Fire damper:

Single blade low resistance cut-off fire dampers for comfort ventilation systems

Model FID S/S c/P

Technical Catalogue

SAFE • VENT®

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1488-CPR-0203/W

1396-CPR-0114

ATEST HIGIENICZNY

CERTYFIKACJA PRODUKTU

- EIS120 Certificate of constancy of performance 1488-CPD-0203/W, 1396-CPR-0114.
- Dampers certified for compliance with EN 15650.
- Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- Cut-off dampers with the fire resistance independent of airflow direction and installation side.
- Lower acoustic noise and hydraulic resistance in the system with reduced partition thickness.

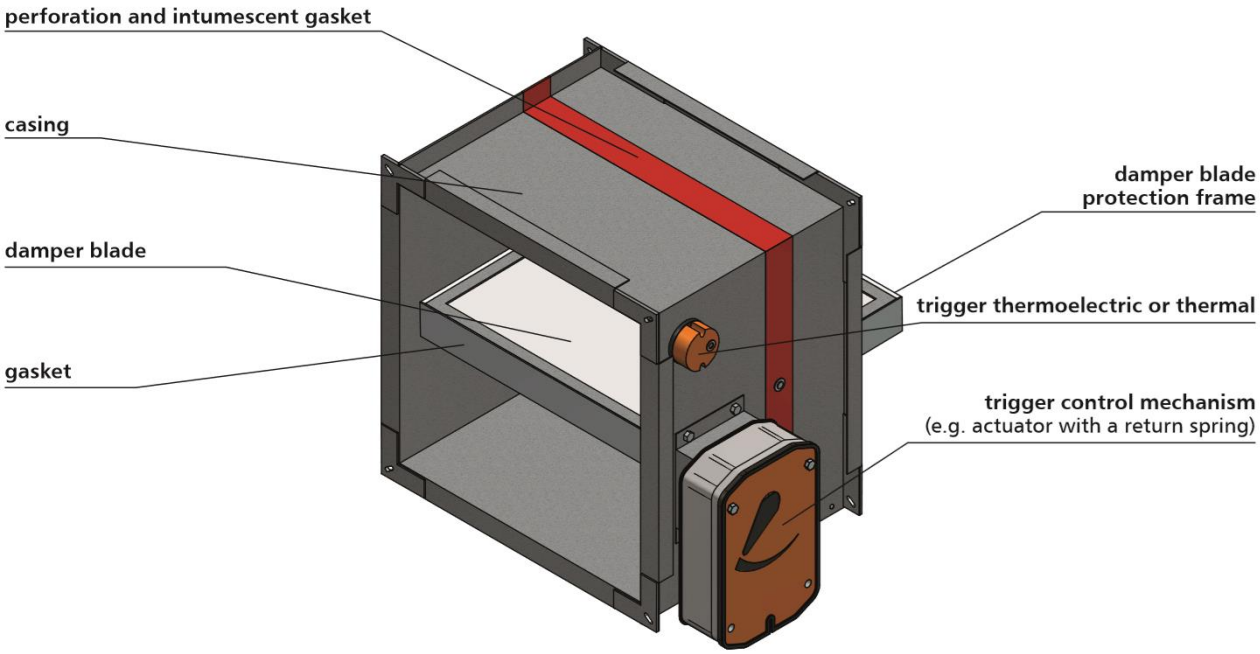
1. Application

The FID S/S c/P low-resistance cut-off dampers are designed for use in general ventilation systems, where those systems pass through vertical and horizontal construction partitions. The dampers are intended, for example, for systems with increased acoustic requirements.

During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building which is not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes.

The dampers cannot be operated in systems exposed to dust, except for when they are included in a special, individually developed programme of service and technical inspections.

2. Design



The FID S/S/ c/P cut-off fire dampers consist of a casing with a rectangular cross section, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically when the thermal or thermoelectric trigger is tripped. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated.

The casing total length is at least 296 mm. In the middle part, in which the damper blade is placed, the casing is perforated - perforation width is 30 mm. On the inner side of the casing, around the damper blade, there is an intumescent gasket. The damper blade is made of a fire-proof panel with the total thickness of 30 mm.

The damper blade is covered with steel reinforcement profile on blade perimeter. The inner surface is equipped with „P"-type ventilation gasket, which ensures the tightness of dampers at the ambient temperature. Both ends of the fire damper casing are finished with flange connections.

3. Versions

3.1 FID S/S c/P – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

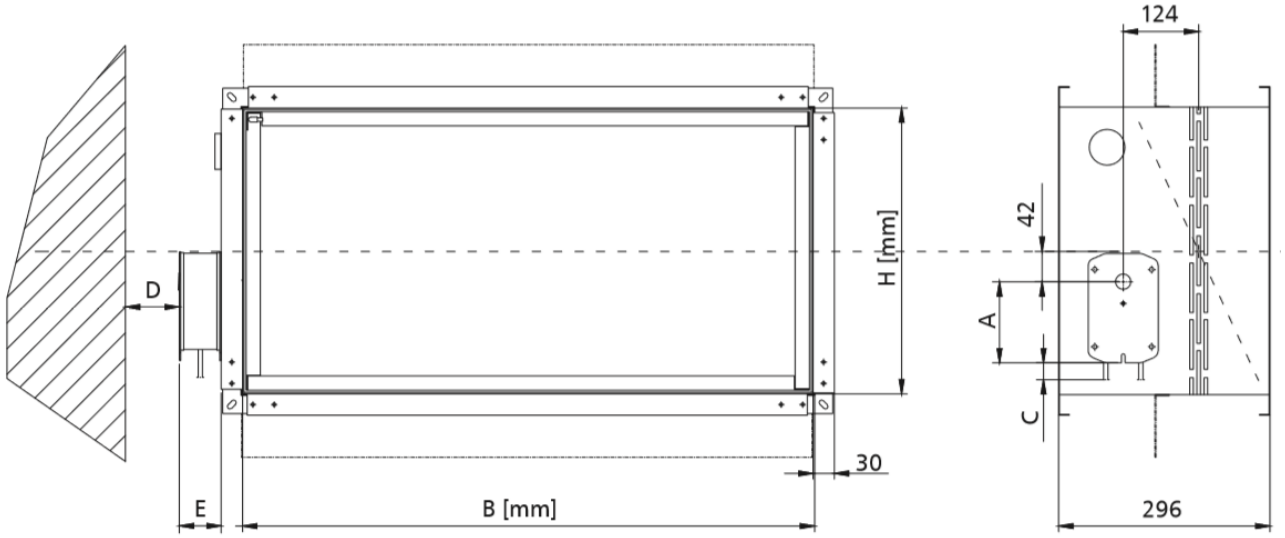
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The FID S/S c/P dampers are equipped with a Belimo trigger control mechanisms BFL, BFN, BF-TL and EXBF axial actuator with

a return spring, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL, BFN, BF-TL and EXBF series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

The thermoelectric trigger is equipped with a test switch and a power supply indicator (LED).

Dampers with Belimo actuators: analogue BFL, BFN, digital BF-TL, EXBF explosion proof actuators close thanks to thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.



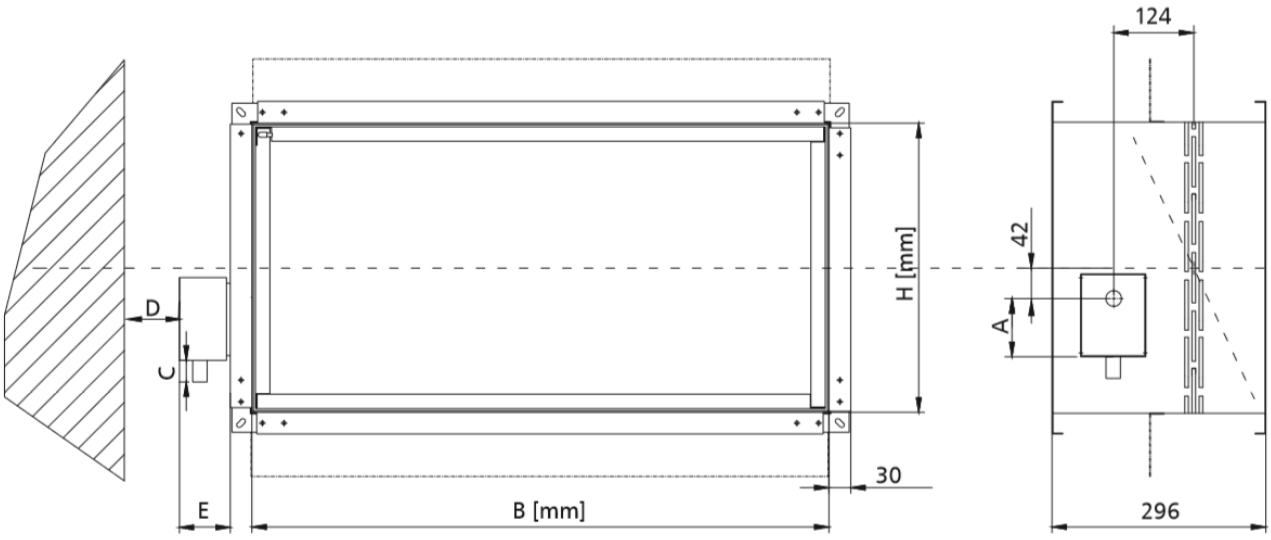
Mechanism	A	C	D	E
BFN	157	30	75	57
BFL	138	30	75	53
BF24TL-ST	198	10	75	65
EXBF	225	55	75	175

3.2 FID S/S c/P – the cut-off fire damper for ventilation ducts with a spring drive and thermal trigger

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically.

The FID S/S c/P dampers are equipped with a RST trigger control mechanism with a spring drive (without an integrated thermal trigger). In this case, a thermal trigger rated at 74°C (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself.

After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST mechanism, there is a mechanical indicator of blade position. It is possible to equip the damper with WK1 or WK2 limit switches used to signal the blade position state.

