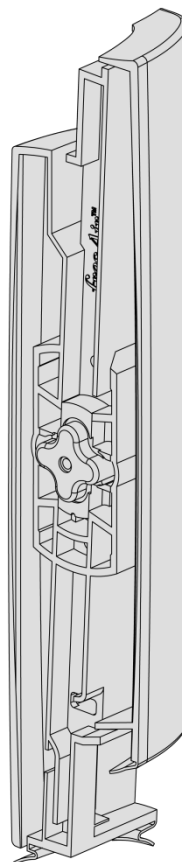


*fresAir*TM

Louvre Window System Technical Brochure

fresAir Crystal...The original design concept
in drainage system

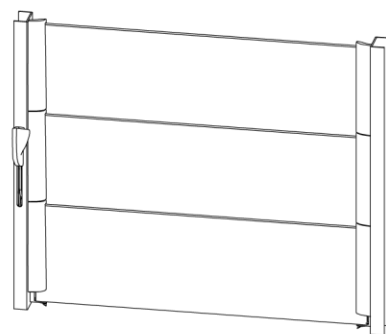


*fresAir*TM Crystal

Height Tables

152 mm Blade Louvre Height

No. of Blades	Height (mm) No Weatherstrip	Height (mm) with Weatherstrip
2	304.8	324.8
3	444.5	464.5
4	584.2	604.2
5	723.9	743.9
6	863.6	
7	1003.3	1023.3
8	1143.0	1163.0
9	1282.7	1302.7
10	1422.4	1442.4
11	1562.1	1582.1
12	1701.8	1721.8
13	1841.5	1861.5
14	1981.2	2001.2
15	2120.9	2140.9
16	2260.6	2280.6
17	2400.3	2420.3
18	2540.0	2560.0
19	2679.7	2699.7
20	2819.4	2839.4
21	2959.1	2979.1

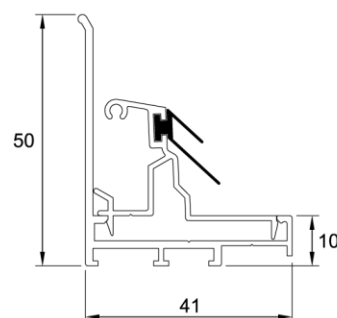


Standard louvre height (ht)
for 152 mm blades can be computed as follows:

