Assembly and Commissioning Instructions

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

KS 15 S12 24V DC - Chain Drive for Windows
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**ABBREVIATIONS**

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<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>A</td>
<td>drive</td>
</tr>
<tr>
<td>AK</td>
<td>connection cable / drive cable</td>
</tr>
<tr>
<td>AP</td>
<td>cover cap</td>
</tr>
<tr>
<td>BD</td>
<td>hinge</td>
</tr>
<tr>
<td>Fxxx</td>
<td>casement bracket</td>
</tr>
<tr>
<td>FAB</td>
<td>overall width of casement</td>
</tr>
<tr>
<td>FAH</td>
<td>overall height of casement</td>
</tr>
<tr>
<td>FG</td>
<td>casement weight</td>
</tr>
<tr>
<td>FL</td>
<td>casement</td>
</tr>
<tr>
<td>FÜ</td>
<td>casement overlap</td>
</tr>
<tr>
<td>HSK</td>
<td>main closing edge</td>
</tr>
<tr>
<td>Kxxx</td>
<td>frame bracket</td>
</tr>
<tr>
<td>L</td>
<td>construction length of drive</td>
</tr>
<tr>
<td>MB</td>
<td>central hinge</td>
</tr>
<tr>
<td>NRWG</td>
<td>NSHEV – natural smoke and heat exhaust ventilation</td>
</tr>
<tr>
<td>NSK</td>
<td>side closing edge</td>
</tr>
<tr>
<td>RA</td>
<td>frame</td>
</tr>
<tr>
<td>RAB</td>
<td>overall width of frame</td>
</tr>
<tr>
<td>RAH</td>
<td>overall height of frame</td>
</tr>
<tr>
<td>RWA</td>
<td>SHEV – smoke and heat exhaust ventilation</td>
</tr>
<tr>
<td>SL</td>
<td>snow load</td>
</tr>
<tr>
<td></td>
<td>opening direction</td>
</tr>
</tbody>
</table>

**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.

**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.
  - Failure to comply with the warning notes can result in irreversible injuries or death.
  - Failure to comply with the warning notes can lead to damage to property.

- **Warning**
  - Failure to comply with the warning notes can result in minor or moderate (reversible) injuries.

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

- **Note**
  - Risk of damage to / destruction of drives and / or windows.

**TARGET GROUP**

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

**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.**

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.
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**

**WARNING**

Intended use according

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

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

- Application for natural ventilation
  - with an installation height of the drive and the bottom side of sash of at least 2.5 m above the floor, or
  - with an opening width at the HSK of the driven part of < 200 mm by a simultaneous speed of < 15 mm/s at the HSK in closing direction.

- Application as NRWG (natural smoke and heat exhaust ventilator(s) for ventilation without dual purpose for ventilation in accordance with EN12101-2.

Pay attention to possible hazards on tilting or rotating windows, whose secondary closing edges are located at less than 2.5 m installation height above the floor, under consideration of the Control Unit and usage! We as manufacturers are well aware of our duties and responsibilities regarding the development, manufacturing and placing of safe window drives on the market and consistently implement them. Ultimately, however, we have no direct influence on the usage of our drives. Therefore, as a precaution, we point out the following:

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

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

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

- the installation height of the drive and lower edge of casement < 2.5 m above the floor
  and one of the following conditions:
  - the opening width at the HSK > 200 mm, or
  - the closing speed at the HSK is > 15 mm/s, or
  - the opening speed at the HSK is > 50 mm/s, or
  - the closing force at the HSK is > 150 N

The following flow chart can be applied, which also includes the protective measures in accordance with EN 60335-2-103/2016-05.
The casement measurements supplied are only for orientation purposes.

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

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.

**Warning**

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.

**Note**

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!

**Warning**

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**

<table>
<thead>
<tr>
<th>Side-hung</th>
<th>Bottom-hung</th>
<th>Roof windows / skyskylight domes</th>
<th>Louvre windows</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Danger spots: crush and shear points according to DIN EN 60335-2-103" /></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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.

