HDTAHU have to be linked and separate Group Addresses must be assigned for each Demand input signal. The number of "partners" has to be defined at design time of the product.

The HDTAHU does not need to know which and how many consumers are allocated in the Hot Water Distribution Segment.

Due to the heartbeat repetition of the EnergyDemHeat… signals, it is sufficient to have a dynamic process image of the N temporary **"most relevant"** demands.

Structure of the Main List (recommendation, manufacturer specific solution)

Main List					
Entry N°	Energy DemHeat..	Attrib: - DemValid - AbsLoadPriority - ShiftLoadPriority - EmergDem	Source FB Type and Instance	Source Individual Addr	Timeout
1					
2					
...					
N ≥ 4					

Criteria for a new entry in the main list of the most relevant signals:
1. first check if there is already an entry in the list with the same sender (source individual address) If Yes: delete the entry in the list (in the next steps the new data will be entered instead)

2. check the DemValid attribute
   Signals with DemValid = false ("no demand") are ignored and not further processed (deleted from the list)
   If DemValid = true: If there is still free space in the list (void entries) the signal is inserted in the list.

3. The following rules apply if the new signal has DemValid = true and all entries in the list are valid. One of the entries may be replaced in the following cases:

   Check the attribute EmergDem:
   This attribute must be considered with the highest priority because the EnergyDemHeat of the consumers who request emergency demand is in this case relevant.

   Check the attribute AbsLoadPriority:
   This attribute must be considered with second priority because the EnergyDemHeat of the consumers who request load priority is in this case relevant.

   Check the attribute ShiftLoadPriority:
   This attribute must be considered with thrid priority because the EnergyDemHeat of the consumers who request shift load priority are prioritised and all other consumers with no priority attributes (AbsLoasPriority or ShiftLoadPriority) have to reduce their energy consumption.

   Check the EnergyDemHeat value with forth priority. The higher the value the more relevant the signal is.

4. If one of the entries in the main list has a timeout, than this entry shall be deleted.

A void entry in the list is marked with the attribute DemValid = false.

2.6.2　Constraints

IMPORTANT: reporting of the Hot Water Demand signal TempFlowWaterDemAbsHDTAHU by the HDTAHU can today not be implemented in **Standard Mode** because the necessary compound HVAC DPT for runtime-interworking is not yet available in **Standard Mode**

Therefore for the time being only LTE implementations of the HDTAHU functional block offer a link to a demand dependent hot water distribution (HFDM) and hot water production system (HPM). HDTAHU implementations in **Standard Mode** must therefore rely on an "autonomous" hot water production / hot water distribution system which provides sufficient hot water flow temperature.

2.6.3　Functional Block diagram
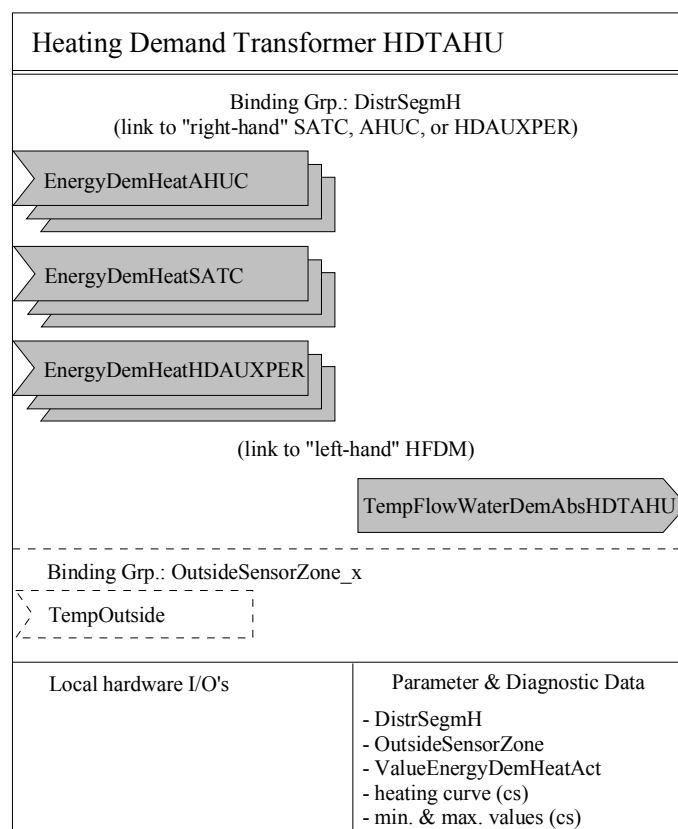
2.6.4 Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
TempFlowWaterDem AbsHDTAHU	Resulting flow water temperature demand to be sent to the HFDM	DPT_TempFlowWater DemAbs	210.100
Inputs			
EnergyDemHeat…	Air handler unit hot water demand from AHUC and/or SATC and/or HDAUXPER in percent (LTE and S-interface)	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
TempOutside	Outside air temperature sensor	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
Parameters			
DistrSegmH	Hot Water Distribution Segment	DPT_UCountValue8_Z	202.002
OutsideSensorZone	Outside Sensor Zone	DPT_UCountValue8_Z	202.002
Diagnostic Data			
ValueEnergyDem HeatAct	Calculation of actual ValueEnergyDemHeat signal	DPT_Percent_U8	5.004

