

# RECTANGULAR VAV DAMPER ERVA

TECHNICAL CATALOGUE





### KEY FEATURES

- Variable airflow
- Constant airflow
- Real-time airflow measurement with FläktGroup compact controller
- Modbus version easily connected to the Building Automation System
- Available in IPSUM compatible version

### RECTANGULAR VAV DAMPER ERVA

ERVA is a rectangular VAV damper for OPTIVENT system. It is used to control and regulate the supply air flow and the exhaust air flow. It can be used for many different purposes, for example to regulate the temperature and the air quality in a room. The damper can be used both for variable and constant flow and, if appropriate, forced shut-off for both the supply and exhaust air. All control equipment is installed on the apparatus casing. Standardly ERVA VAV damper is equipped with compact actuator FG 227VM. Other controllers are available on request. Controller has limiting flow value  $V_{nom}$  preset by manufacturer.

FläktGroup compact controller 227VM is a complete unit comprising of actuator, a dynamic differential pressure sensor for pressure-independent controls and user interface with 3-digit display which enables monitoring the air flow and setting up values of  $V_{max}$  and  $V_{min}$  without external equipment.

For more information on the actuators see "Optivent controls" technical catalogues.

ERVA is available also as an insulated version. Insulation material is glass wool with a thickness of 50 mm.

### SPECIFICATIONS

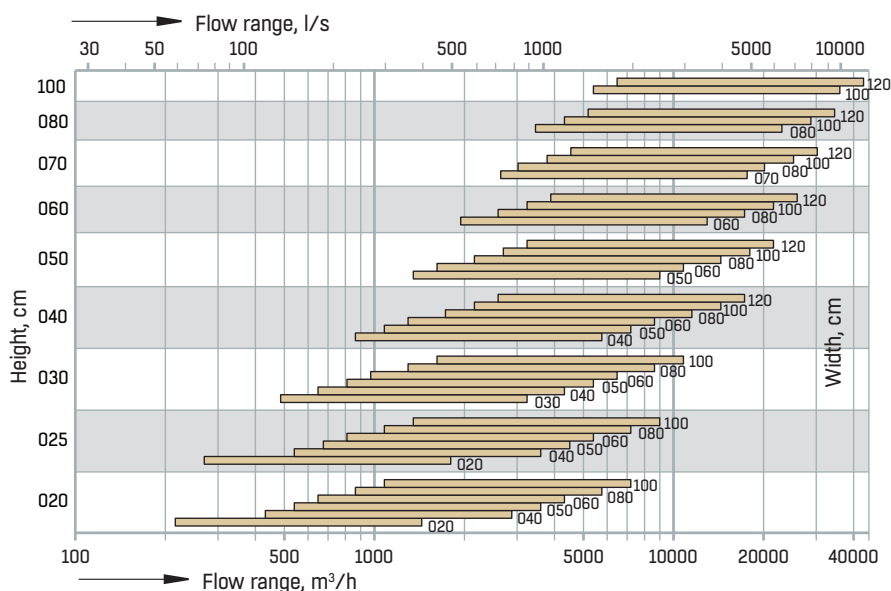
- Intended for air volume regulation
- Acoustically insulated or uninsulated
- Available in vast number of sizes

### PRODUCT CODE EXAMPLE

VAV damper ERVA-1-025-020-2-2

VAV box equipped with FG 227VM actuator width 25 and height 20 cm without insulation.

### QUICK SELECTION



The recommended air flow limits with compact controller 227VM correspond to air velocity 1.5-10 m/s.

## OPERATING RANGE

### OPERATING RANGE OF PARTICULAR CONTROLLER SIZES

Following table shows recommended minimum  $V_{min}$  [m<sup>3</sup>/h] and limiting  $V_{nom}$  [m<sup>3</sup>/h] airflow value<sup>1)</sup> preset by manufacturer.

Height H (cm)	Width W (cm)							
	020	025	030	035	040	045	050	055
020	216-1440	270-1800	324-2160	378-2520	432-2880	486-3240	540-3600	594-3960
025	-	338-2250	405-2700	473-3150	540-3600	607-4050	675-4500	743-4950
030	-	-	486-3240	567-3780	648-4320	729-4860	810-5400	891-5940
040	-	-	-	-	864-5760	972-6480	1080-7200	1188-7920
050	-	-	-	-	-	-	1350-9000	1485-9900
060	-	-	-	-	-	-	-	-
070	-	-	-	-	-	-	-	-
080	-	-	-	-	-	-	-	-
100	-	-	-	-	-	-	-	-

Height H (cm)	Width W (cm)						
	060	070	080	100	120	140	160
020	648-4320	756-5040	864-5760	1080-7200	-	-	-
025	810-5400	945-6300	1080-7200	1350-9000	-	-	-
030	972-6480	1134-7560	1296-8640	1620-10800	-	-	-
040	1296-8640	1512-10080	1728-11520	2160-14400	2592-17280	3024-20160	3456-23040
050	1620-10800	1890-12600	2160-14400	2700-18000	3240-21600	3780-25200	4320-28800
060	1944-12960	2268-15120	2592-17280	3240-21600	3888-25920	4536-30240	5184-34560
070	-	2646-17640	3024-20160	3780-25200	4536-30240	5292-35280	6048-40320
080	-	-	3456-23040	4320-28800	5184-34560	6048-40320	6912-46080
100	-	-	-	5400-36000	6480-43200	7560-50400	8640-57600

<sup>1)</sup> Other settings of  $V_{nom}$  value on request.  $V_{max}$  corresponds to air going through the VAV damper with velocity of 10 m/s.

