

**aumüller**  
**ASSEMBLY INSTRUCTION**  
**KSA + KSA TWIN**  
 CHAIN DRIVE FOR WINDOWS  
 according to Machinery Directive  
 2006/42/EG (annex VI)



**Note the detailed assembly instructions!**  
 Links to safety instructions, detailed assembly instructions, and manufacturer statements: Please scan in the QR code and follow the link to the **AUMÜLLER** homepage.

**Ausführliche Montageanleitung beachten!**  
 Links zu Sicherheitshinweisen, ausführlichen Montage-Anweisungen und Hersteller-Erklärungen: Bitte QR-Code einlesen und Link zur **AUMÜLLER**-Homepage verfolgen.

**Respectez les instructions de montage détaillées !**  
 Liens vers les consignes de sécurité, détaillées instructions de montage et les explications du fabricant: Veuillez scanner le code QR et suivre le lien vers la page d'accueil de **AUMÜLLER**.

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 关于装配说明的链接 (详细的) 和制造商声明 请读取 QR 码并跟踪 **AUMÜLLER** 主页的链接。

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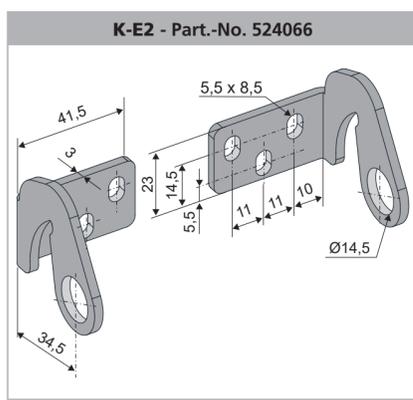
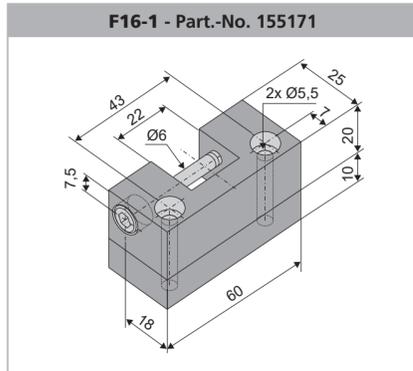
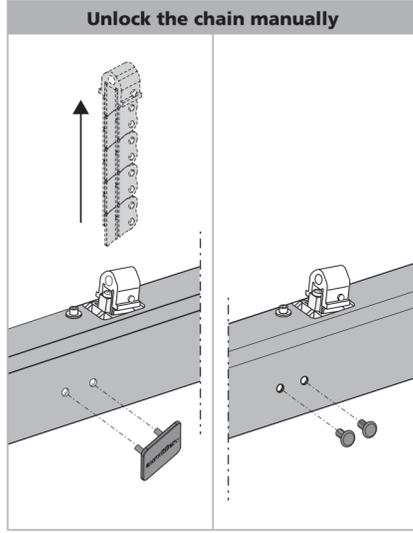
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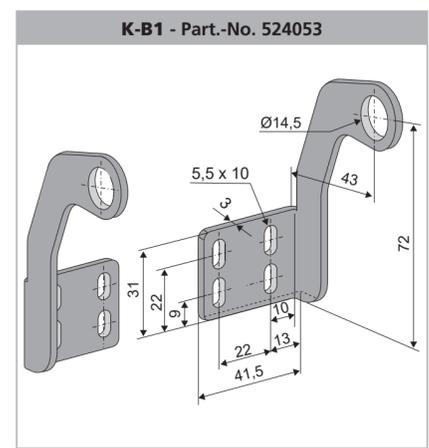
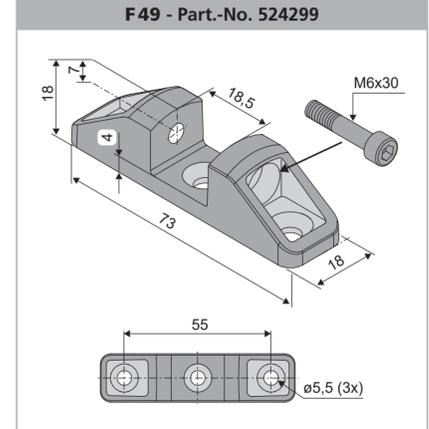
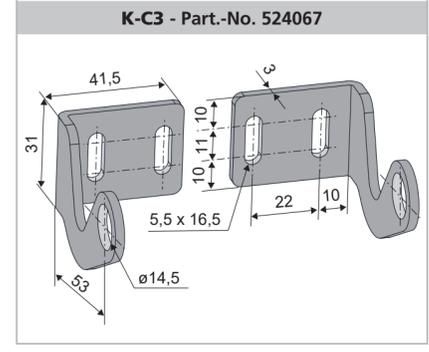
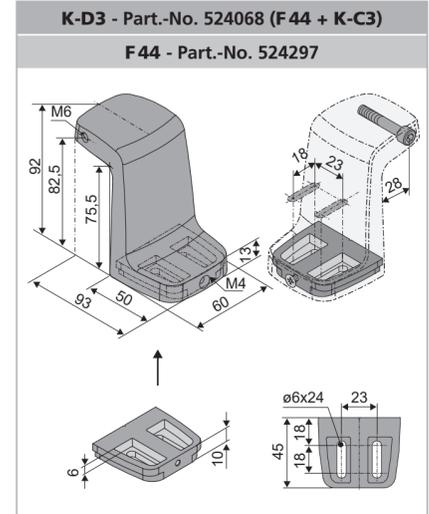
**www.aumueller-gmbh.de**  
**AUMÜLLER AUMATIC GMBH** Tel. +49 8271 8185-0  
 Gemeindewald 11 Fax +49 8271 8185-250  
 86672 Thierhaupten info@aumuellergmbh.de  
 9000028111\_V0.2\_KW 24 / 2023

Stroke [mm]	min. FAH [mm]			
	1 F44 + K-C3	2 F49 + K-B1	3 F16-1 + K-E2	
250	350	300	350	
300	450	350	350	
400	700	500	400	
500	900	650	500	
600	1200	800	600	
800	1600	1050	800	
1000	2000	1350	1000	
1200	2500	1600	1200	
1500	3100	2200	1500	

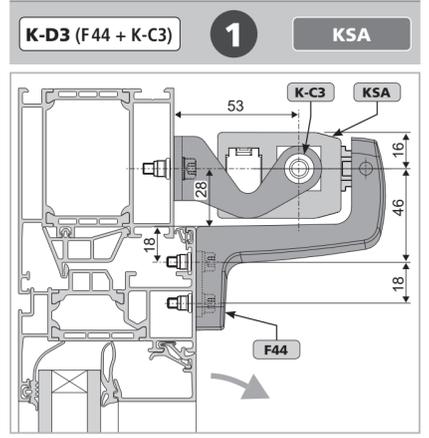
FAH is determined for: (when drive is mounted on the main closing edge)  
 Casement width: max. 1200 mm (with 1 drive)  
 Window overlap: 10 mm



2 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

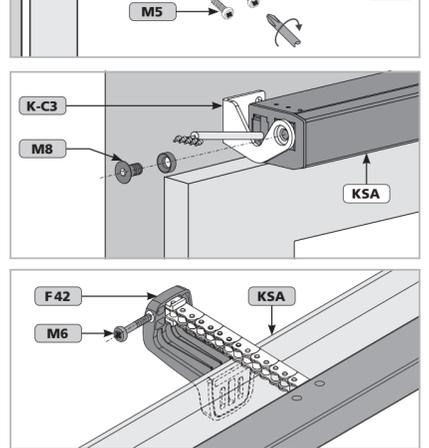


3 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

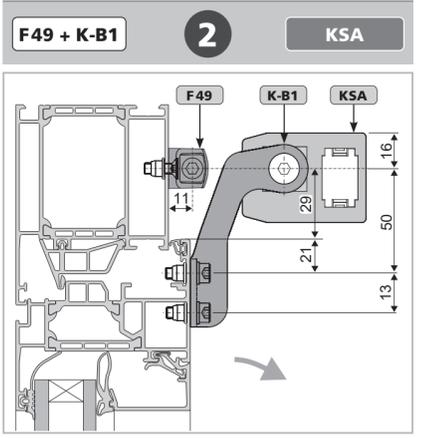


Stroke	KSA				
	A	B	C	W	Y
250	516	253,5	≥ 527	≥ 515	
300 + 400	592	329,5	≥ 661	≥ 591	
500 + 600	694	431,5	≥ 883	≥ 693	
800	795	532,5	≥ 1085	≥ 794	
1000	897	634,5	≥ 1289	≥ 896	
1200	999	736,5	≥ 1493	≥ 998	
1500	1152	889,5	≥ 1799	≥ 1151	

Stroke	KSA				
	B	D	X	Z	
250	592	253,5	≥ 657	≥ 591	
300 + 400	668	329,5	≥ 679	≥ 667	
500 + 600	770	431,5	≥ 883	≥ 769	
800	871	532,5	≥ 1085	≥ 870	
1000	973	634,5	≥ 1289	≥ 972	
1200	1075	736,5	≥ 1493	≥ 1074	
1500	1228	889,5	≥ 1799	≥ 1227	

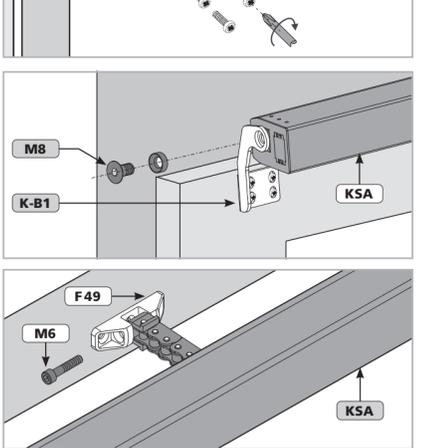


4 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

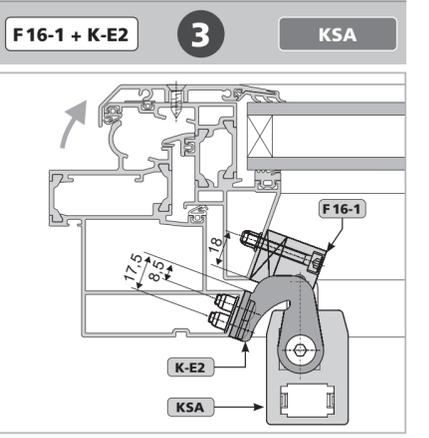


Stroke	KSA				
	A	B	C	W	Y
250	516	253,5	≥ 527	≥ 515	
300 + 400	592	329,5	≥ 661	≥ 591	
500 + 600	694	431,5	≥ 883	≥ 693	
800	795	532,5	≥ 1085	≥ 794	
1000	897	634,5	≥ 1289	≥ 896	
1200	999	736,5	≥ 1493	≥ 998	
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Stroke	KSA				
	B	D	X	Z	
250	592	253,5	≥ 657	≥ 591	
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1500	1228	889,5	≥ 1799	≥ 1227	

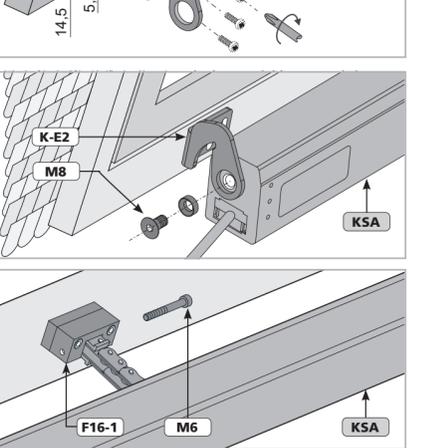


5 KSA 24V DC / 230V AC  
 KSA Twin 24V DC



Stroke	KSA				
	A	B	C	W	Y
250	516	253,5	≥ 527	≥ 515	
300 + 400	592	329,5	≥ 661	≥ 591	
500 + 600	694	431,5	≥ 883	≥ 693	
800	795	532,5	≥ 1085	≥ 794	
1000	897	634,5	≥ 1289	≥ 896	
1200	999	736,5	≥ 1493	≥ 998	
1500	1152	889,5	≥ 1799	≥ 1151	

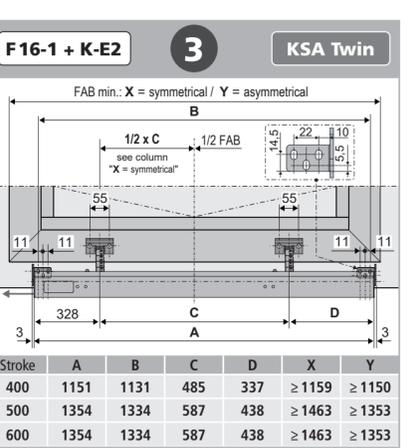
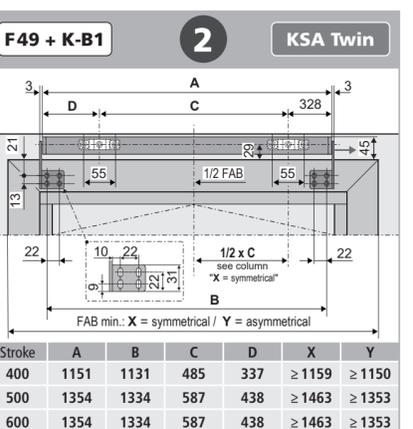
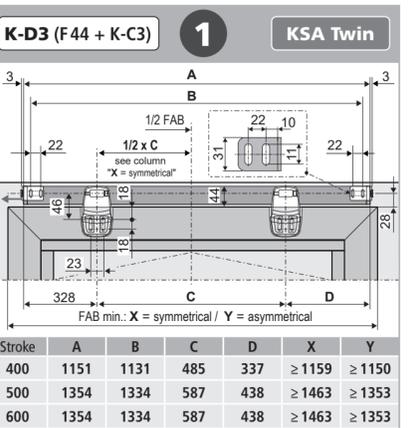
Stroke	KSA				
	B	D	X	Z	
250	592	253,5	≥ 657	≥ 591	
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800	871	532,5	≥ 1085	≥ 870	



6 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

Stroke [mm]	min. FAH [mm]			
	1 F44 + K-C3	2 F49 + K-B1	3 F16-1 + K-E2	
400	700	500	400	
500	900	650	500	
600	1200	800	600	

FAH is determined for: (when drive is mounted on the main closing edge)  
 Casement weight: max. 30 kg/m²  
 Casement width: max. 2000 mm (with 1 drive)  
 Window overlap: 10 mm

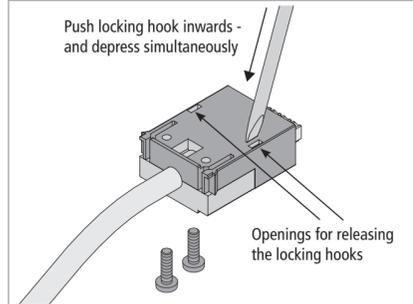
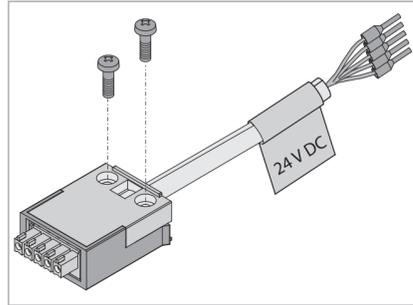
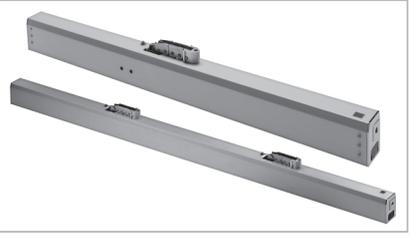


