Visualisation: Actris Henninger Turm GmbH & Co. KG

# + AIR SOLUTIONS

+AIR LIFE

## Passion with every breath

You breathe in and out approximately 23,000 times every day. From the day you are born until the day you die. That makes air a basic element of life – and for about 50 years now it has been a basic element of the work done by D+H.

As the leading provider of system solutions dealing with smoke extraction and ventilation, we produce innovative ideas to provide for optimum indoor climate in hundreds of thousands of buildings worldwide and to provide enough air to stay alive in the event of an emergency.

So if you are looking for intelligent systems that save lives, protect property, improve indoor air quality and reduce energy consumption or satisfy special requirements for advanced architecture, you will always find the perfect solution for your projects with D+H.



# Contents

# + SAVING LIVES + PROTECTING PROPERTY

Would you like to maximise the safety of building occupants and minimise material damage in the event of a fire? An efficient smoke and heat exhaust ventilation (SHEV) system conveys heat, smoke and toxic combustion gases out of the building. This keeps escape and emergency routes smoke-free. It protects property effectively.

This saves lives and reduces damage to the building. With customised solutions from D+H you have a broad spectrum of globally tested drives, control panels and all the components you need to achieve efficient and reliable smoke extraction.

## Innovative smoke extraction in practice: Headquarters of RheinEnergie AG

D+H provides you with innovative standard and customised solutions for smoke and heat exhaust ventilation, and security in case of fires. This is also the case at the headquarters of RheinEnergie AG in Cologne. The heart of the administration building completed in the summer of 2014 is a large atrium in the entrance area. The central area is meant to serve as a multifunctional event location, which carries with it the highest of requirements for fire protection.

To enable fast and reliable smoke extraction from the huge area, large supply air windows in the façade have to be opened. This is a job for the powerful twin-chain drives of the CDP Series. 33 of these powerful devices open and close the large top-hung windows and accomplish strokes of 1000 to 1200 mm in the process. Perfectly synchronised thanks to BSY+ technology. There was no standard solution yet for the profiles of these fitted supply air windows, so D+H developed special brackets for the top-hung window drives. The result was a customised smoke extraction concept that only exists in this form in this specific building.

Since, of course, the main building of an energy provider already has its own emergency power supply, it was possible to install a 230 V smoke extraction solution without additional batteries. This reduces cable materials, saves on electricity costs and supports the sustainable energy planning of RheinEnergie AG. This company has created a true ecological marvel in its headquarters, which is entirely energy self-sufficient. The German Sustainable Building Council (DGNB) has awarded it with the gold Green Building Certificate.

### A true plus for smoke extraction

- \+ Conveys flue and combustion gases out of the building effectively
- \+ Keeps escape and emergency routes smoke-free
- \+ Saves lives
- \+ Protects property

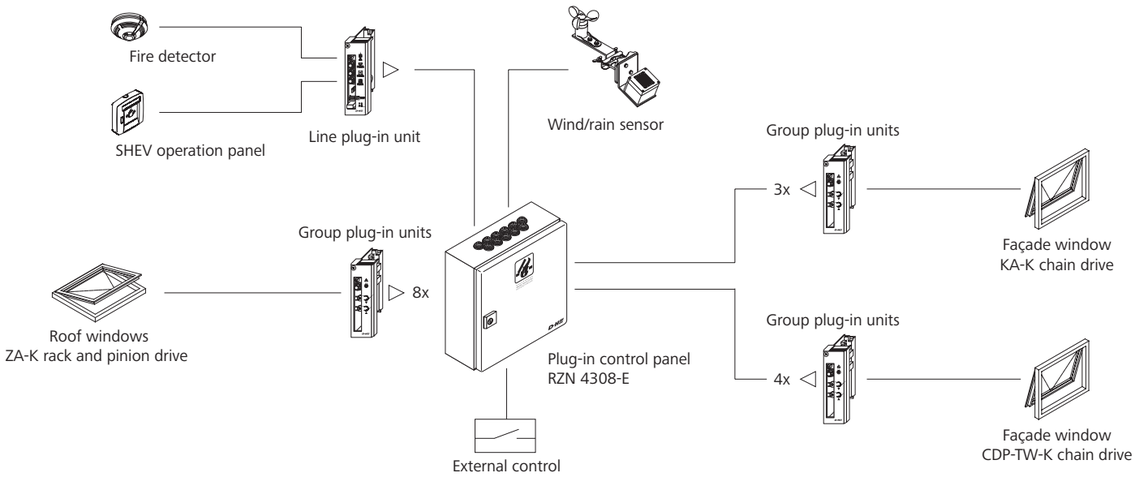
**Main administration building of RheinEnergie AG | Location:** Cologne, Germany **Completion:** Summer 2014 | **Architect:** NHT & Partner GbR, Frankfurt, Germany; Dipl.-Ing. (Graduate Engineer) Norbert Sinning, Darmstadt, Germany | **D+H Service:** Hübler Sicherheit und Service GmbH

Photos: Stefan Schilling

# Safety across the board

The RZN 43xx-E 230 V smoke vent control panel is optimally suited for use in complex structural objects with diverse requirements. The control panel uses its line plug-in unit to respond to all fire detectors, SHEV control panels and wind and rain sensors. The various drives on the intake air and exhaust air windows are controlled by 16 group plug-in units, in accordance with the incoming information.
As part of the project, 128 rack and pinion drives of the ZA Series, 68 chain drives of the KA Series and 33 of the CDP Series are installed.

## System solution for RheinEnergie AG




KA Series

## The all-rounder

The drives of the KA Series easily control nearly all windows with their compressive and tensile force of up to 600 N. Even multiple drives can be controlled simultaneously with BSY+ synchronised electronics, so that they can work perfectly in tandem, and at high speeds in case of danger.

That makes the chain drives of the KA Series suitable for almost every conceivable application and, as true all-rounders, they optimally adapt to every challenge. In addition to their adaptability, they boast impressive operating safety and efficiency.

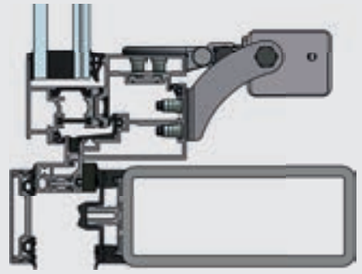
CDP Series

## Power in its finest form

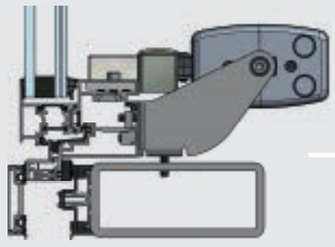
The drives of the CDP Series combine aesthetic requirements with enormous power. Concealed within the classy tube design is a powerful drive that uses an extremely powerful gearbox and a particularly durable chain to achieve load capacities of up to 1500 N with a stroke of 1000 mm. And it does this with a current consumption of only 4 A.

This means the high-performance drive is the very best, even in terms of efficiency. The CDP-TW sets entirely new benchmarks in the force of pressure area. Thanks to two motors, it generates a force of 3000 N.

**Working in tandem to provide fresh air:**
The KA-34/600-K-BSY+ on the upper bottom-hung windows



**Letting the air flow:**
The CDP-1600/1000-TW-K-BSY+ and CDP-1600/1200-TW-K-BSY+ on the bottom top-hung windows of the RAICO type Wing 50 AR



## Smoke extraction? Definitely!

Without smoke extraction, toxic fire smoke and extreme heat accumulate in the building and put lives in danger. In the event of a fire, nine out of ten people die from inhaling toxic flue gases. It is only through effective smoke and heat exhaust ventilation that combustion gases are channelled away with a stable smoke layer interface above the area where there are people, for example, by means of intake air openings in the lower wall area and exhaust air openings in the upper façade or ceiling area. This keeps escape and emergency routes smoke-free.

## Two fire scenarios – one solution

The atrium in the main administration building of RheinEnergie AG is intended to be used for as many different functions as possible: As a meeting point for the numerous employees or as an exhibition area, for example, for electric vehicles. Therefore, the structure is subject to high fire safety requirements. Various smoke tests were conducted and verified that escape routes are kept smoke-free and usable in case of fire. For this purpose, numeric methods from fire engineering were used to simulate two fire scenarios. The first scenario is a car fire in the hall space and then a fire in the nearby cafeteria.

The results show that after a fire has burned for 10 minutes, the smoke spreads over the entire area of the hall, but a lifesaving layer of air is formed. A sufficiently high layer of air with little smoke remains even 15 minutes after a fire breaks out in the car or cafeteria. Using this test, D+H has demonstrated the efficiency of its smoke extraction solution.

Spread of smoke after 10 minutes of fire with D+H's SHEV*

Spread of smoke after 15 minutes of fire*

**Source: Excerpt from the fire protection concept of Dipl.-Ing. (Graduate Engineer) Uhlig, officially recognised expert for fire protection testing, Willich, Germany.*

## Conclusion

D+H enables customised smoke extraction solutions even if there are not any standards yet for the selected window profiles.



