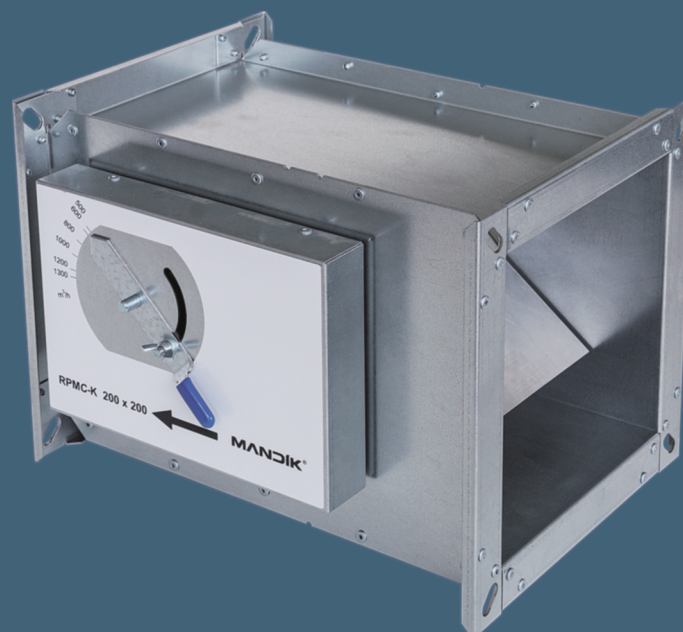


MANDIK®

CONSTANT AIR VOLUME CONTROLLER SQUARE RPMC-K



These technical specifications state a row of manufactured sizes and models of square constant air volume controller (further only controller) RPMC-K. It is valid for production, designing, ordering, delivery, assembly and operation.

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II. GENERAL INFORMATION

1. Description

Fig. 1 Controller RPMC-K



- 1.1. Constant mechanical air volume controllers are meant for input or output air systems. Controllers can be installed in horizontal or vertical position with horizontal blade axis. The aerodynamic forces acting the list due to the flow are compensated by the control device adjusted according required flow.

Mechanical controllers need not be connected to any external power source.

Adjustment of required flow is simply performed by lever with a pointer and scale.

The controller consists of the casing of the controller with a control blade and control device. Control device is placed inside of box with scale for adjustment of required flow. Accuracy of the scale is $\pm 5\%$.

1.2. Controller characteristics

• Nominal size	200x100 ÷ 600x600
• Length	L = 350
• Thickness acc. to EN 1751	External casing leakage class C
• Air flow volume	250 ÷ 12 000 m ³ /h
• Accuracy	10% -15% (on the min./max. positions 20%)

1.3. Working conditions

The faultless functioning of the controllers is ensured under the following conditions::

- maximum speed of air flow 10 m/s
- maximum pressure in the duct 1000 Pa
- the air circulation in the whole controller section must be secured as steady on whole surface

Controllers are designed for macroclimatic areas with mild climate according to EN 60 721-3-3.

Controllers are suitable for systems without abrasive, chemical and adhesive particles.

Temperature in the place of installation is permitted to range from 0°C to + 50°C.

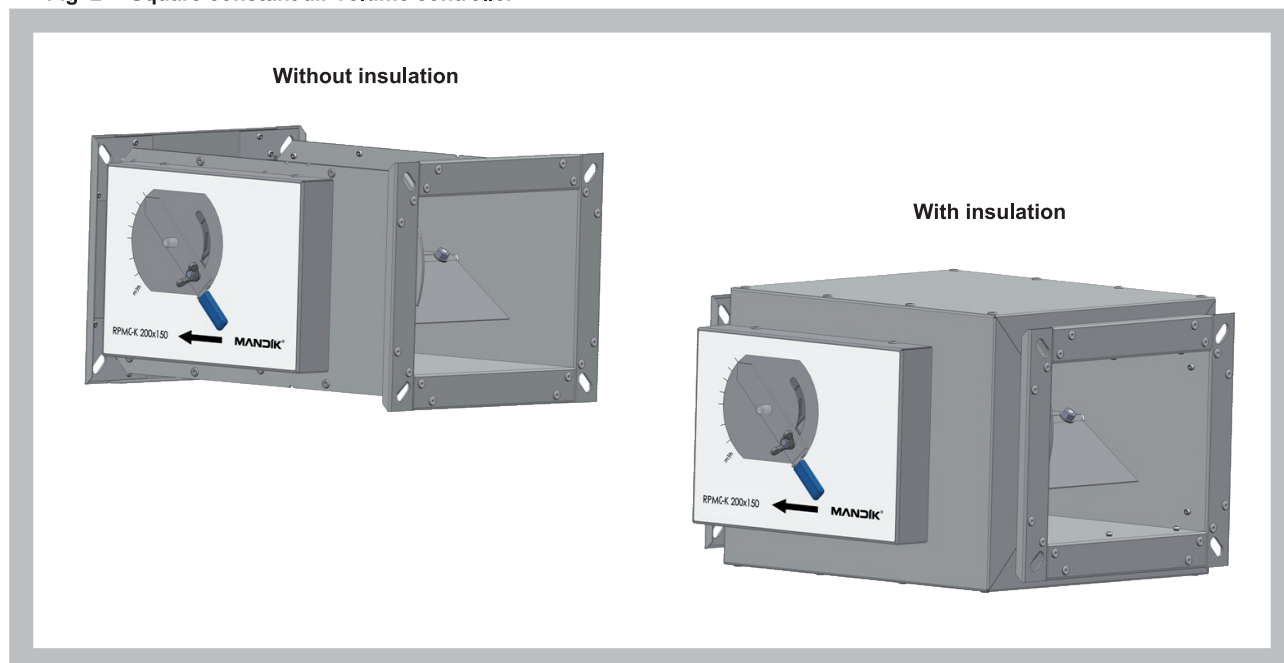
2. Design

- 2.1. The controller consists of the casing of the controller with a control blade and control device. Sliding bearings of blade axis are plastic. Control device consist of spring and shock absorber. On the top of control device box is lever with a pointer and scale for adjustment of required flow.

Controllers can be alternatively equipped by actuating mechanism. It enable remote adjustment of required flow. In this case actuating mechanism don't control controller damper. Actuating mechanism control setting of lever for adjustment of required flow. If is used actuating mechanism temperature range is from 0°C to + 50°C.

The controller body can be alternatively insulated.

Fig. 2 Square constant air volume controller



3. Dimensions, weights

- 3.1. Dimensions, weights

Fig. 3 Square constant air volume controller - mechanical control

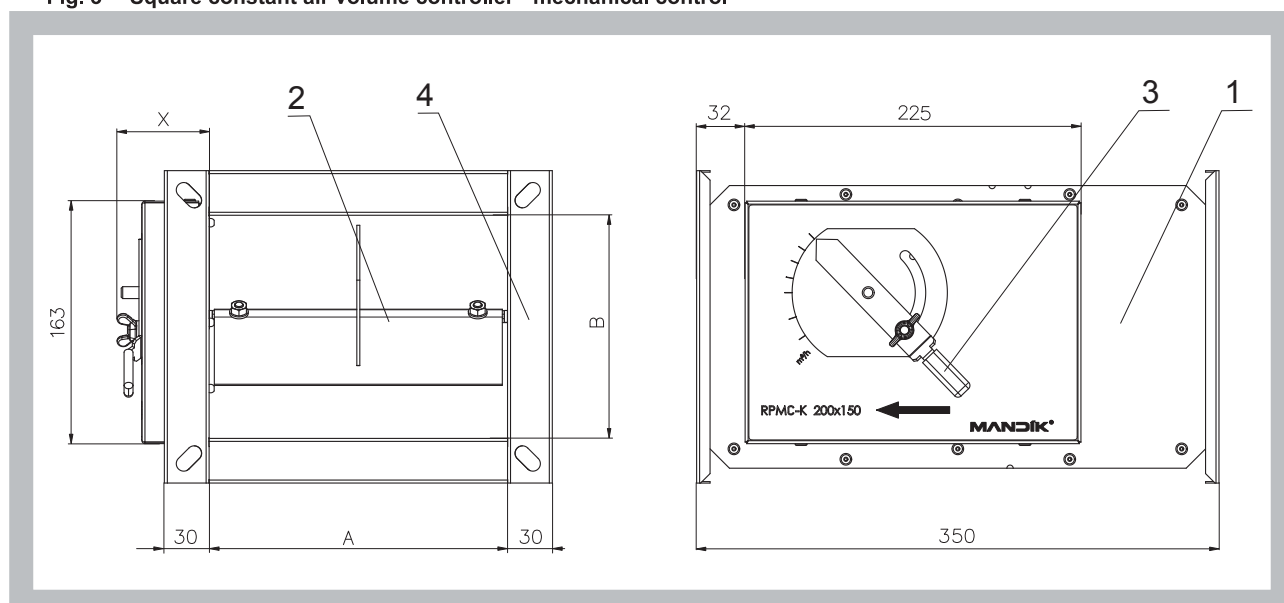


Fig. 4 Square constant air volume controller - with insulation, mechanical control