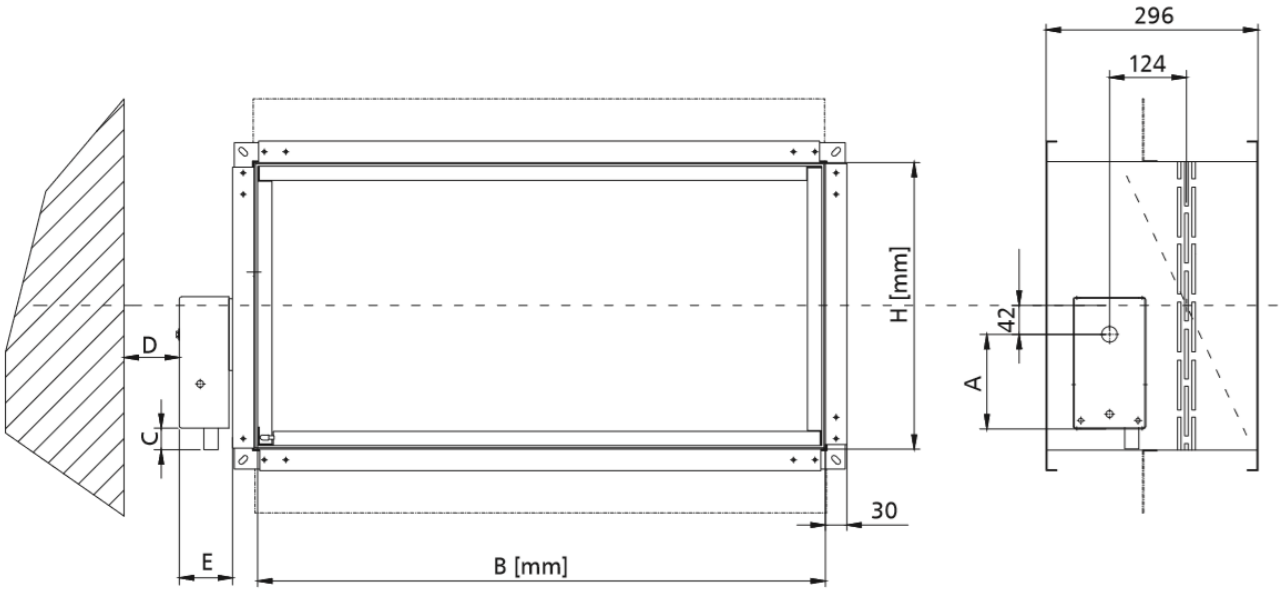


Mechanism	A	C	D	E
RST	50	30	75	70

3.3 FID S/S c/P – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or, in case of a damper with an electromagnetic trigger, additionally remotely by using the fire automation.

The FID S/S c/P dampers are equipped with a **RST-KW1** trigger control mechanism with a spring drive and a cam lever system. A thermal trigger rated at 74°C (optionally at 95°C) is integrated with the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST-KW1 mechanism, there is a mechanical blade position indicator. It is possible to equip a trigger control mechanism with an electromagnetic trigger, activated by the application („pulse") or removal („break") of the power supply voltage and with limit switches used to signal the damper blade position state. The mechanism has a function to test and blade button-release. Blade re-opening is activated manually.



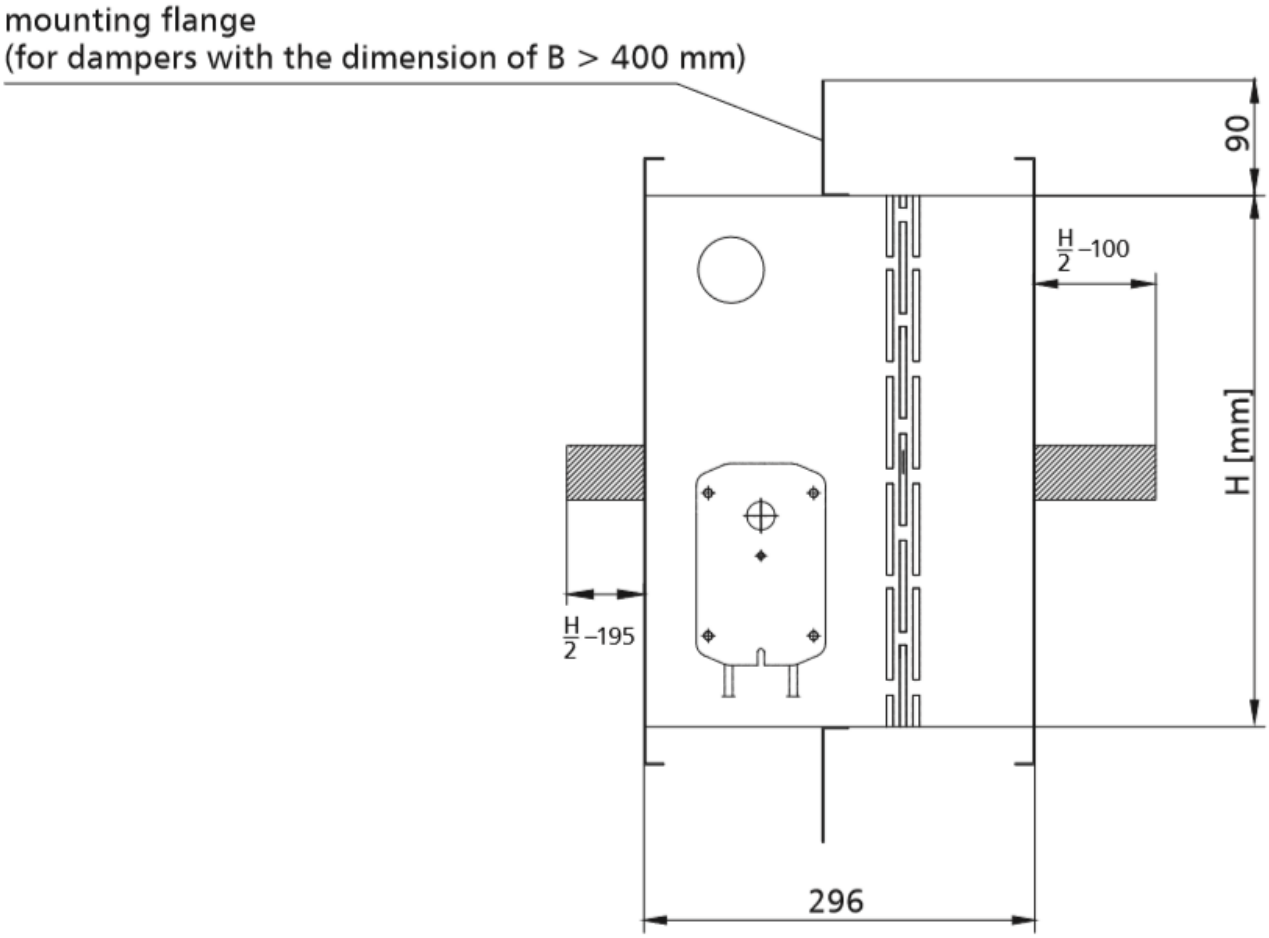
Mechanism	A	C	D	E
RST-KW1	130	30	75	80

4. Dimensions

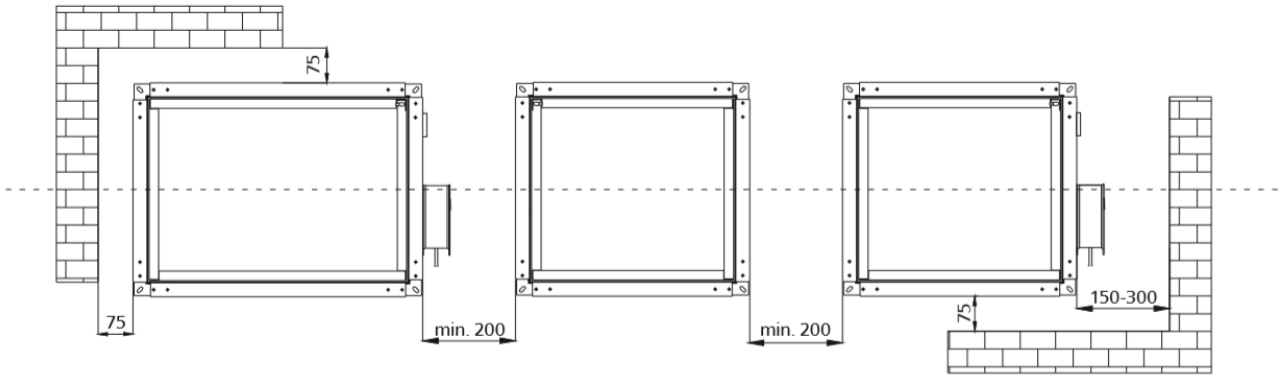
Rectangular dampers:

- Nominal width B: from 200 mm to 800 mm
- Nominal height H: from 200 mm to 400 mm
- The maximum cross-section surface of one damper up to 0.32 m^2

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).



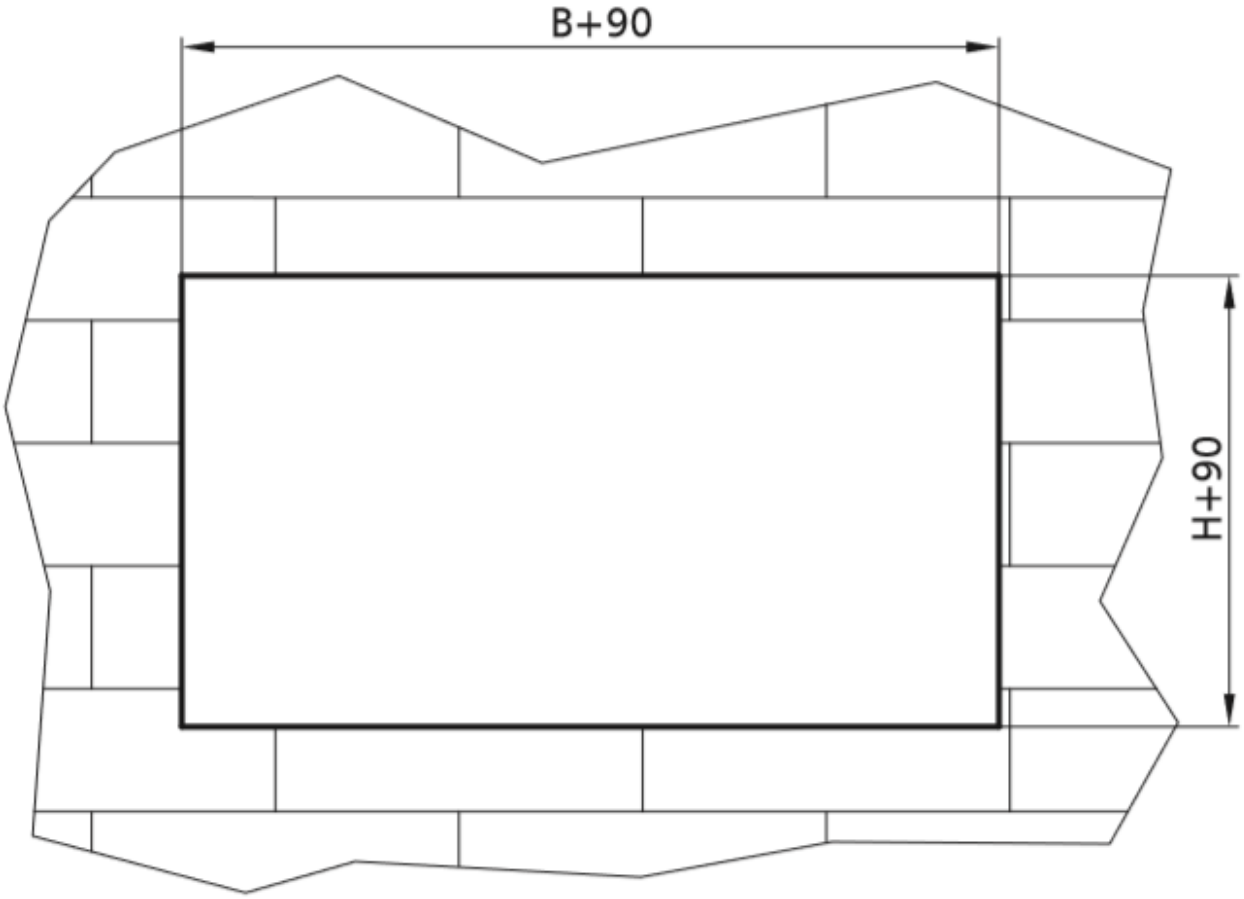
Distance between the installations and partitions



