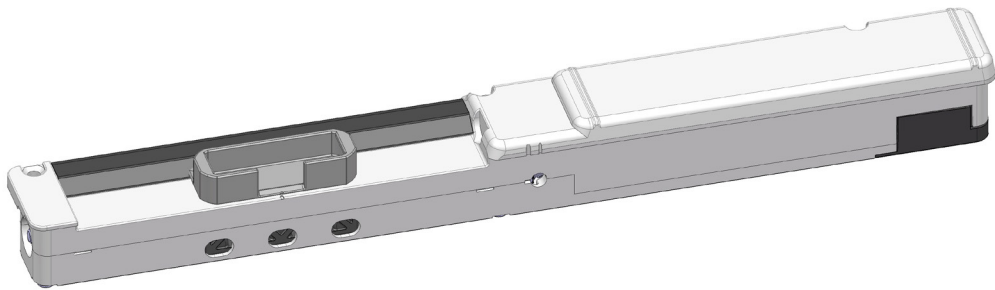


TEINO

Tilt and turn drive

DK-100



Installation and operating manual

Translation of the original installation manual
07.2022

Company information

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1 About this manual

This manual contains descriptions and important information for safe and efficient use of the window drive **DK-100**. The manual represents part of the **DK-100** and must be stored safely.

Prior to installation, this manual must have been read carefully and understood. The prerequisite for safe work is adherence to all specified safety instructions and warnings, as well as the action instructions contained in this manual.

In addition to the information in this manual, the local accident prevention regulations and national health and safety regulations apply.

Figures are intended to aid basic understanding and may differ from the actual design of the **DK-100**.

1.1 Target group

This manual is addressed to expert personnel to allow them to safely install and commission the **DK-100**.

Moreover, it serves to ensure that the user will enjoy safe and reliable operation.

Lastly, it contains information for correct installation and disposal of the product.

1.2 Other applicable documents

This manual includes a copy of the declaration of incorporation.

1.3 Highlighting

Certain text is highlighted as follows:

Example	Highlighting	Explanation
Press <i>Cancel</i> button.	<i>Italic</i>	Operating, display, screen elements
Turn main switch to the OFF position.	Bold	Switch settings
See chapter "Technical Data"	"....."	Cross reference

1.4 Notes and additional information

Notes and additional information are highlighted as follows:

NOTE


Notes are highlighted as shown here.

- Notes contain additional information, recommendations and tips.
- Notes do not contain any warnings of danger.

1.5 Warnings

Signal words

Warnings are introduced by signal words that highlight the extent of the danger. The signal words DANGER, WARNING and CAUTION indicate danger for people.

Danger for people is also indicated by the general danger sign . These warnings must always be observed to prevent injuries or death.

The signal word *ATTENTION* indicates dangers for property. There is no leading symbol for property damage.

Classification based on the severity of the danger

DANGER

Indicates a hazardous situation that will result in death or severe injury if it is not avoided.

WARNING

Indicates a hazardous situation that may result in severe injuries if it is not avoided.

CAUTION

Indicates a hazardous situation that may result in injuries if it is not avoided.

ATTENTION

Indicates measures for the prevention of property damage.

Section-specific warnings

Section-specific warnings relate to a whole chapter, a section or several paragraphs of this manual.

Representation of section-specific warnings

SIGNAL WORD

Type and source of the danger

Possible consequences of ignoring the danger.

- Actions for preventing the danger.

Embedded warnings

Embedded warnings are situation-dependent and relate to a particular action or a part of a section.

 **SIGNAL WORD** – Type of danger. Actions for preventing the danger.

1.6 Exclusion of liability

The obligations agreed in the contract documents, the general terms and conditions, the delivery conditions of the manufacturer, and the legal regulations applicable at the time of conclusion of the contract apply.

The manufacturer reserves the right to make technical changes as part of the improvement and further development of the product.

The manufacturer accepts no liability in the following cases:

- Failure to observe this manual
- Use for any purpose other than the intended use
- Unauthorised conversions and technical changes
- Use of untrained personnel

The warranty terms are contained in the general terms and conditions issued by the manufacturer.

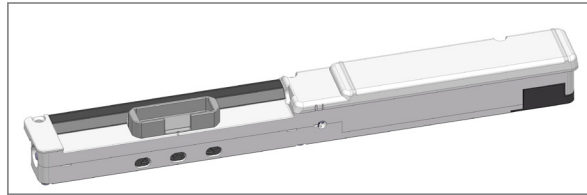
2 Declaration of incorporation

EU declaration of incorporation according to machinery directive 2006/42/EC, annex II part 1 section B

Manufacturer:	VEKA AG Dieselstraße 8 D-48324 Sendenhorst
Person authorised to compile the technical documentation:	Philipp Kalverkamp Dieselstraße 8 D-48324 Sendenhorst

We hereby declare that the following product

Product name:	Window drive
Model name:	DK



Type designation:	100
Article number	187.105.000.000

comply with the conditions of the EMC Directive 2014/30/EU.

The above-mentioned product corresponds to the following basic health and safety requirements according to **annex I** of this directive:

Art. 1.1.2, 1.1.3, 1.1.5, 1.2.1, 1.2.3, 1.2.6, 1.3.2, 1.3.4, 1.3.9, 1.5.1, 1.5.6, 1.5.8, 1.5.9, 1.5.10, 1.5.11, 1.7.1, 1.7.1.1, 1.7.3, 1.7.4.2, 1.7.4.3

The special technical documentation according to annex VII part B has been issued. The person authorised to compile the technical documentation can present the document within a reasonable timeframe in electronic form on justified request.

The partially complete machine may only be commissioned once it has been determined that the machine in which the partially complete machine is to be installed complies with the regulations of the machinery directive.

Additional applied directives and harmonised standards:

- **EMC directive 2014/30/EU**
 - EN 61000-6-1
 - EN 61000-6-3
- **RoHS directive 2011/65/EU**

The protective aims of the **low-voltage directive 2014/35/EU** are complied with according to annex I, no. 1.5.1 of the machinery directive.

The following harmonised standards have been applied:

Harmonised standards	Designation
EN ISO 12100:2010	Safety of machinery - General principles for design - Risk assessment and risk reduction
EN 60335-1	Safety of household and similar electrical appliances
EN 60335-2-103	Household and similar electrical appliances - Safety - Part 2-103: Particular requirements for drives for gates, doors and windows
EN IEC 61000-6-1	Electromagnetic compatibility (EMC) - Part 6-1: Generic standards - Immunity for residential, commercial and light-industrial environments
EN 61000-6-3	Electromagnetic compatibility (EMC) - Part 6-3: Generic standards - Emission standard for residential, commercial and light-industrial environments

The following guide has been applied:

Guide	Version	Designation
CENELEC Guide 32	1st issue, 2014-07	Guide for safety-relevant risk assessment and risk reduction for low voltage equipment

Location: Sendenhorst
 Date: 01/07/2022

 Hermann Schmitz, Head of Technology and Innovation

3 Safety

3.1 General information about safety

The "Safety" chapter contains basic information about safety and gives an overview of all important safety aspects. Other task-specific safety notes can be found in the sections on the individual life phases. Compliance with this information is for your own safety.

3.2 Intended use

The window drive **DK-100** serves as a motor-controlled drive of window sashes whose fittings are in accordance with chapter "7.4.2 Special features of the fitting".

The **DK-100** is exclusively intended for fixed installation in PVC frame profiles with a central gasket.

The **DK-100** may only be used together with a 24V DC power pack with an output power of at least 18 W.

3.3 Reasonably foreseeable misuse

The **DK-100** may not be used in the following areas:

- Explosion-protected zones
- Medical technology
- Outdoor areas
- Industrial sector
- Installation in escape routes

The following always applies:

Any use other than the intended is regarded as unintended use.

The manufacturer shall not be responsible for any resulting damage. The user/operating organisation alone bears the risk for such use.

Moreover, use of the **DK-100** is regarded as use as intended if all applicable international and national safety regulations and the safety regulations in this manual are followed.

3.4 Personnel qualifications

The various tasks described in this manual imply different qualification requirements for the persons charged with performing the tasks.

Inexperienced and insufficiently qualified personnel cannot assess the risks when using the **DK-100** and consequently endanger themselves and other people.