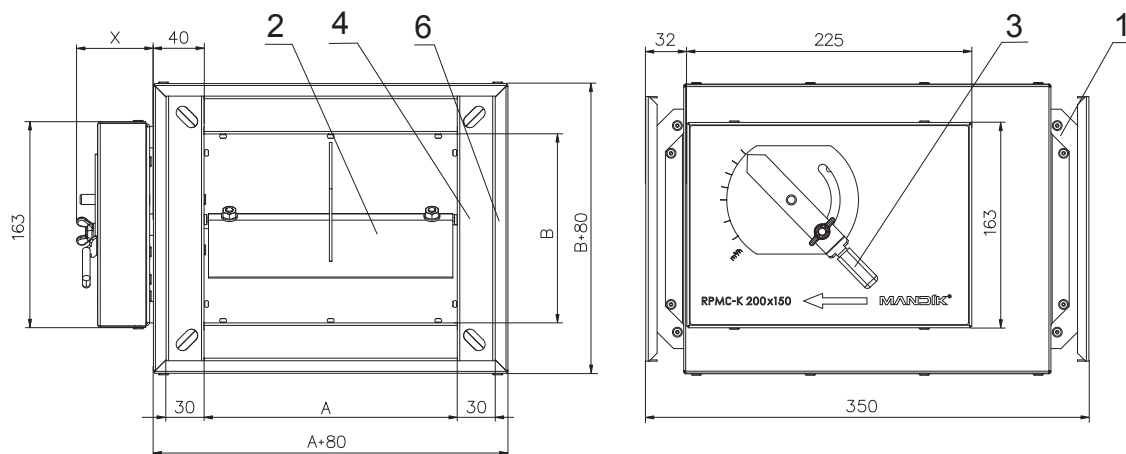


Fig. 5 Square constant air volume controller - actuating mechanism

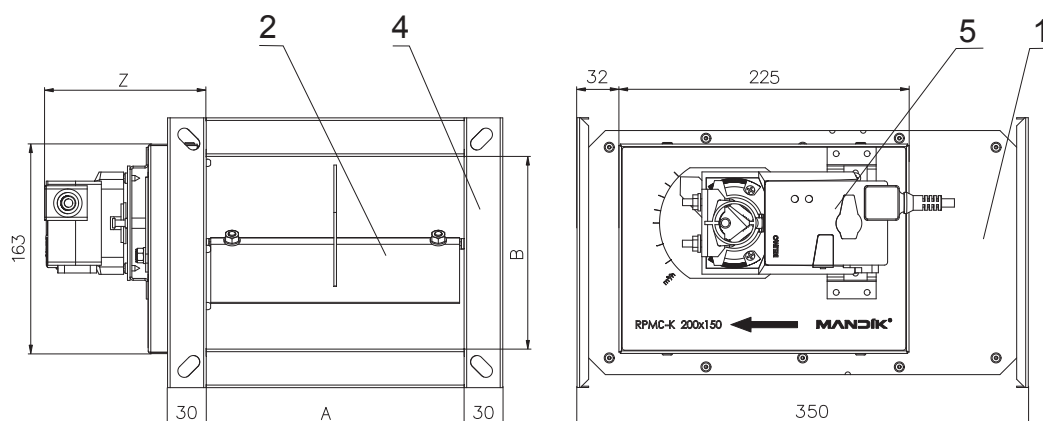
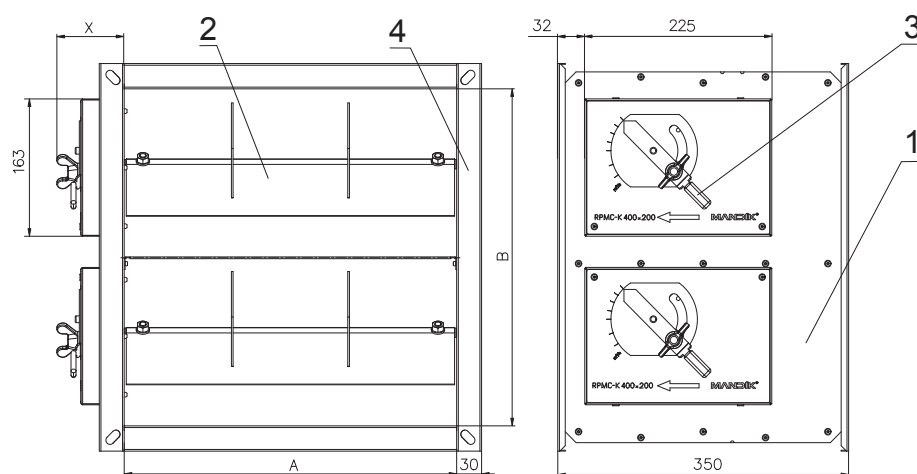


Fig. 6 Square constant air volume controller - $B \geq 400$ mechanical control



Position:

- | | | |
|---------------------|----------|-----------------------|
| 1 Controller casing | 3 Lever | 5 Actuating mechanism |
| 2 Controller blade | 4 Flange | 6 Insulation cover |

Tab. 3.1.1. Dimensions and weights

Size A x B	X	Z	Weight [kg]				EI. actuating mechanism type
			Design				
			mechanical		actuating mechanism		
			without insulation	with insulation	without insulation	with insulation	
200 x 100	62	125	3,97	6,10	4,63	6,76	LM
200 x 150	62	125	4,36	6,74	5,01	7,40	LM
200 x 200	62	125	4,79	7,43	5,45	8,09	LM
300 x 100	62	125	4,69	7,32	5,35	7,98	LM
300 x 150	62	125	5,15	8,03	5,80	8,69	LM
300 x 200	62	125	5,55	8,68	6,21	9,34	LM
300 x 250	62	125	5,96	9,35	6,62	10,01	NM
300 x 300	81	132	6,47	10,11	7,43	11,07	NM
400 x 200	81	132	6,38	10,02	7,04	10,68	LM
400 x 250	87	137	6,88	10,77	7,84	11,73	NM
400 x 300	81	132	7,93	12,06	8,88	13,02	NM
400 x 400	*81	132	10,70	15,34	12,61	17,25	NM
500 x 200	81	132	7,19	11,32	8,15	12,28	NM
500 x 250	87	137	8,77	13,15	9,73	14,11	NM
500 x 300	120	170	9,95	14,58	11,10	15,74	SM
500 x 400	*81	132	12,00	17,14	13,92	19,06	NM
500 x 500	*87	137	15,17	20,81	17,08	22,72	NM
600 x 200	120	170	9,60	14,23	10,75	15,39	SM
600 x 250	120	170	10,26	15,15	11,42	16,31	SM
600 x 300	120	170	10,88	16,02	12,04	17,18	SM
600 x 400	*120	170	16,48	22,12	18,80	24,44	SM
600 x 500	*120	170	17,81	23,95	20,13	26,27	SM
600 x 600	*120	170	19,06	25,70	21,37	28,01	SM

* From B ≥ 400 are controllers assembled from two equal units placed in one case - side to side. Requested air volume is sum of air volume for each controller. Controllers are equipped by two mechanical control or two actuating mechanisms.

4. Placement and Assembly

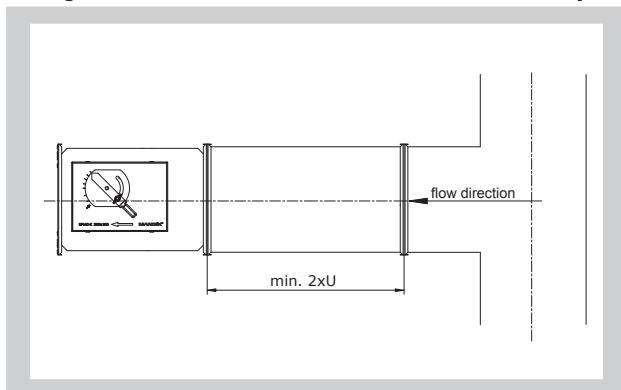
- 4.1. Controllers are intended for installation in ventilation ducts. Operating position is horizontal or vertical with horizontal blade axis.

Controller has to be installed independence of the airflow direction (it is labelled by arrow on the top of control device box).

For faultless functioning, the air circulation in the whole controller section has to be secured as steady on whole surface. Distance between controller and duct elements (bends, double branch joints etc.) has to be minimal 2 x U (double branch joint) and 1 x U (bend).

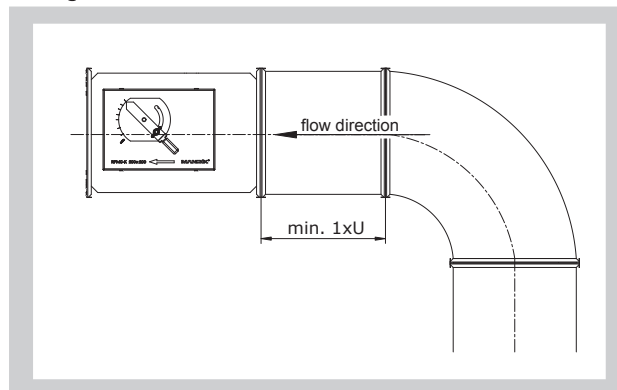
- 4.2. The controller body should not be deformed in the course of installation.