7 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

1 KSA 24V DC / 230V AC  
 KSA Twin 24V DC

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KSA + KSA TWIN**

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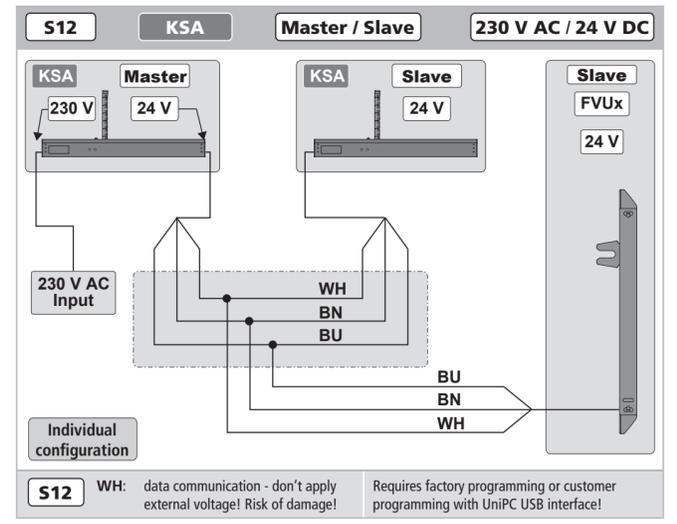
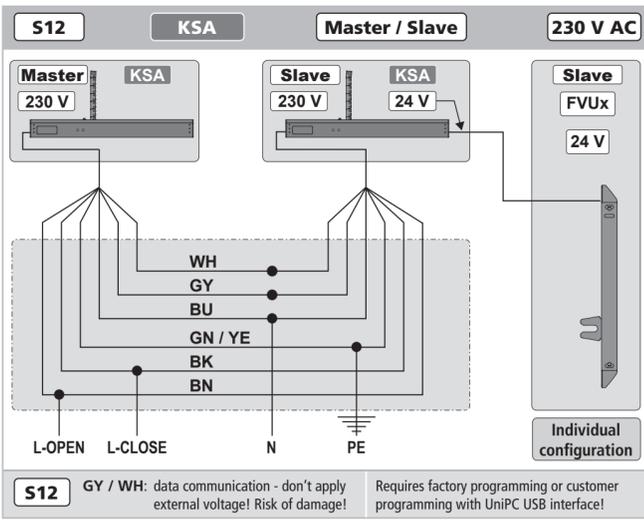
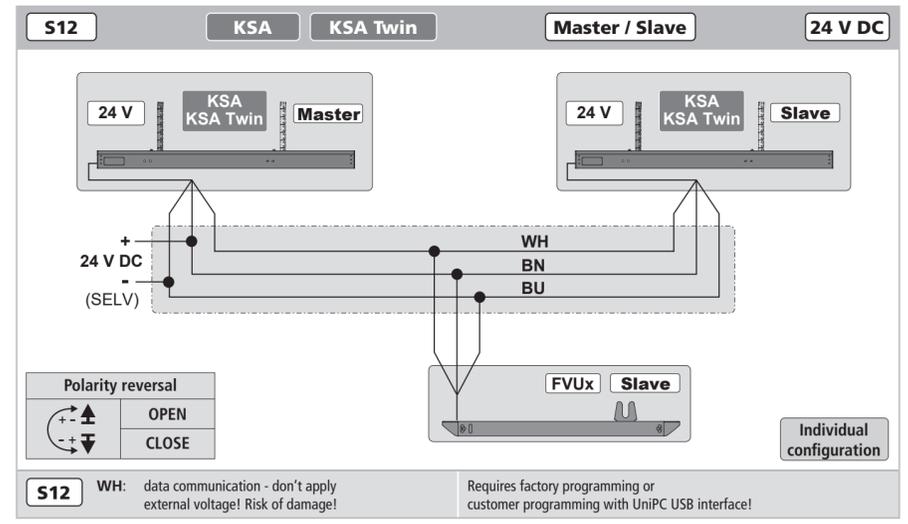
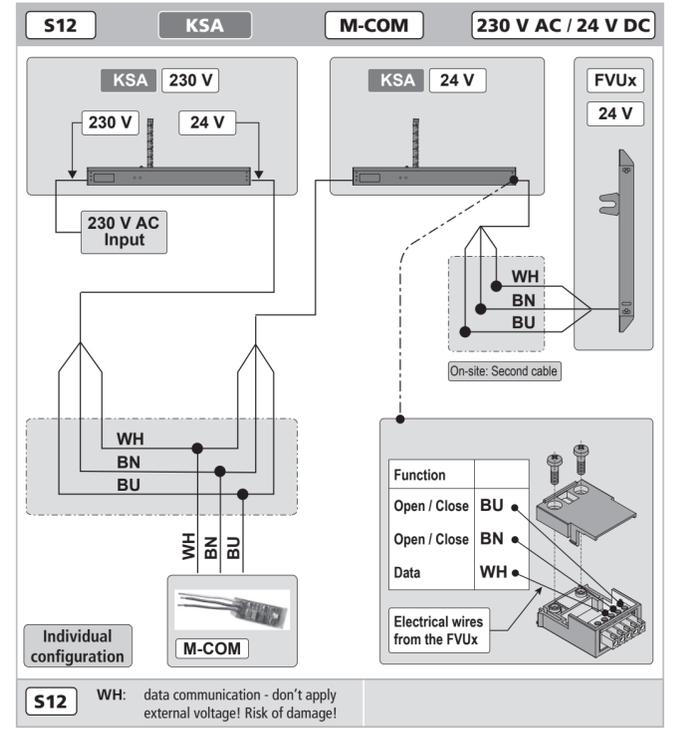
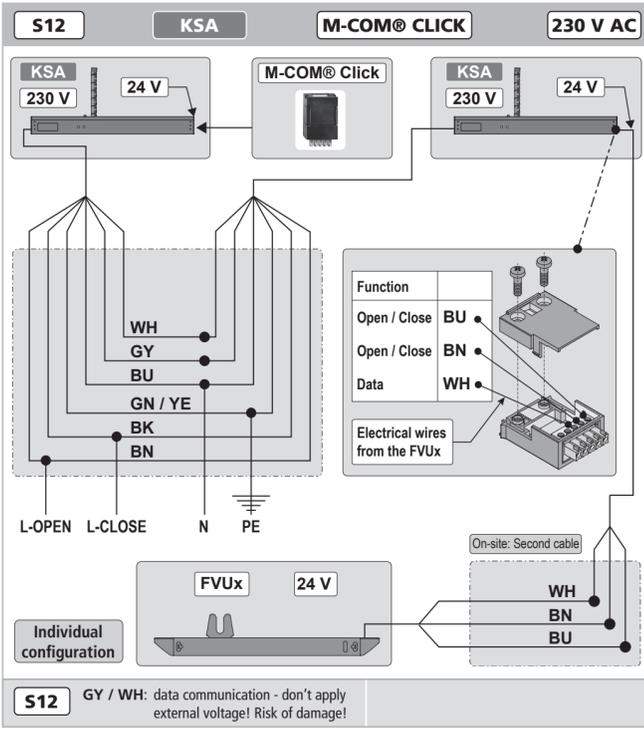
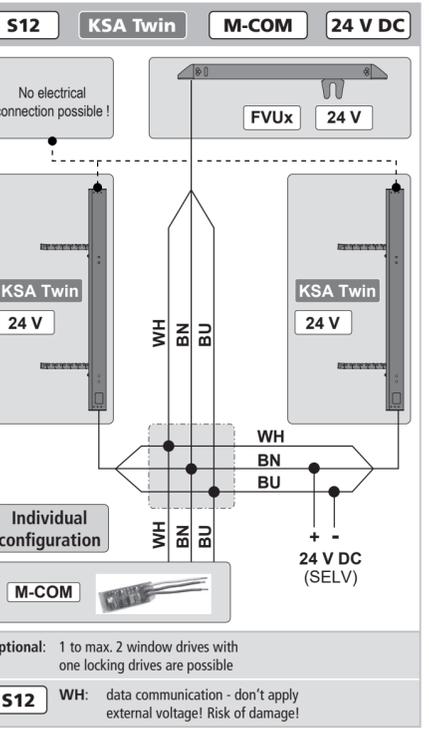
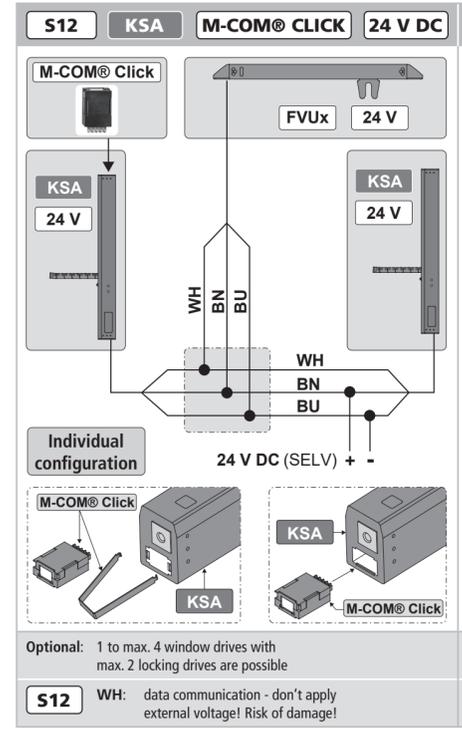
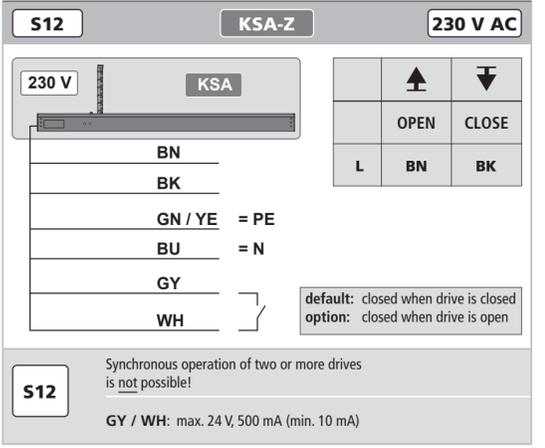
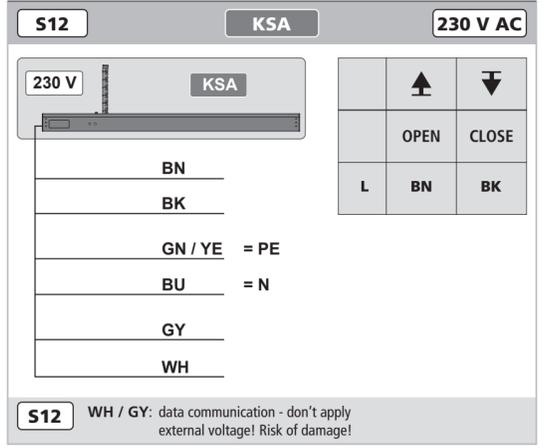
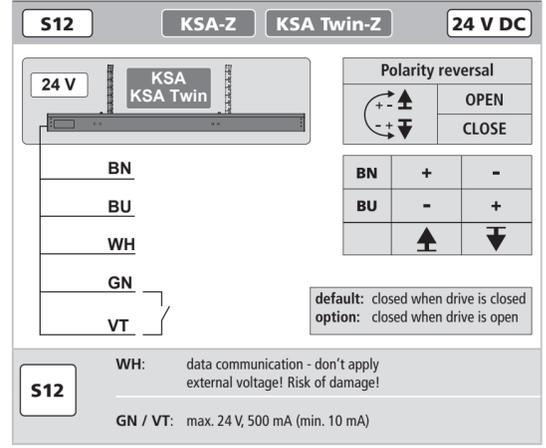
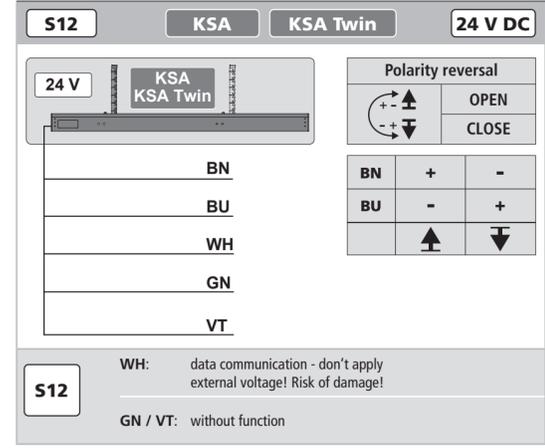
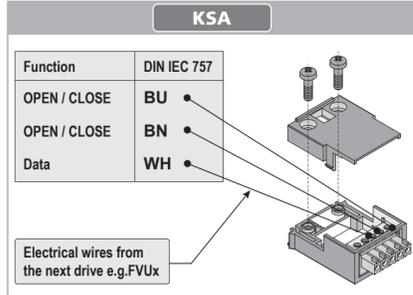
**24 V DC**

Function	DIN IEC 757
OPEN / CLOSE	BU - blue
OPEN / CLOSE	BN - brown
Data	WH - white
Rel: NO	VT - violet
Rel: NO	GN - green

**230 V AC**

Function	DIN IEC 757
L1 (OPEN)	BN - brown
L2 (CLOSE)	BK - black
N	BU - blue
PE	GN / YE - green / yellow
(*)	GY - grey
(*)	WH - white

(\*) Either feedback contact (version „KSA-Z“) or constant control (synchronous control „KSA“)



# aumüller

## Assembly and Commissioning Instructions

according to Machinery Directive 2006/42/EC (annex VI)



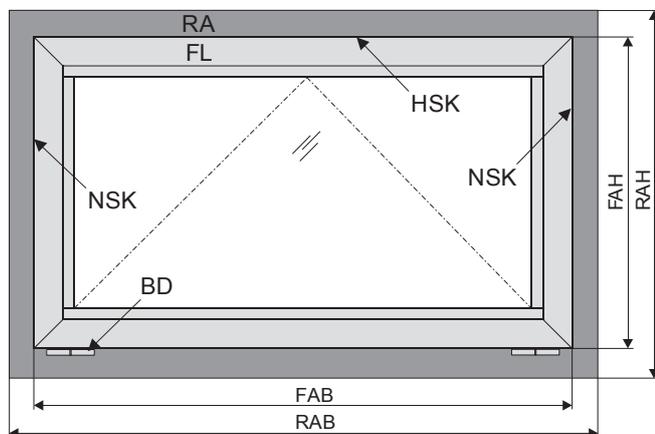
**KSA-TWIN S12 24V DC CHAIN DRIVE FOR WINDOWS** **CE**



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## Abbreviations

Index of abbreviations	
These abbreviations are used consistently throughout these assembly & operating instructions. Unless stated differently, all dimensions indicated in this document are in mm. General tolerances in accordance with DIN ISO 2768-m.	
A	drive
AK	connection cable / drive cable
AP	cover cap
BD	hinge
Fxxx	casement bracket
FAB	overall width of casement
FAH	overall height of casement
FG	casement weight
FL	casement
FÜ	casement overlap
HSK	main closing edge
Kxxx	frame bracket
L	construction length of drive
MB	central hinge
NRWG	NSHEV – natural smoke and heat exhaust ventilation
NSK	side closing edge
RA	frame
RAB	overall width of frame
RAH	overall height of frame
RWA	SHEV – smoke and heat exhaust ventilation
SL	snow load
→	opening direction

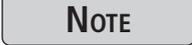


## Target group

These instructions are intended for trained personnel and operators of systems for natural smoke ventilation (NRA / RWA) (natural smoke exhaust system / smoke and heat exhaust system) and natural ventilation via windows, who are knowledgeable of operating modes as well as the remaining risks of the system.

## Warning and safety symbols in these Instructions:

The symbols used in the instructions shall be strictly observed and have the following meaning:

-  **DANGER** Failure to comply with the warning notes results in irreversible injuries or death.
-  **WARNING** Failure to comply with the warning notes can result in irreversible injuries or death.
-  **CAUTION** Failure to comply with the warning notes can result in minor or moderate (reversible) injuries.
-  **NOTE** Failure to comply with the warning notes can lead to damage to property.

-  **Caution / Warning**  
Danger due to electric current.
-  **Caution / Warning**  
Risk of crushing and entrapment during device operation (is provided as a sticker with the drive).
-  **Attention / Warning**  
Risk of damage to / destruction of drives and / or windows.

 **WARNING** Once the assembly and commissioning has been completed, the installer of a machine „power-operated window and door“ shall hand these instructions over to the end-user. The end-user shall store these instructions in a safe place for further reference and use, if required.

 **WARNING** This device is not intended for use by persons (including children) with physical, sensory or mental limitations or lacking experience and / or knowledge, unless they are supervised by a person who is responsible for the safety or were instructed by him on the usage of this equipment. Children should be supervised to ensure that they are not playing with this device. Cleaning and operator's maintenance may not be performed by children without supervision.

## Intended use

### Area of application / Scope of application

This drive is intended for the electromotive opening and closing of windows in facade and roof areas.

**The main task of this product**, in combination with a window and a suitable external control unit, **is to evacuate hot smoke and combustion gases in case of fire**, to save human lives and protect material assets. Furthermore, with the electromotive operated window and a suitable external control unit, **the natural ventilation** of the building can be ensured.

#### NOTE

By attaching the drive to a movable element of the window a so-called "power-operated window" is created which, according to the Machinery Directive 2006 / 42 / EG, represents a machine.

### Intended use according

The drive is intended for stationary installation and electrical connection at the window as part of a building.

The drive is in combination with an external Control Unit (e.g. from **AUMÜLLER**) released for its proper use at a power-operated window for the following use:

- Application for natural ventilation
  - with an installation height of the drive and the bottom side of sash of at least 2,5 m above the floor, **or**
  - with an opening width at the HSK of the driven part of < 200 mm by a simultaneous speed of < 15 mm/s at the HSK in closing direction.
- Application as NRWG (natural smoke and heat exhaust ventilator(s) for ventilation without dual purpose for ventilation in accordance with EN12101-2.

Pay attention to possible hazards on tilting or rotating windows, whose secondary closing edges are located at less than 2,5 m installation height above the floor, under consideration of the Control Unit and usage!

#### WARNING

We as manufacturers are well aware of our duties and responsibilities regarding the development, manufacturing and placing of safe window drives on the market and consistently implement them. Ultimately, however, we have no direct influence on the usage of our drives. Therefore, as a precaution, we point out the following:

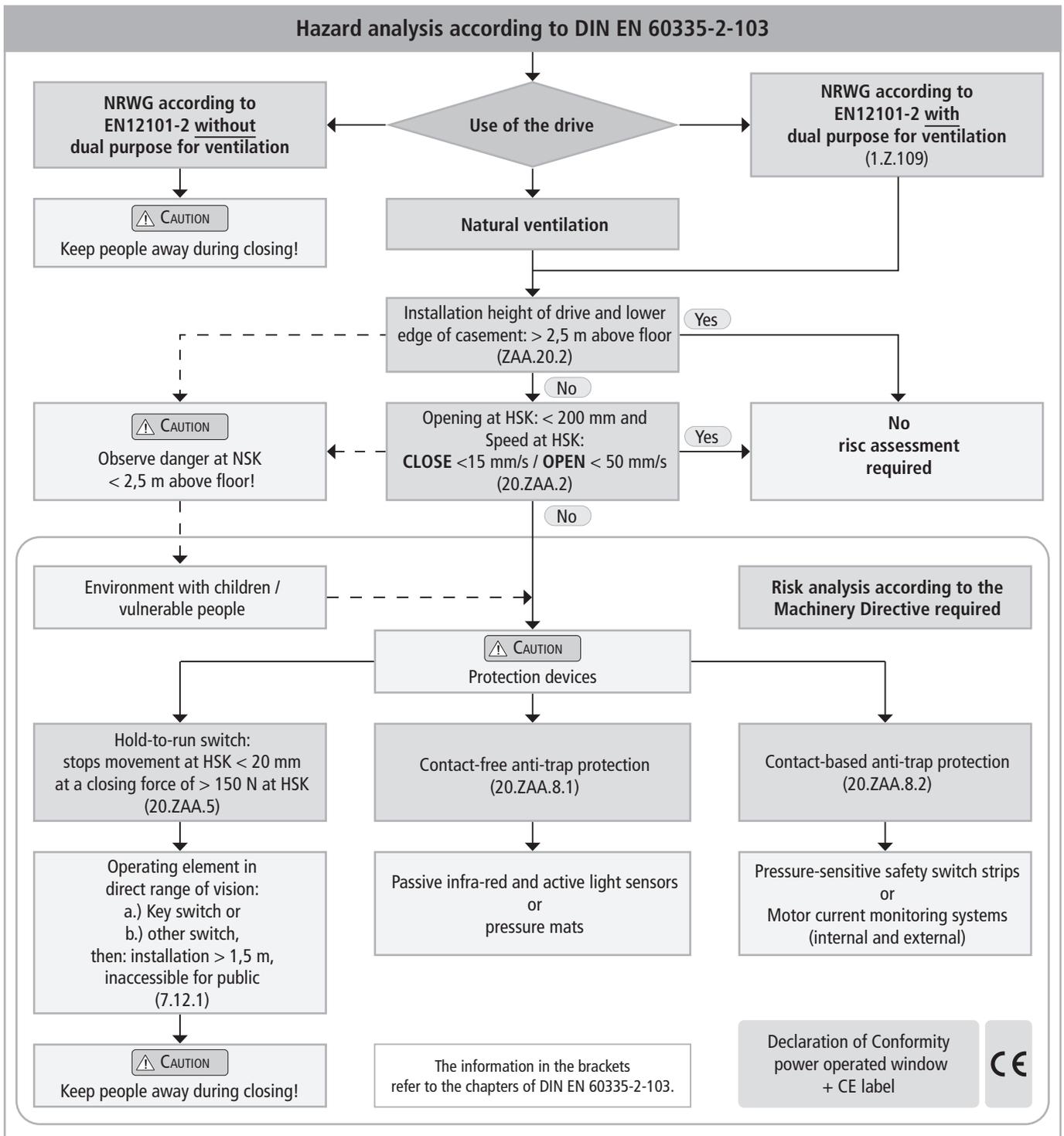
- The **constructor or his agent** (architect, specialist planner) **are obligated to evaluate the hazards to persons**, outgoing from the usage, installation position, opening parameters and from the external Control Unit of the power operated window, **already in the planning phase and to establish necessary protective measures.**
- The **constructor / manufacturer** of the machine "power-operated window" **must implement the planned protective measures** at the installation site or, if not yet established, **determine them** by its own responsibility and detect or **minimize possible remaining risks.**

### The need for a risk assessment at the installation site due to the reasonably foreseeable misuse.

**A risk assessment in accordance with the Machinery Directive 2006 / 42 / EG for the usage of the power-operated window for natural ventilation is absolutely necessary** under the following conditions:

- the installation height of the drive and lower edge of casement < 2,5 m above the floor **and** one of the following conditions:
- the opening width at the HSK > 200 mm, **or**
- the closing speed at the HSK is > 15 mm/s, **or**
- the opening speed at the HSK is > 50 mm/s, **or**
- the closing force at the HSK is > 150 N

The following flow chart can be applied, which also includes the protective measures in accordance with EN 60335-2-103/2016-05.



