Application Descriptions

HVAC ObIS

Continuous Valve Actuator

Summary

This object is used to control continuous actuating valve positioners e.g. for hot water heating radiators.

Version 01.00.01 is a KNX Approved Standard.

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

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Document updates

Version	Date	Modifications
1.0	2002.04.03	Editorially restyled: based on " 18-01_ObIS_OVA.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

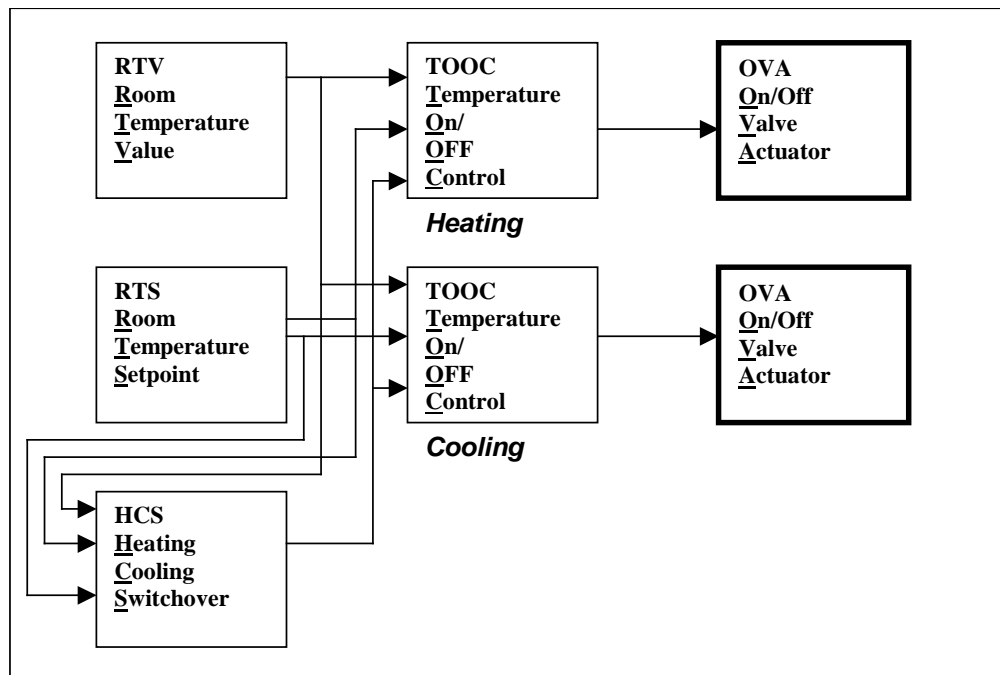# 1 Proposed Application Model(s)

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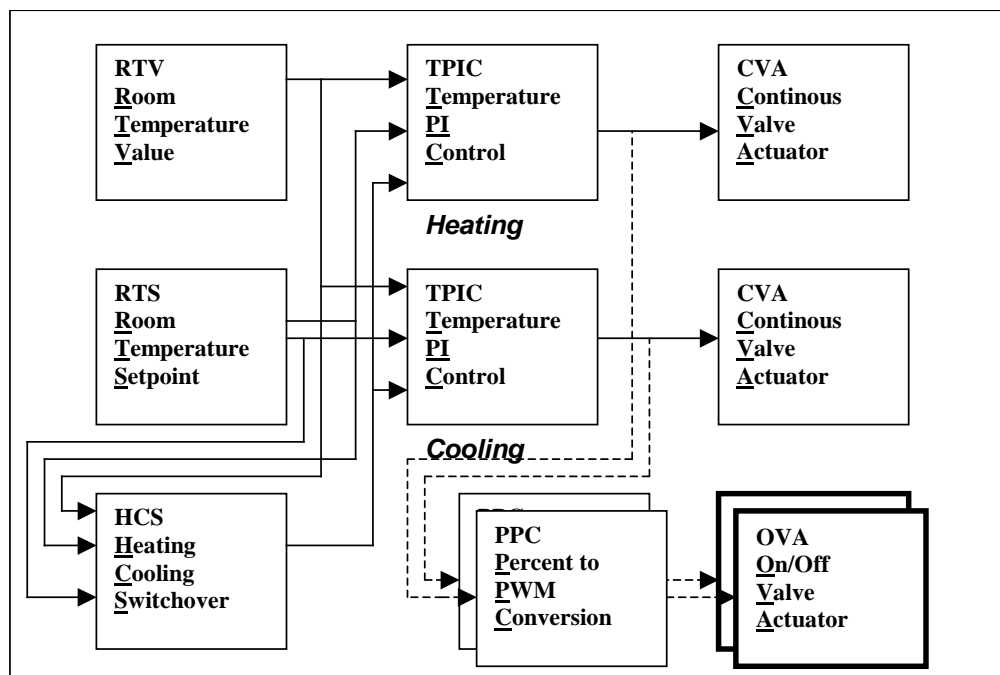with Heating and Cooling with ON/OFF Control**