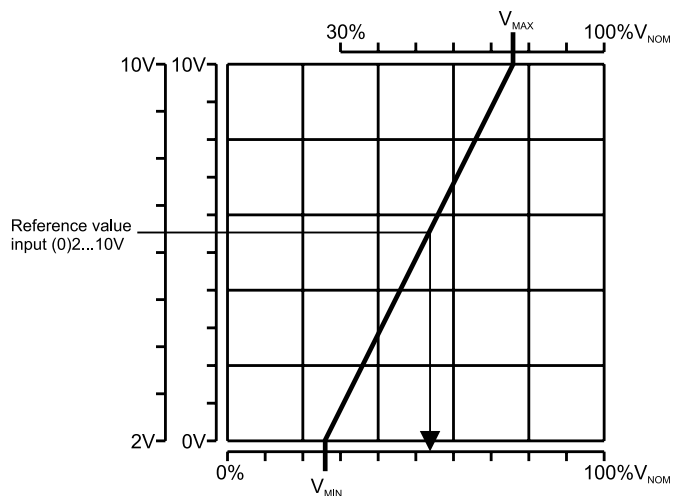
$V_{min}$  corresponds to air going through the VAV damper with velocity of 1.5 m/s.

When air velocity is below 1.5 m/s measuring accuracies cannot be guaranteed.

## MEASURING ACCURACY

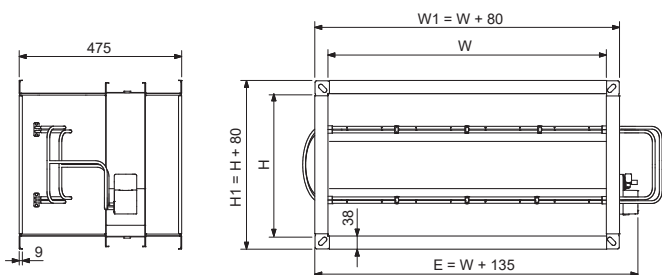
Velocity m/s	Measuring accuracy %
≥ 1.5	±14
≥ 4	±10
≥ 6	±8
≥ 10	±5

## CHANGE OF OPERATION POINT

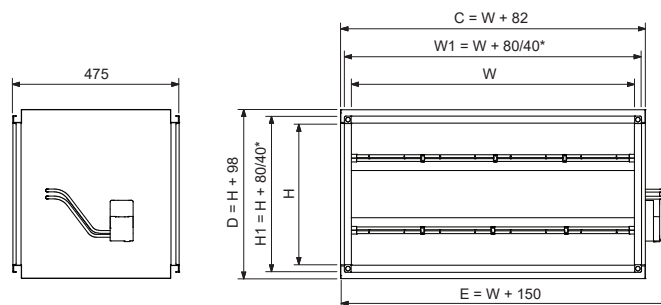


## DIMENSIONS AND WEIGHTS

### FLANGE JOINT WITHOUT INSULATION

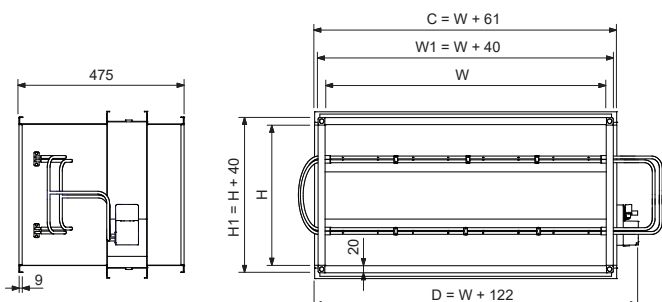


### FLANGE AND SLIP JOINT WITH INSULATION



\*] slip joint

### SLIP JOINT WITHOUT INSULATION



Dimensions given in mm.

