



Smoke control dampers

EK-JZ

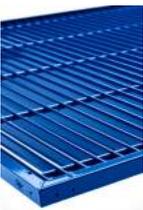
EK2-EU for mechanical smoke extract systems, pressurisation systems (RDA), and also for providing additional supply air.



EK-JS for mechanical smoke extract systems, smoke control damper for single compartments



EK-D for mechanical smoke extract systems, in air release shafts in pressurised ventilation systems (DBA)



Design cover grille with various blade shapes, in all common RAL colour shades



BVDAX for smoke extraction operation with frequency converter, CE certified in accordance with EN 12101-3 Temperature category F400



For mechanical smoke extract systems (MRA), pressurised ventilation systems (DBA) and for providing additional supply air flow

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

- Nominal sizes 200 × 230 - 1200 × 2030 mm, for smoke gas volume flows up to 36540 l/s or 131544 m³/h at 15 m/s, upstream velocities up to 20 m/s possible
- Actuator accessibility optionally in air direction or on the side
- 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 acc. to EN 1751, class 3
- Casing air leakage acc. 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
- External encasing for associated fire-tested control or communication modules
- Coating for use in exterior wall areas
- C_{mod} = for smoke extract and ventilation function in combined systems, which allows for pneumatic flow rate balancing possible by taking intermediate positions

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General information

Application

- Smoke control damper with CE marking and Declaration of Performance for the removal of smoke and heat via smoke extraction systems with mechanical smoke extraction devices
- Can be used for the provision of fresh air (outdoor air supply) in mechanical smoke extract systems
- Can be used in pressurised ventilation 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 characteristics

- C_{mod} for the smoke extraction and ventilation function in combined systems and thus pneumatic balancing possible via the selection of intermediate positions
- Meets the requirements of EN 12101-8
- Tested acc. to EN 1366-2 and 1366-10 for fire resistance properties
- Closed blade air leakage acc. to EN 1751, Class 3, and casing leakage acc. to EN 1751, Class C
- Low sound power level and differential pressure
- Any airflow direction
- Manual release also by TROXNETCOM
- Endurance test according to EN 1366-10, with 20000 OPEN/CLOSED cycles
- Accessibility to the actuator depending on use, sidewise or in airflow direction

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
- External encasing for associated tested control and communication modules (optional)

Optional products

TROXNETCOM

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

Smoke extract fans from the X-FANS subassembly

- Smoke exhaust roof fans BVDAX/BVD
- Smoke exhaust wall fans BVW/BVWAXN
- Radial (centrifugal) smoke exhaust fans BVREH/BVRA
- Smoke exhaust jet fans BVGAX/BVGAXN

All smoke exhaust fans are tested acc. 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

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

Construction features

- Rectangular construction style
- The smoke control damper is opened and closed by means of a reversible drive (various types available)
- Accessibility to the actuator depending on product use, sidewise or in airflow direction
- Suitable for the connection of cover grilles or connecting subframes

Material 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 regularly maintained. For this purpose, the required services must be provided.

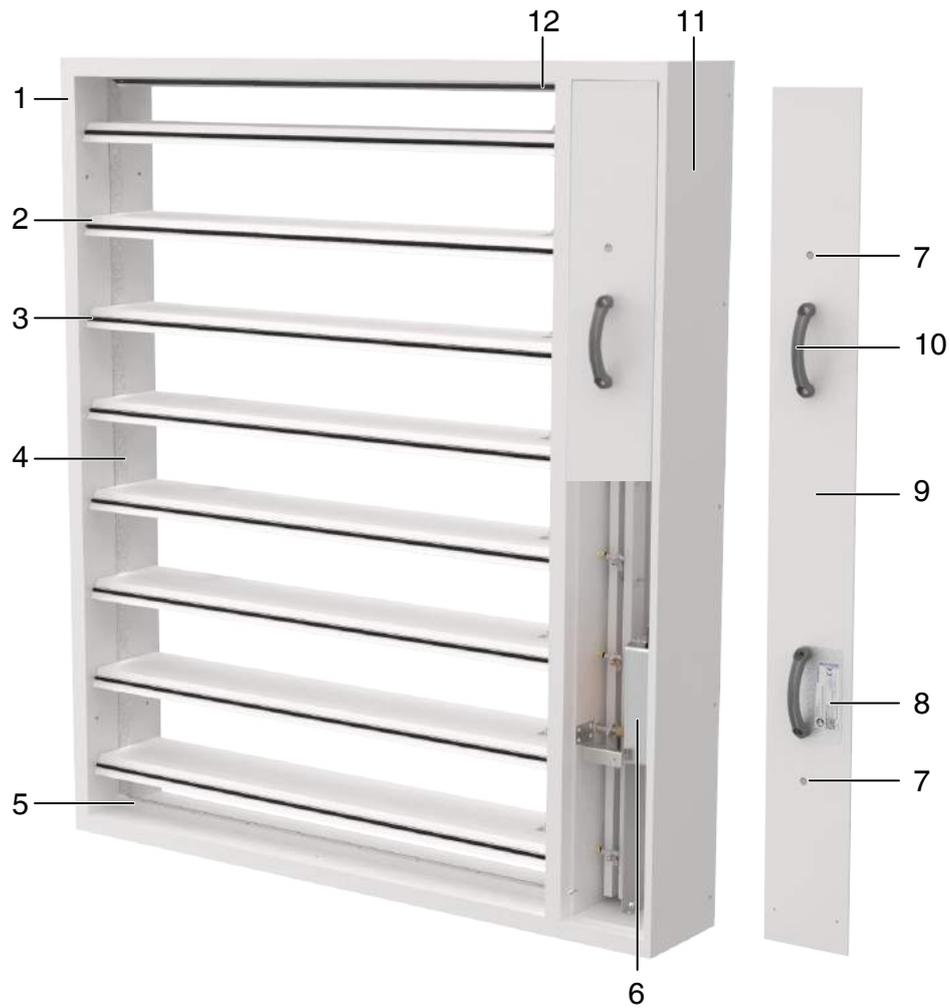
- Maintenance is required at least every 6 months
- Record maintenance, keep documents
- The owner of the smoke extract system must arrange for a functional check of the smoke control damper every six months. For this purposes, follow the maintenance specifications according to EN 13306 in conjunction with DIN 31051. If 2 consecutive tests, one 6 months after the other, are successful, the next test on the damper 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 smoke control dampers are made of calcium silicate panels. In case of fire, the smoke control dampers are opened by a thermally encased actuator. Smoke detection is carried out by a duct smoke detector or via a fire alarm control 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 position is 'open', the free cross-sectional area

