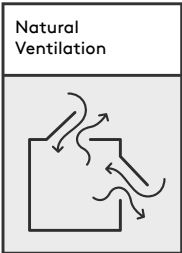


# Planning Folder

## Window and Building Automation

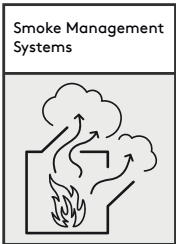


# STG-Beikirch – modular system solutions for air and safety



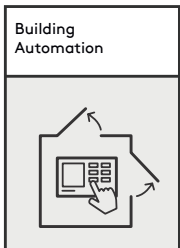
## Natural aeration and ventilation

With natural ventilation systems from STG-Beikirch, energy-efficient, demand-oriented flat roof and façade solutions for a pleasant room climate with a high proportion of fresh air can be realised. Thanks to a modular modular product system of drives and controls, they can be flexibly adapted to all requirements in new construction and renovation - including integration into the building management system.



## Smoke extraction systems

Natural smoke and heat ventilation systems and smoke extraction systems from STG-Beikirch ensure the safety of escape and rescue routes in the event of fire and guarantee the protection of persons, property and real estate. The system portfolio is certified according to current standards, regulations and requirements.



## Building automation

Building automation includes all equipment for automatic control and regulation as well as monitoring, optimization and operation of the technical building equipment. With solutions from STG-Beikirch, the basis is laid for the simple integration of the components of the building envelope into the building management system. Based on a modular system, individual system solutions for control and regulation technology are designed and implemented.

**STG-Beikirch** is part of the **Light + Air** division of the Kingspan Group and is one of Europe's leading manufacturers of smoke protection pressure systems (SPS), smoke and heat extraction systems (SHEVS) and controlled natural ventilation systems. Based in Ireland, the Kingspan Group employs over 14,000 people worldwide and is a leader in sustainable building products such as high-performance insulation and building envelope systems.



Our vision:

Become the GLOBAL LEADER in ENERGY EFFICIENT, sustainable LIGHTING, natural VENTILATION and smoke management solutions for the roof and façade non-residential sector.

## Table of contents

Our products – ranging from intelligent drive technology to individually programmable ventilation and SHE control panels to solutions for integration into central building management systems – meet the highest standards of safety, efficiency and quality.

This Planning File offers a detailed overview of our complete portfolio of drives, control panels, accessories and safety components. To help you find the perfect solution for your application requirements – quickly and reliably.

### Section

- 0      About us; contact details
- 1      Drives
  - 1.1 Linear drives
  - 1.2 Chain drives
  - 1.3 Electrical locking mechanisms
- 2      Control panels
  - 2.1 Central 24 V control panels for SHE and ventilation
  - 2.2 Decentralised 24 V BUS control panels for SHE and ventilation
  - 2.3 Control panels for smoke pressure systems (SPS)
  - 2.4 24 V and 230 V ventilation control panels
  - 2.5 Accessories for SHE and ventilation control panels
- 3      Smoke and heat extraction systems
- 4      Planning aids

## About us; contact details

### **Kingspan + STG-Beikirch:**

Strong partners. Strong brands. Strong portfolio.

STG-Beikirch GmbH & Co. KG is one of Europe's leading manufacturers of ventilation and natural smoke and heat extraction products and system solutions for industrial, commercial and administrative buildings.

Kingspan is the world's leading supplier of roof and wall insulation products and building envelope systems.

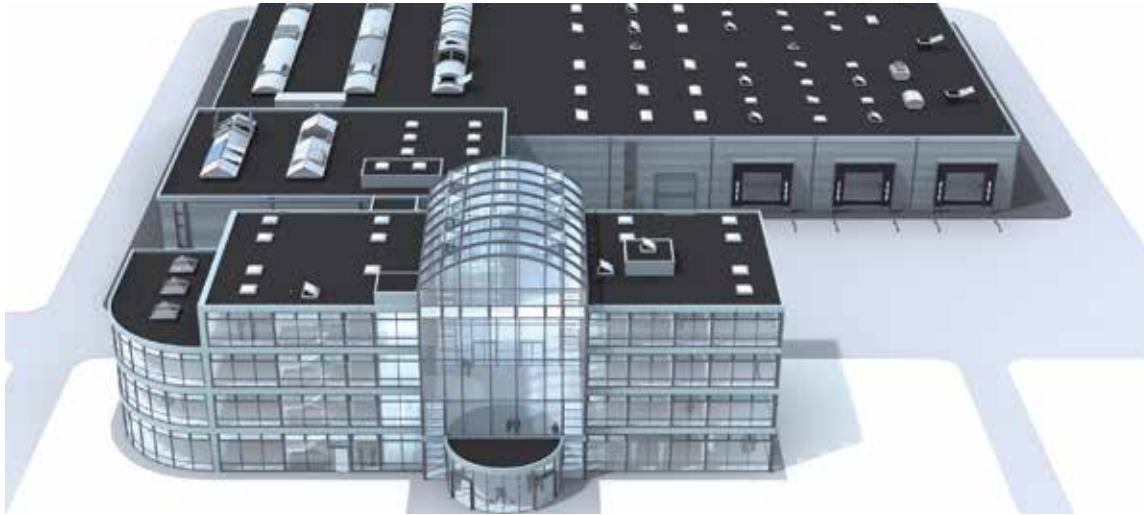
Core competencies and expertise have been pooled in the newly established "Kingspan Light + Air" business unit to focus even more closely on an integrated approach to designing complex system solutions to lighting, ventilation, safety and energy efficiency challenges to create smart building envelopes.

The value chain is, moreover, unique in the marketplace, spanning engineering, production, installation and service. Our activities always focus on energy efficiency – to ensure sustainable and safe construction with maximum value added for our customers.

### **In this section, you will find:**

- Information about the company
- Information about who you can contact

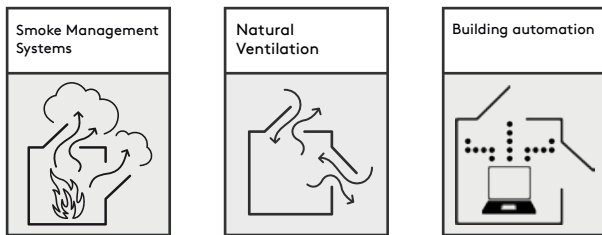
## **System solutions for Natural Ventilation and Smoke and Heat Extraction – smart and safe**



The building envelope forms part of the building management system and therefore influences the safety of people and equipment, the energy performance of a building and the productivity of the people who work in it. Securing the escape and rescue routes is a key factor.

Together with our new shareholder Kingspan, we can offer a unique modular system of components for the entire building envelope.

- Our products – ranging from intelligent drive technology to individually programmable ventilation and SHE control panels to solutions for integration into central building management systems – meet the highest standards of safety, efficiency and quality.



#### ■ Leading experts for more than 30 years

For more than 30 years, STG-Beikirch GmbH & Co. KG has been developing standardised and project-specific façade automation solutions and ranks among Europe's leading manufacturers of smoke pressure systems (SPS), smoke and heat extraction (SHE) and controlled natural ventilation systems.

The technology behind our servo-powered window drives, contactless finger protection, SPS and SHE systems enhances convenience and safety in industrial, commercial and administrative buildings around the world. We also play a valuable role in optimising capital expenditure and operating costs.

Take advantage of our expertise and the competence we have developed from projects of all sizes, from working closely with specialist testing agencies and engineering firms, and from our active involvement in various associations and working groups focusing on customised modular fire protection and ventilation solutions from a single source.

We provide a broad range of products, technologies and services from our production facility in Lemgo. Our portfolio encompasses the design, planning, execution and servicing of ventilation equipment and smoke and heat extraction systems, together with their system components. The Industrial Electronics business unit of STG-Beikirch manufactures electronic components for in-house and third-party production use.

Since October 2016, STG-Beikirch has been part of the new "Light & Air" division of Kingspan.

#### ■ Kingspan Group

Founded in the late 1960s, Kingspan is meanwhile listed on the stock exchange and ranks among the global leaders in the field of sustainable high-performance building insulation products, building envelope systems and solar-integrated building envelopes.

The product portfolio includes daylight systems, insulated roof and wall elements, as well as panels for sectional doors, complete with accessories. The company is acknowledged throughout the entire building industry for its outstanding innovation, design, quality and engineering expertise.

As part of its business strategy to develop products and system solutions to continuously improve energy efficiency and fire protection, Kingspan formed a new global division – "Kingspan Light & Air".

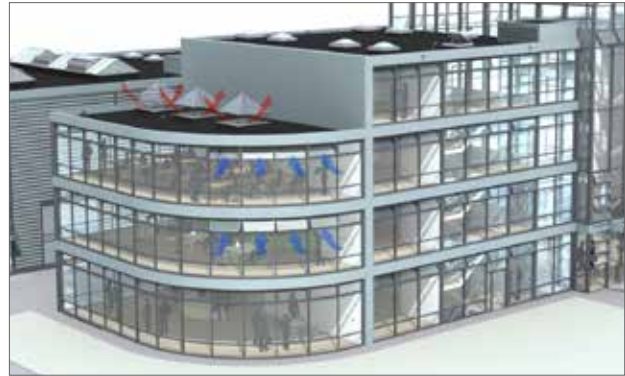
This business unit brings together all the core competencies surrounding sustainable lighting, natural ventilation and smoke management solutions for flat roofs and commercial building façades.

As one of the leading manufacturers and providers of ventilation and safety solutions in the European façade market, STG-Beikirch is one of the key members of the Kingspan Light & Air division.

» For more information about Kingspan, please visit  
[www.kingspan.com](http://www.kingspan.com)

## Window Automation

For automated building envelopes – smart and energy efficient



### 90% of all fire casualties are smoke victims ...

The danger of a fire lies not in the fire itself, but more in the smoke it causes. Smoke and the ensuing toxic fumes spread, restrict visibility and block escape routes. The toxins cause smoke poisoning.

Ensuring quick expulsion of the smoke – which can form in enormous quantities in a short space of time – is crucial. This task is performed by smoke and heat extraction (SHE) systems.

Buildings that are not equipped with SHE are completely enveloped in fumes within just a few minutes.

Any attempt at rescue is rendered impossible by this layer of fumes!

### Smoke and heat extraction (SHE) systems: Natural lift extracts smoke

SHE systems are crucial to save lives and property. A smoke and heat extraction system keeps smoke levels down in the evacuation routes and extracts the smoke reliably out of a building. A system that – in the event of a fire – can save lives, protect property and support rapid evacuation.

### Smoke pressure (SPS) systems: Overpressure keeps out smoke

Smoke pressure systems keep indoor corridors free of smoke. In the event of fire, smoke extraction and fresh air flaps open and flush the toxic smoke out of the indoor safety staircase. Continuous overpressure ensures that toxic smoke and fumes cannot escape from other areas into escape and evacuation routes. Unlike SHE systems, SP systems are specially designed for use in high buildings or indoor building sections.

### Controlled natural ventilation: Thermal lift aerates and ventilates

The importance of controlled natural ventilation in buildings is growing.

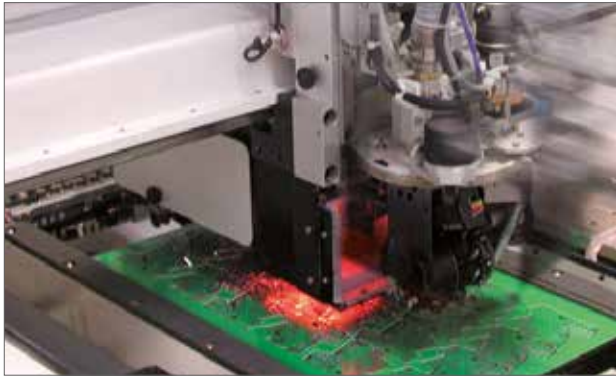
Modern architecture with its large glass façades and technical progress with increasingly improved insulation are preventing the exchange of air.

Controlling the opening of windows leverages natural wind and thermal powers:

- Ensures the necessary exchange of air
- Naturally air conditions the building
- Eliminates excess heat by cooling down at night
- Creates a healthy climate and friendly atmosphere

## Industrial Electronics

From planning through to production



### Your partner for industrial electronics

We support your products throughout their entire life cycle: From layout to tested circuit board, from development and design consulting to supply chain management including procurement of the components and circuit boards, multi-technology assembly, testing and packaging, to international delivery logistics and comprehensive after-sales service.

STG-Beikirch develops and manufactures electronic assemblies and equipment for both its own and customer-specific products. Our activities span the entire field of industrial electronics. Our diverse electronic integration portfolio encompasses assembly development, materials management and production, and even complete assembly of your customised housing.

### Production facilities that incorporate best engineering practice

SMD production equipment, our EMC measuring booth for testing electronic control panels, our electronic assembly and our EN ISO 9001 and EN ISO 14001 certifications all testify to our success and competence as an EMS service provider. We can manufacture your electronic assemblies using cutting-edge systems equipped with both conventional and SMD technology. Comprehensive testing using in-circuit and functional testers is a standard feature of the services we offer.

- **Services portfolio:** Development support, hardware/software development, complete product design, materials management, prototypes/small series, series production, test design/assembly tests, building/final testing of devices, after-sales service/repairs
- **Sectors:** Industry, medical technology, communications/network technology, lighting technology, consumer energy technology, building technology, light management, light control, performance control
- **Manufacturing competencies:** SMD, THT, manual assembly, varnishing, spot soldering, AOI inspection, hardware and software development, device assembly and materials procurement
- **Competencies:** Power electronics, mechanics

Research, development and project delivery are just as much a part of our main business focus as the sale of electronic control panels, drives and electrical SHE and ventilation systems.

» For more information about our Industrial Electronics business unit, please visit:  
[www.stg-beikirch-industriielektronik.de](http://www.stg-beikirch-industriielektronik.de)

## Who to contact

Professional advice from STG-Beikirch's sales representatives team

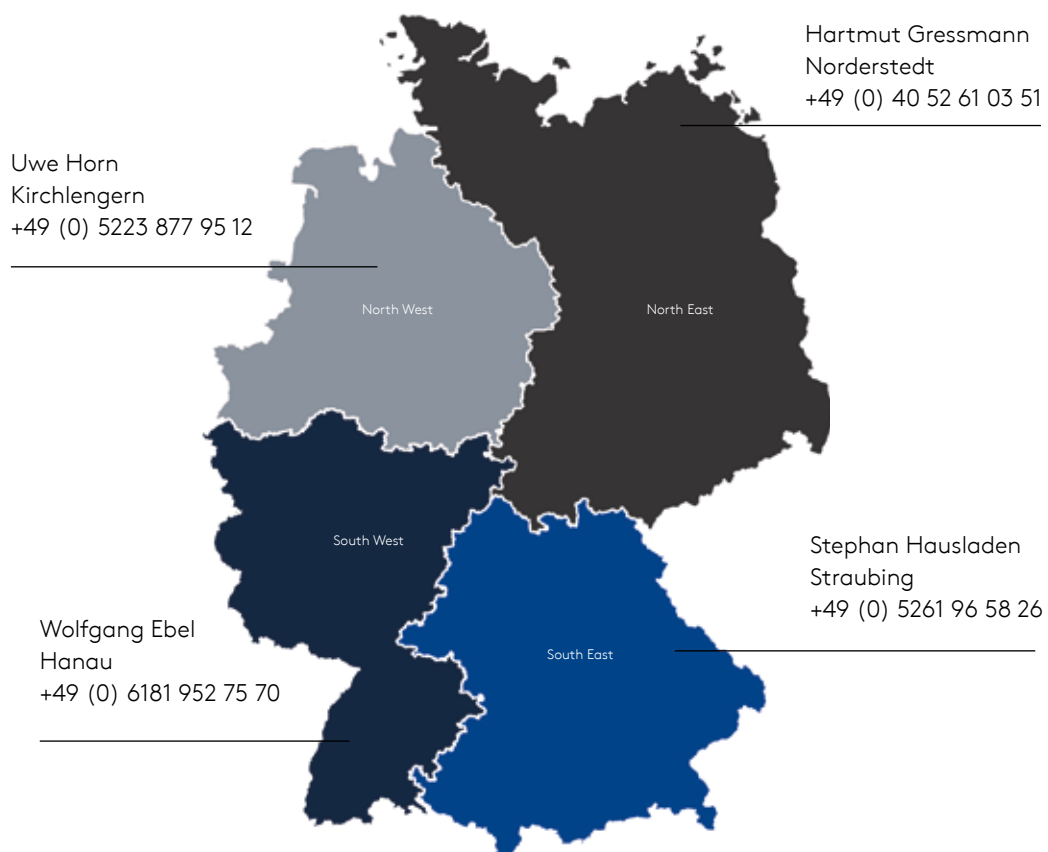
### Export & Business Development Director

Mo Noudari

T: +49 (0) 5261 9658 159

M: +49 (0) 176 182 649 05

E: [m.noudari@stg-beikirch.de](mailto:m.noudari@stg-beikirch.de)



## Training Programmes



### Expand your expertise.

Smoke and heat extraction systems rank among the key technical fire protection components in a building. A thorough technical understanding of these systems is crucial. We therefore offer comprehensive training programmes and seminars – including our SHE experts training course, SHE refresher courses and MZ3 product training sessions.

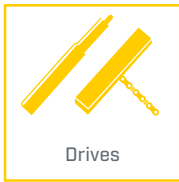
As part of our training programmes, you will be given information about the performance requirements and protective aims of SHE systems and about current statutory norms and guidelines, as well as a practically-oriented overview of the latest equipment and systems technology, and control systems made by STG-Beikirch.

Our training programmes and seminars give you the best possible qualification and ensure you are always up to date with regard to best engineering practice, enabling you to optimise your standard-compliant and technical performance of commissioning, maintenance and repair works.

All training programmes are available in different formats:

- In-house training at our training centre in Lemgo:  
Apart from learning the technical knowledge, you can also see the products themselves close up.
- On-site training allows you to learn quickly without having to travel. Content can be tailored to your individual requirements. Feel free to ask for more details.

» For detailed information about our training programmes, please visit  
[www.stg-beikirch.de/schulungen-seminare.html](http://www.stg-beikirch.de/schulungen-seminare.html)



## 1 Drives

We manufacture all our drives ourselves and can therefore guarantee outstanding quality. We also manufacture all the chains for our drives from high-quality stainless steel.

The consistent modularity of our products – regardless of whether for smoke extraction or natural aeration and ventilation through windows, flaps, louvres or skylight domes – enables us to manufacture a wide range of different drive variants to ensure we can offer the right solution for any project.

### Our portfolio

- Linear drives ranging from 500-2000 N
- Accessories for linear drives – e.g. hinge and standard brackets
- Chain drives ranging from 200-700 N
- Accessories for chain drives
- EasyDrive software and signal contacts
- Electrical locking mechanisms
- Accessories for electrical locking mechanisms – e.g. tappets and sequential controllers

### SYSTEM BENEFITS:

- In-house production of chain, linear and locking drives
- Ideal for reliable smoke extraction and natural aeration and ventilation
- Numerous drives with innovative EasyDrive/2 technology
- Choice of drives with different power levels
- Small and large opening widths
- Special designs for integration in a profile

**EasyDrive<sup>2</sup>**  
Safe Efficient Intelligent

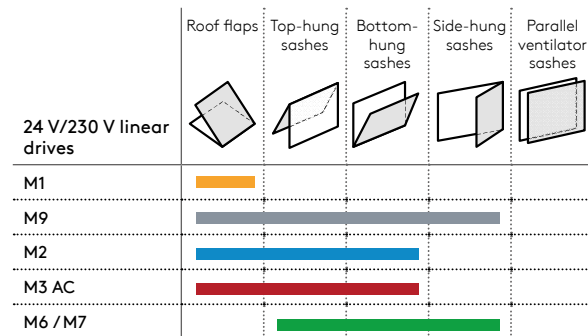
### »» Learn more:

If you would like to learn more about our products and services, please go to [www.stg-beikirch.de](http://www.stg-beikirch.de).

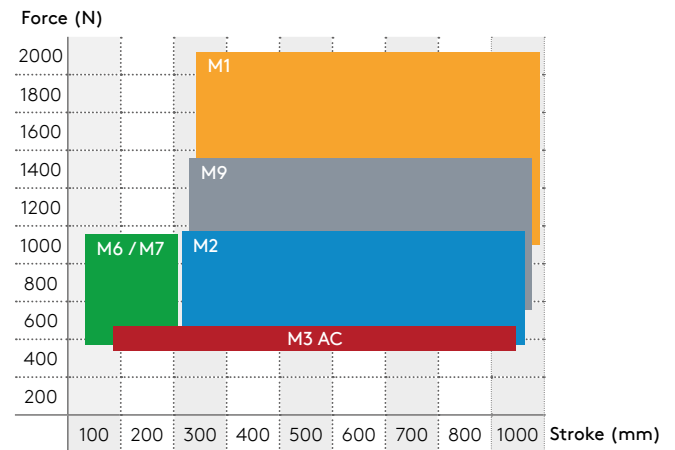
## Guide to selecting 24 V DC and 230 V AC linear and chain drives

- **Note:** The diagrams offer an overview of motor performance.  
As opening widths increase, the pressing forces of chain drives may decrease.  
Please refer to the load-displacement diagrams in Section 4.

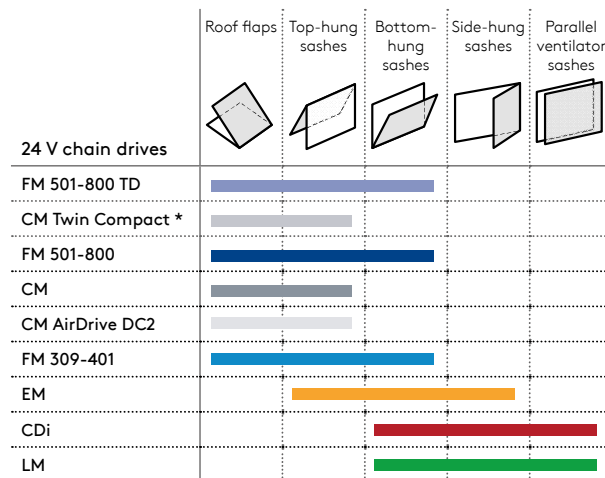
Preferred applications for 24 V/230 V linear drives



Performance range: 24 V/230 V linear drives

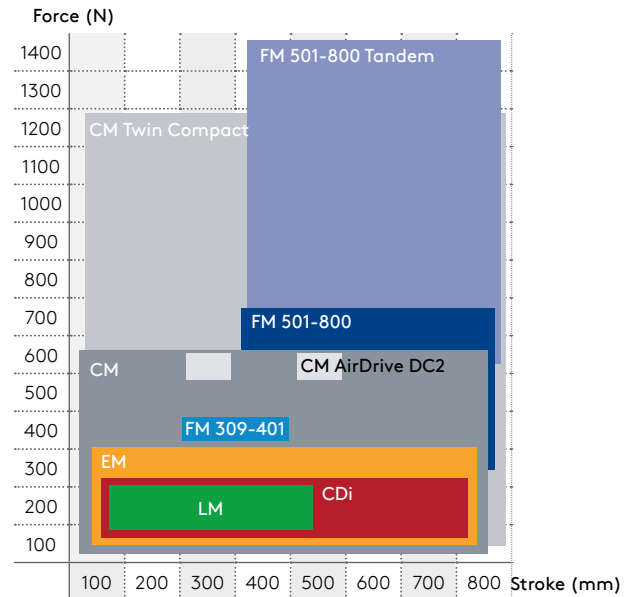


Preferred applications for 24 V chain drives

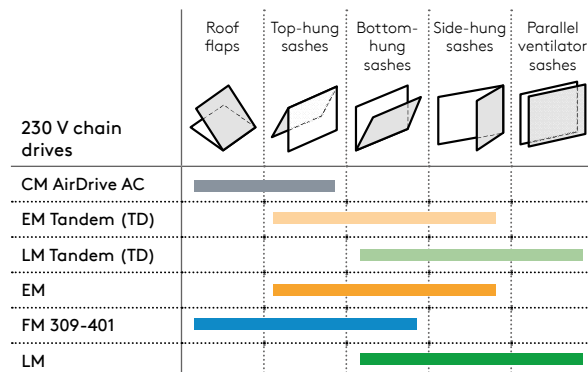


\* particularly suitable for narrow and heavy sashes

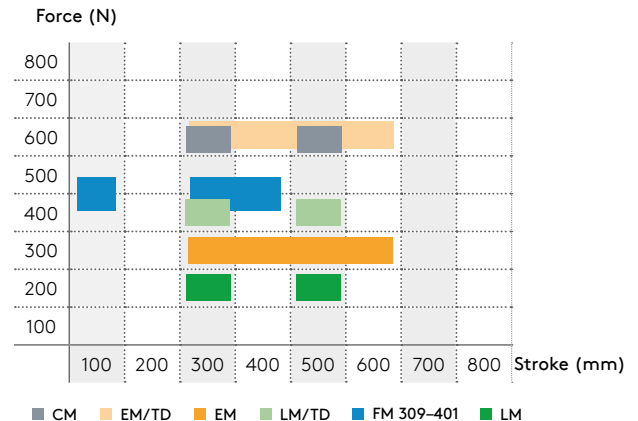
Performance range: 24 V chain drives



Preferred applications for 230 V chain drives



Performance range: 230 V chain drives





## 1.1 Linear drives

1.1

Our 24 V DC linear drives for SHE and daily ventilation are particularly powerful drive systems fitted with a push spindle to open and close larger sashes, flaps and skylight domes.

Drives are available for the widest range of window types and sizes, with up to 2000 N power and opening widths up to 1000 mm. An additional synchronous module ensures the exact synchronisation of linear drives on a single window.

Our 230 V AC drives are available up to 1000 N and with opening widths up to 750 mm.

### Our smoke extraction and ventilation portfolio

**M2**

Page 1.1 | 1



**M6**

Page 1.1 | 3



**M7**

Page 1.1 | 5



**M9**

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**M1**

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### Our controlled natural ventilation portfolio

**M3**

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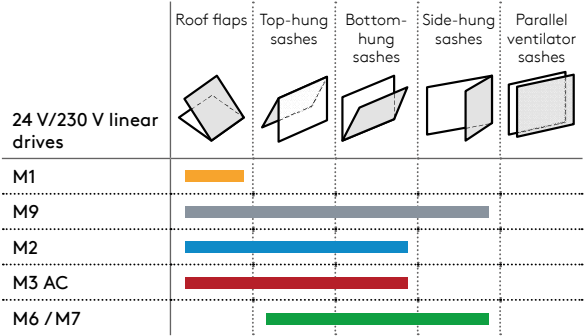
### Accessories

Page 1.1 | 13

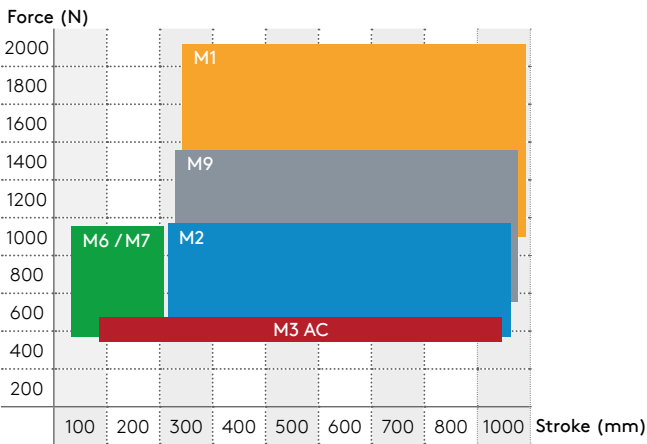
# Guide to selecting 24 V DC and 230 V AC linear drives

The diagrams offer an overview of motor performance.

## Preferred applications for 24 V/230 V linear drives



## Performance range: 24 V/230 V linear drives





### 1.1.1.1 M2 24 V linear drive

Opens and closes window casements, roof windows and skylight domes for smoke and heat extraction and daily ventilation



Universal linear drive for providing ventilation and extracting smoke, for use on window casements, roof flaps, skylight domes and continuous rooflights.

#### Benefits/ Features

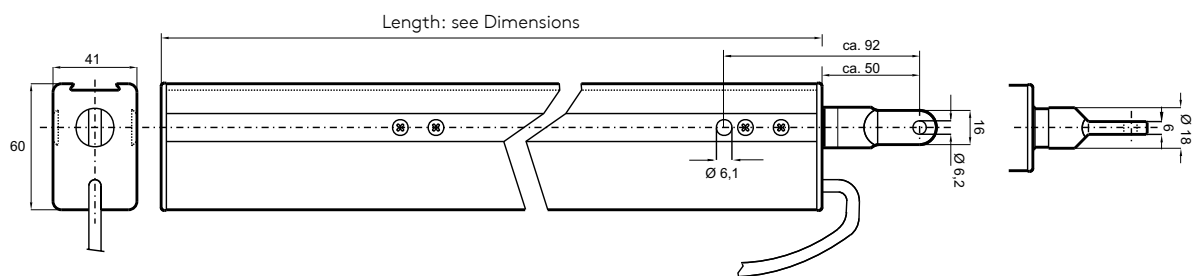
- Different pressing forces available (500 N and 1000 N)
- Automatic switch off when end position is reached
- Optional synchronous modules for synchronous operation of multiple drives
- Maintenance-free due to permanent lubrication
- Dust-tight and splashproof (protection category IP 54)
- Non-corrosive aluminium housing and thrust tube

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung windows
- Skylight domes

#### Material

- Housing: Aluminium
- End caps: Black plastic
- Colour: EV1/anodised silver or RAL on request



## Technical specifications

Version	M2			
	M2 500 N		M2 1000 N	
	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...

## Electrical properties

Rated voltage	24 V DC (-15%/+25%)			
Permissible ripple in rated voltage	2 V <sub>ss</sub>			
Rated current	1 A			
Cutoff	Internal	External, via synchronous module	Internal	External, via synchronous module
Protection class	III			

## Mechanical properties

Stroke length	300, 500, 750 and 1000 mm			
Pressing force	Max. 500 N		Max. 1000 N	
Tractive force	Max. 500 N		Max. 1000 N	
Locking force	2000 N			
Running speed	Approx. 8.3 mm/s		Approx. 4.2 mm/s	
Duty cycle	DC 30 (10 min.)			
Service life	> 10,000 cycles			
Dimensions (L x H x D)	Stroke ≤ 750 mm: (stroke + approx. 228 mm) x 60 x 41 mm	Stroke ≤ 750 mm: (stroke + approx. 238 mm) x 60 x 41 mm	Stroke ≤ 749 mm: (stroke + approx. 228 mm) x 60 x 41 mm	Stroke ≤ 749 mm: (stroke + approx. 238 mm) x 60 x 41 mm
	Stroke ≥ 751 mm: (stroke + approx. 290 mm) x 60 x 41 mm	Stroke ≥ 751 mm: (stroke + approx. 300 mm) x 60 x 41 mm	Stroke ≥ 750 mm: (stroke + approx. 290 mm) x 60 x 41 mm	Stroke ≥ 750 mm: (stroke + approx. 300 mm) x 60 x 41 mm

## Electrical connection

Connecting cable	2 x 0.75 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> + 3 x 0.5 mm <sup>2</sup>	2 x 0.75 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> + 3 x 0.5 mm <sup>2</sup>
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## Installation and ambient conditions

Ambient temperature	-5 °C to +75 °C
Protection category	IP 54

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

## Order information

Version	M2 500 N		M2 1000 N	
	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...
Stroke/mm	Item number			
300	64001300	13362000309	64030300	13362100309
500	64001500	13362000509	64030500	13362100509
750	64001750	13362000759	64030750	13362100759
1000	64000760	13362001009	64031000	13362101009



### 1.1.1.2 M6 24 V linear drive

Opens and closes façade windows to a wide angle to extract smoke and provide ventilation



Linear drive for use in bottom-hung sashes and louvre windows, skylight domes, continuous rooflights or skylights.

#### Benefits/ Features

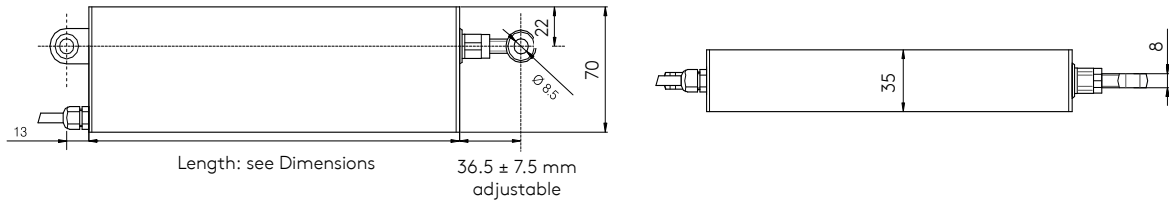
- Different pressing forces available (500 N and 1000 N)
- Integrated electronic max. load cutoff
- Opening angle up to 90°
- Dust-tight and splashproof (protection category IP 54)
- Can be combined with additional locking mechanism using ESF sequential control, see Section 1.3.4
- Parallel operation on large casements using external ESFT tandem control, see Section 1.3.4

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung windows, side-hung sashes
- Preferably for low casements, bottom-hung windows that open inwards
- Skylight domes

#### Material

- Housing: Rectangular aluminium profile
- End caps: Black plastic
- Colour: EV1/anodised silver or RAL on request



#### Technical specifications

Version	M6 500 N		M6 1000 N	
	.../EV1/...	.../LA/EV1/...	.../EV1/...	.../LA/EV1/...
Electrical properties				
Rated voltage	24 V DC (-8%/+20%)			
Rated current	Approx. 0.85 A			
Cutoff	External ESF/ESFT max. load cutoff	Internal	External ESF/ESFT max. load cutoff	Internal
Protection class	III			
Mechanical properties				
Stroke length	100, 150, 200 and 250 mm			
Pressing force	Max. 500 N		Max. 1000 N	
Tractive force				
Locking force	2000 N			
Running speed	Approx. 5.88 mm/s		Approx. 3.33 mm/s	
Duty cycle	DC 30 (10 min.)			
Service life	> 10,000 cycles			
Dimensions (L x H x D)	up to 110 mm stroke: 200 x 70 x 35 mm from 110 mm stroke: (stroke + 90 mm) x 70 x 35 mm			
Electrical connection				
Connecting cable	2 x 0.5 mm², length approx. 2.5 m			
Installation and ambient conditions				
Ambient temperature	-5 °C to +65 °C			
Protection category	IP 54			

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	M6 500 N		M6 1000 N	
	.../EV1/...	.../LA/EV1/...	.../EV1/...	.../LA/EV1/...
Stroke/mm	Item number			
100	64100500	64100501	64100100	64100101
150	64150500	64150501	64150100	64150101
200	64200500	64200501	64200100	64200101
250	64250500	64250501	64250100	64250101



### 1.1.1.3 M7 24 V linear drive

Opens and closes façade windows to a wide angle to extract smoke and provide ventilation



Linear drive for use in bottom-hung sashes and louvre windows, skylight domes, continuous rooflights or skylights.

#### Benefits/ Features

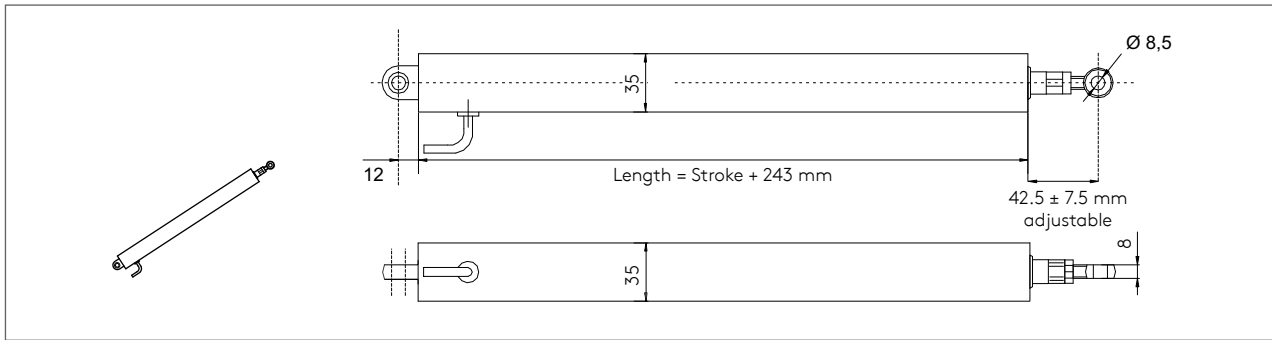
- Different pressing forces available (500 N and 1000 N)
- Integrated electronic max. load cutoff
- Opening angle up to 90°, depending on type of installation and bracket
- Dust-tight and splashproof (protection category IP 54)
- Slimline square housing profile (35 x 35 mm) enables installation on the frame side if clearance on the all-round frame is inadequate
- Can be combined with additional locking mechanism using ESF sequential control, see Section 1.3.4
- Parallel operation on large casements using external ESFT tandem control, see Section 1.3.4

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung windows, side-hung sashes
- Preferably for low casements, bottom-hung windows that open inwards
- Skylight domes

#### Material

- Housing: Rectangular aluminium profile
- End caps: Black plastic
- Colour: EV1/anodised silver or RAL on request



#### Technical specifications

Version	M7 500 N		M7 1000 N	
	.../EV1/...	.../LA/EV1/...	.../EV1/...	.../LA/EV1/...
Electrical properties				
Rated voltage	24 V DC (-8%/+20%)			
Rated current	Approx. 0.85 A			
Cutoff	External ESF/ESFT max. load cutoff	Internal	External ESF/ESFT max. load cutoff	Internal
Protection class	III			
Mechanical properties				
Stroke length	150, 200, 300, 400 and 500 mm			
Pressing force	Max. 500 N		Max. 1000 N	
Tractive force				
Lockiing force	2000 N			
Running speed	Approx. 5.88 mm/s		Approx. 3.33 mm/s	
Duty cycle	DC 30 (10 min.)			
Service life	> 10,000 cycles			
Dimensions (L x H x D)	(Stroke + 243 mm) x 35 x 35 mm			
Electrical connection				
Connecting cable	2 x 0.5 mm², length approx. 2.5 m			
Installation and ambient conditions				
Ambient temperature	-5 °C to +65 °C			
Protection category	IP 54			

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	M7 500 N		M7 1000 N	
	.../EV1/...	.../LA/EV1/...	.../EV1/...	.../LA/EV1/...
Stroke/mm	Item number			
150	67150500	67150501	67150100	67150101
200	67200500	67200501	67200100	67200101
300	67300500	67300501	67300100	13367300101
400	67400500	67400501	67400100	-
500	67500500	67500501	67500100	-



#### 1.1.1.4 M9 and M9 Water Resistant (WR) 24 V linear drive

Opens and closes window casements, skylight domes and roof windows to extract smoke and provide ventilation



Universal linear drive for providing ventilation and extracting smoke, for use on window casements, roof flaps, skylight domes and continuous rooflights. Optional water resistant (WR) type.

