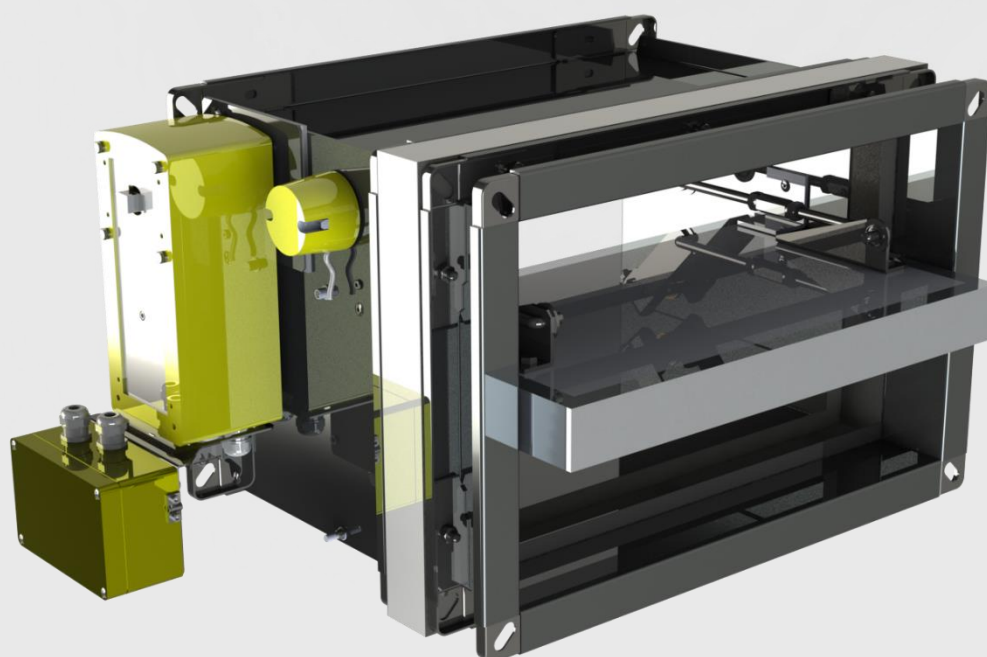


KWP-O- E(S)-EX

Fire Damper

Technical Documentation



TM **SMAY**

 1488	
SMAY Sp. z o.o. 14 CSWU: 1488-CPR-0444/W DWU: 003-CPR-2014 DZ: 007-CE-2016	
EN 15650:2010 Fire damper type: KWP-O-E-Ex; KWP-O-S-Ex	
Nominal activation conditions/sensitivity: Closing/opening during the test at the right time	Pass
Response time/Closure time:	Pass
Reliability:	50 cycles <120s
Fire resistance:	
Integrity - E Insulation - I Smoke leakage - S Mechanical stability (under E) Maintenance of the cross section (under E)	EI 120 (ve h _o i↔o) S
Durability:	
Opening and closing cycle test	KWP-O-E-Ex: 300 cycles, <120S KWP-O-S-Ex: 300 cycles, <120S

Version 6.00

SMAY reserves the right to make changes to this document.

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1. INTRODUCTION

The purpose of technical documentation is to familiarize the user with the intended use, design, operation principle, installation, periodic maintenance and operation of product.

2. LEGAL REGULATIONS

Fire dampers KWP-O-E-Ex and KWP-O-S-Ex have:

- **Certificate of Constancy of Performance No. 1488-CPR-0444/W**, issued by ITB in Warsaw, with an annex No. **Z-1488-CPR-0444/W**.
- ATEX certificate No. JSHP 22 ATEX 0017X, issued by Hamilton in Gdynia

KWP-O-E-Ex and KWP-O-S-Ex are intended for use in potentially explosive places in accordance with the directive **ATEX 2014/34/UE** (on the harmonization of the laws of the Member States relating to equipment and protective systems intended for use in potentially explosive atmospheres), and are compatible with standards:

- **PN-EN ISO 80079-36:2016** Explosive atmospheres — Part 36: Non-electrical equipment for explosive atmospheres — Basic method and requirements.
- **PN-EN ISO 80079-37:2016** Non-electrical equipment for explosive atmospheres — Non-electrical type of protection constructional safety "c", control of ignition sources "b", liquid immersion "k"

The dampers are designed, manufactured and tested in accordance with the following standards: PN-EN 15650 "Ventilation for buildings - Fire dampers" and PN-EN 13501-3 "Fire classification of construction products and building elements - Part 3: Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers". The effectiveness of the dampers is confirmed by tests according to PN-EN 1366-2 "Fire resistance tests for service installations - Part 2: Fire dampers. KWP-O-E-Ex and KWP-O-S-Ex fire dampers are classified as integrity class C (housing integrity) on the basis of tests carried out according to PN-EN 1751 "Ventilation for buildings. Air terminal devices. Aerodynamic testing of dampers and valves".

3. INTENDED USE

The KWP-O-E(S) fire dampers are designed for application in general ventilation systems as cut-off partitions separating the fire-engulfed zone from the remaining part of the building (normally open). The purpose of these dampers is to prevent the spread of fire, heat and smoke.

KWP-O-E-Ex and KWP-O-S-Ex fire dampers are designed and compatible with directive ATEX 2014/34/UE as **equipment of group II category 2 intended for use in explosion hazard zones 1, 2, 21 and 22**. The anti-explosion effectiveness of the dampers has been confirmed compatible with standards: PN-EN 13463-1; PN-EN 13463-5 and approved by certificate ATEX certificate No. JSHP 22 ATEX 0017X.

The dampers are marked with ATEX:



It fulfills the requirements of construction safety "c".

KWP-O-E-Ex and KWP-O-S-Ex fire dampers are classified in the following fire resistance range and can be mounted in the following building partitions:

- **EI 120 (ho ve i↔o) S**
 - concrete ceiling with thickness 150 mm or more,
 - cellular concrete ceiling with thickness 150 mm or more
 - brick walls having a thickness of 115 mm or more (masonry of solid brick, cellular concrete blocks)
 - light type walls made from plasterboards on a steel grate having a thickness of 125 mm or more and having fire resistance class EI120 or higher

Table 1. Table of fire resistance

Construction type	Minimum thickness of the building partition mm	Fire resistance class	Sealing type
Ceiling	≥150 mm	EI 120 (h _o i↔o) S	MORTAR
Rigid wall	≥115 mm	EI 120 (v _e i↔o) S	MORTAR
Flexible wall	≥125 mm	EI 120 (v _e i↔o) S	MINERAL WOOL

where:

E – fire integrity,

I – fire insulation,

S – smoke leakage,

120 – duration of fulfilment of E, I and S criteria, expressed in minutes,

ve – damper mounted directly in the wall,

ho – damper mounted directly in the ceiling,

i↔o – operating effectiveness criteria are fulfilled from the inside to the outside (fire inside), and from the outside to the inside (fire outside).

KWP-O-E and KWP-O-S fire dampers may be installed in vertical building partition with both **horizontal and vertical rotation axis** of baffle, the damper may be rotated in the way enabling location of actuator on left or right side and on top or bottom.

4. TECHNICAL DESCRIPTION

KWP-O-E-Ex and KWP-O-S-Ex fire dampers consist of two steel housing of a rectangular cross-section, a moving, single-axis isolating baffle and an actuating mechanism.

The damper housing and its interacting elements are made of galvanized steel sheet. Connection flanges are on both ends of the housing for easy connection between the duct and the damper.

There is intumescent seal on the inner surface of the housing, in the place of perforation, around the closed isolating baffle. Their characteristic feature is that their volume increases at high temperatures, tightly filling all leaks between the baffle and the body.

