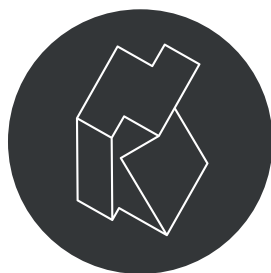


minimal windows®

Technic - Design - Functionality

www.minimal-windows.com





Cover

Arc Residence

Keller minimal windows®

Visualization by @miysis_premium, Products used: minimal windows® curve

minimal windows®

The frameless sliding and fixed window system Keller minimal windows® captivates by slim profile geometry and flush-fitted floors, ceiling and walls installation.

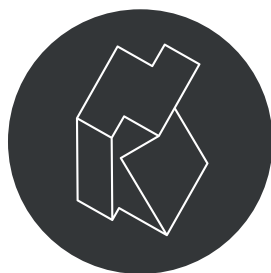
It creates a seamless transition from inside to outdoors.

The living spaces thus created enjoy maximum incidence of light.

MAXIMUM VIEW

Architects, planners and clients can enjoy the wealth of design opportunities offered by this premium modular system.

Our engineers pay the closest attention to the finest details of design and perfection. We use the highest-quality materials, state-of-the-art production processes, innovative ideas and the valuable craft skills of our employees.



DESIGN 09

SYSTEM 21

PRODUCT 39

ACCESSORIES 75

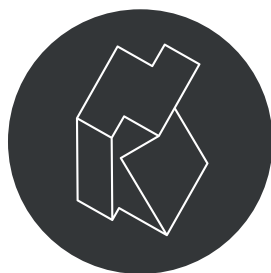




Wainscott Home

Architect: Bates Masi + Architects, Photographer: Michael Moran,
Partner: Smartglass Inc., Products used: minimal windows® & minimal windows® 4+





DESIGN



Timber Estate
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® 4+



Arc Residence
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® curve



Design

F

rameless

The frame profile is pared down to a minimum dimension to allow seamless integration into the floor, ceiling and walls. All you see are the slender leaf profiles. A glass proportion of up to 98 % guarantees unhindered incidence of light.

L

arge-scale

Sliding doors up to 18 m² and fixed windows of up to >18 m² can be achieved. The maximum overall height for sliding doors is up to 6 m.

M

odular

The huge variety of practical configuration variants covers all requirements. You can have up to five-track sliding systems in combination with fixed lights or interior / exterior corners with no distracting posts.

I

ndividual

Choose from an extensive selection of RAL or anodised colours and stainless steel finish. The minimalistic aluminium profiles can thus be optimally and individually matched to the property. Glass facades can be created to suit any environment.

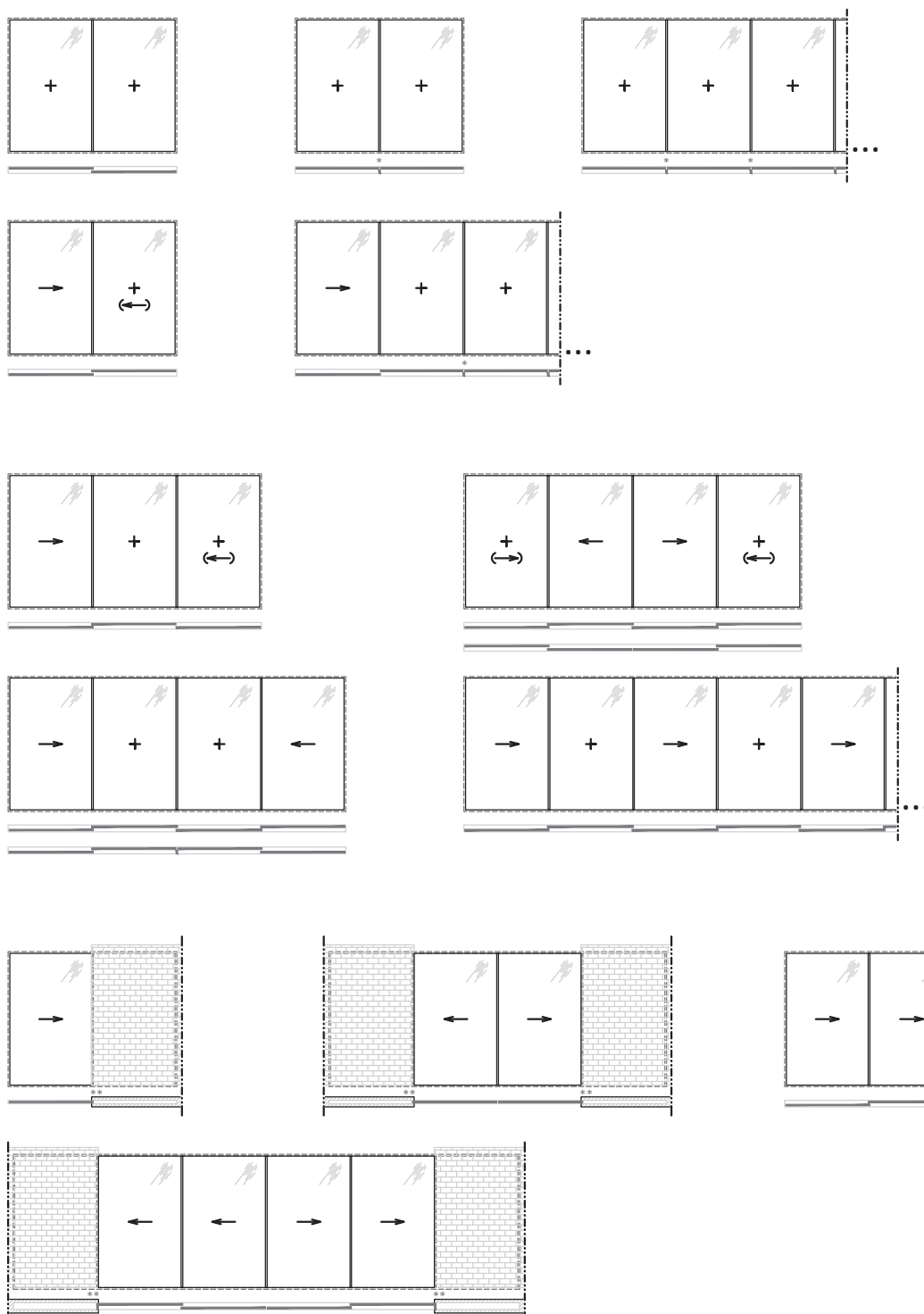




Design



Examples of 1- and 2-track opening methods

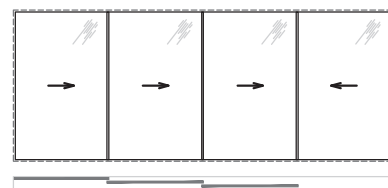
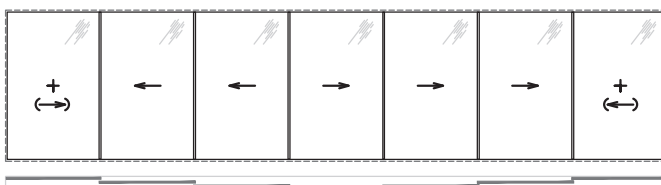
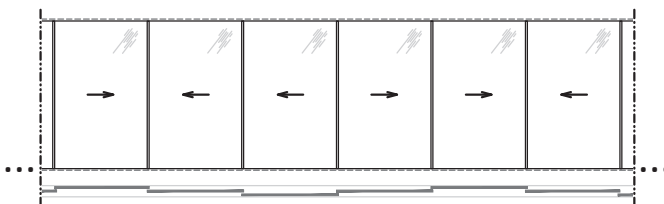
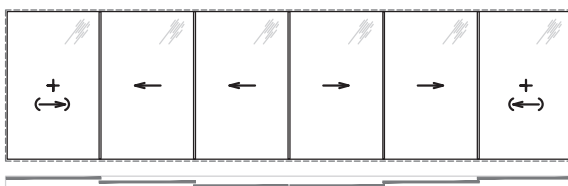
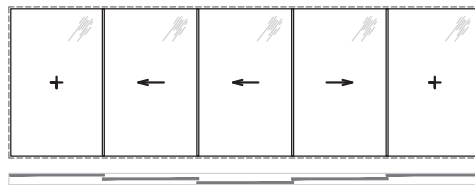
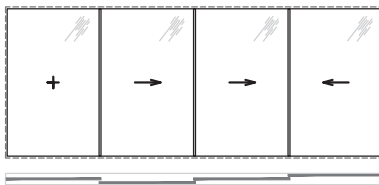
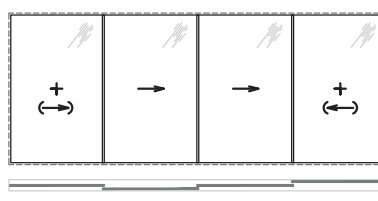
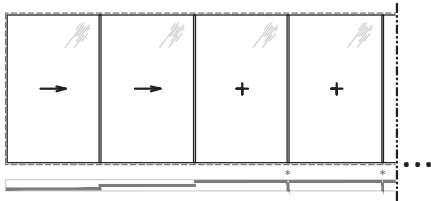
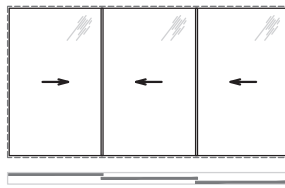
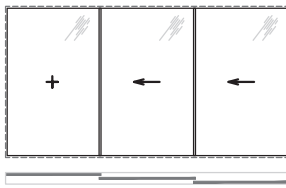


(*) highline
(**) with wall pocket



Design

Examples of 3- and 4-track opening methods





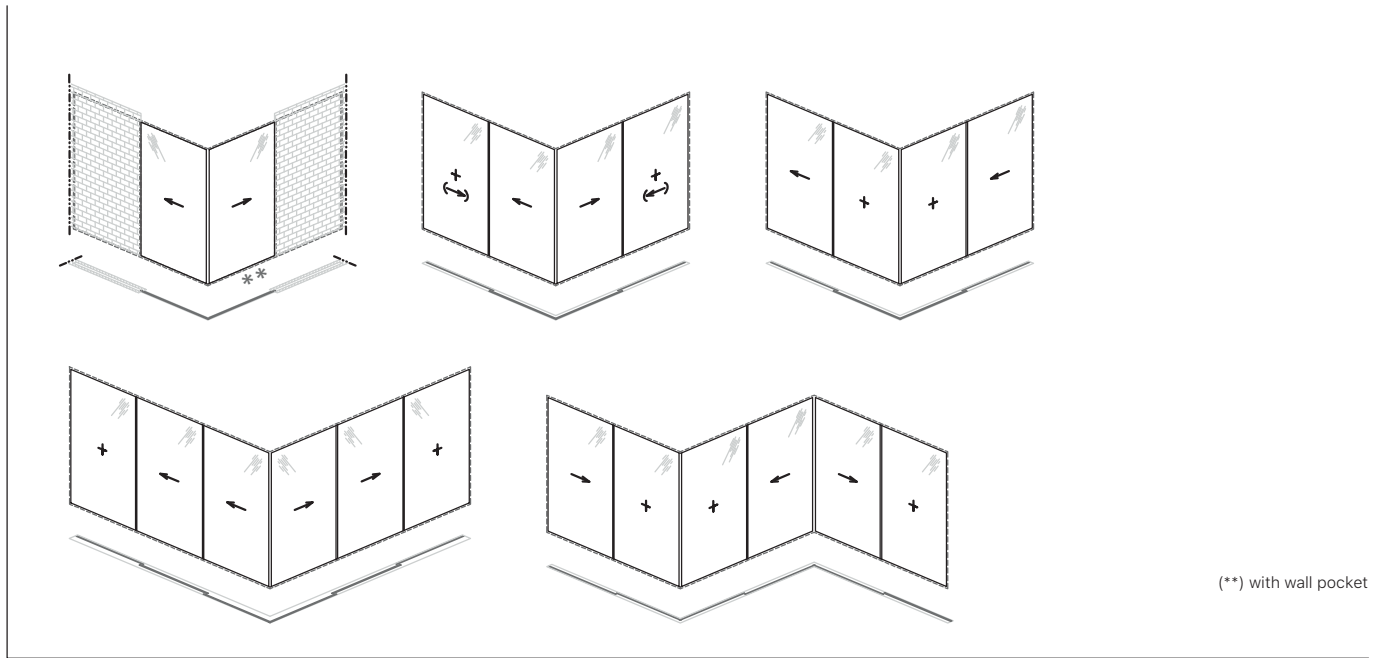
Seabreeze Residence

Architect: VVR Architecten, Photographer: Jurrit Van der Waal,
Partner: Kumasol BV, Products used: minimal windows®4+

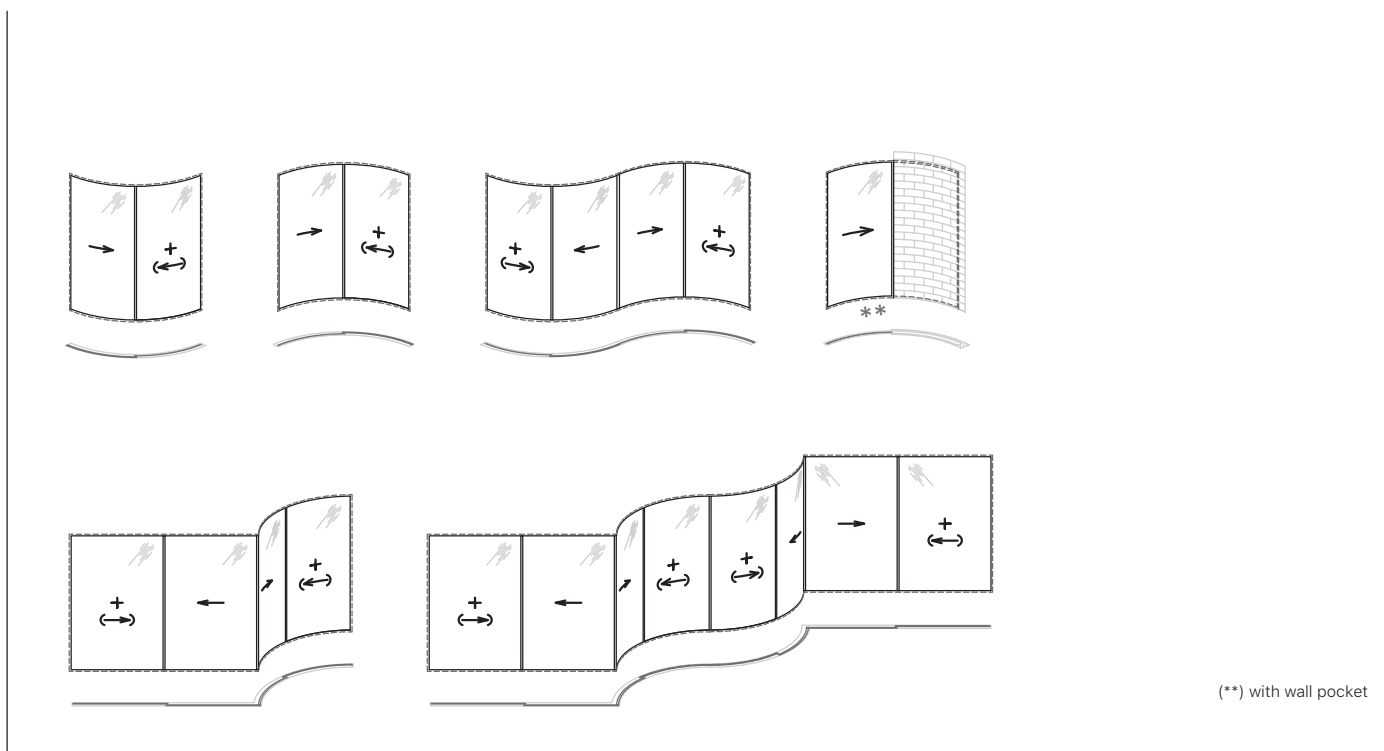


Design

„vision“ : internal and external post-free corners



„curve“ : combination of straight and curved fixed and sliding windows

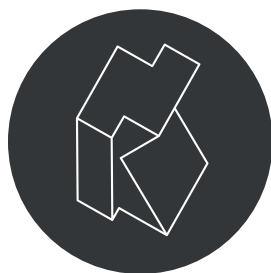




Villa Neo

Architect: Querkopf Architekten, Photographer: Franck Löschke,
Partner: Stol Warker GmbH, Products used: minimal windows® 4+





