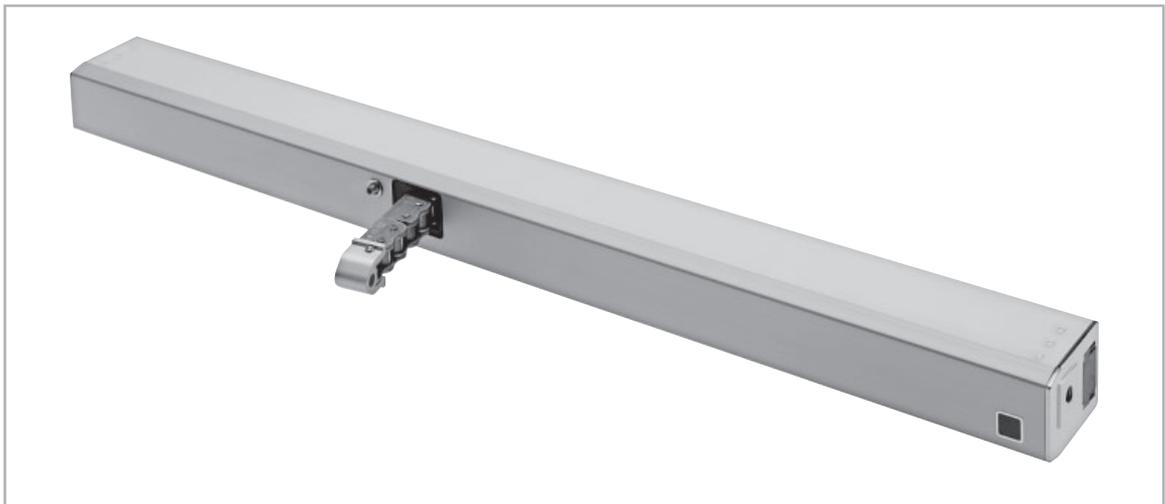


aumüller

Assembly and Commissioning Instructions

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



KSA S12 24V DC / KSA S12 230V AC CHAIN DRIVE FOR WINDOWS **CE**



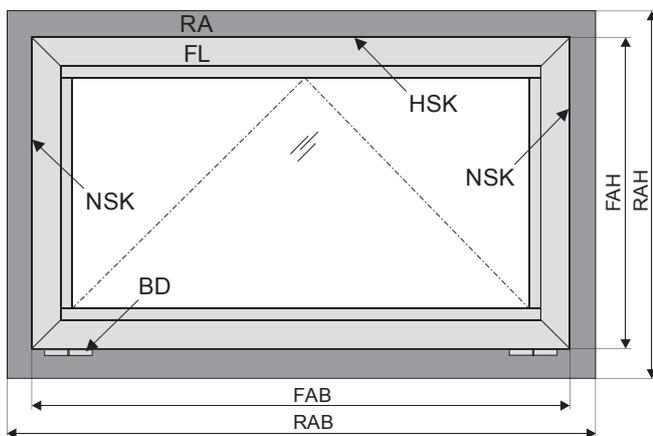
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ABBREVIATIONS

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
NSK	side closing edge
RA	frame
RAB	overall width of frame
RAH	overall height of frame
SL	snow load
→	opening direction



TARGET GROUP

These instructions are intended for trained personnel and operators of systems for natural smoke ventilation (NRA / SHEV) (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.

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.

NOTE

Intended use according

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

In accordance with the Declaration of Conformity the drive, in combination with an external Control Unit from **AUMÜLLER**, is 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 NSHEV (natural smoke and heat exhaust ventilator(s) for ventilation without dual purpose for ventilation in accordance with EN12101-2.

WARNING

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!

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:

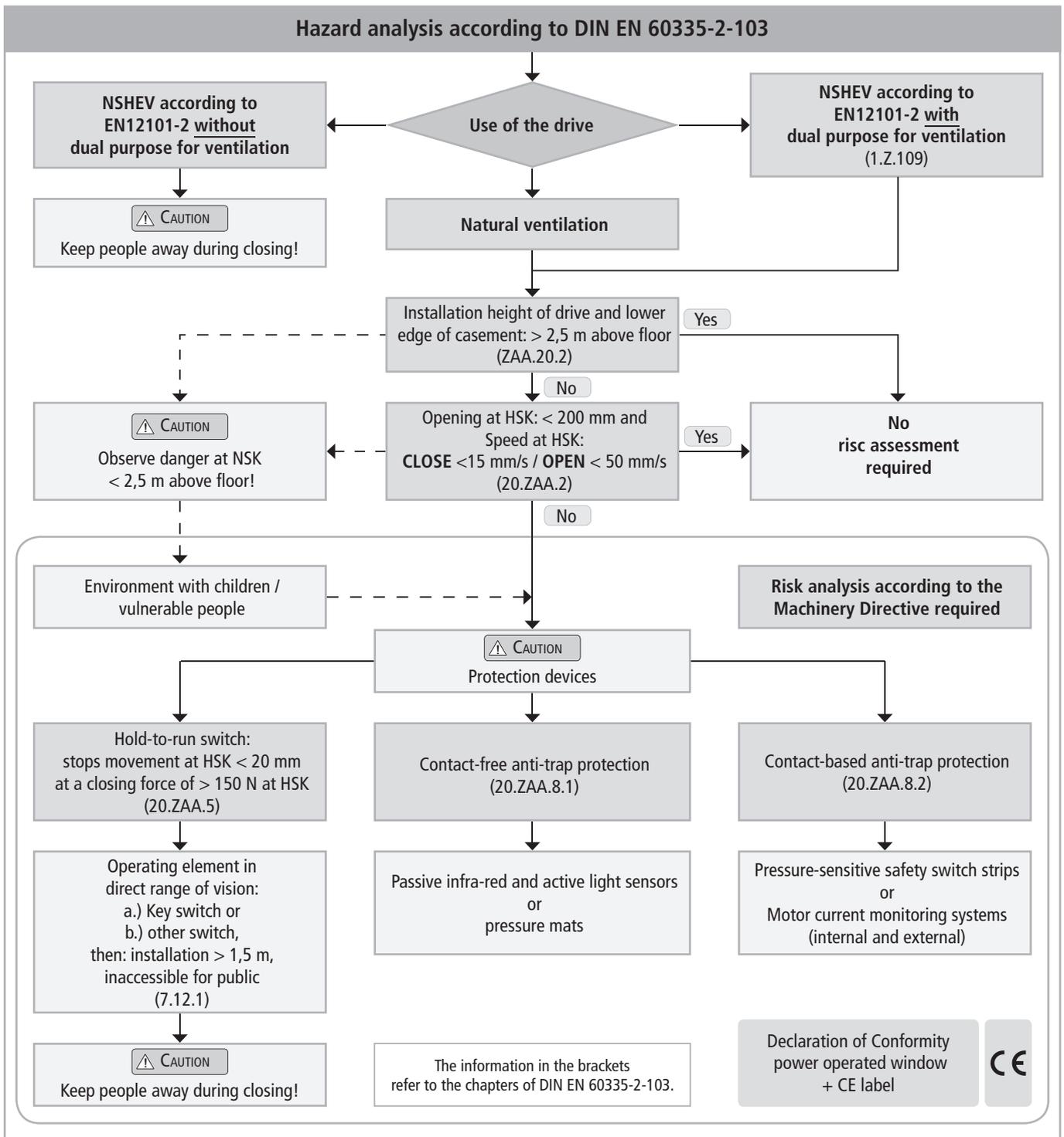
- The **constructor or his agent** (architect, specialist planner) **are obligated to evaluate the hazards to persons**, outgoing from the usage, installation position, opening parameters and from the external Control Unit of the power operated window, **already in the planning phase and to establish 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 it's 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 site 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 regulating and / or control units, 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 machine plate) 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 to 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.

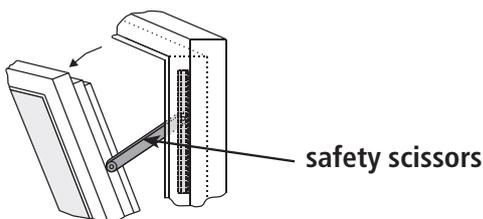
Unintentional or independent opening or falling

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.



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 instructions shall be observed for the installation, specifically:

- VDE 0100 Setting up high-voltage systems up to 1000 V
- VDE 0815 Wiring cables
- Specimen Guideline on Conduits German designation (MLAR).



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 introduced to 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 cleaning and maintenance works and while exchanging parts, all poles of the drive must be disconnected from the power supply and secured against unintentional reactivation.

CAUTION 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!

 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 replacement 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!

- **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

24V



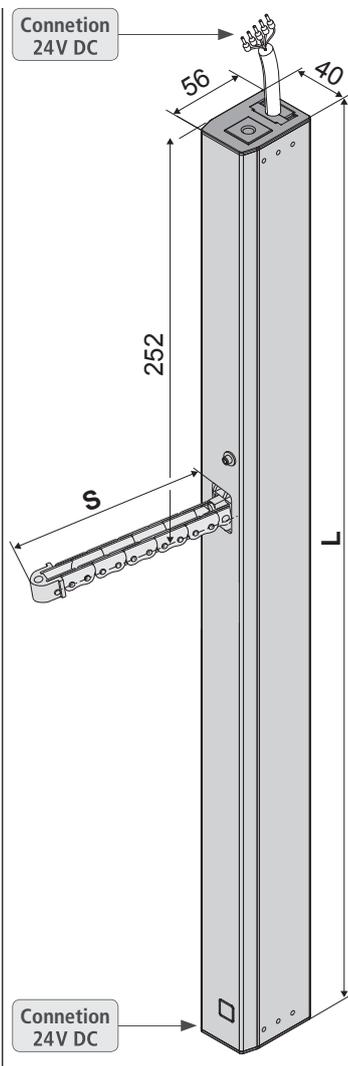
- Application: natural ventilation, SHEV, ferralux®-NSHEV
- Internal Intelligent Control Electronics S12
- Adjustable chain tension / Mechanical chain unlocking
- Version „Z“: Programmable feedback limit position „OPEN“ and „CLOSE“ (max. 24V, 500 mA)

Equipment:

- Additional **AUMÜLLER-Click plug set** for multi-drive operation

Options

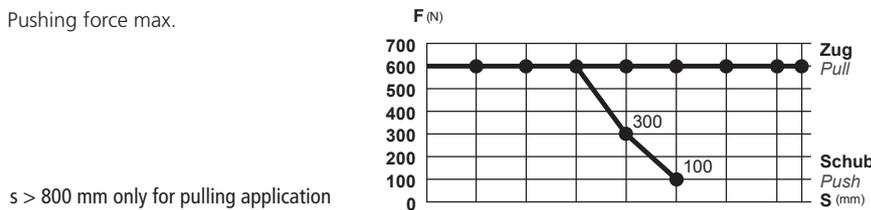
- Programmable special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)



TECHNICAL DATA

U_N	Rated voltage	24V DC (19 V ... 28 V)
I_N	Rated current	0,9 A
I_A	Cut-off current	1,2 A
P_N	Rated power	22 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.	600 N
F_A	Pushing force max.	100 N



s > 800 mm only for pulling application

F_H	Pullout force	3.000 N (fastening depended)
-------	---------------	------------------------------

	Chain	Stainless steel
--	-------	-----------------

	Connecting cable	non-halogen, grey 5 x 0,5 mm ² , ~ 3 m
--	------------------	---

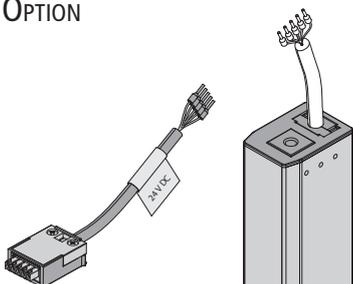
v	Speed	$s < 400$ 8,0 mm/s 8,0 mm/s $s 500 - 600$ 12,0 mm/s 8,0 mm/s $s > 600$ 13,5 mm/s 8,0 mm/s
-----	-------	--

s	Stroke	250 – 1.500 mm
-----	--------	----------------

L	Length	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:

- **AUMÜLLER-Click plug solution** (for 24 V DC) with various cable lengths
 - Part.-No.: 501250 - 1 m cable length
 - 501258 - 2 m cable length
 - 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

02

ORDER DATA

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
250	515	KSA 250 S12 24V	E6/C-0	1	522725
300	591	KSA 300 S12 24V	E6/C-0	1	522730
400	591	KSA 400 S12 24V	E6/C-0	1	522740
500	693	KSA 500 S12 24V	E6/C-0	1	522750
600	693	KSA 600 S12 24V	E6/C-0	1	522760
800	794	KSA 800 S12 24V	E6/C-0	1	522780
1000	896	KSA 1000 S12 24V	E6/C-0	1	522810
1200	998	KSA 1200 S12 24V	E6/C-0	1	522812
1500	1151	KSA 1500 S12 24V	E6/C-0	1	522815

ORDER DATA

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
250	515	KSA 250 S12 24V Z	E6/C-0	1	522723
300	591	KSA 300 S12 24V Z	E6/C-0	1	522733
400	591	KSA 400 S12 24V Z	E6/C-0	1	522743
500	693	KSA 500 S12 24V Z	E6/C-0	1	522753
600	693	KSA 600 S12 24V Z	E6/C-0	1	522763
800	794	KSA 800 S12 24V Z	E6/C-0	1	522783
1000	896	KSA 1000 S12 24V Z	E6/C-0	1	522813
1200	998	KSA 1200 S12 24V Z	E6/C-0	1	522823
1500	1151	KSA 1500 S12 24V Z	E6/C-0	1	522853

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
Microprocessor programming S12		
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	524167
M-COM Click Configuration module for synchronised multi-drive systems	1	524177
AUMÜLLER-Click plug solution 24 V - cable length 1 m	1	501250
AUMÜLLER-Click plug solution 24 V - cable length 2 m	1	501258
AUMÜLLER-Click plug solution 24 V - cable length 3 m	1	501251
AUMÜLLER-Click plug solution 24 V - cable length 5 m	1	501252
AUMÜLLER-Click plug solution 24 V - cable length 10 m	1	501253

**EXPLANATIONS ON THE VERSION „Z“
(FOR EXAMPLE KSA 1500 S12 24V Z)**

24V

230V

Drives with version „Z“ (e.g. KSA 1500 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.

DATA SHEET KSA S12 230V AND KSA S12 230V Z

230V

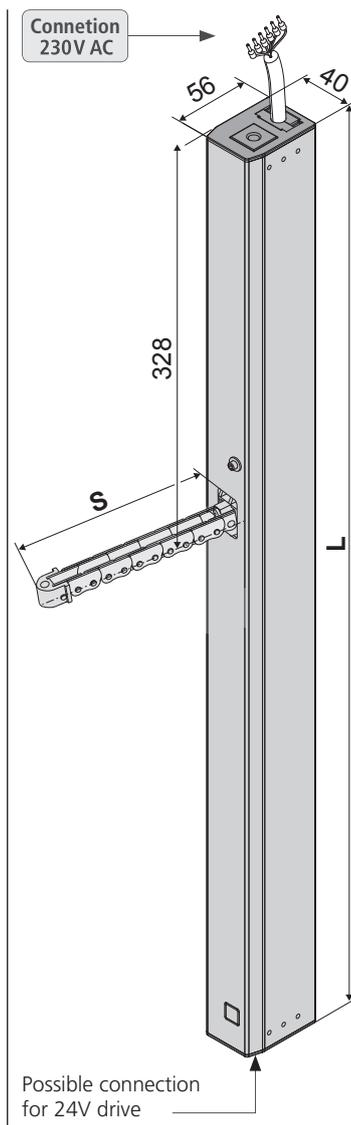
- Application: natural ventilation
- Internal Intelligent Control Electronics S12
- Adjustable chain tension / Mechanical chain unlocking
- Parallel connection up to 8 drives in one group
- Additional connection of a 24V drive possible (on the 24V side)
- Version „Z“: Programmable feedback limit position „OPEN“ and „CLOSE“ (max. 24V, 500 mA)

Equipment:

- Additional **AUMÜLLER-Click plug set** for multi-drive operation

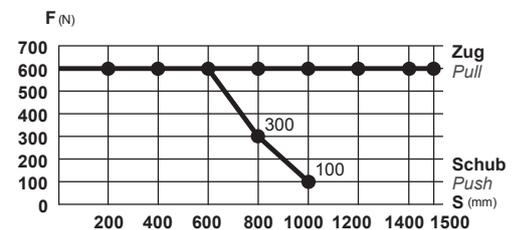
Options

- Programmable synchronised run (max. 4 drives) and special functions (not version „Z“)

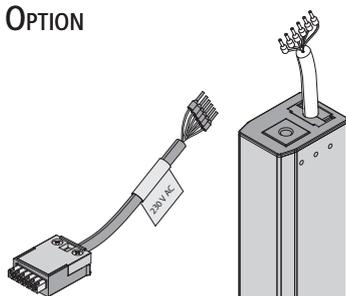
**TECHNICAL DATA**

U_N	Rated voltage	230V AC (50 Hz)
I_N	Rated current	0,2 A
I_A	Cut-off current	0,2 A
P_N	Rated power	46 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.	600 N
F_A	Pushing force max.	

