

Roto E-Tec Drive

Electric window drive integrated in the hardware

Installation, maintenance and operation instructions
for aluminium and timber / PVC profiles



Imprint

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Roto Frank AG Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com



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This manual (original operating instructions) contains important information, directives and installation instructions regarding the further work of the hardware and the electric window drive-unit Roto E-Tec Drive.



Also, this manual contains binding guidelines to ensure the duty to instruct through to the end-user.

Depending of the used profile material, the information and instructions in this manual refer to the products of the Roto AL hardware system for aluminium profiles and the Roto NT hardware system for timber and PVC profiles. In addition, the information and instructions in this manual refer to the window drive Roto E-Tec Drive.

Apart from these installation, maintenance and operation instructions, the following documents (in their respective valid version) apply:

- VFF data sheet KB.01 "Power-operated windows" (an information sheet of the German Window + Facade Association VFF)
- Information sheet "Power-operated windows" of the German electrical and electronic manufacturers' association (ZVEI)
- Machinery Directive (2006/42/EC)
- EN 14351-1:2006+A1:2010
- Catalogue (CTL_41)
- Directives TBDK of the Quality Assurance Association: Locks and Hardware (Richtlinie TBDK der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBH of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBH der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives VHBE of the Quality Assurance Association: Locks and Hardware (Richtlinie VHBE der Gütegemeinschaft Schlösser und Beschläge e. V.)
- Directives FPKF 2011-02-04 of the Quality Assurance Association: Locks and Hardware (Richtlinie FPKF 2011-02-04 der Gütegemeinschaft Schlösser und Beschläge e. V.)

This manual should be stored in such a manner that it can be quickly used, if needed.

Additional markings

To highlight handling directives, results, lists, references and other elements, the following signs are used in this manual:

Marking	Explanation
	Sash
	Frame
	Hardware piece
	Action sequence
	Operation step
	First level of the hierarchy in a list
Refer to page 12	(Cross) reference in the text
→ p. 12	(Cross) reference in tables



Abbreviation	Explanation
AL	Aluminium
HA	Hardware axis
TU-ON	Turn-Only hardware
TU-ONc	Turn-Only hardware with coupleable rebate hinge
T&T	Tilt&Turn hardware
BS	Backset
SW	Sash width
SRW	Sash rebate width
SRH	Sash rebate height
SH	Sash height
S.kg	Sash weight
CL	Clearance
GW	Glass weight
HH	Handle height
TI-ONt	Tilt-Only hardware / handle on top
TI-ONs	Tilt-Only hardware / handle on side
MTS	Magnetic thermostat controller
CL	Centre lock
MVS	Magnetic locking system
FWi	Frame width, inside
RC2	Resistance Class 2
RC3	Resistance Class 3
FHi	Frame height, inside
MD	Mishandling device
DM	Dummy-mullion hardware
TF	Tilt-First hardware
OW	Overlap width
OH	Overlap height

The figures show DIN right-hand versions. All dimensions stated in mm. Otherwise the values are indicated.

Protection of copyright

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NOTE!

Please refer to the Glossary chapter of catalogue CTL_41 for additional notes on abbreviations.

The information in this document is aimed at the following target groups:



Hardware dealers

The “hardware dealers” target group includes all companies/persons who purchase hardware from the hardware manufacturer to resell it without the hardware being modified or subject to further work.

Manufacturers of windows and balcony doors

The “manufacturers of windows and balcony doors” target group includes all companies/persons who purchase hardware from the hardware manufacturer or the hardware dealer and build it into windows and balcony doors.

Constructor of the power-operated window / balcony door

The target group “Constructor of the power-operated windows” includes all companies / persons who connect the window and the drive to each other.

Planning engineer

The target group “Planning engineers” includes construction engineers, architects and the location making the tender.

Building element dealers/Installation company

The “building element dealers” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors in order to sell these on and to install them into a building development, without the windows or balcony doors being modified.

The “installation company” target group includes all companies/persons who purchase windows and balcony doors from the manufacturer of windows and balcony doors, or from a building element dealer, in order to sell these and to install them into a building development, without the windows or balcony doors being modified.

Builder

The “builder” target group includes all companies/persons who order windows and/or balcony doors for installation into their building project.

End-users

The “end-users” target group includes all persons who operate the installed windows and/or balcony doors.

Operator

The target group “Operator” includes all persons who operate the Roto E-Tec Drive installed in the window.



NOTE!

Every target group must fully comply with its instruction obligation. Unless defined otherwise in the following, the documents and information may be transmitted e.g. as printed documents, CD-ROM, or via Internet access.

Responsibility of the hardware dealer

The hardware dealer must transmit the following documents to the manufacturer of windows and balcony doors:

- Catalogue
- Installation, maintenance and operation instructions
- Directive for fixing load-bearing Turn-Only and Tilt&Turn hardware components (TBDK)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibility of the manufacturer of windows and balcony doors

The manufacturer of windows and balcony doors must transmit the following documents to the building element dealer or to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Installation, maintenance and operation instructions
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)
- CE-mark for windows (CPD and machinery directive, if necessary)
- Declaration of Conformity in accordance with EN 14351-1, with specification of conditions of use if a window with drive unit is placed on the market.

The manufacturer must ensure that the end-user is provided with the documents and information intended for him, in printed format.

Responsibility of the building element dealer/installation company

The building element dealer must transmit the following documents to the builder, even when a subcontractor (installation company) is acting as an intermediary:

- Maintenance and operating instructions (with the focus on hardware)
- Guidelines/advice on the product and on liability (VHBH)
- Guidelines/advice for end-users (VHBE)

Responsibilities of the planning engineer

The planning engineer must specify precisely the requirements for the power-operated window, particularly the necessary safety measures. To do this, it is necessary to prepare the following documentation :

- Utilisation concept
- Risk assessment
- Tender with technical and construction requirements

Responsibility of the constructor of the plant

The constructor of the plant must submit the following documentation to the operator and comply with the following conditions:

- Installation plan
- Turn-over report
- User information I Operating instructions
- CE label in immediate vicinity of the manufacturer's information (constructor), easily legible on product (≥ 5 mm) and permanent (e.g. in rebate) and conformity declaration in accordance with Machinery Directive, if the specialised fitter installed the drive in an existing window (becomes manufacturer).
- When installing a complete, power-operated window, the permissibility of the application must be checked.
- Risk assessment to check the planning specifications (see chapter "Responsibilities of the planning engineer").

Responsibility of the builder

The builder must hand over the following documents to the end user:

- Maintenance and operating instructions (with the focus on hardware)
- User guidelines/advice for end-users (VHBE)
- Planning permission

Furthermore, the builder must comply with all official requirements.

Responsibility of the operator

The operator must look after the documentation about maintenance and keep it for future reference. He must also instruct and supervise the regular maintenance through specialised personnel.





In this instructions, safety information is indicated by a symbol. The safety information is introduced by a key word that indicates the severity of the danger.



DANGER!

This symbol in conjunction with the signal word indicates an imminently hazardous situation, which could result in death or serious damage to health if it is not avoided.



WARNING!

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which could result in death or serious damage to health if it is not avoided.



CAUTION!

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to minor or light injuries if it is not avoided.



NOTE!

This symbol in conjunction with the signal word indicates a potentially dangerous situation, which may lead to property or environmental damage if it is not avoided.

All details and instructions in this document were compiled taking into account the relevant standards and regulations, the state of the art, and also many years of knowledge and experience.



The hardware manufacturer accepts no liability for damages resulting from:

- Failure to comply with this document and all product-specific documents and related applicable directives (refer to the chapters Security, Stipulated use).
- Non-stipulated use/misuse (refer to the chapters on Security and Stipulated use).
- Insufficient invitation to tender, failure to adhere to the installation instructions or application drawings or areas of use.
- Increased soiling.

Claims by third parties against the hardware manufacturer on the ground of damages resulting from misuse or failure to follow the instruction obligation on the part of the hardware dealer, the manufacturer of windows and balcony doors, the constructor of power-operated windows, the planner and the building element dealer or the builder are transferred accordingly.

The undertakings agreed in the delivery contract, the general conditions of business and the delivery conditions of the hardware manufacturer, and the legal regulations applicable at the time of concluding a contract are effective.

The warranty covers only original Roto components.

The right to technical modifications for the improvement of performance characteristics and for further development is reserved.



The Roto E-Tec Drive may only be supplied with safety extra-low voltage (SELV). Power supply units and control units from Roto convert mains voltage into SELV.

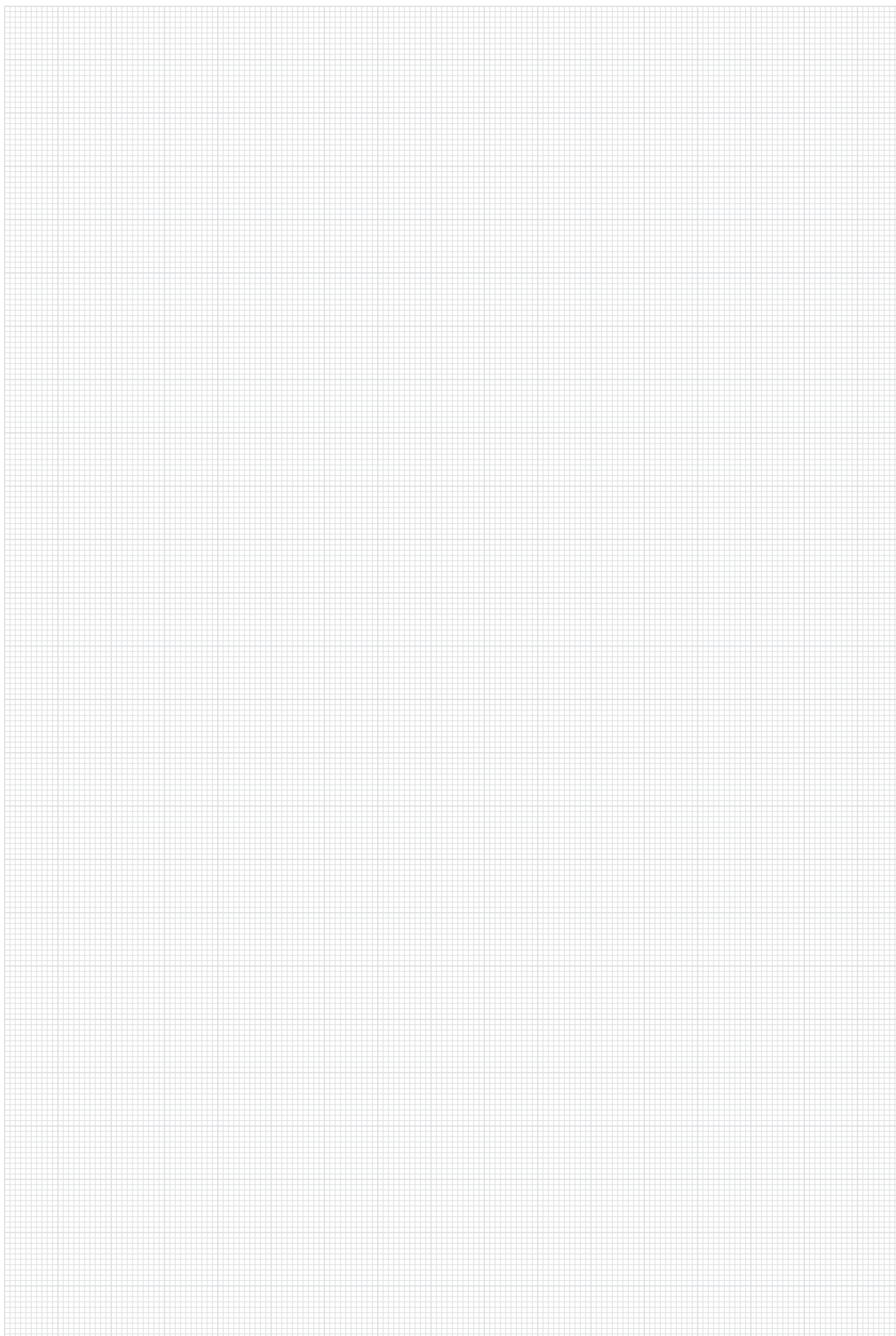
Due to its low movement speed, the Roto E-Tec Drive complies with Protection Class 0 to 3 without additional safety equipment in accordance with the VFF Memorandum "Power-operated windows" (KB.01).

All assembly and installation work must be carried out by experts.

Experts are persons who have sufficient knowledge in the area of power-operated windows, doors and gates due to their training and experience.

Experts are persons who are also sufficiently familiar with the relevant statutory work safety regulations, accident prevention regulations, directives and generally recognised technical regulations (e.g. VDE regulations, BGR guideline, DIN standards) to be able to evaluate whether power-operated windows are working safely.

Adherence to the respective local assembly and installation regulations is a prerequisite for installation.





Concealed drive for locking and unlocking as well as tilting of windows and balcony doors with hardware from the Roto Frank AG.

- Only use the Roto E-Tec Drive with Tilt-First and Tilt-Only windows whilst complying with dimensions and the permissible maximum sash weight.
- Only install Roto E-Tec Drive horizontally at the top.
- Only install 1 Roto E-Tec Drive per window.
- Roto E-Tec Drive is not suitable for the use in heat and smoke vents (HSV) or natural smoke and heat exhaust devices (NSHE).
- Roto E-Tec Drive is not suitable for the use in fire-protection windows.
- Roto E-Tec Drive is not suitable for the use in wet areas, in areas at risk of explosion or corrosive environments.

Correct use also includes adhering to all the specifications in the product-specific documents, such as:

- These installation, maintenance and operation instructions
- Product catalogues
- Information and specifications of the profile manufacturer (e.g. light metal profiles etc.)
- The relevant directives TBDK, VHBH and VHBE of the Quality Assurance Association: Locks and Hardware (Gütegemeinschaft Schlösser und Beschläge e. V.)
- Current national laws and guidelines (see p. 5)

To ensure that the window can be opened even if the drive is faulty, an espagnolette must always be installed at the window.

Roto E-Tec Drive must be operated whilst complying with the relevant safety measures of the VFF Memorandum "Power-operated windows" (KB.01) (an information sheet of the German Window + Facade Association (VFF)).



NOTE!

Any type of use that goes beyond or differs from the defined correct use shall be regarded as misuse.



Application areas:

Roto hardware ranges:

- Roto NT (apart from NT Designo axis 9 mm), (without mishandling device)
- Roto AL with flush-encased gearbox (without mishandling device)
- Roto AL Designo with flush-encased gearbox (without mishandling device)



Opening types:

- Tilt-First, Tilt-Only
- The Roto E-Tec Drive is **not suitable** for Tilt&Turn windows.
- Roto E-Tec Drive is **not suitable** for arched, segmental and pitched windows!



WARNING!

Danger from misuse!

Misuse and incorrect installation of the Roto E-Tec Drive can result in hazardous situations.

- Never use hardware combinations that have not been approved by the hardware manufacturer.
 - Only use original accessories authorised by the hardware manufacturer.
-



WARNING!

Danger from non-compliance with important safety instructions!

Non-compliance with important safety instructions can lead to serious injuries.

Safety instructions must be complied with and stored at all times.



DANGER!

Danger to life through power failure!

Roto E-Tec Drive can fail in emergency situations (power failure) which may obstruct the quick opening of the window.

Never use the Roto E-Tec Drive in windows and balcony doors which are marked as escape routes.



DANGER!

Danger to life from live parts!

Possibility of short circuiting!

Current can lead to lethal injuries!

Take extra care when handling live parts. Only an electrician may connect the power supply unit to the mains voltage.

The respective national regulations must be observed and complied with when doing this (in Germany, e.g. VDE 0100).



WARNING!

Risk of injury due to misuse (children)!

The wrong, incorrect operation of control elements or remote controls by children can lead to injuries.

Do not let children play with firmly mounted control units and keep them away from remote control elements.



WARNING!

Risk of injury from windows which are tilting down (Tilt-Only sash)!

The hardware can be unlocked due to wrong installation or incorrect operation. This can cause the window sash to fall out if no restrictor and cleaning stays are mounted.

Restrictor and cleaning stays must be installed for Tilt-Only sashes if none are present.



CAUTION!**Danger of crushing and trapping from opening and closing forces.**

Moving parts of the drive can cause injuries during operation.

Never reach between the window sash and window frame or between the moving parts of the Roto E-Tec Drive while the drive is moving.



WARNING!**Loss of function due to deformation of drive parts!**

The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive.

Always comply with recommended sash dimensions in accordance with the application diagram. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.



Roto E-Tec Drive / Drive sets

Roto E-Tec Drive type 01 Basic L	782877
Roto E-Tec Drive type 01 Basic R	782892
Roto E-Tec Drive type 02 Basic set L	779647
Roto E-Tec Drive type 02 Basic set R	779648
Roto E-Tec Drive type 03 Plug&Play set L	779681
Roto E-Tec Drive type 03 Plug&Play set R	779651
Roto E-Tec Drive type 01 Individual set L	782893
Roto E-Tec Drive type 01 Individual set R	782894
Roto E-Tec Drive type 02 Individual set L	779652
Roto E-Tec Drive type 02 Individual set R	779653
Roto E-Tec Drive type 03 Individual set L	779654
Roto E-Tec Drive type 03 Individual set R	779675

Accessories

24 V power supply unit	782876
Cable 6 m, black (8 x 0.14 mm²)	387877
Cable in special length	Upon request
Control Unit (testing set)	779676
GS1-M Group control unit	782875



WARNING!

Danger from misuse!

- Misuse and incorrect installation of the Roto E-Tec Drive can result in hazardous situations.
- Never use hardware combinations that have not been approved by the hardware manufacturer.
 - Never use accessories that are not original products or that have not been approved by the hardware manufacturer.



NOTE!

The following installation instructions apply in connection with this document:

Roto NT Timber

- IMO_63
- IMO_109

Roto NT PVC

- IMO_64
- IMO_110

Roto AL

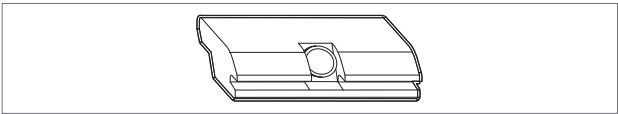
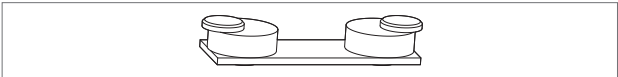
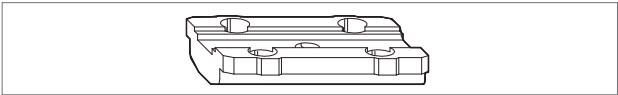
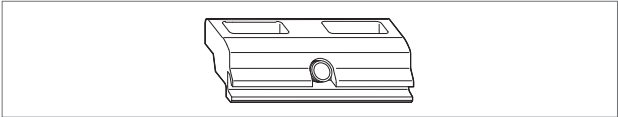
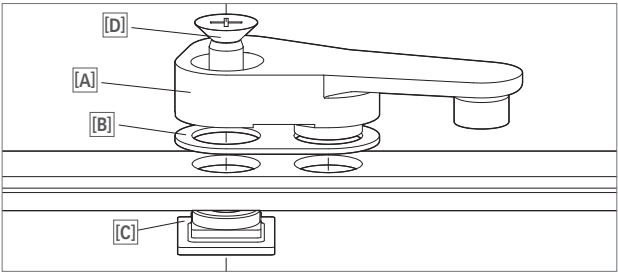
- IMO_332

Roto AL Designo

- IMO_159
- IMO_386

Roto NT Restrictor and cleaning stay

- IMO_98



Description

Material no.

