



NORDdamper

RDTM - Multi-blade Tight Regulation Damper

Intended for use in potentially explosive atmospheres

Maximum air velocity 12 m/s

Maximum duct over or underpressure 1500 Pa

Dampers with manual control or an actuator

ATEX directive 2014/34/EU

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1. General

These Instructions for use are valid for damper types RDTM in design variants intended for use in in potentially explosive atmospheres (named hereinafter also shortly as the “dampers”) according to ATEX directive 2014/34/EU and they complement the Technical specifications TPM 151/21.

Technical specifications TPM 151/21 are valid for these dampers to the extent that in case of a conflict between TPM 151/21 or this document, this document shall prevail.

The document applies to both dampers without an actuator and dampers with an actuator (damper and actuator assemblies), when

- the dampers themselves are designed, classified, certified, manufactured and marked according to EN IEC 60079-0:2018 and EN ISO 80079-36:2016 standards by the manufacturer MANDÍK,
- any actuator is designed, classified, certified, manufactured and marked according to EN IEC 60079-0:2018, EN IEC 60079-1:2014, EN IEC 60079-11:2012, EN IEC 60079-11:2014 standards by the manufacturer SCHISCHEK and the resulting damper and actuator assembly is designed, classified, manufactured and marked by the manufacturer MANDÍK in accordance with the ATEX directive 2014/34 EU.

Information regarding actuators is taken from the manufacturer’s technical documentation from the manufacturer’s official website. In addition, the actuator manufacturer’s technical documentation may contain additional information not listed here that may be important or useful under certain conditions.

1.1 Conditions of use

The dampers may be used under the following conditions:

- the dampers installed, commissioned, operated and maintained in accordance with those Instructions for use and in the case of dampers with a actuator also according to the operating instructions of the actuator manufacturer and
- the damper orientation with blades either in horizontal, or vertical position and
- mean air velocity in the duct of 12 m/s and the duct overpressure or underpressure of max. 1500 Pa, and
- damper control pressure drop, difference of the static pressure in duct section before and after the damper maximally as shown in a separate table, and
- environment protected against weather effects 3K5 according to EN 60721-3-3 mod. A2, without condensation, icing, ice formation and without water from sources other than rain, and
- environment without abrasive, adhesive, electrically charged, chemically active and radioactive particles or droplets, without chemically active or radioactive gases. Under no circumstances should exothermic reactions or precipitation of condensate or the excretion of solid coatings or particles occur during normal operation, and corrosion, especially of the copper and brass components of the damper, may not occur. And further
- ambient temperature according to the given equipment category, whereas
- in the case of subsequent fitting of the damper with an actuator or other electrical elements, the temperature range is narrowed according to the temperature range of the electrical elements used, and
- the duct flange to which the damper flange is mounted must be flat in order to avoid reducing the tightness of the duct and/or the risk of damage to the damper when closing. The damper must be attached to a flange on at least one side. This also applies to when actuator is being set. While
- for dampers supplied with a preparation for an actuator, correct adjustment of the limit positions of the actuator is necessary to prevent mechanical damage to the damper, and further
- dampers can be used in the relevant zone with an explosion hazard under conditions in accordance with the Ex equipment category specified in this point, when the condition for temperature Ta applies both to the outside of the damper and to the transported air.

Damper design	Actuator manufacturer and type series	Category of equipment	Temperature of use	Allowed uses
Dampers with manual control	(not relevant)	II 2G Ex h IIC T6 Gb	-20° ≤ Ta ≤ +70°	zones 1 and 2
Dampers with preparation for actuator	(not relevant)	II 2G Ex h IIC T6 Gb	-20° ≤ Ta ≤ +70°	zones 1 and 2
Dampers with actuator	SCHISCHEK ExMax-...	II 2G Ex IIC T6 Gb	-20° ≤ Ta ≤ +40°	zones 1 and 2
		II 2G Ex IIC T5 Gb	-20° ≤ Ta ≤ +50°	
		II 2G Ex IIC T4 Gb	-20° ≤ Ta ≤ +60°	
	SCHISCHEK RedMax-...	II 3G Ex IIC T6 Gc	-20° ≤ Ta ≤ +40°	zone 2
		II 3G Ex IIC T5 Gc	-20° ≤ Ta ≤ +50°	
		II 3G Ex IIC T4 Gc	-20° ≤ Ta ≤ +60°	

- Manually operated dampers may only be operated by hand with a smooth movement.
- Dampers for fitting an actuator may only be used with actuators intended to be used in potentially explosive atmospheres of the Ex category corresponding to the Ex category of the damper, and
- the angular velocity of the actuator shall not exceed 20°/s, or 3,33 rpm-1 and at the same time
- the actuator torque shall not exceed the limit shown below.
- For dampers with an actuator (assembly manufactured by the manufacturer), the prescribed parameters of the supply voltage and control voltage and voltage and current on the limit switches must be observed, and
- the motor speed setting, spring mechanism speed and torque setting may only be changed so that the actuator setting is in accordance with this document and
- if the damper is electrically connected directly in areas with a risk of explosion, an Ex terminal block intended for the given zone must be used for the connection.

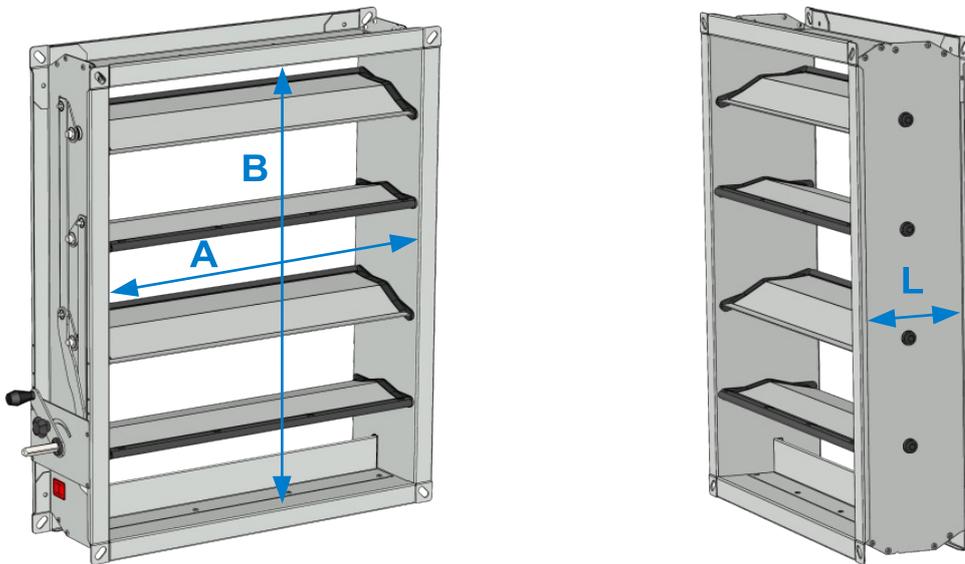
1.2 Description

Multi blade tight regulation dampers RDTM are intended to be used in buildings – in heating, ventilation and air-conditioning (HVAC) systems. Controlled changes of the damper effective cross-section allow to adjust the air flow rate. The damper also allows to cut the air flow completely whenever requested, forming an air-tight barrier. The dampers consist of a rectangular steel body (frame), set of steel counter-running blades equipped with EPDM gaskets and closed from the both sides by sealing end-cups from a composite material based on polyamide with suppressed flammability V-0 in accordance with UL 94 (halogen-free), blade shaft from steel with composite plain bearings (or stainless-steel plain bearings, on demand), steel rod mechanism, and from a manual control, or from actuator control (with actuator), or the dumper is just ready for actuator mounting (without actuator), respectively.

