

BVDAX for smoke extraction operation with frequency converter, CE certified in accordance with EN 12101-3



For mechanical smoke extract systems and pressure differential systems



Maximum size, maximum performance
B = 1.20 m, H = 2.03 m



Minimum leakage with both high and low temperatures due to 2-component sealing system



Vertical damper blade alignment possible

Smoke control dampers

EK-JZ



For mechanical smoke extract systems and pressure differential systems, as well as for providing additional supply air

Rectangular smoke control dampers with ventilation function, low installation depth and large cross section for heat and smoke exhaust with mechanical smoke extract systems, for the provision of additional supply air and for use in pressure differential systems

- Nominal sizes 200 × 230 – 1200 × 2030 mm, for smoke gas flow rates up to 29230 m³/h or 105235 m³/h at 12 m/s, upstream velocities up to 20 m/s possible
- Simple and quick installation in and on components
- Casing, damper blades and actuator encasing made of calcium silicate
- Pressure level 2 (operating pressure -1000 to 500 Pa)
- Automatic release (AA), option of manual override (MA)
- For smoke extract ducts from 35 mm wall thickness
- Closed blade air leakage to EN 1751, class 3
- Casing air leakage to EN 1751, class C

Optional equipment and accessories

- Cover grille (various constructions)
- Connecting subframe for calcium silicate and sheet steel smoke extract ducts
- Integration into the central BMS with TROXNETCOM
- Coating for use in exterior walls
- C_{mod} = for smoke extract and ventilation in combined systems, which allows for pneumatic volume flow rate balancing as the damper blade can take intermediate positions
- Installation accessories

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General information

Application

- Smoke control damper, with CE marking and declaration of performance, for heat and smoke exhaust with mechanical smoke extract systems
- Can be used for the provision of fresh air (additional supply air) to mechanical smoke extract systems
- Can be used in pressure differential systems
- Can be used for ventilation if the mechanical smoke extract system has been certified (general building inspectorate licence) for use with combined systems
- Integration into the central BMS with TROXNETCOM

Special features

- C_{mod} for smoke extract and ventilation in combined systems, which allows for pneumatic volume flow rate balancing as the damper blade can take intermediate positions
- Complies with the requirements of EN 12101-8
- Tested to EN 1366-2 and 1366-10 for fire resistance properties
- Closed blade air leakage to EN 1751, Class 3, and casing leakage to EN 1751, Class C
- Low sound power level and differential pressure
- Any airflow direction
- Manual release is also possible using TROXNETCOM
- Long-time testing to EN 1366-10, with 20000 OPEN/CLOSE cycles

Classification

EI 120/90 (v_{edw} - h_{odw} , $i \leftrightarrow o$) S1000 C_{mod} HOT 400/30 MA multi

Nominal sizes

- 200 × 230 – 1200 × 2030 mm
- Casing lengths L = 250 mm

Parts and characteristics

- Installation orientation is independent of the airflow direction
- Pressure level 2 (operating pressure -1000 to 500 Pa)
- For automatic and manual release
- Smoke control damper with ventilation function

Attachments 1

- Connecting subframe for calcium silicate and sheet steel smoke extract ducts
- Cover grille – crimped wire mesh or square perforated metal plate
- Cover grille – grille with straight or slanted blades

Attachments 2

- Open/Close actuators with 24 V AC/DC or 230 V AC supply voltage
- Network modules for the integration with AS-i networks
- Network modules for other standard bus systems

Optional products

TROXNETCOM

- X-FANS control unit for extract air and smoke extract control

TROX-X smoke exhaust fans from the X-FANS subassembly

- Smoke exhaust fan for roof installation BVDAX/ BVD
- Smoke exhaust fan for wall installation BVW/ BVWAXN
- Smoke exhaust centrifugal fan BVREH /BVRA
- Smoke extract jet fans BVGAX/BVGAXN

All smoke exhaust fans are tested to EN 12101-3, for F200/ F300/F400 and F600, depending on the type. With CE marking, declaration of performance and application approval for the German market.

Speed adjustment for smoke exhaust fans

- Certified frequency inverter unit X-FANS control
- Safe and precise speed adjustment of smoke exhaust fans both in one-zone and in multi-zone systems.

Construction features

- Rectangular construction
- Smoke control damper actuator controlled by reversible open/close actuator
- Remote control with actuator
- Suitable for the connection of cover grilles or connecting subframes

Materials and surfaces

- Casing, damper blade and actuator encasing made of calcium silicate
- Brass bearings
- Blade shafts, drive arm and shaft bearing made of galvanised steel

Standards and guidelines

- Construction Products Regulation
- EN 12101-8 Smoke and heat control systems – Smoke control dampers
- EN 1366-10 Fire resistance tests for service installations – Smoke control dampers
- EN 1366-2 Fire resistance tests for service installations – Fire dampers
- EN 13501-4 Fire classification of construction products and building elements using data from fire resistance tests
- EN 1751 Ventilation for buildings – Air terminal devices

Maintenance

Smoke control dampers must be operational at all times and must be maintained regularly so that they provide the required services.