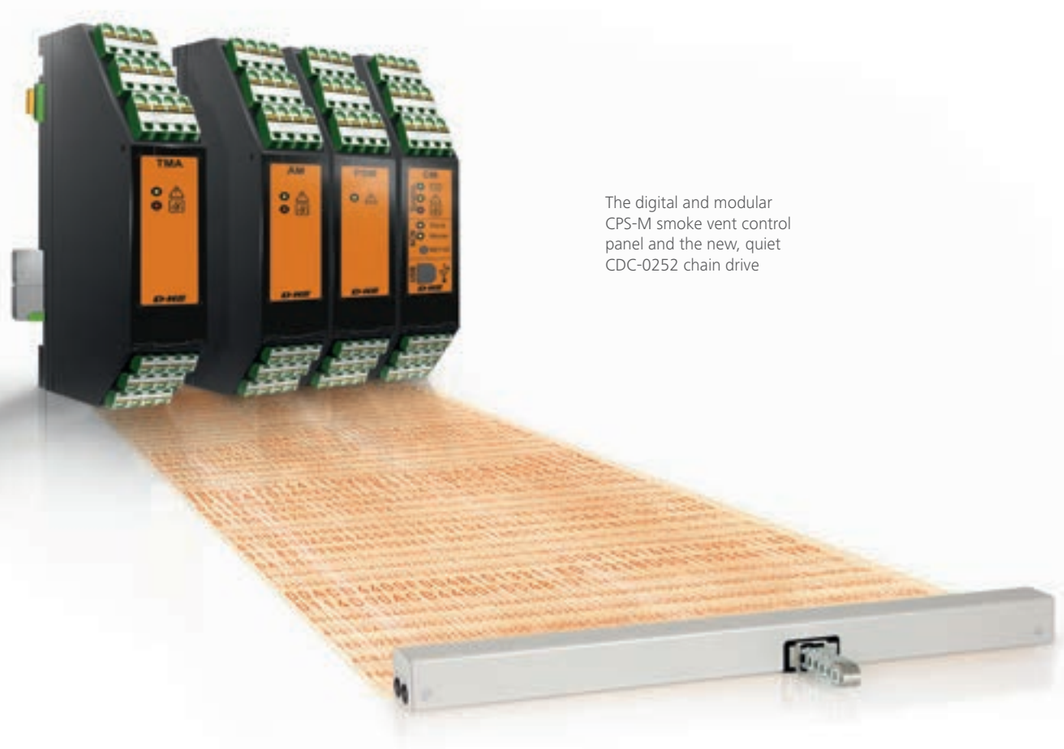

**Karl Maier, Technical Manager at Neumayr High-Tech Fassaden:**

„Without the support of D+H, this large-scale project would not have been realised. From the very beginning they made the impossible possible and quickly had a solution at hand for every problem. This includes the new drives, for which there was no suitable profile system in existence. This makes the SHEV solution at RheinEnergie AG truly one of a kind."

Development + Innovation

## Now everyone can have a say in the topic of safety – the digital and modular CPS-M smoke vent control panel

Maximum safety requires precise communication. That is why, for the first time, the new digital smoke vent control panel communicates bidirectionally. This means that the control panel not only sends its commands to the groups, but can also respond to the drives. The result is an intelligent system in which all components communicate with each other and exchange information. This means that each component can be controlled individually and, using the external interface, from anywhere in the world. This is really quite smart and, thanks to the free cascadability of the system, it can also be used in any building. Thanks to the modular design you now need only a single system solution to implement a sustainable and efficient smoke extraction concept – from the smallest building to a large airport. And due to the control panel's stabilised power supply unit, it is even ideally suited for retrofitting existing systems. This is because the new D+H control panel can control the drives of other manufacturers.




The digital and modular CPS-M smoke vent control panel and the new, quiet CDC-0252 chain drive

# + TESTED QUALITY + CERTIFIED SAFETY

Do you count on certified safety and constancy of performance in the system for your project? That can be arranged. Natural smoke and heat exhaust ventilators (NSHEV) channel hot flue gases away in case of fire to ensure that there is a vital, smoke-free area at ground level and in escape routes. All components used in a smoke extraction solution are combined to create a clearly defined NSHEV system for safety-related reasons. Since 2006, the valid EN 12101-2 standard requires standard-compliant composition of all NSHEV components, which are subject to elaborate testing procedures. Solutions from D+H provide you with both the safety and reliability of the most renowned testing institutes and the world's largest selection of certified products on the market. As a result, you have optimum planning reliability for your projects.

## Natural smoke and heat exhaust ventilators (NSHEV) in the Capitol Music Theatre in Wrocław

D+H lets you make a complete NSHEV solution with perfect visual and technical integration, even in complex architectural concepts. One example is the renovation, modernisation and expansion of the Capitol Music Theatre in Wrocław. In this large-scale, 35-million euro project, the old parts of the theatre building, such as the historic foyer and stage, were connected to the new parts of the building via a paned connector, a large green wall consisting of about 12,000 living plants. The old theatre courtyard was also remodelled, and a large glass roof was added. Today it serves as a central meeting point for both residents and tourists.

With almost 1200 seats, the music theatre forms the cultural highlight of the capital of Lower Silesian, which is also the 2016 European Capital of Culture. The highlight of the D+H complete solution is the combination of state-of-the-art fire protection, natural ventilation and an extraordinary, aesthetic architectural concept. In the building complex spanning approximately 10,000 square metres, a NSHEV roof structure was installed which turned out particularly well, and in which a total of 40 high-speed drives of the ZA Series use integrated synchronous BSY+ control technology to do their work. The drives with a maximum force of pressure of 1500 N were specially developed for particularly large windows in glass roofs. The use of an electric force and position control system means up to eight drives can be precisely synchronised and, at the same time, ensures the load is distributed evenly, and that drives move smoothly. And this is achieved with the entire system being perfectly integrated into the advanced architecture.

This also won over a national jury, which named the spectacular new building as the most beautiful structure completed in Wrocław in 2013. With that, D+H proves once again that beauty and safety can also complement each other perfectly.

### A true plus for NSHEV

- \+ Highest safety with renowned testing institutes
- \+ No additional costs for NSHEV
- \+ Widest range of EN 12101-2 solutions on the market
- \+ NSHEV calculations with the professional myCalc software
- \+ Certified specialist companies right in your area

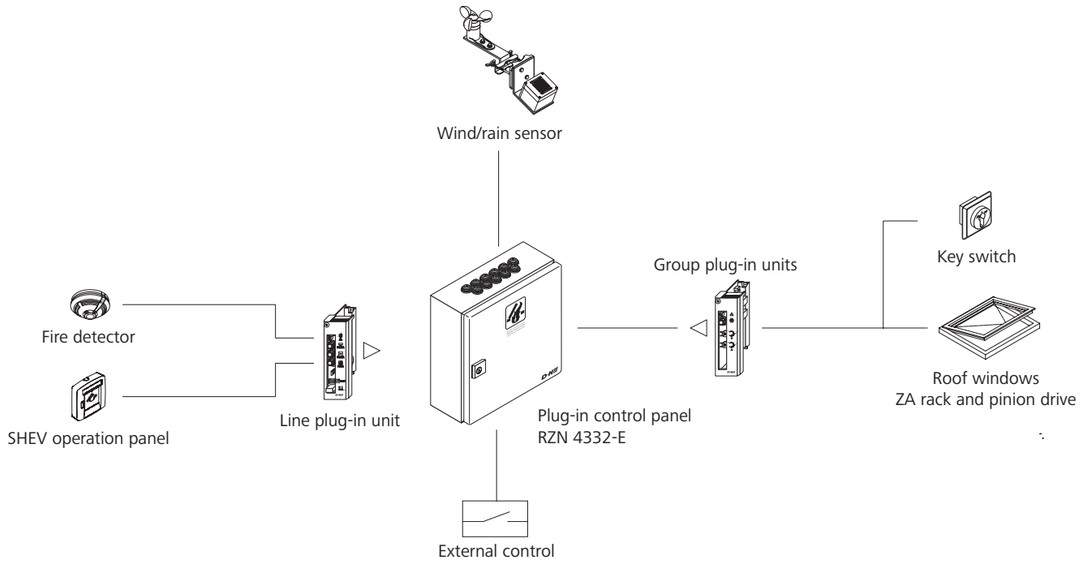
**Capitol Music Theatre | Location:** Wrocław, Poland **| Completion:** Autumn 2013
**Architect:** KKM Kozień, Architekci, Krakow, Poland **| D+H Service:** D+H Poland

