12 A1 Valve Actuator 510E01

Application program usage

product family:	Valve actuators
Product type:	Constant valve actuator
Manufacturer:	Siemens
Name:	Valve actuator AP 562/02
Order-No.:	5WG1 562-7AB02

Commissioning

For commissioning an valve actuator AP562/02 with ETS (Engineering Tool Software) the device only has to be mounted on a valve and connected via the included bus connection block to the KNX bus line. The power supply results from the bus voltage. The connection to the KNX bus line is realized via the bus coupling unit, which is integrated in the device.

After opening the cover of the housing by using the enclosed special key the learning button, the learning LED and the dismantling lever of the valve actuator are visible.

1. Functional description

1.1 General

The valve actuator AP 562/02 is a constantly acting valve actuator, i.e. any valve position between two limit values (0-100%), which can be parameterized, can be reached. The valve adjustment works proportional by an electromotive drive. It is suitable for installation on radiator or zone valves from different manufacturers.

The valve actuator is used in combination with an KNX room temperature controller (RTC), which transmits as actuating value a set command as 1-Byte-object (0-100%). The current valve position is displayed constantly by five LED´s on the front side of the device.

The device comes with two separate binary inputs located at the connection cable, which can be used as a window contact and a presence contact.

The device is supplied with power coming from the bus line and is equipped with an integrated bus coupling unit. The connection to the KNX bus line is realized directly via the enclosed bus connection block at the connection cable.

1.2 Behavior on bus voltage loss and bus voltage recovery

Behavior on bus voltage loss

On bus voltage loss happens no action by the valve actuator.

Behavior on bus voltage recovery

After bus voltage recovery an automatic adjustment (see there) will be carried out.

1.3 Valve adjustment

1.3.1 Automatic adjustment

The valve actuator is adjusting automatically to the respective valve, because the stroke between the two limit values 0% (valve completely closed) and 100% (valve completely opened) can be different regarding the used valve. This automatic adjustment will be carried out after the first connection of the bus voltage, after every download of the application and after a bus voltage recovery after a bus voltage loss.

During this procedure, which can last a couple of minutes, one of the three lower LED´s is flashing respectively:

- lowest LED blinks: spindle is moving back completely.

- second down LED blinks: spindle is moving out until the valve tappet is touched (100% position), after that the spindle will be moved out until the seal is pressed into the valve seat (0% position).
- third down LED blinks: internal calculation procedure.
- After finishing the adjustment procedure only the second down LED is on constantly.

Both limit positions are saved and will remain also in case of bus voltage loss. They are used as fixed reference points for the proportional positioning of the valve. As this before saved values will be deleted after the download of the application, in this case the adjustment will be carried out minimum two times (plausibility check). The adjustment will be repeated as long as two successive value pairs are plausible.
The actual valve position can be parameterized in 10%-steps regarding the valve specific mass flow. (see parameter" valve characteristic curve").
The valve actuator is measuring automatically the valve periodically, in order to compensate changes of the valve characteristics, which can appear over the time caused by the aging of the valve seal.

NOTE: If an already adapted valve actuator will be mounted on a different valve, the adjustment procedure has to be carried out once again by downloading the application.
Resulting from the multiplicity of different valve types it can happen, that despite of the finished adjustment procedure the valve will not be completely closed in the position „0%". An additional pressing can be set by parameters.

1.3.2 Construction site mode

As long as no application is downloaded (factory setting) the valve actuator changes after finishing the adjustment procedure automatically to the construction site mode. Therefore the valve position is set to 25%, that means the valve will be opened 25% in order to avoid the freezing of the radiator. So the valve actuator can be used directly after mounting and connection to the bus voltage.

NOTE: This status lasts as long as an application is downloaded and the first actuating value from the RTC is received.
After downloading the application the first time this construction site mode will be deactivated definitely, that means, after bus voltage recovery or downloading an application once more the valve remains as long in the 0% position (valve closed) as an actuating value > 0% is received. In order to avoid the freezing of the radiators it is recommended to set the RTC to „sending periodically the actuating value" and to activate the function „cyclical transmission of valve position" at the valve actuator. So it is secured, that after a certain time the valve will be opened again.

