Assembly and Commissioning Instructions

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

OFV1 - Locking drive for windows
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**Abbreviations**

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<td>drive</td>
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<td>AK</td>
<td>connection cable / drive cable</td>
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<td>AP</td>
<td>cover cap</td>
</tr>
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<td>BD</td>
<td>hinge</td>
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<td>Fxxx</td>
<td>casement bracket</td>
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<tr>
<td>FAB</td>
<td>overall width of casement</td>
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<td>FAH</td>
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<td>FG</td>
<td>casement weight</td>
</tr>
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<td>FL</td>
<td>casement</td>
</tr>
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<td>casement overlap</td>
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<td>HSK</td>
<td>main closing edge</td>
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<td>Kxxx</td>
<td>frame bracket</td>
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<td>L</td>
<td>construction length of drive</td>
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<tr>
<td>MB</td>
<td>central hinge</td>
</tr>
<tr>
<td>NSK</td>
<td>side closing edge</td>
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<td>RA</td>
<td>frame</td>
</tr>
<tr>
<td>RAB</td>
<td>overall width of frame</td>
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<td>SL</td>
<td>snow load</td>
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**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.
- **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.

**Danger / Warning**

- Danger due to electric current.

**Caution / Warning**

- 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.

**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**

- 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.
**Preliminary remark**

**INTENDED USE**

**Area of application / Scope of application**

This drive is intended for the electromotive locking and unlocking 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 safe 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 a drive to a movable element of the window a so-called "power-operated window" is created which, according to the Machinery Directive 2006 / 42 / EG, represents a machine.

**Intended use according**

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

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

- **Application for natural ventilation**
  - with an installation height of the drive and the bottom side of sash of at least 2,5 m above the floor, **or**
  - with an opening width at the HSK of the driven part of < 200 mm by a simultaneous speed of < 15 mm/s at the HSK in closing direction.

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

The manufacturer of the power-operated window has to carry out a risk assessment for all other applications independently - at the installation-site of the window.

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!

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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.
Preliminary Remark

Hazard analysis according to DIN EN 60335-2-103

- NSHEV according to EN12101-2 without dual purpose for ventilation
- NSHEV according to EN12101-2 with dual purpose for ventilation (1.Z.109)

Use of the drive

- Natural ventilation

- Installation height of drive and lower edge of casement: > 2,5 m above floor (ZAA.20.2)
- Opening at HSK: < 200 mm and Speed at HSK: CLOSE <15 mm/s / OPEN < 50 mm/s (20.ZAA.2)

Risk analysis according to the Machinery Directive required

- Hold-to-run switch: stops movement at HSK < 20 mm at a closing force of > 150 N at HSK (20.ZAA.5)
- Operating element in direct range of vision: a.) Key switch or b.) other switch, then: installation > 1,5 m, inaccessible for public (7.12.1)

- Contact-free anti-trap protection (20.ZAA.8.1)
- Passive infra-red and active light sensors or pressure mats

- Contact-based anti-trap protection (20.ZAA.8.2)
- Pressure-sensitive safety switch strips or Motor current monitoring systems (internal and external)

- Declaration of Conformity power operated window + CE label

Casement data

Facade:
- bottom-hung window, top-hung-window, side-hung window.
- roof window / sky light.

Opening direction:
- inward opening, 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),
- casement size (FAB x FAH),
- 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 opening-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 applications! 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 legal 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 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 / skylight domes</th>
<th>Louvre windows</th>
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</table>
| ![Danger spots: crush and shear points according to DIN EN 60335-2-103](image) |安全规定

重要的是要遵循这些指示，以确保人员的安全。这些指示应保存在安全的地方，以供产品整个服务寿命使用。

风险：压碎和卡住！

窗户可以自动关闭！

集成的负荷切断停止开动驱动装置在闭合和开动时，驱动装置超载。

压缩力完全足以在不小心的情况下压碎手指。

区域应用

该驱动器仅可根据其预定用途使用。对于其他应用，请咨询制造商或其授权经销商。

切勿误用此驱动器进行其他应用！切勿允许儿童玩此驱动器或其调节和 / 或控制单元，包括远程控制！

始终检查系统是否符合当前法律法规。特别注意必须根据开启宽度、开启面积、开启时间和开启速度的开启窗户，驱动器 / 外部设备和电缆以及连接电缆的横截面作为函数的电缆长度和功率消耗。

