



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

EN

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

DE

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

FR

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

CN

Следуйте подробной инструкции по монтажу!
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RU

Przestrzegać szczegółowej instrukcji montażu!
Link do szczegółowy instrukcji montażu i uruchomienia:
Proszę zeskanować kod QR i otworzyć stronę **AUMÜLLER**.

PL

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NL



K82 + B4 + F10.85

1

K82 - Part-No. 151320

B4 - Part-No. 515900

F10.85 - Part-No. 151105

K122-1 + B4 + F30

2

K122-1 + B4 - Part-No. 155116 + 515900

F30 - Part-No. 155160

K15-Set (K15 + B16ST + F11)

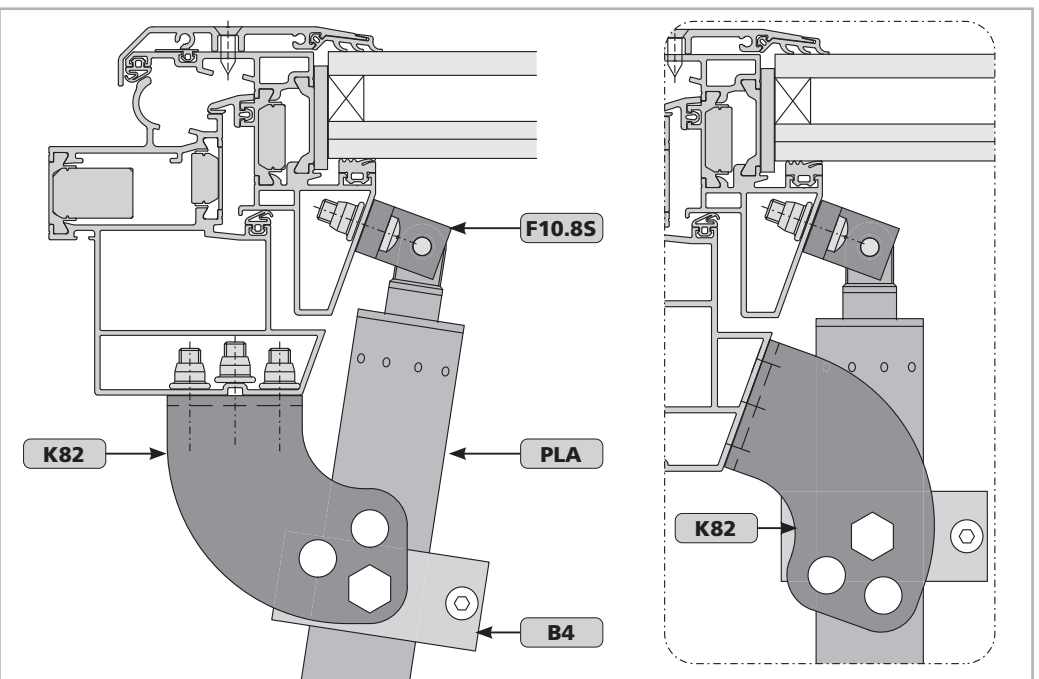
3

K15-Set - Part-No. 517590

K82 + B4 + F10.85

1

Leave the drainage hole open.
Do not close with cable ties.



M6

F10.85

PLA

B4

~ 2

46

M6

B4

PLA

~ 2

46

M6

B4

PLA

~ 2

46

F10.85

PLA

SW14

max. 15 N/m
tighten screw tightly

SW13

max. 15 N/m
tighten screw tightly

K122-1 + B4 + F30

2

Leave the drainage hole open.
Do not close with cable duct.

F30

M6

16

19

68

14

25

68

PLA

F30

M6

16

19

68

14

25

68

PLA

K122-1

M6

65

65

25

14

M6

K122-1

M6

65

65

25

14

M6

F30

K122-1

B4

SW14

max. 15 N/m
tighten screw tightly

F30

K122-1

B4

SW14

max. 15 N/m
tighten screw tightly

K15-Set (K15 + B16ST + F11)

3

Leave the drainage hole open.
Do not close with cable duct.

K15

M5

K15

52

52

17

K15

M5

K15

52

52

17

F11

M6

min. 20

43

min. 40

F11

M6

min. 20

43

min. 40

F11

Grease

Adjust casement pressure.
Window must be fully closed.
± 7 mm

B16ST

SW13

F11

Grease

Adjust casement pressure.
Window must be fully closed.
± 7 mm

B16ST

SW13

aumüller

ASSEMBLY INSTRUCTION PLA

SPINDLE DRIVE FOR WINDOWS

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

CE



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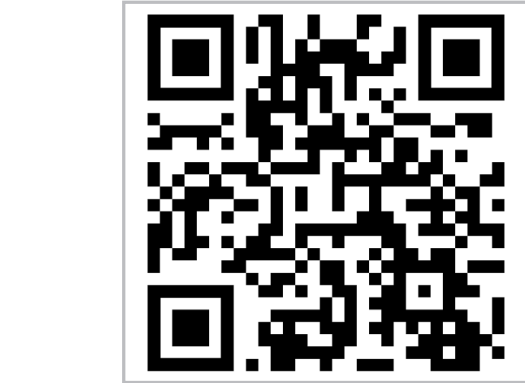
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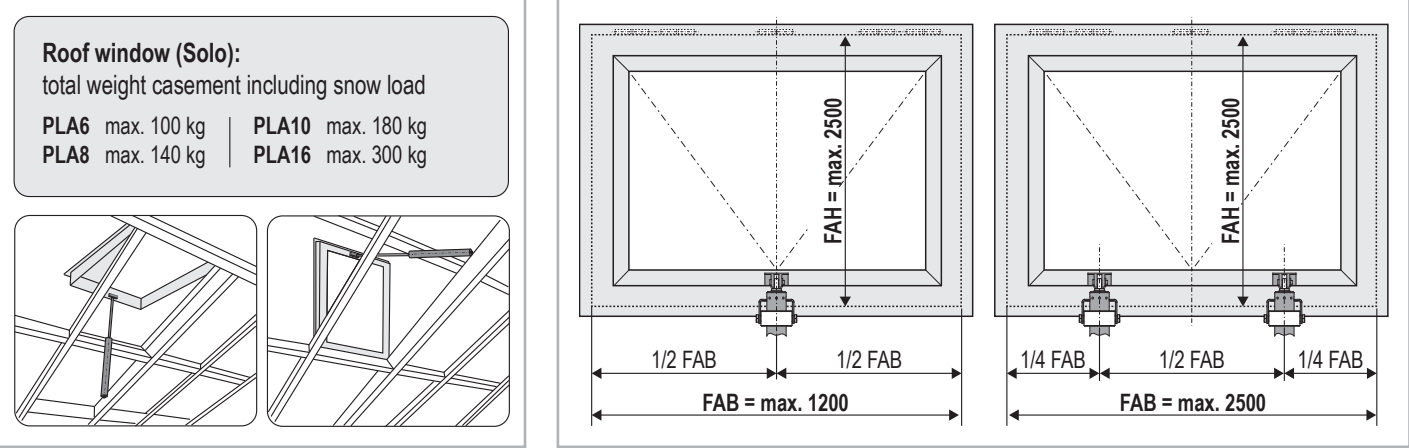
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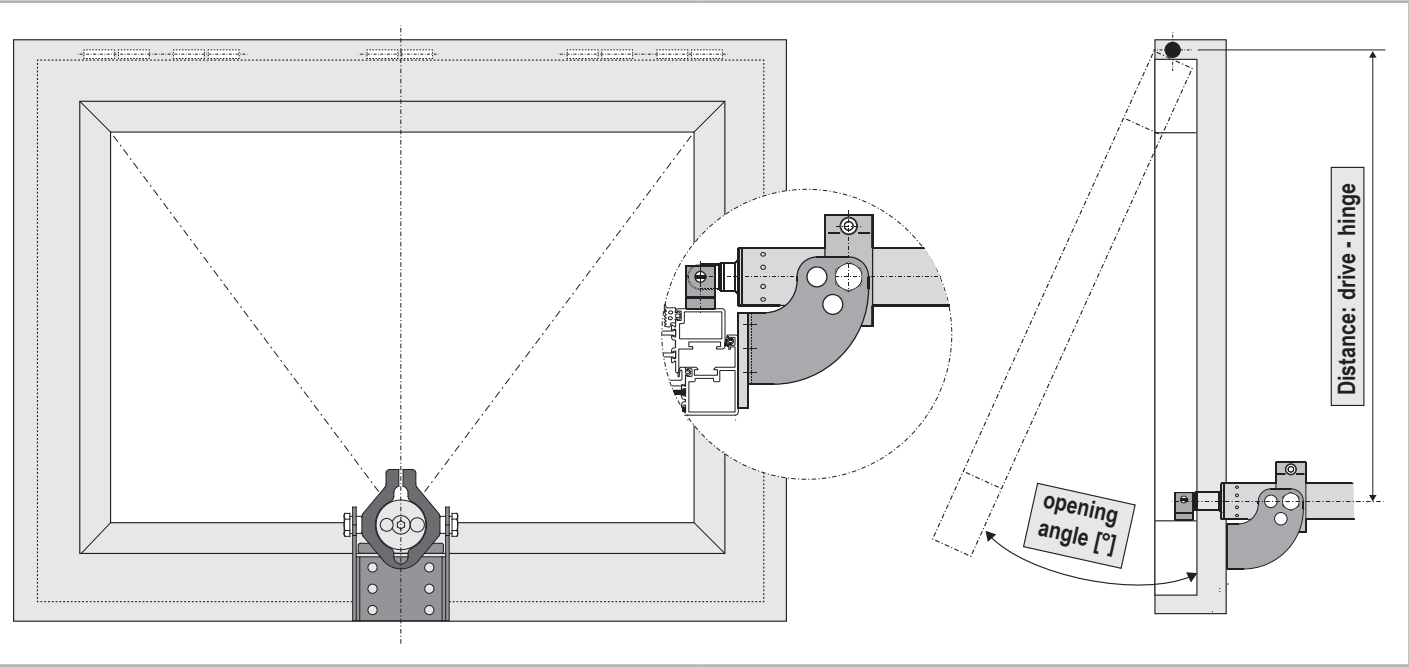
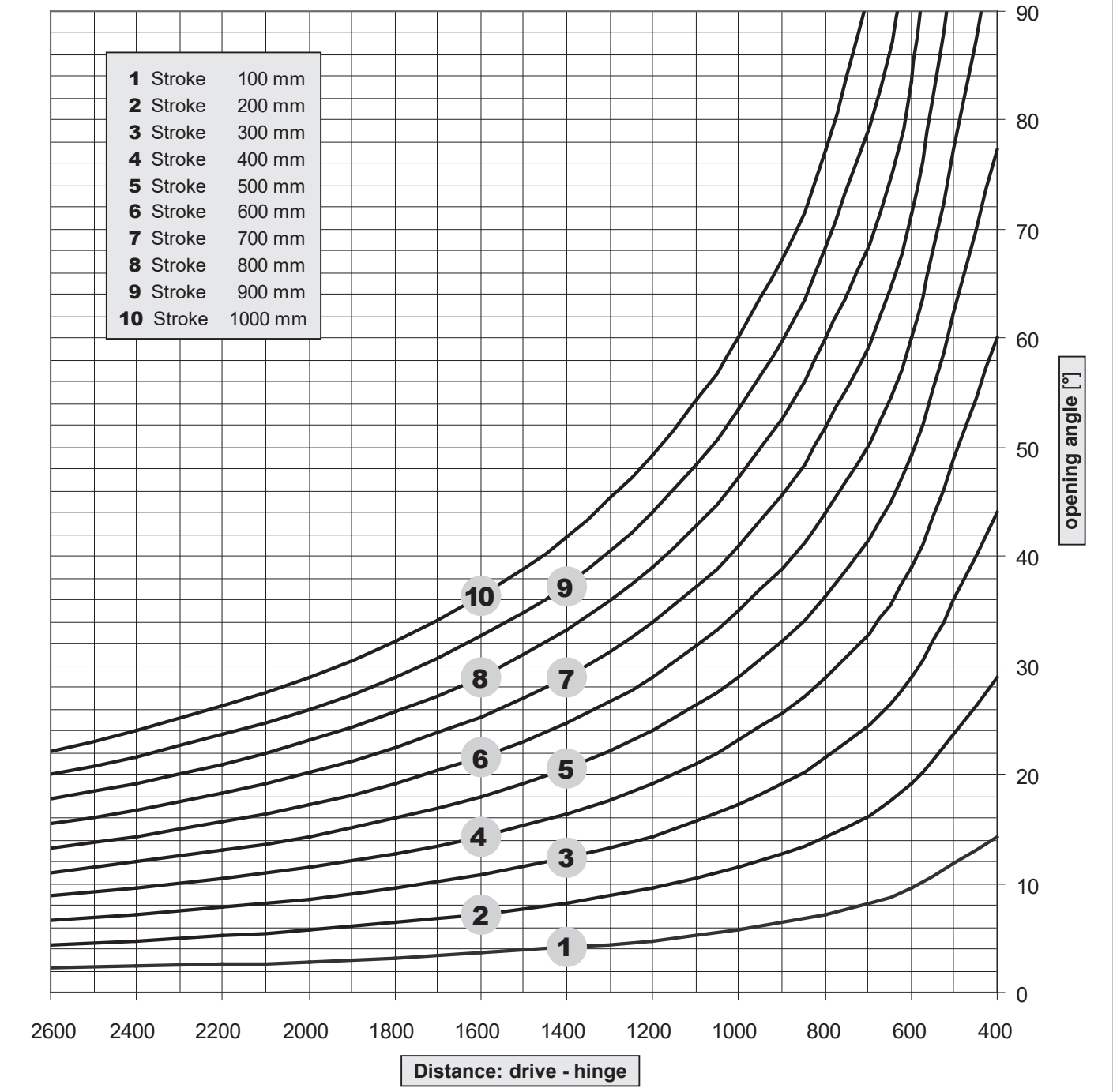


Planning the opening angle for direct operation

This planning diagram is a general guide to help establish the most appropriate drive stroke for the opening width required. The specific installation situations are to be observed.

The opening angle for direct operating drives on the main closing edge depends on:

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



S12 S3 24 V DC

24 V PLA

BN BU WH

Polarity reversal

+	+	-
+	-	+
+	+	-

OPEN CLOSE

S12 WH: data communication - don't apply external voltage! Risk of damage!

S3 WH: Only for special applications. Don't apply external voltage! Risk of damage!

S12 S3 M-COM 24 V DC

Individual configuration

24 V DC (SELV)

PLA 24 V S12 S3

WH BN BU

FVUx 24 V S12

M-COM

Polarity reversal

+	+	-
+	-	+
+	+	-

OPEN CLOSE

S12 WH: data communication - don't apply external voltage! Risk of damage!

S3 WH: Only for special applications. Don't apply external voltage! Risk of damage!

S12 Master / Slave 24 V DC

Master Slave Slave

PLA 24 V S12

PLA 24 V S12

FVUx 24 V S12

24 V DC (SELV)

WH BN BU

Polarity reversal

+	+	-
+	-	+
+	+	-

OPEN CLOSE

S12 WH: data communication - don't apply external voltage! Risk of damage!