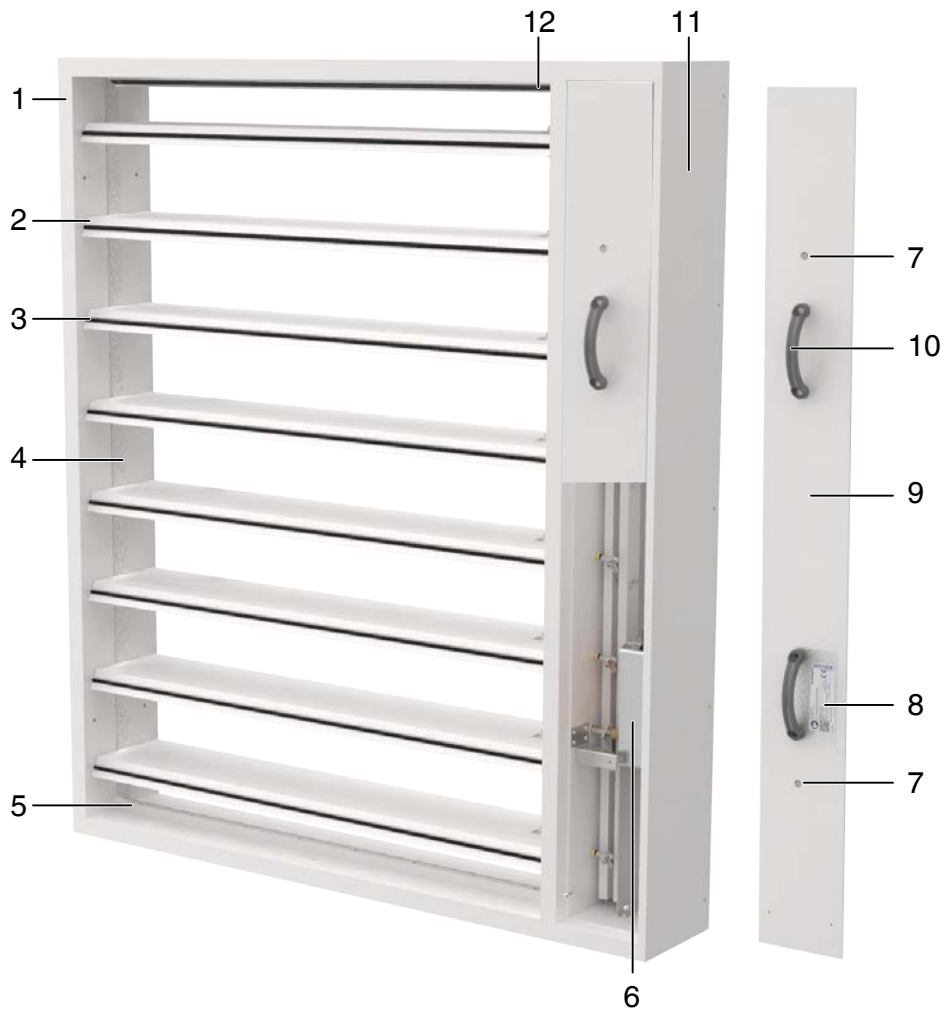
- Maintenance is required at least every 6 months
 - A maintenance report must be created; documents must be kept for reference
- The functional reliability of the smoke control damper must be tested at least every six months; this has to be arranged by the owner of the smoke extract system; functional tests must be carried out in compliance with the basic maintenance principles stated in EN 13306 and DIN 31051. If two consecutive tests, one 6 months after the other, are successful, the next test can be conducted one year later
 - Depending on where dampers are installed, country-specific regulations may apply.
 - For details on maintenance and inspection, refer to the installation and operating manual.

Function

Smoke control dampers are used in mechanical smoke extract systems. They are used for extracting smoke gases and for providing additional supply air to one or more fire compartments. The dampers are made of calcium silicate panels and are opened by an encased actuator; when smoke is detected, the actuator is triggered by a signal either from a duct smoke detector or from a fire alarm system. Smoke control dampers have two safe positions: open and closed. In the case of fire-resistant smoke control dampers for multiple compartments, the safe position is either "open" or "closed", depending on the fire site and the path of the smoke to be extracted. If the safe

position is 'open', the free area must be maintained even in the event of a fire. The blades of EK-JZ move to the defined safe position upon receiving an automatically or manually triggered control signal. According to the specified time-temperature curve, the EK-JZ can still fully open or close after 25 minutes (MA, manual release). With the EK-JZ product type, it is also possible to change the position for modulation uses (Cmod) and thus a pneumatic adjustment in the ventilation operation of a combined system by moving to intermediate positions of the damper blade field. Regular maintenance of the smoke control damper is required to ensure its functional reliability.

Schematic illustration



- ① Casing
- ② Blades
- ③ Blade tip seal (special profile seal)
- ④ Side seal
- ⑤ Travel stop, bottom
- ⑥ Actuator

- ⑦ Cover fixing
- ⑧ Rating plate
- ⑨ Cover of the actuator encasing
- ⑩ Handle (to remove the cover)
- ⑪ Actuator encasing
- ⑫ Travel stop, top

Technical data

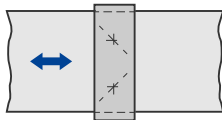
Nominal sizes B × H	200 × 230 mm – 1200 × 2030 mm
Casing length [mm]	250 mm
Flow rate range at maximum upstream velocity	Up to 920 l/s or up to 3310 m³/h – up to 29230 l/s or up to 105235 m³/h
Differential pressure range	Pressure level 2: -1000 – 500 Pa
Operating temperature	At least -30 to 50 °C; the temperature should not fall below the dew point
Upstream velocity*	Up to 12 m/s for maximum dimension and ≤ 20 m/s for damper sizes up to 1200 × 1830 mm, otherwise technical clarification required

* Data applies to uniform upstream and downstream conditions for the smoke control damper

Quick sizing suitable for installation type

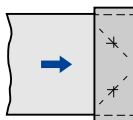
- Quick sizing tables in Easy Product Finder provide a good overview of the volume flow rates for different airflow velocities as well as of differential pressures
- Precise values based on project-specific data can be determined with our Easy Product Finder design software
- You will find the Easy Product Finder on our website www.trox.de/mytrox/auslegungsprogramm-easy-product-finder-182e16348fac3d33

Installation type A, in a duct



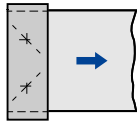
Ducted on both sides, any airflow direction

Installation type B, additional supply air



Ducted on one side, no duct on the downstream side

Installation type C, smoke extract



Ducted on one side, no duct on the upstream side

Installation type D



Air transfer

Specification text

This specification text describes the general properties of the product. Texts for variants can be generated with our Easy Product Finder design programme.

