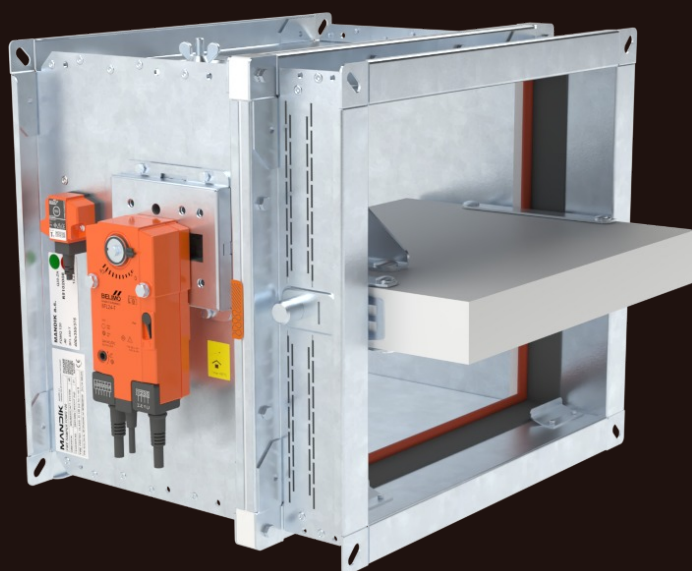


FDMQ 120

Fire damper

Technical Documentation

Installation, Commissioning, Operation, Maintenance and Service Manual



UK
CA
2822

CE
1391



MANDÍK®

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Manufacturer

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These technical specifications state a row of manufactured sizes and models of fire dampers FDMQ 120.
It is valid for production, designing, ordering, delivery, maintenance and operation.

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I. GENERAL

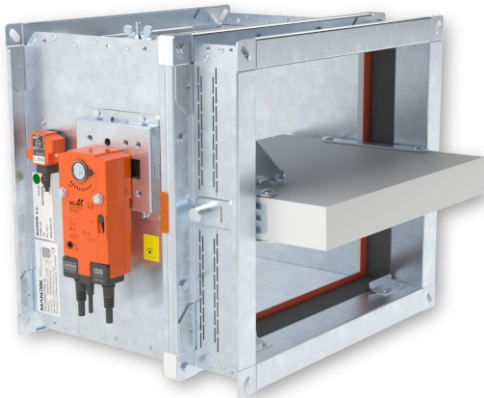
Description

Fire dampers are shutters in ducts of air-conditioning devices that prevent the spread of fire and combustion products from one fire segment to the other one by means of closing the duct in the points of fire separating constructions.

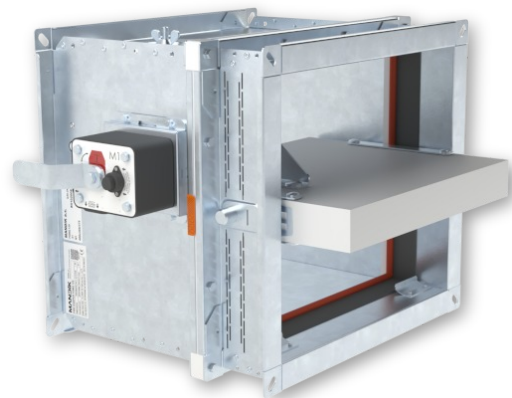
Damper blade automatically closes air duct using a closing spring or a spring return actuator. The closing spring is actuated by pressing a button on the manual control or by melting a fusible link.

The return spring of the actuator is actuated when a thermoelectric activation device BAT is activated, when a test button on BAT is pressed or when power supply of the actuator is interrupted.

After closing the blade, the damper is sealed with silicon against smoke penetration. On request by customer, the damper can be supplied silicon-free. In the closed position, the damper is also sealed with material which increases its volume due to increasing temperature and air proofs the air duct.



FDMQ 120 with spring return actuator



FDMQ 120 with manual control

Damper characteristics

- CE certified acc. to BS EN 15650
- Tested in accordance with BS EN 1366-2
- Classified acc. to BS EN 13501-3+A1
- External Casing leakage class min. ATC 3 (old marking "C") acc. to BS EN 1751, Internal leakage min. class 2 acc. to BS EN 1751
- Cycling test in class C₁₀₀₀₀ acc. to BS EN 15650
- Corrosion resistant acc. to BS EN 15650
- Certificate of constancy of performance UKCA No. [2822-UKCA-CPR-XXXX](#)
- Certificate of constancy of performance CE No. [1391-CPR-XXXX/XXXX](#)
- Declaration of Performance UKCA No. [PM/FDMQ 120/02/XX/X](#)
- Declaration of Performance CE No. [PM/FDMQ 120/01/XX/X](#)
- Hygienic assessment of fire dampers - Report No. [1.6/pos/19/19b](#)

Working conditions

- Exact damper function is provided under the following conditions:
 - maximum air velocity 12 m/s
 - maximum pressure difference 1200 Pa
 - the air circulation in the whole damper section must be secured steady over the entire surface.
- Dampers can be installed with horizontal blade axis.
- Dampers are suitable for systems without abrasive, chemical and adhesive particles.
- Dampers are designed for macroclimatic areas with mild climate according to BS EN IEC 60 721-3-3 ed.2., class 3K22. (Environment 3K22 is typically protected place with regulated temperature)
- Temperature in the place of installation is permitted to range from -30°C to +50°C.

II. DESIGN

Design with manual control

Design .01

- Design with manual control with a fusible link which actuates the shutting device, after the nominal activation temperature 72°C has been reached.
- Automatic initiation of the manual control is not activated if the temperature does not exceed 70°C.
- In case that other activation temperatures are required, fusible links with nominal activation temperature +104°C or +147°C can be supplied (this requirement must be specified in the order).



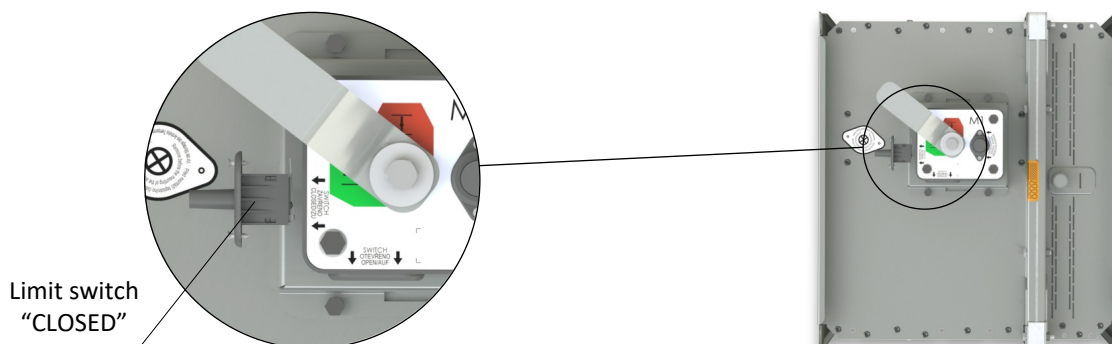
Design .01

ATTENTION:

- Manual controls are produced in four sizes M2 to M5, difference is only in size of a closing spring, which closes the fire damper.
- For the size of fire dampers is always assigned the size of the manual control → see pages 14 to 19
- It is not recommended to use different size of the manual control than given by the manufacturer, otherwise there is a risk of damaging the fire damper.

Design .11

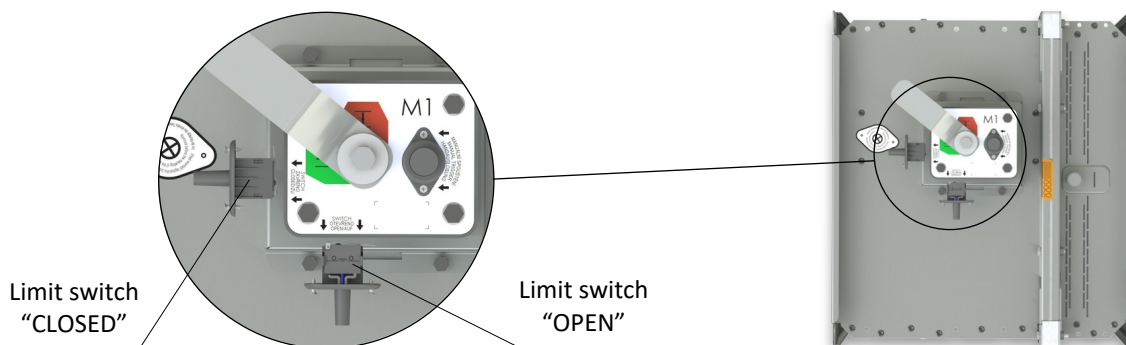
- Design .01 with manual control can be complemented with a limit switch signaling of the damper blade position "CLOSED".
- Cable is connected directly to limit switch.
- Limit switch detail → see page 5



Design .11

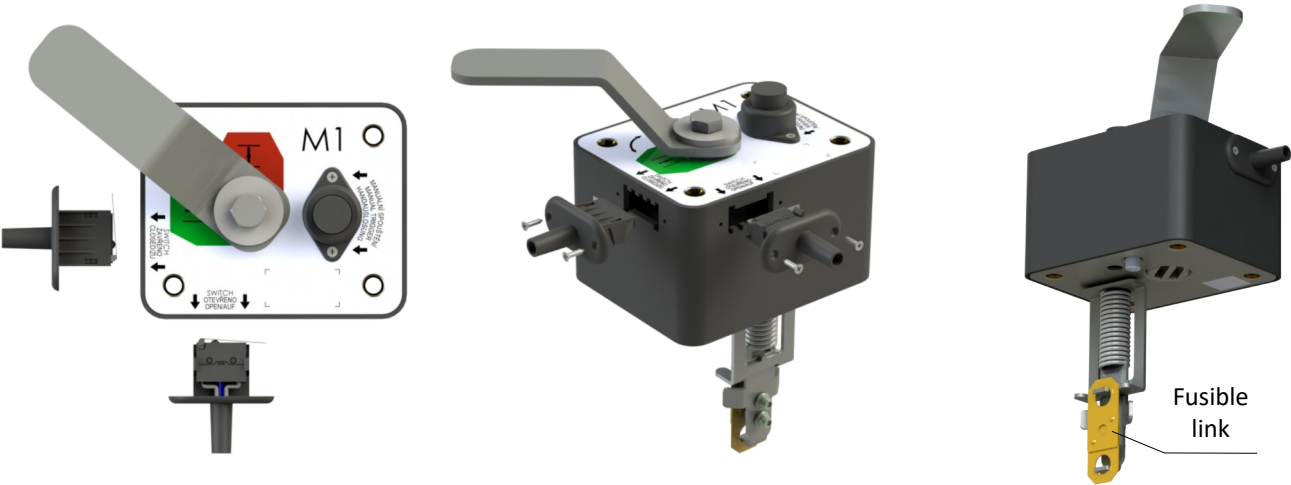
Design .80

- Design .01 with manual control can be complemented with two limit switches signaling of the damper blade position "CLOSED" and "OPEN".
- Cables are connected directly to limit switches.
- Limit switch detail → see page 5



Design .80

Manual control



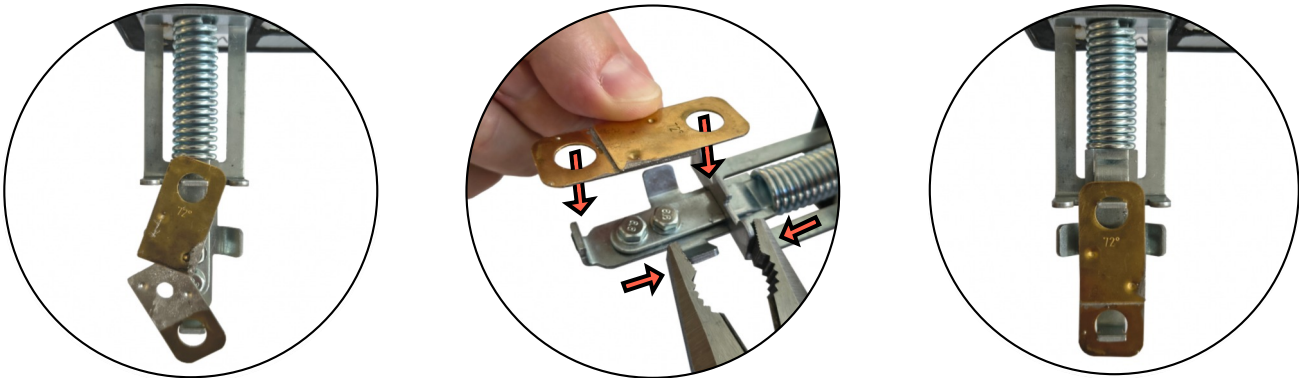
Fusible link replacement:*

- 1. The mechanism (damper) must be in the closed position (indicated by the red area on the sticker).
- 2. Press the Close button.
- 3. Using adjustable pliers, squeeze the fusible link clips together.
- 4. Pull the fusible link out of the clips.
- 5. Using adjustable pliers, squeeze the fusible link clips together again.
- 6. Insert the new fusible link into the clips.

Function check:**

- 7. Open the mechanism (damper) by moving the lever to the Open position (indicated by the green area on the sticker).
- 8. Press the Close button and check that the mechanism closes correctly. Repeat steps 7 and 8 at least 3 times.

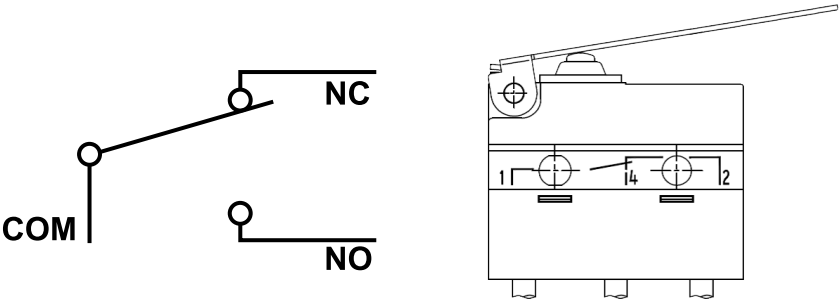
* The mechanism can be removed for change of the fusible link.
** Caution: Risk of injury from moving parts.



Limit switch G905-300E03W1

This limit switch is possible to connect in two following ways

- CUT-OFF if the arm is moving ... connect wire 1+2
- SWITCH-ON if the arm is moving ... connect wire 1+4



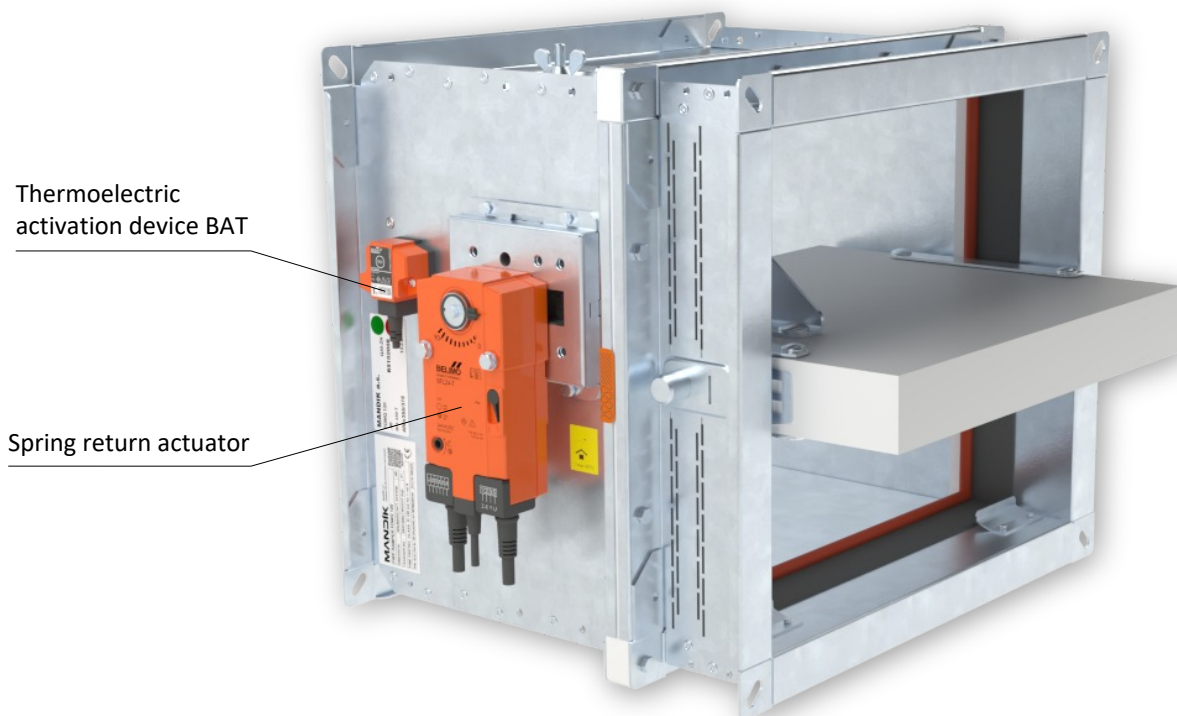
Nominal voltage and maximal current	AC 230V / 5A
Class of protection	IP 67
Working temperature	-25°C ... +120°C

- 1(COM) - black wire
- 2(NC) - gray wire
- 4(NO) - blue wire

Design with spring return actuator

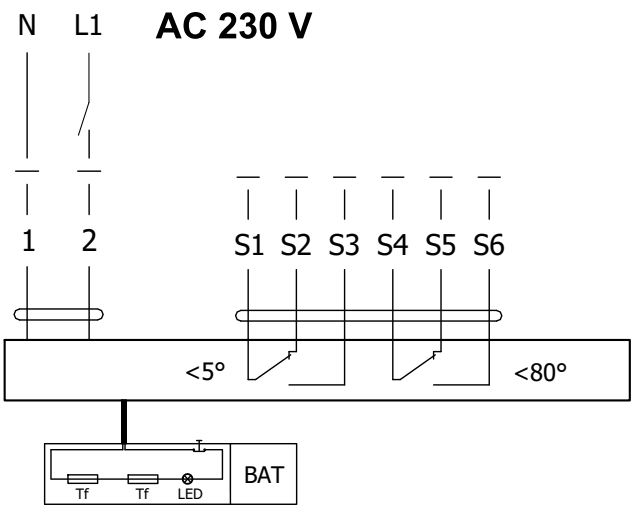
Design .40 and .50

- The fire dampers are equipped with Belimo spring return actuators with thermoelectric activation device BAT. The spring return actuator types are BFL, BFN or BF depending on the damper size. (Further mentioned as „actuator“).
- After being connected to power supply 230V or AC/DC 24V, the actuator rotates the damper blade to the operating position "OPEN" and at the same time pre-stretches its return spring.
- When the actuator is power supplied, the damper blade is in the position "OPEN" and the return spring is pre-stretched.
- Time needed for full opening of the damper blade from the position "CLOSED" to the position "OPEN" is maximum 120 sec. If the actuator power supply is interrupted (due to loss of supply voltage, or pressing a test button on the thermoelectric activation device BAT), the actuator rotates the damper blade to the breakdown position "CLOSED".
- The time of closing the damper blade from the position "OPEN" to the position "CLOSED" takes maximum 20 sec.
- In case that the power supply is restored again (the blade can be in any position), the actuator starts to rotate the damper blade back to the position "OPEN".
- A thermoelectric activation device BAT, which contains two fusible links Tf1 and Tf2, is an integral part of the actuator.
- These fuses are activated when temperature +72°C has been reached (the fuse Tf1 due to temperature outside the duct and the fuse Tf2 due to temperature inside the duct).
- After the fusible link Tf1 or Tf2 has been activated, the power supply is permanently and irreversibly interrupted and the actuator, by means of the pre-stretched spring, rotates the damper blade into the breakdown position "CLOSED".
- Signalisation of damper blade position "OPEN" and "CLOSE" is provided by two microswitches.

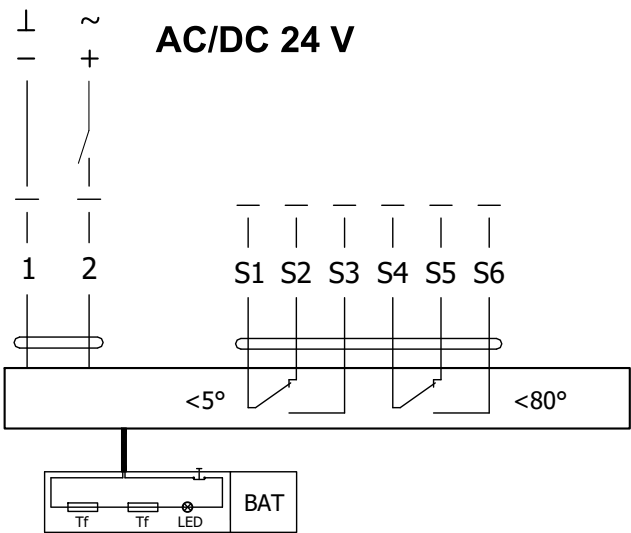


Design .40 and .50

Actuator BELIMO BFL 230-T



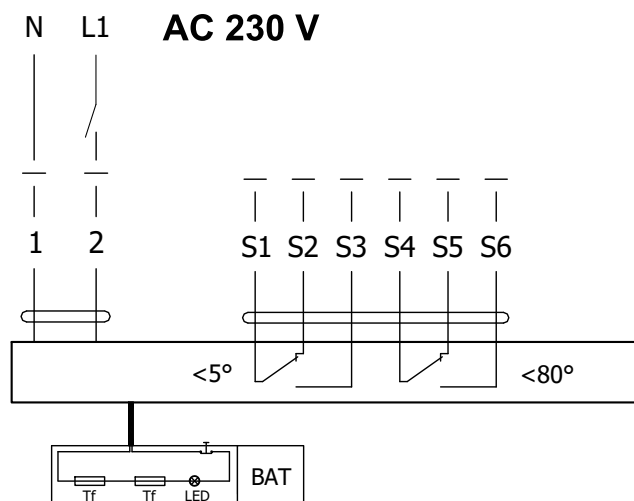
Actuator BELIMO BFL 24-T(-ST)



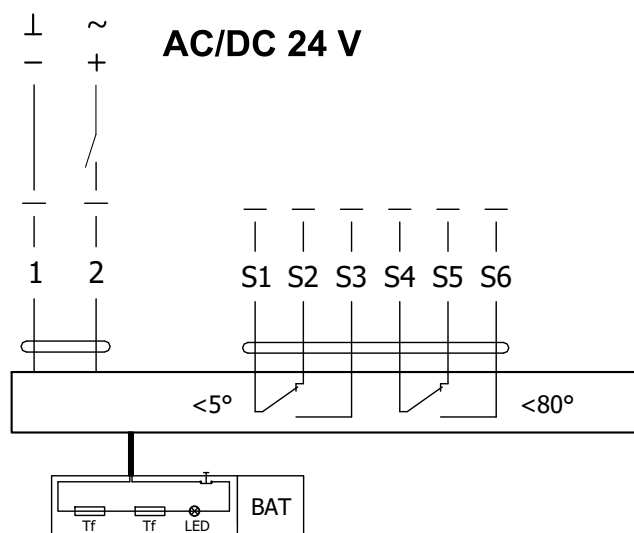
Actuator BELIMO BFL 230-T(-ST), BFL 24-T(-ST)

Actuator BELIMO - 4 Nm/ 3 Nm Spring	BFL 230-T(-ST)	BFL 24-T(-ST)
Power voltage	AC 230 V 50/60Hz	AC/DC 24 V 50/60Hz
Power consumption - in operation - in rest position	2,6 W 0,7 W	2,0 W 0,7 W
Dimensioning	4 VA (Imax 4 A @ 5 ms)	2,8 VA (Imax 2,9 A @ 5 ms)
Protection class	II	III
Degree of protection	IP 54	
Running time - motor - spring return	< 60 s ~ 20 s	
Ambient temperature - normal duty - safety duty - non-operating temperature	-30°C ... +55°C The safe position will be attained up to max. +75°C -40°C ... +55°C	
Connection - supply/control - auxiliary switch	cable 1 m, 2 x 0,75 mm ² (BFL 2xx-T-ST) with 3-pin plug-in connectors cable 1 m, 6 x 0,75 mm ² (BFL 2xx-T-ST) with 6-pin plug-in connectors	
Response temperature fusible link	duct outside temperature +72°C duct inside temperature +72°C	

Actuator BELIMO BFN 230-T

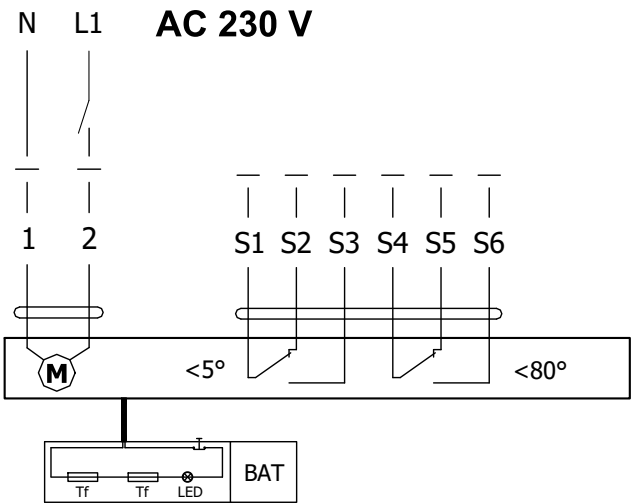


Actuator BELIMO BFN 24-T(-ST)

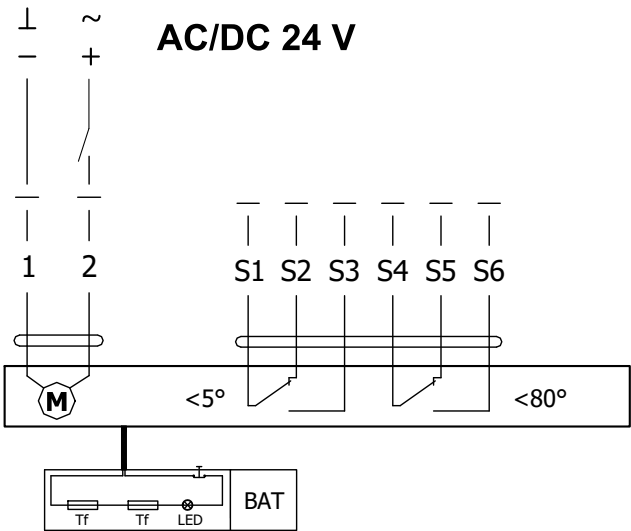


Actuator BELIMO BFN 230-T(-ST), BFN 24-T(-ST)		
Actuator BELIMO - 9 Nm/ 7 Nm Spring	BFN 230-T(-ST)	BFN 24-T(-ST)
Power voltage	AC 230 V 50/60Hz	AC/DC 24 V 50/60Hz
Power consumption - in operation - in rest position	3,5 W 1,3 W	3,2 W 1,2 W
Dimensioning	6,5 VA (I _{max} 4 A @ 5 ms)	4,3 VA (I _{max} 2,9 A @ 5 ms)
Protection class	II	III
Degree of protection	IP 54	
Running time - motor - spring return	< 60 s ~ 20 s	
Ambient temperature - normal duty - safety duty - non-operating temperature	-30°C ... +55°C The safe position will be attained up to max. +75°C -40°C ... +55°C	
Connection - supply/control - auxiliary switch	cable 1 m, 2 x 0,75 mm ² (BFN 2xx-T-ST) with 3-pin plug-in connectors cable 1 m, 6 x 0,75 mm ² (BFN 2xx-T-ST) with 6-pin plug-in connectors	
Response temperature fusible link	duct outside temperature +72°C duct inside temperature +72°C	

Actuator BELIMO BF 230-TN



Actuator BELIMO BF 24-TN (-ST)



Actuator BELIMO BF 230-TN(-ST), BF 24-TN(-ST)

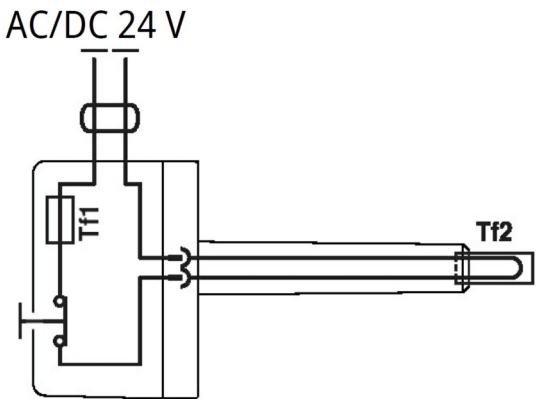
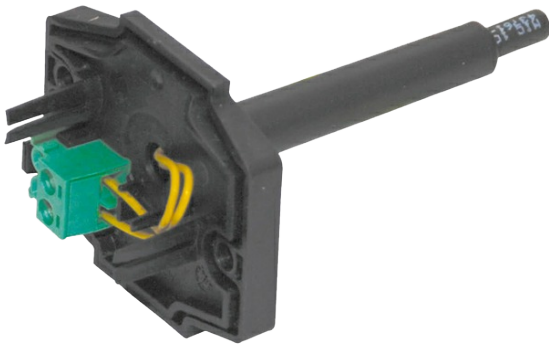
Actuator BELIMO - 18 Nm/ 12 Nm Spring	BF 230-TN(-ST)	BF 24-TN(-ST)
Power voltage	AC 230 V 50/60Hz	AC/DC 24 V 50/60Hz
Power consumption - in operation - in rest position	8,5 W 3 W	7 W 2 W
Dimensioning	11 VA (Imax 8,3 A @ 5 ms)	10 VA (Imax 8,3 A @ 5 ms)
Protection class	II	III
Degree of protection	IP 54	
Running time - motor - spring return	120 s ~ 16 s	
Ambient temperature - normal duty - safety duty - non-operating temperature	-30°C ... +50°C The safe position will be attained up to max. +75°C -40°C ... +50°C	
Connection - supply/control - auxiliary switch	cable 1 m, 2 x 0,75 mm ² (BF 2xx-TN-ST) with 3-pin plug-in connectors cable 1 m, 6 x 0,75 mm ² (BF 2xx-TN-ST) with 6-pin plug-in connectors	
Response temperature fusible link	duct outside temperature +72°C duct inside temperature +72°C	

Thermoelectric activation device BAT

- If the fusible link Tf1 is interrupted (due to temperature outside the duct), it is necessary to replace the spring return actuator. Thermoelectric activation device BAT is integral part of the actuator.
 - If the fusible link Tf2 is interrupted (due to temperature inside the duct) , only the spare part ZBAT 72 needs to be replaced.
- When one of the fusible links responds, the supply voltage is interrupted permanently and irreversibly.
 - The function (interruption of the supply voltage) can be checked by pressing the test button.
 - Installation is carried out with the pre-assembled, self-tapping screws.