1.3.3 Valve protection mode

The valve actuator comes with a valve protection mode, which can be activated optional. This function avoids a blocking of the valve, if it has not moved over a longer period of time (e.g. summer mode).
The valve protection mode is activated every time, if the valve position has not been changed during 7 days. Thereby the valve will be completely opened and closed one time.

NOTE: This procedure will not be displayed by the LED´s on the front side of the device.

1.3.4 Forced mode

The valve actuator can be driven by an object to a parameterizable valve position (forced mode), which should be reached for example in the mode frost protection of the RTC, while a window is opened or at failure of the actuating value.

NOTE: While the forced mode is activated, all received actuating values will be ignored. Is the forced position of the valve parameterized to 0% (factory setting) or near 0%, the freezing of the radiators can happen, if the window is opened for a long time and the outside temperatures are deep. Avoiding this, the forced position should be set to a value > 0%.

1.3.5 Maximum actuating value limitation

The valve actuator stroke can be limited by defined minimum and maximum actuating values (in % of the valve stroke). This is because at the most valves the mass flow does not vary anymore between 60% and 100% position, that means, that from the 60% position on the mass flow is already 100%. By setting a maximum actuating value the frequency of the valve adjustments can be reduced.
With lower actuating values some valves generate an annoying noise because of the reduced valve section. This can be avoided by setting a minimum actuating

value, whose value is higher than that, at which this behavior appears.
The minimum and the maximum actuating value as well as the behavior in this cases are parameterizable.

1.3.6 Adaption to valve characteristics

The valve actuator can be adapted to various valve types, in order to secure an optimized operation. Hence the mode of operation of the installed valve (normal or inverted), the type of valve seal (hard to soft), an additional pressing of the seal and the specific characteristic curve of the valve can be changed.

1.4 Communicative functions

1.4.1 Monitoring of actuating value

The valve actuator can monitor within a parameterized time value the reception of actuating value telegrams, which are transmitted cyclical by the RTC. this is reasonable in order to monitor the function of the RTC and therefore to avoid damages caused by frost, if the last transmitted actuating value was 0%.
If a failure of the actuating value happens, the valve actuator can drive to a defined valve position (>0% = emergency mode) and/or transmit the status of the monitoring of the actuating value via the KNX bus for example to the building control center or to a visualization or display. The emergency mode will be stopped as soon as a new actuating value from the RTC is received.

NOTE: For using this function the RTC must be parameterized to cyclical transmission of the actuating value.

1.4.2 Determination of the maximum actuating value

The valve actuator can influence directly the power output of the heating boiler within a plant via a communication object. If for example the valve actuator is opened just a little bit, thus the energy demand is small, it can be reasonable to reduce the power output of the heating boiler. Therefore the valve actuator will transmit the current energy demand, which will be evaluated regarding the current actuating value, to the heating boiler.
Because within a plant normally are installed several valve actuators, it must be evaluated from all valve actuators this certain actuating value, which is the biggest one and should be transmitted to the heating boiler finally.

This comparison between the actuating values works with a separate communication object.
The actuating values will be compared between all involved devices (valve actuators and heating boiler) periodically. Only if the received actuating value is smaller than its own, the valve actuator sends its own current actuating value. If this case appears for several actuators at the same time, only the biggest one will be transmitted.
Therefore one device of the plant (valve actuator or heating boiler) has to be defined, which transmits periodically its own current actuating value to the rest of the involved devices.

NOTE: It has to be secured, that only one device within the plant is parameterized as sending periodically. All others must be parameterized in that way, that they will only send, if the own actuating value is bigger. If the heating boiler is defined as sending periodically, the value of the object “maximum position” has to be set 0%.

1.5 Binary inputs

The valve actuator comes with an external interface, which consist of the two binary inputs E1 and E2. Those are lead through the device by the connection cable and can be used as potential free contacts.

1.5.1 Binary input window contact “E1”

This potential free contact provides a window contact and sends the current status periodically or if the status changes as a 1-bit object, which can be evaluated from further bus devices and can be used e.g. for changing the operating mode (forced mode/frost protection mode/comfort mode). It is possible to use normally closed (NCC) contacts as well as normally opened contacts (NOC).
The status object also can be linked directly with the object forced position from the valve actuator and provides the opportunity to realize a simple solution for closing the valve during opening the window without the help of a RTC.