must be maintained even in the event of a fire. The smoke control damper moves to the desired safety position after receiving an automatic or manual control signal. A change in position is possible up to 25 minutes at a temperature load in accordance with the ISO standard fire curve (MA, manual release). In addition, the EK-JZ product series enables position changes for modulation applications (C_{mod}) and thus a pneumatic balancing in the venting mode of a combined system. This is done by moving the damper blades to intermediate positions. 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

Order code details Encasing Operating side



1 **R** right (standard): installation in walls and ceilings

2 **S** Side: duct connection on both sides

Note:

In special applications, even for duct connection on both sides, the version **R** can be used - for details, see the installation and operating instructions.



Technical data

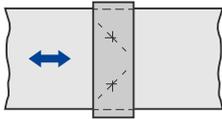
Nominal sizes B × H	200 × 230 mm – 1200 × 2030 mm
Casing length [mm]	250 mm
Flow rate range at maximum upstream velocity	up to 920 l/s or up to 3312 m ³ /h – up to 36540 l/s or up to 131544 m ³ /h
Differential pressure range	Pressure level 2: -1000 – 500 Pa
Operating temperature	At least -30 to 50 °C; the temperature should not fall below the dew point
Upstream velocity*	up to 15 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 smoke control dampers

Quick sizing suitable for installation type

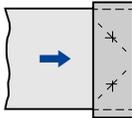
- The quick sizing in the Easy Product Finder gives a good overview of the possible volume flow rates at different flow velocities and the corresponding pressure losses
- Precise values based on project-specific data can be determined with our 'Easy Product Finder' design software
- You can find the Easy Product Finder on our website:
www.trox.de/mytrox/auslegungsprogramm-easy-product-finder-182e16348fac3d33

Installation type A, in a duct



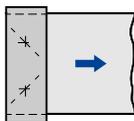
Ducted on both sides, any airflow direction

Installation type B, additional supply air



Ducted on one side, ending with smoke control damper, airflow direction: extract air

Installation type C, smoke extract



Ducted on one side, starting with smoke control damper, airflow direction: supply air

Installation type D



Air transfer flow

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 acc. to product standard EN 12101-8, tested acc. to EN 1366-10 and EN 1366-2, for use in smoke extract systems. In addition to removing smoke, heat and combustion products from a fire compartment, smoke control dampers enable the controlled removal of released hazardous and toxic combustion and fire suppression gases. The EK-JZ smoke control dampers can also be used in pressurised ventilation systems and venting devices of overpressure systems as well as pressure relief dampers for gas 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 OPEN-CLOSE actuators can be controlled either with ready-wired actuator control modules or 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 the smoke extraction and ventilation function in combined systems and thus pneumatic balancing possible via the selection of intermediate positions
- Meets the requirements of EN 12101-8
- Tested acc. to EN 1366-2 and 1366-10 for fire resistance properties
- Closed blade air leakage acc. to EN 1751, Class 3, and casing leakage acc. to EN 1751, Class C
- Low sound power level and differential pressure
- Any airflow direction
- Manual release also by TROXNETCOM
- Endurance test according to EN 1366-10, with 20000 OPEN/CLOSED cycles
- Accessibility to the actuator depending on use, sidewise or in airflow direction

Material 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 W × H: 200 × 230 mm to 1200 × 2030 mm
- Casing length: 250 mm
- Volume flow for maximum dimension: up to 36540 l/s or up to 131544 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: at least -30 °C to 50 °C, the temperature should not fall below the dew point
- Upstream velocities*: up to 15 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 dampers

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 release (AA) or manual release (MA).

Optionally with control or communication module for integration into the central BMS.