**Casement data**

Facade: bottom-hung window / top-hung window / side hung window  
 Roof: roof window / sky light  
 Opening direction: inward opening / outward opening  
 Profile material: aluminum, steel, plastic or wood.

The casement measurements supplied are only for orientation purposes. It is imperative that the **force-path diagram** of the drives are observed.

**NOTE**

When inspecting the drives for conformity with on-site requirements the following items must be observed:

- total weight of casement (glass + frame),
- additional loads: snow load / wind load (suction / pressure),
- casement size (FAB x FAH),
- side ratio FAB / FAH,
- installation / inclination angle,
- required opening area (geometric / aerodynamic),
- crosswind influences,
- driving force and stroke,
- mounting space at the window frame and casement frame.

## Safety instructions



It is important to follow these instructions for the safety of persons. These instructions shall be kept in a safe place for the entire service life of the products.

### Risk of crushing and entrapment! Window can close automatically!

The integrated load cut-off stops the drive during closing and opening when the drive is overloaded.

**The compressive force is absolutely sufficient to crush fingers in case of carelessness.**



### Area of application

The drive shall only be used according to its intended use. For additional applications consult the manufacturer or his authorized dealer.

Do not misuse the drive for other lifting operations!



Do not allow children to play with this drive or its electric controls, including the remote control!

Always check whether the system complies with current regulations. Special attention must be paid to the opening width, the opening area, the opening time and the opening speed of the window, the temperature range of the drives / external devices and cables as well as the cross section of the connecting cables as function of the cable length and power consumption.



All devices must be permanently protected from dirt and moisture, if the drive is not explicitly suitable for use in wet areas (see technical data).

### Installation

These instructions address expert and safety-conscious electricians and / or qualified personnel knowledgeable in electrical and mechanical drive installation.



The safe operation, avoidance of injury to persons and damage to property, as well as risks, is only guaranteed by proper installation and setting according to these installation instructions.

All specifications for installation must be checked independently and, if necessary, adjusted at the installation site. The connection assignment, the electrical supply data (see product label) and performance limits (see technical data) as well as the mounting and installation instructions of the drive must be strictly observed and adhered to!



Never connect 24 V DC drives to 230 V AC mains voltage!  
**Danger to life!**

Do not reach into the window rabbet or the operating element (chain or spindle) during installation and operation! Ensure that, based on the installation position and the opening movement of the casement, persons cannot be trapped between the driven part of the window and surrounding fixed components (e.g. wall).

### Mounting material

The required mounting material must fit with the drive and occurring load and, if necessary, supplemented.



Before installing the drive, check whether the casement is in good mechanical condition, the weight in balance and whether it opens and closes easily!

### Danger spots by crush and shear points

<p>Side-hung</p>	<p>Bottom-hung</p>	<p>Roof windows / skylight domes</p>	<p>Louvre windows</p>
<p> Danger spots: crush and shear points according to DIN EN 60335-2-103</p>			

### Crush and shear points

To avoid injuries, **crushing and shear points** between casement and frame must be secured **against entrapment up to an installation height of 2,5 meters above the floor** with appropriate measures. This can be achieved e.g. by using contact-based or contactless protective devices against entrapment, which stop the motion through contact or through interruption by a person. At a force higher than 150 N at the main closing edge the motion must stop within 20 mm. A warning symbol at the opening element must indicate this clearly.

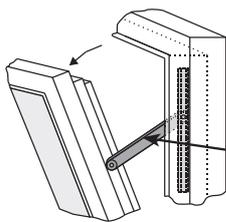
### Unintentional or independent opening or falling

Casements are to be hinged or secured such way that in case one of the mounting elements fails it will not crash / slam down or move in an uncontrolled manner by e.g. using double suspensions, safety scissors, casement stays. Tilting windows shall be equipped with safety scissors or similar devices to avoid damages and risks of injury for persons through improper installation and operation. The safety scissors must be adjusted to the opening stroke of the drive (see technical data) to avoid blocking. The opening width of the safety scissors must be bigger than the drive stroke.



**WARNING**

The movable casement must be secured against unintentional or independent opening as well as falling down.



safety scissors

### Routing cables and electrical connection

Routing or installing of electrical cables and connections may be performed only by specialist companies. Never operate drives, control units, operating elements and sensors at operating voltages and connections contrary to the specifications of the manufacturer. All relevant national instructions shall be observed for the installation.



All-pole disconnecting devices shall be installed in the permanent electrical installation or external Control Unit for the drive. The mains supply lines 230 V / 400 V AC shall be protected separately!



24V DC drives may only be connected to power supply sources that comply with SELV specifications.

**NOTE**

In the case of tandem / multiple operation of drives connected in series, the cross-section of the connection cable must be checked autonomously, depending on the total current consumption of the drive system.



**WARNING**

Damaged mains supply lines of drives with plug connectors may only be replaced by the manufacturer or qualified service / maintenance personnel! Power cables which are fixed to the drive casing cannot be replaced. If the cable is damaged the device must be scrapped!

The types of cable, cable lengths and cross-sections shall be selected in accordance with the manufacturer's technical data. If necessary, the cable types shall be coordinated with the competent local authorities and energy supply companies. Low-voltage lines (24 V DC) shall be routed separate from the high-voltage lines. Flexible cables may not be flush-mounted. Freely suspended cables shall be equipped with strain reliefs.



Cables must be laid such way that they cannot be sheared off, twisted or bent during operation. Drive cables laid inside window profiles must be protected by insulating tubes with a sufficient temperature resistance. Through holes shall be equipped with cable sleeves!

Clamping points shall be checked for tightness of threaded connections and cable ends. Access to junction boxes, clamping points and external drive control boxes shall be ensured for maintenance work.

**Commissioning, operation and maintenance**

After the installation and after each modification in the set up all functions shall be checked with a trial run. It shall be ensured that drive and casement are set correctly and that security systems, if available, are functioning properly.

**After the installation of the system is completed the end-user shall be instructed in all important operating steps.** If necessary, he must be advised of all remaining risks / dangers.

The end-user shall be specifically instructed that no additional forces, except pushing and pulling forces in the opening and closing direction of the casement, may be applied to the spindle, chain or lever of the drive.

**NOTE** Post warning signs!

During the proper assembly of drives with mounting elements at a window, and the connection to an external control unit, the interfaces resulting from mechanical and electrical performance characteristics of single elements shall be observed.

Other persons must be kept away from the casement when a hold-to-run switch (pushbutton) is operated or when a window, which has been opened by a smoke and heat exhaust system, is closing!

 **CAUTION**

The operating element of hold-to-run switches must be installed within direct view from the window, but apart from moving elements. If the switch is not a key-operated switch it must be installed at a minimum height of 1,5 m and inaccessible to the public!

 **CAUTION**

Do not allow children to play with permanently mounted control devices and keep remote controls out of reach for children!

 **CAUTION**



During cleaning, maintenance work and while exchanging parts the drive must be completely disconnected from the power supply and secured against unintentional reactivation.

 **WARNING**

Do not actuate the drive or the casement when repair or re-setting works are performed!

**Replacement parts, fasteners and controls**

The drive shall only be operated with control devices from the same manufacturer. There is no liability, warranty or customer service if third-party parts are used. Exclusively original spare parts of the manufacturer shall be used for mounting elements or expansions.

**Ambient conditions**

The product may not be subjected to impacts or falls, or to vibrations, moisture, aggressive vapors or other harmful environments, unless the manufacturer released it for one or more of these environmental conditions.

- **Operation:**  
 Ambient temperature: -5 °C ... +60°C  
 Relative humidity: < 90% less 20°C;  
 < 50% less 40°C;  
 no formation of condensation

**NOTE** Observe temperature range during installation!

We recommend the use of wind and rain sensors in order to avoid weather-related damages to drives, windows and buildings thru open window sashes.

**NOTE**

- **Transport / Storage:**  
 Storage temperature: -5°C ... +40°C  
 Relative humidity: < 60%

**Accident prevention regulations and workmen's compensation insurance guidelines**

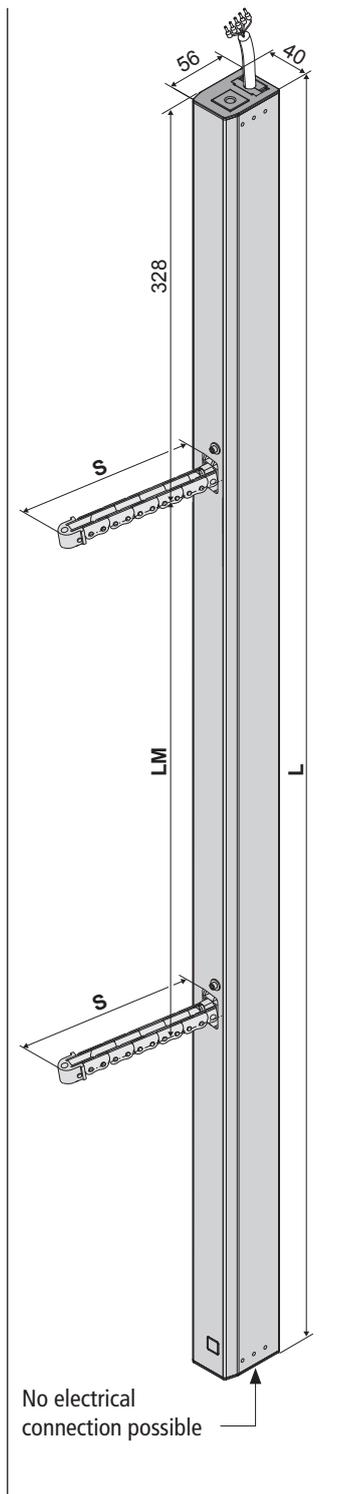
For work on or in a building or building part the provisions and instructions of the respective accident prevention regulations (local workmen's compensation insurance guidelines) shall be observed and adhered to.

**Declaration of Conformity and of Incorporation**

The drive is manufactured and inspected in accordance with European guidelines. The respective Declaration of Conformity and of Incorporation is on hand.

**In case that the use of the drive differs from the intended use, a risk evaluation for the power operated window shall be performed and a Declaration of Conformity according Machinery Directive 2006 / 42 / EG issued.**

## Data sheet KSA S12 24V and KSA S12 24V Z



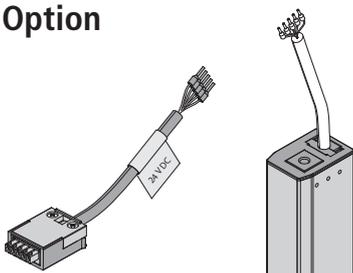
- Application: natural ventilation, SHEV
- Internal Intelligent Control Electronics S12
- Adjustable chain tension / Mechanical chain unlocking
- Version „Z“: Programmable feedback limit position „OPEN“ and „CLOSE“ (max. 24V, 500 mA)

**Options**

- Programmable special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

**Technical Data**

$U_N$	Rated voltage	24V DC (19 V ... 28 V)
$I_N$	Rated current	1,8 A
$I_A$	Cut-off current	2,4 A
$P_N$	Rated power	43 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
$F_Z$	Pulling force max.	1200 N
$F_A$	Pushing force max.	1200 N
$F_H$	Pullout force	5.000 N (fastening depended)
	Chain	Stainless steel
	Connecting cable	non-halogen, grey 5 x 0,5 mm <sup>2</sup> , ~ 3 m
$v$	Speed	$s < 400$ 8,0 mm/s  8,0 mm/s $s 500 - 600$ 12,0 mm/s  8,0 mm/s
$s$	Stroke	400 – 600 mm
$L$	Length	see order data
$LM$	Distance in between chains	see order data
	Sound pressure level A	≤ 70 dB (A)

**Option**

AUMÜLLER chain drives have an integrated cable routing with connection sockets on both housing ends. This enables the following options:

- **Wire Click** (for 24 V DC) with various cable lengths  
Part.-No.: **501251** - 3 m cable length / **501252** - 5 m cable length / **501253** - 10 m cable length
- Series connection of several drives into multi drive systems
- Power supply from both sides

Order Data						
s [mm]	L [mm]	LM [mm]	Version	Finish	PU / pcs.	Part.-No.
400	1150	485	KSA-TWIN 400 S12 24V	E6/C-0	1	522745
500	1353	587	KSA-TWIN 500 S12 24V	E6/C-0	1	522755
600	1353	587	KSA-TWIN 600 S12 24V	E6/C-0	1	522765

Order Data						
s [mm]	L [mm]	LM [mm]	Version	Finish	PU / pcs.	Part.-No.
400	1150	485	KSA-TWIN 400 S12 24V Z	E6/C-0	1	522747
500	1353	587	KSA-TWIN 500 S12 24V Z	E6/C-0	1	522757
600	1353	587	KSA-TWIN 600 S12 24V Z	E6/C-0	1	522767

Options		
Special model	PU / pcs.	Part.-No.
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	from 101	516004
<b>Microprocessor programming S12</b>		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories	PU / pcs.	Part.-No.
M-COM Click Configuration module for synchronised multi-drive systems	1	524177
<b>Wire Click</b> 24 V - cable length 3 m	1	501251
<b>Wire Click</b> 24 V - cable length 5 m	1	501252
<b>Wire Click</b> 24 V - cable length 10 m	1	501253

## Explanations on the Version „Z“ (for example KSA-Twin 400 S12 24V Z)

Drives with version „Z“ (e.g. KSA-Twin 400 S12 24V Z) have an additional volt free contact with connection for an external signal monitoring.  
The volt free contact (max. 24V, 500mA) is open when the drive is in **CLOSED** position.

## Explanations on the product label

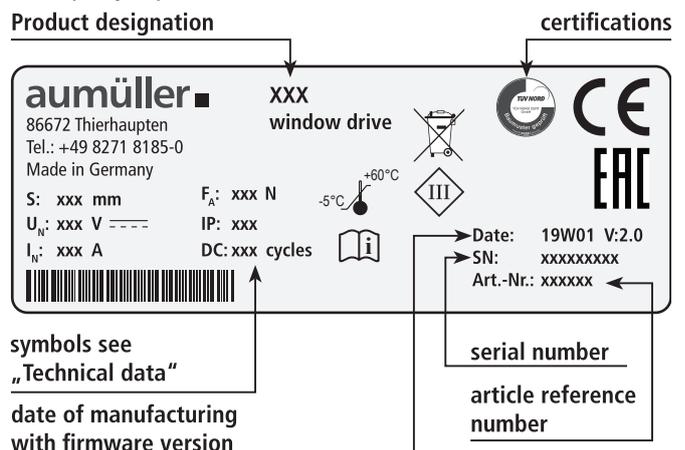
The product label informs about:

- manufacturer’s address
- article reference number and name
- technical characteristics
- date of manufacturing with firmware version
- certifications
- serial number

**NOTE** Never install and operate damaged products.

In the event of any complaints, please indicate the product serial number (SN) (see product label).

Exemplary representation



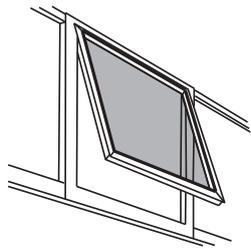
## Areas of application and casement sizes

### Areas of application and casement sizes:

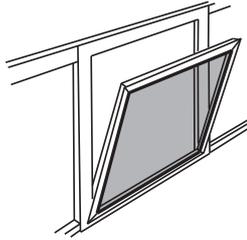
Mounting of drives up to a casement size of max. 4m<sup>2</sup> (depending on the system)

#### Top-hung casement and bottom-hung casement inward opening

FAB min. = L + 100 mm  
FAB max. = 2500 mm

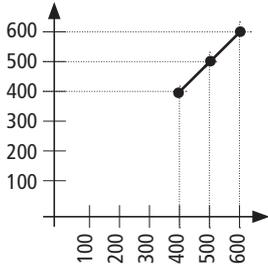


Top-hung casement



Bottom-hung casement

stroke



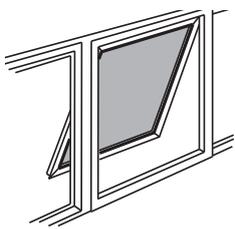
FAH max. = 2500 mm  
with frame bracket **K-B1**  
minimum space required on frame 52 mm

min. FAH

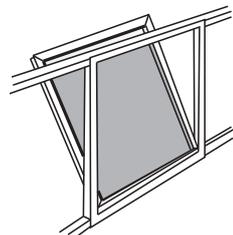
#### Top-hung casement and bottom-hung casement outward opening

FAB min. = L + 100 mm  
FAB max. = 2500 mm

FAH min. = 500 mm  
(for stroke 500)  
FAH max. = 2500 mm



Top-hung casement



Bottom-hung casement

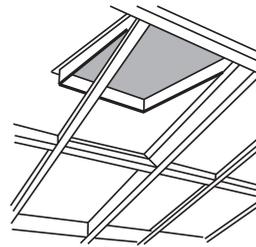
### Roof window

FAB min. = L + 100 mm  
FAB max. = 2500 mm

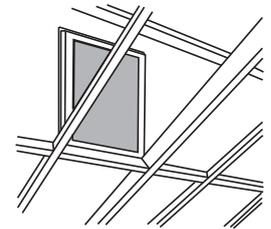
FAH min. = 450 mm  
FAH max. = 2500 mm

total weight casement including snow load

KSA-Twin 400 mm stroke ≤ max. 220 kg  
KSA-Twin 500 mm stroke ≤ max. 220 kg  
KSA-Twin 600 mm stroke ≤ max. 220 kg



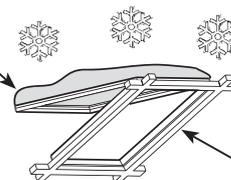
Top-hung casement



Bottom-hung casement

### Snow load on roof windows for SHEV-systems

Example:  
snow load = 60 kg  
(Casement area x  
Typical snow load)



Example: FG = 40 kg

#### Example calculation

Establish snow loading based on national standards /directives  
(in Germany according to DIN 1055-5)  
total weight = FG + snow load  
total weight = (40 kg + 60 kg) = 100 kg

## INSTALLATION STEP 1: Inspection before the installation



**WARNING**

Important instructions for a safe installation. Observe all instructions, wrong installation may result in serious injury!

### Storage of drives at the construction site

Protective measures against damages, dust, moisture or contamination shall be taken. Store drives intermediately only in dry and well ventilated rooms.