Between housing and insulating spacer there is foamed rubber gasket, ensuring the tightness integrity in the ambient temperature.

The isolating baffle of the damper is made of calcium-silica board, and aluminum tape is installed on its perimeter, ensuring reduction of friction.

The baffle is rotating on two steel axles located in the housing. Movement of the baffle is limited in the closed position by a stop bar.

During normal operation of the system, KWP-O-E-Ex and KWP-O-S-Ex dampers are in open position. If a fire breaks out, the damper's baffle rotates to a closed position.

KWP-O-E-Ex damper is provided with an electric actuator with return spring by Schischek ExMax-15-BF series and ExPro-TT-72 BAE thermal fuse, constituting the damper's actuating system having supply voltage AC 230V or AC/DC 24V. After voltage is supplied, the actuator rotates the baffle into the open position. The baffle is closed when the voltage is lost, or when the thermal fuse is activated (the return spring in the actuator closes the baffle by returning to a non-stressed position).

KWP-O-S-Ex damper is provided with a spring mechanism, comprising e.g. the actuating spring, manual release device, and a thermal fuse whose nominal activation temperature is 70±5°C. When the damper is opened with a key, the actuating spring is tensioned. The baffle is kept in open position by the automatic release device, interlocked with a thermal fuse. The damper is automatically closed by the release device. Damage to the thermal fuse automatically rotates the isolating baffle (to closed position) as a result of decompression of the actuating spring. The movement of the rotating baffle is limited by two resistance buffers.

Baffle and also whole automatics controlling the baffle has been merged by ground wire to housing. On housing will be placed grounding clamp, which will be marked with a sticker with the ground symbol.



To the clamp should be put a ground cable to effectively ground the damper.

The type series of the dampers covers the following dimensions: clear damper width **from 200 to 1500 mm** (50 mm intervals) and clear damper height **from 200 to 1000 mm** (50 mm intervals). Length of made dampers KWP-O-E-Ex i KWP-O-S-Ex totals L=350 mm.

Table 2. Type series of damper dimension KWP-O-E-Ex and KWP-O-S-Ex

KWP-O-E(S)-Ex	Szerokość B [mm]																											
	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	
Wysokość H [mm]	200	0,027	0,035	0,042	0,049	0,056	0,064	0,071	0,078	0,085	0,093	0,100	0,107	0,114	0,122	-	-	-	-	-	-	-	-	-	-	-	-	-
	250	0,037	0,046	0,056	0,066	0,076	0,085	0,095	0,105	0,115	0,124	0,134	0,144	0,154	0,163	0,173	0,183	0,193	0,202	-	-	-	-	-	-	-	-	-
	300	0,046	0,058	0,070	0,083	0,095	0,107	0,119	0,132	0,144	0,156	0,168	0,181	0,193	0,205	0,217	0,230	0,242	0,254	0,266	0,279	0,291	0,303	-	-	-	-	-
	350	0,055	0,070	0,085	0,099	0,114	0,129	0,144	0,158	0,173	0,188	0,203	0,217	0,232	0,247	0,262	0,276	0,291	0,306	0,321	0,335	0,350	0,365	0,380	0,394	0,409	0,424	-
	400	0,064	0,082	0,099	0,116	0,133	0,151	0,168	0,185	0,202	0,220	0,237	0,254	0,271	0,289	0,306	0,323	0,340	0,358	0,375	0,392	0,409	0,427	0,444	0,461	0,478	0,496	0,513
	450	0,074	0,093	0,113	0,133	0,153	0,172	0,192	0,212	0,232	0,251	0,271	0,291	0,311	0,330	0,350	0,370	0,390	0,409	0,429	0,449	0,469	0,488	0,508	0,528	0,548	0,567	0,587
	500	0,083	0,105	0,127	0,150	0,172	0,194	0,216	0,239	0,261	0,283	0,305	0,328	0,350	0,372	0,394	0,417	0,439	0,461	0,483	0,506	0,528	0,550	0,572	0,595	0,617	0,639	0,661
	550	0,092	0,117	0,142	0,166	0,191	0,216	0,241	0,265	0,290	0,315	0,340	0,364	0,389	0,414	0,439	0,463	0,488	0,513	0,538	0,562	0,587	0,612	0,637	0,661	0,686	0,711	0,736
	600	0,101	0,129	0,156	0,183	0,210	0,238	0,265	0,292	0,319	0,347	0,374	0,401	0,428	0,456	0,483	0,510	0,537	0,565	0,592	0,619	0,646	0,674	0,701	0,728	0,755	0,783	0,810
	650	-	0,140	0,170	0,200	0,230	0,259	0,289	0,319	0,349	0,378	0,408	0,438	0,468	0,497	0,527	0,557	0,587	0,616	0,646	0,676	0,706	0,735	0,765	0,795	0,825	0,854	0,884
	700	-	0,152	0,184	0,217	0,249	0,281	0,313	0,346	0,378	0,410	0,442	0,475	0,507	0,539	0,571	0,604	0,636	0,668	0,700	0,733	0,765	0,797	0,829	0,862	0,894	0,926	0,958
	750	-	0,164	0,199	0,233	0,268	0,303	0,338	0,372	0,407	0,442	0,477	0,511	0,546	0,581	0,616	0,650	0,685	0,720	0,755	0,789	0,824	0,859	0,894	0,928	0,963	0,998	1,033*
	800	-	-	0,213	0,250	0,287	0,325	0,362	0,399	0,436	0,474	0,511	0,548	0,585	0,623	0,660	0,697	0,734	0,772	0,809	0,846	0,883	0,921	0,958	0,995	1,032*1,070*1,107*	-	-
	850	-	-	0,227	0,267	0,307	0,346	0,386	0,426	0,466	0,505	0,545	0,585	0,625	0,664	0,704	0,744	0,784	0,823	0,863	0,903	0,943	0,982	1,022*1,062*1,102*1,141*1,181*	-	-	-	
	900	-	-	0,241	0,284	0,326	0,368	0,410	0,453	0,495	0,537	0,579	0,622	0,664	0,706	0,748	0,791	0,833	0,875	0,917	0,960	1,002*1,044*1,086*1,129*1,171*	-	-	-	-	-	
950	-	-	-	0,300	0,345	0,390	0,435	0,479	0,524	0,569	0,614	0,658	0,703	0,748	0,793	0,837	0,882	0,927	0,972	1,016*1,061*1,106*1,151*1,195*	-	-	-	-	-	-		
1000	-	-	-	0,317	0,364	0,412	0,459	0,506	0,553	0,601	0,648	0,695	0,742	0,790	0,837	0,884	0,931	0,979	1,026*1,073*1,120*1,168*	-	-	-	-	-	-	-		

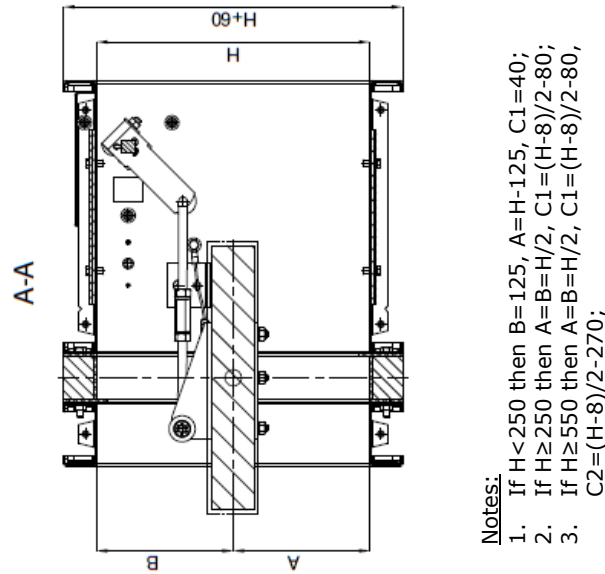
*- Maximum cross-sectional area for KWP-O-S-Ex series totals 1 m², and for KWP-O-E-Ex totals 1,5 m²