SYSTEM



Californian Villa LA
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® NGS

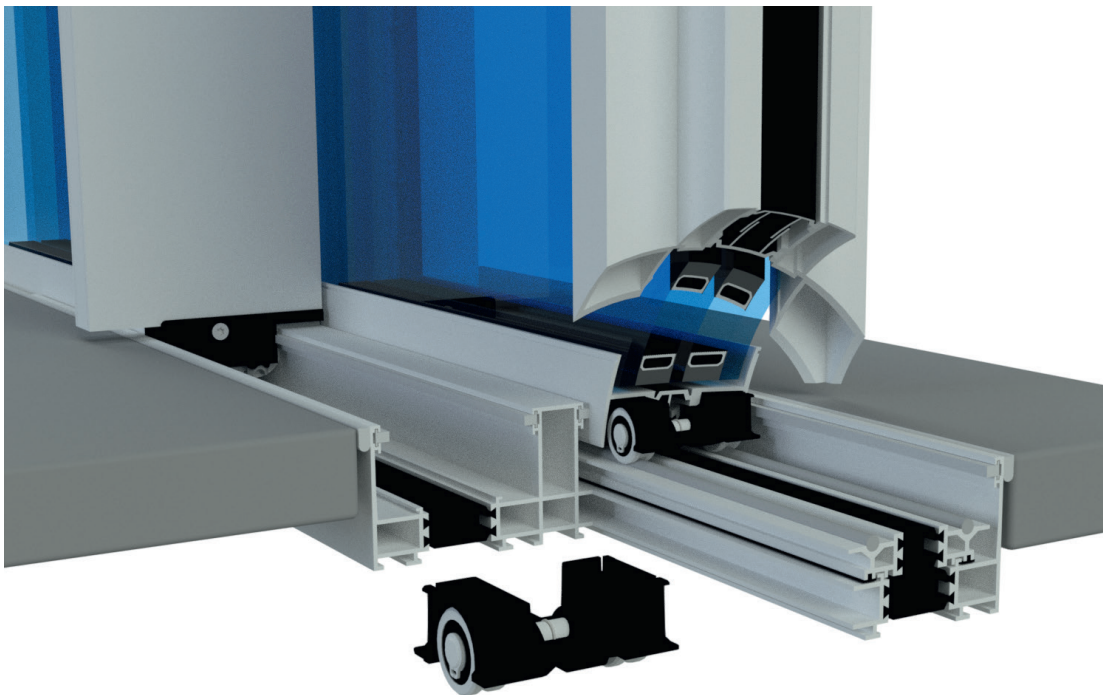
Stainless steel sliding rail

The stainless steel sliding rail recessed into the lower frame profile guarantees easy-action, silent opening and closing of the transparent elements.

Roller carriage

The self-centring, integrated roller carriage is concealed in the lower profile of the sliding leaf.

High-quality stainless steel rollers ensure high load-stability and easy action in daily use for leaf weights of anything up to 1500 kg with NGS (mw = 500kg / mw4+ = 1000 kg).





System

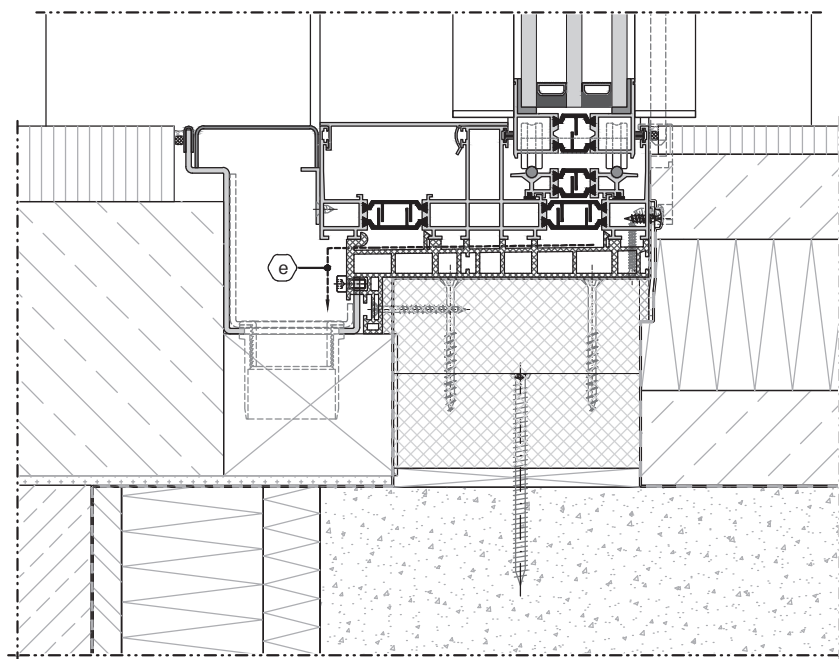
Fitted flush to floor

The outer frame can be recessed around the whole perimeter into the walls, the ceiling and the floor. It creates a threshold-free transition from indoors to out.

The floor profile with the integrated stainless steel sliding rail is on a level with the floor, easy to care for and maintenance-free.

Drainage

Controlled drainage is achieved via a specially-designed system-integrated drainage or optionally via a concealed system drainage gutter with stainless steel cover.



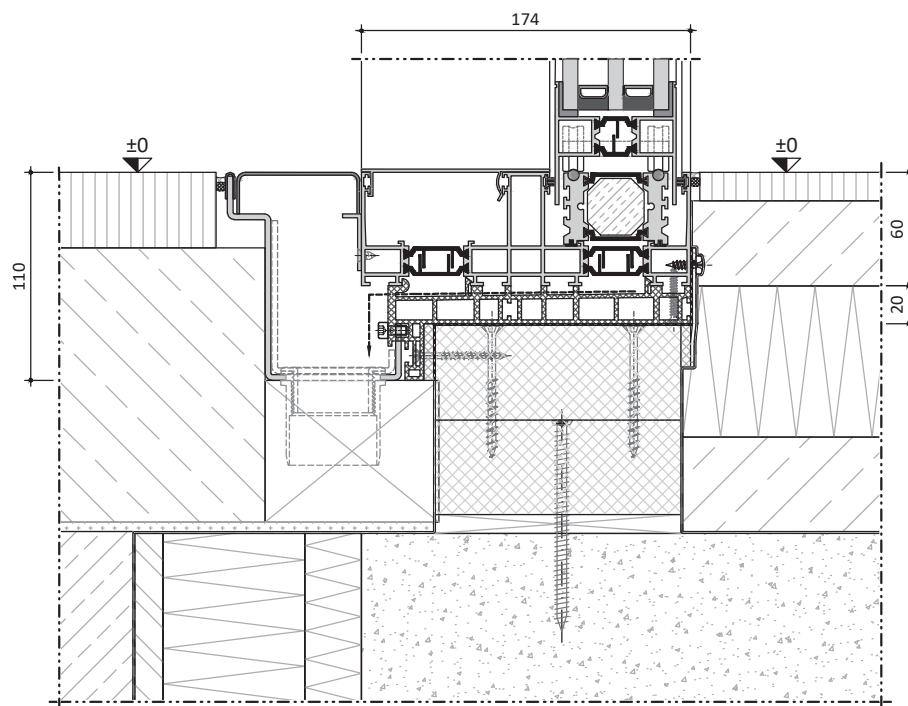


Illustration shows a possible design variant : minimal windows® 4+ freeway





System

Barrier-free

The use of the flush leveled minimal windows® freeway/floor sliding rail guarantees accessibility entirely without thresholds. Thanks to the outer frame perfectly integrated in the floor and the sliding rail elevated precisely to floor level, there is no annoying floor depression.

The level installation makes for a seamless transition from indoors to outdoors.

The barrier-free design offers an obstacle-free, virtually even transition that differs markedly from conventional systems with surface-mounted door frames or deep thresholds.

The flush-with-the-floor system variants have been developed for all the minimal windows® product lines.

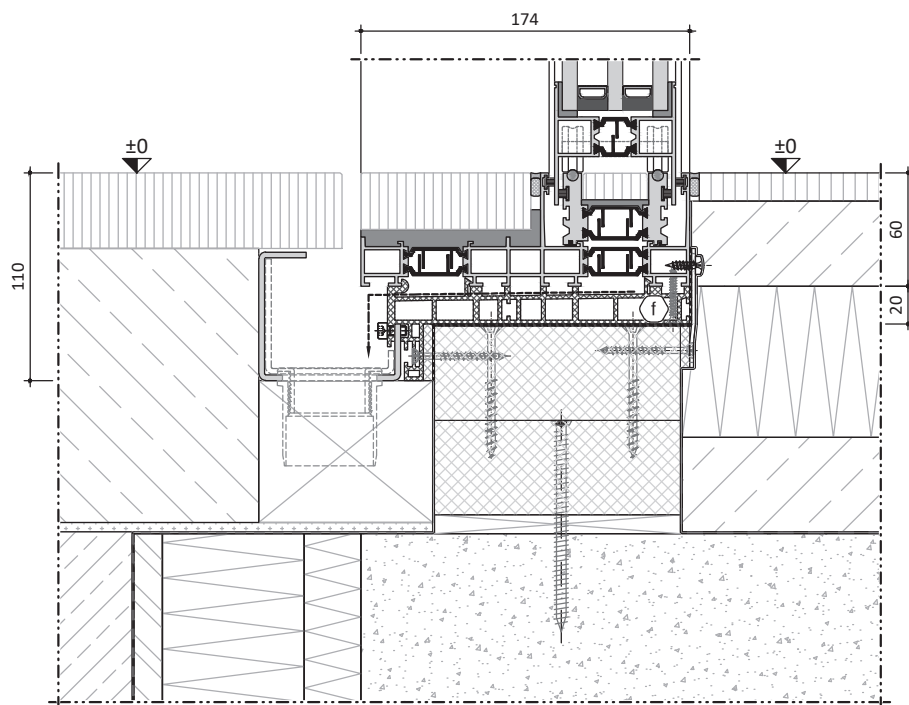


Illustration shows a possible design variant : minimal windows®4+ floor

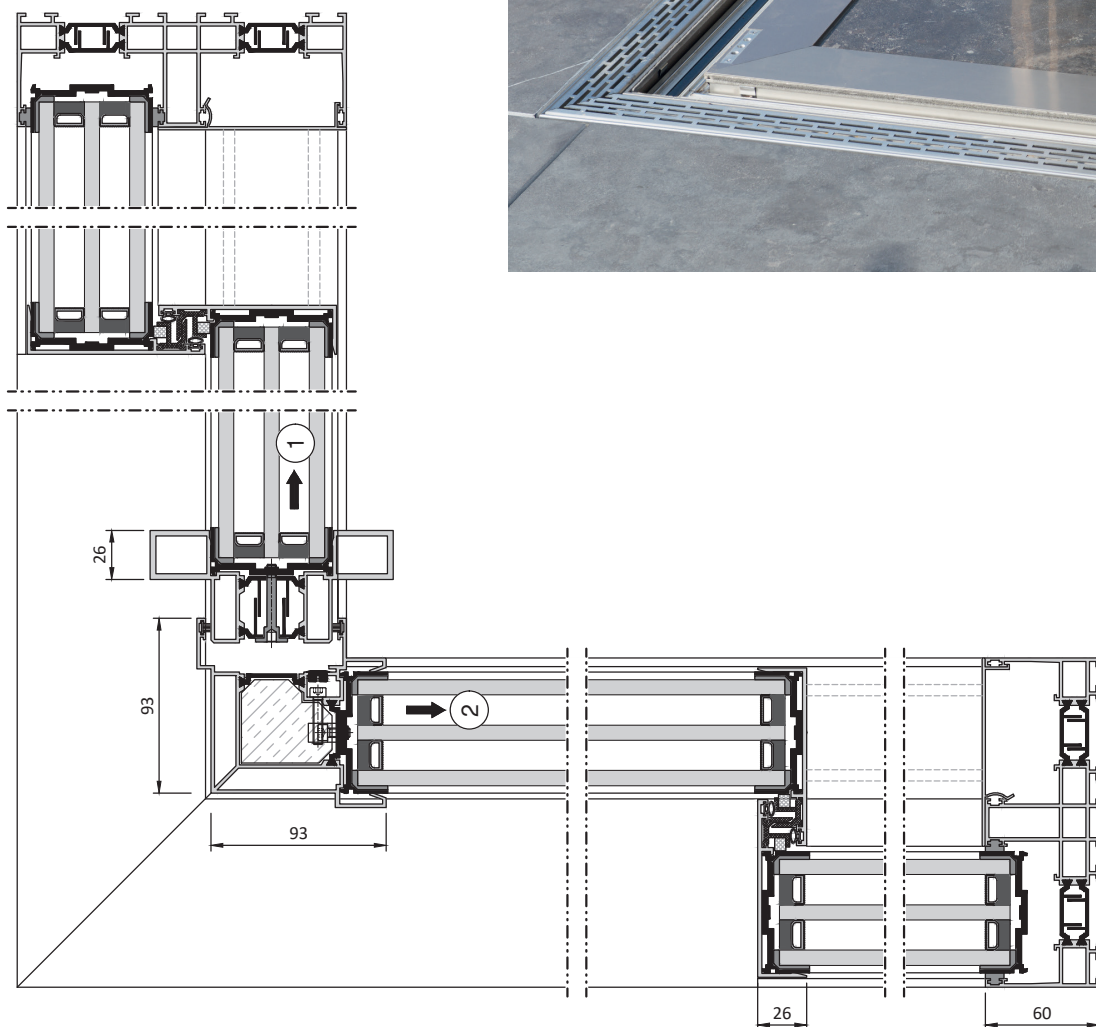


Illustration shows a possible design variant : minimal windows®4+ vision



System

Corner-post-free

Architecture needs space and flexibility.

Keller minimal windows® offer both in terms of configuration options and connection flexibility.

The design sliding window system allows 1- until 5-track sliding and fixed window installations, uninterrupted inside and outside corner solutions with no posts and concealed pocket wall solutions.