Optionally with external encasing for associated tested control or communication module

- 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

L_{WA} [dB(A)]

Order code

Order code smoke control damper EK-JZ

EK-JZ – R – V – C1 / DE / 1200 × 2030 / FA – B24A / S20 / X – 20 / P1 - RAL 9010

1 2 3 4 5 6 7 8 9 10 11 12

1 Type

EK-JZ Smoke control damper

2 Encasing operating side

R right side (Standard)

S Side

3 Damper blade alignment

No entry: damper blade horizontal (standard)

V Vertical damper blade alignment

4 Coating

No entry: without coating (standard)

C1 Promat impregnation

5 Country of destination

DE Germany

CH Switzerland

AT Austria

PL Poland

Other countries of destination on request

6 Nominal size [mm]

Width × height

Width

200 to 1200 (in increments of 50 mm)

Height

230 to 2030 (in increments of 200 mm)

7 Attachments 1

No entry: without attachment

2 entries possible: Attachment for operating side and for installation side

0 No accessory on this side

A Crimped wire mesh (20 × 20 mm), galvanised steel

B Perforated plate with square perforations (10 × 10 mm), galvanised steel

C Grille with slanted blades, aluminium

D Grille with slanted blades, aluminium, with additional crimped wire mesh (20 × 20 mm), galvanised steel

E Grille with slanted blades, aluminium, with additional welded mesh (6 × 6 mm), galvanised steel

F Connecting subframe, galvanised steel

W Connecting subframe sealed, galvanised steel

8 Attachments 2

TROX actuator without expansion module

B24 Actuator 24 V AC/DC

B24SR¹ Actuator B24 + control voltage Y = DC 2 - 10 V

B230 Actuator 230 V AC

Actuator + control module

TROX control modules with AS-i technology (TROXNETCOM)

B24A² Actuator B24 + TROXNETCOM AS-EM/EKB24AS² Actuator B24 + TROXNETCOM AS-EM/SIL2B24AM¹ Actuator B24 + TROXNETCOM AS-EM/M

Communication and power supply unit

B24BKNE Actuator B24 + Belimo BKNE230-24

B24C Actuator B24 + BV-Control BC24E with SLC line

Smoke control damper module with Modbus/RTU protocol

B24D Actuator B24 + Agnosys BRM-10-F-ST

B230D Actuator B230 + Agnosys BRM-10-F

9 Airflow velocity

No entry: up to 15 m/s (standard)

S20 up to 20 m/s

10 Accessories

No entry: no external encasing

X external encasing

11 Installation accessories

No entry: no accessories (standard)

01³ Fixing tab

For horizontal damper blade alignment

02 HT seal (high temperature seal) bottom

03³ Bottom HT seal and fixing tabs

04 Side HT seal

05 Bottom and side HT seals

06³ Bottom and side HT seal and fixing tabs07³ Side HT seal and fixing tabs

08 Top HT seal (special)

09 Top (special) and side HT seals

10³ Top HT seal (special) and fixing tabs11³ Top (special) and side HT seal and fixing tabs12³ Fixing tabs, ceiling (double quantity depends on the nominal size)

For vertical damper blade alignment

13 Top HT seal (special)

14 Side HT seal and top HT seal (special)

15³ Top HT seal (special) and fixing tabs16³ Side HT seal and top HT seal (special) and fixing tabs20³ Bottom HT seal and fixing tabs21³ Bottom HT seal and side HT seal and fixing tabs**12 Surface (attachments 1)**

No entry: without coating (standard)



P1 powder-coated, specify RAL CLASSIC colour

PS powder-coated, specify DB colour shade

Gloss level

RAL 9010 GU 50

RAL 9006 GU 30

All other RAL colours GU 70

¹ Function C_{mod}: Damper blade position in intermediate position

² AS-i system based on the standardised industrial technology (AS-Interface)

³ Selection depends on nominal size

Order example: EK-JZ-R-V-C1/DE/1200×2030/FA-B24A/S20/X-20/P1-RAL9010

Type	EK-JZ
Encasing operating side	right
Damper blade alignment	Vertical damper blade alignment
Coating	Promat impregnation
Country of destination	Germany
Nominal size [mm]	Width 1200, height 2030
Attachment 1	Operating side: Connection frame, galvanised steel, Installation side: Corrugated wire mesh (20 × 20 mm), galvanised steel
Attachment 2	TROX actuator 24 V AC/DC + TROXNETCOM AS-EM/EK module for control with AS-i technology
Airflow velocity	Up to 20 m/s
Accessories	External encasing
Installation accessories	Bottom HT seal and fixing tabs
Surface (attachment part 1)	powder-coated, RAL 9010 (pure white)

Note: Further explanations on item **2 Encasing operating side** see chapter **Function**.

Order code design cover grille AFG (accessories, components)

AFG – EK-JZ – N – V – G – 0 / 1090 × 410 / 0 / P1 - RAL 9016
 | | | | | | | | |
 1 2 3 4 5 6 7 8 9

1 Type
AFG

H 16.7 mm

2 Variant

EK For OTHER use than with EK-JZ (independent of type), depending on the size of the installation opening

EK-JZ type dependent, EK-JZ with horizontal damper blade alignment (standard)

EK-JZV type dependent, EK-JZ with vertical damper blade alignment

6 Blade alignment

0 straight (Standard)

15 slanted

3 Cover size

0 free selection, size is determined by dimensions of the installation opening

N Cover intake cross section (nominal size for EK-JZ and EK-JZV)