$s > 800$ mm only for pulling application



F_H	Pullout force	3.000 N (fastening depended)
	Chain	Stainless steel
	Connecting cable	non-halogen, grey 6 x 0,75 mm ² , ~ 3 m
v	Speed	\leftarrow 8,0 mm/s \rightarrow 8,0 mm/s
s	Stroke	250 – 1.500 mm
L	Length	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:

- **AUMÜLLER-Click plug solution** (for 230 V AC) with various cabel lengths
 - Part.-No.: 501271 - 1 m cable length
 - 501272 - 2 m cable length
 - 501273 - 3 m cable length
 - 501275 - 5 m cable length
 - 501280 - 10 m cable length
- Series connection of several drives into multi drive systems

ORDER DATA

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
250	591	KSA 250 S12 230V	E6/C-0	1	497025
300	667	KSA 300 S12 230V	E6/C-0	1	497030
400	667	KSA 400 S12 230V	E6/C-0	1	497040
500	769	KSA 500 S12 230V	E6/C-0	1	497050
600	769	KSA 600 S12 230V	E6/C-0	1	497060
800	870	KSA 800 S12 230V	E6/C-0	1	497080
1000	972	KSA 1000 S12 230V	E6/C-0	1	497110
1200	1074	KSA 1200 S12 230V	E6/C-0	1	497112
1500	1227	KSA 1500 S12 230V	E6/C-0	1	497115

ORDER DATA

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
250	591	KSA 250 S12 230V Z	E6/C-0	1	497023
300	667	KSA 300 S12 230V Z	E6/C-0	1	497033
400	667	KSA 400 S12 230V Z	E6/C-0	1	497043
500	769	KSA 500 S12 230V Z	E6/C-0	1	497053
600	769	KSA 600 S12 230V Z	E6/C-0	1	497063
800	870	KSA 800 S12 230V Z	E6/C-0	1	497083
1000	972	KSA 1000 S12 230V Z	E6/C-0	1	497113
1200	1074	KSA 1200 S12 230V Z	E6/C-0	1	497123
1500	1227	KSA 1500 S12 230V Z	E6/C-0	1	497153

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:		516004
Microprocessor programming S12		
Electronic stroke reduction 230V S12		495590
Programming drives 24V / 230V S12		524180
Programming synchronised multi-drive systems 230V S12		495588
Optional accessories	PU / pcs.	Part.-No.
AUMÜLLER-Click plug solution 230 V - cable length 1 m	1	501271
AUMÜLLER-Click plug solution 230 V - cable length 2 m	1	501272
AUMÜLLER-Click plug solution 230 V - cable length 3 m	1	501273
AUMÜLLER-Click plug solution 230 V - cable length 5 m	1	501275
AUMÜLLER-Click plug solution 230 V - cable length 10 m	1	501280

EXPLANATIONS ON THE PRODUCT LABEL

The product label informs about:

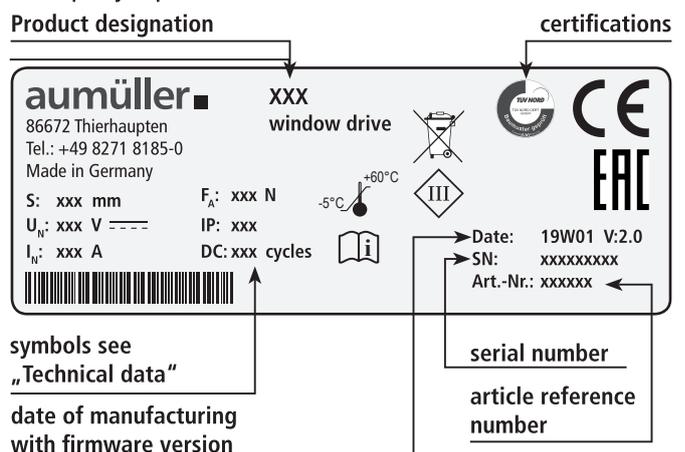
- manufacturer's address
- article reference number and name
- technical characteristics
- date of manufacturing with firmware version
- certifications
- serial number

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



24V

230V

AREAS OF APPLICATION AND CASEMENT SIZES

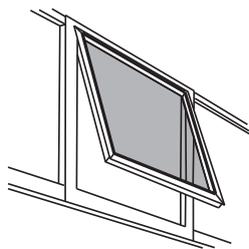
Areas of application and casement sizes:

Mounting of drives up to a casement size of max. 4m² (depending on the system)

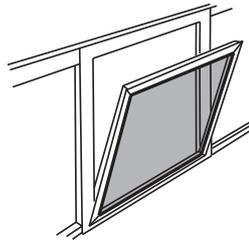
Top-hung casement and bottom-hung casement inward opening

FAB min. = L + 100 mm

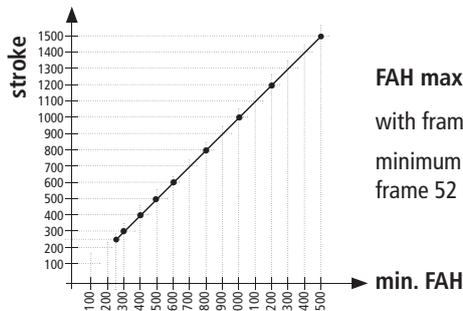
FAB max. = 1400 mm / solo
= 2500 mm / tandem



Top-hung casement



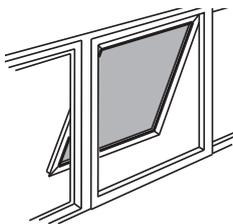
Bottom-hung casement



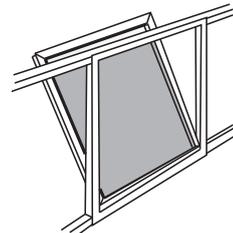
Top-hung casement and bottom-hung casement outward opening

FAB min. = L + 100 mm
FAB max. = 1400 mm / solo
= 2500 mm / tandem

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



Top-hung casement



Bottom-hung casement

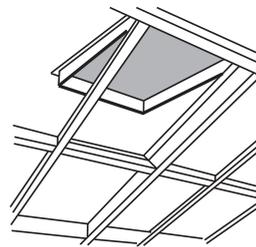
Roof window

FAB min. = L + 100 mm
FAB max. = 1400 mm / solo
= 2500 mm / tandem

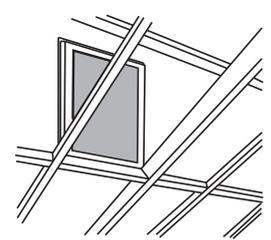
FAH min. = 450 mm
FAH max. = 2500 mm

total weight casement including snow load

- KSA 250 mm stroke ≤ max. 110 kg
- KSA 300 mm stroke ≤ max. 110 kg
- KSA 400 mm stroke ≤ max. 110 kg
- KSA 500 mm stroke ≤ max. 110 kg
- KSA 600 mm stroke ≤ max. 110 kg
- KSA 800 mm stroke ≤ max. 50 kg

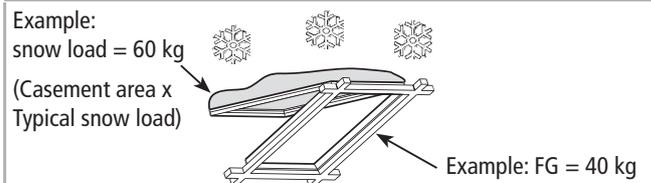


Top-hung casement



Bottom-hung casement

Snow load on roof windows for SHEV-systems



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

24V **230V**



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.

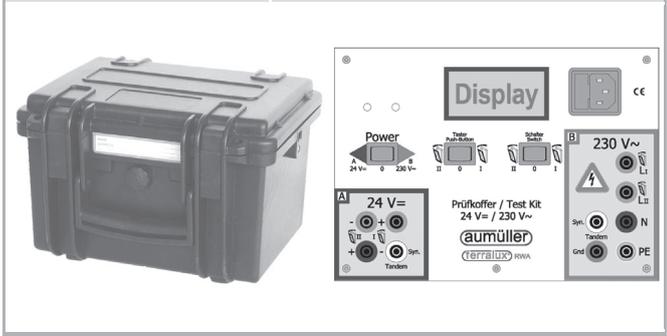
Inspection of drives before installation

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.



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	
Order number:	533981
Application:	Test kit to check running direction and communication of drives 24V DC or 230V AC (including batteries)
Supply voltage:	230V AC
Drive types:	24V DC / 230V AC
Drive current:	max. 3 A
Display:	drive current, battery charge
Ambient temperature:	-5 °C ... + 40 °C
Plastic housing:	250 x 220 x 210 mm
Weight:	approx. 3,6 kg
Feature / equipment:	Control elements: 2 switches + 1 button



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 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,
- 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.

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:

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

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

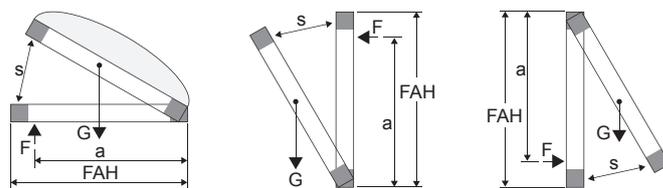
$$F \text{ [N]} = \frac{5,4 \cdot G \text{ [kg]} \cdot s \text{ [m]}}{a \text{ [m]}}$$

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
	1 Countersunk screws M8 (2x)
	2 Brass washers (2x)
	3 Cover caps (2x)
	4 Chain unlocking key (1x)
	5 AUMÜLLER-Click plug solution (1x) depending on the drive-version in 24V or 230V
	6 AUMÜLLER-Click pug set (24V) for multi-drive operation (1x)
	7 Warning sign sticker „Risk of entrapment“ (1x)

INSTALLATION STEP 3:

24V

230V

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.

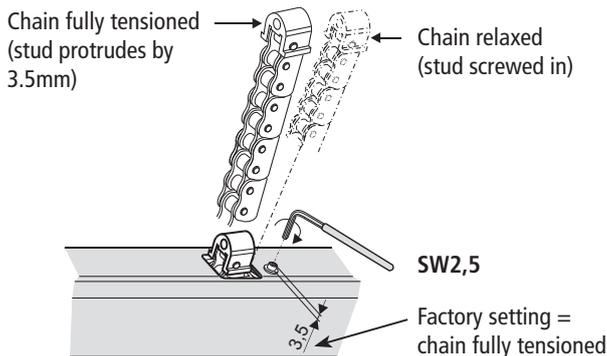


Bottom-hung casements only! Do not change the factory setting for other types of casements!

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

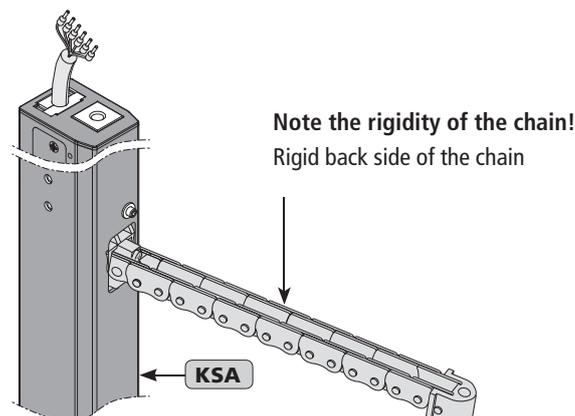


Optimise the smooth running carefully and check the chain tension. Otherwise, the chain can buckle (backlash) during operation in the thrust (push) direction.



Always note the force-path diagram (see chapter „DATA SHEET KSA S12 24V / KSA S12 230V“) and rigidity of the chain, depending on the installed position!

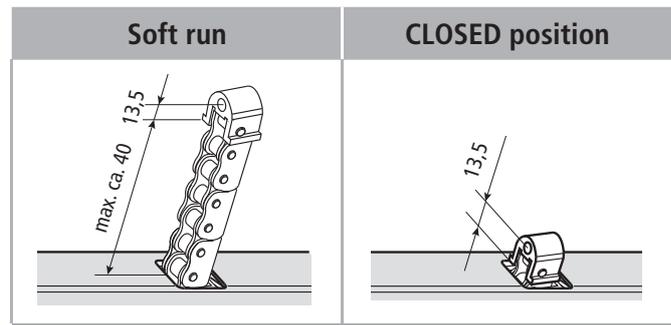
In inclined and vertical uses, ensure that the chain becomes rigid automatically. This is secured if the drive is installed with the motor side (cable outlet) at the top (e.g. for side-hung windows with drive installed at the main closing edge).



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

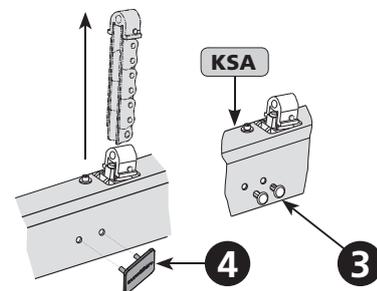
If soft run mode is **not** achieved on retracting the chain:

- 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!

For multiple application the chains should always be pulled out of manually and moved in a CLOSE direction electrically with the same space interval.

INSTALLATION STEP 4: DETERMINE THE CASEMENT BRACKETS

24V

230V

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"> 1 Casement bracket F44 2 1x baseplate 3 1x countersunk screw M4x10 4 1x cylinder head screw M6x35 			<ol style="list-style-type: none"> 1 Casement bracket F49 2 1x cylinder head screw M6x30
<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

24V

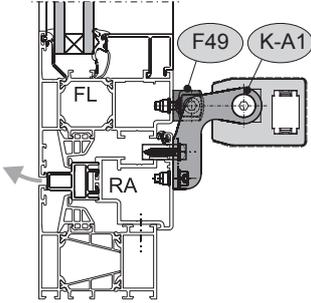
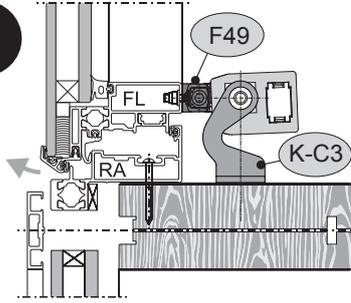
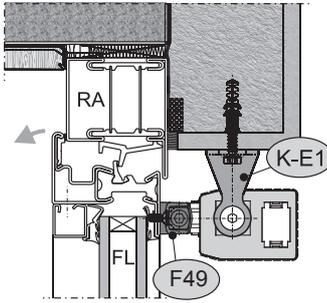
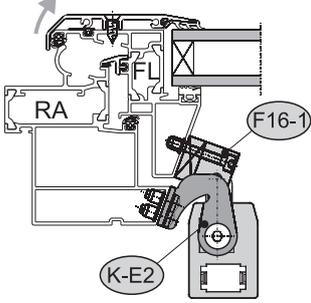
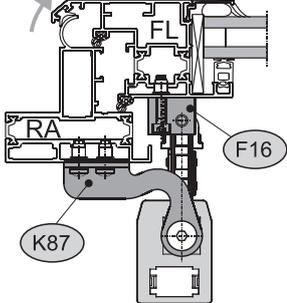
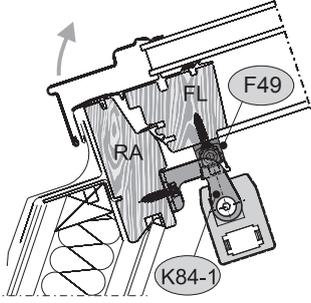
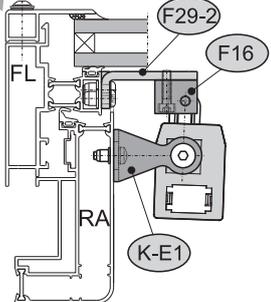
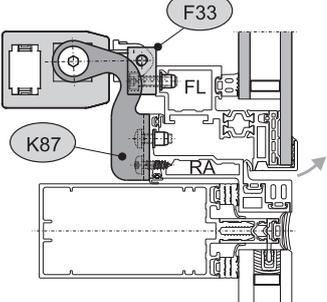
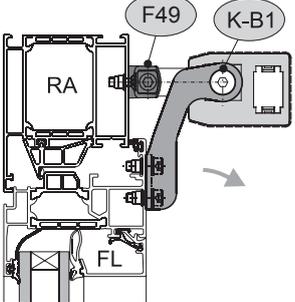
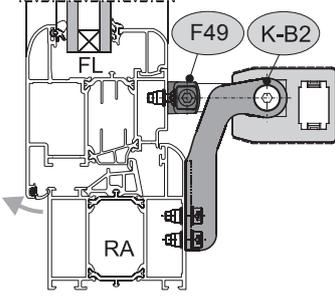
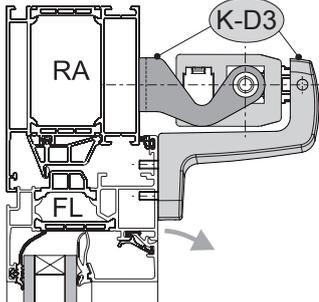
230V

