aumüller

Assembly Instruction FVUx

Locking Drive for windows

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

CE



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!
Ссылки на инструкцию по монтажу и на декларации: Пожалуйста, считайте QR-код и перейдите по ссылке на главную страницу **Aumüller**. **RU**

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

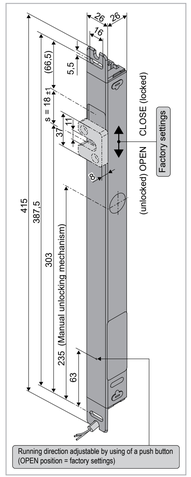
Montage-instructies in acht nemen!
Links naar veiligheidsinstructies, gedetailleerd montage-instructies en fabrikantenverklaringen:
Gelieve QR-code in te lezen en link naar de **Aumüller**-homepage te volgen. **NL**

www.aumueller-gmbh.de

AUMÜLLER AUMATIC GMBH
Gemeindewald 11
86672 Thierhaupten
9000029411_V0.2_KW39/21

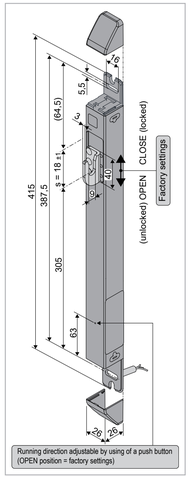
Tel. +49 8271 8185-0
Fax +49 8271 8185-250
info@aumueller-gmbh.de

FVUI



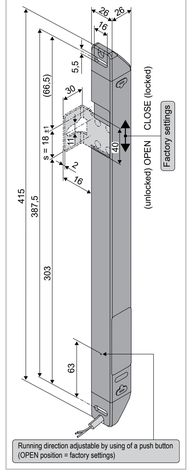
Running direction adjustable by using of a push button (OPEN position = factory settings)

FVUE



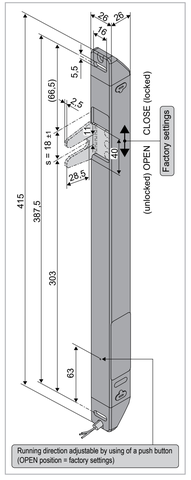
Running direction adjustable by using of a push button (OPEN position = factory settings)

FVUB



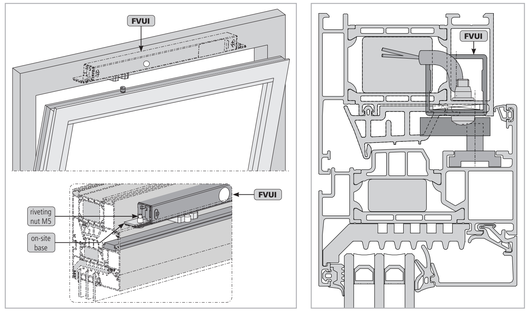
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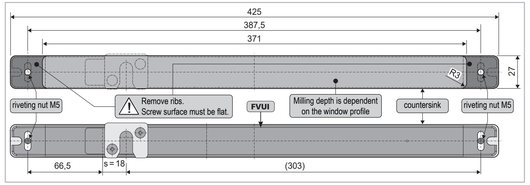
FVUR

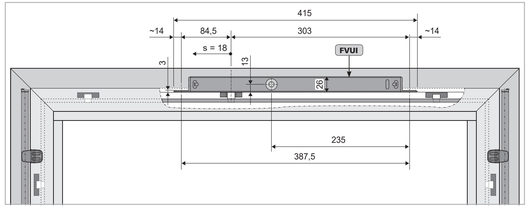


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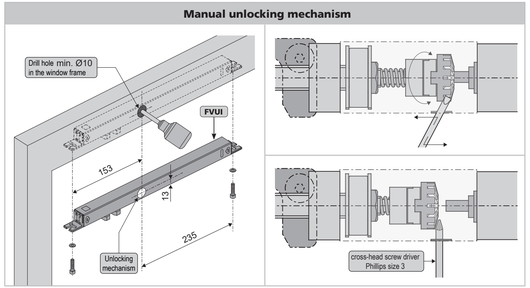
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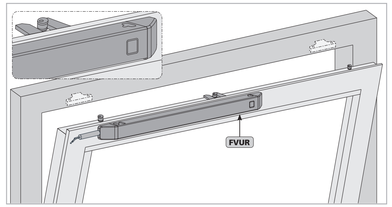


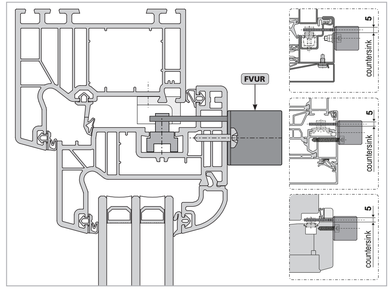


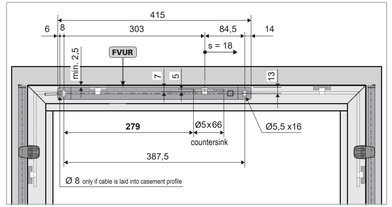
Manual unlocking mechanism

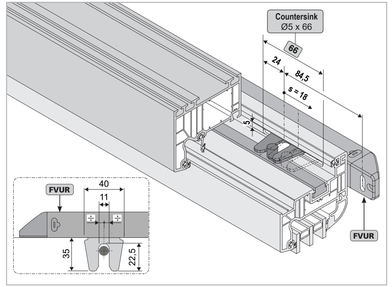


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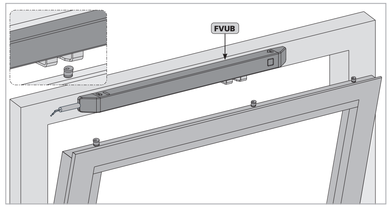


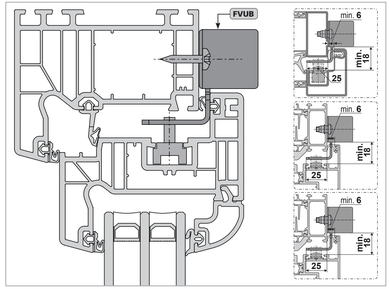


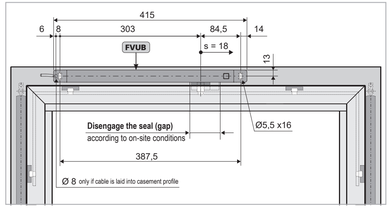


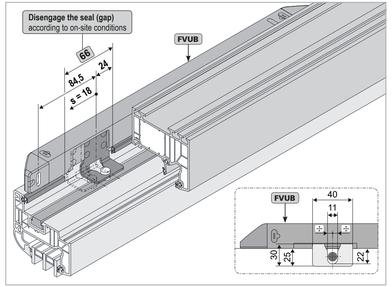


FVUB

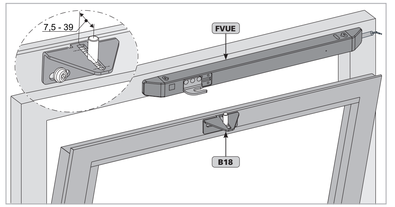


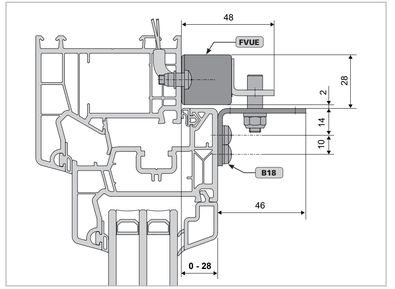


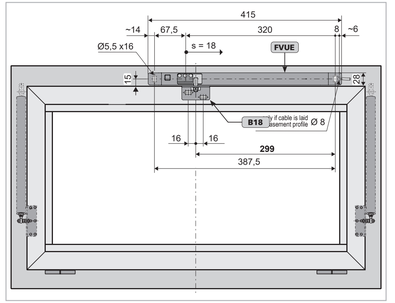


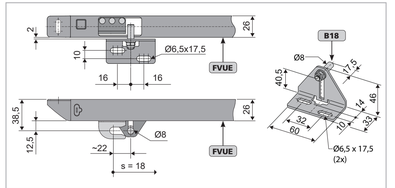


FVUE









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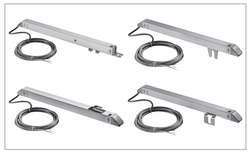
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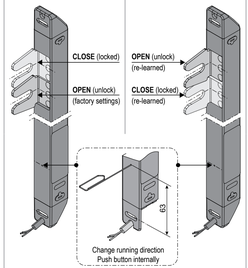
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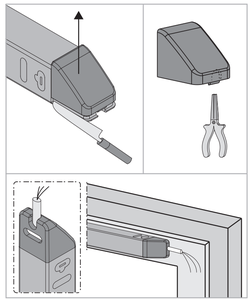
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86672 Thierhaupten
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Tel. +49 8271 8185-0
Fax +49 8271 8185-250
info@aumueller-gmbh.de

FVUI | FVUE | FVUR | FVUB

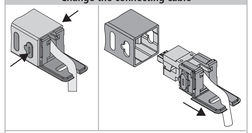
Running direction

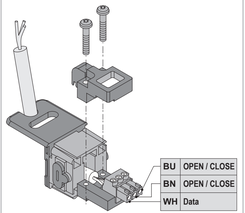
factory settings	has changed (re-learned)
CLOSE (locked)	OPEN (unlock) (re-learned)
OPEN (unlock) (factory settings)	CLOSE (locked) (re-learned)





Change the connecting cable

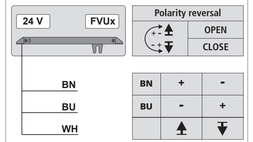




BU	OPEN / CLOSE
BN	OPEN / CLOSE
WH	Data

FVUI | FVUE | FVUR | FVUB

S12 — **24 V DC**



Polarity reversal

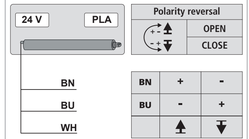
	OPEN
	CLOSE

BN	+	-
BU	-	+

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

Opener-Drive

S3 — **24 V DC**



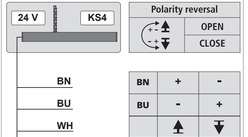
Polarity reversal

	OPEN
	CLOSE

BN	+	-
BU	-	+

S3 WH: no function. Only for special applications. Don't apply external voltage! Risk of damage!

S12 — **24 V DC**



Polarity reversal

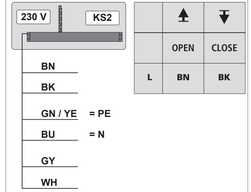
	OPEN
	CLOSE

BN	+	-
BU	-	+

default: closed when drive is closed
option: closed when drive is open

S12 WH: data communication - don't apply external voltage! Risk of damage!
GN / VT: max. 24 V, 500 mA (min. 10 mA)

S12 — **230 V AC**



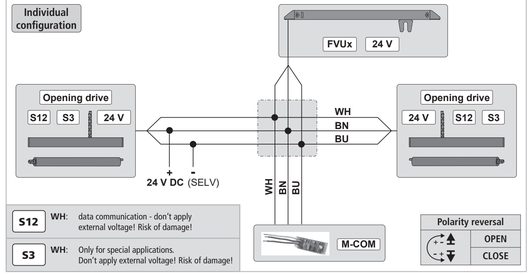
	↑	↓
	OPEN	CLOSE
L	BN	BK

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

S12 | **S3** | **24 V DC**

S12 | **S3** | **M-COM** | **24 V DC**

Individual configuration



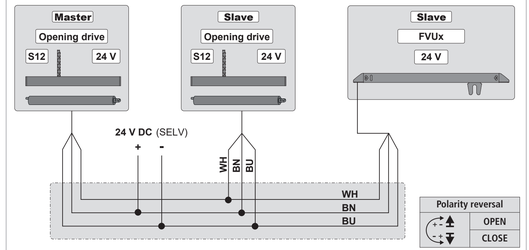
Polarity reversal

	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**



Polarity reversal

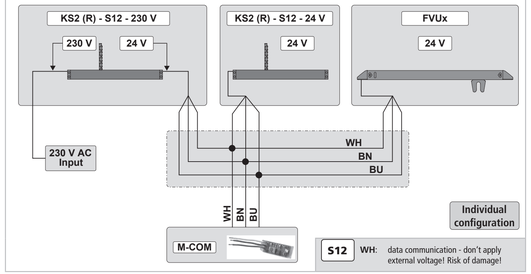
	OPEN
	CLOSE

The programming of the drives in multi-drive occurs at factory or on-site is done via the software DCT.

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

S12 | **230V AC / 24 V DC**

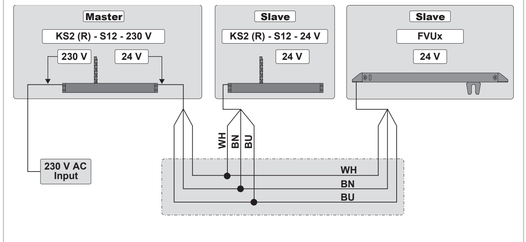
S12 | **M-COM** | **230 V AC / 24 V DC**



Individual configuration

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

S12 — **Master / Slave** — **230 V AC / 24 V DC**



The programming of the drives in multi-drive occurs at factory or on-site is done via the software DCT.

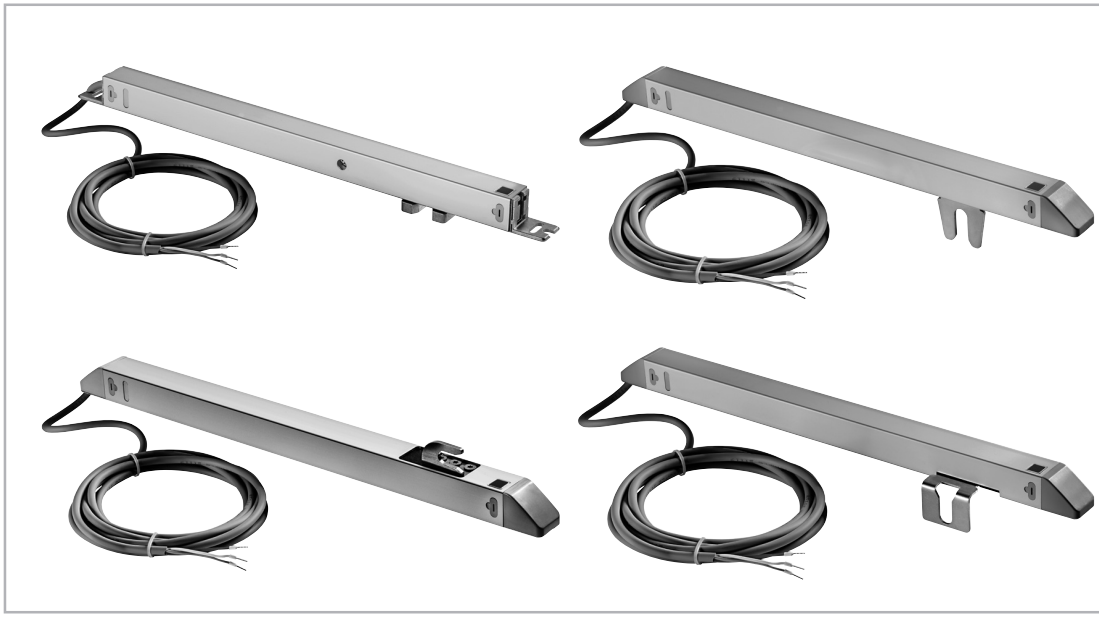
S12 WH: data communication - don't apply external voltage! Risk of damage!

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Assembly and Commissioning Instructions

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



FVU - Locking Drives for windows CE

FVUI FVUR FVUB FVUE

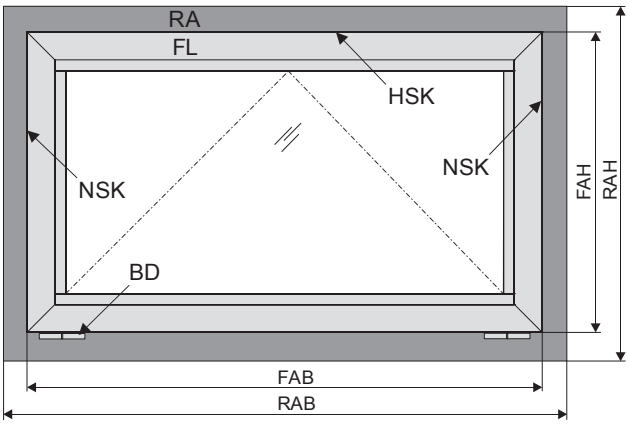
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Abbreviations

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 lenghth 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.

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01

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

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.

⚠ 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**.

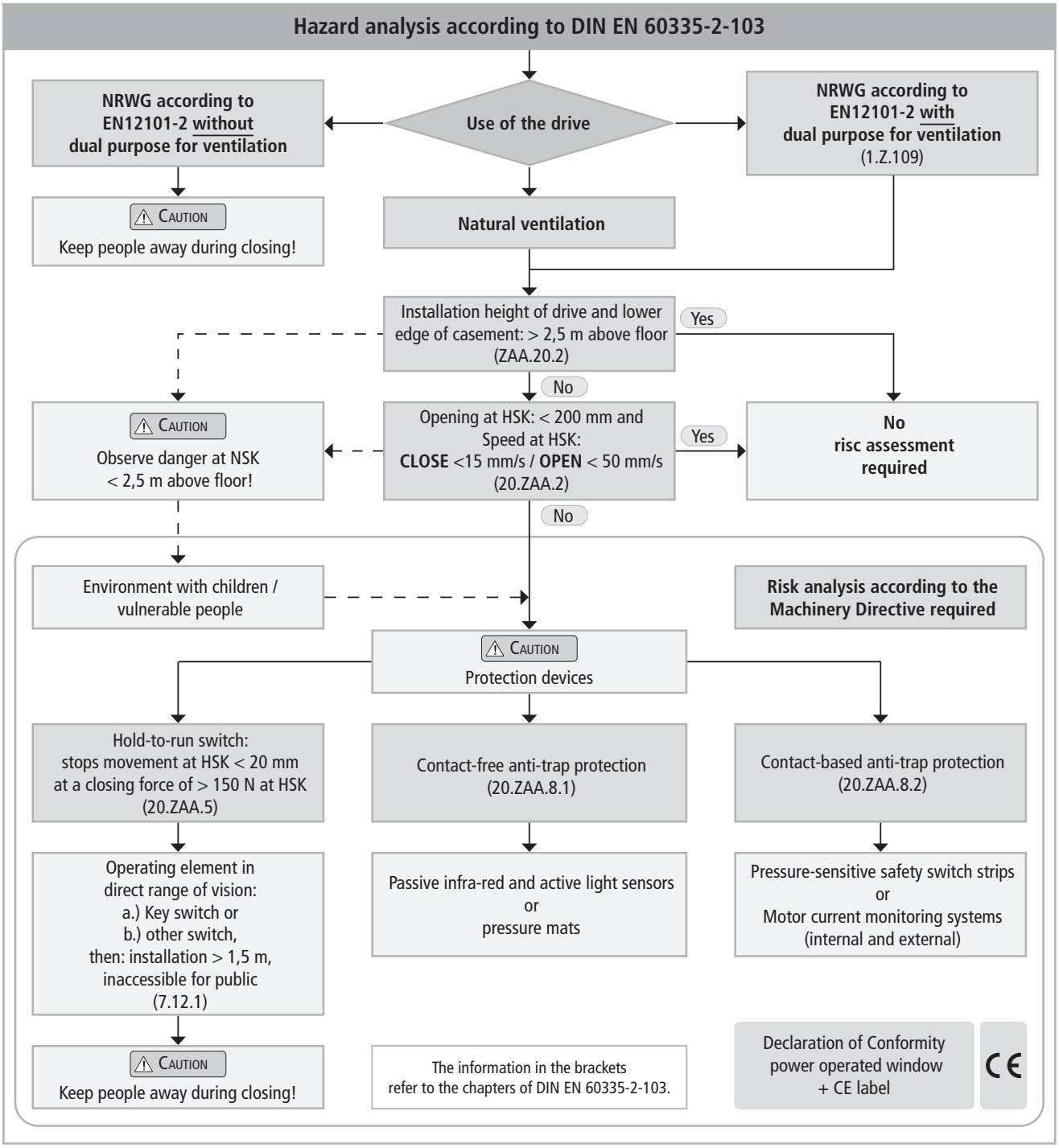
The need for a risk assessment at the installation site due to the reasonably foreseeable misuse.

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.

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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.

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

- total weight of casement (glass + frame),
- casement size (FAB x FAH),
- driving force and stroke,
- mounting site at the window frame and casement frame.

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01

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.

⚠ Warning

Do not misuse the drive for other lifting operations!
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.

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 product lable) 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).

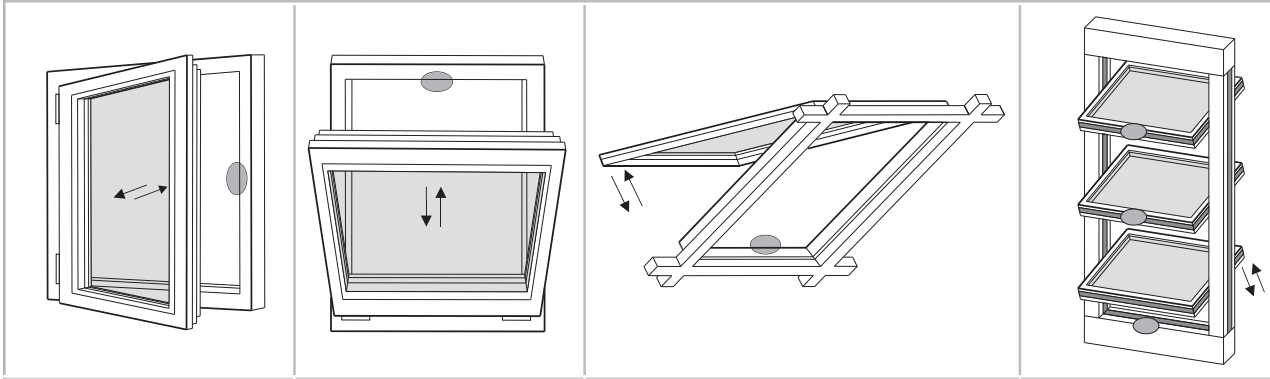
Mounting material

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!

