Assembly and Commissioning Instructions

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



SP8 S2 24V DC / SP8 S2 230V AC - SPINDLE DRIVE FOR WINDOWS









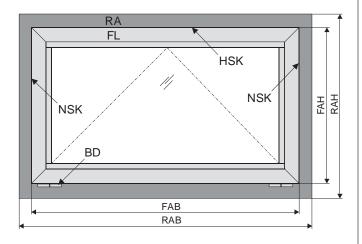
Casement Sizes Opening angle at direct operation INSTALLATION STEP 1: Inspection before the installation Installation step 2: Installation prerequisite and Installation preparation INSTALLATION STEP 3: Casement bracket und Frame brackets / Application examples INSTALLATION STEP 4: Drill holes according to mounting variants INSTALLATION STEP 5: Casement bracket mounting INSTALLATION STEP 6: Frame brackets mounting INSTALLATION STEP 7: Connect spindle drive with casement bracket INSTALLATION STEP 8: Adjustment possibility for disconnection INSTALLATION STEP 9: Cable routing INSTALLATION STEP 10: Electric connection INSTALLATION STEP 11: Supply lines of drives to the control unit	1		Abbreviations Target Groups Warning and Safety Symbols Intended Use Safety Instructions	3 - 8
Opening angle at direct operation Installation step 1: Inspection before the installation Installation step 2: Installation prerequisite and Installation preparation Installation step 3: Casement bracket und Frame brackets / Application examples Installation step 4: Drill holes according to mounting variants Casement bracket mounting Installation step 6: Frame brackets mounting Installation step 7: Connect spindle drive with casement bracket Installation step 8: Adjustment possibility for disconnection Cable routing Installation step 9: Cable routing Electric connection Installation step 10: Electric connection Installation step 11: Supply lines of drives to the control unit Installation step 12: Safety check and Test run Demounting and Disposal Liability	2		Data sheet SP8-Z S2 230V AC	9 - 11
Installation step 2: Installation prerequisite and Installation preparation Installation step 3: Casement bracket und Frame brackets / Application examples Installation step 4: Drill holes according to mounting variants Installation step 5: Casement bracket mounting Installation step 6: Frame brackets mounting Connect spindle drive with casement bracket Installation step 7: Connect spindle drive with casement bracket Installation step 9: Cable routing Installation step 10: Electric connection Installation step 11: Supply lines of drives to the control unit Installation step 12: Safety check and Test run Installation step 12: Safety check and Maintenance Maintenance and Modification Demounting and Disposal Liability	3			12 - 13
Installation step 4: Drill holes according to mounting variants Installation step 5: Casement bracket mounting Installation step 6: Frame brackets mounting Installation step 7: Connect spindle drive with casement bracket Installation step 8: Adjustment possibility for disconnection Installation step 9: Cable routing Installation step 10: Electric connection Installation step 11: Supply lines of drives to the control unit Installation step 12: Safety check and Test run 2 Help in case of Malfunctions, Repairs and Maintenance Maintenance and Modification Demounting and Disposal Liability			•	14 - 15
INSTALLATION STEP 8: Adjustment possibility for disconnection INSTALLATION STEP 9: Cable routing INSTALLATION STEP 10: Electric connection INSTALLATION STEP 11: Supply lines of drives to the control unit INSTALLATION STEP 12: Safety check and Test run 2 Help in case of Malfunctions, Repairs and Maintenance Maintenance and Modification Demounting and Disposal Liability	IN IN IN	ISTALLATION STEP 4: ISTALLATION STEP 5: ISTALLATION STEP 6:	Drill holes according to mounting variants Casement bracket mounting Frame brackets mounting	16 - 23
Demounting and Disposal Liability	IN IN IN	ISTALLATION STEP 9: ISTALLATION STEP 10: ISTALLATION STEP 11:	Cable routing Electric connection Supply lines of drives to the control unit	24 - 26
Liability	7			27
Certificates 2	8		Liability Warranty and Customer Service	28 - 31

ABBREVIATIONS

Index of abbreviations

These abbreviations are used consistently throughout these assembly & operating instructions. Unless stated differently, all dimensions indicated in this document are in mm. General tolerances in accordance with DIN ISO 2768-m.

А	drive
AK	connection cable / drive cable
AP	cover cap
BD	hinge
Fxxx	casement bracket
FAB	overall width of casement
FAH	overall height of casement
FG	casement weight
FL	casement
FÜ	casement overlap
HSK	main closing edge
Kxxx	frame bracket
L	construction lenghth of drive
MB	central hinge
NSK	side closing edge
RA	frame
RAB	overall width of frame
RAH	overall height of frame
SL	snow load
→	opening direction



TARGET GROUP

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

WARNING AND SAFETY SYMBOLS IN THESE IN-STRUCTIONS:

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



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 result in minor or moderate (reversible) injuries.



Failure to comply with the warning notes can lead to damage to property.



Caution / Warning

Danger due to electric current.



Caution / Warning

Risk of crushing and entrapment during device operation (is provided as a sticker with the drive).



Attention / Warning

Risk of damage to / destruction of drives and / or windows.

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.

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 per-

formed by children without supervision.

INTENDED USE

Area of application / Scope of application

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

The main task of this product, in combination with a window and a suitable external control unit, is to evacuate hot smoke and combustion gases in case of fire, to 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.

Note

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

Intended use according to the Declaration of Conformity

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

In accordance with the Declaration of Conformity the drive, in combination with an external Control Unit from **Aumüller**, is released for its proper use at a power-operated window for the following use:

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

⚠ WARNING

Pay attention to possible hazards on tilting or rotating windows, whose secondary closing edges are located at less than 2,5 m installation height above the floor, under consideration of the Control Unit and usage! We as manufacturers are well aware of our duties and responsibilities regarding the development, manufacturing and placing of safe window drives on the market and consistently implement them. Ultimately, however, we have no direct influence on the usage of our drives. Therefore, as a precaution, we point out the following:

