minimal windows®

THE WORLD'S PREMIUM SLIM SLIDING DOOR SYSTEM

PRODUCT DATA

IQ GLASS

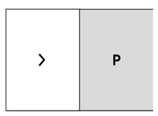
minimal windows®

Technical Product Overview

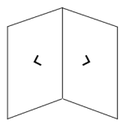
minimal windows offers the most versatile, architectural sliding system on the market, providing architects, designers and specifiers the freedom to design unique shapes, large sizes and minimal frames. The ultra slim profiles with floor to ceiling glass blend the boundaries of inside and out, remove structure and provide fluidity of movement and design.

Typologies

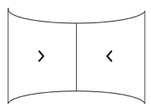
linear sliding



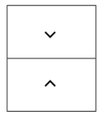
pocket sliding



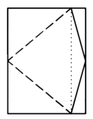
corner opening



curved sliding



vertical sliding



pivot door

Sizes

	sliding pane area	height	sightline	sliding pane weight
minimal windows	8.5m² *	4m*	21mm	500kg*
minimal windows 4+	12m² *	4.5m*	26mm	1000kg*

* These are the maximum tested sizes, larger solutions are available upon request.

Automation is recommended if the sliding panes weigh over 500kg each. All fixed glass panes have unlimited size restrictions.

No maximum widths. Consideration must be given to the width of tall doors. The width of a sliding door cannot be less than a third of its height.

Glass Specification

Typical Spec	8mm TXD outer / 16mm argon gas filled cavity with warm edge spacers / 8mm TXD inner with low e coating.
Typical Ug Value	1.0 W/m²K
Glass Thickness	26mm - 34mm
Glass Options	Any coated glass including solar control coatings, low maintenance glass, anti reflective glass. Low iron glass. Any electrical glass including heated glass, privacy glass and electro chromic glass. Please note that laminated glass is not possible in the standard minimal windows system. We will need to increase the frame specification to the minimal windows 4+ to allow for the inclusion of laminated units if required.
Seal	Glass structurally bonded into the insulated U profiles for a minimal design and high security.

Frame Specification

Insulation	Frame fully thermally broken in both sliding panes, fixed outer frame and base detailing.
Finishes	PPC any RAL colour / anodised / special finishes.
Sliding Mechanism	Stainless steel sliding rails in base frame with stainless steel wheel carriages in underside of each sliding pane. Each wheel carriage contains 2nr wheels with a minimum of 2 carriages per sliding pane. An additional carriage is added for every 100kg of weight.
Deflection	Structure deflection limits +/-5mm. This does not include dead-load deflection which should be allowed for within measurements supplied to IQ. Some installations will also need to review creep/settlement of the building. Contractor responsible for providing a suitable structure for IQ to fixing into.

Performance

Thermal	Uw value > 1.1 W/m²K
Air permeability	Class 4 to EN12207
Driving rain	Class 7A to EN12208
Wind load	Class C4/B5 to EN12210
Sound insulation	up to 39dB achievable
Accessibility	DIN 18040-1, DIN 1804-2
Security	PAS:24

Jura House

minimal windows to all exterior window openings
Architect Lewandowski Architects
Wentworth Estate, Virginia Waters, UK

Cranbourne Road

Two track minimal windows to rear extension
Architect Threefold Architects
London, UK

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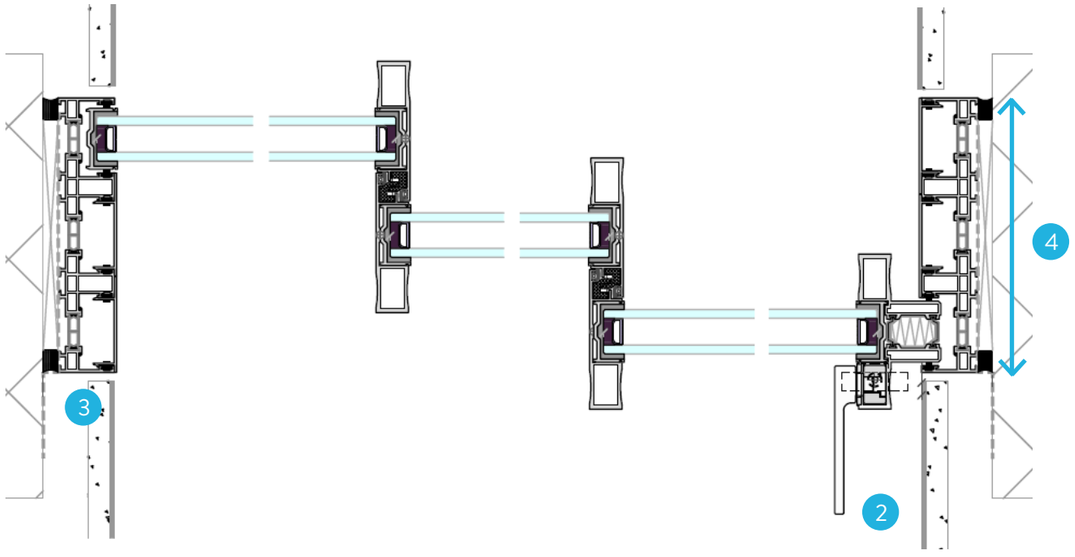
Typical Frame Sections

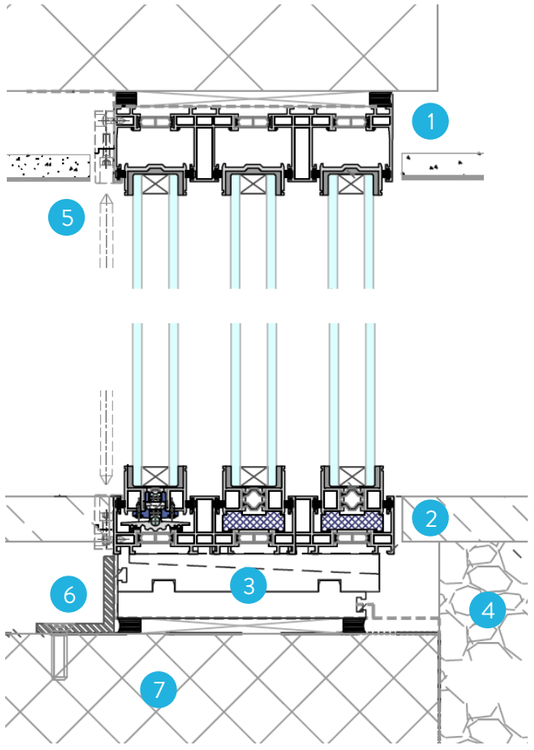
The engineering and detailing of the minimal windows sliding system has been developed and honed over many years. Each update and iteration draws on both the technical experience of the team as well as the requirements of the modern architecture community. Each profile is versatile, being able to be adapted to each architect's individual need in collaboration.

Horizontal Section (3 track example)



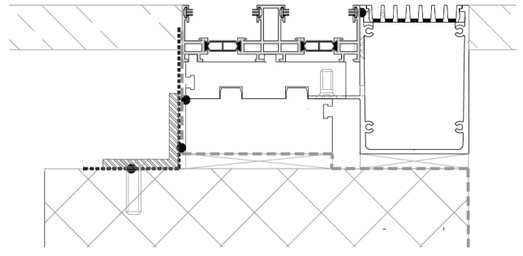
1	interlock	21mm
2	locking mechanism	See page 29 for locking options
3	outer frame	38mm (designed to be hidden by building finishes)
4	frame depth	depends on number of tracks. approx 60mm per track.

Vertical Section (3 track example)



1	head frame	50mm (designed to be hidden by building finishes). Structure live load deflection +/-5mm.
2	base frame	38mm (designed to be hidden by building finishes)
3	drainage base	62mm, two part, collects and directs water
4	drainage	110mm deep
5	locking casing	
6	retaining strap	
7	structure by others	suitable solid structure. Typically concrete, 7N high density blocks or steel.

