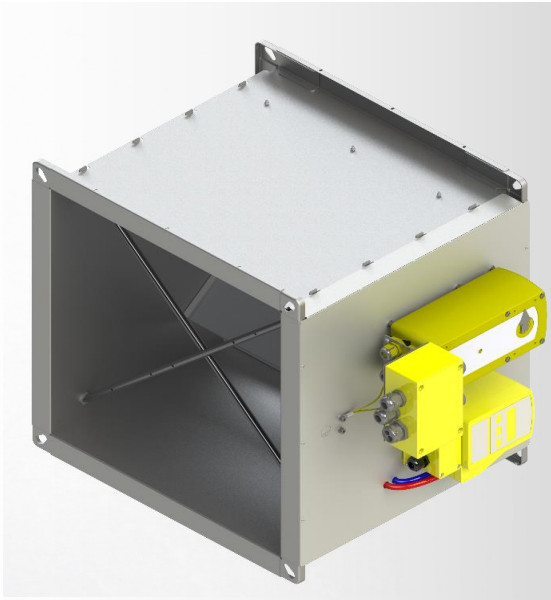
ADDITONAL OPERATING INSTRUCTIONS ACCORDING TO ATEX 2014/34/EU



VQEX

Volumetric flow controller ATEX

PERFORMANCE DATA

- Operating temperature: 10 - 50° C
- Ambient temperature: 0-50°C
- Differential pressure range: 50-1000 Pa
- Volumetric flow range: 291 to 47081 m³/h
- Housing leakage according to DIN EN 1751, class B
- Housing and damper leaf leakage to DIN EN 1751, up to Class 4, (only JK-LU)
- For regulating the air velocity in duct in the range of 2-13 m/s
- Command signal: 0-10 V DC or 2-10 V DC

TESTS AND STANDARDS

- **VDI 6022, Sheet 1**: Hygienic requirements of ventilation and air-conditioning systems
- **DIN EN 13779 (2007**): Ventilation of non-residential buildings
- **Leakage air:** E**N 1751 (2014-06)** Ventilation for buildings - Aerodynamic testing of damper and valves

SPECIAL FEATURES

- Compact dimensions and low depth (400 mm)
- position-independent installation possible
- Low pressure loss
- easy mode of operation and reliable control
- simple commissioning and setting, without the need of additional setting devices at the controller
- with spring return actuator (if required)

APPROVALS AND CERTIFICATES

- RoHS 2002/95/EC
- 2014/34/EU ATEX (product directive)
- EMC 2004/108/EC
- Low voltage 2006/95/EC

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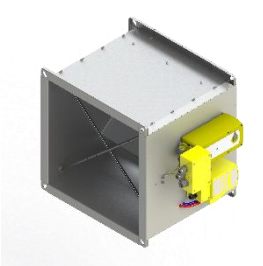
TABLE OF CONTENTS

OVERVIEW OF PRODUCT VERSIONS

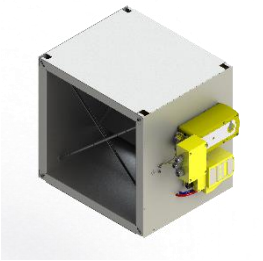
VQEX



Volumetric flow controller, square

- for regulating the air velocity in the duct in the range of 2-13 m/s
- with ATEX unit

VQEX-DS4



Volumetric flow controller, square

- for regulating the air velocity in the duct in the range of 2-13 m/s
- with ATEX unit
- with 40 mm acoustic cladding, pressed to 35 mm
- with sheet metal casing

FUNCTION

A volumetric flow controller is used for pressure-independent volumetric flow regulation in ventilation and air-conditioning systems. It serves to keep the volumetric flow either constant within specified limits (CAV) or to control it variably (VAV).

The housing, measuring sensor, blades, PI controller with pressure sensor and actuator form a closed control loop with feedback, allowing demand-dependent, energy-saving air-conditioning of the single rooms or areas of air-conditioning systems. When suitable electrical controller types are used, room or duct pressure regulation can be achieved.

The first adjustment of the V_{min}, V_{max} and V_{nenn} operating volumetric flows is done prior to delivery ex works in accordance with customer specifications. When these values are set, the functions of all volumetric flow controllers are also checked. The maximum deviation of the volumetric flows is +/- 5 %, relative to the nominal volumetric flow V_{nenn}.

For the measurement of the effective pressure, SCHAKO relies on a measuring principle based on aluminium measuring rods, in which for measuring the average values 6 measuring points each have been attached to the pressure and suction sides, using the median line method.

In comparison with measuring rods or measuring orifices having fewer measuring points, this gives higher accuracy, allowing the inflow area required in front of the volumetric flow controller to be minimised.

When using the controllers in systems with heavy dust contamination, suitable filters must be used.

Since the membrane zero point must not be changed in static sensors, the mounting information documented by the manufacturer must be adhered to. The volumetric flow controllers type VQEX are not suitable for air containing sticky and greasy particles (e.g. kitchen exhaust air).

AREAS OF APPLICATION

- for supply and return air systems
- for hazardous areas of zones 1, 2, 21 and 22
- also for explosion group IIC in zones 1 and 2 (gases)
- Regulation components with protection type IP 66
- for constant CAV or variable VAV installations
- for positive control V_{min}, V_{mid}, V_{max}, "OPEN" or "CLOSED"
- For volumetric flow and linear pressure control
- Measuring range: 0...300 Pa
- at ambient temperatures 0 C….20 to +50°C, requirement: measuring air 0...+50°C/5...95% rH, non-condensing
- with command signal 0...10V DC, 2...10V DC
- with supply voltage 24V AC / DC +/- 15%, 50/60Hz
- with DD varnish coating for aggressive media (please refer to the resistance table in a separate documentation)
- for regulating the air velocity in the duct in the range of 2...13 m/s
- can also be used with vertical axis

The rectangular volumetric flow controller type VQEX made of galvanised steel is suitable for use with aggressive components of polluted air and in areas subject to explosion hazards. The SCHAKO VQEX has been approved for all gases in zones 1 and 2, and for dusts in zones 21 and 22. The SCHAKO VQEX can also be used in zones 1 and 2 of the explosion group IIC.