		Basic FB	S-Mode	Standard Mode Interface	LTE-Mode
			STANDARD MODE	**EXTENDED MODE**	
Outputs	TempFlowWaterDemAbs HDTAHU	**NA**[1])	NA	NA	M
Inputs	EnergyDemHeat...	**(GO$_b$)**[2])		(GO)[2])	M[2])
	TempOutside	**(GO$_b$)**		(GO)	O

[1] *the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency*

[2] *It is not necessary to have mandatory EnergyDemHeat… signals from AHUC, SATC as well as from HDAUXPER, so it may be possible to have only demands from any source (e.g. SATC).*

Table 13: HDTAHU Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	DistrSegmH	M
	OutsideSensorZone	O

Table 14: HDTAHU LTE specific Properties

		Support
Parameter	---	
Diagnostic Data	ValueEnergyDemHeatAct	O

Table 15: HDTAHU Standard Properties of Interface Objects (or memory mapped DP)

2.6.4.1 Output signal: TempFlowWaterDemHDTAHU

Standard Mode

Not applicable.

LTE-HEE Mode

FB: HDT AHU	LTE Server Output Name: **TempFlowWaterDemAbs HDTAHU**					Mandatory ☒ Optional ☐	
Description:							
This output process signal contains the flow temperature heating demand (absolute value) and the different attributes to control the Heating Flow Demand Manager HFDM.							
DPT:	Name	DPT_TempFlowWater DemAbs	DPT ID	210.100	Datatype format	$V_{16}B_{16}$	

Field	Description	Sup.	Range	Unit	COV	Default
TempFlowDem	Flow temperature demand (setpoint)	M	full range	°C	2K	cs
Attributes						
– Demand Valid	Validity of TempFlowDemand	M	true/false	bool	Y	false
– AbsLoadPriority	Absolute load priority	O	true/false	bool	Y	false
– ShiftLoadPriority	Shift load priority	O	true/false	bool	Y	false
– MaxTempLimit	TempFlowDem contains max. temperature limit [1]	O	true/false	bool	Y	false
– MinTempLimit	TempFlowDem contains min. temperature limit [2]	O	true/false	bool	Y	false
– DHWReq	Heat demand from DHW, for DHW only	NA	false	bool	N	false
– RoomCtrlReq	Demand from room heating or cooling	NA	false	bool	N	false
– VentReq	Demand from ventilation	O	true/false	bool	N	true
– AuxAllSeasonReq	Demand from auxiliary heat consumer, all season	O	true/false	bool	N	false
– SystemPumpReq	Request for water circulation in the distribution segment	O	true/false	bool	Y	false
– EmergDem	Emergency heat demand for room frost protection	O	true/false	bool	Y	false
– DHWLegioReq	for DHW only	NA	false	bool	N	false

Communication:			
Binding Group:			
Class	Type		Default
Geographical ☐			
Application Specific ☒	DistrSegmH [3])		1
Unassigned ☐	Broadcast ☐ Configurable ☐		
DP Address:	IO Type(ID): 152 (HDTAHU)	Property ID:	51
LTE-Services (event):	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
InfoReport ☒	Output per default communicating ☐ Binding Group Wildcard allowed ☐		
	Tx Prio: High ☐ Normal ☒ Low ☐		
(LTE Read-Response polling of the output shall always be supported)	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):	Read only ☒ Read/Write ☐		
Exception Handling:			Save at Powerdown ☐
--			