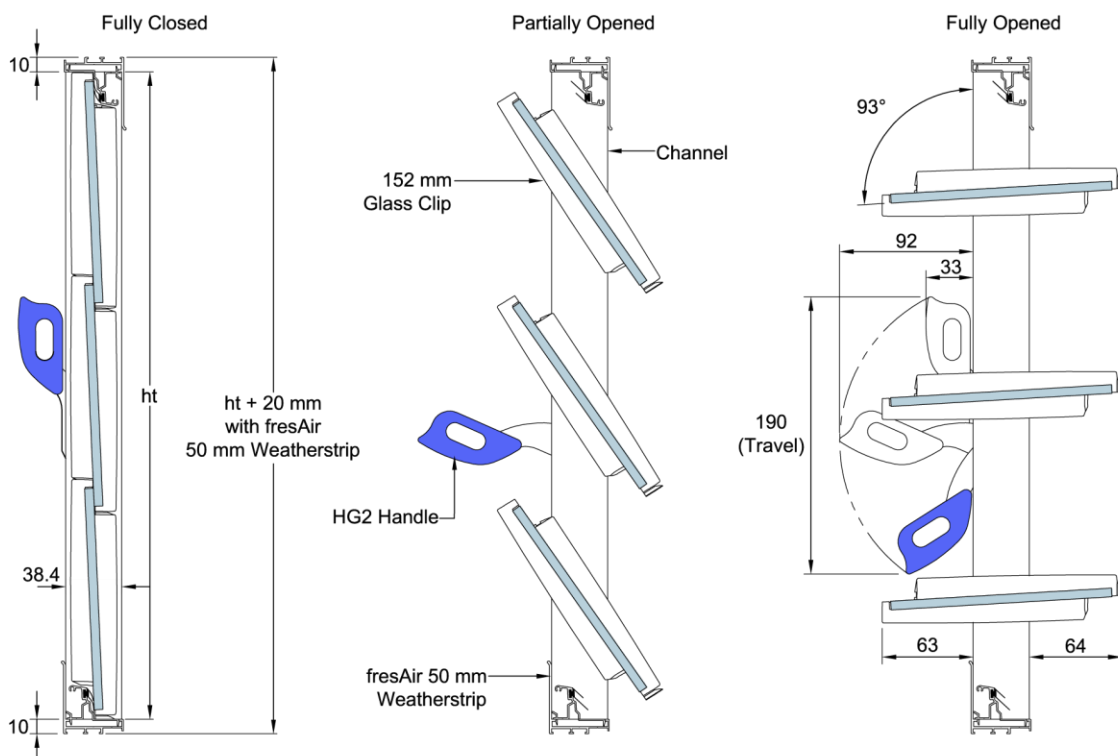
$$ht = (nb \times 139.7) + 25.4$$

where: ht - height of frame nb - number of blades

fresAir 50 mm Weatherstrip



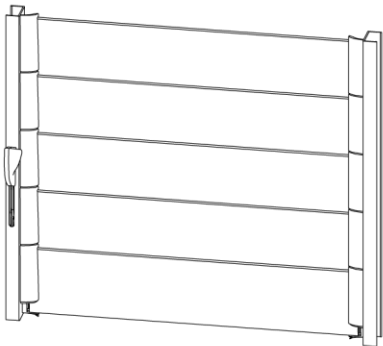
152 mm Louvre Gallery



Height Tables

102 mm Blade Louvre Height

No. of Blades	Height (mm) No Weatherstrip	Height (mm) with Weatherstrip
3	292.1	312.1
4	381.0	401.0
5	469.9	489.9
6	558.8	578.8
7	647.7	667.7
8	736.6	756.6
9	825.5	845.5
10	914.4	934.4
11	1003.3	1023.3
12	1092.2	1112.2
13	1181.1	1201.1
14	1270.0	1290.0
15	1358.9	1378.9
16	1447.8	1467.8
17	1536.7	1556.7
18	1625.6	1645.6
19	1714.5	1734.5
20	1803.4	1823.4
21	1892.3	1912.3

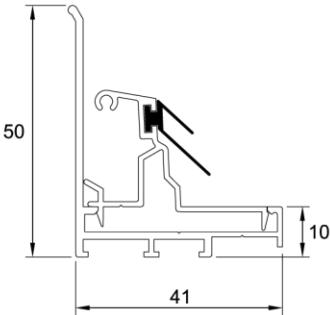


Standard louvre height (ht)
for 102 mm blades can be computed as follows:

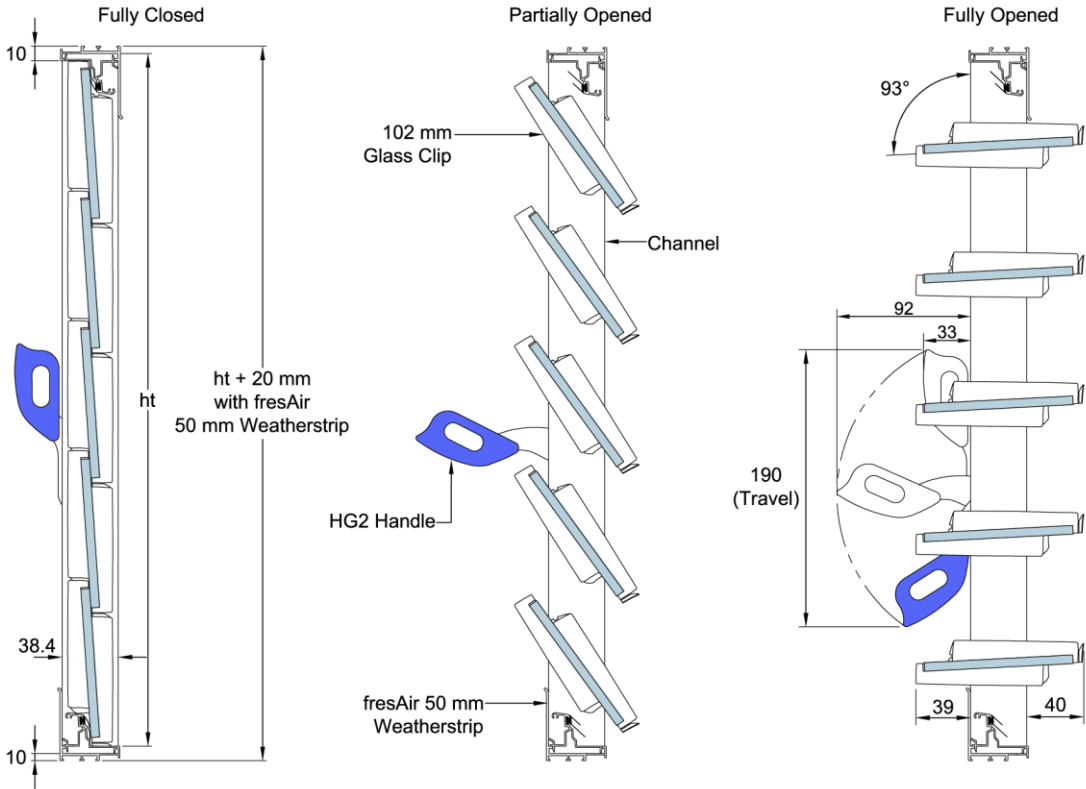
$$ht=(nb \times 88.9) + 25.4$$

where: ht - height of frame nb - number of blades

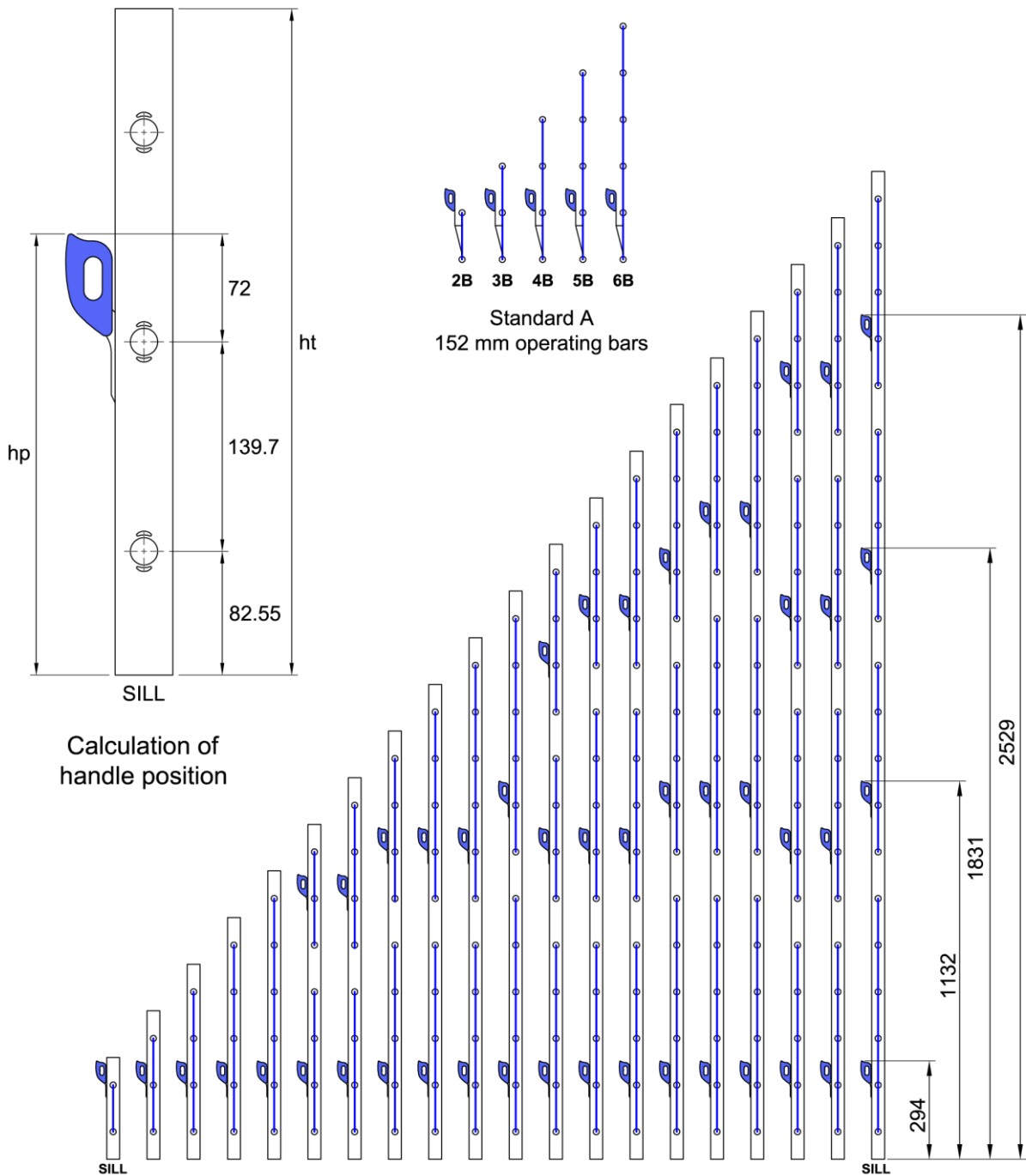
fresAir 50 mm Weatherstrip



102 mm Louvre Gallery



152 mm Louvre Handle Positions And Controls Standard A

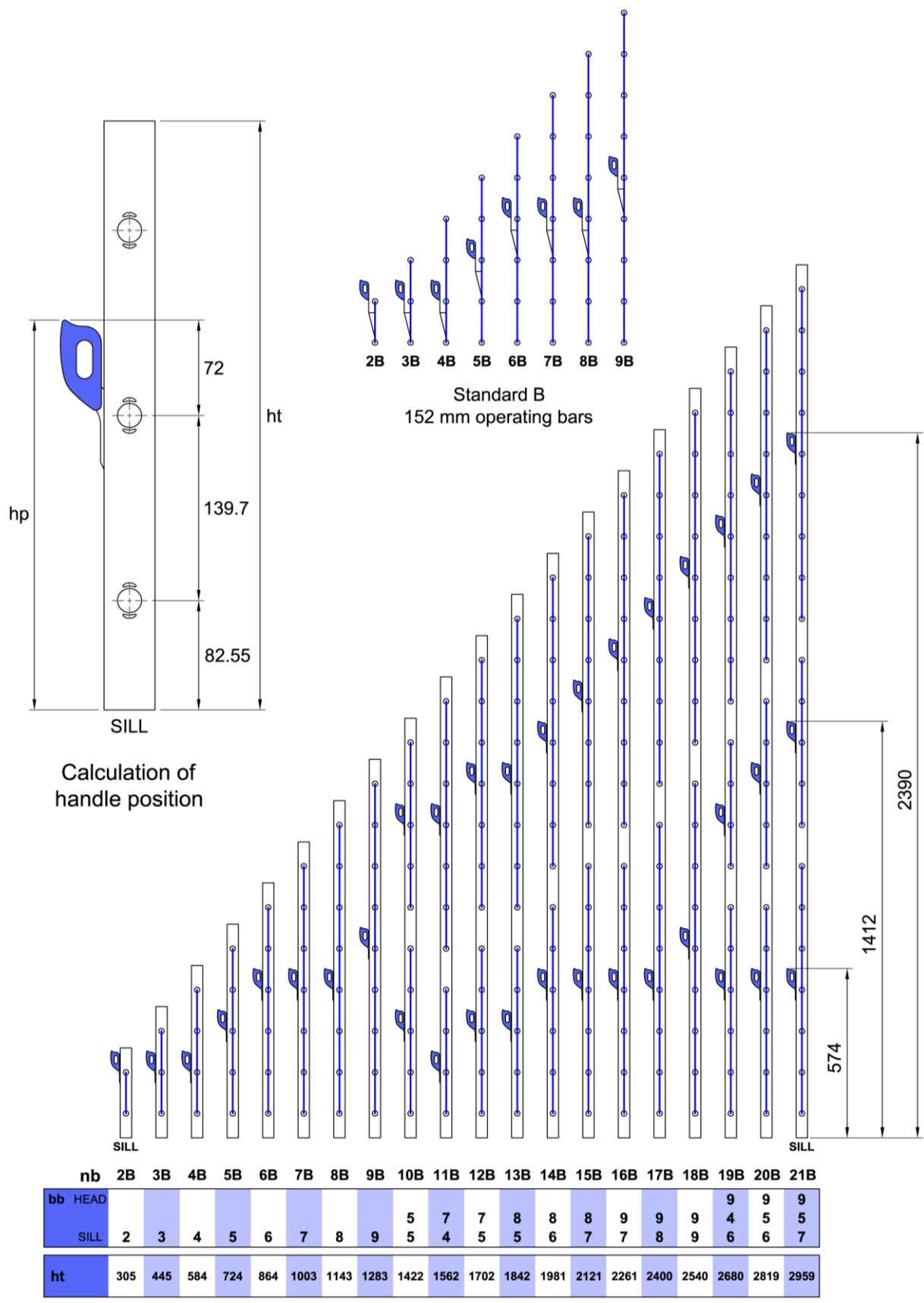