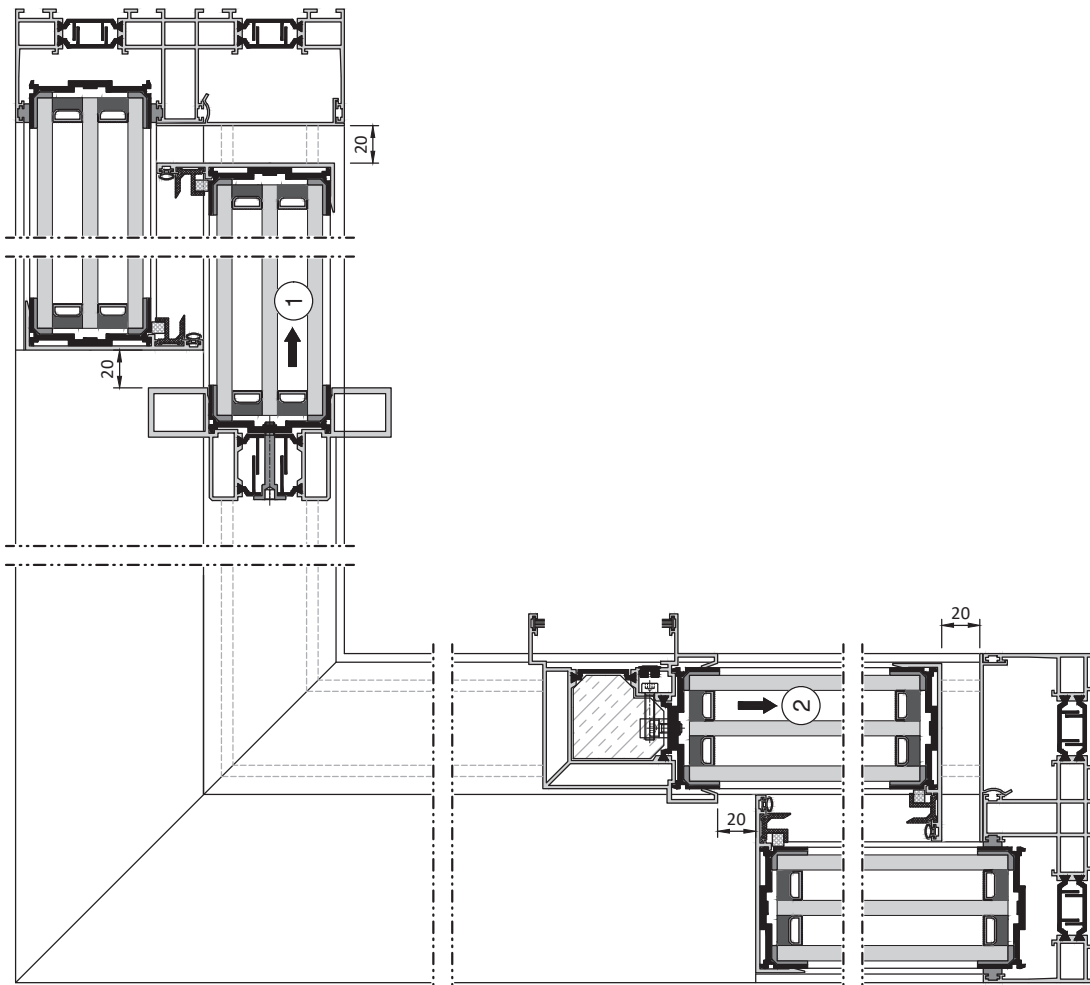


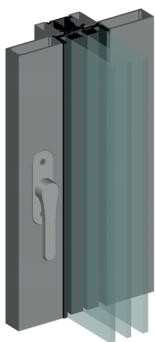
Illustration shows a possible design variant : minimal windows®4+ vision

Manual locking

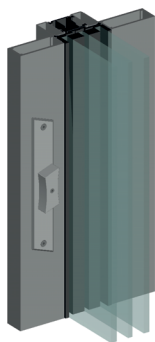
The multipoint locking is concealed inside the handle, double vent or junction profile of the sliding leaf.

Actuation takes place via an elegant design lever with or without cylinder lock.

Type 1



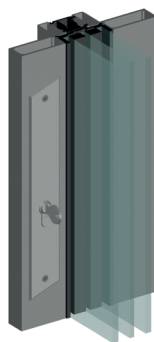
Type 2M



Type 3M



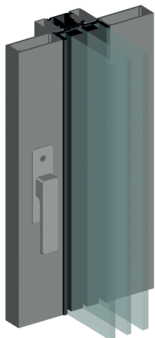
Type 4



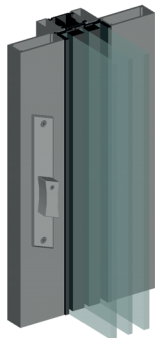
Type 5



Type 1a



Type 2V



Type 3V



Type 5a



a selection of finishing designs



Stainless steel



Anodize E6/C33



Brass, patinated



Corten steel



Crystals



Type 1a: E6/C35 anodize black



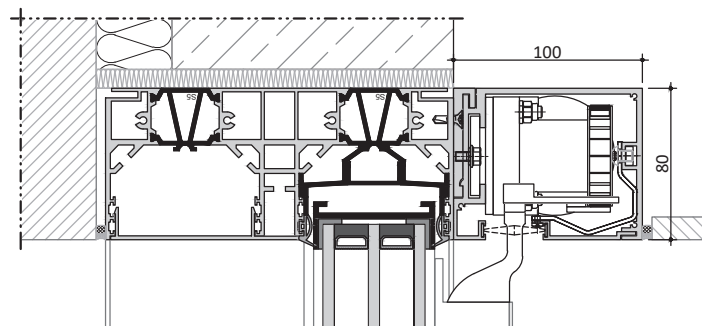
System

smart slider

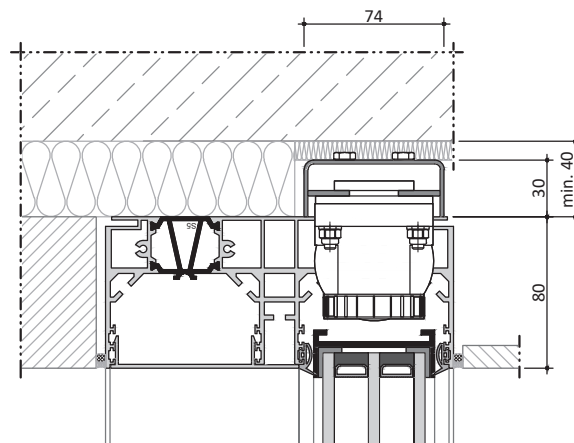
According to the individual system configuration, concealed electric drives and locks can be used to increase operating comfort. Automatic locking (Remote Control, home automation adaptation) and manual locking options (deadman-lock via wall switch) are available.

A single motor with toothbelt can operate several sliding leaves with a combined weight of up to 2400 kg silently. This allows the telescopic-opening of wide expanses of glass façades.

smart slider LD - lateral drive



smart slider TD - top drive





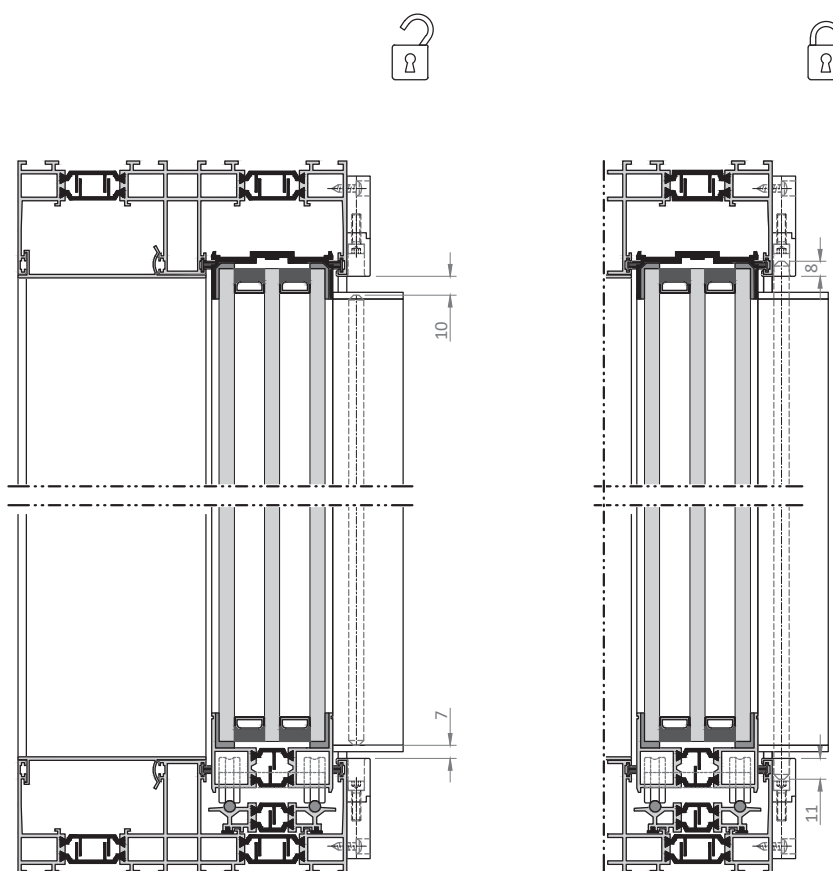
Light Horizon
Architect: Geopol design office, Photographer: Sylwia Gudaczewska,
Partner: KER3MR., Products used: minimal windows® 4+



Security

The two-point locking system offers burglar resistance and is approved according to burglary protection class RC 2 (RC 3 by NGS).

For added security the system can be fitted with an integrated opening and locking monitoring and connected to standard external monitoring systems.



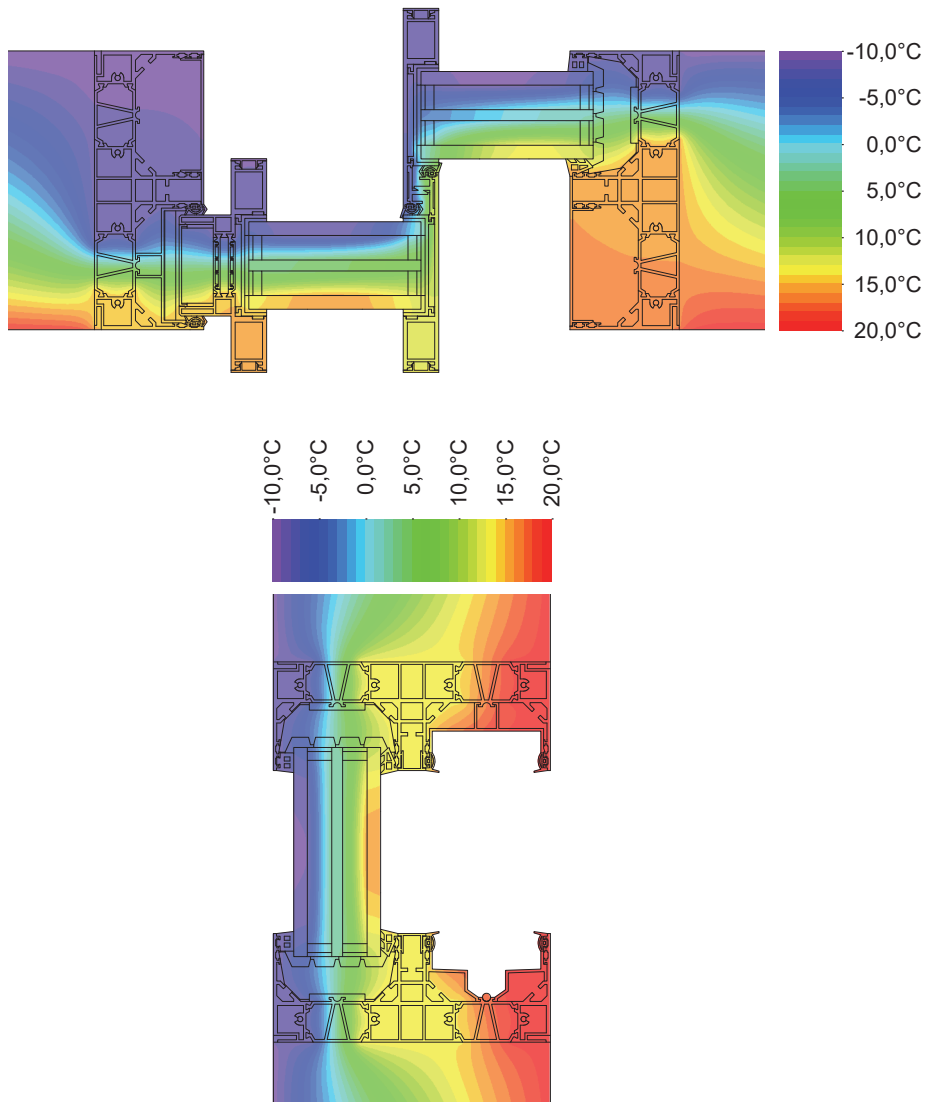


System

Energy

The premium Keller minimal windows®4+, NG S5 & NG S6 series for triple glazing has uninterrupted thermal insulation.

These systems are ideal for passive house construction when using high-quality insulation glazing.







System

Certification

The quality of our systems meets the highest requirements "Made in Luxembourg" and guarantees maximum protection against driving rain, wind loads, air permeability, noise penetration.

All new designs and systems meet high quality standards and correspond to the latest state of the art techniques.



PRÜFBERICHT		
Nr. 40-16/15		
1. Auftraggeber und Hersteller	Keller AG / SA L-9911 Troisvierges	
2. Bezeichnung des Prüfgegenstandes	2-flg. Schiebefenster (Schiebe-Fest) mit Drainageunterbau minimal windows® 4+	
3. Prüfauftrag / Prüfgrundlage und Prüfergebnis	Nachweis der Leistungseigenschaften gemäß EN 14351-1: - Luftdurchlässigkeit gemäß EN 1026/12207 Klasse 4 - Schlagregendichtheit gemäß EN 1027/12208 Klasse E1050 - Widerstand bei Windlast gemäß EN 12211/12210 Klasse C5	
4. Datum der Prüfung	26. März 2015	
5. Ort der Prüfung	Keller AG / SA 38 – 40, route de Wilwerdange L-9911 Troisvierges / Luxemburg	
6. Datum des Prüfberichtes	06. Mai 2015	
7. Umfang des Prüfberichtes	1 Seite Deckblatt 28 Seiten Anlagen	
8. Zusatzbedingungen zu diesem Prüfbericht	1. Es gelten unsere Geschäftsbedingungen 2. Die Prüfergebnisse beziehen sich nur auf den geprüften Prüfgegenstand (Nr. 2) 3. Der Prüfbericht darf nicht verändert und nur als Ganzes veröffentlicht werden.	
9. Unterschrift	 O. Troska, Dipl.-Ing. (FH) Institutsleiter	
	 S. Claessen Prüftechnik	

Akkreditierte Prüfstelle nach DIN EN ISO/IEC 17025
Akkreditierte Zertifizierungsstelle nach DIN EN ISO/IEC 17065
Prof. Überwachungs- und Zertifizierungsstelle nach dem Bauproduktengesetz (BauPG)
BAU-Prüfstelle für Schösser und Beschläge nach RAL-RG/GZ 607 / II
Überwachungs- und Zertifizierungsstelle nach Landesbauordnung (LBO)
BaupBG-Prüfstelle für Fahrwerkrollen - DIN CERTCO anerkannte Prüfstelle

