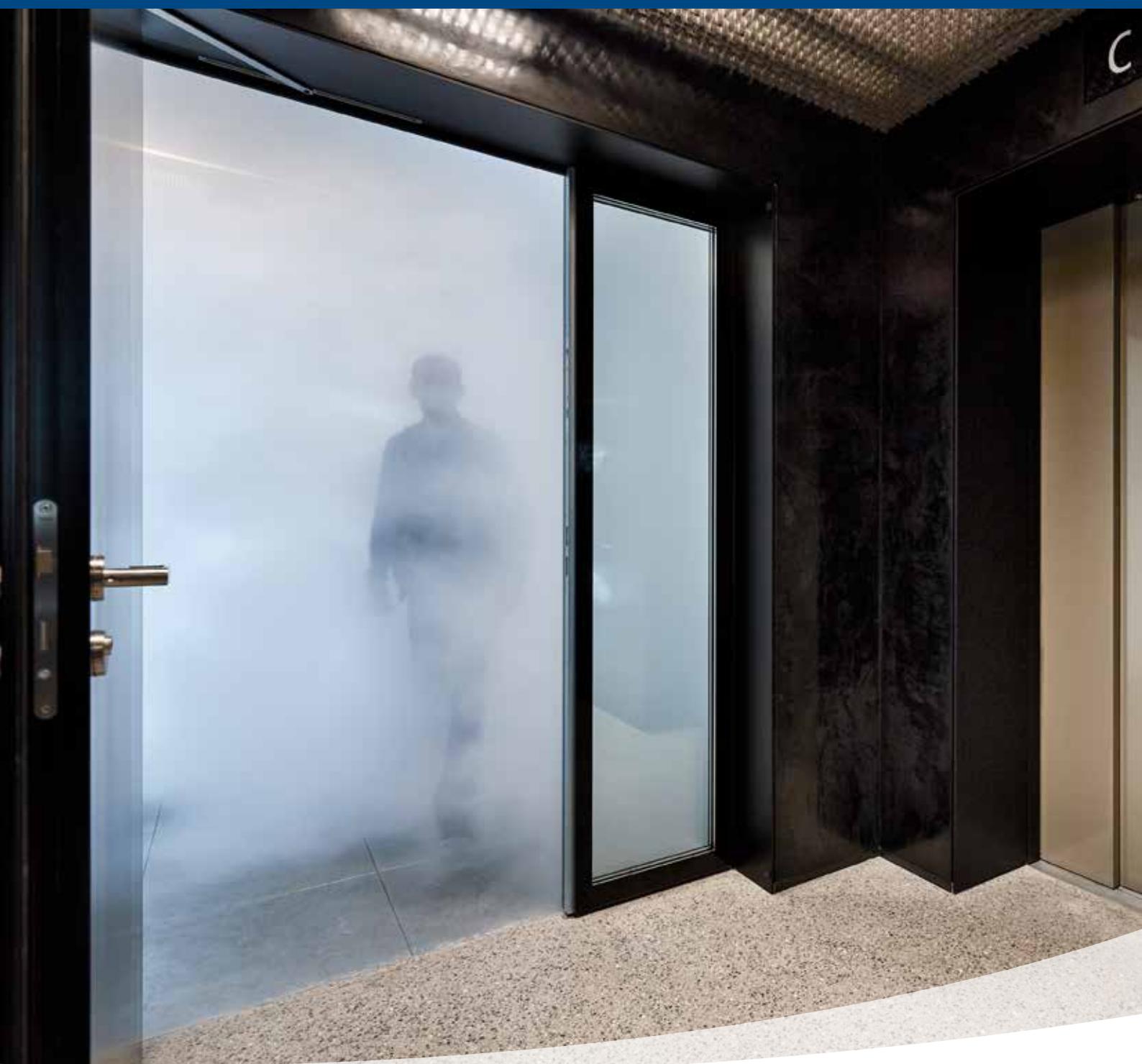


Pressure Differential Systems

The solution for smoke-free escape and emergency routes





Safety can be integrated in planning. With Systemair.

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The overpressure ventilation technology was invented during the eighties as an appropriate element within fire protection concepts for skyscrapers. The manufacturer Systemair was instrumental in pushing the development of an important improvement: the electronic control for pressurisation ventilation fans. This system provides higher security for selfrescue and especially for the fire brigade.





Stairways Pressure Differential Systems

Important for save live and for a fast fire fighting

In the case of fire, it is not just for the people fleeing that smoke gases present the greatest threat. It also puts the rescue service personnel at risk and hinders their work. Therefore, electronically-controlled overpressure systems bring a new dimension to fire protection. With a simple switch, the fire services can switch the supply air fans to maximum power, limiting the need for mobile fans to be used, or even making them unnecessary. This means that electronic overpressure systems do not just support self-rescue, but also provide additional protection against smoke gases for the firefighting personnel, even at high fire temperatures. They provide clear visibility and generally make it possible to reach the source of the fire more quickly.

