

VKM

Volumetric flow limiter

Performance data

- Control accuracy +/-10%, based on volume V_{\max}
- Operating temperature: 10 - 50°C
- Difference pressure range 30 - 300 Pa
- Max. permissible duct pressure: 500 Pa
- Storage temperature: -20 to 60 °C

Special features

- short inflow and outflow distances
- integrated locking device to fix the damper blade
- position-independent installation
- adjustment possible without tools
- maintenance-free

Tests and standards

- **VDI 6022, Sheet 1:** hygienic requirements of ventilation and air-conditioning systems
- **DIN 4102:** Building material class B2
- **DIN EN 1751, class C:** housing leakage (with optional casing (-HSV / -HV2))

Table of Contents

Description VKM	3
Advantages:	3
Field of application	3
Construction	3
Accessories	3
Overview of product versions	4
Dimensions	5
VKM-...-H01-KA0-...	5
Dimensions of accessories	6
Casing (-HSV / -HV2)	6
Locking device (-FV1)	6
Duct connection (-KA0 / -GD1)	6
Technical data	7
Volumetric flow setpoints	7
Flow generated noise	8
Radiated noise	9
Flow generated noise - relative sound spectrum	10
Mounting and operating instructions	11
Legend	11
Order code VKM	12
Specification text	13

DESCRIPTION VKM

The volumetric flow limiter VKM works mechanically and independently without requiring additional auxiliary power. The centrally supported damper is moved by the air flow. The control unit with control valve, spring and damper is attached to the outside of the housing. The required volumetric flow can be set at the installation site. The control unit is protected with a cover. The controller can be used in any installation position. The volumetric flow limiter controls the set volumetric flow and keeps it constant. An integrated locking device (optional) is used to fix the damper blade. This allows the reduction of the volumetric flow e.g. for a reduced operation with subsequent adjustment of the volumetric flow limiter VKM. The volumetric flow limiter VKM is built into the air duct and allows the volumetric flow to be adjusted subsequently, due to an opening on site. The rubber lip seals on both sides allow the positioning and fixation in the pipe. An inflow area and an outflow area of at least 1xD must be provided.

Housing tightness, class C, to DIN EN 1751 when used with the optional casing.

Control accuracy:	+/-10 %, relative to the volume V_{max}
Operating temperature:	10 - 50 °C
Differential pressure range:	30 - 300 Pa
Max. permissible duct pressure:	500 Pa
Storage temperature:	-20 up to 60 °C
V_{min}	16 m ³ /h
V_{max}	230 m ³ /h

For subsequent adjustment of the air volume, inspection openings must be provided on-site in sufficient number and size.

Advantages:

1. Easy adjustment and regulation of the air diffusers
2. can be fitted position-independently
3. Volumetric flow setpoint adjustment from outside possible on the VKM due an opening provided by the customer
4. Control unit and damping element are placed outside the air flow, making the VKM less susceptible to dirt
5. integrated locking device for reduced operation
6. maintenance-free operation
7. Building material class B2 to DIN 4102

Field of application

- for supply and return air systems
- suitable for regulating a constant volumetric flow

Attention:

The VKM is a mechanical system-powered controller that maintains the volumetric flow at a constant level. Tampering with the controller, whether manually or mechanically, will lead to loss of the claim for warranty. When a high volumetric flow setting has been selected, the damper leaf must never be closed manually. Otherwise, the control mechanism can be damaged, resulting in a loss of control accuracy or a defect.

The field of application must always be complied with.

If the VKM is used beyond its allowed field of application, this will result in mechanical overload and thus in a loss of control accuracy or the device may become damaged.

A reduction or increase of the amount of air is possible without reset even if the system is running.

The design optimizations enable conditional mechanical loading. Thanks to the design adjustments, the VKM exhibits particularly high dimensional stability.

Construction

- Housing, control damper and control housing
 - Plastic (polystyrene PS, impact-resistant), building material class B2 to DIN 4102
- Rubber lip seal, on both sides

Accessories

- Casing with inspection openings
 - Galvanised sheet steel (-HSV)
 - Stainless steel 1.4301, V2A (-HV2)
- Rubber lip seal casing (-GD1)
- Locking device (FV1)
 - plastic