Special Features:
[1] This value sets a maximum flow temperature limit for the Heating Flow Demand Transformer HFDM. It is a high temperature limit in this hydraulic circuit (higher temperature may cause some damage).
[2] This value sets a minimum flow temperature limit for the Heating Flow Demand Transformer HFDM. It is a low temperature limit in this hydraulic circuit. High temperature limits have priority.
[3] The in- and output signals of this functional Blocks are in the same Hot Water Distribution Segment (there is a 1:1 connection between HDTAHU and HFDM

2.6.4.2 Input signal: EnergyDemHeat…

This is the common description of all the demand signals from the AHUC, SATC, or HDAUXPER.

Standard Mode

DP Name:	EnergyDemHeat..		Abbr.:	--		Mandatory	☐
FB Name:	HDTAHU					Can be internal	☐
Description							
see LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.							
Datapoint Type							
DPT_Name:	DPT_Percent_U8						
DPT Format:	U$_8$			DPT_ID:	5.004		
Field	Description			Supp.	Range	Unit	Default
	see LTE-HEE mode, without attributes						
Access Type							
♦ Input							
N → this	☐	1 → this	☒				
Spontaneous	☒	Cyclically:	☒		Time-out:	31 min	
Request	☐	Polling:	☐		Period:		
Communication Type							
♦ Group Object Datapoint					Mandatory:	☒	
Default Group Address:		--					
Dynamics							
Power down:	Save:		☐				
Power up:	Value:	No initialisation:		☐	Default value:		☒
		Saved value:		☐	Actual value (not for input):		☐
		Transmit on bus (only for output):		☐	Read from bus (only for input):		☐
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	HDT AHU	LTE Client Input Name:	EnergyDemHeat…		Mandatory ☒ Optional ☐
Description:					
This input process signal contains the heating demand (in percent) and the attributes validity, load priorities and emergency demand from the Supply Air Temperature Controllers SATC, Air Handling Unit Controller AHUC, or Auxiliary Head Demand Percent HDAUXPER.					

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8

Field	Description	Sup.	Unit	Default
ActPosDemAbs	Calculated heating demand (100% = max. demand)	M	%	cs
Attributes – DemValid	Validity of heating demand	M	bool	false
– AbsLoadPriority	Absolute load priority requested by AHUC, SATC, or HDAUXPER	O	bool	false
– ShiftLoadPriority	Shift load priority requested by AHUC, SATC, or HDAUXPER	O	bool	false
– EmergDem	Emergency demand for plant / room frost protection requested by AHUC, SATC, or HDAUXPER	O	bool	false

Communication:				
Binding Group:				
Class	Type		Default	
Geographical ☐				
Application Specific ☒	DistrSegmH		1	
Unassigned ☐	Broadcast ☐	Configurable ☐		
DP Address:	IO Type(ID):	240 (AHUC) 241 (SATC) 146 (HDAUXPER)	Property ID:	51
LTE-Service (event): InfoReport ☒	InfoReport Sniffer on Binding Group:		--	
	Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group: --			
Value after Powerup:	Default Value ☒		Stored Value ☐	
Exception Handling:		Save at Powerdown ☐		
The HDTAHU will use a company specific default value after power-up or in case of communication failure, if no data from AHUC, SATC, or HDAUXPER is received (normally: DemValid = false).				
Special Features:				

2.6.4.3 Input signal: TempOutside

Same as in AHUC, refer to clause 2.2.4.43⬚

2.6.4.4 Parameter: DistrSegmH

FB: HDT AHU	Property Name (<u>Server</u>):	**DistrSegmH**				Mandatory ☒ Optional ☐
Description:						
LTE zoning information Hot Water Distribution Segment						

DPT:	Name	DPT_UCountValue8_Z		DPT ID	202.002	Datatype format	U$_8$Z$_8$
Field		**Description**		**Sup.**	**Range**	**Unit**	**Default**
CounterValue		Hot Water Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	

Communication:					
DP Address: **(in the server)**	IO Type(ID): Start-Index:	152(HDTAHU) 1	Property ID: N° of elements	101 1	
Property access:	Read only	☐	Read/Write	☒	
Protection	Read level	--	Write level	--	
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐	
--					
Special Features:					
HDTAHU DP's are not LTE communicating if zone is 'OutOfService'.					