Fig. 7 Recommended distance from double branch joint



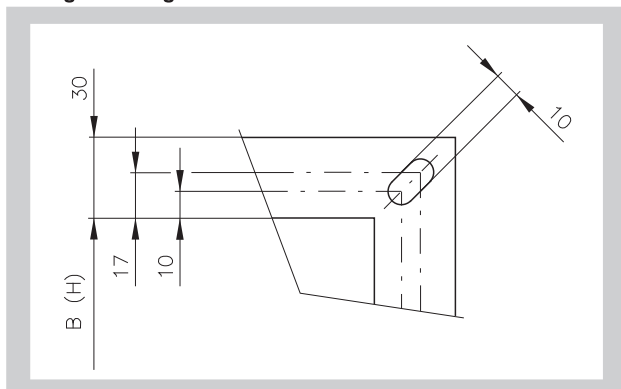
* U - diagonal

Fig. 8 Recommended distance from bend



4.3. Flanges of square controllers are 30 mm wide with oval hole

Fig. 9 Flange



III. TECHNICAL DATA

5. Technical data

5.1. Air volume

Tab. 5.1.1. Air volume

Size A x B		Air volume [m ³ .h ⁻¹]		Size A x B		Air volume [m ³ .h ⁻¹]	
		minimal	maximal			minimal	maximal
200	x 100	250	700	500	x 200	1100	3400
200	x 150	400	1000	500	x 250	1500	4200
200	x 200	500	1300	500	x 300	1800	4800
300	x 100	400	1000	500	x 400	2200	6800
300	x 150	500	1500	500	x 500	3000	8400
300	x 200	600	2000	600	x 200	1500	4000
300	x 250	800	2500	600	x 250	1800	5000
300	x 300	1000	3000	600	x 300	2100	6000
400	x 200	900	2700	600	x 400	3000	8000
400	x 250	1200	3400	600	x 500	3600	10000
400	x 300	1500	4200	600	x 600	4200	12000
400	x 400	1800	5400				

5.2. Controller parameters

Tab. 5.2.1. Controller parameters

Size	Air volume (m³/h)	Max. accuracy (%)	Min. press. difference (Pa)	Size	Air volume (m³/h)	Max. accuracy (%)	Min. press. difference (Pa)
200x100	250	20	70	300x150	500	20	70
	400	15	70		800	15	70
	500	15	70		1000	10	70
	700	10	80		1500	10	70
200x150	400	20	70	300x200	600	20	70
	600	15	70		800	15	70
	800	15	70		1200	15	80
	1000	10	80		2000	10	80
200x200	500	20	70	300x250	800	20	70
	700	15	70		1200	15	70
	1000	10	70		1700	10	80
	1300	10	80		2500	10	80
300x100	400	20	70	300x300	1000	20	70
	600	15	70		1500	15	70
	800	10	70		2000	15	80
	1000	10	80		3000	10	90
400x200	900	20	70	500x500	3000	20	70
	1500	15	70		5000	15	70
	2000	10	70		7000	15	80
	2700	10	70		8400	10	90
400x250	1200	20	70	600x200	1500	20	70
	1600	15	70		2000	15	70
	2500	15	70		3000	15	70
	3400	10	80		4000	10	80
400x300	1500	20	70	600x250	1800	20	70
	2500	15	70		2500	15	70
	3500	15	70		3500	15	80
	4200	10	90		5000	10	80
400x400	1800	20	70	600x300	2100	20	70
	3000	15	70		3500	15	70
	4000	10	70		4500	10	80
	5400	10	70		6000	10	80
500x200	1100	20	70	600x400	3000	20	70
	1500	15	70		4000	15	70
	2500	15	70		6000	15	70
	3400	10	80		8000	10	80
500x250	1500	20	70	600x500	3600	20	70
	2500	15	70		5000	15	70
	3500	15	80		7000	15	80
	4200	10	90		10000	10	80
500x300	1800	20	70	600x600	4200	20	70
	2500	15	70		7000	15	70
	3500	15	80		9000	10	80
	4800	10	90		12000	10	80
500x400	2200	20	70				
	3000	15	70				
	5000	15	70				
	6800	10	80				

6. Elektrical components, wiring diagrams

6.1. Parameters of actuating mechanisms

Tab. 6.1.1. Parameters of actuating

Actuating mechanism	Position indication	Torque	Weight [kg]	Nominal voltage	Power consumption		
					In operation	At rest	Dimensioning
Belimo LM 230A	NO	5 Nm	0,50	AC 100 ... 240 V, 50/60 Hz	1,5 W	0,4 W	4 VA
Belimo LM 230A-S	YES	5 Nm	0,60	AC 100 ... 240 V, 50/60 Hz	1,5 W	0,4 W	4 VA
Belimo NM 230A	NO	10 Nm	0,75	AC 100 ... 240 V, 50/60 Hz	2,5 W	0,6 W	5,5 VA
Belimo NM 230A-S	YES	10 Nm	0,85	AC 100 ... 240 V, 50/60 Hz	2,5 W	0,6 W	6 VA
Belimo LM 24A	NO	5 Nm	0,50	AC 24 V, 50/60 Hz; DC 24 V	1 W	0,2 W	2 VA
Belimo LM 24A-S	YES	5 Nm	0,60	AC 24 V, 50/60 Hz; DC 24 V	1 W	0,2 W	2 VA
Belimo NM 24A	NO	10 Nm	0,75	AC 24 V, 50/60 Hz; DC 24 V	1,5 W	0,2 W	3,5 VA
Belimo NM 24A-S	YES	10 Nm	0,85	AC 24 V, 50/60 Hz; DC 24 V	1,5 W	0,2 W	4 VA
Belimo LM 24A-SR	YES	5 Nm	0,85	AC 24 V, 50/60 Hz; DC 24 V	1,0 W	0,4 W	2 VA
Belimo NM 24A-SR	YES	10 Nm	0,80	AC 24 V, 50/60 Hz; DC 24 V	2,0 W	0,4 W	4 VA
Belimo SM 230A	NO	20 Nm	1,05	AC 100 ... 240 V, 50/60 Hz	2,5 W	0,6 W	6 VA
Belimo SM 230A-S	YES	20 Nm	1,10	AC 100 ... 240 V, 50/60 Hz	2,5 W	0,6 W	6 VA
Belimo SM 24A	NO	20 Nm	1,00	AC 24 V, 50/60 Hz; DC 24 V	2,0 W	0,2 W	4 VA
Belimo SM 24A-S	YES	20 Nm	1,05	AC 24 V, 50/60 Hz; DC 24 V	2,0 W	0,2 W	4 VA
Belimo SM 24A-SR	YES	20 Nm	1,05	AC 24 V, 50/60 Hz; DC 24 V	2,0 W	0,4 W	4 VA

