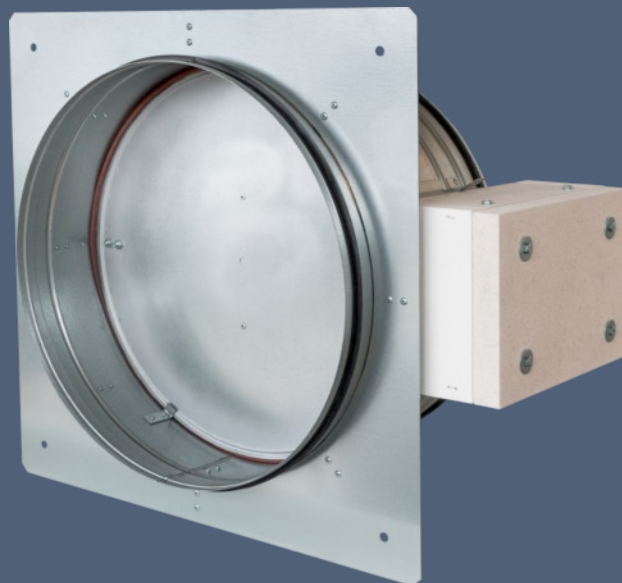


EN 12101-8

MANDÍK[®]**ROUND SMOKE EXTRACTION
DAMPER - SINGLE****SEDS-R**

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

I. CONTENT

II. GENERAL INFORMATION	2
1. Description.....	2
2. Design.....	3
3. Dimensions, weights.....	7
4. Placement and Assembly.....	8
III. TECHNICAL DATA	10
5. Pressure loss.....	10
6. Coefficient of local pressure loss.....	10
7. Noise data and pressure losses.....	11
IV. MATERIAL, FINISHING	12
8. Material.....	12
V. INSPECTION, TESTING	12
9. Inspection, testing.....	12
VI. TRANSPORTATION AND STORAGE	12
10. Logistic terms.....	12
VII. ASSEMBLY, ATTENDANCE, MAINTENANCE AND REVISIONS	12
11. Assembly.....	12
12. Entry into service and revisions.....	13
13. Spare parts.....	13
VIII. PRODUCT DATA	14
14. Product label.....	14
IX. ORDERING INFORMATION	14
15. Ordering key.....	14

II. GENERAL INFORMATION

1. Description

- 1.1. Smoke extraction dampers - single are shutters in smoke exhaust piping 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.

Round smoke extraction dampers only for duct installation - single are classified as

E₆₀₀ 120 (v_e-i↔o) S1500C₁₀₀₀₀MAsingle

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+A1
- External Casing leakage min. class B, Over blade min. class 4, diameter 100 min. class 3
- Cycling test in class C 10000 acc. to EN 12101-8
- ES Certificate No. 1391-CPR-2016/0143
- Declaration of Performance No. PM/SEDS-R/01/20/1
- Hygienic assessment of fire dampers - Report No. 1.6/pos/19/19c

1.3. Working conditions

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

Dampers are designed for maximum air velocity 15 m.s⁻¹.

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, .54

SEDS-R is equipped by actuating mechanism Belimo BLE24 for 24V supply or BLE230 for 230V supply. After being connected to power supply the actuating mechanism displaces the damper blade into operation position "OPEN" or „CLOSED“ (according to method of connection, see connection diagram). Running time is max. 60s. If is power supply cut off, actuating mechanism is stopped in actual position. The crank handle supplied with the actuator allows it to be operated manually. Signaling of the damper blade positions "OPEN" and "CLOSED" is provided by means of two integrated, invariably set terminal switches.

Fig. 2 Damper SEDS-R - actuating mechanism

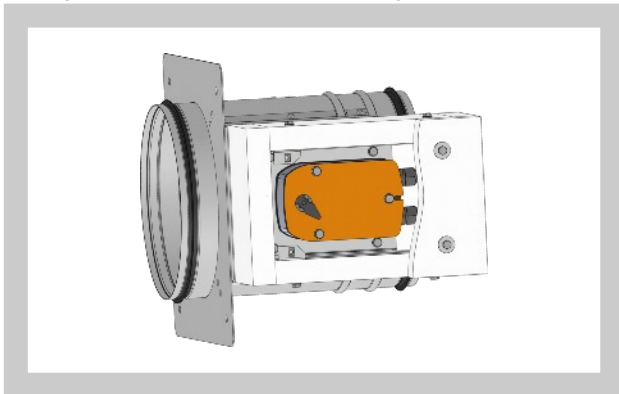


Fig. 3 Actuating mechanism BELIMO BLE 24(-ST)