**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 "Continuous Valve Actuator"

2.1.1 Aims and objectives

This object is used to control continuous actuating valve positioners e.g. for hot water heating radiators.

2.1.2 Functional specification

This ObIS controls the position of a valve positioner depending on the input signal „Continuous Actuating Value " (%) and under consideration of the optional inputs „Manual Override Enable", „Manual Override Value" „Forced Position Enable " and „Forced Position". The CVA status information and the „Position Status" are optional outputs.

2.1.3 Constraints

No constraints are defined for the ObIS Continuous Valve Actuator.

2.1.4 Functional Block

Input(s)					Output(s)	
		Continuous Valve Actuator				
	5.001			5.001		
Continuous Actuating Value	-------	CAV	PS	--------	Position Status	
	See 3.1			See 3.2		
Manual Override Enable	-------	MOE	CVAS	--------	CVA Status	
	5.001					
Manual Override Value	-------	MOV				
	See 3.1					
Forced Position Enable	-------	FPE				
Parameter(s)						
	See 3.1					
Position of deenergiezed Valve	---------	PDV				
	5.001					
Min Actuating Value	---------	MINAV				
	5.001					
Max Actuating Value	---------	MAXAV				
	5.001					
Actuating Value at Timeout	--------	AVT				
	See 3.3					
Timeout Period	--------	TP				
	5.001					
Forced Position Value	--------	FPV				
	See 3.3					
Period for valve Protection	--------	PVP				
Transmit CVA Status on Change Enable	1.003 --------	TCVASC				
Transmit Cycle Time CVA Status	See 3.3 --------	TCTCVA				
Delta Transmit Position Status	See 3.3 --------	DTPS				
Transmit Cycle Time Position Status	See 3.3 ---------	TCTPS				

2.1.4.1 Priority of the inputs

The value that is used for positioning is controlled by the Inputs "Manual Override Enable" and "Forced Position Enable". The priority of these Inputs is shown in the table below.

Table 1 – Priority rules for the ObIS CVA

Manual Override Enable MOE	Forced Position Enable FPE	Used value for positioning
0	0	Continuous Actuating Value CAV
0	1	Forced Position Value FPV
1	0	Manual Override Value MOV
1	1	Manual Override Value MOV

2.1.5   Properties

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

Input(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_VALUE_ACTUATING_-CONTINOUS**	CAV	Continuous Actuating Value	5.001	M
<tbd>	**PID_OVERRIDE_MANUAL_ENABLE**	MOE	Manual Override Enable	See 3.1	O
<tbd>	**PID_OVERRIDE_ VALUE_MANUAL**	MOV	Manual Override Value	5.001	O
<tbd>	**PID_POSITION_FORCED_ENABLE**	FPE	Forced Position Enable	See 3.1	O

Output(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_STATUS_POSITION**	PS	Position Status	5.001	O
<tbd>	**PID_STATUS_CVA**	CVAS	CVA Status	See 3.2	O

Parameter(s)