The dampers are characterized by:

- effort-less, smooth, silent running
- rigid blades with good aerodynamics
- two blade sizes to guarantee optimum filling of the cross-section
- silicone-free design
- wide application range

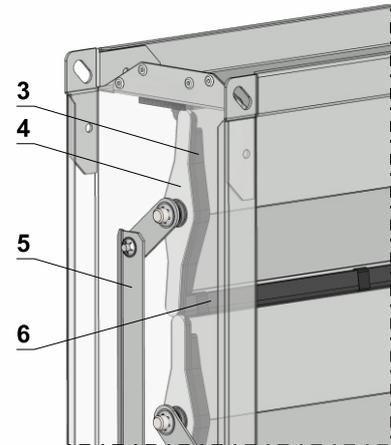
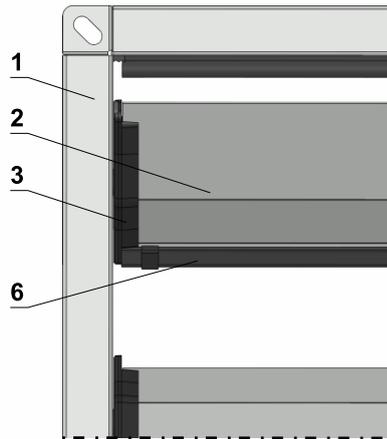
Basic dimensions of the damper



Damper characteristics	
Nominal dimensions AxB:	200 x 200...2000 x 2000 mm by 5 mm
Flange:	30 mm
Body length L:	160 mm
Tightness in acc. with EN 1751:	Casing leakage class ATC 3 (old marking "C") Closed blade leakage class 3
Volume air flow rates:	up to 172 800 m3/h
Mean air velocity in the duct:	max. 12 m/s
Maximum allowed pressure in the duct:	± 1 500 Pa
Maximum pressure difference:	1 000 - 1 500 Pa
Reaction to fire - body (frame), blades, mechanics:	class A1

Damper design elements:

- 1 – Steel body (frame)
- 2 – Steel aerodynamic blade
- 3 – Composite end-cup of V-0 class in acc. with UL-94, halogen free
- 4 – End-cup sliding gasket
- 5 – Rod mechanism
- 6 – EPDM blade seal



1.3 Operation conditions

To guarantee reliable functioning of the damper, the following conditions shall be respected:

- horizontal or vertical blade direction¹⁾ and
- mean air velocity in the duct max. 12 m/s, and
- operation overpressure or vacuum in the duct max. 1500 Pa, and
- control pressure drop, difference of the static pressure in the sections before and after the damper in acc with chapter 4.1.
- mild climate 3K5 in accordance with EN 60721-3-3+A2, without condensation, frost, ice formation, without water from other sources than the rain, and
- environment without abrasive, adhesive, electro-charged, chemically active and radioactive solid or liquid particles, without radioactive gases²⁾ and
- operation temperature of -20°C ... +70°C, while
- in case of the damper equipped with an actuator or other electric devices is the the allowed temperature range limited in accordance with with the temperature range of such devices
- the flange of the duct where the damper is assembled shall be in plane; otherwise, negative impact on the tightness or even risk of damage of the damper during closing. The damper shall be fixed to the duct-flange at least from one side. This applies also when adjusting the actuator.
- for actuator(s) mounted outside the Factory, the end blocks (stoppers) of the actuator(s) are setup correctly to prevent a mechanical damage of the damper.

1) Damper with horizontal blade axis needs less torque and will show slower wear.

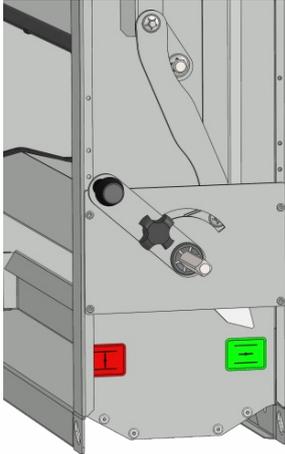
2) With respect to the selected material option and/or surface protection treatment; individual demands may be discussed case by case.

2. Design

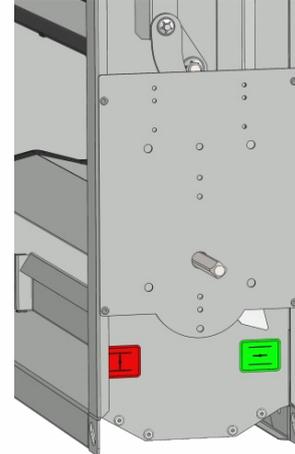
The damper can be supplied

- with manual control including handle and locking nut
- ready to mount an actuator
- with actuator

Damper with manual control including handle and locking nut



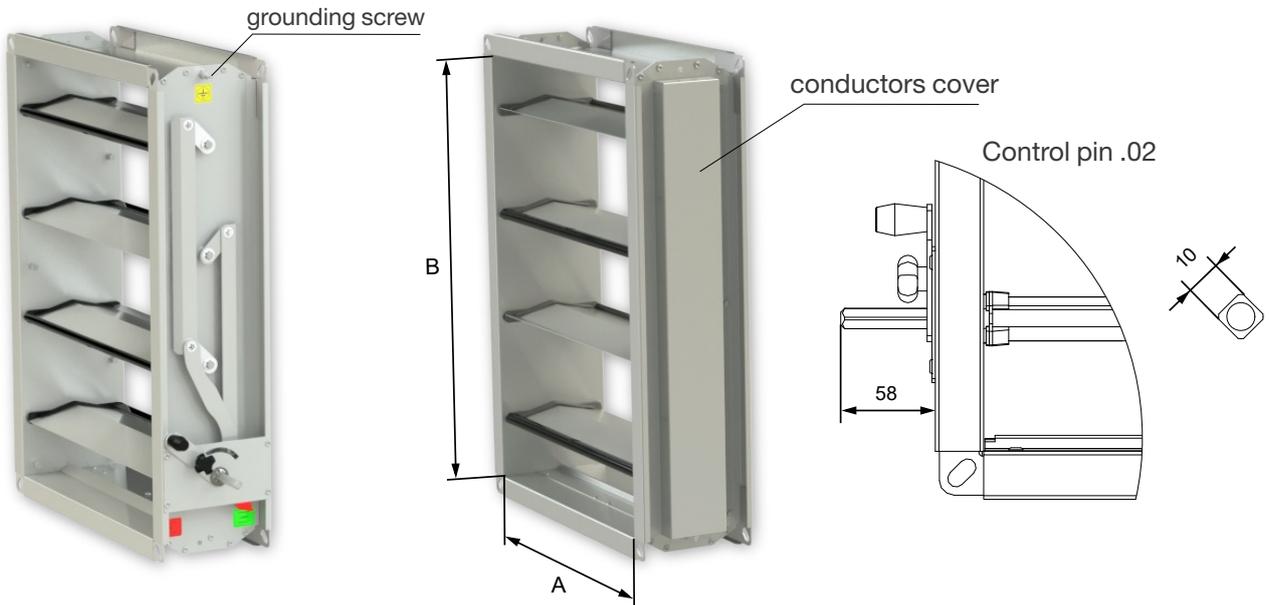
Damper ready to mount an actuator



The dampers are manufactured in these design variants intended to be used in potentially explosive atmospheres

Damper design variant – control type	Design variant ID code in the damper ordering code	
	For zones 1 and 2	For zone 2
manual (zone 1 and 2)	.02	-
for actuator mounting (zone 1 and 2)	.08	-
with actuator, 3-point control	.70	.80
with actuator, 3-point control, limit switches	.71	.81
with actuator, continuous regulation 0...10 V	.71	.82
with actuator, 3-point control, return spring safety position CLOSED	.73	.83
with actuator, 3-point control, return spring safety position OPEN	.73A	.83A
with actuator, 3-point control, return spring safety position CLOSED, limit switches	.74	.84
with actuator, 3-point control, return spring safety position OPEN, limit switches	.74A	.84A
with actuator, continuous regulation 0...10 V, return spring safety position CLOSED	.75	.85
with actuator, continuous regulation 0...10 V, return spring safety position OPEN	.75A	.85A