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Assembly and Commissioning Instructions

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



PLA S3 / S12 24V DC SPINDLE DRIVE FOR WINDOWS

CE



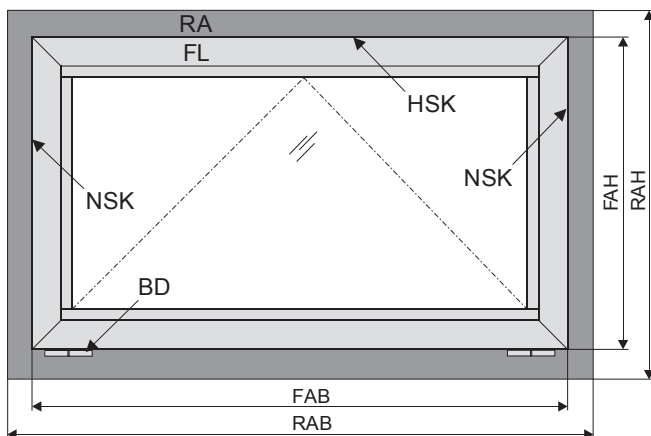
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Abbreviations

Index of abbreviations

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

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



Target group

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

Warning and safety symbols in these Instructions:

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

! DANGER Failure to comply with the warning notes results in irreversible injuries or death.

! WARNING Failure to comply with the warning notes can result in irreversible injuries or death.

! CAUTION Failure to comply with the warning notes can result in minor or moderate (reversible) injuries.

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



Caution / Warning
Danger due to electric current.



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



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

! WARNING

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

! WARNING

This device is not intended for use by persons (including children) with physical, sensory or mental limitations or lacking experience and / or knowledge, unless they are supervised by a person who is responsible for the safety or were instructed by him on the usage of this equipment. Children should be supervised to ensure that they are not playing with this device.

Cleaning and operator's maintenance may not be performed by children without supervision.

Intended use

Area of application / Scope of application

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

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

NOTE

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

Intended use according

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

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

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

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

WARNING

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

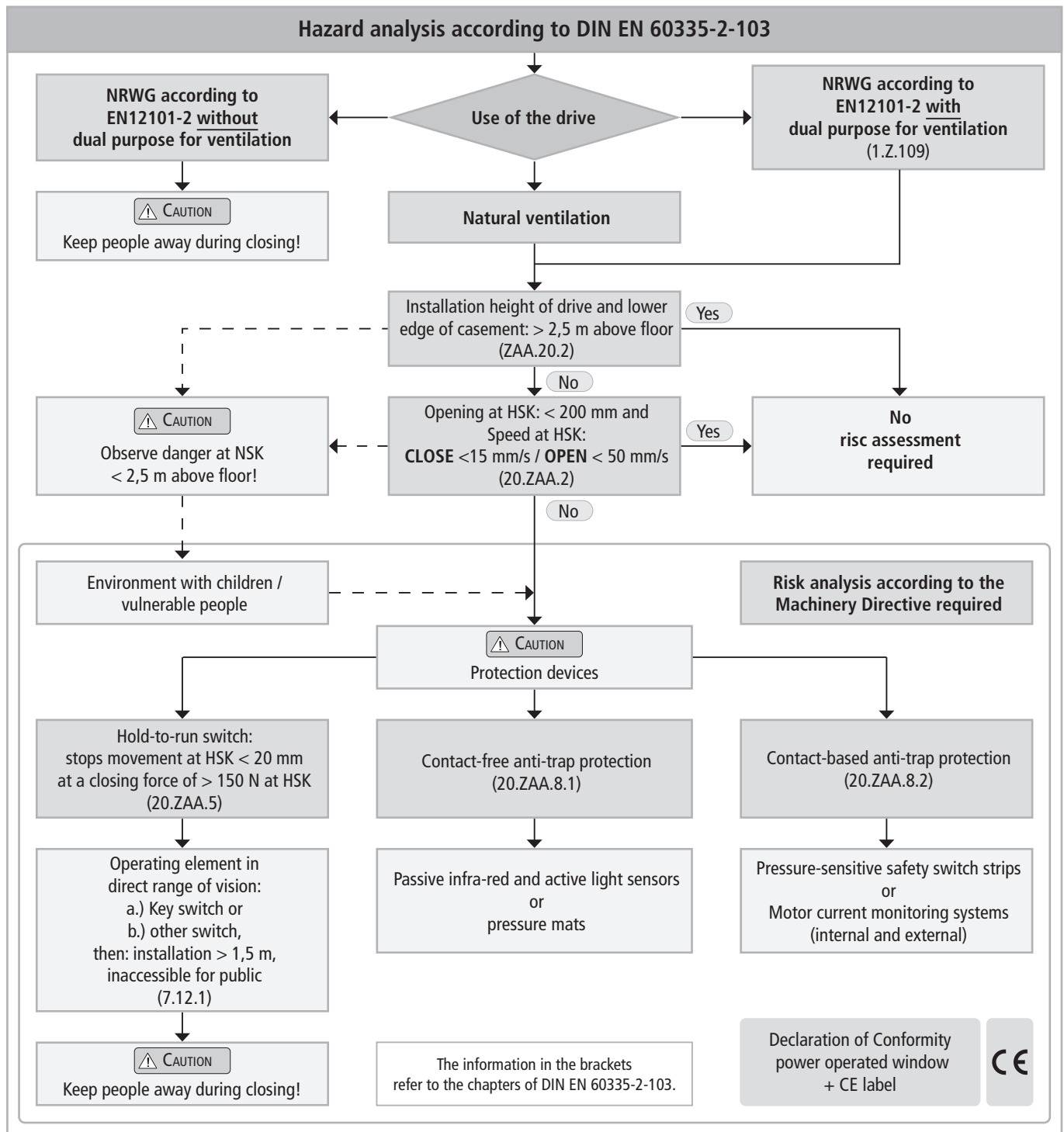
- The **constructor or his agent** (architect, specialist planner) **are obligated to evaluate the hazards to persons**, outgoing from the usage, installation position, opening parameters and from the external Control Unit of the power operated window, **already in the planning phase and to establish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

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

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

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

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

**Casement data**

Facade: bottom-hung window / top-hung window / side hung window

Roof: roof window / sky light

Opening direction: inward opening / outward opening

Profile material: aluminum, steel, plastic or wood.

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 space at the window frame and casement frame.

Safety instructions

WARNING

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!

WARNING

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

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



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

Installation

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

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

NOTE

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



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

Danger to life!

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

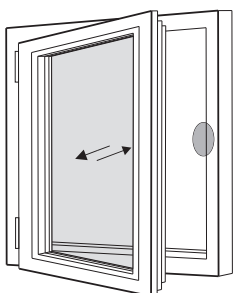
Mounting material

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

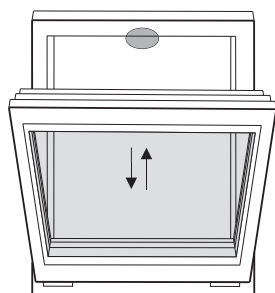
NOTE

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

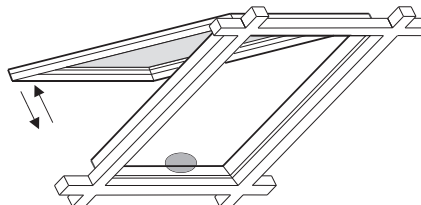
Danger spots by crush and shear points



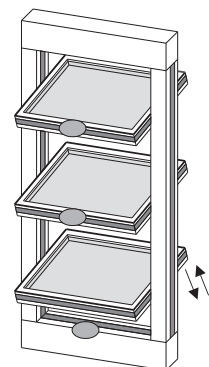
Side-hung



Bottom-hung



Roof windows / skylight domes



Louvre windows

○ Danger spots: crush and shear points according to 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.

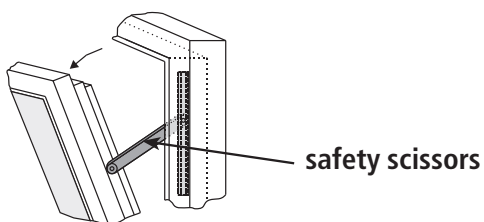
Unintentional or independent opening or falling

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



WARNING

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



Routing cables and electrical connection

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

All relevant national instructions shall be observed for the installation.



All-pole disconnecting devices shall be installed in the permanent electrical installation or external Control Unit for the drive.

The mains supply lines 230 V / 400 V AC shall be protected separately!



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

NOTE

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



WARNING

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

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

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



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

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

Commissioning, operation and maintenance

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

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

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

NOTE Post warning signs!

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

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

 **CAUTION**

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

 **CAUTION**

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

 **CAUTION**



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

 **WARNING**

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

Replacement parts, fasteners and controls

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

Ambient conditions

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

• Operation:

Ambient temperature: -5 °C ... +60°C

Relative humidity: < 90% less 20°C;

< 50% less 40°C;

no formation of condensation

NOTE

Observe temperature range during installation!

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

NOTE

• Transport / Storage:

Storage temperature: -5°C ... +40°C

Relative humidity: < 60%

Accident prevention regulations and workmen's compensation insurance guidelines

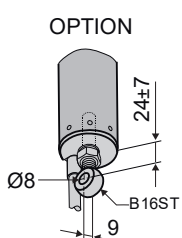
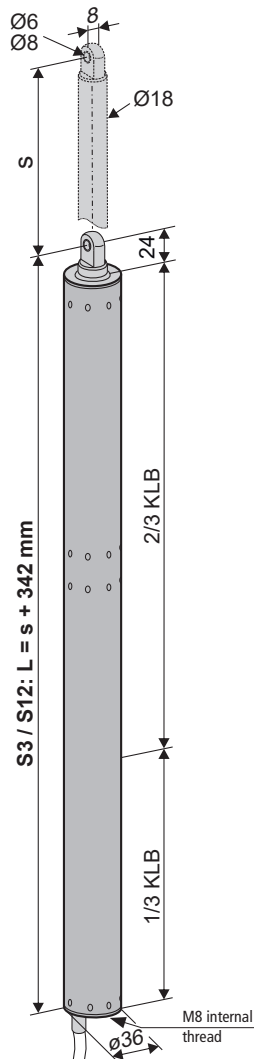
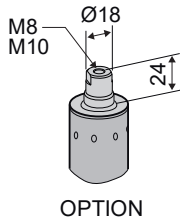
For work on or in a building or building part the provisions and instructions of the respective accident prevention regulations (local workmen's compensation insurance guidelines) shall be observed and adhered to.

Declaration of Conformity and of Incorporation

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

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

Data sheet PLA6 S3 / S12 24V DC



- Application: natural ventilation, SHEV, ferralux®-NSHEV

Options

- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

S3

- Internal load dependend cut-off switch, post cycle resistant S3
- Programmable motion monitored run (up to 300 mm stroke)
- Programmable sequence control with locking drives (S3 / S12)

S12

- Internal Intelligent Control Electronics S12
- Options
- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

Technical data

U_N	Rated voltage	24V DC (19 V ... 28 V)												
I_N	Rated current	0,6 A												
I_A	Cut-off current	0,8 A												
P_N	Rated power	15 W												
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)												
	Protection rating	IP 65												
	Ambient temperature range	-5 °C ... +60 °C												
F_Z	Pulling force max.	600 N												
F_A	Pushing force max.													
		<table border="1"> <caption>Pushing force data</caption> <thead> <tr> <th>Stroke s (mm)</th> <th>Pushing force F (N)</th> <th>Label</th> </tr> </thead> <tbody> <tr> <td>0 - 1100</td> <td>600</td> <td>2/3 KLB</td> </tr> <tr> <td>1100</td> <td>550</td> <td></td> </tr> <tr> <td>1200</td> <td>300</td> <td>1/3 KLB</td> </tr> </tbody> </table>	Stroke s (mm)	Pushing force F (N)	Label	0 - 1100	600	2/3 KLB	1100	550		1200	300	1/3 KLB
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0 - 1100	600	2/3 KLB												
1100	550													
1200	300	1/3 KLB												
F_H	Pullout force	5000 N (fastening depended)												
	Spindle tube	stainless steel												
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m												
v	Speed	↗ 6,0 mm/s ↘ 6,0 mm/s												
s	Stroke	100 – 1200 mm												
L	Length	S3 / S12: s + 342 mm (see order data)												
	Sound pressure level	≤ 70 dB (A)												

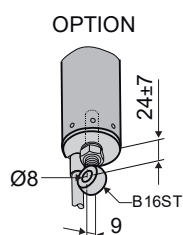
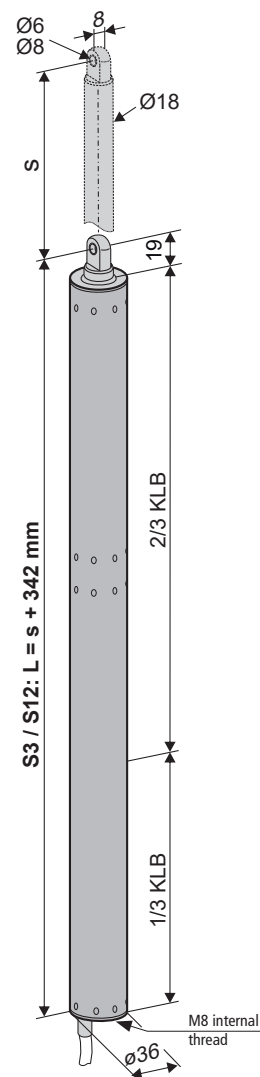
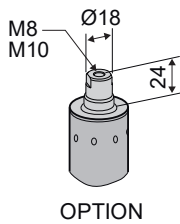
Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA6 100 S3	E6/C-0	1	564111
	442	PLA6 100 S12		1	546310
200	542	PLA6 200 S3	E6/C-0	1	564122
	542	PLA6 200 S12		1	546320
300	642	PLA6 300 S3	E6/C-0	1	564131
	642	PLA6 300 S12		1	546330
400	742	PLA6 400 S3	E6/C-0	1	564141
	742	PLA6 400 S12		1	546340
500	842	PLA6 500 S3	E6/C-0	1	564151
	842	PLA6 500 S12		1	546350
600	942	PLA6 600 S3	E6/C-0	1	564161
	942	PLA6 600 S12		1	546360
750	1092	PLA6 750 S3	E6/C-0	1	564176
	1092	PLA6 750 S12		1	546375
1000	1342	PLA6 1000 S3	E6/C-0	1	564201
	1342	PLA6 1000 S12		1	546400

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	up 101	516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic lenght shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S3		
Motion monitored run / sequence control	1	524181
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories	PU/pcs.	Part.-No.
M-COM Configuration module for synchronised multi-drive systems	1	524177

Data sheet PLA8 S3 / S12 24V DC



- Application: natural ventilation, SHEV, ferralux®-NSHEV

Options

- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

S3

- Internal load dependend cut-off switch, post cycle resistant S3
- Programmable motion monitored run (up to 300 mm stroke)
- Programmable sequence control with locking drives (S3 / S12)

S12

- Internal Intelligent Control Electronics S12

Options

- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

Technical data

U_N	Rated voltage	24V DC (19 V ... 28 V)
I_N	Rated current	1,0 A
I_A	Cut-off current	1,4 A
P_N	Rated power	24 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)
	Protection rating	IP 65
	Ambient temperature range	-5 °C ... +60 °C
F_Z	Pulling force max.	800 N
F_A	Pushing force max.	
F_H	Pullout force	5000 N (fastening depended)
	Spindle tube	stainless steel
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m
v	Speed	10,0 mm/s
s	Stroke	100 – 1200 mm
L	Length	S3 / S12: s + 342 mm (see order data)
	Sound pressure level	≤ 70 dB (A)