Systemair is the leading company when it comes to combining EC motor technology and frequency converter control technology. An airtight building with low leakage places higher demands on the planning and implementation of smoke extraction concepts. When designing an overpressure system, the smoke extraction fans required for smoke extraction in internal shafts play a significant role. Uniting both systems – smoke extraction and the overpressure system – into a functioning overall concept is the latest development from Systemair.

Systemair will come up with individual solutions for your applications.

Nine benefits of electronic overpressure systems from Systemair

1 Faster self rescue

Fire escape stairways are recommended even if other arrangements are permitted for escape and rescue routes. People evacuation is faster through smoke-free stairways or stairways with less smoke – the panic risk can be reduced.

2 Faster rescue by others

On electronic overpressure systems, the air supply of the fans can be switched to the maximum air volume by a firefighter's switch. This enables pushing back and leading smoke away, even at high fire temperatures. The pressure in the stairway exceeds the standards limitation, and a time-consuming installation of mobile fans, allowing a clear view, in many cases is unnecessary.

3 More flexibility during fire-fighting operations

Mobile fans placed in the building entry can become a „tripping hazard“ for emergency task forces. With the Systemair Pressure Differential System those fans are not needed.

4 Higher security for emergency task forces

High air velocities combined with electronically controlled ventilation reduces the concentration of flammable gases and hot air in the zone on fire. This reduces the risk of backdrafts and delays flashover.

5 Higher building protection

With the possibility of overriding the set pressure with the electronic overpressure system a faster access for the firefighters is enabled. This reduces fire damages which can be honoured by the assurance in certain cases.

6 Reliability

Electronic overpressure systems are not affected by wind loads, snow coverings or pressure changes due to cold or warm supply air.

7 Reduction of operating costs

No complex adjusting or cleaning of mechanical control dampers.

8 Steady precision during life cycle

Electronic overpressure systems automatically compensate potential leakages due to normal wear and tear of the building.

9 Architectural freedom

Huge air terminal devices or high roof fans are not required.

The electronic control technology

The pressure differential system MUB-EC by Systemair and its AC version needs no pressure relief unit due to its control characteristics. It offers a complete solution with fewer components and actuators for the pressure differential ventilation in stairways and escape tunnels as conventional systems. The system is also available with smoke extraction function* in EC and AC design.

The complete system as well as its components meets the requirements according to EN 12101-6 (Smoke and heat control systems – part 6: specification for pressure differential systems). The adjusted EC motor/AC motor regulation unit guarantees a standardised regulation performance plus very low energy consumption during the ventilation process.

*Smoke extraction
Optional smoke extract fan certified to EN 12101-3 (Smoke- and heat control systems – part 3: Specification)

Design example

Our MUB-EC centrifugal fan unit is used for residential buildings up to eight floors. The capacity can be increased by parallel operation of two or more units. Higher buildings normally require several supply air units installed at different positions in the stairway. The self-regulating EC control panel is connected to the fan unit via a 0-10V-signal. There is just one standard 230 V cable necessary for the control unit. The optional on/off switch of the MUB-EC ventilation unit can be directly wired to the 400 V power supply. Systemair's complete solution includes periféric controls like, connections for smoke detectors, manual call points and a fire indicator panel.

Control

- Pressure differential regulation module in control cabinet for wall and stand mounting
- Integrated module for EC driven motors or frequency converter
- Automatic regulation system for customisation of operational characteristics via numeric display
- Display of the operational characteristics in real time
- Integrated connection for suitable smoke detectors
- Integrated connection for manual call points
- Control of motorised damper
- Connection for daily ventilation