### WEIGHT (KG) WITHOUT INSULATION

H (cm)	W (cm)														
	020	025	030	035	040	045	050	055	060	070	080	100	120	140	160
020	4.6	5.0	5.5	6.0	6.5	7.0	7.5	7.9	8.4	9.3	10.3	11.2	-	-	-
025	5.2	5.5	6.2	6.6	7.1	7.6	8.0	8.5	9.0	10.0	10.9	11.9	-	-	-
030	-	-	6.8	7.3	7.7	8.2	8.7	9.1	9.6	10.6	11.6	12.5	-	-	-
040	-	-	-	-	9.0	9.5	10.0	10.4	10.9	11.9	12.9	14.6	16.2	17.8	19.4
050	-	-	-	-	-	-	11.3	11.7	12.2	13.2	14.2	15.6	17.0	18.4	20.0
060	-	-	-	-	-	-	-	-	13.5	14.5	15.5	17.4	19.0	20.6	22.2
070	-	-	-	-	-	-	-	-	-	15.8	16.8	19.2	21.0	22.8	24.6
080	-	-	-	-	-	-	-	-	-	-	18.1	21.0	23.0	25.0	27.0
100	-	-	-	-	-	-	-	-	-	-	-	24.2	26.6	29.0	31.4

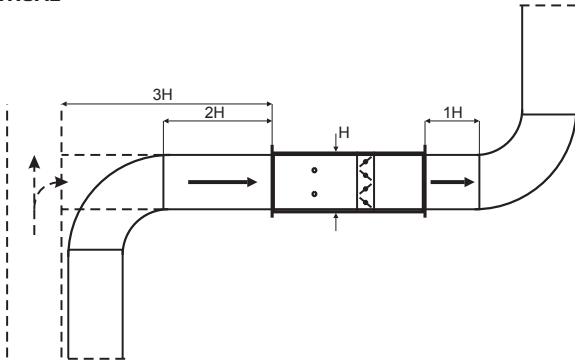
### WEIGHT (KG) WITH INSULATION

H (cm)	W (cm)														
	020	025	030	035	040	045	050	055	060	070	080	100	120	140	160
020	8.0	8.7	9.5	9.0	11.2	12.0	12.8	13.5	14.3	15.9	17.5	19.8	-	-	-
025	8.9	9.5	10.5	11.3	12.1	12.9	13.6	14.4	15.2	16.9	18.4	20.8	-	-	-
030	-	-	11.4	12.2	13.0	13.8	14.6	15.3	16.1	17.8	19.4	21.7	-	-	-
040	-	-	-	-	14.8	15.6	16.4	17.1	17.9	19.6	21.2	23.5	25.7	28.0	30.2
050	-	-	-	-	-	-	18.3	19.0	19.8	21.5	23.0	25.4	27.6	29.9	32.1
060	-	-	-	-	-	-	-	-	21.7	23.4	24.9	27.3	29.5	31.7	34.0
070	-	-	-	-	-	-	-	-	-	25.3	26.8	29.2	31.4	33.6	35.9
080	-	-	-	-	-	-	-	-	-	-	28.7	31.1	33.3	35.5	37.8
100	-	-	-	-	-	-	-	-	-	-	-	33.5	35.8	38.0	40.3

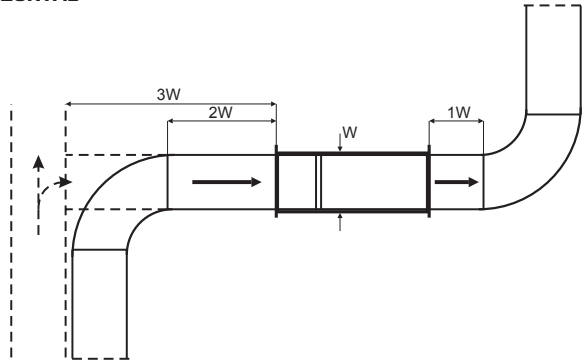
### INSTALLATION GUIDELINES

Due to accuracy of airflow control it is recommended to install ERVA VAV damper in a certain distance from other elements of ventilation