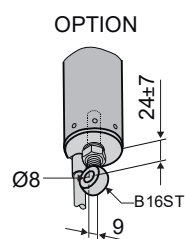
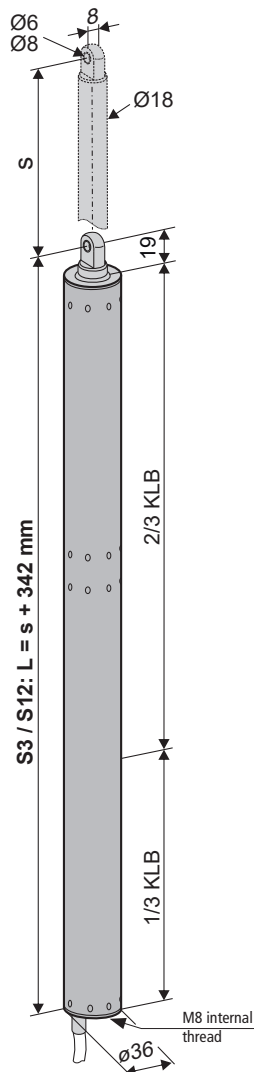
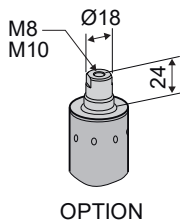
Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA8 100 S3	E6/C-0	1	523711
	442	PLA8 100 S12		1	515210
200	542	PLA8 200 S3	E6/C-0	1	523721
	542	PLA8 200 S12		1	515220
300	642	PLA8 300 S3	E6/C-0	1	523731
	642	PLA8 300 S12		1	515230
400	742	PLA8 400 S3	E6/C-0	1	523741
	742	PLA8 400 S12		1	515240
500	842	PLA8 500 S3	E6/C-0	1	523751
	842	PLA8 500 S12		1	515250
600	942	PLA8 600 S3	E6/C-0	1	523761
	942	PLA8 600 S12		1	515260
750	1092	PLA8 750 S3	E6/C-0	1	523776
	1092	PLA8 750 S12		1	515275
1000	1342	PLA8 1000 S3	E6/C-0	1	523801
	1342	PLA8 1000 S12		1	515295

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	up 101	516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic lenght shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S3		
Motion monitored run / sequence control	1	524181
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories	PU/pcs.	Part.-No.
M-COM Configuration module for synchronised multi-drive systems	1	524177

Data sheet PLA101 S3 / S12 24V DC



- Application: natural ventilation, SHEV, ferralux®-NSHEV

Options

- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

S3

- Internal load dependend cut-off switch, post cycle resistant S3
- Programmable motion monitored run (up to 300 mm stroke)
- Programmable sequence control with locking drives (S3 / S12)

S12

- Internal Intelligent Control Electronics S12

Options

- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

Technical data

U_N	Rated voltage	24V DC (19 V ... 28 V)															
I_N	Rated current	0,8 A															
I_A	Cut-off current	1,0 A															
P_N	Rated power	19 W															
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)															
	Protection rating	IP 65															
	Ambient temperature range	-5 °C ... +60 °C															
F_Z	Pulling force max.	1000 N															
F_A	Pushing force max.																
		<table border="1"> <caption>Pushing force F (N) vs Stroke s (mm)</caption> <thead> <tr> <th>s (mm)</th> <th>F (N) - 2/3 KLB</th> <th>F (N) - 1/3 KLB</th> </tr> </thead> <tbody> <tr> <td>900</td> <td>1000</td> <td>1000</td> </tr> <tr> <td>1000</td> <td>1000</td> <td>800</td> </tr> <tr> <td>1100</td> <td>1000</td> <td>550</td> </tr> <tr> <td>1200</td> <td>1000</td> <td>300</td> </tr> </tbody> </table>	s (mm)	F (N) - 2/3 KLB	F (N) - 1/3 KLB	900	1000	1000	1000	1000	800	1100	1000	550	1200	1000	300
s (mm)	F (N) - 2/3 KLB	F (N) - 1/3 KLB															
900	1000	1000															
1000	1000	800															
1100	1000	550															
1200	1000	300															
F_H	Pullout force	5000 N (fastening depended)															
	Spindle tube	stainless steel															
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m															
v	Speed	↗ 4,6 mm/s ↘ 4,6 mm/s															
s	Stroke	100 – 1200 mm															
L	Length	S3 / S12: s + 342 mm (see order data)															
	Sound pressure level	≤ 70 dB (A)															

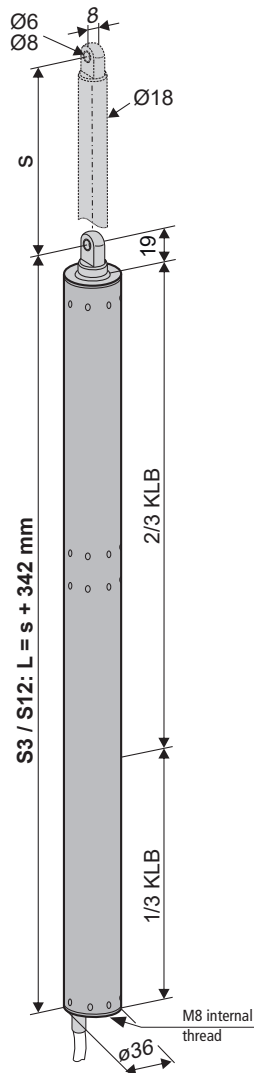
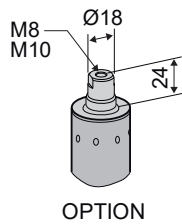
Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA101 100 S3	E6/C-0	1	565111
	442	PLA101 100 S12		1	564910
200	542	PLA101 200 S3	E6/C-0	1	565121
	542	PLA101 200 S12		1	564922
300	642	PLA101 300 S3	E6/C-0	1	565131
	642	PLA101 300 S12		1	564930
400	742	PLA 01 400 S3	E6/C-0	1	565141
	742	PLA101 400 S12		1	564940
500	842	PLA101 500 S3	E6/C-0	1	565151
	842	PLA101 500 S12		1	564950
600	942	PLA101 600 S3	E6/C-0	1	565161
	942	PLA101 600 S12		1	564960
750	1092	PLA101 750 S3	E6/C-0	1	565176
	1092	PLA101 750 S12		1	564975
1000	1342	PLA101 1000 S3	E6/C-0	1	565201
	1342	PLA101 1000 S12		1	565000

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	up 101	516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic lenght shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S3		
Motion monitored run / sequence control	1	524181
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories	PU/pcs.	Part.-No.
M-COM Configuration module for synchronised multi-drive systems	1	524177

Data sheet PLA116 S3 / S12 24V DC



S3 / S12: L = s + 342 mm

1/3 KLB

M8 internal thread

36

19

2/3 KLB

8

Ø18

Ø8

Ø6

24

M10

M8

OPTION

B16ST

9

24±7

OPTION

- Application: natural ventilation, SHEV, ferralux®-NSHEV

Options

- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

S3

- Internal load dependend cut-off switch, post cycle resistant S3
- Programmable motion monitored run (up to 300 mm stroke)
- Programmable sequence control with locking drives (S3 / S12)

S12

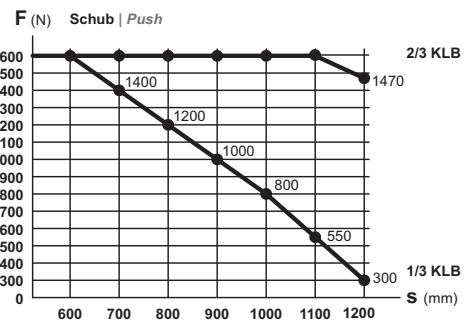
- Internal Intelligent Control Electronics S12

Options

- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)

Technical data

U_N	Rated voltage	24V DC (19 V ... 28 V)
I_N	Rated current	1,0 A
I_A	Cut-off current	1,2 A
P_N	Rated power	24 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)
	Protection rating	IP 65
	Ambient temperature range	-5 °C ... +60 °C
F_Z	Pulling force max.	1600 N
F_A	Pushing force max.	



F_H	Pullout force	5000 N (fastening depended)
	Spindle tube	stainless steel
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m
v	Speed	4,0 mm/s
s	Stroke	100 – 1200 mm
L	Length	S3 / S12: s + 342 mm (see order data)
	Sound pressure level	≤ 70 dB (A)

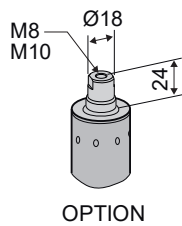
Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA 116 100 S3	E6/C-0	1	565312
	442	PLA 116 100 S12		1	565510
200	542	PLA 116 200 S3	E6/C-0	1	565321
	542	PLA 116 200 S12		1	565520
300	642	PLA 116 300 S3	E6/C-0	1	565331
	642	PLA 116 300 S12		1	565530
400	742	PLA 116 400 S3	E6/C-0	1	565341
	742	PLA 116 400 S12		1	565540
500	842	PLA 116 500 S3	E6/C-0	1	565351
	842	PLA 116 500 S12		1	565550
600	942	PLA 116 600 S3	E6/C-0	1	565361
	942	PLA 116 600 S12		1	565560
750	1092	PLA 116 750 S3	E6/C-0	1	565376
	1092	PLA 116 750 S12		1	565575

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	up 101	516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic length shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S3		
Motion monitored run / sequence control	1	524181
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories		
M-COM Configuration module for synchronised multi-drive systems	1	524177

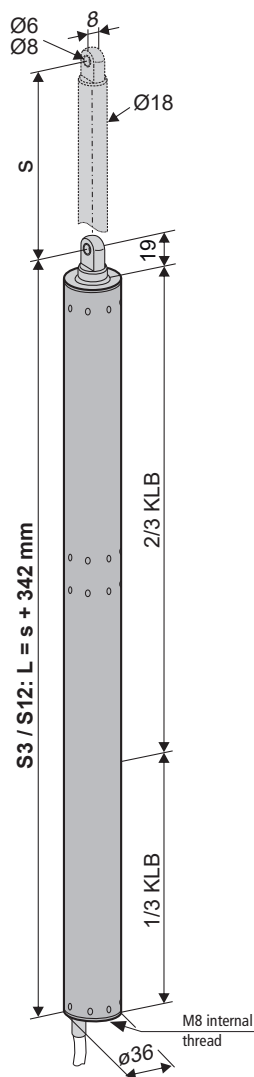
Data sheet PLA10 S12 24V DC



- Application: natural ventilation, SHEV, ferralux®-NSHEV
- Internal Intelligent Control Electronics S12

Options

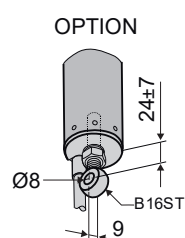
- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)
- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

**Technical data**

U_N	Rated voltage	24V DC (19 V ... 28 V)
I_N	Rated current	1,9 A
I_A	Cut-off current	2,5 A
P_N	Rated power	45 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)
	Protection rating	IP 65
	Ambient temperature range	-5 °C ... +60 °C
F_Z	Pulling force max.	1000 N
F_A	Pushing force max.	



F_H	Pullout force	5000 N (fastening depended)
	Spindle tube	stainless steel
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m
v	Speed	12,6 mm/s
s	Stroke	100 – 1200 mm
L	Length	s + 342 mm (see order data)
	Sound pressure level	≤ 70 dB (A)



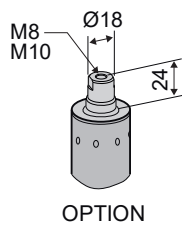
Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA 10 100 S12	E6/C-0	1	523610
200	542	PLA 10 200 S12	E6/C-0	1	523620
300	642	PLA 10 300 S12	E6/C-0	1	523630
400	742	PLA 10 400 S12	E6/C-0	1	523640
500	842	PLA 10 500 S12	E6/C-0	1	523650
600	942	PLA 10 600 S12	E6/C-0	1	523660
750	1092	PLA 10 750 S12	E6/C-0	1	523675
1000	1342	PLA 10 1000 S12	E6/C-0	1	523700

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Lump sum for coating		516030
Specify at order stage:	1 - 20	516004
	21 - 50	516004
	51 - 100	516004
	up 101	516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic lenght shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories	PU/pcs.	Part.-No.
M-COM Configuration module for synchronised multi-drive systems	1	524177

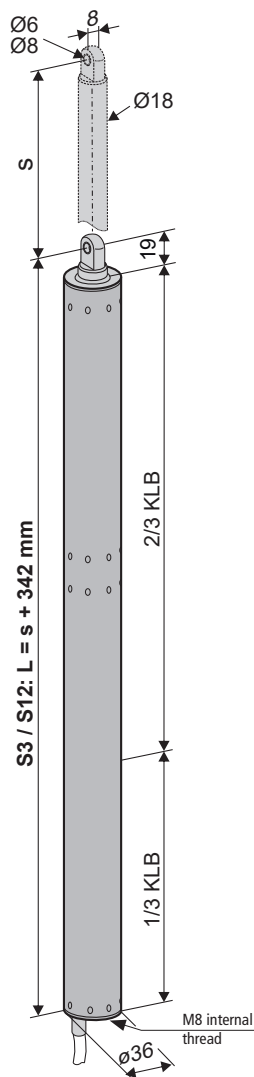
Data sheet PLA16 S12 24V DC



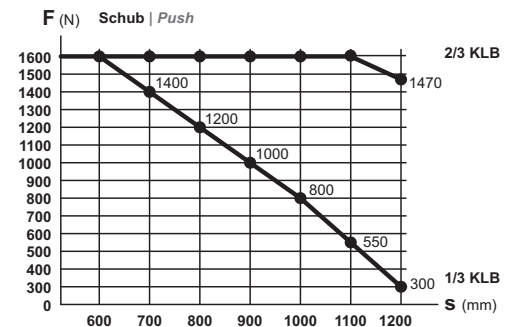
- Application: natural ventilation, SHEV, ferralux®-NSHEV
- Internal Intelligent Control Electronics S12

Options

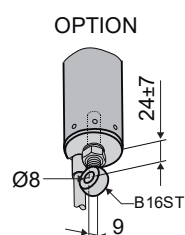
- Programmable synchronised run (max. 4 drives) and special functions
- M-COM for automatic synchronised run of multi drive systems and automatic sequence control with locking drives (S3 / S12)
- Spindle tube with interior thread for clevis
- Eyebolt and clevis for rear suspension

**Technical data**

U_N	Rated voltage	24V DC (19 V ... 28 V)
I_N	Rated current	1,9 A
I_A	Cut-off current	2,5 A
P_N	Rated power	45 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min. / OFF: 7 min.)
	Protection rating	IP 65
	Ambient temperature range	-5 °C ... +60 °C
F_z	Pulling force max.	1600 N
F_A	Pushing force max.	



