MANDÍK

TPM 120/16
Version 2026-10-13

SEDS-R

Single compartment smoke control damper

Technical Documentation
Installation, Commissioning, Operation, Maintenance and Service Manual

CE
1391

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These technical specifications state a row of manufactured sizes and models of circular Single compartment smoke control damper (further only dampers) SEDS-R. It is valid for production, designing, ordering, delivery, maintenance and operation.

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II. GENERAL INFORMATION

1. Description

1.1. Single compartment smoke control damper are shutters in smoke exhaust duct systems. Dampers are designed to remove heat and combustion products (e.g. smoke) from single fire compartment. In the event of fire the Smoke and Fire ventilation system opens the damper in the affected section which removes combustion products and heat from this section.

The damper blade is operated by an actuating mechanism.

The dampers can be installed in various duct sizes with respect to the field of direct applications according with EN 1366-9.

The field of direct applications based on tests results is acceptable according to EN 1363-1, part A.1 and A.2, EN 1366-2, part 13 and EN 1366-10, part 9.

Circular smoke control dampers only for duct installation - single are classified as

E_{600} 120 (v_e-i↔o) S1500C_{mod}MAsingle

The duct can be ended by KMM (TPM 002/96) grilles. During grilles installation blade overlaps has to be respected see chapter 3.3.

Fig. 1 Damper SEDS-R

1.2. Damper characteristics

- CE certified acc. to EN 12101-8
- Tested in accordance with EN 1366-10
- Classified acc. to EN 13501-4
- External Casing leakage min. class ATC 4 (old marking “B“), Over blade min. class 3
- Cycling test in class C_{mod} acc. to EN 12101-8
- ES Certificate No. 1391-CPR-XXXX/XXXX
- Declaration of Perfomance No. PM/SEDS-R/01/XX/X
- Hygienic assessment of smoke control dampers - Report No. 1.6/pos/19/19c

1.3. Working conditions

Dampers are designed for smoke exhaust duct systems with underpressure max. 1500 Pa or overpressure max. 500 Pa.

Dampers are designed for maximum air velocity 15 m/s.

Dampers are designed for installation with horizontal blade axis. Flow direction has to be led from actuating side (it is labeled by arrow on the damper casing).

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

Dampers are designed for macroclimatic areas with mild climate according to EN 60 72133.

Temperature in the place of installation is permitted to range from -30°C to +50°C.

2. Design

2.1. Design with actuating mechanism

Design .44 and .54

Belimo actuators are used for dampers, series BEN for 230V AC resp. 24 V AC/DC.

After connection to the power supply voltage, the actuator moves the damper blade to the "OPEN" position or "CLOSED" (according to the corresponding connection, see wiring diagram). If the power supply is interrupted, the actuator stops at the current position. The signalling of the "OPEN" and "CLOSED" damper blade positions is ensured by two built-in fixed “potential-free” end- limit switches.

The actuator for operating the damper blade is mounted in an insulated cover/box. It is accessible after removing the cover lid. The electrical connection of the actuator is made with a non-flammable cable (or a cable located in the adjoining cable duct), which passes through an opening made in the wall of the insulated cover/box when installing the damper or when connecting the actuator power cable. The cable entry must meet a minimum fire resistance of 30 minutes.

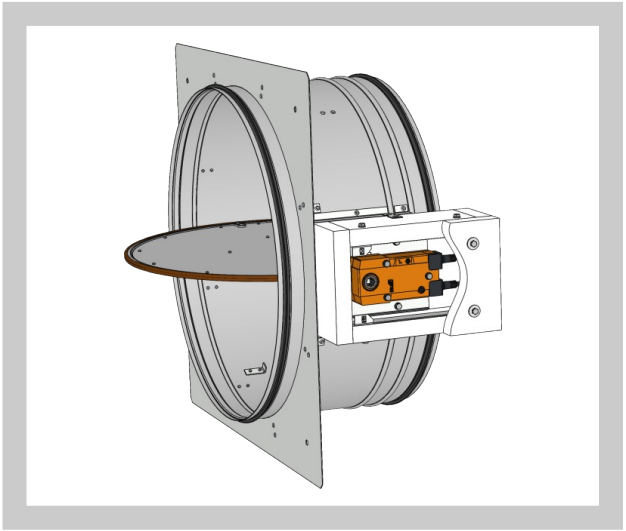
Design .65

Belimo modulating actuators, BEN-SR series for 24V AC/DC are specially designed for remote control of smoke control dampers. The position of the damper blade is adjustable by means of control voltage 0 (2)...10V DC.

The signalling of the "OPEN" and "CLOSED" damper blade positions is ensured by two built-in fixed “potential-free” limit switches.

The actuator for operating the damper blade is mounted in an insulated cover/box. It is accessible after removing the cover lid. The electrical connection of the actuator is made with non-flammable cables (or cables located in the adjoining cable duct), which pass through an opening made in the wall of the insulated cover when installing the damper or when connecting the power cables of the actuator. The cable entry must meet a minimum fire resistance of 30 minutes.

