System 5-35 Hi/Hi+ Tilt and Turn Window

INDEX

Specification

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

The Metal Technology Thermally-Broken Tilt and Turn Window has been designed to offer the specifier the advantages of polyamide thermal break technology in meeting the latest thermal requirements of the current building regulations.

Introduction
Metal Technology 5-35Hi polyamide Tilt and Turn window suite has been developed with a diverse range of profile options. Bespoke thermal isolators and insulation combined with structural mullions, vents, and outer frames offer architects and designers the ability to achieve flexible design solutions.

The 5-35Hi+ range is an adaptation of the 5-35Hi range through the inclusion of additional gaskets and foam inserts which further enhance the system's thermal performance.

As with all Metal Technology systems, the 5-35Hi Tilt and Turn window system is manufactured to exacting standards enabling economy to be combined with strength to give many years of aesthetic, trouble-free operation.

Scope
This specification defines materials, construction, finishes and size limits for the Tilt and Turn Window.

Materials
Aluminium profiles are extruded from aluminium alloy 6060T6, T5 or T4 complying with the recommendations of BS EN 12020-2 / BS EN 755-Parts 1 to 9. Polyamide thermal breaks are produced from glass reinforced nylon sections designed to withstand temperatures in excess of 200°C, allowing the sections to be powder coated after thermally breaking.

Finishes
The range of sections can be provided in either of the following range of finishes:
1. Anodised to BS EN 12373-1 or BS 3987
2. Powder organic coated to BS 6496 or BS EN 12206-1

Where a different colour is required internally and externally, Metal Technology can accommodate this.

Construction
Frame members are mitre cut at 45°, corners are reinforced with extruded aluminium crimping cleats and corner braces, and a secure joint is formed by pneumatically crimping into the extruded crimping cleat. Mullion and transom bars are square cut shaped and fixed securely to the frame by means of stainless steel screws and fixing cleat joints. All frame joints are sealed during construction against entry of water using a suitable sealant. Extruded weatherstrips and glazing gaskets are provided to resist the ingress of water.

Metal Technology recommend that A2 or A4 Austenitic (300 series/class 70) stainless steel fixing screws are used in the assembly of their products.

Glazing
The system is internally beaded and can accommodate glazing units from 28mm to 47mm. Glass is set against extruded gaskets which are fitted into gasket grooves in the window profile. Clip in beads are then fitted to the frame and held secure by means of colour coded wedges. Standard moulded setting/location blocks are provided to clip into the sections.

Installation
Detailed installation instructions are provided which should be strictly followed.

Security
System 5-35Hi/Hi+ has been successfully tested to PAS 24 (using the annex C method) specification for "Enhanced Security Performance Requirements for Doorsets and Windows" as generally accepted on Secure by Design projects. To conform, the window hardware must be in accordance with the tested samples as detailed in Metal Technology's technical literature.

For a summary of results please contact Metal Technology for a test report.

In order to comply with PAS 24 windows should be glazed in accordance with the methods in BS 6262 and BS 8000-7. Units to be sealed to BS EN 1279 and incorporating glass conforming to BS EN 356 Class P1A minimum.

Security products should be labelled by the fabricator in accordance with BS 4873.

Open In Window Fittings
The sections are designed to suit Tilt before Turn fittings, Turn only fittings (side hung) and Tilt only fittings (bottom hung) and a variety of handle options. It is recommended that restrictors be used to prevent the window opening more than 90° in the side hung mode. Metal Technology are able to supply a full range of fittings and accessories. See the relevant section of the fabrication manual for details of gearing options for specific window sizes. Metal Technology should be contacted for any special operating requirements. Where other types of windows are required the Metal Technology System 4-35Hi Commercial Casement or 7-20Hi Pivot Windows should be considered.

Maximum Size Limits

	Vent Width	Vent Height
Tilt before Turn	1600mm	2500mm
Tilt Only Sashes	2400mm	2000mm
Turn Only Sashes	1500mm	2400mm

Note that maximum height and maximum width cannot be achieved simultaneously.

Minimum size limits will be determined by the limitations of the fabricators crimper, and the ironmongery requirements.

For complete details of maximum/ minimum sizes, handle positions and weight restrictions, see the size limitation charts in Section 3 of the fabrication manual.

Performance
Air permeability - BS 6375
test pressure 600 Pa.
Water tightness - BS 6375
test pressure 600 Pa.
Wind resistance - BS 6375
test pressure 2400 Pa.
These levels of performance should be sufficient for any location within the UK and Ireland. However should higher levels of performance be required for any reason, Metal Technology's advice should be sought.

Development
Our policy is to continually research the market for new and improved products. We must therefore retain the right to amend specifications without prior notice. It is recognised at Metal Technology that in some instances special sections may be required for particular projects. When this occurs it may be possible to produce special sections subject to there being sufficient quantity and adequate time.

Specification

System 5-35 Hi / Hi+

TILT AND TURN WINDOW

Thermal Performance

Metal Technology's THERM.AL range, in conjunction with the correct glass specification, is designed to aid compliance with the latest thermal requirements of the current building regulations.

The extended polyamide thermal break profiles, incorporating integral fins have been specifically designed to minimise heat transfer across the window profiles. This innovative and advanced thermal break technology provides the basis of the 5-35Hi system.

The 5-35Hi+ System further boosts thermal performance through the introduction of specially designed thermal gaskets and foam profiles. These reduce radiation heat loss across the air cavities within the window profiles to provide additional thermal enhancement.

The 5-35Hi and 5-35Hi+ systems offer significantly improved U-frame values over more traditional thermally broken aluminium window systems.

	U-frame values	
	5-35Hi	5-35Hi+
Fixed light outer frame	**1.92W / m²K**	**1.34W / m²K**
Outer frame and tilt turn vent	**2.30W / m²K**	**1.63W / m²K**

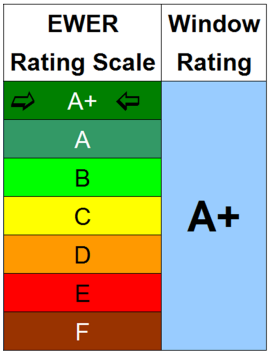
The following table, based on a standard commercial GGF window configuration and warm edge spacers, demonstrates how such improved U-frame values then contribute to improving the overall thermal performance of a complete window.

Achievable whole window U-values	Centre pane U-value	
	1.1W/m²K	0.6W/m²K
5-35Hi tilt turn vent	**1.49W / m²K**	**1.10W / m²K**
5-35Hi+ tilt turn vent	**1.33W / m²K**	**0.94W / m²K**

Metal Technology can provide tailored U-value calculations using their dedicated estimating software to calculate overall project average window U-values for their full range of systems.

Window Energy Rating

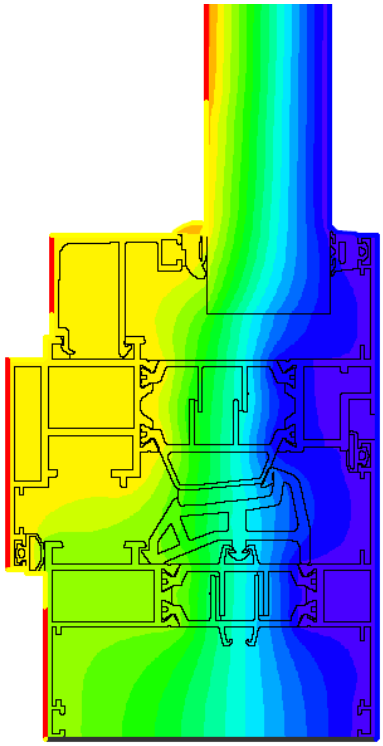
Metal Technology's 5-35Hi+ System has been assessed by an approved simulator in accordance with the BFRC's guidelines, using their official Window Energy Rating software, and has been proven to be capable of achieving an 'A+' rating.



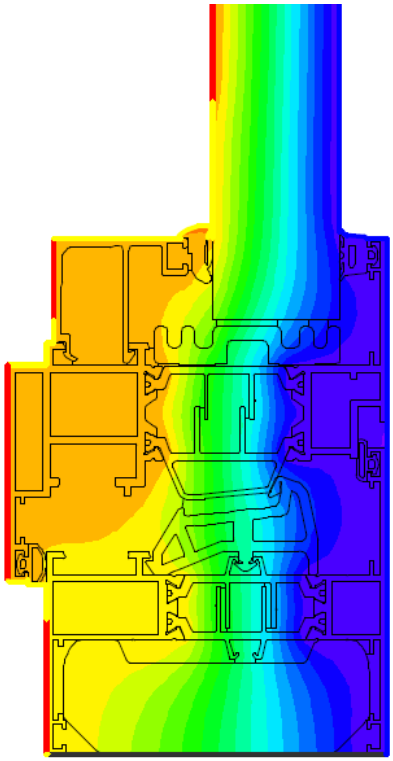
breeam sustainability rating

When assessed in accordance with the profile mass formula, as set out in the BRE's Green Guide for sustainable design and environmental performance, Metal Technology's 5-35Hi and 5-35Hi+ Systems achieved an '**A**' rating.

5-35Hi Tilt and Turn Window



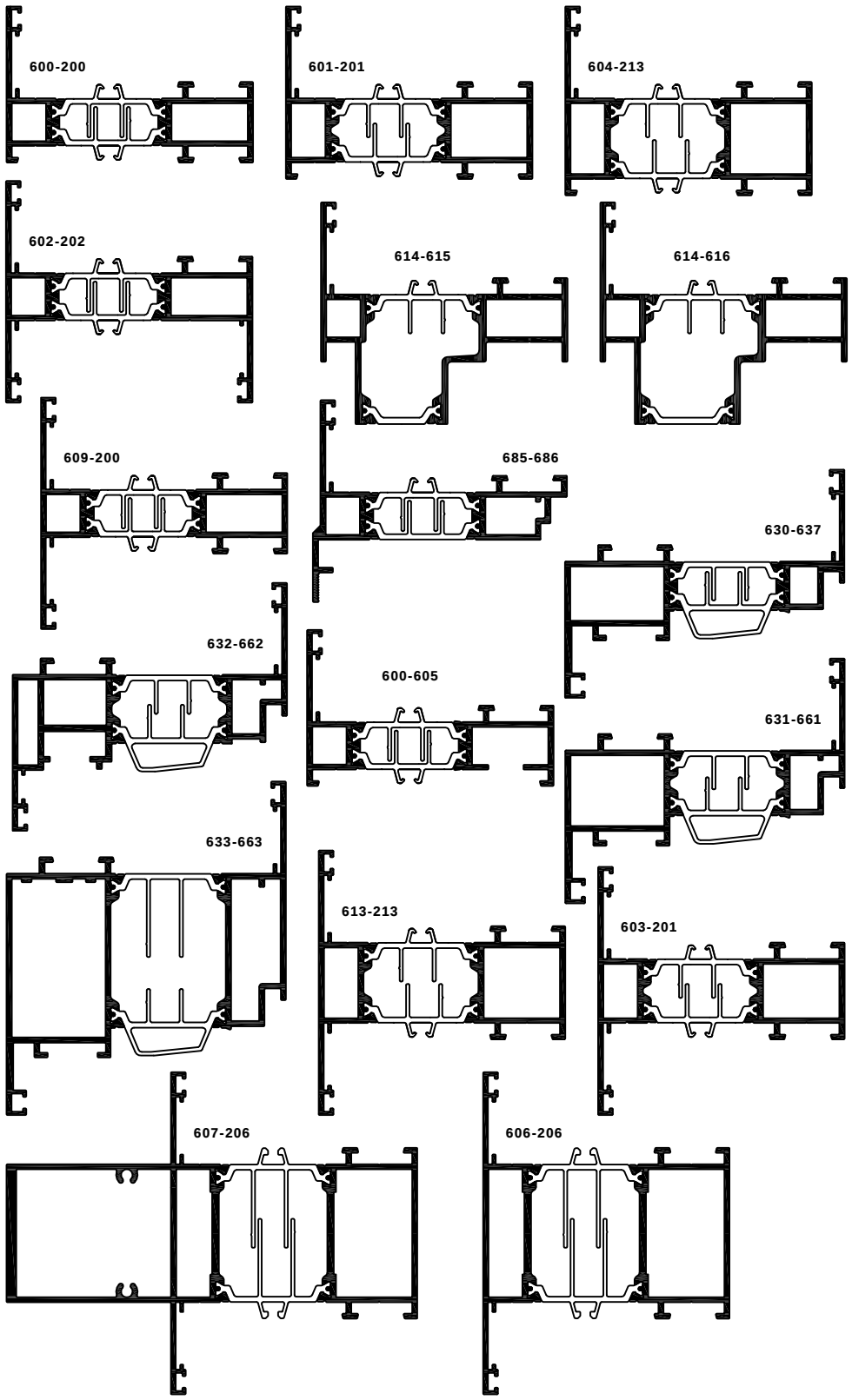
5-35Hi+ Tilt and Turn Window



Profile Index

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



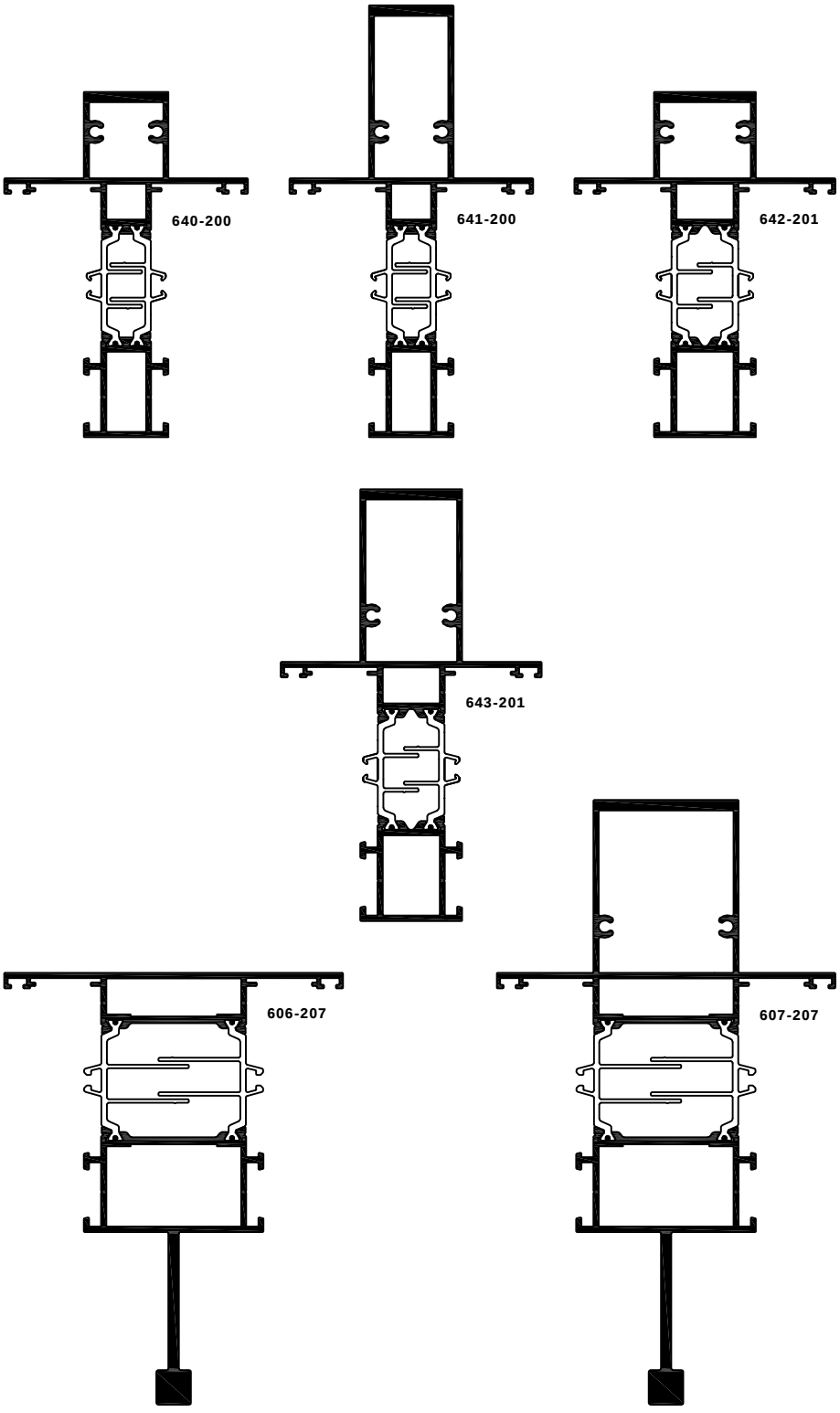
PROFILE ILLUSTRATION	SHEET REF NUMBER	COMPUTER REF NUMBER	PERIMETER mm
	535Hi/1/10	600	176
		200	169
	535Hi/1/140	600	176
		605	204
	535Hi/1/10	601	188
		201	181
	535Hi/1/20	602	237
		202	209
	535Hi/1/60	603	254
		201	181
	535Hi/1/10	604	199
		213	192
	535Hi/1/60	606	299
		206	228
	535Hi/1/70	607	399
		206	228
	535Hi/1/60	609	243
		200	169
	535Hi/1/60	613	265
		213	192
	535Hi/1/30	614	227
		615	224
	535Hi/1/30	614	227
		616	215
	535Hi/1/40	630	180
		637	251
	535Hi/1/40	631	191
		661	263
	535Hi/1/50	632	194
		662	270
	535Hi/1/50	633	246
		663	317
	535Hi/1/20	685	215
		686	139

Scale 1:2

Profile Index

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

PROFILE ILLUSTRATION	SHEET REF NUMBER	COMPUTER REF NUMBER	PERIMETER mm
	535Hi/1/100	606	299
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		207	341
	535Hi/1/80	640	292
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	535Hi/1/80	641	342
		200	169
	535Hi/1/90	642	304
		201	181
	535Hi/1/90	643	354
		201	181

Scale 1:2

Profile Index

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

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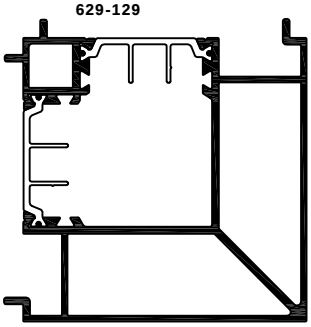
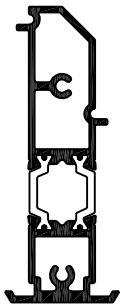
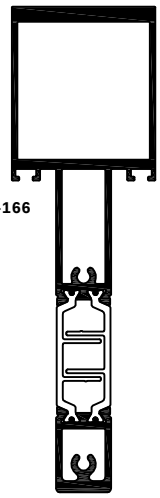
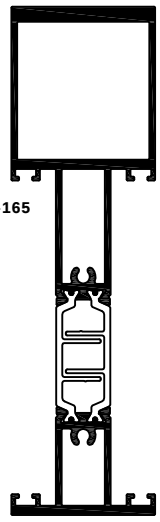
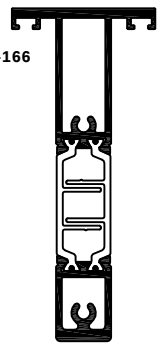
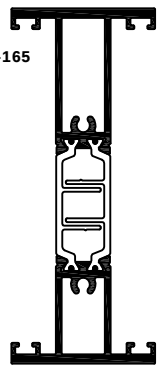
629-129  668-669  667-166  667-165  665-166  665-165 	535Hi/1/140	629	418
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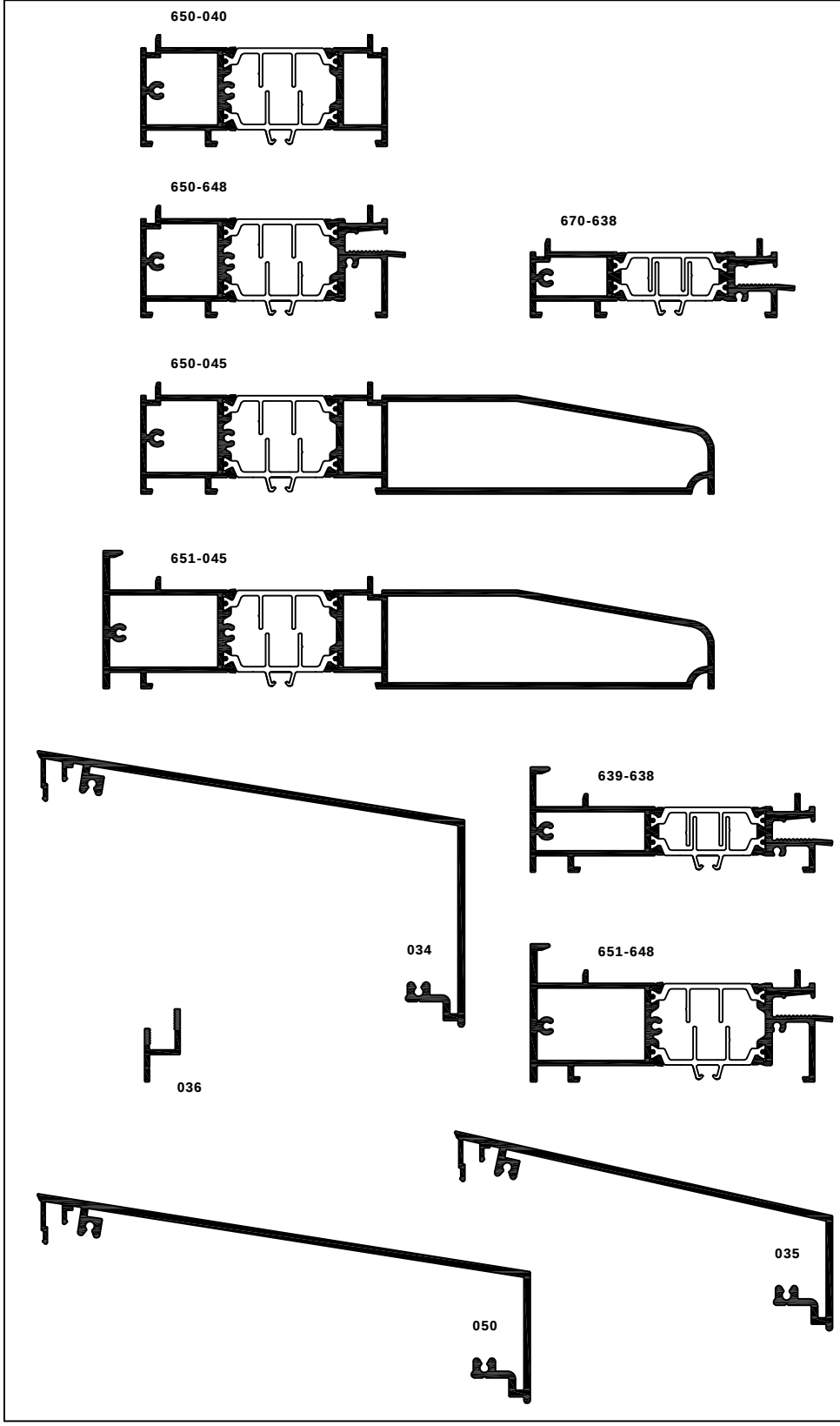
	535Hi/1/120	665	201
		166	91
	535Hi/1/130	667	282
		165	180
	535Hi/1/130	667	282
		166	91
	535Hi/1/120	668	131
		669	150

Scale 1:2

Profile Index

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



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	535Hi/1/150	639	192
		638	164
	535Hi/1/150	650	175
		040	132
	535Hi/1/170	650	175
		045	327
	535Hi/1/160	650	175
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	535Hi/1/170	651	222
		045	327
	535Hi/1/160	651	222
		648	207
	535Hi/1/150	670	143
		638	164

Scale 1:2

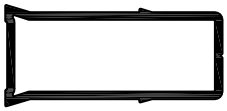
Profile Index

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

PROFILE ILLUSTRATION

007



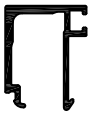
008

009

628

634

636



645

653

PTT16

TW05

HS103

623

635

644

646

654

SHEET REF NUMBER	COMPUTER REF NUMBER	PERIMETER mm
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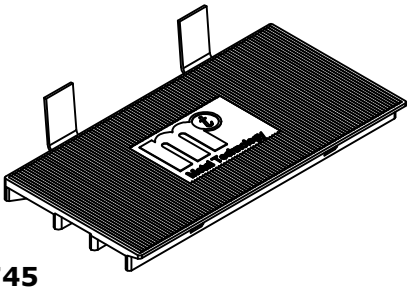
535Hi/1/140	008	166
535Hi/1/140	009	302
535Hi/1/190	623	182
535Hi/1/190	628	196
535Hi/1/190	634	188
535Hi/1/190	635	175
535Hi/1/190	636	169
535Hi/1/190	644	159
535Hi/1/190	645	160
535Hi/1/190	646	149
535Hi/1/190	653	154
535Hi/1/190	654	143
535Hi/1/190	HS103	119
535Hi/1/190	PTT16	47
535Hi/1/190	TW05	80

Scale 1:2

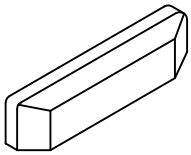
Component Identification

System 5-35 Hi/Hi+

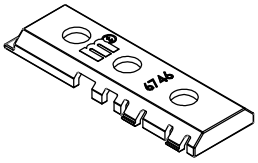
TILT AND TURN WINDOW



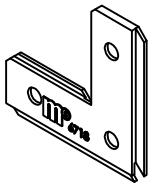
6745
GLAZING SUPPORT BLOCK



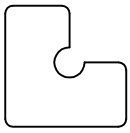
775 DRAINAGE CAP
(Flush for internally beaded applications)



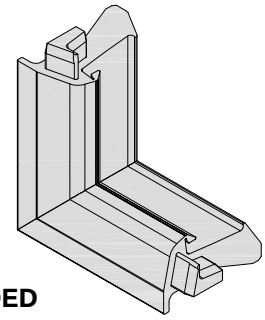
6746
TRANSOM BRACE



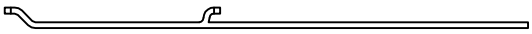
6718
CORNER BRACE



CA23 (Large)
CA24 (Medium)
CORNER BRACES

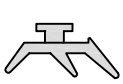


6062 MOULDED
CORNER GASKET

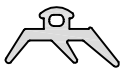


6739 225mm LONG
6740 173.5mm LONG
FIXING LUGS (Galvanised steel)

GASKETS



CA25 (Red)



CA25A

CA26 (Orange)

CA27 (White)

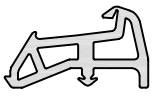
PTT36 (Red)

WEATHERSEAL

060B

6080 (Purple)

6081 (Black)



6061 CENTRE SEAL GASKET

OFF-SET BUBBLE SEAL

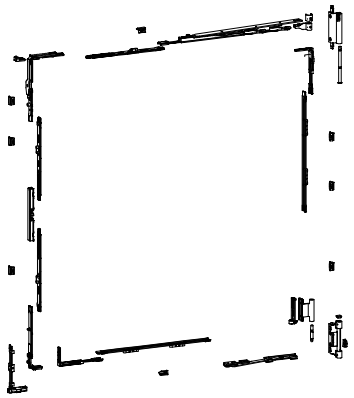
6063

Not to Scale

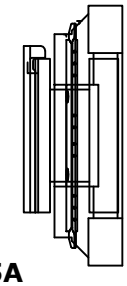
Component Identification

System 5-35 Hi/Hi+

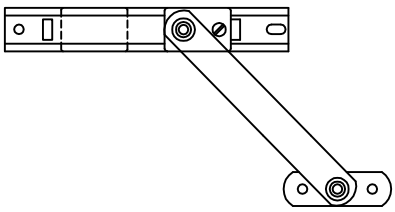
TILT AND TURN WINDOW



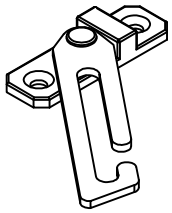
SEE SECTION 3 OF THIS MANUAL FOR GEARING, HANDLES, AND ASSOCIATED ACCESSORIES.



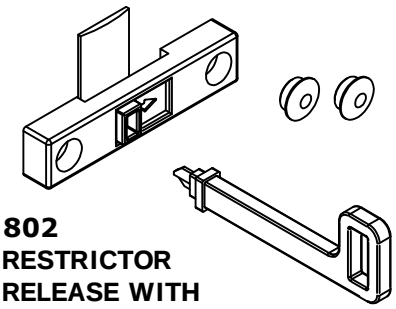
TTGEAR805A
BUTT HINGE



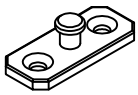
CA36
6" RESTRICTOR
(UNIT = PAIR)



801
RESTRICTOR ARM
(Left hand item shown)

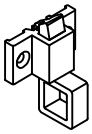


802
RESTRICTOR RELEASE WITH KEY (Left hand item shown)



803
RESTRICTOR STUD

7031
SPRING CATCH KEEP

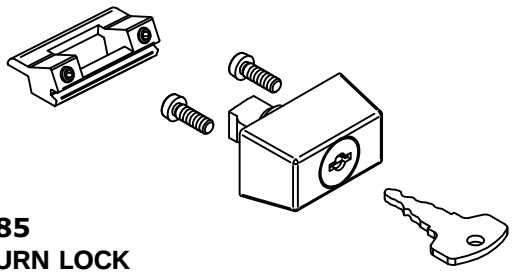


7030
SPRING CATCH

5540 200mm LINK BAR
5542 400mm LINK BAR
5543 500mm LINK BAR
5544 600mm LINK BAR
5546 800mm LINK BAR

7014
POLE OPERATOR

722
PVC PACKER



785
TURN LOCK

TTGEAR2039
ALTERNATIVE BOTTOM CORNER BSU

Not to Scale

Component Identification

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

7200

No 6 x 12mm countersunk self tap screw

7203

No 10 x 16mm pan head self tap screw

7211

M5 x 30mm countersunk machine screw

7216

No 10 x 13mm socket head self tap screw

7218

No 10 x 45mm pan head self tap screw

7220

No 10 x 45mm countersunk self tap screw

7221

No 10 x 70mm countersunk self tap screw

7223

No 7 x 25mm countersunk self drill screw

7236

No 8 x 19mm pan head self tap screw

7237

No 10 x 32mm countersunk self tap screw

7240

No 6 x 16mm pan head self tap screw

7248

No 10 x 38mm countersunk self tap screw

7249

No 10 x 50mm countersunk self tap screw

7251

No 4 x 9.5mm pan head self tap screw

7254

No 8 x 25mm countersunk self tap screw

7255

No 8 x 16mm countersunk type B self tap screw

7256

No 7 x 16mm countersunk self drill screw

7259

No 8 x 38mm countersunk self tap screw

7271

No 8 x 50mm countersunk self tap screw

7275

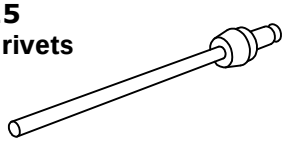
No 8 x 32mm countersunk self tap screw

7276

No 8 x 45mm countersunk self tap screw

7282

No 7 x 19mm countersunk self drill screw

CA15
Pop rivets


Not to Scale

Component Identification

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

020

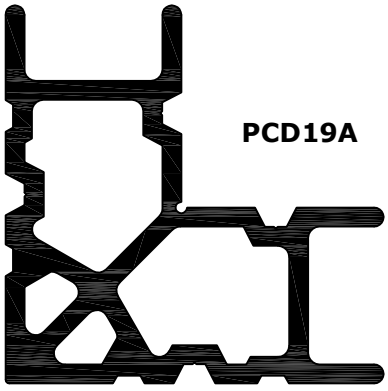
CLEAT REF	SIZE	SECTION	741 SCREWS REQUIRED
521	11mm	200	1
522	16mm	201	1
523	38.5mm	206, 207	2
524	21mm	213	1

741
GRUB SCREW
FOR CLEAT

6020

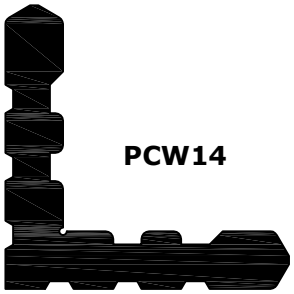
CLEAT REF	SIZE	SECTION	6741 SCREWS REQUIRED
6520	16mm	603, 642, 643	1
6521	11mm	609, 640, 641	1
6523	38.5mm	606, 607	2
6524	21mm	613	1

6741
SELF TAPPING SCREW
FOR CLEAT



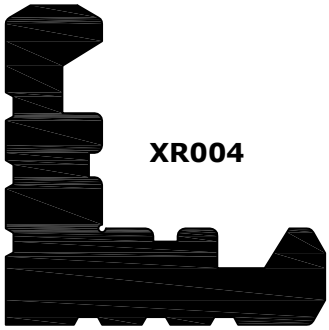
PCD19A

527 - Cut @ 27.8mm



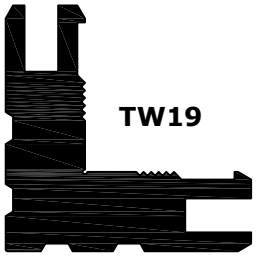
PCW14

516 - Cut @ 22.5mm
594 - Cut @ 27.8mm
6517 - Cut @ 9.7mm
6594 - Cut @ 7.9mm



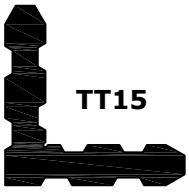
XR004

BB069 - Cut @ 5.5mm



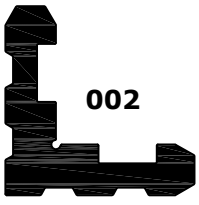
TW19

532 - Cut @ 22.6mm
595 - Cut @ 27.8mm
6533 - Cut @ 9.7mm



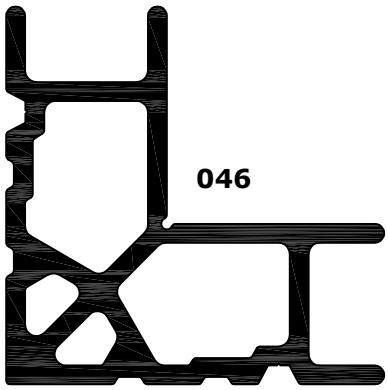
TT15

511 - Cut @ 22.5mm
6510 - Cut @ 14.6mm
6511 - Cut @ 9.7mm
6512 - Cut @ 7.9mm



002

509 - Cut @ 18.6mm



046

6513 - Cut @ 7.9mm

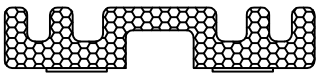
CORNER CLEATS (CRIMPED JOINT)

Not to Scale

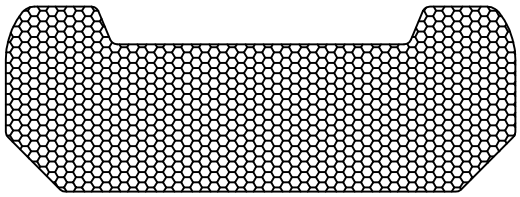
Component Identification

System 5-35 Hi+

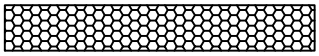
TILT AND TURN WINDOW



6727
GLAZING UNIT PERIMETER FOAM



6728
PERIMETER FOAM



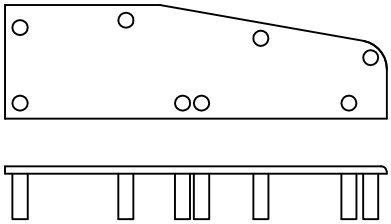
6729
LINER BAR FOAM

Not to Scale

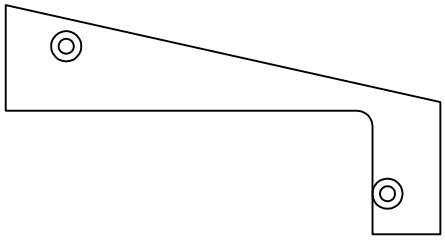
Component Identification

System 5-35 Hi/Hi+

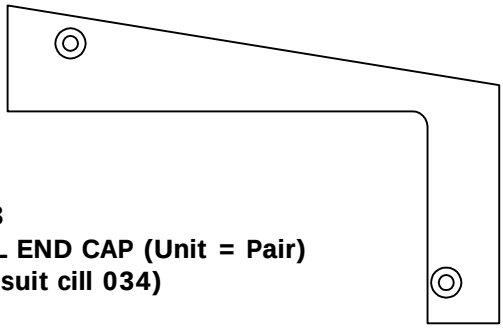
TILT AND TURN WINDOW



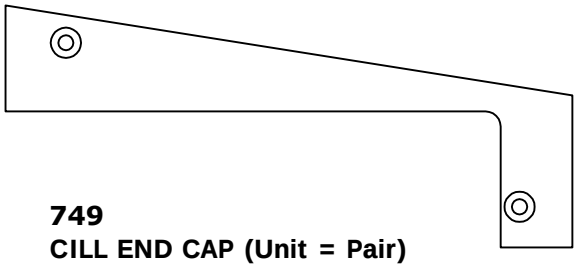
TSF145
uPVC CILL END CAP (Unit = Pair)
(To suit cills 650-045 and 651-045)



730
CILL END CAP (Unit = Pair)
(To suit cill 035)



748
CILL END CAP (Unit = Pair)
(To suit cill 034)



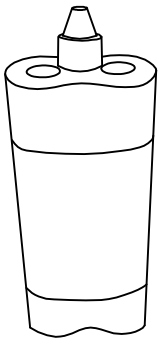
749
CILL END CAP (Unit = Pair)
(To suit cill 050)

Not to scale

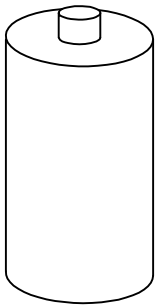
Component Identification

System 5-35 Hi/Hi+

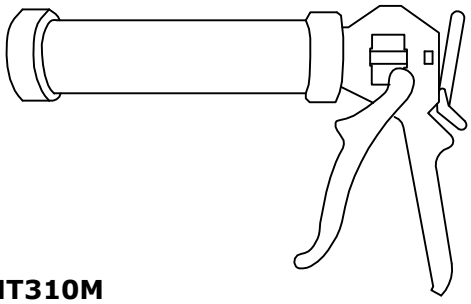
TILT AND TURN WINDOW



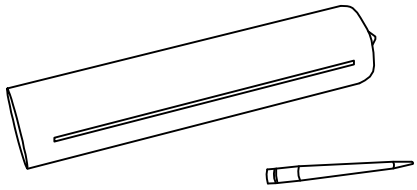
MT1803
2-PART ADHESIVE (grey, white)



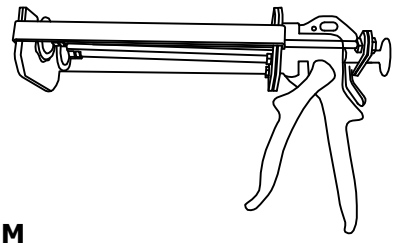
MT60
SURFACE CLEANER



MT310M
MANUAL APPLICATOR GUN



HR50328A
BLACK GASKET ADHESIVE/SEALANT



MT900M
MANUAL APPLICATOR GUN FOR 2-PART ADHESIVE

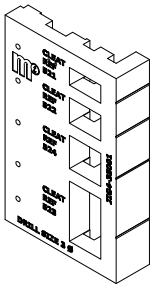
MT1804
STATIC MIXING TUBE

7400
SILICONE SPRAY

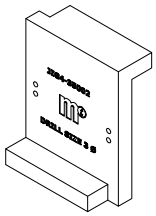
Component Identification

System 5-35 Hi/Hi+

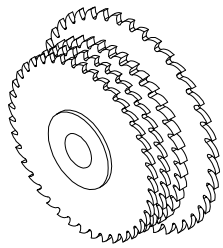
TILT AND TURN WINDOW



JIG4-35001
MULLION/TRANSOM CLEAT PREP JIG

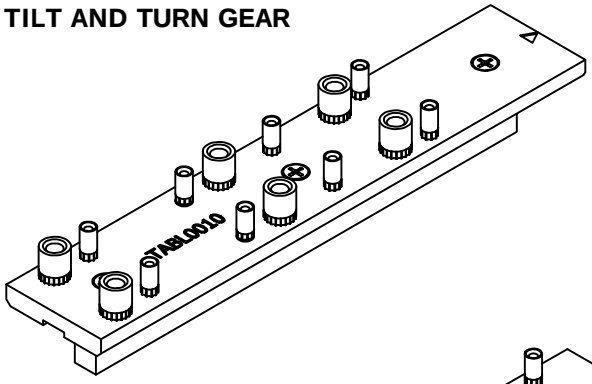


JIG4-35002
MULLION/TRANSOM JIG

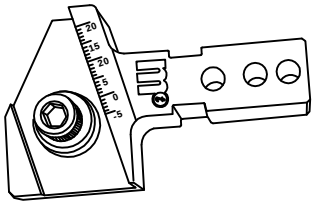


JIG4-35018 - END MILLING BLADES (with 40mm Ø spindle for Elumatic end miller)

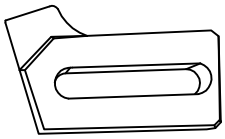
SIEGENIA CONCEALED TILT AND TURN GEAR



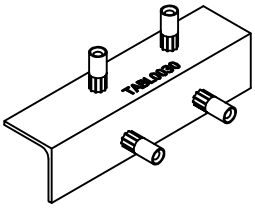
JIG5-20005
TOP AND BOTTOM FRAME HINGE POSITIONS



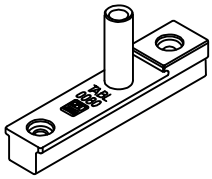
CR124303800/MOD
ADJUSTABLE TOOL HOLDER FOR EP124 CRIMPER



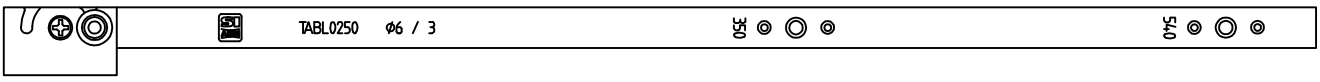
POLSPEC/51
3mm CRIMP KNIFE FOR ADJUSTABLE TOOL



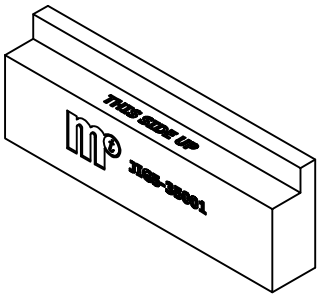
JIG5-20006
TOP AND BOTTOM HINGE SIDE FRAME



JIG5-20008
SASH CABLE BLOCK



JIG5-20007
FRAME CABLE POSITION



JIG4-35021 - SAW BLOCK FOR SECTION 685-686 (bead side up)
JIG5-35001 - SAW BLOCK FOR SECTIONS 630-637, 631-661, 632-662 AND 633-663 (bead side up)
JIG5-35002 - SAW BLOCK FOR SECTIONS 614-615, 614-616 (either side up) AND BEAD SIDE SUPPORT FOR ALL SECTIONS (bead side down)

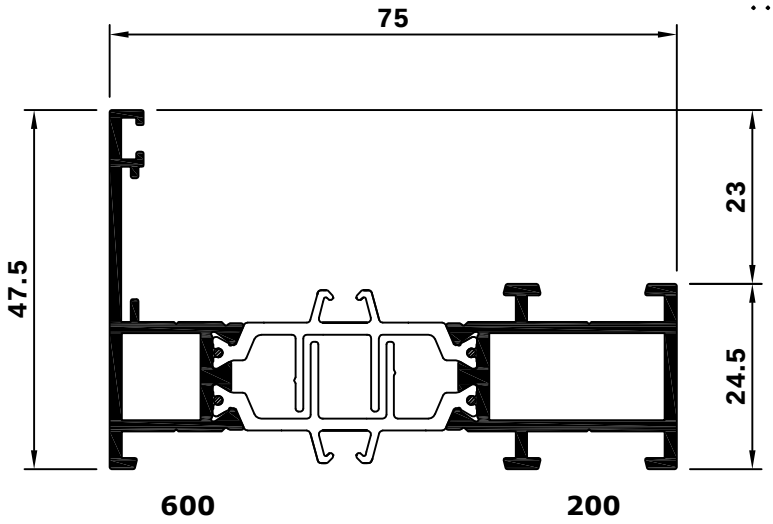
Three of each will be required

Not to scale

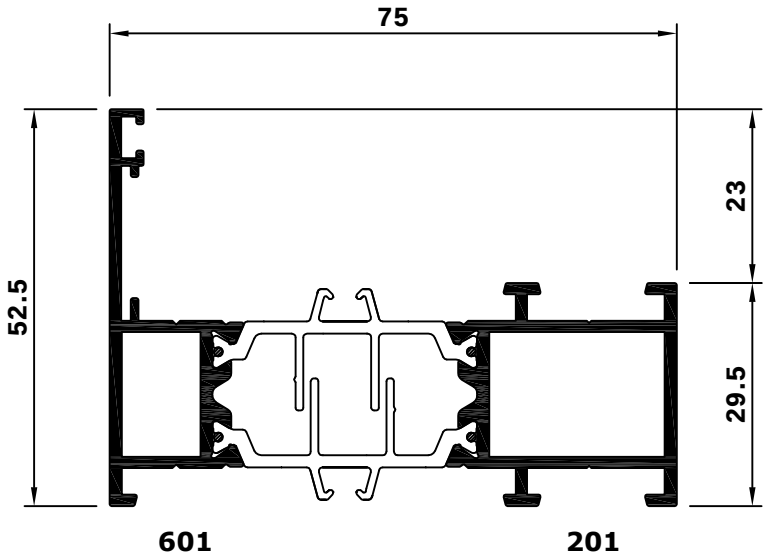
Section Drawings

System 5-35 Hi/Hi+

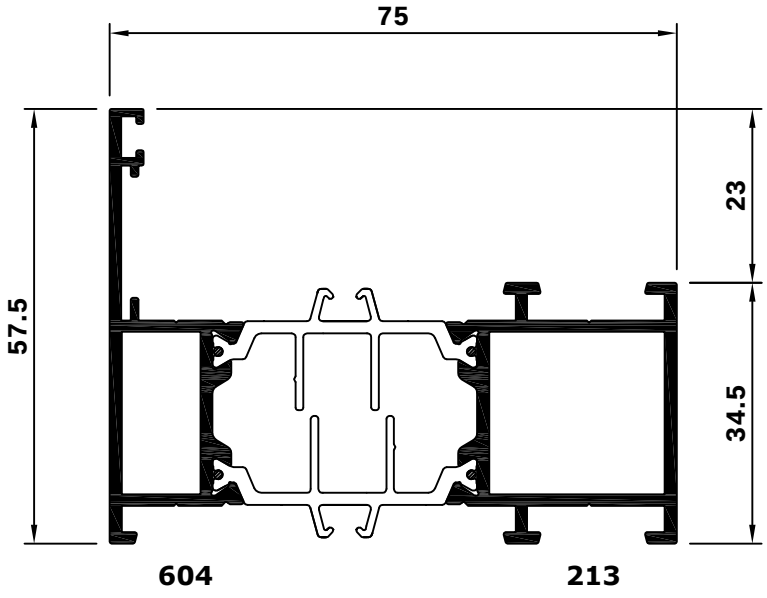
TILT AND TURN WINDOW



600-200
STANDARD SHORT LEG OUTER FRAME



601-201
MEDIUM SHORT LEG OUTER FRAME



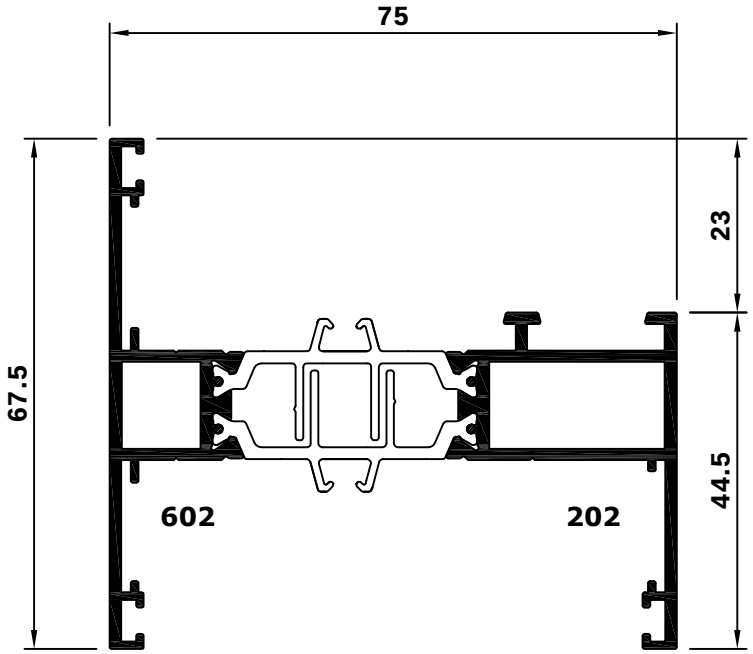
604-213
HEAVY SHORT LEG OUTER FRAME

Scale 1:1

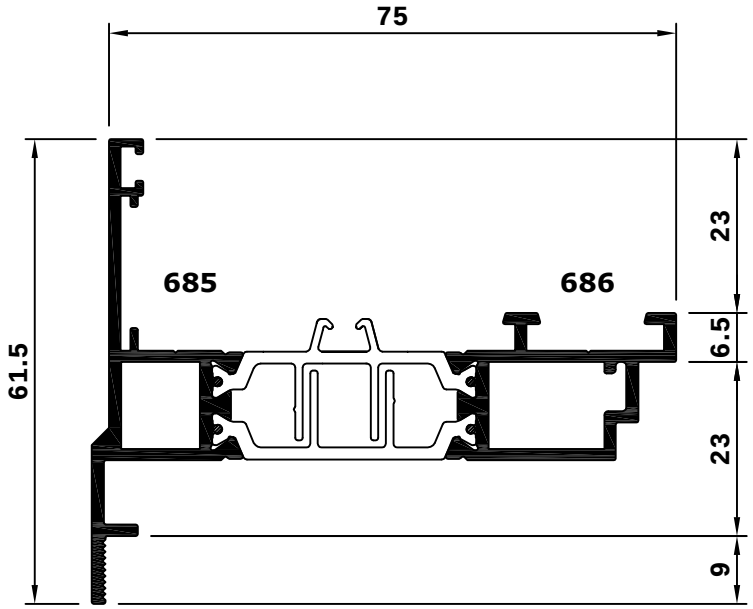
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



602-202
STANDARD LONG LEG OUTER FRAME



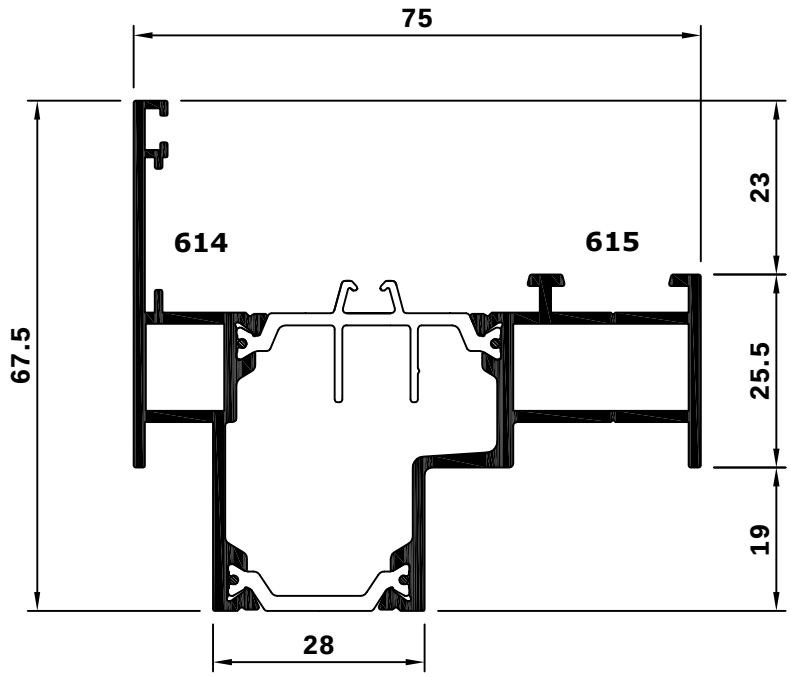
685-686
LINER BAR

Scale 1:1

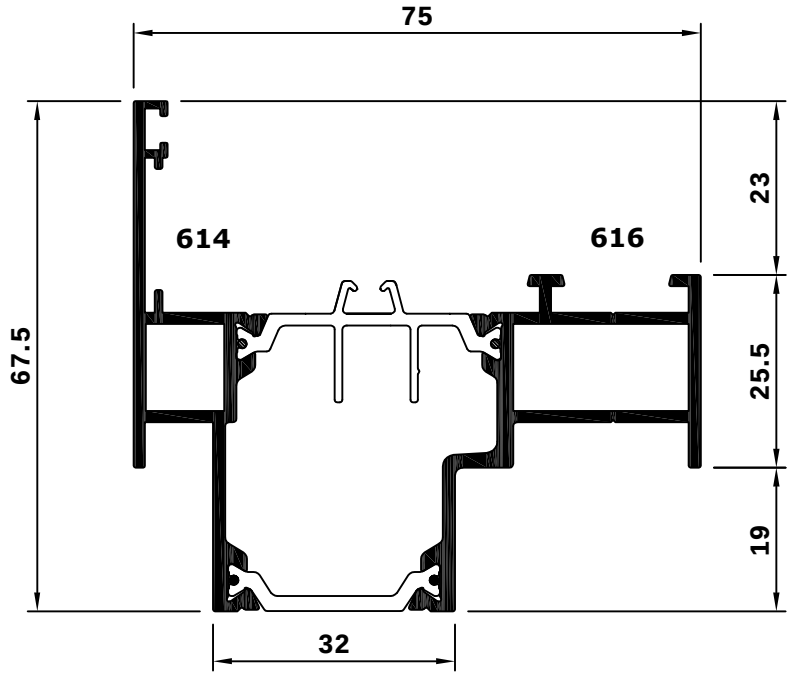
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



614-615
CURTAIN WALLING
OUTER FRAME (28mm)



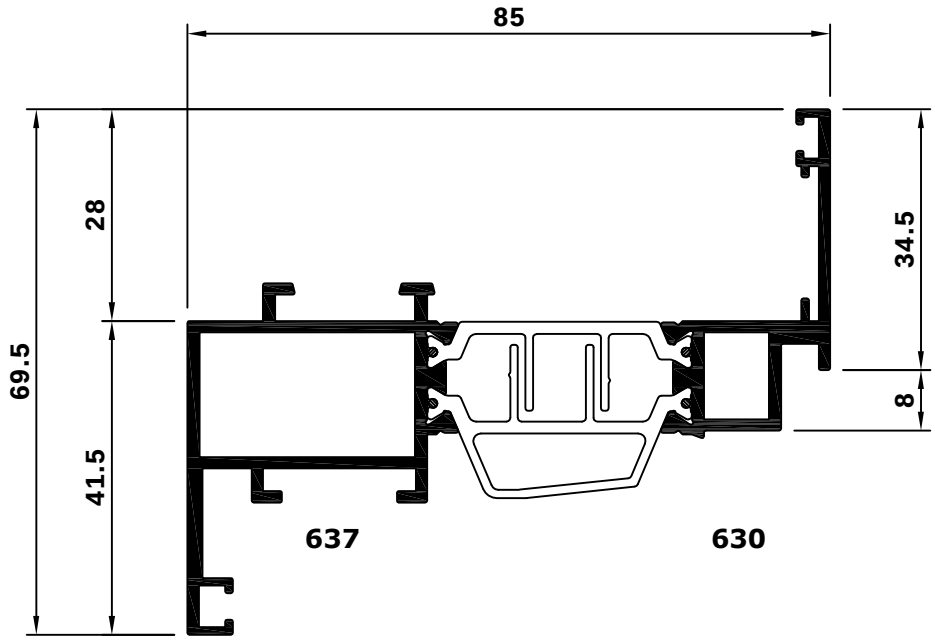
614-616
CURTAIN WALLING
OUTER FRAME (32mm)

Scale 1:1

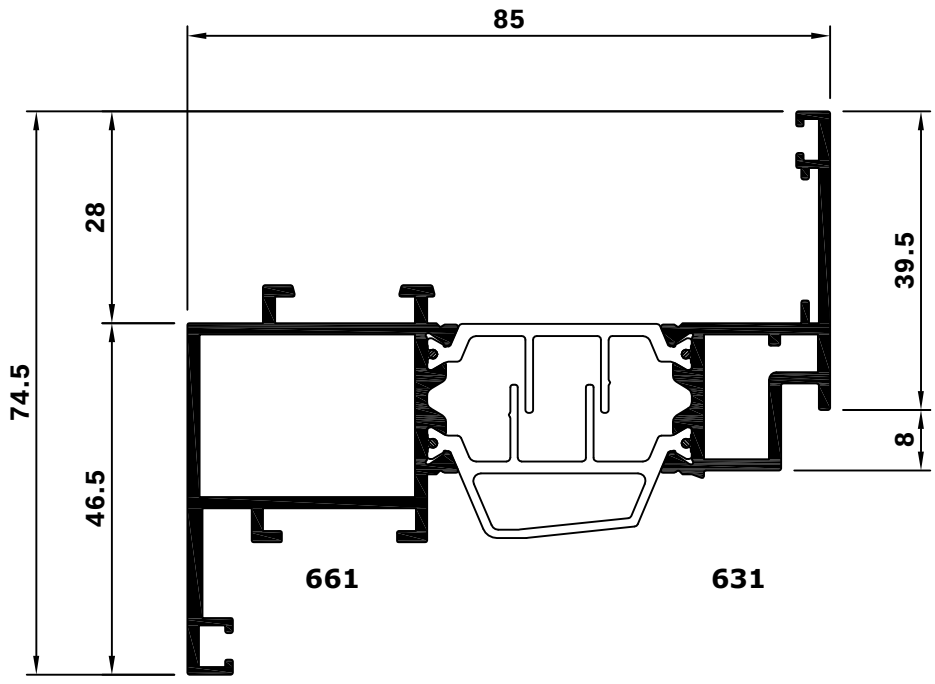
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



630-637
STANDARD TILT AND TURN SASH



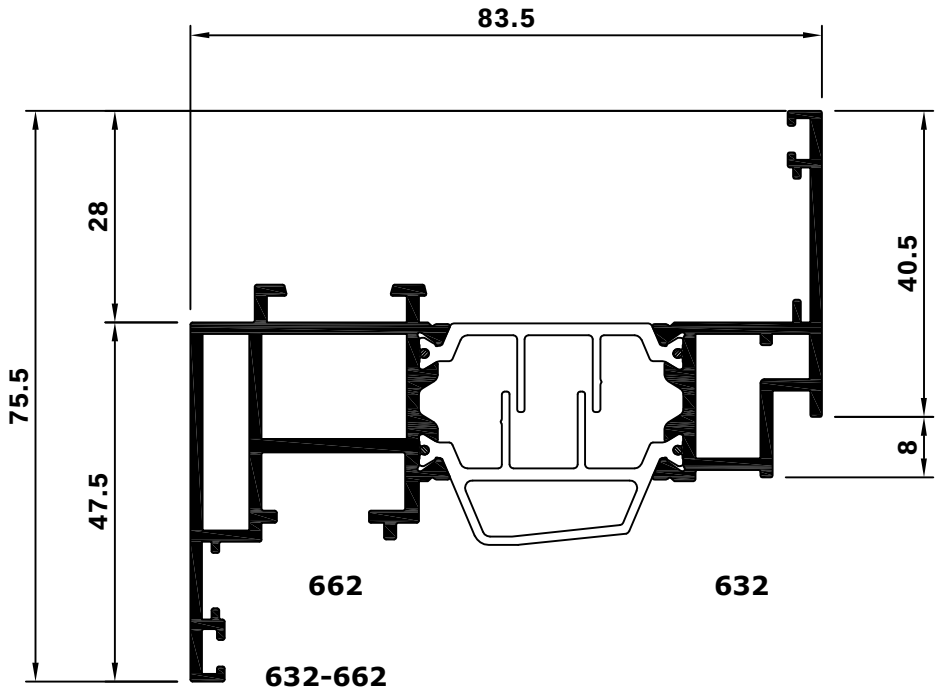
631-661
MEDIUM TILT AND TURN SASH

Scale 1:1

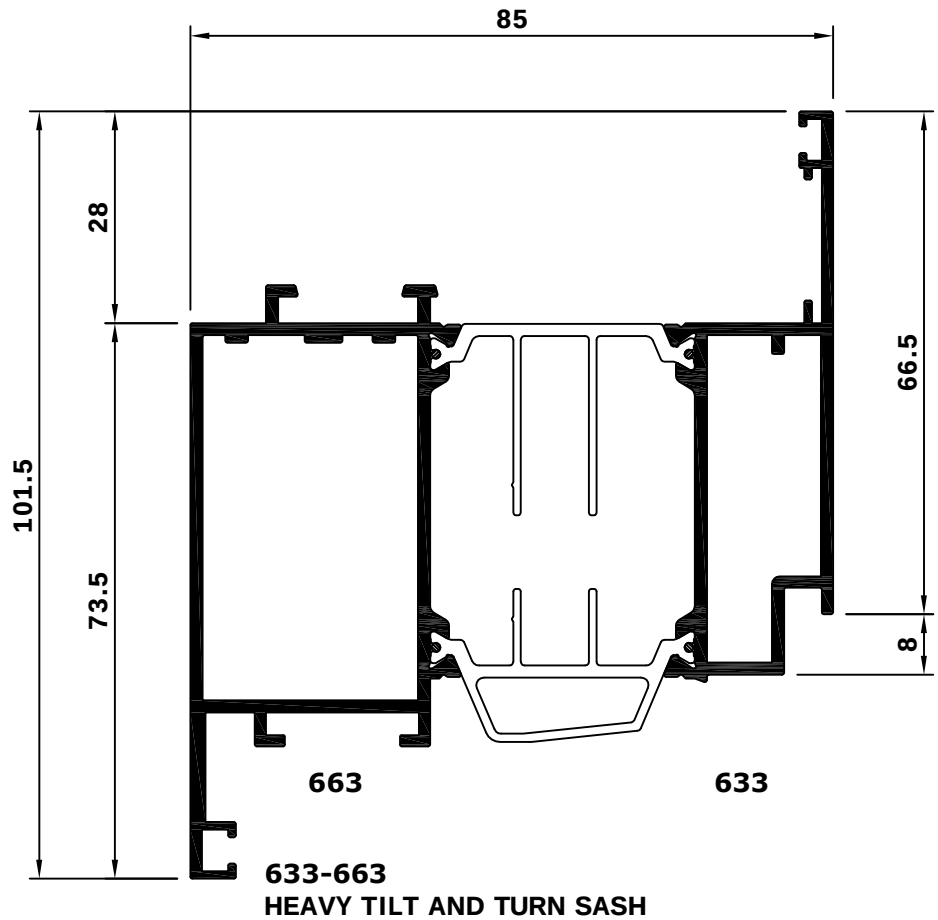
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



632-662
EURO GROOVE TILT AND TURN SASH



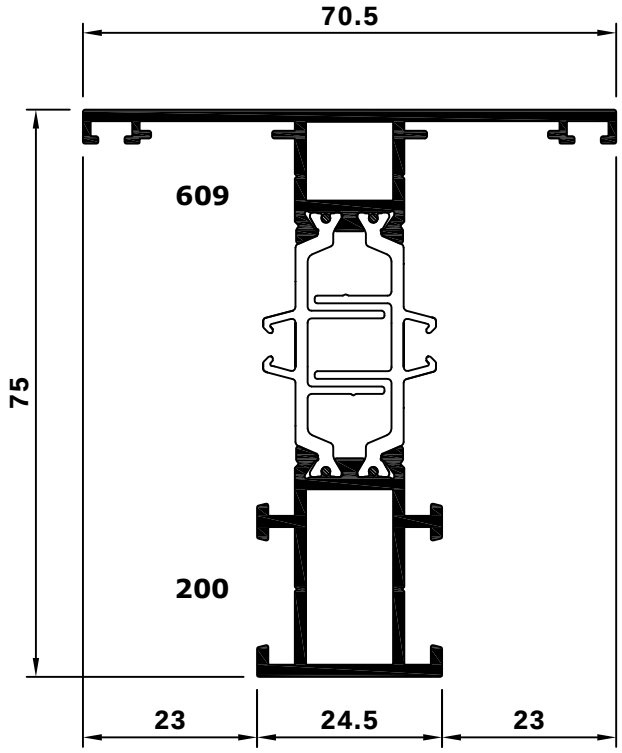
633-663
HEAVY TILT AND TURN SASH

Scale 1:1

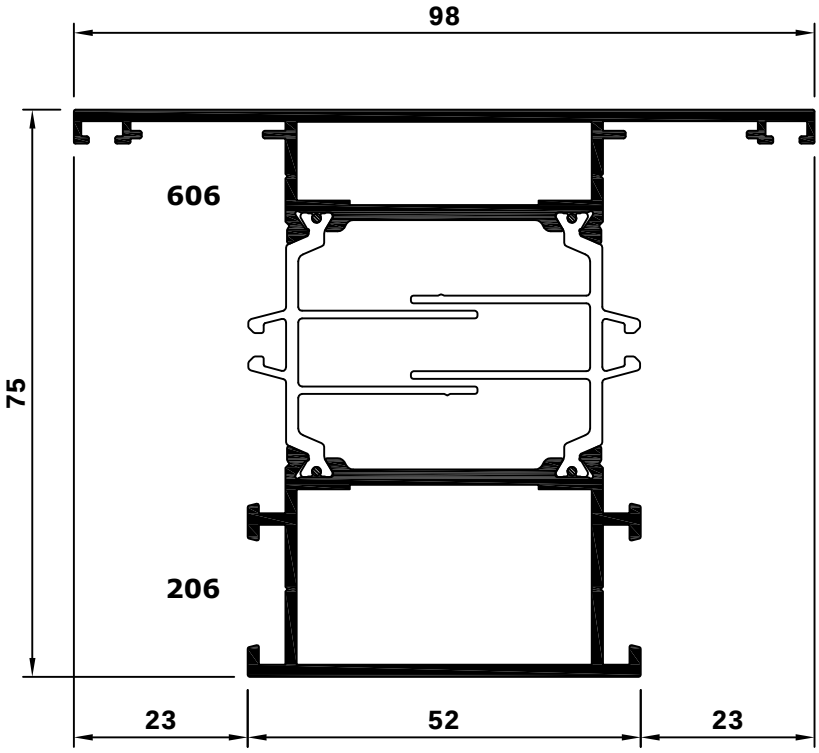
Section Drawings

System 5-35 Hi/Hi+

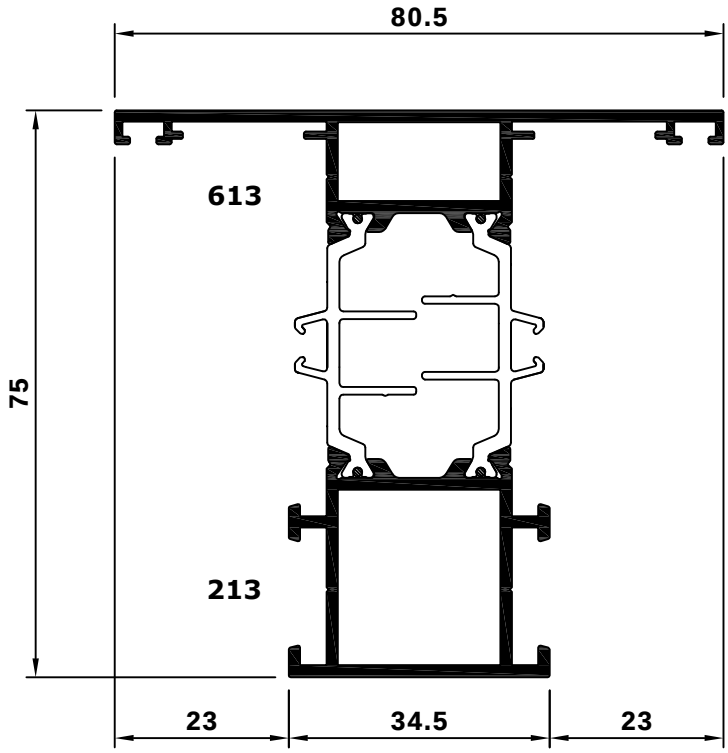
TILT AND TURN WINDOW



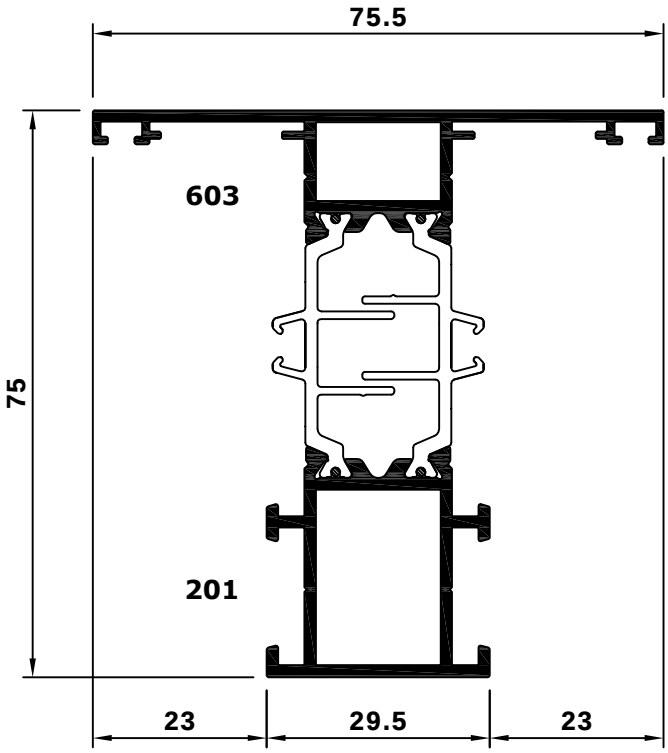
609-200
STANDARD MULLION/TRANSOM



606-206
HEAVY DUTY MULLION/TRANSOM



613-213
DEEP MULLION/TRANSOM



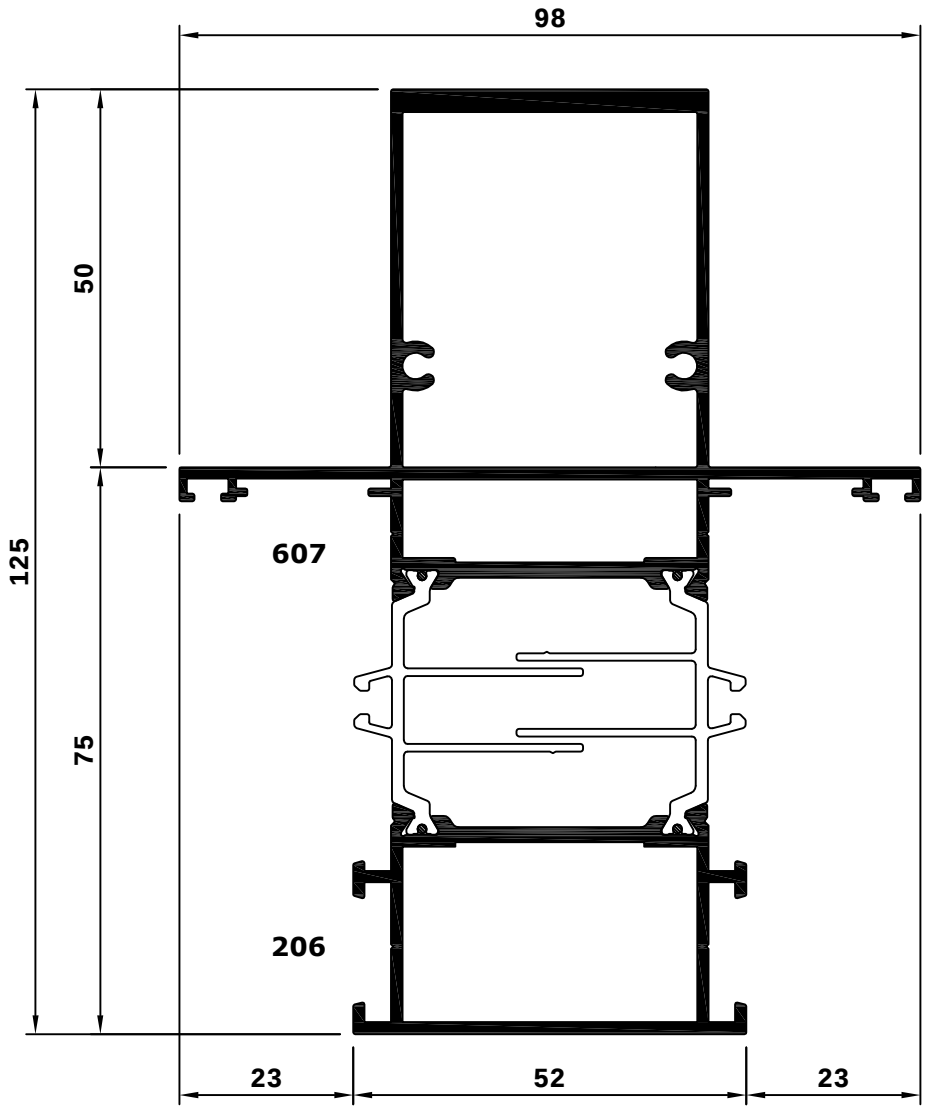
603-201
MEDIUM MULLION/TRANSOM

Scale 1:1

Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



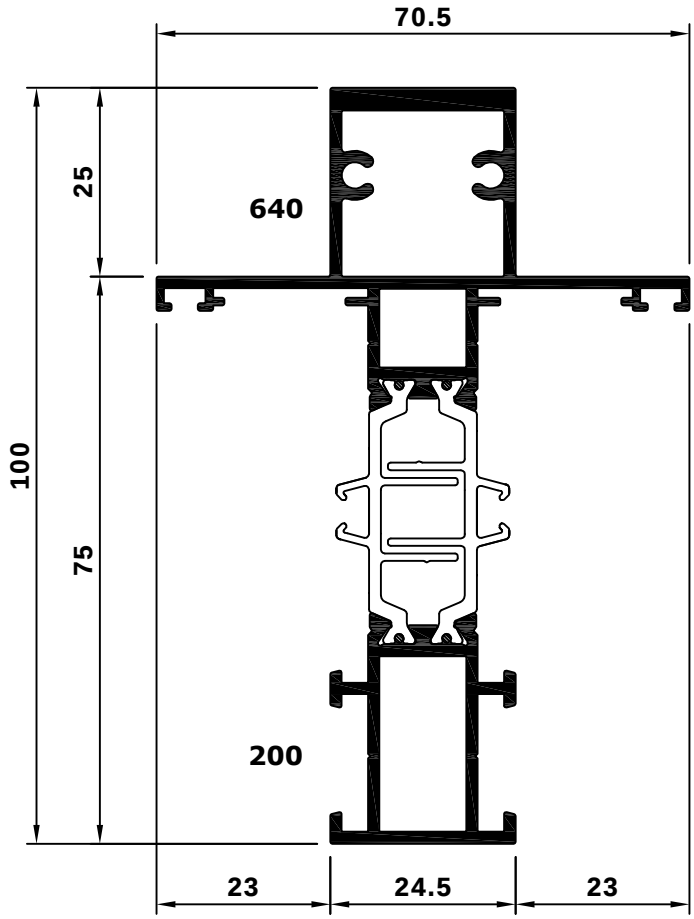
607-206
HEAVY DUTY MULLION WITH BOX

Scale 1:1

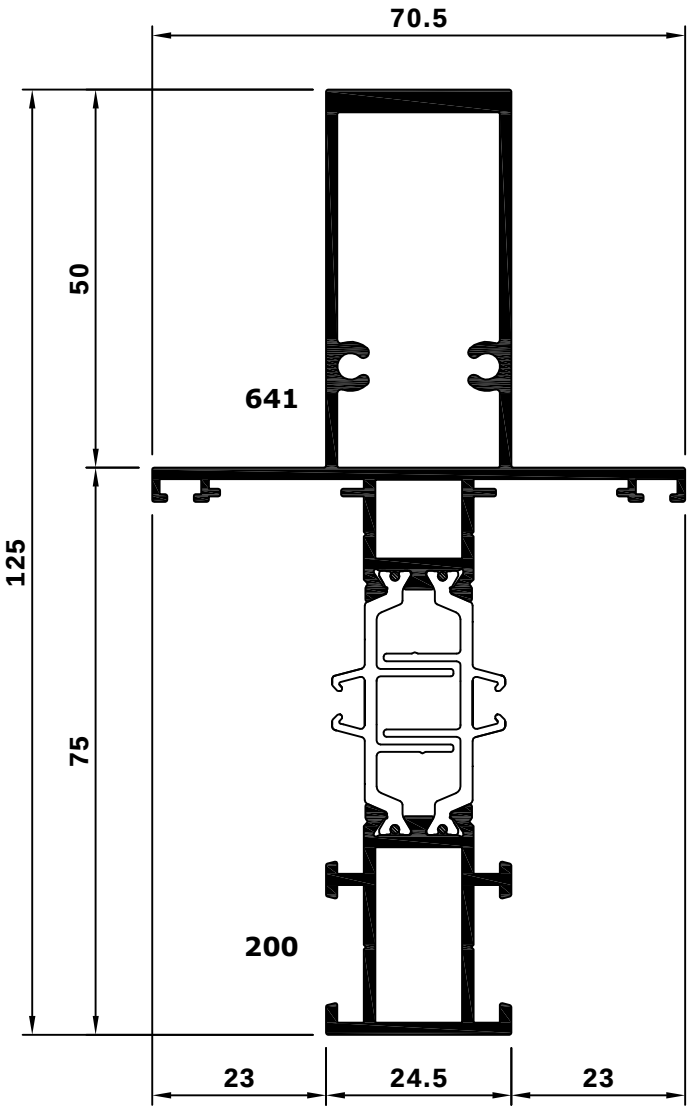
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



640-200
100mm BOX MULLION (STANDARD)



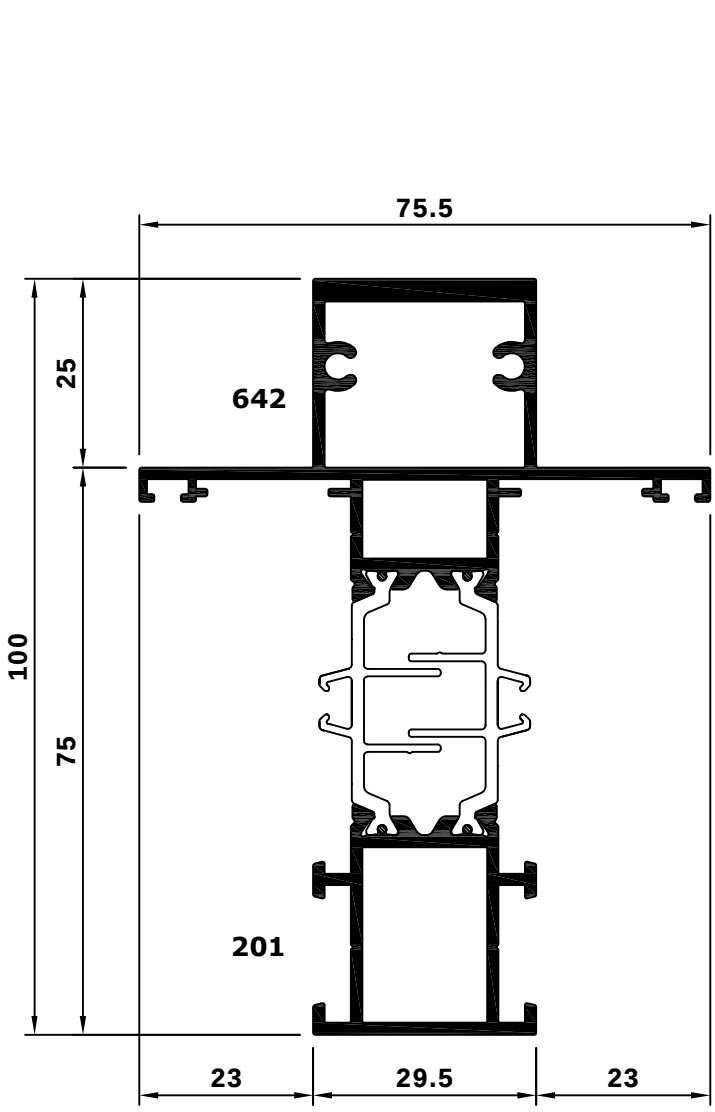
641-200
125mm BOX MULLION (STANDARD)

Scale 1:1

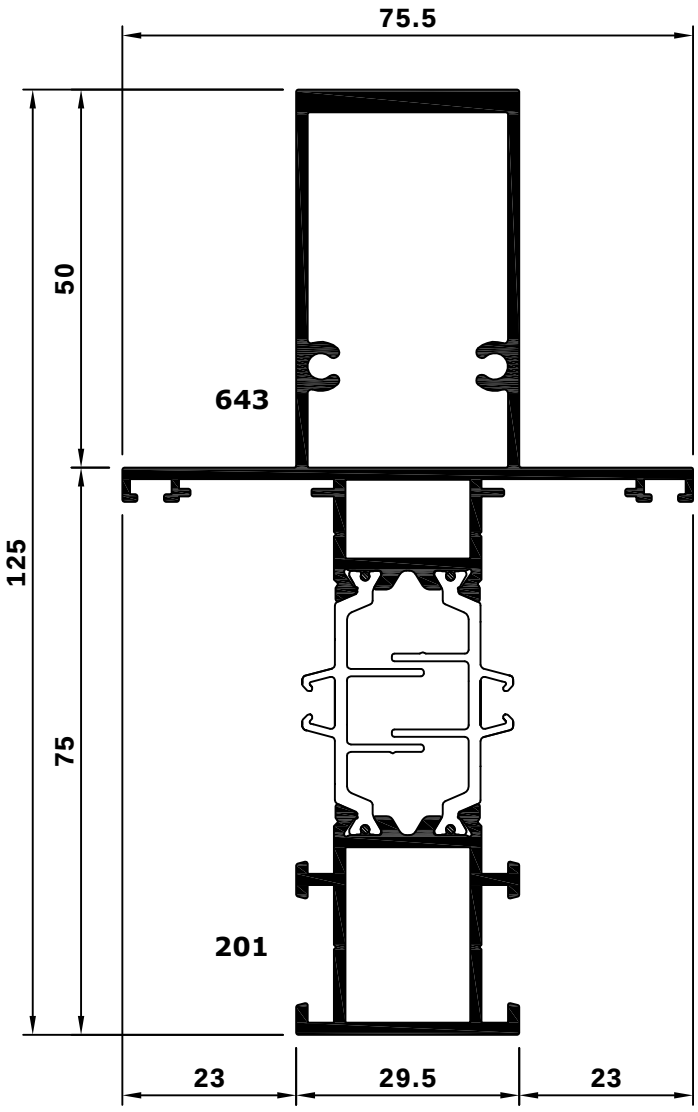
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



642-201
100mm BOX MULLION (MEDIUM)



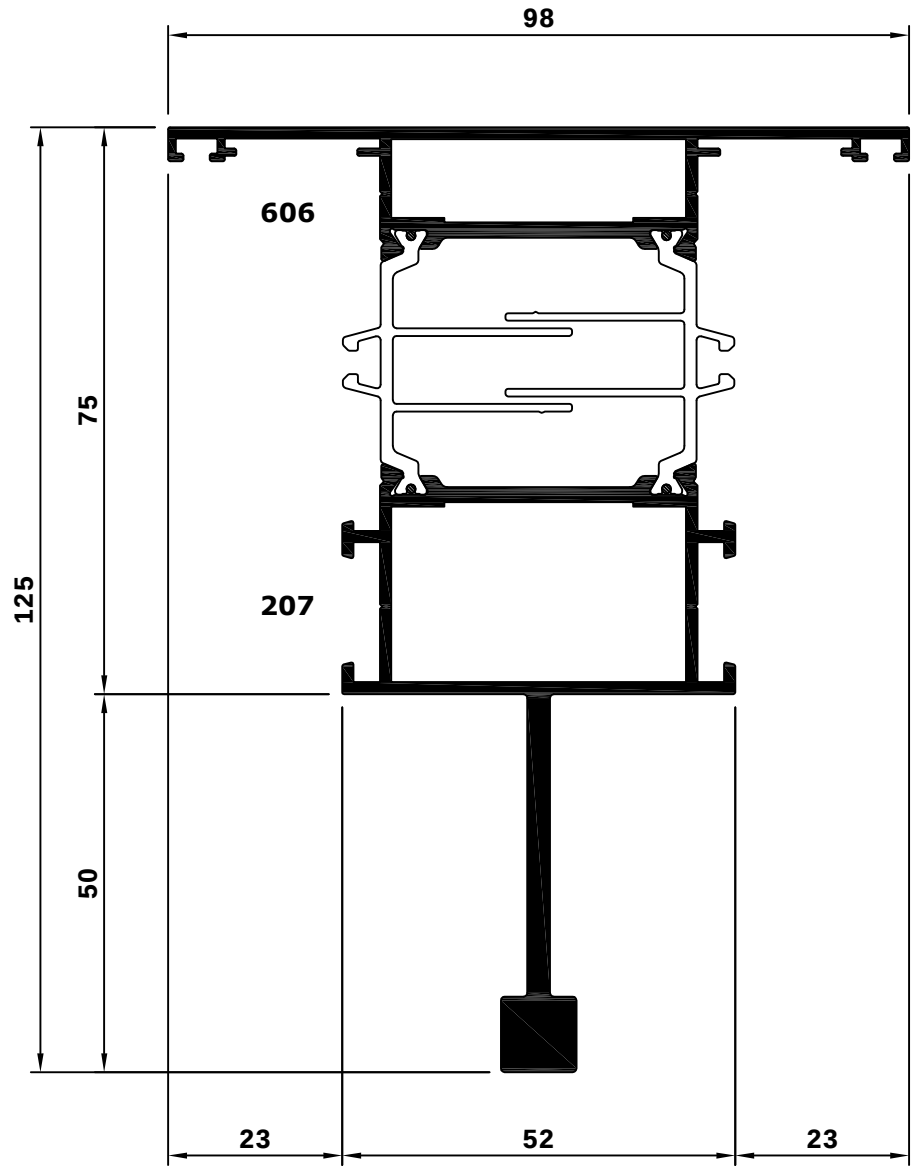
643-201
125mm BOX MULLION (MEDIUM)

Scale 1:1

Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



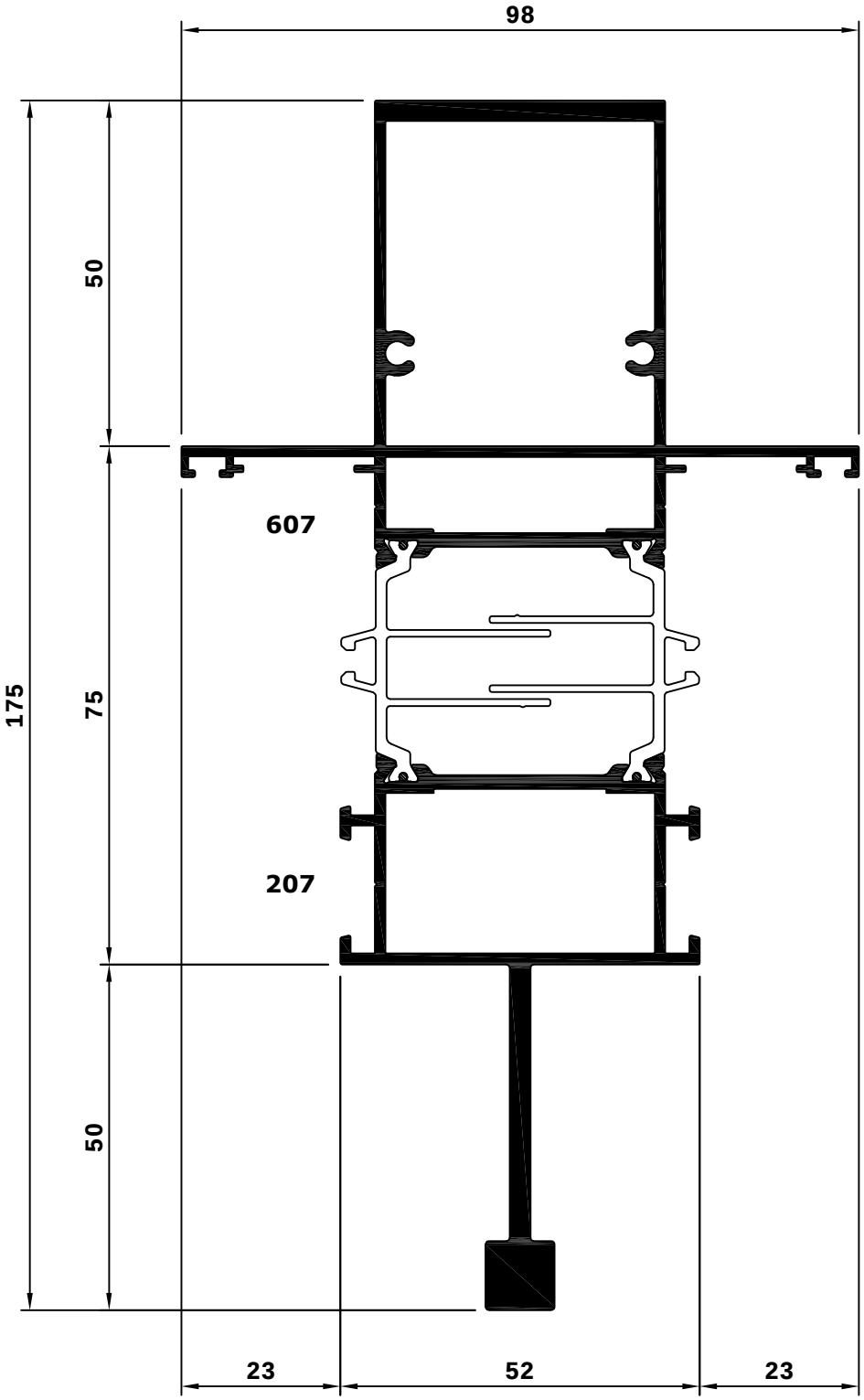
606-207
HEAVY DUTY MULLION WITH FIN

Scale 1:1

Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



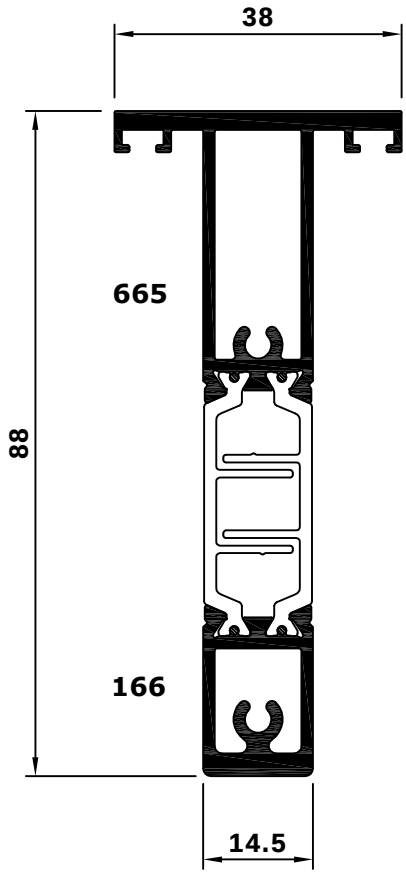
607-207
HEAVY DUTY MULLION WITH FIN AND BOX

Scale 1:1

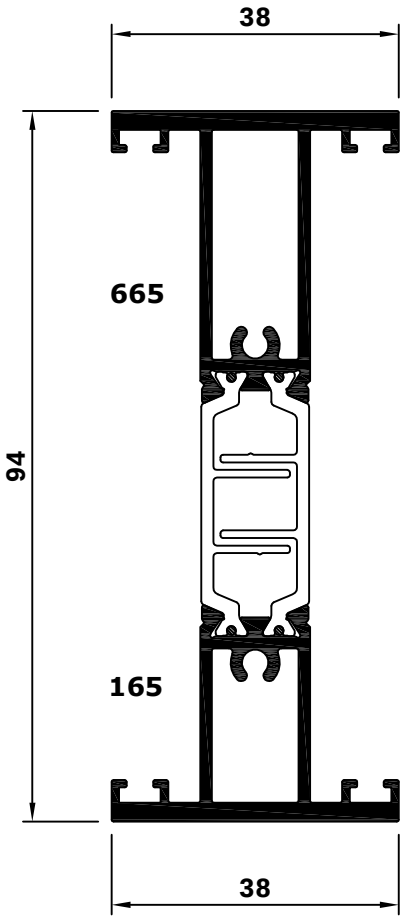
Section Drawings

System 5-35 Hi/Hi+

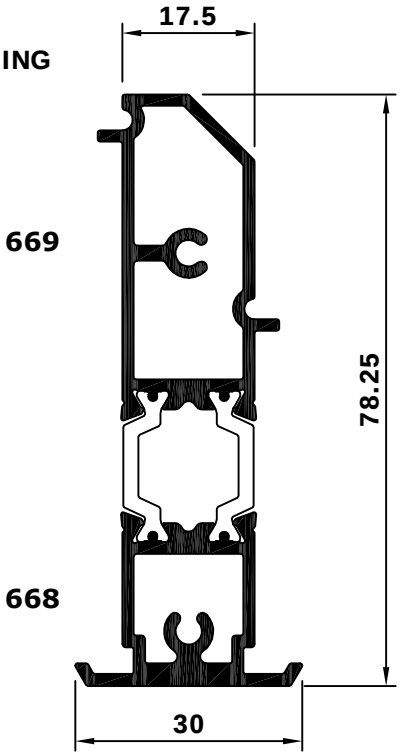
TILT AND TURN WINDOW



665-166
T-BAR COUPLING MULLION



665-165
I-BAR COUPLING MULLION



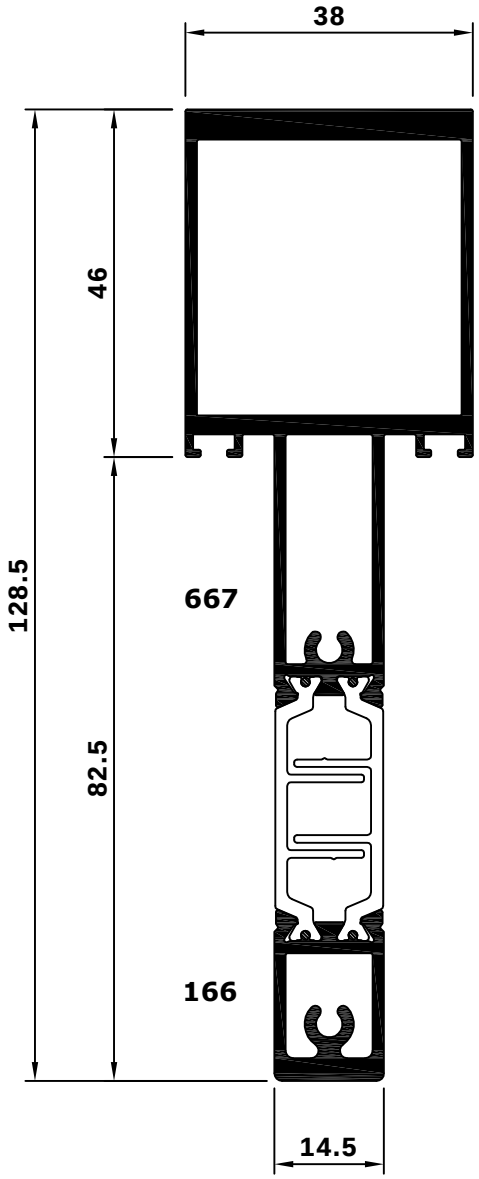
668-669
COUPLING MULLION ADAPTOR

Scale 1:1

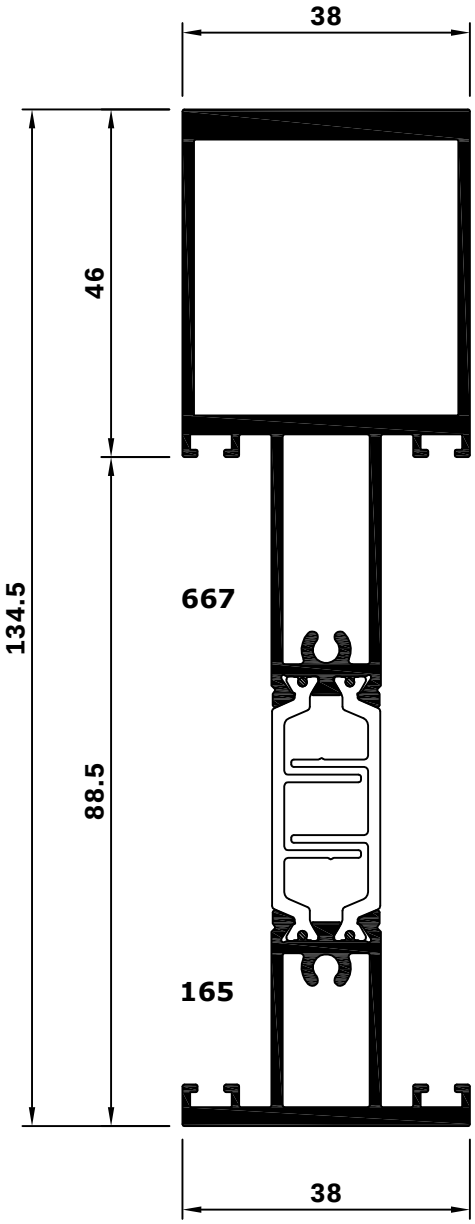
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