### Inspection of drives before installation

Check drives and window before installation for good mechanical condition and completeness. The chains / spindles of the drives must be extendable or retractable easily. The casement must run smoothly and the weight must be in balance.

**NOTE**

We recommend the use of our test kit for the inspection of drives with the rated voltage 24V= / 230V~ (see table below). Damaged products may not be operated under any circumstance.

#### Test kit for drives

<b>Order number:</b>	533984
<b>Application:</b>	Test kit to test the running behavior and to support the commissioning of 24 V DC or 230 V AC window drives
<b>Supply voltage:</b>	230V AC
<b>Drive voltage:</b>	24V DC / 230V AC
<b>Drive current:</b>	max. 5 A
<b>Fine fuse:</b>	5.0 A slow-blow
<b>Power Consumption:</b>	1 W / 12 W (Battery level is maintained / charged)
<b>Ambient temperature:</b>	-15 °C ... + 40 °C
<b>Degree of protection:</b>	IP20 / IP65 (case open/closed)
<b>Electrical protection:</b>	Protection class 1, ES1 according to EN IEC 62368-1
<b>Housing:</b>	plastic (PP)
<b>Dimensions (WxHxD):</b>	400 x 300 x 168 mm
<b>Weight:</b>	approx. 5,3 kg
<b>Controls:</b>	3x switches / 2x push buttons
<b>Display:</b>	TFT-Display, farbig
<b>Scope of delivery:</b>	1x test kit / 1x mains plug 4x safety banana plugs 1x operating manual (German, English)



The test procedure of drives may only be performed on a non-slip and secured mat or a test fixture. During the test run the test element must not be interfered with. The test may only be conducted by or under the supervision of expert personnel.

For testing chain drives the chain must be extended and retracted at an angle of approx. 90°. The spindle tubes of spindle drives in round housing tubes must be secured against independent spinning before starting the test to avoid deviations in the integrated position encoder.

### Inspection of the intended use

The planned use of the drive must be checked for compliance with its intended use. If used otherwise the liability and warranty claim expires.

### Predictable misuse

It is imperative that foreseeable misuse of drives is avoided! Here are a few examples:

- do not connect 24 V DC drives to a 230 V AC mains voltage,
- observe synchronous run and sequence control by drives with multiple interconnection (if existing),
- use drives only indoors,
- avoid additional force influences, e.g. transverse forces.

### Testing mechanical requirements

Prior to the start of the installation check whether :

- the support surface and the profile static for the load transmission is sufficient,
- a support construction for the secure fastening of the drives is required,
- cold bridges (thermal separation) are avoidable at action points,
- there is sufficient space for the swivel movement of the drive.

If not, counter measures must be taken!



The support surface of the frame brackets or casement brackets must rest completely on the window or frame profile. There must be no tilting of the fastening elements during extension and retraction of the drives. A safe and solid fastening must be ensured at the window profile.

It is imperative that the sufficiently mechanical stiffness of the fastener type as well as of the swivel range of the drive is observed.



**CAUTION**

If this is not guaranteed another type of fastening or another type of drive must be selected.

## INSTALLATION STEP 2: Installation prerequisite and Installation preparation

The following conditions must be fulfilled for the installation of the drives so they can be properly assembled with other parts and constructed to a complete machine at the window without impairing the safety and health of persons:

1. The design of the drive must fulfill the requirements.
2. The fastening accessories (casement brackets or frame brackets) must fit the window profile; the profile-dependent hole lay-out must be complied with.
3. The space required for the installation of the drive on the frame and casement profile must be sufficient.
4. The window must be in perfect mechanical condition before the installation. It should open and close easily.
5. The fastening material for the installation of the drive must fit the window material (see table).

Wood windows	Wood screws: i.e. DIN 96, DIN 7996, DIN 571  round head with slot, round head with cross, hex head, special type
steel, stainless steel, aluminum windows	Self-tapping screws, thread screws, sheet-metal screws i.e. ISO 4762, ISO 4017, ISO 7049, ISO 7085, DIN 7500  cylinder head with hex socket, internal serration (Torx), Phillips head or external hex head  blind rivet nut
plastic windows	Screws for plastic i.e. DIN 95606, DIN 95607, ISO 7049, ISO 7085, DIN 7500  round head with cross, external hex head, Torx

Recommendation: if possible, screw through two cavity webs

### Tools required

- Marker,
- Grains,
- Hammer,
- Screwdriver (slotted-head, cross or Torx) size by site conditions,
- Hexagonal wrench size 3 / 4 / 5 / 6,
- Torque wrench,
- Power drill,
- Threadlock adhesive,
- possibly a tool for blind rivet nuts (size 6).

### Check window data on site

- Measure FAB and FAH.
- Check / calculate weight of casement.  
If unknown, it can be determined approximately with the following formula:

$$G \text{ (Casement weight) [kg]} = \frac{\text{FAB [m]} \cdot \text{FAH [m]} \cdot \text{Glass thickness [mm]} \cdot 2,5 \cdot 1,1}{\text{glass-density} \cdot \text{frame share}}$$

- Check / calculate the required drive force and compare with drive data. If unknown, it can be determined approximately with the following formula:

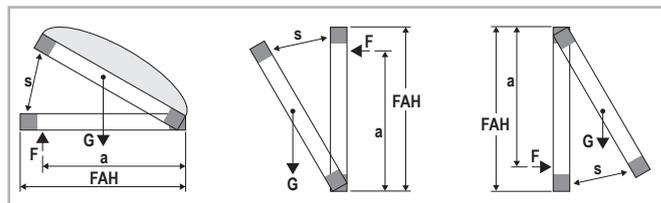
$$F \text{ [N]} = \frac{5,4 \cdot G \text{ [kg]} \cdot s \text{ [m]}}{a \text{ [m]}}$$

Facade

$$F \text{ [N]} = \frac{5,4 \cdot G \text{ [kg]} \cdot \text{FAH [m]}}{a \text{ [m]}}$$

Roof

- a = Distance of action point to hinges
- F = Drive force
- s = Stroke



### Scope of delivery:

Prior to assembly, check items quantity in the delivery for completeness.

Accessories for chain drive	
	Assembly and Commissioning Instructions
	<b>1</b> Countersunk screws M8 (2x)
	<b>2</b> Brass washers (2x)
	<b>3</b> Cover caps (4x)
	<b>4</b> Chain unlocking key (2x)
	<b>5</b> Wire Click (1x)
	<b>6</b> Warning sign sticker „Risk of entrapment“ (1x)

## INSTALLATION STEP 3: Adjusting the initial chain tension and smooth running

### Adjust the initial chain tension on site (bottom-hung casements only)

The smooth running of the drive can be optimised under low load by screwing in the studs (clockwise).

At the factory setting the studs protrude with 3.5 mm out of the housing. In this position the chain is fully tensioned.

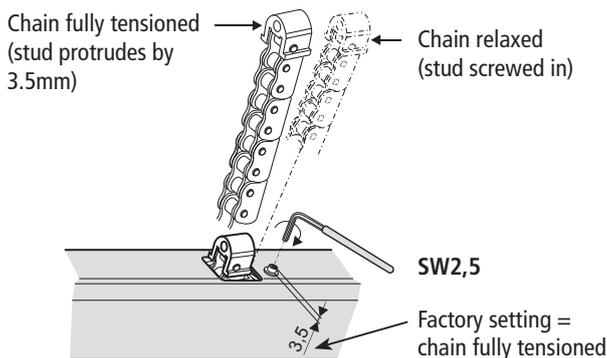


Bottom-hung casements only! Do not change the factory setting for other types of casements!

- The initial chain tension (pre-tension) is reduced by screwing in the stud (max. 5 mm = 7 complete screw rotations).

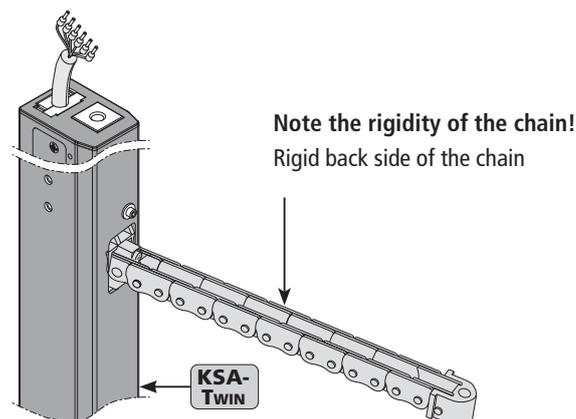


Optimise the smooth running carefully and check the chain tension. Otherwise, the chain can buckle (backlash) during operation in the thrust (push) direction.



Always note the force-path diagram (see chapter „Data sheet KSA-Twin S12 24V“) and rigidity of the chain, depending on the installed position!

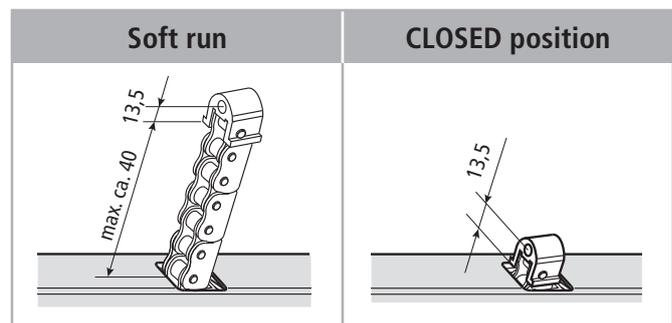
In inclined and vertical uses, ensure that the chain becomes rigid automatically. This is secured if the drive is installed with the motor side (cable outlet) at the top (e.g. for side-hung windows with drive installed at the main closing edge).



### Soft run setting after manual unlocking of the chain

The drive has an electronic position detection. Just before the CLOSED position the chain retracts with reduced speed in the **soft run mode**, to protect the window and the drive.

- If the chain is unlocked manually and is completely pulled out by hand, on starting up ensure that the chain moves with reduced speed in soft run mode from approx. 40 mm before the CLOSED position.
- If necessary repeat this step several times.



### Manual unlocking of chain

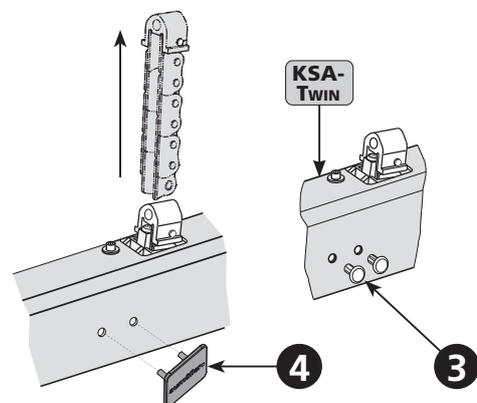
If soft run mode is **not** achieved on retracting the chain:

- Use the Chain unlocking key ④ to unlock both chains and completely pull them out manually.
- Re-close the drive completely electrically and note the soft run mode of app. 40 mm before the CLOSED position.
- Insert cover caps ③.

If the soft run mode begins too early, it is adjusted automatically by the drive's electronics the next time the window is closed.



The manual chain unlocking function may only be used for **installation** purposes!



If the chain does not retract in soft run mode, the drive's transmission can be damaged, resulting in drive failure!

**INSTALLATION STEP 4: Determine the casement brackets**

Casement bracket F16	Casement bracket F16-1	Casement bracket F29-2	
<p>use with K-A1, K-B1, K-B2, K-C3, K-E1, K-E2, K84-1, K87</p>	<p>an Dachflächenfenster Schüco AWS 57RO</p>	<p>use on roof windows Heroal 085 / 180 with F16</p>	
Casement bracket F33	Casement bracket F38	Casement bracket F39	
<p>use with K-A1, K-B1, K-B2, K-C3, K-E1, K-E2, K84-1, K87</p>	<p>use with K-A1, K-B1</p>	<p>use with K-C3, K-E1, K-E2, K84-1</p>	
Casement bracket F44		Casement bracket F49	
<ol style="list-style-type: none"> <li>1 Casement bracket F44</li> <li>2 1x baseplate</li> <li>3 1x countersunk screw M4x10</li> <li>4 1x cylinder head screw M6x35</li> </ol>			<ol style="list-style-type: none"> <li>1 Casement bracket F49</li> <li>2 1x cylinder head screw M6x30</li> </ol>
<p>use with K-C3</p>		<p>use with K-A1, K-B1, K-B2, K-C3, K-E1, K-E2, K84-1, K87, K125</p>	

**INSTALLATION STEP 5: Determine the frame brackets**

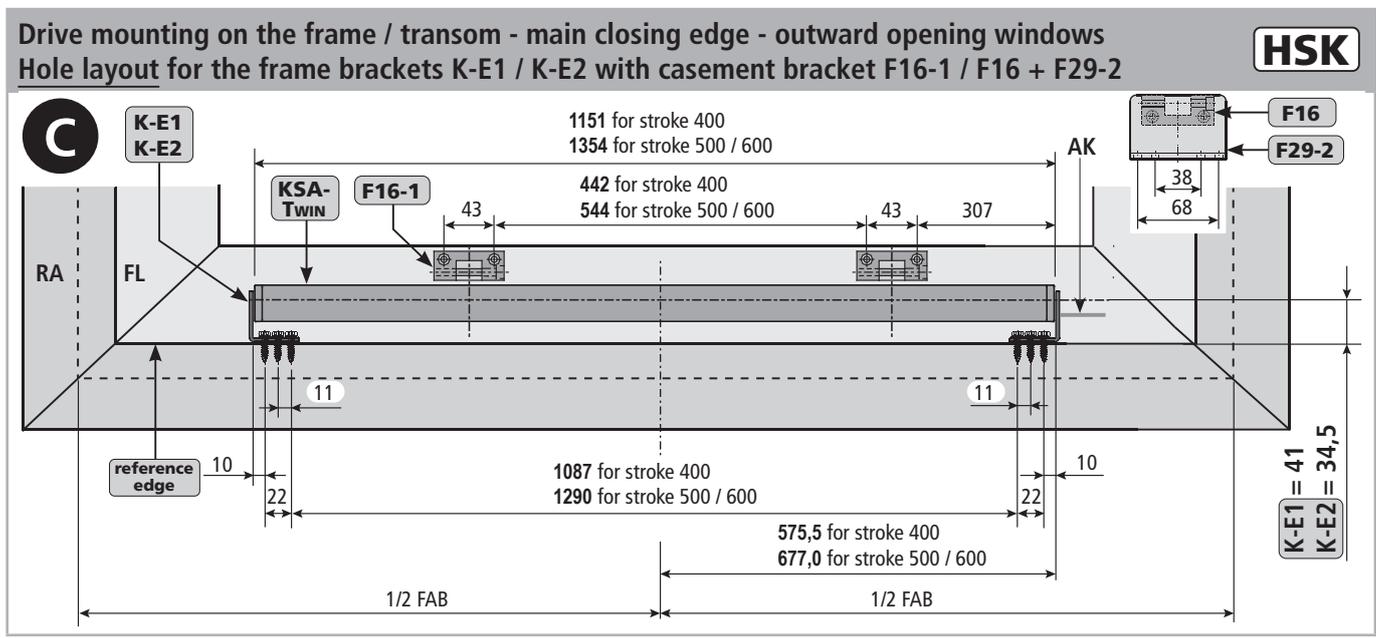
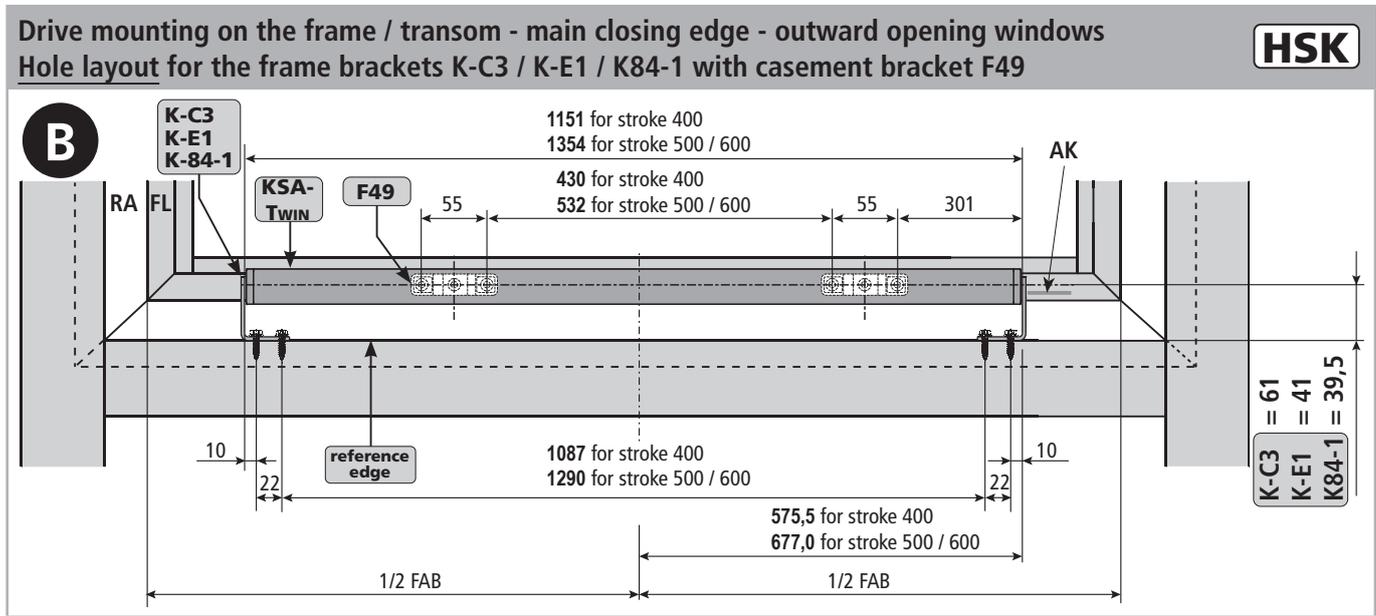
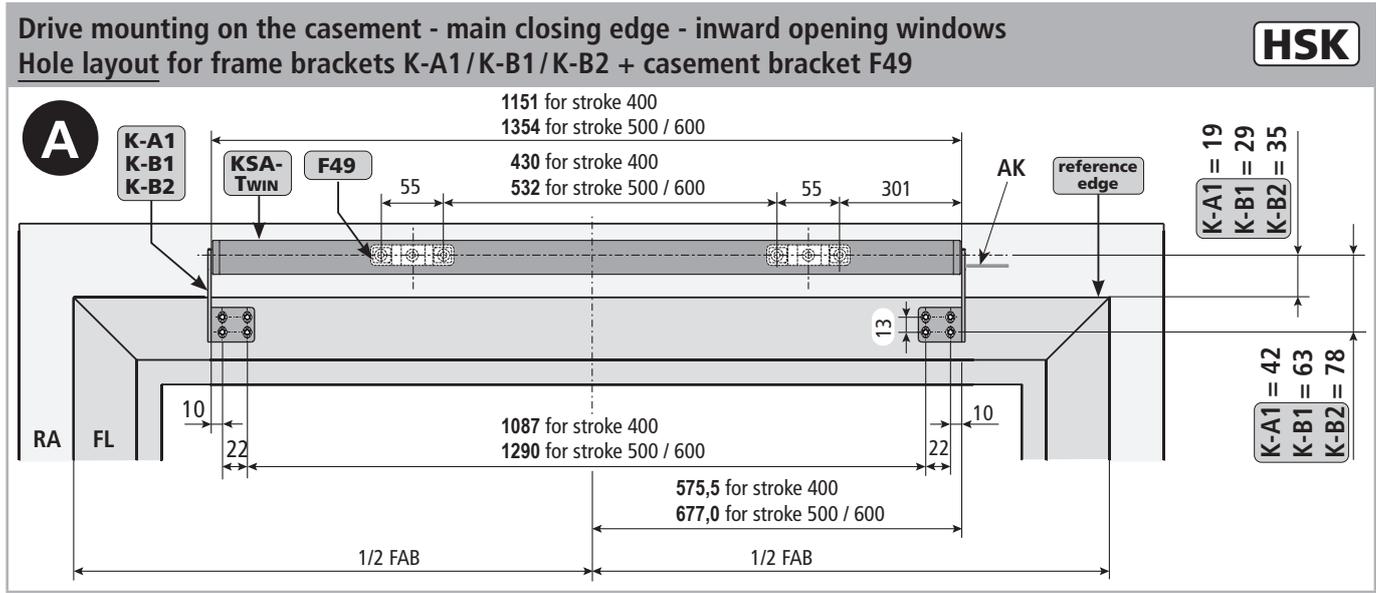
Frame brackets		
<p><b>Frame bracket K-A1</b></p>	<p><b>Frame bracket K-B1</b></p>	<p><b>Frame bracket K-B2</b></p>
<p>use with F16, F33, F38, F49 Space required on window frame 35 mm</p>	<p>use with F16, F33, F38, F49 pace required on window frame 35 - 52 mm</p>	<p>use with F16, F33, F49 pace required on window frame 35 - 52 mm</p>
<p><b>Frame bracket K-C3</b></p>	<p><b>Frame bracket K-D3</b></p>	<p><b>Frame bracket K-E1</b></p>
<p>use with F16, F33, F39, F44, F49</p>	<p>pace required on window frame 50 mm</p>	<p>use with F16, F33, F39, F49</p>
<p><b>Frame bracket K-E2</b></p>	<p><b>Frame bracket K84-1</b></p>	
<p>use with F16, F16-1, F33, F39, F49</p>	<p>use with F16, F33, F39, F49</p>	
<p><b>Frame bracket K87</b></p>	<p><b>Frame bracket K125</b></p>	
<p>use on Schüco AWS 102 (friction hinged windows) Space required on window frame 35 mm</p>	<p>use with F14 und B1 (mounting angle) on the kerb (upstand) of dome rooflights</p>	