nb	2B	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	19B	20B	21B
bb HEAD												4	4	5	5	5	6	4	5	5
SILL	2	3	4	5	6	3	4	4	5	6	6	4	5	5	5	6	6	5	5	5
ht	305	445	584	724	864	1003	1143	1283	1422	1562	1702	1842	1981	2121	2261	2400	2540	2680	2819	2959

Legend: nb - number of blades hp - handle position bb - banks of blades ht - height of frame

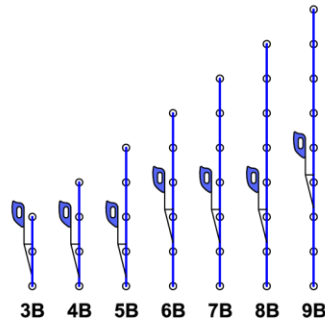
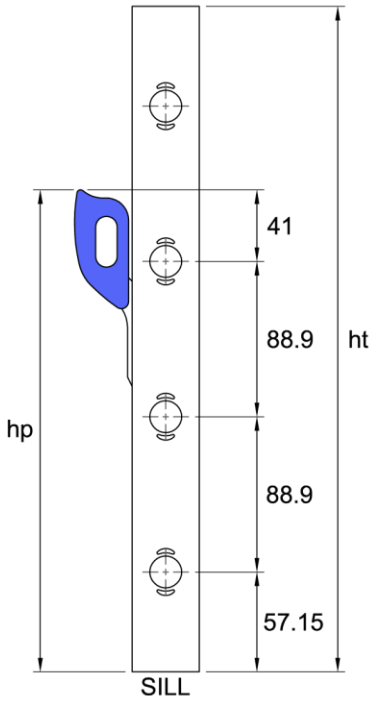
152 mm Louvre Handle Positions And Controls

Standard B



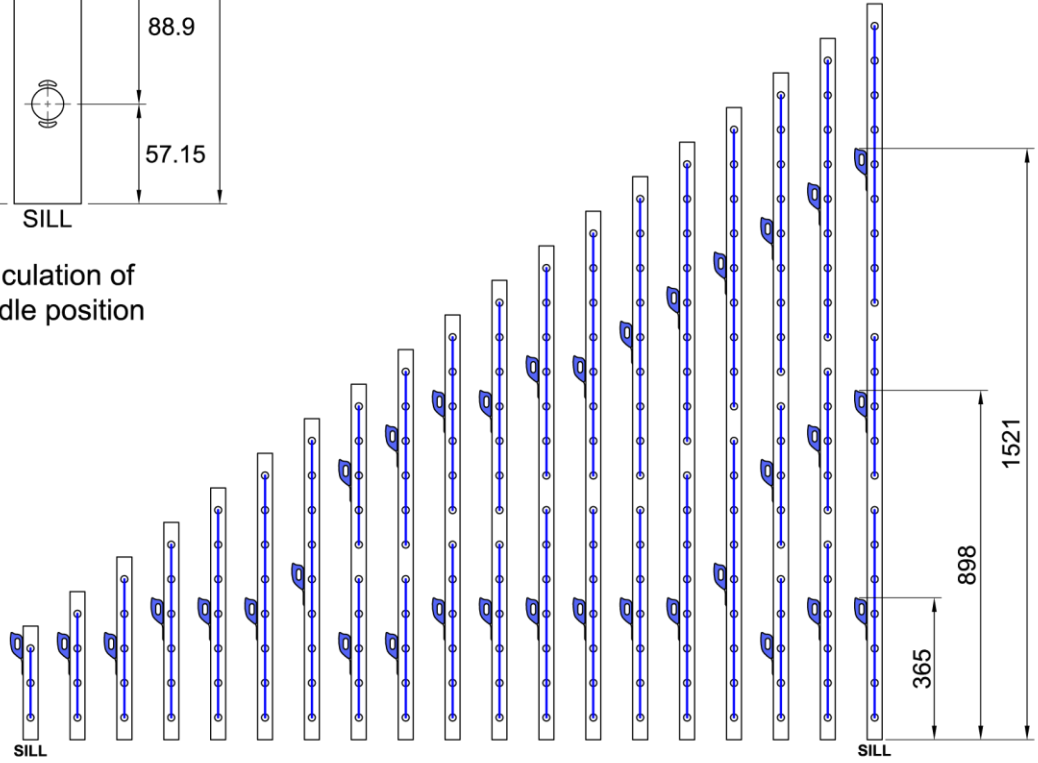
Legend: nb - number of blades hp - handle position bb - banks of blades ht - height of frame