667-166
BOX T-BAR COUPLING MULLION



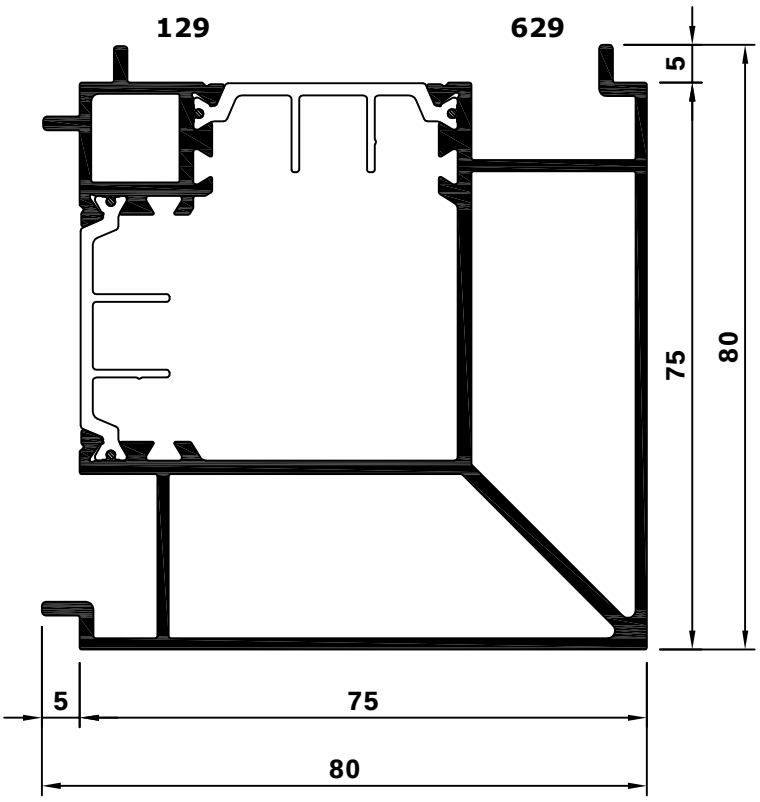
667-165
BOX I-BAR COUPLING MULLION

Scale 1:1

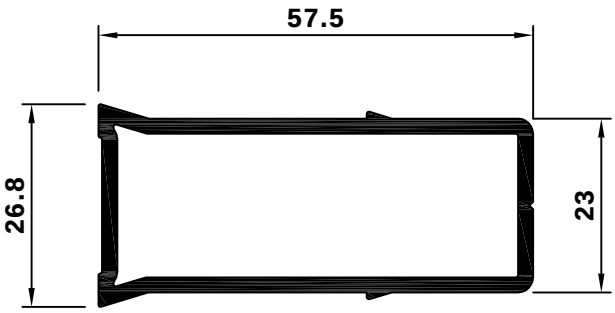
Section Drawings

System 5-35 Hi/Hi+

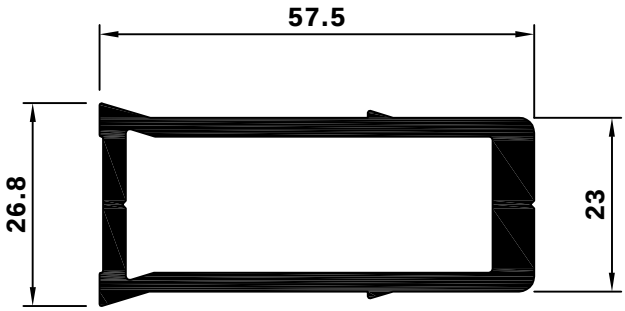
TILT AND TURN
WINDOW



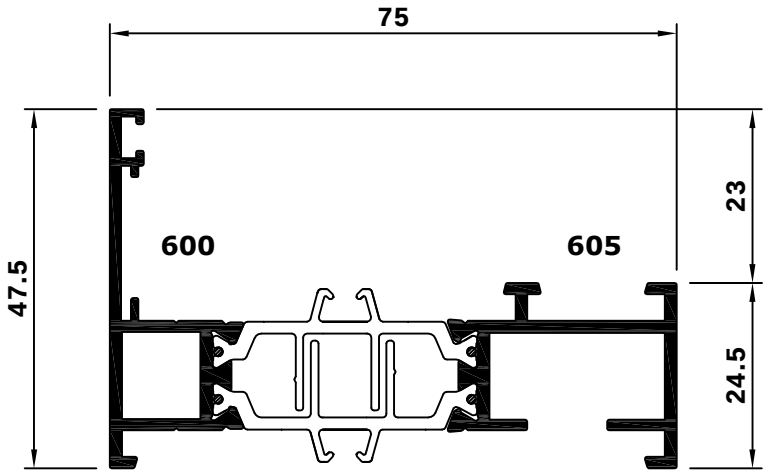
629-129
SQUARE CORNER POST



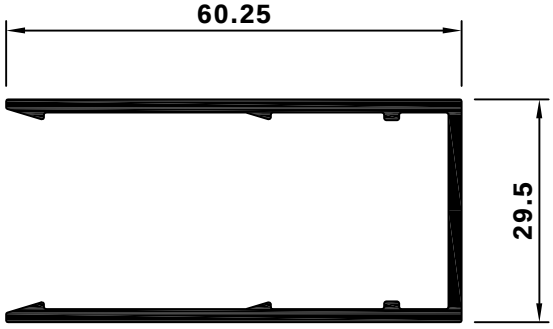
007
SMALL MULLION STIFFENER



008
LARGE MULLION STIFFENER



600-605
SHORT LEG OUTER FRAME



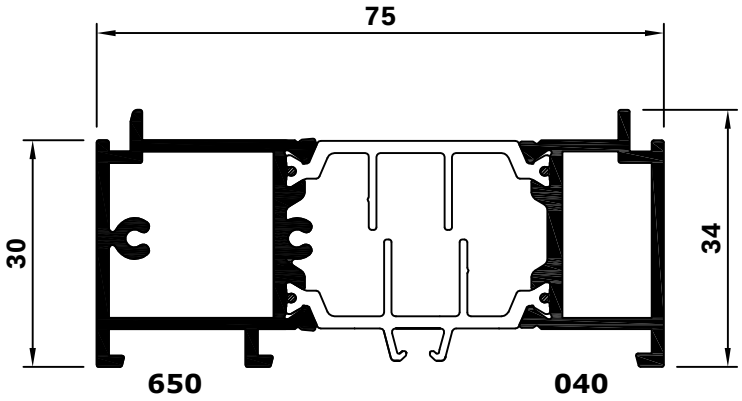
009
MULLION STIFFENER SHEATH

Scale 1:1

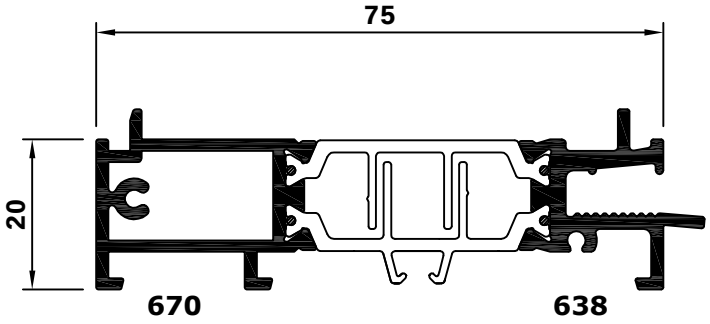
Section Drawings

System 5-35 Hi/Hi+

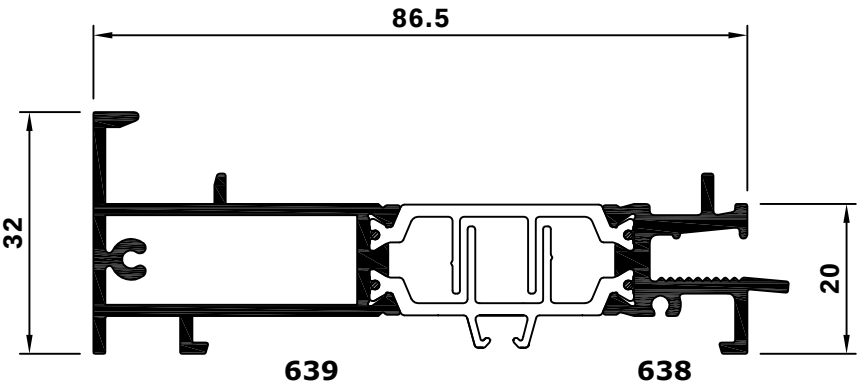
TILT AND TURN WINDOW



650-040
FLUSH HEAD LINER



670-638
STANDARD FLUSH CILL LINER
(FOR PRESSED METAL CILL)



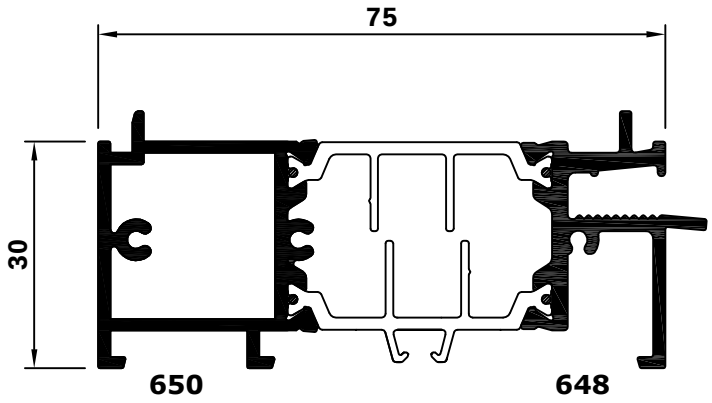
639-638
STANDARD REBATED CILL LINER
(FOR PRESSED METAL CILL)

Scale 1:1

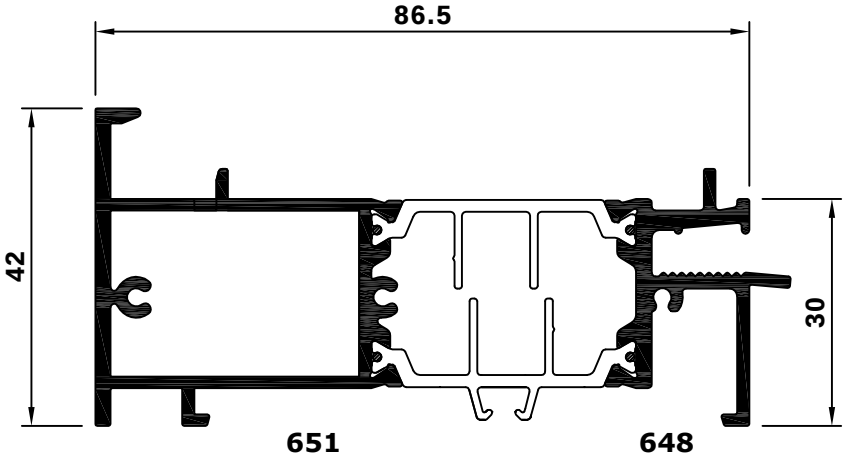
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



650-648
MEDIUM FLUSH CILL LINER
(FOR PRESSED METAL CILL)



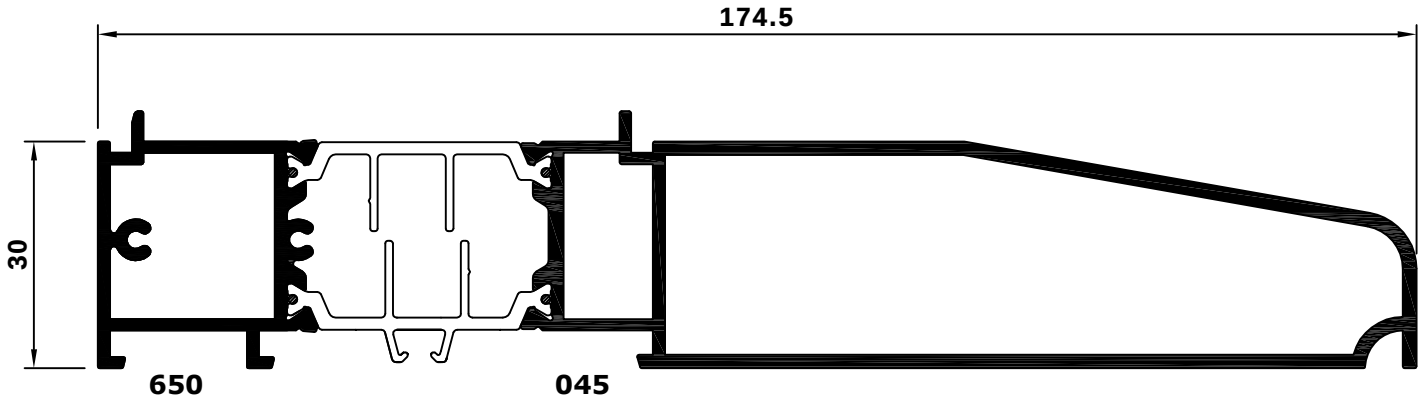
651-648
MEDIUM REBATED CILL LINER
(FOR PRESSED METAL CILL)

Scale 1:1

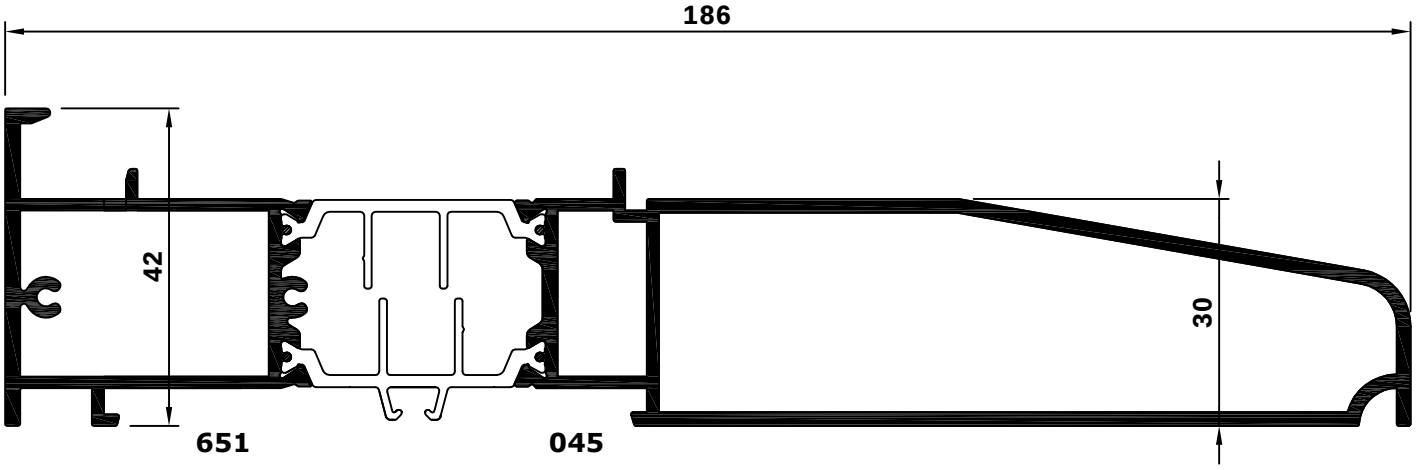
Section Drawings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



650-045
FLUSH SUB-CILL



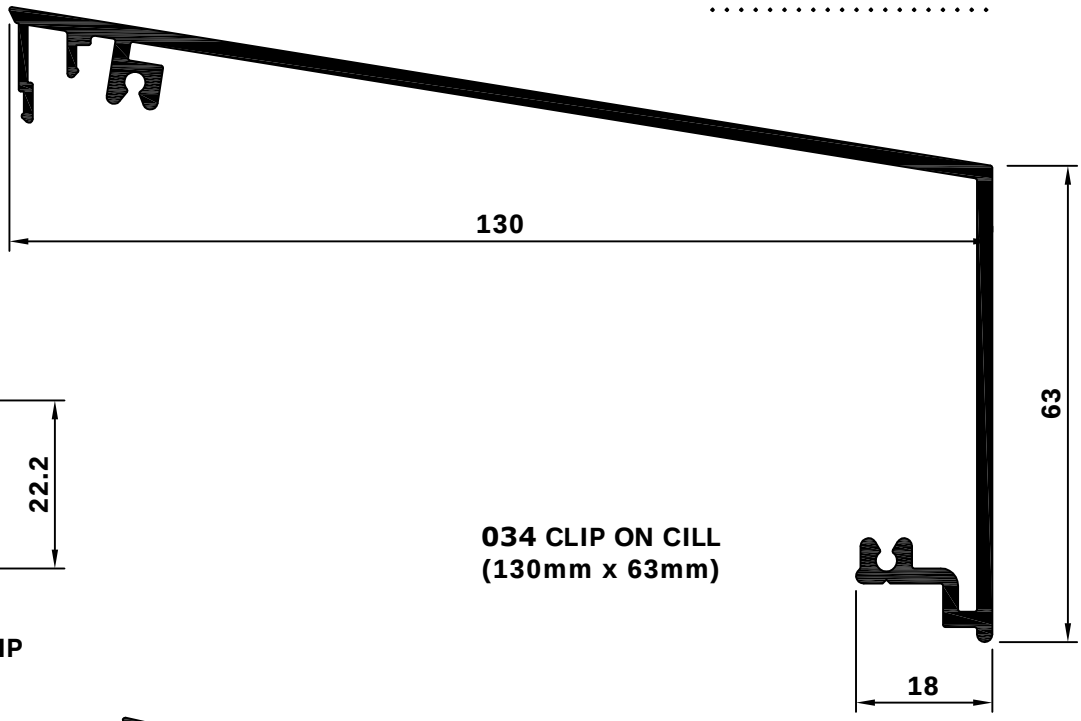
651-045
REBATED SUB-CILL

Scale 1:1

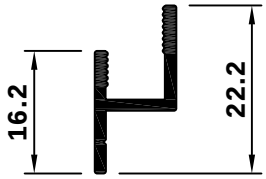
Section Drawings

System 5-35 Hi/Hi+

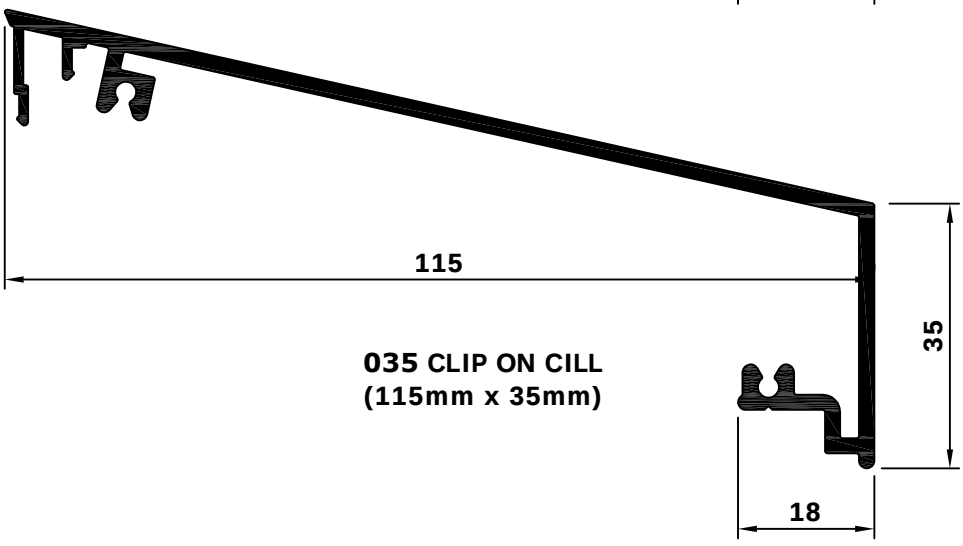
TILT AND TURN
WINDOW



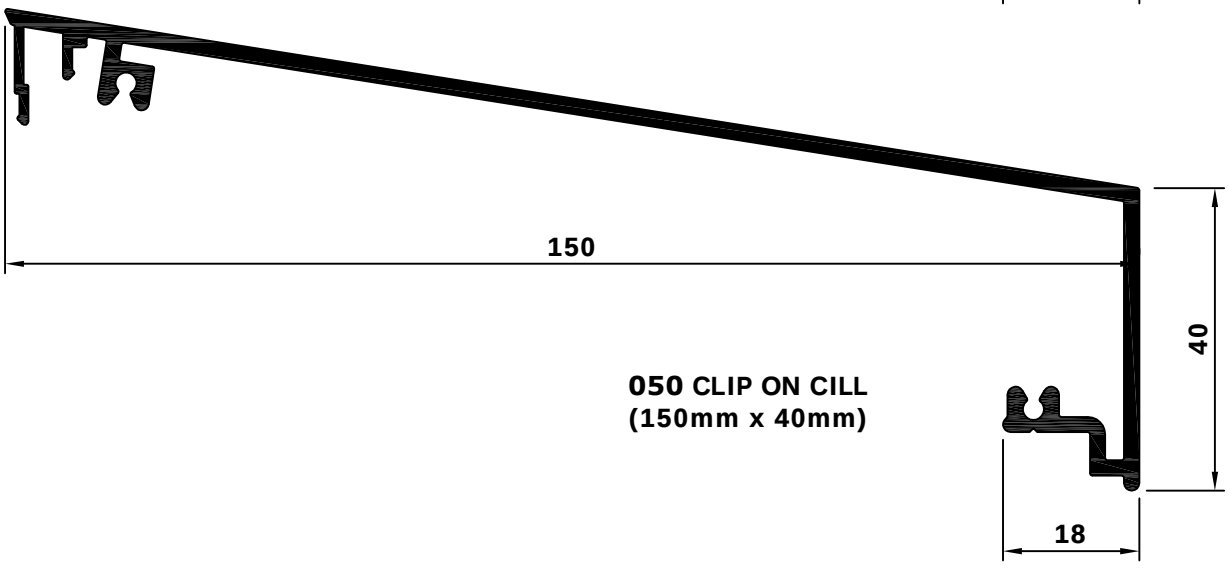
034 CLIP ON CILL
(130mm x 63mm)



036
CILL CLIP



035 CLIP ON CILL
(115mm x 35mm)



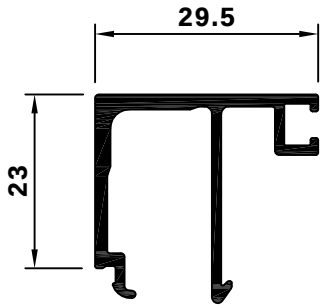
050 CLIP ON CILL
(150mm x 40mm)

Scale 1:1

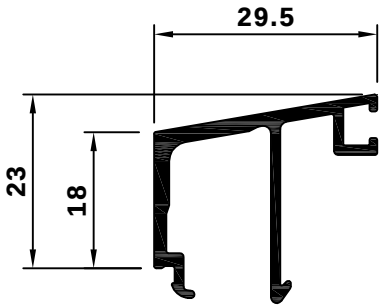
Section Drawings

System 5-35 Hi/Hi+

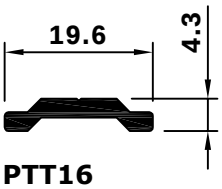
TILT AND TURN WINDOW



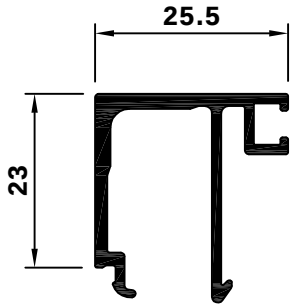
628
28mm/31mm
SQUARE GLAZING BEAD



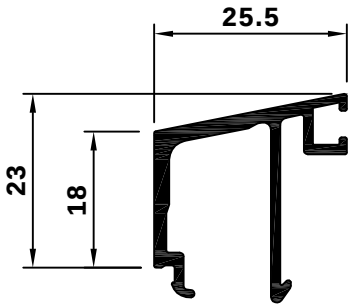
623
28mm/31mm
RAKED GLAZING BEAD



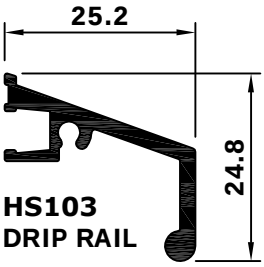
PTT16
LINK ROD



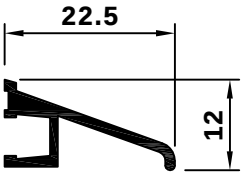
634
32mm/35mm
SQUARE GLAZING BEAD



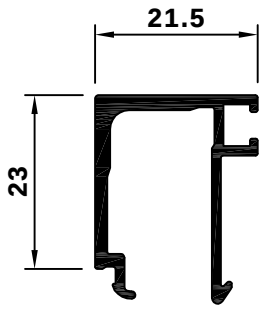
635
32mm/35mm
RAKED GLAZING BEAD



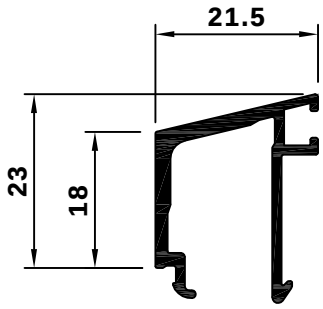
HS103
DRIP RAIL



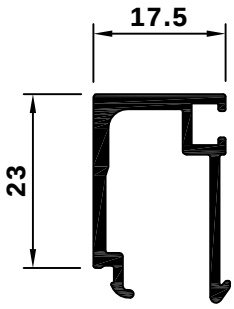
TW05
DRIP RAIL



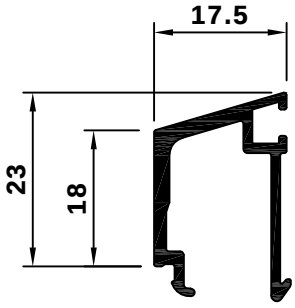
636
36mm/39mm
SQUARE GLAZING BEAD



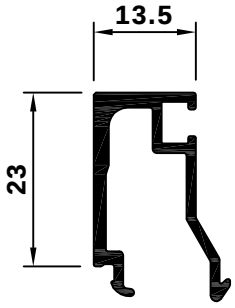
644
36mm/39mm
RAKED GLAZING BEAD



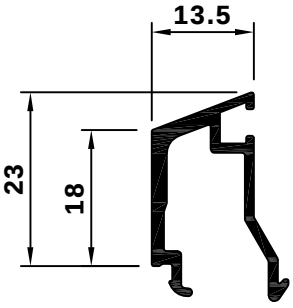
645
40mm/43mm
SQUARE GLAZING BEAD



646
40mm/43mm
RAKED GLAZING BEAD



653
44mm/47mm
SQUARE GLAZING BEAD



654
44mm/47mm
RAKED GLAZING BEAD

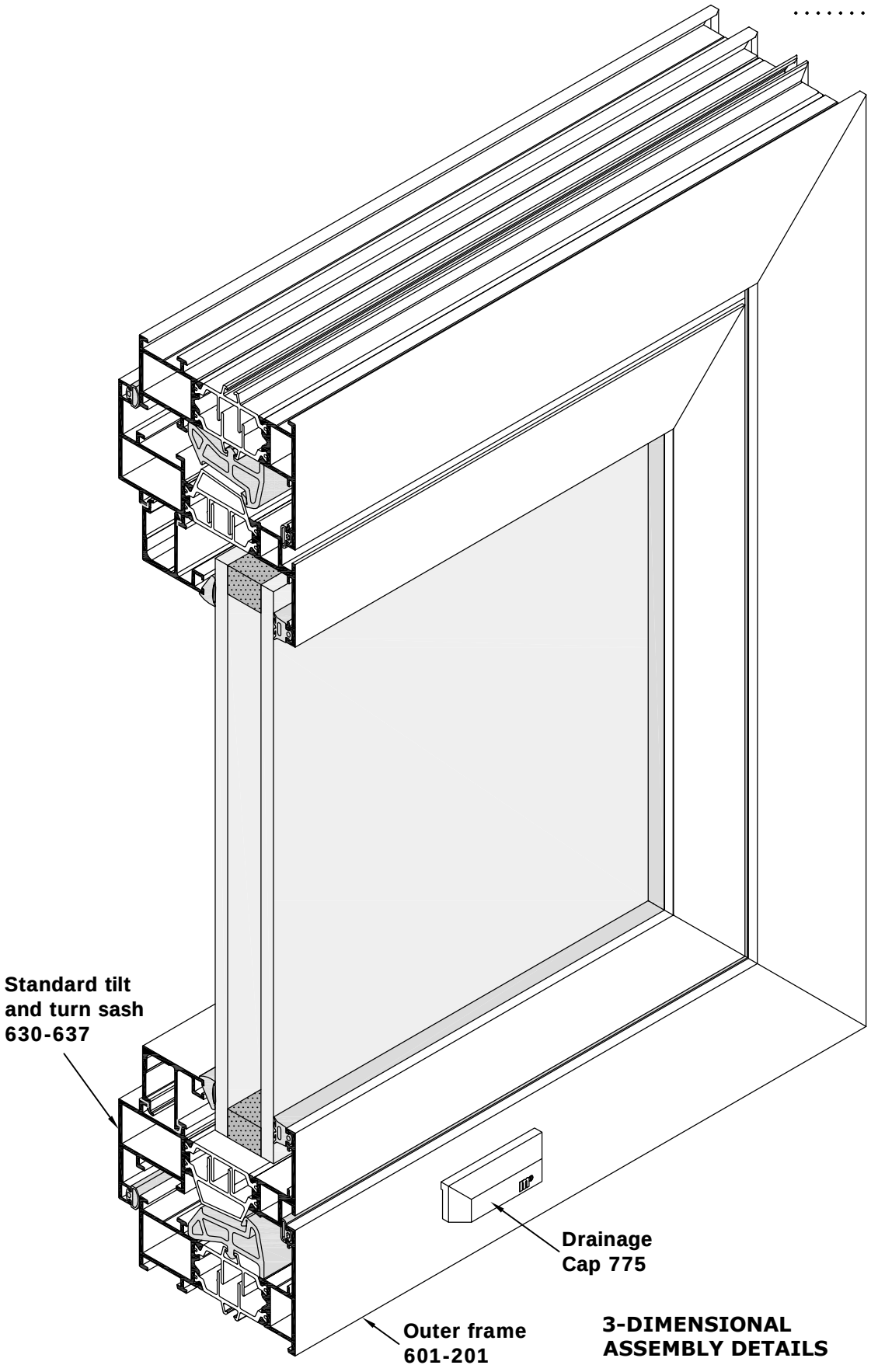
Scale 1:1

General Arrangement

3-Dimensional Assembly Details

System 5-35 Hi

TILT AND TURN WINDOW



3-DIMENSIONAL ASSEMBLY DETAILS

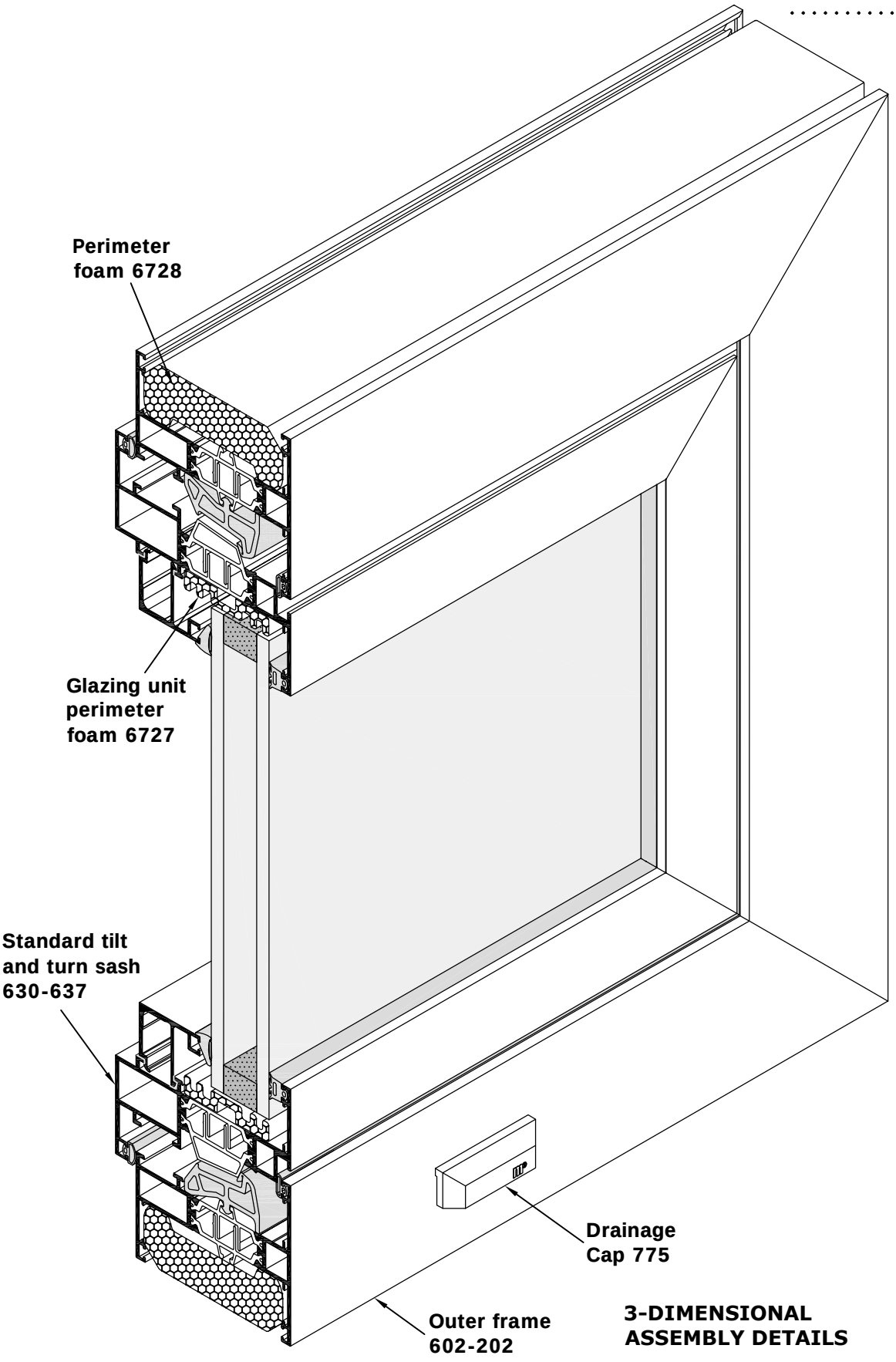
Not to scale

General Arrangement

3-Dimensional Assembly Details

System 5-35 Hi+

TILT AND TURN WINDOW



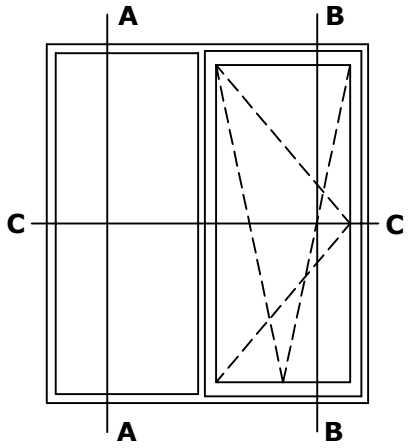
3-DIMENSIONAL ASSEMBLY DETAILS

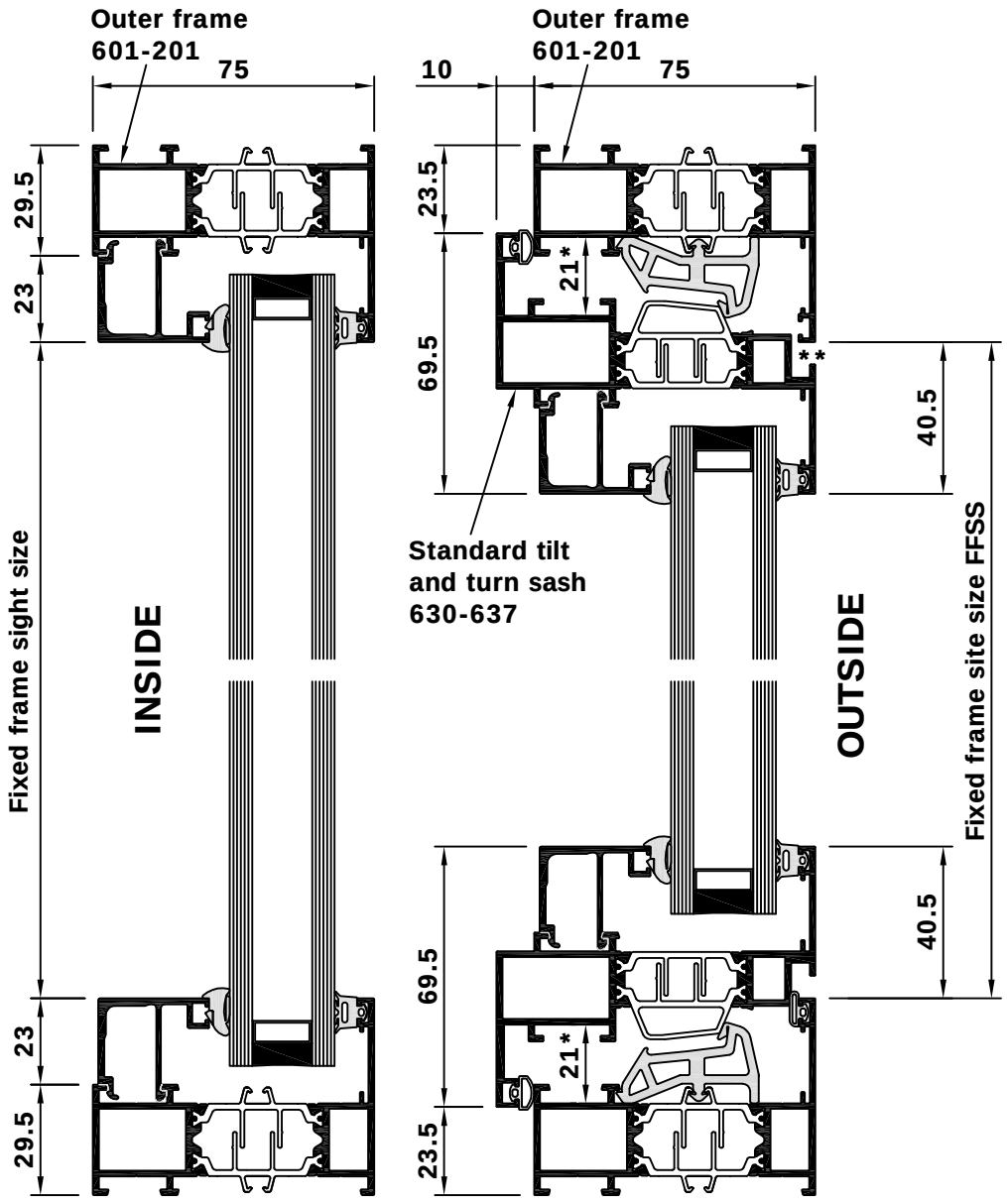
Not to scale

Standard Tilt and Turn Window

System 5-35 Hi

TILT AND TURN WINDOW

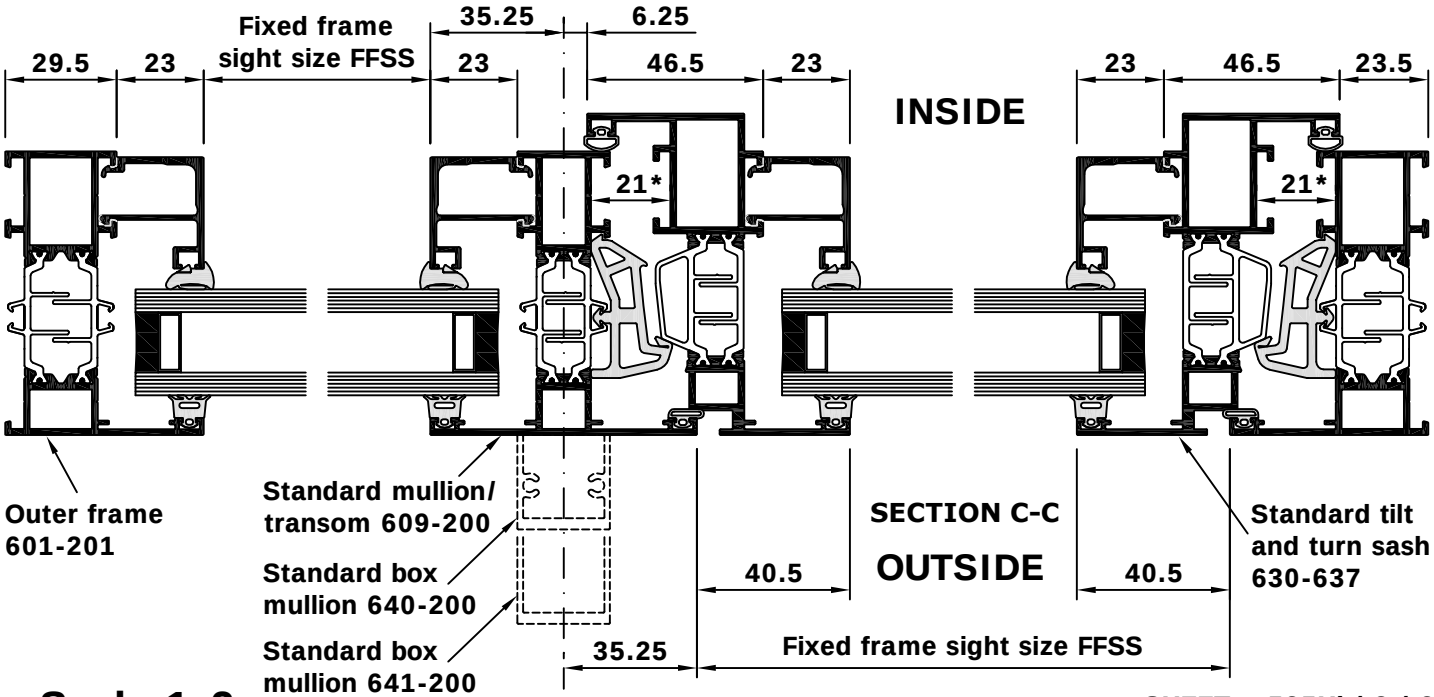




SECTION A-A **SECTION B-B**

* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation

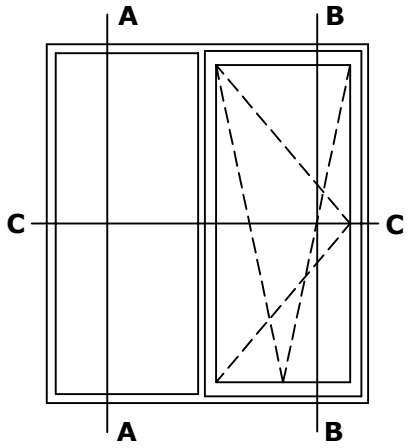


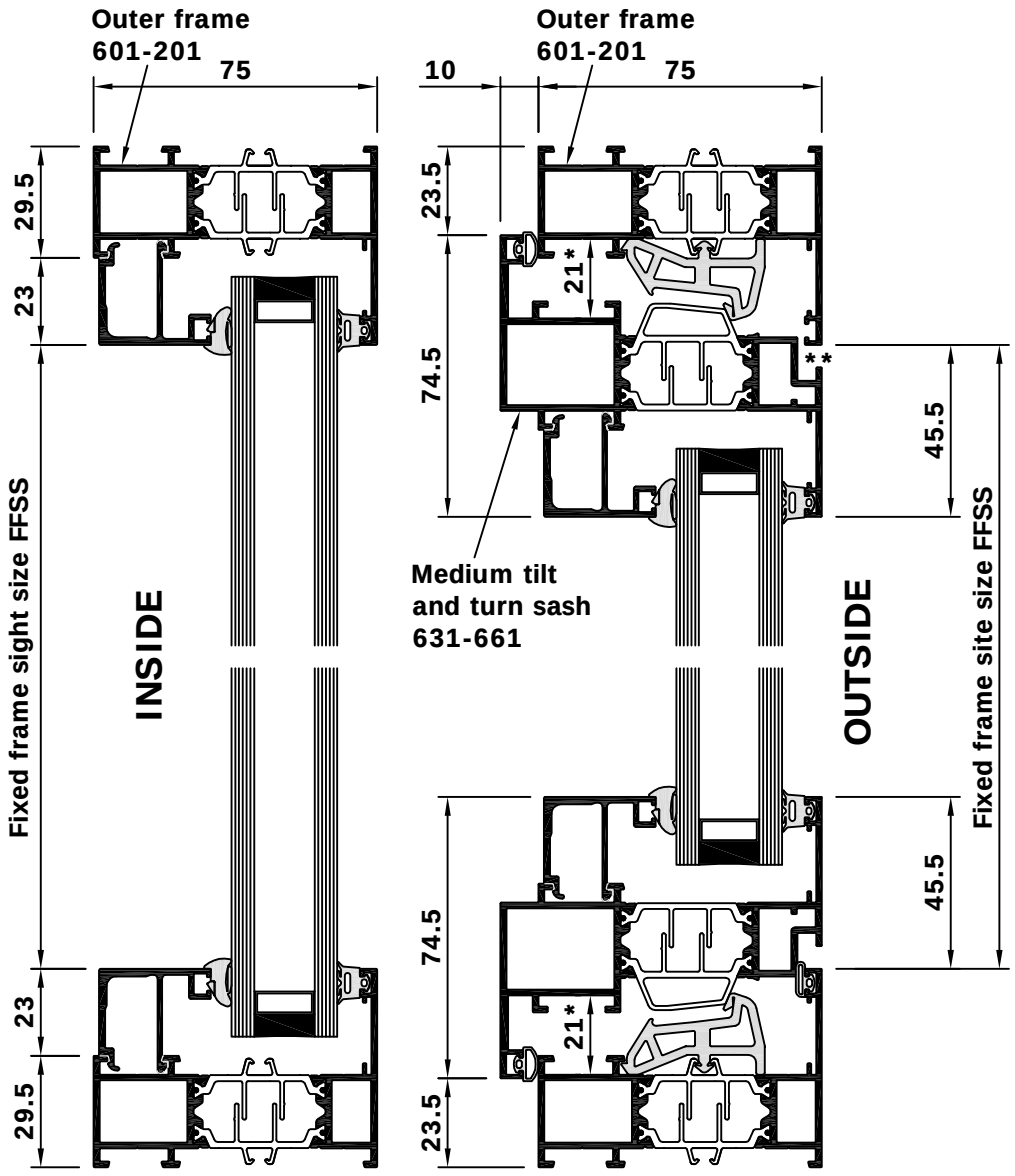
Scale 1:2

Medium Tilt and Turn Window

System 5-35 Hi

TILT AND TURN WINDOW



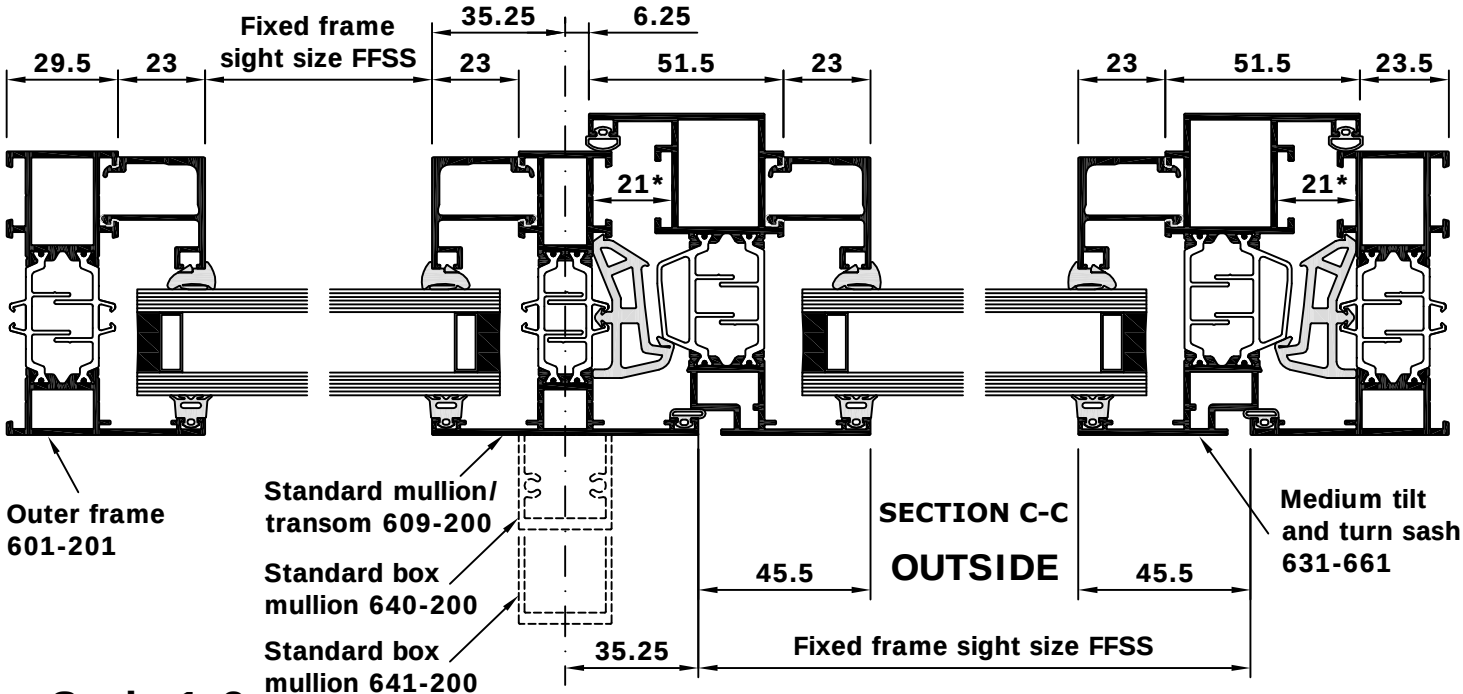


SECTION A-A SECTION B-B

* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation

INSIDE

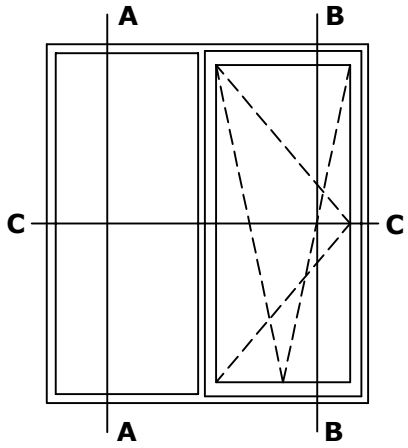


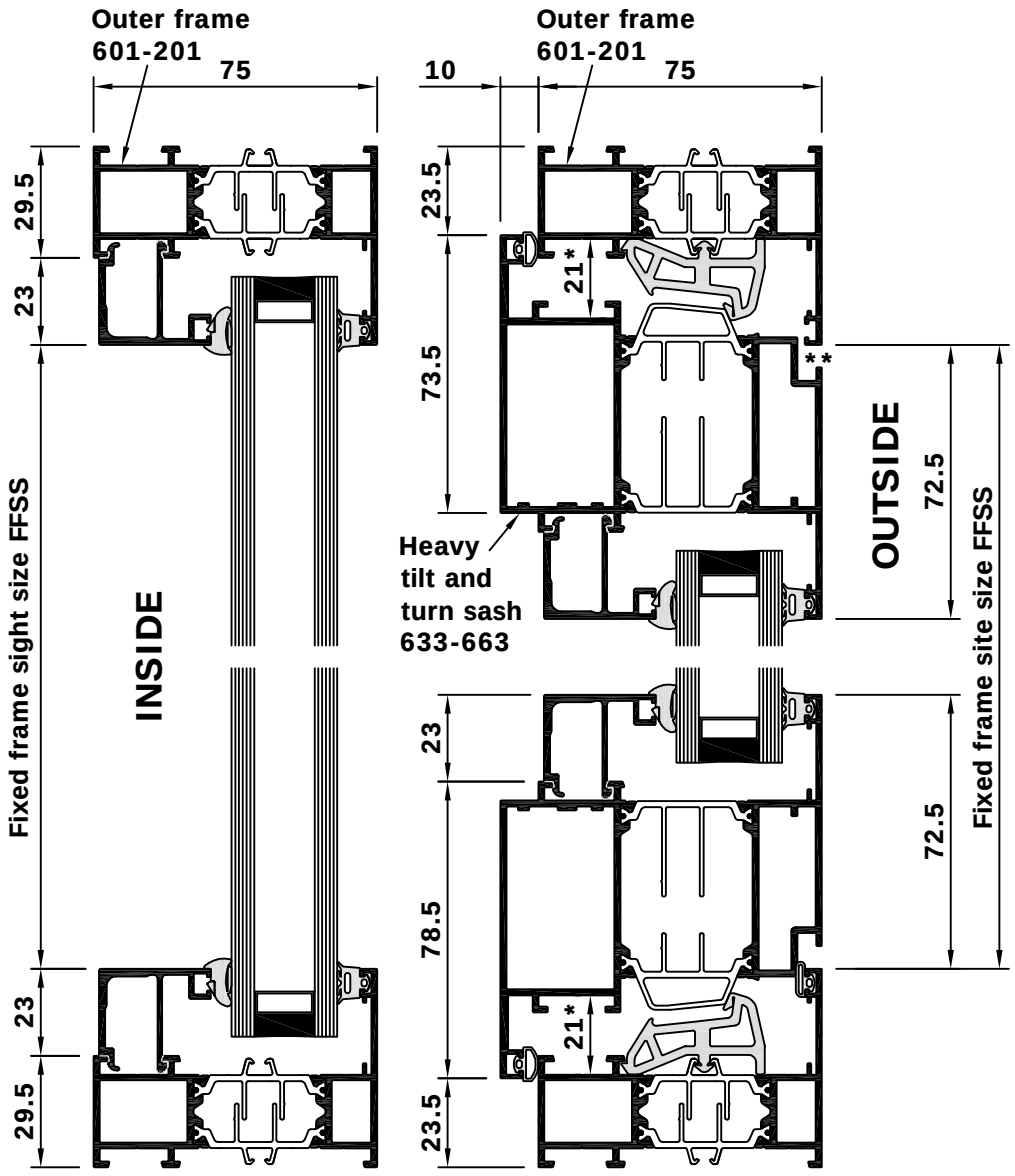
Scale 1:2

Heavy Tilt and Turn Window

System 5-35 Hi

TILT AND TURN WINDOW

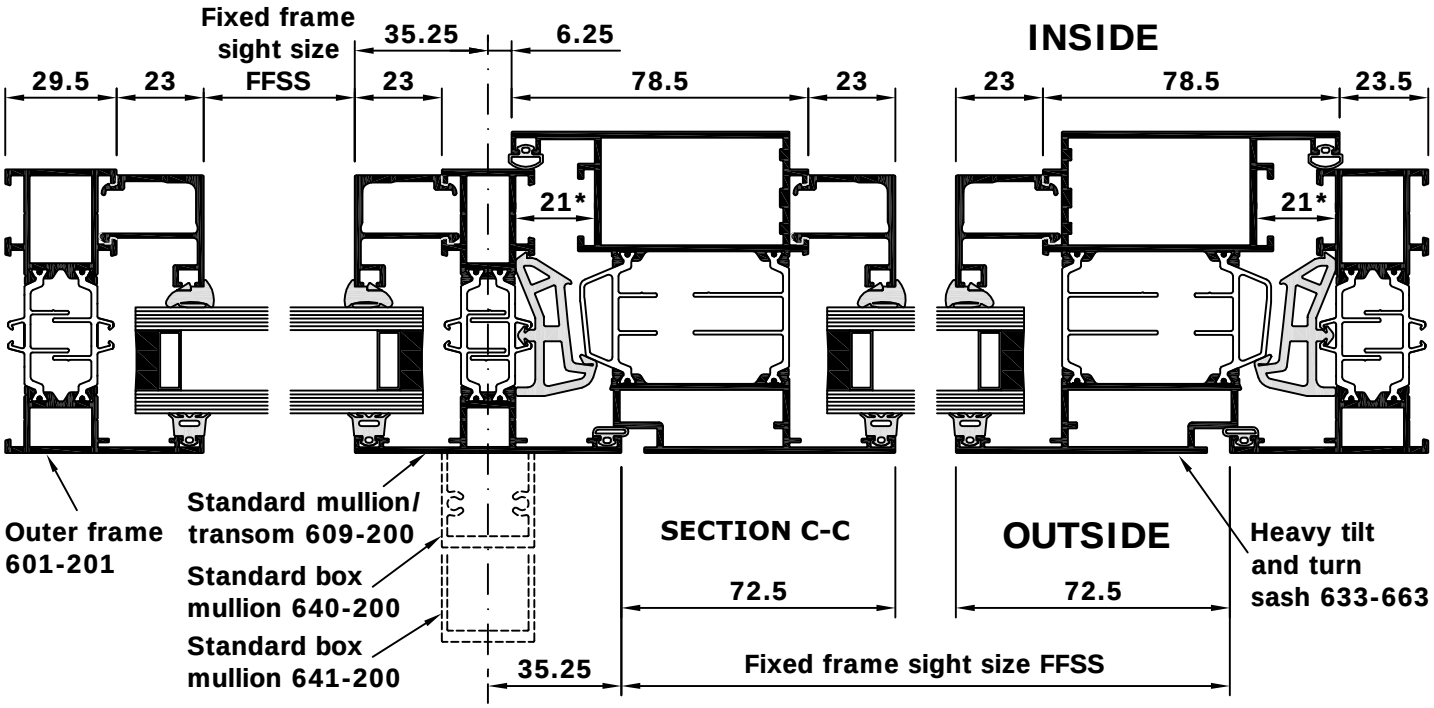




SECTION A-A SECTION B-B

* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation

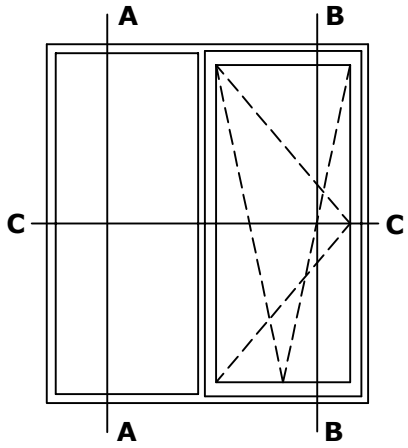


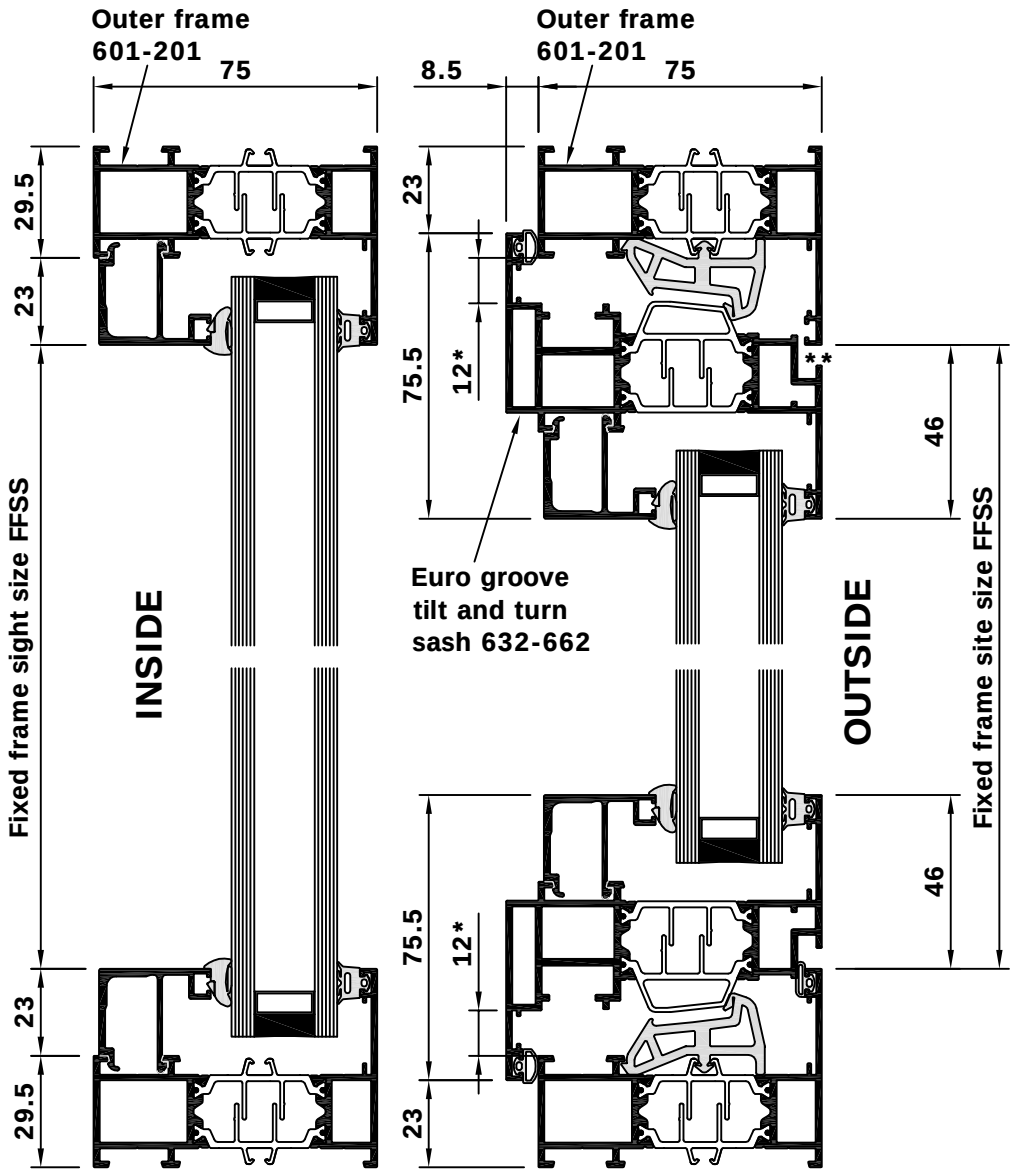
Scale 1:2

Euro Groove Tilt and Turn Window

System 5-35 Hi

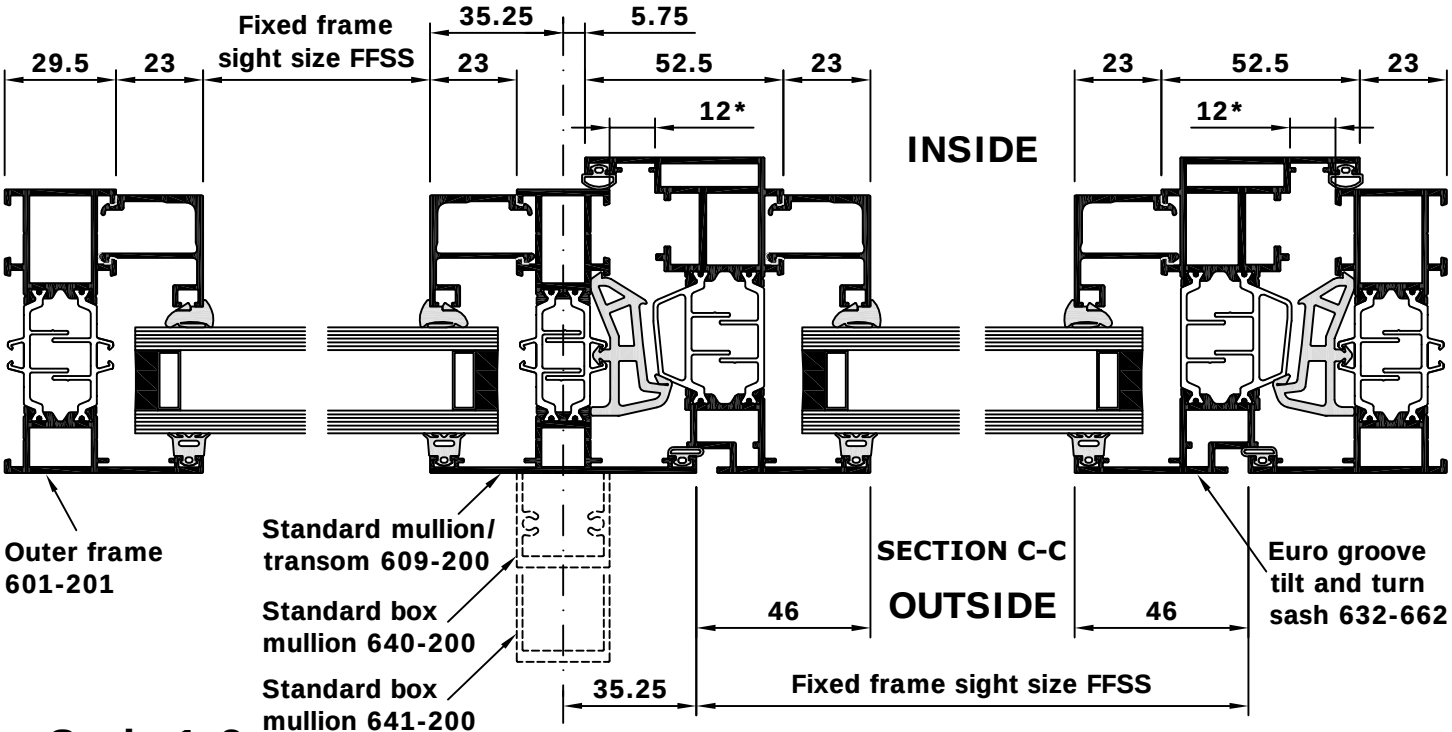
TILT AND TURN WINDOW





* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation



Scale 1:2

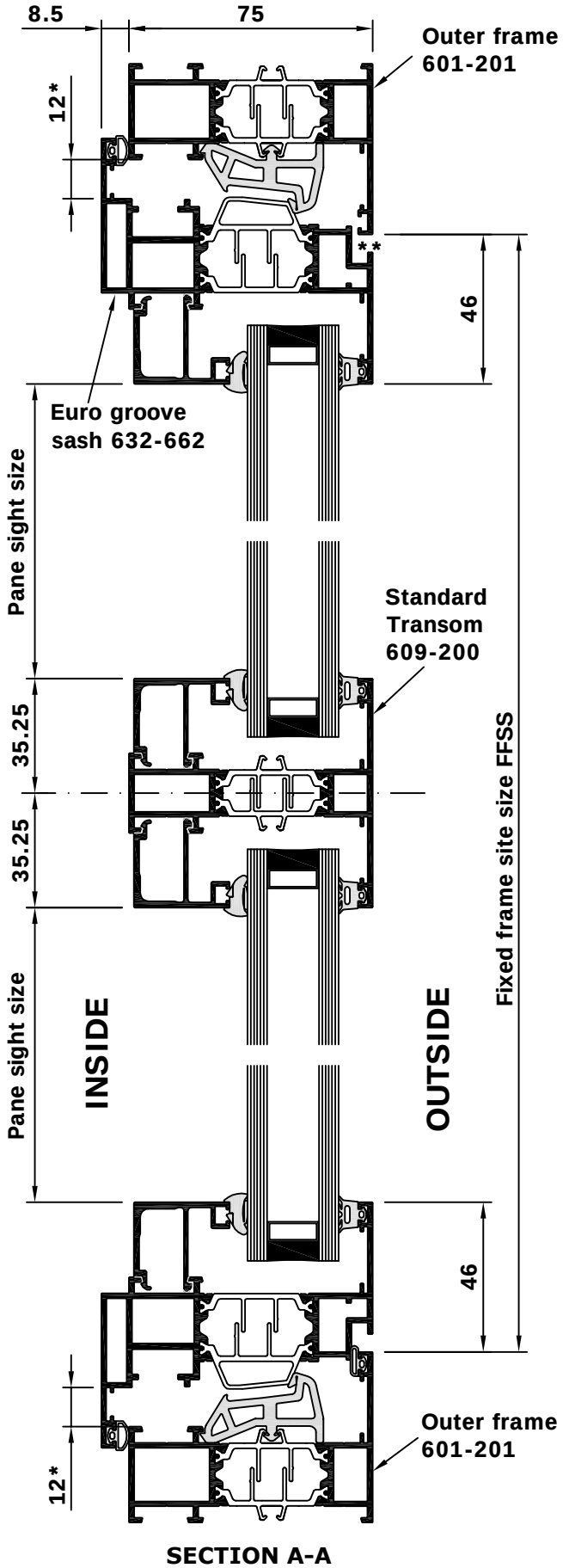
Tilt and Turn Window

Muntin Bar

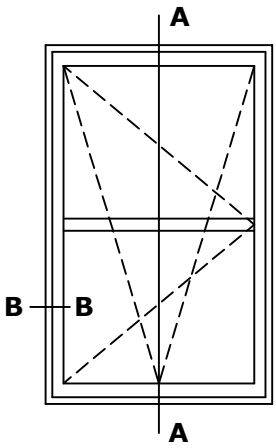
Suitable for use with sashes 630-637, 631-661, 632-662 and 633-663.

System 5-35 Hi

TILT AND TURN WINDOW

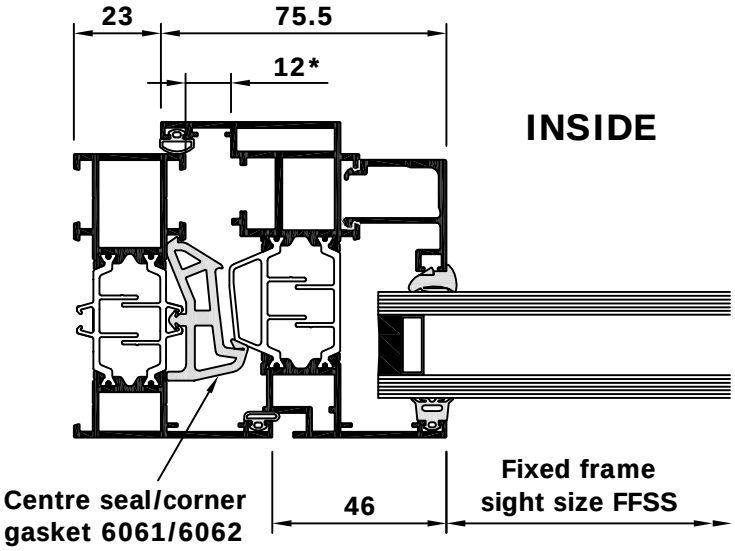


SECTION A-A



*** Tolerance to be in accordance with gearing manufacturers recommendations.**

**** Gasket notched/omitted for pressure equalisation**



SECTION B-B

Scale 1:2

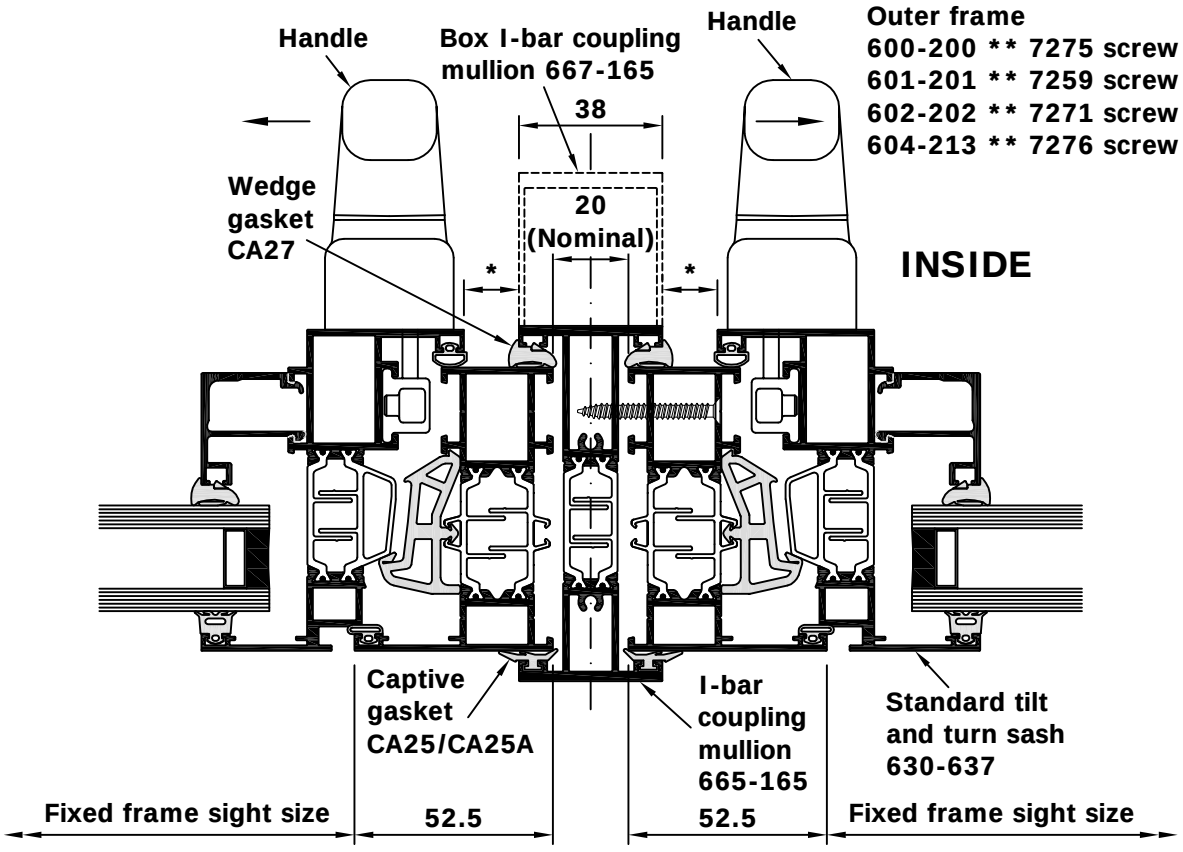
Coupling Mullions

System 5-35 Hi

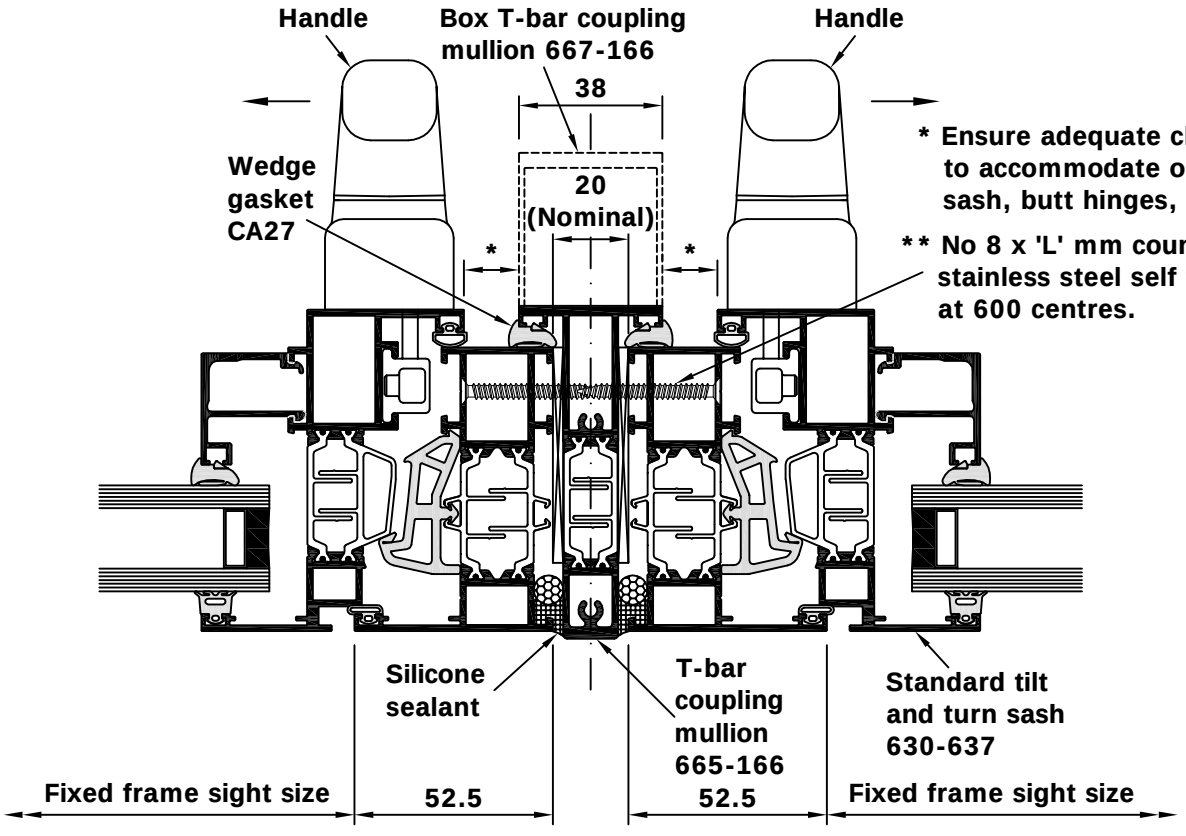
TILT AND TURN WINDOW

These profiles were not intended for use as coupling transoms. The fabricator must ensure that the window design and coupling details can adequately accommodate the anticipated expansion and contraction required for the window configuration. For further advice please contact Metal Technology's Technical Department.

Windows to be screw fixed to coupling mullions as required at 600mm centres.



Outer frame
600-200 ** 7275 screw length 'L' = 32mm
601-201 ** 7259 screw length 'L' = 38mm
602-202 ** 7271 screw length 'L' = 50mm
604-213 ** 7276 screw length 'L' = 45mm



*** Ensure adequate clearance to accommodate opening sash, butt hinges, etc.**

**** No 8 x 'L' mm countersunk head stainless steel self tapping screws at 600 centres.**

Scale 1:2

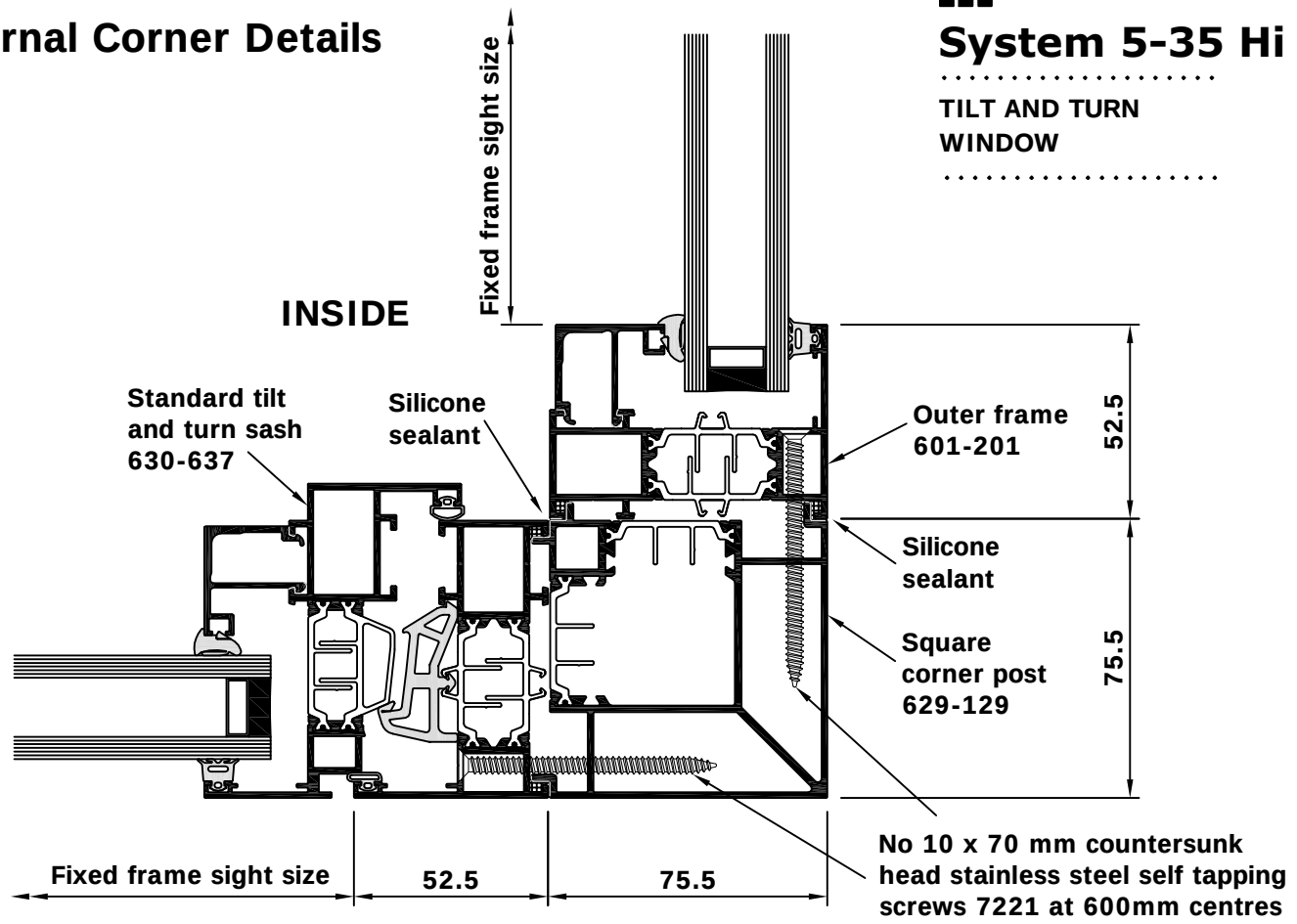
OUTSIDE

90° Corner Post

External Corner Details

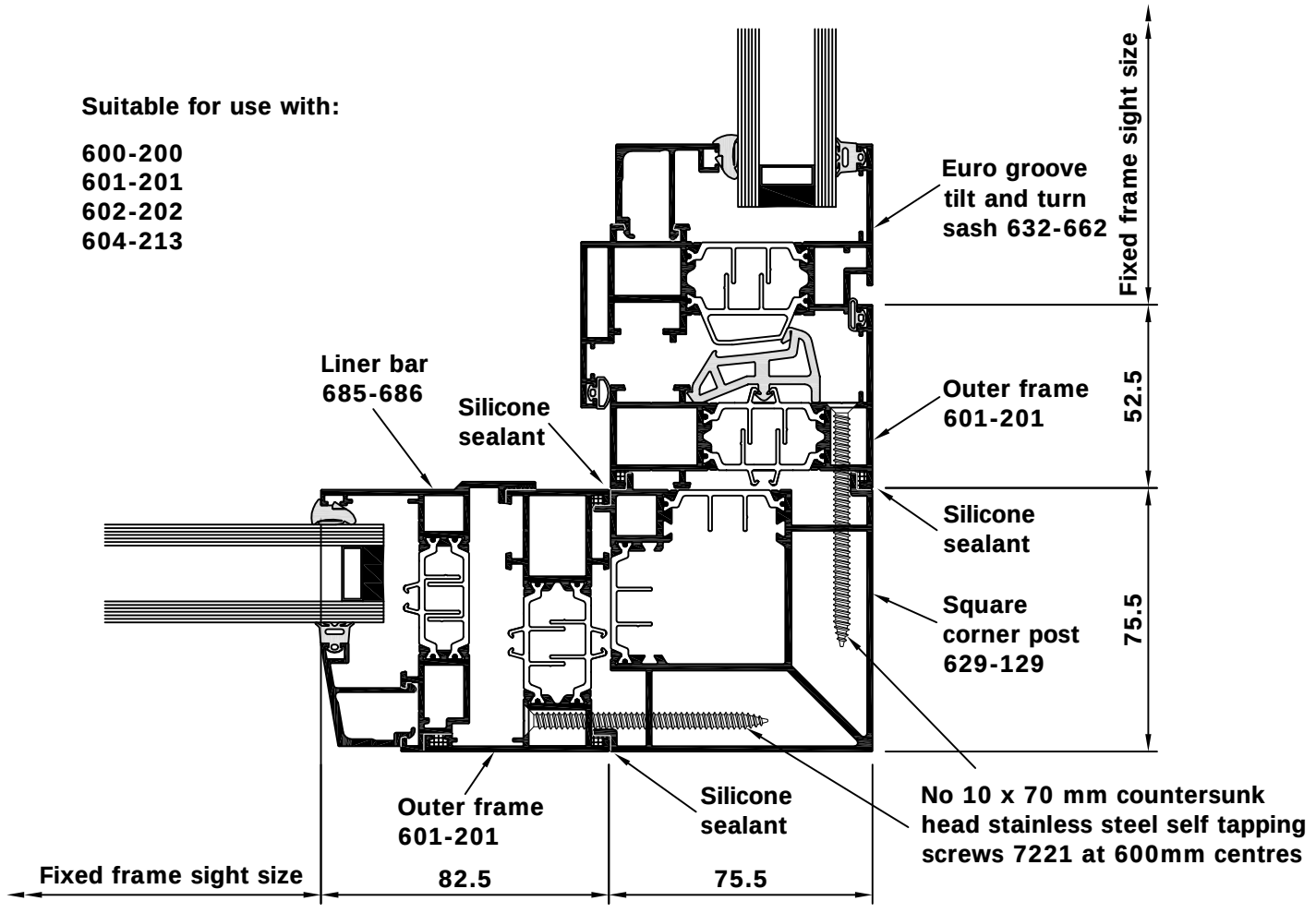
System 5-35 Hi

TILT AND TURN WINDOW



Suitable for use with:

600-200
601-201
602-202
604-213



OUTSIDE

Scale 1:2

Door Coupling Detail

System 5-35 Hi

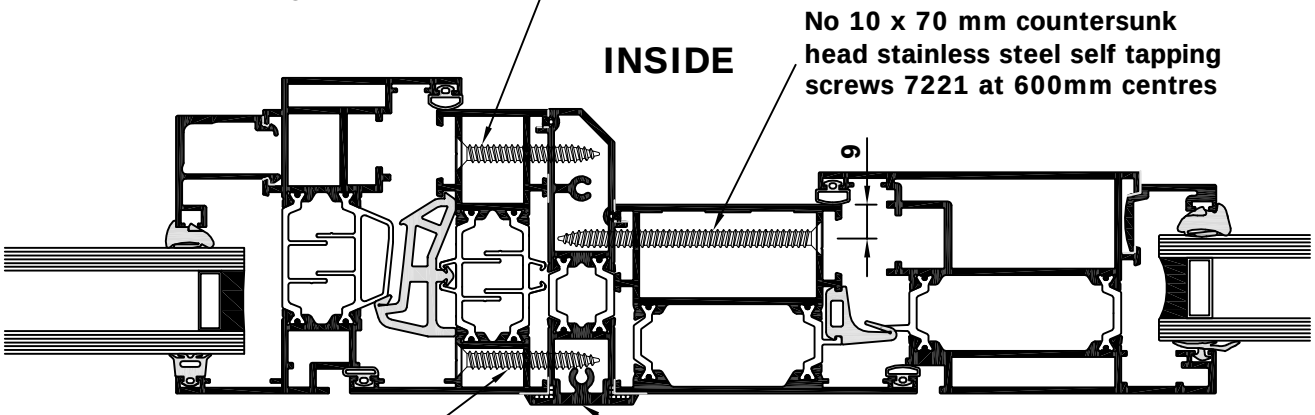
TILT AND TURN WINDOW

668-669 is not intended for use as a coupling transom. While the fabricator must ensure that the window design can adequately accommodate the anticipated expansion and contraction, this coupling detail does not offer this facility, and provides a tight butt joint only. For further advice please contact Metal Technology's Technical Department.

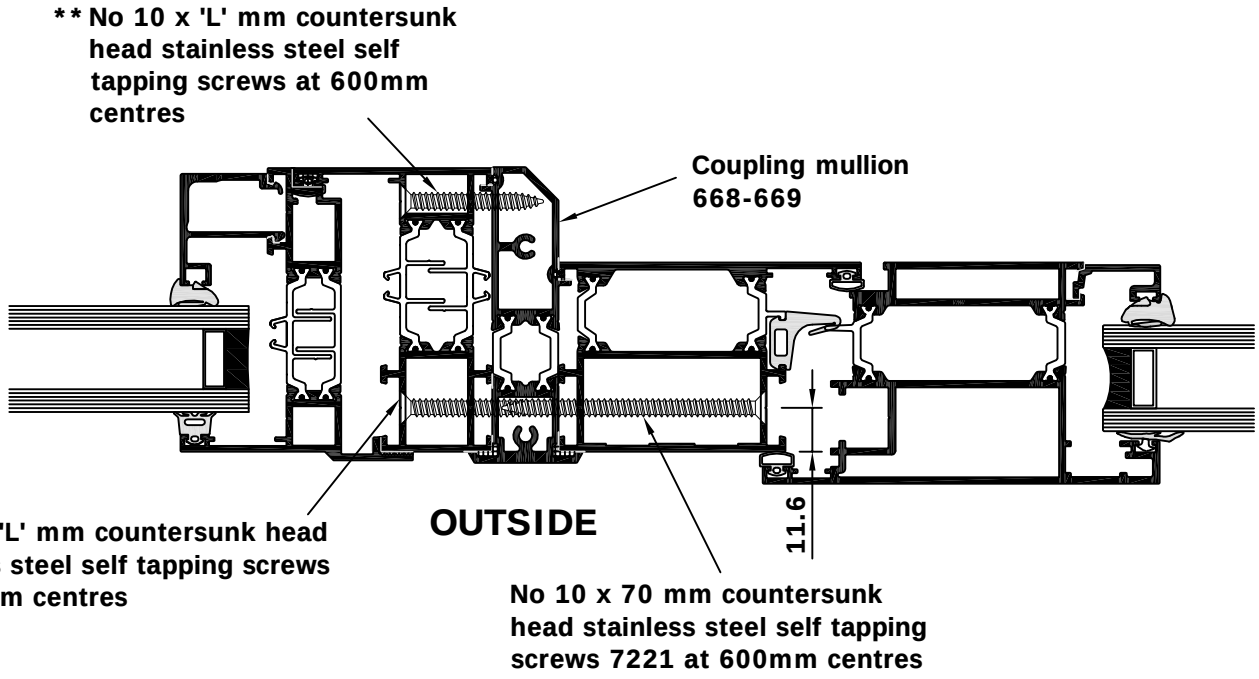
Windows/doors to be screw fixed to coupling mullion at 600mm centres with additional door fixings 25mm above and below hinge positions. Coupling mullion to be lug fixed back to structure at head and cill using plates/straps (by fabricator) fixed to integral screwports within 668-669 profile. Metal Technology recommend that the 668-669 coupling mullion to be secured to the 105-205F outer frame, as indicated, prior to installation on site.