6.2. Wiring diagrams

Fig. 10 Wiring diagram - actuating mechanism Belimo LM(NM, SM) 230A

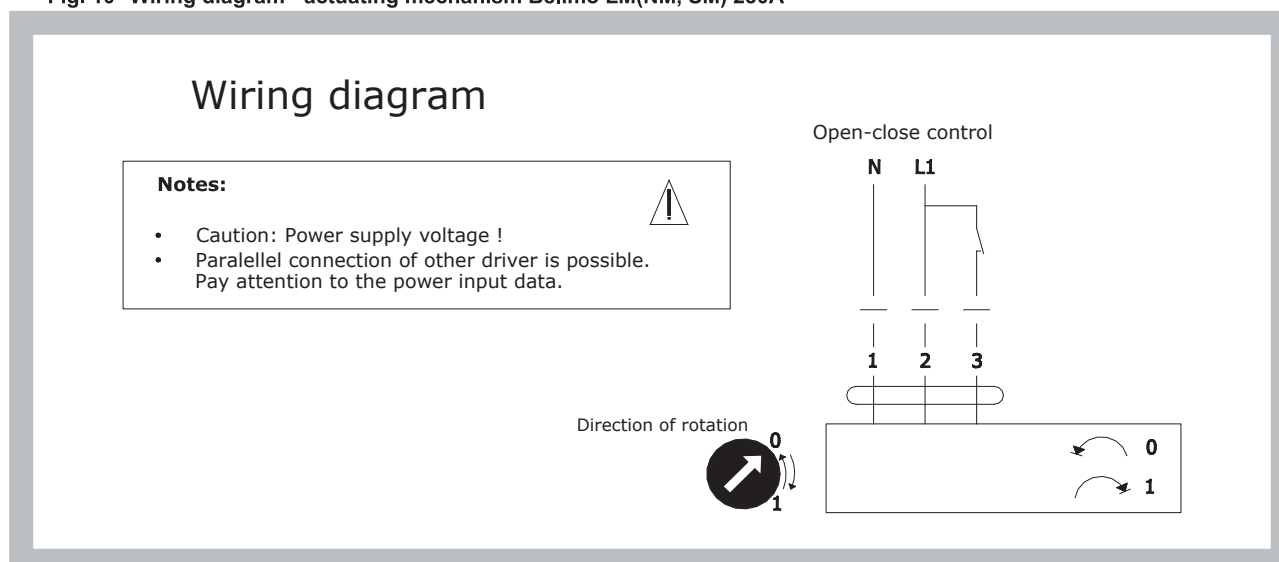


Fig. 11 Wiring diagram - actuating mechanism Belimo LM(NM, SM) 24A

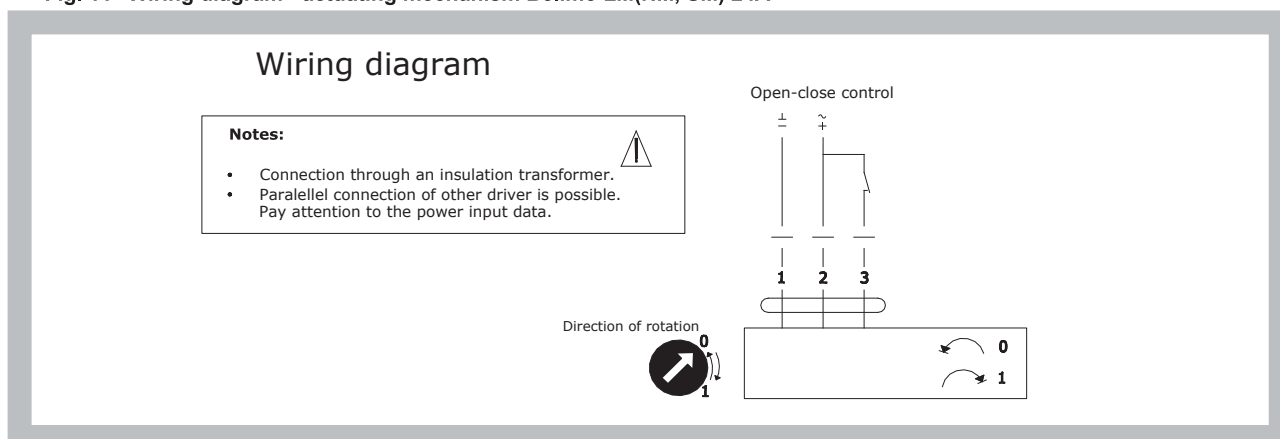


Fig. 12 Wiring diagram - actuating mechanism Belimo NM (SM) 24A-SR

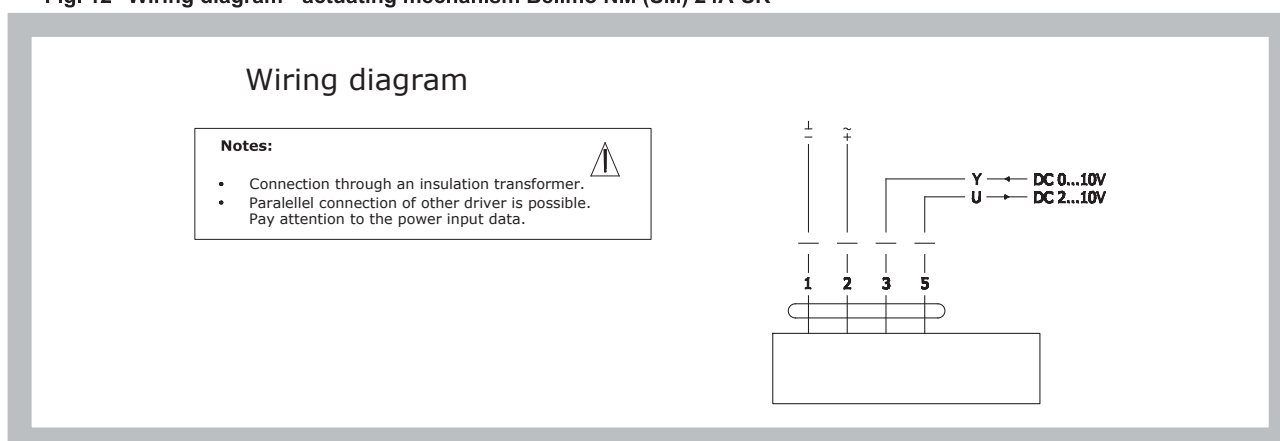


Fig. 13 Wiring diagram - actuating mechanism Belimo LM(NM, SM) 230A-S

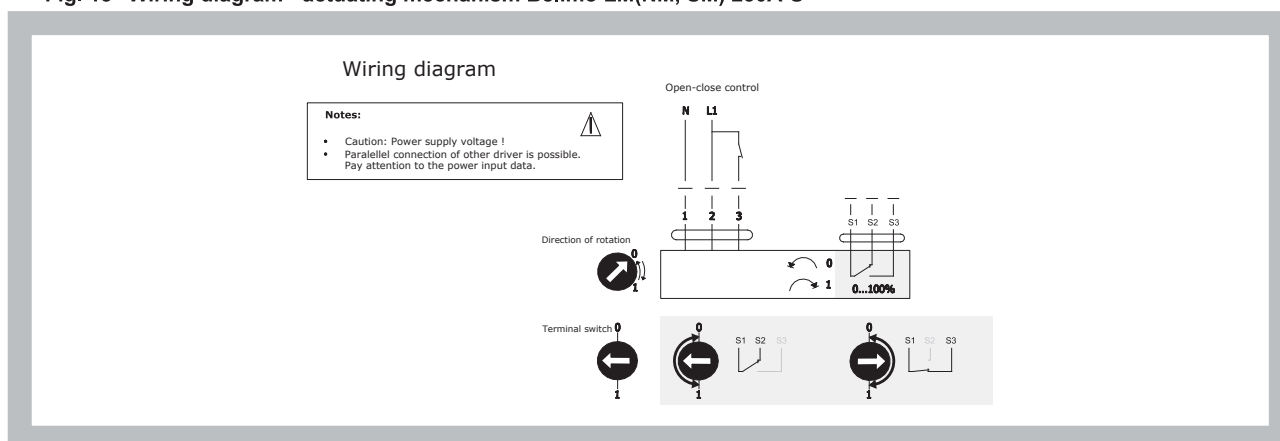
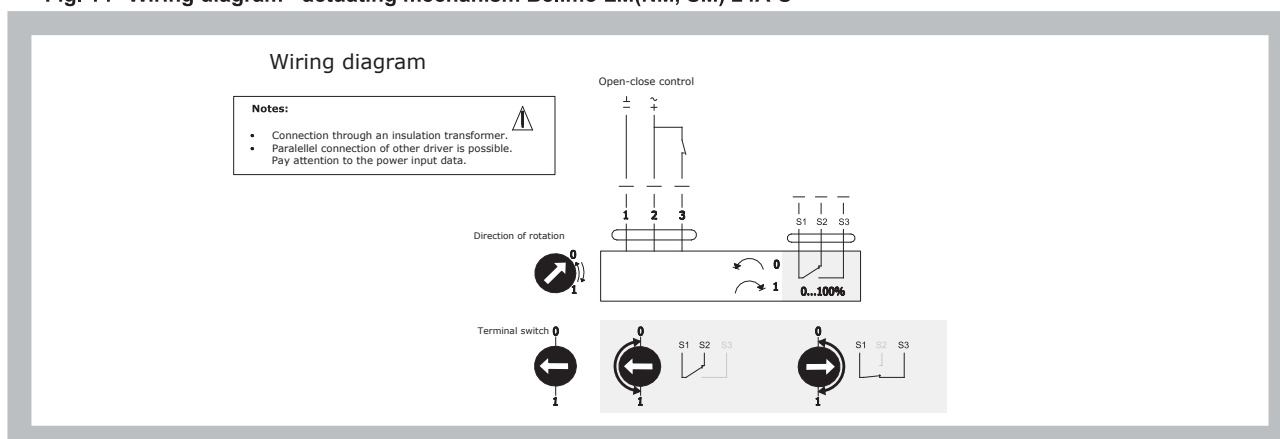


Fig. 14 Wiring diagram - actuating mechanism Belimo LM(NM, SM) 24A-S



7. Pressure loss

7.1. Presure losses

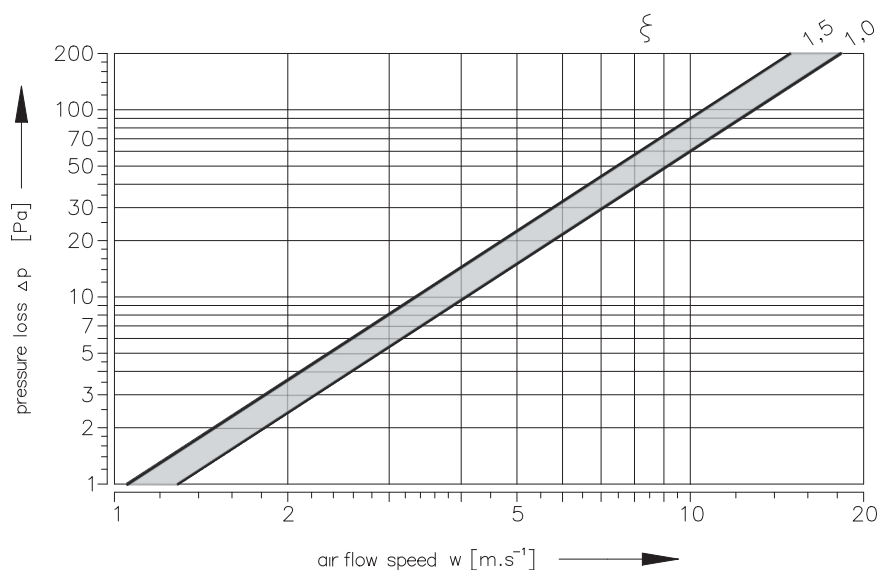
$$\Delta p = \xi \cdot \rho \cdot \frac{w^2}{2}$$

Δp [Pa] pressure loss
 w [m.s⁻¹] air flow speed in nominal contrller section
 ρ [kg.m⁻³] air density
 ξ [-] coefficient of local pressure loss for the nominal controller section (see Tab. 5.3.1.)