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

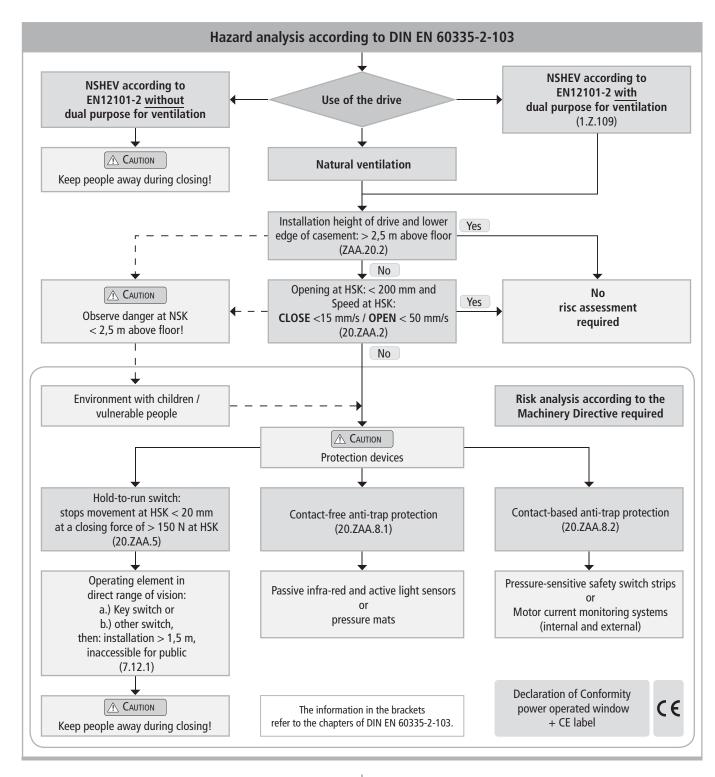
The need for a risk assessment at the installation site due to the reasonably foreseeable misuse.

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

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

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





Casement data

Facade: bottom-hung window, top-hung win-

dow, side-hung window.

Roof: roof window / sky light.
Opening direction: inward / outward opening.

Profile material: aluminum, steel, plastic or wood.

Note

The casement measurements supplied are only for orientation purposes.

It is imperative that the **force-path diagram** of the drives are observed.

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

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

SAFETY INSTRUCTIONS



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

Risk of crushing and entrapment! Window can close automatically!

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

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

Area of application

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



Do not misuse the drive for other lifting operations! Do not allow children to play with this drive or its regulating and / or control units, including the remote control!

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



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

Installation

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

Note

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

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



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

Danger to life!

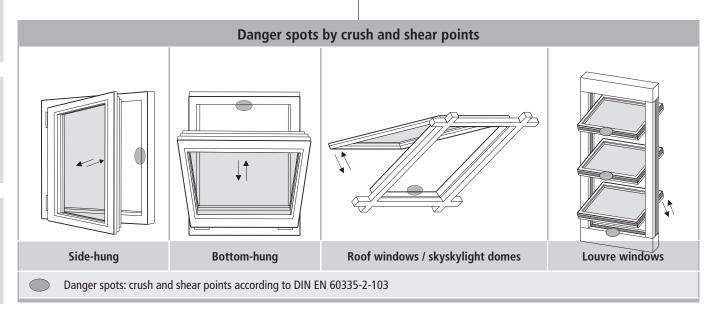
Do not reach into the window rabbet or the operating element (chain or spindle) during installation and operation! Ensure that, based on the installation position and the opening movement of the casement, persons cannot be trapped between the driven part of the window and surrounding fixed components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

Mounting material

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

Note

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



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.

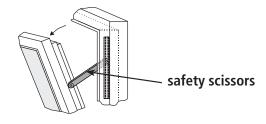
Unintentional or independent opening or falling

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 sensorsat operating voltages and connections contrary to the specifications of the manufacturer.

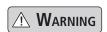
All relevant instructions shall be observed for the installation, specifically:

- 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!



Damaged mains supply lines of drives with plug connectors may only be replaced by the manufacturer or qualified service / maintenance personnel!

Power cables which are fixed to the drive casing cannot be replaced. If the cable is damaged the device must be scrapped!

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



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

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

Commissioning, operation and maintenance

After the installation and after each modification in the set up all functions shall be checked with a trial run. It shall be ensured that drive and casement are set correctly and that security systems, if available, are functioning properly. After the installation of the system is completed the end-user shall be introduced to all important operating steps. If necessary, he must be advised of all remaining risks / dangers.

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

01

Note Post warning signs!

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

CAUTION

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

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

⚠ CAUTION

CAUTION

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



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



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

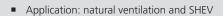
The drive is manufactured and inspected in accordance with European guidelines. The respective Declaration of Conformity and of Incorporation is on hand.

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 SP8 S2 24V DC AND SP8-Z S2 24V DC

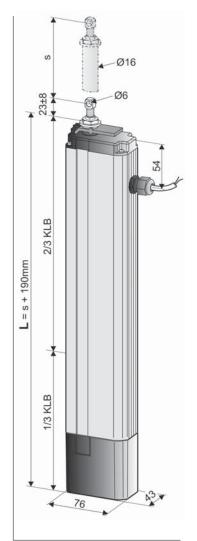
24V



- Internal cut-off switch for end positions
- "Z"-Version: Potential free NC contact for closed end position feedback (max. 24V, 500 mA)
- Preferably application for skylight domes

Option

- Rear suspension (only up to 500 mm stroke possible)
- Stroke reduction
- Protection rating IP65

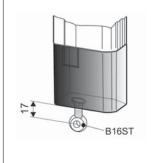


TECHNICAL DATA				
U _N	Rated voltage	24V DC (± 20 %), max. 2 Vpp		
I _N	Rated current	0,8 A		
I_A	Cut-off current	1,0 A		
P_N	Rated power	20 W		
ED	Duty cycle	30 % (ON: 3 min./OFF: 7 min.)		
	Protection rating	IP 54		
1	Ambient temperature range	-5 °C +60 °C		
F_{z}	Pulling force max.	800 N		
F _A	Pushing force	F (N) Schub Push 800 700 650 500 400 300 400 500 400 500 5		
F_{H}	Pullout force	3000 N (fastening depended)		
	Spindle tube	aluminium		
	Connecting cable	non-halogen, grey SP8 : 2 x 0,75 mm², ~ 1 m SP8-Z: 4 x 0,75 mm², ~ 1 m		
V	Speed	X₌7,0 mm/s ≥ 7,0 mm/s		
S	Stroke	100 – 750 mm (± 5 %)		
L	Length	s + 190 mm (see order data)		
	Sound pressure level A	≤ 70 dB (A)		

OPTION: REAR SUSPENSION

The **rear suspension** is fitted at the **factory**.

Only up to 500 mm stroke possible!