2.6.4.5 Parameter: OutsideSensorZone

FB: HDT AHU	Property Name (<u>Server</u>):	**OutsideSensorZone**				Mandatory ☐ Optional ☒
Description:						
LTE zoning number for the link with an Outside Temperature Sensor						

DPT:	Name	DPT_UcountValue8_Z		DPT ID	202.002	Datatype format	U$_8$Z$_8$
Field		**Description**		**Sup.**	**Range**	**Unit**	**Default**
CounterValue		Outside sensor zone number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	

| **Communication:**					
DP Address: **(in the server)**	IO Type(ID): Start-Index:	152 (HDTAHU) 1	Property ID: N° of elements	102 1	
Property access:	Read only	☐	Read/Write	☒	
Protection	Read level	--	Write level	--	
Exception Handling:	Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐	
--					
Special Features:					
HDTAHU is not using an external outside temperature sensor if zone is 'OutOfService'					

2.6.4.6 Diagnostic Data: ValueEnergyDemHeatAct

FB:	HDT AHU	Property Name (<u>Server</u>):	ValueEnergyDemHeatAct			Mandatory ☐ Optional ☒

Description:
This is the calculated ValueEnergyDemHeat… signal (optional). This calculation may be the maximum value or any other company specific algorithm.

DPT:	Name	DPT_Percent_U8		DPT ID	5.004		Datatype format	U_8
Field		Description			Sup.	Range	Unit	Default
ValueEnergyDem HeatAct		Calculated actual ValueEnergyDemHeat			M	0..100	%	cs

Communication:				
DP Address: **(in the server)**	IO Type(ID): Start-Index:	152 (HDTAHU) 1	Property ID: N° of elements	110 1
Property access:	Read only ☒		Read/Write ☐	
Protection	Read level	--	Write level	--

Exception Handling:	Value after Powerup:	Stored Value ☐ Act Value ☒ Default Value ☐
--		

Special Features:
--

2.7   Functional Block: Cooling Demand Transformer for air handling units (CDTAHU)

2.7.1   Description

The Functional Block CDTAHU is converting the cooling demand signals of the air handling unit controllers (SATC, AHUC, or CDAUXPER) into a cooling flow temperature for the Cooling Flow Demand Manager CFDM. It may be a demand compensated curve with minimum and maximum values, which is additionally outside air temperature compensated. This convert algorithm is company specific and not part of this description.

There may be several Supply Air Temperature Controllers SATC, Air Handling unit Controllers AHUC, or Auxiliary Cooling Demand Percent CDAUXPER in the same distribution segment, but there is a 1: 1 connection between the Cooling Demand Transformer CDTAHU and the Cooling Flow Demand Manager CFDM. (Refer also Clause 2.1 Overview).
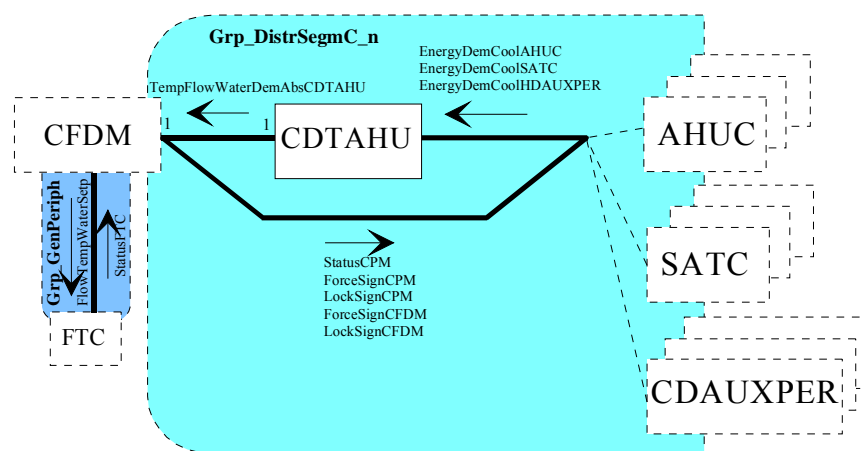
The Cooling Demand Transformer CDTAHU does not have to know which and how many consumers (SATC, AHUC, or CDAUXPER) are allocated in the Distribution Segment. So the CDTAHU has no list of all the SATC, AHUC, or CDAUXPER connected to it. Therefore adding or removing of air handler (cold water consumers) is simple. It is not necessary to store all the EnergyDemCool… signals from all connected air handlers in the Cooling Demand Transformer HDTAHU. Due to the heartbeat reception of the SATC, AHUC, or CDAUXPER demand signals, it is sufficient to have a dynamic process of the most relevant demands. The optional diagnostic value ValueEnergyDemCoolAct represents the value of this calculation. This algorithm is company specific and not part of this description.