L Cover smoke control damper, total (nominal size for EK-JZ and EK-JZV + 240 mm)

7 Dimensions

B × H depending on **2 Variant** and **3 Cover size**

EK in mm steps up to maximum B or H = 2370 mm

EK-JZ and EK-JZV with horizontal or vertical damper blade alignment, depending on the nominal size of the smoke control damper

8 Installation accessories

0 without

4 Blade arrangement

0 horizontal (standard)

V vertical

9 Surface

No entry: anodised, E6-C-0, natural colour

P0 powder-coated RAL 9010 50 %

P1 powder-coated, specify RAL CLASSIC colour

PS powder-coated, specify DB colour shade

Gloss level:

RAL 9010 50 %

RAL 9006 30 %

all other RAL colours 70 %

5 Blade spacing

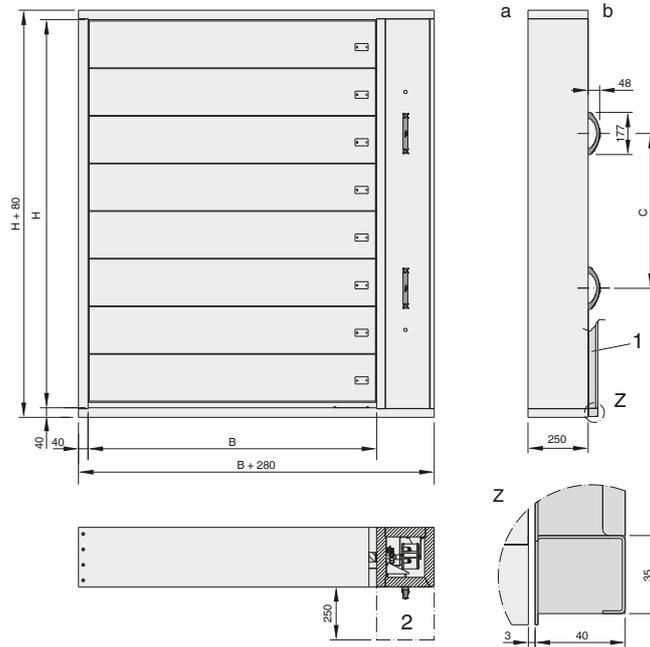
G 25 mm (Standard)

Order example: AFG-EK-JZV-N-V-G-0/1090×410/P1-RAL 9016

Type	AFG
Variant	EK-JZV
Cover size	Nominal size
Blade arrangement	vertical
Blade spacing	25 mm
Blade alignment	straight
Dimensions	1090 × 410 mm
Surface	RAL 9016, traffic white, gloss level 70 %

For more information on grille type AFG, see chapter "Accessories, Components".

Dimensions and weight



a Installation side

b Operating side

1 Connection frame for air duct (steel, only operating side 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: without accessories (standard)

01 Fixing tab

Only with horizontal damper blade alignment

02 Bottom HT seal

03 Bottom HT seal and fixing tabs

04 Side HT seal

05 Bottom and side HT seals

06 Bottom and side HT seal and fixing tabs

07 Side HT seal and fixing tabs

08 Top HT seal (special)

09 Top (special) and side HT seals

10 Top HT seal (special) and fixing tabs

11 Top (special) and side HT seal and fixing tabs

12 Fixing tabs, ceiling (double quantity depends on the nominal size)

Only with vertical damper blade alignment

13 Top HT seal (special)

14 Side HT seal and top HT seal (special)

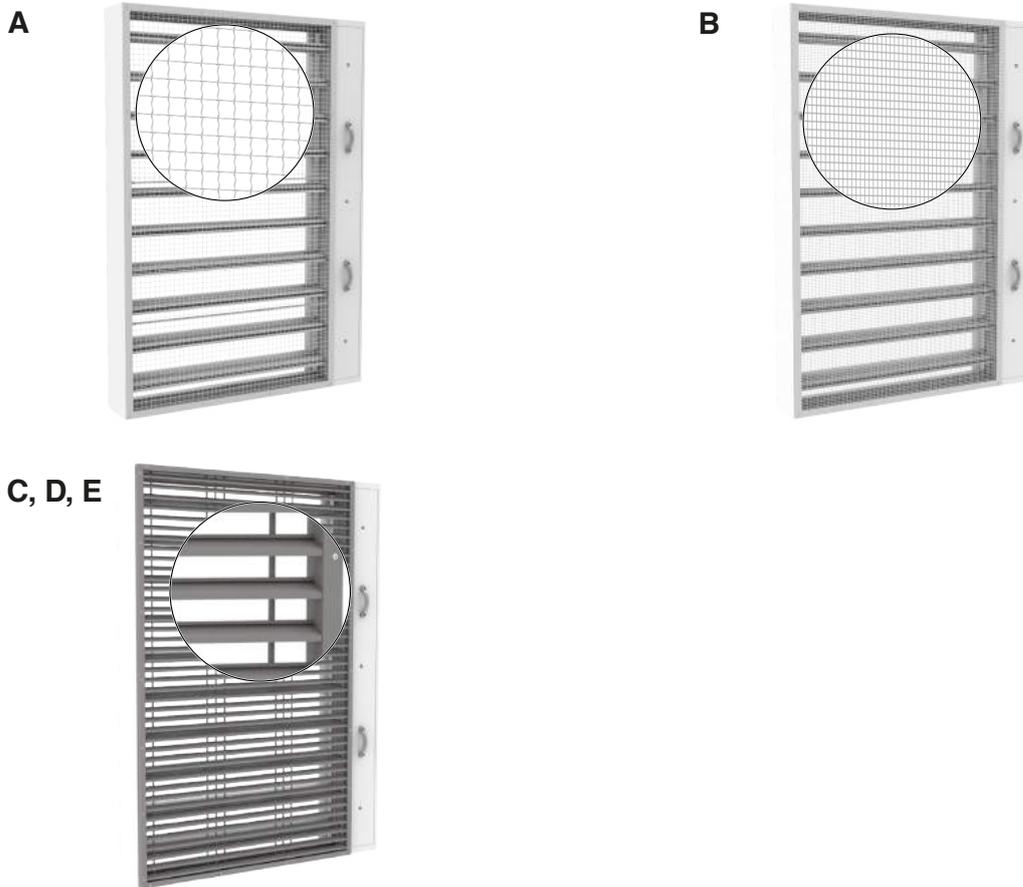
15 Top HT seal (special) and fixing tabs

