



New option
with sound attenuator

Maintenance-free

VK2 volume flow controller

that operates without an auxiliary power supply,
for ventilation and air conditioning systems.

- Adjustable on site.
- Outstanding control accuracy.
- Sizes B x H = 200 x 100 to 600 x 300
- Casing tightness class C according to DIN EN 1751.

VK2 volume flow controller

Overview



With the basic version of the VK2 volume flow controller, the volume flow set point is adjusted manually.

The controllers operate without an auxiliary power supply!

The volume flow set point is preselected at an adjusting device with scale and kept constant at variable pressures to a high degree of accuracy. The controllers are adjusted at the factory for the entire volume flow range.

- The volume flow set point is easy to adjust on site!
- The volume flow set point can be preset at the factory if so requested when ordering. Subsequent changes on site can be made without problem. → see page 7



Option

VK2 volume flow controller with actuator-driven adjustment of the volume flow set point.

Depending on which actuator is selected, two set points or any intermediate values are possible.

Use in systems with variable volume flows, with day/night changeover or fully variable load-dependent operation for example.



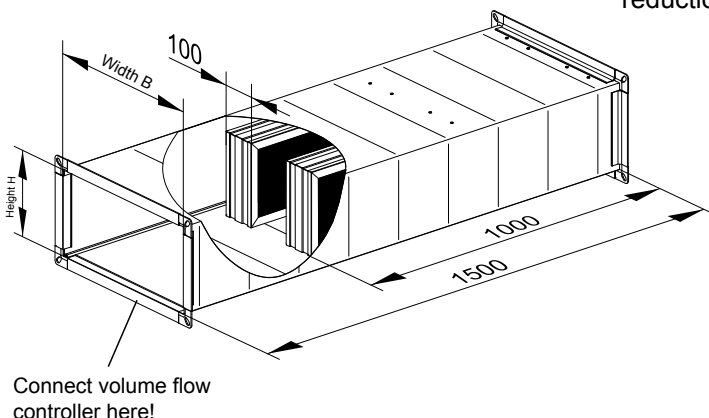
Option

VK2 volume flow controller with acoustic insulation for thermal insulation and reduction of external sound radiation.

Can be used for controllers with manual and actuator-driven adjustment of the volume flow set point!

Option

SKB-V sound attenuators for volume flow controllers for reduction of internal flow noise. Sound attenuator length 1500 mm.