Design .02 - manual

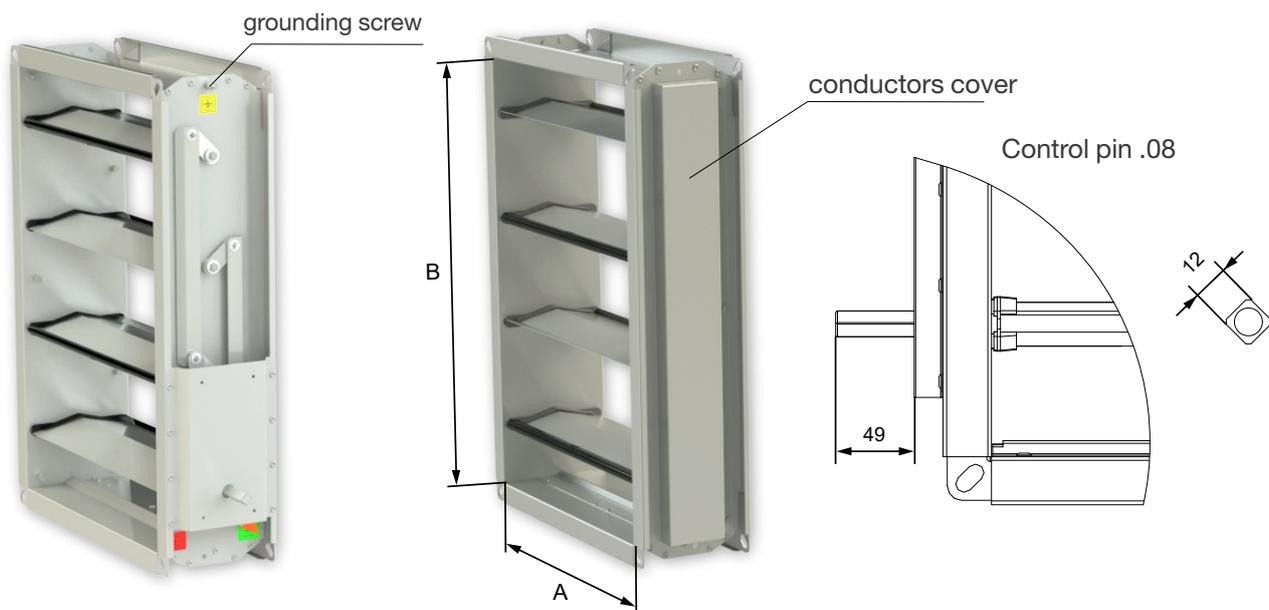


Each damper blade is connected to the damper body by a brass clip and a copper conductor. These wires are protected against accidental damage by a cover.

The minimum space for an actuator is 250 mm (in the direction of the blade rotation axis), but some actuators may require more space.

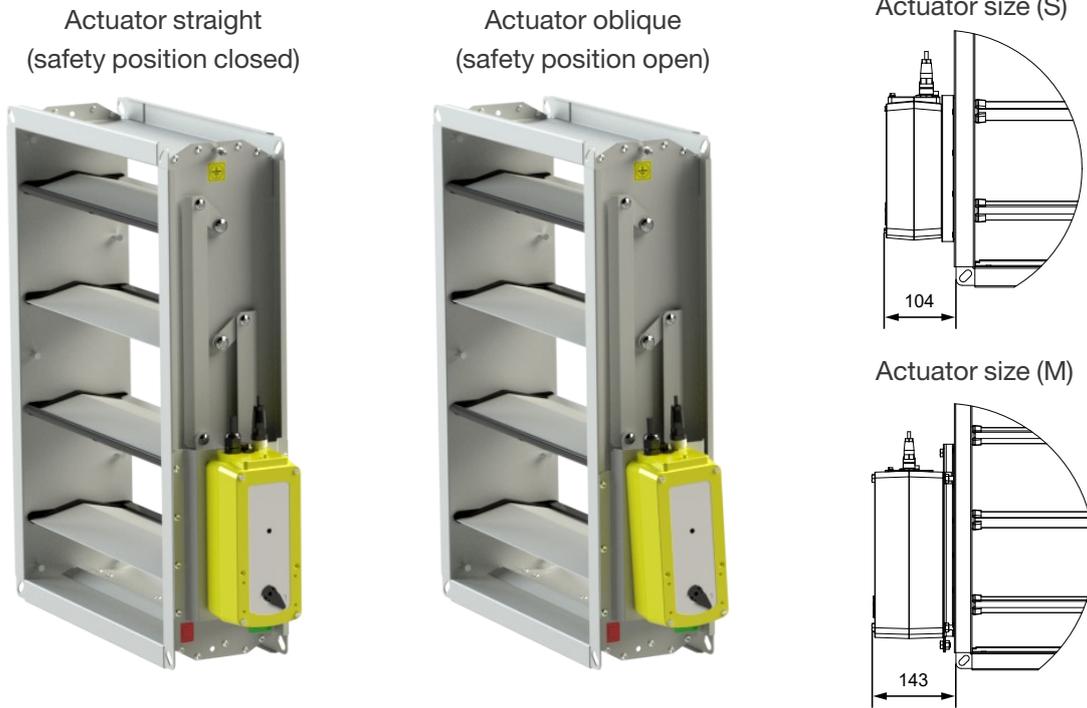
Design .08 - for fitting an actuator

In the case of .08 design variant (preparation for an actuator), the size of the control pin for the Ex design variant is different from the ordinary version - the control pin has dimensions of 12 x 12 mm. If necessary, for example, Schischek also offers adapters from 12 x 12 to 16 x 16 size pins.



Design with actuator

In the case of a damper with a SCHISCHEK actuator size M, an adapter from a 12 x 12 pin to a 16 x 16 mm pin is used.



Each damper blade is connected to the damper body by a brass clip and a copper conductor. These wires are protected against accidental damage by a cover.

The minimum space for an actuator is 250 mm (in the direction of the blade rotation axis), but some actuators may require more space.

Grounding wire assembly

The Damper is equipped with one grounding screw M6 x 35 mm on the control side.



3. Technical data

3.1 Basic range, effective cross-section

Dampers up to B=445 consist of smaller blades with the spacing of 95 mm, dampers from B=450 mm consist of larger blades with the spacing of 145 mm.

Table 1. Basic range, effective cross section in m²

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	0,028	0,036	0,043	0,045	0,057	0,071	0,085	0,089	0,114	0,142	0,170	0,178	-	-	-	-
	250	0,028	0,036	0,043	0,045	0,057	0,071	0,085	0,089	0,114	0,142	0,170	0,178	-	-	-	-
	300	0,044	0,055	0,065	0,069	0,087	0,109	0,131	0,137	0,174	0,218	0,262	0,273	-	-	-	-
	315	0,044	0,055	0,065	0,069	0,087	0,109	0,131	0,137	0,174	0,218	0,262	0,273	-	-	-	-
	400	0,059	0,074	0,088	0,093	0,118	0,147	0,176	0,185	0,235	0,294	0,353	0,368	-	-	-	-
	500	0,068	0,085	0,102	0,107	0,136	0,171	0,205	0,215	0,273	0,341	0,409	0,426	0,477	0,546	0,614	0,682
	600	0,092	0,115	0,137	0,144	0,183	0,229	0,275	0,289	0,366	0,458	0,550	0,573	0,641	0,733	0,824	0,916
	630	0,092	0,115	0,137	0,144	0,183	0,229	0,275	0,289	0,366	0,458	0,550	0,573	0,641	0,733	0,824	0,916
	800	0,115	0,144	0,173	0,181	0,230	0,288	0,345	0,362	0,460	0,575	0,690	0,719	0,805	0,920	1,035	1,150
	1000	0,138	0,173	0,208	0,218	0,277	0,346	0,415	0,436	0,554	0,692	0,830	0,865	0,969	1,107	1,246	1,384
	1200	0,185	0,232	0,278	0,292	0,370	0,463	0,556	0,583	0,741	0,926	1,111	1,158	1,296	1,482	1,667	1,852
	1250	0,185	0,232	0,278	0,292	0,370	0,463	0,556	0,583	0,741	0,926	1,111	1,158	1,296	1,482	1,667	1,852
	1400	0,209	0,261	0,313	0,329	0,417	0,522	0,626	0,657	0,834	1,043	1,252	1,304	1,460	1,669	1,877	2,086
	1600	0,232	0,290	0,348	0,365	0,464	0,580	0,696	0,731	0,928	1,160	1,392	1,450	1,624	1,856	2,088	2,320
	1800	0,279	0,349	0,418	0,439	0,558	0,697	0,836	0,878	1,115	1,394	1,673	1,743	1,952	2,230	2,509	2,788
	2000	0,302	0,378	0,453	0,476	0,604	0,756	0,907	0,952	1,209	1,511	1,813	1,889	2,115	2,418	2,720	3,022

3.2 Weights

Weights of dampers without actuator are shown in the table 2. If the damper is equipped with an actuator, actuator weight should be added.