NOTE: If the window contact effects a complete or almost complete closing of the valve, whilst the window is opened, a long opening period of the window can cause the freezing of the radiator.

1.5.2 Binary input presence contact „E2“

This potential free contact provides a presence contact and sends the current status periodically or if the status changes as a 1-bit object, which can be evaluated from further bus devices and can be used e.g. for changing the operating mode (forced mode/frost protection mode/comfort mode). It is possible to use normally closed (NCC) contacts as well as normally opened contacts (NOC).

If for example in a room the set temperature is reduced because of the current operation mode standby or frost protection, a change to the operation mode comfort (=set temperature will be raised) can be realized locally by a conventional pushbutton.

NOTE: For to secure a return to the former operation mode, the status should be sent cyclical. By setting the parameter to “every 60 min” the then current status (=0, pushbutton not pressed) will be sent after 60 min once again and causes by a “0” on the object of the RTC a return in the respective operation mode.

2. Communication objects and parameters

2.1 Communication objects

Number	Name	Object Function	Length
0	actuating value	Drive to position	1 Byte
1	Forced position	Drive to forced position	1 bit
2	actual valve position	indicate actual valve position	1 Byte
3	Maximum position	Determine maximum position	1 Byte
4	Summer mode	Close valve in summer	1 bit
5	Window contact	indicate state of window contact	1 bit
6	Presence contact	indicate state of presence contact	1 bit
7	Failure of actuating value	signal failure of actuating value	1 bit

Obj	Object name	Object Function	Type	Flags
0	actuating value	Drive to position	1 Byte	CRW
Via this object the set actuating value (0...100%) is received from the RTC and the respective valve position will be approached.				
1	Forced position	Drive to forced position	1 bit	CRW
If an “1” is sent on this object, the valve will be driven to the before parameterized position for the forced mode. The valve lasts as long in this position as a “0 “ will be sent on this object, that means the forced mode is canceled again. After this that position, which was saved before turning to the forced mode, will be approached and will be changed not until another actuating value is received, which is different to that one valid before turning to the forced mode.				
2	actual valve position	indicate actual valve position	1 Byte	CRT
This object sends the current actual valve position (0...100%) on the KNX bus. The frequency can parameterized in subject to the percentile position change. This function is not necessary for the normal operation and will be used mainly for diagnostic reasons and for error search.				
3	Maximum position	Determine maximum position	1 Byte	CRWT
This object provides – according to the parameterization – the following functionalities: • Receiving the actual actuating value (0...100%) of the other valve actuators or the heating boiler, which have the same group address, comparison of the own actuating value with those and sending the own actuating value on this object, if it is higher than the others. • Sending the own actuating value to the other valve actuators in order to initiate this comparison.				

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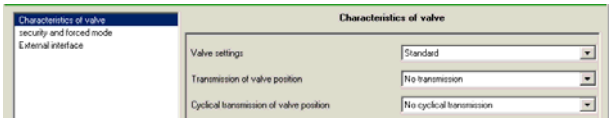
Obj	Object name	Object Function	Type	Flags
4	Summer mode	Close valve in summer	1 bit	CRW
If an "1" is sent on this object, the summer mode will be activated und the valve remains closed (actuating value 0%). the valve will remain as long in this position "0%" as a "0" will be sent on this object. During the whole period the actuating values will be ignored. After this it will be driven to that actuating value, which was sent before or during the summer mode. This position will be changed earliest, if another actuating value will be received as that one, which was valid before the summer mode.				
5	Window contact	indicate state of window contact	1 bit	CRT
This object sends the status of the binary input window contact "E1", if used. The status can be sent out at changing or periodically. If this object will be linked with the object "1 Forced position" in a group address, the actuator will drive the valve by receiving an "1" in the defined forced position. This object is only available, if the window contact E1 has been activated at the parameter page „External interface".				
6	Presence contact	indicate state of presence contact	1 bit	CRT
This object sends the status of the binary input presence contact "E2", if used. The status can be sent out at changing or periodically. This object can be linked e.g. with the object "comfort mode" of the RTC in a group address and can effect a extension of the operation mode "comfort". This object is only available, if the presence contact E2 has been activated at the parameter page „External interface".				
7	Failure of actuating value	signal failure of actuating value	1 bit	CRT
This object sends an alarm telegram , if during a defined period of time no new actuating value is received from the RTC. Further an actuating value can be defined by parameters, which should be approached in case of failure of actuating value. This object is only available, if the parameter "monitoring of actuating value" has been activated.				

