Range controller SBG24

Suitable for modulating damper actuators ..24-SR

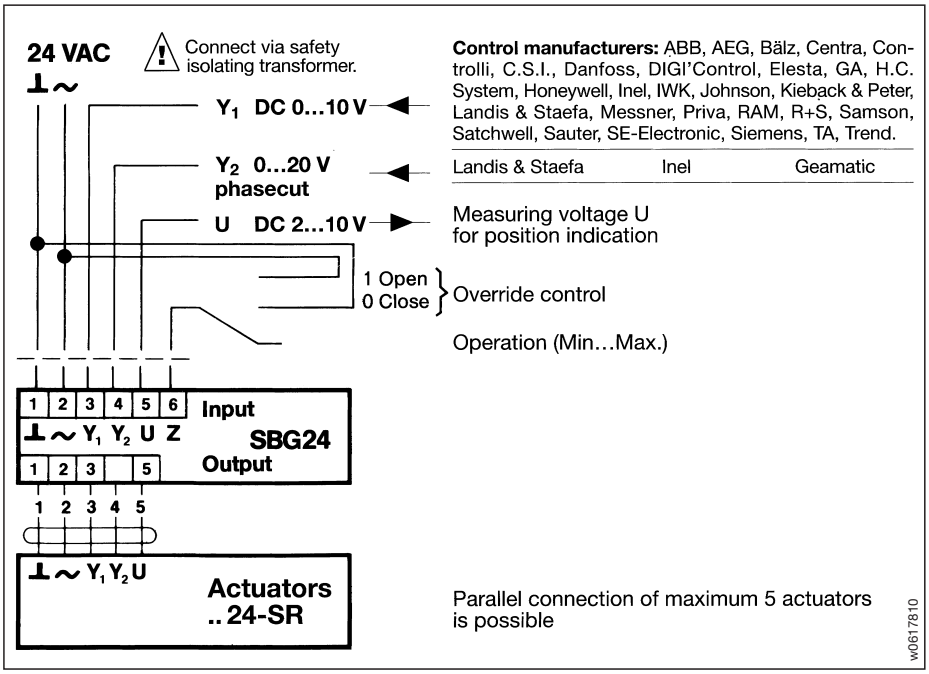
Application

In central air handling units and other ducted systems, multiblade-dampers are mainly used as control and mixing dampers. The control characteristics of dampers, however, depend upon many factors. Even with correctly sized dampers and fans it is only possible to adjust the air volume with a universal adjustment kit.

With the range controller SBG24, this is easily achieved, since the working range (∢) of the dampers can be defined by the Min.-Max. setting potentiometer.

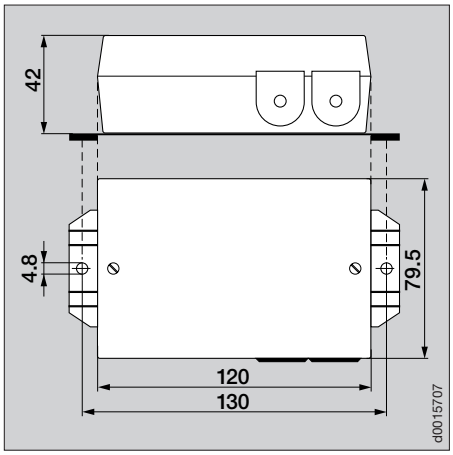
The SBG24 is usually installed close to the damper actuator (and at the same time used as connection box).