ID	Name	Abbr.	Description	Datapoint Type	M/O
<tbd>	**PID_POSITION_VALVE_-DEENERGIZED**	PDV	Position of deenergized valve	See 3.1	O
<tbd>	**PID_VALUE_ACTUATING_MINIMUM**	MINAV	Minimum Actuating Value	5.001	O
<tbd>	**PID_VALUE_ACTUATING_MAXIMUM**	MAXAV	Maximum Actuating Value	5.001	O
<tbd>	**PID_PERIOD_TIMEOUT**	TP	Timeout Period	See 3.3	O
<tbd>	**PID_VALUE_ACTUATING_TIMEOUT**	AVT	Actuating Value at Timeout	5.001	O
<tbd>	**PID_VALUE_POSITION_FORCED**	FPV	Forced Position Value	5.001	O
<tbd>	**PID_PERIOD_PROTECTION_VALVE**	PVP	Period for Valve Protection	See 3.3	O
<tbd>	**PID_TRANSMIT_CHANGE_CVA_-STATUS**	TCVASC	Transmit CVA Status Change Enable	1.003	O
<tbd>	**PID_CYCLE_TIME_TRANSMIT_CVA_STATUS**	TCTCVA	CVA Status Transmit Cycle Time	See 3.3	O
<tbd>	**PID_TRANSMIT_DELTA_STATUS_POSTION**	DTPS	Delta Transmit Position Status	See 3.3	O
<tbd>	**PID_ CYCLE_TIME_TRANSMIT_ STATUS_POSITION**	TCTPS	Position Status Transmit Cycle Time	See 3.3	O

2.1.5.1 Property PID_VALUE_ACTUATING_CONTINOUS   CAV

Unit:	%
Range:	0 … 100
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	>> 10/day

Description: This value is the positioning input value in percent.

2.1.5.2 Property PID_OVERRIDE_MANUAL_ENABLE   MOE

Unit	-
Range:	0,1
Default Value:	0
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day
Description:	This object serves to switch over from automatic mode (0) to manual mode (1). In manual mode the input Manual Override Value MOV is used for positioning instead of the „Continuous Actuating Value" CAV. See 3.1

2.1.5.3 Property PID_OVERRIDE_VALUE_MANUAL   MOV

Unit	%
Range:	0 .. 100
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day
Description:	If the Manual Override Enable is set (MOE = 1) the „Manual Override Value" MOV is used for positioning instead of the „Continuous Actuating Value" CAV

2.1.5.4 Property PID_POSITION_FORCED_ENABLE   FPE

Unit:	-
Range:	0,1
Default Value:	0
Communication Object/Parameter:	C
Input/Output:	I
R/W Rate	< 1/day
Description:	This communication object is used to force the valve positioner to the pre-programmed „Forced Position Value" FPV.

2.1.5.5 Property PID_STATUS_POSITION   PS

Unit:	%
Range:	0..100
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	>> 10/day
Description:	This object contains the actual value of the valve positioner.

2.1.5.6 Property PID_STATUS_CVA   CVAS

Unit:	-
Range:	(coding: see 3.2)
Default Value:	-
Communication Object/Parameter:	C
Input/Output:	O
R/W Rate	>> 10/day
Description:	CVA status (coding: see 3.2) is an optional communication object which is read only.

2.1.5.7 Property PID_POSITION_VALVE_DEENERGIZED PDV

Unit:	-
Range:	0,1
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the direction of control action of the valve positioner. The parameter must be set to „0" if the valve is deenergized closed. It must be set to „1" if the valve is deenergized open.

2.1.5.8 Property PID_VALUE_ACTUATING_MINIMUM MINAV

Unit:	%
Range:	min 0 ... 50
Default Value:	0
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	If the actuating value is less than MINAV the valve positioner either remains to position „0 %".or goes to position „0 %". This parameter is used to adapt the valve positioner to the valve.

2.1.5.9 Property PID_VALUE_ACTUATING_MAXIMUM MAXAV

Unit:	%
Range:	min 51 ... 100
Default Value:	100
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	If the actuating value is greater than MAXAV the connected valve either remains to position „100%".or goes to position „100%". This parameter is used to adapt the valve positioner to the valve.