OPEN-IN DOOR WITH SYSTEM 5-35 Hi TILT AND TURN

Outerframe
600-200 ** 7237 screw length 'L' = 32mm
601-201 ** 7248 screw length 'L' = 38mm
602-202 ** 7249 screw length 'L' = 50mm
604-213 ** 7220 screw length 'L' = 45mm



OPEN-OUT DOOR WITH SYSTEM 5-35 Hi TILT AND TURN

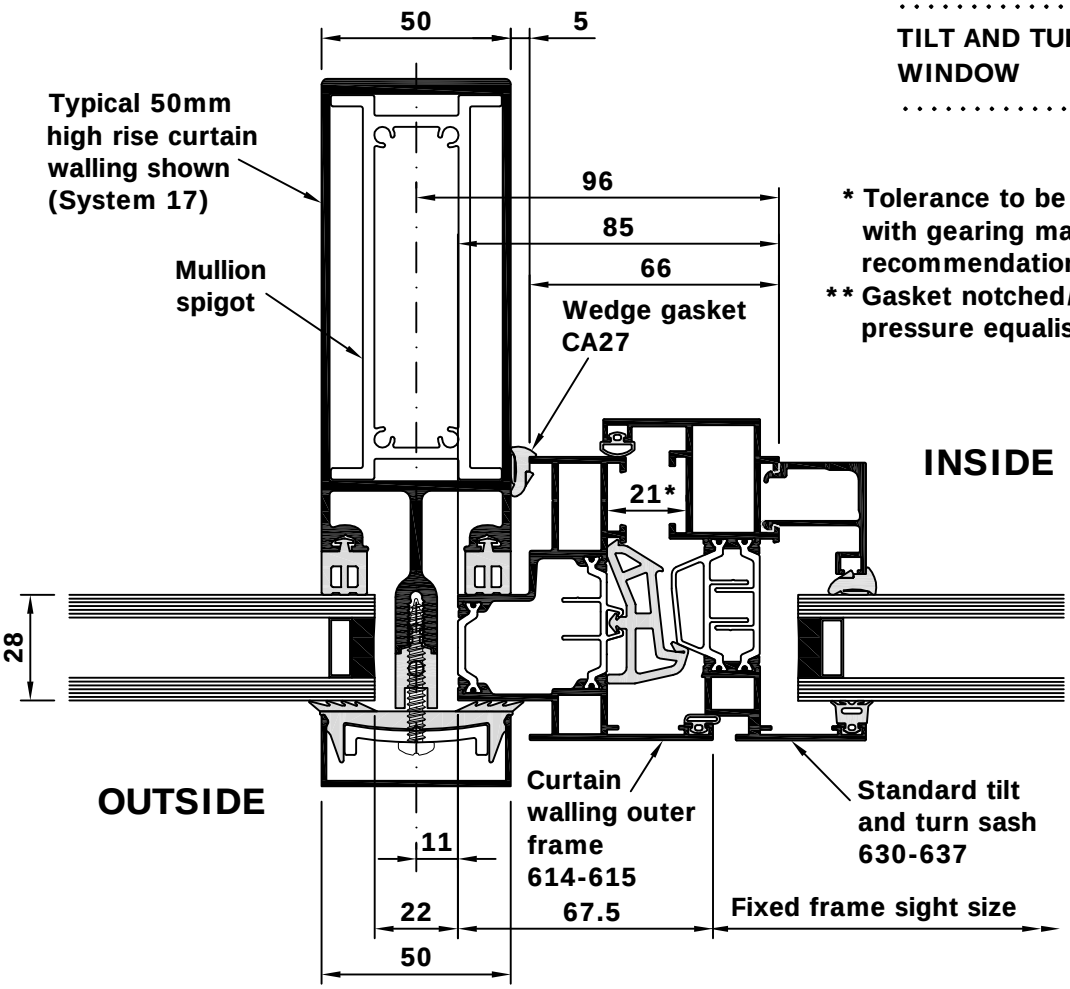


Scale 1:2

Curtain Wall Insert

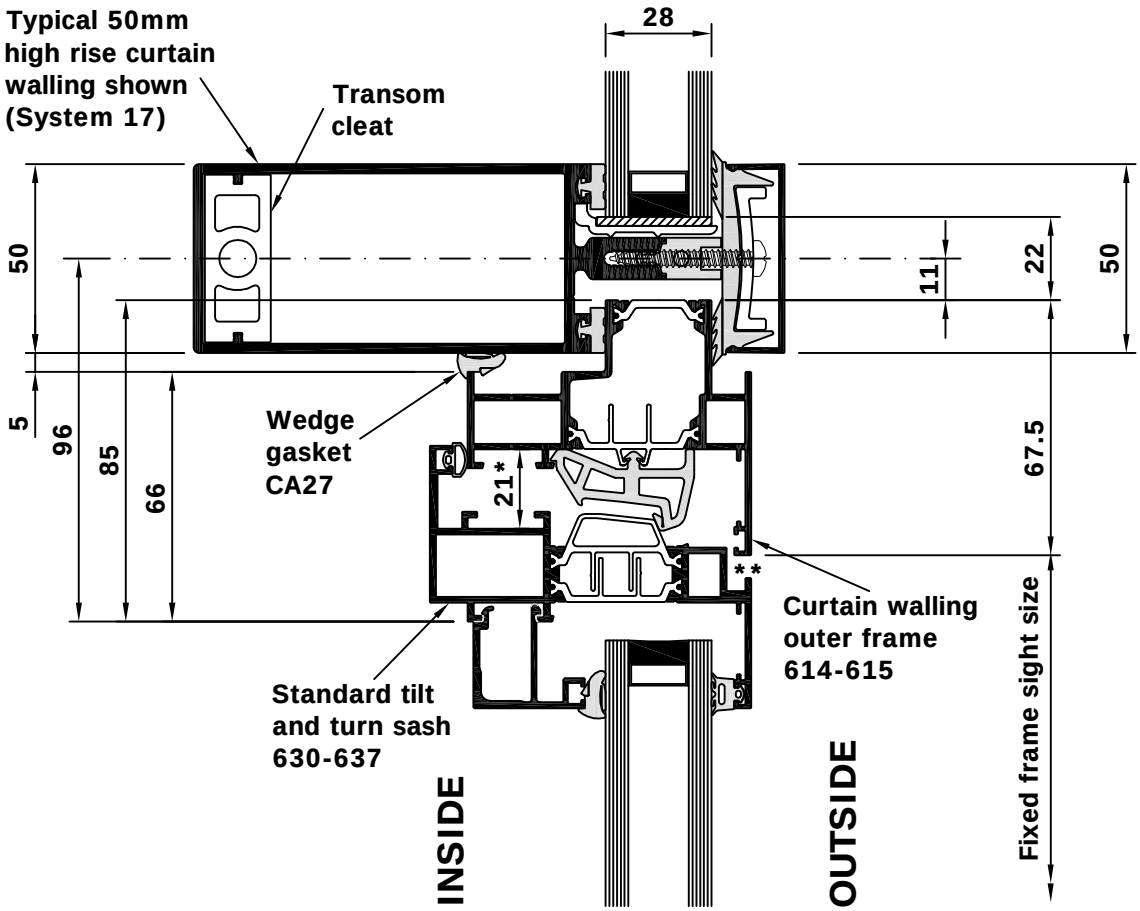
System 5-35 Hi

TILT AND TURN WINDOW



* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation



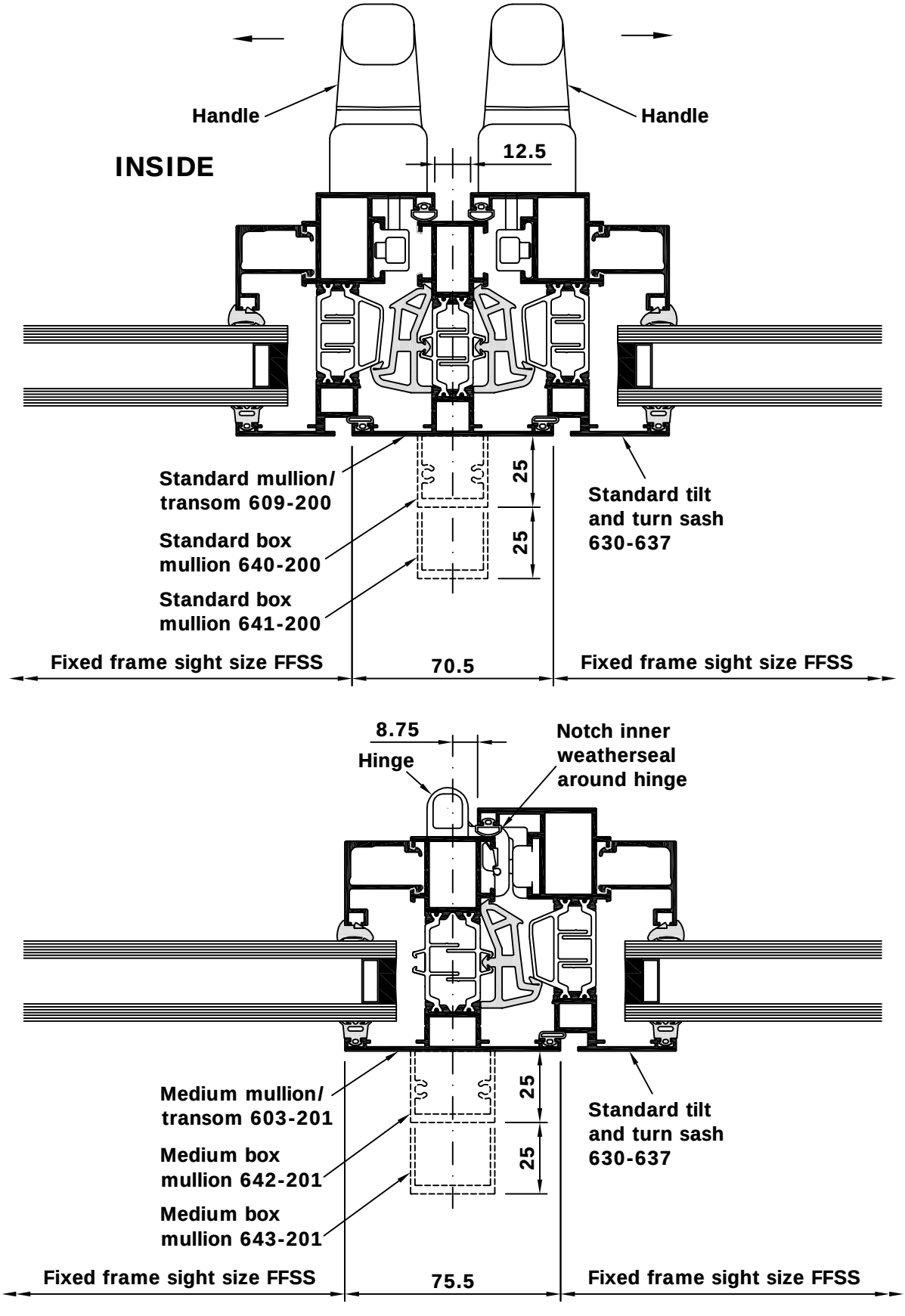
Scale 1:2

Handles and Hinges at Mullion/ Transom

Tilt before Turn, Side Hung and Bottom Hung Open In Windows

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



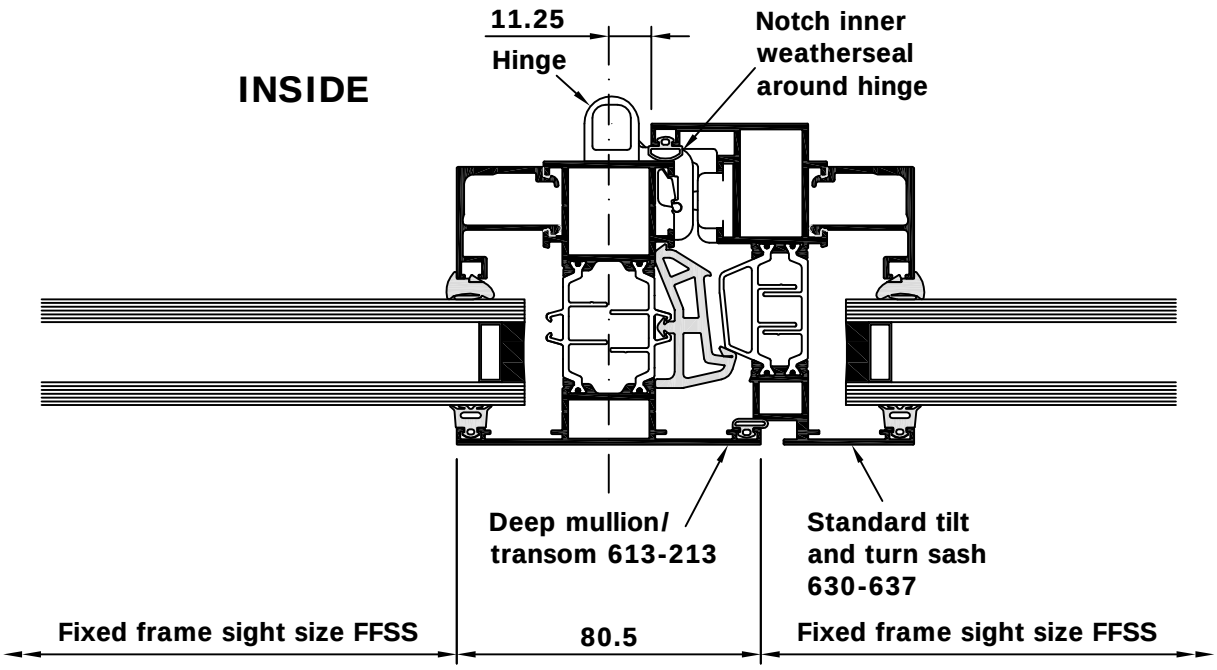
Scale 1:2

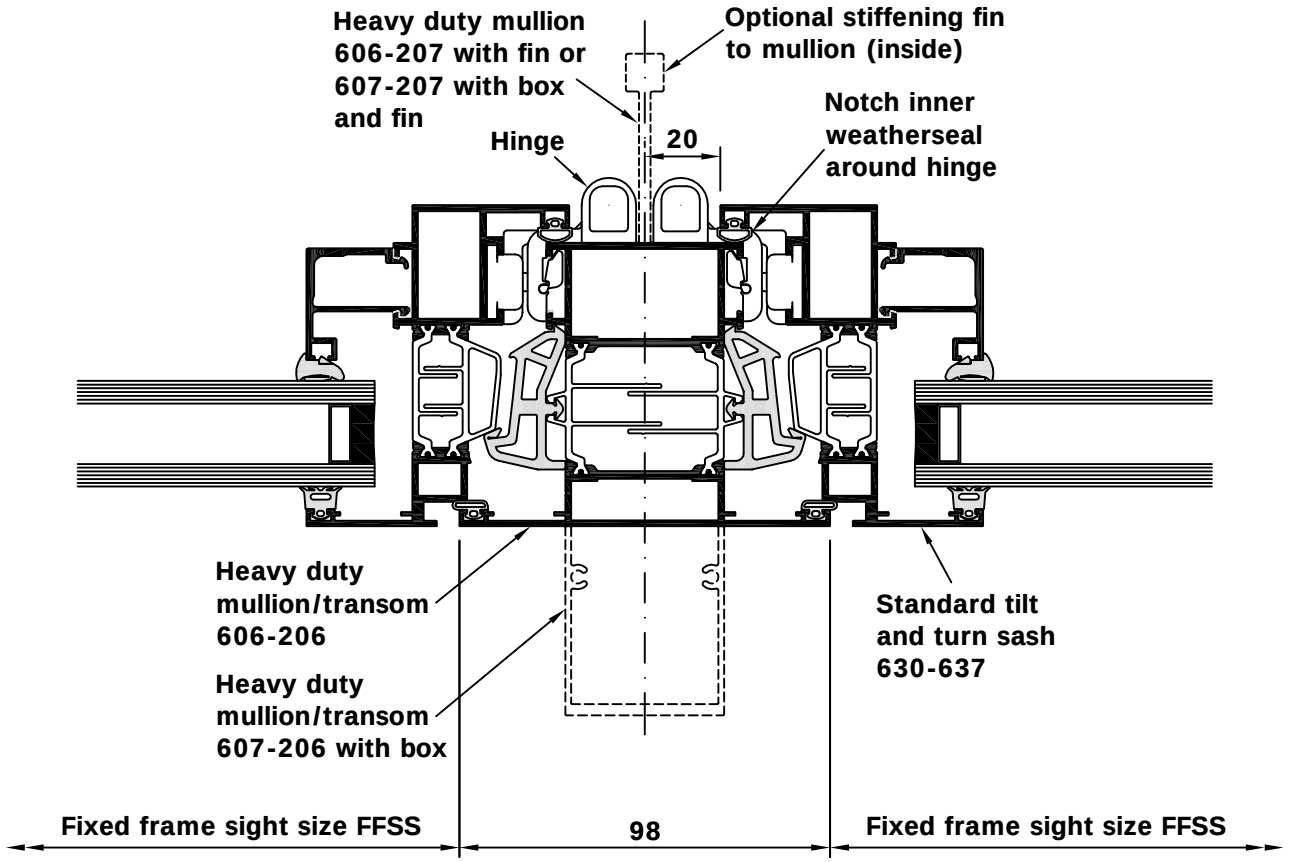
Handles and Hinges at Mullion/ Transom

Tilt before Turn, Side Hung and Bottom Hung Open In Windows

System 5-35 Hi/Hi+

TILT AND TURN WINDOW





Scale 1:2

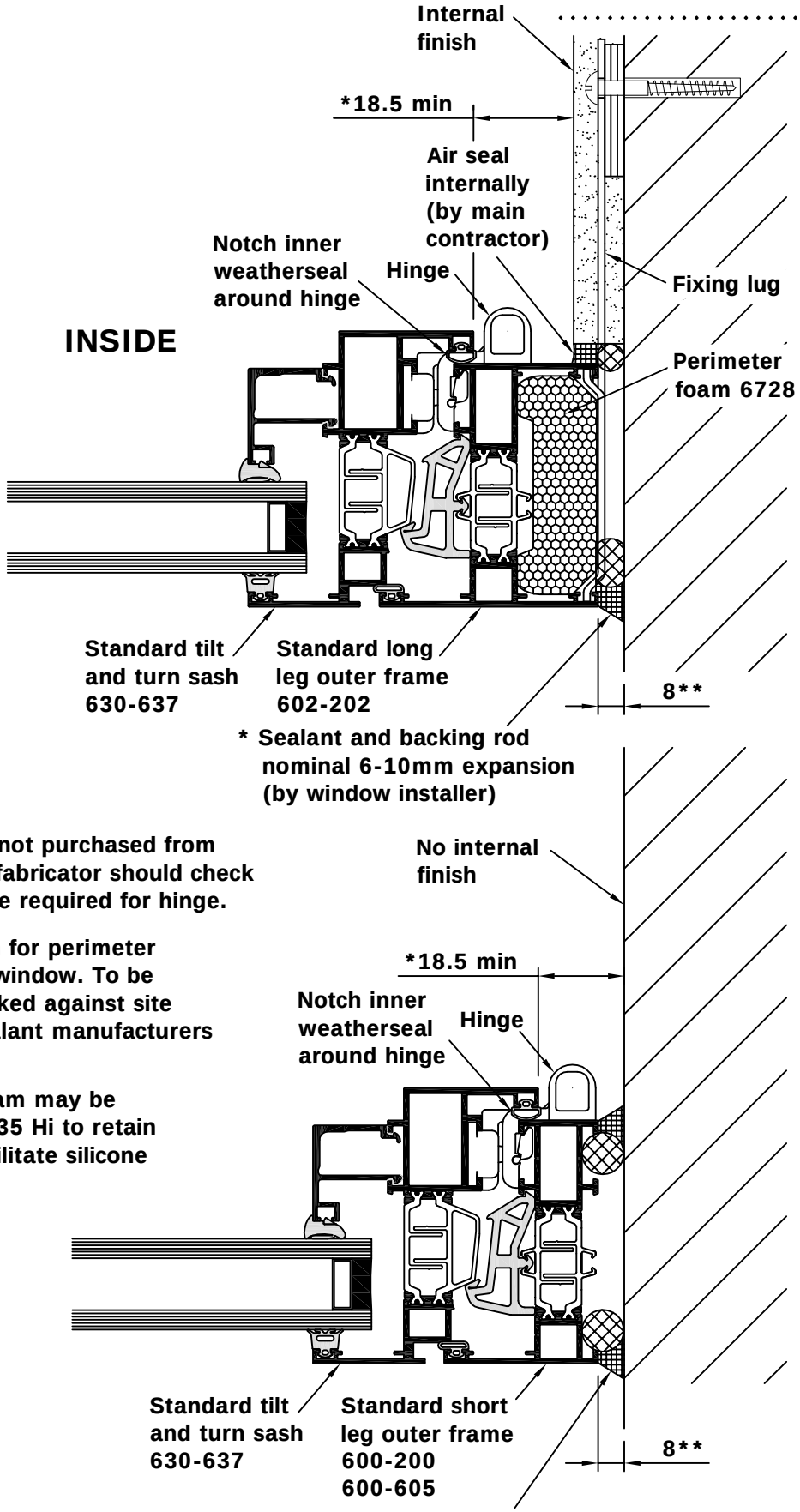
OUTSIDE

Hinges at Jamb/Cill

Tilt before Turn, Side Hung and Bottom Hung Open In Windows

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



* Where fittings are not purchased from Metal Technology fabricator should check minimum clearance required for hinge.

** Nominal dimension for perimeter clearance around window. To be adjusted and checked against site conditions and sealant manufacturers recommendations.

*** 6728 perimeter foam may be incorporated in 5-35 Hi to retain backing rod to facilitate silicone pointing

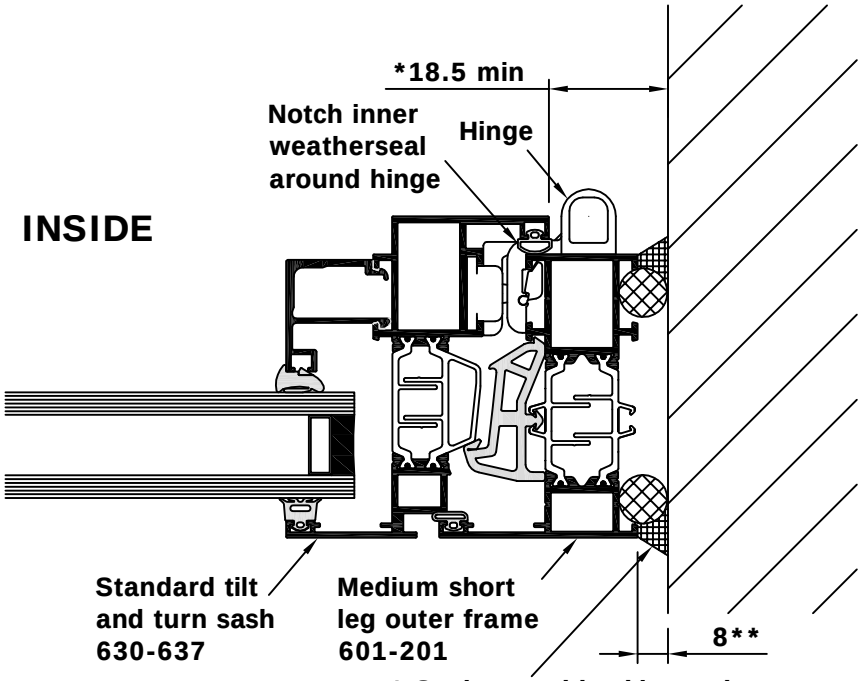
Scale 1:2

Hinges at Jamb/Cill

Tilt before Turn, Side Hung and Bottom Hung Open In Windows

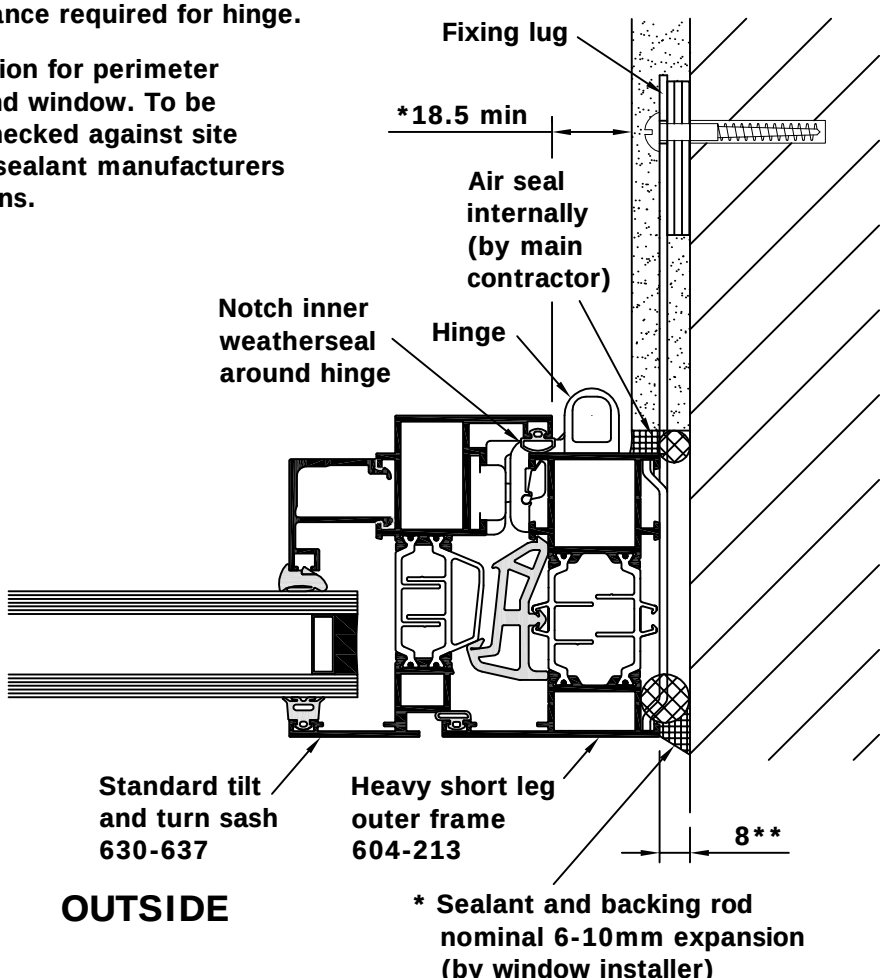
System 5-35 Hi/Hi+

TILT AND TURN WINDOW



*** Where fittings are not purchased from Metal Technology fabricator should check minimum clearance required for hinge.**

**** Nominal dimension for perimeter clearance around window. To be adjusted and checked against site conditions and sealant manufacturers recommendations.**



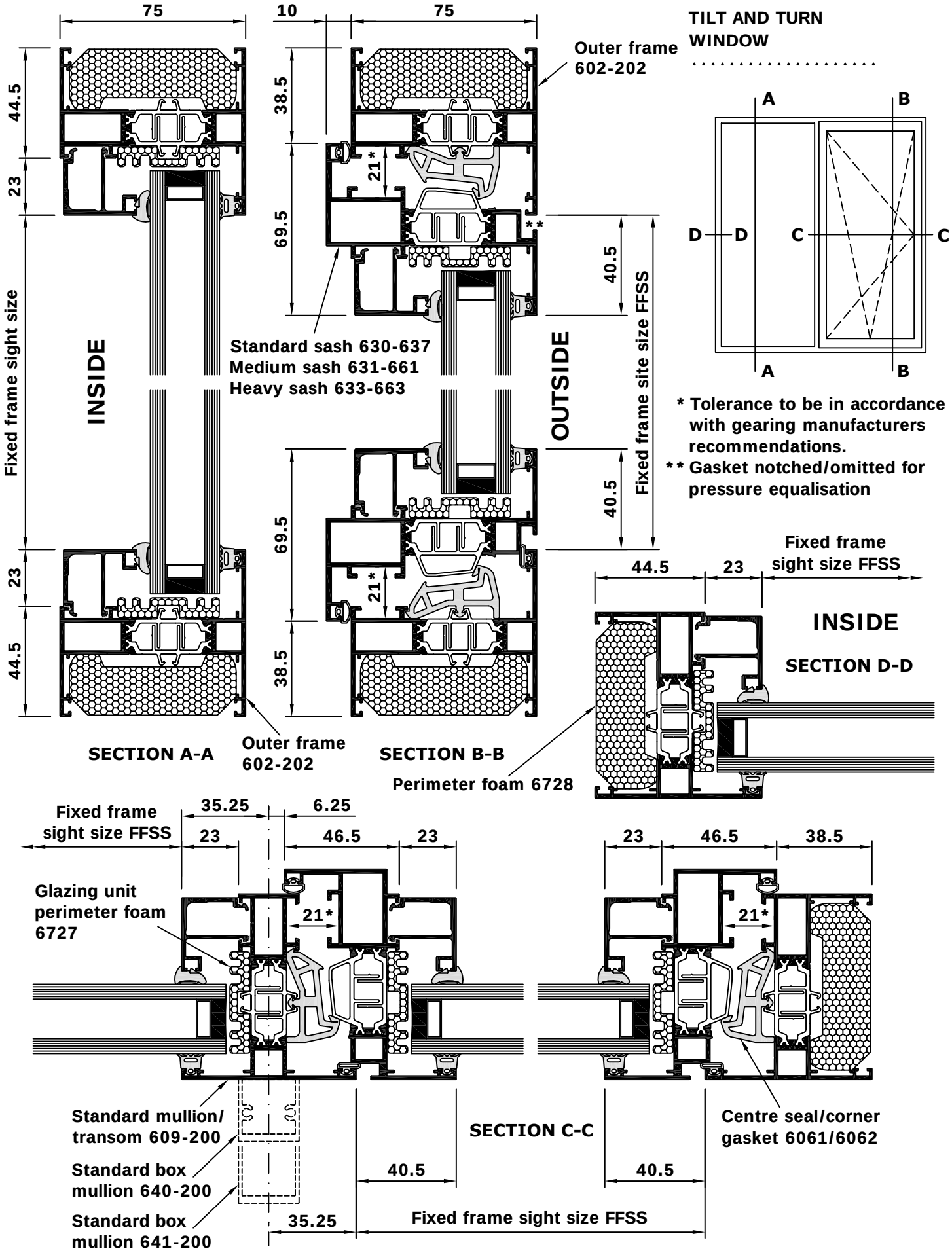
Scale 1:2

Standard Tilt and Turn Window

Sashes 630-637, 631-661 and 633-663

System 5-35 Hi+

TILT AND TURN WINDOW



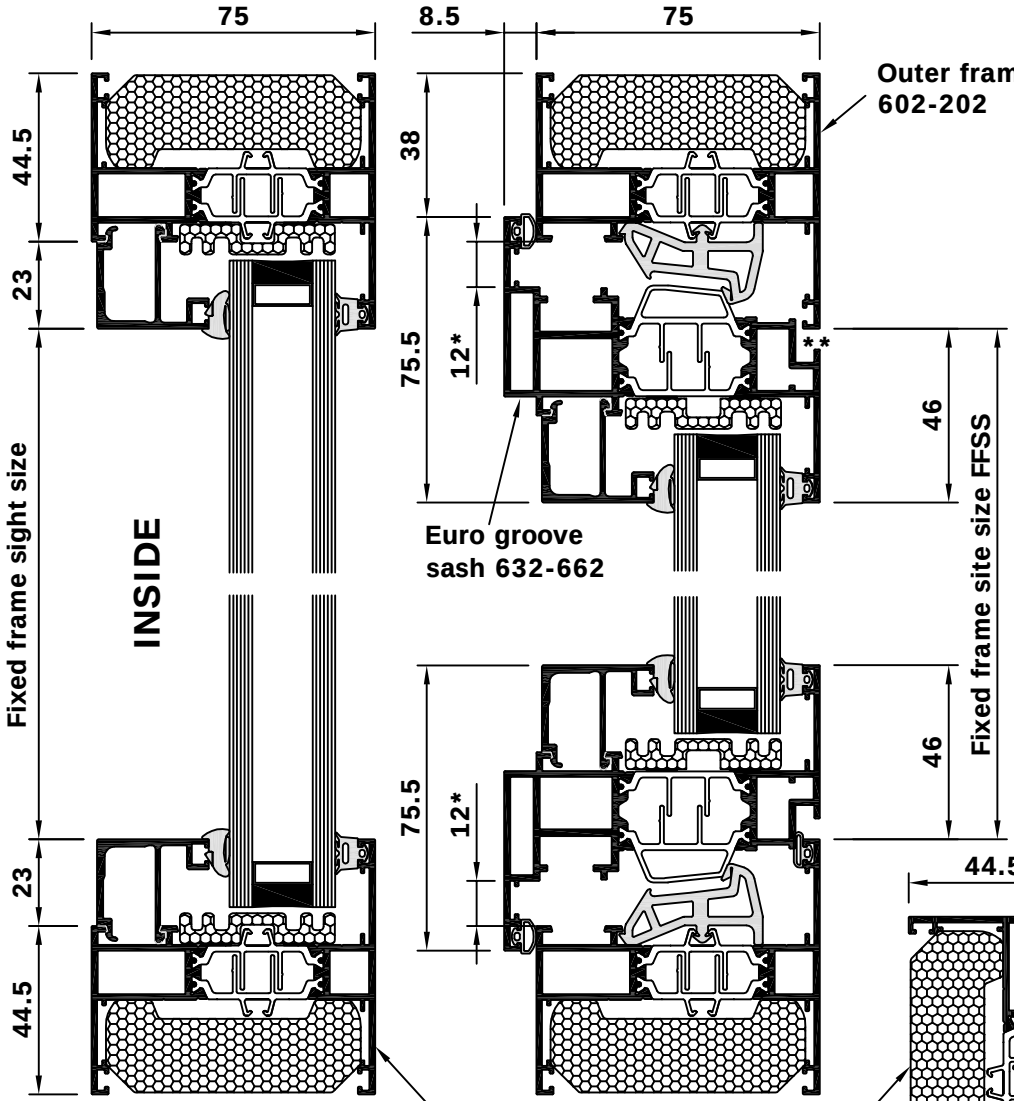
Scale 1:2

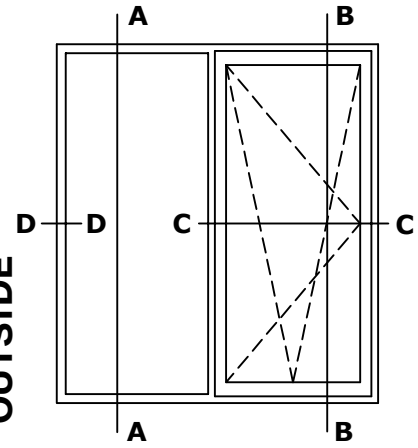
Euro Groove Tilt and Turn Window

Sash 632-662

System 5-35 Hi+

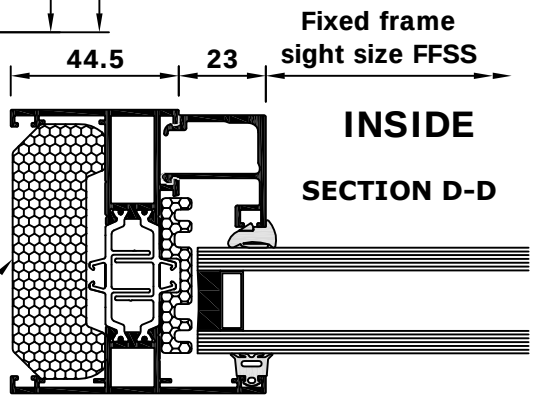
TILT AND TURN WINDOW

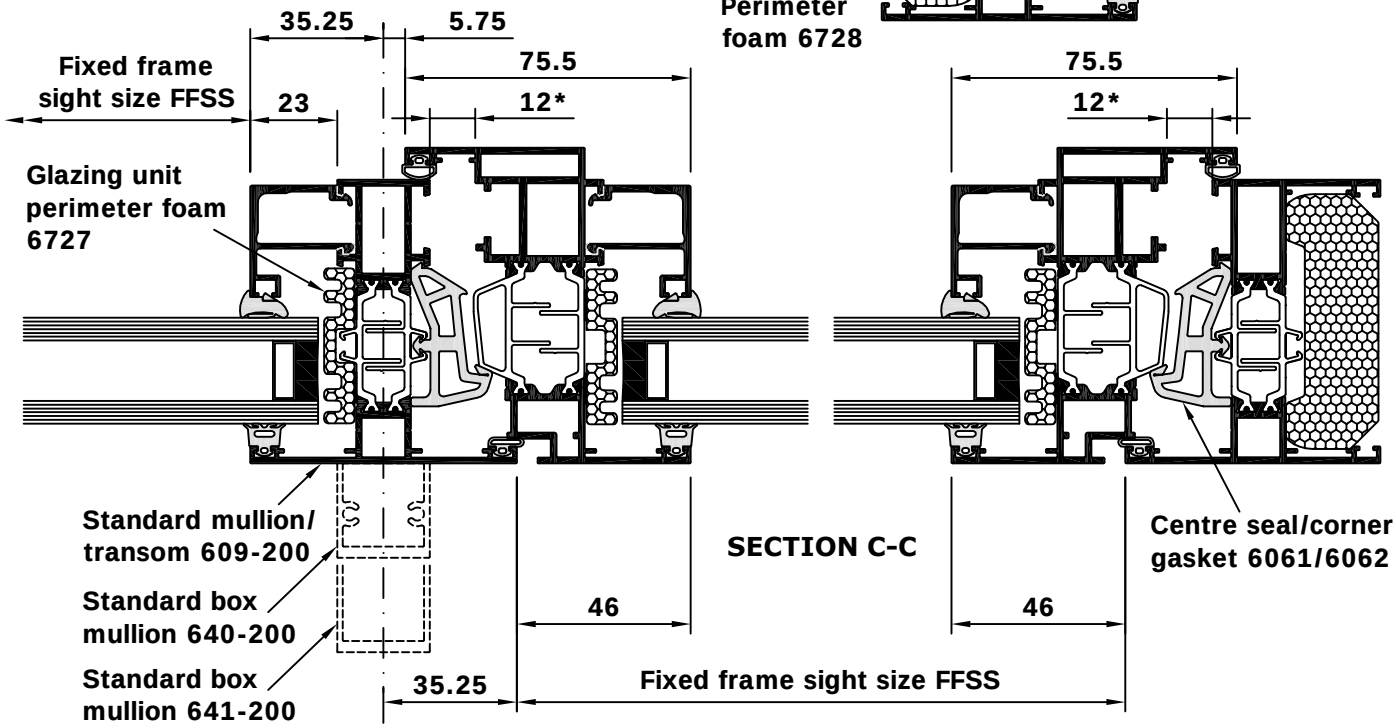




* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation





Scale 1:2

OUTSIDE

SHEET 535Hi / 2 / 170

rev 7 18/10/12

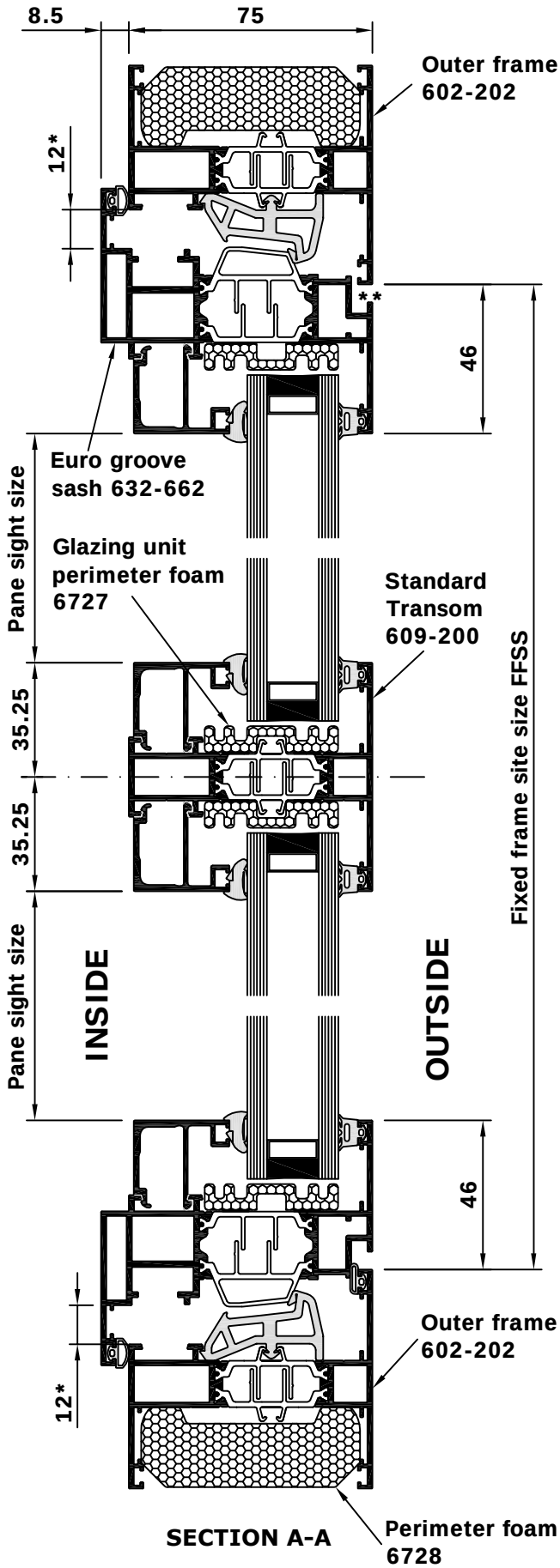
Tilt and Turn Window

Muntin Bar

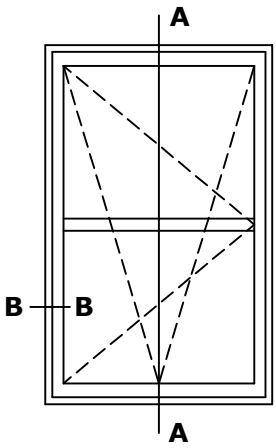
Suitable for use with sashes 630-637, 631-661, 632-662 and 633-663.

System 5-35 Hi+

TILT AND TURN WINDOW

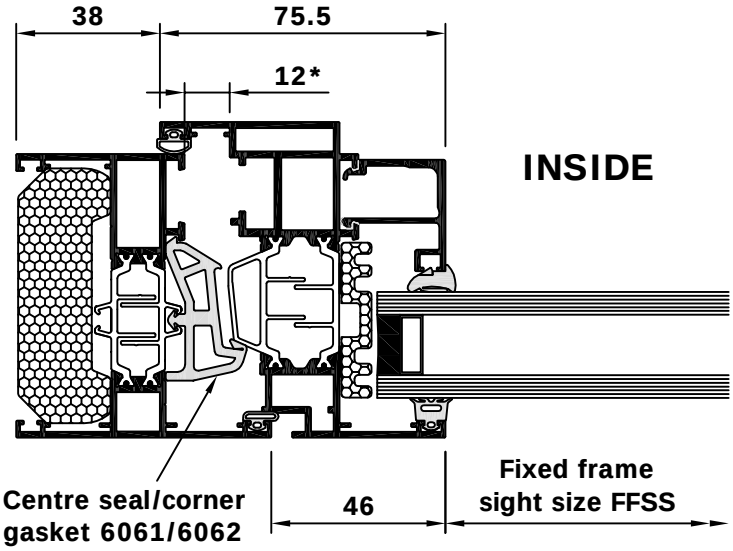


SECTION A-A



* Tolerance to be in accordance with gearing manufacturers recommendations.

** Gasket notched/omitted for pressure equalisation



SECTION B-B

OUTSIDE

Scale 1:2

Coupling Mullions

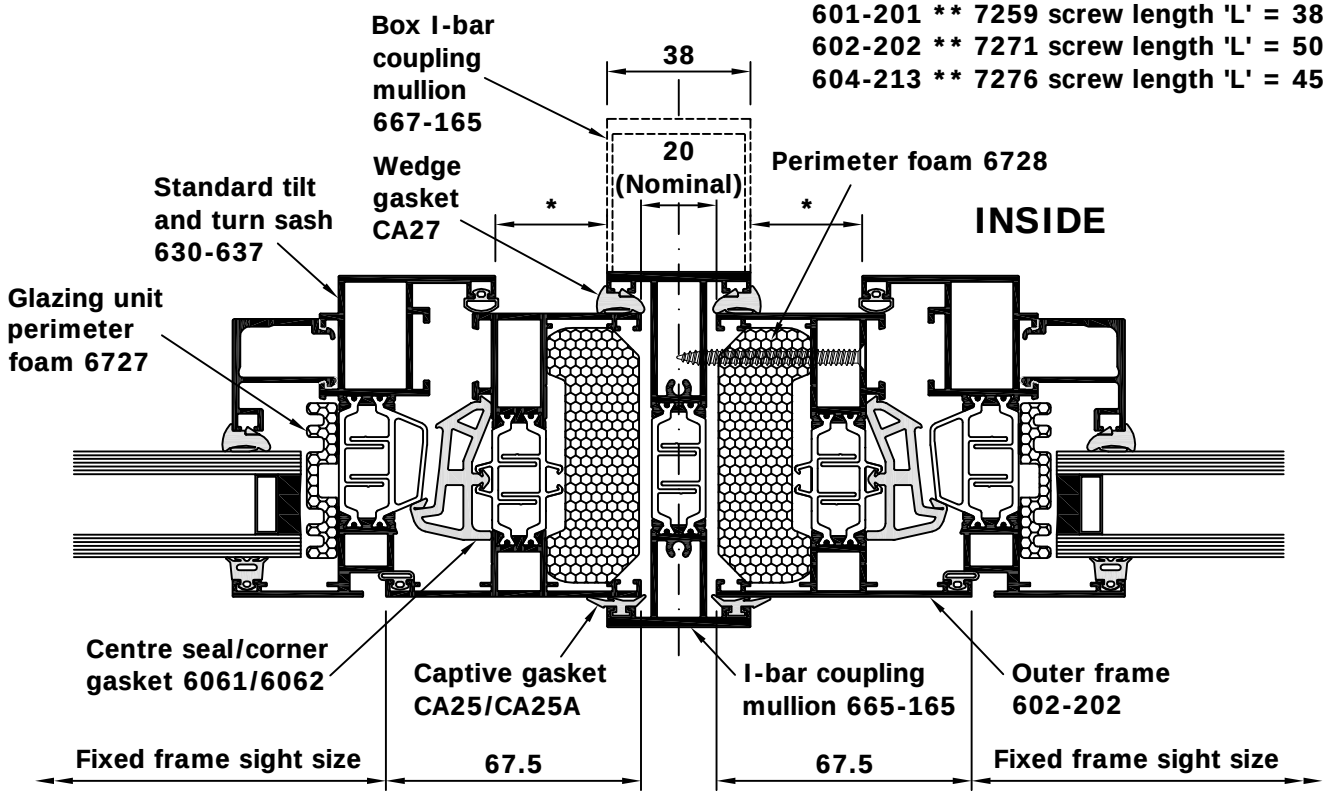
System 5-35 Hi+

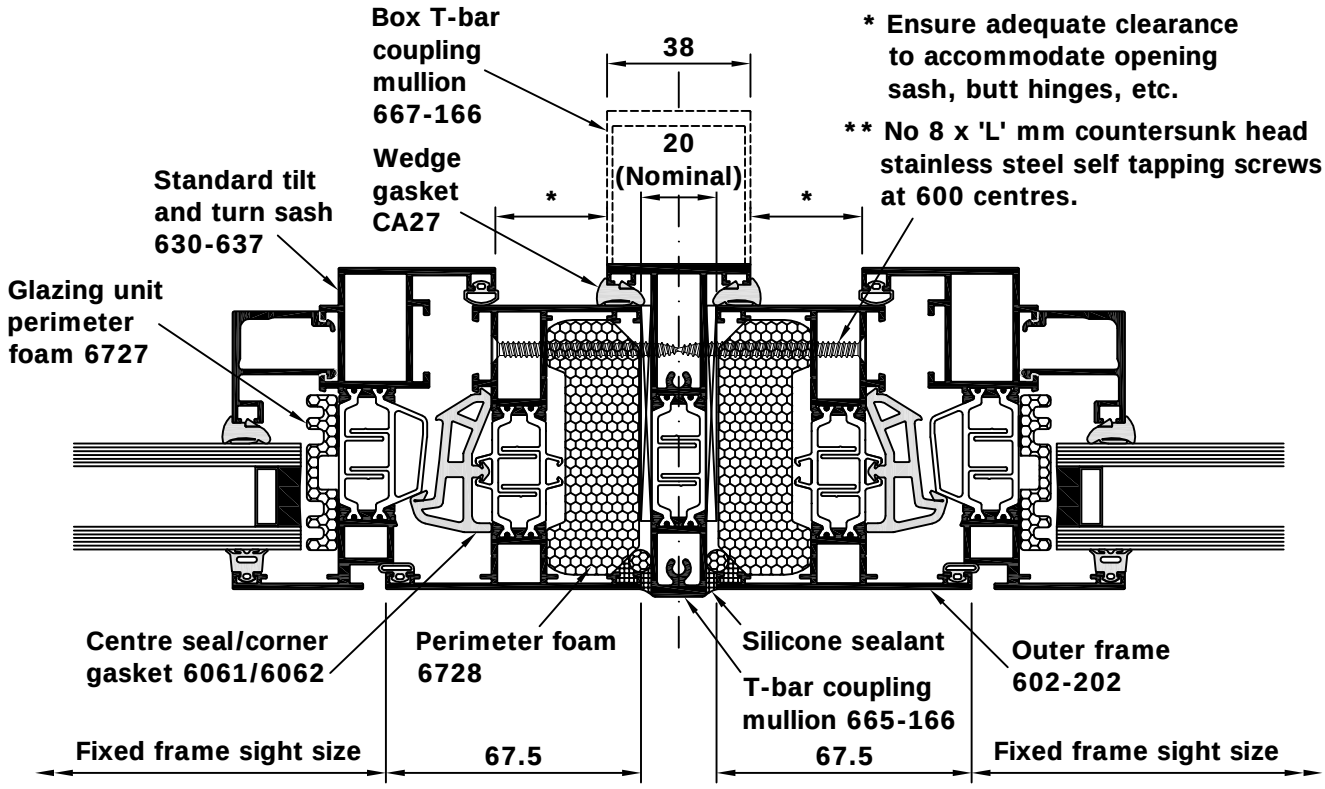
TILT AND TURN WINDOW

These profiles were not intended for use as coupling transoms. The fabricator must ensure that the window design and coupling details can adequately accommodate the anticipated expansion and contraction required for the window configuration. For further advice please contact Metal Technology's Technical Department.

Windows to be screw fixed to coupling mullions as required at 600mm centres.

Outer frame
600-200 ** 7275 screw length 'L' = 32mm
601-201 ** 7259 screw length 'L' = 38mm
602-202 ** 7271 screw length 'L' = 50mm
604-213 ** 7276 screw length 'L' = 45mm





OUTSIDE

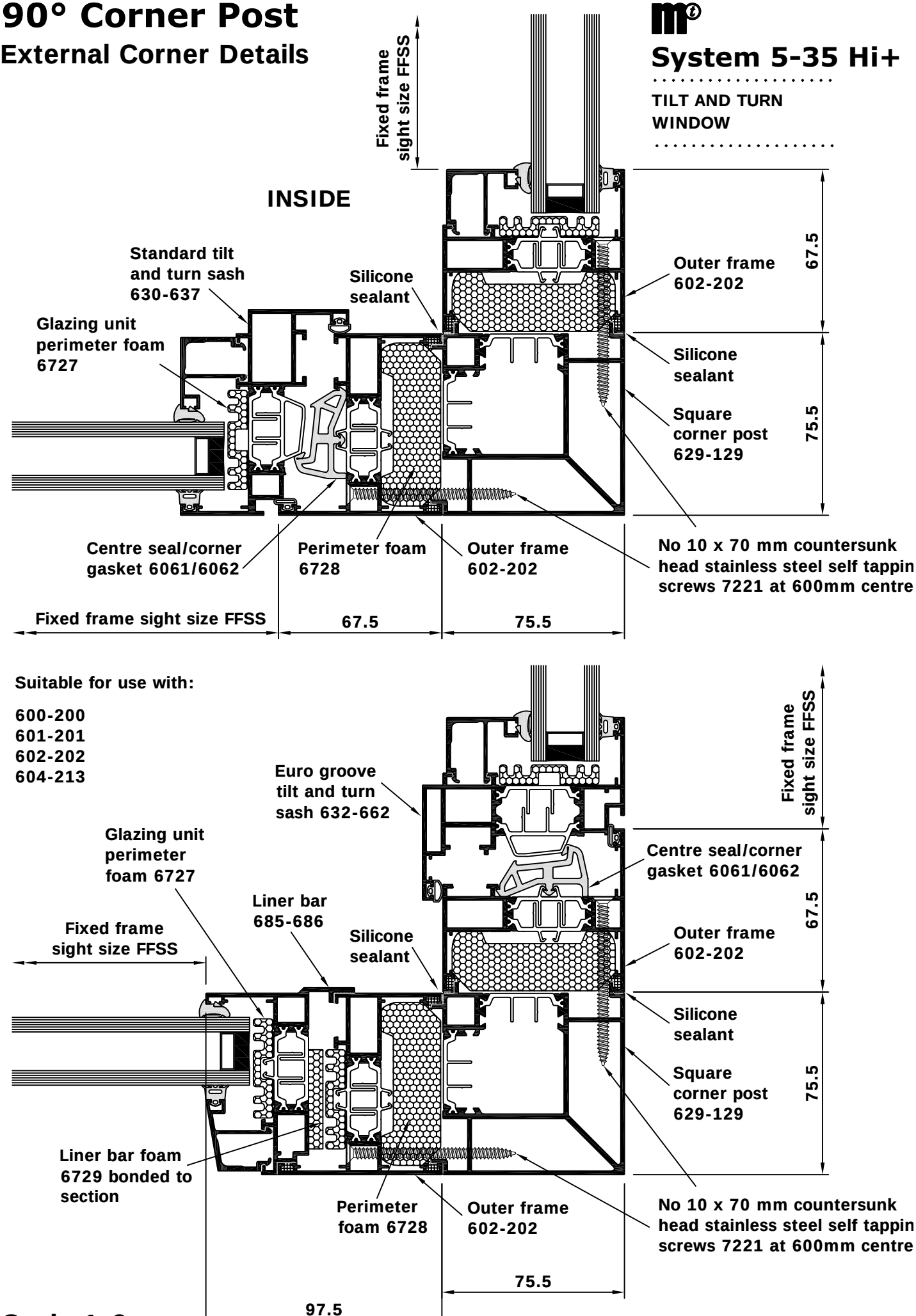
Scale 1:2

90° Corner Post

External Corner Details

System 5-35 Hi+

TILT AND TURN WINDOW



Scale 1:2

Coupling Detail

System 5-35 Hi+

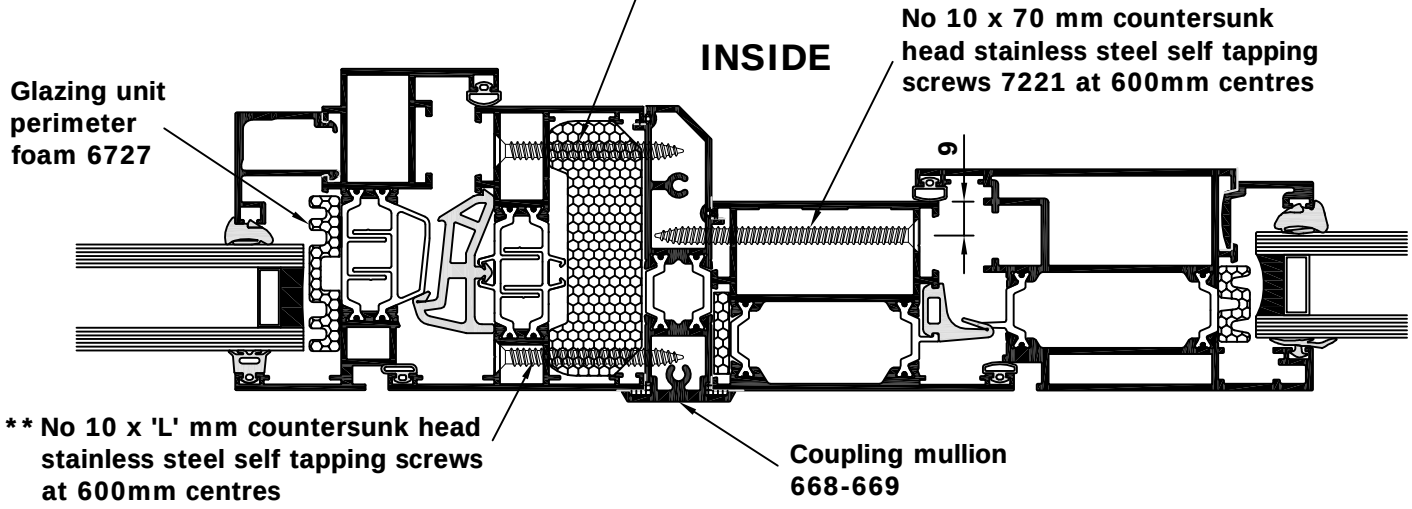
TILT AND TURN WINDOW

668-669 is not intended for use as a coupling transom. While the fabricator must ensure that the window design can adequately accommodate the anticipated expansion and contraction, this coupling detail does not offer this facility, and provides a tight butt joint only. For further advice please contact Metal Technology's Technical Department.

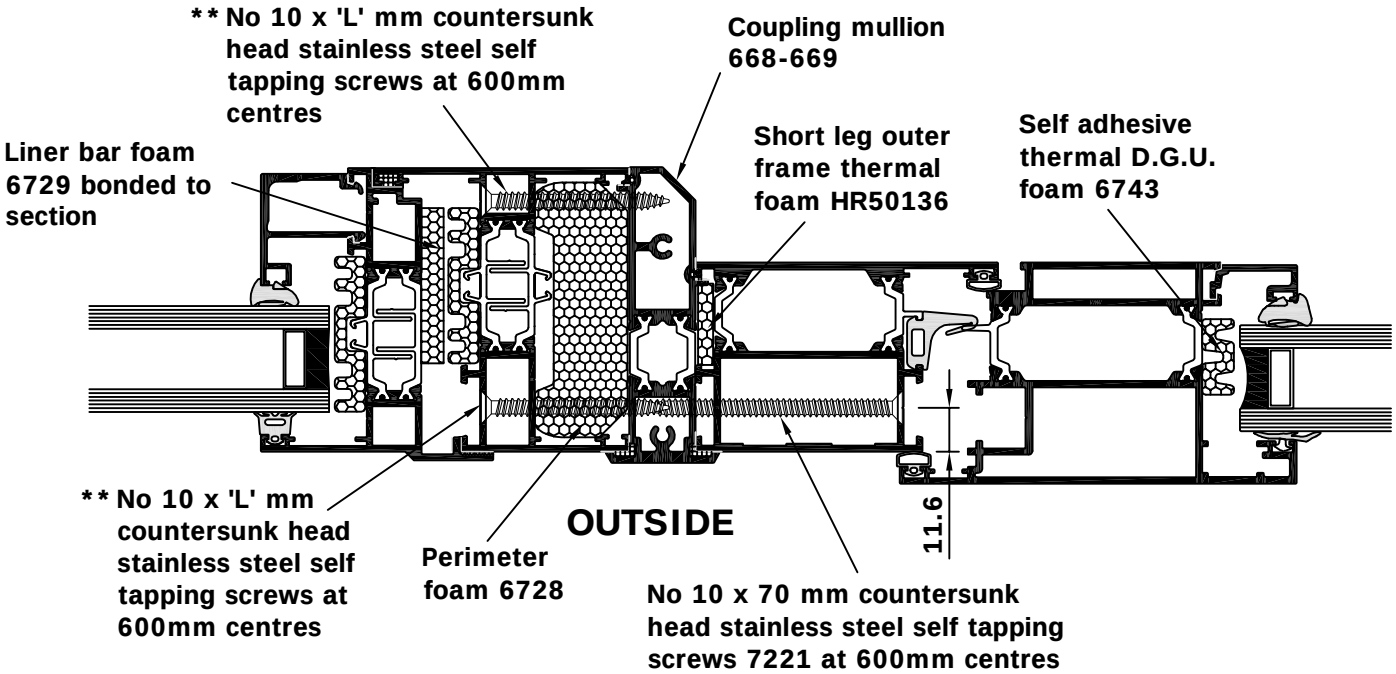
Windows/doors to be screw fixed to coupling mullion at 600mm centres with additional door fixings 25mm above and below hinge positions. Coupling mullion to be lug fixed back to structure at head and cill using plates/straps (by fabricator) fixed to integral screwports within 668-669 profile. Metal Technology recommend that the 668-669 coupling mullion to be secured to the 105-205F outer frame, as indicated, prior to installation on site.

OPEN-IN DOOR WITH SYSTEM 5-35 Hi+ TILT AND TURN

Outerframe
600-200 ** 7237 screw length 'L' = 32mm
601-201 ** 7248 screw length 'L' = 38mm
602-202 ** 7249 screw length 'L' = 50mm
604-213 ** 7220 screw length 'L' = 45mm



OPEN-OUT DOOR WITH SYSTEM 5-35 Hi+ TILT AND TURN

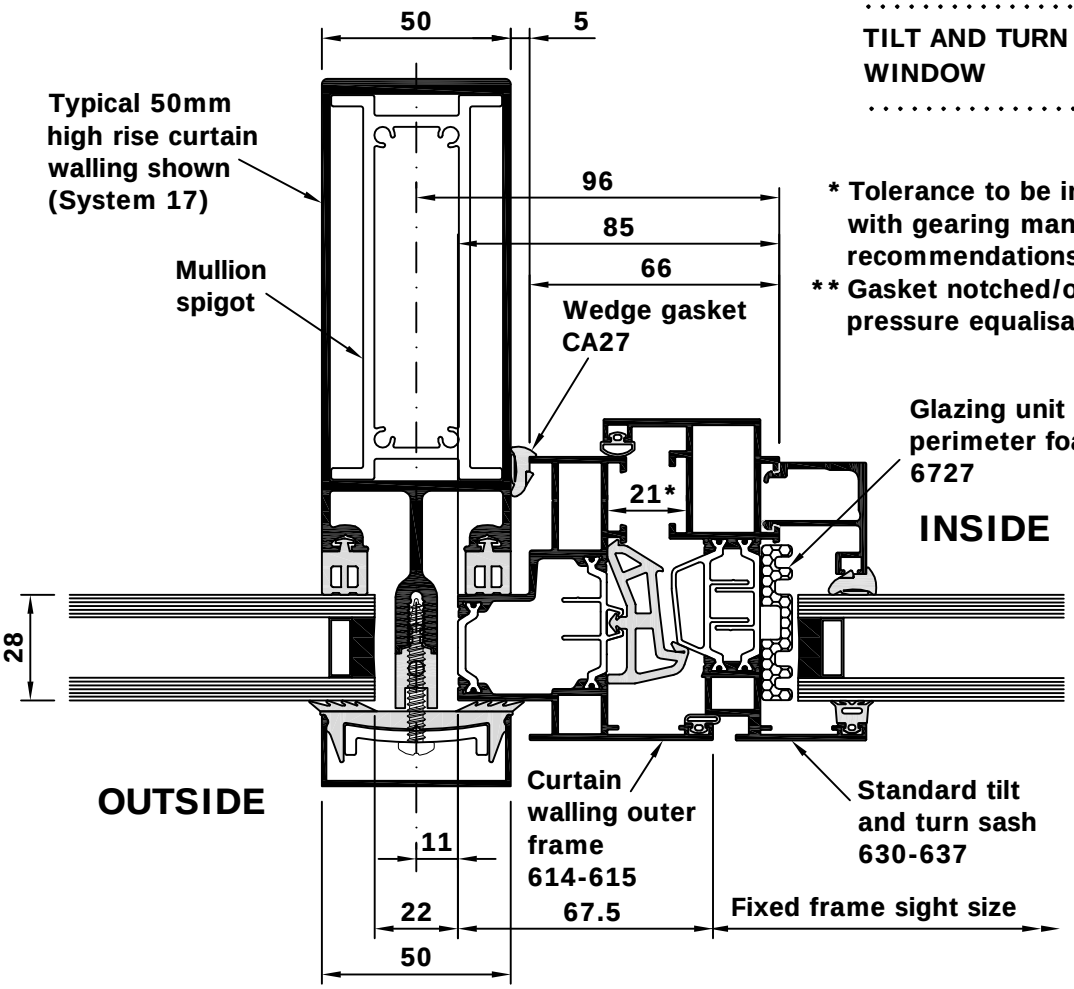


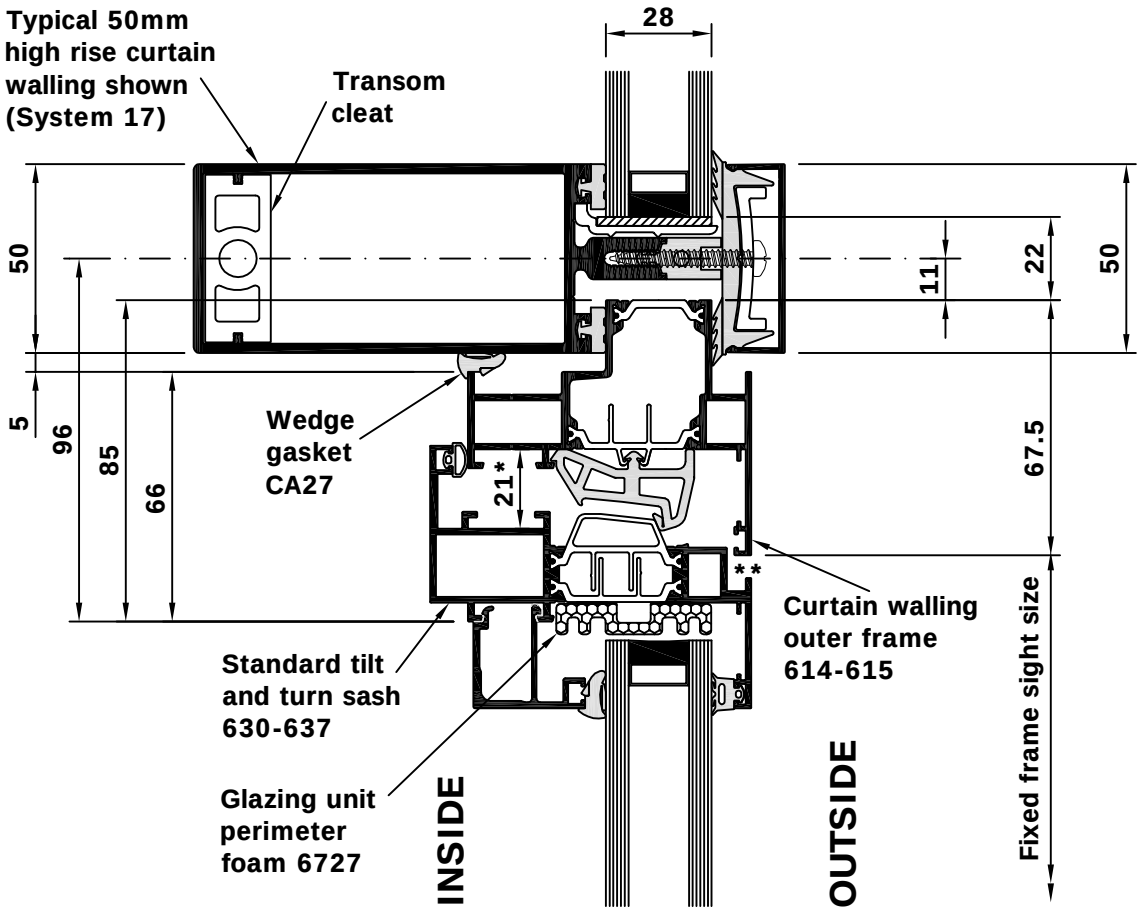
Scale 1:2

Curtain Wall Insert

System 5-35 Hi+

TILT AND TURN WINDOW





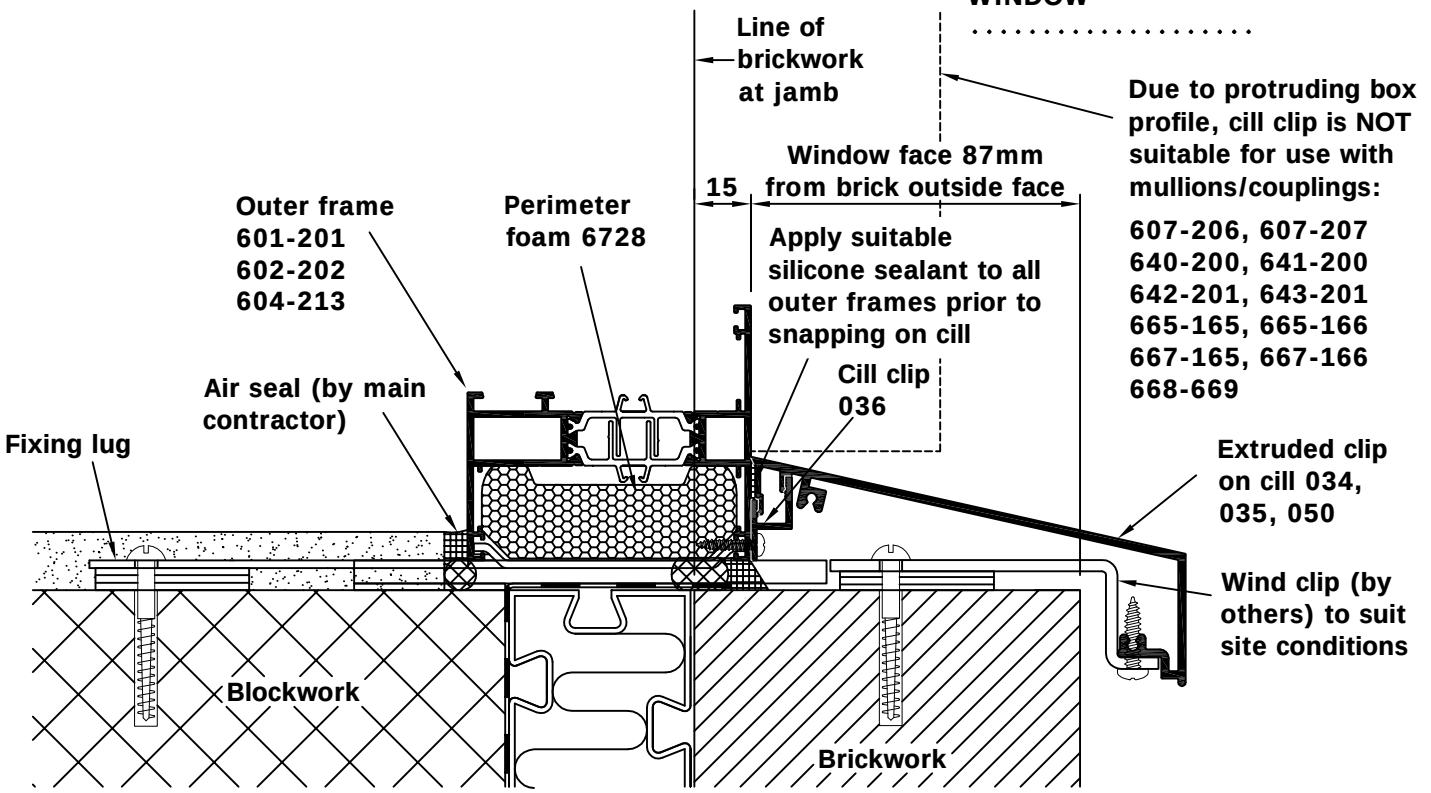
Scale 1:2

Cill Liner Options

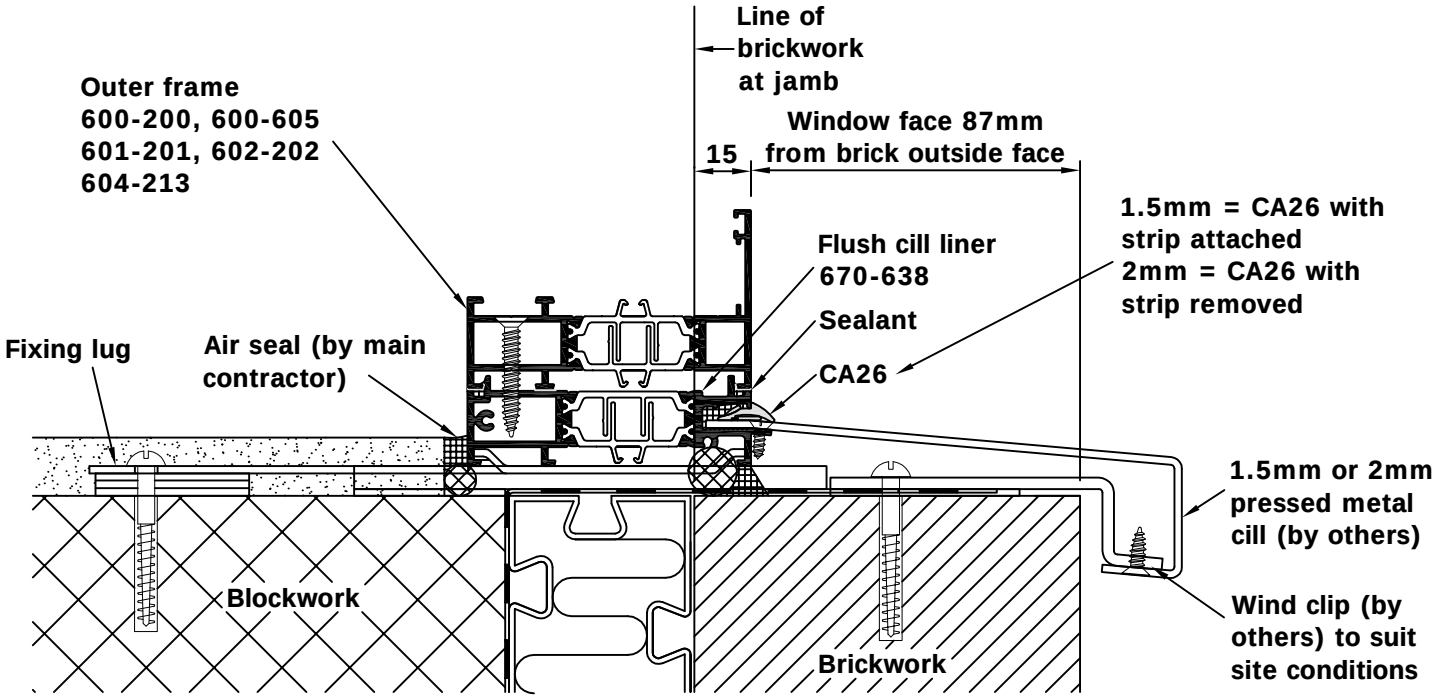
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Cill Clip Option



Standard Flush Cill Liner Option



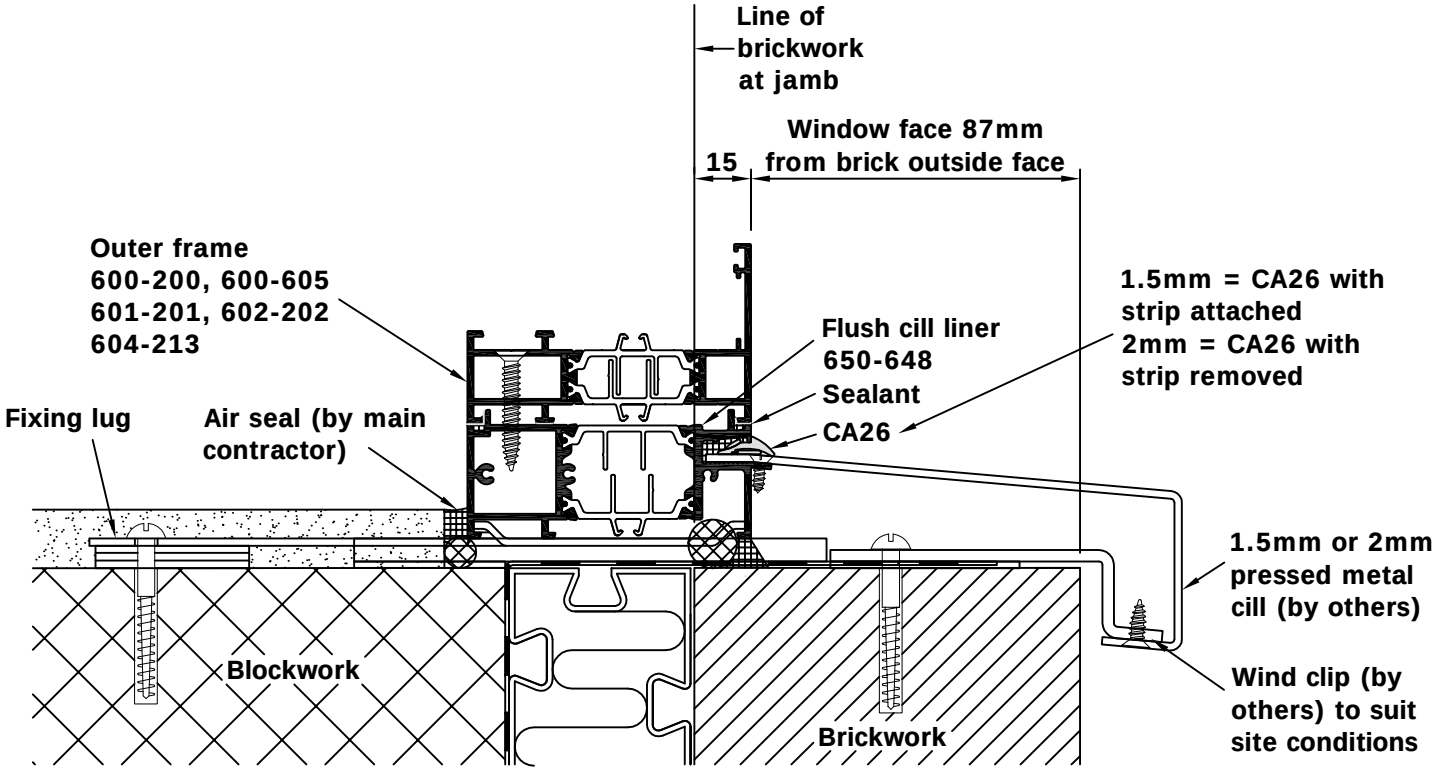
Scale 1:2

Cill Liner Options

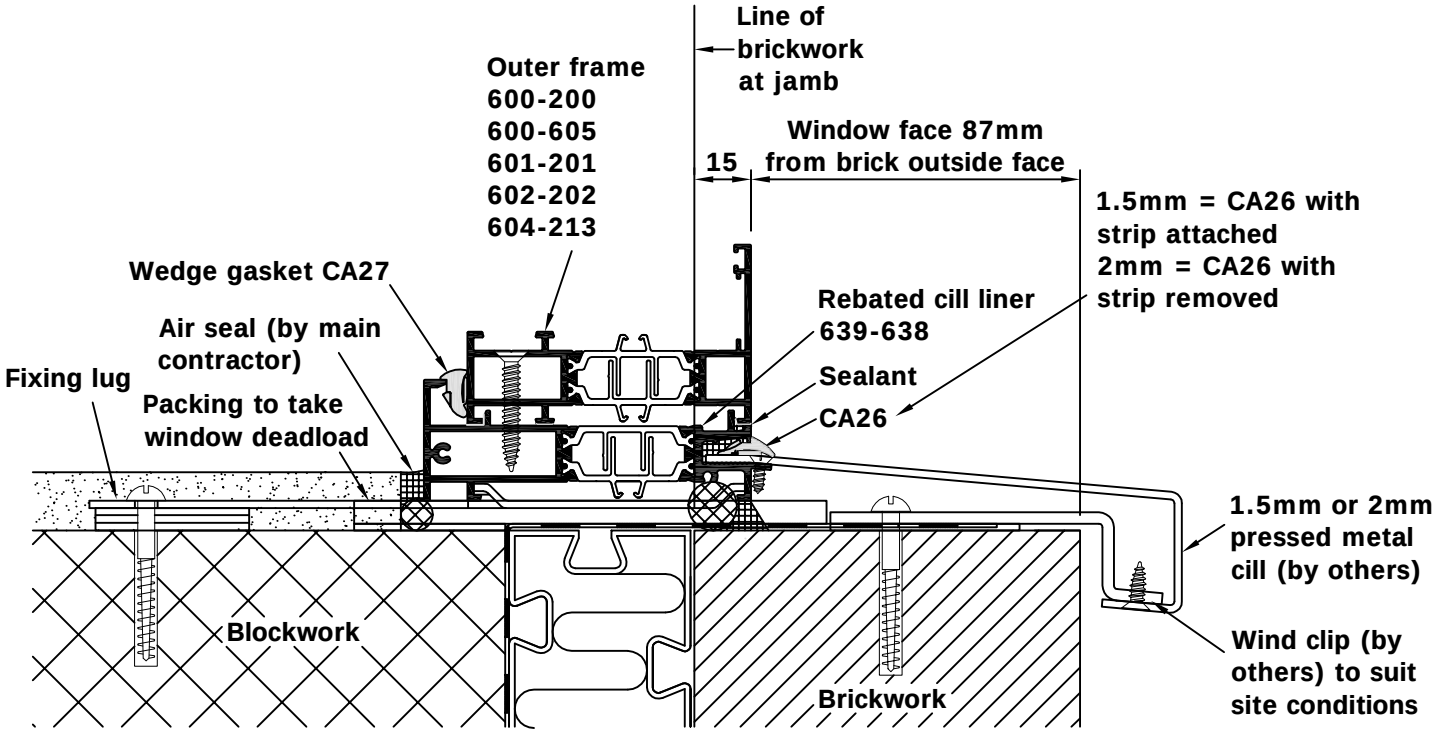
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Medium Flush Cill Liner Option



Standard Rebated Cill Liner Option



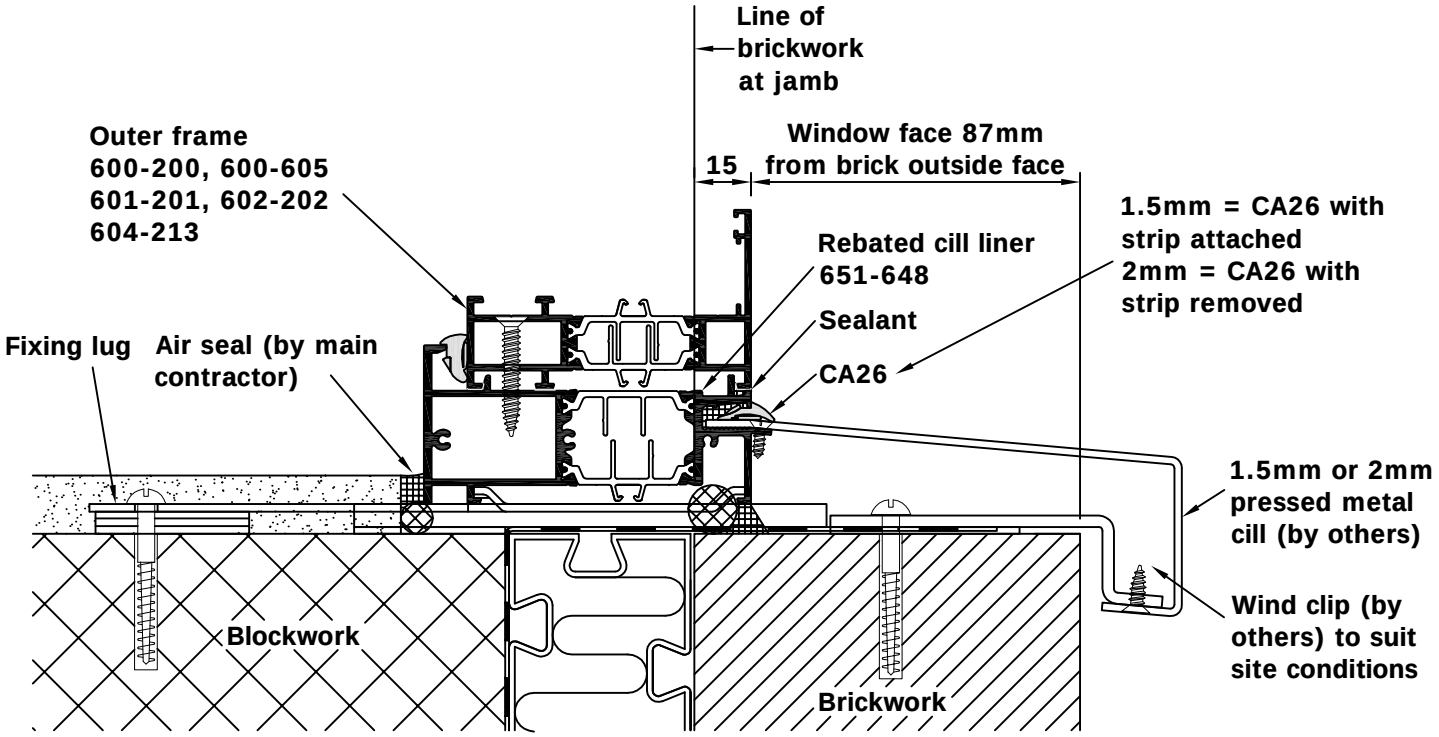
Scale 1:2

Cill Liner Options

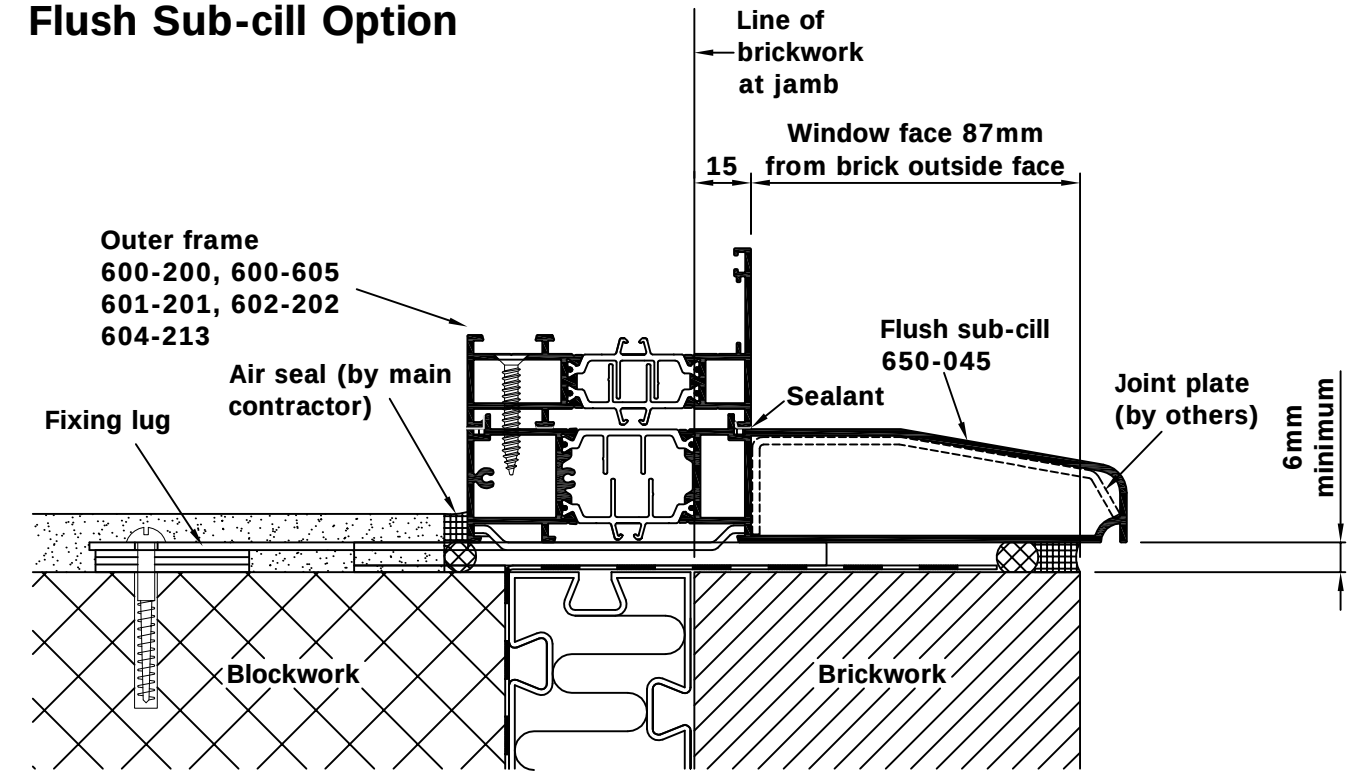
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Medium Rebated Cill Liner Option



Flush Sub-cill Option



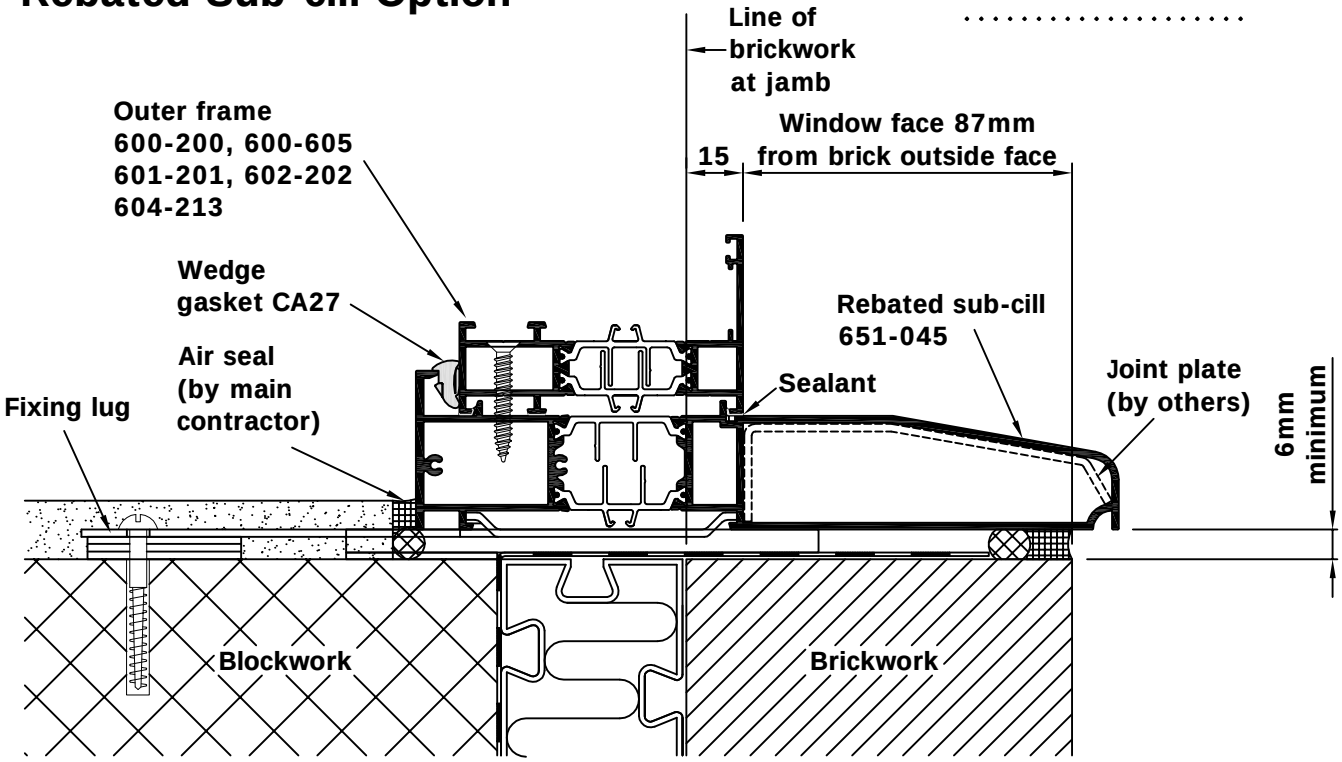
Scale 1:2

Cill and Head Liner Options

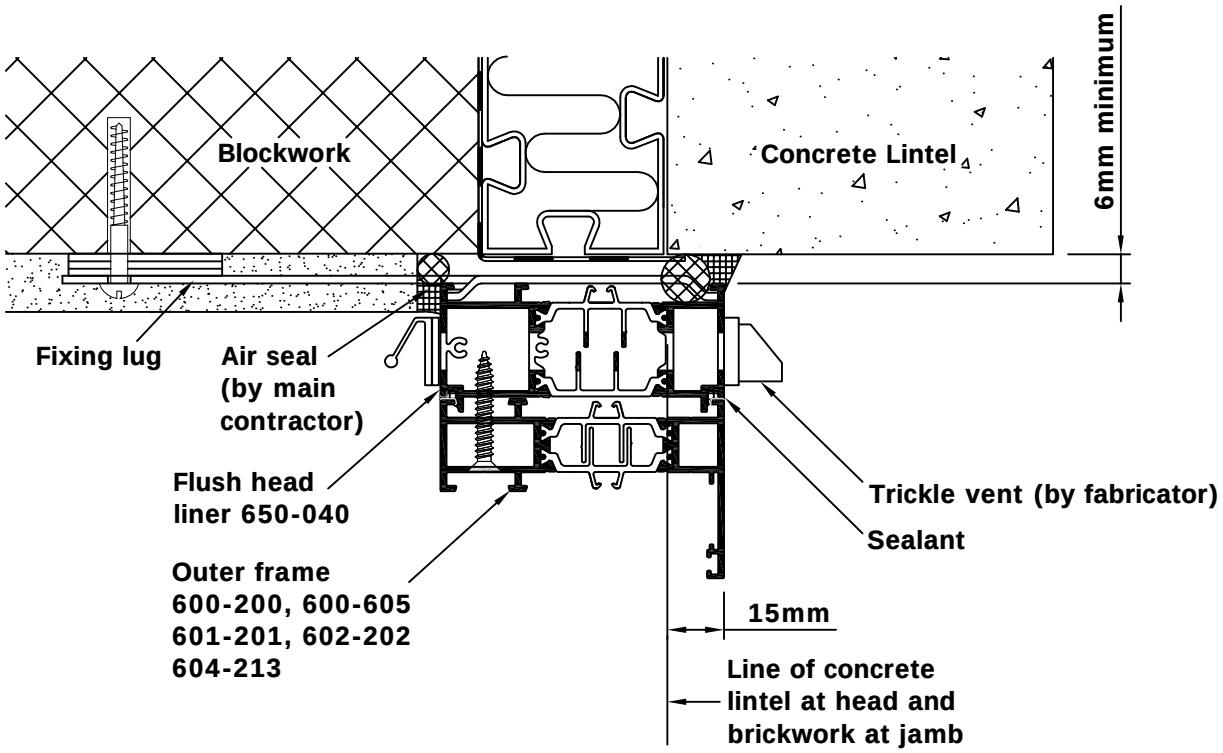
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Rebated Sub-cill Option



Flush Head Liner Trickle Vent Detail



Scale 1:2

Ironmongery

General Cautionary Notes

Sheets labelled Hi / Hi+ are applicable to both variations of the system. Where the details have no impact on the thermal gaskets / foams, these have been omitted for clarity. Where sheets refer to Hi or Hi+ only, details shown apply accordingly.

The fabricator must ensure all windows and opening vents, their operation and all other associated ironmongery are in accordance with the size, weight and opening restrictions within this manual and any applicable British and European standards, building regulations, disabled access and Health and Safety requirements. Sashes should not be left unattended other than in their closed and secured position.

When considering multi light applications fabricators should look at each application in relation to the sections used and the ironmongery required in order to determine compatibility (i.e that there is sufficient depth of section to accommodate the combination of profiles in conjunction with the ironmongery, drip rails and drainage requirements). Special and careful consideration should be given to butt hinge applications, applications using the 685-686 liner bar and applications incorporating open-in and open-out vent combinations. When using butt hinges in bottom hung applications additional loads may be applied to the transom. Application-specific structural analysis will therefore be required. Similar consideration should be given to window perimeter structural interface details. Metal Technology recommend that each application is drawn out with all structure, ironmongery and fixing details applied in order to determine compatibility.

Fabricators should be aware that when working with large size windows the maintenance of tight tolerances of ±1mm is critical to maintenance of the proper gasket cover around the window. The gasket cover around the sash must be centralized. All fixings must be sealed in place using a suitable sealant. All fixings must be compatible with the materials into which they are fastened. i.e.- when attaching into aluminum, austenitic A2 or A4 x class 70 stainless steel fixings are recommended. Fabricators must ensure that all adhesives, sealants and lubricants are fully compatible with the glass, materials and finish they are to be in contact with. Metal Technology recommend that fabricators sample all proposed adhesives and sealants to ensure compatibility on a project-by-project basis. Frames should be set aside after gluing to allow glue to harden.

Gearing

Metal Technology offers a range of gearing options for tilt and turn, turn only, and tilt only windows. Alternative solutions for security applications are also available. Refer to Vent Size Limitation Charts in section 3 of this manual for further details of gearing and handle options.

Turn Lock - 785

For tilt and turn windows Metal Technology offers an additional surface-mounted key-operated turn lock which can be engaged to prevent the window operating in turn mode even if the turn function of the handle has been engaged.

Turn Restrictor

For tilt and turn, and turn only windows, Metal Technology offers an additional surface-mounted key-operated turn restrictor, consisting of the following components:

801 Restrictor arm
802 Restrictor release (including key)
803 Restrictor stud

The turn restrictor prevents the sash from opening beyond a pre-detemined position when the turn function of the handle has been engaged.
The restrictor is located below the sash. Therefore, to accommodate the component, the fabricator must allow sufficient clearance/depth of frame.

Spring Catches

For bottom hung open in applications, where standard operating handles may be out of reach, Metal Technology offers a simple spring catch and window pull operated solution. Refer to "Vent Size Limitation Chart - Bottom Hung Open In Using Spring Catches" for further details of associated accessories.
Where a window pull is required, fabricator must ensure adequate clearance/depth of frame above the sash to facilitate engagement.

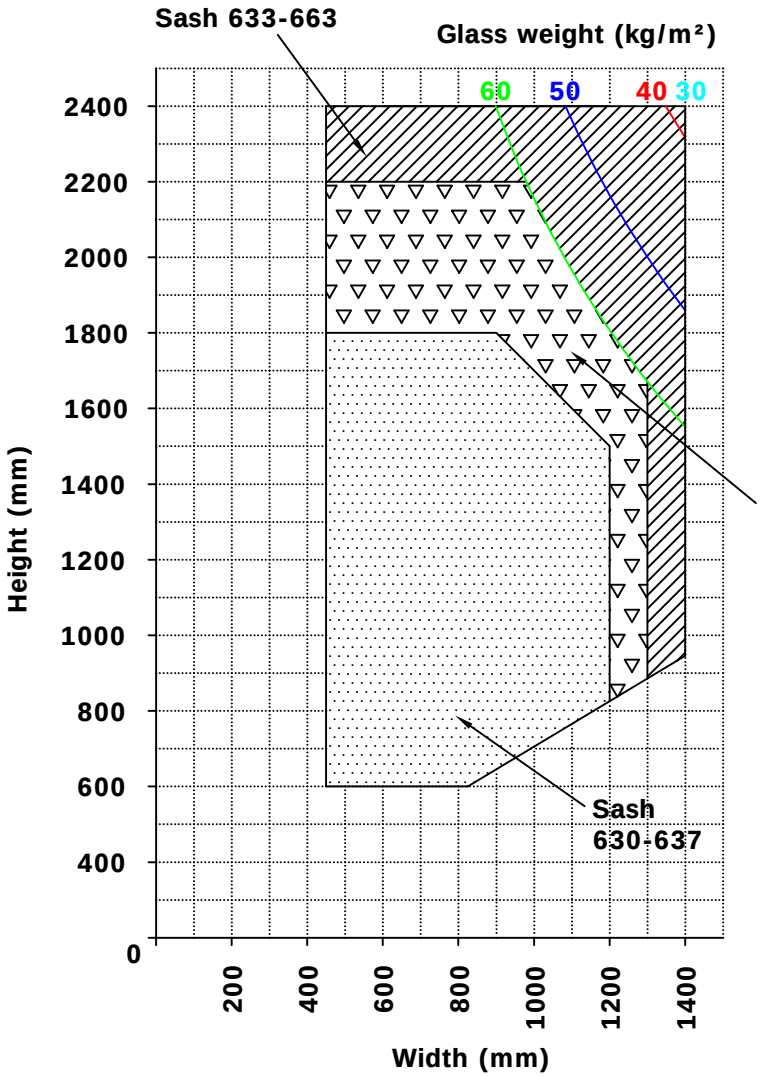
Vent Size Limitation Chart

Siegenia Tilt Before Turn Fittings

System 5-35 Hi/Hi+

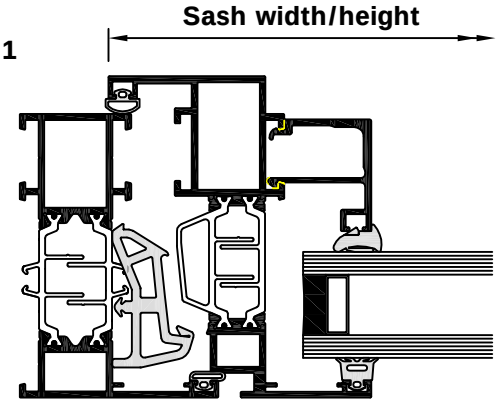
TILT AND TURN WINDOW

Sashes should not be left unattended other than in their closed and secured position.
For sash sizes or weights outside these limitations, fabricator may submit an Oversize Vent Application form for Metal Technology's consideration.
For handle located centrally at jamb, Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:



Additional Fittings	Reference
Lockable handle with manual turn lock (Siegenia) *	TT28A
Locking keys (Siegenia)	TT33
Firemans axe boss	786
Loose handle for firemans axe boss	787
90 degree restrictor stay for sash widths 450-1300	788A
90 degree restrictor stay for sash widths 1301-1400	788B

* Includes reinforcing plate



Maximum sash weight limitation = 90Kg / 120Kg**

Where there is a muntin (i.e. mullion/transom) contained within a sash the maximum weight shall be 75Kg.

PTT16 link rods issued separately in bar length.

**** For sash weights over 90Kg. "120Kg accessory bag TTGEAR746" must be used.**
For sash weights over 90Kg with sash widths from 1020mm to 1250mm "Additional stay TTGEAR718" and "Coupling stay striker TTGEAR747" must be used.