#### VERTICAL

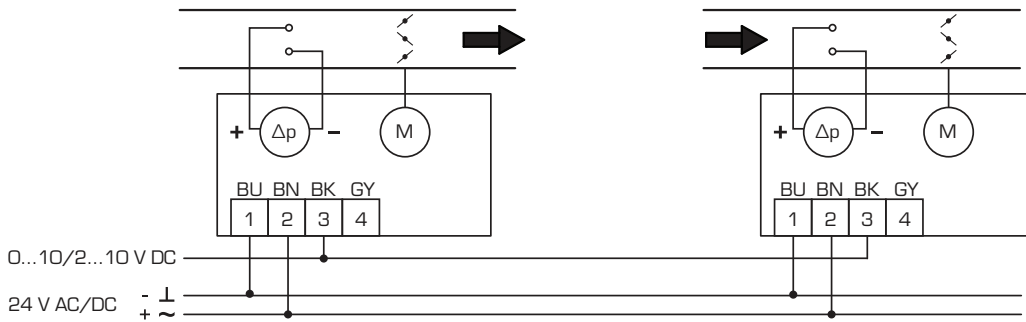


#### HORIZONTAL

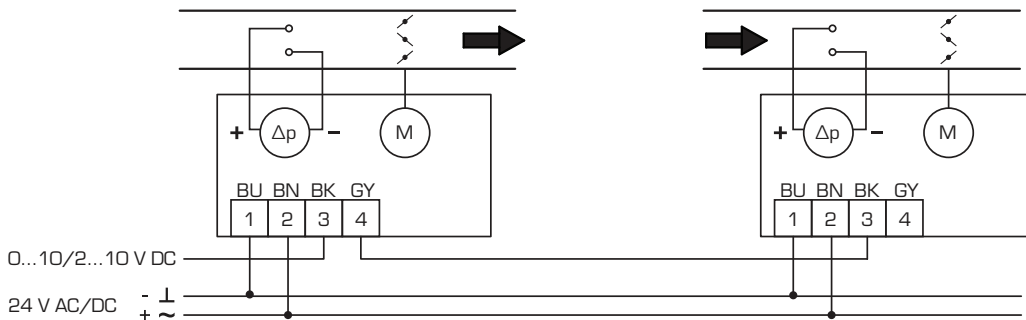


### WIRING DIAGRAMS – EXAMPLES OF ERVA ELECTRIC CONNECTIONS WITH COMPACT ACTUATOR GRUNER 227VM

#### PARALLEL CONTROL OF TWO DAMPERS

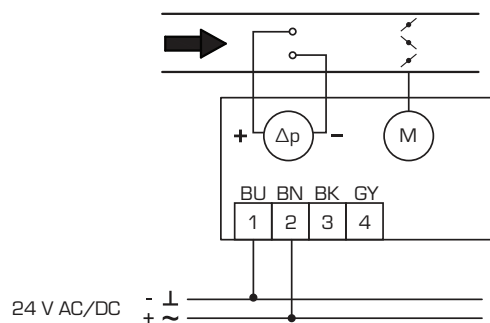


#### MASTER-SLAVE CONTROL OF TWO DAMPERS



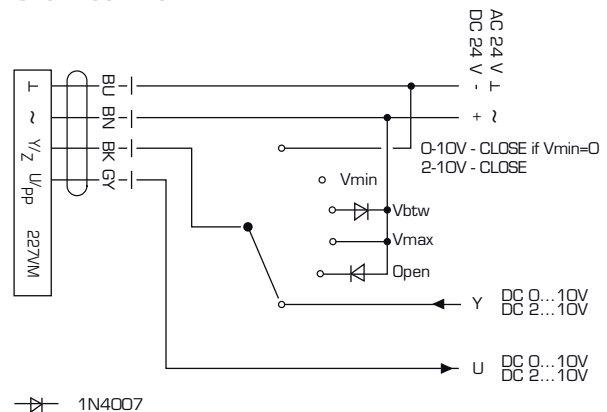
**NOTE!**  
 $V_{min}$  must be set to 0.  
 $V_{max}$  must be set to  $V_{nom}$