E-Tec Drive installation set

477455

consists of:

- [A] Adapter
- [B] Packer
- [C] SEC connector
- [D] Countersunk screw M5 x 12

Rebate clearance reduction

on the frame

477407

on the sash

477408

Run-up block

212008

SEC coupler component

Connecting-rod connector

348576

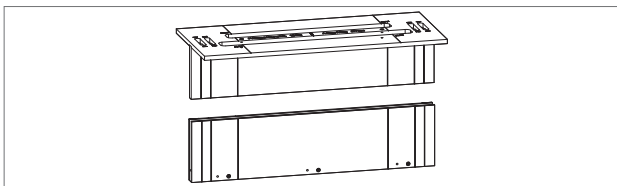
Run-up wedge

V.01

684282

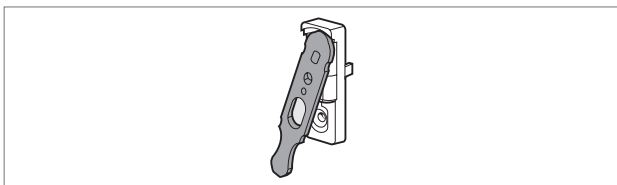
V.02

684283



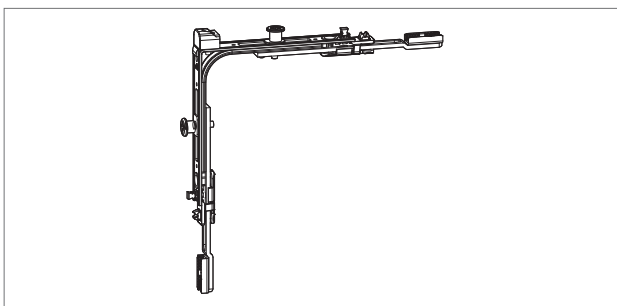
Routing jig

For routing a recess for the Roto E-Tec Drive in the surround frame **484650**



Sash lifter NT

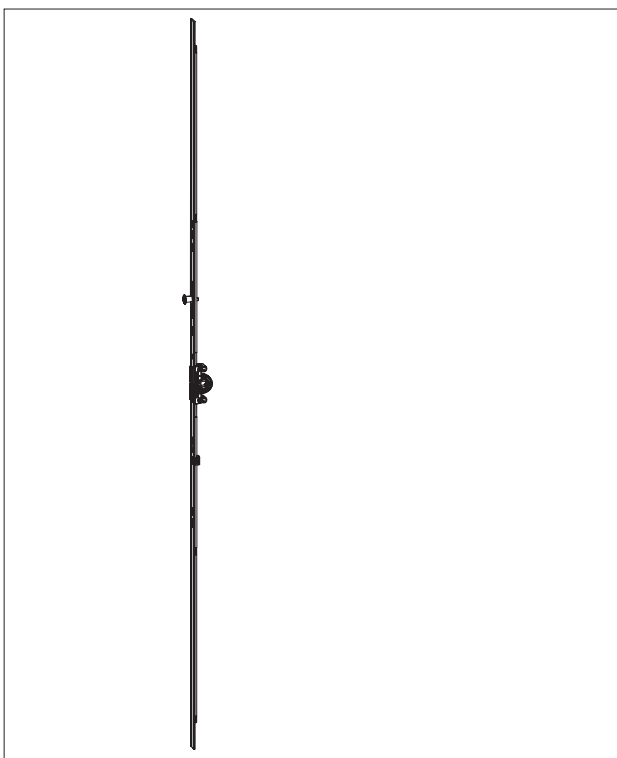
284220



Corner drive

1P/1V Roto Sil

779677



T&T espagnolette, centred/variable E-Tec Drive

980 mm/BS 15/1S Roto Sil

779679



Maximum sash sizes and weights

The technical data, application diagrams, and component classifications in the product-specific documentation of the hardware manufacturer give instructions on the maximum permitted sash sizes and weights. Here, the component with the smallest permitted load bearing capacity decides the maximum permitted sash weight.

- Check compliance of the technical data, application diagrams, and component classifications before the use of electronic data sets, and especially their use in fenestration programmes.
- In principle, the maximum permissible sash sizes and weights apply in this installation instruction. All other specifications can be found in the product-specific documentation from the hardware manufacturer.
- The maximum permitted sash sizes and weights must never be exceeded. In the case of uncertainty contact the hardware manufacturer.



Guidelines from the profile manufacturer

The manufacturer of windows and/or balcony doors must comply with all specified system-related dimensions (e.g. gasket gap dimensions or locking-point distances). Furthermore, he must check these regularly and make certain of them, especially on the first use of new hardware components, during manufacture, in an ongoing manner up to and including the window installation.



NOTE!

The hardware components are designed in such a manner, that the system-related dimensions can be adjusted, provided the hardware can have an effect on these. If a deviation from these dimensions is noticed only after the installation of the windows, the hardware manufacturer is not responsible for any possible additional work arising.

Composition of hardware

Burglary inhibiting windows and balcony doors require hardware which fulfils particular requirements.

Windows and balcony doors for damp rooms, and those for use in environments with aggressive and corrosive air components require hardware which fulfils particular requirements.

The resistance of windows and balcony doors to wind loads when closed and locked depends on the actual designs of the windows and balcony doors. Wind loads prescribed by law and standards (e.g. as per EN 12210 – especially test pressure P3) can be dissipated by the hardware system.

The hardware combinations and installations appropriate for windows and balcony doors in the previously mentioned areas should be specifically selected and agreed with the hardware manufacturer and the profile manufacturer.



NOTE!

The guidelines of the hardware manufacturer relating to the combination of the hardware (e.g. the use of additional stay arms, the design of hardware for burglary-inhibiting sashes for windows and balcony doors, etc.) are binding.



WARNING!

Risk of injury due to incorrect assembly.

Wrong, incorrect assembly can lead to serious injuries.

All assembly instructions and advice must be complied with.



ADVICE

- All assembly and installation work must be carried out by experts. Experts are persons, who are familiar with the guideline VFF Memorandum "Power-operated windows" (KB.01), the relevant statutory work safety and accident prevention regulations, the respective locally applicable assembly and installation regulations and the regulations and generally recognised rules of technology.
- The drive is not suitable for use with protection class 4 applications.
- Only install 1 Roto E-Tec Drive per window.
- Do not attach handles to the window to avoid incorrect operation and damages. Use blank covers to cover the handle opening. If a handle is requested, this is only permitted if it is installed in connection with an operating lock-out. Please use a service handle for occasional manual opening (e.g. to clean the window pane).
- Do not operate the drive if the window is tilted or opened via the service handle to avoid damages.
- Never store windows with installed Roto E-Tec drives outside. Penetrating rain water can damage the drive.
- Ensure that the hardware can be operated easily during installation, otherwise the Roto E-Tec Drive might be damaged. If it is difficult to operate the hardware manually, it must be re-adjusted to avoid damaging the drive.
- When positioning the window, ensure that no drilling dust enters the Roto E-Tec Drive. Close the window after assembly and attach blind plug or escutcheon cover so that subsequent trades do not accidentally soil the drive.



RECOMMENDATION!

The installation of an operating lock-out is recommended to avoid damaging the drive or window. It prevents an opening instruction to the drive if the window sash is not locked and therefore prevents the drive to extend its scissor stay if the window is tilted manually or opened.

The operating lock-out consists of a GS1-M (**782875**) and an MTS contact element (**292118**).



NOTE!

If a normal window handle is used, the operating lock-out **must** be installed.



The hardware overviews on the following pages are recommendations of Roto Frank AG.

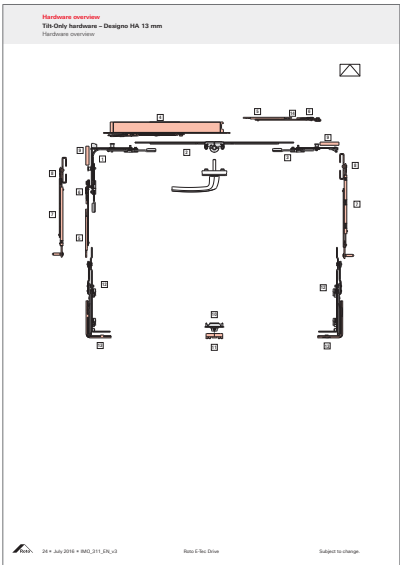
The hardware overview chapter shows on the left page the single hardware components in the hardware overview and on the right page the respective parts list.

Position numbers in surrounding squares allow the allocation between hardware overview and parts list.

The colours of the components enable the assignment to the installation location:

- = Frame components
- = Sash components

Hardware overview
110-Only hardware – Design HA 13 mm
Hardware overview

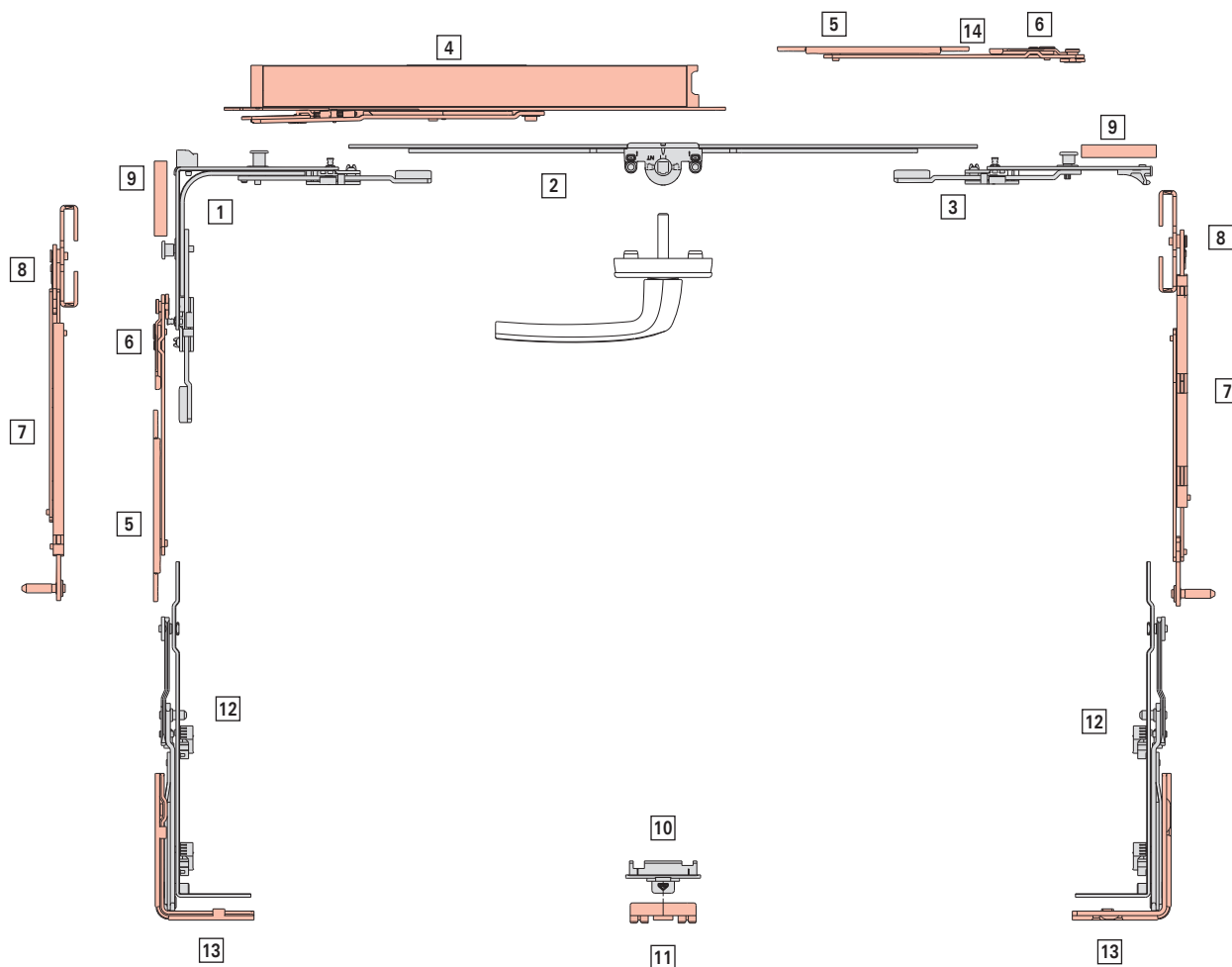


Hardware overview
110-Only hardware – Design HA 13 mm
Parts list

Application range
Sash rebate width **SR02** 451 – 1000 mm
Sash rebate height **SR04** 580 – 1200 mm
Sash weight **S kg** max. 60 kg

Pos.	Order code	Accessories	Part no.
01	Order code	Accessories	Part no.
02	SR02	SR02	SR02
03	SR04	SR04	SR04
04	SR05	SR05	SR05
05	SR06	SR06	SR06
06	SR07	SR07	SR07
07	SR08	SR08	SR08
08	SR09	SR09	SR09
09	SR10	SR10	SR10
10	SR11	SR11	SR11
11	SR12	SR12	SR12
12	SR13	SR13	SR13
13	SR14	SR14	SR14
14	SR15	SR15	SR15
15	SR16	SR16	SR16
16	SR17	SR17	SR17
17	SR18	SR18	SR18
18	SR19	SR19	SR19
19	SR20	SR20	SR20
20	SR21	SR21	SR21
21	SR22	SR22	SR22
22	SR23	SR23	SR23
23	SR24	SR24	SR24
24	SR25	SR25	SR25
25	SR26	SR26	SR26
26	SR27	SR27	SR27
27	SR28	SR28	SR28
28	SR29	SR29	SR29
29	SR30	SR30	SR30
30	SR31	SR31	SR31
31	SR32	SR32	SR32
32	SR33	SR33	SR33
33	SR34	SR34	SR34
34	SR35	SR35	SR35
35	SR36	SR36	SR36
36	SR37	SR37	SR37
37	SR38	SR38	SR38
38	SR39	SR39	SR39
39	SR40	SR40	SR40
40	SR41	SR41	SR41
41	SR42	SR42	SR42
42	SR43	SR43	SR43
43	SR44	SR44	SR44
44	SR45	SR45	SR45
45	SR46	SR46	SR46
46	SR47	SR47	SR47
47	SR48	SR48	SR48
48	SR49	SR49	SR49
49	SR50	SR50	SR50
50	SR51	SR51	SR51
51	SR52	SR52	SR52
52	SR53	SR53	SR53
53	SR54	SR54	SR54
54	SR55	SR55	SR55
55	SR56	SR56	SR56
56	SR57	SR57	SR57
57	SR58	SR58	SR58
58	SR59	SR59	SR59
59	SR60	SR60	SR60
60	SR61	SR61	SR61
61	SR62	SR62	SR62
62	SR63	SR63	SR63
63	SR64	SR64	SR64
64	SR65	SR65	SR65
65	SR66	SR66	SR66
66	SR67	SR67	SR67
67	SR68	SR68	SR68
68	SR69	SR69	SR69
69	SR70	SR70	SR70
70	SR71	SR71	SR71
71	SR72	SR72	SR72
72	SR73	SR73	SR73
73	SR74	SR74	SR74
74	SR75	SR75	SR75
75	SR76	SR76	SR76
76	SR77	SR77	SR77
77	SR78	SR78	SR78
78	SR79	SR79	SR79
79	SR80	SR80	SR80
80	SR81	SR81	SR81
81	SR82	SR82	SR82
82	SR83	SR83	SR83
83	SR84	SR84	SR84
84	SR85	SR85	SR85
85	SR86	SR86	SR86
86	SR87	SR87	SR87
87	SR88	SR88	SR88
88	SR89	SR89	SR89
89	SR90	SR90	SR90
90	SR91	SR91	SR91
91	SR92	SR92	SR92
92	SR93	SR93	SR93
93	SR94	SR94	SR94
94	SR95	SR95	SR95
95	SR96	SR96	SR96
96	SR97	SR97	SR97
97	SR98	SR98	SR98
98	SR99	SR99	SR99
99	SR100	SR100	SR100

The actual scope of delivery depends on the ordered hardware configuration (height and width of the window).





Application range

Sash rebate width **SRW**..... 451 – 1000 mm

Sash rebate height **SRH**..... 580* – 1200 mm

Sash weight **S.kg**..... max. 60 kg

[1]	Corner drive 1V 1S E-Tec Drive			779677
[2]	T&T espagnolette, centred/variable, backset, 15 mm			
	SRH / mm	SRW/mm	Size / mm	Material no.
	580 – 800	451 – 620	400	259718
		621 – 800	400	259718
		801 – 1000	980	289863
	801 – 1200	451 – 620	400	259718
		621 – 800	400	259718
		801 – 1000	980	289863
[3]	Espagnolette connector			282716
[4]	E-Tec Drive (→ p. 18)			779648
[5]	Tilt-stay NT ¹⁾			482823
[6]	Sash hinge-bearing ¹⁾			348277
[8]	Restrictor and cleaning stay, sash-bearing groove ¹⁾			348277
[7]	Restrictor and cleaning stay ¹⁾			
	SRH / mm	SRW/mm	Type	Material no.
	580 – 800		Type 1	347131
	801 – 1200		Type 2	347132
[9]	Striker			
[10]	Centre-closer, concealed, sash component			450984
	SRW 451 – 620		0 piece	
	SRW 621 – 800		0 piece	
	SRW 801 – 1000		1 piece	
[11]	Centre-closer, concealed, frame component			
	SRW 451 – 620		0 piece	
	SRW 621 – 800		0 piece	
	SRW 801 – 1000		1 piece	
[12]	Sash-component for rebate hinge			391697
[13]	Rebate hinge			
[14]	Packer not dep.			

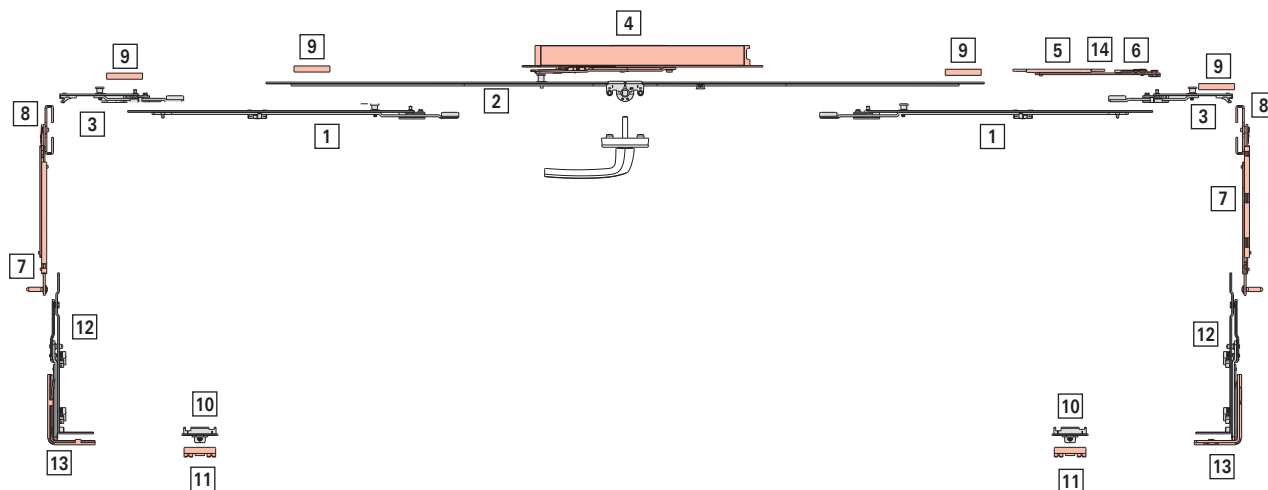
* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).

¹⁾ Restrictor and cleaning stay and tilt-stays

SRH	SRW		451 – 620		621 – 800		801 – 1000	
	Sort	Type Installation	Sort	Type Installation	Sort	Type Installation	Sort	Type Installation
580 – 800	1x RCS 1	Right	1x RCS 1	Right	1x RCS 1	Right	1x RCS 1	Right
	1x TS	Left	1x TS	Left	1x TS	Left	1x TS	Left
801 – 1200	1x RCS 2	Right	1x RCS 2	Right	1x RCS 2	Right	1x RCS 2	Right
	1x TS	Left	1x TS	Left	1x TS	Left	1x TS	Top

TS = Tilt-stay

RCS = Restrictor and cleaning stay





Application range

Sash rebate width **SRW**..... 1001 – 2000 mm

Sash rebate height **SRH**..... 580* – 1200 mm

Sash weight **S.kg**..... max. 60 kg

[1] Centre lock			
SRH / mm	SRW/mm	Size / mm	Material no.
470 – 700	1001 – 1200	-	-
	1201 – 1600	200	308267
	1601 – 2000	400	622881
701 – 1200	1001 – 1200	-	-
	1201 – 1600	200	308267
	1601 – 2000	400	779677
[2] T&T espagnolette, centred/variable, backset 15 mm			
SRH / mm	SRW/mm	Size / mm	Material no.
580 – 700	1001 – 1200	980	779679
	1201 – 1600	980	779679
	1601 – 2000	980	779679
701 – 1200	1001 – 1200	980	779679
	1201 – 1600	980	779679
	1601 – 2000	980	289863
[3] Espagnolette connector			282716
[4] E-Tec Drive (→ p. 18)			779648
[5] Tilt-stay NT ¹⁾			482823
[6] Sash hinge-bearing ¹⁾			348277
[7] Restrictor and cleaning stay ¹⁾			
SRH / mm	SRW/mm	Type	Material no.
580 – 700		Type 1	347131
701 – 1200		Type 2	347132
[8] Restrictor and cleaning stay, sash-bearing groove ¹⁾			348277
[9] Striker			
[10] Centre-closer, concealed, sash component			450984
SRW 1001 – 1600		1 piece	
SRW 1601 – 2000		2 piece	
[11] Centre-closer, concealed, frame component			
SRW 1001 – 1600		1 piece	
SRW 1601 – 2000		2 piece	
[12] Sash-component for rebate hinge			391697
[13] Rebate hinge			
[14] Packer not dep.			