ORDER DATA						
s [mm]	L [mm]	Version	Finish	PU / pcs.	PartNo.	
100	290	SP8 100 S2 24V	E6/C-0	1	514110	
100	290	SP8-Z 100 S2 24V	L0/C-0	1	514310	
200	390	SP8 200 S2 24V	T6/C 0	1	514120	
200	390	SP8-Z 200 S2 24V	E6/C-0	1	514320	
	200	400	SP8 300 S2 24V	F6/6 0	1	514130
300	490	SP8-Z 300 S2 24V	E6/C-0	1	514330	
400	590	SP8 400 S2 24V	E6/C-0	1	514140	
400		SP8-Z 400 S2 24V		1	514340	
F00	690	SP8 500 S2 24V	56/6 0	1	514150	
500		SP8-Z 500 S2 24V	E6/C-0	1	514350	
600	700	SP8 600 S2 24V	E6/C-0	1	514160	
600	790	SP8-Z 600 S2 24V		1	514360	
750	940	SP8 750 S2 24V	55/5 0	1	514175	
750		SP8-Z 750 S2 24V	E6/C-0	1	514375	

DATA SHEET SP8-Z S2 230V AC

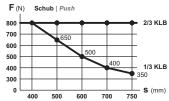
- Application: natural ventilation as single-drive
- Internal cut-off switch for end positions
- Potential free NC contact for closed end position feedback (max. 24V, 500 mA)
- Parallel connection up to 8 drives in one group
- Preferably application for skylight domes
- Minimum basic length of housing for stroke s = 300 mm

- Rear suspension (only up to 500 mm stroke possible)
- Stroke reduction (for s < 300 mm)
- Protection rating IP65

Ø16 2/3 KLB L = s + 190 mm1/3 KLB

TECHNICAL DATA

U_N	Rated voltage	230V AC (50 Hz)
I _N	Rated current	0,12 A
I_A	Cut-off current	0,2 A
P_N	Rated power	5 W
ED	Duty cycle	30 % (ON: 3 min./OFF: 7 min.)
	Protection rating	IP 54
1	Ambient temperature range	-5 °C +60 °C
F_z	Pulling force max.	800 N
F_{Δ}	Pushing force	F(N) Schub Push

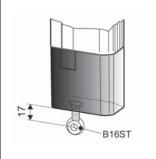


$F_{\rm H}$	Pullout force	3000 N (fastening depended)
	Spindle tube	aluminium
	Connecting cable	non-halogen, grey – 6 x 0,75 mm², ~ 1 m
V	Speed	X₌7,0 mm/s ≥ 7,0 mm/s
S	Stroke	300 – 750 mm (± 5 %)
L	Length	s + 190 mm (see order data)
	Minimum lenght of housing	490 mm (s 300 mm)
	Sound pressure level A	≤ 70 dB (A)

OPTION: REAR SUSPENSION

The rear suspension is fitted at the factory.

Only up to 500 mm stroke possible!



ORDER	ORDER DATA				
s [mm]	L [mm]	Version	Finish	PU / pcs.	PartNo.
300	490	SP8-Z 300 S2 230V	E6/C-0	1	496231
400	590	SP8-Z 400 S2 230V	E6/C-0	1	496241
500	690	SP8-Z 500 S2 230V	E6/C-0	1	496251
600	790	SP8-Z 600 S2 230V	E6/C-0	1	496261
750	940	SP8-Z 750 S2 230V	E6/C-0	1	496276



24V

230V

OPTIONS		
Special model	PU / pcs.	PartNo.
Rear Suspension		
Cape for rear suspension (only up to 500 mm stroke possible) incl. eyebolt B16ST M8 x 40 mm, bore Ø8 mm	1	512002
Protection rating IP65		
Drive with additional gaskets for IP65		512005
Mechanical stroke reduction		
Without basic lenght shortening of housing		516000
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
	1 – 20	516004
Charify at avelay stage.	21 – 50	516004
Specify at order stage:	51 – 100	516004
	up 101	516004
Extra length connecting cable:		
for spindle drive 24V DC - 3 m – non-halogen, grey – 2 x 0,75 mm²		501023
for spindle drive 24V DC - 5 m – non-halogen, grey – 2 x 0,75 mm²		501024
for spindle drive 24V DC - 10 m – non-halogen, grey – 2 x 0,75 mm²		501039
for spindle drive 24V DC - 5 m – non-halogen, grey – 4 x 0,75 mm² ("Z"-Version)	501044	
for spindle drive 24V DC - $$ 10 m - non-halogen, grey - 4 x 0,75 mm² ("Z"-Version)		501046
for spindle drive 230V AC - 3 m – non-halogen, grey – 6 x 0,75 mm²		501163
for spindle drive 230V AC - 5 m – non-halogen, grey – 6 x 0,75 mm²		501164
for spindle drive 230V AC - 10 m – non-halogen, grey – 6 x 0,75 mm ²		501166

EXPLANATIONS ON THE VERSION "Z" (FOR EXAMPLE SP8-Z S2 24V)

Drives with **version** "**Z**" (e.g SP8-**Z** S2 24V) have an additional volt free contact with connection for an external signal monitoring.

The volt free contact (max. 24V, 500mA) is open when the drive is in **CLOSED** position.

EXPLANATIONS ON THE PRODUCT LABEL

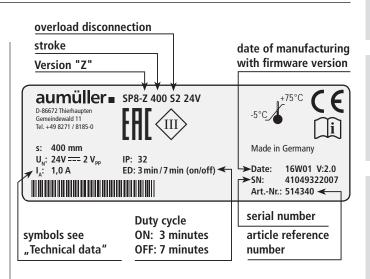
The product label provides information about:

- manufacturer,
- article reference number and name,
- technical caracteristics,
- date of manufacturing with firmware version,
- serial number.

Nоте

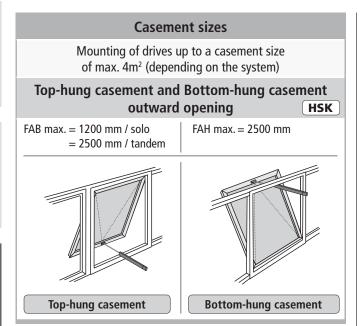
Never install and operate damaged products.

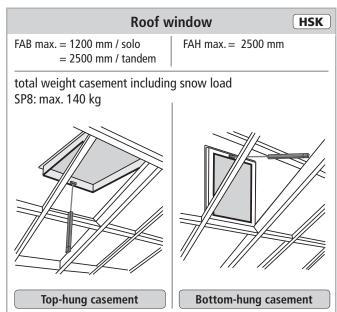
In the event of any complaints, please indicate the product serial number (SN) (see product label).