Tab. 5.3.1. Coefficient of local pressure loss ξ (the values are valid when the damper of the controller is completely open)

Size A x B	ξ	Size A x B	ξ	Size A x B	ξ
200 x 100	1,386	400 x 200	1,344	500 x 500	1,224
200 x 150	1,379	400 x 250	1,330	600 x 200	1,316
200 x 200	1,372	400 x 300	1,316	600 x 250	1,295
300 x 100	1,379	400 x 400	1,288	600 x 300	1,274
300 x 150	1,368	500 x 200	1,330	600 x 400	1,231
300 x 200	1,358	500 x 250	1,312	600 x 500	1,189
300 x 250	1,347	500 x 300	1,295	600 x 600	1,147
300 x 300	1,337	500 x 400	1,260		

Diagram 7.1.1. Pressure losses (the values are valid when the damper of the controller is completely open)



8. Noise data

8.1. Air-regenerated Noise

The noise arising due to the flow of air volume controller is listed in the following tables Tab. 8.1.1.

$\dot{V}$ [m³.h⁻¹] - air flow volume
 Δp_{st} [Pa] - pressure differential
 L_W [dB/Okt.] - level of acoustic power in the octave band
 L_{WA} [dB(A)] - total level of acoustic power corrected by filter A
 f_m [Hz] - mean frequencies in the octave bands

Tab. 8.1.1.

Δp _{st} = 50 Pa										
Size	V̇ [m³/h]	LW [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
200 x 100	250	53	52	48	48	48	49	49	46	56
	400	58	57	55	54	53	55	55	52	62
	550	59	61	62	61	61	59	59	53	66
	700	67	66	67	68	68	67	67	59	73
200 x 150	400	41	40	36	36	36	37	37	34	44
	600	44	43	41	40	39	41	41	38	48
	800	59	61	62	61	61	59	59	53	66
	1000	67	66	67	68	68	67	67	59	73
200 x 200	500	41	40	36	36	36	37	37	34	44
	765	44	43	41	40	39	41	41	38	48
	1035	59	61	62	61	61	59	59	53	66
	1300	67	66	67	68	68	67	67	59	73
300 x 100	400	44	43	39	39	39	40	40	37	47
	600	49	48	46	45	44	46	46	43	53
	800	59	61	62	61	61	59	59	53	66
	1000	67	66	67	68	68	67	67	59	73
300 x 150	500	41	40	36	36	36	37	37	34	44
	835	45	44	42	41	40	42	42	39	49
	1165	59	61	62	61	61	59	59	53	66
	1500	67	66	67	68	68	67	67	59	73
300 x 200	600	43	42	38	38	38	39	39	36	46
	1065	46	45	43	42	41	43	43	40	50
	1535	59	61	62	61	61	59	59	53	66
	2000	67	66	67	68	68	67	67	59	73
300 x 250	800	45	44	40	40	40	41	41	38	48
	1365	47	45	43	42	41	43	43	40	50
	1935	59	61	62	61	61	59	59	53	66
	2500	67	66	67	68	68	67	67	59	73
300 x 300	1000	45	44	40	40	40	41	41	38	48
	4665	47	46	44	43	42	44	44	41	51
	2335	59	61	62	61	61	59	59	53	66
	3000	67	66	67	68	68	67	67	59	73
400 x 200	900	44	43	40	40	40	41	41	38	47
	1500	46	45	43	44	41	43	43	40	50
	2100	59	61	62	61	61	59	59	53	66
	2700	67	66	67	68	68	67	67	59	73
400 x 250	1200	45	44	41	41	39	42	42	39	48
	1935	46	45	43	42	41	43	43	40	50
	2665	59	61	62	61	61	59	59	53	66
	3400	67	66	67	68	68	67	67	59	73
400 x 300	1500	46	45	42	42	40	42	42	40	49
	2400	48	47	45	44	43	45	45	42	52
	3300	59	61	62	61	61	59	59	53	66
	4200	67	66	67	68	68	67	67	59	73
400 x 400	1800	48	48	44	44	43	45	45	42	51
	3000	50	49	47	46	45	47	47	44	54
	4200	59	61	62	61	61	59	59	53	66
	5400	67	66	67	68	68	67	67	59	73

$\Delta p_{st} = 50 \text{ Pa}$

Size	V̇ [m³/h]	LW [dB/Okt]								L _{WA} [dB(A)]
		fm [Hz]								
		63	125	250	500	1000	2000	4000	8000	
500 x 200	1100	42	41	37	37	36	38	38	35	45
	1865	44	43	41	40	38	41	41	38	48
	2635	59	61	62	61	61	59	59	53	66
	3400	67	66	67	68	68	67	67	59	73
500 x 250	1500	44	43	39	39	38	40	40	37	47
	2400	47	46	44	43	40	44	44	41	51
	3300	59	61	62	61	61	59	59	53	66
	4200	67	66	67	68	68	67	67	59	73
500 x 300	1800	45	44	40	40	39	41	41	38	48
	2800	47	46	44	43	41	44	44	41	51
	3800	59	61	62	61	61	59	59	53	66
	4800	67	66	67	68	68	67	67	59	73
500 x 400	2200	50	49	45	45	44	46	46	43	53
	3735	53	52	50	49	47	50	50	47	57
	5265	59	61	62	61	61	59	59	53	66
	6800	67	66	67	68	68	67	67	59	73
500 x 500	3000	54	53	49	49	49	50	50	47	57
	4800	56	55	53	52	49	53	53	50	60
	6600	59	61	62	61	61	59	59	53	66
	8400	67	66	67	68	68	67	67	59	73
600 x 200	1500	43	42	39	39	39	40	40	37	46
	2335	45	43	41	40	38	41	41	38	48
	3165	59	61	62	61	61	59	59	53	66
	4000	67	66	67	68	68	67	67	59	73
600 x 250	1800	45	44	40	40	40	41	41	38	48
	2865	47	45	43	42	40	43	43	41	50
	3935	59	61	62	61	61	59	59	53	66
	5000	67	66	67	68	68	67	67	59	73
600 x 300	2100	47	46	42	42	42	43	43	40	50
	3400	47	46	44	43	42	44	44	42	51
	4700	59	61	62	61	61	59	59	53	66
	6000	67	66	67	68	68	67	67	59	73
600 x 400	3000	51	50	46	46	46	47	47	44	53
	4665	52	51	49	48	47	49	49	46	56
	6335	59	61	62	61	61	59	59	53	66
	8000	67	66	67	68	68	67	67	59	73
600 x 500	3600	53	52	48	48	48	49	49	46	55
	5735	55	54	52	51	50	52	52	49	59
	7865	59	61	62	61	61	59	59	53	66
	10000	67	66	67	68	68	67	67	59	73
600 x 600	4200	55	54	50	50	50	51	51	48	58
	6800	57	56	54	53	52	54	54	51	61
	9400	59	61	62	61	61	59	59	53	66
	12000	67	66	67	68	68	67	67	59	73