Frame brackets		
<p>Frame bracket K-A1</p>	<p>Frame bracket K-B1</p>	<p>Frame bracket K-B2</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>Frame bracket K-C3</p>	<p>Frame bracket K-D3</p>	<p>Frame bracket K-E1</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>Frame bracket K-E2</p>	<p>Frame bracket K84-1</p>	
<p>use with F16, F16-1, F33, F39, F49</p>	<p>use with F16, F33, F39, F49</p>	
<p>Frame bracket K87</p>	<p>Frame bracket K125</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

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

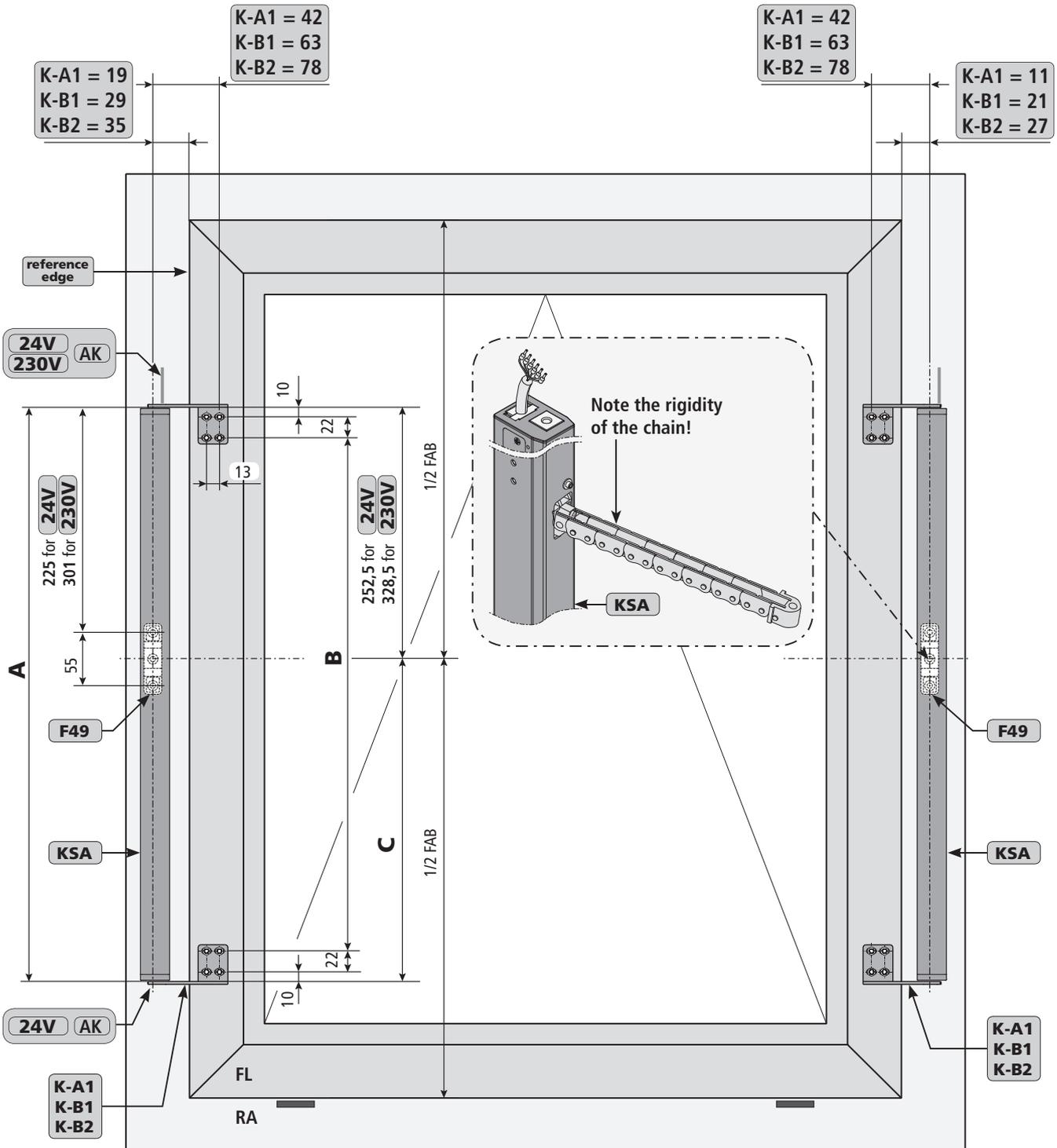
INSTALLATION STEP 6: HOLE LAYOUT FOR FRAME BRACKET AND CASEMENT BRACKET

24V

230V

Drive mounting on the casement - auxillary closing edge - inward opening windows
Hole layout for the frame brackets K-A1 / K-B1 / K-B2 with casement bracket F49

NSK



24V

230V

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

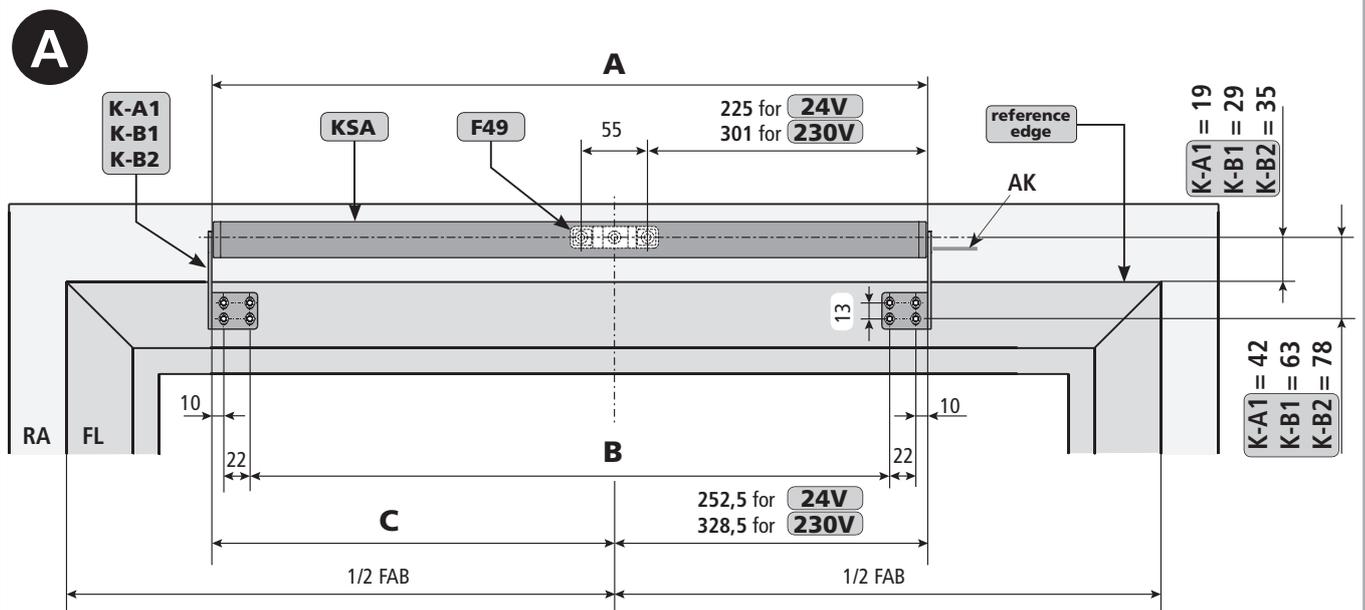
HOLE LAYOUT: SOLO

24V

230V

Drive mounting on the casement - main closing edge - inward opening windows
Hole layout for frame brackets K-A1/K-B1/K-B2 + casement bracket F49

HSK



24V

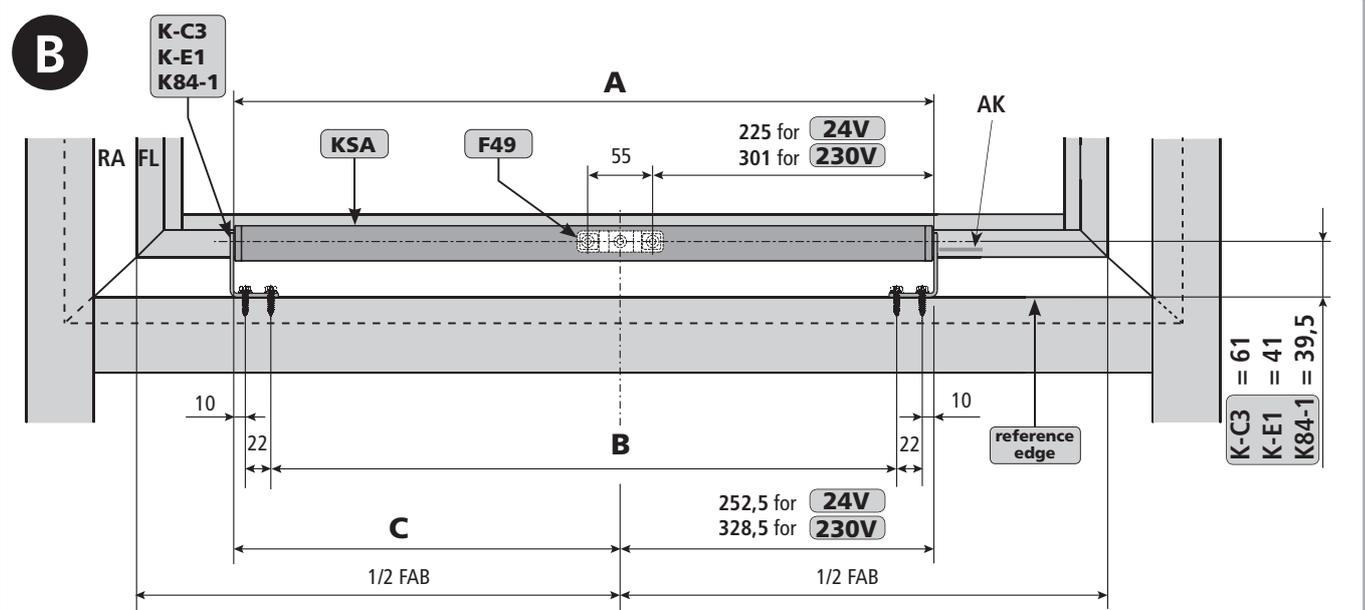
230V

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

Drive mounting on the frame / transom - main closing edge - outward opening windows
Hole layout for the frame brackets K-C3 / K-E1 / K84-1 with casement bracket F49

HSK



24V

230V

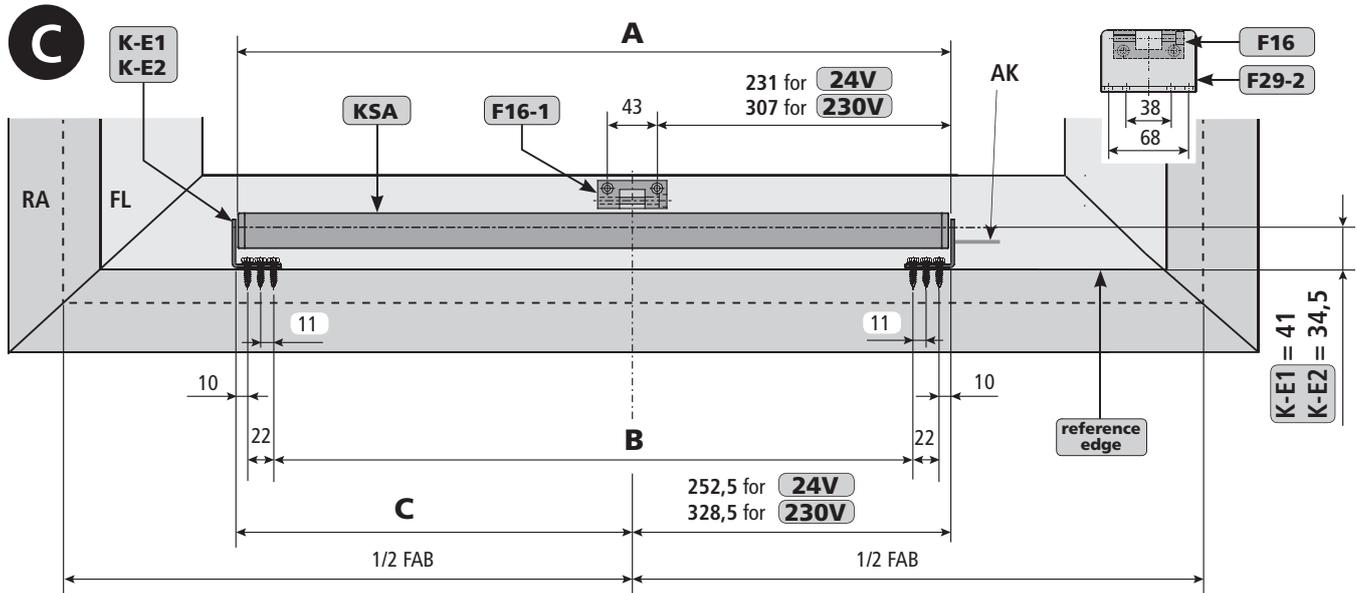
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

HOLE LAYOUT: SOLO

24V **230V**

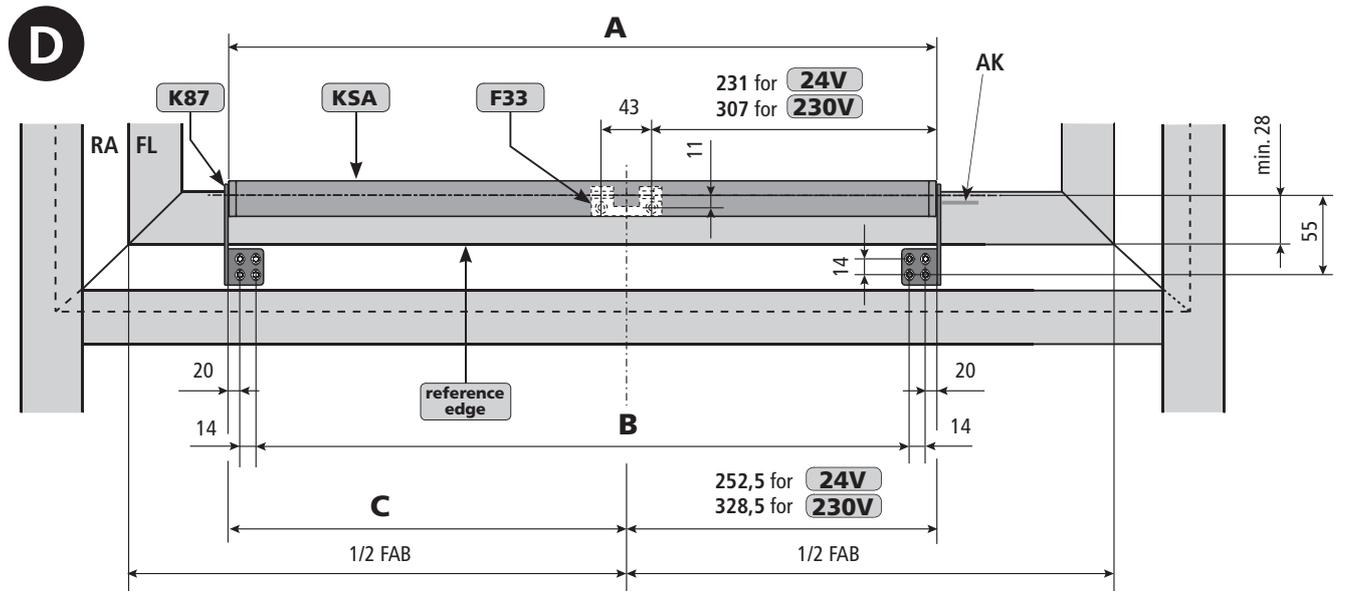
Drive mounting on the frame / transom - main closing edge - outward opening windows
 Hole layout for the frame brackets K-E1 / K-E2 with casement bracket F16-1 / F16 + F29-2 **HSK**



24V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

230V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

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



24V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	448	524	626	727	829	931	1084
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

230V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	524	600	702	803	905	1007	1160
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

