

How to plan smoke-free escape routes safely.



ESSMANN SHE competence for staircases

A fire is more than just flames.

Be safe with ESSMANN smoke protection systems.

ESSMANN competence for fire prevention.

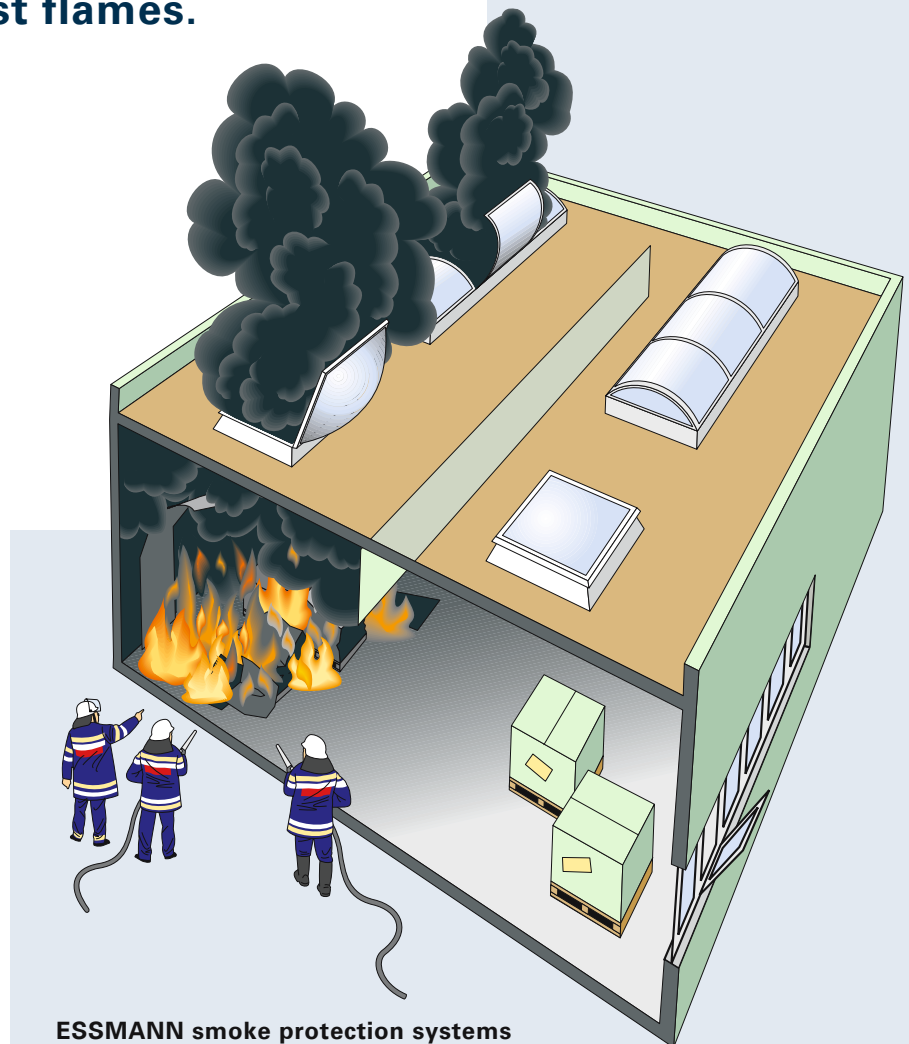
Smoke protection systems by ESSMANN provide the basis for a comprehensive fire protection concept for all planned projects. A safe, energy-efficient solution is developed for each specific building to suit its architectural environment. A wide range of ESSMANN services enhance the practical expertise and innovative safety technologies.

When seconds count:

Save lives – protect property.

Smoke protection is the key to safe fire protection. Surveys have shown that only approx. 20% of all fire deaths are caused by burns. More than 80% are most frequently caused by poisoning and suffocation through inhaling toxic fumes. A staircase can fill with smoke within just a few minutes, even if only paper or foam are burning. This example shows the importance of a complete smoke protection system.

Effective smoke protection is a combination of numerous individual measures. Each component in the system has to work smoothly. Only well-engineered SHE technology complies with these stringent safety requirements. It only takes one part of the system to fail and the fire prevention system will not perform as required.