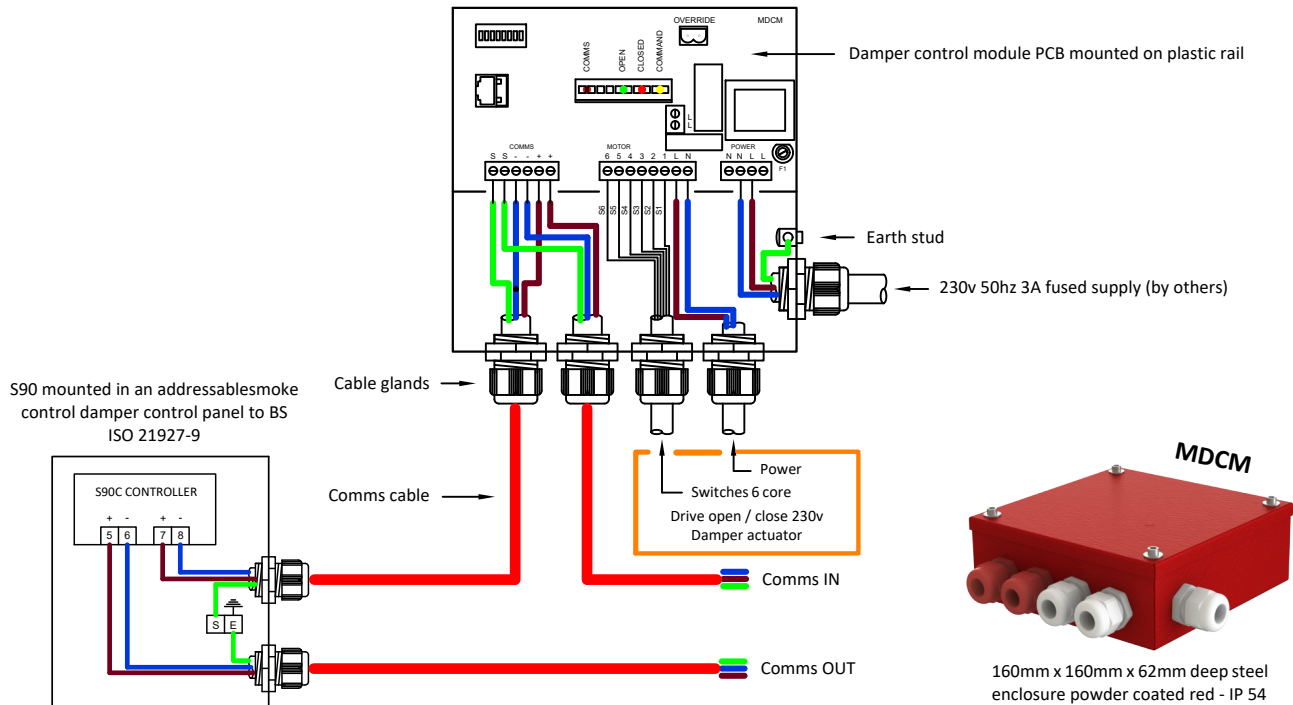
BELIMO ZBAT 72
Black (BK) = 72°C (standard)



Thermoelectrical starting mechanism BAT 72	
Power voltage	AC/DC 24 V 50/60Hz
Rated current	1 A
AC/DC throughput resistance	<1 Ω
Protection class	III
Degree of protection	IP 54
Probe length	65 mm
Ambient temperature	-30°C ... +50°C
Storage temperature	-40°C ... +50°C
Ambient humidity	Max. 95% RH, non-condensing
Connection supply	Cable 1 m, 2 x 0.5 mm², Betaflam cable heatresistant up to 145°C
Response temperature fusible link	Duct inside temperature 72°C Duct outside temperature 72°C

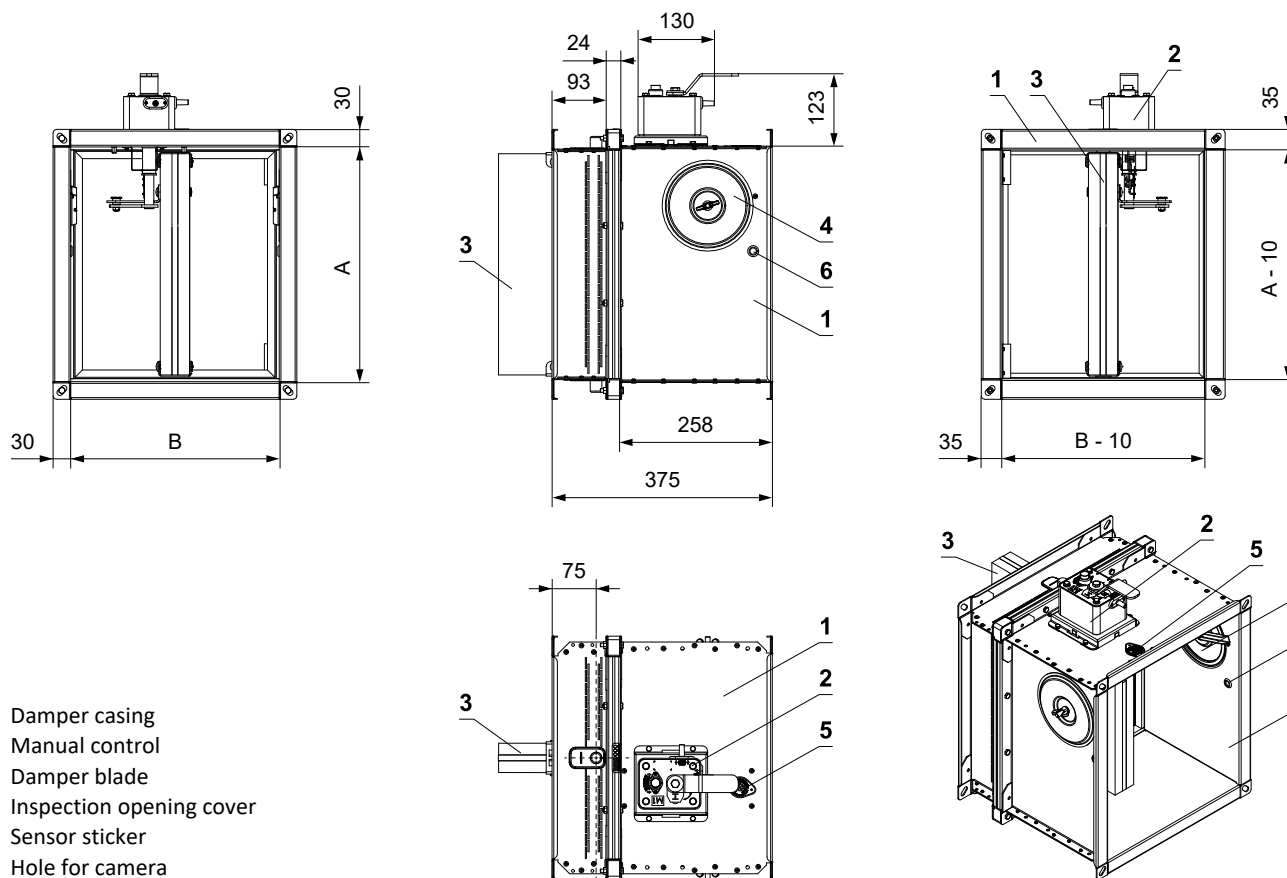
Communication and control module MDCM

- The MDCM damper control module is connected on a bi directional communication loop back to a control panel, typically located at the FCC.
- Each MDCM has a 230v local spur to power the damper actuator.
- Up to 96x MDCM's can be connected on one loop and multiple loops can be incorporated.
- This accessory is only required with MANDIK control systems.
- Max terminal size in MDCM 2.5 mm²

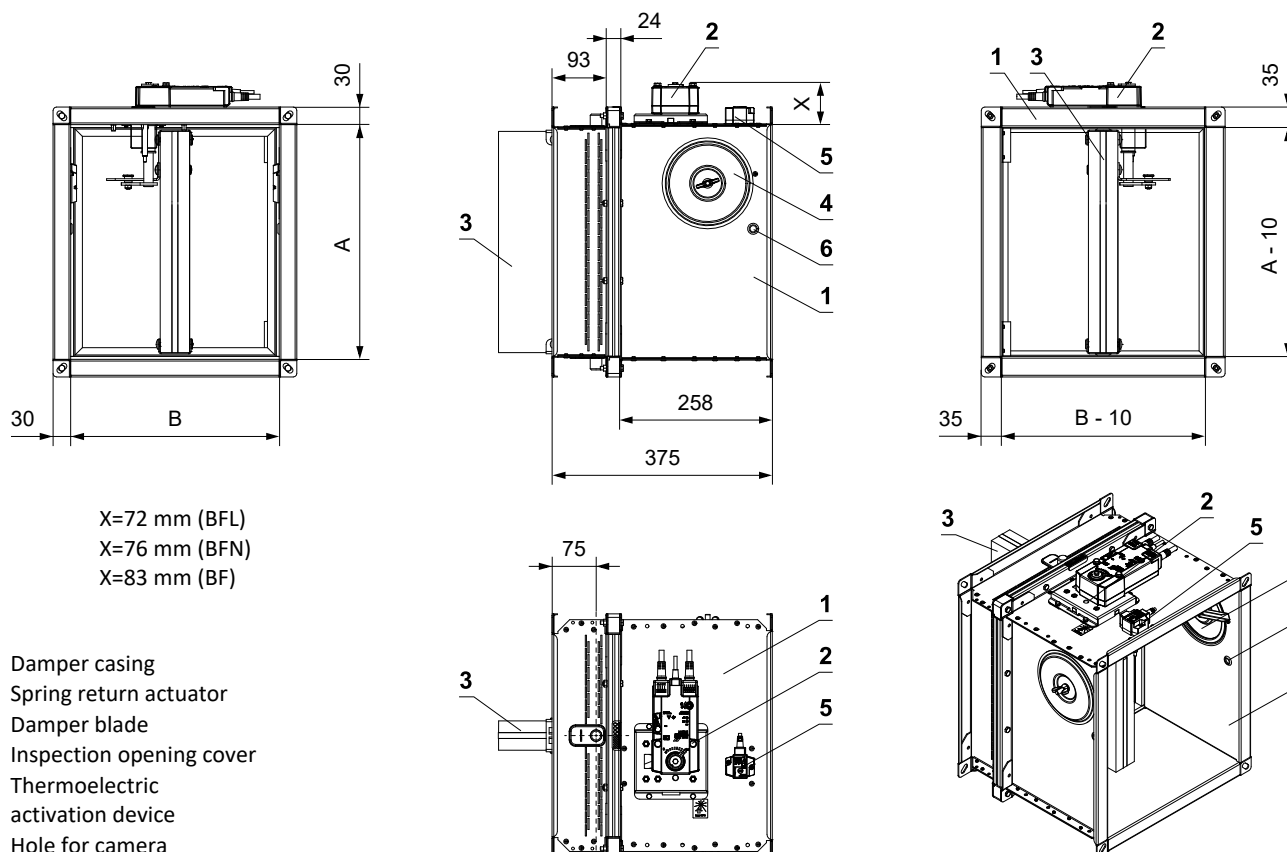


III. DIMENSIONS

FDMQ 120 with manual control

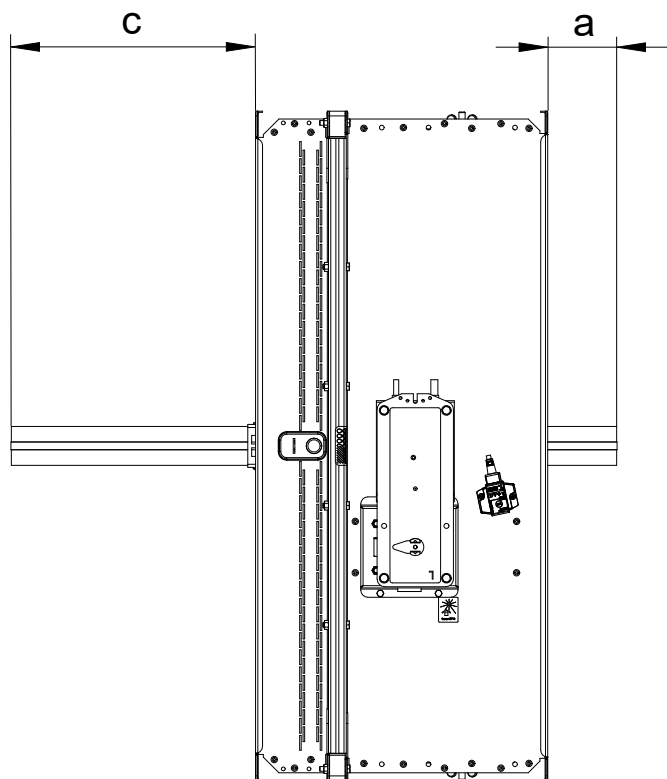


FDMQ 120 with spring return actuator

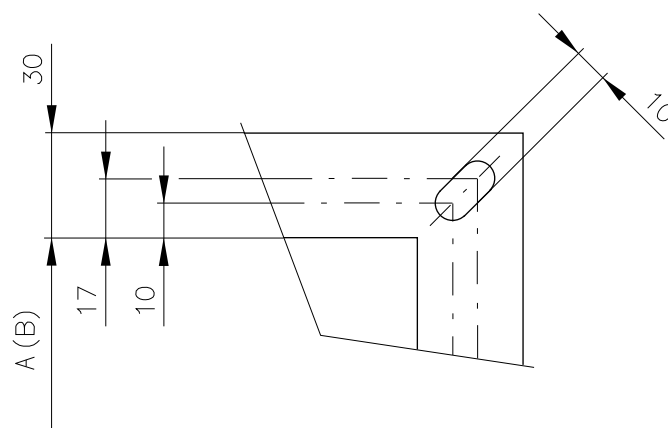
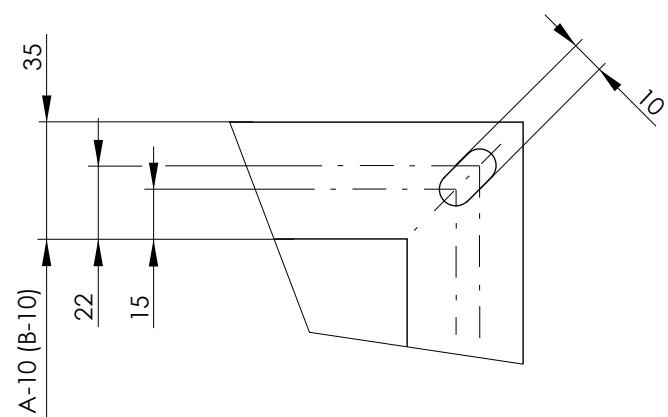


Damper blade overlaps

- Open damper blade overlaps the damper body by the value "c" or "a". These values are specified in chapter Technical parameters → see pages 14 to 19



Values "a" and "c" has to be respected when projecting following air-conditioning duct.

Flange of a damper - CONTROL SIDE**Flange of a damper - INSTALLATION SIDE**

30 mm wide flanges are fitted with oval holes in the corners

Technical parameters

A x B [mm]	Damper blade overlaps		Weight		Free area S _r [m ²]	Spring return actuator	Manual control	A x B [mm]	Damper blade overlaps		Weight		Free area S _r [m ²]	Spring return actuator	Manual control					
	a [mm]	c [mm]	Man. [kg]	Actu. [kg]*					a [mm]	c [mm]	Man. [kg]	Actu. [kg]*								
150 x	150	-	-	8,4	8,5	0,0094	BFL	M2	650	3	248	17,7	18	0,1006	BFL	M2				
	180	-	13	8,8	8,9	0,0131			700	28	273	18,6	18,8	0,1094	BFN					
	200	-	23	9	9,2	0,0156			710	33	278	18,7	19	0,1111						
	225	-	35,5	9,4	9,5	0,0188			750	53	298	19,4	19,7	0,1181						
	250	-	48	9,7	9,8	0,0219			800	78	323	20,2	20,5	0,1269						
	280	-	63	10,1	10,2	0,0256			150	-	-	9,4	9,5	0,0150			BFL			
	300	-	73	10,4	10,5	0,0281			180	-	13	10	10,1	0,0210	M2					
	315	-	80,5	10,6	10,7	0,0300			200	-	23	10,4	10,5	0,0250						
	355	-	100,5	11,1	11,2	0,0350			225	-	36	10,9	11	0,0300						
	400	-	123	11,7	11,8	0,0406			250	-	48	11,3	11,5	0,0350						
	450	-	148	12,3	12,5	0,0469			280	-	63	11,9	12,1	0,0410						
	500	-	173	13	13,2	0,0531			300	-	73	12,3	12,5	0,0450						
	550	-	198	13,6	13,8	0,0594			315	-	80,5	12,6	12,8	0,0480						
	560	-	203	13,8	14	0,0606			355	-	100,5	13,4	13,6	0,0560						
	600	-	223	14,3	14,5	0,0656			400	-	123	14,3	14,5	0,0650						
	630	-	238	14,7	14,9	0,0694			450	-	148	15,3	15,5	0,0750						
	180 x	150	-	-	8,8	8,9			0,0116	BFL	M2	500	-	173		16,2		16,5	0,0850	BFN
		180	-	13	9,2	9,4			0,0163			550	-	198		17,2	17,4	0,0950		
200		-	23	9,6	9,7	0,0194	560	-	203			17,4	17,6	0,0970						
225		-	36	10	10,1	0,0233	600	-	223			18,1	18,4	0,1050						
250		-	48	10,4	10,5	0,0271	630	-	238			18,7	19	0,1110						
280		-	63	10,8	11	0,0318	650	3	248			19,1	19,4	0,1150						
300		-	73	11,1	11,3	0,0349	700	28	273			20	20,3	0,1250	BFN					
315		-	80,5	11,4	11,6	0,0372	710	33	278			20,2	20,5	0,1270						
355		-	100,5	12	12,2	0,0434	750	53	298			21	21,3	0,1350						
400		-	123	12,7	12,9	0,0504	800	78	323			21,9	22,2	0,1450						
450		-	148	13,5	13,7	0,0581	150	-	-			9,7	9,8	0,0169		BFL				
500		-	173	14,3	14,5	0,0659	180	-	13			10,4	10,5	0,0236						
550		-	198	15,1	15,3	0,0736	200	-	23			10,8	11	0,0281						
560		-	203	15,2	15,5	0,0752	225	-	36			11,3	11,5	0,0338						
600		-	223	15,8	16,1	0,0814	250	-	48			11,9	12,1	0,0394						
630		-	238	16,3	16,5	0,0860	280	-	63			12,6	12,7	0,0461						
650		3	248	16,6	16,9	0,0891	300	-	73			13	13,2	0,0506	BFL					
700		28	273	17,4	17,6	0,0969	315	-	80,5			13,3	13,5	0,0540						
710	33	278	17,5	17,8	0,0984	355	-	100,5	14,2	14,4	0,0630									
750	53	298	18,1	18,4	0,1046	400	-	123	15,2	15,4	0,0731									
800	78	323	18,9	19,2	0,1124	450	-	148	16,2	16,5	0,0844									
200 x	150	-	-	9	9,2	0,0131	BFL	M2	500	-	173	17,3	17,6	0,0956		BFN	M3			
	180	-	13	9,6	9,7	0,0184			550	-	198	18,3	18,6	0,1069						
	200	-	23	9,9	10,1	0,0219			560	-	203	18,6	18,8	0,1091						
	225	-	36	10,4	10,5	0,0263			600	-	223	19,4	19,7	0,1181						
	250	-	48	10,8	11	0,0306			630	-	238	20	20,3	0,1249						
	280	-	63	11,3	11,5	0,0359			650	3	248	20,4	20,8	0,1294						
	300	-	73	11,7	11,8	0,0394			700	28	273	21,5	21,8	0,1406	BFN					
	315	-	80,5	11,9	12,1	0,0420			710	33	278	21,7	22	0,1429						
	355	-	100,5	12,6	12,8	0,0490			750	53	298	22,5	22,9	0,1519						
	400	-	123	13,4	13,6	0,0569			800	78	323	23,5	23,9	0,1631						
	450	-	148	14,3	14,5	0,0656			150	-	-	10,1	10,2	0,0191		BFL				
	500	-	173	15,2	15,4	0,0744			180	-	13	10,8	11	0,0268						
	550	-	198	16	16,3	0,0831			200	-	23	11,3	11,5	0,0319						
	560	-	203	16,2	16,4	0,0849			225	-	36	11,9	12,1	0,0383						
	600	-	223	16,9	17,1	0,0919			250	-	48	12,6	12,7	0,0446						
	630	-	238	17,4	17,6	0,0971			280	-	63	13,3	13,5	0,0523						

Sizes in increments of 5 mm can be manufactured on request.

A x B [mm]		Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	A x B [mm]		Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control
		a [mm]	c [mm]	Man. [kg]	Actu. [kg]*						a [mm]	c [mm]	Man. [kg]	Actu. [kg]*			
280 x	300	-	73	13,8	14	0,0574	BFL	M2	315 x	710	33	278	25,4	25,8	0,1842	BFN	M2
	315	-	80,5	14,1	14,3	0,0612				750	53	298	26,4	26,9	0,1958		M3
	355	-	100,5	15,1	15,3	0,0714				800	78	323	27,7	28,1	0,2103		
	400	-	123	16,2	16,4	0,0829				150	-	-	11,1	11,2	0,0248	BFL	M2
	450	-	148	17,4	17,6	0,0956				180	-	13	12	12,2	0,0347		
	500	-	173	18,6	18,8	0,1084				200	-	23	12,6	12,8	0,0413		
	550	-	198	19,7	20	0,1211				225	-	36	13,4	13,6	0,0495		
	560	-	203	20	20,3	0,1237				250	-	48	14,2	14,4	0,0578		
	600	-	223	20,9	21,2	0,1339	280			-	63	15,1	15,3	0,0677			
	630	-	238	21,6	21,9	0,1415	300			-	73	15,7	15,9	0,0743			
	650	3	248	22	22,4	0,1466	315			-	80,5	16,2	16,4	0,0792	M2		
	700	28	273	23,2	23,6	0,1594	355			-	100,5	17,4	17,6	0,0924			
	710	33	278	23,4	23,8	0,1619	400			-	123	18,7	19	0,1073			
	750	53	298	24,3	24,7	0,1721	450			-	148	20,2	20,5	0,1238			
800	78	323	25,5	25,9	0,1849	M3	500	-	173	21,7	22	0,1403					
300 x	150	-	-	10,4	10,5		0,0206	550	-	198	23,1	23,5	0,1568	BFN	M3		
	180	-	13	11,1	11,3	0,0289	560	-	203	23,4	23,8	0,1601					
	200	-	23	11,7	11,8	0,0344	600	-	223	24,6	25	0,1733					
	225	-	36	12,3	12,5	0,0413	630	-	238	25,4	25,8	0,1832					
	250	-	48	13	13,2	0,0481	650	3	248	26	26,4	0,1898					
	280	-	63	13,8	14	0,0564	700	28	273	27,4	27,9	0,2063					
	300	-	73	14,3	14,5	0,0619	710	33	278	27,7	28,1	0,2096					
	315	-	80,5	14,7	14,9	0,0660	750	53	298	28,8	29,3	0,2228					
	355	-	100,5	15,7	15,9	0,0770	800	78	323	30,2	30,7	0,2393	BF				
	400	-	123	16,9	17,1	0,0894	M2	150	-	-	11,7	11,8	0,0281	M2			
	450	-	148	18,1	18,4	0,1031		180	-	13	12,7	12,9	0,0394				
	500	-	173	19,4	19,7	0,1169		200	-	23	13,4	13,6	0,0469				
	550	-	198	20,6	21	0,1306		225	-	36	14,3	14,5	0,0563				
	560	-	203	20,9	21,2	0,1334		250	-	48	15,2	15,4	0,0656				
600	-	223	21,9	22,2	0,1444	280		-	63	16,2	16,4	0,0769					
630	-	238	22,6	23	0,1526	300		-	73	16,9	17,1	0,0844					
650	3	248	23,1	23,5	0,1581	315		-	80,5	17,4	17,6	0,0900					
700	28	273	24,3	24,7	0,1719	355		-	100,5	18,7	19	0,1050					
710	33	278	24,6	25	0,1746	400		-	123	20,2	20,5	0,1219					
750	53	298	25,5	26	0,1856	M3		450	-	148	21,9	22,2	0,1406				
800	78	323	26,7	27,2	0,1994			500	-	173	23,5	23,9	0,1594				
315 x	150	-	-	10,6	10,7			0,0218	550	-	198	25,1	25,5		0,1781	BFN	M3
	180	-	13	11,4	11,6			0,0305	560	-	203	25,5	25,9		0,1819		
	200	-	23	11,9	12,1		0,0363	600	-	223	26,7	27,2	0,1969				
	225	-	36	12,6	12,8		0,0435	630	-	238	27,7	28,1	0,2081				
	250	-	48	13,3	13,5		0,0508	650	3	248	28,3	28,8	0,2156				
	280	-	63	14,1	14,3		0,0595	700	28	273	29,9	30,4	0,2344				
	300	-	73	14,7	14,9		0,0653	710	33	278	30,2	30,7	0,2381				
	315	-	80,5	15,1	15,3		0,0696	750	53	298	31,4	32	0,2531				
	355	-	100,5	16,2	16,4		0,0812	800	78	323	32,9	33,5	0,2719				
	400	-	123	17,4	17,6		0,0943	M2	150	-	-	12,3	12,5	0,0319	M2		
	450	-	148	18,7	19		0,1088		180	-	13	13,5	13,7	0,0446			
	500	-	173	20	20,3		0,1233		200	-	23	14,3	14,5	0,0531			
	550	-	198	21,3	21,7	0,1378	225		-	36	15,3	15,5	0,0638				
	560	-	203	21,6	21,9	0,1407	250		-	48	16,2	16,5	0,0744				
600	-	223	24,1	24,5	0,1680	280	-		63	17,4	17,6	0,0871					
630	-	238	23,4	23,8	0,1610	300	-		73	18,1	18,4	0,0956					
650	3	248	23,9	24,3	0,1668	315	-		80,5	18,7	19	0,1020					
700	28	273	25,2	25,6	0,1813	355	-		100,5	20,2	20,5	0,1190					

Sizes in increments of 5 mm can be manufactured on request.

A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	
	a [mm]	c [mm]	Man. [kg]	Actu. [kg]*					a [mm]	c [mm]	Man. [kg]	Actu. [kg]*				
450 x	400	-	123	21,9	22,2	0,1381	BFL	560 x	150	-	-	13,8	14	0,0401	BFL	
	450	-	148	23,7	24,1	0,1594	M2		180	-	13	15,2	15,5	0,0562		
	500	-	173	25,5	26	0,1806			200	-	23	16,2	16,4	0,0669		
	550	-	198	27,3	27,8	0,2019			225	-	36	17,4	17,6	0,0803		
	560	-	203	27,7	28,1	0,2061			250	-	48	18,6	18,8	0,0936		
	600	-	223	29,1	29,6	0,2231			280	-	63	20	20,3	0,1097		
	630	-	238	30,1	30,7	0,2359			300	-	73	20,9	21,2	0,1204		
	650	3	248	30,8	31,4	0,2444			315	-	80,5	21,6	21,9	0,1284		
	700	28	273	32,6	33,1	0,2656			355	-	100,5	23,4	23,8	0,1498		
	710	33	278	32,9	33,5	0,2699			400	-	123	25,5	25,9	0,1739		M2
	750	53	298	34,3	34,9	0,2869			450	-	148	27,7	28,1	0,2006		
	800	78	323	35,9	36,6	0,3081			500	-	173	29,9	30,4	0,2274		BFL
500 x	150	-	-	13	13,2	0,0356		BFL	550	-	198	32	32,6	0,2541	BFL	
	180	-	13	14,3	14,5	0,0499	560		-	203	32,5	33	0,2595			
	200	-	23	15,2	15,4	0,0594	600		-	223	34,1	34,7	0,2809			
	225	-	36	16,2	16,5	0,0713	630		-	238	35,4	36	0,2969			
	250	-	48	17,3	17,6	0,0831	650		3	248	36,2	36,9	0,3076			
	280	-	63	18,6	18,8	0,0974	700		28	273	38,3	39	0,3344	BF		
	300	-	73	19,4	19,7	0,1069	710		33	278	38,7	39,4	0,3397			
	315	-	80,5	20	20,3	0,1140	750		53	298	40,3	41	0,3611	M3		
	355	-	100,5	21,7	22	0,1330	800		78	323	42,3	43	0,3879			
	400	-	123	23,5	23,9	0,1544	M2		150	-	-	14,3	14,5	0,0431		M2
	450	-	148	25,5	26	0,1781			180	-	13	15,8	16,1	0,0604		
	500	-	173	27,5	28	0,2019			200	-	23	16,9	17,1	0,0719		
550	-	198	29,5	30	0,2256	225		-	36	18,1	18,4	0,0863				
560	-	203	29,9	30,4	0,2304	250		-	48	19,4	19,7	0,1006	BFL			
600	-	223	31,4	32	0,2494	280		-	63	20,9	21,2	0,1179				
630	-	238	32,6	33,1	0,2636	300		-	73	21,9	22,2	0,1294				
650	3	248	33,3	33,9	0,2731	315		-	80,5	22,6	23	0,1380				
700	28	273	35,2	35,8	0,2969	355		-	100,5	24,6	25	0,1610				
710	33	278	35,6	36,2	0,3016	400		-	123	26,7	27,2	0,1869	M2			
750	53	298	37	37,7	0,3206	450		-	148	29,1	29,6	0,2156				
800	78	323	38,9	39,6	0,3444	M3		500	-	173	31,4	32	0,2444	BFL		
550 x	150	-	-	13,6	13,8		0,0394	550	-	198	33,7	34,3	0,2731			
	180	-	13	15,1	15,3		0,0551	560	-	203	34,1	34,7	0,2789			
	200	-	23	16	16,3		0,0656	600	-	223	35,9	36,6	0,3019			
	225	-	36	17,2	17,4		0,0788	630	-	238	37,3	37,9	0,3191			
	250	-	48	18,3	18,6		0,0919	650	3	248	38,1	38,8	0,3306			
	280	-	63	19,7	20		0,1076	700	28	273	40,3	41	0,3594		BF	
	300	-	73	20,6	21		0,1181	710	33	278	40,7	41,5	0,3651			
	315	-	80,5	21,3	21,7		0,1260	750	53	298	42,4	43,2	0,3881		M3	
	355	-	100,5	23,1	23,5		0,1470	800	78	323	44,5	45,3	0,4169			
	400	-	123	25,1	25,5		0,1706	M2	150	-	-	14,7	14,9		0,0454	BFL
	450	-	148	27,3	27,8		0,1969		180	-	13	16,3	16,5		0,0635	
	500	-	173	29,5	30	0,2231	200		-	23	17,4	17,6	0,0756			
550	-	198	31,6	32,2	0,2494	225	-		36	18,7	19	0,0908				
560	-	203	32	32,6	0,2546	250	-		48	20	20,3	0,1059				
600	-	223	33,7	34,3	0,2756	280	-		63	21,6	21,9	0,1240				
630	-	238	34,9	35,5	0,2914	300	-		73	22,6	23	0,1361				
650	3	248	35,7	36,4	0,3019	315	-		80,5	23,4	23,8	0,1452				
700	28	273	37,8	38,4	0,3281	355	-		100,5	25,4	25,8	0,1694				
710	33	278	38,2	38,9	0,3334	400	-		123	27,7	28,1	0,1966	BFL			
750	53	298	39,8	40,5	0,3544	450	-		148	30,1	30,7	0,2269				
800	78	323	41,7	42,5	0,3806	M3	500		-	173	32,6	33,1	0,2571			

Sizes in increments of 5 mm can be manufactured on request.

A x B [mm]		Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	A x B [mm]		Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control
		a [mm]	c [mm]	Man. [kg]	Actu. [kg]*						a [mm]	c [mm]	Man. [kg]	Actu. [kg]*			
630 x	550	-	198	34,9	35,5	0,2874	BFN	M2	710 x	225	-	36	20,2	20,5	0,1028	BFL	M2
	560	-	203	35,4	36	0,2934				250	-	48	21,7	22	0,1199		
	600	-	223	37,3	37,9	0,3176				280	-	63	23,4	23,8	0,1404		
	630	-	238	38,6	39,3	0,3358	300			-	73	24,6	25	0,1541	BFN		
	650	3	248	39,5	40,3	0,3479	315			-	80,5	25,4	25,8	0,1644			
	700	28	273	41,8	42,5	0,3781	355			-	100,5	27,7	28,1	0,1918			
	710	33	278	42,2	43	0,3842	400			-	123	30,2	30,7	0,2226	BFN		
	750	53	298	44	44,8	0,4084	450			-	148	32,9	33,5	0,2569			
	800	78	323	46,1	47	0,4386	500			-	173	35,6	36,2	0,2911			
	150	-	-	14,9	15,2	0,0469	BFL			550	-	198	38,2	38,9	0,3254	BF	
180	-	13	16,6	16,9	0,0656	560		-	203	38,7	39,4	0,3322					
200	-	23	17,7	18	0,0781	600		-	223	40,7	41,5	0,3596					
225	-	36	19,1	19,4	0,0938	630		-	238	42,2	43	0,3802					
250	-	48	20,4	20,8	0,1094	650		3	248	43,2	44	0,3939					
280	-	63	22	22,4	0,1281	700		28	273	45,6	46,5	0,4281					
300	-	73	23,1	23,5	0,1406	710		33	278	46,1	47	0,4350					
315	-	80,5	23,9	24,3	0,1500	750		53	298	48	48,9	0,4624					
355	-	100,5	26	26,4	0,1750	800		78	323	50,3	51,3	0,4966					
400	-	123	28,3	28,8	0,2031	BFN		150	-	-	16,2	16,5	0,0544	BFN			
450	-	148	30,8	31,4	0,2344		180	-	13	18,1	18,4	0,0761					
500	-	173	33,3	33,9	0,2656		200	-	23	19,4	19,7	0,0906					
550	-	198	35,7	36,4	0,2969		225	-	36	21	21,3	0,1088					
560	-	203	36,2	36,9	0,3031		250	-	48	22,5	22,9	0,1269					
600	-	223	38,1	38,8	0,3281		280	-	63	24,3	24,7	0,1486					
630	-	238	39,5	40,3	0,3469		300	-	73	25,5	26	0,1631					
650	3	248	40,5	41,2	0,3594		315	-	80,5	26,4	26,9	0,1740					
700	28	273	42,7	43,5	0,3906		355	-	100,5	28,8	29,3	0,2030					
710	33	278	43,2	44	0,3969		400	-	123	31,4	32	0,2356					
750	53	298	45	45,8	0,4219	750 x	450	-	148	34,3	34,9	0,2719	BFN				
800	78	323	47,2	48,1	0,4531		500	-	173	37	37,7	0,3081					
150	-	-	15,6	15,8	0,0506		550	-	198	39,8	40,5	0,3444					
180	-	13	17,4	17,6	0,0709		560	-	203	40,3	41	0,3516					
200	-	23	18,6	18,8	0,0844		600	-	223	42,4	43,2	0,3806					
225	-	36	20	20,3	0,1013		630	-	238	44	44,8	0,4024					
250	-	48	21,5	21,8	0,1181		650	3	248	45	45,8	0,4169					
280	-	63	23,2	23,6	0,1384		700	28	273	47,5	48,4	0,4531					
300	-	73	24,3	24,7	0,1519		710	33	278	48	48,9	0,4604					
315	-	80,5	25,2	25,6	0,1620		750	53	298	50	51	0,4894					
355	-	100,5	27,4	27,9	0,1890	800	78	323	52,3	53,4	0,5256						
400	-	123	29,9	30,4	0,2194	800 x	150	-	-	16,9	17,1	0,0581	BFN				
450	-	148	32,6	33,1	0,2531		180	-	13	18,9	19,2	0,0814					
500	-	173	35,2	35,8	0,2869		200	-	23	20,2	20,5	0,0969					
550	-	198	37,8	38,4	0,3206		225	-	36	21,9	22,2	0,1163					
560	-	203	38,3	39	0,3274		250	-	48	23,5	23,9	0,1356					
600	-	223	40,3	41	0,3544		280	-	63	25,5	25,9	0,1589					
630	-	238	41,8	42,5	0,3746		300	-	73	26,7	27,2	0,1744					
650	3	248	42,7	43,5	0,3881		315	-	80,5	27,7	28,1	0,1860					
700	28	273	45,2	46	0,4219		355	-	100,5	30,2	30,7	0,2170					
710	33	278	45,6	46,5	0,4286		400	-	123	32,9	33,5	0,2519					
750	53	298	47,5	48,4	0,4556	800 x	450	-	148	35,9	36,6	0,2906					
800	78	323	49,8	50,8	0,4894		500	-	173	38,9	39,6	0,3294					
150	-	-	15,7	15,9	0,0514		550	-	198	41,7	42,5	0,3681					
180	-	13	17,5	17,8	0,0719		560	-	203	42,3	43	0,3759					
200	-	23	18,7	19	0,0856		600	-	223	44,5	45,3	0,4069					

Sizes in increments of 5 mm can be manufactured on request.