2.2 Parameter

2.2.1 Characteristics of valve



Parameter	Setting
Valve settings	**Standard** User defined
For adjusting the valve actuator to the installed valve. • Standard: for common valves and applications. • User defined: provides enhanced adjustment possibilities. If this setting is chosen also the respective parameter page appears.	
Transmission of valve position	• **No transmission** • at change of 1% • at change of 2% • at change of 3% • at change of 5% • at change of 7% • at change of 10% • at change of 15%
This function is not necessary for normal operation. It will be used mainly for diagnostic reasons and for error search. • No transmission: the current valve position only will be sent, if the position adjustment is finished. • at change of x%: the current valve position will be sent, if it differs from the last sent value from a value of x% on. When the defined actuating value is reached, the valve position is sent as well, even if the chosen change is not reached from the last actuating value telegram on. NOTE: If really no sending of the valve position should be executed, this object may not be linked with a group address.	
Cyclical transmission of valve position	• **No cyclical transmission** • every 2 min • every 3 min • every 5 min • every 10 min • every 15 min • every 20 min • every 30 min • every 45 min • every 60 min
With this parameter can be defined, if and how often the current valve position/actuating value should be sent. • No cyclical transmission: the valve position will not be sent. • every x min: the valve position will be sent at intervals of x min.	

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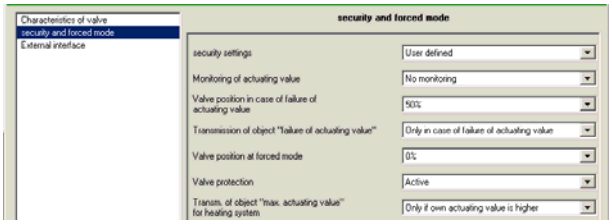
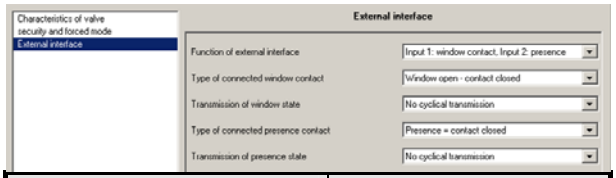
2.2.2 Security and forced mode



Parameter	Setting
security settings	• **Standard** • User defined
• Standard: no security settings possible. • User defined: If this option is chosen, more parameters for monitoring of the actuating value and valve protection are available.	
Monitoring of the actuating value	• **No monitoring** • 5 min • 10 min • 15 min • 20 min • 30 min • 45 min • 60 min
Only visible at setting "User defined". With this parameter can be set, if and during which intervals the reception of actuating values from the room temperature controller should be monitored. • No monitoring: no monitoring of the reception of actuating values. • x min: period of time, after that a actuating value is expected. Recommended setting: 2x cycles time, within the RTC sends an actuating value. Therefore the RTC has to be parameterized to cyclical sending of the actuating value.	
Valve position in case of failure of actuating value	• 0% • 10% • 20% • 30% • 40% • **50%** • 60% • 70% • 80% • 90% • 100%
Only visible at setting "User defined". With this parameter will be defined that valve position, to which the valve should be driven in case of failure of actuating value (emergency mode). As soon as a new actuating value from the RTC is received, that position will be approached.	