Components

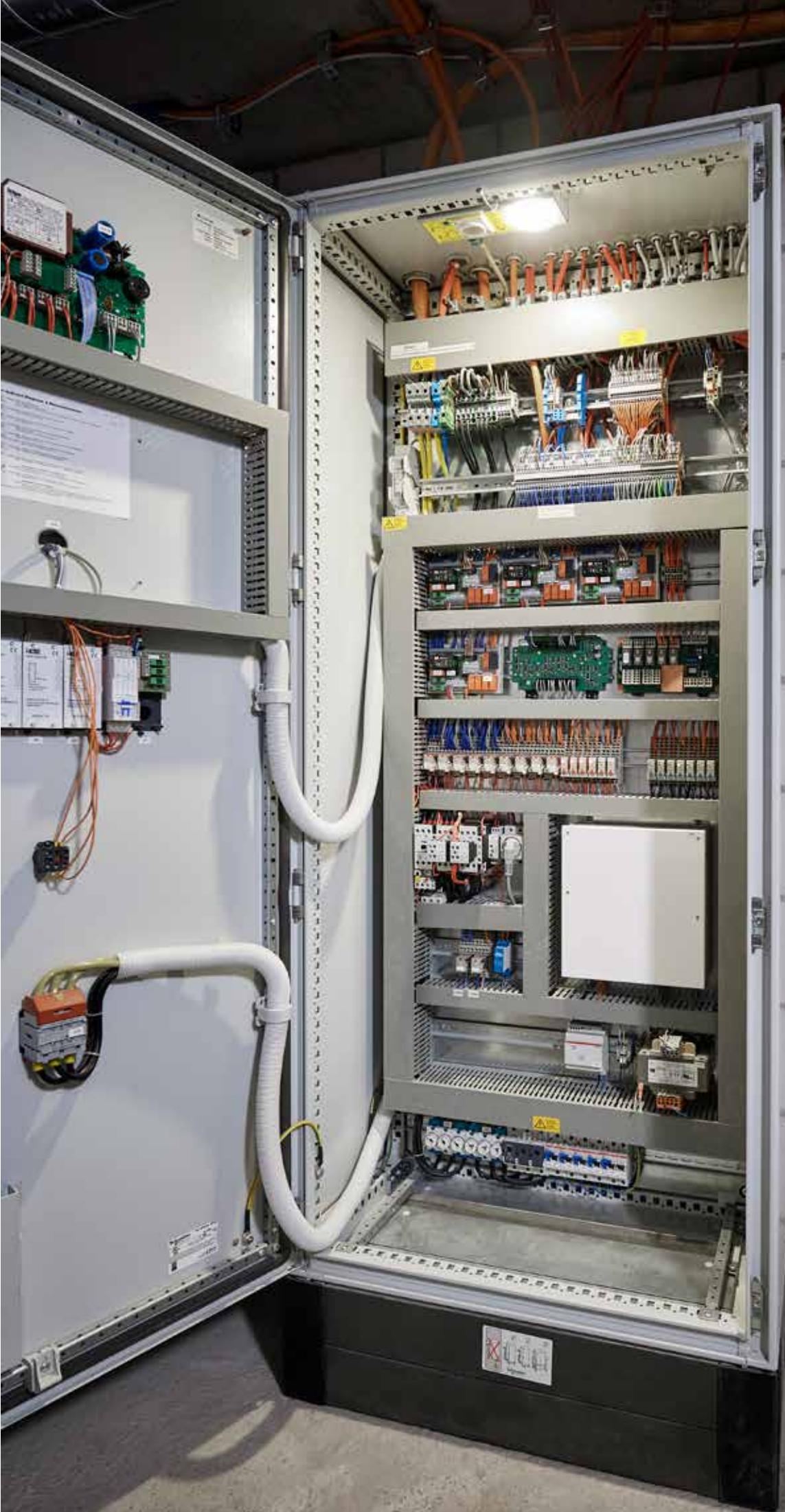
The stairways pressure differential system is delivered as a project-related overall system.

Basic components include:

- Supply air fan unit MUB EC-P / MUB FU-P/B oder equivalent axial fans
- Pressure differential control panel module 230V AWS-ÜD-EC or suitable control panel 230V AES-ÜD-FU
- Pressure differential control panel module 24V AES-ÜD-EC or suitable control panel 24V AES-ÜD-FU
- Operating switch
- incl. pressure differential sensor

You will find standard accessories on page 18 or in our online-catalogue at www.systemair.com.