Part	Description	Siegenia reference	Metal Technology reference
2-11	BS LM4200 SI-SILVER	MMBS0010-525020	TTGEAR713
20a	Stay LM4200 SZ 20	273098	TTGEAR714
20b	Stay LM4200 SZ 35	314203	TTGEAR715
21-29	VS LM-TBT FBS-EUL KPS TS B1	MMVS0320-100030	TTGEAR716
30-31	Coupling Set LM A0156 TS B1	MMKL0060-100030	TTGEAR726
35-37	MV LM4200-DK TS B1	246979	TTGEAR717
38-41	Additional Stay LM4200 TS B1	247006	TTGEAR718
42	Coupling Stay Striker MV	MXSK0010	TTGEAR747

Standard tilt before turn gear (Siegenia)

Sash height \ Sash width	450 to 600	601 to 1250	1251 to 1400
600 to 1250	2-11, 20a, 21-29, 30-31	2-11, 20b, 21-29, 30-31	2-11, 20b, 21-29, 30-31, 35-37, 38-41, 42
1251 to 2400	2-11, 20a, 21-29, 30-31, 35-37	2-11, 20b, 21-29, 30-31, 35-37	2-11, 20b, 21-29, 30-31, 35-37x2, 38-41, 42

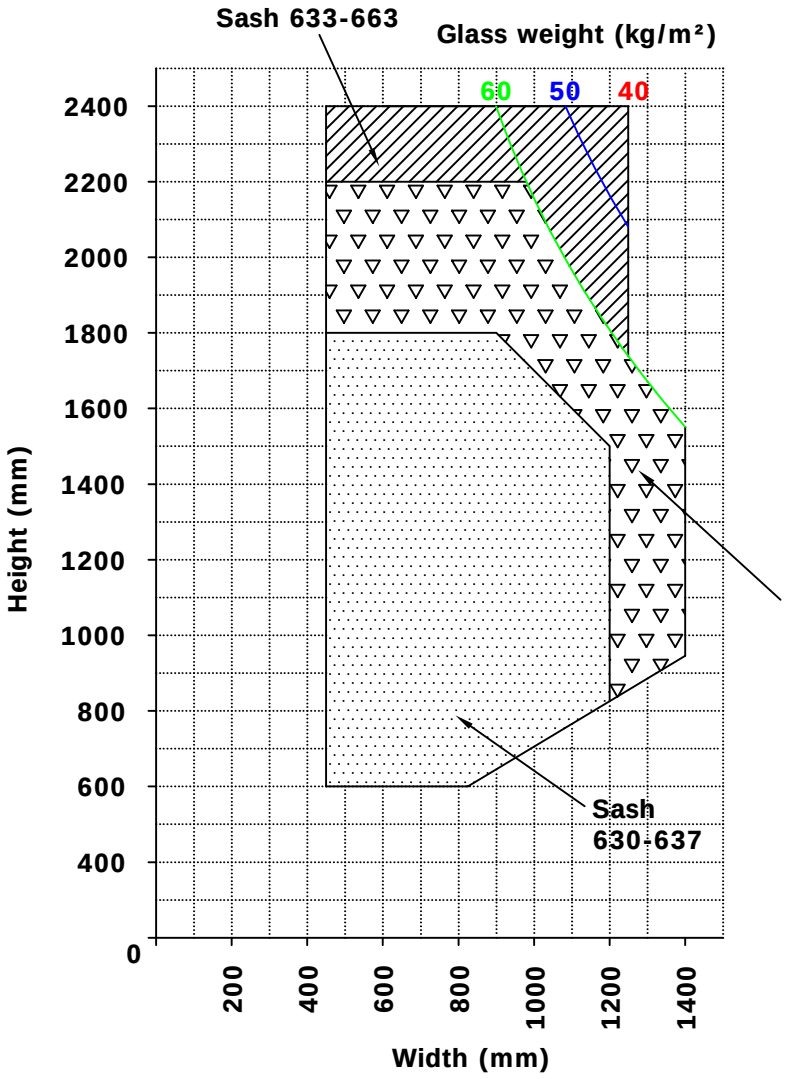
Vent Size Limitation Chart

Siegenia Turn Only Fittings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

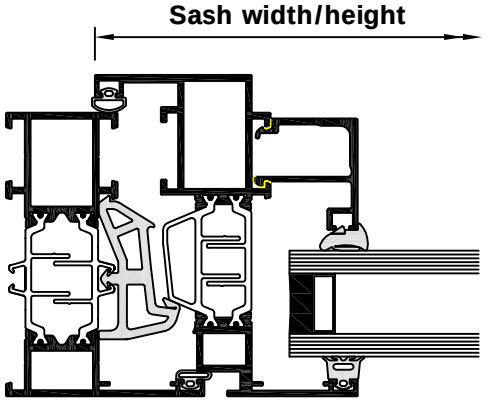
Sashes should not be left unattended other than in their closed and secured position.
For sash sizes or weights outside these limitations, fabricator may submit an Oversize Vent Application form for Metal Technology's consideration.
For handle located centrally at jamb, Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:



Additional Fittings	Reference
Lockable handle (Siegenia) *	TT28A
Locking keys (Siegenia)	TT33
Firemans axe boss	786
Loose handle for firemans axe boss	787
90 degree restrictor stay for sash widths 450-1300	788A
90 degree restrictor stay for sash widths 1301-1400	788B

*** Includes reinforcing plate**

In turn only applications tilt and turn handle TT28A may be manually adjusted so that it can only move through a 90° rotation. Refer to Metal Technology's Technical Department for further details.



Maximum sash weight limitation = 90Kg / 120Kg**

Where there is a muntin (i.e. mullion/transom) contained within a sash the maximum weight shall be 75Kg.

PTT16 link rods issued separately in bar length.

**** For sash weights over 90Kg. "120Kg accessory bag TTGEAR746" must be used.**

Part	Description	Siegenia reference	Metal Technology reference
2-11	BS LM4200 SI-SILVER	MMBS0010-525020	TTGEAR713
20-24	VS LM-D SDF TS B1	MMVS0280-100030	TTGEAR2087
25-26	HANDLE COUPLING SET LM A0156	MMKL0060-100030	TTGEAR726
30-32	MV LM4200-D VS/BS TS B1	246986	TTGEAR2083
33-37	MV LM4200-D VSU/VSO A0102	MMMV0040-100030	TTGEAR2084

Standard turn only gear (Siegenia)

Sash height \ Sash width	450 to 1250	1251 to 1400
600 to 1250	2-11, 20-24, 25-26	2-11, 33-37, 25-26
1251 to 2000	2-11, 20-24, 25-26, 30-32	2-11, 33-37, 30-32, 25-26
2001 to 2400	2-11, 20-24, 25-26, 30-32	N/A

Vent Size Limitation Chart

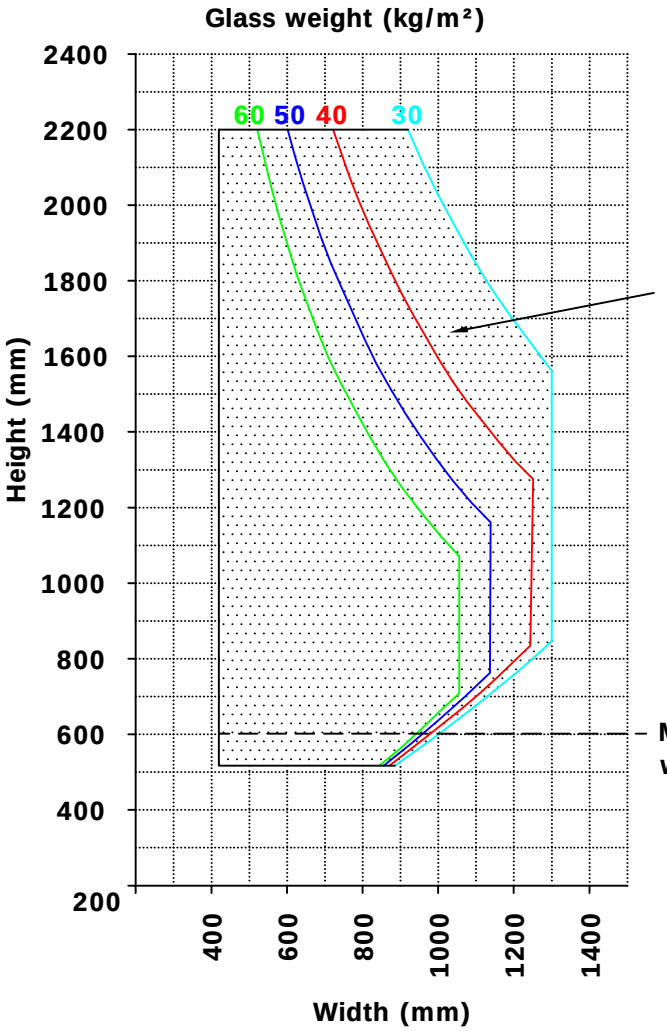
Siegenia Standard Concealed Tilt Before Turn Fittings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

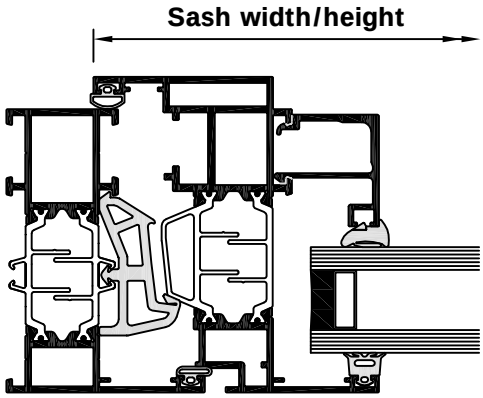
These charts are applicable to handles fitted centrally and at 1/3 height. Where handles are fitted at 1/3 height, Metal Technology recommends that final operational approval of the window in situ is obtained from the client prior to ordering of materials. Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:

No suspension cable



Additional Fittings	Reference
Key-safe lockable handle with turn lock	TTGEAR2046
Turn disabling component	TTGEAR2070 x 2 no.

For details of tilt only and turn only options please refer to Metal Technology's Technical Department.



Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List – Handle at Centre

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Part	Description	Metal Technology reference	Fixing screws 7282 19mm screw	Fixing screws 7223 25mm screw	Striker info
1a	Corner Slider VSO Small	TTGEAR2000	1	3	1 roller
1b	Corner Slider VSO	TTGEAR2001	0	6	1 roller
2-a	Stay Sash Part 2 V-V sz.1	TTGEAR2002	0	3	
2-b	Stay Sash Part 2 V-V sz.2+3 1RS	TTGEAR2003	0	4	1 roller
2-c	Stay Sash Part 2 V-V sz.4 1 RS	TTGEAR2004	0	5	1 roller
2-d	Stay Sash Part 2 V-V sz.5 1RS	TTGEAR2005	0	6	1 roller
3-a	Stay Arm V-V 18 TBT sz.1 rh	TTGEAR2006/RH	2	0	
	Stay Arm V-V 18 TBT sz.1 lh	TTGEAR2006/LH	2	0	
3-b	Stay Arm V-V 18 TBT sz.2+3 rh	TTGEAR2007/RH	2	0	
	Stay Arm V-V 18 TBT sz.2+3 lh	TTGEAR2007/LH	2	0	
3-c	Stay Arm V-V 18 TBT sz.4 rh	TTGEAR2008/RH	2	0	
	Stay Arm V-V 18 TBT sz.4 lh	TTGEAR2008/LH	2	0	
3-d	Stay Arm V-V 18 TBT sz.5 rh	TTGEAR2009/RH	2	0	
	Stay Arm V-V 18 TBT sz.5 lh	TTGEAR2009/LH	2	0	
16-18	Additional stay TBT TS	TTGEAR2010	3	4	1 roller
7	Corner Slider VSU / S-ES 9mm	TTGEAR2011	0	6	1 t/bearing
8-a	Centre Lock Gr. 50	TTGEAR2012	0	2	1 roller
8-b	Centre Lock Gr. 70	TTGEAR2013	0	3	1 roller
10	Bottom Hinge V-V 18 with Stop r/h TS	TTGEAR2015/RH	3	1	
	Bottom Hinge V-V 18 with Stop l/h TS	TTGEAR2015/LH	3	1	
11	Corner Hinge V-V	TTGEAR2016	0	4	
14-a	Gear 3/7 SZ 0 TS	TTGEAR2017	0	0	
14-b	Gear 3/7 SZ 1 TS	TTGEAR2018	0	2	
14-c	Drive Gear 3/7 - Size 1a MV	TTGEAR2019	0	2	1 roller
14-d	Drive Gear 3/7 - Size 2 MV	TTGEAR2020	0	4	1 roller
14-e	Drive Gear 3/7 - Size 3 MV	TTGEAR2021	0	6	1 roller
14-f	Drive Gear 3/7 - Size 4 / TL	TTGEAR2022	0	10	2 rollers
15	Corner Slider BSU/BS Size 20	TTGEAR2023	0	3	1 roller
15-a	Corner Slider BSU/BS Size 50	TTGEAR2024	0	3	2 rollers
15-b	Corner Slider BSU/BS Size 70	TTGEAR2025	0	4	2 rollers
15-c	Corner Slider BSU/BS Size 90	TTGEAR2026	0	5	2 rollers
15-d	Corner Slider BSU/BS Size 130	TTGEAR2027	0	7	3 rollers
20	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
30	Extension rod 230mm, no spud	6767	0	4	
31	Corner Slider Size 40	TTGEAR2080	0	3	1 roller
Profile Related Part					
6	Striker Plate Metal Technology	TTGEAR2035	0	1	
21-25	Acc. Bag Alu. 14/18 r/h	TTGEAR2032/RH	3	1	
	Acc. Bag Alu. 14/18 l/h	TTGEAR2032/LH	3	1	
9	Tilt Lock B.S-ES FH TBT RH1320/1 TS	TTGEAR2033/RH	0	2	
	Tilt Lock B.S-ES FH TBT LH1320/1 TS	TTGEAR2033/LH	0	2	
19	Additional Stay Packer	TTGEAR2034	0	0	
25*	BSU with 3 Screw Fixing positions	TTGEAR2039	1	0	

Refer to Fitting Manual pages 2 and 3

Sash height \ Sash width	402 to 517	518 to 717	718 to 887	888 to 1087	1088 to 1287	1288 to 1300
517 to 637	1a, 2a, 3a, 7, 10, 11, 14a, 15, 21-25, 9, 6x2	1b, 2a, 3a, 7, 10, 11, 14a, 15, 21-25, 9, 6x2	1b, 2b, 3b, 7, 10, 11, 14a, 15, 21-25, 9, 6x3	1b, 2c, 3c, 7, 8a, 10, 11, 14a, 15, 21-25, 9, 6x4	1b, 2d, 3d, 7, 8a, 10, 11, 14a, 15, 21-25, 9, 6x4	N/A
638 to 717	1a, 2a, 3a, 7, 10, 11, 14b, 15, 21-25, 9, 6x2	1b, 2a, 3a, 7, 10, 11, 14b, 15, 21-25, 9, 6x2	1b, 2b, 3b, 7, 10, 11, 14b, 15, 21-25, 9, 6x3	1b, 2c, 3c, 7, 8a, 10, 11, 14b, 15, 21-25, 9, 6x4	1b, 2d, 3d, 7, 8a, 10, 11, 14b, 15, 21-25, 9, 6x4	1b, 2c, 3c, 7, 8b, 10, 11, 14b, 15, 16-18, 19, 21-25, 9, 6x5
718 to 837	1a, 2a, 3a, 7, 10, 11, 14c, 15a, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14c, 15a, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14c, 15a, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14c, 15a, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14c, 15a, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14c, 15a, 16-18, 19, 20, 21-25, 9, 6x7
838 to 1037	1a, 2a, 3a, 7, 10, 11, 14c, 15b, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14c, 15b, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14c, 15b, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14c, 15b, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14c, 15b, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14c, 15b, 16-18, 19, 20, 21-25, 9, 6x7
1038 to 1237	1a, 2a, 3a, 7, 10, 11, 14d, 15b, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14d, 15b, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14d, 15b, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14d, 15b, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14d, 15b, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14d, 15b, 16-18, 19, 20, 21-25, 9, 6x7
1238 to 1497	1a, 2a, 3a, 7, 10, 11, 14d, 15c, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14d, 15c, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14d, 15c, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14d, 15c, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14d, 15c, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14d, 15c, 16-18, 19, 20, 21-25, 9, 6x7
1498 to 1917	1a, 2a, 3a, 7, 10, 11, 14e, 15d, 20, 21-25, 9, 6x5,	1b, 2a, 3a, 7, 10, 11, 14e, 15d, 20, 21-25, 9, 6x5	1b, 2b, 3b, 7, 10, 11, 14e, 15d, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8a, 10, 11, 14e, 15d, 20, 21-25, 9, 6x7	1b, 2d, 3d, 7, 8a, 10, 11, 14e, 15d, 20, 21-25, 9, 6x7	1b, 2c, 3c, 7, 8b, 10, 11, 14e, 15d, 16-18, 19, 20, 21-25, 9, 6x8
1918 to 2200	1a, 2a, 3a, 7, 10, 11, 14f, 15d, 20, 21-25, 9, 6x6	1b, 2a, 3a, 7, 10, 11, 14f, 15d, 20, 21-25, 9, 6x6	1b, 2b, 3b, 7, 10, 11, 14f, 15d, 20, 21-25, 9, 6x7	1b, 2c, 3c, 7, 8a, 10, 11, 14f, 15d, 20, 21-25, 9, 6x8	1b, 2d, 3d, 7, 8a, 10, 11, 14f, 15d, 20, 21-25, 9, 6x8	1b, 2c, 3c, 7, 8b, 10, 11, 14f, 15d, 16-18, 19, 20, 21-25, 9, 6x9

*** Add 1 no per sash when hinged off a mullion, and screw to suit.**

Vent Size Limitation Chart

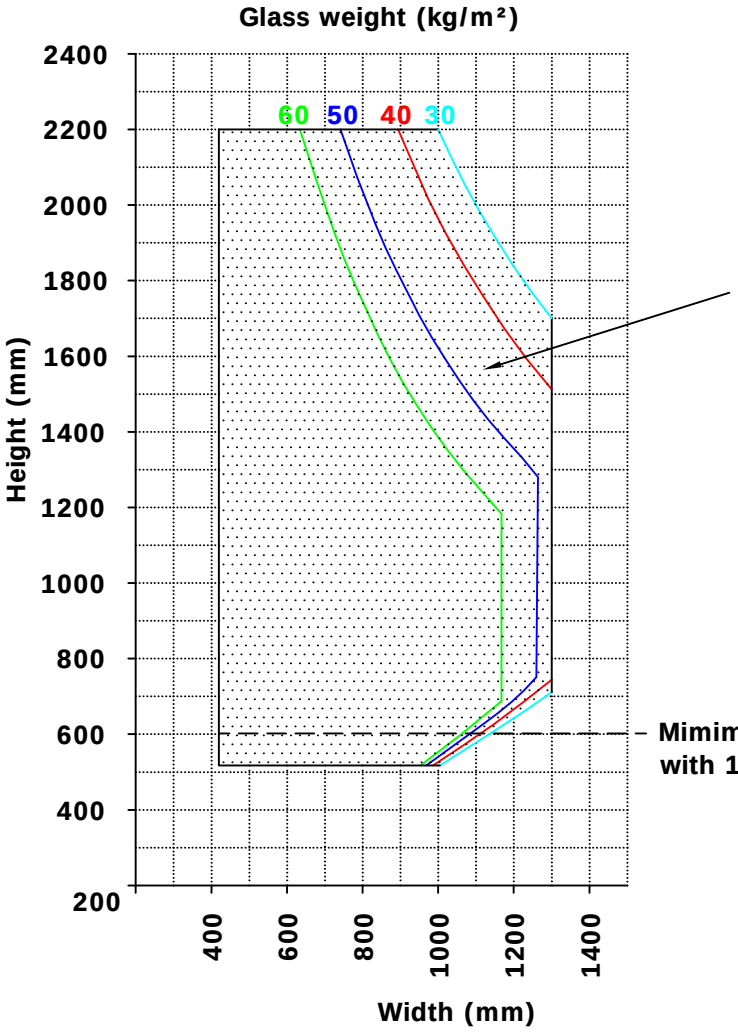
Siegenia Standard Concealed Tilt Before Turn Fittings with Additional Load Bearing Device

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

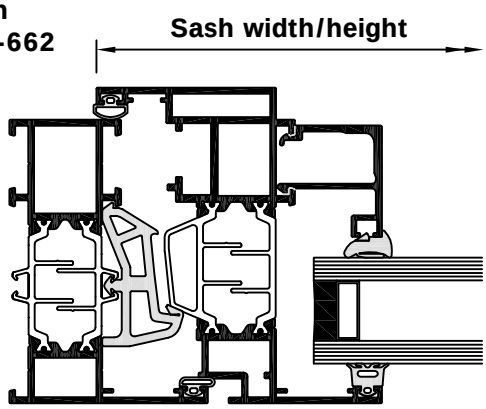
These charts are applicable to handles fitted centrally and at 1/3 height. Where handles are fitted at 1/3 height, Metal Technology recommends that final operational approval of the window in situ is obtained from the client prior to ordering of materials. Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:

Suspension cable



Additional Fittings	Reference
Key-safe lockable handle with turn lock	TTGEAR2046
Turn disabling component	TTGEAR2070 x 2 no.

For details of tilt only and turn only options please refer to Metal Technology's Technical Department.



Siegenia Standard Concealed Tilt Before Turn Gearing with Additional Load Bearing Device Kitting List – Handle at Centre

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Part	Description	Metal Technology reference	Fixing screws 7282 19mm screw	Fixing screws 7223 25mm screw	Striker info
1a	Corner Slider VSO Small	TTGEAR2000	1	3	1 roller
1b	Corner Slider VSO	TTGEAR2001	0	6	1 roller
2-a	Stay Sash Part 2 V-V sz.1	TTGEAR2002	0	3	
2-b	Stay Sash Part 2 V-V sz.2+3 1RS	TTGEAR2003	0	4	1 roller
2-c	Stay Sash Part 2 V-V sz.4 1 RS	TTGEAR2004	0	5	1 roller
2-d	Stay Sash Part 2 V-V sz.5 1RS	TTGEAR2005	0	6	1 roller
3-a	Stay Arm V-V 18 TBT sz.1 rh	TTGEAR2006/RH	2	0	
	Stay Arm V-V 18 TBT sz.1 lh	TTGEAR2006/LH	2	0	
3-b	Stay Arm V-V 18 TBT sz.2+3 rh	TTGEAR2007/RH	2	0	
	Stay Arm V-V 18 TBT sz.2+3 lh	TTGEAR2007/LH	2	0	
3-c	Stay Arm V-V 18 TBT sz.4 rh	TTGEAR2008/RH	2	0	
	Stay Arm V-V 18 TBT sz.4 lh	TTGEAR2008/LH	2	0	
3-d	Stay Arm V-V 18 TBT sz.5 rh	TTGEAR2009/RH	2	0	
	Stay Arm V-V 18 TBT sz.5 lh	TTGEAR2009/LH	2	0	
16-18	Additional stay TBT TS	TTGEAR2010	3	4	1 roller
7	Corner Slider VSU / S-ES 9mm	TTGEAR2011	0	6	1 t/bearing
8-a	Centre Lock Gr. 50	TTGEAR2012	0	2	1 roller
8-b	Centre Lock Gr. 70	TTGEAR2013	0	3	1 roller
10	Bottom Hinge V-V 18 with Stop r/h TS	TTGEAR2015/RH	3	1	
	Bottom Hinge V-V 18 with Stop l/h TS	TTGEAR2015/LH	3	1	
11	Corner Hinge V-V	TTGEAR2016	0	4	
14-a	Gear 3/7 SZ 0 TS	TTGEAR2017	0	0	
14-b	Gear 3/7 SZ 1 TS	TTGEAR2018	0	2	
14-c	Drive Gear 3/7 - Size 1a MV	TTGEAR2019	0	2	1 roller
14-d	Drive Gear 3/7 - Size 2 MV	TTGEAR2020	0	4	1 roller
14-e	Drive Gear 3/7 - Size 3 MV	TTGEAR2021	0	6	1 roller
14-f	Drive Gear 3/7 - Size 4 / TL	TTGEAR2022	0	10	2 rollers
15	Corner Slider BSU/BS Size 20	TTGEAR2023	0	3	1 roller
15-a	Corner Slider BSU/BS Size 50	TTGEAR2024	0	3	2 rollers
15-b	Corner Slider BSU/BS Size 70	TTGEAR2025	0	4	2 rollers
15-c	Corner Slider BSU/BS Size 90	TTGEAR2026	0	5	2 rollers
15-d	Corner Slider BSU/BS Size 130	TTGEAR2027	0	7	3 rollers
20	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
30	Extension rod 230mm, no spud	6767	0	4	
31	Corner Slider Size 40	TTGEAR2080	0	3	1 roller
26	Sash Bearing Block Filler	TTGEAR2028	0	0	
27	Sash Bearing Block	TTGEAR2029	0	2	
28	Suspension Cable	TTGEAR2030	0	2	
Profile Related Part :-					
6	Striker Plate Metal Technology	TTGEAR2035	0	1	
21-25	Acc. Bag Alu. 14/18 r/h	TTGEAR2032/RH	3	1	
	Acc. Bag Alu. 14/18 l/h	TTGEAR2032/LH	3	1	
9	Tilt Lock B.S-ES FH TBT RH1320/1 TS	TTGEAR2033/RH	0	2	
	Tilt Lock B.S-ES FH TBT LH1320/1 TS	TTGEAR2033/LH	0	2	
19	Additional Stay Packer	TTGEAR2034	0	0	
25*	BSU with 3 Screw Fixing positions	TTGEAR2039	1	0	

*** Add 1 no per sash when hinged off a mullion, and screw to suit.**

Refer to Fitting Manual pages 2 and 3

Sash height \ Sash width	402 to 517	518 to 717	718 to 887	888 to 1087	1088 to 1287	1288 to 1300
517 to 637	1a, 2a, 3a, 7, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x2	1b, 2a, 3a, 7, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x2	1b, 2b, 3b, 7, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x3	1b, 2c, 3c, 7, 8a, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x4	1b, 2d, 3d, 7, 8a, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x4	N/A
638 to 717	1a, 2a, 3a, 7, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x2	1b, 2a, 3a, 7, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x2	1b, 2b, 3b, 7, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x3	1b, 2c, 3c, 7, 8a, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x4	1b, 2d, 3d, 7, 8a, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x4	1b, 2c, 3c, 7, 8b, 10, 11, 14b, 15, 16-19, 26, 27, 28, 21-25, 9, 6x5
718 to 937	1a, 2a, 3a, 7, 10, 11, 14c, 15, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14c, 15, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14c, 15, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14c, 15, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14c, 15, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14c, 15, 16-19, 26, 27, 28, 20, 21-25, 9, 6x7
938 to 1037	1a, 2a, 3a, 7, 10, 11, 14c, 15a, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14c, 15a, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14c, 15a, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14c, 15a, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14c, 15a, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14c, 15a, 16-19, 26, 27, 28, 20, 21-25, 9, 6x7
1038 to 1137	1a, 2a, 3a, 7, 10, 11, 14d, 15a, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14d, 15a, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14d, 15a, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14d, 15a, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14d, 15a, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14d, 15a, 16-19, 26, 27, 28, 20, 21-25, 9, 6x7
1138 to 1337	1a, 2a, 3a, 7, 10, 11, 14d, 15b, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14d, 15b, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14d, 15b, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14d, 15b, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14d, 15b, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14d, 15b, 16-19, 26, 27, 28, 20, 21-25, 9, 6x7
1338 to 1497	1a, 2a, 3a, 7, 10, 11, 14d, 15c, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2a, 3a, 7, 10, 11, 14d, 15c, 26, 27, 28, 20, 21-25, 9, 6x4	1b, 2b, 3b, 7, 10, 11, 14d, 15c, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2c, 3c, 7, 8a, 10, 11, 14d, 15c, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2d, 3d, 7, 8a, 10, 11, 14d, 15c, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8b, 10, 11, 14d, 15c, 16-19, 26, 27, 28, 20, 21-25, 9, 6x7
1498 to 1737	1a, 2a, 3a, 7, 10, 11, 14e, 15c, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2a, 3a, 7, 10, 11, 14e, 15c, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2b, 3b, 7, 10, 11, 14e, 15c, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8a, 10, 11, 14e, 15c, 26, 27, 28, 20, 21-25, 9, 6x7	1b, 2d, 3d, 7, 8a, 10, 11, 14e, 15c, 26, 27, 28, 20, 21-25, 9, 6x7	1b, 2c, 3c, 7, 8b, 10, 11, 14e, 15c, 16-19, 26, 27, 28, 20, 21-25, 9, 6x8
1738 to 1917	1a, 2a, 3a, 7, 10, 11, 14e, 15d, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2a, 3a, 7, 10, 11, 14e, 15d, 26, 27, 28, 20, 21-25, 9, 6x5	1b, 2b, 3b, 7, 10, 11, 14e, 15d, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2c, 3c, 7, 8a, 10, 11, 14e, 15d, 26, 27, 28, 20, 21-25, 9, 6x7	1b, 2d, 3d, 7, 8a, 10, 11, 14e, 15d, 26, 27, 28, 20, 21-25, 9, 6x7	1b, 2c, 3c, 7, 8b, 10, 11, 14e, 15d, 16-19, 26, 27, 28, 20, 21-25, 9, 6x8
1918 to 2200	1a, 2a, 3a, 7, 10, 11, 14f, 15d, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2a, 3a, 7, 10, 11, 14f, 15d, 26, 27, 28, 20, 21-25, 9, 6x6	1b, 2b, 3b, 7, 10, 11, 14f, 15d, 26, 27, 28, 20, 21-25, 9, 6x7	1b, 2c, 3c, 7, 8a, 10, 11, 14f, 15d, 26, 27, 28, 20, 21-25, 9, 6x8	1b, 2d, 3d, 7, 8a, 10, 11, 14f, 15d, 26, 27, 28, 20, 21-25, 9, 6x8	1b, 2c, 3c, 7, 8b, 10, 11, 14f, 15d, 16-19, 26, 27, 28, 20, 21-25, 9, 6x9

Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List – Handle at 1/3

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

There are two different variable height ranges available:
- option 1 (handle positioned 243.5 - 493.5mm from the bottom of the overall sash)
- option 2 (handle positioned 358.5 - 608.5mm from the bottom of the overall sash)

Step 1 - select the correct kit from sheet "Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre".
Step 2 - select handle position required on the matrix shown below - either option 1 or option 2.
Step 3 - add the fittings shown on the matrix shown below ("Add fittings" column) for your handle height selection - these are required in addition to the parts already identified from sheet "Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre" (Step 1).
Step 4 - delete the fittings shown on the matrix shown below ("Remove fittings" column) for your handle height selection - these fittings were selected in step 1. Fittings added in step 3 now replace these and convert the half handle kit to the variable low handle kit.

Option 1 - handle between 243.5 - 493.5mm

			Fixing screws		
Part	Description	Metal Technology reference	7282 19mm screw	7223 25mm screw	Striker info
1b	Corner Slider VSO S.ES Small	834	1	3	1 t/bearing
2	Corner Slider VSO	TTGEAR2001	0	6	1 roller
3	Drive Gear 3/7 - Size 1a MV	TTGEAR2019	0	2	1 roller
4	Linkage 230	6767	0	4	
5	Linkage 460MV	TTGEAR2036	0	4	1 roller
6	Linkage 690MV	TTGEAR2053	0	5	1 roller
7	Linkage 920MV	TTGEAR2054	0	6	2 rollers
8	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
9	Striker plate (Metal Technology)	TTGEAR2035	0	1	

Option 2 - handle between 358.5 - 608.5mm

			Fixing screws		
Part	Description	Metal Technology reference	7282 19mm screw	7223 25mm screw	Striker info
1a	Corner Slider VSU / S-ES 9mm	TTGEAR2011	0	6	1 t/bearing
2	Corner Slider VSO	TTGEAR2001	0	6	1 roller
3	Drive Gear 3/7 - Size 1a MV	TTGEAR2019	0	2	1 roller
4	Linkage 230	6767	0	4	
5	Linkage 460MV	TTGEAR2036	0	4	1 roller
6	Linkage 690MV	TTGEAR2053	0	5	1 roller
7	Linkage 920MV	TTGEAR2054	0	6	2 rollers
8	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
9	Striker plate (Metal Technology)	TTGEAR2035	0	1	

Refer to Fitting Manual page 6		
Option 1		
Sash height ⇩	Add fittings	Remove fittings
602 to 832	1b, 3, 9	7, 14a or 7, 14b or 7, 14c
833 to 1082	1b, 3, 4, 9	7, 14c or 7, 14d
1083 to 1312	1b, 3, 5, 9	7, 14d
1313 to 1542	1b, 3, 6, 9	7, 14d or 7, 14e
1543 to 1772	1b, 3, 7, 9x2	7, 14e

Refer to Fitting Manual page 6		
Option 2		
Sash height ⇩	Add fittings	Remove fittings
602 to 947	3, 9	14a or 14b or 14c
948 to 1197	3, 4, 9	14c or 14d
1198 to 1427	3, 5, 9	14d
1428 to 1657	3, 6, 9	14d or 14e
1658 to 1887	3, 7, 9x2	14e

Note: Metal Technology do not recommend fitting the handle any lower than 1/3 from the bottom of the sash rebate.

Security Requirements

Tilt and Turn Euro Groove Sash 632-662

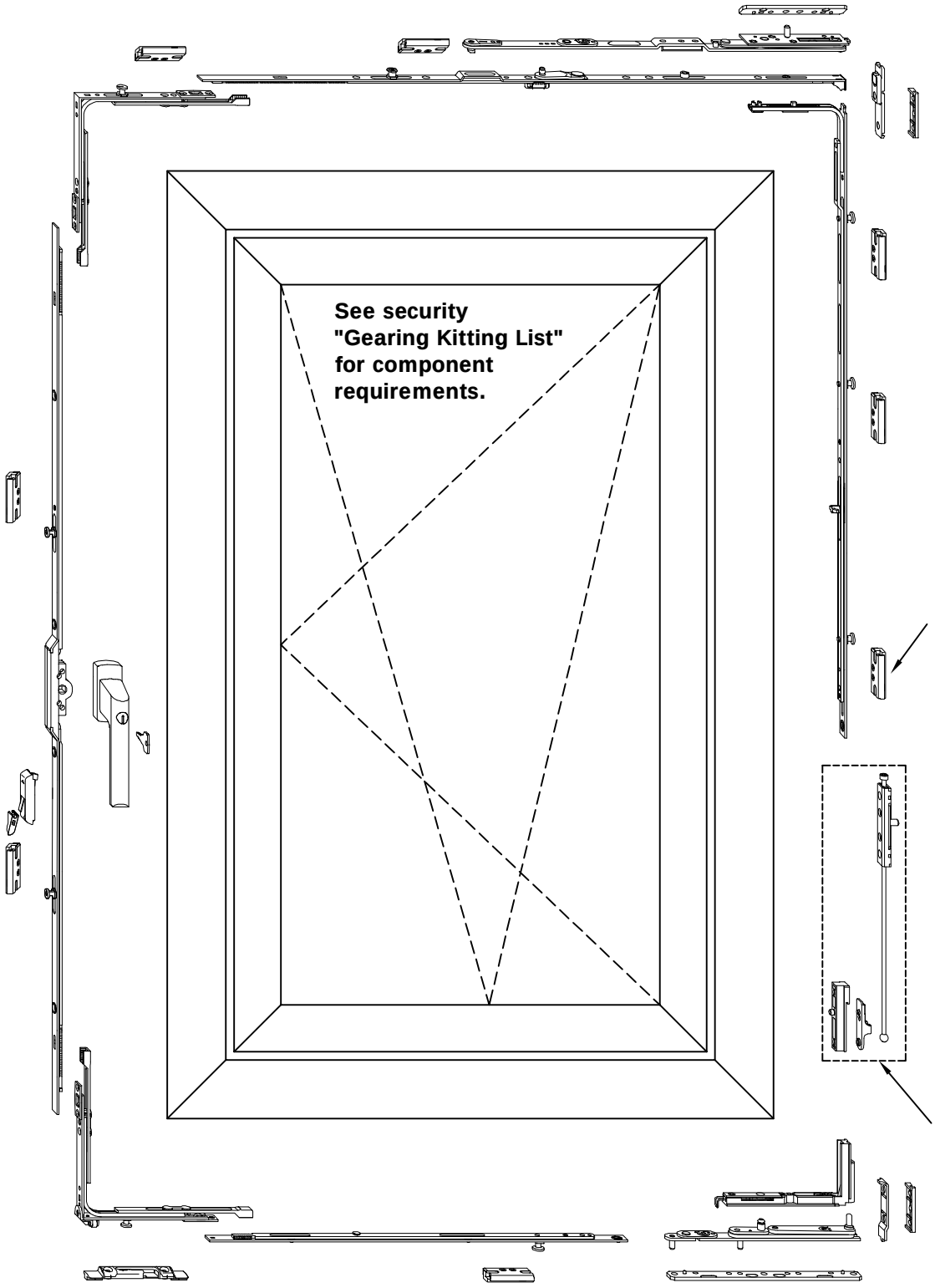
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Metal Technology has successfully tested System 5-35 Hi/Hi+ to BS 7950 and PAS 24 using the following ironmongery:

As required by Secure by Design, security products should be labelled by the fabricator in accordance with BS 4873.

All security windows must be manufactured in conjunction with standard fabrication details as stated in this manual. Components to be fixed using screws listed on kitting list.



Not to Scale

Vent Size Limitation Chart - Security

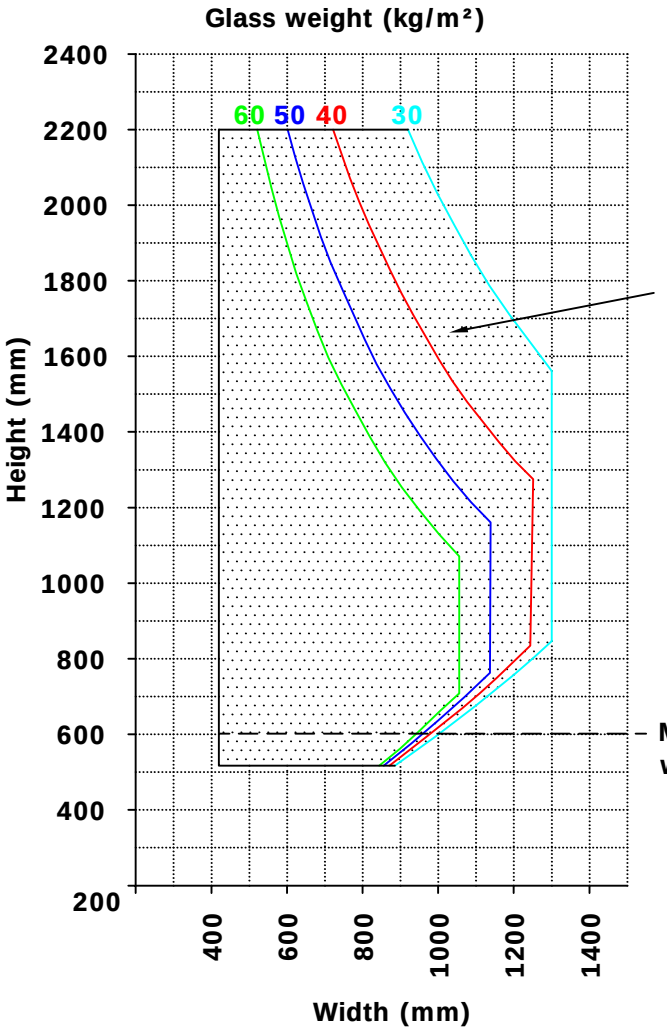
Siegenia Security Concealed Tilt Before Turn Fittings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

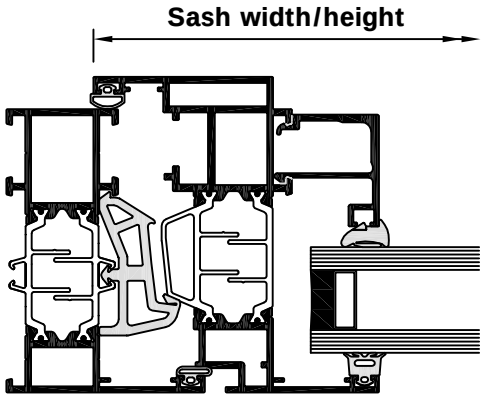
These charts are applicable to handles fitted centrally and at 1/3 height. Where handles are fitted at 1/3 height, Metal Technology recommends that final operational approval of the window in situ is obtained from the client prior to ordering of materials. Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:

No suspension cable



Additional Fittings	Reference
Key-safe lockable handle with turn lock	TTGEAR2046
Turn disabling component	TTGEAR2070 x 2 no.

For details of tilt only and turn only options please refer to Metal Technology's Technical Department.



Siegenia Security Concealed Tilt Before Turn Gearing Kitting List – Handle at Centre

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Part	Description	Metal Technology reference	Fixing screws 7282 19mm screw	Fixing screws 7223 25mm screw	Striker info
1	Narrow Corner Drive VS S-ES TS	834	1	3	1 t/bearing
7	Corner Drive VS S-ES TS	833	0	6	1 roller
2-a	Stay Sash Part 2 V-V sz.1	TTGEAR2002	0	3	
2-b	Stay Sash Part 2 V-V sz.2+3 1RS	TTGEAR2003	0	4	1 roller
2-c	Stay Sash Part 2 V-V sz.4 1 RS	TTGEAR2004	0	5	1 roller
2-d	Stay Sash Part 2 V-V sz.5 1RS	TTGEAR2005	0	6	1 roller
3-a	Stay Arm V-V 18 TBT sz.1 rh	TTGEAR2006/RH	2	0	
	Stay Arm V-V 18 TBT sz.1 lh	TTGEAR2006/LH	2	0	
3-b	Stay Arm V-V 18 TBT sz.2+3 rh	TTGEAR2007/RH	2	0	
	Stay Arm V-V 18 TBT sz.2+3 lh	TTGEAR2007/LH	2	0	
3-c	Stay Arm V-V 18 TBT sz.4 rh	TTGEAR2008/RH	2	0	
	Stay Arm V-V 18 TBT sz.4 lh	TTGEAR2008/LH	2	0	
3-d	Stay Arm V-V 18 TBT sz.5 rh	TTGEAR2009/RH	2	0	
	Stay Arm V-V 18 TBT sz.5 lh	TTGEAR2009/LH	2	0	
16-18	Additional Stay TBT TS	TTGEAR2010	3	4	1 roller
12	Corner Drive VSU S-ES FH/9 TS	TTGEAR2011	0	6	1 t/bearing
8-a	Extension S-ES SZ 0 TS	827	0	2	1 roller
8-b	Linkage S-ES SZ 230 TS	TTGEAR2040	0	4	1 roller
8-c	Linkage S-ES SZ 460 TS	TTGEAR2041	0	4	1 roller
8-d	Linkage S-ES SZ 690 MV TS	TTGEAR2042	0	5	1 roller
10	Bottom Hinge V-V 18 with Stop r/h TS	TTGEAR2015/RH	3	1	
	Bottom Hinge V-V 18 with Stop l/h TS	TTGEAR2015/LH	3	1	
11	Corner Hinge V-V	TTGEAR2016	0	4	
14-a	Gear 3/7 SZ 0 TS	TTGEAR2017	0	0	
14-b	Gear 3/7 SZ 1 TS	TTGEAR2018	0	2	
14-c	Gear 3/7 S-ES SZ 1A MV TS	TTGEAR2043	0	3	1 roller
14-d	Gear 3/7 S-ES SZ 2 MV TS	TTGEAR2044	0	5	2 rollers
14-e	Gear 3/7 S-ES SZ 3 MV TS	TTGEAR2045	0	10	2 rollers
15	Corner Drive BS SZ.20 1S TS	TTGEAR2023	0	3	1 roller
15-a	Corner Slider BS S-ES A0103 SZ 50 TS	TTGEAR2047	0	4	2 rollers
15-b	Corner Slider BS S-ES A0103 SZ 70 TS	TTGEAR2048	0	5	2 rollers
15-c	Corner Slider BS S-ES A0103 SZ 90 TS	TTGEAR2049	0	6	2 rollers
15-d	Corner Slider BS S-ES A0103 SZ 130 TS	TTGEAR2050	0	8	3 rollers
20	Mishandling Device FAV. TS	TTGEAR2031	0	0	
31a	MV Extension S-ES SZ. 40 TS	TTGEAR2078	0	3	1 roller
31b	MV Extension S-ES SZ. 60 TS	TTGEAR2079	0	4	1 roller
Profile Related Part					
30	Striker Plate Metal Technology	TTGEAR2035	0	1	
6	Striker Plate S-ES A5220	TTGEAR2051	2	1	
29	Striker Plate S-RS A1320/1 TS	TTGEAR2052	0	2	
21-25	Acc. Bag Alu. 14/18 r/h	TTGEAR2032/RH	4	0	
	Acc. Bag Alu. 14/18 l/h	TTGEAR2032/LH	4	0	
9	Tilt Lock B.S-ES FH TBT RH1320/1 TS	TTGEAR2033/RH	0	2	
	Tilt Lock B.S-ES FH TBT LH1320/1 TS	TTGEAR2033/LH	0	2	
19	Additional Stay Packer	TTGEAR2034	0	0	
25*	BSU with 3 Screw Fixing positions	TTGEAR2039	1	0	

*** Add 1 no per sash when hinged off a mullion, and screw to suit.**

Refer to Fitting Manual pages 4 and 5

Sash height \ Sash width	402 to 517	518 to 717	718 to 887	888 to 1087	1088 to 1287	1288 to 1580
517 to 637	1, 2a, 3a, 12, 10, 11, 14a, 15, 21-25, 9, 6x2	7, 2a, 3a, 12, 10, 11, 14a, 15, 21-25, 9, 6x2	7, 2b, 3b, 12, 8a, 10, 11, 14a, 15, 21-25, 9, 6x3, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14a, 15, 21-25, 9, 6x4, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14a, 15, 21-25, 9, 6x4, 29	N/A
638 to 717	1, 2a, 3a, 12, 10, 11, 14b, 15, 21-25, 9, 6x2	7, 2a, 3a, 12, 10, 11, 14b, 15, 21-25, 9, 6x2	7, 2b, 3b, 12, 8a, 10, 11, 14b, 15, 21-25, 9, 6x3, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14b, 15, 21-25, 9, 6x4, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14b, 15, 21-25, 9, 6x4, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14b, 15, 16-18, 19, 21-25, 9, 6x4, 29, 30
718 to 837	1, 2a, 3a, 12, 10, 11, 14c, 15a, 20, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14c, 15a, 20, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14c, 15a, 20, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14c, 15a, 20, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14c, 15a, 20, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14c, 15a, 20, 16-18, 19, 21-25, 9, 6x6, 29, 30
838 to 1037	1, 2a, 3a, 12, 10, 11, 14c, 15b, 20, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14c, 15b, 20, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14c, 15b, 20, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14c, 15b, 20, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14c, 15b, 20, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14c, 15b, 20, 16-18, 19, 21-25, 9, 6x6, 29, 30
1038 to 1237	1, 2a, 3a, 12, 10, 11, 14d, 15b, 20, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14d, 15b, 20, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14d, 15b, 20, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 15b, 20, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 15b, 20, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 15b, 20, 16-18, 19, 21-25, 9, 6x6, 29, 30
1238 to 1497	1, 2a, 3a, 12, 10, 11, 14d, 15b, 20, 31a, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14d, 15b, 20, 31a, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14d, 15b, 20, 31a, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 15b, 31a, 20, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 15b, 31a, 20, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 15b, 20, 16-18, 19, 31a, 21-25, 9, 6x7, 29, 30
1498 to 1917	1, 2a, 3a, 12, 10, 11, 14e, 15c, 20, 31b, 21-25, 9, 6x5,	7, 2a, 3a, 12, 10, 11, 14e, 15c, 20, 31b, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14e, 15c, 20, 31b, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14e, 15c, 31b, 20, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14e, 15c, 31b, 20, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14e, 15c, 20, 16-18, 19, 31b, 21-25, 9, 6x7, 29, 30
1918 to 2397	1, 2a, 3a, 12, 8bx2, 10, 11, 14e, 15d, 31a, 20, 21-25, 9, 6x8	7, 2a, 3a, 12, 8bx2, 10, 11, 14e, 15d, 31a, 20, 21-25, 9, 6x8	7, 2b, 3b, 12, 8a, 8bx2, 10, 11, 14e, 15d, 20, 31a, 21-25, 9, 6x8, 29	7, 2c, 3c, 12, 8a, 8bx3, 10, 11, 14e, 15d, 20, 31a, 21-25, 9, 6x10, 29	7, 2d, 3d, 12, 8a, 8bx3, 10, 11, 14e, 15d, 20, 31a, 21-25, 9, 6x10, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 8bx2, 14e, 15d, 20, 16-18, 19, 31a, 21-25, 9, 6x11, 29, 30
2398 to 2500	1, 2a, 3a, 12, 8cx2, 10, 11, 14e, 15d, 31b, 20, 21-25, 9, 6x8	7, 2a, 3a, 12, 8cx2, 10, 11, 14e, 15d, 31b, 20, 21-25, 9, 6x8	7, 2b, 3b, 12, 8a, 8cx2, 10, 11, 14e, 15d, 20, 31b, 21-25, 9, 6x8, 29	7, 2c, 3c, 12, 8a, 8b, 8cx2, 10, 11, 14e, 15d, 20, 31b, 21-25, 9, 6x11, 29	N/A	N/A

Vent Size Limitation Chart - Security

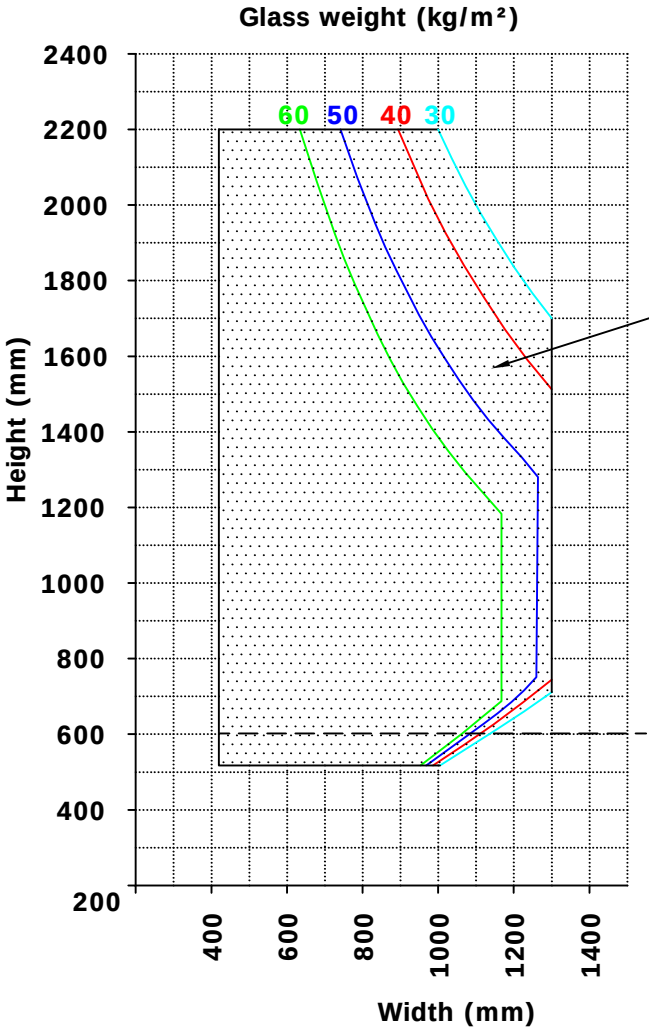
Siegenia Security Concealed Tilt Before Turn Fittings with Additional Load Bearing Device

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

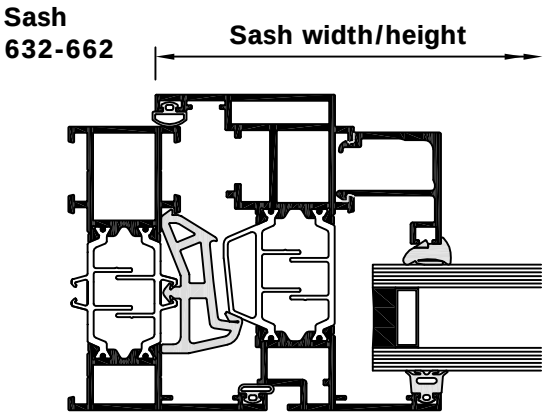
These charts are applicable to handles fitted centrally and at 1/3 height. Where handles are fitted at 1/3 height, Metal Technology recommends that final operational approval of the window in situ is obtained from the client prior to ordering of materials. Metal Technology recommend the following fittings for the system 5-35 Hi range of windows:

Suspension cable



Additional Fittings	Reference
Key-safe lockable handle with turn lock	TTGEAR2046
Turn disabling component	TTGEAR2070 x 2 no.

For details of tilt only and turn only options please refer to Metal Technology's Technical Department.



Siegenia Security Concealed Tilt Before Turn Gearing with Additional Load Bearing Device Kitting List – Handle at Centre

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Part	Description	Metal Technology reference	Fixing screws: 7282 19mm screw	Fixing screws: 7223 25mm screw	Striker info
1	Narrow Corner Drive VS S-ES TS	834	1	3	1 t/bearing
7	Corner Drive VS S-ES TS	833	0	6	1 roller
2-a	Stay Sash Part 2 V-V sz.1	TTGEAR2002	0	3	
2-b	Stay Sash Part 2 V-V sz.2+3 1RS	TTGEAR2003	0	4	1 roller
2-c	Stay Sash Part 2 V-V sz.4 1 RS	TTGEAR2004	0	5	1 roller
2-d	Stay Sash Part 2 V-V sz.5 1RS	TTGEAR2005	0	6	1 roller
3-a	Stay Arm V-V 18 TBT sz.1 rh	TTGEAR2006/RH	2	0	
	Stay Arm V-V 18 TBT sz.1 lh	TTGEAR2006/LH	2	0	
3-b	Stay Arm V-V 18 TBT sz.2+3 rh	TTGEAR2007/RH	2	0	
	Stay Arm V-V 18 TBT sz.2+3 lh	TTGEAR2007/LH	2	0	
3-c	Stay Arm V-V 18 TBT sz.4 rh	TTGEAR2008/RH	2	0	
	Stay Arm V-V 18 TBT sz.4 lh	TTGEAR2008/LH	2	0	
3-d	Stay Arm V-V 18 TBT sz.5 rh	TTGEAR2009/RH	2	0	
	Stay Arm V-V 18 TBT sz.5 lh	TTGEAR2009/LH	2	0	
16-18	Additional Stay TBT TS	TTGEAR2010	3	4	1 roller
12	Corner Drive VSU S-ES FH/9 TS	TTGEAR2011	0	6	1 t/bearing
8-a	Extension S-ES SZ 0 TS	827	0	2	1 roller
8-b	Linkage S-ES SZ 230 TS	TTGEAR2040	0	4	1 roller
8-c	Linkage S-ES SZ 460 TS	TTGEAR2041	0	4	1 roller
8-d	Linkage S-ES SZ 690 MV TS	TTGEAR2042	0	5	1 roller
10	Bottom Hinge V-V 18 with Stop r/h TS	TTGEAR2015/RH	3	1	
	Bottom Hinge V-V 18 with Stop l/h TS	TTGEAR2015/LH	3	1	
11	Corner Hinge V-V	TTGEAR2016	0	4	
14-a	Gear 3/7 SZ 0 TS	TTGEAR2017	0	0	
14-b	Gear 3/7 SZ 1 TS	TTGEAR2018	0	2	
14-c	Gear 3/7 S-ES SZ 1A MV TS	TTGEAR2043	0	3	1 roller
14-d	Gear 3/7 S-ES SZ 2 MV TS	TTGEAR2044	0	5	2 rollers
14-e	Gear 3/7 S-ES SZ 3 MV TS	TTGEAR2045	0	10	2 rollers
15	Corner Drive BS SZ.20 1S TS	TTGEAR2023	0	3	1 roller
20	Mishandling Device FAV. TS	TTGEAR2031	0	0	
57	Corner Drive VSU S-ES TS	TTGEAR2086	0	3	1 roller
51	Linkage SZ 230 Clampable TS	6767	0	4	
52	Linkage S-ES SZ 460 TS	TTGEAR2041	0	4	1 roller
53	Linkage S-ES SZ 690 MV TS	TTGEAR2042	0	5	1 roller
54	Linkage S-ES SZ 920 2MV TS	TTGEAR2055	0	6	2 rollers
55	Extension S-ES SZ 0 TS	827	0	2	1 roller
56	Extension S-ES SZ 1 TS	828	0	4	1 roller
26	Sash Bearing Block Filler	TTGEAR2028	0	0	
27	Sash Bearing Block	TTGEAR2029	0	2	
28	Suspension Cable	TTGEAR2030	0	2	
Profile Related Part					
30	Striker Plate Metal Technology	TTGEAR2035	0	1	
6	Striker Plate S-ES A5220	TTGEAR2051	2	1	
29	Striker Plate S-RS A1320/1 TS	TTGEAR2052	0	2	
21-25	Acc. Bag Alu. 14/18 r/h	TTGEAR2032/RH	4	0	
	Acc. Bag Alu. 14/18 l/h	TTGEAR2032/LH	4	0	
9	Tilt Lock B.S-ES FH TBT RH1320/1 TS	TTGEAR2033/RH	0	2	
	Tilt Lock B.S-ES FH TBT LH1320/1 TS	TTGEAR2033/LH	0	2	
19	Additional Stay Packer	TTGEAR2034	0	0	
25*	BSU with 3 Screw Fixing positions	TTGEAR2039	1	0	

Refer to Fitting Manual pages 4 and 5

Sash height \ Sash width	402 to 517	518 to 717	718 to 887	888 to 1087	1088 to 1287	1288 to 1300
517 to 637	1, 2a, 3a, 12, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x2	7, 2a, 3a, 12, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x2	7, 2b, 3b, 12, 8a, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x3, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x4, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14a, 26, 27, 28, 21-25, 9, 6x4, 29	N/A
638 to 717	1, 2a, 3a, 12, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x2	7, 2a, 3a, 12, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x2	7, 2b, 3b, 12, 8a, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x3, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x4, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14b, 15, 26, 27, 28, 21-25, 9, 6x4, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14b, 15, 16-18, 19, 26, 27, 28, 21-25, 9, 6x4, 29, 30
718 to 837	1, 2a, 3a, 12, 10, 11, 14c, 15, 20, 26, 27, 28, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14c, 15, 20, 26, 27, 28, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14c, 15, 20, 26, 27, 28, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14c, 15, 20, 26, 27, 28, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14c, 15, 20, 26, 27, 28, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14c, 15, 16-18, 19, 20, 26, 27, 28, 21-25, 9, 6x6, 29, 30
838 to 1037	1, 2a, 3a, 12, 10, 11, 14c, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14c, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14c, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14c, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14c, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14c, 16-18, 19, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29, 30
1038 to 1057	1, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14d, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 16-18, 19, 20, 26, 27, 28, 55, 57, 21-25, 9, 6x6, 29, 30
1058 to 1187	1, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x4	7, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x4	7, 2b, 3b, 12, 8a, 10, 11, 14d, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x5, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x6, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 16-18, 19, 20, 26, 27, 28, 56, 57, 21-25, 9, 6x6, 29, 30
1188 to 1287	1, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14d, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 16-18, 19, 20, 26, 27, 28, 51, 55, 57, 21-25, 9, 6x7, 29, 30
1288 to 1497	1, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14d, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14d, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14d, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14d, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14d, 16-18, 19, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29, 30
1498 to 1517	1, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14e, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14e, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14e, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14e, 16-18, 19, 20, 26, 27, 28, 52, 55, 57, 21-25, 9, 6x7, 29, 30
1518 to 1647	1, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14e, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14e, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14e, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14e, 16-18, 19, 20, 26, 27, 28, 52, 56, 57, 21-25, 9, 6x7, 29, 30
1648 to 1877	1, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x5	7, 2a, 3a, 12, 10, 11, 14e, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x5	7, 2b, 3b, 12, 8a, 10, 11, 14e, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x6, 29	7, 2c, 3c, 12, 8a, 8b, 10, 11, 14e, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x7, 29	7, 2d, 3d, 12, 8a, 8c, 10, 11, 14e, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x7, 29	7, 2c, 3c, 12, 8a, 8d, 10, 11, 14e, 16-18, 19, 20, 26, 27, 28, 53, 56, 57, 21-25, 9, 6x7, 29, 30
1878 to 2107	1, 2a, 3a, 12, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x9	7, 2a, 3a, 12, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x9	7, 2b, 3b, 12, 8a, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x9, 29	7, 2c, 3c, 12, 8a, 8bx3, 10, 11, 14e, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x11, 29	7, 2d, 3d, 12, 8a, 8bx3, 10, 11, 14e, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x11, 29	7, 2c, 3c, 12, 8a, 8bx2, 8d, 10, 11, 14e, 16-18, 19, 20, 26, 27, 28, 54, 56, 57, 21-25, 9, 6x12, 29, 30
2108 to 2200	1, 2a, 3a, 12, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x9	7, 2a, 3a, 12, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x9	7, 2b, 3b, 12, 8a, 8bx2, 10, 11, 14e, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x9, 29	7, 2c, 3c, 12, 8a, 8bx3, 10, 11, 14e, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x11, 29	7, 2d, 3d, 12, 8a, 8bx3, 10, 11, 14e, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x11, 29	7, 2c, 3c, 12, 8a, 8bx2, 8d, 10, 11, 14e, 16-18, 19, 20, 26, 27, 28, 51, 54, 56, 57, 21-25, 9, 6x12, 29, 30

* Add 1 no per sash when hinged off a mullion, and screw to suit.

Siegenia Security Concealed Tilt Before Turn Gearing Kitting List – Handle at 1/3

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

There are two different variable height ranges available:
- option 1 (handle positioned 243.5 - 493.5mm from the bottom of the overall sash)
- option 2 (handle positioned 358.5 - 608.5mm from the bottom of the overall sash)

Step 1 - select the correct kit from sheet "Siegenia Security Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre".
Step 2 - select handle position required on the matrix shown below - either option 1 or option 2.
Step 3 - add the fittings shown on the matrix shown below ("Add fittings" column) for your handle height selection - these are required in addition to the parts already identified from sheet "Siegenia Security Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre" (Step 1).
Step 4 - delete the fittings shown on the matrix shown below ("Remove fittings" column) for your handle height selection - these fittings were selected in step 1. Fittings added in step 3 now replace these and convert the half handle kit to the variable low handle kit.

Option 1 - handle between 243.5 - 493.5mm

			Fixing screws		
Part	Description	Metal Technology reference	7282 19mm screw	7223 25mm screw	Striker info
1b	Corner Slider VSO S.ES Small	834	1	3	1 t/bearing
2	Corner Drive VS S-ES TS	833	0	6	1 S-ES
3	Gear 3/7 S-ES SZ 1A MV TS	TTGEAR2043	0	3	1 S-ES
4a	Linkage 230	6767	0	4	
4b	Linkage S-ES SZ 230 TS	TTGEAR2040	0	4	1 S-ES
5	Linkage S-ES SZ 460 TS	TTGEAR2041	0	4	1 S-ES
6	Linkage S-ES SZ 690 MV TS	TTGEAR2042	0	5	1 S-ES
7	Linkage S-ES SZ 920 2MV TS	TTGEAR2055	0	6	2 S-ES
8	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
9	Striker Plate S-ES A5220	TTGEAR2051	2	1	

Option 2 - handle between 358.5 - 608.5mm

			Fixing screws		
Part	Description	Metal Technology reference	7282 19mm screw	7223 25mm screw	Striker info
1a	Corner Drive VSU S-ES FH/9 TS	TTGEAR2011	0	6	1 t/bearing
2	Corner Drive VS S-ES TS	833	0	6	1 S-ES
3	Gear 3/7 S-ES SZ 1A MV TS	TTGEAR2043	0	3	1 S-ES
4a	Linkage 230	6767	0	4	
4b	Linkage S-ES SZ 230 TS	TTGEAR2040	0	4	1 S-ES
5	Linkage S-ES SZ 460 TS	TTGEAR2041	0	4	1 S-ES
6	Linkage S-ES SZ 690 MV TS	TTGEAR2042	0	5	1 S-ES
7	Linkage S-ES SZ 920 2MV TS	TTGEAR2055	0	6	2 S-ES
8	Mishandling Device 9mm l & r/h	TTGEAR2031	0	0	
9	Striker Plate S-ES A5220	TTGEAR2051	2	1	

Refer to Fitting Manual page 7		
Option 1		
Sash height ⇩	Add fittings	Remove fittings
602 to 832	1b, 3, 9	12, 14a or 12, 14b or 12, 14c
833 to 1082	1b, 3, 4a, 9	12, 14c or 12, 14d
1083 to 1312	1b, 3, 5, 9	12, 14d
1313 to 1542	1b, 3, 6, 9	12, 14d or 12, 14e
1543 to 1772	1b, 3, 7, 9x2	12, 14e

Refer to Fitting Manual page 7		
Option 2		
Sash height ⇩	Add fittings	Remove fittings
602 to 947	3, 9	14a or 14b or 14c
948 to 1197	3, 4a, 9	14c or 14d
1198 to 1427	3, 5, 9	14d
1428 to 1657	3, 6, 9	14d or 14e
1658 to 1887	3, 7, 9x2	14e

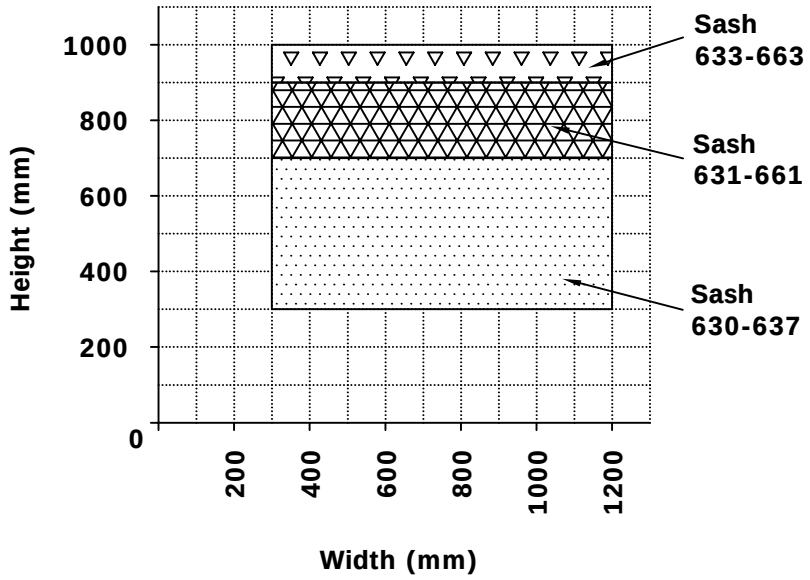
Note: Metal Technology do not recommend fitting the handle any lower than 1/3 from the bottom of the sash rebate.

Vent Size Limitation Chart

Bottom Hung Open In Using Spring Catches

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



MAXIMUM VENT WEIGHT - 50kg

Spring catches are not recommended for high rise or exposed applications.

Sash Width mm	No of catches/ keeps (7030/7031)	No of hinges (TTGEAR805A)	No of restrictors (CA36)	Link bar reference
300 - 500	1	2	1 pair	-
501 - 700	2	2	1 pair	5540
701 - 800	2	2	1 pair	5542
801 - 900	2	2	1 pair	5543
901 - 1000	2	3	1 pair	5544
1001 - 1200	2	3	1 pair	5546

When two hinges are used, these should be centred at 1/4 points along the cill.
When three hinges are used, these should be centred 100mm from corners, and at the mid-point along the cill.

Additional Components

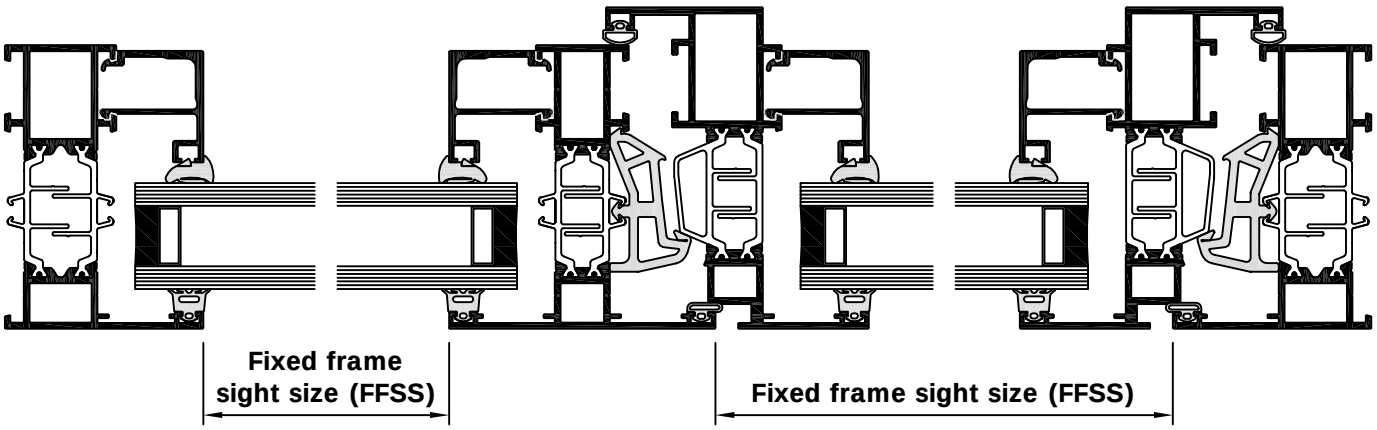
Pole operator with hook - 7014 (as required)

Bar Cutting Sizes

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

All cutting sizes in this range are calculated from the fixed frame sight sizes. This is the distance measured between the tops of the glazing legs as illustrated below.



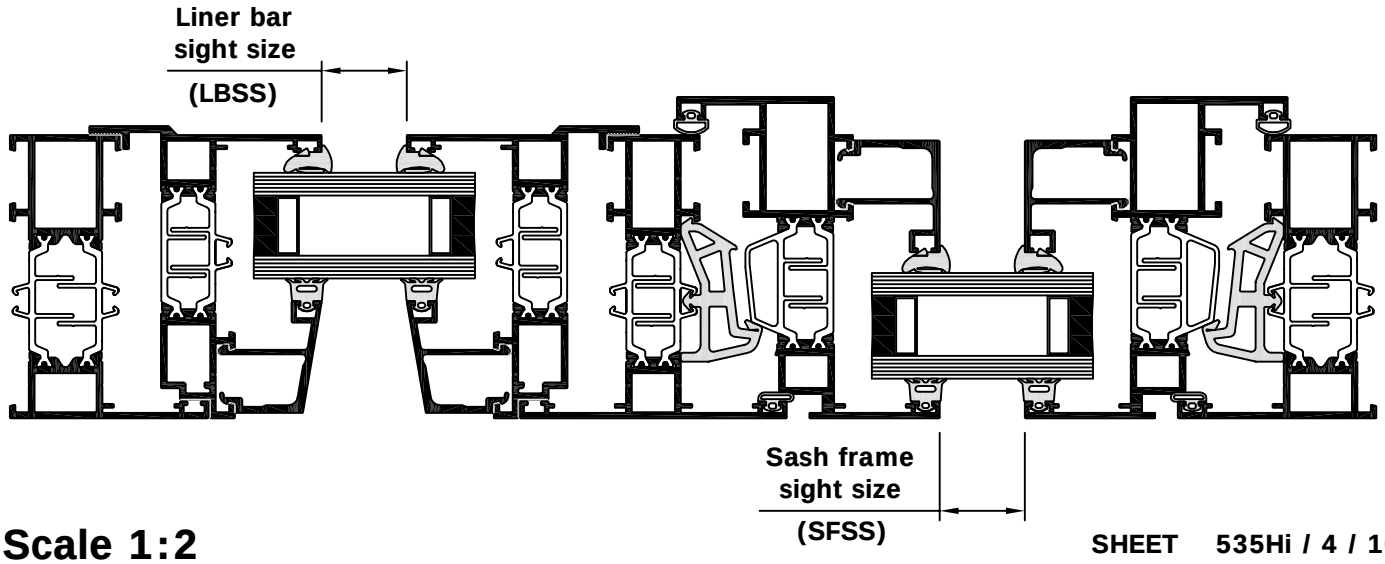
The fixed frame sight size can be calculated from the Ready Reckoner, the section drawings or dimensioned general arrangement drawings provided.

For the cutting sizes for the fixed light glass and beads see the fabrication sheet entitled "Fabrication and Cutting Sizes - Fixed Light Beads and Glass Sizes", and for the opening vents the drawing specific to the sash section used.

The length of integral mullions or transoms should be calculated on the basis of fixed frame sight size plus 56mm using the end preparation shown on the applicable "Mullion/Transom End Prep" fabrication sheets.

Note: Where the mullions/transoms with extended back boxes are used an appropriate adjustment must be made if the end of the bar is more than 28mm beyond the line of the top of the glazing leg. See applicable "Mullion/Transom End Prep" fabrication sheet.

For additional details showing how sashes with muntin bars are calculated see "Bar Cutting Sizes for Muntin Bar" sheet.

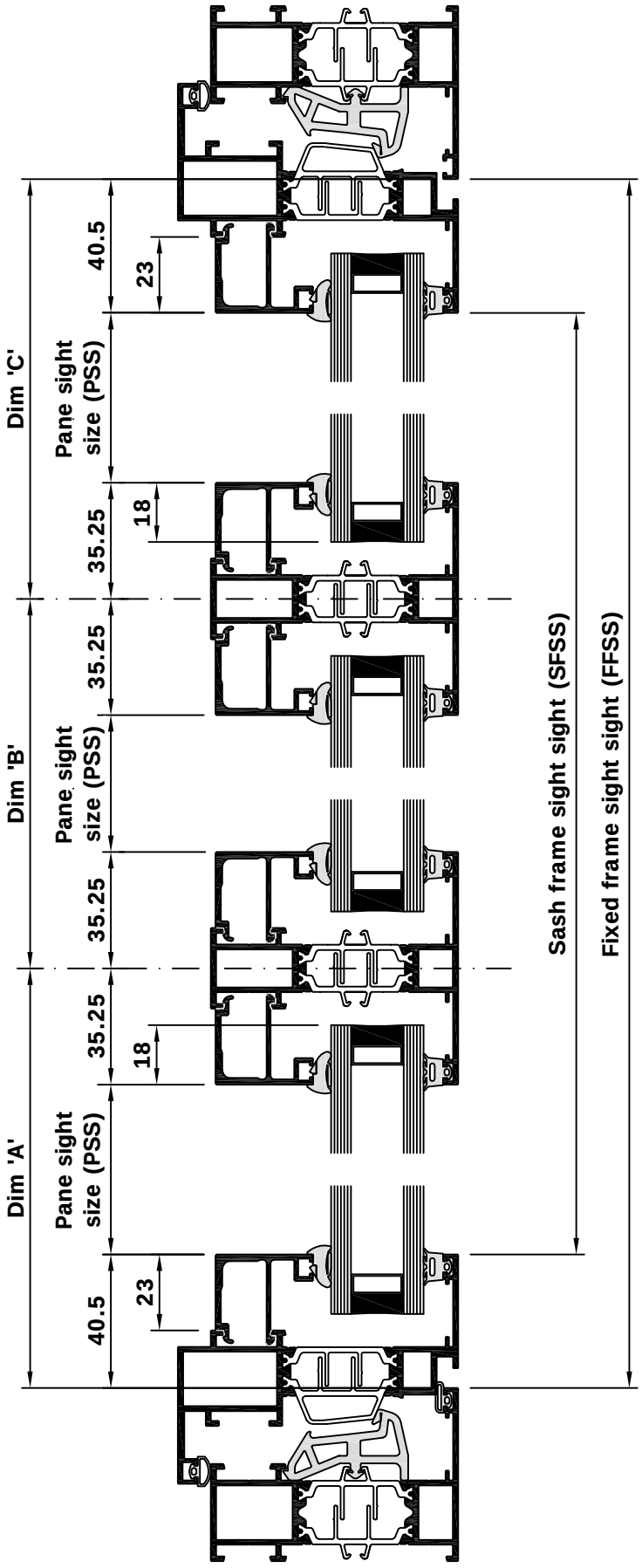


Scale 1:2

Bar Cutting Sizes
For Muntin Bar

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



All cutting sizes for beads and glass into sashes with muntin bars are to be calculated using pane sight sizes (PSS).

The pane sight sizes are calculated using fixed frame sight sizes and muntin bar centre dimensions 'A', 'B' and 'C' etc.

For the cutting sizes for a single muntin bar, glass and beads see the fabrication sheet entitled "Fabrication and Cutting Sizes - Single Muntin Bar into Tilt and Turn Vents", and for the opening vents the drawing specific to the sash section used.

The length of a single muntin bar should be calculated on the basis of fixed frame sight size
less 25mm for 630-637 standard sash or
less 35mm for 631-661 medium sash or
less 36mm for 632-662 euro groove sash or
less 89mm for 633-663 heavy sash using the end preparation shown on "Muntin Bar End Prep" fabrication sheet.

Scale 1:2

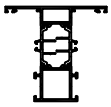
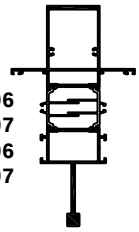
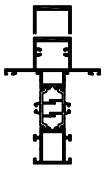
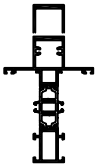
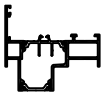
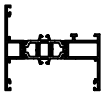
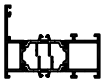
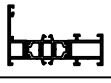
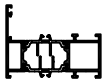
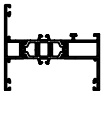
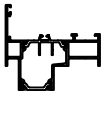
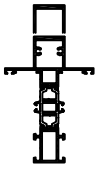
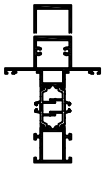
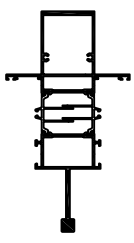
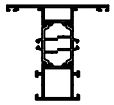
FFSS Ready Reckoner

(To Calculate Fixed Frame Sight Sizes)

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

The following grid can be used to calculate the fixed frame sight sizes (F.F.S.S.) directly from your fabrication sizes. Select the appropriate sections from the horizontal and vertical axes and read across to their point of intersection on the grid. Subtract the resultant figure from your fabrication size to obtain the appropriate fixed frame sight size (F.F.S.S.).
All mullion/transom dimensions are calculated from the section centre line.
When incorporating liner bar 685-686 add 60mm to the dimension stated in the grid and subtract the total from your fabrication size to determine your liner bar sight size (L.B.S.S.).

613-213 	87.75	92.75	97.75	107.75	107.75	75.5	78	89.25	80.5
606-206 606-207 607-206 607-207 	96.5	101.5	106.5	116.5	116.5	84.25	86.75	98	89.25
603-201 642-201 643-201 	85.25	90.25	95.25	105.25	105.25	73	75.5	86.75	78
609-200 640-200 641-200 	82.75	87.75	92.75	102.75	102.75	70.5	73	84.25	75.5
614-615 614-616 	-	-	-	-	135	102.75	105.25	116.5	107.75
602-202 	115	-	-	135	-	102.75	105.25	116.5	107.75
604-213 	-	-	115	-	-	92.75	95.25	106.5	97.75
601-201 	-	105	-	-	-	87.75	90.25	101.5	92.75
600-200 600-605 	95	-	-	115	-	82.75	85.25	96.5	87.75
	600-200 600-605 	601-201 	604-213 	602-202 	614-615 614-616 	609-200 640-200 641-200 	603-201 642-201 643-201 	606-206 606-207 607-206 607-207 	613-213 

Not to Scale

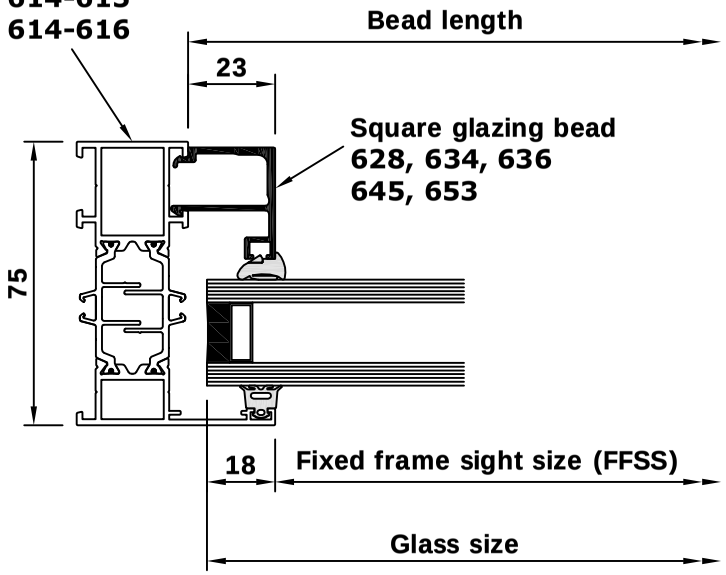
Fabrication and Cutting Sizes

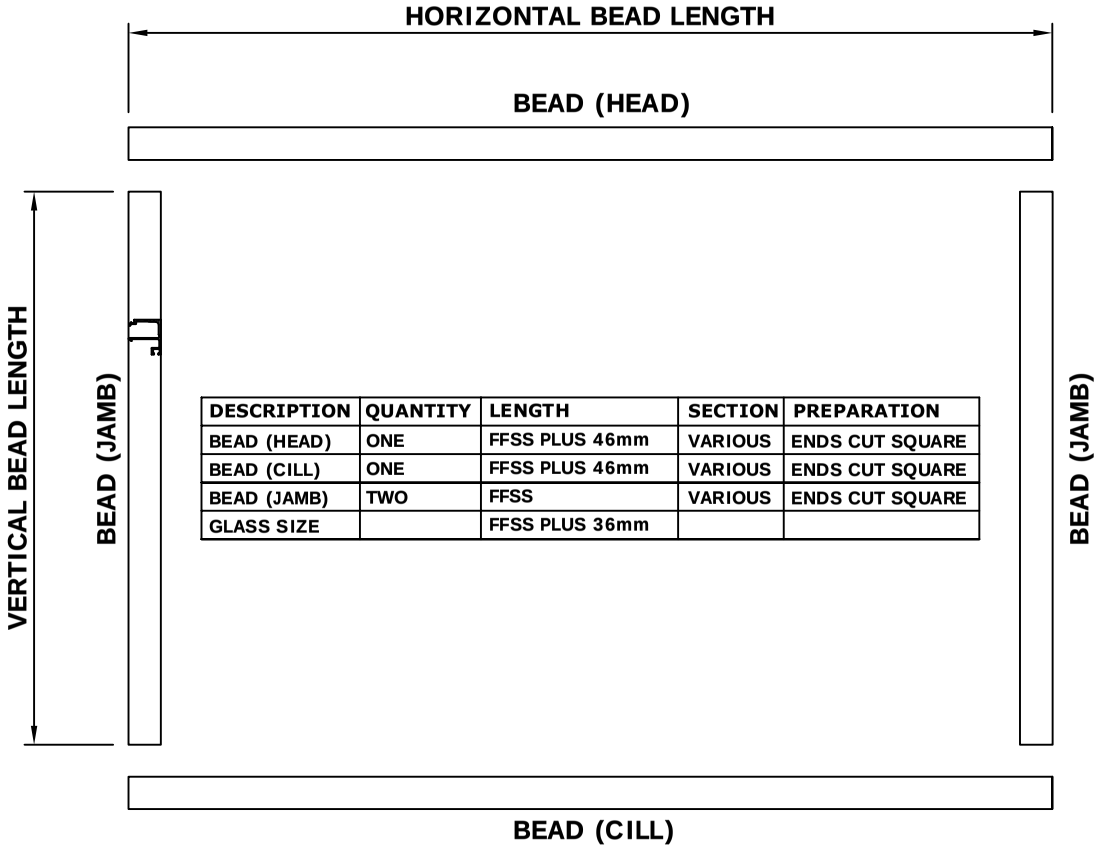
Fixed Light Square Beads and Glass Sizes (Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW

Outer frame
600-200
600-605
601-201
602-202
604-213
614-615
614-616





DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
BEAD (HEAD)	ONE	FFSS PLUS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS PLUS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS	VARIOUS	ENDS CUT SQUARE
GLASS SIZE		FFSS PLUS 36mm		

Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.

Not to Scale

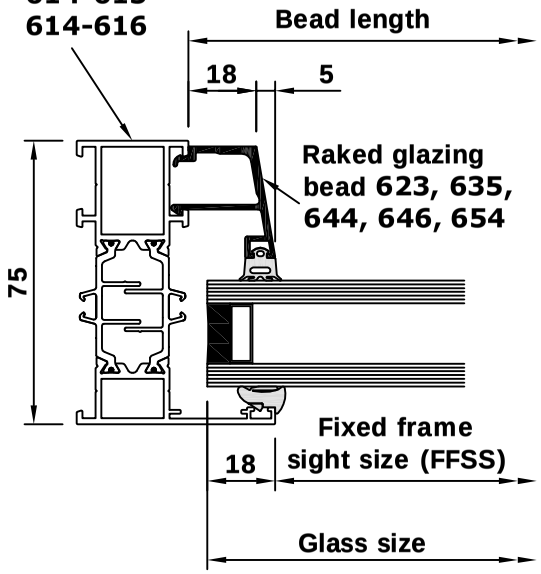
Fabrication and Cutting Sizes

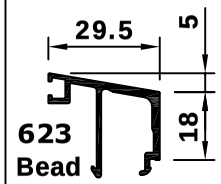
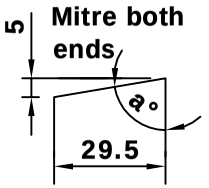
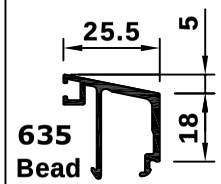
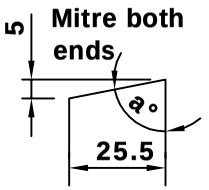
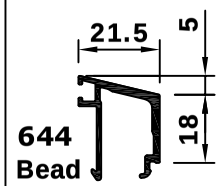
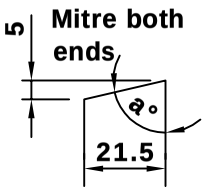
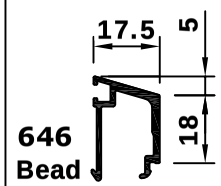
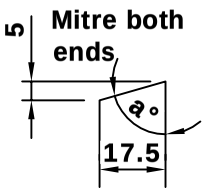
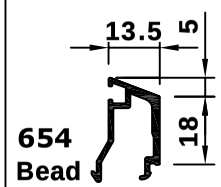
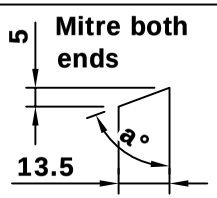
Fixed Light Raked Beads and Glass Sizes (Not Including Outer Frame)

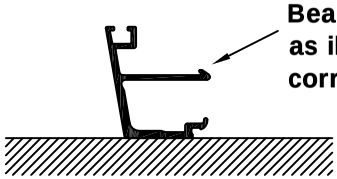
System 5-35 Hi/Hi+

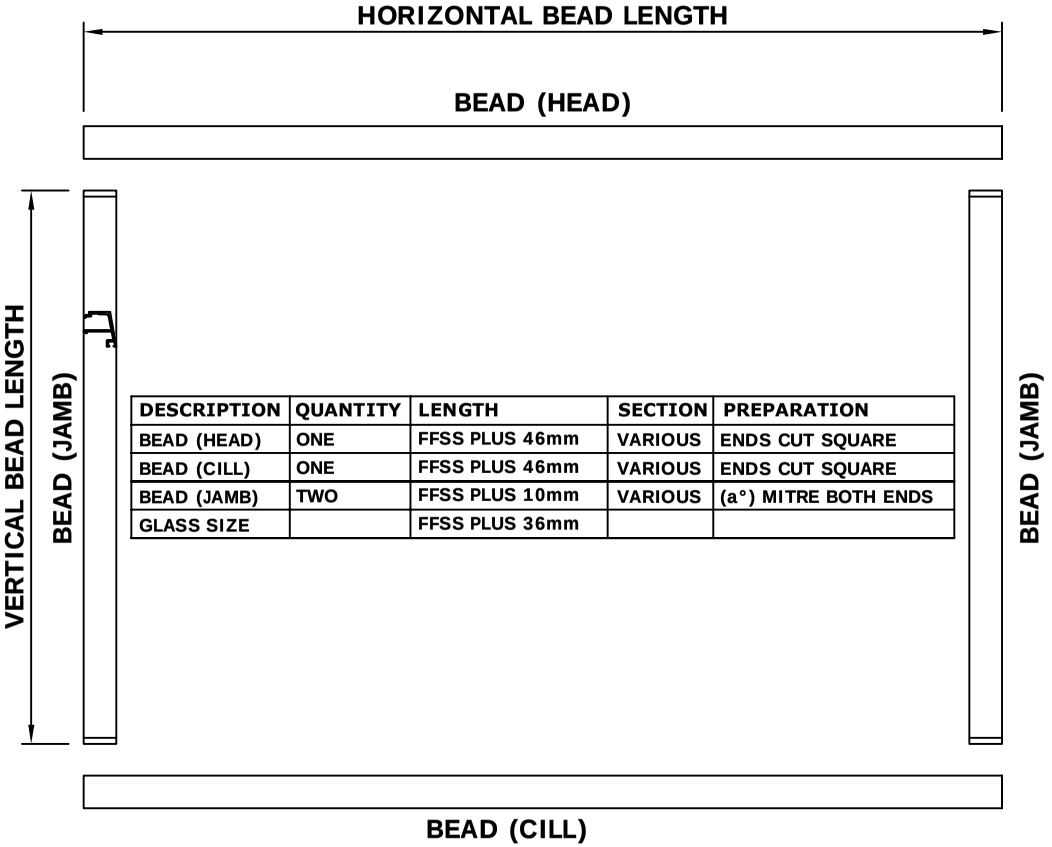
TILT AND TURN WINDOW

Outer frame
600-200
600-605
601-201
602-202
604-213
614-615
614-616



Raked glazing bead options	Jamb bead end preparation
	 Angle (a°)=80.4°
	 Angle (a°)=78.9°
	 Angle (a°)=76.9°
	 Angle (a°)=74.1°
	 Angle (a°)=69.7°





DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
BEAD (HEAD)	ONE	FFSS PLUS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS PLUS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS PLUS 10mm	VARIOUS	(a°) MITRE BOTH ENDS
GLASS SIZE		FFSS PLUS 36mm		

Note :-
All bead lengths are tight sizes.
Clearance of not more than
0.5mm should be allowed at
each end of the glazing bead.

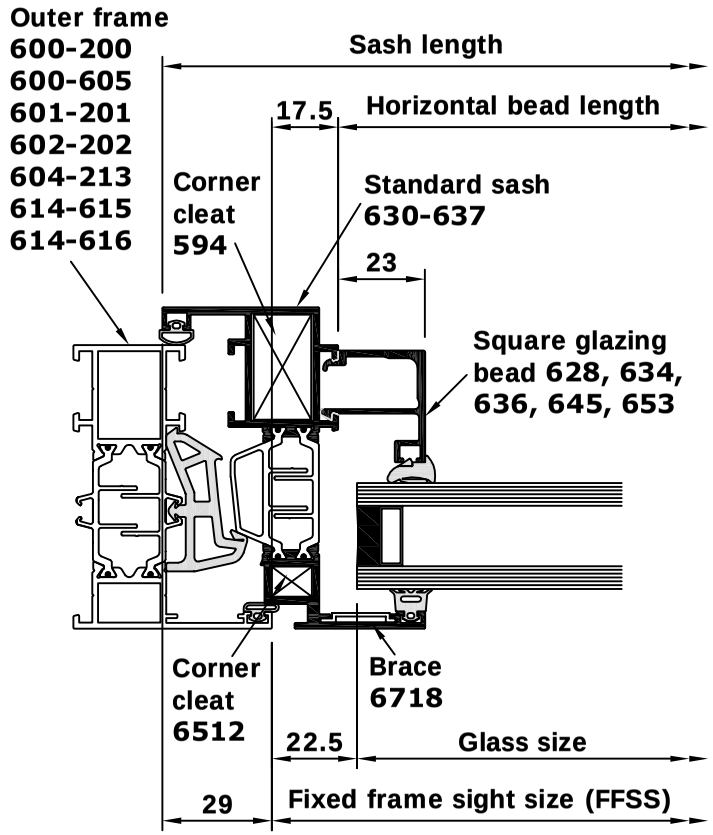
Not to Scale

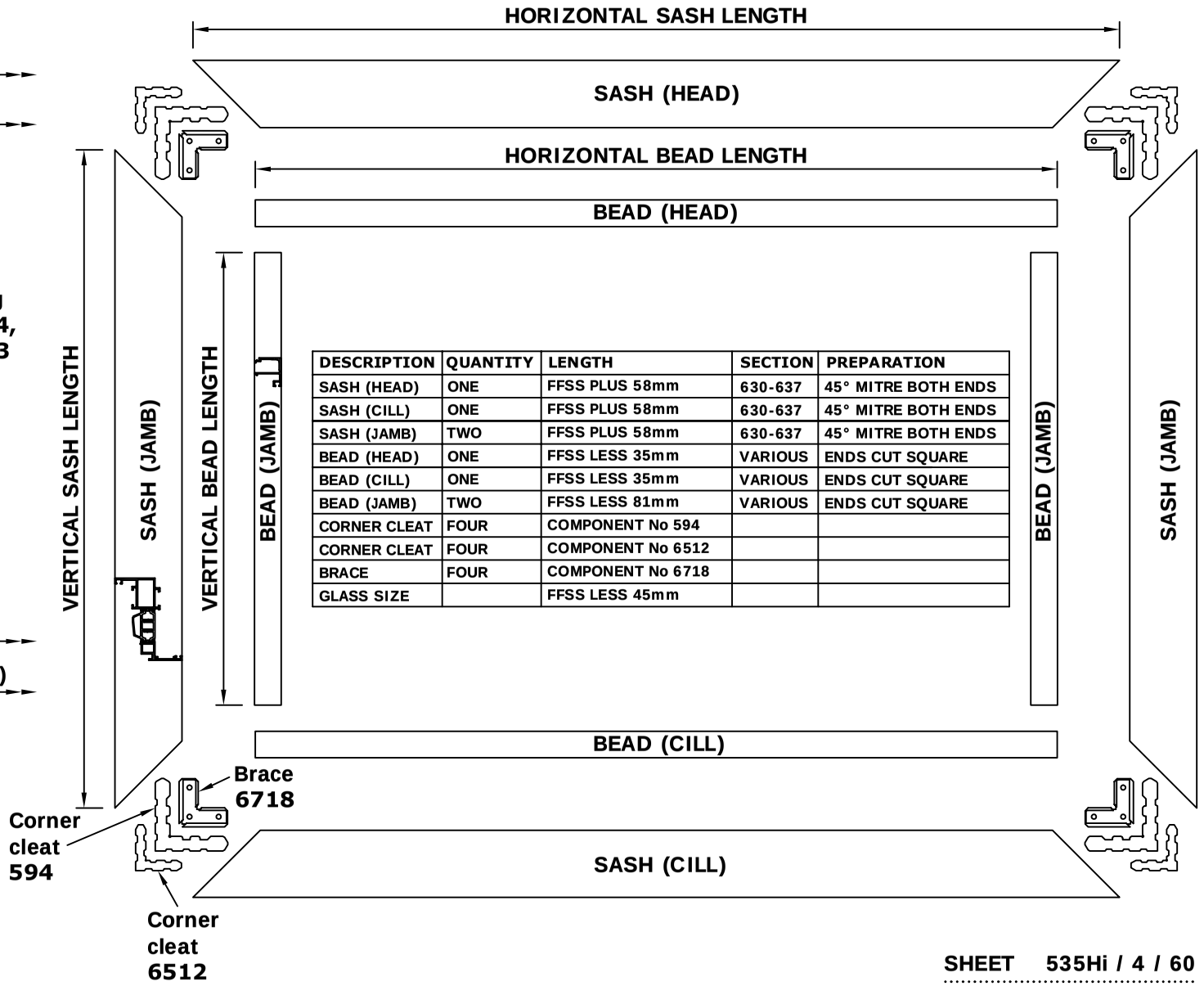
Fabrication and Cutting Sizes

Standard Tilt and Turn Vent - Window Assembly (Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN WINDOW





DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
SASH (HEAD)	ONE	FFSS PLUS 58mm	630-637	45° MITRE BOTH ENDS
SASH (CILL)	ONE	FFSS PLUS 58mm	630-637	45° MITRE BOTH ENDS
SASH (JAMB)	TWO	FFSS PLUS 58mm	630-637	45° MITRE BOTH ENDS
BEAD (HEAD)	ONE	FFSS LESS 35mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS LESS 35mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS LESS 81mm	VARIOUS	ENDS CUT SQUARE
CORNER CLEAT	FOUR	COMPONENT No 594		
CORNER CLEAT	FOUR	COMPONENT No 6512		
BRACE	FOUR	COMPONENT No 6718		
GLASS SIZE		FFSS LESS 45mm		

Note :-
All bead lengths are tight sizes.
Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.