05

Application examples

Application examples for different types of windows		
<p><b>Top-hung outward opening Frame mounting</b></p> <p><b>A</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Top-hung outward opening Transom mounting</b></p> <p><b>B</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Bottom-hung outward opening Transom mounting</b></p> <p><b>B</b></p> <p>Detail of mounting on aluminium window</p>
<p><b>Roof Frame mounting</b></p> <p><b>C</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Roof Frame mounting</b></p> <p><b>D</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Roof Frame mounting</b></p> <p><b>B</b></p> <p>Detail of mounting on wooden window</p>
<p><b>Roof Frame mounting</b></p> <p><b>C</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Friction hinged outward opening Frame mounting</b></p> <p><b>D</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Bottom-hung inward opening Casement mounting</b></p> <p><b>A</b></p> <p>Detail of mounting on aluminium window</p>
<p><b>Top-hung outward opening Frame mounting</b></p> <p><b>A</b></p> <p>Detail of mounting on aluminium window</p>	<p><b>Bottom-hung inward opening Frame mounting</b></p> <p><b>E</b></p> <p>Detail of mounting on aluminium window</p>	

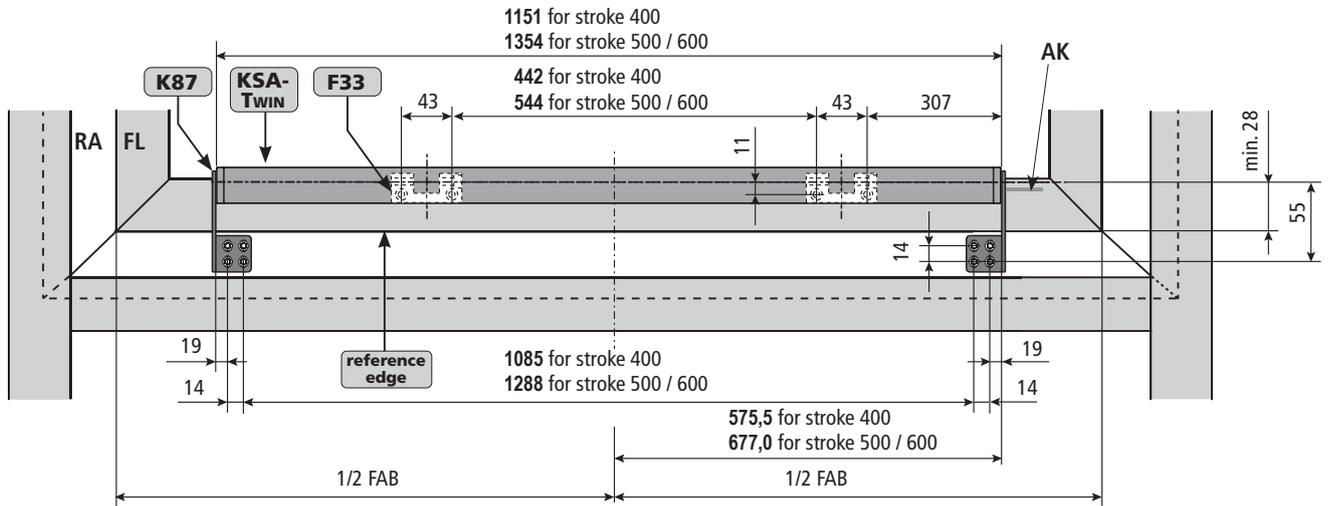
## INSTALLATION STEP 6: Hole layout for frame bracket and casement bracket



Drive mounting on the frame - main closing edge - outward opening windows  
Hole layout for frame brackets K-87 with casement bracket F16 / F33

HSK

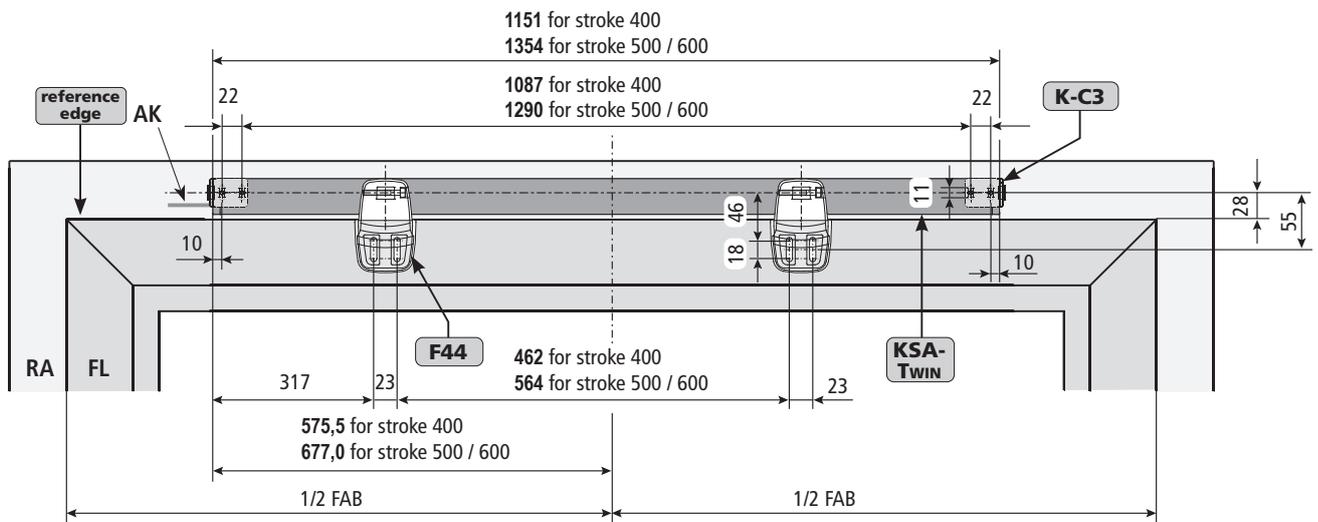
D



Drive mounting on the frame - main closing edge - inward opening windows  
Hole layout for frame brackets K-D3 (K-C3 with casement bracket F44)

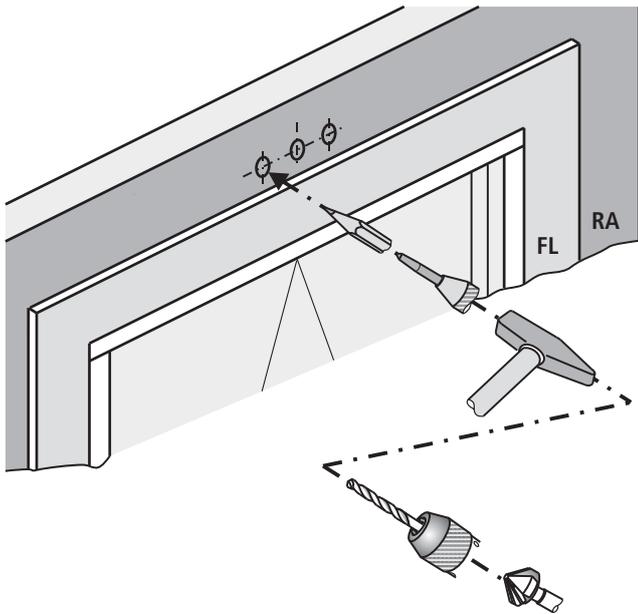
HSK

E



## INSTALLATION STEP 7: Assembly casement bracket

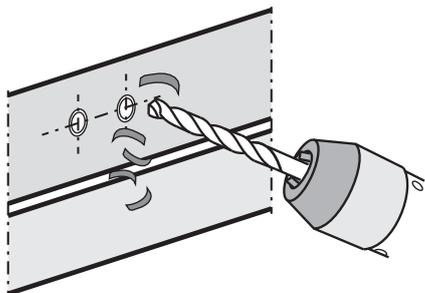
- Determine fastenings.
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (INSTALLATION STEP 4 - 6) or project-specific documents and drawings).



Do not drill into the drive.  
Chips can accumulate in the drive!



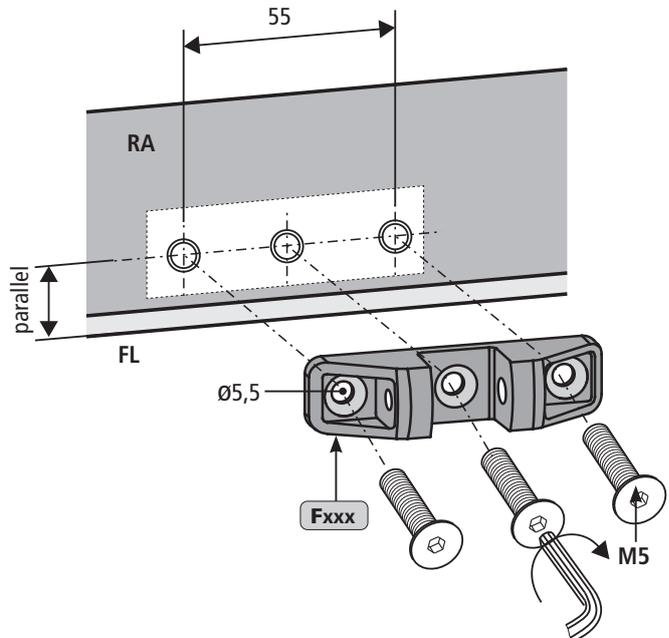
Carefully clear away drilling swarfs to prevent seals from being damaged.  
Avoid surface scratches, for example by using masking tape.



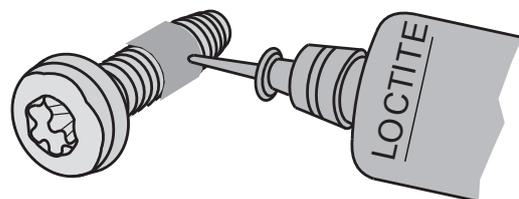
- Fit casement bracket Fxxx (M5).



Make sure it is parallel to casement edge.  
„Casement bracket“ center and „chain output“ must be in line.



- Secure fasteners against loosening; i. e. by applying removable thread-locking compound such as "Loctite".



## INSTALLATION STEP 8A: Swiveling drive mounting on the casement - main closing edge or auxillary closing edge

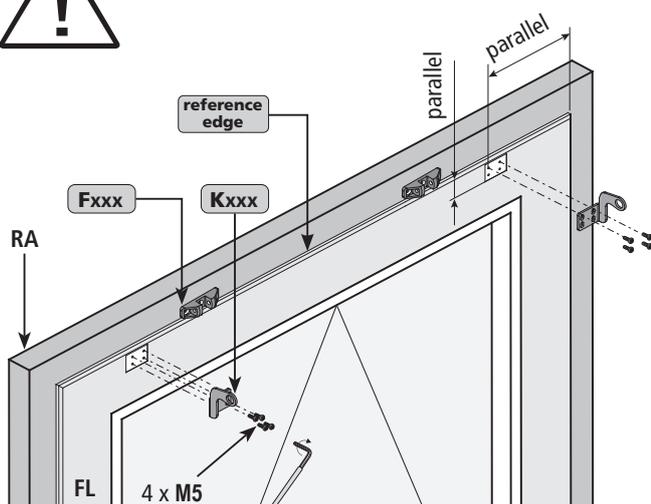
HSK

NSK

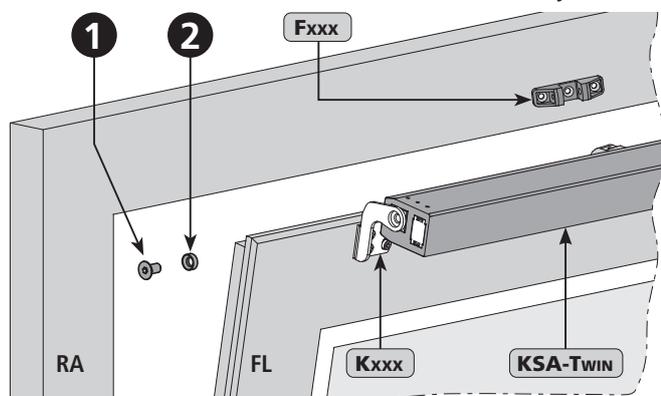
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (INSTALLATION-STEP 4 - 6) or project-specific documents and drawings.
- Fit frame brackets **Kxxx** (M5).



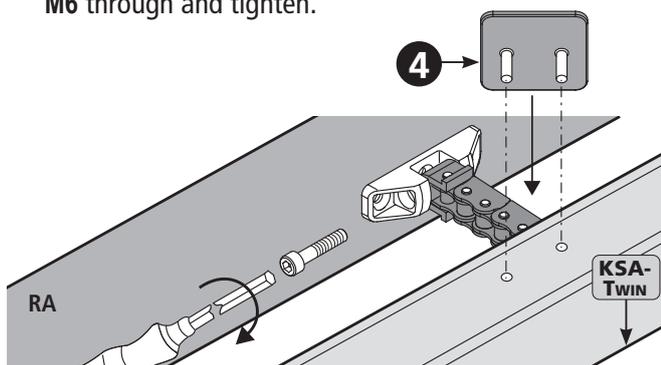
Make sure they are parallel to casement edge.



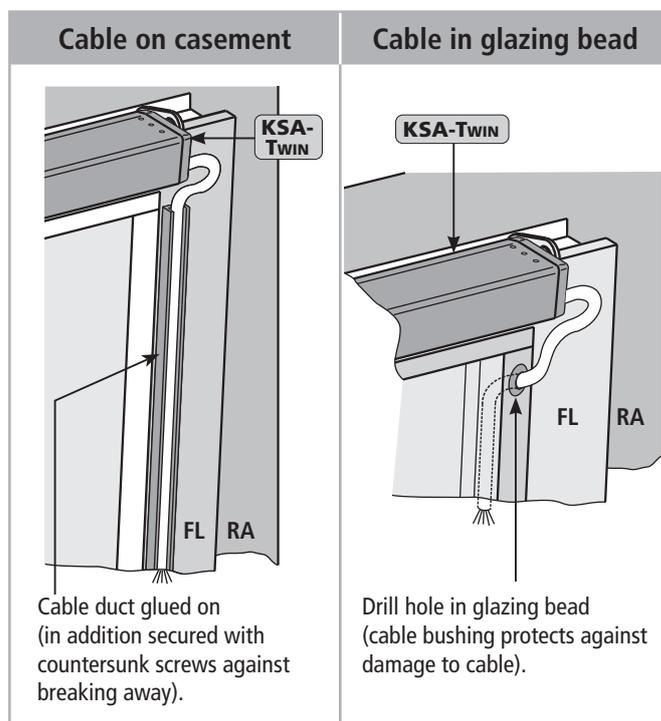
- Attach drive to the frame brackets.
- Insert brass washers **2** and firmly tighten with countersunk screws M8 **1**. Drive should freely swivel.



- Insert the Chain unlocking key **4** in the hole.
- Pull both chains out manually by the same distance (Installationstep 3: „ADJUSTING THE INITIAL CHAIN TENSION AND SMOOTH RUNNING“).
- Connect chain with casement bracket. Pass shaft screw M6 through and tighten.



- Route cable on or in the casement.

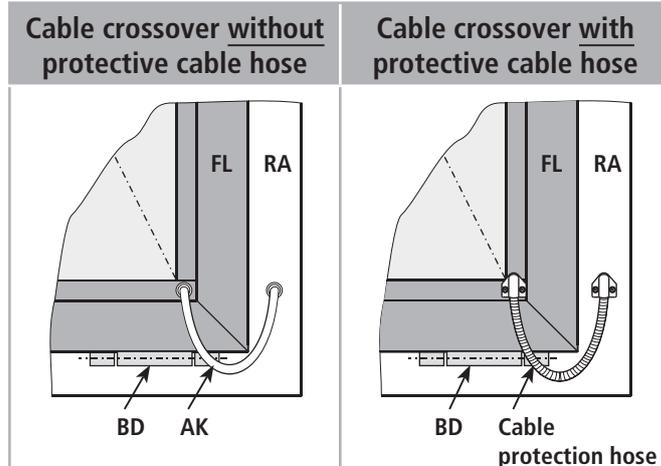


### Connection cable routing on the casement:

- The drive and its connection cable are swivelling. As a consequence, foresee cable routing with a loop.
- Cable must be protected against damage (shearing-off, kinking, splitting), i.e. by using bushings.



Upon removal of the glazing bead is the danger that the glass may fall.