The calculation of the resulting flow temperature demand output depending on cooling demand signal inputs is not part of the KNX certification.

To insure interworking to following section describes a **recommended procedure** to calculate the resulting cold water flow temperature demand (TempFlowWaterDemAbsCDTAHU). The mechanism is complex and may also depend on company specific needs and parameter settings.

Plug & Play mechanism in the LTE-HEE implementation:

Remark: This mechanism is only possible in LTE-HEE implementations.

> *CDTAHU functionality can today not be implemented in Standard Mode since the necessary DPT are not available in Standard Mode.*
> *If DPT_TempFlowWaterDemAbs would be available in the Standard Mode in the future, there would be still some restrictions concerning the implementation.*
> *Reason:*
> *In the shared variable model (e.g. S-mode) implementation all "partners" of the CDTAHU have to be linked and separate Group Addresses must be assigned for each Demand input signal. The number of "partners" has to be defined at design time of the product.*

The CDTAHU does not need to know which and how many consumers are allocated in the Cold Water Distribution Segment.

Due to the heartbeat repetition of the EnergyDemCool… signals, it is sufficient to have a dynamic process image of the N temporary **"most relevant"** demands.

Structure of the Main List (recommendation, manufacturer specific solution)

Main List					
Entry N°	Energy DemCool..	Attrib: - DemValid - AbsLoadPriority - ShiftLoadPriority - EmergDem	Source FB Type and Instance	Source Individual Addr	Timeout
1					
2					
...					
N ≥ 4					

Criteria for a new entry in the main list of the most relevant signals:

1. first check if there is already an entry in the list with the same sender (source individual address) If Yes: delete the entry in the list (in the next steps the new data will be entered instead)

2. check the DemValid attribute
   Signals with DemValid = false ("no demand") are ignored and not further processed (deleted from the list)
   If DemValid = true: If there is still free space in the list (void entries) the signal is inserted in the list.

3. The following rules apply if the new signal has DemValid = true and all entries in the list are valid. One of the entries may be replaced in the following cases:

   Check the attribute EmergDem:
   This attribute must be considered with the highest priority because the EnergyDemCool of the consumers who request load priority is in this case relevant.

   Check the attribute AbsLoadPriority:
   This attribute must be considered with second priority because the EnergyDemCool of the consumers who request load priority is in this case relevant.

   Check the attribute ShiftLoadPriority:
   This attribute must be considered with second third because the EnergyDemCool of the consumers who request shift load priority are prioritised and all other consumers with no priority attributes (AbsLoasPriority or ShiftLoadPriority) have to reduce their energy consumption.

   Check the EnergyDemCool value with forth priority. The higher the value the more relevant the signal is.

4.　If one of the entries in the main list has a timeout, than this entry shall be deleted.

A void entry in the list is marked with the attribute DemValid = false.

2.7.2　Constraints

IMPORTANT: reporting of the Cold Water Demand signal TempFlowWaterDemAbsCDTAHU by the CDTAHU can today not be implemented in **Standard Mode** because the necessary compound HVAC DPT for runtime-interworking is not yet available in **Standard Mode**

Therefore for the time being only LTE implementations of the CDTAHU functional block offer a link to a demand dependent cold water distribution (CFDM) and cold water production system (CPM). CDTAHU implementations in **Standard Mode** must therefore rely on an "autonomous" cold water production / cold water distribution system which provides sufficient cold water flow temperature.