Packing at base is created from rigid packers. These do not absorb the deflection of the structure, this will therefore be passed directly onto the track and should be considered by the structural engineer when designing the structure.



Drainage Channel (optional)

Channel	Black Anodised
Grill	Silver Anodised. Available PPC any RAL however not recommended for longevity.

The water captured by the system is propelled forward under FFL, consideration should be taken if obstacles such as floor lights or cast finishes are being used. Trays can be used to provide a more robust waterproofing where required.

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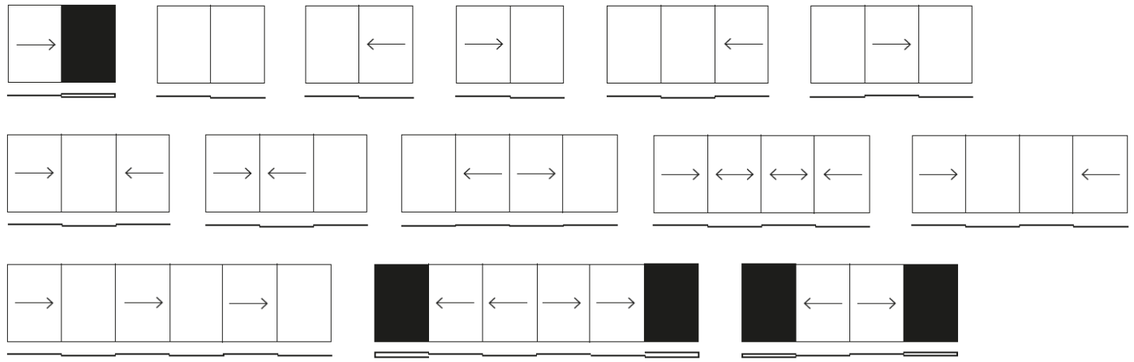
Linear Sliding Configurations

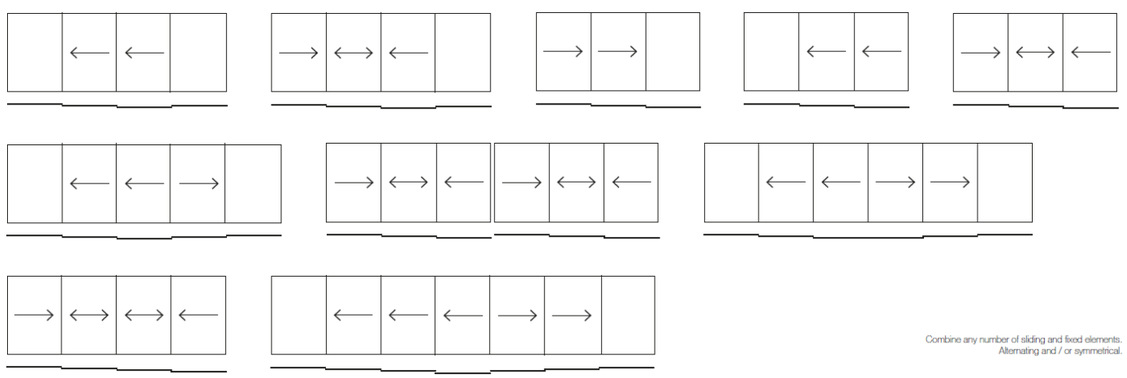
Create large expanses of minimally framed sliding glass with the minimal windows sliding door system. Almost any sliding configuration is possible, allowing architects and designers to create expansive screens of clear glass which spans floor to ceiling, wall to wall.

Combine any number of sliding and fixed glass panes. Create alternating patterns of symmetrical or asymmetrical tracks.

Examples of 1 and 2 Track Openings



Examples of 3 and 4 Track Openings

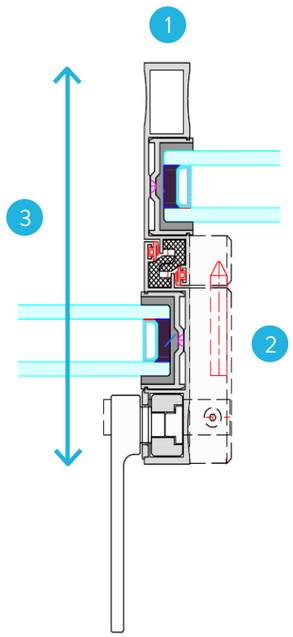


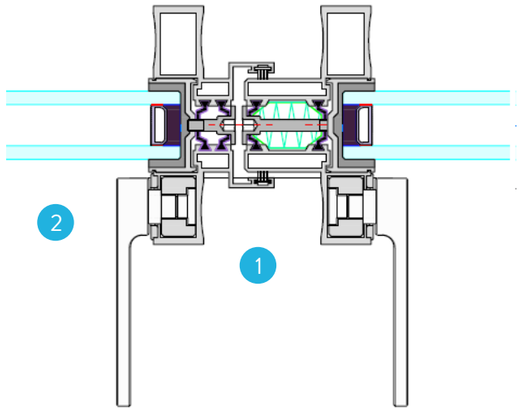
Combine any number of sliding and fixed elements.
Alternating and / or symmetrical.

Bi-parting Configurations

21mm Coupling

95mm Coupling





1	coupling	21mm	1	coupling	95mm
2	locking	example detail shows 4 point bar latching device at base with cross bar 2 sashes	2	locking	example detail shows 2 point locking via lever handle operated shoot bolts
3	two tracks	169mm			

Cotswolds

Full facade of minimal windows combining fixed and sliding units
Architect Found Associates, Manser Medal Winner 2012
Cotswolds AONB, UK

Clifftops

Multiple one fixed, one sliding installations to luxury holiday villas
Architect Morrow + Lorraine
Dorset, UK

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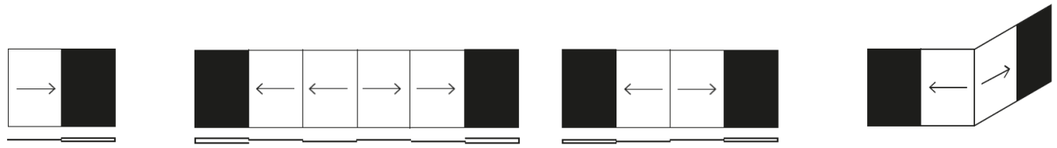
Pocket Sliding Configurations

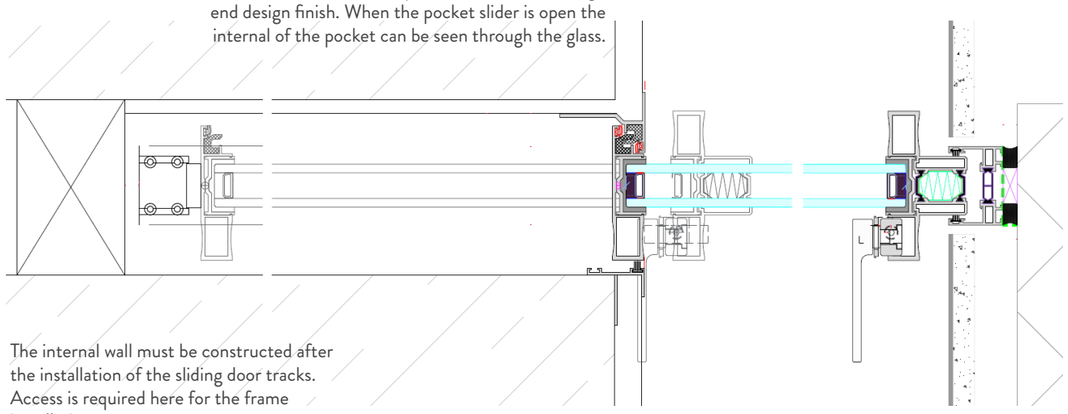
Frameless glass doors that disappear into the structure offer architects flexibility in the design of picture windows. The minimal frames slide away into the wall structure changing a wall from transparent glass to an opening with one motion. The pocket door detailing considers typical construction methods but as always flexibility of design is offered to architects.