- The work may only be carried out by persons who are experienced in performing the assigned work and who have been instructed about the dangers.
- For all tasks, only persons who are expected to perform the work reliably are permitted to carry it out.

Persons	Activity	Qualification	Life phase
Qualified personnel (electrician)	Electrical work	Professional training in electrical technology or an equivalent technical qualification (internal training and/or external education)	Connecting the power pack
Expert personnel (window builder)	Manual work	Professional training as glazier specialised in window construction or an equivalent technical qualification (internal training and/or external education)	Installation, connection, commissioning, troubleshooting, maintenance, removal from service, dismantling
User	Operating the DK-100	None	Operation
Qualified personnel (disposal technician)	Correct disposal	Knowledge of the disposal regulations applicable at the place of use	Removal from service, dismantling, disposal

Tab. 1: Personnel qualifications

3.5 Danger due to electrical energy

In the event of contact with live components, there is a risk of death caused by electric current. Death or severe injuries are the consequence.

- Only electricians may perform work on electrical equipment. Before starting work on the electrical system, ensure a voltage-free state. In doing so, observe the electrical safety rules:
 - Switch the **DK-100** to a voltage-free state.
 - Secure to prevent reactivation.
 - Check that a voltage-free state exists.
 - Earth and short-circuit.
 - Cover adjacent live components.
- Use only electrically insulated tools.
- Look out for damage to the electrical equipment and check regularly. Danger due to loose cable connections and scorched wires. Immediately rectify any defects.
- Keep moisture away from live parts. There is a risk of short-circuits.

4 Product description

4.1 Function

The window drive **DK-100** serves as a motor-controlled drive of window sashes whose fittings are in accordance with chapter „7.4.2 Special features of the fitting“.

The window drive **DK-100** will only work in connection with an installed magnet on the sash profile, see chapter „7.4.7 Installing the magnet“.

To establish the 24V voltage supply for the **DK-100** a separately available Texino power pack 24 V DC (N1H18-24-0.75 FZ, Art. No. 187.300) with an output power of at least 18 W is required.

The **DK-100** is installed in PVC frame profiles.

4.2 Operating modes

For a detailed description, refer to chapter „7.2.1 Operating modes“.

Button operation

The drive is controlled with the aid of a button.

Switch operation

The drive is controlled with the aid of a switch.

Quick operation

The drive runs at increased speed to reduce runtimes.

Slow operation

The drive runs at reduced speed to reduce noise emission.

Hinge side left/right

The drive operates with the sashes either attached to the right or left.

Safety mode

The drive is controlled with the aid of a deadman switch.

4.3 Overall view

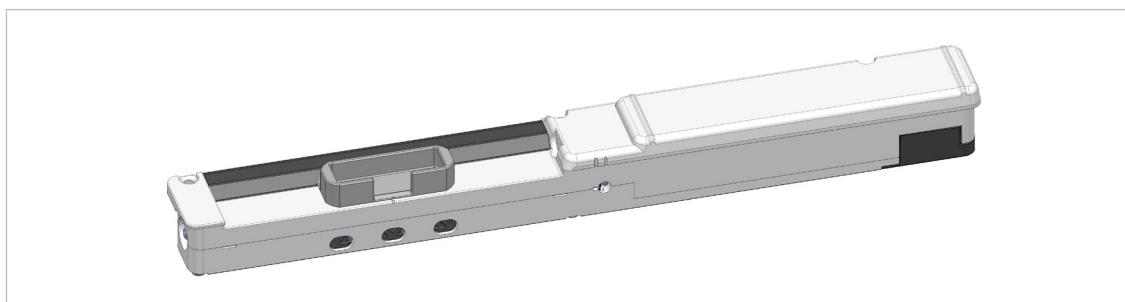


Fig. 1: DK-100

5 Technical data

5.1 Measurements, weight and housing

Description	Value
Measurements L x W x H	336 x 37 x 34 mm
Weight	768 g
Protection class	IP 21

Tab. 2: Measurements, weight and housing

5.2 Performance data

DK-100

Description	Type	Unit
Rated voltage (DC)	24	V
Rated current	0.75	A
Rated power	18	W
Circuit breaker, max. breaking current	16	A
Output SIG		
Output voltage	24	V
Rated current	160	mA

Tab. 3: Performance data

5.3 Connections

Connections DK-100

Brief description	Designation	Colour
0 V	Earth	white
SIG	Switch input, BUS line	green
24 V	24V voltage supply	brown

Tab. 4: Connections DK-100

5.4 Ambient conditions

Description	Value
Installation location	PVC frame profile, interior
Operating temperature range	-15 to +50 °C
Maximum relative air humidity	10 to 85 % non-condensing

Tab. 5: Ambient conditions for operation

5.5 Type plate

The type plate is located on the connection cap on the underside of the **DK-100**.

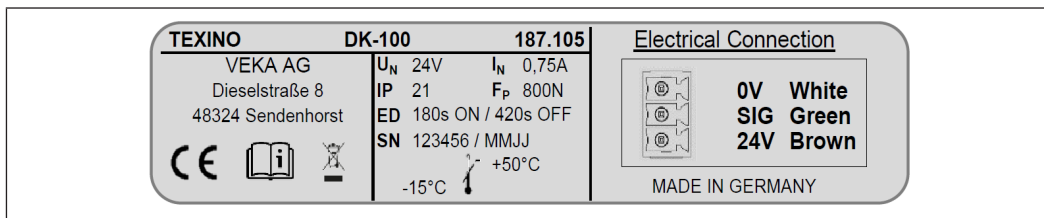


Fig. 2: Type plate DK 100

Stickers and signs can become dirty or otherwise become unrecognisable. Therefore, under certain circumstances, it may not be possible to identify dangers and follow important instructions.

- Always keep the type plate in legible condition.
- Do not remove or cover signs.

Symbols on the type plate	Explanation
	Separate collection of electrical and electronic devices. Devices with this symbol must not be disposed of with domestic waste.

Tab. 6: Symbols

6 Transport and storage

6.1 Transport

NOTE

Only transport the **DK-100** in its original packaging.

6.2 Storage conditions

ATTENTION

Property damage due to incorrect storage!

Improper storage can result in material damage.

Observe the following conditions.

Observe the following points when storing:

- Only store the **DK-100** in closed rooms.

Description	Value
Storage location	Dry, clean and dust-free
Storage temperature range	-20 to +60 °C
Maximum relative air humidity	10 to 85 % non-condensing

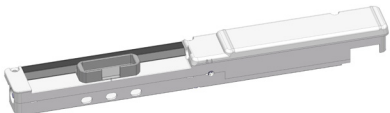
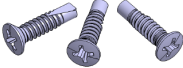

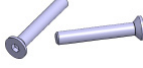







Tab. 7: Ambient conditions for storage

6.3 Unpacking

1. Open the packaging and check the **DK-100** for damage.
2. Dispose of the packaging material correctly.

6.4 Items supplied

6.4.1 DK-100 (set 187.105)

Item	Designation	Quantity	Unit	Image
1	DK-100	1	pcs.	
2	Fastening screws drive	3	pcs.	
3	Electronics cover	1	pcs.	
4	Fastening screws cover	2	pcs.	
5	Connector	1	pcs.	
6	Connection line	3	m	
7	Magnet, for screw-fitting	1	pcs.	
8	Magnet, self-adhesive	1	pcs.	
9	Cover cap, white	1	pcs.	
10	Cover cap, anthracite	1	pcs.	
11	Fastening screw magnet	1	pcs.	
12	Installation manual	1	pcs.	(No image)
13	Sticker power-operated window	1	pcs.	(No image)

Tab. 8: Items supplied

7 Connection, installation and commissioning

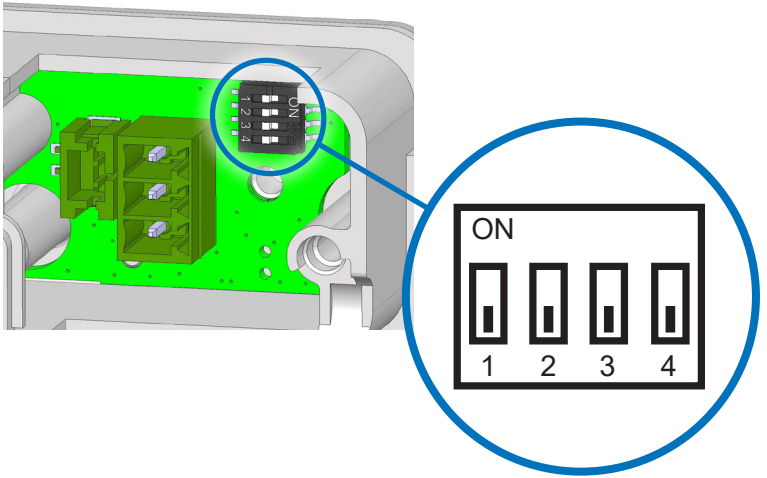
7.1 Safety

⚠ WARNING

Risk of breaking!