Rectangular or square smoke control dampers to product standard EN 12101-8, tested to EN 1366-10 and EN 1366-2, for use in smoke extract systems. Smoke control dampers are not only used for the exhaust of smoke, heat and combustion products from a fire compartment, but also for the controlled removal of dangerous and toxic combustion and fire suppression gases. EK-JZ smoke control dampers can also be used in pressure differential systems and as pressure relief dampers in gas fire extinguishing systems. Also for extracting smoke gases and for providing additional supply air for the mechanical smoke extract of one or more fire compartments and in all listed systems of the same type that need to fulfil modulation applications. EK-JZ can be used in combined smoke exhaust systems which have been approved for controlled ventilation. The fire-resistant smoke control damper for multiple compartments is suitable for installation in and on fire-resistant smoke extract ducts or smoke extract shafts and in fire-resistant standard supporting constructions. The control of open/close actuators can be implemented with control modules that are factory wired or with bus modules inside the temperature-resistant actuator encasing.

Classification

EI 120/90 (v_{edw} - h_{odw} , $i \leftrightarrow o$) S1000 C_{mod} HOT 400/30 MA multi

Special features

- C_{mod} for smoke extract and ventilation in combined systems, which allows for pneumatic volume flow rate balancing as the damper blade can take intermediate positions
- Complies with the requirements of EN 12101-8
- Tested to EN 1366-2 and 1366-10 for fire resistance properties
- Closed blade air leakage to EN 1751, Class 3, and casing leakage to EN 1751, Class C
- Low sound power level and differential pressure
- Any airflow direction
- Manual release is also possible using TROXNETCOM
- Long-time testing to EN 1366-10, with 20000 OPEN/CLOSE cycles

Materials and surfaces

- Casing, damper blade and actuator encasing made of calcium silicate
- Brass bearings

- Blade shafts, drive arm and shaft bearing made of galvanised steel

Technical data

- Nominal sizes B × H: 200 × 230 mm – 1200 × 2030 mm
- Casing length: 250 mm
- Volume flow rate at maximum dimension: up to 29230 l/s or up to 105235 m³/h (after technical clarification, up to 48720 l/s or up to 175390 m³/h possible)
- Differential pressure range: pressure level 2: -1000 – 500 Pa
- Operating temperature: -30 °C to 50 °C; the temperature should not fall below the dew point
- Upstream velocities*: up to 12 m/s for maximum dimension and ≤ 20 m/s for damper sizes up to 1200 × 1830 mm, otherwise technical clarification required

* Technical data applies to uniform upstream and downstream conditions for the smoke control damper

Attachments

Connecting subframe and cover grille for the operating side and/or installation side.

- Connecting subframe for calcium silicate and sheet steel smoke extract ducts
- Cover grille – crimped wire mesh or square perforated metal plate
- Cover grille – external weather louvre or ventilation grille

Open/close actuators for the control of smoke control dampers, with automatic (AA) or manual release (MA).

Optional control or communication module for integration with the central BMS.

- Supply voltage 24 V AC/DC or 230 V AC
- Limit switches for capturing the end positions OPEN and CLOSED
- Override control for up to 25 minutes
- Module for the control of smoke control dampers (optional)
- Indicator lights for indicating the damper blade position
- Monitoring of signal reception

Sizing data

q_v [m³/h]

Δp_{st} [Pa]

Air-regenerated noise

LPA [dB(A)]

Order code

EK-JZ - R - V - C1 / DE / 1200 x 2030 / 13 / FA / B24A / P1 - RAL...

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1 Type

EK-JZ

Smoke control damper according to EN 12101-8

2 Actuator encasing As seen from the operating side

R = Right (as standard)

L = Left

3 Damper blade alignment

No entry required = Horizontal damper blade alignment (standard)

V = Vertical damper blade alignment

4 Coating

No entry required = None (standard)

C1 = Promat SR impregnation

5 Country of destination

DE Germany

CH Switzerland

AT Austria

PL Poland

and others

6 Nominal size [mm]

B x H (B in 50 mm increments; H in 200 mm increments)

From 200 x 230 to 1200 x 2030

7 Accessories 1

No entry required = None (standard)

01 Fixing tabs (quantity depends on B x H)

Only in the case of horizontal damper blade alignment

02 Lower HT seal

03 Lower HT seal and fixing tabs (quantity depends on B x H)

04 Side HT seal

05 Lower and side HT seals

06 Lower and side HT seals and fixing tabs (quantity depends on B x H)

07 Side HT seal and fixing tabs (quantity depends on B x H)

08 Upper (special) HT seal

09 Upper (special) and side HT seals

10 Upper (special) HT seal and fixing tabs (quantity depends on B x H)

11 Upper (special) and side HT seals and fixing tabs (quantity depends on B x H)

12 Ceiling fixing tabs (double quantity depends on B x H)

Only in the case of vertical damper blade alignment

13 Upper (special) HT seal

14 Side and upper (special) HT seals

15 Upper (special) HT seal and fixing tabs (quantity depends on B x H)

16 Upper (special) and side HT seals and fixing tabs (quantity depends on B x H)

8 Attachments 1

No entry required: None

F – Connecting subframe, galvanised steel, cover grille

A – Crimped wire mesh, 20 x 20, galvanised steel

B – Square perforated metal plate, 10 x 10, galvanised steel

C – Grille with slanted blades made of aluminium

D – Grille with slanted blades, aluminium, additionally with crimped wire mesh, 20 x 20, galvanised steel

E – Grille with slanted blades, aluminium, additionally with welded wire mesh, 6 x 6 mm, galvanised steel

Character 1 refers to the operating side, without attachment on operating side: 0

Character 2 defines installation side, without attachment on installation side: 0

Example: FA: Connecting subframe on the operating side, crimped wire mesh 20 x 20 on the installation side

Any combination is possible

9 Attachments 2

Actuator

B24 – Actuator, Belimo, 24 V AC/DC

B24SR – Actuator, Belimo, 24 V AC/DC, continuous control with operating range of 2 – 10 V DC, ventilation function C_{mod}¹