#### Benefits/ Features

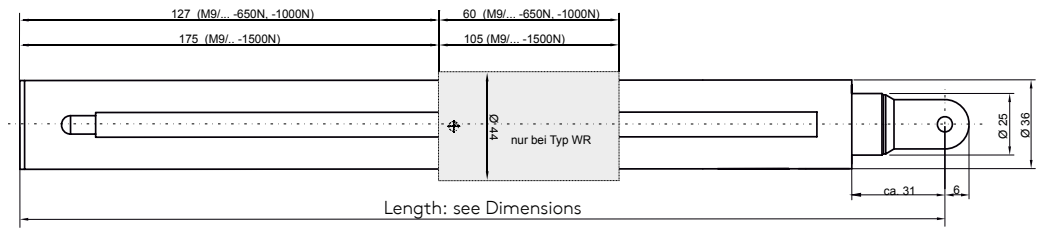
- Different pressing forces available (650 N, 1000 N and 1500 N)
- Integrated electronic max. load cutoff
- Optional synchronous modules for synchronous operation of multiple drives
- Dust-tight and splashproof (protection category IP 54)
- Non-corrosive aluminium housing and thrust tube
- Optional water resistant (WR) type specially designed for moist environments
- Installation position of WR type: Do not tilt upper push rod by more than 45°

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung or side-hung windows
- Skylight domes, continuous rooflights

#### Material

- Housing: Aluminium
- End caps: Aluminium
- Colour: EV1/anodised silver or RAL on request



## Technical specifications

Version	M9				
	M9 650 N		M9 1000 N		M9 1500 N
	.../LA/EV1/(WR)/...	.../SG/EV1/...	.../LA/EV1/(WR)/...	.../SG/EV1/...	.../SG/EV1/...
Electrical properties					
Rated voltage	24 V DC/50 Hz (-15%/+25%)				
Permissible ripple in rated voltage	2 V <sub>ss</sub>				
Rated current	1 A				1.6 A
Cutoff	Internal	External, via synchronous module	Internal	External, via synchronous module	External, via synchronous module
Protection class	III				
Mechanical properties					
Stroke length	300, 500, 750 and 1000 mm				
Pressing force	Max. 650 N		Max. 1000 N		Max. 1500 N
Tractive force	Max. 650 N		Max. 1000 N		Max. 1500 N
Locking force	2000 N				
Running speed	Approx. 6.7 mm/s		Approx. 3.8 mm/s		Approx. 5.1 mm/s
Duty cycle	DC 30 (10 min.)				
Service life	> 10,000 cycles				
Dimensions	(Stroke + approx. 260 mm) x 36 mm diameter (WR: 44 mm diameter)				(Stroke + 364 mm) x 36 mm diameter (WR: 44 mm diameter)
Electrical connection					
Connecting cable	2 x 0.75 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> 3 x 0.5 mm <sup>2</sup>	2 x 0.75 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> 3 x 0.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> 3 x 0.5 mm <sup>2</sup>
Installation and ambient conditions					
Ambient temperature	-5°C to +75°C, WR: +5°C to +60°C				
Protection category	IP 54 WR: IP 44 (permissible installation position: do not tilt upper push rod by more than 45°)				

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

## Order information

Version	M9 650 N			M9 1000 N			M9 1500 N
	.../LA/EV1/...	.../LA/EV1/ WR/...	.../SG/EV1/...	.../LA/EV1/...	.../LA/EV1/ WR/...	.../SG/EV1/...	.../SG/EV1/...
Stroke/mm	Item number						
300	66002303	66002316	13369200309	66001303	66001315	13369100309	13369300309
500	66002503	66002516	13369200509	66001503	66001515	13369100509	13369300509
750	66002753	66002716	13369200759	66001753	66001755	13369100759	13369300759
1000	66021003	66021016	13369201009	66001993	66001955	13369101009	13369301009



### 1.1.1.5 M1 24 V linear drive

Opens and closes window casements, skylight domes and roof windows to extract smoke and provide ventilation



Linear drive for use on heavy skylight domes, continuous rooflights, roof flaps and skylights. Suitable for ventilation and smoke and heat extraction.

#### Benefits/ Features

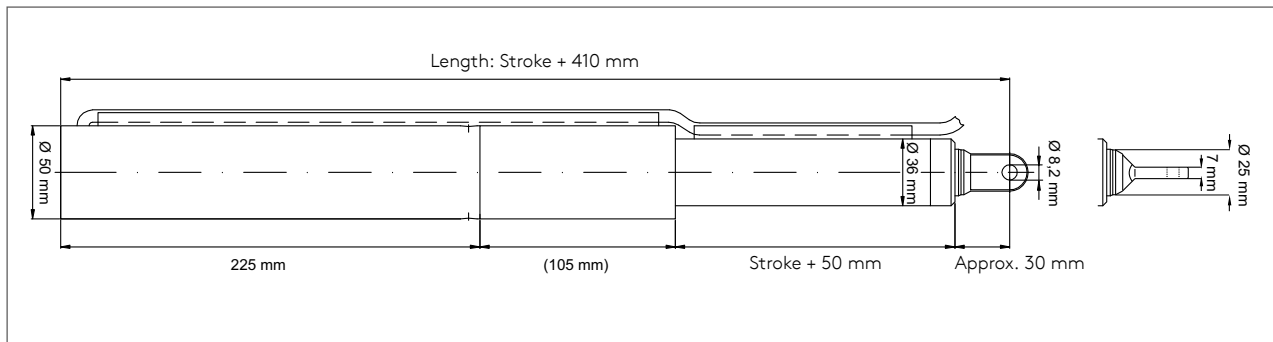
- Different pressing forces available (1000 N, 1500 N and 2000 N)
- Integrated electronic max. load cutoff
- Optional synchronous modules for synchronous operation of multiple drives
- Fast running speed
- Dust-tight and splashproof (protection category IP 54)
- Non-corrosive aluminium housing and thrust tube

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung windows
- Skylight domes and continuous rooflights

#### Material

- Housing: Aluminium
- Colour: EV1/anodised silver or RAL on request



### Technical specifications

Version	M1					
	M1 1000 N		M1 1500 N		M1 2000 N	
	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...

### Electrical properties

Rated voltage	24 V DC (-20 %/+50 %)					
Permissible ripple in rated voltage	2 V <sub>ss</sub>					
Rated current	2.5 A			3 A		
Cutoff	Internal	External, via synchronous module	Internal	External, via synchronous module	Internal	External, via synchronous module
Protection class	III					

### Mechanical properties

Stroke length	300, 500, 750 and 1000 mm					
Pressing force	Max. 1000 N		Max. 1500 N		Max. 2000 N	
Tractive force						
Locking force	2000 N					
Running speed	Approx. 16.6 mm/s	Approx. 14.6 mm/s	Approx. 11.6 mm/s	Approx. 9.8 mm/s	Approx. 10.7 mm/s	Approx. 9.2 mm/s
Duty cycle	DC 30 (10 min.)					
Service life	> 10,000 cycles					
Dimensions	50 mm diameter x (stroke + approx. 410 mm)					

### Electrical connection

Connecting cable	2 x 1.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> + 3 x 0.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> + 3 x 0.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup>	2 x 1.5 mm <sup>2</sup> + 3 x 0.5 mm <sup>2</sup>
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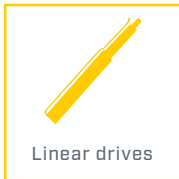
### Installation and ambient conditions

Ambient temperature	-5°C to +75°C
Protection category	IP 54

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

### Order information

Version	M1 1000 N		M1 1500 N		M1 2000 N	
	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...	.../LA/EV1/...	.../SG/EV1/...
Stroke/mm	Item number					
300	66900303	66900309	66910303	66910309	66920303	66920309
500	66900503	66900509	66910503	66910509	66920503	66920509
750	66900753	66900759	66910753	66910759	66920753	66920759
1000	66901003	66901009	66911003	66911009	66921003	66921009



### 1.1.2 M3 230 V linear drive

Provides ventilation in window casements, roof flaps and skylight domes



Linear drive for ventilating roof flaps and skylights, skylight domes and continuous rooflights. M3 runs on 230 V mains voltage and therefore does not require a ballast.

#### Benefits/ Features

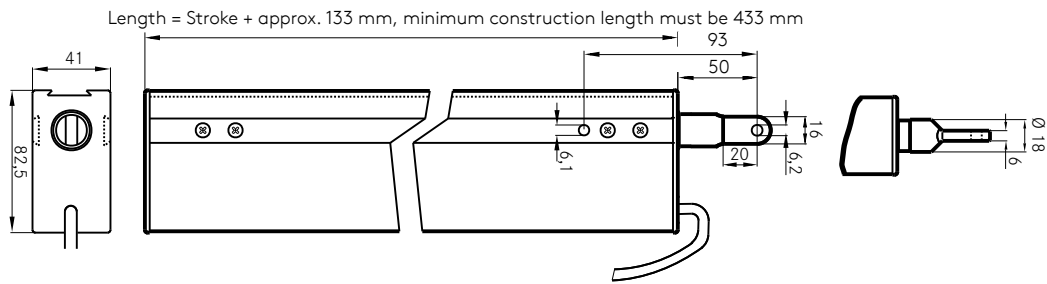
- Compact drive in rectangular aluminium profile without interfering attachments
- Tight closing without limit switch adjustment with integrated electronic load cutoff, therefore always tight closing of window flaps, no limit switch adjustment required
- Dust-tight and splashproof (protection category IP 54)
- Non-corrosive aluminium housing and thrust tube
- Potential-free contact for "not closed" message (contact closes when leaving closed position)

#### Applications

- Skylights or roof flaps
- Vertical façades, e.g. top-hung windows
- Skylight domes and continuous rooflights

#### Material

- Housing: Rectangular aluminium profile
- End caps: Grey plastic
- Colour: EV1/anodised silver or RAL on request



#### Technical specifications

##### Electrical properties

Rated voltage	230 V AC/50 Hz (-15%/+10%)
Rated current	Approx. 0.2 A
Cutoff	Integrated electronic load cutoff
Protection class	II

##### Mechanical properties

Stroke length	82, 300, 500 and 750 mm
Pressing force	Max. 500 N
Tractive force	Max. 250 N
Locking force	2000 N
Running speed	Approx. 10 mm/s
Duty cycle	DC 30 (10 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	(Stroke + approx. 133 mm) x 82.5 mm x 41 mm

##### Electrical connection

Connecting cable	5 x 0.75 mm <sup>2</sup> , length approx. 1.60 m, grey
------------------	--

##### Installation and ambient conditions

Ambient temperature	-5 °C to +75 °C
Protection category	IP 54

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

#### Order information

Version	M3/...-500: 250N/LA/EV1/AC
---------	----------------------------

Stroke/mm	Item number
-----------	-------------

82	65210820
300	65213000
500	65215000
750	65217500



### 1.1.3 Linear Drive Accessories

The range of window profiles and opening types is extensive. To ensure proper installation, we offer numerous conventional, angle and hinge brackets – all of which are perfectly tailored to the specific window system and drives in question.

#### Our portfolio

- Hinge brackets
- Brackets
- Angle brackets
- Miscellaneous accessories
- Synchro module
- WPS/2



#### » Learn more:

If you would like to learn more about our products and services, please visit [www.stg-beikirch.de](http://www.stg-beikirch.de).

## Overview: Brackets and Linear Drives

	M2 500 N	M2 1000 N	M3 500 N	M6 500 N	M6 1000 N	M7 500 N	M7 1000 N	M9 650 N	M9 1000 N	M9 1500 N	M1 1000 N	M1 1500 N	M1 2000 N
K26/B (650 N)	x		x										
K26/B/XL (1000 N)	x	x	x <sup>4)</sup>										
K27/B (650 N)	x		x										
K27/B/XL (1000 N)	x	x	x <sup>4)</sup>										
K28/B1 (650 N)	x												
K28/B2 (B3) (650 N)			x <sup>1)</sup>										
K29/B1 (650 N)	x												
K29/B2 (B3) (650 N)			x <sup>2)</sup>										
K31 (650 N)	x		x										
K9/O (1000 N)								x	x		x		
K9/C (650 N)								x					
K9/K (650 N)								x <sup>3)</sup>					
K10/O (2000 N)									x	x <sup>4)</sup>	x	x <sup>4)</sup>	x <sup>4)</sup>
K9/M (650 N)				x		x		x					
K9/M2 (500 N)	x		x										
K9/MO (650 N)								x					
K9/2/M-90 (1000 N)				x	x	x	x	x	x				
K12/O (1000 N)									x		x		

<sup>1)</sup> K28/B3 must be used with varnished drives.

<sup>2)</sup> K29/B3 must be used with varnished drives.

<sup>3)</sup> In conjunction with K9/O.

<sup>4)</sup> Preferred application.



Hinge brackets

### 1.1.3.1 Hinge Brackets for linear drives



FB9/A hinge bracket

#### FB9/A hinge bracket

For M2, M3, M6, M7, M9.

- Incl. locking pin and spring clip
- Material: Die-cast zinc
- Locking pin: 6 mm diameter
- Eyebolt drill hole: 6.2 mm diameter
- Max. permissible force: 1000 N

#### Order information

FB9/A	
Item number	20301001



FB9/C hinge bracket

#### FB9/C hinge bracket

For M1, M2, M6, M7, M9.

- Material: Galvanised steel
- Locking pin: 8 mm diameter
- Base bolt/eyebolt drill hole: 8.2 mm diameter
- Max. permissible force: 1000 N

#### Order information

FB9/C	
Item number	65609020



FB9/G hinge bracket

#### FB9/G hinge bracket

For M2 500 N, M3, M9.

- Special version for skylight domes
- Material: Galvanised steel
- Locking pin: 6 mm diameter
- Eyebolt drill hole: 6.2 mm diameter
- Max. permissible force: 650 N

#### Order information

FB9/G	
Item number	65609000



FB9/H hinge bracket

### FB9/H hinge bracket

For M2, M3, M6, M7, M9.

- Like FB9/A but with releasable lateral pin for ventilation systems
- Material: Galvanised steel
- Locking pin: 6 mm diameter
- Eyebolt drill hole: 6.2 mm diameter
- Max. permissible force: 1000 N

#### Order information

FB9/H	
Item number	20301018



FB9/J hinge bracket

### FB9/J hinge bracket

For M1, M2, M3, M6, M7, M9.

- Material: Steel
- Locking pin: 8 mm diameter
- Eyebolt drill hole: 8.2 mm diameter
- Max. permissible force: 1500 N

#### Order information

FB9/J	
Item number	65609040



FB11/C hinge bracket

### FB11/C hinge bracket

For M1, M9.

- Suitable also for narrow frames, maximum load-bearing capacity and good corrosion protection
- Material: Galvanised steel
- Locking pin: 8 mm diameter
- Base bolt/eyebolt drill hole: 8.2 mm diameter
- Max. permissible force: 3000 N

#### Order information

FB11/C	
Item number	65609021



Brackets

### 1.1.3.2 Brackets for linear drives



K26/B sliding bottom-hung bracket

#### K26/B sliding bottom-hung bracket Fur M2 and M3.

- For mounting the narrow side of the drive onto window frames, skylight domes, etc.
- Installation in the bottom clamp guide
- Material: Aluminium, stainless steel
- Max. permissible force: 650 N

##### Order information

K26/B	
Item number	27000581



K26/B/XL sliding bottom-hung bracket

#### K26/B/XL sliding bottom-hung bracket Fur M2 and M3.

- For mounting the narrow side of the drive onto window frames, skylight domes, etc.
- Installation in the bottom clamp guide
- Material: Aluminium, stainless steel
- Max. permissible force: 1000 N

##### Order information

K26/B/XL	
Item number	65502600



K27/B sliding bottom-hung bracket

#### K27/B sliding bottom-hung bracket Fur M2 and M3.

- Height-adjustable bracket for mounting the narrow side of the drive onto window frames, skylight domes, etc.
- Preferably used on slanted skylight dome bases
- Installation in the bottom clamp guide
- Material: Aluminium, stainless steel
- Max. permissible force: 650 N

##### Order information

K27/B	
Item number	27000580



K27/B/XL sliding bottom-hung bracket

### K27/B/XL sliding bottom-hung bracket

Fur M2 and M3.

- Height-adjustable bracket for mounting the narrow side of the drive onto window frames, skylight domes, etc.
- Installation in the bottom clamp guide
- Material: Galvanised steel, aluminium, stainless steel
- Max. permissible force: 1000 N

#### Order information

K27/B/XL	
Item number	27000582



K28/B clamping frame bracket

### K28/B clamping frame bracket

Fur M2 and M3.

- For universal application
- Complete with two special clamping screws for the lateral clamp guides
- Specially large contact surface for mounting on the frame
- Material: Galvanised steel
- Max. permissible force: 650 N
- **Note:** Please select the right bracket for the type of drive.

#### Order information

	K28/B1	K28/B2	K28/B3
Item number	65502800	65502802	65502805
M2 500 N (standard or RAL)	x	–	–
M3 (standard)	–	x	–
M3 (varnished in RAL)	–	–	x



K29/B clamping frame bracket

### K29/B clamping frame bracket

Fur M2 and M3.

- Like K28/B but offset and available with two installation heights
- Material: Powder-coated steel
- Max. permissible force: 650 N
- **Note:** Please select the right bracket for the type of drive.

#### Order information

	K29/B1	K29/B2	K29/B3
Item number	65502900	65502902	65502905
M2 500 N (standard or RAL)	x	–	–
M3 (standard)	–	x	–
M3 (varnished in RAL)	–	–	x



### 1.1.3.2 Brackets



K31 bracket with threaded pin

#### K31 bracket with threaded pin

For M2 and M3.

- For top- and bottom-hung windows, roof flaps and skylight domes
- With drill hole and threaded pin
- Material: Galvanised steel
- Max. permissible force: 650 N

#### Order information

K31	
Item number	65000013



K9/O clamping frame bracket

#### K9/O clamping frame bracket

For M9 and M1.

- The mounting bracket and clamping ring can be slid virtually over the entire drive and is suitable for all widespread profile systems for roof and façade windows
- Material: Die-cast aluminium
- Max. permissible force: 1000 N

#### Order information

K9/O	
Item number	65500150



K9/C clamping frame bracket

#### K9/C clamping frame bracket

For M9.

- Mounting bracket with clamping ring, suitable for universal installation
- Specially suited for wide-spaced installation on windows and skylight domes
- Material:  
Bracket: Steel; Clamping ring: Die-cast aluminium
- Max. permissible force: 650 N

#### Order information

K9/C	
Item number	65500030



K9/K mounting bracket

### K9/K mounting bracket for K9/O

For M9.

- In conjunction with K9/O e.g., for inward-opening bottom-hung windows.
- Important: The motor suspension must be spaced at least 100 mm apart from the casement.
- Material: Galvanised steel
- Max. permissible force: 650 N

#### Order information

K9/K	
Item number	65500110



K10/O clamping frame bracket

### K10/O clamping frame bracket

For M9 and M1.

- Specially for drives with more than 1500 N and other drives with 36 mm tube diameter.
- Split fork bracket for easy installation/adjustment.
- Can be slid virtually over the entire drive.
- Suitable for all profile systems on roof and façade windows.
- Material: Bracket: Steel;  
Clamping ring: Die-cast aluminium
- Max. permissible force: 2000 N

#### Order information

K10/O	
Item number	13365501100



K12/O clamping frame bracket

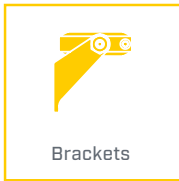
### K12/O clamping frame bracket

For M9 and M1.

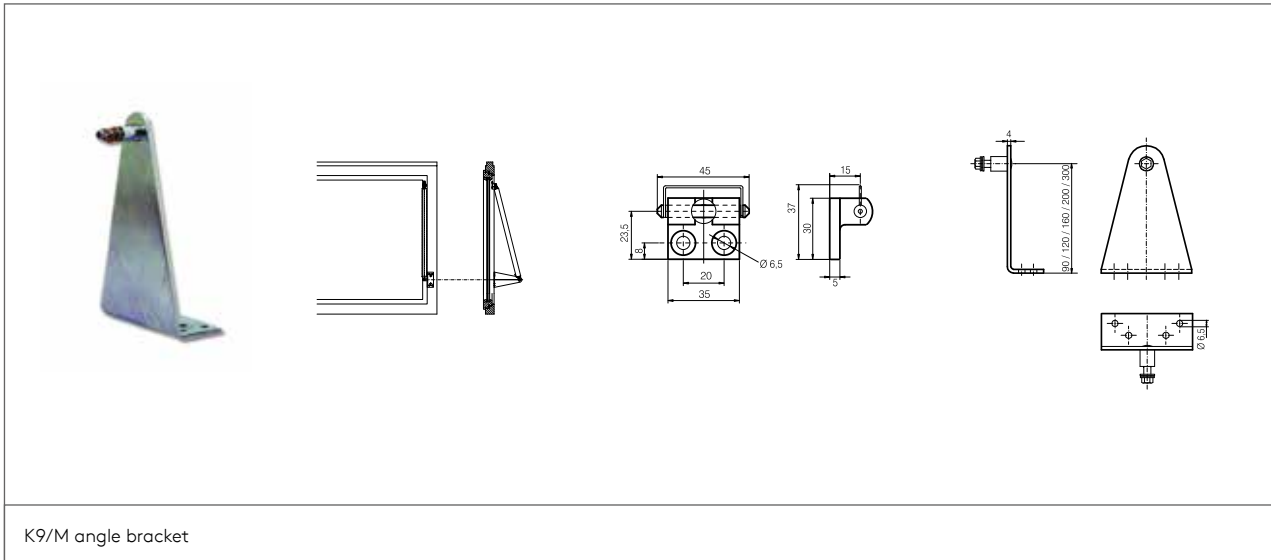
- Sturdy bracket for high-performance drives with 36 mm tube diameter.
- Can be slid virtually over the entire drive.
- Suitable for all profile systems on roof and façade windows.
- Most applications do not require an additional fastening bracket.
- Material: Steel, aluminium
- Max. permissible force: 1500 N
- **Note:** Optional profile reinforcement can be ordered under item number 13342503135.

#### Order information

K12/O	
Item number	13342503140



### 1.1.3.3 Angle brackets for linear drives



#### K9/M angle bracket

For M6 500 N, M7 500 N and M9 650 N.

- For inward- or outward-opening top-, bottom- and side-hung windows
- Min. space required between casement and soffit: 45 mm
- Locking pin for hinge bracket: 6 mm diameter
- Fastening bolt for angle bracket: 8 mm diameter
- Drill hole needed for eyebolt: 6.2 mm diameter
- Drill hole needed for base bolt: 8.2 mm diameter
- Material: Galvanised steel
- Max. permissible force: 650 N

#### ■ Attention:

Angle brackets must be installed above the centre of the window – measured from the hinge side. Please order suitable drives for the relevant casement size separately.

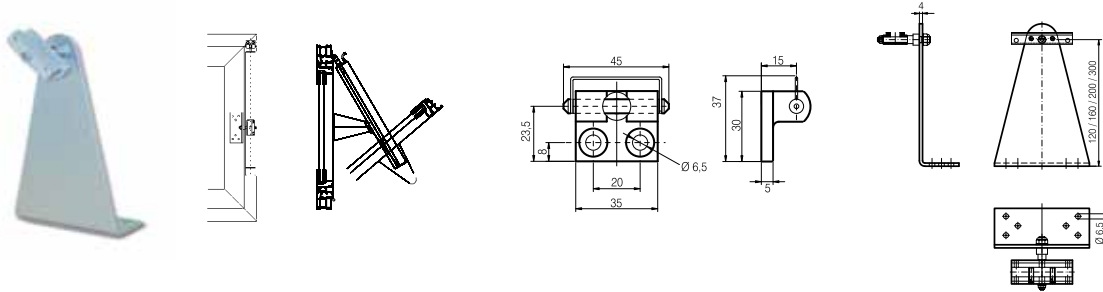
#### ■ Note:

Only for use with drives with base bolt.

Please order the following parts: FB9/A hinge bracket and angle bracket.

Hinge bracket	
FB9/A	
Item number	20301001

Angle bracket	
K9/M	
Version	Item number
...-20	65500130
...-160	65500134
...-200	65500135
...-300	65500136



K9/M2 angle bracket

### K9/M2 angle bracket

For M2 500 N and M3.

- For inward- or outward-opening bottom- and side-hung windows
- Min. space required between casement and soffit: 48 mm
- Locking pin: 6 mm diameter
- Eyebolt drill hole: 6.2 mm diameter
- Material: Galvanised steel
- Max. permissible force: 500 N

### ■ Attention:

Do not mount the angle bracket below half-height of the window.

Please order suitable drives for the relevant casement size separately.

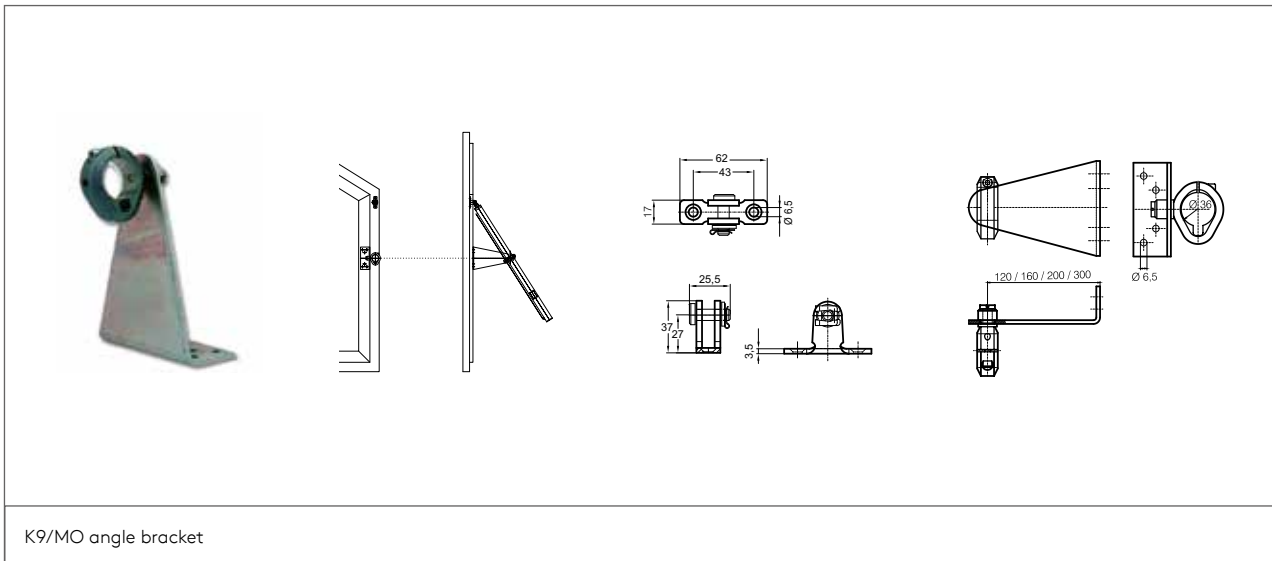
Please order the following parts: FB9/A hinge bracket and angle bracket.

Hinge bracket	
FB9/A	
Item number	20301001

Angle bracket	
K9/M2	
Version	Item number
...-120	65500156
...-160	65500157
...-200	65500158
...-300	65500159



### 1.1.3.3 Angle brackets



K9/MO angle bracket

#### K9/MO angle clamping ring bracket

For M9 650 N.

- Clamping ring installation for top-, bottom- and side-hung windows in a façade, with a required opening angle up to about 60°
- Min. space required between casement and soffit: 56 mm
- Locking pin for hinge bracket: 8 mm diameter
- Eyebolt drill hole: 8.2 mm diameter
- Material: Galvanised steel
- Max. permissible force: 650 N

#### ■ Attention:

Angle brackets must be installed above the centre of the window – measured from the hinge side.

Please order suitable drives for the relevant casement size separately.

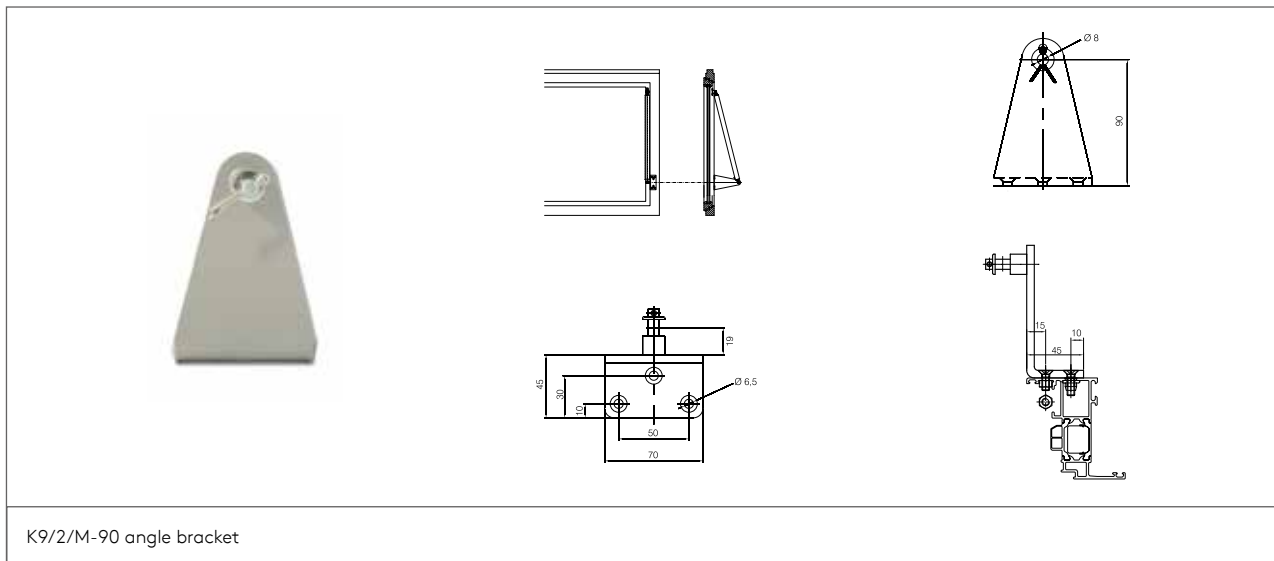
#### ■ Note:

Only for use with drives with base bolt.

Please order the following parts: FB9/C hinge bracket and angle bracket.

Hinge bracket	
FB9/C	
Item number	65609020

Angle bracket	
K9/MO	
Version	Item number
...-120	65500160
...-160	65500161
...-200	65500162
...-300	65500163



### K9/2/M-90 angle bracket

For M6, M7 and M9 <sup>1)</sup>.

- For mounting linear drives with base bolt on the side of top- or bottom-hung windows
- Min. space required between casement and soffit: 40 mm
- Fastening bolt for angle bracket: 8 mm diameter
- Material: Steel
- Max. permissible force: 1000 N

<sup>1)</sup> Please order drive with 8.2 mm drill hole for eyebolt.

### ■ Attention:

Angle brackets must be installed above the centre of the window – measured from the hinge side.

### ■ Note:

Only for use with drives with base bolt.

Please order the following parts: FB9/A or FB9/C hinge bracket and angle bracket.

Hinge bracket	
FB9/A	
Item number	20301001

Hinge bracket	
FB9/C	
Item number	65609020

Angle bracket	
K9/2/M	
Version	Item number
...-90	27000637



Brackets

### 1.1.3.4 Miscellaneous accessories for linear drives



K9/L base bolt

#### K9/L base bolt

For M9.

- For installation with FB9/C hinge bracket, e.g. for louvre designs with linear drives and "eye-eye" fastening
- **Note:** Option, mounted on the drive, cannot be retrofitted. Please order together with the drive.

#### Order information

K9/L	
Item number	65500120



PA9 position indicator

#### PA9 position indicator

For M9 and M1.

- Magnetically activated contact. In the cable duct, incl. solenoid switch
- Can be mounted anywhere along the entire lift of the drive
- Multiple PA9 can be used
- **Note:** Option, mounted on the drive, cannot be retrofitted. Please order together with the drive.

#### Order information

PA9	
Item number	66000000



SR90-A adjustable ring for shortening stroke

#### SR90-A adjustable ring for shortening stroke

For M9 (up to 650 N).

- For precise specification of the travel path (at the point of installation), e.g. in conjunction with hold-open arms, louvre windows, shutters
- Material: Aluminium, anodised silver (EV1)
- Max. permissible force: 650 N

#### Order information

SR90-A	
Item number	96011360



### 1.1.3.5 SM3 synchronous module

For operating two drives on one window or roof flap



SM3 synchronous module is a microprocessor-controlled synchronisation and cutoff controller for simultaneously activating two 24 V DC smoke extraction and/or ventilation drives on one opening element (casement/dome, etc.). The synchronous module version is dictated by the application and current consumption of the drives.

#### Benefits/ Features

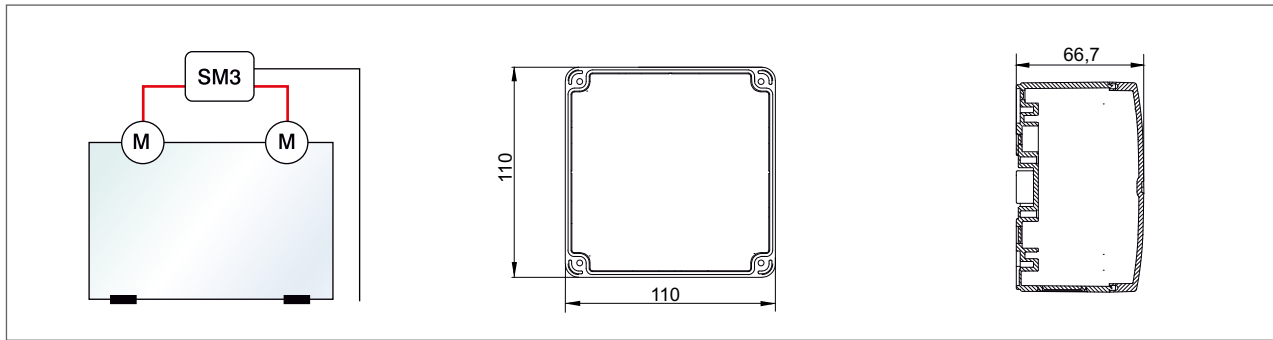
- For operating two drives with signal generators, without limit switches and without integrated load cutoff
- Safe operation in conjunction with up to 1000 mm lifts, regardless of the drive running times or the window/roof flap material
- Up to 10 m permissible cable length between SM3 and drives
- Integrated stopping times in "Close" direction to eliminate potential differences in running time
- Factory-preset cutoff thresholds when raising and lowering
- Service port interface for additional configuration options
- Configurable alert contact

#### Applications

- For operating two drives with signal generators, without limit switches and without integrated load cutoff

#### Unit properties

- If load-related differences occur, they are automatically eliminated and exact synchronisation assured
- The integrated current-dependent overload cutoff mechanism shuts the drives down at the end points and (if overload occurs) interim points
- Upon reaching the end position, the synchronous module locks to prevent multiple activation in the same direction, and can only be controlled in the opposite direction
- Faulty or missing drives are detected and the control of other connected drives prevented



### Technical specifications

#### Electrical properties

Rated voltage	24 V DC (-20 %/+25 %)
Permissible ripple in rated voltage	2 Vss
Cutoff	Integrated electronic max. load cutoff, cutoff values dictated by connected drive, see also Planning aids: Section 4
Protection class	III

#### Mechanical properties

Dimensions (L x H x D)	110 x 110 x 66.7 mm
------------------------	---------------------

#### Electrical connection

Connection	4-pole to the drives, 2-pole (3-pole with circuit monitoring) on site
Terminals	max. 6 mm <sup>2</sup> for motor power supply cable, max 2.5 mm <sup>2</sup> for forwarding cable, max. 1.5 mm <sup>2</sup> for drives and signal cables
Safety cutoff	In the event of undervoltage < 17.5 V, wire breakage, blockage after 5 attempts to drive in same direction
Max. cable length between control unit and drive	10 m
Potential-free signal contact	Resistive load, max. 1 A/60 V DC (SELV)

#### Installation and ambient conditions

Ambient temperature	0 °C to +70 °C
Protection category	IP 54

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

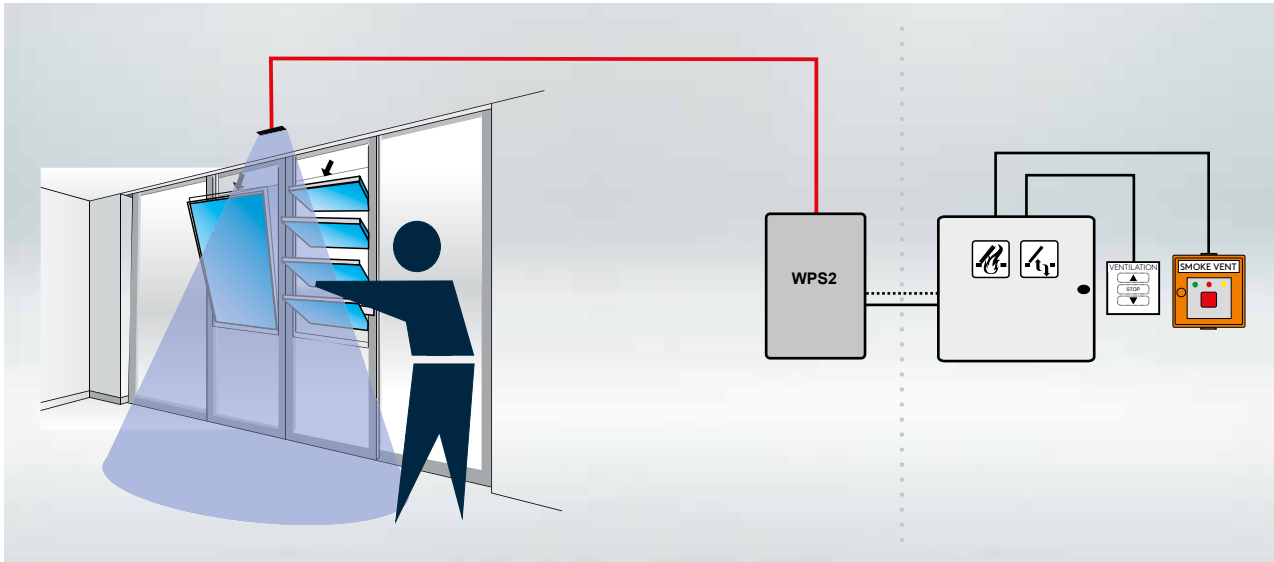
SM3 type	Suitable for drive	Item number
SM3 1.0A/1.0A/A	M2 500 N	13368011060
SM3 1.0A/1.0A/B	M2 1000 N	13368011065
SM3 1.0A/1.0A/C	M9 650 N	13368011075
SM3 1.1A/1.1A/A	M9 1000 N	13368011080
SM3 2.0A/2.0A/A	M9 1500 N	13368011055
SM3 3.5/2.5A/B	M1 1000 N	13368011035
SM3 3.5/2.5A /A	M1 1500 N	13368011000
SM3 4A/2.5A /A	M1 2000 N	13368011005

■ **Note:** Please refer to our planning aids in Section 4.6 for help with choosing the right synchronous control for your drives.



### 1.1.3.6 WPS®2 Window Protection System

Contactless pinch protection for power-operated windows

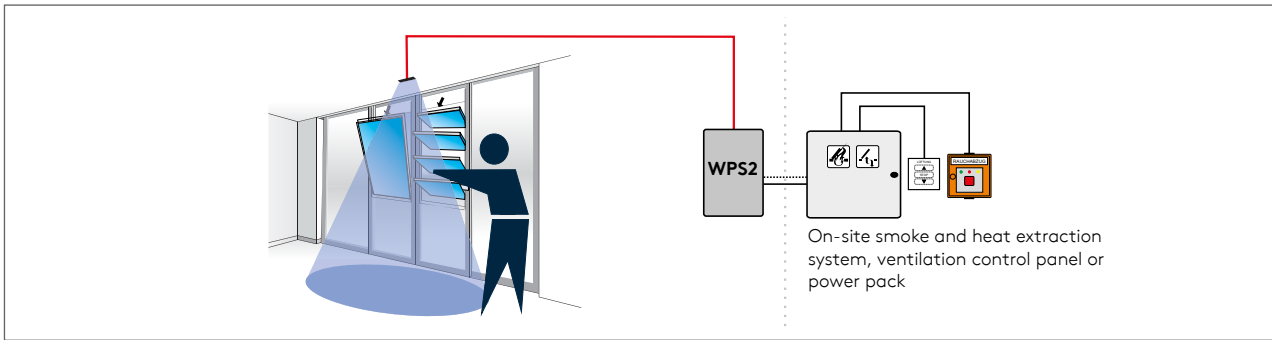


WPS/2 is a finger protection mechanism for automatically operated (power-operated) windows. Special infrared sensors or laser scanners detect the potential danger if somebody is near the window hazard zone, and immediately stop closing the window. The sensor continuously monitors the immediate pinch points and the hazard zone in and around the window. Multiple windows next to each other can also be monitored in one process. WPS/2 is suitable for all types of windows. No major structural work is needed – only the sensor and receiver require installation.

The WPS can be retrofitted, regardless of the drive and control panel make.

#### Benefits/ Features

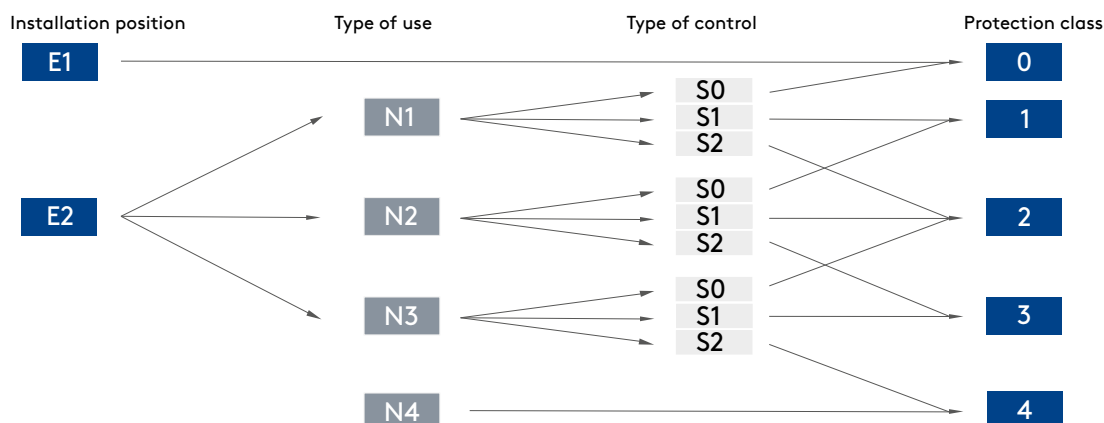
- Only finger protection to be TÜV approved in accordance with Machinery Directive 2006/42/EC incl. SIL certification
- Satisfies strictest protection class requirements for power-operated windows
- Regardless of drive and control panel make
- Wide-surface monitoring zone
- Individually adjustable
- Rapid response
- Monitors main and secondary closing edges and drives
- Suitable for all types of windows
- Compact control panel
- Extremely flexible, can be configured to work with different sensors



■ **Note:** The size of the monitored area is dictated by the installation height and type of sensor.