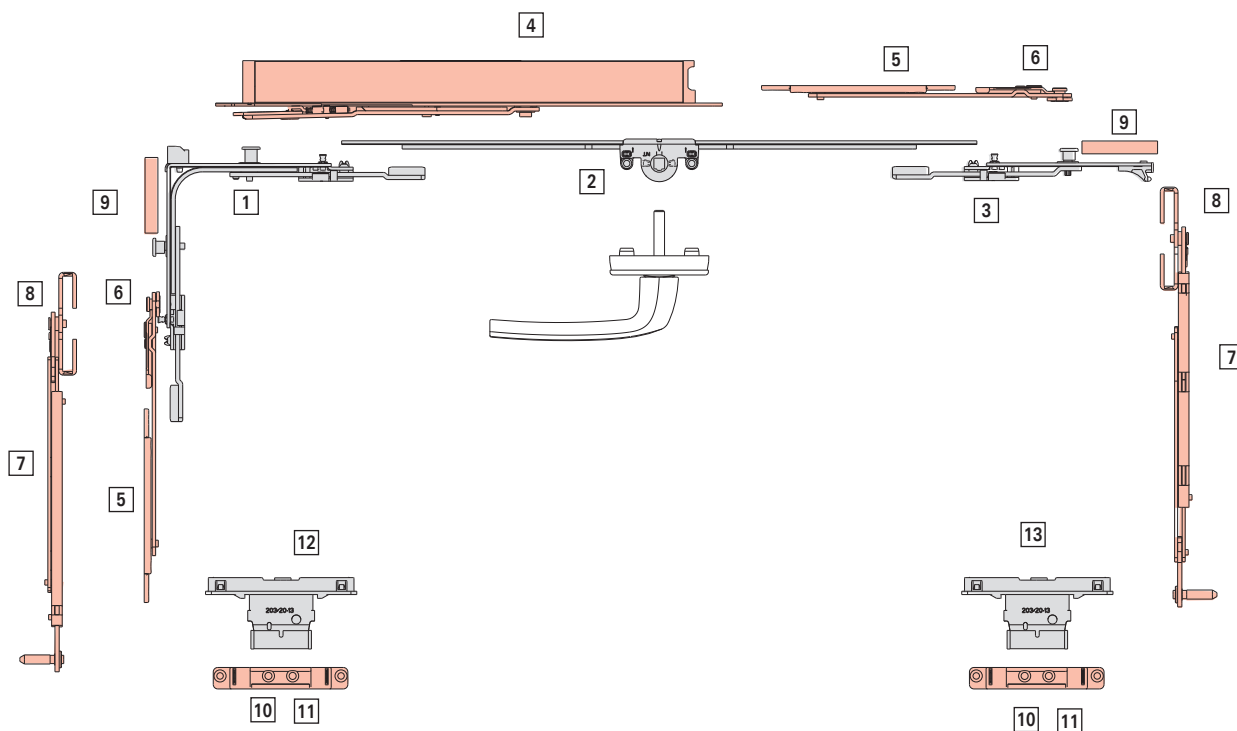
* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).

1) Restrictor and cleaning stay and tilt-stays

SRH	SRW		1001 – 1200		1201 – 1600		1601 – 2000	
	Sort	Type Installation	Sort	Type Installation	Sort	Type Installation	Sort	Type Installation
470 – 700	1x RCS 1	Right	1x RCS 1	Right	1x RCS 1	Right	1x RCS 1	Right
	1x TS	Left	1x TS	Left	1x TS	Left	1x TS	Left
701 – 1200	1x RCS 2	Right	1x RCS 2	Right	1x RCS 2	Right	1x RCS 2	Right
	1x TS	Left	1x TS	Left	1x TS	Left	1x TS	Top

TS = Tilt-stay

RCS = Restrictor and cleaning stay





Application range

Sash rebate width **SRW**..... 451 – 1000 mm

Sash rebate height **SRH**..... 290* – 1200 mm

Sash weight **S.kg**..... max. 60 kg

[1]	Corner drive 1V 1S E-Tec Drive			779677
[2]	T&T espagnolette, centred/variable, backset 15 mm			
	SRH / mm	SRW/mm	Size / mm	Material no.
	290 – 560	451 – 620	400	259718
		621 – 800	400	259718
		801 – 1000	980	289863
	561 – 1200	451 – 620	400	259718
		621 – 800	400	259718
		801 – 1000	980	289863
[3]	Espagnolette connector			282716
[4]	E-Tec Drive (→ p. 18)			779648
[5]	Tilt-stay NT ¹⁾			482823
[6]	Sash hinge-bearing ¹⁾			348277
[7]	Restrictor and cleaning stay ¹⁾			
	SRH / mm	SRW/mm	Type	Material no.
	290 – 560		Type 1	347131
	561 – 1200		Type 2	347132
[8]	Restrictor and cleaning stay, sash-bearing groove ¹⁾			348277
[9]	Striker			
[10]	Stay bearing			
[11]	Stay-bearing pin, not dep.			
[12]	Tilt-Only hinge, with alignment			
[13]	Tilt-Only hinge, without alignment			

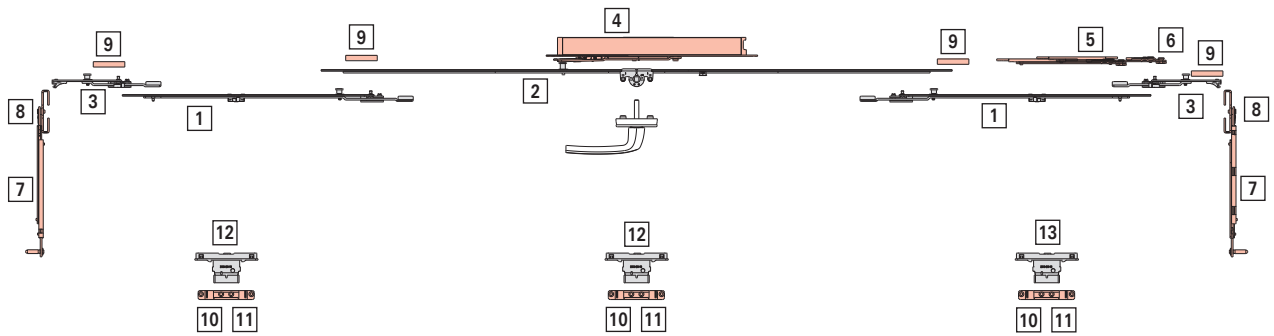
* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).

1) Restrictor and cleaning stay and tilt-stays

SRH	SRW		451 – 620		621 – 800		801 – 1000	
	Sort	Type Installation	Sort	Type Installation	Sort	Type Installation		
290 – 560	1x RCS 1	Right	1x RCS 1	Right	1x RCS 1	Right		
	1x TS	Left	1x TS	Left	1x TS	Left		
561 – 1200	1x RCS 2	Right	1x RCS 2	Right	1x RCS 2	Right		
	1x TS	Left	1x TS	Left	1x RCS 2	Left		
					1x TS	Top		

TS = Tilt-stay

RCS = Restrictor and cleaning stay





Application range

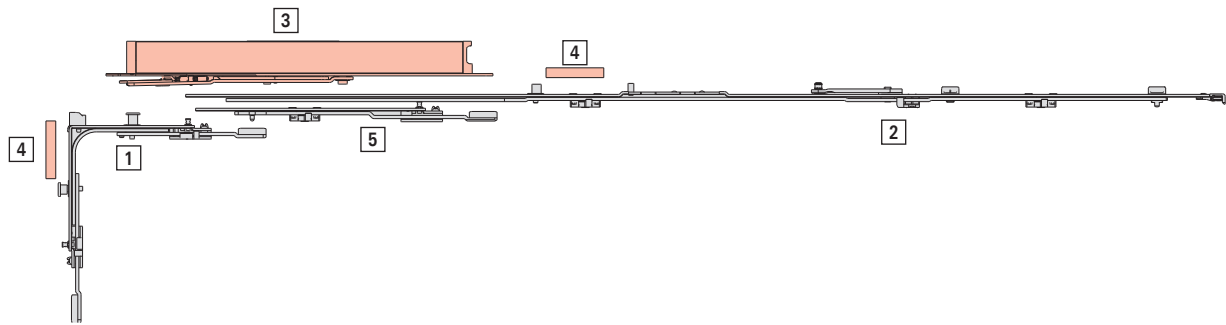
Sash rebate width **SRW**..... 1001 – 2000 mm

Sash rebate height **SRH**..... 290* – 1200 mm

Sash weight **S.kg**..... max. 60 kg

[1] Centre lock			
SRH / mm	SRW / mm	Size / mm	Material no.
290 – 560	1001 – 1200	-	-
	1201 – 1600	200	308267
	1601 – 2000	400	622881
561 – 1200	1001 – 1200	-	-
	1201 – 1600	200	308267
	1601 – 2000	400	779677
[2] T&T espagnolette, centred/variable, backset 15 mm			
SRH / mm	SRW / mm	Size / mm	Material no.
290 – 560	1001 – 1200	980	779679
	1201 – 1600	980	779679
	1601 – 2000	980	779679
561 – 1200	1001 – 1200	980	779679
	1201 – 1600	980	779679
	1601 – 2000	980	289863
[3] Espagnolette connector			282716
[4] E-Tec Drive (→ p. 18)			779648
[5] Tilt-stay NT			482823
[6] Sash hinge-bearing			348277
[7] Restrictor and cleaning stay			
SRH / mm	SRW / mm	Type	Material no.
290 – 560	1001 – 2000	Type 1	347131
561 – 1200	1001 – 2000	Type 2	347132
[8] Restrictor and cleaning stay, sash-bearing groove			348277
[9] Striker			
[10] Stay bearing			
[11] Stay-bearing pin, not dep.			
[12] Tilt-Only hinge, with alignment			
[13] Tilt-Only hinge, without alignment			

* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).



**Application range**

Sash rebate width **SRW**..... 690 – 1400 mm
 Sash rebate height **SRH**..... 361* – 2400 mm
 Sash weight **S.kg**..... max. 100 kg

Hinge side K / A / E5			
[1]	Corner drive 1V 1S E-Tec Drive		779677
[2]	Stay guide		
	SRH / mm	SRW/mm	Material no.
	360	690	260204
	500	890	260208
	500	1290	260215
[3]	E-Tec Drive (→ p. 18)		779648
[4]	Striker		
[5]	Centre lock		
	SRH / mm	SRW/mm	Size / mm
	361 – 2400	690 – 800	-
		801 – 1000	200
		1001 – 1200	200
		1201 – 1400	-
			Material no.
			308267
			308267
			308267

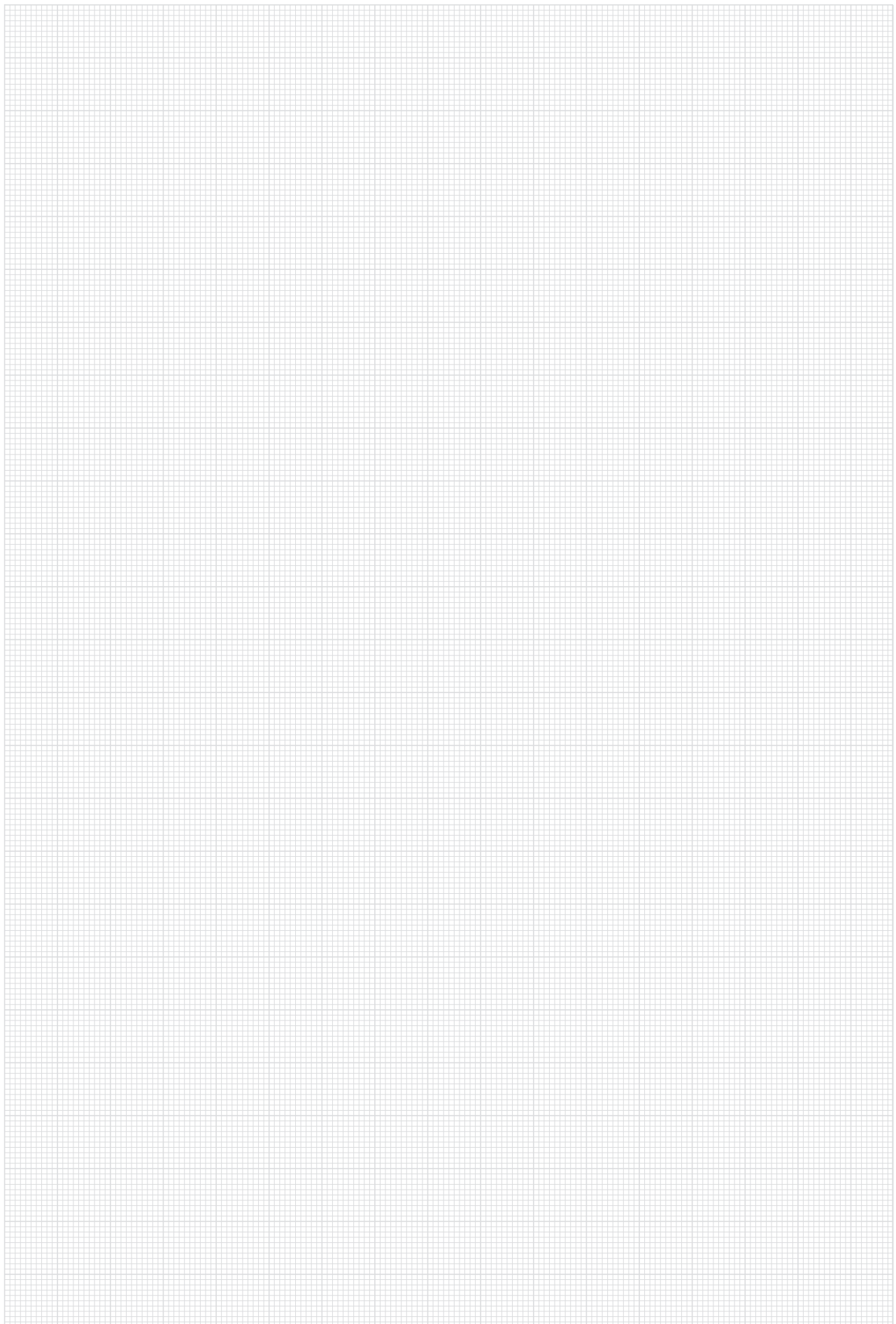
* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).

Application range

Sash rebate width **SRW**..... 690 – 1400 mm
 Sash rebate height **SRH**..... 361* – 2400 mm
 Sash weight **S.kg**..... max. 80 kg

Designo HA 13 mm			
[1]	Corner drive 1V 1S E-Tec Drive		779677
[2]	Stay guide		
	SRH / mm	SRW/mm	Material no.
	360	690	385394
	500	890	385415
	500	1290	385416
[3]	E-Tec Drive (→ p. 18)		779648
[4]	Striker		
[5]	Centre lock		
	SRH / mm	SRW/mm	Size / mm
	361 – 2400	690 – 800	-
		801 – 1000	200
		1001 – 1200	200
		1201 – 1400	-
			Material no.
			308267
			308267
			308267

* if below SRH 600, reduce tilt-depth to 80 mm (programming of E-Tec Drive necessary).




Hinge side AL¹⁾
Tilt-First

SW	740 – 1600	Clearance	11.5 mm
SH	635 – 2400		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

Tilt-Only, handle non-centred (with Roto E-Tec Drive DIN R)

SW	680 – 1600	Clearance	11.5 mm
SH	635 – 1300		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

Tilt-Only, handle centred (with Roto E-Tec Drive DIN R)

SW	1008 – 1600	Clearance	11.5 mm
SH	1008 – 1300		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

Hinge side AL Designo²⁾
Tilt-First

SW	830 – 1600	Clearance	11.5 mm
SH	635 – 2400		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

Tilt-Only, handle non-centred (with Roto E-Tec Drive DIN R)

SW	680 – 1600	Clearance	11.5 mm
SH	635 – 1300		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

Tilt-Only, handle centred (with Roto E-Tec Drive DIN R)

SW	1008 – 1600	Clearance	11.5 mm
SH	1008 – 1300		

S.kg_{max.}: Roto E-Tec Drive can be used for a max. sash weight of 100 kg. The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.

Maximum operating torque 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Maximum sash area (SW x SH) 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request.

1) 1) Only with flush-encased gearbox without mishandling device

2) 2) Only with flush-encased gearbox without mishandling device and tilt-depth reduction


WARNING!

The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.

Installation

Roto E-Tec Drive for aluminium profiles

Routing out window frame / Preparing connecting-rods

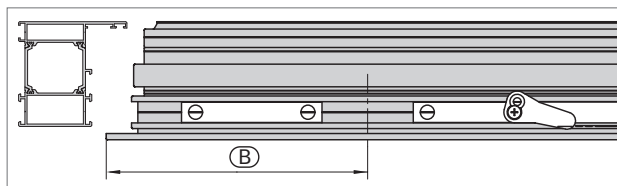
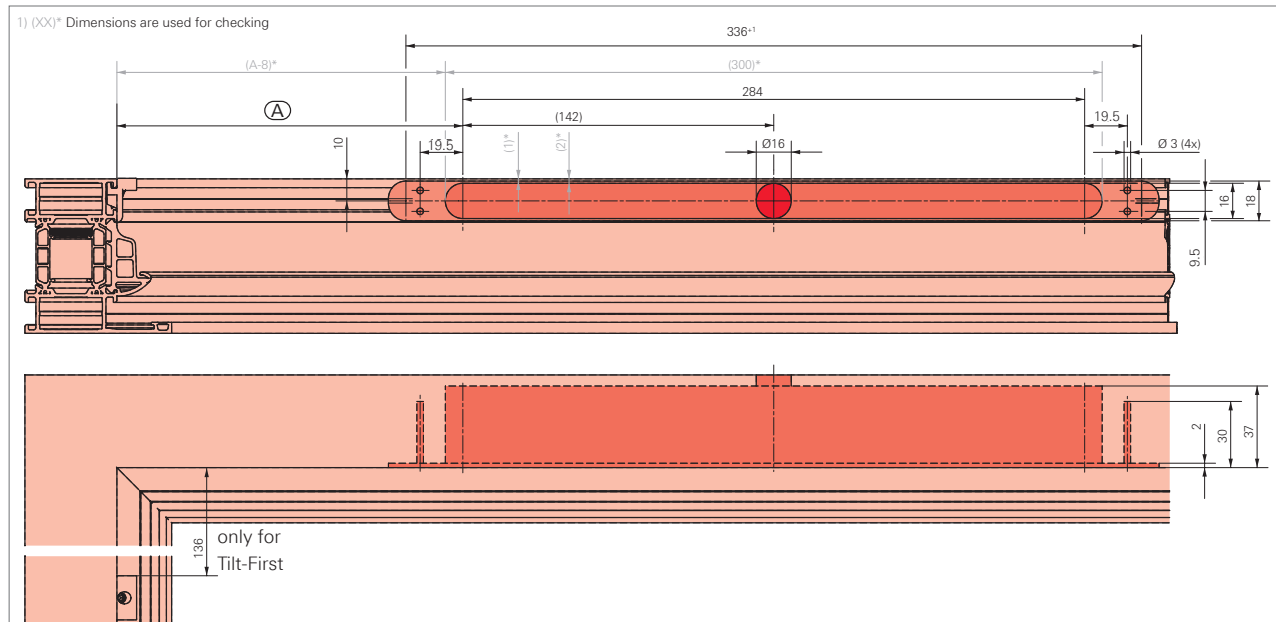
Drilling and routing dimensions

Opening type	Espagnolette position	(A) / mm	(B) / mm
Tilt-First		158	
Tilt-Only	non-centred	SW - 380	SW - 504
	centred	SW/2 + 124	SW/2

1. Drilling and routing dimensions for right-handed Tilt-First and Tilt-Only windows (implementation for Tilt-First windows fitted on the left as mirror image).

(A) Position milling pocket motor

(B) Position espagnolette / Handle axis



Espagnolette position Tilt-Only sash



NOTE!

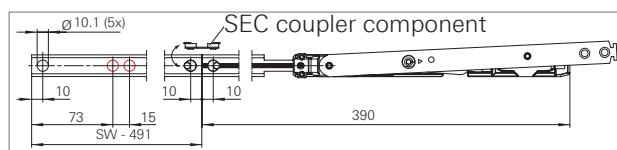
Routing channel must be cleaned from chips and other dirt after routing.

2. Provide upper connecting-rod(s) with additional holes for the adapter.

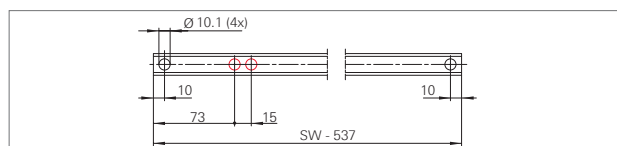
AL TF

Connecting-rod [T3] in combination with small sash stay.

The SEC coupler component (mat. no. **348576**) connects the connecting-rod with the sash stay.

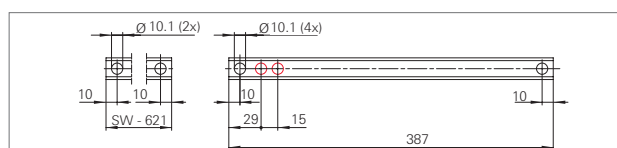


Connecting-rod [T3] in combination with large sash stay.