16 Side HT seal and top HT seal (special) and fixing tabs

20 Bottom HT seal and fixing tabs

21 Bottom HT seal and side HT seal and fixing tabs

Attachments 1



Cover grille, explanation

Grille	Description
A*	Crimped wire mesh 20 × 20 mm
B*	Perforated plate 10 x 10 mm
C**	Aluminium grille with slanted blades
D**	Aluminium grille with crimped wire mesh 20 × 20 mm
E**	Aluminium grille with welded mesh 6 × 6 mm

* No temperature limit

** Up to the strength limit of the aluminium; as the temperature rises, the strength drops. Cold supply air flowing in counteracts the loss of strength.

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 mounted directly on the smoke control damper or at the end of the duct. This application was proven in the fire test according to EN 1366-10
- The free cross section of the cover grille is approx. 80% for crimped wire mesh (A) and approx. 70% for perforated plates (B)
- Cover grilles in variants C, D, E cover the blades of the EK-JZ smoke control damper. The cover of the encasing remains free
- If the cover grilles are ordered separately, you may choose a size that covers the damper blades including the actuator encasing entirely, 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
- Cover grilles and accessories are supplied as loose items

Materials and surfaces

Connection frame made of galvanised sheet steel:

- F
- W: additionally sealed

- E: Grille with slanted blades made of aluminium, welded wire mesh made of galvanised steel
- All attachments can be powder coated

Cover grille

- 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

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
Connecting subframe W	–	W0
–	Connecting subframe W	0W
Connecting subframe W	Connecting subframe W	WW

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

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

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

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

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

Any combination is possible

W: Connecting subframe with HT seal (high temperature seal) - only TROX UK

**EK-JZ: free cross-sections end grille A, B, C, D, E**

H-Dimension	No. of blades	free cross section	free cross-section EK-JZ + grille				
			A	B	C	D	E
430	2	70.70 %	59.50 %	49.10 %	49.23 %	41.44 %	39.70 %
630	3	73.65 %	61.99 %	51.15 %	51.29 %	43.17 %	41.36 %
830	4	75.18 %	63.28 %	52.21 %	52.35 %	44.06 %	42.22 %
1030	5	76.12 %	64.07 %	52.86 %	53.00 %	44.61 %	42.75 %
1230	6	76.75 %	64.60 %	53.30 %	53.44 %	44.98 %	43.10 %
1430	7	77.20 %	64.98 %	53.61 %	53.76 %	45.25 %	43.36 %
1630	8	77.55 %	65.27 %	53.85 %	54.00 %	45.45 %	43.55 %
1830	9	77.81 %	65.49 %	54.04 %	54.19 %	45.61 %	43.70 %
2030	10	78.03 %	65.68 %	54.19 %	54.34 %	45.73 %	43.82 %

Accessories, Components

Design cover grille AFG



Design cover grille AFG for smoke control dampers EK-JZ

Application

- Functional and aesthetic cladding
- Diverse design variants for optimal integration into the architectural design concept
- To protect against unintentional damage to the smoke control dampers
- For easy inspection of the smoke control damper
- Simple wall installation

Options

- Blade spacing: 16.7 or 25 mm
- Vertical or horizontal blade arrangement
- Straight or slanted blades
- Natural colour anodised (E6-C-0) or powder-coated according to RAL (all common RAL colours possible)

Technical data

Example 1000 × 1230 mm:

- Effective upstream face velocity: 5 m/s
- Volume flow rate q_v : 4320 m³/h

Note: Precise intermediate values can be calculated with our 'Easy Product Finder' design programme. You can find the Easy Product Finder on our website:

- www.trox.de/mytrox/auslegungsprogramm-easy-product-finder-182e16348fac3d33

EK-JZ: free cross-sections Design cover grille AFG

H-Dimension	No. of blades	free cross section	free cross-section EK-JZ + grille	
			25 mm Blade spacing	16.7 mm Blade spacing
430	2	70.70 %	55.71 %	47.28 %
630	3	73.65 %	58.04 %	49.25 %
830	4	75.18 %	59.24 %	50.28 %
1030	5	76.12 %	59.98 %	50.90 %
1230	6	76.75 %	60.48 %	51.33 %
1430	7	77.20 %	60.84 %	51.63 %
1630	8	77.55 %	61.11 %	51.86 %
1830	9	77.81 %	61.32 %	52.04 %
2030	10	78.03 %	61.49 %	52.18 %

Attachments 2

Application

- Open/close actuators for the opening and closure of smoke control dampers, with automatic release (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)
- 2 integrated limit switches with potential-free contacts enable damper position indication OPEN and CLOSED
- Connecting cables of the 24 V actuator are equipped with plugs, which ensure quick and easy connection to the TROX AS-i bus system (retrofitable)
- 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 25 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 of the actuator.