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.

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.

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 setup 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.

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

CAUTION

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

WARNING

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

Replacement parts, fasteners and controls
The drive shall only be operated with control devices from the same manufacturer. There is no liability, warranty or customer service if third-party parts are used. Exclusively original 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

DATA SHEET KS 15 S12 24V

- Application: natural ventilation, RWA
- Symmetrical chain output
- Internal Intelligent Control Electronics S12
- Feedback limit position „CLOSE“ (max. 24V, 500 mA)
- Integrated plug solution

Options
- Programmable special functions
- Programmable feedback limit position „OPEN“ (max. 24V, 500 mA)
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

TECHNICAL DATA

\[
\begin{align*}
U_n & \quad \text{Rated voltage} \quad 24\text{V DC (19 V ... 28 V)} \\
I_n & \quad \text{Rated current} \quad 3.75 \text{ A} \\
I_c & \quad \text{Cut-off current} \quad 5 \text{ A} \\
P_n & \quad \text{Rated power} \quad 90 \text{ W} \\
\text{DC} & \quad \text{Duty cycle} \quad 5 \text{ cycles (ED 30 % - ON: 3 min./OFF: 7 min.)} \\
\text{Protection rating} & \quad \text{IP 20} \\
\text{Ambient temperature range} & \quad -5 \degree \text{C ... +60 \degree \text{C}} \\
F_p & \quad \text{Pulling force max.} \quad \begin{align*} 
& \quad \bullet \ 300 \text{ N to 1.500 N freely adjustable} \\
& \quad \bullet \ \text{preset 1500N, soft run 300N} \\
F_s & \quad \text{Pushing force max.} \quad 1.500 \text{N, to 1.000 mm linear} \\
F_h & \quad \text{Pullout force} \quad 5.000 \text{ N (fastening depended)} \\
\text{Chain} & \quad \text{High-quality, robust and nickel-plated steel chain} \\
\text{Connecting cable} & \quad \text{non-halogen, } \varnothing \text{ 9 mm, grey} \\
& \quad 5 \times 1 \text{ mm}^2, ~ 3 \text{ m} \\
v & \quad \text{Speed} \quad \begin{align*} 
& \quad \bullet \ 6.0 \text{ mm/s to 17 mm/s, freely adjustable} \\
& \quad \bullet \ \text{preset 17 mm/s} \\
s & \quad \text{Stroke} \quad 250 \text{ – 1000 mm} \\
L & \quad \text{Length} \quad \text{see order data} \\
\text{Feedback contact} & \quad \text{limit position „CLOSE“ (max. 24V, 500 mA)} \\
\text{Sound pressure level} & \quad \leq 70 \text{ dB (A)}
\end{align*}
\end{align*}
\]

ORDER DATA

<table>
<thead>
<tr>
<th></th>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>800</td>
<td>800</td>
<td>KS 15 800 S12 24V</td>
<td>E6/C-0</td>
<td>1</td>
<td>525380</td>
</tr>
<tr>
<td>1000</td>
<td>920</td>
<td>KS 15 1000 S12 24V</td>
<td>E6/C-0</td>
<td>1</td>
<td>525400</td>
</tr>
</tbody>
</table>

Set: Frame bracket and casement bracket (kit)

| Set: Frame bracket unit KS 15 Schüco AWS S7 RO | K153: Stainless steel, vibratory grinding Aluminium, E6/C-0 | 1 | 524080 |
| Set: Frame bracket unit KS 15 Raico FRAME+100/120 Ri | K154: Stainless steel, vibratory grinding Aluminium, E6/C-0 | 1 | 524085 |
Options