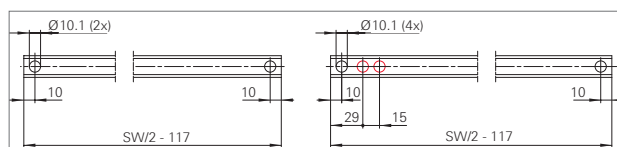


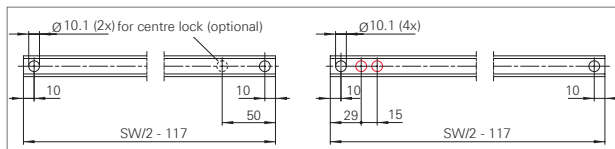
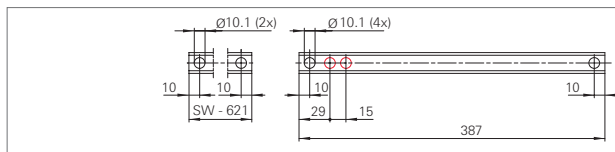
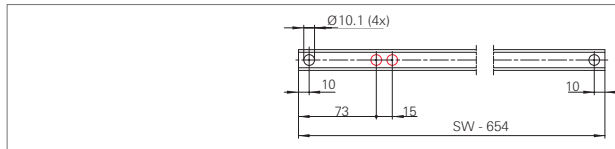
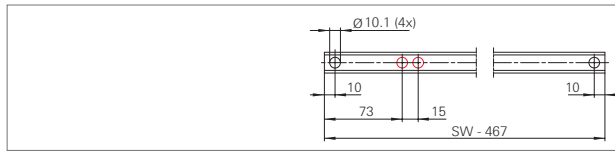
AL TI-ON

Connecting-rods [T1] and [T2] in combination with non-centred espagnolette.



Connecting-rods [T1] and [T2] in combination with centred espagnolette.





AL Designo TF

Connecting-rod **T3** in combination with sash stay 500 and corner drive without mishandling device.

Connecting-rod **T3** in combination with sash stay 735 and corner drive without mishandling device.

AL Designo TI-ON

Connecting-rods **T1** and **T2** in combination with non-centred espagnolette

Connecting-rods **T1** and **T2** in combination with centred espagnolette

3. Attach surround frame and sash.

Observe specific sizes for TF sash stay with AL.

Observe specific sizes for TF sash stay (and scissor-stay guide) for AL Designo.

AL TF

Sash stay

SW/mm	Material no.
≤ 914	728969
≥ 915	728970

AL Designo TF

Sash stay and scissor-stay guide

SW / mm	Description	DIN	PQ	Material no.
≥ 1035	TF scissor-stay guide 735	L/R	10	626999
	Sash stay 735 no. 1	L	10	624947
	Sash stay 735 no. 1	R	10	624946
	Sash stay 735 no. 3	L	10	624953
	Sash stay 735 no. 3	R	10	624952
	Sash stay 735 no. 4	L	10	624959
	Sash stay 735 no. 4	R	10	624958
≤ 1034	TF scissor-stay guide 500	L/R	10	625025
	Sash stay 500 no. 1	L	10	624945
	Sash stay 500 no. 1	R	10	624944
	Sash stay 500 no. 3	L	10	624951
	Sash stay 500 no. 3	R	10	624950
	Sash stay 500 no. 4	L	10	624957
	Sash stay 500 no. 4	R	10	624956



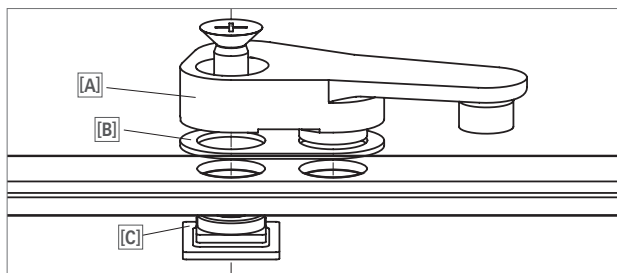
NOTE!

All other hardware components see installation instructions for AL and AL Designo.

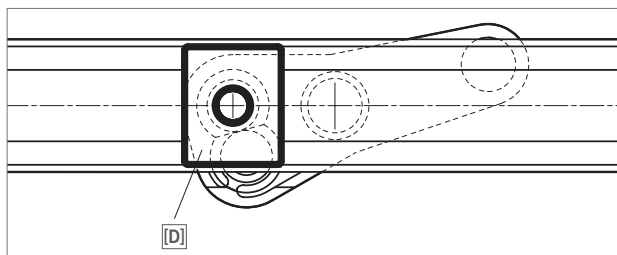
Installation

Roto E-Tec Drive for aluminium profiles

Installing Roto E-Tec Drive



- [A] Adapter
- [B] Packer
- [C] Connector



- [D] Connector perpendicular to connecting-rod!

4. E-Tec Drive installation set: Fasten adapter, packer and connector on upper connecting-rod with screw.

Watch orientation of adapter and connector.

Depicted adapter orientation Roto E-Tec Drive, DIN R.

View from below, DIN R.

5. Insert Roto E-Tec Drive in routed area of surround frame and support on side if necessary so that base plate is flush with fold edge.
Fasten to the frame with the four included aluminium-specific screws.
6. Hinge the sash.



NOTE!

Consider the other applicable documents for the window installation on page 18 .

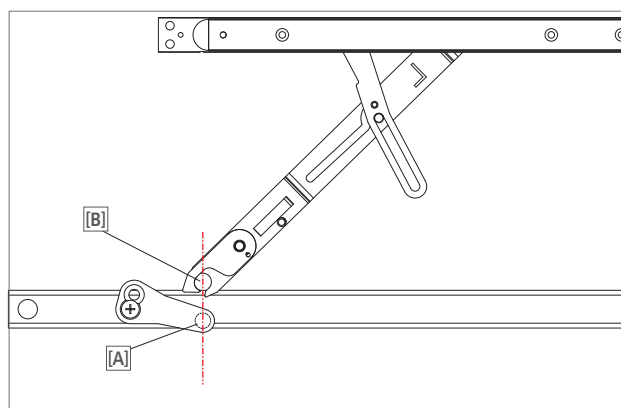


WARNING!

Risk of injury from windows which are tilting down (Tilt-Only sash)!

The hardware can be unlocked by wrong installation or incorrect operation which can lead to the window sash falling out, if no restrictor and cleaning stay is mounted on the Tilt-Only sash.

Restrictor and cleaning stays must be installed for Tilt-Only sashes if none are present.



[A] Backset of adapter

[B] Accommodation of the Roto E-Tec Drive

7. Check installation visually:

Bring sash manually into a tilting position. Then drive up the Roto E-Tec Drive and check the alignment between the backset of the adapter [A] and the Roto E-Tec Drive accommodation [B] from above. [A] and [B] must align exactly (see illustration). Then, the drive is adjusted correctly.

If the alignment between [A] and [B] is not correct, the position of the drive in the frame must be corrected.

Representation: DIN R

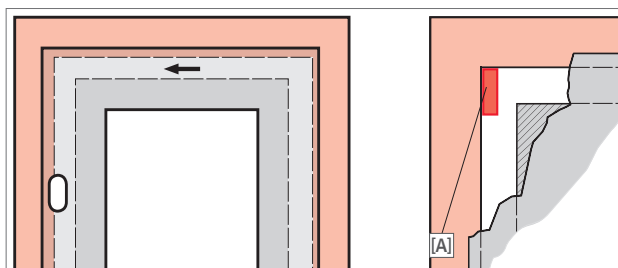


NOTE!

When checking the alignment between the Roto E-Tec Drive accommodation and the backset of the adapter, no tensioning may occur. Mechanical tensioning can damage the mechanism of the scissor stay and result in a defect of the drive.

9. Continue with initial operation (see p. 64).

10. Insert filled-out turn-over report, mounting and operating instructions in adhesive pouch and apply to window.

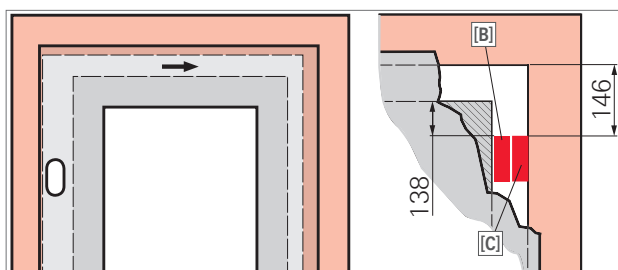


Locking and unlocking by the Roto E-Tec Drive can lead to horizontal movements of the sash. If this happens, carry out stabilising measures.

Case A: Sash is pushed when unlocking.

Common in: light sashes, $SH > SW$,

$SH_{Tilt-Only} < SW_{Tilt-Only}$

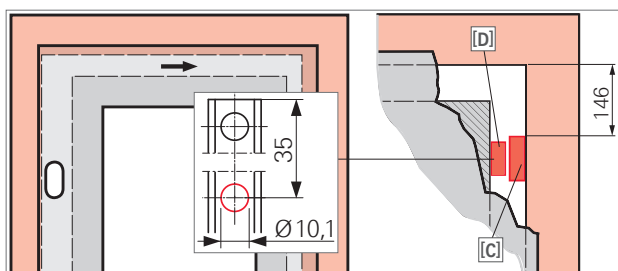


Case B: Sash is pulled when locking.

Common in: light sashes, $SH > SW$,

$SH_{Tilt-Only} < SW_{Tilt-Only}$

AL without corner drive

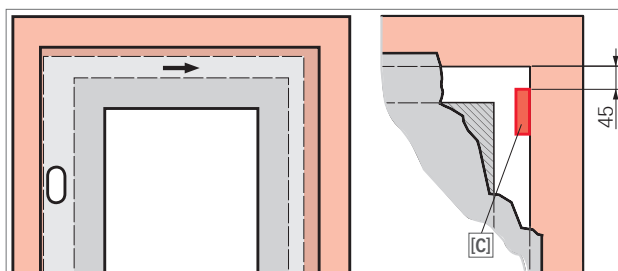


AL with corner drive

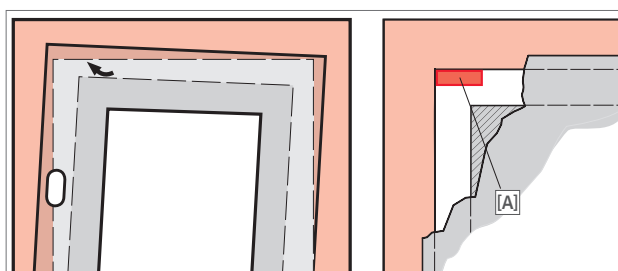


NOTE!

For the clearance reduction (material no. 477408) on the sash side, place an additional hole $\varnothing 10,1$ mm in connecting-rod T4.



AL Designo



Case C: Sash is lifted when locking.

Common in: light sashes, $SH < SW$

[A] Run-up wedge V.01 / V.02

[B] Run-up block

[C] Clearance reduction frame

[D] Clearance reduction sash



NOTE!

Also see depictions in parts list on p. 19.

**Hardware-technical requirements:**

- Corner drive E-Tec with run-up block (1)
- Insert striker to the side (2)
- Stay arm / stay guide (see table p. 33) (3)
- Do not install lifting mishandling device. If required, use a sash lifter (4) with the corresponding frame part (5).

If necessary:

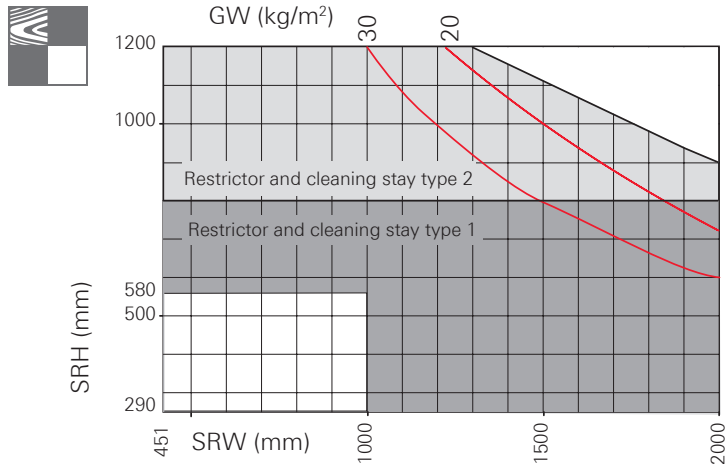
- Centre lock CL 200 CON (see table p. 33)
- Turn lock, surface-mounted
- System-specific run-up wedges for clearance reduction



Installation

Roto E-Tec Drive for timber / PVC profiles

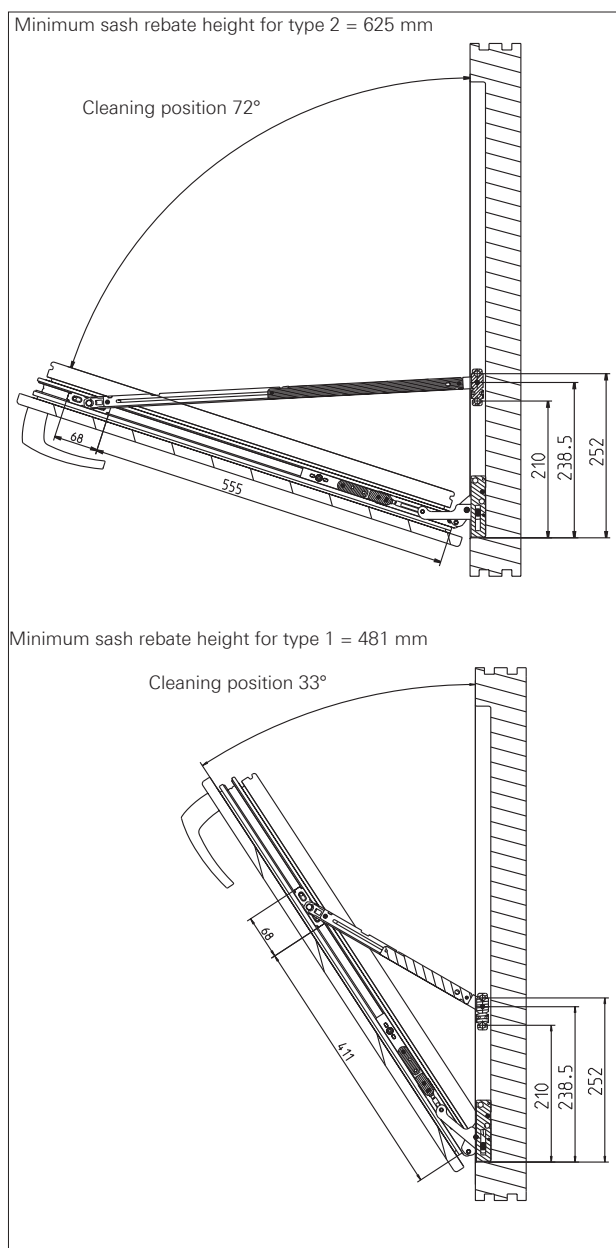
Application range TI-ON – Roto NT Designo HA 13 mm



The information in the application diagram refers to the glass weight in kg/m².

1 mm/m² glass thickness = 2.5 kg

= Impermissible application range



Tilt-Only sash, hinge side NT Designo HA 13 mm (with rebate hinge and two restrictor and cleaning stays)

Max. operating torque: 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Max. sash area (SRW x SRH): 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request



ADVICE!

- Roto E-Tec Drive S.kg_{max.} 60 kg
The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.
- Screw-fixing only in steel.
- Assembly only in connection with restrictor and cleaning stays or tilt-stays.



WARNING!

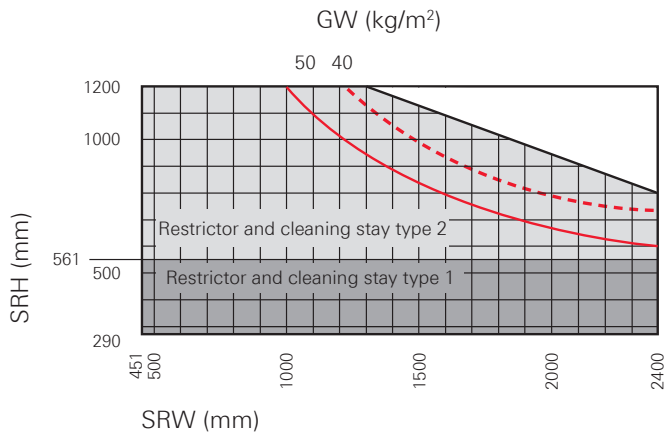
Loss of function due to deformation of drive parts!

The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive. Always comply with recommended sash dimensions in accordance with the application diagram. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.



ADVICE!

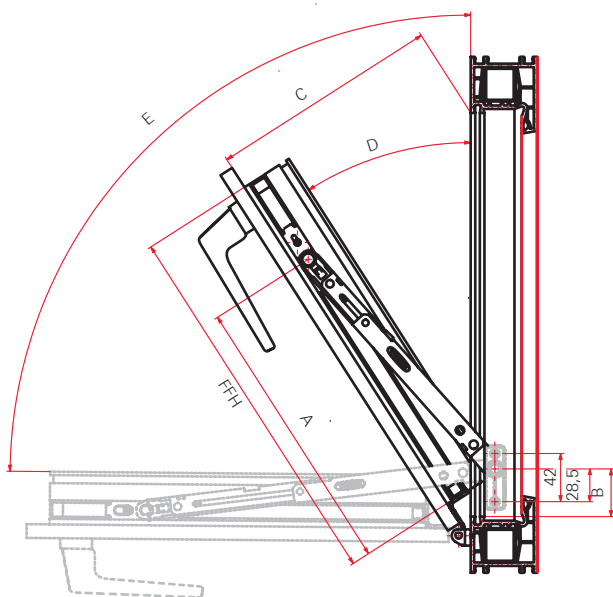
- Observe clearance 12 – 14 mm at the top.
- For low tilt-depths, observe free turning of the E-Tec Drive via the sash rebate.
- Central gasket systems should be preferred.
- If the sash rebate height is below 600 mm, reduce the tilt-depth of the E-Tec Drive to 80 mm (programming of E-Tec Drive necessary).
- Ensure the hardware is running smoothly.



The information in the application diagram refers to the glass weight in kg/m².

1 mm/m² glass thickness = 2.5 kg

□□□ = Impermissible application range



Tilt-Only sash, hinge side NT, K, A and E5 (with rebate hinge and two restrictor and cleaning stays)

Max. operating torque: 7.5 Nm ($\triangleq$ displacement force $\approx$ 750 N)

Max. sash area (SRW x SRH): 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request



ADVICE!

- Roto E-Tec Drive S.kg_{max.} 60 kg
The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.
- Screw-fixing only in steel.
- Assembly only in connection with restrictor and cleaning stays or tilt-stays.



WARNING!

Loss of function due to deformation of drive parts!

The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive. Always comply with recommended sash dimensions in accordance with the application diagram. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.



ADVICE!

- Observe clearance 12 – 14 mm at the top.
- For low tilt-depths, observe free turning of the E-Tec Drive via the sash rebate.
- Central gasket systems should be preferred.
- If the sash rebate height is below 600 mm, reduce the tilt-depth of the E-Tec Drive to 80 mm (programming of E-Tec Drive necessary).
- Ensure the hardware is running smoothly.

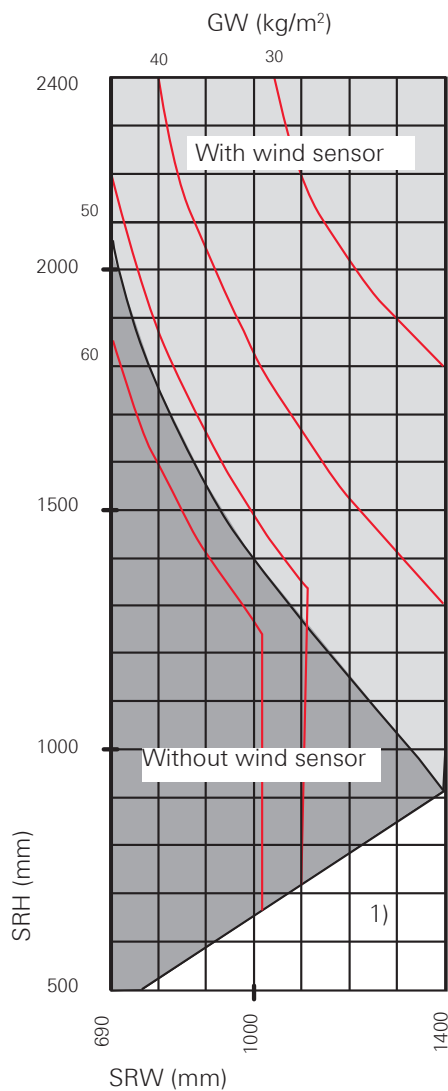
Application range for restrictor and cleaning stay type 1 and type 2

Sash rebate height SRH	Restrictor and cleaning stay type	Sash hinge bearing position A	Frame hinge bearing position B	Tilt-depth restrictor position C	Opening angle restrictor position D	Opening angle cleaning position E
290 – 400	Type 1	250	45	180–245	33°	90°
401 – 560	Type 1	280	75	205–275	27°	67°
561 – 700	Type 2	525	170	225–277	22°	88°
701 – 850	Type 2	575	220	244–292	19°	72°
851 – 1200	Type 2	625	270	261–363	17°	62°

Installation

Roto E-Tec Drive for timber / PVC profiles

Application range TF – Roto NT Designo HA 13 mm



1) Window formats and weights deviating from the application diagram must be approved by Roto.

The information in the application diagram refers to the glass weight in kg/m².

1 mm/m² glass thickness = 2.5 kg

□□□ = Impermissible application range

Tilt-First sash, hinge side NT Designo HA 13 mm

Maximum operating torque 7.5 Nm ($\triangle$ displacement force $\approx$ 750 N)

Maximum sash area (SRW x SRH): 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request



NOTE!