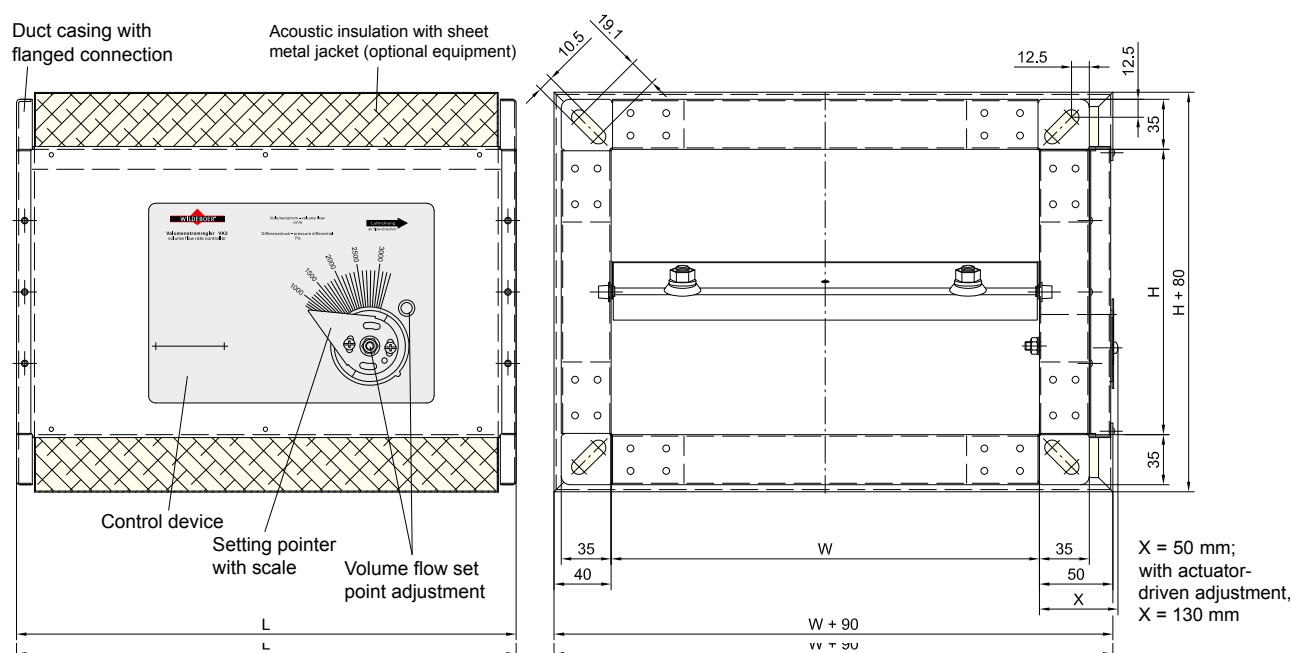


Maximum possible reduction in dB with a

Width B [mm]	200	300	400	500	600
Number of splitters	1	1	2	2	3
Height H [mm]					
100	-	-	-	-	-
150	-15	-9	-	-	-
200	-15	-9	-15	-11	-14
250	-	-9	-15	-11	-15
300	-	-9	-15	-11	-14

VK2 volume flow controller

Description, sizes, technical data



VK2 volume flow controllers are maintenance-free mechanical controllers that operate without an auxiliary power supply to maintain volume flows in ventilation and air conditioning systems constant.

They are installed in supply and exhaust air ventilation ducts and are not position-sensitive. The casing and control mechanism are made of galvanized sheet steel. The centrally supported damper blade which controls the volume flow has a stainless steel axis in special bushings. The adjustment device is equipped with rotary pointer, scale and locking device. The volume flow set points can be adjusted manually or by actuator within the volume flow ranges V_{\min} to V_{\max} .

The special control mechanism ensures a high degree of control accuracy with a deviation of only approx. $\pm 5\%$ to $\pm 15\%$ *). Accordingly, the volume flow throughout the entire pressure range is kept constant.

- Sizes B x H x L: in accordance with adjacent table
- Total volume flow range: $V_{\min} = 200$ to $V_{\max} = 7000 \text{ m}^3/\text{h}$
- Pressure range: 50 to 1000 Pa \Rightarrow see page 4
- Casing tightness: Class C according to DIN EN 1751
- Interior temperature range: -20 to +70°C, up to 90°C for a short time only

Options

- Actuator AC 230 V or AC/DC 24 V, setting to two volume flow set points.
- Continuous actuator AC/DC 24 V, setting to any desired volume flow set point.
- External acoustic insulation with sheet metal jacket.
- Presetting of volume flow set point at the factory \Rightarrow see page 7
- SKB-V sound attenuator for volume flow controller

VK2 volume flow controllers

- satisfy the **hygiene requirements** according to VDI 6022-1, VDI 3803-1, DIN 1946-4, DIN EN 13779, SWKI VA104-01, SWKI 99-3, ÖNORM H6020 and ÖNORM H6021.
- are **resistant to microbes**, and therefore **do not promote the growth of micro-organisms (fungi, bacteria)**. This reduces the risk of infection for people and also the necessary cleaning and disinfection work!
- are **resistant to cleaning agents and disinfectants** and are suitable for use in hospitals and similar facilities!
- come with **Environmental Product Declaration** according to ISO 14025 and EN 15804: EPD-WIL-20150037-ICA1-DE.