$\Delta p_{st} = 100 \text{ Pa}$

Size	V̇ [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
200 x 100	250	45	44	40	40	40	41	44	38	48
	400	48	47	45	44	43	45	47	42	52
	550	48	50	51	50	50	48	50	42	55
	700	52	51	52	53	53	52	51	44	58
200 x 150	400	46	45	41	41	41	42	42	39	49
	600	49	48	46	45	44	46	46	43	53
	800	49	51	52	51	51	49	49	43	56
	1000	52	51	52	53	53	52	52	44	58
200 x 200	500	46	45	41	41	41	42	42	39	49
	765	49	48	46	45	44	46	46	43	53
	1035	49	51	52	51	51	49	49	43	56
	1300	52	51	52	53	53	52	52	44	58
300 x 100	400	47	46	42	42	42	43	43	40	50
	600	51	50	48	47	46	48	48	45	55
	800	49	51	52	51	51	49	49	43	56
	1000	52	51	52	53	53	52	52	44	58
300 x 150	500	46	45	41	41	41	42	42	39	49
	835	51	50	48	47	46	48	48	45	55
	1165	45	47	48	47	47	45	45	39	52
	1500	54	52	53	54	54	53	53	45	59
300 x 200	600	48	47	43	43	43	44	44	41	51
	1065	51	50	48	47	46	48	48	45	55
	1535	56	58	59	58	58	56	56	50	63
	2000	54	53	54	55	55	54	54	46	60
300 x 250	800	51	50	46	46	46	47	47	44	54
	1365	53	51	49	48	47	49	49	46	56
	1935	52	54	55	54	54	52	52	46	59
	2500	55	54	55	56	56	55	55	47	61
300 x 300	1000	51	50	46	46	46	47	47	44	54
	4665	53	52	50	49	48	50	50	47	57
	2335	53	54	55	54	54	52	52	46	59
	3000	56	55	56	57	57	56	56	48	62
400 x 200	900	50	49	45	45	45	46	46	43	53
	1500	52	51	49	48	47	49	49	46	56
	2100	52	54	55	54	54	52	52	46	59
	2700	54	53	54	55	55	54	54	46	60
400 x 250	1200	51	50	46	46	46	47	47	44	54
	1935	52	51	49	48	47	49	49	46	56
	2665	52	54	55	54	54	52	52	46	59
	3400	55	54	55	56	56	55	55	47	61
400 x 300	1500	52	51	47	47	47	48	48	45	55
	2400	54	53	51	50	49	51	51	48	58
	3300	58	60	61	60	60	58	58	52	65
	4200	61	60	61	62	62	61	61	53	67
400 x 400	1800	54	53	49	49	49	50	50	47	57
	3000	56	55	53	52	51	53	53	50	60
	4200	60	62	63	62	62	60	60	54	67
	5400	63	62	63	64	64	63	63	55	69

$\Delta p_{st} = 100 \text{ Pa}$

Size	V [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
500 x 200	1100	48	47	43	43	43	44	44	41	51
	1865	50	49	47	46	45	47	47	44	54
	2635	50	52	53	52	52	50	50	44	57
	3400	53	52	53	54	54	53	53	45	59
500 x 250	1500	50	49	45	45	45	46	46	43	53
	2400	52	51	49	48	47	49	49	46	56
	3300	51	53	54	53	53	51	51	45	58
	4200	54	53	54	55	55	54	54	46	60
500 x 300	1800	51	50	46	46	46	47	47	44	54
	2800	53	52	50	49	48	50	50	47	57
	3800	52	54	55	54	54	52	52	46	59
	4800	54	53	54	55	55	54	54	46	60
500 x 400	2200	55	54	50	50	50	51	51	48	58
	3735	58	57	55	54	53	55	55	52	62
	5265	56	58	59	58	58	56	56	50	63
	6800	60	59	60	61	61	60	60	52	66
500 x 500	3000	59	58	54	54	54	55	55	52	62
	4800	61	60	58	57	56	58	58	55	65
	6600	60	62	63	62	62	60	60	54	67
	8400	62	61	62	63	63	62	62	54	68
600 x 200	1500	49	48	44	44	44	45	45	42	52
	2335	51	49	47	46	45	47	47	44	54
	3165	54	56	57	56	56	54	54	48	61
	4000	58	57	58	59	59	58	58	50	64
600 x 250	1800	50	49	45	45	45	46	46	43	53
	2865	52	51	49	48	47	49	49	46	56
	3935	51	52	53	52	52	50	50	44	57
	5000	54	52	53	54	54	53	53	45	59
600 x 300	2100	52	51	47	47	47	48	48	45	55
	3400	53	52	50	49	48	50	50	47	57
	4700	52	54	55	54	54	52	52	46	59
	6000	54	53	54	55	55	54	54	46	60
600 x 400	3000	56	55	51	51	51	52	52	49	59
	4665	57	56	54	53	52	54	54	51	61
	6335	56	58	59	58	58	56	56	50	63
	8000	61	60	61	62	62	61	61	53	67
600 x 500	3600	58	57	53	53	53	54	54	51	61
	5735	60	59	57	56	55	57	57	54	64
	7865	58	60	61	60	60	58	58	52	65
	10000	63	62	63	64	64	63	63	55	69
600 x 600	4200	60	59	55	55	55	56	56	53	63
	6800	62	61	59	58	57	59	59	56	66
	9400	61	63	64	63	63	61	61	55	68
	12000	64	63	64	65	65	64	64	56	70

$\Delta p_{st} = 250 \text{ Pa}$

Size	V̇ [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
200 x 100	250	53	52	48	48	48	49	49	46	56
	400	56	55	53	52	51	53	53	50	60
	550	56	58	59	58	58	56	56	50	63
	700	60	59	60	61	61	60	60	52	66
200 x 150	400	55	54	50	50	50	51	51	48	58
	600	58	57	55	54	53	55	55	52	62
	800	58	60	61	60	60	58	58	52	65
	1000	61	60	61	62	62	61	61	53	67
200 x 200	500	55	54	50	50	50	51	51	48	58
	765	58	57	55	54	53	55	55	52	62
	1035	58	60	61	60	60	58	58	52	65
	1300	61	60	61	62	62	61	61	53	67
300 x 100	400	51	50	46	46	46	47	47	44	54
	600	54	53	51	50	49	51	51	48	58
	800	53	55	56	55	55	53	53	47	60
	1000	56	55	56	57	57	56	56	48	62
300 x 150	500	55	54	50	50	50	51	51	48	58
	835	53	52	50	49	48	50	50	47	57
	1165	58	60	61	60	60	58	58	52	65
	1500	56	55	56	57	57	56	56	48	62
300 x 200	600	58	57	53	53	53	54	54	51	61
	1065	61	60	58	57	56	58	58	55	65
	1535	61	63	64	63	63	61	61	55	68
	2000	64	63	64	65	65	64	64	56	70
300 x 250	800	59	58	54	54	54	55	55	52	62
	1365	61	60	58	57	56	58	58	55	65
	1935	61	63	64	63	63	61	61	55	68
	2500	64	63	64	65	65	64	64	56	70
300 x 300	1000	59	58	54	54	54	55	55	52	62
	4665	62	61	59	58	57	59	59	56	66
	2335	61	63	64	63	63	61	61	55	68
	3000	65	64	65	66	66	65	65	57	71
400 x 200	900	59	58	54	54	54	55	55	52	62
	1500	61	60	58	57	56	58	58	55	65
	2100	60	62	63	62	62	60	60	54	67
	2700	63	62	63	64	64	63	63	55	69
400 x 250	1200	60	59	55	55	55	56	56	53	63
	1935	62	61	59	58	57	59	59	56	66
	2665	61	63	64	63	63	61	61	55	68
	3400	64	63	64	65	65	64	64	56	70
400 x 300	1500	61	60	56	56	56	57	57	54	64
	2400	63	62	60	59	58	60	60	57	67
	3300	68	69	70	69	69	67	67	61	74
	4200	70	69	70	71	71	70	70	62	76
400 x 400	1800	64	63	59	59	59	60	60	57	67
	3000	65	64	62	61	60	62	62	59	69
	4200	69	71	72	71	71	69	69	63	76
	5400	72	71	72	73	73	72	72	64	78

$\Delta p_{st} = 250 \text{ Pa}$

Size	V [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
500 x 200	1100	58	57	53	53	53	54	54	51	61
	1865	60	59	57	56	55	57	57	54	64
	2635	59	61	62	61	61	59	59	53	66
	3400	63	62	63	64	64	63	63	55	69
500 x 250	1500	60	59	55	55	55	56	56	53	63
	2400	62	61	59	58	57	59	59	56	66
	3300	60	62	63	62	62	60	60	54	67
	4200	63	62	63	64	64	63	63	55	69
500 x 300	1800	61	60	56	56	56	57	57	54	64
	2800	63	62	60	59	58	60	60	57	67
	3800	62	64	65	64	64	62	62	56	69
	4800	64	63	64	65	65	64	64	56	70
500 x 400	2200	64	63	59	59	59	60	60	57	67
	3735	67	66	64	63	62	64	64	61	71
	5265	65	67	68	67	67	65	65	59	72
	6800	70	69	70	71	71	70	70	62	76
500 x 500	3000	68	67	63	63	63	64	64	61	71
	4800	69	68	66	65	64	66	66	63	73
	6600	68	70	71	70	70	68	68	62	75
	8400	71	70	71	72	72	71	71	63	77
600 x 200	1500	58	57	53	53	53	54	54	51	61
	2335	60	59	57	56	55	57	57	54	64
	3165	64	66	67	66	66	64	64	58	71
	4000	67	66	67	68	68	67	67	59	73
600 x 250	1800	60	59	55	55	55	56	56	53	63
	2865	62	60	58	57	56	58	58	55	65
	3935	61	63	64	63	63	61	61	55	68
	5000	64	63	64	65	65	64	64	56	70
600 x 300	2100	60	59	55	55	55	56	56	53	63
	3400	62	61	59	58	57	59	59	56	66
	4700	61	63	64	63	63	61	61	55	68
	6000	63	62	63	64	64	63	63	55	69
600 x 400	3000	64	63	59	59	59	60	60	57	67
	4665	66	65	63	62	61	63	63	60	70
	6335	64	66	67	66	66	64	64	58	71
	8000	69	68	69	70	70	69	69	61	75
600 x 500	3600	66	65	61	61	61	62	62	59	69
	5735	68	67	65	64	63	65	65	62	72
	7865	67	69	70	69	69	67	67	61	74
	10000	72	71	72	73	73	72	72	64	78
600 x 600	4200	69	68	64	64	64	65	65	62	72
	6800	70	69	67	66	65	67	67	64	74
	9400	69	71	72	71	71	69	69	63	76
	12000	71	70	71	72	72	71	71	63	77