OVERVIEW OF PRODUCT VERSIONS

VKM-xxx-H01-KA0



Volumetric flow limiter, round

- with rubber lip seal

VKM-xxx-HSV / HV2-GD1

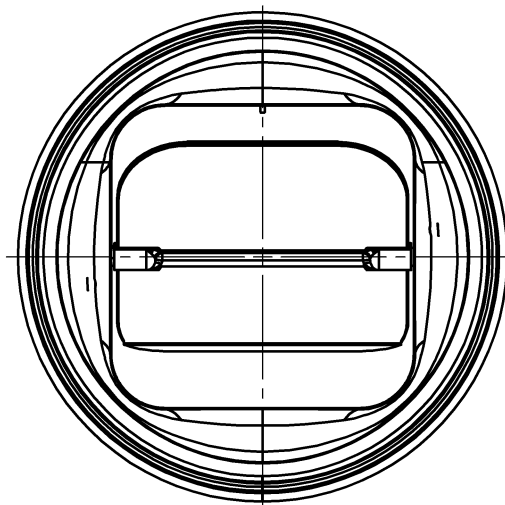
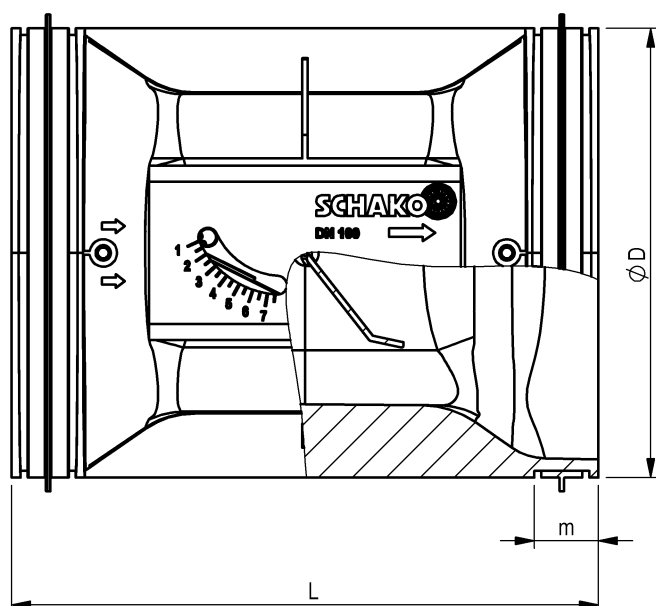


Volumetric flow limiter, round

- with rubber lip seal
- with casing (-HSV / -HV2)
- with rubber lip seal (-GD1)

DIMENSIONS

VKM-...-H01-KA0-...