B230 – Actuator, Belimo, 230 V AC

Actuator combined with TROX control module

B24A – Actuator, Belimo, 24 V AC/DC with TROXNETCOM control module AS-EM/EK²

B24AS – Actuator, Belimo, 24 V AC/DC with TROXNETCOM control module AS-EM/SIL2²

B24AM – Actuator, Belimo, 24 V AC/DC with TROXNETCOM control module AS-EM/M, for function C_{mod}¹

Other communication modules:

B24BKNE – Actuator, Belimo, 24 V AC/DC, Belimo communication and power supply unit BKNE230-24

B24C – Actuator, Belimo, 24 V AC/DC, BV-Control communication and power supply unit with SLC® technology BC24 G2)

B24D – Actuator Belimo, 24 V AC/DC, Agnosys fire damper smoke control damper module BRM-10-F-ST

B230D – Actuator Belimo, 230 V AC, Agnosys fire damper and smoke control damper module BRM-10-F

¹ Function C_{mod} for damper blade in intermediate position

² The AS-i system is based on the industrial standard AS-Interface

**10 Surface finish (attachments 1)**

No entry required: None (standard)

P1 Powder-coated, specify RAL CLASSIC colour

PS Powder-coated, DB colour ...

Gloss level:

RAL 9010 50 %

RAL 9006 30 %

All other RAL colours 70 %

Order example: EK-JZ-R-V-C1/DE/800 × 1030/14/A0/B24A/P1-RAL9010-50%

Actuator encasing

Operating side, on the right

Damper blade alignment

Vertical

Coating

Impregnation

Country of destination

Germany

Nominal size

800 × 1030 mm

Accessories 1

Side and upper (special) HT seals

Attachment 1

Cover grille on the operating side

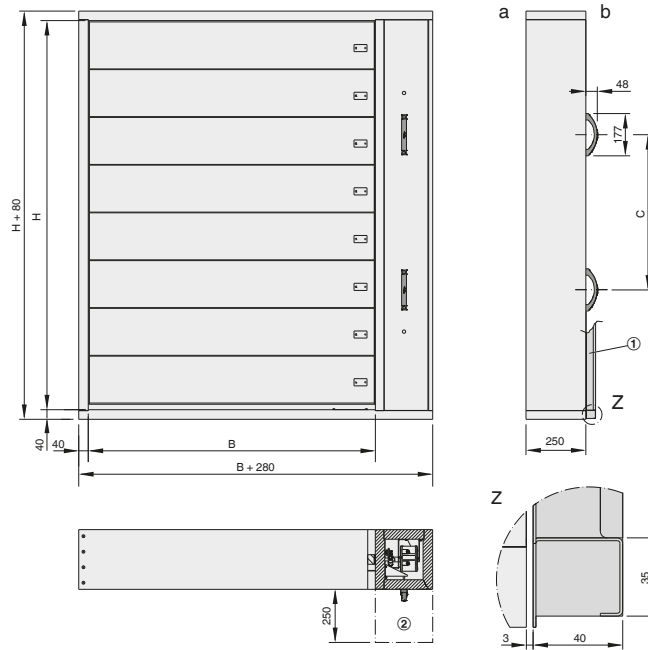
Attachment 2

TROX actuator Belimo, with TROXNETCOM control module AS-EM/EK

Surface attachment

P1-RAL9010 50 % cover grille with powder coating, RAL 9010, pure white, gloss level 50 %

Dimensions and weight



a Installation side

b Operating side

① Subframe for connection to the duct (steel, operating side only and or installation side, optional)

② Keep clear to provide access to the actuator encasing

Weights [kg], width 200 – 650 mm

L	H	B									
		200	250	300	350	400	450	500	550	600	650
250	230	21	22	23	24	25	27	28	29	30	31
250	430	29	31	32	33	35	36	38	39	41	42
250	630	37	39	41	43	44	46	48	50	51	53
250	830	46	48	50	53	54	56	58	61	62	64
250	1030	54	56	59	61	63	66	68	70	73	75
250	1230	62	65	67	70	73	75	78	81	83	86
250	1430	71	73	76	79	82	85	88	91	94	97
250	1630	79	82	85	88	92	95	98	101	105	108
250	1830	87	91	94	98	101	105	108	112	115	119
250	2030	95	99	103	107	111	114	118	122	126	130

Weights [kg], width 700 – 1200 mm

L	H	B										
		700	750	800	850	900	950	1000	1050	1100	1150	1200
250	230	32	34	35	36	37	38	39	40	42	43	44
250	430	44	45	47	48	49	51	52	54	55	57	58
250	630	55	57	58	60	62	64	65	67	69	71	72
250	830	66	69	70	72	75	77	78	80	83	85	87
250	1030	77	80	82	84	87	89	91	94	96	98	101
250	1230	89	91	94	97	99	102	104	107	110	112	115
250	1430	100	103	106	109	112	115	117	120	123	126	129
250	1630	111	114	118	121	124	127	130	134	137	140	143
250	1830	122	126	129	133	136	140	143	147	150	154	158
250	2030	134	137	141	145	149	153	156	160	164	168	172

Accessories

No entry required = None (standard)

01 Fixing tabs (quantity depends on B x H)

Only in the case of horizontal damper blade alignment

02 Lower HT seal

03 Lower HT seal and fixing tabs (quantity depends on B x H)

04 Side HT seal

05 Lower and side HT seals

06 Lower and side HT seals and fixing tabs (quantity depends on B x H)

07 Side HT seal and fixing tabs (quantity depends on B x H)

08 Upper (special) HT seal

09 Upper (special) and side HT seals

10 Upper (special) HT seal and fixing tabs (quantity depends on B x H)

11 Upper (special) and side HT seals and fixing tabs (quantity depends on B x H)

12 Ceiling fixing tabs (double quantity depends on B x H)

Only in the case of vertical damper blade alignment

13 Upper (special) HT seal

14 Side and upper (special) HT seals

15 Upper (special) HT seal and fixing tabs (quantity depends on B x H)

16 Upper (special) and side HT seals and fixing tabs (quantity depends on B x H)

Attachments 1

F, A, B, C, D, E – Connecting subframes and cover grilles

Application

- A connecting subframe (F) is required for sheet steel smoke extract ducts
- Cover grilles are attached to the damper or to the end of ducts; this application has been approved based on a fire test to EN 1366-10
- The cover grille free area is approx. 80 % for crimped wire mesh (A) and approx. 70 % for perforated metal plates