When connecting SCHAKO components to customer installations, any compatibility problems should be previously checked and solved on-site.

Additional information for defining explosion protection
(Hazardous zone 1 = Gases / Hazardous zone 2 = Dusts)

- Device group II: Use in the remaining hazardous areas, subdivided into:
- Category 2 - occasional hazard for Zones 1 and 21
- Category 3 - rare / brief hazard for Zone 2 and Zone 22

TESTS AND STANDARDS

The volumetric flow controller VQEX-... has been tested in accordance with the following guidelines:

Completed tests

- VDI 6022, Sheet 1: Hygienic requirements of ventilation and air-conditioning systems
- DIN EN 13779 (2007): Ventilation of non-residential buildings
- DIN EN 1751 (2014-06): Ventilation for buildings - Aerodynamic tests of dampers and valves

Applied standards

- RoHS 2002/95/EC
- 2014/34/EU ATEX (product directive)
- EMC 2004/108/EC
- Low voltage 2006/95/EC

PROCESSING

Housing

- Galvanised sheet steel
- Galvanised sheet steel with DD coating

Blades

- opposed, made of extruded aluminium profile (JK-LU)
- opposed, made of sheet steel profile (HKU)

Blade seal

- made of PUR, silicone-free
- airtight sealing design to DIN-EN 1751, up to class 4, including multi-leaf damper JK-LU
- not sealing airtight, including multi-leaf damper HKU

Blade support

- Sintered bearing

Blade activation

- Stainless steel gear wheels

Measuring rods

- Aluminium

Model

- Rectangular design, for duct connection to DIN EN 1505, with blade seal (airtight according to DIN EN 1751, up to class 4), without blade seal (not airtight)
- Housing leakage air flow to DIN EN 1751, class B

Controllers and actuators

The description of the fields of application and the technical data for the controller SCHISCHEK ExRegV300-A and for the actuator SCHISCHEK ExMax-…-CY / -CYF can be found in the SCHISCHEK documentation at www.schischek.de

A098 = ATEX-NM-K2
Controller ExReg V300-A with actuator ExMax-5.10-CY Nm

A099 = ATEX-SM-K2
Controller ExReg V300-A with actuator ExMax-15.30-CY Nm

A100 = ATEX-NM-F-K2
Controller ExReg V300-A with actuator ExMax-5.10-CYF Nm and spring return

A101 = ATEX-SM-F-K2
Controller ExReg V300-A with actuator ExMax-15-CYF Nm and spring return

The controller ATEX-NM-(F-)K2 is mounted for VQEX up to 711x711. Otherwise the ATEX-SM-(F-)K2 is used.

AVAILABLE SIZES

H = height
201
357
400
565
711
1003

W = Width
201
225
252
318
357
400
449
503
565
634
711
797
894
1003

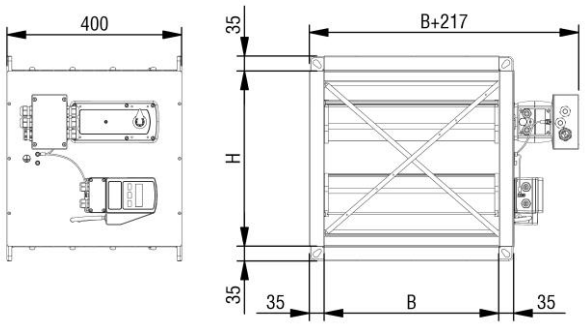
All heights and widths combinable. Exceptions:

- H=201 mm only available up to width=634 mm
- H=357 mm only available up to width=797 mm
- H=711 mm only available from width=318 mm upwards

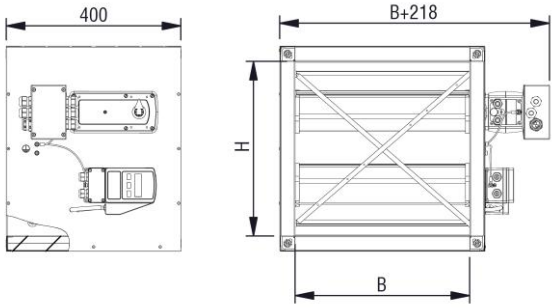
see table p.6

DIMENSIONS

VQEX



VQEX-DS4



40 mm thick sound-absorbing material is pressed to 35 mm, with sheet metal casing