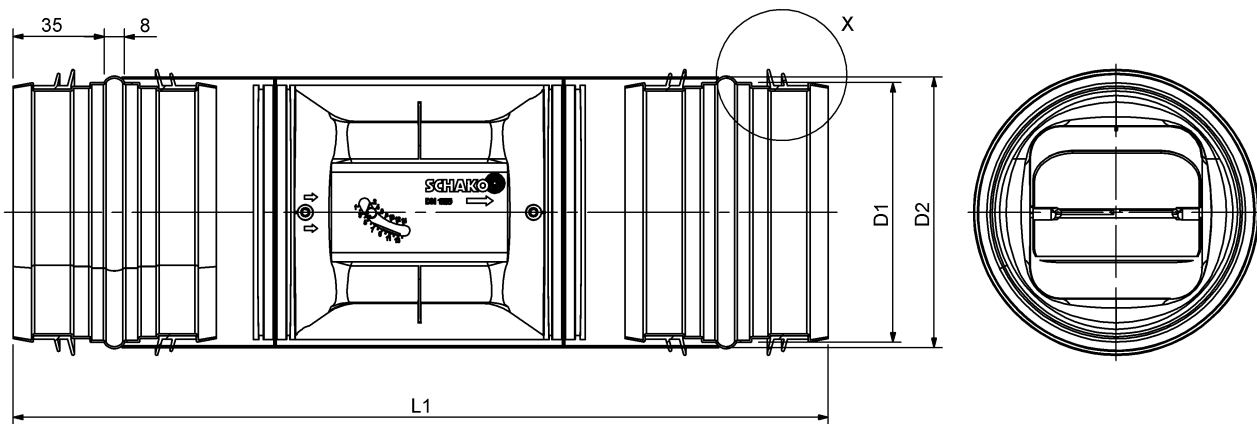


Available sizes

NW	ØD	L	m
080	78	115	14
100	98	128	16
125	123	150	16

DIMENSIONS OF ACCESSORIES

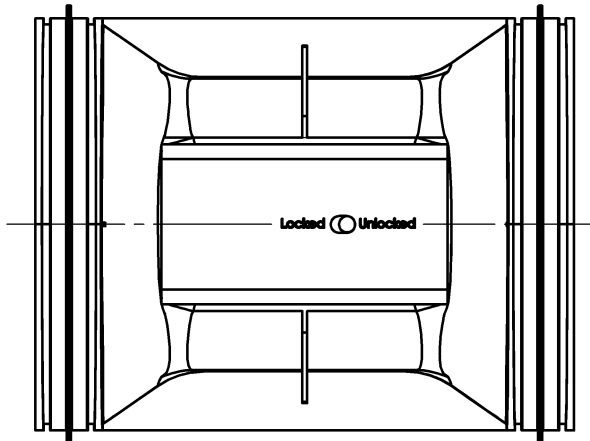
Casing (-HSV / -HV2)



Available sizes

NW	øD1	øD2	L1
080	80	84,5	210
100	100	104,5	230
125	125	129,5	250

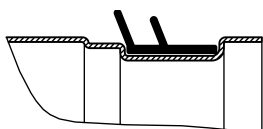
Locking device (-FV1)



Duct connection (-KA0 / -GD1)

- Without rubber lip seal (-KA0, standard)
- with rubber seal (-GD1, only possible for version -HSV or -HV2)

Detail X



TECHNICAL DATA

Volumetric flow setpoints

Controller position	V	Nominal width		
		80	100	125
1	m ³ /h	16	25	30
	l/s	4	7	8
2	m ³ /h	18	28	36
	l/s	5	8	10
3	m ³ /h	20	31	40
	l/s	6	9	11
4	m ³ /h	23	34	45
	l/s	6	9	13
5	m ³ /h	25	38	55
	l/s	7	11	15
6*	m ³ /h	28	43	60
	l/s	8	12	17
7	m ³ /h	32	47	70
	l/s	9	13	19
8	m ³ /h	37	55	78
	l/s	10	15	22
9	m ³ /h	42	63	90
	l/s	12	18	25
10	m ³ /h	50	74	105
	l/s	14	21	29
11	m ³ /h	60	88	130
	l/s	17	24	36
12	m ³ /h	70	108	160
	l/s	19	30	44
13	m ³ /h	87	130	190
	l/s	24	36	53
14	m ³ /h	100	150	230
	l/s	28	42	64

* Preset upon delivery (standard)

For the parameter setting of the control components, an air density of 1.2 kg/m³ has been taken into account.

Example: Control unit housing with scale



Flow generated noise

NW	RS	V (m ³ /h)	V [l/s]	$\Delta p_t = 50 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 100 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 150 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 200 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 250 \text{ Pa } L_{WA}$ [dB(A)]
80	1	16	4	28	33	35	41	44
	4	23	6	29	37	41	43	45
	8	37	10	30	37	44	47	50
	14	100	28	44	49	52	53	55
100	1	25	7	28	36	40	44	46
	4	34	9	29	38	43	46	49
	8	55	15	33	40	45	49	51
	14	150	42	40	47	51	55	57
125	1	30	8	30	37	41	43	47
	4	45	13	30	39	43	46	47
	8	78	22	31	38	44	48	51
	14	230	64	41	46	51	53	56

RS = controller setting

Radiated noise

NW	RS	V (m ³ /h)	V [l/s]	$\Delta p_t = 50 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 100 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 150 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 200 \text{ Pa } L_{WA}$ [dB(A)]	$\Delta p_t = 250 \text{ Pa } L_{WA}$ [dB(A)]
80	2	18	5	17	18	19	23	24
	4	23	6	18	18	21	22	25
	8	37	10	17	20	23	26	28
	14	100	28	24	29	34	36	38
100	2	28	8	17	18	20	23	25
	4	34	9	18	19	21	24	26
	8	55	15	18	20	23	26	28
	14	150	42	27	32	36	37	38
125	2	36	10	17	18	20	23	26
	4	45	13	17	18	21	35	27
	8	78	22	17	18	22	25	28
	14	230	64	27	31	34	35	38

RS = controller setting

Flow generated noise - relative sound spectrum

NW80							
Relative sound spectrum (dB)							
Correction value K_L							
Frequency (Hz)							
Hz	125	250	500	1000	2000	4000	8000
K_L	-6	-3	-3	-8	-8	-14	-16

NW100							
Relative sound spectrum (dB)							
Correction value K_L							
Frequency (Hz)							
Hz	125	250	500	1000	2000	4000	8000
K_L	1,0	-3	-2	-5	-8	-14	-16