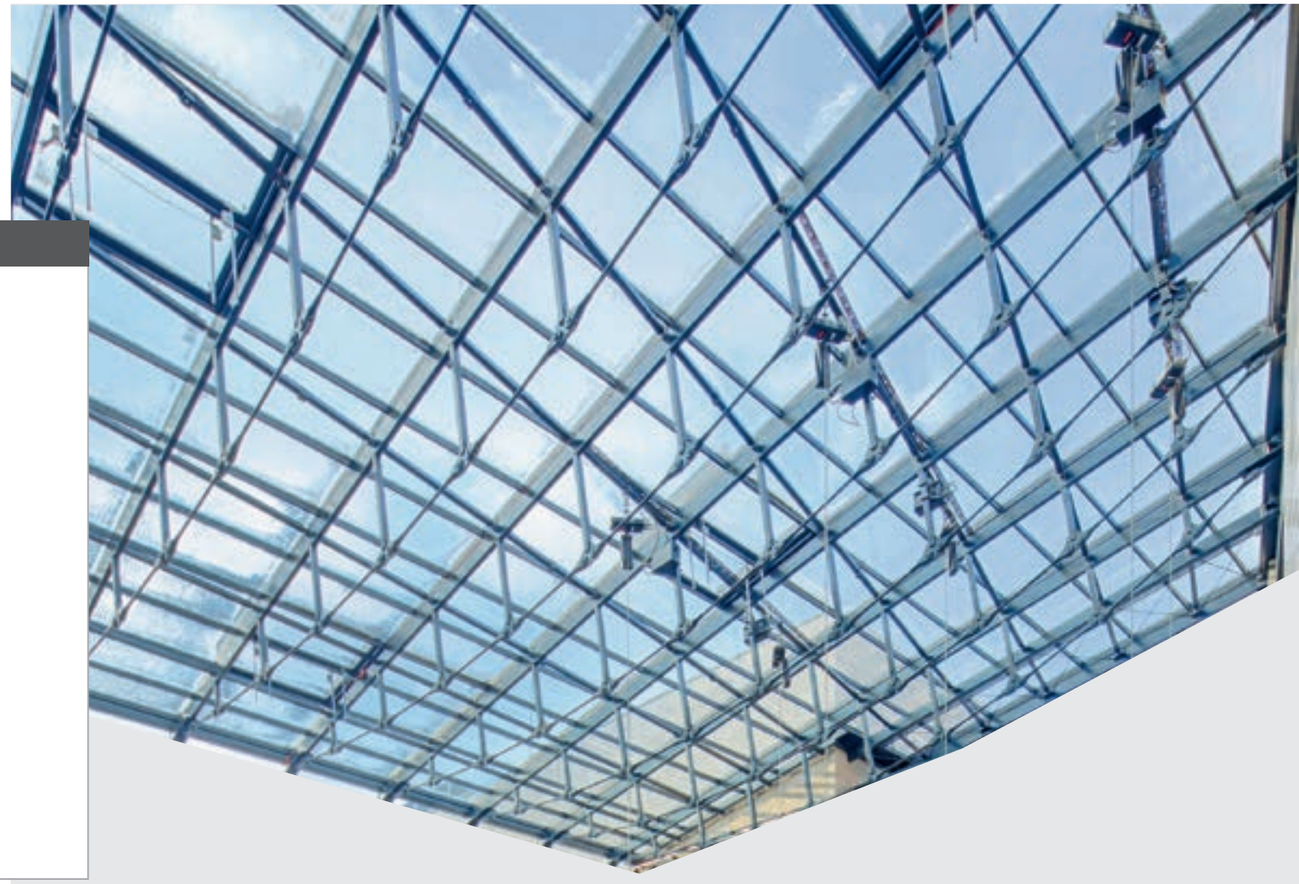

Photos: Bartosz Makowski

# Safety guaranteed

The RZN 4332-E smoke vent control panel is used in structural objects with diverse requirements. The control panel provides a total current of up to 32 A, has an emergency battery power supply that lasts at least 72 hours and approval from VdS and TÜV. It uses three group plug-in units to control the rack and pinion drives on the roof windows.

## System solution for Capitol Music Theatre



RZN-E Series

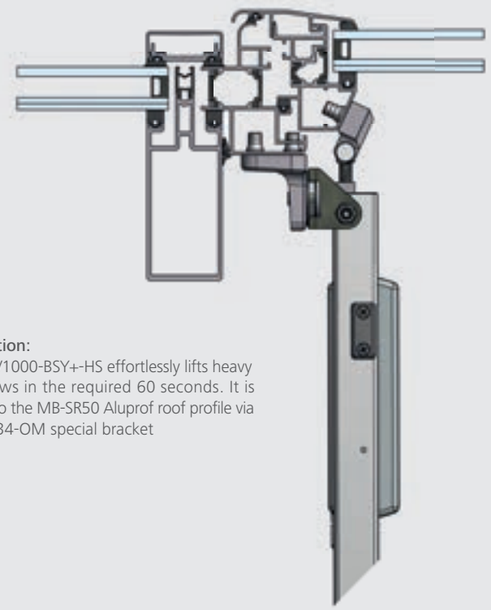
## The all-rounder

The smoke extraction control panel of the E Series (plug-in units) can be configured for nearly every use, thanks to their maximum of 14 slots. They transform the input current from 230 V to 24 V and provide an output power ranging from 8 to 64 A. As a result, they control the corresponding number of drives after an alarm is triggered by a fire detector or smoke detector. A battery guarantees an emergency power supply lasting at least 72 hours.

ZA Series

## Faster than fire fighters

The drives of the ZA Series are also suited for the highest requirements for smoke extraction and natural ventilation. Its high-speed function makes the difference. In an emergency, windows are opened at top speed, so they are more quickly able to perform their lifesaving function. Furthermore, the drives remain operable even in extreme heat. Using optional BSY+ technology, the electronic force and position control of up to eight drives can be precisely synchronised.



**Fast operation:**
The ZA 155/1000-BSY+-HS effortlessly lifts heavy roof windows in the required 60 seconds. It is connected to the MB-SR50 Aluprof roof profile via the ZA-BS034-OM special bracket

## What you always wanted to know about NSHEV

A NSHEV must always be used in Europe if natural smoke extraction is required by the building code. In Germany this requirement is found primarily in the building code for special structures such as places of assembly, shops, schools, museums and hospitals. The requirement includes proving the aerodynamic efficiency of the smoke vent area of a NSHEV (natural smoke and heat exhaust ventilator) in accordance with EN 12101.

Testing of the NSHEVs is divided into various performance classes. These are indicated on the CE marking. Therefore, in the tendering processes, the specialist planners and architects in charge must select NSHEV classes that correspond to the requirements of the building project. In Germany, there are different regional requirements for wind and snow loads. The temperature resistance of the entire NSHEV must be ensured for at least 30 minutes at 300 °C.

In addition to having their functional safety tested, devices which are also used for everyday ventilation must be opened to the ventilation position 10,000 times. NSHEV solutions from D+H offer the largest selection of certified systems on the market and the guarantee that you can always offer your customers maximum safety.

Therefore D+H has developed an optimum solution for manufacturing an NSHEV. If D+H plans to introduce a drive, it is tested and certified in combination with all profile systems of common window manufacturers. You get this additional benefit for all D+H products exclusively, without additional costs.

## You can perform calculations with myCalc

With the high-performance D+H software myCalc, you can perform your own aerodynamic calculations for roofs and façades. This easy-to-use, professional tool helps you select D+H products with EN 12101-2 certification.

# + URBAN COMFORT + UP-TO-DATE VENTILATION

Looking for the perfect indoor climate – energy-saving, environmentally friendly and state-of-the-art? With controlled natural ventilation (CNV) you can optimise the indoor air simply by using natural power sources and thermal airflow. This is not only easy, but is also beneficial to a healthy working and living climate. Solutions from D+H give you everything you need to control these natural resources intelligently. You can use them to create an extremely environmentally friendly, healthy, cost-effective and state-of-the-art alternative to air-conditioning systems and other mechanical ventilation systems. Well above the industry standard with an assured service life of 20,000 double strokes for the drives.

## Natural ventilation in practice: Henninger Tower

With D+H you can integrate and synchronise ventilation systems spanning multiple buildings using components which are perfectly matched to one another. This is being done in Henninger Tower, the new landmark in Frankfurt that is currently under construction. One of Germany's tallest and most beautiful residential towers is being built on the location of the former grain silo of the Henninger Brewery in the Sachsenhausen district. It is slated to reach a height of 140 metres and be completed in Spring 2017. Even though it's not yet completed, the building won the International Iconic Award 2015 for visionary architecture. Intelligent control devices as well as integrated window drives and locking mechanisms of the CDC and VCD Series from D+H provide fresh air: Perfectly synchronised, they enable the targeted exchange of warm, dissipated indoor air with healthy, fresh outdoor air as needed. The system is fully automated and can also be operated at the press of a button. This improves indoor air hygiene and creates pleasant and cost-efficient thermal comfort and a perfect living atmosphere in the 211 newly created apartments, distributed across 34 of a total of 40 storeys. Of course, this also holds true in the four apartments with a 360-degree view, which are located at the top of the keg-shaped structure.

### A true plus for natural ventilation

- \+ Low investment costs through lower costs for system technology
- \+ Low maintenance costs thanks to low-maintenance technology
- \+ Less energy consumption, because neither active cooling nor mechanical ventilation is needed
- \+ Shorter construction times thanks to simple, fast commissioning
- \+ Small space requirements, because no ducts or distributor shafts are needed
- \+ Reduced $CO_2$-emissions

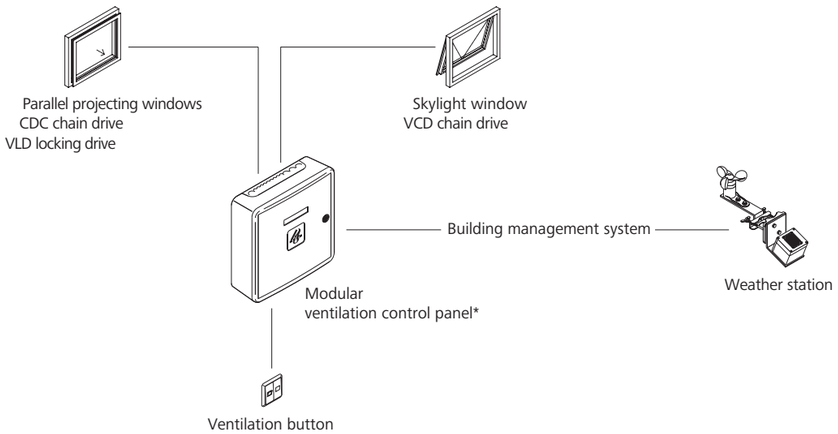
**Henninger Tower | Location:** Frankfurt, Germany **| Completion**: Spring 2017
**Architect:** Meixner Schlüter Wendt, Frankfurt, Germany **| D+H Service:** D+H Ammersbek (Key Account Management)

*Visualisations: Actris Henninger Turm GmbH & Co. KG*

# Perfectly matched to one another

The ventilation control panel of the GVL-M Series adds intelligence and versatility. The control panel responds automatically to weather station data. High-performance chain drives of the CDC Series open and close the 174 sound-absorbing parallel projecting windows in the Henninger Tower invisibly and effortlessly, just like the integrated chain drives, which reliably lock and unlock all windows.
Everything is controlled fully automatically or, if necessary, individually by residents. In addition, drives of the VCD Series provide an extra helping of fresh air. They move the ventilation flaps in the skylight windows of the balconies and terraces. And thanks to the BSY+ technology, everything works together seamlessly. As a result, the intelligent interaction of all components from D+H in Henninger Tower always ensure excellent ventilation and optimum sound absorption. Well above the industry standard with a guaranteed service life of 20,000 double strokes for the drives.