Table 3. KWP-O-E-Ex weight [kg]

KWP-O-E-Ex	Width B [mm]														
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	
Heigh H [mm]	200	11,9	14,2	16,4	18,6	20,8	23,0	25,2	-	-	-	-	-	-	
	300	14,0	16,6	19,3	21,8	24,4	27,0	29,7	32,6	35,3	38,0	40,7	-	-	
	400	16,2	19,2	22,2	25,2	28,2	31,5	34,6	37,6	40,7	43,7	46,7	55,1	58,5	61,9
	500	18,3	21,7	25,2	28,6	32,3	35,7	39,2	42,6	46,0	49,4	52,9	62,1	65,8	70,9
	600	20,3	24,2	28,1	32,2	36,0	39,8	43,7	47,5	51,3	55,2	59,0	70,3	74,4	78,6
	700	-	26,7	31,3	35,4	39,7	43,9	48,2	52,4	56,6	62,2	66,4	77,1	81,7	86,2
	800	-	29,2	34,2	38,8	43,4	48,0	52,7	57,3	63,3	68,0	72,6	84,0	89,0	93,9
	900	-	32,0	37,1	42,0	47,1	52,1	57,2	63,6	68,6	73,7	78,7	90,9	96,2	-
	1000	-	-	40,0	45,4	50,9	56,3	63,2	68,6	74,1	79,5	84,9	-	-	-

Table 4. KWP-O-S-Ex weight [kg]

KWP-O-S-Ex	Width B [mm]														
	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	
Heigh H [mm]	200	11,8	14,0	16,2	18,4	20,6	22,8	-	-	-	-	-	-	-	
	300	13,8	16,5	19,1	21,7	24,3	26,9	29,6	32,0	34,4	36,8	-	-	-	
	400	16,0	19,0	22,1	25,0	28,0	31,1	34,1	36,9	40,0	43,1	46,2	49,3	52,4	55,5
	500	18,2	21,6	25,0	28,4	31,8	35,2	38,7	42,3	45,7	49,1	52,5	55,9	59,3	62,7
	600	-	23,8	27,7	31,5	35,3	39,5	43,4	47,2	51,1	55,0	58,9	62,8	66,7	70,6
	700	-	26,3	30,6	34,8	39,4	43,6	47,9	52,1	56,4	60,7	65,0	69,3	73,6	-
	800	-	-	33,5	38,1	43,1	47,7	52,4	57,1	61,7	66,3	70,9	-	-	-
	900	-	-	36,4	41,8	46,8	51,8	56,9	62,0	67,0	72,0	-	-	-	-
	1000	-	-	39,4	45,2	50,6	56,0	61,5	67,0	72,4	-	-	-	-	-



- Notes:**
1. If $H < 250$ then $B = 125$, $A = H - 125$, $C1 = 40$;
 2. If $H \geq 250$ then $A = B = H/2$, $C1 = (H - 8)/2 - 80$;
 3. If $H \geq 550$ then $A = B = H/2$, $C1 = (H - 8)/2 - 80$, $C2 = (H - 8)/2 - 270$;

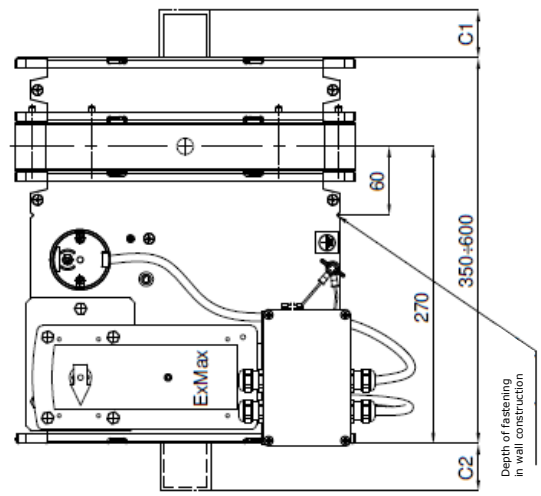
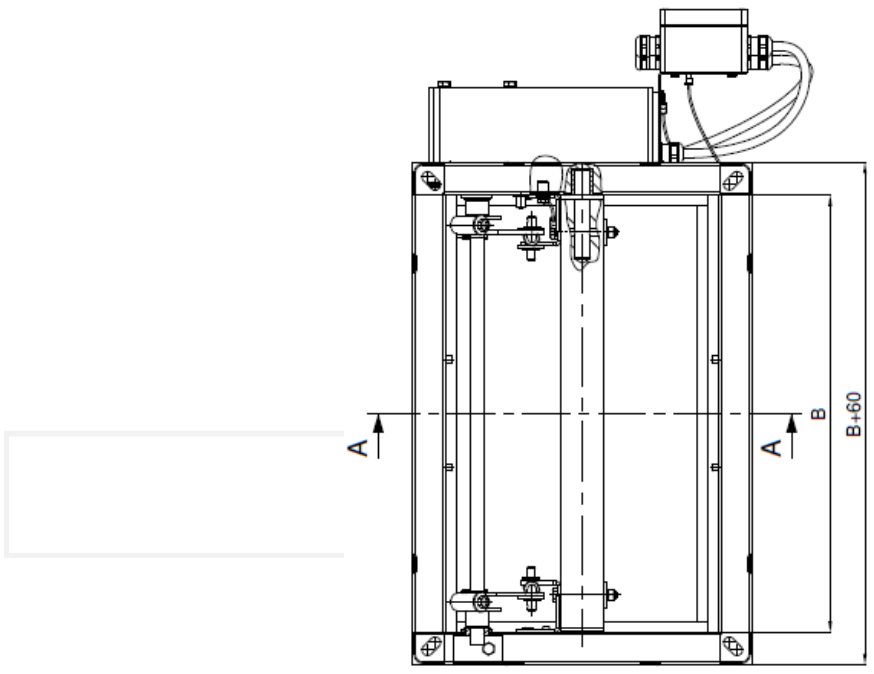
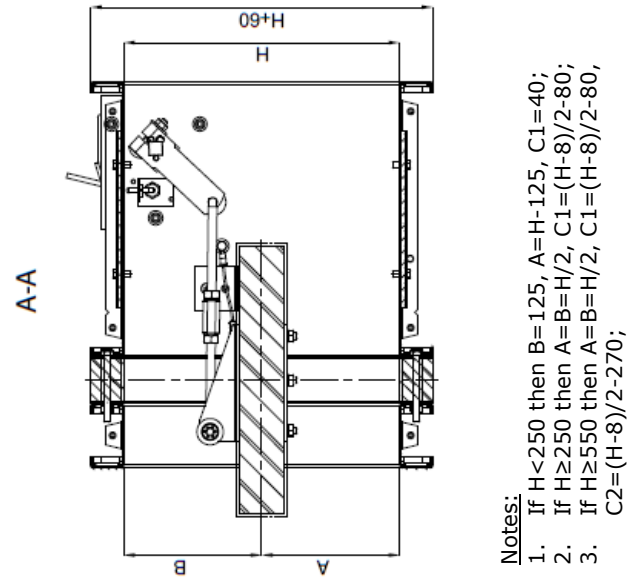


Figure 1.KWP-O-E-Ex damper



Notes:

1. If $H < 250$ then $B = 125$, $A = H - 125$, $C1 = 40$;
2. If $H \geq 250$ then $A = B = H/2$, $C1 = (H - 8)/2 - 80$;
3. If $H \geq 550$ then $A = B = H/2$, $C1 = (H - 8)/2 - 80$,
 $C2 = (H - 8)/2 - 270$;

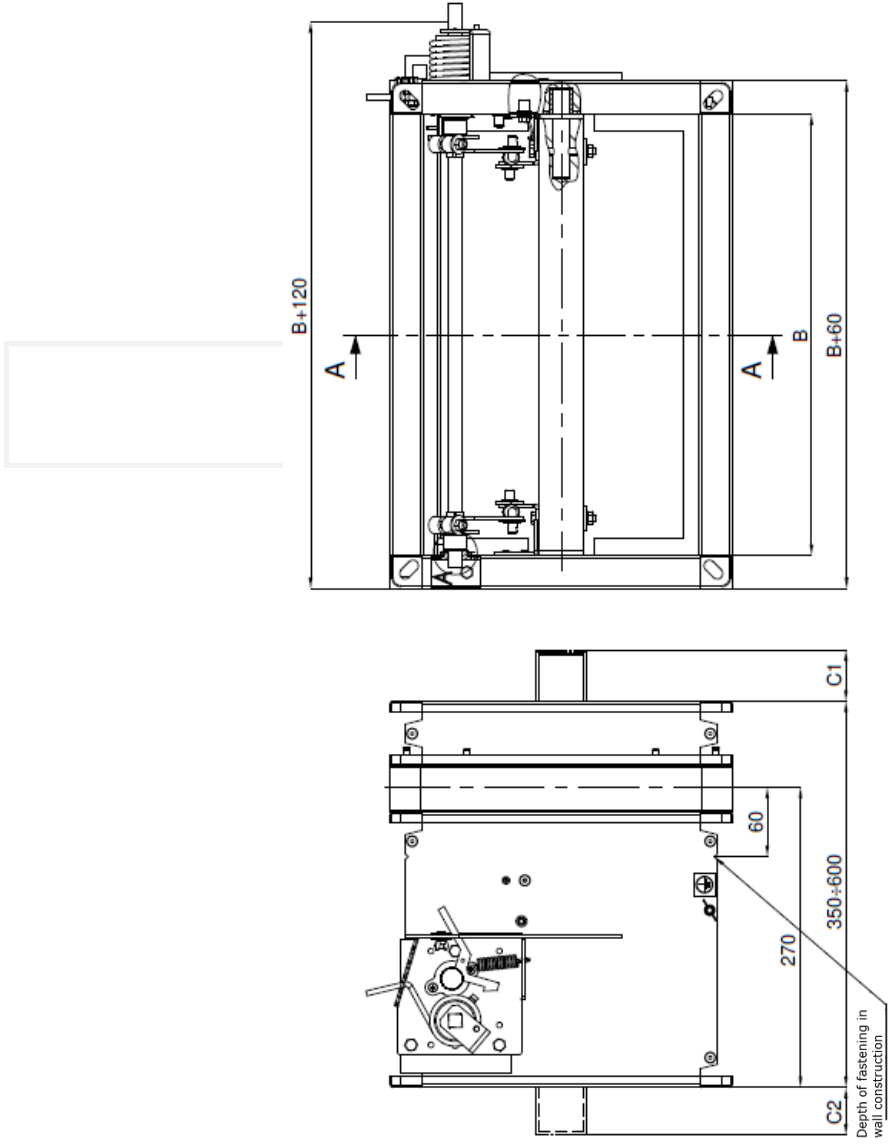


Figure 2. KWP-O-S-Ex damper

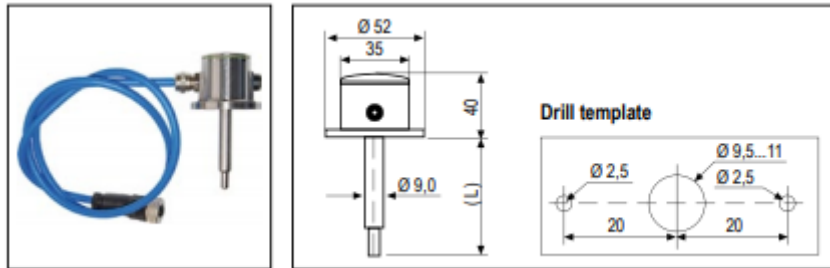
5. BELIMO ELECTRIC ACTUATORS USED IN KWP-O-ES-EX



- Schischek ExMax-BF-15 actuator:

Technical data	ExMax- 5.10 - BF	ExMax- 15 - BF
Torque motor (min.)	5 / 10 Nm selectable on site	15 Nm
Torque spring (F)	min. 10 Nm	min. 15 Nm
Torque blockade	In blockade and end positions torques are higher than above specified torques for motor and spring.	
Dimensioning of external load	Upon spring return the external load should be max. 80 % of torque spring (F).	
Supply voltage / frequency	24...240 VAC/DC \pm 10 %, self adaptable, frequency 50...60 Hz \pm 20 %	
Power consumption	max. starting currents see ① Extra information (in acc. with voltage, $I_{start} \gg I_{rated}$), approx. 5 W holding power, approx. 16 W for heater	
Protection class	Class I (grounded)	
Angle of rotation and indication	95° incl. \sim 5° pretension, mechanical value indication	
Working direction	Selectable by left/right mounting to the damper/valve shaft	
Motor running times	3 / 15 / 30 / 60 / 120 s/90° selectable on site	
Motor	Brushless DC motor	
Control mode	On-off and 3-pos. in acc. with wiring, selectable on site	
Spring return (F)	spring return upon voltage interruption, response time up to 1 sec. after voltage interruption	
Spring return running time (F)	\sim 3 or 10 s/90° selectable on site	
3 sec. mode – spring return	\sim 3 to 4 s/90° angle of rotation acc. to external load	
Safety operations at 10 sec. (F)	min. 10,000 acc. to construction of damper and ambient	
at 3 sec. (F)	min. 1,000 acc. to construction of damper and ambient	
Ex-I tripping circuit	Intrinsically safe circuit to connect the ExPro-TT... safety temperature trigger directly to the actuator with M12 quick connection	
Auxiliary switches	2 integrated auxiliary switches, switching at 5° and 85° angle of rotation, potential free. Grid fuse-protection is recommended!	
	$U_{max}/I_{max} AC = 250 V/5 A$; $U_{min} AC/DC = 5 V$;	After one-time operation with $U > 24 V AC/DC$ or $I > 100 mA$: $U_{min} AC/DC = 12 V$
	$U_{max}/I_{max} DC = 48 V/1 A$; $I_{min} AC/DC = 5 mA$;	$I_{min} AC/DC = 100 mA$
Axle of the actuator	Double square 12 x 12 mm, direct coupling, 100 % overload protected and self locking up to 15 Nm	
Electrical connection	Cable \sim 1 m, wire cross section 0.5 mm ² , equipotential bonding 4 mm ² . Connections in hazardous areas require an Ex-e terminal box!	
Diameter of cable	\sim \varnothing 9.6 mm	
Cable gland	M16 x 1.5 mm	
Manual override	Use delivered socket wrench, max. 4 Nm	
Heater	Integrated, controlled heater for ambient temperature down to $-40^{\circ}C$	
Housing material	Aluminium die-cast housing, coated. Optional with seawater resistant coating (...CTS) or stainless steel housing, № 1.4581 / UNS-J92900 / similar AISI 316Nb (...VAS)	
Dimensions (L x W x H)	210 x 95 x 80 mm, for diagrams see ① Extra information	
Weight	\sim 3.5 kg aluminium housing, stainless steel \sim 7 kg	
Ambients	Storage temperature $-40...+70^{\circ}C$, working temperature $-40...+40^{\circ}C$ at T6 and $-40...+50^{\circ}C$ at T5	
Humidity	0...90 % rH, non condensing	
Operating 3 sec. motor run time	In 3 s mode the motor will work only after 1 minute of voltage supply. While open/close operation (open voltage supply and shut it down) motor works only with speed of 15 s/90°	
\geq 15 sec. motor run time	at 15 / 30 / 60 / 120 s 100 % of ED is permitted (ED = duty cycle)	
Wiring diagrams	SB 7.0 / 7.1	SB 7.0 / 7.1
Scope of delivery	Actuator, 4 screws M4 x 100 mm, 4 nuts M4, Allen key for simple manual override	
Parameter at delivery	5 Nm, 30 s/90°	15 Nm, 30 s/90°