2.1.5.10 Property PID_PERIOD_TIMEOUT TP

Unit:	min
Range:	0; 1 ... 60
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	This parameter defines the time during which at least one actuating value must have been received; else AVT is used instead of CAV

2.1.5.11 Property PID_VALUE_ACTUATING_TIMEOUT   AVT

Unit: %
Range: 0 ... 100
Default Value: free
Communication Object/Parameter: P
Input/Output: R/W
R/W Rate   << 1/day
Description: This parameter is used as actuating value if no „Continuous Actuating
                 Value" CAV has been received during the timeout period.

2.1.5.12 Property PID_VALUE_POSITION_FORCED   FPV

Unit: %
Range: 0 ... 100
Default Value: free
Communication Object/Parameter: P
Input/Output: R/W
R/W Rate   << 1/day
Description: This parameter is used as actuating value if the „Forced Position Enable"
                 FPE object is set.

2.1.5.13 Property PID_PERIOD_PROTECTION_VALVE   PVP

Unit: d
Range: 0; 1 ... 7
Default Value: free
Communication Object/Parameter: P
Input/Output: R/W
R/W Rate   << 1/day
Description: This parameter defines the time during which at least two different ac-
                 tuating value must have been received; otherwise the valve protection will
                 be activated It will not be activated if PVP is set to "0".

2.1.5.14 Property PID_TRANSMIT_CHANGE_CVA_STATUS   TCVASC

Unit: -
Range: 0,1
Default Value: free
Communication Object/Parameter: P
Input/Output: R/W
R/W Rate   << 1/day
Description: This parameter defines whether the „CVA Status" CVAS is transmitted on
                 change or not.

2.1.5.15 Property PID_CYCLE_TIME_TRANSMIT_CVA_STATUS   TCTCVA

Unit: min.
Range: 0; 15 ... 60
Default Value: free
Communication Object/Parameter: P
Input/Output: R/W
R/W Rate   << 1/day
Description: The CVA Status will be transmitted cyclically after the given cycle time. It
                 will not be transmitted cyclically if the cycle time is set to "0".

2.1.5.16 Property PID_TRANSMIT_DELTA_STATUS_POSITION   DTPS

Unit:	%
Range:	0..25
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The „Position Status" PS will be transmitted automatically if the difference between the last transmitted PS and the current PS is greater than the given delta value. It will not be transmitted automatically if the DTPS is set to "0".

2.1.5.17 Property PID_ CYCLE_TIME_TRANSMIT_STATUS_POSITION   CTPS

Unit:	min.
Range:	0; 15 ... 60
Default Value:	free
Communication Object/Parameter:	P
Input/Output:	R/W
R/W Rate	<< 1/day
Description:	The „Position Status" PS 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 Type(s)

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
1.003	FPE (Forced Position_Enable)	disable	enable
1.003	MOE (Manual_ Overide_Enable)	disable	enable
1.009	PDV Position of Deenergized Valve	closed	open
1.003	TCVASC Transmit_On_ Change_Enable	disable	enable

3.2 Datapoint Type "CVA Status"

Format:	1 octet	
	000EDCBA	
Encoding:	See below	
Range:	A ...H = {0,1}	
Unit:	-	
Datapoint Types		
Code:	Symbol:	Encoding:
<tbd>	<tbd>	A : 0 = automatic; 1 = manual B: 0 = unforced position; 1 =forced position C: 1 = timeout actuating value active D: 1= malfunction of the valve positioner E: 0= Valve closed 1 = not closed

3.3   Datapoint Type "8-bit unsigned multiplier with special function for zero"

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

Datapoint Types

Code:	Symbol:	Encoding:	Range:	Unit:
<tbd>	<tbd>	"time"	1…255 0 = corresponding function disabled	1 min
<tbd>	<tbd>	„time for valve protection"	1…255 0 = corresponding function disabled	1 d
<tbd>	<tbd>	percent	1..100 0 = corresponding function disabled	%