L51 MRWA
Entrauchung AEH
Abluft 40'000m³/h



Function

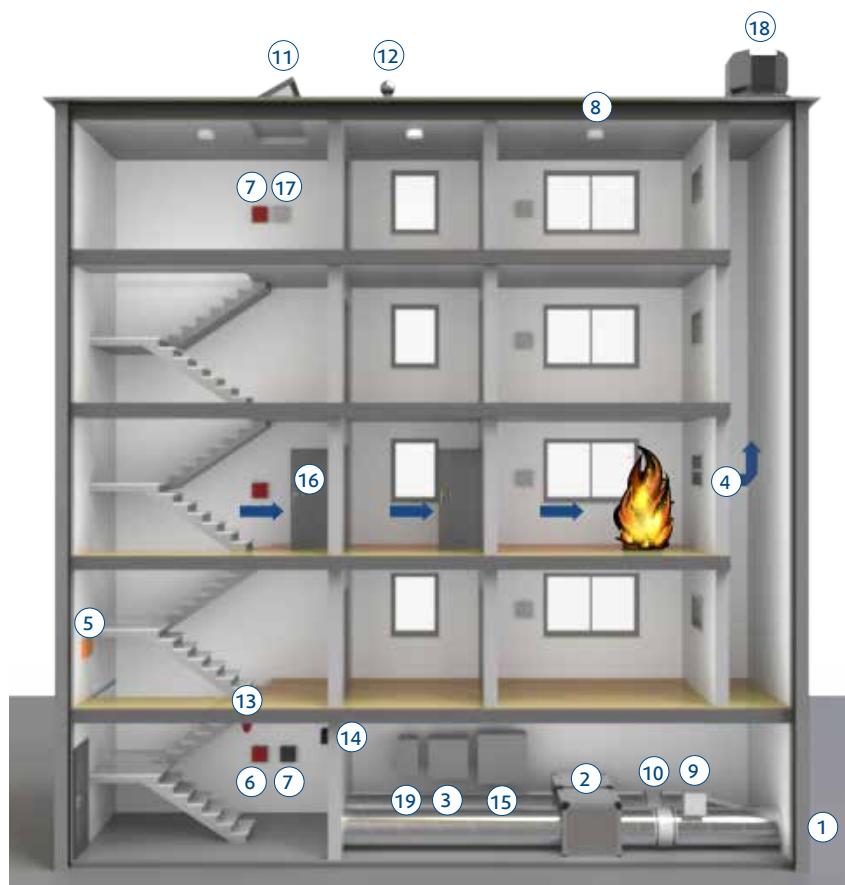
Multibox EC

Thanks to a special control system, we are able to realise a constant differential pressure in stairwells, using EC fans. The constantly-measured differential pressure is evaluated in the control system in real-time and compared with corresponding setpoint values. The speed of the EC fans is adjusted by the control system so that the setpoint values are adhered to in the stairwell. This prevents the forces required to open the doors from getting too high (max. 100 N). By selectively controlling the outflows in the individual storeys, e.g.

windows, the necessary airspeed (at least 0.75 m/s, or 2 m/s) – depending on the stairwell – is achieved by the open door between the stairwell and the rooms on the individual storeys. The light dome also serves to constantly exchange the air in the stairwell and can also be used for daily ventilation as required. Another option is to couple a smoke gas extraction fan to the system. The extract air fan is needed if the outflow openings on the individual storeys lead to an extract air shaft/duct which has too high a pressure loss.

- ① Fresh air intake
- ② Supply air fan MUB EC
- ③ Smoke pressure system control
- ④ Control air discharge opening
(window, damper, door)*
- ⑤ Pressure sensor
- ⑥ Operating switch
- ⑦ Push-button switch
- ⑧ Smoke alarm
- ⑨ Duct smoke alarm
- ⑩ Fresh air damper
- ⑪ Light dome

*not necessary for
scavenging air system



Optional:

- ⑫ Wind and rain sensor
- ⑬ Flashing light
- ⑭ Acoustic alarm
- ⑮ Uninterruptible power supply
- ⑯ Door closer contact
- ⑰ Ventilation button
- ⑱ Exhaust fan F400/F600
- ⑲ Frequency converter incl.
Firemode for exhaust fan