#### CAV CONSTANT AIR VOLUME



**NOTE!**  
 $V_{max}$  must be set to 0, the controller will have  $V_{min}$  as setpoint.

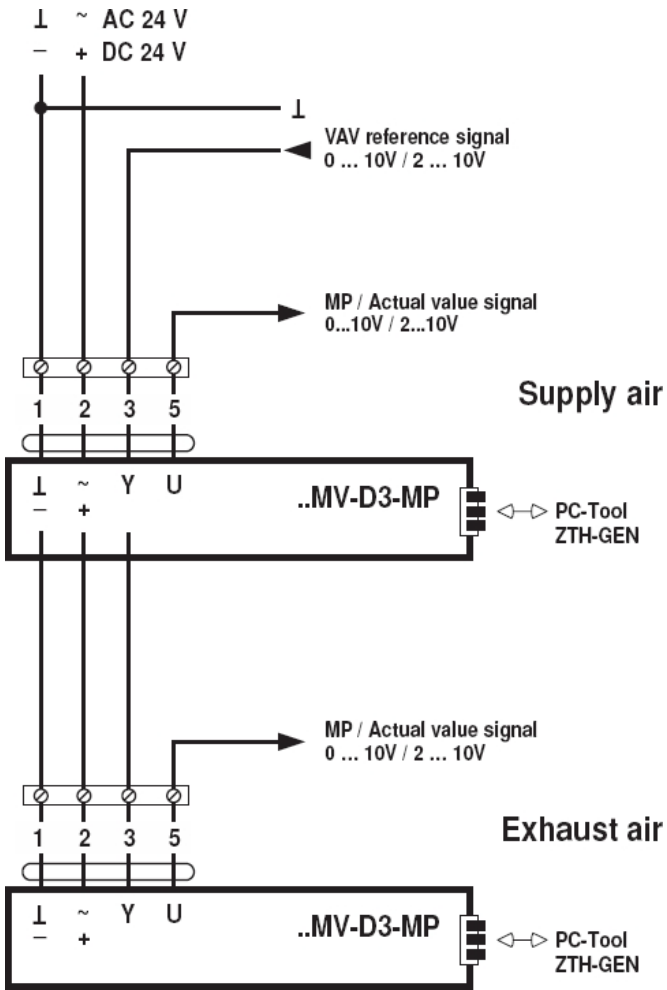
#### FORCED CONTROL



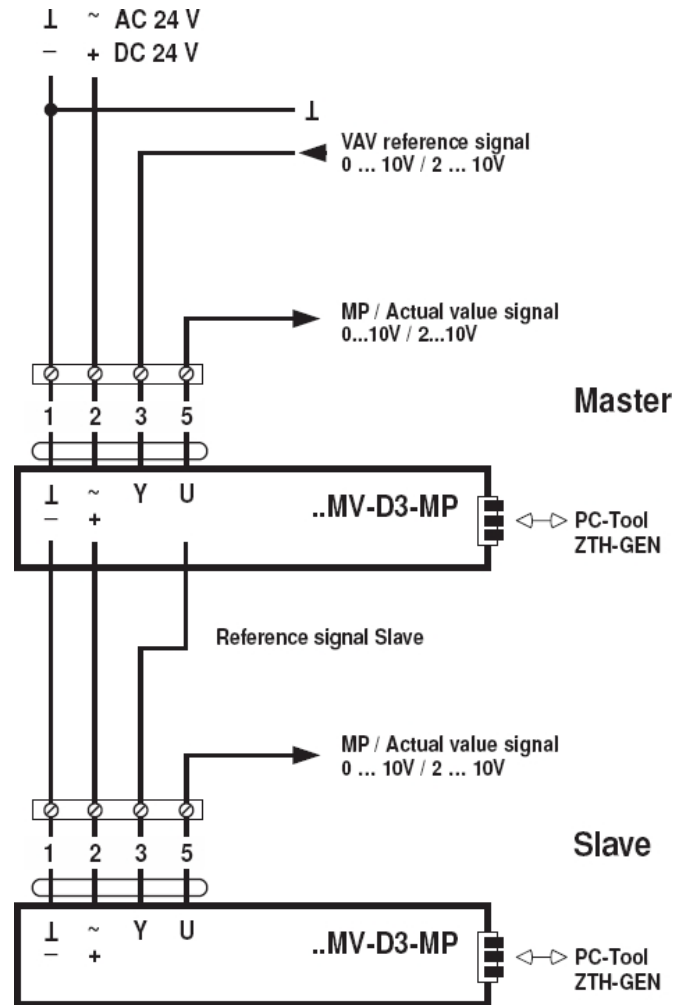
For more information and options see "Optivent controls" technical catalogues.