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, please refer to the installation and operating manual

EK-JZ: Motor allocation matrix, flow velocity standard

B/H	230	430	630	830	1030	1230	1430	1630	1830	2030
200										
250										
300										
350										
400										
450										
500										
550			1							
600										
650										
700										
750						2				
800										
850										
900										
950									3	
1000										
1050										
1100										
1150										
1200										

$V_{Upstream} \leq 15 \text{ m/s}$

1 BEN/BEN-SR: A00000082597 BEN 230 TR, A00000082633 BEN 24 ST TR, A00000082925 BEN 24 SR ST TR

2 BEE/BEE-SR: A00000082634 BEE 24 ST TR, A00000082596 BEE 230 TR, A00000082926 BEE 24 SR ST TR

3 BE: M466DZ7 BE230-12 TR, M466DZ6 BE24-12-ST-TR

EK-JZ: Motor allocation matrix, flow velocity S20

B/H	230	430	630	830	1030	1230	1430	1630	1830	2030
200										
250										
300										
350										
400										
450										
500		1								
550										
600										
650										
700										
750					2					
800										
850										
900										
950								3		
1000										
1050										
1100										
1150										
1200										4

$V_{Upstream} > 15 \text{ m/s} - 20 \text{ m/s}$

1 BEN/BEN-SR: A00000082597 BEN 230 TR, A00000082633 BEN 24 ST TR, A00000082925 BEN 24 SR ST TR

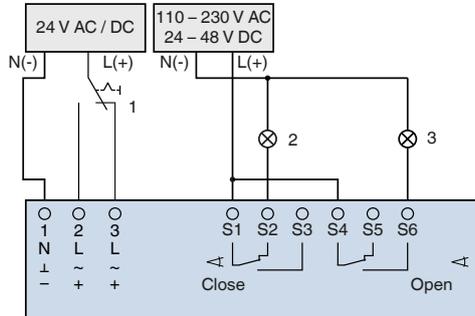
2 BEE/BEE-SR: A00000082634 BEE 24 ST TR, A00000082596 BEE 230 TR, A00000082926 BEE 24 SR ST TR

3 BE: BE230-12 TR, BE24-12-ST-TR

4 Technical clarification necessary

Wiring examples, technical data

Wiring example 24 V AC / DC

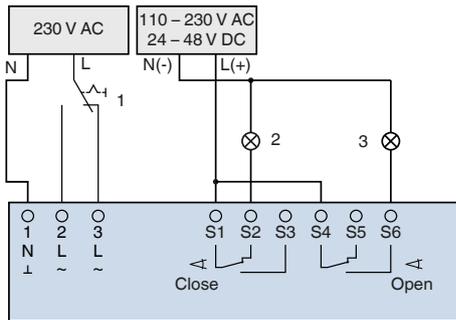


1 switch for opening and closing, to be provided by others

2 Control lamp CLOSED, to be provided by others

3 Control lamp OPEN, to be provided by others

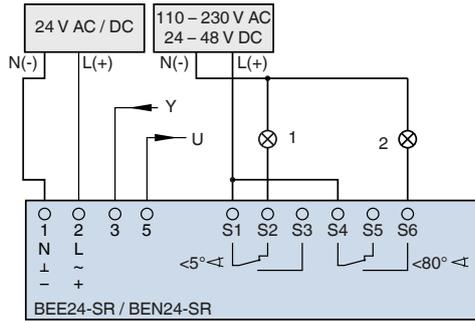
Actuator	BEN24-ST	BEE24-ST	BE24-ST
Supply voltage (AC)	AC 19.2 – 28.8 V, 50/60 Hz		
Supply voltage (DC)	DC 21.6 – 28.8 V, 50/60 Hz		
Power consumption – when running	3 W	2.5 W	12 W
Power consumption – when idle	0.1 W		0.5 W
Power rating for cable sizing	I_{max} 8,2 A @ 5 ms		
Torque	15 Nm	25 Nm	40 Nm
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 Control lamp CLOSED, to be provided by others
 3 Control lamp OPEN, 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	I_{max} 4 A @ 5 ms		I_{max} 7,9 A @ 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 variable