### Connection cable routing on the hinge side:

- Make sure that during opening or closing procedure the cable will not be damaged by shearing-off, kinking, crushing.
- Protect cable feedthrough in profile e.g. by using cable bushings, cable transitions.

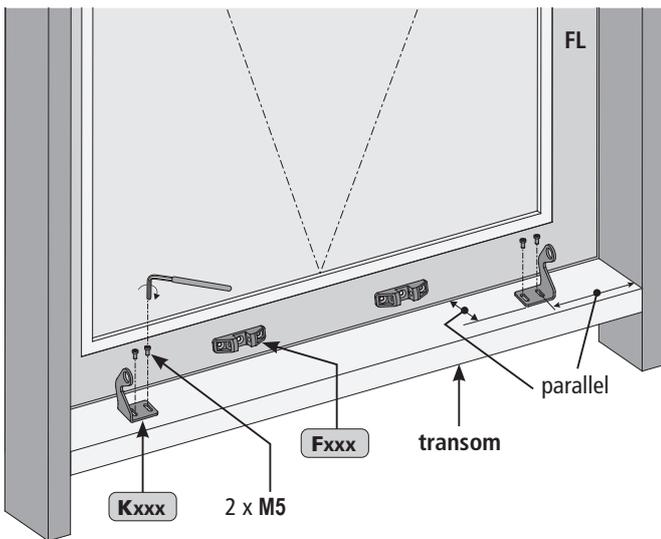
**MONTAGE-SCHRITT 8B:** Swiveling drive mounting on the window frame or transom - main closing edge - outward opening windows

**HSK**

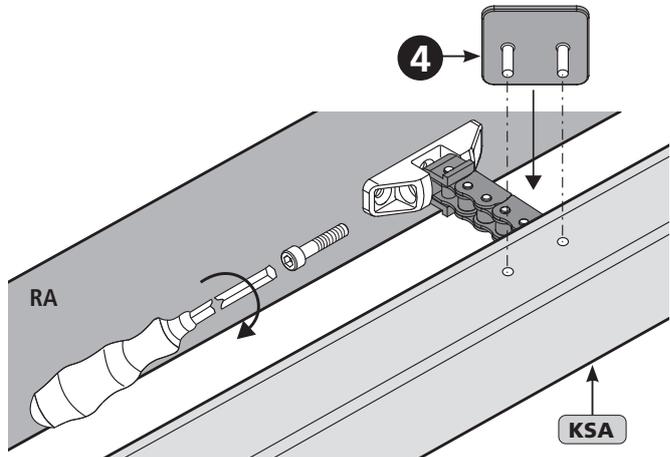
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (INSTALLATION-STEP 4 - 6) or project-specific documents and drawings).
- Fit frame brackets **Kxxx** (M5).



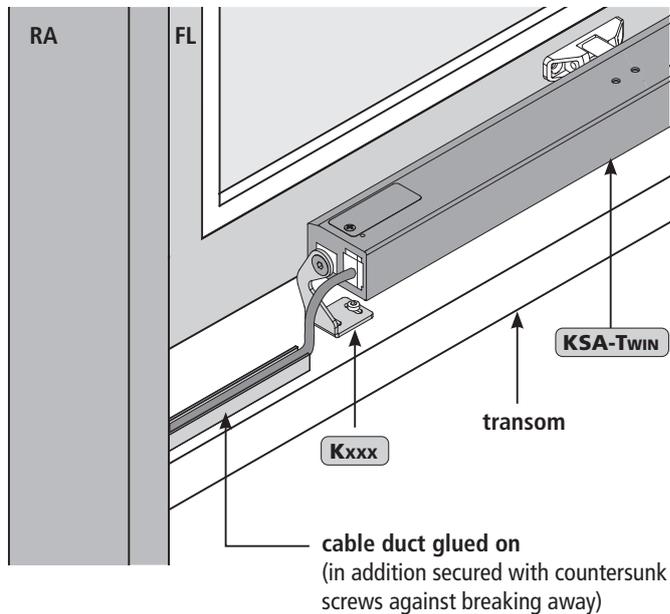
Make sure they are parallel to casement edge.



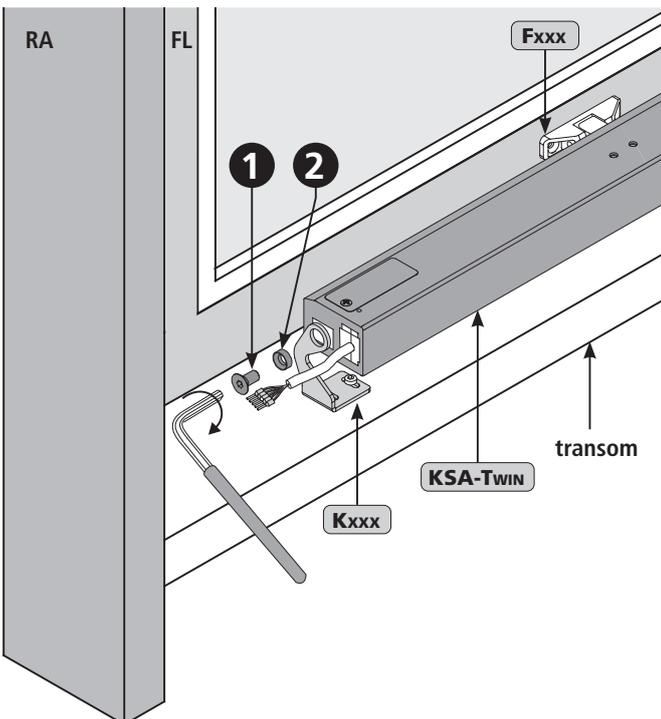
- Insert the Chain unlocking key ④ in the hole.
- Pull both chains out manually by the same distance (see „INSTALLATION-STEP 3“).
- Connect chain with casement bracket. Pass shaft screw M6 through and tighten.



- Route cable on the frame or mullion/transom. The drive and its connection cable are swivelling. As a consequence, foresee cable routing with a loop. Cable must be protected against damage (shearing-off, kinking, splitting).



- Attach drive to the frame brackets.
- Insert brass washers ② and firmly tighten with countersunk screws M8 ①. The drive should freely swivel between the frame brackets **Kxxx**.



Note softlauf modus!  
(see INSTALLATION STEP 3: SOFT RUN MODE)



Check swiveling area (INSTALLATION STEP 12: AFETY CHECK AND PERFORMING TEST RUN).

Ensure that drive and connection cable can swivel freely.

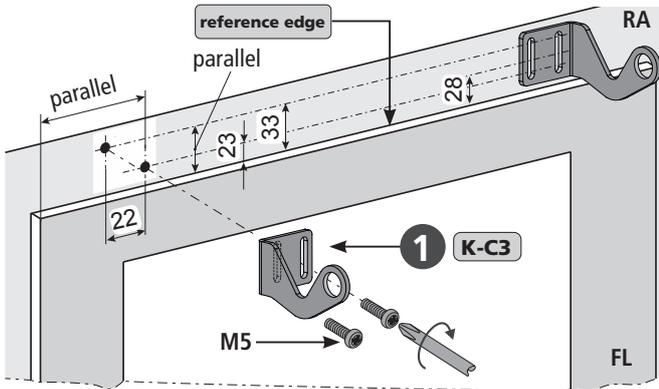
**INSTALLATION STEP 8C:** - main closing edge or auxillary closing edge  
- inward opening windows

**HSK**  
**NSK**

■ Fasten frame bracket **K-C3** ① with screws (M5).



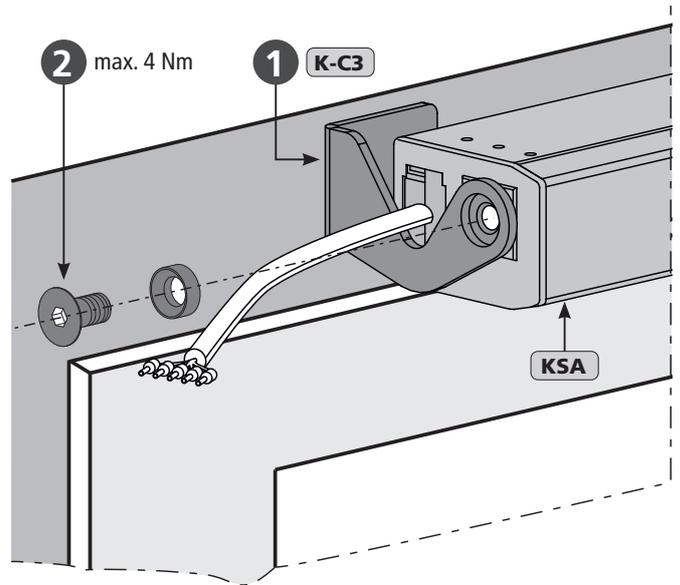
Make sure they are parallel to casement edge.



■ Attach drive to the frame brackets **K-C3** ①.  
■ Secure the drive with screws ②.



Drive should freely swivel - between frame brackets **K-C3** ①.

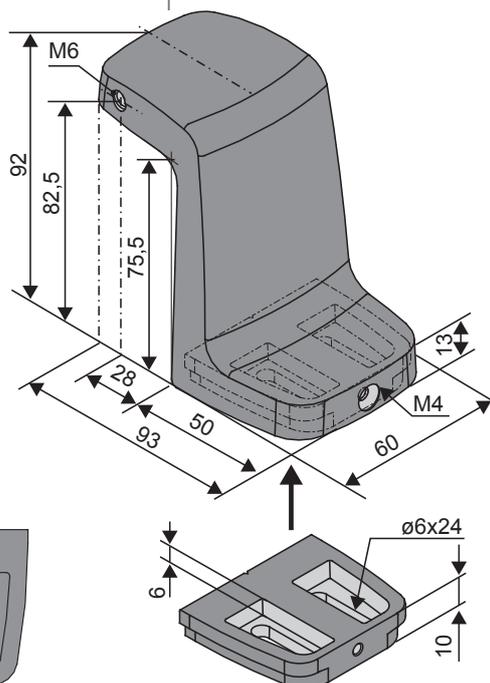
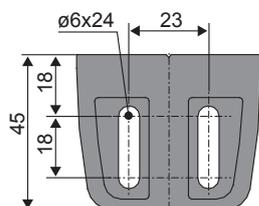
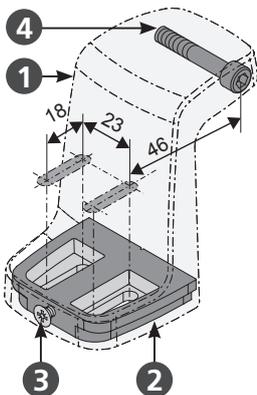


**NOTE**

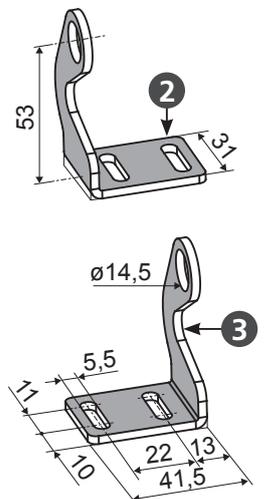
If required, use washers corresponding to the used screws.

**Casement bracket K-D3**

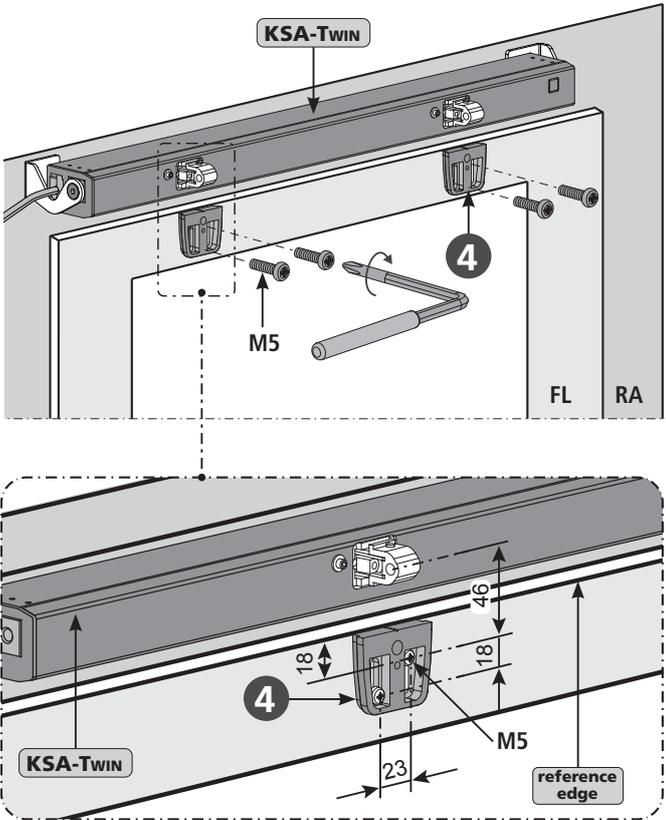
- ① Casement bracket F44
- ② 1x baseplate
- ③ 1x countersunk screw M4x10
- ④ 1x cylinder head screw M6x35



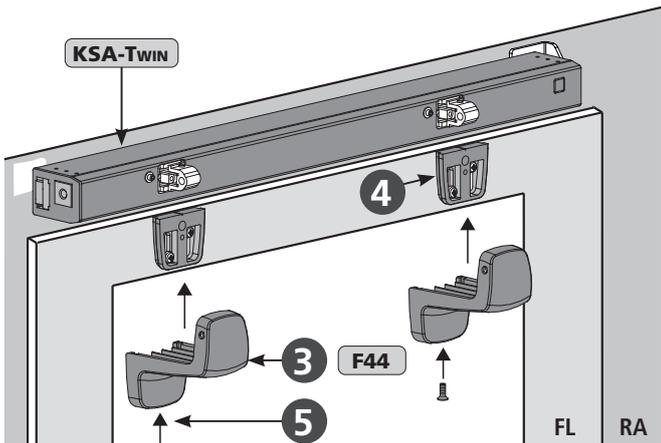
- ① Casement bracket K-C3
- ② 1x part left
- ③ 1x part right



- Screw the baseplate 4 from casement bracket F44 3 onto casement (M5). If necessary, use washers.



- Slide casement bracket F44 3 on the baseplate 4 and secure with screw 5.

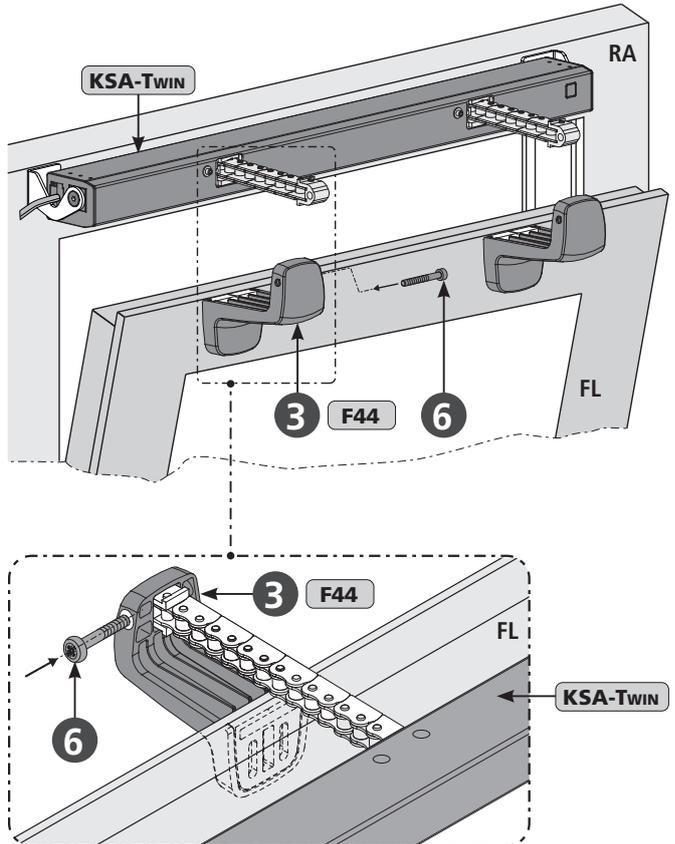


- Connect control voltage (e.g. using a tester) and move out the chain approx. 100 mm.

NOTE

For multi-drive operation actuate all drives together.

- Secure chain in the casement bracket F44 3 with screw 6.