Table 2. Damper's weight without actuator (kg)

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	3,4	3,7	4	4,1	4,6	5,2	5,9	6,1	7,1	8,4	9,6	9,9	-	-	-	-
	250	3,6	3,9	4,3	4,4	4,9	5,6	6,3	6,5	7,7	9,1	10,5	10,8	-	-	-	-
	300	4,2	4,6	5	5,1	5,7	6,5	7,3	7,5	8,8	10,3	11,9	12,2	-	-	-	-
	315	4,3	4,7	5,1	5,2	5,8	6,6	7,4	7,6	8,9	10,5	12	12,4	-	-	-	-
	400	4,9	5,4	5,8	5,9	6,7	7,6	8,4	8,7	10,2	11,9	13,6	14,1	-	-	-	-
	500	5,2	5,7	6,1	6,3	7,1	8	8,9	9,2	10,8	12,7	14,5	15	21,8	24,3	26,9	29,4
	600	6,1	6,6	7,1	7,3	8,1	9,2	10,2	10,5	12,3	14,4	16,5	17	24,8	27,7	30,5	33,4
	630	6,2	6,7	7,3	7,4	8,3	9,4	10,4	10,7	12,5	14,6	16,7	17,2	25,1	28	30,9	33,8
	800	7,3	7,9	8,5	8,7	9,7	11	12,2	12,6	14,7	17,2	19,6	20,3	29,6	33	36,4	39,8
	1000	8,5	9,2	9,9	10,1	11,3	12,7	14,1	14,6	17	19,8	22,6	23,3	34,2	38,1	42	45,8
	1200	8,9	9,6	10,3	10,7	16,2	18	19,9	20,5	23,7	27,4	31,2	32,1	41,6	46,3	51	55,7
	1250	9	9,7	10,4	10,8	16,4	18,3	20,2	20,8	24	27,8	31,6	32,6	42,1	46,9	51,7	56,4
	1400	9,6	10,9	12,4	12,8	18,1	20,2	22,3	22,9	26,4	30,6	34,8	35,8	46,4	51,7	56,9	62,2
	1600	11,3	12	13,5	13,8	20	22,2	24,5	25,1	29	33,5	38	39,1	50,9	56,6	62,3	68
	1800	12,4	13,7	15,4	15,7	22,2	24,7	27,2	27,9	32,1	37,1	42,1	43,3	57	63,4	69,9	76,3
	2000	14,6	16	17,4	17,8	24,2	26,9	29,6	30,5	35	40,4	45,8	47,2	62,1	69	76	82,9

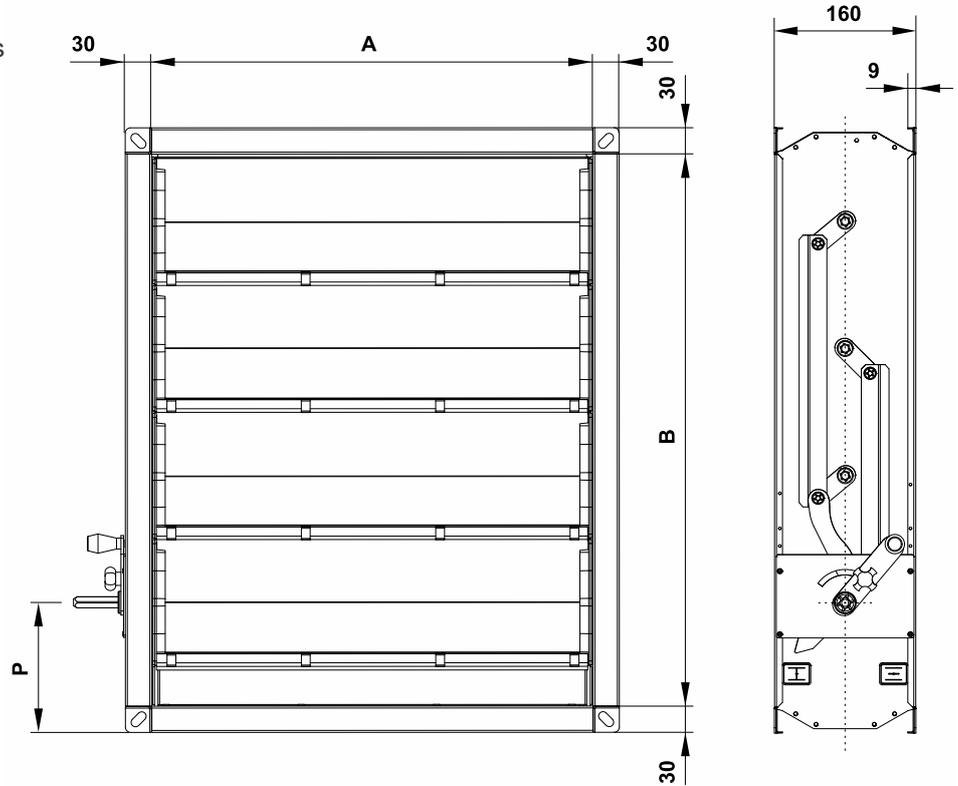
3.3 Dimensions

For damper control, 250 mm of space is needed, in the direction of the main shaft axis. Position of the main shaft axis is shown in Table 2. The handle of dampers with manual control does not exceed the outline of the damper body (frame).

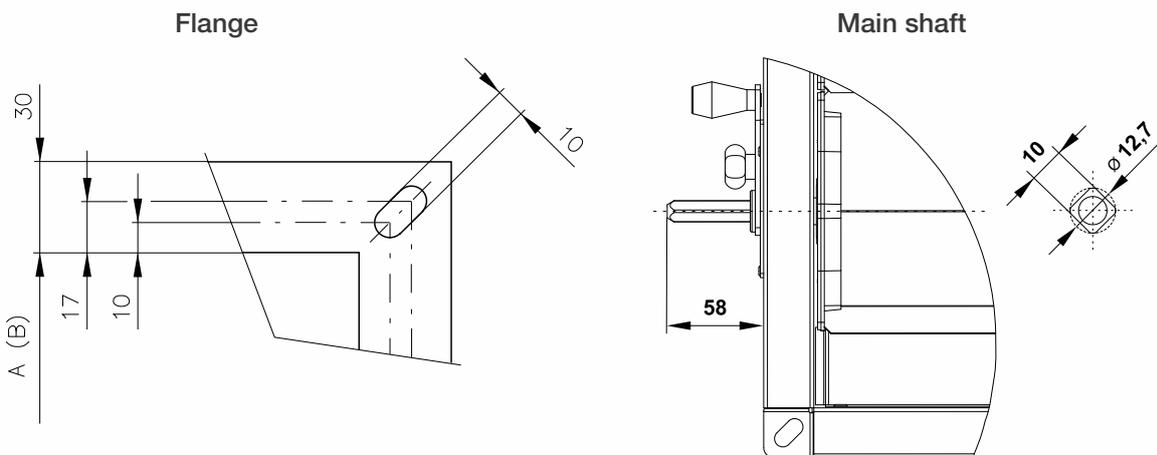
Damper dimensions

Position of the main shaft axis

B (mm)	P (mm)	
200	83,5	
250	113,5	
300	88,5	
315	103,5	
400	93,5	
500	143,5	
600	118,5	
630	148,5	
800	153,5	
1000	188,5	
1200	138,5	
1250	168,5	
1400	153,5	
1600	208,5	
1800	138,5	
2000	173,5	



Connection dimensions



3.4 Installation in the duct

The dampers are intended to be incorporated into HVAC duct. If the damper is installed in such way that blade axis are not horizontal, 50% stronger actuators are needed to control the damper compared to the same damper with horizontal blades.

3.5 Actuator torques

Necessary ... the highest permissible torques of actuators for RDTM dampers																
B (mm)	A (mm)															
	200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
to 200	4-10	4-10	4-10	4-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-	-
250	4-10	4-10	4-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-	-
300	4-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-	-
315	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-	-
400	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-	-
500	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30
600	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	20-30
630	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	20-30
800	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	15-30	20-30	20-30
1000	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	20-30	20-30	20-30	20-30
1200	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50
1250	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50
1400	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50	30-50
1600	15-30	15-30	15-30	15-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50	30-50	30-50	30-50
1800	20-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50	30-50	30-50	30-50	30-50	30-50
2000	20-30	20-30	20-30	20-30	20-30	20-30	20-30	20-30	30-50	30-50	30-50	30-50	30-50	30-50	30-50	30-50

3.6 Assignment and setting of actuators SCHISCHEK ExMax-... and RedMax...

Types of actuators manufactured by SCHISCHEK						
Damper design (assemblies)	Actuator type	Actuator size	Torque	Return spring	Limit switches	Continuous regulation 0...10 V
.70	ExMax-5.10	S	5/10 Nm	no	no	no
	ExMax-15.30	S	15/30 Nm	no	no	no
	ExMax-50.75	M	50/75 Nm	no	no	no
.71	ExMax-5.10-S	S	5/10 Nm	no	yes	no
	ExMax-15.30-S	S	15/30 Nm	no	yes	no
.72	ExMax-5.10-Y	S	5/10 Nm	no	no	yes
	ExMax-15.30-Y	S	15/30 Nm	no	no	yes
	ExMax-50.75-Y	M	50/75 Nm	no	no	yes
.73 .73A	ExMax-5.10-F	S	5/10 Nm	yes	no	no
	ExMax-15-F	S	15 Nm	yes	no	no
	ExMax-30-F	M	30 Nm	yes	no	no
	ExMax-50-F	M	50 Nm	yes	no	no
.74 .74A	ExMax-5.10-SF	S	5/10 Nm	yes	yes	no
	ExMax-15-SF	S	15 Nm	yes	yes	no
	ExMax-30-SF	M	30 Nm	yes	yes	no
	ExMax-50-SF	M	50 Nm	yes	yes	no