As per risk assessment for power-operated windows, WPS2 is also suitable for providing the highest level of protection. Assessment is performed by the fitter in line with Machinery Directive 2006/42/EC based on the following risk assessment:

- Installation position**
- **E1** Installed at a height of at least 2.5 m
  - **E2** less than 2.5 m and freely accessible
- Type of use**
- **N1** Rooms used commercially (e.g. offices)
  - **N2** Rooms used by people who have been shown how to operate the technology (e.g. homes)
  - **N3** Rooms frequented by visitors not trained to use the equipment safely (e.g. shops, public venues)
  - **N4** Rooms for people with special protection requirements (e.g. nursery schools)
- Type of control**
- **S0** Manual operation (e.g. key switch)
  - **S1** e.g. Manual operation with visual contact
  - **S2** Automatic operation



The outcome dictates the requisite protection class and measures.

- Protection class**
- **0** = No need for protective measures
  - **1** = Warning signs
  - **2** = Access control, e.g. signals
  - **3** = Access control, e.g. keypad operation
  - **4** = Secured by safeguards, e.g. light curtains such as WPS2

WPS2 solutions are available on request.

■ **Note:** Please also consult the EuroWindow guidance sheet KB.01 "Power-operated windows".



## 1.2 Chain drives

Our 24 V DC chain drives for SHE and daily ventilation can be concealed in a window profile or mounted on it, depending on their size and power. Drives are available for the widest range of window types and sizes, with up to 700 N power per drive and opening widths up to 800 mm. Chain drives fitted with EasyDrive technology can, moreover, be configured with the appropriate software.

Our 230 V AC chain drives for daily ventilation are available up to 600 N and with opening widths up to 800 mm. In the case of wide casements or to increase actuating force, two drives can be mounted in tandem on one window.

1.2

### LM

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### CDi

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### CDs

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### EM

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### FM 309-401

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### CM

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### CM

#### Twin Compact

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#### FM 501-800

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#### FM Tandem

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### Our controlled natural ventilation portfolio

#### LM

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#### LM Tandem

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#### EM

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#### EM Tandem

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#### CM

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#### FM

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### Accessories

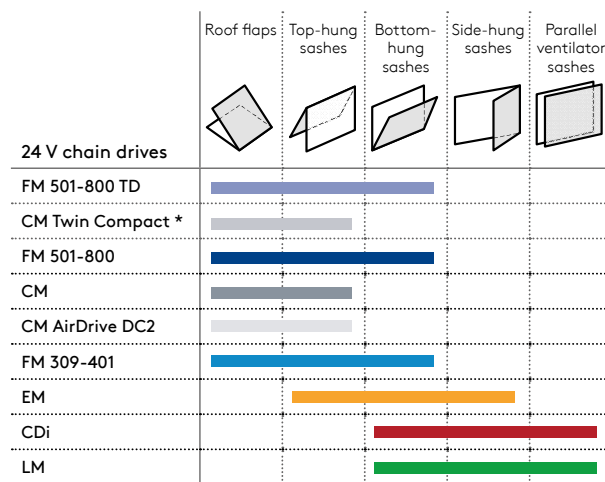
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## Guide to selecting 24 V DC and 230 V AC chain drives

■ **Note:** The diagrams offer an overview of motor performance.

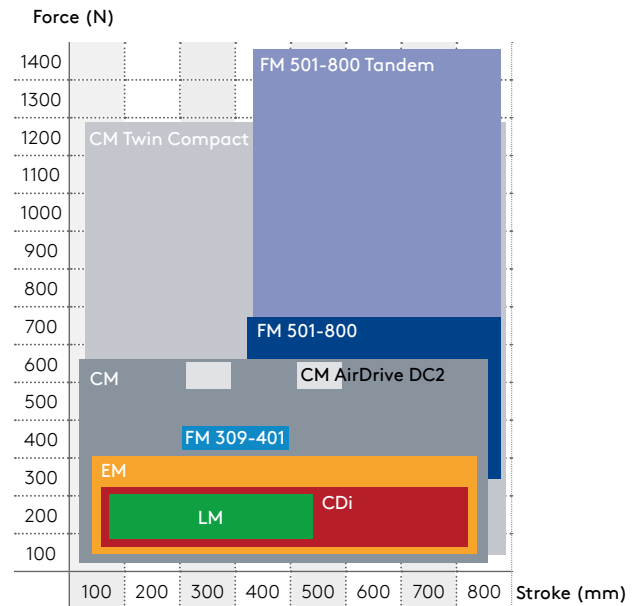
As opening widths increase, the pressing forces of chain drives may decrease. Please refer to the load-displacement diagrams in Section 4.

### Preferred applications for 24 V chain drives

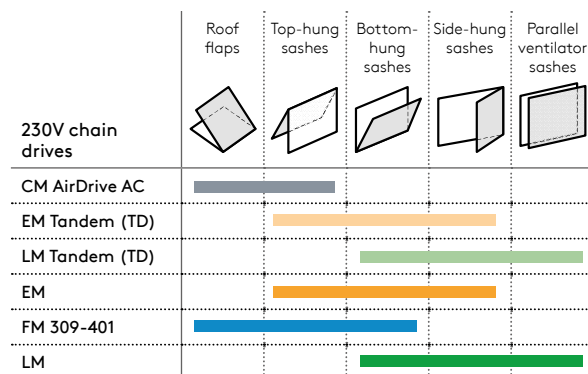


CM Twin Compact is particularly suitable for narrow and heavy sashes.

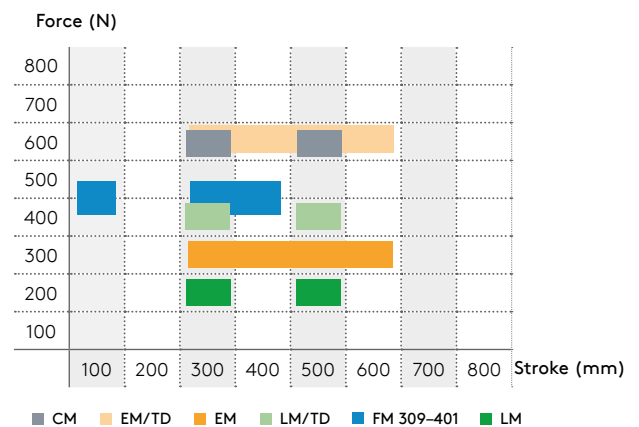
### Performance range: 24 V chain drives



### Preferred applications for 230 V chain drives



### Performance range: 230 V chain drives





### 1.2.1.1 LM 24 V chain drive

Compact drive for surface-mounted or concealed installation, for SHE and ventilation

**EasyDrive**<sup>2</sup>  
Safe Efficient Intelligent



In many cases, its slimline design makes concealed installation of the LM possible. With no need for a pivot area, installation is even possible in confined spaces. Numerous fastening options make the drive with pressing/tensile forces of up to 200 N suitable for varied uses. Available types: LM/2 or LM/EasyDrive/2.

#### Benefits/ Features

- For surface-mounted or concealed installation
- Small installation depth
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested
- Optional parallel operation of multiple drives on one casement using integrated tandem (LM/2) or synchronous control (LM/EasyDrive/2)

#### Special benefits of LM/EasyDrive/2

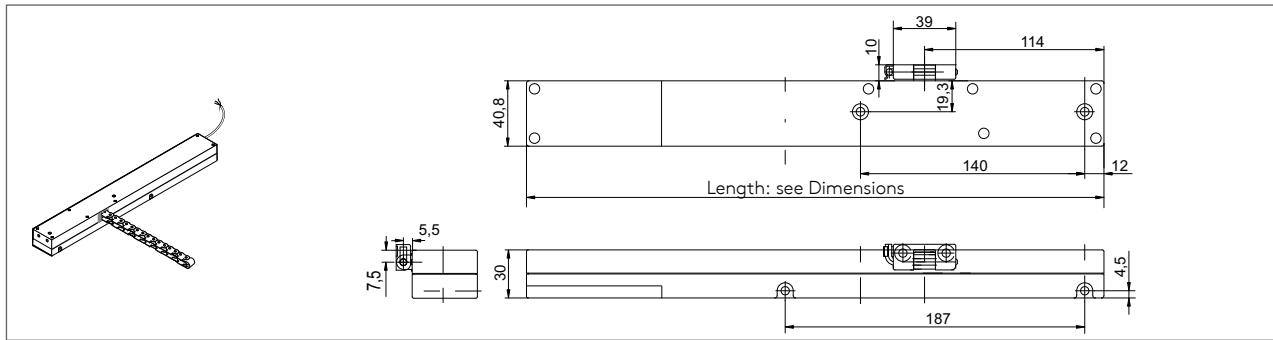
- Up to 4 drives can be synchronised
- Synchronisation and reference run can be performed without the EasyDrive software
- Stroke, speed, force: separately adjustable for OPEN/CLOSE using the EasyDrive software
- Integrated signal contact with configurable function
- Two terminals for easy connection between drives
- Adjustable seal closure relief

#### Applications

- Smoke extraction; natural aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



## Technical specifications

Version	LM/2		LM/EasyDrive/2	
	.../350-150N/...	.../500-80N/...	.../350-200N/...	.../500-200N/...
Electrical properties				
Rated voltage	24 V DC (-20 %/+25 %)		24 V DC (-20 %/+25 %)	
Permissible ripple in rated voltage	2 Vss			
Rated current	0.5 A at 200 N		0.55 A at 200 N	
Cutoff	Integrated electronic max. load cutoff			
Protection class	III			
Mechanical properties				
Stroke length, approx.	350 mm	500 mm	20-350 mm (adjustable)	20-500 mm (adjustable)
Pressing force	Up to 300 mm: max. 200 N up to 350 mm: max. 150 N	Max. 80 N	(Adjustable) Up to 300 mm: max. 200 N up to 350 mm: max. 150 N	(Adjustable) Up to 300 mm: max. 200 N up to 500 mm: max. 80 N
Tractive force	Max. 200 N		Max. 200 N (adjustable)	
Locking force	Max. 3000 N			
Running speed	Approx. 10 mm/s		4-10 mm/s (adjustable)	
Duty cycle	DC 30 (3 min.)		DC 30 (10 min.)	
Service life	> 10,000 cycles			
Dimensions (L x H x D)	360.5 x 30 x 40.8 mm	442 x 30 x 40.8 mm	360.5 x 30 x 40.8 mm	442 x 30 x 40.8 mm
Electrical connection				
Connection	3 x 0.75 mm², length approx. 3 m		6-pole, connecting cable not included in the scope of supply	
Installation and ambient conditions				
Ambient temperature	-10 °C to +60 °C			
Protection category	IP 20			
Approvals and certificates				
Type tested	TÜV			

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

## Order information

Version	LM/2		LM/EasyDrive/2	
	.../S/...	.../W/...	.../S/...	.../W/...
<b>Stroke/mm</b>				
350	2209072	2209015	13330020351	13330020352
500	2209076	2209014	13330020501	13330020502



### 1.2.1.2 CDi 24 V chain drive

For concealed installation, for SHE and ventilation

**EasyDrive<sup>2</sup>**  
Safe Efficient Intelligent



CDi was developed specially for concealed installation in window profiles. The centre seal – which is key to ensuring the seal integrity of a window – is not damaged. Appropriate fastening materials are available for all common types of window profile. CDi is available as a standard drive for ventilation applications or as CDi/EasyDrive/2 with numerous possible ventilation and smoke extraction applications.

#### Benefits/ Features

- For concealed installation in a window profile
- No damage to the important centre seal
- Special fastening sets available to suit different window systems
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested
- Optional parallel operation of multiple drives on one casement using integrated tandem (CDi) or synchronous control (CDi/EasyDrive/2)

#### Special benefits of CDi/EasyDrive/2

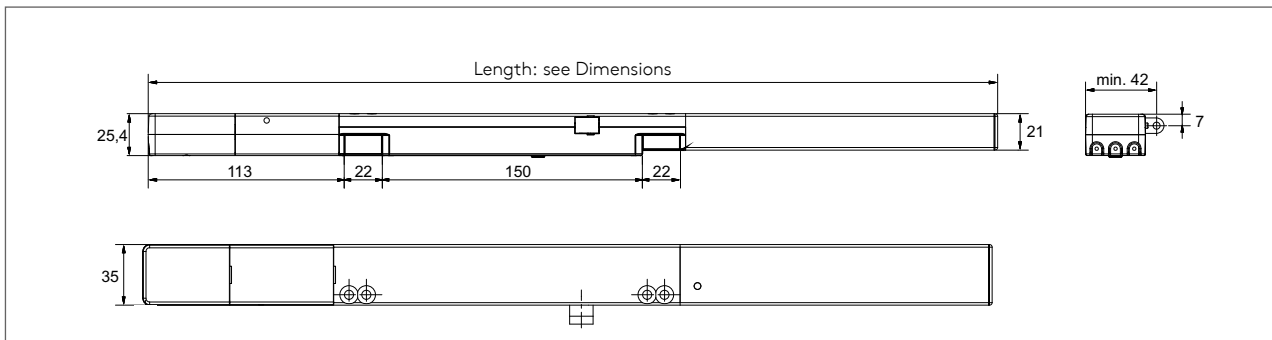
- Up to 4 drives can be synchronised
- Synchronisation and reference run can be performed without the EasyDrive software
- Stroke, speed, force: separately adjustable for OPEN/CLOSE using the EasyDrive software
- Integrated signal contact with configurable function
- Adjustable seal closure relief

#### Applications

- Smoke extraction; natural aeration and ventilation
- For concealed installation in a window profile

#### Material

- Housing: Zinc alloy/Aluminium/ABS
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: Black



#### Technical specifications

Version	CDi	CDi/EasyDrive/2
Electrical properties		
Rated voltage	24 V DC (-15 %/+25 %)	
Permissible ripple in rated voltage	2 Vss	
Rated current	0.6 A at 200 N	0.55 A at 200 N
Cutoff	Integrated electronic max. load cutoff	
Protection class	III	
Mechanical properties		
Stroke length, approx.	300 mm	300, 500, 600 and 800 mm (adjustable)
Pressing force	150 N in rated operation/max. 200 N for brief periods	(Adjustable) CDi/300 = 150 N rated operation/200 N briefly CDi/500 = max. 80 N rated operation > 500 mm = no pressing forces
Tractive force	200 N in rated operation/max. 300 N for brief periods	max. 200 N/300 N briefly (adjustable)
Locking force	max. 3000 N	
Running speed	Approx. 15 mm/s	4-10 mm/s (adjustable)
Duty cycle	DC 30 (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	490 x 25.4 x 35 mm	CDi/300 = 490 x 25.4 x 35 mm CDi/500 = 590 x 25.4 x 35 mm CDi/600 = 640 x 25.4 x 35 mm CDi/800 = 740 x 25.4 x 35 mm

#### Electrical connection

Connection	3-pole, not included in the scope of supply	6-pole, not included in the scope of supply
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#### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C	
Protection category	IP 20	

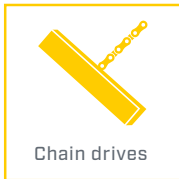
#### Approvals and certificates

Type tested	TÜV	
-------------	-----	--

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	CDi/...-300N/SW/DC2	CDi/EasyDrive/2/...-300N/RWA
<b>Stroke/mm</b>		
300	13326000300	13336020300
500	-	13336020500
600	-	13336020600
800	-	13336020800



### 1.2.1.3 CDs 24 V chain drive

For surface mounting for SHEVS and ventilation



Compact window drive for surface mounting. Ideal for daily ventilation operation. Connection on both sides via plug connectors for easy connection of several drives to one window casement. Simple basic configuration on site without PC tool. For ventilation and smoke extraction.

#### Benefits/ Features

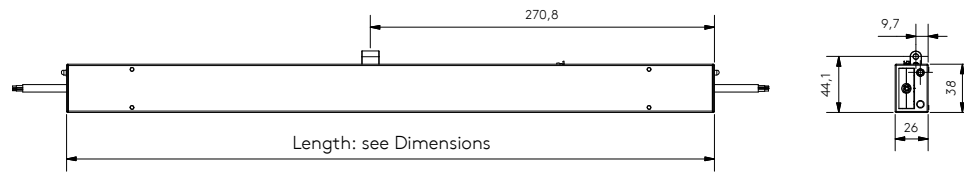
- Low installation height
- Simple installation by click fastening - both on the frame and on the sash - with slim brackets and concealed fastening screws
- Connectors can be connected on both sides
- Adjustable seal relief
- Integrated overload protection
- Stroke, speed, force: for OPEN/CLOSE separately adjustable via software
- Running speed in OPEN and CLOSE direction reducible to < 5 mm/s
- Reverse on detection of overload in CLOSE direction
- Synchronous operation of up to 4 drives and additional connection of up to two locking motors
- Teaching of: Closing position and opening width, as well as connecting several drives without further aids, also on site
- Integrated configurable signal contact

#### Applications

- Smoke extraction; natural aeration and ventilation
- Windows, facades and conservatories

#### Material

- Housing: Aluminium, End caps: plastic
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: EV1/anodised silver or RAL on request



### Technical specifications

#### Electrical properties

Rated voltage	24 V DC (-15 %/+25 %)
Permissible ripple in rated voltage	2 Vss
Rated current	approx. 1 A t 300 N
Cutoff	Integrated electronic max. load cutoff
Protection class	III

#### Mechanical properties

Stroke length, approx.	200, 400, 600 and 800 mm (Reduction of opening width possible)
Pressing force	max. 300 N, pressure load capacity of the chain depending on the opening width
Tractive force	max. 300 N
Locking force	max. 3000 N
Laufgeschwindigkeit	4-10 mm/s (adjustable)
Running speed	DC 30 (10 min)
Service life	>10,000 cycles
Dimensions (L x H x D)	CDs/200 = 510 x 26 x 38 mm CDs/400 = 610 x 26 x 38 mm CDs/600 = 710 x 26 x 38 mm CDs/800 = 810 x 26 x 38 mm

#### Electrical connection

Connection	6-core connecting cable, not included in the scope of supply
------------	---

#### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

#### Approvals and certificates

Type tested	TÜV
-------------	-----

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

### Order information

Version	CDs/...-300N/RWA
Stroke/mm	Item number
200	13337020204
400	13337020404
600	13337020604
800	13337020804



#### 1.2.1.4 EM 24 V chain drive

Universal 300 N drive for SHE and ventilation

**EasyDrive**<sup>2</sup>  
Safe Efficient Intelligent



With its tractive and pressing force of 300 N, EM is the standard drive for applications in the mid-performance range. Its small surface height makes it suitable for applications involving confined installation spaces, e.g. in front of shades. Its linear design blends easily with window and façade profiles. Available types: EM/2 or EM/EasyDrive/2 with numerous possible applications.

#### Benefits/ Features

- Drive with small installation depth
- 300 N pressing force up to 600 mm opening width
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested
- Optional parallel operation of multiple drives on one casement using integrated tandem (EM/2) or synchronous control (EM/EasyDrive/2)

#### Special benefits of EM/EasyDrive/2

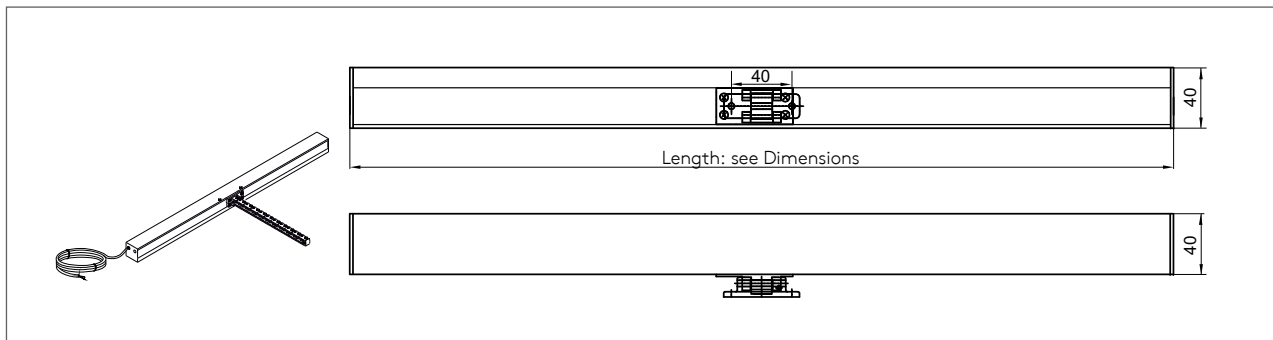
- Up to 4 drives can be synchronised
- Synchronisation and reference run can be performed without the EasyDrive software
- Stroke, speed, force: separately adjustable for OPEN/CLOSE using the EasyDrive software
- Integrated signal contact with configurable function
- Two terminals for easy connection between drives
- Adjustable seal closure relief

#### Applications

- Smoke extraction; natural aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	EM/2	EM/EasyDrive/2
Electrical properties		
Rated voltage	24 V DC (-20 %/+25 %)	24 V DC (-10 %/+25 %)
Permissible ripple in rated voltage	2 Vss	
Rated current	1 A at 300 N	Approx. 0.8 A at 300 N
Cutoff	Integrated electronic max. load cutoff	
Protection class	III	
Mechanical properties		
Stroke length, approx.	327, 419, 511, 603 and 810 mm	Adjustable: 21-511 mm, 21-603 mm, 21-810 mm
Pressing force	Up to 603 mm: 300 N > 603 mm: 100 N	(Adjustable) Up to 603 mm: 300 N > 603 mm: 100 N
Tractive force	300 N	300 N (adjustable)
Locking force	3000 N	
Running speed	Approx. 12 mm/s	4-10 mm/s (adjustable)
Duty cycle	DC 30 (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	EM/2/327: 544 x 40 x 40 mm EM/2/419: 636 x 40 x 40 mm EM/2/511-603: 820 x 40 x 40 mm EM/2/810: 1011 x 40 x 40 mm	Stroke 21-511 mm = 820 x 40 x 40 mm Stroke 21-603 mm = 1011 x 40 x 40 mm Stroke 21-810 mm = 1011 x 40 x 40 mm

#### Electrical connection

Connection	3 x 0.75 mm <sup>2</sup> , cable length approx. 3 m	6-pole, cable not included in the scope of supply
------------	---	---

#### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

#### Approvals and certificates

Type tested	TÜV
-------------	-----

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	EM/2		EM/EasyDrive/2	
	.../S/...	.../W/...	.../S/...	.../W/...
Stroke/mm	Item number			
327	2206103	2205930	-	-
419	2206144	2205922	-	-
511	2206185	2205948	13332020501	13332020502
603	2206227	2205955	13332020601	13332020602
810	2206003	2206004	13332020801	13332020802



### 1.2.1.5 FM 309-401 24 V chain drive

Powerful and quiet drive for SHE and ventilation



FM 309-401 is fitted with a double chain that merges and interlocks like a zip. This gives the drives excellent mechanical stability despite the flat chain design. As a result, even opening units with little frame clearance can be motor-actuated. Its strong and quiet drive and special design make it suitable for applications with more stringent requirements in terms of convenience, e.g. including conservatories.

#### Benefits/ Features

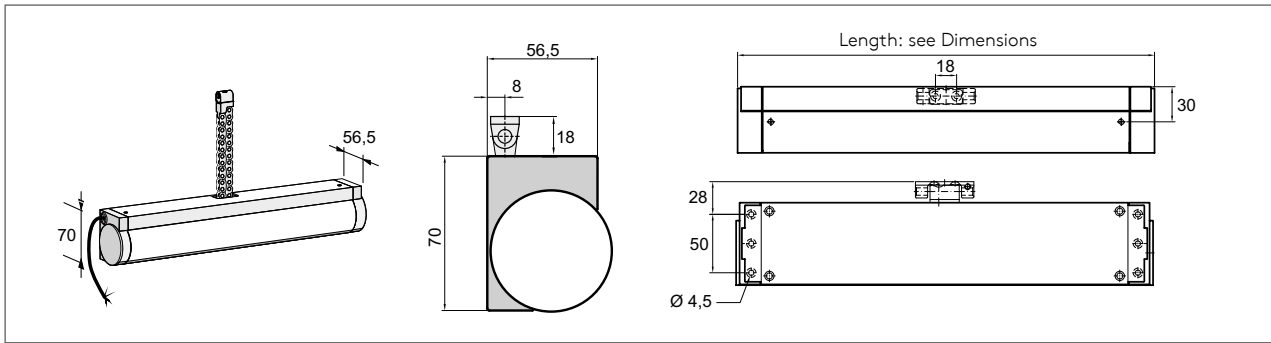
- Tractive/pressing forces up to 450 N
- Double chain drive, zip fastener principle
- Low-noise drive
- Mechanically adjustable seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Applications

- Smoke extraction; natural aeration and ventilation
- Top-, bottom-, side-hung and roof windows, even if they have little frame clearance
- Conservatories

#### Material

- Housing: Aluminium, End caps: Black or grey plastic
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	FM/309–450N/RWA	FM/401–450N/RWA
Electrical properties		
Rated voltage	24 V DC (-20 %/+30 %)	
Permissible ripple in rated voltage	2 Vss	
Rated current	1 A at 450 N	
Cutoff	Integrated OPEN + CLOSED limit switch with additional overload protection	
Protection class	III	
Mechanical properties		
Stroke length, approx.	309 mm	401 mm
Pressing force	450 N	
Tractive force	450 N	
Locking force	3000 N	
Running speed	Approx. 10 mm/s	
Duty cycle	DC 25 (4 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	449 x 70 x 56.5 mm	541 x 70 x 56.5 mm
Electrical connection		
Connection	2 x 0.75 mm², connecting cable length approx. 3 m	
Installation and ambient conditions		
Ambient temperature	-10 °C to +60 °C	
Protection category	IP 20	
Approvals and certificates		
Type tested	TÜV	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	FM 309-401	
	.../S/...	.../W/...
Stroke/mm	Item number	
	2103240	2103208
401	2101343	2101327



### 1.2.1.6 CM 24 V chain drive

Opens and closes roof and top-hung windows outwards, for SHE and ventilation

**EasyDrive<sup>2</sup>**  
Safe Efficient Intelligent



The drives in the CM series are powerful – up to 600 N – yet with a slim and linear design. All of the brackets and connections are located on one installation level behind the drive. Brackets can be slid along the drive to various positions for easier installation.

#### Benefits/ Features

- Tractive/pressing forces up to 600 N
- Sliding brackets facilitate installation
- Brackets behind the drive for a better appearance
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested
- Optional parallel operation of multiple drives on one casement using integrated tandem (CM) or synchronous control (CM/EasyDrive/2)

#### Special benefits of CM/EasyDrive/2

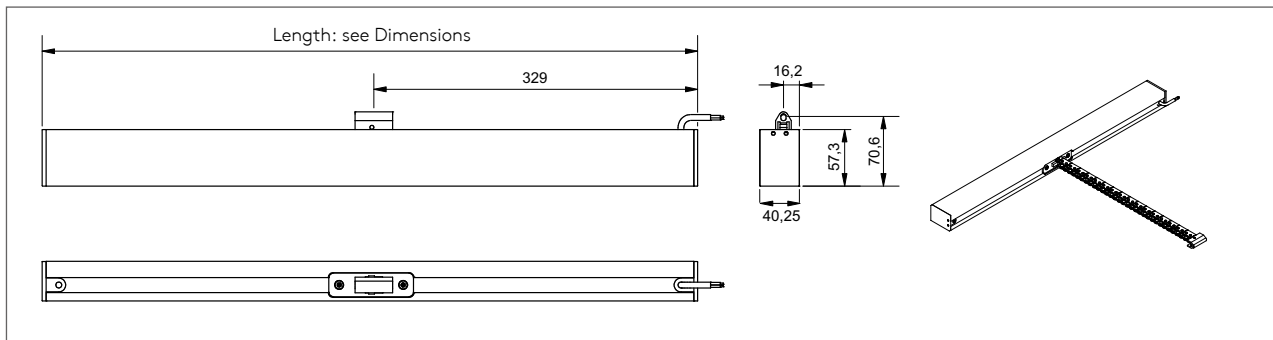
- Up to 4 drives can be synchronised
- Synchronisation and reference run can be performed without the EasyDrive software
- Stroke, speed, force: separately adjustable for OPEN/CLOSE using the EasyDrive software
- Integrated signal contact with configurable function
- Two terminals for easy connection between drives
- Adjustable seal closure relief

#### Applications

- Smoke extraction; natural aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium profile, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	CM	CM/EasyDrive/2
Electrical properties		
Rated voltage	24 V DC (-20 %/+25 %)	
Permissible ripple in rated voltage	2 Vss	
Rated current	1.5 A at 600 N	1.3 A at 600 N
Cutoff	Integrated electronic max. load cutoff	
Protection class	III	
Mechanical properties		
Stroke length, approx.	CM/400 = 394 mm CM/600 = 597 mm CM/800 = 800 mm	20-800 mm (adjustable)
Pressing force	Up to 600 mm: 600 N Up to 800 mm: 200 N	(Adjustable) Up to 600 mm: max. 600 N Up to 800 mm: max. 200 N
Tractive force	600 N	Max. 600 N (adjustable)
Locking force	3000 N	
Running speed	Approx. 11.5 mm/s	4-10 mm/s (adjustable)
Duty cycle	DC 30 (5 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	Stroke 400 mm = 666 x 57 x 40 mm Stroke 600 mm = 766 x 57 x 40 mm Stroke 800 mm = 866 x 57 x 40 mm	
Electrical connection		
Connection	3 x 0.75 mm², cable length approx. 3 m	6-pole, not included in the scope of supply
Installation and ambient conditions		
Ambient temperature	-10 °C to +60 °C	
Protection category	IP 20	
Approvals and certificates		
Type tested	TÜV	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

#### Order information

Version	CM		CM/EasyDrive/2	
	.../S/...	.../W/...	.../S/...	.../W/...
Stroke/mm	Item number			
400	205001601	205001602	13335020401	13335020402
600	205002401	205002402	13335020601	13335020602
800	205003201	205003202	13335020801	13335020802



### 1.2.1.7 CM EasyDrive/2 Twin Compact 24 V chain drive

Specialist for narrow, heavy casement formats, for SHE and ventilation



CM EasyDrive/2 Twin Compact is a real powerhouse with 1200 N pressing and tractive force. Compactly designed and fitted with opposite directional stainless steel chains, it has been specially designed to open and close narrow opening elements with heavy casement loads.

#### Benefits/ Features

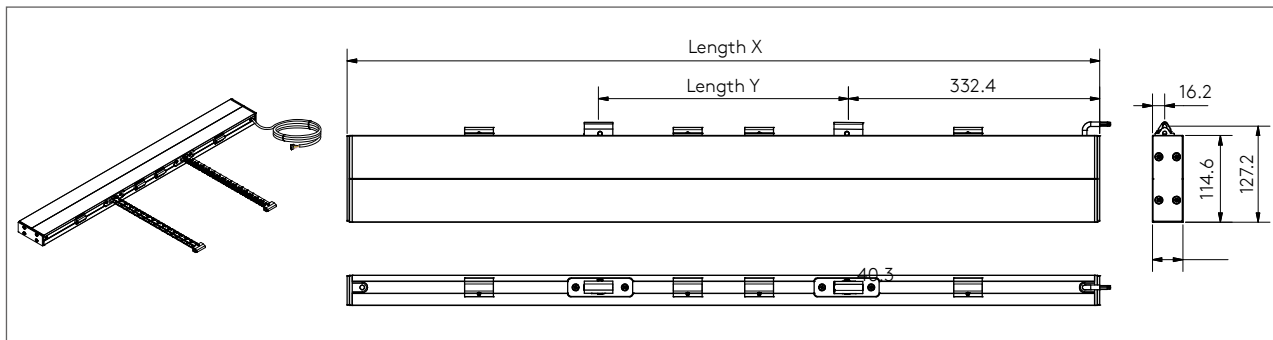
- Tractive/pressing forces up to 1200 N
- Opposite directional stainless steel chains
- Sliding brackets facilitate installation
- Brackets behind the drive for a better appearance
- Integrated overload protection
- Non-corrosive external parts
- Stroke, speed, force: separately adjustable for OPEN/CLOSE using the EasyDrive software
- Integrated signal contact with configurable function
- Adjustable seal closure relief

#### Applications

- Smoke extraction; natural aeration and ventilation
- Specially designed for narrow and heavy top-hung and roof windows

#### Material

- Housing: Aluminium profile, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



### Technical specifications

#### Electrical properties

Rated voltage	24 V DC (-20% / +25%)
Permissible ripple in rated voltage	2 Vss
Rated current	2,7 A at 1200 N load
Cutoff	Integrated electronic max. load cutoff
Protection class	III

#### Mechanical properties

Stroke length, approx.	20-800 mm (adjustable)	
Pressing force	(Adjustable) Up to 600 mm chain opening height: max. 1200 N Up to 800 mm chain opening height: max. 400 N	
Tractive force	Max. 1200 N (adjustable)	
Locking force	Max. 6000 N	
Running speed	4-10 mm/s (adjustable)	
Duty cycle	DC 30 (5 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	Length X: up to 400 stroke = 995.5 x 40.3 x 114.6 mm up to 600 stroke = 1,095.5 x 40.3 x 114.6 mm up to 800 stroke = 1,195.5 x 40.3 x 114.6 mm	Length Y: up to 400 stroke = 330.6 x 40.3 x 114.6 mm up to 600 stroke = 430.6 x 40.3 x 114.6 mm up to 800 stroke = 530.6 x 40.3 x 114.6 mm

#### Electrical connection

Connection	6-pole
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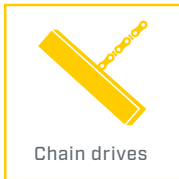
#### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 30

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

### Order information

Version	CM/EasyDrive/2 Twin Compact	
	.../S/...	.../W/...
Stroke/mm	Item number	
400	13335420401	13335420402
600	13335420601	13335420602
800	13335420801	13335420802



### 1.2.1.8 FM 501-800 24 V chain drive

Powerful and low-noise drive with up to 700 N, for SHE and ventilation



FM 501-800 is fitted with a double chain that merges and interlocks like a zip. As a result, the structure is very stable on all sides when the chain is extended. Nevertheless, the chain is flexible and, in many instances, allows the drive to be fixed without the need for further swivel brackets. The seal closure on the drive is mechanically adjustable. Its quiet operation makes it suitable for use in acoustically sensitive environments.

#### Benefits/ Features

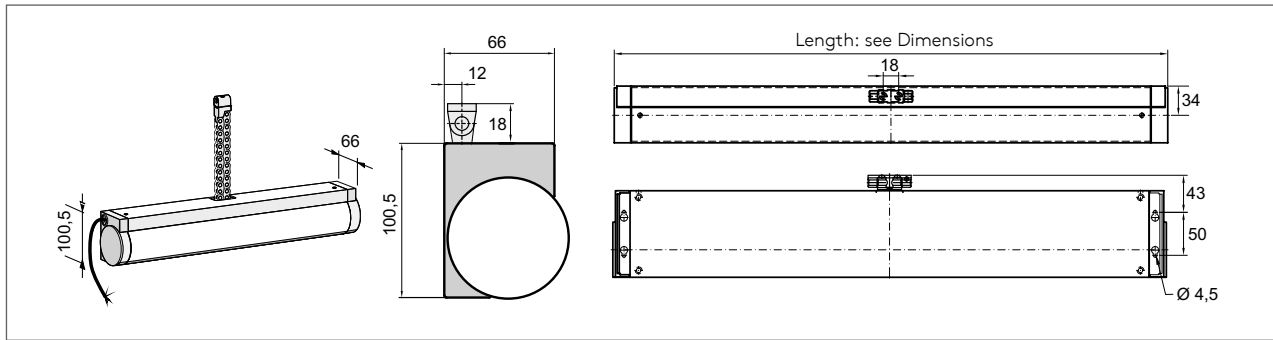
- Tractive/pressing forces up to 700 N
- Double chain drive, zip fastener principle
- Low-noise drive
- Mechanically adjustable seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Applications

- Smoke extraction; natural aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium, End caps: Black or grey plastic
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



## Technical specifications

### Electrical properties

Rated voltage	24 V DC (-20 %/+25 %)
Permissible ripple in rated voltage	2 V <sub>ss</sub>
Rated current	FM/...-300 N = approx. 1.2 A; FM/...-500 N = approx. 1.6 A FM/600-600 N = approx. 1.8 A; FM/501-700 N = approx. 2.0 A
Cutoff	Integrated OPEN + CLOSED limit switch with additional overload protection
Protection class	III

### Mechanical properties

Stroke length, approx.	FM/...-300N = 700, 800 mm; FM/...-500 N = 501, 600 mm FM/600-600 N = 600 mm; FM/501-700 N = 501 mm
Pressing force	FM/501-... = max. 700 N FM/600-... = max. 600 N FM/700-... = max. 300 N FM/800-... = max. 300 N
Tractive force	
Locking force	max. 3000 N
Running speed	Approx. 10 mm/s
Duty cycle	DC 30 (3 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	FM/501 = 643 x 66 x 100.5 mm; FM/600 = 744 x 66 x 100.5 mm FM/700 = 846 x 66 x 100.5 mm; FM/800 = 948 x 66 x 100.5 mm

### Electrical connection

Connection	2 x 0.75 mm <sup>2</sup> , cable length approx. 3 m
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### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

### Approvals and certificates

Type tested	TÜV
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Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

## Order information

Version	FM 501-800							
	... 300N/S...	... 300N/W...	... 500N/S...	... 500N/W...	... 600N/S...	... 600N/W...	... 700N/S...	... 700N/W...
Stroke/mm	Item number							
501	-	-	2100691	2100675	-	-	2104958	2104933
600	-	-	-	-	2109320	2109312	-	-
700	2104040	2104024	-	-	-	-	-	-
800	2104081	2104065	-	-	-	-	-	-



### 1.2.1.9 FM 501-800 Tandem 24 V chain drive

For roof, top- and bottom-hung windows requiring two drives, for SHE and ventilation



FM 501-800 is fitted with a double chain that merges and interlocks like a zip. As a result, the structure is very stable on all sides, even when the chain is extended. Nevertheless, the chain is flexible and, in many instances, allows the drive to be fixed without the need for further swivel brackets. The seal closure on the drive is mechanically adjustable. Its quiet operation makes it suitable for use in acoustically sensitive environments.