Danger spots by crush and shear points



Side-hung	Bottom-hung	Roof windows / skyskylight domes	Louvre windows

Danger spots: crush and shear points according to DIN EN 60335-2-103

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Crush and shear points

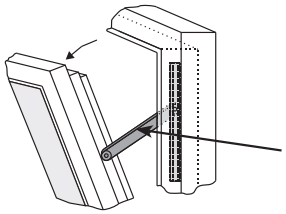
To avoid injuries, **crushing and shear points** between casement and frame must be secured **against entrapment up to an installation height of 2,5 meters above the floor** with appropriate measures. This can be achieved e.g. by using contact-based or contactless protective devices against entrapment, 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.

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01

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.

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

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

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



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

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

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

NOTE 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.

- **Transport / Storage:**
  Storage temperature: -5°C … +40°C
  Relative humidity: < 60%

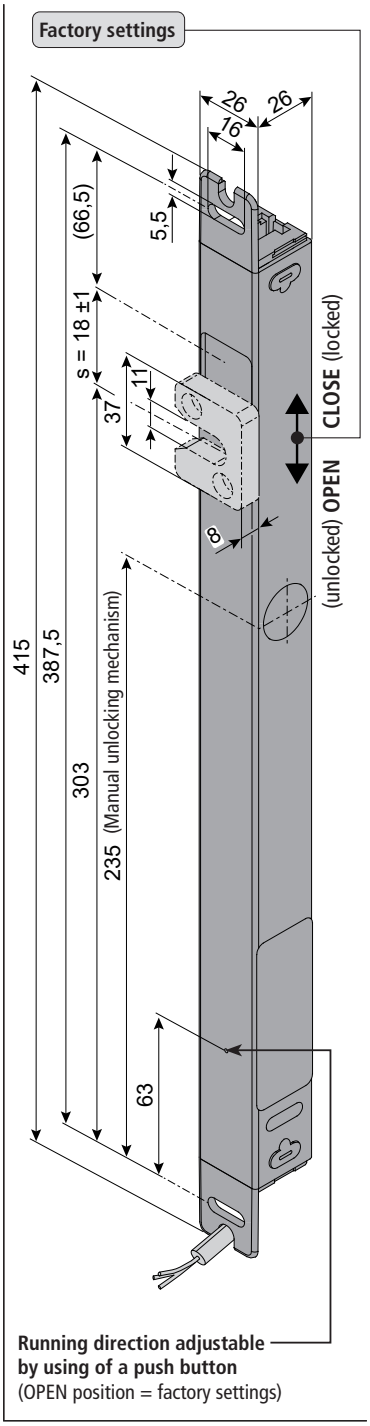
Accident prevention regulations and workmen's compensation insurance guidelines
For work on or in a building or building part the provisions and instructions of the respective accident prevention regulations (local workmen's compensation insurance guidelines) shall be observed and adhered to.

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.

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Data sheet FVUI

FVUI



- Application: natural ventilation, RWA, ferralux®-NRWG
- Surface or concealed mounting inside profiles
- Locking plate (8 mm) or optional locking plate (6 mm)
- Locking position selectable
- Manual unlocking mechanism
- Running direction adjustable

Options

- Special functions programmable

- M-COM suitable internal Control Electronics and sequence control for drives S3 / S12
- Star wiring
- Current of the drives does not run over FVUI
- Sequence control via communication wire

Technical Data

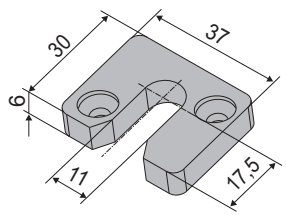
U_N	Rated voltage	24V DC (19V ... 28V)
I_N	Rated current	0,6 A
I_A	Cut-off current	~ 1,0 A
P_N	Rated power	15 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min./OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
F_A	Pushing force max.	~ 600 N
F_L	Breakout force max.	~ 1000 N
F_H	Pullout force max.	1.500 N
t	Running time	~ 5,0 s
s	Stroke	~ 18 mm (± 1)
	Connecting cable	non-halogen, grey ø 6,2 mm, 3 x 0,5 mm², ~ 3 m
	Coupling adapter	die-cast zinc
	Housing	aluminium (E6/C-O)
L, (WxH)	Dimensions	L = 415 mm, 26 x 26 mm (W x H)
	Sound pressure level	≤ 70 dB (A)

Order data

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
18	415	FVUI	E6/C-0	1	**515910**

Accessories (separate order)

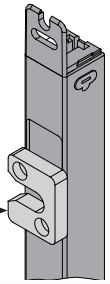
Locking plate B31 (optional)
Part.-No.: **515911**
Material: die-cast zinc
Locking plate 6 mm due to limited space



Mounting possibilities of the locking plate

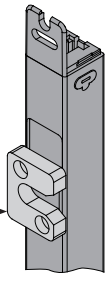
Locking plate is included separately (optional installation possible)

Mounting example "Version - 1"



Locking plate
is included separately

Mounting example "Version - 2"



Locking plate
is included separately

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Data sheet FVUB R

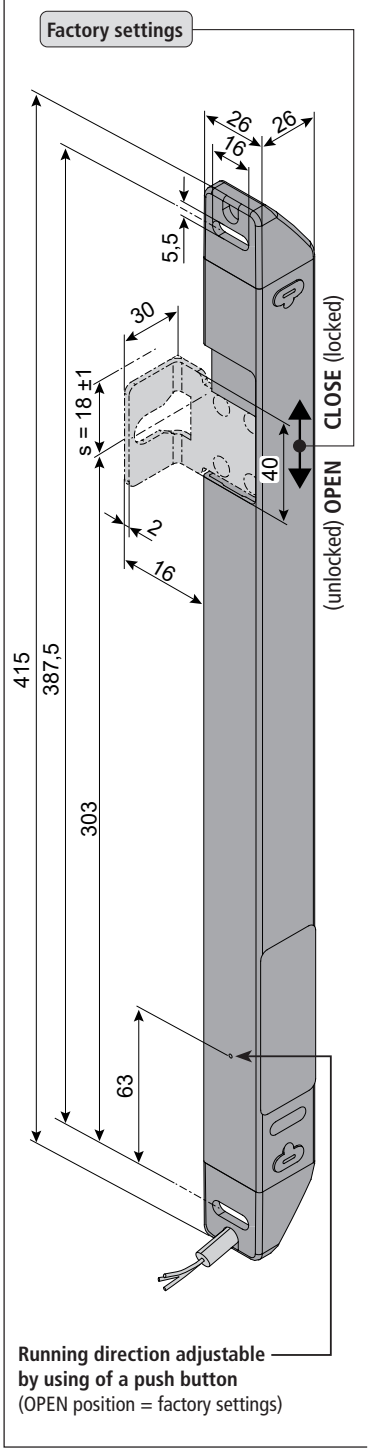
FVUB

- Application: natural ventilation, RWA, ferralux®-NRWG
- Surface mounting on the on the main / side closing edge (HSK / NSK) of the window frame profiles (RM) of inward opening windows
- Required mounting space 28 mm
- Locking drives for existing locking bar
- Running direction adjustable

Options

- Coupling adapter customizable for project-specific / profile-specific demands

(right)



- M-COM suitable internal Control Electronics and sequence control for drives S3 / S12
- Star wiring
- Current of the drives does not run over FVUB
- Sequence control via communication wire

Technical Data

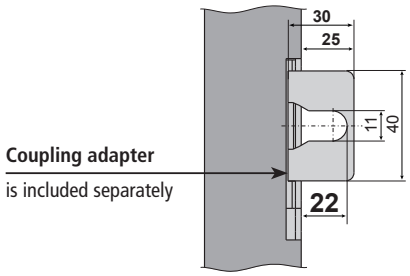
U_N	Rated voltage	24V DC (19V ... 28V)
I_N	Rated current	0,6 A
I_A	Cut-off current	~ 1,0 A
P_N	Rated power	15 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min./OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
F_A	Pushing force max.	~ 600 N
F_L	Breakout force max.	~ 1000 N
F_H	Pullout force max.	1.500 N
t	Running time	~ 5,0 s
s	Stroke	~ 18 mm (± 1)
	Connecting cable	non-halogen, grey ø 6,2 mm, 3 x 0,5 mm², ~ 3 m
	Coupling adapter	stainless steel
	Housing	aluminium (E6/C-O)
L, (WxH)	Dimensions	L = 415 mm, 26 x 26 mm (W x H)
	Sound pressure level	≤ 70 dB (A)

Order data

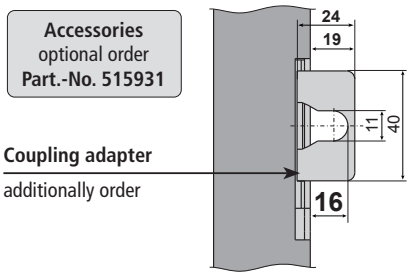
s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
18	415	FVUB R	E6/C-0	1	**515930**

Mounted Dimensions of the Coupling adapter

Coupling adapter is included separately



Accessories: Coupling adapter (separate order)



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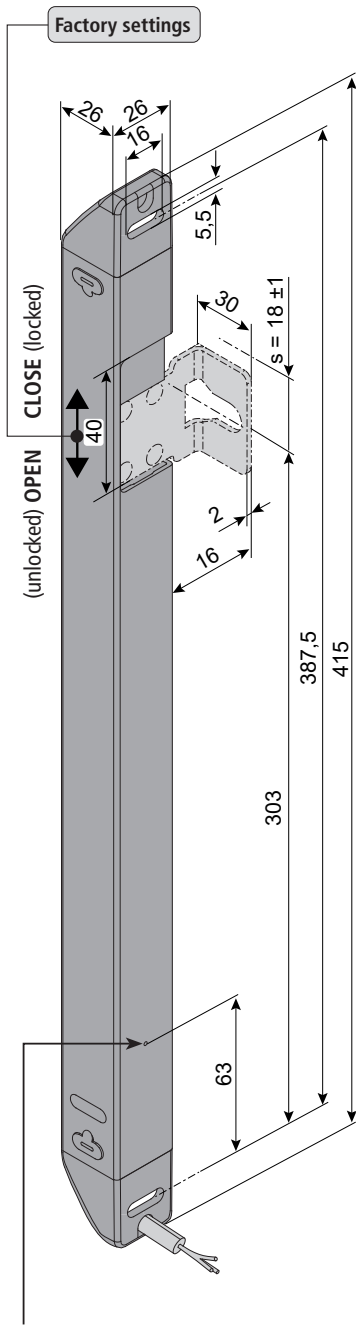
Data sheet FVUB L

- Application: natural ventilation, RWA, ferralux®-NRWG
- Surface mounting on the on the main / side closing edge (HSK / NSK) of the window frame profiles (RM) of inward opening windows
- Required mounting space 28 mm
- Locking drives for existing locking bar
- Running direction adjustable

Options

- Coupling adapter customizable for project-specific / profile-specific demands

(left)



Running direction adjustable by using of a push button
(OPEN position = factory settings)

- M-COM suitable internal Control Electronics and sequence control for drives S3 / S12
- Star wiring
- Current of the drives does not run over FVUB
- Sequence control via communication wire

Technical Data

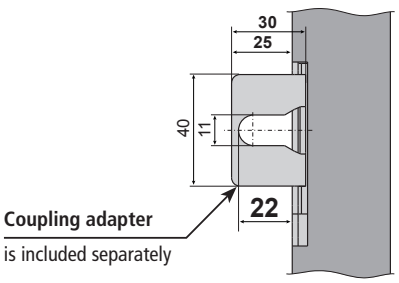
U_N	Rated voltage	24V DC (19V ... 28V)
I_N	Rated current	0,6 A
I_A	Cut-off current	~ 1,0 A
P_N	Rated power	15 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min./OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
F_A	Pushing force max.	~ 600 N
F_L	Breakout force max.	~ 1000 N
F_H	Pullout force max.	1.500 N
t	Running time	~ 5,0 s
s	Stroke	~ 18 mm (± 1)
	Connecting cable	non-halogen, grey ø 6,2 mm, 3 x 0,5 mm², ~ 3 m
	Coupling adapter	stainless steel
	Housing	aluminium (E6/C-O)
L, (WxH)	Dimensions	L = 415 mm, 26 x 26 mm (W x H)
	Sound pressure level	≤ 70 dB (A)

Order data

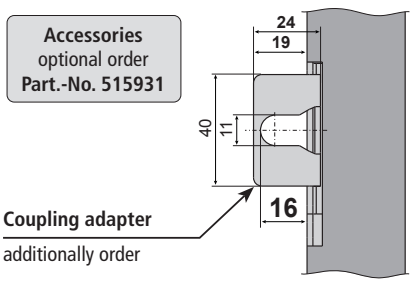
s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
18	415	FVUB L	E6/C-0	1	**515940**

Mounted Dimensions of the Coupling adapter

Coupling adapter is included separately



Accessories: Coupling adapter (separate order)



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Data sheet FVUR

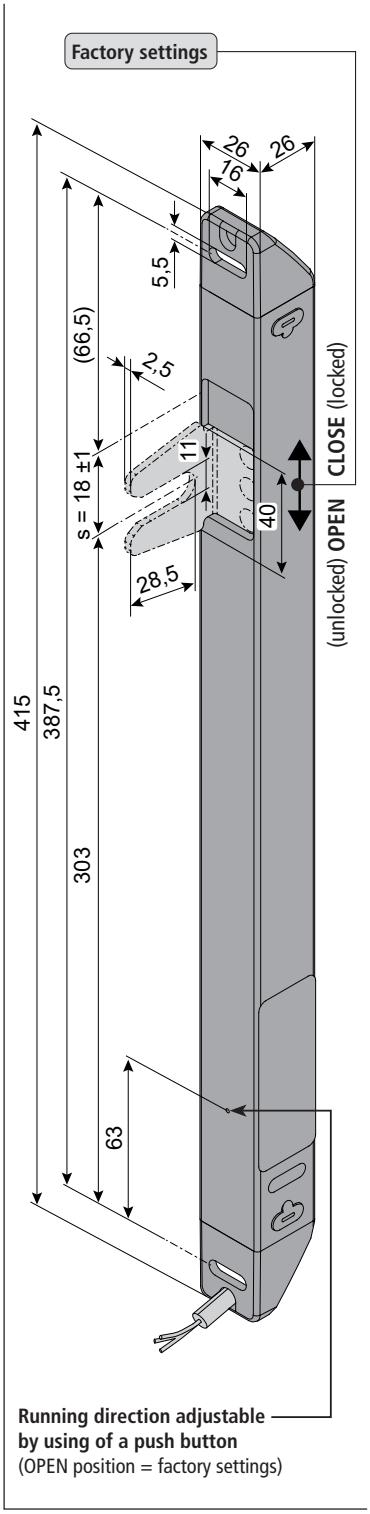
FVUR

- Application: natural ventilation, RWA, ferralux®-NRWG
- Surface mounting on the on the main / side closing edge (HSK / NSK) of the window frame profiles (RM) of outward opening windows or on the casement profiles (FM) of inward opening windows
- Required mounting space 26 mm
- Locking drives for existing locking bar
- Running direction adjustable

Options

- Coupling adapter customizable for project-specific / profile-specific demands

- M-COM suitable internal Control Electronics and sequence control for drives S3 / S12
- Star wiring
- Current of the drives does not run over FVUR
- Sequence control via communication wire



Technical Data

U_N	Rated voltage	24V DC (19V ... 28V)
I_N	Rated current	0,6 A
I_A	Cut-off current	~ 1,0 A
P_N	Rated power	15 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min./OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
F_A	Pushing force max.	~ 600 N
F_L	Breakout force max.	~ 1000 N
F_H	Pullout force max.	1.500 N
t	Running time	~ 5,0 s
s	Stroke	~ 18 mm (± 1)
	Connecting cable	non-halogen, grey ø 6,2 mm, 3 x 0,5 mm², ~ 3 m
	Coupling adapter	stainless steel
	Housing	aluminium (E6/C-O)
L, (WxH)	Dimensions	L = 415 mm, 26 x 26 mm (W x H)
	Sound pressure level	≤ 70 dB (A)

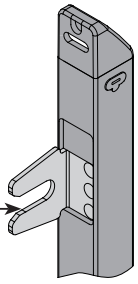
Order data

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
18	415	FVUR	E6/C-0	1	**515920**

Mounting possibilities of the Coupling adapter

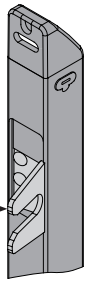
Coupling adapter is included separately (optional installation possible)

Mounting example "Version - 1"



Coupling adapter
is included separately

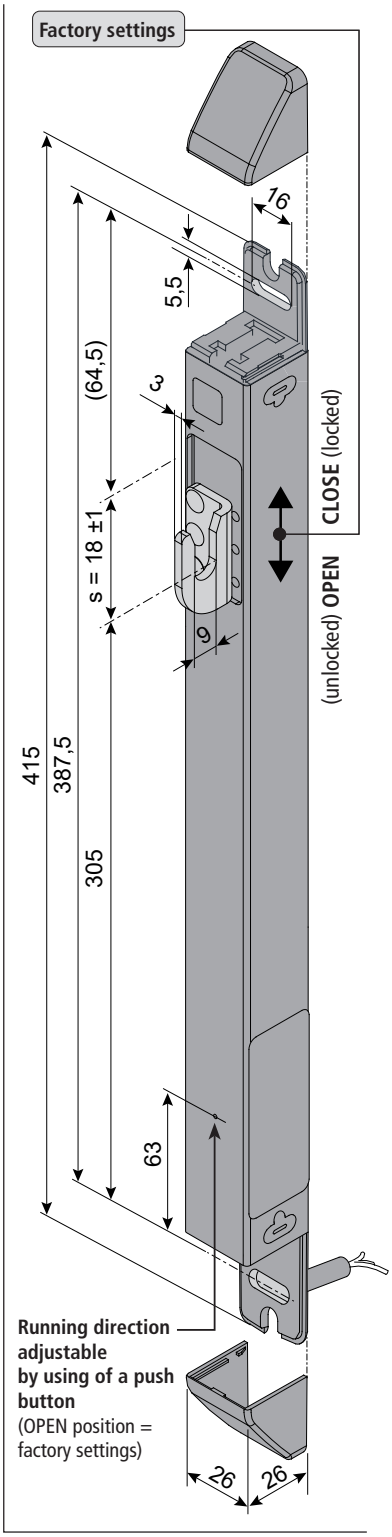
Mounting example "Version - 2"



Coupling adapter
is included separately

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Data sheet FVUE



- Application: natural ventilation, RWA, ferralux®-NRWG
- Surface mounting on the on the main / side closing edge (HSK / NSK) of the window frame profiles (RM) of inward opening windows
- Required mounting space 28 mm
- Locking drive suitable for applications without a locking bar
- Running direction adjustable

Options

- Coupling adapter customizable for project-specific / profile-specific demands

- M-COM suitable internal Control Electronics and sequence control for drives S3 / S12
- Star wiring
- Current of the drives does not run over FVUE
- Sequence control via communication wire

Technical Data

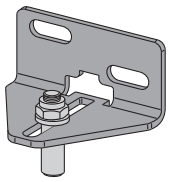
U_N	Rated voltage	24V DC (19V ... 28V)
I_N	Rated current	0,6 A
I_A	Cut-off current	~ 1,0 A
P_N	Rated power	15 W
DC	Duty cycle	5 cycles (ED 30 % - ON: 3 min./OFF: 7 min.)
	Protection rating	IP 32
	Ambient temperature range	-5 °C ... +60 °C
F_A	Pushing force max.	~ 600 N
t	Running time	~ 5,0 s
s	Stroke	~ 18 mm (± 1)
	Connecting cable	non-halogen, grey ø 6,2 mm, 3 x 0,5 mm², ~ 3 m
	Coupling adapter	stainless steel
	Housing	aluminium (E6/C-O)
L, (WxH)	Dimensions	L = 415 mm, 26 x 26 mm (W x H)
	Sound pressure level	≤ 70 dB (A)

Order data

s [mm]	L [mm]	Version	Finish	PU / pcs.	Part.-No.
18	415	FVUE	E6/C-0	1	**515915**

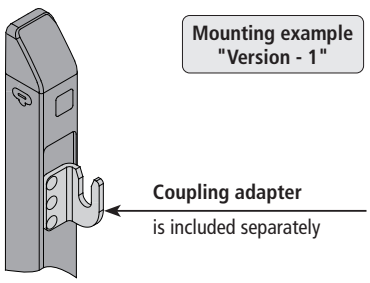
Locking angle B18

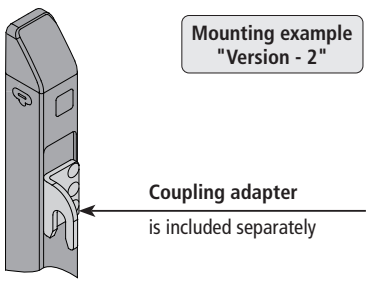
(included)



Mounting possibilities of the Coupling adapter

Coupling adapter is included separately (optional installation possible)





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Options				
Special model			PU / pcs.	Part.-No.
Drive housing painted/powder coated in other RAL colours				
Lump sum for coating				**516030**
Specify at order stage:			1 – 20	**516004**
			21 – 50	**516004**
			51 – 100	**516004**
			from 101	**516004**
Extra length connecting cable:				
5 m – non-halogen grey – 3 x 0,5 mm²				**501034**
10 m – non-halogen grey – 3 x 0,5 mm²				**501036**
Microprocessor programming S12				
Programming drives 24V / 230V S12				**524180**
Optionales Accessories			PU / pcs.	Part.-No.
M-COM Configuration module for synchronised multi-drive systems			1	**524177**
Locking plate B31	for **FVUI**	(thickness **6** mm, due to limited space) made of die-cast zinc	1	**515911**
Coupling adapter FVUB-16 mm	for **FVUB**	(**16** mm Long hole for locking pins) made of stainless steel	1	**515931**
Cover cap	for **FVUR** and **FVUB** and **FVUE**	(2 piece) made of plastic, RAL 7035 (light gray)	2	**515921**
Locking angle	for **FVUE**	Stainless steel angle (including bolt Ø 8x30, nut M6, washer A6.4)	1	**301595**

Explanations on the product label

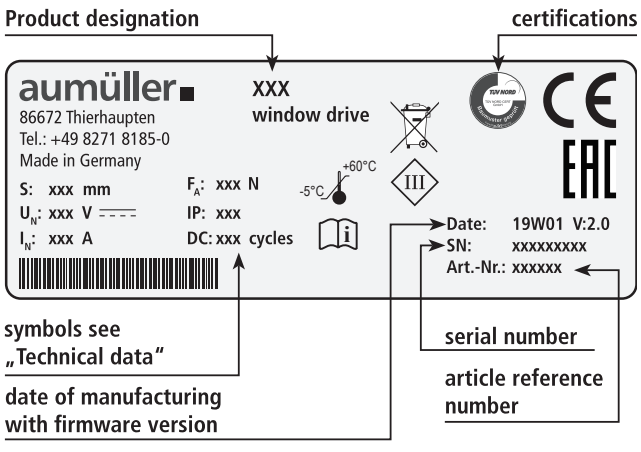
The product label informs about:

- manufacturer's address
- article reference number and name
- technical caracteristics
- 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



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Determination of locking points

The number of locking points depends on:

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

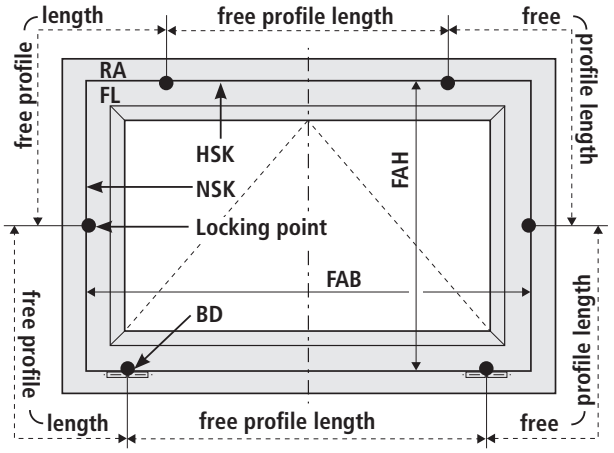
Only the worst case with secured values and application ranges must serve as a basis.