Example Openings



Typical Detail, Single Track Pocket

We recommend that an internal finish is applied (by others) to the inside of the pocket structure for a high end design finish. When the pocket slider is open the internal of the pocket can be seen through the glass.



The internal wall must be constructed after the installation of the sliding door tracks. Access is required here for the frame installation.

Sweethaws

Two track minimal windows sliding into pockets.
Smerin Architects
Ashdown Forest, UK

Malbrook Road

Two track minimal windows opening on a 90 degree corner then sliding into pockets.
Architect Tigg Coll
Putney, UK

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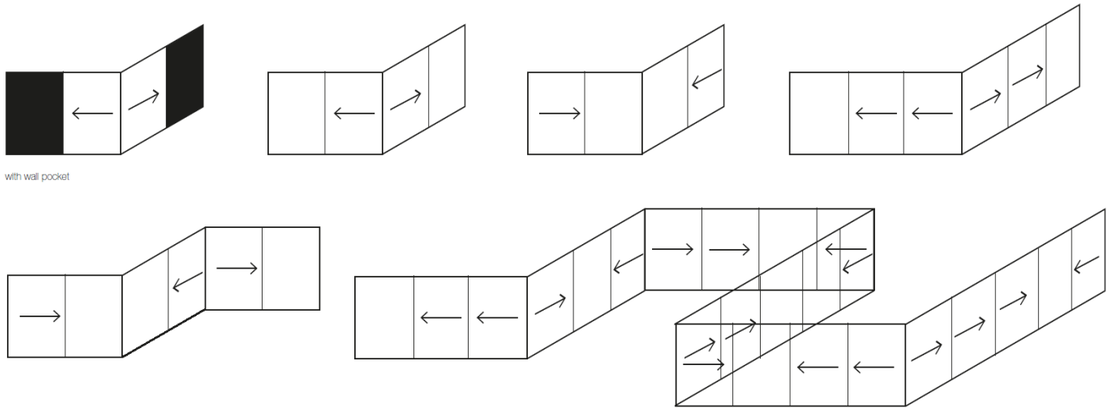
Open Corner Configurations

Opening corners defy the visual expectations of buildings, creating space and light where solid structure is expected. The opening glass with the minimal windows system allows for opening or fixed corners at almost any angle. Doors can move away from a junction and onto themselves or into pockets to blur the boundaries of a building.

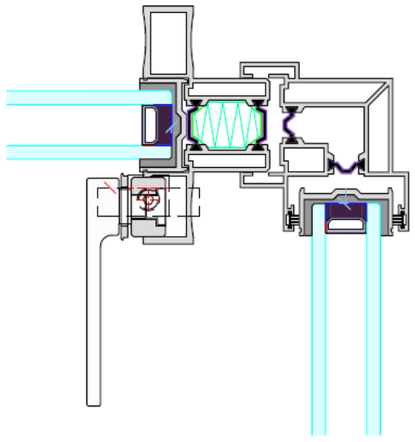
Example Openings



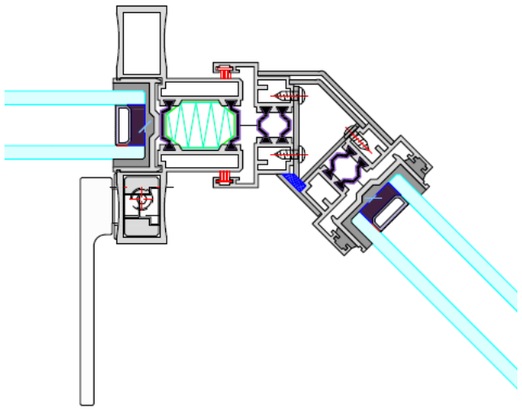
Open Corner Specification

Live Load Deflection	+/- 5mm. The builder/structural engineer will need to design an opening that is within the deflection tolerance.
Opening Angles	Any angle between 65 to 177°
Fixed Corners	Fixed corners can be created at any angle. These can be frameless glass to glass corner connections or framed corner connections at the architects choice.

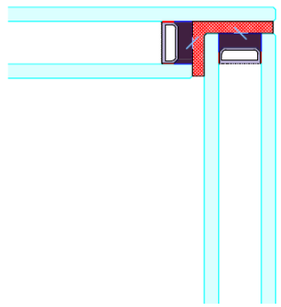
90 Degree Open Corner Example



135 Degree Open Corner Example



90 Degree Frameless Fixed Corner Example



Water End

Multiple installations of minimal windows mixed with structural glazing
Architect Kirkland Fraser Moor
Hertfordshire, UK

House Z-M

Full elevation of minimal windows, opening on various corners
Architect Dhoore Vanweert
Belgium

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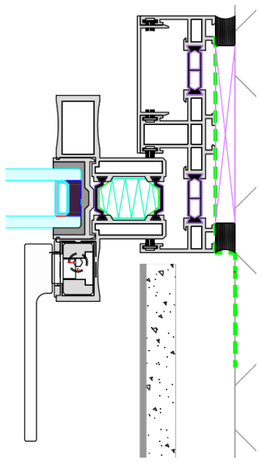
Locking + Security

Glass spanning from wall to wall is possible with the minimal locking options available with minimal windows. Each locking possibility is integrated into the thin aluminium framing, ensuring no compromise to the frameless visual design.

Architects and their clients have to choose the locking options carefully considering how the doors will be used and accessed as well as the visual effect on the aperture.

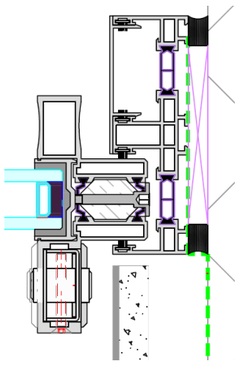
Locking Options

type 1 (thrust lever)



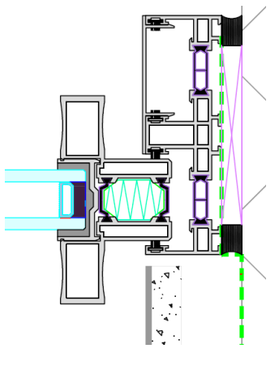
Internally accessed
2 / 4 point locking
Handle turns 180 degrees (shown at 90 degrees)
Handle operates internal shot bolt which locates into pre-cast positions in ceiling and floor.
Handle PPC to match frame

type 4 (internal key)



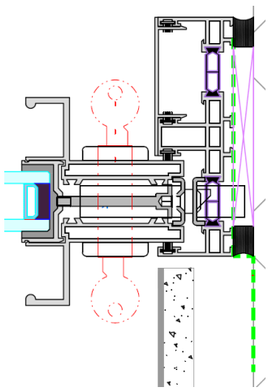
Internally accessed
2 point locking
Removable key
Turns 180 degrees
Operates internal shot bolt which locates into pre-cast positions in ceiling and floor.

electro magnetic



Controlled via any electrical input including wall switch / remote control.
Includes glass break sensor, closure monitoring and opening monitoring.

external-internal key

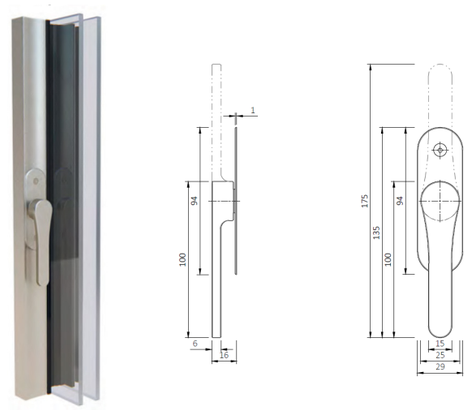


Accessible from both inside and outside.
Multipoint Cylinder Lock EN 1303 Certified.
Removable key
Sightline 45mm
Only suitable for linear sliding configurations i.e.. not opening corner or bi-parting.