Roto E-Tec Drive S.kg_{max.} 80 kg

The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.



WARNING!

Loss of function due to deformation of drive parts!

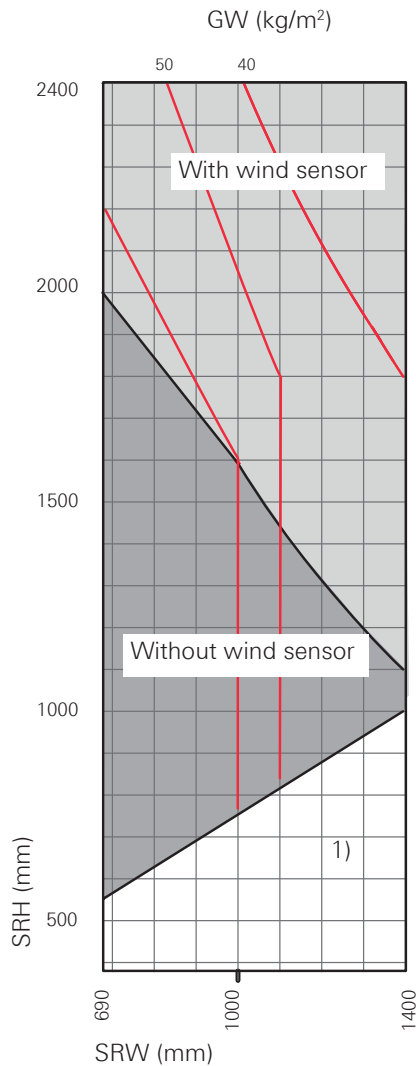
The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive.

Always comply with recommended sash dimensions in accordance with the application diagram. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.



ADVICE!

- Observe clearance 12 – 14 mm at the top.
- For low tilt-depths, observe free turning of the E-Tec Drive via the sash rebate.
- Central gasket systems should be preferred.
- If the sash rebate height is below 600 mm, reduce the tilt-depth of the E-Tec Drive to 80 mm (programming of E-Tec Drive necessary).
- Ensure the hardware is running smoothly.



1) Window formats and weights deviating from the application diagram must be approved by Roto.

The information in the application diagram refers to the glass weight in kg/m².

1 mm/m² glass thickness = 2.5 kg

□□□ = Impermissible application range

Tilt-First sash, hinge side NT Designo HA 13 mm

Maximum operating torque 7.5 Nm ($\triangle$ displacement force $\approx$ 750 N)

Maximum sash area (SRW x SRH): 1.44 m² at wind speed 10 m/s

Larger formats (only with wind sensor) upon request



NOTE!

Roto E-Tec Drive S.kg_{max.} 100 kg

The sash weight varies depending on the hardware. Therefore, the application diagram of the hardware must be observed.



WARNING!

Loss of function due to deformation of drive parts!

The non-compliance of the recommended sash dimensions can lead to deformations and a loss of the functions of the Roto E-Tec Drive. Always comply with recommended sash dimensions in accordance with the application diagram. The non-compliance with recommended sash dimensions results in a warranty loss for the Roto E-Tec Drive.



ADVICE!

- Observe clearance 12 – 14 mm at the top.
- For low tilt-depths, observe free turning of the E-Tec Drive via the sash rebate.
- Central gasket systems should be preferred.
- If the sash rebate height is below 600 mm, reduce the tilt-depth of the E-Tec Drive to 80 mm (programming of E-Tec Drive necessary).
- Ensure the hardware is running smoothly.

Installation

Roto E-Tec Drive for timber / PVC profiles

Suitable hardware components TF

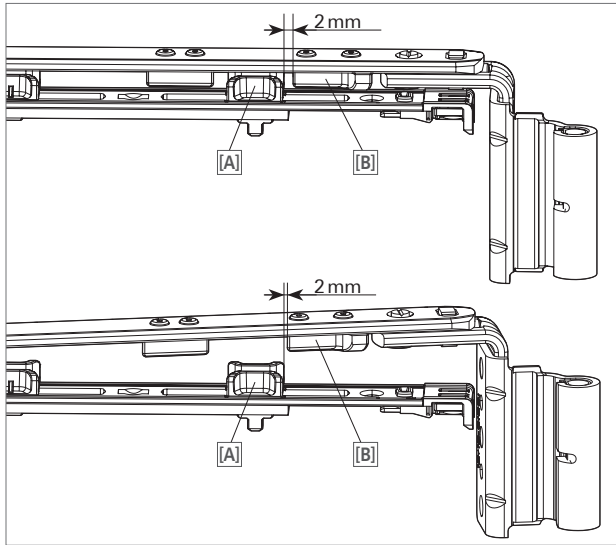


Illustration: Tilt-First sash stay and scissor-stay guide

[A] Striker-entry

[B] Taper action

Check installation situation Roto NT:

- Taper action / striker-entry



NOTE!

When moving from locking/unlocking to tilting, there must be a clearance of at least 2 mm between the fixed and moving parts of the hardware.

Suitable hardware components Tilt-First



NOTE!

All other hardware components see installation instructions for Roto NT and Roto NT Designo axis 13 mm.



1. Carry out routing for window frame and cable feedthrough hole at the individual profile component in accordance with routing pattern. If the rebate depth is insufficient, leave out the areas of the mounting flange in the window frame.
2. Pull in cable. The cable has to poke out approx. 20 cm from the centre of the routing.
3. Position the cable with the plug into the Roto E-Tec Drive and insert it into the strain relief clamp.
4. Position the Roto E-Tec Drive into the routing and fasten on using 3 of the supplied screws 3.9 x 25.



NOTE!

If the clearance is too large, use the supplied installation base to correct the position of the drive.

5. Hinge the sash.



NOTE!

Consider the other applicable documents for the window installation on page 18.

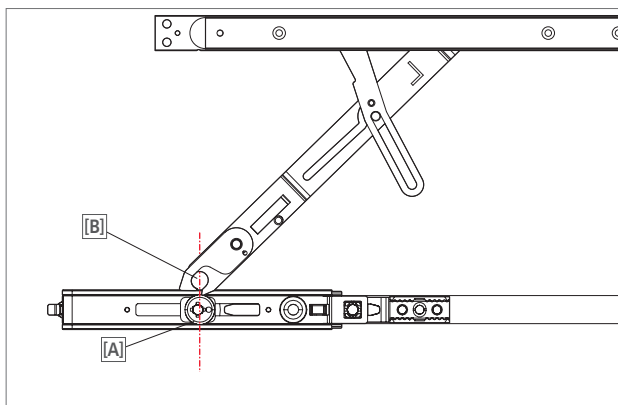


WARNING!

Risk of injury from windows which are tilting down (Tilt-Only sash)!

The hardware can be unlocked by wrong installation or incorrect operation which can lead to the window sash falling out, if no restrictor and cleaning stay is mounted on the Tilt-Only sash.

Restrictor and cleaning stays must be installed for Tilt-Only sashes if none are present.



[A] Cam

[B] Accommodation of the Roto E-Tec Drive

6. Check installation visually:

Bring sash manually into a tilting position. Then drive up the Roto E-Tec Drive (see p. 64) and check the alignment between the cam [A] and the Roto E-Tec Drive accommodation [B] from above. [A] and [B] must align exactly (see illustration). Then, the drive is adjusted correctly.

If the alignment between [A] and [B] is not correct, the position of the drive in the frame must be corrected.

Representation: DIN R



NOTE!

- When checking the alignment between the Roto E-Tec Drive accommodation and the cam, no tensioning may occur. Mechanical tensioning can damage the mechanism of the scissor stay and result in a defect of the drive.
- Before the initial operation of the Roto E-Tec Drive, ensure that the hardware can be operated easily by hand. Non-compliance will lead to a defect of the drive.

7. Continue with initial operation (see p. 64).

8. Insert filled-out turn-over report, mounting and operating instructions in adhesive pouch and apply to window.



Routing dimensions for the Roto E-Tec Drive in window frame for Tilt-First sash:

Roto E-Tec Drive is installed above the corner drive.

The figures show the routing dimensions for left-handed windows; routing dimensions for windows fitted on the right as mirror image.



NOTE!

Routing channel must be cleaned from chips and other dirt after routing.

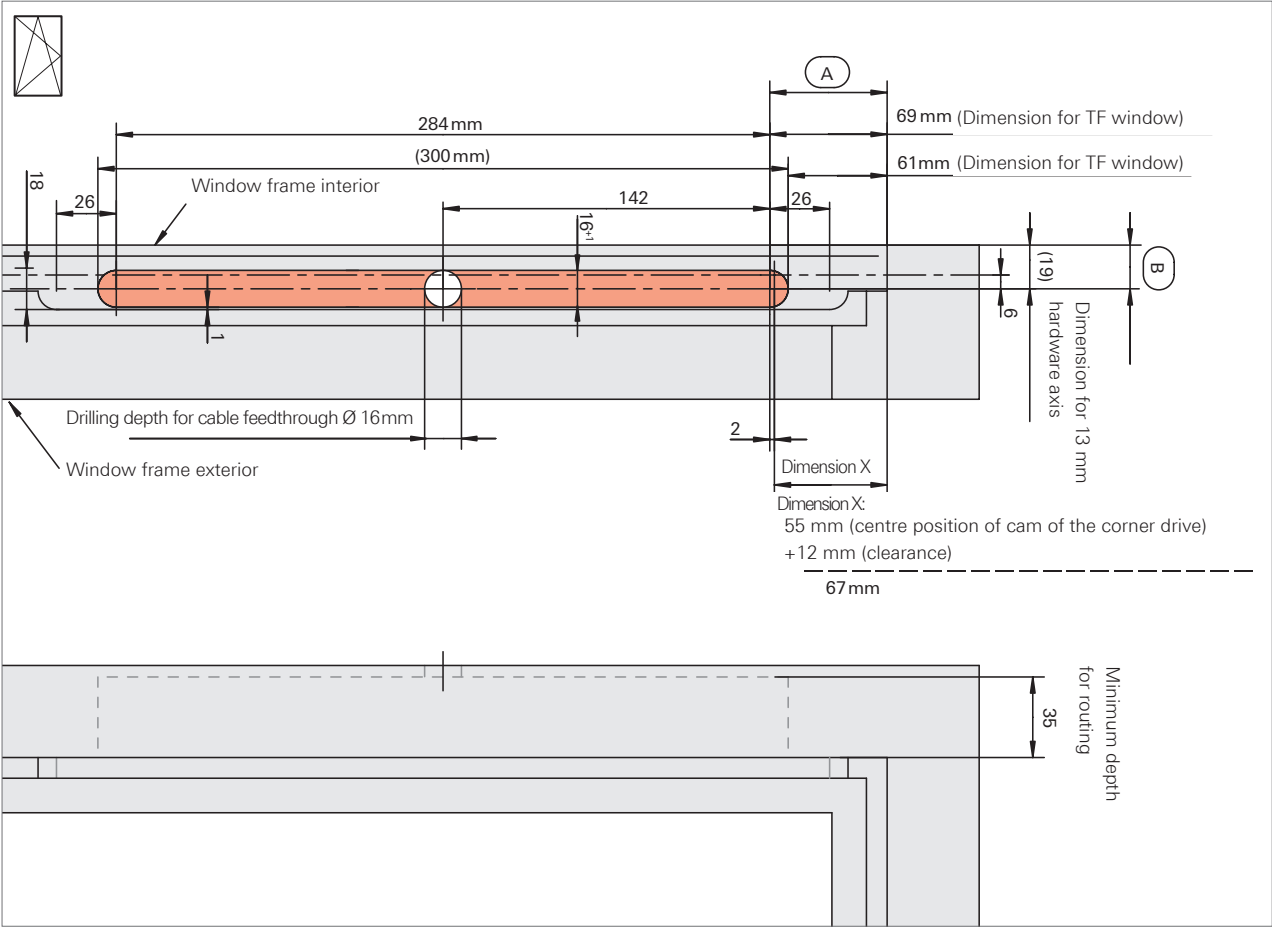


Illustration: Installation dimensions / routing dimensions for window fitted on the left (frame)

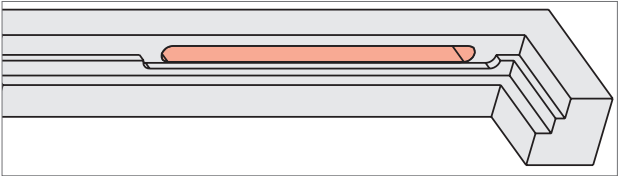


Illustration: 3D view – Corner window frame

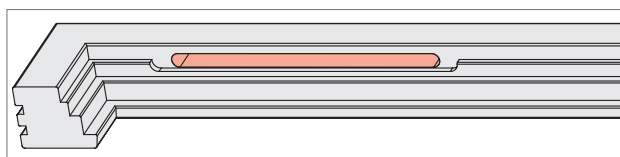
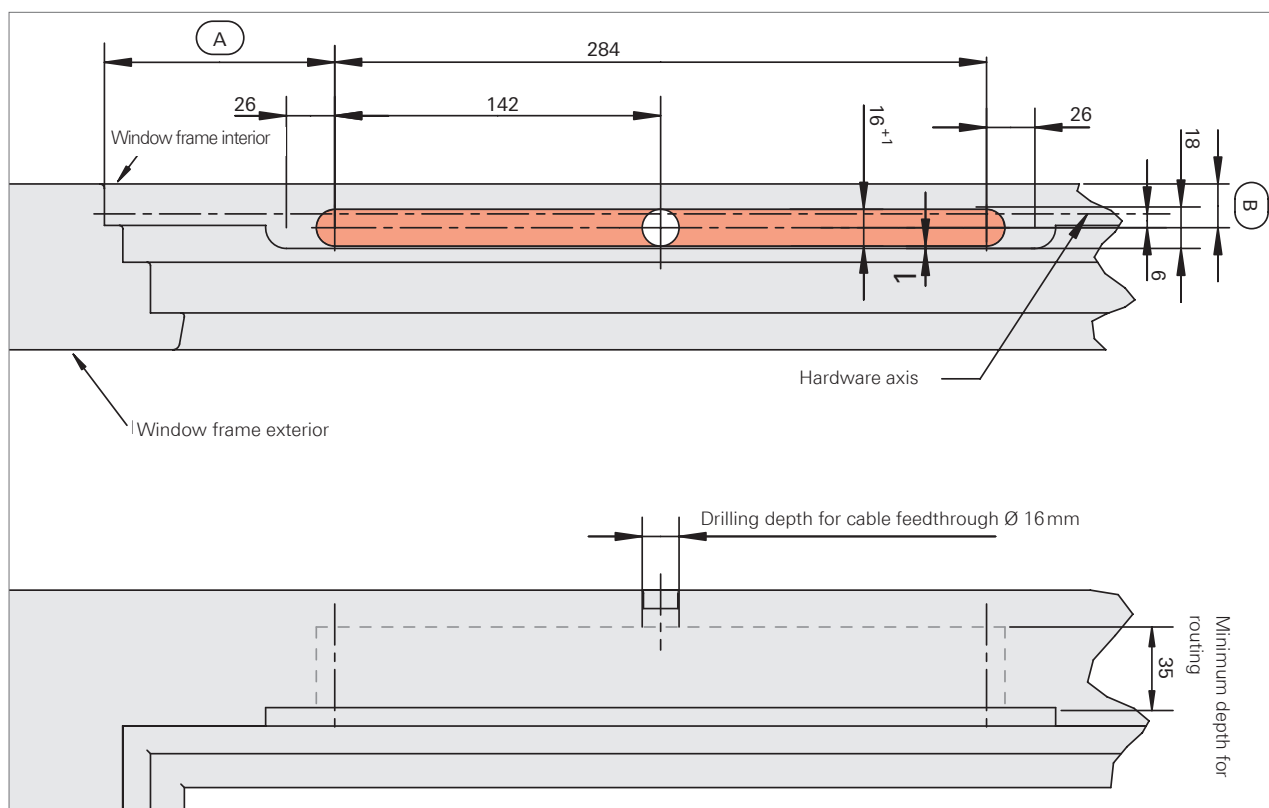
Axis dimension	A ₂₅	B ₂₅
9	69	15
13	69	19

Routing dimensions for the Roto E-Tec Drive in window frame for Tilt-Only sash:



NOTE!

Routing channel must be cleaned from chips and other dirt after routing.

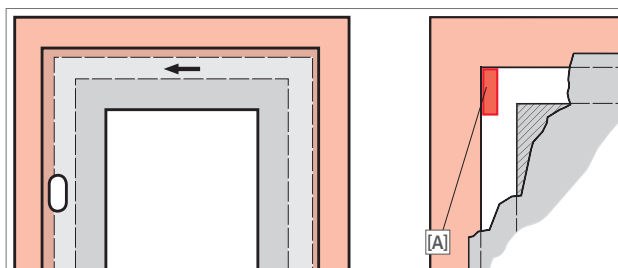


SRW/mm	Routing dimension A from left frame corner	Routing dimension B from left frame corner	
		9 mm axis dimension	13 mm axis dimension
451 – 1000	69	15	19
1001 – 2000	SRW/2-102	15	19

- The routing dimensions assume an exact centre position of the drive.
- At the indicated positions, always a Roto E-Tec Drive right is installed.
- The locking cam of the espagnolette must always be positioned on the left of the sash centre.



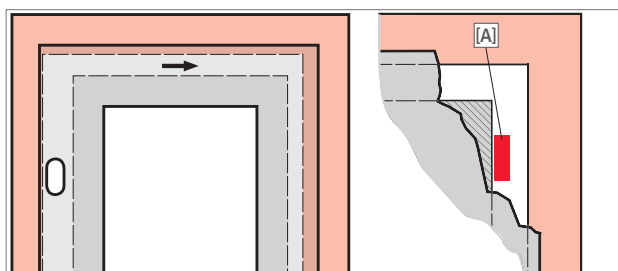
Locking and unlocking by the Roto E-Tec Drive can lead to horizontal movements of the sash. If this happens, carry out stabilising measures.



Case A: Sash is pushed when unlocking.

Common in: light sashes, $SH > SW$,

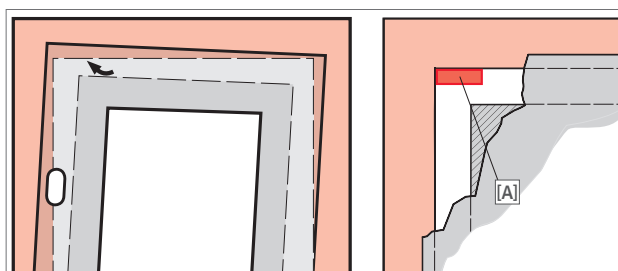
$SH_{Tilt-Only} < SW_{Tilt-Only}$



Case B: Sash is pulled when locking.

Common in: light sashes, $SH > SW$,

$SH_{Tilt-Only} < SW_{Tilt-Only}$



Case C: Sash is lifted when locking.

Common in: light sashes, $SH < SW$

[A] Run-up block



Delivery state of the Roto E-Tec Drive

For the delivery state, the Roto E-Tec Drive is in the position "Window locked". It must be installed into the window frame in this state.

Installation of the Roto E-Tec Drive in PVC frames

The following installation processes must be integrated into the window-construction manufacturing steps for the Roto E-Tec Drive.



DANGER!

Danger to life when routing in steel reinforced PVC!

Routing in steel reinforced PVC can lead to death or serious injuries. The PVC profile and steel reinforcement must be routed separately.

1. Carry out routing for window frame in PVC profile as individual profile component without steel reinforcement. Leave out steel reinforcement of window frame separately.
2. Leave out steel reinforcement in accordance with routing pattern.
3. Protect the offset punching of the steel reinforcement from corrosion. Please note: Rust danger!
4. Insert steel reinforcement into PVC profile and screw in. Position steel reinforcement so that the Roto E-Tec Drive can be screwed into the steel reinforcement.
5. Pull in cable. The cable has to poke out approx. 20 cm from the centre of the routing.
6. Position the cable with the plug into the Roto E-Tec Drive and insert it into the strain relief clamp.
7. Position Roto E-Tec Drive in the routing, use the supplied packers so that the contact surface of the mounting flange is level with the interior edge of the window frame.
8. Fasten on the Roto E-Tec Drive using the 3 supplied screws 3.9 x 25.



NOTE!

It must be screwed into the steel reinforcement on every side of the device with at least one (1) screw.



NOTE!

If the clearance is too large, use the supplied installation base to correct the position of the drive.



9. Hinge the sash.



NOTE!

Consider the other applicable documents for the window installation on page 18.

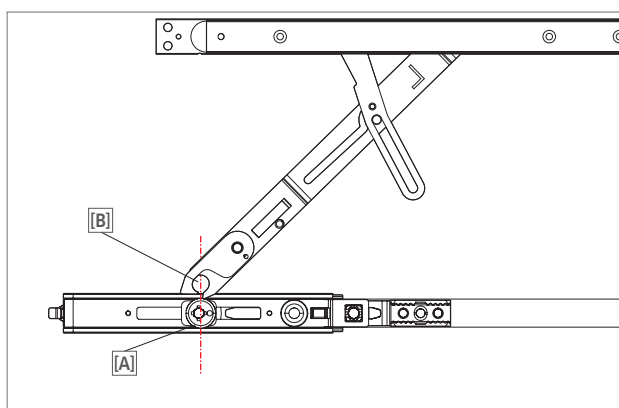


WARNING!