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

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

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

Free profile lengths between two locking points



		Free profile length for Ix⁴-values of the window casement profiles			
		20-34 cm⁴	35-50 cm⁴	51-55 cm⁴	56-99 cm⁴
Static wind slipstream loads on the RWA - according to EN 12101-2.	WL 1000	1300 mm	1500 mm	1700 mm	1900 mm
	WL 1500	1200 mm	1400 mm	1600 mm	1800 mm
	WL 2000	1100 mm	1275 mm	1450 mm	1650 mm
	WL 2500	900 mm	1025 mm	1150 mm	1275 mm
	WL 3000	800 mm	900 mm	1000 mm	1100 mm

Values apply only for AUMÜLLER ferralux NRWG.

NOTE

The number of locking points or the free profile length between two locking points are described into the respective system documents of the window profile. This information must be adhered.
The requirements for the tightness of the windows according to EN 14351-1 must be observed!

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FVUx

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 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 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.

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INSTALLATION STEP 2: Installation prerequisite and Installation preparation

The following conditions must be fulfilled for the installation of the drives so they can be properly assembled with other parts and constructed to a complete machine at the window without impairing the safety and health of persons:

1. The design of the drive must fulfill the requirements.
2. The fastening accessories (casement brackets or frame brackets) must fit the window profile; the profile-dependent hole lay-out must be complied with.
3. The space required for the installation of the drive on the frame and casement profile must be sufficient.
4. The window must be in perfect mechanical condition before the installation. It should open and close easily.
5. The fastening material for the installation of the drive must fit the window material (see table).

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

Tools required

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

Check window data on site

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

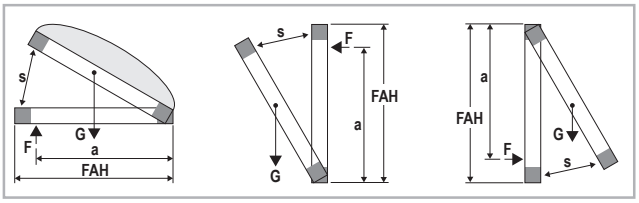
G (Casement weight) [kg] = **FAB** [m] * **FAH** [m] * **Glass thickness** [mm] * **2,5** glass-density * **1,1** frame share

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

F [N] = **Facade** $\frac{\mathbf{5,4} * \mathbf{G}\ [kg] * \mathbf{s}\ [m]}{\mathbf{a}\ [m]}$

F [N] = **Roof** $\frac{\mathbf{5,4} * \mathbf{G}\ [kg] * \mathbf{FAH}\ [m]}{\mathbf{a}\ [m]}$

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.

Accessories: Locking drive

Information	Assembly and Commissioning Instructions
FVUI FVUR FVUB	1x Coupling adapter (locking plate) including screws • Depending on the version, one of the options shown is available in the delivery program.
FVUE	
	FVUR FVUB FVUE 2x Cover caps
	2x Adhesive dots for unlocking mechanism FVUI
	1x Warning sign sticker „Risk of entrapment“

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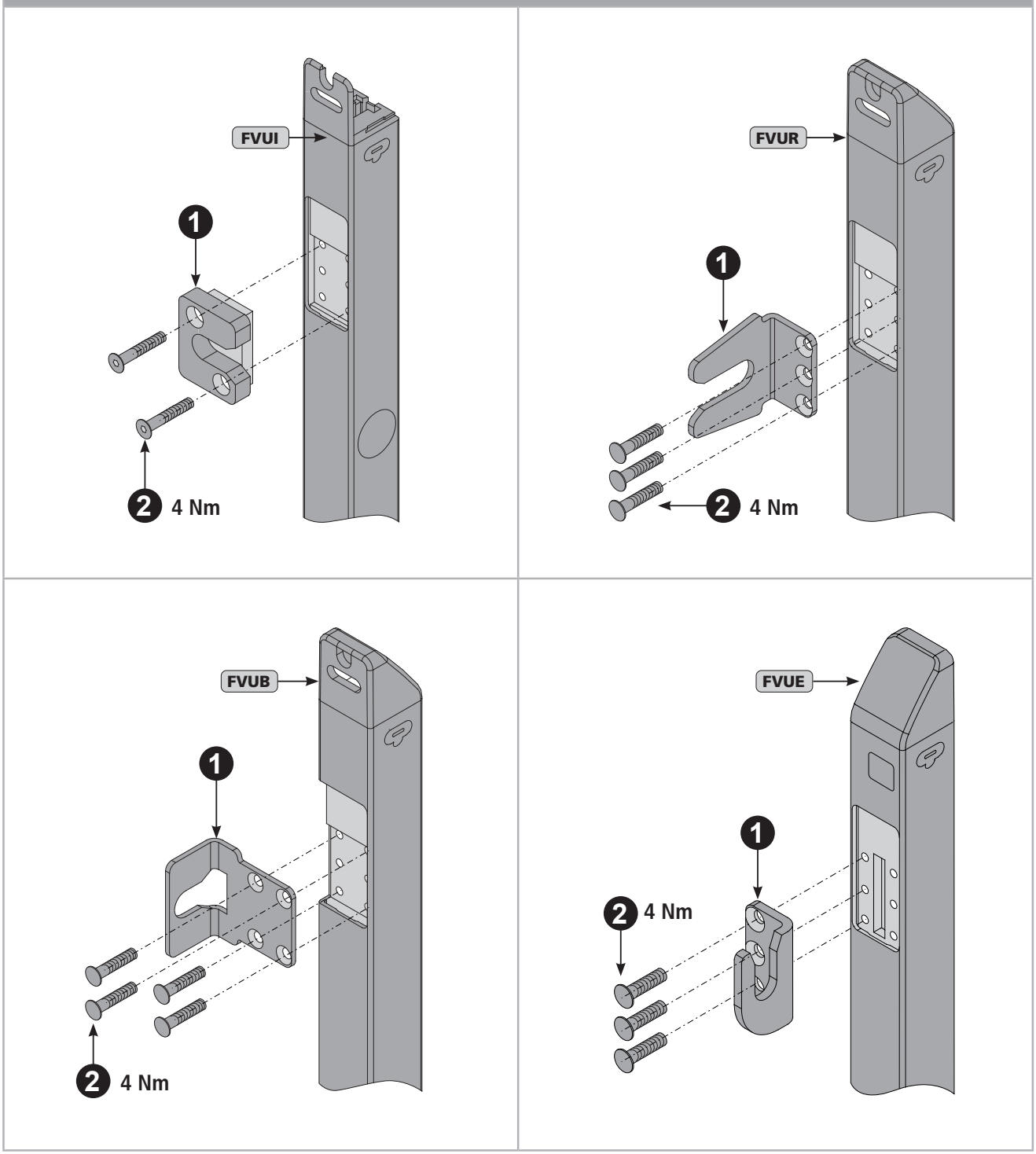
FVUx

Installation step 3: On-site assembly at Coupling adapter / Locking plate

- Mount the separately supplied coupling adapter (locking plate) ❶ - according to on-site conditions:
- Use the countersunk screws ❷ to fix the coupling adapter (locking plate) ❶ on the locking drive **FVUx**.
- Firmly tighten with countersunk screws ❷ (4 Nm).

Note Application examples see chapter: „Installation step 7 - Hole layouts".

On-site assembly of the coupling adapter (locking plate)



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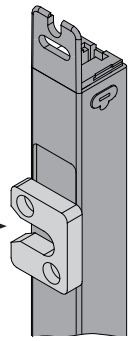
Mounting possibilities of the coupling adapter (locking plate)

Coupling adapter / Locking plate is supplied separately (optional installation possible)

FVUI

Part.-No. 515910

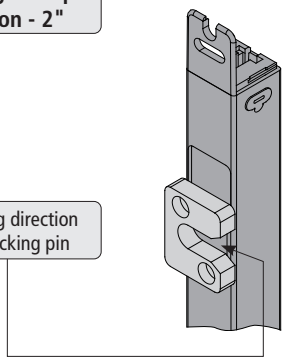
Mounting example "Version - 1"



FVUI

Part.-No. 515910

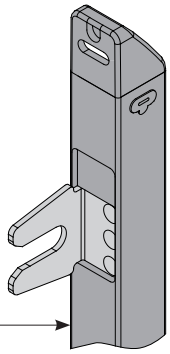
Mounting example "Version - 2"



FVUR

Part.-No. 515920

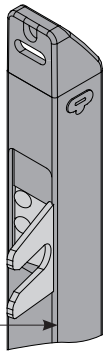
Mounting example "Version - 1"



FVUR

Part.-No. 515920

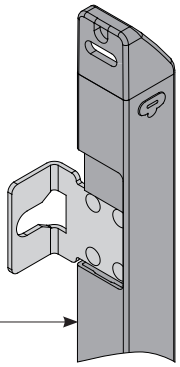
Mounting example "Version - 2"



FVUB

Part.-No. 515930

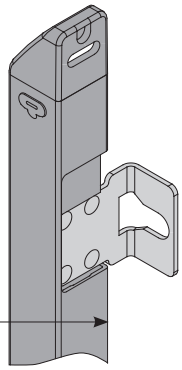
Mounting example "FVUB R"



FVUB

Part.-No. 515940

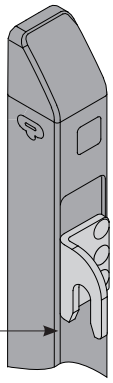
Mounting example "FVUB L"



FVUE

Part.-No. 515915

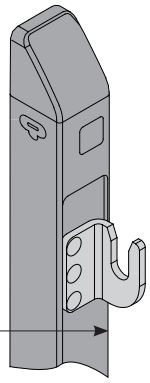
Mounting example "Version - 1"



FVUE

Part.-No. 515915

Mounting example "Version - 2"



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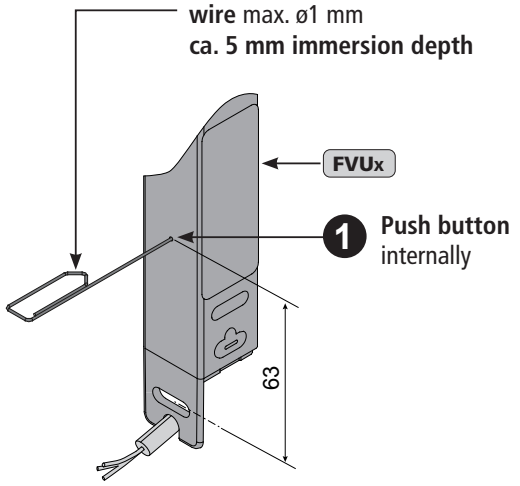
Installation step 4: Change of the run direction

FVUx

The **push button** ❶ in the locking drive **FVUx** is used to change the run direction.

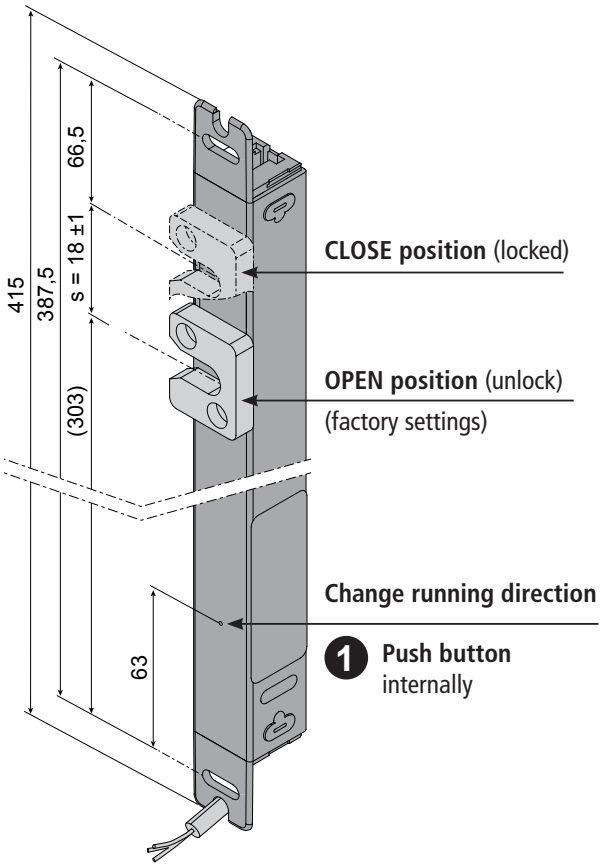
- Make the connection for the control voltage at the not yet mounted locking drive **FVUx** (see chapter: „Electric connection").
- To change the running direction, switch on the supply voltage in **CLOSE** direction.
- Using a wire (max. Ø 1mm) and press carefully the internally push button within the drilling ❶ (for about one second).
  Now the locking drive **FVUx** automatically moves to the **changed CLOSE** position.

Change of the run direction

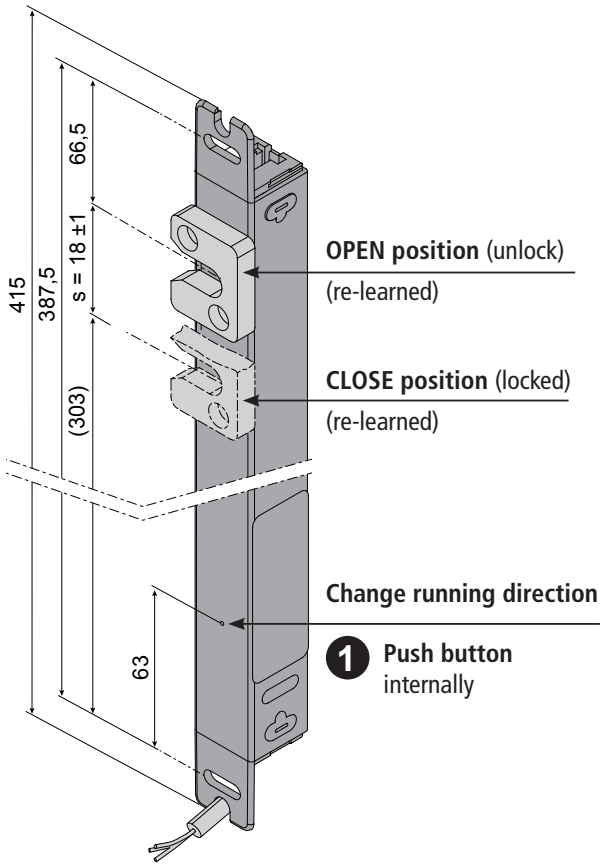


Change running direction

Factory settings



Running direction has changed (re-learned)



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Installation step 5: Assembly opening drive

- Mount opening drive (see separate „Assembly and Commissioning Instructions“ for each drive).
- Make the connection for the control voltage to the opening drive (see chapter: „Electric connection“).

The opening drives **must have** an integrated disconnection and / or an electronic overload disconnection.

- M-COM suitable internal load dependent cut-off switch and sequence control. For drives with internal load dependent cut-off switch **S3 / S12**
  - sequence control via communication wire,
  - wiring with drives,
  - current of the drives does not run over **FVUx**.

Installation step 6: Test run before assembly

FVUx

The opening drive and the not mounted locking drive **FVUx** must be tested **separately**.

Test run: Opening drive

- **Switch on t**he **control voltage** at the opening drive**.**
- Move opening drive in **CLOSE** direction.
- Move opening drive in **OPEN** direction and ensure the ease of movement of casement.
- Unhinge the opening drive.
- **Switch off** the **control voltage** from the opening drive.

Test run: Locking drive

- Make the connection for the control voltage to the not mounted locking drive **FVUx** (see chapter: „Electric connection“).

During **start-up** of locking drives **FVUx** the voltage may be switched on only:

- with opened casement
- unhinged opening drive

- **Switch on** the **control voltage** at locking drive **FVUx -** in **CLOSE** direction.
- Check whether the stroke of the locking drive **FVUx** with the stroke of the on-site locking bar moves synchronously.
- If necessary, change the run direction (see chapter: „Change of the run direction“).
- Move locking drive **FVUx** in **OPEN** direction.
- **Switch off** the **control voltage** from the locking drive **FVUx.**
- Assembly the locking drives **FVUx** (see installation step 7 to 10).

Prerequisite for subsequent installation steps

FVUx

The window fitting is prepared by the customer for operation with the locking drive **FVUx** and the locking pin - for the coupling adapter / locking plate - is in a suitable position mounted.