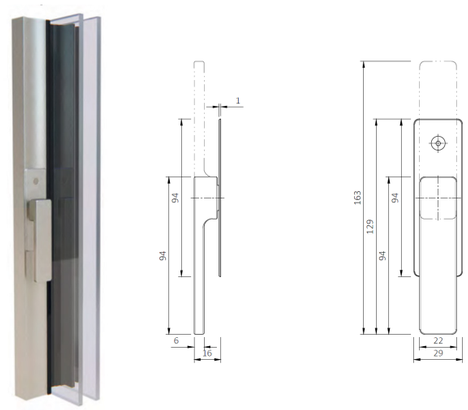
Damage can occur due to misuse if the rotational locking handle is not fully turned before opening or closing the doors. Care must be taken.

Type 1 Handle Options

Type 1



Type 1a



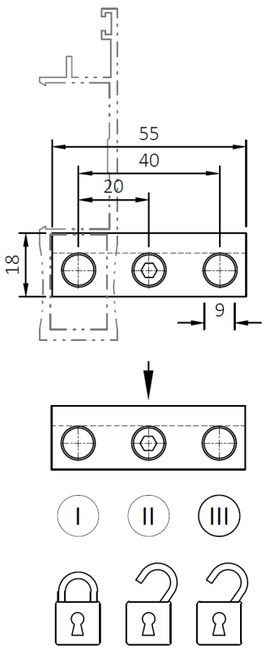
Slot Aeration

Slot aeration allows the minimal windows to be secured in a slightly open position to allow full height ventilation.

The two aeration positions create a 7mm and 27mm vertical ‘space’ between the sliding pane frame and the fixed outer profile.

The visual appearance of the doors and locking is unchanged. The only difference can be seen in the recessed floor and ceiling lock housing which will contain three instead of the usual one locking slot.

Slot aeration is only available on 2 point locking options.



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PAS:24 Certification

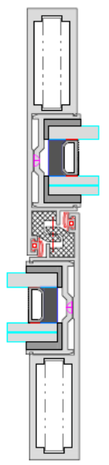
The minimal windows sliding door system has been specifically tested for the PAS:24 security rating, which is a requirement for any new build dwelling in the UK. The slim sliding glass door was tested as a door (rather than a window like some competitors) to fully showcase the security of this high quality building component. The system was tested at ift Rosenheim in Germany.

Sample Door Specification

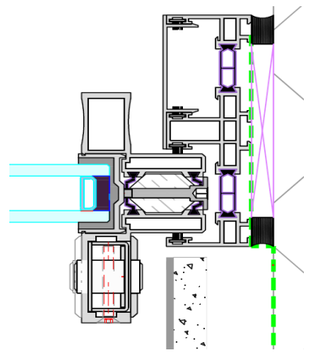
Testing House	ift Rosenheim Germany
Configuration	Two pane, sliding + fixed
Frame Spec	ZK2/AK2 profiles, with thermal break
Sightline	21mm vertical profile
Lock	Type 4
Weight (kg)	Approx. 815kg
Width	3230mm
Height	2700mm
Modifications	Reinforcement in vertical profile

The Details

ZK2 vertical profile

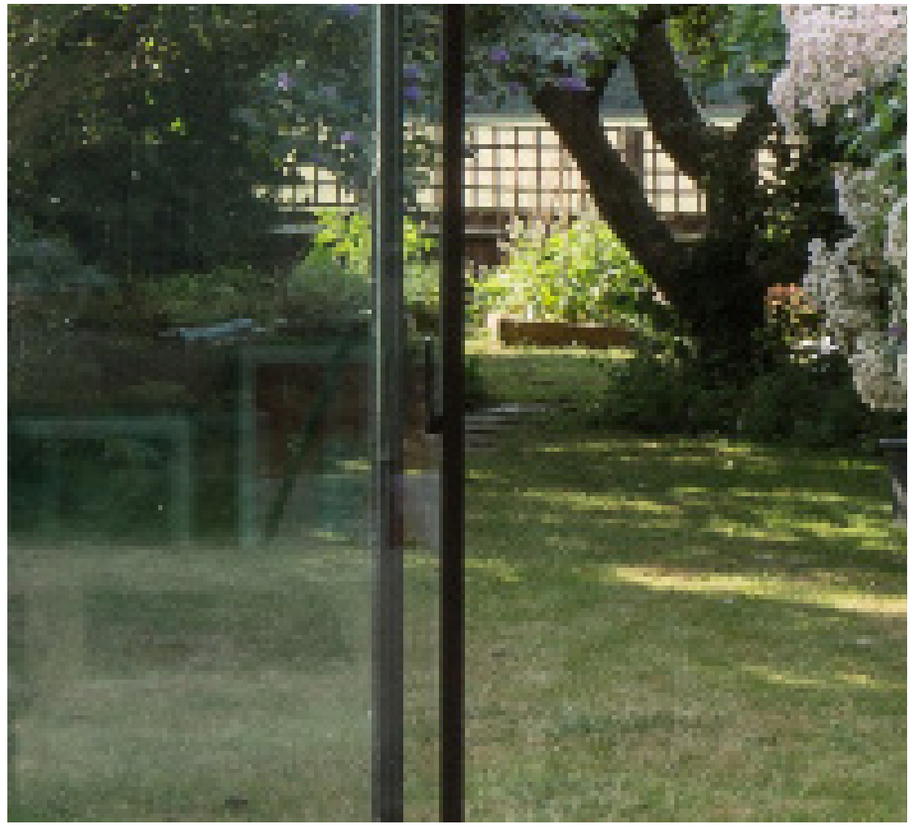


type 4 (internal key)



Turney Road

Two track installation with internal type 1 lock
Architect Ian McChesney
London, SE21, UK



Cool Blue Villa

Full elevations of minimal windows over two floors
Architect 123DV Architectuur
Marbella, Spain

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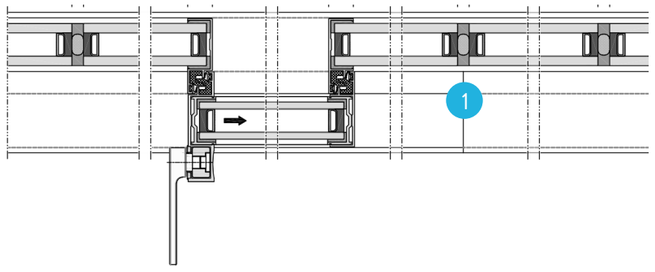
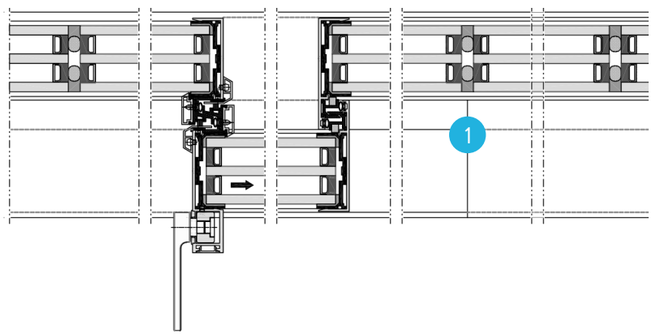
highline

The minimal highline solution allows the minimal windows sliders to be integrated into large glass façades with continuity of design and detail. Fluidity of glass across the building face provides architects with clean lines and clarity of light through the building facade, combining minimal sightlines with large, high specification glazing.

Type 1

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.