▪ **ExPro-TT-72 thermal fuse:**



Technical data	
Supply	only by ...Max-...-BF... actuators by Schischek
Connection	~ 1 m cable
Cable	2 × 0,5 mm ² , -40...+220 °C, halogen-free inductance = 0,6 mH/km, capacitance = 30 nF/km
Cable gland	M12 × 1,5 mm Ex-e, brass nickel-plated Ø 4...6 mm
Temperature fuse	1 × duct, 1 × outside duct (not changeable)
Response temperatures	Tf1 room ambient temperature at +72 °C Tf2 duct temperature at +71 °C
Ambient temperature	Ta -40...+72 °C, working temperature Tb -40...+55 °C
Storage temperature	-40...+55 °C
Humidity protection	< 95 % rH, non condensing
Weight	200 g
Materials	thermowell brass plated, housing № 1.4581 / UNS-J92900 / similar AISI 316Nb cover brass plated, seal cover FPM
Maintenance	maintenance free, a yearly function control is recommended

6. CONDITIONS OF TRANSPORT AND STORAGE

Fire dampers KWP-O-E-Ex and KWP-O-S-Ex should be stored in cardboard boxes and/or on pallets. Dampers should have a pre-protected actuator cardboard box. Fire dampers should be stored indoors, providing protection against atmospheric agents, at a minimum temperature of +5°C.

Do not allow mechanical damage of damper, that may be caused e.g. blows or dropping.

After each transport, visual inspection of each fire damper must be carried out.

7. INSTALLATION TECHNOOGY

Before installing fire dampers please read assembly technology recommended by the manufacturer. The way of installing recommended by one manufacturer may not be the same for other dampers. Recommended material and dimensions of the openings follow from experience from conducted research. In rectangular dampers, most of all dampers with cross-sectional area more than 1 m², it is recommended to use mounting wedge and spreader securing the housing against squeezing during assembly.

Squeezing the housing can change the dimensions of slot between baffle and housing, correct dimensions of this slot is needed to keep correct way of opening and closing the damper. Correct preparation housing to montage is presented on the figure.

Be careful that any of metal item cannot get in damper (for example tools, loose fasteners), and cannot any left after installing the ventilation ducts.

To preserve the declared resistance, insulation and smoke leakage EIS120, dampers should be installed in a wall, which was classified as EIS120. It is allowed to install dampers in wall with other fire-resistance, should be remembered that fire-resistance in this situation is resistance of lowest classified (in this regard) element in this system.

Ducts made of flammable and non-flammable materials can be connected to the damper. Ducts should be installed that they cannot load the damper during fire. Ducts lengthening during fire can be compensated by support and knee.

ATTENTION: Distance between fire dampers or fire damper and construction elements must be compatible with standard 1366-2:

Minimal 200 mm between fire damper, which are installed in different ventilating ducts,

Minimal 75 mm between fire damper and construction element (wall/ceiling).

The damper housing must be effectively grounded by connecting a ground wire with grounding clamp, which are placed on damper housing, and marked by symbol.



7.1. INSTALLATION TECHNOLOGY – RIGID WALL

- a. Make an opening in the wall with the 100 [mm] (acceptable $80 \div 120$ [mm]) greater than the nominal dimensions of the fire damper = B+100 and H+100.
- b. Put the closed fire damper into the installation opening on depth marked by undercuts on the damper body (dimension 60 mm), from one side fix it with suspension Z1, and from other side fix it to the ventilation duct suspended on Z2 suspension.
- c. After setting the fire damper as described, fill the gap between the fire damper and the wall with cement, cement-lime mortar, concrete, or PROMASTOP MG III of production of the PROMAT company.
- d. After 48 hours from the installation, the suspensions and supports used during installation of fire damper, may be removed.

ATTENTIONS:

- Carry out the installation in protective clothing, (gloves, glasses, helmet),
- Pay attention at the sharp edges of the sheets,
- Damper Baffle axis must be in horizontal or vertical position after montage
- Damper cannot be formwork for wall
- Ventilations duct should be installed that they cannot put any load on the damper, their suspension must ensure their full load capacity.
- The suspensions of the ventilation duct connected with the damper battery must be done according to instruction manufacturer of ventilation ducts
- In place of suspensions Z1 and Z2, which are installed for the time of assembly of the damper and in place of mortar binding it can be used mounting brackets, paying attention to the immobilization of the damper.