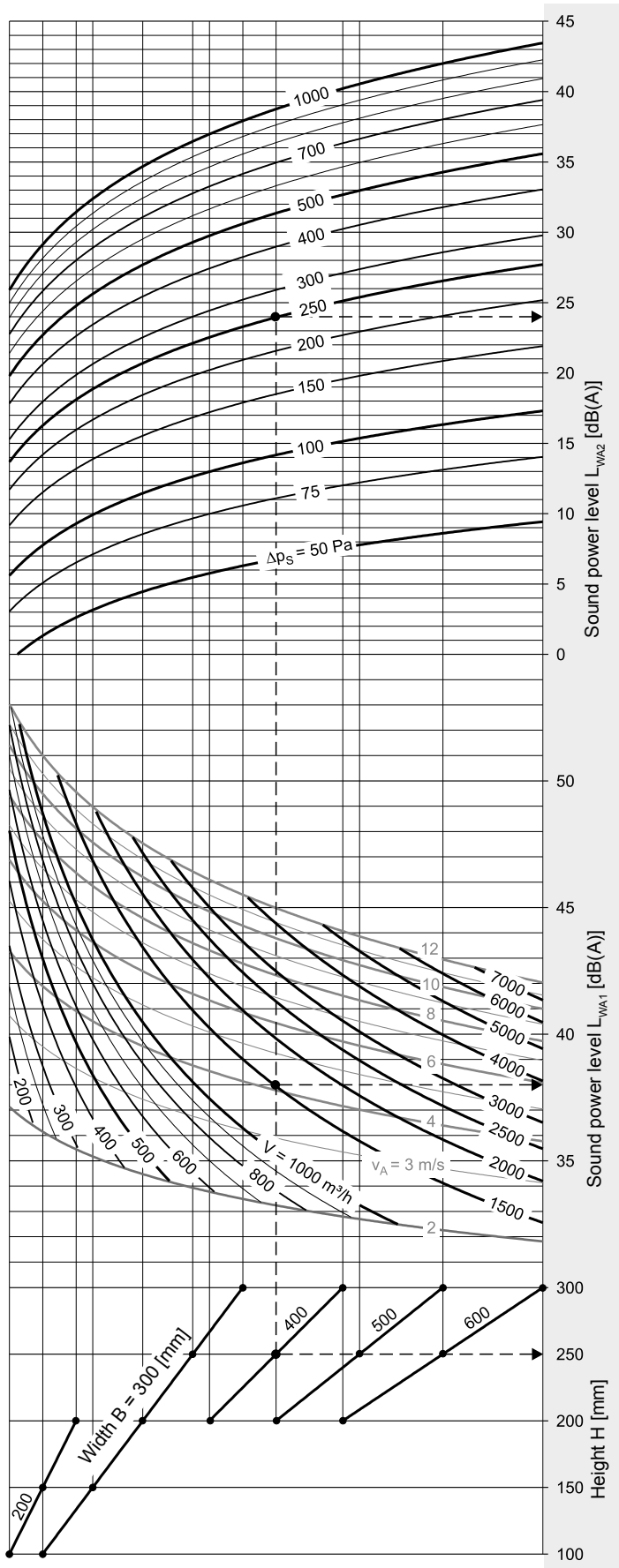
Width	Height	Length	Inflow cross-section A_A	Volume flow	
B	H	L	$[\text{m}^2]$	V_{\min}	V_{\max}
[mm]	[mm]	[mm]		$[\text{m}^3/\text{h}]$	$[\text{m}^3/\text{h}]$
200	100	300	0.020	200	800
	150	325	0.030	250	1200
	200	425	0.040	350	1550
300	100	300	0.030	250	1200
	150	325	0.045	350	1650
	200	350	0.060	500	2100
250	450	0.075	600	2800	
	300	500	0.090	750	3500
400	200	375	0.080	700	3300
	250	450	0.100	800	3700
	300	500	0.120	1000	4250
500	200	375	0.100	875	4125
	250	400	0.125	1000	4375
	300	500	0.150	1200	5200
600	200	350	0.120	1125	4750
	250	500	0.150	1400	6000
	300	500	0.180	1600	7000

*) Larger deviations occur with lower volume flow rates, especially with small sizes! Where control deviations are specified as a percentage, the corresponding volume flow set point specified is used as reference.

It is assumed that the incoming flows are extensively undisturbed.

VK2 volume flow controller

Sound power level in the connecting duct (flow noise)



Example:

Specified:	Width	B	=	400 mm
	Height	H	=	250 mm
	Volume flow	V	=	1500 m³/h
	Velocity	v _A	=	4.2 m/s
	Static pressure drop	Δp _S	=	250 Pa
Result:	Sound power level	L _{WA1}	=	38 dB(A)
		L _{WA2}	=	24 dB(A)
		L _{WA}	=	62 dB(A)

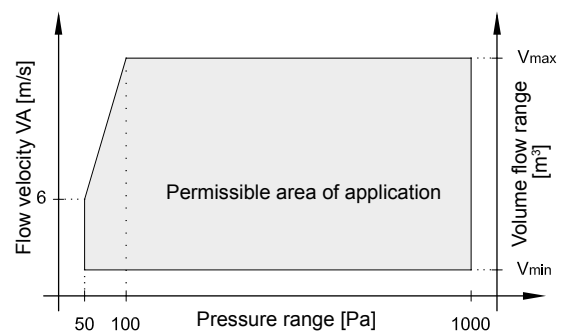
- The sound power level inside the connecting duct is calculated in the nomograms as an A-weighted overall level L_{WA} .