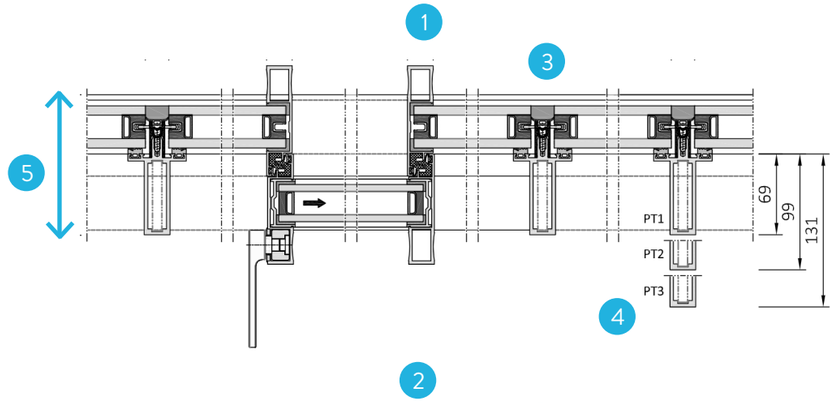


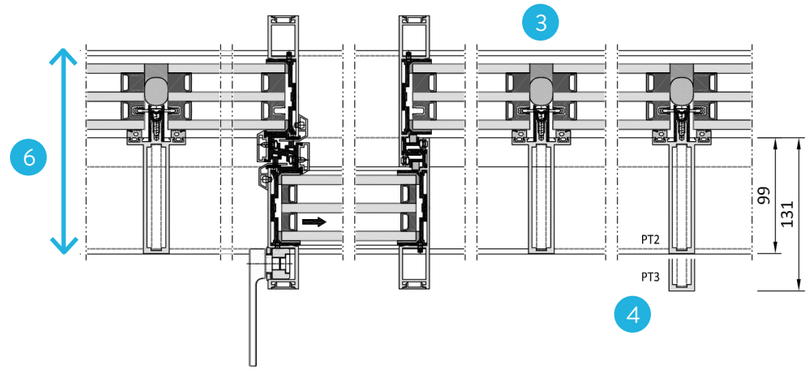


1	Sightline	10mm

Type 2

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.





1	Sliding to Fixed Sightline	22mm
2	Sliding to Fixed Sightline	26mm
3	Fixed Sightline	20mm
4	Internal Wind Post	dependant on wind load and height
5	System Depth	120mm
6	System Depth	174mm

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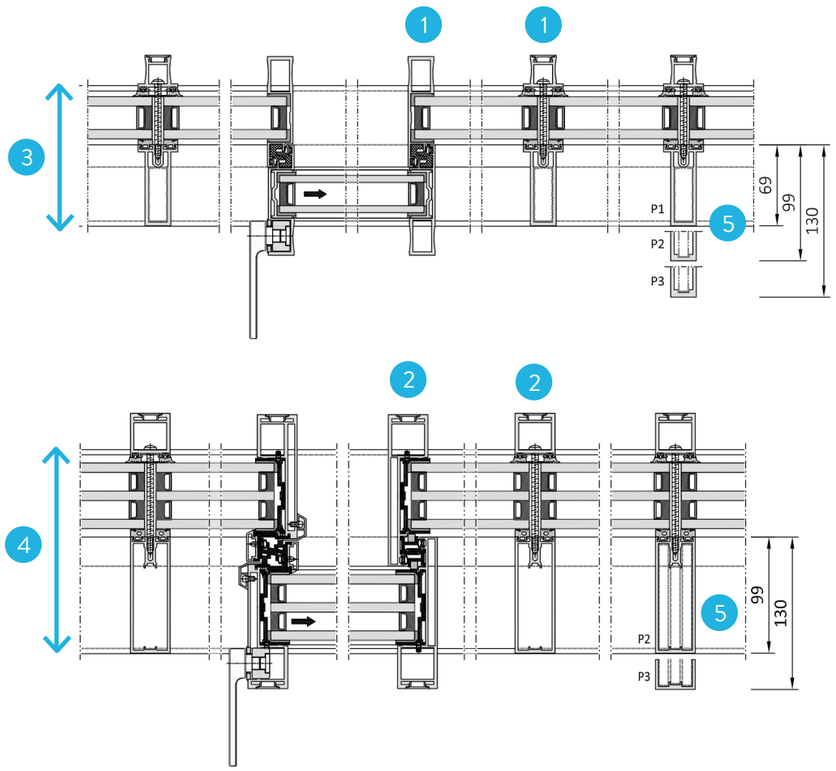
Highline

Type 3

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.



1	Sightline	22mm
2	Sightline	34mm
3	System Depth	120mm
4	System Depth	174mm
5	Internal Wind Posts	dependant on wind load and height

System Comparison

Highline can be utilised with both the minimal windows and minimal windows 4+ profile series. Architects can choose between both framing options to create a glass facade that meets the project requirements. There is always the possibility of exceeding these parameters where required. Contact the team with your project requirements to see what is possible.

	fixed pane area	height	Glass Thickness	pane weight
minimal windows	18m²*	4m*	36mm	500kg*
minimal windows 4+	18m²*	4.5m*	56mm	1000kg*

* These are the maximum tested sizes, larger solutions are available upon request.

Performance

	highline	highline 4+
Uw Value	> 1.1 W/m²K	> 0.7 W/m²K
Air Permeability	Class 4	Class 4
Driving Rain	Class 7A	Class 8A
Wind Load	Class C4/B5	Class C5
Sound Insulation	up to 39 dB	up to 45 dB
Security	RC2	RC2
Barrier Free	DIN 18040-1, DIN 18040-2	DIN 18040-1, DIN 18040-2