- Cover grille variants C, D, E cover the section of blades of the EK-JZ but not the actuator encasing
- If you order a cover grille separately, you may choose a size that covers the damper blades and the actuator encasing and fix the grille along the perimeter of the shaft wall
- Connecting subframes are factory mounted and form a unit
- Connecting subframes and cover grilles may also be ordered separately
- The cover grill and accessories are supplied separately

Materials and surfaces

- F: Connecting subframe made of galvanised sheet steel

- All attachments can be powder-coated

Cover grilles

- A: Crimped wire mesh made of galvanised steel
- B: Perforated metal plate made of galvanised sheet steel
- C: Grille with slanted blades made of aluminium
- D: Grille with slanted blades made of aluminium, crimped wire mesh made of galvanised steel
- E: Grille with slanted blades made of aluminium, welded wire mesh made of galvanised steel

Connecting subframes and cover grilles

Operating side	Installation side	Order code
Connecting subframe	–	F0
–	Connecting subframe	0F
Connecting subframe	Connecting subframe	FF
Cover grille A	–	A0
–	Cover grille A	0A
Cover grille A	Cover grille A	AA
Cover grille B	–	B0
–	Cover grille B	0B
Cover grille B	Cover grille B	BB
Cover grille C	–	C0
–	Cover grille C	0C
Cover grille C	Cover grille C	CC
Cover grille D	–	D0
–	Cover grille D	0D
Cover grille D	Cover grille D	DD
Cover grille E	–	E0
–	Cover grille E	0E
Cover grille E	Cover grille E	EE

A: Crimped wire mesh, 20 × 20 × 1.8 mm, galvanised steel (AG-E)

B: Square perforated metal plate, 10 × 10 mm, galvanised steel (AG-E)

C: Grille with slanted blades, aluminium (ALG-E)

D: Grille with slanted blades, aluminium, additionally with crimped wire mesh, 20 × 20 × 1.8 mm, galvanised steel (ALG-E)

E: Grille with slanted blades, aluminium, additionally with welded wire mesh, 6 × 6 mm, galvanised steel (ALG-E)

Any combination is possible

Attachments 2

Application

- Open/close actuators for the opening and closure of smoke control dampers, with automatic (AA) or manual release (MA).
- With integral limit switches for capturing the end positions
- Override control for up to 25 minutes
- Ambient temperature for normal operation: -30 to 50 °C, up to 95%, without temperatures below the dew point, no condensation (EN 60730-1)
- Two integral limit switches with volt-free contacts can indicate the damper blade position (OPEN and CLOSED)
- The connecting cables of the 24 V actuator are fitted with plugs, which ensure quick and easy connection to the TROX AS-i bus system
- The connecting cable of the 230 V AC actuator is fitted with wire end ferrules

Variants

B24

- 24 V AC/DC supply voltage
- BEN24-ST TR: Torque 15 Nm
- BEE24-ST TR: Torque 20 Nm
- BE24-12-ST TR: Torque 40 Nm

B230

- Supply voltage 230 V AC
- BEN230 TR: Torque 15 Nm
- BEE230 TR: Torque 25 Nm
- BE230-12 TR: Torque 40 Nm

B24-SR

- BEN24-SR: Torque 15 Nm
- BEE24-SR: Torque 25 Nm

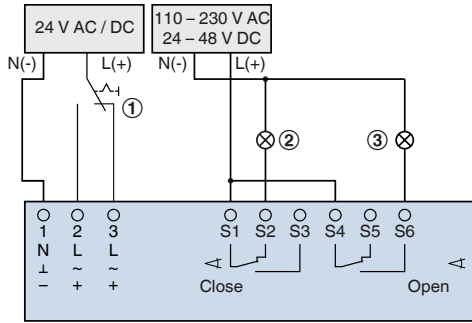
The torque required to operate the smoke control damper depends on the size which is why the actuator type cannot be chosen freely.

Installation information

- Feeding the electric connecting cable through the actuator encasing requires a drilled hole of the exact size (\varnothing max. + 1 mm)
- A wire clamping bracket is required
- For details on maintenance and inspection, refer to the installation and operating manual.

Wiring examples, technical data

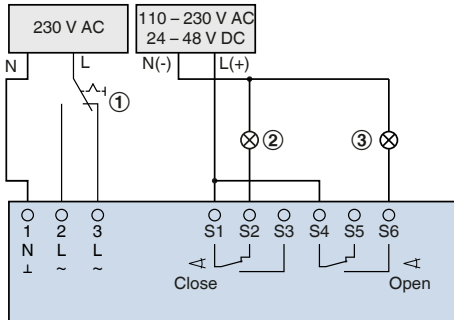
Wiring example 24 V AC / DC



- ① Switch for opening and closing, to be provided by others
- ② Indicator light for CLOSED position, to be provided by others
- ③ Indicator light for OPEN position, to be provided by others

Actuator	BEN24-ST	BEE24-ST	BE24-ST
Supply voltage (AC)	AC 19.2 – 28.8 V, 50/60 Hz		
Supply voltage (DC)	DC 21.6 – 28.8 V, 50/60 Hz		
Power consumption – when running	3 W	2.5 W	12 W
Power consumption – when idle	0.1 W		0.5 W
Power rating for cable sizing	I _{max.} 8.2 A at 5 ms		
Torque	15 Nm	25 Nm	40 Nm
Run time for 90°	< 30 s		
Limit switch contacts	2 × EPU		
Switching current	1 mA – 3 A (0.5 A inductive), AC 250 V		1 mA – 6 A (0.5 A inductive), AC 250 V
Limit switch – open	5°		3°
Limit switch – close	80°		87°
Connecting cable – actuator	Cable 1 m, 3 × 0.75 mm ² , halogen-free		
Connecting cable – limit switches	Cable 1 m, 6 × 0.75 mm ² , halogen-free		
IEC protection class	III safety extra low voltage (SELV)		
Protection level	IP 54		
EC conformity	CE according to 2014/30/EU Low Voltage Directive CE according to 2014/35/EU		
Operating temperature	-30 to 55 °C		
Weight	0.9 kg	1.1 kg	2.7 kg

