Application Descriptions

HVAC ObIS

Heating Cooling Switchover (HCS)

Summary

This function generates the switchover signal for switching over from heating to cooling mode and reverse. This occurs depending on the current room temperature value and the current setpoint values for heating and cooling mode.

Version 01.00.01 is a KNX Approved Standard.

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

Document updates

Issue	Date	Modifications
1.0	2002.04.02	Editorially restyled, based on " 15-01_ObIS_HCS.doc"
1.0	2009.06.15	Editorial update in view of inclusion in the KNX Specifications v2.0.
01.00.01	2013.10.29	Editorial updates for the publication of KNX Specifications 2.1.

References

None.

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Contents
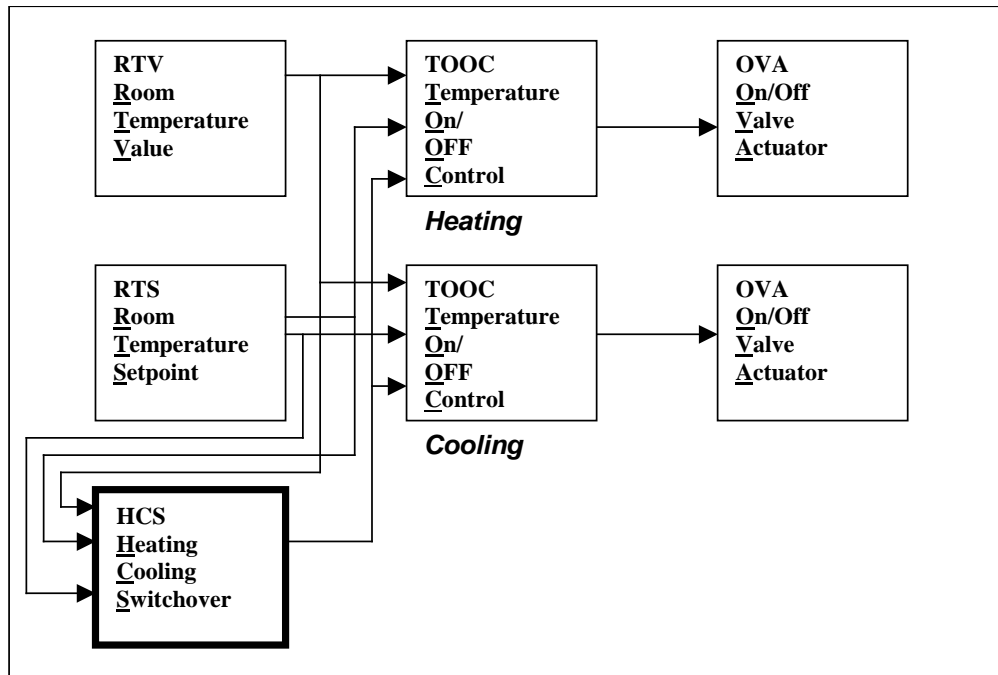
1 Application Model(s)

**Figure 1 - Example for Individual Room Temperature Control
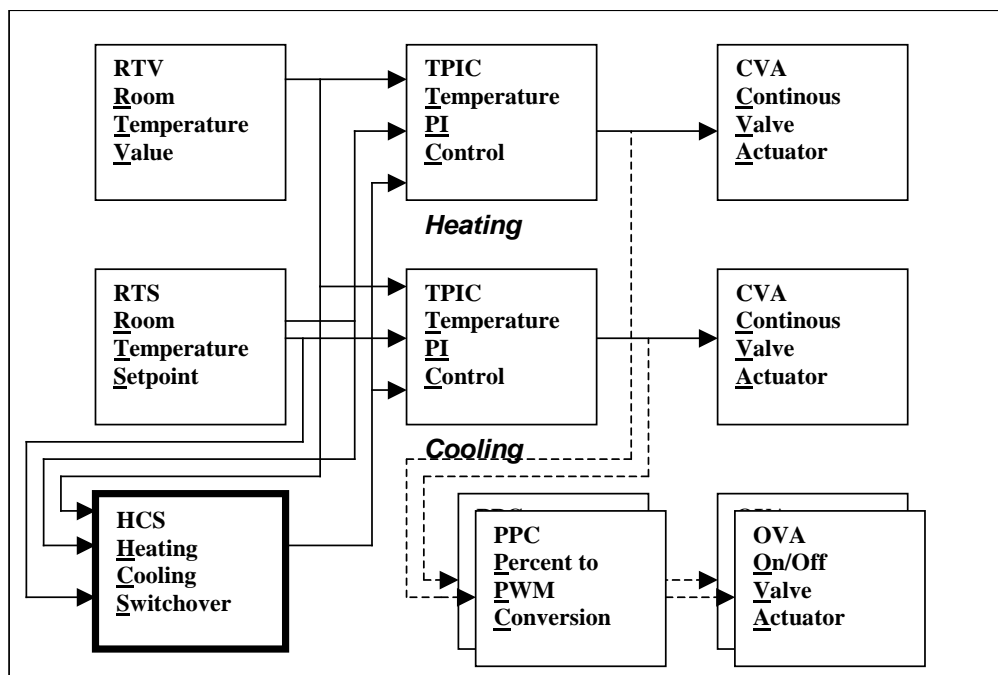with Heating and Cooling with ON/OFF Control**