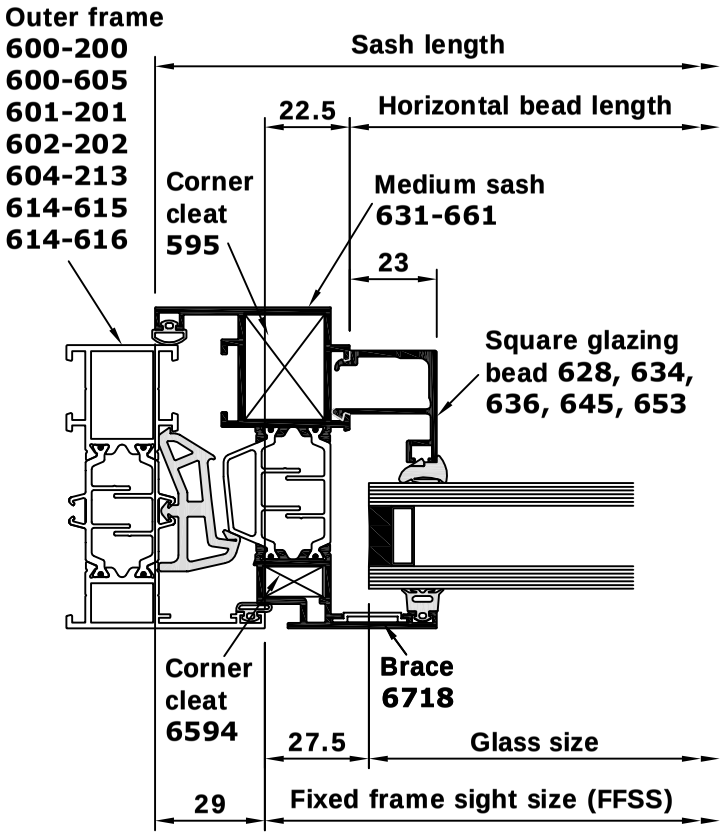
Not to Scale

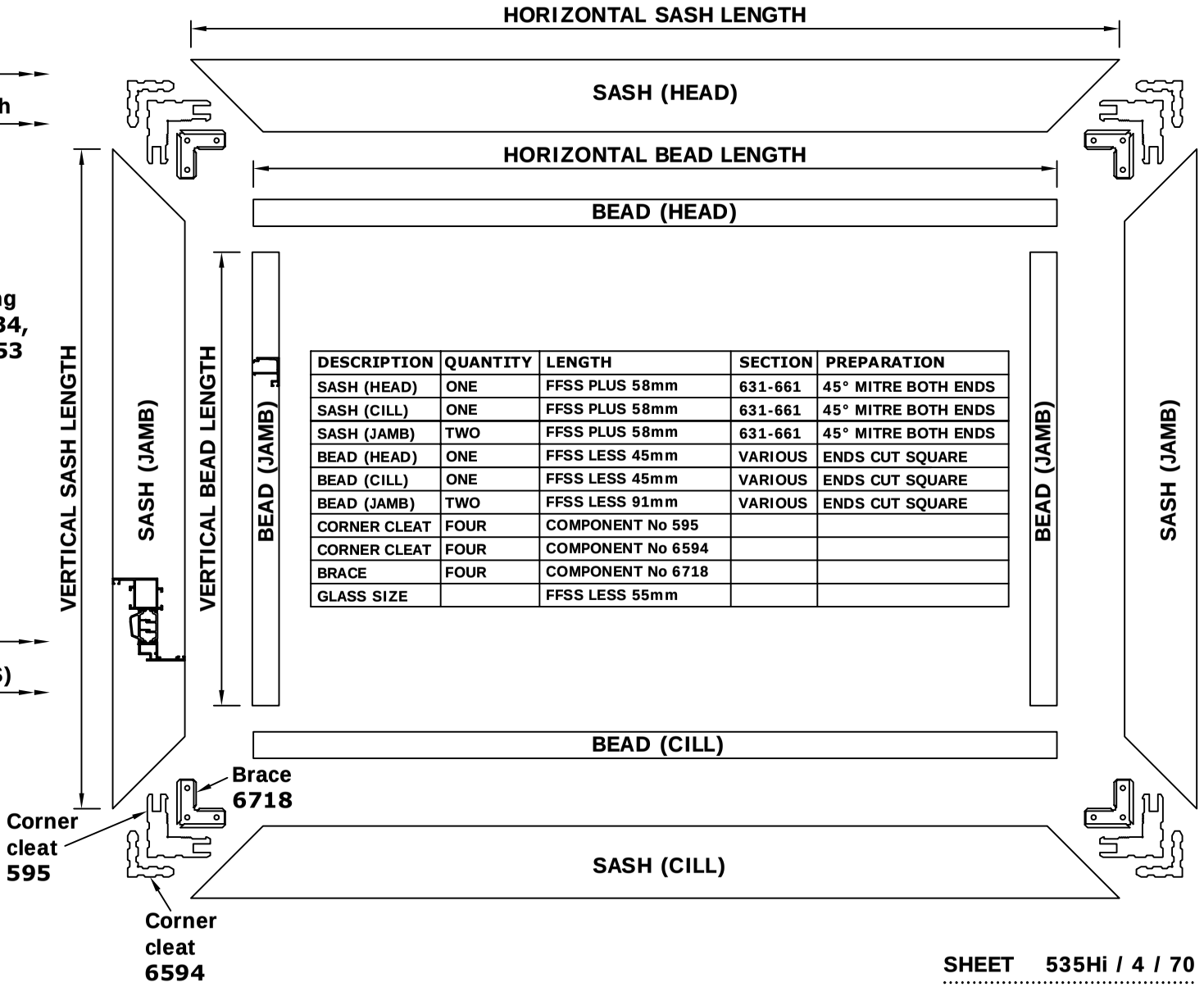
Fabrication and Cutting Sizes

Medium Tilt and Turn Vent - Window Assembly
(Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW





DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
SASH (HEAD)	ONE	FFSS PLUS 58mm	631-661	45° MITRE BOTH ENDS
SASH (CILL)	ONE	FFSS PLUS 58mm	631-661	45° MITRE BOTH ENDS
SASH (JAMB)	TWO	FFSS PLUS 58mm	631-661	45° MITRE BOTH ENDS
BEAD (HEAD)	ONE	FFSS LESS 45mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS LESS 45mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS LESS 91mm	VARIOUS	ENDS CUT SQUARE
CORNER CLEAT	FOUR	COMPONENT No 595		
CORNER CLEAT	FOUR	COMPONENT No 6594		
BRACE	FOUR	COMPONENT No 6718		
GLASS SIZE		FFSS LESS 55mm		

Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.

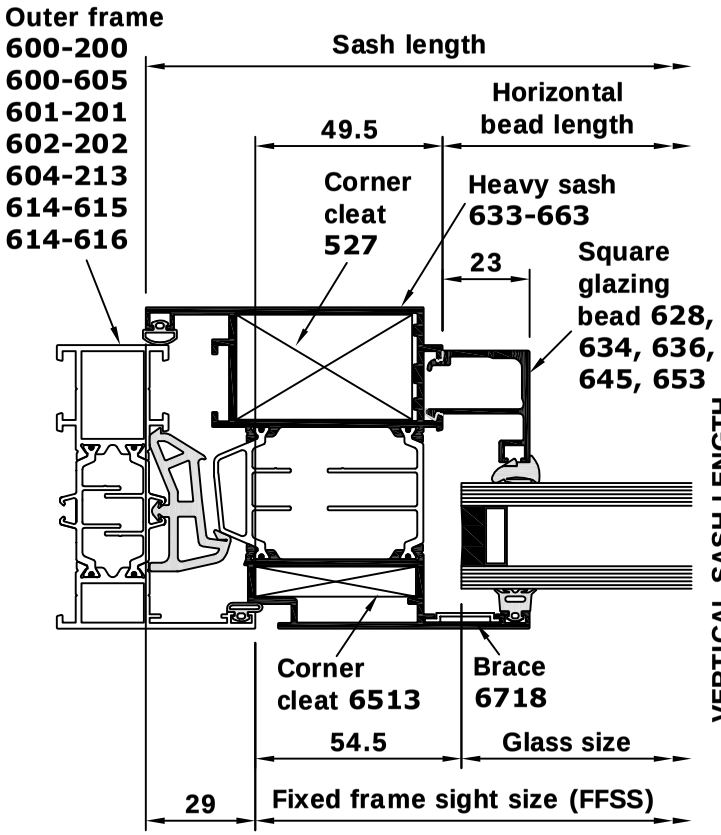
Not to Scale

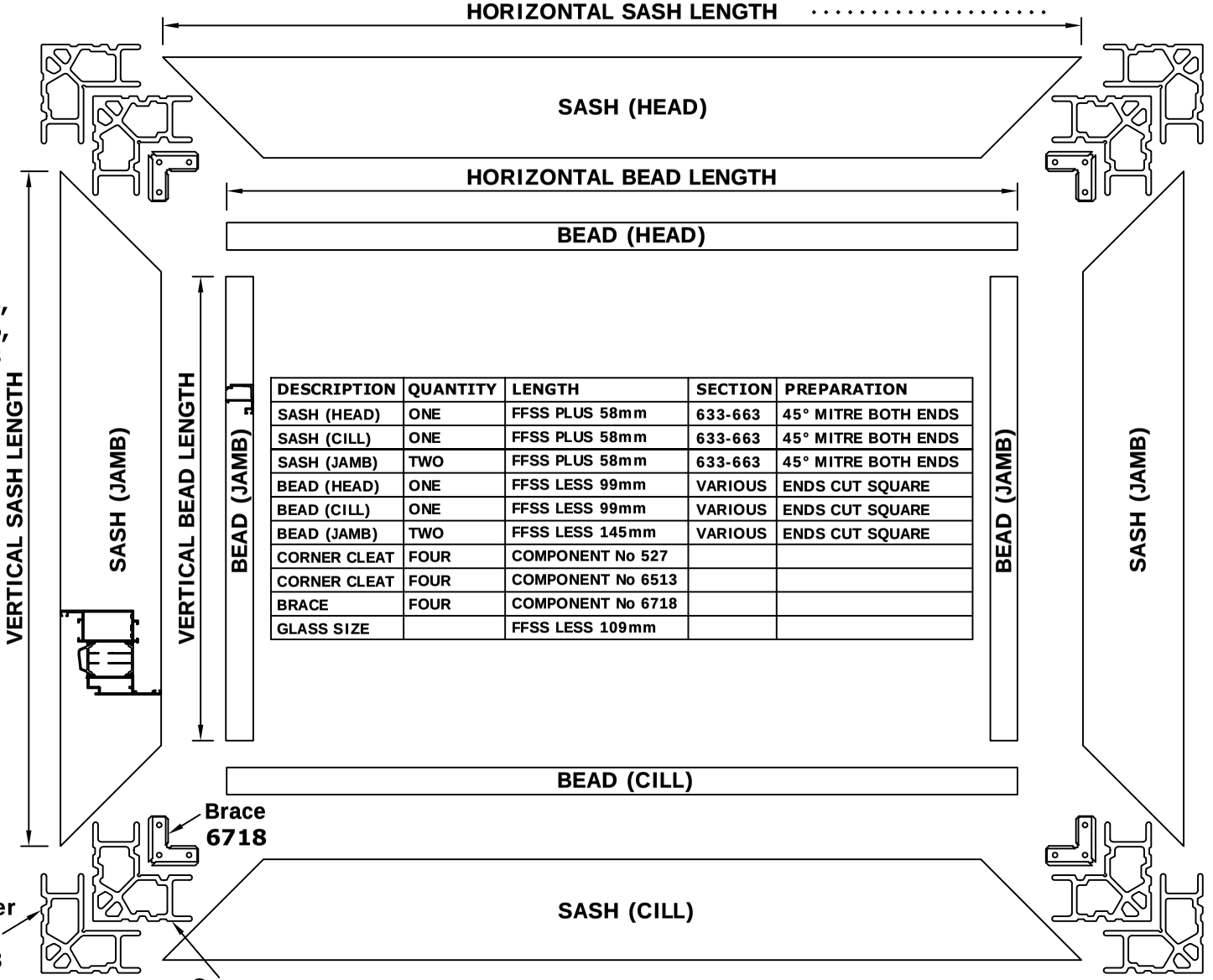
Fabrication and Cutting Sizes

Heavy Tilt and Turn Vent - Window Assembly
(Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW





DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
SASH (HEAD)	ONE	FFSS PLUS 58mm	633-663	45° MITRE BOTH ENDS
SASH (CILL)	ONE	FFSS PLUS 58mm	633-663	45° MITRE BOTH ENDS
SASH (JAMB)	TWO	FFSS PLUS 58mm	633-663	45° MITRE BOTH ENDS
BEAD (HEAD)	ONE	FFSS LESS 99mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS LESS 99mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS LESS 145mm	VARIOUS	ENDS CUT SQUARE
CORNER CLEAT	FOUR	COMPONENT No 527		
CORNER CLEAT	FOUR	COMPONENT No 6513		
BRACE	FOUR	COMPONENT No 6718		
GLASS SIZE		FFSS LESS 109mm		

Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.

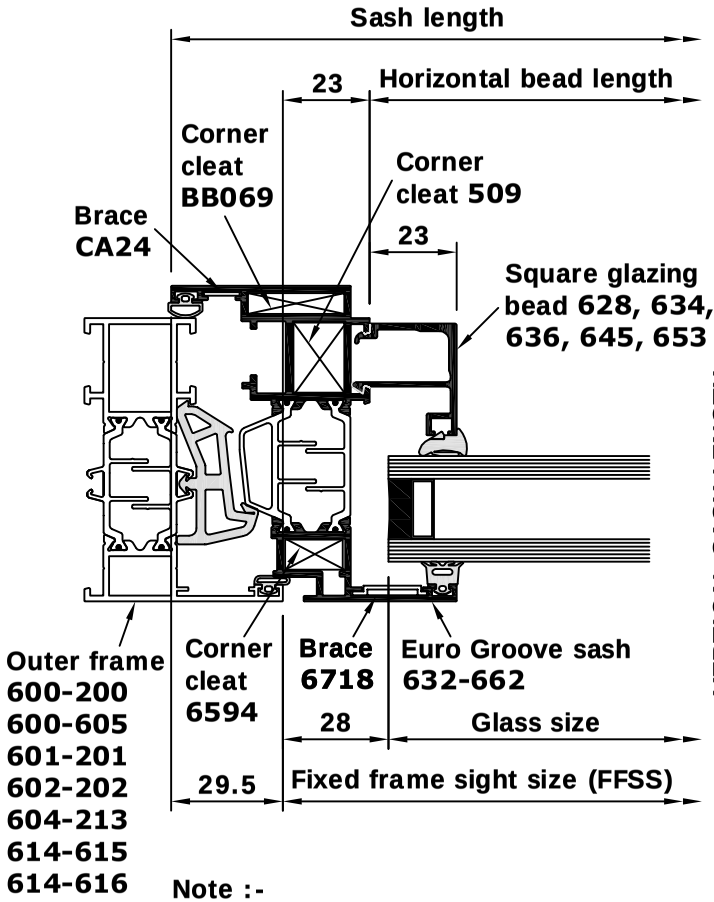
Not to Scale

Fabrication and Cutting Sizes

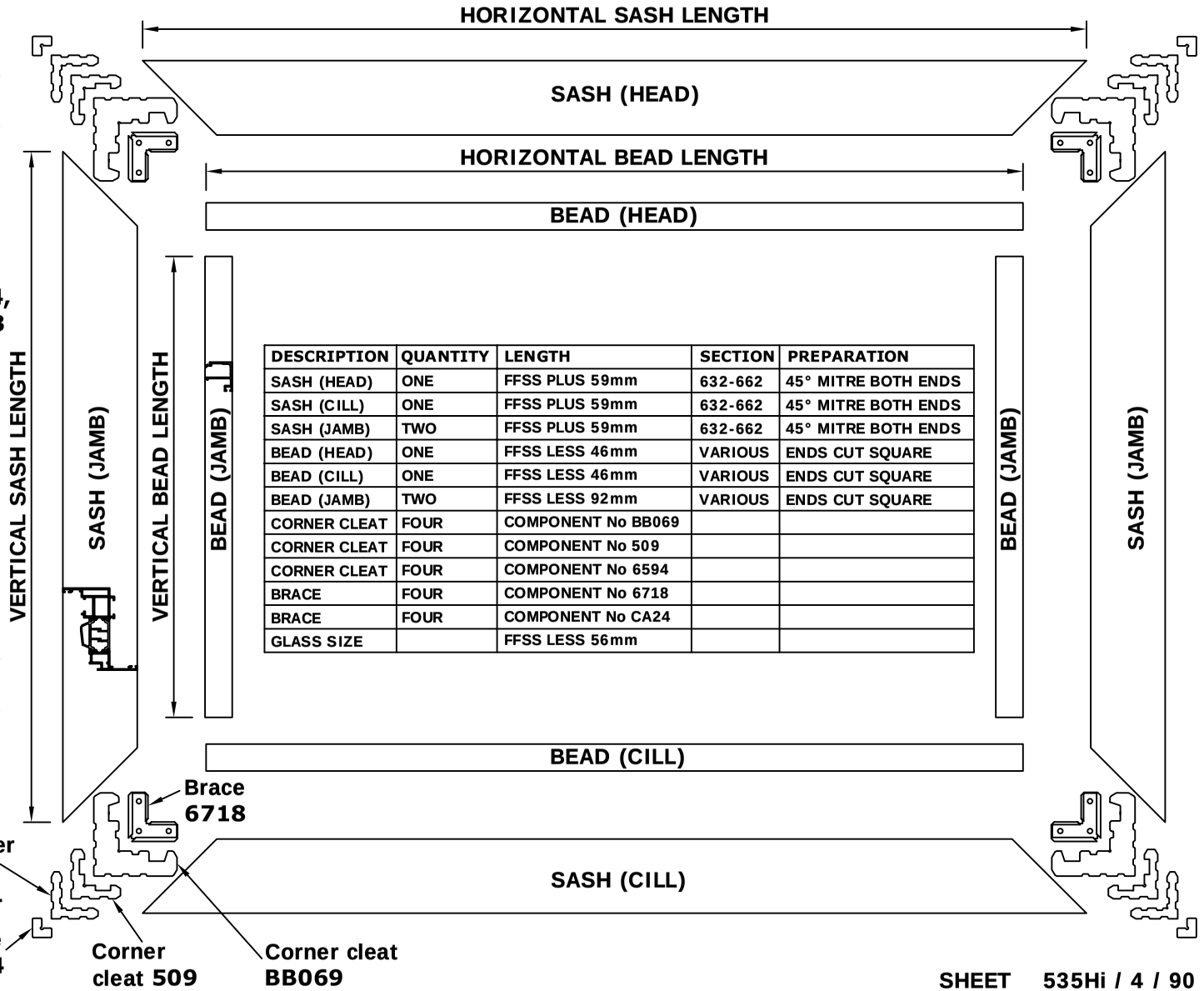
Euro Groove Tilt and Turn Vent - Window Assembly
(Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW



Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.



DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
SASH (HEAD)	ONE	FFSS PLUS 59mm	632-662	45° MITRE BOTH ENDS
SASH (CILL)	ONE	FFSS PLUS 59mm	632-662	45° MITRE BOTH ENDS
SASH (JAMB)	TWO	FFSS PLUS 59mm	632-662	45° MITRE BOTH ENDS
BEAD (HEAD)	ONE	FFSS LESS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS LESS 46mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS LESS 92mm	VARIOUS	ENDS CUT SQUARE
CORNER CLEAT	FOUR	COMPONENT No BB069		
CORNER CLEAT	FOUR	COMPONENT No 509		
CORNER CLEAT	FOUR	COMPONENT No 6594		
BRACE	FOUR	COMPONENT No 6718		
BRACE	FOUR	COMPONENT No CA24		
GLASS SIZE		FFSS LESS 56mm		

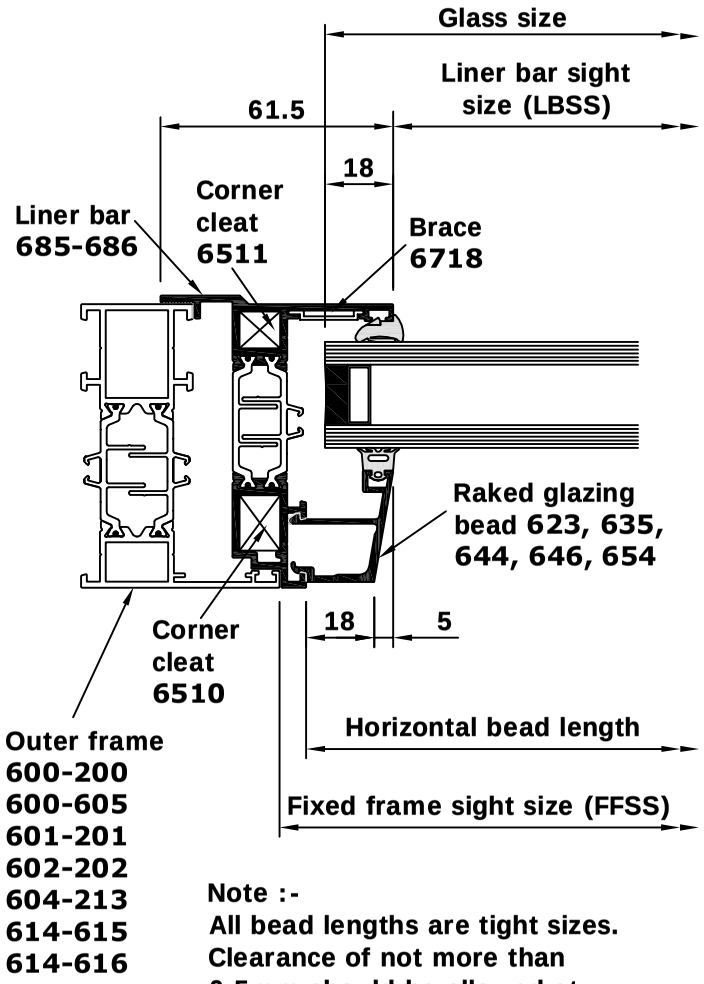
Not to Scale

Fabrication and Cutting Sizes

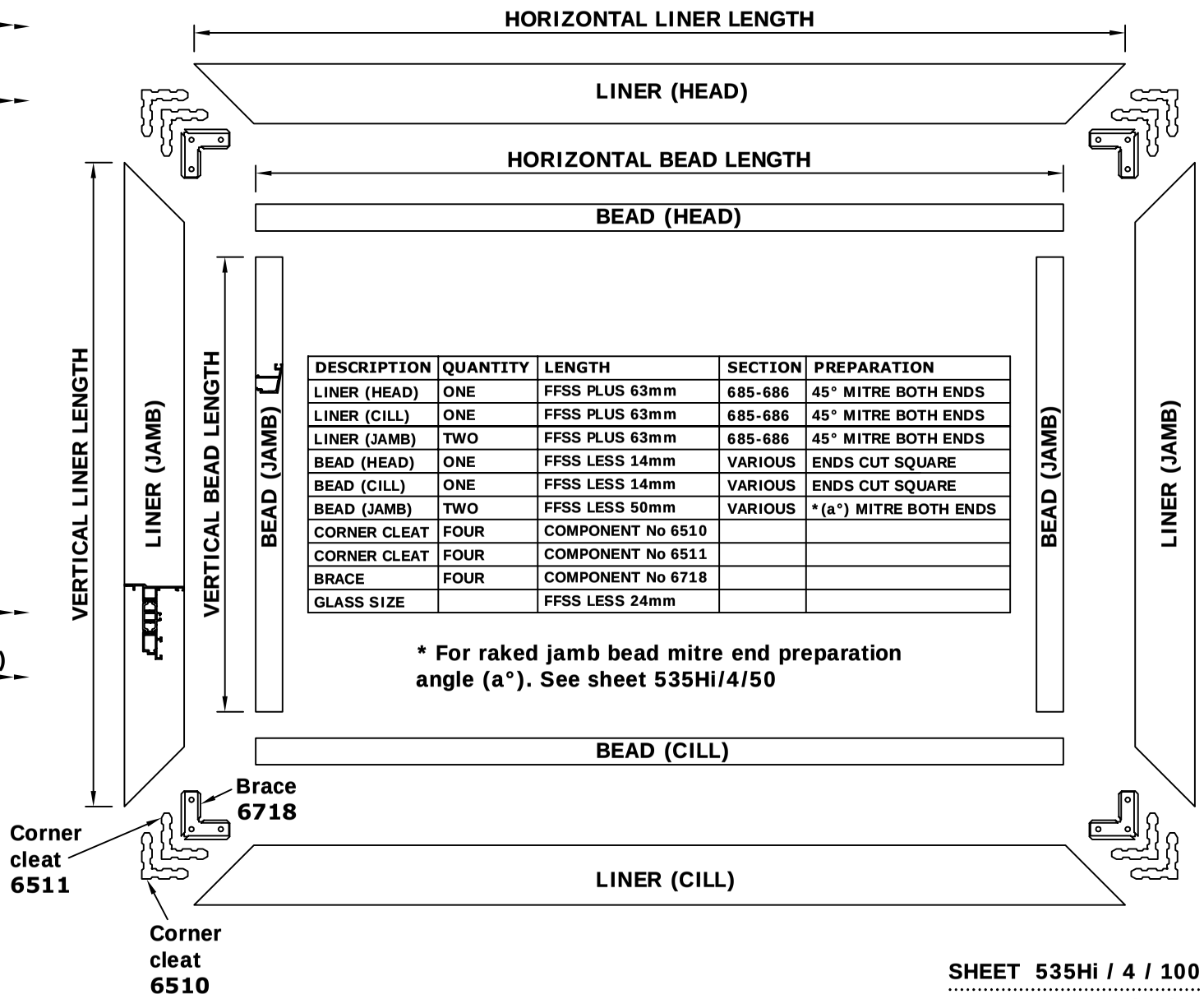
Standard Glaze Out Liner - Window Assembly
(Not Including Outer Frame)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW



Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.



DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
LINER (HEAD)	ONE	FFSS PLUS 63mm	685-686	45° MITRE BOTH ENDS
LINER (CILL)	ONE	FFSS PLUS 63mm	685-686	45° MITRE BOTH ENDS
LINER (JAMB)	TWO	FFSS PLUS 63mm	685-686	45° MITRE BOTH ENDS
BEAD (HEAD)	ONE	FFSS LESS 14mm	VARIOUS	ENDS CUT SQUARE
BEAD (CILL)	ONE	FFSS LESS 14mm	VARIOUS	ENDS CUT SQUARE
BEAD (JAMB)	TWO	FFSS LESS 50mm	VARIOUS	*(a°) MITRE BOTH ENDS
CORNER CLEAT	FOUR	COMPONENT No 6510		
CORNER CLEAT	FOUR	COMPONENT No 6511		
BRACE	FOUR	COMPONENT No 6718		
GLASS SIZE		FFSS LESS 24mm		

* For raked jamb bead mitre end preparation angle (a°). See sheet 535Hi/4/50

Not to Scale

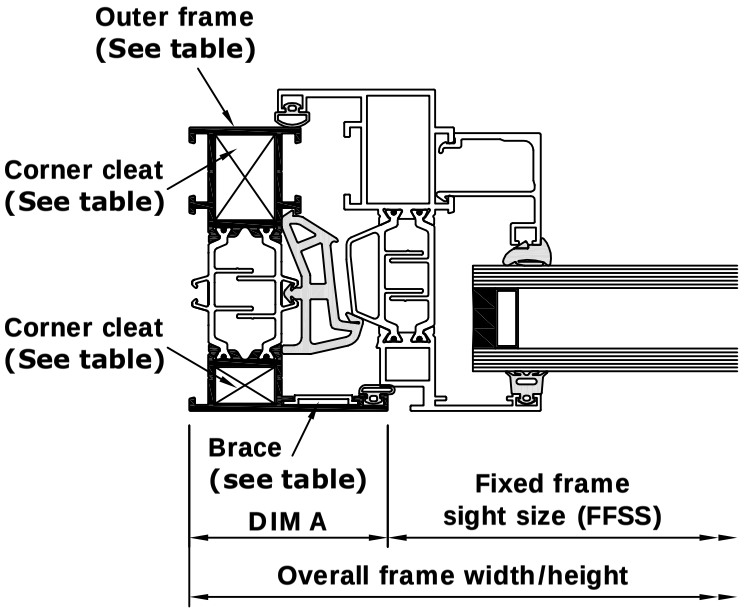
Fabrication and Cutting Sizes

Outer Frame - Window Assembly

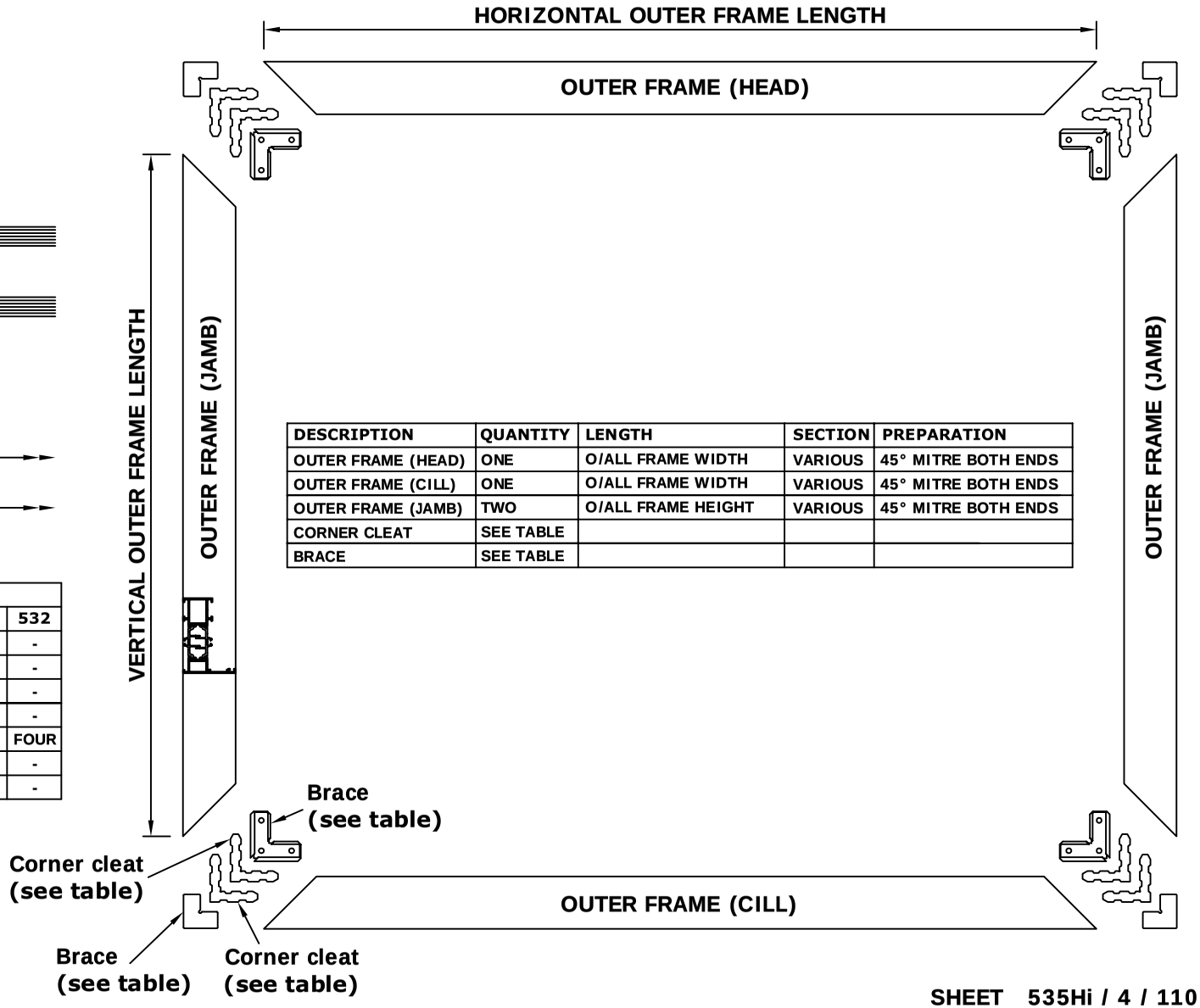
(Not Including Tilt and Turn Vent or Glazing Beads)

System 5-35 Hi/Hi+

TILT AND TURN
WINDOW



OUTER FRAME	DIM A	BRACE		CORNER CLEAT					
		CA23	6718	6511	511	6517	516	6533	532
600-200	47.5mm	-	FOUR	FOUR	FOUR	-	-	-	-
600-605	47.5mm	-	FOUR	FOUR	FOUR	-	-	-	-
601-201	52.5mm	-	FOUR	-	-	FOUR	FOUR	-	-
602-202	67.5mm	EIGHT	FOUR	FOUR	FOUR	-	-	-	-
604-213	57.5mm	-	FOUR	-	-	-	-	FOUR	FOUR
614-615	67.5mm	-	FOUR	FOUR	FOUR	-	-	-	-
614-616	67.5mm	-	FOUR	FOUR	FOUR	-	-	-	-



DESCRIPTION	QUANTITY	LENGTH	SECTION	PREPARATION
OUTER FRAME (HEAD)	ONE	O/ALL FRAME WIDTH	VARIOUS	45° MITRE BOTH ENDS
OUTER FRAME (CILL)	ONE	O/ALL FRAME WIDTH	VARIOUS	45° MITRE BOTH ENDS
OUTER FRAME (JAMB)	TWO	O/ALL FRAME HEIGHT	VARIOUS	45° MITRE BOTH ENDS
CORNER CLEAT	SEE TABLE			
BRACE	SEE TABLE			

Not to Scale

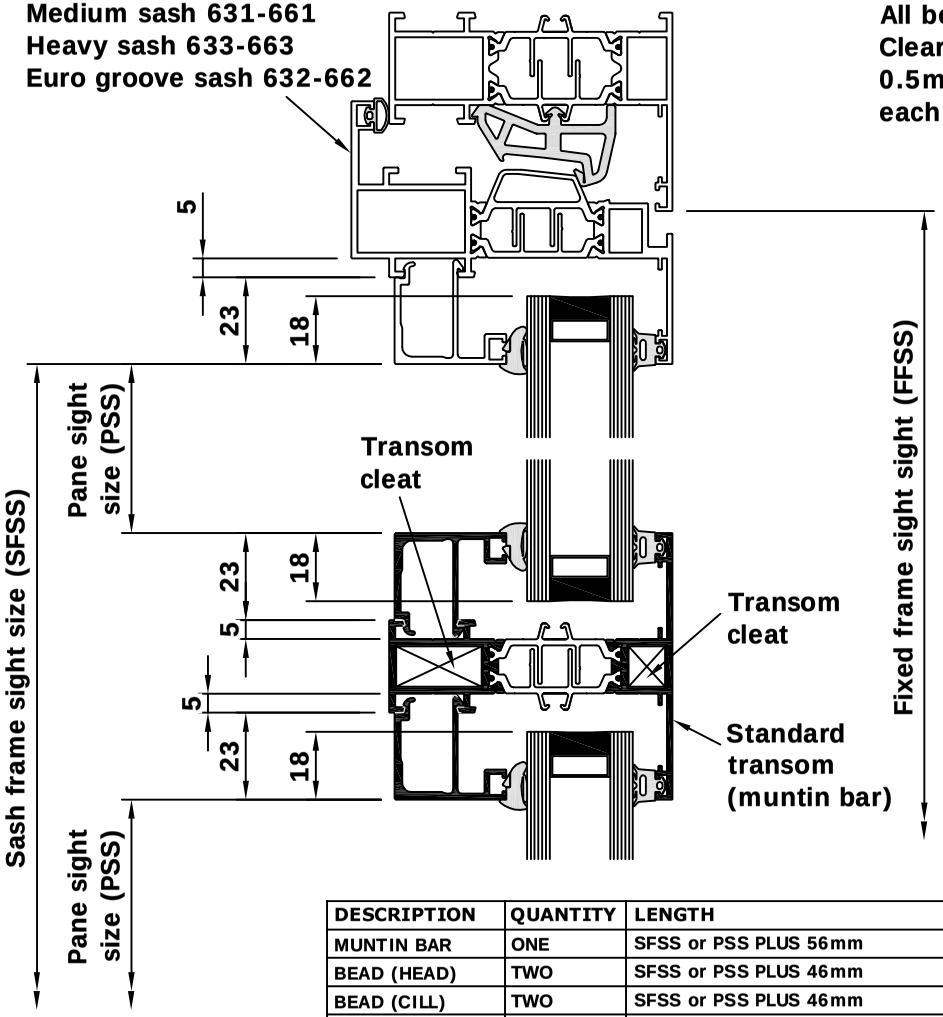
Fabrication and Cutting Sizes

Single Muntin Bar into Tilt and Turn Vents - Window Assembly (Not Including Sash and Outer Frame)

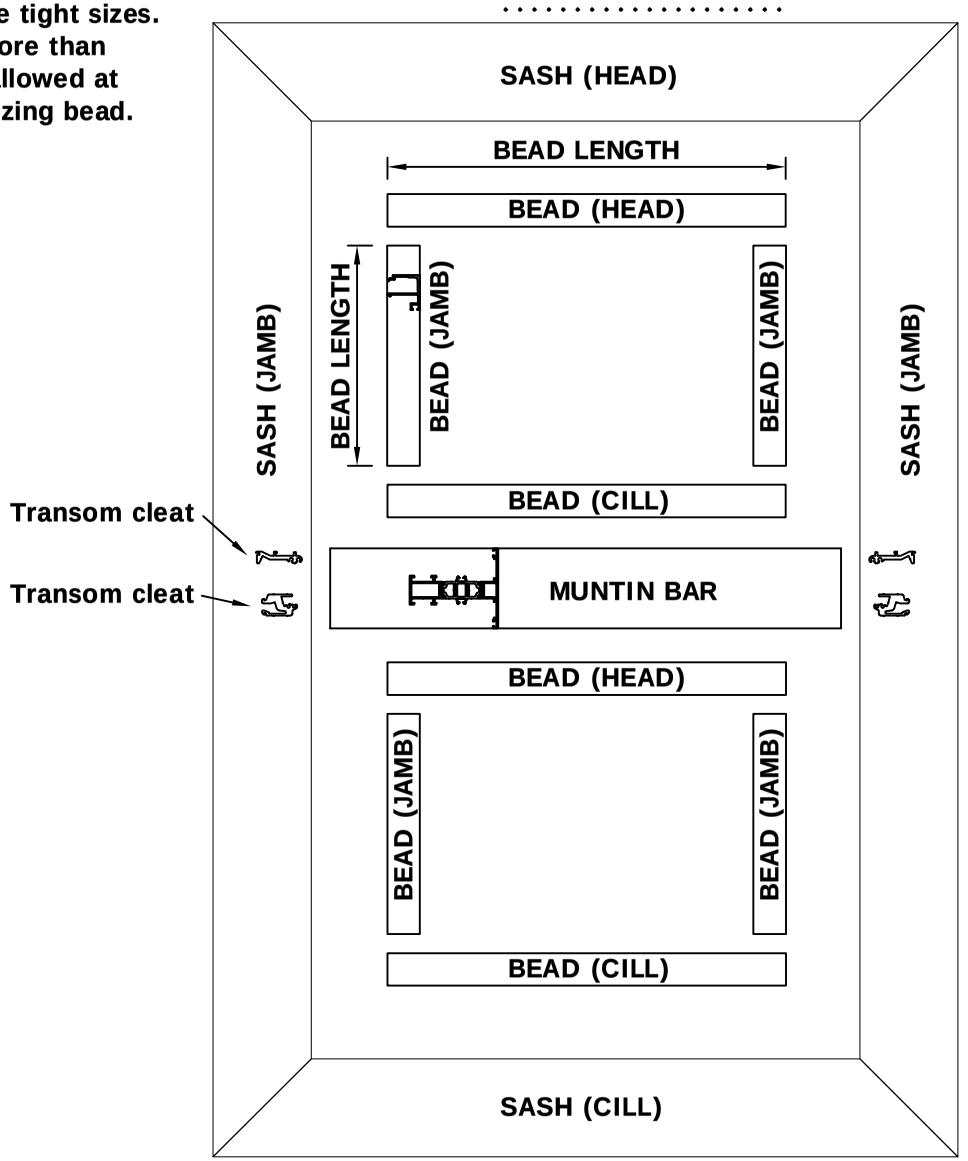
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Standard sash 630-637
Medium sash 631-661
Heavy sash 633-663
Euro groove sash 632-662



Note :-
All bead lengths are tight sizes. Clearance of not more than 0.5mm should be allowed at each end of the glazing bead.



DESCRIPTION	QUANTITY	LENGTH
MUNTIN BAR	ONE	SFSS or PSS PLUS 56mm
BEAD (HEAD)	TWO	SFSS or PSS PLUS 46mm
BEAD (CILL)	TWO	SFSS or PSS PLUS 46mm
BEAD (JAMB)	FOUR	FOR SQUARE BEADS: SFSS or PSS
GLASS SIZE	TWO	SFSS or PSS PLUS 36mm

Further integral muntins may be calculated by using the pane sight sizes (PSS).

Not to Scale

Mullion Stiffener Prep

System 5-35 Hi/Hi+

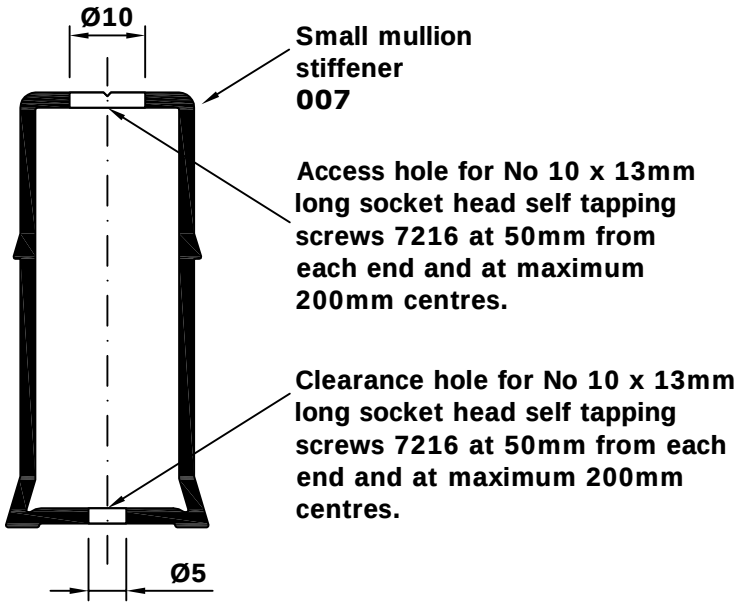
TILT AND TURN
WINDOW

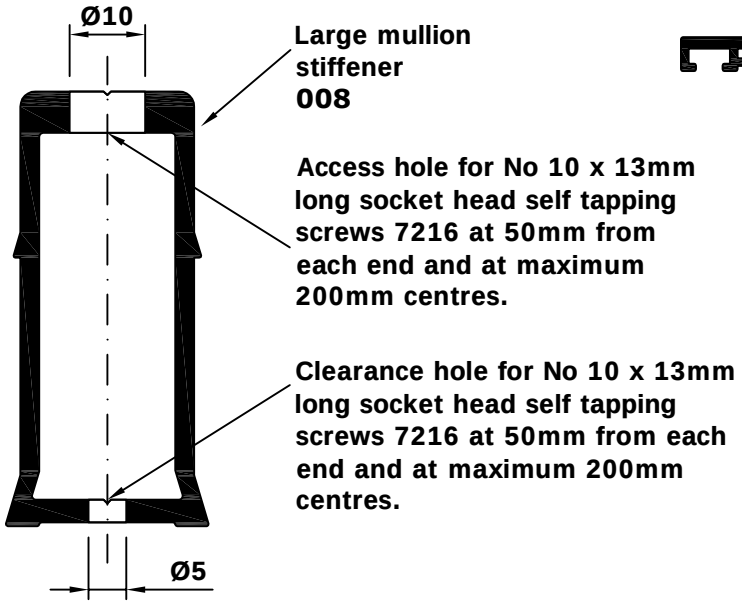
Metal Technology recommend that the No 10 x 13mm socket head self tapping screws 7216 are fixed at 200mm centres and sealed in position using HR50328A sealant. Variation from these centres will affect the structural performance of the combined mullion and must be checked and confirmed by a structural engineer.

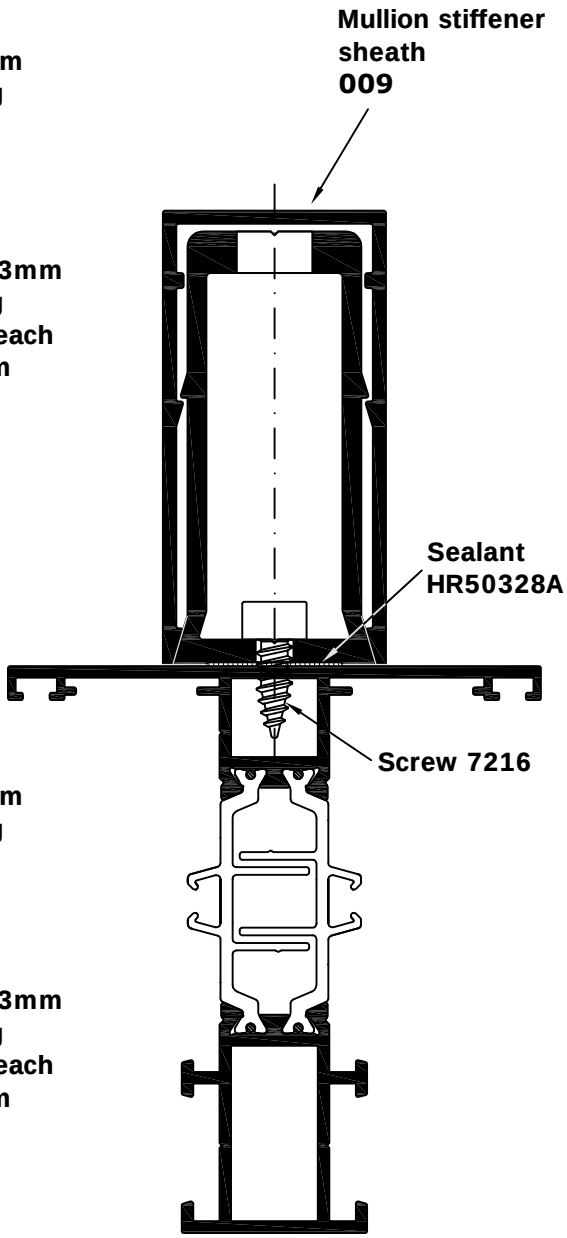
Cutting sizes to be calculated to suit site application.

Care should be taken to accommodate cill and head liner profiles.

These profiles are suitable for use with 603-201, 603-218, 606-206, 606-207, 609-200, 613-213 and 613-221, when used as mullions, and should be fixed to profiles 603, 606, 609, and 613 only.







Scale 1:1

Saw Blocks

System 5-35 Hi/Hi+

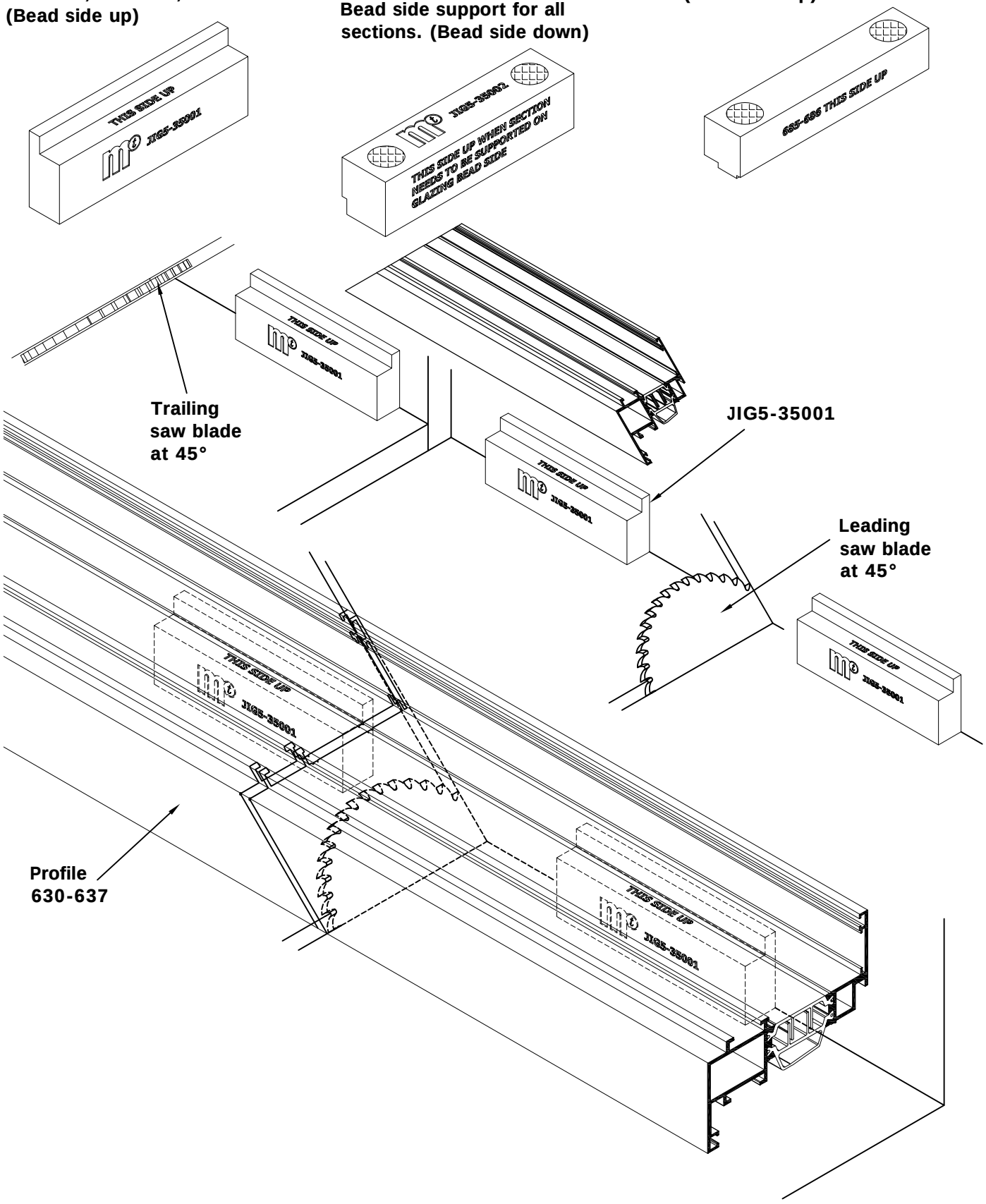
TILT AND TURN WINDOW

Saw blocks to be used in threes and to be positioned to either side of the leading blade as illustrated below. Each block should be positioned with the applicable profile code facing up and with the writing the correct way around. Blocks incorporate magnetic spuds to help location and should be positioned below clamps.

JIG5-35001
Saw block for sections 630-637, 631-661, 632-662, 633-663. (Bead side up)

JIG5-35002
Saw block for sections 614-615, 614-616. (Either side up) Bead side support for all sections. (Bead side down)

JIG4-35021
Saw block for section 685-686. (Bead side up)



Not to Scale

Mullion / Transom End Prep

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Bar length = Fixed frame sight size + 55mm

70.5mm wide section

609-200

75.5mm wide section

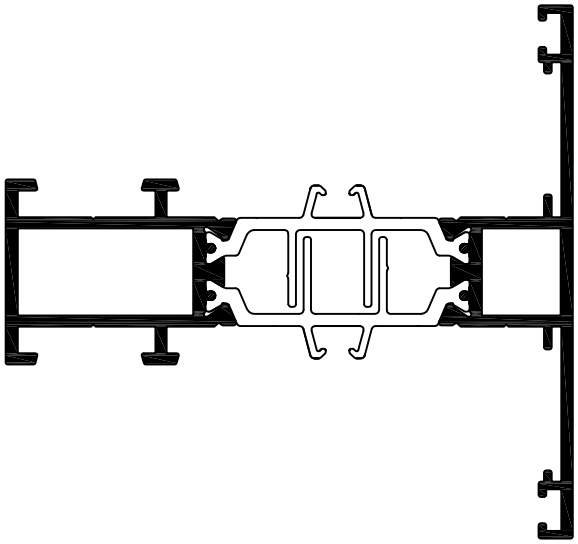
603-201

80.5mm wide section

613-213

98mm wide section

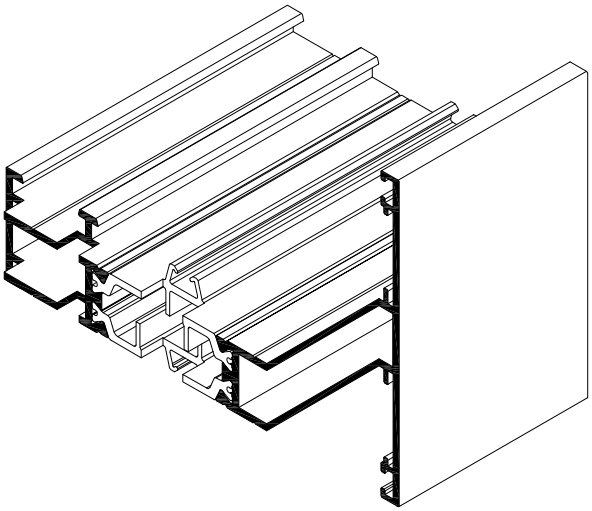
606-206

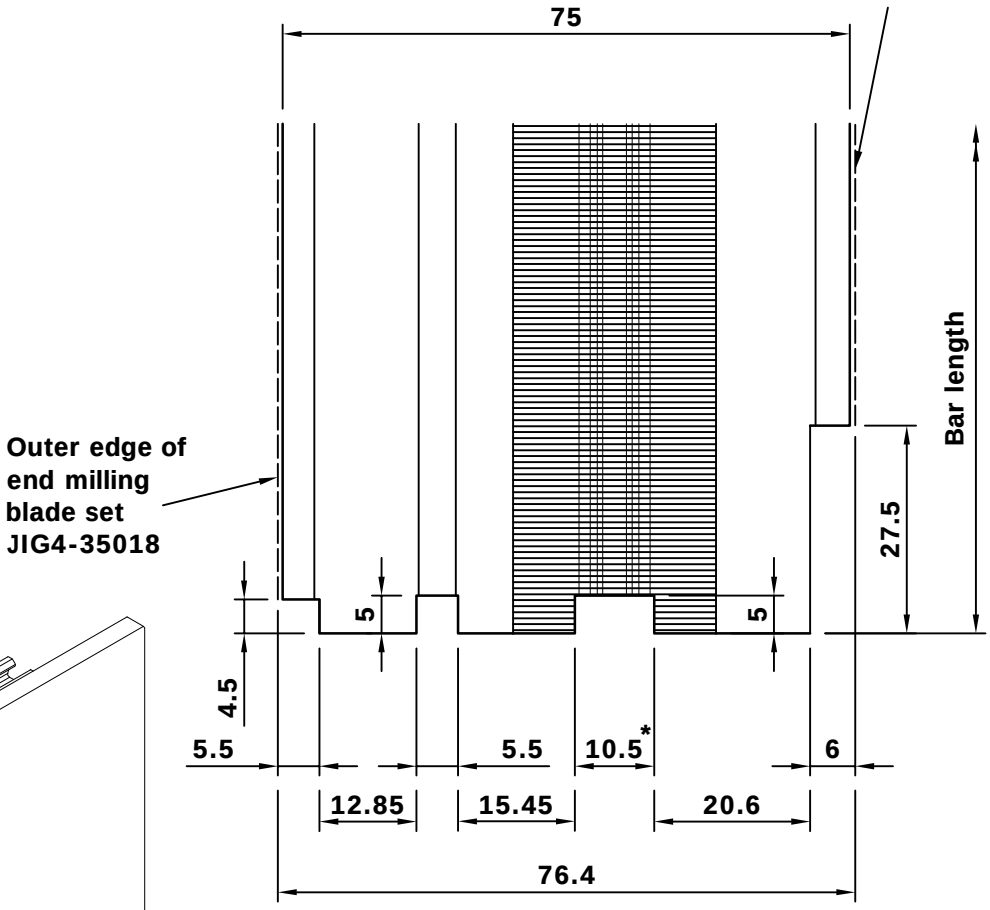


These profiles are suitable for use with the following sections:

Outer frames

600-200
600-605
601-201
602-202
604-213
614-615
614-616
685-686





*** Metal Technology recommend this end milling blade is interchangeable with a 10.5mm spacer for use in muntin applications**

Scale 1:1

Mullion End Prep

System 5-35 Hi/Hi+

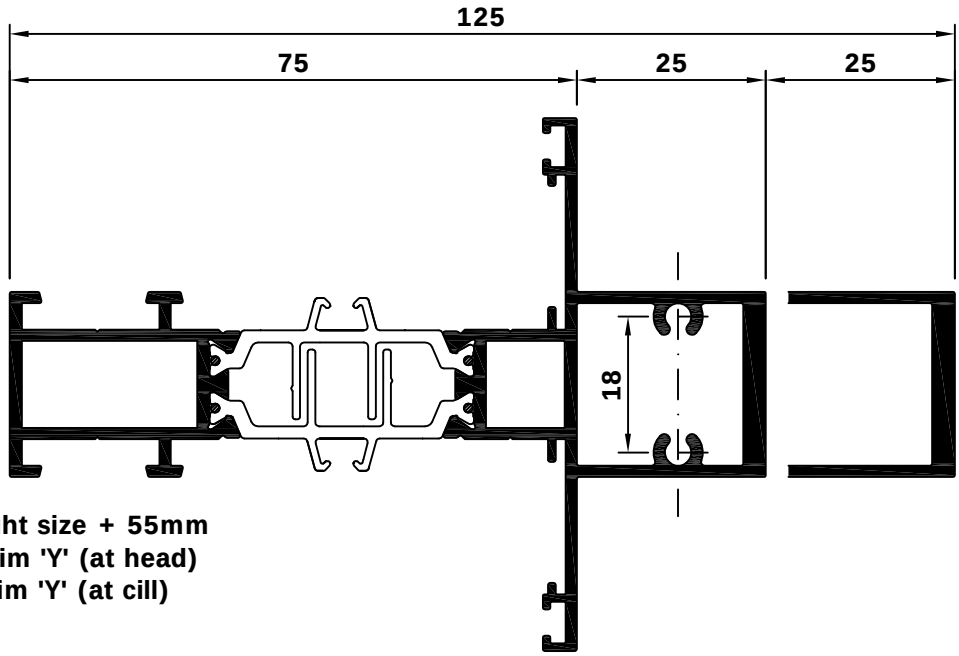
TILT AND TURN WINDOW

100mm deep sections

640-200
642-201

125mm deep sections

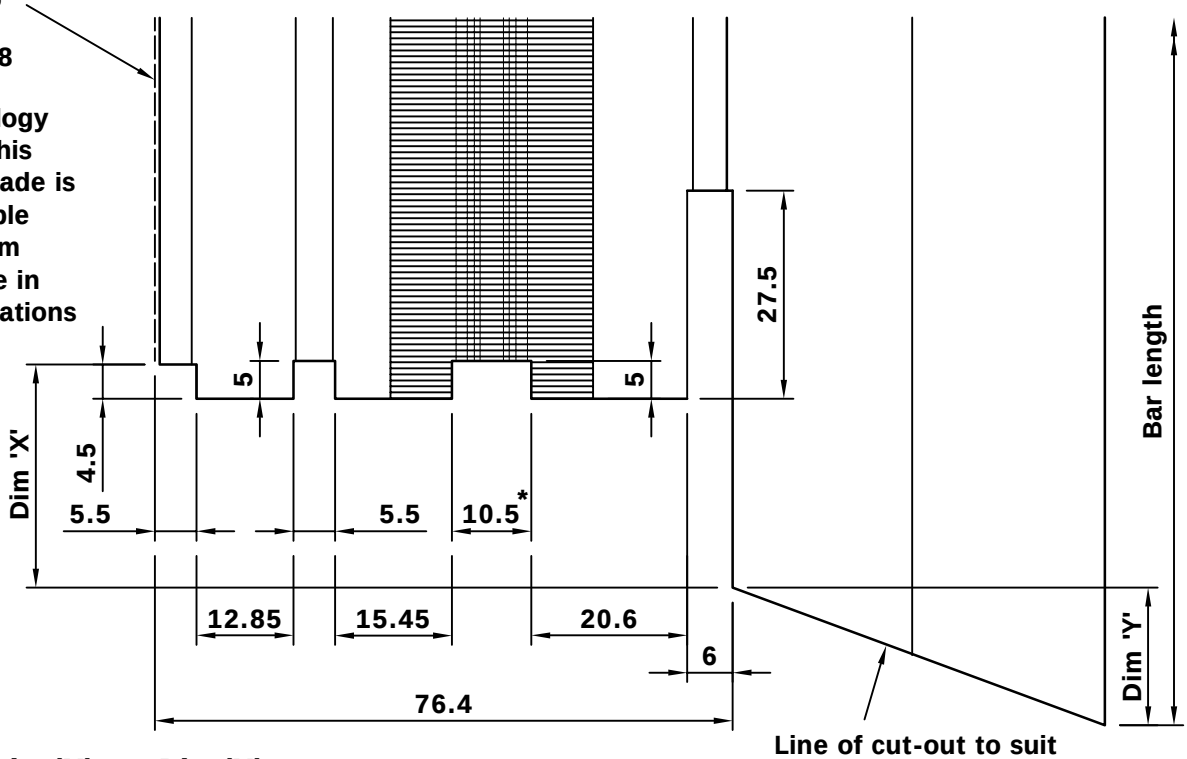
641-200
643-201
607-206



Bar length = Fixed frame sight size + 55mm
+ dim 'X' and dim 'Y' (at head)
+ dim 'X' and dim 'Y' (at cill)

Outer edge of end milling blade set JIG4-35018

*** Metal Technology recommend this end milling blade is interchangeable with a 10.5mm spacer for use in muntin applications**



Section	Dim 'X'	Dim 'Y'
600-200	24.5	as specified by fabricator
600-605	24.5	as specified by fabricator
601-201	29.5	as specified by fabricator
602-202	44.5	as specified by fabricator
604-213	34.5	as specified by fabricator

If 'Y' is specified as 0, bar will be square ended. Values of 'X' and 'Y' must be provided for both ends of the bar.

Notes:

1. **Please note these sections are not suitable for use as transoms.**
2. **Box mullion should be notched over outer frame and cill liner if applicable, to suit application.**
3. **For further advice please contact Metal Technology's Technical Department.**

Scale 1:1

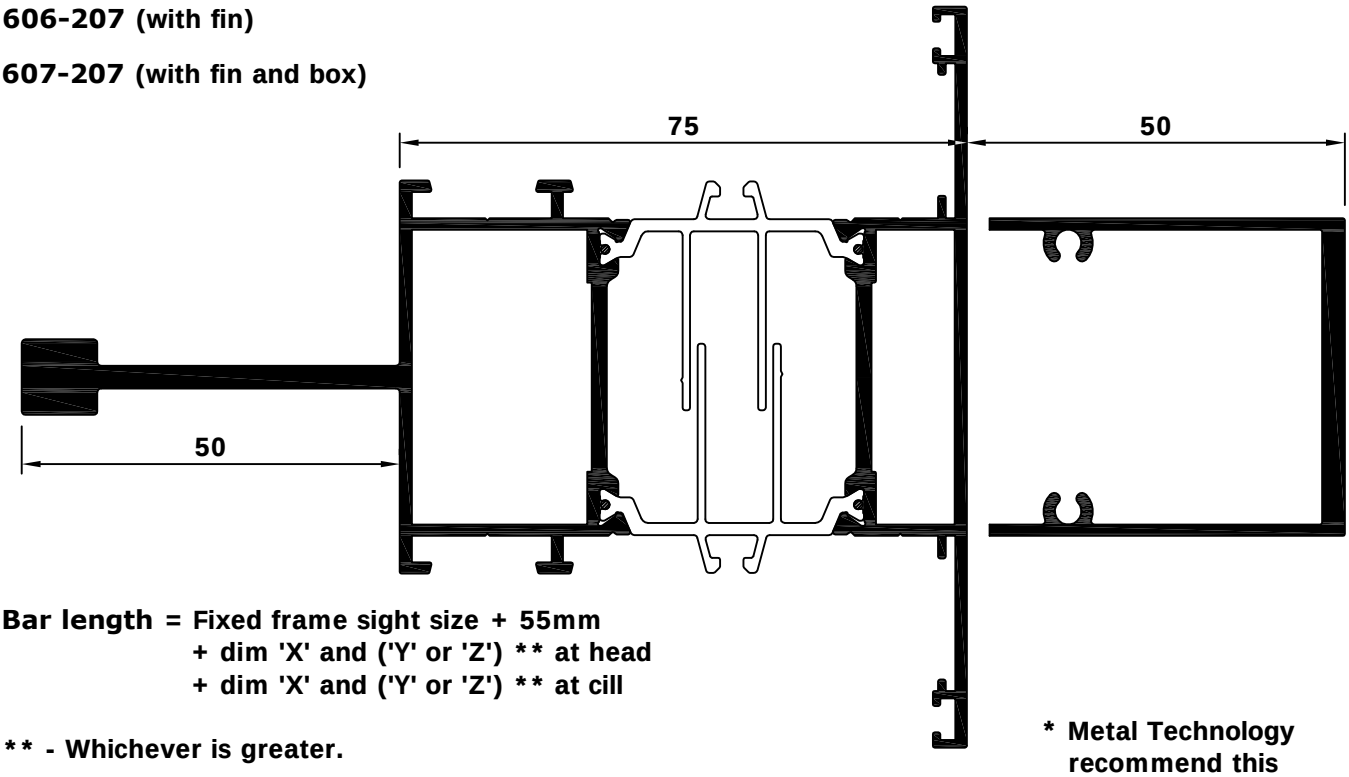
Heavy Duty Mullion End Prep

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

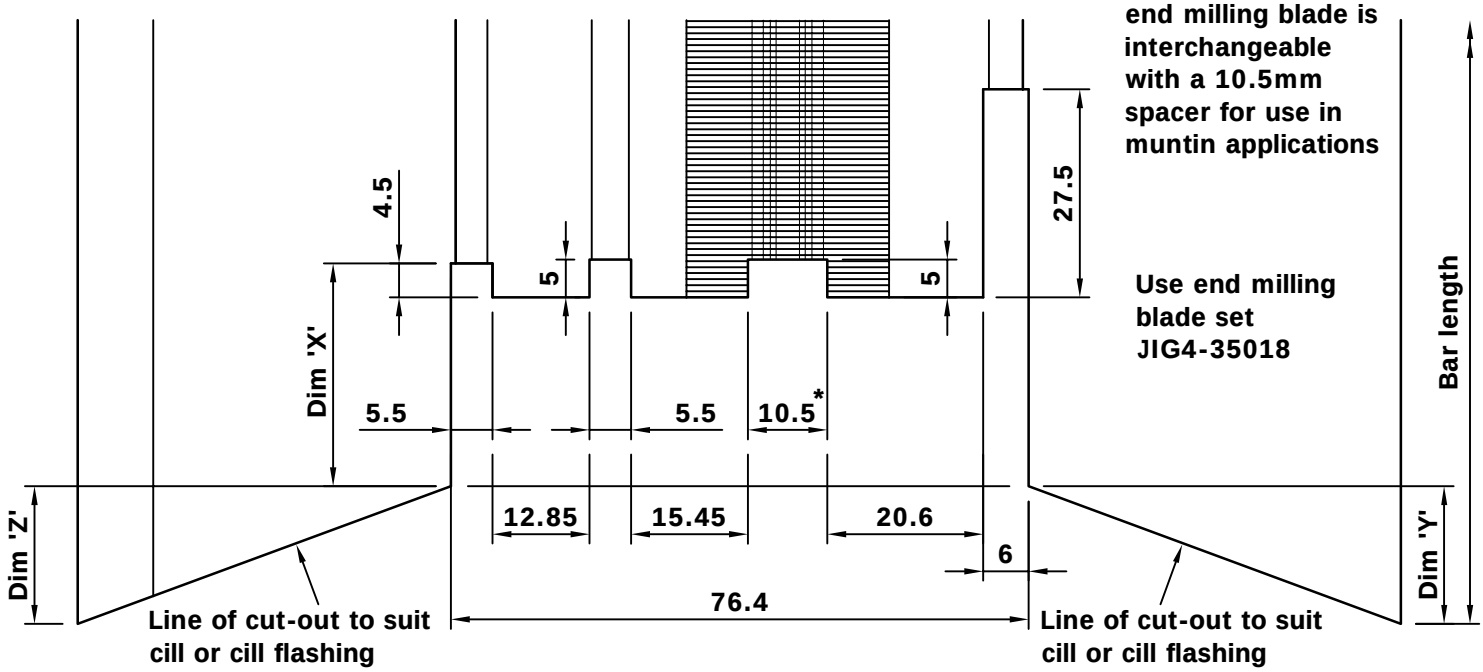
606-207 (with fin)

607-207 (with fin and box)



Bar length = Fixed frame sight size + 55mm
+ dim 'X' and ('Y' or 'Z') ** at head
+ dim 'X' and ('Y' or 'Z') ** at cill

** - Whichever is greater.



* Metal Technology recommend this end milling blade is interchangeable with a 10.5mm spacer for use in muntin applications

Use end milling blade set JIG4-35018

Section	Dim 'X'	Dim 'Y' and Dim 'Z'
600-200	24.5	as specified by fabricator
600-605	24.5	as specified by fabricator
601-201	29.5	as specified by fabricator
602-202	44.5	as specified by fabricator
604-213	34.5	as specified by fabricator

If 'Y' or 'Z' is specified as 0, bar will be square ended. Values of 'X', 'Y' and 'Z' must be provided for both ends of the bar.

Notes:

1. Please note these sections are not suitable for use as transoms.
2. Box mullion should be notched over outer frame, and cill liner if applicable, to suit application.
3. For further advice please contact Metal Technology's Technical Department.

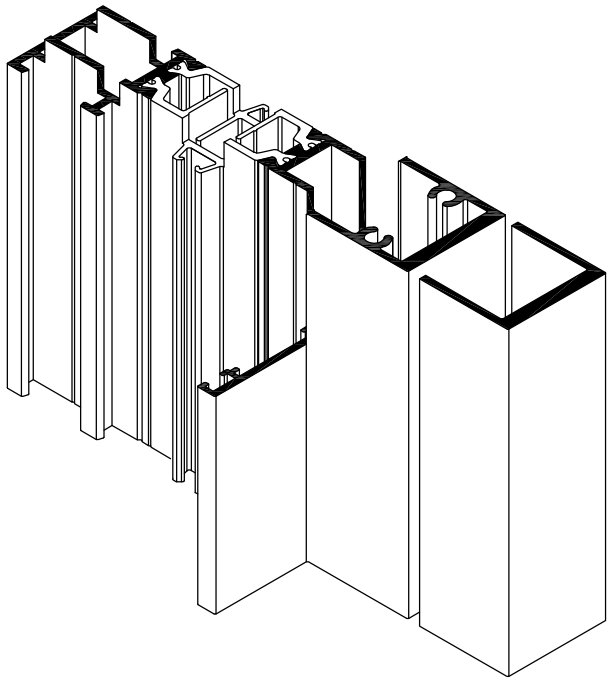
Scale 1:1

Mullion End Prep
3-Dimensional Views

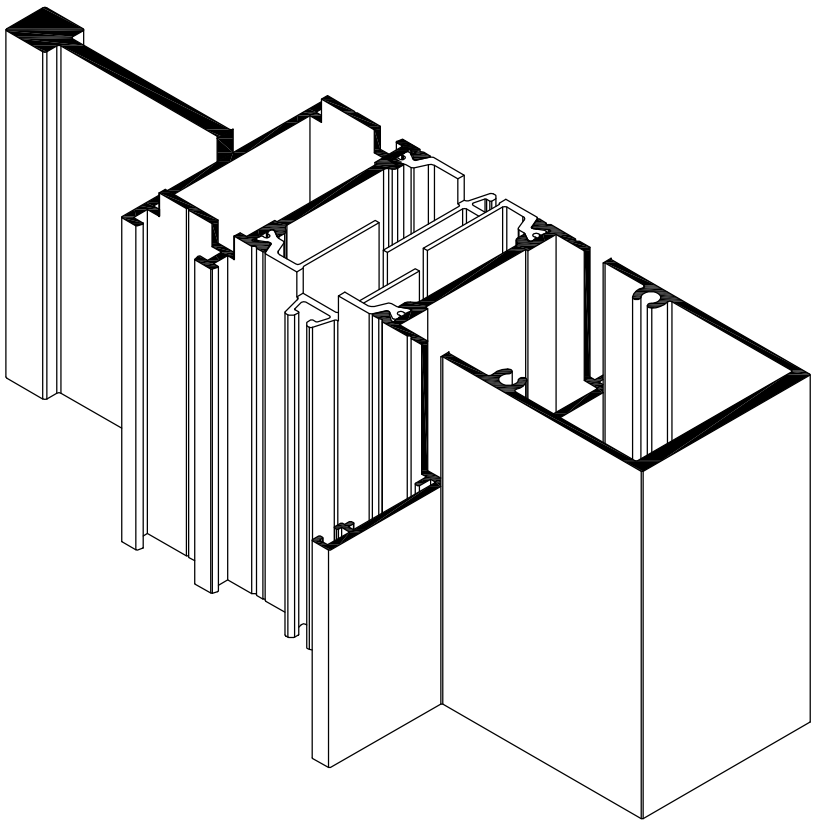
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

MULLION END PREPARATION



MULLION END PREPARATION



Scale 1:1

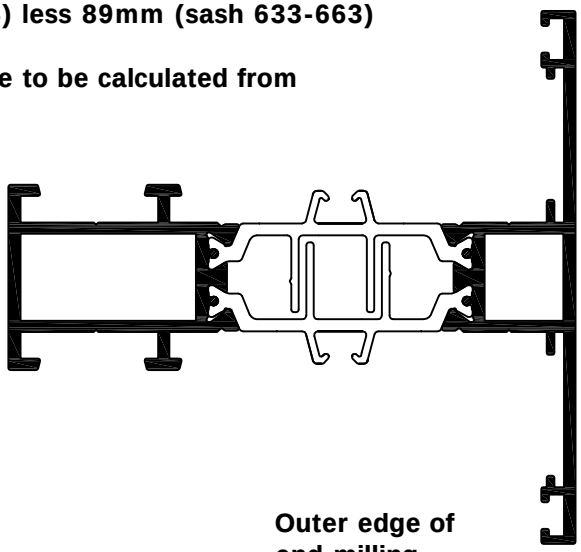
Muntin Bar End Prep

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

For single muntin bars
Muntin bar length = Fixed frame sight size (FFSS) less 25mm (sash 630-637)
= Fixed frame sight size (FFSS) less 35mm (sash 631-661)
= Fixed frame sight size (FFSS) less 36mm (sash 632-662)
= Fixed frame sight size (FFSS) less 89mm (sash 633-663)

For bar lengths of multiple muntin bars, these are to be calculated from dimensioned general arrangement drawings.



Standard mullion / transom (muntin bar) options
603-201
606-206
609-200
613-213

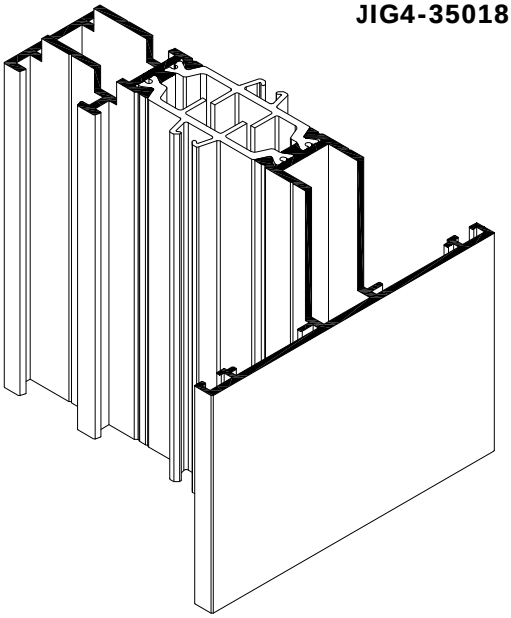
This profile is suitable for use with the following sash sections:

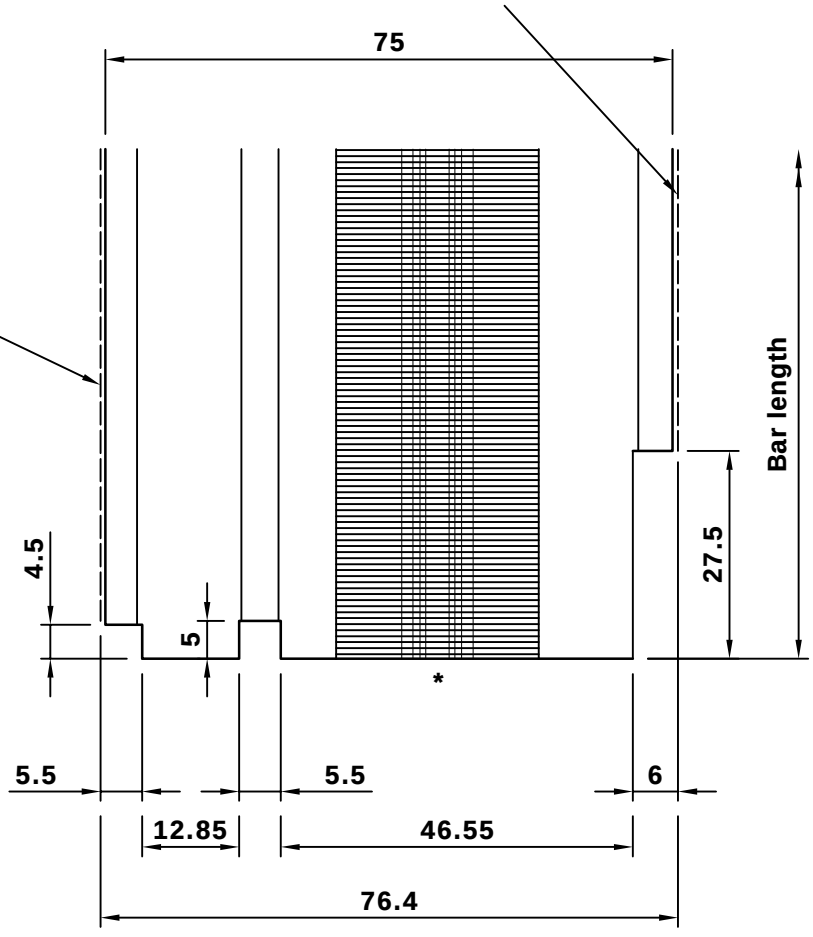
630-637 Standard tilt and turn sash

631-661 Medium tilt and turn sash

633-663 Heavy tilt and turn sash

632-662 Euro groove tilt and turn sash





*** Replace end milling blade in JIG4-35018 with 10.5mm spacer supplied.**

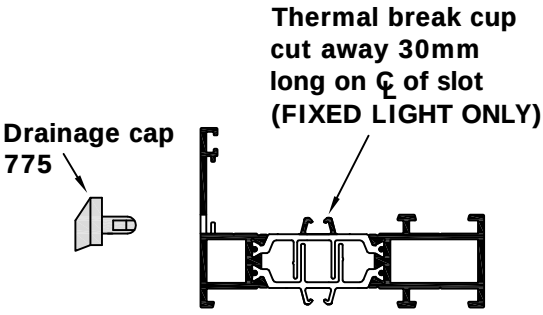
Scale 1:1

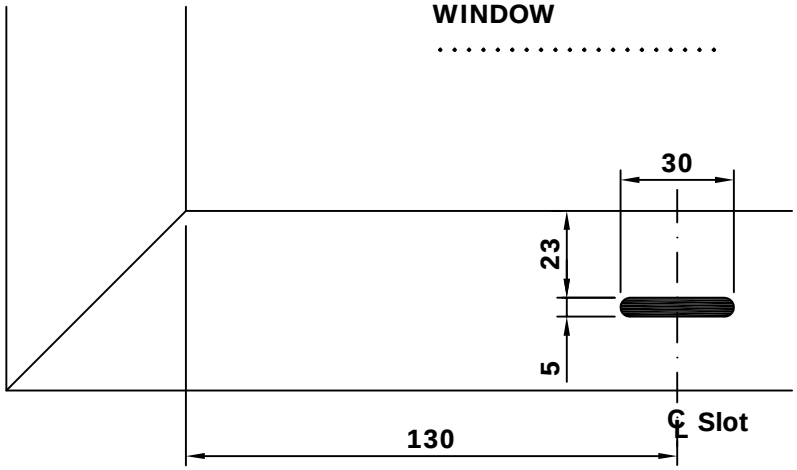
Drainage Details

To suit glaze in outer frame and liner bar

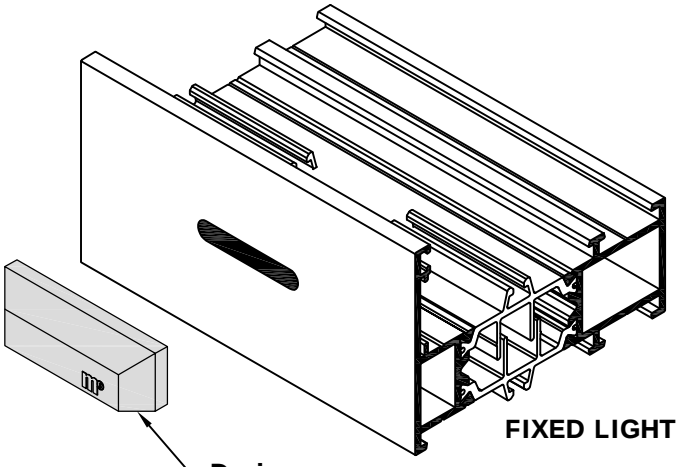
System 5-35 Hi

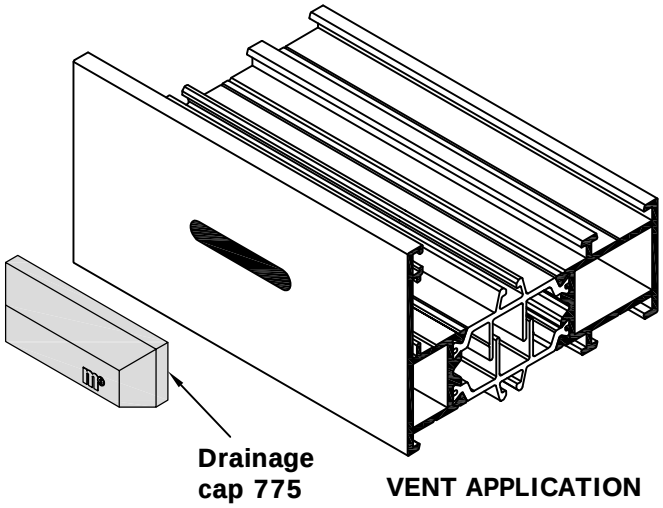
TILT AND TURN WINDOW

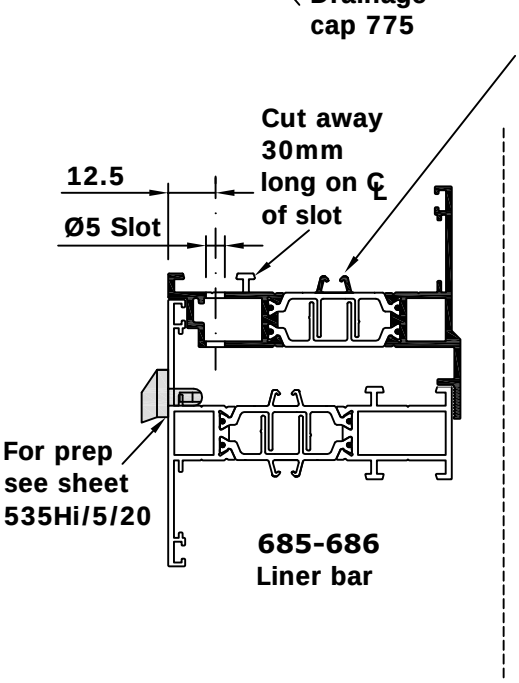


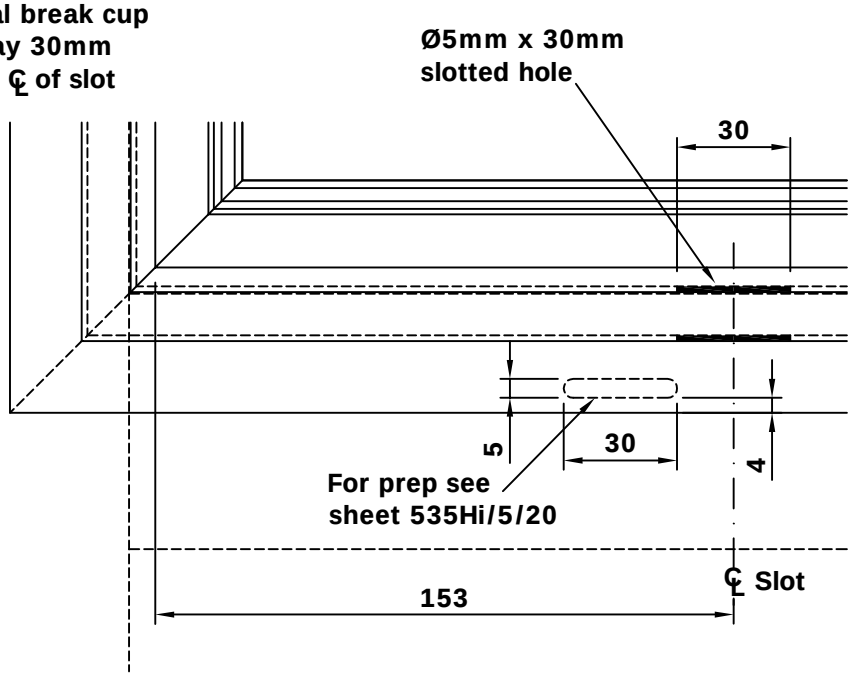


Fixed light / Outer frame
600-200, 600-605, 601-201, 602-202
604-213, 614-615, 614-616









Refer to System 4-35 Hi drainage details for bead prep in externally glazed fixed light applications only.

Where centres of drainage preps exceed 1000mm provide an extra central prep.

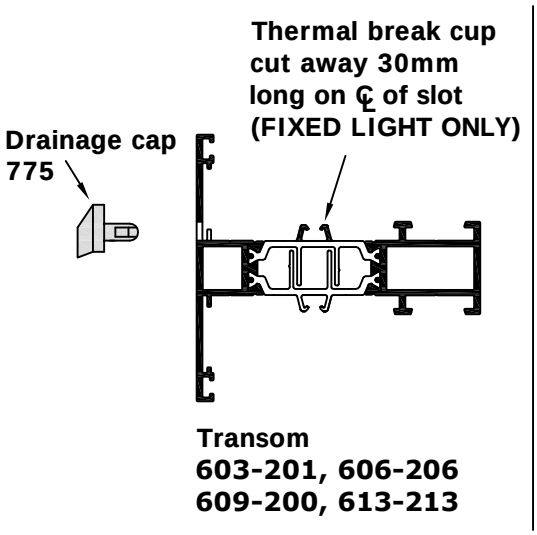
Scale 1:2

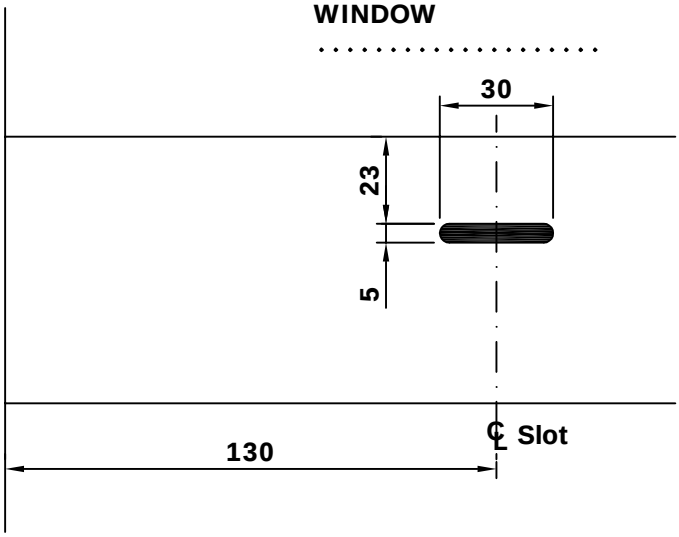
Drainage Details

To suit glaze in transom

System 5-35 Hi

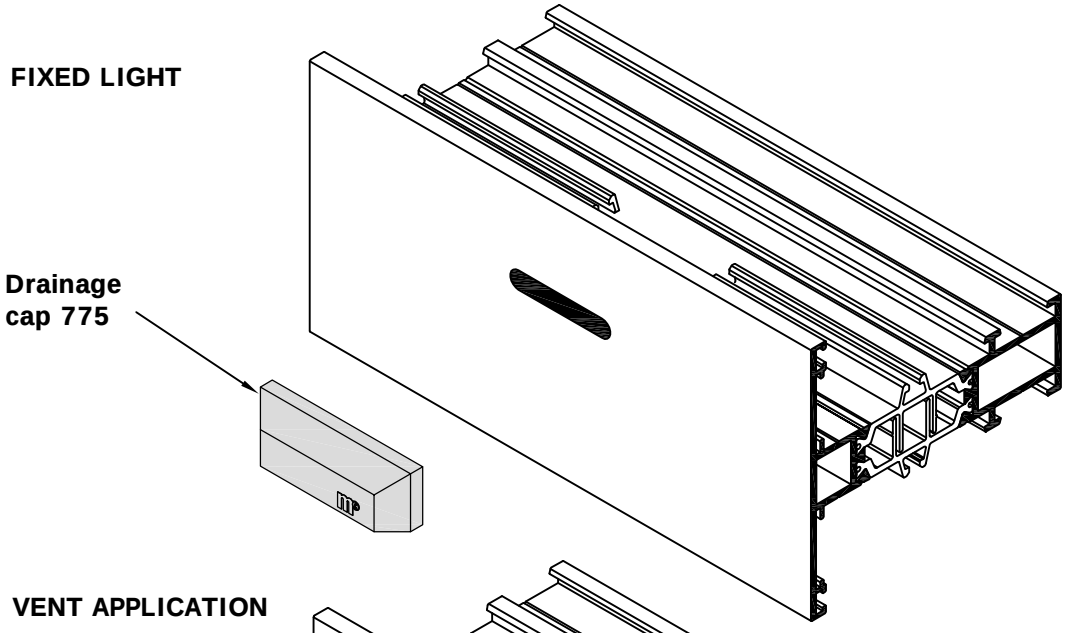
TILT AND TURN WINDOW



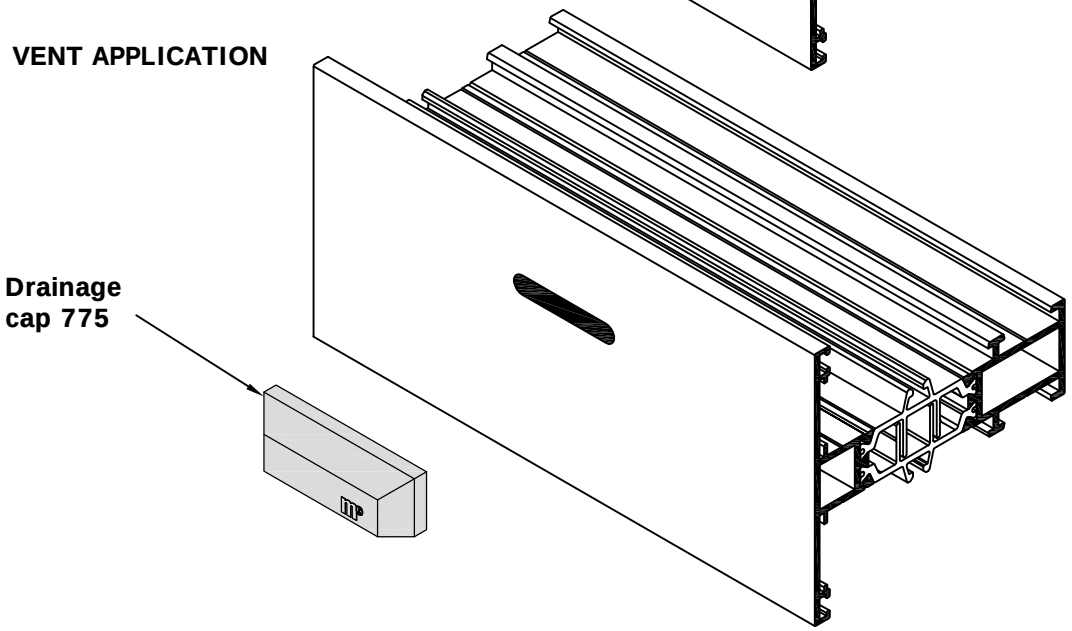


Where centres of drainage preps exceed 1000mm provide an extra central prep.

FIXED LIGHT



VENT APPLICATION



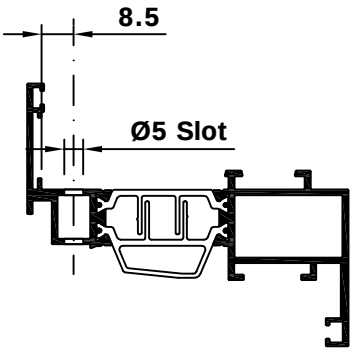
Scale 1:2

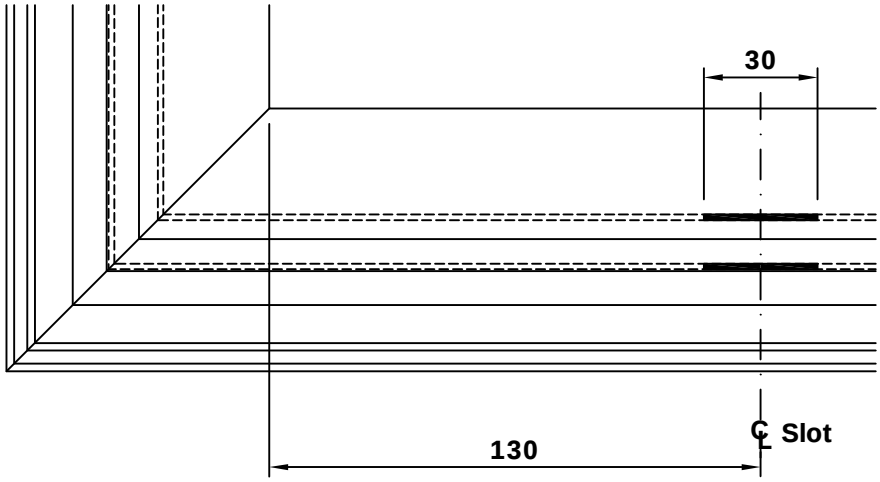
Drainage Details

To suit inside glaze sashes 630-637, 631-661, 633-663 and euro groove sash 632-662

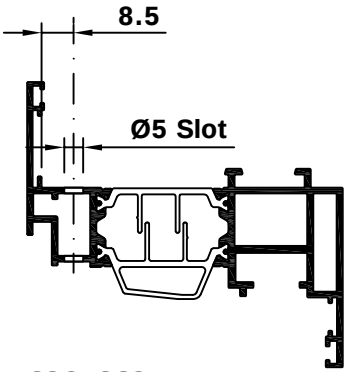
System 5-35 Hi

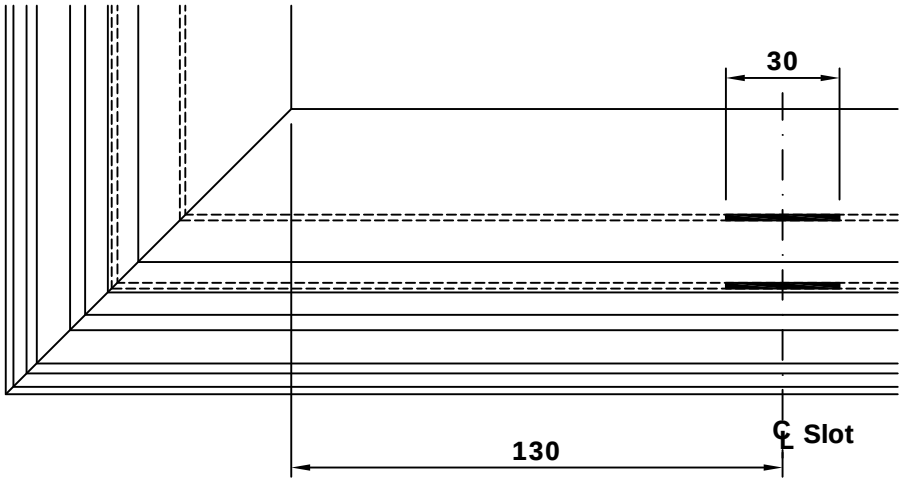
TILT AND TURN WINDOW





630-637
Standard tilt and turn sash
631-661
Medium tilt and turn sash
633-663
Heavy tilt and turn sash





632-662
Euro groove tilt and turn sash

Where centres of drainage preps exceed 1000mm provide an extra central prep.