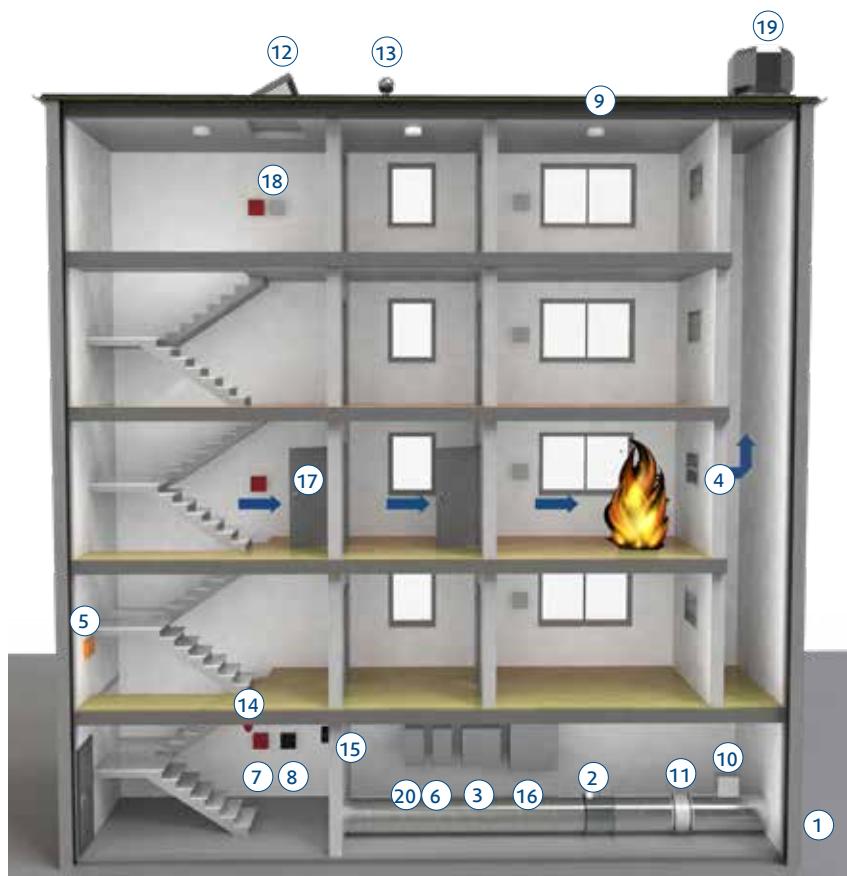
Axial fan with frequency control

Thanks to a special control system, a constant differential pressure is realised in the stairwell using AXC fans. The constantly-measured differential pressure is evaluated in the control system in real-time and compared with corresponding setpoint values. The speed of the fans is adjusted by the control system so that the setpoint values are adhered to in the stairwell. This prevents the forces required to open the doors from getting too high (max. 100 N). By selectively controlling the outflows in the individual storeys, e.g.

windows, the necessary airspeed (at least 0.75 m/s, or 2 m/s) – depending on the stairwell – is achieved by the open door between the stairwell and the rooms on the individual storeys. The light dome also serves to constantly exchange the air in the stairwell and can also be used for daily ventilation as required. Another option is to couple a smoke gas extraction fan to the system. The extract air fan is needed if the outflow openings on the individual storeys lead to an extract air shaft/duct which has too high a pressure loss.

- ① Fresh air intake
- ② Supply air fan
- ③ Smoke pressure system control
- ④ Control air discharge opening (window, damper, door)*
- ⑤ Pressure sensor (wire breakage and short circuits)
- ⑥ Frequency converter incl. Firemode for supply fan
- ⑦ Operating switch
- ⑧ Push-button switch (wire breakage and short circuits)
- ⑨ Smoke alarm (wire breakage and short circuits)
- ⑩ Duct smoke alarm (wire breakage and short circuits)
- ⑪ Fresh air damper
- ⑫ Light dome

*not necessary for scavenging air system



Optional:

- ⑬ Wind and rain sensor
- ⑭ Flashing light
- ⑮ Acoustic alarm
- ⑯ Uninterruptible power supply
- ⑰ Door closer contact
- ⑱ Ventilation button
- ⑲ Exhaust fan F400/F600
- ⑳ Frequency converter incl. Firemode for exhaust fan

Multibox EC



Characteristics and advantages at a glance

- High efficiency in all areas of the fan curve
- Removable panels
- Flexible air flow direction
- Installation in any mounting position
- Silent operation



Casing

The casing consists of an aluminium frame with fibreglass reinforced plastic corners of PA6. The double skin panels are manufactured from galvanized steel with 20 mm mineral wool insulation.

Moto

MUB-EC fans are driven by EC-external rotor motors. All motors are suitable for 50/60Hz.

Impeller

All models are equipped with impellers with backward curved blades, manufactured from aluminium.

Speed control

100% speed control by a 0-10V signal.

Motor protection

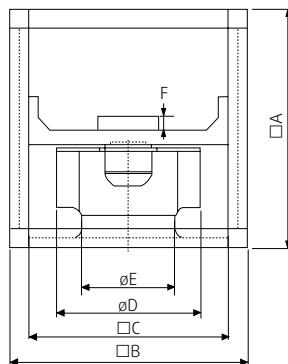
Integrated electronic motor protection.

Please find more information in our online-catalogue at www.systemair.com.

Technical data

MUB	062 560 EC-UDA	062 630 EC-UDA	100 710 EC-UDA
Item no.	on request	on request	on request
Voltage/Frequency	V/50 Hz 400	400	400
Phase	~ 3	3	3
Power	W 1.976	2.480	6.434
Current	A 3,05	3,80	8,96
Max. airflow	m ³ /h 10.790	12.860	26.806
Fan impeller speed	min ⁻¹ 1.360	1.209	1.205
Max. temp. of transported air	°C 60	60	40
Max. temp. of transported air when speed-controlled	°C 60	60	40
Sound pressure level at 3 m (20 m ² Sabine)	dB(A) 64	68	74
Weight	kg 135	97	175
Insulation class. motor	F	F	F
Enclosure class. motor	IP 54	54	54

Dimensions



MUB EC	□A	□B	□C	ØD	ØE	F
560	800	800	720	560	360	70
630	800	800	720	630	407	70
710	1000	1000	920	806	470	73

Axial fan AXC

The adjustable pitch angle setting offers a wide performance and maximum flexibility to match precisely individual airflow requirements. The AXC axial fans have been performance tested in accordance with DIN ISO 5801, DIN 24163 and AMCA 210-99 on the Systemair fan test rig.

Impeller

The AXC die cast aerofoil aluminium impellers can be offered with full or fractional solidities, maximum efficiencies can be obtained. Different impeller/hub configurations allow high operating pressures.