#### Benefits/ Features

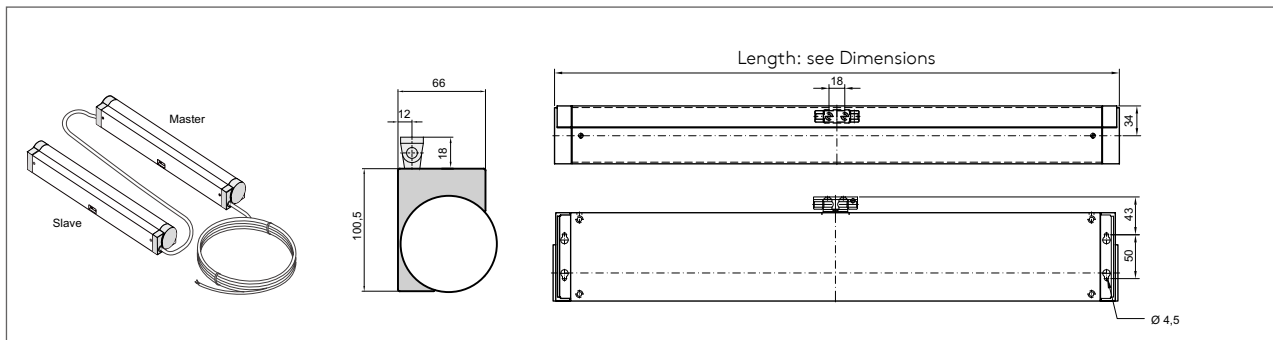
- Tractive/pressing forces up to 2 x 700 N
- Tandem drive with double chain, zip fastener principle
- Tandem control integrated in the Master
- Low-noise drive
- Mechanically adjustable seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Applications

- Smoke extraction; natural aeration and ventilation
- Wide and/or heavy top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium, End caps: Black or grey plastic
- Opening mechanism: Double stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



## Technical specifications

### Electrical properties

Rated voltage	24 V DC (-20 %/+25 %)
Permissible ripple in rated voltage	2 Vss
Rated current	FM/800-2 x 300 N = approx. 2 x 1.2 A FM/600-2 x 600 N = approx. 2 x 1.8 A FM/501-2 x 700 N = approx. 2 x 2.0 A
Cutoff	Integrated OPEN + CLOSED limit switch with additional overload protection
Protection class	III

### Mechanical properties

Lift length, approx.	501, 600 and 800 mm
Pressing force	2 x 300 N [FM/800-.../TD] 2 x 600 N [FM/600-.../TD] 2 x 700 N [FM/501-.../TD]
Tractive force	
Locking force	Max. 2 x 3000 N
Running speed	Approx. 10 mm/s
Duty cycle	DC 30 (3 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	FM/501 = 643 x 66 x 100.5 mm FM/600 = 744 x 66 x 100.5 mm FM/800 = 948 x 66 x 100.5 mm

### Electrical connection

Connection	Mains cable 2 x 0.75 mm <sup>2</sup> , length approx. 3 m; connecting cable 4 x 0.75 mm <sup>2</sup> , length approx. 1.5 m
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### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

## Order information

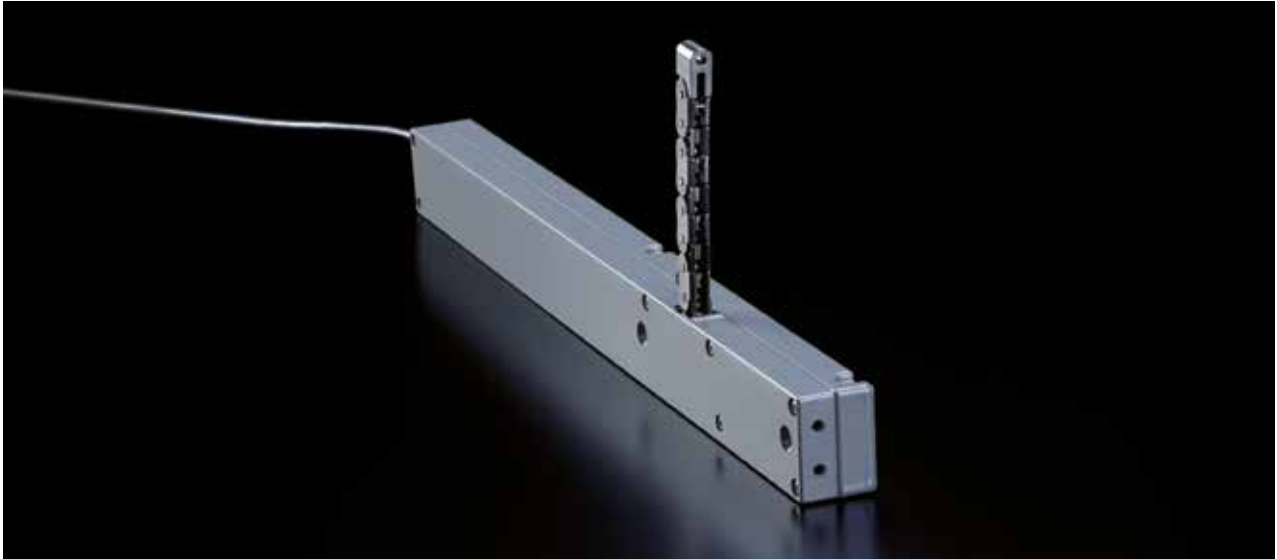
Version	FM 501-800 Tandem					
	... 2 x 300N/TD/S...	... 2 x 300N/W...	... 2 x 600N/S...	... 2 x 600N/W...	... 2 x 700N/S...	... 2 x 700N/W...
Stroke/mm	Item number					
501	-	-	-	-	2109866	2109858
600	-	-	2109924	2109916	-	-
800	2109981	2109973	-	-	-	-



### 1.2.2.1 LM and LM AirDrive ventilation chain drives

Compact 230 V or 24 V drive for daily ventilation in bottom- and top-hung and roof windows

**AirDrive**  
Reliable Controlled Ventilation



In many cases, its slimline design makes concealed installation of the LM possible. With no need for a swivel range, installation is also possible in confined spaces. Numerous fastening options make the drive with pressing/tractive forces of up to 200 N suitable for varied uses.

LM/AirDrive is an affordable drive for standard ventilation applications and is supplied complete with mains cable and brackets for connection to the frame. LM/AirDrive is available with 24 V DC or 230 V AC. The 230 V versions are fitted with an integrated ballast unit and run on 230 V mains voltage.

#### Benefits/ Features

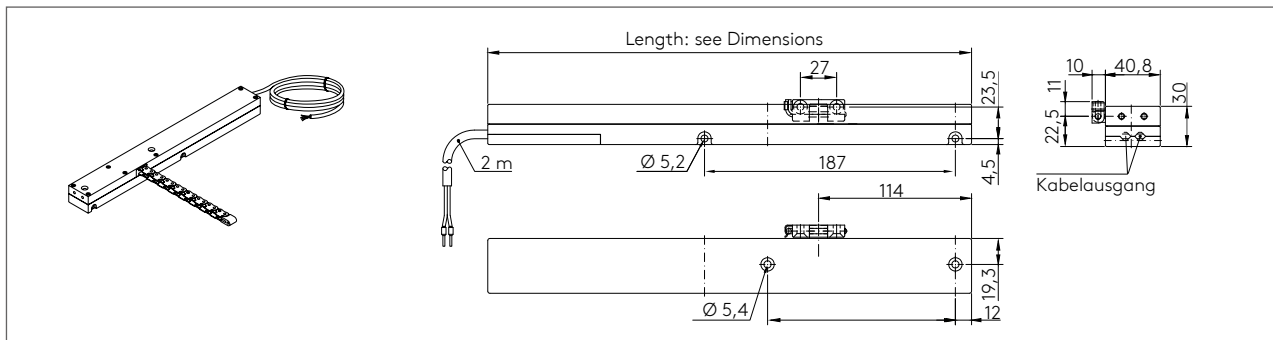
- For surface-mounted or concealed installation
- Small installation depth
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested
- LM/AirDrive is available with 24 V DC or 230 V AC

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	LM/AC		LM/AirDrive	
	.../350-150N/...	.../500-80N/...	.../AC	.../DC2

#### Electrical properties

Rated voltage	230 V AC, 50 Hz (±10 %)		230 V AC, 50 Hz (±10 %)	24 V DC (-20 %/+25 %)
Permissible ripple in rated voltage	-		-	2 V <sub>ss</sub>
Rated current	Approx. 0.14 A		Approx. 0.14 A	0.5 A
Cutoff	Integrated electronic max. load cutoff			
Protection class	I		I	III

#### Mechanical properties

Stroke length, approx.	350 mm	500 mm	250 mm	
Pressing force	Up to 300 mm: max. 200 N up to 350 mm: max. 150 N	Max. 80 N	Max. 150 N	
Tractive force	Max. 200 N		Max. 150 N	
Locking force	Max. 2000 N			
Running speed	Approx. 8 mm/s		Approx. 8 mm/s	Approx. 10 mm/s
Duty cycle	DC 30 (3 min.)			
Service life	> 10,000 cycles			
Dimensions (L x H x D)	360.5 x 30 x 40.8 mm	442 x 30 x 40.8 mm	360.5 x 30 x 40.8 mm	

#### Electrical connection

Connection	4 x 0.75 mm <sup>2</sup> , length approx. 3 m	4 x 0.75 mm <sup>2</sup> , length approx. 2 m	2 x 0.75 mm <sup>2</sup> , length approx. 2 m
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#### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C	-10 °C to +50 °C
Protection category	IP 20	

#### Approvals and certificates

Type tested	TÜV	-
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Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

#### Order information

Version	LM/AC		LM/AirDrive	
	.../S/...	.../W/...	.../AC	.../DC
Stroke/mm	Item number			
250	-	-	13310001251	13310000251
350	2109065	2109057	-	-
500	2109063	2109055	-	-



### 1.2.2.2 LM Tandem 230 V chain drive

230 V drive for daily ventilation in particularly wide bottom- and top-hung and roof windows requiring two drives



Versatile 230 V drive solution comprising two LM/2 drives with up to 2 x 200 N pressing and tractive force, for wide casements, flaps and skylights. An external ballast unit is used for control.

#### Benefits/ Features

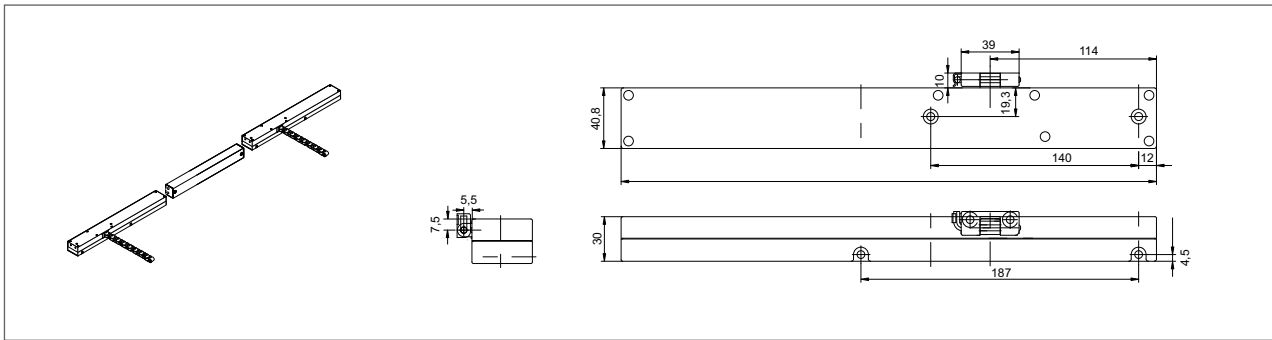
- 230 V drive with external ballast
- For surface-mounted or concealed installation
- Small installation depth
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Die-cast zinc
- Ballast housing: Aluminium profile
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



### Technical specifications

Version	LM/2 Tandem AC	
	.../350-150/...	.../500-80/...
Electrical properties		
Rated voltage	230 V AC, 50 Hz (±10 %)	
Rated current	Approx. 0.28 A	
Cutoff	Integrated electronic max. load cutoff	
Protection class	II	
Mechanical properties		
Stroke length, approx.	350 mm	500 mm
Pressing force	Up to 300 mm: max. 2 x 200 N up to 350 mm: max. 2 x 150 N	Max. 2 x 80 N
Tractive force	Max. 2 x 200 N	
Holding force	Max. 2 x 3000 N	
Running speed	Approx. 8 mm/s	
Duty cycle	DC 30 (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	360.5 x 30 x 40.8 mm	442 x 30 x 40.8 mm
Ballast dimensions (L x H x D)	424 x 40 x 40 mm	
Electrical connection		
Connection	H05VV-F mains cable 3 x 0.75 mm², length approx. 8 m EWKF connecting cable 6 x 0.75 mm², length approx. 0.80 m	
Installation and ambient conditions		
Ambient temperature	-10 °C to +50 °C	
Protection category	IP 20	
Approvals and certificates		
Type tested	TÜV	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

### Order information

Version	LM/2 Tandem AC	
	.../S/...	.../W/...
<b>Stroke/mm</b>		
350	13322001979	13322001950
500	13322001956	13322001984



### 1.2.2.3 EM 230 V chain drive

Universal 230 V drive with 300 N for daily ventilation



With its tractive and pressing force of 300 N, EM AC is a universal drive for the mid-performance range. Its small surface height makes it suitable for applications involving confined installation spaces, e.g. in front of shades. Its linear design blends easily with window and façade profiles. EM AC is equipped with an integrated ballast unit and runs on 230 V mains voltage.

#### Benefits/ Features

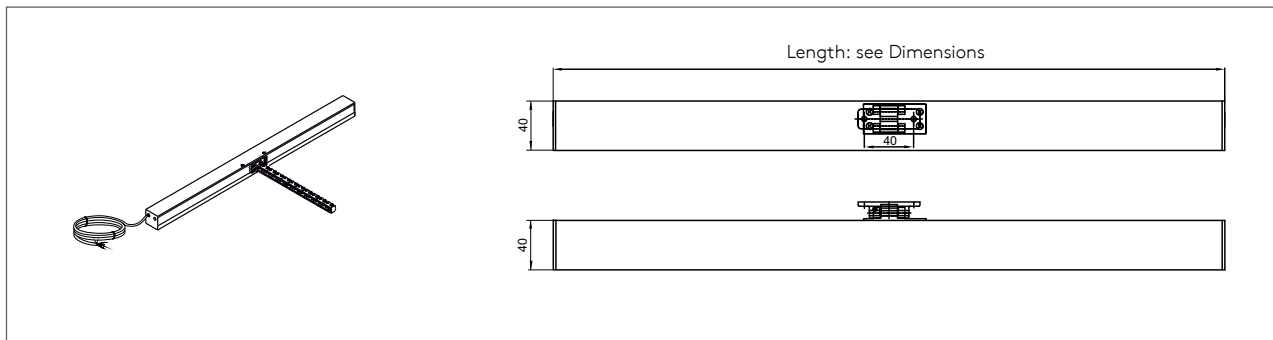
- Drive with small installation depth and slim, linear housing
- 300 N pressing force up to 600 mm opening width
- Integrated 230 V ballast
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium profile, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

##### Electrical properties

Rated voltage	230 V AC, 50 Hz (±10 %)
Rated current	Approx. 0.16 A
Cutoff	Integrated electronic max. load cutoff
Protection class	II

##### Mechanical properties

Stroke length, approx.	327, 419, 511, 603 and 810 mm
Pressing force	Up to 603 mm: 300 N > 603 mm: 100 N
Tractive force	300 N
Locking force	3000 N
Running speed	Approx. 12 mm/s
Duty cycle	DC 30 (10 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	EM/327S-419S: 636 x 40 x 40 mm EM/511S-603S: 820 x 40 x 40 mm

##### Electrical connection

Connection	H05 VV-F 3 x 0.75 mm², cable length = 5 m
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##### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

##### Approvals and certificates

Type tested	TÜV
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Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

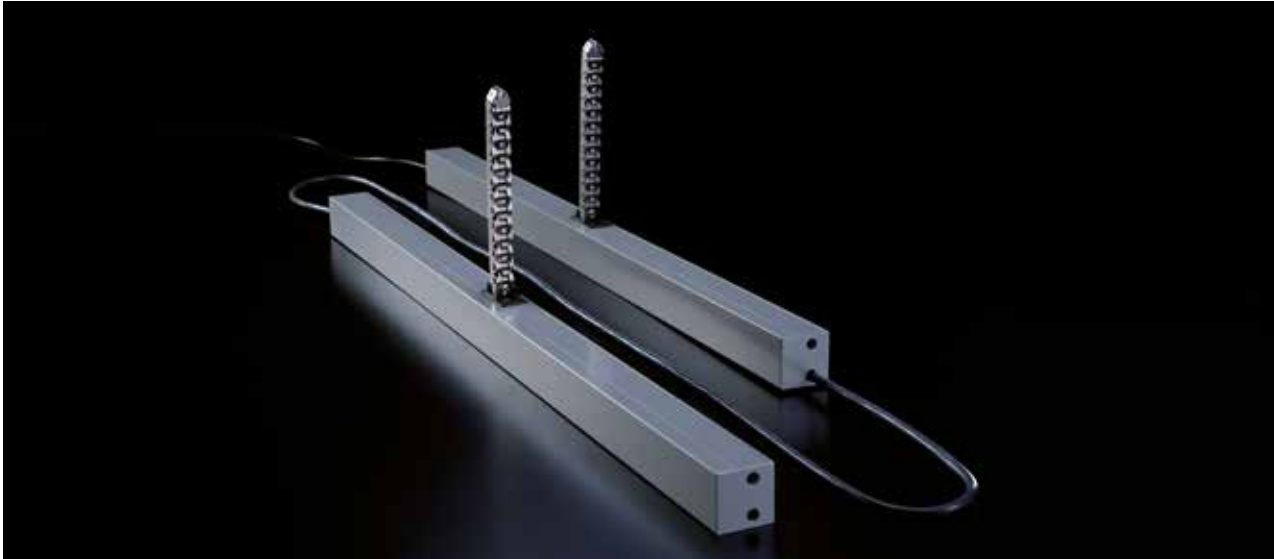
#### Order information

Version	EM/S AC	
	.../S/...	.../W/...
Stroke/mm	Item number	
327	13322782980	13322782800
419	13322783220	13322783140
511	13322783550	13322783480
603	13322783890	13322783710
810	13322791120	13322791130



#### 1.2.2.4 EM Tandem 230 V chain drive

Universal 230 V drive with 2 x 300 N for daily ventilation



With their tractive and pressing force of 2 x 300 N, the 230 V tandem drives in the EM series are universally suitable for wide casements. Their small surface height makes them suitable for applications involving confined installation spaces, e.g. in front of shades. Their linear design blends easily with window and façade profiles. EM Tandem AC is equipped with an integrated ballast unit and runs on 230 V mains voltage.

#### Benefits/ Features

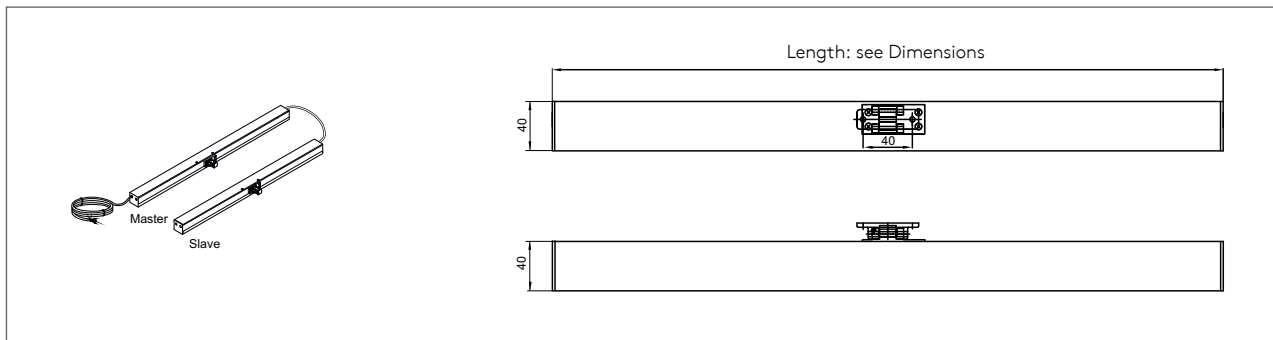
- 230 V tandem drives
- Small installation depth and slim, linear housing
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts
- Integrated 230 V ballast
- TÜV type tested

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows
- Universal tandem drives for wide casements/flaps

#### Material

- Housing: Aluminium profile, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



## Technical specifications

### Electrical properties

Rated voltage	230 V AC, 50 Hz (±10 %)
Rated current	Approx. 0.28 A
Cutoff	Integrated electronic max. load cutoff
Protection class	II

### Mechanical properties

Stroke length, approx.	327, 419, 511 and 603 mm
Pressing force	2 x 300 N
Tractive force	2 x 300 N
Locking force	Max. 2 x 3000 N
Running speed	Approx. 12 mm/s
Duty cycle	DC 30 (10 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	820 x 40 x 40 mm each

### Electrical connection

Connection	H05VV-F 3 x 0.75mm², length approx. 8 m, black
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### Installation and ambient conditions

Ambient temperature	-10 °C to +60 °C
Protection category	IP 20

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

## Order information

Version	EM/S Tandem AC	
	.../S/...	.../W/...
Stroke/mm	Item number	
327	13322712520	13322783130
419	13322783370	13322783380
511	13322712450	13322783680
603	13322784020	13322784030



### 1.2.2.5 CM AirDrive ventilation chain drive

Specialist for daily ventilation in narrow, heavy bottom- and top-hung and roof windows

**Air|Drive**  
Reliable Controlled Ventilation



The AirDrive units in the CM series were designed specially for ventilation applications. With their force of 600 N, they are ideal for operating heavy roof windows and top-hung sashes. They are characterised by their slimline, linear design and low power consumption. CM/AirDrive is available with 24 V DC or 230 V AC.

#### Benefits/ Features

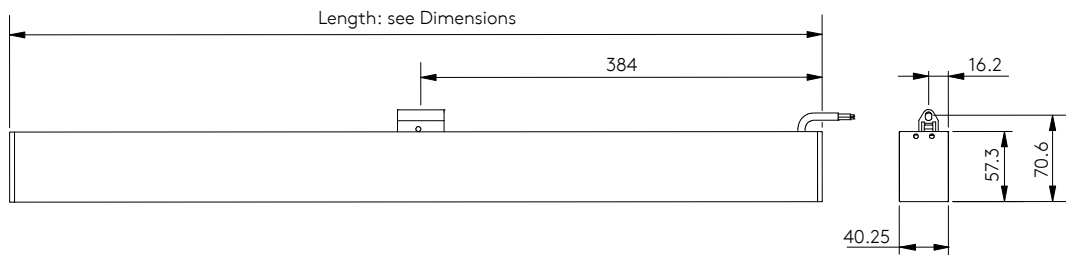
- Tractive/pressing forces up to 600 N
- Same housing for 24 V DC and 230 V AC versions
- Brackets concealed behind the drive for a better appearance
- Electronically defined contact pressure ensures seal closure
- Integrated overload protection
- Non-corrosive external parts

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows

#### Material

- Housing: Aluminium, End caps: Die-cast zinc
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	CM AirDrive AC	CM/AirDrive DC2
<b>Electrical properties</b>		
Rated voltage	230 V AC ( $\pm 10\%$ )	24 V DC ( $-20\%/+25\%$ )
Permissible ripple in rated voltage	-	2 V <sub>ss</sub>
Rated current	0.1 A	1.5 A
Cutoff	Integrated electronic max. load cutoff	
Protection class	II	III
<b>Mechanical properties</b>		
Stroke length, approx.	300 and 500 mm	
Pressing force	600 N	
Tractive force	600 N	
Locking force	3000 N	
Running speed	6 mm/s	
Duty cycle	30 DC (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	At stroke 300: 643 x 70.6 x 40.25 mm At stroke 500: 743 x 70.6 x 40.25 mm	At stroke 300: 643 x 70.6 x 40.25 mm At stroke 500: 743 x 70.6 x 40.25 mm
<b>Electrical connection</b>		
Connection	H05VV-F 3 x 0.75 mm <sup>2</sup> , cable length approx. 5 m	2 x 0.75 mm <sup>2</sup> , cable length approx. 3 m
<b>Installation and ambient conditions</b>		
Ambient temperature	-10 °C to +60 °C	
Protection category	IP 30	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

The drives are equipped with an integrated switching power pack for 230 V AC mains operation. Suitable switching and relay contacts must therefore be incorporated to enable control of the drives.

#### Order information

Version	CM AirDrive AC		CM/AirDrive DC2	
	.../S/...	.../W/...	.../S/...	.../W/...
Stroke/mm	Item number			
300	13315070301	13315070302	13315020301	13315020302
500	13315070501	13315070502	13315020501	13315020502



### 1.2.2.6 FM 309-401 AC 230 V chain drive

230 V drive for daily ventilation in top-, bottom-, side-hung and roof windows



The FM 309-401 230 V drive series is fitted with a double chain that merges and interlocks like a zip. This gives the drives excellent mechanical stability despite the flat chain design. As a result, even opening units with little frame clearance can be servo powered. Its strong and quiet drive and special design make it suitable for applications with more stringent requirements in terms of convenience, e.g. including conservatories. Available types: FM/309/140 and FM/309-401. FM 309-401 AC is equipped with an integrated ballast unit and runs on 230 V mains voltage.

#### Benefits/ Features

- Tractive/pressing forces up to 450 N
- Double chain drive, zip fastener principle
- Low-noise drive
- Mechanically adjustable seal closure
- Integrated overload protection
- Non-corrosive external parts
- TÜV type tested

#### Special benefits of FM 309/140 AC

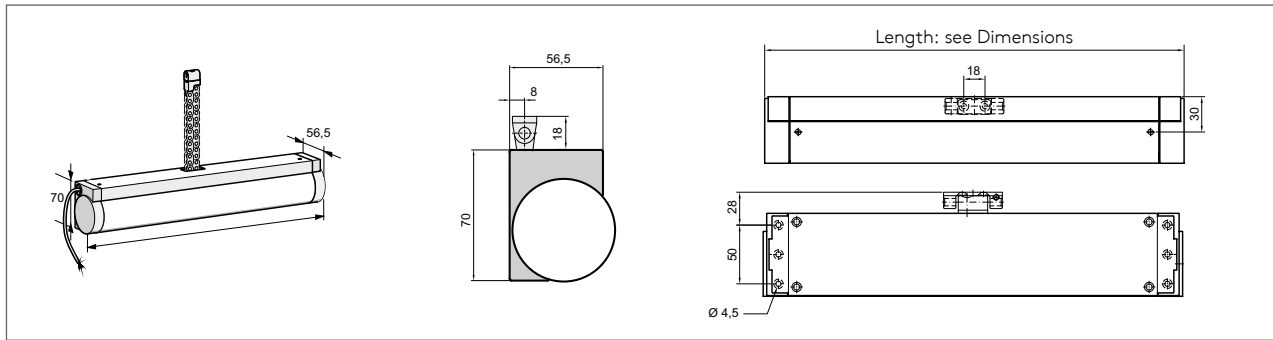
- Opening widths can be switched between 309 mm and 140 mm, therefore particularly suited for use in conservatories with retrofitted sun protection

#### Applications

- Daily aeration and ventilation
- Top-, bottom-, side-hung and roof windows, even if they have little frame clearance
- Conservatories

#### Material

- Housing: Aluminium, End caps: Black and grey plastic
- Opening mechanism: Stainless steel chain, maintenance-free
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



### Technical specifications

Version	FM/309/140/AC	FM/309/401/AC
Electrical properties		
Rated voltage	230 V DC (-15 %/+10 %)	
Rated current	Approx. 0.23 A	
Cutoff	Integrated OPEN + CLOSED end switch with additional overload protection	
Protection class	II	
Mechanical properties		
Stroke length, approx.	140 and 309 mm, switchable	309, 401 mm
Pressing force	450 N	
Tractive force	450 N	
Locking force	3000 N	
Running speed	Approx. 10 mm/s	
Duty cycle	DC 25 (4 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	449 x 70 x 56.5 mm	FM/309: 449 x 70 x 56.5 mm FM/401: 541 x 70 x 56.5 mm
Electrical connection		
Connection	3 x 0.75 mm², cable length approx. 3 m	
Installation and ambient conditions		
Ambient temperature	-10 °C to +50 °C	
Protection category	IP 40	
Approvals and certificates		
Type tested	TÜV	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

### Order information

Version	FM AC			
	FM/309/140		FM 309-401	
	.../S/...	.../W/...	.../S/...	.../W/...
Stroke/mm	Item number			
309	2109593	2103927	2103653	2103612
401	-	-	2101616	2101400



### 1.2.3 Chain drive accessories

The choice of window profiles and opening types is extensive. The range of accessories for our chain drives is just as extensive – including a large number of brackets and hinge brackets, acoustic signals and signal contacts, right up to our innovative EasyDrive software. All accessory components are, of course, perfectly matched to individual window systems and the drives in question.

#### Our portfolio

- LM accessories
- CDS accessories
- EM accessories
- CM accessories
- FM accessories
- EasyDrive software
- EasyDrive/2 cable sets
- Cable transitions
- WPS/2



#### » Learn more:

If you would like to learn more about our products and services, please visit [www.stg-beikirch.de](http://www.stg-beikirch.de).



### 1.2.3.1 LM accessories



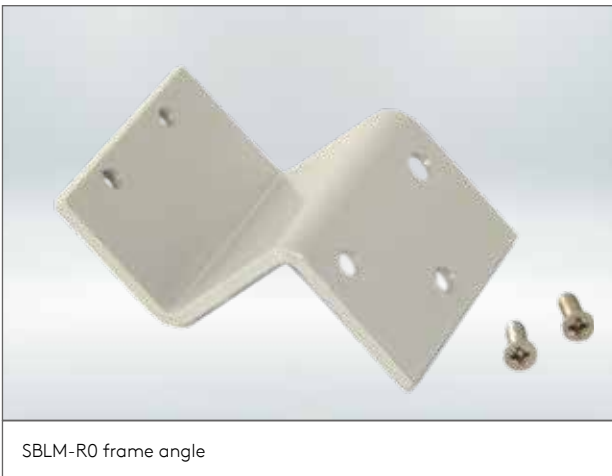
#### SBLM swivel bracket

For all LM drives.

- For movable installation of the chain drive on top-, bottom-hung and roof windows.
- Can be mounted on the casement if its height is less than the minimum specification.
- Consists of two swivel plates and two bearing angles incl. bearing bushes.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBLM	
	.../S	.../W
Item number	2600443	2600435



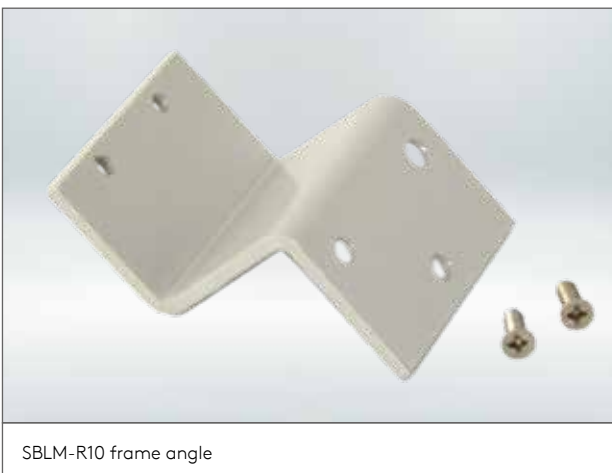
#### SBLM-R0 frame angle

For all LM drives.

- For mounting on the frame of flush windows.
- For accommodating the hinge bracket.
- Accessories for Tandem drives, please order in pairs!

#### Order information

Version	SBLM-R0	
	.../S	.../W
Item number	2600351	2600344



#### SBLM-R10 frame angle

For all LM drives.

- For mounting on the frame of windows with 10 mm projection.
- For accommodating the hinge bracket.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBLM-R10	
	.../S	.../W
Item number	2600385	2600377



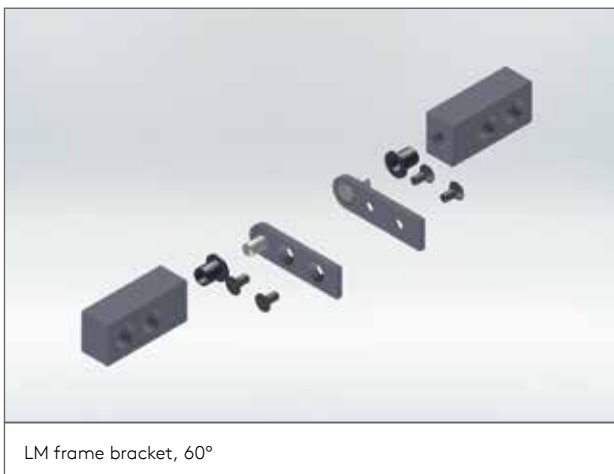
### SBLM-R15 frame angle

For all LM drives.

- For mounting on the frame of windows with 15 mm projection.
- For accommodating the hinge bracket.
- When ordering accessories for Tandem drives, please order in pairs!

#### Order information

Version	SBLM-R15	
	.../S	.../W
Item number	2600419	2600401



### LM frame bracket, 60°

For all LM drives.

- Can only be used in conjunction with SBLM-R0.
- For inward-opening bottom- and side-hung sashes.
- Enables sashes to be opened by up to 60°.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	LM frame bracket, 60°	
	.../S	.../W
Item number	13318000051	13318000052



### Mounting strip

For Schüco AWS (Royal S65).

- Bolting strip for fixing LM drives to the window casement.
- When ordering accessories for Tandem drives, please order in pairs!

#### Order information

Mounting strip	
Item number	2502755



### 1.2.3.2 CDs accessories



Steel bracket set BLR/CDs for frame mounting

#### Steel bracket set BLR/CDs

For all CDs drives.

- For frame mounting of the chain drive on tilt windows inward.
- Consisting of mounting accessories, two folding angles and wing bracket.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	BLR/CDs	
	chromated	.../S
Item number	13342504180	13342504181



Steel bracket set FLR/CDs for swivelling drive mounting

#### Steel bracket set FLR/CDs

For all CDs drives.

- For sash-side mounting with pivoting drive on tilt and turn windows inwards or for frame-side mounting on tilt and turn windows outwards.
- Consisting of mounting and fastening accessories two folding angles and a wing block.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	FLR/CDs	
	chromated	.../S
Item number	13342504195	13342504196



Steel bracket set FLR/CDs-60° with limited swivel range

#### Steel bracket set FLR/CDs-60°

For all CDs drives.

- Swivel bracket for limited rotation for sash mounting on pivot and tilt windows, enables opening widths up to 60°.
- Consisting of mounting accessories, two fold-down angles and winged trestle.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	FLR/CDs-60°	
	chromated	.../S
Item number	13342504200	13342504201



#### CDs Cable sets

Pre-assembled cable sets for connection and connection.

- Silicone cable, 6-core
- Colour: Black (sw)

#### Order information

Version	Silicone cable 2 x 0.75 mm <sup>2</sup> + 4 x 0.25 mm <sup>2</sup> .../sw
Type	Item No.
Connecting cable 1.50 m	13332572155
Power cable 3.10 m	13332570315
Power cable 5.10 m	13332570515



### 1.2.3.3 EM accessories



SBEM-DF swivel bracket

#### SBEM-DF swivel bracket

For all EM drives.

- For mounting the chain drive on outward opening top-hung and roof windows.
- Consists of mounting accessories, two folding angles and hinge bracket.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	SBEM-DF	
	.../S	.../W
Item number	2502391	2502359



SBEM-SK0 swivel bracket

#### SBEM-SK0 swivel bracket

For all EM drives.

- For flush installation of the EM on outward opening tilting top-hung sashes with small frames.
- Consisting of mounting and fastening accessories, two folding angles and asymmetric hinge bracket.
- When ordering accessories for Tandem drives, please order in pairs!

##### Order information

Version	SBEM-SK0	
	.../S	.../W
Item number	2502350	2502351



SBEM-KF0 swivel bracket

#### SBEM-KF0 swivel bracket

For all EM drives.

- For mounting the chain drive on the casement of bottom- or side-hung windows.
- Consists of mounting accessories, two folding angles and hinge bracket.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	SBEM-KF0	
	.../S	.../W
Item number	2502383	2502367



### SBEM-KF10 swivel bracket

For all EM drives.

- For mounting on bottom- or side-hung windows with 10 mm sash overlap.
- Consists of mounting accessories, two folding angles and hinge bracket.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBEM-KF10	
	.../S	.../W
Item number	2600179	2600161



### SBEM-KF15 swivel bracket

For all EM drives.

- For mounting on bottom- or side-hung windows with 15mm sash overlap.
- Consists of mounting accessories, two folding angles and hinge bracket.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBEM-KF15	
	.../S	.../W
Item number	2502409	2502375



### SBEM-R0 folding mechanism

For all EM drives.

- For flush frame mounting.
- Consists of mounting accessories, one angle and two fastening screws for the hinge bracket, and two folding angles.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBEM-R0	
	.../S	.../W
Item number	2502482	2502474



### 1.2.3.3 EM accessories



SBEM-R10 folding mechanism

#### SBEM-R10 folding mechanism

For all EM drives.

- For frame mounting on windows with 10 mm sash overlap.
- Consists of mounting accessories, one angle and two fastening screws for the hinge bracket, and two folding angles.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	SBEM-R10	
	.../S	.../W
Item number	2600203	2600195



SBEM-R15 folding mechanism

#### SBEM-R15 folding mechanism

For all EM drives.

- For frame mounting on windows with 15mm sash overlap.
- Consists of mounting accessories, one angle and two fastening screws for the hinge bracket, and two folding angles.
- Accessories for Tandem, please order in pairs!

##### Order information

Version	SBEM-R15	
	.../S	.../W
Item number	2502516	2502508



## 1.2.3.4 CM accessories



CM installation kit, type 1.0

### CM installation kit, type 1.0

For all CM drives.

- For installation on top-, bottom- and side-hung sashes with suitable profiles, and roof flaps, e.g. RAICO WING 105 D.
- Consists of brackets, hinge bracket incl. bolts, screws and rivet nuts.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	CM installation kit, type 1.0	
	.../S	.../W
Item number	2504000	2504001



CM installation kit, type 2.0

### CM installation kit, type 2.0

For all CM drives.

- For installation on top-, bottom- and side-hung sashes with suitable profiles, and roof flaps, e.g. WICONA WICTEC 50+60.
- Consists of brackets, hinge bracket incl. bolts, screws and rivet nuts.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	CM installation kit, type 2.0	
	.../S	.../W
Item number	2504010	2504011



CM installation kit, type 3.0

### CM installation kit, type 3.0

For all CM drives.

- For installation on top-, bottom- and side-hung sashes with suitable profiles, and roof flaps, e.g. HUECK 85 E.
- Consists of brackets, lining, hinge bracket incl. bolts, screws and rivet nuts.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	CM installation kit, type 3.0	
	.../S	.../W
Item number	2504030	2504031



CM installation kit, type 4.0

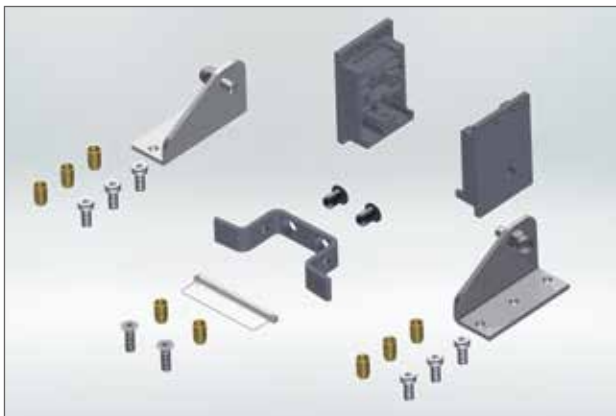
### CM installation kit, type 4.0

For all CM drives.

- For installation on roof windows, e.g. SCHÜCO AWS 57 RO.
- Consists of brackets, hinge bracket incl. bolts, screws and rivet nuts.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	CM installation kit, type 4.0	
	.../S	.../W
Item number	2504020	2504021



CM installation kit, type 10.0

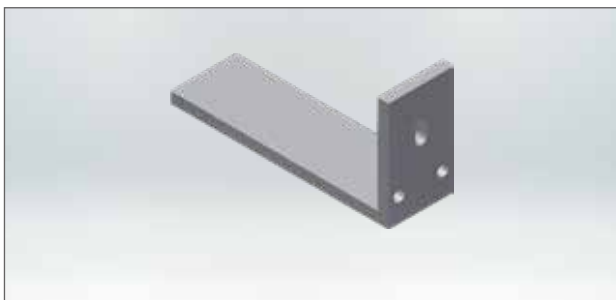
### CM installation kit, type 10.0

For all CM drives.

- For surface-mounted installation on roof flaps or façade bars.
- Consists of drilled end caps, brackets, hinge bracket incl. bolts, screws and rivet nuts.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	CM installation kit, type 10.0	
	.../S	.../W
Item number	13305000801	13305000802



Support bracket

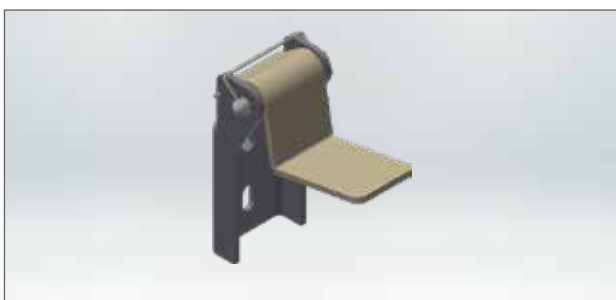
### Support bracket

For CM EasyDrive/2 Twin Compact.

- For installation on the casement of inward opening bottom-hung windows.

#### Order information

Version	Support bracket	
	.../S	.../W
Item number	13205000161	13205000162



Tilt restriction

### Tilt restriction

For CM EasyDrive/2 Twin Compact.

- For installation on the frame of top-hung or roof windows to support the drive.

#### Order information

Version	Tilt restriction	
	.../S	.../W
Item number	13342504081	13342504082



## 1.2.3.5 FM accessories



SBFM1 swivel bracket

### SBFM1 swivel bracket

For FM 309-401.

- For installation at the bottom of outward opening top-hung windows.
- Can be mounted on the frame if the casement height is less than the minimum specification.
- Accessories for Tandem, please order in pairs!

#### Order information

Version	SBFM-1	
	.../S	.../W
Item number	67001011	67001012



SBFM4 swivel bracket

### SBFM4 swivel bracket

For FM 309-401.

- For installation at the top of inward opening bottom-hung windows.
- Can be mounted on the casement if its height is less than the minimum specification.
- When ordering accessories for Tandem drives, please order in pairs!

#### Order information

SBFM-4	
Item number	67001040



SBFM5 swivel bracket

### SBFM5 swivel bracket

For all FM chain drives.