Risk of injury from windows which are tilting down (Tilt-Only sash)!

The hardware can be unlocked by wrong installation or incorrect operation which can lead to the window sash falling out, if no restrictor and cleaning stay is mounted on the Tilt-Only sash.

Restrictor and cleaning stays must be installed for Tilt-Only sashes if none are present.



[A] Cam

[B] Accommodation of the Roto E-Tec Drive

10. Check installation visually:

Bring sash manually into a tilting position. Then drive up the Roto E-Tec Drive (see p. 64) and check the alignment between the cam [A] and the Roto E-Tec Drive accommodation [B] from above. [A] and [B] must align exactly (see illustration). Then, the drive is adjusted correctly.

If the alignment between [A] and [B] is not correct, the position of the drive in the frame must be corrected.

Representation: DIN R



NOTE!

When checking the alignment between the Roto E-Tec Drive accommodation and the cam, no tensioning may occur. Mechanical tensioning can damage the mechanism of the scissor stay and result in a defect of the drive.

10. Continue with initial operation (see p. 64).

11. Insert filled-out turn-over report, mounting and operating instructions in adhesive pouch and apply to window.

Routing dimensions for the Roto E-Tec Drive in window frame for Tilt-First sash:

Roto E-Tec Drive is installed above the corner drive. The figures show the routing dimensions for left-handed windows; routing dimensions for windows fitted on the right as mirror image.



NOTE!

Routing channel must be cleaned from chips and other dirt after routing.

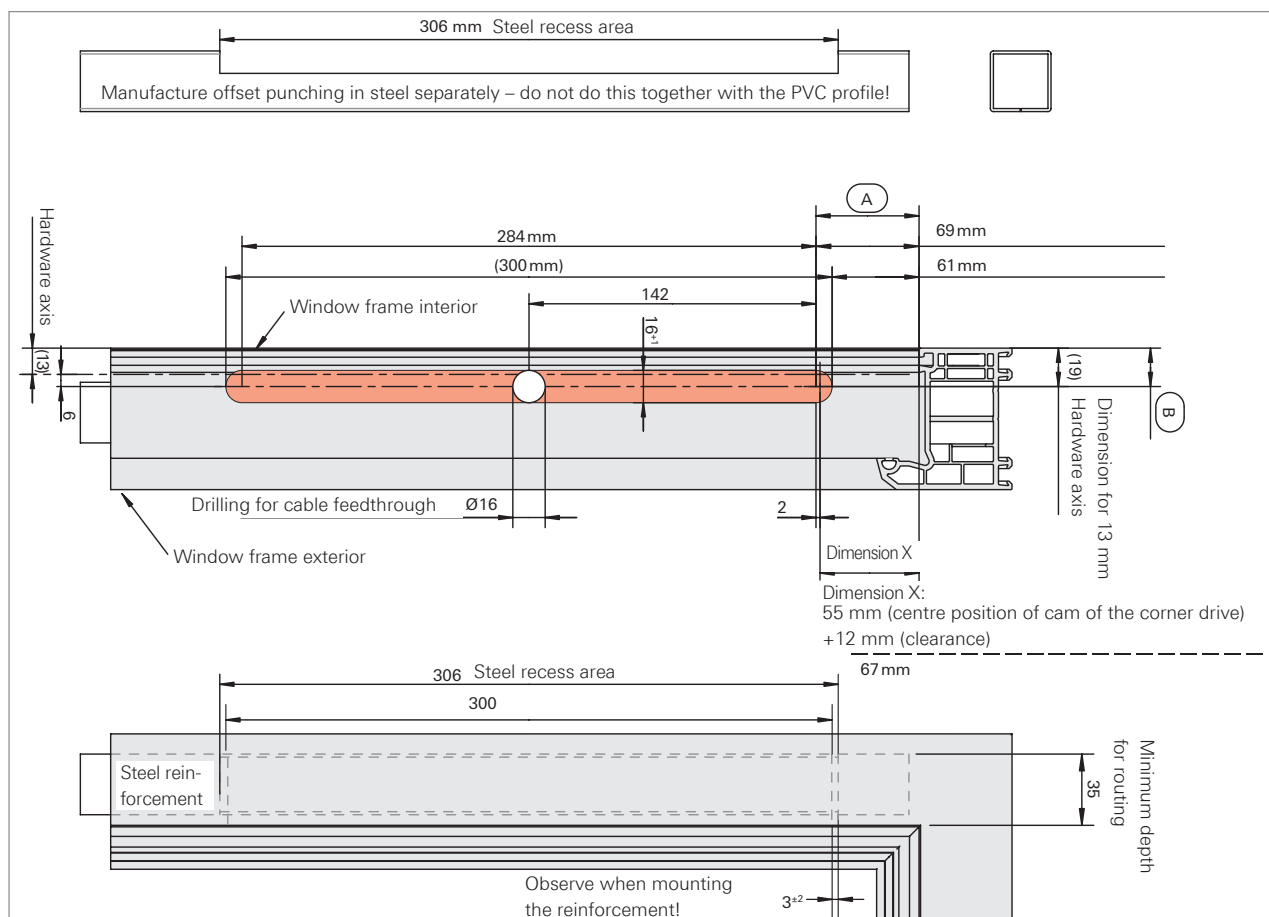


Illustration: Installation dimensions / routing dimensions for window fitted on the left (frame)

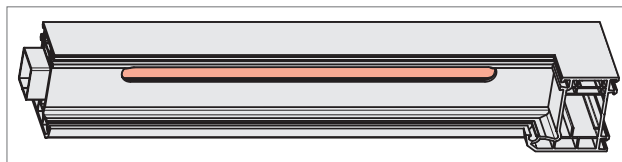


Illustration: 3D view – Corner window frame

Axis dimension	A ₁₃	B ₁₃
9	69	15
13	69	19



Routing dimensions for the Roto E-Tec Drive in window frame for Tilt-Only sash:



NOTE!

Routing channel must be cleaned from chips and other dirt after routing.

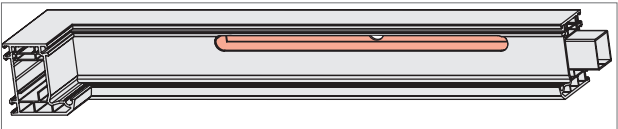
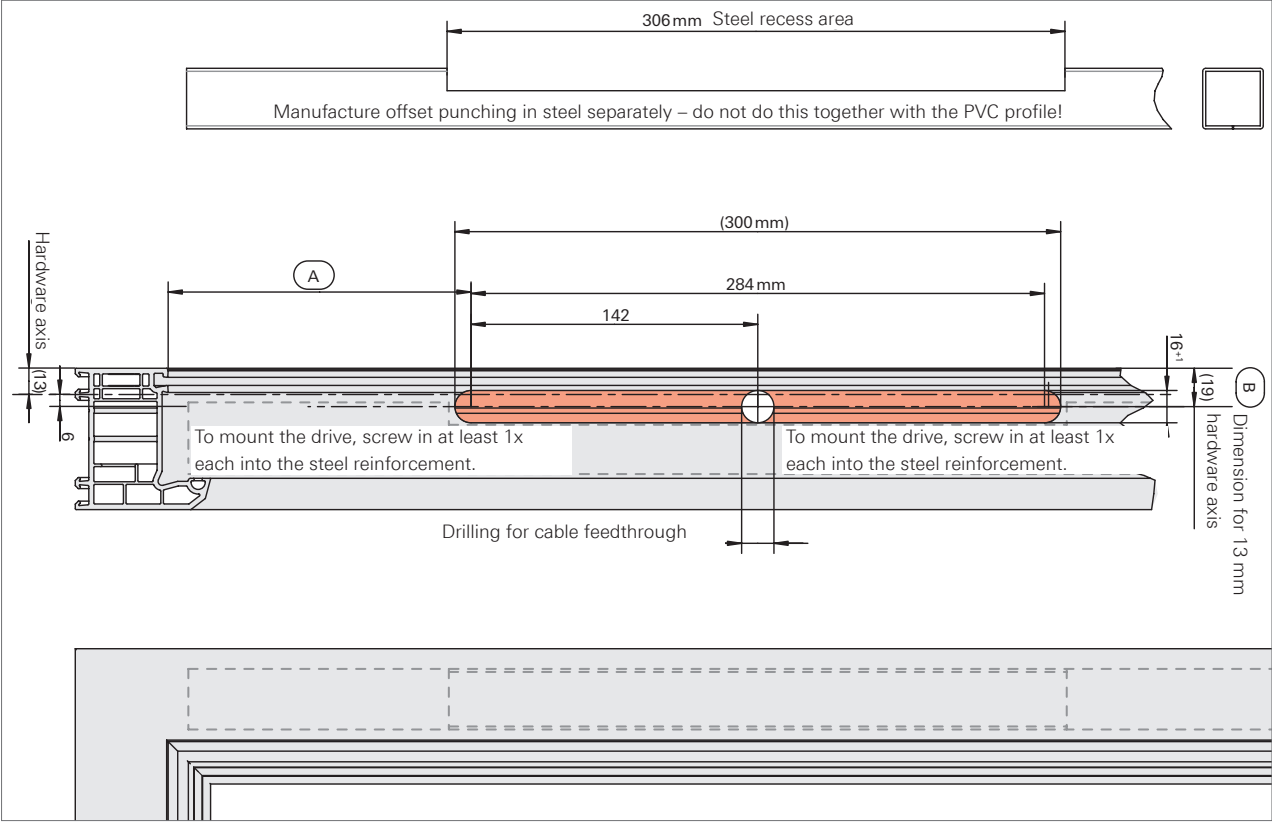
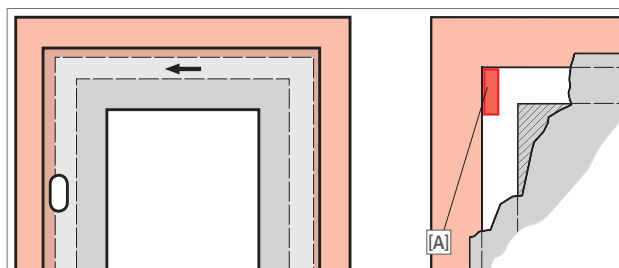


Illustration: 3D view – Corner window frame

SRW/mm	Routing dimension (A) from left frame corner	Routing dimension (B) from left frame corner	
		9 mm axis dimension	13 mm axis dimension
451 – 1000	69	15	19
1001 – 2000	SRW/2-102	15	19

- The routing dimensions assume an exact centre position of the drive.
- At the indicated positions, always a Roto E-Tec Drive right is installed.
- The locking cam of the espagnolette must always be positioned on the left of the sash centre.

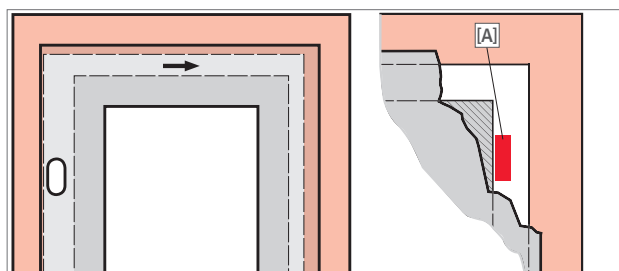


Locking and unlocking by the Roto E-Tec Drive can lead to horizontal movements of the sash. If this happens, carry out stabilising measures.

Case A: Sash is pushed when unlocking.

Common in: light sashes, $SH > SW$,

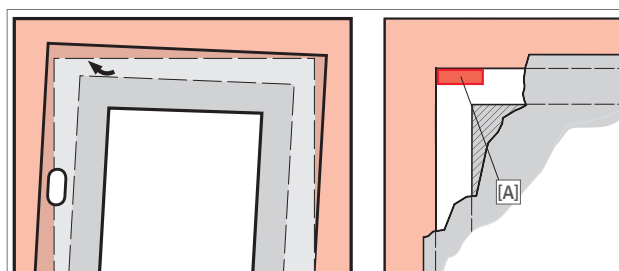
$SH_{Tilt-Only} < SW_{Tilt-Only}$



Case B: Sash is pulled when locking.

Common in: light sashes, $SH > SW$,

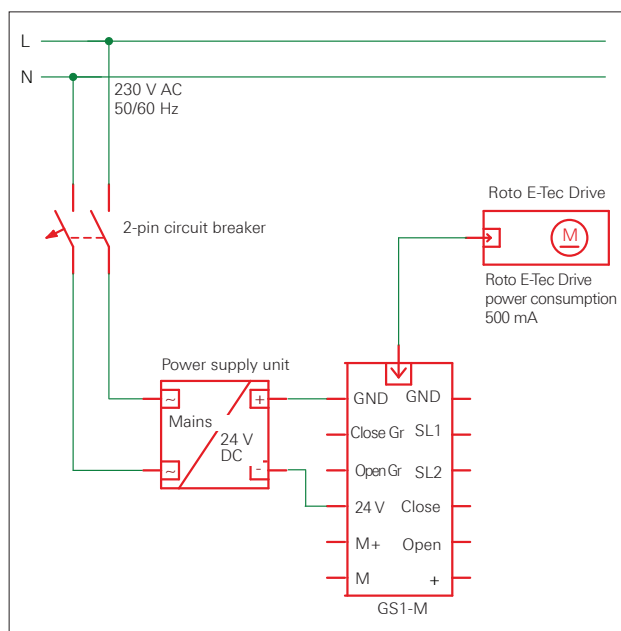
$SH_{Tilt-Only} < SW_{Tilt-Only}$



Case C: Sash is lifted when locking.

Common in: light sashes, $SH < SW$

[A] Run-up block



1. Connect power cable to the power supply unit on the primary side.



WARNING!

Read the operating and installation instructions for the power supply unit before installation.

2. Connect power supply unit with the GS1-M on the secondary side. Alternatively: Remove plug and carry out the wiring manually.
3. Place power supply unit into junction box.
4. Connect push-button in accordance with basic circuits.
5. Insert Roto E-Tec Drive cable for GS1-M into RJ45 socket.
6. Place GS1-M into second junction box.



WARNING!

The installation of power supply units may only be carried out by an electrician.



NOTE!

Patch in 2-pin circuit breaker which corresponds to overvoltage category II.



NOTE!

Observe minimum air gap of 8 mm between the primary and secondary lines to ensure that the products comply with the characteristics of protection class II. Minimum air gap of 8 mm must also be observed between primary lines and surrounding metal parts.



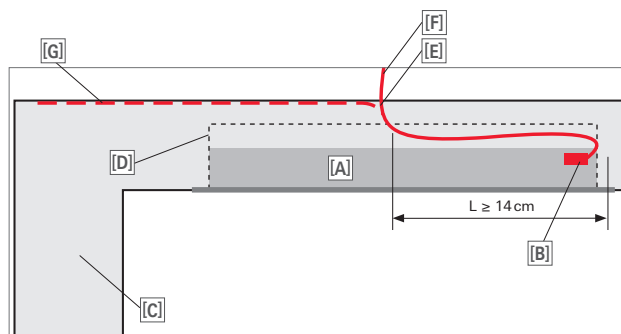
NOTE!

Install the power supply unit always in the interior. The electrician must ensure that the end-users cannot access live components.



NOTE!

If using third-party power supply units, ensure they comply with DIN EN 60335-1 and/or DIN EN 60335-2-103.



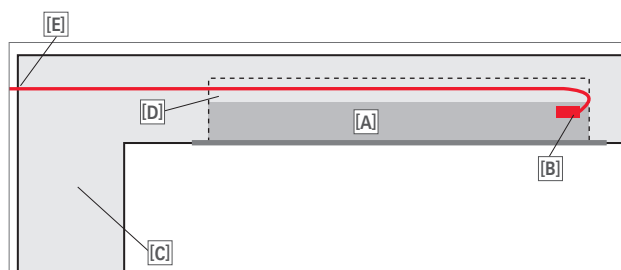
Insert or lay cable into the window frame from the top (window fitted on the right).

The cable feedthrough hole in the window frame has a diameter of 16 mm. It must be sealed off using a suitable agent (silicone, butyl etc.). The distance L (between cable feedthrough hole and cable connection Roto E-Tec Drive) must be ≥ 14 cm; this creates a cable loop through which the device can be removed easily.



ADVICE!

- Do not lay cable in area of subsequent drilling!
- Observe minimum mounting height of the operating button of 1.5 m.
- Mount push-button within view of the drive.



Insert or lay cable into the window frame from the side (window fitted on the right).

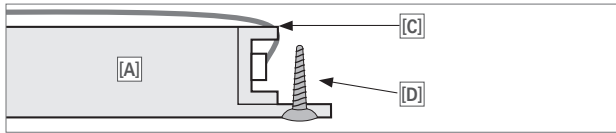
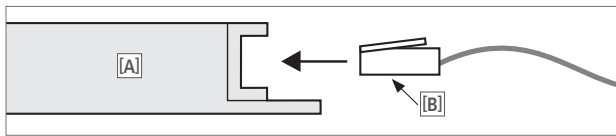
The cable feedthrough hole in the window frame has a diameter of 16 mm. It must be sealed off using a suitable agent (silicone, butyl etc.).



ADVICE!

- Do not lay cable in area of subsequent drilling!
- Observe minimum mounting height of the operating button of 1.5 m.
- Mount push-button within view of the drive.

- [A] Roto E-Tec Drive
- [B] Cable connector
- [C] Frame
- [D] Routing
- [E] Cable feedthrough hole
- [F] Cable feedthrough masonry
- [G] It is also possible to lay cables in a frame groove outside the frame



- [A] Roto E-Tec Drive
- [B] Connector
- [C] Strain relief clamp
- [D] Screw 3.9x25

1. Insert connector into the Roto E-Tec Drive with the locking stud pointing upwards. The connector must engage easily with an audible clicking noise. Never use force when inserting.



2. Insert cable into strain relief clamp (= screwing protection).



ADVICE!

- If the cable is not inserted into the strain relief clamp, it can be damaged when the drive is screwed in.
- Use the supplied stainless steel screws for the aluminium profiles.
- Use the supplied timber screws for PVC and timber profiles.



DANGER!

Danger to life from live parts!

Possibility of short circuiting!

Current can lead to lethal injuries!

- Take extra care when handling live parts. Only an electrician may connect the power supply unit to the mains voltage. The respective national regulations must be observed and complied with when doing this (in Germany, e.g. VDE 0100).
- Only operate and control Roto E-Tec Drive with SELV (24VDC).



WARNING!

Only connect the Roto E-Tec Drive with the power supply when all work has been completed.

Before switching on, ensure that there is no short circuit.



Check operation of Roto E-Tec Drive with control unit (testing set):

1. Connect control unit (testing set).
2. Check Roto E-Tec Drive: Simple press of button
→:Window can be unlocked, tilted and locked.
3. Remove control unit (testing set).

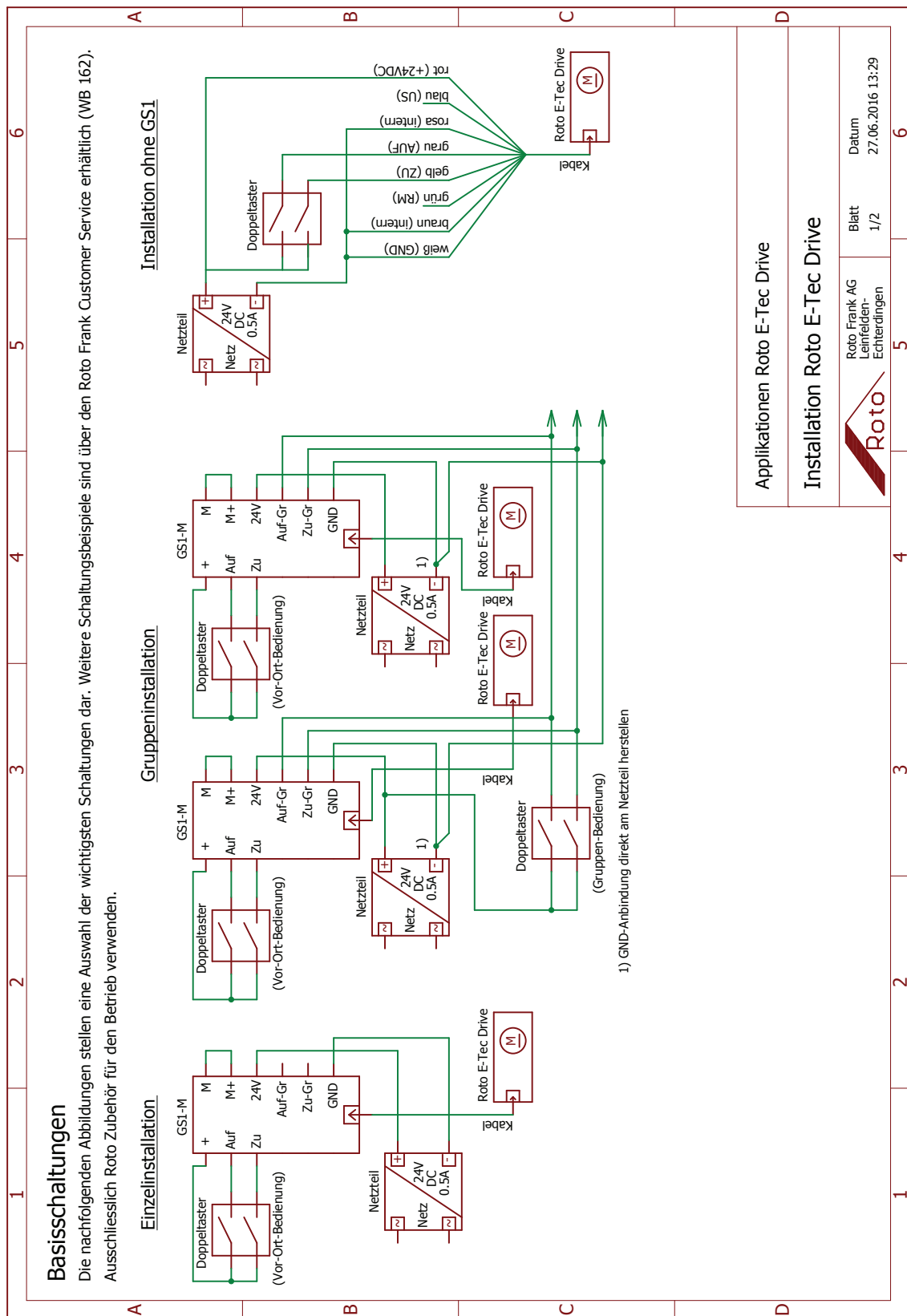
Push-button

The push-buttons may not be locked against each other (reset!).