所有设备必须在受到泥土和湿气损坏时得到永久保护，如果驱动器不是专门用作湿区（见技术数据）。

安装

这些说明适用于专家和安全意识强的电工和 / 或具备电气和机械驱动安装知识的合格人员。

正确和安全地操作，避免对人员和财产造成伤害，以及风险，仅可根据这些安装说明进行。

所有安装说明必须单独检查，并根据需要在安装地点进行调整。连接分配、电气供电数据（见机器板）和性能极限（见技术数据）以及驱动器的安装和安装说明，都必须严格遵守和遵循！

切勿将 24 V DC 驱动器连接到 230 V AC 主电源！

危险！

切勿伸入窗户凹槽或操作元素（链或轴）进行安装和操作！确保根据安装位置和窗户的开启移动，人员不会被驱动部分的窗户和周围固定的组件（例如墙）夹住。

安装材料

所需的安装材料必须适合驱动器和发生的负载，并根据需要进行补充。

安装驱动器之前，请检查窗框是否处于良好的机械状态，重量平衡，并且它能轻易地开启和关闭！

危险点：压碎和剪切点，根据 DIN EN 60335-2-103
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 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 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.

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 (push button) 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!

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

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

- **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 OFV1

- With Internal Intelligent Control Electronics and sequence control for drives PL6 S1 / PL10 S1 as well as for drives type S2 / S3 / S12 (I max. 3A - drive current runs over OFV1 / undercurrent detection)
- Two adjustable rotation angles 90° / 180°
- Opening direction selectable: right / left turning
- Square shaft adapter 7x55 mm

ORDER DATA

- $U_n$: Rated voltage 24V DC (19 V ... 28 V)
- $I_n$: Rated current 0,8 A
- $I_{cu}$: Cut-off current 1,1 A
- $I_0$: Quiescent current < 28 mA (10 Nm)
- $I_b$: Current of connected drives S1: max. 0,9 A / S3, S12: max. 3,0 A
- $P_n$: Rated power 19 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
- Torque max. 10 Nm
- Initial torque 22 Nm
- Rotating angle direction yes (self-learning)
- Rotating angle 90° / 180° (right / left)
- Runtime 90° - 4,5 s; 180° - 9,0 s
- Connecting cable non-halogen, grey 4 x 0,75 mm², ~ 3 m
- Housing ABS, greywhite
- Dimensions (W x H x D) 40 x 156 x 83,5 mm
- Sound pressure level ≤ 70 dB (A)

TECHNICAL DATA

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<tr>
<td>OFV1</td>
<td>1</td>
<td>513850</td>
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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).
DETERMINATION OF LOCKING POINTS

The number of locking points depends on:
- object-specific requirements
- processing guidelines and authorized ranges of application of the manufacturer
- EN 12102-2 NRWG (depending of profile group and wind load classification WL)
- EN 12207 Air permeability
- EN 12208 Driving rain tightness
- EN 12210 Resistance to wind load
- EN 1627 Burglar resistance
- EN 14351-1 Window or door standard
- DIN 1991-1-3 Snow loads
- DIN 1991-1-4 Wind loads

Only the worst case with secured values and application ranges must serve as a basis.

Locking points are centers / axes of the following components: casement hinges / stays (BD), sealing points of the locking system, application points of directly actuating drives (force transmission axes at 90° to the casement profile, with closed window).

Drives used in SHEV mounting devices such as: RWA 1000, RWA 1050, RWA 1100 are not included in the locking points.

Free profile lengths are effective distances between two locking points. Corner and edge distances shall be calculated as straight lines.

| Free profile length for Ix-values of the window casement profiles |
|------------------------|----------------|----------------|----------------|----------------|
|                       | 20-34 cm²       | 35-50 cm²      | 51-55 cm²      | 56-99 cm²      |
| Static wind slipstream loads on the SHEV - according to EN 12102-2. |
| WL 1000                | 1300 mm         | 1500 mm        | 1700 mm        | 1900 mm        |
| WL 1500                | 1200 mm         | 1400 mm        | 1600 mm        | 1800 mm        |
| WL 2000                | 1100 mm         | 1275 mm        | 1450 mm        | 1650 mm        |
| WL 2500                | 900 mm          | 1025 mm        | 1150 mm        | 1275 mm        |
| WL 3000                | 800 mm          | 900 mm         | 1000 mm        | 1100 mm        |

Values apply only for AUMÜLLER FERRALUX NRWG.