A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control		
	a [mm]	c [mm]	Man. [kg]	Actu. [kg]*					a [mm]	c [mm]	Man. [kg]	Actu. [kg]*					
800 x	630	-	238	46,1	47	0,4301	BF	M3	315	-	80,5	34,9	35,5	0,2580	BFN	M2	
	650	3	248	47,2	48,1	0,4456			355	-	100,5	38,2	38,9	0,3010			
	700	28	273	49,8	50,8	0,4844			400	-	123	41,7	42,5	0,3494			
	710	33	278	50,3	51,3	0,4921			450	-	148	45,5	46,4	0,4031			
	750	53	298	52,3	53,4	0,5231			500	-	173	49,1	50,1	0,4569			
	800	78	323	54,8	56	0,5619			550	-	198	52,7	53,7	0,5106			
	150	-	-	18,1	18,4	0,0656	BFL	M2	1100 x	560	-	203	53,3	54,4	0,5214	BF	M3
	180	-	13	20,4	20,7	0,0919			600	-	223	56	57,2	0,5644			
	200	-	23	21,9	22,2	0,1094			630	-	238	58	59,2	0,5966			
	225	-	36	23,7	24,1	0,1313			650	3	248	59,3	60,5	0,6181			
	250	-	48	25,5	26	0,1531			700	28	273	62,4	63,8	0,6719			
	280	-	63	27,7	28,1	0,1794			710	33	278	63	64,4	0,6826			
900 x	300	-	73	29,1	29,6	0,1969	M2	750	53	298	65,3	66,8	0,7256	M4			
	315	-	80,5	30,1	30,7	0,2100		800	78	323	68,1	69,7	0,7794				
	355	-	100,5	32,9	33,5	0,2450		1250 x	180	-	13	25,5	26		0,1286	BFL	
	400	-	123	35,9	36,6	0,2844			200	-	23	27,5	28		0,1531		
	450	-	148	39,2	39,9	0,3281			225	-	36	30	30,5		0,1838		
	500	-	173	42,4	43,2	0,3719			250	-	48	32,4	32,9		0,2144		
	550	-	198	45,5	46,4	0,4156	280		-	63	35,2	35,8	0,2511				
	560	-	203	46,1	47	0,4244	300		-	73	37	37,7	0,2756				
	600	-	223	48,5	49,4	0,4594	315		-	80,5	38,4	39,1	0,2940	BFN			
	630	-	238	50,2	51,2	0,4856	355		-	100,5	42	42,7	0,3430				
	650	3	248	51,4	52,4	0,5031	400	-	123	45,8	46,7	0,3981	M3				
	700	28	273	54,2	55,3	0,5469	450	-	148	50	51	0,4594					
	710	33	278	54,8	55,9	0,5556	500	-	173	53,9	55	0,5206					
	750	53	298	56,9	58,1	0,5906	550	-	198	57,7	58,9	0,5819					
800	78	323	59,6	60,8	0,6344	560	-	203	58,4	59,7	0,5941						
1000 x	150	-	-	19,4	19,7	0,0731	BFL	M2	600	-	223	61,2		62,6	0,6431	BF	
	180	-	13	21,9	22,2	0,1024			630	-	238	63,3		64,7	0,6799		
	200	-	23	23,5	23,9	0,1219			650	3	248	64,7		66,1	0,7044		
	225	-	36	25,5	26	0,1463			700	28	273	67,9	69,5	0,7656			
	250	-	48	27,5	28	0,1706			710	33	278	68,5	70,1	0,7779			
	280	-	63	29,9	30,4	0,1999			750	53	298	70,9	72,7	0,8269			
	300	-	73	31,4	32	0,2194	BFN	800	78	323	73,8	75,7	0,8881	M4			
	315	-	80,5	32,6	33,1	0,2340		180	-	13	27,7	28,1	0,1444				
	355	-	100,5	35,6	36,2	0,2730		200	-	23	29,9	30,4	0,1719				
	400	-	123	38,9	39,6	0,3169		225	-	36	32,6	33,1	0,2063				
	450	-	148	42,4	43,2	0,3656		250	-	48	35,2	35,8	0,2406				
	500	-	173	45,8	46,7	0,4144		280	-	63	38,3	39	0,2819				
	550	-	198	49,1	50,1	0,4631		300	-	73	40,3	41	0,3094				
	560	-	203	49,8	50,8	0,4729		315	-	80,5	41,8	42,5	0,3300				
600	-	223	52,3	53,4	0,5119	1400 x	355	-	100,5	45,6	46,5	0,3850	M3				
630	-	238	54,2	55,3	0,5411		400	-	123	49,8	50,8	0,4469					
650	3	248	55,4	56,6	0,5606		450	-	148	54,2	55,3	0,5156					
700	28	273	58,4	59,7	0,6094		500	-	173	58,4	59,7	0,5844					
710	33	278	59	60,3	0,6191		550	-	198	62,4	63,8	0,6531					
750	53	298	61,2	62,6	0,6581		560	-	203	63,1	64,5	0,6669					
800	78	323	64	65,4	0,7069		600	-	223	66,1	67,6	0,7219					
1100 x	180	-	13	23,4	23,7		0,1129	BFL	M2	630	-	238		68,2	69,8	0,7631	BF
	200	-	23	25,1	25,5	0,1344	650			3	248	69,6	71,3	0,7906			
	225	-	36	27,3	27,8	0,1613	700			28	273	72,9	74,7	0,8594			
	250	-	48	29,5	30	0,1881	710			33	278	73,5	75,4	0,8731			
	280	-	63	32	32,6	0,2204	750			53	298	75,9	77,9	0,9281			
	300	-	73	33,7	34,3	0,2419	800			78	323	78,8	80,9	0,9969			

Sizes in increments of 5 mm can be manufactured on request.

A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	A x B [mm]	Damper blade overlaps		Weight		Free area S _f [m ²]	Spring return actuator	Manual control	
	a	c	Man.	Actu.					a	c	Man.	Actu.				
	[mm]	[mm]	[kg]	[kg]*					[mm]	[mm]	[kg]	[kg]*				
1500 x	180	-	13	29,1	29,6	0,1549	BFL	M2	500	-	173	61,2	62,6	0,6269	BF	M3
	200	-	23	31,4	32	0,1844			550	-	198	65,3	66,8	0,7006		
	225	-	36	34,3	34,9	0,2213			560	-	203	66,1	67,6	0,7154		
	250	-	48	37	37,7	0,2581			600	-	223	69,1	70,8	0,7744		
	280	-	63	40,3	41	0,3024			630	-	238	71,3	73	0,8186		
	300	-	73	42,4	43,2	0,3319	BFN	M3	650	3	248	72,7	74,5	0,8481	M5	
	315	-	80,5	44	44,8	0,3540			700	28	273	75,9	77,9	0,9219		
	355	-	100,5	48	48,9	0,4130			710	33	278	76,6	78,6	0,9366		
	400	-	123	52,3	53,4	0,4794	BF		750	53	298	79	81,1	0,9956		
	450	-	148	56,9	58,1	0,5531			800	78	323	81,7	84,1	1,0694		

Sizes in increments of 5 mm can be manufactured on request.

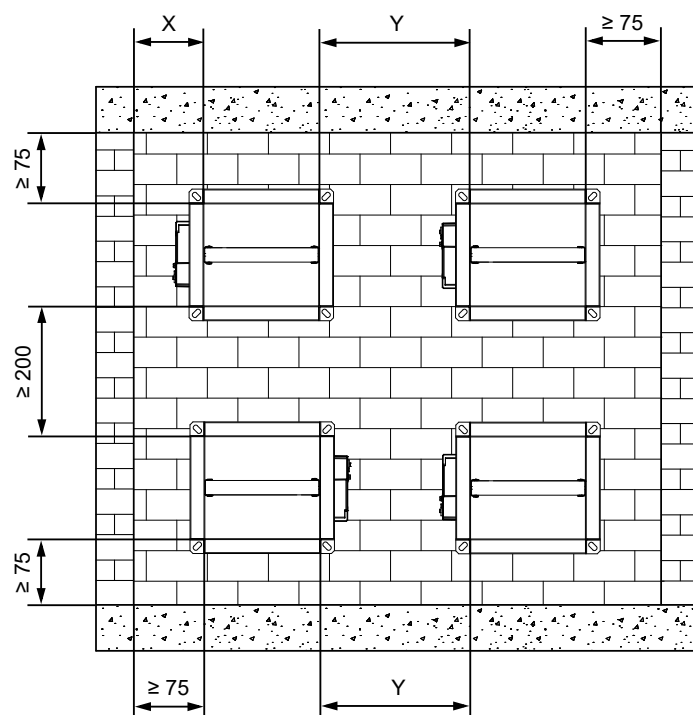
IV. INSTALLATION

Placement and installation

- The fire dampers are suitable for installation in arbitrary position in vertical and horizontal passages of fire separating constructions. The damper installation procedures must be done so that all load transfer from the fire separating constructions to the damper is absolutely excluded. Following air-conditioning duct must be suspended or supported so that all load transfer from the following duct to the fire damper is absolutely excluded. The gap between the installed damper and the fire separating construction must be perfectly filled with approved material.
- The damper must be installed so that the damper blade (in closed position) is situated in the fire separating construction - marked by the label BUILT-IN EDGE on the damper casing. If such solution is not possible, the duct between the fire separating construction and the damper blade must be protected according to the certified installation method → see pages 23 to 45
- During the installation and plastering process, the actuating mechanism must be protected (covered) against damage and pollution. The damper casing should not be deformed during bricking in. Once the damper is built in, the damper blade should not grind against the damper casing during opening or closing.
- The distance between the fire damper and the construction (wall, ceiling) must be 75 mm at the minimum, according to BS EN 1366-2. If two or more dampers are to be installed in one fire separating construction, the distance between adjacent dampers must be 200 mm at the minimum, according to BS EN 1366-2.

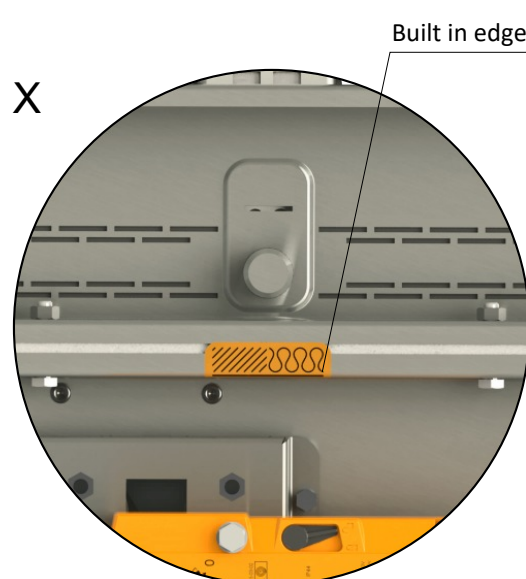
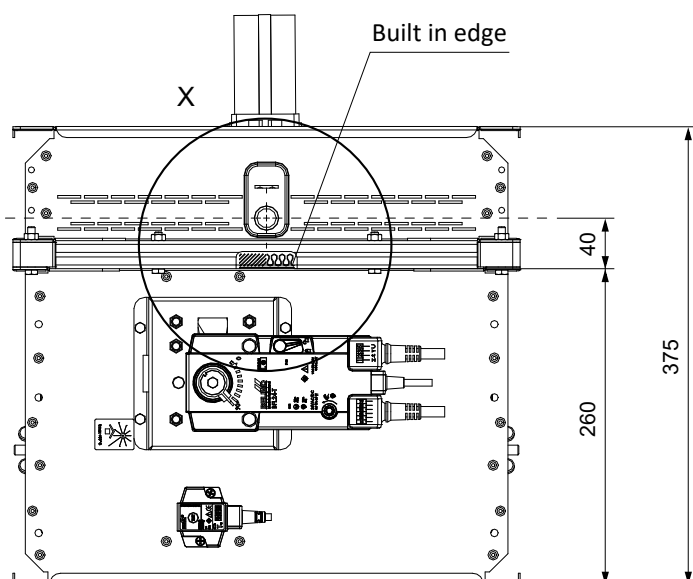
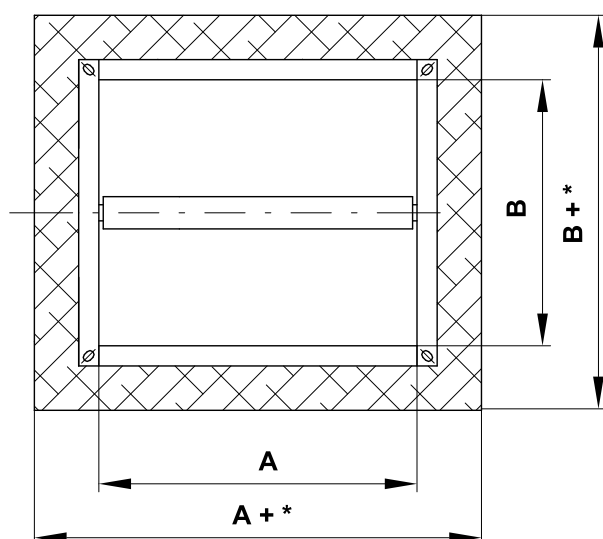
Minimum distance between the fire dampers and the construction

- minimum distance 200 mm between dampers, according to BS EN 1366-2
- minimum distance 75 mm between damper and construction (wall/ceiling), according to BS EN 1366-2
- recommended minimum distance 150 mm necessary for access to the actuator
- recommended minimum distance 250 mm necessary for access to the manual control



X = recommended min. distance for actuator ≥ 150 mm
 X = recommended min. distance for manual control (≥ 250 mm)
 Y = for actuator (≥ 200 mm) acc. to BS EN 1366-2
 Y = recommended min. distance for manual control (≥ 250 mm)

- Always consult the wall manufacturers specific guidelines for penetration size, location to other services, fire stopping and load bearing capacity.
- No other services should pass through the dampers building work opening.
- For lightweight walls always consult the wall manufacturer specific guidelines for penetrations sizes and distances.

Built in edge**Dimensions of an installation opening***** Mortar or gypsum**

- min. $A(B)+100$
- max. $A(B)+300$

*** Ablative Coated Batt, damper in solid/gypsum wall construction**

- min. $A(B)+100$
- max. $A(B)+360$

*** Ablative Coated Batt, damper outside solid/gypsum wall construction**

- $A(B)+200$

*** Ablative Coated Batt, damper in sandwich wall construction EUROCLAD**

- min. $A(B)+100$
- max. $A(B)+400$

*** Ablative Coated Batt, 2 dampers in one opening in shaft wall construction**

- min. $A(B)+100$
- max. $A(B)+180$

Statement of installations

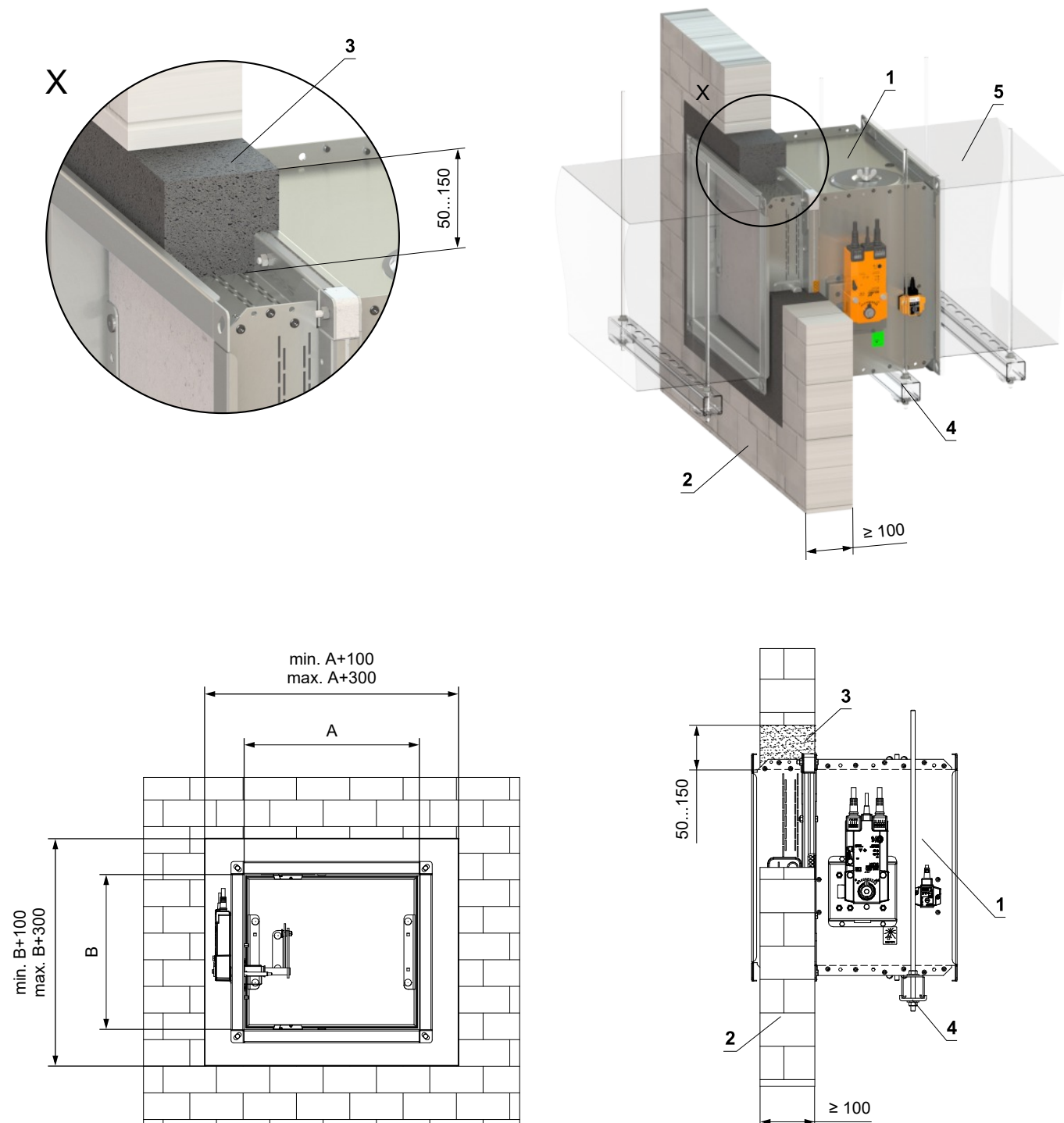
Placement	wall/ceiling min. thickness [mm]	Method of installation	Fire resistance	Page
In solid wall construction	100	Mortar or gypsum	EI 120 (v _e) S [H] - 500 Pa	23
		2 dampers in battery - mortar or gypsum		24
		4 dampers in battery - mortar or gypsum	EI 120 (v _e) S [H]	25
		Ablative Coated Batt		26
Outside solid wall construction	100	ISOVER Ultimate Protect - Ablative Coated Batt		27-28
		Flamebar EN Fire Duct - FPL 110 insulation	EI 120 (v _e) S [H]	29-30
In gypsum wall construction	100	Mortar or gypsum	EI 120 (v _e) S [H] - 500 Pa	31
		2 dampers in battery - mortar or gypsum		32
		4 dampers in battery - mortar or gypsum	EI 120 (v _e) S [H]	33
		Ablative Coated Batt		34
Outside gypsum wall construction	100	ISOVER Ultimate Protect - Ablative Coated Batt		35-36
		Flamebar EN Fire Duct - FPL 110 insulation	EI 120 (v _e) S [H]	37-38
In sandwich wall construction	150	Ablative Coated Batt with fire-resistant boards	EI 120 (v _e) S [H]	39
In shaft wall construction	105	Mortar or gypsum	EI 120 (v _e) S [H]	40
	107	2 dampers in one opening - mortar or gypsum		41
		2 dampers in one opening - Ablative Coated Batt	EI 120 (v _e) S [H]	42
		Mortar or gypsum	EI 120 (h _o) S [H] - 500 Pa	43
In solid ceiling construction	150	2 dampers in battery - mortar or gypsum		44
		4 dampers in battery - mortar or gypsum	EI 120 (h _o) S [H]	45

Installation in solid wall construction

In solid wall construction - mortar or gypsum

EI 120 (v_e) S [H] - 500 Pa

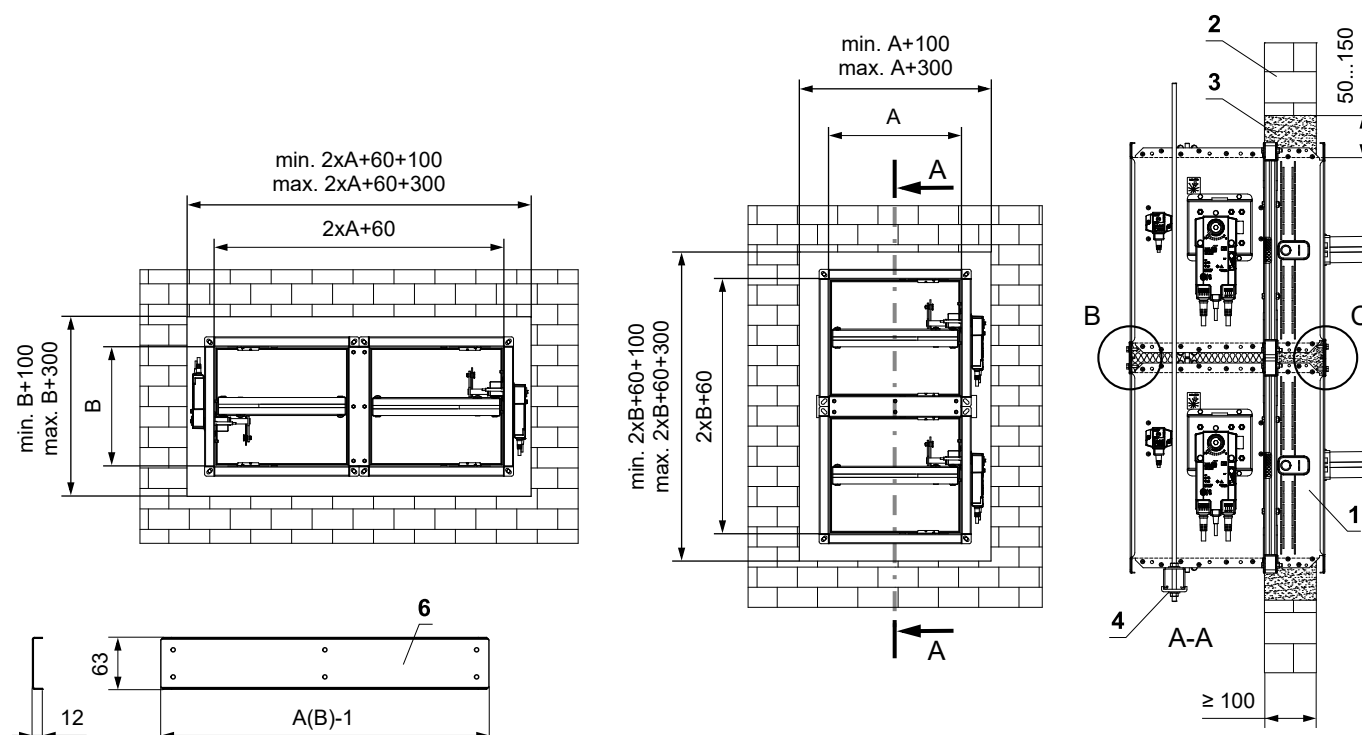
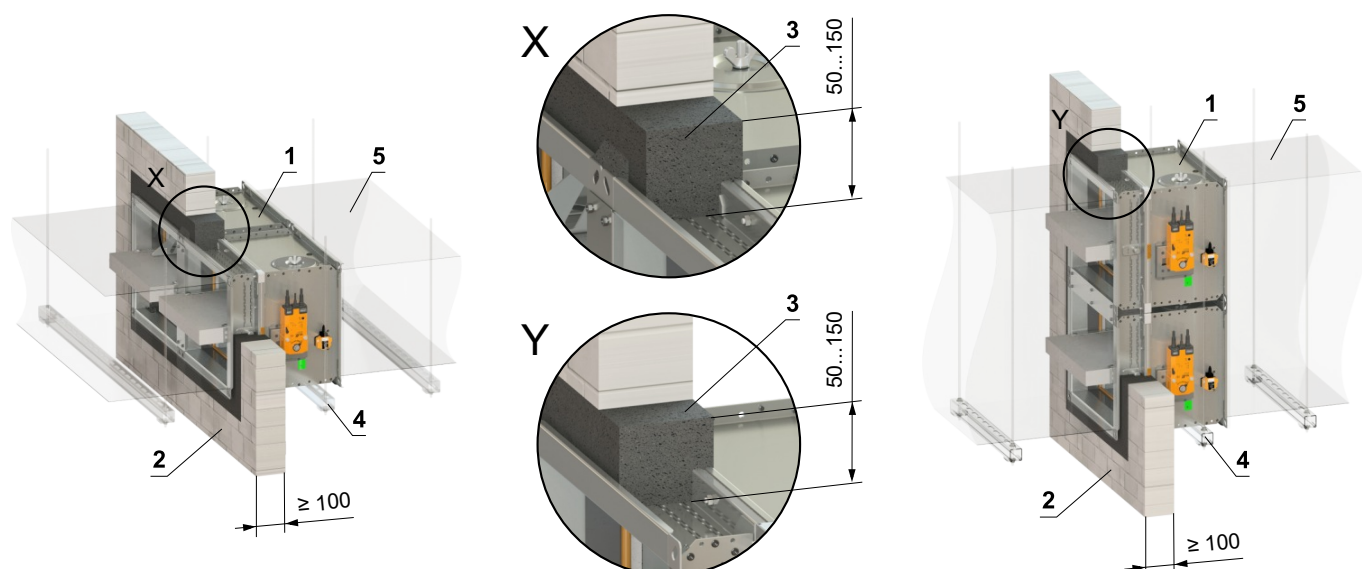
- For connection following duct → see page 50
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.



- 1 FDMQ 120
- 2 Solid wall construction
- 3 British gypsum thistle bond 60 (or equivalent can be used)
minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct

In solid wall construction - 2 dampers in battery - mortar or gypsum

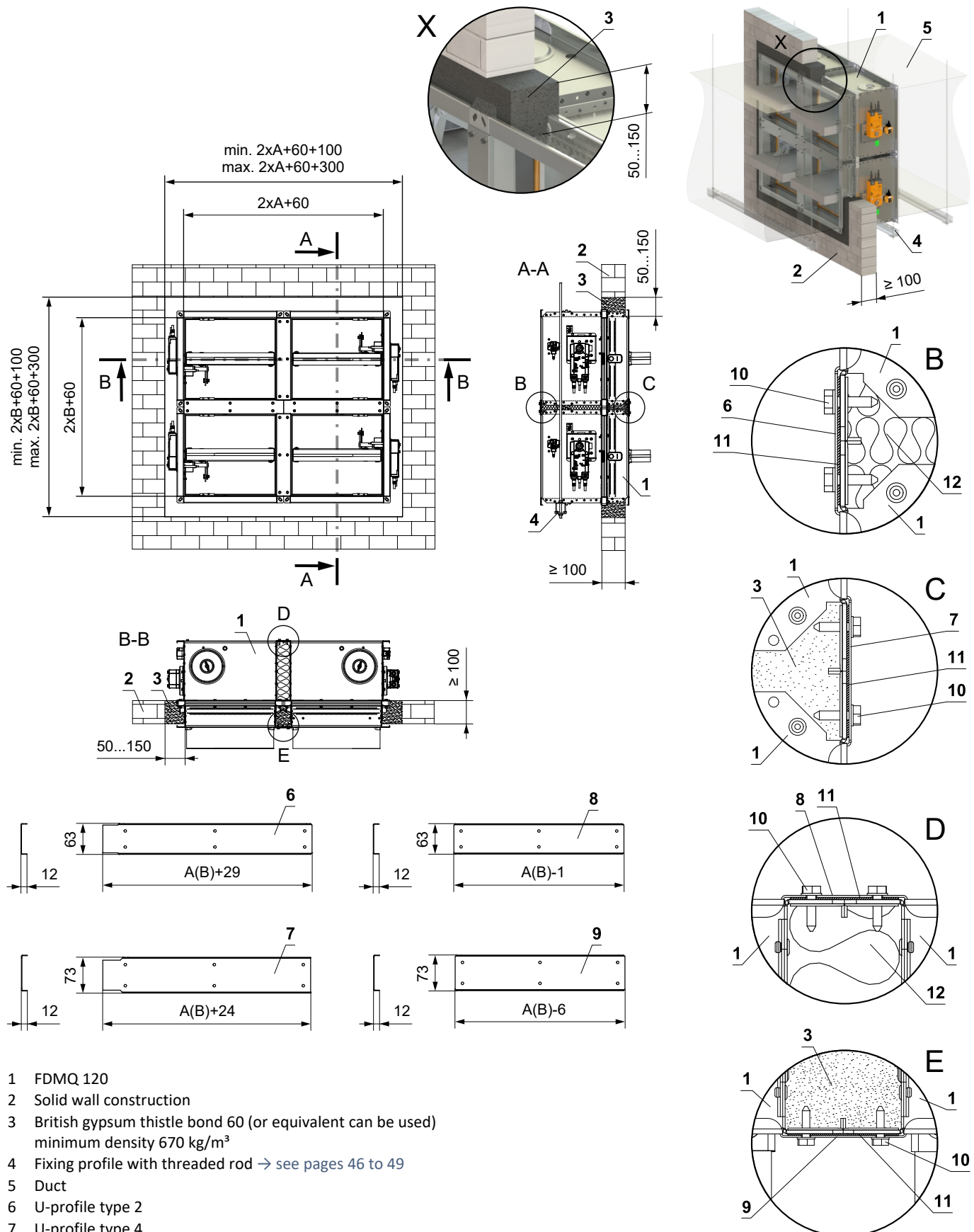
EI 120 (v_e) S [H]



- 1 FDMQ 120
- 2 Solid wall construction
- 3 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct
- 6 U-profile type 3
- 7 U-profile type 1
- 8 Screw TEK 4,8x18 mm (span ≤ 200 mm)
- 9 Seal
- 10 Insulation board made of stone wool, min. density 66 kg/m³ (e.g. ISOVER Ultimate Protect SLAB 4), th. 60 mm

- For connection following duct → see page 50
- Gap between damper and construction is filled by mortar or gypsum
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.

In solid wall construction - 4 dampers in battery - mortar or gypsum

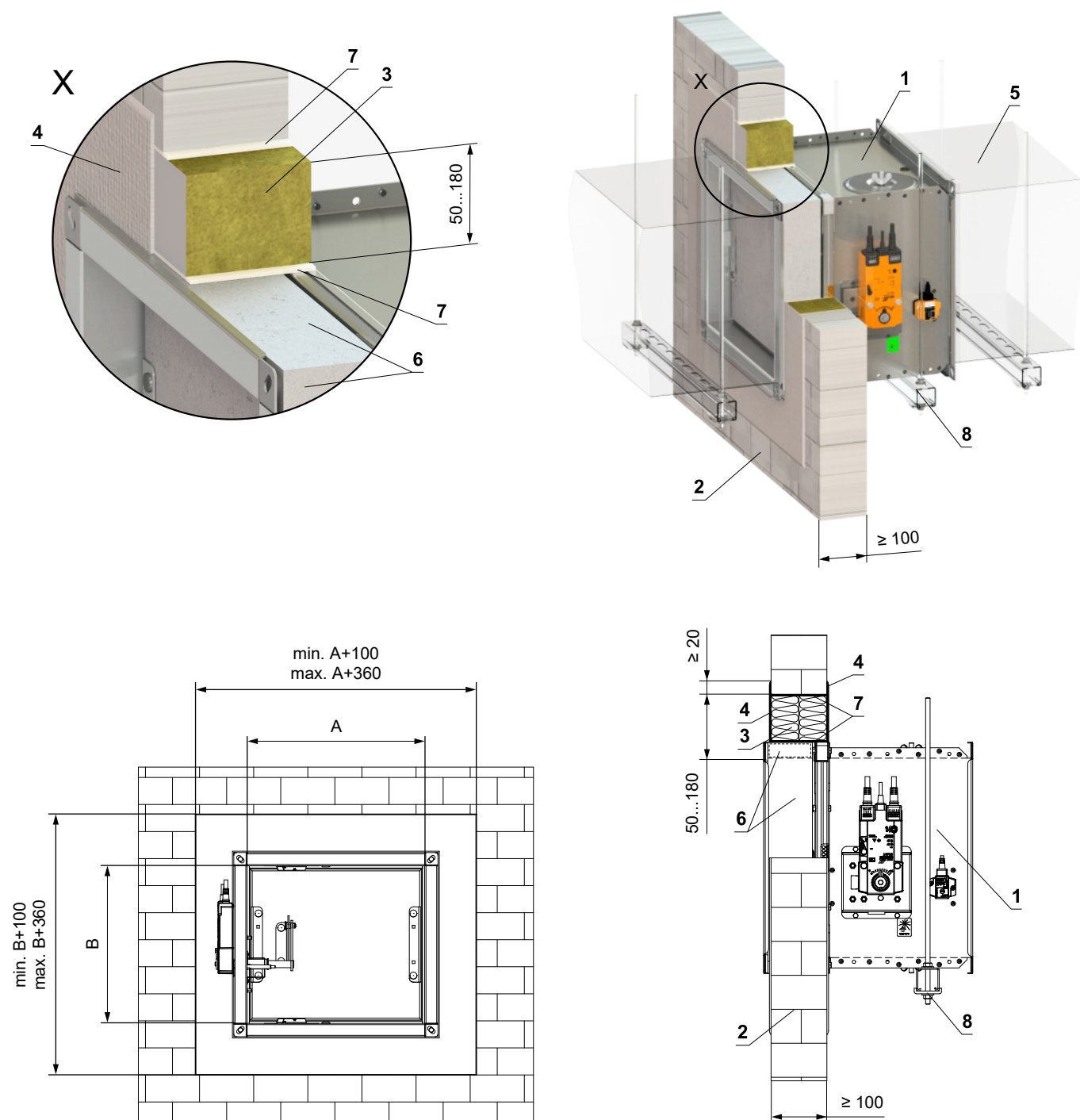
EI 120 (v_e) S [H]

- 1 FDMQ 120
- 2 Solid wall construction
- 3 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct
- 6 U-profile type 2
- 7 U-profile type 4
- 8 U-profile type 1
- 9 U-profile type 3
- 10 Screw TEK 4,8x18 mm (span ≤ 200 mm)
- 11 Seal
- 12 Insulation board made of stone wool, min. density 66 kg/m³ (e.g. ISOVER Ultimate Protect SLAB 4), th. 60 mm

- For connection following duct → see page 50
- Gap between damper and construction is filled by mortar or gypsum
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.