2.7.3　Functional Block diagram
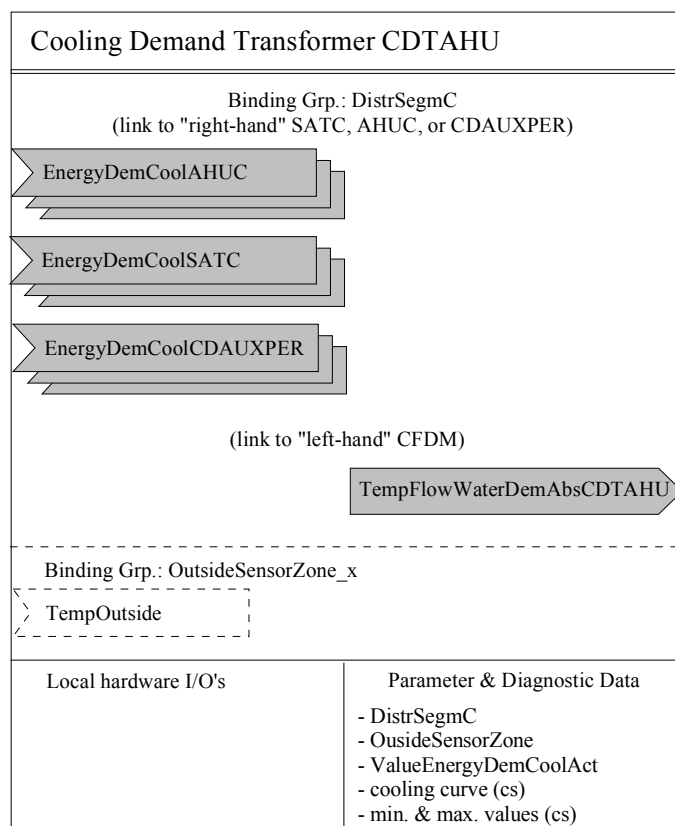
2.7.4   Description of the Datapoints

Datapoint	Description	Datapoint Type	DPT_ID
Outputs			
TempFlowWaterDem AbsCDTAHU	Resulting flow water temperature demand to be sent to the CFDM	DPT_TempFlowWater DemAbs	210.100
Inputs			
EnergyDemCool..	Air handler unit cold water demand from AHUC and/or SATC and/or CDAUXPER in percent	DPT_ActPosDemAbs DPT_Percent_U8	207.104 5.004
TempOutside	Outside air temperature sensor	DPT_TempHVACAbs_Z DPT_Value_Temp	205.100 9.001
Parameters			
DistrSegmC	Cold Water Distribution Segment	DPT_UCountValue8_Z	202.002
OutsideSensorZone	Outside Sensor Zone	DPT_UCountValue8_Z	202.002
Diagnostic Data			
ValueEnergyDem CoolAct	Calculation of actual ValueEnergyDemCool signal	DPT_Percent_U8	5.004

		Basic FB	STANDARD MODE S-Mode	EXTENDED MODE Standard Mode Interface	LTE-Mode
Outputs	TempFlowWaterDemAbs CDTAHU	**NA[1])**	NA	**NA**	M
Inputs	EnergyDemCool...	**(GO_b)**[2])		(GO)[2])	M[2])
	TempOutside	**(GO_b)**		(GO)	O

[1]) the information is NA in the Basic FB and all other modes because the datapoint type is <u>today</u> not yet available in Standard Mode. Splitting of DPT is not possible because of necessary data consistency

[1]) It is not necessary to have mandatory EnergyDemCool… signals from AHUC, SATC as well as from CDAUXPER, so it may be possible to have only demands from any source (e.g. SATC).

Table 16: CDTAHU Runtime Interworking - dependence on Configuration Modes

		Support
Parameter	DistrSegmC	M
	OutsideSensorZone	O

Table 17: CDTAHU LTE specific Properties

		Support
Parameter	---	
Diagnostic Data	ValueEnergyDemCoolAct	O

Table 18: CDTAHU Standard Properties of Interface Objects (or memory mapped DP)

2.7.4.1 Output signal: TempFlowWaterDemCDTAHU

Standard Mode

Not applicable.