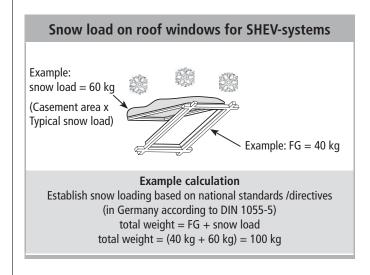




CASEMENT SIZES

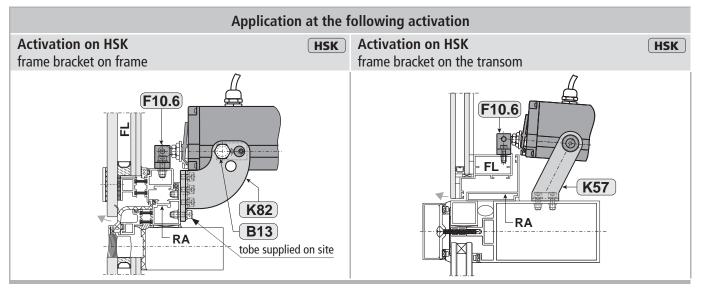






OPENING ANGLE AT DIRECT OPERATION (OUTWARD OPENING WINDOWS)

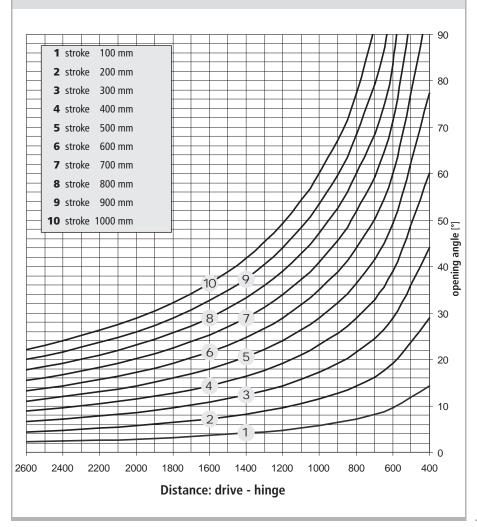


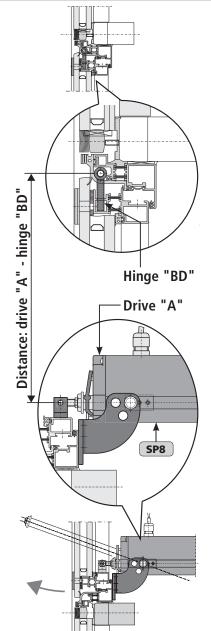


Planning the opening angle for direct operation

This diagram is a general guide to help establish the most appropriate drive stroke for the opening width required. The specifice installation conaitions are to be observed. The opening angle for direct operating drives on the main closing edge (HSK) depends on:

- distance: in between hinges (BD) and activation point of drive
- stroke or the opening width at the activation point of drive
- casement height





INSTALLATION STEP 1: INSPECTION BEFORE THE INSTALLATION



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

Storage of drives at the construction site

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

Inspection of drives before installation

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

Note

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

Test kit for drives

Order number:

533981

Application:

Test kit to check running direction and communication of drives 24V DC or

230V AC (including batteries)

Supply voltage:

230V AC

Drive types:

24V DC / 230V AC

Drive current:

max. 3 A

Display:

drive current, battery charge

Ambient temperature:

-5 °C ... + 75 °C

Plastic housing:

250 x 220 x 210 mm

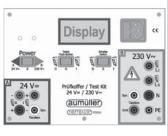
Weight:

approx. 3,6 kg

Feature / equipment:

Control elements: 2 switches + 1 button





The test procedure of drives may only be performed on a non-slip and secured mat or a test fixture. During the test run the test element must not be interfered with. The test my 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).

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

Tools required

- Marker,
- Grains,
- Hammer,
- Screwdriver (slotted-head-, cross- or Torx) size by site conditions,
- Hexagonal wrench size 2,5 / 3 / 4 / 5,
- End wrench for SW 13, SW 14,
- Torque wrench,
- Power drill,
- Threadlock adhesive,
- possibly a tool for blind rivet nuts (size 6).

Check window data on site

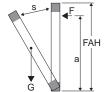
- Measure FAB and FAH.
- Check / calculate weight of casement.
 If unknown, it can be determined approximately with the following formula:

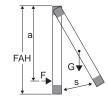
 Check / calculate the required drive force and compare with drive data. If unknown, it can be determined approximately with the following formula:

$$F [N] = \frac{5.4 * G [kg] * FAH [m]}{a [m]}$$

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

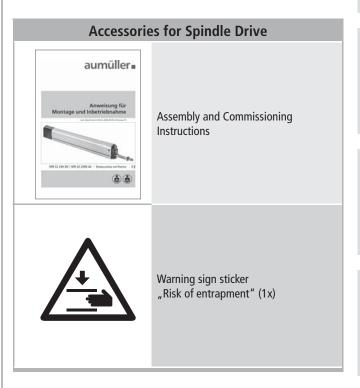






Scope of delivery:

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



05

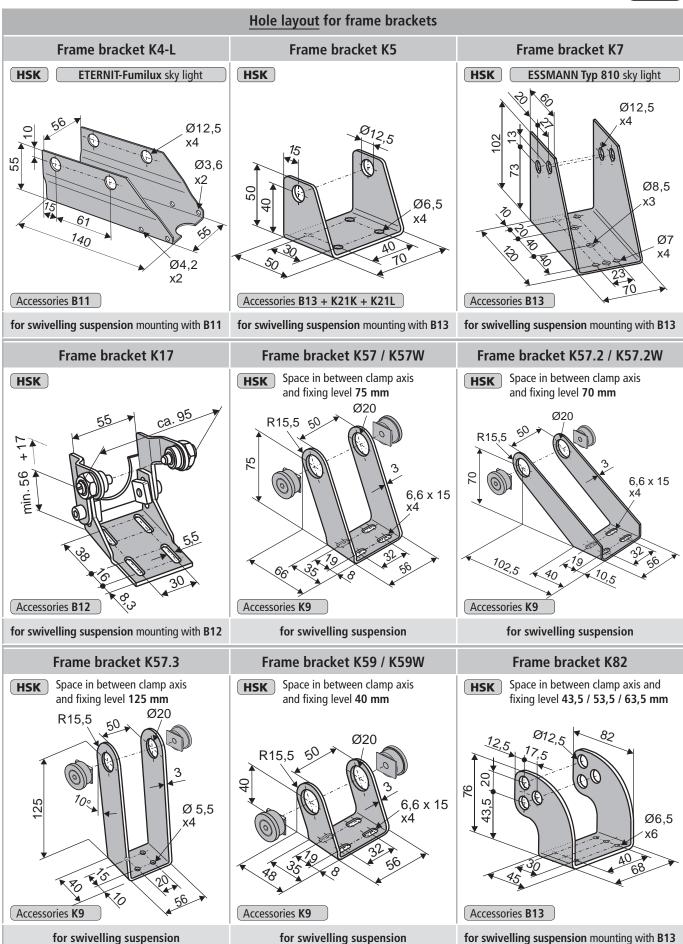
Installation step 3a: Determine the casement brackets



INSTALLATION STEP 3A: DETERMINE THE CASEMENT BRACKETS HSK			
Hole layout for casement brackets			
Casement bracket F1	Casement bracket F1.1	Casement bracket F1V	
HSK 9 06,5	HSK 9 06,5 06,5 06,5 06,5 06,5 06,5 06,5 06,5	#SK Ø11x7 / Ø6,5 (x2)	
Suspension with bore Ø 6 mm	Suspension with bore Ø 6 mm	Suspension with bore Ø 6 mm	
Casement bracket F2	Casement bracket F10.6	Casement bracket F12	
M6x35 DIN 931 Ø7,5 x2	HSK Ø6 Ø6,5	HSK ESSMANN Typ 810 sky light 86,5 82 86,5 8	
66		37 27	