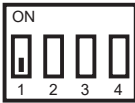
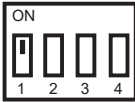
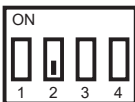
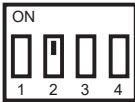
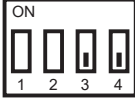
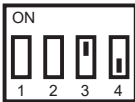
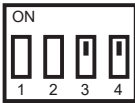
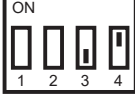
Fittings must take into account chapter „7.4.2 Special features of the fitting“.

7.2 Setting the operating mode

Description	Image
<p>Disconnect the DK-100 from the power supply.</p> <p>To adjust the operating modes, use a suitable tool to move the DIP switch to the desired position (see „7.2.1 Operating modes“).</p>	

Tab. 9: Changing the operating mode

7.2.1 Operating modes

Operating mode	Switch	Switch position	Image
<p>Hinge side right</p> <p>Select this operating mode if the window sash is attached on the right.</p>	1	OFF	
<p>Hinge side left</p> <p>Select this operating mode if the window sash is attached on the left.</p>		ON	
<p>Quick operation</p> <p>The drive runs faster to reduce runtimes. Select this operating mode if fast opening and closing are more important than low noise.</p>	2	OFF	
<p>Slow operation</p> <p>The drive runs slower to reduce noise emission. Select this operating mode for installing the automated window in quiet areas.</p>		ON	
<p>Button operation</p> <p>The drive is controlled with the aid of a button. Select this operating mode if the sash is equipped with a handle and automated operation is supposed to be available in addition to manual operation. The drive uses the magnet to automatically determine the current sash position and switches between the statuses tilted and closed if the button is pressed for at least 100 ms.</p>	3 4	OFF OFF	
<p>Switch operation</p> <p>The drive is controlled with the aid of a switch. Select this operating mode to control the drive using a permanent switch status:</p> <ul style="list-style-type: none"> Switch closed: window closes Switch open: window opens 	3 4	ON OFF	
<p>Bus operation</p> <p>The drive is controlled with the aid of a control system.</p>	3 4	ON ON	
<p>Safety mode ON</p> <p>Activates deadman controls for increased safety requirements. The drive is operated with a button as a deadman switch. The button must be pressed and held at all times while the window closes.</p>	3 4	OFF ON	

Tab. 10: Operating modes

7.3 Electrical installation

⚠ WARNING

Electric shock!

A qualified electrician must establish the voltage supply.

- a) Route the connection line (6) of the **DK-100** in the frame profile according to chapter „7.4.5 Installation DK-100“ and guide it out of the frame profile at a suitable location.
- b) Connect the individual wires of the connection line (6) with the connector (5) on the connection side of the **DK-100** according to the configuration shown here (fig. 4).

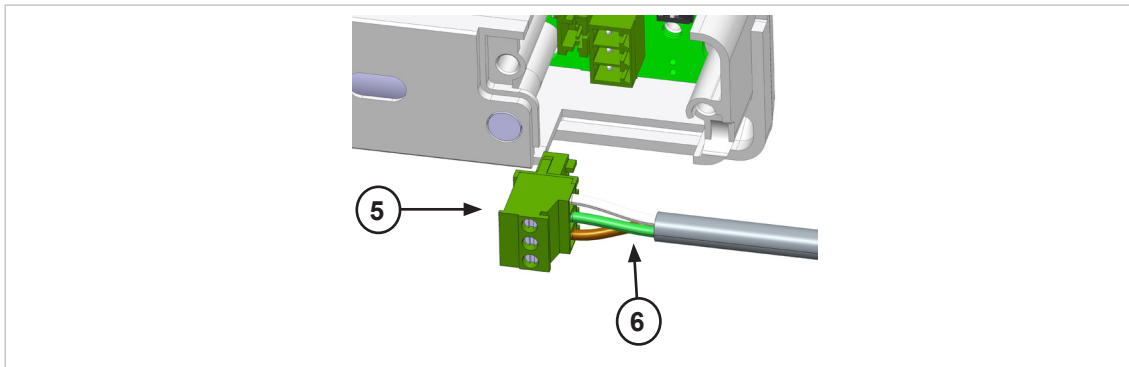


Fig. 3: Connector

NOTE

To connect the **DK-100**, a Texino power pack 24 V DC (N1H18-24-0.75 FZ, Art. No. 187.300) and a commercially available electronic button or commercially available electronic switch are required.

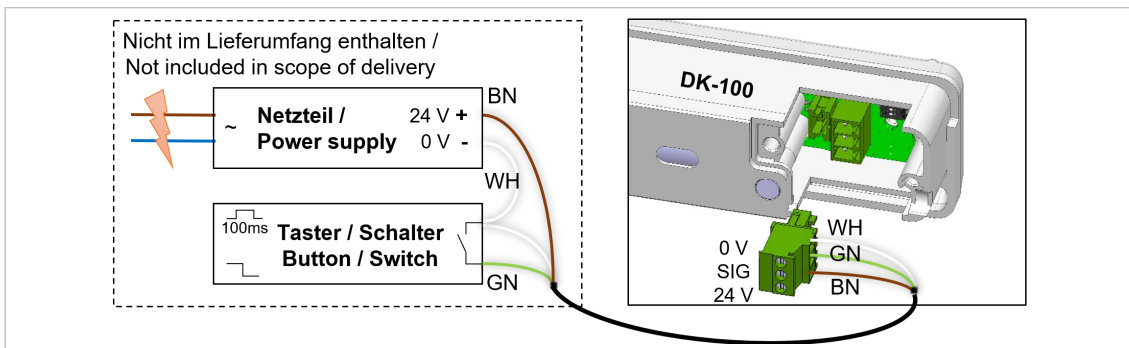


Fig. 4: Connection diagram DK 100: Manual operation

- c) Shorten the individual wires to a suitable connection length and connect them with the power pack and a switch or button as shown in figure 4.
 - For the configuration of the individual wires of the connection line (6), refer to table 4 (see page 13).
 - Connect the line 0 V with the connection 0 V (-) of the power pack.
 - Connect the line 24 V with the connection 24 V (+) of the power pack.
 - Connect a switch or button so that it connects the line SIG with the line 0V when the contact is closed.

NOTE

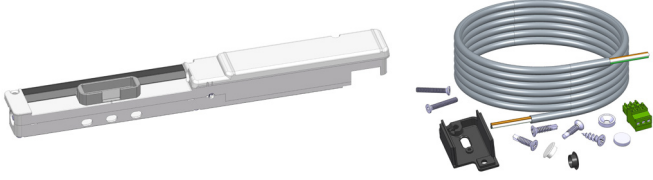
Prior to installation of the **DK-100**, ensure that the operating mode switch or button on the corresponding DIP switch is selected (chapter „7.2 Setting the operating mode“).