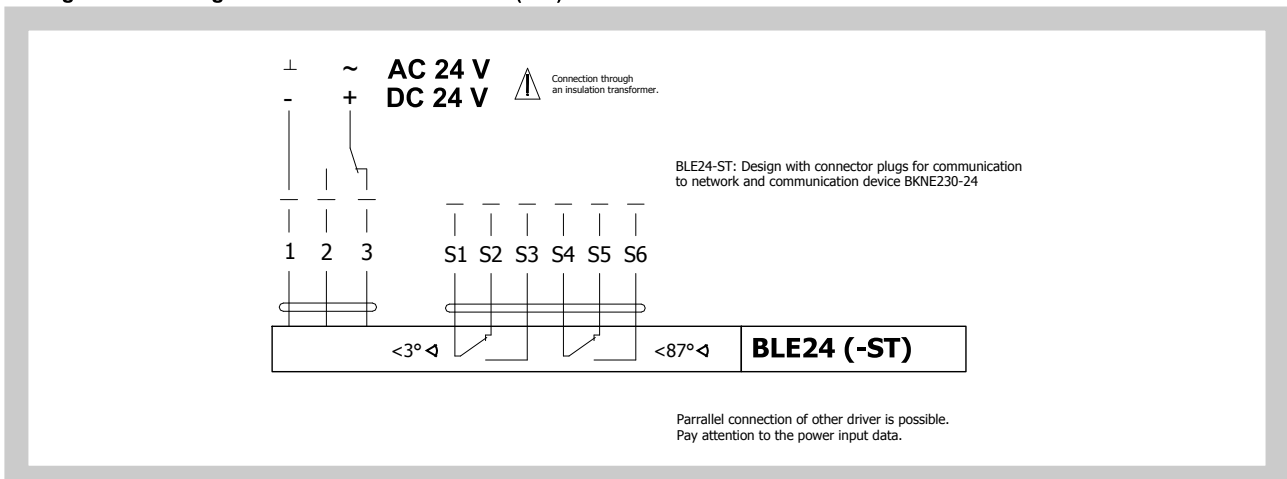
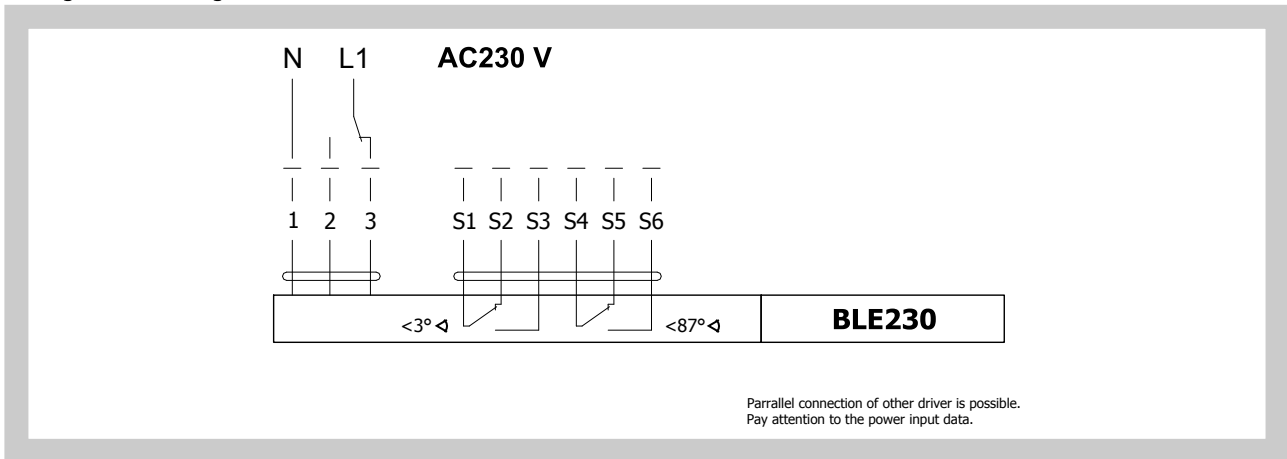


Fig. 4 Actuating mechanism BELIMO BLE 230



Tab. 2.1.1. Actuating mechanism BELIMO BLE 24(-ST), BLE 230

Actuating mechanism BELIMO	BLE 24(-ST)	BLE230
Nominal voltage	AC 24V 50/60Hz DC 24 V	AC 230 V 50/60Hz
Power consumption - motoring - holding	7,5 W < 0,5 W	5W < 1 W
Dimensioning	9 VA (I _{max} 2,7 A @ 5 ms)	12 VA (I _{max} 6 A @ 5 ms)
Protection class	III	II
Degree of protection	IP 54	
Running time for 95°	< 30 s	
Ambient temperature range	- 30 °C ... + 50 °C	
Non-operating temperature	- 40 °C ... + 80 °C	
Connecting - motor - auxiliary switch	cable 1 m, 3 x 0,75 mm ² cable 1 m, 6 x 0,75 mm ² (BLE 24-ST) with plug-in connectors	

2.2. Design with the communication and power supply unit

Design .66

Design with the communication and power supply unit BKNE230-24 and the actuating mechanism BLE24(BE24-12)-ST.

BKNE230-24 functions as a decentralized network device for supplying the actuating mechanism BLE24(BE24-12)-ST on one hand and on the other hand it transmits signals from communication and control device BKSE24-6.

It simplifies electrical wiring and interconnection of dampers. It facilitates on site check and enables central control and checks of fire damper by means of a simple 2-conductor wiring. BKNE230-24 signals the damper position „OPEN“/„CLOSED“ (from switches on the actuator) and any fault alarms to the BKSE24-6 unit. It also receives positioning commands from the control unit and triggers the actuator to the required position. The last control command is retained throughout temporary power failures.

The BKNE230-24 unit monitors the positions of the switches on the actuator, its running time and the exchange of data with the control and monitoring unit BKSE24-6. It also monitors the actuator current and the power supply. In order to make installation as simple as possible the smoke extraction damper actuators ...-ST are fitted with plug connectors that can be inserted directly into the BKNE230-24 unit.

The 2-wire conductor must be connected to screw terminals 6 and 7. It is recommended that a fire alarm signal cable suitable for the application be used for the 2-wire conductor. It is essential to ensure the correct polarity.