In solid wall construction - Ablative Coated Batt
EI 120 (v_e) S [H]

- For connection following duct → see page 50



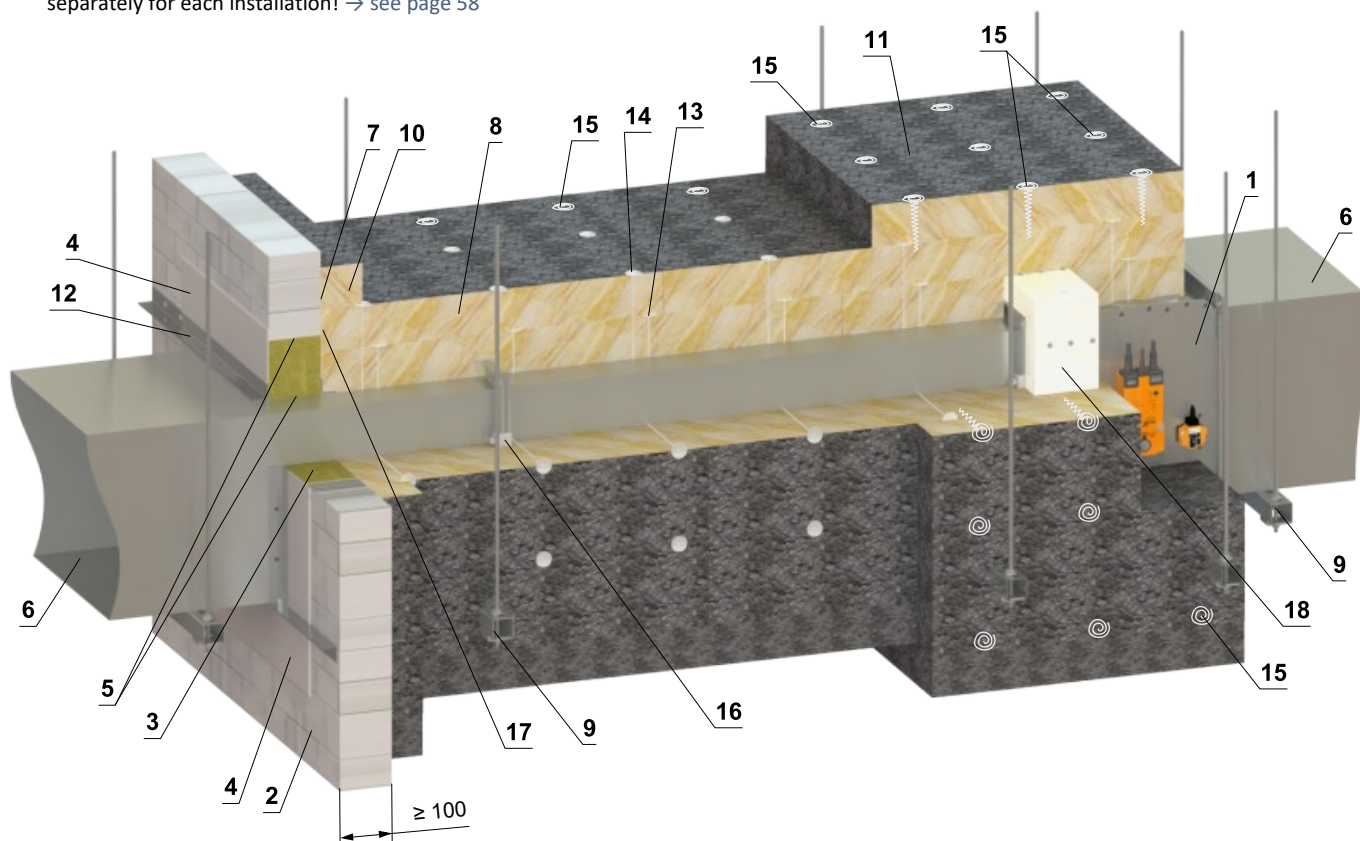
- 1 FDMQ 120
- 2 Solid wall construction
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Duct
- 6 Protective cladding boards - (not part of the damper) but must be used as part of the penetration filling → see page 59
- 7 Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-S ACR)
- 8 Fixing profile with threaded rod → see pages 46 to 49

Installation outside solid wall construction

Outside solid wall construction - ISOVER Ultimate Protect - Ablative Coated Batt

EI 120 (v_e) S [H]

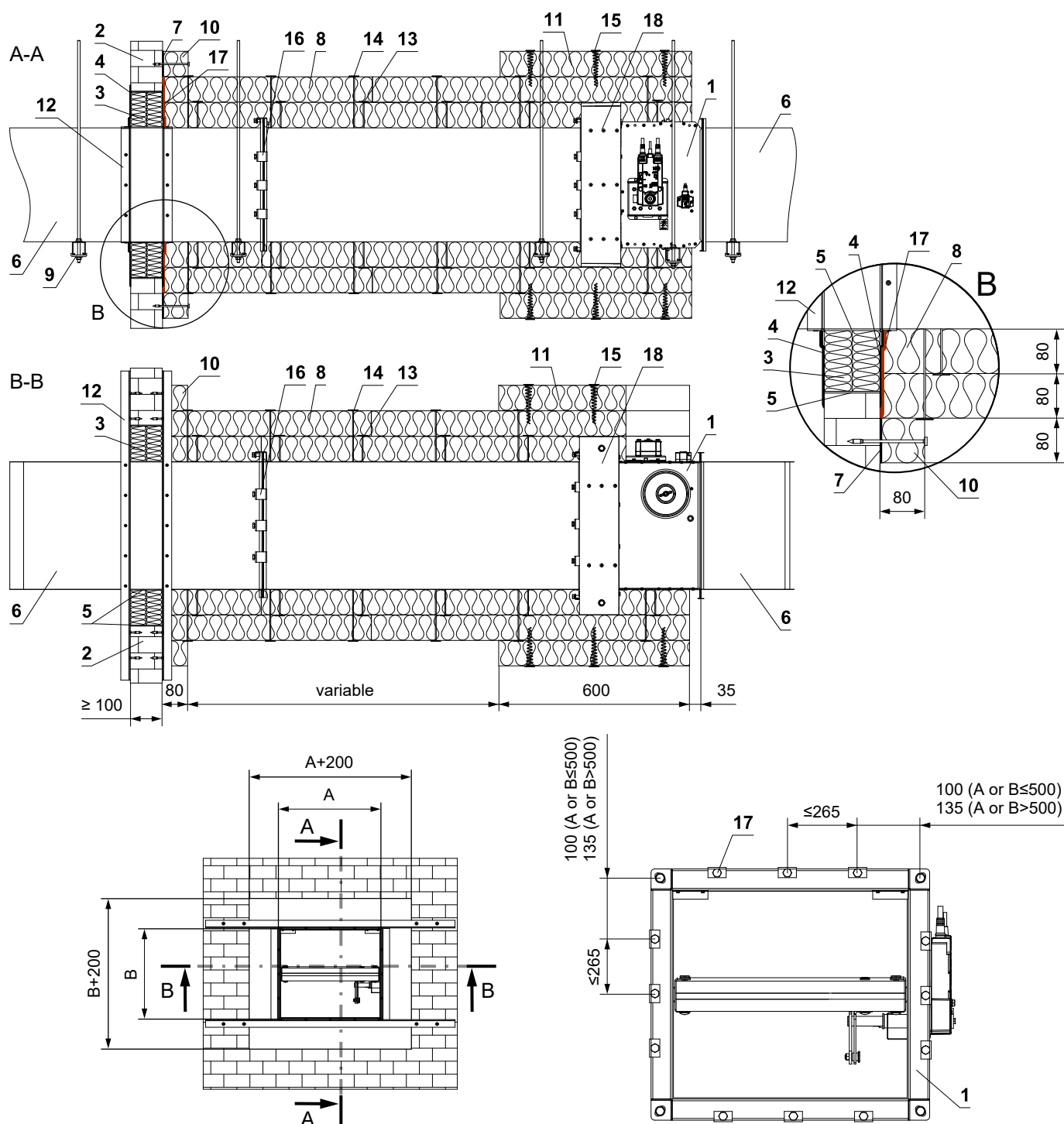
- For connection following duct → see page 50
- Minimum and maximum distance between the wall and the fire damper is unlimited.
- When installing the insulation, follow the ISOVER manufacturer's instructions.
- The fire damper and duct must be suspended separately.
- The duct must be suspended on both sides of the fire damper in accordance with national standards.
- The duct between the fire damper and the fire separating construction must be suspended using threaded rods and mounting profiles or another suspension system in accordance with national standards.
- Fire damper inspection holes are covered with insulation, therefore it's necessary to make an inspection hole in the connecting duct.
- Load on suspension system depends on weight of the fire damper and duct system → see page 46
- Max. length between two suspension systems is 1500 mm.
- Installation must be done in such a way that all load transfer from the fire separating construction to the damper is completely eliminated.
- If the threaded rod is located inside the duct insulation, the distance between the threaded rod and the duct must be max. 30 mm.
- If the threaded rod is located outside the duct insulation, the distance between the threaded rod and the insulation must be max. 40 mm.
- The insulation boards are fastened to the duct.
- Reinforcing frame VRM-Q 120 must always be used for this type of installation. VRM-Q 120 is not part of the fire damper and must be ordered separately for each installation! → see page 58



- | | | | |
|---|---|----|---|
| 1 | FDMQ 120 | 10 | Duct penetration insulation collar - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm - glued (pos. 7) and fixed with screws to the wall construction |
| 2 | Solid wall construction | 11 | Insulating collar of the damper and duct connection - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm |
| 3 | Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m ³ + Firestop acrylic sealant HILTI CFS-SACR or equivalent) | 12 | L-profile 30x30x3 mm - dimensions and installation acc. to ISOVER manufacturer |
| 4 | Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent) | 13 | Stud-welded pins 80 mm - quantity and placing acc. to ISOVER manufa. |
| 5 | Insulation board made of stone wool, with a surface treatment of aluminum foil, min. density 66 kg/m ³ (ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm) | 14 | Stud-welded pins 160 mm - quantity and placing acc. to ISOVER manufa. |
| 6 | Standard air ducts, made of galvanized sheet thickness 0,8 mm, flanges 30 mm, acc. to BS EN 1507 and DIN 24190 | 15 | Fire spiral shaped screws - quantity and placing acc. to ISOVER manufa. |
| 7 | ISOVER Protect BSK glue - apply on the insulation and stick it to the fire separation construction | 16 | Steel clamp min. M8 bolts |
| 8 | Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-SACR) | 17 | ISOVER Protect BSF |
| 9 | Fixing profile with threaded rod → see pages 46 to 49 | 18 | VRM-Q 120 → see page 58 |

(continued on next page)

(continuation of installation Outside solid wall construction - ISOVER Ultimate Protect - Ablative Coated Batt)

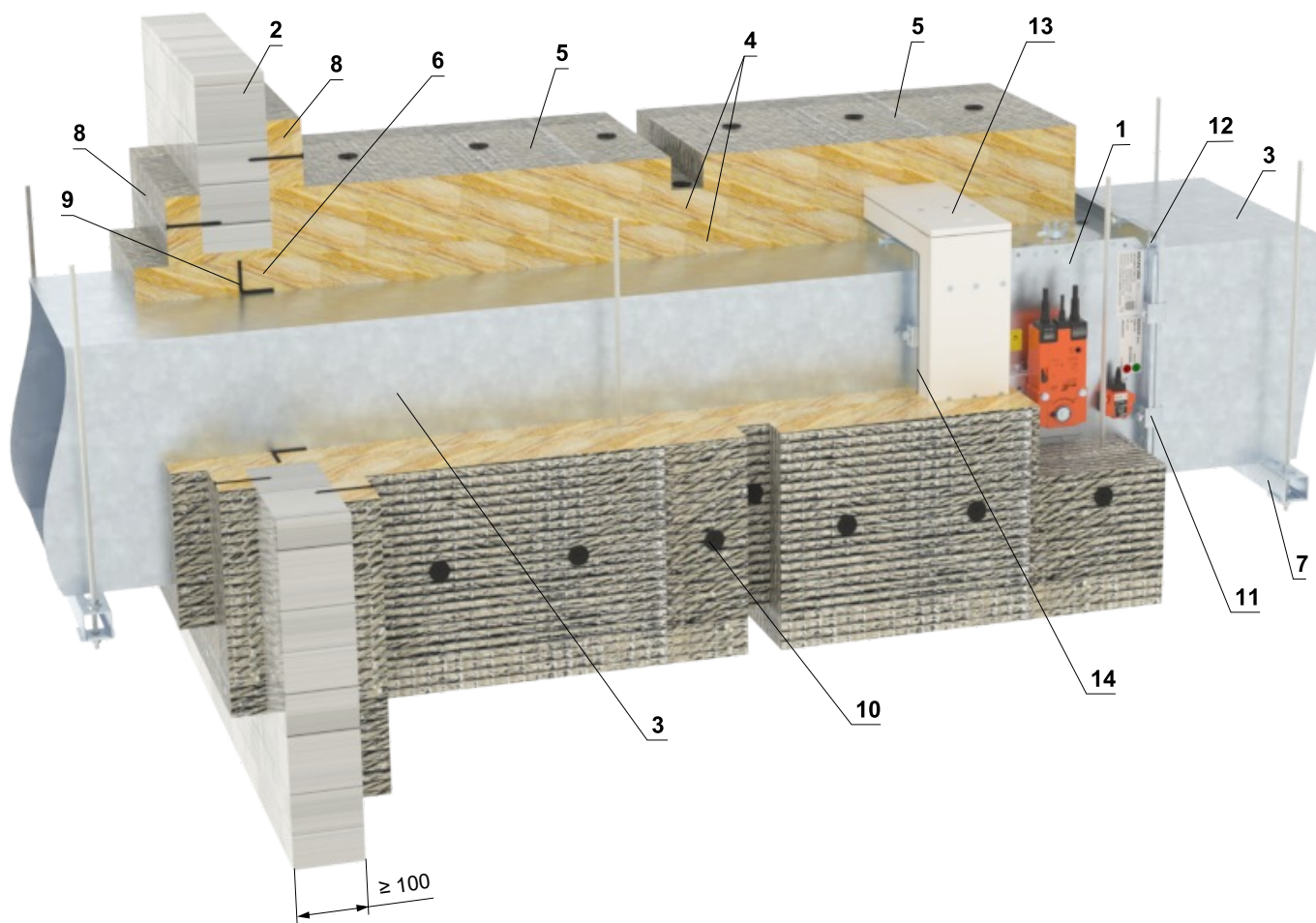


- | | | | |
|---|---|----|---|
| 1 | FDMQ 120 | 10 | Duct penetration insulation collar - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm - glued (pos. 7) and fixed with screws to the wall construction |
| 2 | Solid wall construction | 11 | Insulating collar of the damper and duct connection - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm |
| 3 | Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m ³ + Firestop acrylic sealant HILTI CFS-SACR or equivalent) | 12 | L-profile 30x30x3 mm - dimensions and installation acc. to ISOVER manufacturer |
| 4 | Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent) | 13 | Stud-welded pins 80 mm - quantity and placing acc. to ISOVER manufa. |
| 5 | Insulation board made of stone wool, with a surface treatment of aluminum foil, min. density 66 kg/m ³ (ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm) | 14 | Stud-welded pins 160 mm - quantity and placing acc. to ISOVER manufa. |
| 6 | Standard air ducts, made of galvanized sheet thickness 0,8 mm, flanges 30 mm, acc. to BS EN 1507 and DIN 24190 | 15 | Fire spiral shaped screws - quantity and placing acc. to ISOVER manufa. |
| 7 | ISOVER Protect BSK glue - apply on the insulation and stick it to the fire separation construction | 16 | Steel clamp min. M8 bolts |
| 8 | Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-SACR) | 17 | ISOVER Protect BSF |
| 9 | Fixing profile with threaded rod → see pages 46 to 49 | 18 | VRM-Q 120 → see page 58 |

Outside solid wall construction - Flamebar EN Fire Duct - FPL 110 insulation

EI 120 (v_e) S [H]

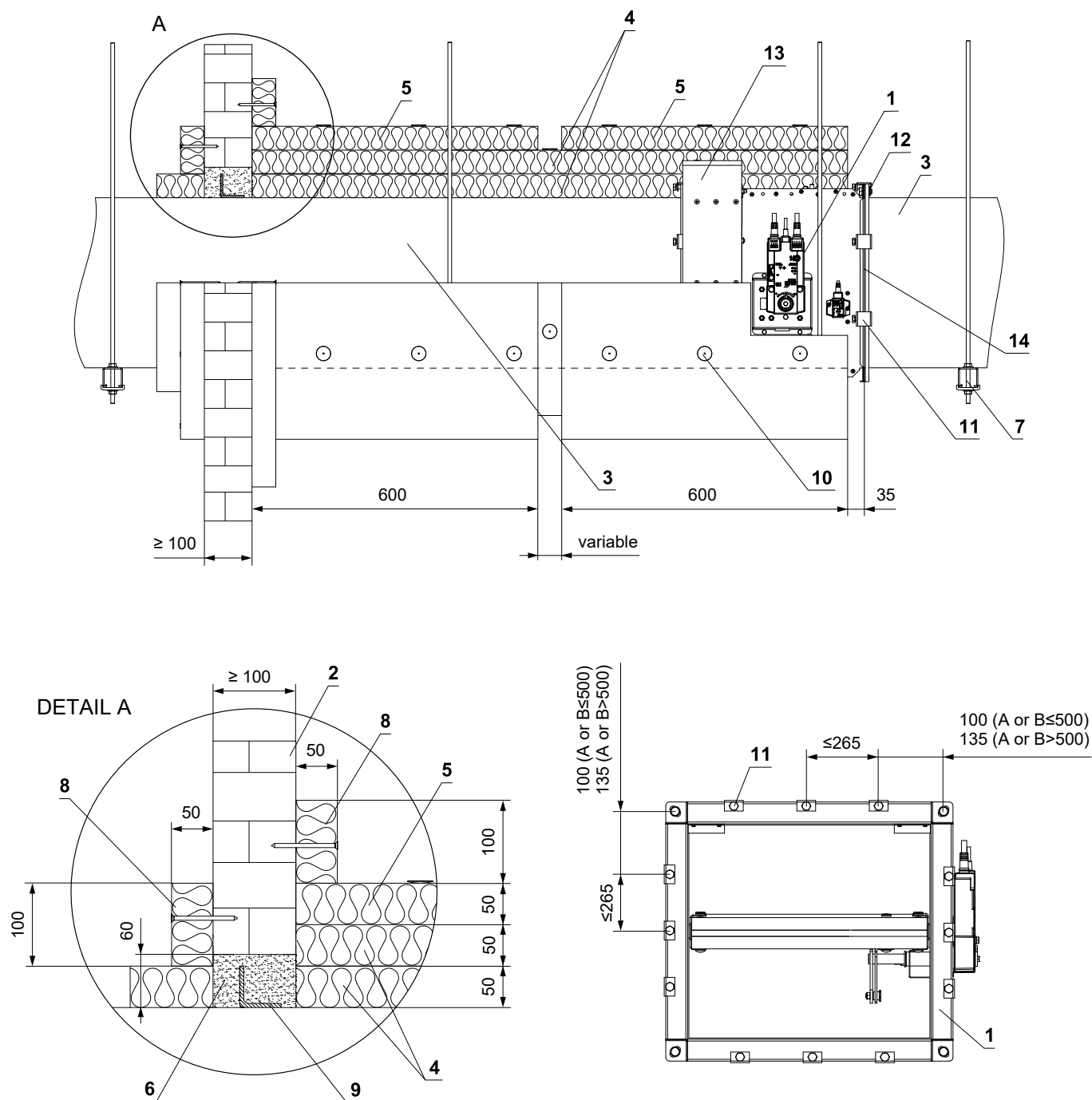
- Minimum and maximum distance between the wall and the fire damper is unlimited.
- The fire damper and duct must be suspended separately.
- The duct must be suspended on both sides of the fire damper in accordance with national standards.
- The duct between the fire damper and the fire separating construction must be suspended using threaded rods and mounting profiles or another suspension system in accordance with national standards.
- Fire damper inspection holes are covered with insulation, therefore it's necessary to install an access door in the connecting duct. (This must be a Flamebar access door if installed in the fire duct.)
- Load on suspension system depends on weight of the fire damper and duct system → see page 46
- Max. length between two suspension systems is 1500 mm.
- Installation must be done in such a way that all load transfer from the fire separating construction to the damper is completely eliminated.
- Reinforcing frame VRM-Q 120 must always be used for this type of installation. VRM-Q 120 is not part of the fire damper and must be ordered separately for each installation! → see page 58



- | | |
|---|---|
| 1 FDMQ 120 | 8 Penetration insulation pattress - FPL 110 FOIL FACED SLAB, thickness 50 mm - glued with Idenden 10-450 and fixed with screws to the wall construction |
| 2 Solid wall construction | 9 Reinforcement of the duct - steel L-profile 50x50x5 mm or flange to Flamebar spec. on all sides of the duct within 100 mm of the wall |
| 3 Flamebar EN fire Duct - made of galvanised sheet metal, thickness is dependant on duct size, type BW18 fire sprayed with Flamebar BW18 (insulated duct), type BW11 fire sprayed with Flamebar BW11 (not insulated duct) | 10 Insulation pins - riveted to the duct - after the insulation boards are pushed over the insulation pins, secure the ends with disc plates in each insulation layer |
| 4 Insulation - two layers of stone wool FPL 110 SLAB, thickness 2x 50 mm, density 105 kg/m ³ , the second layer of insulation is provided with aluminium foil on the outside (FPL 110 FOIL FACED SLAB) - visible edges of mineral wool are covered with self-adhesive aluminium tape | 11 Steel clamp - flange connection with Flamebar G-Clamps with M8 bolts, max. spacing 200 mm |
| 5 Insulation collar - additional insulation of the fire damper and gypsum wall construction - third layer of insulation FPL 110 FOIL FACED SLAB, thickness 50 mm and width 600 mm | 12 Bolt assembly - flange connection at corners - M10 bolt and nut |
| 6 Filling - FPL 110 mineral wool - fill the gap between the duct and the wall | 13 VRM-Q 120 → see page 58 |
| 7 Fixing profile with threaded rod → see pages 46 to 49 | 14 Sealing - all joints between duct segments are insulated with Flamebar Fibre Gasket self-adhesive tape and Flamebar Intumescent Sealant |

(continued on next page)

(continuation of installation Outside solid wall construction - FPL duct - Rockwool insulation)



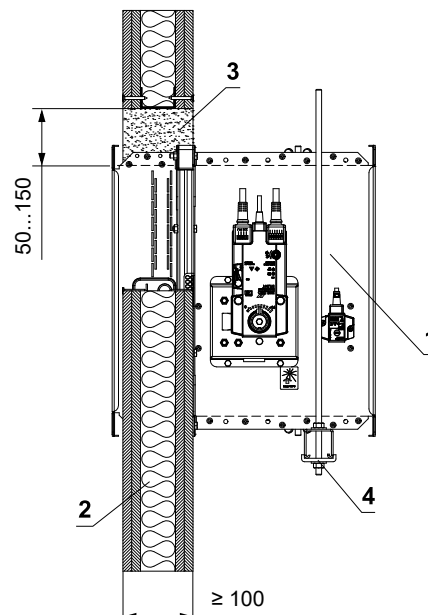
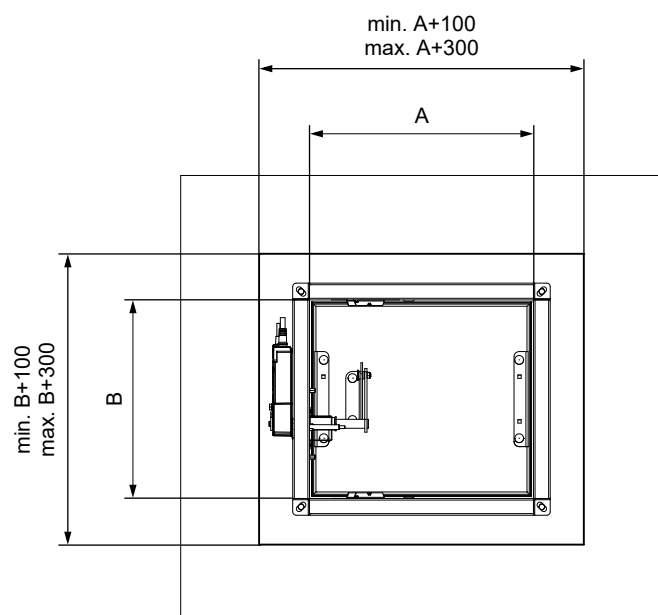
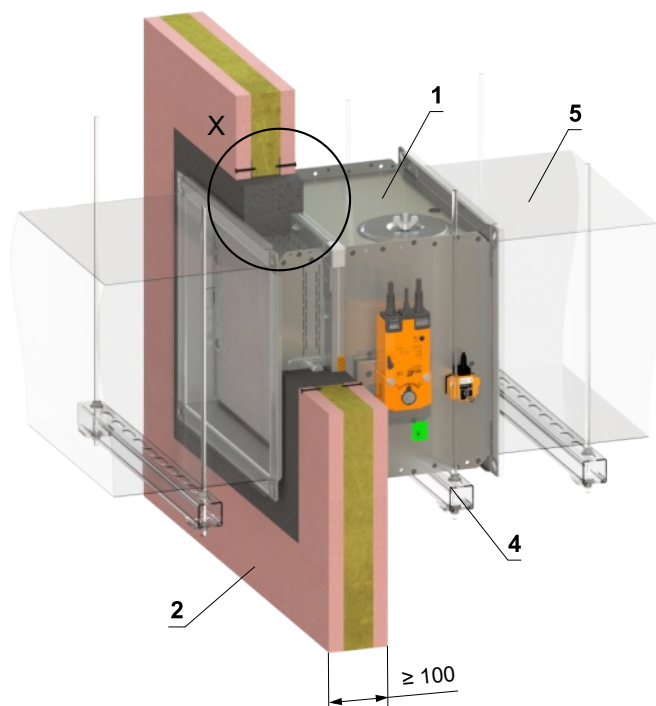
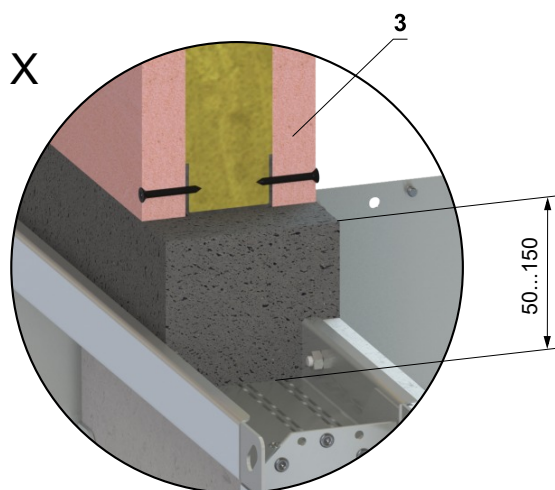
- 1 FDMQ 120
- 2 Solid wall construction
- 3 Flamebar EN fire duct - made of galvanised sheet metal, thickness is dependant on duct size, type BW18 fire sprayed with Flamebar BW18 (insulated duct), type BW11 fire sprayed with Flamebar BW11 (not insulated duct)
- 4 Insulation - two layers of stone wool FPL 110 SLAB, thickness 2x 50 mm, density 105 kg/m³, the second layer of insulation is provided with aluminium foil on the outside (FPL 110 FOIL FACED SLAB) - visible edges of mineral wool are covered with self-adhesive aluminium tape
- 5 Insulation collar - additional insulation of the fire damper and gypsum wall construction - third layer of insulation FPL 110 FOIL FACED SLAB, thickness 50 mm and width 600 mm
- 6 Filling - FPL 110 mineral wool - fill the gap between the duct and the wall
- 7 Fixing profile with threaded rod → see pages 46 to 49
- 8 Penetration insulation pattress - FPL 110 FOIL FACED SLAB, thickness 50 mm - glued with Idenden 10-450 and fixed with screws to the wall construction
- 9 Reinforcement of the duct - steel L-profile 50x50x5 mm or flange to Flamebar spec. on all sides of the duct within 100 mm of the wall
- 10 Insulation pins - riveted to the duct - after the insulation boards are pushed over the insulation pins, secure the ends with disc plates in each insulation layer
- 11 Steel clamp - flange connection with Flamebar G-Clamps with M8 bolts, max. spacing 200 mm
- 12 Bolt assembly - flange connection at corners - M10 bolt and nut
- 13 VRM-Q 120 → see page 58
- 14 Sealing - all joints between duct segments are insulated with Flamebar Fibre Gasket self-adhesive tape and Flamebar Intumescent Sealant

Installation in gypsum wall construction

In gypsum wall construction - mortar or gypsum

EI 120 (v_e) S [H] - 500 Pa

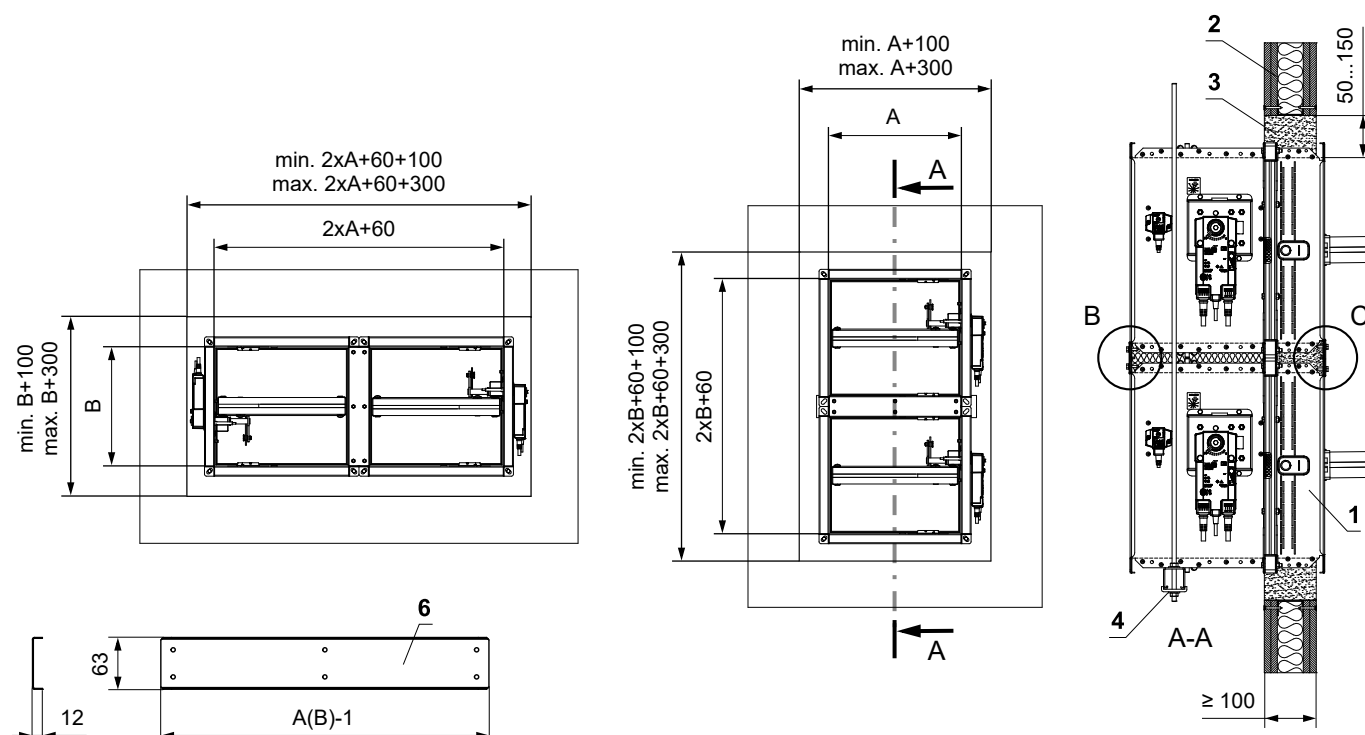
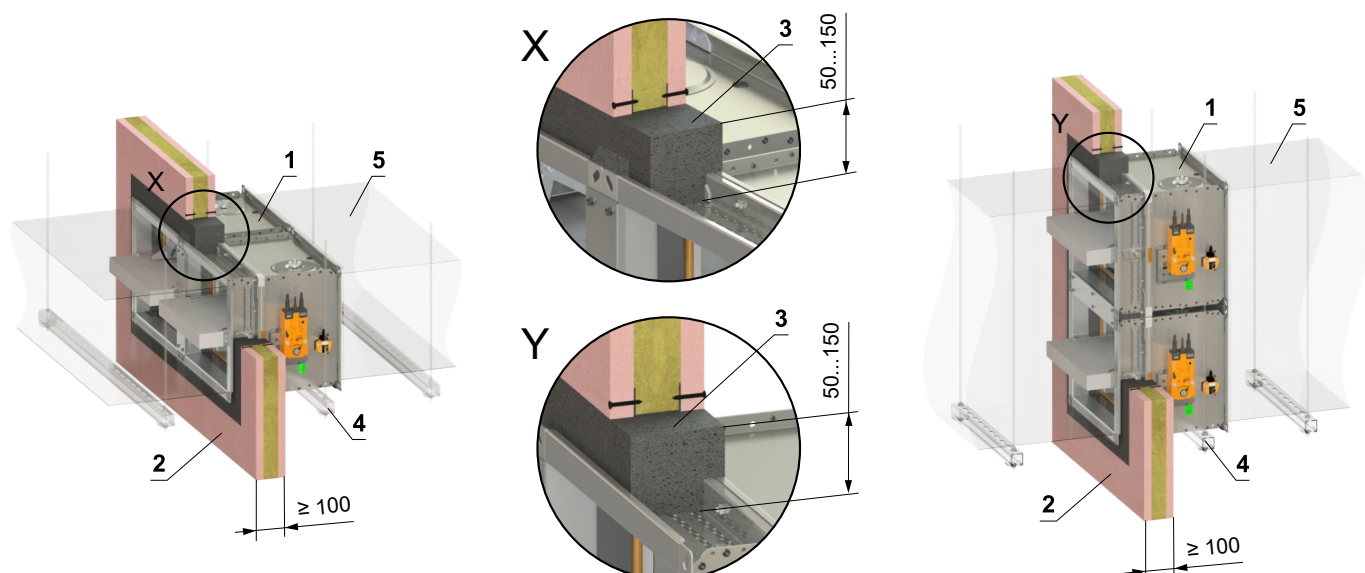
- For connection following duct → see page 50
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.
- The installation opening is lined with a UW/CW profile.