USEABLE VOLUMETRIC FLOW RANGES

H (mm)	V		B (mm)													
			201	225	252	318	357	400	449	503	565	634	711	797	894	1003
201	min.	(m³/h)	291	326	365	460	517	579	650	728	818	918	-	-	-	-
		[l/s]	81	91	102	128	144	161	181	202	227	255	-	-	-	-
	max.	(m³/h)	1891	2117	2371	2991	3358	3763	4224	4732	5315	5964	-	-	-	-
		[l/s]	525	588	659	831	933	1045	1173	1314	1476	1657	-	-	-	-
357	min.	(m³/h)	517	578	648	817	918	1028	1154	1293	1452	1630	1828	2049	-	-
		[l/s]	144	161	180	227	255	286	321	360	403	453	508	570	-	-
	max.	(m³/h)	3358	3759	4210	5313	5965	6683	7502	8404	9440	10593	11879	13316	-	-
		[l/s]	933	1044	1170	1476	1657	1856	2084	2334	2622	2942	3300	3699	-	-
400	min.	(m³/h)	579	648	726	916	1028	1152	1293	1449	1627	1826	2048	2295	2575	2889
		[l/s]	161	180	202	254	286	320	360	402	452	506	570	638	715	803
	max.	(m³/h)	3763	4212	4717	5953	6683	7488	8405	9416	10577	11868	13310	14920	16736	18776
		[l/s]	1045	1170	1310	1654	1856	2080	2335	2616	2938	3297	3697	4144	4649	5216
565	min.	(m³/h)	818	915	1025	1294	1452	1627	1827	2046	2298	2579	2892	3242	3637	4080
		[l/s]	227	254	285	360	403	452	506	569	639	716	805	901	1010	1133
	max.	(m³/h)	5315	5949	6663	8409	9440	10577	11872	13300	14940	16764	18800	21074	23639	26521
		[l/s]	1476	1653	1851	2336	2622	2938	3298	3695	4150	4657	5222	5854	6566	7367
711	min.	(m³/h)	-	-	-	1628	1828	2048	2299	2575	2892	3246	3640	4080	4577	5135
		[l/s]	-	-	-	452	506	570	639	715	805	900	1011	1133	1271	1426
	max.	(m³/h)	-	-	-	10581	11879	13310	14940	16737	18800	21096	23658	26520	29748	33375
		[l/s]	-	-	-	2939	3300	3697	4150	4649	5222	5860	6572	7367	8263	9271
1003	min.	(m³/h)	-	-	-	2296	2578	2889	3242	3632	4080	4578	5135	5756	6456	7243
		[l/s]	-	-	-	638	716	807	899	1009	1133	1271	1426	1599	1793	2012
	max.	(m³/h)	-	-	-	14927	16758	18776	21076	23611	26521	29760	33375	37411	41965	47081
		[l/s]	-	-	-	4146	4655	5216	5855	6559	7367	8267	9271	10392	11657	13078

- MIN value refers to air velocity of 2 m/s
- MAX value refers to air velocity of 13 m/s

When the air volume drops below the V_{min} shown in the chart, the correct functioning of the volumetric flow controller is no longer guaranteed. Other sizes available upon request.

ATTENTION: IMPORTANT FOR PARAMETERISATION

- The table of “useable volumetric flow ranges” corresponds to the complete measuring range.
- When the air volume drops below $V_{min,}$ the correct functioning of the volumetric flow controller is no longer guaranteed.
- If only V_{max} is specified in the order, a variable volumetric flow controller will be delivered. The V_{min} value will be set to the value specified in the catalogue.
- If only one air volume is specified in the order (as V_{min} or V_{kon}), then the volumetric flow controller will be delivered as a constant volumetric flow controller. The volume specified in the order is set to the V_{min} value, and the V_{max} value is set to 100%.
- If no values are specified in the order, the controller will be programmed with the standard values in table p. 6.
- The air volumes V_{min} and V_{max} and the operating mode 0/2-10 V can be changed directly at the controller within the nominal volumetric flow.
- For the parameter setting of the regulation components, an air density of 1.2 kg/m³ has been taken into account.

MINIMUM TORQUE VQEX-HKU

H (mm)	B (mm)													
	201	225	252	318	357	400	449	503	565	634	711	797	894	1003
201	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	-	-	-	-
357	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	-	-
400	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm
565	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm
711	-	-	-	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm
1003	-	-	-	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm

MINIMUM TORQUE VQEX-JK-LU

H (mm)	B (mm)													
	201	225	252	318	357	400	449	503	565	634	711	797	894	1003
201	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	-	-	-	-
357	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	-	-
400	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm
565	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	5 Nm	10 Nm	10 Nm	10 Nm	10 Nm
711	-	-	-	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm
1003	-	-	-	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	10 Nm	15 Nm	15 Nm	15 Nm	15 Nm	15 Nm

ATEX-NM(-F)-K2
ATEX-SM(-F)-K2

VQEX-JK-LU DAMPER BLADE LEAKAGE, CLASSIFICATION TO DIN EN 1751

H dimension in mm	Test pressure in Pa				
	100	250	500	750	1000
200-599	Class 3	Class 3	Class 3	Class 3	Class 3
600-1003	Class 4	Class 4	Class 4	Class 4	Class 3
H 600 - 1003, class 4 at 1000 Pa available at an extra charge					

ACCESSORIES

Acoustic cladding (-DS 4)

made of sound-absorbing, insulating 40 mm material, non-flammable according to DIN 4102-17, with sheet steel covering made of galvanised sheet steel (standard), with cage nuts (M6)

Mineral wool silencer (-ZSQ-EX)

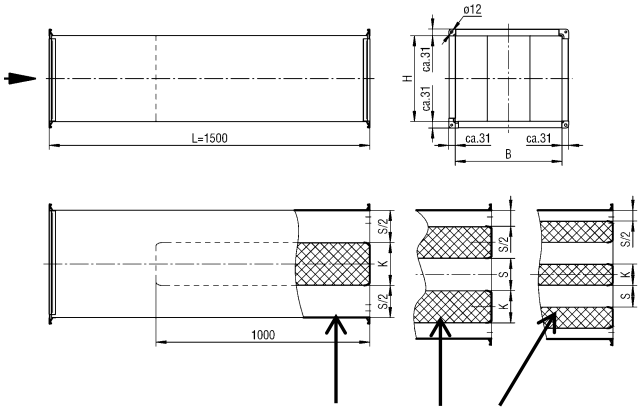
--- Housing of galvanised sheet steel (standard)
--- Baffle frame made of galvanised sheet steel (standard), on both sides with METU profile M3
--- Mineral fibre boards according to DIN 4102 A2, with glass filament cover, biosoluble, abrasion-resistant