Scale 1:2

Drainage Details

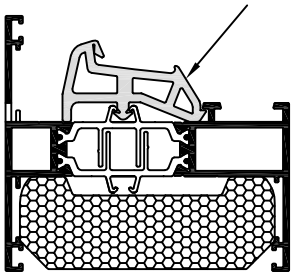
To suit glaze in outer frame and liner bar

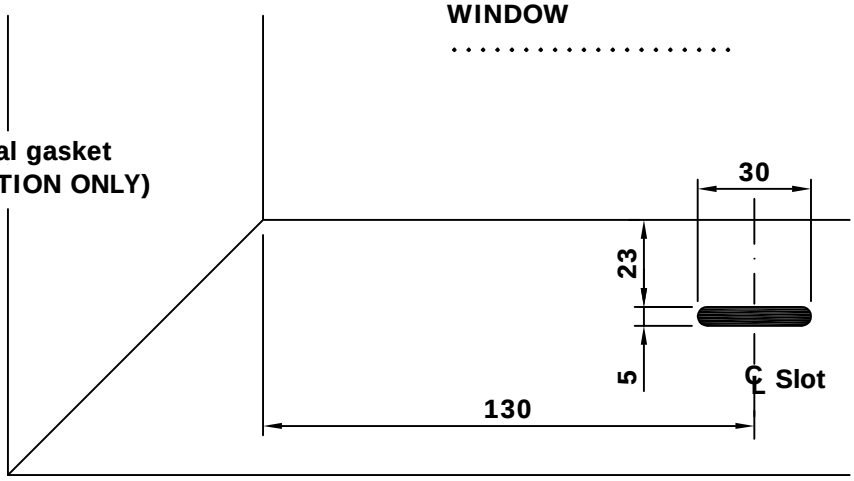
System 5-35 Hi+

TILT AND TURN WINDOW

Drainage cap 775

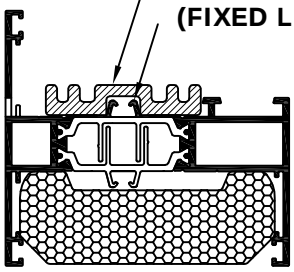
6061 Centre seal gasket (VENT APPLICATION ONLY)

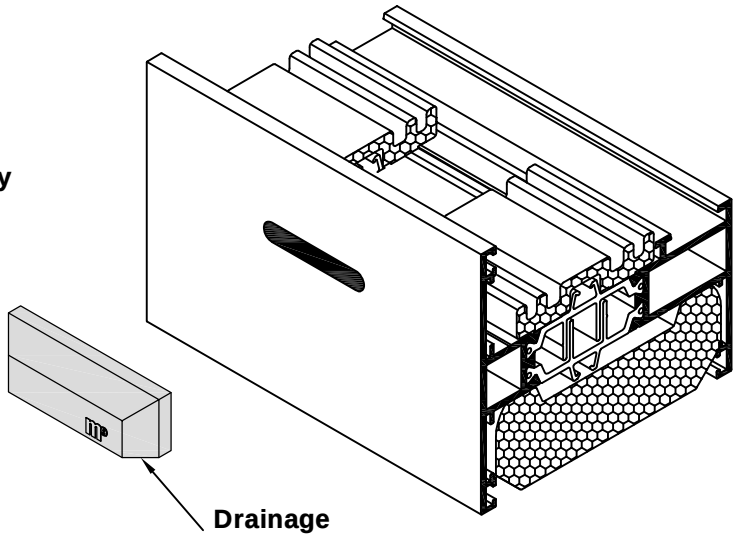




Outer frame
600-200, 600-605
601-201, 602-202
604-213, 614-615
614-616

Thermal break cup and dgu foam 6727 cut away 30mm long on ℄ of slot (FIXED LIGHT ONLY)

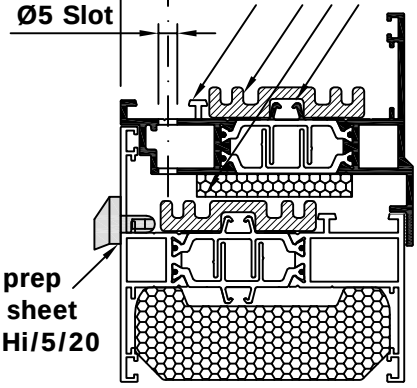




Cut away section, thermal break cup, and 6727 foam 30mm long on ℄ of slot

12.5

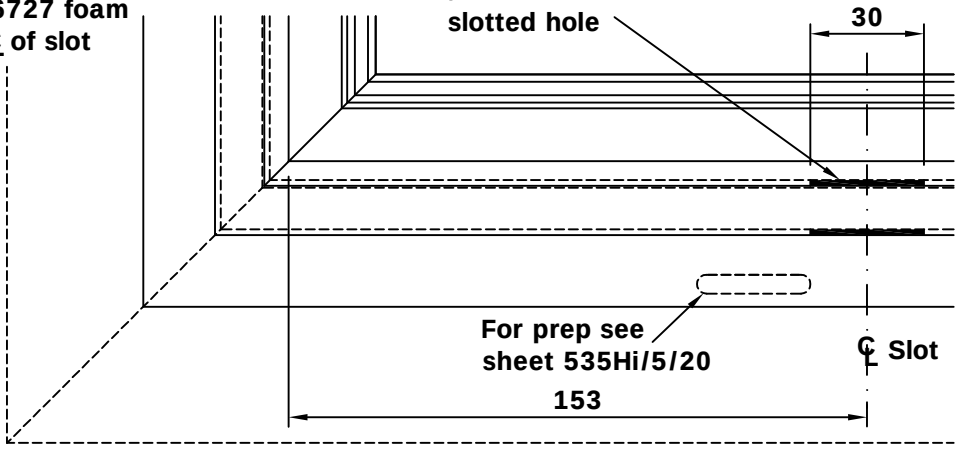
Ø5 Slot



For prep see sheet 535Hi/5/20

685-686
Liner bar

Ø5mm x 30mm slotted hole



Refer to System 4-35Hi drainage details for bead prep in externally glazed fixed light applications only.

Where centres of drainage preps exceed 1000mm provide an extra central prep.

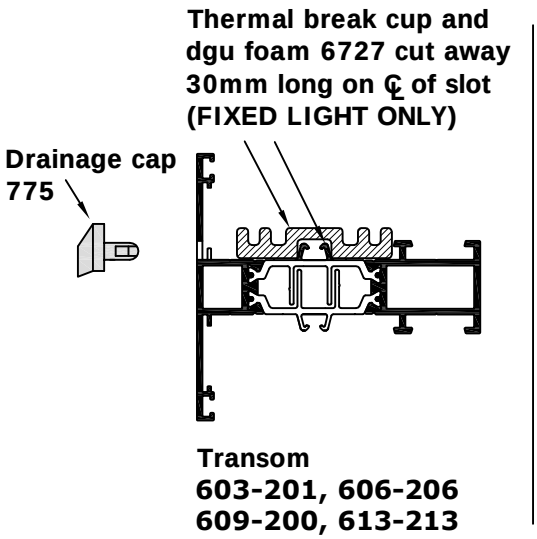
Scale 1:2

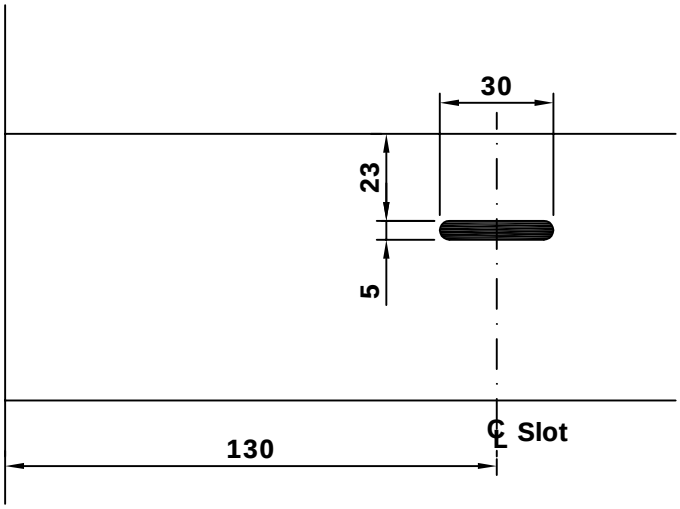
Drainage Details

To suit glaze in transom

System 5-35 Hi+

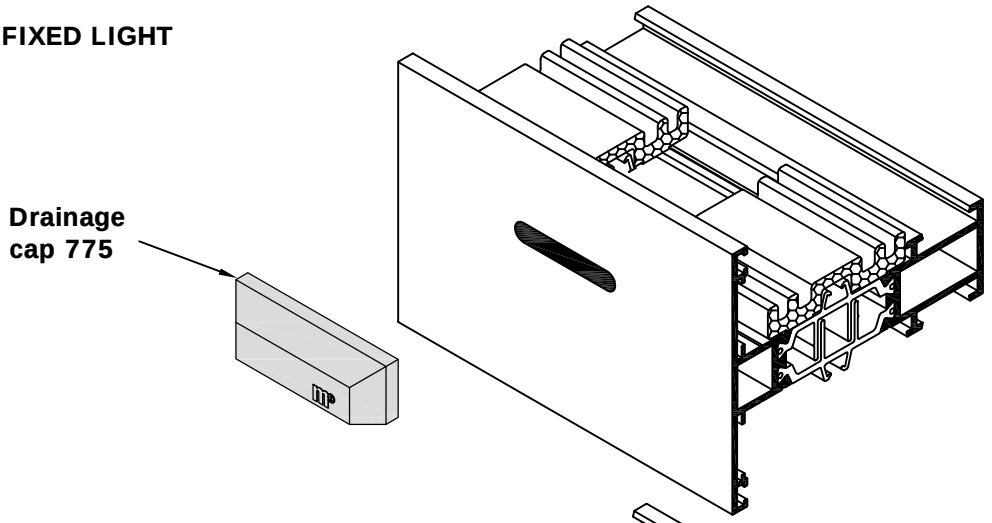
TILT AND TURN WINDOW



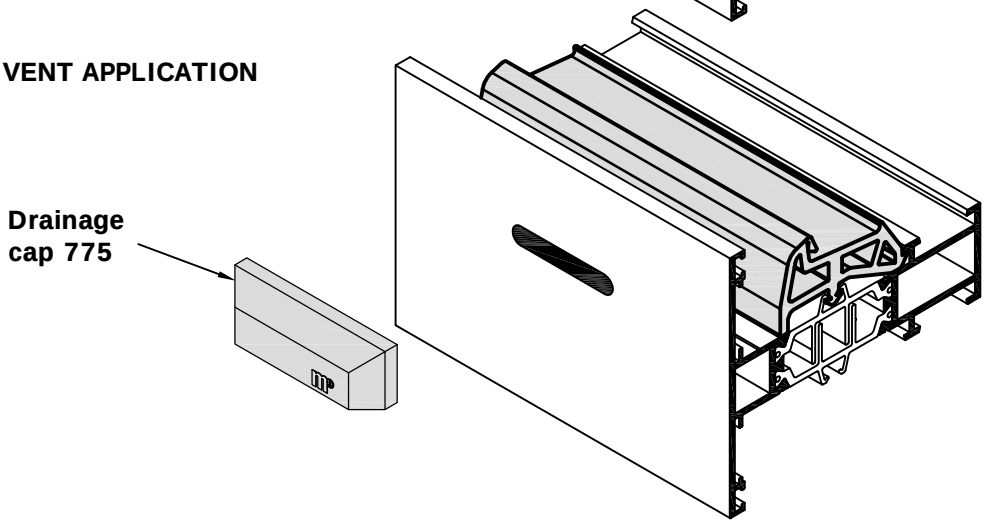


Where centres of drainage preps exceed 1000mm provide an extra central prep.

FIXED LIGHT



VENT APPLICATION



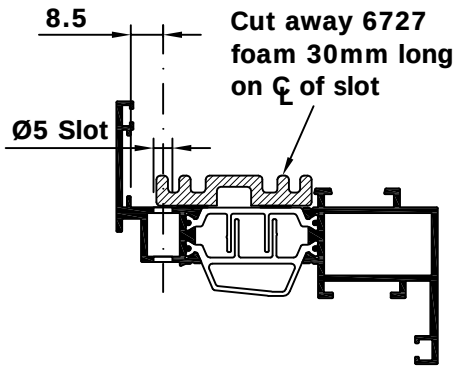
Scale 1:2

Drainage Details

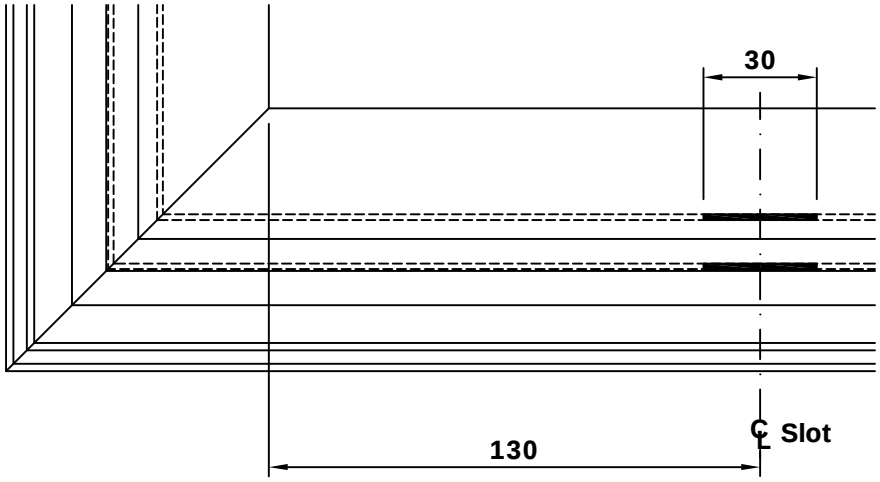
To suit inside glaze sashes 630-637, 631-661, 633-663 and euro groove sash 632-662

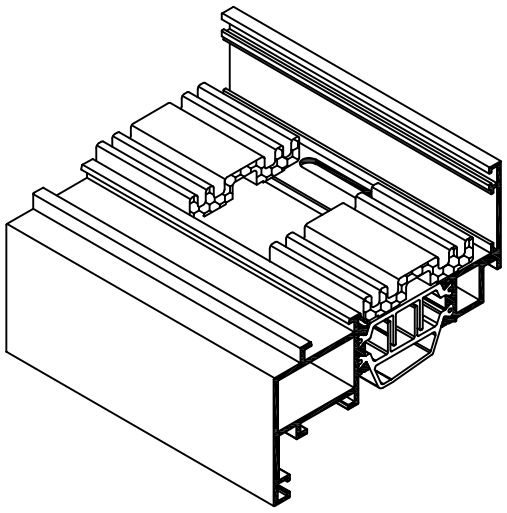
System 5-35 Hi+

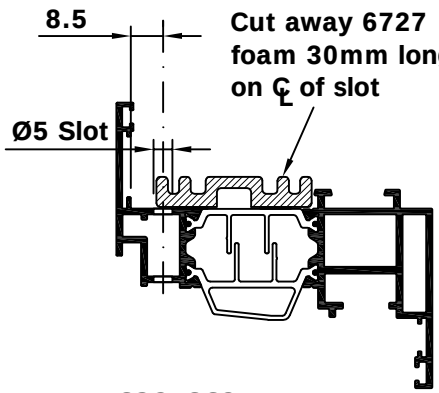
TILT AND TURN WINDOW



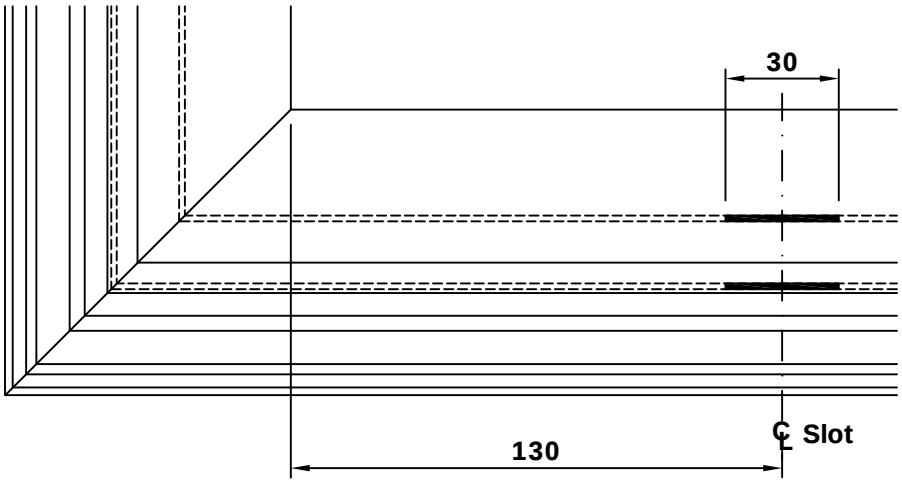
630-637
Standard tilt and turn sash
631-661
Medium tilt and turn sash
633-663
Heavy tilt and turn sash







632-662
Euro groove tilt and turn sash



Where centres of drainage preps exceed 1000mm provide an extra central prep.

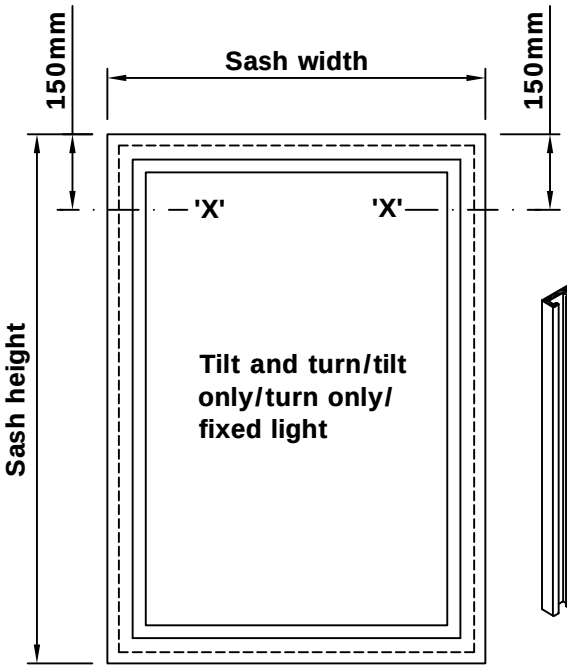
Scale 1:2

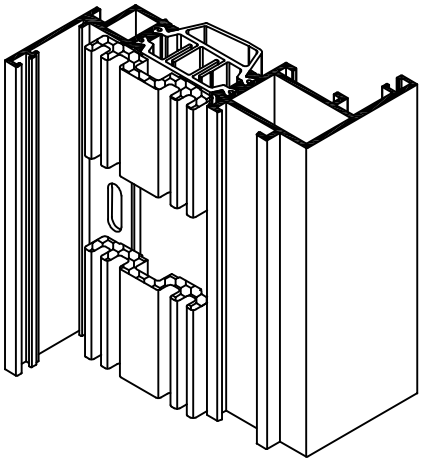
Pressure Equalisation

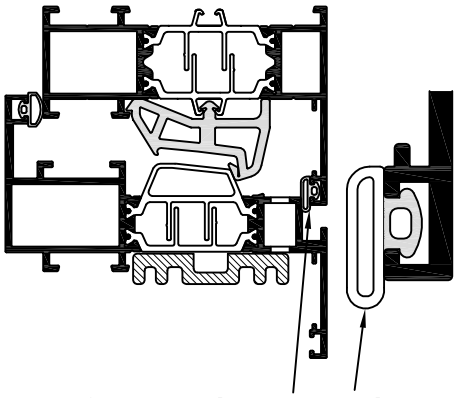
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Omit foams and gaskets for Hi applications only.







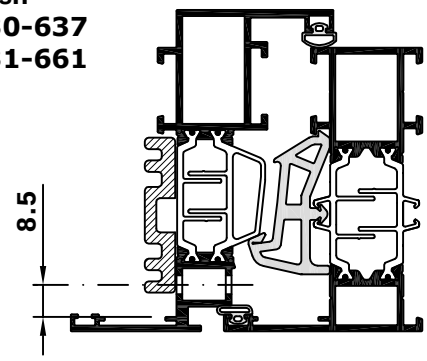
Outer frame gasket 6063 to be omitted/notched externally at head of opening sashes for pressure equalisation of the drainage cavity. Gasket may be notched for 100mm centrally at head of sash. However, in exposed conditions this notch may be increased, or the gasket omitted across the head of the sash for the full width.

5 x 15mm slot through profile at top corners of vent to give pressure equalisation and allow drainage (at positions marked 'X' above)

In Hi+ applications omit foam for 30mm at pressure equalisation positions.

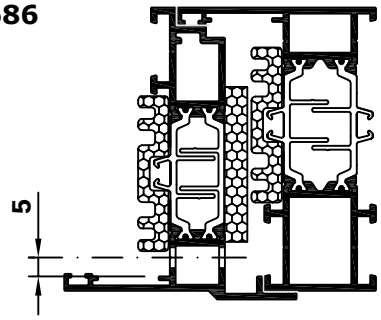
INSIDE

Sash
630-637
631-661

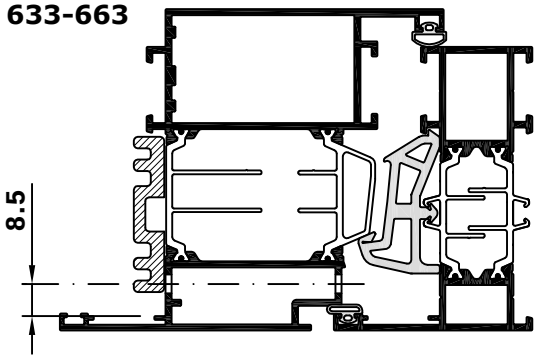


INSIDE

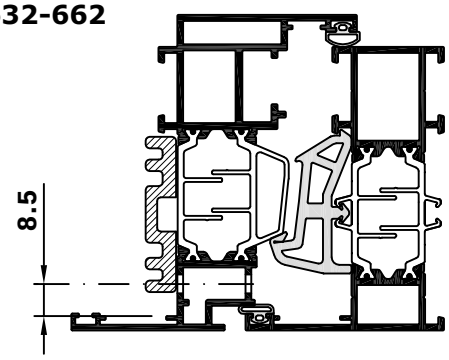
Liner bar
685-686



Sash
633-663



Sash
632-662



OUTSIDE

OUTSIDE

Scale 1:2

Corner Assembly Details

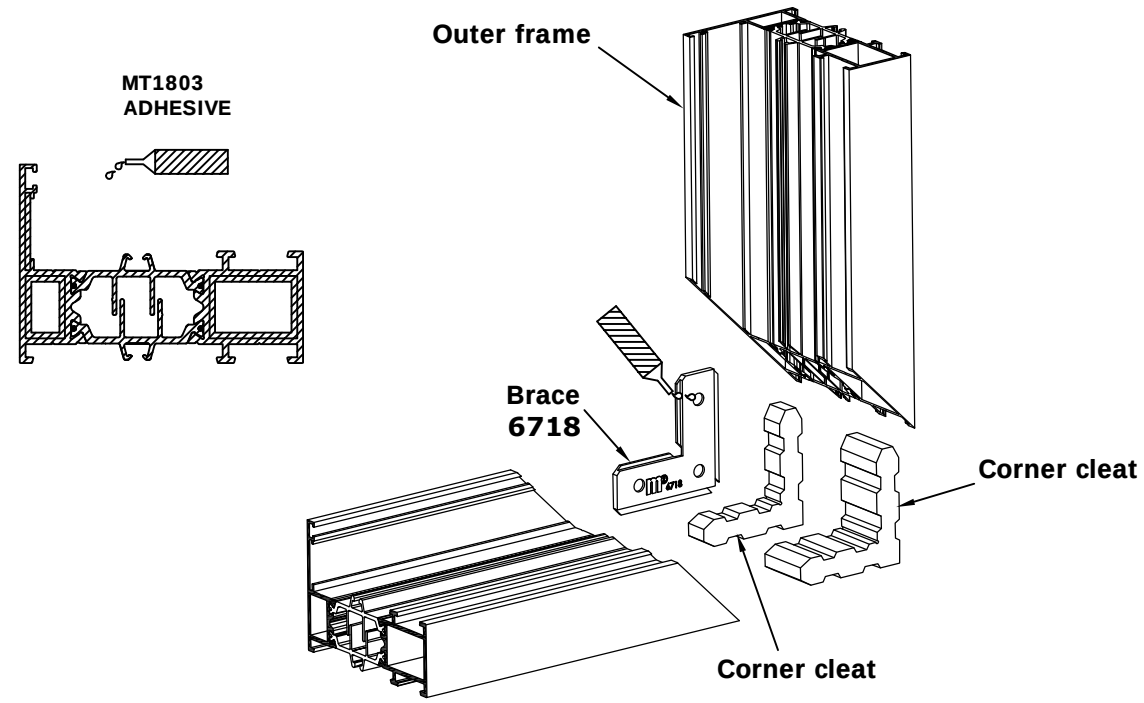
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

IMPORTANT: PLEASE READ THESE NOTES BEFORE CORNER ASSEMBLY.

METAL TECHNOLOGY RECOMMEND THE USE OF PNEUMATIC CRIMPERS, AND MT1803 ADHESIVE TO ENSURE THE STABILITY OF CORNER JOINTS. PARTICULAR ATTENTION SHOULD BE PAID TO THE BONDING OF THE CORNER BRACES TO THE PROFILE.

1. **Before applying MT1803 adhesive ensure all surfaces to be glued are free from grease or dust. Clean all aluminium mating surfaces with MT60 surface cleaner and allow to dry. Fabricator must ensure MT60 surface cleaner is fully compatible with surface finish on a project-by-project basis.**
2. **Apply MT1803 adhesive to the mating surfaces of the mitre cut aluminium and thermal break profiles. Adhesive need only be applied to one side of the mitred joint.**
3. **Apply MT1803 adhesive to the internal perimeter of the cleat chambers and corner brace grooves of the frame sections. This must be applied to both sides of the mitred joint and to sufficient depth to ensure full bonding/sealing of the cleats and braces.**
4. **Insert corner cleats and braces and push sections together. Ensure mitred joint is aligned and true. Crimp fully assembled mitred corner.**
5. **Bond and seal the 6718 corner braces into position by injecting MT1803 into the three holes provided.**
6. **Wipe away any excess adhesive from the mitred joint using MT60 surface cleaner and allow to dry. Ensure all bead and gasket recesses are clear of adhesive.**
7. **Seal crimps with HR50328A sealant.**
8. **Check the mitre is tight on both sides and that there is no movement.**



MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Not to scale

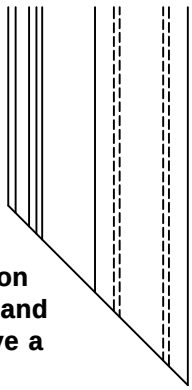
Corner Crimping Detail

Standard and Medium Outer Frames

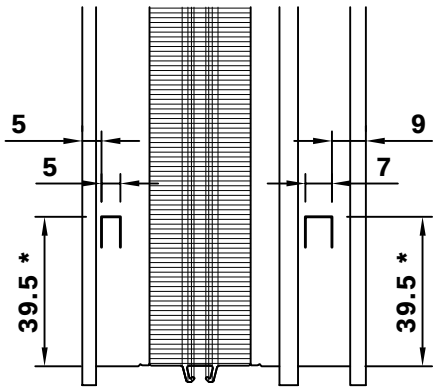
System 5-35 Hi/Hi+

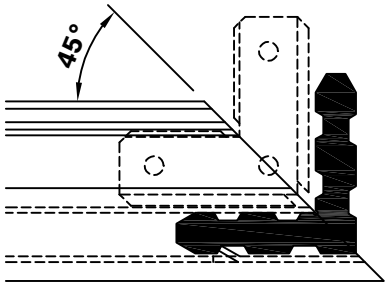
TILT AND TURN WINDOW

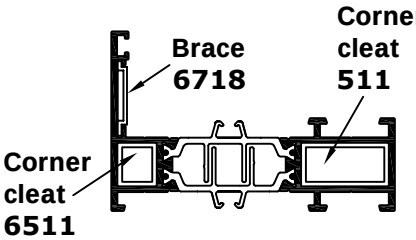
For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.



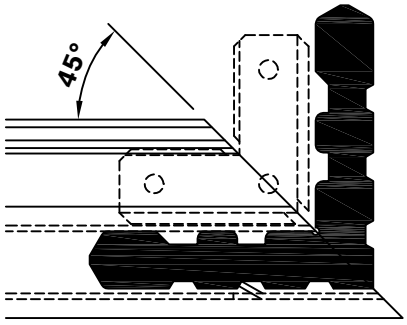
*** This dimension to be checked and adjusted to give a tight mitre**

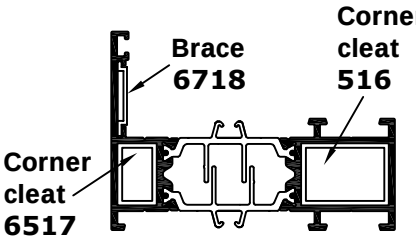




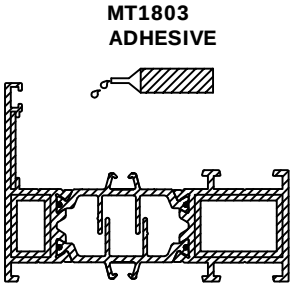


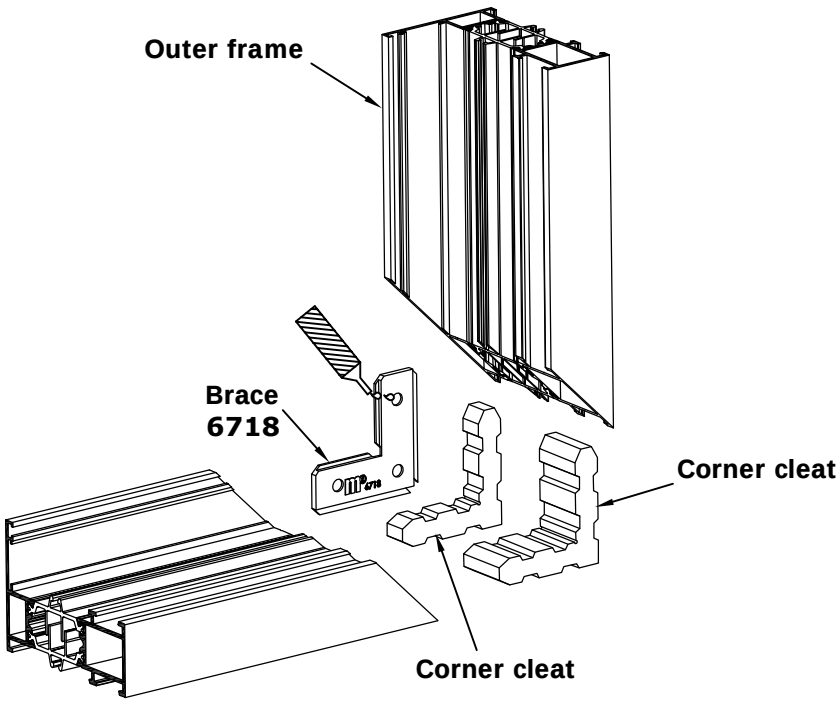
600-200
600-605
Standard short leg outer frame





601-201
Medium short leg outer frame





MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

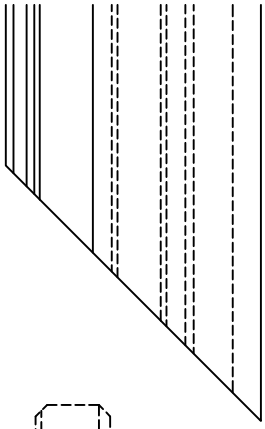
Corner Crimping Detail

Standard Long Leg Outer Frame

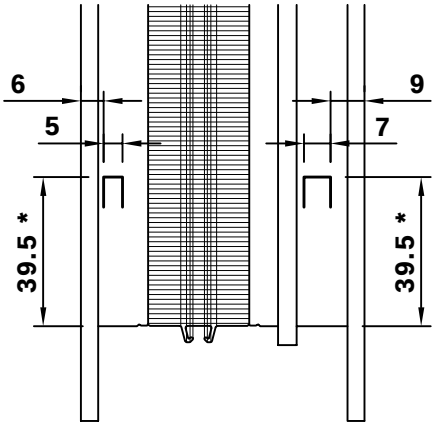
System 5-35 Hi/Hi+

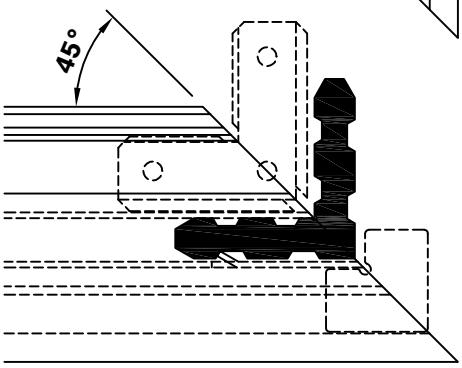
TILT AND TURN WINDOW

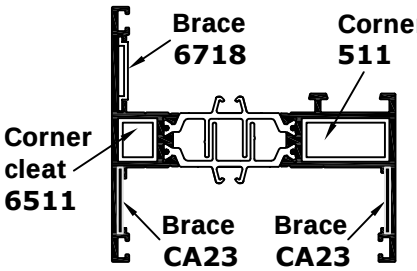
For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.



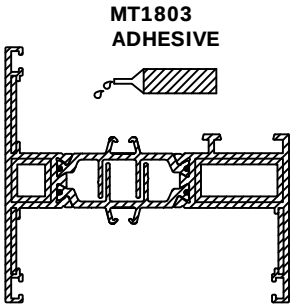
*** This dimension to be checked and adjusted to give a tight mitre**

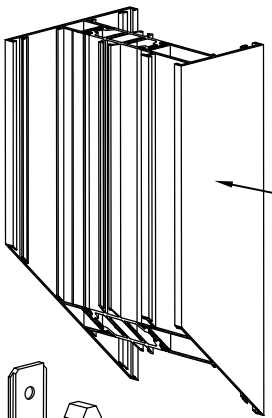




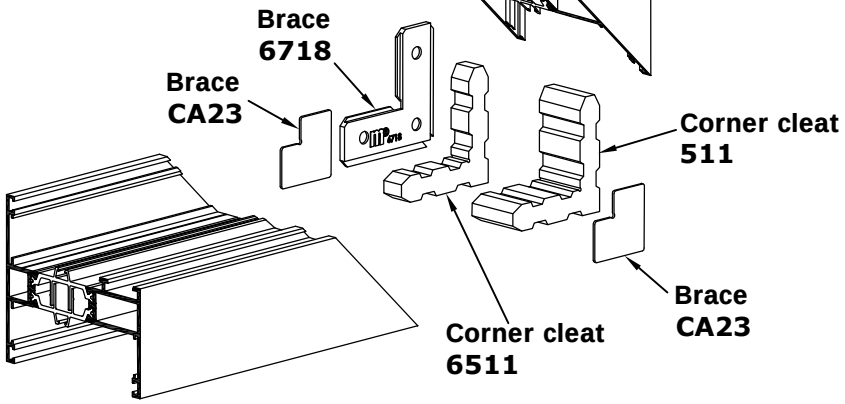


602-202
Standard long leg outer frame





Standard sash
602-202



MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

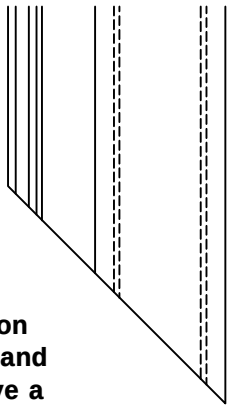
Corner Crimping Detail

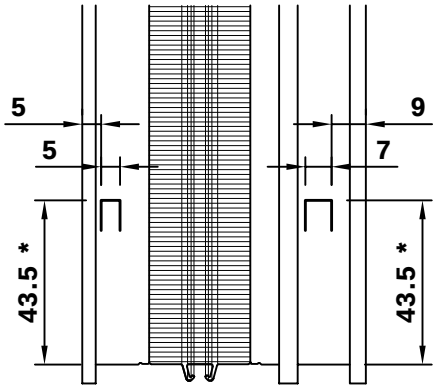
Heavy Short Leg Outer Frame

For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

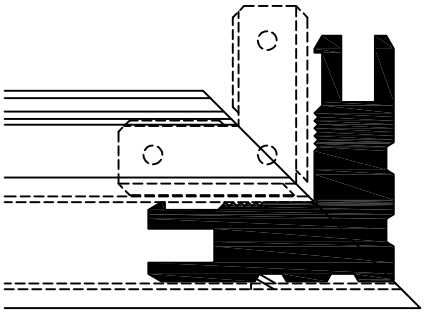
System 5-35 Hi/Hi+

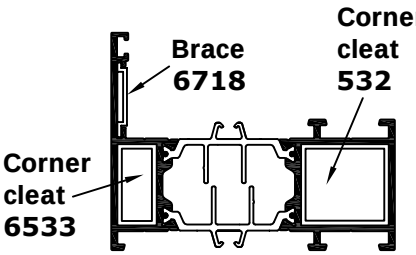
TILT AND TURN WINDOW



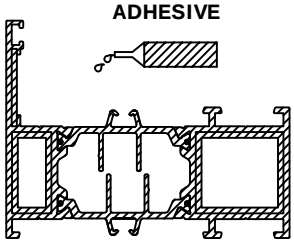


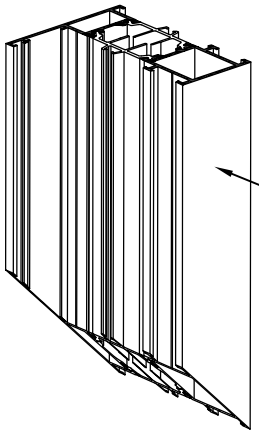
*** This dimension to be checked and adjusted to give a tight mitre**



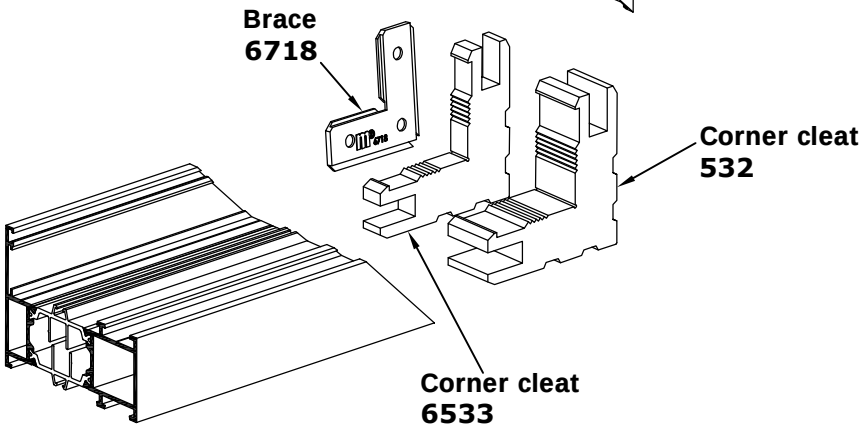


604-213
Heavy short leg outer frame





Heavy short leg outer frame 604-213



MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

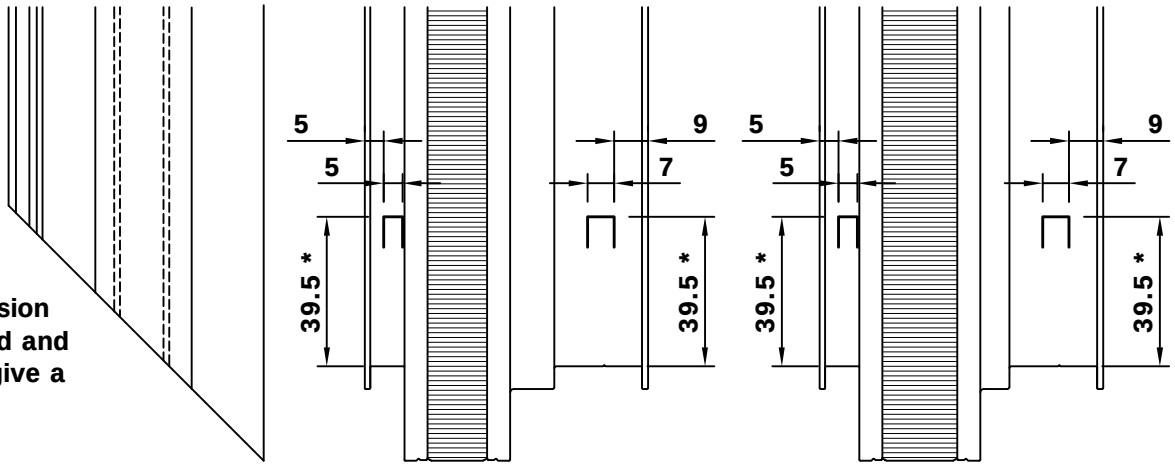
Corner Crimping Detail

Curtain Walling Frames

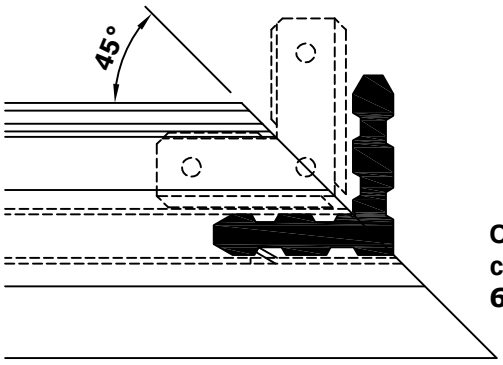
System 5-35 Hi/Hi+

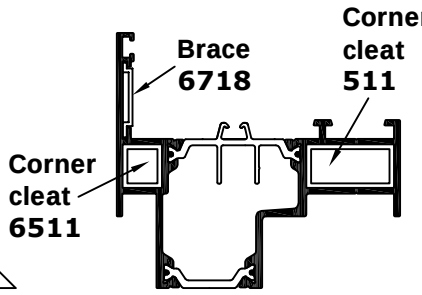
TILT AND TURN WINDOW

For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

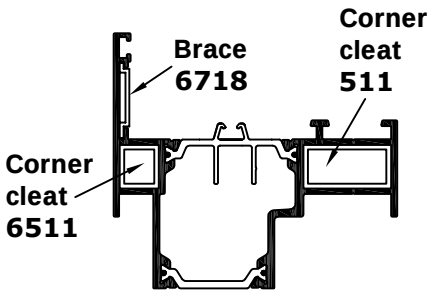


*** This dimension to be checked and adjusted to give a tight mitre**

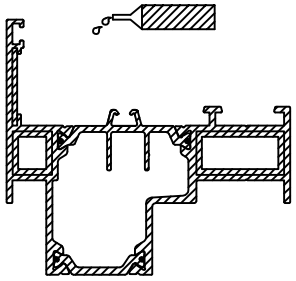


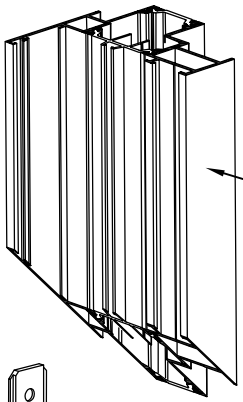


614-615
Curtain walling frame

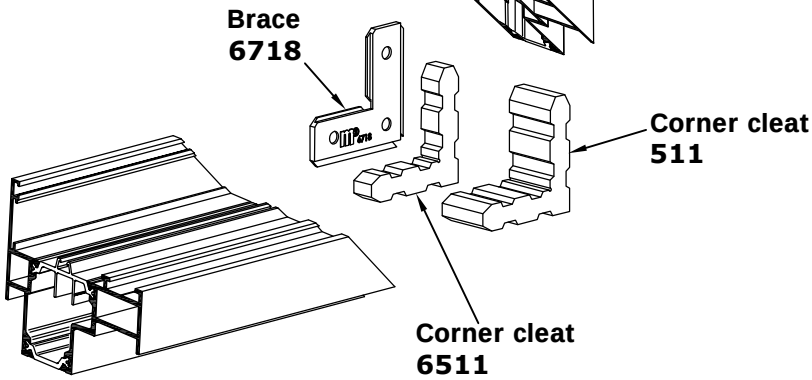


614-616
Curtain walling frame





Curtain walling outer frame



MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

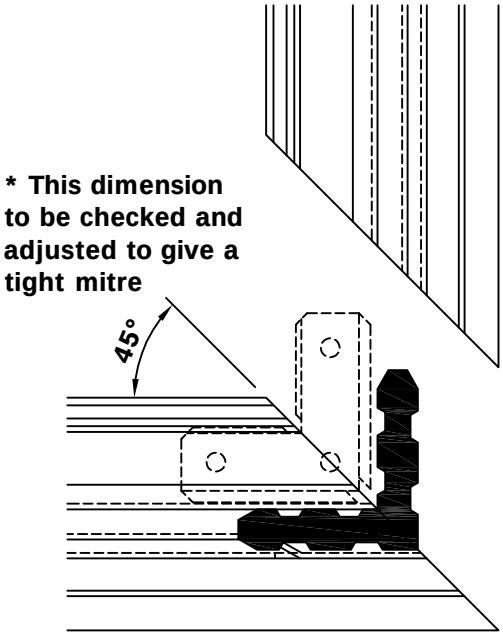
Corner Assembly Details

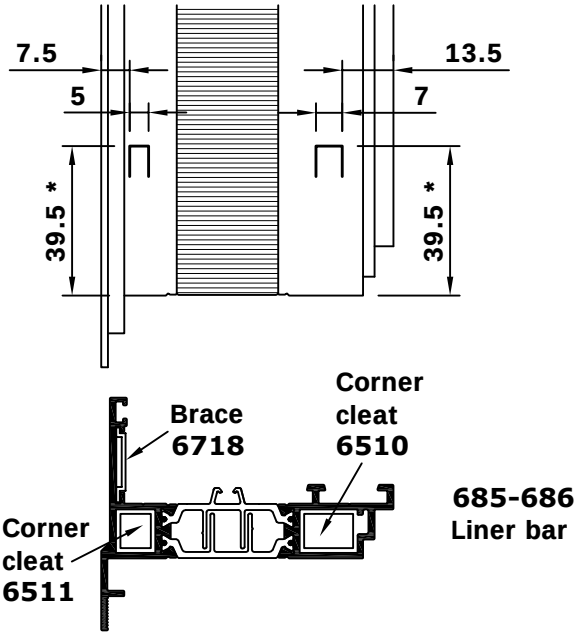
Liner Bar

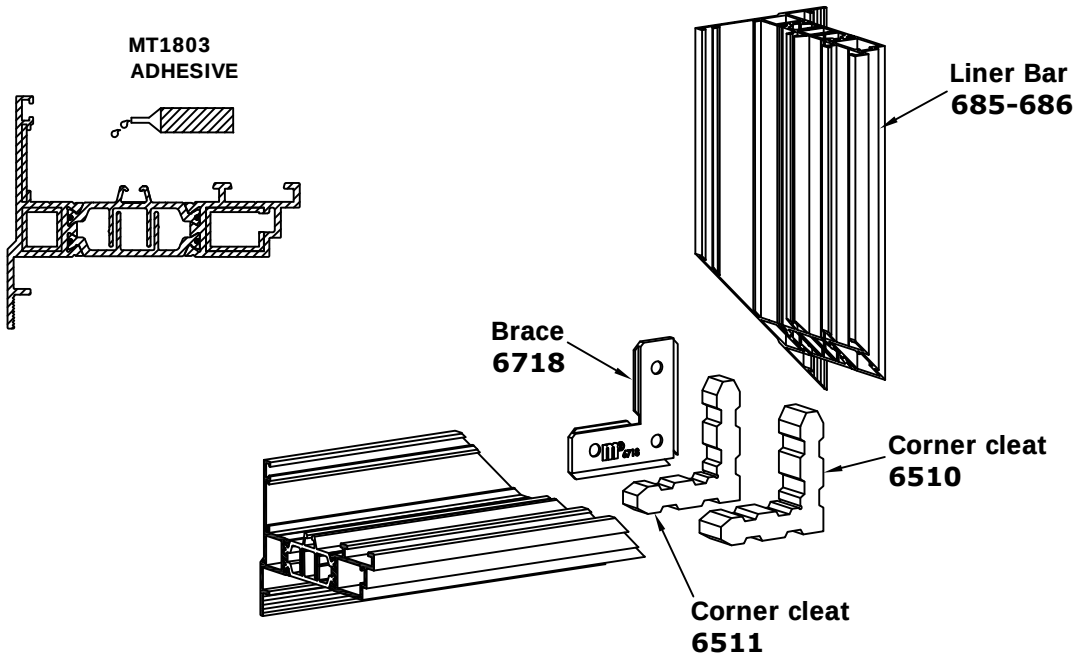
For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

System 5-35 Hi/Hi+

TILT AND TURN WINDOW







MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

Corner Assembly Details

Standard Sash

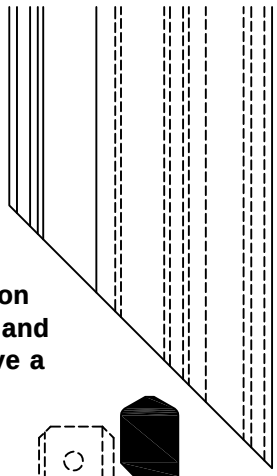
System 5-35 Hi/Hi+

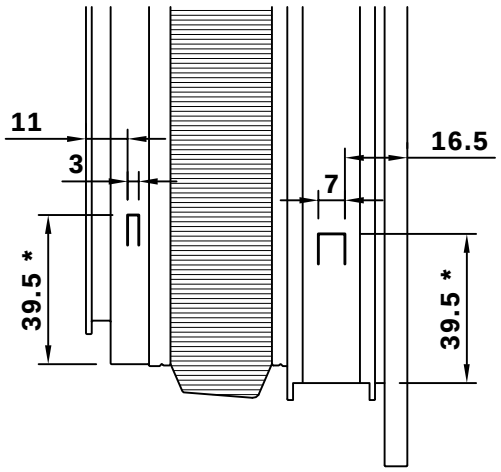
TILT AND TURN WINDOW

For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

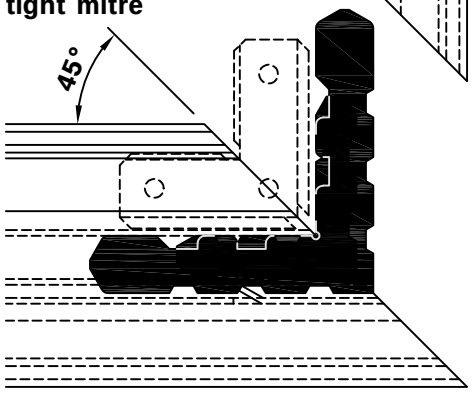
CR124303800/MOD adjustable tool holder and POLSPEC/51 3mm crimping knife are available for use with Elumatic EP124 crimper to achieve stepped crimp.

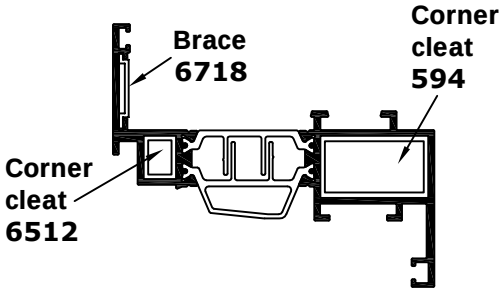
Ensure euro groove is notched at corners prior to crimping, to allow insertion of link rods and corner drives.



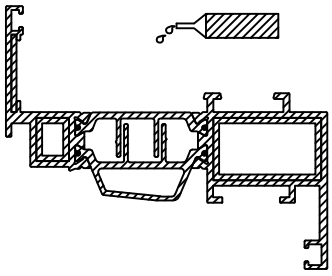


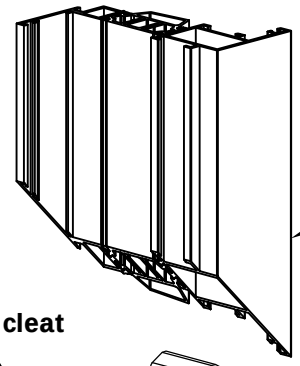
*** This dimension to be checked and adjusted to give a tight mitre**



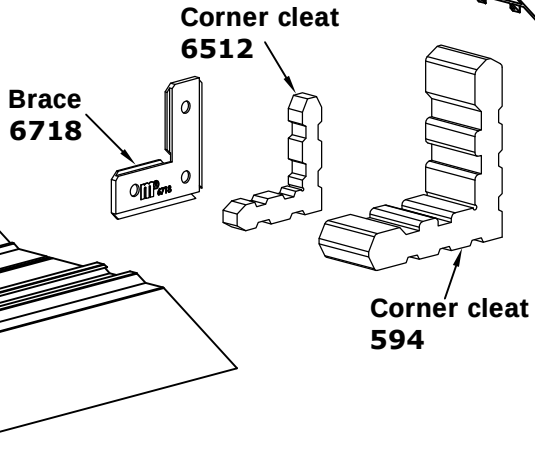


630-637 Standard sash





Standard sash 630-637



MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

Corner Assembly Details

Medium Sash

System 5-35 Hi/Hi+

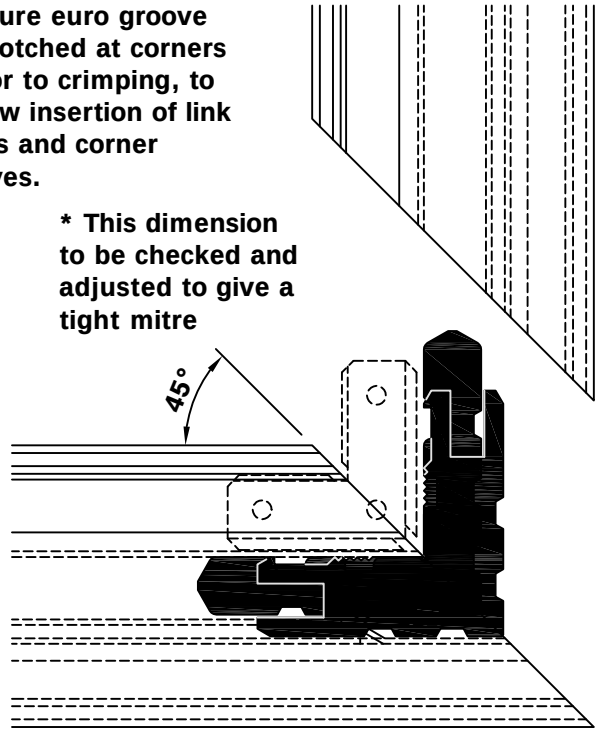
TILT AND TURN WINDOW

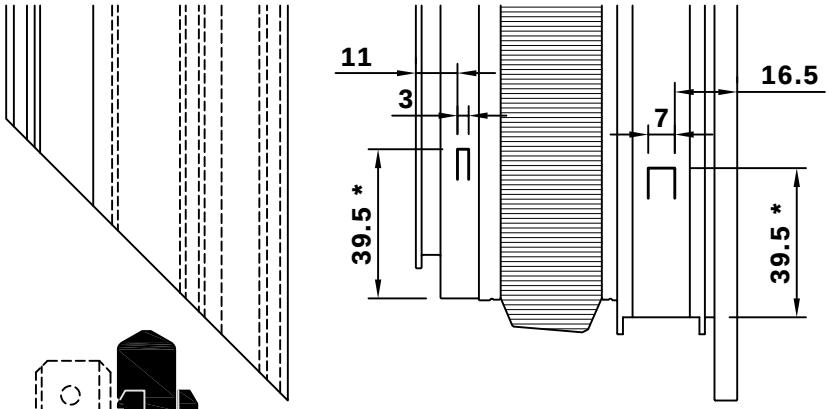
For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

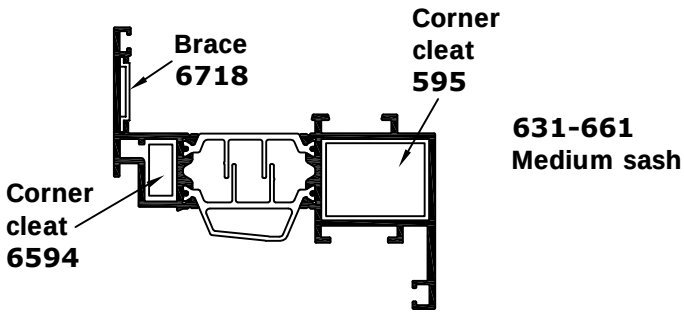
CR124303800/MOD adjustable tool holder and POLSPEC/51 3mm crimping knife are available for use with Elumatic EP124 crimper to achieve stepped crimp.

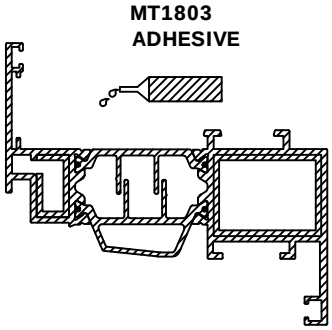
Ensure euro groove is notched at corners prior to crimping, to allow insertion of link rods and corner drives.

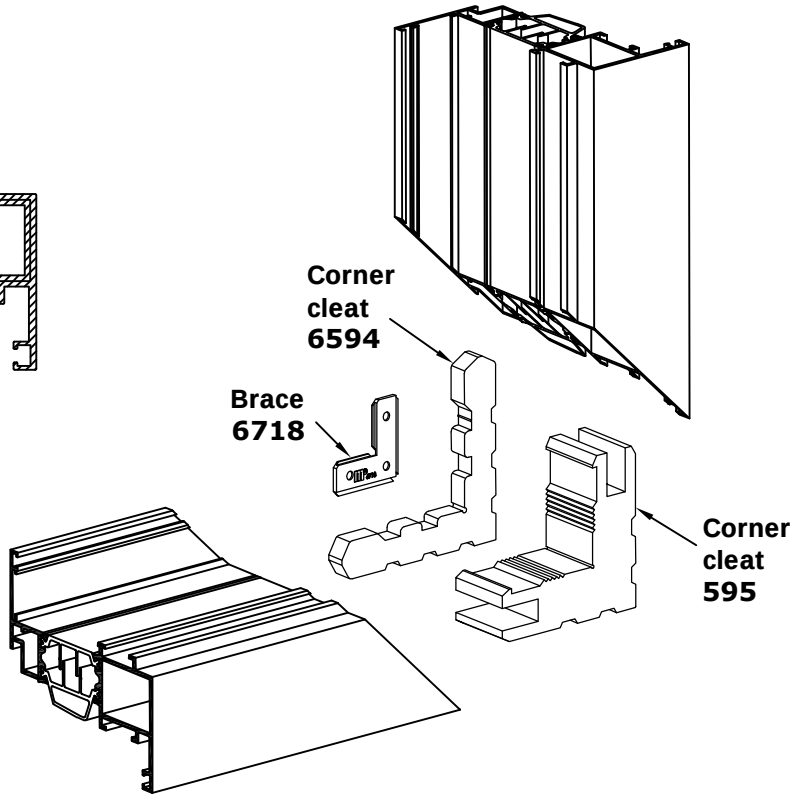
*** This dimension to be checked and adjusted to give a tight mitre**











MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

Corner Assembly Details

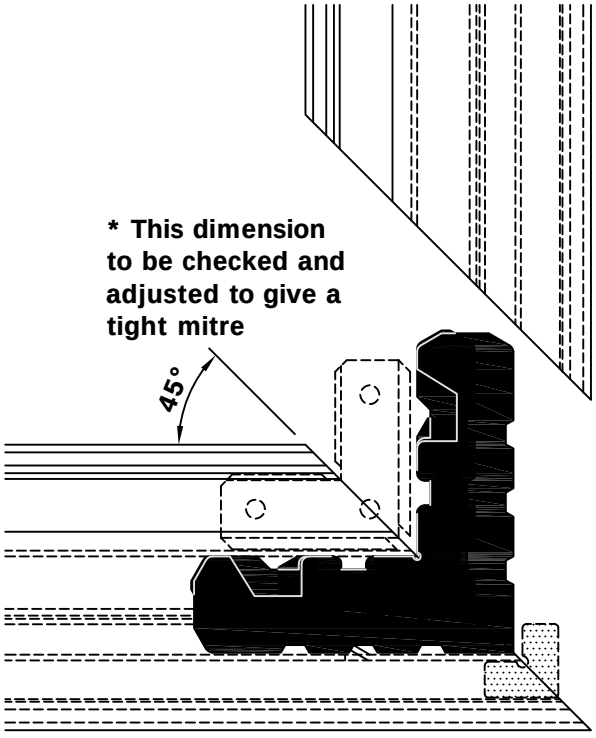
Euro Groove Sash

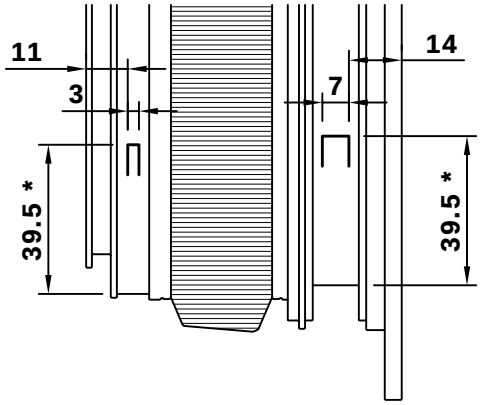
System 5-35 Hi/Hi+

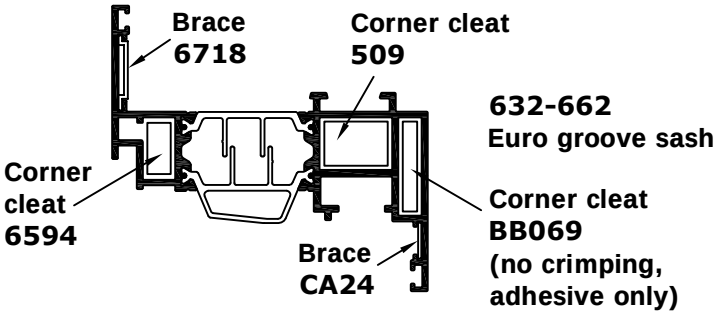
TILT AND TURN WINDOW

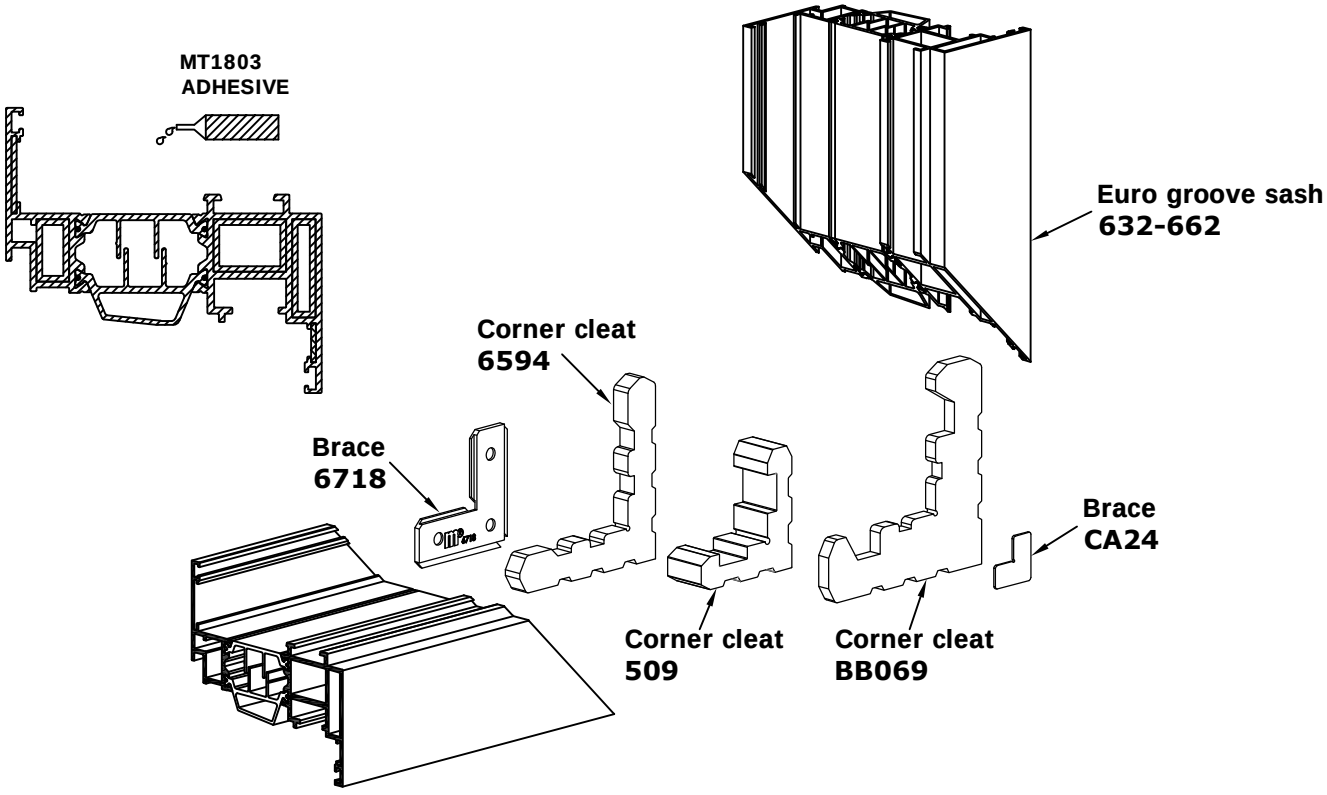
For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

CR124303800/MOD adjustable tool holder and POLSPEC/51 3mm crimping knife are available for use with Elumatic EP124 crimper to achieve stepped crimp.









MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.

Scale 1:2

Corner Assembly Details

Heavy Sash

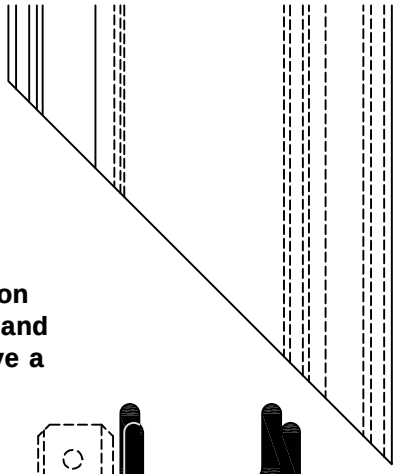
System 5-35 Hi/Hi+

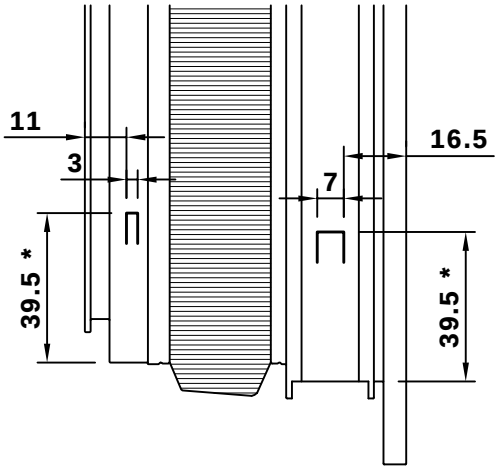
TILT AND TURN WINDOW

For typical details of corner assembly and adhesive/sealant application see "Corner Assembly Details" sheet.

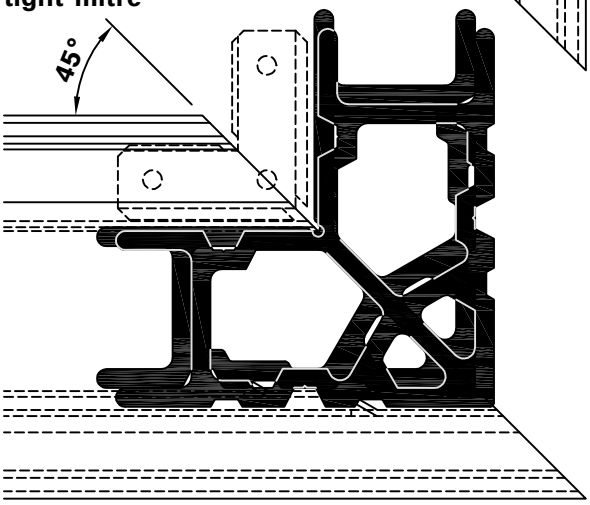
CR124303800/MOD adjustable tool holder and POLSPEC/51 3mm crimping knife are available for use with Elumatic EP124 crimper to achieve stepped crimp.

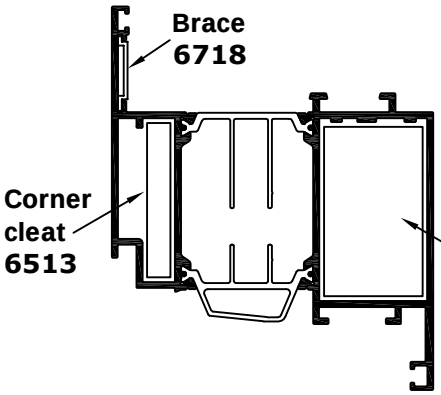
Ensure euro groove is notched at corners prior to crimping, to allow insertion of link rods and corner drives.



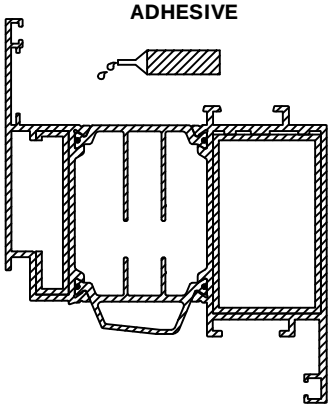


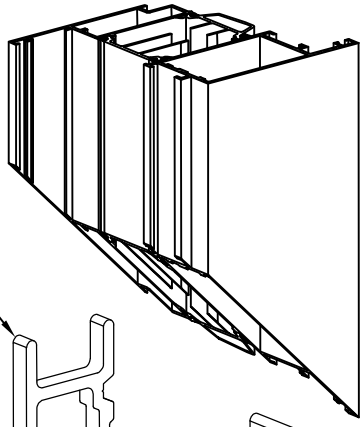
*** This dimension to be checked and adjusted to give a tight mitre**

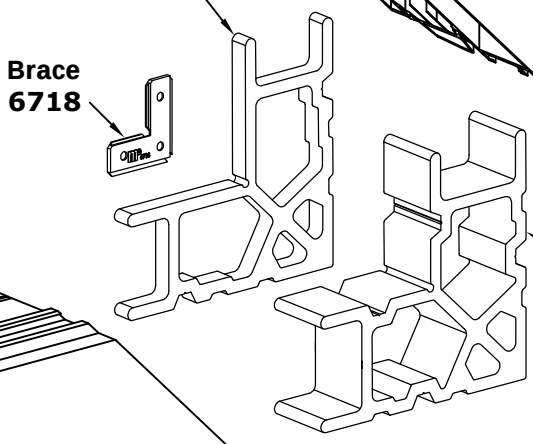




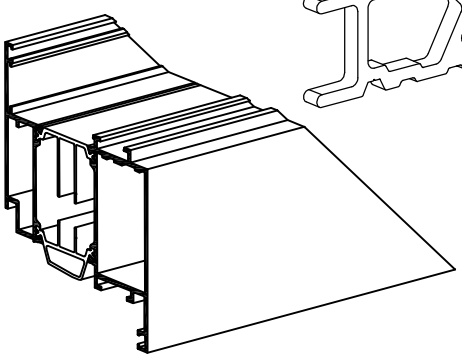
633-663
Heavy sash







MT1803 ADHESIVE SHOULD BE APPLIED TO THE PERIMETER OF THE CLEAT CHAMBER OF THE FRAME SECTION AND THE CORNER BRACE GROOVE.



Scale 1:2

Mullion/Transom Assembly

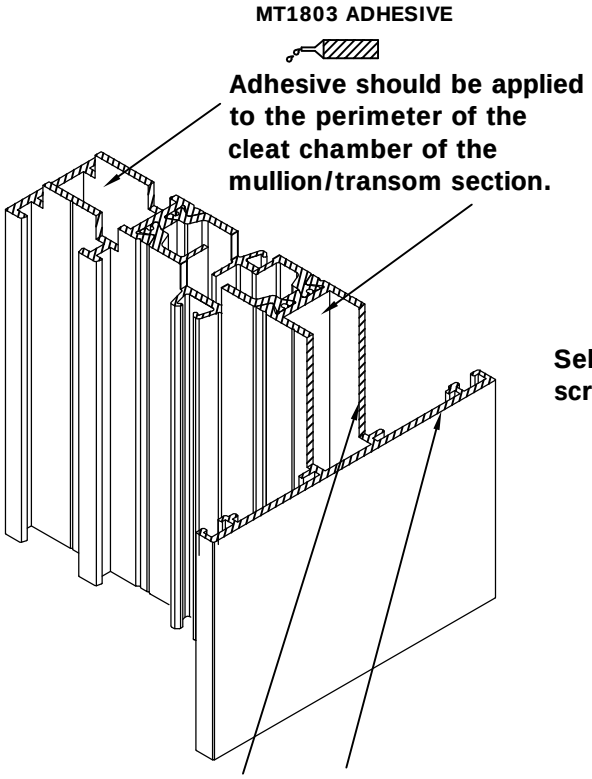
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

IMPORTANT: PLEASE READ THESE NOTES BEFORE ASSEMBLY.

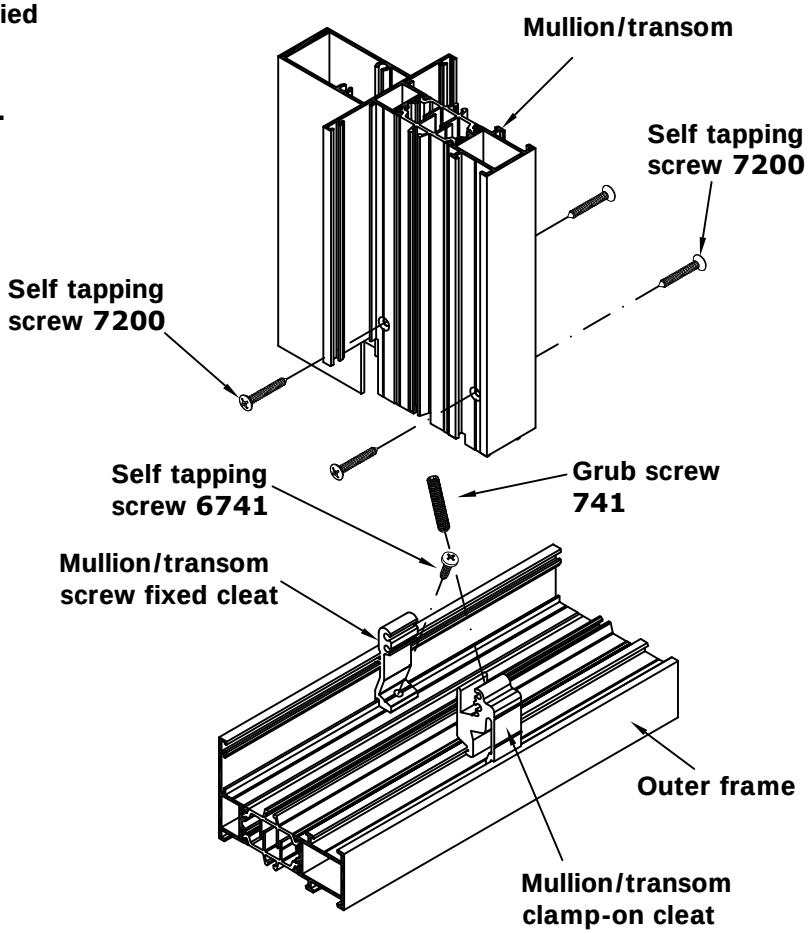
NOTE: Transoms must be installed before frame corners are crimped.

1. Using JIG4-35002 drill and countersink the offset screw holes in the mullion/transom at the positions shown.
2. Before applying MT1803 adhesive ensure all surfaces are free from grease or dust. Clean all aluminium mating surfaces with MT60 surface cleaner and allow to dry. Fabricator must ensure MT60 surface cleaner is fully compatible with surface finish on a project-by-project basis.
3. Mark centre line of mullion/transom on outer frame. Place JIG4-35001 on outer frame aligning appropriate cleat centre line with position marked.
4. Clip clamp-on cleat onto outer frame through appropriate aperture in jig. Tighten 741 grub screw (minimum torque setting 3.5Nm) and ensure cleat is firmly attached.
5. With JIG4-35001 still in position drill angled hole(s) in outer frame opposite clamp-on cleat.
6. Remove JIG4-35001 and attach screw fixed cleat with 6741 self tapping screw(s).
7. Apply MT1803 adhesive to the mating surfaces of the cut aluminium and thermal break profiles (as shown).
8. Apply MT1803 adhesive to the internal perimeter of the cleat chamber to sufficient depth to ensure full bonding/sealing of the cleat.
9. Align the sections over cleats and screw tightly into the offset screwports using 7200 self-tapping screws, ensuring all screws are bedded and sealed.
10. Wipe away any excess adhesive from the joint using MT60 surface cleaner and allow to dry. Ensure all bead and gasket recesses are clear of adhesive.
11. Check the joint is tight on both sides and that there is no movement.
12. Clip transom braces 6746 into position. Bond and seal as "Transom Brace Application Detail" and "Mullion/Transom Sealing Detail" sheets.



PICTORIAL VIEW OF ADHESIVE APPLICATION TO ALL MULLION/ TRANSOM END PREPS

MULLION/TRANSOM TO OUTER FRAME ASSEMBLY

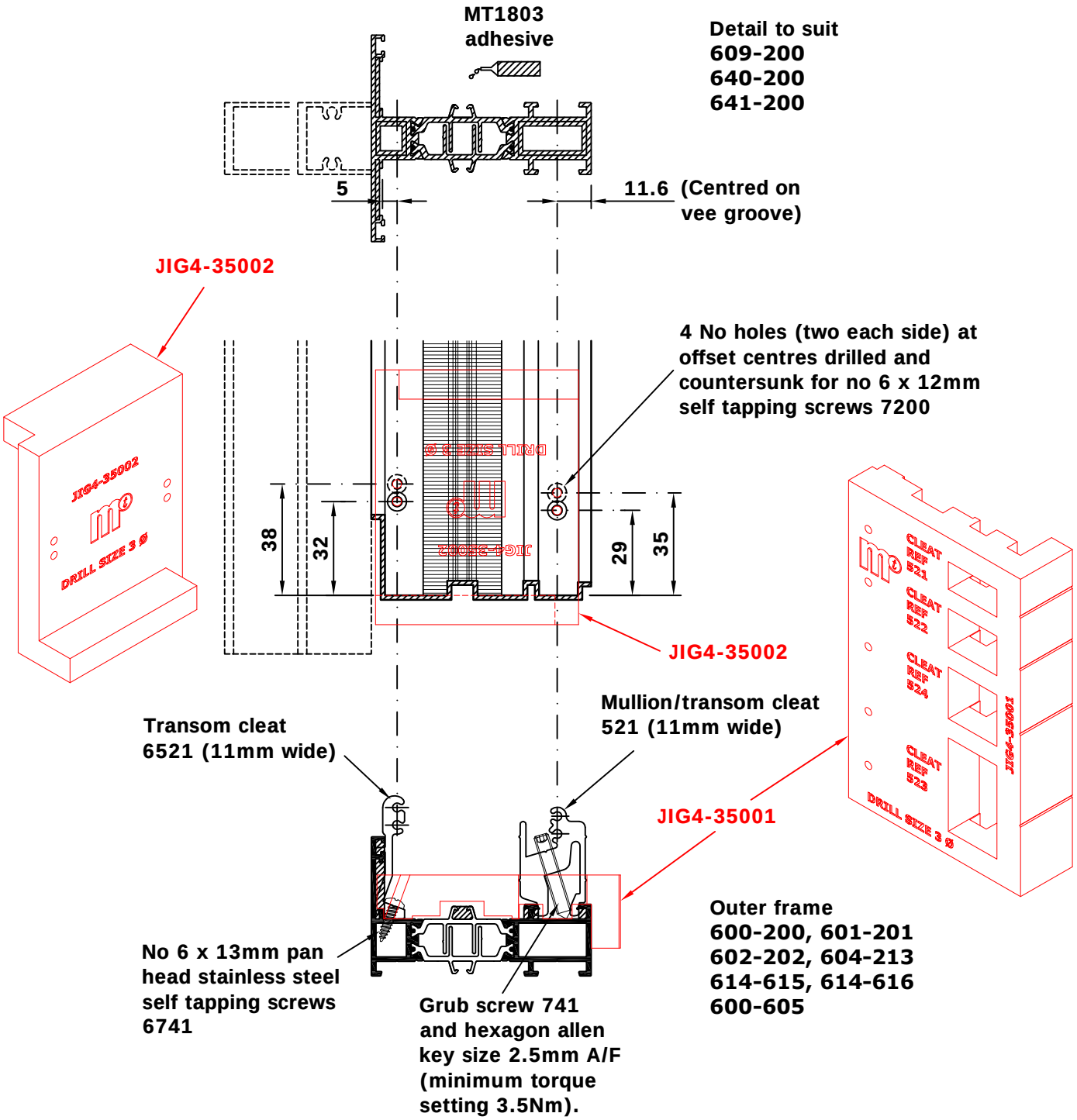


Not to Scale

Mullion/Transom Assembly to Outer Frames

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



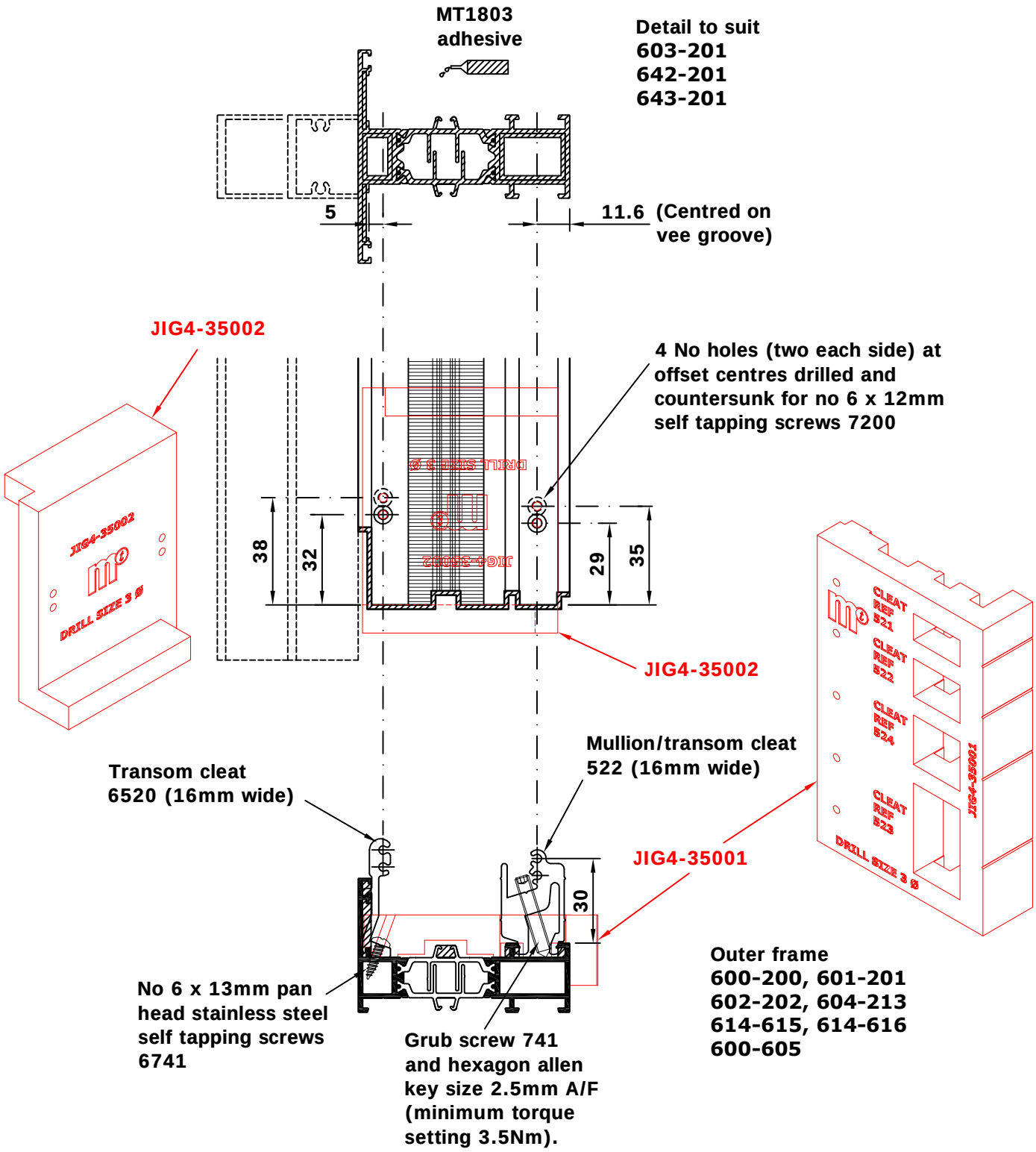
For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

Scale 1:2

Mullion/Transom Assembly to Outer Frames

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



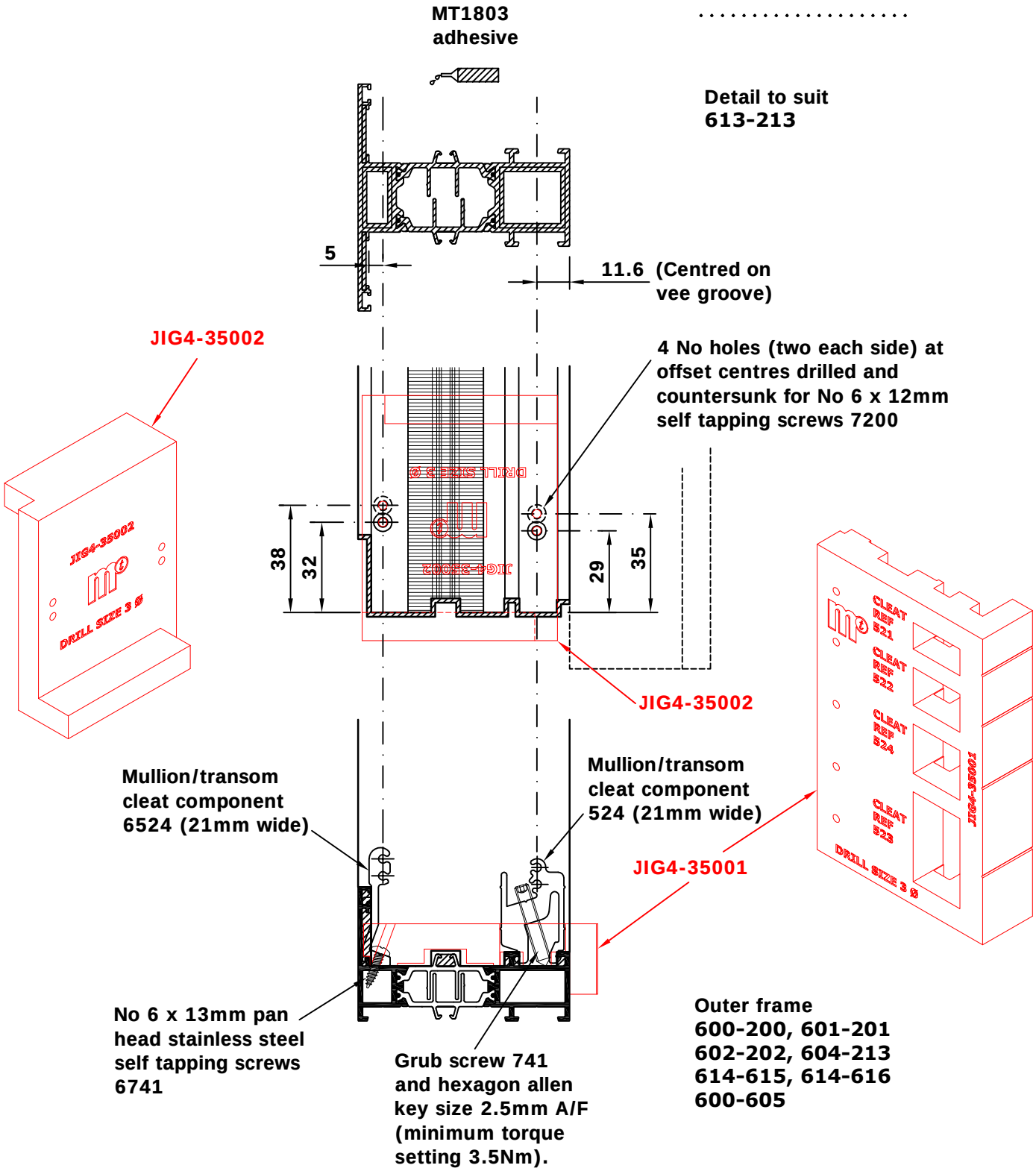
For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

Scale 1:2

Mullion/Transom Assembly to Outer Frames

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



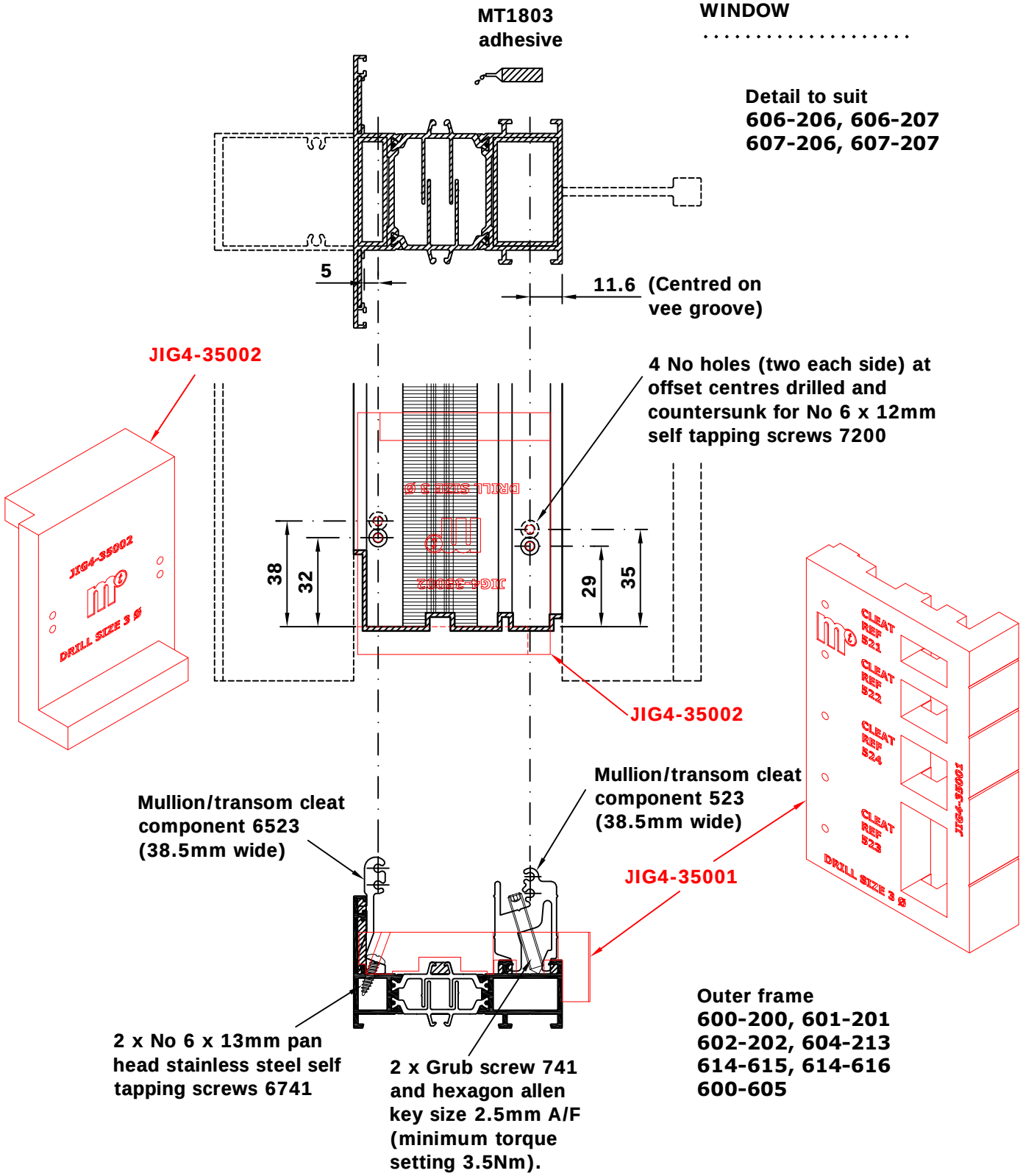
For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

Scale 1:2

Mullion/Transom Assembly to Outer Frames

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

Scale 1:2

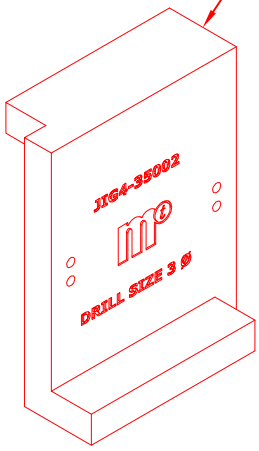
Mullion/Transom Cruciform

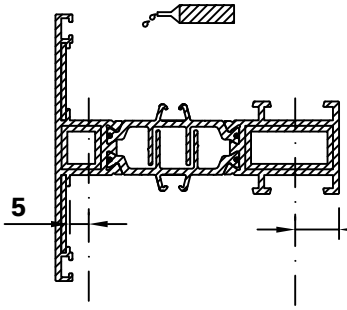
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

MT1803 adhesive

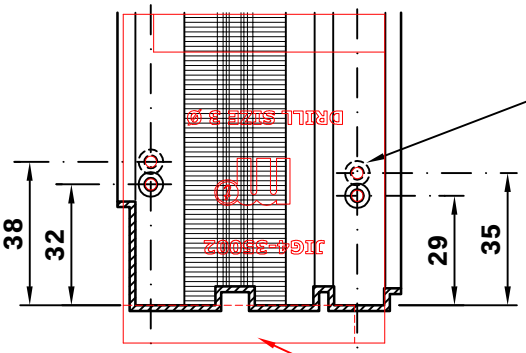
JIG4-35002





(Centred on vee groove)

Transom
603-201
606-206
609-200
613-213



4 No holes (two each side) at offset centres drilled and countersunk for no 6 x 12mm self tapping screws 7200

JIG4-35002

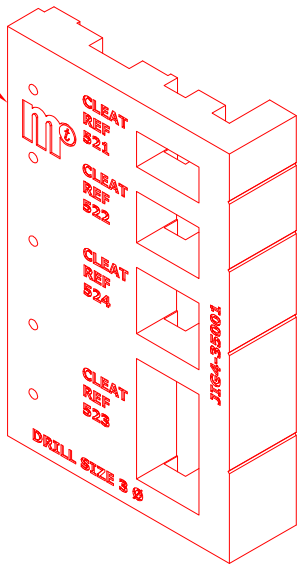
Transom cleat
6520 (16mm wide)
6521 (11mm wide)
6523 (38.5mm wide)
6524 (21mm wide)

See "Component Identification" page for section references

Transom cleat
521 (11mm wide)
522 (16mm wide)
523 (38.5mm wide)
524 (21mm wide)

See "Component Identification" page for section references

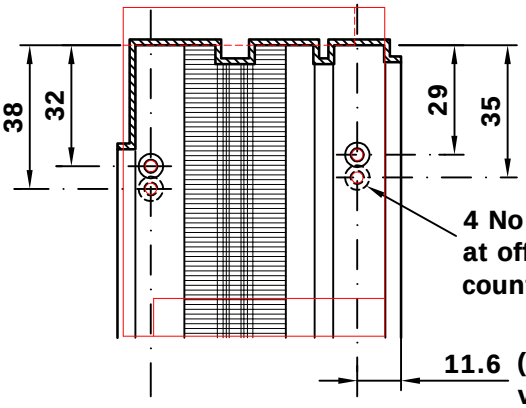
JIG4-35001



No 6 x 13mm pan head stainless steel self tapping screws 6741

Grub screw 741 and hexagon allen key size 2.5mm A/F (minimum torque setting 3.5Nm).

Detail to suit
603-201, 606-206, 606-207, 607-206, 607-207, 609-200, 613-213, 640-200, 641-200, 642-201, 643-201



4 No holes (one each side) at offset centres drilled and countersunk for screw 7200

11.6 (Centred on vee groove)

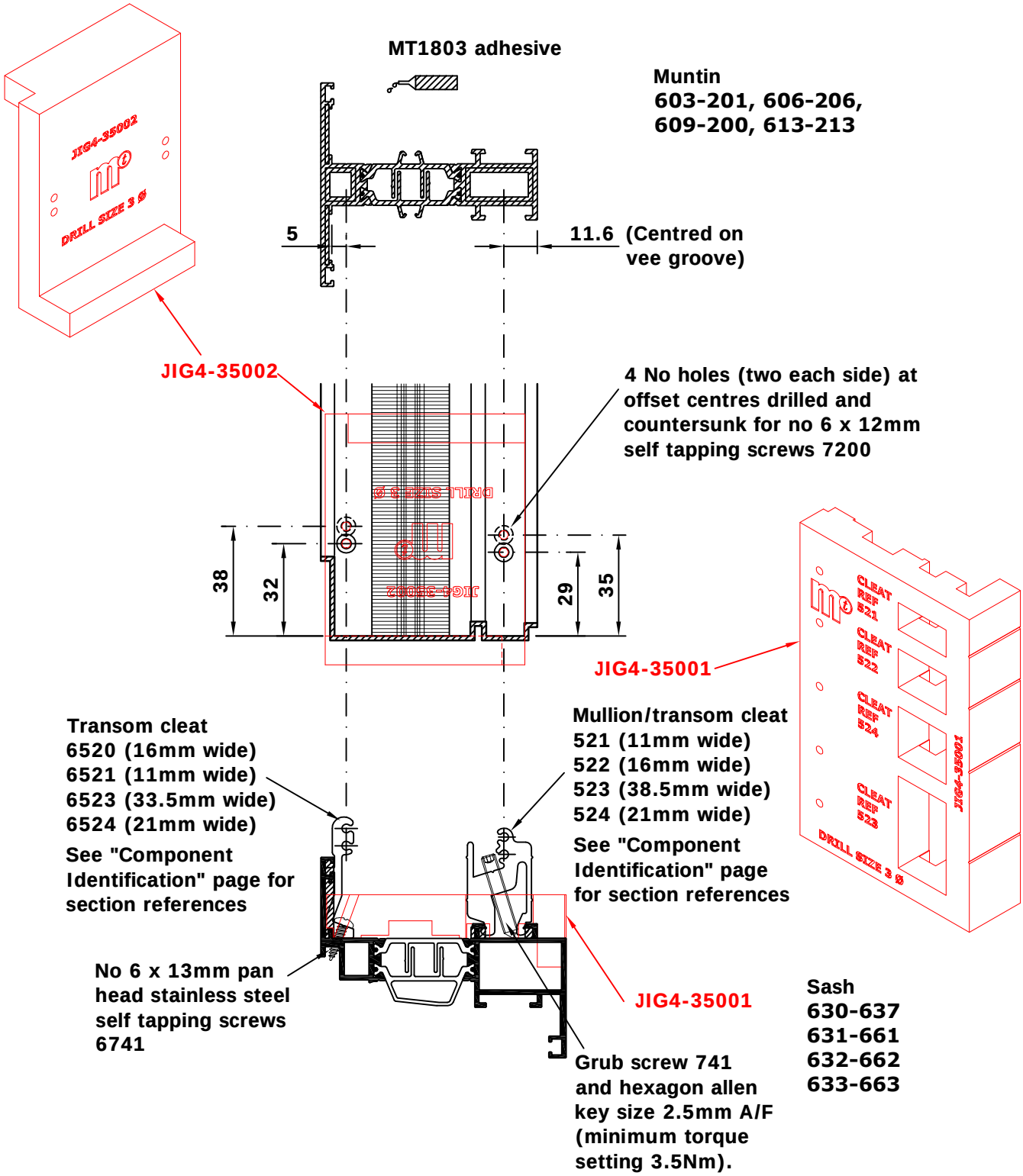
For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

Scale 1:2

Muntin Assembly to Sashes

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



For isometric details of joint assembly and adhesive/sealant application see "Mullion/Transom Sealing Detail" sheet.