F_H	Pullout force	5000 N (fastening depended)
	Spindle tube	stainless steel
	Connecting cable	non-halogen, grey 3 x 1,0 mm ² , ~ 3 m
v	Speed	7,0 mm/s
s	Stroke	100 – 1200 mm
L	Length	s + 342 mm (see order data)
	Sound pressure level	≤ 70 dB (A)



Order data

s [mm]	L [mm]	Version	Finish	PU/pcs.	Part.-No.
100	442	PLA16 100 S12	E6/C-0	1	565710
200	542	PLA16 200 S12	E6/C-0	1	565720
300	642	PLA16 300 S12	E6/C-0	1	565730
400	742	PLA16 400 S12	E6/C-0	1	565740
500	842	PLA16 500 S12	E6/C-0	1	565750
600	942	PLA16 600 S12	E6/C-0	1	565760
750	1092	PLA16 750 S12	E6/C-0	1	565775
1000	1342	PLA16 1000 S12	E6/C-0	1	565800

Options

Special model	PU/pcs.	Part.-No.
Front Fixing		
Spindle tube with interior thread M8	1	515061
Spindle tube end with interior thread M10	1	515060
Drive housing painted/powder coated in other RAL colours		
Specify at order stage:		516030 + 516004
Extra length connecting cable:		
5 m – non-halogen, grey – 3 x 1,0 mm ²		501037
10 m – non-halogen, grey – 3 x 1,0 mm ²		501039
Mechanic stroke reduction S3		
w/o basic lenght shortening of housing	1	516000
Accessories for front / rear suspension		
B16ST Eyebolt Ø8 mm, galvanized	1	100044
B16VA Eyebolt Ø8 mm, stainless steel	1	100144
B27ST Clevis M8x16 mm, galvanized, thread M8x45 mm	1	105510
B28ST Clevis M10x20 mm, galvanized, thread M10x50 mm	1	105520
Microprocessor programming S12		
Electronic stroke reduction 24V S12		524190
Programming drives 24V / 230V S12		524180
Optional accessories		
M-COM Configuration module for synchronised multi-drive systems	1	524177

Explanations on the product label

The product label informs about:

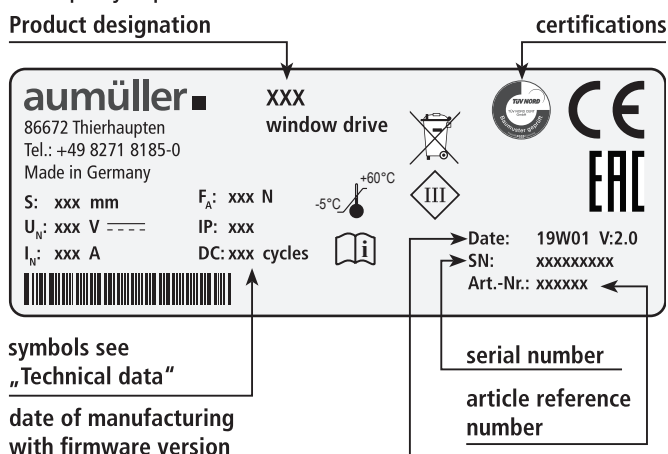
- manufacturer's address
- article reference number and name
- technical characteristics
- date of manufacturing with firmware version
- certifications
- serial number

NOTE

Never install and operate damaged products.

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

Exemplary representation



Areas of application and casement sizes

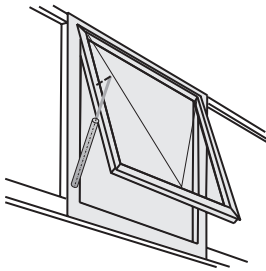
Areas of application and casement sizes:

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

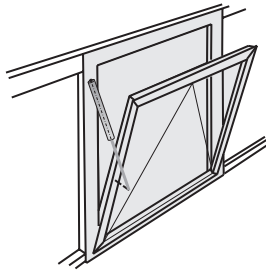
Top-hung casement and Bottom-hung casement inward opening **NSK**

FAB max. = 1200 mm / solo
= 2500 mm / tandem

FAH max. = 2500 mm



Top-hung casement

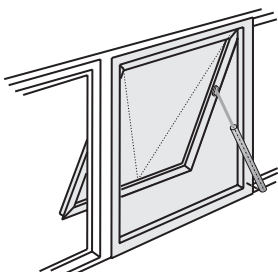


Bottom-hung casement

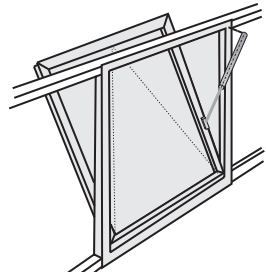
Top-hung casement und Bottom-hung casement outward opening **NSK**

FAB max. = 1200 mm / solo
= 2500 mm / tandem

FAH max. = 2500 mm



Top-hung casement



Bottom-hung casement

Roof window

HSK

FAB max. = 1200 mm / solo
= 2500 mm / tandem

FAH max. = 2500 mm

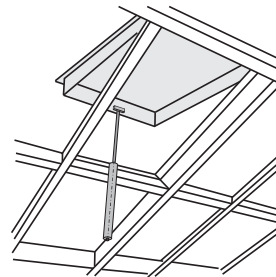
total weight casement including snow load

PLA6 max. 100 kg

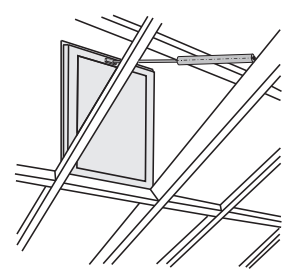
PLA8 max. 140 kg

PLA10 max. 180 kg

PLA16 max. 300 kg



Top-hung casement



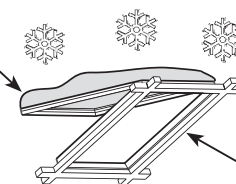
Bottom-hung casement

Snow load on roof windows for SHEV-systems

Example:

snow load = 60 kg

(Casement area x
Typical snow load)



Example: FG = 40 kg

Example calculation

Establish snow loading based on national standards /directives
(in Germany according to DIN 1055-5)

total weight = FG + snow load

total weight = (40 kg + 60 kg) = 100 kg

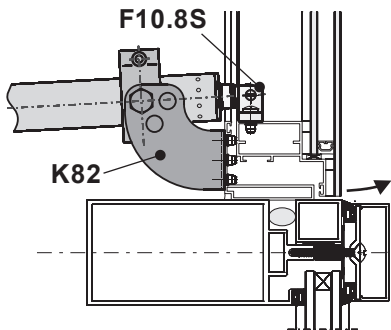
Opening angle at direct operation (outward opening windows)

HSK NSK

Application at the following activation

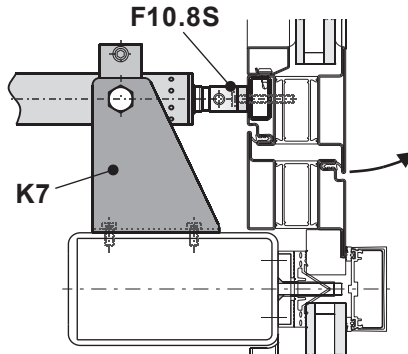
Activation on HSK
frame bracket on frame

HSK



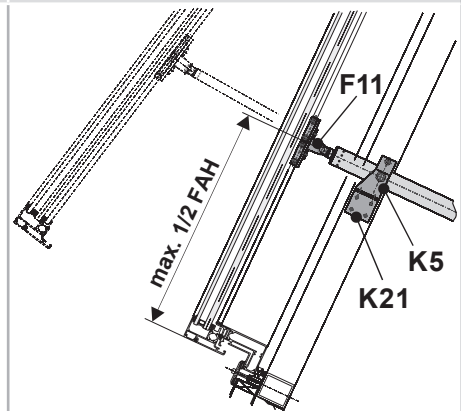
Activation on HSK
frame bracket on the transom

HSK



Activation on NSK
frame bracket on the transom

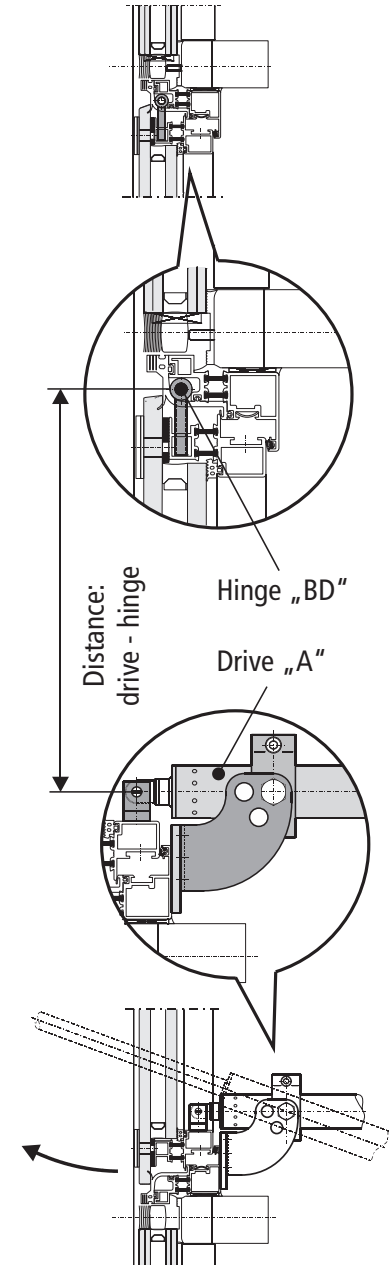
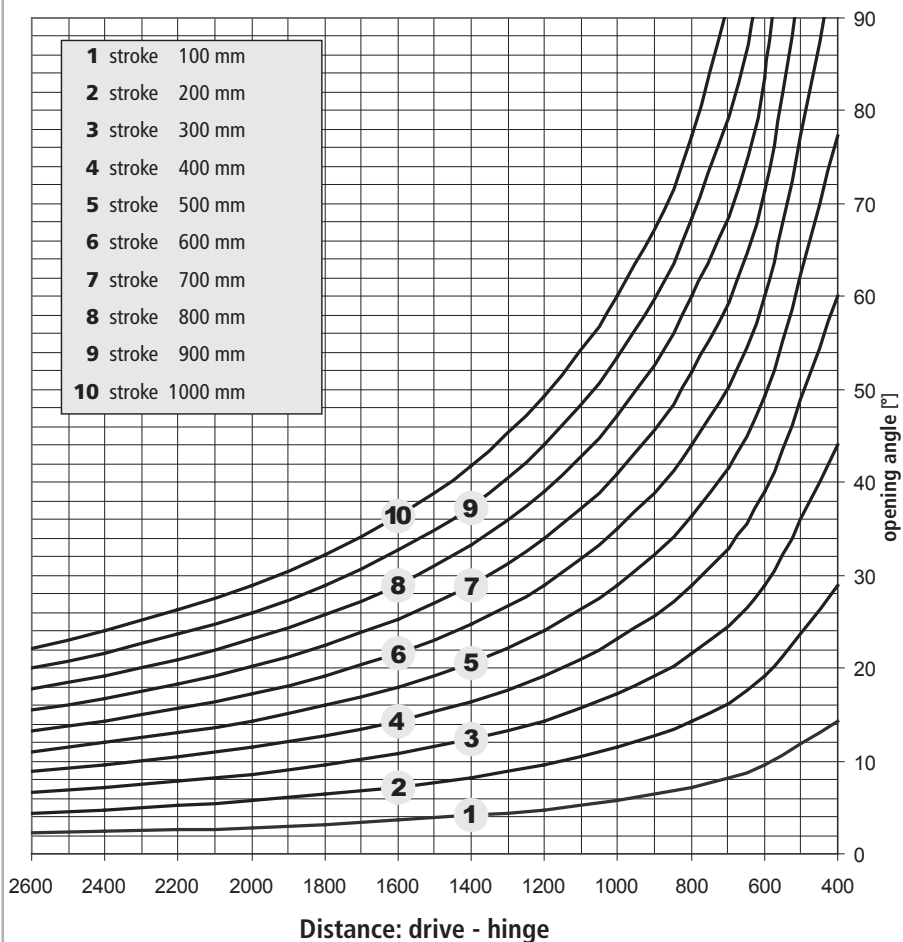
NSK



Planning the opening angle for direct operation

This planning diagram is a general guide to help establish the most appropriate drive stroke for the opening width required. The specific installation conditions are to be observed. The opening angle for direct operating drives on the main closing edge (HSK) or on the side closing edge (NSK) 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

WARNING

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

Storage of drives at the construction site

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

Inspection of drives before installation

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

NOTE

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

Test kit for drives

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



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

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

Inspection of the intended use

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

Predictable misuse

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

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

Testing mechanical requirements

Prior to the start of the installation check whether :

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

If not, counter measures must be taken!



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

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

Tools required

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

Check window data on site

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

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

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

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

Facade

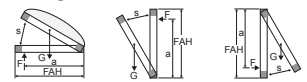
$$F \text{ [N]} = \frac{5,4 \cdot G \text{ [kg]} \cdot FAH \text{ [m]}}{a \text{ [m]}}$$

Roof

a = Distance of action point to hinges

F = Drive force

s = Stroke



Scope of delivery:

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

Accessories for Spindle Drive	
	Assembly and Commissioning Instructions
	Warning sign sticker „Risk of entrapment“ (1x)

Positioning of the drives at the HSK

Positioning of the drives at the HSK		HSK
One Spindle Drive	Two Spindle Drive	

INSTALLATION STEP 3A: Determine the casement brackets

HSK **NSK**

Hole layout for casement brackets

Casement bracket F1	Casement bracket F1.1	Casement bracket F1V
HSK	HSK	HSK
Suspension with bore Ø 6 mm	Suspension with bore Ø 6 mm	Suspension with bore Ø 6 mm
Casement bracket F10.6	Casement bracket F10.85	
HSK	HSK	
Suspension with bore Ø 6 mm	Suspension with bore Ø 8 mm	
Casement bracket F11ST / F11VA	Casement bracket F12	Casement bracket F13
NSK	HSK	NSK
Suspension with bore Ø 8 mm	ESSMANN Typ 810 sky light Suspension with bore Ø 6 mm	Suspension with bore Ø 8 mm

Determine the casement brackets

Hole layout for casement brackets

Casement bracket F29	Casement bracket F29-1	Casement bracket F30
NSK HEROAL 085D	HSK HEROAL 085D	NSK WICONA Wictec 50
Suspension with Ø 8 mm - mounting with K122	Suspension with Ø 8 mm - mounting with K5	Suspension with Ø 8 mm - with K122-1
Casement bracket F36	Casement bracket F40	Support B2
NSK SCHÜCO AWS 57RO	HSK	HSK
Suspension with Ø 8 mm - with K122-1	Suspension with bore Ø 8 mm	mounting with casement bracket F 40

INSTALLATION STEP 3B: Determine the frame brackets

HSK **NSK**

Hole layout for frame brackets

Frame bracket K4-L	Frame bracket K5	Frame bracket K7
HSK ETERNIT-Fumilux sky light	HSK	HSK ESSMANN Typ 810 sky light
for swivelling suspension mounting with B4	for swivelling suspension mounting with B4	for swivelling suspension mounting with B4
Frame bracket K15	Frame bracket K15-Set	Frame bracket K17
NSK Required space on the frame: 40 mm	NSK Required space on the frame: 40 mm	HSK
Suspension with bore Ø 8 mm	Suspension with bore Ø 8 mm	for swivelling suspension mounting with B5
Frame bracket K37	Frame bracket K82	Frame bracket K97L
NSK Required space on the frame: 40 mm	HSK	NSK Required space on frame: 20 mm
Suspension with bore Ø 8 mm	for swivelling suspension mounting with B4	Suspension with bore Ø 8 mm