## System solution for Henninger Tower




**VCM 1004 control panel, the predecessor model of the GVL-M, was used in Henninger Tower.*

**CDC** Series

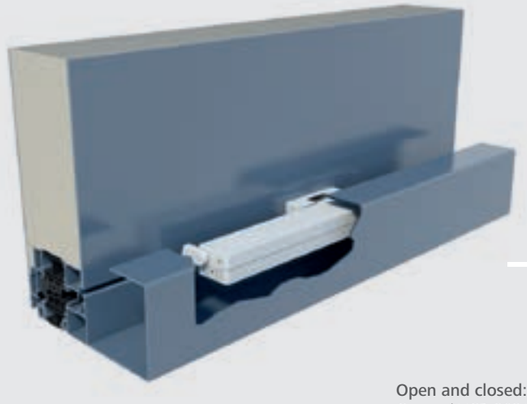
## The undercover specialists

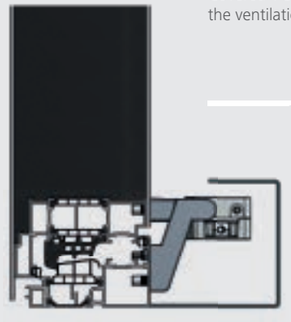
The drives of the CDC Series are so narrow and compact that they fit in almost all common window profiles. A large selection of suitable brackets means that they can be installed in no time and operate entirely out of sight, just like the integrated fitting drives of the VLD Series, which use a microprocessor to lock and unlock all latch pane fittings of the windows reliably. This is visually appealing, preserving the aesthetics of the architecture, and also further increases the level of burglary protection.

**VCD** Series

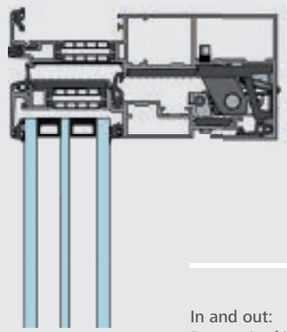
## Ventilation whisperer

The elegant ventilation drives of the VCD Series are suitable for almost all façade and roof windows. The slim and compact construction is excellently suited to every architectural style. Despite their aesthetic appearance, the chain drives actually generate a lot of power, are as quiet as a whisper and feature low current consumption. In addition, the installation is particularly easy thanks to numerous suitable bracket solutions.





**Open and closed:**
Covered VCD 203/250 devices open and close the ventilation flaps in the skylight windows



**In and out:**
Every pair of integrated chain drives of the CDC Series moves the parallel projecting windows back and forth; in addition also integrated locking drives of the VLD Series lock and unlock reliably all windows

## Conclusion

The D+H ventilation solution for the Henninger Tower has been used to implement the highest aesthetic demands using a well-concealed technology. A customized yet cost-efficient system solution for urban residential architecture with a sophisticated façade design.

„In addition to the qualities the Henninger Tower boasts as a symbol of commemoration and identity, the new building is also a contemporary, one-of-a-kind multi-storey apartment house. One aspect of the building's charm is in the façade structure, which consists of balconies and conservatories, but there are also other factors."

*Florian Schlüter, Claudia Meixner, Martin Wendt*
*MEIXNER SCHLÜTER WENDT Architekten*

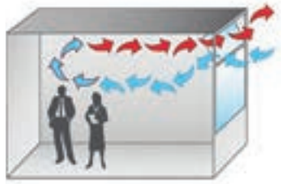
*Actris Henninger Turm GmbH & Co KG*



## The three types of natural ventilation

**Single-sided ventilation**

The air starts to circulate as soon as the windows are opened on one side of the room. Because the amount of air exchange is limited, it only works in small rooms with just a few people.



**Cross ventilation**

Ventilation is provided by window openings on two or three sides of the building using differences in wind pressure along the façade. This allows fresh air to quickly reach large, deep rooms.

**Hybrid ventilation**

Here, electronically controlled windows are combined with an exhaust fan. This provides fresh air even in rooms with particularly complex climatic conditions.

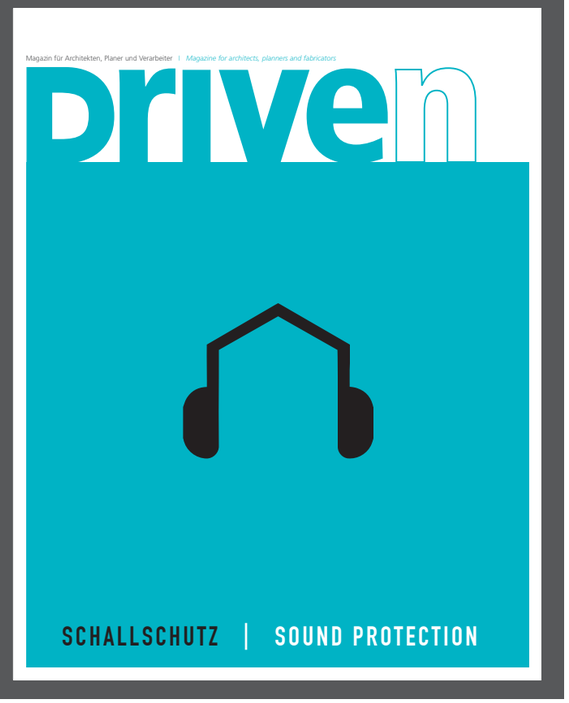
Development + Innovation

## Acoustic ventilation controllers or how you teach windows to listen, think and act.

In inner cities, noise is everywhere. Studies show that noise, even in small doses, negatively effects performance and the ability to concentrate. This makes it all the more important to minimize its unhealthy impact in peoples' living and workspaces. Therefore, D+H has been working alongside institutions, including the Fraunhofer Institute for Building Physics, to create solutions for acoustic ventilation controllers. Here, ventilation systems are developed, which listen, think and then act accordingly.

You can find all the information about acoustic ventilation controllers and other interesting articles related to smoke extraction and ventilation in the 01/2016 edition of our customer magazine „Driven."

www.dh-partner.com



*Visualisations: Actris Henninger Turm GmbH & Co. KG*

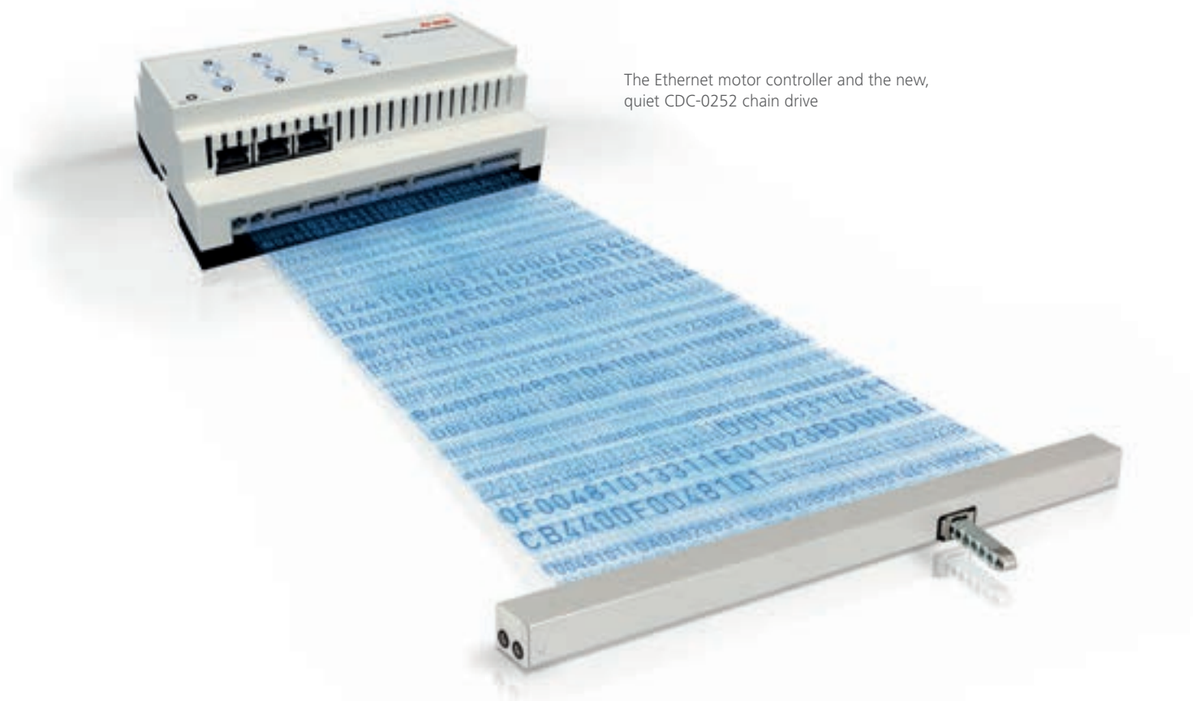
Development + Innovation

# The new digital ventilation control panel: The future is in the air

The new ventilation control panel from D+H brings fresh air to natural ventilation. It provides fresh air, indoor climate control and custom ventilation strategies in up to 20 different zones. And, thanks to innovative bus communication (ACB), it also provides custom window position control.