Maximum possible cable extension

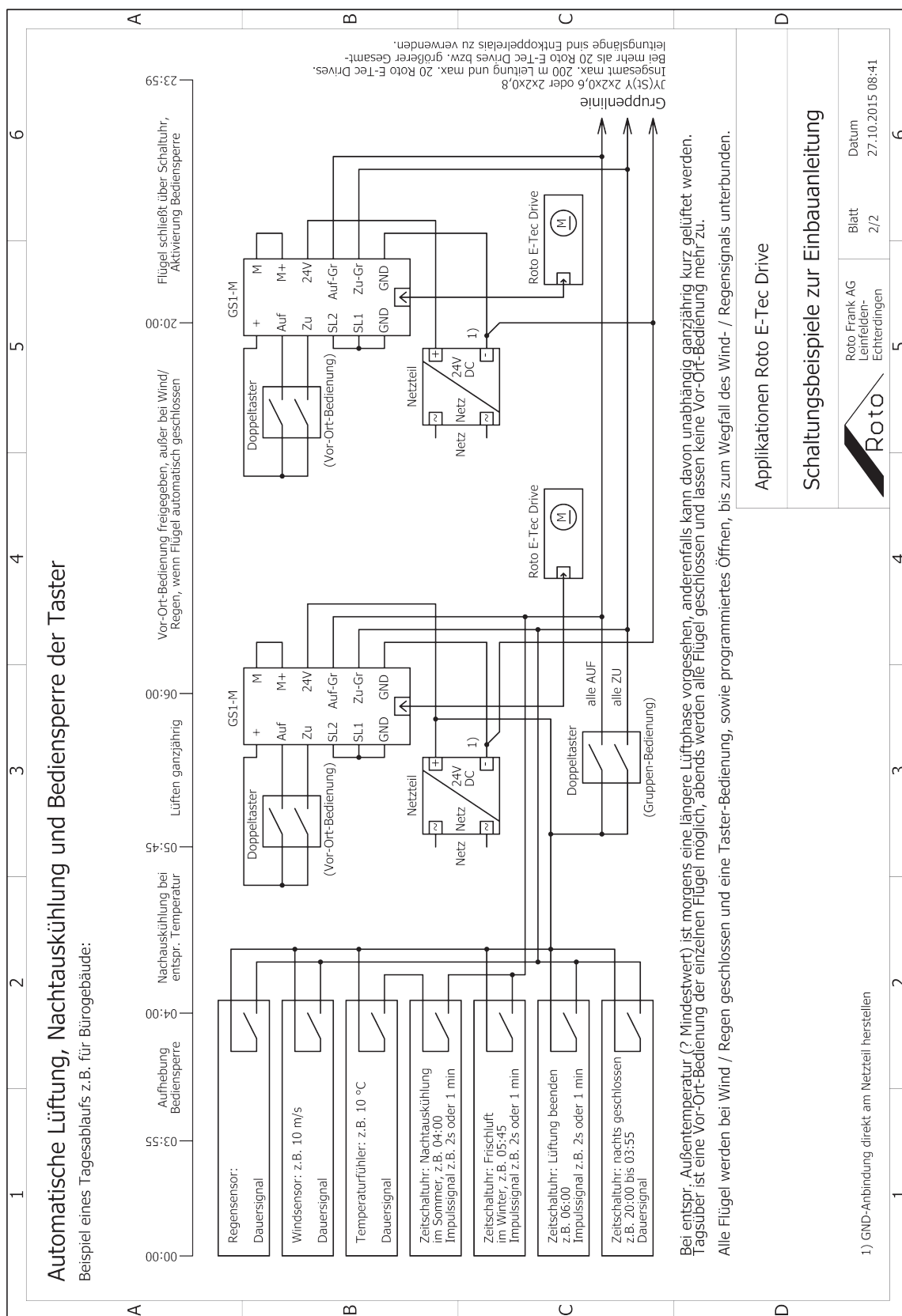
Cable in special length without additional extension up to max.10 m.

Permissible extensions on 6 m cable				
Cross section / mm ²	0.14	0.5	1.5	2.5
Max. cable length / m	4	16	50	83



NOTE!

By using one of the shown application circuits, it is possible that the risk situation at the machine might change. In this case, another risk assessment must be carried out and it is possible that additional protection measures might have to be taken.



Applikationen Roto E-Tec Drive
Schaltungsbeispiele zur Einbauanleitung

Roto Frank AG
Leinfelden-
Echterdingen

Blatt
2/2

Datum
27.10.2015 08:41

1) GND-Anbindung direkt am Netzteil herstellen



Group control unit GS1-M

782875

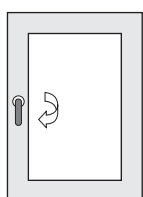
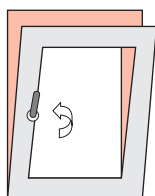
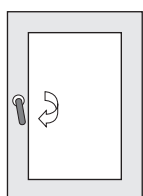
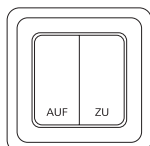


The group control unit simplifies the wiring of the drive by leading the single conductors or the RJ45 connector onto the relevant connecting terminals.

Using the 2 integrated push-buttons (Open/Close), the functions of the drive can be checked.

Additionally, a group installation is possible. One GS1-M is required for each drive. A group can consist of up to 20 drives. (see circuit examples p. 61)

By plugging the RJ45 connector from the GS1-M into the control unit, it is possible to parametrise or update the software without removing the drive.



CAUTION!

Risk of injury due to incorrectly installed drive!

The incorrect installation of the drive can lead to injuries.

The incomplete machine or Roto E-Tec Drive may only be started up if it was determined that the machine or system into which the machine was installed complies with the regulations of the European Guideline 2006 / 42 / EC about machines and the EU Conformity Declaration was issued in accordance with Appendix II Part A.

Programming the final position

1. Slide escutcheon cover of window handle open.
2. Lock the window using the service handle until the handle meets a resistance.
The drive-unit cam of the Roto E-Tec Drive is now in contact with the drive unit.
3. Press AUF (open) and ZU (close) buttons simultaneously 3 times within 4 sec.
The reset of the final position is confirmed by a short and one long beeping sound.
4. Press the button AUF (open).
The window unlocks and tilts. The service handle turns into the tilt position.



NOTE!

Equip the button to operate the drive with suitable signs.

5. Press the button ZU (close).
The window closes and locks. The service handle first turns into the locking position, then briefly into the opposite direction to uncouple the window mechanically from the drive.
The successful programming of the final position is confirmed by 2 short beeping noises.

Roto E-Tec Drive has now been taught its end position for this window and the hardware has been released for manual and electric handling. In the case of an error, the final position can be re-programmed at any time (see above).



NOTE!

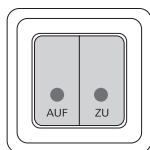
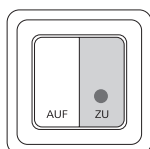
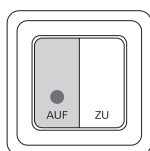
It is possible that the service handle may not reach a vertical handle position in the tilt or locked position due to the joint effect of installation tolerances on the window. This is not a technical fault.

5. Pull off service handle.
6. Close escutcheon cover.

**Resetting the final position**

If functional faults occur, the saved final position of the drive can be reset.
To do this:

1. Press AUF (open) and ZU (close) buttons simultaneously 3 times within 4 sec.
The reset of the final position is confirmed by a short and one long beeping sound.
2. Carry out again the initial operation, see p. 64 from step 4.



CAUTION!

Danger of crushing and trapping from opening and closing forces.

Moving parts of the drive can cause injuries during operation. Never reach between the window sash and window frame or between the moving parts of the Roto E-Tec Drive while the drive is moving.

Tilt window electrically

Briefly press the button AUF (open).

The window sash unlocks first and then automatically moves into the tilt position.



NOTE!

A constant signal on the button ZU (close) e.g. by a wind sensor when the wind pressure is too high, prevents the opening of the window.

Lock window electrically

Briefly press the button ZU (close).

The window sash automatically drives into the locked position and then locks.

Stop the drive

The drive can be stopped in any window sash position by briefly pressing the respective opposite button or by simultaneously pressing both buttons (AUF and ZU).



NOTE!

If the sash is already flush with the window frame during the closing process, pressing on the AUF button can unlock the window because the drive cannot complete the closing process. Therefore always wait until the drive has completed locking the window sash.

Operating the window by hand (turn opening, tilting)

1. Bring window into the locking position using the ZU (close) button and wait until the locking process is complete.
2. Ensure that it is not possible to give an electric impulse into the AUF (open) direction. Switch off controller if necessary.
3. Slide escutcheon cover open and place service handle.
4. It is now possible to bring the window into any position using the service handle.



ADVICE!

- Before using the electrical drive again, close and lock the window, pull off the service handle and close the escutcheon cover.
- Do not open or close the window sash with force under all circumstances. The drive could be damaged.
- Do not operate the drive if the window is tilted or opened via the service handle to avoid damages.



WARNING!

Do not continue to use the drive in the case of an error. The drive is to be decommissioned by switching off the supply voltage. Only use the drive after a specialist workshop has carried out a repair.



Reset

Malfunctions can be removed by resetting, the final position of the hardware is re-programmed again (see chapter "Initial operation").

1. Press AUF (open) and ZU (close) buttons simultaneously 3 times within 4 sec.
The reset of the final position is confirmed by a short and one long beeping sound.
2. Then completely open Roto E-Tec Drive and close again.
The successful programming of the final position is confirmed by 2 short beeping noises.



NOTE!

Special characteristics during reset

In combination with the MTS / MVS contact element, a reset is only possible if the window is closed and locked.



The Roto E-Tec Drive can be operated at a permanently reduced movement speed to minimise operating noises (e.g. in bedrooms).

The switch is carried out via the AUF (open) / ZU (close) buttons and is then permanently saved.

1. To switch, push down the AUF (open) and ZU (close) buttons simultaneously for 5 seconds.
2. After 5 seconds, release both buttons and immediately briefly press them again.

The Roto E-Tec Drive confirms the command via four short beeping noises.

3. A repetition of steps 1 and 2 switches the drive back to normal speed.



The Roto E-Tec Drive has an integrated ventilation function.

1. To start, press the AUF (open) button 3x.
The Roto E-Tec Drive confirms the command via one short beeping noise.
2. The Roto E-Tec Drive opens, after 10 min it closes automatically.



NOTE!

The preset time of 10 minutes can be changed to between 1 and 60 min via the PC using the control unit.

The acoustic signals of the Roto E-Tec Drive can be deactivated together. Here, the acoustic signals are permanently deactivated and can be activated again if needed.

1. To deactivate, push down the AUF (open) and ZU (close) buttons simultaneously for 10–15 seconds.
2. After 10 to 15 seconds, release both buttons and immediately briefly press them again.
3. To re-activate the acoustic signals, repeat steps 1 and 2.

**NOTE!**

This setting is not confirmed by an acoustic signal.

**NOTE!**

The acoustic signals can be deactivated individually via the PC using the control unit.



Troubleshooting

Problem	Cause	Corrective action	Specialist company	End-users
Drive does not respond when you are pressing the button.	– Incorrect wiring.	– Match wiring with the operating instructions. Short circuit between plus (red) and minus (white).	■	–
	– Cable is defective.	– Check the red and white braids in the cable for continuity. Short circuit between plus (red) and minus (white).	■	–
	– Wrong or defective power supply unit.	– It should be possible to measure 24 V at the outlet of the power supply unit and it should be designed for 0.5 A.	■	–
	– Drive does not receive signal from the external controls.	– Ensure power supply (24 V $\pm 5\%$ between red and blue). Input signals (grey and yellow braids approx. 24 V) should be checked when the external controls are operated.	■	–
	– Drive receives stop signal from the external controls.	– Input signals (grey and yellow braids approx. 24 V) should be checked for constant signals.	■	–
Drive does not drive up.	– Power supply interrupted.	– Ensure power supply (24 V $\pm 5\%$).	■	–
	– Control signal does not reach drive unit.	– Input signals (grey braid approx. 24 V / yellow braid 0 V) should be checked when the external controls are operated.	■	–
	– Drive is already in position "AUF" (open).	– Check position of the window sash. The reset function enables the resetting of the temporary final position.	□	□
3x double beeping tones audible	– Hardware is blocked.	– Check window for manual function. Remove the cause of the blockage.	□	□
	– Hardware is too stiff.	– Check window for manual function and, if necessary, make the hardware run smoother.	■	–
The drive does not respond to commands 60 seconds after switching on the operating voltage. 4x double beeping tones audible	– Speed sensor defective.	– Open window manually. Remove drive and send in for repair.	■	–

■ = To be carried out **only** by a specialist company.

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user

Troubleshooting

Problem	Cause	Corrective action	Specialist company	End-users
Drive does not close.	– Power supply interrupted. – Control signal does not reach drive unit. – Drive is already in position "ZU" (close).	– Ensure power supply (24 V $\pm$5%). Check polarity of the voltage. – Input signals (yellow braid approx. 24 V / grey braid 0 V) should be checked when the external controls are operated. – Check position of the window sash. The reset function enables the resetting of the temporary final position.	■ ■ □	– – □
3x double beeping tones audible	– Hardware is blocked. – Hardware is too stiff.	– Check window for manual function. Remove the cause of the blockage. – Check window for manual function and, if necessary, make the hardware run smoother.	□ ■	□ –
Drive is stiff.	– Are chips or other dirt in the drive? – Connecting rod is not positioned correctly.	– Check drive for dirt and make it run smoother. – Move the connecting rod of the espagnolette by 1 to 2 sprockets.	■ ■	– –
Drive does not tilt the window sash open. 3x double beeping tones audible	– Drive stops when the power is switched off. – Draught – Wind pressure too strong	– Check the installation position of the Roto E-Tec Drive in the window frame. – Check engagement of hardware in locking points and check the installation situation of frame and sash components. – Remove cause for draught. – In the event of wind pressure, there might be a closing signal, e.g. from an installed wind monitor. Wait for the wind pressure to decrease.	■ ■ □ □	– – □ □
Drive does not tilt the window sash shut. 3x double beeping tones audible	– Drive stops when the power is switched off. – Wind pressure too strong – Draught	– Remove possible obstacle and try again. If necessary, reprogramme final position. – Use wind monitor. – Remove cause for draught. – Try again when there is less wind.	□ □ □ □	□ □ □ □

■ = To be carried out **only** by a specialist company.

– = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

□ = To be carried out either by a specialist company or by the end-user



The check list lists the most important points for the use of the Roto E-Tec Drive and is intended to help to check these points.

To be checked / observed by the constructor of the power-operated window



- Presence of the necessary planning documents (see chapter "Stipulated use") ☐
- Utilisation concept ☐
- Risk assessment ☐
- Tender with technical and construction requirements ☐
- CE conformity for the power-operated window (entire machine) confirmed ☐
- Documents for the operator / user attached to the window ☐

Check of the permissible window size in accordance with the application diagram

☐

Verification of the routing position

- This is a Tilt-First window. ☐
- This is a Tilt-Only window. ☐
- The window is fitted on the left. ☐
- The window is fitted on the right. ☐

Check of the hardware-technical requirements

- Corner drive 1  / 1  with run-up block (mat. no. **779677**) (Insert striker to the side) ☐
- Stay arm / stay guide (see table from p. 23) ☐
- Centre lock (CL 200) as required (see table from p. 23) ☐
- NT: No lifting mishandling device installed ☐
- NT: Sash lifter (mat. no. **284220**) installed instead of the lifting mishandling device ☐
- AL: No tilt range limitation installed ☐
- A window handle is not installed (otherwise only with operating lock-out) ☐
- Turn lock, surface-mounted (for large sashes) ☐
- System-specific run-up wedges for clearance reduction ☐
- 90° handle operation for TF: Window tilts reliably ☐
- Handle in turn position: Sash drives correctly into the frame ☐
- Sash area > 1.44 m²: Wind sensor installed ☐
- Checked smooth operation of the hardware using service handle ☐

Observe during the installation in PVC windows

- Leave out steel reinforcement separately. ☐
- Protect the offset punching from corrosion. ☐
- Use supplied packers. ☐

To be checked / observed by the window fitter

- The cable pokes out approx. 20 cm from the centre of the routing. ☐
- Do not restrict the cable with screws. (The cable can be damaged by screws!) ☐
- Use the supplied packers for PVC windows. ☐
- For Tilt-Only sashes: Restrictor and cleaning stays as well as tilt-stay installed correctly both in number and position. ☐

To be checked / observed by the electrician

- Power supply unit with correct voltage / correct current / correct performance (24 V / 500 mA / max. 15 W per drive). ☐
- Connect pink and brown wire to white (ground). ☐
- Use double switches without mutual interlock ☐



Maintenance and care

The 6-monthly or annual maintenance of the Roto E-Tec Drive by a specialist company is mandatory and must be ordered and documented by the operator of the power-operated window.

The Roto E-Tec Drive may not come into contact with chips or dirt. If the lubrication at the Roto E-Tec Drive is removed during cleaning, the grease must be re-applied on guide tracks and at the pitched PVC component before the drive is commissioned again (compare with image).

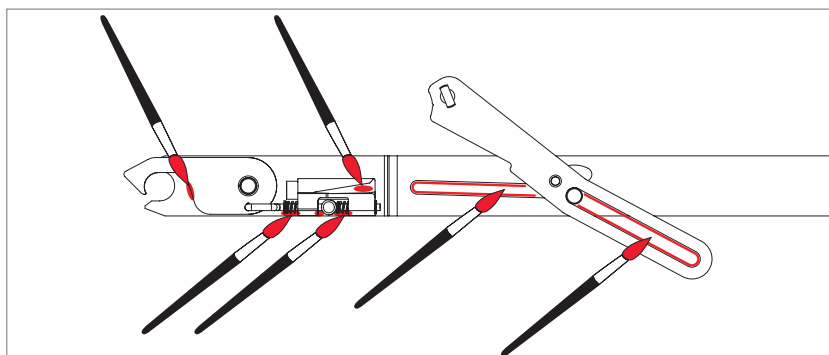
At least annually, every six months for school and hotel buildings:

	Specialist company	End-users
Check the correct function of the entire system.	■	—
Check position of the window sash in the window frame (clearance).	■	—
Check the position of the taper action towards the striker-entry.	■	—
Check specified run-up blocks and clearance limitations.	■	—
If necessary, tighten fixing screws.	■	—
Replace damaged screws.	■	—
If necessary, replace components.	■	—
Check the smooth operation of the hardware.	□	□
Lubricate moving parts with hardware grease.	□	□

■ = To be carried out **only** by a specialist company.

— = **Not** to be carried out by the end-user; the end-user may not carry out installation work!

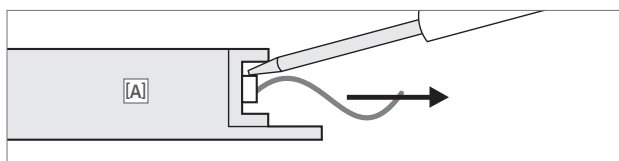
□ = To be carried out either by a specialist company or by the end-user.



ADVICE!

Observe the following notes during maintenance work:

- Do not use the drive and disconnect it from the power supply if maintenance, adjustment or repair work is carried out.
- Remove emerging or residual grease at the lubricating points and dispose of in accordance with the valid local regulations.
- Collect exchanged oil in suitable containers and dispose of in accordance with the environmental regulations.
- Wear suitable gloves to avoid skin contact with the lubricant.



[A] Roto E-Tec Drive

1. Take cable out of the strain relief clamp.
2. Push down bracket at the connector with a small screwdriver or similar carefully.
3. Pull out cable.





Check the delivery on receipt immediately for completeness and transport damage.