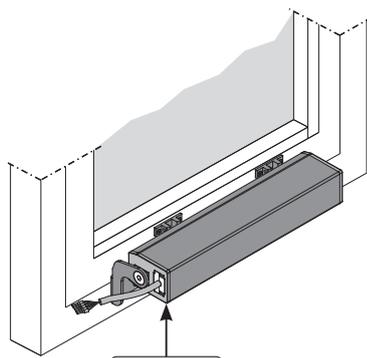
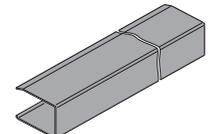
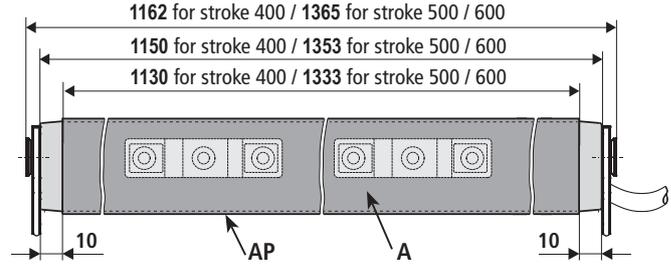
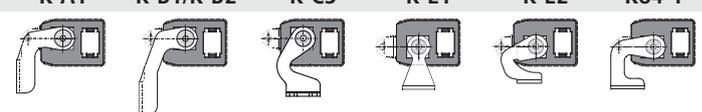
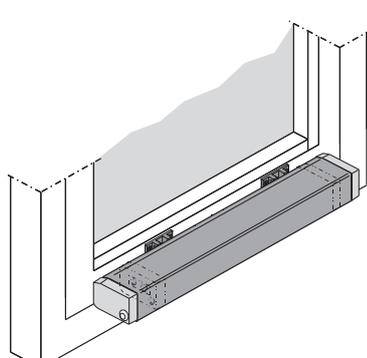
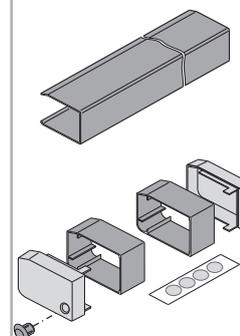
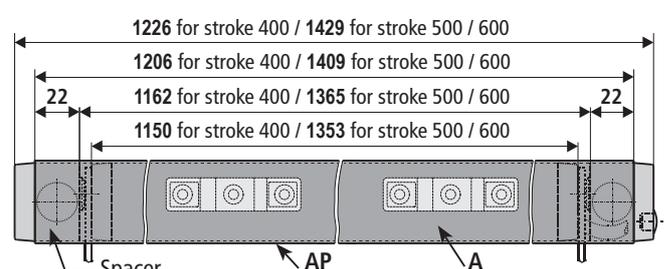
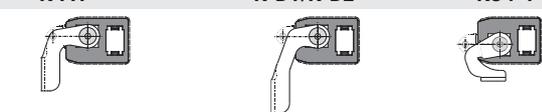
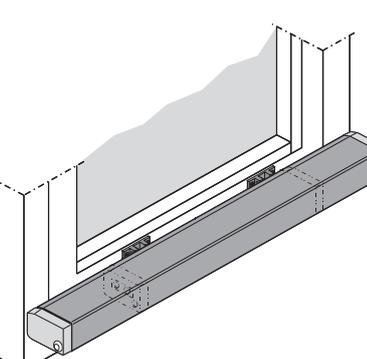
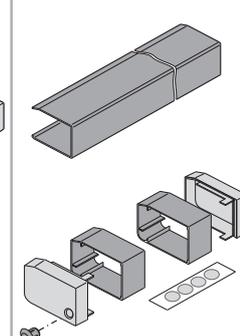
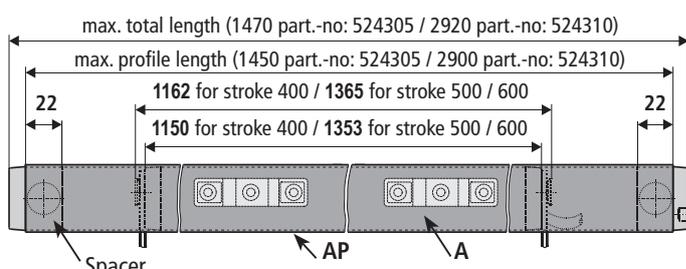
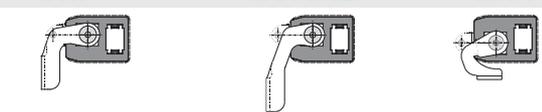
Note softlauf modus!  
(see INSTALLATION STEP 3: SOFT RUN MODE)

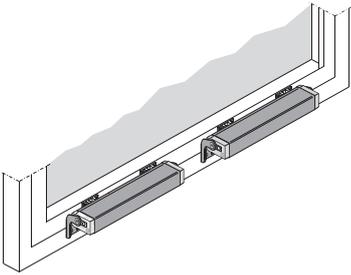
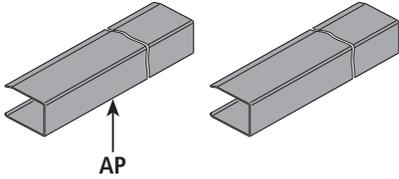
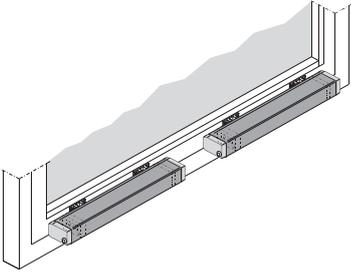
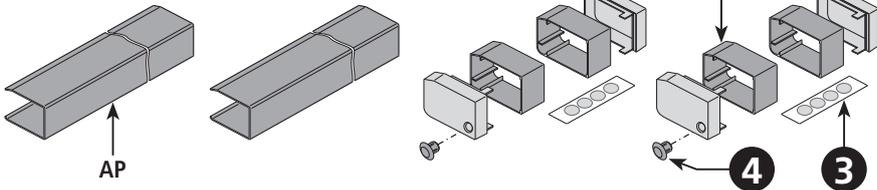
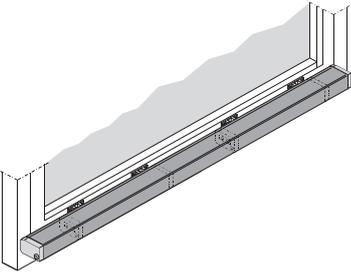
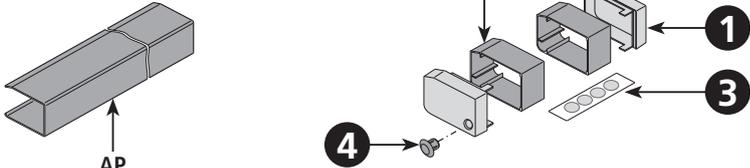
 Check swiveling area (INSTALLATION STEP 12: AFETY CHECK AND PERFORMING TEST RUN).  
Ensure that drive and connection cable can swivel freely.

## INSTALLATION STEP 9: Concealing the drive

The housing of the chain drive is covered using the cover profile kit (e.g. in case of change in colour). In case of complete concealment (versions 2 and 3) the brackets are also partly covered and are hardly visible. Equally, it is possible to install the facing across the whole width of the window.

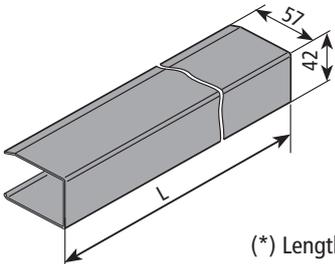
- Uniform appearance.
- Individual choice of colour (cover profile available in RAL colours).
- Adjustment to the frame dimensions, through the possibility of shortening the cover profile.
- Protection from dirt.

Concealment options for single use		
<b>Version 1</b>	Concealment of the drive (e.g. due to colour change)	Completely visible brackets
 <p><b>KSA-TWIN</b></p>	<p><b>cover profile only</b></p> 	 <p>1162 for stroke 400 / 1365 for stroke 500 / 600 1150 for stroke 400 / 1353 for stroke 500 / 600 1130 for stroke 400 / 1333 for stroke 500 / 600</p> <p>10 AP A 10</p> <p>Can be used with:</p> <p><b>K-A1 K-B1/K-B2 K-C3 K-E1 K-E2 K84-1</b></p> 
<b>Version 2</b>	Complete concealment of the drive	Partially visible brackets
	<p><b>Cover profile and installation kit</b></p> 	 <p>1226 for stroke 400 / 1429 for stroke 500 / 600 1206 for stroke 400 / 1409 for stroke 500 / 600 1162 for stroke 400 / 1365 for stroke 500 / 600 1150 for stroke 400 / 1353 for stroke 500 / 600</p> <p>22 Spacer AP A 22</p> <p>Can be used with:</p> <p><b>K-A1 K-B1/K-B2 K84-1</b></p> 
<b>Version 3</b>	Variable concealment (e.g. over the whole width of the window)	Partially visible brackets
	<p><b>Cover profile and installation kit</b></p> 	 <p>max. total length (1470 part-no: 524305 / 2920 part-no: 524310) max. profile length (1450 part-no: 524305 / 2900 part-no: 524310)</p> <p>1162 for stroke 400 / 1365 for stroke 500 / 600 1150 for stroke 400 / 1353 for stroke 500 / 600</p> <p>22 Spacer AP A 22</p> <p>Can be used with:</p> <p><b>K-A1 K-B1/K-B2 K84-1</b></p> 

Concealment options for multiple use		
<b>Version 1</b>	Concealment of the drive (e.g. due to colour change)	Completely visible brackets
	2x cover profile 	
<b>Version 2</b>	Complete concealment of the drive	Partially visible brackets
	2x cover profile und 2x installation kit 	
<b>Version 3</b>	Variable concealment (e.g. over the whole width of the window)	Partially visible brackets
	1x cover profile und 1x installation kit 	

**Cover-profile**

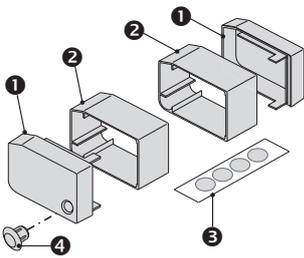
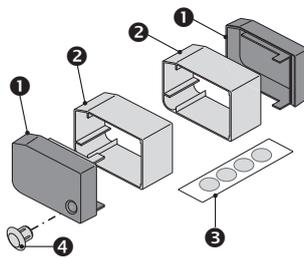
<b>Part.-No.:</b>	524305 L = 1,45 m (*) 524310 L = 2,90 m (*) 524302 L = customized
<b>Application:</b>	Cover profile for surface mounted drives KSA / KSA-Twin with frame bracket sets K-A1, K-B1, K-B2, K-C3, K-E1, K-E2, K84-1; Profile length adjustable to the length of the drives or of the casement.
<b>Material:</b>	aluminium + plastic (grey)
<b>Feature / Equipment:</b>	incl. mounting aid for cover profile shortening on the job site + mounting set.



(\*) Length without cover caps

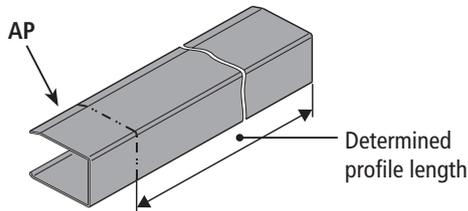
**Installation Kit for cover profile (grey end caps)**

<b>Part.-No.:</b>	524300 Color grey 524303 Color black
<b>Material:</b>	aluminium, plastic (grey)
<b>Feature / Equipment:</b>	<ul style="list-style-type: none"> <li>1 2x end cap</li> <li>2 2x spacer</li> <li>3 4x stickers</li> <li>4 1x dummy plug</li> </ul>

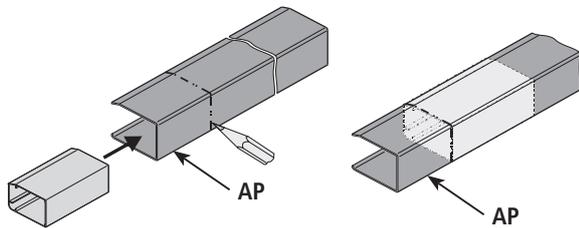
Installation Kit Color: grey	Installation Kit Color: black
	

## Installing the cover profile

- Select the drive facing variant required.
- Determine the profile length. Please refer to the above tables in this chapter: „Concealing the drive“ or the project-specific planning documents for length dimensions.



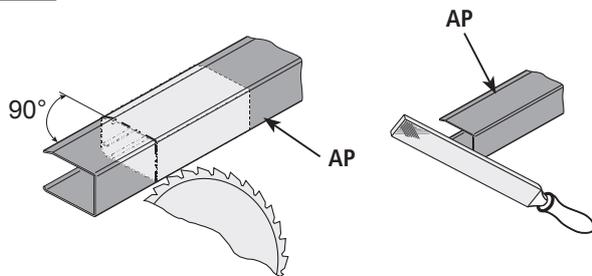
- Mark the required length.
- Push the mounting aid (piece of drive housing profile) into the cover profile AP.



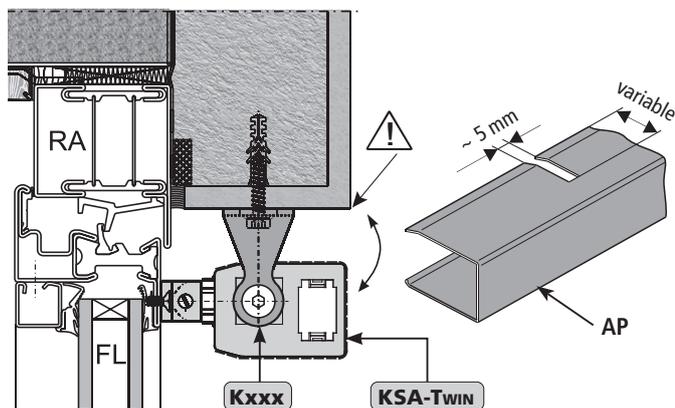
- Use a saw to shorten the cover profile AP to the required length.
- Deburr saw cut edge.



Ensure that you saw the profile perpendicular.

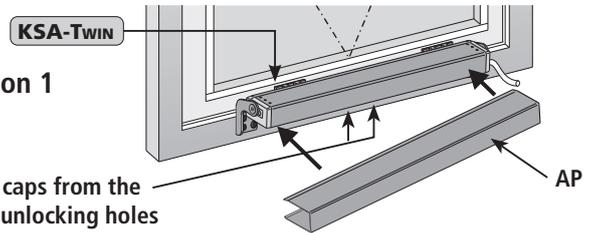


- Check the swivel area of the drive and if necessary cut out the cover profile AP in the area of the brackets.



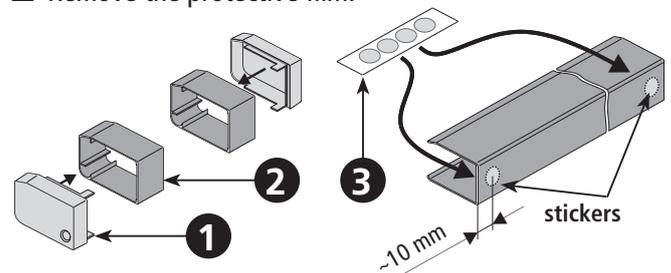
- If necessary, paint the cover profile AP with the required colour.

- Push on the cover profile AP so that it fits tightly. If necessary, remove the cover caps from the chain unlocking holes.

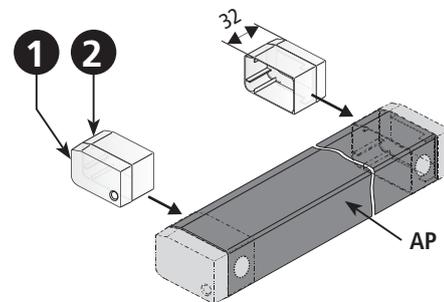


### Version 1

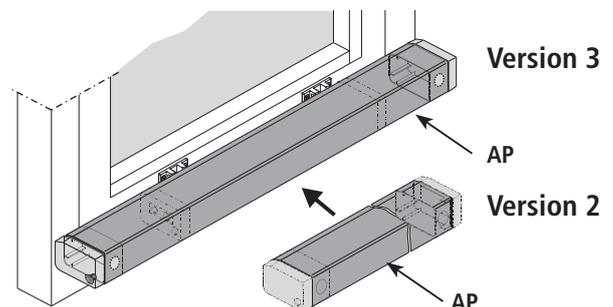
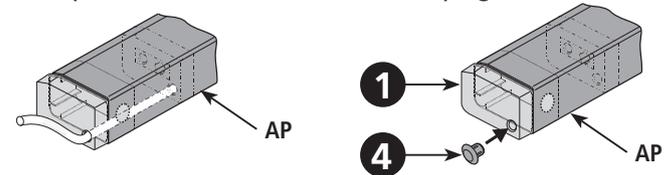
- Push end caps 1 onto the spacers 2 so that they are flush.
- Glue stickers 3 on both sides in the cover profile.
- Remove the protective film.



- Push the spacers 2 together with the end caps into the profile from the front.
- Align so that they are flush.
- Press on all parts firmly in the area of the stickers 3.



- If necessary, feed the cable through the hole in the end cap or close off the hole with blind plugs 4.



## INSTALLATION STEP 10: Electric Connection



Make sure when establishing the connection that there is no voltage at the terminals!  
Unused wires must be safely insulated!

**Connection assignment** 24V

		↑	↓
BN	+	-	
BU	-	+	

WH is used for communication, with synchronized multi-drive operation

Version Z:  
contact max. 24 V, 500 mA (min. 10mA)

The running direction of the 24V-drive may be changed by interchanging (polarity reversal) the wires „BN – (brown)“ - „BU – (blue)“.

Wire colour coding		Direction of travel
Colour	DIN IEC 757	OPEN ↑
black	BK	
white	WH	CLOSE ↓
brown	BN	
blue	BU	
green / yellow	GN / YE	
green	GN	
violet	VT	
grey	GY	
		<b>polarity reversal</b>

**Multi-drive operation with master and slave** 24V

⚠ Drives do not work, if the cable WH is not connected

junction box site-supplied

24 V DC control from control unit

Only with factory programming or customer programming with UniPC USB interface.

**WH** is used for communication, with synchronized multi-drive operation.

Optional: 1 or 2 drives and max. 2 locking drives are possible.

**Multi-drive operation with M-COM** 24V

⚠ Drives do not work, if the cable WH is not connected

junction box site-supplied

24 V DC control from control unit

**WH** is used for communication, with synchronized multi-drive operation

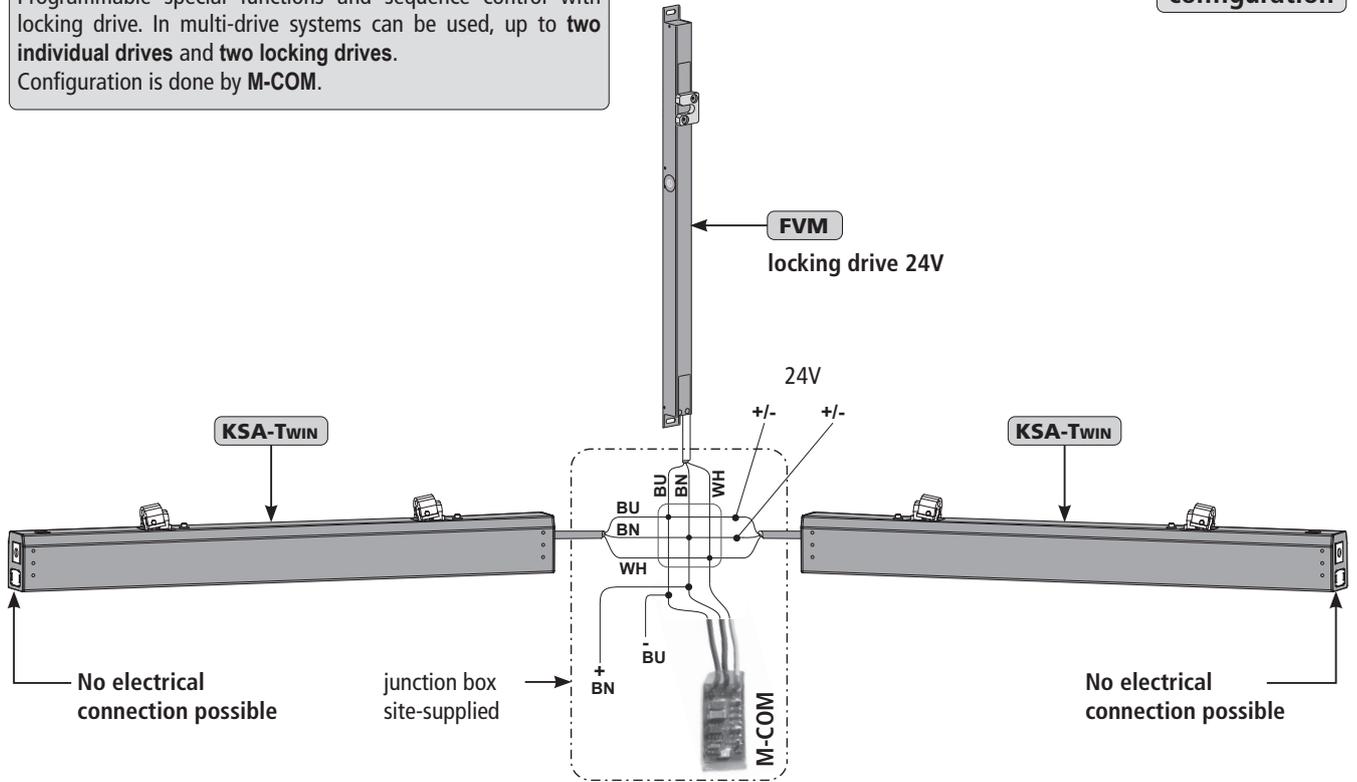
Optional: 1 or 2 drives and max. 2 locking drives are possible.