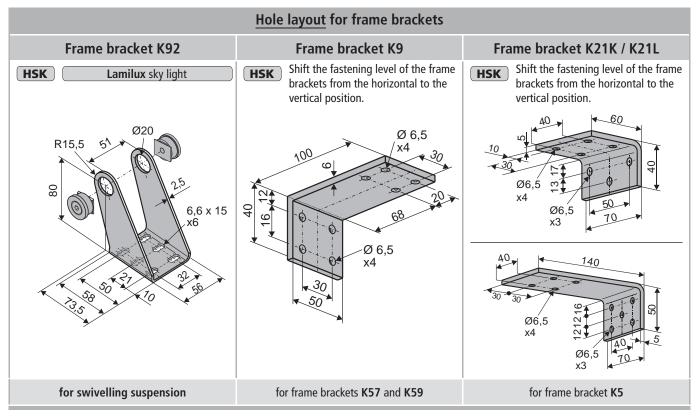
Installation Step 3B: Determine the frame brackets





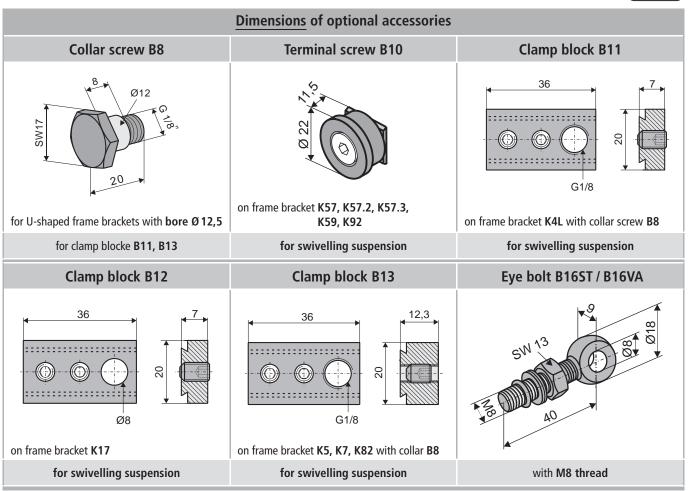
DETERMINE THE FRAME BRACKETS





INSTALLATION STEP 3C: OPTIONAL ACCESSORIES

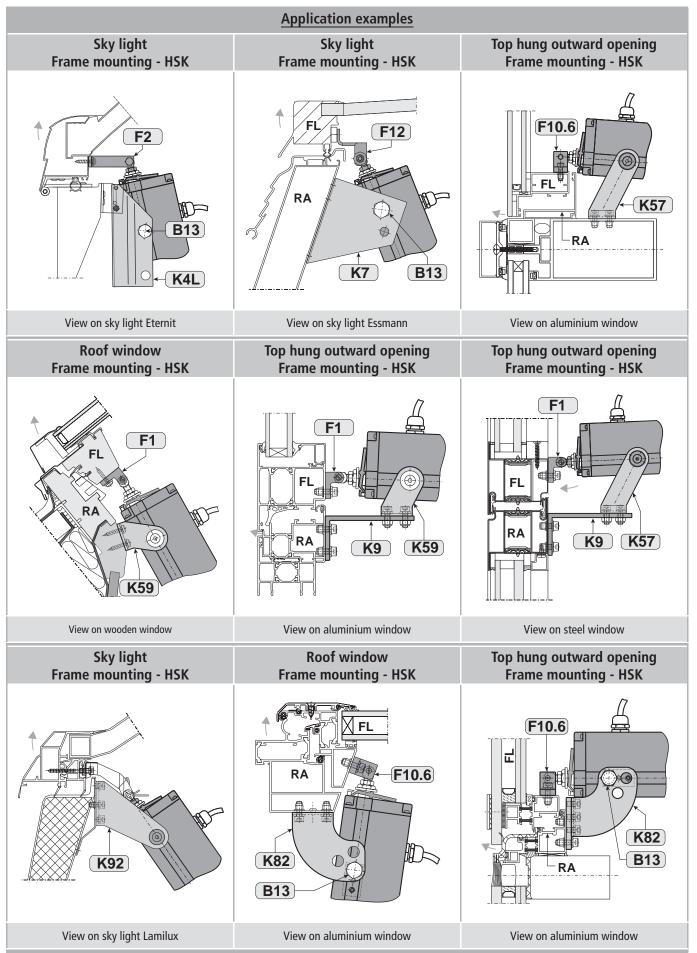






APPLICATION EXAMPLES

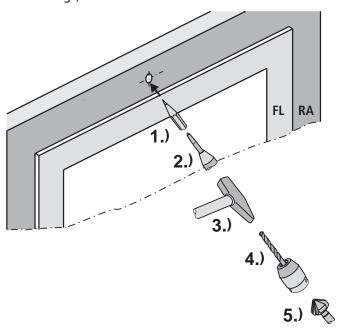




Installation step 4: Drill holes according to mounting variants



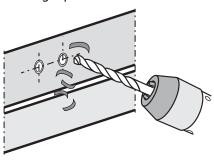
- Determine fastenings.
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (see chapter "Installation stepe 3" or project-specific documents and drawings).



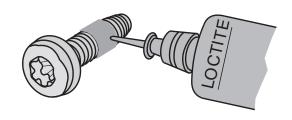


Carefully clear away drilling swarfs to prevent seals from being damaged.

Avoid surface scratches, for example by using masking tape.



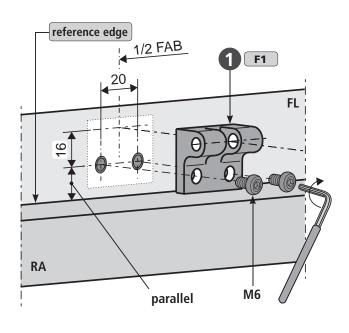
■ Secure fasteners against loosening; e.g. by applying removable thread-locking compound such as "Loctite".



INSTALLATION STEP 5: CASEMENT BRACKET MOUNTING

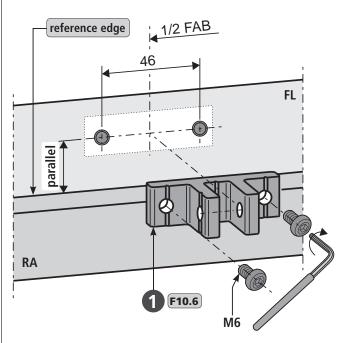
HSK

■ Fit casement bracket **Fxxx ①**.