Villa Glasscube

minimal windows highline
Belgian Coast

minimal windows®

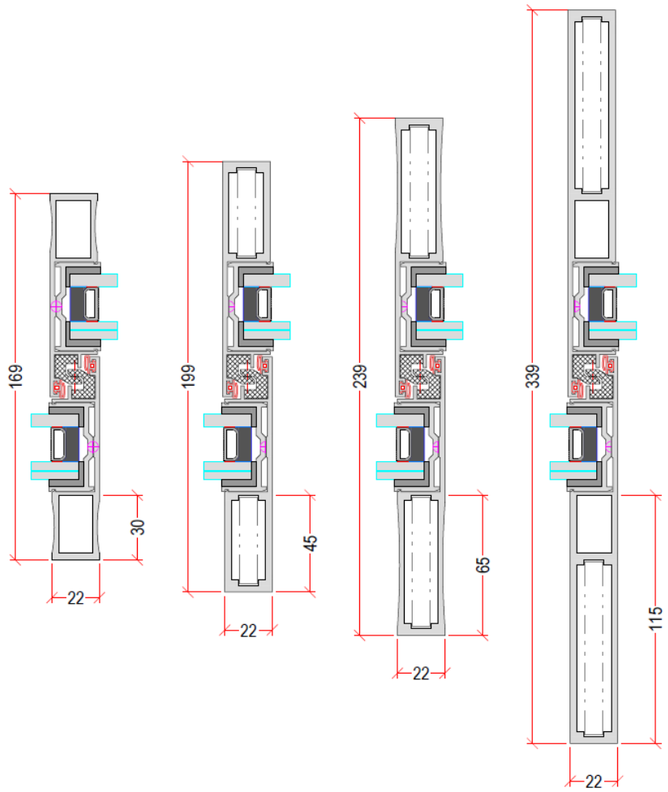
Vertical Wind Posts

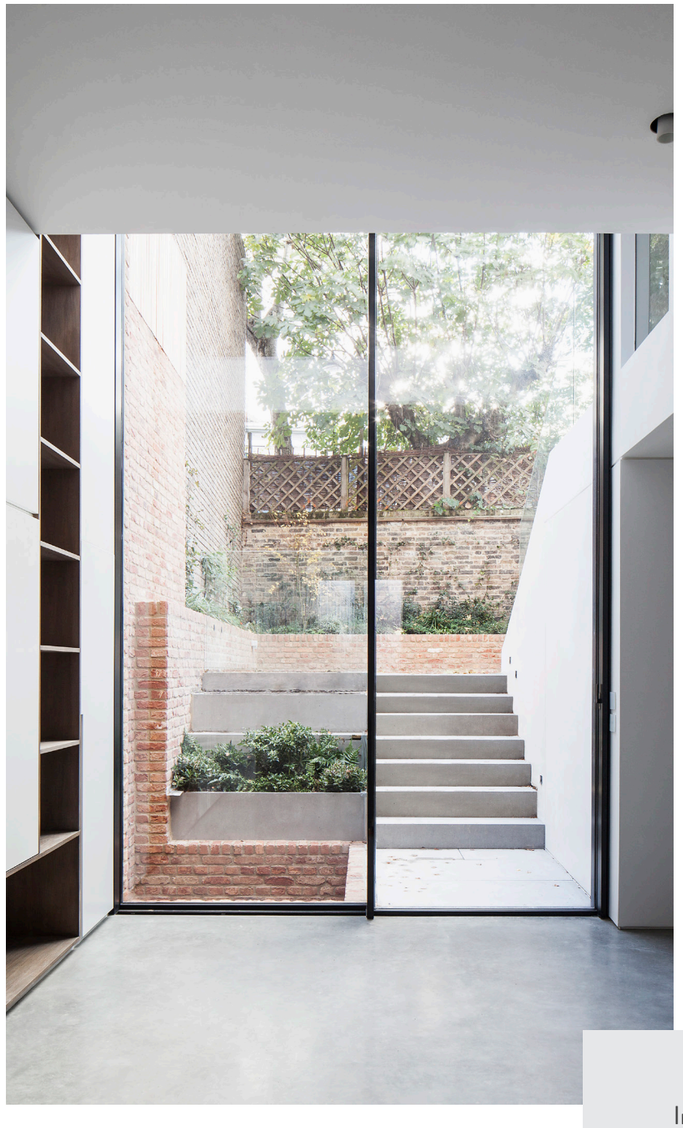
Versatility of design and application offers architects unprecedented scope to de-construct the traditional facade. Glazed surfaces can extend the whole extent of the structure, viscerally connecting the opposing natures of inside and out. While these limits are removed the inherent structure, performance and strength of the system is maintained through the vertical interlocks. These provide the weather seal and wind endurance of the slim sliding door.

Wind Posts

The vertical profile of the minimal windows is determined depending on the height, weight and wind load of the project. The team at IQ can easily determine the optimum vertical profile selection based on a simple calculation which will be done on clarification of all project particulars.

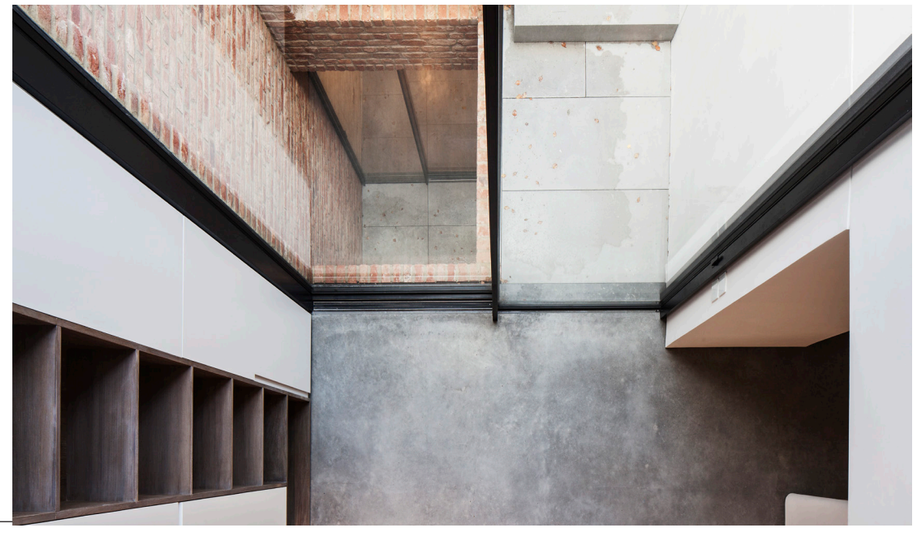
We assume a minimum wind load of 0.65 kN/m^2 using profile ZK1 as standard.





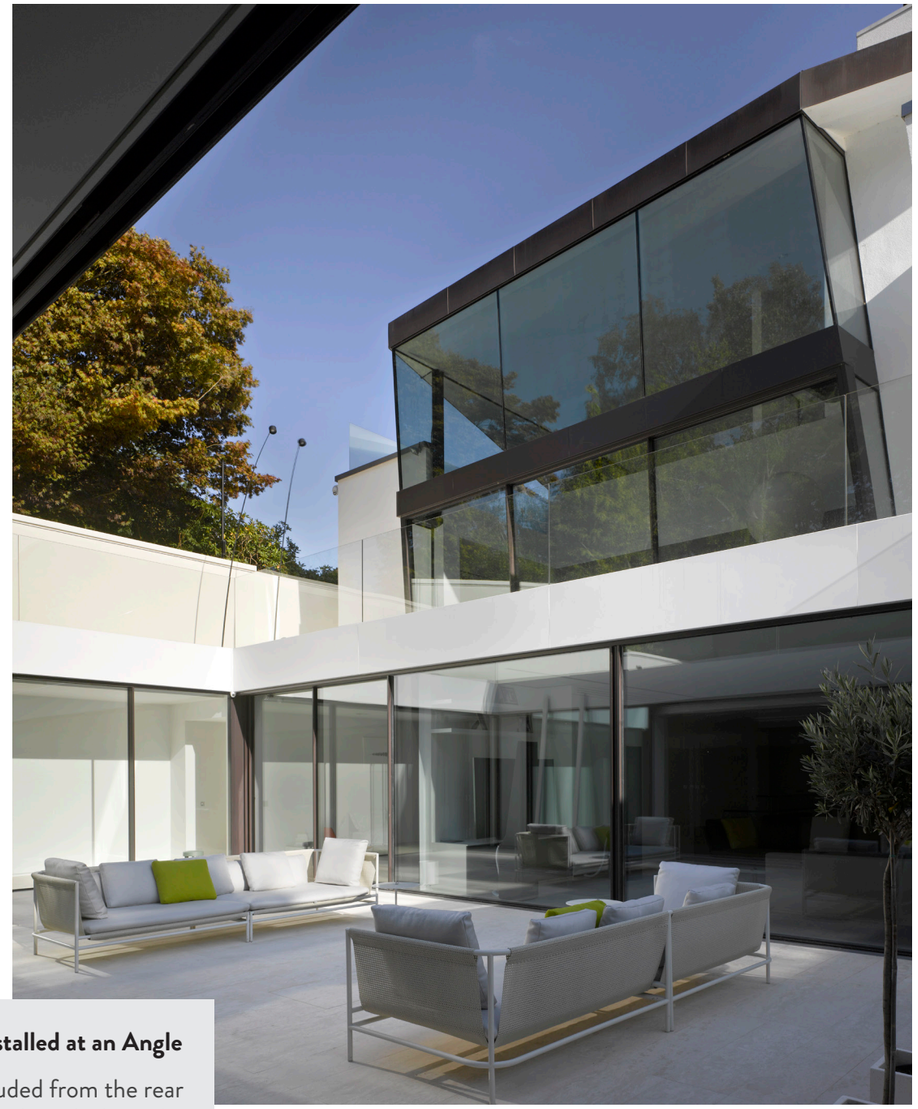
Bespoke Head Detail

In order to create these ultra tall doors that exceeded the tested height and width-frame ratio a bespoke head detail was created. A second sliding rail and wheel system was installed in the head of the doors to provide additional support to the sliding movement ensuring no 'juddering' and a smooth sliding action.