More information in catalogue Belimo.

Fig. 5 Damper SEDS-R - actuating mechanism and BKNE

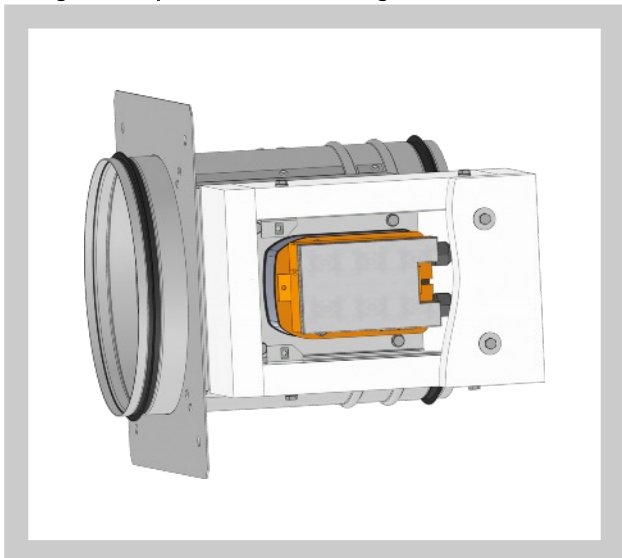
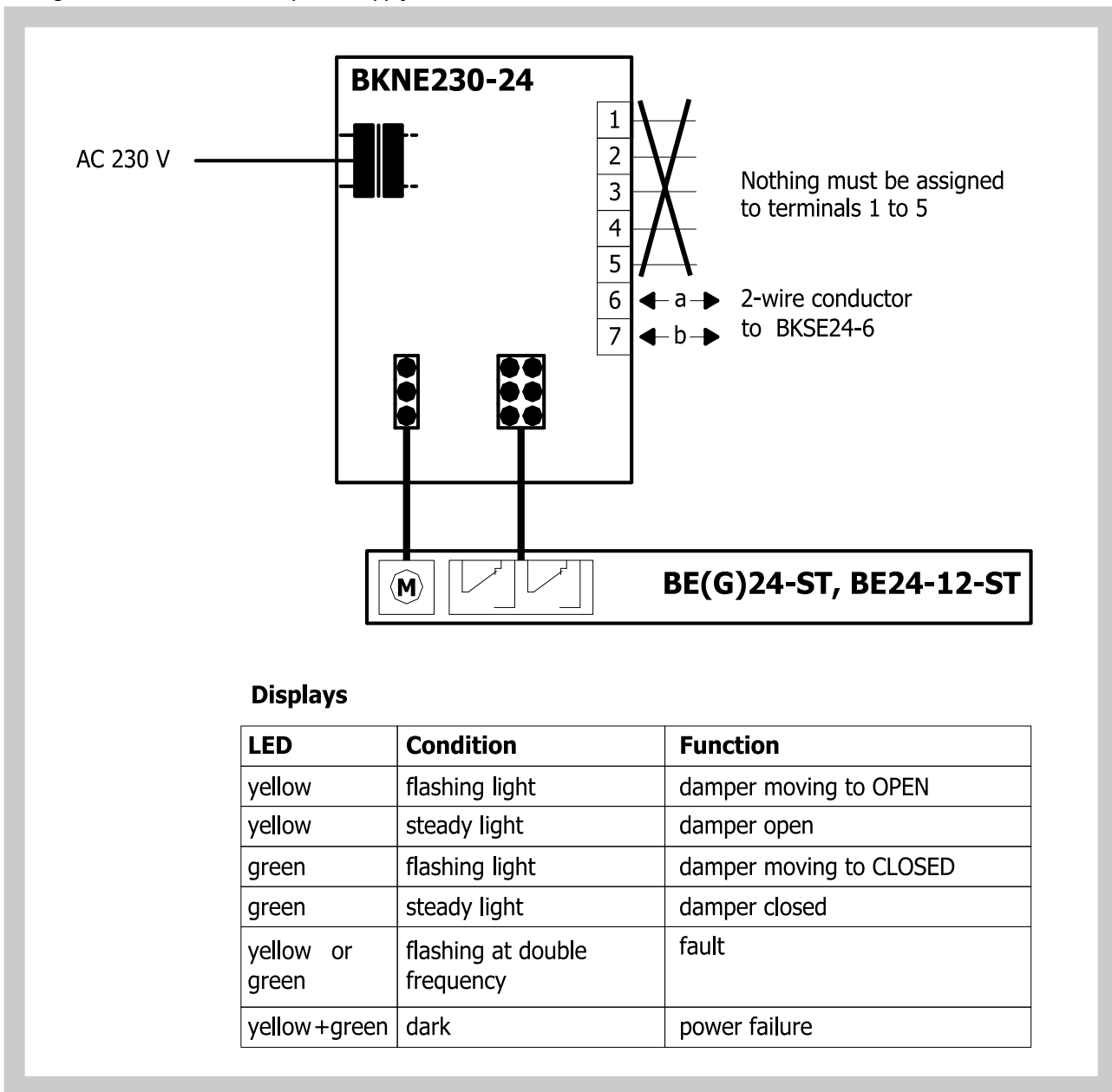


Fig. 6 Communication and power supply unit BKNE 230-24



Displays

LED	Condition	Function
yellow	flashing light	damper moving to OPEN
yellow	steady light	damper open
green	flashing light	damper moving to CLOSED
green	steady light	damper closed
yellow or green	flashing at double frequency	fault
yellow+green	dark	power failure