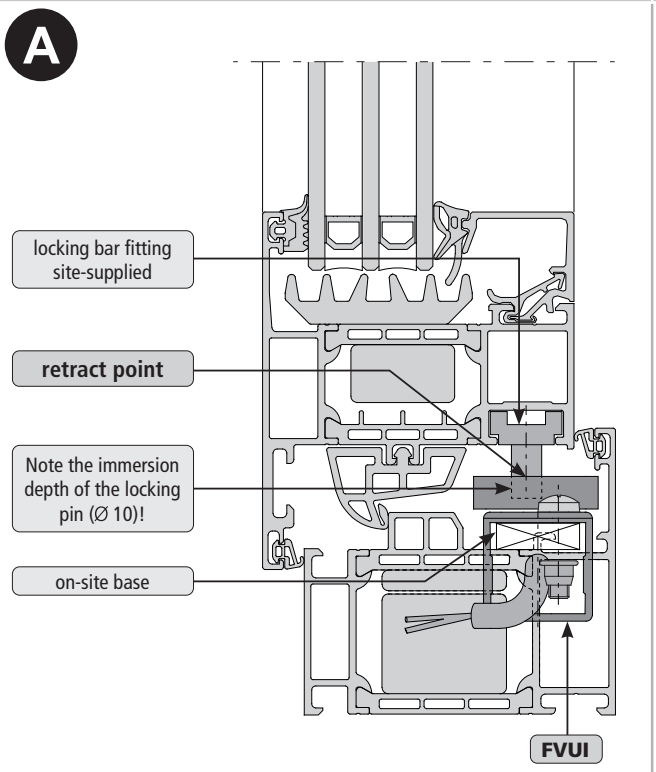
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Installation step 7a: Hole layouts for locking drive FVUI

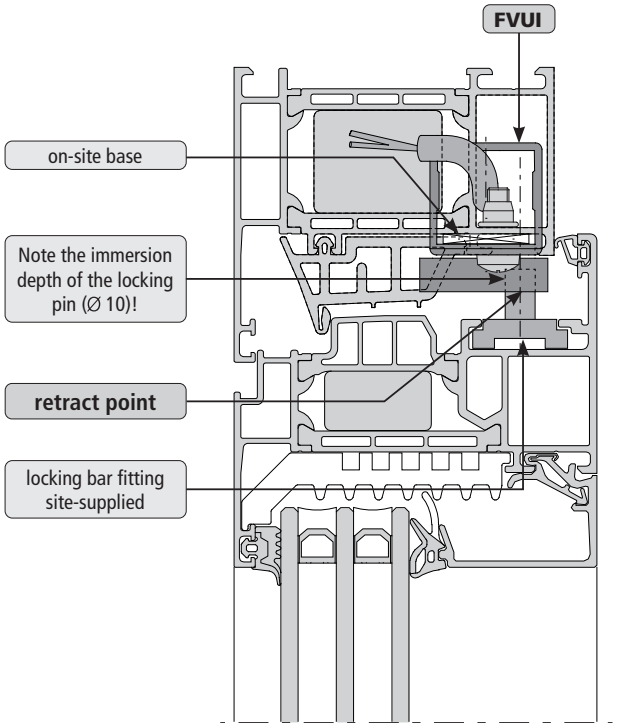
FVUI

Application examples

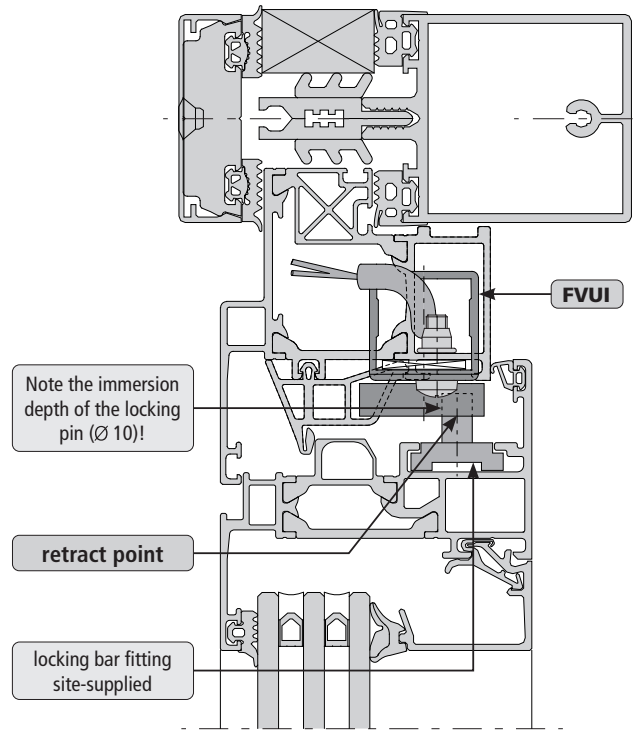
Frame assembly (concealed mounting inside profiles) **outward opening window** HSK



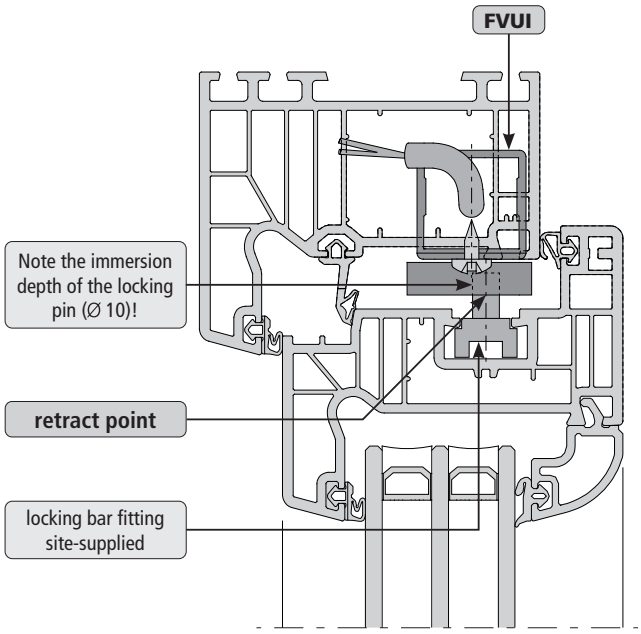
Frame assembly (concealed mounting inside profiles) **inward opening window**



Frame assembly (concealed mounting inside profiles) **inward opening window**



Frame assembly (concealed mounting inside profiles) **inward opening window**



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Hole layouts for locking drive FVUI

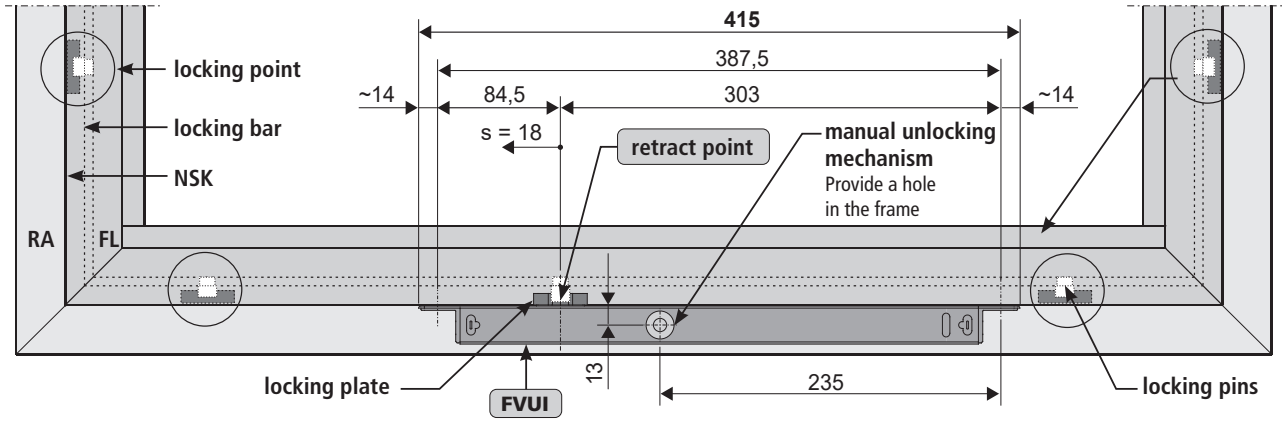
Hole layout - concealed mounting inside profiles - Frame assembly - HSK

HSK

A See: Installation step 9A

Note the immersion depth of the locking pin (Ø 10)!

Window versions		
	Bottom-hung	- inward opening
	Top-hung	- outward opening
	Side-hung	

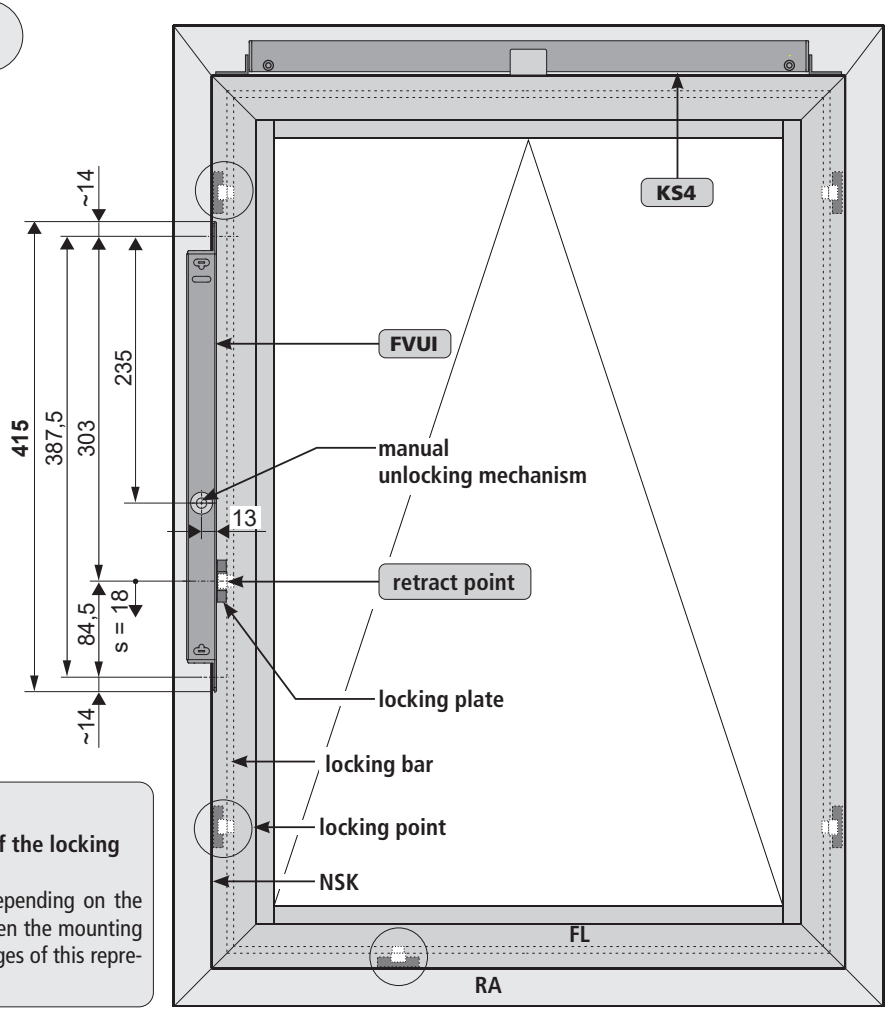


Hole layout - concealed mounting inside profiles - Frame assembly - NSK

NSK

See: Installation step 9A

Note the immersion depth of the locking pin (Ø 10)!



Note

Mounting possibilities of the locking plate

The locking plate can - depending on the application - be turned. Then the mounting dimensions are mirror images of this representation.

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Installation step 7b: Hole layouts for locking drive FVUR

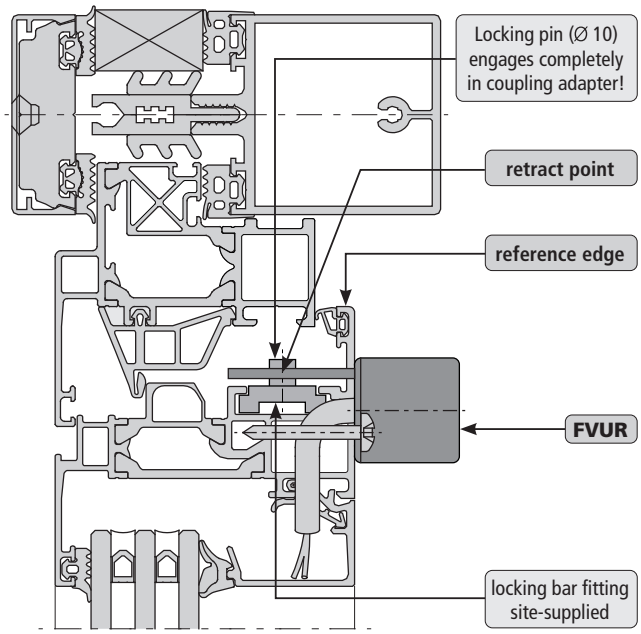
FVUR

Application examples

Bottom-hung - inward opening window casement assembly - HSK

HSK

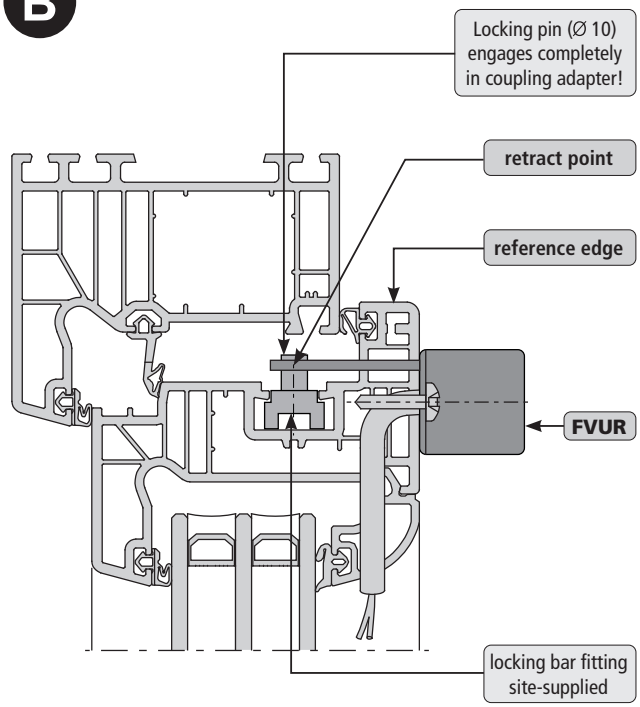
B



Bottom-hung - inward opening window casement assembly - HSK

HSK

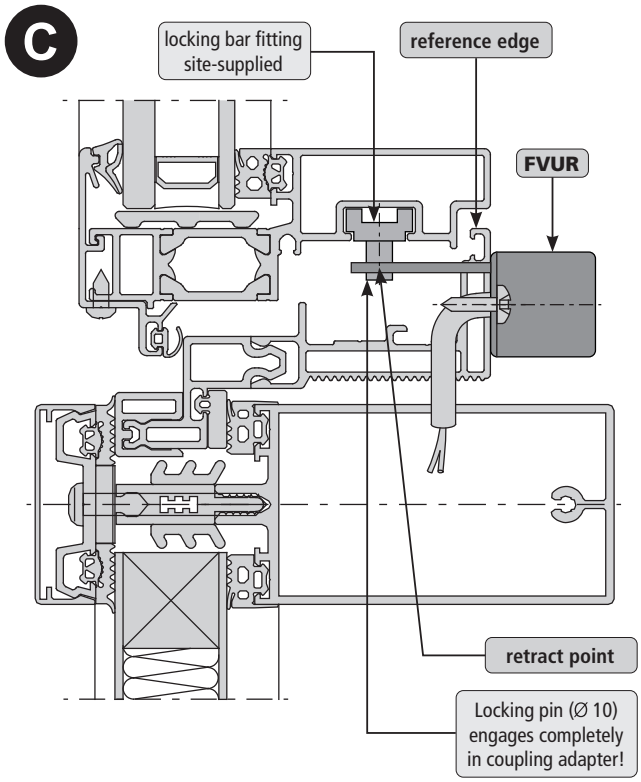
B



Top-hung - outward opening window frame assembly - HSK

HSK

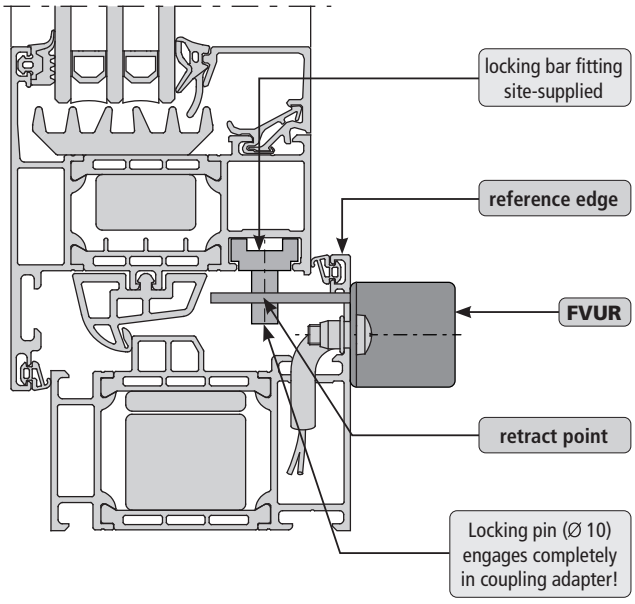
C



Top-hung - outward opening window frame assembly - HSK

HSK

C



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Hole layouts for locking drive FVUR

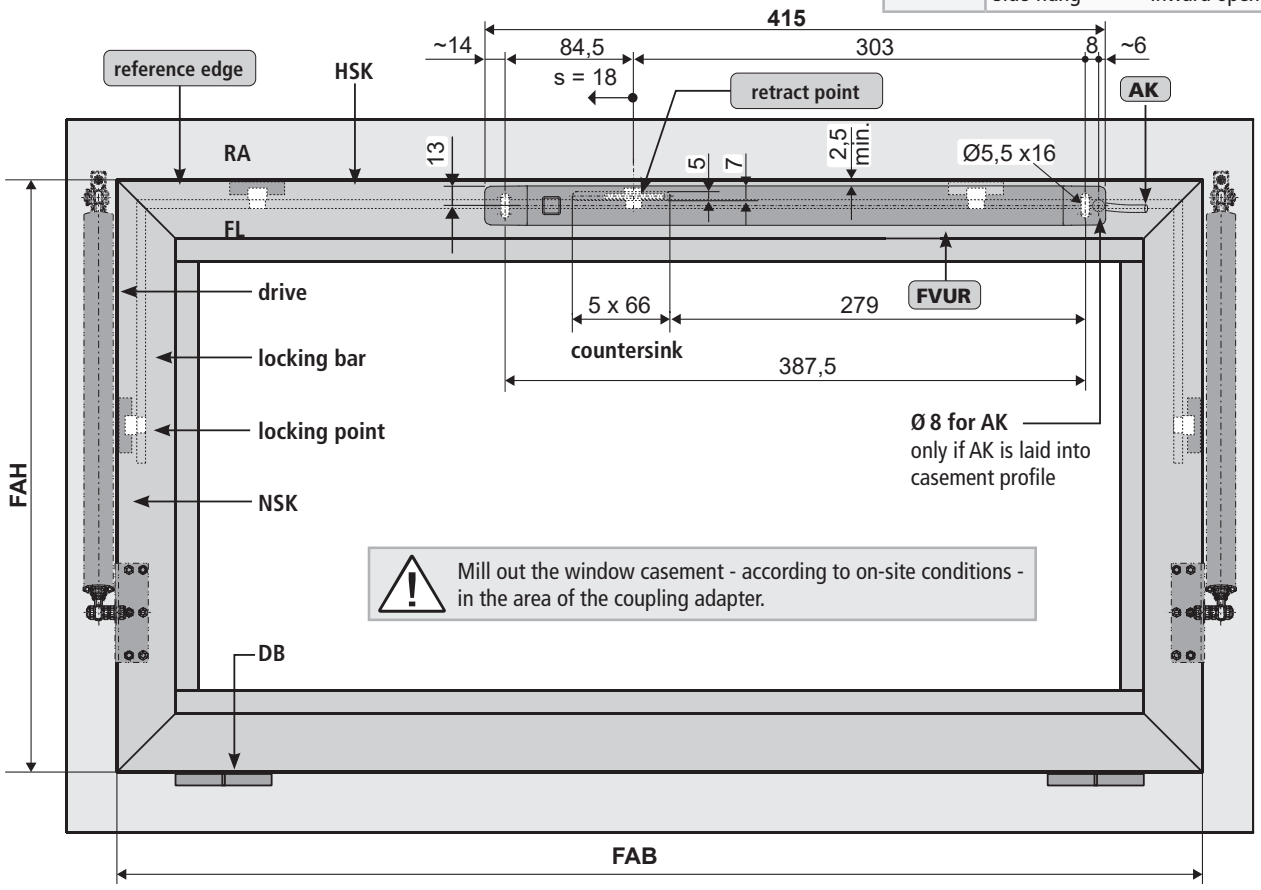
FVUR

Hole layout FVUR - casement assembly at the inward opening window - HSK

HSK

B See: Installation step 9B

Window versions		
	Bottom-hung	- inward opening
	Top-hung	- inward opening
	Side-hung	- inward opening

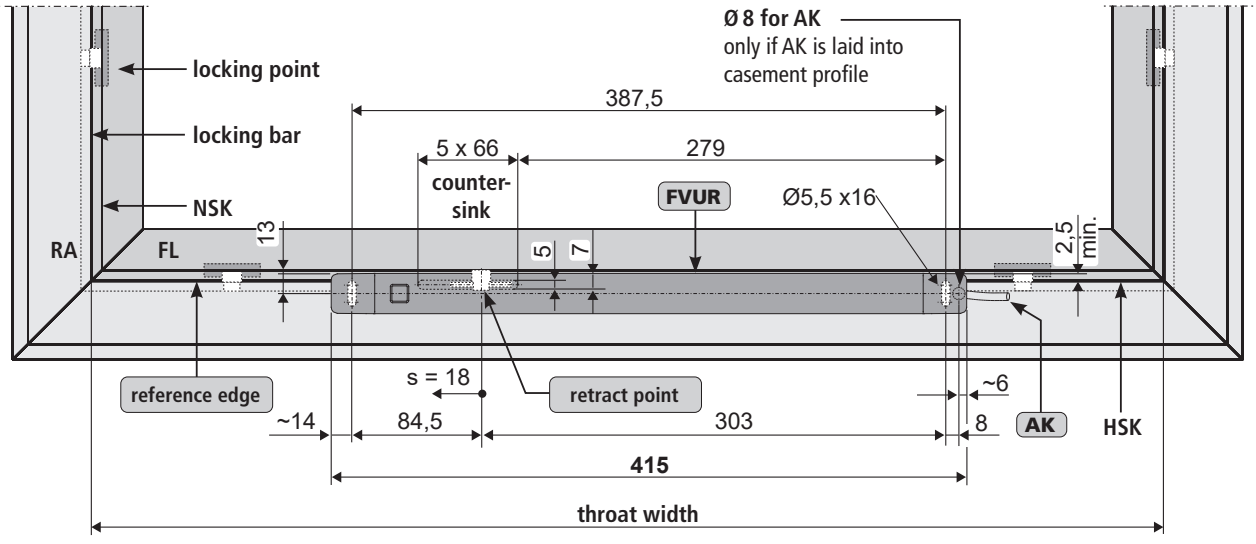


Hole layout FVUR - frame assembly at the outward opening window - HSK

HSK

C See: Installation step 9B

Window versions				
	Bottom-hung	- outward opening	Side-hung	- outward opening
	Top-hung	- outward opening	Frinction hinged	- outward opening