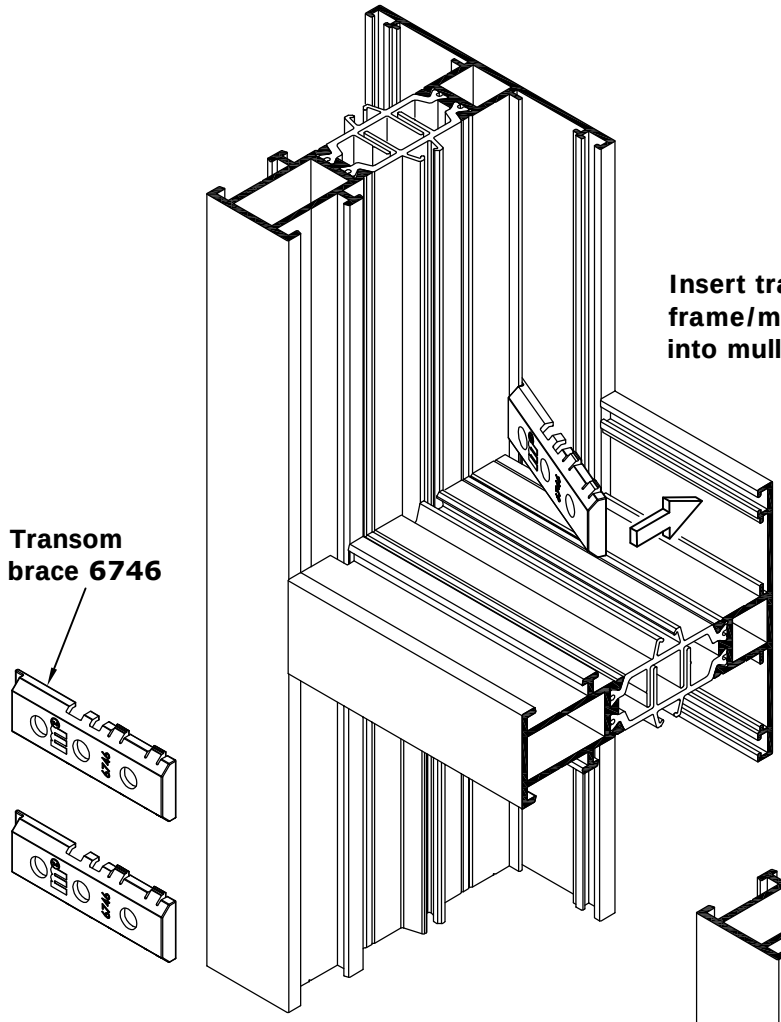
Scale 1:2

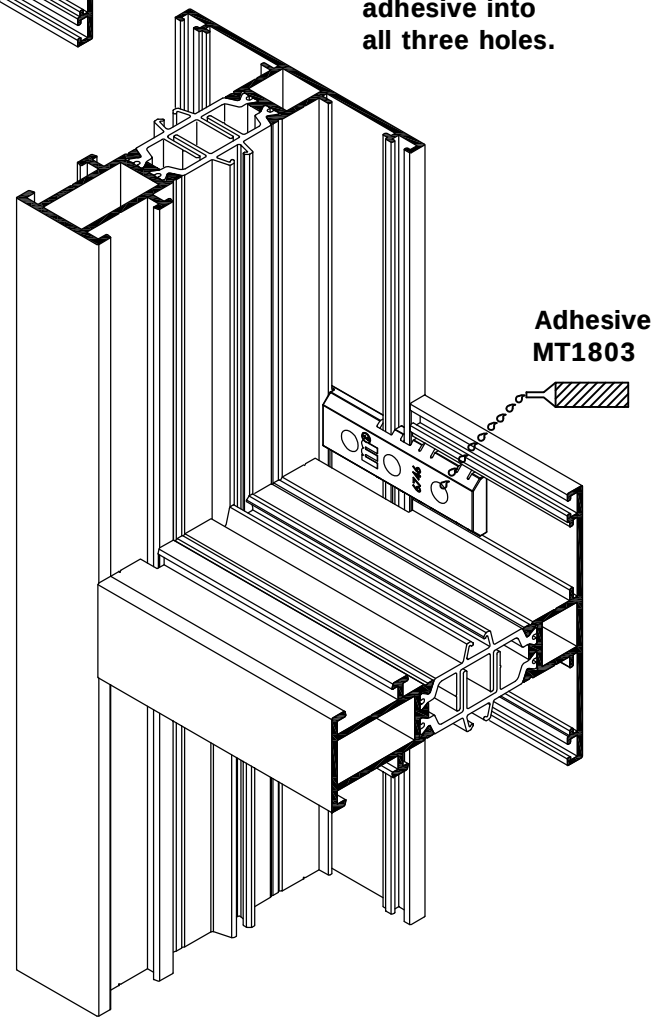
Transom Brace Application Detail

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Transom brace 6746 must be used at both ends of all mullions and transoms.
Braces to be securely bonded using MT1803 adhesive.





Fabrication method:

1. **Transom joint to be fabricated as per "Mullion/Transom Assembly" sheets.**
2. **Assemble window frame and crimp corners as per "Corner Assembly Details" sheet.**
3. **Insert transom braces into outer frame/mullion grooves and clip into mullion/transom as shown above.**
4. **Bond transom brace into place using MT1803 adhesive injected into all three holes.**
5. **Complete transom end sealing detail as per sheet "Mullion/Transom Sealing Detail".**

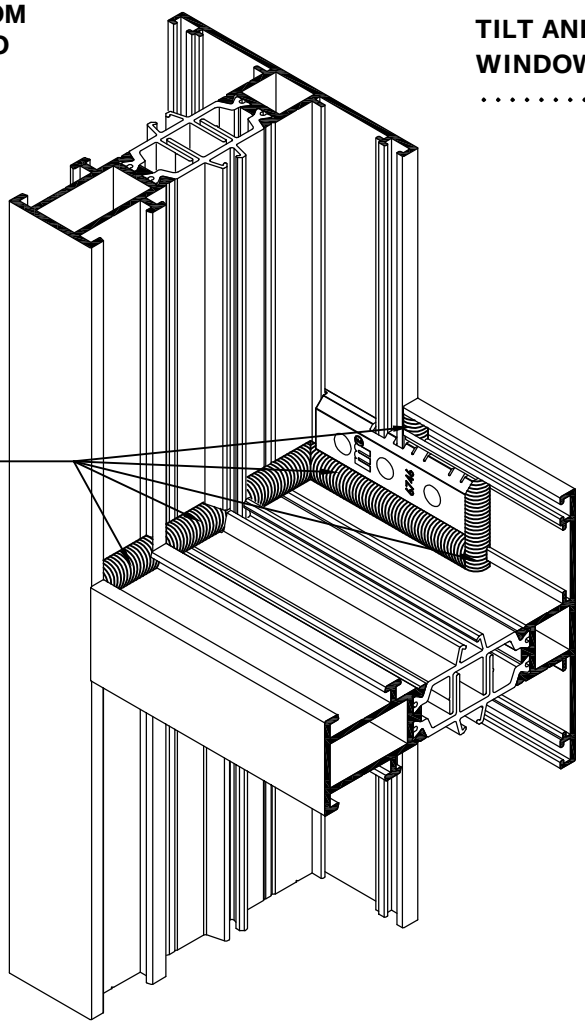
Not to scale

Mullion/Transom Sealing Detail

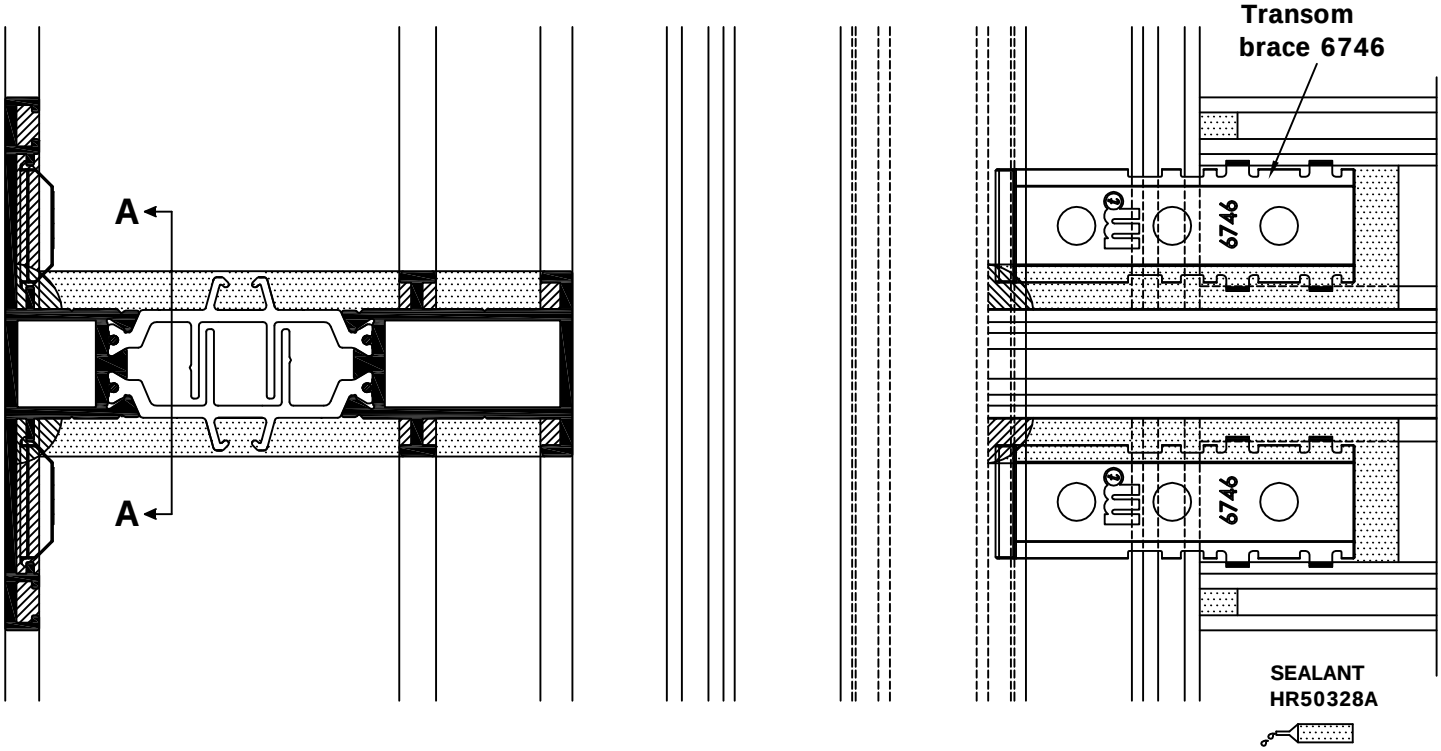
System 5-35 Hi/Hi+

THE FOLLOWING DETAIL SHOULD BE APPLIED TO ALL MULLION/TRANSOM CONNECTIONS. THESE DETAILS TO BE READ IN CONJUNCTION WITH ASSEMBLY DETAILS

TILT AND TURN WINDOW



Apply a final fillet of HR50328A sealant to junction of mullion and transom



VIEW ON A-A

Not to scale

Liner Bar Fixings

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

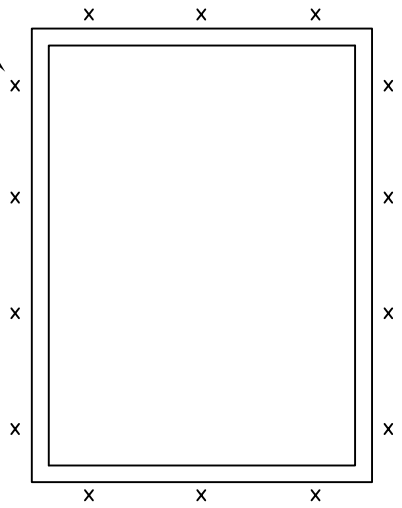
Metal Technology do NOT recommend that tilt and turn sashes be hung off liner bars.

All fixings must be sealed using HR50328A sealant.

Outside glazed fixed lights where inside glazing is not possible (i.e. Where columns or walls are behind windows). See glazing details section 8 of this manual for raked bead options.

Top/side hung opening casements within inside glazed fixed lights (for further details refer to System 435Hi manual).

Positions of fixings 75mm from corners and maximum 250mm centres



Maximum glass weights:

Fixed light inserts = 50Kg
Top hung casement inserts = 50Kg
Side hung casement inserts = 50Kg

Glazing supports to be positioned to avoid screw heads.

No 10 x 45mm pan head stainless steel self tapping screw 7218.

5 vee groove

Access holes Ø5mm (Use vee in section to locate drill for holes)

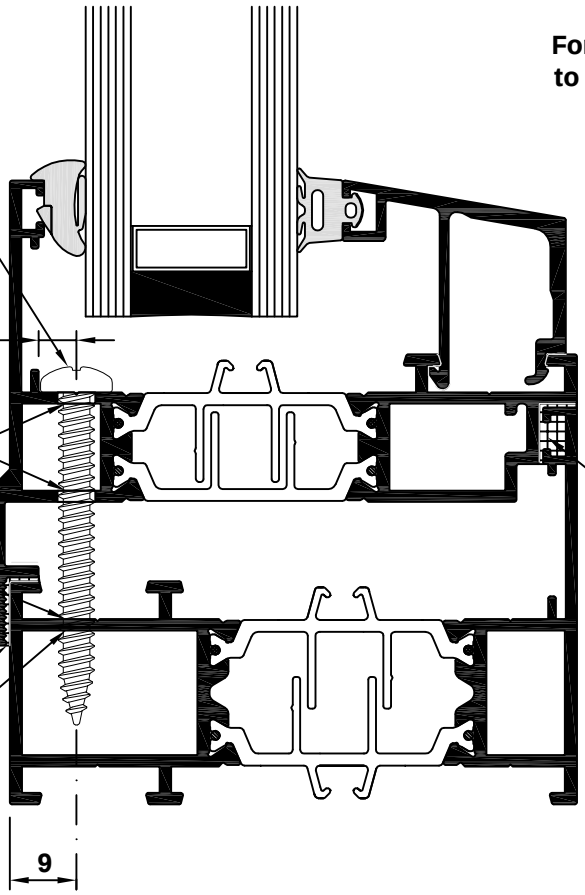
HR50328A sealant to be applied to end of screw before insertion

Silicone seal inside

Pilot hole Ø3.8mm

For drainage details refer to section 5 of this manual

Silicone seal outside



Scale 1:1

Drip Rails
Preparation Details

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

ALL FIXINGS MUST BE SEALED USING HR50328A SEALANT.

The drip rail is an optional recommendation for exposed situations. A length of drip rail (TW05) should be secured to the frame directly above the vent and also to the cill of the vent.

At rivet fixing positions (shown on details) a series of 3mm pilot holes should be drilled, commencing 75mm in from each end and at the required intervals to accept the drip rail rivets CA15 (not exceeding 250mm centres).

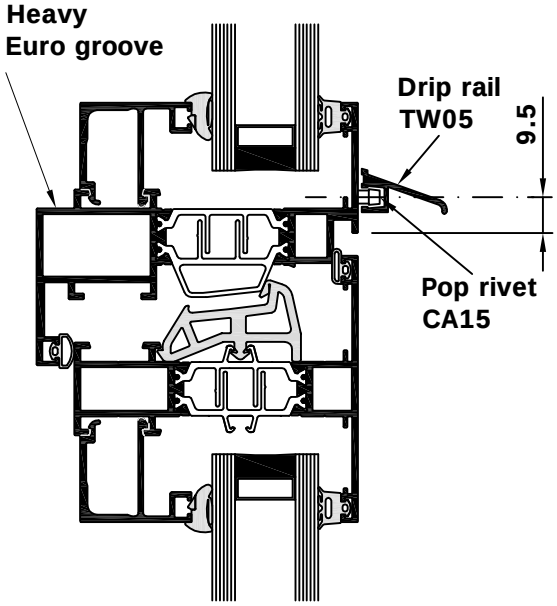
When the CA15 rivets are in place a bead of silicone should then be applied to the silicone groove extruded in the drip rail. The drip rail is then simply push-fitted over the rivets.

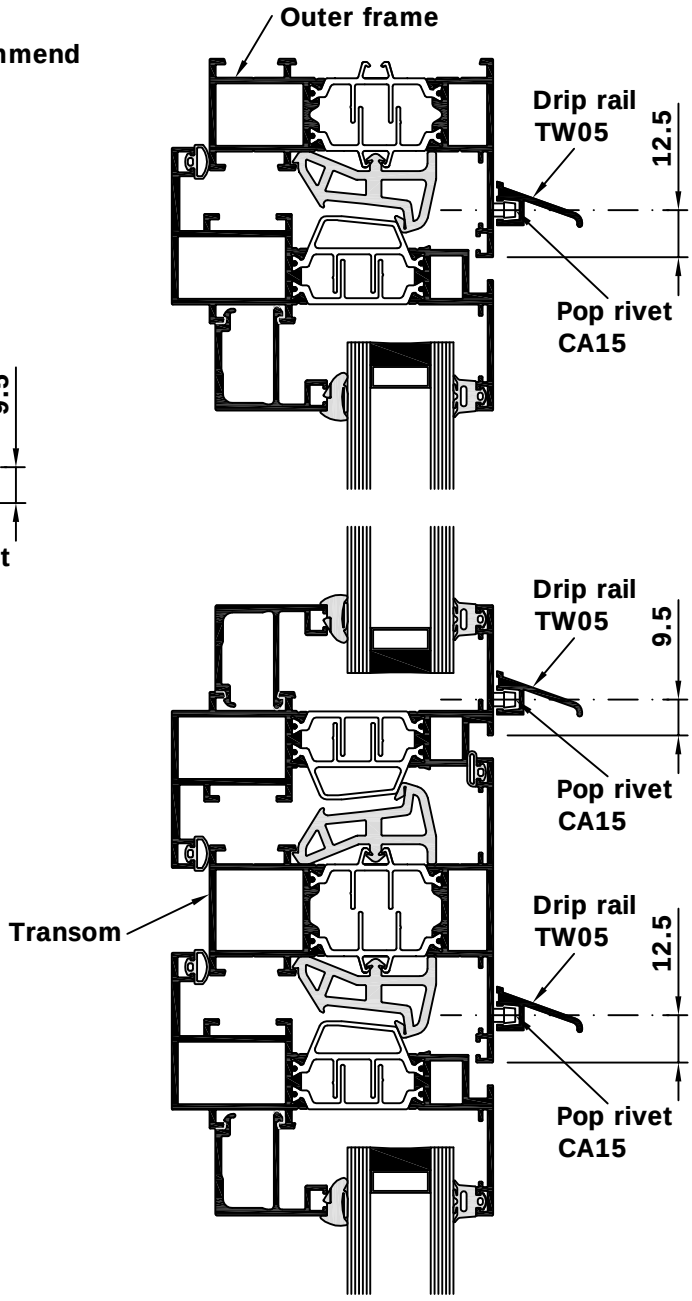
The length of the drip rail above the sash should be 20mm greater than the fixed frame sight size (FFSS) and centralised over the sash.

The length of the drip rail secured to the sash should be equal to the sash frame width less 70mm (square cut).

In very exposed locations Metal Technology recommend using HS103 in lieu of TW05 at the head of vents.

Sashes:
630-637 Standard
631-661 Medium
633-663 Heavy
632-662 Euro groove





Scale 1:2

Fittings (Handles and Hinges)

Available configurations for sashes 630-637, 631-661 and 633-663

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

All fixings must be sealed using HR50328A sealant.

MULLION/TRANSOM	SASH/ FIXED	HINGE/ FIXED	SASH/ SASH	SASH/ HINGE	HINGE/ HINGE
609-200 640-200 641-200	✓	Possible but not recommended	**✓	✗	✗
603-201 642-201 643-201	✓	✓	✓	✗	✗
613-213	✓	✓	✓	✓	✗
606-207 606-206 607-207 607-206	✓	✓	✓	✓	✓

**** When both sashes are in the tilt position there may be as little as 2.5mm clearance between sashes, subject to fabrication tolerance and site adjustment.**

COUPLING MULLIONS	OUTER FRAMES				
	600-200	600-605	601-201	604-213	602-202
667-165 665-165 667-166 665-166	HINGE ✗ SASH ✓	HINGE ✗ SASH ✓	HINGE ✗ SASH ✓	HINGE* ✓ SASH ✓	HINGE ✓ SASH ✓

*** The internal wedge gasket CA27 to be trimmed around hinges.**

Sash 632-662 is not included on the above charts, as Metal Technology's standard gearing for this sash uses concealed hinges. If alternative gearing is sourced, fabricator must check compatibility with the applicable window configurations.

Handle Preparation Details

System 5-35 Hi/Hi+

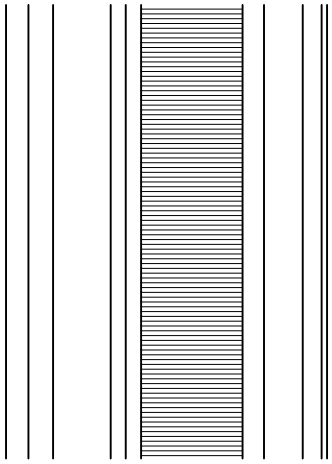
TILT AND TURN WINDOW

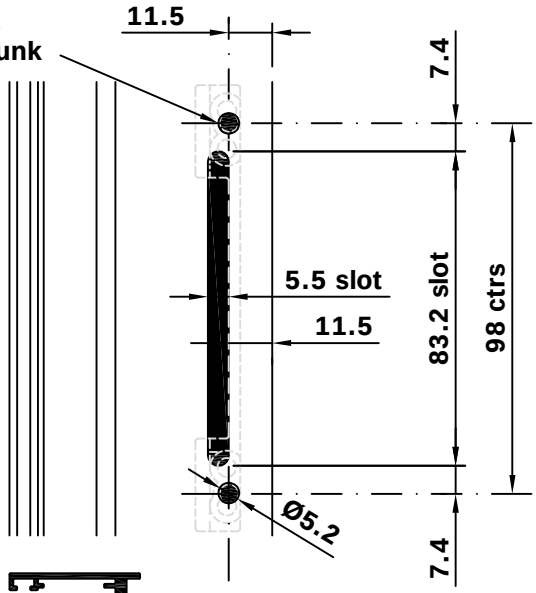
All fixings must be sealed using HR50328A sealant.

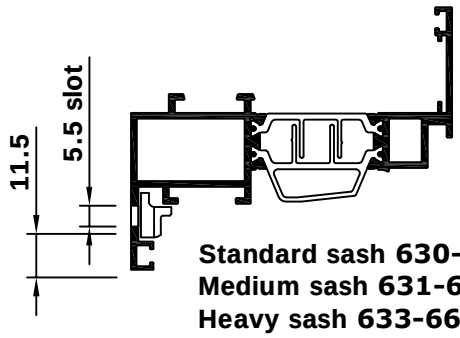
When assembling fittings onto window frames please refer to instructions supplied with fittings. (If instructions are not supplied, copies should be requested).

Sashes 630-637, 631-661, 633-663

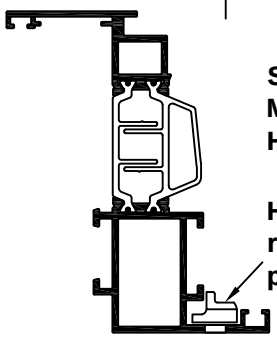
Handles secured using 2 No M5 x 30mm countersunk machine screws 7211







Standard sash 630-637
Medium sash 631-661
Heavy sash 633-663

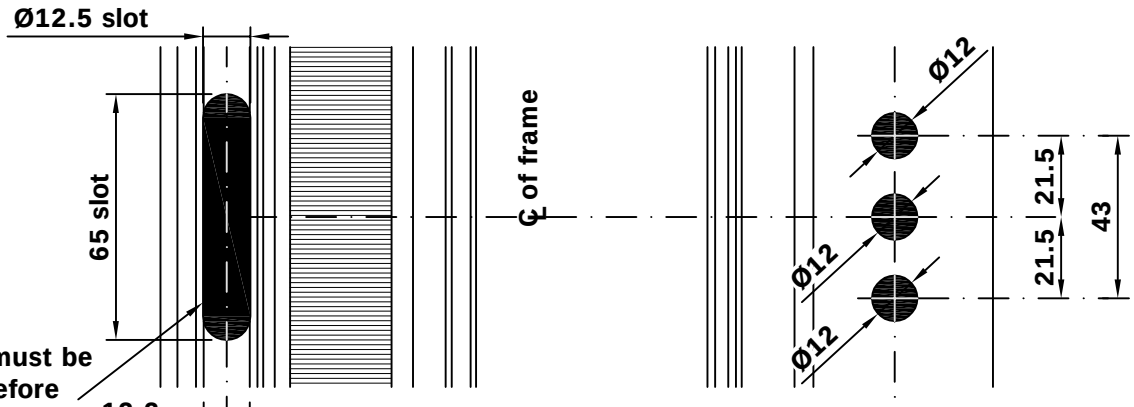


Standard sash 630-637
Medium sash 631-661
Heavy sash 633-663

Handle reinforcing plate

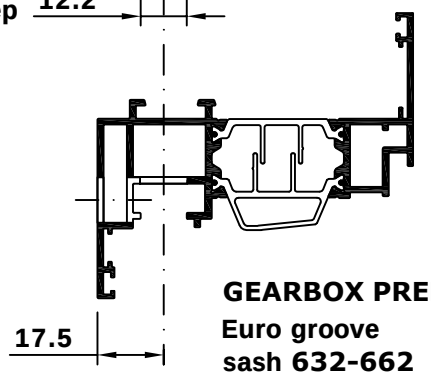
5.5 slot

Sash 632-662



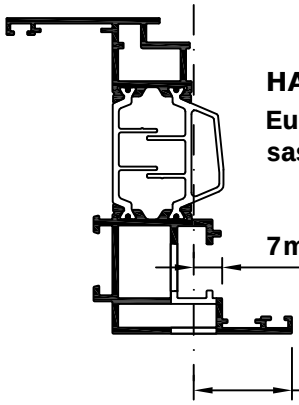
Slot must be cut before handle prep

12.2



GEARBOX PREP
Euro groove
sash 632-662

17.5



HANDLE PREP
Euro groove
sash 632-662

7mm Siegenia

25.5mm Siegenia

Scale 1:2

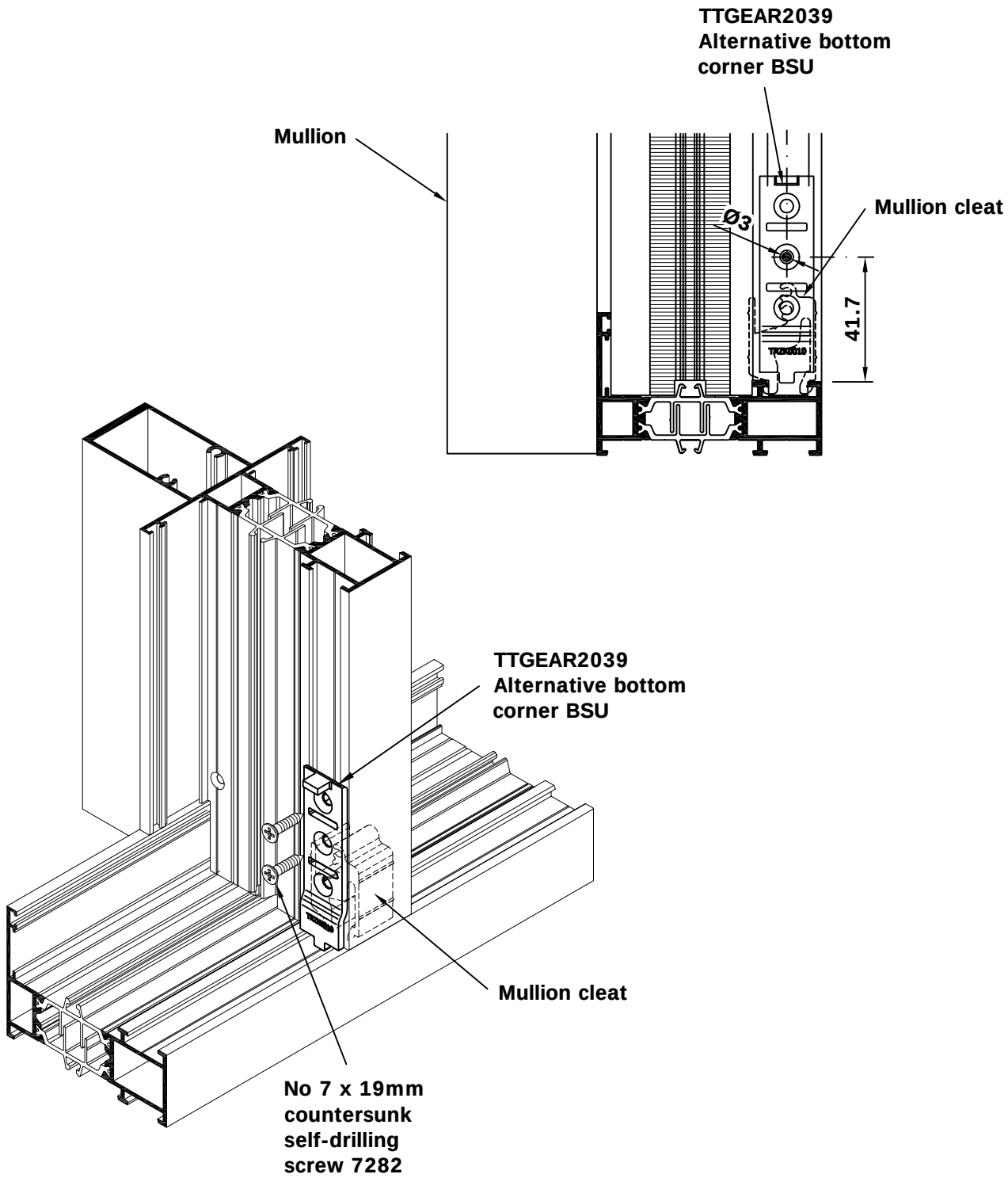
Additional Prep for TTGEAR2039 Alternative Bottom Corner BSU

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Only required when fixing into mullion.

In instances where fixing of this component coincides with a mullion cleat, fabricator to drill additional 3mm Ø pilot hole in the mullion and secure using No 7 x 19mm countersunk stainless steel self drilling screw 7282 via central hole in lieu of lower fixing.



Not to Scale

Prep for Siegenia Concealed Tilt and Turn Gearing

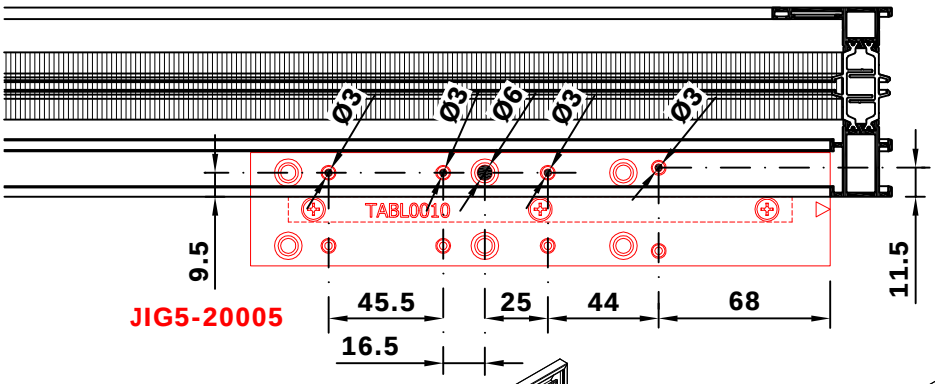
Head, Cill and Jamb Preps

Holes to be jig drilled using JIG5-20005 and JIG5-20006.

Refer to gearing manufacturers fitting instructions for further information.

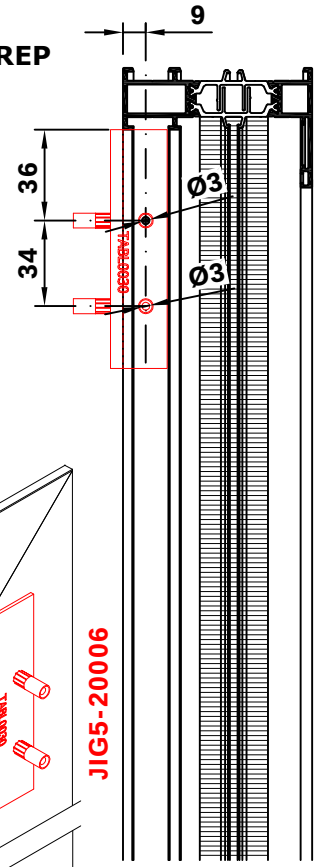
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

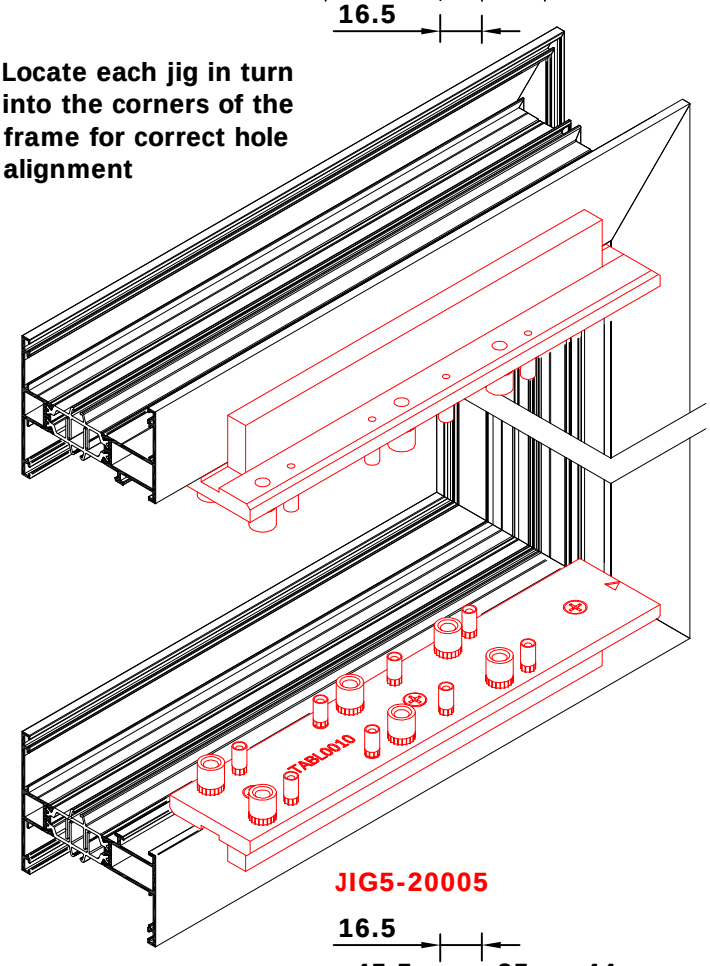


JIG5-20005

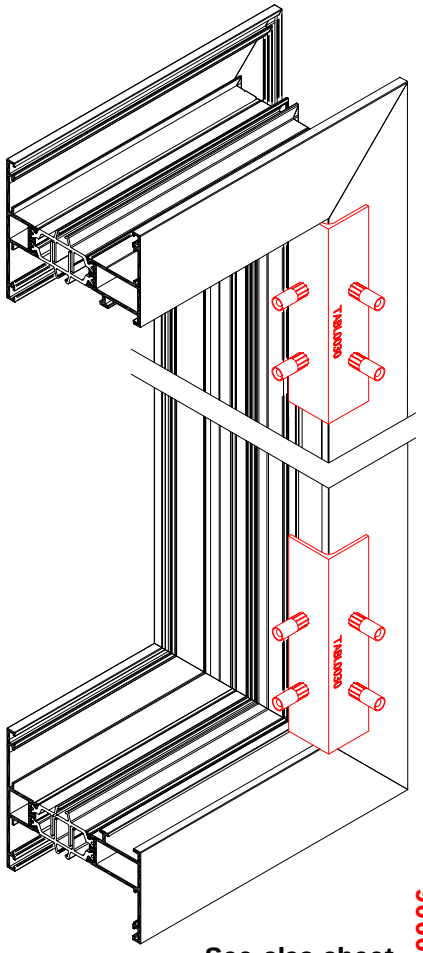
HEAD PREP DETAIL



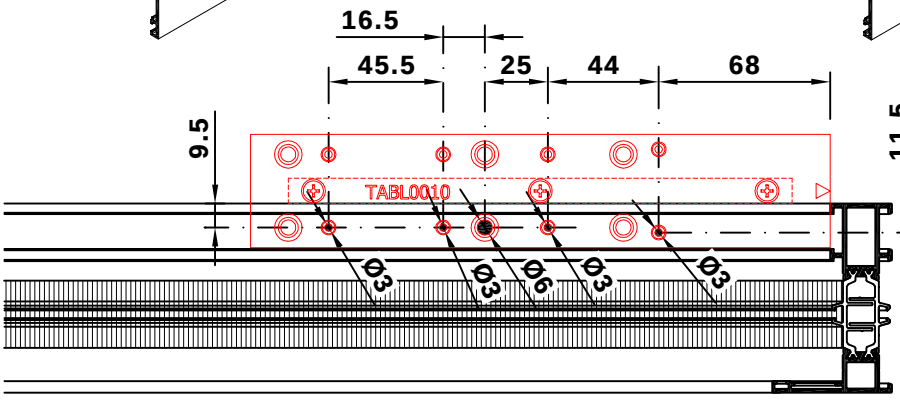
Locate each jig in turn into the corners of the frame for correct hole alignment



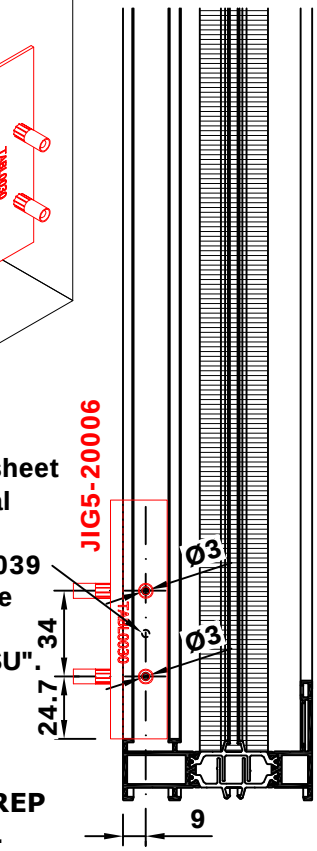
JIG5-20005



JIG5-20006



See also sheet "Additional Prep for TTGEAR2039 Alternative Bottom Corner BSU".



CILL PREP DETAIL

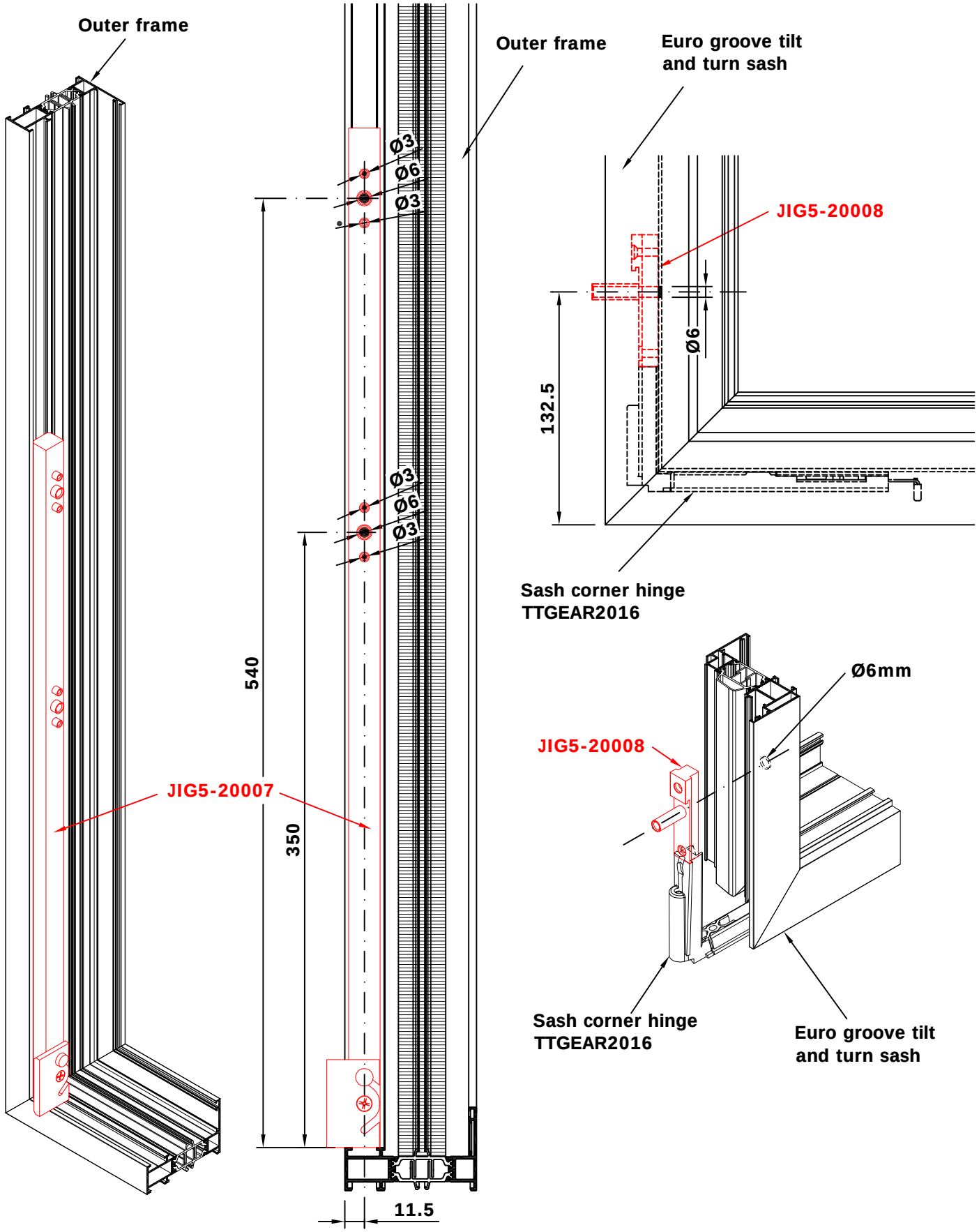
Not to scale

Prep for Siegenia Concealed Tilt and Turn Gearing

Suspension Cable

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



Not to scale

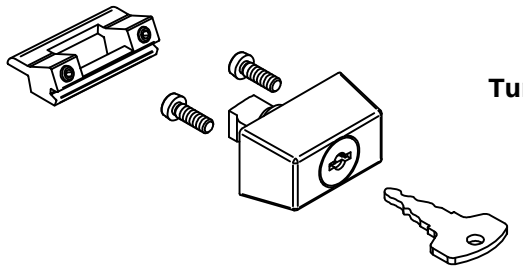
Turn Lock Prep

System 5-35 Hi/Hi+

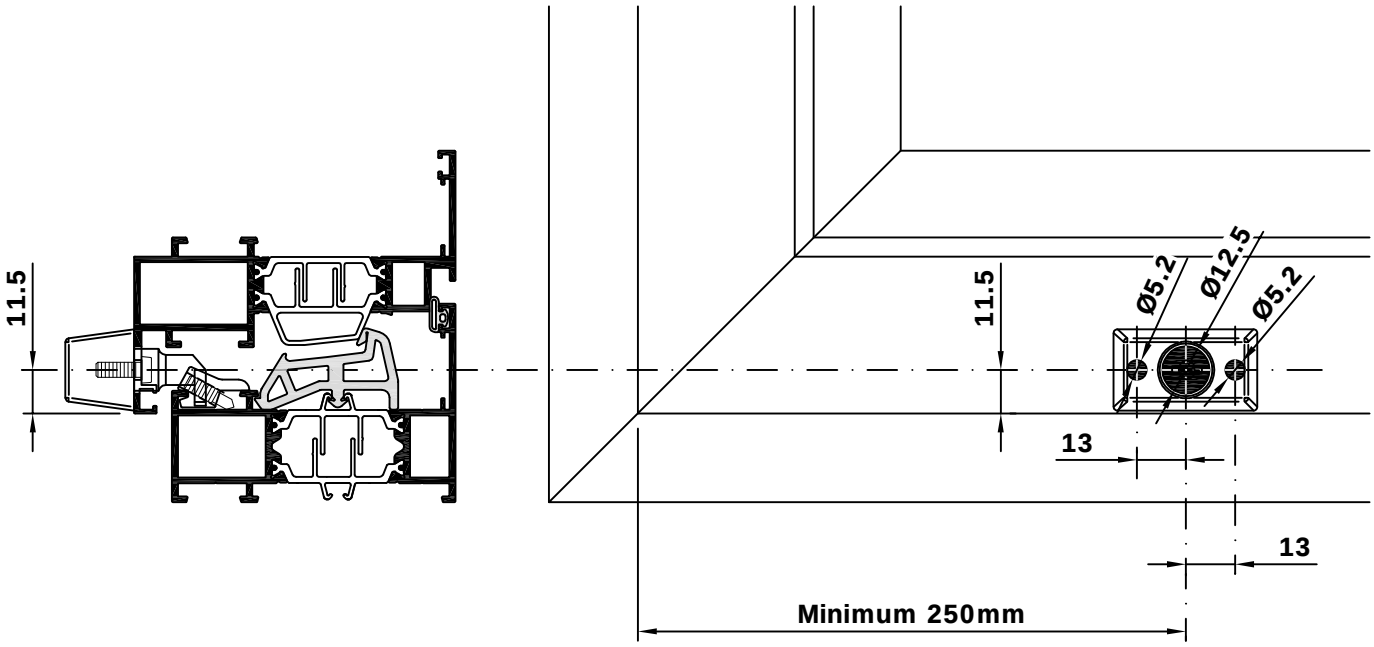
TILT AND TURN WINDOW

Turn Lock 785 is suitable for use with sashes 630-637, 631-661 and 633-663.

All fixings must be sealed using HR50328A sealant.



Turn lock 785



Assembly instructions

1. Pre drill the holes in the sash for the turn lock.
2. Position the turn lock in the corresponding holes and secure with the machine screws provided.
3. Fix keep to outer frame aligned with the turn lock and secure by tightening the grub screws.

Scale 1:2

Releasable Turn-Restrictor Prep To Suit Sash 632-662

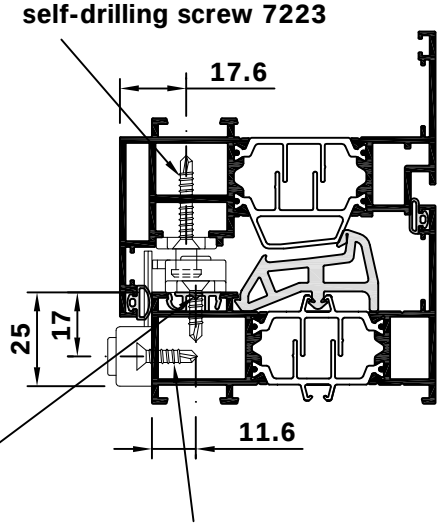
System 5-35 Hi/Hi+

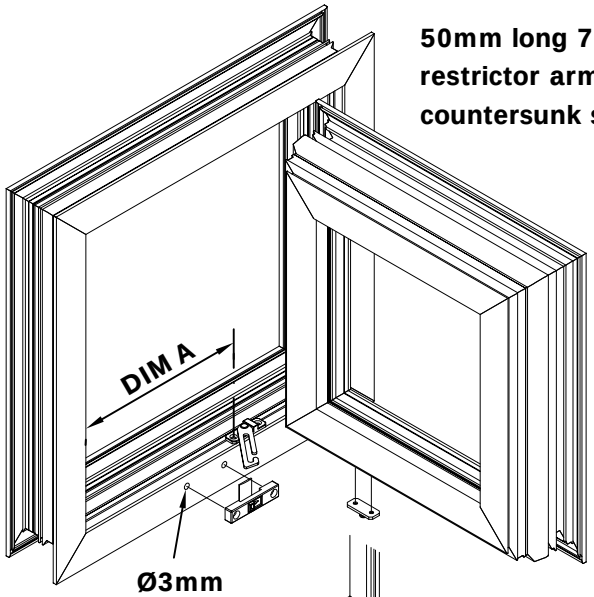
TILT AND TURN WINDOW

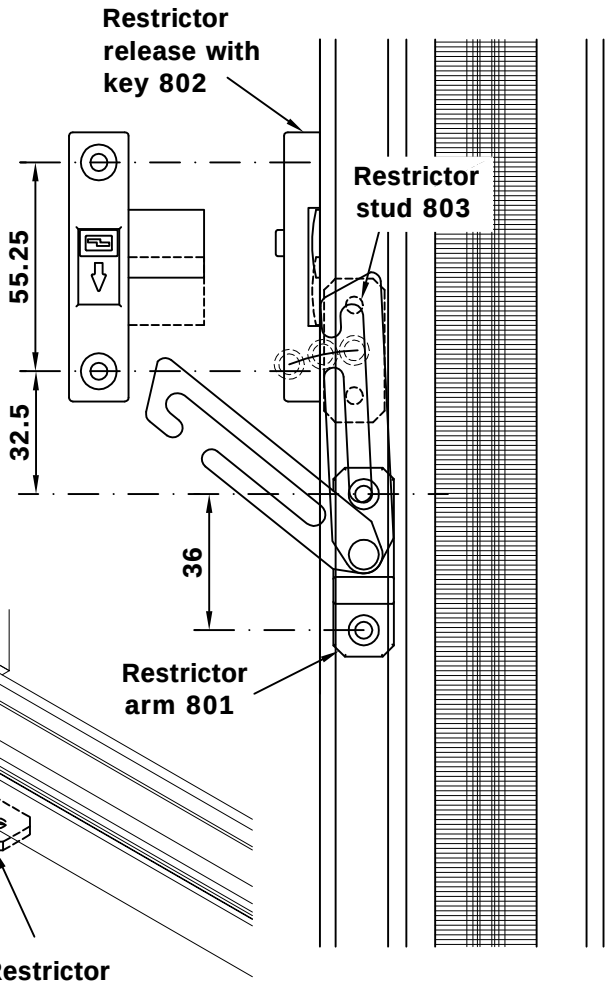
Only suitable for use with outer frames / transoms 601-201, 604-213, 603-201, 606-206, 613-213. Fabricator to ensure outer frame selection allows sufficient clearance between underside of 802 restrictor release, and internal finish/cill board.

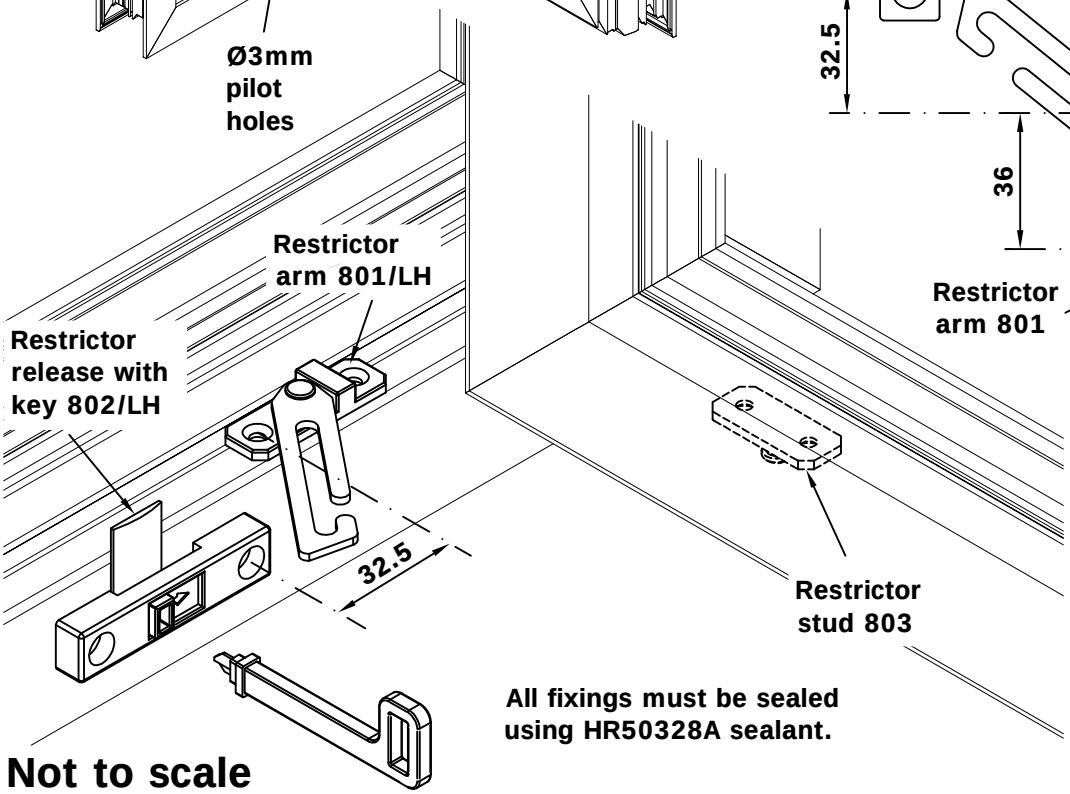
Note that this releasable restrictor does not provide any friction to assist in keeping the sash in the open position. The sash may therefore be susceptible to closing/slamming due to wind/air pressure differences.

1. **Fit restrictor arm 801 (LH or RH) using No 7 x 16mm countersunk self drill screws 7256. Dim A is determined by the required window restriction i.e. 100mm. (Nearer to the hinge the further the window will open). Ensure distance from the corner doesn't interfere with the gearing.**
2. **Fit restrictor stud 803 using No 7 x 25mm countersunk self drill screw 7223. When the window is closed the restrictor stud 803 should line up with the "gate" of the restrictor arm as shown.**
3. **Fit the restrictor release 802 (LH or RH) to front of frame through 3mm pilot holes, 32.5mm from fixing hole of restrictor arm 801.**









All fixings must be sealed using HR50328A sealant.

Not to scale

Releasable Turn-Restrictor Prep

To Suit Sashes 630-637, 631-661, 633-663

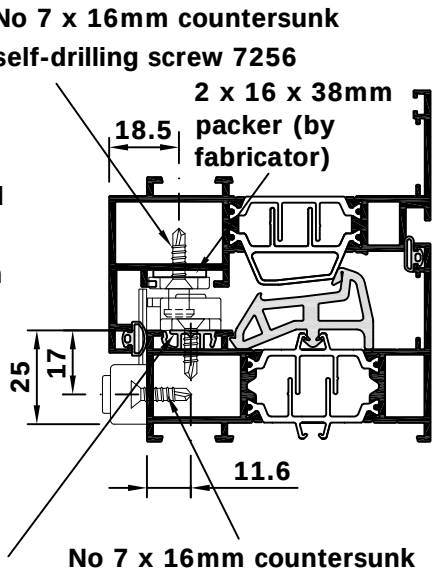
System 5-35 Hi/Hi+

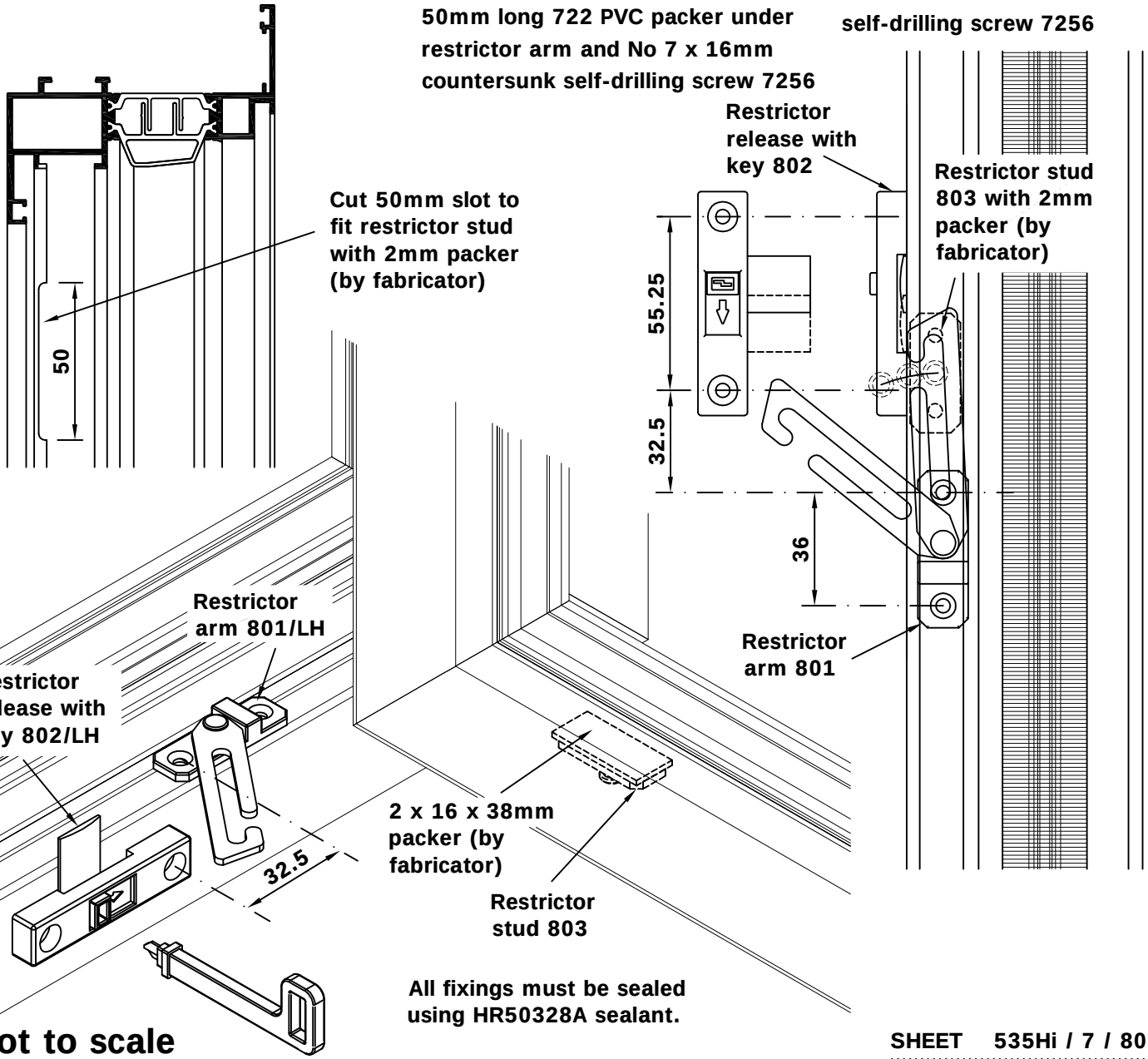
TILT AND TURN WINDOW

Only suitable for use with outer frames / transoms 601-201, 604-213, 603-201, 606-206, 613-213. Fabricator to ensure outer frame selection allows sufficient clearance between underside of 802 restrictor release, and internal finish/cill board.

Note that this releasable restrictor does not provide any friction to assist in keeping the sash in the open position. The sash may therefore be susceptible to closing/slamming due to wind/air pressure differences.

1. **Fit restrictor arm 801 (LH or RH) using No 7 x 16mm countersunk self drill screws 7256. Distance from the corner is determined by the required opening restriction i.e. 100mm. (Nearer to the hinge the further the window will open). Ensure distance from the corner doesn't interfere with the gearing.**
2. **Notch 50mm slot as indicated to fit 2mm packer and restrictor stud 803 using No 7 x 16mm countersunk self drill screw 7256. When the window is closed the restrictor stud 803 should line up with the "gate" of the restrictor arm as shown.**
3. **Fit the restrictor release 802 (LH or RH) to front of frame through 3mm pilot holes 32.5mm from fixing hole of restrictor arm 801.**





Not to scale

Spring Catches

To Suit Sashes 630-637, 631-661, 633-663

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

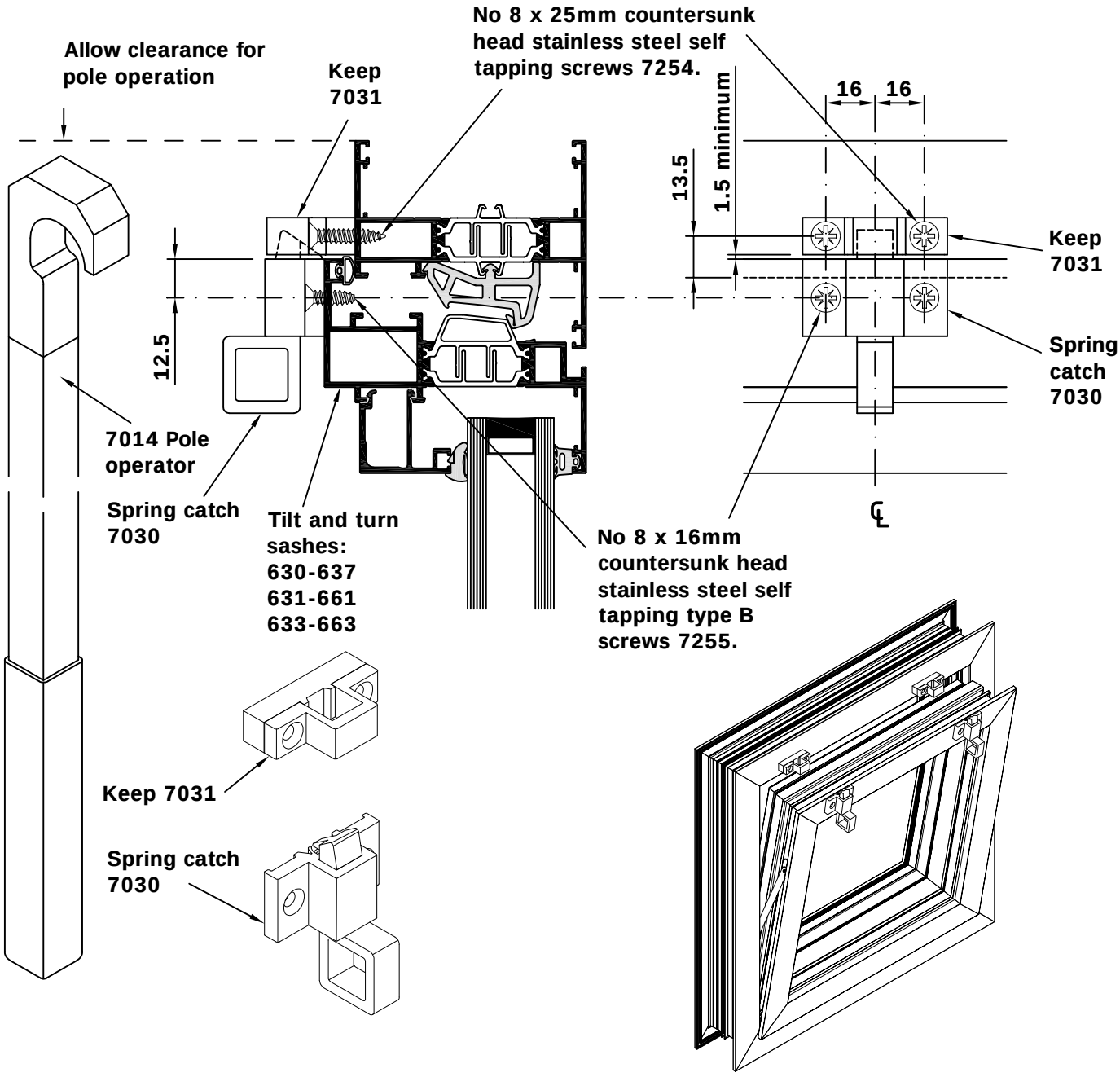
All fixings must be sealed using HR50328A sealant.

A pole operator with hook (7014 - 1500mm long) can be used where spring catches may be out of reach. Fabricator must ensure there is sufficient clearance above the spring catch to allow pole operator to engage. Pole operators are not suitable for use when windows are inserted into curtain walling.

Metal Technology recommend that single catches are placed centrally. Where two catches are required these should be positioned at the 1/4 points along the sash. Link bars are supplied over length and are to be cut to size to suit spring catch positions.

Link bar length = spring catch centres + 12mm

1 pair restrictor arms (CA36) to be fitted at jambs of window to limit opening to 100mm. Refer to "CA36 Restrictor Installation" sheet for fitting details.



Scale 1:2

CA36 Restrictor Installation

For use with Spring Catches 7030 to Suit Sashes 630-637, 631-661, 633-663

System 5-35 Hi/Hi+

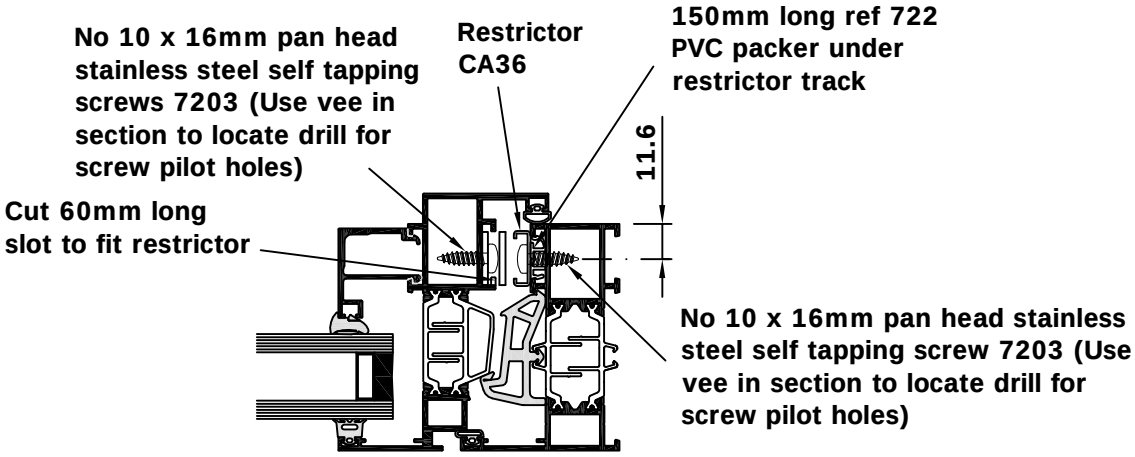
TILT AND TURN WINDOW

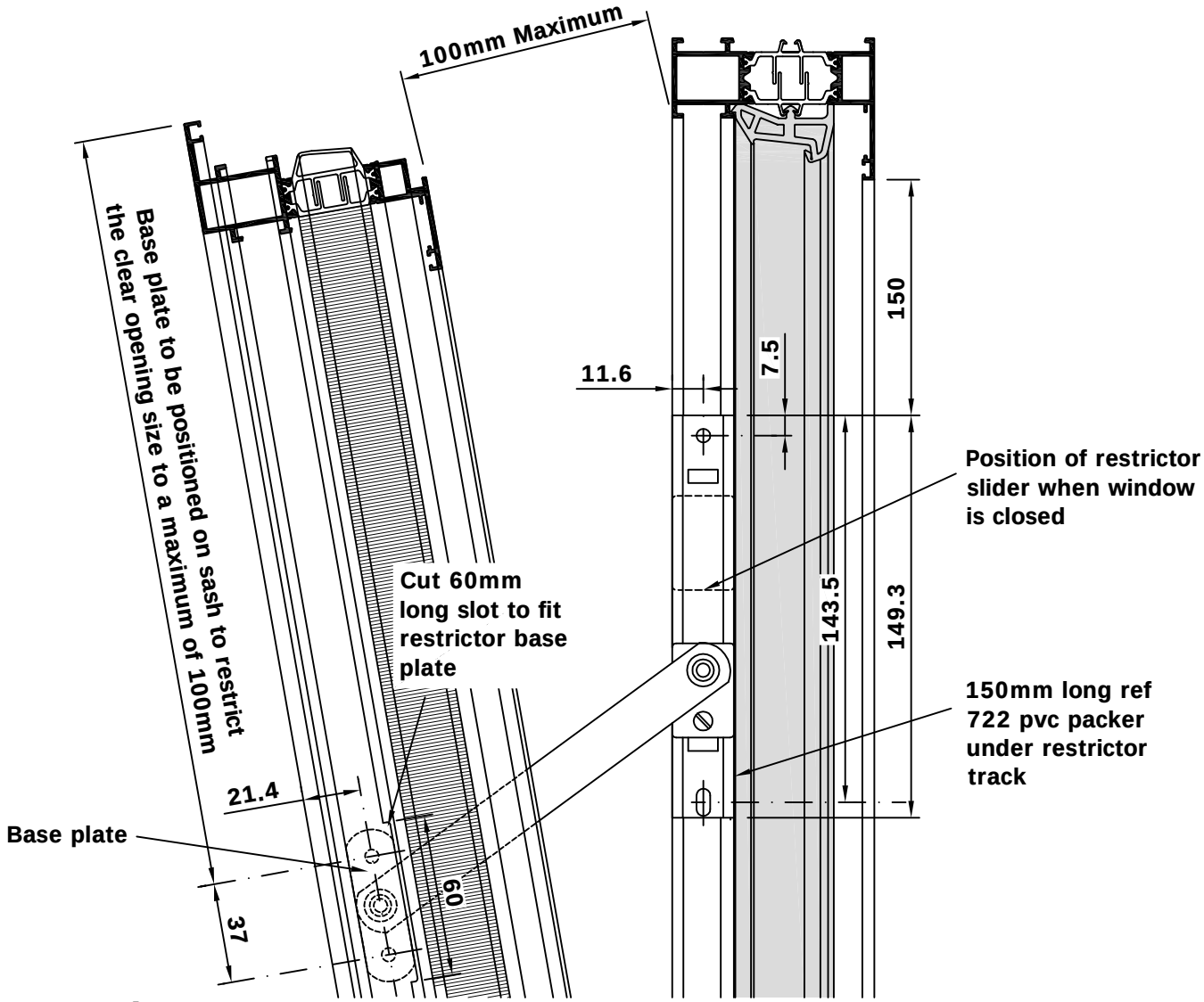
Not suitable for sashes over 1200mm wide.

While this restrictor offers a friction facility to assist in keeping the sash in the open position, it cannot be released for cleaning purposes. Due to the restricted access offered by this restrictor, Metal Technology recommend that these windows be cleaned from the outside.

1 pair restrictor arms (CA36) to be fitted at jambs of window to limit opening to 100mm.

All fixings must be sealed using HR50328A sealant.



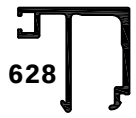
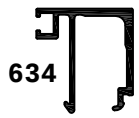
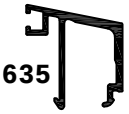


Not to Scale

Glazing Bead and Gasket Requirements

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Glazing unit size	External gasket	Internal gasket	Glazing bead	
			Square	Raked
28mm 29mm 30mm 31mm	6080 (purple) 6080 (purple) 6081 (black) 6081 (black)	CA27 (white) PTT36 (red) CA27 (white) PTT36 (red)		
32mm 33mm 34mm 35mm	6080 (purple) 6080 (purple) 6081 (black) 6081 (black)	CA27 (white) PTT36 (red) CA27 (white) PTT36 (red)		
36mm 37mm 38mm 39mm	6080 (purple) 6080 (purple) 6081 (black) 6081 (black)	CA27 (white) PTT36 (red) CA27 (white) PTT36 (red)		
40mm 41mm 42mm 43mm	6080 (purple) 6080 (purple) 6081 (black) 6081 (black)	CA27 (white) PTT36 (red) CA27 (white) PTT36 (red)		
44mm 45mm 46mm 47mm	6080 (purple) 6080 (purple) 6081 (black) 6081 (black)	CA27 (white) PTT36 (red) CA27 (white) PTT36 (red)		

These unit sizes (i.e. 28mm to 47mm) are based on nominal sizes. Where glazing unit tolerance is at its extreme (±0.5mm) or where alternative glass thicknesses are being considered the gasket/bead/section combination should be physically checked on a sample window.

For thicker glazing unit sizes than those indicated, refer to Metal Technology's technical department.

Not to scale

Weatherseal Preparation Details

Weatherseal 060B, 6063

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Cut weatherseal into four individual lengths with mitred corners.

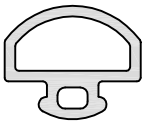
Push fit weatherseal into section grooves. See detail below for fitting direction.

Weatherseals must not be stretched and should be cut 1-3% oversize as required to accommodate shrinkage. When oversizing the gasket to accommodate any anticipated potential shrinkage, fabricators should ensure gasket is not installed so that it remains wrinkled. While it is preferable that gaskets be installed too long, rather than too short, excessive wrinkles or distortion should be avoided once the gasket has had an opportunity to settle into its natural state within its final intended environment.

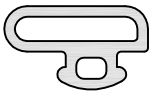
All corners to be bonded with cyanoacrylate (superglue) adhesive.

Notch external weatherseal 6063 at head of vent, in accordance with "Pressure Equalisation" sheet.

Where gaskets are supplied in a bag, the bag should be re-sealed to prevent drying out. Should gaskets become dry and difficult to apply, they can be re-lubricated using 7400 silicone spray as they are inserted into the window frames.

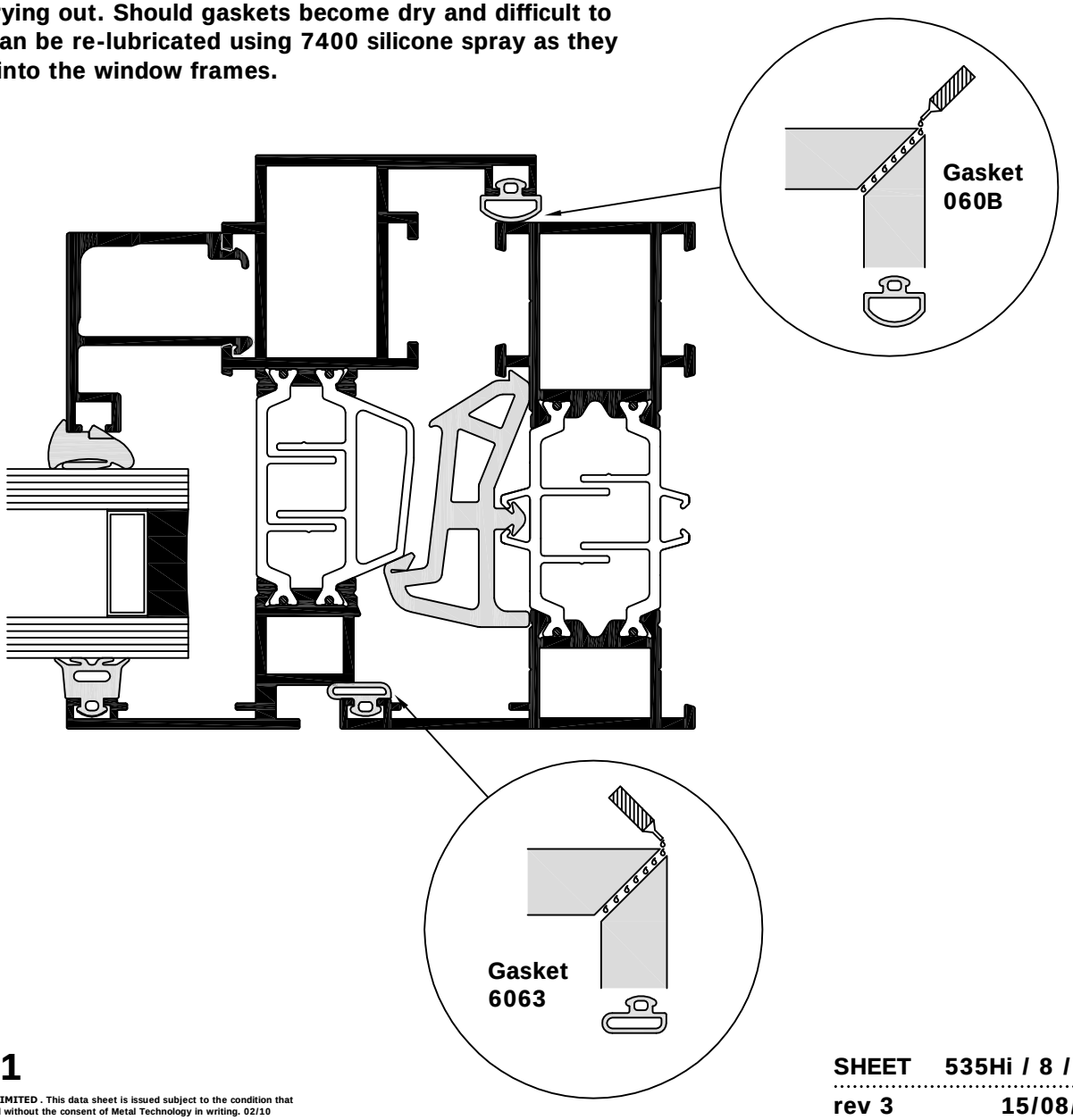


Weatherseal gasket 060B



Weatherseal gasket 6063

Scale 2:1



Scale 1:1

Weatherseal Preparation Details

Gasket 6080, 6081 (Outside)
Wedge CA27, PTT36 (Inside)

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Cut 6080 or 6081 gasket into four individual lengths with mitred corners and fit into section grooves. In internally beaded applications factory bond gasket corners using cyanoacrylate (superglue) adhesive.

In externally beaded applications mitred gasket corners may be sealed using HR50328A on site.

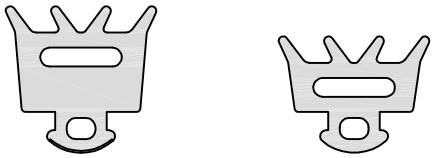
Metal Technology recommend installers apply HR50328A sealant to the mating surface of the retained gasket with the glass, at the mitred corners, on site immediately prior to offering up the glazing unit.

After locating glass and inserting bead, cut wedge gasket into four individual lengths and push fit between profile and glazing unit. Corners and joints to be sealed using HR50328A sealant as indicated.

Gaskets must not be stretched and should be cut 1-3% oversize as required to accommodate shrinkage. When oversizing the gasket to accomodate any anticipated potential shrinkage, fabricators should ensure gasket is not installed so that it remains wrinkled. While it is preferable that gaskets be installed too long, rather than too short, excessive wrinkles or distortion should be avoided once the gasket has had an opportunity to settle into its natural state within its final intended environment.

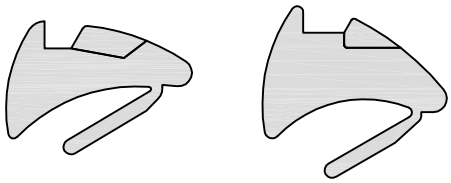
Where gaskets are supplied in a bag, the bag should be resealed to prevent drying out. Should gaskets become dry and difficult to apply, they can be re-lubricated using 7400 silicone spray as they are inserted into the window frames.

Gasket 6080 or 6081 (Outside)



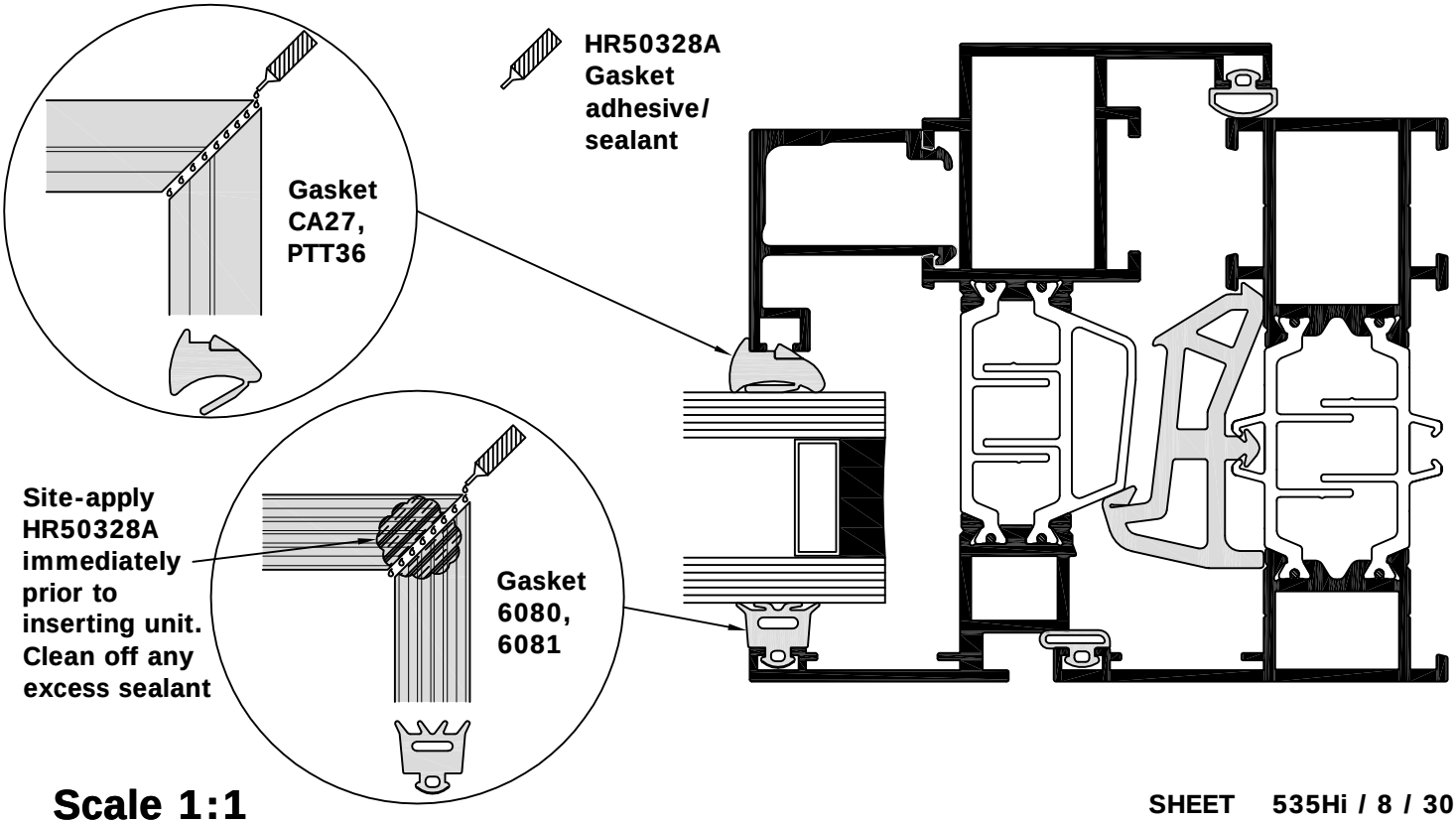
Gasket 6080 **Gasket 6081**

Wedge gasket CA27 or PTT36 (Inside)



Gasket PTT36 **Gasket CA27**

Scale 2:1



Scale 1:1

Centre Seal and Moulded Corner Gasket Preparation Details

Centre Seal 6061 and Corner Gasket 6062

System 5-35 Hi/Hi+

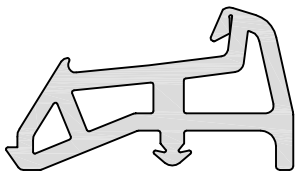
TILT AND TURN WINDOW

Cut 6061 centre seal into four individual lengths with square cut ends.

Push fit gasket into groove in outer frame/transom/mullion to perimeter of sash. Square cut and butt joint gasket 6061 with moulded corner gasket 6062 into section grooves. See detail below for fitting direction.

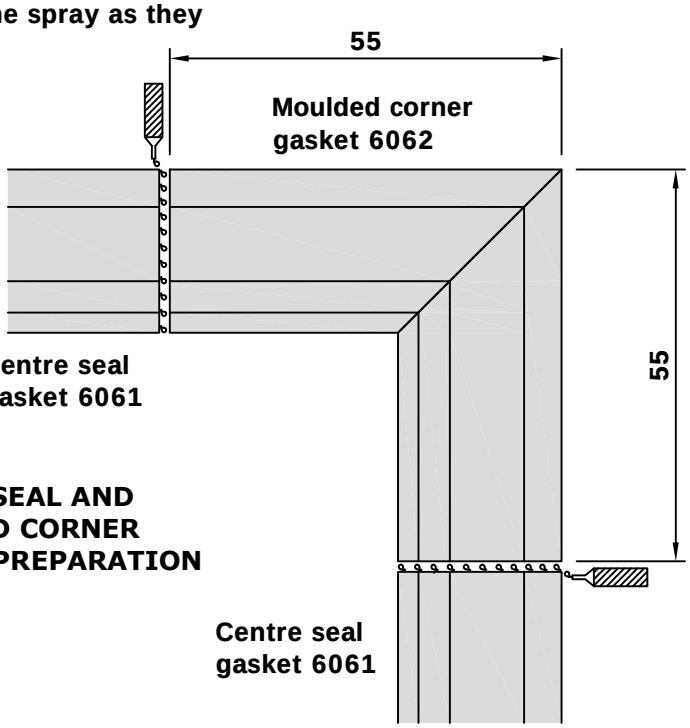
Thermal centre gasket should not be stretched and and may be cut 1-3% oversize as required to accommodate shrinkage.

Where gaskets are supplied in a bag, the bag should be resealed to prevent drying out. Should gaskets become dry and difficult to apply, they can be re-lubricated using 7400 silicone spray as they are inserted into the window frames.



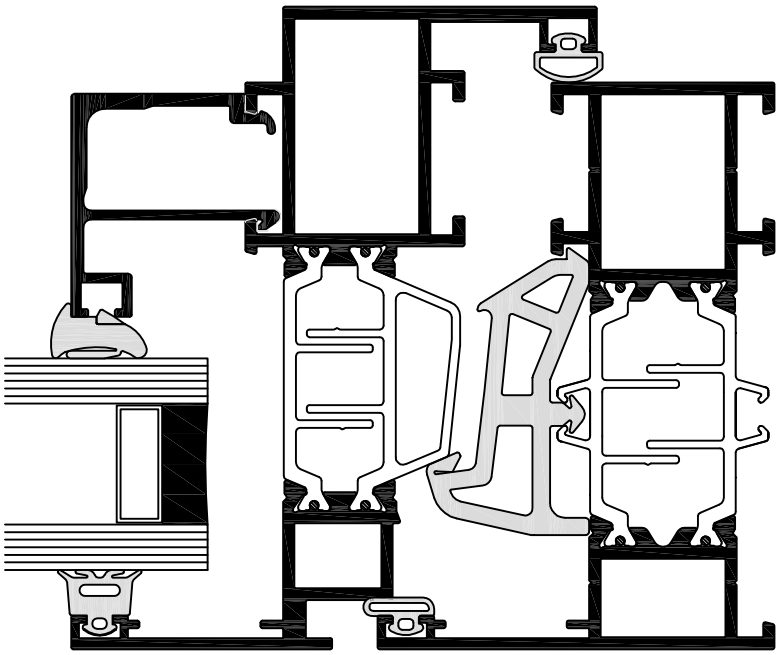
Centre seal gasket 6061. Bond with HR50328A.

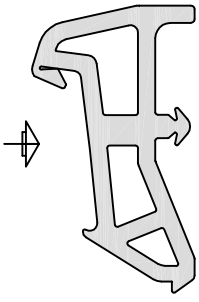
Scale 1:1



HR50328A Gasket adhesive/ sealant

CENTRE SEAL AND MOULDED CORNER GASKET PREPARATION





Push fit gasket direction (factory applied)

Scale 1:1

Perimeter Foam Preparation Details

Perimeter Foam 6728

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

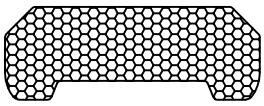
Perimeter foam 6728 may also be used in Hi applications to facilitate perimeter pointing/sealing.

Thermal foams should not be exposed to UV light and must be kept in a clean, dry and dust free environment at between 5° and 35°C. Fabricators should minimise exposure period of the foams to the elements and provide additional on-site protection to prevent depositing of builders debris.

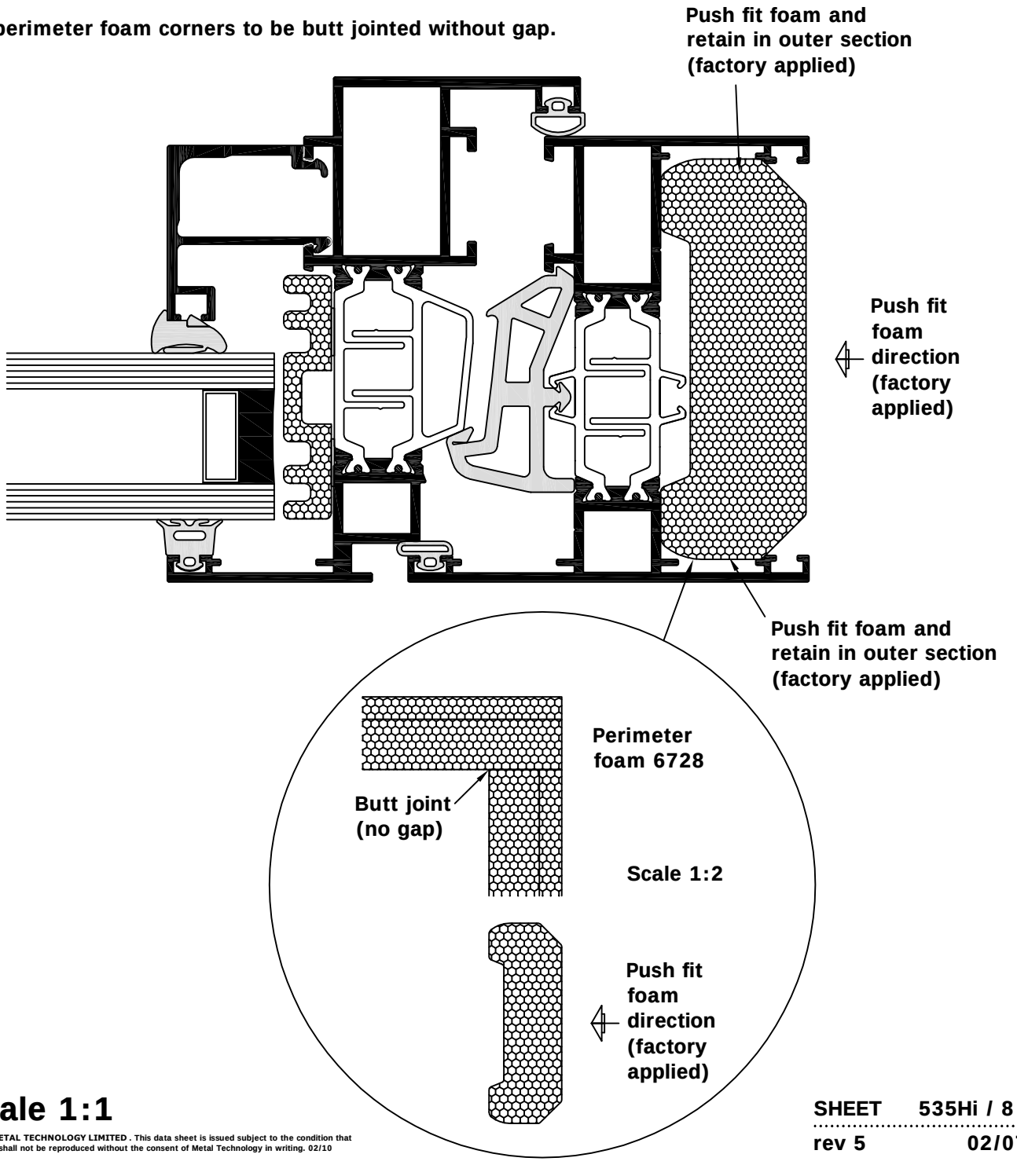
Cut 6728 perimeter foam into four individual lengths with square cut ends.

Push fit perimeter foam into section.

All perimeter foam corners to be butt jointed without gap.



Perimeter foam 6728.
Scale 1:2



Scale 1:1

Glazing Unit Perimeter Foam Preparation Details

Glazing Unit Perimeter Foam 6727

System 5-35 Hi+

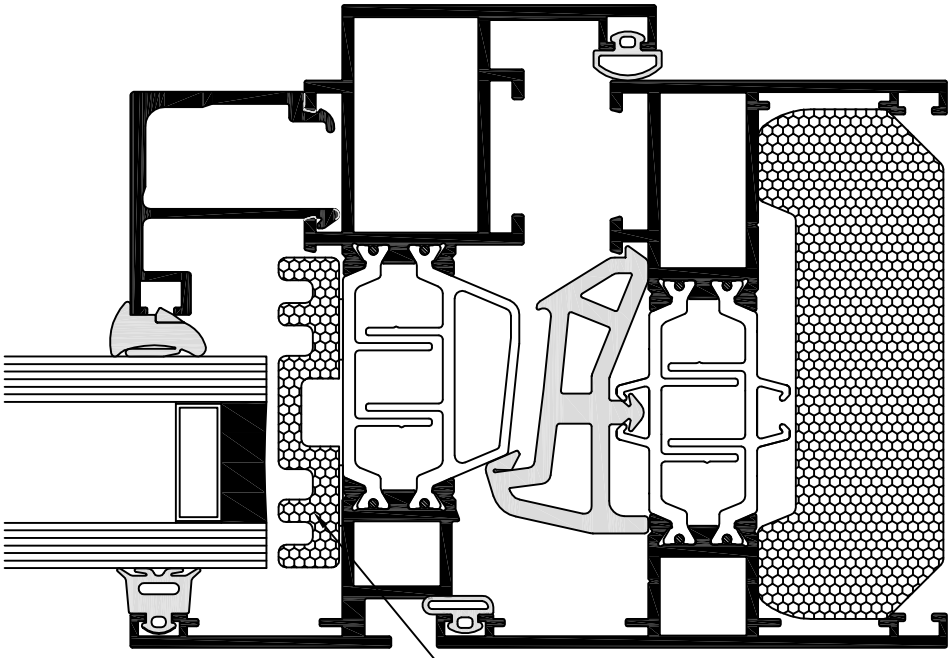
TILT AND TURN WINDOW

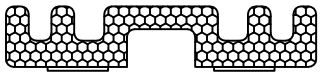
Thermal foams should not be exposed to UV light, and must be kept in a clean, dry, and dust-free environment at between 5° and 35°C. Minimum recommended application temperature for adhesive thermal foams is 20°C and therefore these should be applied in clean, dry, and dust-free factory conditions. Before applying self-adhesive foams ensure all surfaces are free from grease or dust. Clean all mating surfaces with suitable cleaning agent. Fabricators should minimise the exposure period of the foams to the elements and provide additional on-site protection to prevent depositing of builders debris.

Cut 6727 glazing unit perimeter foam into four individual lengths with square cut ends.

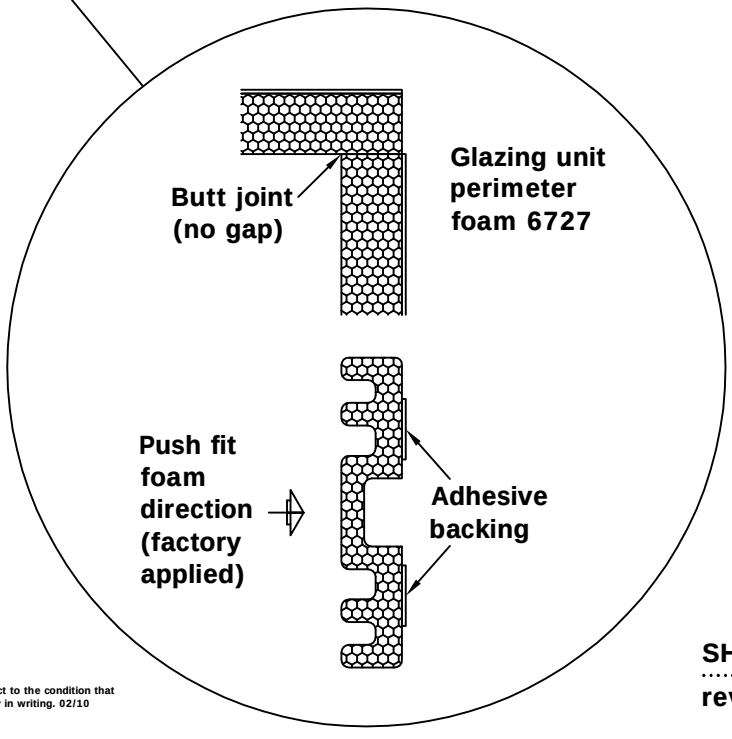
All foam corners to be butt jointed without gap.

Glazing unit perimeter foam to be factory applied to sash/frame where DGUs are to be installed. Remove release strip from rear of foam and bond to frame, omitting foam at glazing support, pressure equalisation and drainage locations.





Glazing unit closed cell foam 6727 bond to section using self-adhesive backing.