102 mm Louvre Handle Positions And Controls



102 mm operating bars

Calculation of handle position



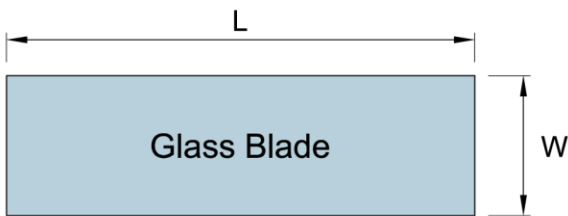
nb	3B	4B	5B	6B	7B	8B	9B	10B	11B	12B	13B	14B	15B	16B	17B	18B	19B	20B	21B
bb HEAD								5	6	6	7	7	8	9	9	9	9	9	9
SILL	3	4	5	6	7	8	9	5	5	6	6	7	7	7	8	9	5	5	5
ht	292	381	470	559	648	737	826	914	1003	1092	1181	1270	1359	1448	1537	1626	1715	1803	1892

Legend: nb - number of blades hp - handle position bb - banks of blades ht - height of frame

Glass Blade Calculations

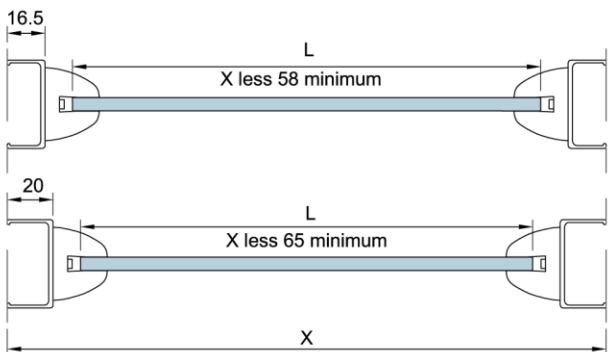
Blade Width (W)

152 mm Clips : 150 mm - 152 mm
 102 mm Clips : 100 mm - 102 mm



Blade Length (L)