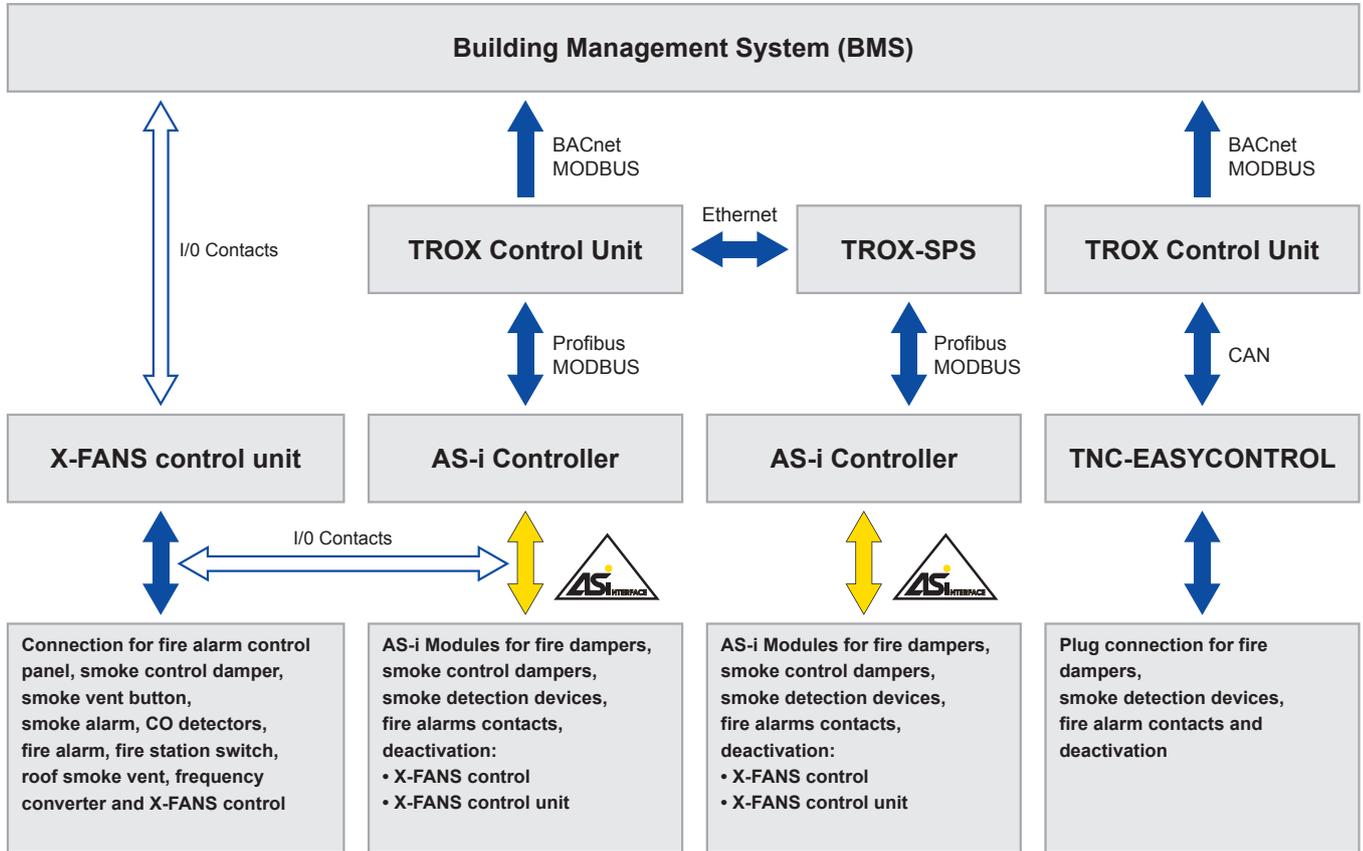


- 1 Control lamp CLOSED, to be provided by others
- 2 Control lamp OPEN, to be provided by others
- Y: 0(2) - 10 V DC Operating range (setpoint)
- U: 2 - 10 V DC Position feedback (actual value)

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 @ 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 proven by the manufacturer to be a unit in terms of fire protection and may therefore only be used in such constellations.

B24A – AS-EM/EK Application

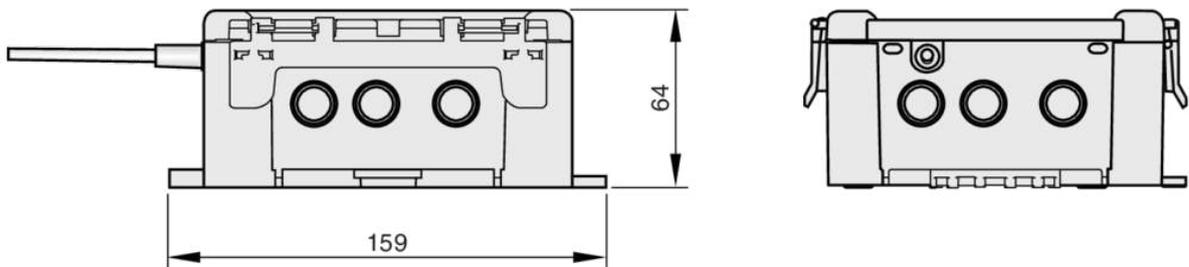
- Module for the control of smoke control dampers
- Detection of the damper position "CLOSED" and "OPEN"
- Opening the smoke control damper even without controller communication
- LEDs for OPEN and CLOSED positions; monitoring of run time errors
- Integrated AS-Interface slave
- Monitoring of signal 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)
- Ready to plug in for Belimo actuators (factory mounted and wired)

Use

B24A - mounted on 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	–
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**