7.4 Assembly

NOTE

- The **DK-100** is installed after welding of the profiles.
- Route the cables while it is not yet installed.
- Prior to installation
 - select the operating mode on the DIP switch (chapter „7.2 Setting the operating mode“)
 - establish the electrical connection (chapter „7.3 Electrical installation“)
- All geometries shown here are intended as examples only, using a VEKA SOFTLINE 82 system. Profiles not produced by VEKA may require distance plates or sealing plates / pieces to achieve the required positioning

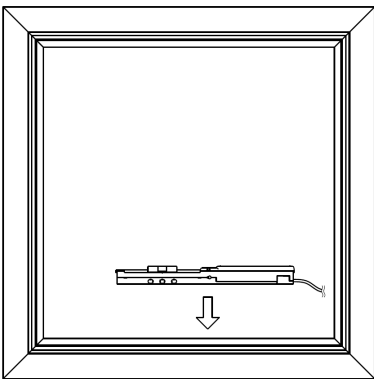
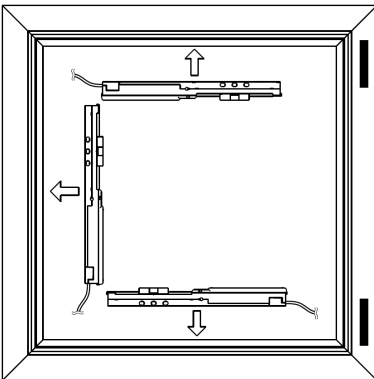
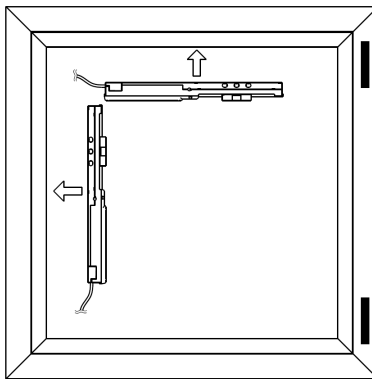
Components for installation of the DK-100

	Designation	Quantity	Unit	Image
Necessary	Set DK-100 187.105	1	pcs.	

Tab. 11: Components DK-100

7.4.1 Installation position

The drive can be installed for the following applications according to the table.

Tilt and turn fitting	activePilot Comfort PAD fitting (Winkhaus)	activePilot Comfort PAD fitting (Winkhaus)
Window profile		
with centre gasket		without centre gasket
		
DK-100 may only be inserted at the bottom, irrespective of the hinge side	DK-100 may not be inserted on the hinge side	DK-100 may not be inserted on the hinge side or at the bottom

Tab. 12: Installation position

7.4.2 Special features of the fitting

- Details regarding the fittings such as maximum sizes, sash weights, etc. are listed in the technical documentation issued by the relevant fitting manufacturers.
- This distance L must always be selected so that a mushroom head and the centre of the cam are aligned. No other fitting components must be in the way.
- The distance L can also be found on the following side of the milled feature.
- Tilt and turn fitting with positively controlled scissor-type support/upper guiderail and linking on all sides.
- Use an additional centre locking mechanism with reinforced bolt for power transmission from the motor to the window hardware, provided the fitting manufacturer offers it.
- Sash lifters or casement rider blocks must be installed in the bottom section in the vertical frame pieces to transfer the transverse load.
- The fitting must not be equipped with an incorrect latch position block.

7.4.3 Special features of the handle

- Do not use lockable and secure handles.
- Use handles with a light arrester.
- During automated opening or closing, the handle may not end up in precisely the end position. However, this is only a visual aspect and has no effect on the function.

7.4.4 Milling and drilling work

NOTE

Installation of the **DK-100** requires milling and drilling work on the profile.

All milling and drilling work can be performed on the individual profile pieces and must be performed prior to welding.

Remove shavings from the hollow chambers by blowing them out.

Do not damage weldable seals when milling or drilling.

If work on the reinforcement and profile is performed separately, milling and drilling work on the reinforcement must be performed separately and at the required position.

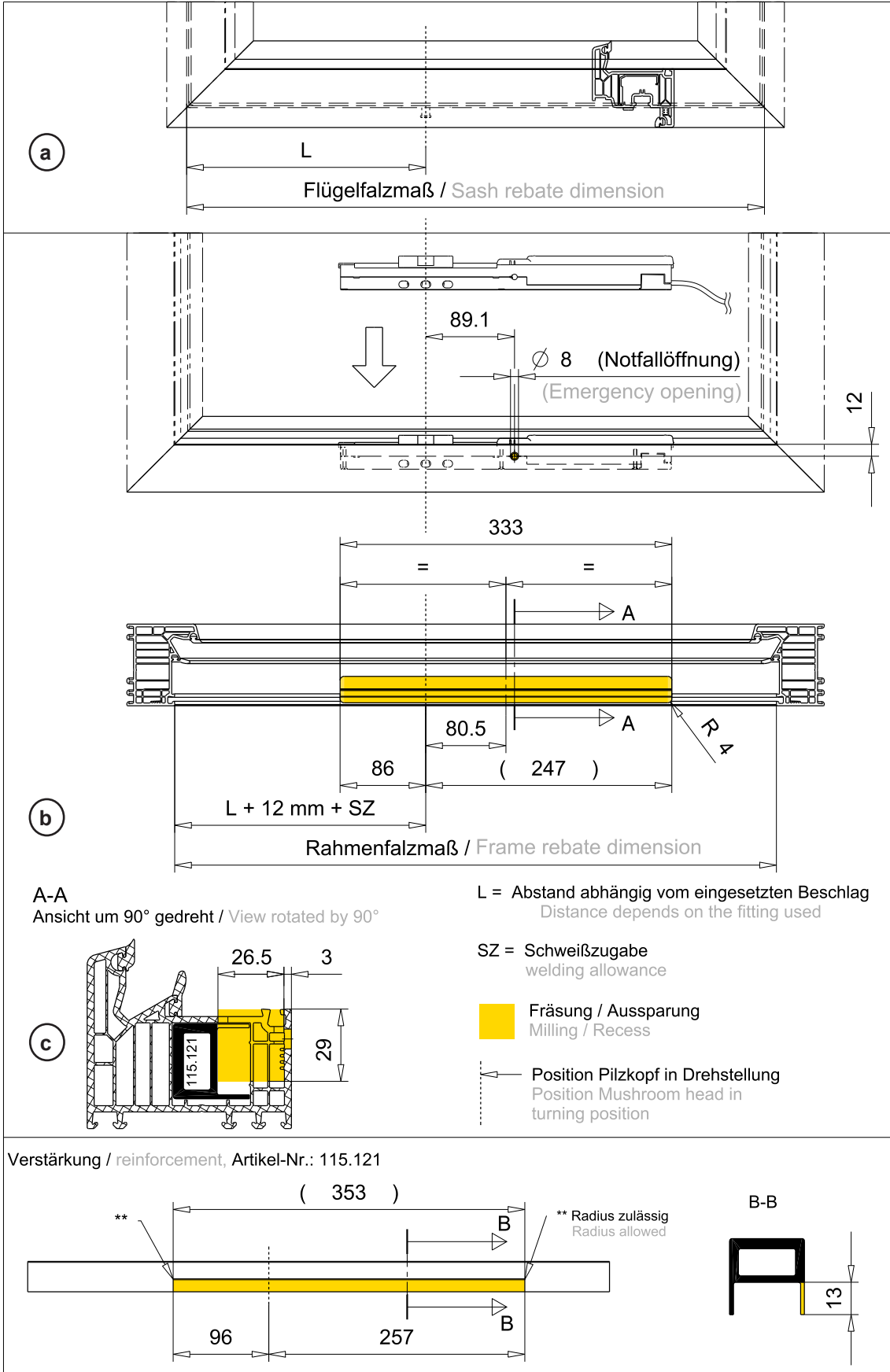
Preparing and milling profiles:

The position of the **DK-100** is defined according to the following drawing using the milled feature in the frame profile. It depends on the size of the window and the fitting in use and the associated position of the fitting tap in the sash profile.

- a) On the sash, measure measurement L from the outer sash rebate edge (handle side) to the centre of the mushroom head (position: turned position).
- b) On the frame profile, transfer the required milling measurement onto the frame rebate edge $L + 12 \text{ mm} + \text{WA}$ (welding allowance).
- c) Cut the milled feature into the profile according to the drawing.