ACCESSORIES DIMENSIONS

Accessories mineral wool silencer (-ZSQ-EX)

with baffles type MWK

Connection side



with 1 baffle, or 2 or 3 baffles

additional silencer ZSQ-Ex

Available sizes and insertion loss

B (mm)	KA (-)	K (mm)	S (mm)	D_e [dB/Okt] fm (Hz)							
				63	125	250	500	1000	2000	4000	8000
201	1	100	100	1	3	9	18	36	37	22	13
225	1	100	125	1	2	8	19	32	26	16	11
252	1	100	152	1	2	7	16	26	24	14	8
318	1	100	218	1	4	7	8	15	15	8	5
357	1	200	157	1	2	9	22	36	30	17	12
400	1	200	200	1	2	8	18	28	24	14	10
449	1	200	249	1	4	11	19	25	20	11	7
503	1	200	303	1	4	8	10	17	17	9	6
565	1	200	365	1	4	7	8	15	15	8	5
634	3	100	111	1	2	9	22	36	30	17	12
711	3	100	137	1	2	8	18	28	24	14	10
797	2	200	199	1	4	11	19	25	20	11	7
894	2	200	247	1	4	8	10	17	17	9	6
1003	2	200	302	1	4	7	8	15	15	8	5

- Possible combinations of width and height same as "Available sizes" for VQEX; other sizes available upon request
- The parameters KA (number of baffles), K (baffle thickness) and S (gap width) depend on the width B

SOUND DATA

Inflow area (m²)

Height	Width													
	201	225	252	318	357	400	449	503	565	634	711	797	894	1003
201	0.04	0.045	0.05	0.064	0.072	0.08	0.09	0.1	0.11	0.13	x	x	x	x
357	0.072	0.08	0.09	0.11	0.13	0.14	0.16	0.18	0.2	0.22	0.25	0.28	x	x
400	0.08	0.09	0.1	0.13	0.14	0.16	0.18	0.2	0.23	0.25	0.28	0.32	0.36	0.4
565	0.11	0.13	0.14	0.18	0.2	0.23	0.25	0.28	0.32	0.36	0.4	0.45	0.51	0.57
711	x	x	x	0.23	0.25	0.28	0.32	0.36	0.4	0.45	0.51	0.57	0.64	0.71
1003	x	x	x	0.32	0.36	0.4	0.45	0.5	0.57	0.64	0.72	0.8	0.9	1.0

Flow generated noise (A = 1 m²)

v_K m/s	Δp_t = 100 Pa							Δp_t = 250 Pa							Δp_t = 500 Pa							Δp_t = 1000 Pa						
	L_{W1} [dB/oct]						L_{WA1} [dB(A)]	L_{W1} [dB/oct}						L_{WA1} [dB(A)]	L_{W1} [dB/oct]						L_{WA1} [dB(A)]	L_{W1} [dB/oct]						L_{WA1} [dB(A)]
	f_m (Hz)							f_m (Hz)							f_m (Hz)							f_m (Hz)						
	125	250	500	1000	2000	4000		125	250	500	1000	2000	4000		125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
3	62	61	60	59	56	52	63	68	68	67	67	65	63	72	74	74	73	73	71	69	78	81	82	81	81	80	77	86
6	68	67	66	65	63	58	70	73	73	72	71	69	67	76	78	79	78	77	76	74	82	84	85	84	84	84	82	90
9	73	73	73	71	69	65	76	79	78	78	76	75	73	82	79	80	81	80	80	78	86	86	88	87	87	86	85	92
12	75	74	74	72	70	67	77	82	81	81	79	78	76	85	85	85	84	84	83	81	89	88	90	89	90	89	88	95

Radiated noise (A = 1m²)