Tab. 2.2.1. Communication and supply device BKNE 230-24

Communication and supply device	BKNE 230-24
Nominal voltage	AC 230V 50/60Hz
Power consumption	10 W (including actuating mechanism)
Dimensioning	19 VA (including actuating mechanism)
Degree of protection	II
Ambient temperature range	- 30 °C ... + 50 °C
Non-operating temperature	- 40 °C ... + 80 °C
Connecting - net - actuator - terminal board	cable 1 m without plug 6-pole connector, 3-pole connector screw terminals for cable 2x1,5 mm ²

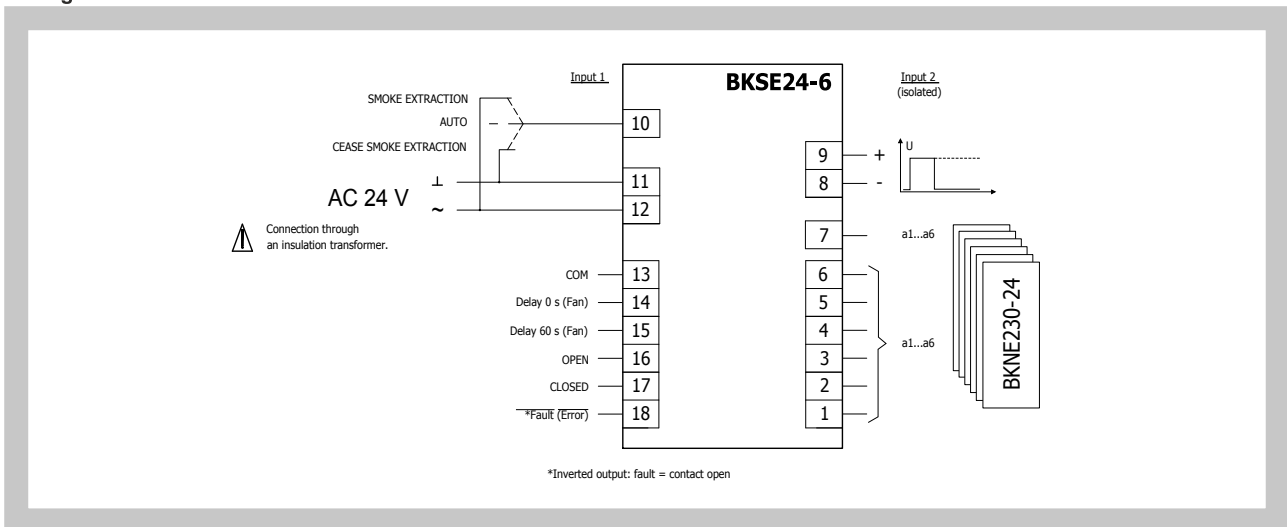
2.3. Communication and control devices

BKSE24-6 indicates operating status and fault signals for the smoke extraction dampers. The auxiliary contacts that are incorporated also allow functions to be signaled or passed on to higherlevel control systems. The signals from the BKNE230-24 unit are received by the BKSE24-6 unit and evaluated individually. All BKNE230-24 units are triggered simultaneously. To BKSE24-6 can be connected max. 6 BKNE230-24.

Communication is via the 2-wire conductor. Correct operation of the dampers is indicated by means of two LEDs. The operating status of the SBSE-Control system and any faults are also indicated by this LED and the corresponding fault LED.

The BKSE24-6 unit can be clipped directly to a 35 mm DIN mounting rail and connected by means of two 9-pole plug-in terminals.

Fig. 7 Communication and control devices BKSE 24-6



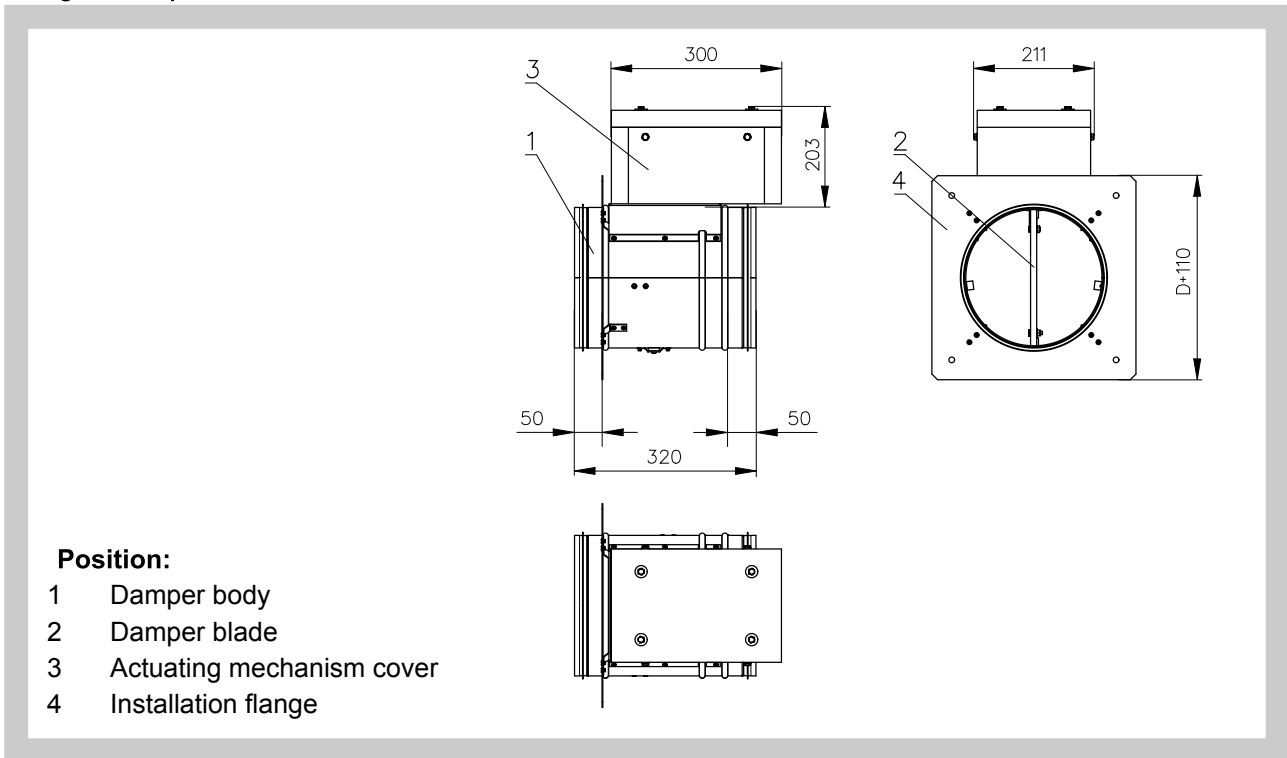
Tab. 2.3.1. Communication and control devices BKSE 24-6