The number of locking points or the free profile length between two locking points are described into the respective system documents of the window profile. This information must be adhered.

The requirements for the tightness of the windows according to EN 14359-1 must be observed!
**INSTALLATION STEP 1: INSPECTION BEFORE THE INSTALLATION**

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

- **WARNING**
  
  There must not be any chamber gear in the fitting!

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

<table>
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<td><strong>Supply voltage:</strong></td>
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<td><strong>Drive types:</strong></td>
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<td><strong>Drive current:</strong></td>
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<td><strong>Display:</strong></td>
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<td><strong>Ambient temperature:</strong></td>
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<td><strong>Plastic housing:</strong></td>
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<td><strong>Weight:</strong></td>
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<td><strong>Feature / equipment:</strong></td>
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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.

- **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,
  - possibly there is sufficient space for the swivel movement of the drive.
  
  If not, counter measures must be taken!

- **Caution**
  
  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).

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:

![Formula for calculating weight of casement](image)

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

![Formula for calculating drive force](image)

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

Tools required
- Marker,
- Grains,
- Hammer,
- Knife,
- Screwdriver (cross, Torx),
- Hexagonal wrench,
- Torque wrench,
- Power drill,
- Threadlock adhesive,
- possibly a tool for blind rivet nuts.

<table>
<thead>
<tr>
<th>Wood screws:</th>
<th>Wood windows</th>
</tr>
</thead>
<tbody>
<tr>
<td>i.e DIN 96, DIN 7996, DIN 571</td>
<td>round head with slot, round head with cross, hex head,special type</td>
</tr>
</tbody>
</table>

| Self-tapping screws, thread screws, sheet-metal screws | 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 | |

| Screws for plastic | Screws for plastic |
| i.e. DIN 95606, DIN 95607, ISO 7049, ISO 7085, DIN 7500 | round head with cross, external hex head, Torx |

**Accessories for locking drive**

- Assembly and Commissioning Instructions
- 1x Adapter plate
- 1x Square: Vk 7 x 55
- 2x Countersunk screw M5 x 40
- 1x Countersunk screw M5 x 16
- 1x Spax countersunk screw 4,5 x 30
- 2x Head screw M 5 x 16
- 2x Spring rings
- 1x Cable fastener
- 1x Connecting cable with plug
- 1x Warning sign sticker „Risk of entrapment“
# Installation Step 3: Assembly Opening Drive

- Mount opening drive (see separate „Assembly and Commissioning Instructions“ for each window-drive).
- Make the connection for the control voltage to the opening drive (see chapter: „Electric Connection“).
- Unhook the opening drive spindle / opening drive chain from the window casement, so that the casements can be manually moved.

## Application Examples

<table>
<thead>
<tr>
<th>SHEV 1000 - Inward Opening Window</th>
<th>SHEV 1050 Solo - Inward Opening Window</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Solo</strong></td>
<td><strong>Tandem</strong></td>
</tr>
<tr>
<td><strong>Casement DIN Left</strong></td>
<td><strong>Casement DIN Right</strong></td>
</tr>
<tr>
<td><img src="image1.png" alt="Image" /></td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
</tbody>
</table>

With internal load dependent cut-off switch and sequence control for drives PL6 S1 / PL10 S1 (SHEV) as well as for drives type S2 / S3 / S12 (I max. 3A - drive current runs over OFV1 / undercurrent detection)

![Image](image3.png) ![Image](image4.png)
**INSTALLATION STEP 4: REMOVE THE HOUSING FROM OFV1 AND PLUG IN CONNECTION CABLE**

- Loosen the screws 1 and remove the housing 2 from the locking drive OFV1.
- Insert the lock-tight plug 3 - from the connection cable 4 - in the adapter bushing 5.