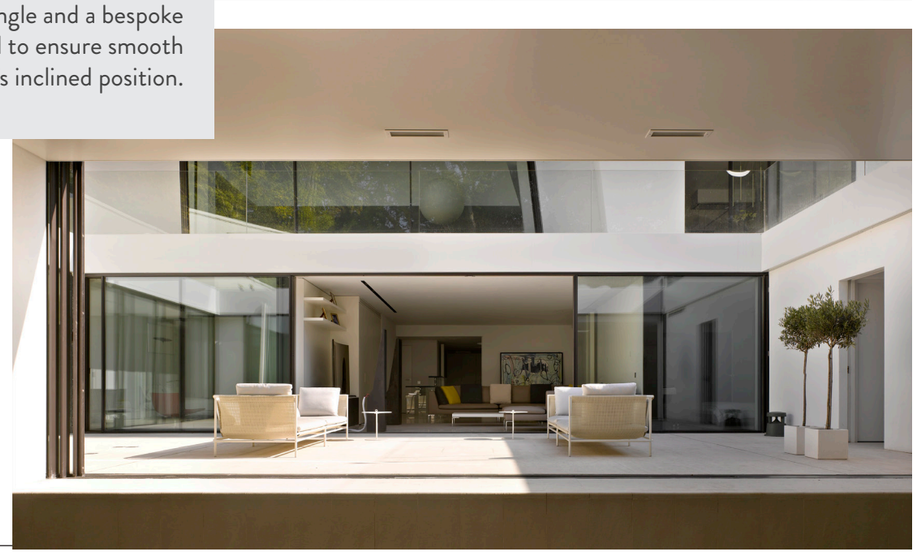
Portland Road

6m tall minimal windows 4+, one fixed, one sliding
Architect Barc Architects
London, UK



Installed at an Angle

The glass box protruded from the rear elevation at an angle and a bespoke detail was required to ensure smooth sliding at this inclined position.

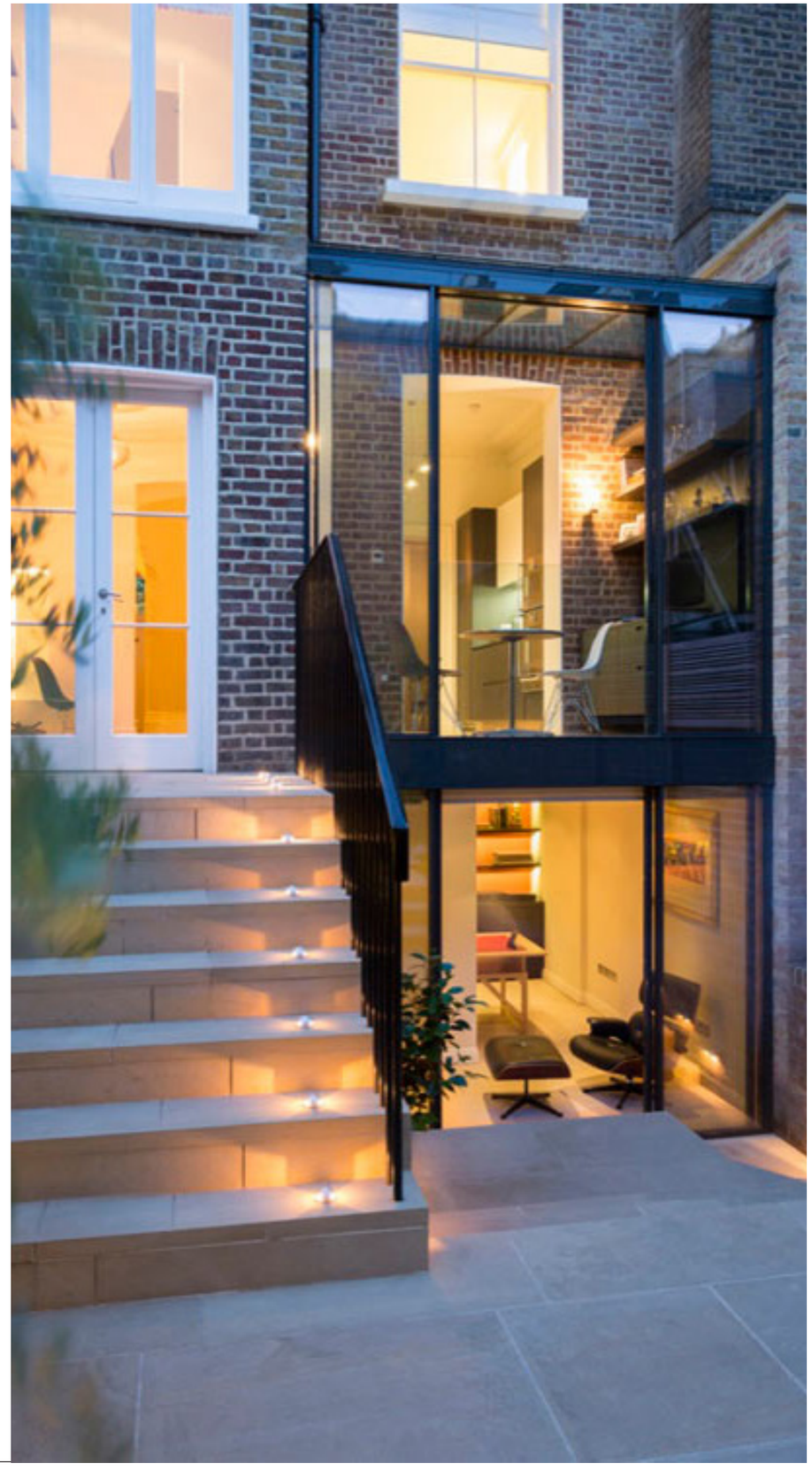


The Hampstead House

Multiple minimal windows to substantial new build
Architect Belsize Architects
Highgate, London, UK

Kensington Gate

Double height glass extension with minimal windows Juliet balcony
Architect TFFA
London, W8, UK

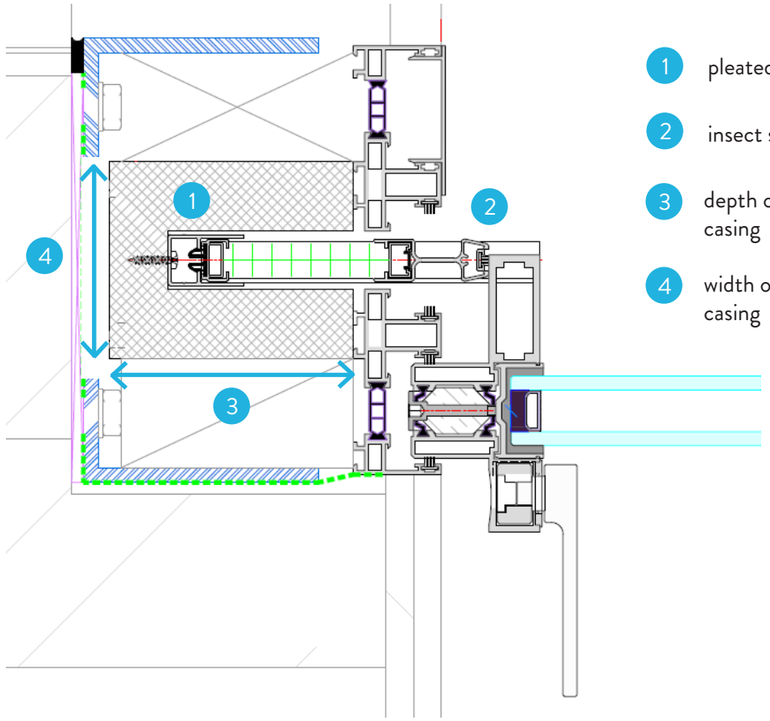


minimal windows®

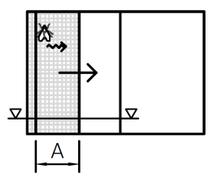
Insect Screens

Versatility of design and application offers architects unprecedented scope to de-construct the traditional facade. Glazed surfaces can extend the whole extent of the structure, viscerally connecting the opposing natures of inside and out. While these limits are removed the inherent structure, performance and strength of the system is maintained through the vertical interlocks. These provide the weather seal and wind endurance of the slim sliding door.