Fig. 2 Damper SEDS-R - actuating mechanism



Tab. 2.1.1. Actuator BELIMO BEN 24(-ST), BEN 24-SR, BEN 230

Actuator BELIMO - 15 Nm	BEN 24(-ST)	BEN 24-SR	BEN 230
Power voltage	AC/DC 24 V 50/60Hz	AC/DC 24 V 50/60Hz	AC 230 V 50/60Hz
Power consumption - in operation - in the end position	3 W 0,1 W	3 W 0,3 W	4 W 0,4 W
Dimensioning	6 VA (Imax 8,2 A @ 5 ms)	6,5 VA (Imax 8.2 A @ 5 ms)	7 VA (Imax 4 A @ 5 ms)
Protection class	III	III	II
Degree of protection	IP 54		
Adjustment time for 95°	< 30 s		
Ambient temperature Storage temperature	-30°C … +55°C -40°C … +80°C		
Connection - drive - auxiliary switch	Cable 1 m, 3 x 0,75 mm² Cable 1 m, 6 x 0,75 mm² (BEN 24-ST) with plug connectors	Cable 1 m, 4 x 0,75 mm² Cable 1 m, 6 x 0,75 mm²	Cable 1 m, 3 x 0,75 mm² Cable 1 m, 6 x 0,75 mm²

Fig. 3 Actuator BELIMO BEN 24(-ST)

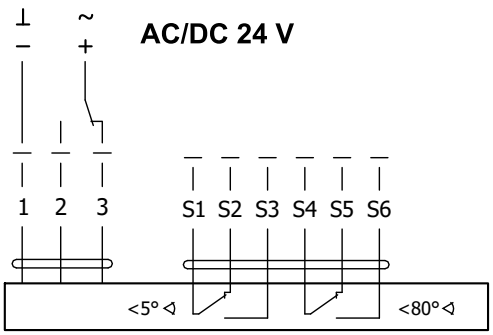


Fig. 4 Actuator BELIMO BEN 24-SR

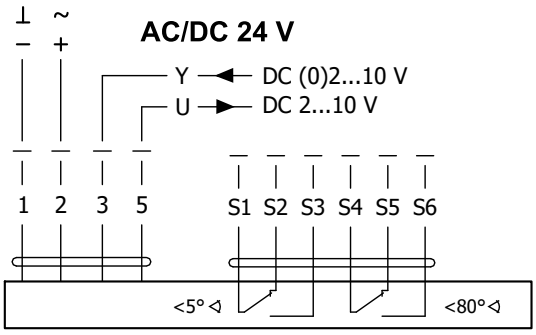
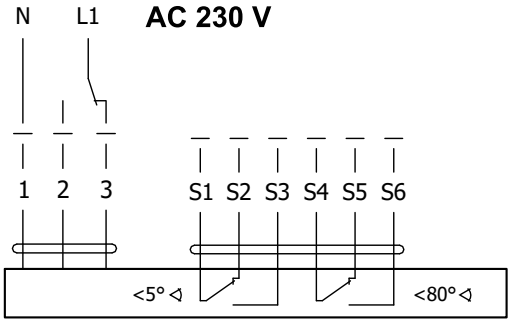