Types of actuators manufactured by SCHISCHEK						
Damper design (assemblies)	Actuator type	Actuator size	Torque	Return spring	Limit switches	Continuous regulation 0...10 V
.75 .75A	ExMax-5.10-YF	S	5/10 Nm	yes	no	yes
	ExMax-15-YF	S	15 Nm	yes	no	yes
	ExMax-30-YF	M	30 Nm	yes	no	yes
	ExMax-50-YF	M	50 Nm	yes	no	yes
.80	RedMax-5.10	S	5/10 Nm	no	no	no
	RedMax-15.30	S	15/30 Nm	no	no	no
	RedMax-50.75	M	50/75 Nm	no	no	no
.81	RedMax-5.10-S	S	5/10 Nm	no	yes	no
	RedMax-15.30-S	S	15/30 Nm	no	yes	no
.82	RedMax-5.10-Y	S	5/10 Nm	no	no	yes
	RedMax-15.30-Y	S	15/30 Nm	no	no	yes
	RedMax-50.75-Y	M	50/75 Nm	no	no	yes
.83 .83A	RedMax-5.10-F	S	5/10 Nm	yes	no	no
	RedMax-15-F	S	15 Nm	yes	no	no
	RedMax-30-F	M	30 Nm	yes	no	no
	RedMax-50-F	M	50 Nm	yes	no	no
.84 .84A	RedMax-5.10-SF	S	5/10 Nm	yes	yes	no
	RedMax-15-SF	S	15 Nm	yes	yes	no
	RedMax-30-SF	M	30 Nm	yes	yes	no
.84 .84A	RedMax-50-SF	M	50 Nm	yes	yes	no
.85 .85A	RedMax-5.10-YF	S	5/10 Nm	yes	no	yes
	RedMax-15-YF	S	15 Nm	yes	no	yes
	RedMax-30-YF	M	30 Nm	yes	no	yes
	RedMax-50-YF	M	50 Nm	yes	no	yes

Possible types and prescribed settings of actuators for dampers of types RDTM equipped with actuators									
Designation in the table below	Allowed actuator types	Allowed torque settings	Forbidden torque settings	Allowed motor speed settings	Forbidden motor speed settings	Allowed spring speed settings (if the actuator is equipped with one)	Forbidden spring speed settings	Allowed switch positions	Forbidden switch positions
5	ExMax-5.10...(S) RedMax-5.10...(S)	5 Nm	10 Nm	15/30/60/120 s	3 s	10 s	3 s	01, 02, 03, 04	00, 05, 06, 07, 08, 09
5-10	ExMax-5.10...(S) RedMax-5.10...(S)	5/10 Nm	–	15/30/60/120 s	3 s	10 s	3 s	01, 02, 03, 04, 06, 07, 08, 09"	00, 05

Possible types and prescribed settings of actuators for dampers of types RDTM equipped with actuators									
Designation in the table below	Allowed actuator types	Allowed torque settings	Forbidden torque settings	Allowed motor speed settings	Forbidden motor speed settings	Allowed spring speed settings (if the actuator is equipped with one)	Forbidden spring speed settings	Allowed switch positions	Forbidden switch positions
10-15	ExMax-5.10...(S) RedMax-5.10...(S)	10 Nm	5 Nm	15/30/60/120 s	3 s	10 s	3 s	06, 07, 08, 09	00, 01, 02, 03, 04, 05
	ExMax-15.30...(S) RedMax-15.30...(S)	15 Nm	30 Nm					01, 02, 03, 04	00, 05, 06, 07, 08, 09
	ExMax-15...(S) RedMax-15...(S)		-					01, 02, 03, 04, 06, 07, 08, 09	00, 05
15-30	ExMax-15.30...(S) RedMax-15.30...(S)	15/30 Nm	-	15/30/60/120 s	3 s	10 s	3 s	01, 02, 03, 04, 06, 07, 08, 09	00, 05
	ExMax-15... (S) RedMax-15... (S)	15 Nm		40/60/90/120/150 s	-	20 s	-		
	ExMax-30-YF (M) RedMax-30-YF (M)	30 Nm		-	-	-	-		
30	ExMax-15.30... (S) RedMax-15.30...(S)	30 Nm	15 Nm	15/30/60/120 s	3 s	10 s	3 s	06, 07, 08, 09	00, 01, 02, 03, 04, 05
	ExMax-30-YF (M) RedMax-30-YF (M)		-	40/60/90/120/150 s	-	20 s	-	00, 01, 02, 03, 04, 05, 06, 07, 08, 09	-
30-50	ExMax-15.30...(S) RedMax-15.30...(S)	30 Nm	15 Nm	15/30/60/120 s	3 s	10 s	3 s	06, 07, 08, 09	00, 01, 02, 03, 04, 05
	ExMax-30-YF (M) RedMax-30-YF (M)		-	40/60/90/120/150 s	-	-	-	00, 01, 02, 03, 04, 06, 07, 08, 09	-
	ExMax-50.75...(M) RedMax-50.75...(M)	50 Nm	75 Nm	40/60/90/120/150 s	-	20 s	-	00, 01, 02, 03, 04	05, 06, 07, 08, 09
	ExMax-50...(M) RedMax-50...(M)		-		00, 01, 02, 03, 04, 05, 06, 07, 08, 09	-			

Blue - default setting

(S), (M) - actuator size

Assignment of SCHISCHEK actuator torque to RDTM damper sizes																
B (mm)	A (mm)															
	200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
to 200	5-10	5-10	5-10	5-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-
250	5-10	5-10	5-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-
300	5-10	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-
315	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-
400	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	-	-	-	-
500	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30
600	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	30
630	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	30
800	10-15	10-15	10-15	10-15	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	15-30	30	30
1000	10-15	10-15	10-15	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	30	30	30	30
1200	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	30	30	30	30	30	30	30-50
1250	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	30	30	30	30	30	30	30-50
1400	15-30	15-30	15-30	15-30	15-30	15-30	15-30	15-30	30	30	30	30	30	30	30-50	30-50
1600	15-30	15-30	15-30	15-30	30	30	30	30	30	30	30	30	30-50	30-50	30-50	30-50
1800	30	30	30	30	30	30	30	30	30	30	30-50	30-50	30-50	30-50	30-50	30-50
2000	30	30	30	30	30	30	30	30	30-50	30-50	30-50	30-50	30-50	30-50	30-50	30-50

4. Basic parameters

4.1 Maximum allowed duct pressure, maximum pressure

Maximum allowed duct pressure is ±1500 Pa. Maximum allowed control pressure drop or difference of the static pressure in the sections before and after the damper is shown in Table 3.

Table 3. Maximum allowed pressure difference (Pa)

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1200	-	-	-	-
	250	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1200	-	-	-	-
	300	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1200	-	-	-	-
	315	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1200	-	-	-	-
	400	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1200	-	-	-	-
	500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	600	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	630	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1000	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1200	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1250	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1400	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1600	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	1800	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000
	2000	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500	1200	1200	1000	1000

4.2 Closing torque

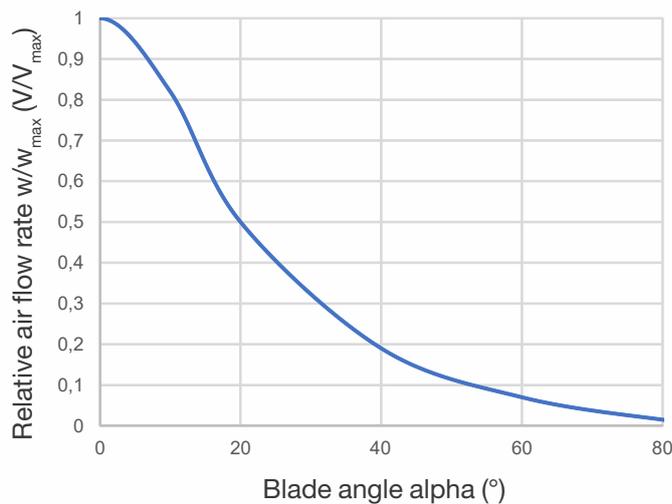
Aerodynamic forces acting on the blades and hence, on the closing mechanism depend, among other factors, on the fan characteristics, or on the external pressure drop characteristics of the HVAC system connected. Nevertheless, the torque from aerodynamic forces is typically inferior to the torque needed to close the damper tightly. At the moment the damper is almost closed, the aerodynamic forces are already negligible. For dampers used in another position than with damper blade axis horizontal, 50% actuator torque increase is highly recommended.