Casing

Axial fan casings are heavy gauge, galvanised sheet steel, with spun flanges for high rigidity. Long cased execution as standard stock range. Also available with an acoustically insulated box.

Motor

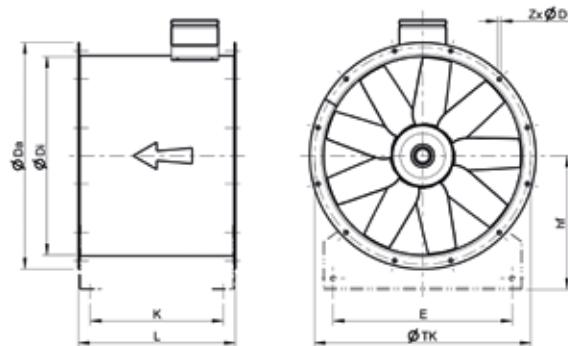
Three phase motor, IP55, insulation class F, in accordance with IEC norm. The built-in motors are equipped with PTC thermistors for optimum motor protection. Single or two speed motors. Speed controllable by frequency converter.

Please find more information in our online-catalogue at www.systemair.com.

Technical data

AXC	1000-5/16°-4	900-10/16°-4	630-6/16°-2	630-6/11°-2	560-6/14°-2
Item no,	31531	31532	31533	31534	31535
Voltage/Frequency	V/50 Hz	400	400	400	400
Phase	~ 3	3	3	3	3
Power	W	11	11	7,5	5,5
Current	A	21	21	13,9	10,6
Max. airflow	m ³ /h	32.000	26.545	21.480	16.500
Fan impeller speed	min ⁻¹	1.460	1.460	2.930	2.940
Max. temp. of transported air	°C	55	55	55	55
Max. temp. of transported air when speed-controlled	°C	55	55	55	55
Sound pressure level at 3 m (20 m ² Sabine)	dB(A)	75	72	79	76
Weight	kg	273	272	115	191
Insulation class. motor		F	F	F	F
Enclosure class. motor		IP 55	55	55	55

Dimensions



Characteristics and advantages at a glance

- AXC with aerofoil impeller, adjustable pitch angle for maximum efficiency
- Die cast aluminium hub and blades
- Terminal box in IP65 mounted at the outside of the casing for easy wiring, IP65
- Suitable for operating temperatures between -20 °C and +55 °C
- Inspection hole to verify correct direction of rotation

AXC	ØDa	ØDi	hf	ØTK	E	ZxØD	Motor	L	K
560	650	560	375	620	500	12x12	80-112	500	424
							132-160	750	674
630	720	630	425	690	570	12x12	80-112	500	424
							132-160	750	674
900	1005	900	560	970	830	16x15	100-132	640	552
							160-200	762	850
1000	1105	1000	670	1070	930	16x15	100-132	552	640
							160-200	762	850

Roof fan DVV and DVG-V



Characteristics and advantages at a glance

- Max. temperature 400°C/120 min, 600°C/120 min.
- IE2 high efficiency motor inside
- Vertical exhaust
- Low sound level



Casing

The casing is manufactured from seawater resistant aluminium. The base frame consists of galvanised steel.

Motor

Frequency converter controllable IEC flange motors which comply with Efficiency Class IE2.

Impeller

The impeller with backward-curved blades is manufactured from stainless steel.

Speed control

For speed control use frequency inverter.

Please find more information in our online-catalogue at www.systemair.com.

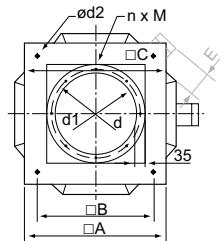
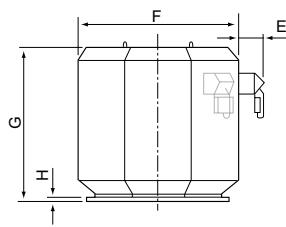
Technical data

DVV	DVV 800D6-XL/F600	DVV 630D4-XL/F600	DVG-V 800D6-XL/F400	DVG-V 630D4-XL/F400
Item no.	95520	95515	95538	95669
Voltage/Frequency	V 400	400	400	400
Motor circuit connection	D	Y/Y	D	D
Phase	Hz 50	50	50	50
Power	~ 3	3	3	3
Current	W 5.500	5.500	5.500	5.500
Starting current	A 11,2	11	10,5	11
Max. airflow	A 66	70	76	83,9
Fan impeller speed	m³/h 26.500	20.900	26.070	18.900
Max. temperature 120 min.	1/min 955	1.461	973	1.457
Sound pressure level in 4 m	°C 600	600	400	400
Sound pressure level in 10 m	dB(A) 71	75	74	75
Weight	dB(A) 64	69	66	69
Insulation class. motor	kg 247	164	202	150
Enclosure class. motor	F	F	F	F
Enclosure class, motor	IP 55	54	55	55

*also available as F400.