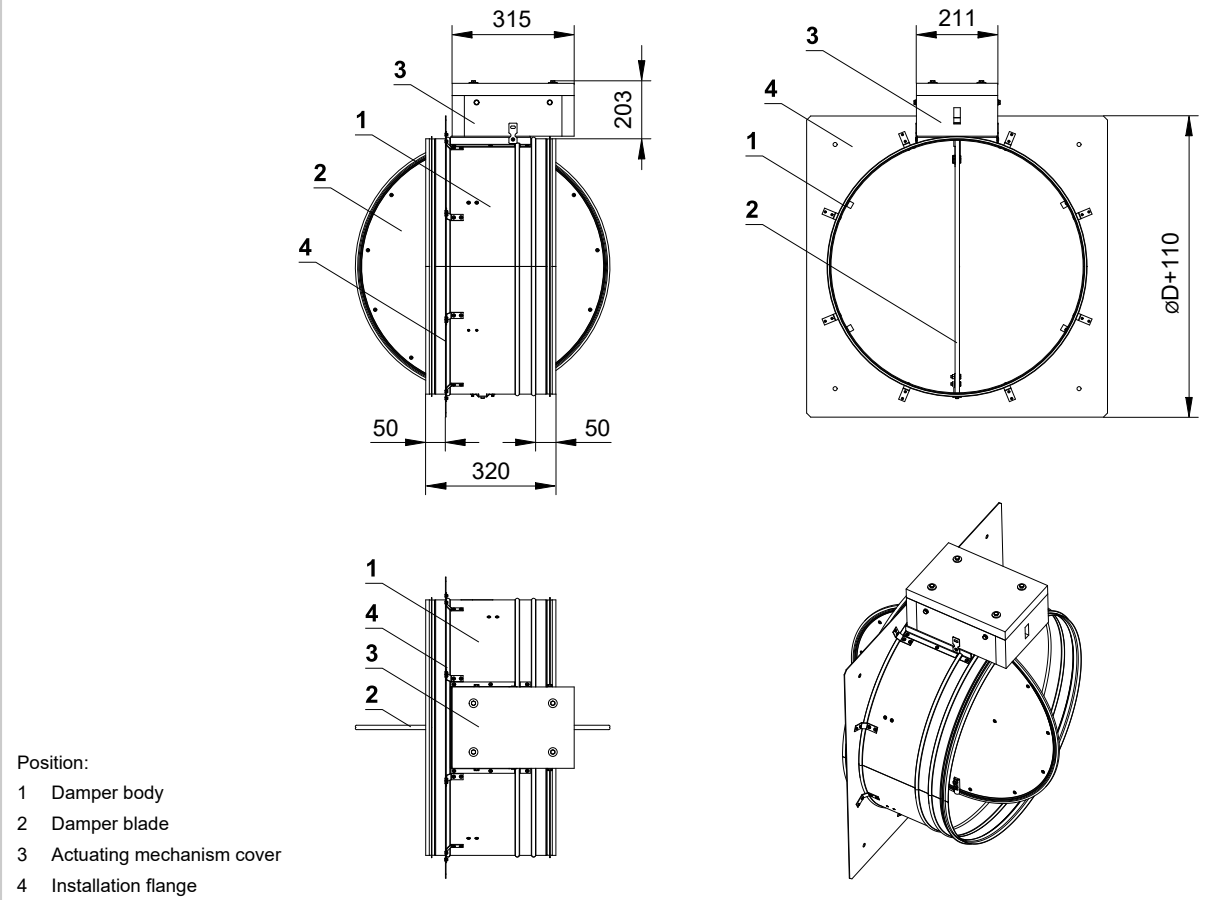
Fig. 5 Actuator BELIMO BEN 230



3. Dimensions, weights

3.1. Dimensions

Fig. 6 Damper SEDS-R



Position:
1 Damper body
2 Damper blade
3 Actuating mechanism cover
4 Installation flange

3.2. Weights and free area

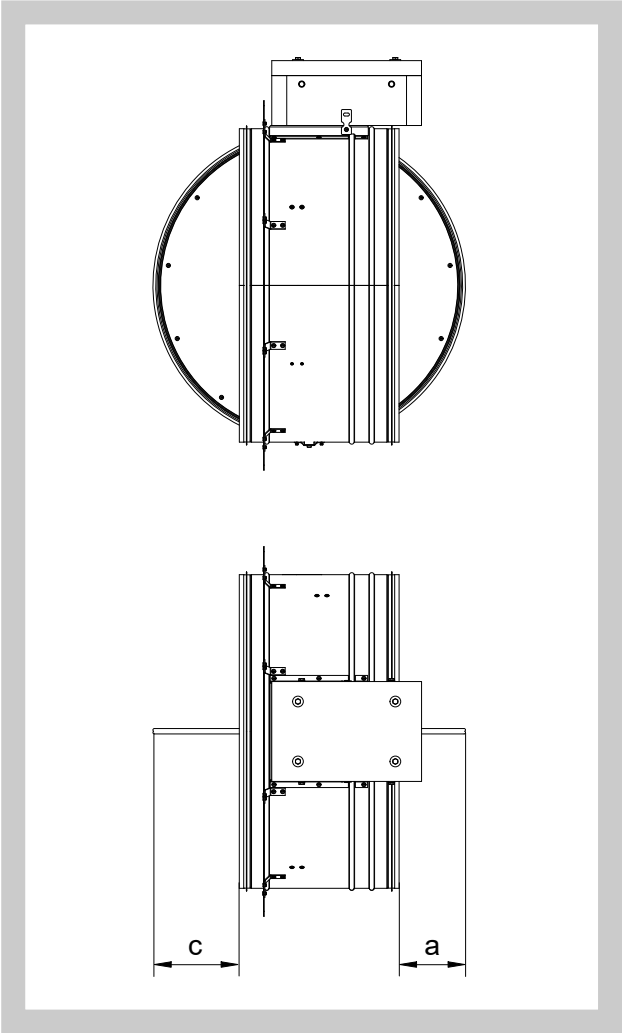
Tab. 3.2.1. Weights and free area

Size øD	a	c	Weight [kg]	Free area S_f [m²]	Actuating mechanism
100	-	-	10	0,0061	BELIMO BEN (15 N.m)
125	-	-	10,5	0,0100	BELIMO BEN (15 N.m)
160	-	-	11	0,0172	BELIMO BEN (15 N.m)
180	-	-	11,5	0,0222	BELIMO BEN (15 N.m)
200	-	-	12	0,0278	BELIMO BEN (15 N.m)
250	-	-	13	0,0446	BELIMO BEN (15 N.m)
280	-	-	13,5	0,0565	BELIMO BEN (15 N.m)
315	15,5	-	14,5	0,0722	BELIMO BEN (15 N.m)
355	35,5	-	15,5	0,0925	BELIMO BEN (15 N.m)
400	58	18	16,5	0,1183	BELIMO BEN (15 N.m)
450	83	43	18	0,1508	BELIMO BEN (15 N.m)
500	108	68	19,5	0,1872	BELIMO BEN (15 N.m)
560	138	98	21,5	0,2360	BELIMO BEN (15 N.m)
630	173	133	24,5	0,3001	BELIMO BEN (15 N.m)