<table>
<thead>
<tr>
<th>OPTIONS</th>
<th>PU / pcs.</th>
<th>Part.-No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Special model</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive housing painted/powder coated in other RAL colours</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lump sum for coating</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specify at order stage:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plug solution:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Aumüller</strong>-Click plug solution - 5 m – non-halogen, grey – 5 x 1,0 mm²</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microprocessor programming S12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Electronic stroke reduction 24V S12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Programming drives 24V / 230V S12</td>
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</tr>
<tr>
<td><strong>OPTIONAL ACCESSORIES</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-COM Configuration module for synchronised multi-drive systems</td>
<td>1</td>
<td>524177</td>
</tr>
</tbody>
</table>

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).
**Areas of Application and Casement Sizes**

<table>
<thead>
<tr>
<th>Areas of application and casement sizes:</th>
<th>Roof window</th>
</tr>
</thead>
</table>
| **Top-hung casement and bottom-hung casement** | **FAB min.** = L + 100 mm  
**FAB > 1,80 meter** = 2 drives | **total weight casement including snow load** |
| **Total weight casement including snow load** | **KS 15** 800 mm stroke ≤ max. 220 kg  
**KS 15** 1000 mm stroke ≤ max. 220 kg |
| **Snow load on roof windows for RWA-systems** | **Example calculation:** Establish snow loading based on national standards /directives  
(in Germany according to EN 1991-3) |
| **Example:** snow load = 100 kg  
(Casement area x Typical snow load) | **Example calculation:**  
**total weight**  
= FG + snow load  
**total weight**  
= (100 kg + 100 kg snow load) = 200 kg |

To increase the profile statics, equip the window with additional stiffening elements.
**INSTALLATION STEP 1: INSPECTION BEFORE THE INSTALLATION**

**Warning**

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

**Storage of drives at the construction site**

Protective measures against damages, dust, moisture or contamination shall be taken. Store drives immediately 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.

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.

**Caution**

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).

### Check window data on site
- **Weight**
  \[ \text{weight} = \text{FAB} \cdot \text{FAH} \cdot \text{Glass thickness} \cdot 2.5 \cdot 1.1 \]

### Scope of delivery:
Prior to assembly, check items quantity in the delivery for completeness.

### Tools required
- Marker,
- Grains,
- Hammer,
- Screwdriver (slotted-head, cross or Torx) sized 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).
**Installation Step 3: Frame Brackets and Casement Bracket (Set: Schüco + Raico)**

<table>
<thead>
<tr>
<th>Frame Brackets (different frame brackets for Schüco and Raico)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Frame bracket (Set: Schüco)</strong></td>
</tr>
<tr>
<td>1 Frame bracket K153 (for Schüco)</td>
</tr>
<tr>
<td>8 1x Frame bracket - part left</td>
</tr>
<tr>
<td>9 1x Frame bracket - part right</td>
</tr>
<tr>
<td><strong>Frame bracket (Set: Raico)</strong></td>
</tr>
<tr>
<td>1 Frame bracket K154 (for Raico)</td>
</tr>
<tr>
<td>8 1x Frame bracket - part left</td>
</tr>
<tr>
<td>9 1x Frame bracket - part right</td>
</tr>
<tr>
<td>10 1x Mounting block</td>
</tr>
</tbody>
</table>

**Casement bracket (the same casement bracket for Schüco and Raico)**

<table>
<thead>
<tr>
<th>Casement bracket F54</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 1x Baseplate</td>
</tr>
<tr>
<td>3 2x Bearing block</td>
</tr>
<tr>
<td>4 4x Screw M5x30</td>
</tr>
<tr>
<td>5 1x Chain-adapter</td>
</tr>
<tr>
<td>6 1x Cylinder head screw M5x30</td>
</tr>
</tbody>
</table>

**Note**

Screws 11 - for mounting on the window - are to be provided by the customer!
Outward opening roof window - frame mounting - Schüco AWS 57RO

To increase the profile statics, equip the window with additional stiffening elements.

Outward opening roof window - frame mounting - Raico FRAME+100/120RI

To increase the profile statics, equip the window with additional stiffening elements.