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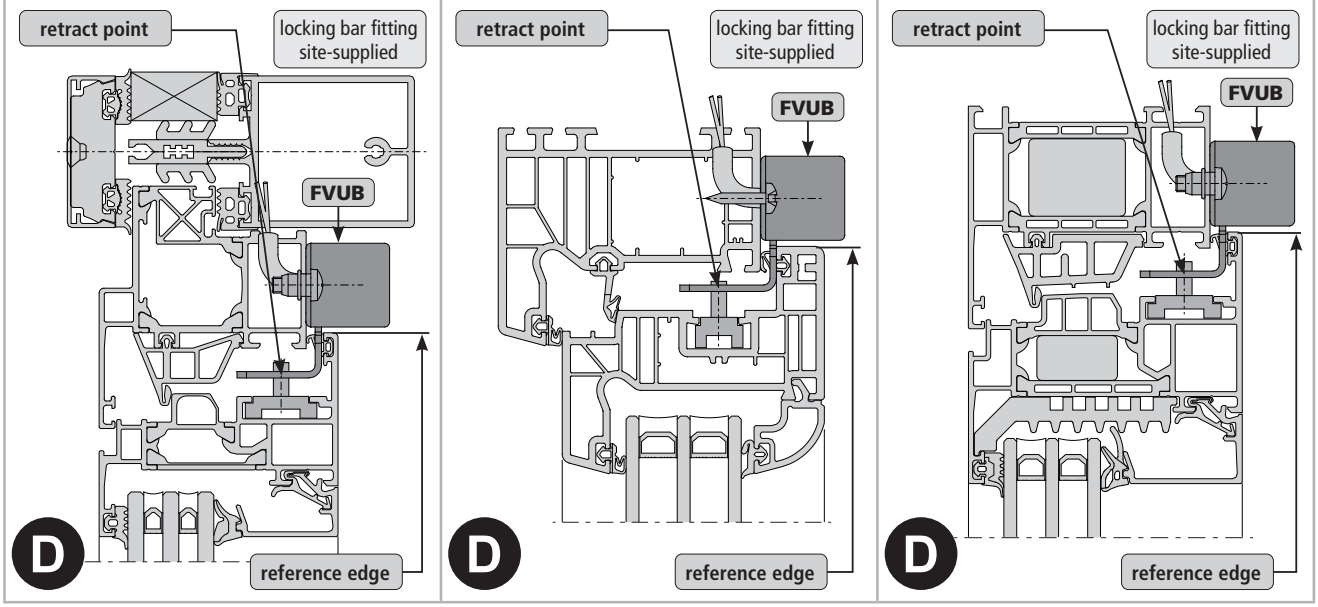
Installation step 7c: Hole layouts for locking drive FVUB

FVUB

Application examples

Bottom-hung - inward opening windows - frame assembly - HSK

HSK

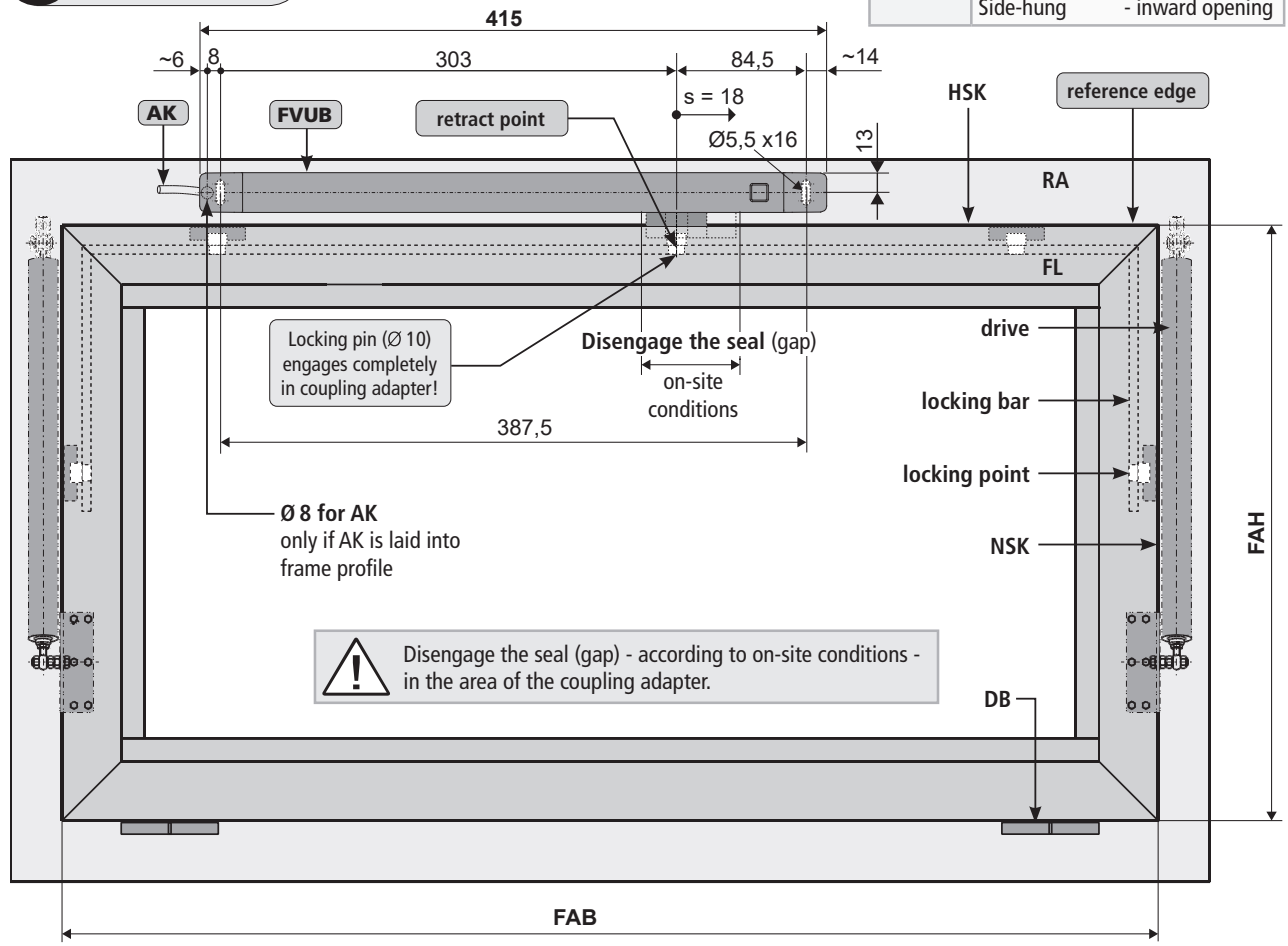


Hole layout FVUB - frame assembly at the inward opening windows - HSK

HSK

D See: Installation step 9c

Window versions		
	Bottom-hung	- inward opening
	Top-hung	- inward opening
	Side-hung	- inward opening



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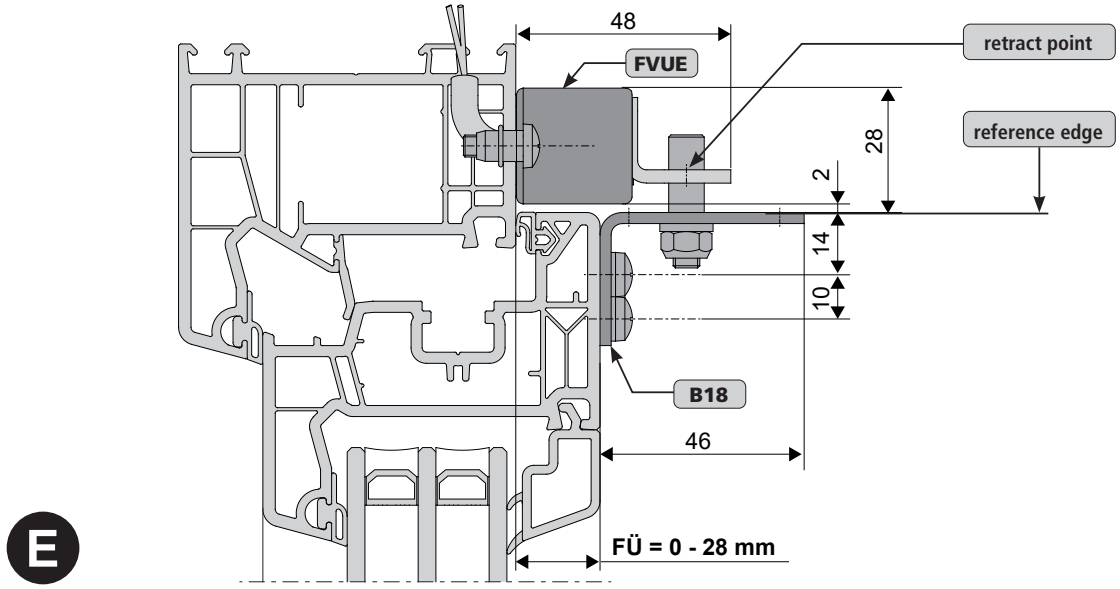
Installation step 7D: Hole layouts for locking drive FVUE

FVUE

Application examples

Bottom-hung - inward opening windows - frame assembly - HSK

HSK



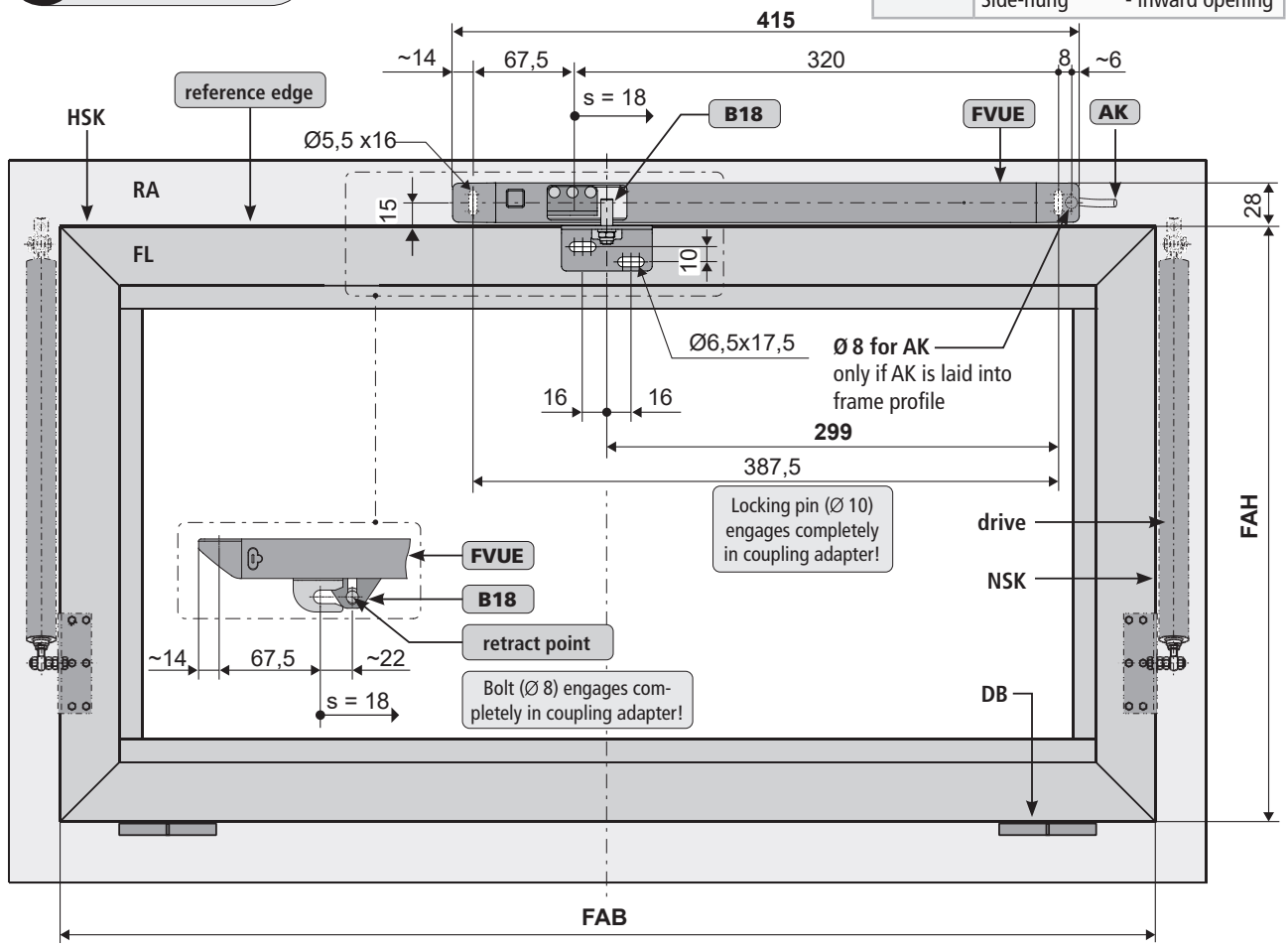
E

Hole layout FVUE - frame assembly at the inward opening windows - HSK

HSK

E See: Installation step 9D

Window versions		
	Bottom-hung	- inward opening
	Top-hung	- inward opening
	Side-hung	- inward opening



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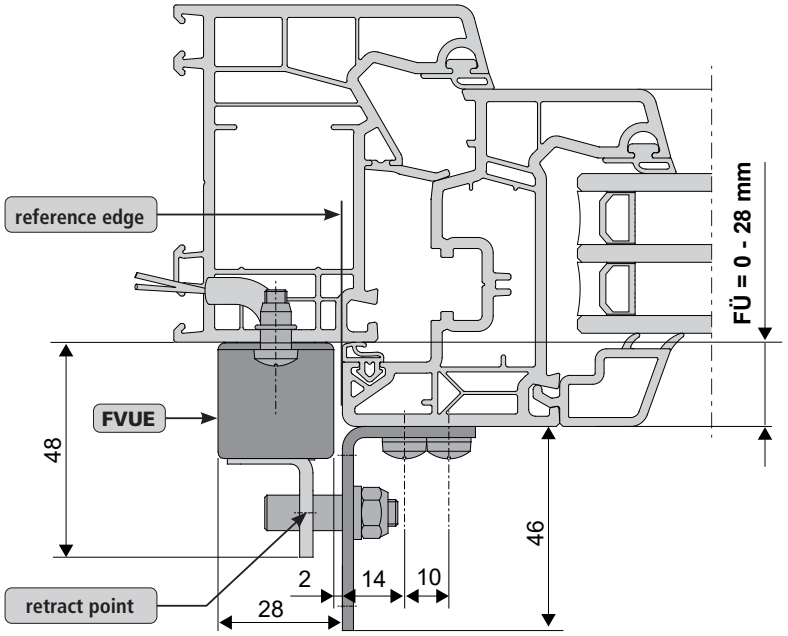
Hole layouts for locking drive FVUE

FVUE

Application examples

Bottom-hung - inward opening windows - frame assembly - NSK

NSK

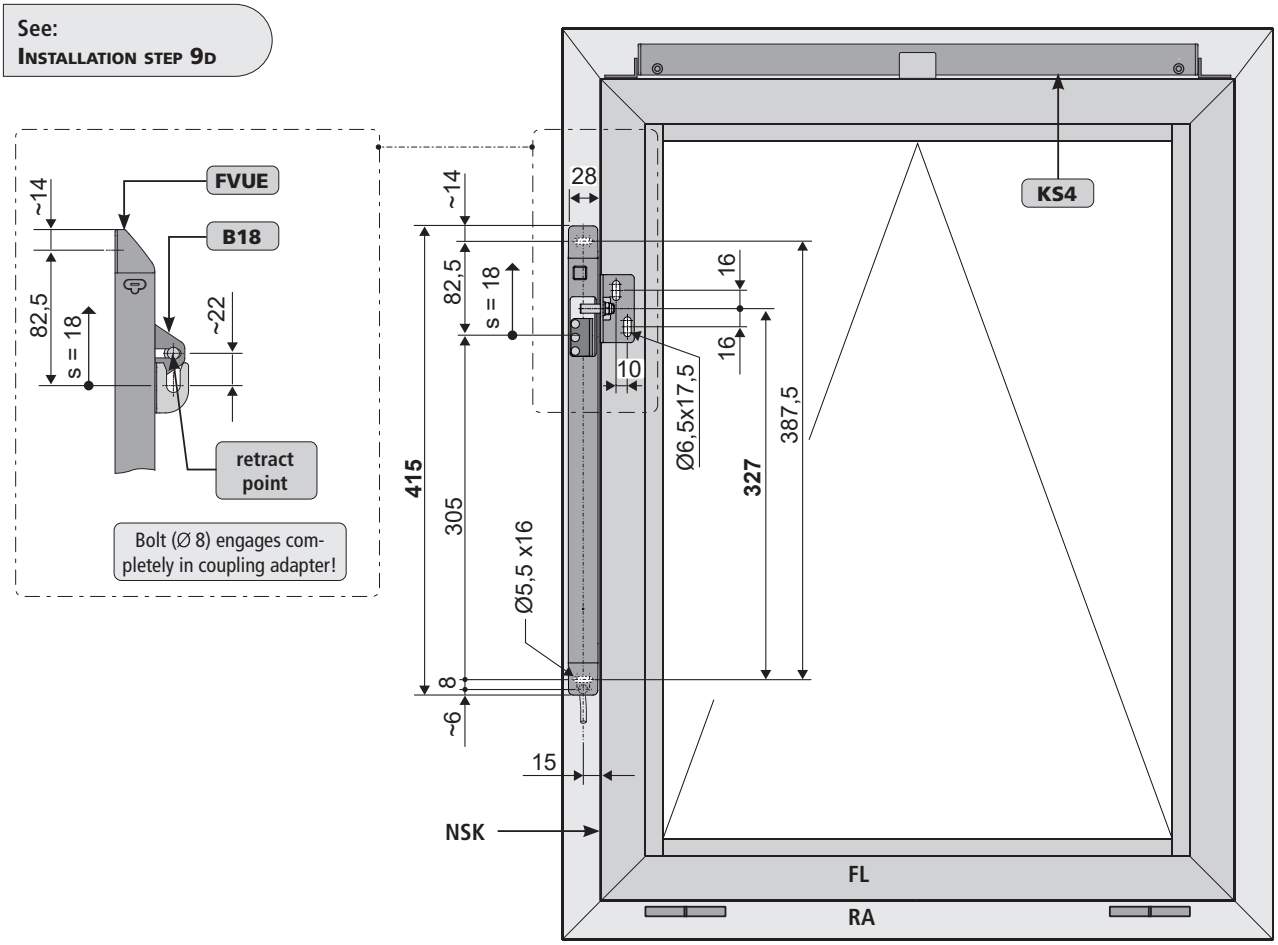


E

Hole layout FVUE - frame assembly at the inward opening windows - NSK

NSK

See:
INSTALLATION STEP 9D



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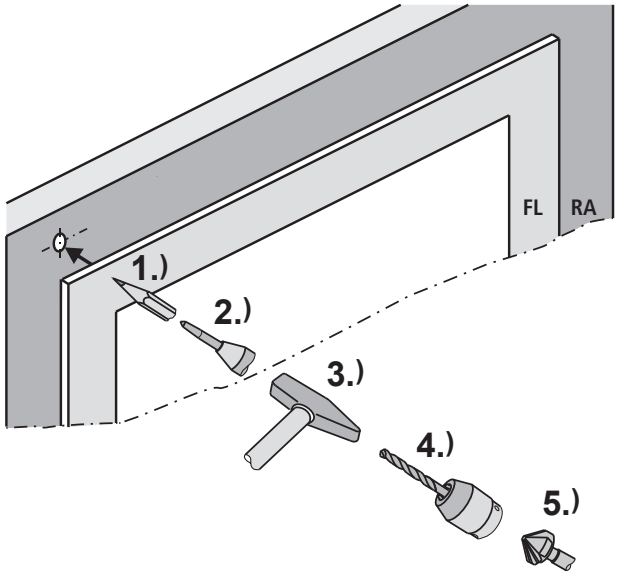
Installation step 8A: Drill holes according to mounting variants

- Determine position of locking drive **FVUx** on casement.
- Determine locking direction. Possibly see the chapter "Installation step 4 - Change of the run direction".
- 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 step 7" or project-specific documents and drawings).

Note Pay attention to the position "retract point of the locking pin" in the locking plate or the coupling adapter!

Note If necessary, make a countersink (free space) for the coupling adapter. See chapter "Installation step 9 - Concealed mounting inside profiles or Frame assembly".

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



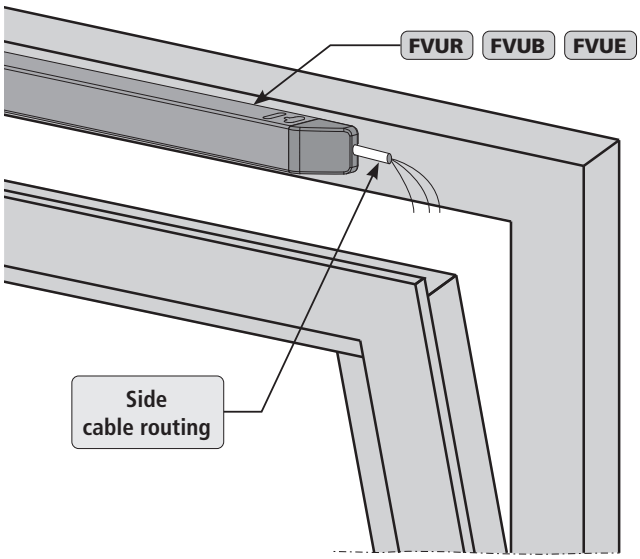
Carefully clear away drilling swarfs to prevent seals from being damaged.
Avoid surface scratches, for example by using masking tape.