- Similar model to SBFM4, but with swivel range restricted to 4°. This ensures transmission of the max. pressing force of the drive.
- When ordering accessories for Tandem drives, please order in pairs!

#### Order information

SBFM-5	
Item number	2600856



### Base plate

For all FM chain drives.

- Base plate for roof window installation if there is not enough space to bolt the standard hinge bracket to the sash frame.
- Consists of base plate.

#### Order information

Version	Base plate	
	.../FM 309-401	.../FM 501-800
Item number	2600096	2600104



### SBFM-U10 lining plate

For all FM chain drives.

- 10 mm lining plate.
- For lining FM drives on windows with narrow rebate.
- When ordering accessories for Tandem drives, please order in pairs!

#### Order information

Version	SBFM-U10	
	.../S	.../W
Item number	67000051	67000052



### 1.2.3.5 FM accessories



OPEN / CLOSE signal contact

#### OPEN / CLOSE signal contact

For all FM chain drives.

- Potential-free relay contact for displaying window status.
- For FM Tandem drives with locking motors on request.

#### Order information

##### FM OPEN / CLOSE signal contact

Item number	50001792
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Acoustic detector

#### Acoustic detector

For all FM chain drives.

- Acoustic signal in CLOSE direction.
- Consists of Piezo buzzer incl. circuit board.
- **Note:** If incorporating an acoustic signal for an FM 309-401 chain drive, the drive will be housed in the casing used for type FM/401 (length 541 mm).

#### Order information

##### FM acoustic detector

Item number	13202600040
-------------	-------------



### 1.2.3.6 Miscellaneous accessories



USB converter and EasyDrive software

#### USB converter and EasyDrive software

- For configuring EasyDrive/2 drives on a computer.
- Consists of the configuration software and a USB converter with USB interface for connection to a PC.

#### Order information

##### USB converter/2 and EasyDrive software

Item number	13303000032
-------------	-------------



EasyDrive/2 cable sets

#### EasyDrive/2 cable sets

Pre-assembled cable sets for connecting and joining EasyDrive/2 drives.

- Silicone cable, 6-wire
- Colour: Black (sw) or white (ws)

#### Order information

Version	EasyDrive/2/cable	
	.../sw	.../ws
Cable	Item number	
1.50 m	13332500155	13332500152
3.10 m	13332500315	13332500312
5.10 m	13332500515	13332500512
8.10 m	13332500815	13332500812



KF9/W cable transition

#### KF9/W cable transition

For connecting chain drives mounted on case-ments.

- With flexible spiral hose
- Length: 30 cm
- Colour: White

#### Order information

##### KF9/W cable transition

Item number	20200171
-------------	----------



KUE-T1 cable transition

#### KUE-T1 cable transition

Plug-connected, concealed cable transition for chain drives.

- Plug connection with locking screws, can be disconnected.
- For use as an electrical interface between window casements and frames fitted with 24 V chain drives.

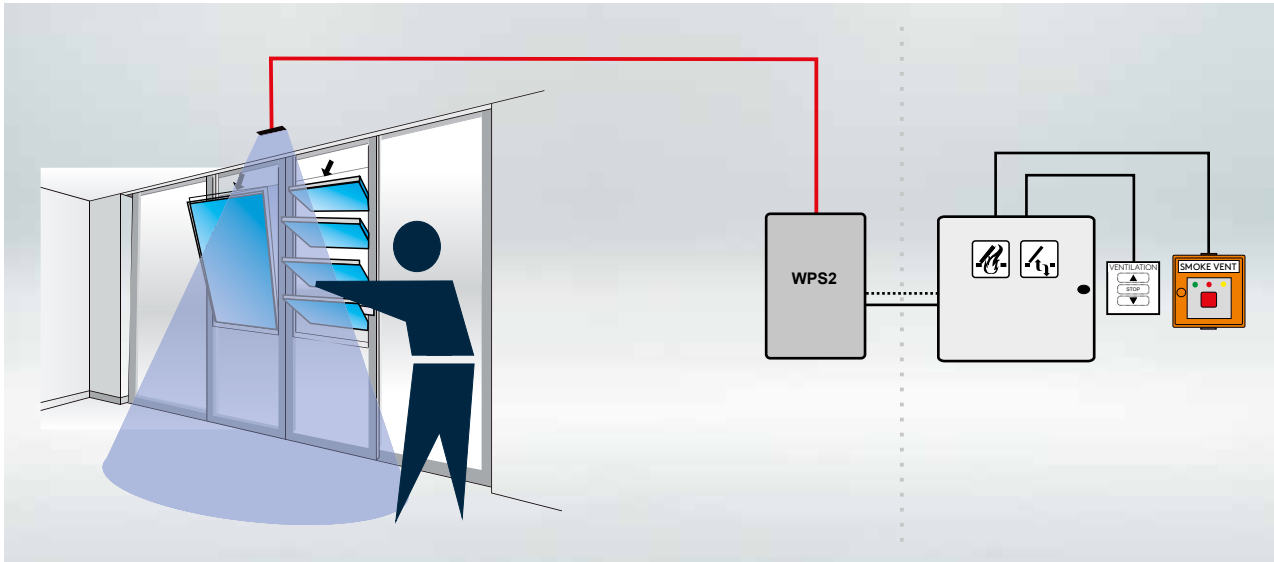
#### Order information

KUE-T1 cable transition	
Item number	13302600113



### 1.1.3.7 WPS®2 Window Protection System

Contactless pinch protection for power-operated windows

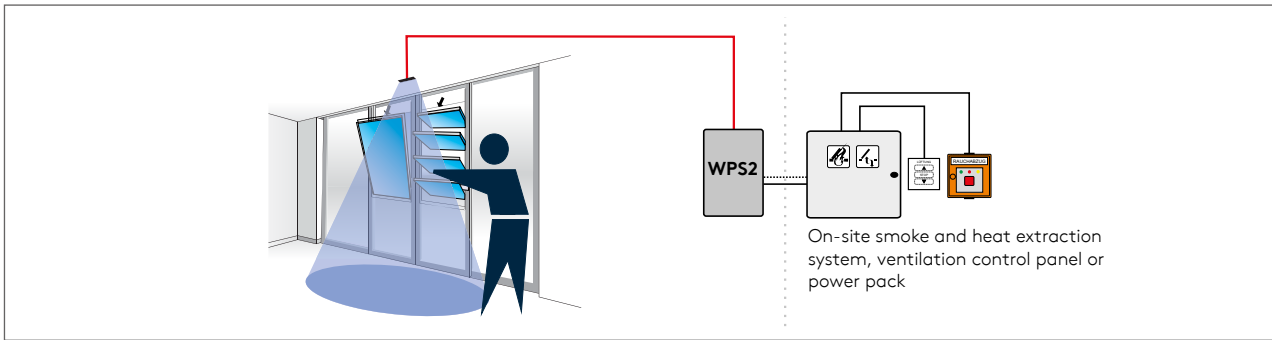


WPS/2 is a finger protection mechanism for automatically operated (power-operated) windows. Special infrared sensors or laser scanners detect the potential danger if somebody is near the window hazard zone, and immediately stop closing the window. The sensor continuously monitors the immediate pinch points and the hazard zone in and around the window. Multiple windows next to each other can also be monitored in one process. WPS/2 is suitable for all types of windows. No major structural work is needed – only the sensor and receiver require installation.

The WPS can be retrofitted, regardless of the drive and control panel make.

#### Benefits/ Features

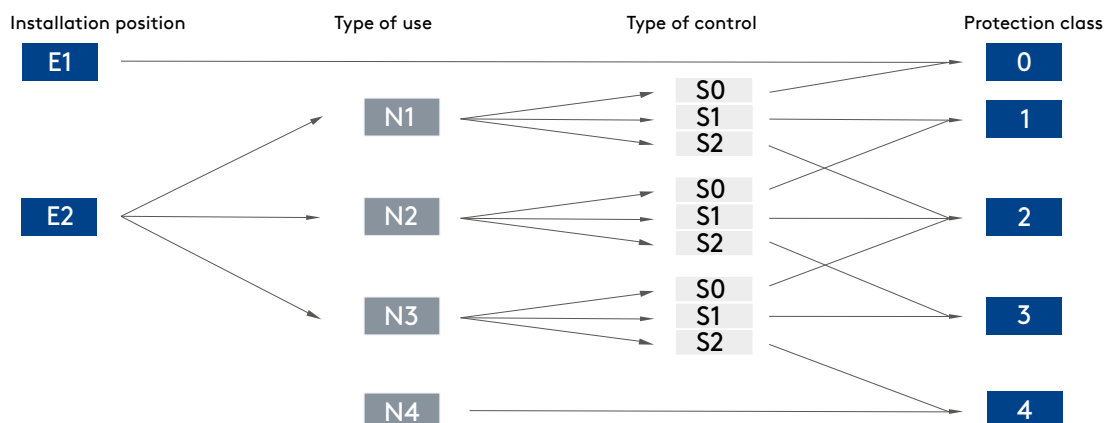
- Only finger protection to be TÜV approved in accordance with Machinery Directive 2006/42/EC incl. SIL certification
- Satisfies strictest protection class requirements for power-operated windows
- Regardless of drive and control panel make
- Wide-surface monitoring zone
- Individually adjustable
- Rapid response
- Monitors main and secondary closing edges and drives
- Suitable for all types of windows
- Compact control panel
- Extremely flexible, can be configured to work with different sensors



■ **Note:** The size of the monitored area is dictated by the installation height and type of sensor.

As per risk assessment for power-operated windows, WPS2 is also suitable for providing the highest level of protection. Assessment is performed by the fitter in line with Machinery Directive 2006/42/EC based on the following risk assessment:

- Installation position**
- **E1** Installed at a height of at least 2.5 m
  - **E2** less than 2.5 m and freely accessible
- Type of use**
- **N1** Rooms used commercially (e.g. offices)
  - **N2** Rooms used by people who have been shown how to operate the technology (e.g. homes)
  - **N3** Rooms frequented by visitors not trained to use the equipment safely (e.g. shops, public venues)
  - **N4** Rooms for people with special protection requirements (e.g. nursery schools)
- Type of control**
- **S0** Manual operation (e.g. key switch)
  - **S1** e.g. Manual operation with visual contact
  - **S2** Automatic operation



The outcome dictates the requisite protection class and measures.

- Protection class**
- **0** = No need for protective measures
  - **1** = Warning signs
  - **2** = Access control, e.g. signals
  - **3** = Access control, e.g. keypad operation
  - **4** = Secured by safeguards, e.g. light curtains such as WPS2

WPS2 solutions are available on request.

■ **Note:** Please also consult the EuroWindow guidance sheet KB.01 "Power-operated windows".



## 1.3 Electrical locking mechanisms

Apart from the appropriate holding power of the drives (at one or more lock points), larger windows often require an additional locking drive to ensure compliance with the performance classes defined in EN 14351-1 – particularly with regard to wind loads, resistance to heavy rain and airtightness.

An alternative solution would be to use our magnetic clamps, e.g. on inward opening bottom-hung sashes. They hold the window securely closed without the need for an additional locking drive.

STG-Beikirch offers various locking drives for servo powered windows with chain or linear drives to satisfy different requirements, together with additional locking mechanisms and magnetic clamps.

1.3

### Our portfolio

#### RM

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#### RM mini

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#### ZUV2

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#### EHM

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### Accessories

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### 1.3.1.1 RM 24 V locking motor

Locking drive engages with the window fitting to unlock/lock it

**EasyDrive<sup>2</sup>**  
Safe Efficient Intelligent



Slimline locking drive for mounting on the surface or in the profile, to enhance the chain drive. The tappet on the locking motor engages with the window fitting and unlocks it before the chain drive opens the casement. Integrated sequential control ensures the correct sequence of actions when opening and closing. Available types: RM Basic and RM EasyDrive/2.

#### Benefits/ Features

- Incorporated max. load cutoff and sequential control
- RM Basic is compatible with all chain drives in the LM/2, EM/2, CM and FM (with signal contact) series
- Actuating force 600 N or 1200 N
- Installed on the casement or concealed in the profile
- Tappet optionally left or right
- For actuating push rods
- Two locking motors can be tandem operated on one casement

#### Special benefits of RM/EasyDrive/2

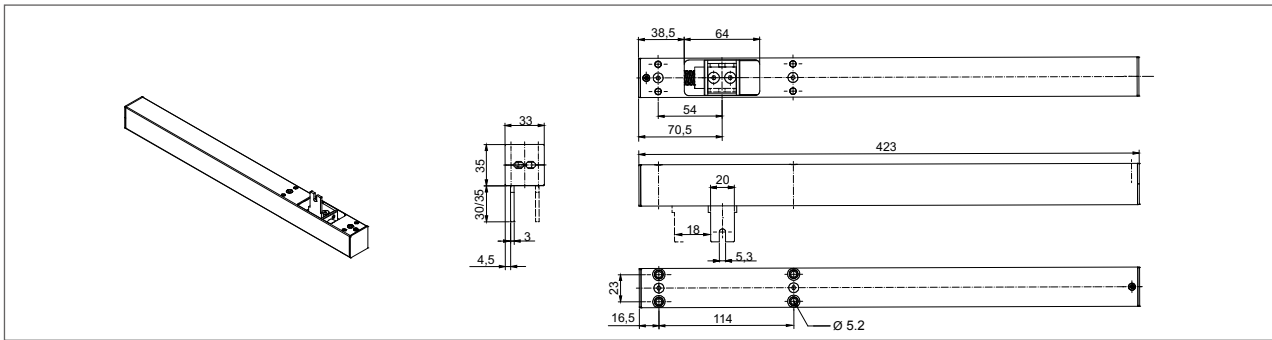
- Specially designed for combination with all EasyDrive/2 chain drives and CDs
- Configuration on a computer with EasyDrive software and USB converter/2
- Optional time-lagged operation of two RM EasyDrive/2 with EasyDrive software
- Adjustable locking direction
- Actuating force 1200 N

#### Applications

- For locking larger windows using the inside fitting

#### Material

- Housing: Aluminium profile, End caps: Black plastic
- Colour: powder-coated white (RAL 9016) or silver grey (RAL 9006) or RAL on request



#### Technical specifications

Version	RM Basic	RM/EasyDrive/2
Electrical properties		
Rated voltage	24 V DC (-20 %/+25 %)	24 V DC (-15 %/+25 %)
Permissible ripple in rated voltage	2 Vss	
Rated current	0.8 A at 600 N 1.2 A at 1200 N	1.5 A at 1200 N
Cutoff	Integrated electronic max. load cutoff	
Protection class	III	
Mechanical properties		
Stroke length, approx.	18 mm	
Pressing force	600 N or 1200 N	1200 N
Tractive force	600 N or 1200 N	1200 N
Locking force	Max. 3000 N	
Running speed	Approx. 6 mm/s	Approx. 3 mm/s
Duty cycle	DC 30 (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	423 x 35 x 35 mm	
Electrical connection		
Connection	On-site mains connection: 2 x 0.74 mm², length approx. 3 m Terminals for drives: Max. 1 mm² cross section	2 x 6-pole terminals
Installation and ambient conditions		
Ambient temperature	-10 °C to +60 °C	
Protection category	IP 20	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

- **Note:** Please order tappet and connection cable separately.

#### Order information

Version	RM Basic		RM/EasyDrive/2	
	.../S/...	.../W/...	.../S/...	.../W/...
Force/N		Item number		
600	2150010	2150020	-	-
1200	2150110	2150120	13360621001	13360621002



### 1.3.1.2 RM mini 24 V locking motor

Locking motor integrated in the profile engages with the window fitting to unlock/lock it

**EasyDrive<sup>2</sup>**  
Safe Efficient Intelligent



Very small locking drive for integration in the profile to enhance chain drives. The tappet on the locking motor engages with the window fitting and unlocks it before the chain drive opens the casement. Integrated sequential control ensures the correct sequence of actions when opening and closing. Available types: RM mini and RM mini EasyDrive/2.

#### Benefits/ Features

- Extremely compact housing for integration in the profile
- Size and fastenings perfectly matched to CDi chain drives
- RM mini is compatible with all chain drives in the LM/2, EM/2, CM and FM (with signal contact) series
- Automatic cutoff by installed limit switch and integrated sequential control for operating the connected chain drives
- Actuating force 600 N
- Optional tandem operation of two RM mini in one window

#### Special benefits of RM/EasyDrive/2

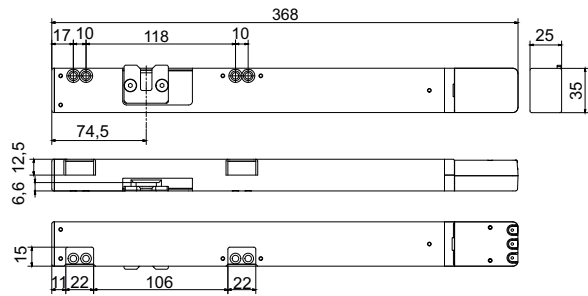
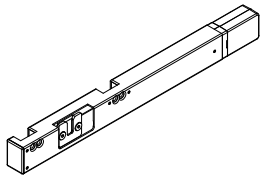
- Specially designed for combination with EasyDrive/2 chain drives and CDs
- Adjustable locking direction
- Optional time-lagged operation of two RM mini EasyDrive/2 with EasyDrive software

#### Applications

- Motorised actuation of window fittings in combination with chain drives

#### Material

- Housing: Aluminium/ABS
- Colour: Black



#### Technical specifications

Version	RM mini	RM mini/EasyDrive/2
Electrical properties		
Rated voltage	24 V DC (-15 %/+25 %)	24 V DC (-20 %/+25 %)
Permissible ripple in rated voltage	2 Vss	
Rated current	0.6 A at 600 N	
Cutoff	Integrated OPEN + CLOSED limit switch with additional electronic overload protection	
Protection class	III	
Mechanical properties		
Stroke length, approx.	18 mm	
Pressing force	600 N	
Tractive force	600 N	
Locking force	2000 N	
Running speed	2.25 mm/s	
Duty cycle	DC 30 (10 min.)	
Service life	> 10,000 cycles	
Dimensions (L x H x D)	368 x 25 x 35 mm	
Electrical connection		
Connection	8-pole plug-in screw terminal	
Installation and ambient conditions		
Ambient temperature	-10 °C to +60 °C	
Protection category	IP 20	

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

■ **Note:** Please order tappet and connection cable separately.

#### Order information

RM mini	RM mini EasyDrive/2
<b>Item number</b>	
13369000000	13360820605



### 1.3.2 ZUV2 additional lock

Electromotive additional lock for inward opening windows, for combination with linear drives and sequential control



Electromotive additional lock for use in connection with linear drives on large casements without own fittings. It provides an additional locking point and assures adequate seal closure on large casements. One additional ZWV mechanical secondary lock can provide two additional locking points on one side of a casement.

#### Benefits/ Features

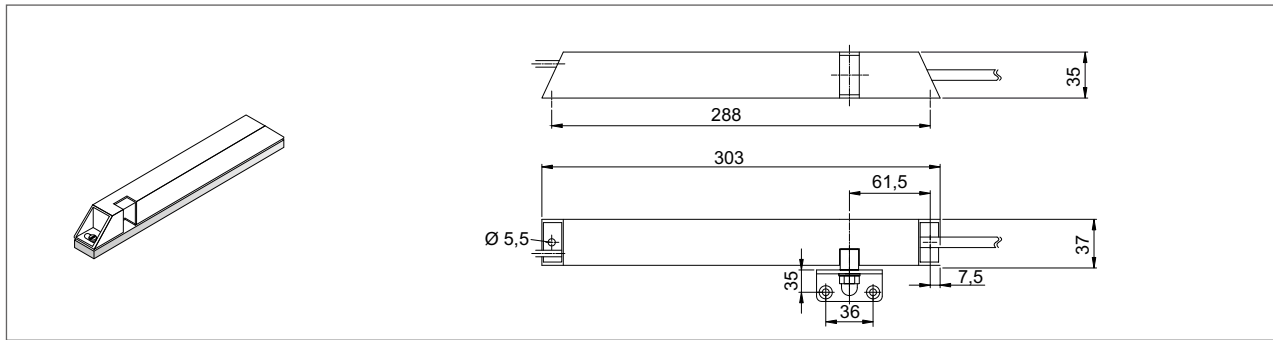
- Locking force max. 500 N
- Without integrated load cutoff; ESF or ESF-T electronic sequential control (must be ordered separately) for automatic load-dependent cutoff when end position is reached
- Provides additional lock points
- Can be combined with ZWV mechanical secondary lock with 1 m connecting rod

#### Applications

- Electromotive lock on inward opening bottom-, side-hung and pivoting windows
- Provides an additional lock on a window in combination with linear drives

#### Material

- Housing: Aluminium profile
- Colour: EV1/anodised silver



#### Technical specifications

##### Electrical properties

Rated voltage	24 V DC (-8%/+20%)
Permissible ripple in rated voltage	2 V <sub>ss</sub>
Rated current	Approx. 0.65 A
Cutoff	External electronic load cutoff with sequential control
Protection class	III

##### Mechanical properties

Stroke length, approx.	Matched to bolt lock
Pressing force	500 N
Tractive force	500 N
Locking force	Max. 3000 N
Running speed	5 s (until completely open / locked)
Duty cycle	DC 30 (10 min.)
Service life	> 10,000 cycles
Dimensions (L x H x D)	303 x 35 x 37 mm

##### Electrical connection

Connection	2 x 0.5 mm <sup>2</sup> , cable length approx. 2.5 m
------------	--

##### Installation and ambient conditions

Ambient temperature	-5 °C to +65 °C
Protection category	IP 54

Depending on the power controls used, higher currents must be expected in the start-up torque when dimensioning the cable cross-sections of the motor supply cables. Functionally reliable operation is guaranteed when connected to corresponding control systems from the same manufacturer. Conformity of functional reliability must be requested for operation on control systems from third party manufacturers.

■ **Note:** Please order accessories such as mounting plate and ZWV separately.

Depending on the control centres used, current surges when starting up may need to be considered when dimensioning the power supply and the motor wiring. Functionally reliable operation is guaranteed when connected to appropriate control panels from the same manufacturer. Please check functional reliability conformity if you are planning to use control panels from different manufacturers.

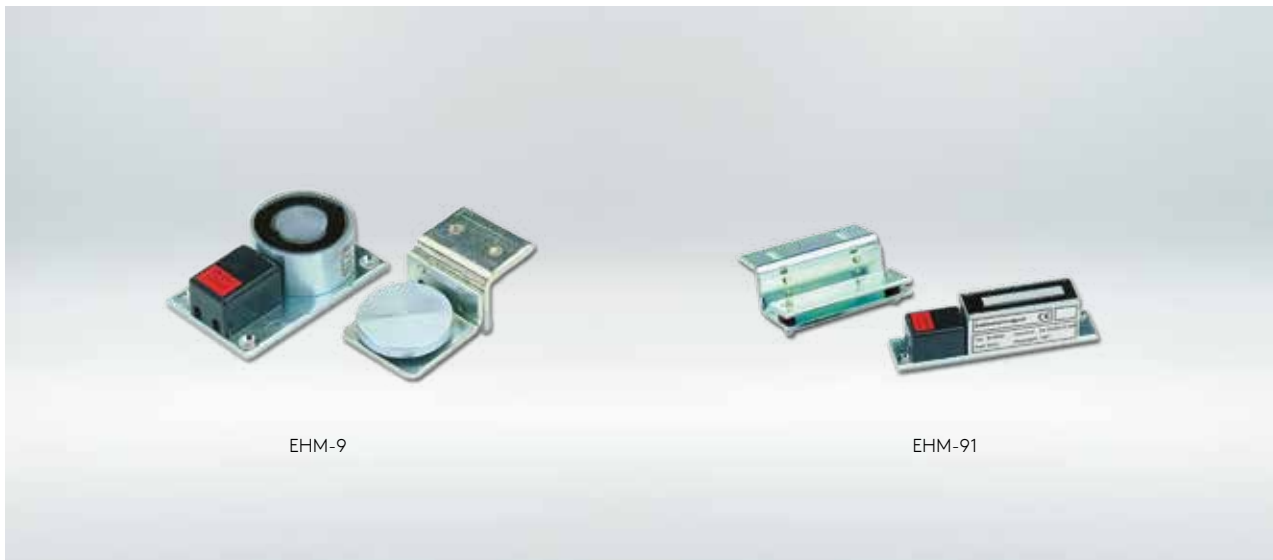
#### Order information

ZUV2/EV1
Item number
68053022



### 1.3.3 EHM-9 and EHM-91 electric magnetic clamps

Enhance drives, assure sufficient contact pressure



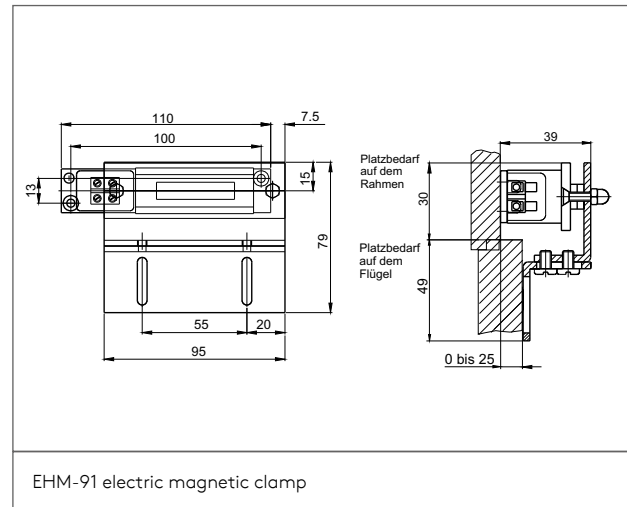
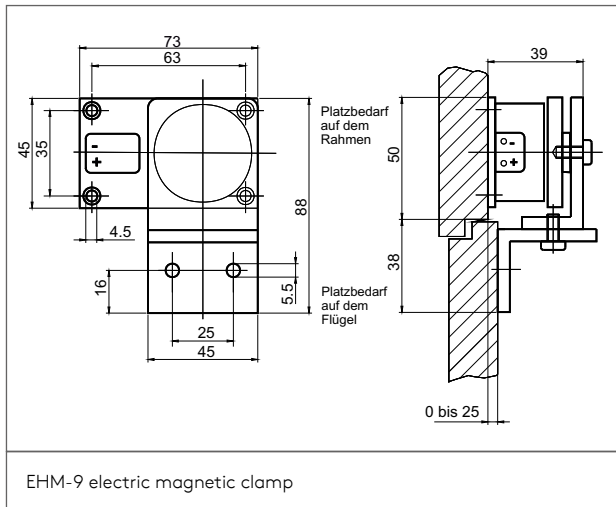
Electrically operated magnetic clamps can be used in addition to drives on bottom- or side-hung sashes to assure adequate seal closure, especially on asymmetric drives. Available types: EHM-9 (round) or EHM-91 (rectangular).

#### Benefits/ Features

- Holding force 600 N (EHM-9) or 400 N (EHM-91)
- With counter plate and adjustable casement bracket
- Complete with motor connection module
- Can be used on control panels without disconnecting motor voltage

#### Applications

- Enhanced seal closure on motorised casements, especially when the drive is mounted on one side or asymmetrically
- Adjustable locking direction



#### Technical specifications

Version	EHM-9	EHM-91
Electrical properties		
Rated voltage	24-32 V DC	
Rated current	60 mA	80 mA
Cutoff	External, integrated reverse polarity protection	
Protection class	III	
Mechanical properties		
Locking force	Locking force 600 N	Locking force 400 N
Duty cycle	DC 100	
Dimensions (L x H x D)	73 x 45 x 35 mm; Counter plate: 88 x 45 x 40 mm	110 x 30 x 35 mm; Counter plate 95 x 79 x 40 mm
Electrical connection		
Connection	2-pole, cable not included in the scope of supply	
Installation and ambient conditions		
Protection category	IP 40	

#### Order information

EHM-9	EHM-91
<b>Item number</b>	
30000525	30000530



### 1.3.4 Lock accessories

The choice of window profiles and opening types is extensive. We can offer matching accessories for our electric locks, such as tappets or sequential controllers that are perfectly compatible with the individual systems.

#### Our portfolio

- ZWV secondary lock for ZUV2 additional lock
- Tappets
- Sequential controllers



#### » Learn more:

If you would like to learn more about our products and services, please visit [www.stg-beikirch.de](http://www.stg-beikirch.de).



### 1.3.4 Electric lock accessories



#### RM tappet

For RM Basic and RM/EasyDrive/2 locking motors.

- Profile-dependent tappet for engaging with the fitting.
- Optional use on the right or left side.
- Lengths 30 mm and 35 mm.

#### Order information

Version	RM EasyDrive/2 tappet	
	30 mm	35 mm
Item number	2502570	2502571



#### ZWV secondary lock

Additional secondary lock to enhance the ZUV2 additional lock, for particularly wide or tall case-ments.

- Complete with 1 m connecting rod
- Housing: Special aluminium profile 35 x 35 mm
- Ambient temperature range: -5 °C to +65 °C
- Colour: EV1/anodised silver

#### Order information

ZWV	
Item number	68053023

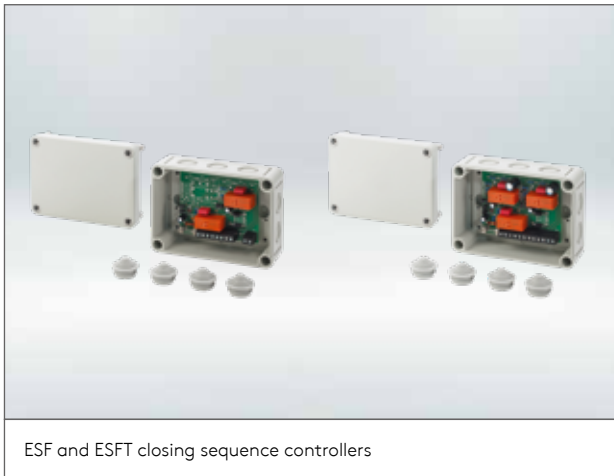
#### Lining plates for ZUV2 and ZWV

As ZUV2 and ZWV accessories.

- With 5 mm
- Colour: EV1/anodised silver

#### Order information

Version	EV1 lining plates	
	ZUV2	ZWV
Material thickness	Item number	
5 mm	68053031	68053029



### ESF and ESFT 24 V closing sequence controllers

For M6 and M7 linear drives (without own max. load cutoff) and ZUV2 additional locks.

- ESF is used to operate M6 / M7 linear drives without internal load cutoff in combination with a ZUV2 additional lock.
- ESFT allows tandem operation of two M6 / M7 linear drives without internal load cutoff in combination with a ZUV2 additional lock.
- Housing: Surface mounted, grey ABS plastic
- Dimensions (L x H x D): 130 x 95 x 56 mm
- Operating voltage: 24-33 V DC
- Connection: Screw terminals up to 2.5 mm<sup>2</sup>
- Protection category: IP 54
- Ambient temperature: 0-70 °C

#### Order information

Version	Closing sequence controllers	
	ESF	ESFT
Item number	68053052	68053051



## 2 Control panels

STG-Beikirch offers control panels, control systems and a wide range of accessories to build SHE and ventilation systems that suit both the building requirements and the individual needs of occupants and operators.

The systems can be activated manually from SHE control points, or automatically by smoke detectors or thermal sensors, such as a fire alarm system, and can be operated with a wide range of pneumatic or electric controllers.

Vent switches or sensors can drive the manual or automatic aeration and ventilation of a building. Windows and skylight domes that close automatically – when it starts to rain or the wind speed gets up, for example – offer a building reliable protection against weather-related damages.

2

### Our portfolio

- Central controllers for 24 V SHE and ventilation systems
- Decentralised BUS control panels for 24 V SHE and ventilation systems
- Control panels for smoke pressure systems (SPS)
- 24 V and 230 V ventilation control panels
- Accessories for SHE and ventilation control panels

### » Find out more:

If you would like to learn more about our products and services, please go to [www.stg-beikirch.de](http://www.stg-beikirch.de).



2.1 Central 24 V control panels for SHE and ventilation

SHE systems made by STG-Beikirch keep smoke levels reliably low on escape routes, enable fast and safe evacuation in the event of fire, and thus help the fire brigade to fight the fire. At the same time, they can be used to protect production and manufacturing equipment, and warehouse goods.

The SHE systems are, moreover, suitable for natural aeration and ventilation and can be integrated seamless and efficiently in building management systems.

Our portfolio

TRZ staircase  
control panel

Compact  
Control Panel

EasyConnect  
20 A

MZ3 BASIC

MZ3

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### 2.1.1 (TRZ) staircase control panels

Control panels servicing the widest range of SHE and ventilation requirements



24 V DC control panel for electromotive smoke extraction and daily ventilation. Designed specifically for use in staircases. Available types: TRZ Plus 2A, TRZ Plus Comfort and Compact Control Panel 2A (/M). Special versions: TRZ Plus DG (for pressurised gas generators) on request, and TRZ VdS, see Section 3.1.4.

#### Benefits/ Features

- Max. 2 A current output
- Complete with “Daily ventilation” function
- One SHE group (RG) and one ventilation group (LG)
- PC service port interface for advanced configuration options
- Integrated service timer
- Integrated 230 V AC/24 V DC power supply, emergency power batteries and charging pack for 72 hours operational readiness during power cuts
- Optional additional extension modules (already integrated in TRZ Plus Comfort)
- Optional flush-mounted version
- TÜV type tested
- Tested to EN 12101-10

#### Applications

- Ventilation and smoke and heat extraction in staircases

#### Material

- Plastic housing for surface-mounted installation, Compact Control Panel 2A/M: Sheet steel
- Colour:
  - TRZ Plus: Blue, yellow, grey, orange, red
  - Compact Control Panel 2A: Grey
  - Compact Control Panel 2A/M: Traffic white (RAL 9016)

## Technical specifications

Version	TRZ Plus Comfort	TRZ Plus 2A	Compact Control Panel 2A	Compact Control Panel 2A
Electrical properties				
Primary energy supply				
Mains supply voltage	230 V AC/50 Hz, (±10 %), separate fuse protection			
System voltage	27 V DC (rated) (-25 % /+10 %)			
Power consumption	Max. 75 W at 2 A current output			
Power consumption (standby)	< 5 W			
Connection terminal	Screw terminal max. 2.5 mm²			
Fuse protection	F1 mains: Print fuse 1.25 A/T TE5 250 V, motor circuit FKS 10 A			
Secondary energy supply				
Battery	2 x 12 V, 1.2 Ah, VdS			
Current output after 72 h in emergency power supply mode	2 A for 180 sec. according to DIN EN 12101-10			
Output				
Voltage	27 V DC (rated) (-30 % /+10 %), smoothed			
Power	Pmax = 54 W; Pmin = 0 W			
Current (rated)	Drives: 2 A at DC 30; Magnetic clamps: 0.7 A at DC 100			
Opening/closing action	Voltage polarity reversal			
Clocking in accordance with prEN 12101-9	Adjustable			
Autom. release	OPEN/CLOSE direction: after 3 min. (in ventilation mode)			
Circuit monitoring	With diodes			
Connection terminal	Max. 1,5 mm², spring loaded terminal			
Fuse protection	FKS 5 A			
"SHE triggered" and "Malfunction" messages forwarded via potential-free contacts	Integrated	Retrofit option with additional TRZ/WRMAS-Basic module		
Input for wind/rain sensor				
Integrated vent switch	Yes	No		
Integrated SHE manual call point	Yes	Retrofittable with additional TRZ/RBH-Basic module	No	
Service timer	Yes			
Service port	Yes			

## Mechanical properties

Dimensions (H x W x D)	220 x 146 x 84 mm	300 x 300 x 132 mm	300 x 300 x 111 mm
Weight	Approx. 4.5 kg incl. batteries	Approx. 5.5 kg incl. batteries	

## Installation and ambient conditions

Nominal temperature	20 °C		
Ambient temperature	-5 °C to +40 °C		
Protection category	IP 20	IP 44	IP 20

## Order information

Version	TRZ Plus Comfort		TRZ Plus 2 A		Compact Control Panel 2A		Compact Control Panel 2A/M	
	-	.../o.W.	-	.../o.W.	-	.../o.W.	-	.../o.W.
Item number								
White	-	-	-	-	13362501200	13362501206	13362504200	13362504206
Blue	62500230	13362500236	62500030	13362500036	-	-	-	-
Yellow	62500240	13362500246	62500040	13362500046	-	-	-	-
Grey	62500210	13362500216	62500010	13362500016	-	-	-	-
Orange	62500250	13362500256	62500050	13362500056	-	-	-	-
Red	62500220	13362500226	62500020	13362500026	-	-	-	-



## 2.1.2 Compact Control Panel

High-performance SHE and ventilation control panels



24 V DC control panel for electromotive smoke extraction and daily ventilation.  
Available types: Compact Control Panel 4A/M or Compact Control Panel 8A/M in metal housing.

### Benefits/ Features

- 4 A or 8 A current output, depending on model
- Complete with "Daily ventilation" function
- One SHE group (RG) and two ventilation groups (LG)
- PC service port interface for advanced configuration options
- Integrated service timer
- Integrated 24 V DC power supply, emergency batteries and charging pack, parallel operation, 72 hours operational readiness during power cuts
- Monitoring of detector circuits (automatic detectors and SHE manual call points), emergency batteries and connected drives
- Optional cascading of up to 8 control panels
- DIP switch for adjustable special functions
- TÜV type tested
- Tested to EN 12101-10

### Applications

- Buildings with smoke and heat extraction and/or natural aeration and ventilation requirements

### Material

- Housing: choice of plastic or metal
- Colour: Grey

## Technical specifications

Version	Compact Control Panel 4A		Compact Control Panel 8A	
Electrical properties				
Primary energy supply				
Mains supply voltage	230 V AC/50 Hz, (±10%), separate fuse protection			
System voltage	27 V DC (rated) (-25% / +10%)			
Power consumption	Approx. 150 W at 4 A current output		Approx. 300 W at 8 A current output	
Power consumption (standby)	< 5 W			
Connection terminal	Screw terminal max. 2.5 mm²			
Fuse protection	Mains: 230 V AC; T 3.15 A/H Motor circuit FKS 10 A			
Secondary energy supply				
Battery	2.2 Ah		7.2 Ah	
Current output after 72 h in emergency power supply mode	4 A for 180 sec. (as per EN 12101-10)		8 A for 180 sec. (as per EN 12101-10)	
Output				
Voltage	27 V DC (rated) (-25%/+10%), smoothed			
Power	Pmax = 108 W; Pmin = 0 W		Pmax = 216 W; Pmin = 0 W	
Current (rated)	Drives: 4 A at ED 30, output with separate fuse protection; Magnetic clamps: 1 A at ED 100 at ED 100		Drives: 8 A at ED 30, output with separate fuse protection; Magnetic clamps: 2 A at ED 100	
Opening/closing action	Voltage polarity reversal			
Autom. release	OPEN/CLOSE direction: after 3 min. (in ventilation mode)			
Circuit monitoring	With diodes			
Connection terminal	max. 6 mm², screw terminal			
Fuse protection	FKS 10 A			
Mechanical properties				
Dimensions (H x W x D)	Type 4A: 300 x 300 x 132 mm Type 4A/M: 300 x 300 x 111 mm		Type 8A: 300 x 300 x 187 mm Type 8A/M: 400 x 300 x 180 mm	
Weight	Approx. 6 kg incl. battery		Type 8A: approx. 6.5 kg incl. battery Type 8A/M: approx. 14.9 kg incl. battery	
Installation and ambient conditions				
Nominal temperature	20 °C			
Ambient temperature	-5 °C to +40 °C			
Protection category	Type 4A: IP 44 as per EN 60529 Type 4A/M: IP 20 as per EN 60529		Type 8A: IP 44 as per EN 60529 8A/M metal housing: IP 42 as per EN 60529	

## Order information

Version	Compact Control Panel			
	... 4A	... 4A/M	... 8A	... 8A/M
<b>Item number</b>				
-	13362501400	13362504400	13362501800	62500800
o.W.	13362501406	13362504406	13362501806	13362500806



### 2.1.3 Compact Control Panel EasyConnect 20 A **Easy|Connect**

Connectable, flexible, powerful control panel for SHEV and Ventilation



24 V DC compact control panel with high current output of max. 20 amps with networking capability from up to 26 further EasyConnect compact control panels.