3.3. For damper (Fig. 7) the open damper blade overlaps the damper body from dimension D=315 by the value “a” or “a” and “c”. These values are specified in the Tab. 3.2.1.

Values "a" and "c" has to be respected when projecting related smoke exhaust ducts.

Fig. 7 Value “a” and “c”



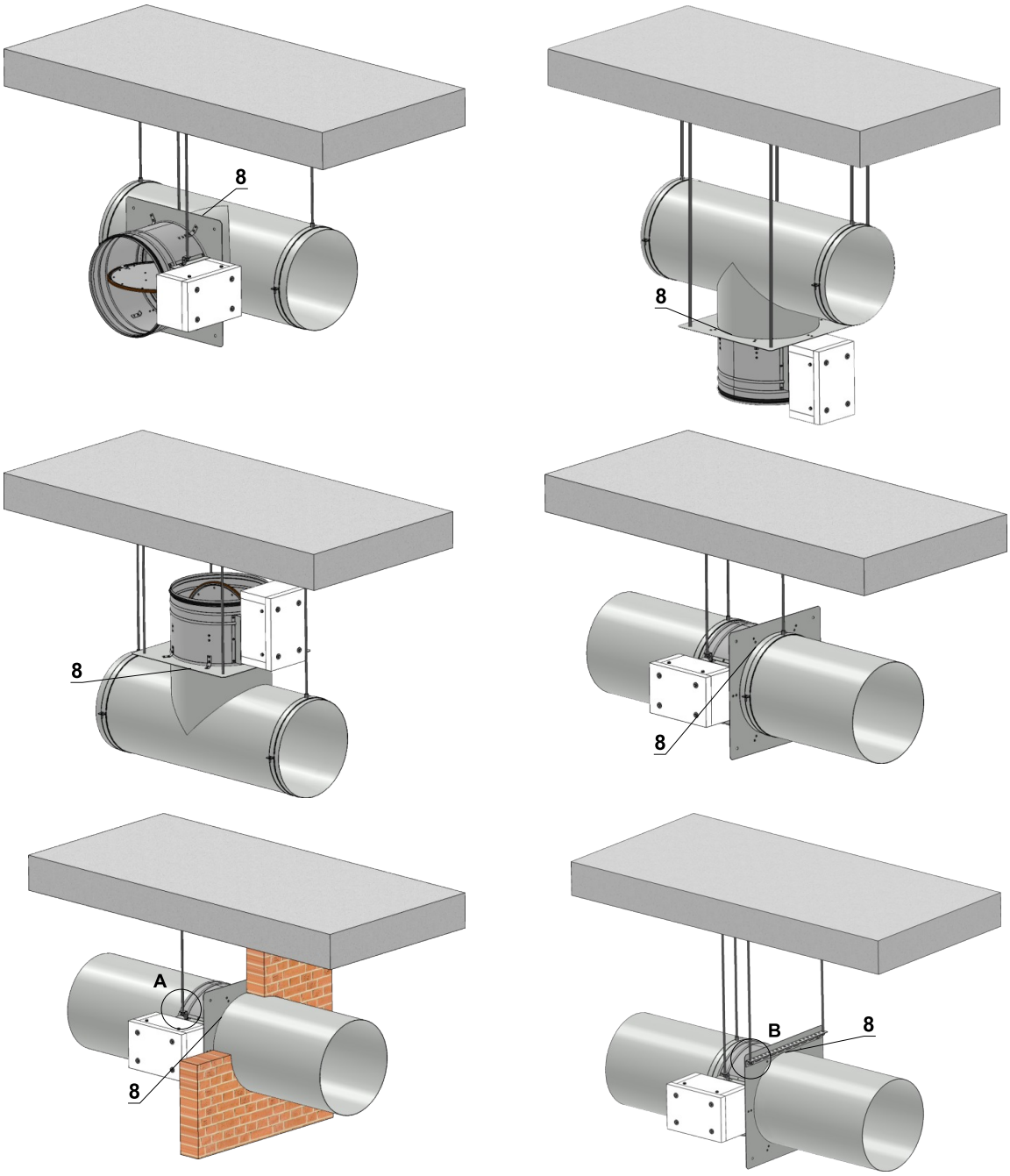
4. Placement and Assembly

4.1. Single compartment smoke control damper are designed to remove heat and combustion products (e.g. smoke) from single fire compartment according EN1366-9.
Single compartment smoke control damper are designed for installation with horizontal blade axis. Backtoback smoke exhaust duct has to be hung or supported so as all load transfer from the backtoback smoke exhaust duct to the damper is absolutely excluded. To provide needed access space to the control device, all other objects must be situated at least 350 mm from the control parts of the damper.