5. Installation

The FID S/S c/P rectangular dampers are EI120(ve ho i ↔ o)S-rated when installed in concrete partitions with the thickness of at least 110 mm, made of full bricks or cellular concrete blocks with the thickness of at least 115 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm.

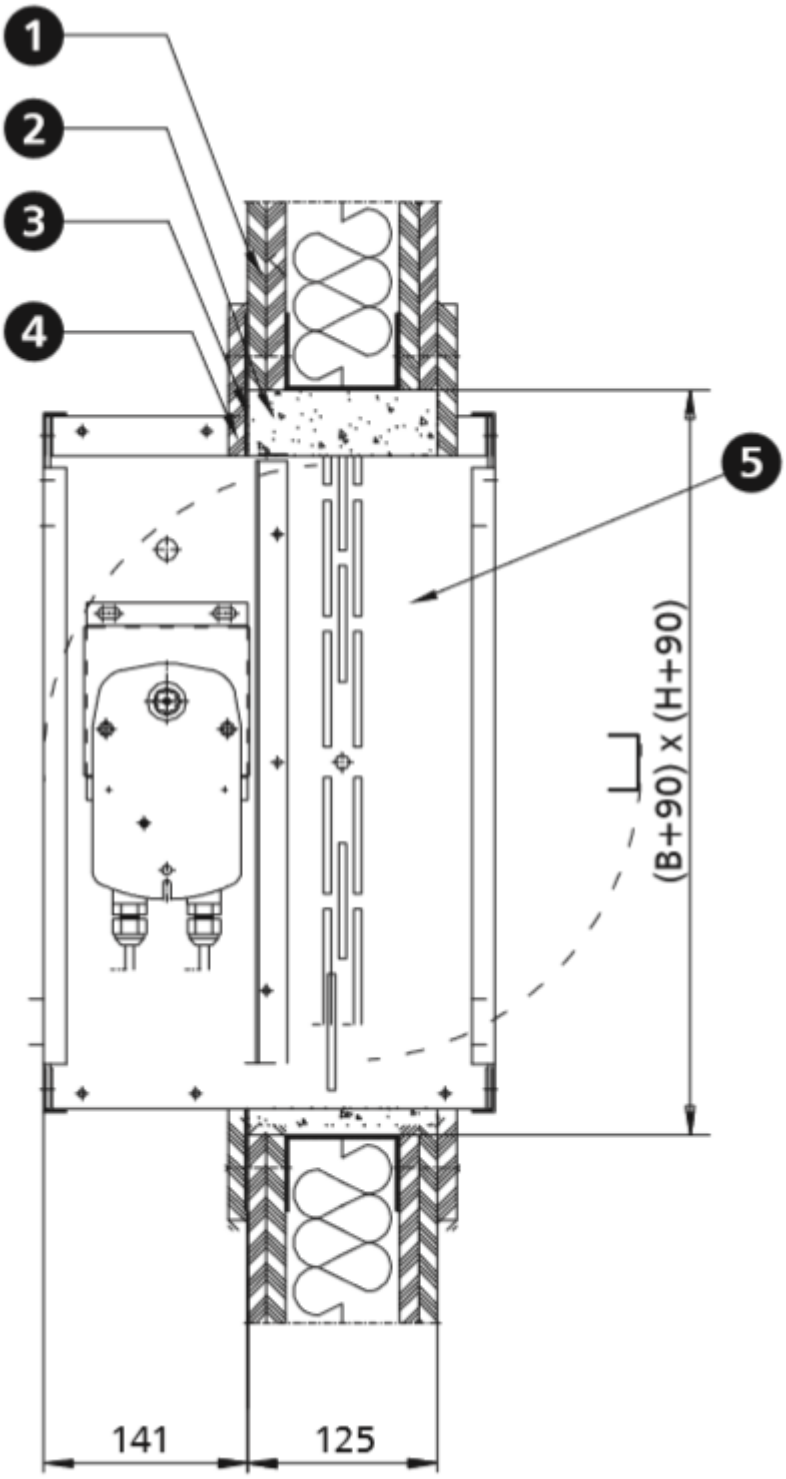
5.1 Preparation of installation openings



5.2 Sample installation in lightweight walls of plaster-cardboard panels

1. Lightweight wall
2. Sealing - plaster mortar*
3. Mounting flange - embedding border
4. Circumferential belt of 100 x 12.5 plaster-cardboard panels
5. Fire damper FID S

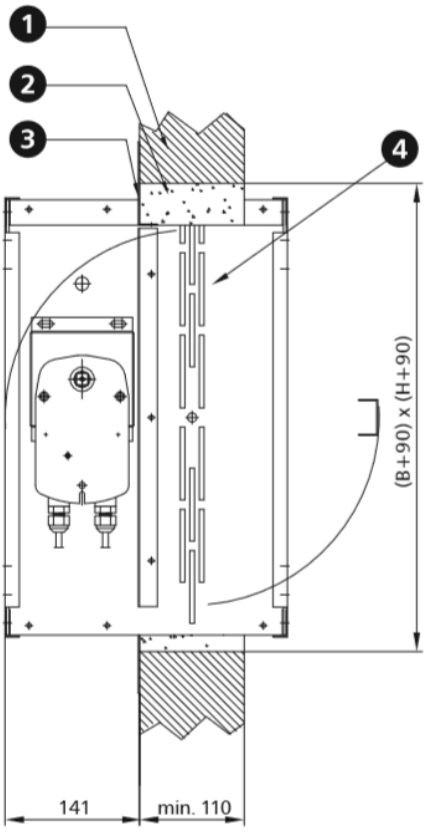
It is possible to use a different sealing which ensures the required fire resistance

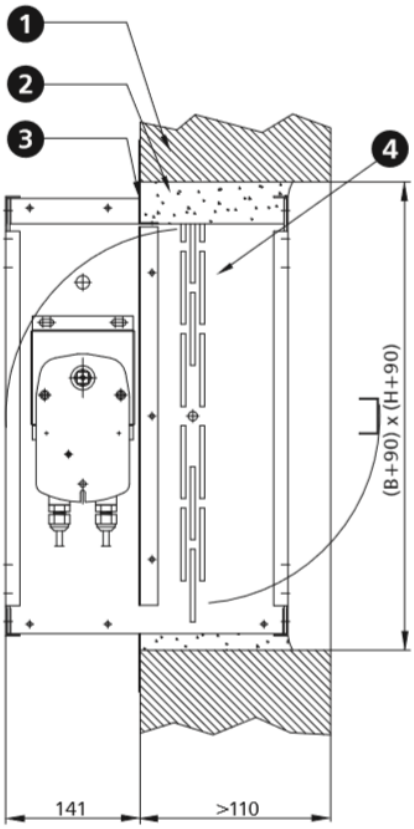


5.3 Sample installation in concrete walls

1. Rigid wall
2. Sealing - cement or cement-lime masonry mortar*
3. Mounting flange - embedding border
4. Fire damper FID S

It is possible to use a different sealing which ensures the required fire resistance