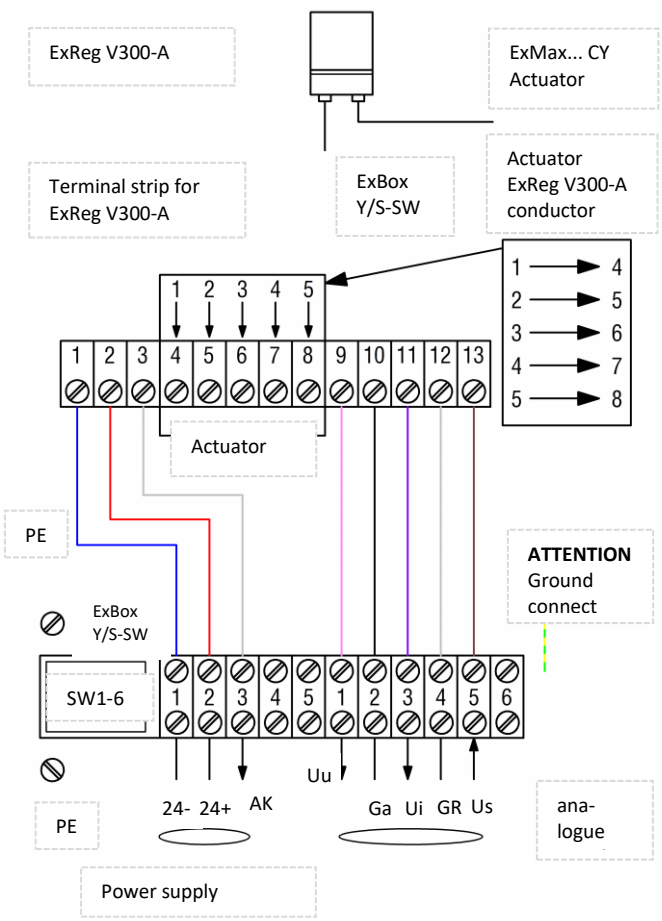
v_K m/s	Δp_t = 100 Pa							Δp_t = 250 Pa							Δp_t = 500 Pa							Δp_t = 1000 Pa						
	L_{W1} [dB/oct]						L_{WA1} [dB(A)]	L_{W1} [dB/oct]						L_{WA1} [dB(A)]	L_{W1} [dB/oct]						L_{WA1} [dB(A)]	L_{W1} [dB/oct]						L_{WA1} [dB(A)]
	f_m (Hz)							f_m (Hz)							f_m (Hz)							f_m (Hz)						
	125	250	500	1000	2000	4000		125	250	500	1000	2000	4000		125	250	500	1000	2000	4000		125	250	500	1000	2000	4000	
3	69	61	55	48	44	41	58	75	68	62	56	51	50	65	82	75	68	53	58	53	72	90	82	77	72	67	60	80
6	75	67	61	52	48	44	64	80	72	66	59	54	51	69	85	80	73	66	62	57	76	95	85	79	75	70	66	83
9	80	73	67	57	53	49	69	85	75	70	61	58	54	73	86	81	75	67	65	61	77	96	87	82	76	71	69	85
12	82	76	69	61	56	52	72	87	77	72	63	60	58	75	90	83	78	70	66	64	80	97	88	84	76	73	71	86

Correction value

for flow generated and radiated noise

A (m²)	0.04	0.06	0.08	0.10	0.12	0.16	0.20	0.25	0.36	0.40	0.50	0.60	0.80	1.00
KF (-)	-14	-12	-11	-10	-9	-8	-7	-6	-5	-4	-3	-2	-1	0

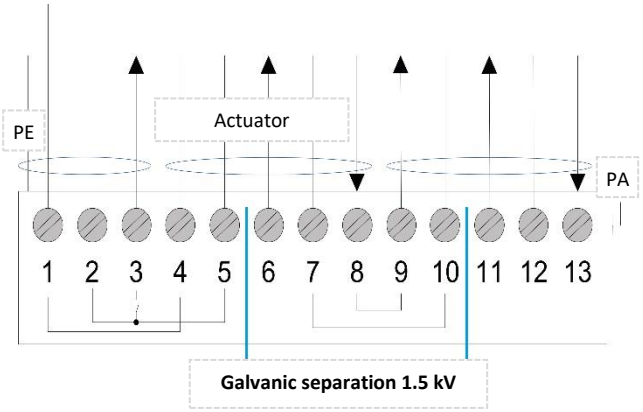
CONNECTION DIAGRAM ATEX UNIT



Connection diagram of terminal box

left: 1 to 5	right: 1 to 6
1 to 1 = blue	9 to 1 = pink
2 to 2 = red	10 to 2 = black
3 to 3 = white	11 to 3 = purple
	12 to 4 = grey
	13 to 5 = brown

CONNECTION DIAGRAM – ATEX CONTROLLER



Connection assignment of ATEX controller V300-A
1 = 24 V AC / DC (-)
2 = 24 V AC / DC (+)
3 = AK - alarm contact
4 = 24 V AC / DC (-) power supply actuator
5 = 24 V AC / DC (+) power supply actuator
6 = Y_i - Setpoint value of the actuator 4... 20mA
7 = G_a - Ground Y, Gd
8 = U_u = actual value of actuator 0...10 V
9 = U_u - damper position 0...10 V
10 = Ga: ground drive, GND
11 = U_i = actual value of controller 0/2...10 V
12 = G_r - Ground of the controller, GND
13 = U_s - Setpoint value of the controller 0/2...10 V

Connection of Schischek ExReg-V300-A

ExReg-V300-A is the standard version for controlling variable volumetric flows (VAV). The alarm contact (terminal 3) serves to provide feedback for normal operation. Moreover, the device has an analogue output (terminal 11) which emits the current setpoint value as a continuous signal and analogue feedback of the damper position (terminal 9). This function is mainly used for saving energy.

A setpoint value is specified via terminal 13. The voltage for the minimal and maximal volumetric flow is defined either in the range of 0 to 10 V or in the range of 2 to 10 V. Depending on the settings applied in menu 6 (setpoint value), the function of positive control may be used additionally. If the voltage value exceeds approximately 12 V, the damper leaf opens. In case the voltage value falls below 0.2 V, the damper leaf will be completely closed. During this positive control function (damper OPEN / CLOSED), the control remains inoperable. If the input is not connected, the value set in menu 7.2 (default) will be used as constant volumetric flow.

Controllers of type V300 and V300-B can be provided upon request as well.

PRIOR TO MOUNTING AND COMMISSIONING

An instruction leaflet containing information on safety, transport disposal, installation, commissioning and maintenance is enclosed with each SCHAKO product. For safety reasons, this instruction leaflet must be read under all circumstances and completely adhered to.

Marking

The product has the following ATEX marking:

II 2G Ex h IIC T6 Gb
II 2D Ex h IIIC T80°C Db
EPS 11 ATEX 2 307 X

The devices have been designed for use in areas subject to explosion hazards according to ATEX of device group II, device category 2 for Zones 1 and 21, as well as device category 3 for Zones 2 and 22.

These devices are ONLY suitable for use in approved Ex zones. The operating safety of the devices is only guaranteed when used in accordance with their designated use.