Air exchange is controlled based on outdoor and indoor temperatures, $CO_2$-values and room humidity. Additionally, a weather station can transmit data such as wind direction and strength, rain intensity, brightness and sunlight to the control panel. The location, time and date are also incorporated into the ventilation control process. Thus, the control panel can also control two time programs per day, such as cooling at night and fresh air in the morning. Other useful functions include an emergency closing function in case of bad weather, holiday operation or ventilation by fully opening windows for a short time. A browser-based controller can be used to implement nearly all data.
Programming the ventilation controller is also very easy using the D+H Software Service & Configuration Suite (SCS). The ventilation control panel can be installed in any building sustainably, because its scalable design allows easy retroactive upgrades. It consists mainly of three components: The ventilation control panel, the brain of the system, which processes all incoming information and transmits the corresponding commands, the motor controller, which controls opening widths with precision using BSY+ and ACB technology, and a convenient u::Lux operating button. It has four illuminated tactile buttons and a high-resolution colour display with an intuitively-designed user interface.

This allows the new D+H ventilation control panel to implement cost-efficient and custom ventilation strategies in complex buildings with low wiring effort and expense.



The Ethernet motor controller and the new, quiet CDC-0252 chain drive

# + REDUCING ENERGY COSTS + INCREASING SAFETY

Are you planning on reducing the operating costs of your construction project for the long term without sacrificing safety and increasing the comfort of the building at the same time? With Lift Smoke Control (LSC) solutions from D+H, you can close permanent openings in the top of the shaft and retain valuable energy in the building. In case of fire, one of the most state-of-the-art smoke extraction systems in the world opens the blinds on the top of the shafts in no time and directs the poisonous combustion gas out of the building reliably. The system consists of only a few components that can be installed quickly and are immediately ready for operation. If you estimate an average savings potential of 2000 euros annually for each lift shaft, the investment pays for itself within a few years. This applies to new buildings and installation in existing facilities.

## Lift Smoke Control in use: Kontorhaus Alsterufer 1–3, Hamburg

D+H allows you to combine effective smoke extraction solutions with high savings potential for energy consumption related to heating and cooling buildings. Here, the Lift Smoke Control solution from D+H meets the highest requirements for safety in case of fire and for energy-optimised operation for everyday use. Additionally, it is environmentally friendly and even improves ventilation comfort.

This is why the new prestige project in Hamburg, Kontorhaus Alsterufer 1-3, has already received the LEED Gold award for ecological construction in the planning phase. Located directly on the Außenalster Lake, the office building – designed by the renowned architecture firm APB – will be completed by Summer 2016. The new building has five lift shafts, each of which features an all-in-one D+H lift beam system. The special requirement: The lift status transmitters (LST) are to be installed directly onto the lift cars and also ensure needs-based ventilation.

If the $CO_2$-value increases in the shaft, the ventilation flaps in the top of shaft open automatically. However, if the LST acceleration sensor does not report any movement, such as on weekends or at the end of the workday, the flaps remain closed. Heating energy cannot escape. This special solution can be used at any time to guarantee optimum air quality in the lift car.

### A true plus for lift shaft smoke extraction

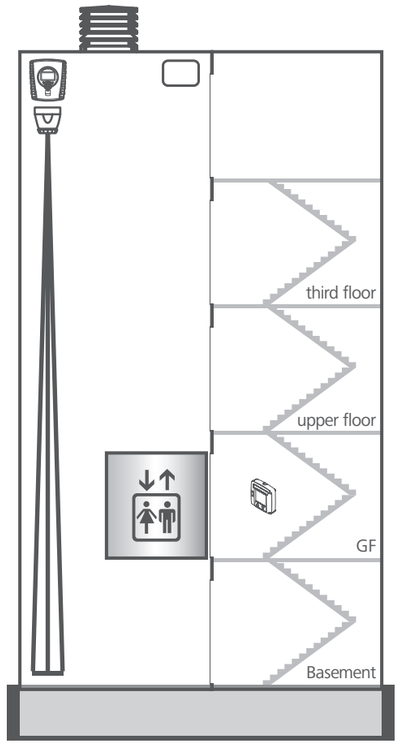
- \+ Closes permanent openings in the top of the shaft
- \+ Provides high potential for energy savings that pays for itself within a few years
- \+ Improves air quality in the shaft
- \+ Increases comfort in living and workspaces by reducing the draughts

**Kontorhaus Alsterufer 1–3 | Location:** Hamburg, Germany **| Completion:** Summer 2016 | **Architect:** APB. Grossmann-Hensel, Schneider, Andresen, Hamburg **| D+H Service:** D+H Hamburg

# The right solution for any lift shaft

The Lift Smoke Control all-in-one solution from D+H is always the right choice. The lift beam easily inspects all shaft heights, ranging from 8 to 200 meters. While doing so, it continuously transmits an infrared beam, which the reflector reflects on the shaft floor. The intelligent control unit takes over temperature monitoring and all ventilation functions. Additionally, D+H provides two more all-in-one solutions: a point smoke detector system with optical fire detectors and a smoke extraction system with an intake pipe that spans the entire height of the shaft.

## Kontorhaus Alsterufer 1–3 system solution




## All-in-one solution

As compact as it gets: The system monitors the lift shaft, regulates the time-controlled interval ventilation and, if needed, the air quality and the moisture measurement. Everything customized to meet your needs.



**Lift beam:**
An integrated laser assists with accurate shaft adjustment



**Opening element:**
Blind without weatherproofing and cap



**Lift status transmitter:**
Equipped with an integrated temperature, air quality and acceleration sensor

# + MORE POWER FEWER COSTS

You are completing a challenging large-scale architectural project and, as a result, want to keep the wiring effort and expense for smoke extraction as low as possible? You also want to save a lot of money in the process without compromising the safety and functionality? The D+H 230 V SHEV solution lets you achieve both: You can move the heaviest windows easily using the corresponding drives and long cabling routes. You can still use significantly thinner and more convenient cable sizes.

## Integrated 230 V smoke vent in practice: HafenCity University Hamburg

With D+H, you have the world's first 230 V complete system with EN 12101-2 approval at your disposal. The system is particularly suitable for complex large-scale projects. Such projects often involve moving a multitude of heavy windows and laying long cable routes. One example is the new HafenCity University building in Hamburg.

The spectacular architecture consists of two building elements as well as a large glass foyer in the entrance areas. Using this challenging architectural design, the larger cable size of a conventional 24 V system would have quickly led to bottlenecks in the cable trays. And the high weight of the cable would have also led to structural engineering problems. D+H has developed the perfect solution for this: a smoke and heat exhaust system that includes a complete 230 V emergency power supply system.

Today, this model has already been successfully installed in hundreds of places, including large atria, shopping malls, airports, train stations and large office buildings. This system has been ensuring the safety of the approx. 2500 students at HafenCity University Hamburg, which offers courses in architecture and metropolitan development, since April 2014. It also provides students with much fresher air for maximum concentration while studying.

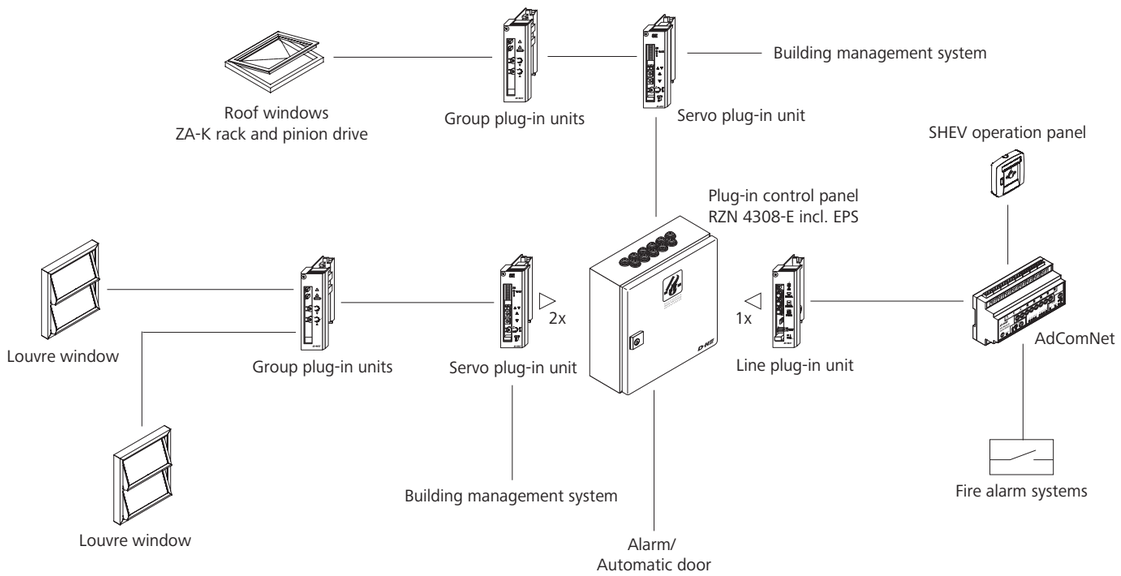
### A true plus for 230 V smoke extraction

- \+ One-of-a-kind system with consistent 230 V AC power supply from the controller to the drives
- \+ More performance, less wiring effort and expense
- \+ Ideal for long wiring paths and applications involving particularly heavy loads
- \+ Cable size is reduced by a factor of 10
- \+ Approval in accordance with the German directives VdS 2581 and VdS 2593
- \+ Certificate of Constancy of Performance in accordance with EN 12101-10

**HafenCity University Hamburg | Location:** HafenCity Hamburg, Germany
**Completion:** April 2014 **| Architect:** Code Unique, Dresden **| D+H Service:** D+H Hamburg

Photos: Cordelia Ewert

## System solution for HafenCity University Hamburg




230 V SHEV

### High-performance control panel

The 230 V AC SHEV system is the only system in the world with a consistent 230 V power supply from the controller to the drives. It was designed for use in complex buildings with long cable routes and various heavy-load applications in the roof area. Typical buildings are glass atria, train stations, airports and large multi-purpose halls. It offers the perfect combination of maximum performance and minimum wiring effort and expense. The control panels offer space for various plug-in units for smoke extraction and ventilation functions and are thus particularly simple to install and retrofit.