#### Benefits/ Features

- Current output of 20 A
- Two SHE groups (RG) and two ventilation groups (LG), can be used separately or connected together
- Two drive lines for 24 V DC drives, max. current output 16 A per drive line
- Two connection inputs for SHEV button (max. 10 per connection), smoke detector (up to 20 per connection), fire alarm system (FAS) and ventilation switches (up to 10 per connection)
- Further connection options for: Wind/rain detector, 3 configurable potential-free relay outputs (default: fault, trip, wind/rain signal), one separate voltage output 27 V DC / 4 A (10 s)
- Integrated 24 V DC power supply, emergency batteries and charging pack, parallel operation, 72 hours operational readiness during power cuts
- Line monitoring of the detector circuits (automatic detectors, SHE manual call points, FAS) and the connected drives, mains and battery monitoring
- Basic functions adjustable via DIP switches
- 6 displays on the front panel (operation, activation, fault, Bus, maintenance, 230 V)
- Status and error code display via internal 2 x 7-segment display

#### Applications

- Buildings with smoke and heat extraction requirements and/or natural ventilation requirements

#### Material

- Housing: plastic
- Colour: Grey

## Technical specifications

### Electrical properties

#### Primary energy supply

Mains supply voltage	100 V - 240 V AC; 47 Hz - 63 Hz, ( $\pm 10\%$ ), separate fuse protection
System voltage	27 V DC (rated) ( $-25\%/+10\%$ )
Power consumption	560 W at 20 A current output
Power consumption (standby)	< 5 W
Connection terminal	Screw terminal max. 2,5 mm <sup>2</sup>
Fuse protection	F1, 10 A, safety fuse

#### Secondary energy supply

Battery	7.2 Ah
Current output after 72 h in emergency power supply mode	20 A for 180 sec. (acc. to DIN EN 12101-10)

#### Output

Voltage	27 V DC (rated), ( $-25\%/+10\%$ )
Power	P <sub>max</sub> = 540 W, P <sub>min</sub> = 0 W
Current (rated)	Drives: 16 A at DC 30, output with separate fuse protection; Magnetic clamps: max. 6 A at DC 100 (referring to 10 min)
Opening/closing action	Voltage polarity reversal
Autom. release	OPEN/CLOSE direction: after 3 min.
Circuit monitoring	via active motor monitoring module
Connection terminal	max. 6 mm <sup>2</sup> , screw terminal
Fuse protection	Drive fuse channel 1: F4, 15 A, FKS, drive fuse channel 2: F5, 15 A, FKS

### Mechanical properties

Dimensions (H x W x D)	300 x 400 x 132 mm
Weight	approx. 5.9 kg

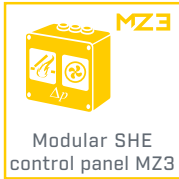
### Installation and ambient conditions

Ambient temperature	-5 °C to +40 °C
Protection category	IP 44

## Order information

### EasyConnect 20 A

Item number	1338620006
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## 2.1.4 MZ3 Basic modular control panel

Compact modular standard control panel based on MZ3 for SHE and ventilation

**MZ3**



MZ3 Basic modular control panels are standardised SHE control panels based on the functional, modular and configurable MZ3 system. MZ3 Basic meets the requirements for pre-configured SHE control panels that perform the most commonly required applications.

### Benefits/ Features

- Compact SHE standard control panel based on MZ3
- Pre-configured at the factory and therefore ready for immediate use
- With one SHE and two ventilation groups assigned to 3 to 6 motor outputs, depending on the size of the control panel
- Standard equipped for activation by manual SHE control points, smoke detectors and fire alarm systems
- Connections for two vent switches and one wind/rain sensor
- Option for bridging both ventilation groups to form a single group
- Energy supply tested to EN 12101-10

### Applications

- Natural smoke extraction (NSE)
- Natural aeration and ventilation

### Material

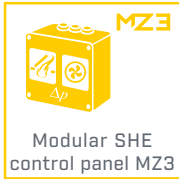
- Housing: Sheet steel, surface-mounted installation

## Technical specifications

Version	MZ3 Basic 16A	MZ3 Basic 24 A	MZ3 Basic 32A	MZ3 Basic 48A
Electrical properties				
Primary energy supply				
Mains supply voltage	230 V AC/50 Hz (±15%)			
System voltage	27 V DC (rated) (-25% / +10%)			
Output current	16 A	24 A	32 A	48 A
Input current	2.5 A	3.75 A	5 A	7.5 A
Power consumption	540 W	810 W	1080 W	1620 W
Connection terminal	Push-in terminal max. 2.5 mm²			
Battery fuse protection	On site: 16 A			
Secondary energy supply				
Battery	2 x 12 V/12 Ah	2 x 12 V/18 Ah		
Fuse protection	FKS 40 A			
Output				
Voltage	27 V DC (rated) (-25 % / +10 %)			
Power (per motor channel)	Pmax = 216 W; Pmin = 0 W			
Rated current (per motor channel)	8 A at DC 30, intrinsically safe			
Opening/closing action	Output voltage reverse polarity			
Autom. release	OPEN/CLOSE direction: after 3 min. (in ventilation mode)			
Circuit monitoring	With diodes			
Number of motor channels	3	3	3	3
Motor channels/Ventilation groups	[1, 2]   3	[1, 2]   3	[1, 2, 3]   3	[1, 2, 3]   3
Potential-free signal contacts	Activation, malfunction, operation			
Input				
Input for SHE manual call point	1 x SHE group, circuit monitored			
Input for automatic detector	Circuit monitored			
Input for fire alarm system	Circuit-monitored NO contact			
Input for vent switch	Yes, 2 ventilation groups can be combined into one			
Input for wind/rain sensor	Yes			
Mechanical properties				
Dimensions (H x W x D)	600 x 400 x 210 mm	800 x 600 x 210 mm	800 x 600 x 210 mm	800 x 600 x 210 mm
Installation and ambient conditions				
Nominal temperature	20 °C			
Ambient temperature	-5 °C to +40 °C			
Protection category	IP 42			

## Order information

Version	MZ3 Basic			
	16A Basic	24A Basic	32A Basic	48A Basic
Item number	13383000050	13383332000	13383000060	13383348000



### 2.1.5 MZ3 modular control panel

SHE and MSE control cabinets up to 192 A, custom-configured and built to project requirements

**MZ3**



MZ3 is a functional, modular and configurable SHE control system that can also be used for natural aeration and ventilation or incorporated into a building management system.

When planning and configuring an MZ3 using the MZ3 Planning and Configuration Tool, each required function is simply compiled on the computer using the Drag & Drop function.

Thanks to the new functional approach to system configuration, the individual requirements of any building can be easily and flexibly mapped during system compilation with the help of the MZ3 Tool. The system was designed to be fit for the future and is already able to link systems together or to link to the building automation system.

The LON interface ensures that MZ3 is compatible with the other LON-SHE components made by STG-BEIKIRCH and can be efficiently integrated into decentralised SHE and ventilation control networks.

A building management system has fully access to all MZ3 ventilation functions via the KNX interface and can therefore incorporate the connected opening elements effectively into the ventilation concepts.

Please refer to Section 2.2 for products and information about decentralised solutions.

These MZ3 solutions are custom-configured for your project – please don't hesitate to ask us for advice.

■ **Note:** Please ask for a free demonstration copy of our MZ3 Tool.



MZ3 Tool for planning and configuration

## Benefits/ Features

- New functional approach to system configuration
- Very flexibly, project-specific solutions with custom configuration of functions
- Standard design for systems up to 192 A - larger systems are possible – please consult us
- Control functions can be interconnected via BUS system to create a decentralised system configuration
- Interconnectivity with building management systems via BUS systems (LON, KNX, etc.)
- Integrated functions include: smoke extraction based on wind direction and strength, restricting opening to any position, servicing and monitoring function, configurable status reports for each area, temperature-dependent ventilation control, night-time cooling, various shade functions and analogue signal processing
- Planning and configuration with user-friendly MZ3 Tool
- Drag & Drop makes configuration easy
- The Configuration Tool specifies all the components and calculates the most cost-efficient and space-saving variant
- Little wiring needed
- Energy supply tested to EN 12101-10

## Applications

- Natural smoke extraction (NSE)
- Mechanical smoke extraction (MSE)
- Controlled natural ventilation
- Ventilation control
- Smoke extraction/aeration and ventilation based on wind direction and strength



## 2.4 24 V and 230 V ventilation control panels

Activated by vent switches and sensors, our power packs, ventilation and wind/rain control panels can manually and/or automatically open and close electromotive windows, roof flaps and skylight domes in all sorts of buildings for ventilation purposes.

As part of the smart control system, they offer huge benefits for property developers, architects, occupants and the environment.

### Our portfolio

VNT 2.5A and  
VNT 8A/2

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iVent/2 8A

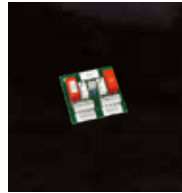
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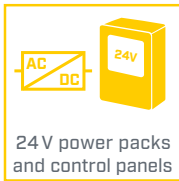
WRZ

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Switchgears

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### 2.4.1 VNT 2,5A and VNT 8A/2 ballasts

For operating 24 V drives on 230 V AC mains voltage



Various performance classes of VNT ballast units are available. If the input mains voltage is 230 V AC, they supply polarised 24 V DC voltage (+24 V or -24 V) to operate linear and chain drives.

#### Benefits/ Features

- OPEN/CLOSE keypad operation via external 230 V AC vent switch
- Multiple power packs can be cascaded and operated via one or several vent switches
- Integrated fuse protection for primary 230 V AC voltage
- Multi-coloured LED display of status and malfunctions

#### Applications

- Connecting 24 V drives to a 230 V supply

#### Material

- Plastic housing for surface-mounted installation, grey

Technical specifications		
Version	Ballast power pack 2.5A	Ballast power pack 8A/2
<b>Electrical properties</b>		
Mains supply voltage	95–265 V AC, 50/60 Hz	230 V AC (rated) (±10%)
Output		
Voltage	24 V DC (rated) (±10%)	27.5 V (rated)
Permissible ripple in rated voltage	< 5%	< 2%
Current (rated)	Max. 2.5 A	Max. 8 A
<b>Mechanical properties</b>		
Duty cycle	DC 30 (10 min.)	
Dimensions (H x W x D)	94 x 130 x 81 mm	175 x 250 x 75 mm
<b>Installation and ambient conditions</b>		
Ambient temperature	-5 °C to +40 °C	0 °C to 50 °C
Protection category	IP 54	

Order information		
Version	VNT 2.5A	VNT 8A/2
Item number	68104450	13380000020



### 2.4.2 24 V iVent/2 8A ventilation control panel

Versatile control panel for natural aeration and ventilation



Ventilation control panel for operating 24 V DC drives with up to 8 A current consumption.  
 Optional connection of ventilation buttons, wind/rain sensors and ventilation control sensors.

#### Benefits/ Features

- Integrated standard ventilation control function
- Visual display of malfunctions and operating status
- Optional cascading of multiple iVent/2 8A and operation via one or several vent switches
- Functions governing interaction with shades <sup>1)</sup>
- Internal function monitor signals malfunctions
- Complete with service port interface for configuring advanced functions using the PC Service Port Software. Examples:
  - Time-dependent stroke limitation <sup>1)</sup>
  - Automatic ventilation via temperature <sup>1)</sup>
  - Automatic closing after a set time <sup>1)</sup>
  - Manual ventilation, pulse or keypad (dead man) operation <sup>1)</sup>
  - Alteration of the properties governing the operating displays <sup>1)</sup>
  - Adjustable pause time when reversing drive voltage polarity <sup>1)</sup>
- Higher-level closing function in case of rain

#### Applications

- Natural aeration and ventilation

#### Material

- Plastic housing for surface-mounted installation
- Colour: Grey

<sup>1)</sup> Full functional scope only possible using a notebook/PC with Service Port Software installed, and a connecting cable.

## Technical specifications

### Electrical properties

Primary energy supply

Mains supply voltage	230 V AC ( $\pm 10\%$ ), separate fuse protection
Power consumption	Approx. 260 W
Power consumption (standby)	Approx. 7 W
Connection terminal	Spring terminal max. 2.5 mm <sup>2</sup>

Output

Voltage	27.5 V DC (rated)
Permissible ripple in rated voltage	0.3 V <sub>ss</sub>
Current (rated)	8 A at DC 30 (10 min.)
Current (short-term)	10 A for 5 s
Opening/closing action	Voltage polarity reversal
Fuse protection	FKS 10 A 32 V

### Mechanical properties

Dimensions (H x W x D)	250 x 175 x 75 mm
Weight	Approx. 1.6 kg

### Installation and ambient conditions

Nominal temperature	20 °C
Ambient temperature	0 °C to +50 °C
Protection category	IP 54

## Order information

### iVent/2 8A

Item number	13380000021
-------------	-------------



### 2.4.3 WRZ wind and rain detection panel

For operating 230 V AC ventilation drives and wind/rain sensors



Ventilation control panel for operating max. 40 x 230 V AC ventilation drives (e.g. M3) with a total current consumption of 8 A, split among 4 motor groups. Optional connection of vent switches and wind/rain sensors. The wind/rain detection panel is available in types 10M/1G<sup>1)</sup> and 40M/4G<sup>1)</sup>, to which either up to 10 drives in one group or max. 40 drives in up to 4 groups (max. 10 drives per group) can be connected.

#### Benefits/ Features

- Connection for up to two WRM/2 24V wind/rain sensors or up to two RM/2 24V rain sensors (type WRZ 40 M/4G)
- Connection for 230 V and 24 V vent switches
- Automatically closes windows, flaps and skylight domes operated by 230 V AC drives following wind/rain signal
- 4 potential-free relay contacts for quadrupling and forwarding a wind/rain signal (type WRZ 10 M/1G)
- Timer-controlled forwarding of the wind/rain signal, configurable via DIP switch
- Timer-controlled supply to the CLOSE drive output (ventilation function is released in spite of wind/rain signal), configurable via DIP switch (type WRZ 10 M/1G)
- Optional cascading of multiple WRZ 10M-1G to duplicate the signal; max. 4 can be cascaded with a WRZ40M-4G
- Visual status display
- Indication of the triggering of the respective detectors, separated by wind and rain

#### Applications

- 230 V AC ventilation drives and 24 V DC wind/rain sensors

#### Material

- Plastic housing for surface-mounted installation
- Colour: Grey

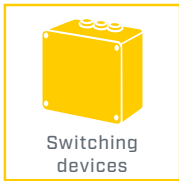
<sup>1)</sup> M = Motor, G = Group

## Technical specifications

Version	WRZ 10 M/1G	WRZ 40 M/4G
Electrical properties		
Primary energy supply		
Mains supply voltage	230 V AC (±10%), separate fuse protection	
Power consumption	Max. 465 W	Max. 1860 W
Power consumption (standby)	Depends on the connected loads	
Connection terminal	Spring terminal max. 2.5 mm²	
Output for drives		
Voltage	230 V AC (rated) (±10%)	
Rated current	2 A per group of drives	
Automatic release	Adjustable duration or 2 sec. pulse (for solenoid valves)	
Connection terminal	Spring terminal max. 2.5 mm²	
Fuse protection	T 3.15 A H	
Output for wind/rain sensors		
Voltage	24 V (rated)	
Current	max. 500 mA (total current, 2 wind/rain sensors)	
Connection terminal	Spring terminal max. 1.5 mm²	
Max. number	2 (WRM/2 or RM/2)	
Fuse protection	No	
Mechanical properties		
Dimensions (H x W x D)	125 x 125 x 60 mm	175 x 250 x 75 mm
Weight	approx. 0.34 kg	approx. 1 kg
Installation and ambient conditions		
Nominal temperature	20 °C	
Ambient temperature	0 °C to 50 °C	-5 °C to +40 °C
Protection category	IP 66	IP 54

## Order information

Version	WRZ-10M-1G	WRZ-40M-4G	
		with switch	without switch
Item number	13388000150	13388000335	13388000330



## 2.4.4 Switching devices



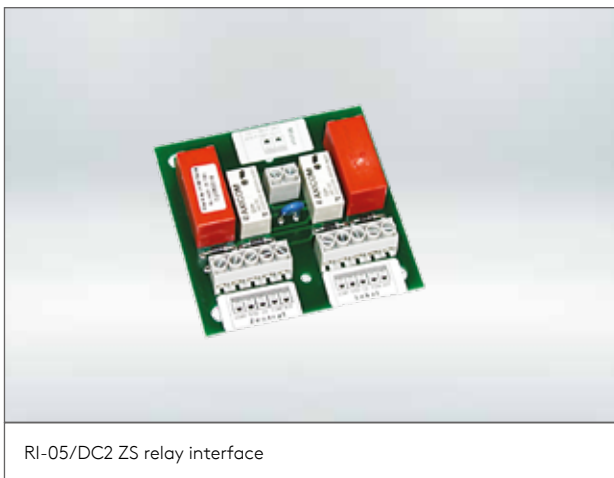
### RI-05/DC2 relay interface

For operating two-pole drives on 5-pole controllers, e.g. sensors, power packs and vent switches.

- Operating voltage: 24 V DC (-15 %/+25 %)
- Output: 2-pole
- Current output: max. 10 A
- Local input: 5-pole
- Protection category: IP 54
- Dimensions (W x H x D): 85 x 37 x 86 mm
- Housing for surface-mounted installation, grey plastic

#### Order information

RI-05/DC2 relay interface	
Item number	2200293



### RI-05/DC2 ZS relay interface

Like RI-05/DC2 but with additional overriding central command.

- Operating voltage: 24 V DC (-15 %/+25 %)
- Output: 2-pole 24 V DC
- Current output: max. 10 A
- Central/local input: 5-pole
- Protection category: IP 54
- Dimensions (W x H x D): 85 x 37 x 86 mm
- Housing for surface-mounted installation, grey plastic

#### Order information

RI-05/DC2 ZS relay interface	
Item number	2201481



### GSM2G group switching module

For connecting 230 V drives split into two groups. Each group can be controlled separately from a 230 V vent switch.

- With central "OPEN/CLOSE" input to override all group controls.
- Also suitable for use as a group switching relay for parallel operation of 230 V drives (without integrated group relay), such as shutter drives.

#### Order information

GSM2G	
Item number	60000687



## 2.5 Accessories for SHE and ventilation control panels

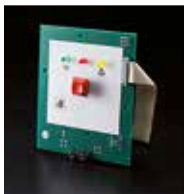
We offer a wide range of accessories for our SHE and ventilation controllers.

Our safety components – such as SHE manual call points and automatic detectors – comply with the specifications of applicable standards and directives.

Sensors control a room climate to individual requirements, while wind and rain detectors ensure that all electromotive window casements and roof flaps are reliably closed in bad weather.

### Our portfolio

**Accessories  
for SHE  
control panels**  
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**Service Port  
Software**  
Page 2.5 | 3



**SHE manual  
call point and  
accessories**  
Page 2.5 | 5



**Smoke  
detectors and  
accessories**  
Page 2.5 | 7



**Emergency  
batteries**  
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**Vent  
switches**  
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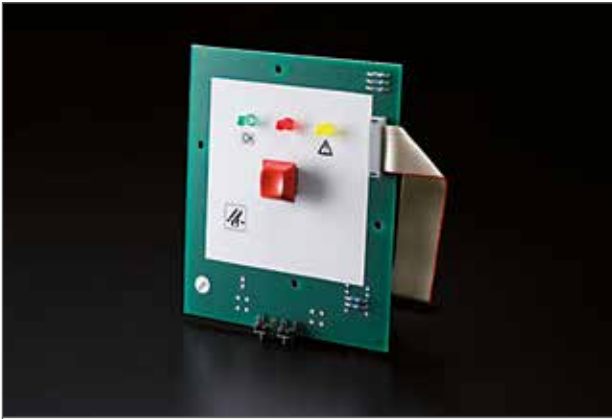


**Sensors**  
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## 2.5.1 Accessories for SHE control panels



TRZ/RBH-Basic additional module for SHE manual call point

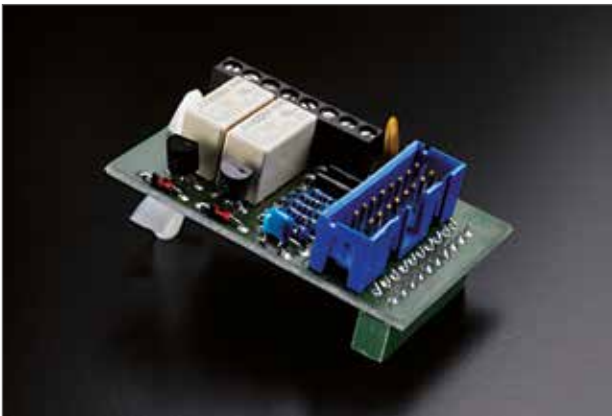
### TRZ/RBH-Basic additional module for SHE manual call point

For TRZ Plus 2A.

- For retrofitting in the front door.
- With SHE activation key and CLOSE SHE key.
- Operational readiness, activation and malfunction displays.
- Labelling and functions based on VdS 2592.
- Glass pane included in the scope of supply.

#### Order information

TRZ/RBH-Basic	
Item number	61900080



TRZ/WRMAS-Basic additional module

### TRZ/WRMAS-Basic additional module

For TRZ Plus 2A and Compact Control Panel 2A (/M).

For connecting one WRM/2 24V wind/rain sensor or one RM/2 24V rain sensor and for forwarding (SHE) alarms and malfunction messages.

- Alarm = NO contract, malfunction = NC contact.
- One connection each for potential-free message alarm (SHE activation) and collective malfunction, contact load max. 24 V / max. 0.5 A.

#### Order information

TRZ/WRMAS-Basic	
Item number	61900090



TRZ flush mounting kit

### TRZ flush mounting kit

For all TRZ SHE control panels.

Flush mounting kit comprising a flush-mounted box and a masking frame for flush-mounted installation.

- Flush-mounted box dimensions (H x W x D):  
270 x 154 x 85 mm
- Masking frame dimensions (H x W x D):  
322 x 247 x 2 mm

#### Order information

TRZ flush mounting kit	
Item number	13320200400



Flush mounting kit for Compact Control Panel 2A/4A

#### Flush-mounting kit for Compact Control Panel 2A/4A

For Compact Control Panel 2A and 4A in plastic housing.

Flush mounting kit comprising a flush-mounted box and a masking frame for flush-mounted installation.

- Flush-mounted box dimensions (H x W x D):  
331 x 311 x 103mm
- Masking frame dimensions (H x W x D):  
400 x 400 x 2 mm

#### Order information

##### Flush mounting kit for Compact Control Panel 2A/4A

Item number	13362501405
-------------	-------------



Flush mounting kit for Compact Control Panel 2A/4A/M

#### Flush mounting kit for Compact Control Panel 2A/4A/M

For Compact Control Panel 2A/M and 4A/M in metal housing.

Flush mounting kit comprising a flush-mounted box and a masking frame for flush-mounted installation.

- Flush-mounted box dimensions (H x W x D):  
331 x 311 x 103mm
- Masking frame dimensions (H x W x D):  
400 x 400 x 2 mm

#### Order information

##### Flush mounting kit for Compact Control Panel 2A/4A/M

Item number	13362501401
-------------	-------------



Flush mounting kit for Compact Control Panel 8A

#### Flush mounting kit for Compact Control Panel 8A

For Compact Control Panel 8A in plastic housing.

Flush mounting kit comprising a flush-mounted box and a masking frame for flush-mounted installation.

- Flush-mounted box dimensions (H x W x D):  
331 x 311 x 155mm
- Masking frame dimensions (H x W x D):  
400 x 400 x 2 mm

#### Order information

##### Flush mounting kit for Compact Control Panel 8A

Item number	13362501805
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## 2.5.1 Accessories for SHE control panels



UEB3-1K monitoring module

### UEB3 monitoring modules

For switching a fire alarm system onto an SHE or SPS control panel made by STG-BEIKIRCH for monitoring wire breakage in the mains cable.

- One UEB3 module must be provided within the fire alarm system control panel for each fire alarm system cable.
- UEB3 monitoring module variants:  
UEB3-1K, UEB3-1K-AE (with active end module and 1 k $\Omega$  resistance) and UEB3-2K7-AE (with active end module and 2.7 k $\Omega$  resistance).

#### Order information

Version	Item number	Application
UEB3-1K	13350003857	Smoke detector input on Compact Control Panel 4A and 8A
UEB3-1K-AE	13350003855	Smoke detector input on TRZ and Compact Control Panel 2A and LON motor nodes
UEB3-2K7-AE	13350003856	Separate fire alarm system input on MZ3



ZSM3 timer

### ZSM3 timer

Digital timer for installation in MZ3 modular control panel.

- Date-independent programming
- Date-related programming
- Pulse, cycle and random programming
- Sunrise- and sunset-related programming
- Programming via PC and mobile appliances
- Bluetooth Low Energy interface

- Operating voltage: AC 110-230 V  $\pm$ 10 % 50/60 Hz
- Switching capacity resistive load: 16 A / 250 V AC
- Switching capacity DC: 300 mA / 60 V DC
- Shortest ON/OFF switch time: 1 min.
- Switch output: Changeover contact, potential-free
- Switching channels: 2
- Operating temperature: -20 °C to +55 °C
- Protection category: IP 20
- Protection class: II

#### Order information

ZSM3 timer	
Item number	13280000385



## 2.5.2 Service Port Software

For parametrisation of devices via the service port interface



Service Port Software makes it easy to configure and set the functions of products equipped with a service port interface. The service port cable connects device and PC. The software and connecting cable are needed to reset a servicing alert. The ability to adjust other functions depends on the functions of the supported devices.

### Benefits/ Features

- Use one software tool to set the parameters and configuration for all sorts of devices

### Applications

- TRZ staircase control panels, types TRZ Plus 2A, TRZ Plus Comfort, TRZ Plus 2A/UP, TRZ Plus DG
- Compact Control Panel 2A, 4A and 8A
- SPS Compact Control Panel, WPS2 Window Protection System
- iVent/2 8A ventilation control panel

### System requirements

- Microsoft Windows XP SP2 or newer
- PC with MS.Net Framework 2.0(1)2) runtime environment and MS Installer 33)
- At least 50 MB space on the hard drive
- CPU with at least 700 MHz frequency and 265 K cache
- One free USB port, 1.1 or higher
- PDF reader

#### Order information

##### Service Port USB connecting cable incl. software

Item number	
3000100	

- **Note:** Manufacturer-specific certified proof of competence is mandatory to ensure proper handling of the Service Port Software.



### 2.5.3 RBH/3A SHE manual call points and accessories

Manual call point for manual activation of an SHE message



Manual control point for operating SHE control panels made by STG-BEIKIRCH.

#### Benefits/ Features

- ABS housing, flat design as per DIN 14655 for indoor installation
- Optional aluminium housing (type RBH/3A(/SU)/ALU)
- Concealed "CLOSE SHE" key
- Complete with key(s) and "Out of order" warning sign
- Optional buzzer for RBH/3A/SU and RBH/3A/SU/ALU
- "OPEN SHE" and "CLOSE SHE" function keys
- LED display: "OPEN SHE", "In operation" and "Malfunction"
- Certification based on prEN 12101-9:2004

#### Technical specifications

- Operating voltage: 24 V DC (+15 % / +25 %)
- Supply cable requirement: 4 x 2 x 0.8 mm<sup>2</sup>
- Dimensions (H x W x D): 125 x 125 x 36 mm
- Ambient temperature: -5 °C to +40 °C
- Protection category: IP 40

#### Material

- Housing: ABS plastic or aluminium
- Colour: Blue, yellow, grey, orange, red

Order information				
Version	RBH/3A			
	-	.../SU/...	.../ALU/...	.../SU/ALU/...
Colours	Item number			
Blue	60000298	60000277	60001298	60001398
Yellow	60000299	60000278	60001299	60001399
Grey	60000297	60000275	60001297	60001397
Orange	60000301	60000262	60001300	60001400
Red	60000295	60000276	60001295	60001395



Flush mounting kit for RBH/3A

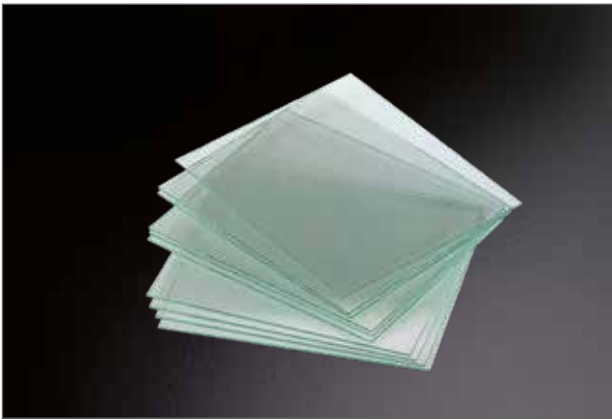
### Flush mounting kit for RBH/3A

For RBH/3A SHE manual call point.

- Optional RBH/ALU flush mounting kit for RBH/3A/ALU in aluminium housing.
- Flush-mounted box dimensions (H x W x D): 175 x 133 x 34mm
- Masking frame dimensions (H x W x D): 204 x 204 x 2mm

#### Order information

Version	Flush mounting kit for RBH/3A	
	RBH/KS	RBH/ALU
Item number	13320200410	13320200430



EGL replacement glass panes

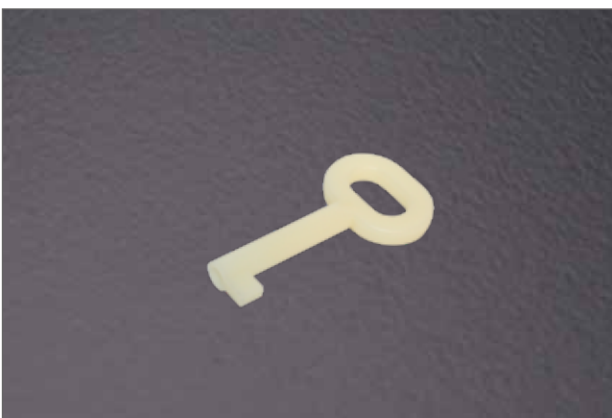
### EGL replacement glass panes

Replacement glass panes for RBH/3A... SHE and SPS manual call points

- Supplied in a pack of 10.

#### Order information

EGL	
Item number	95240451



ES-RBH replacement key(s)

### ES-RBH/... replacement key(s)

Replacement key(s) RBH/3A SHE and SPS manual call points.

- Optional metal key(s) ES-RBH/M.

#### Order information

Version	ES-RBH/... replacement key(s)	
	neutral	M
Item number	13220202172	20202011



## 2.5.3 RBH/3A SHE manual call point and accessories



HR-9 "Rauchabzug" sign

### HR-9 "Rauchabzug" sign

Optional plastic (HR-9/K) or metal version (HR-9/M).

- Compliant with DIN 4066
- Dimensions: 200 x 70 mm

#### Order information

Version	HR-9	
	.../K	.../M
Item number	95411931	95411930



AG-026 electronic alarm siren

### AG-026 electronic alarm siren

Acoustic support for SHE, SPS and/or malfunction messages.

- Particularly low current consumption (30 mA)
- Various alarm tones to choose from
- Integrated volume control
- Operating voltage: 10 V – 28 V DC
- Starting current: approx. 30 mA, for 2 ms
- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup>
- Sound level: 80 dB-116 dB A (depending on tone)
- Protection category: IP 65
- Dimensions: 93 mm diameter x 75 mm
- Colours: Red, white

#### Order information

Version	AG-026	
	.../R (red)	.../W (white)
Item number	10001001	10001000



## 2.5.4 MSD 523 photo optical smoke detector

VdS-approved photo optical smoke detector



For use with SPS and SHE systems made by STG-BEIKIRCH.  
Optional MSD 523/MS complete with base.

### Technical specifications

- Operating voltage: 18 V DC – 30 V DC
- Alert criterion: Current increase, 2-conductor technology
- Monitored area: max. 120 m<sup>2</sup>
- Installation height: max. 16 m
- Perm. airspeed: max. 20 m/s
- Current consumption: idle: max. 120 µA  
alert: min. 19 mA, max. 22.5 mA
- Ambient temperature: -25 °C to +60 °C
- VdS approval: G207123

Order information		
Version	MSD 523	
	MSD 523	.../MS
Item number	20202139	62005300

- **Note:** The maximum monitored area and installation height in the room being monitored is dependent on the roof slope and the horizontal distance between the smoke detectors as specified in EN DIN 54-7.



SRS01 ball impact protection

#### SRS01 ball impact protection for automatic detectors

Ball impact protection for MSD 523 photo optical smoke detectors.

- Material: Steel, nickel-plated
- Interior dimensions: 125 mm diameter, height 87 mm
- Exterior dimensions: 159 mm diameter, height 91 mm

#### Order information

SRS01	
Item number	20202214



## 2.5.5 NB emergency power batteries

24 V DC emergency power replacement for SHE motor control panels



For TRZ SHE control panels, Compact Control Panels 4A/8A and MZ3 modular control panels.

### Benefits/ Features

- Two 12 V batteries form a 24 V DC emergency power replacement for SHE motor control panels
- Emergency power batteries for larger control panels or customised systems available on request, subject to type clarification

### Versions

- 24 V/0.8 Ah NB-8E
- 24 V/1.2 Ah NB-901
- 24 V/2.2 Ah NB-902
- 24 V/3.4 Ah NB-903
- 24 V/7.2 Ah NB-907
- 24 V/12 Ah NB-910
- 24 V/18 Ah NB-915
- 24 V/26 Ah NB-926
- 24 V/40 Ah NB-940

- **Note:** All standard batteries supplied with the corresponding SHE control panels must be regularly checked! They must be replaced as part of the maintenance schedule after a specified operating time of 4 years!

### Order information

Version	NB								
	...-8E	...-901	...-902	...-903	...-907	...-910	...-915	...-926	...-940
Item number	95233050	95233100	95233150	95233160	95233200	95233210	95233211	95233230	95233240



## 2.5.6 Vent switches

For 24 V and 230 V systems

### Vent switches for 24 V systems



#### LTA 25 vent switch

Manual ventilation using OPEN/STOP/CLOSE buttons, integrated "OPEN" LED display. Optional surface (AP) or flush mounting (UP).

- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup>
- Operating voltage: 24 V DC
- Dimensions: AP: 81 x 81 x 51 mm  
UP: 81 x 81 x 7mm
- Colour: Grey (AP), pure white (UP)

#### Order information

Version	LTA 25	
	.../AP	.../UP
Item number	60000461	60000460

### Vent switches for 24 V or 230 V systems



#### LTA 11 vent switch

Manual ventilation using OPEN/CLOSE/STOP rockers. Optional surface (AP) or flush mounting (UP).

- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup>
- Operating voltage: 24 V DC or 230 V AC
- Dimensions: AP: 84 x 84 x 53mm  
UP: 81 x 81 x 16mm
- Colour: Grey (AP), pure white (UP)

#### Order information

Version	LTA 11	
	.../AP	.../UP
Item number	60000490	60000730



### LTA 12 ventilation key switch

Use a key to manually OPEN and CLOSE the ventilation. For use of a profile half-cylinder as per DIN 18 252 (please order SZ10 profile half-cylinder separately). Optional surface (AP) or flush mounting (UP).

- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup> (24 V)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V)
- Contacts: 3-way changeover double pole switch
- Operating voltage: 24 V DC or 230 V AC
- Dimensions: 81 x 81 mm
- Colour: Pure white

#### Order information

Version	LTA 12	
	.../AP	.../UP
Item number	60000481	60000465



### LTA 13/AP ventilation key switch

Use a key to manually OPEN and CLOSE the ventilation. For use of a profile half-cylinder as per DIN 18 252 (please order SZ10 profile half-cylinder separately). For surface mounting.

- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup> (24 V)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V)
- Contacts: 3-way changeover double pole switch
- Operating voltage: 24 V DC or 230 V AC
- Dimensions: 90 x 70 x 65 mm (W x H x D)
- Colour: Grey

#### Order information

LTA 13/AP	
Item number	95220151



### WHA-14 manual/automatic mode selector switch

For switching between automatic temperature control and manual mode. Optional surface (AP) or flush mounting (UP).

- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup> (24 V)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V)
- Operating voltage: 24 V DC or 230 V AC
- Dimensions: 81 x 81 mm
- Colour: Pure white

#### Order information

Version	WHA-14	
	.../AP	.../UP
Item number	60000771	60000770



## 2.5.6 Vent switches



LT 25 vent switch

### LT 25 vent switch

OPEN and CLOSE rockers to manually control ventilation, reciprocal locking, for use in 230 V controllers. Optional surface (AP) or flush mounting (UP).

- Supply cable requirement: 4 x 1.5mm<sup>2</sup>
- Operating voltage: 230 V AC
- Dimensions: AP: 70 x 80 x 55 mm  
UP: 81 x 81 x 16mm
- Colour: Grey (AP), pure white (UP)

#### Order information

Version	LT 25	
	... /AP	... /UP
Item number	95220200	60000740



SZ10 profile half-cylinder

### SZ10 profile half-cylinder

For LTA 12 and LTA 13/AP vent switches.

- Profile half-cylinder as per DIN 18 252.
- Complete with three keys, simultaneous locking.

#### Order information

SZ10	
Item number	94810900



## 2.5.7 Sensors

Accessories for ventilation and wind/rain detection panels



WRM/2 24V wind/rain sensor

### WRM/2 24V wind/rain sensor

Connects to 24 V DC SHE and ventilation control panels and 230 V AC wind/rain detection panels. Integrated electronic assessment of wind and rain alerts. Heated sensor surface, dependent on the outdoor temperature.

Optional wind pulse forwarding through separate output.

- Supply voltage: 20–30 V DC or 20–28 V AC
- Power consumption: max. 110mA
- Power consumption in standby: approx. 33 mA
- Output potential-free changeover contact: max. 30 V/1 A
- Connections: max. 2.5 mm<sup>2</sup>
- Ambient temperature range: -20 °C to +60 °C
- Supplied complete with mounting bracket.

#### Order information

WRM/2 24V	
Item number	13360000531



RM/2 24V rain sensor

### RM/2 24V rain sensor

Connects to 24 V DC SHE and ventilation control panels and 230 V AC wind/rain detection panels. Integrated electronic assessment of rain alerts. Heated sensor surface, dependent on the outdoor temperature.

- Supply voltage: 20–30 V DC or 20–28 V DC
- Power consumption: max. 110mA
- Power consumption in standby: approx. 33 mA
- Output potential-free changeover contact: max. 30 V/1A
- Connections: max. 2.5 mm<sup>2</sup>
- Supplied complete with mounting bracket.

#### Order information

RM/2 24V	
Item number	13360000385



### SR-400 standpipe

Standpipe for WRM/2 24V wind/rain sensor and RM/2 24V rain sensor.

Supports a favourable flow position when mounting sensors, e.g., on flat roofs.

- Dimensions (H x W x D): 1,000 x 245 x 245 mm
- Material: Plastic

#### Order information

SR-400	
Item number	21100180



### TS-1030 temperature sensor

Automatically controls the ventilation based on room temperature, for use in dry environments. +5 °C to +30 °C set point adjustment. Optional surface (AP) or flush mounting (UP).

- Switch contact: 1 x changeover
- Dimensions (H x W x D): 70 x 70 x 26 mm
- Connections: 2 x 2 x 0.8 mm<sup>2</sup> (24 V DC)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V AC)

#### Order information

Version	TS-1030	
	.../AP	.../UP
Item number	2500098	20402010



### FS-3095 humidity sensor

Automatically controls the ventilation based on room humidity. Optional surface (AP) or flush mounting (UP).

- 30–95 % relative humidity set point adjustment
- Switch contact: 1 x changeover
- Dimensions (H x W x D): 75 x 75 x 25.5 mm
- Colour: White
- Supply cable requirement: 2 x 2 x 0.8 mm<sup>2</sup> (24 V)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V)

#### Order information

Version	FS-3095	
	.../AP	.../UP
Item number	20402017	20402016



## 2.5.7 Sensors



### MS multi-sensor

Automatically controls the ventilation in dry rooms, based on air temperature, humidity and CO<sub>2</sub> content in the room.

- Displays temperature, relative humidity and air quality.
- Individually adjustable switching thresholds for temperature, humidity and CO<sub>2</sub>.
- Integrated OPEN/CLOSE vent switch.
- Supply voltage: 24 V DC (-20 %/+30 %)
- Current consumption: 10-50 mA at 24 V
- Operating range: 0-40 °C, 10-90 % RF, no condensation
- Switching current of potential-free switches: 0.5 A DC
- Protection class: IP 20
- Dimensions (H x W x D): 120 x 80 x 38 mm

### Order information

MS	
Item number	13321102060



### 3 Smoke and heat extraction systems

Smoke and heat extraction systems are key components of a fire protection concept. The aim must always be to guarantee the very highest levels of safety and thus the best possible protection of people and property. To ensure functional reliability over the entire life cycle, the individual components must be regularly checked – including and especially in combination with the other components of an integrated system.

VdS Schadenverhütung – the damage prevention arm of the independent German Association of Property Insurers – has tested and certified the manufacturing operations of STG-Beikirch. This certification testifies to the high standards of quality and performance that we demand of our smoke and heat extraction systems. They include our LiSE lift shaft system with building code approval (DIBt Approval No. Z-78.12-247).

#### Our portfolio

- **LiSE lift shaft smoke and heat extraction system with building code approval**  
Detects and extracts smoke, aerates and ventilates lift shafts.