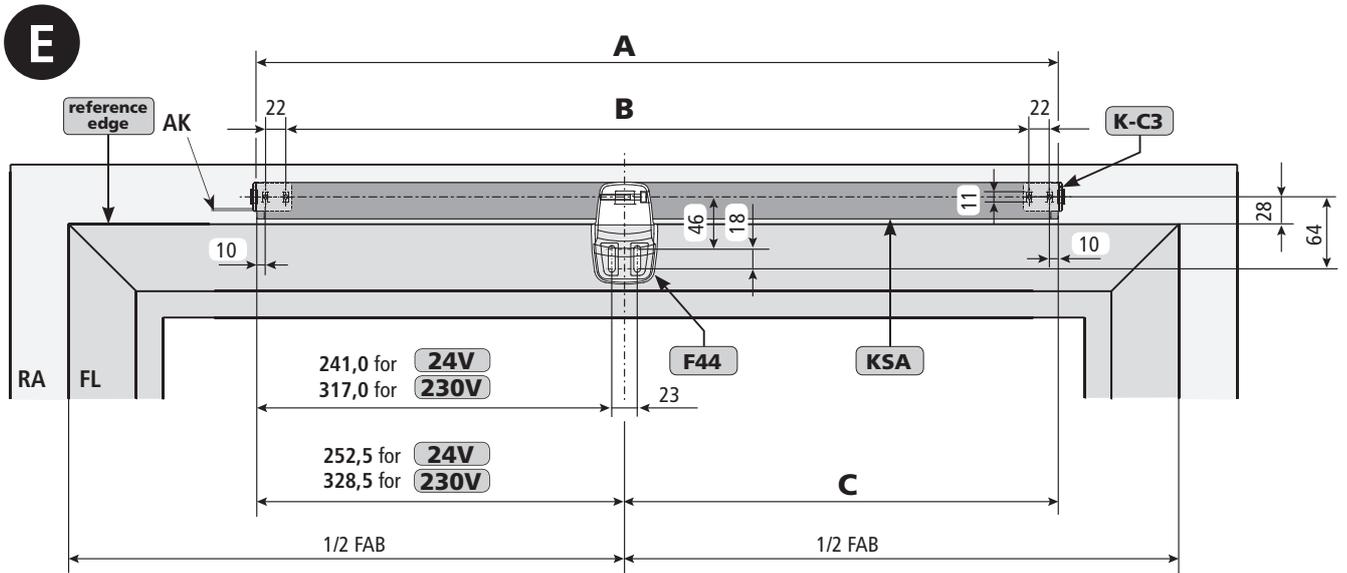
HOLE LAYOUT: SOLO

24V

230V

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



24V

230V

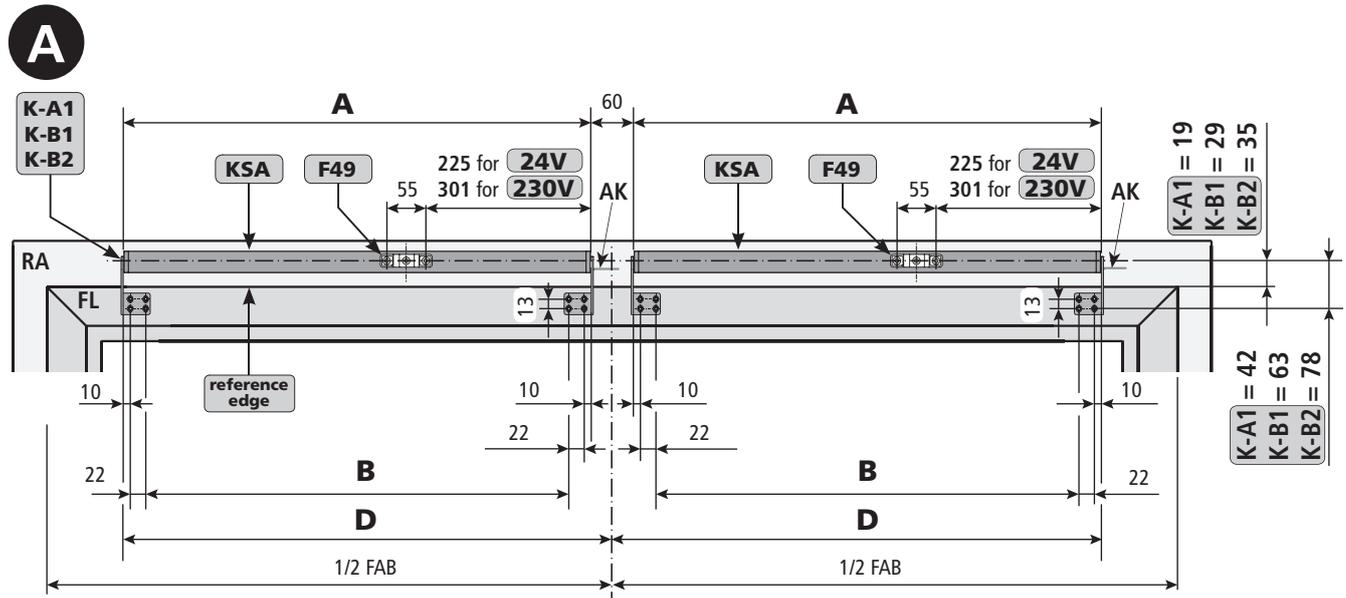
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
C	263,5	339,5	441,5	542,5	644,5	746,5	899,5

HOLE LAYOUT: TANDEM

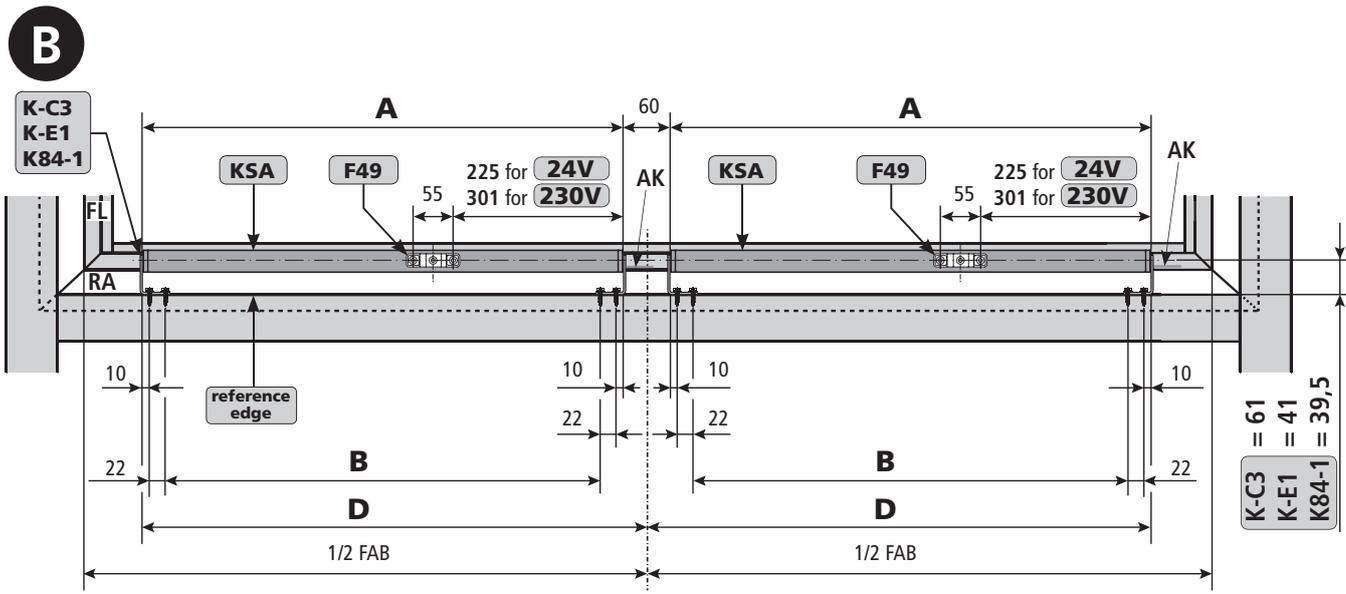
24V 230V

Drive mounting on the casement - main closing edge - inward opening windows
Hole layout for frame brackets K-A1/K-B1/K-B2 + casement bracket F49 HSK



24V								230V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500		stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152	A	592	668	770	871	973	1075	1228
B	452	528	630	731	833	935	1088	B	528	604	706	807	909	1011	1164
D	546	622	724	825	927	1029	1182	D	622	698	800	901	1003	1105	1258

Drive mounting on the frame / transom - main closing edge - outward opening windows
Hole layout for the frame brackets K-C3 / K-E1 / K84-1 with casement bracket F49 HSK

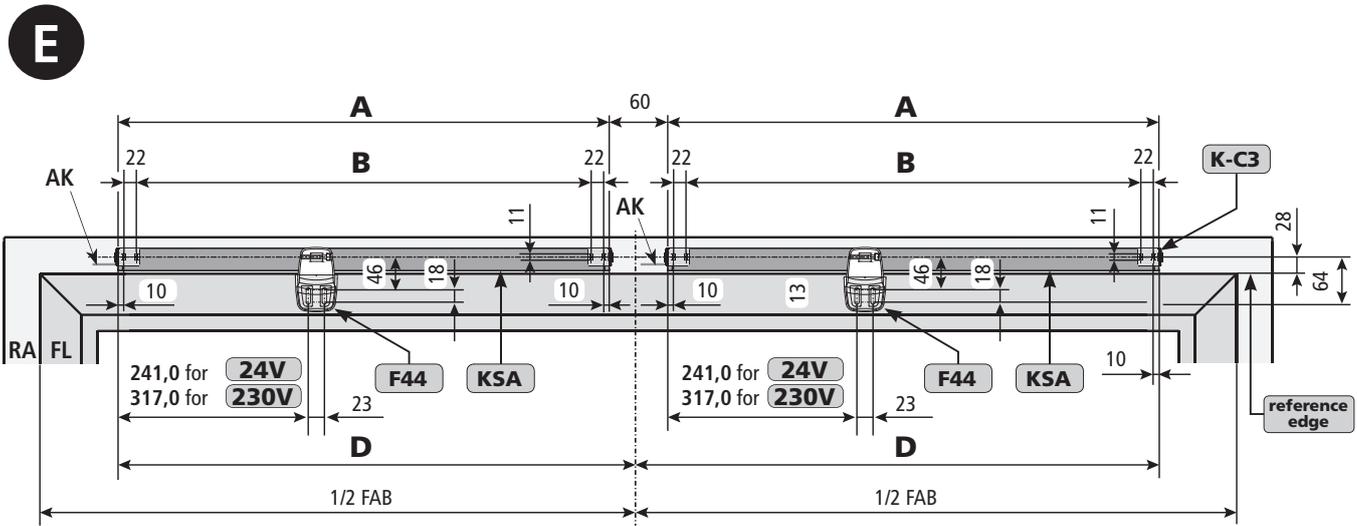


24V								230V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500		stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152	A	592	668	770	871	973	1075	1228
B	452	528	630	731	833	935	1088	B	528	604	706	807	909	1011	1164
D	546	622	724	825	927	1029	1182	D	622	698	800	901	1003	1105	1258

HOLE LAYOUT: TANDEM

24V **230V**

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**



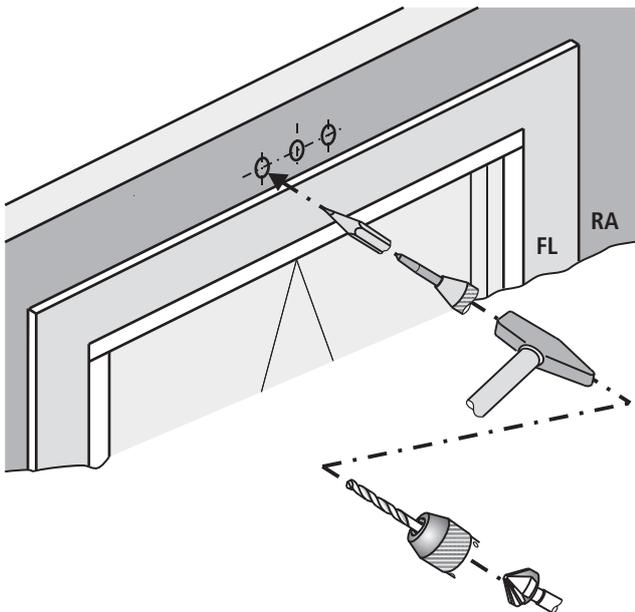
24V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	516	592	694	795	897	999	1152
B	452	528	630	731	833	935	1088
D	546	622	724	825	927	1029	1182

230V							
	stroke 250	stroke 300/400	stroke 500/600	stroke 800	stroke 1000	stroke 1200	stroke 1500
A	592	668	770	871	973	1075	1228
B	528	604	706	807	909	1011	1164
D	622	698	800	901	1003	1105	1258

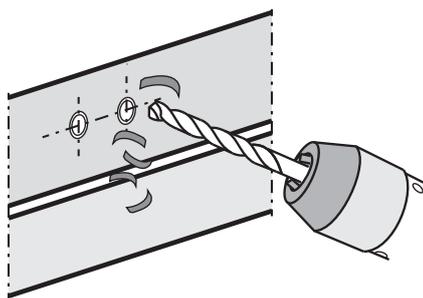
05

INSTALLATION STEP 7: ASSEMBLY CASEMENT BRACKET**24V****230V**

- 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).



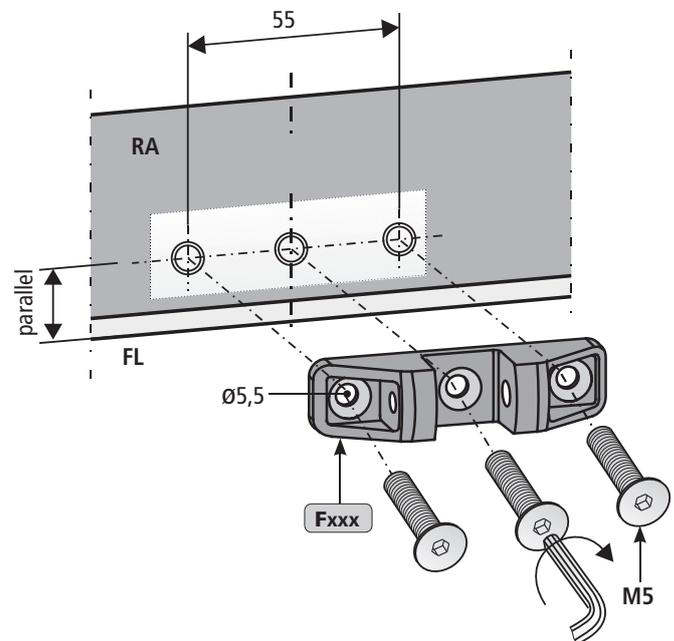
Carefully clear away drilling swarfs to prevent seals from being damaged. Avoid surface scratches, for example by using masking tape.



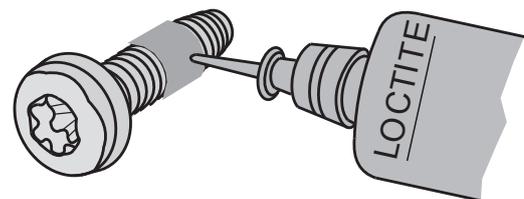
- Fit casement bracket Fxxx (M5).



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".



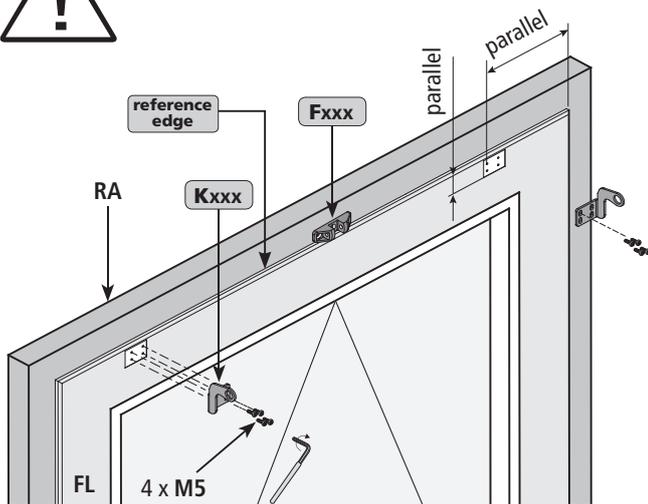
INSTALLATION STEP 8A: SWIVELING DRIVE MOUNTING ON THE CASEMENT - main closing edge or auxillary closing edge



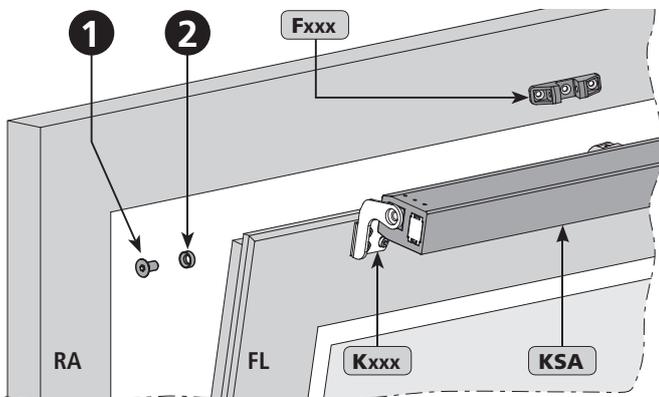
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (INSTALLATION-STEP 4 - 6) or project-specific documents and drawings.
- Fit frame brackets Kxxx (M5).