230 V emergency power supply

### Economical without fail

One thing is certain: safe operation with the 230 V EPS 401 emergency power supply. In addition to VdS approval, it also boasts a certified constancy of performance in accordance with EN 12101-10.
It has inverters with high-quality sine-output voltage, various status displays and a battery-powered impedance monitor. Dead batteries can be changed easily. This makes the 230 V emergency power supply both reliable and cost-efficient.

*Photos: Cordelia Ewert*

# Graduate engineer Thomas Rößler answers the five most important questions regarding the world's first certified 230 V complete system.

**In general, what advantage does a 230 V emergency power supply system have over a 24 V system?**

*T. Rößler:* The central point here is the cabling: For a 24 V system, I need larger cable cross-sections the longer the building's dimensions become. This doesn't make a difference if the length is 2 m, but when we start talking about more than 20 or 30 m, the cable cross-sections increase dramatically. A cable that is 100 m long, for example, can have a cross-section of over 16 $mm^2$. In larger buildings, we start having problems with structural aspects due to the heavy weight of the cables. The enormous advantage of a 230 V system here is that the system makes it possible to reduce the cross-section drastically. The normal installation cable can be used – in almost any length.

**What practical implications does this have?**

*T. Rößler:* The cost savings are enormous: In a 230 V solution, we can provide power to distant flaps and drives with significantly less expensive cables and lower weights. This makes the entire system more cost-effective. For smaller structures, such as a stairwell, a 24 V system is ideal. However, once we start talking about multiple storeys or an industry hall, for example, where there are larger cable routes, the 230 V solution is clearly more cost-effective.

**Can you give us an idea of how high these savings are?**

*T. Rößler:* Of course, we can provide some sample calculations. If we assume a cable route of 100 m in a complete SHEV system of a building, the total savings for control panels and cables would be several thousand euros. The difference becomes greater the longer the cable routes are. But the cost factor is not the only consideration. The visual advantages can also be a deciding factor. Large cable trays for a 24 V emergency power supply are sometimes difficult to reconcile with architects' ideas. In the 230 V solution, cable trays become much smaller and less obtrusive. Planners very often have problems with overloaded cable trays. One solution would be to have cabling with significantly smaller cross-sections.

**What about SHEV components that are operated at 24 V? How are they compatible with a 230 V control panel?**

*T. Rößler:* The SHEV control panel can be used to control and supply both 230 V and 24 V components. Whereas our drives are all designed for 24 V or 230 V, the weather sensors, for example, are supplied with 24 V. Using the 24 V plug-in unit in the SHEV control panel, we are able to supply the power for the weather control panel and, at the same time, supply the sun shading drive using the 230 V plug-in unit, for example. This interaction is very important for large buildings.

**The alternative of a 230 V SHEV system with its benefits – how well known is this among planners and architects?**

*T. Rößler:* It is still not sufficiently well known. I would like the communication among various specialist planners to function better through comprehensive coordination so that the advantages are visible for planners in different areas as well. In a way that the electrical planners have the advantage of lower cable costs, structural engineers benefit from lower cable cross-sections and architects can put their design ideas into practice. In our experience with the previously mentioned example structures, you can see very clearly that everyone benefits from increased collaboration between those involved.

*Thomas Rößler, Sales Manager for Germany, Austria, Switzerland D+H Mechatronic AG*

# + INTELLIGENT CONTROL ECONOMICAL PLANNING

You are thinking about how to combine life-saving smoke extraction with convenient ventilation – especially for complex applications? And in doing so, combining local smoke extraction controllers into one system? D+H is offering you AdComNet (ACN), the first SHEV bus system on the market that is certified in accordance with VdS.

With this innovative system, you have a flexible and economical bus communication at your disposal that you can use to control all drives. Solutions from D+H allow you to fulfil all current national and international fire protection directives and simultaneously save energy and money thanks to shorter cabling routes and smaller cross-sections.

## Comfortable without fail: AdComNet at the DNB Bank headquarters

D+H allows you to achieve comfort and safety in large buildings in an intelligent way – even for projects involving numerous storeys and various fire compartments. In addition to safe smoke extraction from escape routes in case of fire, AdComNet also provides you with effective thermal regulation through targeted ventilation.

At the new DNB Bank headquarters in Oslo, this is especially economical in the cold winter months and critical in terms of environmental technology. The 17-storey main building is part of the newly created „barcode cluster" district, which connects the main train station of the Norwegian capital to the fjord. After six years of construction time, the mega project was commissioned in 2013. It combines 20 different locations of the bank into three buildings which are connected via the ground floor. The extravagant architecture is based on numerous pixels. The individual pixel cubes have a side length of 6 meters which is the exact size that each work group at the bank would ideally need.

The modular pixel structure of the architecture requires an equally modular system architecture that is only achieved with the AdComNet solution from D+H. Despite low wiring effort and expense, the solution guarantees completely flexible use of space in the pixels. The pixel structure pattern in the façade is interrupted by the large, public entrance area and the meandering circular route in the interior, which connects all storeys to each other.

### A true plus thanks to bus communication

- \+ Large savings potential thanks to lower wiring effort and expense
- \+ Reduction of cable cross-sections and lengths
- \+ Only a tenth of the usual power consumption per node
- \+ No special power supply required if the mains power fails

**DNB Bank Headquarters | Location:** Oslo, Norway **| Completion:** 2013
**Architect:** MVRDV: Winy Maas, Jacob van Rijs, Nathalie de Vries, Rotterdam, Netherlands
**D+H Service:** D+H Sweden

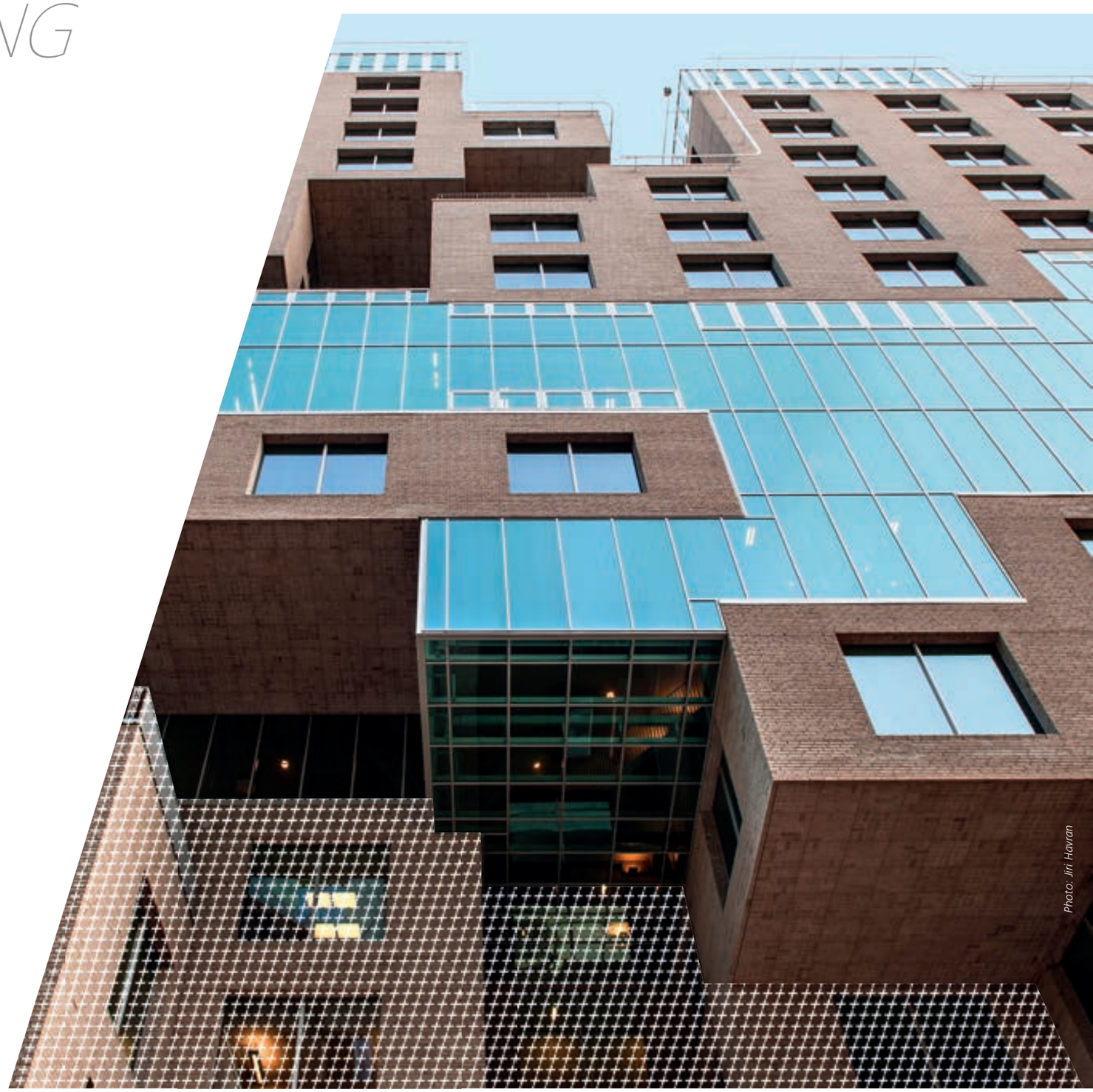
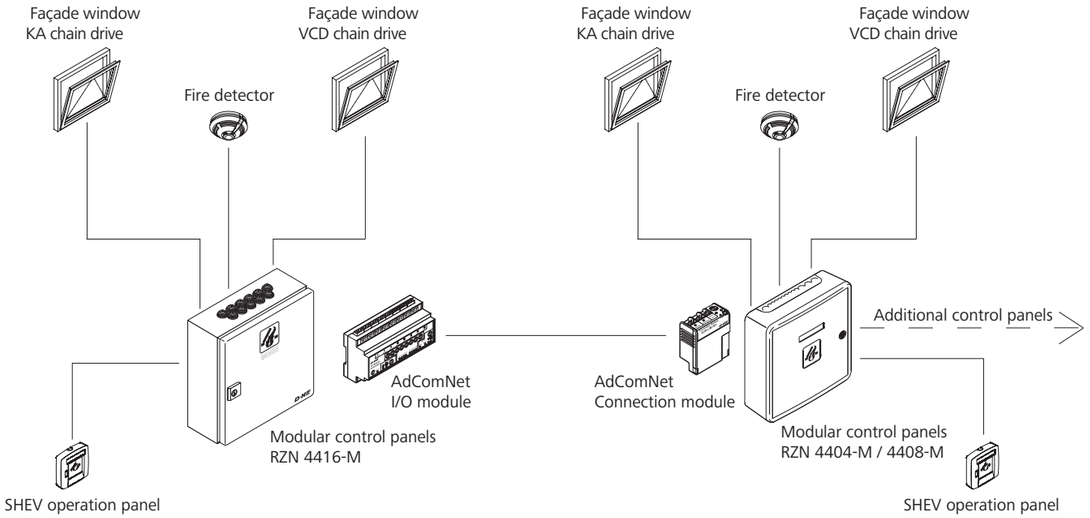