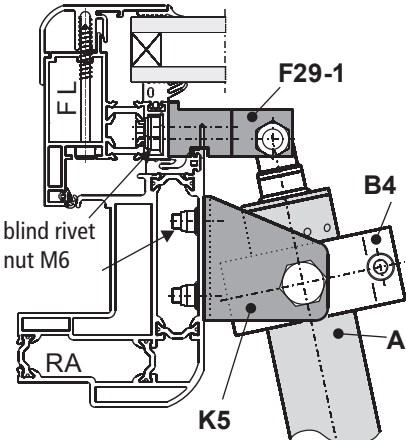
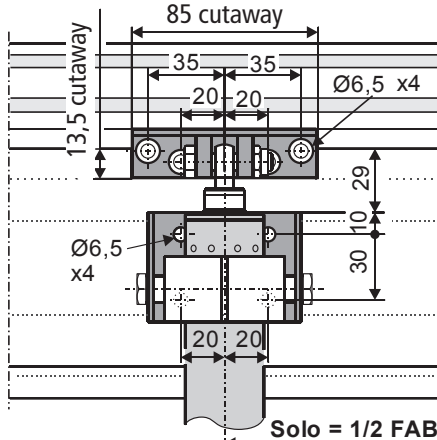
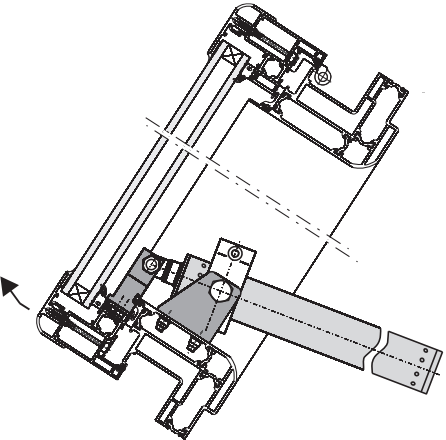
Determine the frame brackets

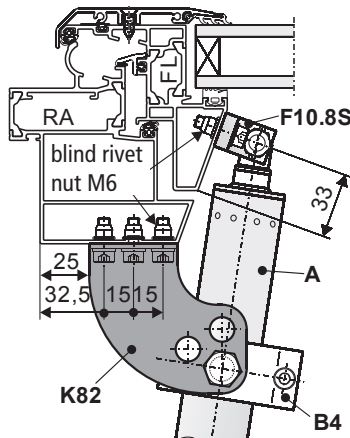
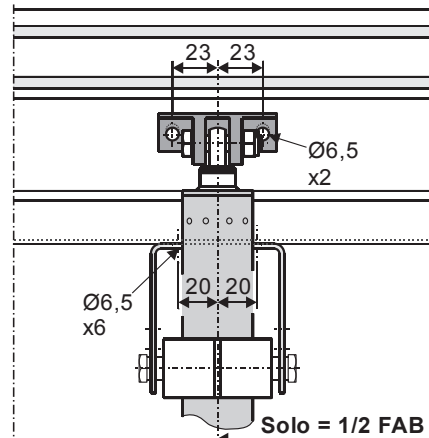
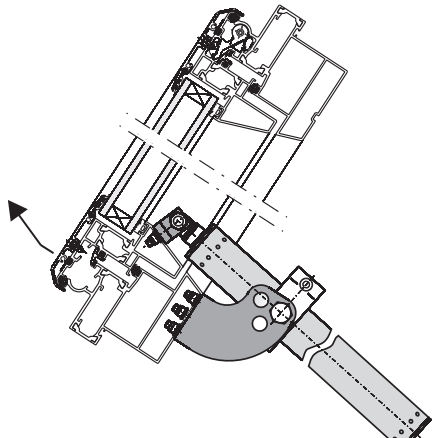
HSK NSK

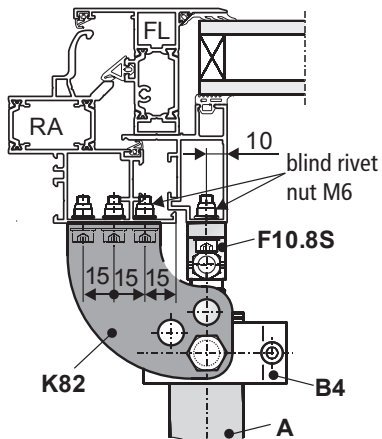
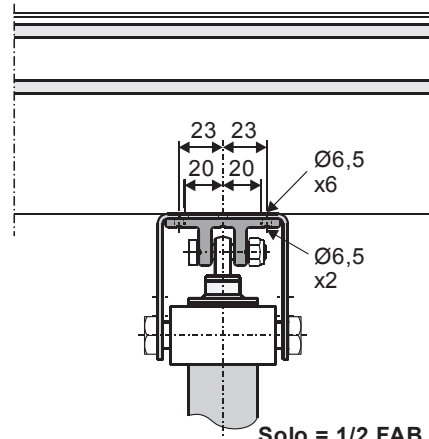
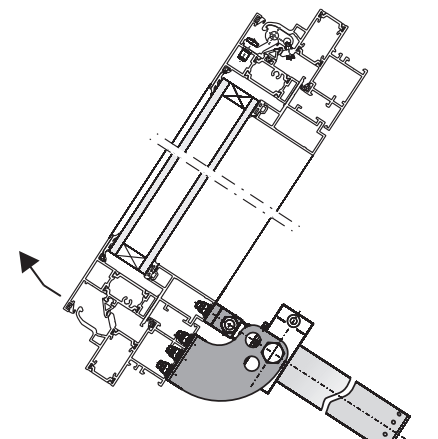
Hole layout for frame brackets

Frame bracket K97R NSK Required space on frame: 20 mm Suspension with bore Ø 8 mm	Frame bracket K122 NSK SCHÜCO RS106D HEROAL 085D for swivelling suspension mounting with B4	Frame bracket K122-1 NSK SCHÜCO AWS 57RO WICONA Wictec 50 for swivelling suspension mounting with B4
Frame bracket K127 NSK SCHÜCO AWS 57RO WICONA Wictec 50 for swivelling suspension mounting with B4	Frame bracket-angle K21K HSK Shift the fastening level of the frame brackets from the horizontal to the vertical position. for casement bracket K5	Frame bracket-angle K21L HSK Shift the fastening level of the frame brackets from the horizontal to the vertical position. for casement bracket K5
Adjustable clamping B4 For: - K4-L - K5 - K7 - K82 - K122 /122-1 - K127 for swivelling suspension	Adjustable clamping B5 For: K17 for swivelling suspension	Collar screw B8 for adjustable clamping B4
Eye bolt B16ST / B16VA with M8 thread	Clevis B27ST with M8 thread	Clevis B28ST with M10 thread

INSTALLATION STEP 4A: Hole layout: Activation on HSK

System: HEROAL 085D		
Roof window - outward opening Frame assembly - HSK	Top view Drilling	Roof window - sectional view HEROAL 085D
		

System: SCHÜCO AWS 57R0		
Roof window - outward opening Frame assembly - HSK	Top view Drilling	Roof window - sectional view SCHÜCO AWS 57R0
		

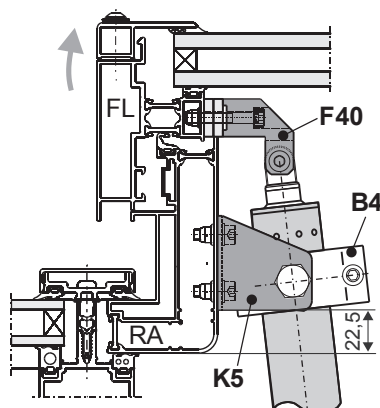
System: RAICO Wing 105D		
Roof window - outward opening Frame assembly - HSK	Top view Drilling	Roof window - sectional view RAICO Wing 105D
		

Hole layout: Activation on HSK

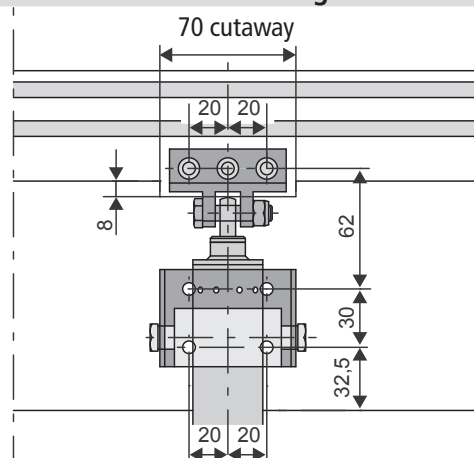
HSK

System: Alcoa AA100 - Kawneer

Roof window - outward opening
Frame assembly - HSK

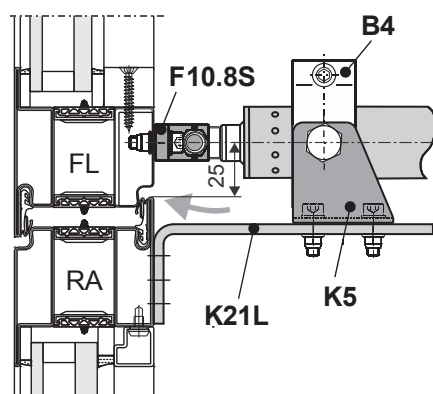


Top view
Drilling

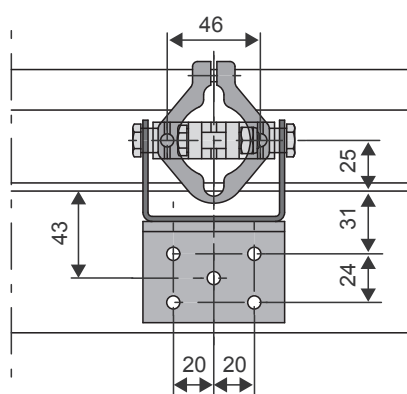


System: Forster Unico

Top-hung casement - outward opening
Frame assembly - HSK

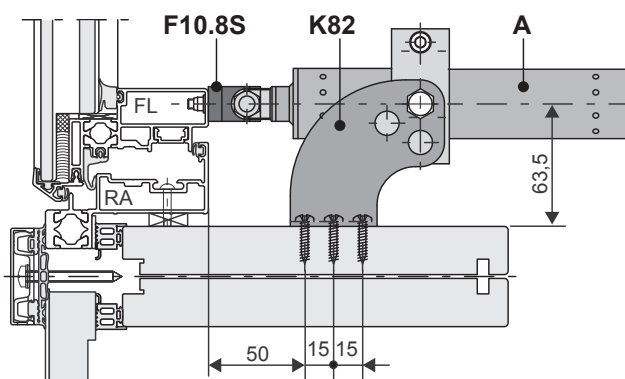


Top view
Drilling

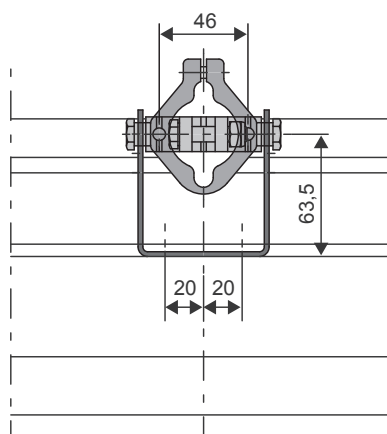


System: Schüco FW 50+

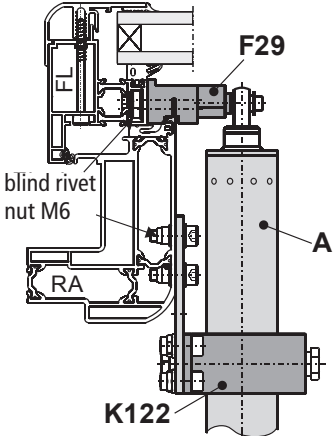
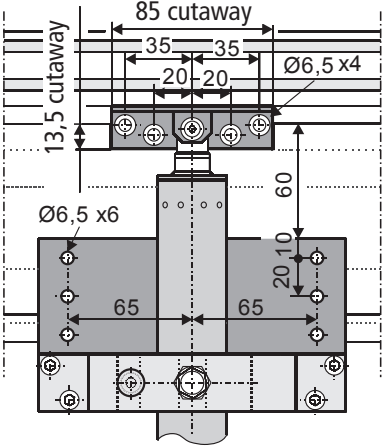
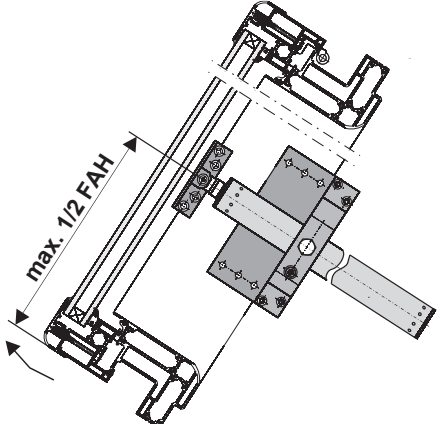
Top-hung casement - outward opening
Frame assembly - HSK

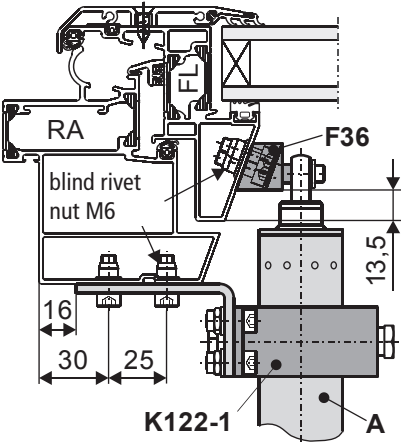
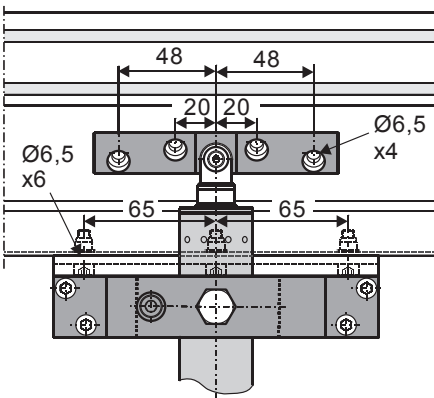
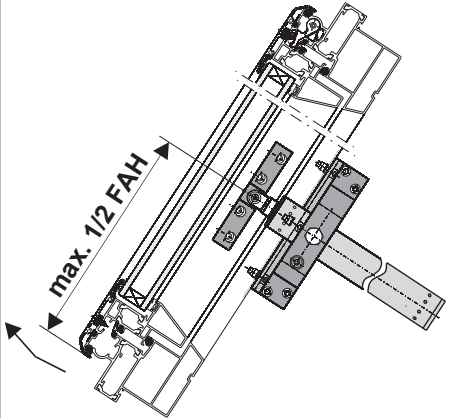