Fräsbild und Positionierung DK-100 / Milling pattern and positioning DK-100

1-100037-06



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Fig. 5: Milling pattern and positioning DK-100

7.4.5 Installation DK-100

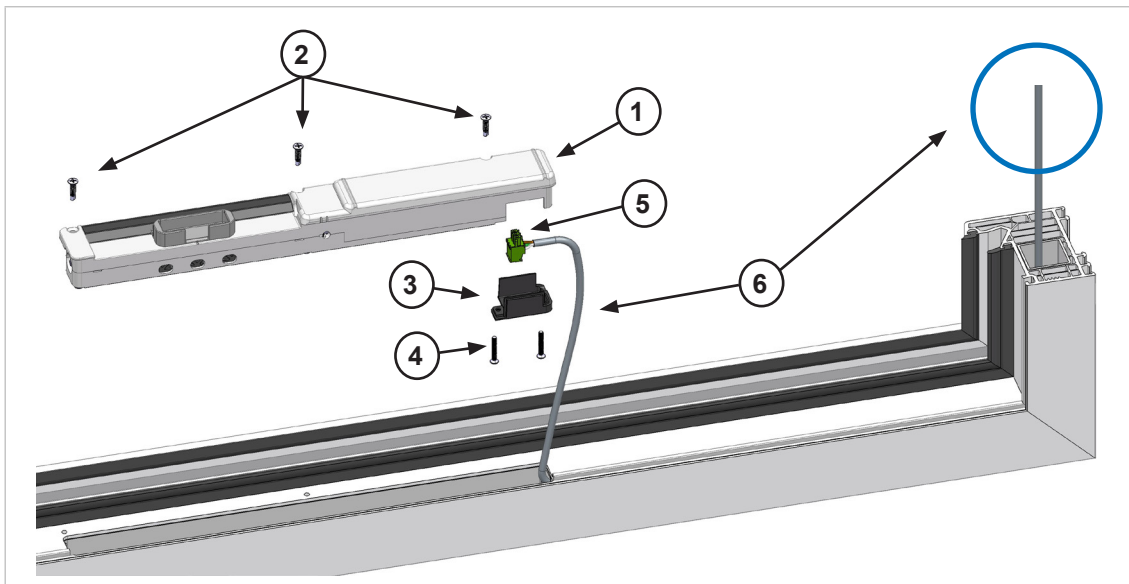


Fig. 6: Components installation

- a) Route the connection cable (6) of the **DK-100** through the frame profile to the required position (e.g. operating unit, control system).

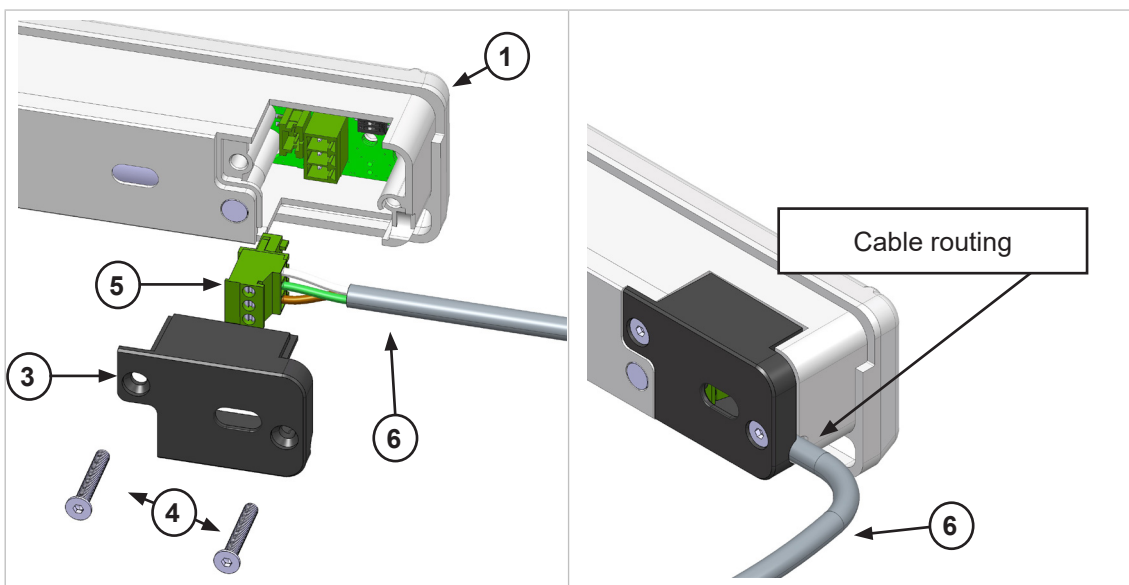


Fig. 7: Installation cover

Fig. 8: Cable routing

- b) Connect the connector (5) to the connection cable (6) according to chapter "7.2 Electrical connection".
- c) Connect the connector (5) with the **DK-100** (1) via the plug connection.
- d) Guide the connection cable (6) out through the cable routing.
- e) Use the fastening screws (4) to fasten the cover (3) to the **DK-100** (1).

NOTE

Ensure that the desired operating mode is selected on the corresponding DIP switch prior to installing the **DK-100** (chapter „7.2 Setting the operating mode“).

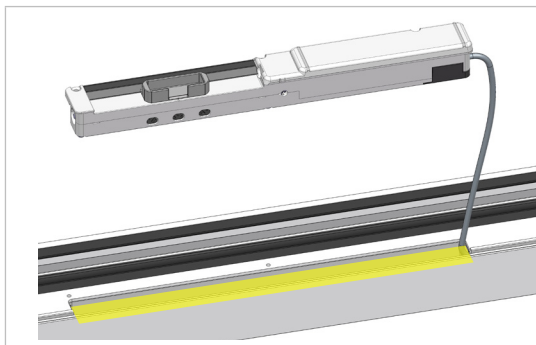


Fig. 9: Inserting the DK-100

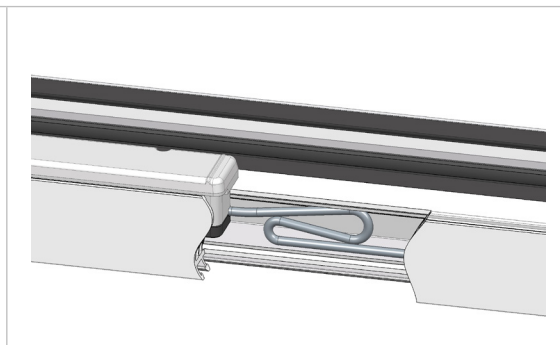


Fig. 10: Inserting the connection line

f) Insert the **DK-100** in the milled feature.

NOTE

We recommend inserting the connection cable into the frame with a loop (fig. 10). This makes it possible to remove the **DK-100** at a later point.

ATTENTION

Material damage due to crushing or stretching!

- Select the routing of the connection cable so that no damage to the cable occurs when the window is installed.
- Leave enough cable for a suitable loop!

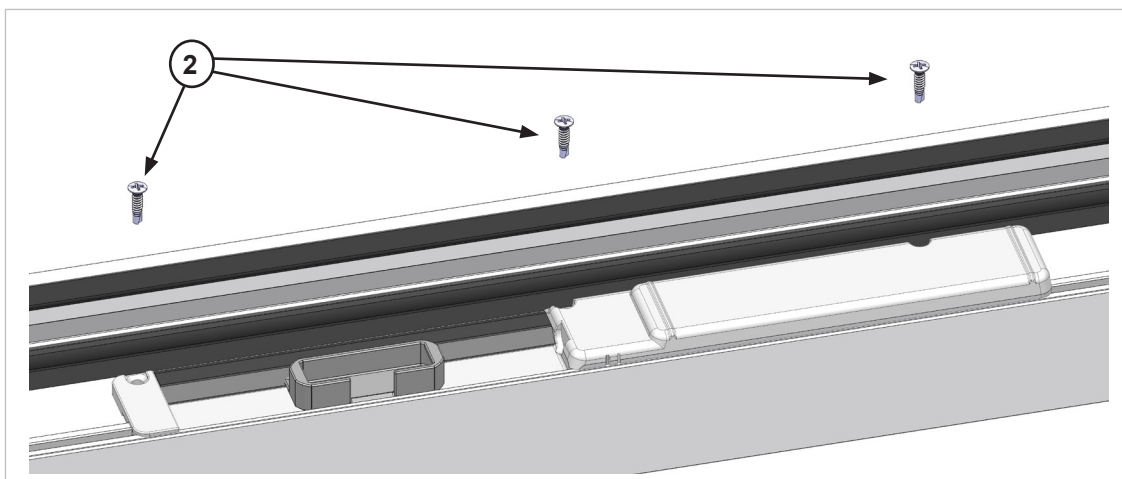


Fig. 11: Fastener DK-100

g) Pre-drill the frame with a \varnothing 3 mm drill and use the supplied fastening screws (2) to screw the **DK-100** in place in the profile.