Special operation

It must be ensured that all metallic parts and conductive plastics are properly and permanently connected to earth potential.

The attached and installed electrical devices must have a suitable explosion-proof design. The combination of electrical and non-electrical devices must be examined again from a safety point of view.

To avoid propagating brush discharges in housings with RAL coating, it must be ensured that the air in the ventilation system is not heavily contaminated with non-conductive particles.

Disposal

The devices have been prepared in accordance with the RoHS directive restricting the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). After its final decommissioning, the volumetric flow controller must be properly disposed of.

Type of ignition protection

The type of ignition protection of the volumetric flow controller is guaranteed by its safe design.

Quality

The SCHAKO production facilities are certified according to the QM procedure EN ISO 9001.

Zero point adjustment of the static pressure sensor

see SCHISCHEK documentation

For Schischek ExReg-V300-A controller, a zero adjustment must be performed for commissioning to correct mounting position-dependent measurement deviations. For this purpose, the pressure connections P+ and P- are to be short-circuited mechanically and the adjustment should be carried out according to menu 3.2. [0-point]. To achieve a constant operating temperature, the controller should be connected to the supply voltage about 15 minutes before the zero adjustment begins.

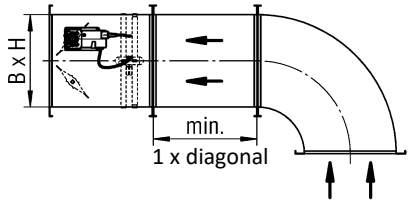
Disposal

The devices have been prepared in accordance with the RoHS directive restricting the use of certain hazardous substances in electrical and electronic equipment (2002/95/EC). After its final decommissioning, the volumetric flow controller must be properly disposed of.

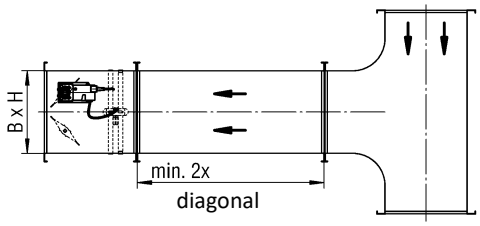
INSTALLATION INFORMATION

To avoid unnecessary controller errors, the min. distances according to the following table / drawings must be observed. For combinations of several connection pieces or pieces with fire dampers or silencers, the larger minimum distances must be observed. All volumetric flow controllers can be assembled with horizontal or vertical damper axis.

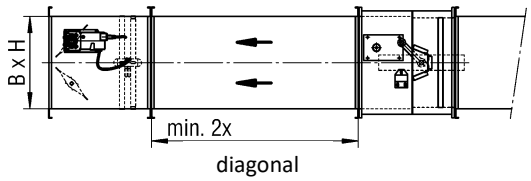
Distance to a bend



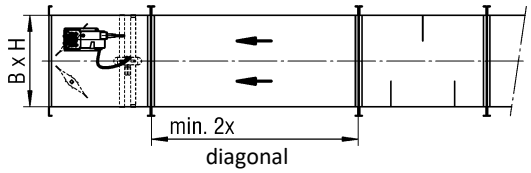
Distance to other connection piece



Distance to a fire damper



Distance to a silencer



Distances

Distance to	VQEX
Bend	1 x diagonal
Other connection pieces (e.g. T-junction, branching piece, reducing piece, etc.)	2 x diagonal
Fire damper	2 x diagonal
Silencer	2 x diagonal

MAINTENANCE AND SERVICE

Important note

1. The controllers must be assembled in a way to allow inspection. For maintenance, service, retrofitting, etc., inspection openings in sufficient number and size must be provided on-site.
2. For volumetric flow controllers with integrated controller with static membrane pressure sensor, it is imperative to observe the notice sign regarding its mounting position. The volumetric flow controllers are not suitable for air containing sticky and greasy components.
3. The volumetric flow controller and all mounted components must be grounded via the existing connections at any time.

Mounting instructions

- When the device is delivered, check whether the controllers are complete and have been delivered without damage. Complaints have to be communicated immediately and directly to the transporter and SCHAKO.
- The volumetric flow controller must not be carried on the regulation components, measuring cross or the damper blade, but only on the housing.
- The controllers must be carefully stored on-site. They must be protected from dust, dirt and from direct weather effects.
- Assembly must be carried out by expert personnel, observing recognised technical rules and regulations.
- By default, the volumetric flow controllers should be used with an integrated controller and with a static membrane pressure sensor. It is imperative to observe the notice sign regarding its mounting position and perform a zero-point adjustment after installation.