**WIRING DIAGRAMS – EXAMPLES OF ERVA ELECTRIC CONNECTIONS WITH COMPACT ACTUATOR BELIMO (L,N)MV-D3-MP**

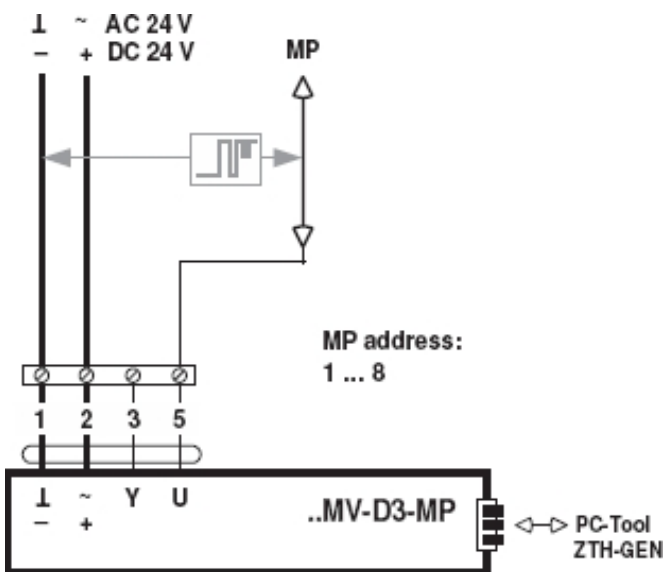
**PARALLEL CONTROL OF TWO DAMPERS**



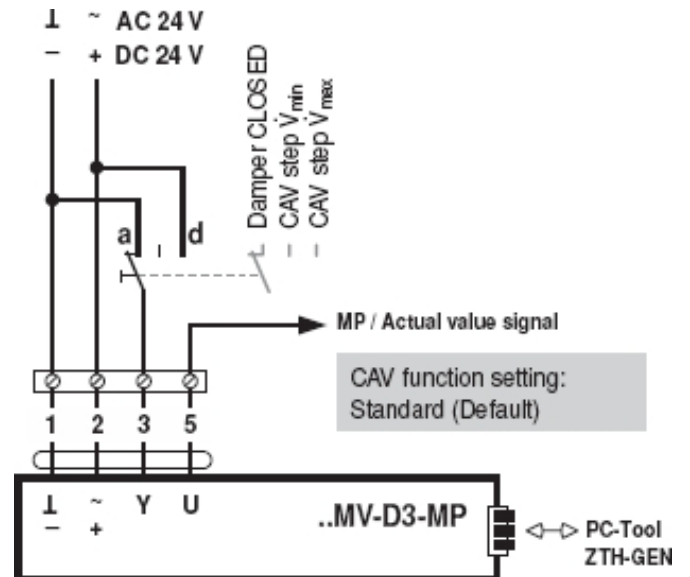
**MASTER-SLAVE CONTROL OF TWO DAMPERS**



**CONTROL VIA MP-BUS**

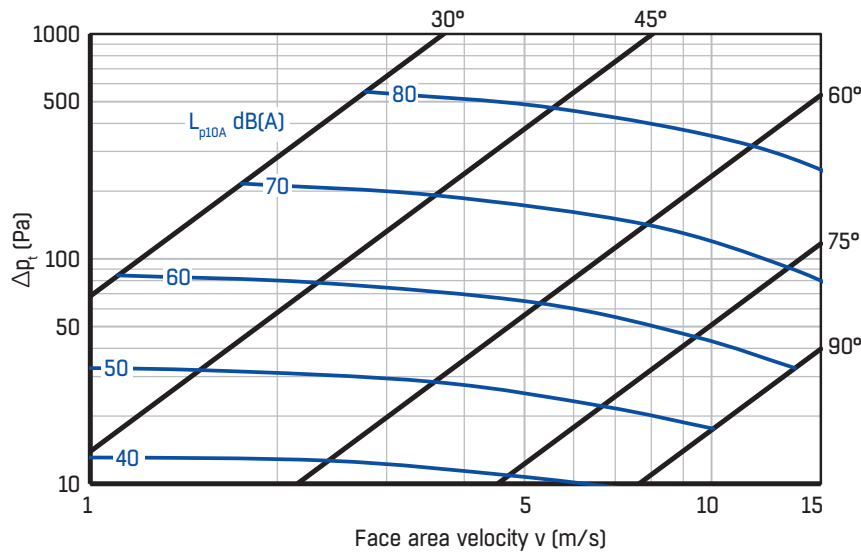


**CAV CONSTANT AIR VOLUME**



## ACOUSTIC DATA

### SOUND PRESSURE LEVEL IN ROOM



### SOUND POWER LEVEL IN DUCT

Correction K <sub>oct</sub> (dB)								
Middle frequency (Hz)	63	125	250	500	1000	2000	4000	8000
Correction K <sub>oct</sub> (dB)	1	0	-3	-1	1	-2	-10	-20
Tolerance ±	6	5	3	3	3	3	3	3

Correction K <sub>A</sub> (dB)												
ERVA face area (m <sup>2</sup> )	0.02	0.04	0.05	0.1	0.12	0.2	0.24	0.4	0.5	0.7	1	1.6
Correction K <sub>A</sub> (dB)	-7	-5	-4	-3	-2	-1	0	1	2	3	4	5

The sound power level in the duct for each octave band is obtained by adding the corrections K<sub>oct</sub> of octave bands and K<sub>A</sub> of the face area (see tables above) to the total sound pressure level L<sub>p10A</sub>, dB(A),

according to the following formula:

$$L_{Woct} = L_{p10A} + K_{oct} + K_A$$

Correction factor K<sub>oct</sub> is the average in the area of application of ERVA.

### SOUND POWER LEVEL EMITTED TO SURROUNDING, CONTROLLER WITHOUT ACOUSTIC INSULATION

#### ERVA-a-050-020

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	44	53	50	57	55	60	56	59	53	59	59	61
250	36	47	46	51	48	55	50	54	50	55	55	58
500	30	43	45	51	40	49	49	53	46	53	51	54
1000	23	36	39	46	37	45	43	48	42	49	49	52
2000	21	35	38	45	35	42	40	47	39	48	49	53
4000	21	31	33	40	32	39	40	45	35	45	48	51
L <sub>WA</sub> , dB(A)	33	45	46	53	45	52	50	55	48	56	56	59

#### ERVA-a-050-025

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	45	55	52	57	56	61	58	61	56	59	61	63
250	38	49	47	51	50	55	51	55	53	55	56	60
500	31	45	46	51	42	50	51	54	49	53	53	56
1000	25	38	40	46	39	46	45	49	44	49	51	54
2000	22	37	39	44	36	43	42	48	41	48	51	55
4000	22	34	35	40	33	40	41	46	38	45	49	53
L <sub>WA</sub> , dB(A)	35	47	48	53	47	53	52	56	51	56	58	61

## ERVA-a-050-030

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	47	58	55	57	58	62	61	63	59	60	63	66
250	40	51	49	52	52	56	54	57	56	56	58	63
500	33	47	48	51	44	51	54	56	52	54	56	59
1000	27	41	43	46	41	47	48	51	47	50	53	57
2000	24	40	41	44	37	44	45	49	44	49	54	57
4000	24	37	37	40	35	42	44	48	41	45	51	56
L <sub>WA</sub> , dB(A)	36	49	49	53	48	54	55	58	54	56	60	64