Communication and control devices	BKSE 24-6
Nominal voltage	AC 24 V 50/60Hz
Power consumption	3,5 W (operating position)
Dimensioning	5,5 VA 18 VA (I _{max} 6.4 A @ 2.5 ms)
Protection class	III
Degree of protection	IP 20
Ambient temperature range	0 ... + 50 °C
Connecting	screw terminals for cable 2x1,5 mm ²

3. Dimensions, weights

3.1. Dimensions

Fig. 8 Damper SEDS-R



3.2. Weights and effective area

Tab. 3.2.1. Weights and effective area

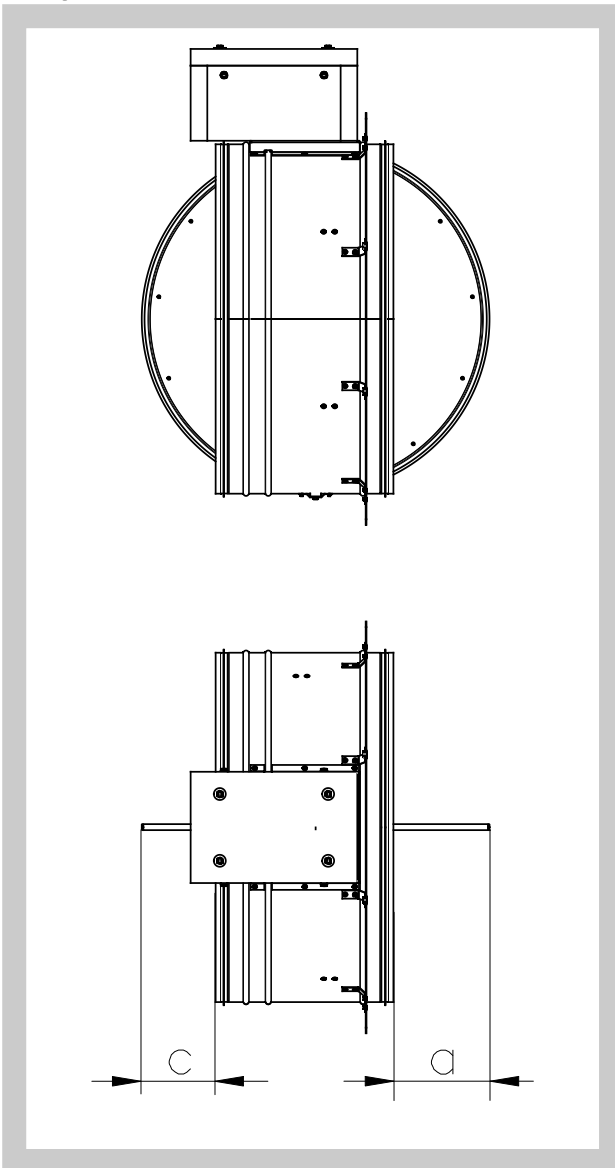
Size ØD	a	c	Weight [kg]	Effective area S _{ef} [m ²]	Actuating mechanism
100	-	-	10	0,0061	BELIMO BLE (15 N.m)
125	-	-	10,5	0,0100	BELIMO BLE (15 N.m)
160	-	-	11	0,0172	BELIMO BLE (15 N.m)
180	-	-	11,5	0,0222	BELIMO BLE (15 N.m)
200	-	-	12	0,0278	BELIMO BLE (15 N.m)
250	-	-	13	0,0446	BELIMO BLE (15 N.m)
280	-	-	13,5	0,0565	BELIMO BLE (15 N.m)
315	15,5	-	14,5	0,0722	BELIMO BLE (15 N.m)
355	35,5	-	15,5	0,0925	BELIMO BLE (15 N.m)
400	58	18	16,5	0,1183	BELIMO BLE (15 N.m)
450	83	43	18	0,1508	BELIMO BLE (15 N.m)
500	108	68	19,5	0,1872	BELIMO BLE (15 N.m)
560	138	98	21,5	0,2360	BELIMO BLE (15 N.m)
630	173	133	24,5	0,3001	BELIMO BLE (15 N.m)

If is used the communication and supply device BKNE230-24, the weight is higher by 0,68 kg.