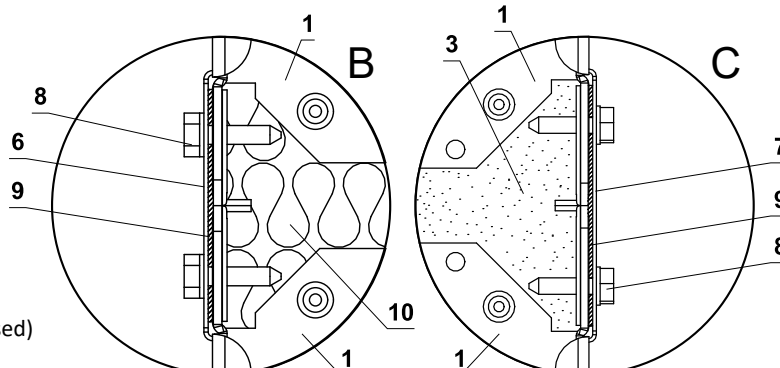
- 1 FDMQ 120
- 2 Gypsum wall construction
- 3 British gypsum thistle bond 60 (or equivalent can be used)
minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct

In gypsum wall construction - 2 dampers in battery - mortar or gypsum

EI 120 (v_e) S [H]

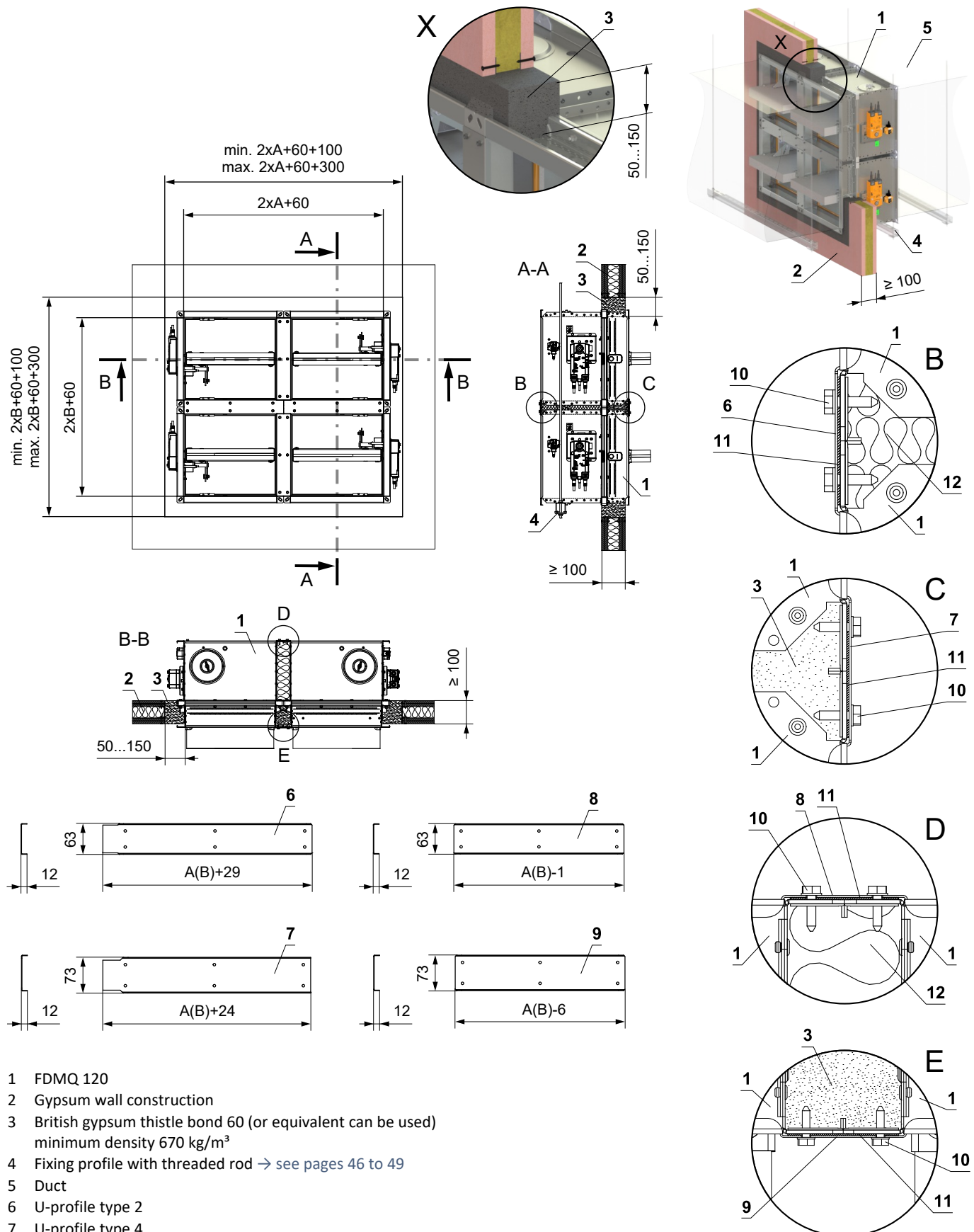


- 1 FDMQ 120
- 2 Gypsum wall construction
- 3 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct
- 6 U-profile type 3
- 7 U-profile type 1
- 8 Screw TEK 4,8x18 mm (span ≤ 200 mm)
- 9 Seal
- 10 Insulation board made of stone wool, min. density 66 kg/m³ (e.g. ISOVER Ultimate Protect SLAB 4), th. 60 mm



- For connection following duct → see page 50
- Gap between damper and construction is filled by mortar or gypsum
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.
- The installation opening is lined with a UW/CW profile.

In gypsum wall construction - 4 dampers in battery - mortar or gypsum

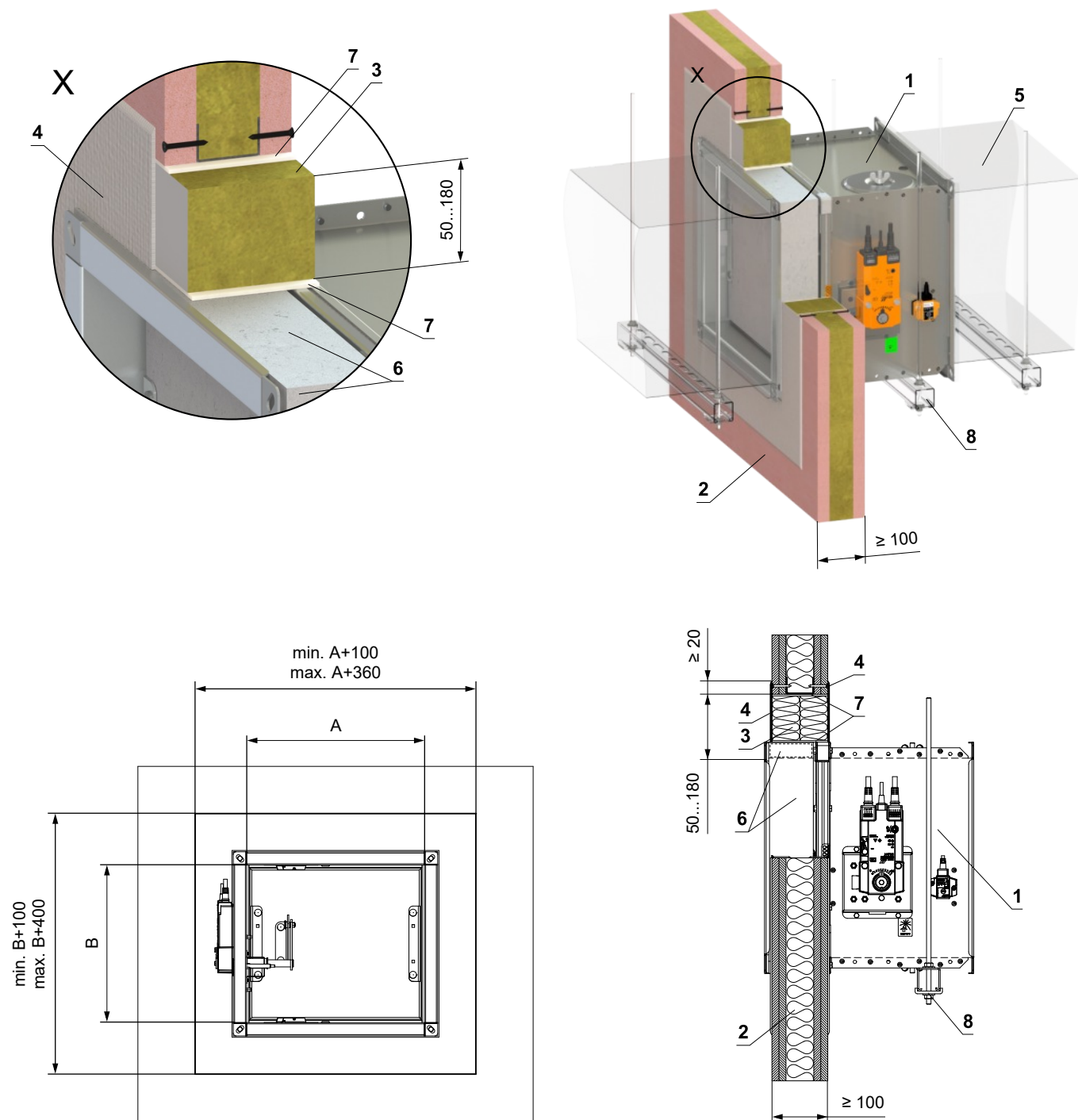
EI 120 (v_e) S [H]

- For connection following duct → see page 50
- Gap between damper and construction is filled by mortar or gypsum
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.
- The installation opening is lined with a UW/CW profile.

In gypsum wall construction - Ablative Coated Batt

EI 120 (v_e) S [H]

- For connection following duct → see page 50
- The installation opening is lined with a UW/CW profile.



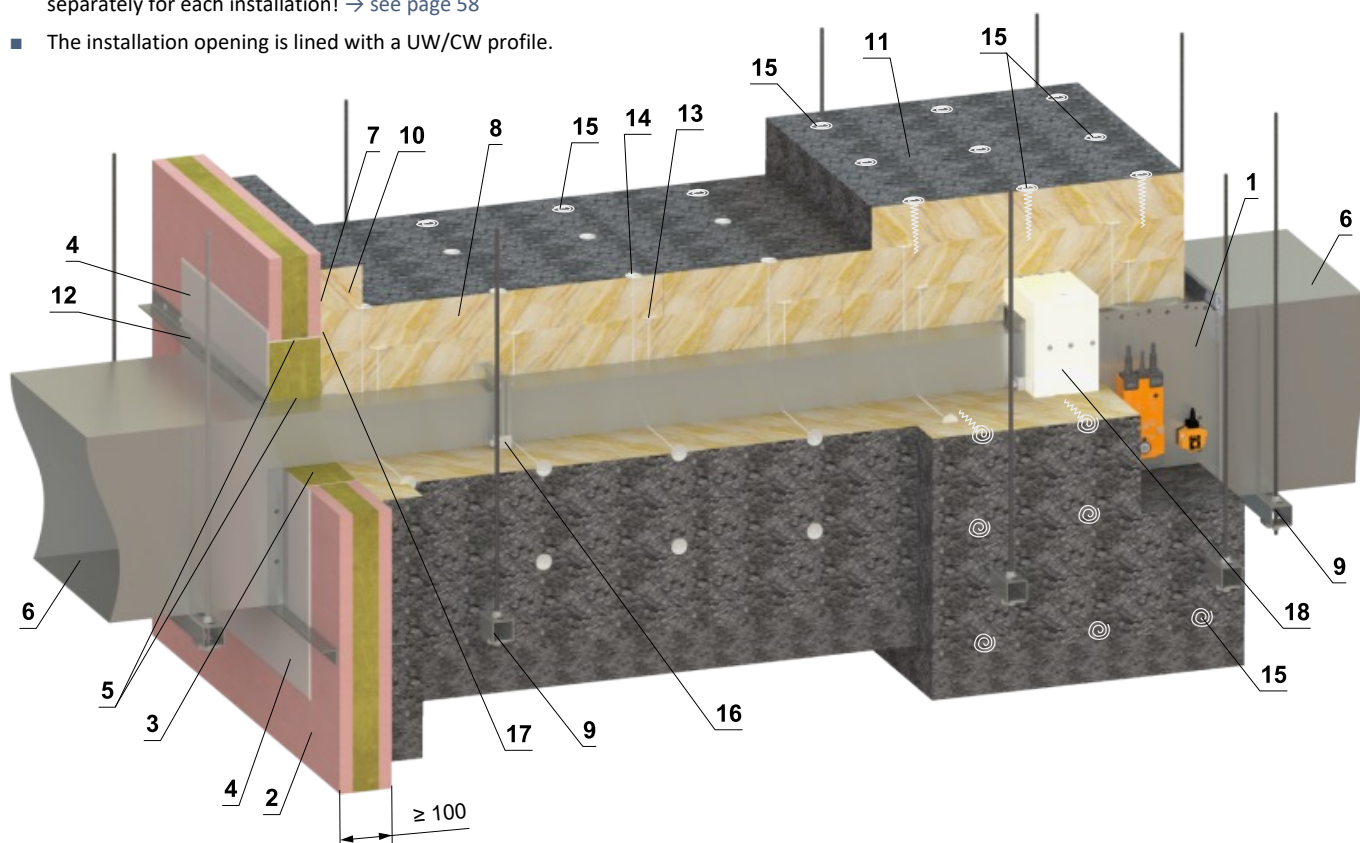
- 1 FDMQ 120
- 2 Gypsum wall construction
- 3 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 4 Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent)
- 5 Duct
- 6 Protective cladding boards - (not part of the damper) but must be used as part of the penetration filling → see page 59
- 7 Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-S ACR)
- 8 Fixing profile with threaded rod → see pages 46 to 49

Installation outside gypsum wall construction

Outside gypsum wall construction - ISOVER Ultimate Protect - Ablative Coated Batt

EI 120 (v_e) S [H]

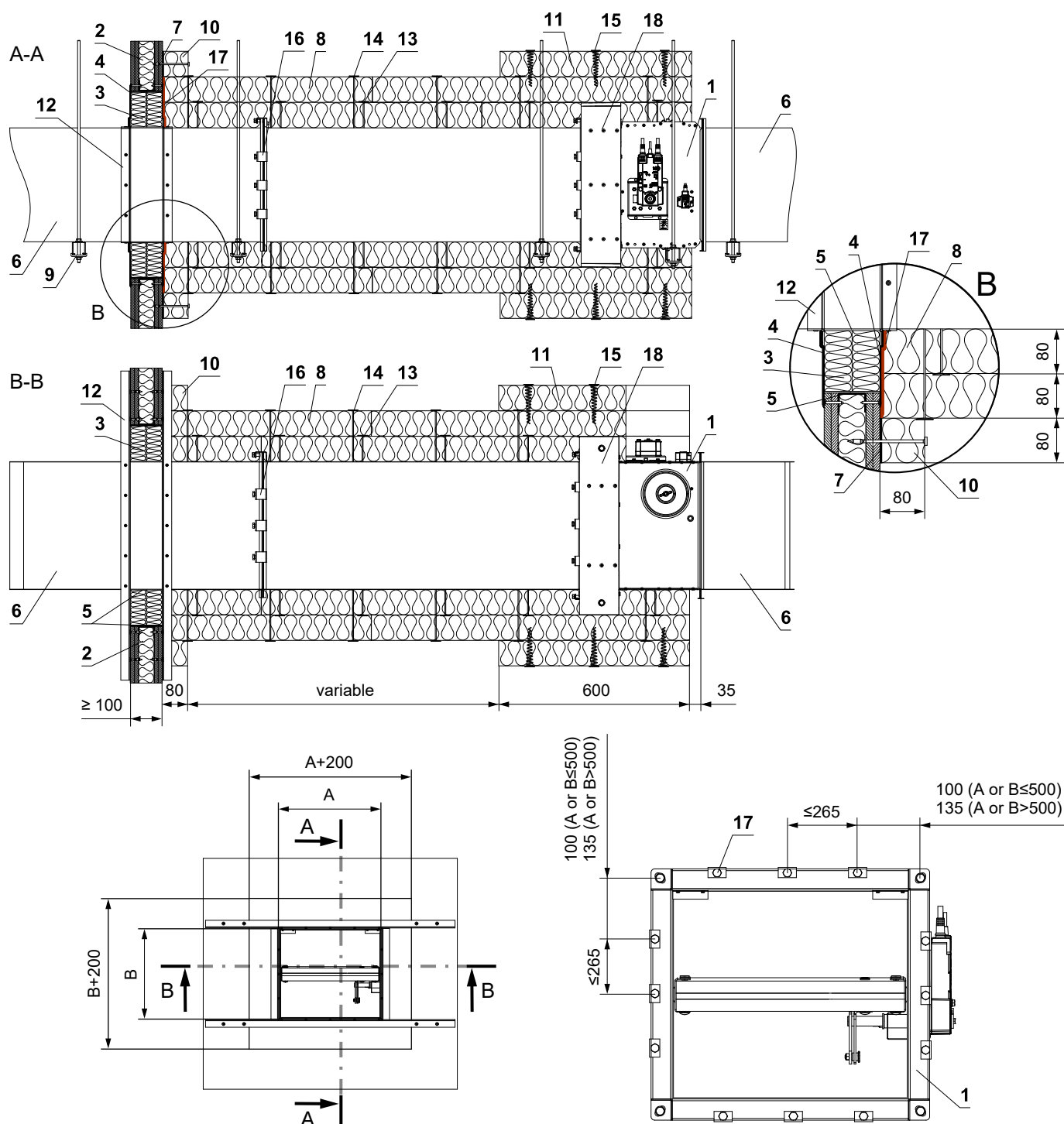
- For connection following duct → see page 50
- Minimum and maximum distance between the wall and the fire damper is unlimited.
- When installing the insulation, follow the ISOVER manufacturer's instructions.
- The fire damper and duct must be suspended separately.
- The duct must be suspended on both sides of the fire damper in accordance with national standards.
- The duct between the fire damper and the fire separating construction must be suspended using threaded rods and mounting profiles or another suspension system in accordance with national standards.
- Fire damper inspection holes are covered with insulation, therefore it's necessary to make an inspection hole in the connecting duct.
- Load on suspension system depends on weight of the fire damper and duct system → see page 46
- Max. length between two suspension systems is 1500 mm.
- Installation must be done in such a way that all load transfer from the fire separating construction to the damper is completely eliminated.
- If the threaded rod is located inside the duct insulation, the distance between the threaded rod and the duct must be max. 30 mm.
- If the threaded rod is located outside the duct insulation, the distance between the threaded rod and the insulation must be max. 40 mm.
- The insulation boards are fastened to the duct.
- Reinforcing frame VRM-Q 120 must always be used for this type of installation. VRM-Q 120 is not part of the fire damper and must be ordered separately for each installation! → see page 58
- The installation opening is lined with a UW/CW profile.



- | | | | |
|---|---|----|---|
| 1 | FDMQ 120 | 10 | Duct penetration insulation collar - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm - glued (pos. 7) and fixed with screws to the wall construction |
| 2 | Gypsum wall construction | 11 | Insulating collar of the damper and duct connection - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm |
| 3 | Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m ³ + Firestop acrylic sealant HILTI CFS-SACR or equivalent) | 12 | L-profile 30x30x3 mm - dimensions and installation acc. to ISOVER manufacturer |
| 4 | Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent) | 13 | Stud-welded pins 80 mm - quantity and placing acc. to ISOVER manufa. |
| 5 | Insulation board made of stone wool, with a surface treatment of aluminum foil, min. density 66 kg/m ³ (ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm) | 14 | Stud-welded pins 160 mm - quantity and placing acc. to ISOVER manufa. |
| 6 | Standard air ducts, made of galvanized sheet thickness 0,8 mm, flanges 30 mm, acc. to BS EN 1507 and DIN 24190 | 15 | Fire spiral shaped screws - quantity and placing acc. to ISOVER manufa. |
| 7 | ISOVER Protect BSK glue - apply on the insulation and stick it to the fire separation construction | 16 | Steel clamp min. M8 bolts |
| 8 | Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-SACR) | 17 | ISOVER Protect BSF |
| 9 | Fixing profile with threaded rod → see pages 46 to 49 | 18 | VRM-Q 120 → see page 58 |

(continued on next page)

(continuation of installation Outside gypsum wall construction - ISOVER Ultimate Protect - Ablative Coated Batt)

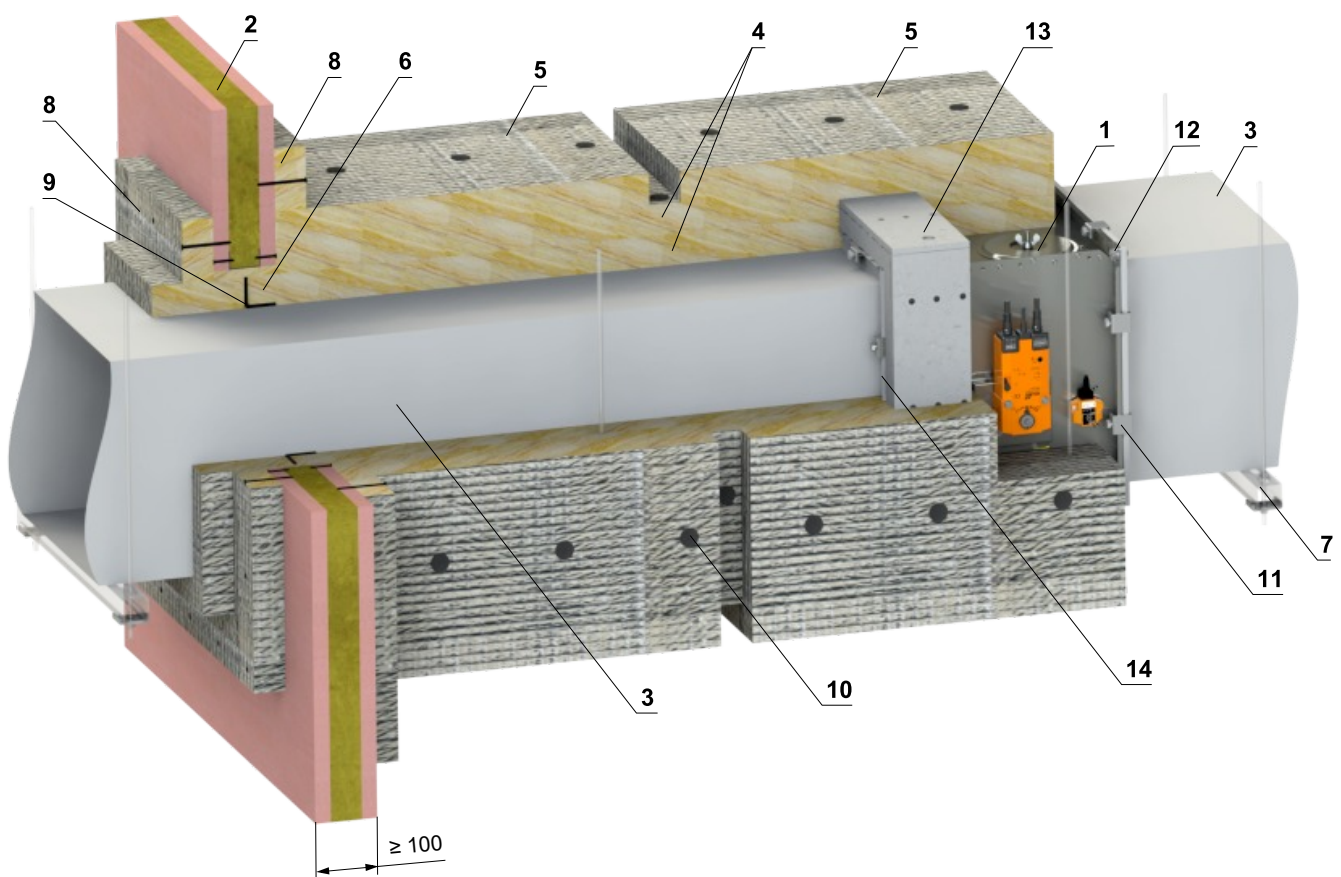


- | | | | |
|---|---|----|---|
| 1 | FDMQ 120 | 10 | Duct penetration insulation collar - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm - glued (pos. 7) and fixed with screws to the wall construction |
| 2 | Gypsum wall construction | 11 | Insulating collar of the damper and duct connection - ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm |
| 3 | Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m ³ + Firestop acrylic sealant HILTI CFS-SACR or equivalent) | 12 | L-profile 30x30x3 mm - dimensions and installation acc. to ISOVER manufacturer |
| 4 | Fire stop coating thickness 1 mm (e.g. HILTI CFS-CT, PROMASTOP-CC or equivalent) | 13 | Stud-welded pins 80 mm - quantity and placing acc. to ISOVER manufa. |
| 5 | Insulation board made of stone wool, with a surface treatment of aluminum foil, min. density 66 kg/m ³ (ISOVER Ultimate Protect SLAB 4.0 Alu1, th. 80 mm) | 14 | Stud-welded pins 160 mm - quantity and placing acc. to ISOVER manufa. |
| 6 | Standard air ducts, made of galvanized sheet thickness 0,8 mm, flanges 30 mm, acc. to BS EN 1507 and DIN 24190 | 15 | Fire spiral shaped screws - quantity and placing acc. to ISOVER manufa. |
| 7 | ISOVER Protect BSK glue - apply on the insulation and stick it to the fire separation construction | 16 | Steel clamp min. M8 bolts |
| 8 | Fire resistant mastic - fill the gap on both sides of the fire separation construction and around the perimeter of penetration and damper body. (e.g. HILTI CFS-SACR) | 17 | ISOVER Protect BSF |
| 9 | Fixing profile with threaded rod → see pages 46 to 49 | 18 | VRM-Q 120 → see page 58 |

Outside gypsum wall construction - Flamebar EN Fire Duct - FPL 110 insulation

EI 120 (v_e) S [H]

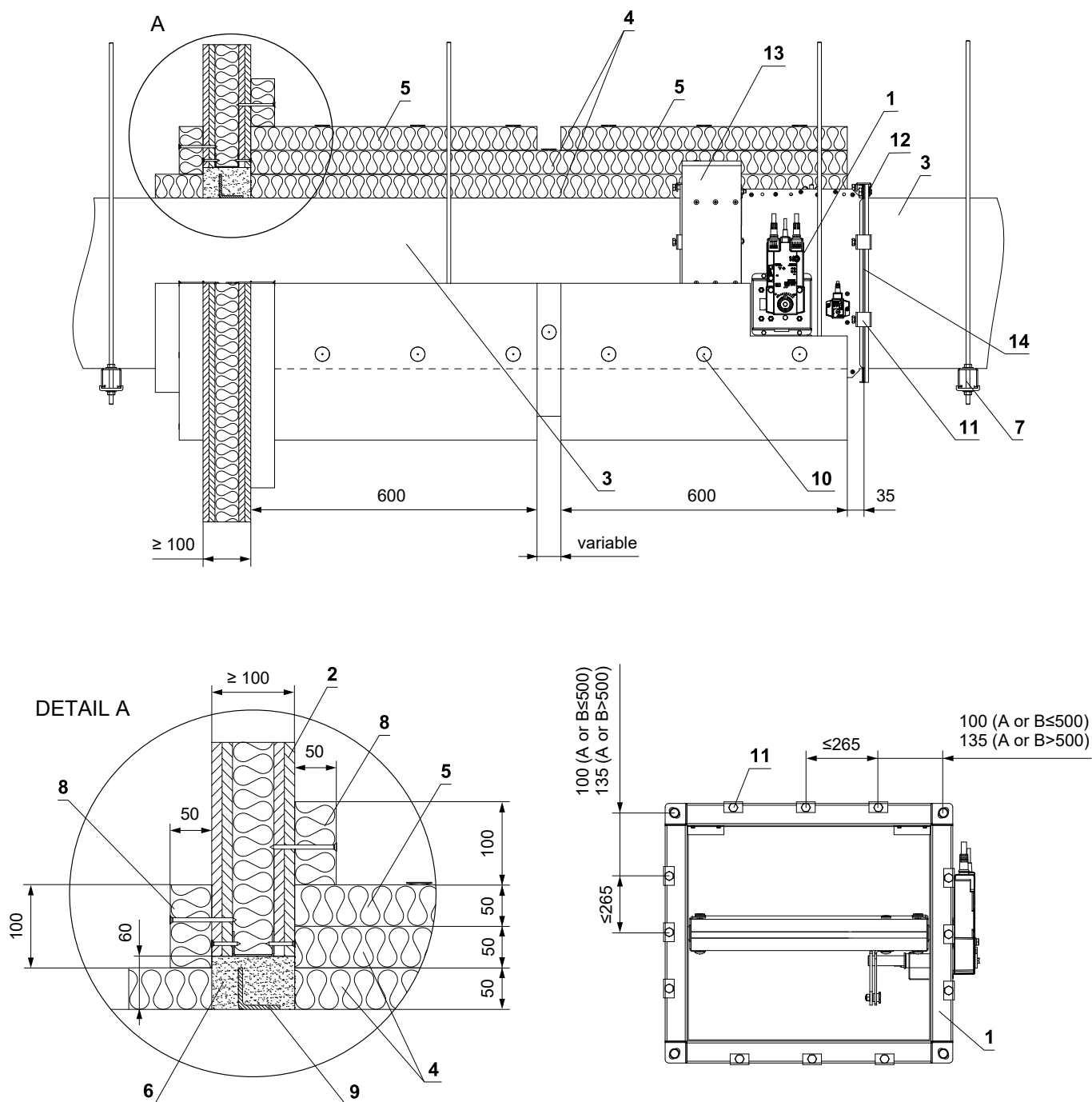
- Minimum and maximum distance between the wall and the fire damper is unlimited.
- The fire damper and duct must be suspended separately.
- The duct must be suspended on both sides of the fire damper in accordance with national standards.
- The duct between the fire damper and the fire separating construction must be suspended using threaded rods and mounting profiles or another suspension system in accordance with national standards.
- Fire damper inspection holes are covered with insulation, therefore it's necessary to install an access door in the connecting duct. (This must be a Flamebar access door if installed in the fire duct.)
- Load on suspension system depends on weight of the fire damper and duct system → [see page 46](#)
- Max. length between two suspension systems is 1500 mm.
- Installation must be done in such a way that all load transfer from the fire separating construction to the damper is completely eliminated.
- Reinforcing frame VRM-Q 120 must always be used for this type of installation. VRM-Q 120 is not part of the fire damper and must be ordered separately for each installation! → [see page 58](#)
- The installation opening is lined with a UW/CW profile.