Top-hung outward opening - frame mounting (Mounting universal for facade)

To increase the profile statics, equip the window with additional stiffening elements.
**Installation Step 4: Hole Layout for Frame Brackets and Casement Brackets**

Roof window outward opening - hole layout - frame mounting

To increase the profile statics, equip the window with additional stiffening elements.

---

**Hole Layout for Frame Brackets and Casement Brackets**

To increase the profile statics, equip the window with additional stiffening elements.

---

**Assembly Instruction**

KS 15 S12 24V DC
**INSTALLATION STEP 5: ASSEMBLY FRAME BRACKET**

- Determine fastenings for frame brackets **Kxxx**.
- Produce drill holes with appropriate cross-section.

**NOTE**

Screws - for mounting on the window - are to be provided by the customer!

**Hole layout - frame bracket Kxxx**

For further mounting dimensions, please refer to the hole layouts „INSTALLATION STEP 3 AND 4“ or project-specific documents and drawings.

**NOTE**

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

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

- Mout the frame brackets **Kxxx** - with on-site screws (M6) - to the frame.

Make sure it is parallel to casement edge.

Screws and rivet nuts provided on-site

Example: Schüco

Example: Schüco (bei Hub 800)

Example: Schüco (bei Hub 1000)

Example: Schüco

**Example: Schüco**

Example: Schüco

Example: Schüco

Example: Schüco

Example: Schüco

Example: Schüco

Example: Schüco

Example: Schüco
**INSTALLATION STEP 6: ASSEMBLY CASEMENT BRACKETS AND THE DRIVE**

- Determine fastenings for casement brackets F54 ②.
- Produce drill holes with appropriate cross-section.

**NOTE**
Screws - for mounting on the window - are to be provided by the customer!

### Hole layout

**Baseplate ① of casement brackets F54 ②**

For further mounting dimensions, please refer to the hole layouts „INSTALLATION STEP 3 AND 4“ or project-specific documents and drawings.

**NOTE**

- **Fit the baseplate ③ of the casement bracket F54 ② at casement.**
  - Make sure it is parallel to casement edge.
  - Center of the casement bracket F54 ② and center of the drive KS 15 must be in line.

- **Connect control voltage of the drive KS 15 (e.g. using a tester).**
- **Move out the chain of drive KS 15 approx. 100 to 150 mm.**
  
**NOTE**
For multi-drive operation actuate all drives KS 15 together.
(see chapter: ELECTRIC CONNECTION)

- **Insert the chain-adapter ⑥ of the casement bracket F54 ② into the first chain-part of the drive KS 15.**
  - Note from the chain the rigid-backed stiffness and from the chain-adapter ⑥ the waistband side of the casement bracket F54 ②!
- **Secure the chain with screw M5x30 ⑦.**

**NOTE**
For multi-drive operation actuate all drives KS 15 together.
(see chapter: ELECTRIC CONNECTION)

- **Mount the first bearing block ④ of the casement bracket F54 ② on the baseplate ③ - with screws ⑤.**

**NOTE**
Screws - for mounting on the window - are to be provided by the customer!
Assembly Instruction

KS 15 S12 24V DC

Insert the chain-adapter 3 in the first bearing block 4.

Mount the second bearing block 4 on the base plate 3 - with screws 5.

Retract the chain of the drive KS 15 so far, that the two mounting bolts 8 are at the same height as the casement brackets Kxxx 1.

Insert the two mounting bolts 8 of the drive KS 15 in the frame brackets Kxxx 1.

Insert the mounting bolts in the frame brackets

Insert the two mounting bolts 8 of the drive KS 15 by 90°.

Tighten the pin screw 9 - of the mounting bolts 8 - (max. 4 Nm).

Insert the two mounting bolts 8 of the drive KS 15 by 90°.

Turn the two mounting bolts 8 of the drive KS 15 by 90°.

Tighten the pin screw 9 - of the mounting bolts 8 - (max. 4 Nm).

The drive KS 15 - including connection cable - should freely swivel between the frame brackets Kxxx 1.