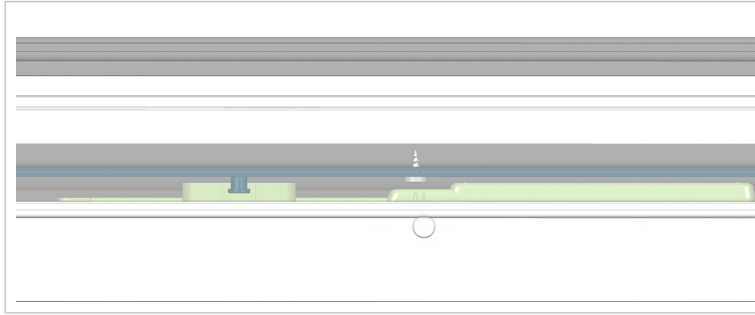


Fig. 12: Installed DK-100

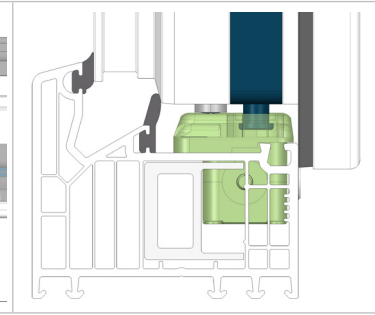


Fig. 13: Sectional view of the installed DK-100

7.4.6 Preparing the emergency opening (optional)

In the event of a fault, the cam can be moved manually using a screwdriver (hexalobular internal TX30) (fig. 14).

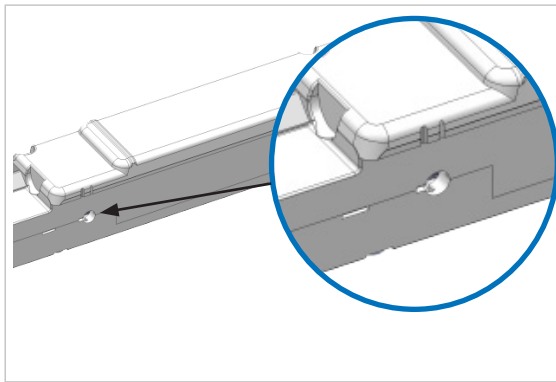


Fig. 14: Opening for screwdriver

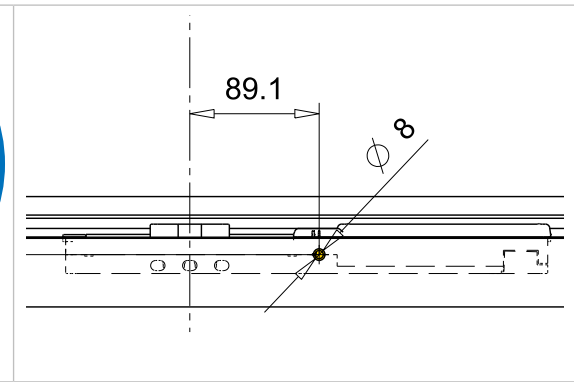


Fig. 15: Drilling in frame profile

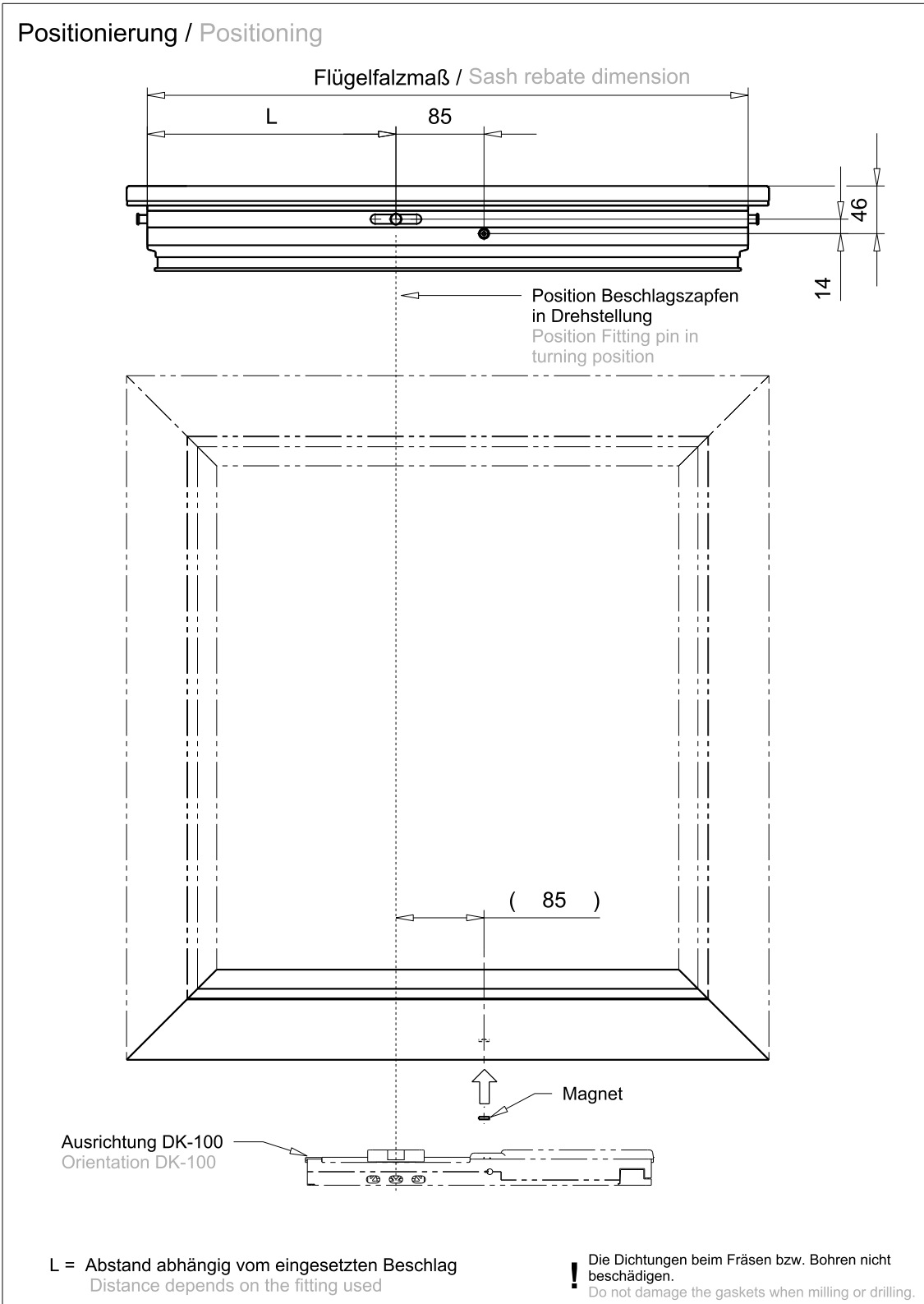
- a) Make a drilling (D = 8 mm) at the relevant position in the frame profile (fig. 14 and 15),
 - cover it with a cover cap and glue the cover cap in place with adhesive or
 - mark the position for an optional drilling in an emergency.

7.4.7 Installing the magnet

Positionierung Magnet DK-100

Positioning Magnet DK-100

1-100270-01



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Fig. 16: Positioning magnet DK-100

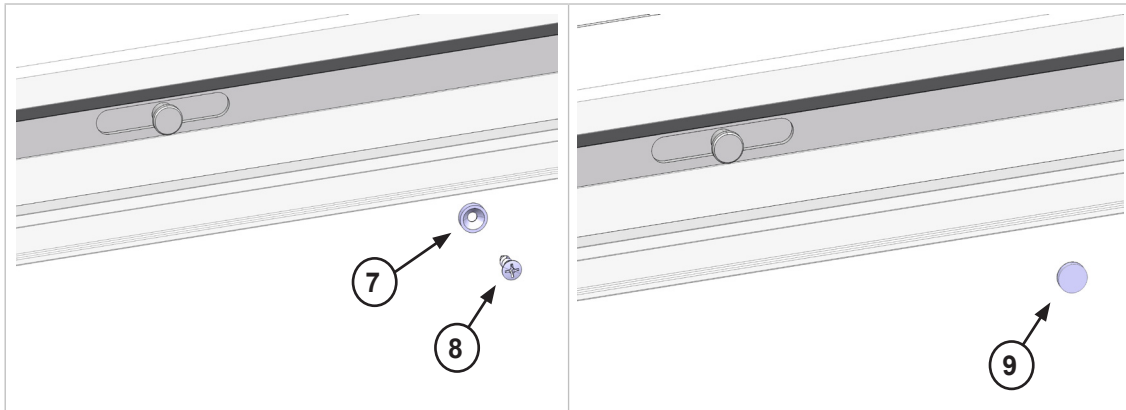


Fig. 17: Installation magnet, for screw-fitting Fig. 18: Installation magnet, self-adhesive

Installation magnet, for screw-fitting

- a) Pre-drill the sash profile at the required position with a Ø 3 mm drill and screw the magnet (7) in place with manual force using the fastening screw (8). Attention - risk of magnet breaking!