NW125							
Relative sound spectrum (dB)							
Correction value K_L							
Frequency (Hz)							
Hz	125	250	500	1000	2000	4000	8000
K_L	-2	0	-1	-7	-10	-15	-16

Difference pressure range 0 - 300 Pa

Air velocity: 0.5 - 5.0 m/s

K_L = correction value; relative sound power level, relative to L_{WA}

$$K_{LW} = L_{WA} + \{K_L\}$$

CALCULATION EXAMPLE

Design data VKM-100

NW 100 mm | $V=25 \text{ m}^3/\text{h}$ |

$\Delta p=100 \text{ Pa}$ | $L_{WA} = 36 \text{ dB(A)}$

Hz	125	250	500	1000	2000	4000	8000
K_L	1	-3	-2	-5	-8	-14	-16

Sound values calculated according to formula

$$K_{LW(\text{relativ})} = L_{WA} + \{K_L\}$$

gives

Hz	125	250	500	1000	2000	4000	8000
L_{WA}	36	36	36	36	36	36	36
K_L	1	-3	-2	-5	-8	-14	-16
K_{LW}	37	33	34	31	28	22	20

MOUNTING AND OPERATING INSTRUCTIONS

The volumetric flow limiter VKM is used for the previously time- and cost-intensive adjustment of volumetric flows in ventilation and air-conditioning installations. Its easy handling and perfect functioning allow you to save valuable working time on site.

You simply set the desired volumetric flow at the installation site. The VKM controls the set volumetric flow and keeps it constant within the specified limits during changes in pressure. After adjustment, the integrated locking device can be used to fix the damper blade for the reduced operation. An inflow area and an outflow area of at least $1xD$ must be provided.

For further information, see volumetric flow limiter model VKM installation and mounting instructions.

Legend

V	(m ³ /h) [l/s]	= Volumetric flow
K _L	(-)	= K _L = correction value; relative sound power level, relative to L _{WA}
K _{LW}	(-)	= Relative sound spectrum
L _{WA}	[dB(A)]	= Sound power level
Δp	(Pa)	= Pressure difference
Δp _t	(Pa)	= Pressure loss
Hz	(fm)	= Hertz
NW	(mm)	= Nominal width

ORDER CODE VKM

01	02	03	04	05
Type	Nominal width	Model	Duct connection	locking device
Example				
VKM	-080	-HSV	-GD1	-FV0

Sample

VKM-080-HSV-GD1-FV0

Volumetric flow limiter, type VKM, round design | NW 80 mm | with casing made of galvanised sheet steel | with rubber lip seal | without locking device

Order details

01 - Type

VKM = Volumetric flow limiter, type VKM

02 - Nominal width

080 = NW 80 mm
 100 = NW 100 mm
 125 = NW 125 mm

03 - Model

H01 = without casing (standard)
 HSV = casing made of galvanised sheet steel
 HV2 = casing made of stainless steel 1.4301 (V2A)

04 - Duct connection

KA0 = without rubber lip seal (standard)
 GD1 = with rubber seal (only possible for version -HSV or -HV2)

05 - Locking device

FV0 = without locking device (standard)
 FV1 = with locking device

Attention!

The volumetric flow setpoints for the controller settings can be found under [Page 7!](#)

SPECIFICATION TEXT

Volumetric flow limiter model VKM in round design, maintenance-free, position-independent installation, for keeping the volumetric flow constant in ventilation and air-conditioning installations in a pressure range from 30 to 300 Pa. Mechanical control principle, independent without auxiliary power with control damper, controller spring and damping element. An integrated locking device (optional) is used to fix the damper blade. The volumetric flow deviation is $\pm 10\%$, relative to the maximum volumetric flow. Installed in ductwork. For on-site adjustment of the preset volumetric flow, an opening on site must be provided.

Housing, control damper and control housing made of plastic (polystyrene PS, impact-resistant), building material class B2 to DIN 4102, rubber lip seal on both sides. Housing tightness, class C, to DIN EN 1751 when used with the optional casing made of galvanised sheet steel.

Product: SCHAKO **type VKM**

Nominal width:

- NW 80 mm (-080)
- NW 100 mm (-100)
- NW 125 mm (-125)

Model:

- without casing (standard) (-H01)
- with casing made of galvanised sheet steel (-HSV)
- with casing made of stainless steel 1.4301 (V2A) (-HV2)

Duct connection:

- without rubber lip seal (standard) (-GD0)
- with rubber lip seal for the version with casing (-HSV / -HV2) (-GD1)

Locking device:

- without locking device (standard) (-FV0)
- with locking device (-FV1)