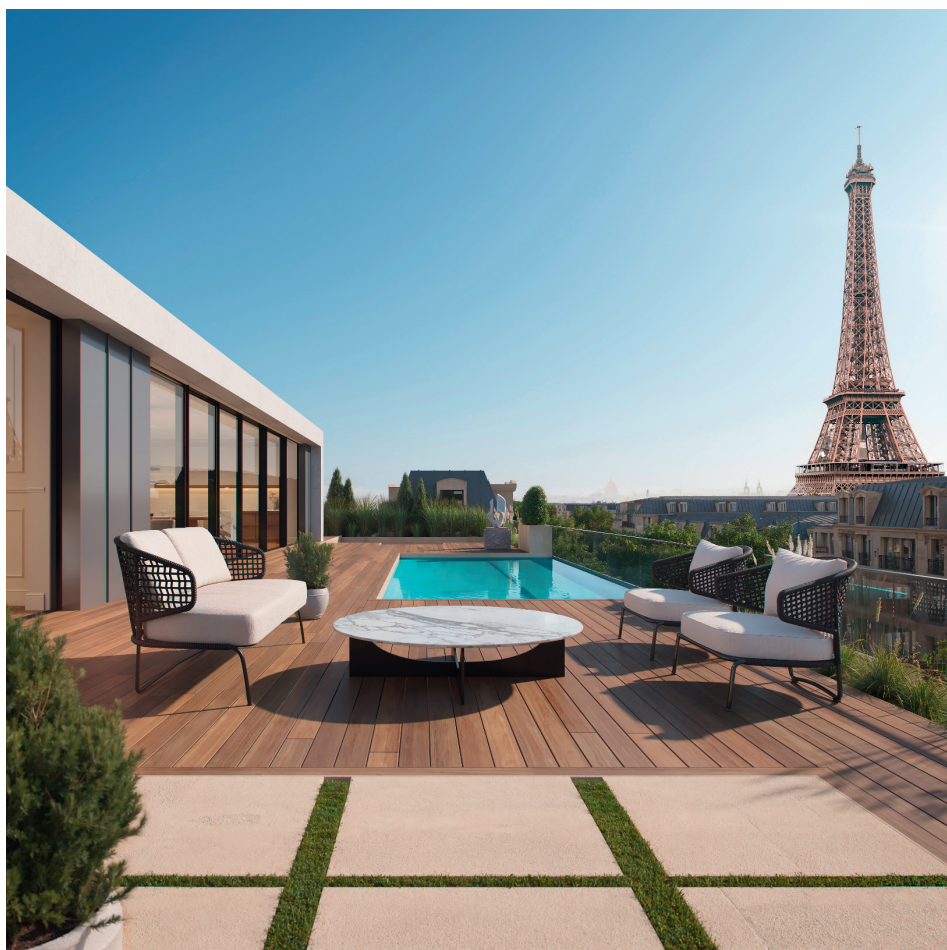
Institutleitung:
Oliver Troska, Dipl.-Ing. (FH)

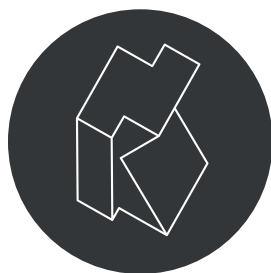
Es gelten unsere
Geschäftsbedingungen


Deutsche
Akkreditierungsstelle
D-PL-11024-01-00



Paris Penthouse
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® NGS





PRODUCT





Natural Retreat

Architect: Lab 32 Architecten, Photographer: Monique Lipsch, Koen Stijnen,
Partner: Kumasol BV, Products used: minimal windows® 4+

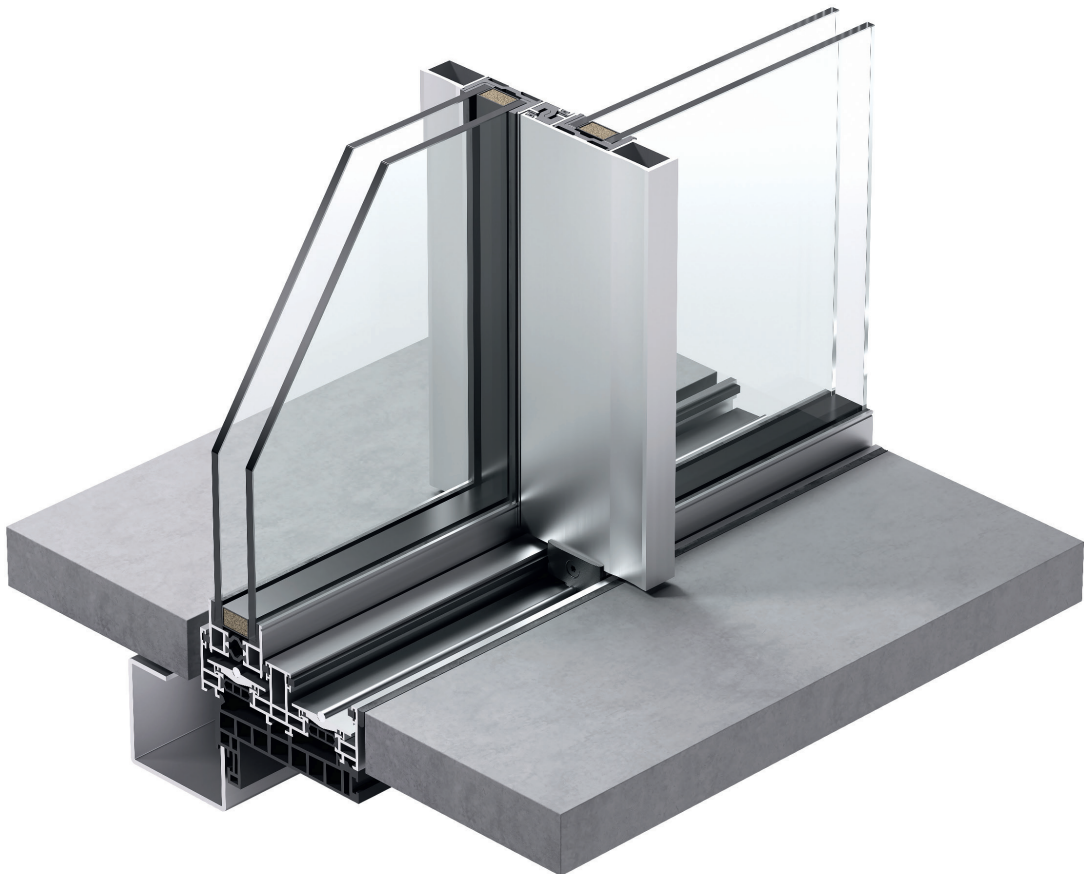


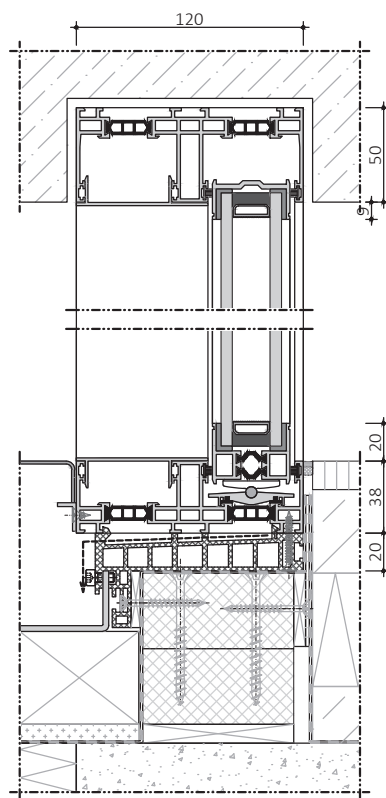
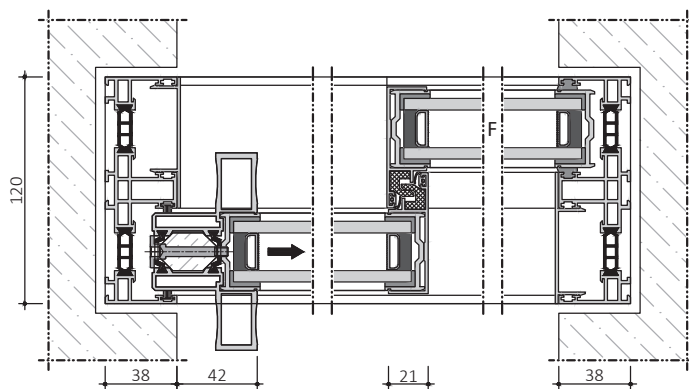
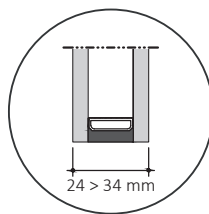
Product

minimal windows®

Keller minimal windows® is a practically frameless, extremely easy-action sliding window system with a minimalistic facing width of the leaf profile of only 21 mm.

The system features double insulation glazing in thermal separated aluminium frame profiles.







Product

minimal windows®

Facing width from centre point	21 mm
Maximum leaf size	up to 8,5 m ² / fixed light up to 18 m ²
Maximum leaf height	4 m
Maximum leaf weight	500 kg
Glass thickness	24 to 34 mm
Thermal transmission coefficient	$U_w \geq 1,30 \text{ W/m}^2\text{K}$ (a) $U_w > 1,1 \text{ W/m}^2\text{K}$ (b)
Motorisation	up to 2.400 kg total weight (with one motor and combined leaves)
Barrier-free accessibility	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207
Driving rain tightness	up to class 7A according to EN 12208
Resistance to wind load	up to class C4/B5 according to EN 12210
Sound insulation	up to 39 dB achievable
Resistance to burglary	up to RC 2 according to EN 1627

(a) Calculation for sliding-fixe 4,5 x 4,0 m with double glass $U_g 1.0 \text{ W/m}^2\text{K}$

(b) Calculation for sliding-fixe 4,5 x 4,0 m with HM glass $U_g 0.8 \text{ W/m}^2\text{K}$



Lanaken Villa
Architect: AMA group (Associated architects BV), Photographer: © Marc Sourbron,
Partner: Group Ceyssens, Products used: minimal windows®

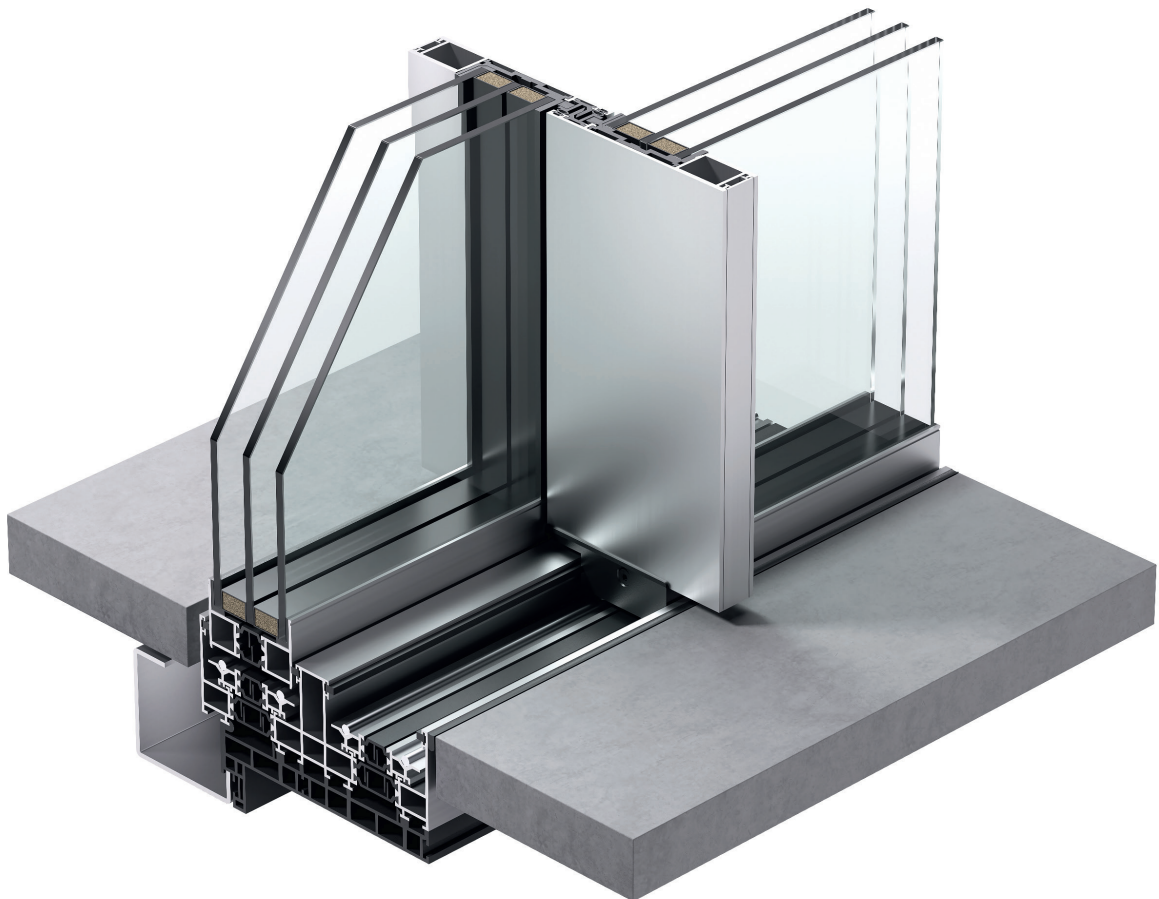


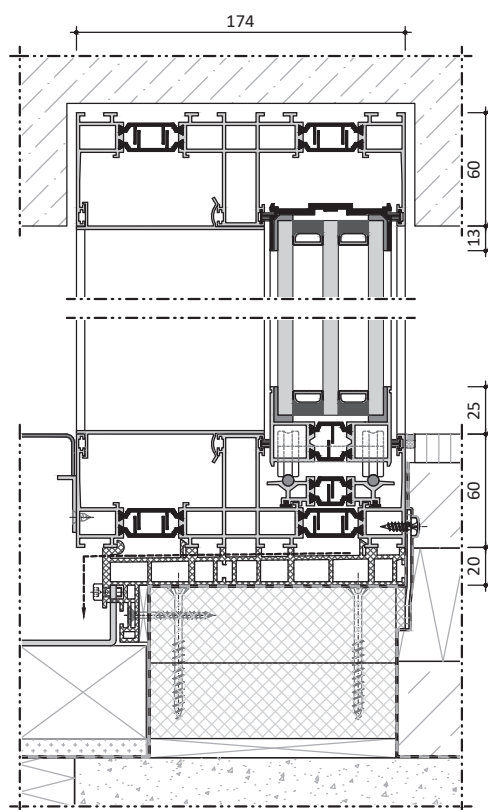
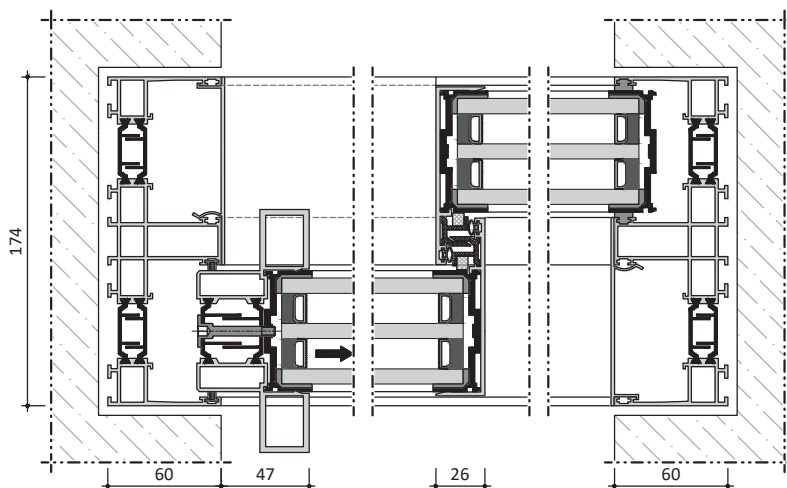
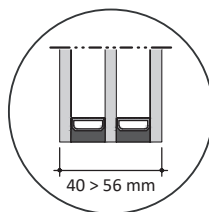
Product

minimal windows® 4+

The premium version of the triple-glazed design sliding window is the most highly insulated variant and is the perfect solution for the passive house area.

With high-quality insulated glass pane it is possible to achieve a U_w value of $\geq 0.70 \text{ W/m}^2\text{K}$.