Typical Detail



1	pleated insect screen	
2	insect screen cover	
3	depth of screen casing	depends on screen length. See table.
4	width of screen casing	70mm



A	B	C
> 1000mm < 1300mm	~1160mm	90mm
> 1301mm < 2000mm	~1850mm	105mm

Snelsmore House

minimal windows 4+ with applied glazing bars for a steel look
Architect Ark Architects
Newbury, UK

Applied Glazing Bars

Applied glazing bars are available for glass units up to 1.3m wide x 2.44m tall. The glazing bars are finished to match the frame and are 25mm wide. The glazing bar design is bespoke and done to the architect's specification.

Golden Triangle Pool House

minimal windows with heated glass to modern garden pool house
Architect NC Architecture
Oakdene, Cheshire, UK

Specifications for Swimming Pool Glazing

When any glazing is going to be installed within a pool environment frames should be pre-anodised and then coated with marine grade PPC.

It is best practice to use laminated glass when any glazing is going to be installed within 2m of a swimming pool. This is to protect the pool filtration system in the event of glass breakage.

If you would like to use laminated glass within the minimal windows system we must use our minimal windows® 4+ system. This system can hold a thicker glass unit which allows us to incorporate the required laminated pane within the glass specification.

The Thatched House

minimal windows to traditional thatched cottage
Undisclosed Location

Electrical Glazing in minimal windows

Heated Glass is possible to install into a two track minimal windows slider using a wiring loom system within the head profile.

2 Track System = one sliding, one fixed, heated glass in both panes.

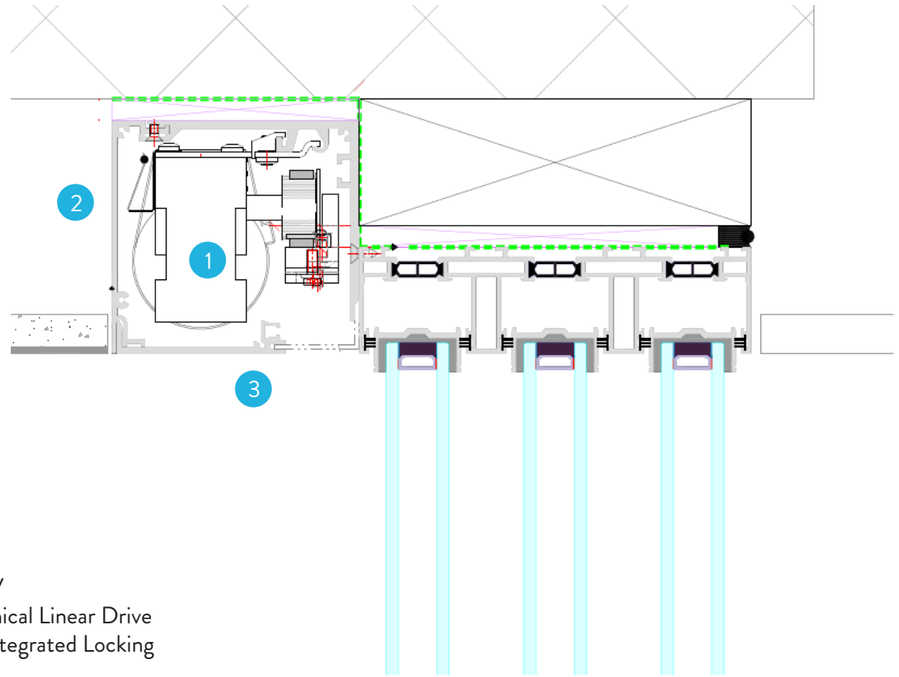
3 Track System = heated glass in only the fixed pane and adjacent sliding pane (leading pane non-heated).

minimal windows®

Automation

Versatility of design and application offers architects unprecedented scope to de-construct the traditional facade. Glazed surfaces can extend the whole extent of the structure, viscerally connecting the opposing natures of inside and out. While these limits are removed the inherent structure, performance and strength of the system is maintained through the vertical interlocks. These provide the weather seal and wind endurance of the slim sliding door.

Typical Detail



1 MOT800 24V Electromechanical Linear Drive System with Integrated Locking

2 Motor Housing — 117mm x 120mm, PPC to march frame

3 Removable Cover Profile — 82mm, PPC to match frame

Motor Comparison

	MOT800	MOT200
maximum weights	For sliding panes weighing a combined weight up to 800kg.	For sliding panes weighing a combined weight up to 2000kg.
Internal / External use	Internal use only	Available in an internal (IP22) or external (IP65) version.
Mains Connection	1 x 230 V AC, 50-60 Hz, 10A	1 x 230 V AC or 1 x 115 V AC, 50-60 Hz, 10A
Ambient Temp.	-15OC to +50OC	-15OC to +50OC
No of Sliding Panes	max 3 (more may be possible on request)	max 3 (more may be possible on request)
Max leaf weights	up to 800kg	up to 1000kg
Sliding Length	up to 800kg	up to 1000kg

minimal windows®

See minimal windows® at the Showroom

A large purpose built minimal windows® installation is available to view at the IQ Glass UK showroom in Amersham.

The sliding door installation is installed outside in a purpose built example dwelling so that all details can be realised fully in a built environment.

Our minimal windows® example is installed outside and is subjected to real UK weather conditions throughout its lifetime. This gives architects, specifiers and their clients a true indication or how the system operates over time.

Variations of the minimal windows® system on show are:

- 90° opening corner
- Single track pocket door
- Three Pane Slider
- Two Pane Slider
- Type 1 Lock
- Type 4 Lock
- minimal windows® as a window
- Vitra Pivot

If you would like to make an appointment to view the minimal windows® please get in touch with your sales representative at IQ.

Click here to view videos of our showroom

How to Specify a minimal window® from IQ Glass

The minimal windows® system is exclusive to IQ Glass in the UK. The aluminium window and door system is the first choice for architects and designers all over the UK looking for slim frame design with modern performance values. If you would like to specify a minimal window® on your project just speak to the team at IQ who would be happy to assist.

Speak to the team at IQ

The team at IQ are the experts in our product range. If you are considering using a minimal window® product on your project speak to the team at IQ who will be able to advise you on the best solution for your intended design, ensure that all specification criteria are met and advise the feasibility to areas of the installation you may not have considered.

Get a Quotation

We advise our customers to get a quotation for their intended minimal window® installations from IQ. This allows us all to ensure that the preferred product and design is within budget. If it is not we can help you adjust the specification to reach all performance, design and budgetary requirements.

Add us to your NBS Specification

To assist you in specification we have created individual NBS Specification sheets for the minimal window® product. These, easy to navigate, documents contain all the vital information needed for specification. They are available for you to complete on your own, alternatively ask your sales representative at IQ to complete this on your behalf.

Place the Order

When ready you (or your client or the builder) can then place the order for your minimal window® with us. A full in-house handover will take place and your project will be passed to the contracts and design team. Once your project deposit is placed we will then undertake full design drawings for the installation and any other additional glazing works. Please allow at least 20 working days for the design process.

The project will be appointed a dedicated contracts manager who will oversee the installation process. The estimated lead time for a minimal window® is 10 to 12 weeks depending on system and material chosen. This may be longer for specialist installations. This will be confirmed on order.

Where can I see the minimal windows® product before order?

We have several minimal window® configurations available to view at our showroom in Amersham. These aluminium windows and doors have been installed in a purpose built structure, exposed to the environment and used on a day to day basis. This will enable you to see just how well the minimal window® system withstands the wet British climate and how smoothly they operate over time.

If you or your clients would like to see the minimal windows® products in person just contact us and arrange an appointment at the showroom.

The Courtyard Showroom
Sky House
Raans Road
Amersham
Buckinghamshire
HP6 6JQ

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