LTE-HEE Mode

FB:	CDT AHU	LTE Server Output Name:	**TempFlowWaterDemAbs CDTAHU**				Mandatory ☒ Optional ☐

Description:

This output process signal contains the flow temperature cooling demand (absolute value) and the different attributes to control the Cooling Flow Demand Manager CFDM.

DPT:	Name	DPT_TempFlowWater DemAbs		DPT ID	210.100	Datatype format	$V_{16}B_{16}$

Field	Description	Sup.	Range	Unit	COV	Default
TempFlowDem	Flow temperature demand (setpoint)	M	full range	°C	0.5K	cs
Attributes						
– Demand Valid	Validity of TempFlowDemand	M	true/false	bool	Y	false
– AbsLoadPriority	Absolute load priority	O	true/false	bool	Y	false
– ShiftLoadPriority	Shift load priority	O	true/false	bool	Y	false
– MaxTempLimit	TempFlowDem contains max. temperature limit [1]	O	true/false	bool	Y	false
– MinTempLimit	TempFlowDem contains min. temperature limit [2]	O	true/false	bool	Y	false
– DHWReq	Heat demand from DHW, for DHW only	NA	false	bool	N	false
– RoomCtrlReq	Demand from room heating or cooling	NA	false	bool	N	false
– VentReq	Demand from ventilation	O	true/false	bool	N	true
– AuxAllSeasonReq	Demand from auxiliary heat consumer, all season	O	true/false	bool	N	false
– SystemPumpReq	Request for water circulation in the distribution segment	O	true/false	bool	Y	false
– EmergDem	Emergency heat demand for room frost protection	O	true/false	bool	Y	false
– DHWLegioReq	for DHW only	NA	false	bool	N	false

Communication:

Binding Group:		
Class	Type	Default
Geographical ☐		
Application Specific ☒	DistrSegmC [3]	1
Unassigned ☐	Broadcast ☐ Configurable ☐	

DP Address:	IO Type(ID): 215 (CDTAHU) Property ID: 51		
LTE-Services (event):	COV ☒ MinRepTime: 10 sec Heartbeat: 15 min		
InfoReport ☒	Output per default communicating ☐	Binding Group Wildcard allowed ☐	
	Tx Prio: High ☐ Normal ☒ Low ☐		
(LTE Read-Response polling of the output shall always be supported)	Transm after Powerup: Stored Value ☐ Act Value ☒ Default Value ☐		
Property-Service (individual access):	Read only ☒ Read/Write ☐		

Exception Handling:		Save at Powerdown ☐
--		

Special Features:

[1] This value sets a maximum flow temperature limit for the Cooling Flow Demand Transformer CFDM. It is a high temperature limit in this hydraulic circuit.

[2] This value sets a minimum flow temperature limit for the Cooling Flow Demand Transformer CFDM. It is a low temperature limit in this hydraulic circuit. Low temperature limits have priority.

[3] The in- and output signals of this functional Blocks are in the same Cold Water Distribution Segment (there is a 1:1 connection between CDTAHU and CFDM

2.7.4.2 Input signal: EnergyDemCool…

This is the common description of all the demand signals from the AHUC, SATC, or CDAUXPER.

Standard Mode

DP Name:	EnergyDemCool..		Abbr.:	--		Mandatory	☐
FB Name:	CDTAHU					Can be internal	☐
Description							
see LTE-HEE mode, only % value, no demand validity, load priority or emergency demand attributes.							
Datapoint Type							
DPT_Name:	DPT_Percent_U8						
DPT Format:	U$_8$			DPT_ID:	5.004		
Field	Description			Supp.	Range	Unit	Default
	see LTE-HEE mode without attributes						
Access Type							
♦ Input							
N → this	☐	1 → this	☒				
Spontaneous	☒	Cyclically:	☒		Time-out:	31 min	
Request	☐	Polling:	☐		Period:		
Communication Type							
♦ Group Object Datapoint						Mandatory:	☒
Default Group Address:		--					
Dynamics							
Power down:	Save:		☐				
Power up:	Value:	No initialisation:	☐		Default value:	☒	
		Saved value:	☐		Actual value (not for input):	☐	
		Transmit on bus (only for output):	☐		Read from bus (only for input):		☐
Exception Handling							

Special Features							

LTE-HEE Mode

FB:	CDT AHU	LTE Client Input Name:		EnergyDemCool…			Mandatory ☒ Optional ☐

Description:
This input process signal contains the cooling demand (in percent) and the attribute validity from the Supply Air Temperature Controllers SATC, Air Handling Unit Controller AHUC, or Auxiliary Cooling Demand Percent CDAUXPER.