Installation step 8B: Side cable routing (cable output)

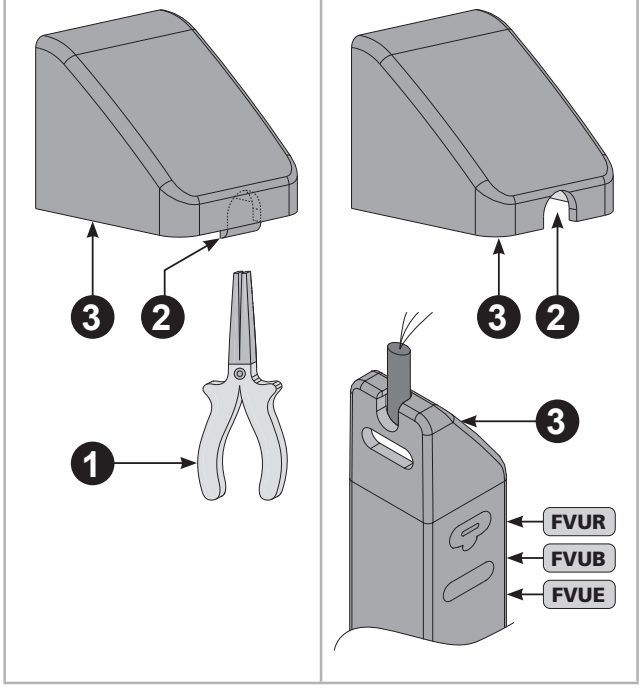
FVUR FVUB FVUE

Note For side cable routing, the cover cap ❸ has a pre-punched opening.

- Using flat nose pliers ❶, remove the pre-punched opening ❷ from the cover cap ❸ and then deburr.



Remove pre-punched opening



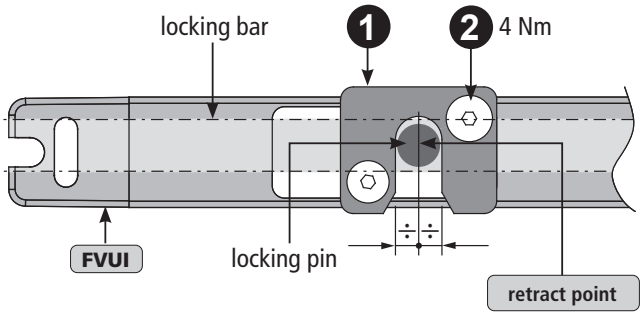
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FVUI

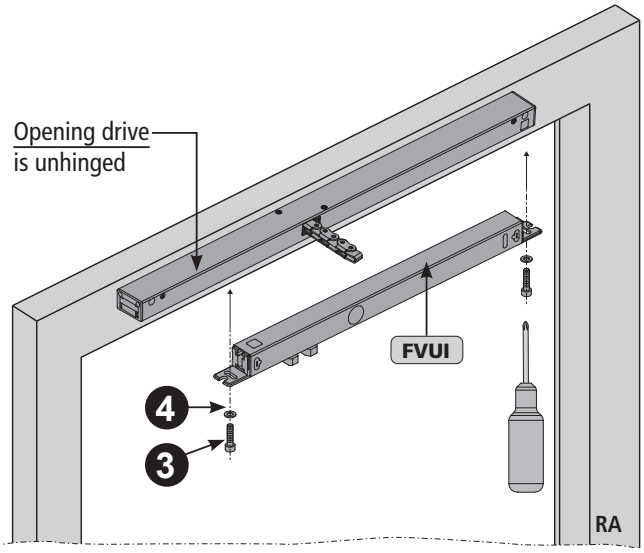
Installation step 9a: Concealed mounting inside profiles - in the frame

- Ensure a countersink (free space) for the locking drive **FVUI** and the locking plate (coupling adapter) according to the window profile and the actual stroke of the window locking bar.

The locking pin (Ø 10 mm) of the locking bar must be centered in the mounting slot of the locking plate ❶ from the locking drive **FVUI**. Maybe adjust the locking pin.



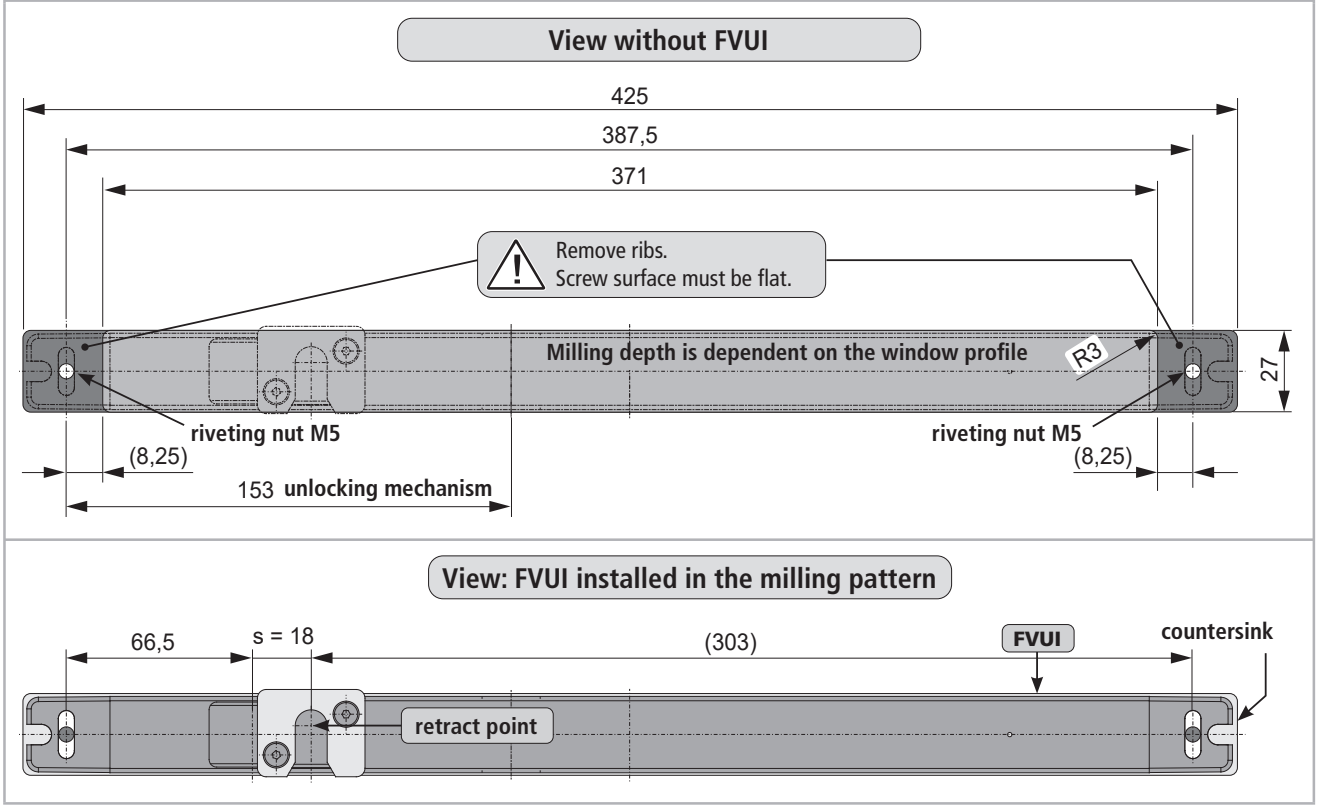
- Mount the locking drive **FVUI** with screws ❸ and washers ❹ in the pre-cut (milled out) window frame.



Note

Window defect: If the window does not open anymore, the locking drive **FVUI** ha a unlocking mechanism.
See chapter "Manual unlocking mechanism - if the window is defect".

Milling layout for locking drive FVUI - concealed mounting inside profiles



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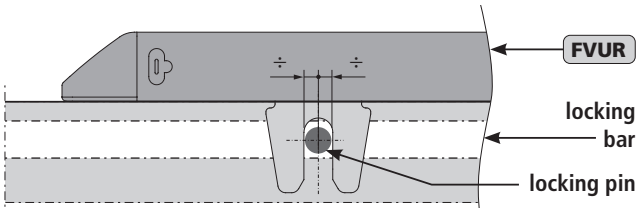
Installation step 9b: FVUR - Casement assembly - inward opening

FVUR

- Ensure free space (countersink) in the area of the locking bar (catch) according to the window profile and the actual stroke of the window bar.

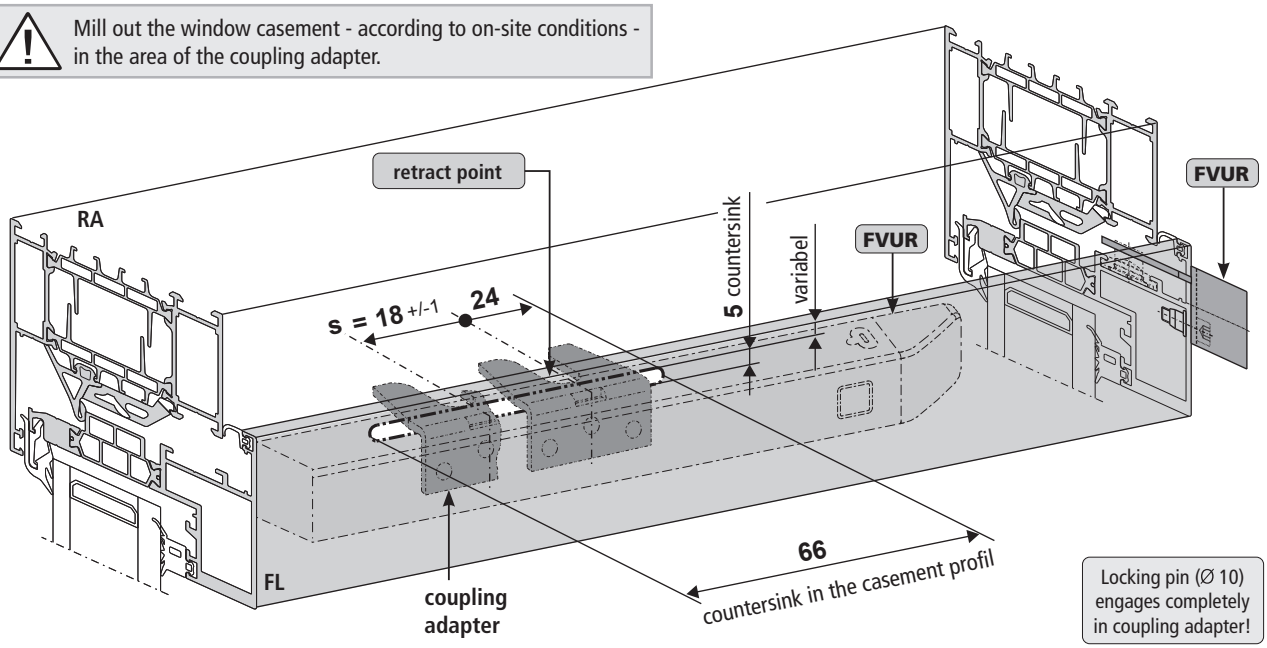
The locking pin (Ø10 mm) of the locking bar must be centered in the mounting slot of the locking plate ❶ from the locking drive **FVUR**. Maybe adjust the locking pin.

Ensure that the locking bar and the coupling adapter moves freely.



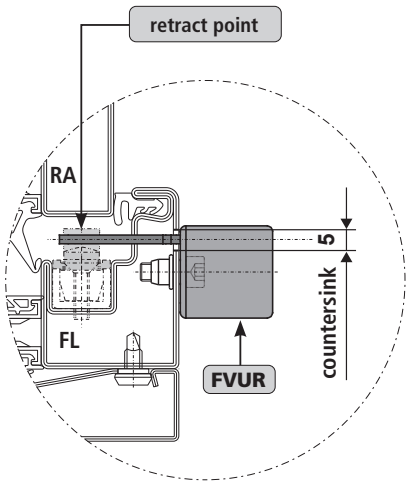
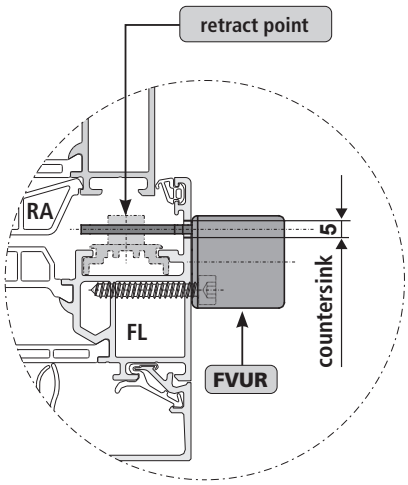
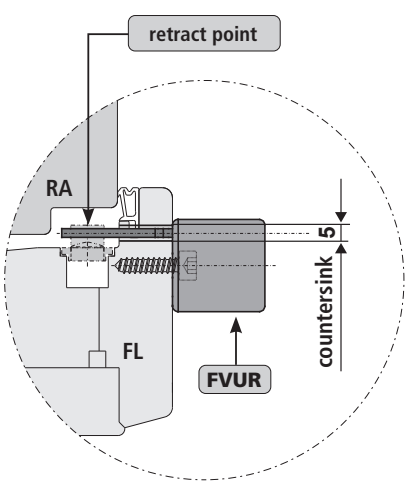
Position of the locking drive FVUR - application example

Mill out the window casement - according to on-site conditions - in the area of the coupling adapter.



Locking pin (Ø 10) engages completely in coupling adapter!

Countersink for FVUR - application example

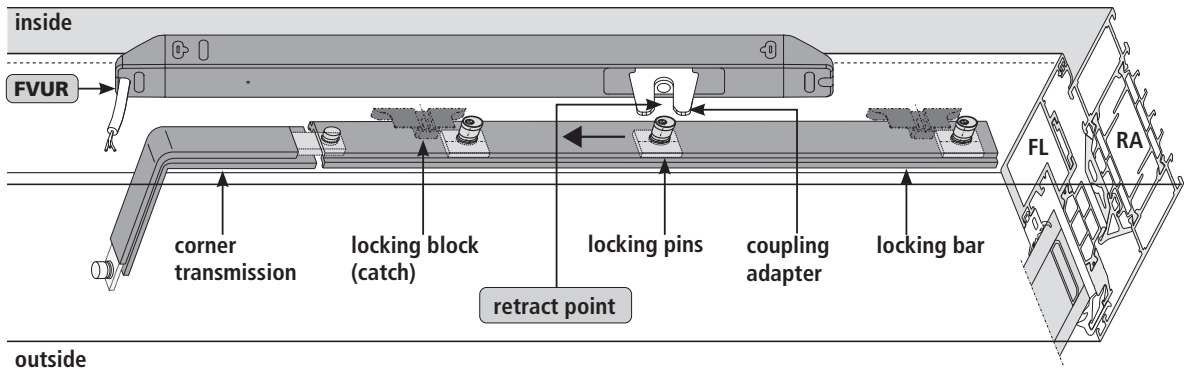
steel window	aluminium window	wood window
		

Mill out the window casement - according to on-site conditions - in the area of the coupling adapter.

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Stroke control: Locking drive FVUR and locking bar fitting

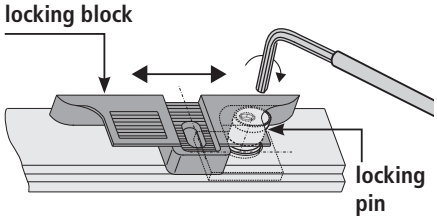
FVUR



- Screw locking drive **FVUR** onto casement frame (**M5**).

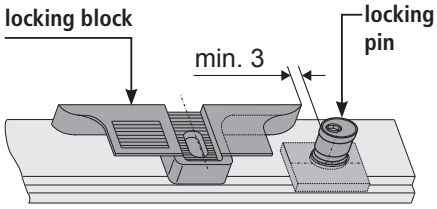
Make sure they are parallel to casement edge. The drive body must lie completely flush on the casement frame surface.

Locking block: locked



The locking pin should completely move into the locking block when locking.

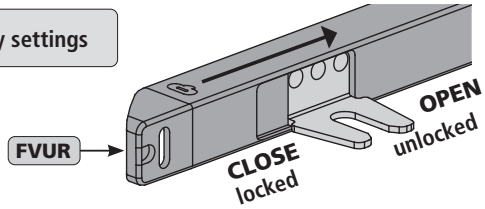
Locking block: unlocked



The locking pin should completely move out of the locking block when unlocking.

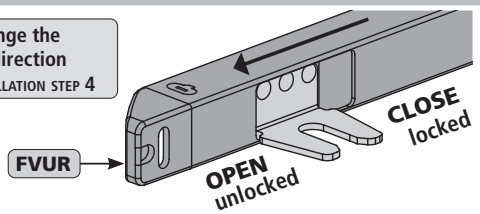
Locking drive in **OPEN** (unlocked)

Factory settings

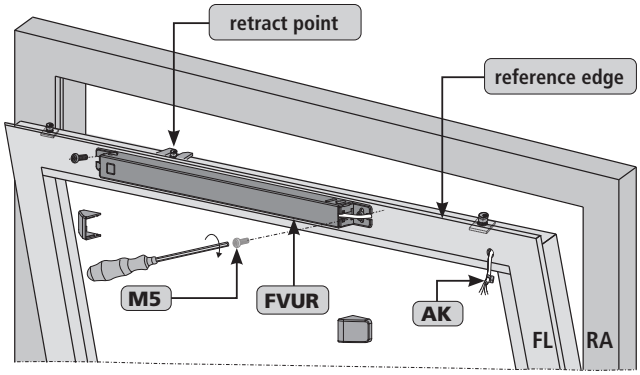


Locking drive in **OPEN** (unlocked)

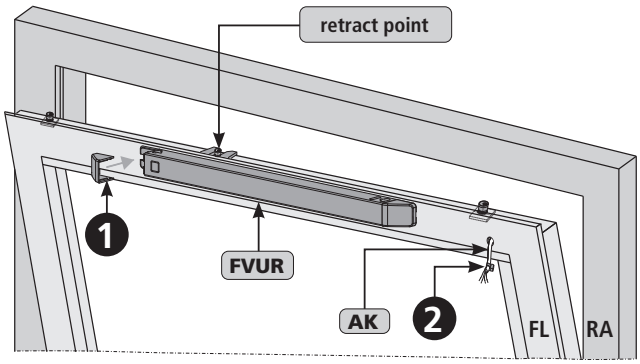
Change the run direction see INSTALLATION STEP 4



- Check whether the stroke of the locking drive **FVUR** with the stroke of the on-site locking bar moves synchronously.
- Adjust locking block and locking pin on-site-supplied fittings.



- Depending on the conditions on-site, prepare the connection cable (**AK**) for installation (see chapter „Cable routing“).
- Put the cover cap ❶ on the locking drive **FVUR**.
- Pay attention to a strain relief ❷ of the cable.



Check function! (see chapter „Safety check and Test run“).

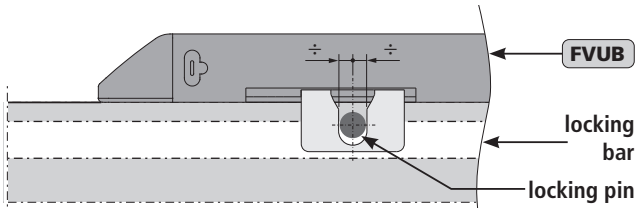
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Installation step 9c: FVUB - Frame assembly - inward opening window

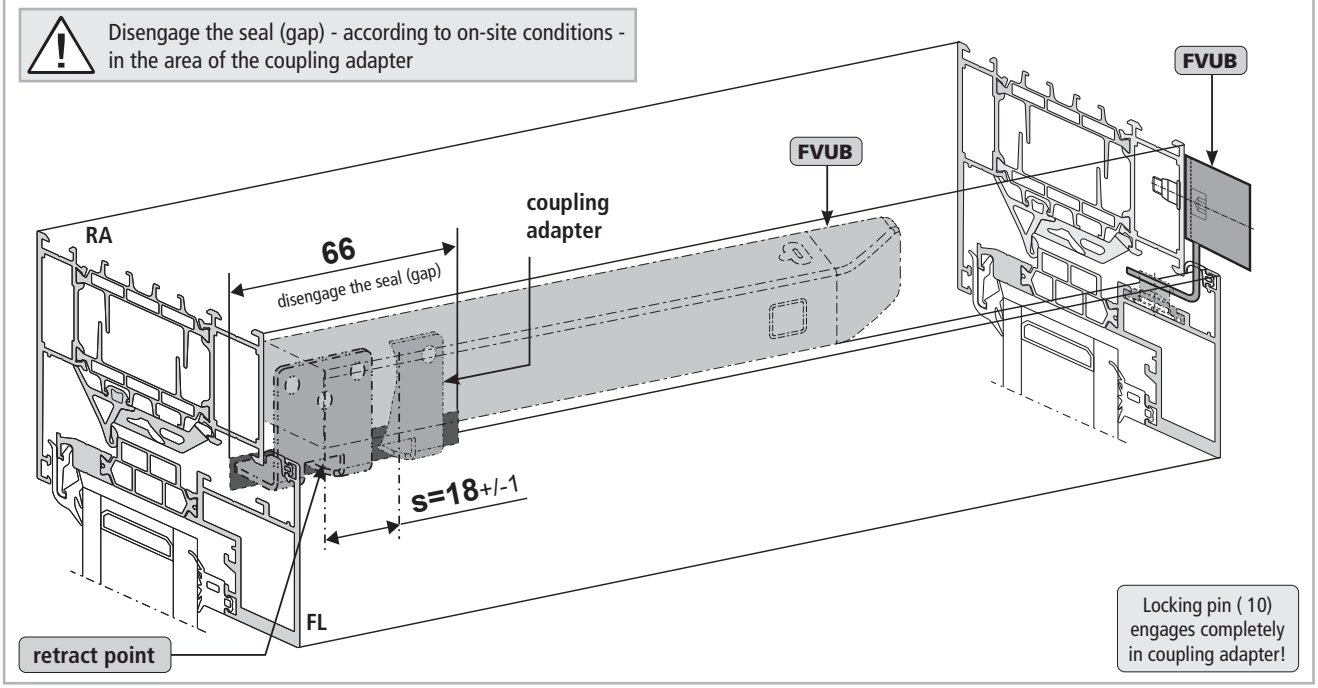
- Ensure free space (countersink) in the area of the locking bar (catch) according to the window profile and the actual stroke of the window bar.

The locking pin (10 mm) of the locking bar must be centered in the mounting slot of the locking plate from the locking drive **FVUB**. Maybe adjust the locking pin.