Note the cable routing!
(see chapter: CABLE ROUTING)

Note the softlauf modus!
(see chapter: SOFT RUN MODE)

Check swiveling area! (see chapter: SAFETY CHECK AND TEST RUN).
**INSTALLATION STEP 7: CABLE ROUTING**

<table>
<thead>
<tr>
<th>Cable in the window frame</th>
<th>Cable in glued cable duct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drill hole for cable Ø 9 in the window frame (cable bushing protects against damage to cable).</td>
<td>Glued cable duct (in addition secured with countersunk screws against breaking away).</td>
</tr>
</tbody>
</table>

**Connection cable routing on the window frame:**
- 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 cable protection hose or cable bushings.

---

⚠️ Upon removal of the glazing bead is the danger that the glass may fall.
**INSTALLATION STEP 8: ELECTRIC CONNECTION**

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)”.

---

**Connection assignment**

<table>
<thead>
<tr>
<th>BN</th>
<th>BU</th>
<th>WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>+</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>-</td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>

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

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

---

**Wire colour coding**

<table>
<thead>
<tr>
<th>Colour</th>
<th>DIN IEC 757</th>
</tr>
</thead>
<tbody>
<tr>
<td>white</td>
<td>WH</td>
</tr>
<tr>
<td>brown</td>
<td>BN</td>
</tr>
<tr>
<td>blue</td>
<td>BU</td>
</tr>
<tr>
<td>green</td>
<td>GN</td>
</tr>
<tr>
<td>violet</td>
<td>VT</td>
</tr>
<tr>
<td>grey</td>
<td>GY</td>
</tr>
</tbody>
</table>

---

**Direction of travel**

- OPEN  
  
- CLOSE

---

**Polarity reversal**

---

**Multi-drive operation: KS 15 and locking drives**

**Configuration with M-COM**

**Opening drive as Master / Slave**

---

**WH**: is used for communication, with synchronized multi-drive operation. Drives does not work, if the cable WH is not connected.

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

---

Assembly Instruction  
KS 15 S12 24V DC
**Electric Connection configured with M-COM**

Multi-drive operation with M-COM and locking drives - 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 (See Assembly and Commissioning Instructions M-COM).

### M-COM (Main control unit)

<table>
<thead>
<tr>
<th>Feature / Equipment:</th>
<th>524177</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application:</td>
<td>Configuration module for the automatic configuration and monitoring of max. 4 opening drives / 2 locking drives type S12 / S3 in multi-drive systems.</td>
</tr>
<tr>
<td>Rated voltage:</td>
<td>24V DC (19 V ... 28 V)</td>
</tr>
<tr>
<td>Current consumption:</td>
<td>&lt;12 mA</td>
</tr>
<tr>
<td>Protection class:</td>
<td>IP30 rubber jacket</td>
</tr>
<tr>
<td>Ambient temperature:</td>
<td>0 °C ... + 70 °C</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>45 x 17 x 6 mm</td>
</tr>
<tr>
<td>Connecting wires:</td>
<td>3 wires 0,5 mm² x 50 mm</td>
</tr>
</tbody>
</table>

### UniPC with configuration interface

<table>
<thead>
<tr>
<th>Feature / Equipment:</th>
<th>524178</th>
</tr>
</thead>
<tbody>
<tr>
<td>Application:</td>
<td>Hard- and software for configuration of drives supplied by AUMÜLLER AUTOMATIC GmbH</td>
</tr>
<tr>
<td>Rated voltage:</td>
<td>24V DC +/-20%</td>
</tr>
<tr>
<td>Parameterizable drives:</td>
<td>24V DC type S3, S12, S12 V.2</td>
</tr>
<tr>
<td>Scope of delivery:</td>
<td>230V AC type S12, S12 V.2</td>
</tr>
<tr>
<td>Scope of delivery:</td>
<td>software UniPC (Downloadlink*), Interface &quot;ParInt&quot;, USB cable, connection cable</td>
</tr>
</tbody>
</table>

* *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.
Installation Step 9: 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!