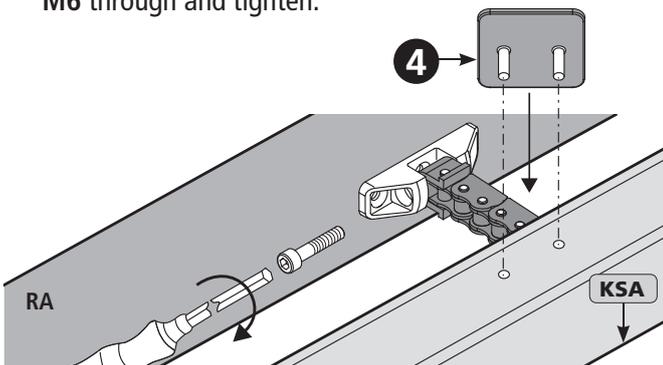
Make sure they are parallel to casement edge.



- 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 SMOOT RUNNING“).
- Connect chain with casement bracket. Pass shaft screw M6 through and tighten.



- Route cable on or in the casement.

Cable on casement	Cable in glazing bead
<p>Cable duct glued on (in addition secured with countersunk screws against breaking away).</p>	<p>Drill hole in glazing bead (cable bushing protects against damage to cable).</p>
<p>Connection cable routing on the casement:</p> <ul style="list-style-type: none"> • 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.

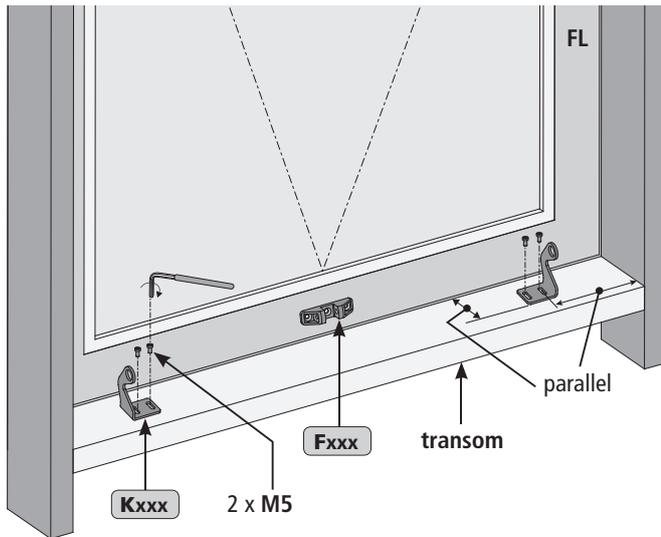
Cable crossover <u>without</u> protective cable hose	Cable crossover <u>with</u> protective cable hose
<p>Connection cable routing on the hinge side:</p> <ul style="list-style-type: none"> • Make sure that during opening or closing procedure the cable will not be damaged by shearing-off, kinking, crushing. • 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

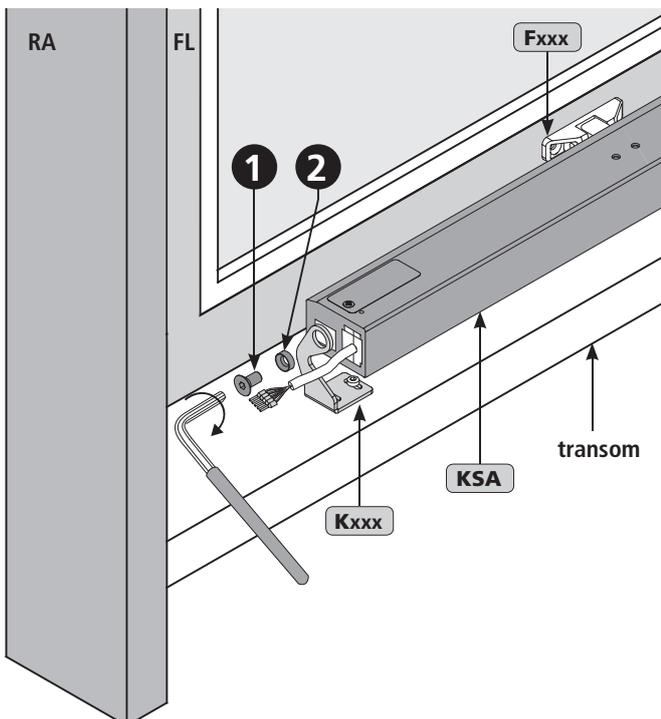
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (INSTALLATION-STEP 4 - 6) or project-specific documents and drawings).
- Fit frame brackets **Kxxx** (M5).



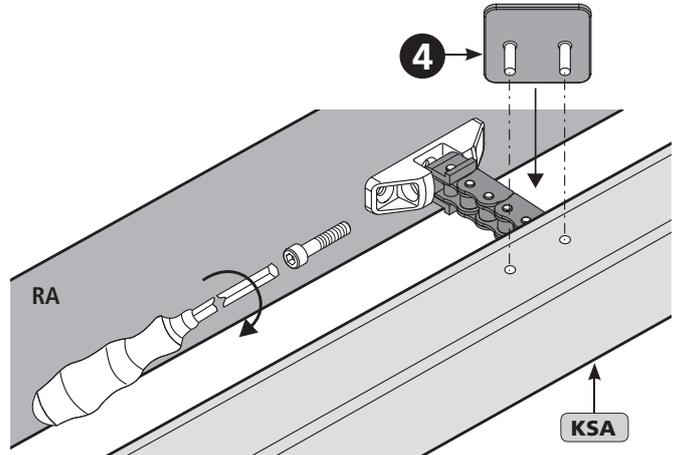
Make sure they are parallel to casement edge.



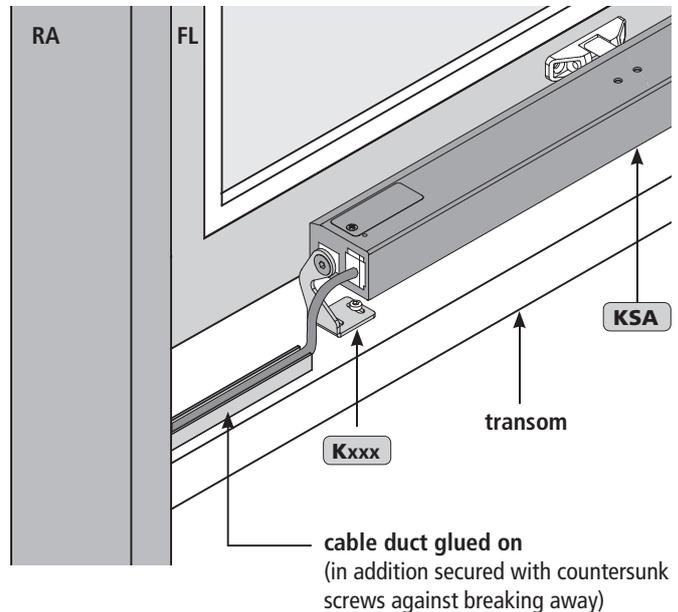
- Attach drive to the frame brackets.
- Insert brass washers **2** and firmly tighten with countersunk screws M8 **1**. The drive should freely swivel between the frame brackets **Kxxx**.



- 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).



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.

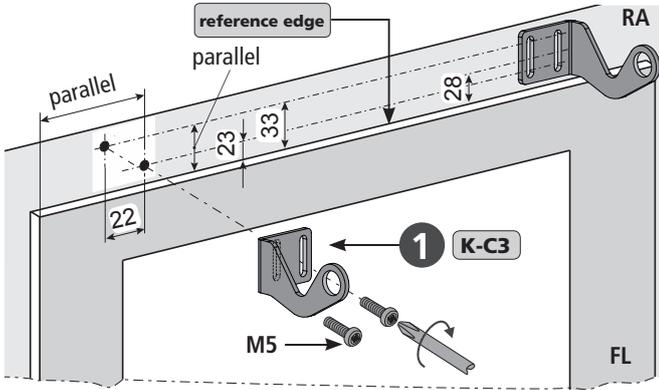
INSTALLATION STEP 8c: SWIVELING DRIVE MOUNTING ON THE WINDOW FRAME
 - main closing edge or auxiliary closing edge
 - inward opening windows

HSK
NSK

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



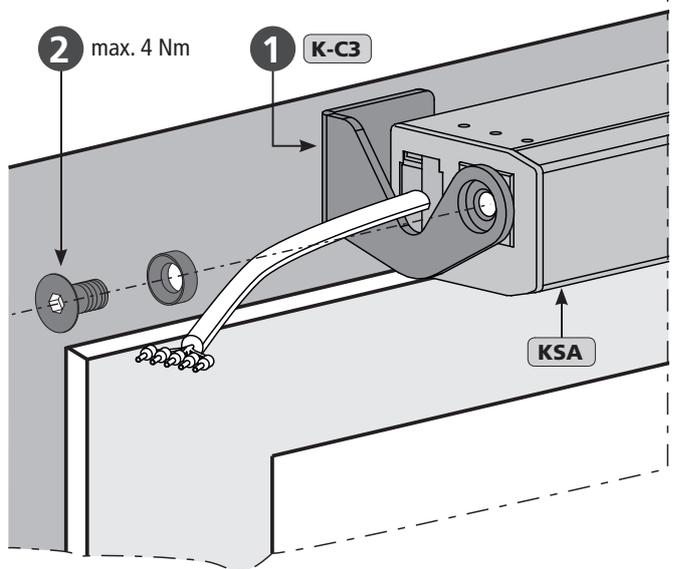
Make sure they are parallel to casement edge.



■ 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.

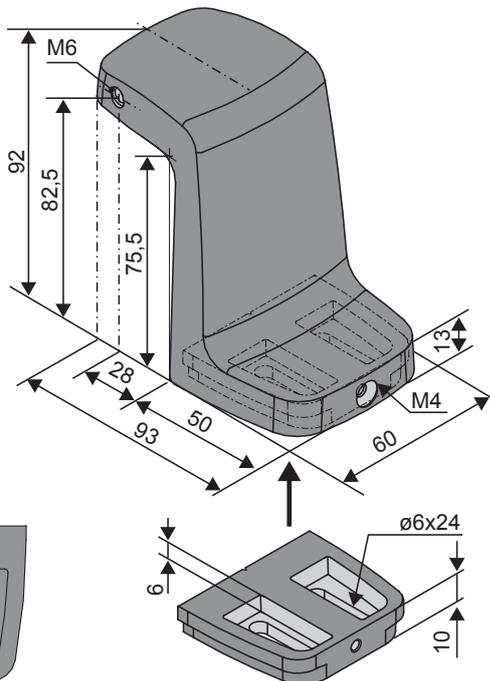
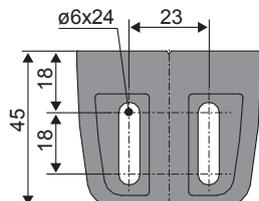
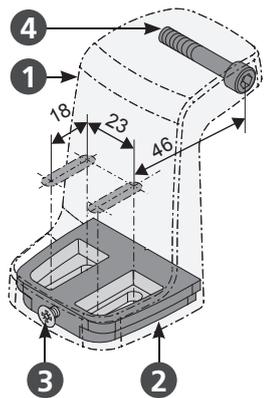


NOTE If required, use washers corresponding to the used screws.

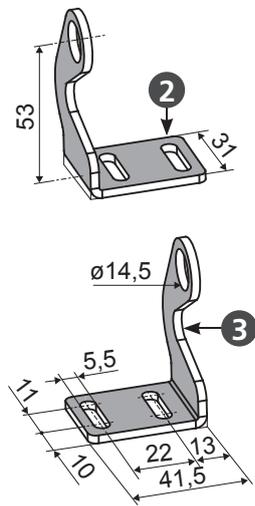
05

Casement bracket K-D3

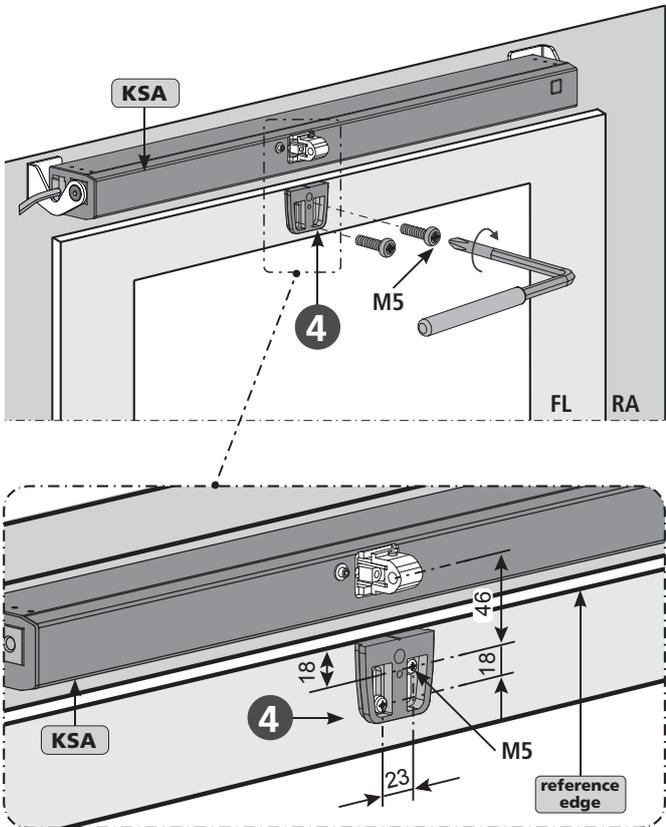
- ① Casement bracket F44
- ② 1x baseplate
- ③ 1x countersunk screw M4x10
- ④ 1x cylinder head screw M6x35



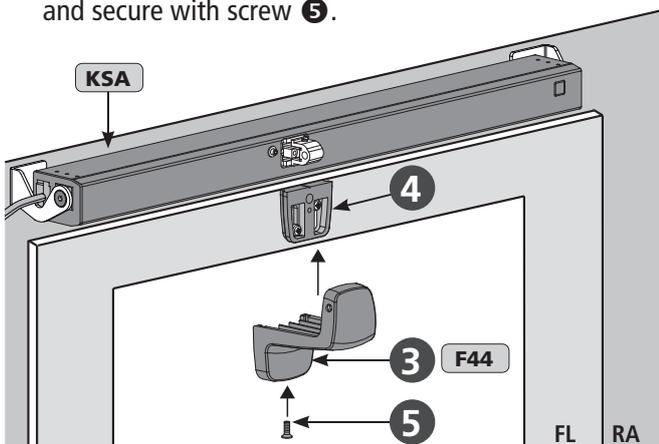
- ① Casement bracket K-C3
- ② 1x part left
- ③ 1x part right



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



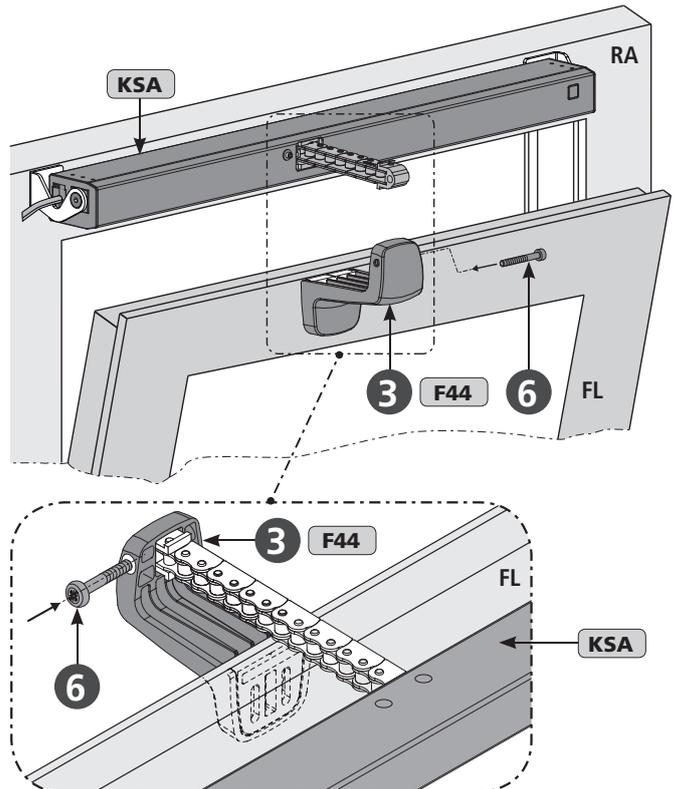
- Slide casement bracket F44 3 on the baseplate 4 and secure with screw 5.