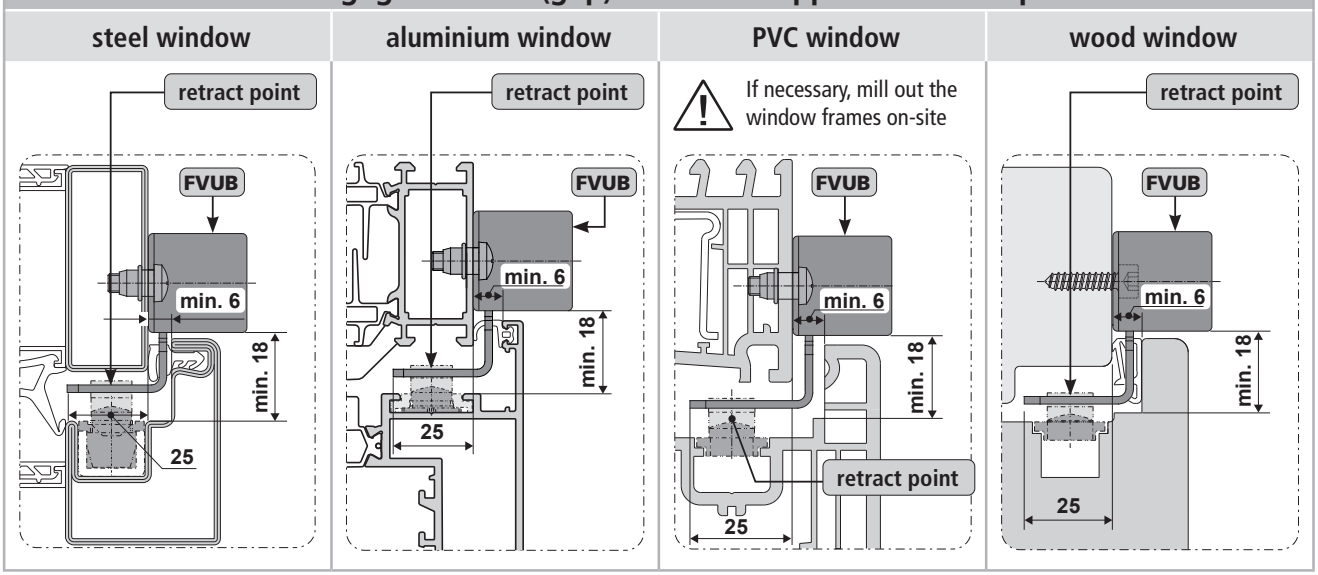
Ensure that the locking bar and the coupling adapter moves freely.



Position of the locking drive FVUB - application example



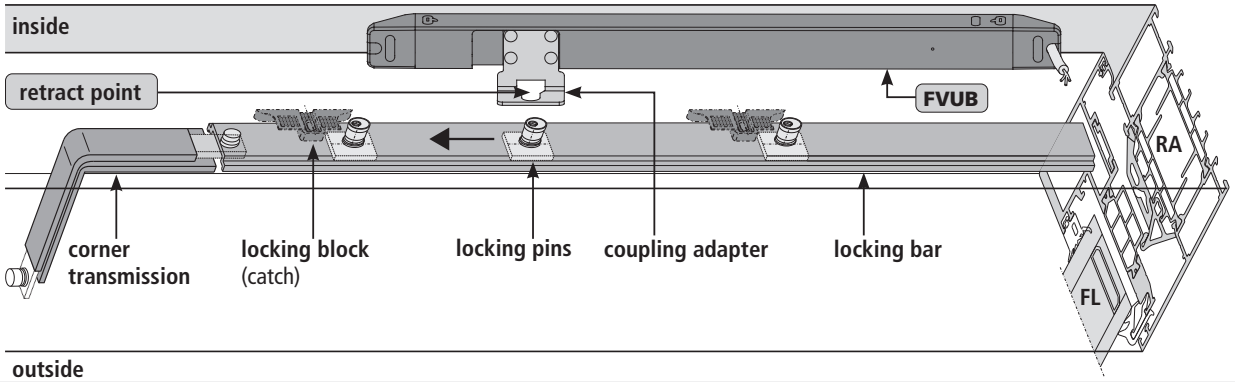
Disengage the seal (gap) for FVUB - application example



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Stroke control: Locking drive FVUB and locking bar fitting

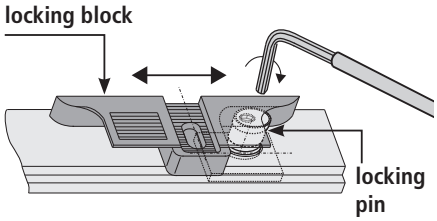
FVUB



■ Screw locking drive **FVUB** onto window frame (**M5**).

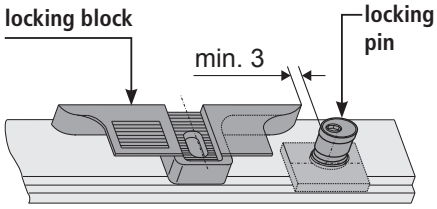
Make sure they are parallel to casement edge. The drive body must lie completely flush on the window frame surface.

Locking block: locked



The locking pin should completely move into the locking block when locking.

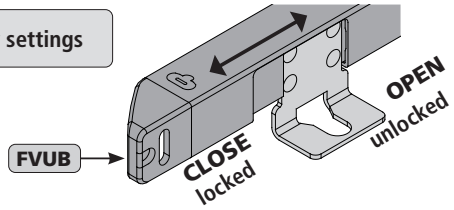
Locking block: unlocked



The locking pin should completely move out of the locking block when unlocking.

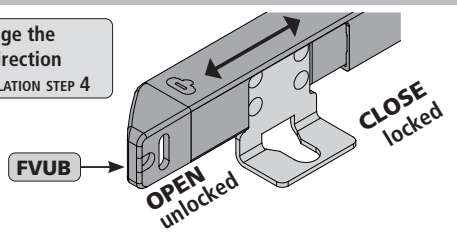
Locking drive in **OPEN** (unlocked)

Factory settings



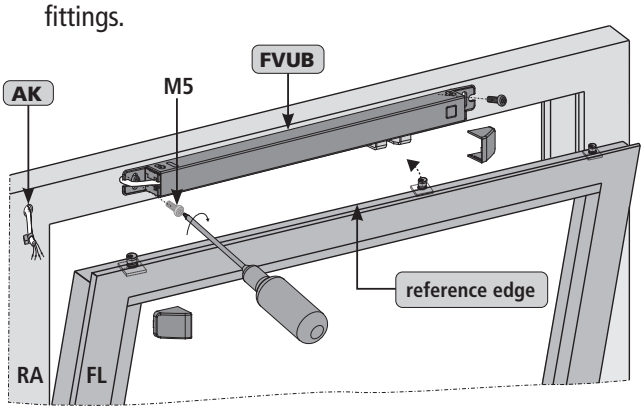
Locking drive in **OPEN** (unlocked)

Change the run direction see Installation step 4



■ Check whether the stroke of the locking drive **FVUB** with the stroke of the on-site locking bar moves synchronously.

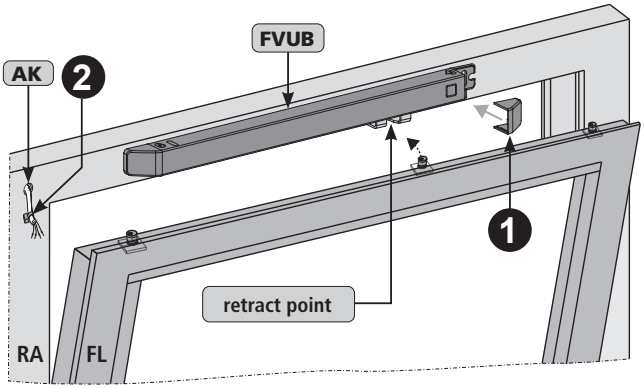
■ Adjust locking block and locking pin on-site-supplied fittings.



■ Depending on the conditions on-site, prepare the connection cable (**AK**) for installation (see chapter „Cable routing").

■ Put the cover cap ❶ on the locking drive **FVUB**.

■ Pay attention to a strain relief ❷ of the cable.



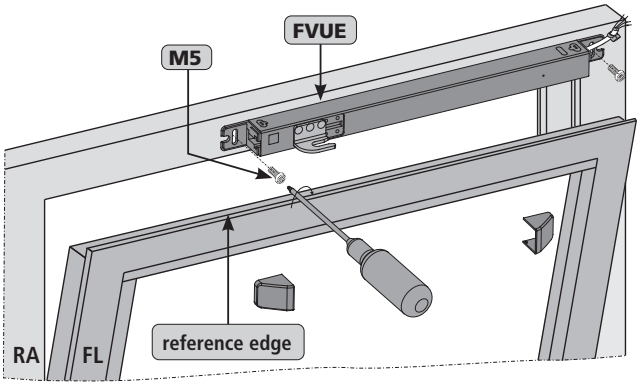
Check function! (see chapter „Safety check and Test run").

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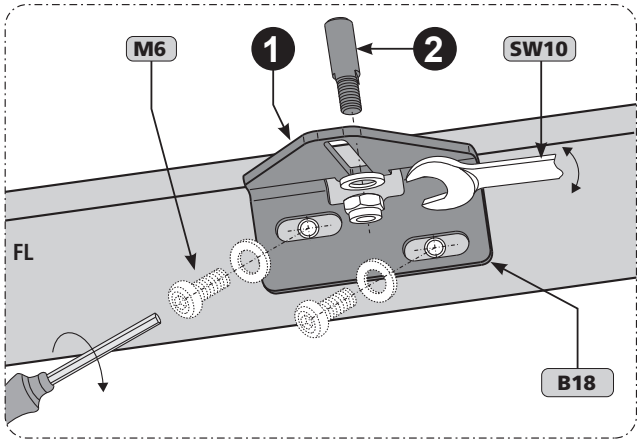
Installation step 9d: FVUE - Frame assembly - inward opening window

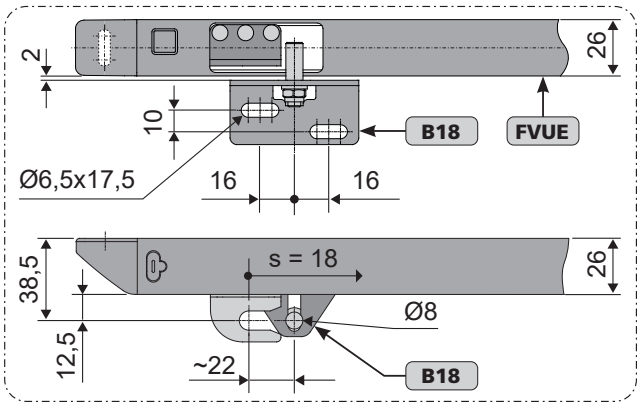
- Screw locking drive **FVUE** onto window frame (**M5**).

Make sure they are parallel to casement edge. The drive body must lie completely flush on the window frame surface.

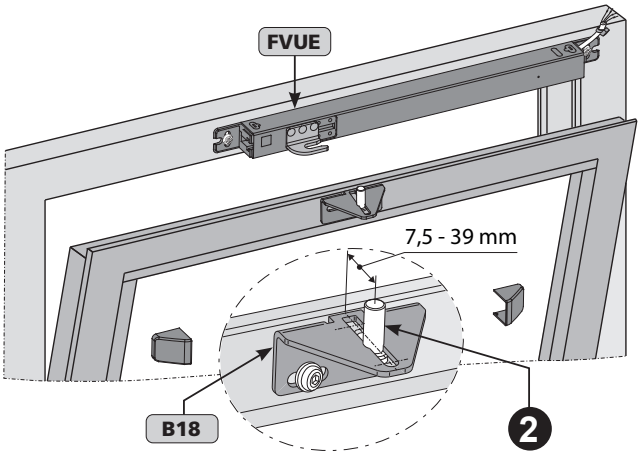


- Screw locking angle ❶ - according to site condition.
- The locking pin ❷ must be centered in the mounting slot of the locking drives **FVUE**.

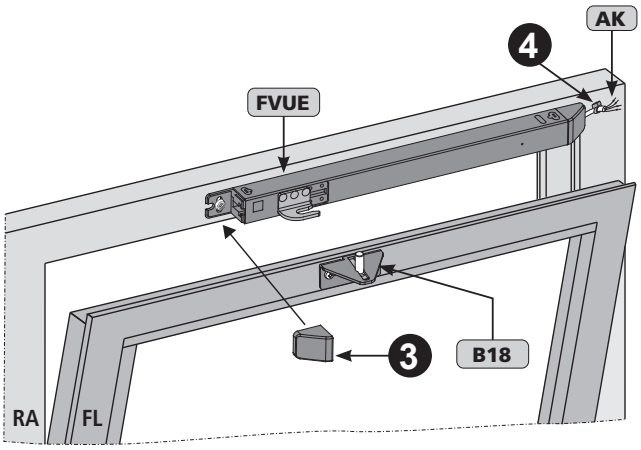




- Adjust the locking pin ❷. It should completely move into the locking drive **FVUE**.
- Firmly tighten the locking pin ❷ - using spanner SW10.



- Depending on the conditions on-site, prepare the connection cable (**AK**) for installation (see chapter „Cable routing").
- Put the cover cap ❸ on the locking drive **FVUE**.
- Pay attention to a strain relief ❹ of the cable.



Check function! (see chapter „Safety check and Test run").

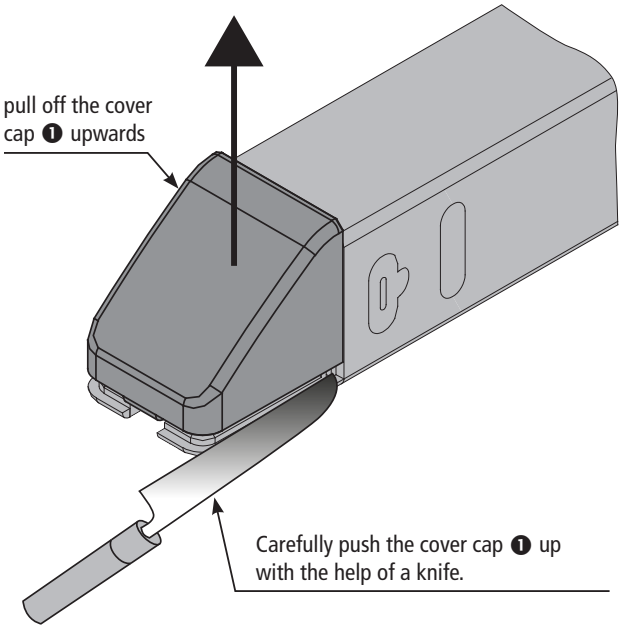
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Installation step 10: Change the connection cable (remove cover caps) FVUx

Remove cover caps

In case of cable break or on-site conditions, a cable change may be necessary.

- Therefore remove the cover cap ❶ from the locking drive **FVUR / FVUB / FVUE** - as described below:
- Pull off the cover cap ❶ upwards.
  Simultaneously release the cover cap ❶ from the locking drive **FVUR / FVUB / FVUE** with a knife or screwdriver.



Note

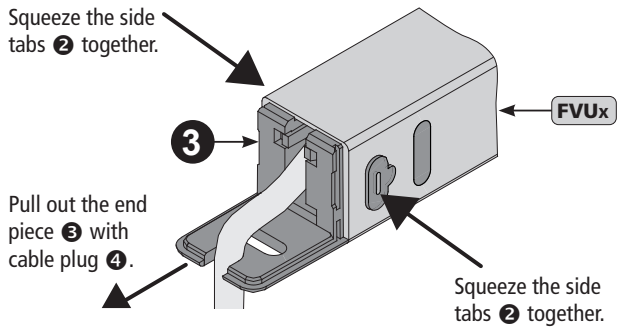
In order to protect the cover cap ❶ from loss or improper use, it is firmly engaged on the locking drive **FVUR / FVUB / FVUE**.

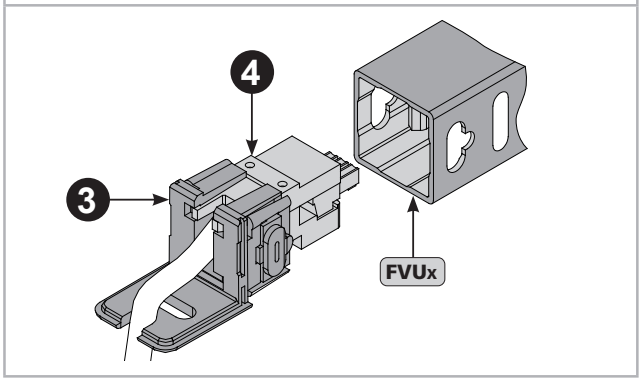
If the force is applied too much, the snap-in hooks of the cover cap ❶ will be destroyed!

Change the connecting cable

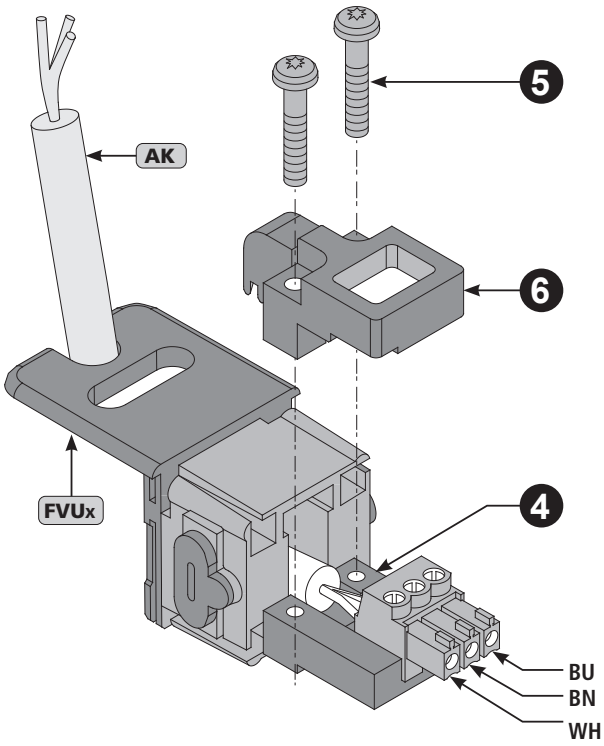
- Press the two side straps ❷ together.
  At the same time pull out the end piece ❸ and the cable plug ❹ from the locking drive **FVUx**.

Dismantle the end-piece and the cable plug





- Loosen the two screws ❺.
- Remove the upper part ❻ from the cable plug ❹.
- Replace connecting cable by on-site customer connection cable.



Connection assignment

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

Note

Reassemble the locking drive **FVUx**. This assembly is done in reverse order as just described.

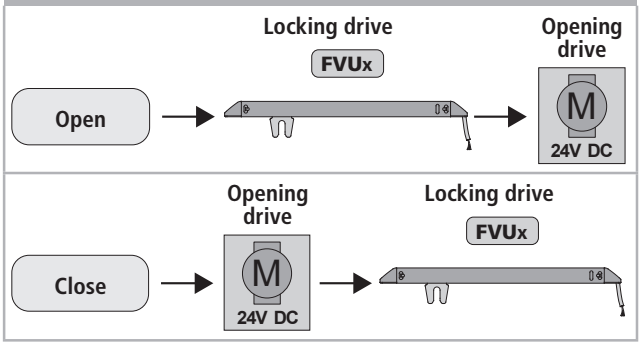
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Installation step 11: Test run and Installation by M-COM

Test run: Locking drive

- Close the casement manually. During the test run press the casement fixed to the frame.
- **Switch on** the **control voltage** at locking drive **FVUx** - in **CLOSE** direction
- Check by hand whether the casement is firmly locked.
  If the casement is not firmly locked, the cause of the fault remedy.
- Move locking drive **FVUx** in **OPEN** direction.
- Ensure the easy movement of the casement.
- Open the casement manually.
- **Switch off** the **control voltage** from the locking drive **FVUx**.

Sequence control:



- Hinge opening drive on casement.
- Make mechanical settings in accordance with „Assembly and Commissioning Instructions" of the drives.

Installation: M-COM

- Installing the **M-COM** (see separate „Installation Instructions" for M-COM) and the electrical connection - according to chapter: „Electric connection".

Installing **M-COM** in a voltage-free state. The configuration is always in **CLOSE** direction.

- **Switch on** the **control voltage** at locking drive **FVUx** and at opening drive - in **CLOSE** direction.
- **M-COM** is configured (see LED display).
- Check sequence control.
- Ensure the easy movement of the casement.
- The locking pins must completely retract into the receiving groove of the locking blocks.