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

\[ A_{\text{mm}^2} = \frac{I_{\text{A (total)}} \times L_{\text{m (length supply line)}} \times 2}{2.0 \times (\text{voltage drop}) \times 56 \text{ m} / (\Omega \times \text{mm}^2)} \]

Calculation example

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

\[ A = \frac{(2 \times 4.0A) \times 10m + 2}{2.0V \times 56m / (\Omega \times \text{mm}^2)} \]

\[ A = 1.42 \text{mm}^2 \rightarrow 1.5 \text{mm}^2 \text{ chosen} \]

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 10: Soft Run Mode

Soft run setting for drives with S12

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.
- In soft run mode the zero-point - and thus the CLOSE-position of the window - is recognized.
- The drives with S12 must turn off in the soft run range (about 40 mm in front of the CLOSE-position).
- In closing direction in case of overload outside the 40 mm soft run range, the chain moves out by approximately 10 mm.

Installation Step 11: 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 Automatic 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:

<table>
<thead>
<tr>
<th>Problem</th>
<th>Possible causes</th>
<th>Possible solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive does not start</td>
<td>• Duration of mains power supply too short</td>
<td>• Adjust supply voltage as specified in the technical documentation</td>
</tr>
<tr>
<td></td>
<td>• Drive run direction not correct</td>
<td>• Check drive cables</td>
</tr>
<tr>
<td></td>
<td>• Connecting cable not connected</td>
<td>• Check all connection cables</td>
</tr>
<tr>
<td></td>
<td>• Power supply / Control Unit voltage incorrect, too high or too low (see data sheet)</td>
<td>• Check power supply unit and replace if necessary</td>
</tr>
<tr>
<td></td>
<td>• No mains supply to power supply unit / Control Unit (no voltage)</td>
<td>• Connect power supply</td>
</tr>
<tr>
<td></td>
<td>• Drive has shut down on overload</td>
<td>• First move drive in CLOSE position</td>
</tr>
<tr>
<td>Drive doesn’t start after having been in operation several times</td>
<td>• Operating time has been exceeded, drive has been overheated</td>
<td>• Wait until drive has cooled down and start again</td>
</tr>
<tr>
<td></td>
<td>• See possible solutions above associated with „Drive doesn’t start“</td>
<td>• See possible solutions associated with: “Drive doesn’t start“</td>
</tr>
<tr>
<td>Drive doesn’t close</td>
<td>• Closing edge safety mechanism has been triggered</td>
<td>• Release safety area for operation and reset closing edge safety mechanism</td>
</tr>
<tr>
<td></td>
<td>• See possible solutions above associated with „Drive doesn’t start“</td>
<td>• See possible solutions associated with: “Drive doesn’t start“</td>
</tr>
<tr>
<td>Drive travels uncontrollably in open and close direction</td>
<td>• Residual ripple of power supply / control unit too high</td>
<td>• Adjust drive voltage to the required value of drive. (values see data sheet of drive)</td>
</tr>
<tr>
<td></td>
<td>• Fault in power supply unit / control unit</td>
<td>• Check output voltage of power supply unit or control unit</td>
</tr>
<tr>
<td>Drive closes, but after about 10 mm the drive open</td>
<td>• Close the window outside the 40 mm (Soft run mode).</td>
<td>• Drive mounted so, that the closing process takes place within the 40 mm (e.g. use spacer under the casement bracket).</td>
</tr>
</tbody>
</table>

MAINTENANCE AND REPAIR

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 AUTOMATIC 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. RWA/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 Automatik GmbH**.

Contact data are available at our homepage **(www.aumueller-gmbh.de)**
CERTIFICATE AND DECLARATION OF CONFORMITY

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

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

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

Technical file and declaration at firm:

AUMÜLLER AUTOMATIC 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 AUTOMATIC 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)

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