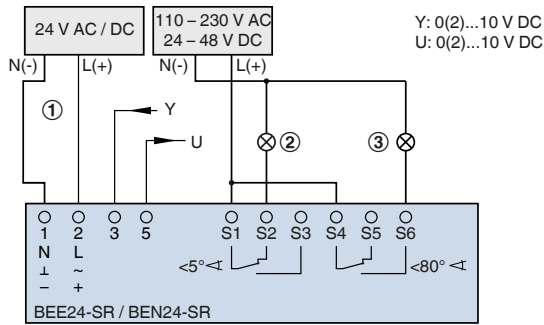
Wiring example 230 V AC



- ① Switch for opening and closing, to be provided by others
- ② Indicator light for CLOSED position, to be provided by others
- ③ Indicator light for OPEN position, to be provided by others

Actuator	BEN230 TR	BEE230 TR	BE230 TR
Supply voltage (AC)	AC 198 – 264 V, 50/60 Hz		
Power consumption – when running	4 W	3.5 W	8 W
Power consumption – when idle	0.4 W		0.5 W
Power rating for cable sizing	Imax. 4 A at 5 ms		Imax. 7.9 A at 5 ms
Torque	15 Nm	25 Nm	40 Nm
Run time for 90°	< 30 s		
Limit switch contacts	2 × EPU		
Switching current	1 mA – 3 A (0.5 A inductive), AC 250 V		1 mA – 6 A (0.5 A inductive), AC 250 V
Limit switch – open	5°		3°
Limit switch – close	80°		87°
Connecting cable – actuator	Cable 1 m, 3 × 0.75 mm ² , halogen-free		
Connecting cable – limit switches	Cable 1 m, 6 × 0.75 mm ² , halogen-free		
IEC protection class	II reinforced insulation		
Protection level	IP 54		
EC conformity	CE according to 2014/30/EU Low Voltage Directive CE according to 2014/35/EU		
Operating temperature	-30 to 55 °C		-30 to 50 °C
Weight	0.9 kg	1.1 kg	2.7 kg

Wiring example 24 V AC / DC

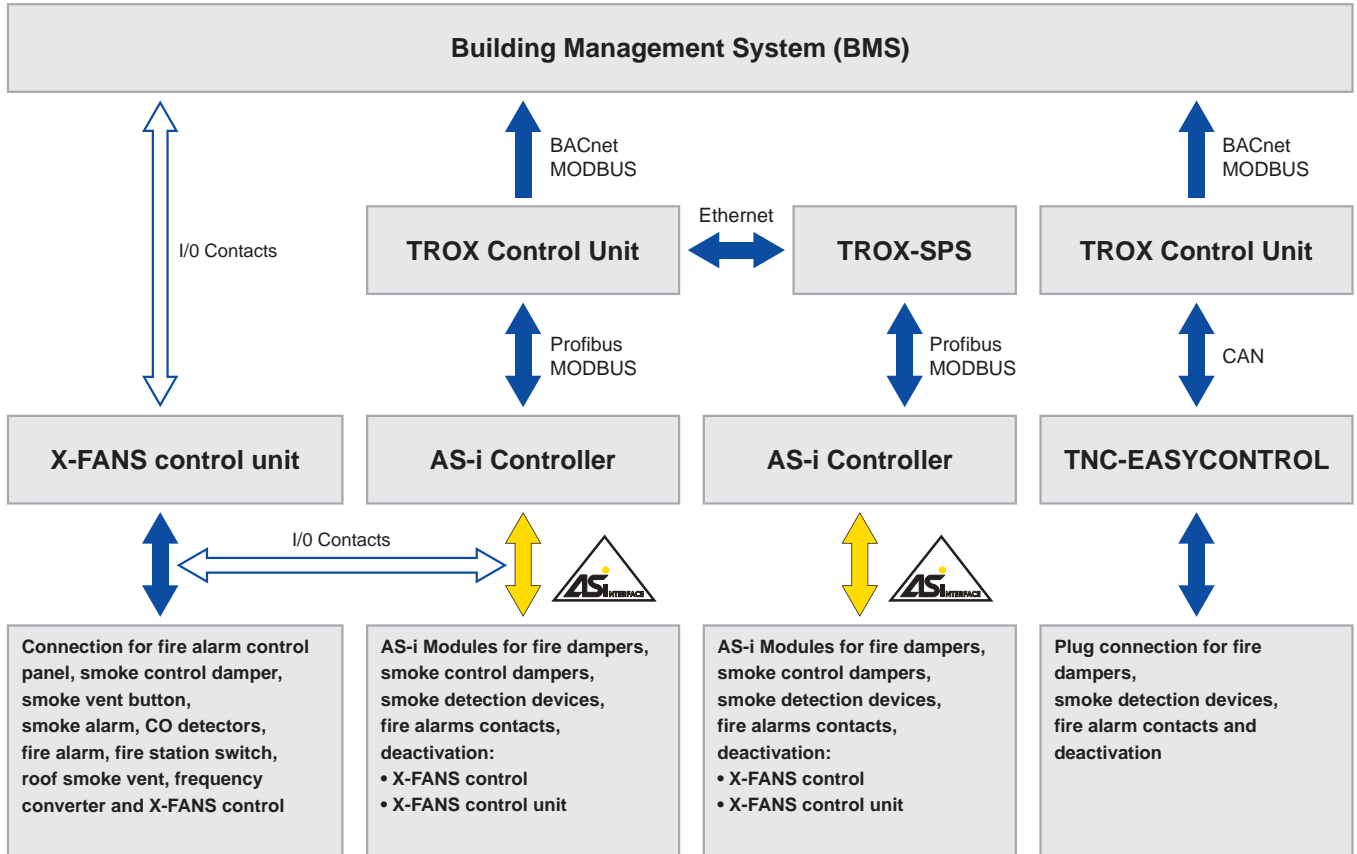


- ① Switch for opening and closing, to be provided by others
- ② Indicator light for CLOSED position, to be provided by others
- ③ Indicator light for OPEN position, to be provided by others