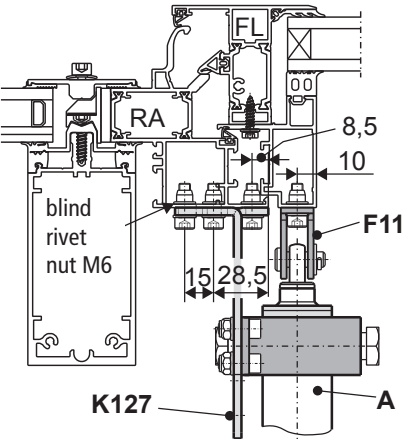
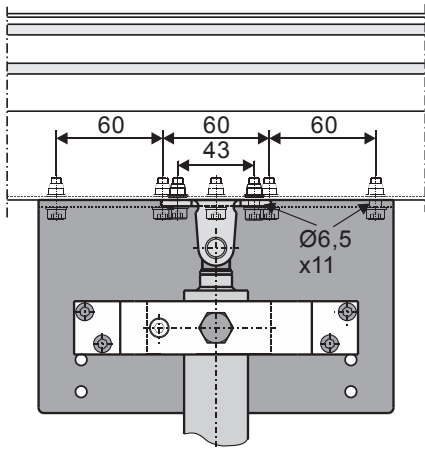
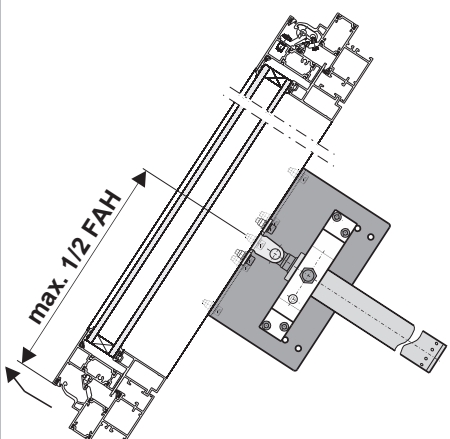
Top view
Drilling



INSTALLATION STEP 4B: Hole layout: Activation on NSK

System: HEROAL 085D		
Roof window - outward opening Frame assembly - NSK	Top view Drilling	Roof window - sectional view HEROAL 085D
		

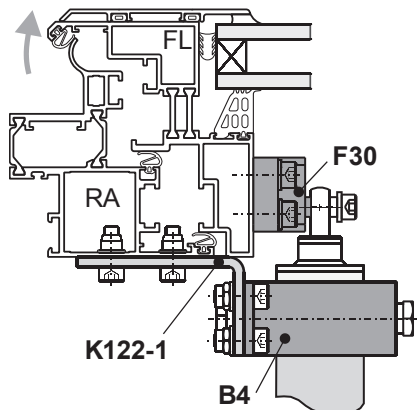
System: SCHÜCO AWS 57R0		
Roof window - outward opening Frame assembly - NSK	Top view Drilling	Roof window - sectional view SCHÜCO AWS 57R0
		

System: RAICO Wing 105D		
Roof window - outward opening Frame assembly - NSK	Top view Drilling	Roof window - sectional view RAICO Wing 105D
		

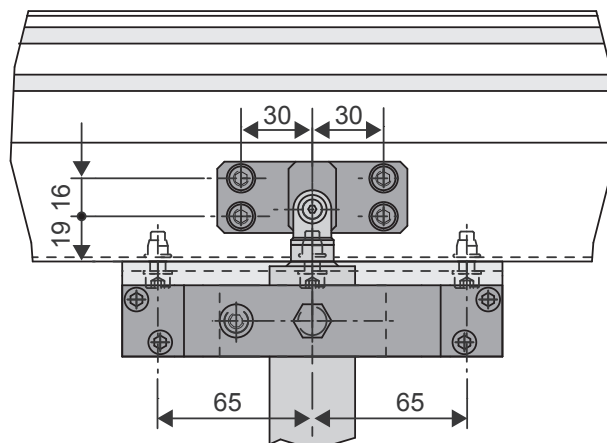
Hole layout: Activation on NSK

System: WICONA Wictec 50

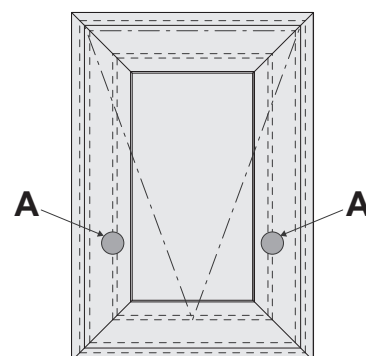
Roof window - outward opening
Frame assembly - NSK



Top view
Drilling

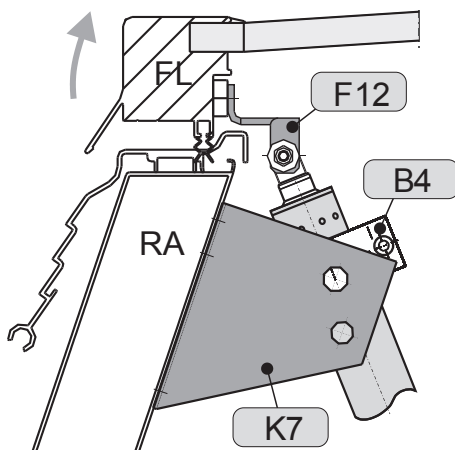


Top view



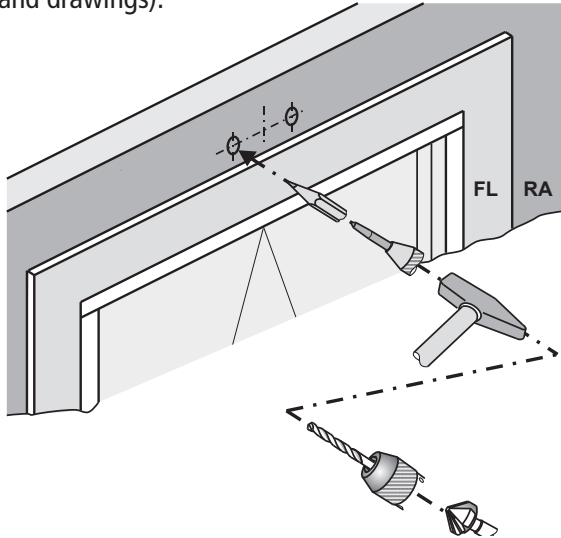
INSTALLATION STEP 4c: Sky light

Sky light: Frame assembly - HSK



INSTALLATION STEP 5A: Assembly for direct operation - activation on HSK (outward opening)

- Determine fastenings.
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (see chapter „INSTALLATIONSTEP 3 + 4“) or project-specific documents and drawings).



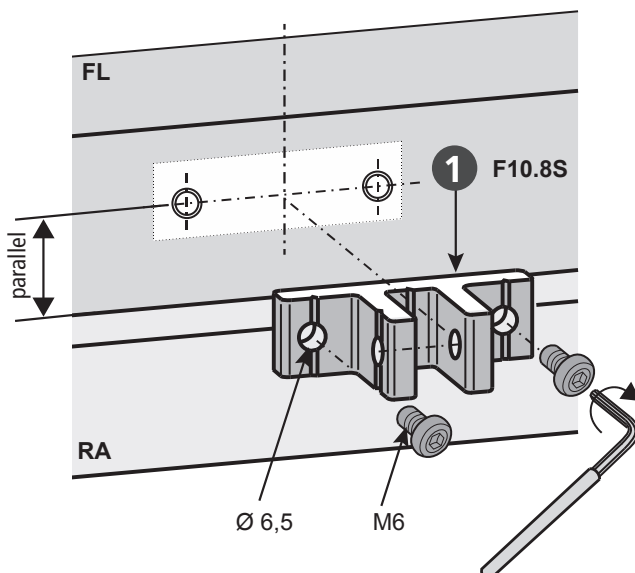
Do not drill into the drive.
Drilling swarfs can collect in the drive!
Carefully clear away drilling swarfs to prevent seals from being damaged.
Avoid surface scratches, for example by using masking tape.

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

- Fit casement bracket **F10.8S** ①.



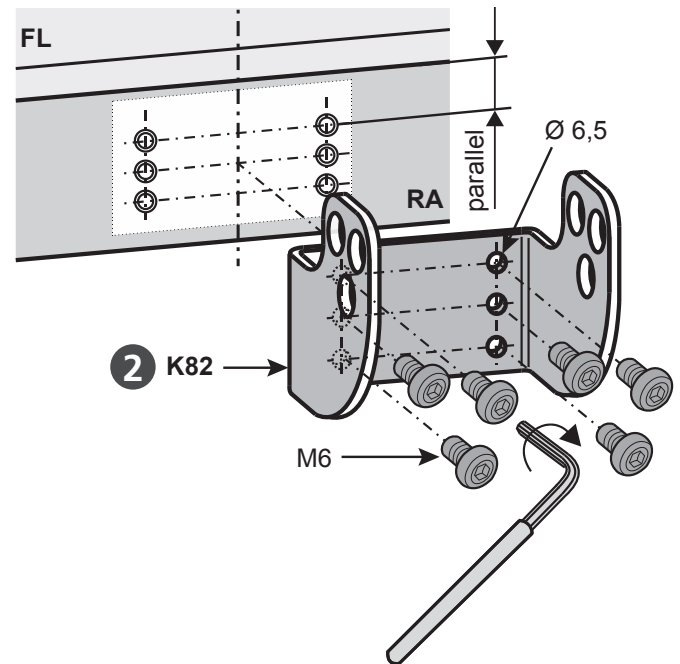
Make sure it is parallel to casement edge.
„Casement bracket“ center and „spindle“ must be in line.



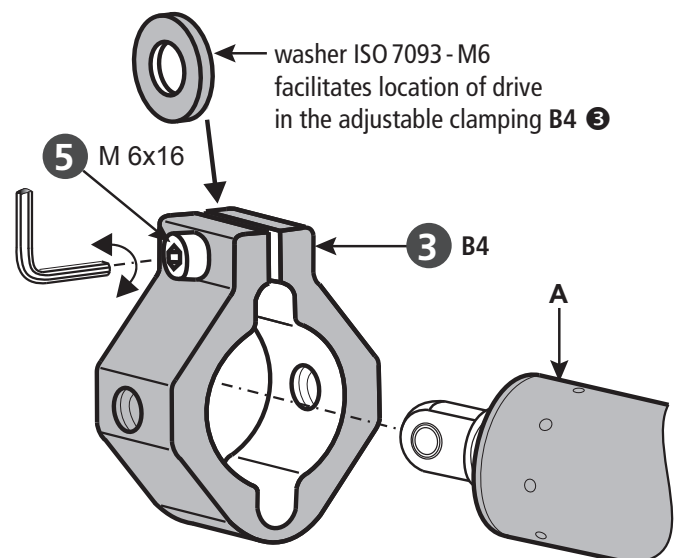
- Fit frame bracket **K82** ②.



Make sure they are parallel to casement edge.



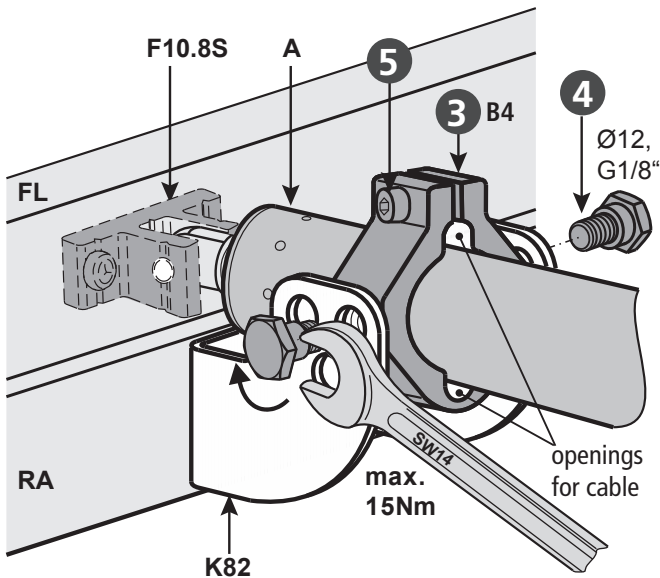
- Untighten the cylinder head screw **M6** ⑤ from the adjustable clamping **B4** ③.
- If necessary, insert washer **ISO 7093-M6** and slightly re-tighten together with screw.
- Slide the adjustable clamping **B4** ③ gently on the body by hand (do not force).



NOTE

Washer **ISO 7093-M6** is not included in the scope of delivery.

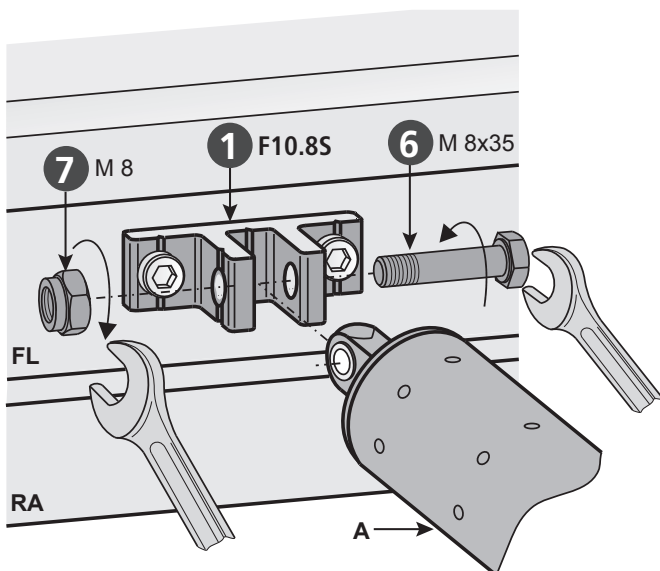
- Attach drive with adjustable clamping **B4** ③ to frame bracket **K82** ②.
- Screw in the collar screw ④ and tighten to a maximum of 15 Nm.
- If necessary, pass the drive cable through the openings in the adjustable clamping **B4** ③.



Equipment: Adjustable clamping **B4** ③

- | | | | |
|---|---|---|------------------------------|
| ⑤ | ④ | ④ | 2x collar screw Ø12, G1/8" |
| | ⑤ | ⑤ | 1x cylinder head screw M6x16 |

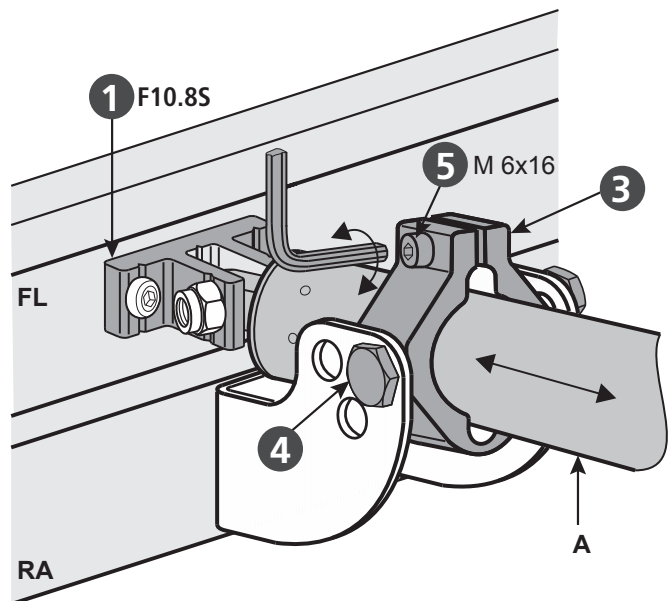
- Attach drive to casement bracket **F10.8S** ①.
- Insert screw **M8x35** ⑥ and tighten with even secure nut **M8** ⑦.