NOTE!

Claim any damage as soon as it is detected. Claims for damage can only be invoked within the statutory reclamation period.



Disposal of electronic scrap in accordance with the statutory requirements of the individual countries, e.g. with EU directives (2002/95/EC: Directive on the restriction of the use of certain hazardous substances in electrical and electronic equipment, RoHS and 2002/96/EC: requirements of the waste electrical and electronic equipment directive WEEE).



According to the law "ElektroG" in Germany, waste electronic equipment must not be disposed of in household waste, it must be taken to an appropriate disposal station.



Technical specifications			
Power supply	24 VDC ±5 % stabilised		
Temperature range	Operating-mode:	0 °C – +60 °C	
	Storability:	-20 °C – +85 °C	
Humidity	5 % – 90 % relative humidity, non-condensing		
IP rating	IP20 in accordance with DIN EN 60 529		
Tilting / closing:	> 150 N → Risk of crushing!		
Locking / unlocking force	750 N		
Opening distance	~120 mm		
Hardware travel	16 mm – 36 mm (±2 mm)		
Typical opening / closing times in [s]			
Tilt-First & Tilt-Only hardware	Normal	Open	110
		Close	130
	Quick	Open	70
		Close	80
Current consumption	No-load operation:		approx. 35 mA
	Locking / Unlocking:		max. 500 mA
Weight (g)	450 (with stay)		
Dimensions (L x W x H)	335 x 18 x 30 mm without scissor stay		
Routing dimensions (L x W x H)	300 x 16 x 35 mm		
Connection	Plug-in connector FCC68, telephone cable, colour-coded, cable length: max. 6 m		
Emission sound pressure level	≤ 70 dB(A)		
Test	20,000 cycles at 750 N in complete cycle (AUF/ZU, open/ close)		

Type plate			
	Ref.-Nr.: 0815		
	E: 2	N: 2	S: 2 SK: 3
	RL 2006/42/EG		Datum: 01.01.1999
	Mustermann-Service GmbH		
			Netzteil: 230V AC 50/60Hz, 150mA
			Antrieb: 24V DC, 500mA



**Einbauerklärung
für eine unvollständige Maschine
nach der EG-Richtlinie 2006/42/EG (Anhang II B)**

***Declaration of incorporation
for a partly completed machinery
in accordance of EC – Directive 2006/42/EC (annex II-part B)***

Hersteller
manufacturer Roto Frank AG
Wilhelm-Frank-Platz 1
D-70771 Leinfelden-Echterdingen

Wir bestätigen, dass die Konformität des nachstehend bezeichneten Produktes:
We confirm herewith, that the conformity of the following designated product:

Produktbezeichnung
product designation E-Tec Drive

Typenbezeichnung
type designation -

Seriennummer, Baujahr
serial number, year of manufacture siehe Typenschild
according to identification plate

alle grundlegenden Anforderungen der Maschinenrichtlinie 2006/42/EG erfüllt, soweit es im Rahmen des Lieferumfangs möglich ist. Ferner erklären wir, dass die speziellen technischen Unterlagen, gemäß Anhang VII Teil B dieser Richtlinie, erstellt wurden.
all essential requirements of the Machinery Directive 2006/42/EC are met, as far as it is possible, according to the scope of supply and services. We also declare, that the relevant technical documents, referred to in annex VII, part B of this directive, have been created.

Folgende grundlegende Anforderungen kommen zur Anwendung:
2006/42/EG, Anhang I, allgemeine Grundsätze;
2006/42/EG, Anhang I 1, grundlegende Sicherheits- und Gesundheitsanforderungen
The following basic requirements are applied
2006/42/EG, annex 1, general principles;
2006/42/EG, annex I 1, general health and safety requirements

Die unvollständige Maschine entspricht zusätzlich den Bestimmungen der Richtlinie 2004/108/EG über elektromagnetische Verträglichkeit. Die Schutzziele der Richtlinie 2006/95/EG über elektrische Betriebsmittel werden eingehalten.
The partly completed machinery also complies with the provisions of Directive 2004/108/EC relating to electromagnetic compatibility. The safety objectives of directive 2006/95/EC on electrical resources are respected.

Bevollmächtigter für die Zusammenstellung der relevanten technischen Unterlagen gemäß Anhang VII B ist die Firma Roto Frank AG, Anschrift siehe oben.
Authorized representative to compile the relevant technical documents referred to in annex VII B, is the company Roto Frank AG, address see above.

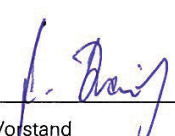
Wir verpflichten uns, den Marktaufsichtsbehörden (auf begründetes Verlangen), die technischen Unterlagen zu der unvollständigen Maschine per E-Mail oder Post zu übermitteln.
We obligate ourselves, to submit the national authorities (on a well-founded request), the relevant information about the partly completed machinery by e-mail or post.

Die unvollständige Maschine darf erst dann in Betrieb genommen werden, wenn ggf. festgestellt wurde, dass die Maschine oder Anlage, in welche die unvollständige Maschine eingebaut werden soll, den Bestimmungen der Richtlinie 2006/42/EG über Maschinen entspricht und die EG Konformitätserklärung gemäß Anhang II Teil A ausgestellt ist.
The partly completed machinery must not be put into operation, if determined necessary was, that the machine or installation, in which the partly completed machinery has to be installed, should comply with the provisions of Directive 2006/42/EC on machinery and the EC declaration of conformity is issued in accordance with Annex II part A.

Roto Frank AG 
Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen

Leinfelden-Echterdingen, 29.04.13

Ort, Datum
place, date


Vorstand
member of the board of directors



Objective

Power-operated windows are facade or roof elements equipped with drive systems which are common as components of heat and smoke vents (HSV) as well as ventilation systems in buildings of different types and uses. The automation of building openings can result in a particular risk potential which the constructor, operator or maintainer must meet with the relevant safety measures. Specialised knowledge is required to correctly assess potential risks and to implement suitable safety measures. This chapter is aimed at planners, constructors and operators as an application aid to create and properly document as well as label power-operated windows for HSV and ventilation purposes.

Legal framework**Machinery Directive (MaschRL)**

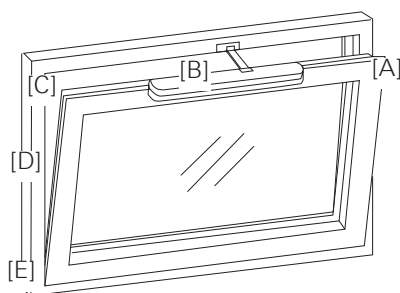
A machine is a unit of interconnected parts of which at least one is mobile. It is a unit which is equipped with an additional drive system other than the immediately used, human force. It is hereby irrelevant whether the unit is equipped with a connecting cable or connected to a power supply. In the Machinery Directive, the manufacturer is that person who joins the drive or drive system with the window (e.g. metal worker, window fabricator or HSV fitter). The manufacturer of a machine or his proxy must ensure that a risk assessment is carried out to determine the applicable safety and health protection guidelines for the machine. The machine must be constructed and manufactured whilst considering the results of the risk assessment.

(German) Equipment and product safety act (GPSG)

The amendment of the 9th enactment of the Equipment and product safety act (GPSG) implemented the EC Machinery Directive 2006/42/EC in Germany.

DIN EN 14351-1

The appendix of the product standard DIN EN 14351-1 for windows and doors (coexistence period ended on January 31, 2010) refers to the EC Machinery Directive.

**Possible sources of danger for power-operated windows**

- [A] Risk of impact
- [B] Drive (incomplete machine)
- [C] Risk of crushing and shearing at main closing edge
- [D] Risk of crushing and shearing at adjacent closing edges
- [E] Risks of adjacent closing edges and reveals

Incomplete machines

The Machinery Directive considers drives or drive systems as incomplete machines. They are designed to be installed in other machines or equipment, in this case window or smoke exhaust and ventilation flaps, and form a machine together with these.

The drive manufacturer must present the following documents for the incomplete machine in accordance with the Machinery Directive 2006/42/EC:

- Installation instructions
- EC installation explanation



Responsibilities

Responsibility / measure	Client / builder	Architect / specialised planner	Drive manufacturer	Manufacturer of power-operated windows
User information for the drive			■	
Safety instructions			■	
Installation explanation and installation instructions drive			■	
EC conformity declaration + licence drive			■	
Utilisation concept of the building	■			
Plant-technical concept		■		
Risk assessment, hazard evaluation planning phase		■		
LV creation with technical and construction requirements		■		
Risk assessment, hazard evaluation before installation				■
Implementation of technical safety measures				■
Implementation of organisational safety measures	■			
EC conformity declaration power-operated window (machine)				■
Application of CE label				■

Important notes for existing power-operated windows

Changes to existing power-operated windows must be inspected in accordance with the Equipment and product safety act (GPSG) as part of a hazard analysis (risk assessment). If the result shows that significant new or additional dangers must be expected, a substantial change exists and the company which carried out the changes must carry out the conformity declaration and labelling as described hereafter. The manufacturer (issuer of the conformity declaration) of the power-operated window is not liable for changes implemented by a third party.

If safety defects in an existing power-operated window are detected by for example a maintenance company, the necessary safety measures must be implemented in consultation with the client. This procedure is also recommended if the maintenance company is not the original manufacturer of the system.

Documentation and labelling duties

In accordance with the Machinery Directive 2006/42/EC, the following documentation and labelling must be present from the manufacturer for a power-operated window.

EC conformity declaration

The EC conformity declaration must contain at least the following information:

- Company name and complete address of the manufacturer and, if necessary, his proxy
- Name and address of the person who is authorised to compile the technical documentation; this person must be resident in the EC
- Description and identification of the machine including general name, function, model, type, serial number and trade name.
- A sentence which explicitly states that the machine complies with all pertinent regulations of this guideline and, if necessary, a similar sentence in which the compliance with other guidelines and/or pertinent regulations which the machine complies with is declared. The references must be declared in accordance with the publication in the Official Journal of the European Union
- Place and date of the declaration
- Information about the person who is authorised to issue this declaration on behalf of the manufacturer or his proxy as well as signature of that person



CE label

The CE label consists of the letters "CE" with the type face shown:

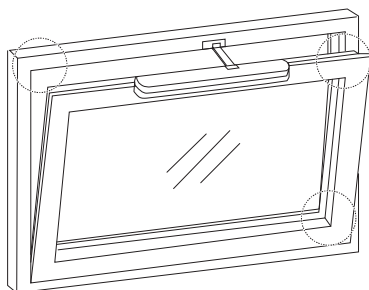
If the CE label is reduced or increased in size, the proportions defined here must be adhered with.

The components of the CE label must have roughly the same height; the minimum height is 5 mm. The CE label must be attached in the immediate vicinity of the manufacturer (or proxy)'s information and be implemented in the same style.

By attaching the CE sign, the manufacturer confirms compliance with all relevant EC guidelines. This also means that a type plate can only carry a CE sign which points to several guidelines (e.g. MaschRL and DIN EN 12101-2) at the same time. In this case

the power class of the NRWG must also be specified on the type plate.

	Ref.-Nr.: 0815					Netzteil: 230V AC 50/60Hz, 150mA		
	E: 2	N: 2	S: 2	SK: 3		Antrieb: 24V DC, 500mA		
	RL 2006/42/EG		Datum: 01.01.1999					
	Mustermann-Service GmbH							



Example for attachment options on a power-operated window

Example for a CE label on a power-operated window with manufacturer's information of the power-operated window, manufacturing date and optional information on the type plate

- Installation situation (E)
- Use (N)
- Control system (S)
- Protection class (SK)

Risk assessment and possible safety measures

for power-operated windows in accordance with the Machinery Directive 2006/42/EC

Risk assessment and safety measures for power-operated windows

Project / building development

Project name:

Street, No.:

Postal code, town:

Reference no.:

Client

Company:

Street, No.:

Postal code, town:

Contact partner:

Manufacturer of machine acc. to MaschRL

Company:

Street, No.:

Postal code, town:

Contact partner:

Installation situation

Installation site / Position:

Installation height:

Window designation:

Window no.:

Risk classification per table on the other side

Installation position: E

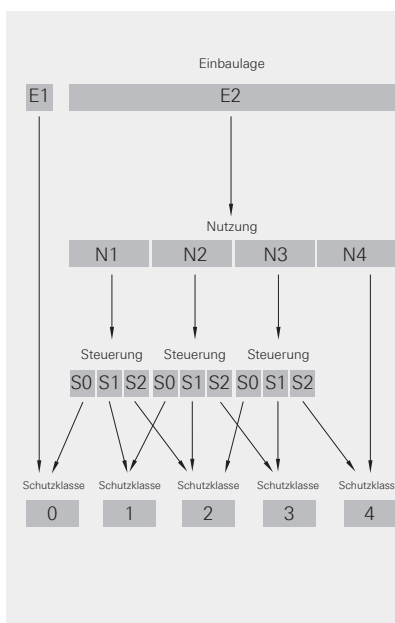
Use: N

Control system: S

Protection class: SK

Implemented safety measures

Advice



Safety measures implemented: ☐ Yes ☐ No

Client informed on:

☐ CE label

☐ Conformity declaration

System producer	Client
Stamp / Date / Signature	Date / Signature

Risk assessment

Examples of installation positions	Risks	Risk parameters
- Installation height of sash lower edge at least 2.5 m above floor or solid access level - Permanently installed devices in front of the window which prevent access - Window ledges or recesses which prevent free access to the window for the user	low	E1
Installation height of sash lower edge above floor or solid access level less than 2.5 m and window is freely accessible	higher	E2
Room use/utilisation	Risks	Risk parameters
Rooms of commercial use where users are instructed into the technology (e.g. offices, industrial spaces)	low	N1
- Living spaces where the inhabitant is instructed in how to use the technology - Rooms where the user/visitor can assess the risks or can be supervised	medium	N2
Rooms which are intended for the regular stay of persons who are not instructed in the use of the technology (e.g. sales rooms, meeting places)	high	N3
Rooms intended for the use by vulnerable individuals (e.g. nurseries, schools, hospitals)	very high	N4
Control system or operation	Risks	Risk parameters
Manual operation or independent hold with visual controls for all windows (e.g. use of a key switch)	very low	S0
Manual operation with independent hold with visual controls for all windows	low	S1
Automatic operation (e.g. wind-rain controls, building management system) or manual operation without visual contact for all windows	higher	S2

Protection classes / safety measures

Class	Examples of safety measures
0	No safety measure required
1	Warning notes
2	- Secure access via structural measures or - via rounded, cushioned edges, closing forces from 80 to 150 N, no shearing effects or - acoustic warning signals or - warning lights or - EMERGENCY-STOP switch at the window or - moving devices in front of the window which prevent access
3	- Dead man's switch without super-ordinate central controls or - stopping movement 25 mm before final position over 10 m/s; trigger of an optical or acoustic signal; further movement with signal until final position is reached or - slow sash movement from no more than 5 mm/s or - access width less than 8 mm or - rounded, cushioned edges, low closing forces < 80 N, no shearing effects
4	- Securing via touch-activated safety devices, e.g. strip sensor, contact sensor or - securing via a safety device which operates touch-less, e.g. light barriers, light grid or - dead man's switch with authorised operation per window without super-ordinate central controls (e.g. key switch) or - access width less than 4 mm or - prevention of access via structural measures

Reference: The contents corresponds to a publication by ZVEI



Roto E-Tec Drive

Turn-over report for the end-user documentations



The turn-over report must be filled out twice by the implementing installation company. This copy remains with the end-user documents as part of the documentation.

Profile manufacturer and description (please enter):

Profile material
 Aluminium ☐
 Timber ☐
 PVC ☐

Used hardware

Roto AL ☐
 Roto AL Designo ☐
 Roto NT, hinge side E5 ☐
 Roto NT, hinge side A ☐
 Roto NT, hinge side K ☐
 Roto NT, hinge side Designo, axis 13 mm ☐

Opening type

Tilt-First ☐
 Tilt-Only ☐

Roto E-Tec Drive model

right ☐
 left ☐

Initial operation of the Roto E-Tec Drive carried out in workshop in accordance with installation instructions ☐

Roto E-Tec Drive moved into locking position, manual operation possible ☐

Accessories

MTS contact element (against incorrect operation) ☐

Miscellaneous:

Place, Date, Signature, Company stamp



Roto E-Tec Drive

Turn-over report for the installation company



The turn-over report must be filled out twice by the implementing installation company. This copy remains with the specialised company as part of the documentation.

Profile manufacturer and description (please enter):

Profile material
 Aluminium ☐
 Timber ☐
 PVC ☐

Used hardware

Roto AL ☐
 Roto AL Designo ☐
 Roto NT, hinge side E5 ☐
 Roto NT, hinge side A ☐
 Roto NT, hinge side K ☐
 Roto NT, hinge side Designo, axis 13 mm ☐

Opening type

Tilt-First ☐
 Tilt-Only ☐

Roto E-Tec Drive model

right ☐
 left ☐

Initial operation of the Roto E-Tec Drive carried out in workshop in accordance with installation instructions ☐

Roto E-Tec Drive moved into locking position, manual operation possible ☐

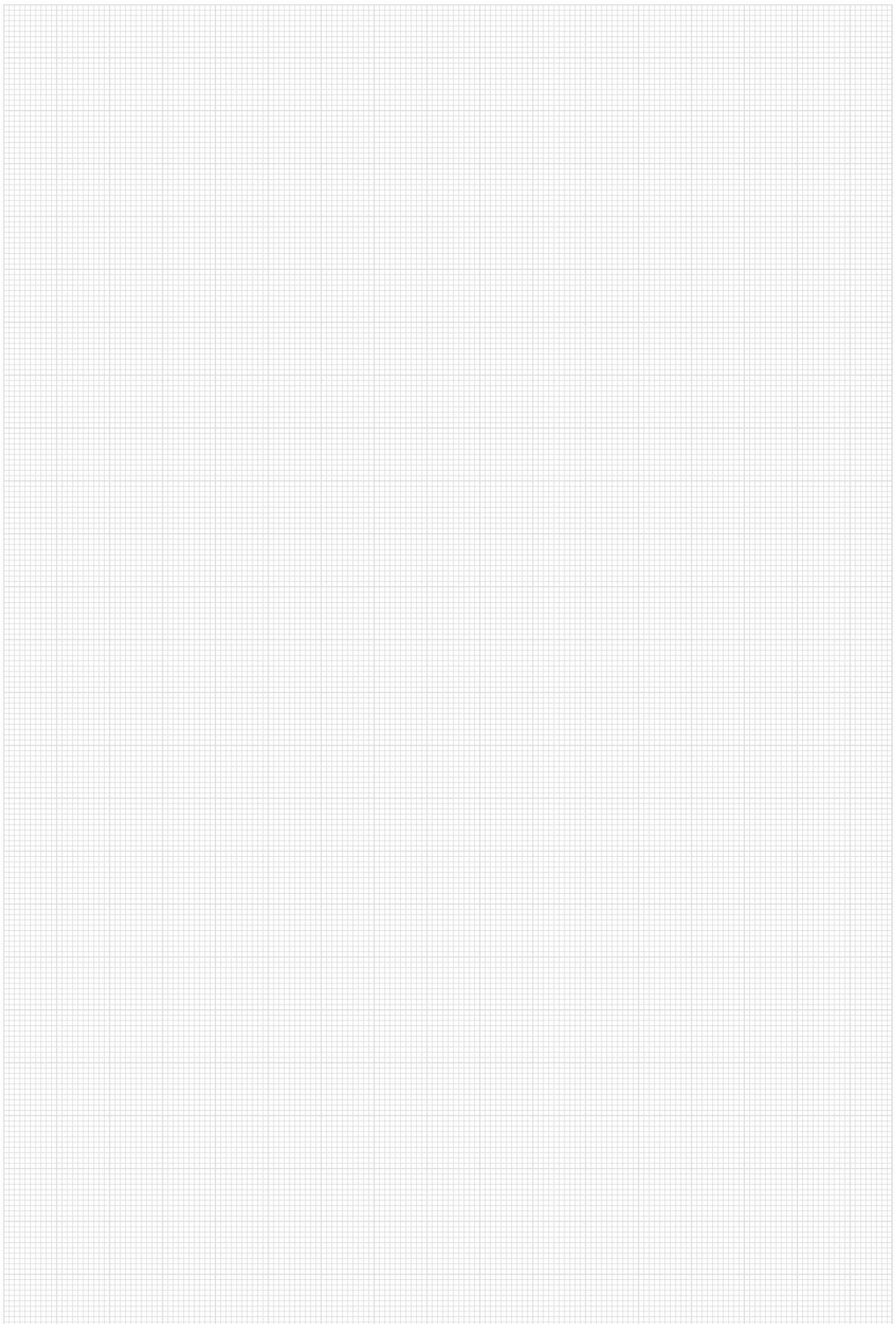
Accessories

MTS contact element (against incorrect operation) ☐

Miscellaneous:

Place, Date, Signature, Company stamp





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Roto Frank AG Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Telephone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com



Roto Frank AG
Window and Door Technology

Wilhelm-Frank-Platz 1
70771 Leinfelden-Echterdingen
Germany

Phone +49 711 7598 0
Fax +49 711 7598 253
info@roto-frank.com

www.roto-frank.com



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