ESSMANN smoke protection systems

- prevent the build up of smoke, safeguard escape routes and protect life,
- provide smoke-free zones for the fire brigade to focus on tackling indoor fires,
- thermal relief protects buildings and fixtures from total destruction
- reduce fire damage caused by fumes and decomposition products.

Professional planning for increased safety.

Fire prevention is statutory, e.g. in regional building ordinances and applicable DIN standards.

The systems are also subject to special requirements regarding their product and system quality.

Architects, building contractors or planners are even held personally responsible if violations are detected. For this reason alone, active smoke protection should be entrusted to professionals, like ESSMANN.

Basic statutes and technical regulations must be taken into consideration when planning, designing and implementing them.

These are specified, for example, in the following ordinances:

- regionally applicable regional building ordinances
- regionally applicable special building ordinances
- relevant fire protection authority requirements
- DIN VDE 0108
- further legal requirements

The right solution for every SHE requirement.

Customised for your staircase project.

Complete ESSMANN SHE staircase sets comprise the following basic elements for fire prevention in buildings:

- **Opening units**
- **Control centres**
- **Release buttons**

ESSMANN SHE staircase sets can be expanded and integrated into a full system, depending on the building requirements. Accessories, such as additional buttons, wind or rain sensors or visual smoke detectors, offer increased comfort and safety.

Fresh air, yes or no: a question of the release principle.

It depends on the intended use: Should the SHE be a pure emergency release system, i.e. just open in case of fire? Or should the system be additionally used for daily staircase ventilation?

ESSMANN offers various approaches to SHE control for both cases:

- **OPEN function only:**
Pneumatically or electrically activated pressurised gas release
- **OPEN and CLOSE function:**
Servomotor release



*top: ESSMANN skylight dome SHE set
middle: ESSMANN side window SHE set
bottom: ESSMANN roof-top window SHE set*



ESSMANN skylight dome SHE set

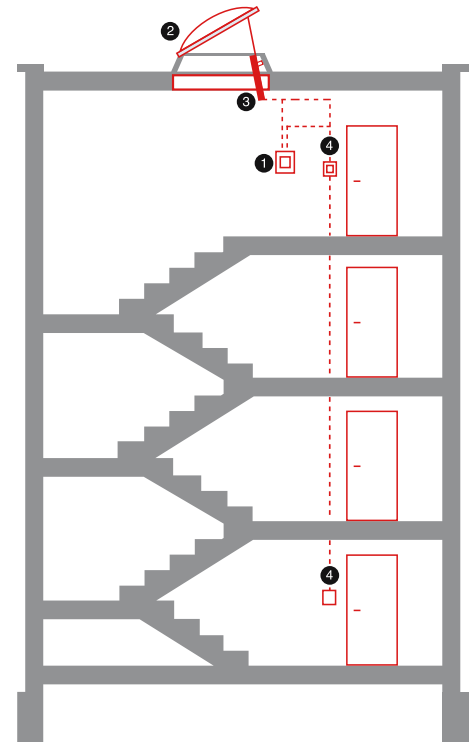
Scope of application: Staircases with smoke extraction through the flat roof.



Light and air equal safety.

Bright and pleasant staircases – a matter of course in modern architecture. ESSMANN skylight domes help. Combined with an appropriate staircase SHE system they comply with all smoke extraction requirements, rules and regulations.

All you have to do is press the button on the release: The SHE skylight dome is triggered to open independently of the power supply – by a lifting cylinder powered either by 24 V emergency power, a servomotor opener or a pressurised CO₂ line. The servomotor powered SHE version comes complete with daily ventilation. By contrast, pneumatic units are fully sufficient when planning only for emergencies. The system must, however, be closed each time the smoke extraction system has been opened and must be returned to secured state.

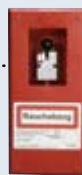


- ❶ ESSMANN 24 V control centre as a set for staircase skylight domes
- ❷ Skylight dome $\geq 120 \times 120$ cm
- ❸ 24 V servomotor opener with integrated load breaking Lift 50 cm (other lifting heights available on request) (cable diameter 3 x 1.5 mm to 100 mm)
- ❹ NAT-DIN emergency release button (cable diameter 4 x 2 x 0.8 mm)

Pneumatic lifting cylinder



NASK-P emergency release station



Clamping ring console



Pneumatic release:

Pneumatic release:

- Pneumatic lifting cylinder with 50 cm lifting height, end position lock – various clamping ring consoles can be mounted to suit different ceiling thicknesses.
- Emergency release systems (NASKP) on the ground and upper floor or on every third floor, lever operation for OPEN – in surface-mounted or flush-mounted version (with mounting frame) for up to 150 g CO₂ tanks.
- Empty conduit on site for flush mounting with inside diameter of 16 mm for OPEN and/or inside diameter of 22 mm for 2-way operation OPEN and CLOSE.
- Steel or copper pipe for surface mounting.