Actuator	BEN24-SR	BEE24-SR
Supply voltage (AC)	AC 19.2 – 28.8 V, 50/60 Hz	
Supply voltage (DC)	DC 21.6 – 28.8 V, 50/60 Hz	
Power consumption – when running	3 W	
Power consumption – when idle	0.3 W	
Power rating for cable sizing	I _{max} . 8.2 A at 5 ms	
Torque	15 Nm	25 Nm
Run time for 90°	< 30 s	
Limit switch contacts	2 × EPU	
Switching current	1 mA – 3 A (0.5 A inductive), AC 250 V	
Limit switch – open	5°	
Limit switch – close	80°	
Connecting cable – actuator	Cable 1 m, 4 × 0.75 mm ² , halogen-free	
Connecting cable – limit switches	Cable 1 m, 6 × 0.75 mm ² , halogen-free	
IEC protection class	III safety extra low voltage (SELV)	
Protection level	IP 54	
EC conformity	CE according to 2014/30/EU Low Voltage Directive CE according to 2014/35/EU	
Operating temperature	-30 to 55 °C	
Weight	1.1 kg	0.9 kg

Interfaces to higher level systems

TROX fire and smoke protection systems have standardised interfaces for central building management systems. In the simplest case, the interface consists of discrete signalling contacts that connect the alternating inputs and outputs of TROX systems and other building components.



Control and communication modules for smoke control dampers

Order characteristic	B24A	B24AS	B24AM	B24BKNE	B24C	B230D	B24D
Module type	AS-EM/EK	AS-EM/SIL2	AS-EM/M	BKNE230-24	BC24	BRM-10-F	BRM-10-F-ST
EK2-EU	x	x	x	x	x	x	x
EK-JZ	x	x	x	x	x	x	x

Note:

The smoke control dampers, actuators and communication modules described have each been verified by the manufacturer as a unit in terms of fire protection and may therefore only be used in such constellations.

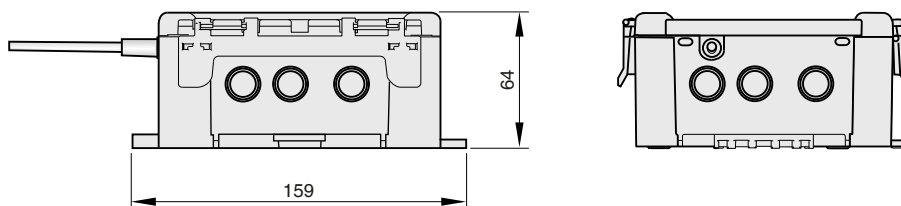
B24A – AS-EM/EK
Application

- Module for the control of smoke control dampers
- Capturing damper blade positions OPEN and CLOSED
- Actuators can be started even without controller communication
- LEDs for OPEN and CLOSED positions; monitoring of run time errors
- Integral AS-Interface slave
- Monitoring of signal reception
- Master can be used to monitor the run time of the damper blade actuator
- Supply voltage of the module and the 24 V DC actuator using AS-Interface (2-wire control)
- Plug-in connection for Belimo actuators (factory mounted and wired)

Use

B24A – Mounted to the smoke control damper

Description	AS-EM/EK
Electrical design	4 inputs/3 outputs
Output function	PNP transistor
Supply voltage	26.5 – 31.6 V DC
Current consumption, including actuator	450 mA
Inputs	
Switching	DC PNP
Sensor voltage supply	AS-i
Voltage range	18 – 30 V AC
With short circuit protection	Yes
Switching level – high signal 1	10
Input current high/low	> 7 mA/< 2 mA
Input characteristic	IEC 61131-2 Type 2
Outputs, PNP	
Galvanically isolated	No
Max. current load per output	400 mA per output/400 in total (from AS-i)
Outputs, relay	
Galvanically isolated	Yes
Maximum voltage	32 V
Max. current load	500 mA
Ambient temperature	-5 to 75 °C
Protection level, IEC protection class	IP 42
AS-i profile	S-7.A.E
I/O configuration	7 Hex
ID code	7 Hex
EMC	EN 61000-6-2; EN 61000-6-3

AS-EM/EK


B24AS – AS-EM/SIL2
Application

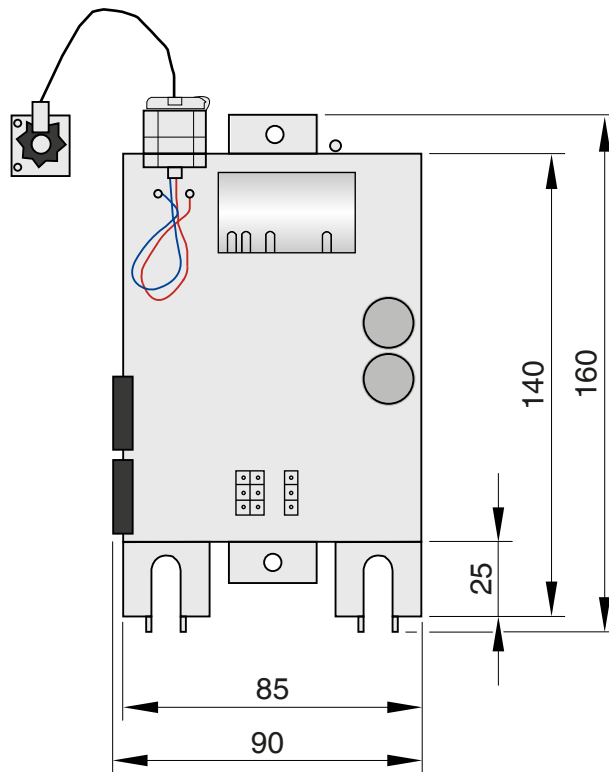
- Module for the control of smoke control dampers
- Capturing damper blade positions OPEN and CLOSED
- Approved up to SIL2 to IEC/EN 61508
- Integral AS-Interface slave
- Monitoring of signal reception
- Master can be used to monitor the run time of the damper blade actuator
- Connection with terminals
- Supply voltage of the module and the 24 V DC actuator using AS-Interface (2-wire control)
- Plug-in connection for Belimo actuators (factory mounted and wired)