# Electrical Connection Configured with M-COM

## Multi-drive operation with M-COM and locking drive - star wiring

Options:  
 Programmable special functions and sequence control with locking drive. In multi-drive systems can be used, up to **two individual drives** and **two locking drives**.  
 Configuration is done by **M-COM**.

**Individual configuration**



BN	=	brown
BU	=	blue
WH	=	white

<b>M-COM (Main control unit)</b>		<b>24V</b>
<b>Order number:</b>	<b>524177</b>	
<b>Application:</b>	Configuration module for the automatic configuration and monitoring of max. 4 opening and 2 locking drives type S12 / S3 in multi-drive systems.	
<b>Rated voltage:</b>	24V DC (19 V ... 28 V)	
<b>Current consumption:</b>	<12 mA	
<b>Drive type:</b>	S12	
<b>Protection class:</b>	IP30 rubber jacket	
<b>Ambient temperature:</b>	0 °C ... + 70 °C	
<b>Dimensions:</b>	45 x 17 x 6 mm	
<b>Connecting wires:</b>	3 wires 0,5 mm <sup>2</sup> x 50 mm	
<b>Feature / Equipment:</b>	printed circuit board with connecting wires for integration in site-supplied junction box.	

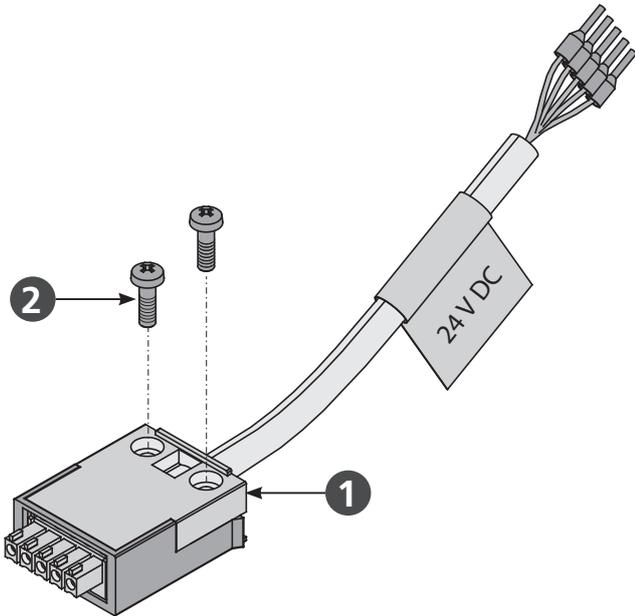
<b>Wire Click</b>		<b>24V</b>
<b>Order number:</b>	501251 - 3 m cable length - 24 V DC 501252 - 5 m cable length - 24 V DC 501253 - 10 m cable length - 24 V DC	
<b>Application:</b>	Unitary plug-solution for AUMÜLLER Click Systems.	
<b>Rated voltage:</b>	24V DC (19 V ... 28 V)	
<b>Connecting cable:</b>	non-halogen, grey 5 x 0,5 mm <sup>2</sup>	
<b>Terminal:</b>	to 1,5 mm <sup>2</sup>	
<b>Feature / Equipment:</b>	<ul style="list-style-type: none"> <li>• Flexible cable length</li> <li>• Connect multiple drives in series connection</li> <li>• Torsion-plug</li> <li>• Locking hooks prevent withdrawal of the plug under tensile load</li> <li>• Strain relief according DIN EN 60335-1 by screwing the housing halves</li> </ul>	

<b>UniPC with configuration interface</b>		<b>24V</b>
<b>Order number:</b>	<b>524178</b>	
<b>Application:</b>	Hard- and software for configuration of drives supplied by AUMÜLLER GmbH.	
<b>Rated voltage:</b>	24V DC +/-20%	
<b>Parameterizable drives:</b>	24V DC type S3, S12 230V AC type S12	
<b>Scope of delivery:</b>	software UniPC (Downloadlink*), Interface "ParInt", USB cable, connection cable * <a href="https://www.aumueller-gmbh.de/downloads">https://www.aumueller-gmbh.de/downloads</a>	
<b>Features / Equipment:</b>	Power supply 24V DC is not included in the scope of delivery! Any extended settings require a software licence.	
Any reconfiguration of a drive is entirely at the user's own risk and responsibility.		

## Wire Click - site-supplied customised construction

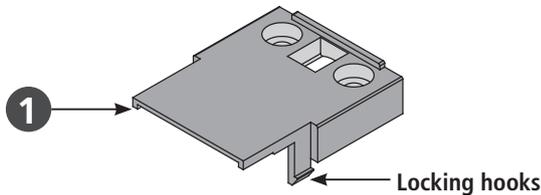
**Wire Click** enabling the use of site-supplied cable. It simplifies assembly and the electrical connection of the drives.

- Loosen the screws ② and remove the housing cover ①.

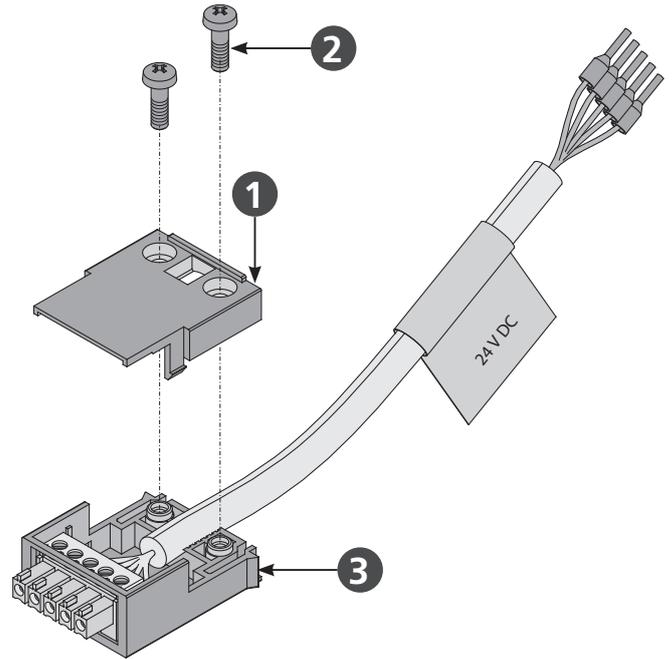
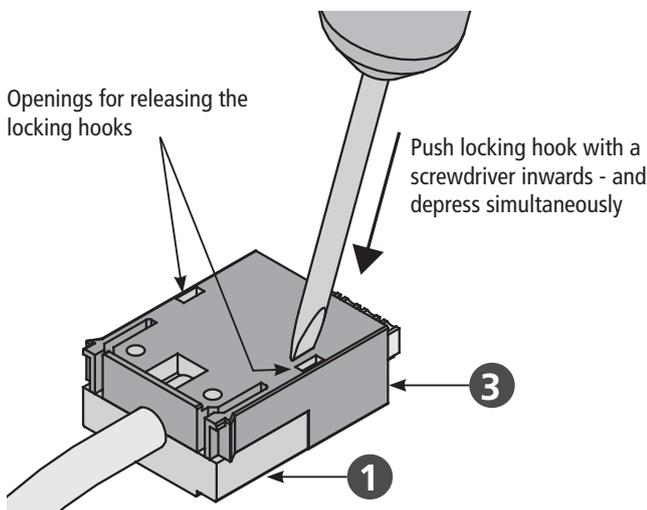


**NOTE**

Locking hooks - at the housing cover ① - prevent withdrawal of the plug under tensile load.



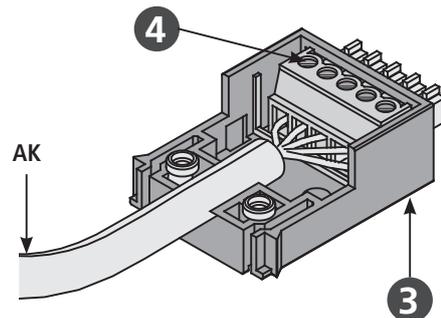
- On the underside of the plug housing ③ are two openings for releasing the locking hooks. Push locking hook with a screwdriver inwards - and depress simultaneously.



- Replace cable set - provided by the customer in place of connecting cable.
- Moung the housing cover ① with the both screws ②.

**NOTE**

Terminals ④ to 1,5 mm<sup>2</sup>.  
The performances (especially the fire behavior) of locally provided cables, must be checked on own responsibility on compliance with the application-specific local regulations!



**Connection assignment**

Function	Colour	DIN IEC 757	
OPEN / CLOSE	blue	BU	
OPEN / CLOSE	brown	BN	
Data	white	WH	
Rel: NO	violet	VT	
Rel: NO	green	GN	

## INSTALLATION STEP 11: Supply lines of Control Unit to the Drives

Observe current regulations and guidelines regarding the "Fire behavior of building materials-circuit integrity maintenance of electric cable systems" (E30, E60, E90) and the prescribed constructional regulations!

**RECOMMENDATION**

For safety reasons a cable of the next higher wire cross section should be selected.

**Formula to calculate**

the required wire cross-section of a supply line

**24V**

$$A \text{ mm}^2 = \frac{I_A \text{ (total)} * L_m \text{ (length supply line)} * 2}{2,0V_{\text{(voltage drop)}} * 56 \text{ m} / (\Omega * \text{mm}^2)}$$

**Calculation example**

Available data:

- cut-off current per drive (i. e. 2 x 4.0A) from data sheet
- length to be bridged from the last window to the control unit (i. e. 10 meters)

$$A = \frac{(2 * 4,0A) * 10m * 2}{2,0V * 56m / (\Omega * \text{mm}^2)}$$

A = 1,42mm<sup>2</sup> -> **1,5mm<sup>2</sup>** chosen

### Laying and connecting the drive cable

- Avoid extreme temperature differences in the installation area (danger of condensation).
- Set clamping point close to window and ensure accessibility.
- Ensure expansion possibilities of the drive and the drive cable.
- Consider the cable length and the cross sections of the drives supply lines.

## INSTALLATION STEP 12: Safety check and Test run

Check the mounted system for its safety; perform test run and commissioning.

### Safety test:

- Connect operating voltage.
- Check fastening (frame brackets, casement brackets) for firm fit or tightening.

### Test run:

- Visual inspection of casement movements.
- Stop immediately by malfunction!
- Pay attention to collision with facade construction and correct installation, if required.

### Risk evaluation:

Before operating a power-operated window to which window drives were mounted, which were sold by the manufacturer as incomplete machines according to installation declaration, the possible risk to ahazard of persons must be determined, evaluated and minimized by taking appropriate technical measures in accordance with the Machinery Directive. Separate documents for performing a risk assessment can be downloaded from the homepage of

**Firm AUMÜLLER AUMATIC GmbH**  
([www.aumueller-gmbh.de](http://www.aumueller-gmbh.de)).

### Operation of the power-operated window

When operating the power-operated window safety instructions must be observed, specifically those pertaining to commissioning, operation and maintenance.

## Help in case of Malfunctions, Repairs and Maintenance

Professional repair of a defect drive can only be performed at the manufacturer's factory or manufacturer-certified specialist company. Unauthorized opening or manipulation of the drive terminates warranty.

1. Exchange defect drives or have them repaired by the manufacturer.
2. In case of problems during installation or normal operation the following table might be useful:

Problem	Possible causes	Possible solutions
<b>Drive does not start</b>	<ul style="list-style-type: none"> <li>• Duration of mains power supply too short</li> <li>• Drive run direction not correct</li> <li>• Connecting cable not connected</li> <li>• Power supply / Control Unit voltage incorrect, too high or too low (see data sheet)</li> <li>• No mains supply to power supply unit / Control Unit (no voltage)</li> <li>• Drive has shut down on overload</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust supply voltage as specified in the technical documentation</li> <li>• Check drive cables</li> <li>• Check all connection cables</li> <li>• Check power supply unit and replace if necessary</li> <li>• Connect power supply</li> <li>• First move drive in CLOSE position</li> </ul>
<b>Drive doesn't start after having been in operation several times</b>	<ul style="list-style-type: none"> <li>• Operating time has been exceeded, drive has been overheated</li> <li>• See possible solutions above associated with „Drive doesn't start“</li> </ul>	<ul style="list-style-type: none"> <li>• Wait until drive has cooled down and start again</li> <li>• See possible solutions associated with: „Drive doesn't start“</li> </ul>
<b>Drive doesn't close</b>	<ul style="list-style-type: none"> <li>• Closing edge safety mechanism has been triggered (if existing)</li> <li>• See possible solutions above associated with „Drive doesn't start“</li> </ul>	<ul style="list-style-type: none"> <li>• Release safety area for operation and reset closing edge safety mechanism</li> <li>• See possible solutions associated with: „Drive doesn't start“</li> </ul>
<b>Drive travels uncontrolled in open and close direction</b>	<ul style="list-style-type: none"> <li>• Residual ripple of power supply / control unit too high</li> <li>• Fault in power supply unit / control unit</li> </ul>	<ul style="list-style-type: none"> <li>• Adjust drive voltage to the required value of drive. (values see data sheet of drive)</li> <li>• Check output voltage of power supply unit or control unit</li> </ul>
<b>Drive closes, but after about 10 mm the drive open</b>	<ul style="list-style-type: none"> <li>• Close the window outside the 40 mm (Soft run mode).</li> </ul>	<ul style="list-style-type: none"> <li>• Drive mounted so, that the closing process takes place within the 40 mm (e.g. use spacer under the casement bracket).</li> </ul>

## Maintenance and Modification

To ensure continuous function and safety of the drive periodic maintenance by a specialist company is required at least once a year (as mandated by law and recommended by manufacturer). Operational readiness must be checked regularly. Frequent inspection of the system for imbalance and signs of wear or damages of cables and fastening elements must be performed.

During maintenance contaminations must be removed from the drive. Fastenings and clamping screws must be checked for tightness. Test runs during the opening and closing procedure of the devices must be performed.

The drive itself is maintenance-free. Defect devices may only be repaired in our factory. Only spare parts of the manufacturer may be used. When the connection cable of this device is damaged it must be replaced by the manufacturer or his customer service or a similarly qualified person to avoid endangerment.

It is recommended to conclude a maintenance contract. A sample maintenance contract can be downloaded from the homepage of

**Firm AUMÜLLER AUMATIC GmbH**  
([www.aumueller-gmbh.de](http://www.aumueller-gmbh.de)).

While cleaning the windows, drives may not have direct contact with water or cleaning agents. Drives must be protected from dirt and dust during the construction phase or renovations.

### Maintenance process

1. Open or extend power-operated casement completely.
2. Completely disconnect the system from the mains and secure it against automatic or manual activation.
3. Check windows and fittings for damages.
4. Check all mechanical fastenings (if required, observe information on torques in installation instructions).
5. Check electric drives for damages and contaminations.
6. Check connecting cables (drive cable) for:
  - tightness of the cable screw
  - functionality of the strain relief
  - damages
7. Check the mobility of hinges and fittings and re-adjust or apply lubricant, e.g. silicone spray (observe the instructions of the manufacturer of this window system).
8. Check peripheral seal, remove contaminations or replace.
9. Perform cleaning to maintain functionality (e.g. clean extending elements of the drive, such as chains or spindles by damp wiping them with acid or lye-free agents and drying them and, if required, lubricate them with cleansing oil e.g., Ballistol).
10. Turn on operating voltage.
11. Open and close the power-operated window via the operating voltage (functional test).
12. If available, check and re-adjust protection systems of the safe guard fixture.
13. Check the intactness of the CE label at the power-operated system.
14. Check the intactness of warning instructions and labels at the respective drive.
15. Perform a risk assessment in accordance with Machinery Directive 2006 / 42 / EG, if required, e.g. after modifying the machine.

## Demounting

The drives are demounted by reversing the steps, as for the installation. The adjustments are omitted.

1. Completely disconnect the system from the power supply before demounting a drive.
2. After demounting a drive the window must be secured against independent opening.

Dispose of parts according to the locally applicable legal provisions.

## Disposal

The symbol of the „crossed-out dustbin“ means that you are legally obliged to collect these appliances separately and recycle them in an environmentally friendly manner. Do not throw old electrical appliances into the household waste! Information on return options can be found at: <https://www.aumueller-gmbh.de/umweltschutz>

Before disposing of old electronic devices, please delete all personal data stored on them, if available. Remove any device batteries or rechargeable batteries and put them in the old battery collection. Tape the poles beforehand to avoid a short circuit.

Dispose of the shipping and transport material, separated according to material, in the appropriate recycling bin.



## Liability

We reserve the right to change or discontinue products at any time without prior notice. Illustrations are subject to change. Although we take every care to ensure accuracy, we cannot accept liability for the content of this document.

## Warranty and Customer Service

In principal apply our:

„General Terms for the Supply of Products and Services of the German Electrical Industry (ZVEI)“.

The warranty corresponds with legal provisions and applies to the country in which the product has been acquired.

The warranty includes material and manufacturing defects incurred during normal use.

The warranty period for delivered material is twelve months.

Warranty and liability claims for personal injuries or material damages are excluded, if caused by one or more of the following:

- No proper incoming goods inspection.
- Improper use of the product.
- Improper installation, commissioning, operation, maintenance or repair of the product.
- Operating the product by defect and improper installed or not functioning safety and protection devices.
- Ignoring instructions and installation requirements in these instructions.
- Unauthorized constructional modifications at the product or accessories.
- Disaster situations due to effects of foreign bodies and Acts of God.
- Wear and tear.

Contact persons for possible warranty claims, for spare parts or accessories are the employees of the responsible branch office or the responsible person at

**Firm AUMÜLLER AUMATIC GmbH.**

Contact data are available at our homepage

**([www.aumueller-gmbh.de](http://www.aumueller-gmbh.de))**

## Certificate and Declaration of Conformity

We declare under our sole responsibility that the product described under "Data sheet" is in conformity with the following directives:

- 2014/30/EU  
Directive relating to Electro-Magnetic Compatibility
- 2014/35/EU  
Low voltage Directive



We further declare that the drive is an incomplete machine within the meaning of the European Machinery Directive (2006/45/EG).

Technical file and declaration at firm:

**AUMÜLLER AUMATIC GmbH**  
Gemeindewald 11  
D-86672 Thierhaupten

Ramona Meinzer  
Managing Director (Chairman)

### Note:

The proof of the application of a quality management system is for company:

**AUMÜLLER AUMATIC GmbH**  
according to the certification basis **DIN EN 9001** as well the "Declaration of Incorporation and Conformity" can be accessed via the QR code or directly on our homepage:  
**(www.aumueller-gmbh.de)**



### Translation of the original instructions (German)

#### Important note:

We are aware of our responsibility, which is why we present life-supporting and value-preserving products with greatest possible conscientiousness. Although we make every effort to ensure that the data and information are as correct and up-to-date as possible, we still cannot guarantee that they are free from mistakes and errors.

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The publication of these assembly and commissioning instructions supersedes all previous editions.

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