Table 4. Closing torque (Nm)

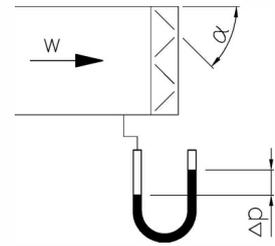
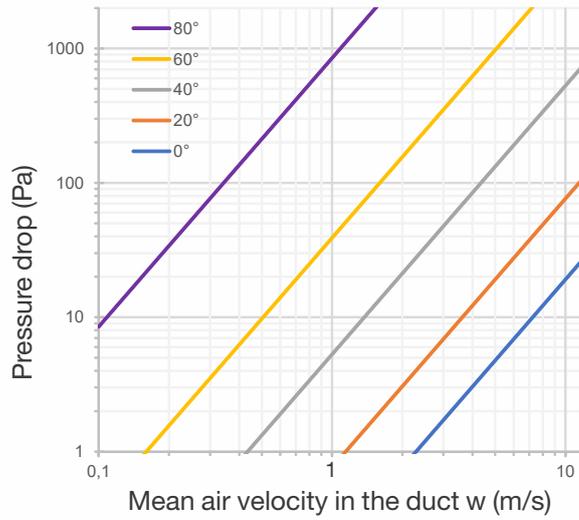
		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	4	4	4	4	10	10	10	10	10	10	10	10	-	-	-	-
	250	4	4	4	4	10	10	10	10	10	10	10	10	-	-	-	-
	300	10	10	10	10	10	10	10	10	10	10	10	10	-	-	-	-
	315	10	10	10	10	10	10	10	10	10	10	10	10	-	-	-	-
	400	10	10	10	10	10	10	10	10	10	10	10	10	-	-	-	-
	500	10	10	10	10	10	10	10	10	10	10	15	15	15	15	15	15
	600	10	10	10	10	10	10	10	10	10	15	15	15	15	15	15	20
	630	10	10	10	10	10	10	10	10	10	15	15	15	15	15	15	20
	800	10	10	10	10	10	10	10	15	15	15	15	15	15	15	20	20
	1000	10	10	10	10	10	10	15	15	15	15	15	15	20	20	20	20
	1200	10	10	10	10	15	15	15	15	15	20	20	20	20	20	20	30
	1250	10	10	10	10	15	15	15	15	15	20	20	20	20	20	20	30
	1400	10	10	10	10	15	15	15	15	20	20	20	20	20	20	30	30
	1600	10	10	10	10	20	20	20	20	20	20	20	20	30	30	30	30
	1800	10	10	10	10	20	20	20	20	20	20	30	30	30	30	30	30
	2000	10	10	15	15	20	20	20	20	30	30	30	30	30	30	30	30

5. Flow characteristics, pressure drop, tightness

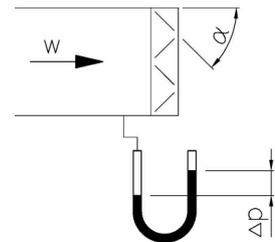
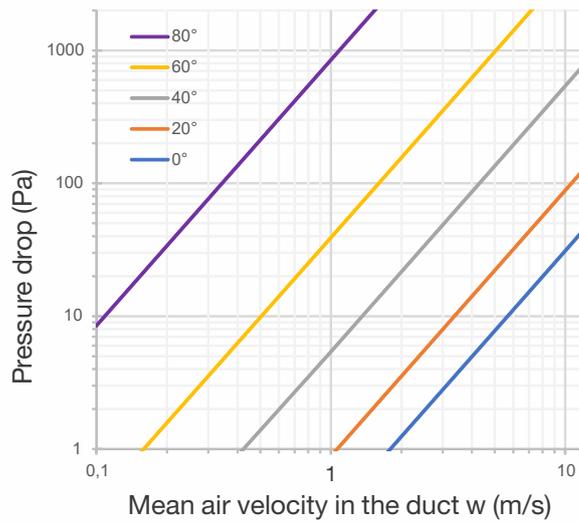
Flow characteristics at constant pressure drop of 40 Pa



Pressure drop as function of the air velocity and blade angle, damper in the duct



Pressure drop as function of the air velocity and blade angle, damper at the end of the duct



Body (frame) leakage class C acc. to EN 1751

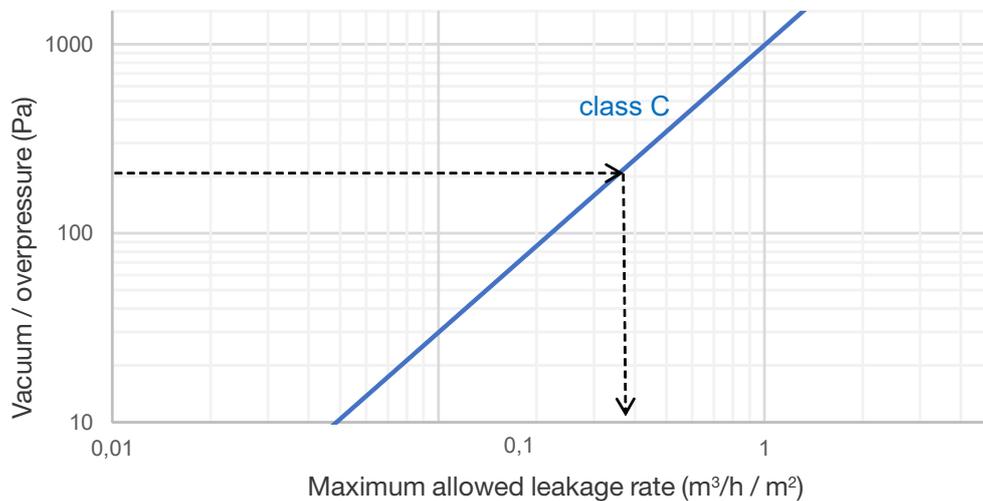


Table 5. Virtual surface area of damper body (frame) in m² considered for maximum allowed body leakage rate in acc. with EN 1751

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	0,8	0,9	1	1	1,2	1,4	1,6	1,7	2	2,4	2,8	2,9				
	250	0,9	1	1,1	1,1	1,3	1,5	1,7	1,8	2,1	2,5	2,9	3				
	300	1	1,1	1,2	1,2	1,4	1,6	1,8	1,9	2,2	2,6	3	3,1				
	315	1	1,1	1,2	1,3	1,4	1,6	1,8	1,9	2,2	2,6	3	3,1				
	400	1,2	1,3	1,4	1,4	1,6	1,8	2	2,1	2,4	2,8	3,2	3,3				
	500	1,4	1,5	1,6	1,6	1,8	2	2,2	2,3	2,6	3	3,4	3,5	3,8	4,2	4,6	5
	600	1,6	1,7	1,8	1,8	2	2,2	2,4	2,5	2,8	3,2	3,6	3,7	4	4,4	4,8	5,2
	630	1,7	1,8	1,9	1,9	2,1	2,3	2,5	2,5	2,9	3,3	3,7	3,8	4,1	4,5	4,9	5,3
	800	2	2,1	2,2	2,2	2,4	2,6	2,8	2,9	3,2	3,6	4	4,1	4,4	4,8	5,2	5,6
	1000	2,4	2,5	2,6	2,6	2,8	3	3,2	3,3	3,6	4	4,4	4,5	4,8	5,2	5,6	6
	1200	2,8	2,9	3	3	3,2	3,4	3,6	3,7	4	4,4	4,8	4,9	5,2	5,6	6	6,4
	1250	2,9	3	3,1	3,1	3,3	3,5	3,7	3,8	4,1	4,5	4,9	5	5,3	5,7	6,1	6,5
	1400	3,2	3,3	3,4	3,4	3,6	3,8	4	4,1	4,4	4,8	5,2	5,3	5,6	6	6,4	6,8
	1600	3,6	3,7	3,8	3,8	4	4,2	4,4	4,5	4,8	5,2	5,6	5,7	6	6,4	6,8	7,2
	1800	4	4,1	4,2	4,2	4,4	4,6	4,8	4,9	5,2	5,6	6	6,1	6,4	6,8	7,2	7,6
	2000	4,4	4,5	4,6	4,6	4,8	5	5,2	5,3	5,6	6	6,4	6,5	6,8	7,2	7,6	8