4.2. During installation the damper blade must be in position CLOSED. The damper body should not be deformed in the course of installation. Once the damper built in, its blade should not grind on the damper body during opening or closing.

4.3. Installation examples

Fig. 8 Installatiom examples



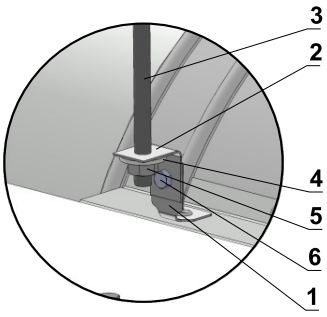
* Examples of fire sealants

- Hilti CFS-S ACR
- DenBraven FP403
- DenBraven Pyrocryl
- Promat Promaseal-AG
- Soudal Firecryl FR
- PROTECTA® FR ACRYLIC
- Soudal Firecryl FR
- Rockwoll FIREPRO® High Expansion Intumescent Sealant
- ASTROFLAME PFP

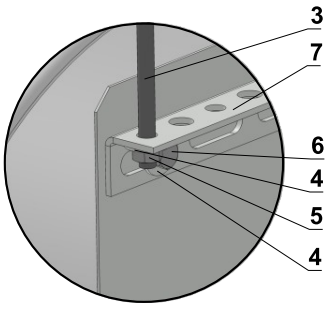
Position:

1 Damper hinge
2 Holder L
3 Threaded rod
4 Washer
5 Nut
6 Screw connection
7 Profile 30x30
8 Connection between duct and damper, seal with fire sealant*

Detail A



Detail B

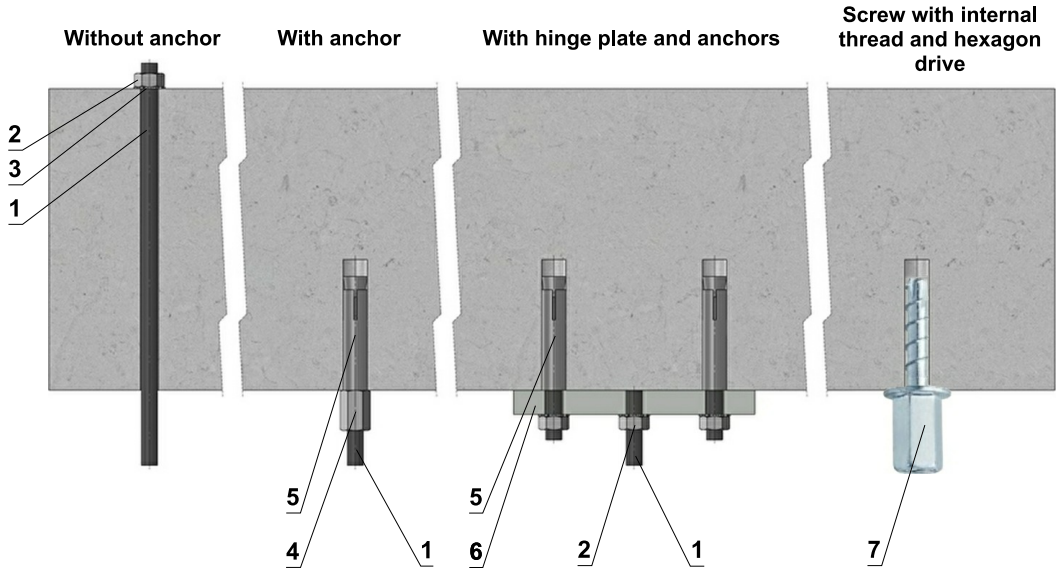


5. Suspension systems

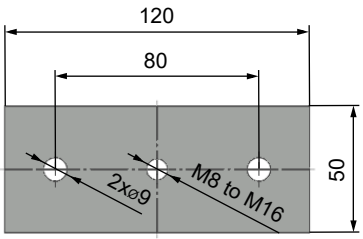
5.1. Mounting to the ceiling wall

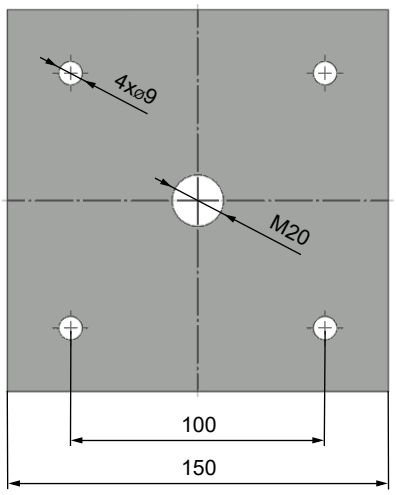
Fig. 9 Mounting to the ceiling wall

Anchoring possible after national standards

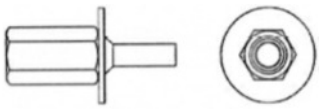


Hinge plates





Screw with internal thread and hexagon drive



Position:

1 Threaded rod M8 – M20
2 Nut
3 Washer
4 Coupling Nut
5 Anchor
6 Hinge plate - min. thickness 10 mm
7 Concrete screw tested for fire resistance R30-R90, max. Tension up to 0.75 KN (length 35 mm)

Load capacities of threaded hanger rods F [N] at the required fire resistance 90 minutes

Size	A_s [mm²]	Weight G [kg]	
		for 1 piece	for 1 pair
M8	36,6	22	44
M10	58	35	70
M12	84,3	52	104
M14	115	70	140
M16	157	96	192
M18	192	117	234
M20	245	150	300

III. TECHNICAL DATA

6. Pressure loss

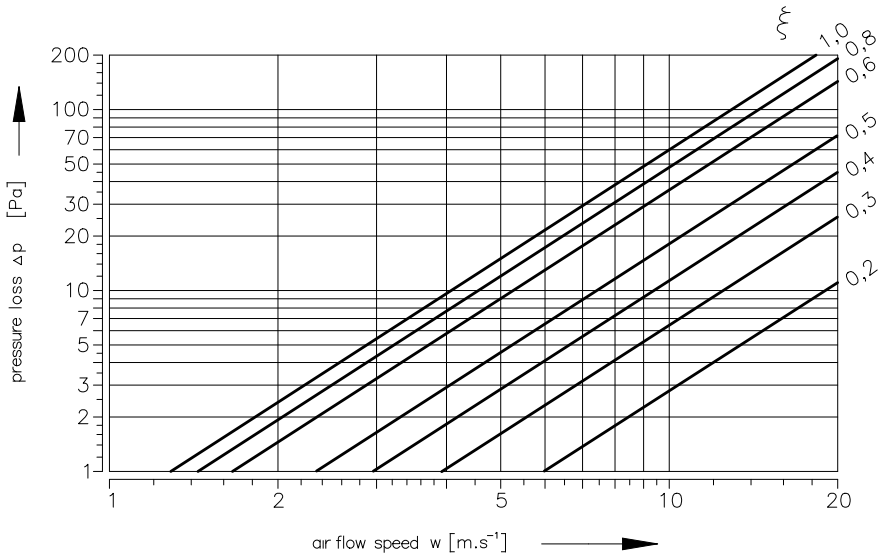
6.1. Pressure loss calculation

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

Δp	[Pa]	presure loss
w	[m.s^{-1}]	air flow speed in nominal damper section
ρ	[kg.m^{-3}]	air density
ξ	[-]	coefficient of local pressure loss for the nominal damper section (see Tab. 7.1.1.)

6.2. Determination of pressure loss by using diagram ρ = 1,2 kg.m^{-3}

Diagram 6.2.1. Pressure losses for air density ρ =1,2 kg.m^{-3}



7. Coefficient of local pressure loss

7.1. Coefficient of local pressure loss ξ (-)

Tab. 7.1.1. Coefficient of local pressure loss

øD	100	125	160	180	200	250	280
ξ	1,111	0,930	0,760	0,649	0,576	0,500	0,424
øD	**315**	**355**	**400**	**450**	**500**	**560**	**630**
ξ	0,381	0,341	0,315	0,283	0,252	0,214	0,182