The Wildeboer dimensioning software calculates corresponding octave sound power levels L_{W-Oct} for every size and all operating points; and also when incorporating additional SKB-V sound attenuators into the design.

- With SKB-V sound attenuators, the sound power levels L_{WA} can be reduced by up to 13 dB.
- Important: The sound levels indicated in the nomograms are sound power levels! The values represent the sound energy introduced into the duct system. They should be applied for acoustic calculations, e.g. when adding sound attenuators.

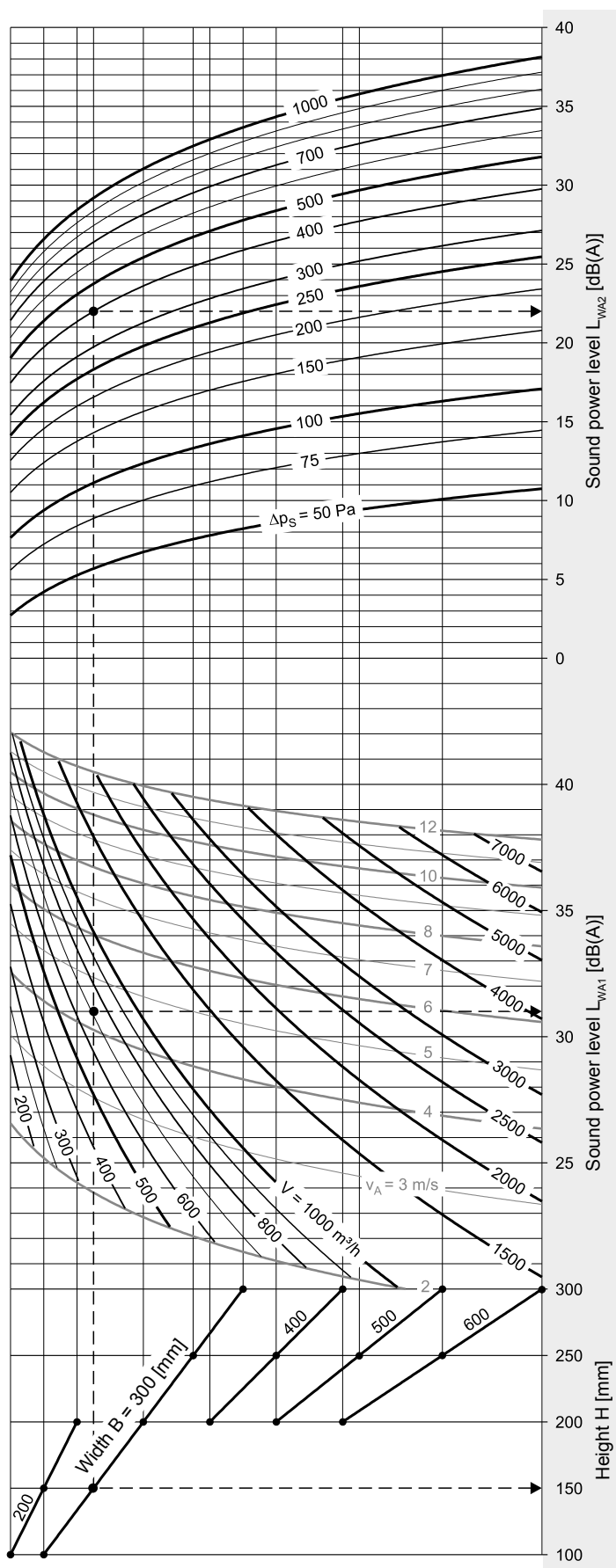
Please note: The sound power levels L_p or L_{pA} are specified more than once to generally indicate attenuations of up to 19 dB. When comparing numerical values, always bear in mind the difference between the sound power level and sound pressure level. Additionally, the degree of attenuation only becomes apparent once the specific ducts, deflections, branches and rooms have actually been connected.