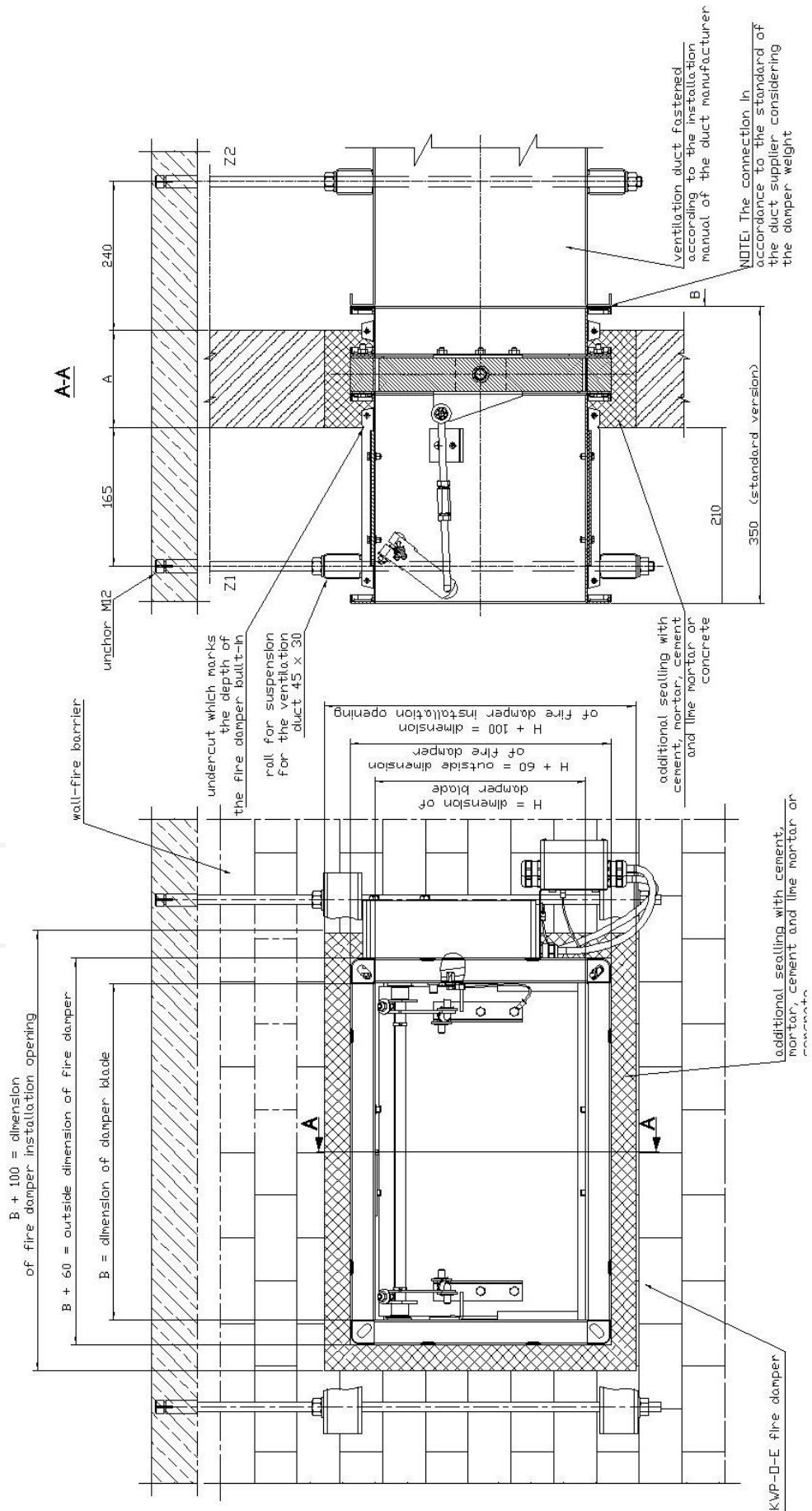


Figure 3. Installation method of fire dampers KWP-O in rigid wall

7.2. INSTALLATION TECHNOLOGY – FLEXIBLE WALL

- a. Make an opening in the wall with the dimensions 100 [mm] (acceptable 80 ÷ 120 [mm]) greater than the nominal dimensions of the fire damper = B+100 and H+100.
- b. Make a frame of two layers of GKF boards, 12,5 mm thick and the width relative to the width of opening, mounting by screws remembering to carefully seal the contact edges with a mastic: Hilti Firestop Coating CP 673, Promastop-Coating, Promaseal-Mastic or Soudal Firesilicone B1 FR.
- c. Put the closed fire damper into the installation opening and support or suspend, in this way that the minimum installation depth mark is on the plane of the flange surface.
- d. After setting the fire damper as described, fill the gap between the fire damper and the wall with non-flammable mineral wool of high density, 80 kg/m³ or more.
- e. Seal the place of filling with mineral wool using the sealing compounds given in pts.2.
- f. Mount collar, both side of wall, made of GKF boards, 15 mm thick and 150 mm wide, using screws.
- g. After mounting the collar, remove the supports or suspensions, check the fire damper correct operation and leave it in open position.