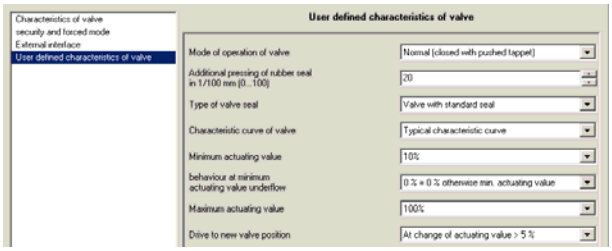
Parameter	Setting
Transmission of object "failure of actuating value"	• Always after a monitoring period has passed • **Only in case of failure of actuating value**
Only visible at setting "User defined". With this parameter will be defined, when the status object should be sent. • Always after a monitoring period has passed: periodically sending of the status, value „0" while normal operation, value „1" while emergency mode • Only in case of failure of actuating value: sending value „1", if the emergency mode is activated.	
Valve position at forced mode	• **0%** • 10% • 20% • 30% • 40% • 50% • 60% • 70% • 80% • 90% • 100%
With this parameter that valve position will be defined, which one the valve should approach if the object "forced mode" is activated.	
Valve protection	• Inactive • **Active**
Only visible at setting "User defined". With this parameter the function valve protection will be activated. • Inactive: function valve protection will not be executed. • Active: the valve will be opened and closed completely once, if the valve position has not been changed within 7 days.	
Transm. of object "max. actuating value" for heating system	• **Only if own actuating value is higher** • every 2 min • every 3 min • every 5 min • every 10 min • every 15 min • every 20 min • every 30 min • every 45 min • every 60 min
With this parameter will be set, when with the object "max. actuating value" the own actual actuating value should be sent. • Only if own actuating value is higher: has to be chosen for all valve actuators and the heating boiler within a plant, except one. • every x min: has to be chosen for one device (valve actuator or heating boiler) of the plant. Defines the periods of time, within this device should initiate periodically the comparison of actuating values by sending the own actuating value.	

2.2.3 External interface



Parameter	Setting
Function of external interface	• **None** • input 1: window contact, input 2: none • input 1: window contact, input 2: presence
With this parameter will be chosen, which one of the two interfaces "E1" and "E2" will be used. → The following parameters are only visible, if the respective option for the interface has been chosen.	
Type of connected window contact	• **window open – contact closed** • window open – contact open
With this parameter will be chosen, if a normally closed (NCC) contact or a normally opened contact (NOC) will be used as window contact.	
Transmission of window state	• **No cyclical transmission** • **every 2 min** • **every 3 min** • **every 5 min** • **every 10 min** • **every 15 min** • **every 20 min** • **every 30 min** • **every 45 min** • **every 60 min**
With this parameter will be chosen, if and how often the status object of the connected window contact will be sent. • No cyclical transmission: sending only at change of status • every x min.: sending all x min.	
Type of connected presence contact	• **presence = contact closed** • presence = contact open
With this parameter will be chosen, if a normally closed (NCC) contact or a normally opened contact (NOC) will be used as presence contact.	
Transmission of window state	• **No cyclical transmission** • every 2 min • every 3 min • every 5 min • every 10 min • every 15 min • every 20 min • every 30 min • every 45 min • every 60 min
With this parameter will be chosen, if and how often the status object of the connected presence contact will be sent. • No cyclical transmission: sending only at change of status • every x min.: Sending all x min.	

2.2.4 User defined characteristics of valve



NOTE: This parameter page is only visible, if at the parameter page „Characteristics of valve" at „valve settings" the option „user defined" has been chosen.

Parameter	Setting
Mode of operation of valve	• **Normal (closed with pushed tappet)** • Inverted (open with pushed tappet)
With this parameter will be chosen, in which mode of operation the installed valve and therefore the valve actuator works. • Normal: suitable setting for all common valves. • Inverted: Setting for adaption to inverted valves.	
Additional pressing of rubber seal in 1/100 mm (0...100)	• **20**
With this parameter will be chosen, in which way the automatic adjustment will be executed respectively which additional pressing should be carried out. Depending on the installed valve, an optimized adaption can be carried out by the 3 different modes of adjustment. • 0...79: Mode of automatic adjustment: „start and end limit point via position". The start limit point and the end limit point will be evaluated by a measurement at the valve. The set parameter value effects an additional pressing of the rubber seal in excess of the measured end limit point in 1/100 mm. This can be necessary, if the valve is not yet sealed in the evaluated end limit point because of the condition of the seal. value „1" represents 1/100 mm value „10" represents 0,1 mm value „20" represents 0,2 mm etc. NOTE: In order to avoid a damage of the seal, the value should be raised in steps of maximum 10 (representing 1/10 mm). • 80: Mode of the automatic adjustment: "start limit point by position, end limit point by force": The start limit point will be evaluated by a measurement at the valve. The end limit point will be evaluated by closing the valve with a defined force of 100N during each positioning once again. There is no additional pressing effected in excess of this evaluated point.	