C1 Channel (16.5 mm height)
 $L = X \text{ less } 58 \text{ mm}$

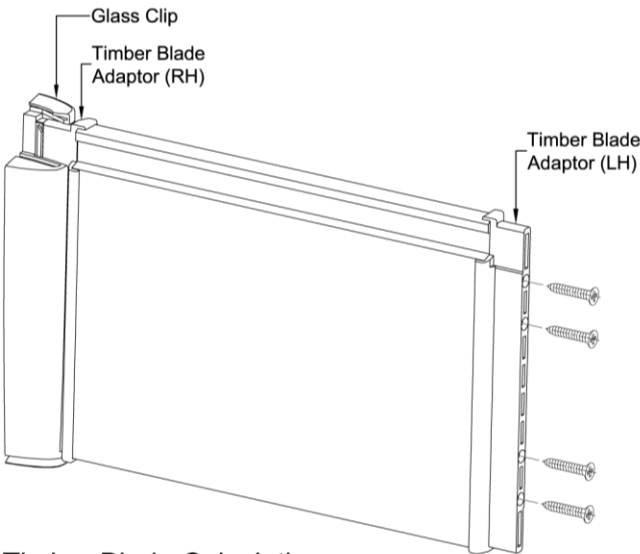


where: L = Glass Blade Length
 X = Jamb to Jamb

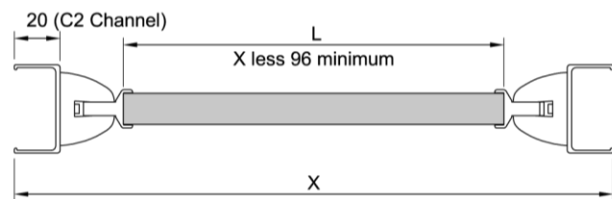
Caution : Allowable Tolerance: $\pm 0.7 \text{ mm}$, oversized blades will bow the clips and result in stiff operations.

Timber Blade Adaptors

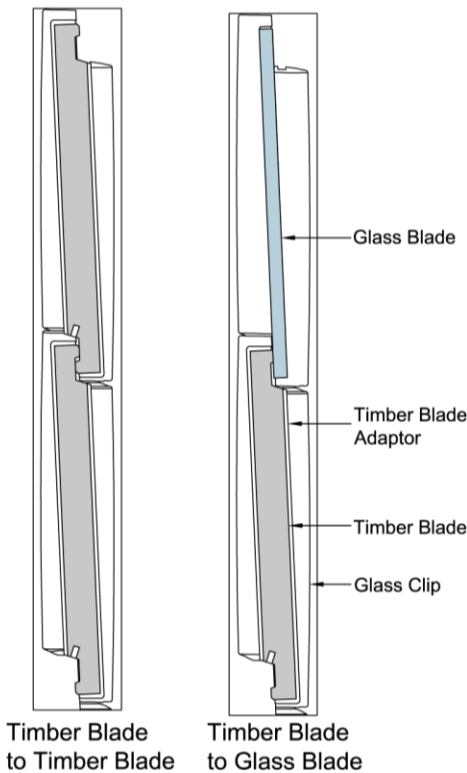
Available for 102 mm and 152 mm timber blades



Timber Blade Calculation (with timber adaptors)



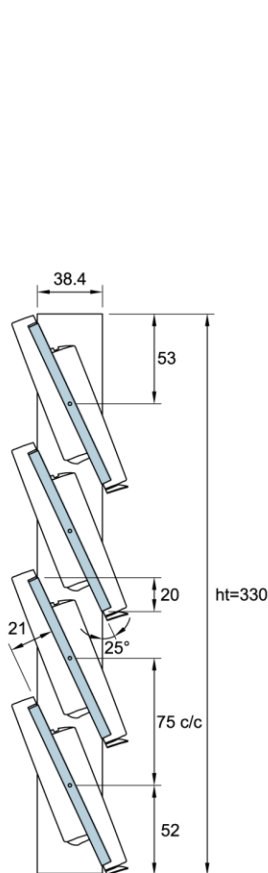
where: L = Timber Blade Length X = Jamb to Jamb



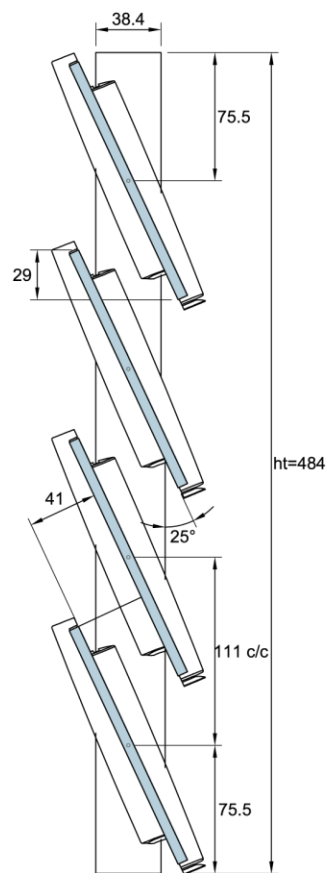
Fixed Clip Louvres

Height Table for Fixed Clips

No. of Blades	152 mm	102mm
2	262.1	-
3	373.1	255
4	484.1	330
5	595.1	405
6	706.1	480
7	817.1	555
8	928.1	630
9	1039.1	705
10	1150.1	780
11	1261.1	855
12	1372.1	930
13	1483.1	1005
14	1594.1	1080
15	1705.1	1155
16	1816.1	1230
17	1927.1	1305
18	2038.1	1380
19	2149.1	1455
20	2260.1	1530
21	2371.1	1605