Product

minimal windows® 4+

Facing width from centre point	26 or 34 mm
Maximum leaf size	up to 12 m ² / fixed light up to 18 m ²
Maximum leaf height	4,5 m
Maximum leaf weight	1.000 kg
Glass thickness	40 to 56 mm
Thermal transmission coefficient	$U_w \geq 1,0 \text{ W/m}^2\text{K}$ (a) $U_w > 0,7 \text{ W/m}^2\text{K}$ (b)
Motorisation	up to 2.400 kg total weight (with one motor and combined leaves)
Barrier-free accessibility	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207
Driving rain tightness	up to class 8A according to EN 12208
Resistance to wind load	up to class C5 according to EN 12210
Sound insulation	up to 45 dB achievable
Resistance to burglary	up to RC 2 according to EN 1627

(a) Calculation for sliding-fixe 6,0 x 4,5 m with glass $U_g 0.8 \text{ W/m}^2\text{K}$

(b) Calculation for sliding-fixe 6,0 x 4,5 m with glass $U_g 0.5 \text{ W/m}^2\text{K}$



Mountain Mansion
Keller minimal windows® Autumn haven
Visualization by @miysis_premium. Products used: minimal windows® NGS



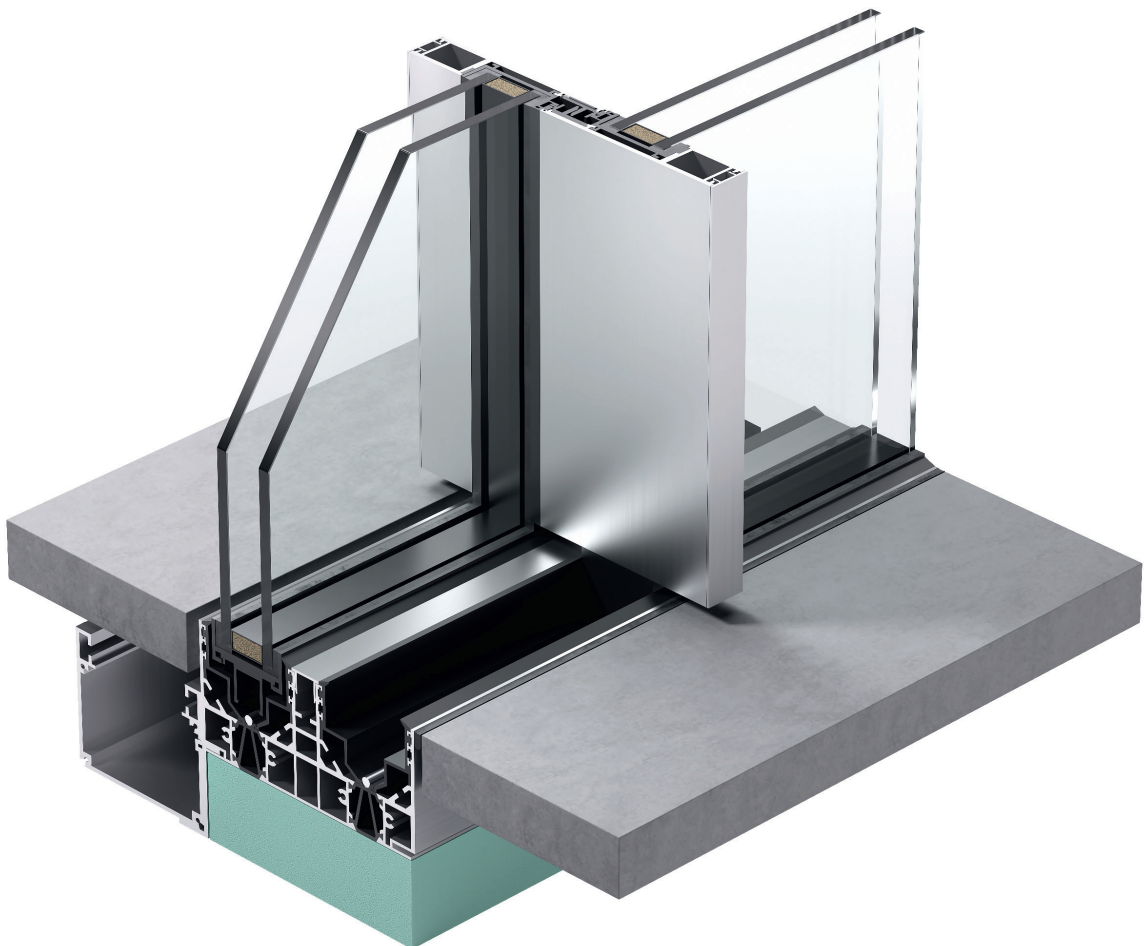
Product

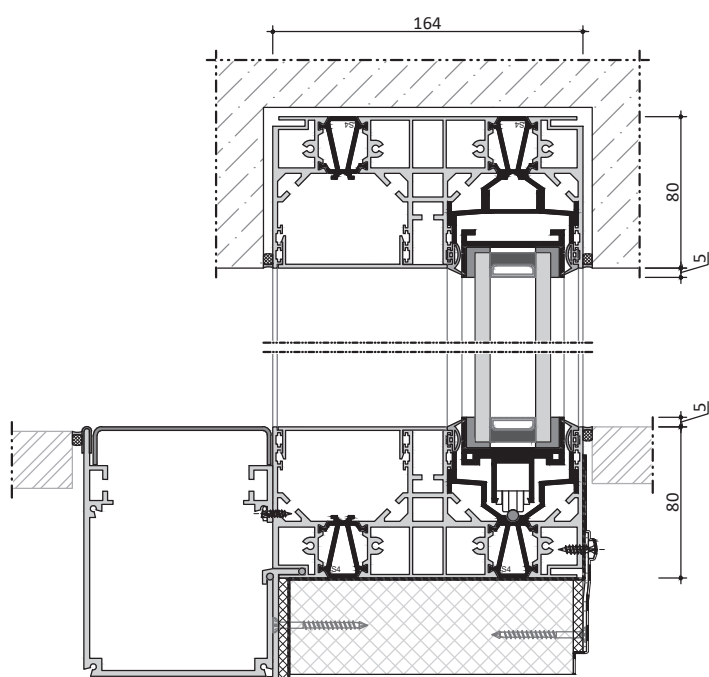
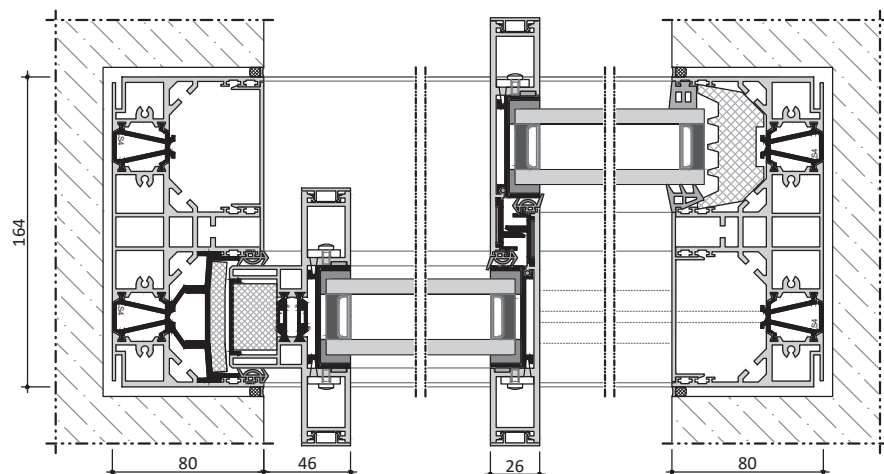
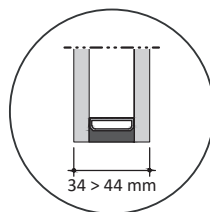
minimal windows® NG S4

The revolutionary redesign of the minimal windows® Next Generation Slider frame system marks a significant milestone in the development of contemporary glazing systems. A key focus of this innovation is to standardise the application for different glazing parameters.

The result of these efforts is a seamless integration of four series consolidations into one system with a uniform and well thought-out design. This progress enables even more flexible and efficient solutions to be realised in modern architecture.

NG S4 glass thickness of **34 mm to 44 mm**.







Product

minimal windows® NG S4

Facing width from centre point	26/36 mm
Maximum sliding leaf size	18 m ²
Maximum sliding leaf height	6 m
Maximum sliding leaf weight	1.500 kg
Glass thickness	34 to 44 mm
Thermal transmission coefficient	$U_w \geq 1,15 \text{ W/m}^2\text{K}$ (a) $U_w > 0,9 \text{ W/m}^2\text{K}$ (b)
Motorisation	up to 2.400 kg total weight (with one motor and combined leaves)
Barrier-free accessibility	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207 (c)
Driving rain tightness	up to class 8A according to EN 12208 (d)
Resistance to wind load	up to class C5 according to EN 12210 (c)
Sound insulation	up to 44 dB achievable (c)
Resistance to burglary	up to RC 3 according to EN 1627 & PAS 24

(a) Theoretical R&D calculation for sliding-fixe 6.0 x 6.0 m with glass $U_g 1,0 \text{ W/m}^2\text{K}$

(b) Theoretical R&D calculation for sliding-fixe 4.0 x 6.0 m with glass $U_g 0,6 \text{ W/m}^2\text{K}$

(c) Target value, waiting for official testing

(d) Target value for drainage type 1 (target value for drainage type 2 & 3 >8A)



Villa Contemporaine
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® 4+



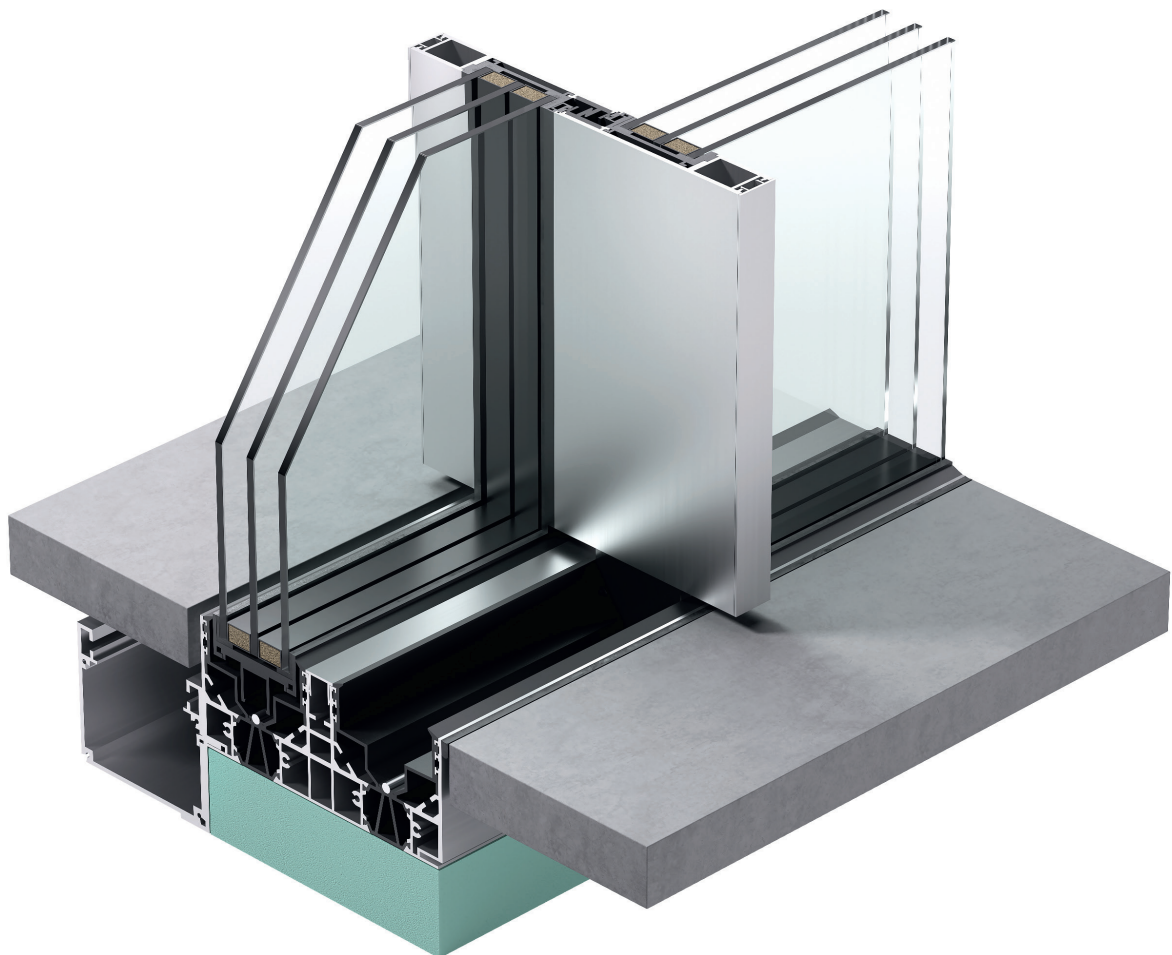
Product

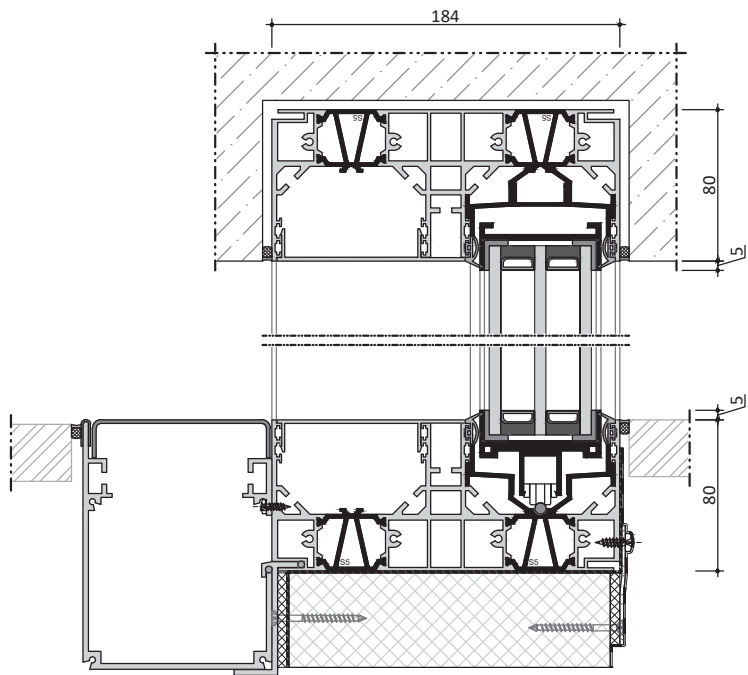
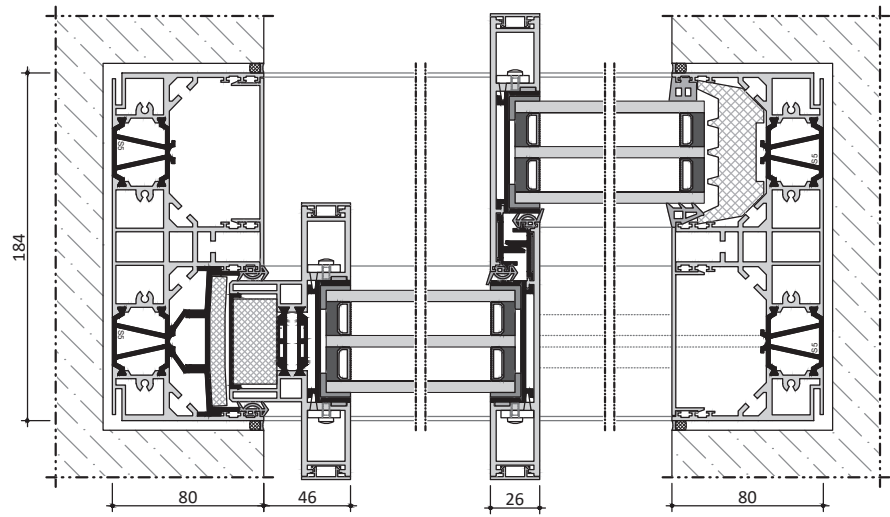
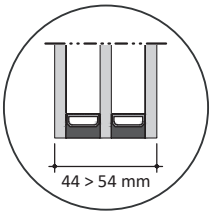
minimal windows® NG S5

The revolutionary redesign of the minimal windows® Next Generation Slider frame system marks a significant milestone in the development of contemporary glazing systems. A key focus of this innovation is to standardise the application for different glazing parameters.