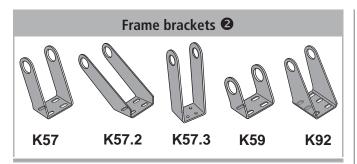


Make sure they are parallel to casement edge. "Casement bracket" center and "spindle" must be in line.



Installation step 6a: Frame brackets mounting with terminal screw B10

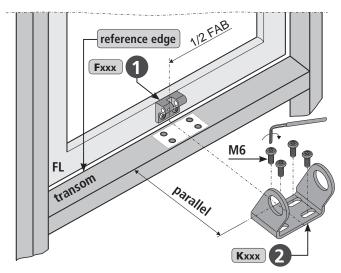


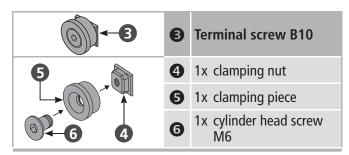


■ Fit frame bracket **Kxxx** ②.

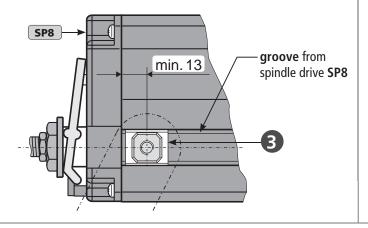


Make sure they are parallel to casement edge.





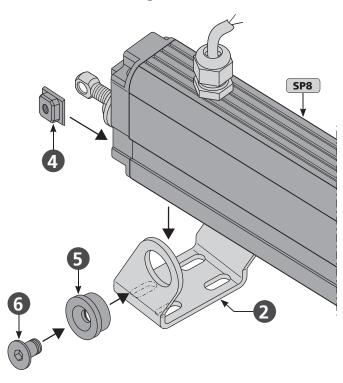
■ Insert clamping nuts **4** - from terminal screw **B10 3** - on both sides in the grooves of the spindle drive **SP8**.



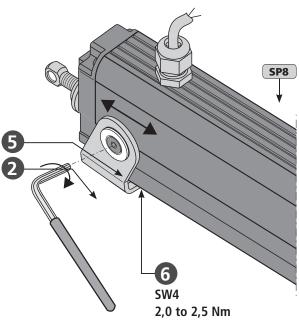


Clamping nuts **4** - of the terminal screws **B10 3** - must be **completely** inserted in the grooves of the spindel drive **SP8**.

- Position spindle drive **SP8** in the frame bracket **②**.
- Insert clamping piece **⑤** of the terminal screw **B10 ⑥** in the frame bracket **②**.

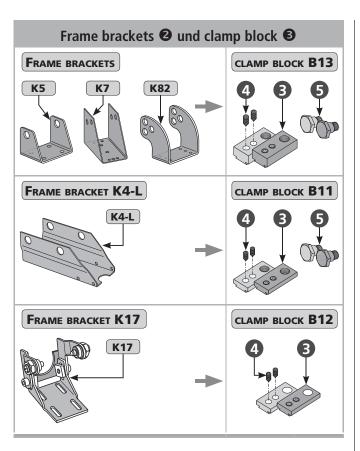


■ Tighten the clamping piece **⑤** with cylinder head screws **⑥** (torque 2,0 to 2,5 Nm).



INSTALLATION STEP 6B: Frame brackets mounting with clamp block

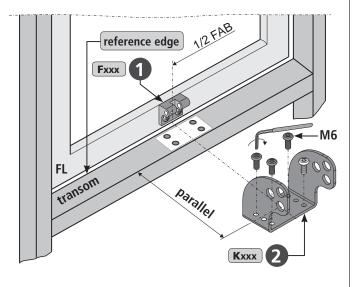




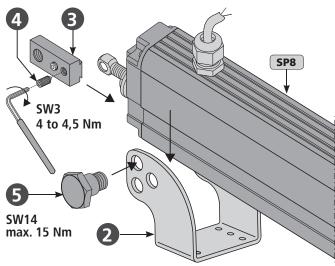
■ Fit frame bracket **Kxxx** ②.



Make sure they are parallel to casement edge.

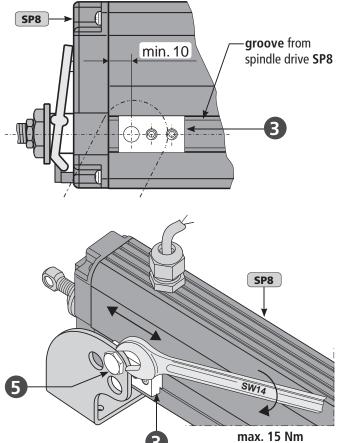


- Insert clamp blocke **Bxxx** ③ on both sides in the grooves of the spindle drive **SP8** and tighten with cylinder head screws ④ (torque 4,0 to 4,5 Nm).
- Position spindle drive **SP8** in the frame bracket **②**.
- Insert collar screw **⑤** and tighten (torque max.15 Nm).





Clamp block 3 must be **completely** inserted in the grooves of the spindel drive **SP8**.



05

INSTALLATION STEP 7: Connect spindle drive with casement bracket

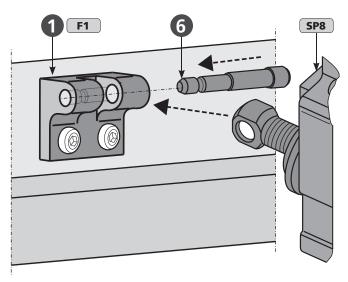


Mounting with casement bracket F1

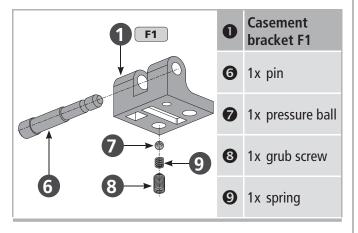
- Attach spindle drive SP8 to the casement bracket F1 ①.
- Insert the pin **⑤** from casement bracket **F1 ①**.

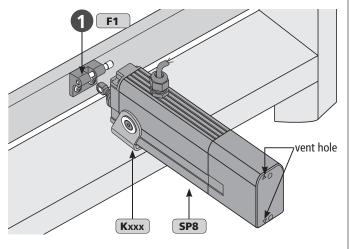


Pin **6** - of the casement bracket **F1 1** - needs to slot in securely. The snap is audible.



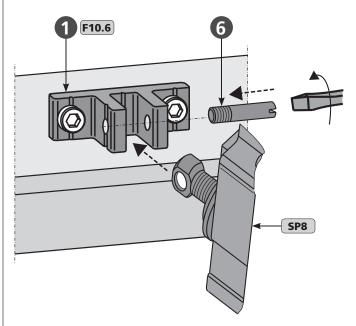
■ Optionally adjust the pressure ball • - of the casement bracket F1 • - with grub screw • and the spring •.