LEGEND

ΔL_W	[dB/Okt]	=	Level correction value / octave
Δp	(Pa)	=	Pressure difference
$\Delta p_{t\,min}$	(Pa)	=	Minimum static pressure difference
Δp_t	(Pa)	=	Pressure loss
Δp_W	(Pa)	=	Differential pressure
A	(m^2)	=	Inflow area (W x H)
B	(mm)	=	Width
D_e	[dB/Okt]	=	Insertion loss
EK	(m/s)	=	Calibration curve
EW	%	=	Setpoint value
EW_{Vmax}	(m^3/h)	=	Set value of maximum air volume
EW_{Vmin}	(m^3/h)	=	Set value of minimum air volume
F	(m^2)	=	Surface
f_m	(Hz)	=	Octave band centre frequency
H	(mm)	=	Height
K	(mm)	=	Baffle thickness
K1	(-)	=	Measuring cross constant
KA	(-)	=	Number of baffles
KF	(-)	=	Correction factor
$L_{W\,abst}$	[dB/Okt]	=	Radiated noise / octave
L_W	[dB/oct]	=	Sound power level/ octave ($L_W = L_{W1} + KF$)
L_{W1}	[dB/oct]	=	Sound power level / octave, relative to 1 m^2 of inflow area
L_{WA}	[dB(A)]	=	A-weighted sound power level ($L_{WA} = L_{WA1} + KF$)
L_{WA1}	[dB(A)]	=	A-weighted sound power level in duct, relative to 1 m^2 of inflow area
NW	(mm)	=	Nominal width
S	(mm)	=	Gap width
U_5	(V) DC	=	Measurement output (electric voltage)
V	(m^3/h)	=	Air volume
V	[l/s]	=	Air volume
v_K	(m/s)	=	Duct velocity
V_{max}	(m^3/h)	=	Maximum air volume
V_{min}	(m^3/h)	=	Minimum air volume
V_{kon}	(m^3/h)	=	Constant air volume
V_{Nenn}	(m^3/h)	=	Nominal air volume
ϱ	(kg/m^3)	=	Density

CALCULATION FORMULAE

Calculation of the nominal volumetric flow
V_{nenn} = EK x F x 3600

Einstellwerte für V_{min}: The required volumetric flow that is to flow at the 0 V DC command signal (operating mode 0-10 V DC) or at the 2 V DC command signal (operating mode 2 - 10 V DC) at terminal 13 (U_S or in terminal box terminal 5) or with positive control V_{min} is set in m^3/h at the controller. This value refers to the set V_{nenn} volumetric flow.
Formula: $EW_{Vmin} = V_{min} / V_{nenn}$ x 100 percent

Einstellwerte für V_{max}: The required volumetric flow that is to flow at the 10 V DC command signal at terminal 13 (U_S or terminal box terminal 5) or with positive control V_{max} is set in m^3/h at the controller. This value refers to the set V_{nenn} nominal volumetric flow.
Formula: $EW_{Vmax} = V_{max} / V_{nenn}$ x 100 percent

ORDER CODE

01	02	03	04	05	06	07	08	09
Type	Model	Width	Height	Material	Attachment assembly	Mode	Volumetric flow V_{min}	Volumetric flow V_{max}
Example								
VQEX	-HU	-0201	-0400	-SV	-A098	-2	-00550	-02000
VQEX	-JU	-0565	-0711	-DD	-A101	-0	-03000	-09000

10	11
Acoustic clad-ding	Damper position
-DS0	-NA
-DS4	-NO

SAMPLE

VQEX-HU-0201-0400-SV-A098-2-00550-02000-DS0-NA
Volumetric flow controller in rectangular design, model HKU I Width 0201 I Height 0400 I galvanised sheet steel I with attachment assembly ATEX-NM-K2 I Mode 2-10 V I V_{min}=550 m³/h I V_{max}=2000 m³/h I without acoustic cladding I without spring return actuator

VQEX-JU-0565-0711-DD-A101-0-00300-09000-DS4-NO
Volumetric flow controller in rectangular design, model JK-LU I Width 0565 I Height 0711 I with DD coating inside I with attachment assembly ATEX SM-F-K2 I Mode 0-10 V I V_{min}=3000 m³/h I V_{max}=9000 m³/h I with acoustic cladding 40 mm I with damper position, NO=currentless OPEN

ORDER DETAILS

01 - Type
VQEX = Volumetric flow controller in rectangular design, model ATEX

02 - Model
HU = HKU (standard)
JU = JK-LU (sealing airtight)

03 - Width
0201 – 0225 – 0252 – 0318 – 0357 – 0400 – 0449 – 0503 – 0565 – 0634 – 0711 – 0797 – 0894 – 1003
in mm, always four digits

04 - Height
0201 –0357 – 0400 – 0565 –0711 – 1003
in mm, always four digits

05 - Material
SV = galvanised sheet steel (standard)
DD = DD-coating on the inside with galvanised sheet steel (only for HKU available)

06 - Attachment assembly
A098 = ATEX-NM-K2 (standard)
A099 = ATEX-SM-K2
A100 = ATEX-NM-F-K2 (with spring return)
A101 = ATEX-SM-F-K2 (with spring return)

07 - Mode
0 = 0-10 V
2 = 2-10 V (standard)

08 - Volumetric flow set value V_{min}/V_{kon}
00000 = ex works, see table p. 6
xxxxx = 5-digit value in m³/h according to customer specification

09 - Volumetric flow set value V_{max}
00000 = ex works, see table p. 6
xxxxx = 5-digit value in m³/h according to customer specification

10 - Acoustic cladding
DS0 = without acoustic cladding (standard)
DS4 = Acoustic cladding with 40 mm

11 - Damper position
NA = no spring return actuator (standard)
NO = currentless OPEN - normally open (only for actuators with spring return)
NC = currentless CLOSED - normally closed (only for actuators with spring return)

ATTENTION
Additional silencers must be ordered separately!

SPECIFICATION TEXT

VQEX

Volumetric flow controller made of galvanised sheet steel in rectangular design, for duct connection to EN 1505, for use in supply and return air systems for constant or variable volumetric flow regulation, ATEX version available in accordance with product directive ATEX 2014/34/EU.
Allowed differential pressure range: 50-1000 Pa.
Allowed ambient temperature: 0…50°C.

For use with duct velocities of 2...13 m/s.
It is possible to subsequently adjust the manufacturer set operation volume flow.

The output signals 0/2…10 VDC can be used for actual value display and for display of the damper position.