- Lay the connection cable 4 under the circuit board.
- Secure connection cables 4 on motor housing with supplied cable fastener 6.
- Cut off protruding end of cable fastener 6.
- Lead connecting cable 4 through the housing opening.

**Connection assignment OFV1**

<table>
<thead>
<tr>
<th>Terminal</th>
<th>BU</th>
<th>BN</th>
<th>BK</th>
<th>WH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>blue</td>
<td>brown</td>
<td>black</td>
<td>white</td>
</tr>
<tr>
<td>2</td>
<td>blue</td>
<td>brown</td>
<td>black</td>
<td>white</td>
</tr>
<tr>
<td>3</td>
<td>blue</td>
<td>brown</td>
<td>black</td>
<td>white</td>
</tr>
</tbody>
</table>

Note: the opening direction of the casement
**Installation Step 5: DIP Switch and LED Display**

- Set the DIP switches, when the locking drive OFV1 is not mounted.

Set the DIP switches in a **voltage-free** state.

### DIP switch and LED display

**Rotating direction:**
- **right**
  - DIP-1 = OFF
- **left**
  - DIP-1 = ON

**Position locked CLOSE position**

**Factory settings**

---

**Note**

In case of wrong direction of rotation, reverse polarity from the opening drive.

### DIP Switch

<table>
<thead>
<tr>
<th>DIP-1</th>
<th>OFF</th>
<th>ON</th>
<th>Rotating direction: right (casement DIN left)</th>
<th>Rotating direction: left (casement DIN right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LED-1</td>
<td>OFF</td>
<td>green</td>
<td>ready for operation</td>
<td>red</td>
</tr>
<tr>
<td></td>
<td>green: blinking</td>
<td>opening drive in operation</td>
<td>red: blinking</td>
<td>OFV fault</td>
</tr>
<tr>
<td></td>
<td>red/green: blinking</td>
<td>undervoltage (&lt; 19V)</td>
<td>blank</td>
<td>opening drive fault</td>
</tr>
<tr>
<td></td>
<td>LED-2</td>
<td>OFF</td>
<td>power supply: none</td>
<td>LED-3</td>
</tr>
<tr>
<td></td>
<td>green</td>
<td>power supply: in <strong>CLOSE</strong> direction</td>
<td>green</td>
<td>OFV non-operation</td>
</tr>
<tr>
<td></td>
<td>red</td>
<td>power supply: in <strong>OPEN</strong> direction</td>
<td>red</td>
<td>OFV left rotation</td>
</tr>
</tbody>
</table>

---

**Terminals**

- Terminal 1 BU = blue feed line from control unit 24 V DC
- Terminal 2 BN = brown feed line from control unit 24 V DC
- Terminal 4 BK = black to the opening drive
- Terminal 5 WH = white to the opening drive

---

**Note**

- Terminal 1 BU = blue feed line from control unit 24 V DC
- Terminal 2 BN = brown feed line from control unit 24 V DC
- Terminal 4 BK = black to the opening drive
- Terminal 5 WH = white to the opening drive

---

**Note the opening direction of the casement**
**INSTALLATION STEP 6: HOLE LAYOUT FOR OFV1**

**Application examples**

<table>
<thead>
<tr>
<th>Bottom-hung inward opening Casement assembly</th>
<th>Hole layout in the adapter plate</th>
</tr>
</thead>
</table>

View on aluminium window

**Casement assembly - inward opening window**

<table>
<thead>
<tr>
<th>Window versions</th>
<th>Bottom-hung</th>
<th>Top-hung</th>
<th>Side-hung</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- inward opening window</td>
<td>- inward opening window</td>
<td>- inward opening window</td>
</tr>
</tbody>
</table>

- **RA**
- **FL**
- **NSK**
- **PL6 / PL10**
- **HSK**
- **OFV1**

**Reference edge**

- **FAH** = max. 2000
- **FAB** - solo = min. 400 - max. 1200 (for wood and alu) min. 400 - max. 800 (for plastic)
- **FAB** - tandem = min. 1000 - max. 2400 (for wood and alu) min. 800 - max. 2000 (for plastic)

If **FAB > 1000 mm**, a locking drive is required!