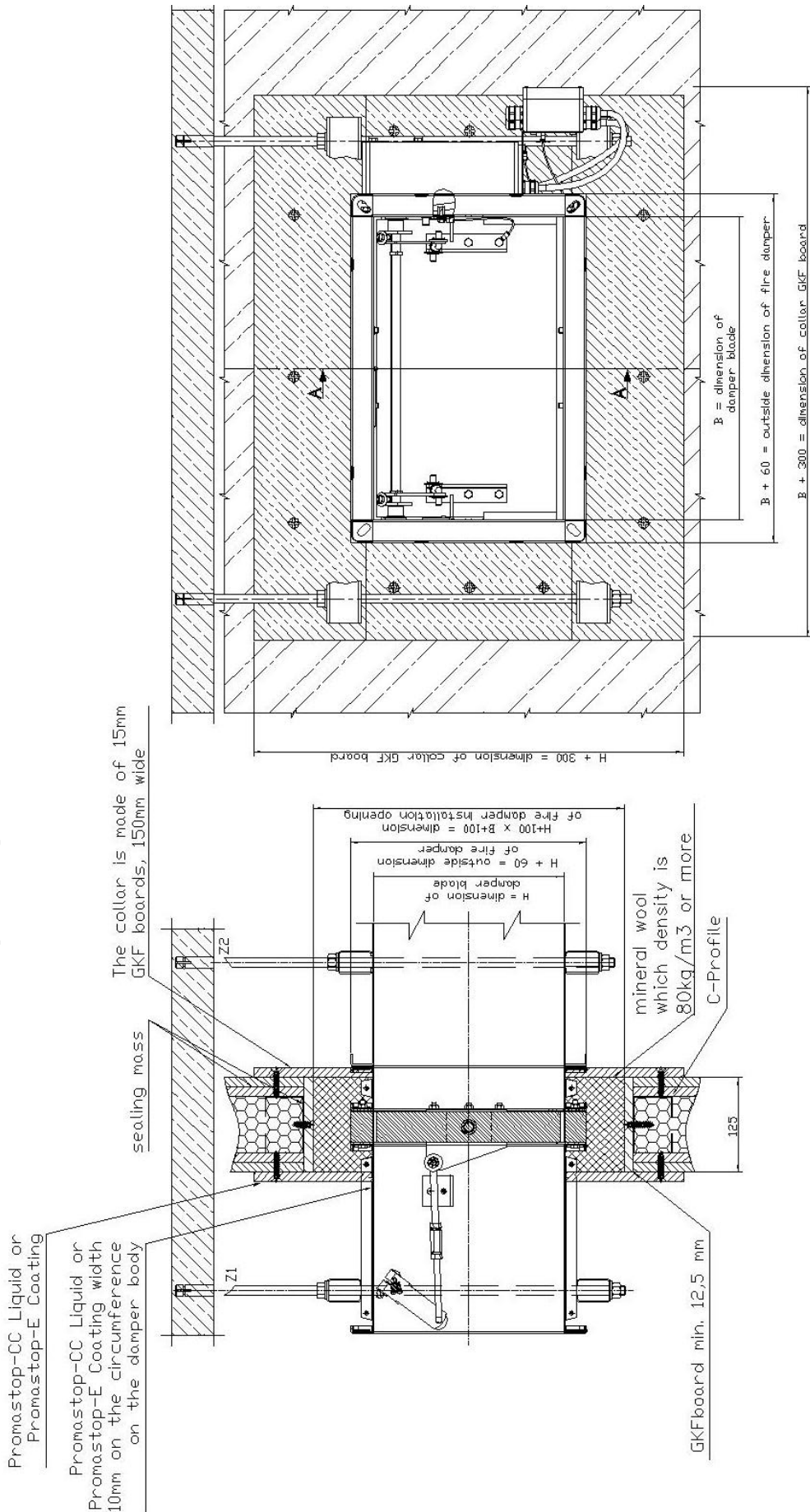


Figure 4. Installation method of fire dampers KWP-O in flexible wall

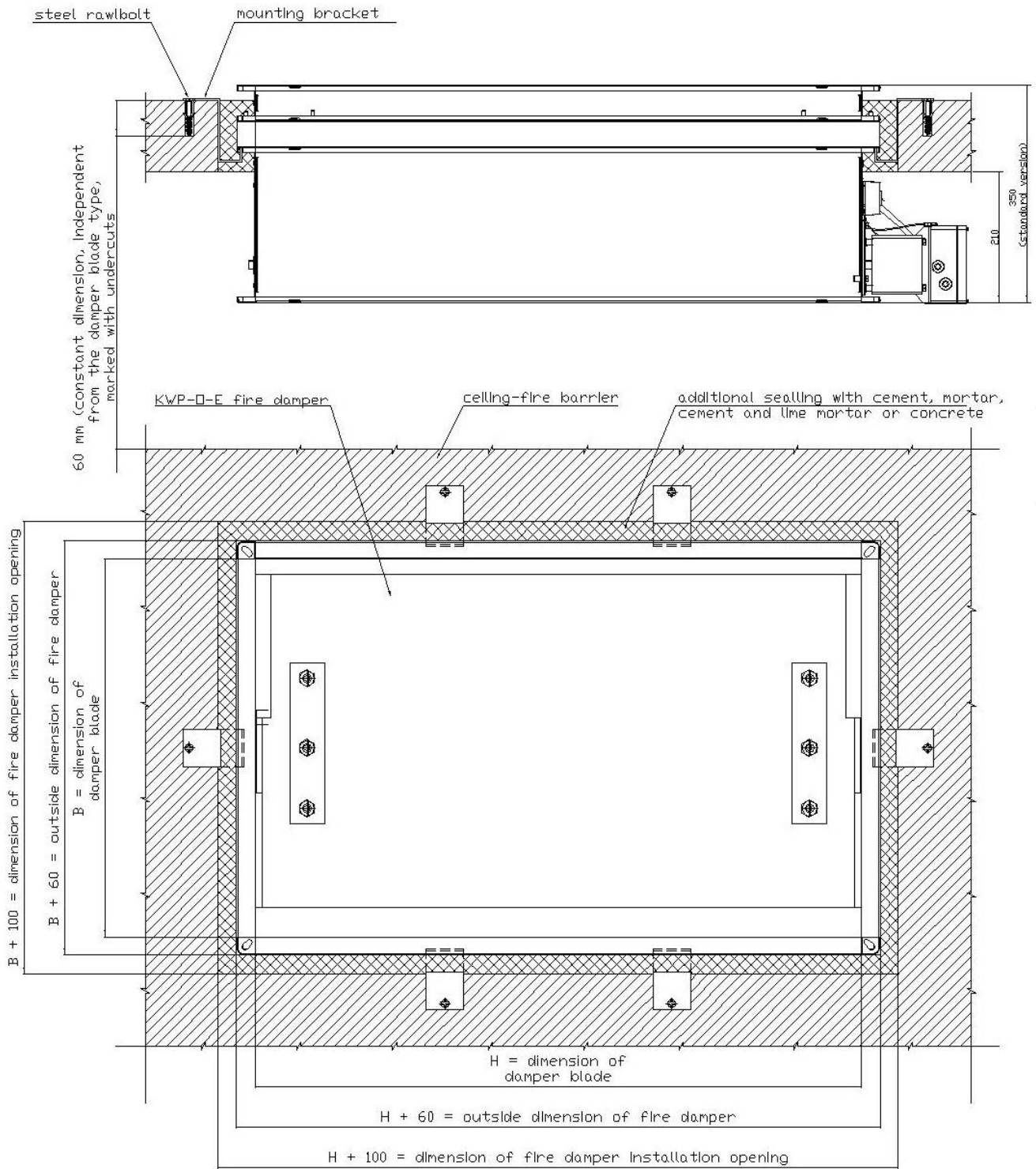


Figure 6. Installation method of fire dampers in ceiling

7.4. INSTALLATION TECHNOLOGY – STRUCTURES THICKER THAN 135 mm

The KWP-O-E(S) damper can be installed also in horizontal compartments thicker than length of damper's body. In this case, ventilation ducts are going to be partially inbuilt in the fire compartment (Figure 7).

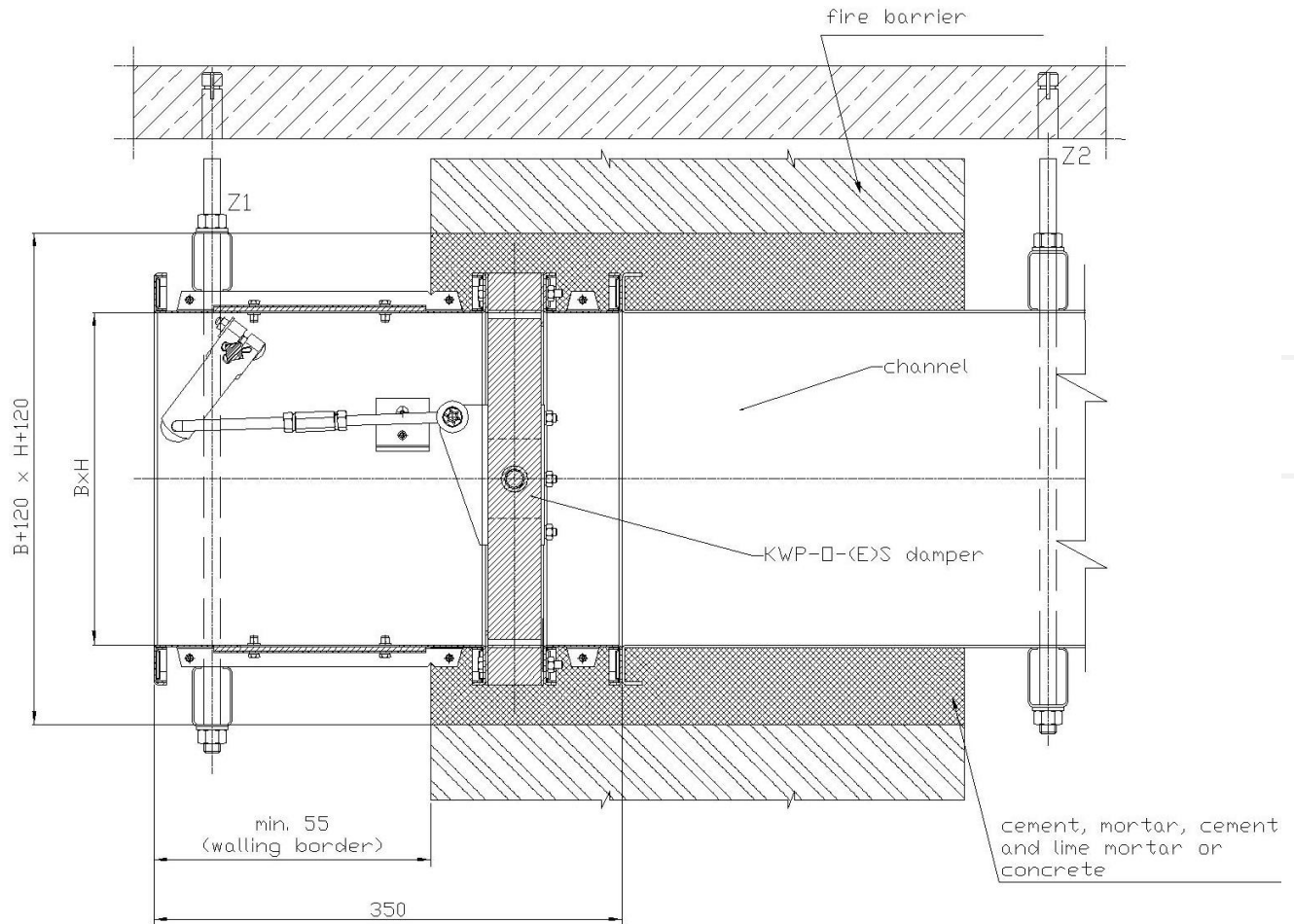


Figure 7. Installation method of fire dampers in structures thicker than 135 mm

8. PRINCIPLES OF MAINTENANCE

Before started any operation and maintenance works it is recommended to read this documentation. This responsibility falls mostly on workers which will operate device/systems during operation and service works. In case of lack of trained personnel (which have specific technical skills) service works should be made by SMAY Service or SMAY Authorized service.

Damage to the KWP damper resulting from non-compliance with the guidelines included in this documentation, will not be subject to warranty repairs.

Exchange and modification of device components can be done, just by SMAY Service or SMAY Authorized service (does not apply to exchange thermal fuse).