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Parameter	Setting
• 90: Mode of the automatic adjustment: "start limit point by position, end limit point by force": The start limit point will be evaluated by a measurement at the valve. The end limit point will be evaluated by closing the valve with a defined force of 120N during each positioning once again. There is no additional pressing effected in excess of this evaluated point. • 81...86: Mode of the automatic adjustment: "end limit point by force, start limit point by a fixed setting of the stroke": The end limit point during will be evaluated by closing the valve with a defined force during each positioning once again. The start limit point will be evaluated by a fixed setting of the stroke, calculated from the referring evaluated end position point. There is no additional pressing effected in excess of the evaluated end point. Value „81" represents 100N closing pressure and 1 mm stroke Value „82" represents 100N closing pressure and 2 mm stroke Value „83" represents 100N closing pressure and 3 mm stroke Value „84" represents 100N closing pressure and 4 mm stroke Value „85" represents 100N closing pressure and 5 mm stroke Value „86" represents 100N closing pressure and 6 mm stroke Value „91" represents 120N closing pressure and 1 mm stroke Value „92" represents 120N closing pressure and 2 mm stroke Value „93" represents 120N closing pressure and 3 mm stroke Value „94" represents 120N closing pressure and 4 mm stroke Value „95" represents 120N closing pressure and 5 mm stroke Value „96" represents 120N closing pressure and 6 mm stroke NOTE: Entering of the values „87...89" respectively „97...100" effects the same closing pressure and stroke like at the values „86" respectively „96".	
Type of valve seal	• Valve with standard seal • Valve with hard seal • Valve with soft seal • Valve with medium soft seal
This parameter only should be changed, if the valve does not open at low actuating values.	
Characteristic curve of valve	• linear characteristic curve • own characteristic curve • **typical characteristic curve**
• linear characteristic curve: for high-grade valves with linear. characteristic curve. • own characteristic curve: suitable for special valves with known characteristic curve. • typical characteristic curve: suitable for all common types of valves. NOTE: If the parameter "own characteristic curve" has been chosen, an additional parameter page „Own characteristic curve of valve" will be visible. If the parameter "linear characteristic curve " has been chosen, an additional parameter page „Linear characteristic curve of valve" will be visible. Description of parameter settings: see there.	

Parameter	Setting
Minimum actuating value	• 0% • 5% • **10%** • 15% • 20% • 25% • 30% • 40%
With this parameter the minimum valve position can be fixed, which should be approached. Hence annoying noise, evoked by small valve section, can be avoided. • x%: This actuating value will be approached as minimum actuating value (before approaching the 0% position = valve closed).	
behavior at minimum actuating value underflow	• 0% • **0% = 0% otherwise min. actuating value**
With this parameter can be set, which valve position will be approached in fact, if the actuating value, which is received from the RTC, is lower than the defined minimum actuating value. • 0%: The valve actuator is closing the valve completely (0% position), if the actuating value, which is received from the RTC, is lower than the defined minimum actuating value. • 0% = 0%, otherwise min. actuating valuee: The valve actuator is approaching the defined minimum actuating value, if the actuating value, which is received from the RTC, is lower than the defined minimum actuating value.	
Maximum actuating value	• 60% • 70% • 75% • 80% • 85% • 90% • 95% • **100%**
With this parameter can be defined the maximum valve position, which should approached. With this the frequency of positionings can be reduced, because at most of the valves the maximum mass flow is reached even at a valve position of 60% and does not vary after that position. • x%: This actuating value will be approached as the maximum valve position, even if a bigger one will be received from the RTC.	