---

![Reference edge](image-url)
**Installation Step 7: Assembly OFV1**

- Use the handle to manually close and lock the window.
- Unscrew handle.
- Use screws 2 to attach adapter plate 1 on window. Use existing boreholes of handle.
- Fasten the adapter plate 1 with an additional suitable screw 3. Drill appropriate hole.

![](image1)

Drill hole for square Vk7x55 4 are in the upper part of the adapter plate 1.

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

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

Plug the square Vk7x55 4 in the square opening of the chamber gear (window fitting). Pay attention to the correct slot position (CLOSE position).

If necessary shorten the square Vk7x55 4.

Remodel the adapter plate 1 so, that the square Vk7x55 4 is in the upper part of the adapter plate 1.

The head of the square Vk7x55 4 must be flush with the adapter plate 1. It may not protrude in any way.

Square opening of the window fitting

Note the position of groove (CLOSE position)

![Diagram](image2)

Square Vk7x55 4 may not protrude in any way.

Insert the locking drive OFV1 into groove of square Vk7x55 4 and fasten it with two screws 5 and spring rings 6 on the adapter plate 1.

- Install square Vk7x55 4 and locking drive OFV1 in CLOSED position.
**Installation Step 8a: Test Run and Installation**

The opening drive and the not mounted locking drive OFV1 must be tested together.

- The opening drive is unhinged.
- Make the connection for the control voltage to the locking drive OFV1 (see chapter: „Electric Connection - Installation Step 11“).

During start-up of locking drive OFV1 the 24 V-control voltage may be switched on only with unhinged opening drive.

**Opening Drive S3 / S12**

Locking drive OFV1 is mounted, opening drive (S3/S12) is unhinged

- Switch on the control voltage at locking the drive OFV1 and at the opening drive - S3/S12 - in OPEN direction for a short time.
- Switch the control voltage - from the locking drive OFV1 and from the opening drive - S3/S12 - in CLOSE direction.

Now the opening drive - S3/S12 moves in CLOSE position. The Locking drive OFV1 waits up to 3 minutes, to learn undercurrent detection. Then the locking drive OFV1 moves in CLOSE position too.

- Check the function of locking drive OFV1 - by repeating OPEN-/CLOSE-movements for a few times.
- If necessary, correct the DIP switches (see chapter: „DIP Switches and LED Display“).
- Move the locking drive OFV1 and opening drive - S3/S12 in OPEN direction.
- Ensure the easy movement of the casement.
- Switch off the control voltage from the locking drive OFV1 and from the opening drive - S3/S12.

- Hinge opening drive - S3/S12 on casement, without disconnecting opening drive from the locking drive OFV1.
- Make mechanical settings in accordance with „Assembly and Commissioning Instructions“ of the drives.
- Switch on the control voltage at locking drive OFV1 and at opening drive - S3/S12 - in CLOSE direction.
- Check sequence control - with unhinged opening drive.
- Ensure the easy movement of casement.

When error occur a resetting (Reset) is possible. Disconnect the opening drive - S3/S12, then restart the installation process - as described above - without opening drive. After about three minutes, the locking drive OFV1 is reset to the delivery settings.

**Opening Drive S1**

Locking drive OFV1 is mounted, opening drive (S1) is unhinged

- Set the DIP switch 3 to OFF and DIP-switch 4 to ON when installing with opening drive - S1
  
- Check function and sequence control - with unhinged opening drive.
- Hinge opening drive - S1.
- Switch on the control voltage at locking drive OFV1 and at opening drive - S1 - in CLOSE direction.
- Check sequence control again.
- Ensure the easy movement of the casement.

Never operate opening drive - S1 without locking drive OFV1 (Risk of damage or destruction of drives and / or windows).

**Opening Drive S1 and USKM**

Locking drive OFV1 is mounted, opening drive (S1) is unhinged

- Set the DIP switch 3 to ON and DIP-switch 4 to ON or OFF when installing with opening drive - S1 and USKM.

- Check function and sequence control - with unhinged opening drive.
- Hinge opening drive - S1.
- Switch on the control voltage at locking drive OFV1 and at opening drive - S1 - in CLOSE direction.
- Check sequence control again.
- Ensure the easy movement of the casement.