Scale 1:1

Liner Bar Foam Preparation Details

Liner Bar Foam 6729

System 5-35 Hi+

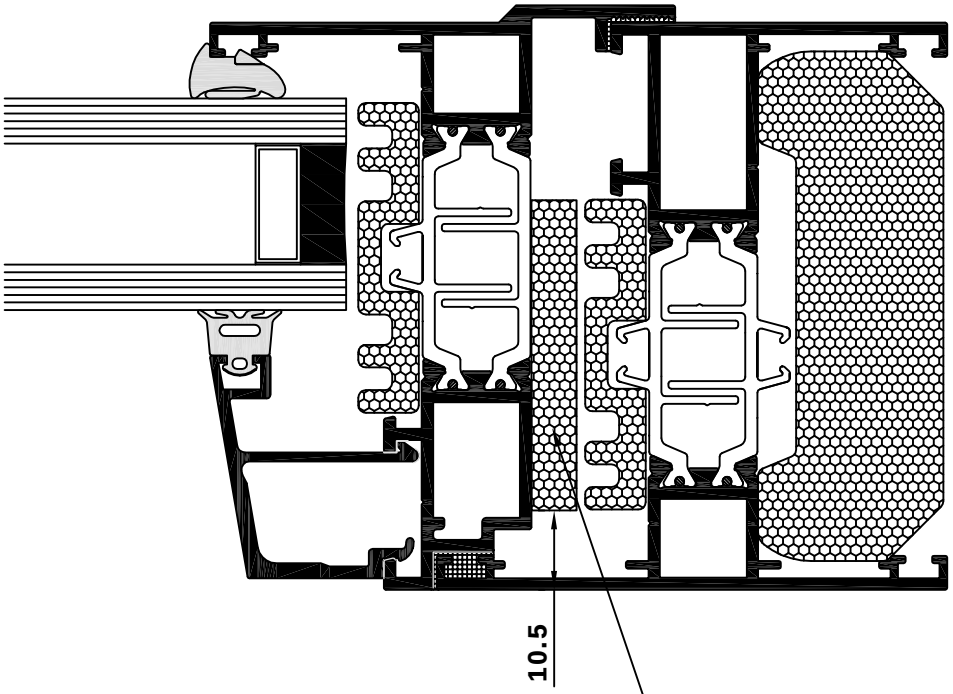
TILT AND TURN WINDOW

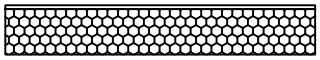
Thermal foams should not be exposed to UV light, and must be kept in a clean, dry, and dust-free environment at between 5° and 35°C. Minimum recommended application temperature for adhesive thermal foams is 20°C and therefore these should be applied in clean, dry, and dust-free factory conditions. Before applying self-adhesive foams ensure all surfaces are free from grease or dust. Clean all mating surfaces with suitable cleaning agent. Fabricators should minimise the exposure period of the foams to the elements and provide additional on-site protection to prevent depositing of builders debris.

Cut 6729 liner bar foam into four individual lengths with square cut ends.

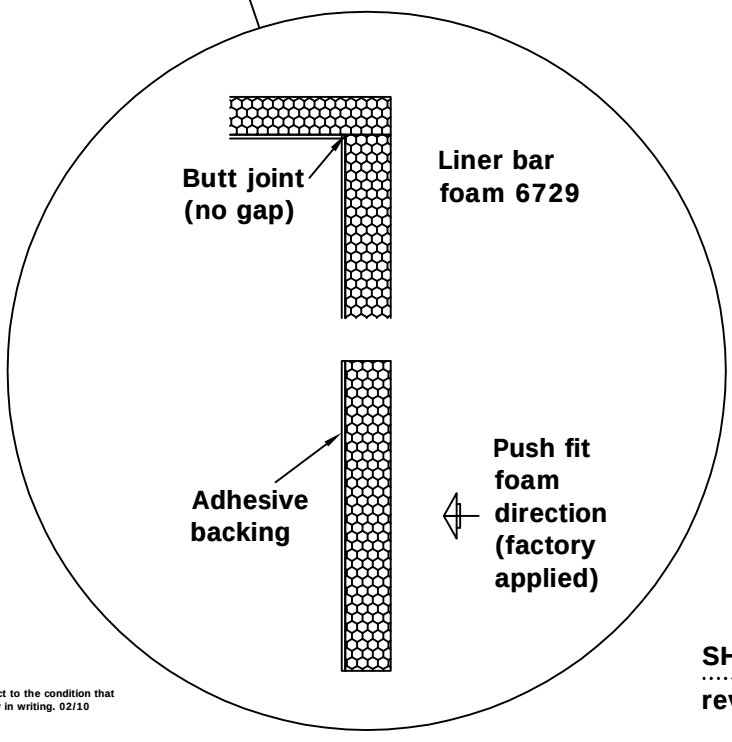
All foam corners to be butt jointed without gap.

Liner bar foam to be factory applied to liner bar. Remove release strip from rear of foam and bond to frame, omitting foam at glazing support, pressure equalisation and drainage locations.





Liner bar foam 6729 bond to section using self-adhesive backing



Scale 1:1

Installation Procedures

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

The following instructions are a general guideline and cover the most common conditions. For further information, advice or project specific applications contact Metal Technology's Technical Department.

All windows should be adequately protected against minor scuffs and abrasions during installation. This can be achieved using a suitable low tack tape to all exposed surfaces of the window frame. Low tack tape should be periodically renewed and should not remain on the windows for more than 6 months from the date of application. (This period may vary depending on exposure, application and manufacturers instructions)
LOW TACK TAPE IS NOT A SUBSTITUTE FOR CAREFUL HANDLING.

Ensure that the brickwork opening is the correct size and square, with sufficient clearance to accommodate any expansion, contraction, building movement and the minimum joint width requirement for the applicable sealant.

Where window units are installed in runs (i.e. ribbon windows etc..) a continuous subcill should be used. Where joints are required within the subcill these should be butt jointed and sealed using a suitable butt strap/splice plate. Where required the joint should be designed to accommodate all applicable movement, expansion and contraction. All subcills should be positioned on top of a continuous EPDM membrane returned upward, behind the window frame and sealed and bonded where required.

All aluminium should be isolated from direct contact with masonry, concrete and other incompatible materials by means of packing pieces, EPDM membranes, suitable paint or similar materials.

Metal Technology recommend the use of fixing lugs where practical. These should be fitted to the frames prior to offering the window into the opening. The choice of fixing lug will depend on site application (see manual for available options). The number and position of fixing lugs will depend on the window size and applicable loading. General fixing lug locations are 150mm from the corner, 150mm either side of a mullion/transom and at a maximum of 600mm centres (see manual for further clarification).

Where required fixing lugs may be cranked to accommodate the gap between the window frame and the structure. This should be done prior to snapping the lug into the frame.

Alternatively, where the gap between the frame and the structure is not suitable for adequately cranking the fixing lug, frame packers may be used.

Where direct 'through the frame' fixing is unavoidable this should be achieved using proprietary window frame anchors to suit application. All through the frame fixings should be suitable and adequate for the application and applied loadings. The number and position of the fixings will depend on window size and applied loads, etc. The general position for 'through the frame' fixing is as per lug fixing stated previously. All fixings should be made through the aluminium portion of the window frame and must be compatible with the window frame and substrate and/or be isolated from any incompatible materials in such a way as to avoid any adverse reaction.

Installation Procedures

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

cont...

All 'through the frame' fixings must be adequately sealed in position using a suitable sealant to prevent any water from permeating past the fixing into the cleat chambers, flashing areas and/or surrounding structure and into the building.

Where long equal leg outer frame options are being used the void around the perimeter of the window should be filled with insulation (i.e. 6728 perimeter foam) to provide a surface for locating the backing rod and pointing the sealant against.

Position the frame within the opening ensuring that all exposed aluminium is isolated from any material which may react unfavourably with it. This also applies to the fixings used to secure the windows. Metal Technology recommend that all fastenings to aluminium be Austenitic Stainless Steel A2-A4 grade, aluminium or other such compatible materials.

Suitable proprietary frame packers should be used to ensure the window is plumb, square, level, vertical and centralised within the opening.

Window frames must be adequately packed below the window cill, at the fixing points, to ensure the load is directly transferred to the structure below. Frame packers should not protrude past the external line of the window frame in order not to interfere with sealing the window to the structure.

Fix the window to the opening as required ensuring that the outer frame is not bowed or distorted and that the fixings used are adequate and suitable for the applicable loading conditions and application.

Ensure that the structure to which the window is fixed is sound and capable of adequately accepting the fixings and the subsequent loads transferred by them.

Check the diagonals, plumb, level and verticallity as the frame is finally tightened.

Apply a suitable sealant to the perimeter of the frame as per the sealant manufacturers recommendations and instructions. Any excess sealant should be removed so as not to detract from the finished product/installation.

Cement and plaster can damage the finish of this product if they are not removed promptly. Any such contaminants should be removed using a weak solution of mild detergent in water. (i.e. 5% of Teepol in water)

Finished surfaces should be cleaned with a soft cloth or sponge. Where stubborn marks persist a natural bristle brush may be used with care. Abrasive cleaners, solvents or other cleaning agents should not be used.

To prevent handles being damaged on site by unauthorised personnel, Metal Technology recommend that windows should be installed without handles being fitted. Handle preps should then be sealed with low tack tape. Handles should only be applied to the windows on handover. At handover all windows should be secured in the closed and locked position, operating stickers applied, and keys removed.

For additional information on window installation and glazing refer to BS 6262, other relevant British Standards and/or Metal Technology's Technical Department.

Metal Technology recommend that windows should be installed by experienced and qualifed window installers. All installers should be fully trained and qualified with regard to the relevant Health and Safety requirements for the applicable site operations and should possess a current CSCS card endorsed with a relevant and recognised NVQ or CWCT Window Installers Part 1 qualification.

Typical Fixing Detail

System 5-35 Hi/Hi+

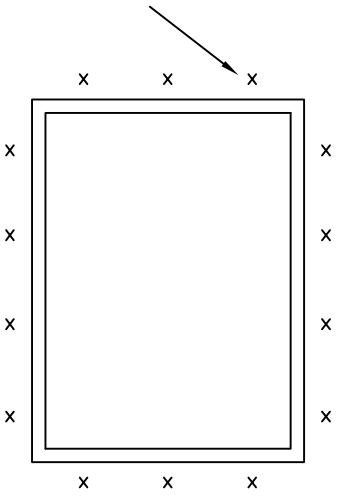
TILT AND TURN WINDOW

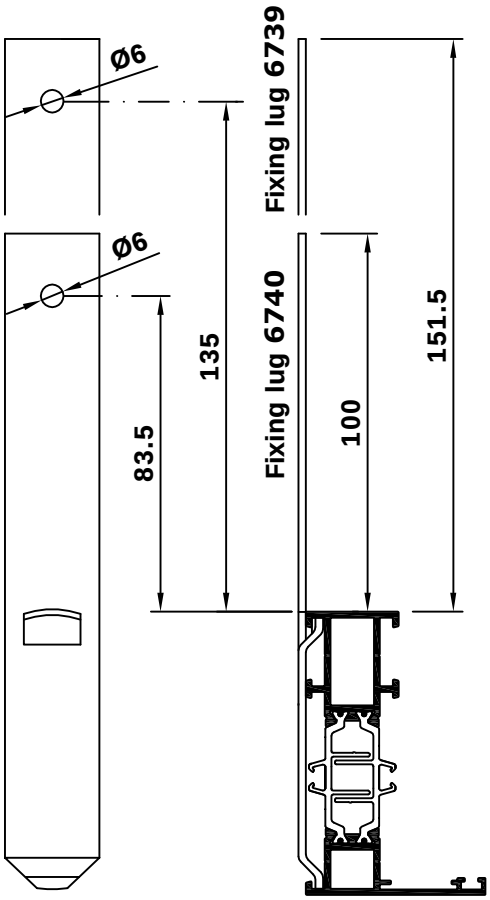
Fixing lugs provide lateral restraint only. Dead load support to be provided by perimeter structure.

All fixings to be adequate and suitable for loading conditions and application.

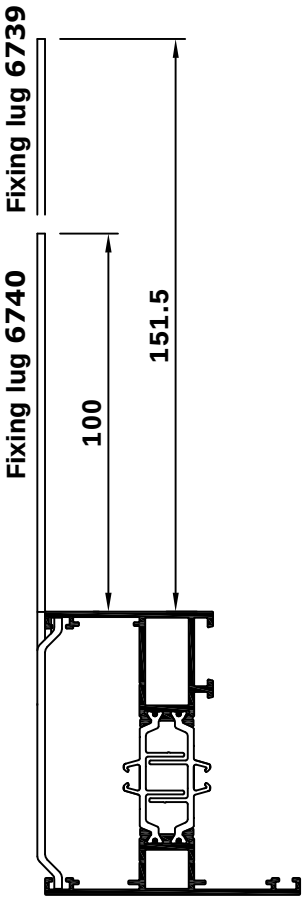
See sheet "Fixing Lug - Structural Limitations"
Particular consideration should be given to the dead load acting on the fixing lugs which may be cantilevered over the wall cavity at cill level. Additional support may be required.

Positions of fixing lugs 150mm from corners and maximum 600mm centres and 150mm either side of a mullion / transom

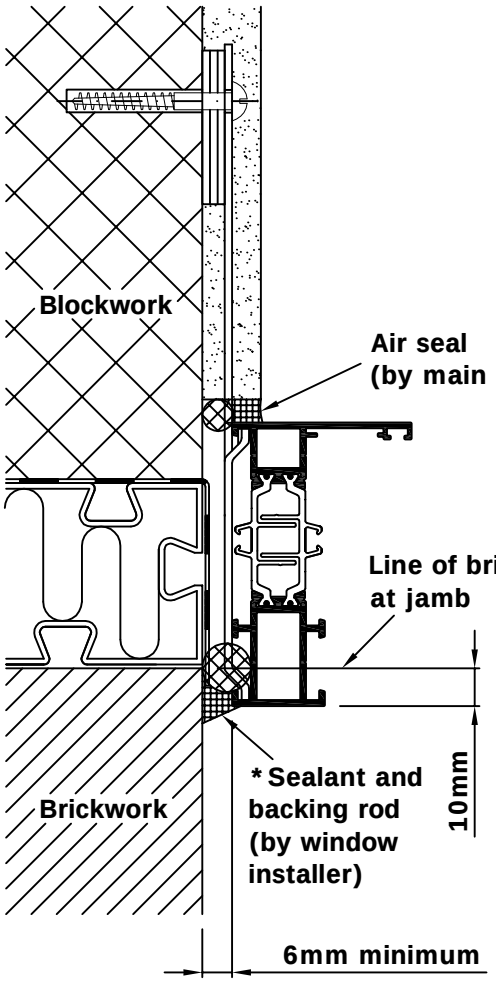




Section
600-200
600-605
601-201
604-213



Section
602-202



*** All sealants to be installed in strict accordance with manufacturers relevant details and BS 6093 to suit site conditions.**

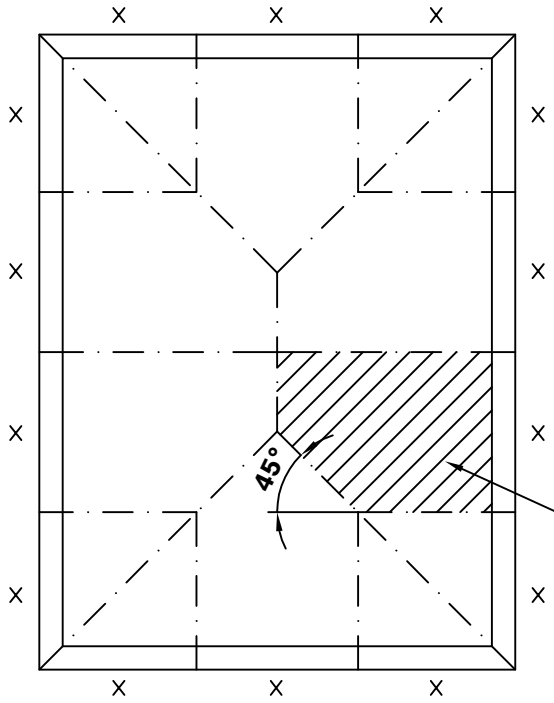
Scale 1:2

Fixing Lug - Structural Limitations

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Fixing lugs provide lateral restraint only. Dead load support to be provided by perimeter structure.

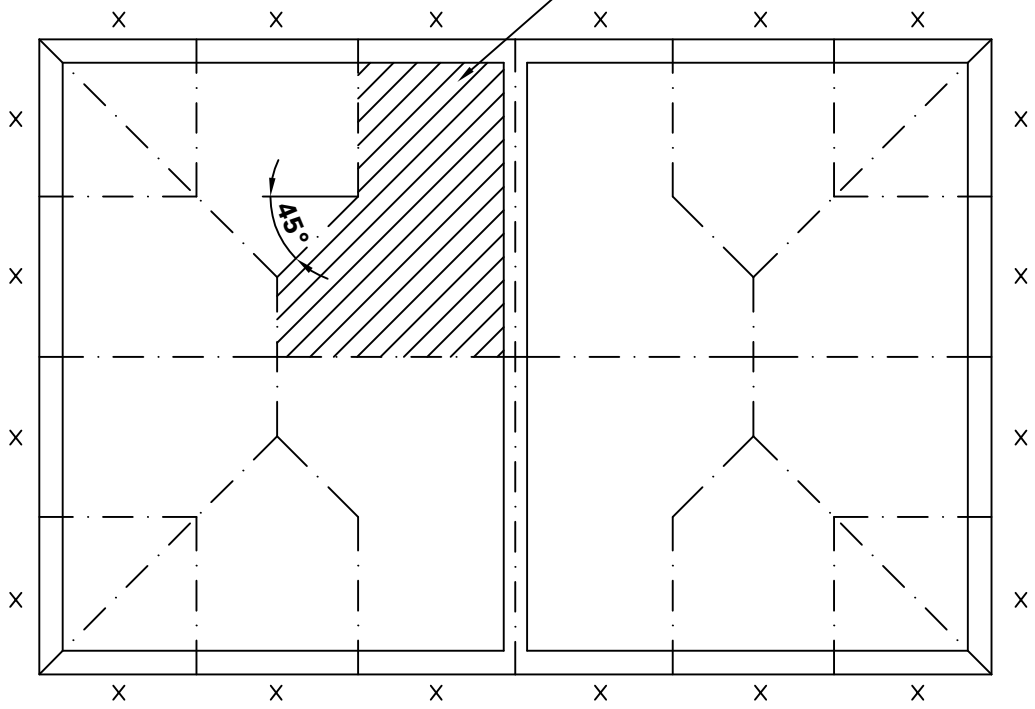


Standard recommended fixing lug locations = 150mm from corners, 150mm either side of a mullion/transom and a maximum of 600mm centres.

Maximum lateral load per fixing lug = 500N

Where lateral load per lug exceeds 500N reduce fixing centres accordingly.

Load per fixing lug = area supported by lug (m^2) x design wind load (N/m^2 or Pa)



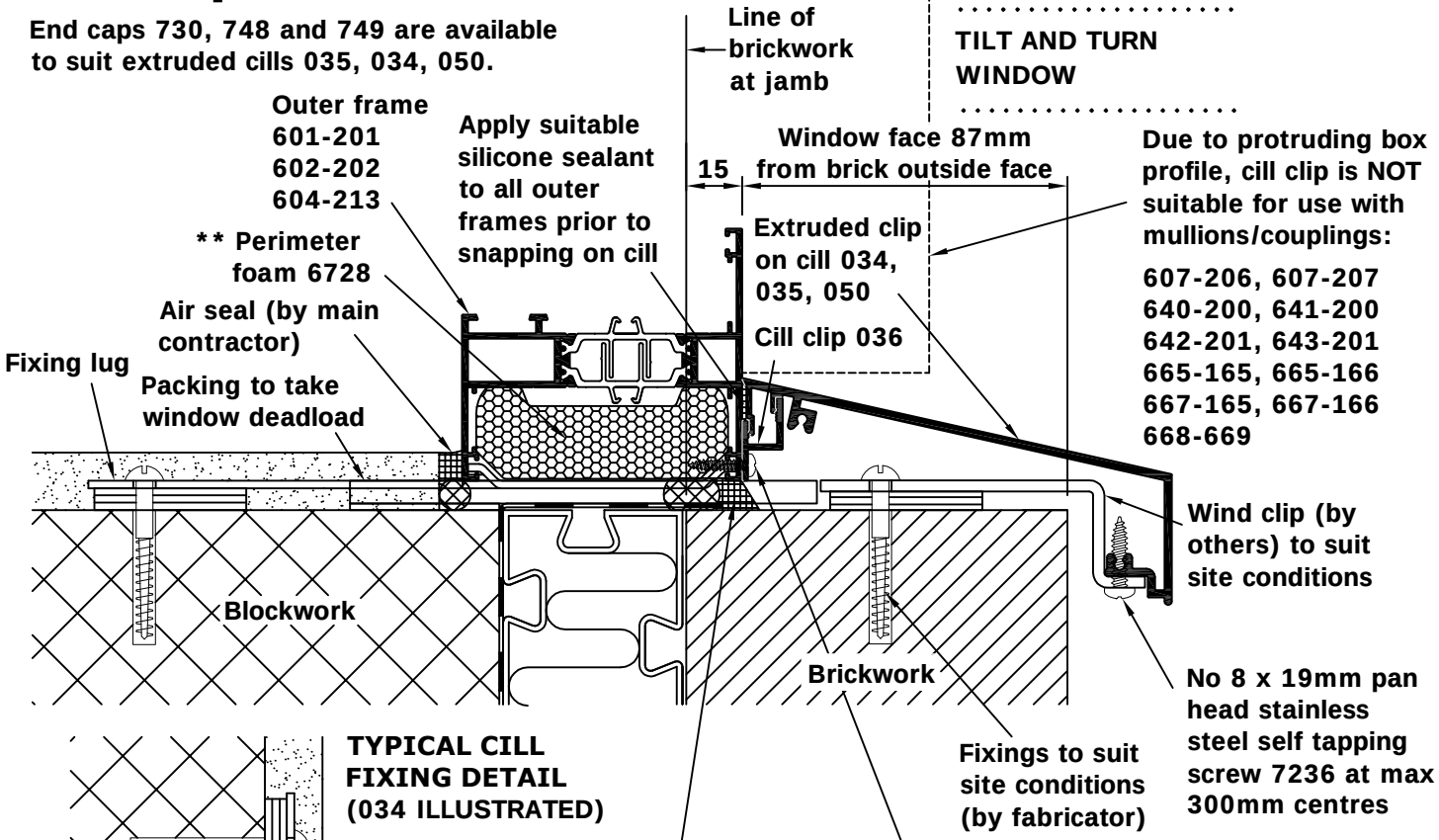
NOTE: Fabricator to ensure that the fixing to the structure and the structure itself is also capable of withstanding the imposed loads (i.e. wind load and dead load).

Extruded Clip on Cill and Cill Clip

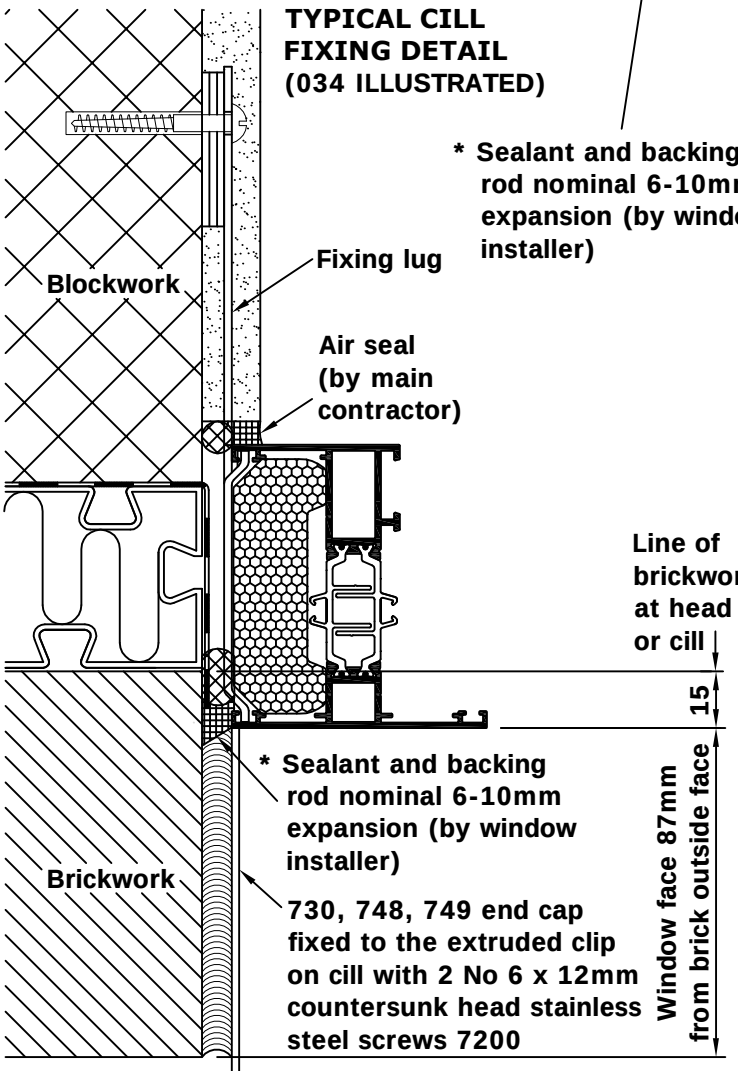
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

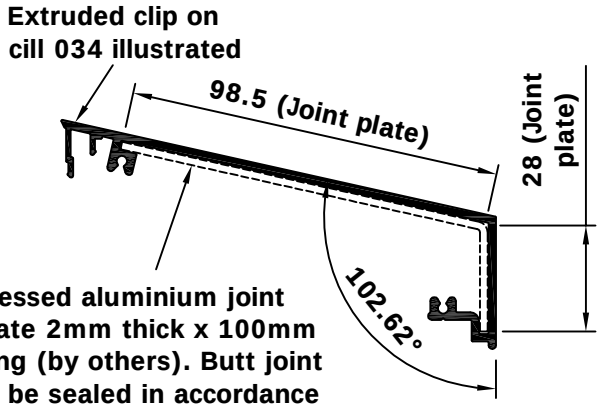
End caps 730, 748 and 749 are available to suit extruded cills 035, 034, 050.



TYPICAL CILL FIXING DETAIL (034 ILLUSTRATED)



TYPICAL JAMB FIXING DETAIL



* All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.

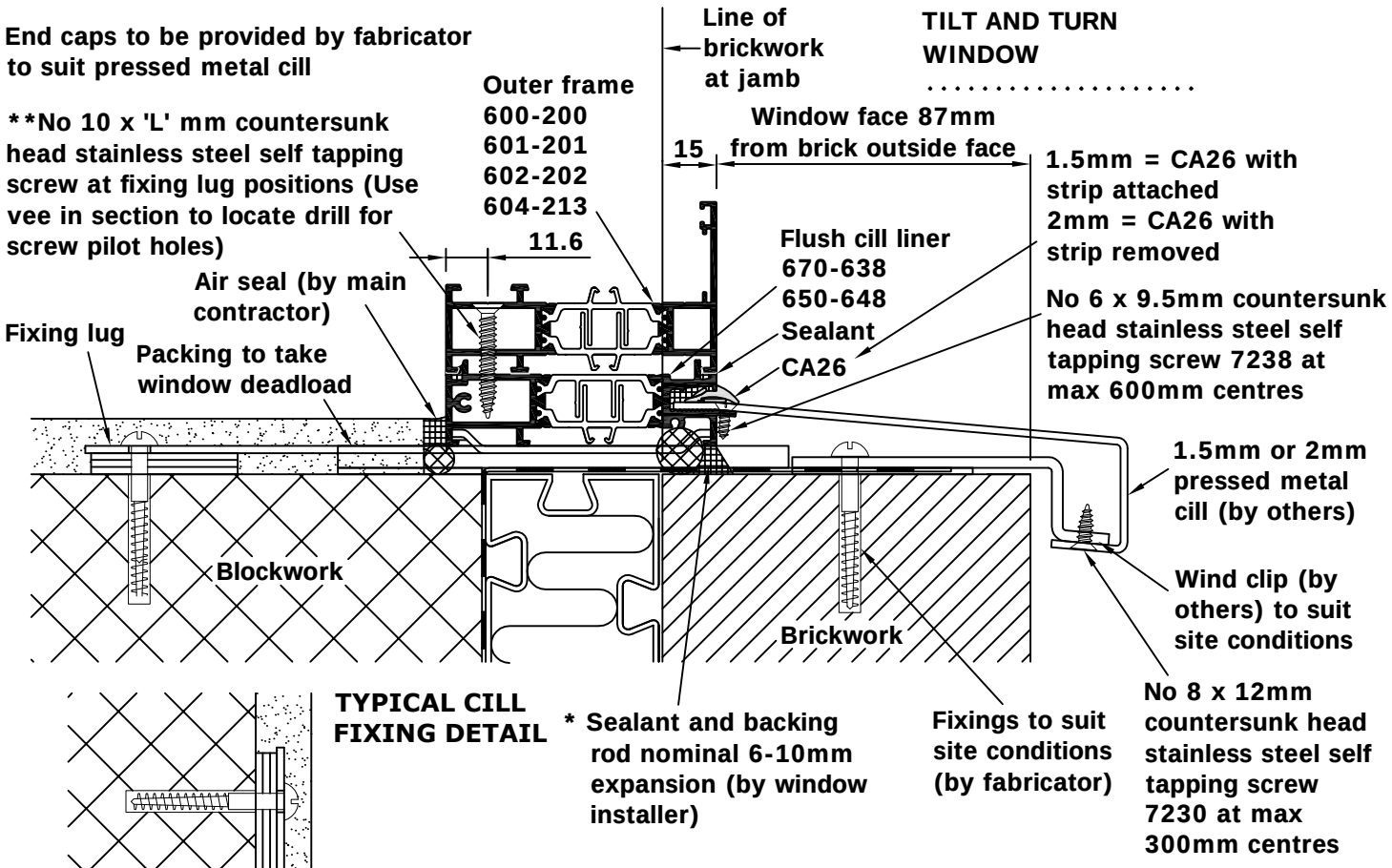
** 6728 perimeter foam may be incorporated in 5-35 Hi to retain backing rod to facilitate silicone pointing

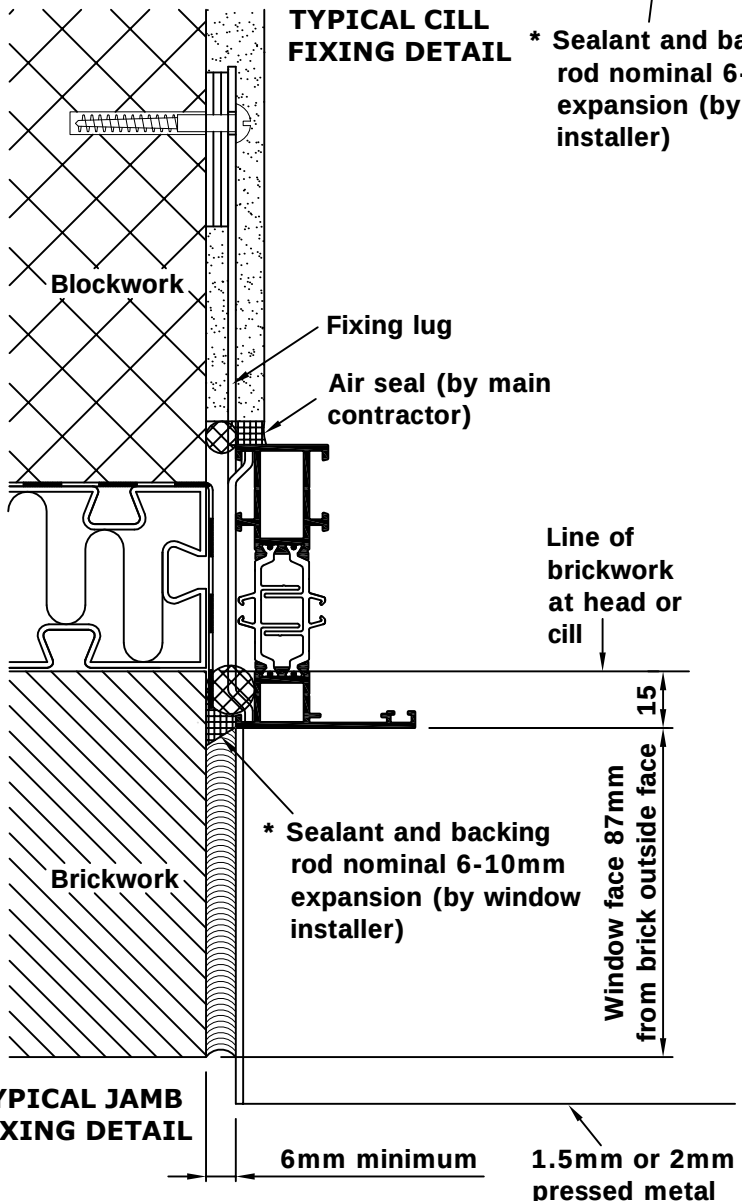
Scale 1:2

Flush Cill Liners (for pressed metal cill)

System 5-35 Hi/Hi+

TILT AND TURN WINDOW





O/frame :-
600-200 **7237 screw length 'L' = 32mm
601-201 **7248 screw length 'L' = 38mm
602-202 **7249 screw length 'L' = 50mm
604-213 **7220 screw length 'L' = 45mm

Cill pressing and CA26 gasket may be bonded to the sub-cill to prevent removal of gasket on site.

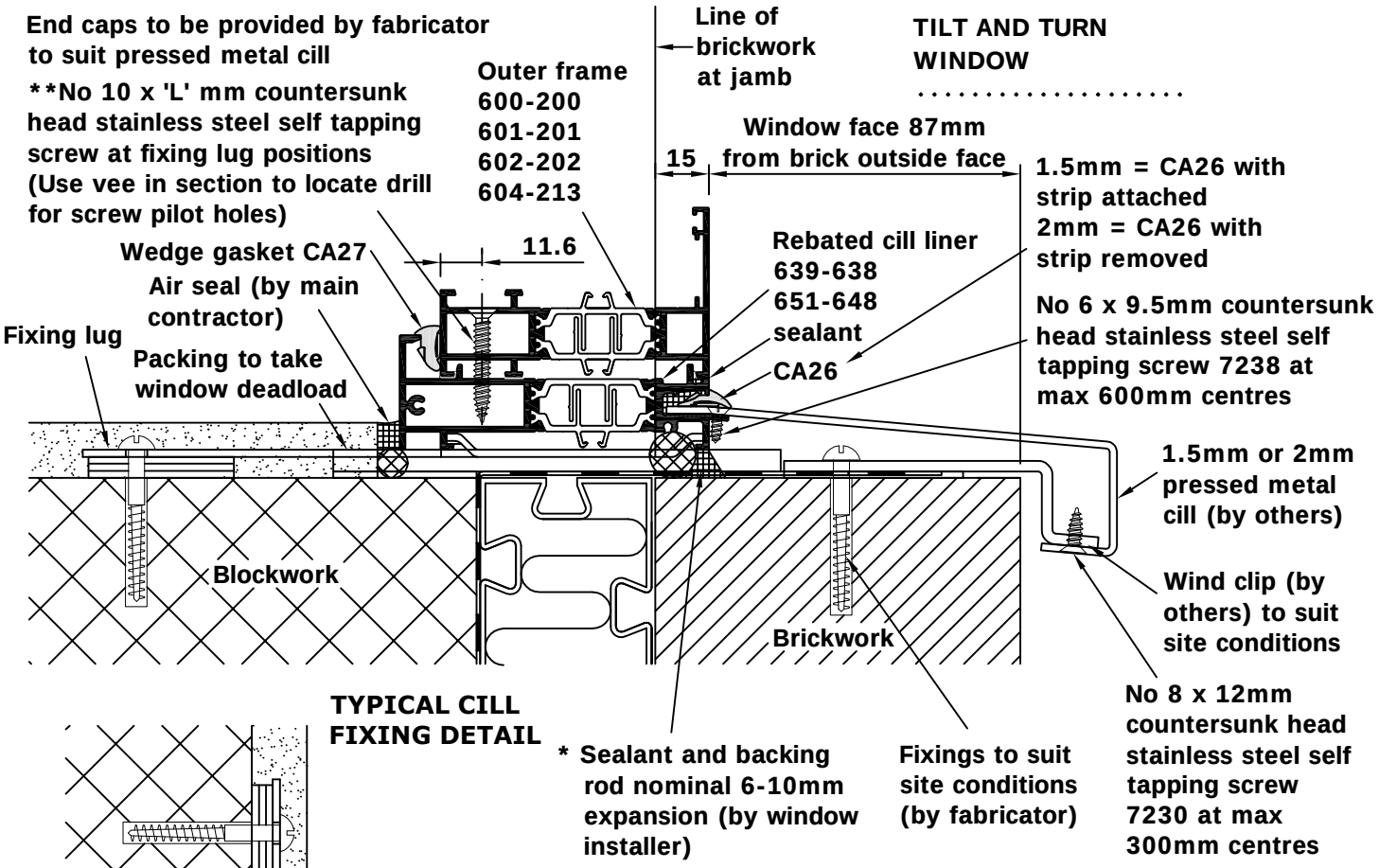
* All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.

Scale 1:2

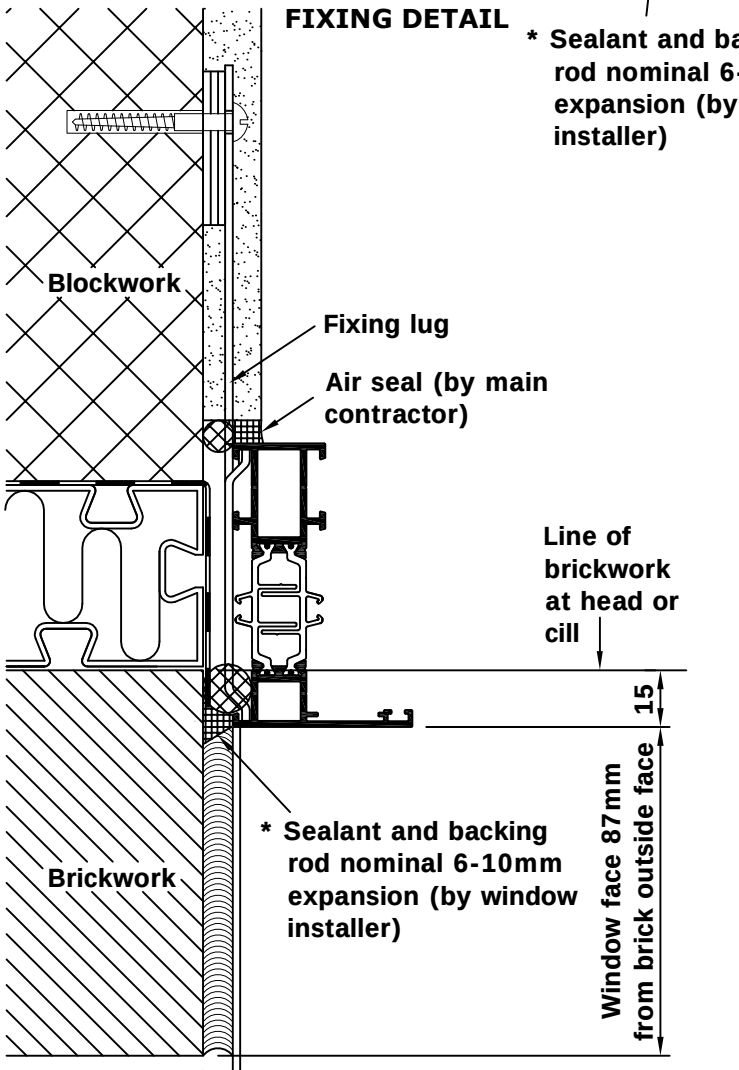
Rebated Cill Liners (for pressed metal cill)

System 5-35 Hi/Hi+

TILT AND TURN WINDOW



TYPICAL CILL FIXING DETAIL



TYPICAL JAMB FIXING DETAIL

O/frame :-
600-200 **7237 screw length 'L' = 32mm
601-201 **7248 screw length 'L' = 38mm
602-202 **7249 screw length 'L' = 50mm
604-213 **7220 screw length 'L' = 45mm

Cill pressing and CA26 gasket may be bonded to the sub-cill to prevent removal of gasket on site.

*** All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.**

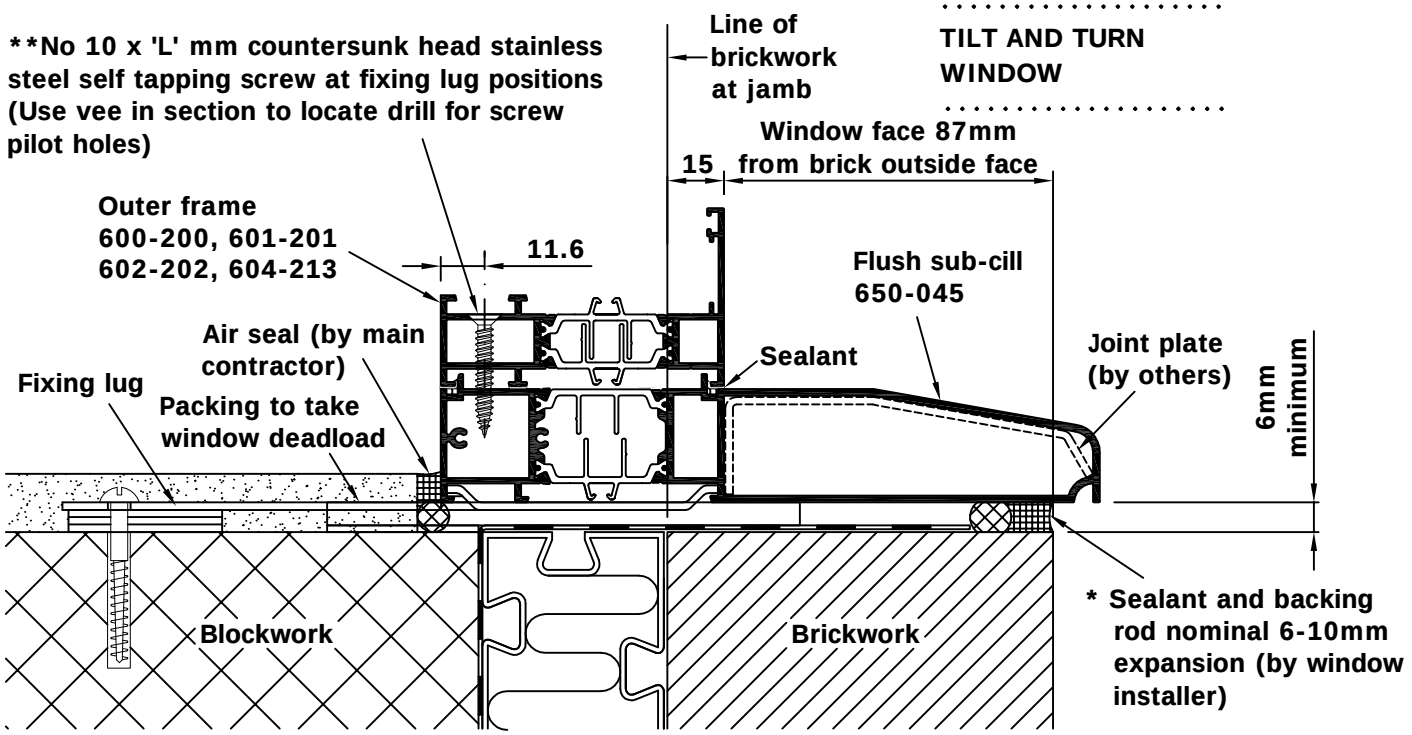
Scale 1:2

Flush Sub-Cill

System 5-35 Hi/Hi+

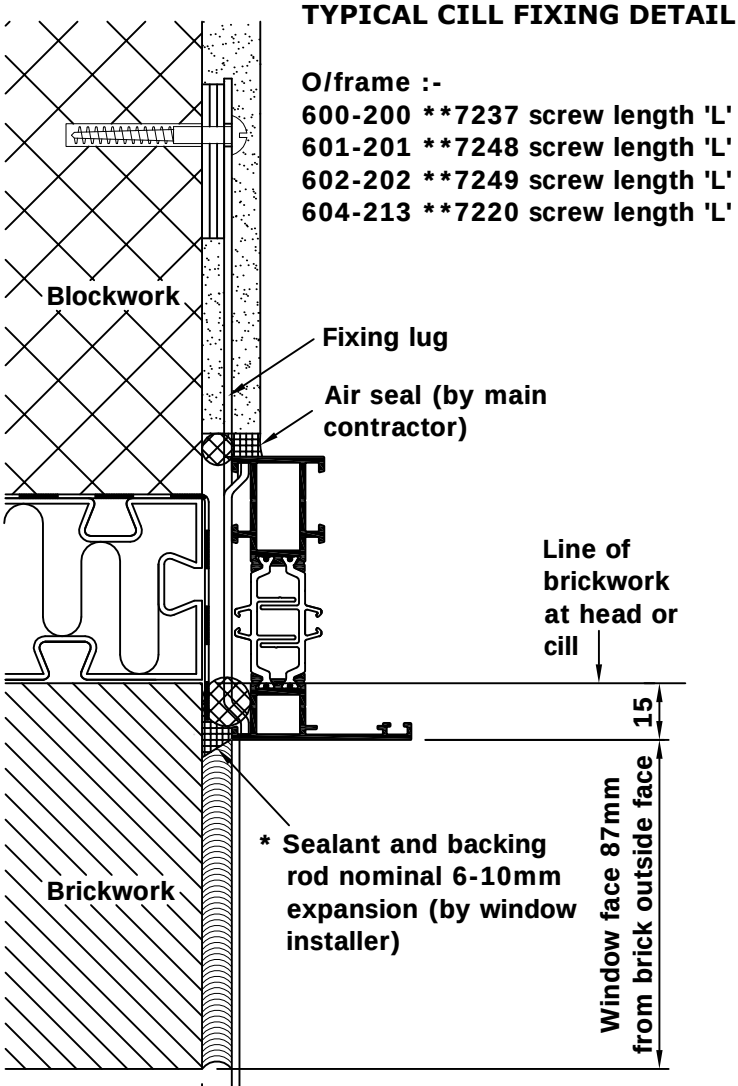
TILT AND TURN WINDOW

uPVC end caps TSF145 are available to suit cill 650-045.

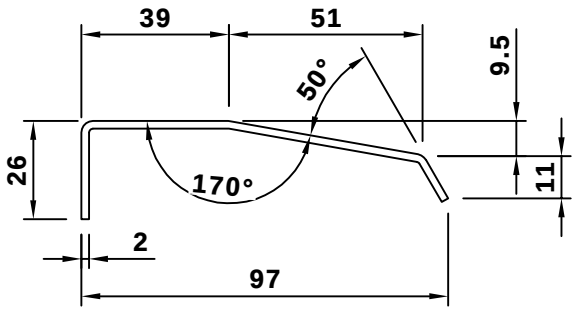


TYPICAL CILL FIXING DETAIL

O/frame :-
600-200 **7237 screw length 'L' = 32mm
601-201 **7248 screw length 'L' = 38mm
602-202 **7249 screw length 'L' = 50mm
604-213 **7220 screw length 'L' = 45mm



TYPICAL JAMB FIXING DETAIL



Pressed aluminium joint plate 2mm thick x 100mm long (by others). Butt joint to be sealed in accordance with sealant manufacturers recommendations for expansion joints.

*** All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.**

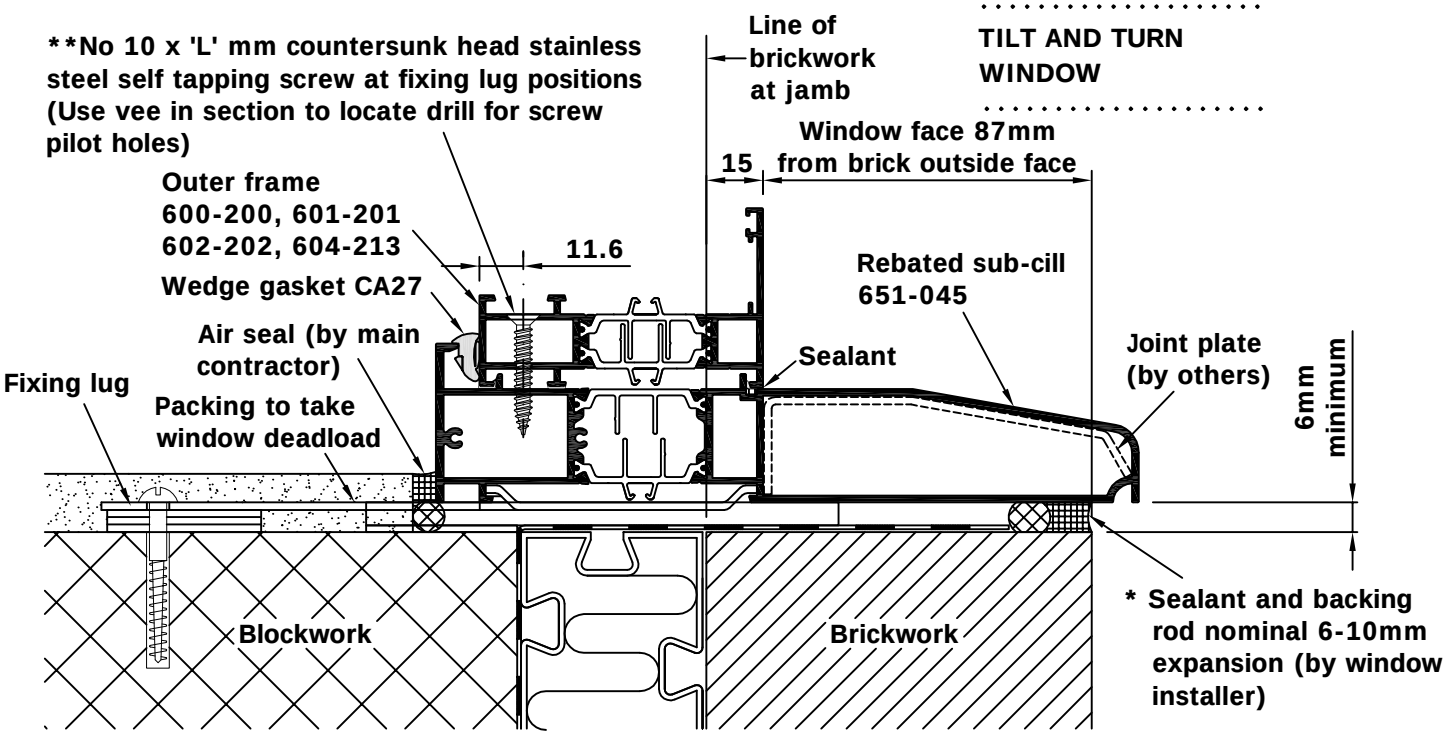
Scale 1:2

Rebated Sub-Cill

System 5-35 Hi/Hi+

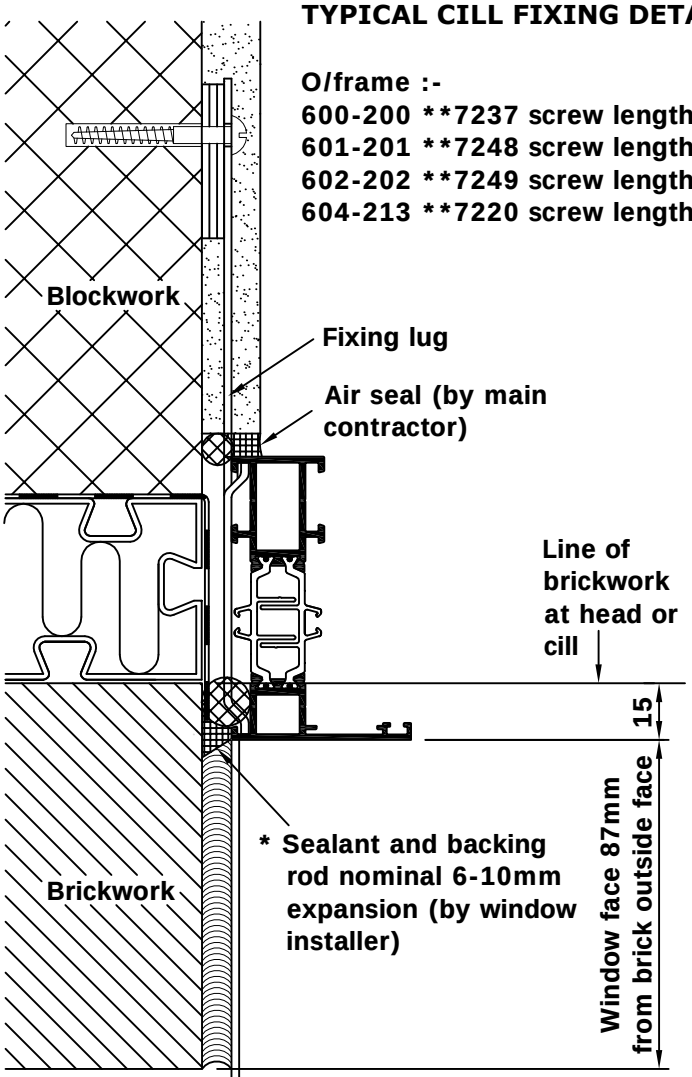
TILT AND TURN WINDOW

uPVC end caps TSF145 are available to suit cill 651-045.

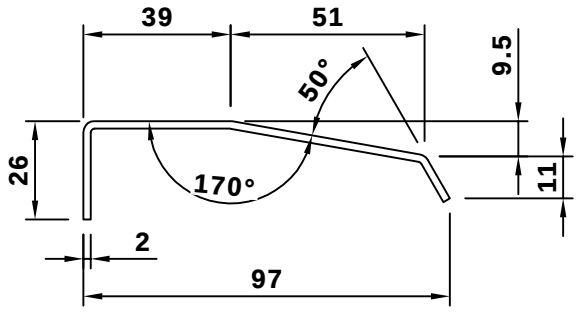


TYPICAL CILL FIXING DETAIL

O/frame :-
600-200 **7237 screw length 'L' = 32mm
601-201 **7248 screw length 'L' = 38mm
602-202 **7249 screw length 'L' = 50mm
604-213 **7220 screw length 'L' = 45mm



TYPICAL JAMB FIXING DETAIL



Pressed aluminium joint plate 2mm thick x 100mm long (by others). Butt joint to be sealed in accordance with sealant manufacturers recommendations for expansion joints.

*** All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.**

Scale 1:2

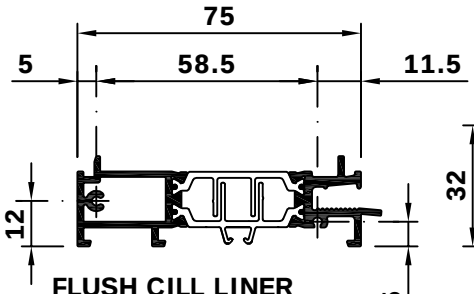
Cill Liner End Plate Details

For Pressed Metal Cills

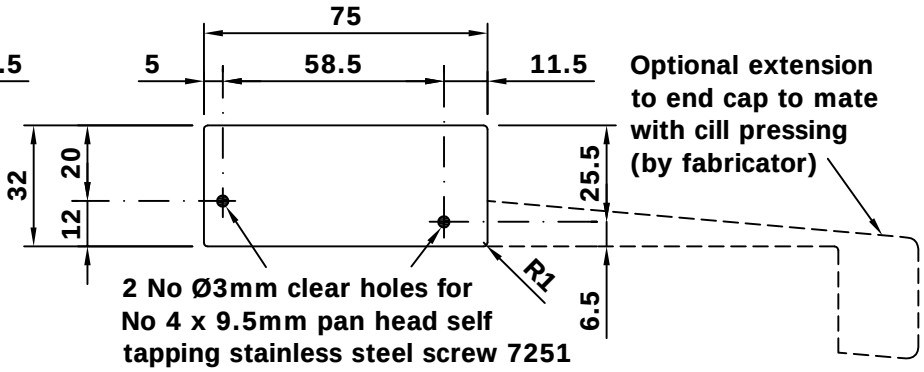
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

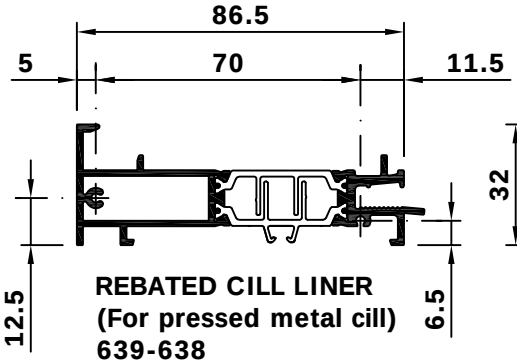
All fixings must be sealed using HR50328A sealant.



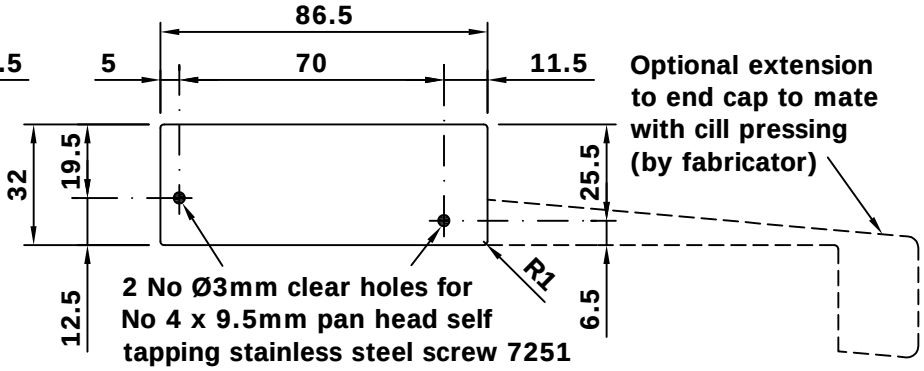
FLUSH CILL LINER
(For pressed metal cill)
670-638



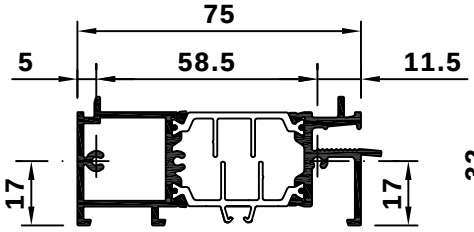
CILL LINER END PLATE
(2mm THICK RIGID PVC) BY FABRICATOR



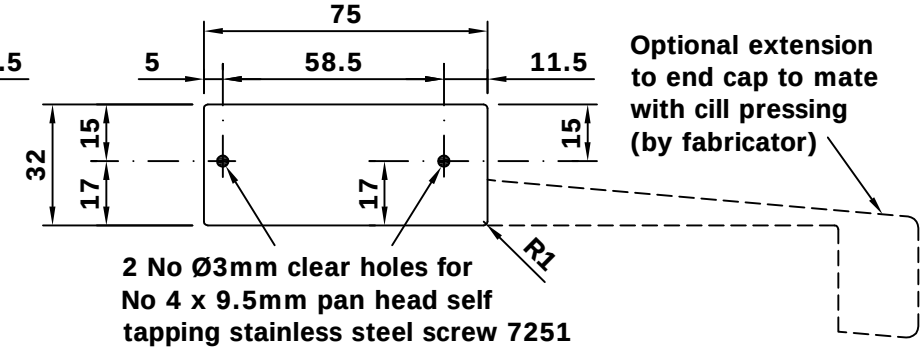
REBATED CILL LINER
(For pressed metal cill)
639-638



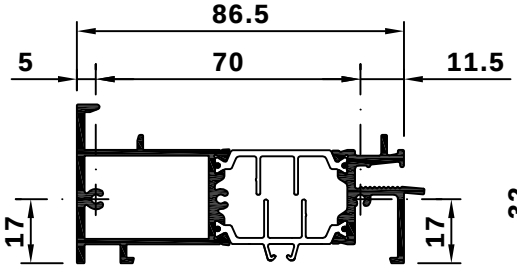
CILL LINER END PLATE
(2mm THICK RIGID PVC) BY FABRICATOR



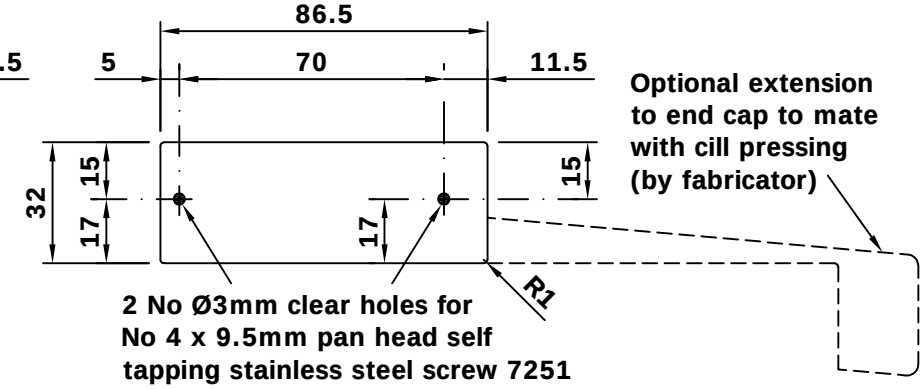
FLUSH CILL LINER
(For pressed metal cill)
650-648



CILL LINER END PLATE
(2mm THICK RIGID PVC) BY FABRICATOR



REBATED CILL LINER
(For pressed metal cill)
651-648



CILL LINER END PLATE
(2mm THICK RIGID PVC) BY FABRICATOR

Scale 1:2

Flush Head Liner and End Plate Details

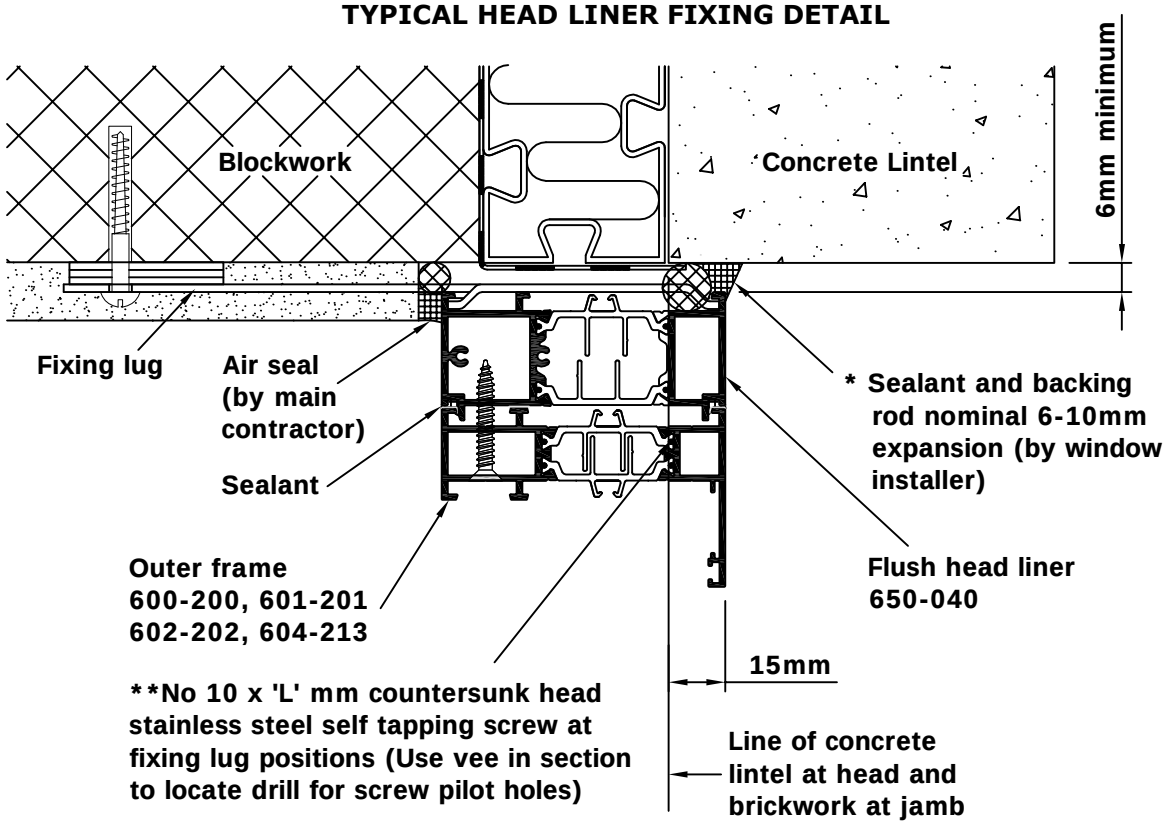
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

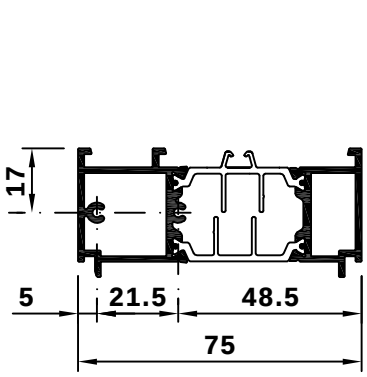
All fixings must be sealed using HR50328A sealant.

*** All sealants to be installed in accordance with manufacturers relevant details and BS 6093 to suit site conditions.**

TYPICAL HEAD LINER FIXING DETAIL

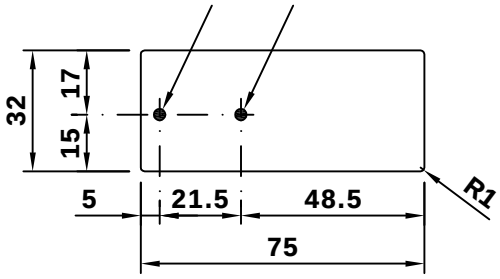


O/frame :-
600-200 **7237 screw length 'L' = 32mm
601-201 **7248 screw length 'L' = 38mm
602-202 **7249 screw length 'L' = 50mm
604-213 **7220 screw length 'L' = 45mm



FLUSH HEAD LINER 650-040

2 No Ø3mm clear holes for No 4 x 9.5mm pan head self tapping stainless steel screw 7251



HEAD LINER END PLATE (2mm THICK RIGID PVC) BY FABRICATOR to be sealed in place to full perimeter and webs of head liner bar

Scale 1:2

Glazing Details

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Metal Technology recommend that the maximum size of any fixed pane should not exceed 4m² or 120kg. To be read in conjunction with 4-35Hi/5-35Hi wind and dead loading charts.

Note vent size and weight limitations also apply - see graphs in section 3 of this manual.

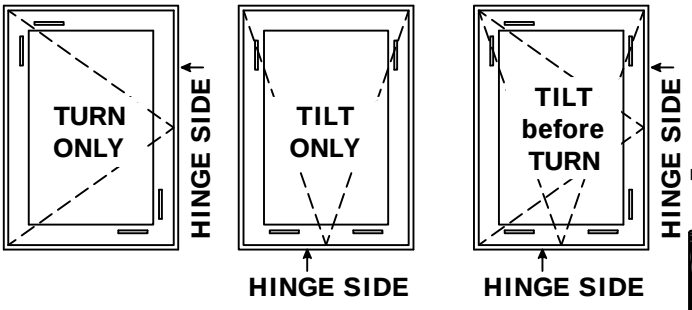
Metal Technology suggest that 6745 glazing support/location blocks be fitted during factory fabrication.

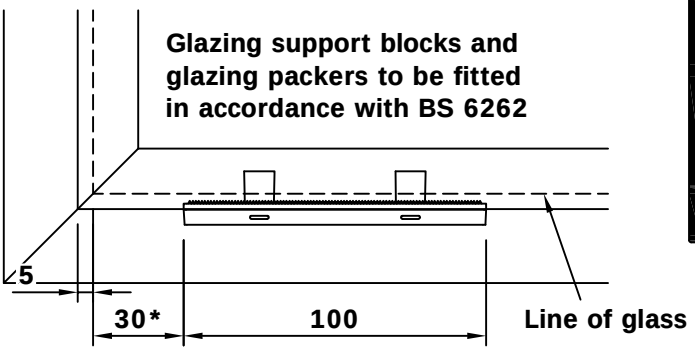
Refer to gearing manufacturers instructions in all instances, as additional/alternative glass packing may be required.

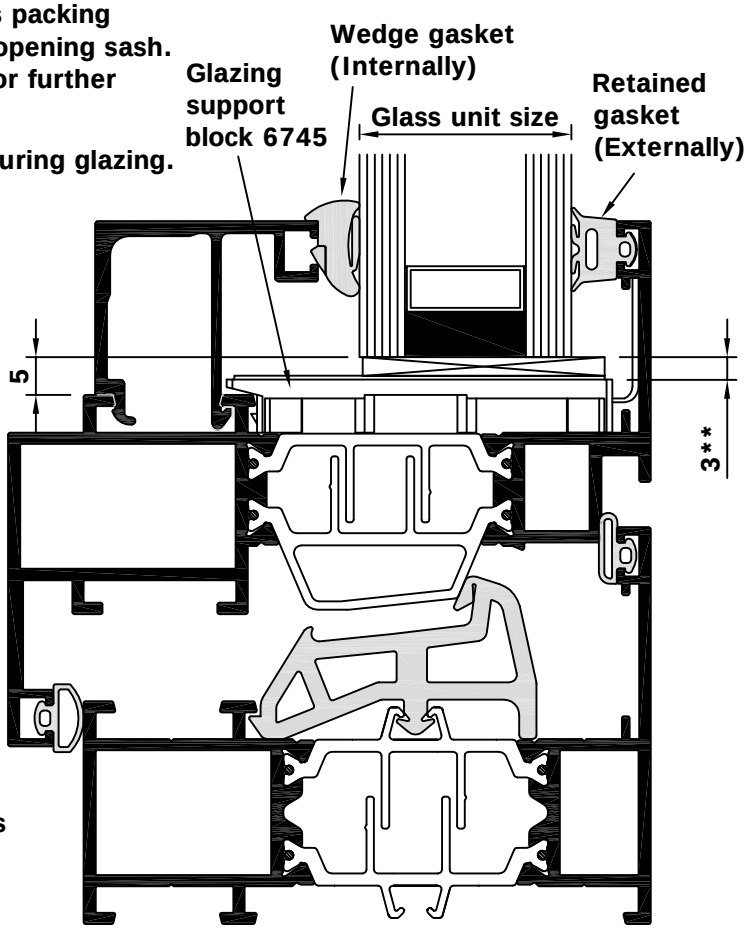
Particular care and attention should be paid to glass packing requirements when introducing a muntin within an opening sash. Contact Metal Technology's Technical Department for further assistance.

Additional packers can then be installed on site during glazing.**

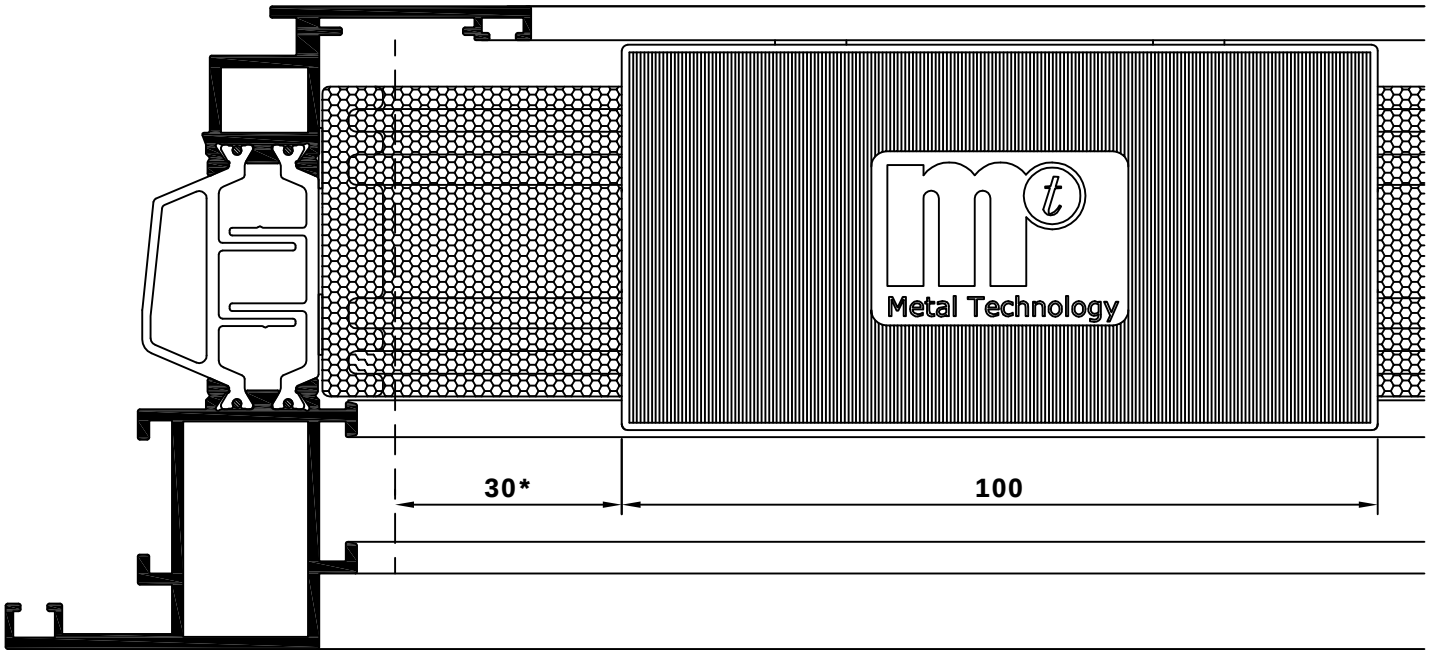
*** Minimum dimension. Setting blocks to be positioned to avoid drainage slots.**
**** Additional glazing packers by window installer. Approximate thickness 3mm, adjusted to suit glass tolerance.**







In Hi+ applications only 6727 glazing unit perimeter foam to abut 6745 glazing support.



Not to scale

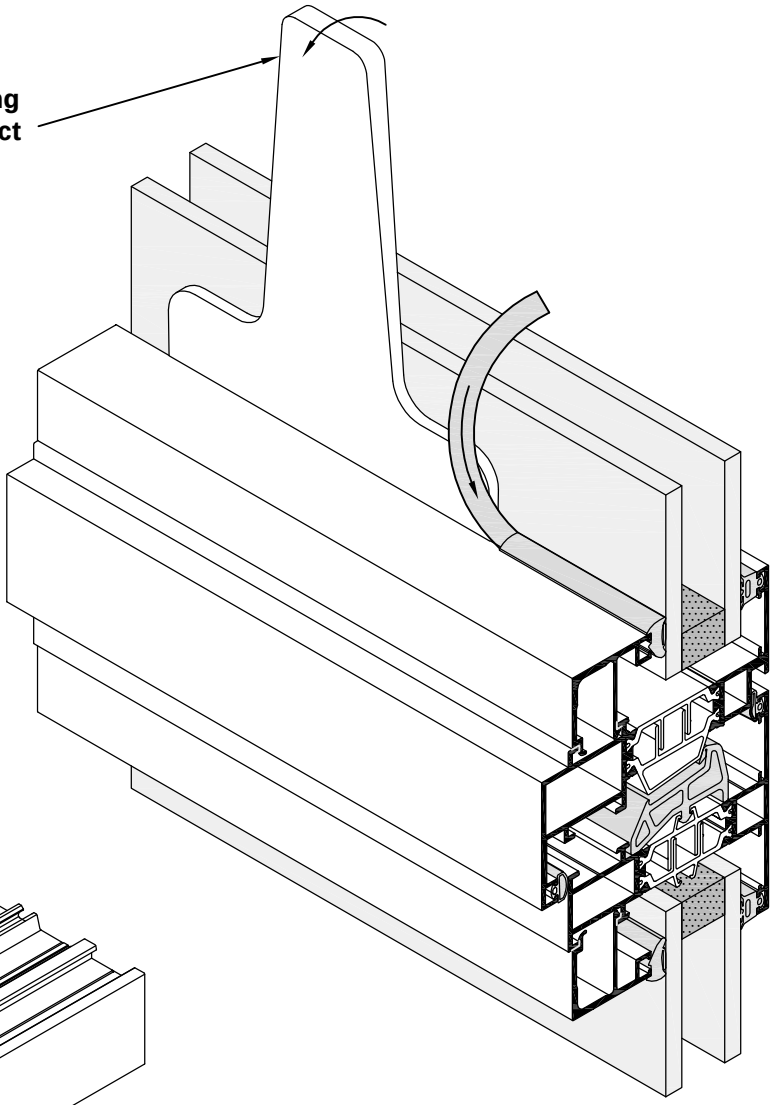
Glazing Procedure

3-Dimensional Details

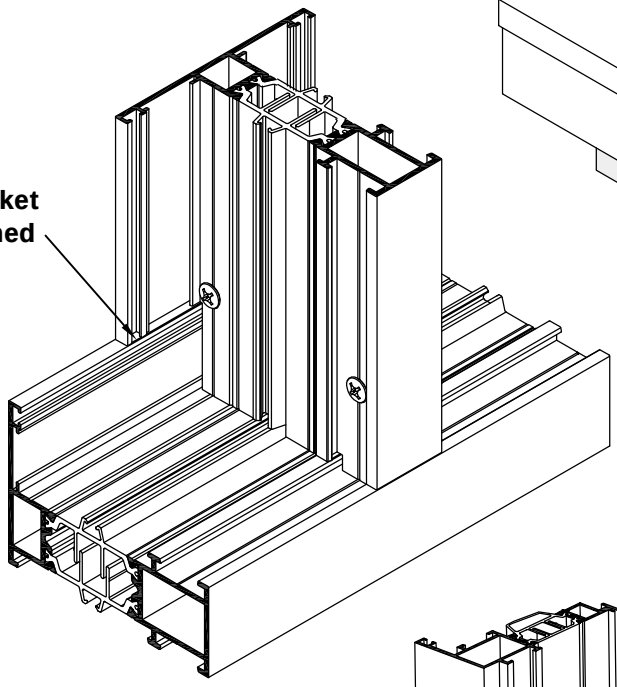
System 5-35 Hi/Hi+

TILT AND TURN WINDOW

Use glazing paddle to press pane against external retained gasket and insert wedge gasket. To facilitate installation of glazing gaskets, Metal Technology suggest spraying glass edge with silicone spray 7400 (subject to confirmation of compatibility with glass coatings - ie self-cleaning glass).

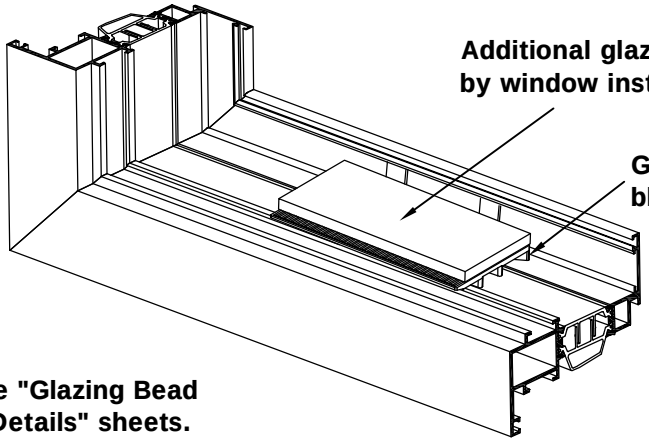


Wedge gasket to be notched over frame



Additional glazing packers by window installer.

Glazing support block 6745



For glazing details and glazing options see "Glazing Bead and Gasket Requirements" and "Glazing Details" sheets.

FOLLOWING CORRECT GLAZING PROCEDURE ALL VENTS TO BE CHECKED FOR OPERATION.

Not to scale

Site Glazing Procedures

System 5-35 Hi/Hi+

TILT AND TURN WINDOW

1. **Gaskets should be fitted using suitable installation equipment.**

2. **Clean gasket mounting surfaces and races. Ensure glazing cavity is clean and free from debris and swarf and that all drainage slots are adequate and free of obstruction.**

3. **Check that the gaskets are clean and in a relaxed condition. If gaskets have been stretched they should be left for a sufficient period to allow them to return to their natural state.**

4. **If the gaskets show visible imperfections, such as cuts or abrasions, they should be changed.**

5. **If 6080/6081 retained gasket has not been factory fitted, insert into external gasket race (i.e. outer frame or bead). Refer to "Weatherseal Preparation Details" sheet.**

6. **Clean the perimeter of the glass and check for any imperfections and/or damage.**

7. **If not already factory fitted, place glazing support blocks (6745) in position within the frame ensuring that drainage slots are not obstructed.**

8. **Apply HR50328A sealant to mating surface of the retained gasket with the glass at the mitred corners, immediately prior to offering up the glazing unit. Refer to "Weatherseal Preparation Details" sheet.**

9. **Insert the glass and centralise within the frame, with additional glass packers at setting and location block positions as required. See "Glazing Details" sheet. Ensure the unit is correctly heeled and toed and is adequately held in place by the glass packers.**

10. **Fit the beads to the frame in the following sequence: Head, cill, jambs. In exposed applications seal the ends of beads (i.e. horizontal beads to outer frame; vertical beads to horizontal beads) with a suitable low-modulus silicone sealant (subject to confirmation of compatibility with glass coatings - i.e. self cleaning glass).**

11. **Temporarily restrain the unit in place using 100mm cuttings of wedge gasket at the head, cill and jambs. Check operation of opening sash. Adjust glass packers and/or gearing as required and re-check operation. Once the sash is operating satisfactorily, ensure the additional load bearing device, where applicable, has been correctly adjusted in accordance with the gearing manufacturers literature.**

12. **Mitre cut wedge gasket into four individual lengths. Refer to "Weatherseal Preparation Details" sheet.**

13. **Remove temporary gaskets. Locate wedge gasket between profile and glazing unit. Fit into the corners first, then at the centre and then install the centre of each loop until complete.**

14. **Seal all gasket corner joints on site using HR50328A sealant.**

15. **Ensure that the gasket is properly located in the race/nib.**

16. **Ensure that the wedge gasket forces the glass onto the pre-installed retained gasket (6080 or 6081). Gaskets should be a tight fit - slack gaskets cause leaks. If lubricant is necessary Metal Technology suggest spraying glass edge with 7400 silicone spray (subject to confirmation of compatibility with glass coatings - i.e. self cleaning glass).**

17. **Ensure that there are no gaps or overlaps at the corners of the gaskets.**

18. **For additional information on window installation and glazing refer to BS 6262, other relevant British Standards and/or Metal Technology's Technical Department.**

APPENDIX

Section 0: Specification, Profile Index and Component ID

535Hi/0/10 rev 14	Specification Hi/Hi+
535Hi/0/20 rev 8	Specification Hi/Hi+
535Hi/0/30 rev 3	Profile Index Hi/Hi+
535Hi/0/40 rev 4	Profile Index Hi/Hi+
535Hi/0/50 rev 6	Profile Index Hi/Hi+
535Hi/0/60 rev 4	Profile Index Hi/Hi+
535Hi/0/70 rev 3	Profile Index Hi/Hi+
535Hi/0/80 rev 3	Component ID Hi/Hi+
535Hi/0/90 rev 2	Component ID Hi/Hi+
535Hi/0/100 rev 3	Component ID Hi/Hi+
535Hi/0/110 rev 0	Component ID Hi/Hi+
535Hi/0/120 rev 0	Component ID Hi+
535Hi/0/130 rev 0	Component ID Hi/Hi+
535Hi/0/140 rev 1	Component ID Hi/Hi+
535Hi/0/150 rev 2	Component ID Hi/Hi+

Section 1: Section Drawings

535Hi/1/10 rev 3	Section Drawings Hi/Hi+
535Hi/1/20 rev 6	Section Drawings Hi/Hi+
535Hi/1/30 rev 4	Section Drawings Hi/Hi+
535Hi/1/40 rev 4	Section Drawings Hi/Hi+
535Hi/1/50 rev 3	Section Drawings Hi/Hi+
535Hi/1/60 rev 4	Section Drawings Hi/Hi+
535Hi/1/70 rev 3	Section Drawings Hi/Hi+
535Hi/1/80 rev 3	Section Drawings Hi/Hi+
535Hi/1/90 rev 3	Section Drawings Hi/Hi+
535Hi/1/100 rev 4	Section Drawings Hi/Hi+
535Hi/1/110 rev 3	Section Drawings Hi/Hi+
535Hi/1/120 rev 3	Section Drawings Hi/Hi+

535Hi/1/130 rev 3	Section Drawings Hi/Hi+
535Hi/1/140 rev 5	Section Drawings Hi/Hi+
535Hi/1/150 rev 1	Section Drawings Hi/Hi+
535Hi/1/160 rev 1	Section Drawings Hi/Hi+
535Hi/1/170 rev 1	Section Drawings Hi/Hi+
535Hi/1/180 rev 1	Section Drawings Hi/Hi+
535Hi/1/190 rev 0	Section Drawings Hi/Hi+

Section 2: General Arrangement Drawings

535Hi/2/10 rev 6	General Arrangement - 3-Dimensional Assembly Details Hi
535Hi/2/20 rev 6	General Arrangement - 3-Dimensional Assembly Details Hi+
535Hi/2/30 rev 7	Standard Tilt and Turn Window Hi
535Hi/2/40 rev 6	Medium Tilt and Turn Window Hi
535Hi/2/50 rev 4	Heavy Tilt and Turn Window Hi
535Hi/2/60 rev 6	Euro Groove Tilt and Turn Window Hi
535Hi/2/70 rev 5	Tilt and Turn Window - Muntin Bar Hi
535Hi/2/80 rev 4	Coupling Mullions Hi
535Hi/2/90 rev 6	90° Corner Post - External Corner Details Hi
535Hi/2/100 rev 9	Door Coupling Detail Hi
535Hi/2/110 rev 3	Curtain Wall Insert Hi
535Hi/2/120 rev 4	Handles and Hinges at Mullion / Transom - Tilt before Turn, Side Hung and Bottom Hung Open In Windows Hi/Hi+
535Hi/2/130 rev 4	Handles and Hinges at Mullion / Transom - Tilt before Turn, Side Hung and Bottom Hung Open In Windows Hi/Hi+
535Hi/2/140 rev 6	Hinges at Jamb / Cill - Tilt before Turn, Side Hung and Bottom Hung Open In Windows Hi/Hi+
535Hi/2/150 rev 6	Hinges at Jamb / Cill - Tilt before Turn, Side Hung and Bottom Hung Open In Windows Hi/Hi+
535Hi/2/160 rev 5	Standard Tilt and Turn Window - Sashes 630-637, 631-661 and 633-663 Hi+
535Hi/2/170 rev 7	Euro Groove Tilt and Turn Window - Sash 632-662 Hi+
535Hi/2/180 rev 5	Tilt and Turn Window - Muntin Bar Hi+
535Hi/2/190 rev 0	Coupling Mullions Hi+
535Hi/2/200 rev 1	90° Corner Post - External Corner Details Hi+
535Hi/2/210 rev 1	Coupling Detail Hi+
535Hi/2/220 rev 2	Curtain Wall Insert Hi+
535Hi/2/230 rev 2	Cill Liner Options Hi/Hi+
535Hi/2/240 rev 2	Cill Liner Options Hi/Hi+
535Hi/2/250 rev 2	Cill Liner Options Hi/Hi+
535Hi/2/260 rev 3	Cill and Head Liner Options Hi/Hi+

Section 3: Ironmongery Requirements

535Hi/3/10 rev 4	Ironmongery - General Cautionary Notes Hi/Hi+
535Hi/3/20 rev 8	Vent Size Limitation Chart - Siegenia Tilt Before Turn Fittings Hi/Hi+
535Hi/3/30 rev 6	Vent Size Limitation Chart - Siegenia Turn Only Fittings Hi/Hi+
535Hi/3/40 rev 6	Vent Size Limitation Chart - Siegenia Standard Concealed Tilt Before Turn Fittings Hi/Hi+
535Hi/3/50 rev 6	Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre Hi/Hi+
535Hi/3/60 rev 9	Vent Size Limitation Chart - Siegenia Standard Concealed Tilt Before Turn Fittings with Additional Load Bearing Device Hi/Hi+
535Hi/3/70 rev 9	Siegenia Standard Concealed Tilt Before Turn Gearing with Additional Load Bearing Device Kitting List - Handle at Centre Hi/Hi+
535Hi/3/80 rev 8	Siegenia Standard Concealed Tilt Before Turn Gearing Kitting List - Handle at 1/3 Hi/Hi+
535Hi/3/90 rev 7	Security Requirements - Tilt and Turn Euro Groove Sash 632-662 Hi/Hi+
535Hi/3/100 rev 10	Vent Size Limitation Chart - Security - Siegenia Security Concealed Tilt Before Turn Fittings Hi/Hi+
535Hi/3/110 rev 8	Siegenia Security Concealed Tilt Before Turn Gearing Kitting List - Handle at Centre Hi/Hi+
535Hi/3/120 rev 7	Vent Size Limitation Chart - Security - Siegenia Security Concealed Tilt Before Turn Fittings with Additional Load Bearing Device Hi/Hi+
535Hi/3/130 rev 4	Siegenia Security Concealed Tilt Before Turn Gearing with Additional Load Bearing Device Kitting List - Handle at Centre Hi/Hi+
535Hi/3/140 rev 0	Siegenia Security Concealed Tilt Before Turn Gearing Kitting List - Handle at 1/3 Hi/Hi+
535Hi/3/150 rev 0	Vent Size Limitation Chart - Bottom Hung Open In Using Spring Catches Hi/Hi+

Section 4: Profile Cutting and Prepping Details

535Hi/4/10 rev 4	Bar Cutting Sizes Hi/Hi+
535Hi/4/20 rev 5	Bar Cutting Sizes - For Muntin Bar Hi/Hi+
535Hi/4/30 rev 5	FFSS Ready Reckoner (To Calculate Fixed Frame Sight Sizes) Hi/Hi+
535Hi/4/40 rev 2	Fabrication and Cutting Sizes - Fixed Light Square Beads and Glass Sizes Hi/Hi+
535Hi/4/50 rev 3	Fabrication and Cutting Sizes - Fixed Light Raked Beads and Glass Sizes Hi/Hi+
535Hi/4/60 rev 4	Fabrication and Cutting Sizes - Standard Tilt and Turn Vent - Window Assembly Hi/Hi+
535Hi/4/70 rev 5	Fabrication and Cutting Sizes - Medium Tilt and Turn Vent - Window Assembly Hi/Hi+
535Hi/4/80 rev 5	Fabrication and Cutting Sizes - Heavy Tilt and Turn Vent - Window Assembly Hi/Hi+
535Hi/4/90 rev 4	Fabrication and Cutting Sizes - Euro Groove Tilt and Turn Vent - Window Assembly Hi/Hi+
535Hi/4/100 rev 4	Fabrication and Cutting Sizes - Standard Glaze Out Liner - Window Assembly Hi/Hi+
535Hi/4/110 rev 2	Fabrication and Cutting Sizes - Outer Frame - Window Assembly Hi/Hi+
535Hi/4/120 rev 3	Fabrication and Cutting Sizes - Single Muntin Bar into Tilt and Turn Vents - Window Assembly Hi/Hi+
535Hi/4/130 rev 4	Mullion Stiffener Prep Hi/Hi+
535Hi/4/140 rev 4	Saw Blocks Hi/Hi+
535Hi/4/150 rev 0	Mullion / Transom End Prep Hi/Hi+
535Hi/4/160 rev 0	Mullion End Prep Hi/Hi+
535Hi/4/170 rev 0	Heavy Duty Mullion End Prep Hi/Hi+

	535Hi/4/180 rev 0	Mullion End Prep - 3-Dimensional Views Hi/Hi+
	535Hi/4/190 rev 0	Muntin Bar End Prep Hi/Hi+

Section 5: Drainage Details

535Hi/5/10 rev 5	Drainage Details - To suit glaze in outer frame and liner bar Hi
535Hi/5/20 rev 4	Drainage Details - To suit glaze in transom Hi
535Hi/5/30 rev 5	Drainage Details - To suit inside glaze sashes 630-637, 631-661, 633-663 and euro groove sash 632-662 Hi
535Hi/5/40 rev 5	Drainage Details - To suit glaze in outer frame and liner bar Hi+
535Hi/5/50 rev 6	Drainage Details - To suit glaze in transom Hi+
535Hi/5/60 rev 2	Drainage Details - To suit inside glaze sashes 630-637, 631-661, 633-663 and euro groove sash 632-662 Hi+
535Hi/5/70 rev 2	Pressure Equalization Hi/Hi+

Section 6: Assembly Details

535Hi/6/10 rev 4	Corner Assembly Details Hi/Hi+
535Hi/6/20 rev 3	Corner Crimping Detail - Standard and Medium Outer Frames Hi/Hi+
535Hi/6/30 rev 3	Corner Crimping Detail - Standard Long Leg Outer Frame Hi/Hi+
535Hi/6/40 rev 3	Corner Crimping Detail - Heavy Short Leg Outer Frame Hi/Hi+
535Hi/6/50 rev 6	Corner Crimping Detail - Curtain Walling Frames Hi/Hi+
535Hi/6/60 rev 3	Corner Assembly Details - Liner Bar Hi/Hi+
535Hi/6/70 rev 5	Corner Assembly Details - Standard Sash Hi/Hi+
535Hi/6/80 rev 5	Corner Assembly Details - Medium Sash Hi/Hi+
535Hi/6/90 rev 5	Corner Assembly Details - Euro Groove Sash Hi/Hi+
535Hi/6/100 rev 6	Corner Assembly Details - Heavy Sash Hi/Hi+
535Hi/6/110 rev 3	Mullion/Transom Assembly Hi/Hi+
535Hi/6/120 rev 4	Mullion/Transom Assembly to Outer Frames Hi/Hi+
535Hi/6/130 rev 1	Mullion/Transom Assembly to Outer Frames Hi/Hi+
535Hi/6/140 rev 1	Mullion/Transom Assembly to Outer Frames Hi/Hi+
535Hi/6/150 rev 1	Mullion/Transom Assembly to Outer Frames Hi/Hi+
535Hi/6/160 rev 0	Mullion/Transom Cruciform Hi/Hi+
535Hi/6/170 rev 0	Muntin Assembly to Sashes Hi/Hi+
535Hi/6/180 rev 0	Transom Brace Application Detail Hi/Hi+
535Hi/6/190 rev 2	Mullion/Transom Sealing Detail Hi/Hi+
535Hi/6/200 rev 1	Liner Bar Fixings Hi/Hi+
535Hi/6/210 rev 3	Drip Rails - Preparation Details Hi/Hi+

Section 7: Ironmongery and Component Assembly

535Hi/7/10 rev 4	Fittings (Handles and Hinges) - Available configurations for sashes 630-637, 631-661, 633-663 Hi/Hi+

535Hi/7/20 rev 5	Handle Preparation Details Hi/Hi+
535Hi/7/30 rev 3	Additional Prep for TTGEAR2039 Alternative Bottom Corner BSU Hi/Hi+
535Hi/7/40 rev 3	Prep for Siegenia Concealed Tilt and Turn Gearing - Head, Cill and Jamb Preps Hi/Hi+
535Hi/7/50 rev 2	Prep for Siegenia Concealed Tilt and Turn Gearing - Suspension Cable Hi/Hi+
535Hi/7/60 rev 3	Turn Lock Prep Hi/Hi+
535Hi/7/70 rev 3	Releasable Turn-Restrictor Prep - To Suit Sash 632-662 Hi/Hi+
535Hi/7/80 rev 2	Releasable Turn-Restrictor Prep - To Suit Sashes 630-637, 631-661, 633-663 Hi/Hi+
535Hi/7/90 rev 2	Spring Catches - To Suit Sashes 630-637, 631-661, 633-663 Hi/Hi+
535Hi/7/100 rev 2	CA36 Restrictor Installation - For use with Spring Catches 7030 to Suit Sashes 630-637, 631-661, 633-663 Hi/Hi+

Section 8: Gaskets, Glazing, and Installation

520Hi+/8/10 rev 2	Glazing Bead and Gasket Requirements Hi/Hi+
520Hi+/8/20 rev 3	Weatherseal Preparation Details Hi/Hi+
520Hi+/8/30 rev 3	Weatherseal Preparation Details Hi/Hi+
520Hi+/8/40 rev 3	Centre Seal and Moulded Corner Gasket Preparation Details Hi/Hi+
520Hi+/8/50 rev 5	Perimeter Foam Preparation Details Hi/Hi+
520Hi+/8/60 rev 2	Glazing Unit Perimeter Foam Preparation Details Hi+
520Hi+/8/70 rev 3	Liner Bar Foam Preparation Details Hi+
520Hi+/8/80 rev 3	Installation Procedures Hi/Hi+
520Hi+/8/90 rev 1	Installation Procedures Hi/Hi+
520Hi+/8/100 rev 4	Typical Fixing Detail Hi/Hi+
520Hi+/8/110 rev 3	Fixing Lug - Structural Limitations Hi/Hi+
520Hi+/8/120 rev 4	Extruded Clip on Cill and Cill Clip Hi/Hi+
520Hi+/8/130 rev 2	Flush Cill Liners (for pressed metal cill) Hi/Hi+
520Hi+/8/140 rev 2	Rebated Cill Liners (for pressed metal cill) Hi/Hi+
520Hi+/8/150 rev 2	Flush Sub-Cill Hi/Hi+
520Hi+/8/160 rev 2	Rebated Sub-Cill Hi/Hi+
520Hi+/8/170 rev 3	Cill Liner End Plate Details - For Pressed Metal Cills Hi/Hi+
520Hi+/8/180 rev 3	Flush Head Liner and End Plate Details Hi/Hi+
520Hi+/8/190 rev 1	Glazing Details Hi/Hi+
520Hi+/8/200 rev 2	Glazing Procedure - 3-Dimensional Details Hi/Hi+
520Hi+/8/210 rev 3	Site Glazing Procedures Hi/Hi+