8. Noise data and pressure loses

Tab. 8.1.1. Noise data and pressure loses

Size		v [m.s^{-1}]								Size		v [m.s^{-1}]							
		3	4	5	6	7	8	9	10			3	4	5	6	7	8	9	10
100	$\dot{V}$ [m^3.h^{-1}]	85	113	141	170	198	226	254	283	315	$\dot{V}$ [m^3.h^{-1}]	842	1122	1403	1683	1964	2244	2525	2806
	L_{WA} [dB]	19	26	32	37	41	45	48	50		L_{WA} [dB]	6	13	19	24	28	31	34	37
	Δp [Pa]	6	11	17	24	33	43	54	67		Δp [Pa]	2	4	6	8	11	15	19	23
125	$\dot{V}$ [m^3.h^{-1}]	133	177	221	265	309	353	398	442	355	$\dot{V}$ [m^3.h^{-1}]	1069	1425	1782	2138	2494	2851	3207	3563
	L_{WA} [dB]	20	27	33	38	42	45	48	51		L_{WA} [dB]	6	13	19	24	28	32	35	37
	Δp [Pa]	5	9	14	20	27	36	45	56		Δp [Pa]	2	3	5	7	10	13	17	20
160	$\dot{V}$ [m^3.h^{-1}]	217	290	362	434	507	579	651	724	400	$\dot{V}$ [m^3.h^{-1}]	1357	1810	2262	2714	3167	3619	4072	4524
	L_{WA} [dB]	18	25	31	36	40	43	46	49		L_{WA} [dB]	6	14	20	24	28	32	35	38
	Δp [Pa]	4	7	11	16	22	29	37	46		Δp [Pa]	2	3	5	7	9	12	15	19
180	$\dot{V}$ [m^3.h^{-1}]	275	366	458	550	641	733	824	916	450	$\dot{V}$ [m^3.h^{-1}]	1716	2289	2861	3434	4006	4578	5150	5722
	L_{WA} [dB]	17	24	30	35	39	42	46	48		L_{WA} [dB]	5	13	19	23	27	31	34	37
	Δp [Pa]	4	6	10	14	19	25	32	39		Δp [Pa]	2	3	4	6	8	11	14	17
200	$\dot{V}$ [m^3.h^{-1}]	339	452	565	679	792	905	1018	1131	500	$\dot{V}$ [m^3.h^{-1}]	2121	2827	3534	4241	4948	5655	6362	7069
	L_{WA} [dB]	16	23	29	34	38	41	44	47		L_{WA} [dB]	4	12	18	22	26	30	33	36
	Δp [Pa]	3	6	9	12	17	22	28	35		Δp [Pa]	1	2	4	5	7	10	12	15
250	$\dot{V}$ [m^3.h^{-1}]	530	707	884	1060	1237	1414	1590	1767	560	$\dot{V}$ [m^3.h^{-1}]	2659	3545	4431	5317	6203	7090	7976	8862
	L_{WA} [dB]	12	20	26	30	34	38	41	44		L_{WA} [dB]	3	11	17	21	25	29	32	35
	Δp [Pa]	3	5	7	11	15	19	24	30		Δp [Pa]	1	2	3	5	6	8	10	13
280	$\dot{V}$ [m^3.h^{-1}]	665	886	1108	1329	1551	1773	1994	2216	630	$\dot{V}$ [m^3.h^{-1}]	3367	4489	5611	6733	7855	8978	10100	11222
	L_{WA} [dB]	8	17	22	29	32	35	36	39		L_{WA} [dB]	2	10	16	20	24	28	31	34
	Δp [Pa]	2	4	6	9	12	16	21	25		Δp [Pa]	1	2	3	4	5	7	9	11

IV. MATERIAL, FINISHING

9. Material

9.1. Damper casing and damper blade are made of galvanized plate without any other surface finish.

9.2. Fasteners are galvanized.

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. Dampers are transported by box freight vehicles without direct weather impact, there must not occur any shocks and ambient temperature must not exceed +40°C. Dampers must be protected against mechanic damages when transported and manipulated. During transportation, the damper blade must be in the "CLOSED" position.

11.2. Dampers are stored indoor in environment without any aggressive vapours, gases or dust. Indoor temperature must be in the range from -30°C to +40°C and maximum relative humidity 95 % (avoid condensation on the damper body). Dampers must be protected against mechanic damages when transported and manipulated.

VII. ASSEMBLY, ATTENDANCE, MAINTENANCE AND REVISIONS

12. Assembly

12.1. Assembly, maintenance and damper function check can be done only by qualified and trained person, i.e. “AUTHORIZED PERSON” according to the manufacturer documentation. All works done on the smoke control dampers must be done according international and local norms and laws.

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

12.3. To ensure reliable smoke exhaust damper function it is necessary to avoid blocking the closing mechanism and contact surfaces with collected dust, fibre and sticky materials and solvents.

12.4. **Manual operation**

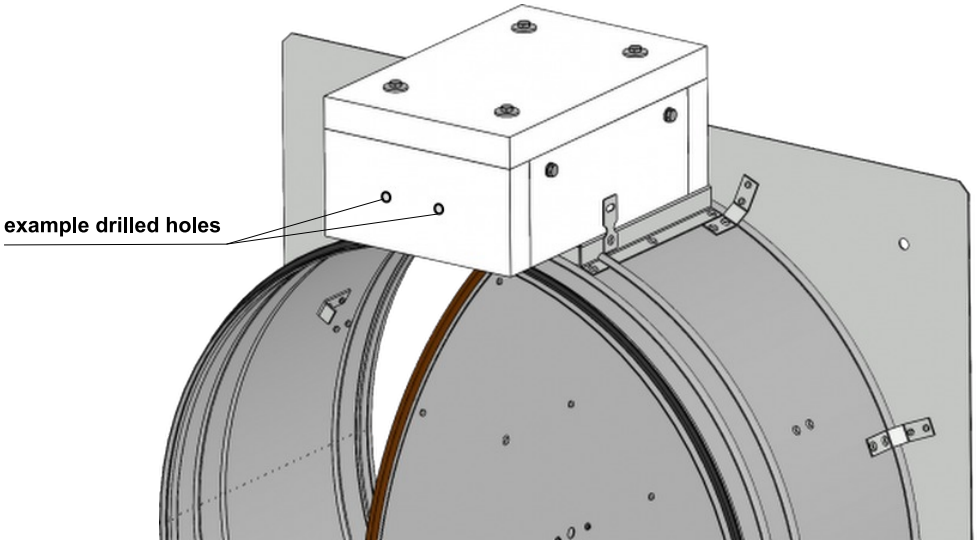
Without power supply, the damper can be operated manually and fixed in any required position.