Photo: Jiri Havran

# This much safety is complex

AdComNet links 19 control panels in the building together so that completely different scenarios for opening and closing windows are possible depending on how the room is being used. In case of fire, for example, the windows in the affected area are opened immediately so that the dangerous fire smoke can escape. The windows are closed in areas not affected by the fire to protect these areas from the smoke.

## DNB Bank system solution

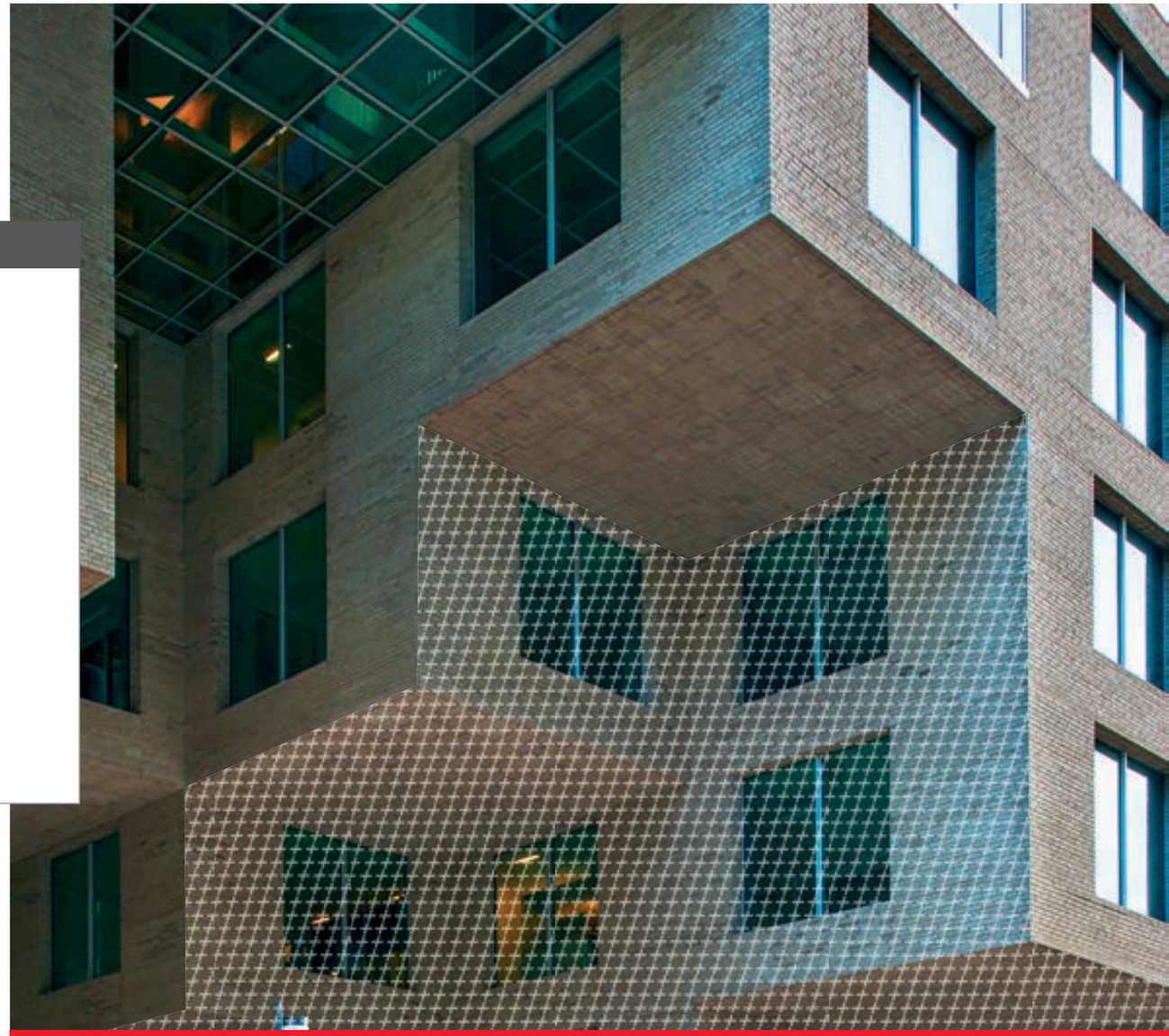




AdComNet

## With the best connections

AdComNet is the innovative combination of hardware components and a user-friendly operator software. The system combines all the knowledge related to smoke extraction and ventilation and reliably implements the necessary control and regulation processes. In doing so, the connection module combines the SHEV controller with the AdComNet. The I/O module is equipped with eight digital inputs and outputs and, via the integrated trigger line, enables the supply of smoke detectors and smoke buttons to the AdComNet.



## AdComNet + AdComBus – a disambiguation

The term „bus" refers to a system for data transfer between several nodes over a shared transfer path. AdComNet (ACN) is an especially safe bus communication network developed by D+H which combines standard smoke extraction controllers into a single comprehensive system. The Advanced Communication Network links control panels that are now conventional to enable complex scenarios for opening and closing windows or other ventilation equipment, depending on how the room is being used. This increases safety and networked communication also reduces the costs.

AdComBus (ACB) now makes the communication network even smarter. Thanks to the newest D+H solution with bidirectional, digital communication control panels, from now on any drive, even one within a group, can be controlled individually and with perfect positioning. Previously, the drives always operated as a group, but now they can function autonomously.

The Advanced Communication Bus allows drives to send status reports, such as completion or possible execution problems, back to the control panel and improve communication in the entire system.

# What is D+H contributing to the future of smart buildings?

Dialogue between Christoph Kern, member of the D+H board, and Stefan Decknatel, Head of Innovation Management.

*Kern:* Before we start talking about automated buildings, we should clarify a few terms. We need to make a distinction between smart home and smart building. A smart home describes intelligently networked functions in a residential building where various processes can be automated. One good example is the heating system's controller, that is switched off as soon as a window is opened. Here a window contact is linked to the heater so that the heater valve is automatically blocked in the event of window ventilation, reducing the loss of heating energy and therefore cutting energy consumption.

When „smart" systems like this are integrated in non-residential buildings, such as offices, industrial buildings etc., we call them smart buildings. Various systems for automatic control are installed and interlinked here so that users experience greater comfort levels, but operating processes are also more efficient. Building automation and energy management are the key words you will encounter again and again in this context.

*Christoph Kern, member of the board at D+H Mechatronic AG*

## „Simplicity is the goal"

*Decknatel:* In principle, the smart home and smart building do not exist at all yet. These terms are attempts at giving a name to a process that is still ongoing. However, we are still at the outset of development. Therefore, I'd prefer to call it a smart building system. Intelligent windows are still a vision. Whether something of this nature will become widespread one day is still a strategic question. Studies have shown that completely automated windows are not yet accepted at all in Germany. People need to feel like they can intervene. The case may be different 10 or 15 years from now. In the USA, people think it is completely normal for climate control systems to work independently.

**You can find this entire discussion in the 01/2016 edition of our customer magazine, "Driven".**

Driven

*Stefan Decknatel, Head of Innovation Management at D+H Mechatronic AG*

**The new D+H CDC-0252 chain drive**

## Calm and quiet

The sleek, universal chain drives of the CDC Series for mounted installation or profile-integrated installation have always operated quietly without being noticed. From now on, with the innovative CDC-0252, they will work more quietly than you ever imagined.

Because there is metal touching metal in conventional drives, they are somewhat louder due to their construction. This has to be prevented. Using an innovative decoupling process to disconnect the drive technology and additional design measures, D+H has separated these metal elements from each other. The result: Just as stable, but substantially quieter. Quieter by 6.8 dB, to be precise. When you consider the fact that the human ear experiences a difference of just 10 dB as being twice as loud, it becomes clear: the new CDC-0252 is the quietest revolution in the world of drives. The CDC is smart, too. The high-performance chain drive can be custom programmed using a computer or tablet. As a result, the drive functions, performance features, stroke lengths, opening widths and speeds can be configured according to requirements. And those options can even be configured separately for opening and closing. For the first time, there is a design that can perform a stroke of 800 mm in under 60 seconds thanks to its high-speed function.