Factory sealed elements, should have undamaged, original seals, installed by SMAY Service or SMAY Authorized service.

After installation of the KWP-O-E-Ex and KWP-O-S-Ex, fire damper, when running the system, it is recommended to carry out regular checks and record them as shown in table below. It is recommended to repeat checks at intervals or at least once every 6 months.

Table 5. Recommended checks

Fire damper type	
Control date	
Check actuator wiring condition, if doesn` t damaged	
Check limit switch wiring condition, if doesn` t damaged	
Check cleanliness in fire damper, clean if necessary	
Check baffle and seal condition, if necessary report a problem	
Confirm correct operation of safe shutdown of the fire damper, if necessary report a problem	
Confirm correct operation of the fire damper when OPEN and CLOSE, using the control system and physical observation	
Confirm correct operation of limit switches in OPEN and CLOSED positions, if necessary report a problem	
Confirm that the fire damper meets its function as a part of the control system	
Confirm that the fire damper remains its working position	
ATTENTION: Fire dampers are usually part of ventilation system. In this case, the entire system should be checked according to the operating and maintenance requirements.	

In order to check the proper functioning of fire damper, in particular:

KWP-O-E-Ex fire damper:

- Take off inspection hatch, Make a visual inspection of the interior of fire damper, determine the condition of the baffle and seal, whether there are no damage or dirt that could block the fire baffle during closing. After an inspection put the inspection hatch back.
- Check the fire damper without disconnecting the supply voltage from the actuator.
- The opening and closing test should be carried out by positioning the baffle from control system („open” and „closed” position read on the position indicator located on the actuator).
- Put the inspection hatch back. Leave the fire damper in the right position.
- Make a control protocol.

KWP-O-S-Ex fire damper:

- a. Take off inspection hatch, Make a visual inspection of the interior of fire damper, determine the condition of the baffle and seal, whether there are no damage or dirt that could block the fire baffle during closing. After an inspection put the inspection hatch back.
- b. Check the wiring of the limit switches.
- c. Close the fire damper by pulling on the hand release. The baffle should close freely. Check that the baffle is closed properly. If the baffle does not close properly, adjust by pulling the spring to the next latch of the spring mechanism.
- d. After that, move several times the baffle using a key, attaching it to the axle
- e. After doing the above, leave the fire damper in the open position
- f. Make a control protocol.

Fire damper can be cleaned with a dry or damp cloth. Dirt and other pollution can be cleaned with generally available cleaners. Do not use aggressive, caustic cleaners and sharp tools.

Replacing the thermal fuse element in KWP-O-S-Ex:

Exchange must be performed on the closed position.
 To replace the thermal fuse element:

- a. Release the spring **7** from the spring mechanism plate **1**.
- b. Unscrew the bolt **14** and pull out the entire thermal fuse element. The assembly of these elements consists of a thermal fuse element **16**, hook **6**, console **5**, washer **7**, release spring **9**, nut M8 **12**, round nut **8**, thermal fuse plate **13**. To replace the thermal fuse, press the hook **6** towards the nut and put into console. When you put the thermal fuse, release the hook and push the lever of hand mechanism.
- c. Install the assembly of thermal fuse with the bolt **14**.
- d. Pull the spring onto spring mechanism plate **1**.
- e. Open the fire damper and check that it opens and closes correctly after push the hand release lever **11**.

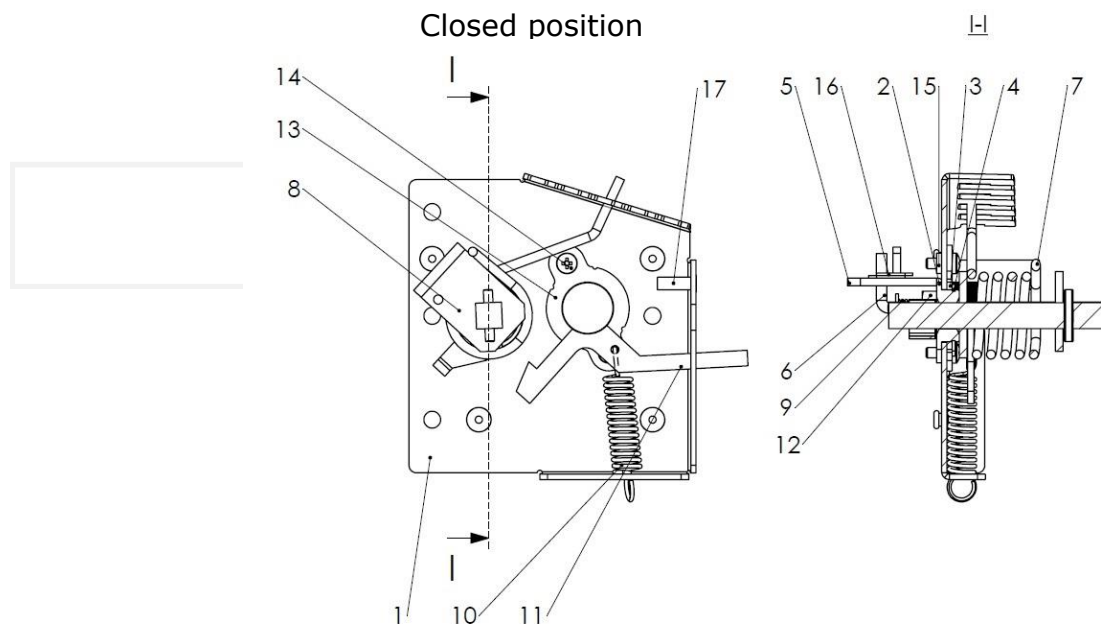


Figure 8. Spring mechanism – replacement of the thermal fuse element

Table 6. Diagnostic card

Diagnostic card			
No.	Symptoms of malfunction	Causes of malfunction	How to remove malfunction
1	No signaling opening/closing fire damper	1. Failure to fully open the baffle (wrong connected ventilation duct) 2. Improperly connected wires of limit switch 3. Damaged actuator	1. Removing the cause of blocking baffle 2. Correct wiring 3. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer)
2	No actuator response after connecting power	1. Damaged actuator 2. Damaged temperature sensor 3. Locked baffle	1. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer) 2. Replacing the temperature sensor to a new one 3. Removing the cause of blocking baffle
3	No possibility of opening the fire damper with actuator by key	1. Broken mechanism in the actuator (too rapid rotation) 2. Locked baffle	1. Replacing the actuator with a new one (after consulting with fire damper`s manufacturer) 2. Removing the cause of blocking baffle

9. TERMS OF WARRANTY

- a. The manufacturer provides guarantee for the delivered product for a period of 24 months from the date of sale or another period agreed in the contract. There is a possibility of extending the guarantee, provided that a separate Maintenance and Service Agreement is signed between the manufacturer and the owner/manager of the facility.
- b. The basis for complaint handling is to file a complaint within the warranty period, within 7 days of the defect being discovered. Make the product available in the state in which it appeared to be defective, together with a detailed description of the technical problem and documents confirming the performance of any inspection provided by the manufacturer and periodic maintenance.
- c. The manufacturer undertakes to remove the defect within 2 working days of receiving the notification. The manufacturer undertakes to remove the defect within 21 working days from the date of receipt of the application together with the complete set of documents, and in the case of necessity to bring in hard-to-reach materials or parts, the repair will be carried out within the shortest technically reasonable time.
- d. The warranty period is extended by the duration of the repair.
- e. The warranty is valid in the cases described in the OWG.
- f. OWG & OWS documents are available on the website www.smay.pl
- g. Above terms of warranty apply only in Poland.