The result of these efforts is a seamless integration of four series consolidations into one system with a uniform and well thought-out design. This progress enables even more flexible and efficient solutions to be realised in modern architecture.

NG S5 glass thickness of **44 mm to 54 mm**.







Product

minimal windows® NG S5

Facing width from centre point	26/36 mm
Maximum sliding leaf size	18 m ²
Maximum sliding leaf height	6 m
Maximum sliding leaf weight	1.500 kg
Glass thickness	44 to 54 mm
Thermal transmission coefficient	$U_w \geq 0,95 \text{ W/m}^2\text{K}$ (a) $U_w > 0,75 \text{ W/m}^2\text{K}$ (b)
Motorisation	up to 2.400 kg total weight (with one motor and combined leaves)
Barrier-free accessibility	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207 (c)
Driving rain tightness	up to class 8A according to EN 12208 (d)
Resistance to wind load	up to class C5 according to EN 12210 (c)
Sound insulation	up to 45 dB achievable (c)
Resistance to burglary	up to RC 3 according to EN 1627 & PAS 24

(a) Theoretical R&D calculation for sliding-fixe 6.0 x 6.0 m with glass $U_g 0,8 \text{ W/m}^2\text{K}$

(b) Theoretical R&D calculation for sliding-fixe 4.0 x 6.0 m with glass $U_g 0,6 \text{ W/m}^2\text{K}$

(c) Target value, waiting for official testing

(d) Target value for drainage type 1 (target value for drainage type 2 & 3 >8A)



Autumn Haven
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows® NGS



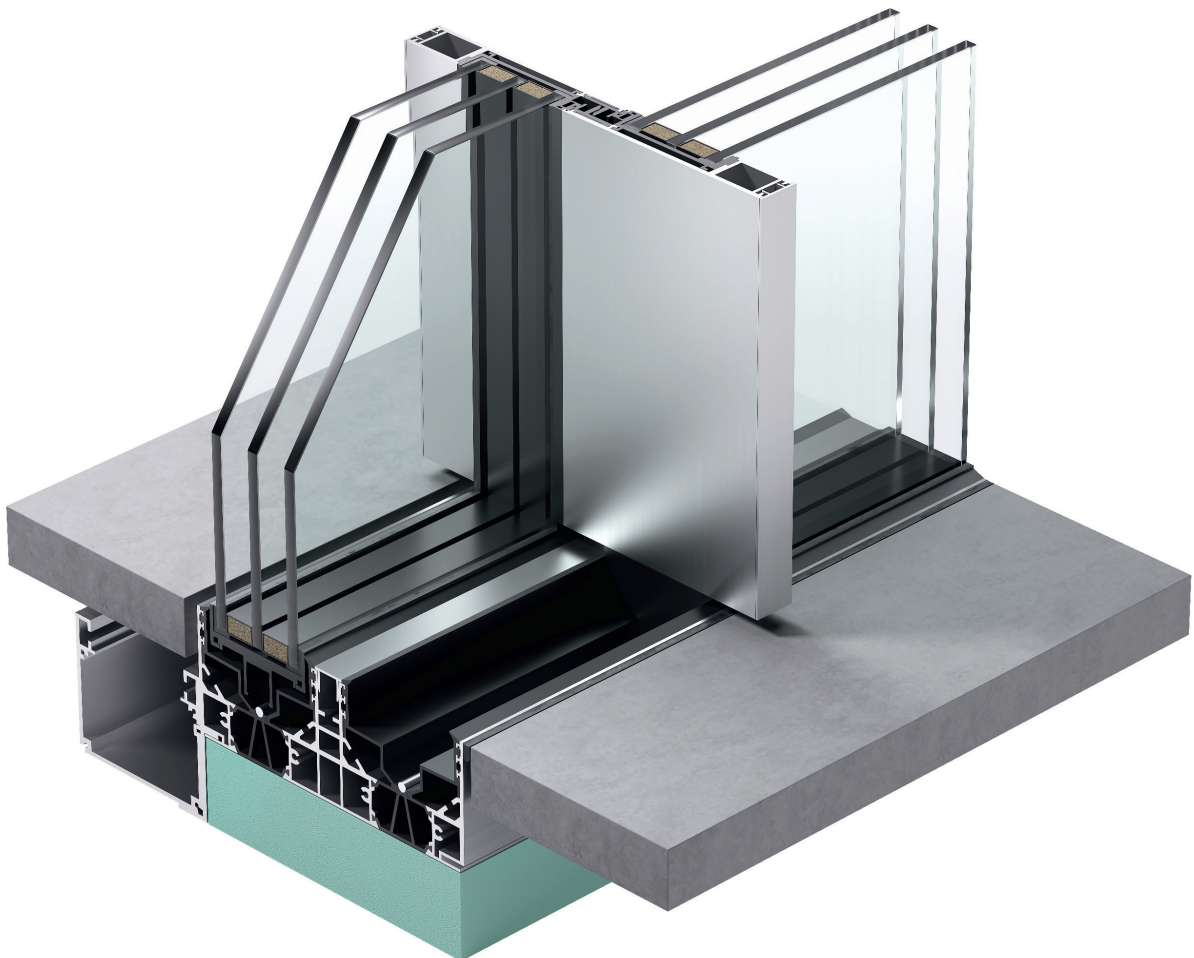
Product

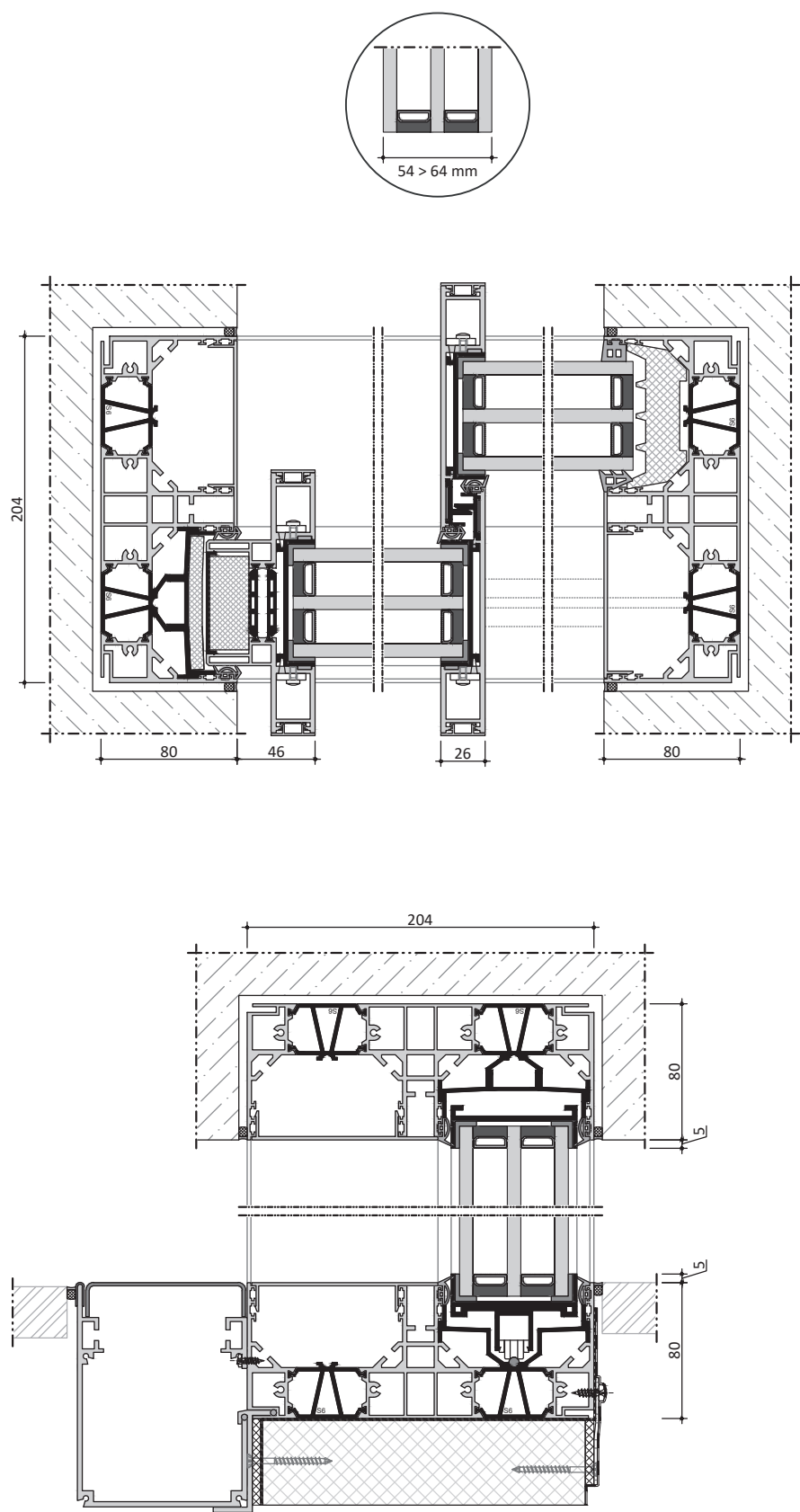
minimal windows® NG S6

The revolutionary redesign of the minimal windows® Next Generation Slider frame system marks a significant milestone in the development of contemporary glazing systems. A key focus of this innovation is to standardise the application for different glazing parameters.

The result of these efforts is a seamless integration of four series consolidations into one system with a uniform and well thought-out design. This progress enables even more flexible and efficient solutions to be realised in modern architecture.

NG S6 glass thickness of **54 mm to 64 mm**.







Product

minimal windows® NG S6

Facing width from centre point	26/36 mm
Maximum sliding leaf size	18 m ²
Maximum sliding leaf height	6 m
Maximum sliding leaf weight	1.500 kg
Glass thickness	54 to 64 mm
Thermal transmission coefficient	$U_w \geq 0,9 \text{ W/m}^2\text{K}$ (a) $U_w > 0,65 \text{ W/m}^2\text{K}$ (b)
Motorisation	up to 2.400 kg total weight (with one motor and combined leaves)
Barrier-free accessibility	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207 (c)
Driving rain tightness	up to class 8A according to EN 12208 (d)
Resistance to wind load	up to class C5 according to EN 12210 (c)
Sound insulation	up to 46 dB achievable (c)
Resistance to burglary	up to RC 3 according to EN 1627 & PAS 24

(a) Theoretical R&D calculation for sliding-fixe 6.0 x 6.0 m with glass $U_g 0,8 \text{ W/m}^2\text{K}$

(b) Theoretical R&D calculation for sliding-fixe 4.0 x 6.0 m with glass $U_g 0,5 \text{ W/m}^2\text{K}$

(c) Target value, waiting for official testing

(d) Target value for drainage type 1 (target value for drainage type 2 & 3 >8A)



Villa Glasscube

Architect: Govaert & Vanhoutte, Photographer: Tim Van De Velde,
Partner: Group Ceyssens, Products used: minimal windows®



Product

minimal windows® highline

The innovative premium glass façade system combines aesthetics with outstanding performance features. The slender and frameless glass façades enhance the pure minimalism of current architecture.

The glass façade between two structural floors comprises thermally insulated, concealed aluminium frame profiles and is ideal wherever minimum facing width and maximum glazing height is desired.

The flush-mounted or symmetrically alternating offset planes of the glass façade can be combined with ultra-slender design sliding doors to give the perfect solution for high-rise residential projects and business premises. Available as double- or triple glazing versions.

Stability of the sliding system tested under extreme wind loads with a nominal load of 2,000 Pa (approx. 200 km/h) and a peak load of 3,000 Pa (approx. 250 km/h; with brief gusts of wind) in accordance with EN12210 and the classification C4/B5.

We distinguish 3 different design variants:

Type 1 - Glass-To-Glass,

flush-surface glass façade with vertical 10 mm butt joint and SG bonding.

Type 2 - Semi-SG,

flush-surface glass façade with vertical 20 mm butt joint outside and 22 mm design static profiles inside.

Type 3 - Cover-Cap-Look,

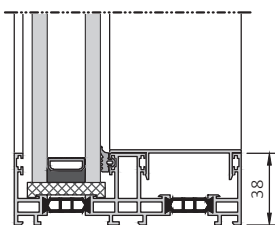
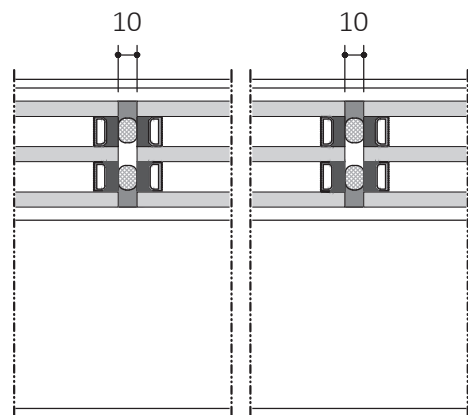
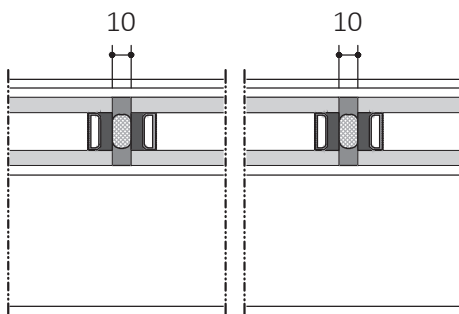
flush-surface glass façade with 22/34/36 mm exterior cover in different design variants and vertical 22/34/36 mm design static profiles inside.

TYP 1 Glass-To-Glass

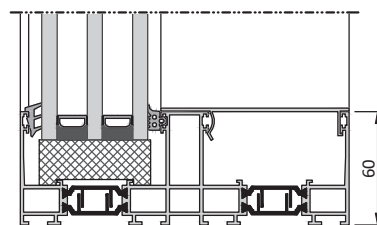
Vertical 10 mm butt joint with SG bonding

System glass façade between two floors made from insulated, concealed aluminium frame profiles and post-free glass-to-glass butt jointed implementation. The Glass-To-Glass variant (type 1) is designed as a flush-surface glass façade.

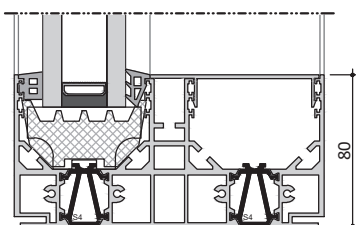
Design sliding doors can be optionally fitted in the second inner track.