# + SMOKE EXTRACTION SIMPLE VENTILATION

You are looking for a natural smoke extraction option that also offers the comfort of controlled ventilation and daylight?

Solutions from D+H provide you with skylight systems that direct poisonous gasses out of the building effectively in case of fire and guarantee extremely economical ventilation for everyday use thanks to low current consumption. The pre-installed systems from D+H consist of skylight fittings and integrated motorised rack and pinion drives, which can operate in virtually any snow/wind load conditions.

## Skylight systems in the Graz Nord shopping centre

D+H skylight systems allow you to fulfil the highest requirements for natural smoke extraction in accordance with EN 12101-2 as well as for controlled ventilation. In addition to quick and safe opening in case of fire, you can implement effective ventilation in everyday use. This was also used in the renovation of the Graz shopping centre, where a new shopping paradise was built on an area of approximately 10,000 m² in late 2015. An architectural highlight is the 10-meter-high canopy that combines two catering pavilions with the large main hall. Roof openings and skylights from Eberspächer ensure plenty of natural light and fresh air on the rest spots on the curved promenade below, and create a pleasant atmosphere for shopping and strolling.

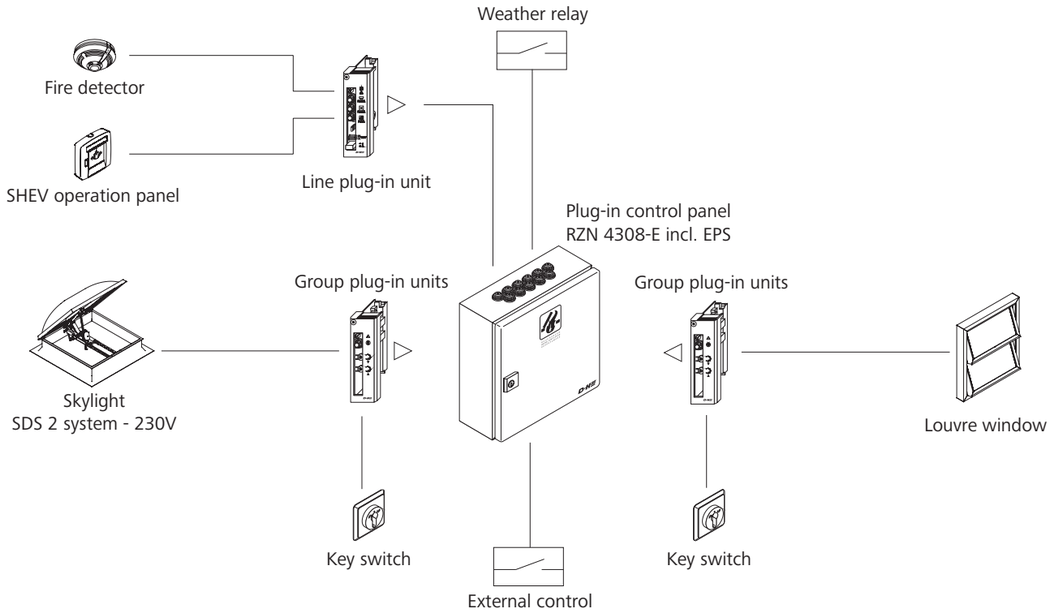
### A true plus for skylight systems

- \+ Optimal aerodynamic smoke extraction values by quick opening to 172°
- \+ Optimal power transmission, resulting in minimal strain and long service life of the fan frame and hinges
- \+ Best protection of the drive unit, so it can be used almost anywhere
- \+ Quick installation and easy handling thanks to assemblies pre-installed at the factory

**Graz Nord shopping centre | Location:** Graz, Austria | **Completion:** 2015
**Architect:** BEHF Corporate Architects , Vienna | **D+H Service:** D+H Vienna


Photos: Markus Kaiser

## Graz Nord shopping centre system solution

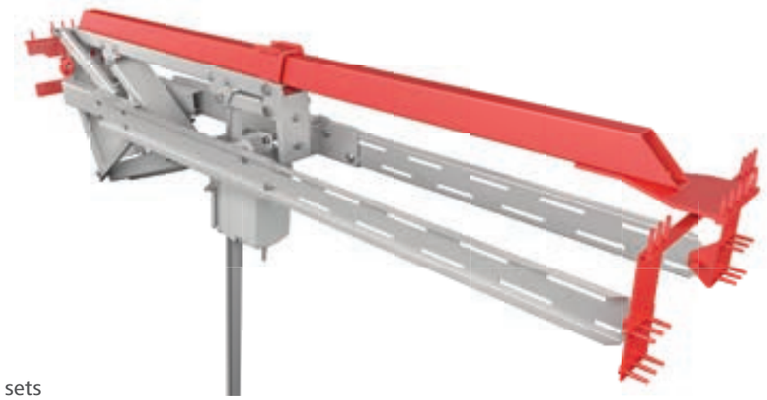



SDS Series

## The powerhouse

The high-performance drive from the DXD Series is designed specifically for heavy-load applications in combination with smoke extraction and ventilation for skylight systems. In addition to the drive unit, the skylight drive system (SDS) also includes a suitable installation set for various skylight providers.

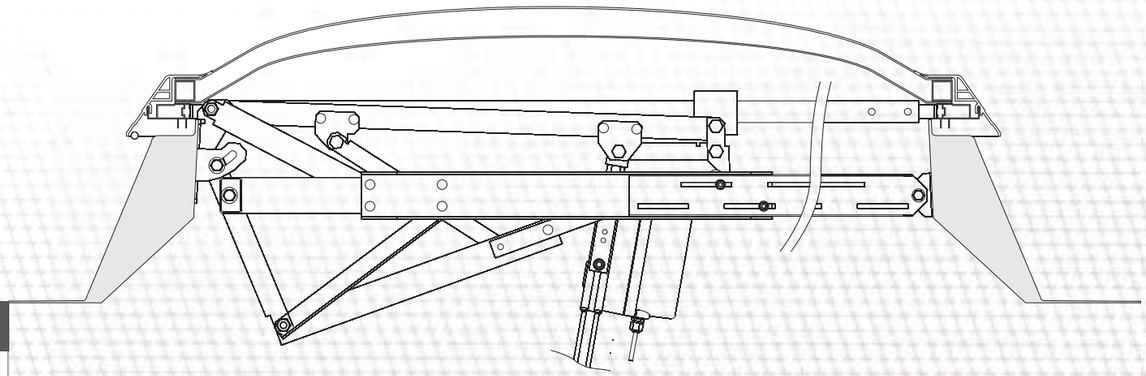
A high-speed function in the rack and pinion drive allows for especially fast opening of the skylight in case of fire. In addition, intelligent force, speed and path management ensures that the system has a good grasp on the situation during start-up and shut-down. A damped return flow also protects fan frames and hinges.



Installation sets

## Pure customized solution

Skylights from Eberspächer have been installed in the Graz Nord shopping centre. D+H offers customized installation solutions for manufacturers. In addition to Eberspächer, there are installation sets for skylights from Heller, Lamilux and other manufacturers.



## Skylight system opening phases

# + EXPERTISE STATE-OF-THE-ART

For D+H, safety and comfort are not only the results of outstanding products. Benefit from extensive system solutions and from our unique expertise in the area of smoke extraction and natural ventilation, as well as from the customized and object-oriented special applications, which set us apart from the competition. All D+H service and sales partners are certified and regularly trained smoke extraction specialist companies. Together with D+H Mechatronic AG, they are there to help you anywhere in the world with full service and consistent quality assurance in all phases of the project, from consulting and project planning to installation, commissioning and maintenance. The service of D+H is divided into four areas.

## Planning support

No matter what challenges you are facing: At D+H you will find a partner that will support you starting in the earliest phases of your projects. From the outset, we are happy to take over all project planning for you in matters related to smoke extraction and ventilation – including coordination with fire protection experts and building authorities. This ensures planning reliability. As a client of D+H you can take advantage of extensive expertise of all relevant standards and regulations worldwide.
You will bring state-of-the-art solutions for smoke extraction and ventilation to your object development in an economical and technically optimal way – and make the building safe.

## Installation

Our partner system guarantees that D+H products are installed exclusively by educated and specially trained technicians in compliance with the technical directives and regulations. This normally happens after the windows have been installed. In addition, an in-person handover and briefing by the certified SHEV contractors is included in the service.

## Commissioning

After the installation, D+H makes sure that the installed smoke vent operates flawlessly. Before the expert approval by the TÜV, a professional approval process is always carried out by D+H. This guarantees a smooth and uncomplicated expert approval process later on.

## Maintenance

The building operator is responsible for the functional safety of the smoke vent. Through a service contract, the operator can verify that he/she is in compliance with this obligation and is only commissioning maintenance services from the most qualified SHEV specialist companies. Maintenance work on a smoke vent normally takes less than 30 minutes and saves human lives in case of fire.

D+H Academy

## Quenching the thirst for knowledge

Take advantage of our expertise anytime and anywhere. On-the-go with the customer, at the office or at home on the couch: Through D+H Academy, you can learn critical knowledge in the area of smoke extraction and ventilation anywhere. Just visit the academy on your tablet, smartphone or computer. As a sales partner or D+H customer, you have the option of learning about the latest technology at any time. There are training sessions on product innovations, webinars and plenty of interesting background information. Still need access to the academy? Simply contact us or one of our partners in your area.

Photos: Kajetan Kandler

# +AIR LOCATION

All solutions from D+H offer you one thing above all – benefits. From initial planning to maintenance. If you want to know how we can best support you and your project, get in contact with us. We are right in your area.

**You can find your responsible D+H Partner at www.dh-partner.com**

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