Mounting with casement bracket F10.6

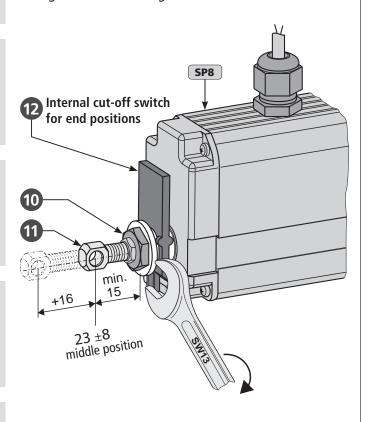
- Attach spindle drive SP8 to the casement bracket F10.6 ①.
- Screw in pin **6** of the casement bracket **F10.6 1**.
- Secure pin **⑤** against loosening itself with e.g. thread-locking compound such as "Loctite".



INSTALLATION STEP 8: ADJUSTMENT POSSIBILITY FOR DISCONNECTION

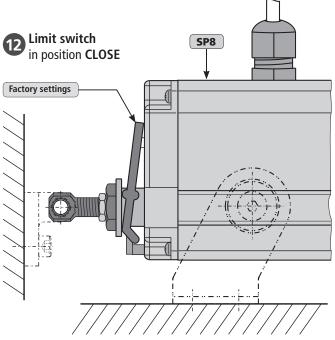


- Loosen the lock nut **①** of the spindle drive **SP8**.
- Manually turn eye bolt **B16 ①** inward or outward depending on site conditions.
- Tighten lock nut **1** again.





The limit switch **②** has to be pushed/activated when the window is closed.

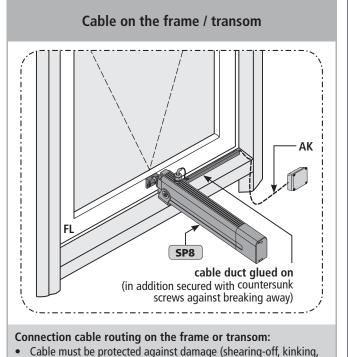


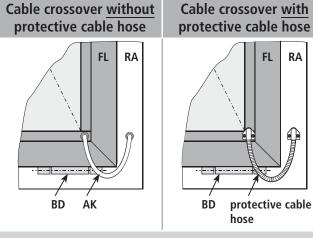


Ensure that spindle drive **SP8** shuts off via limit switch **②** and **not** via overload disconnection.

INSTALLATION STEP 9: CABLE ROUTING ON THE FRAME / TRANSOM

HSK





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.



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

splitting), i.e. by using bushings.

Installation Step 10: Electric connection

24V

230V

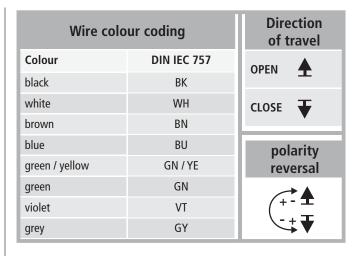


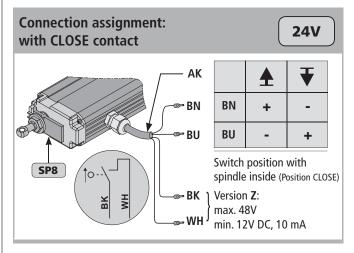
Make sure when establishing the connection that there is no voltage at the terminals! Unused wires must be safely insulated!

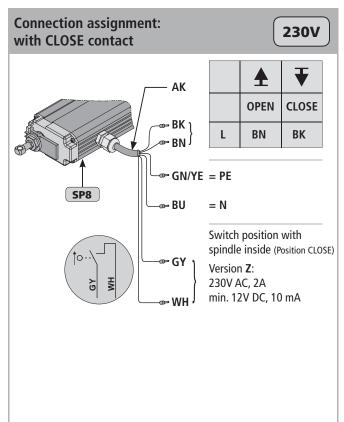
The running direction of the drive may be changed by interchanging (polarity reversal) the wires "BN – (brown)" - "BU – (blue)".

Connection assignment: without CLOSE contact			24V	
AK		1	₹	
→ BN	BN	+	-	
BU	BU	-	+	
SP8				

Cable junction box (for renewal)	24V
Order number: Application:	513344 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).
	21 05 15 15 15 15 15 15 15 15 15 15 15 15 15







06

INSTALLATION STEP 11:

SUPPLY LINES OF DRIVES TO THE CONTROL UNIT

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

RECOMMENDATION

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

Formula to calculate

the required wire cross-section of a supply line

24V

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

Calculation example

Available data:

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

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

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

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 of drives.

INSTALLATION STEP 12:

SAFETY CHECK AND TEST RUN

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

Safety test:

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

Test run:

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

Risk evaluation:

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

Firm **A**UMÜLLER Aumatic GmbH (www.aumueller-gmbh.de).

Operation of the power-operated window

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

06



HELP IN CASE OF MALFUNCTIONS, REPAIRS AND MAINTENANCE

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

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

Problem	Possible causes	Possible solutions
Drive does not start	Duration of mains power supply too short	 Adjust supply voltage as specified in the technical documen- tation
	• Drive run direction not correct	• Check drive cables change polarity
	Connecting cable not connected	• Check all connection cables
	Power supply / Control Unit voltage incorrect, too high or too low (see data sheet)	Check power supply unit and replace if necessary
	 No mains supply to power supply unit / Control Unit (no voltage) 	Connect power supply
	Drive has shut down on overload	• First move drive in CLOSE direction
Drive doesn't start after having been in operation several times	Operating time has been exceeded, drive has been overheated	Wait until drive has cooled down and start again
	 See possible solutions above associated with "Drive doesn't start" 	 See possible solutions associated with: "Drive doesn't start"
Drive doesn't close	Safety mechanism has been triggered	Release safety area for operation and briefly move the drive in OPEN direction
	 See possible solutions above associated with "Drive doesn't start" 	 See possible solutions associated with: "Drive doesn't start"
Drive travels uncontrolled in open and close direction	Residual ripple of power supply / Control Unit too hight	Adjust drive voltage to the required value of drive. (values see data sheet of drive)
	Fault in power supply unit / Control Unit	Check output voltage of power supply unit or Control Unit

Maintenance and modification

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

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

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

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

Firm Aumüller Aumatic GmbH (www.aumueller-gmbh.de).