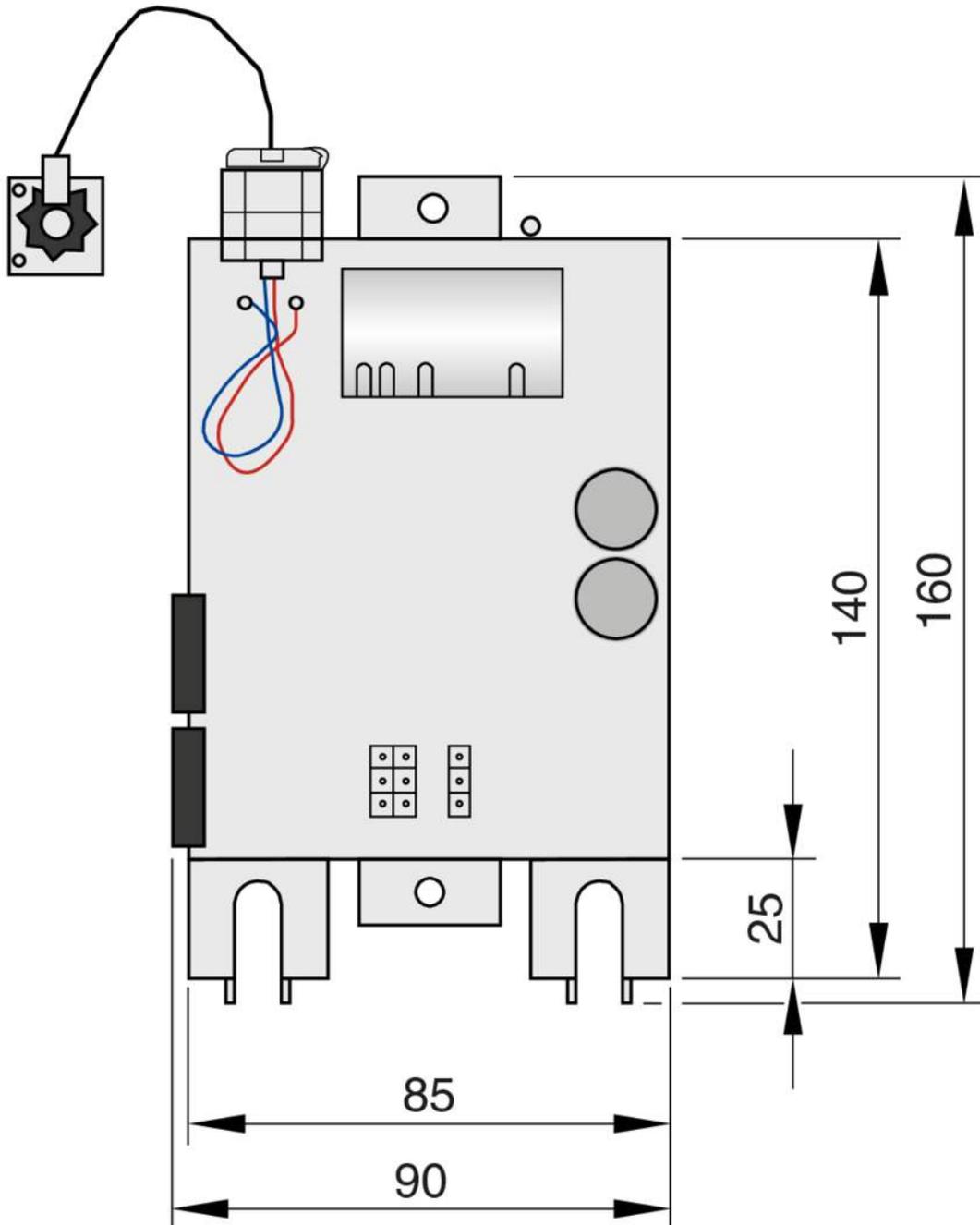
- Module for the control of smoke control dampers
- Detection of the damper position "CLOSED" and "OPEN"
- Approved up to SIL2 to IEC/EN 61508
- Integrated AS-Interface
- Monitoring of signal reception
- Master can be used to monitor the run time of the damper blade actuator
- Connection with terminals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

Use

B24AS - mounted on smoke control damper

Description	AS-EM/SIL2
Supply voltage	26.5 to 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
AS-i power	1 × green
Peripheral error	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 LED DI0	1 × yellow (DI0)
Input status LED DI1	1 × yellow (DI1)
Input status LED DI2	1 × yellow (DI2)
Binary inputs	2 safe digital inputs
Binary outputs	2 transistor outputs (typically 24 V DC from AS-i, voltage range 18 – 30 V)
Ambient temperature	-20 – 50 °C
Protection level, IEC protection class	IP 42
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
Casing dimensions (B × H × D)	139 × 159 × 64 mm

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 positions CLOSED and OPEN
- Time-controlled selection of 13 intermediate positions of the damper blade (opening angle between 0° and 90°)
- Opening the fire damper even without controller communication
- Emergency position can be set (OPEN or CLOSED)
- LEDs for OPEN and CLOSED positions; monitoring of run time errors
- Integrated 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)
- Ready to plug in for Belimo actuators

Use

B24AM - mounted on 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	–
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-E communication module 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 cross section

Δp_t [Pa]

Total differential pressure

v [kg]

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