- | | | | |
|---|---|----|--|
| 1 | FDMQ 120 | 8 | Penetration insulation pattress - FPL 110 FOIL FACED SLAB, thickness 50 mm - glued with Idenden 10-450 and fixed with screws to the wall construction |
| 2 | Gypsum wall construction | 9 | Reinforcement of the duct - steel L-profile 50x50x5 mm or flange to Flamebar spec. on all sides of the duct within 100 mm of the wall |
| 3 | Flamebar EN fire Duct - made of galvanised sheet metal, thickness is dependant on duct size, type BW18 fire sprayed with Flamebar BW18 (insulated duct), type BW11 fire sprayed with Flamebar BW11 (not insulated duct) | 10 | Insulation pins - riveted to the duct - after the insulation boards are pushed over the insulation pins, secure the ends with disc plates in each insulation layer |
| 4 | Insulation - two layers of stone wool FPL 110 SLAB, thickness 2x 50 mm, density 105 kg/m ³ , the second layer of insulation is provided with aluminium foil on the outside (FPL 110 FOIL FACED SLAB) - visible edges of mineral wool are covered with self-adhesive aluminium tape | 11 | Steel clamp - flange connection with Flamebar G-Clamps with M8 bolts, max. spacing 200 mm |
| 5 | Insulation collar - additional insulation of the fire damper and gypsum wall construction - third layer of insulation FPL 110 FOIL FACED SLAB, thickness 50 mm and width 600 mm | 12 | Bolt assembly - flange connection at corners - M10 bolt and nut |
| 6 | Filling - FPL 110 mineral wool - fill the gap between the duct and the wall | 13 | VRM-Q 120 → see page 58 |
| 7 | Fixing profile with threaded rod → see pages 46 to 49 | 14 | Sealing - all joints between duct segments are insulated with Flamebar Fibre Gasket self-adhesive tape and Flamebar Intumescent Sealant |

(continued on next page)

(continuation of installation Outside gypsum wall construction - FPL duct - Rockwool insulation)



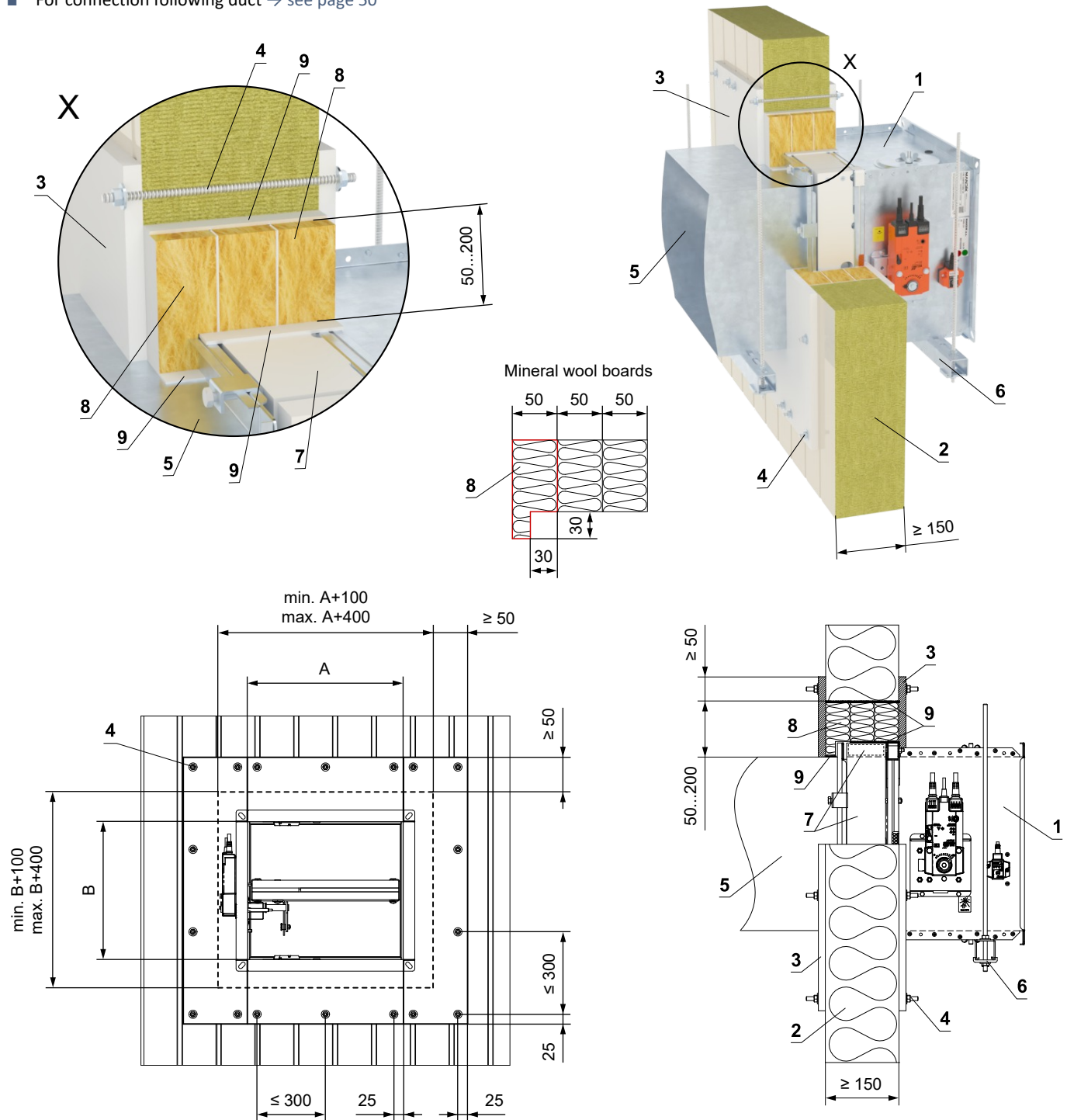
- 1 FDMQ 120
- 2 Gypsum wall construction
- 3 Flamebar EN fire Duct - made of galvanised sheet metal, thickness is dependant on duct size, type BW18 fire sprayed with Flamebar BW18 (insulated duct), type BW11 fire sprayed with Flamebar BW11 (not insulated duct)
- 4 Insulation - two layers of stone wool FPL 110 SLAB, thickness 2x 50 mm, density 105 kg/m³, the second layer of insulation is provided with aluminium foil on the outside (FPL 110 FOIL FACED SLAB) - visible edges of mineral wool are covered with self-adhesive aluminium tape
- 5 Insulation collar - additional insulation of the fire damper and gypsum wall construction - third layer of insulation FPL 110 FOIL FACED SLAB, thickness 50 mm and width 600 mm
- 6 Filling - FPL 110 mineral wool - fill the gap between the duct and the wall
- 7 Fixing profile with threaded rod → see pages 46 to 49
- 8 Penetration insulation pattress - FPL 110 FOIL FACED SLAB, thickness 50 mm - glued with Idenden 10-450 and fixed with screws to the wall construction
- 9 Reinforcement of the duct - steel L-profile 50x50x5 mm or flange to Flamebar spec. on all sides of the duct within 100 mm of the wall
- 10 Insulation pins - riveted to the duct - after the insulation boards are pushed over the insulation pins, secure the ends with disc plates in each insulation layer
- 11 Steel clamp - flange connection with Flamebar G-Clamps with M8 bolts, max. spacing 200 mm
- 12 Bolt assembly - flange connection at corners - M10 bolt and nut
- 13 VRM-Q 120 → see page 58
- 14 Sealing - all joints between duct segments are insulated with Flamebar Fibre Gasket self-adhesive tape and Flamebar Intumescent Sealant

Installation in sandwich wall construction

In sandwich wall construction EUROCLAD - Ablative Coated Batt with fire-resistant boards

EI 120 (v_e) S [H]

■ For connection following duct → see page 50

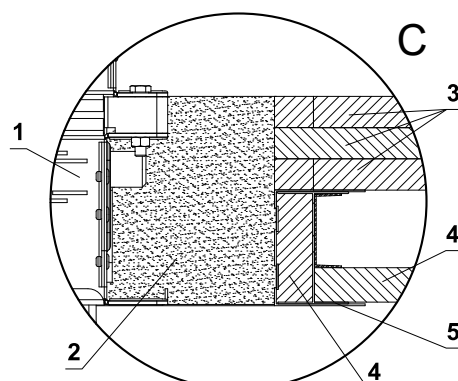
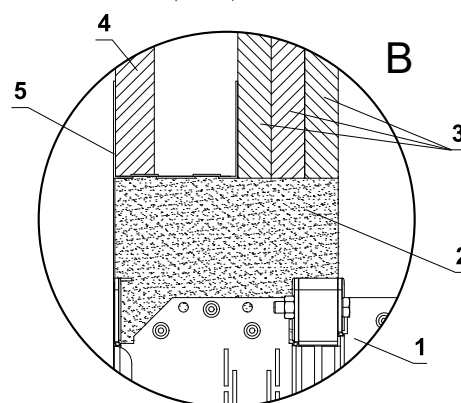
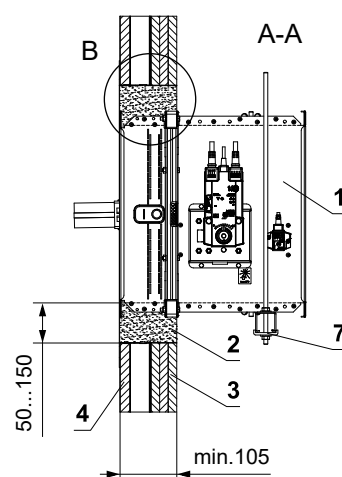
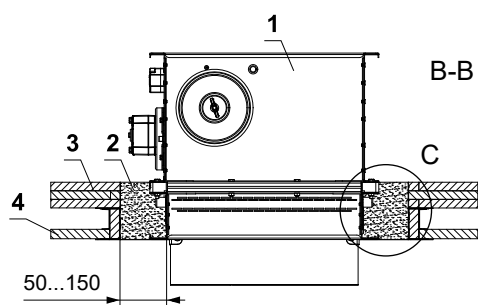
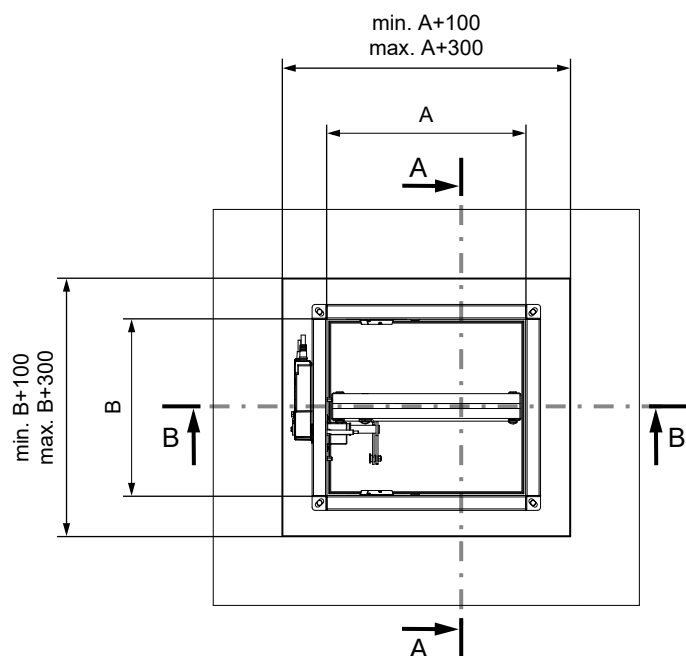
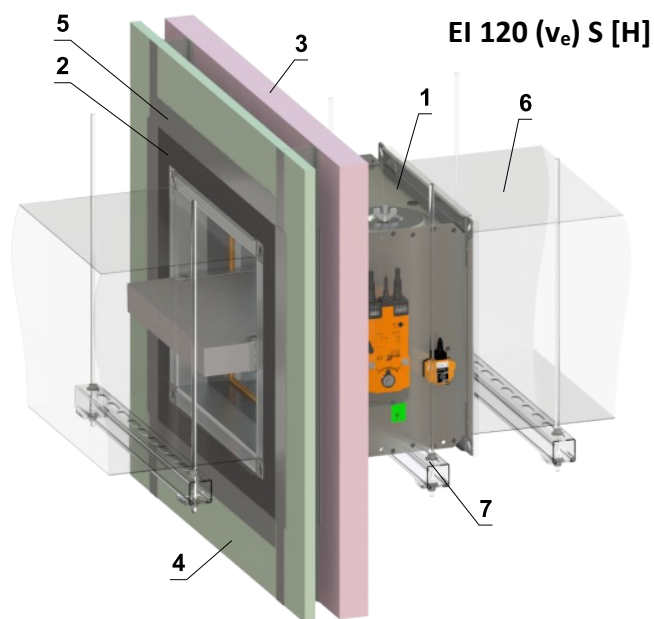


- 1 FDMQ 120
- 2 Sandwich wall construction - min. th. 150 mm (Euroclad Firemaster Extra)
- 3 Fire-resistant board - min. th. 15 mm, min. density 870 kg/m³ (e.g. PROMATECT-H)
- 4 Fixing connection of boards - threaded rod M8 (length of the threaded rod for 150 mm sandwich construction is min. 220 mm, 2 pcs large washer M8, 2 pcs nut M8). The boards must be tightly fixed to the sandwich wall construction!
- 5 Duct
- 6 Fixing profile with threaded rod → see pages 46 to 49
- 7 Protective cladding boards - (not part of the damper) but must be used as part of the penetration filling → see page 59
- 8 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³)
- 9 Fire-resistant mastic - (HILTI CFS-S ACR...) fill the gap from both sides of the fire separation construction and around the perimeter of penetration and damper casing

Installation in shaft wall construction

In shaft wall construction - mortar or gypsum

- For connection following duct → see page 50
- Damper can be installed on either side of the wall.
- It is possible to use e.g. wall type A306030, A306035... from www.british-gypsum.com or RNS 121, RNS 122... from www.siniat.co.uk
- It is possible to use walls that have the same or greater thickness and density of boards than the walls listed below (more layers of boards can also be used)
- Follow the instructions of the shaft wall manufacturer.

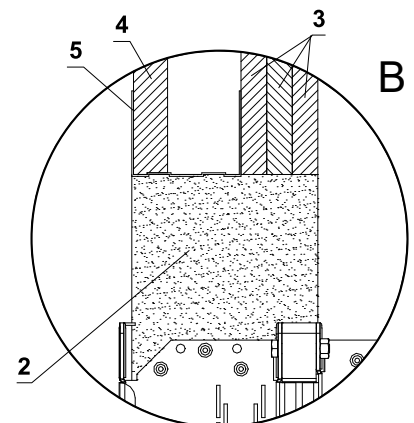
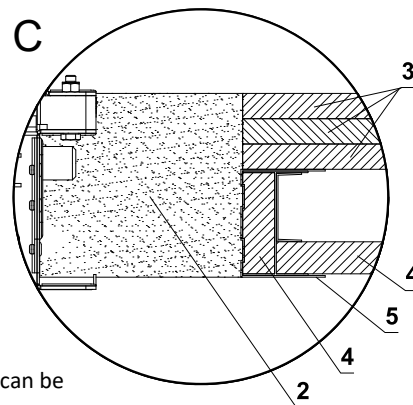
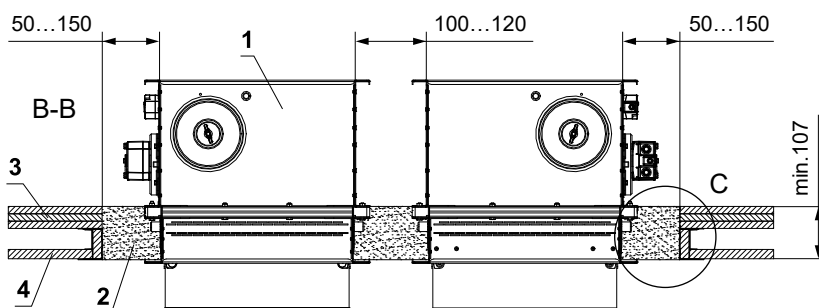
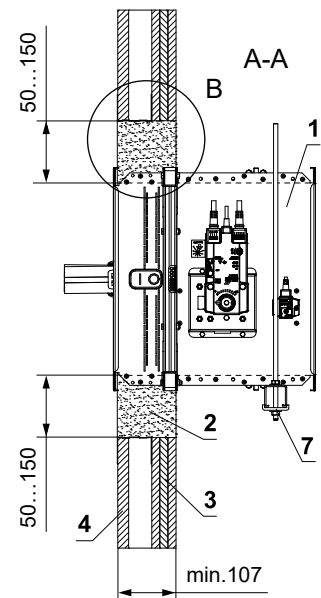
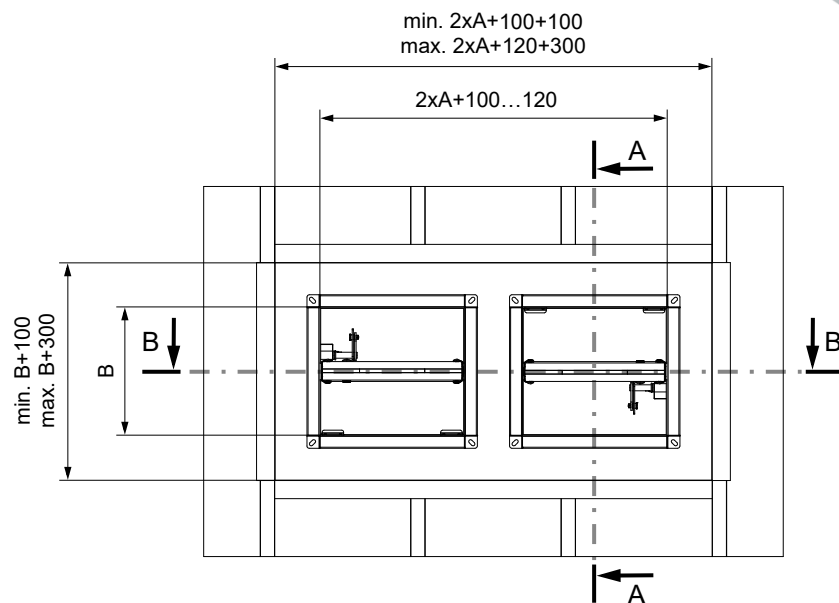
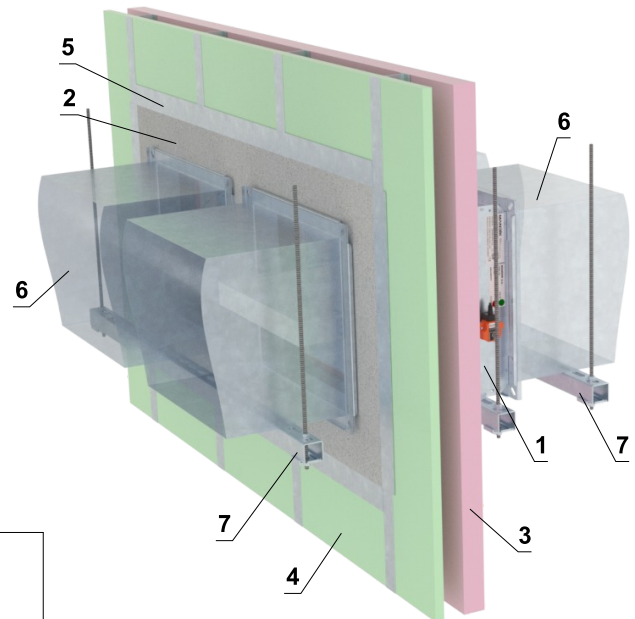


- 1 FDMQ 120
- 2 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 3 Plasterboard BS EN 520 - Type F - min. 3x15 mm
- 4 Plasterboard BS EN 520 - Type F - min. 1x19 mm
- 5 Plasterboard profile
- 6 Duct
- 7 Fixing profile with threaded rod → see pages 46 to 49

In shaft wall construction - 2 dampers in one opening - mortar or gypsum

EI 120 (v_e) S [H]

- For connection following duct → see page 50
- Damper can be installed on either side of the wall.
- It is possible to use e.g. wall type A306030, A306035... from www.british-gypsum.com
- It is possible to use walls that have the same or greater thickness and density than the walls listed below (more layers of boards can also be used)
- Follow the instructions of the shaft wall manufacturer.

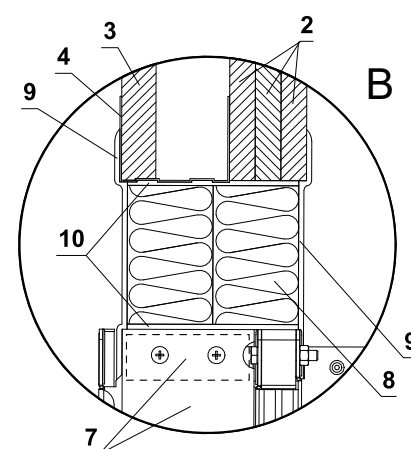
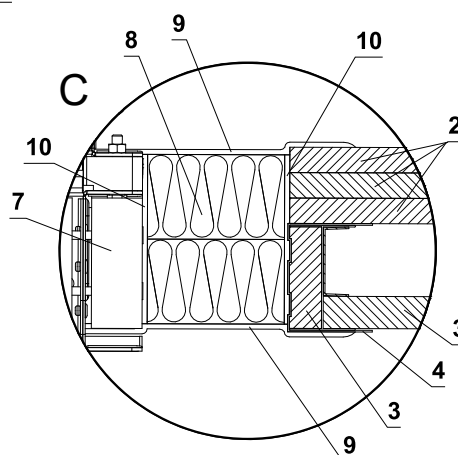
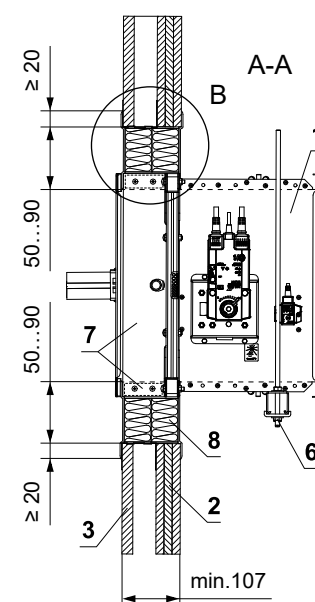
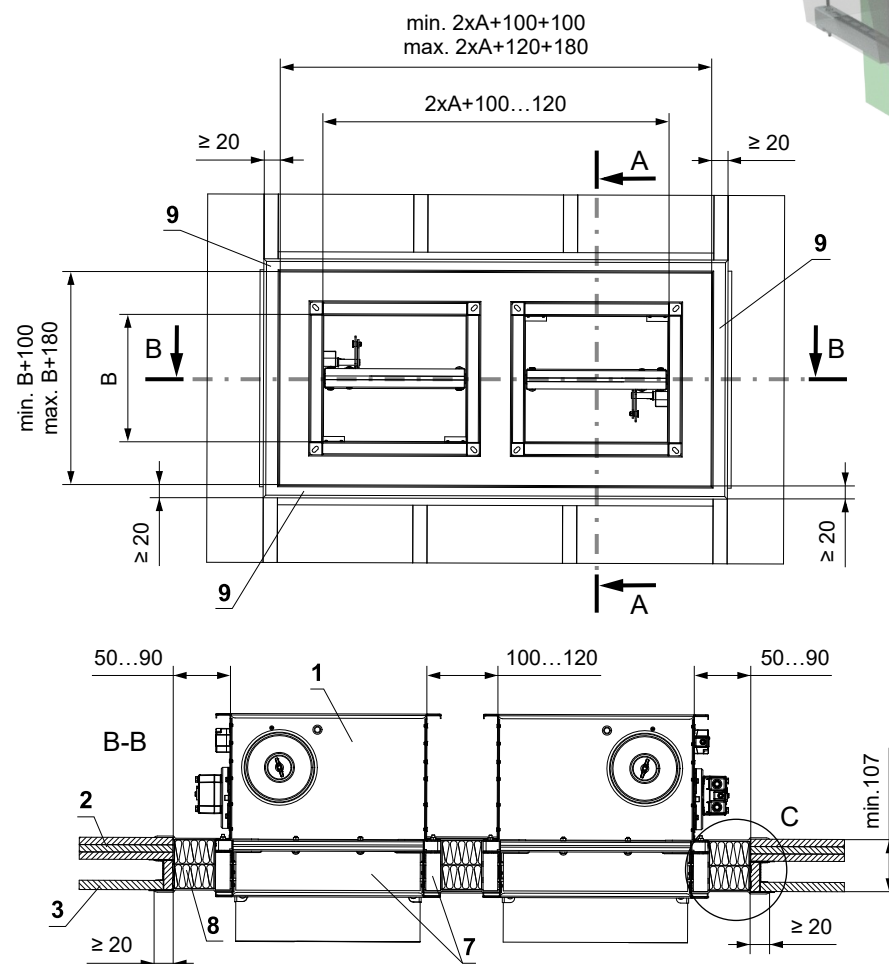
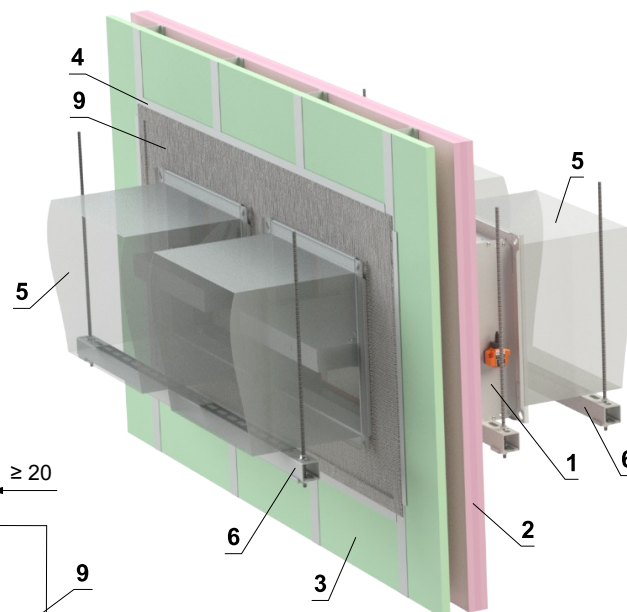


- 1 FDMQ 120
- 2 British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- 3 Plasterboard BS EN 520 - Type F - min. 3x15 mm
- 4 Plasterboard BS EN 520 - Type F - min. 1x19 mm
- 5 Plasterboard profile
- 6 Duct
- 7 Fixing profile with threaded rod → see pages 46 to 49

In shaft wall construction - 2 dampers in one opening - Ablative Coated Batt

EI 120 (v_e) S [H]

- For connection following duct → see page 50
- Damper can be installed on either side of the wall.
- It is possible to use e.g. wall type A306030, A306035... from www.british-gypsum.com
- It is possible to use walls that have the same or greater thickness and density of boards than the walls listed below (more layers of boards can also be used)
- Follow the instructions of the shaft wall manufacturer.



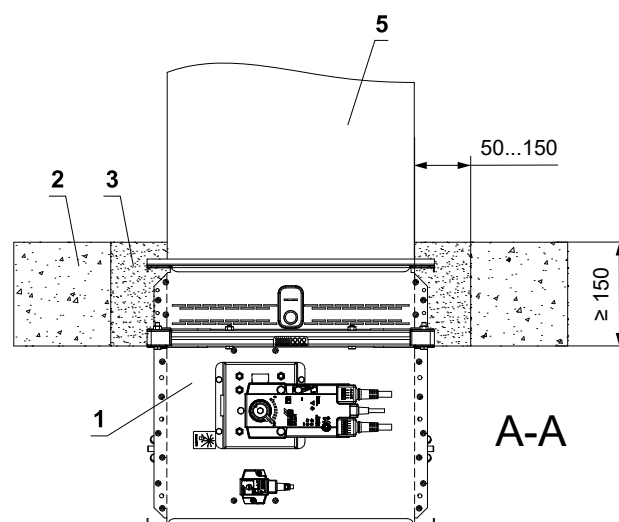
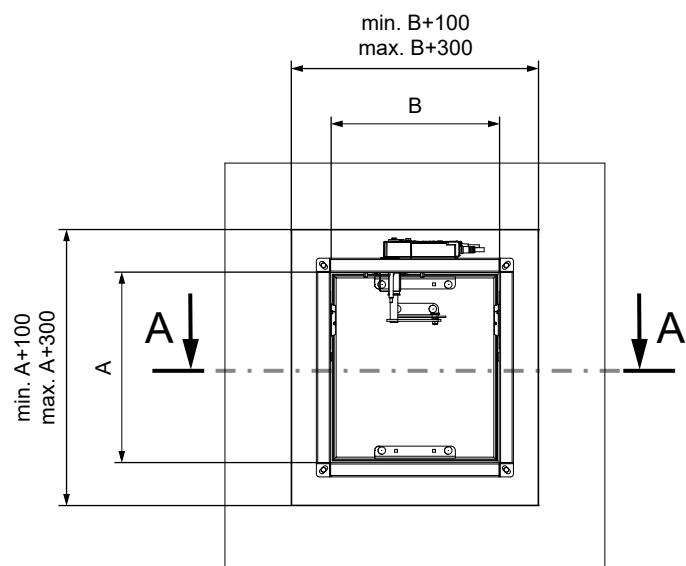
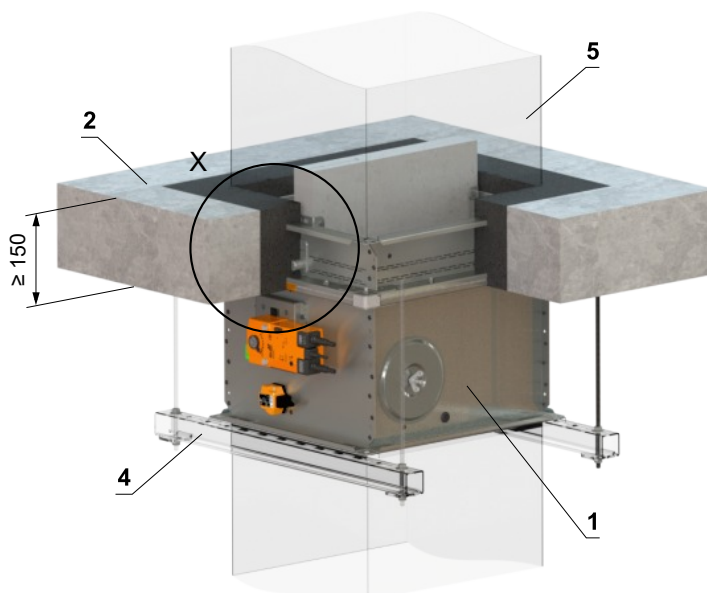
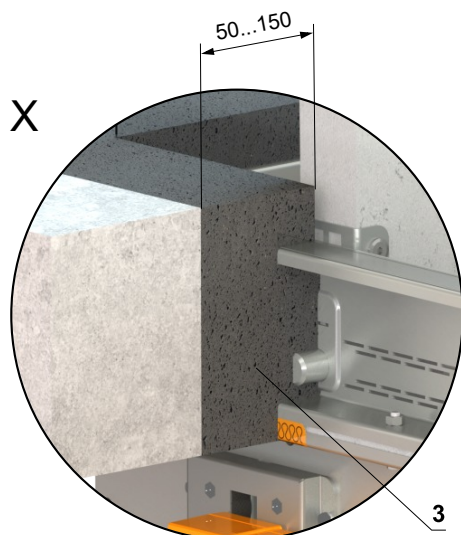
- 1 FDMQ 120
- 2 Plasterboard EN 520 - Type F - min. 3x15 mm
- 3 Plasterboard EN 520 - Type F - min. 1x19 mm
- 4 Plasterboard profile
- 5 Duct
- 6 Fixing profile with threaded rod → see pages 46 to 49
- 7 Protective cladding boards - (not part of the damper) but must be used as part of the penetration filling → see page 59
- 8 Ablative Coated Batt (e.g. Firestop Board HILTI CFS-CT B 1S 140/50 - min. density 140 kg/m³ + Firestop acrylic sealant HILTI CFS-S ACR or equivalent)
- 9 Fire stop coating - th. 1 mm (HILTI CFS-CT...) - coating is overcoated on the support construction and on the damper casing/duct
- 10 Fire-resistant mastic - (HILTI CFS-S ACR...) fill the gap from both sides of the fire separation construction and around the perimeter of penetration and damper casing

Installation in solid ceiling construction

In solid ceiling construction - mortar or gypsum

El 120 (h_o) S [H] - 500 Pa

- For connection following duct → see page 50
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.
- The damper can be installed from both sides of the construction, i.e. from the top or the bottom side of the ceiling.

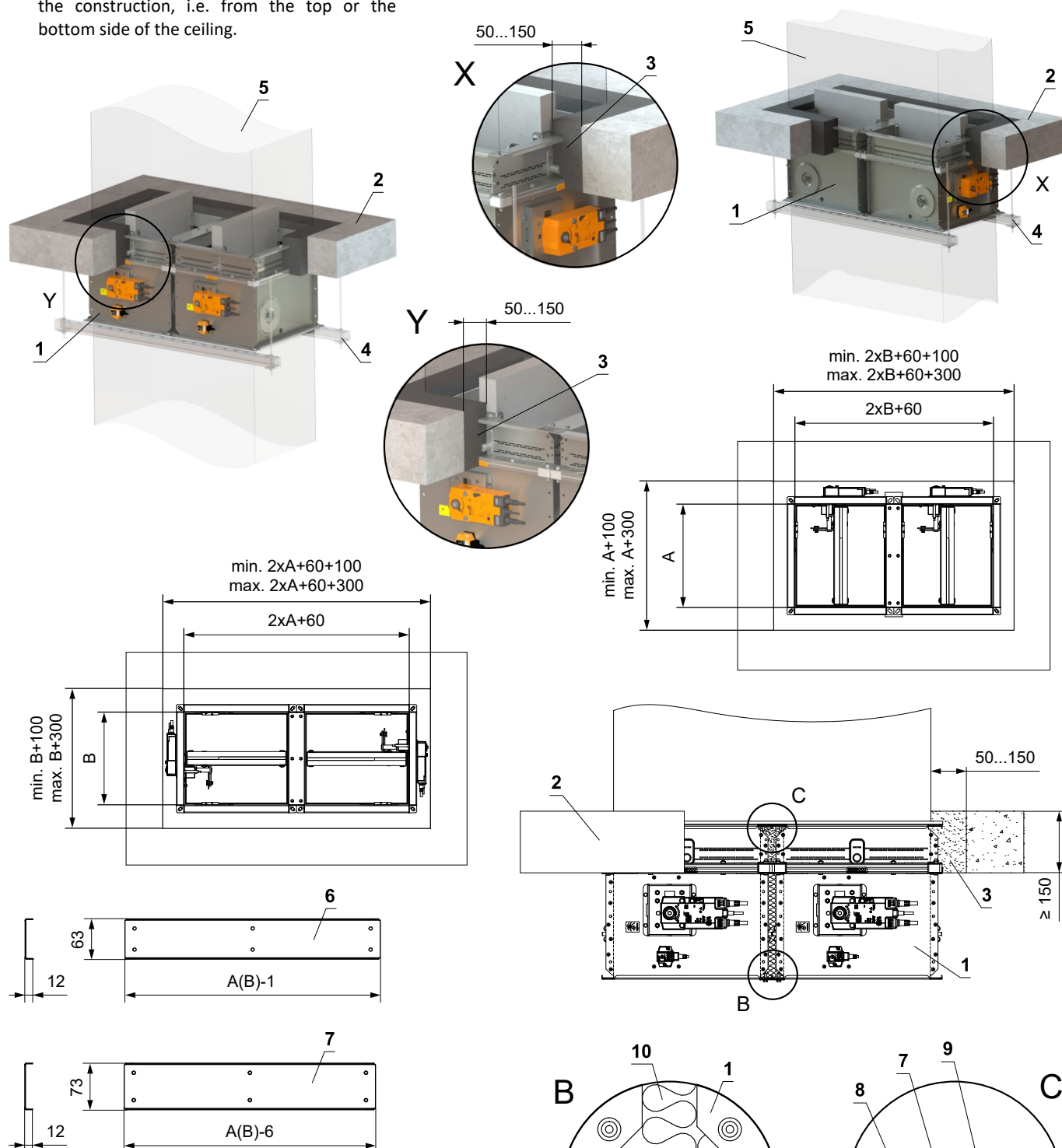


- 1 FDMQ 120
- 2 Solid ceiling construction
- 3 British gypsum thistle bond 60 (or equivalent can be used)
minimum density 670 kg/m³
- 4 Fixing profile with threaded rod → see pages 46 to 49
- 5 Duct

In solid ceiling construction - 2 dampers in battery - mortar or gypsum

EI 120 (h_o) S [H]

- The damper can be installed from both sides of the construction, i.e. from the top or the bottom side of the ceiling.