**Note**

Electric load disconnection and sequential control of locking drive OFV1 is provided by the control module USKM.
**Installation Step 9: Mount the Housing on the OFV1**

- Using the screws 1 and mount the housing 2 on the locking drive OFV1.

**Installation Step 10: Cable Routing**

### Cable Routing on or in the Casement
- **Cable on Casement**
- **Cable in Glazing Bead**

**Connection cable routing on the casement:**
- 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 without Protective Cable Hose**
- Connection cable routing on the hinge side:
  - Make sure that during opening or closing procedure the cable will not be damaged by shearing-off, kinking, crushing.
  - Protect cable feedthrough in profile e.g. by using cable bushings, cable transitions.

**Cable Crossover with Protective Cable Hose**

**Cable Routing on the Frame**
- Route cable on the frame or mullion/transom.
- Cable must be protected against damage (shearing-off, kinking, splitting).

---

<table>
<thead>
<tr>
<th>CableRouting on or in the Casement</th>
<th>Cable Crossover without Protective Cable Hose</th>
<th>Cable Crossover with Protective Cable Hose</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cable on Casement</strong></td>
<td><img src="image" alt="Cable Crossover without Protective Cable Hose" /></td>
<td><img src="image" alt="Cable Crossover with Protective Cable Hose" /></td>
</tr>
<tr>
<td><strong>Cable in Glazing Bead</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

Cable duct glued on (in addition secured with countersunk screws against breaking away).

Flank hole in glazing bead (cable bushing protects against damage to cable).
**INSTALLATION STEP 11: 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 drive may be changed by interchanging (polarity reversal) the wires „BN – (brown)” - „BU – (blue)”.

### Connection assignment from the locking drive

<table>
<thead>
<tr>
<th>OFV1</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BN</td>
<td>+</td>
<td>-</td>
</tr>
<tr>
<td>BU</td>
<td>-</td>
<td>+</td>
</tr>
</tbody>
</table>

### Connection assignment: opening drive

**S1**

<table>
<thead>
<tr>
<th>Opening drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>BN 24V DC</td>
</tr>
<tr>
<td>BU</td>
</tr>
</tbody>
</table>

AK non halogen, 2 x 0.75 mm²

**S3**

<table>
<thead>
<tr>
<th>Opening drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>BN 24V DC</td>
</tr>
<tr>
<td>BU</td>
</tr>
</tbody>
</table>

WH no function (strip), (for special applications)

AK non halogen, 3 x 1.0 mm²

**S12**

<table>
<thead>
<tr>
<th>Opening drive</th>
</tr>
</thead>
<tbody>
<tr>
<td>BN 24V DC</td>
</tr>
<tr>
<td>BU</td>
</tr>
</tbody>
</table>

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

Version Z:

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

In drives KS4: standard „CLOSE“ optional „OPEN“

AK non halogen, 3 x 1.0 mm²

### 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

- +
- -
**Assembly Instruction OFV1**

**UniPC with configuration interface**

- **Order number:** 524178
- **Application:** Hard- and software for configuration of drives supplied by Aumüller GmbH
- **Rated voltage:** 24V DC +/-20%
- **Parameterizable drives:** 24V DC type MP, S3, S12, S12 V.2
  230V AC type S12, S12 V.2
- **Scope of delivery:** software UniPC (Download link*), 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)**

- **Order number:** 513344
- **Application:** to extend a drive cable
- **Rated voltage:** only for „safety extra 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).

**USKM**

- **Order number:** 512140
- **Application:** Control module with 3 outputs and individual settable cut-off current, monitored motion run, delayed sequence control.
- **Rated voltage:** 24V DC +/- 20 %, (max. 2 Vpp) < 50 mA
- **Close circuit current:** max. 3 drives; s < 300 mm
- **Connections:** max. 2,5 A
- **Drive type:** S1, S2, S3, S12, MP, OFV1
- **Protection rating:** IP 54
- **Ambient temperature range:** 0 °C ... +70 °C
- **Surf. mount. plastic housing:** 110 x 110 x 66 mm

**Features / Equipment:**
- DIP switches for settings
- connection terminals: 2,5 mm²

**Functions:**
- External electronic cut-off switch (max. 0,9 A), motion-monitoring
- up to 3 drives / locking drives, max. 2 sequential controls
**Electric Connection**

### Locking Drive OFV1 with USKM

**USKM Control Module**

- **24 V DC control from control unit**
- **Polarity reversal**

**Opening Drive (Solo or tandem operation)**

- **24 V DC**
- **Max. 2.4 A per drive**

**DIP switches in the USKM set in accordance with the electronic cut-off switch.**

**Version without sequential control module**

- Disconnection and sequential control for the locking drive OFV1 is provided by the control module USKM.