Wiring diagram



Technical data	SBG24	
Nominal voltage	AC 24 V 50/60 Hz	
Nominal voltage range	AC 21.6…27.6 V	
Power consumption	1 W + connected actuators	
For wire sizing	1.5 VA + connected actuators	
Electrical connection	Terminals	
Control signal Y	Y_1 DC 0…10 V	Y_2 0…20 V phasecut
Input impedance	100 kΩ (0.1 mA)	8 kΩ (50 mW)
Operating range	DC 2…10 V	2…10 V phasecut
Direction of rotation	reversible with switch A/B (direct/reverse acting)	
Positioning range	adjustable Max. = 0.2…1 (≈20…90° rotation∢) Min. = 0…80% of max.	
Override control	⊥ to terminal 6 = position 0 (closed) ~ to terminal 6 = position 1 (open)	
Measuring voltage U	DC 2…10 V (max. 0.5 mA) for position 0…1	
Output actuator	Terminal 3: DC 2…10 V (max. 0.5 mA)	
Protection class	III safety extra-low voltage	
Degree of protection	IP40	
Ambient temperature	−20 … +50 °C	
Humidity test	to EN 60730-1	
EMC	CE according to 89/336/EEC	
Mode of operation	Type 1	
Maintenance	maintenance free	
Weight	400 g	

Dimensions



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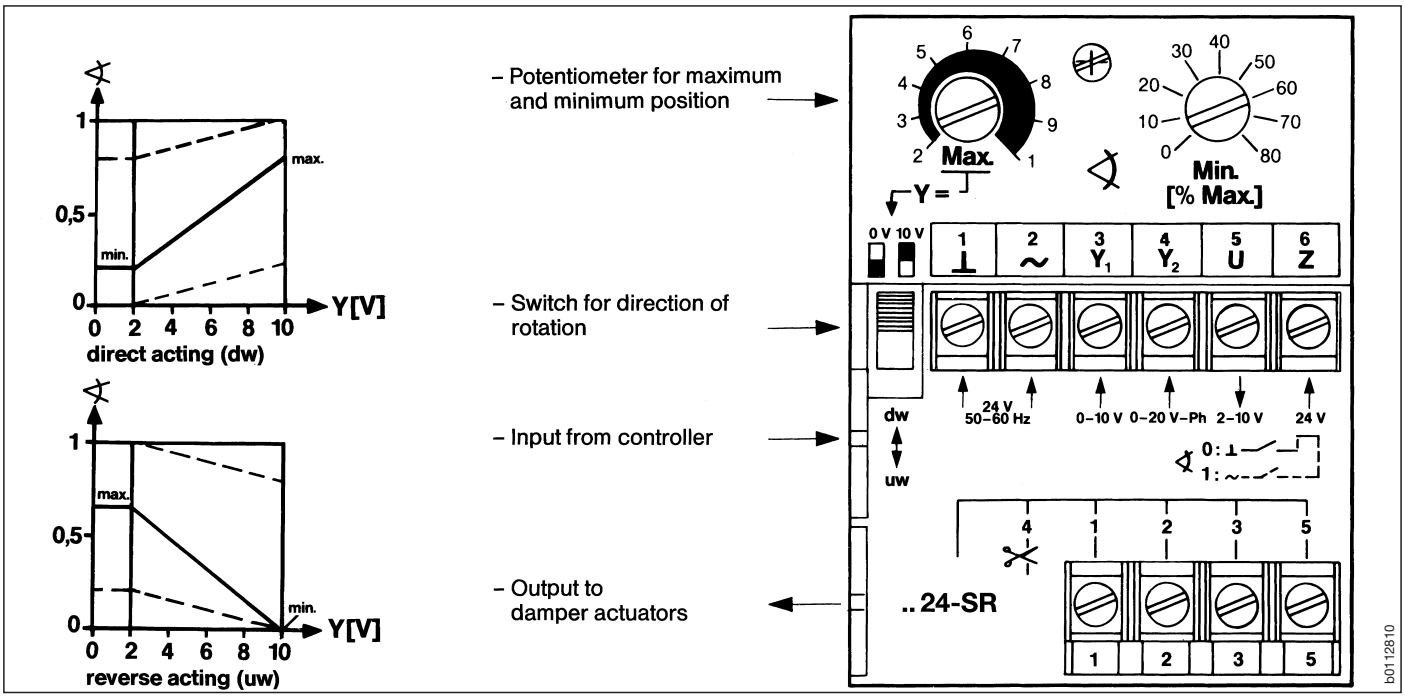
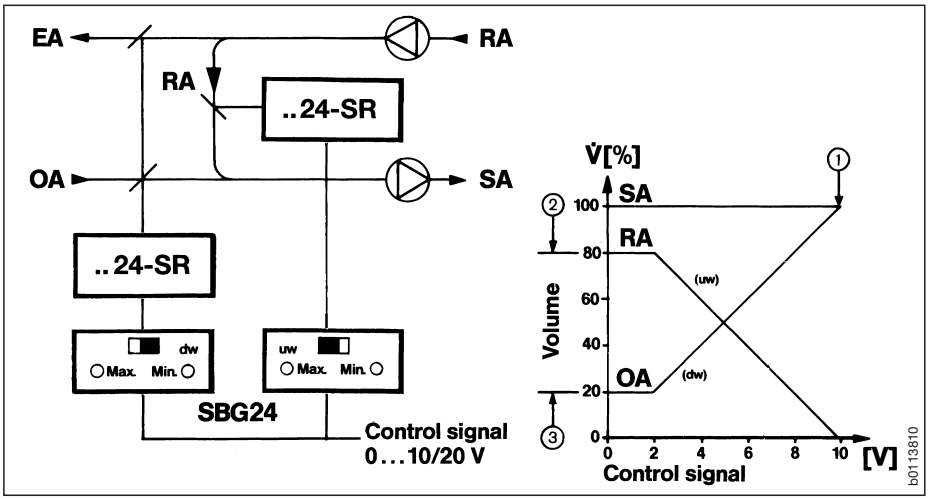
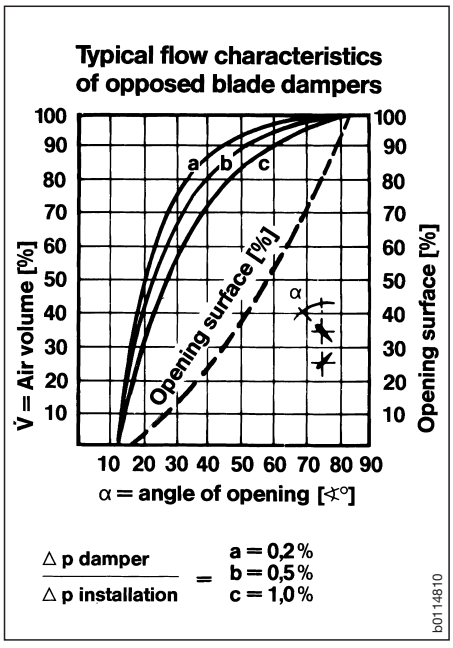