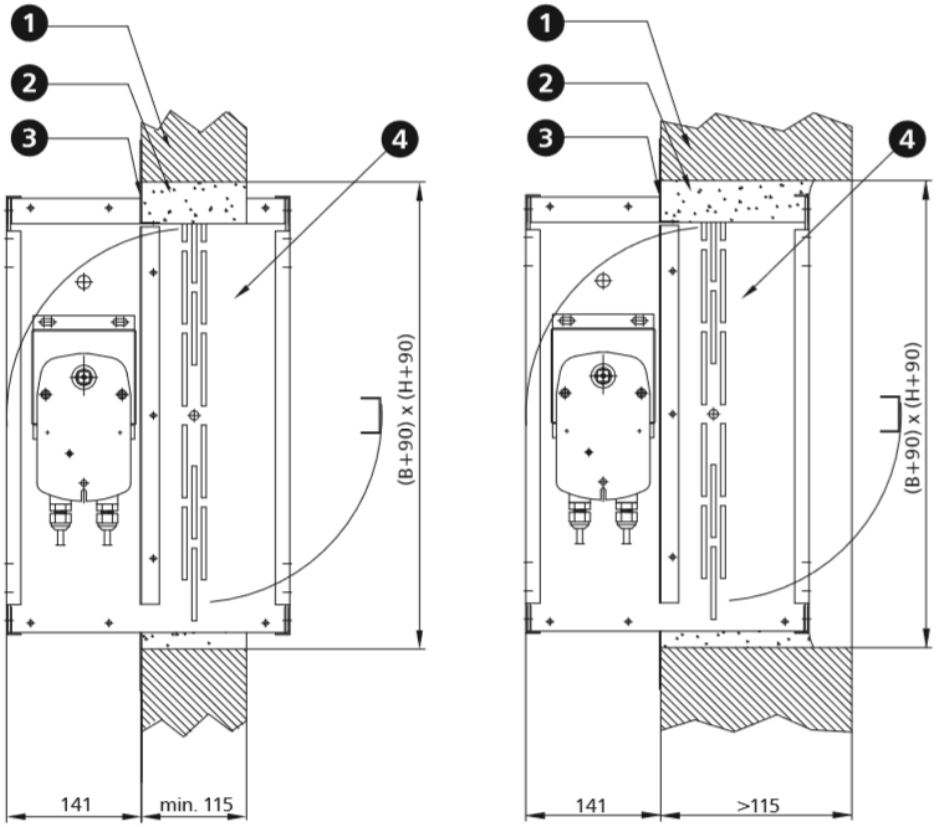




5.4 Sample installation on masonry wall

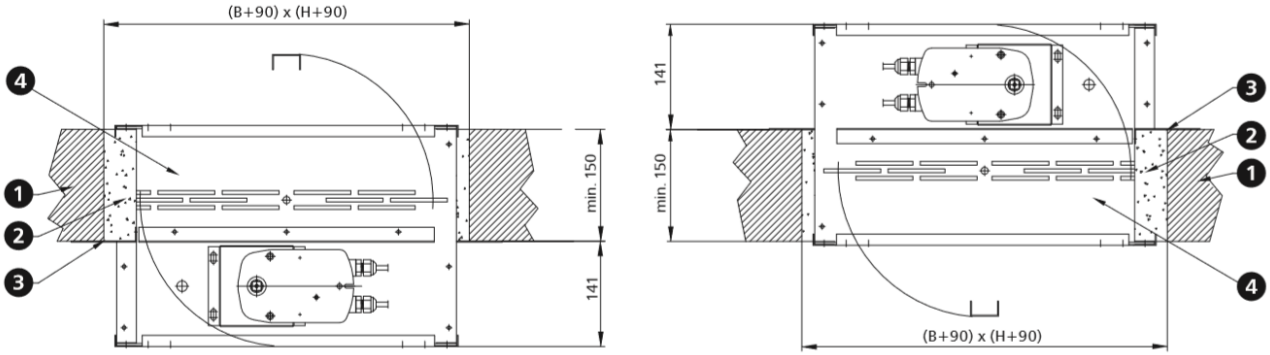
1. Rigid wall
2. Sealing - cement or cement-lime masonry mortar*
3. Mounting flange - embedding border
4. Fire damper FID S

ℹ It is possible to use a different sealing that ensures the required fire resistance



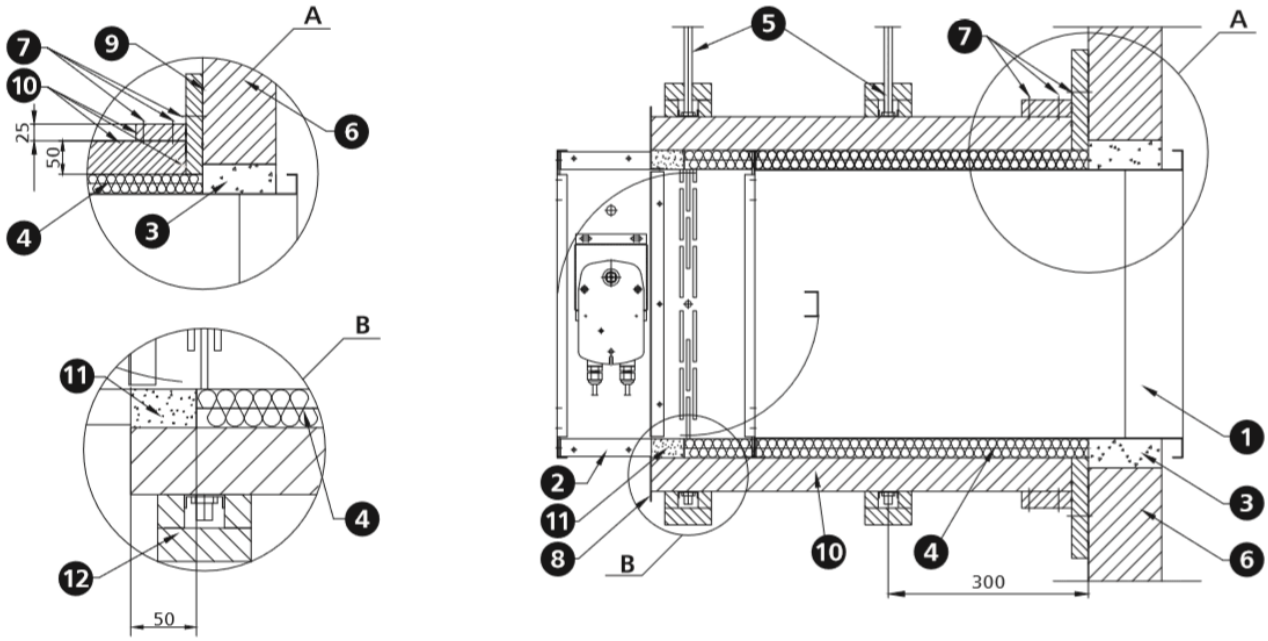
If the damper is installed in a wall with the thickness of less than 115 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

5.5 Sample installation in ceilings



1. Ceiling
2. Sealing - cement or cement-lime masonry mortar*
3. Mounting flange - embedding border
4. Fire damper FID S

ℹ It is possible to use a different sealing which ensures the required fire resistance



1. Ventilation duct
2. Fire damper FID S
3. e.g. cement mortar*
4. Mineral wool with the density of at least 80 kg/m^3 and thickness 30 mm, A1 class
5. Suspension rod M12
6. Wall
7. ST3,5x50 screw
8. Angle - casting limits
9. Board joints sealed with a bonding agent, e.g. Promat H 84
10. Non-combustible board with the thickness corresponding to the fire rating of the fire partition (e.g. Promatect L500 for EI120 - thickness 50 mm)
11. e.g. gypsum mortar
12. Suspension rod insulation

It is possible to use a different sealing which ensures the required fire resistance

Fire damper installation with a vertical axis of rotation

Installation must be specified in the design plans and specifications and selected when ordering. Fire damper dimensions BxH are specified for the fire damper with a horizontal axis of rotation.

6. Technical parameters of FID S/S c/P rectangular dampers

B – nominal width [mm]
H – nominal height [mm]
v – velocity [m/s]
Sk – duct cross section [m^2]
Se – damper active cross section [m^2]
Q – flow [m^3/h]
Dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

			Height H [mm]															
			200					250					300					
		V [m/s]	SK [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]	SK [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]	SK [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]
Width B [mm]	200	4	0.04	0.033	468	7	27	0.05	0.043	612	6	26	0.06	0.053	756	6	28
		6			702	15	37			918	13	37			1134	13	38
		8			936	26	45			1224	24	45			1512	22	44
		10			1170	41	51			1530	37	50			1890	34	50
	250	4	0.05	0.041	585	6	27	0.0625	0.053	765	6	27	0.075	0.066	945	5	26
		6			878	14	37			1148	13	38			1418	11	37
		8			1170	24	45			1530	23	45			1890	20	44
		10			1463	38	50			1913	36	51			2363	31	50
	300	4	0.06	0.049	702	6	27	0.075	0.064	918	6	28	0.09	0.079	1134	4	26
		6			1053	13	38			1377	13	38			1701	10	36
		8			1404	24	45			1836	22	46			2268	18	44
		10			1755	37	51			2295	35	51			2835	28	49
	350	4	0.07	0.057	819	6	27	0.0875	0.074	1071	6	28	0.105	0.092	1323	4	25
		6			1229	13	38			1607	13	38			1985	9	35
		8			1638	22	45			2142	22	46			2646	16	43
		10			2048	35	51			2678	35	51			3308	25	49
	400	4	0.08	0.065	936	5	27	0.1	0.085	1224	4	25	0.12	0.105	1512	4	24
		6			1404	12	38			1836	9	35			2268	8	34
		8			1872	22	45			2448	17	43			3024	14	42
		10			2340	34	51			3060	26	49			3780	22	47
	450	4	0.09	0.073	1053	5	27	0.1125	0.096	1377	3	22	0.135	0.118	1701	3	23
		6			1580	11	37			2066	7	33			2552	7	33
		8			2106	20	45			2754	13	40			3402	13	41
		10			2633	31	51			3443	20	46			4253	20	47
	500	4	0.1	0.081	1170	4	26	1.125	0.106	1530	3	23	0.15	0.131	1890	3	23
		6			1755	10	36			2295	8	34			2835	7	34
		8			2340	18	44			3060	13	41			3780	13	41
		10			2925	28	50			3825	21	47			4725	20	47
	550	4	0.11	0.089	1287	4	25	0.1375	0.117	1683	3	23	0.165	0.144	2079	3	22
		6			1931	9	36			2525	7	33			3119	6	33
		8			2574	17	43			3366	13	41			4158	12	40
		10			3218	26	49			4208	20	47			5198	18	46
	600	4	0.12	0.098	1404	3	21	0.15	0.128	1836	3	20	0.18	0.158	2268	2	20
		6			2106	7	32			2754	6	31			3402	5	31
		8			2808	12	39			3672	10	38			4536	10	38
		10			3510	19	45			4590	16	44			5670	15	44
	650	4	0.13	0.106	1521	3	22	0.1625	0.138	1989	3	21	0.195	0.171	2457	2	20
		6			2282	7	32			2984	6	31			3686	5	30
		8			3042	12	40			3978	10	39			4914	9	38
		10			3803	19	46			4973	16	45			6143	14	44
	700	4	0.14	0.114	1638	3	21	0.175	0.149	2142	2	20	0.21	0.184	2646	2	19
		6			2457	6	32			3213	5	31			3969	5	30
		8			3276	12	39			4284	10	38			5292	8	37
		10			4095	18	45			5355	15	44			6615	18	43
	750	4	0.15	0.122	1755	3	21	0.1875	0.159	2295	2	20	0.225	0.197	2835	2	20
		6			2633	6	31			3443	5	31			4253	5	30
		8			3510	11	39			4590	10	38			5670	8	38
		10			4388	17	45			5738	15	44			7088	13	43
	800	4	0.16	0.130	1872	2	20	0.2	0.170	2448	2	20	0.24	0.210	3024	2	19
		6			2808	5	30			3672	5	30			4536	4	29
		8			3744	10	38			4896	9	38			6048	8	37
		10			4680	15	43			6120	14	44			7560	12	43