**SHEVS applications require a line monitoring (line end module) to be connected upstream of the last or the only locking drive OFV1!**

### Solo Operation - Locking Drive OFV1

**Solo operation**

- **24 V DC control from control unit**
- **Polarity reversal**

**Version with sequential control module**

- By applying the 24V voltage supply on terminal 1(-) and 2(+) the locking mechanism OFV1 the casement.
- After complete opening of the casement locking the opening drive on terminal 4 and 5 receives the command to move up (opening of the casement).

**SHEVS applications require a line monitoring (line end module) to be connected upstream of the last or the only locking drive OFV1!**

---

**Notes:**
- **BN = brown**
- **BU = blue**
- **WH = white**
- **BK = black**
- **S1 S2 S3 S12**
Locking drive OFV1 and opening drive without internal cut-off switch (S1)

Rotating direction: right
DIP-1 = OFF

Rotating direction: left
DIP-1 = ON

Locking drive OFV1 and opening drive with internal cut-off switch (S12)

Rotating direction: right
DIP-1 = OFF

Rotating direction: left
DIP-1 = ON

BK = black
BN = brown
BU = blue
WH = white
**INSTRUCTIONS ON CONNECTION: MAX. LENGHT FROM THE LINES OF DRIVES TO THE CONTROL UNIT**

Select the following values (see the tables below):
- number of the locking drives OFV1
- cut-off current of the opening drive
- measure the cable length of the locking drive OFV1

Be determined the **line cross-section** from the lines of drive to the control unit and the **cable length** of the locking drive OFV1.

**NOTE**
To calculate can also be used the line calculation program. Details can be found on our website:
(www.aumuller-gmbh.de)

### Max. lenght (m) from the lines of drives to the control unit - **ONE** locking drive OFV1

<table>
<thead>
<tr>
<th>Cut-off current (A)</th>
<th>1,5 m</th>
<th>2,0 m</th>
<th>2,5 m</th>
<th>3,0 m</th>
<th>3,5 m</th>
<th>4,0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,8 A</td>
<td>90</td>
<td>150</td>
<td>240</td>
<td>360</td>
<td>450</td>
<td>540</td>
</tr>
<tr>
<td>1,2 A</td>
<td>58</td>
<td>97</td>
<td>155</td>
<td>232</td>
<td>319</td>
<td>406</td>
</tr>
<tr>
<td>1,6 A</td>
<td>42</td>
<td>70</td>
<td>112</td>
<td>168</td>
<td>229</td>
<td>300</td>
</tr>
<tr>
<td>2,4 A</td>
<td>26</td>
<td>43</td>
<td>96</td>
<td>104</td>
<td>137</td>
<td>172</td>
</tr>
<tr>
<td>3,0 A</td>
<td>20</td>
<td>33</td>
<td>52</td>
<td>78</td>
<td>112</td>
<td>154</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line cross-section (mm²) from the lines of drive to the control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
</tbody>
</table>

### Max. lenght (m) from the lines of drives to the control unit - **TWO** locking drive OFV1

<table>
<thead>
<tr>
<th>Cut-off current (A)</th>
<th>1,5 m</th>
<th>2,0 m</th>
<th>2,5 m</th>
<th>3,0 m</th>
<th>3,5 m</th>
<th>4,0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,8 A</td>
<td>45</td>
<td>75</td>
<td>120</td>
<td>180</td>
<td>250</td>
<td>320</td>
</tr>
<tr>
<td>1,2 A</td>
<td>29</td>
<td>49</td>
<td>78</td>
<td>116</td>
<td>176</td>
<td>236</td>
</tr>
<tr>
<td>1,6 A</td>
<td>21</td>
<td>35</td>
<td>56</td>
<td>84</td>
<td>120</td>
<td>160</td>
</tr>
<tr>
<td>2,4 A</td>
<td>13</td>
<td>22</td>
<td>35</td>
<td>52</td>
<td>80</td>
<td>120</td>
</tr>
<tr>
<td>3,0 A</td>
<td>10</td>
<td>17</td>
<td>26</td>
<td>39</td>
<td>52</td>
<td>78</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line cross-section (mm²) from the lines of drive to the control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
</tbody>
</table>