**Figure 2 - Example for Individual Room Temperature Control
with Heating and Cooling with PI Control**

2 ObIS Function Model(s)

2.1 ObIS Function Model "Heating/Cooling Switchover"

2.1.1 Aims and objectives

This function generates the switchover signal for switching over from heating to cooling mode and reverse. This occurs depending on the present room temperature value and the present setpoints value for heating and cooling mode.

2.1.2 Functional specification

After restart the heating/cooling mode is switched to the parameterised default value. If the present room temperature value is lower than the present setpoint value for heating the heating /cooling mode is set to 1. If the present room temperature value is higher than the present setpoint value for cooling the heating /cooling mode is reset to 0.

2.1.3 Constraints

No constraints are defined for ObIS HCS.

2.1.4 Functional Block

Input(s)		Heating/Cooling Switchover		Output(s)	
Current Room Temperature Value	DPT 9.001 ---------	ARTV	HCM	See 3.1 ---------	Heating/cooling mode
Current Temperature Setpoint Value Heating	DPT 9.001 ---------	ATSVH	ATSV	DPT 9.001 -----------	Current Temperature Setpoint Value
Current Temperature Setpoint Value Cooling	DPT 9.001 ---------	ATSVC	TDSA	See 3.3 ---------	Temperature Difference Setpoint-Actual
Heating/Cooling Control	See 3.1 ---------	HCC			
Parameter(s)					
Heating/cooling Mode after Restart	See 3.1 ---------	HCMR			
Heating/cooling switchover by object / automatically	See 3.3 ---------	HCSOA			
HCM Transmit Condition	See 3.2 ---------	HCMTC			
Cycle Time Transmit HCM	See 3.2 ---------	CTHCM			

2.1.5   Properties

ID	Name	Abbr.	Description	Datapoint Type	M/O
1	**PID_OBJECT_TYPE**		Object Type	KNX_PropDataType	M

Input(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_SETPOINT_VALUE_ACTUAL_TEMERATURE_HEATING**	ATSVH	Actual Temperature Setpoint Value Heating	5.001	M
<tbd>	**PID_SETPOINT_VALUE_ACTUAL_ TEMERATURE_COOLING**	ATSVC	Actual Temperature Setpoint Value Cooling	5.001	M
<tbd>	**PID_ROOM_TEMPERATURE_VALUE_ ACTUAL**	ARTV	Actual Room_Temperature Value	5.001	M
<tbd>	**PID_CONTROL_HEATING_COOLING**	HCC	Heating Cooling Control	see 3.1	M

Output(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_MODE _HEATING_COOLING**	HCM	Heating Cooling Mode	see 3.1	M
<tbd>	**PID_SETPOINT_VALUE_ACTUAL**	ATSV	Actual Temperature Setpoint Value	5.001	O
<tbd>	**PID_DIFFERENCE_TEMPERATURE_ SETPOINT_ACTUAL**	TDSA	Temperature Difference Setpoint-Actual	see 3.3	O

Parameter(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_MODE_HEATING_COOLING_RESTART**	HCMR	Heating/cooling Mode after Restart	see 3.1	M
<tbd>	**PID_SWITCHOVER_HEATING_COOLING_OBJECT_AUTOMATIC**	HCSOA	Heating/cooling switchover by object/automatically	see 3.3	O
<tbd>	**PID_ MODE_HEATING_COOLING TRANSMIT_CONDITION**	HCMTC	Heating Cooling Mode Transmit Condition	see 3.2	O
<tbd>	**PID_MODE_HEATING_COOLING _TRANSMIT_CYCLE**	CTHCM	Cycle Time Transmit Heating Cooling Mode	see 3.2	O

2.1.5.1   Property PID_SETPOINT_VALUE_ACTUAL_ TEMPERATURE_HEATING
                                                                    ATSVH

Unit:	°C
Range:	min. 5 … 30
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 10/day
Description:	This Group Object contains the current value of the room temperature setpoint for heating.