B – nominal width [mm]
H – nominal height [mm]

v – velocity [m/s]
Sk – duct cross section [m^2]
Se – damper active cross section [m^2]

Q – flow [m^3/h]
Dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

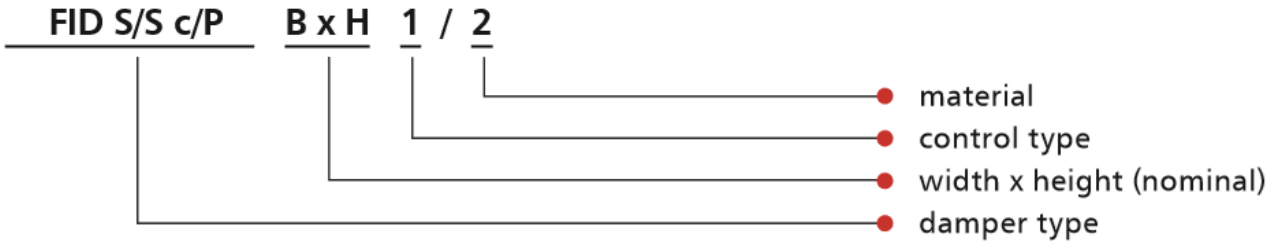
			Height H [mm]									
			350					400				
		V [m/s]	SK [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]	SK [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]
Width B [mm]	200	4	0.07	0.063	900	5	26	0.08	0.073	1044	5	26
		6			1350	12	37			1566	11	37
		8			1800	21	44			2088	19	44
		10			2250	32	50			2610	30	50
	250	4	0.0875	0.078	1125	4	25	0.1	0.091	1305	4	25
		6			1688	10	36			1958	9	35
		8			2250	17	43			2610	16	43
		10			2813	27	49			3263	25	49
	300	4	0.105	0.094	1350	4	26	0.12	0.109	1566	4	24
		6			2025	10	36			2349	8	35
		8			2700	17	44			3132	15	42
		10			3375	27	50			3915	23	48
	350	4	0.1225	0.109	1575	4	25	0.14	0.127	1827	4	25
		6			2363	9	36			2741	8	36
		8			3150	15	43			3654	15	43
		10			3938	24	49			4568	23	49
	400	4	0.14	0.125	1800	3	24	0.16	0.145	2088	3	23
		6			2700	8	34			3132	7	34
		8			3600	13	42			4176	12	41
		10			4500	21	48			5220	19	47
	450	4	0.1575	0.141	2025	3	24	0.18	0.163	2349	3	21
		6			3038	7	34			3524	6	32
		8			4050	13	42			4698	10	39
		10			5063	20	48			5873	16	45
	500	4	0.175	0.156	2250	2	20	0.2	0.181	2610	2	20
		6			3375	5	31			3915	5	31
		8			4500	10	38			5220	9	38
		10			5625	15	44			6525	14	44
	550	4	0.1925	0.172	2475	2	19	0.22	0.199	2871	2	20
		6			3713	5	29			4307	5	30
		8			4950	8	37			5742	8	38
		10			6188	13	43			7178	13	43
	600	4	0.21	0.188	2700	2	18	0.24	0.218	3132	2	19
		6			4050	4	29			4698	4	28
		8			5400	8	36			6264	7	36
		10			6750	12	42			7830	11	42
	650	4	0.2275	0.203	2925	2	19	0.26	0.236	3393	2	18
		6			4388	4	29			5090	4	29
		8			5850	8	37			6786	7	36
		10			7313	12	42			8483	11	42
	700	4	0.245	0.219	3150	2	18	0.28	0.254	3654	2	18
		6			4725	4	28			5481	4	29
		8			6300	7	36			7308	7	36
		10			7875	11	42			9135	11	42
	750	4	0.2625	0.234	3375	2	18	0.3	0.272	3915	2	17
		6			5063	4	29			5873	4	28
		8			6750	7	36			7830	6	35
		10			8438	11	42			9788	10	41
	800	4	0.28	0.250	3600	2	18	0.32	0.290	4176	2	18
		6			5400	4	29			6264	4	28
		8			7200	7	36			8352	6	36
		10			9000	11	42			10440	10	41

7. Estimated Weights of FID S/S c/P dampers for rectangular ventilation ducts [kg]

		Width B [mm]							
		200	250	300	400	500	600	700	800
Height H [mm]	200	7,5	8	9	10	11	14	16	18
	250	8	9,5	10	11	14	15	17	19
	300	9	10,5	11	12	15	16	18	20
	350	10	11,5	12	13	16	17	19	21
	400	11	12,5	13,5	14	18	19	21	22

For dampers with no actuator, subtract ~1 kg.

8. Marking



1 – Control:

- RST trigger control mechanism
  RST – thermal trigger
  RST/WK1 – thermal trigger + limit switch (closed blade signal)
  RST/WK2 – thermal trigger + limit switch (open/closed blade signal)

- RST-KW1 trigger control mechanism
  RST-KW1/S – thermal trigger
  RST-KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)
  RST-KW1/24I – thermal trigger + „pulse" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
  RST-KW1/24P – thermal trigger + „break" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
  RST-KW1/230I – thermal trigger + „pulse" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
  RST-KW1/230P – thermal trigger + „break" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

- Belimo trigger control mechanism
  BF24TL-T-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control

EXBF24-T – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
EXBF230-T – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
BFL24-T – actuator with a return spring, U = 24 V AC/DC
BFL230-T – actuator with a return spring, U = 230 V AC
BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
BFN24-T – actuator with a return spring, U = 24 V AC/DC
BFN230-T – actuator with a return spring, U = 230 V AC
BFN24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

2 – Material:

[No symbol] – galvanized steel, Zn 275 g/m^2 coating
KN – 1.4404 acid-proof stainless steel

Example marking:

FID S/S c/P 400 x 400 BFL24-T
EIS120 low-resistance cut-off damper with a 24 V compact Belimo actuator with limit switches.

9. Power Supply Control

9.1 Cooperation with smoke exhaust/cut-off dampers – drive quick selection table

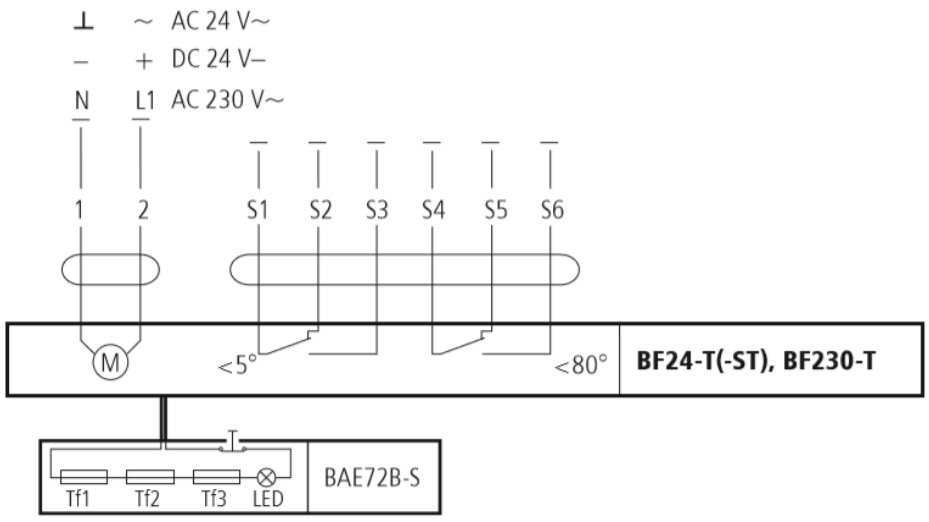
	FID S/S c/P	FID S/S p/P FID S/S p/O	FID S/V p/P FID S/V-M p/P	FID PRO	WIP/ S	WIP/T	WIP/T-G	WIP/V WIP/V-M	WIP PRO/S	WIP PRO/V WIP PRO/V-M
BF24-T (ST)		X			X	X			X	
BF230-T		X			X	X			X	
BFL24-T (-ST)	X	X		X	X	X			X	
BFL230-T	X	X		X	X	X			X	
BFN24-T (-ST)	X	X			X	X			X	
BFN230-T	X	X			X	X			X	
BE24			X			X		X		X
BE230			X			X		X		X
BLE24			X			X		X		X
BLE230			X			X		X		X
EXBF24-T	X	X		X	X	X			X	
EXBF230-T	X	X		X	X	X			X	
BF24TL-T (-ST)	X	X		X	X	X			X	
RST	X	X		X						
RST/WK1	X	X		X						
RST/WK2	X	X		X						
RST-KW1/S	X	X		X						
RST-KW1/S/WK2	X	X		X	X	X	X		X	
RST-KW1/24I	X	X		X						
RST-KW1/24P	X	X		X					X	
RST-KW1/230I	X	X		X						
RST-KW1/230P	X	X		X					X	
BF24 (-ST)							X			
BF230							X			
BFL24 (-ST)							X			
BFL230							X			
BFN24 (-ST)							X			
BFN230							X			

9.2 Actuators

9.2.1 BF electric actuators

SPECIFIKATIONS	BF24 (BF24-T)	BF230 (BF230-T)
Power supply	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
Power demand: - **For spring tensioning** - **For holding**	 7 W 2 W	 8 W 3 W
Sizing (apparent power)	10 VA	11 VA
Protection class	III	II
Ingress protection rating	IP 54	IP 54
Auxiliary circuit breaker: - **Activation position**	2 x EPU 3 (0.5) A 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V~ 5°, 80°
Torque - **Motor** - **Return spring**	 18 Nm 12 Nm	 18 Nm 12 Nm
Cable connection: - **Motor (length: 0.9 m)** - **Auxiliary circuit breaker**	 2 x 0.75 mm^2 6 x 0.75 mm^2	 2 x 0.75 mm^2 2 x 0.75 mm^2
Movement time (0-90°) - **Motor** - **Return spring**	 120 s ~16 s	 120 s ~16 s
Operating temperature range	-30…+50°C	-30…+50°C
Sound intensity level: - **Motor** - **Return spring**	 max 45 dB (A) ~63 dB (A)	 max 45 dB (A) ~63 dB (A)