$\Delta p_{st} = 500 \text{ Pa}$

Size	V̇ [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
200 x 100	250	59	58	54	54	54	55	55	52	62
	400	62	61	59	58	57	59	59	56	66
	550	62	64	65	64	64	62	62	56	69
	700	67	66	67	68	68	67	67	59	73
200 x 150	400	60	59	55	55	55	56	56	53	63
	600	63	62	60	59	58	60	60	57	67
	800	63	65	66	65	65	63	63	57	70
	1000	67	66	67	68	68	67	67	59	73
200 x 200	500	61	60	56	56	56	57	57	54	64
	765	64	63	61	60	59	61	61	58	68
	1035	64	66	67	66	66	64	64	58	71
	1300	68	67	68	69	69	68	68	60	74
300 x 100	400	54	53	49	49	49	50	50	47	57
	600	57	56	54	53	52	54	54	51	61
	800	56	58	59	58	58	56	56	50	63
	1000	59	58	59	60	60	59	59	51	65
300 x 150	500	61	60	56	56	56	57	57	54	64
	835	64	63	61	60	59	61	61	58	68
	1165	65	67	68	67	67	65	65	59	72
	1500	62	61	62	63	63	62	62	54	68
300 x 200	600	64	63	59	59	59	60	60	57	67
	1065	67	66	64	63	62	64	64	61	71
	1535	67	69	70	69	69	67	67	61	74
	2000	71	70	71	72	72	71	71	63	77
300 x 250	800	67	66	62	62	62	63	63	60	70
	1365	69	68	66	65	64	66	66	63	73
	1935	68	70	71	70	70	68	68	62	75
	2500	72	71	72	73	73	72	72	64	78
300 x 300	1000	68	67	63	63	63	64	64	61	71
	4665	70	69	67	66	65	67	67	64	74
	2335	69	71	72	71	71	69	69	63	76
	3000	73	72	73	74	74	73	73	65	79
400 x 200	900	66	65	61	61	61	62	62	59	69
	1500	69	68	66	65	64	66	66	63	73
	2100	68	70	71	70	70	68	68	62	75
	2700	71	70	71	72	72	71	71	63	77
400 x 250	1200	67	66	62	62	65	63	63	60	70
	1935	69	68	66	65	65	66	66	63	73
	2665	68	70	71	70	66	68	68	62	75
	3400	71	70	71	72	72	71	71	63	77
400 x 300	1500	68	67	63	63	66	64	64	61	71
	2400	70	69	67	66	66	67	67	64	74
	3300	69	71	72	71	67	69	69	63	76
	4200	72	71	72	73	73	72	72	64	78
400 x 400	1800	71	69	65	65	68	66	66	63	73
	3000	72	71	69	68	68	69	69	66	76
	4200	71	73	74	73	69	71	71	65	78
	5400	74	73	74	75	75	74	74	66	80

$\Delta p_{st} = 500 \text{ Pa}$

Size	V [m³/h]	L _w [dB/Okt]								L _{WA} [dB(A)]
		f _m [Hz]								
		63	125	250	500	1000	2000	4000	8000	
500 x 200	1100	65	64	60	60	63	61	61	58	68
	1865	67	66	64	63	66	64	64	61	71
	2635	66	68	69	68	65	66	66	60	73
	3400	69	68	69	70	66	69	69	61	75
500 x 250	1500	67	66	62	62	65	63	63	60	70
	2400	68	67	65	64	67	65	65	62	72
	3300	67	69	70	69	66	67	67	61	74
	4200	70	69	70	71	67	70	70	62	76
500 x 300	1800	68	67	63	63	66	64	64	61	71
	2800	70	69	67	66	69	67	67	64	74
	3800	69	71	72	71	68	69	69	63	76
	4800	71	70	71	72	68	71	71	63	77
500 x 400	2200	70	69	65	65	68	66	66	63	73
	3735	72	71	69	68	71	69	69	66	76
	5265	72	74	75	74	74	72	72	66	79
	6800	77	76	77	78	75	77	77	69	83
500 x 500	3000	74	73	69	69	68	70	70	67	77
	4800	75	74	72	71	74	72	72	69	79
	6600	74	76	77	76	76	74	74	68	81
	8400	77	76	77	78	75	77	77	69	83
600 x 200	1500	65	64	60	60	59	61	61	58	68
	2335	67	66	64	63	66	64	64	61	71
	3165	66	68	69	68	68	66	66	60	73
	4000	70	69	70	71	68	70	70	62	76
600 x 250	1800	66	65	61	61	60	62	62	59	69
	2865	68	67	65	64	67	65	65	62	72
	3935	68	70	71	70	70	68	68	62	75
	5000	72	71	72	73	73	72	72	64	78
600 x 300	2100	67	66	62	62	62	63	63	60	70
	3400	69	68	66	65	64	66	66	63	73
	4700	68	70	71	70	70	68	68	62	75
	6000	70	69	70	71	71	70	70	62	76
600 x 400	3000	71	70	66	66	66	67	67	64	74
	4665	72	71	69	68	67	69	69	66	76
	6335	72	74	75	74	74	72	72	66	79
	8000	74	73	74	75	75	74	74	66	80
600 x 500	3600	73	72	68	68	68	69	69	66	76
	5735	74	73	71	70	69	71	71	68	78
	7865	73	75	76	75	75	73	73	67	80
	10000	79	78	79	80	80	79	79	71	85
600 x 600	4200	75	74	70	70	70	71	71	68	78
	6800	76	75	73	72	71	73	73	70	80
	9400	75	77	78	77	77	75	75	69	82
	12000	78	77	78	79	79	78	78	70	84

8.2. Radiated noise

The radiated noise of air volume controller is listed in Tab. 8.2.1.

- $\dot{V}$ [m³·h⁻¹] - air flow volume
 Δp_{st} [Pa] - pressure differential
 L_{WA} [dB(A)] - total level of acoustic power corrected by filter A

Tab. 8.2.1.

Size	$\dot{V}$ [m ³ /h]	L_{WA} [dB(A)]	L_{WA} [dB(A)]	L_{WA} [dB(A)]	L_{WA} [dB(A)]
		$\Delta p_{st} = 50 \text{ Pa}$	$\Delta p_{st} = 100 \text{ Pa}$	$\Delta p_{st} = 250 \text{ Pa}$	$\Delta p_{st} = 500 \text{ Pa}$
200 x 100	250	33	38	48	54
	400	39	43	51	56
	550	42	46	52	57
	700	43	48	55	61
200 x 150	400	35	39	45	50
	600	39	43	50	55
	800	42	46	53	58
	1000	43	48	55	62
200 x 200	500	35	39	46	51
	765	40	44	51	55
	1035	43	47	54	59
	1300	44	49	56	63
300 x 100	400	36	40	46	52
	600	40	44	50	56
	800	43	47	53	59
	1000	44	49	55	61
300 x 150	500	35	39	46	51
	835	40	44	51	56
	1165	44	48	54	60
	1500	46	50	57	62
300 x 200	600	35	40	48	54
	1065	39	44	52	58
	1535	43	48	56	61
	2000	45	50	58	64
300 x 250	800	35	40	48	55
	1365	40	45	53	60
	1935	44	49	57	63
	2500	46	51	59	66
300 x 300	1000	36	41	49	56
	4665	40	45	53	60
	2335	44	49	57	63
	3000	46	51	59	66
400 x 200	900	35	40	48	54
	1500	40	45	52	59
	2100	42	47	55	61
	2700	44	49	57	63
400 x 250	1200	38	43	50	56
	1935	42	47	54	60
	2665	45	50	57	63
	3400	47	52	59	65