Area of application for all sizes



VK2 volume flow controller

Sound power level outside the connecting duct (radiated noise)



Example:

Specified:	Width	B	=	300 mm
	Height	H	=	150 mm
	Volume flow	V	=	700 m³/h
	Flow velocity	v_A	=	4.3 m/s
	Static pressure drop	Δp_s	=	400 Pa
Result:	Radiated noise			
	Sound power level*)	L_{WA1}	=	31 dB(A)
		L_{WA2}	=	22 dB(A)
		L_{WA}	=	53 dB(A)

*) The mean **sound pressure level in the room** with the following equipment is:

• **14 dB less with acoustic insulation**

• **8 dB less without acoustic insulation**

than the sound power levels L_{WA} determined from the nomograms.

However, the acoustic insulation can only achieve the stated values if the connected circular ventilation ducts are sound-proofed (insulated) accordingly.

The sound pressure level can be further reduced by carrying out additional sound attenuation measures on site (suspended ceilings, high degree of room attenuation).

Nomenclature

B	[mm]	Width
H	[mm]	Height
V	[m³/h]	Volume flow
A_A	[m²]	Inflow cross-section
v_A	[m/s]	Flow velocity in A_A
Δp_s	[Pa]	Static pressure drop
L_{WA}	[dB(A)]	A-weighted sound power level
		$L_{WA} = L_{WA1} + L_{WA2}$
L_{W-Oct}	[dB]	Octave sound power level
		$L_{W-Oct} = L_{WA} + \Delta L$
ΔL	[dB]	Relative sound power level to L_{WA}
f	[Hz]	Octave mid frequency
L_p	[dB]	Sound pressure level
L_{pA}	[dB(A)]	A-weighted sound pressure level

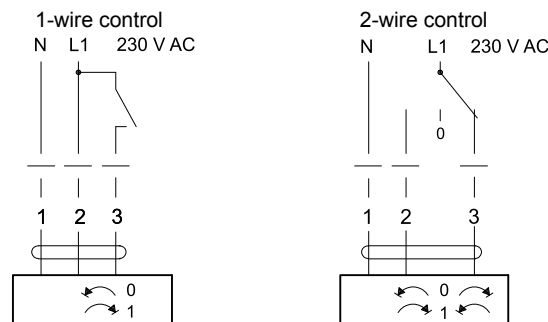
VK2 volume flow controller

Technical data for adjusting actuators, installation instructions

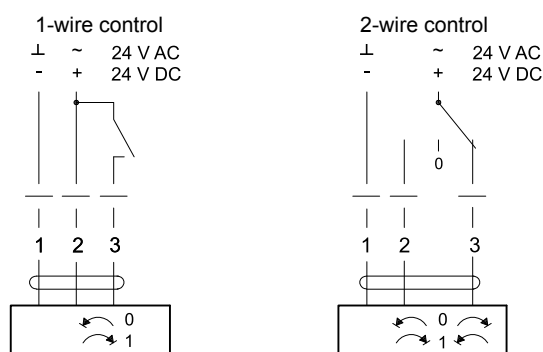
Technical data for adjusting actuators

	M1	M2	M3
Supply voltage	230 V AC	24 V AC/DC	24 V AC/DC
Function area	85 to 265 V	19.2 to 28.8 V	19.2 to 28.8 V
Runtime for 90°	150 s	150 s	150 s
Connected load	≤ 6 VA	≤ 4 VA	≤ 4 VA
Power consumption	≤ 2.5 W	≤ 2 W	≤ 2 W
Degree of protection	IP 54	IP 54	IP 54
Connection cable approx. 1 m long 0.75 mm ²	3-wire	3-wire	4-wire
Ambient temperature	-30 to +50°C	-30 to +50°C	-30 to +50°C