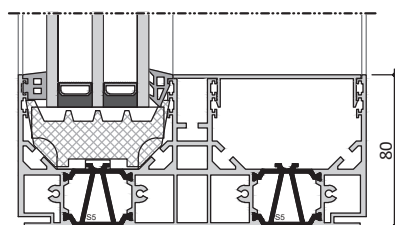
minimal windows®



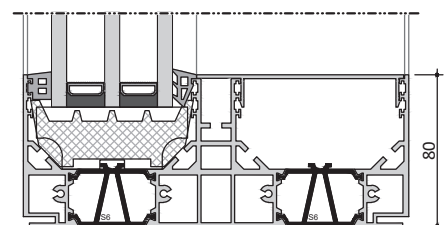
minimal windows® 4



minimal windows® NG S4



minimal windows® NG S5



minimal windows® NG S6



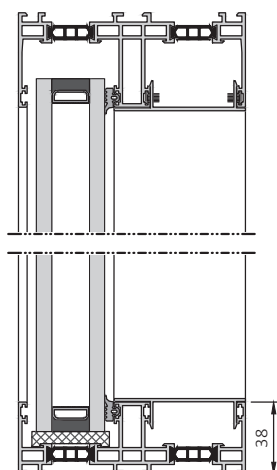
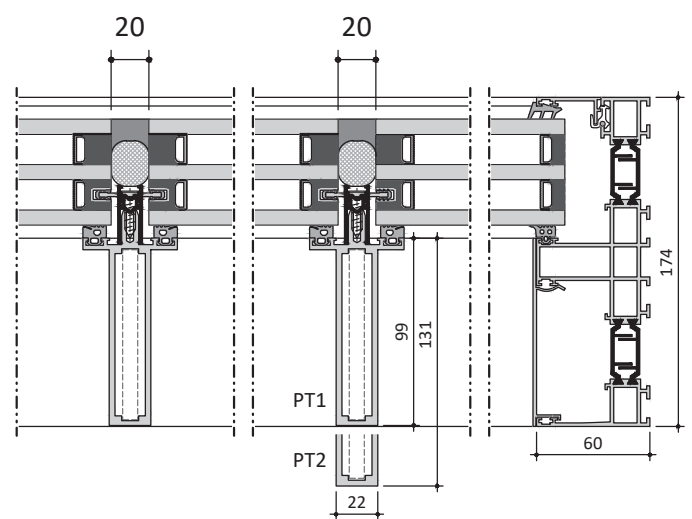
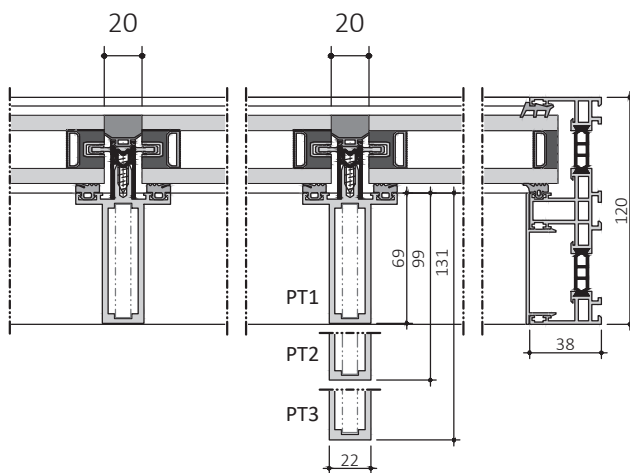
Product

TYP 2 Semi-SG

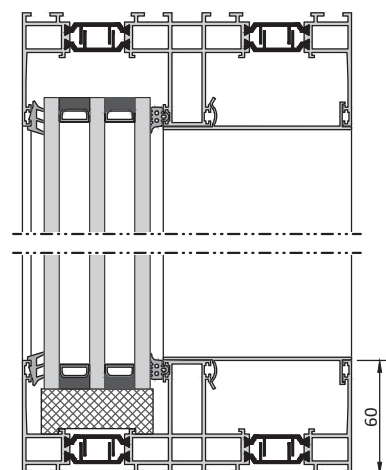
Vertical 20 mm butt join outside, 22 mm static post inside

System glass façade between two floors made from insulated, concealed aluminium frame profiles. Minimalistic facing width of the vertical design post profiles of only 22 mm. The Semi-SG variant (type 2) is designed as a flush-surface glass façade in 2 tracks.

Design sliding doors can be optionally fitted in the second inner track.



minimal windows®



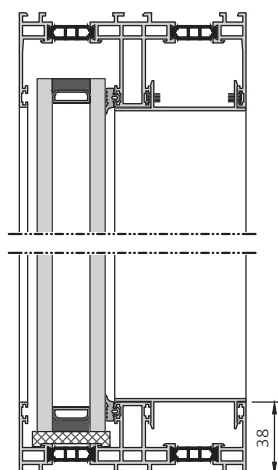
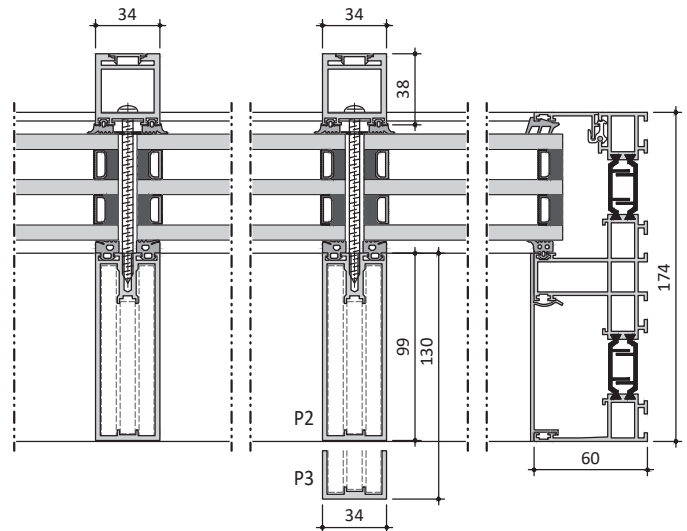
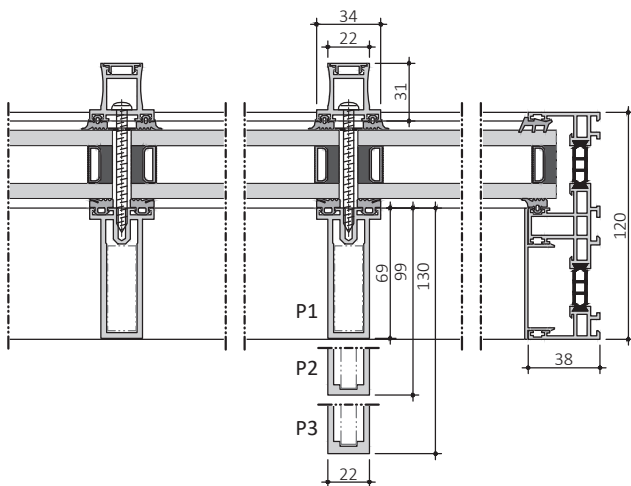
minimal windows® 4

TYP 3 Cover-Cap-Look

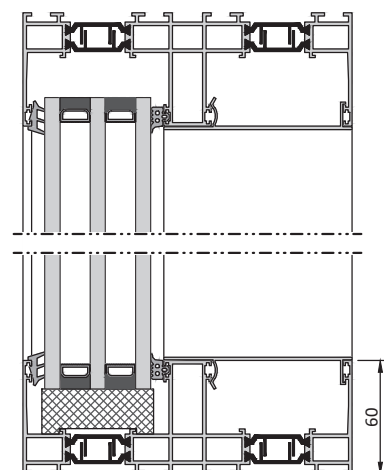
Exterior cover cap, static post inside

System glass façade between two floors made from insulated, concealed aluminium frame profiles. Minimalistic facing width of the vertical design post profiles of only 22 / 34 mm. The Cover-Cap-Look (Type 3) is designed as a flush-surface glass façade in 2 tracks.

Design sliding doors can be optionally fitted in the inner track.



minimal windows®



minimal windows®4



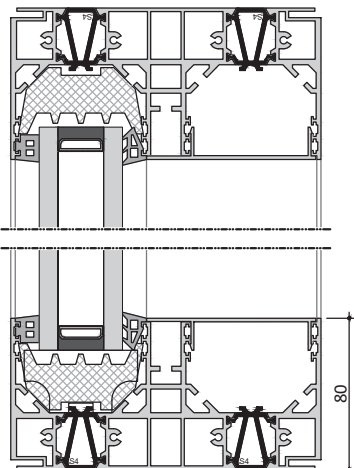
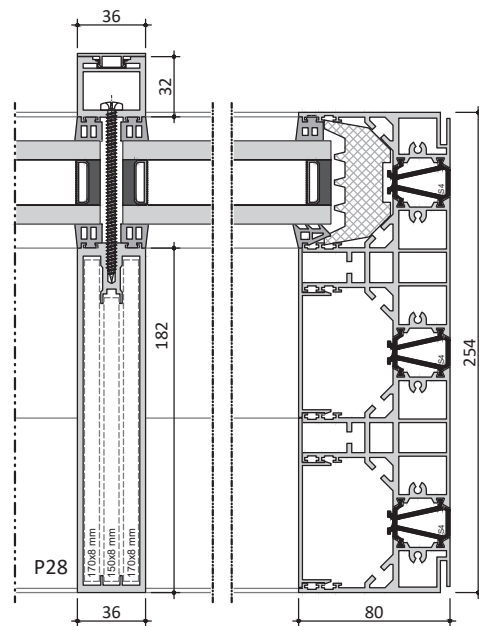
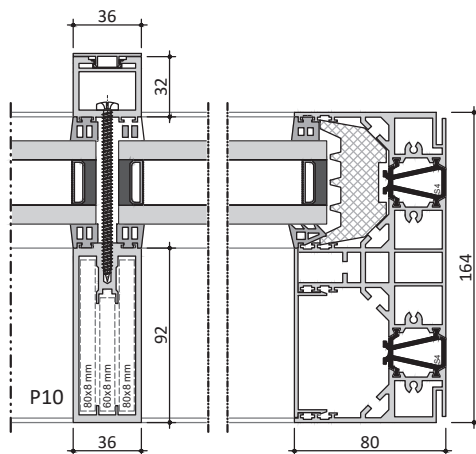
Product

TYP 3 Cover-Cap-Look

Exterior cover cap, static post inside

System glass façade between two floors made from insulated, concealed aluminium frame profiles. Minimalistic facing width of the vertical design post profiles of only 36 mm. The Cover-Cap-Look (Type 3) is designed as a flush-surface glass façade in 2/3/... tracks.

Design sliding doors can be optionally fitted in the inner track.



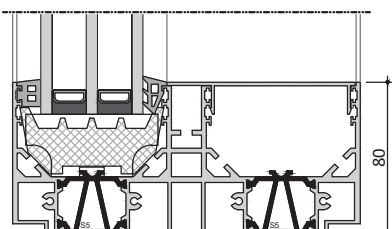
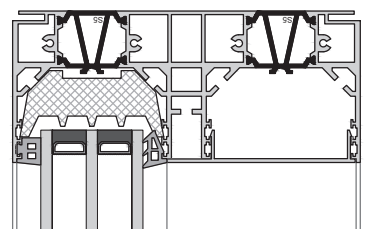
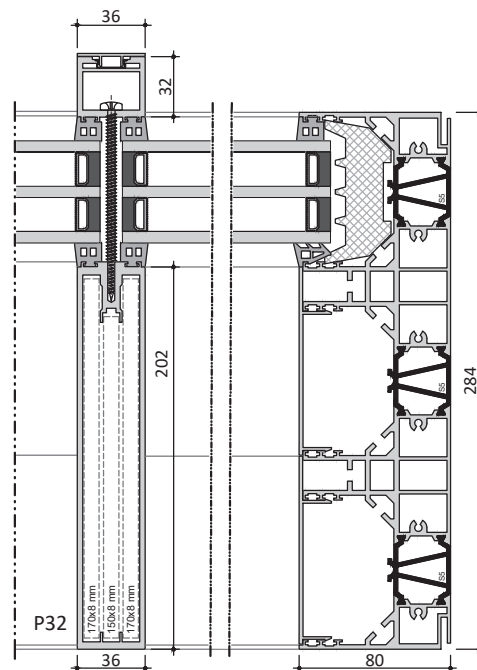
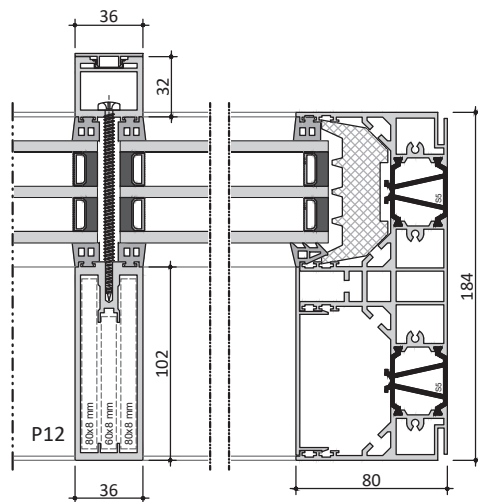
minimal windows® NG S4

TYP 3 Cover-Cap-Look

Exterior cover cap, static post inside

System glass façade between two floors made from insulated, concealed aluminium frame profiles. Minimalistic facing width of the vertical design post profiles of only 36 mm. The Cover-Cap-Look (Type 3) is designed as a flush-surface glass façade in 2/3/... tracks.

Design sliding doors can be optionally fitted in the inner track.



minimal windows® NG S5



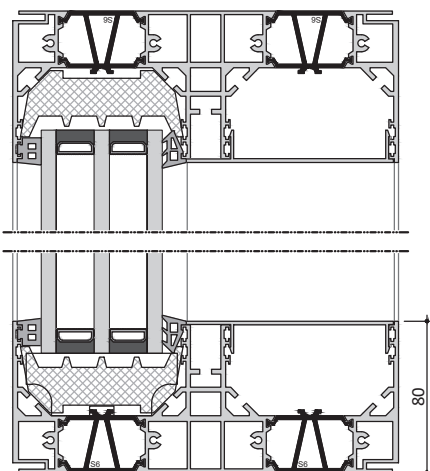
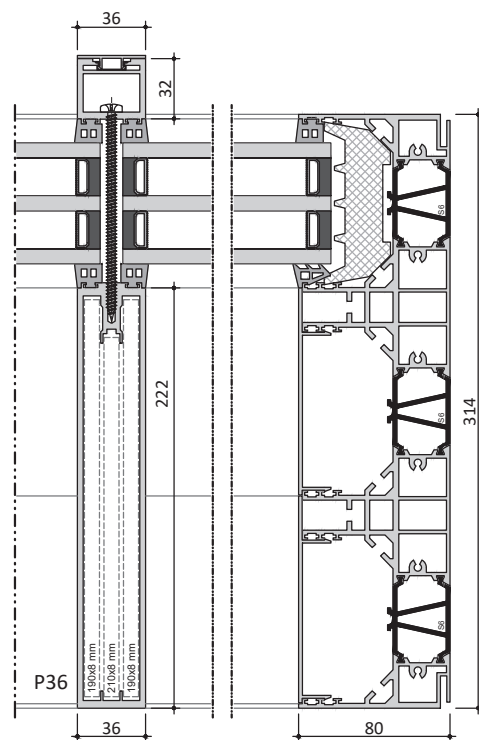
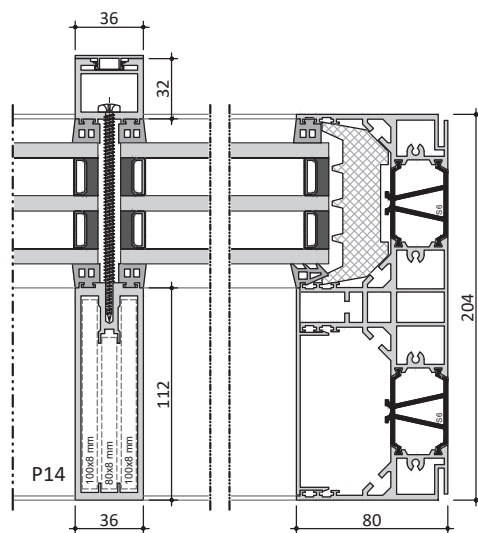
Product

TYP 3 Cover-Cap-Look

Exterior cover cap, static post inside

System glass façade between two floors made from insulated, concealed aluminium frame profiles. Minimalistic facing width of the vertical design post profiles of only 36 mm. The Cover-Cap-Look (Type 3) is designed as a flush-surface glass façade in 2/3/... tracks.