#### » Find out more:

If you would like to learn more about our products and services, please go to [www.stg-beikirch.de](http://www.stg-beikirch.de).



### 3.2 LiSE lift shaft smoke and heat extraction system<sup>®</sup> CE and building code approval

Building code approved system for detecting and extracting smoke, and aerating and ventilating lift shafts



Energy- and cost-optimised solution that builds on the principle of point type smoke detectors. LiSE works with a closed smoked extraction aperture that only opens to provide controlled natural ventilation or smoke and heat extraction when activated manually as required, or by automatic detectors.

#### Benefits/ Features

- Building code approval (DIBt approval no. Z-78.12-247)
- Reliably extracts smoke from lift shafts while complying with EnEV
- Specific and controlled ventilation
- No permanent opening
- Reduces heat losses
- Considerable reduces energy consumption and CO<sub>2</sub> emissions in the building
- Improves the air quality in shaft and lift
- Sustainable use protects the climate and environment

#### Safety

- In the event of fire, evacuating people in a lift is the top priority
- Complies with all legal requirements and European standards
- Complies with Construction Products Directive, Machinery Directive, safety rules for lifts and VdS guidance sheet 2895
- Comprehensive, modular portfolio of components
- Enhances safety in the building

## LiSE CE system components



### Control: TRZ Plus Comfort

Modern, smart and certified controller. TRZ Plus Comfort has battery backup and controls the smoke extraction apertures and the air quality in both the shaft and the lift itself. If smoke is detected, an appropriate alert is sent to the lift controller, which takes the lift to the next stop in the direction of travel and opens the doors to let the occupants out.

#### Order information

TRZ Plus Comfort o.W. / orange / LiSE CE

Item number	13362500254
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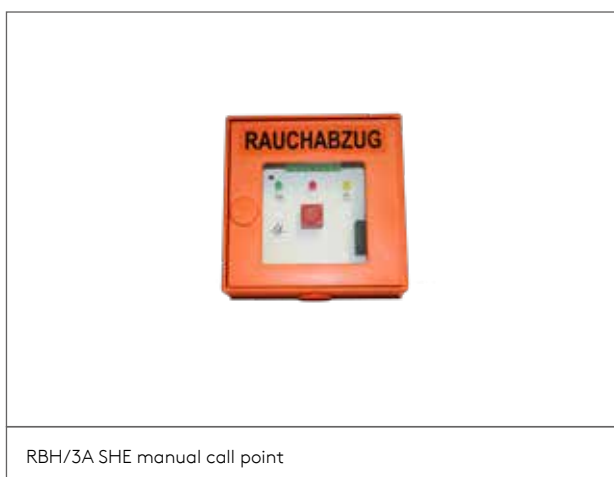


### Smoke extraction aperture /Venting flap

An electromotive (24 V) louvre fan extracts the smoke and vents the lift. Venting flaps ensure both effective ventilation control and reliable smoke extraction. They prevent the uncontrolled outflow of heat and energy through permanent apertures.

#### Order information:

FIEGER louvre window (glass), type STG-BEIKIRCH LiSE (dimensions: 450 x 450 mm<sup>2</sup> up to 1150 x 1150 mm<sup>2</sup>, please indicate required dimensions).



### Manual activation: RBH/3A SHE manual call point

To enhance the continuous monitoring of the lift shaft, it must be possible to trigger an alarm near the main access point and activate smoke extraction.

The RBH/3A SHE manual call point displays whether smoke extraction is operational, a malfunction has occurred or an alarm has been triggered.

#### Order information

RBH/3A/orange

Item number	60000301
-------------	----------

## LiSE CE system components



MSD 523-E smoke detector

### Smoke detection: MSD 523-E smoke detector

The point type smoke detectors in the lift shaft automatically detect smoke as specified in EN 54-7 and VdS 2504.

MSD 523-E was designed specifically for use in lift shafts. It ensures active early detection of fires in lift shafts.

- Special version with base.

#### Order information

MSD 523-E	
Item number	62005400



MS multi-sensor

### Ventilation: MS multi-sensor

When smoke extractors as per EnEV are closed, lift shafts must be ventilated. Automatic ventilation is preferred to ensure the exchange of air based on CO<sub>2</sub> content, temperature and, if appropriate, humidity.

MS multi-sensor measures and displays air temperature, humidity and CO<sub>2</sub> concentration. The threshold levels driving ventilation control can be adjusted. If a measurement is higher or lower than a specific setting, the SHE system connected via potential-free contacts opens or closes.

#### Order information

MS multi-sensor	
Item number	13321102060



TS-1030 temperature sensor

### Ventilation: TS-1030 temperature sensor

Automatically controls the ventilation based on room temperature, for use in dry environments. +5 °C to +30 °C set point adjustment. Optional surface (AP) or flush mounting (UP).

- Switch contact: 1x changeover
- Dimensions (H x W x D): 70 x 70 x 26 mm
- Connections: 2 x 2 x 0.8 mm<sup>2</sup> (24 V DC)  
4 x 1.5 mm<sup>2</sup> incl. PE (230 V AC)

#### Order information

Version	TS-1030	
	.../AP	.../UP
Item number	2500098	20402010

## LiSE CE system components



WRM/2 24V wind/rain sensor

### Ventilation: WRM/2 24V wind/rain sensor

Automatic ventilation configurations must include a WRM/2 24V wind/rain sensor to ensure windows and flaps are not accidentally opened in bad weather.

#### Order information

WRM/2 24V	
Item number	13360000531

- **Note:** An extensive range of accessories can be used to extend the system, e.g. various control units and switches, see Section 2.5.

## 4 Planning aids

### Detailed engineering

In addition to our data sheets, we have compiled complex engineering aids to help you plan the widest range of projects to your individual requirements.

### Our planning aids

- Installation examples
- Load-displacement diagrams for chain drives
- Wind loads
- Snow loads
- Cable length diagrams
- Cable diameter determination
- Synchronous control selection table
- Sample wiring plans (staircase control panel, SHE motor control panel)
- Connection examples (SHE/ventilation controllers)

### » Find out more:

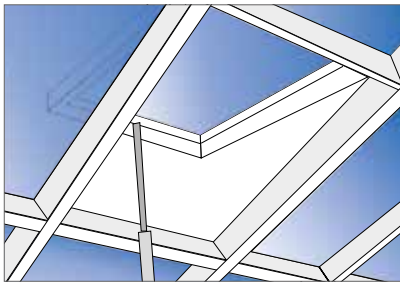
If you would like to learn more about our products and services, please go to [www.stg-beikirch.de](http://www.stg-beikirch.de).



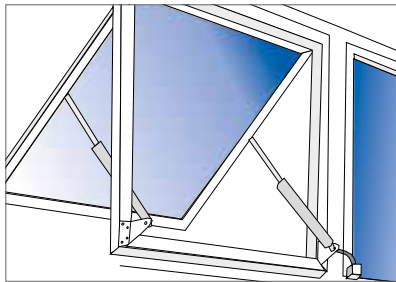
## 4.1 Mounting examples on sashes and flaps

### Hinge side at the top

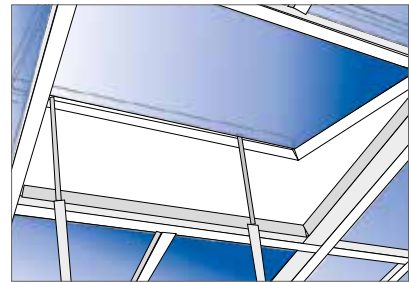
Top-hung window, outward opening at the bottom, with linear drive



Top-hung window, outward opening, with two linear drives <sup>1)</sup>



Roof window, outward opening at the bottom, with two linear drives <sup>1)</sup>



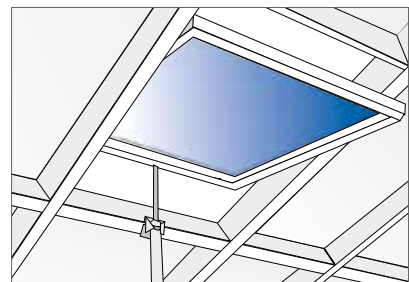
Top-hung window, outward opening at the bottom, with chain drive



Top-hung window, outward opening at the bottom, with chain drive



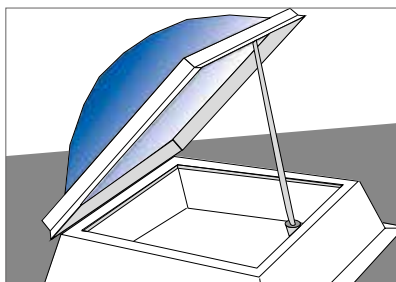
Pivoting roof window, outward opening at the bottom, with linear drive



Pivoting window, outward opening at the bottom, with linear drive

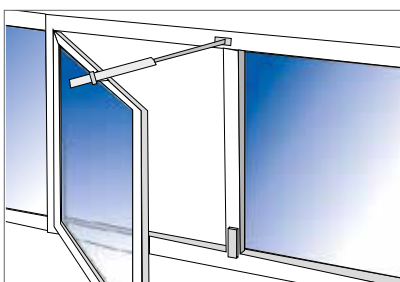


Skylight dome with linear drive

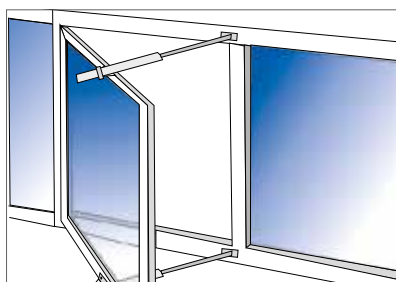


### Hinges right or left

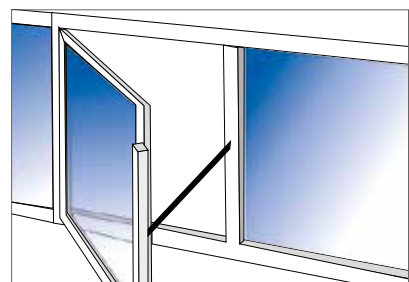
Side-hung window, inward opening, with linear drive and magnetic clamp



Side-hung window, inward opening, with two linear drives <sup>1)</sup>



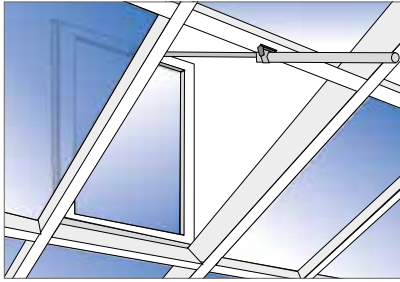
Side-hung window, inward opening, with chain drive



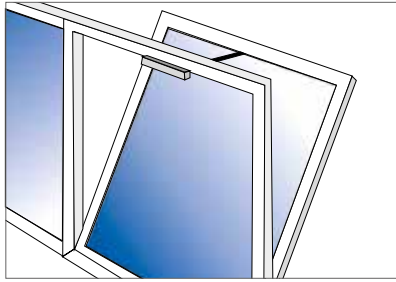
<sup>1)</sup> Tandem or synchronous operation

## Hinges at the bottom

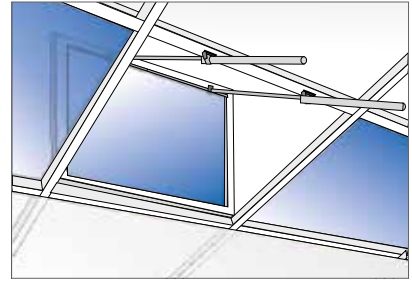
Bottom-hung window, outward opening at the top, with linear drive



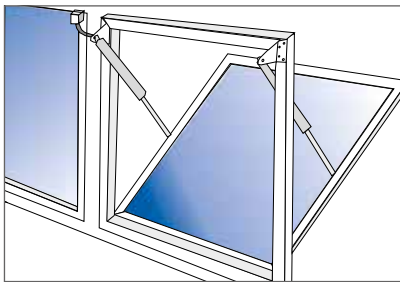
Bottom-hung window, outward opening at the top, with chain drive



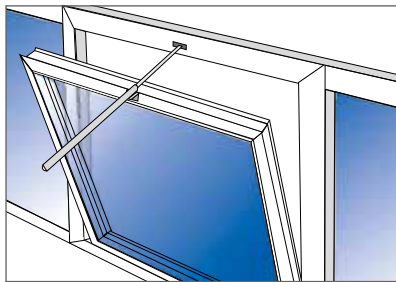
Roof window, outward opening at the top, with two linear drives <sup>1)</sup>



Top-hung window, outward opening at the top, with two linear drives <sup>1)</sup>



Bottom-hung window, inward opening at the top, with linear drive



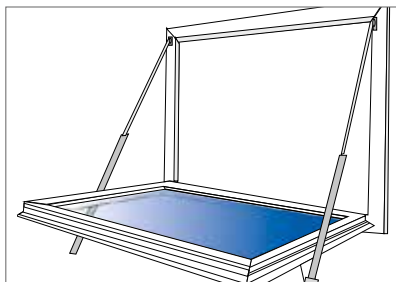
Bottom-hung window, inward opening at the top, with chain drive



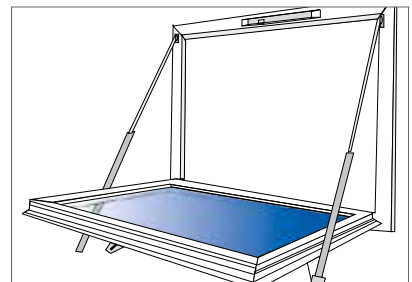
Bottom-hung window, inward opening at the top, with drawbridge chain drives



Bottom-hung window, inward opening at the top, with two linear drives <sup>1)</sup>

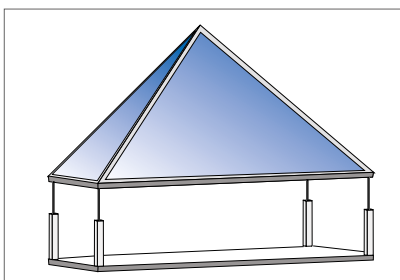


Bottom-hung window, inward opening at the top, with two linear drives <sup>1)</sup> and additional lock

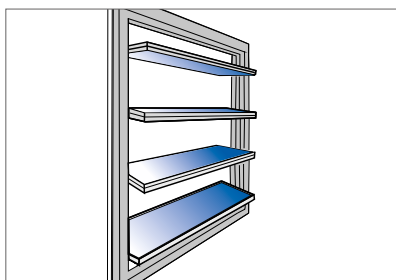


## Further mounting examples

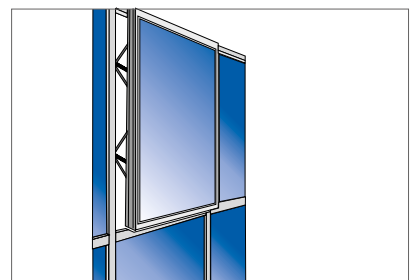
Glass pyramid with four synchronised drives (on-site support structure)



Louvre window with louvre drive



Parallel ventilator windows with four chain drives

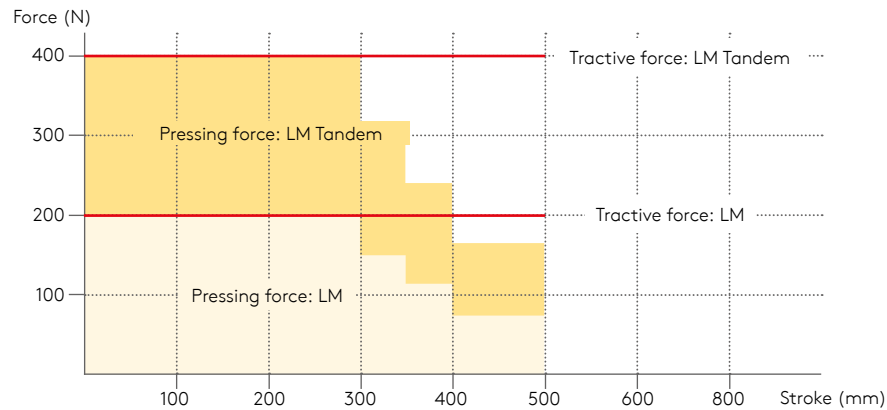


<sup>1)</sup> Tandem or synchronous operation

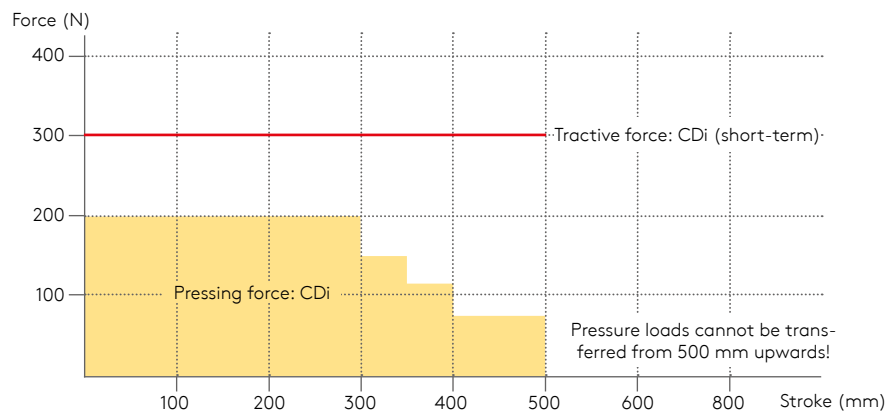


## 4.2 Chain drive load-displacement diagrams

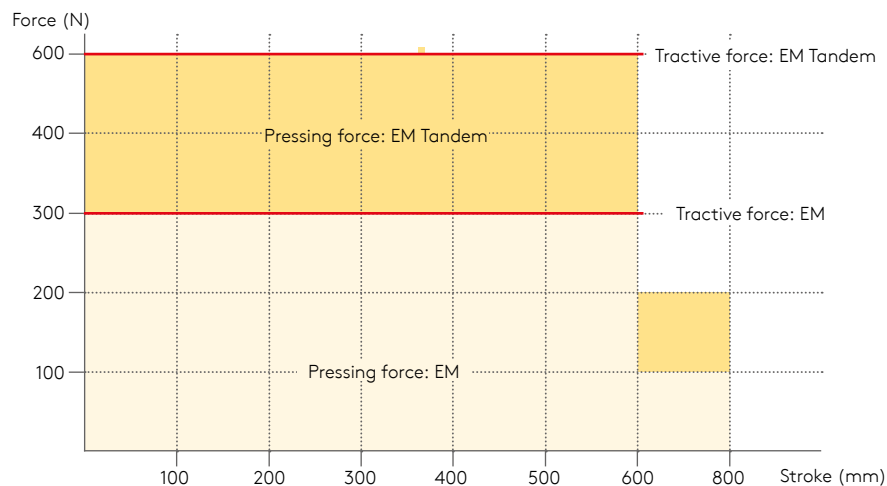
### Load-displacement diagram: LM chain drive series



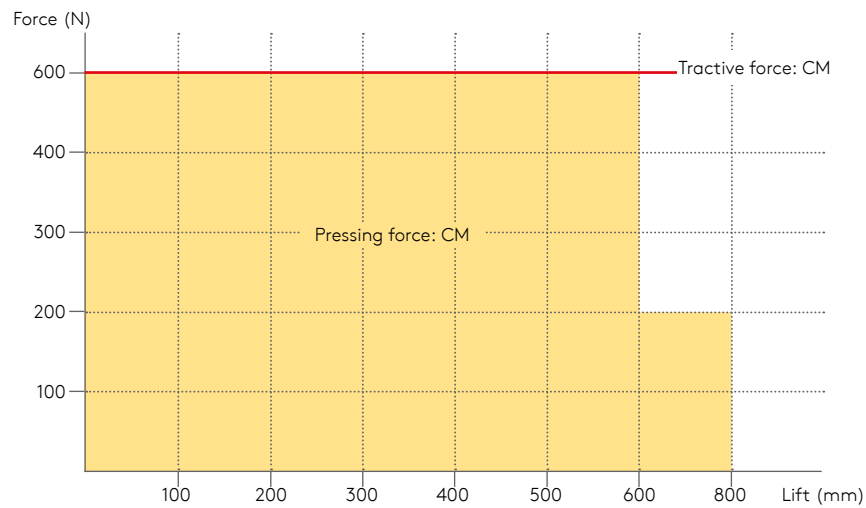
### Load-displacement diagram: CDi chain drive series



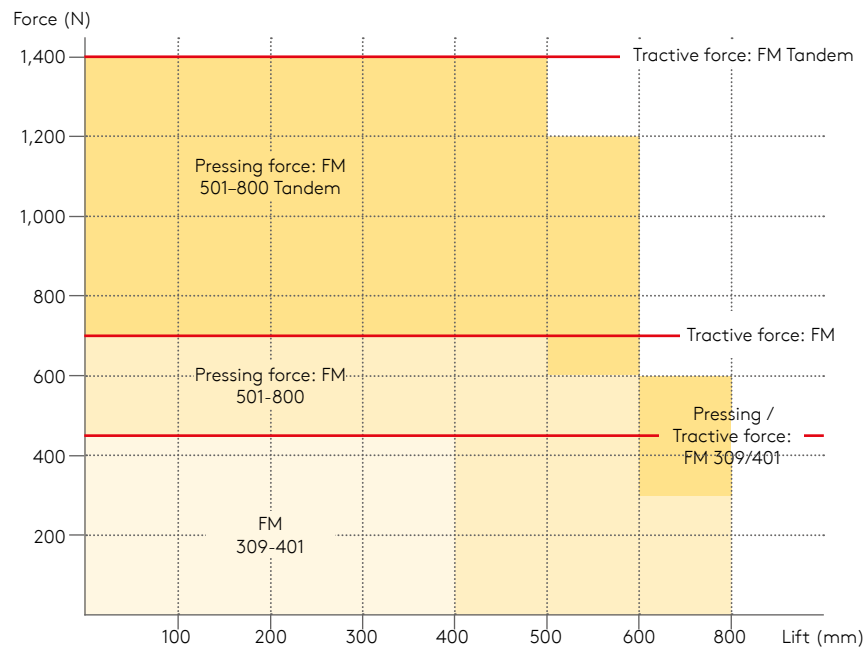
### Load-displacement diagram: EM chain drive series



## Load-displacement diagram: CM chain drive series



## Load-displacement diagram: FM chain drive series



## 4.3 Wind load table as per EN 1991-1-4



Idealised wind load chart, original charts can be found in EN 1991-1-4.

Wind zone	$u_{ref}$	$q_{ref}$
1	22.5 m/s	0.32 kN/m <sup>2</sup>
2	25.0 m/s	0.39 kN/m <sup>2</sup>
3	27.5 m/s	0.47 kN/m <sup>2</sup>
4	30.0 m/s	0.56 kN/m <sup>2</sup>

The wind zone chart indicates time-averaged wind speeds ( $u_{ref}$ ) with their associated speed pressures ( $q_{ref}$ ).

The speed ( $u_{ref}$ ) applies at a height of 10 m above ground level on flat, open terrain, category II.

### Terrain category II:

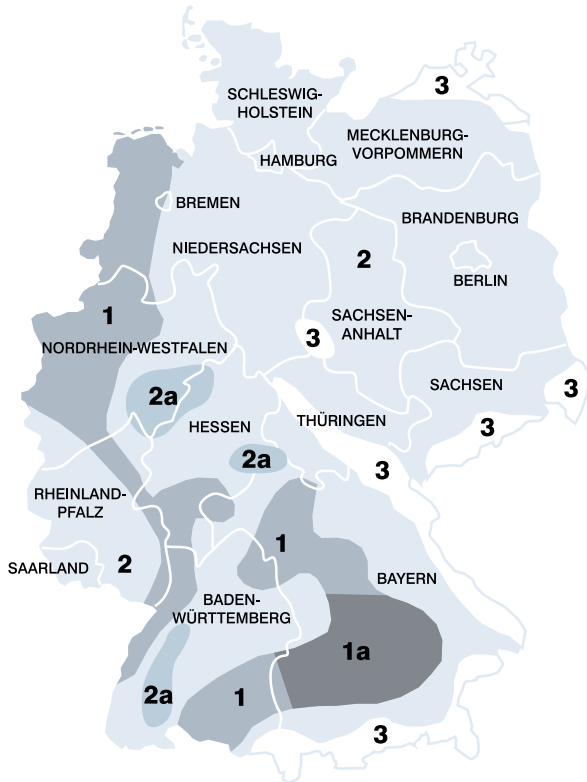
Terrain with hedges, occasional farms, houses or trees, agricultural region.

■ **Note:** Detailed analysis requires consideration of EN 1991-1-4 in its entirety.

## Simplified speed pressures for structures up to 25 m in height

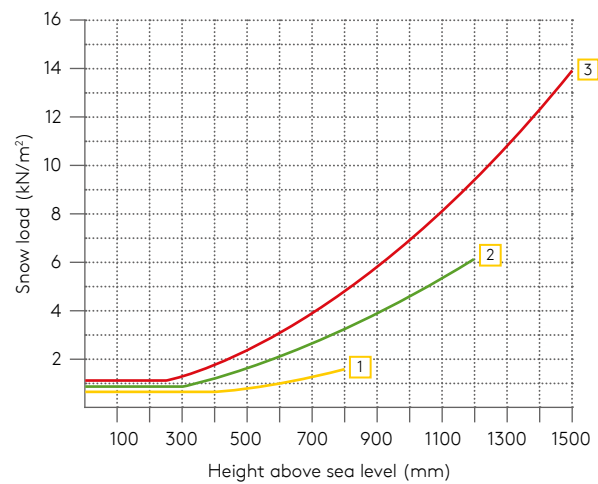
Wind zone		Speed pressure $q$ in kN/m <sup>2</sup> at a building height $h$ within the boundaries ...		
		$h \leq 10$ m	$10 \text{ m} < h \leq 18$ m	$18 \text{ m} < h \leq 25$ m
1	Inland	0.50	0.65	0.75
	Baltic Sea coast and islands	0.85	1.00	1.10
2	Inland	0.65	0.80	0.90
	Baltic Sea coast and islands	1.05	1.20	1.30
3	Inland	0.80	0.95	1.10
	Baltic Sea coast and islands	1.25	1.40	1.55
4	Inland	0.95	1.15	1.30
	North Sea and Baltic Sea coast and Baltic Sea islands	1.40	–	–
4	North Sea islands	1.40	–	–

## 4.4 Snow load table as per EN 1991-1-3



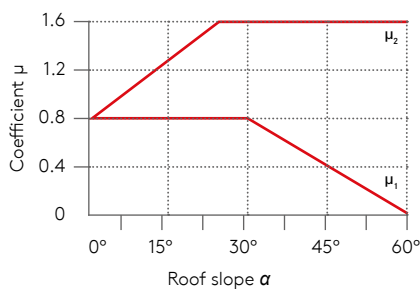
Idealised snow load chart, original charts can be found in EN 1991-1-3.

Zone		Base amounts (minimum values)
1	Zone 1	0.65 kN/m <sup>2</sup> (up to 400 m above sea level)
	Zone 1a	Zone 1 x 1.25
2	Zone 2	0.85 kN/m <sup>2</sup> (up to 285m above sea level)
	Zone 2a	Zone 2 x 1.25
3	Zone 3	1.10 kN/m <sup>2</sup> (up to 255m above sea level)



■ **Note:** Detailed analysis requires consideration of EN 1991-1-3 in its entirety.

### Snow load reduction factors as per EN 1991-1-3 (extracts)



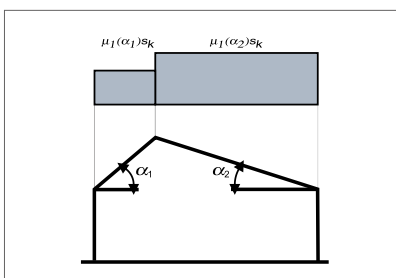
$$F_S = S_K \times \mu_i$$

$F_S$  = Snow load

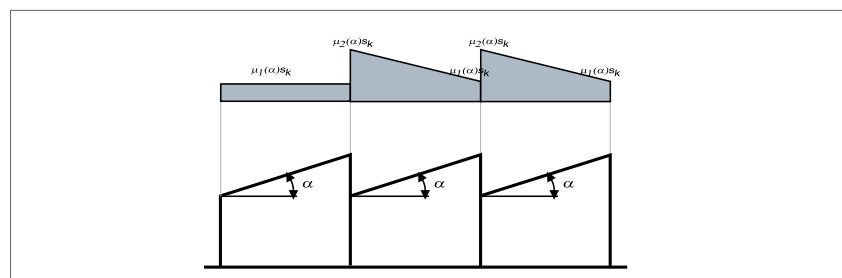
$S_K$  = characteristic snow load in kN/m<sup>2</sup>

$\mu_i$  = largest snow load coefficient

Snow load diagram for pitched roofs (extract)



Snow load diagram for monopitch and shed roofs (extract)





## 4.5 Cable length diagram, cable length determination

Help with determining the maximum cable length, depending on the cable diameter and rated currents of the drives

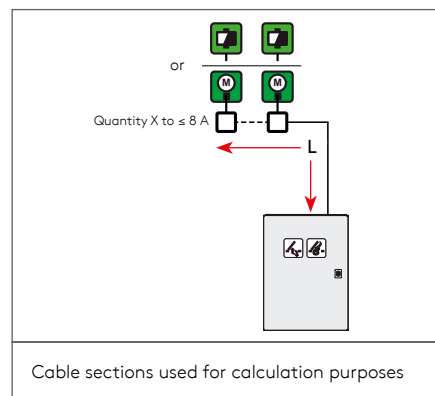
### Formula for calculating cable lengths

$$L(l) = \frac{A_L \times U}{2 \times x \times I^{1)}$$

$$[m] ([A]) = \frac{[mm^2] \times [V]}{\left[\frac{\Omega \times mm^2}{m}\right] \times [A]}$$

[Unit equation]

<sup>1)</sup> Since the formula already considers both outward and return cable conductors, only the single cable length needs to be entered.

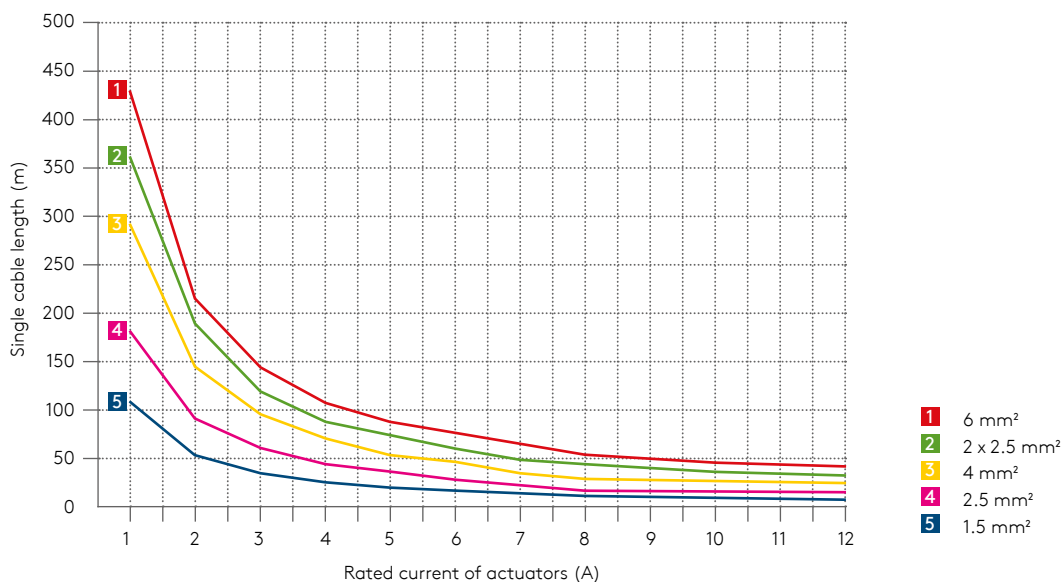


Definition	Dimension symbol	Unit character
Cable diameter	A	mm <sup>2</sup>
Specific resistance	$\rho$	( $\Omega \times mm^2$ )/m
Cable length	L	m
Amperage	I	A
Voltage	U	V

Permissible loss of voltage over the length of cable: 2.5 V. Specific resistance of copper (electric cable): 0.0175 ( $\Omega \times mm^2$ )/m.

### Cable length diagram

To determine the permissible cable length, depending on the cable diameter and total rated current of the actuators.

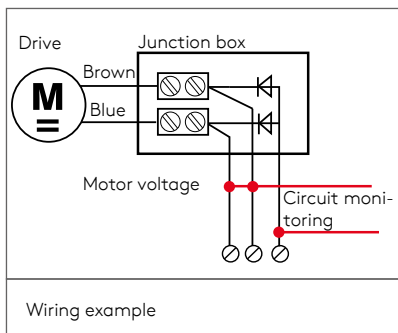


## Cable diameter table

Current I [A]	Cable diameter A [mm <sup>2</sup> ]				
	1.5 mm <sup>2</sup>	2.5 mm <sup>2</sup>	4 mm <sup>2</sup>	2 x 2.5 mm <sup>2</sup>	6 mm <sup>2</sup>
Cable length L [m]					
1	107	179	286	357	429
2	54	89	143	179	234
3	36	60	95	119	143
4	27	45	71	89	107
5	21	36	57	71	86
6	18	30	48	60	71
7	15	26	41	51	61
8	13	22	36	45	54
9	12	20	32	40	48
10	11	18	29	36	43
11	10	16	26	32	39
12	9	15	24	30	36

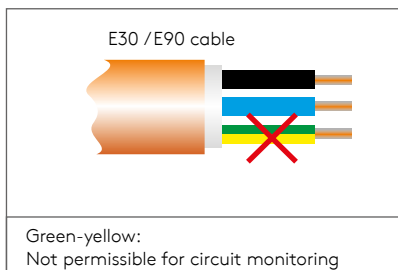
■ **Note:** When calculating cable diameters for the actuators, bear in mind the current surges on start-up.

## Notes on cable selection

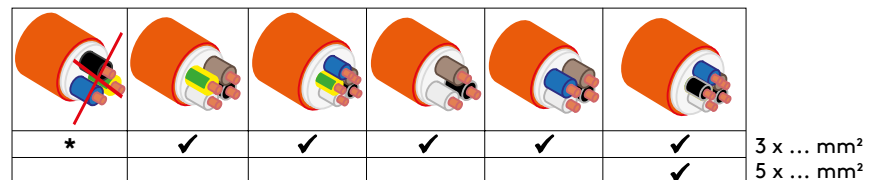


3 or 5 cores (duplicated layout) are required for the supply cables to the SHE drive motors. Two (4) cores are for the motor voltage, the 3rd or 5th core is used to monitor the circuit.

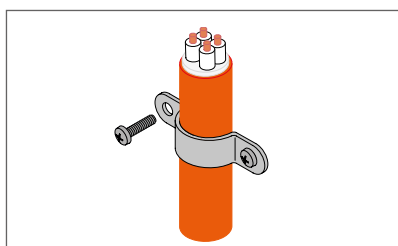
Cable selection and wiring must comply with the (Model) Conduit Systems Directive (in German: MLAR). Retaining E30 or E90 functional reliability is particularly important!



## Examples for possible cable types and fastenings



\* Only suitable for TRZ SHE control panel with 2-wire circuit monitoring, see technical literature for TRZ.



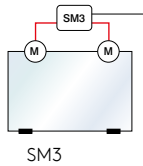
Cable system, consisting of load support system and cables with appropriately fire-resistance-tested plugs and screws.

Cable system as per DIN 4102-12  
Safety cable + laying system

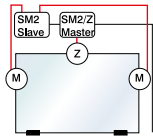


## 4.6 Selection matrix for synchronous control

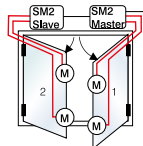
This matrix helps select synchronous modules for sashes, primarily with more than two drives.