Servomotor release:

- 24 V servomotor opener with 50 or 75 cm lifting height, integrated load breaking and clamping console.
- 24 V control centre for servo powered control, with 72 hour emergency batteries and smoke detector connection.
- Emergency release button with malfunction display (surface mounted).
- Further buttons can be added - smoke detectors, wind and rain detectors ... (see overleaf)

Servomotor opener



ETZ control centre



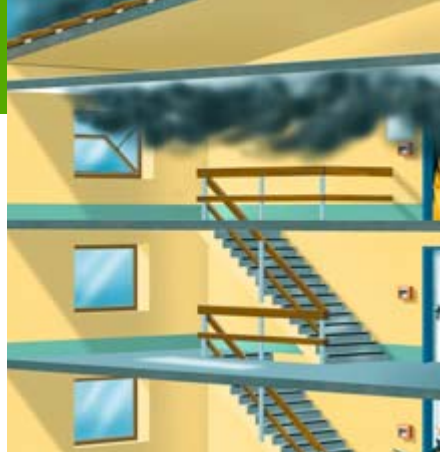
NAT-DIN emergency release button



Servomotor release

ESSMANN side window SHE set

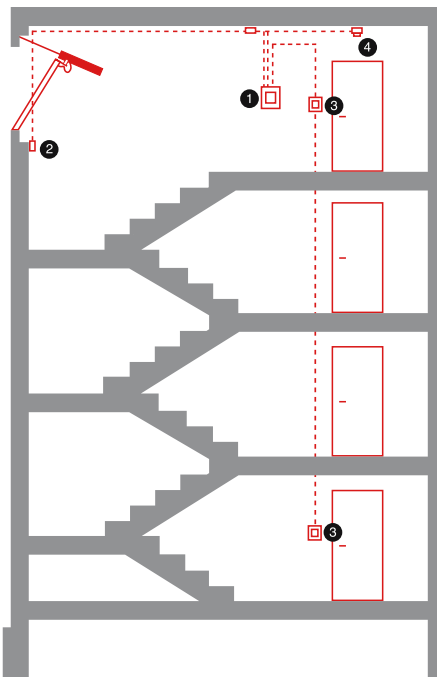
Scope of application: Staircase with smoke extraction through side windows in the wall.



Effective smoke extraction through the outside wall.

Specific architectural designs or regional building ordinance requirements for certain building functions may necessitate the installation of smoke extraction through side windows directly beneath the roof: possible even at defined floor intervals, e.g. for inside staircases, depending on the installation height. ESSMANN offers a wide range of opening systems with independent power supply for SHE side windows.

- **Opening system for smoke extraction only** using electrically activated pressurised gas springs or pneumatic cylinders triggered by pressurised CO₂ gas.
 - **Opening system for both smoke extraction and natural ventilation** using electric chain or spindle motors.
- The opening systems can be professionally mounted or retrofitted on swing-opening, folding, tilting or rotating casements in plastic, wood or aluminium frames.



- 1 ESSMANN 24 V control centre as a set for staircase side windows
- 2 24 V servomotor opener with integrated load breaking Lift 50 cm (other lifting heights available on request, cable diameter 3 x 1.5 mm to 100 mm)
- 3 NAT-DIN emergency release button (cable diameter 4 x 2 x 0.8 mm)
- 4 Automatic smoke detectors using 2-detector technology (cable diameter 2 x 2 x 0.8 mm)

Pneumatic or electric pressurised gas release:

- If a compressed air network is already available: Pneumatic lifting cylinder with 50 cm lifting height, end position lock and clamping ring console, together with the stipulated number of emergency release stations, available for surface or flush mounting.
- Smoke protection active station for controlling up to 8 emergency release stations or 8 electrically activated pressurised gas generators – as the triggers that open the SHE side windows. Manual operation or automatic control using up to 6 visual smoke detectors.