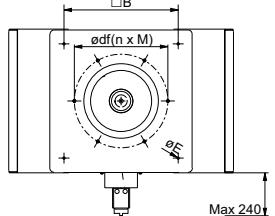
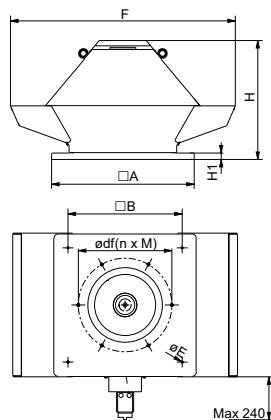
Dimensions

DVV



DVV	ød2	E	F	G	H	n x M	£A	£B	£C	ød	ød1
630	18	225	1100	958	40	12xM8	995	880	990	500	541
800	18	310	1272	1165	40	16xM10	995	880	990	630	674

DVG-V



DVG-V	□A	□B	øE	F	ødf (n x M)	H1	H
630	1039	840	14	1573	674 (8 x M8)	40	858
800	1255	1050	14	2024	872 (8 x M8)	40	999

Induction thrust fan IHS



Characteristics and advantages at a glance

- Easy installation and maintenance
- Reduces the required supply air volume
- Supply and extract air shafts can be minimized - which saves space and money
- Compact design for low ceilings
- Suitable for mounting in false ceilingst



The IHS is an induction thrust fan in a compact casing with an integrated, direct driven high performance centrifugal fan. It can be supplied with on-off switch (optional) and is suitable for horizontal installation.

Casing

Casing manufactured from galvanised steel, for maximum protection against corrosion.

Motor

3-phase motors according to IEC standards; protection class IP55.

Impeller

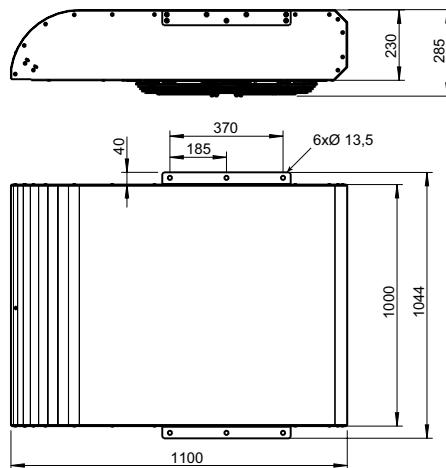
Aerodynamic centrifugal impeller for maximum boost and minor sound emission.

Please find more information in our online-catalogue at www.systemair.com.

Technical data

IHS	50-4/6 (B)	50-4/8 (B)
Item no.	37254	37255
Voltage/Frequency	V 400	400
Phase	~ 3	3
Power	W 1.500	1.300
Current	A 3,7	3,3
Starting current	A 25,9	15,6
Thrust	N 52	52
Max. airflow	m ³ /h 6.196	6.138
Fan impeller speed	1/min 1.445	1.430
Max. temperature	°C 55	55
Max. temp. of transported air for 120 min.	°C 300	300
Schalldruckpegel in 3 m (Freifeld)	dB(A) 73	73
Weight	kg 100	100
Insulation class. motor	H	H
Enclosure class. motor	IP 55	55

Dimensions



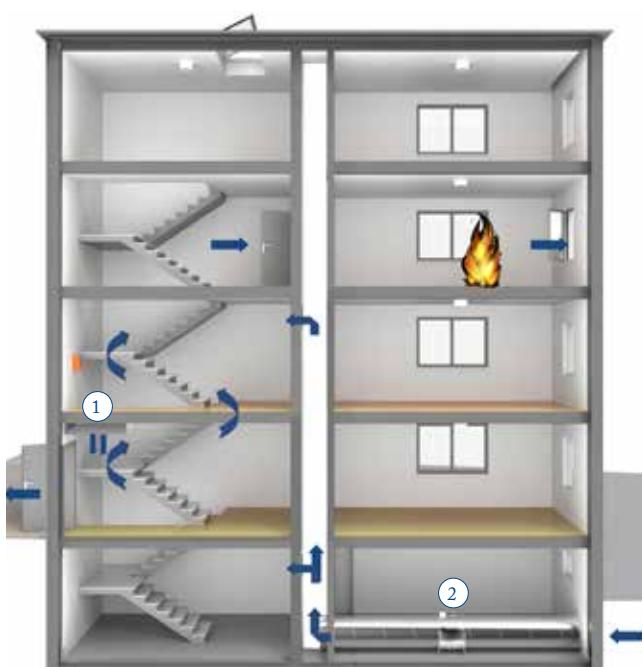
Functional principle of IHS

New ideas and approaches when the physics offers almost no way out.