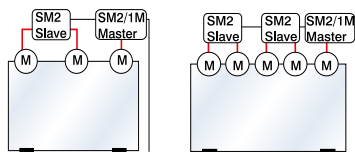
Item number	Designation	M2-500N	M2-1000N	M9-650N	M9-1000N	M9-1500N	M1-1000N	M1-1500N	M1-2000N
<b>SM3</b>									
<b>Two drives with one SM3</b>									
13368011060	SM3 1.0A/1.0A/A	x							
13368011065	SM3 1.0A/1.0A/B		x						
13368011075	SM3 1.0A/1.0A/C			x					
13368011080	SM3 1.1A/1.1A/A				x				
13368011055	SM3 2.0A/2.0A/A					x			
13368011000	SM3 3.5/2.5A/A						x		
13368011035	SM3 3.5/2.5A/B							x	
13368011005	SM3 4A/2.5A/A								x



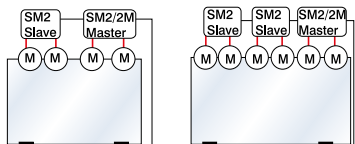
<b>SM2</b>									
<b>1 Two drives + ZUV add. lock, combined with one slave module</b>									
68011110	SM2/Z Master 1.0A/1.0A	x	x	x					
68011111	SM2/Z Master 1.1A/1.1A				x				
68011120	SM2/Z Master 2.0A/2.0A					x			
68011135	SM2/Z Master 3.5A/2.5A						x	x	



<b>2 2 x 2 sequential drives, combined with one slave module</b>									
68011210	SM2 Master 1.0A/1.0A	x	x	x					
68011211	SM2 Master 1.1A/1.1A				x				
68011220	SM2 Master 2.0A/2.0A					x			
68011235	SM2 Master 3.5A/2.5A						x	x	



<b>3 3 and 5 drives, 1 slave module for 3 drives, 2 slave modules for 5 drives</b>									
68011310	SM2/1M Master 1.0A/1.0A	x	x	x					
68011311	SM2/1M Master 1.1A/1.1A				x				
68011320	SM2/1M Master 2.0A/2.0A					x			
68011335	SM2/1M Master 3.5A/2.5A						x	x	



<b>4 4 and 6 drives, 1 slave module for 4 drives, 2 slave modules for 6 drives</b>									
68011410	SM2/2M Master 1.0A/1.0A	x	x	x					
68011411	SM2/2M Master 1.1A/1.1A				x				
68011420	SM2/2M Master 2.0A/2.0A					x			
68011435	SM2/2M Master 3.5A/2.5A						x	x	

<b>SM2 slave modules for use with master modules in combinations 1 - 4</b>									
68011509	SM2 Slave 0.85A/2.0A	x	x	x	x	x			
68011517	SM2 Slave 1.7A/4.0A						x	x	

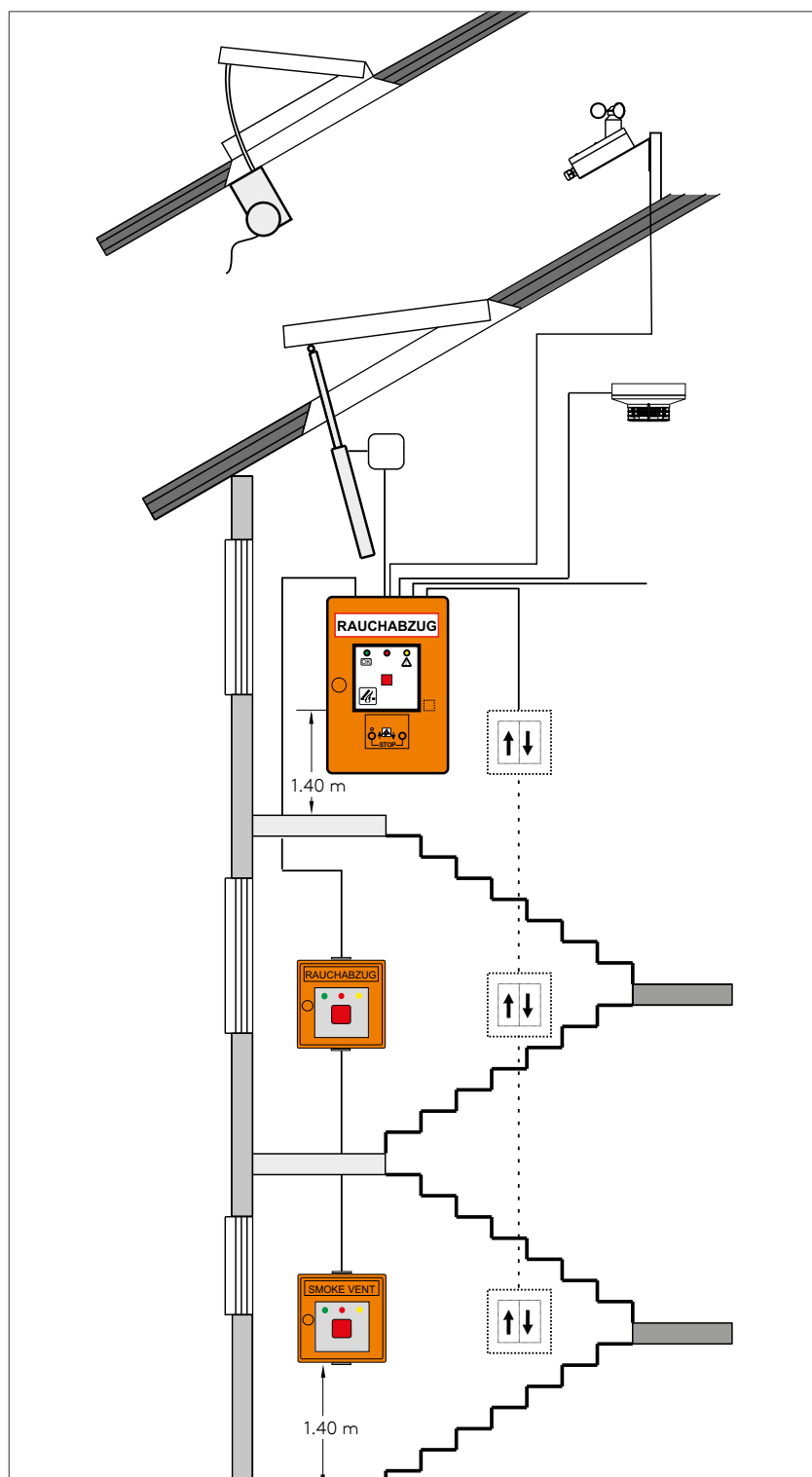


## 4.7 Sample wiring plans (TRZ, MZ3, ...)

### Sample wiring plan for staircase SHE

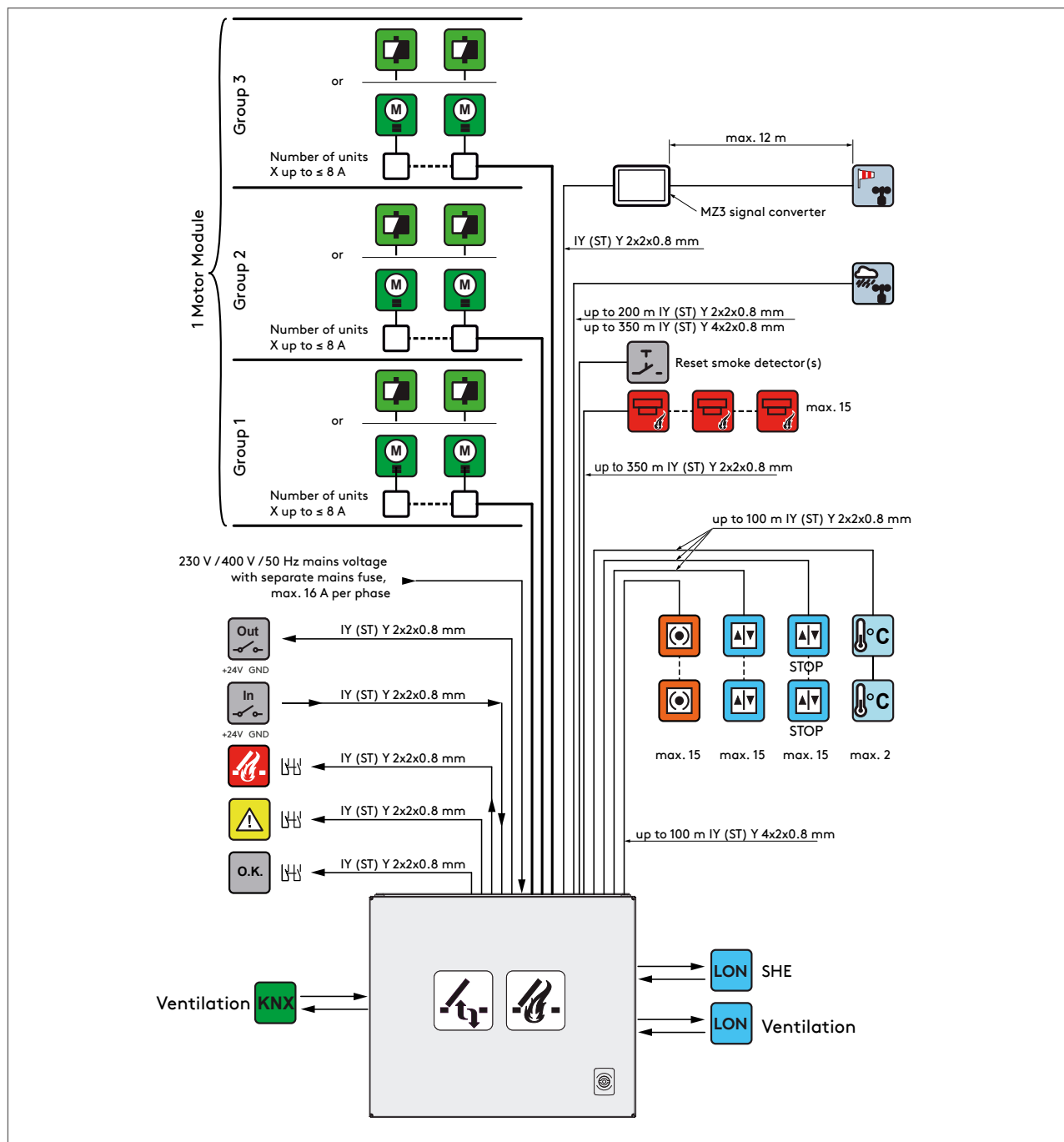
#### ■ Notes:

- We recommend installing an automatic detector on each floor of the staircase.
- SHE functions always take precedence over ventilation functions.
- Cable selection and wiring must comply with the (Model) Conduit Systems Directive (in German: MLAR).
- Retaining E30 (30 min.) or E90 (90 min.) functional reliability is particularly important!
- All cables leading to the control panel (apart from the mains cable) carry 24 V DC and must be laid separately from the mains cable.
- Compliance with the relevant VDE regulations governing cable installation is mandatory.
- Do not use cable diameters that are smaller than the specified sizes.  
They are specified for an ambient temperature of 20 °C.
- Compliance with the cable manufacturer's specifications governing installation and wiring is mandatory.



## MZ3 sample wiring plan

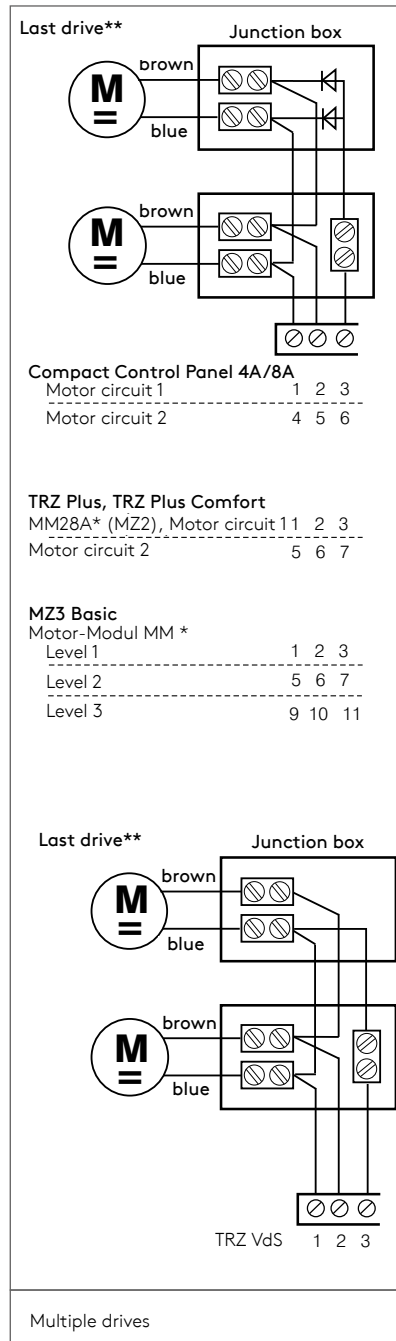
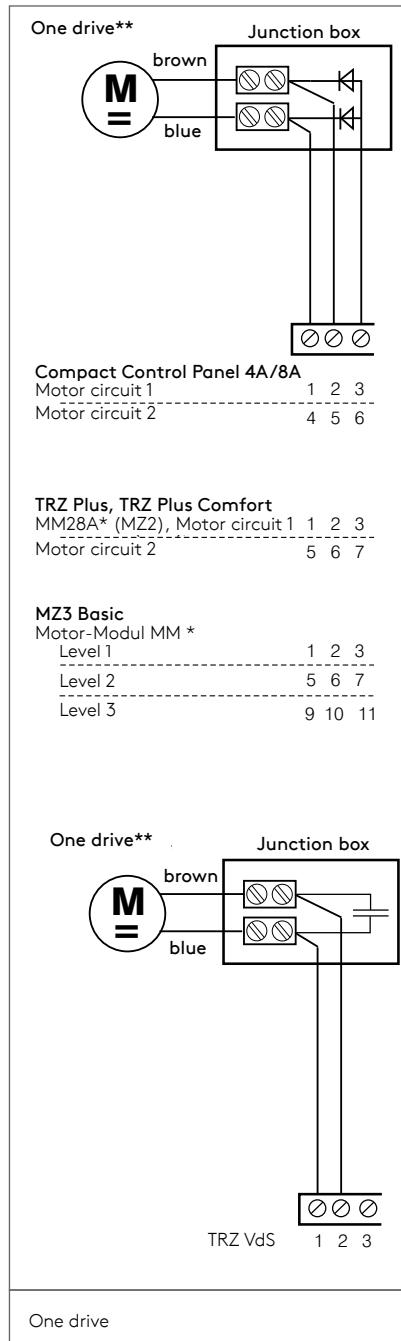
Compliance with applicable specifications governing cable installation with retention of functional reliability for 30 min. or 90 min. is mandatory. Any deviations must be agreed with the construction manager, the local authorities responsible for approving the installation, the energy utility companies, fire prevention authorities or trade association. Do not use cable diameters that are smaller than the specified sizes. They are specified for an ambient temperature of 20 °C. Use larger diameters for higher temperatures. In the case of E90 (E30), the cable diameters must be adjusted in compliance with the manufacturer's specifications. All cables leading to the control centre (apart from the mains cable) carry 24 V DC and must be laid separately from the mains cable. Compliance with the relevant VDE regulations governing cable installation is mandatory.







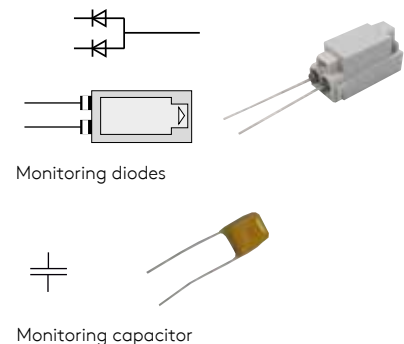
## 4.8 Sample connection diagrams

### Connection diagram: 24 V DC drive - control panel



	1 (5) (9)	2 (6) (10)	3 (7) (11)	Compact, MZ2, MZ3 Basic
24 V DC	-	+		
24 V DC	+	-		

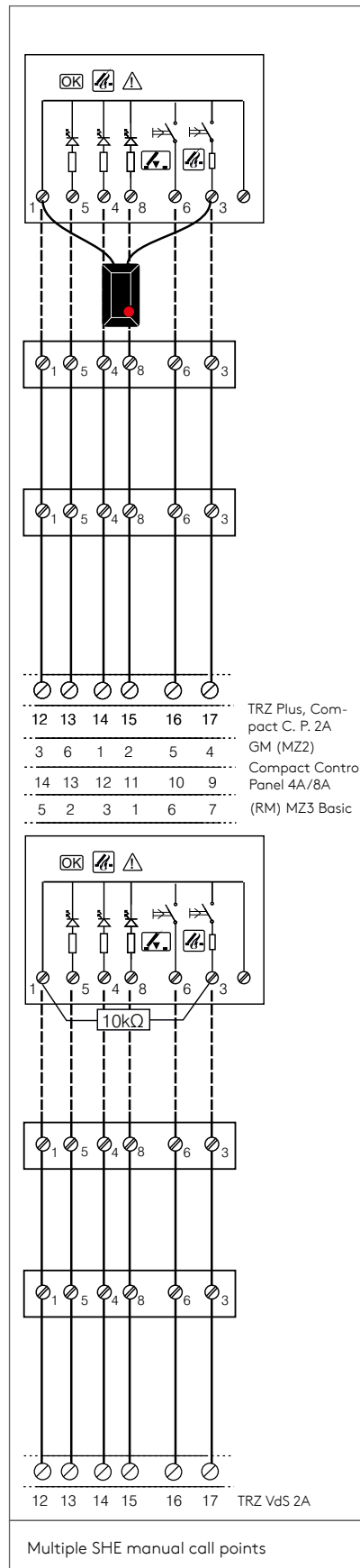
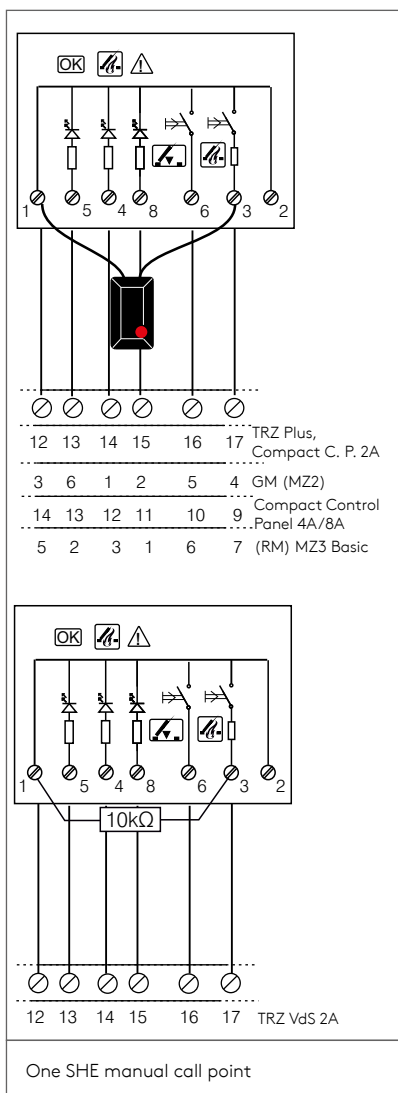
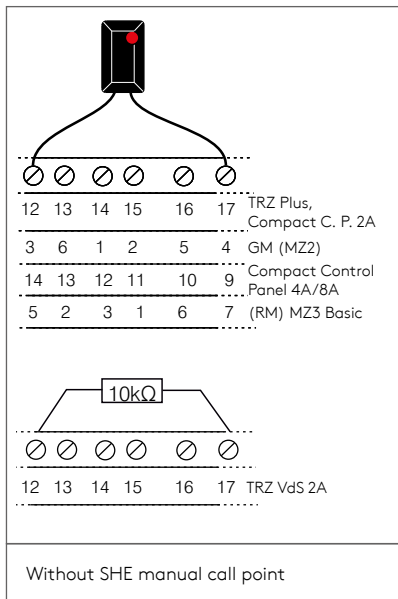
Motor voltage polarity for OPEN/CLOSE



\* Functional scope is dictated by the configuration of the MZ2/MZ3.

\*\* With integrated max. load or end cutoff.

## Connection diagram: RBH/3A SHE manual call point - control panel



### Notes:

#### General:

Make sure all systems are disconnected from the mains (230 V AC/400 V AC) and all batteries are disconnected before performing any work.



#### Connection:

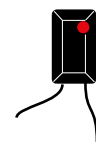
Feed the connecting cables into the control panel housing. Connect the cables to the terminals as per diagram. Make sure the connections are correct! If the system runs in the wrong direction, swap the wires!

#### Malfunctions:

Incorrect terminal assignment or number/colour mistakes can cause the control panel or external units to malfunction.

#### Operating instructions:

These connection diagrams are not designed to replace the individual operating instructions. Always read and follow the installation specifications in the technical literature!

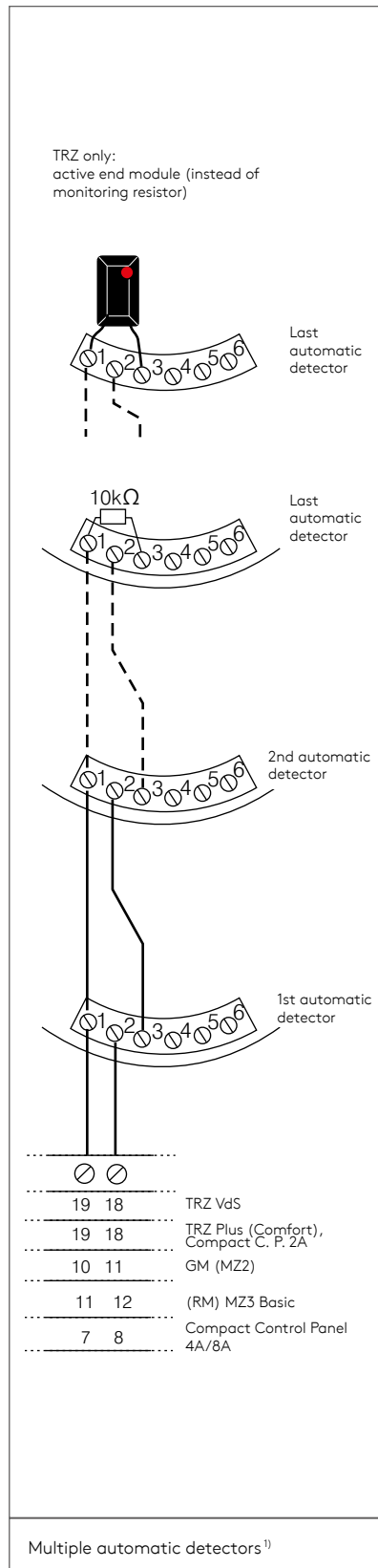
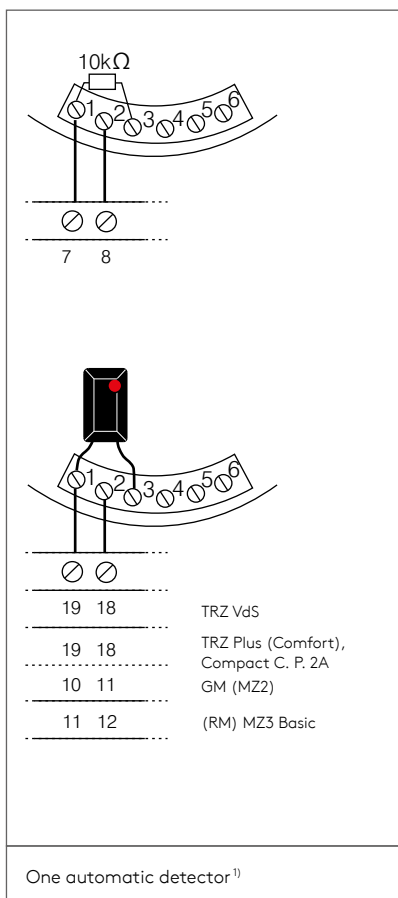
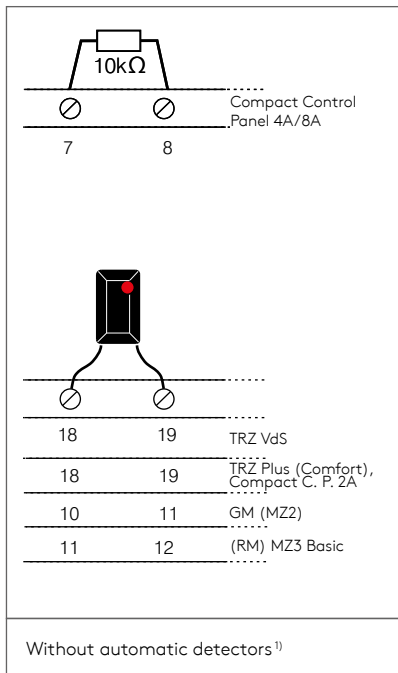


Active end module



Monitoring resistor

## Connection diagram: Automatic detector – control panel



### Notes:

#### General:

Make sure all systems are disconnected from the mains (230 V AC / 400 V AC) and all batteries are disconnected before performing any work.



#### Connection:

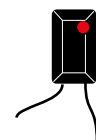
Feed the connecting cables into the control panel housing. Connect the cables to the terminals as per diagram. Make sure the connections are correct! If the system runs in the wrong direction, swap the wires!

#### Malfunctions:

Incorrect terminal assignment or number/colour mistakes can cause the control panel or external units to malfunction.

#### Operating instructions:

These connection diagrams are not designed to replace the individual operating instructions. Always read and follow the installation specifications in the technical literature!



Active end module



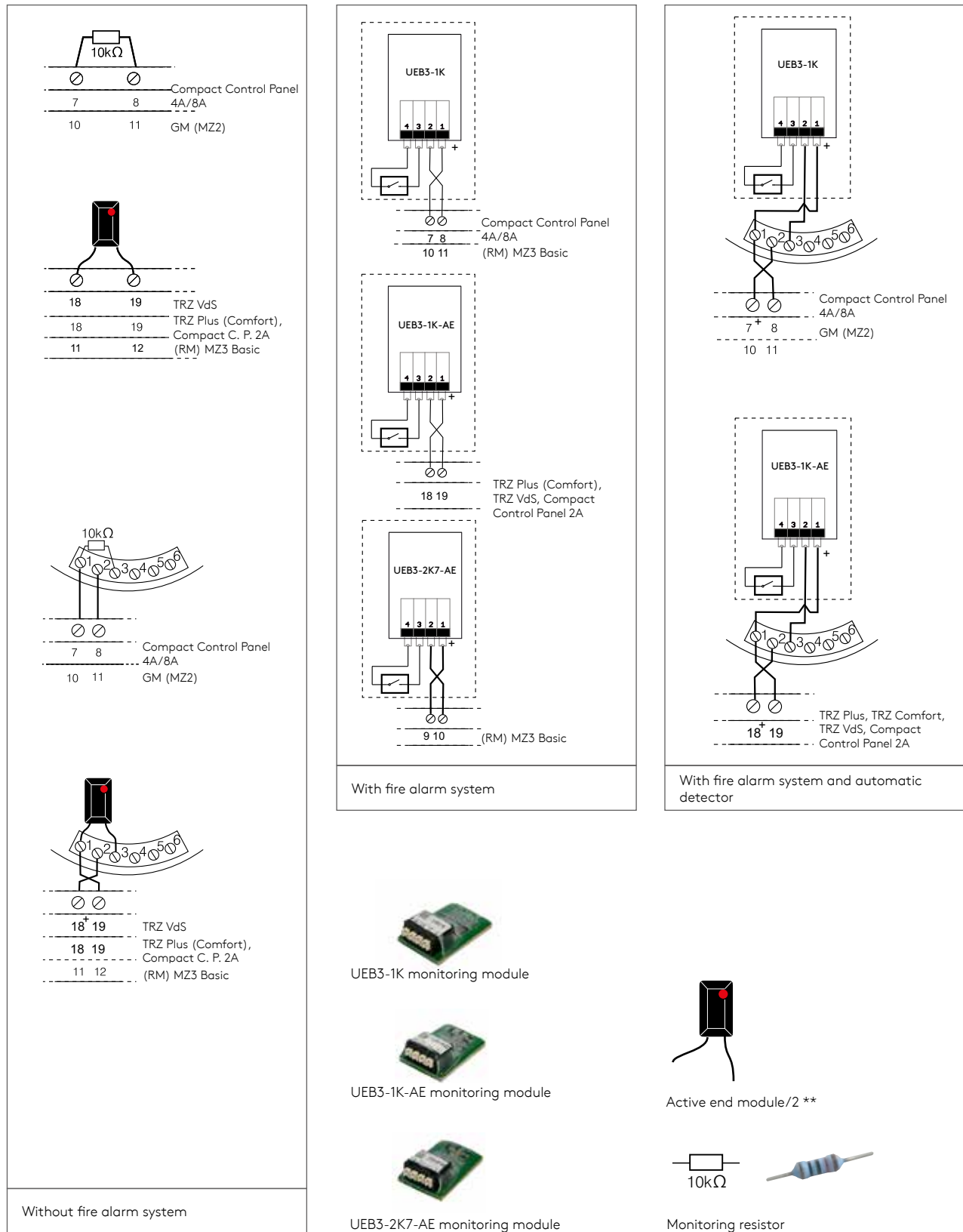
Monitoring resistor

<sup>1)</sup> Applicable for detector types SSD 521, UTD 521, UTD 523, MSD 523 and MSD 523-E.

\* Functional scope is dictated by the configuration of the MZ2/MZ3.

\*\* Polarity is irrelevant for installation.

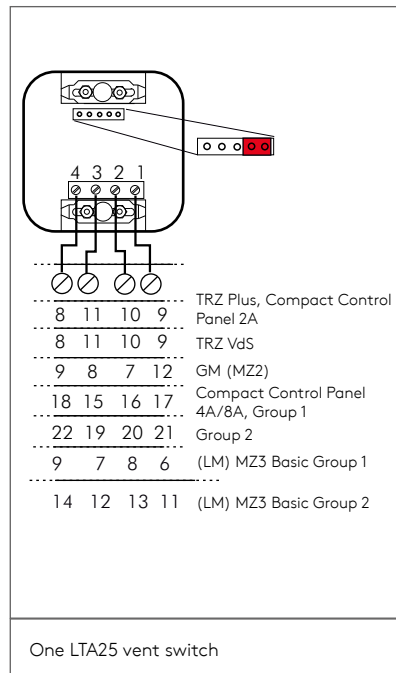
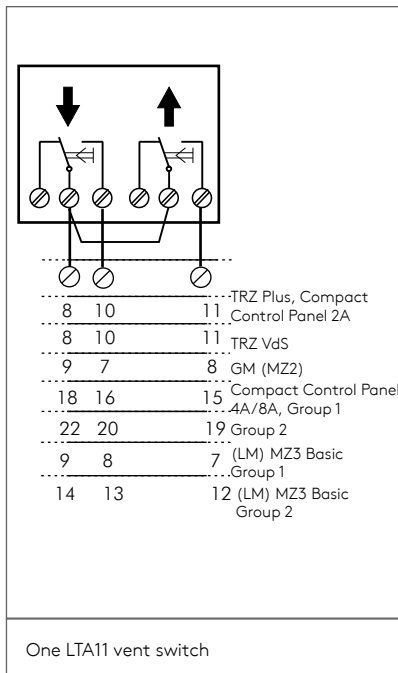
## Connection diagram: Fire alarm system – control panel



\* Functional scope is dictated by the configuration of the MZ2/MZ3.

\*\* Polarity is irrelevant for installation.

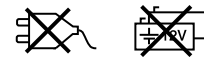
## Connection diagram: LTA11 and LTA25 vent switches - control panel



### Notes:

#### General:

Make sure all systems are disconnected from the mains (230 V AC / 400 V AC) and all batteries are disconnected before performing any work.



#### Connection:

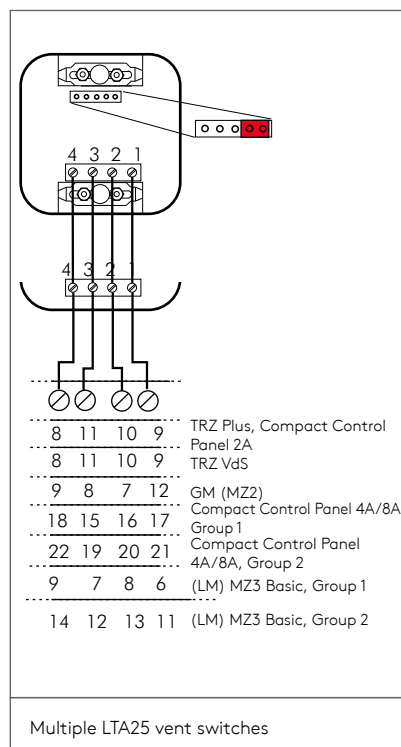
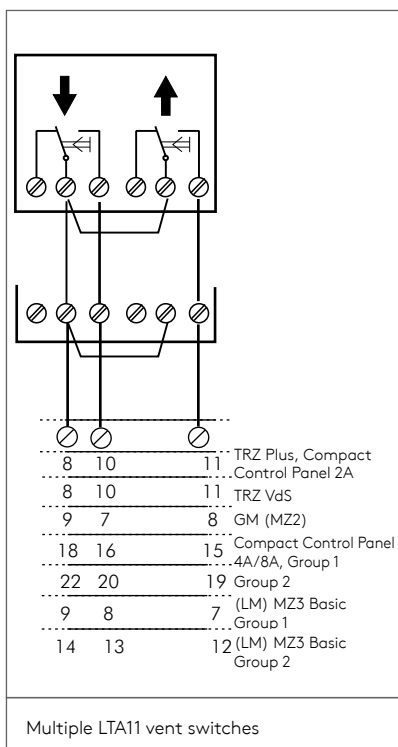
Feed the connecting cables into the control panel housing. Connect the cables to the terminals as per diagram. Make sure the connections are correct! If the system runs in the wrong direction, swap the wires!

#### Malfunctions:

Incorrect terminal assignment or number/colour mistakes can cause the control centre or external units to malfunction.

#### Operating instructions:

These connection diagrams are not designed to replace the individual operating instructions. Always read and follow the installation specifications in the technical literature!



Jumper (on the back of the LTA25)



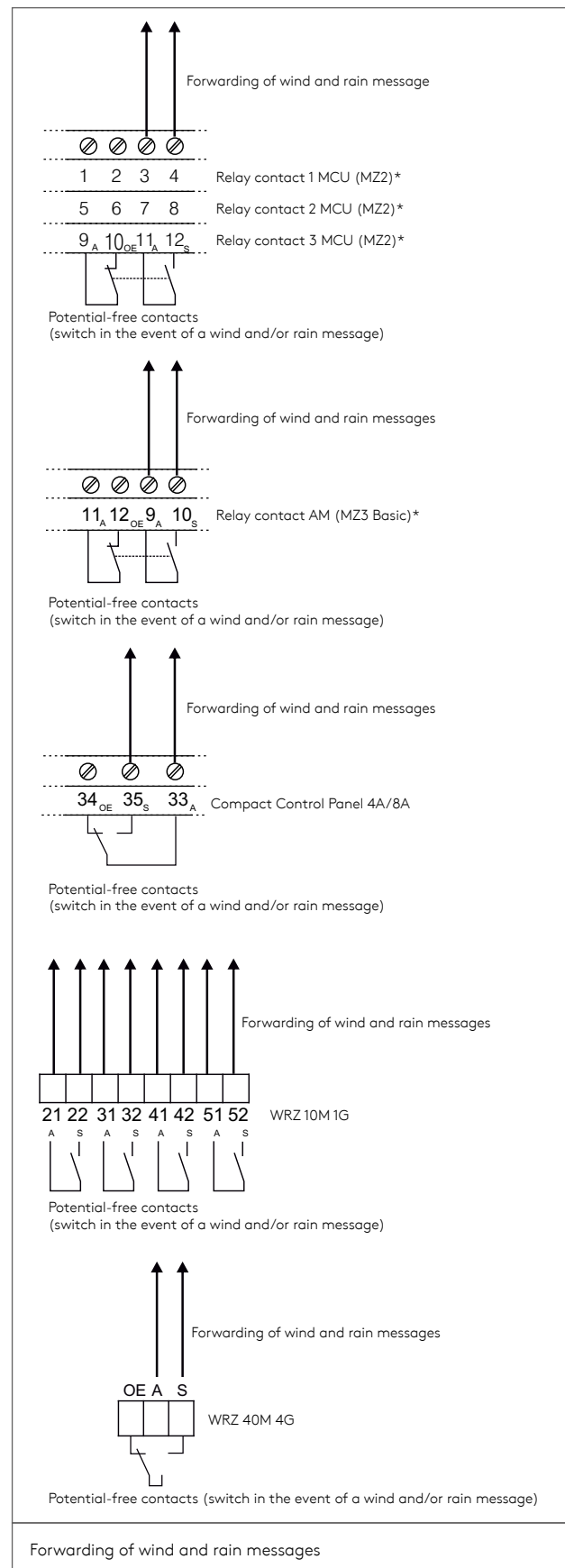
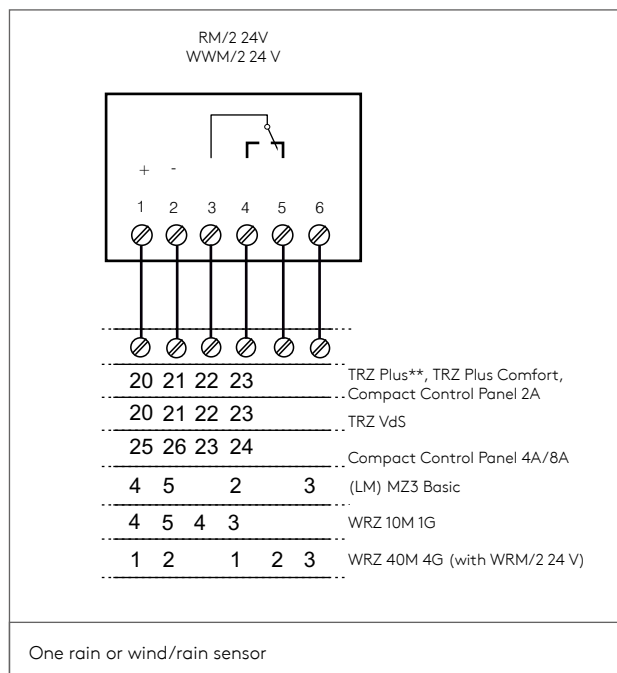
TRZ Plus  
Compact Control Panel 2A  
TRZ VdS  
GM (MZ2)  
LM3G (MZ2)  
Compact Control Panel 4A/8A  
(LM) MZ3 Basic



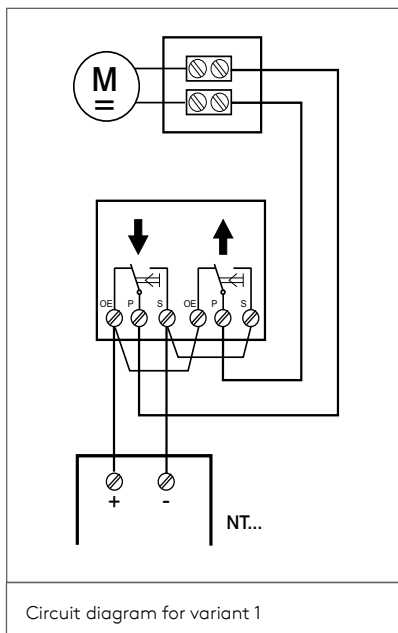
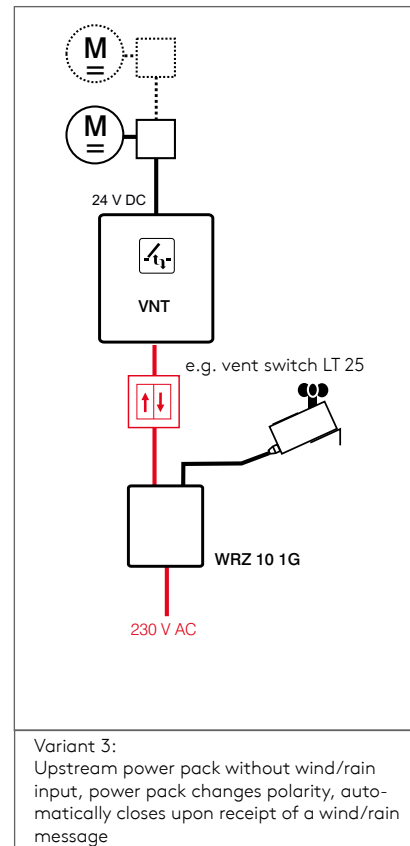
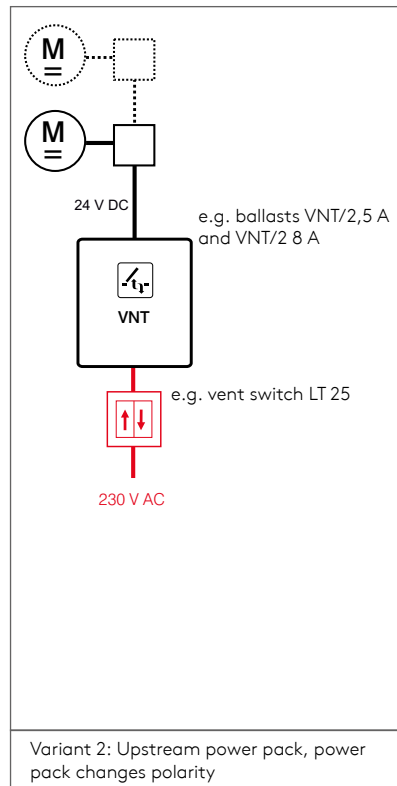
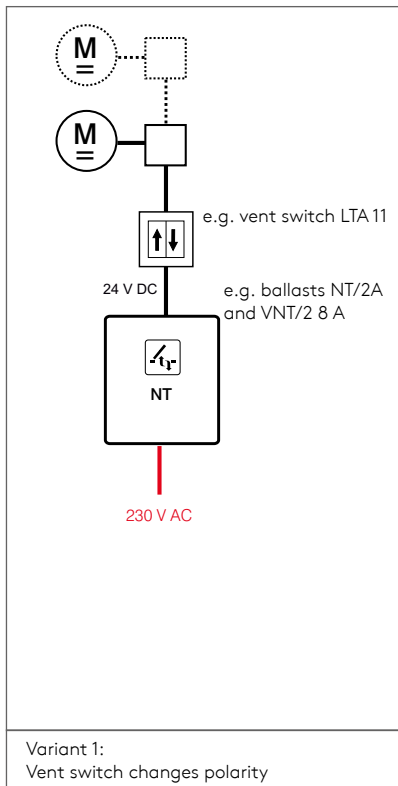
\* Functional scope is dictated by the configuration of the MZ2/MZ3.

## Connection diagram: WRM/2 and RM/2 wind and/or rain sensor - control panel

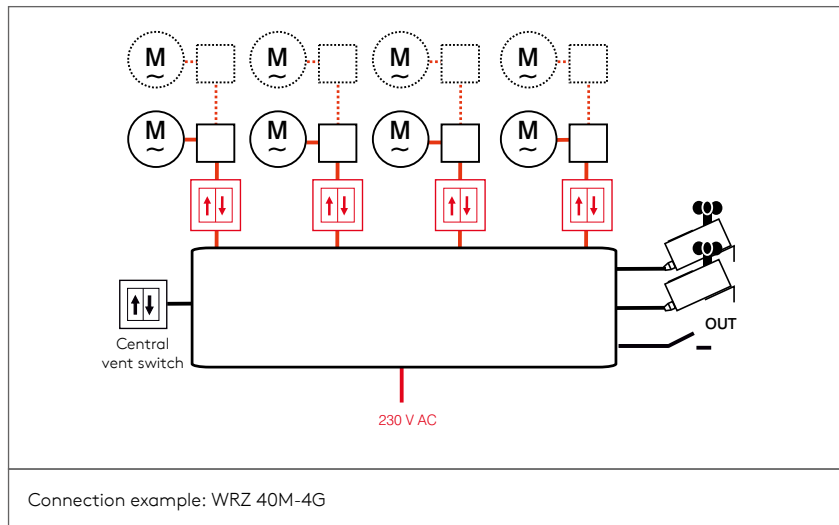
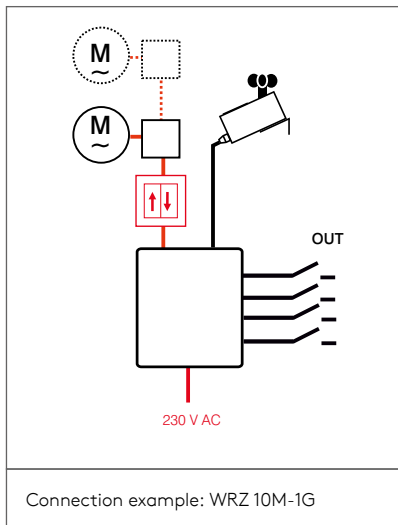
\* Functional scope is dictated by the configuration of the MZ2/MZ3.  
 \*\* Only possible with additional TRZ/WRMAS-Basic module.



## Application examples and upstream power pack variants



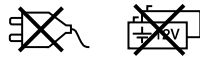
## WRZ10M-1G and WRZ40M-4G wind/rain sensors control the 230 V drive



### ■ Notes:

#### ■ General:

Make sure all systems are disconnected from the mains (230 V AC / 400 V AC) and all batteries are disconnected before performing any work.



#### ■ Connection:

Feed the connecting cables into the control panel housing. Connect the cables to the terminals as per diagram. Make sure the connections are correct! If the system runs in the wrong direction, swap the wires!

#### ■ Malfunctions:

Incorrect terminal assignment or number/colour mistakes can cause the control panel or external units to malfunction.

#### ■ Operating instructions:

These connection diagrams are not designed to replace the individual operating instructions. Always read and follow the installation specifications in the technical literature!

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