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

Maintenance process

- 1. Open or extend power-operated casement completely.
- **2.** Completely disconnect the system from the mains and secure it against automatic or manual activation.
- 3. Check windows and fittings for damages.
- **4.** Check all mechanical fastenings (if required, observe information on torques in installation instructions).
- 5. Check electric drives for damages and contaminations.
- 6. Check connecting cables (drive cable) for:
 - tightness of the cable screw
 - functionality of the strain relief
 - damages
- 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).
- If available, check and re-adjust protection systems of the safe guard fixture.
- **13.** Check the intactness of the CE label at the power-operated system (e.g. SHEV/Natural smoke and heat exhaust ventilators).
- **14.** Check the intactness of warning instructions and labels at the respective drive.
- **15.** Perform a risk assessment in accordance with Machinery Directive 2006 / 42 / EG, if required, e.g. after modifying the machine.



DEMOUNTING

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

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

Dispose of parts according to the locally applicable legal provisions.

DISPOSAL

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





LIABILITY

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

WARRANTY AND CUSTOMER SERVICE

In principal apply our:

"General Terms for the Supply of Products and Services of the Electrical Industry (ZVEI)".

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

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

The warranty period for delivered material is twelve months.

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

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

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

Firm AUMÜLLER AUMATIC GmbH.

Contact data are available at our homepage

(www.aumueller-gmbh.de)

KONFORMITÄTSERKLÄRUNG DECLARATION OF CONFORMITY

Hersteller | Manufacturer

aumüller**.**

AUMÜLLER AUMATIC GmbH Gemeindewald 11 86672 Thierhaupten Germany

Produktart | Product type: Spindelantriebe für Fenster | Spindle drives for windows

Produktbaureihe | *Product series:* SP8 xxx S2 - 24V

SP8-Z xxx S2 - 230V

Ab Seriennummer | From serial number: XXXXXX-XX-XXX

Ab Datum | From date: (Year-W-Week) 18W02

Wir bestätigen die Konformität des oben bezeichneten Produktes mit folgend gelisteten EU-Richtlinien sowie Normen: We herewith confirm the conformity of the above mentioned product with EC Directives and the standards listed below:

EU RECHTSAKTEEU LEGAL AKTS

Richtlinie über elektromagnetische Verträglichkeit 2014/30/EU Directive relating to Electro-Magnetic Compatibility 2014/30/EU

> Niederspannungsrichtlinie 2014/35/EU Low Voltage Directive 2014/35/EU

HARMONISIERTE NORMEN HARMONIZED STANDARDS

DIN EN 61000-6-1 DIN EN 61000-6-2 DIN EN 61000-6-3 DIN EN 61000-6-4 DIN EN 60335-2-103

SONSTIGE TECHNISCHE NORMEN UND SPEZIFIKATIONEN FURTHER TECHNICAL STANDARDS AND SPECIFICATIONS

Montageanweisung | Installation instructions

Thierhaupten, 10.01.2018

Geschäftsführer / Verantwortlich für die technische Dokumentation Managing Director / Head of technical documentation



Die Sicherheitshinweise der mitgelieferten Produktdokumentation sind zu beachten! The safety instructions of the supplied product documentation are to be observed!



EINBAUERKLÄRUNG

für eine unvollständige Maschine, nach Anhang II-1 B der EG-Richtlinie 2006/42/EG

DECLARATION OF INCORPORATION

for a partly completed machinery, in accordance with Annex II-1 part B of EC-Directive 2006/42/EC

Hersteller | Manufacturer

aumüller∎

AUMÜLLER AUMATIC GmbH

Gemeindewald 11 86672 Thierhaupten

Germany

Produktart | Product type: Spindelantriebe für Fenster | Spindle drives for windows

Produktbaureihe | Product series: SP8 xxx S2 - 24V

SP8-Z xxx S2 - 230V

Ab Seriennummer | From serial number: XXXXXX-XX-XXX

Ab Datum | From date: (Year-W-Week) 18W02

Hiermit erklären wir, dass die o.g. unvollständige Maschine den folgenden grundlegenden Sicherheits- und Gesundheitsschutzanforderungen der Maschinenrichtlinie 2006/42/EG entspricht:

Herewith we declare that the above mentioned incomplete machine complies with the following essential health and safety requirements of Machinery Directive 2006/42/EC:

Anhang I, Artikel | Annex I, sections:

1.1.2; 1.1.3; 1.1.5; 1.3.2; 1.3.4; 1.3.7; 1.5.1; 1.5.2; 1.5.6; 1.5.8; 1.5.10; 1.5.11; 1.7.3; 1.7.4; 1.7.4

Die speziellen technischen Unterlagen nach Anhang VII B sowie die Montageanleitung nach Anhang VI wurden erstellt. The relevant technical documentation described in Annex VII part B as well as the assembly instructions described in Annex VI have been compiled.

Weiterhin bestätigen wir die Konformität des Produkts mit folgenden EU Richtlinien oder Normen: Furthermore we confirm the conformity of the product with EU Directives or standards listed below:

Richtlinie über die elektromagnetische Verträglichkeit 2014/30/EU;

Directive relating to Electro-Magnetic Compatibility 2014/30/EC;

Niederspannungsrichtlinie 2014/35/EU;

Low Voltage Directive 2014/35/EC;

DIN EN 60335-2-103

Das Produkt ist in der von uns gelieferten Ausführung zum Einbau in eine Maschine gemäß der Montage- und Installationsanweisung bestimmt. Die Inbetriebnahme des Produktes ist solange untersagt, bis festgestellt wurde, dass die Maschine, in die es eingebaut werden soll, den Bestimmungen der EG Maschinenrichtlinie 2006/42/EG entspricht und die EG-Konformitätserklärung gemäß Anhang II A ausgestellt ist.

The product in the version delivered by us is intended to be integrated in a machine in accordance with the operating and installation instructions. It is prohibited to put the product into operation until the machine, into which it is to be integrated, has been declared in conformity with the provisions of the EC Machinery Directive 2006/42/EC and until the EC Declaration of Conformity according to annex II A is issued.

Auf Verlangen werden wir den zuständigen staatlichen Behörden die spezielle technische Dokumentation als PDF Dokument übermitteln.

Upon request, we will pass on to the appropriate national authority the relevant technical documentation as PDF file.

Kontakt / Contact: Tel.:+49 (0)2871 8185 0

Fax: +49 (0)2871 8185 250 Email: info@aumueller-gmbh.de

Thierhaupten: 10.01.2018

R Meinzer



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.

All information and data contained in this document are subject to alterations without prior notice. Distribution and reproduction of this document as well as the use and disclosure of its content is not authorized unless expressly approved. Offenders will be held liable for the payment of damages. All rights reserved in the case of a patent award or utility model registration.

Basically the General Terms and Conditions of **Aumüller Automatic** GmbH apply to all offers, supplies and services.

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

AUMÜLLER AUMATIC GMBH Gemeindewald 11 86672 Thierhaupten Tel. +49 8271 8185-0 Fax +49 8271 8185-250 info@aumueller-gmbh.de

www.aumueller-gmbh.de

9000002601_V1.2_KW15/18