- 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

Version 1 Concealment of the drive (e.g. due to colour change) Completely visible brackets

stroke	Version	A	B	C
250	24V	495	515	527
	230V	571	591	603
300 / 400	24V	571	591	603
	230V	647	667	679
500 / 600	24V	673	693	705
	230V	749	769	781
800	24V	774	794	806
	230V	850	870	882
1000	24V	876	896	908
	230V	952	972	984
1200	24V	978	998	1010
	230V	1054	1074	1086
1500	24V	1131	1151	1163
	230V	1207	1227	1239

cover profile only

KSA

Can be used with:
K-A1 K-B1/K-B2 K-C3 K-E1 K-E2 K84-1

Version 2 Complete concealment of the drive Partially visible brackets

stroke	Version	A	B	C	D
250	24V	515	527	571	591
	230V	591	603	647	667
300 / 400	24V	591	603	647	667
	230V	667	679	723	743
500 / 600	24V	693	705	749	769
	230V	769	781	825	845
800	24V	794	806	850	870
	230V	870	882	926	946
1000	24V	896	908	952	972
	230V	972	984	1028	1048
1200	24V	998	1010	1054	1074
	230V	1074	1086	1130	1150
1500	24V	1151	1163	1207	1227
	230V	1227	1239	1283	1303

Cover profile and installation kit

Can be used with:
K-A1 K-B1/K-B2 K84-1

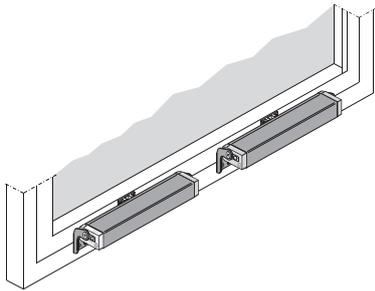
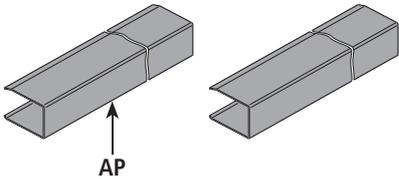
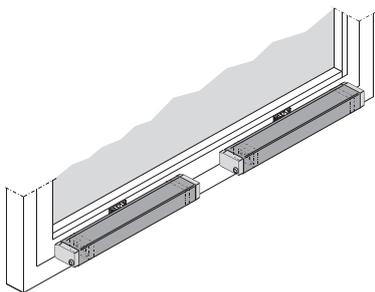
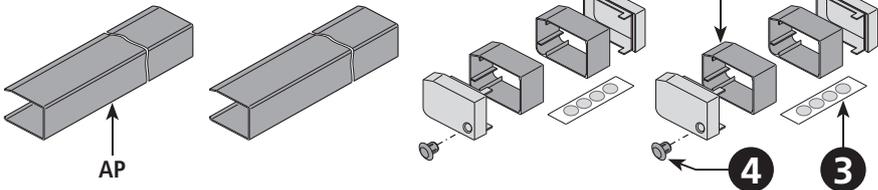
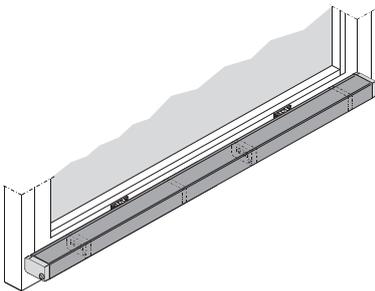
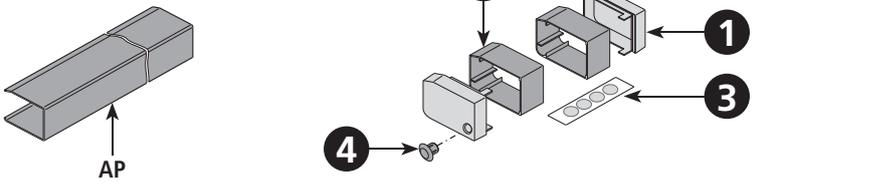
Version 3 Variable concealment (e.g. over the whole width of the window) Partially visible brackets

stroke	Version	A	B
250	24V	515	527
	230V	591	603
300 / 400	24V	591	603
	230V	667	679
500 / 600	24V	693	705
	230V	769	781
800	24V	794	806
	230V	870	882
1000	24V	896	908
	230V	972	984
1200	24V	998	1010
	230V	1074	1086
1500	24V	1151	1163
	230V	1227	1239

Cover profile and installation kit

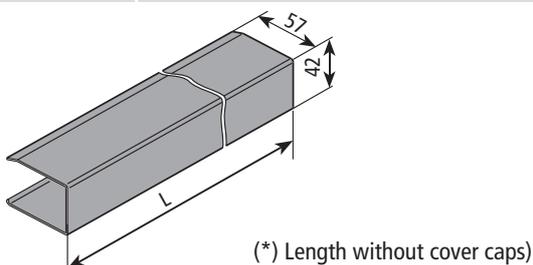
Can be used with:
K-A1 K-B1/K-B2 K84-1

Concealment options for multiple use

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

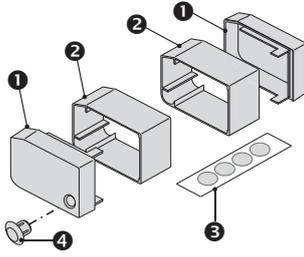
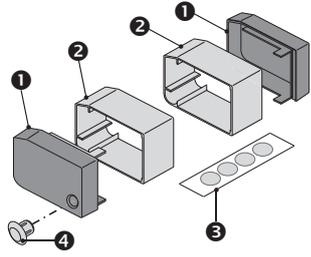
Cover-profile

Part.-No.:	524305 L = 1,45 m (*) 524310 L = 2,90 m (*) 524302 L = customized
Application:	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.
Material:	aluminium + plastic (grey)
Feature / Equipment:	incl. mounting aid for cover profile shortening on the job site + mounting set.



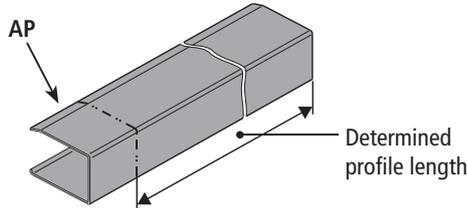
Installation Kit for cover profile (grey end caps)

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

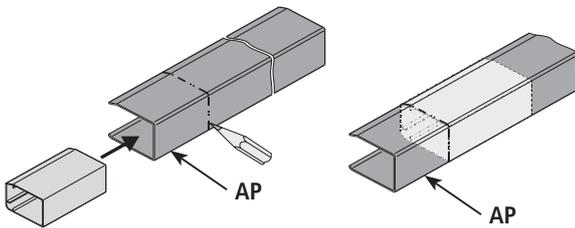
<p>Installation Kit Color: grey</p>	<p>Installation Kit Color: black</p>
	

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.



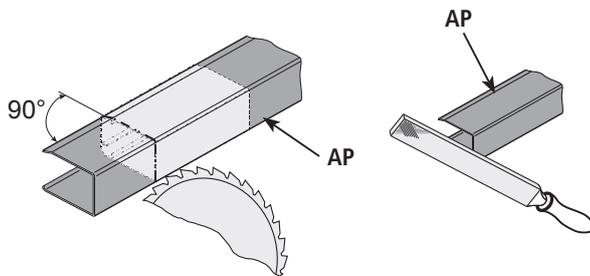
- Mark the required length.
- Push the mounting aid (piece of drive housing profile) into the cover profile AP.



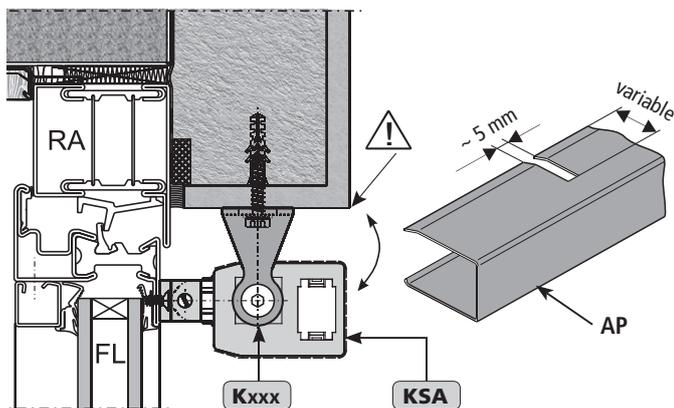
- Use a saw to shorten the cover profile AP to the required length.
- Deburr saw cut edge.



Ensure that you saw the profile perpendicular.

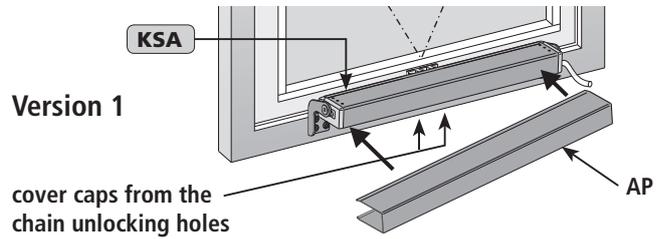


- Check the swivel area of the drive and if necessary cut out the cover profile AP in the area of the brackets.

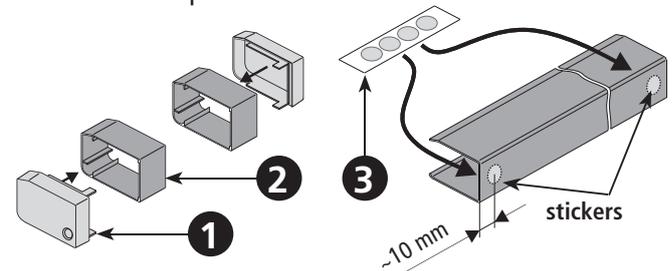


- If necessary, paint the cover profile AP with the required colour.

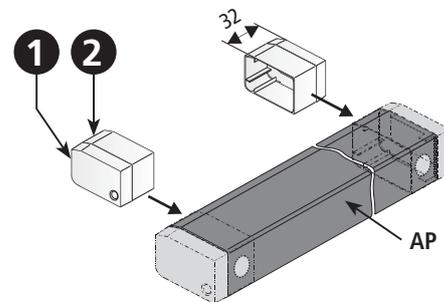
- Push on the cover profile AP so that it fits tightly. If necessary, remove the cover caps from the chain unlocking holes.



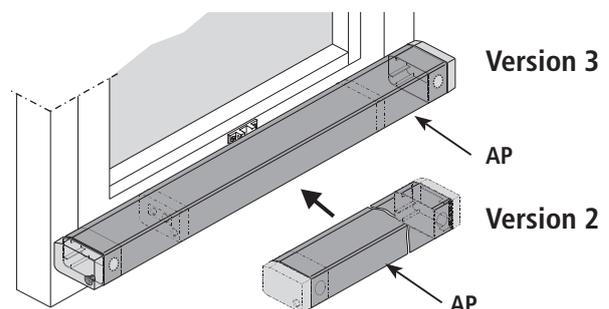
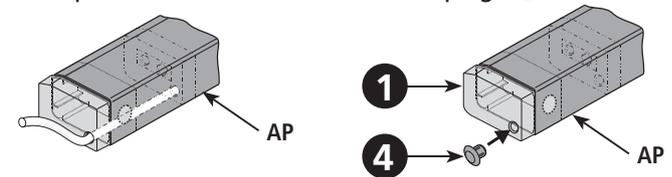
- Push end caps 1 onto the spacers 2 so that they are flush.
- Glue stickers 3 on both sides in the cover profile.
- Remove the protective film.



- 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

24V

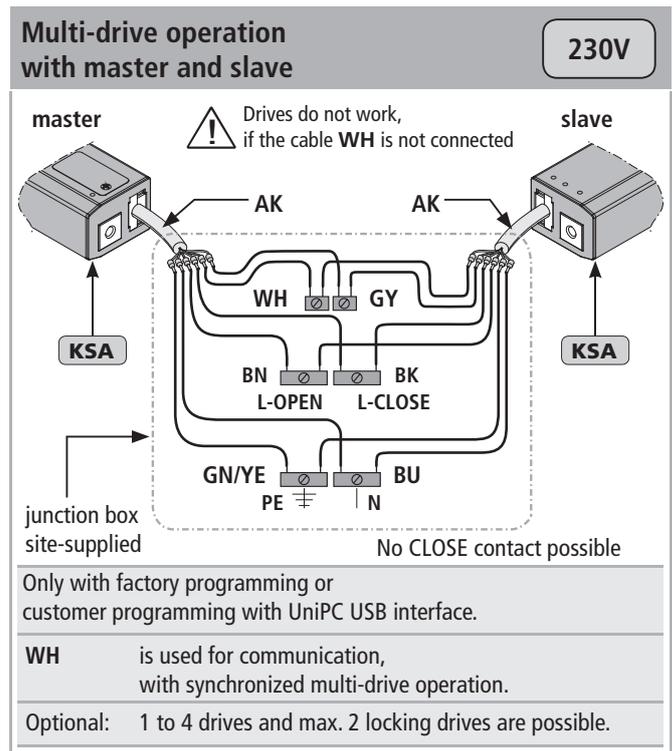
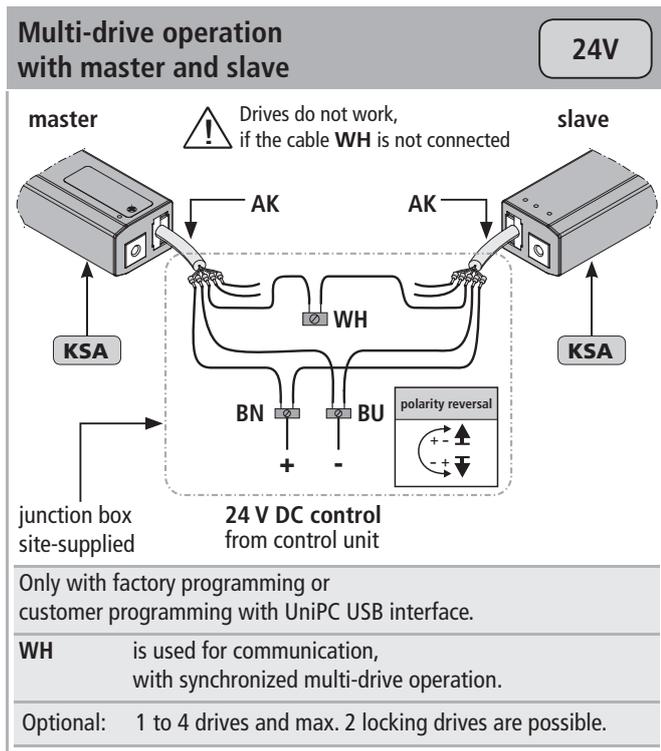
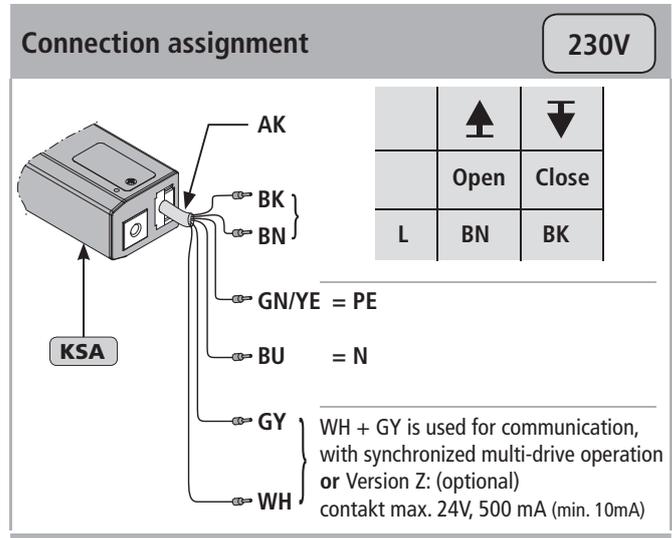
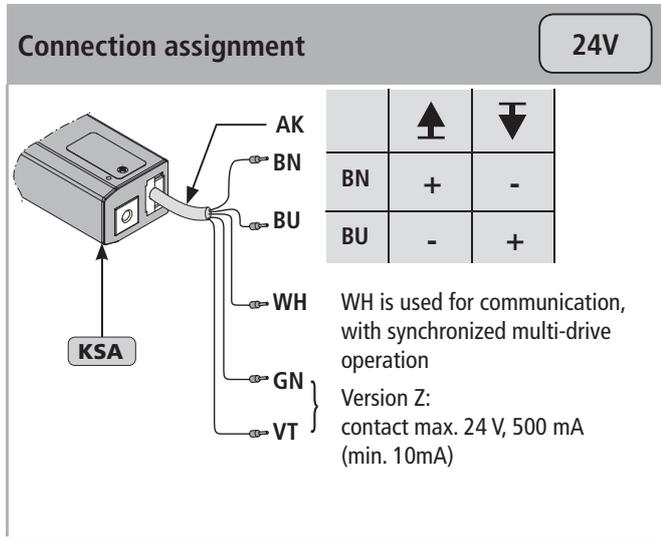
230V



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

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	
black	BK	OPEN
white	WH	
brown	BN	CLOSE
blue	BU	
green / yellow	GN / YE	polarity reversal
green	GN	
violet	VT	
grey	GY	



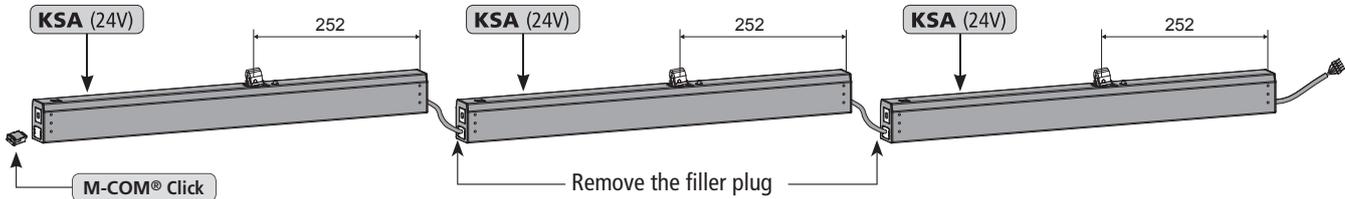
KSA-DRIVES (24V) WITH M-COM® Click

24V 230V

Multi-drive operation with M-COM® Click - series connection

AUMÜLLER chain drives have an integrated cable routing with connection sockets on both housing ends. This enables the connect multiple drives.