Design sliding doors can be optionally fitted in the inner track.



minimal windows® NG S6

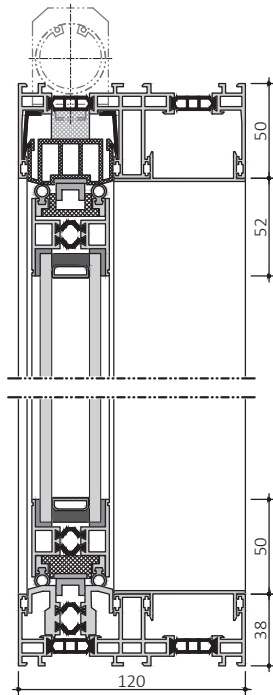


Villa RS

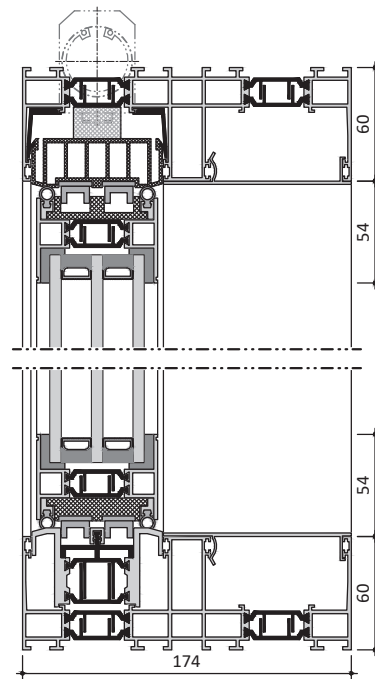
Architect: MundS Architekten, Photographer: © Lars Gruber

Partner: METALL UND GLAS Beilmann GmbH, Products used: minimal windows® & minimal windows® 4+

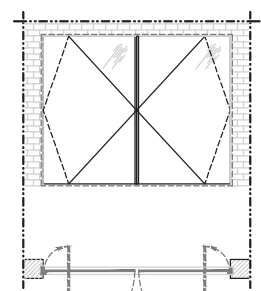
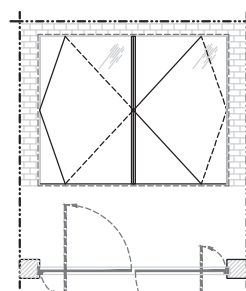
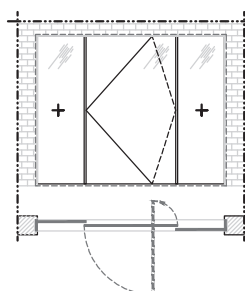
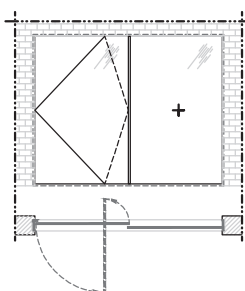
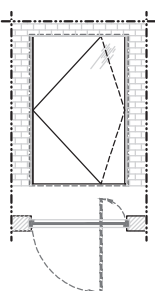
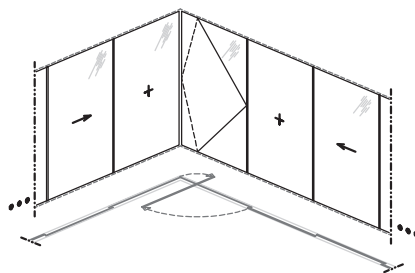
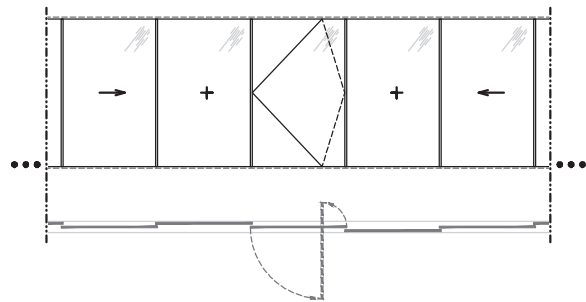
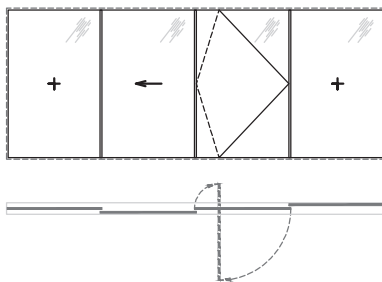




minimal windows®



minimal windows®4





Product

Keller minimal windows® pivot

Keller minimal windows® - pivot are inward or outward-opening side-hung doors with pivot technology and the same minimalistic frame proportions.

This further highlight of the minimal windows® product range enables a further opening variant in the almost frameless design, which can be incorporated brilliantly in 8 different installation types. Where installation space is tight, the innovative rotary leaf hardware also allows many different adjustment options for positioning the rotary leaf axis.

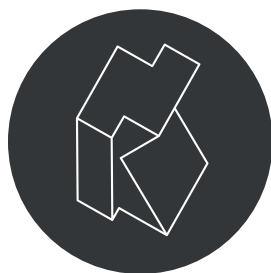
A great many of the largest sliding elements can be used. A virtually unlimited combination of sliding and pivoting leaf elements is designed in different tracks.

	minimal windows® pivot	minimal windows®4+ pivot
Maximum leaf dimensions	W = 1.800 mm x H = 3.000 mm	W = 1.800 mm x H = 3.000 mm
Maximum leaf weight	Wt = 250 kg	Wt = 350 kg
Minimum distance rotary leaf axis <>stop	150 mm	150 mm
Maximum distance rotary leaf axis <>stop	½ leaf width	½ leaf width
Horizontal adjustability of lower rotary bearing	+/- 3 mm	+/- 3 mm
Vertical adjustability of lower rotary bearing	+/- 3 mm	+/- 3 mm
Horizontal adjustability of upper rotary bearing	+/- 3 mm	+/- 3 mm
Vertical decoupling of upper rotary bearing<>leaf hinge part	Yes	Yes
Rotary leaf lock in 90° open position	Yes	Yes
Optional door closer and/or door opener, top	Yes	Yes
Barrier-free accessibility	DIN 18040-1, DIN 18040-2	DIN 18040-1, DIN 18040-2
Air permeability	up to class 4 according to EN 12207	up to class 4 according to EN 12207
Driving rain tightness	up to class 6A according to EN 12208	up to class 7A according to EN 12208
Resistance to wind load	up to class C2/B3 according to EN 12210	up to class C3/B4 according to EN 12210
Resistance to burglary	up to RC 2 according to EN 1627	up to RC 2 according to EN 1627



Seaside Villa
Keller minimal windows®
Visualization by @miysis_premium, Products used: minimal windows®





ACCESSORIES



Glazing

Keller minimal windows® can be equipped with high-quality double and triple insulating glass with thicknesses from 24 to 64(74) mm.

All partners of Keller minimal windows® determine the thermal insulation values of the sliding systems (U_w value) based on the insulation values of the glazing (U_g value) and the warm edge spacer (ψ value).

Glass types examples:

- P4A safety glass (anti-burglary glass)
- noise insulation glass
- bullet-resistant glass
- privacy protection glass with or without sandblasting
- decorative glass
- solid glass corners - insulation glass
- glass with controllable transparency (privacy glass)





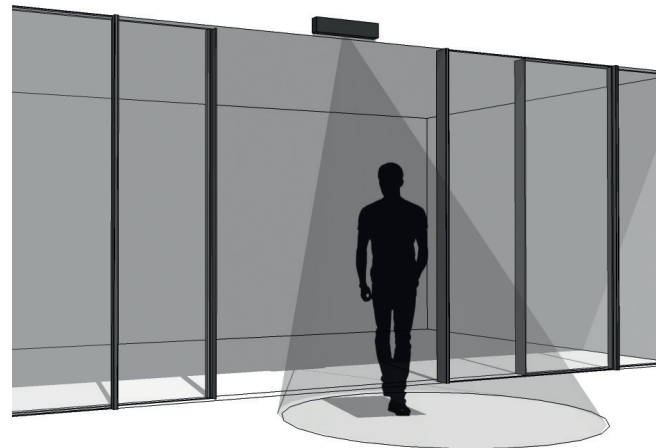
Accessories

Safety accessories

Innovative and reliable. Keller minimal windows® sliding systems are individually designed to customer preferences and installation circumstances.

We therefore present a range of products and accessories to be able to offer intelligent and tailored solutions every time.

Products such as linear actuators, opening and locking monitors (magnetic contacts), opening and securing sensors, etc. complete our range of security accessories and offer enhanced safety.



Villa Wallis
Architect: Andrea Pelati-Architecte, Photographer: Stephan Offermann
Partner: Karl Blaser AG, Products used: minimal windows® 4+



Orchard House

Architect: Strom Architects, Photographer: IQ Glass
Partner: IQ Glass Solutions Ltd, Products used: minimal windows®



Accessories

Insect screens

Especially for large openings Keller minimal windows® offers system-integrated, tailor-made insect screens for easy and long-term protection.

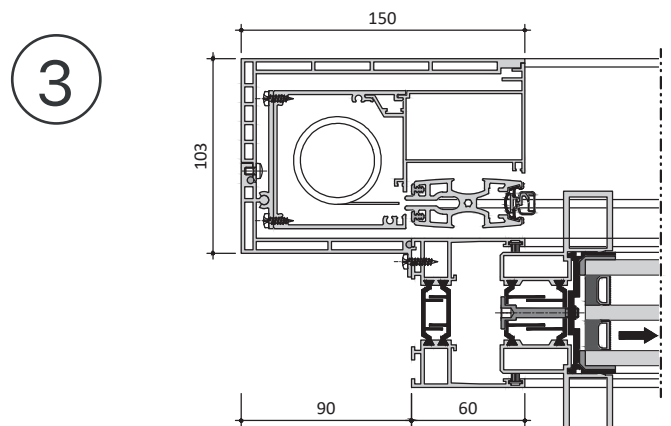
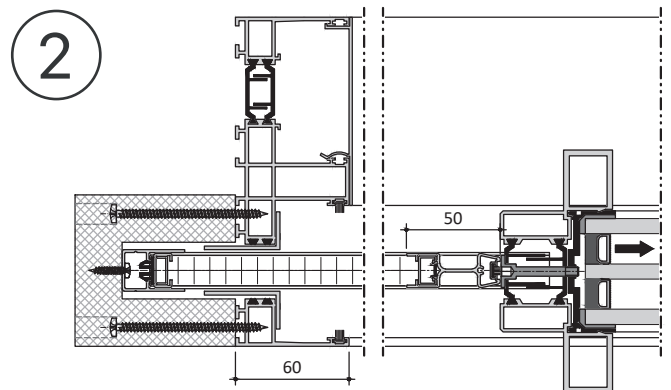
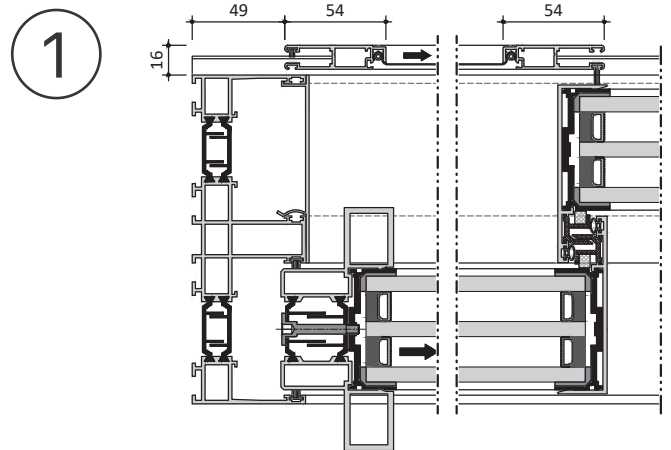
Every installation is different. We use slender, sliding clamping frames with low mounting depth or insect screen that roll up vertically.

The almost-invisible screen is made of high-quality fabric which provides a practically unhindered view outdoors. The insect screen colour can be matched to the colour of the sliding leaf.

The Keller minimal windows® insect screen is discrete, stable and weatherproof.

Varianten:

1. Sliding insect screen for minimal windows® und minimal windows®4+
2. Plisse insect screen for minimal windows® and minimal windows®4+
3. Rollo insect screen for minimal windows®4+ and minimal windows® NGS







Accessories

Glass railing

For floor-to-ceiling window openings on upper floors, fall protection is necessary. Strength, stability, and suitability of the material are crucial in designing railings.

The minimal windows® guardline glass railings* combine outstanding quality and safety with elegant design.

Thanks to modern techniques for seamless installation, the components seamlessly integrate into the respective architectural design.

*Country-specific regulations must be observed.

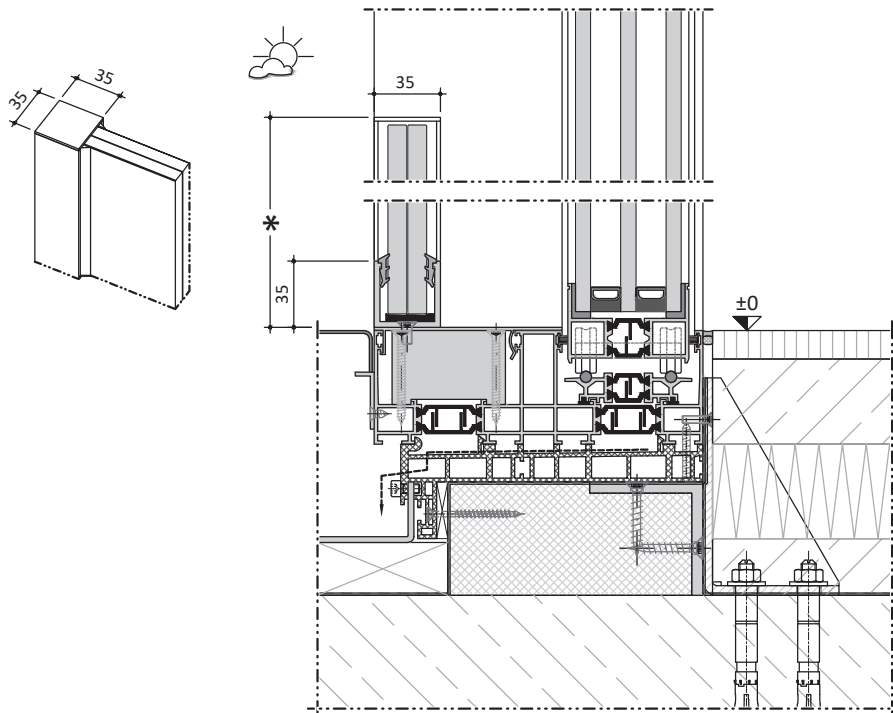


Illustration shows a possible design variant : minimal windows®4+



Regal Chateau
Architect: Nadine Boul, Photographer: Marc Sourbron
Partner: Group Ceyskens, Products used: minimal windows® 4+



Backcover
Lake House
Architect: Dirk Jan Postel, Photographer: Christian Richters,
Partner: Kumasol BV, Products used: minimal windows® 4+



Keller Minimal Windows S.A.
38-40, route de Wilwerdange
9911 Troisvierges
LUXEMBOURG

Phone: +352 28 38 66 01
Email: info@keller-minimal-windows.com

www.minimal-windows.com