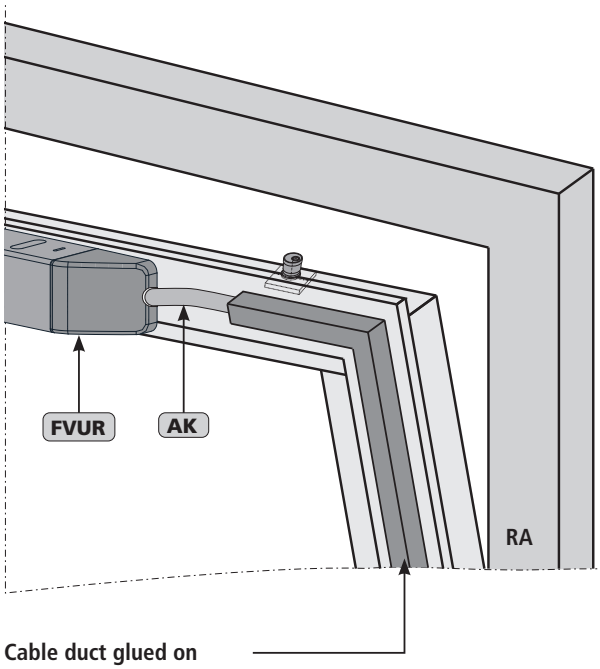
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FVUx

Installation step 12: Cable routing

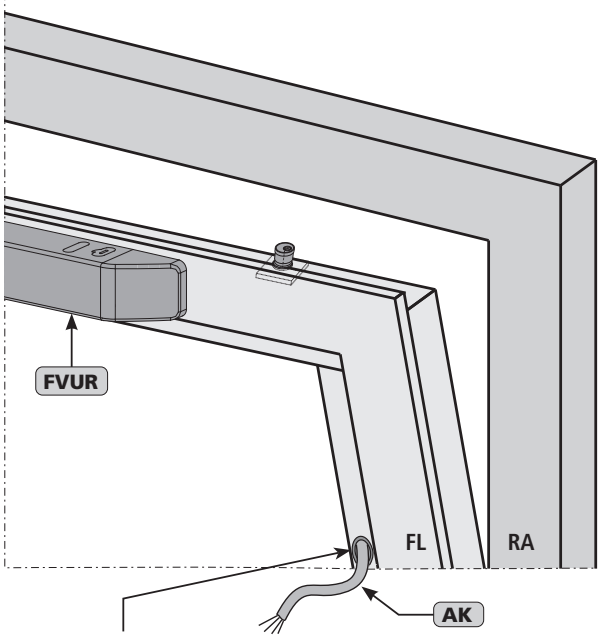
Cable routing at the window casement

Cable in glued cable duct



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

Cable in glazing bead

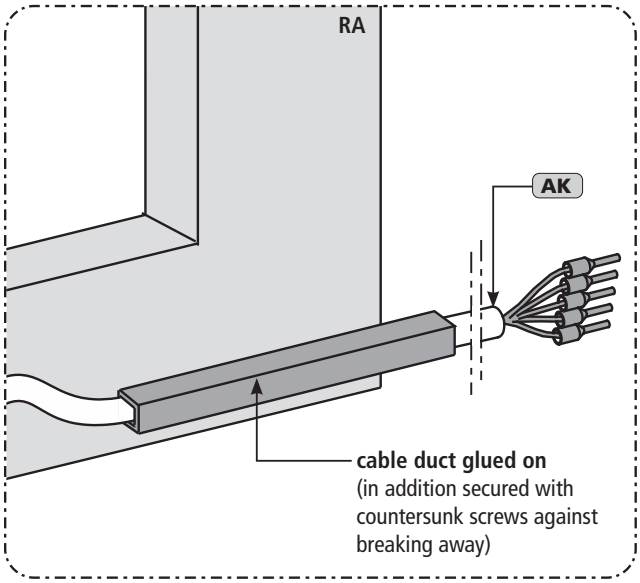


Drill hole in glazing bead
(cable bushing protects against damage to cable).

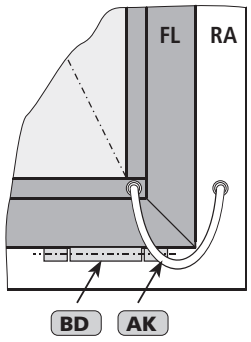
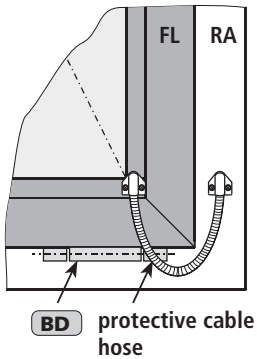
Connection cable routing on the window casement:
- Cable must be protected against damage (shearing-off, kinking, splitting), i.e. by using cable hose.

Cable routing at the window frame

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



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

Cable crossover without protective cable hose	Cable crossover with protective cable hose
	

Connection cable routing on the hinge side:
- Make sure that during opening or closing procedure the cable will not be damaged by shearing-off, kinking, crushing.
- Protect cable feedthrough in profile e.g. by using cable bushings, cable transitions.

07

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Installation step 13: Electric connection

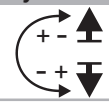
Make sure when establishing the connection that there is no voltage at the terminals! Unused wires must be safely insulated!

No voltage on white wires (**WH**) - drive can be damaged.

Wire colour coding	
Colour	**DIN IEC 757**
white	WH
brown	BN
blue	BU
green	GN
violet	VT
grey	GY

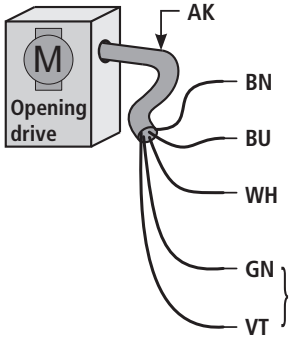
Direction of travel	
OPEN	▲
CLOSE	▼

polarity reversal



Connection assignment

Opening drive

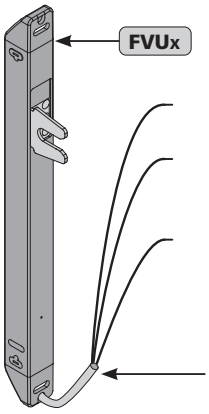


	▲	▼
BN	+	-
BU	-	+

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

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

Locking drive

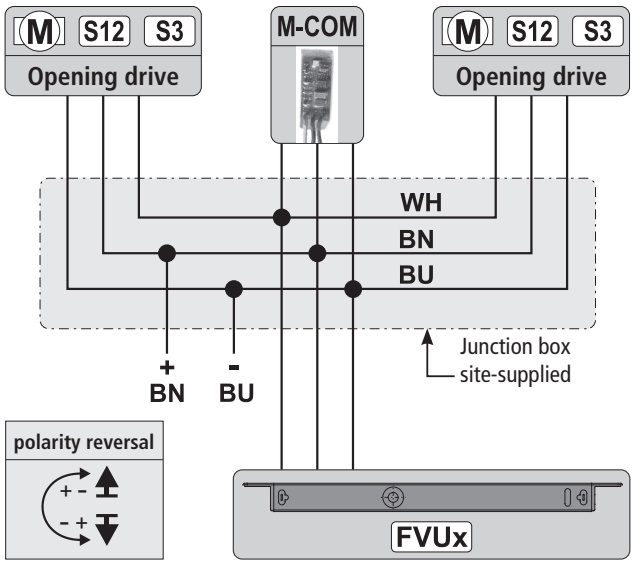


	▲	▼
BN	+	-
BU	-	+

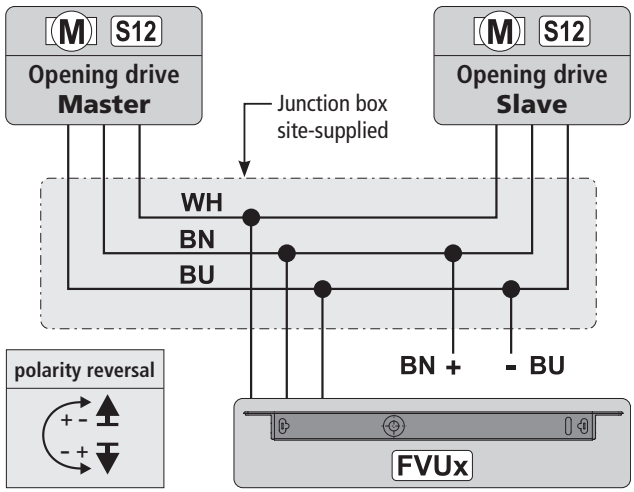
WH is used for communication, with synchronized multi-drive operation)

Multi-drive operation: Opening drive and locking drive

Configuration by M-COM



Opening drive as **Master / Slave**



The programming of the drives in multi-drive occurs at factory or on-site with Parameterisation-Interface.

WH: is used for communication, with synchronized multi-drive operation. **WH** wires connect, otherwise no function.
Optional: 1 to 4 drives and max. 2 locking drives are possible.

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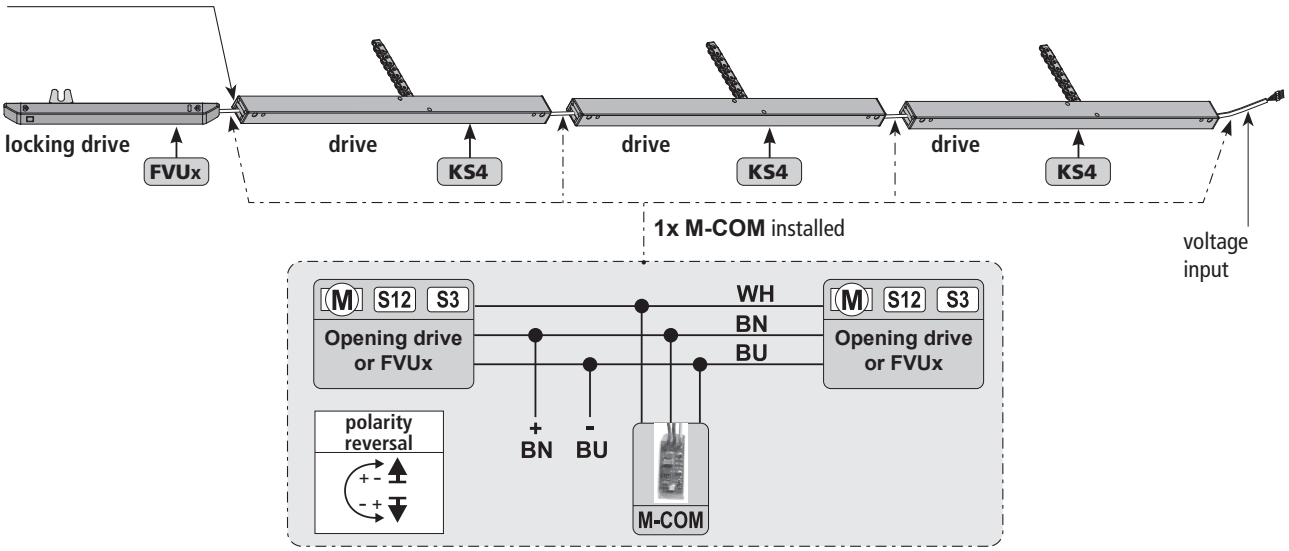
Electric connection configured by M-COM

FVUx

Multi-drive operation by M-COM and Aumüller-Click drives - series connection

Individual configuration

Remove the filler plug and install the attached **Aumüller Click plug set** (e.g. KS4 drive).



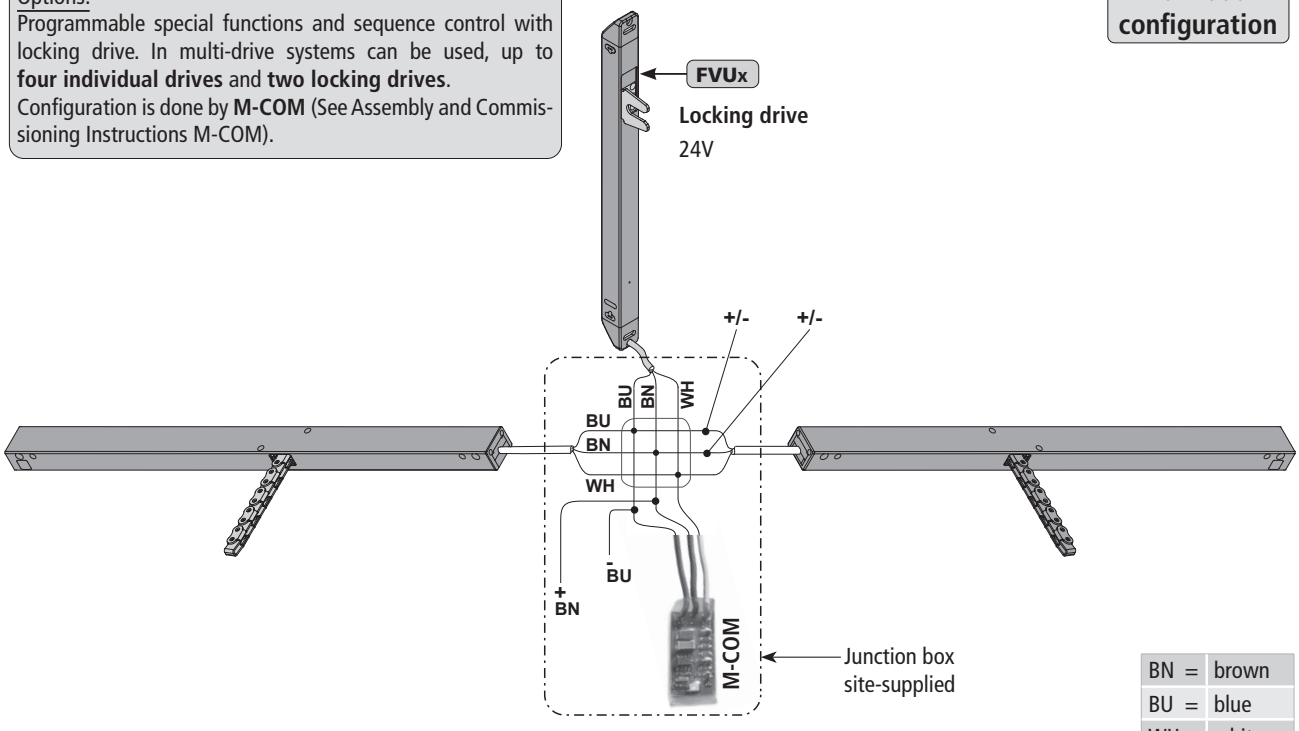
A maximum of **three individual drives** and **one locking drive** in series connection possible.
Configuration is done by **M-COM** (See Assembly and Commissioning Instructions M-COM).

BN =	brown
BU =	blue
WH =	white

Multi-drive operation by M-COM and Aumüller drives - star wiring

Individual configuration

Options:
Programmable special functions and sequence control with locking drive. In multi-drive systems can be used, up to **four individual drives** and **two locking drives**.
Configuration is done by **M-COM** (See Assembly and Commissioning Instructions M-COM).



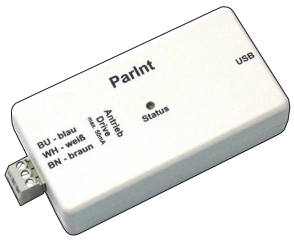
BN =	brown
BU =	blue
WH =	white

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M-COM (Main control unit)

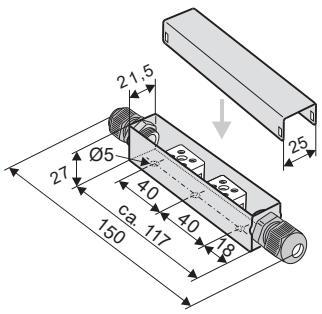
Part.-No.:	**524177**
Application:	Configuration module for the automatic configuration and monitoring of max. 4 opening drives / 2 locking drives type S12 / S3 in multi-drive systems.
Rated voltage:	24V DC (19 V ... 28 V)
Current consumption:	<12 mA
Drive type:	S12
Protection class:	IP30 rubber jacket
Ambient temperature:	0 °C ... + 70 °C
Dimensions:	45 x 17 x 6 mm
Connecting wires:	3 wires 0,5 mm² x 50 mm
Feature / Equipment: printed circuit board with connecting wires for integration in site-supplied junction box.	

Parameterisation-Interface

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 mm² 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.

Cable junction box (for renewal)

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.
	

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Installation step 14: 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

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

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 = 1,42mm² -> **1,5mm²** choosen

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 15: Safety check and Test run

FVUx

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.

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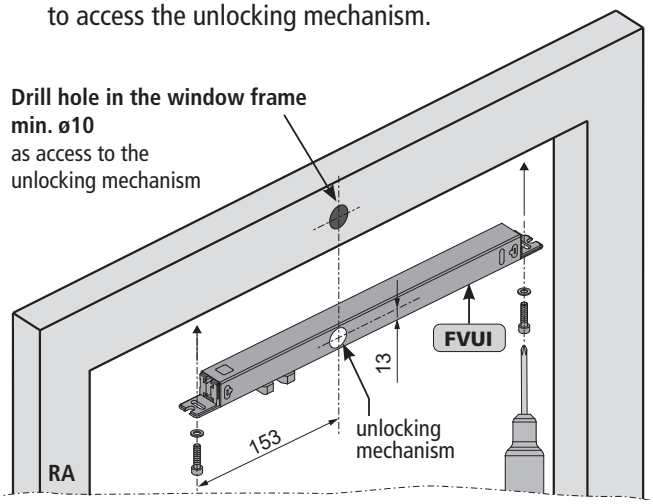
aumüller

Manual unlocking mechanism - if the window is defect

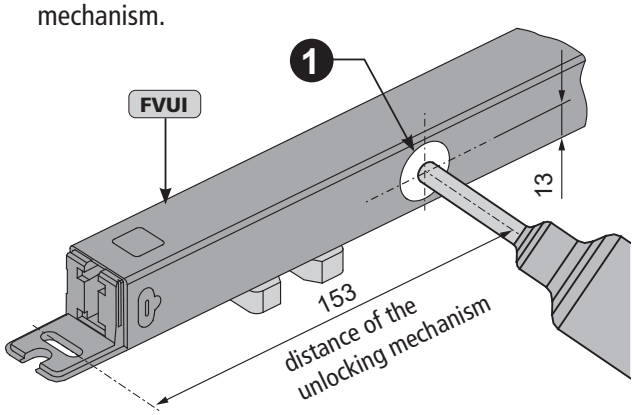
FVUI

The unlocking mechanism ensures a manual unlocking and opening of the window - e.g. with a defective drive - in the closed state.

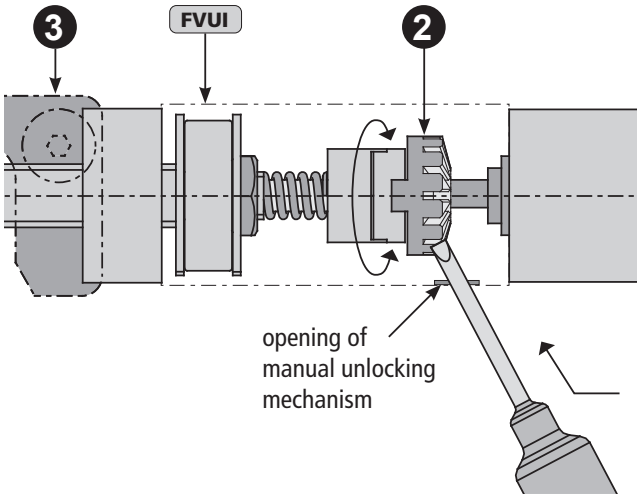
- For concealed mounting of the locking drive **FVUI** inside profiles, drill a hole in the window frame, to access the unlocking mechanism.



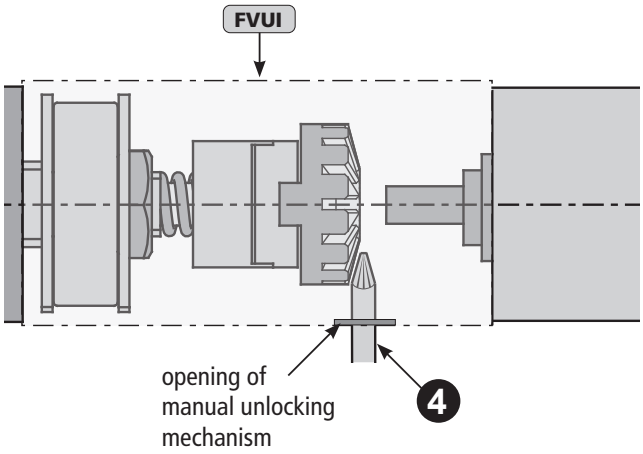
- Carefully punch through the sticker ❶ of the unlocking mechanism.



- Insert small slot screw driver into the groove of the gear wheel ❷ (bevel pinion).
- Press the gear wheel ❷ in the direction of locking plate ❸ with the slot screw driver and at the same time turn it - until connection is disconnected.



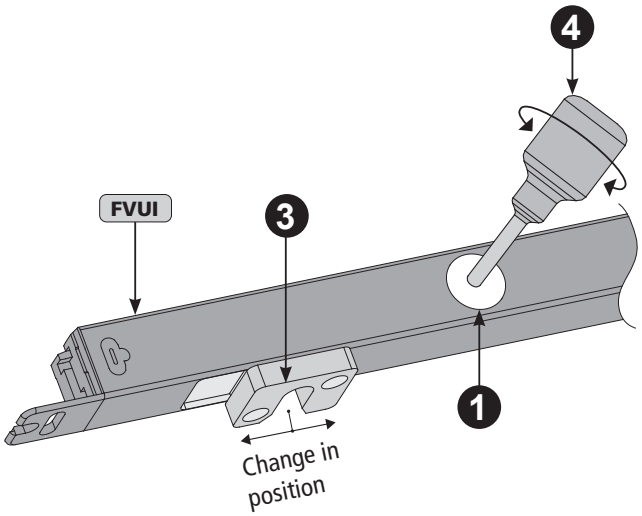
- Insert a cross-head screw driver Phillips size 3 ❹ - through opening of unlocking mechanism - into the groove of the gear wheel ❷ (bevel pinion).



NOTE Cross-head screw driver Phillips size 3 ❹ is not included in the scope of delivery.

- By turning the screw driver ❹, the locking plate ❸ moves - depending on the direction of rotation to the right or left.

NOTE Because of the minimal movement of the locking plate ❸ with each turning of the screw driver, many turns may be necessary.



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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
Locking drive does not start	• Duration of mains power supply too short	• Adjust supply voltage as specified in the technical documentation
	• Drive run direction from the opening drive is not correct	• Check drive cables change polarity
	• Connecting cable not connected	• Check all connection cables

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. RWA/Natural smoke and heat exhaust ventilators).
14. Check the intactness of warning instructions and labels at the respective drive.
15. Perform a risk assessment in accordance with Machinery Directive 2006 / 42 / EG, if required, e.g. after modifying the machine.

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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)

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Certificate and Declaration of Conformity

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

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

CE

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.
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.

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