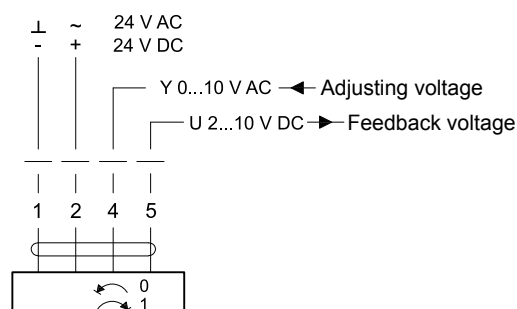
Adjusting actuator M1



Adjusting actuator M2



Adjusting actuator M3



Installation instructions

- VK2 Volume flow controllers are adjusted for the entire scaled application area.
- To install the controller, a straight inlet section which is at least three times as long as the nominal width B and a straight outlet section which is at least 1.5 times as long as nominal width B is required. Installation directly downstream or upstream of flow disruption points (bends, branches, etc.) reduces the control accuracy.
- The volume flow set point is adjusted during installation. This does not affect the control accuracy.
- The basic version is adjusted manually by setting the pointer to the required set point on the scale and fixing this setting.
- Dual controller: If the duct cross-section is larger than the available controller size, two or more VK2 volume flow controllers can be installed in parallel. The volume flow must be distributed in such a way that the same flow velocity is configured for each controller. Suitable metal plates for connecting the flanges and compensating for differences in length must be provided on site. Sound power levels must be added up.
- VK2 volume flow controllers and SKB-V sound attenuators are supplied individually. Assembly on site!
- Volume flow controllers with actuator-driven adjustment enable two-point operation (single-wire control) in combination with the actuators M1 (230 V AC) and M2 (24 V AC/DC). The corresponding motor limit stops are positioned in order to adjust the two volume flows.

In the delivery condition, the two limit stops of the actuators are set at the 0 direction of travel and the largest possible angle of rotation. The maximum angle of rotation corresponds to the largest possible volume flow set point, and the minimum is equivalent to a "cutoff" at a residual leakage that is significantly lower than the minimum volume flow as specified in the catalogue.

This can be extended to include three-point operation using an additional 0 circuit arrangement (two-wire control). When actuated in this way, the actuator remains in its current position and the VK2 volume flow controller adjusts the corresponding set point.

- Volume flow controllers with actuator-driven adjustment in combination with the actuator M3 (24 V AC/DC) enable continuous adjustment of the set point. The actuator is activated by an adjusting voltage $Y = 0...10 \text{ V DC}$ and travels to the position specified by the actuating signal; in this case the operating range of the motor only starts at 2 V. The volume flow set point changes more or less linearly in relation to the adjusting voltage.

In the delivery condition, the actuator is set to 0 direction of travel and the adjustable mechanical limit stops are set for the largest possible angle of rotation, which means that when $Y = 10 \text{ V}$ the maximum angle of rotation corresponding to the maximum volume flow set point is approached, and at $0...2 \text{ V}$ the minimum angle of rotation is approached; this corresponds to a "cutoff" at a residual leakage that is significantly lower than the minimum volume flow set point.

The purpose of the feedback voltage $U = 2...10 \text{ V DC}$ is to provide an electrical indication of the volume flow set point setting and serve as a subsequent actuating signal for other actuators.

- All adjusting actuators are overload-proof, do not require a limit switch and stop automatically at the limit stop.
- So they can be adjusted manually, adjusting actuators are equipped with a self-resetting push button.
- The direction of travel of all adjusting actuators can be reversed via a changeover switch on the motor.
- In the event of a power failure, the motor remains in its current position and the controller controls the corresponding set point.
- Assembly instructions are enclosed with the volume flow controllers and must be observed!

VK2 volume flow controller

Order data, specification text

Size:

Width B [mm] x Height H [mm]

⇒ see page 3

Actuator-driven set point adjustment:

230 V AC two-point/three-point actuator M1

24 V AC/DC two-point/three-point actuator M2

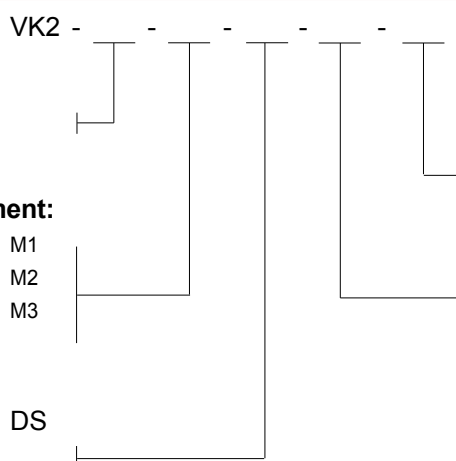
24 V AC/DC continuous actuator M3

⇒ see pages 2, 3 and 6

Acoustic insulation:

with acoustic insulation: DS

⇒ see pages 2 and 3



with sound attenuator

- from height 150 mm; mounting on site -

SKB-V with glass fibre

SKB-V-L with glass fibre + perforated sheet metal

⇒ for technical design also see user manual 6.2: SB splitters and SKB sound attenuators

Presetting volume flow [m³/h]

- not with actuator driven set point setting -
The numerical value must be in the range V_{min} and V_{max} according to the size of the controller!