Individual configuration



A maximum of **three individual drives** in series connection possible. Configuration is done by M-COM® Click.

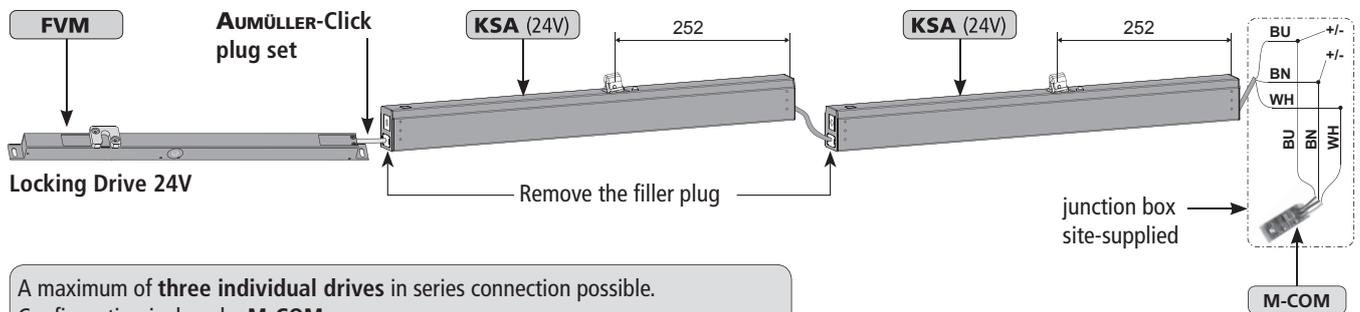
KSA-DRIVES (24V) + LOCKING DRIVE WITH M-COM

24V

Multi-drive operation with M-COM - series connection

AUMÜLLER chain drives have an integrated cable routing with connection sockets on both housing ends. This enables the connect multiple drives.

Individual configuration



A maximum of **three individual drives** in series connection possible. Configuration is done by M-COM.

Installation: M-COM® Click in series connection

M-COM® Click

KSA

Remove the filler plug with tongs

Tongs included in the scope of delivery: M-COM® Click

filler plug KSA

Remove the filler plug individually

Push locking hook with a screwdriver inwards - and depress simultaneously.

locking hook filler plug KSA

KSA-DRIVES (24V / 230V) WITH M-COM® Click

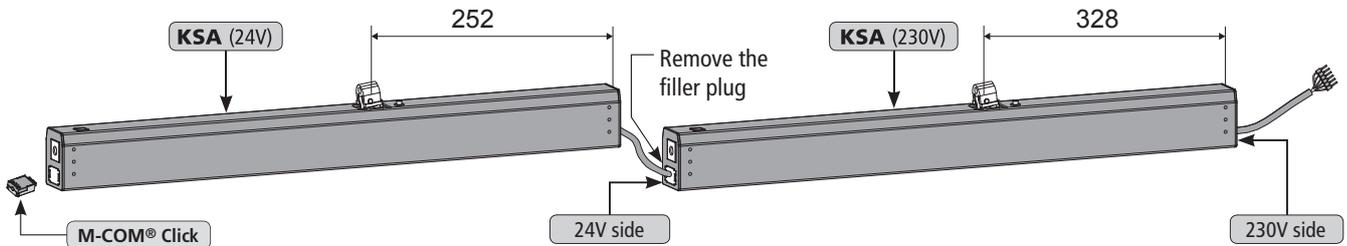
24V

230V

Multi-drive operation with M-COM® Click - series connection

AUMÜLLER chain drives have an integrated cable routing with connection sockets on both housing ends. This enables the connect multiple drives with 1x drive 230 V and 1x drive 24V - configured with M-COM® Click.

Individual configuration



KSA-DRIVES (24V/230V) + LOCKING DRIVE WITH M-COM

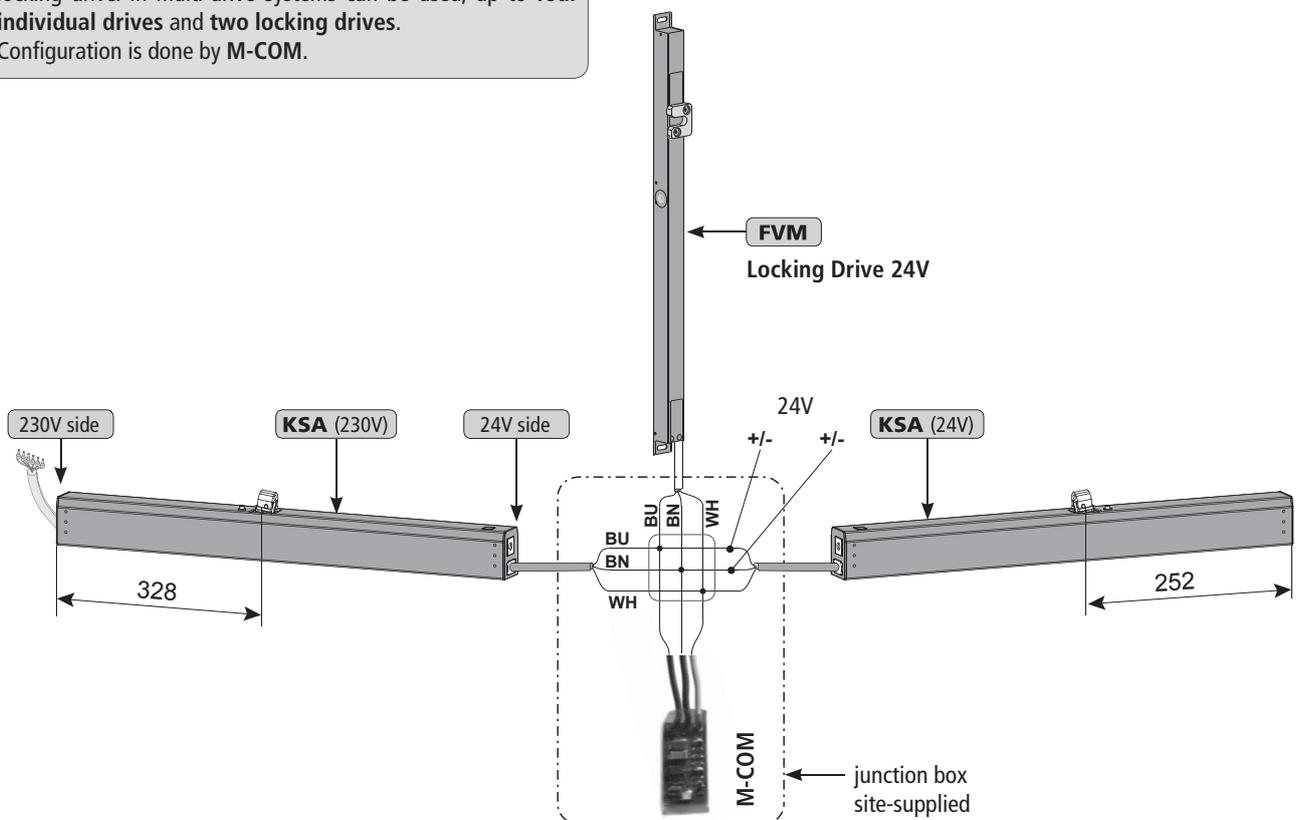
24V

230V

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 **four individual drives** and **two locking drives**. Configuration is done by M-COM.

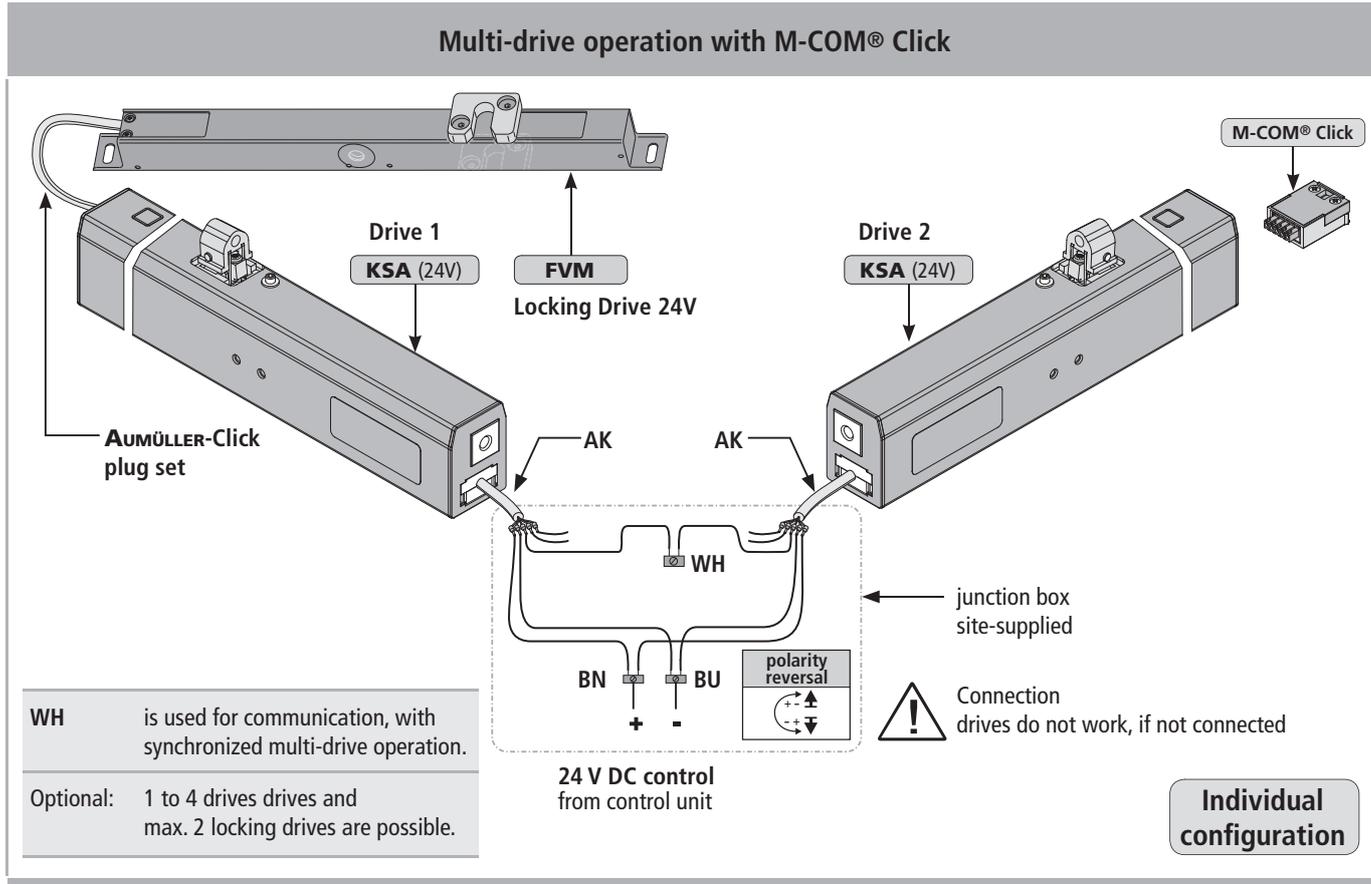
Individual configuration



BN	=	brown
BU	=	blue
WH	=	white

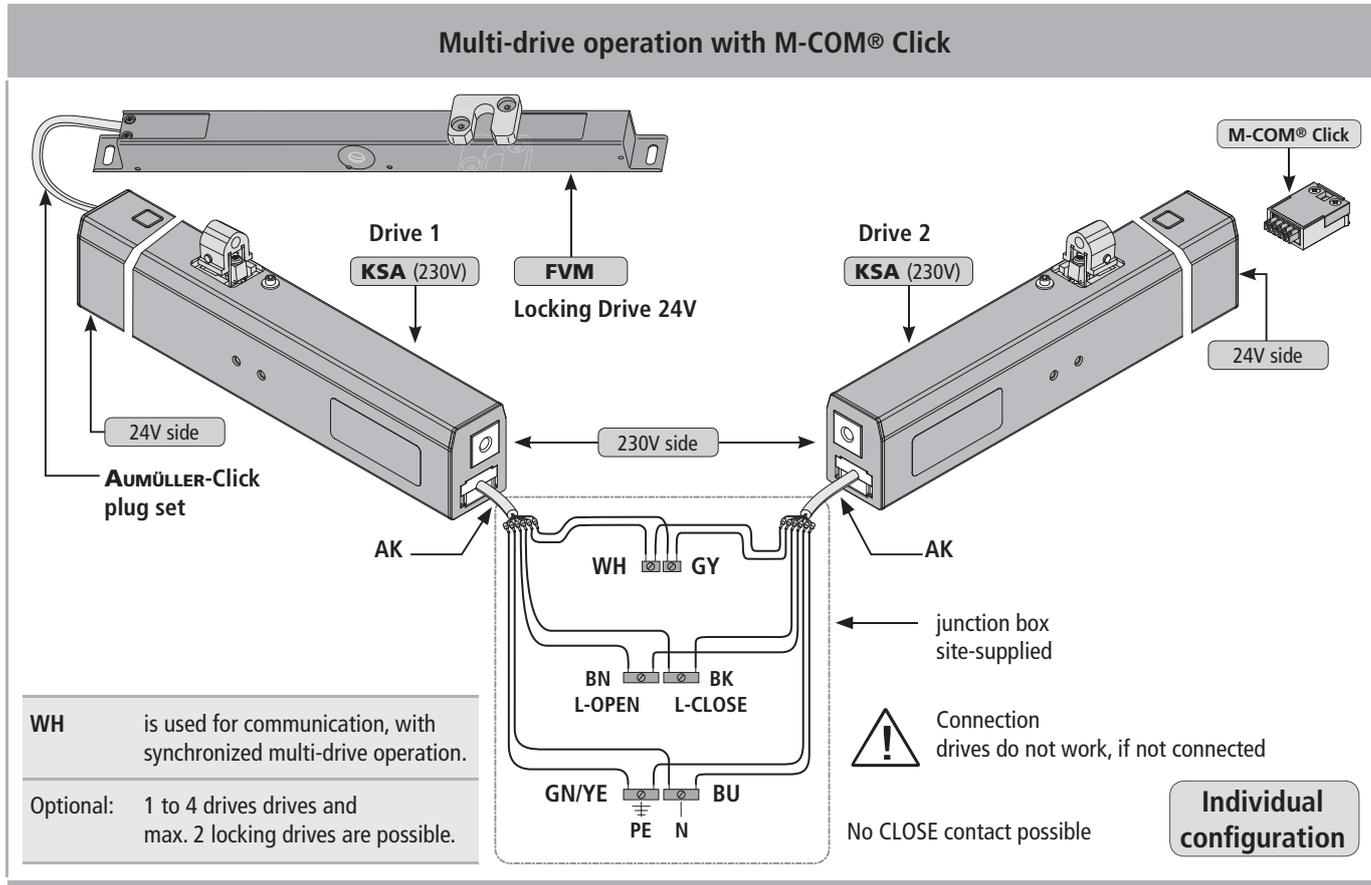
KSA-DRIVES (24V) + LOCKING DRIVE WITH M-COM® Click