Pneumatic lifting cylinder



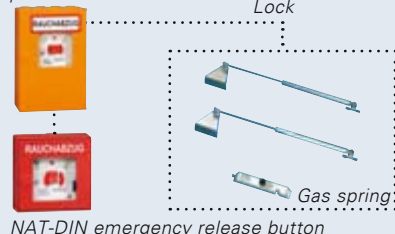
Pneumatic release

- Casement locking fixture with pressurised gas spring, opening angle of 30 – 75° and at least 2 emergency release buttons (upper/ground floor) for surface mounting.

Servomotor release:

- 24 V servomotor opener with 50 or 75 cm lifting height, integrated load break ing and clamping console.
- Alternatively: 24 V chain drive for mounting on aluminium side window, lifting height 30/50 cm, e.g. in glass buildings.

NAS-E2 8DG smoke protection active station



Electric pressurised gas release

Casement heights of at least 60 cm and casement widths of max. 120 cm. Easy, space-saving installation.

- 24 V control centre for servo powered control, with 72 hour emergency batteries and smoke detector connection.
- Emergency release button with mal function display (surface mounted).
- Further buttons can be added – smoke detectors, wind and rain sensors ... (see overleaf).



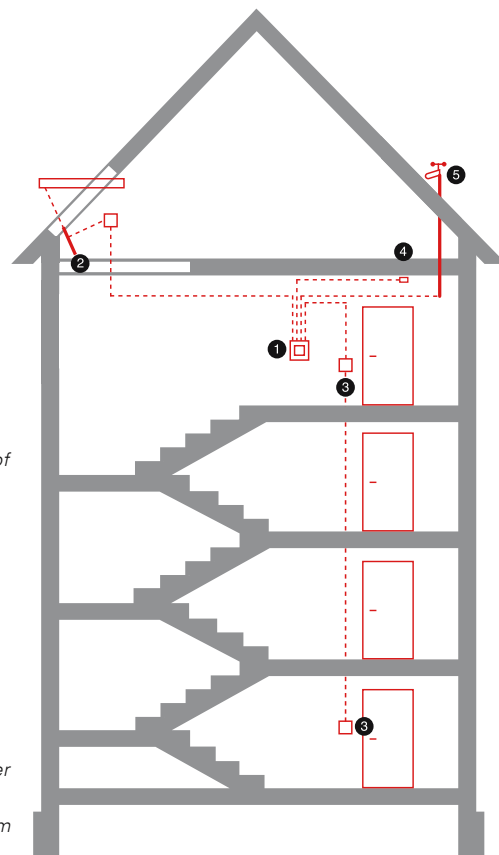
Servomotor release

ESSMANN roof window SHE set Scope of application: Staircases with smoke extraction through roof windows.



Planning reliability for smoke protection and ventilation comfort.

ESSMANN offers a complete practical solution without any gaps in the system. For both new buildings and retrofits in all conventional types of roof windows. If smoke develops, the pressure lines can be activated pneumatically to open the system in good time. Or electrically, using servomotor drives for additional ventilation. Thanks to its compact dimensions, the chain motor is a "strike-proof" alternative to the spindle motor. ESSMANN's long-standing, tried-and-tested smoke protection competence guarantees the functionally reliable coordination of all components and complies with all fire prevention requirements.



- ❶ ESSMANN 24 V control centre as a set for roof windows
- ❷ 24 V servomotor opener with integrated load breaking Lift 50 cm (other lifting heights available on request), (cable diameter 3 x 1.5 mm to 100 mm)
- ❸ NAT-DIN emergency release button (cable diameter 4 x 2 x 0.8mm)
- ❹ Automatic smoke detector (cable diameter 2 x 2 x 0.8 mm)
- ❺ Wind and rain sensor (optional) (cable diameter 2 x 2 x 0.8 mm to 150 m, cable diameter 4 x 2 x 0.8 mm to 300 m). All cables apart from the feeder run on 24 V DC.

Pneumatic release:

- Pneumatic lifting cylinder with 50 cm lifting height, end position lock – various clamping ring consoles can be mounted to suit different ceiling thicknesses.
- Emergency release systems (NASK-P) on the ground and upper floor or on every third floor, lever operation for OPEN – surface or flush mounted (with mounting frame) for up to 150 g CO₂ tanks.
- Empty conduit on-site for flush-mounted installation with inside diameter of 16 mm for OPEN or inside diameter of 22 mm for two-way operation OPEN and CLOSE.
- Steel or copper pipe for surface mounting.