- 3.3. For damper (Fig. 9) 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. 9 Value "a" a "c"

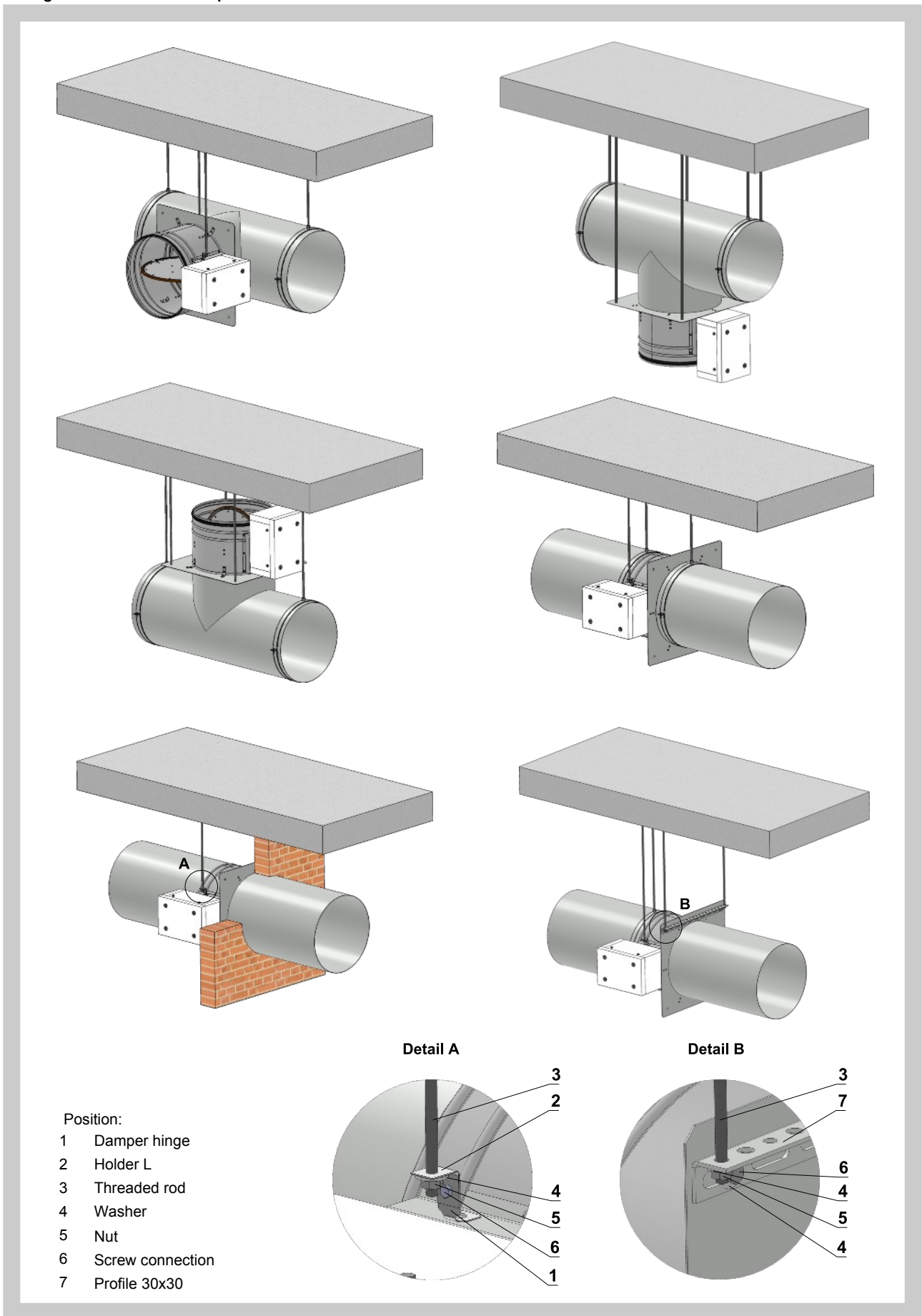


4. Placement and Assembly

- 4.1. Smoke extraction dampers single are designed to remove heat and combustion products (e.g. smoke) from single fire compartment according EN1366-9. Smoke extraction dampers single 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. 10 Installation examples