Installation magnet, self-adhesive

- a) Ensure that the surface is clean, grease-free and dry.
- b) Remove the protective film on the adhesive surface of the magnet.
- c) Attach the magnet (9) to the required position on the sash profile.

7.5 Commissioning

⚠ WARNING

Crushing injuries!

The moving cam can cause severe crushing injuries if body parts get caught.

- Never reach into the open sash during operation.
- Only operate the drive when it is installed in the window and only when the sash is tilted or closed.

Prior to initial commissioning or the reference run, check the fitting for smooth running by manually turn-opening the sash, tilting and closing it.

The drive does not run:

- when the sash is in the turned position
- without operation

7.5.1 Risk assessment

NOTE

The builder of the complete machine must issue a final risk assessment to determine whether additional protective measures are required. Possible additional protective measures include:

- Emergency Stop button.

Before the **DK-100** can be commissioned, a risk assessment must be performed.

- First use the document "Risk assessment and possible protective measures" to determine whether additional safety measures are required prior to commissioning.
- Ensure that the **DK-100** is installed according to the previous chapters and the correct operating mode has been selected according to chapter „7.2 Setting the operating mode“.

7.5.2 Reference run

Irrespective of the operating mode, a reference run is started in the delivery condition after first activation of the operating element.

- a) After professional installation of the **DK-100**, manually close the sash of the window on the turning handle.
- b) Activate the operating element to start a reference run.
 - The drive slowly moves to the end positions with increased force, scans them and saves the positions.
 - First the sash is opened, then closed.
 - The values of the 3D magnetic sensor are saved in each of the positions.
 - Once the end positions have been saved, the drive returns to the centre position. The **DK-100** is now operational.

NOTE

If the required end position values are not reached, the drive returns to the factory-set neutral position and repeats the reference run when the operating element is activated again.

If the reference run has to be repeated at a later point in time, it can be restarted either by

- turning off power to the drive during the run.
- holding the magnet up to the **DK-100**.

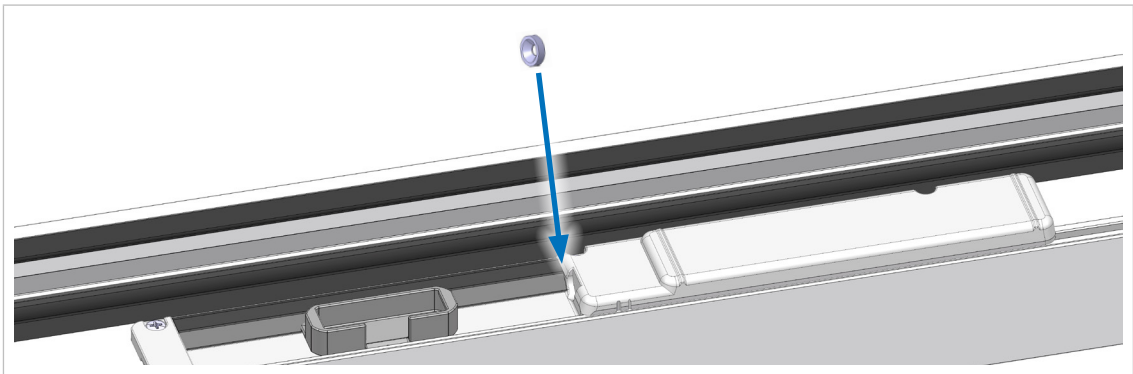


Fig. 19: Triggering a reference run again

- a) Unscrew the magnet from the sash profile and hold it up to the recess in the housing for at least 5 seconds (fig. 19).
The drive acknowledges detection of the magnet in the recess by briefly moving back and forth.
- b) Then screw the magnet back onto the sash profile and close the sash.
- c) Activate the operating element to start a reference run.

NOTE

- A power failure during motor-controlled opening and closing returns the **DK-100** to its delivery condition.
- When the voltage supply returns, activating the operating element starts a reference run.
- Every 100 cycles the **DK-100** automatically starts another reference run.

8 Service and maintenance

⚠ WARNING

Risk of injury as a result of improperly performed maintenance and service work!

- Prior to starting work, ensure that there is sufficient space
- Ensure that the installation space is clean and tidy
- Secure the window against unintentional opening or closing

⚠ CAUTION

Possible property damage caused by incomplete or incorrect service or maintenance!

- Observe the maintenance instructions issued by the fitting manufacturer
- Perform the maintenance work continuously and completely

NOTE

- Hand over maintenance information to end customers, end users and the responsible party
- Have a specialised company perform repairs and rectify large-scale malfunctions
- Incorrect or incomplete maintenance can significantly reduce the product's service life

8.1 Maintenance

Maintenance work must be performed at the prescribed intervals. If regular maintenance reveals increased wear, shorten the intervals according to the circumstances.

Interval	Maintenance work	Personnel
yearly	Clean fittings and components, use a soft cloth to remove adhesions and dirt from the drive and fittings	User
	Lubricate moving components	User
	Check components for tight fit, in particular moving components and contact a specialised company if any abnormalities are detected	User
	Check for ease of movement	User
as required	Replace damaged components	Specialised company

Tab. 13: Maintenance plan

8.2 Lubrication and lubricating points

Recommended lubricant compatible with the conventional lubricants for the fitting:



Fig. 33: OKS 481 (spray grease)



Fig. 34: OKS 480 (grease cartridge)

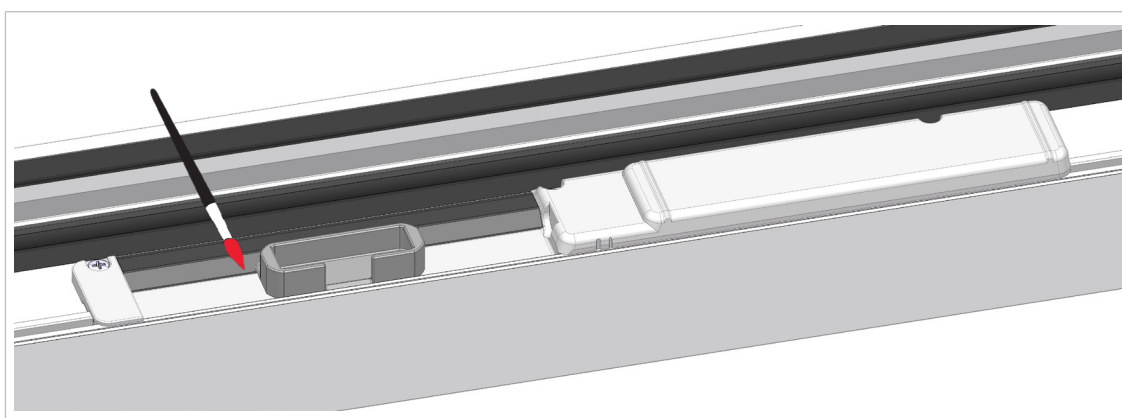


Fig. 35: Lubricating points

The drive must be lubricated on the threaded spindle. For this purpose, the gasket must be slightly opened / folded over.

When using a grease cartridge, we recommend a small brush for optimal application of the lubricant

8.3 Repair work

Repair work includes replacing and repairing components. However, this is only required if components are damaged or show signs of failing. The function and safety in use of the automated window always depends on the components being in perfect condition and well-attached. Only allow a specialised company to perform all repair work.

During repair work, note the following:

- Loose or faulty screws may impair function
 - Check screws for tightness and positioning
 - Retighten or replace loosened and faulty screws
- Replace faulty components (drive or fitting) with original spare parts
- Do not perform makeshift repairs

9 Faults

9.1 Safety

The following always applies:

- In the event of a fault, immediately turn off the voltage supply to the **DK-100**.
- Determine the cause of the fault.
- Have malfunctions in the voltage supply eliminated by an authorised electrician.
- Ensure that all troubleshooting work is performed and completed in accordance with the specifications and instructions in this manual.
- Use only manufacturer-approved spare parts.