## ERVA-a-050-040

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	47	58	56	58	59	63	61	63	60	61	63	67
250	40	52	50	52	52	57	55	58	57	56	58	63
500	33	48	49	51	44	51	54	57	53	54	56	60
1000	27	42	44	47	41	47	49	52	47	50	54	57
2000	24	41	41	45	37	44	46	50	45	50	55	58
4000	25	37	38	41	36	43	45	49	42	46	52	56
L <sub>WA</sub> , dB(A)	36	50	50	53	49	55	55	59	54	57	61	64

## ERVA-a-050-050

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	48	59	56	58	59	64	62	63	60	61	63	68
250	40	52	50	52	52	58	56	59	57	57	59	64
500	34	49	49	52	45	52	54	58	53	54	57	60
1000	28	43	44	47	42	47	49	52	47	51	55	58
2000	25	41	42	45	37	45	46	51	45	51	55	58
4000	26	37	39	42	36	43	46	49	43	47	53	56
L <sub>WA</sub> , dB(A)	37	51	50	54	49	55	56	59	54	58	61	65

## ERVA-a-050-060

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	48	60	57	59	60	65	62	64	60	62	64	69
250	41	53	51	53	53	59	57	60	57	58	60	65
500	35	50	50	53	46	53	55	59	53	55	58	61
1000	29	44	45	48	42	48	50	53	48	52	56	59
2000	25	42	42	46	38	46	47	52	45	52	55	59
4000	27	38	40	43	37	44	47	50	44	48	54	57
L <sub>WA</sub> , dB(A)	38	52	51	55	50	56	57	61	55	59	62	66

## ERVA-a-050-080

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	50	61	58	60	61	66	64	65	62	63	65	71
250	42	54	52	54	54	60	58	61	59	59	61	66
500	36	51	50	54	47	55	56	60	54	56	59	62
1000	30	45	45	49	43	50	51	54	49	53	57	60
2000	26	43	43	47	39	47	48	53	46	53	57	60
4000	28	39	41	44	38	45	48	51	45	49	55	58
L <sub>WA</sub> , dB(A)	40	53	52	56	51	57	58	62	56	60	63	67



**ERVA-a-050-100**

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	50	62	59	62	62	67	64	66	63	64	66	71
250	42	55	53	55	55	62	58	63	59	60	62	68
500	37	52	52	55	48	55	57	61	56	57	60	63
1000	31	47	47	51	45	50	52	55	50	54	58	61
2000	28	44	44	48	40	49	49	54	48	54	58	61
4000	29	40	42	45	39	46	49	52	46	50	56	59
<b>L<sub>WA</sub>, dB(A)</b>	40	54	54	57	52	59	59	63	58	61	64	68

**SOUND POWER LEVEL EMITTED TO SURROUNDING, CONTROLLER WITH ACOUSTIC INSULATION****ERVA-a-050-020**

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	35	44	47	52	51	55	53	57	53	53	53	59
250	25	36	41	46	45	49	45	49	48	48	49	53
500	19	31	38	46	36	43	43	49	43	45	45	50
1000	15	26	30	37	28	36	35	40	36	39	39	44
2000	12	22	26	34	24	29	28	34	29	34	35	40
4000	12	21	23	28	23	26	26	31	24	25	27	34
<b>L<sub>WA</sub>, dB(A)</b>	23	34	39	46	40	45	43	49	44	46	46	51

**ERVA-a-050-025**

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	35	46	48	54	52	56	54	57	53	55	56	60
250	26	38	42	48	47	51	47	50	48	50	52	54
500	20	33	40	48	37	44	45	49	43	47	48	51
1000	15	28	31	39	30	37	37	41	36	41	42	45
2000	13	24	28	36	25	30	29	35	29	35	38	41
4000	13	23	24	30	25	27	28	32	24	26	31	35
<b>L<sub>WA</sub>, dB(A)</b>	24	36	41	48	42	47	46	50	44	48	50	52

**ERVA-a-050-030**

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	36	49	50	56	54	58	57	58	53	57	60	61
250	28	41	45	50	49	53	50	51	48	53	55	55
500	22	36	42	50	38	45	48	50	44	50	51	52
1000	17	31	34	41	32	39	39	42	36	43	46	46
2000	14	27	31	39	27	32	32	37	29	37	43	43
4000	14	25	26	32	27	28	30	34	24	28	35	36
<b>L<sub>WA</sub>, dB(A)</b>	25	39	43	50	43	48	48	50	44	51	53	53

## ERVA-a-050-040

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	36	50	50	57	54	58	57	59	54	58	60	61
250	29	41	45	51	49	54	51	52	49	53	55	55
500	23	37	43	51	38	46	48	51	45	50	51	52
1000	17	32	34	41	32	39	39	42	36	43	46	47
2000	14	28	31	40	28	32	33	38	30	38	44	44
4000	14	25	27	33	28	29	31	35	24	28	35	36
L <sub>WA</sub> , dB(A)	40	43	51	43	49	48	51	45	51	53	54	51