Housing made of galvanised sheet steel:
Opposed blades, air-tight to DIN EN 1751, up to Class 4, made of extruded aluminium profile, sintered bearing
Product: SCHAKO type VQEX-JK-LU
Opposed blades, not airtight, made of galvanised sheet steel, Sintered bearing
Product: SCHAKO Type VQEX-HKU
Housing leakage according to DIN EN 1751, class B

Aluminium measuring rods in which for measuring the average values 6 measuring points each have been attached to the pressure and suction sides, using the median line method.

Damper bearing: sintered bearing
With electric controller, ATEX-NM-K2,
Supply voltage: 24 VAC/DC ±15%, 50/60 Hz
wiring and adjusting by manufacturer.

with spring return actuator (at an extra charge)
--- currentless CLOSED
--- currentless OPEN
Housing (at an extra charge) made of:
--- galvanised sheet steel with DD coating (-DD)

ACCESSORIES VQEX

Acoustic cladding (-DS 4)

made of sound-absorbing, insulating 40 mm material with sheet steel covering made of galvanised sheet steel, non-flammable according to DIN 4102-17. In this model, each corner angle contains an M6 cage nut

Mineral wool silencer (-ZSQ-EX)

Housing made of galvanised sheet steel
M3 Metu profile on both sides
Baffle frame made of galvanised sheet steel
Mineral fibre boards according to DIN 4102 A2, with glass filament cover, biosoluble, abrasion-resistant
with baffles MWK

ATTENTION
The additional silencer is not included in the order code of the volumetric flow controllers and must be ordered separately.

CERTIFICATE OF CONFORMITY

Konformitätsbescheinigung

(1)

(2) Geräte und Schutzsysteme zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen – **Richtlinie 2014/34/EU**

(3) Bescheinigungsnummer

EPS 11 ATEX 2 307 X **Revision 3**

(4) Gerät: Volumenstromregler Typ: VRA, VREX, VQEX und VPEX

(5) Hersteller: Schako KG

(6) Anschrift: Steigstraße 25-27
78600 Kolbingen
Deutschland

(7) Die Bauart dieses Gerätes sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Konformitätsbescheinigung festgelegt.

(8) Bureau Veritas Consumer Products Services Germany GmbH bescheinigt aufgrund einer freiwilligen Prüfung auf Basis der Richtlinie 2014/34/EU des Europäischen Parlaments und des Rates vom 26. Februar 2014 die Erfüllung der grundlegenden Sicherheits- und Gesundheitsanforderungen für die Konzeption und den Bau von Geräten und Schutzsystemen zur bestimmungsgemäßen Verwendung in explosionsgefährdeten Bereichen gemäß Anhang II der Richtlinie. Die Ergebnisse der Prüfung sind in der vertraulichen Dokumentation unter der Referenznummer 10TH0561 festgelegt.

(9) Die grundlegenden Sicherheits- und Gesundheitsanforderungen werden erfüllt durch Übereinstimmung mit:

EN ISO 80079-36:2016 **EN ISO 80079-37:2016**

(10) Falls das Zeichen „X" hinter der Bescheinigungsnummer steht, wird auf besondere Bedingungen für die sichere Anwendung des Gerätes in der Anlage zu dieser Bescheinigung hingewiesen.

(11) Diese Konformitätsbescheinigung bezieht sich nur auf Konzeption und Prüfung des festgelegten Gerätes gemäß Richtlinie 2014/34/EU. Weitere Anforderungen dieser Richtlinie gelten für die Herstellung und das Inverkehrbringen dieses Gerätes. Diese Anforderungen werden nicht durch diese Bescheinigung abgedeckt.

(12) Die Kennzeichnung des Gerätes muss die folgenden Angaben enthalten:

II 2G Ex h IIC T6 Gb

II 2D Ex h IIIC T80°C Db

Zertifizierungsstelle Explosionsschutz

H. Schaffer

Hamburg, 15.05.2020

Seite 1 von 2

Bescheinigungen ohne Unterschrift und Siegel haben keine Gültigkeit. Diese Bescheinigung darf nur unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung von Bureau Veritas Consumer Products Services Germany GmbH. EPS 11 ATEX 2 307 X, Revision 3.

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(13) **Anlage**

(14) **Konformitätsbescheinigung EPS 11 ATEX 2 307 X** **Revision 3**

(15) Beschreibung des Gerätes:

Die Volumenstromregler werden zur druckunabhängigen Regelung von Volumenströmen in Lüftungs- und Klimaanlagen eingesetzt. Der Antrieb erfolgt durch zugelassene elektrische oder pneumatische Stellantriebe (Systeme). Die Messung des Volumenstroms erfolgt mittels eines Doppelmesskreuzes und kann extern durch ein zugelassenes System ausgewertet werden.

(16) Referenznummer: 10TH0561

(17) Besondere Bedingungen:

Es muss sichergestellt werden, dass alle metallischen Teile sowie die leitfähigen Kunststoffe ordnungsgemäß und dauerhaft mit dem Erdpotential verbunden sind.

Die an- und eingebauten elektrischen Geräte müssen in geeigneter Weise explosionsgeschützt ausgeführt sein. Die Zusammenführung von elektrischen und nichtelektrischen Geräten muss erneut sicherheitstechnisch betrachtet werden.

Zur Vermeidung von Gleitstielbüschelentladungen muss bei den Gehäusen mit RAL Lack sichergestellt werden, dass die Luft im Lüftungssystem keine starke Belastung an nichtleitfähigen Partikeln aufweist.

(18) Grundlegende Sicherheits- und Gesundheitsanforderungen:

Durch Übereinstimmung mit Normen abgedeckt.

Zertifizierungsstelle Explosionsschutz

H. Schaffer

Hamburg, 15.05.2020

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