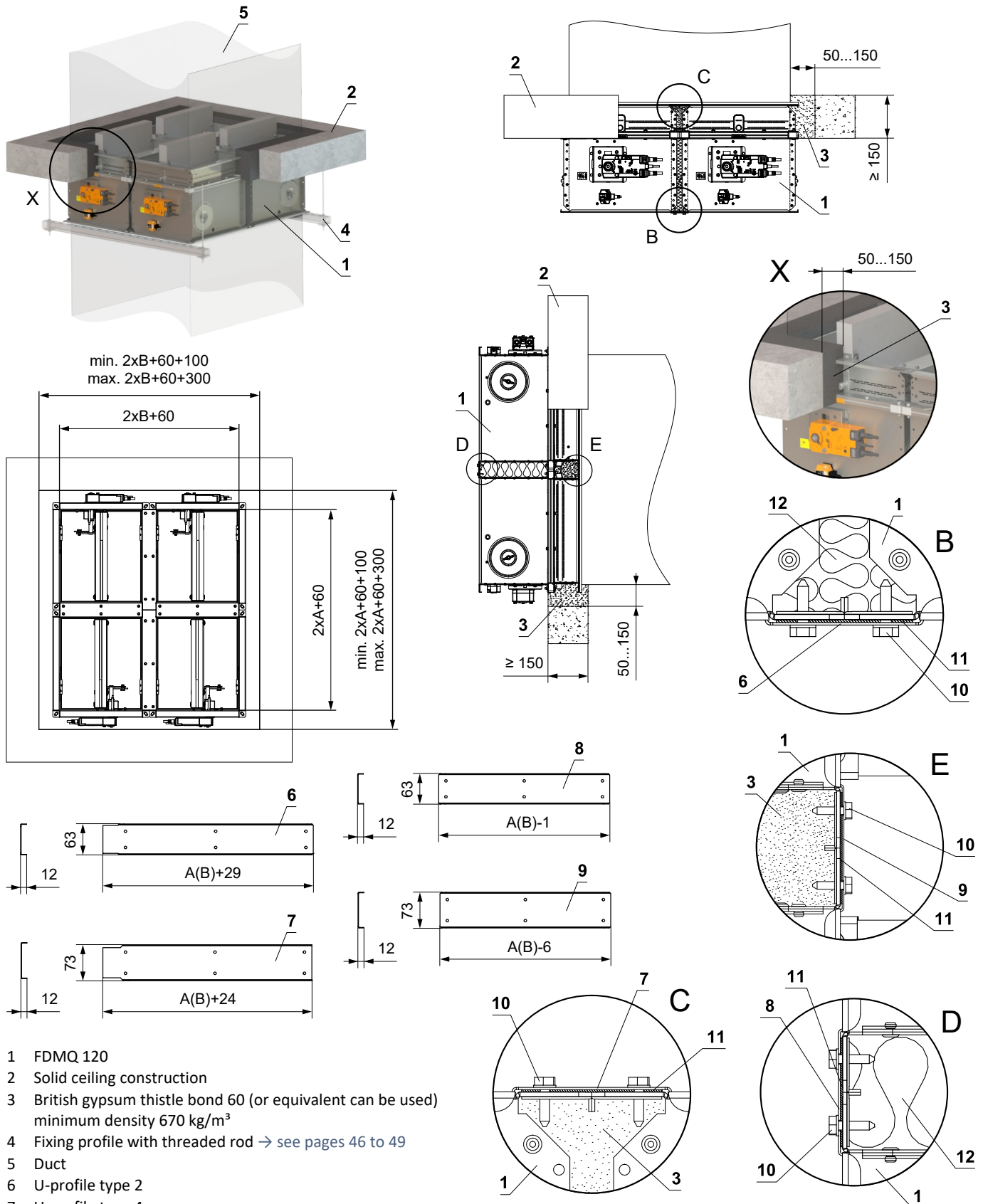
- FDMQ 120
- Solid ceiling construction
- British gypsum thistle bond 60 (or equivalent can be used) minimum density 670 kg/m³
- Fixing profile with threaded rod → see pages 46 to 49
- Duct
- U-profile type 3
- U-profile type 1
- Screw TEK 4,8x18 mm (span ≤ 200 mm)
- Seal
- Insulation board made of stone wool, min. density 66 kg/m³ (e.g. ISOVER Ultimate Protect SLAB 4), th. 60 mm

- For connection following duct → see page 50
- Gap between damper and construction is filled by mortar or gypsum
- This installation was tested without supports. Supports are optional, if are used, follow the manufacturer's instructions and national standards.

In solid ceiling construction - 4 dampers in battery - mortar or gypsum

EI 120 (h_o) S [H]

- The damper can be installed from both sides of the construction, i.e. from the top or the bottom side of the ceiling.

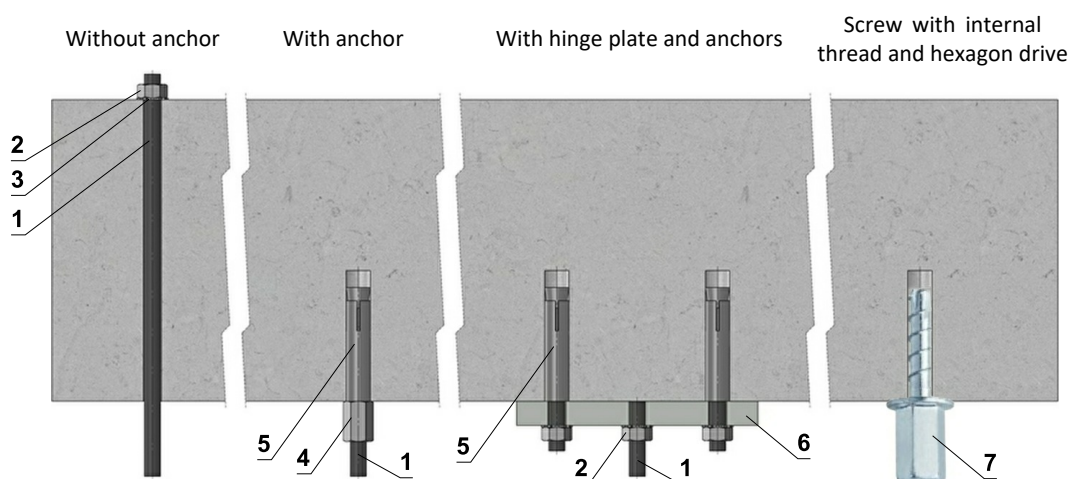


V. SUSPENSION SYSTEMS

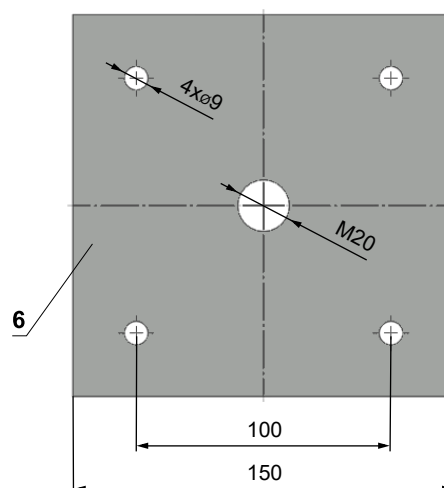
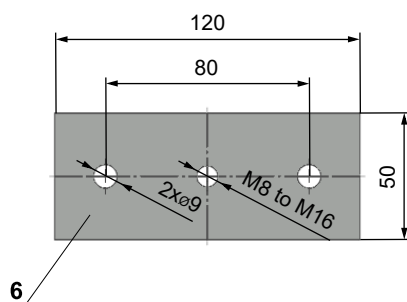
Mounting to the ceiling wall

- The dampers must be suspended using threaded rods and mounting profiles. Their dimensioning depend on the weight of the damper.
- The dampers and the duct must be suspended separately.
- Following air-conditioning duct must be suspended or supported so that all load transfer from the following duct to the damper flanges is absolutely excluded. Adjacent duct must be suspended or supported, as required by the duct suppliers.

Examples of anchoring to the ceiling construction Follow the instructions of fixing specialist or installation company



Hinge plates



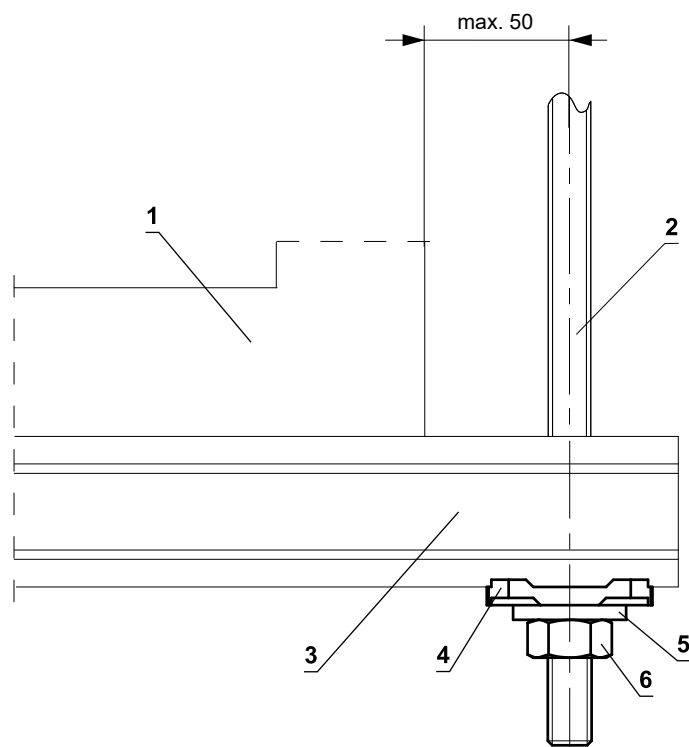
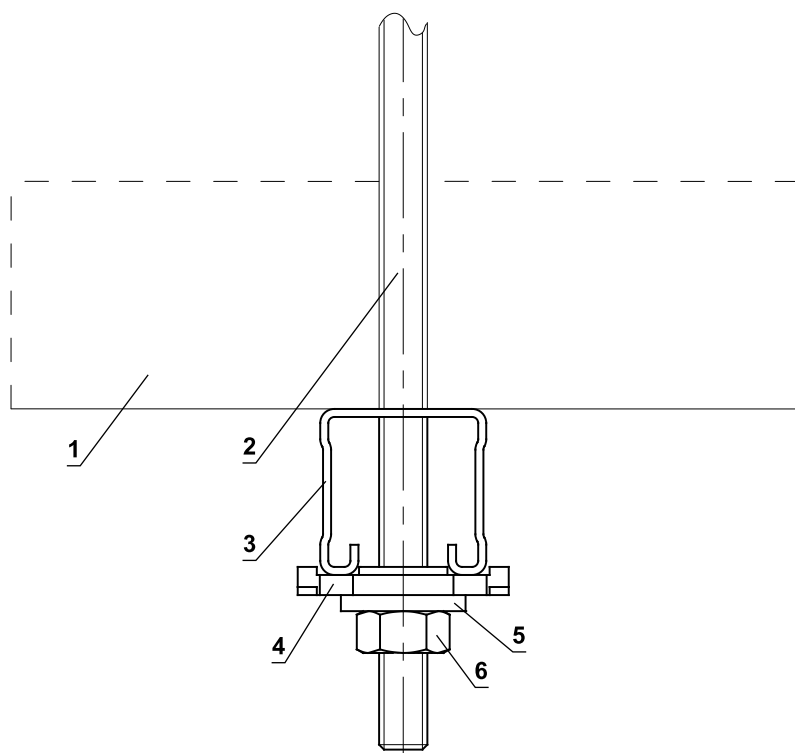
- If in doubt, always consult an anchor specialist engineer such as Halfen or Hilti.

Load capacities of threaded rods at the required fire resistance 60 min. < t ≤ 120 min.

Size	As [mm ²]	Weight [kg]	
		for 1 rod	for 2 rods
M8	36,6	22	44
M10	58	35	70
M12	84,3	52	104
M16	157	96	192
M18	192	117	234
M20	245	150	300

- 1 Threaded rod M8 - M20
- 2 Nut M8 - M20
- 3 Washer for M8 - M20
- 4 Coupling Nut M8 - M20
- 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)

Example of placing of mounting profiles HILTI

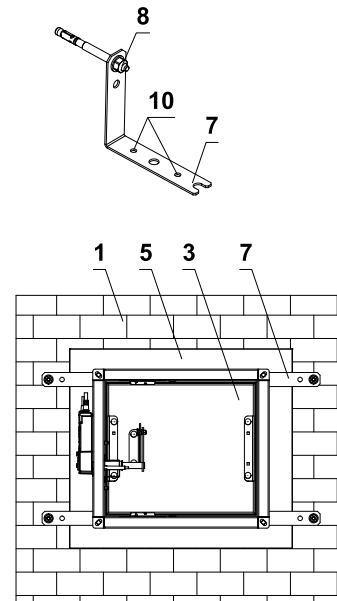
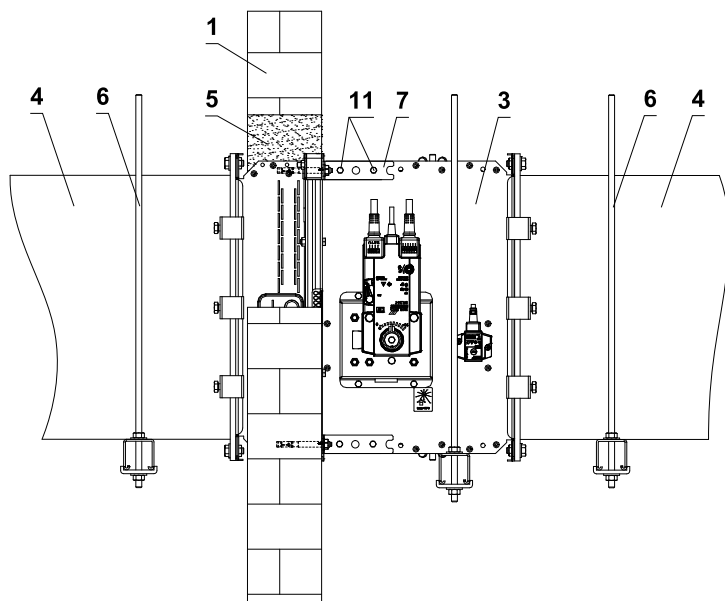


- 1 FDMQ 120
- 2 Threaded rod M8 - M20
- 3 Support HILTI MQ-41 (or MQ-41/3 or equivalent)
- 4 Bored plate HILTI MQZ-L or equivalent
- 5 Washer for M8 - M20
- 6 Nut M8 - M20

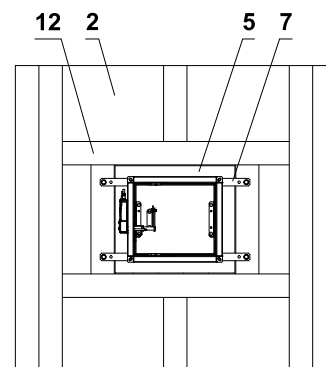
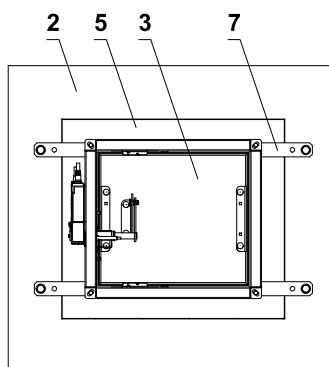
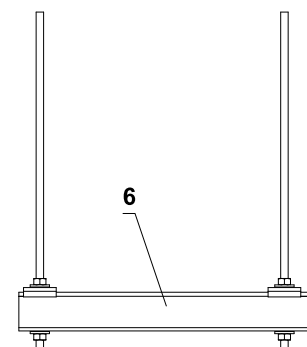
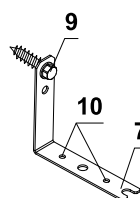
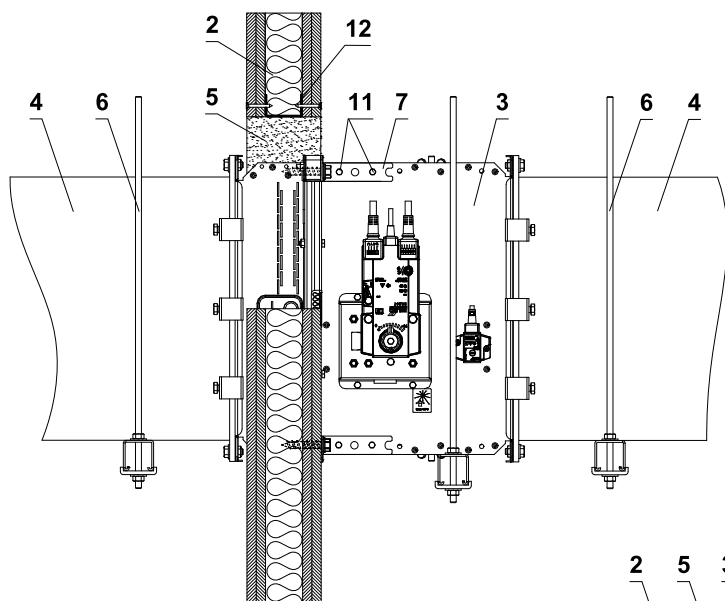
■ Dimension elements of the suspension system acc. to the weight of the damper, → see page 46

Example of fixing FDMQ 120 to the wall

In solid wall construction



In gypsum wall construction



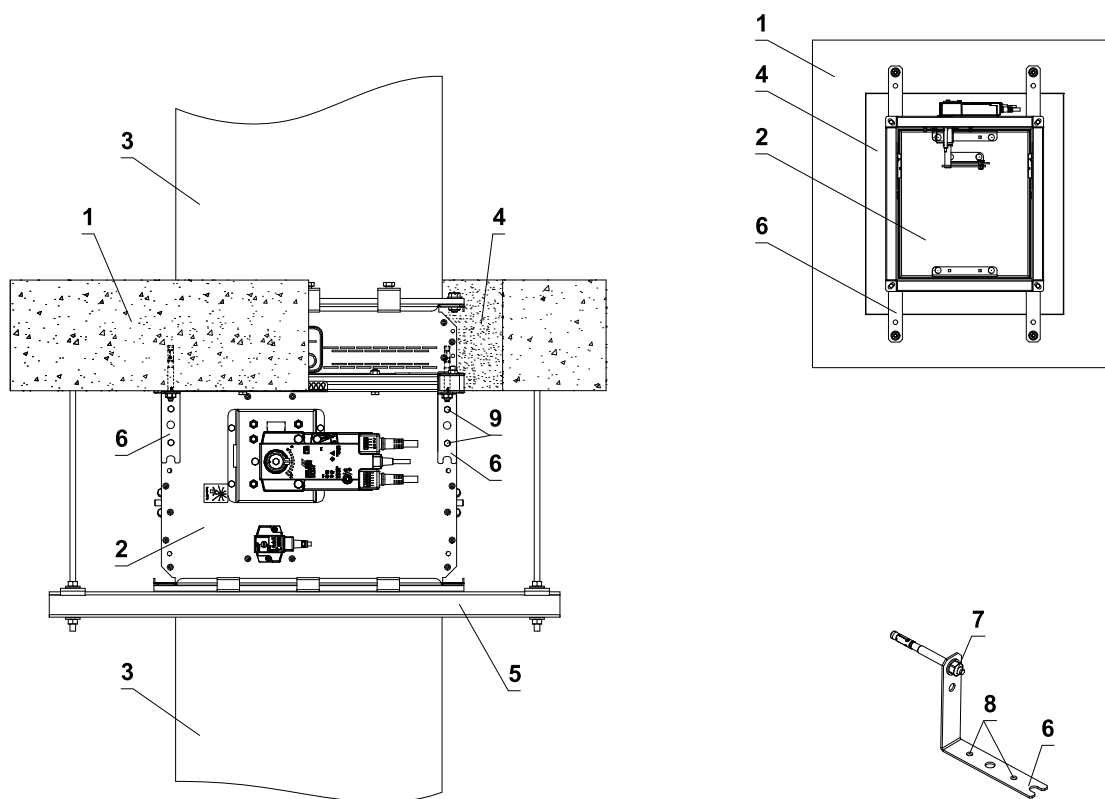
Grid from "U" profile

- 1 Solid wall construction
- 2 Gypsum wall construction
- 3 FDMQ 120
- 4 Duct
- 5 Penetration
- 6 Profile with threaded rod → see page 47
- 7 Fixing element/steel holder for connecting damper to the wall (optional accessories MANDIK, a.s. or sheet metal min. thickness 2 mm and min. width 60 mm)
- 8 Nut M8 with anchor
- 9 Hexagon head screw
- 10 Installation holes
- 11 Screw assembly M6 (screw M6x10, nut M6)
- 12 Gypsum grid from "U" profile

- The method of attachment must follow the minimum requirements for attachment and connection of ductwork in accordance with national regulations. Also, the elements can be suspended from the top, or supported from bottom, or fastened from the side.

Example of fixing FDMQ 120 to the ceiling

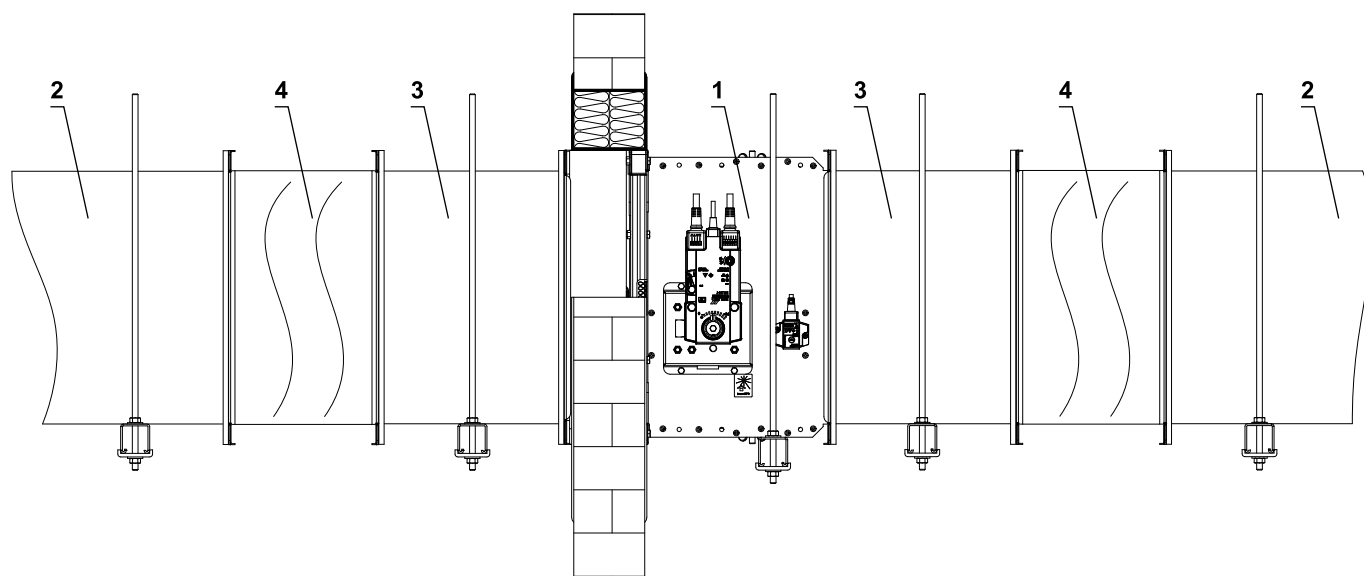
In solid ceiling construction



- 1 Solid ceiling construction
- 2 FDMQ 120
- 3 Duct
- 4 Penetration
- 5 Profile with threaded rod → see page 47
- 6 Fixing element/steel holder for connecting damper to the ceiling (optional accessories MANDIK, a.s. or sheet metal min. thickness 2 mm and min. width 60 mm)
- 7 Nut M8 with anchor
- 8 Installation holes
- 9 Screw assembly M6 (screw M6x10, nut M6)

- The method of attachment must follow the minimum requirements for attachment and connection of ductwork in accordance with national regulations. Also, the elements can be suspended from the top, or supported from bottom, or fastened from the side.

Example of duct connection



- 1 FDMQ 120
- 2 Connecting air duct
- 3 Extension piece (if required)
- 4 Damping pad or breakaway connection as DW 144

VI. TECHNICAL DATA

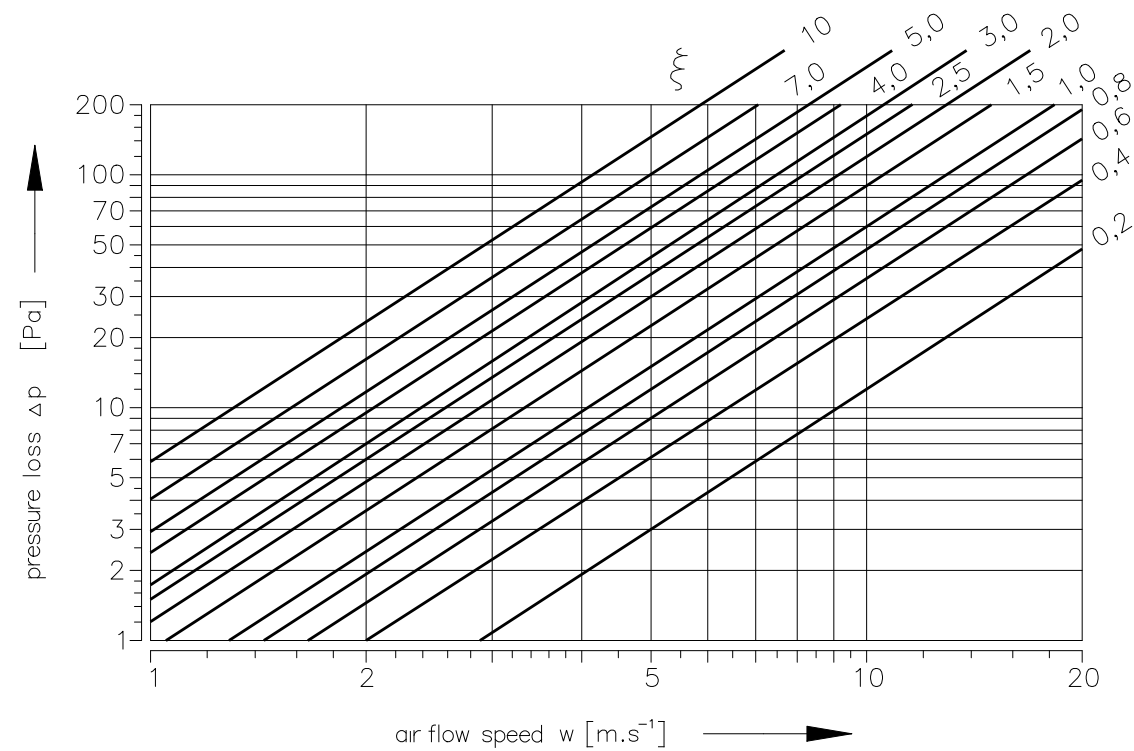
Pressure loss

Pressure loss calculation

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

Δp	[Pa]	pressure loss
w	[m/s]	air flow speed in nominal damper section
ρ	[kg/m³]	air density
ξ	[-]	coefficient of local pressure loss for the nominal damper section → see page 52

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



Coefficient of local pressure loss

	A													
B	150	180	200	225	250	280	300	315	355	400	450	500	550	560
150	3,522	3,307	3,081	2,980	2,850	2,704	2,629	2,510	2,421	2,326	2,252	2,187	2,166	2,139
180	2,557	2,389	2,236	2,153	2,064	1,962	1,889	1,802	1,727	1,664	1,610	1,569	1,547	1,529
200	1,972	1,843	1,723	1,653	1,590	1,502	1,451	1,383	1,325	1,276	1,235	1,201	1,186	1,172
225	1,522	1,465	1,321	1,197	1,173	1,141	1,106	1,067	1,015	0,964	0,948	0,917	0,891	0,881
250	1,249	1,164	1,083	1,044	1,008	0,952	0,902	0,867	0,828	0,799	0,772	0,752	0,739	0,732
280	1,133	1,032	1,002	0,960	0,926	0,881	0,827	0,781	0,728	0,705	0,685	0,673	0,665	0,650
300	1,041	0,947	0,896	0,861	0,823	0,775	0,729	0,677	0,648	0,635	0,601	0,592	0,587	0,584
315	0,865	0,803	0,749	0,724	0,693	0,658	0,618	0,595	0,569	0,546	0,527	0,513	0,503	0,499
355	0,735	0,684	0,638	0,609	0,585	0,556	0,528	0,506	0,483	0,464	0,448	0,436	0,428	0,424
400	0,640	0,596	0,555	0,529	0,509	0,481	0,463	0,439	0,420	0,402	0,389	0,377	0,371	0,367
450	0,567	0,527	0,490	0,470	0,452	0,430	0,405	0,387	0,370	0,355	0,343	0,332	0,330	0,324
500	0,514	0,478	0,443	0,426	0,413	0,387	0,369	0,350	0,334	0,321	0,310	0,301	0,298	0,293
550	0,490	0,455	0,421	0,405	0,390	0,367	0,344	0,326	0,317	0,300	0,289	0,287	0,278	0,275
560	0,469	0,434	0,404	0,390	0,371	0,349	0,334	0,318	0,303	0,291	0,281	0,273	0,270	0,266
600	0,439	0,409	0,384	0,368	0,355	0,333	0,316	0,301	0,289	0,281	0,270	0,259	0,253	0,244
630	0,429	0,398	0,370	0,357	0,343	0,322	0,306	0,291	0,278	0,267	0,257	0,250	0,237	0,243
650	–	0,379	0,356	0,342	0,329	0,309	0,297	0,284	0,266	0,257	0,250	0,240	0,229	0,233
700	–	0,375	0,348	0,333	0,321	0,306	0,289	0,275	0,262	0,250	0,244	0,234	0,222	0,221
710	–	0,368	0,343	0,329	0,316	0,300	0,285	0,268	0,257	0,247	0,237	0,230	0,219	0,219
750	–	0,354	0,330	0,321	0,309	0,286	0,271	0,260	0,246	0,238	0,230	0,222	0,219	0,215
800	–	0,344	0,320	0,309	0,297	0,282	0,264	0,251	0,239	0,229	0,221	0,215	0,211	0,209

	A												
B	600	630	650	700	710	750	800	900	1000	1100	1250	1400	1500
150	2,112	2,091	2,083	2,067	2,062	2,044	2,029	1,992	1,972	–	–	–	–
180	1,513	1,495	1,480	1,469	1,462	1,449	1,436	1,412	1,394	1,377	1,363	1,348	1,340
200	1,154	1,144	1,131	1,123	1,120	1,109	1,099	1,080	1,066	1,053	1,040	1,031	1,024
225	0,874	0,861	0,841	0,833	0,824	0,817	0,810	0,795	0,785	0,775	0,758	0,744	0,740
250	0,725	0,714	0,705	0,704	0,698	0,693	0,685	0,673	0,665	0,656	0,648	0,641	0,638
280	0,645	0,641	0,617	0,612	0,606	0,601	0,593	0,585	0,576	0,563	0,549	0,540	0,530
300	0,569	0,554	0,550	0,549	0,548	0,541	0,532	0,524	0,507	0,496	0,490	0,488	0,480
315	0,493	0,487	0,481	0,479	0,476	0,470	0,467	0,459	0,452	0,447	0,442	0,436	0,434
355	0,419	0,414	0,408	0,405	0,404	0,399	0,397	0,389	0,384	0,379	0,374	0,370	0,368
400	0,363	0,358	0,352	0,351	0,350	0,345	0,343	0,336	0,331	0,327	0,324	0,321	0,318
450	0,319	0,315	0,311	0,310	0,309	0,306	0,301	0,296	0,293	0,289	0,286	0,281	0,280
500	0,288	0,285	0,284	0,281	0,279	0,276	0,273	0,268	0,264	0,261	0,258	0,256	0,254
550	0,272	0,269	0,264	0,259	0,256	0,254	0,253	0,248	0,245	0,242	0,237	0,234	0,232
560	0,264	0,259	0,256	0,255	0,253	0,250	0,248	0,244	0,240	0,236	0,233	0,231	0,230
600	0,242	0,241	0,239	0,238	0,237	0,233	0,228	0,226	0,222	0,219	0,216	0,214	0,212
630	0,240	0,237	0,234	0,233	0,232	0,229	0,226	0,223	0,220	0,217	0,213	0,211	0,209
650	0,230	0,227	0,225	0,223	0,222	0,219	0,216	0,210	0,208	0,206	0,201	0,198	0,196
700	0,219	0,219	0,218	0,217	0,215	0,213	0,211	0,207	0,204	0,202	0,199	0,196	0,194
710	0,217	0,217	0,216	0,215	0,214	0,212	0,209	0,205	0,201	0,199	0,197	0,195	0,193
750	0,211	0,208	0,206	0,205	0,204	0,203	0,201	0,197	0,193	0,189	0,187	0,185	0,183
800	0,206	0,203	0,201	0,200	0,199	0,197	0,194	0,191	0,188	0,186	0,183	0,182	0,181