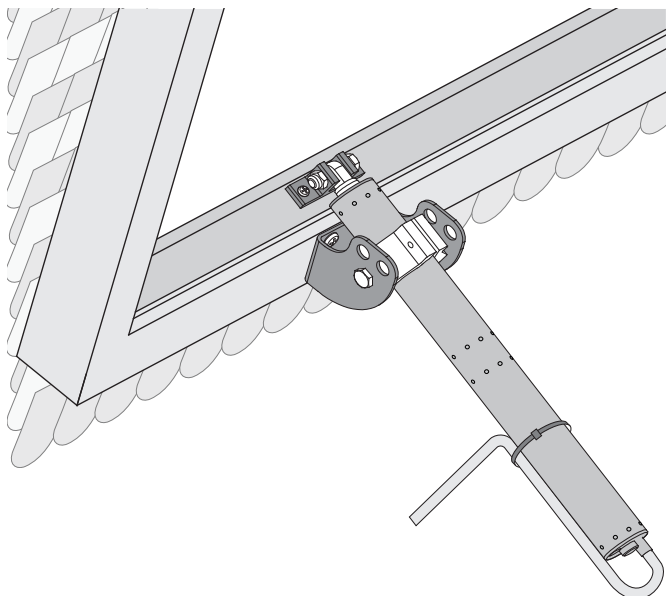
Equipment: Casement bracket **F10.8S** ①

- | | |
|---|---|
| ⑥ | 1x screw M8x35 |
| ⑦ | 1x even secure nut M8, with polyamide clamping part |

- Adjust casement pressure. Tighten the cylinder head screw **M6** ⑤ from the adjustable clamping **B4** ③ to torque of 10 Nm.



Leave the drainage hole open.
Do not close with cable duct.

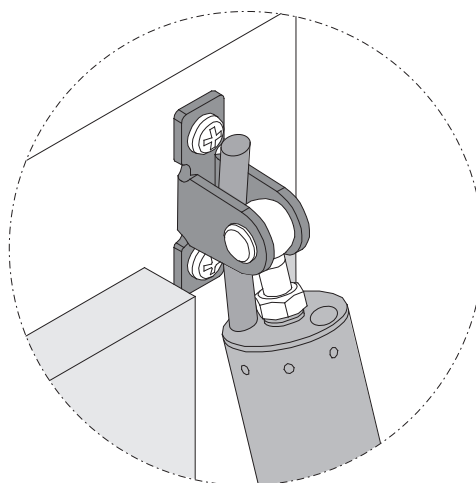
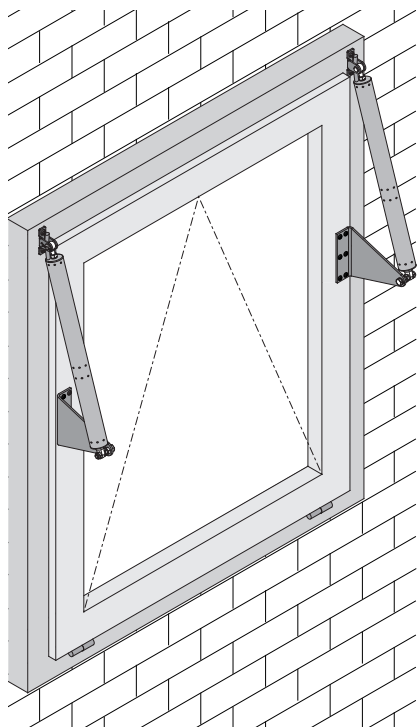


INSTALLATION STEP 5B: Assembly for side-closing edge operation - NSK

NSK

Application with rotated PLA drive (Connection cable above)

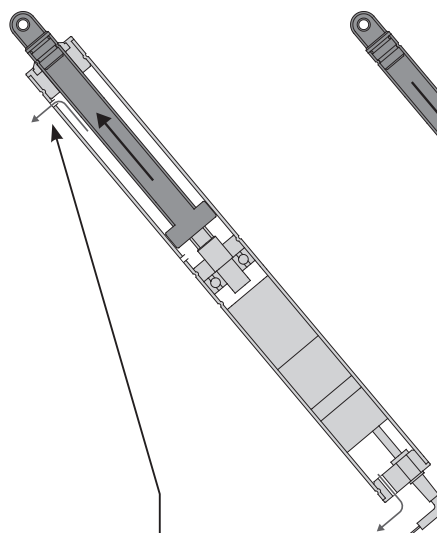
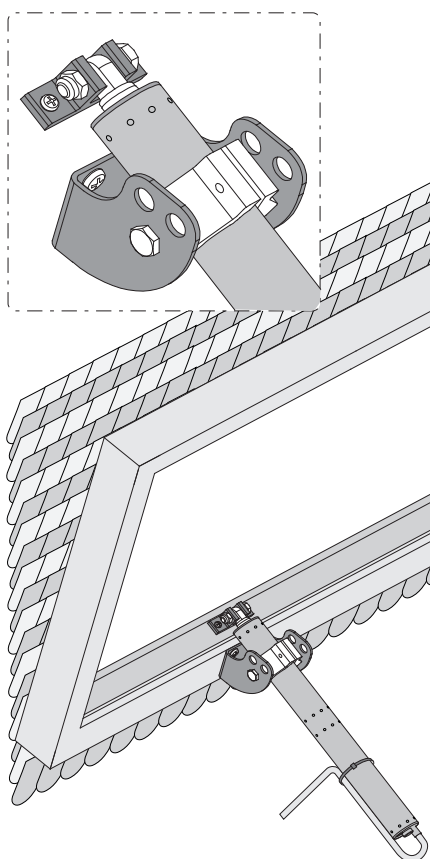
NSK



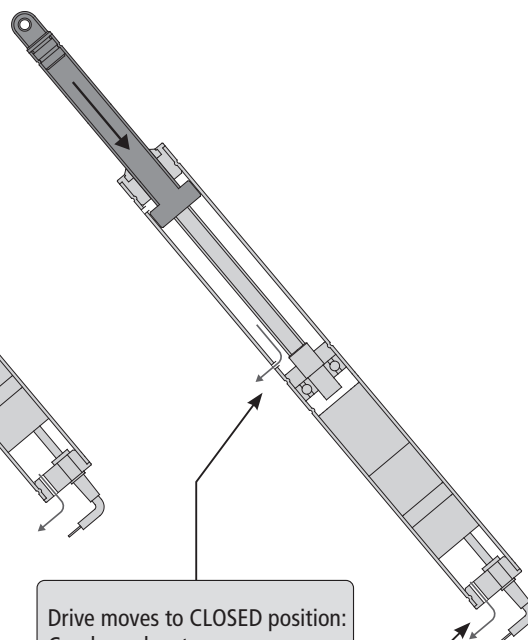
Leave drainage holes open.
Do not close with cable duct.

Application: PLA assembly at the HSK (connection cable below)

HSK



Drive moves to OPEN position:
Condensed water can escape
through the drainage hole.



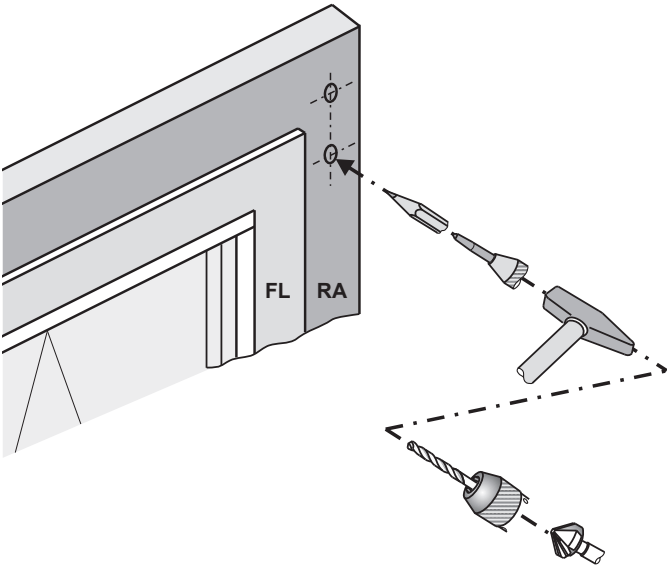
Drive moves to CLOSED position:
Condensed water can escape
through the drainage hole.



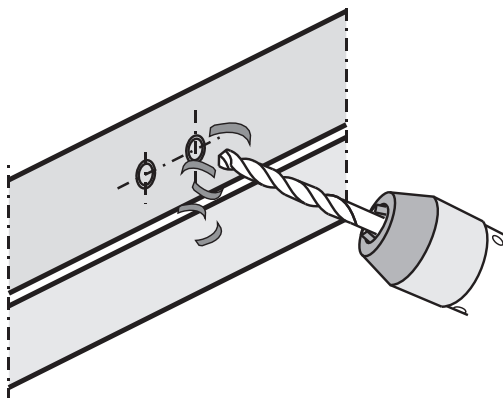
Leave drainage holes open.
Do not close with cable duct.

Escapes through the breathable
gore membrane the condensation.

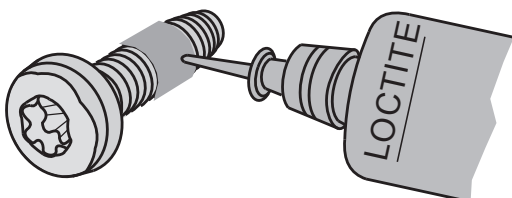
- Determine fastenings.
- Produce drill holes with appropriate cross-section. For the mounting dimensions please refer to the above-mentioned hole layout drawings (see chapter „INSTALLATIONSTEP 3 + 4“) or project-specific documents and drawings).



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



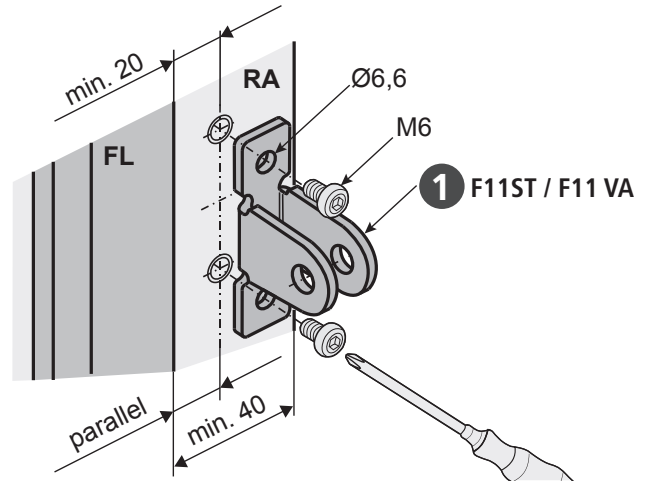
- Secure fasteners against loosening; i. e. by applying removable thread-locking compound such as "Loctite".



- Fit casement bracket F11/ST / F11VA ①.



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



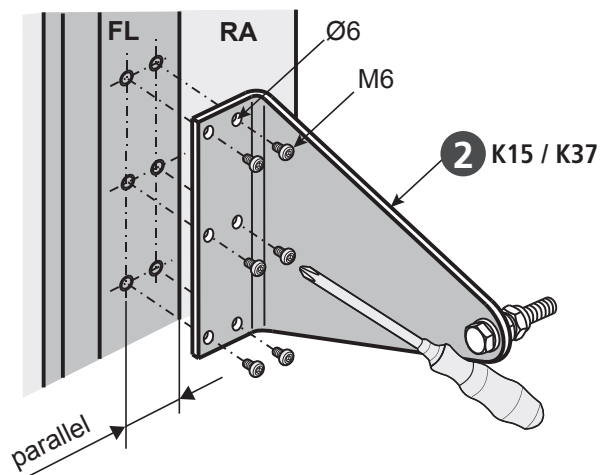
Equipment: Casement bracket F11ST / F11VA ①

⑤	1x bolt Ø8
⑥	1x washer
⑦	1x cotter pin

- Fit frame bracket K15 / K37 ②.



Make sure they are parallel to casement edge.



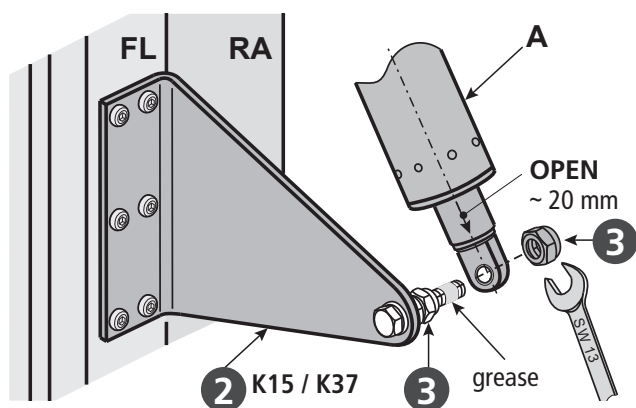
Equipment: Frame bracket K15 / K37 ②

③	2x even secure nut M8, with polyamide clamping part
	1x screw M8
	1x spring washer
	1x nut M8

- Attach drive to the frame bracket **K15 / K37** **2** and tighten with both even secure nut **3**.

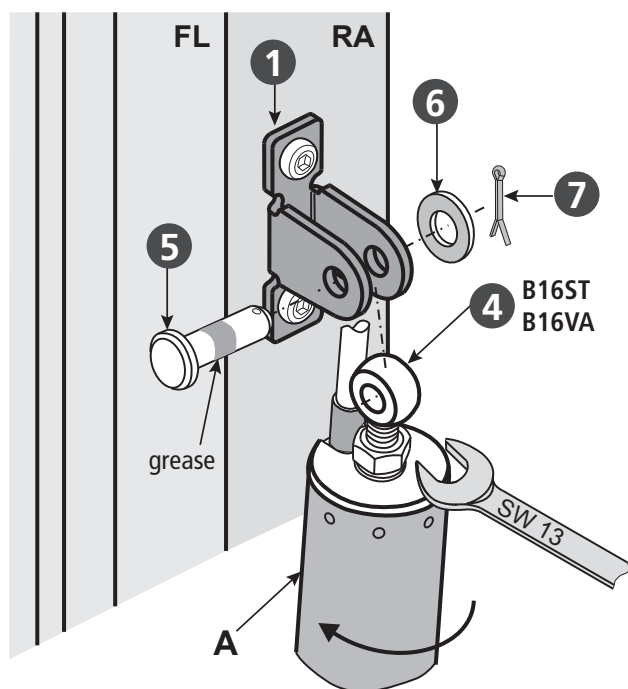
NOTE

For easy mounting to frame brackets / casement brackets, move drives ~20 mm open. Operation only by using a test device and both drives at the same time.



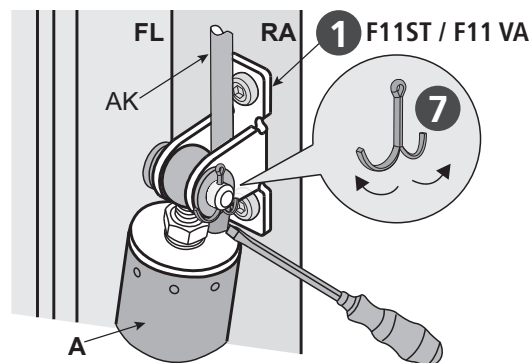
Ensure to align to the casement bracket **1**.