Application example



As can be seen in the diagram, the OA actuator is direct acting (dw), and the RA actuator is reverse acting (uw).
This function has to be set at each range controller.

The diagram below shows the typical flow characteristics of opposed blade dampers.
The values shown are a typical example.



Adjustment
Initial settings should be minimum potentiometer set to 0% and maximum potentiometer set at 1. At maximum control output voltage (DC 10 V), the OA/EA dampers are fully open and the RA damper fully closed. The SA volume is now measured using a suitable instrument. The Max. potentiometer of the OA/EA range controller is now turned down until the desired SA volume is reached, e. g. 100 L/S ①.
The control signal is now set at 0 V, which closes the OA/EA dampers and opens the RA damper.
The Max. potentiometer on the RA range controller is now turned down until the air volume reading on the SA is 80% e. g. 80 L/S ②. Now the OA/EA Min. potentiometer is increased until the SA volume reads 100 L/S again ③ (80% RA 20% Min. OA).
The dampers are now working from a control input signal of DC 0...10 V, but with a reduced angle of rotation (∢), i. e. the control of the damper is improved (ratio of air volume to angle of rotation) and therefore the linearity is better. The result is a linear mixing ratio at nearly constant SA volume.

Operation
The operation of the range controller is best explained when used on an air handling unit with outside air (OA), recirculated air (RA) and exhaust air (EA) dampers.
When the mixing ratio of OA/RA is changed, it is desirable to keep the supply air (SA) volume constant.
The desired minimum OA quantity in our example is 20%.
OA/EA and RA actuators are each fitted with a positioner SBG24 and controlled with the same signal (i. e. DC 0...10 V).

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