III. TECHNICAL DATA

5. Pressure loss

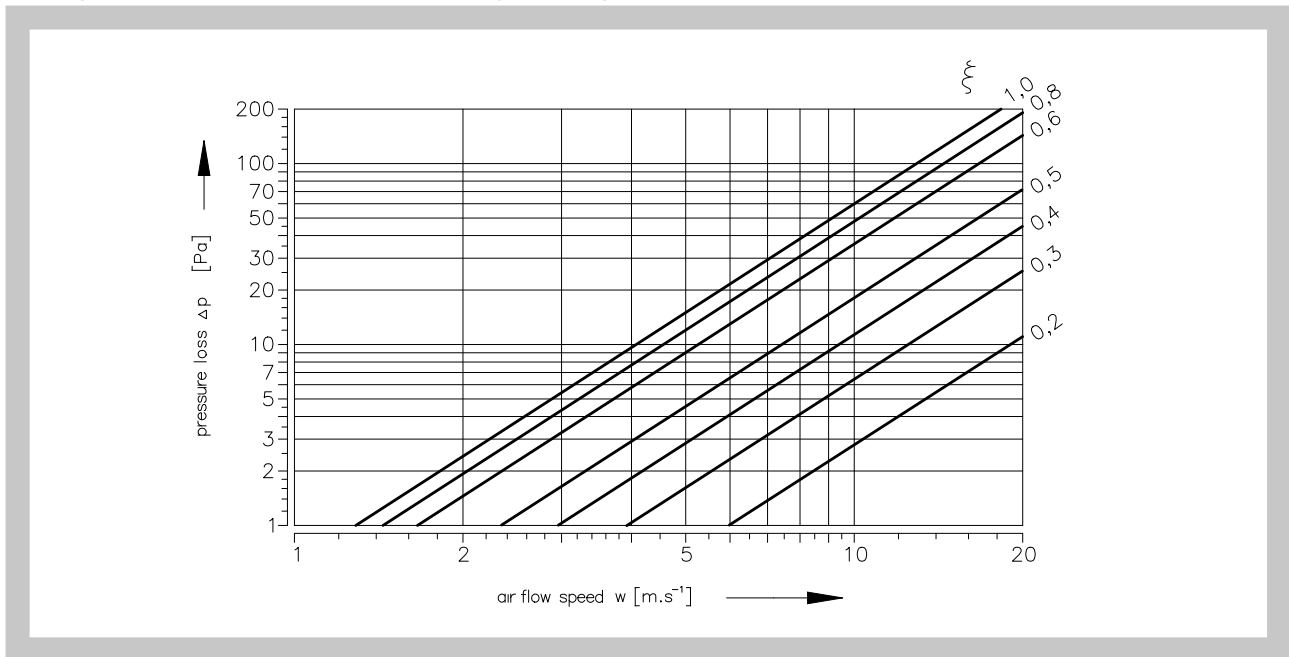
5.1. Pressure loss calculation

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

- Δp [Pa] pressure 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. 6.1.1.)

5.2. Determination of pressure loss by using diagram $\rho = 1,2 \text{ kg.m}^{-3}$

Diagram 5.2.1. Pressure losses for air density $\rho = 1,2 \text{ kg.m}^{-3}$



6. Coefficient of local pressure loss

6.1. Coefficient of local pressure loss ξ (-)

Tab. 6.1.1. Coefficient of local pressure loss

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

7. Noise data and pressure losses

Tab. 7.1.1. Noise data and pressure losses

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

8. Material

- 8.1. Damper casing and damper blade are made of galvanized plate without any other surface finish.
- 8.2. Fasteners are galvanized.

V. INSPECTION, TESTING

9. Inspection, testing

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

VI. TRANSPORTATION AND STORAGE

10. Logistic terms

- 10.1. 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.
- 10.2. 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.

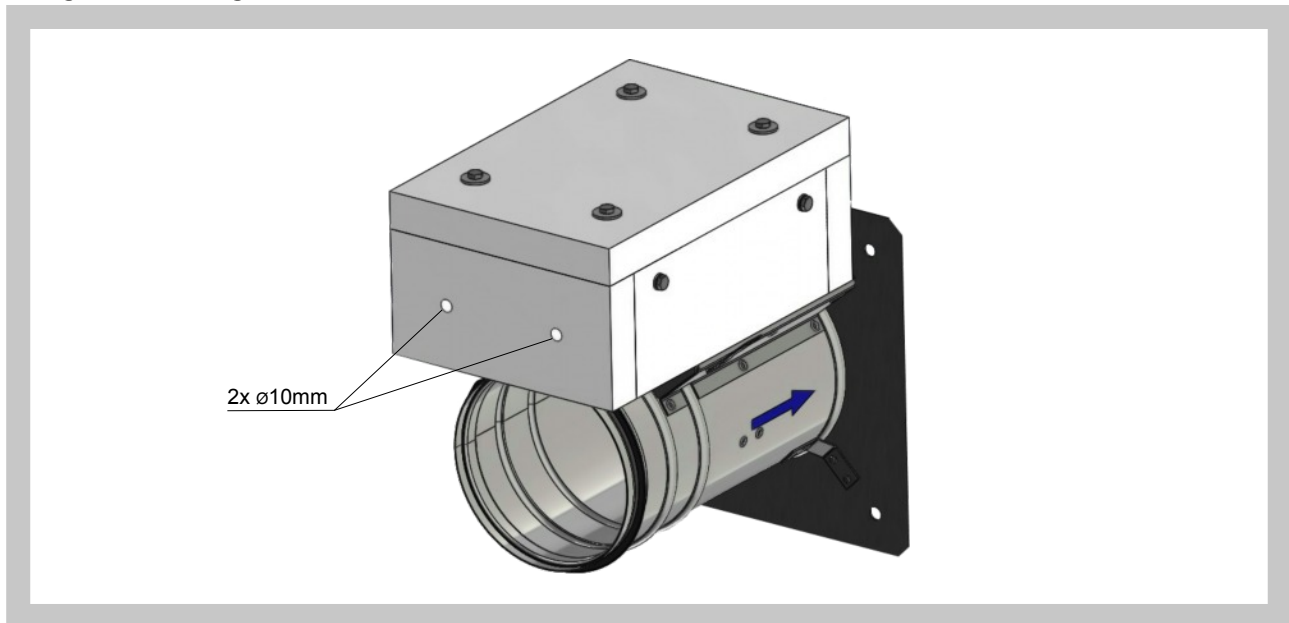
VII. ASSEMBLY, ATTENDANCE, MAINTENANCE AND REVISIONS

11. Assembly

- 11.1. 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 fire dampers must be done according international and local norms and laws.
- 11.2. All effective safety standards and directives must be observed during damper assembly.
- 11.3. 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.
- 11.4. **Manual operation**
Without power supply, the damper can be operated manually and fixed in any required position.