### Max. lenght (m) from the lines of drives to the control unit - **THREE** locking drive OFV1

<table>
<thead>
<tr>
<th>Cut-off current (A)</th>
<th>1,5 m</th>
<th>2,0 m</th>
<th>2,5 m</th>
<th>3,0 m</th>
<th>3,5 m</th>
<th>4,0 m</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,8 A</td>
<td>30</td>
<td>50</td>
<td>80</td>
<td>120</td>
<td>170</td>
<td>220</td>
</tr>
<tr>
<td>1,2 A</td>
<td>19</td>
<td>32</td>
<td>52</td>
<td>77</td>
<td>100</td>
<td>130</td>
</tr>
<tr>
<td>1,6 A</td>
<td>14</td>
<td>23</td>
<td>37</td>
<td>56</td>
<td>78</td>
<td>100</td>
</tr>
<tr>
<td>2,4 A</td>
<td>9</td>
<td>14</td>
<td>23</td>
<td>35</td>
<td>52</td>
<td>78</td>
</tr>
<tr>
<td>3,0 A</td>
<td>7</td>
<td>11</td>
<td>17</td>
<td>26</td>
<td>39</td>
<td>52</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Line cross-section (mm²) from the lines of drive to the control unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
<tr>
<td>1,5</td>
</tr>
</tbody>
</table>
**Installation step 12:**
**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

\[
A_{\text{mm}^2} = \frac{I_{\text{A (total)}} \cdot L_{\text{m (length supply line)}} \cdot 2}{2,0V_{(\text{voltage drop})} \cdot 56 \text{ m} / (\Omega \cdot \text{mm}^2)}
\]

**Calculation example**

- 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)

\[
A = \frac{(2 \cdot 4.0A) \cdot 10m \cdot 2}{2,0V \cdot 56m / (\Omega \cdot \text{mm}^2)} = 1,42\text{mm}^2 \rightarrow 1,5\text{mm}^2 \text{ chosen}
\]

---

**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 13:**
**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).

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**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>Locking 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 from the opening drive is not correct</td>
<td>Check drive cables change polarity</td>
</tr>
<tr>
<td></td>
<td>Connecting cable not connected</td>
<td>Check all connection cables</td>
</tr>
<tr>
<td></td>
<td>DIP switch is wrong setting</td>
<td>Setting the DIP switch properly</td>
</tr>
<tr>
<td>Opening drive does not operate correctly</td>
<td>DIP switch is wrong setting</td>
<td>Setting the DIP switch properly</td>
</tr>
<tr>
<td>Locking drive does not unlock in direction OPEN and/or does not lock in direction CLOSED</td>
<td>DIP switch is wrong setting</td>
<td>Setting the DIP switch properly</td>
</tr>
<tr>
<td>LED-1 red</td>
<td>OFV1 fault short circuit / cable break in the drive line or defect in the electronics</td>
<td>Check the connection form the OFV1 and check the OFV1</td>
</tr>
<tr>
<td>LED-1 red blinking</td>
<td>opening drive fault DIP 3 = OFF opening drive is turned off due to voltage overload - caused by short circuit in the drive line or defect in the electronics DIP 3 = ON opening drive is shut off due to undervoltage - caused by cable break in the drive line or defective opening drive</td>
<td>Check the connection from the opening drive and check the opening drive</td>
</tr>
<tr>
<td>LED-1 blinking red / green LED-2 OFF</td>
<td>power supply is &lt;19 V none power supply</td>
<td>correct power supply Check the connection</td>
</tr>
</tbody>
</table>

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 Automatic GmbH (www.iumeller-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.
**Disposal / Warranty**

**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.

**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 Automatic GmbH.
Contact data are available at our homepage (www.aumueller-gmbh.de)

**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.
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)

**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.