Closed blades leakage class 3 in acc. with EN 1751

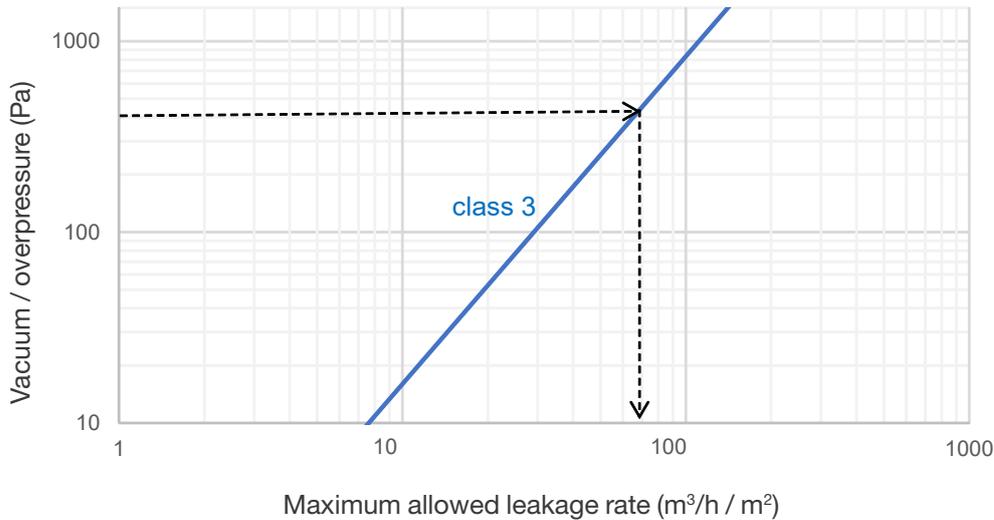


Table 6. Damper cross section in m² considered for maximum allowed closed blades leakage in acc. with EN 1751

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	0,04	0,05	0,06	0,06	0,08	0,10	0,12	0,13	0,16	0,20	0,24	0,25				
	250	0,05	0,06	0,08	0,08	0,10	0,13	0,15	0,16	0,20	0,25	0,30	0,31				
	300	0,06	0,08	0,09	0,09	0,12	0,15	0,18	0,19	0,24	0,30	0,36	0,38				
	315	0,06	0,08	0,09	0,10	0,13	0,16	0,19	0,20	0,25	0,32	0,38	0,39				
	400	0,08	0,10	0,12	0,13	0,16	0,20	0,24	0,25	0,32	0,40	0,48	0,50				
	500	0,10	0,13	0,15	0,16	0,20	0,25	0,30	0,32	0,40	0,50	0,60	0,63	0,70	0,80	0,90	1
	600	0,12	0,15	0,18	0,19	0,24	0,30	0,36	0,38	0,48	0,60	0,72	0,75	0,84	0,96	1,08	1,20
	630	0,13	0,16	0,19	0,20	0,25	0,32	0,38	0,40	0,50	0,63	0,76	0,79	0,88	1,01	1,13	1,26
	800	0,16	0,20	0,24	0,25	0,32	0,40	0,48	0,50	0,64	0,80	0,96	1	1,12	1,28	1,44	1,60
	1000	0,20	0,25	0,30	0,32	0,40	0,50	0,60	0,63	0,80	1	1,20	1,25	1,40	1,60	1,80	2
	1200	0,24	0,30	0,36	0,38	0,48	0,60	0,72	0,76	0,96	1,20	1,44	1,50	1,68	1,92	2,16	2,40
	1250	0,25	0,31	0,38	0,39	0,50	0,63	0,75	0,79	1,00	1,25	1,50	1,56	1,75	2	2,25	2,50
	1400	0,28	0,35	0,42	0,44	0,56	0,70	0,84	0,88	1,12	1,40	1,68	1,75	1,96	2,24	2,52	2,80
	1600	0,32	0,40	0,48	0,50	0,64	0,80	0,96	1,01	1,28	1,60	1,92	2	2,24	2,56	2,88	3,20
	1800	0,36	0,45	0,54	0,57	0,72	0,90	1,08	1,13	1,44	1,80	2,16	2,25	2,52	2,88	3,24	3,60
	2000	0,40	0,50	0,60	0,63	0,80	1	1,20	1,26	1,60	2	2,40	2,50	2,80	3,20	3,60	4

6. Noise data

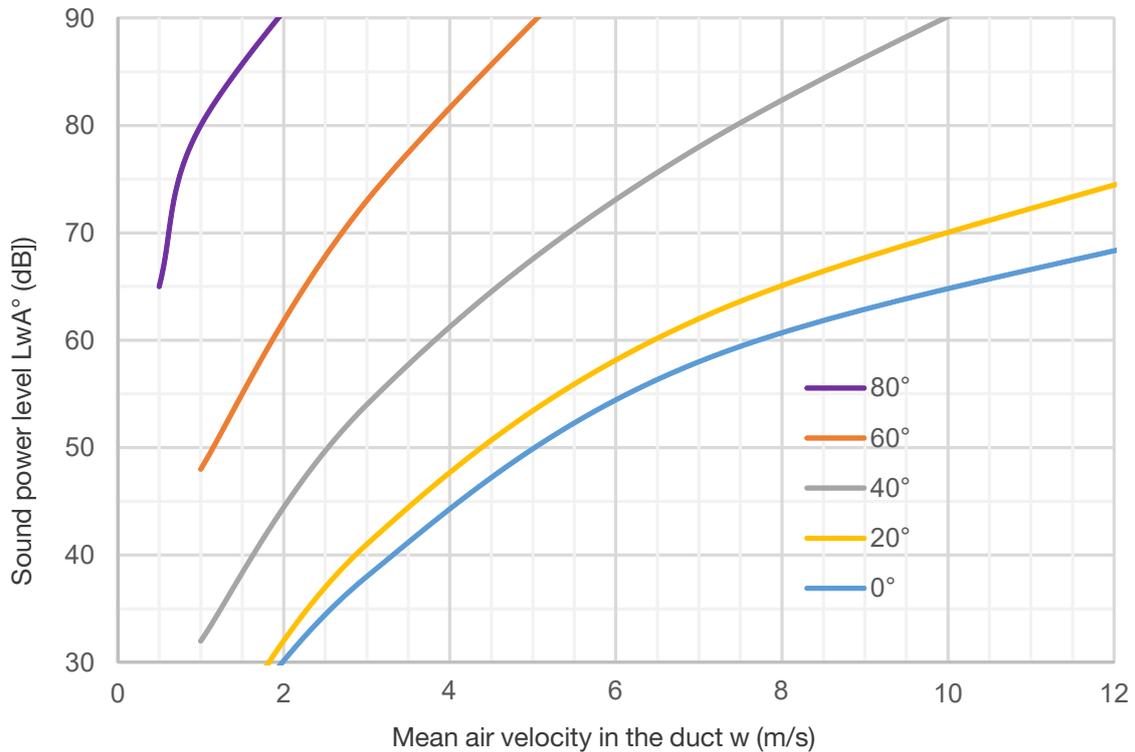
To some extent, the damper prevents the propagation of the noise between duct sections separated by the damper. Nevertheless, the damper generates its own noise, as a function of the mean air velocity in the duct and damper blade angle, in acc. with Table7, Graph on page 12 , and the following formula for the total acoustic power corrected by A-filter.

$$LwA = LwA^{\circ} + K$$

Table 7. Size correction factor K (dB) for acoustic power

		A (mm)															
		200	250	300	315	400	500	600	630	800	1000	1200	1250	1400	1600	1800	2000
B (mm)	200	-14	-13	-12	-12	-11	-10	-9	-9	-8	-7	-6	-6				
	250	-13	-12	-11	-11	-10	-9	-8	-8	-7	-6	-5	-5				
	300	-12	-11	-10	-10	-9	-8	-7	-7	-6	-5	-4	-4				
	315	-12	-11	-10	-10	-9	-8	-7	-7	-6	-5	-4	-4				
	400	-11	-10	-9	-9	-8	-7	-6	-6	-5	-4	-3	-3				
	500	-10	-9	-8	-8	-7	-6	-5	-5	-4	-3	-2	-2	-2	-1	0	0
	600	-9	-8	-7	-7	-6	-5	-4	-4	-3	-2	-1	-1	-1	0	0	1
	630	-9	-8	-7	-7	-6	-5	-4	-4	-3	-2	-1	-1	-1	0	1	1
	800	-8	-7	-6	-6	-5	-4	-3	-3	-2	-1	0	0	0	1	2	2
	1000	-7	-6	-5	-5	-4	-3	-2	-2	-1	0	1	1	1	2	3	3
	1200	-6	-5	-4	-4	-3	-2	-1	-1	0	1	2	2	2	3	3	4
	1250	-6	-5	-4	-4	-3	-2	-1	-1	0	1	2	2	2	3	4	4
	1400	-6	-5	-4	-4	-3	-2	-1	-1	0	1	2	2	3	4	4	4
	1600	-5	-4	-3	-3	-2	-1	0	0	1	2	3	3	4	4	5	5
	1800	-4	-3	-2	-2	-1	0	0	1	2	3	3	4	4	5	5	6
	2000	-4	-3	-2	-2	-1	0	1	1	2	3	4	4	4	5	6	6

Aerodynamic noise emissions to the duct L_{wA}° - sound power level corrected by A-filter for a damper of 1m² cross section



7. Materials, surface treatment

Standard materials

Damper body and damper blades from DX51+Z275 carbon steel, damper is supplied without additional surface treatment.