DPT:	Name	DPT_ActPosDemAbs		DPT ID	207.104	Datatype format	U_8B_8
Field		Description			Sup.	Unit	Default
ActPosDemAbs		Calculated cooling demand (100% = max. demand)			M	%	cs
Attributes							
– DemValid		Validity of cooling demand			M	bool	false
– AbsLoadPriority		Absolute load priority requested by AHUC, SATC, or CDAUXPER			O	bool	false
– ShiftLoadPriority		Shift load priority requested by AHUC, SATC, or CDAUXPER			O	bool	false
– EmergDem		Emergency demand for plant / room protection requested by AHUC, SATC, or CDAUXPER			O	bool	false

Communication:

Binding Group:			
Class		Type	Default
Geographical ☐			
Application Specific ☒		DistrSegmC	1
Unassigned ☐		Broadcast ☐	Configurable ☐

DP Address:	IO Type(ID):	240 (AHUC) 241 (SATC) 210 (CDAUXPER)	Property ID:	52
LTE-Service (event):	InfoReport Sniffer on Binding Group:		--	
InfoReport ☒	Timeout:	31 Min		
LTE-Service (polling): Read – Response ☐	Read Wildcard / Resp Sniffer on Binding Group:	--		

Value after Powerup:	Default Value ☒		Stored Value ☐
Exception Handling:		Save at Powerdown	☐
The CDTAHU will use a company specific default value after power-up or in case of communication failure, if no data from AHUC, SATC, or CDAUXPER is received (normally: DemValid = false).			
Special Features:			

2.7.4.3 Input signal: TempOutside

Same as in AHUC, refer to clause 2.2.4.43

2.7.4.4 Parameter: DistrSegmC

FB: CDT AHU	Property Name (Server):		DistrSegmC				Mandatory ☒ Optional ☐
Description:							
LTE zoning information Cold Water Distribution Segment							
DPT:	Name	DPT_UCountValue8_Z		DPT ID	202.002	Datatype format	U_8Z_8
Field		Description		Sup.	Range	Unit	Default
CounterValue		Cold Water Distribution Segment number		M	1..31	--	1
Status - OutOfService - all other flags		 Zone active /inactive not supported, fixed to '0'		 O NA	 true/false	bitset	 false
Command - NormalWrite - SetOSV & ResetOSV - all other commands		 Set zone inactive / active not supported		 M O NA		enum	
Communication:							
DP Address: **(in the server)**		IO Type(ID): Start-Index:	215(CDTAHU) 1		Property ID: N° of elements	101 1	
Property access:		Read only ☐		Read/Write	☒		
Protection		Read level	--		Write level	--	
Exception Handling:		Value after Powerup:	Stored Value ☒	Act Value ☐	Default Value ☐		
--							
Special Features:							
CDTAHU DP's are not LTE communicating if zone is 'OutOfService'.							

2.7.4.5 Parameter: OutsideSensorZone

Same as in HDTAHU, refer to clause 2.6.4.5⏎

2.7.4.6 Diagnostic Data: ValueEnergyDemCoolAct

This is the calculated ValueEnergyDemCool… signal (optional). This calculation may be the maximum value or any other company specific algorithm.

This diagnostic value corresponds to the ValueEnergyDemHeatAct signal, same datapoint type but instead of heating / cooling value. For further information refer to 2.6.4.6.

3 Actuators

Air Handling Unit Controller AHUC or Supply Air Temperature Controller SATC Functional Blocks may have different actuators like valves, pumps, fans, dampers,.. connected. All these connection are optional and depend on the controller Functional Block type. For more details about actuators please refer HVAC Specifications - Functional Blocks Sensors, HMI, Actuators, Common Controller Functions [02].

3.1 Future Functional Blocks

In the near future the following Functional Blocks may be specified in KNX:

♦ Functional Block: Fan (Supply, Return)
♦ Functional Block: Pump