12.5. Electrical connection of the actuator in protection box

Protection box without slot or predrilled holes

Drill two holes into the protection box (from outside to inside) and pull through field wiring cables (fire resistant cables) to connect actuator trailing lead. Protection box is made of calcium silicate plates.

Fig. 10 Example of position of holes in the wall of the box, without pre-manufactured slot

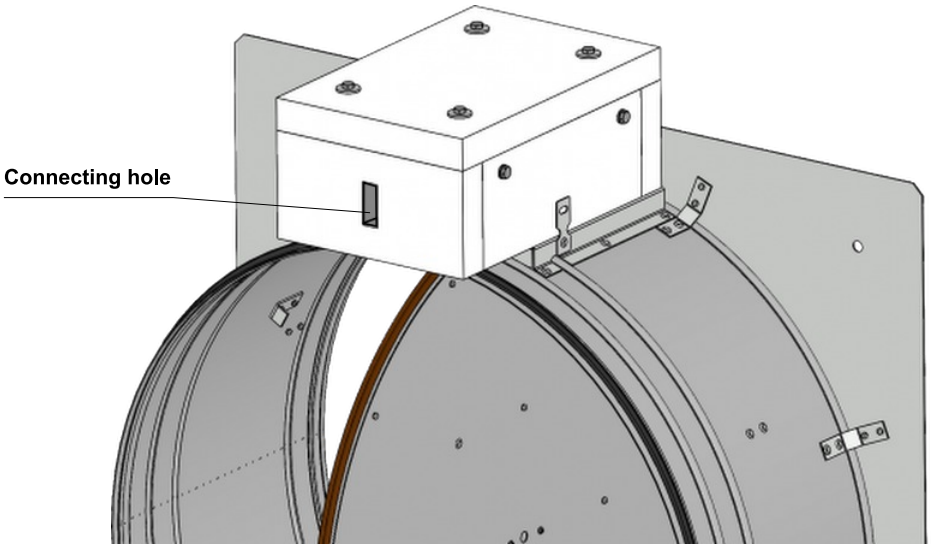


Procedure:

- Use drill (drill size acc. To suit connecting cable Ø + 2 mm for seal up by mastic) and make two holes (see fig. 10). **It is possible to drill holes in any side of the housing.**
- Pull the heat resistant cable through the calcium silicate plate (wall) and connect with cables from actuator acc. to above mentioned electrical diagram.
- Seal up the space around cable with fire resistant mastic (HILTI CFS-S ACR, PROMASTOP) or equivalent.
- Let the mastic harden.

Protection box with slot including intumescent tapes – not available for UK

Fig. 11 Example of pre-manufactured slot in the insulating box, with intumescent tape inside slot



To connect the actuator, use the prepared hole in the box, which is equipped with intumescent tape. If necessary, the hole can be additionally filled with fire-resistant sealant.

13. Entry into service and revisions

13.1. Before entering the dampers into operation after assembly and after sequential revisions, checks and functionality tests of all designs including operation of the electrical components must be successfully provided and finished. After entering into operation, these revisions must be done according to requirement set by national regulations.

13.1.1. In case that dampers are found unable to serve for their function for any cause, it must be clearly marked. The operator is obliged to ensure that the damper is put into condition in which it is ready for function and meanwhile he is obliged to provide the fire protection by another appropriate way.

13.1.2. Results of regular checks, imperfections found and all-important facts connected with the damper function must be recorded in the "FIRE BOOK" and immediately reported to the operator.

13.2. Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out for all designs.

13.2.1. Visual inspection of proper damper integration, inside damper area, damper blade, contact surfaces and silicon sealing.

13.2.2. Check of damper blade displacement can be realize after actuating mechanism supply connection or signal connection from higher level control systems. Blade displacement from position “OPEN” to position “CLOSED” and return displacement is checked.

14. Spare parts

14.1. Spare parts are supplied only on basis of an order.

VIII. PRODUCT DATA

15. Product label

15.1. Product label is placed on the damper casing

Fig. 12 Product label (Nameplate)

IX. ORDERING INFORMATION

16. Ordering key

EXAMPLE:

SEDS-R EN DN 355 .44 RS-ZN
Smoke control damper SEDS-R, dimension DN 355 mm, control design with actuating mechanism AC 230 V, straight connection to circular duct, galvanized material variant.

1| Smoke control damper type - SEDS-R

2| Country of destination

3| Damper dimensions ØD→ see page 6

4| Damper design

.44	With actuating mechanism BEN for 230V
.54	With actuating mechanism BEN for 24V
.65	With actuating mechanism BEN-SR for 24V

5|Duct connection

RS	Straight connection to circular duct

6| Material

ZN	Galvanized

The producer reserves the right for innovations of the product.
For actual product information see www.mandik.com

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