24V



KSA-DRIVES (230V) + LOCKING DRIVE WITH M-COM® Click

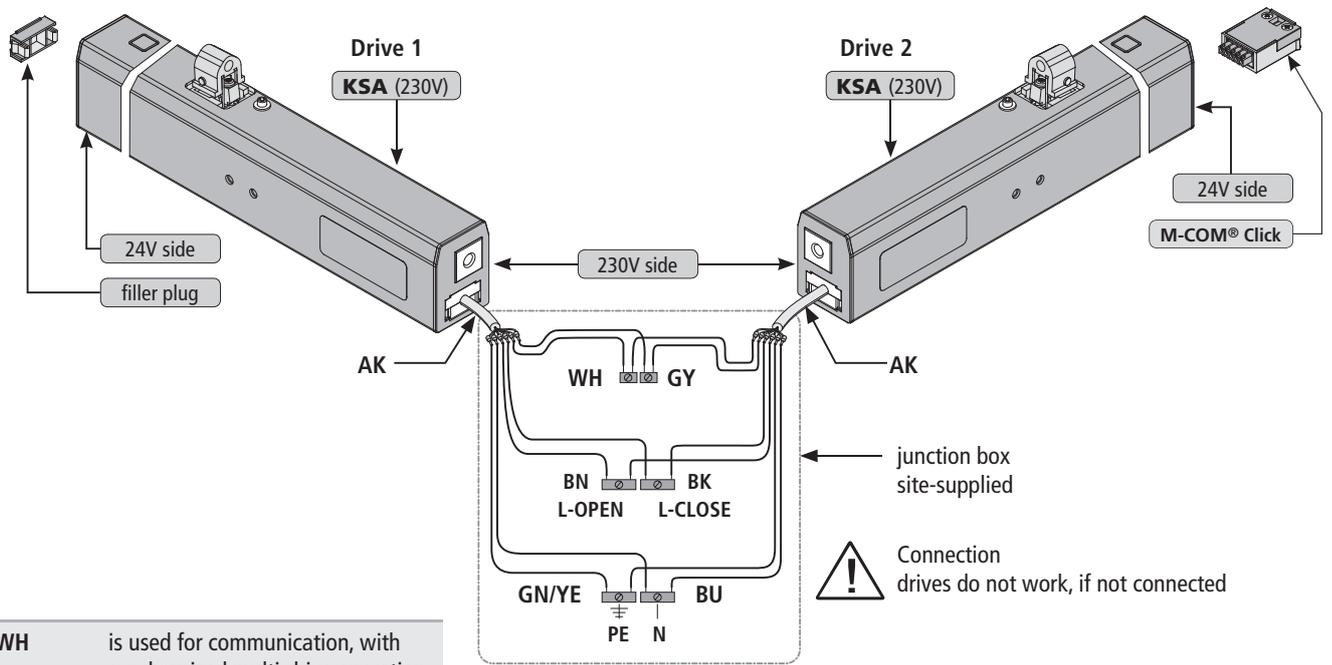
230V



KSA-DRIVES (230V) WITH M-COM® Click

230V

Multi-drive operation with M-COM® Click - star wiring



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

Optional: 1 to 4 drives drives are possible.

No CLOSE contact possible

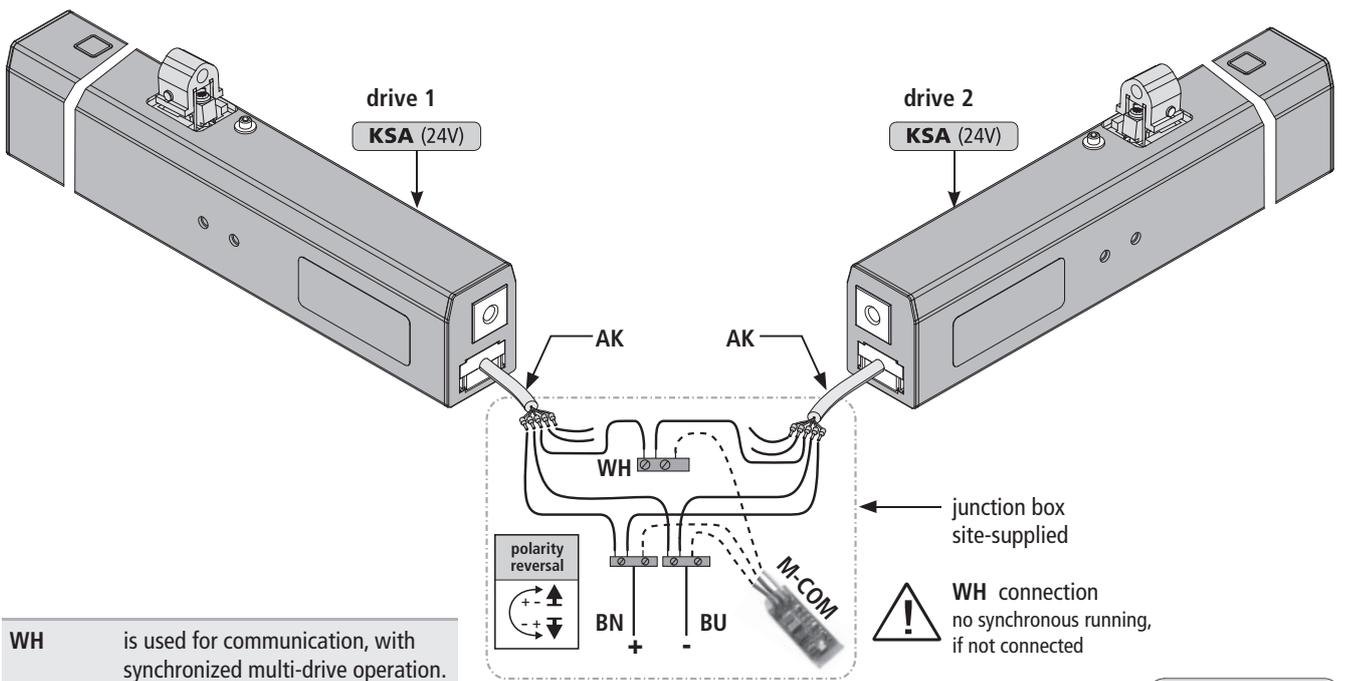
! Connection drives do not work, if not connected

Individual configuration

KSA-DRIVES (24V) WITH M-COM

24V

Multi-drive operation with M-COM



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

Optional: 1 to 4 drives drives are possible.

24 V DC control from control unit

! WH connection no synchronous running, if not connected

Individual configuration

KSA-DRIVE (230V) + LOCKING DRIVE

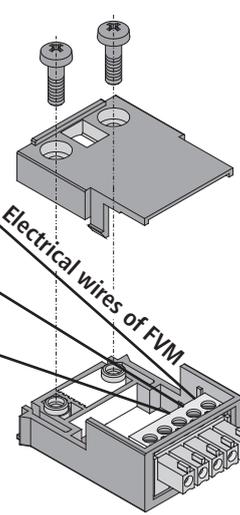
230V

Multi-drive operation (factory programming)

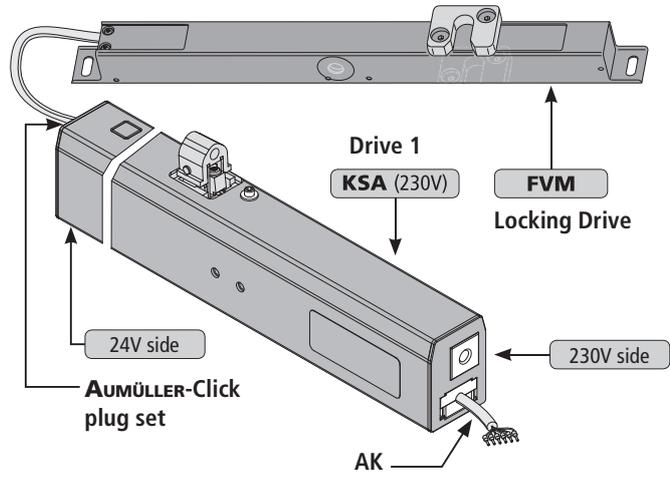
Connection assignment:
FVM with AUMÜLLER-Click plug set

AUMÜLLER-Click plug set is included.

Function	Colour	DIN IEC 757
OPEN / CLOSE	blue	BU
OPEN / CLOSE	brown	BN
Data	white	WH



Electrical wires of FVM



Individual configuration

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

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

Optional: 1 to 4 drives and max. 2 locking drives are possible.

M-COM (Main control unit)

24V

Order number:	524177
Application:	Configuration module for the automatic configuration and monitoring of max. 4 opening / 2 locking drives type S12 / S3 in multi-drive systems.
Rated voltage:	24V DC +/- 20%, (max. 2 Vss)
Current consumption:	<12 mA
Drive type:	S12
Protection class:	IP30 rubber jacket
Ambient temperature:	0 °C ... + 70 °C
Dimensions:	45 x 17 x 6 mm
Connecting wires:	3 wires 0,5 mm ² x 50 mm

Feature / Equipment:
printed circuit board with connecting wires for integration in site-supplied junction box.



M-COM® Click (Main control unit)

24V

Order number:	524167
Application:	Configuration module for the automatic configuration and monitoring of max. 4 opening / 2 locking drives type S12 / S3 in multi-drive systems.
Rated voltage:	24V DC +/- 20%, (max. 2 Vss)
Current consumption:	<12 mA
Drive type:	S12
Protection class:	IP30
Ambient temperature:	0 °C ... + 70 °C
Dimensions:	40 x 26 x 15 mm
Connection:	for AUMÜLLER chain drives with AUMÜLLER-Click plug solution.
Equipment:	Tongs for removing the M-COM® Click

Feature:
configured by simply plugging in the last drive of the multi-drive operation.
Supply lines form the line voltage 24V or 230V possible, but can only be used on the 24V side.



24V

230V

UniPC with configuration interface

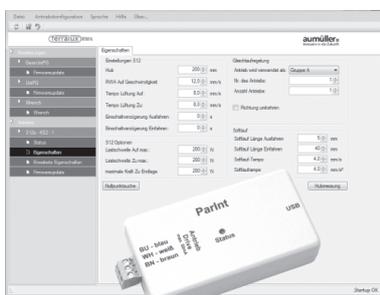
24V

230V

Order number:	524178
Application:	Hard- and software for configuration of drives supplied by AUMÜLLER AUMATIC GmbH
Rated voltage:	24V DC +/-20%
Parameterizable drives:	24V DC type S3, S12, S12 V.2 230V AC type S12, S12 V.2
Scope of delivery:	software UniPC (Downloadlink*), Interface "ParInt", USB cable, connection cable * http://www.aumueller-gmbh.de/Downloads

Features / Equipment:

Power supply 24V DC is not included in the scope of delivery!
Any extended settings require a software licence.

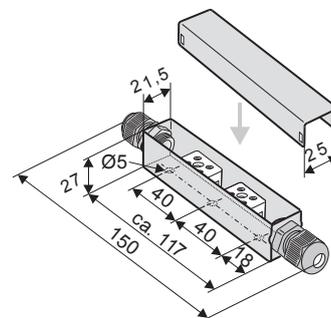


Any reconfiguration of a drive is entirely at the user's own risk and responsibility.

Cable junction box (for renewal)

24V

Order number:	513344
Application:	to extend a drive cable
Rated voltage:	only for low voltage to max. 50V DC/AC
Material:	stainless steel (V2A)
Protection class:	IP 40
Dimensions:	25 x 27 x 150 mm
Equipment:	with cable gland (grey) including strain relief, with 2 loose ceramic terminals (bipolar).



AUMÜLLER-Click plug solution

24V

Order number:	501250 - 1 m cable length - 24 V DC 501258 - 2 m cable length - 24 V DC 501251 - 3 m cable length - 24 V DC 501252 - 5 m cable length - 24 V DC 501253 - 10 m cable length - 24 V DC
Application:	Unitary plug-solution for all AUMÜLLER chain drives and AUMÜLLER folding arm drives
Rated voltage:	24V DC ($\pm 20\%$), max. 2 Vpp
Connecting cable:	non-halogen, grey 5 x 0,5 mm ²
Terminal:	to 1,5 mm ² - 5 pieces

- Flexible cable length
- Connect multiple drives in series connection
- Torsion-plug
- Locking hooks prevent withdrawal of the plug under tensile load
- Strain relief according DIN EN 60335-1 by screwing the housing halves



AUMÜLLER-Click plug solution

230V

Order number:	501271 - 1 m cable length - 230 V AC 501272 - 2 m cable length - 230 V AC 501273 - 3 m cable length - 230 V AC 501275 - 5 m cable length - 230 V AC 501280 - 10 m cable length - 230 V AC
Application:	Unitary plug-solution for all AUMÜLLER chain drives and AUMÜLLER folding arm drives
Rated voltage:	230V AC ($\pm 20\%$)
Connecting cable:	non-halogen, grey 6 x 0,75 mm ²
Terminal:	to 1,5 mm ² - 6 pieces

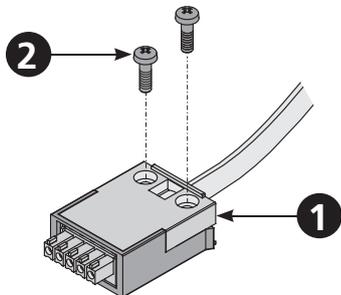
- Flexible cable length
- Connect multiple drives in series connection
- Torsion-plug
- Locking hooks prevent withdrawal of the plug under tensile load
- Strain relief according DIN EN 60335-1 by screwing the housing halves



AUMÜLLER-Click plug solution - SITE-SUPPLIED CUSTOMISED CONSTRUCTION

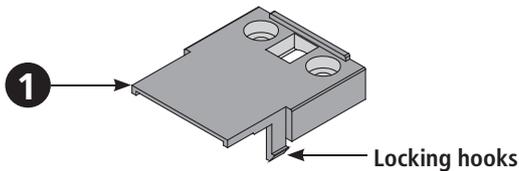
The **AUMÜLLER-Click plug solution** enabling the use of site-supplied cable. It simplifies assembly and the electrical connection of the drives.

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

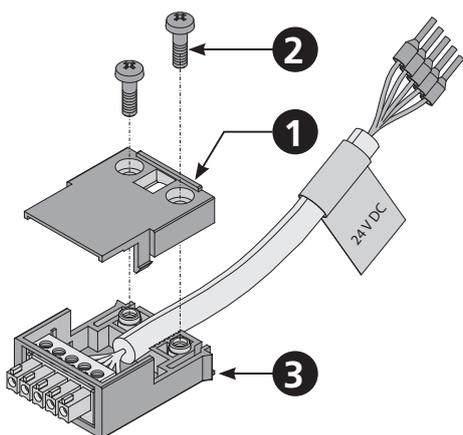
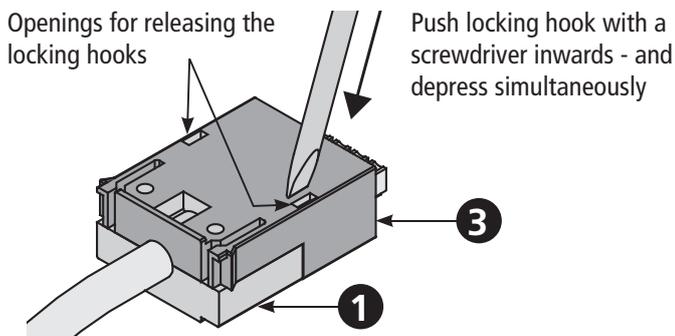


NOTE

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.



24V

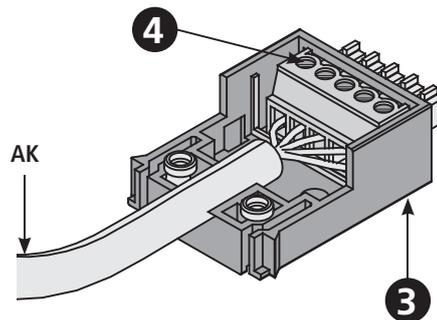
230V

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

Terminals **4** to 1,5 mm².

The performances (especially the fire behavior) of locally provided cables, must be checked on own responsibility on compliance with the application-specific local regulations!

NOTE



Connection assignment

24V

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

Connection assignment

230V

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

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

INSTALLATION STEP 11:**SUPPLY LINES OF CONTROL UNIT TO THE DRIVES**

Observe current regulations and guidelines e.g. DIN 4102-12 regarding the "Fire behavior of building materials-circuit integrity maintenance of electric cable systems" (E30, E60, E90) and the "Specimen Guideline on Conduits German designation - MLAR", and also 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

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

Calculation exampleAvailable 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)

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

$$A = 1,42\text{mm}^2 \rightarrow 1,5\text{mm}^2 \text{ chosen}$$

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 a hazard 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).

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

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 for smoke and heat exhaust systems). 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 replacement 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).

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 (e.g. SHEV/Natural smoke and heat exhaust ventilators).
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

According to the European Directive 2012/19 / EU on Waste Electrical and Electronic Equipment (WEEE) and its transposition into national law, obsolete electrical appliances must be collected separately and sent for environmentally friendly recycling.



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 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)



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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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