Noise data

Level of acoustic output corrected with filter A

$$L_{WA} = L_{W1} + 10 \log(S) + K_A$$

L_{WA}	[dB(A)]	level of acoustic output corrected with filter A
L_{W1}	[dB]	level of acoustic output L_{W1} related to the 1 m ² section
S	[m ²]	duct cross section
K_A	[dB]	correction to the weight filter A

Level of acoustic output in octave ranges

$$L_{Woct} = L_{W1} + 10 \log(S) + L_{rel}$$

L_{Woct}	[dB]	spectrum of acoustic output in octave range
L_{W1}	[dB]	level of acoustic output L_{W1} related to the 1 m ² section
S	[m ²]	duct cross section
L_{rel}	[dB]	relative level expressing the shape of the spectrum

Tables of acoustics values

Level of acoustic output L_{W1} [dB] related to the 1 m ² section																	
	ξ [-]																
w [m/s]	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1	1,5	2	2,5	3	4	5	8	10
2	15,5	18,7	20,9	22,6	24	25,2	26,3	27,2	28	31,2	33,4	35,1	36,5	38,8	40,5	44,2	45,9
3	26,1	29,2	31,5	33,2	34,6	35,8	36,9	37,8	38,6	41,7	44	45,7	47,1	49,4	51,1	54,7	56,5
4	33,6	36,7	39	40,7	42,1	43,3	44,3	45,3	46,1	49,2	51,5	53,2	54,6	56,9	58,6	62,2	64
5	39,4	42,5	44,8	46,5	47,9	49,1	50,2	51,1	51,9	55	57,3	59	60,4	62,7	64,4	68	69,8
6	44,1	47,3	49,5	51,3	52,7	53,9	54,9	55,8	56,6	59,8	62	63,8	65,2	67,4	69,2	72,8	74,5
7	48,2	51,3	53,5	55,3	56,7	57,9	58,9	59,8	60,7	63,8	66,1	67,8	69,2	71,4	73,2	76,8	78,6
8	51,6	54,8	57	58,8	60,2	61,4	62,4	63,3	64,1	67,3	69,5	71,3	72,7	74,9	76,7	80,3	82
9	54,7	57,9	60,1	61,8	63,2	64,4	65,5	66,4	67,2	70,4	72,6	74,3	75,7	78	79,7	83,4	85,1
10	57,4	60,6	62,8	64,6	66	67,2	68,2	69,1	70	73,1	75,3	77,1	78,5	80,7	82,5	86,1	87,9
11	59,9	63,1	65,3	67,1	68,5	69,7	70,7	71,6	72,4	75,6	77,8	79,6	81	83,2	85	88,6	90,3
12	62,2	65,4	67,6	69,3	70,7	71,9	73	73,9	74,7	77,9	80,1	81,8	83,2	85,5	87,2	90,9	92,6

Correction to the weight filter A											
w [m/s]	2	3	4	5	6	7	8	9	10	11	12
K_A [dB]	-15	-11,8	-9,8	-8,4	-7,3	-6,4	-5,7	-5	-4,5	-4	-3,6

Relative level expressing the shape of the spectrum L_{rel}								
	f [Hz]							
w [m/s]	63	125	250	500	1000	2000	4000	8000
2	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2	-43,9	-56,4
3	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6	-37,4	-48,9
4	-3,9	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2	-43,9
5	-4	-4,1	-5,9	-9,4	-14,6	-21,5	-30,0	-40,3
6	-4,2	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6	-37,4
7	-4,5	-3,9	-4,9	-7,5	-11,9	-17,9	-25,7	-35,1
8	-4,9	-3,9	-4,5	-6,9	-10,9	-16,7	-24,1	-33,2
9	-5,2	-3,9	-4,3	-6,4	-10,1	-15,6	-22,7	-31,5
10	-5,5	-4	-4,1	-5,9	-9,4	-14,6	-21,5	-30
11	-5,9	-4,1	-4	-5,6	-8,9	-13,8	-20,4	-28,8
12	-6,2	-4,3	-3,9	-5,3	-8,4	-13,1	-19,5	-27,6

VII. MATERIAL, FINISHING

- Damper casings are made from galvanized sheet metal without further surface treatment.
- Damper blades are made from fire resistant asbestos free boards made of mineral fibres.
- Manual control have cover made of mechanically resistant and durable plastic and the other parts are galvanized without further surface treatment.
- Fusible links are made of sheet brass, thickness 0,5 mm.
- Fasteners and springs are galvanized.
- According to the customer's requirements, dampers can be made of stainless steel material.

Specifications for stainless-steel design:

- Class A2 – Food-grade stainless steel (AISI 304 – BS EN 1.4301)
- Class A4 – Chemistry-grade stainless steel (AISI 316, 316L – BS EN 1.4401, BS EN 1.4404)

The respective stainless steel is the material for all components that are located or entering the damper inner space; components outside the damper casing are typically from galvanised sheet metal (fasteners for mounting the actuator or manual control, mechanical components except Item 4), frame components.

The following components, including the fasteners, are made from stainless steel at all times:

- 1) Damper casing and all components permanently attached
- 2) Blade holders including pins, metal parts of blades
- 3) Control components inside the damper (L-profile, pin with lever, rod, fasteners)
- 4) Parts of a manual control entering the inner space of a damper casing (lower sheet of a manual control, lock holder "1", lock lever "2", closing spring, 8 dia. stopper pin, manual control pin)
- 5) Inspection opening cover including the stirrup and fasteners (if they are parts of the cover)
- 6) Bearing for torque transfer from the lever with pin on the blade L-profile (made from AISI 440C)

The damper blade is made from boards of homogeneous material Promatect-H, connected with galvanized "U" clips on the outside, sealed with Promat K84 glue.

Fusible link is identical for all material variants of the dampers. Upon specification by customer, the fusible link can be made from A4 from stainless steel sheet metal.

Thermoelectric activation device BAT is modified for stainless-steel variant of the dampers; standard galvanised screws are replaced with stainless-steel M4 screws of corresponding class. Damper casing has stainless-steel riveting M4 nuts.

Plastic, rubber and silicon components, sealants, foaming tapes, glass-ceramic seals, housings, brass bearings of the blade, actuators, and end switches are identical for all material variants of the dampers.

Some fasteners and components are only available in one class of stainless steel; the type will be used in all stainless-steel variants.

The damper blade in the variant for chemical environments (Class A4) is always treated with a coating of chemically resistant Promat SR.

Any other requirements for the design will be considered atypical and will be addressed on an individual basis.

VIII. TRANSPORTATION AND STORAGE

Logistic terms

- Dampers are delivered on pallets. As standard, the dampers are wrapped in plastic foil for protection during transport and must not be used for long-term storage. Temperature changes during transport can cause condensation of water inside the packaging and thereby cause corrosion of materials used in the dampers (e.g. white corrosion on zinc-coated items or mould on calcium silicate). Therefore, it is necessary to remove the transport packaging immediately after unloading to allow air to circulate around the product.
- The dampers must be stored in clean, dry, well ventilated and dust-free environment out of direct sunlight. Ensure protection against moisture and extreme temperatures (minimum temperature +5°C). The dampers must be protected against mechanical and accidental damage prior to installation.
- Another required packaging system should be approved and agreed by manufacturer. Packaging material is not returnable in case that another packaging system (material) is required and used and it is not included into final price of damper.
- Dampers are transported by box freight vehicles without direct weather impact, there must not occur any shocks and ambient temperature must not exceed +50°C. Dampers must be protected against impact when transported and manipulated. During transportation, the damper blade must be in the "CLOSED" position.
- Dampers must be stored indoor in environment without any aggressive vapours, gases or dust. Indoor temperature must be in the range from -30°C to +50°C and maximum relative humidity 95%. (avoid condensation on the damper body). Dampers must be protected against impact when transported and manipulated.

IX. ASSEMBLY, ATTENDANCE AND MAINTENANCE

- 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.
- All effective safety standards and directives must be observed during damper assembly.
- To ensure reliable damper function it is necessary to avoid blocking the actuating mechanism and contact surfaces with collected dust, fibre and sticky materials and solvents.
- Flange and screw joints must be conductively connected to protect against dangerous contact. 2 galvanized lock washers that are placed under the head of one screw and a fastened nut are used for conductive connection.

Manual operation - actuator control without electric voltage

- A special wrench (part of the actuator) can be used to manually turn the damper blade to any position. When the wrench is turned in the direction of the arrow, the damper blade rotates to its open position. As the blade rotation is stopped, in every position, the actuator will be locked. Unlocking is possible even manually as per instructions on the actuator, or by the activation of the supply voltage.
- If the actuator is manually locked, the damper blade will not close in the event of a fire after the activation of the thermoelectric activation device BAT. To restore correct damper operation, the actuator must be unlocked (manually or by applying power supply).

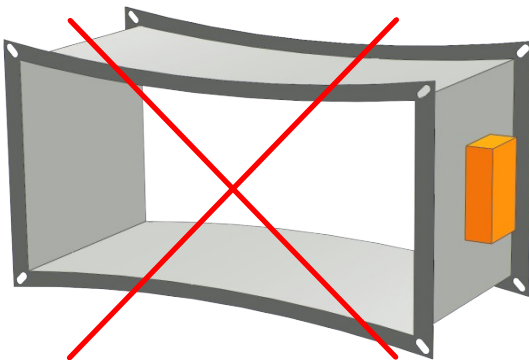
Limit switches

- If the damper is equipped with limit switches and these switches are not used during operation (e.g. because of a project change), they can be left on the damper and not connected (they need not be dismantled).
- On the other hand, if the limit switch is to be added to the damper design, the change can be implemented by change kit.
- These facts must be recorded in the respective operation documentation of the damper (record books of the damper, fire logs, etc.) and subsequently, adequate function checks must be carried out.

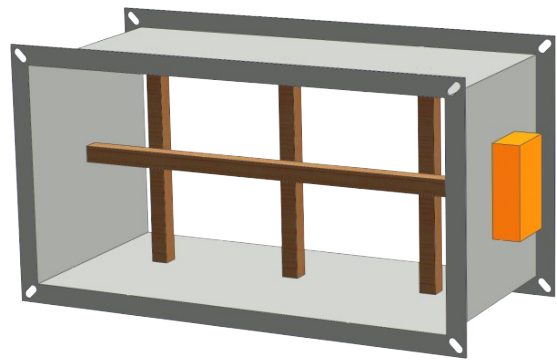
Installation / fixing the damper

- The damper casing shall not be deformed in the course of bricking in.
- Once the damper is built in, the damper blade shall not grind on the damper casing during opening or closing.

Protection of the damper casing against buckling during installation, especially for large sizes!

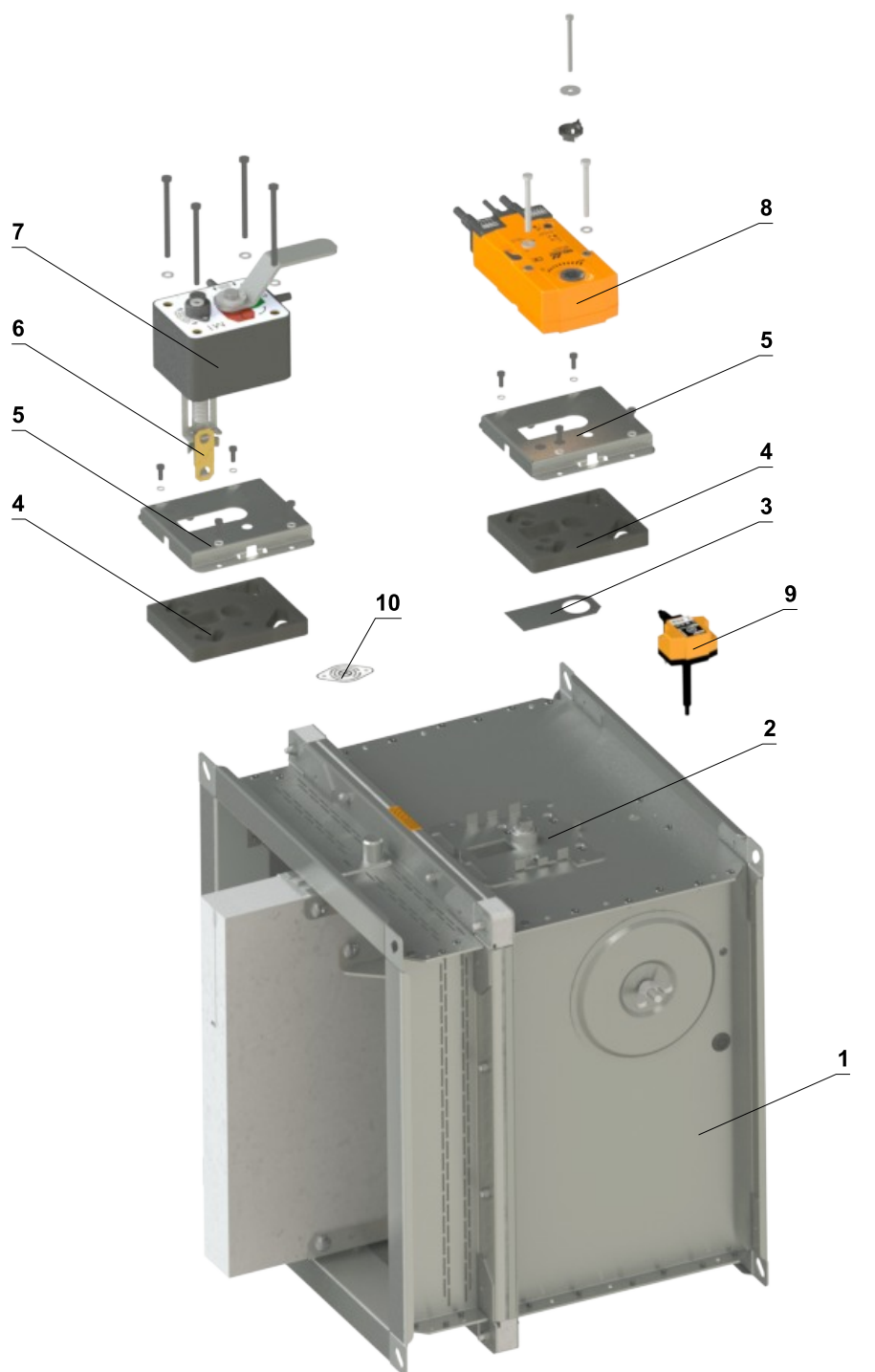


WRONG!



Reinforcement of the casing with wooden beams

Change of manual control for the actuator or vice versa

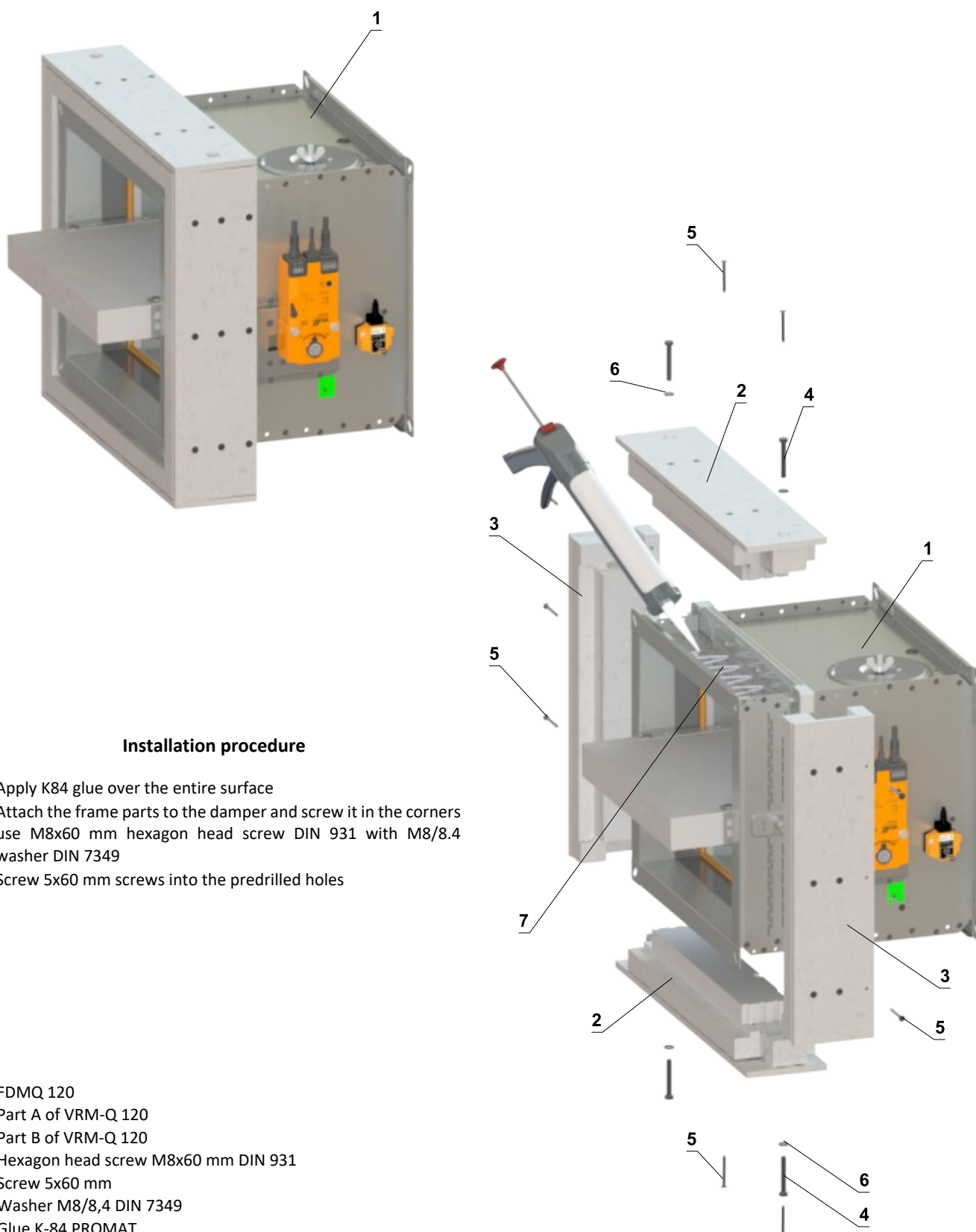


- | | |
|-------------------------------|--|
| 1 Damper | 6 Fusible link |
| 2 Mounting plate | 7 Manual control |
| 3 Sealing cover | 8 Spring return actuator |
| 4 Sealing of a mounting plate | 9 Thermoelectric activation device BAT |
| 5 Cover of a mounting plate | 10 Sensor sticker |

Reinforcing frame VRM-Q 120

- For damper placement outside wall construction is necessary to use reinforcing frame VRM-Q 120
- Fastening material is included in the package except glue K84
- Install reinforcing frame only after connecting duct.

Fixing reinforcing frame VRM-Q 120 to the damper casing



Installation procedure

- 1) Apply K84 glue over the entire surface
- 2) Attach the frame parts to the damper and screw it in the corners use M8x60 mm hexagon head screw DIN 931 with M8/8.4 washer DIN 7349
- 3) Screw 5x60 mm screws into the predrilled holes

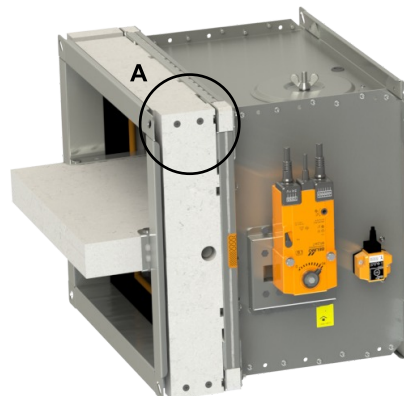
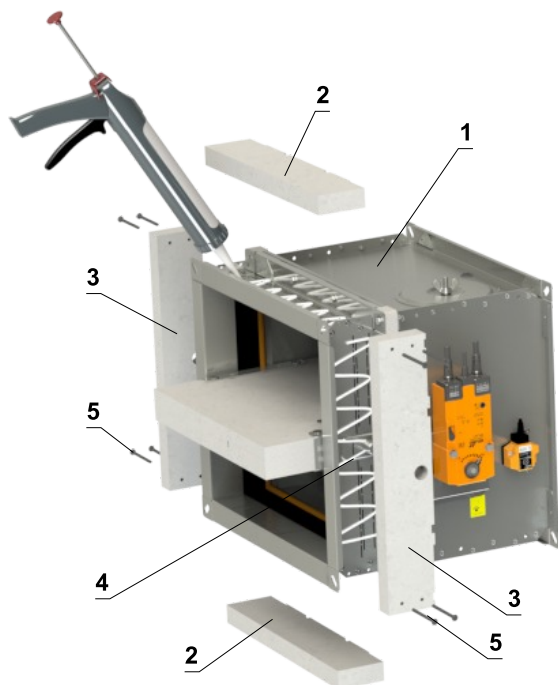
- 1 FDMQ 120
- 2 Part A of VRM-Q 120
- 3 Part B of VRM-Q 120
- 4 Hexagon head screw M8x60 mm DIN 931
- 5 Screw 5x60 mm
- 6 Washer M8/8,4 DIN 7349
- 7 Glue K-84 PROMAT

Protective cladding boards

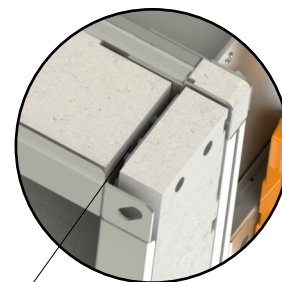
- Protective cladding boards must be used as part of the penetration filling of installation with ablative coated batt
- Can be ordered from MANDIK (installed on the damper or as an accessory) or can be sourced from local supplier
- If protective cladding boards are required, this must be specified in the ordering key
- Boards are made of PROMATECT-MST, thickness 30 mm (PROMATECT 250, thickness 30 mm can be used as an alternative)
- Glue K84 is not included in the package

Installation procedure

- 1) Apply K84 glue over the entire surface
- 2) Attach protective cladding boards to the damper and glue them to the casing
- 3) Screw parts A and B together using 4x screw 5x70 mm
- 4) Completely fill the gaps with glue



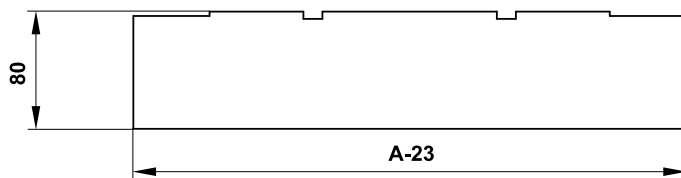
DETAIL A



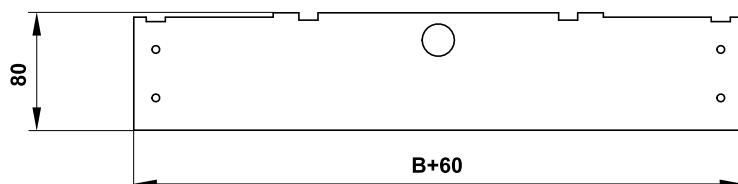
Completely fill the gaps between boards!

- 1 FDMQ 120
- 2 Part A of protective cladding boards
- 3 Part B of protective cladding boards
- 4 Glue PROMAT K-84
- 5 Screw 5x70 mm

Part A



Part B



- Detailed dimensions of protective cladding boards on request

Entry into service and revisions

- 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. Check of fusible link and actuating mechanism. Check the closing function of the damper blade. This can be done by removing the fusible link from the damper casing. After entering into operation, these revisions must be done according to requirement set by national regulations.
- 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.
- 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.
- Before entering the dampers with actuator into operation after their assembly and by sequential checks. Check of blade rotation into the breakdown position "CLOSED" can be done after disconnecting the actuator supply (e.g. by pressing the test button at the thermoelectric activation device BAT or disconnecting the supply from ELECTRICAL FIRE SIGNALISATION). Check of blade rotation back into the "OPEN" position can be done after restoration of power supply (e.g. by releasing the test button or restoration of supply from ELECTRICAL FIRE SIGNALISATION). Without power supply, the damper can be operated manually and fixed in any required position. Release of the locking mechanism can be achieved manually or automatically by applying the supply voltage. It is recommended to provide periodical checks, maintenance and service actions on fire equipment by authorized persons. The authorized persons can be trained by producer, or by authorized distributor. All effective safety standards and directives must be observed during fire damper assembly.
- Visual inspection of proper damper installation, inner area of a damper, damper blade, contact surfaces and silicon seal.
- For regular or exceptional inspection of interior of fire damper, micro-camera device can be used. On each fire damper is an inspection opening. In the case of inspection by camera, take out the black rubber cap, insert the camera inside the damper, check interior and at the end of inspection, put the rubber cap back tightly to cover the empty hole.

For dampers with manual control, following checks must be carried out

Check of a manual control and fusible link

- **To check the function of the manual control proceed as follows:**
- Turn the damper blade to "CLOSED" position as follows:
 - The damper blade is in "OPEN" position.
 - Press the control button of the manual control to turn the damper blade to "CLOSED" position.
 - Check the damper blade rotation to "CLOSED" position.
 - Damper blade closing shall be smooth and fast, the control lever shall be in „CLOSED“ position.
- Turn the damper blade to "OPEN" position as follows:
 - Turn the control lever by 90°.
 - Check the damper blade rotation to "OPEN" position.
 - The lever will automatically lock in "OPEN" position.
- **Check of function and condition of the fusible link:**
 - To check the function and the status of the fuse it's possible to remove the manual control from the casing of the fire damper which is attached to the damper casing with four screws M6.
 - Removing the fusible link from the fuse holder of a manual control, checks its correct functionality.
 - The manual control is identified as M2 to M5, depending on the closing spring strength.

For the designs with actuators, following checks must be carried out

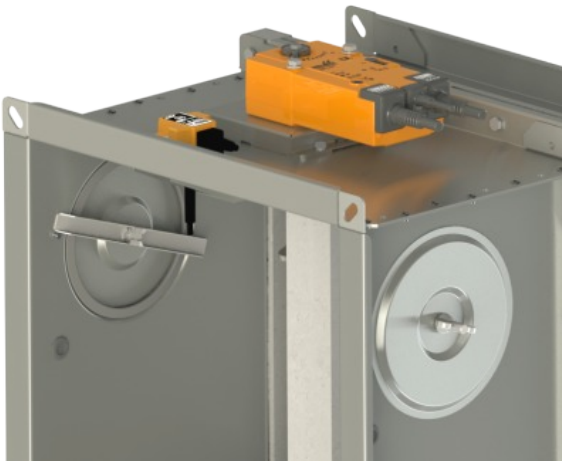
- Check the rotation of the blade to "CLOSED" failure position after disconnection the power supply of the actuator (e.g. by pressing the test button on the thermoelectric activation device BAT or by disconnection the power supply from electrical fire signalization). Check the rotation of the blade back to "OPEN" position by restoring the power supply to the actuator (e.g. by releasing the test button or by restoring the power supply from electrical fire signalization).

The check of function of the damper with actuator can be carried out as follows

- By disconnecting and restoring the power supply, e.g. by a signal from electrical fire signalization.
- By pressing the test button on the thermoelectric activation device BAT (simulating fuse tripping).

Inspection opening disassembly

- Release the covering lid by turning the wing nut and while turning the lid right or left release it from the security belt. Then tilt the lid and remove it from its original position.



Inspection opening detail

- Ensure each damper is fully checked for operational capability, control should be initiated from the control system or by manual control. Damper blades should open and close correctly and operation should be visually inspected and documented prior to handover.

How to proceed after Tf1 or Tf2 fuses have been activated

- If the fusible link **Tf1** is interrupted (due to temperature outside the duct), it is necessary to replace the spring return actuator. → see page 10
- If the fusible link **Tf2** is interrupted (due to temperature inside the duct), only the spare part ZBAT 72 needs to be replaced. → see page 10

X. ORDERING INFORMATION

Ordering key

1	2	3	4	5	6	7	8	9	10	11	
FDMQ 120	UK	500x250 /	375	.01	104	A	Q30	-	ZN	IW	G

EXAMPLES:

FDMQ 120 UK 500x250/375 .40 Q30-ZN

Fire damper FDMQ 120, dimension 500x250 mm, built length 375 mm, control design with spring return actuator AC 230 V, standard activation temperature 72 °C, flange dimension 30 mm, galvanized material variant, without installation kit/frame, standard silicon seal.

FDMQ 120 UK 500x250/375 .01 104 A Q30-ZN IW G

Fire damper FDMQ 120, dimension 500x250 mm, built length 375 mm, control design with manual control, activation temperature 104 °C, with protective cladding boards, flange dimension 30 mm, galvanized material variant, impregnation against humidity, rubber cold seal.

1| Fire damper type - FDMQ 120

2| Country of destination

3| Damper dimensions A x B → see pages 14 to 19

"A" is the width of the damper

"B" is the height of the damper

4| Built length - 375 mm

5| Damper design

.01	Manual control and thermal
.02	Manual control and thermal (Zone 1,2)
.11	Manual control and thermal with a terminal switch („CLOSED“)
.12	Manual control and thermal with a terminal switch („CLOSED“) (Zone 1,2)
.80	Manual control and thermal with two terminal switches („OPEN“, „CLOSED“)
.81	Manual control and thermal with two terminal switches („OPEN“, „CLOSED“) (Zone 1,2)
.40	With actuator BF 230-TN (BFL, BFN 230-T) - voltage AC 230 V
.41 *	With actuator BF 24-TN (BFL, BFN 24-T), with smoke detector ORS 142 K and with supply device BKN 230-24-MOD (voltage AC 230 V)
.42 **	With actuator ExMax-15-BF, with thermoelectric activation device ExPro-TT (Zone 1,2) - supply voltage range 24 to 230 VAC/DC
.50	With actuator BF 24-TN (BFL, BFN 24-T) - voltage AC/DC 24 V
.51 *	With actuator BF 24-TN (BFL, BFN 24-T), with smoke detector ORS 142 K (voltage AC/DC 24 V)
.63	With communication and supply device BKN 230-24-MOD, with actuator BF 24-TN-ST (BFL, BFN 24-T-ST)
.63S	With communication and supply device BKN 230-24-MOD, with actuator BF 24-TN-ST (BFL, BFN 24-T-ST) and with smoke detector ORS 142 K

* For sizes A<160 mm or B<160 mm, the optical smoke detector ORS 142 K is not part of the fire damper and is supplied separately.

** These designs are supplied only with an activation temperature of 72 °C.

■ Detailed information for ATEX dampers (ZONE 1,2) → see Appendix

6| Activation temperature

Manual control	Spring return actuator control
72 °C *	72 °C *
104 104 °C	
147 147 °C	

* Standard activation temperature

8| Flange dimension

Q30	Flange width 30 mm
-----	--------------------

7| Installation kit/frame

	Without installation kit/frame
A	With protective cladding boards (for Ablative Coated Batt installation)
VRM-Q 120	Reinforcing frame VRM-Q 120

9| Material and other design options

ZN	Galvanized
A2	Stainless steel 1.4301 (AISI 304)
A4	Stainless steel 1.4404 (AISI 316L) - included damper blade impregnation against chemical - type PROMAT SR

10| Surface treatment

	Without surface treatment
IW	Damper blade impregnation, impregnating agent PROMAT 2000 - impregnation against humidity
IA	Damper blade impregnation, impregnating agent PROMAT SR - impregnation against chemical

11| Cold seal variant

	Silicone rubber *
G	Silicone-free rubber

* Standard cold seal

Accessories

Protective cladding boards



- 1| Accessory type - cladding boards
- 2| Fire damper type - FDMQ 120
- 3| Damper dimensions A x B → see pages 14 to 19

Reinforcing frame VRM-Q 120



- 1| Accessory type - reinforcing frame VRM-Q 120
- 2| Fire damper type - FDMQ 120
- 3| Damper dimensions A x B → see pages 14 to 19

Data label

- Data label is placed on the damper casing (example)

MANDÍK®		MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic			
FIRE DAMPER - XXXX		  MANUAL			
DIMENSION:				DESIGN:	
SERIAL.NO.:				WEIGHT (kg):	
CLASSIFICATION:					
TPM XXX/XX	Cert. No.: 2822-UKCA-CPR-XXXX, DoP: PM/XXXX/XX/XX/XX	XX	EN 15650:2010		

MANDÍK®		MANDÍK, a.s. Dobříšská 550, 267 24 Hostomice, Czech Republic	
FIRE DAMPER - XXXX			
DIMENSION:		DESIGN:	
SERIAL.NO.:		WEIGHT (kg):	
CLASSIFICATION:			
TPM XXX/XX	Cert. No.: 1391-CPR-XXXX/XXXX, DoP: PM/XXXX/XX/XX/X	XX	EN 15650:2010

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

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