Size	V [m³/h]	L _{WA} [dB(A)]	L _{WA} [dB(A)]	L _{WA} [dB(A)]	L _{WA} [dB(A)]
		Δp _{st} = 50 Pa	Δp _{st} = 100 Pa	Δp _{st} = 250 Pa	Δp _{st} = 500 Pa
400 x 300	1500	39	44	51	58
	2400	43	48	56	62
	3300	46	51	59	65
	4200	47	52	60	66
400 x 400	1800	43	48	55	62
	3000	46	51	59	65
	4200	49	54	61	67
	5400	50	55	63	69
500 x 200	1100	35	40	48	54
	1865	40	45	52	59
	2635	43	48	55	61
	3400	47	51	58	63
500 x 250	1500	36	41	48	56
	2400	47	51	55	60
	3300	49	53	58	63
	4200	53	56	61	65
500 x 300	1800	38	43	51	57
	2800	42	47	55	61
	3800	44	49	58	64
	4800	47	52	60	66
500 x 400	2200	42	46	53	58
	3735	46	50	58	62
	5265	47	52	60	65
	6800	51	56	64	69
500 x 500	3000	45	50	57	63
	4800	48	53	60	66
	6600	50	55	63	68
	8400	52	57	65	70
600 x 200	1500	35	40	48	54
	2335	39	44	52	59
	3165	42	47	55	61
	4000	44	50	57	65
600 x 250	1800	36	41	50	56
	2865	40	45	54	60
	3935	43	48	57	63
	5000	45	51	59	67
600 x 300	2100	37	42	50	57
	3400	42	47	55	61
	4700	45	50	57	64
	6000	47	52	60	66
600 x 400	3000	41	46	53	59
	4665	44	49	56	63
	6335	46	51	58	65
	8000	51	55	62	67
600 x 500	3600	44	49	56	62
	5735	46	51	59	65
	7865	49	54	61	67
	10000	53	58	66	72
600 x 600	4200	46	51	58	64
	6800	49	54	61	67
	9400	51	56	63	69
	12000	53	58	65	71

8.3. Radiated noise - insulated controller

The radiated noise of air volume controller is listed in Tab. 8.3.1.

$\dot{V}$ [m³.h⁻¹] - air flow volume

Δp_{st} [Pa] - pressure differential

L_{WA} [dB(A)] - total level of acoustic power corrected by filter A

Tab. 8.3.1.

Size	$\dot{V}$ [m ³ /h]	L_{WA} [dB(A)]	L_{WA} [dB(A)]	L_{WA} [dB(A)]	L_{WA} [dB(A)]
		$\Delta p_{st} = 50 \text{ Pa}$	$\Delta p_{st} = 100 \text{ Pa}$	$\Delta p_{st} = 250 \text{ Pa}$	$\Delta p_{st} = 500 \text{ Pa}$
200 x 100	250	24	28	33	38
	400	32	35	40	44
	550	34	38	44	48
	700	36	40	46	52
200 x 150	400	26	29	34	38
	600	32	35	41	44
	800	34	38	45	49
	1000	37	41	48	53
200 x 200	500	28	31	35	39
	765	34	37	42	45
	1035	38	41	47	50
	1300	39	43	49	54
300 x 100	400	27	31	36	41
	600	33	36	41	45
	800	37	40	45	49
	1000	39	42	47	51
300 x 150	500	26	30	36	41
	835	33	37	42	47
	1165	38	41	46	50
	1500	42	45	50	54
300 x 200	600	26	30	38	44
	1065	30	35	43	49
	1535	35	39	47	52
	2000	36	41	49	56
300 x 250	800	26	31	38	45
	1365	30	35	43	50
	1935	36	40	48	53
	2500	37	42	50	57
300 x 300	1000	26	31	39	46
	4665	31	36	44	51
	2335	35	40	49	54
	3000	37	42	51	58
400 x 200	900	24	29	37	44
	1500	29	34	42	48
	2100	32	37	45	51
	2700	35	40	48	54
400 x 250	1200	27	32	40	46
	1935	30	36	44	53
	2665	34	39	47	55
	3400	37	42	51	58

Size	V [m³/h]	L _{WA} [dB(A)]	L _{WA} [dB(A)]	L _{WA} [dB(A)]	L _{WA} [dB(A)]
		Δp _{st} = 50 Pa	Δp _{st} = 100 Pa	Δp _{st} = 250 Pa	Δp _{st} = 500 Pa
400 x 300	1500	29	34	42	50
	2400	34	39	46	52
	3300	37	42	49	55
	4200	39	44	51	57
400 x 400	1800	33	38	45	51
	3000	37	42	49	55
	4200	40	45	52	58
	5400	42	47	54	60
500 x 200	1100	24	28	36	42
	1865	29	34	41	48
	2635	33	38	45	51
	3400	41	44	49	53
500 x 250	1500	27	31	39	45
	2400	30	35	43	49
	3300	33	38	46	52
	4200	37	42	49	55
500 x 300	1800	28	33	41	47
	2800	32	37	45	51
	3800	35	40	47	53
	4800	37	42	50	56
500 x 400	2200	32	36	43	49
	3735	36	40	48	53
	5265	38	43	51	57
	6800	42	47	55	61
500 x 500	3000	35	40	47	53
	4800	38	43	51	57
	6600	42	46	54	59
	8400	43	48	56	62
600 x 200	1800	25	29	37	43
	2865	29	34	42	48
	3935	32	37	45	51
	5000	35	41	47	56
600 x 250	1800	27	31	39	45
	2865	30	35	43	49
	3935	33	38	47	53
	5000	37	41	50	54
600 x 300	2100	27	32	40	46
	3400	31	36	44	50
	4700	34	39	47	53
	6000	36	42	50	58
600 x 400	3000	32	36	43	49
	4665	35	40	47	53
	6335	37	42	50	56
	8000	42	46	54	58
600 x 500	3600	34	39	46	52
	5735	37	42	49	55
	7865	40	45	52	58
	10000	44	49	57	63
600 x 600	4200	35	40	48	54
	6800	40	44	52	57
	9400	42	47	54	60
	12000	46	50	57	62

IV. MATERIAL, FINISHING

9. Material

- 9.1. Controller casings and control device parts are made of galvanized steel plate. Controller blade is made of aluminium plate. Damper axis and spring are made of stainless steel. Bearings are made of plastic.
- 9.2. The controller is delivered without further surface treatment.

V. INSPECTION, TESTING

10. Inspection, testing

- 10.1. The appliance is constructed and preset by the manufacturer, its operation is dependent on proper installation and adjustment.

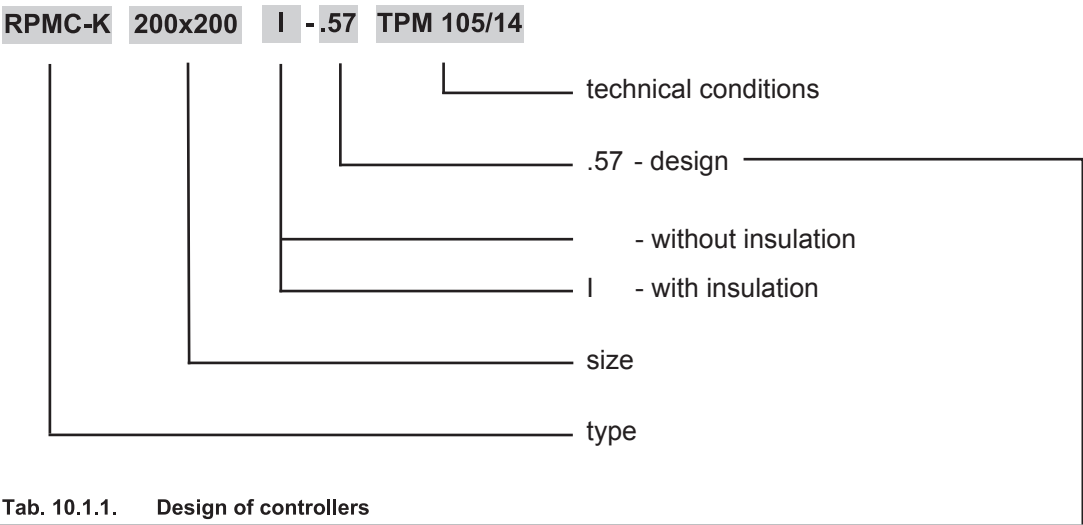
VI. TRANSPORTATION AND STORAGE

11. Logistic terms

- 11.1. Controllers are transported by box freight vehicles without direct weather impact, there must not occur any sharp shocks and ambient temperature must not exceed + 40 °C. Controllers must be protected against mechanic damages when transported and manipulated.
- 11.2. Controllers are stored in indoor environment without any aggressive vapours, gases or dust. Indoor temperature must be in the range from -5 °C to +40 °C and maximum relative humidity 80 %. Controllers must be protected against mechanic damages when transported and manipulated.

VII. ORDERING INFORMATION

12. Ordering key



Tab. 10.1.1. Design of controllers

Design - type of control	Additional digits
Manually controlled	.01
Actuating mechanism 230V, open-close control	.45
Actuating mechanism 230V, open-close control, with limit switch	.46
Actuating mechanism 24V, open-close control	.55
Actuating mechanism 24V, open-close control, with limit switch	.56
Actuating mechanism 24V SR modulating control	.57

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