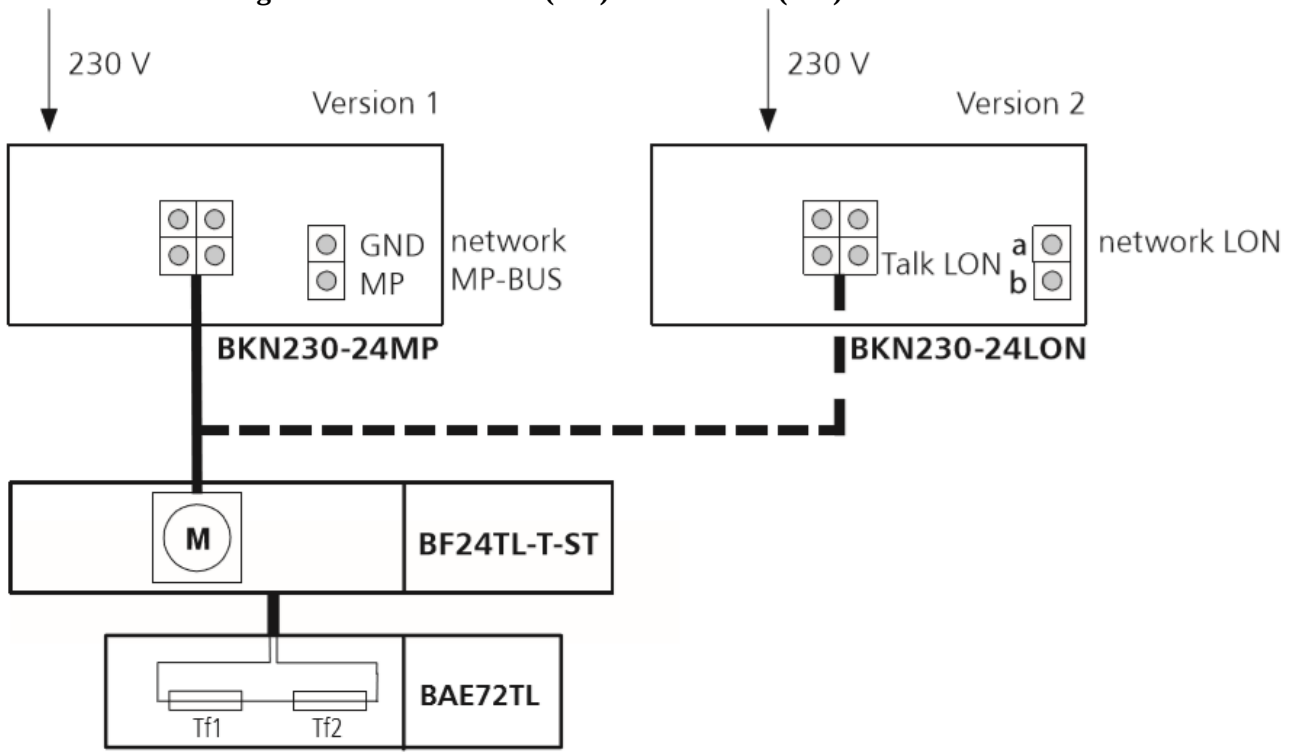
9.2.1.1 Electrical diagram of the BF…-T series actuator:



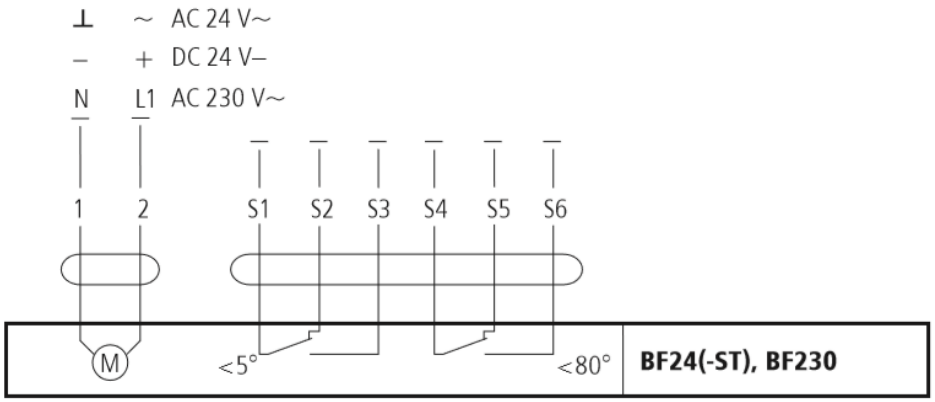
note: 24 V connection through a safety transformer.
To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch. It is possible to connect further actuators in parallel. Check the power consumption.

note:
The location of the actuator limit switches is shown for the no voltage position.

9.2.1.2 Electrical diagram of the BF24TL-T(-ST) and BF24TL(-ST) actuator:



9.2.1.3 Electrical Diagram of the BF series actuator:



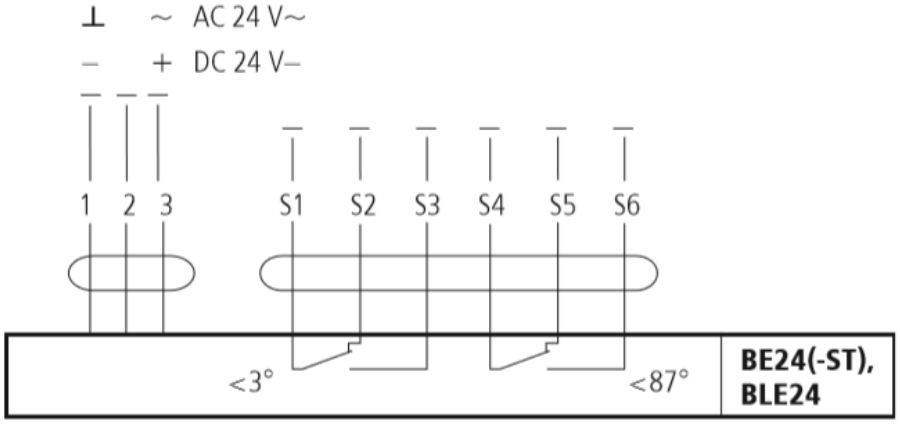
note: 24 V connection through a safety transformer. To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch. It is possible to connect further actuators in parallel. Check the power consumption.

note:
The location of the actuator limit switches is shown for the no voltage position.

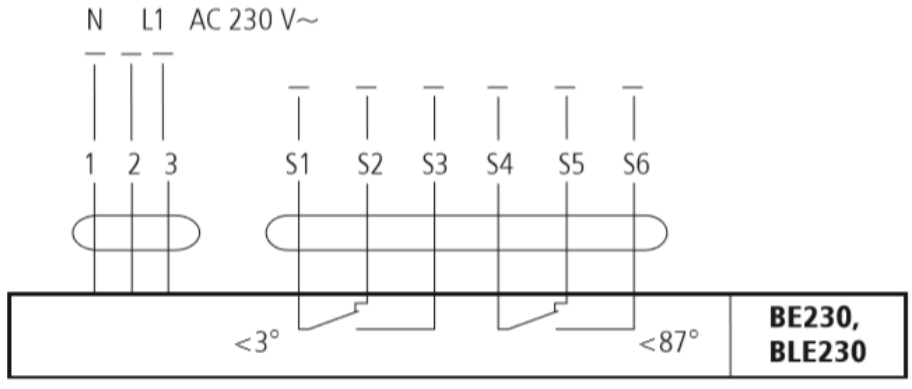
9.2.2 BE, BLE electric actuators

Specifications	BE24. BE24-ST	BE230	BLE24	BLE230
Power Supply	AC 24 V 50/60 Hz	AC 230 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz
Power demand: **- In movement** **- For holding**	 12 W 0.5 W	 8 W 0.5 W	 7.5 W 0.5 W	 5 W 0.5
Sizing (apparent power)	18 VA	15 VA	9 VA	12 VA
Protection class	III	II	III	II
Ingress protection rating	IP 54	IP 54	IP 54	IP 54
Auxiliary circuit breaker:	2 x SPDT 6 (1.5) A AC 250 V	2 x SPDT 6 (1.5) A AC 250 V	2 x EPU 3 (1.5) A 250 V	2 x EPU 3 (1.5) A 250 V~
- Activation position	5°, 80°	5°, 80°	5°, 80°	5°, 80°
Torque - motor	40 Nm	40 Nm	15 Nm	15 Nm
Movement time (0-90°) – motor	< 60 s for 90°	< 60 s for 90°	< 30 s for 90°	< 30 s for 90°
Operating temperature	-30…+50°C	-30…+50°C	-30…+50°C	-30…+50°C
Sound intensity level	~62 dB (A)	~62 dB (A)	~62 dB (A)	~62 dB (A)

9.2.2.1Electric diagram of the BE, BLE series actuator



note:
The actuator operation control requires routing three wire system to it. The actuator rotation sense is changed by the application of the power supply voltage to the terminal 2 or 3, depending on the desired direction.



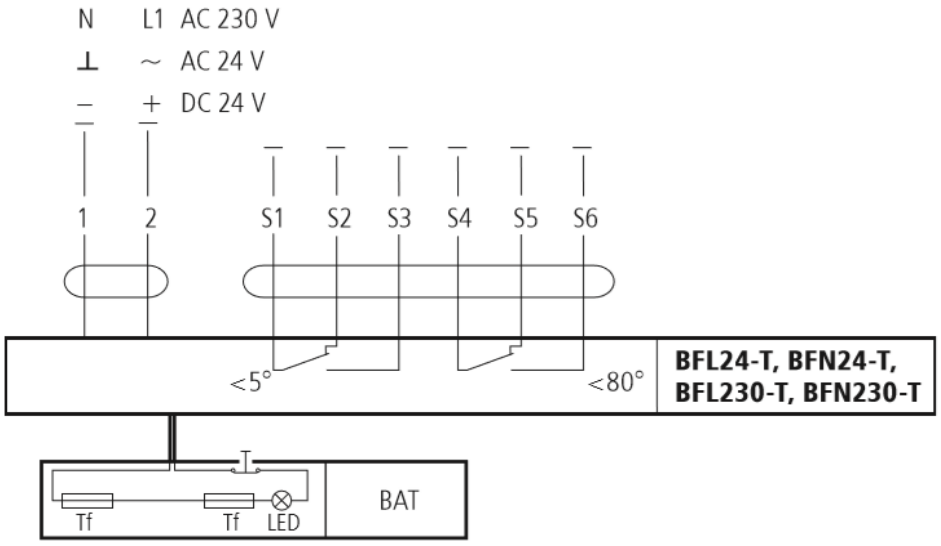
note: 24 V connection through a safety transformer.
To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch. It is possible to connect further drives in parallel. Check the power consumption.

note:
The location of the actuator limit switches is shown for the no voltage position.