- Attach the drive to the casement bracket **F11ST / F11VA** **1**. Note the cable position.
- Attach drive with bolt **5**.



Slowly turn the drive clockwise.

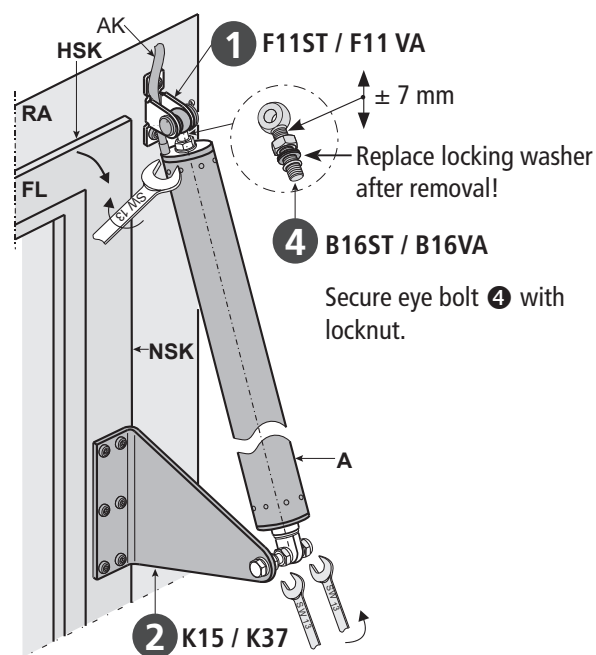
- Secure bolt **5** with washer **6** and cotter pin **7**.
- Spread out the cotter pin **7**.



- Move drives to close the window.
- Adjust casement pressure - using eyebolt **B16** **4**.



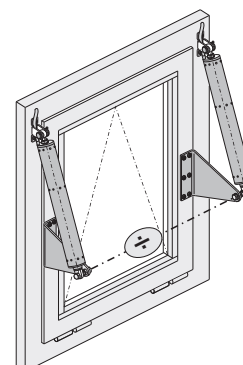
Window must be fully closed.
Drive must be parallel to NSK.
Drive should freely turn in the frame bracket.



- To fit the second drive.



Fit both mounting bracket so that their axes are in line. Check contact pressure of casement.



INSTALLATION STEP 6: Electric connection



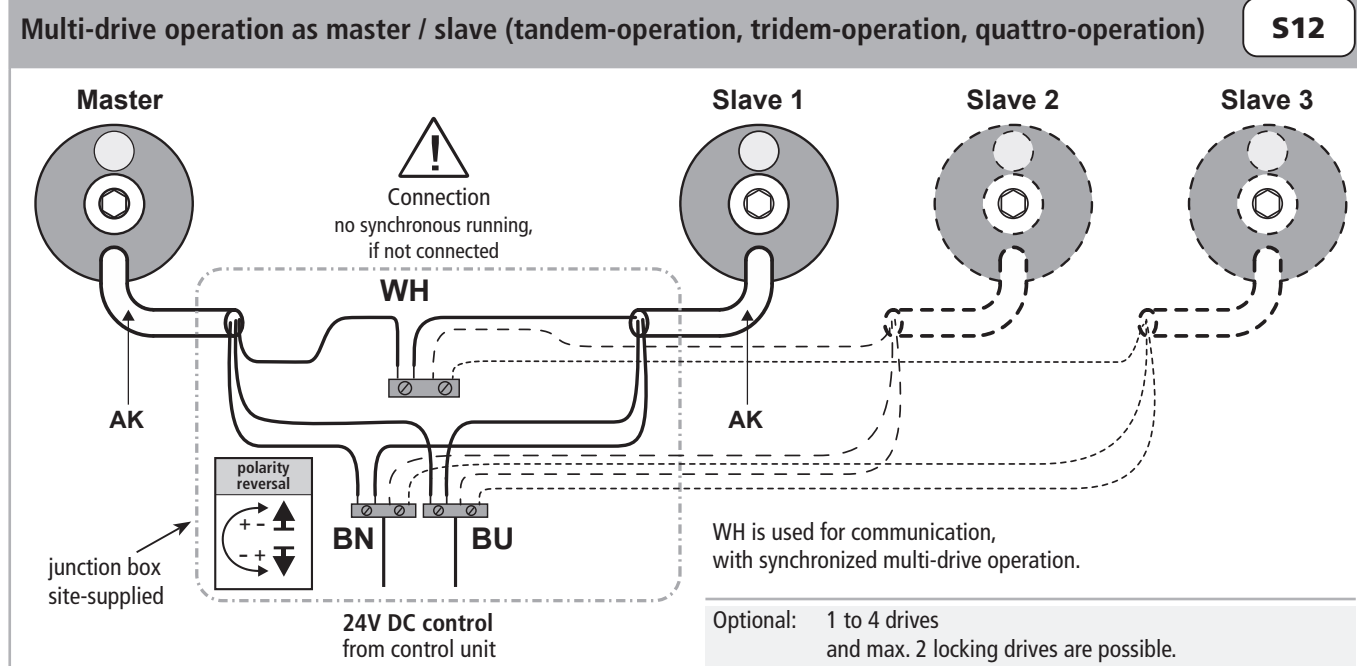
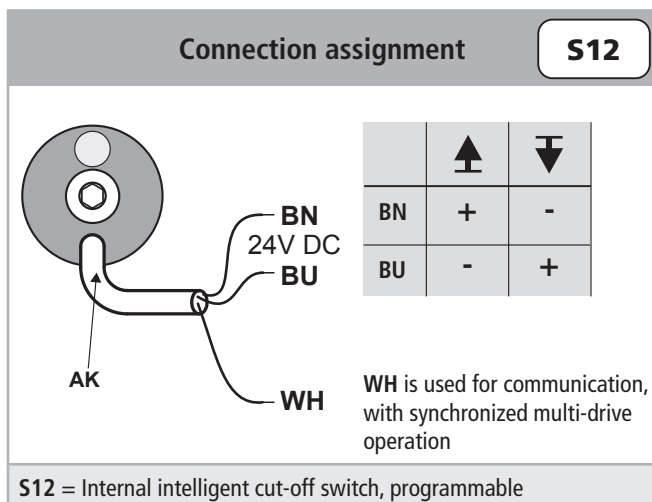
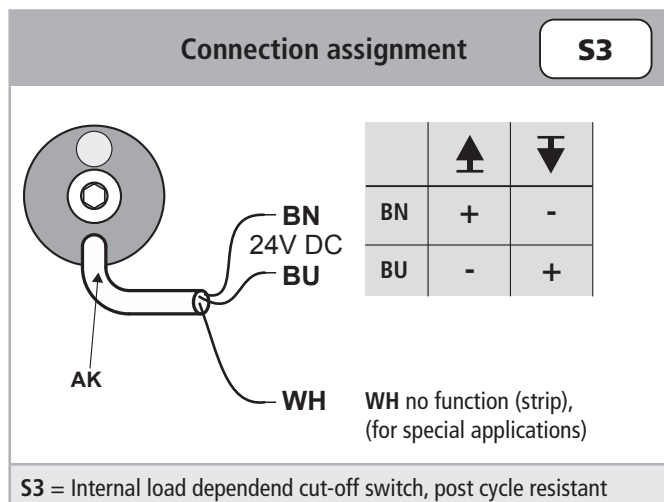
Make sure when establishing the connection that there is no voltage at the terminals!
Unused wires must be safely insulated!

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



Drives must be switched by the controller to the opposite direction (pole reversed) when switched off at overload.

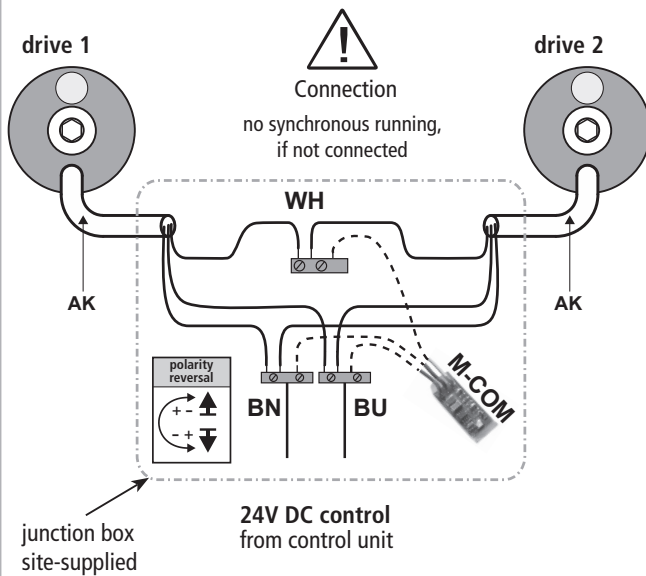
Wire colour coding		Direction of travel
Colour	DIN IEC 757	
black	BK	OPEN ↑
white	WH	CLOSE ↓
brown	BN	
blue	BU	
green / yellow	GN / YE	
green	GN	
violet	VT	
grey	GY	
		polarity reversal



Electric connection

Multi-drive operation with M-COM

24V



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

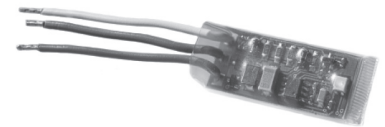
Optional: 1 to 4 drives
and max. 2 locking drives are possible.

M-COM (Main control unit)

24V

Part.-No.:	524177
Application:	Main control unit for the automatic configuration and monitoring of max. 4 opening / 2 locking drives type S12 / S3 in multi-drive systems.
Rated voltage:	24V DC +/- 20%, (max. 2 Vss)
Current consumption:	<12 mA
Drive type:	S12
Protection class:	IP30 rubber jacket
Ambient temperature:	0 °C ... + 70 °C
Dimensions:	45 x 17 x 6 mm
Connecting wires:	3 wires 0,5 mm ² x 50 mm

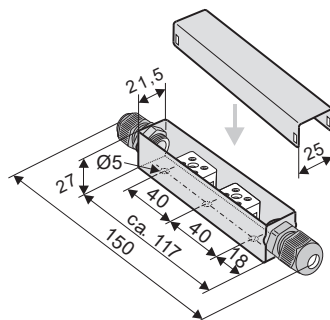
Feature / Equipment:
printed circuit board with connecting wires for integration in site-supplied junction box.



Cable junction box (for renewal)

24V

Part.-No.:	513344
Application:	to extend a drive cable
Rated voltage:	only for low voltage to max. 50V DC/AC
Material:	stainless steel (V2A)
Protection class:	IP 40
Dimensions:	25 x 27 x 150 mm
Equipment:	with cable gland (grey) including strain relief, with loose ceramic terminals.



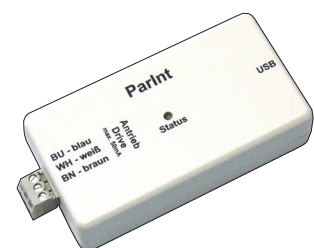
Parameterisation-Interface

24V

230V

Part.-No.:	524178
Application:	Hardware interface for parameterisation of AUMÜLLER drives with the AUMÜLLER software DC.
Rated voltage:	24V DC +/-20%
Configurable drives:	24V DC in version S12, S3 230V AC in version S12
Connections:	3x Pluggable screw terminals 1,0 mm ² 1x USB port
Scope of delivery:	1x Interface 1x USB cable 1x Connection cable

Features / Equipment:
Power supply 24V DC is not included in the scope of delivery!



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

INSTALLATION STEP 7: Supply lines of Control Unit to the Drives

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

RECOMMENDATION

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

Formula to calculate

the required wire cross-section of a supply line

24V

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

Calculation example

Available data:

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

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

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

Laying and connecting the drive cable

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

INSTALLATION STEP 8: Safety check and Test run

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

Safety test:

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

Test run:

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

Risk evaluation:

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

Firm AUMÜLLER AUMATIC GmbH
(www.aumueller-gmbh.de).

Operation of the power-operated window

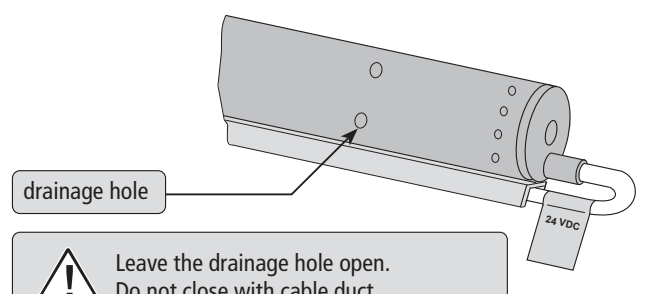
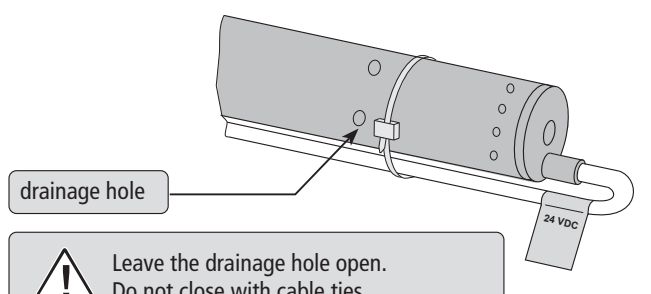
When operating the power-operated window safety instructions must be observed, specifically those pertaining to commissioning, operation and maintenance.

Connection cable routing

HSK

NSK

Connection cable routing on the drive body

 drainage hole ! Leave the drainage hole open. Do not close with cable duct.	 drainage hole ! Leave the drainage hole open. Do not close with cable ties.
Cable duct glued on.	Attach connection cable with cable ties.

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 • Drive run direction not correct • Connecting cable not connected • Power supply / Control Unit voltage incorrect, too high or too low (see data sheet) • No mains supply to power supply unit / Control Unit (no voltage) • Drive has shut down on overload	• Adjust supply voltage as specified in the technical documentation • Check drive cables change polarity • Check all connection cables • Check power supply unit and replace if necessary • Connect power supply • First move drive in CLOSE position
Drive doesn't start after having been in operation several times	• Operating time has been exceeded, drive has been overheated • See possible solutions above associated with „Drive doesn't start“	• Wait until drive has cooled down and start again • See possible solutions associated with: "Drive doesn't start"

Maintenance and modification

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

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

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

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

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

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

Maintenance process

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

Demounting

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

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

Dispose of parts according to the locally applicable legal provisions.

Disposal

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

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

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



Liability

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

Warranty and Customer Service

In principal apply our:

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

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

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

The warranty period for delivered material is twelve months.

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

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

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

Firm AUMÜLLER AUMATIC GmbH.

Contact data are available at our homepage

(www.aumueller-gmbh.de)

Certificate and Declaration of Conformity

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

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



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

Technical file and declaration at firm:

AUMÜLLER AUMATIC GmbH
Gemeindewald 11
D-86672 Thierhaupten

Ramona Meinzer
Managing Director (Chairman)

Note:

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

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



Translation of the original instructions (German)

Important note:

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

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

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