Depending on the stairwell, an air speed of 0.75 or 2 m/s must be maintained at the open door to the room with the fire. When the entry door is opened for people to escape, the appropriate amount of air flows out of the stairwell. This volume must be added once more. If the flow is reduced, the fans, and above all the duct system,

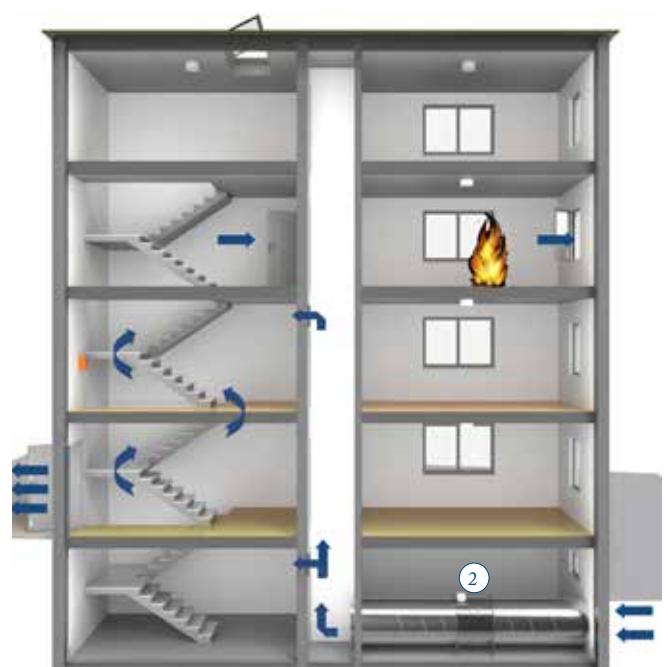
can be designed with significantly smaller dimensions. This reduces the cost and takes up less space. This is where the induction thrust fan IHS is applied. It is installed above the entry door and reduces thanks to the generated air curtain the flow volume through the opened entrance.

With IHS



- (1) IHS
- (2) Fan

Without IHS



Accessories

Operating switch



Operating switch for Overload Pressure Control Unit from plastic. With protection glass. This switch has absolute priority! All other activators have lower ranking. In case of cutting the connection cable the „max. Overload pressure mode“ is activated.

AES-ÜD-BA

Item no.	35719
H/b/d	mm 125/125/70
Enclosure class, motor	IP 44
Colour	rot

Duct smoke alarm



Duct smoke alarm with 600 mm air sampling tube for detecting smoke in the fresh air duct, with potential-free output contact and LED contamination display.

Connection bolts: 3 x M16

KRM

Item no.	35937	230 V AC	35720	24 V AC
H/b/d	mm 257/166/77	257/166/77	257/166/77	257/166/77
Enclosure class, motor	IP 54	54	54	54
Colour	rot	rot	rot	rot

Smoke detector



Smoke detector (optical and thermal) with socket for connection with Multi-sensor alarm with limit-value technology, in compliance with DIN-EN 54-7, with VdS approval. High operational safety thanks to intelligent evaluation of the signal from the optical and thermal measurement chamber.

AMM-2

Item no.	35711
Enclosure class, motor	IP 40
Material	ABS
Colour	weiß

Smoke alarm



Automatic smoke alarm with limit-value technology, in compliance with DIN-EN 54-7, with VdS approval. High operational safety thanks to intelligent evaluation of the signal from the optical measurement chamber, with detector base.

ARM-1

Item no.	35710
Enclosure class, motor	IP 40
Material	ABS
Colour	weiß



The flashing light signals the optical alarm in the case of fire.



The acoustic alarm signals the alarm state locally.

HRM-3K-OR

Item no.	77154	77155	77156
Colour	Grau	Gelb	Orange
Enclosure class, motor	IP 42	42	42

BL-1

Item no.	36358
Voltage	V 230

Wind and rain sensor



The wind and rain sensor detects and evaluates the wind speed and precipitation. If wind, rain or snow is coming, it switches off the ventilation and closes the light dome.

H-230

Item no.	36359
Voltage	V 230
Enclosure class, motor	IP 43
Material	Plastic
Colour	grey

Light dome



The light dome serves as a smoke extraction system and keeps the escape routes free of smoke in case of fire. Available in a range of sizes.

Fire dampers



Large, single, fire resistant down-draft air seal for installation in air shafts of RDA systems. The fire damper opens automatically in the event of a fire. The large cross-sections offer a free, unobstructed discharge area for fire gasses. The damper can be mounted flush with the wall. The system is smoke-tight and offers fire resistance for 90 minutes.

Wind and rain sensor



The wind and rain sensor detects and evaluates the wind speed and precipitation. If wind, rain or snow is coming, it switches off the ventilation and closes the light dome.

AES-ÜD-DKWR

Item no.	36798
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Systemair around the globe

3

Distribution Centers

50

Countries with Sales Subsidiaries





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