## ERVA-a-050-050

Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	37	50	51	57	54	58	57	59	54	58	60	61
250	30	42	45	51	50	55	51	53	50	53	55	56
500	23	38	44	52	38	46	49	51	46	51	52	53
1000	17	32	35	41	32	40	39	42	36	44	47	48
2000	15	28	31	40	28	33	34	38	30	39	44	44
4000	15	25	27	33	28	29	32	35	24	29	36	36
L <sub>WA</sub> , dB(A)	27	40	44	51	44	49	49	51	46	51	54	54

## ERVA-a-050-060

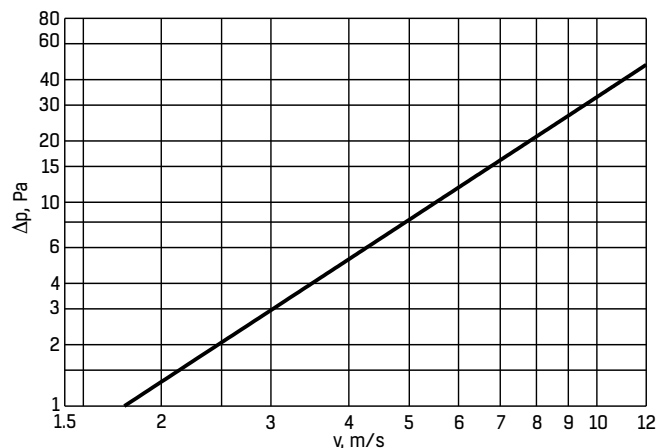
Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	37	51	52	58	55	59	58	60	55	59	61	62
250	30	43	46	52	51	56	51	54	51	54	56	57
500	24	39	45	53	39	47	50	52	47	52	53	54
1000	17	33	36	42	33	41	40	43	37	45	48	49
2000	16	29	32	41	29	34	34	39	30	40	44	45
4000	16	26	27	34	29	30	33	36	25	30	37	37
L <sub>WA</sub> , dB(A)	27	41	45	53	45	50	50	53	47	52	54	55

## ERVA-a-050-080

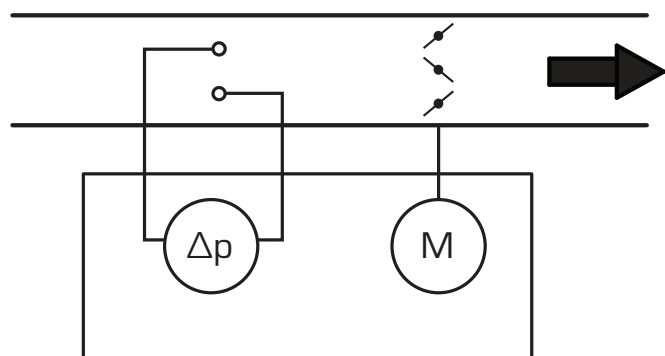
Frequency [Hz]	100 Pa				250 Pa				500 Pa			
	3 m/s	6 m/s	9 m/s	12 m/s	3 /m/s	6 m/s	9 m/s	12 m/s	3 m/s	6 m/s	9 m/s	12 m/s
125	38	52	53	59	57	60	59	61	56	61	63	63
250	31	44	47	53	52	57	52	55	51	55	57	58
500	26	40	46	54	40	49	51	53	47	53	54	55
1000	19	34	36	43	34	42	41	45	38	46	49	51
2000	17	30	34	42	30	35	36	40	32	42	46	46
4000	17	27	28	35	30	31	34	37	26	31	38	39
L <sub>WA</sub> , dB(A)	29	42	46	53	46	52	51	53	48	53	56	57

## PRESSURE DROP

### ERVA VAV DAMPER (DAMPER FULLY OPEN)



## SCHEMATIC DIAGRAM



## PRODUCT CODE

### VAV damper

ERVA-a-bbb-ccc-d-e

Actuator (a)

- 1 = Compact controller FG 227VM
- 2 = Compact controller EMBL
- 3 = Compact controller KNX
- 4 = Alternative controller (coding separately)
- 5 = Compact controller for Modbus, 227VM-MB
- 6 = Compact controller for Modbus, IPSUM version 227VM-MB-ST

Width (bbb)

- 020, 025, 030, 035, 040, 045, 050,
- 055, 060, 070, 080, 100, 120, 140, 160

Height (ccc)

- 020, 025, 030, 040, 050, 060, 070, 080, 100

Joint type and casing insulation (d)

- 1 = Slip joint without insulation
- 2 = Flange joint without insulation
- 3 = Slip joint with insulation
- 4 = Flange joint with insulation

Tightness class (e)

- 2 = Tightness class 2

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