Executing personnel

- Electrician
- Window builder

9.2 Fault list

Fault	Possible cause	Rectification
Drive does not run	Magnet position faulty	Ensure that the magnet position is correct according to the assembly drawing
	Incorrect connection.	Connect the DK-100 according to the connection diagram.
	Drive faulty (Window cannot be opened. Defect occurred during active run and the run could not be completed up to the centre position of the cam)	Replace DK-100. Move the cam to the centre position according to chapter „9.3 Manual operation in the event of a fault (emergency function)“.
Drive moves in the wrong direction	Magnet position faulty	Ensure correct magnet position according to chapter „7.4.7 Installing the magnet“
	Incorrect operating status hinge side left/right	Check and, if necessary, change the switch position of DIP switch 1.
Drive only moves in one direction	Magnet position faulty	Ensure correct magnet position according to chapter „7.4.7 Installing the magnet“
	Incorrect operating status switch/button	Check and, if necessary, change the switch position of DIP switch 3 and 4.
Drive stops during operation and returns to centre position	Load limitation on drive triggered: - Foreign object in tilted status - Fitting moving too sluggishly - Handle moving too sluggishly	Ensure that the window moves smoothly: Remove potential foreign objects. Remove arrester from handle. Grease fitting components. Only use fittings approved by the manufacturer according to these installation instructions and observe the maximum and minimum dimensions of the window.

Drive stops during operation and returns to centre position	Magnet position faulty	Ensure correct magnet position according to chapter „7.4.7 Installing the magnet“
	Incorrect operating status of operating element	Check and, if necessary, change the switch position of DIP switch 3 and 4.
Drive generates unusual noise	Incorrect operating status slow/fast run	Check and, if necessary, change the switch position of DIP switch 2.
	Window handle with arrester used	Remove arrester
	Fitting moving too sluggishly	Grease fitting components. Only use fittings approved by the manufacturer according to these installation instructions and observe the maximum and minimum dimensions of the window.
	Drive defective	Replace DK-100
	Fitting defective	Replace fitting
Handle cannot be used	Drive has stopped in end position	Move the cam to the centre position according to chapter „9.3 Manual operation in the event of a fault (emergency function)“.
Window cannot be opened	Defect occurred during active run and the run could not be completed up to the centre position of the cam.	Move the cam to the centre position according to chapter „9.3 Manual operation in the event of a fault (emergency function)“.

Tab. 14: Troubleshooting

9.3 Manual operation in the event of a fault (emergency function)

If the **DK-100** gets a fault during active operation and the cam has not returned to the centre position, proceed as follows:

Variant 1: Drilling with 8 mm diameter exists

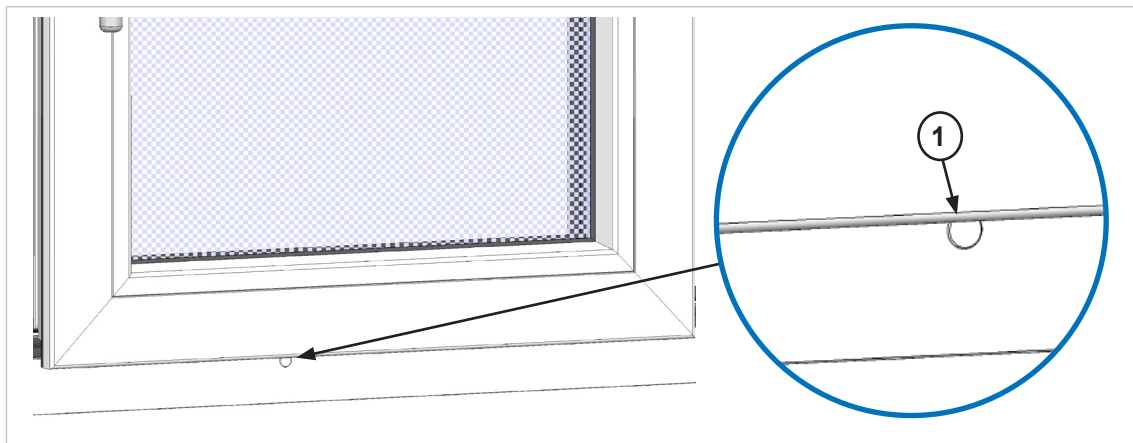


Fig. 36: Cover cap

- a) Remove cover cap (1) from emergency opening, if applicable.

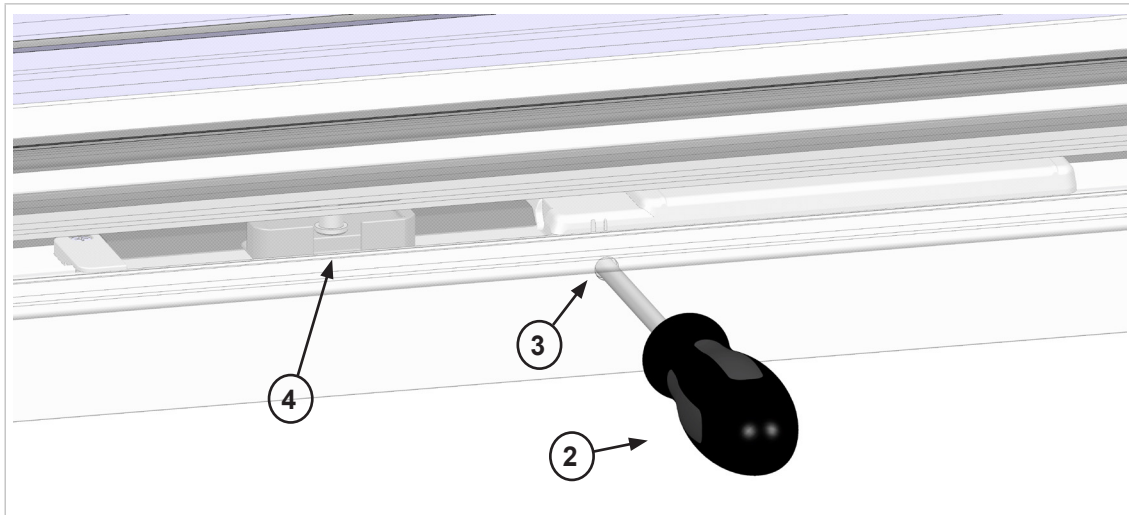


Fig. 37: Operation of emergency function

- b) Insert a screwdriver (hexalobular internal TX30) (2) through the emergency opening (3) to turn the cam (4) to the centre position.
- c) Open window and replace drive.

**Variant 2: No drilling with 8 mm diameter exists
Marking in the profile exists**

- a) Drill hole (D = 8 mm) according to "7.4.5 Preparing the emergency opening (optional)" at the marking.
- b) Proceed with variant 1, step b).

**Variant 3: No drilling with 8 mm diameter exists
Marking in the profile does not exist**

- a) Determine fitting used. Determine position of the mushroom head in turn position through the fitting manufacturer.
- b) Drill hole (D = 8 mm) according to "7.4.5 Preparing the emergency opening (optional)" at the marking.
- c) Proceed with variant 1, step b).

9.4 Switching back on after faults

Only operate the **DK-100** if there are no defects that may affect safe operation.

10 Removal from service

10.1 Safety

The following always applies:

- Only work on the **DK-100** when it is voltage-free.

Executing personnel

- Qualified personnel (disposal technician)

11 Dismantling and disposal

At the end of its service life, dismantle the **DK-100** and ensure that it is disposed of in an environment-friendly manner.



NOTE

- Used and defective electrical and electronic devices must not be disposed of with domestic waste. These devices contain valuable raw materials that can be reused.
- Deliver the **DK-100** to an appropriate receiving point.

11.1 Safety

The intentional or unintentional reuse of used components can result in danger to people.

Observe the following points:

- The operating organisation is responsible for correct disposal.
- Only qualified personnel may carry out disposal.
- Observe the applicable local regulations and laws.

Executing personnel

- Electrician
- Disposal experts Risk assessment and possible protective measures
- The EC Declaration of Conformity must include at minimum the following information:

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A large, dark teal geometric shape, resembling a stylized mountain peak or a large triangle, occupies the bottom half of the page. It is solid in color and has a sharp peak at the top center.