2.1.5.2 Property PID_SETPOINT_VALUE_ACTUAL_TEMPERATURE_COOLING
ATSVC

Unit:	°C
Range:	min. 20 … 35
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 10/day
Description:	This Group Object contains the actual value of the room temperature setpoint for cooling.

2.1.5.3 Property PID_ROOM TEMPERATURE_VALUE_ACTUAL   ARTV

Unit:	°C
Range:	min. 5 … 35
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	> 10/day
Description:	This Group Object contains the current room temperature value.

2.1.5.4 Property PID_CONTROL_HEATING_COOLING   HCC

Unit:	-
Range:	0;1
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	> 1/day
Description:	HCC is used for an external switchover of the output HCM (Heating/cooling mode) if the parameter HCSOA (Heating cooling switchover by object/automatically) is set to „1" = object (Coding of HCC see 3.1).

2.1.5.5 Property PID_MODE _HEATING_COOLING   HCM

Unit:	-
Range:	0,1
Default Value:	see parameter
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	< 10/day
Description:	After restart the heating/cooling mode is switched to the parameterised default value.

Depending on the parameter HCSOA, HCM is controlled by the object HCC or automatically:

If the present room temperature value is lower than the present setpoint value for heating the heating /cooling mode is set to 1. If the present room temperature value is higher than the present setpoint value for cooling the heating /cooling mode is reset to 0.

2.1.5.6 Property PID_SETPOINT_VALUE_ACTUAL   ATSV

Unit:	°C
Range:	-
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	> 1/day
Description:	This Group Object contains the actual value of the room temperature setpoint (e. g. for display).

2.1.5.7 Property PID_DIFFERENCE_TEMPERATURE_SETPOINT_ACTUAL TDSA

Unit:	0,1 K
Range:	-128..127
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	> 1/day
Description:	This Group Object contains the difference between the setpoint value of the room temperature (ATSV) and the actual value of the room temperature (ARTV).

calculation: TDSA = ATSV - ARTV

2.1.5.8 Property PID_MODE_HEATING_COOLING_RESTART   HCMR

Unit:	-
Range:	0,1
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter serves as default value for the heating cooling mode after restart.

2.1.5.9 Property PID_SWITCHOVER_HEATING_COOLING_OBJECT_AUTOMATIC HCSOA

Unit:	-
Range:	0,1
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter is used to define whether HCM is controlled by the object HCC or automatically.

2.1.5.10 Property PID_MODE_HEATING_COOLING_TRANSMIT_CONDITION HCMTC

Unit:	-
Range:	0 = only on change of output
	1 = always on change of at least 1 input
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The heating cooling mode will be transmitted automatically if either the output value has changed or if at least one of the inputs has changed. In the second case the HCM will be transmitted even if it was not changed.

2.1.5.11 Property PID_ MODE_HEATING_COOLING_TRANSMIT_CYCLE CTHCM

Unit:	minutes ("0" = no transmission)
Range:	0; 15 … 60 minutes
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The heating cooling mode will be transmitted cyclically after the given cycle time. It will not be transmitted cyclically if the cycle time is set to "0".

3 Datapoint Types

3.1 Datapoint Type "Boolean"

Format:	1 bit		
	V		
Encoding:	See below		
Range:	V = {0,1}		
Unit:	-		

Datapoint Types			
Code:	Symbol:	Encoding: V = 0	V = 1
<tbd>	HCM, HCC, HCMR	Cooling	Heating
<tbd>	HCSOA	automatically	by object
<tbd>	HCMTC	Only on change of outputs	Always on change of at least one input

3.2 Datatype "8-bit unsigned multiplier with special function for zero"

Format:	1 byte			
	VVVVVVVV			
Encoding:	See below			
Range:	V = [0…255] binary encoded			
Unit:	See below			

Datapoint Types				
Code:	Symbol:	Encoding:	Range:	Unit:
<tbd>	CTHCM	"time"	1…255 0 = corresponding function disabled	1 min

3.3 Datatype "8-bit signed integer"

Format:	1 byte			
	VVVVVVVV			
Encoding:	See below			
Range:	V = [-128 … 127] binary encoded			
Unit:	See below			

Datapoint Types				
Code:	Symbol:	Encoding:	Range:	Unit:
5.020	DPT_TempHVACRel8	"temperature"	-128…127	0.1 K

This Datapoint Type shall only be used for the encoding of parameters. It shall not be used for the encoding of any temperature value (real temperatures, shift values, offset values …) that are transmitted on the bus using group communication.