Blade end-capes are made of PA6 plastic with glass fibers UV stabilized with suppressed flammability V0 according to UL94.

Lead-free carbon steel blade pins with plastic plain bearings, DX51+Z275 carbon steel mechanical linkages and levers.

The control pin is all metal from carbon steel with a zinc coating.

The blade end-capes are equipped with a closed-pore EPDM foam seal with a sliding layer of PA6.

Interconnecting wires and clips are made of copper and brass, respectively.

RDTM damper blades are equipped along their length with an EPDM seal secured by steel clips.

In the case of actuator dampers, the actuator cover is made of aluminium alloy, painted.

Premium materials

According to the customer's request, dampers made of stainless steel material can be supplied, which includes everything metal that is on the damper, except for connecting (grounding) wires and clips, which are made of copper or brass, respectively.

Specifications of stainless steel design:

- Class A2 – Food-grade stainless steel (AISI 304 – EN 1.4301)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – EN 1.4401, EN 1.4404)
 - The control pin is always made of AISI 316L stainless steel.

In the case of dampers with actuator, the actuator cover can be made in case of special customer requirement:

- made of aluminum alloy painted with seawater-resistant paint with nickel-plated brass cable glands (actuator ...-CTS or -CTM), or
- made of AISI 316 stainless steel with nickel-plated brass cable glands (actuator ...-VAS or ...-VAM).

Additional information:

Some types of connecting materials and parts are available in only one type of stainless steel, this type will be used in all stainless steel designs. The position arrow is always made of stainless steel AISI 316L.

The position arrow is made of stainless steel AISI 316L.

Under no circumstances can the damper be supplied in a painted version.

8. Quality inspection, testing by the manufacturer

The dimensions are checked with common measuring devices according to the standard of non-tolerated dimensions used in HVAC.

Interoperation checks of parts and main dimensions are carried out according to the manufacturing documentation.

The final control includes:

- control of damper opening and closing, and
- checking the electrical connection of each damper blade with the damper body using an electrical detection device.

The damper assembly with the actuator is connected to voltage, the extreme working positions are defined and the operation of the damper and the function of the limit switches (if included) are tested.

9. Installation, commissioning, operation, maintenance, operational checks

The installation consists of:

- installation of the damper in the air duct
- grounding and conductive connection with the neighbour duct pieces
- eventually, installation of the actuator (not part of the damper)
- or for the electrical connection of the actuator (in the case of a damper with an actuator).

All effective safety standards and directives must be observed during damper assembly.

The dampers must be earthed with an M6 earthing screw, using a nut and a spring washer (these parts are included in the delivery of the damper).

According to EN 332000-4-41,-4-47 and -5-54, flange connections must be conductively connected during the installation to protect against dangerous contact. For the conductive connection, 2 pcs of spring washers in galvanized design are used, which are placed under the head of one screw and under the screwed-on nut.

Before putting the dampers into operation, it is necessary to perform a visual check of the correct installation of the damper and a check of the interconnection of all metal components.

In the case of subsequent mounting of the damper with an actuator, it is necessary:

- verify that the speed and torque of the actuator are in accordance with this document
- adjust the limit positions of the actuator and
- check that the actuator cannot be released from the holder and that the damper control pin cannot slip.

In the case of a damper with manual control, it is necessary to check the smooth operation of the damper.

In the case of a damper with a actuator, it is necessary to connect the actuator electrically and test the operation of the damper. **If the electrical connection of the damper is located in an area with a risk of explosion, it is necessary to use an Ex terminal block corresponding to the given zone.** For actuators with return spring the electrical connection must correspond to the permitted spring closing time.

During operability checks, it is necessary to check the mutual conductive connection of all metal components, including damper blade with the damper body (casing) of the damper. The grounding damper blade needs to be checked using an electrical measuring or detection device:

- during commissioning
- as part of every inspection, maintenance, as well as every possible repair or other intervention on the damper
- at the latest after 1 year from commissioning

If no blade grounding defect is found after 1 year from commissioning, then periodically at least every 5 years thereafter, otherwise annually.

10. Packing, transport and storage

The delivery includes a complete damper including the control mechanism.

The dampers are transported as bulk cargo, using suitable covered means of transport. When agreed upon with the manufacturer, the dampers can be loaded onto pallets or wooden crates. Dampers must be protected from mechanical damage during transport and storage. If packing is used, it is non-returnable and its price is not included in the price of the damper.

If not otherwise agreed, the handover is considered when the goods is forwarded to the carrier.

The dampers must be stored in the 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%. Dampers must be protected against mechanic damages when transported and manipulated.

11. Damper identification

The dampers are equipped with a durable identification label. It contains the following information:

- manufacturer’s logo
- name and address of the manufacturer
- product type and design varian
- size and weight
- serial number and year of manufacture
- number of the technical specifications
- number of the instructions for use
- Ex device category
- Ex certificate number
- sign Ex.



In the case of a damper equipped with an actuator, the assembly is additionally marked with an assembly label containing:

- manufacturer’s logo
- statement that it is a damper and actuator assembly
- type, size and design number of the assembly (the name of the assembly type is identical to the name of the damper type)
- manufacturer and type of actuator
- weight of assembly
- information that changing the actuator settings is only permitted in accordance with MAN 171/25
- Ex category device (assemblies)
- sign Ex.

This assembly label is located near the damper identification label (example)

MANDIK® Damper and actuator assembly

Type, size and design: RDM 1000x500 .70

Actuator: SCHISCHEK ExMax-5.10-CTS

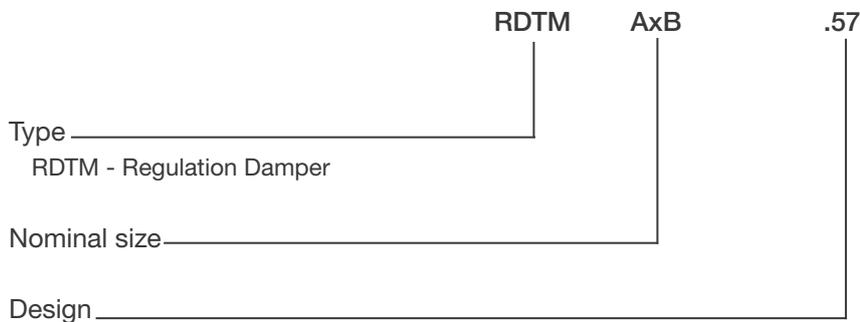
Assembly weight: 12,7 kg Instructions for use: MAN 168/24

Device category:

	II 2G Ex IIC T6 Gb	-20°C ≤ Ta ≤ +40°C
	II 2G Ex IIC T5 Gb	-20°C ≤ Ta ≤ +50°C
	II 2G Ex IIC T4 Gb	-20°C ≤ Ta ≤ +60°C

Changing the actuator or changing its settings is permitted only in accordance with the Instructions for use.

12. Product marking



Example: RDTM 630x1000 .09



ETS NORD AS

Address: Peterburi tee 53
11415 Tallinn
Estonia

Phone: +372 680 7365
info@etsnord.ee
www.etsnord.ee

ETS NORD Finland

Address: Pakkasraitti 4
04360 Tuusula
Finland

Phone: +358 401 842 842
info@etsnord.fi
www.etsnord.fi

ETS NORD Sweden

Address: Järsjögatan 7
69235 Kumla
Sweden

Phone: +46 19 554 20 50

Address: Pinjegatan 5
21363 Malmö
Sweden

Phone: +46 40-94 68 70
info@etsnord.se
www.etsnord.se

ETS NORD International

info@etsnord.com
www.etsnord.com



Let's move the air together!