Servomotor release:

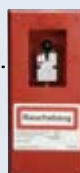
- 24 V servomotor opener with 50 or 75 cm lifting height, integrated load breaking and clamping console.
- 24 V control centre for servo powered control, with 72 hour emergency batteries and smoke detector connection.

- Emergency release button with mal function display (surface mounted).
- Further buttons can be added - smoke detectors, wind and rain sensors ... (see overleaf)

Pneumatic lifting cylinder



NASK-P emergency release station

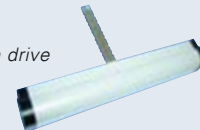


Clamping ring console



Pneumatic release

Chain drive



Servomotor opener



Smoke detector



Wind and rain detector



Emergency release button NAT-DIN



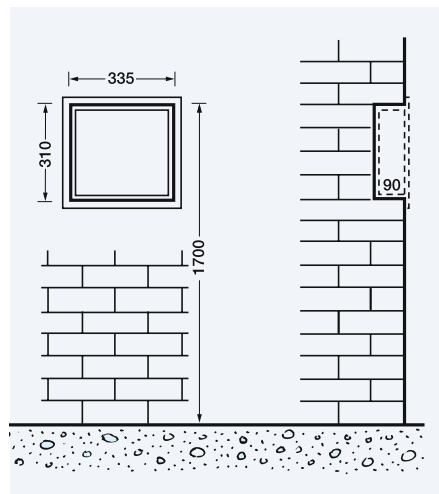
ETZ control centre

Servomotor release

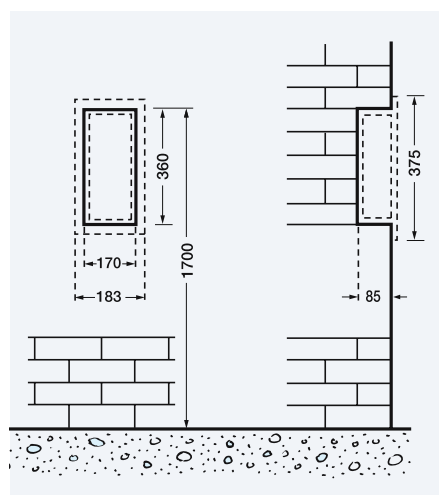
ESSMANN planning reliability.

Important Tables and Data.

ESSMANN skylight dome nominal sizes	Incident light surface m ²	Geometric area and ventilation cross-section of the various lifting heights m ²		
		30 cm	50 cm	75 cm
LK 60/60	0,16	0,16	–	–
LK 60/90	0,28	0,28	–	–
LK 70/137	0,59	0,50	0,59	–
LK 70/141	0,61	0,51	0,61	–
LK 80/80	0,36	0,36	–	–
LK 90/90	0,49	0,42	0,49	–
LK 90/120	0,70	0,51	0,70	–
LK 100/100	0,64	0,48	0,64	–
LK 100/150	1,04	0,63	1,04	–
LK 100/200	1,44	0,78	1,30	–
LK 100/250	1,84	0,93	1,55	1,84
LK 120/120	1,00	0,60	1,00	–
LK 120/150	1,30	0,69	1,15	1,30
LK 120/240	2,20	0,96	1,60	2,20
LK 125/125	1,10	0,63	1,05	1,10
LK 125/250	2,42	1,00	1,67	2,42
LK 141/231	2,55	1,00	1,66	2,49
LK 150/150	1,69	0,78	1,30	1,69
LK 150/240	2,86	1,06	1,75	2,63
LK 150/270	3,25	1,14	1,90	2,85
LK 180/240	3,52	1,14	1,90	2,85
LK 180/270	4,00	1,24	2,05	3,07
LK 200/200	3,24	1,08	1,80	2,70