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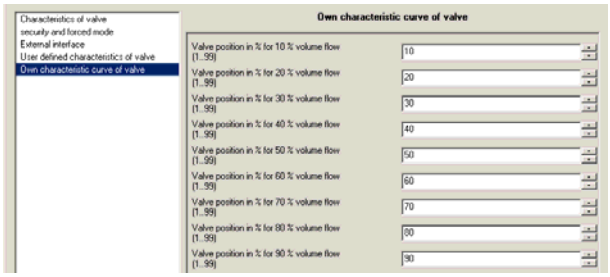
Parameter	Setting
Drive to new valve position	• Position always accurate • At change of actuating value >1% • At change of actuating value >2% • At change of actuating value >3% • **At change of actuating value >5%** • At change of actuating value >7% • At change of actuating value >10% • At change of actuating value >15%
With this parameter can be defined, at which change of the received actuating value in relationship to the last adjustment the valve should be adjusted once again. With this the frequency of small positionings can be avoided. • Position always accurate: the valve will be positioned by each change of the actuating value. • At change of actuating value >x%: Value, from which change of the actuating value a new adjustment will be effected. NOTE: If a too high value has been chosen, the accurate room temperature control can be affected, because the valve position will be adjusted only by big deviations of the set temperature.	

2.2.5 Own characteristic curve of valve



NOTE: This parameter page is only visible, if at the parameter page „Characteristics of valve" at „valve settings" the option „user defined" and at the parameter page "User defined characteristics of valve" at "Characteristic curve of valve" the option "Own characteristic curve" has been chosen.

Parameter	Setting
Valve position in % for 10% volume flow (1..99)	• 10
Valve position in % for 20% volume flow (1..99)	• 20
Valve position in % for 30% volume flow (1..99)	• 30
Valve position in % for 40% volume flow (1..99)	• 40
Valve position in % for 50% volume flow (1..99)	• 50
Valve position in % for 60% volume flow (1..99)	• 60
Valve position in % for 70% volume flow (1..99)	• 70
Valve position in % for 80% volume flow (1..99)	• 80
Valve position in % for 90% volume flow (1..99)	• 90
With this parameters the valve actuator can be adapted via 9 points of the characteristic curve to the specific characteristic curve of the installed valve. Therefore has to be evaluated that valve position in % out of the characteristic curve, at which a volume flow of 10%, 20% ...90%will be reached. This value has to be set for the concerning parameters. NOTE: The standard values are fitting for a valve with a linear characteristic curve.	

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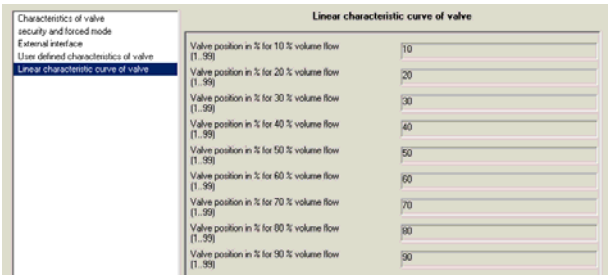
2.2.6 Linear characteristic curve of valve



NOTE: This parameter page is only visible, if at the parameter page „Characteristics of valve" at „valve settings" the option „user defined" and at the parameter page "User defined characteristics of valve" at "Characteristic curve of valve" the option "Linear characteristic curve" has been chosen.

Parameter	Setting
Valve position in % for 10% volume flow (1..99)	• 10
Valve position in % for 20% volume flow (1..99)	• 20
Valve position in % for 30% volume flow (1..99)	• 30
Valve position in % for 40% volume flow (1..99)	• 40
Valve position in % for 50% volume flow (1..99)	• 50
Valve position in % for 60% volume flow (1..99)	• 60
Valve position in % for 70% volume flow (1..99)	• 70
Valve position in % for 80% volume flow (1..99)	• 80
Valve position in % for 90% volume flow (1..99)	• 90
At this parameter page the values are only displayed and cannot be changed. The values are showing a valve with a linear characteristic curve. Hence this option should be used exclusively for such valves, which are specified as „linear valve", otherwise the accurate room temperature control can be affected.	