9.2.3 BFL, BFN ELECTRIC ACTUATORS

Specifications	BFL24 (BFL24-T)	BFL230 (BFL230-T)	BFN24 (BFN24-T)	BFN230 (BFN230-T)
Power Supply	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
Power demand: **- Spring tensioning** **- For holding**	 2.5 W 0.7 W	 3.5 W 1.1 W	 4 W 1.4 W	 5 W 2.1
Sizing (apparent power)	4 VA	6.5 VA	6 VA	10 VA
Protection class	III	II	III	II
Ingress protection rating	IP 54	IP 54	IP 54	IP 54
Auxiliary circuit breaker: **- Activation position**	2 x SPDT 3 (0.5) A AC 250 V 5°, 80°	2 x SPDT 3 (0.5) A AC 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V 5°, 80°
Torque **- motor** **- return spring**	 4 Nm 3 Nm	 4 Nm 3 Nm	 9 Nm 7 Nm	 9 Nm 7 Nm
Movement time (0-90°): **- motor** **- return spring**	 < 60 s ~20 s	 < 60 s ~20 s	 < 60 s ~20 s	 < 60 s ~20 s
Operating temperature	-30…+55°C	-30…+55°C	-30…+55°C	-30…+55°C
Sound intensity level **- motor** **- return spring**	 max 43 dB (A) ~62 dB (A)	 max 43 dB (A) ~62 dB (A)	 max 55 dB (A) ~67 dB (A)	 max 55 dB (A) ~67 dB (A)

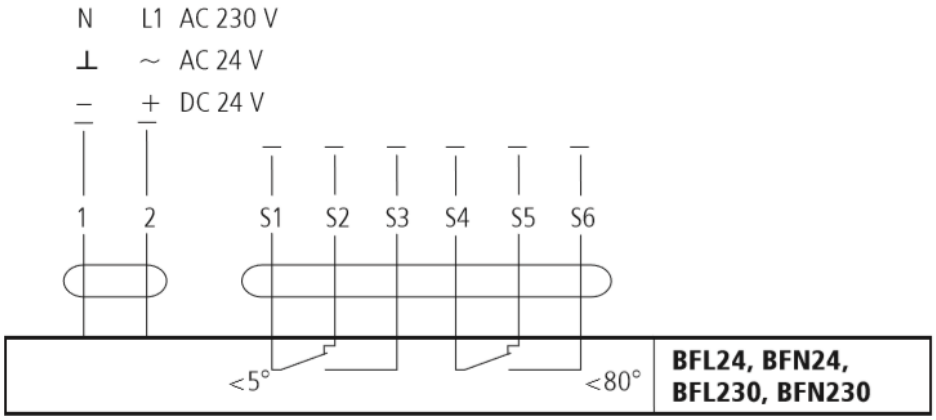
9.2.3.1 Electrical diagram of the BFL…-T, BFN…-T series actuator:



note: 24 V connection through a safety transformer. To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch. It is possible to connect further actuators in parallel. Check the power consumption.

note:
The location of the actuator limit switches is shown for the no voltage position.

9.2.3.2 Electrical diagram of the BFL, BFN series actuator:



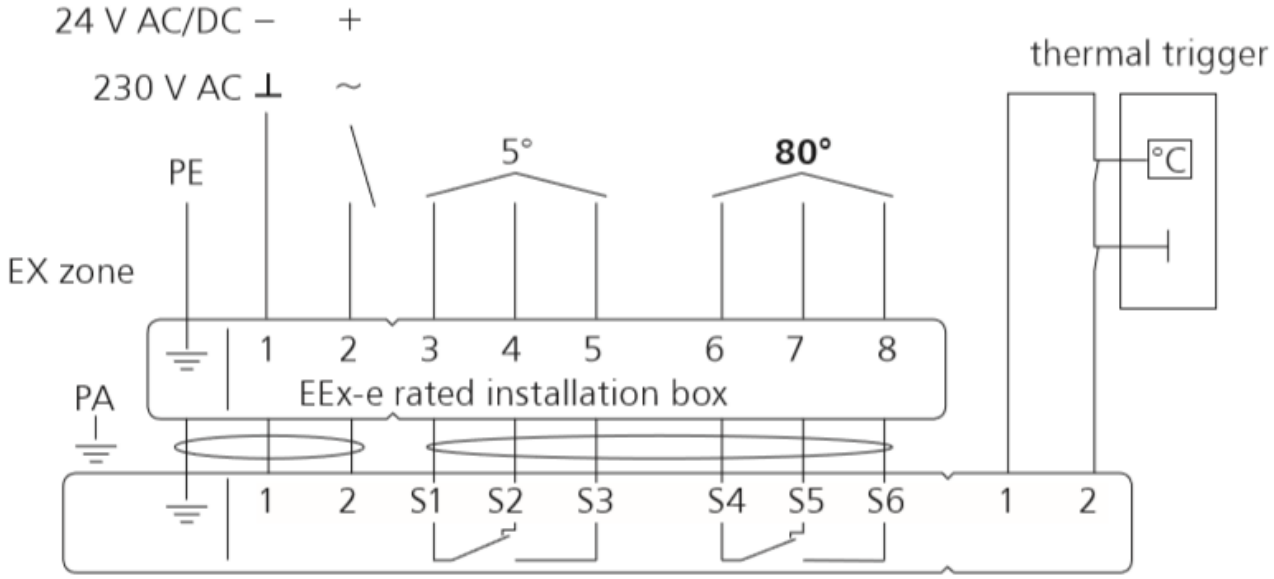
note: 24 V connection through a safety transformer.
To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch. It is possible to connect further actuators in parallel. Check the power consumption.

note:
The location of the actuator limit switches is shown for the no voltage position.

9.2.4 EXBF actuators

SPECIFIKATIONS	EXBF B 001 2…0 N 000	EXBF A 001 2 …0 N 000
Zone	1, 2, 21, 22	
ATEX-rating	II 2 GD EEx d IIC T6	
Power supply	24 V AC ±20% 50/60 Hz / 24 V DC -10/+20%	230 V AC ±14% 50/60 Hz
Power demand: **- For spring tensioning** **- For holding**	 7 W 2 W	 8 W 3 W
Sizing (apparent power)	10 VA	11 VA
Ingress protection rating	IP 66	IP 66
Auxiliary circuit breaker:	2 x SPDT 6 A (3) max 250 v AC	2 x SPDT 6 A (3) max 250 V AC
- Activation position	5°, 80°	5°, 80°
Torque: **- Motor** **- Return spring**	 18 Nm 12 Nm	 18 Nm 12 Nm
Movement time (0-90°) - **Motor** - **Return spring**	 150 s ~20 s	 150 s ~20 s
Ambient temperature	-30…+50°C	-30…+50°C

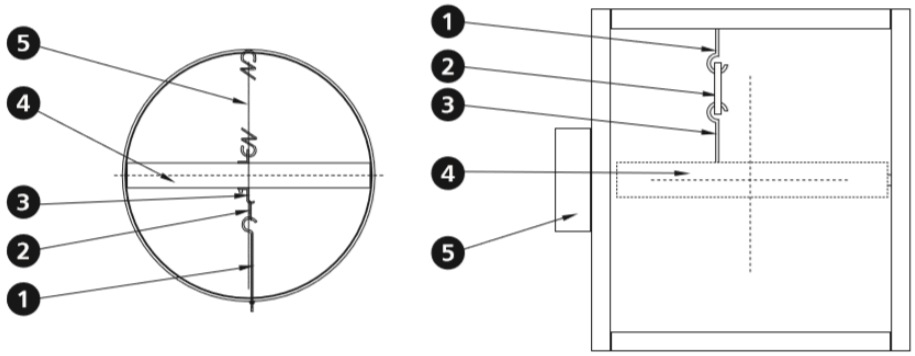
9.2.4.1 Connection diagram for EXBF and EXBF…-T actuators:



9.3 RST trigger control mechanisms

In the RST version the WK1 limit switches are independent units installed inside the fire damper casing. The thermal trigger is on the damper blade. The driving spring is installed on the damper blade or in a guard box on its casing.

1. Moving hook with nut
2. Fusible link
3. Fixed hook on the damper blade
4. Damper blade
5. Drive spring



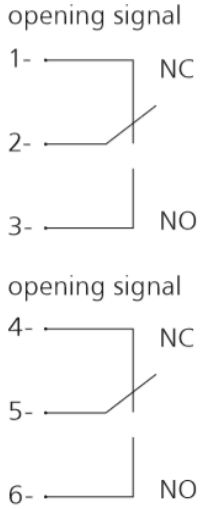
9.3.1 Independent limit switches – RST version

WK1 – limit switch (closed damper blade signal)
WK2 – limit switch (closed/open damper blade signal)

9.3.2 Switch specifications

WK1 and WK2 limit switch	1xNO/1xNC SPDT 5 A, 230 V AC
Limit switch operating temperature	-25 ... +85°C
Casing	plastic

9.3.2.1 Electric connection diagram of WK1 and WK2 limit switches



note:
When the damper blade closes, the closed indication limit switch is switched over (contacts 2-3 are closed).