- 11.5.** For electrical connection of the actuator use the prefabricated slot in the protection box on the top side of the box.
- 11.6.** If it is necessary to use other position of the connecting holes, then make two holes to the protection box to pull in connecting cables (heat resistant cables) to the cables of damper's actuator. Protection box is made of calcium silicate plates.

Fig. 11 Connecting holes



Procedure:

- use drill $\varnothing 10$ and make two holes (see figure 11). It is possible to make 2 holes in any wall of the box.
- pull the heat resistant cable through the calcium silicate plate (wall) and connect with cables from actuator according to above mentioned electrical diagram
- seal up the space in the hall with fire resistant mastic or sealant
- let the sealant harden

12. Entry into service and revisions

- 12.1.** 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.
- 12.1.1.** 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.
- 12.1.2.** 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.
- 12.2.** Before entering the dampers into operation after their assembly and by sequential checks, the following checks must be carried out for all designs.
- 12.2.1.** Visual inspection of proper damper integration, inside damper area, damper blade, contact surfaces and silicon sealing.
- 12.2.2.** 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.

13. Spare parts

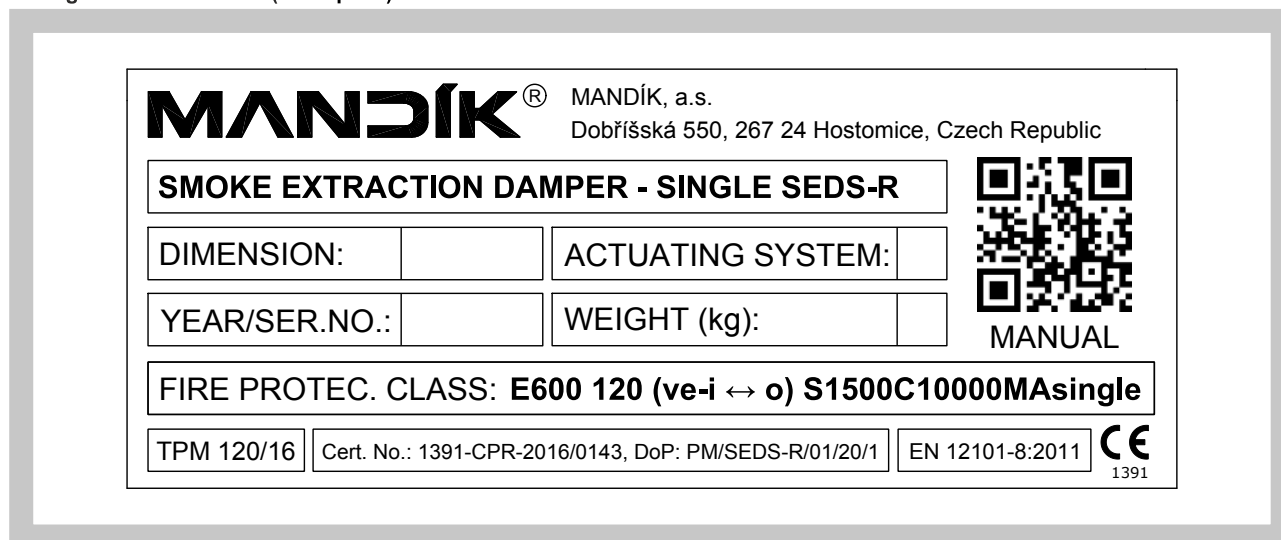
- 13.1.** Spare parts are supplied only on basis of an order.

VIII. PRODUCT DATA

14. Product label

14.1. Product label is placed on the damper casing

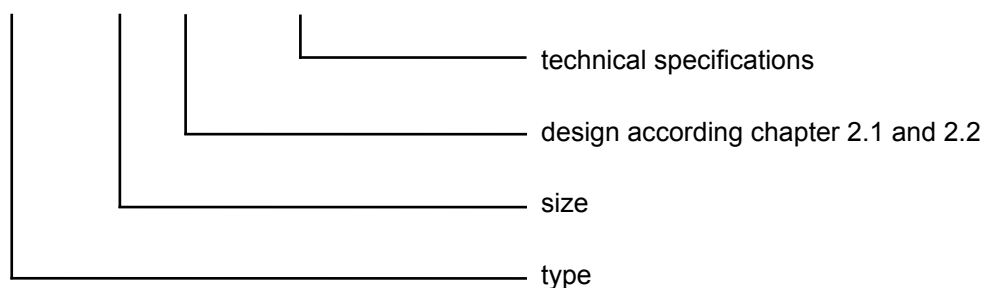
Fig. 12 Product label (Nameplate)



IX. ORDERING INFORMATION

15. Ordering key

SEDS-R 180 -.44 TPM 120/16



MANDÍK, a.s.
Dobříšská 550
26724 Hostomice
Czech Republic
Tel.: +420 311 706 706
E-Mail: mandik@mandik.cz
www.mandik.com

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