Flush mounted
24 V EMZ control centre

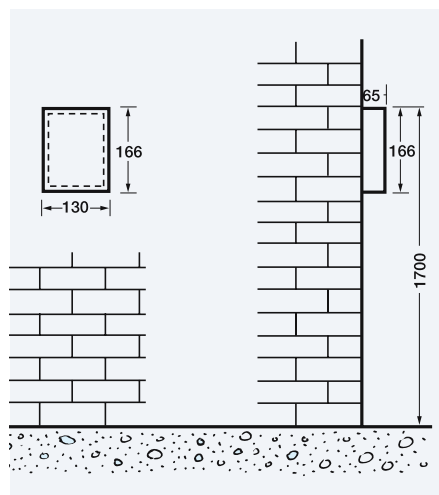


Flush mounted
NASK-P emergency release station

NAS-E2 8 DG smoke protection active station

Cable type* Installation cable	Number of pressurised gas generators per group							
	1	2	3	4	5	6	7	8
3 x 1,5 mm	950	900	850	800	750	700	650	600
3 x 2,5 mm	1600	1520	1440	1360	1280	1200	1120	1040
Smoke detector SHE button Ø Cable 4 x 2 x 0,8 mm for NAT	approx. 290 m							

*The cable types are only recommendations.
The relevant fire protection authority must be consulted to determine which cable types to use in each case.



Surface mounted

ESSMANN Smoke Protection Components.

At a glance, by area of application.

Openers



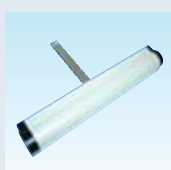
Pneumatic lifting cylinders for manual release by means of CO₂ lock, in open and closed condition. Depressurised idle position. With clamping ring console.



Gas springs and casement lock* for electrical impulse release. Pressurised gas generator system with lock in idle position. End position damped gas springs. Size: 35 x 35 x 230 mm (WxHxL). Tandem lock for casement widths of 120 cm and more.



24 V servomotor with integrated load breaking. Box profile 40 x 60 mm, coated white or silver anodised. 50 – 75 cm lift, overall lift length + 225 mm.



24 V chain drive** with functionally reliable double chain and end position cut-off. Coated aluminium. Size: 449 x 70 x 56.5 mm.

Control centres

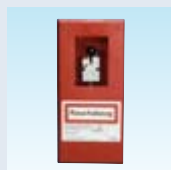


NAS-E2 8 DG Smoke protection active station* for up to 6 visual smoke detectors. Control of up to 8 pressurised gas generators. Control lamps for line malfunction, network and battery control as well as SHE release. Emergency power supply 72 h. Size: 145 x 220 x 85 mm (WxHxD).

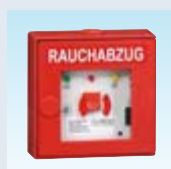


ETZ 24 V/2M-1G basic staircase control centre, 1 SHE button, automatic ventilation "Closed" (10 min.) for max. 2 x 24 V servomotor openers. Acoustic and visual malfunction notification. 10 x SHE buttons, 6 x automatic detectors, wind and rain sensor can be connected. Size: 145 x 220 x 85 mm (WxHxD).

Releases



NASK-P emergency release station for pneumatic SHE activation. Manual operation. Visual "Open" display. For 38 g or 150 g CO₂ tanks. With flush-mounting frame. Size: 166 x 360 x 94 mm (WxHxD).



NAT-DIN 24 V DIN emergency release button with emergency "Open" and "Close" button. LED for normal operation (green), SHE activation (red) and malfunction message (yellow). Size: 124 x 124 x 35 mm (WxHxD).

Ventilation



24 V ventilation button for daily aeration and ventilation using the control centre. With "Open" and "Close" button and stop function. Size: 80 x 80 mm (WxHxD).

Accessories



Visual smoke detector: Alarm on photoelectric detection of light diffused through penetrating smoke. 2-wire technology, up to 6 detectors can be used per wire, including assembly base. Size: 119 x 58 mm (diameter x H).



Wind and rain detector: built-in evaluation electronics notify the control centre. With heated rain sensor, wind speed and adjustable switch-on delay in the sensor. Size: 80 x 180 mm (WxH).

*for side windows only

**for side and roof windows only

ESSMANN

▲ LIGHT ● AIR ■ SAFETY

A member of the **ESSMANN GROUP**.

ESSMANN GmbH
Im Weingarten 2
D-32107 Bad Salzufflen
Telephone +49(0)5222.791-0
Telefax +49(0)5222.791-236
E-Mail info@essmann.de
www.essmann.de
www.essmann-group.de