9.4 RST-KW1 mechanisms

	RST-KW1/S	RST-KW1/S/WK2	RST-KW1/24I	RST-KW1/24P	RST-KW1/230I	RST-KW1/230P
Rated voltage	-	-	24 V – 48 V DC	24 V – 48 V DC	230 AC	230 AC
Power consumption	-	-	3.5 W	1.6 W	2 W	2 W
Thermal trigger	74°C (optionally 95°C)					
Connections – trigger	-	-	Wire 0.6m, 2 x 0.5 mm^2			
Connections – limit switches	-	Wire 0.6m, 6 x 0.5 mm^2				
Limit switch	-	2 x BI/NC 5A. 230 V AC				
Movement time	max. 2 s					
Mechanism operation control (closing)	-	-	Voltage application „pulse”	Voltage removal „break”	Voltage application „pulse”	Voltage removal „break”
Mechanism operation control (opening)	Manual	Manual	Manual	Manual	Manual	Manual
Pulse width	max. 1 s					

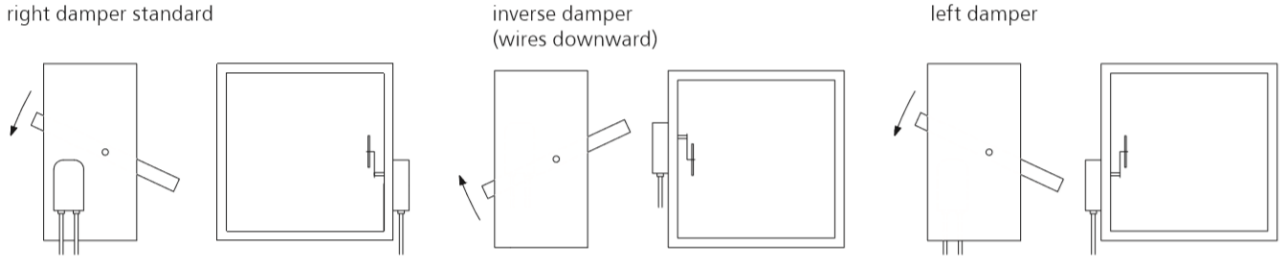
9.4.1 Description of electrical connections:

RST-KW1 mechanism power supply	**Closing limit switch**	**Opening limit switch**
Wire number: 1-2	Wire number: 3-4 – NO (normally open)	Wire number 6-7 – NO (normally open)
	Wire number 4-5 – NC (normally closed)	Wire number 7-8 – NC (normally closed)

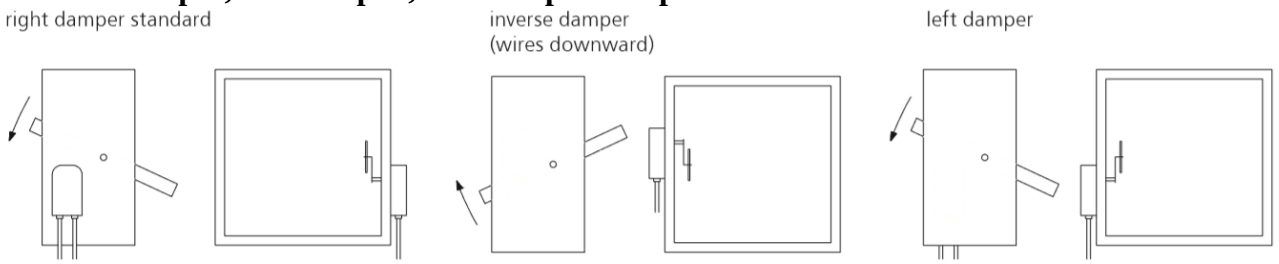
9.5 Manufacture standards

Damper type	Description	Standard	Option
FID S/S c/P	Right damper	X	
	Inverse damper		X
	Left damper		X
	Actuator normal to the axis flow	X	
	Actuator along the axis flow		
FID S/S p/P FID S/V p/P	Right damper	X	
	Inverse damper		X
	Left damper		X
	Actuator normal to the axis flow	X	
	Actuator along the axis flow		X
FID S/S p/O	Right damper	X	
	Inverse damper		
	Left damper		
	Actuator normal to the axis flow	X	
	BF actuator along the v (exception)	X	
	Actuator along the axis flow		X
FID PRO	Right damper	X	
	Inverse damper		
	Left damper		
	Actuator normal to the axis flow	X	
	Actuator along the axis flow		X
WIP	Right damper		
	Inverse damper		X
	Left damper		X
	Actuator normal to the axis flow	X	
	Actuator along the axis flow	X	
WIP PRO	Right damper		X
	Inverse damper		X
	Left damper	X	
	Actuator normal to the axis flow	X	
	Actuator along the axis flow		

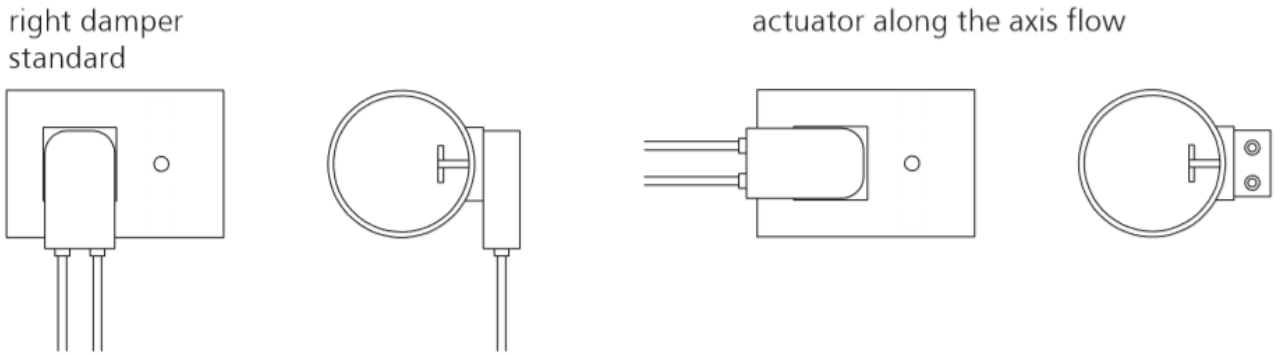
9.5.1 FID S/S c/P damper



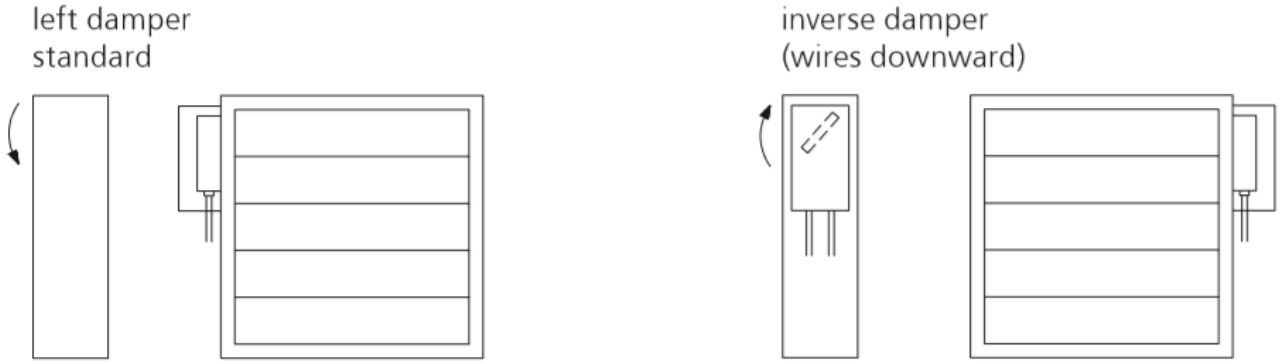
9.5.2 FID S/S p/P, FID S/S p/O, FID S/V p/P damper



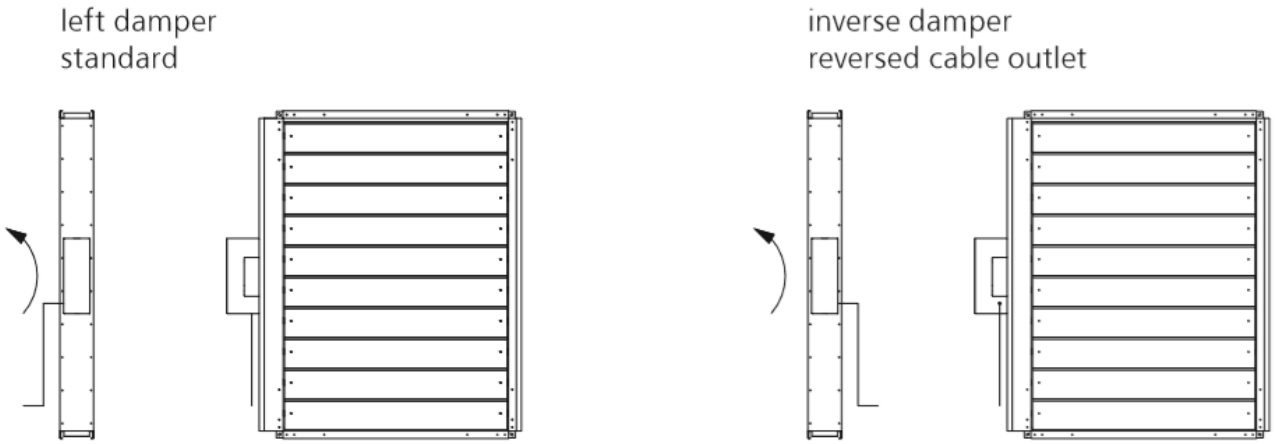
9.5.3 FID PRO/S damper



9.5.4 WIP/S, WIP/V, WIP/V-M, WIP/T, WIP/T-G damper



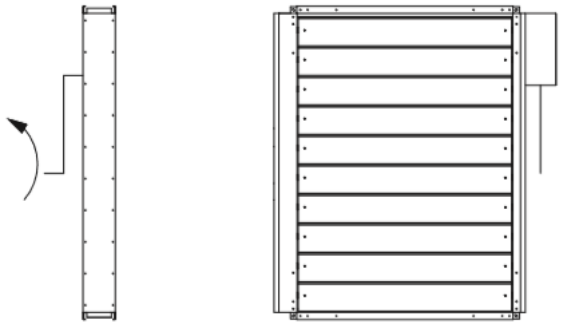
9.5.5 WIP PRO/S, WIP PRO/V, WIP PRO/V-M damper with an actuator



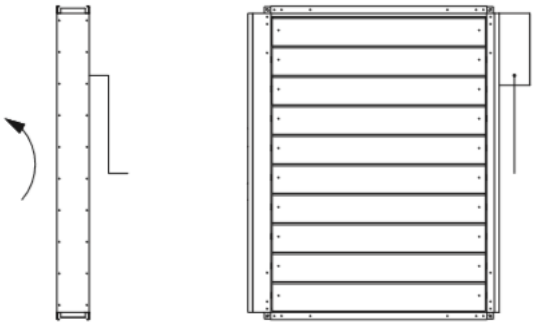
Installation in reversed horizontal and vertical position available

9.5.6 WIP PRO/S, WIP PRO/V, VIP PRO/V-M damper with RST-KW1 mechanism

left damper
standard



inverse damper
reversed cable outlet



Installation in reversed horizontal and vertical position available