Use

B24AS – Mounted to the smoke control damper

Description	AS-EM/SIL2
Supply voltage	26.5 – 31.6 V DC
Current consumption	< 400 mA from AS-i
Max. current load per output	340 mA
Max. current load per module	340 mA
Status LED	
AS-i power	1 × green
PeripheralFault	1 × red, blinking
ComError	1 × red, static
Output Q0	1 × yellow (DO0)
Output Q1	1 × yellow (DO1)
Input status LED SI-1	1 × yellow
Input status LED SI-2	1 × yellow
Input status DI0	1 × yellow (DI0)
Input status DI1	1 × yellow (DI1)
Input status DI2	1 × yellow (DI2)
Binary inputs	2 outputs with transistor (typically 24 V DC from AS-i, voltage range 18 – 30 V)
Operating temperature	-20 to 70 °C
Storage temperature	-20 to 75 °C
Protection level, IEC protection class	IP 54
Casing material	Plastic
AS-i profile	S-7.B.E (Safety at Work) and S7.A.E (motor module)
EMC	EN 61000-6-2; EN 61000-6-3

AS-i module AS-EM/SIL2



B24AM – AS-EM/M
Application

- Module for the control of smoke control dampers with C_{mod} Function:
- Capturing the damper blade end positions (CLOSED and OPEN)
- Time-controlled selection of 13 intermediate positions of the damper blade (opening angle between 7° – 90°)
- Actuators can be started even without controller communication
- Emergency position can be set (OPEN or CLOSED)
- LEDs for OPEN and CLOSED positions; monitoring of run time errors
- Integral AS-Interface slave
- Monitoring of signal reception
- Master can be used to monitor the run time of the damper blade actuator
- Supply voltage of the module and 24 V DC actuator using AS-Interface (2-wire control)
- Plug-in connection for Belimo actuators

Use

B24AM – Mounted to the smoke control damper

Description	AS-EM/M
Electrical design	4 inputs/3 outputs
Output function	PNP transistor
Supply voltage	26.5 – 31.6 V DC
Current consumption, including actuator	450 mA
Inputs	
Switching	DC PNP
Sensor voltage supply	AS-i
Voltage range	18 – 30 V AC
With short circuit protection	Yes
Switching level – high signal 1	10
Input current high/low	> 7 mA/< 2 mA
Input characteristic	IEC 61131-2 Type 2
Outputs, PNP	
Galvanically isolated	No
Max. current load per output	400 mA per output/400 in total (from AS-i)
Outputs, relay	
Galvanically isolated	Yes
Maximum voltage	32 V
Max. current load	500 mA
Ambient temperature	-5 to 75 °C
Protection level, IEC protection class	IP 42
AS-i profile	S-7.A.E
I/O configuration	7 Hex
ID code	7 Hex
EMC	EN 61000-6-2; EN 61000-6-3

B24BKNE – Communication module

Application

- Communication and power supply unit for 24 V actuators in smoke extract applications, status LEDs, retention of the damper control input signal, 230 V AC connection, 1 m cable, free of halogens

Use

B24BKNE – BKNE230-24 communication module

Description	BKNE230-24
Nominal voltage	230 V AC 50/60 Hz
Functional range	198 – 264 V AC
Rating	19 VA (including actuator)
Power consumption	10 W (including actuator)
Length / cross section	On the actuator = 1 m, 3 (6*) × 0.75 mm ² (free of halogens)
IEC protection class	II (protective insulation)
Ambient temperature	-30 to 50 °C
Storage temperature	-40 to 80 °C
Protection level	IP 54
EC conformity	EMC to 89/336/EEC, 73/23/EEC
Mode of action	Type 1 (EN60730-1)
Software class	A (EN60730-1)
Maintenance	Maintenance-free
Weight	680 g

B24C – Communication module

Application

- SLC technology
- The BC 24 module is used for the control of damper actuators
- Power supply and communication are implemented with an interchangeable two core cable, SLC24-16B system.
- A thermoelectric release mechanism and a duct smoke detector can be connected without the need for additional devices

Use

B24C – BC24-G2 communication module from BV-Control AG

Description	B24C
Nominal voltage	From SLC® control module
Power consumption	1 W
Connections	Plug connections, screw terminals
Damper power supply	24 V
Ambient temperature	-20 to 50 °C
Storage temperature	-20 to 80 °C
Humidity	95 % rh, no condensation
Weight	255 g
B × H × T	114 × 153 × 54 mm
Max. impulse voltage	2.5 kV (EN60730-1)

B24D, B230D – Communication module

Application

- AGNOSYS system
- BRM-F-ST module is used for the monitoring and control of smoke control dampers
- Up to 126 modules can be connected in a ring topology

Use

B24D – AGNOSYS BRM10FST communication module

B230D – AGNOSYS BRM10F communication module

Description	B24D/B230D
Nominal voltage	18 – 32 V DC (typically 24 V)
Connections	Plug connections, screw terminals
Damper power supply	24/230 V AC 24 V DC
Ambient temperature	0 to 45 °C
Humidity	90 % rh, no condensation
Weight	510 g
B × H × T	158 × 180 × 65 mm

Nomenclature

L [mm]

Length of the smoke control damper

B [mm]

Width of the smoke control damper

H [mm]

Height of the smoke control damper

q_v [m³/h]; [l/s]

Volume flow rate

L_{WA} [dB(A)]

A-weighted sound power level of air-regenerated noise for the smoke control damper

A [m²]

Free area

Δp_t [Pa]

Total differential pressure

v [kg]

Airflow velocity based on the upstream cross section (B × H)