⇒ see pages 2 and 3

Ordering example: VK2 - 400 x 250 - DS - 1500 - SKB-V

Maintenance-free, rectangular volume flow controller for position-independent installation in ventilation ducts for supply and exhaust air ventilation and air conditioning systems. Casing and control mechanism made of galvanized sheet steel, with acoustic insulation. With centrally supported damper blade for volume flow control, with stainless steel bearing axis in special bushings. Adjustment device with rotary pointer, scale and locking device for the volume flow set point, can be adjusted manually or by actuator. Volume flow controller designed as mechanical controller for constant volume flows without auxiliary power supply. With special control mechanism for a high degree of control accuracy throughout the entire control range. The volume flow set point must be infinitely adjustable throughout the control range. The volume flow must be kept constant at variable pressures of between 50 and 1000 Pa with a deviation of roughly $\pm 5\%$ to $\pm 15\%$. Casing tightness class C according to DIN EN 1751. Certificate of conformity as proof of compliance with the hygiene requirements according to VDI 6022-1, VDI 3803-1, DIN 1946-4, DIN EN 13779, SWKI VA104-01, SWKI 99-3, ÖNORM H6020 and ÖNORM H6021. With Environmental Product Declaration certificate according to ISO 14025 and EN 15804.

Units

Volume flow: m³/h

Pressure drop: Pa

Maximum sound power level

Flow noise dB(A)

including SKB-V sound attenuator

Radiated noise dB(A)

Manufacturer: WILDEBOER®

Type: VK2

Width: mm

Height: mm

complete with fixings deliver:

install: units

units sound attenuator SKB-V - L

deliver:

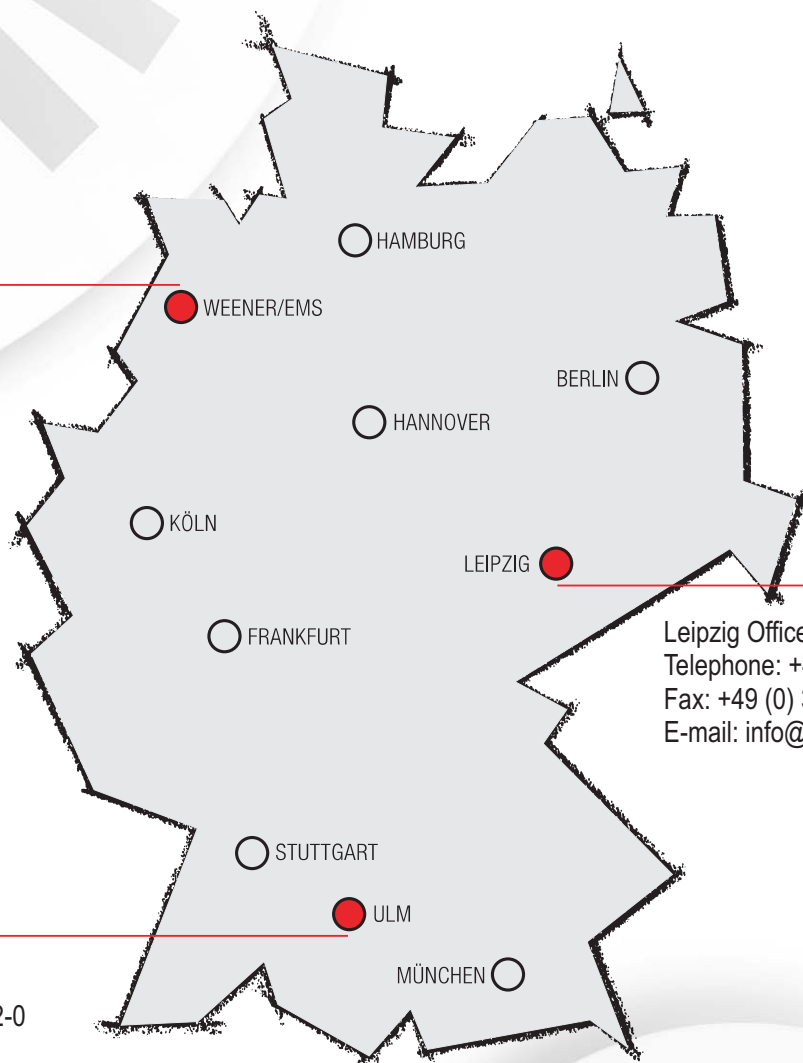
install: units

Select texts not highlighted in bold as required!

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