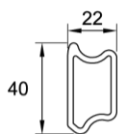
Fixed Clip 102 mm
for 6 mm glass



Fixed Clip 152 mm
for 6 mm glass

Torsion Bar and Adaptors

For large span louvre windows



Bar Profile

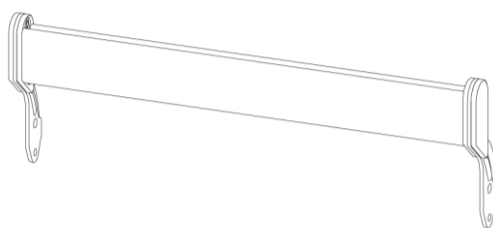


(LH)

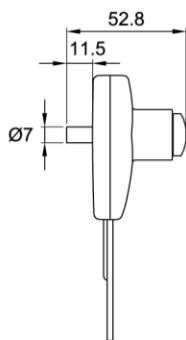


(RH)

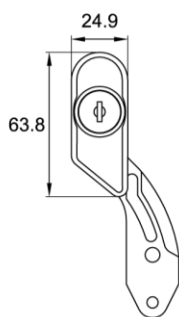
Adaptors



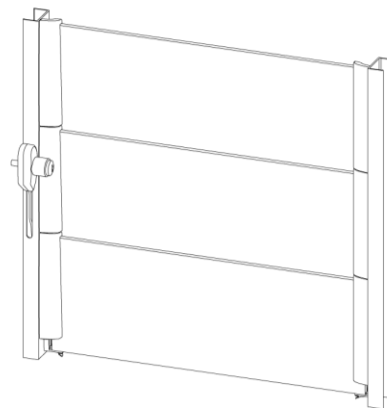
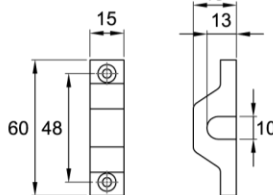
Handle Locks and Keepers



Lock (LH)

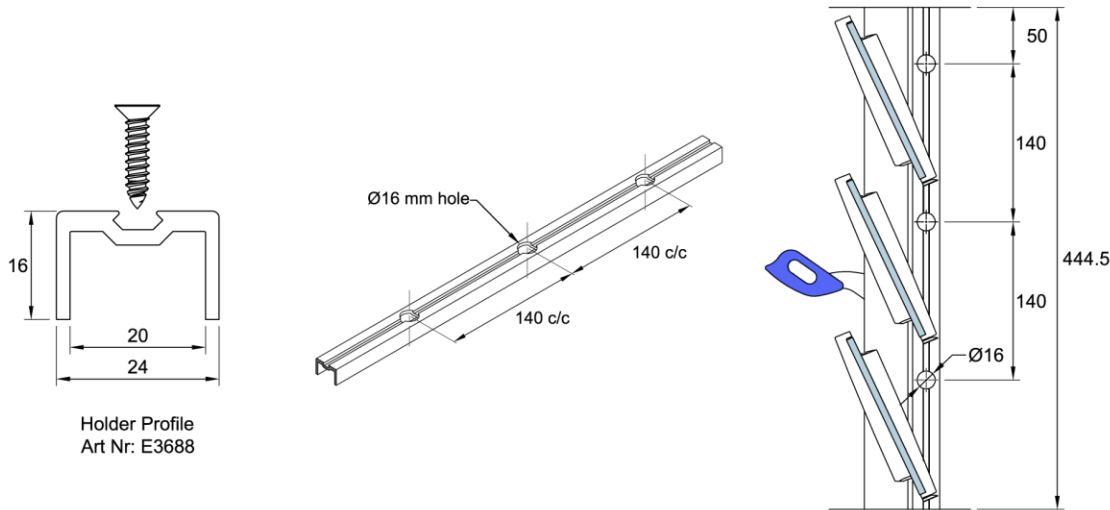


Keeper



Security Bar Holder

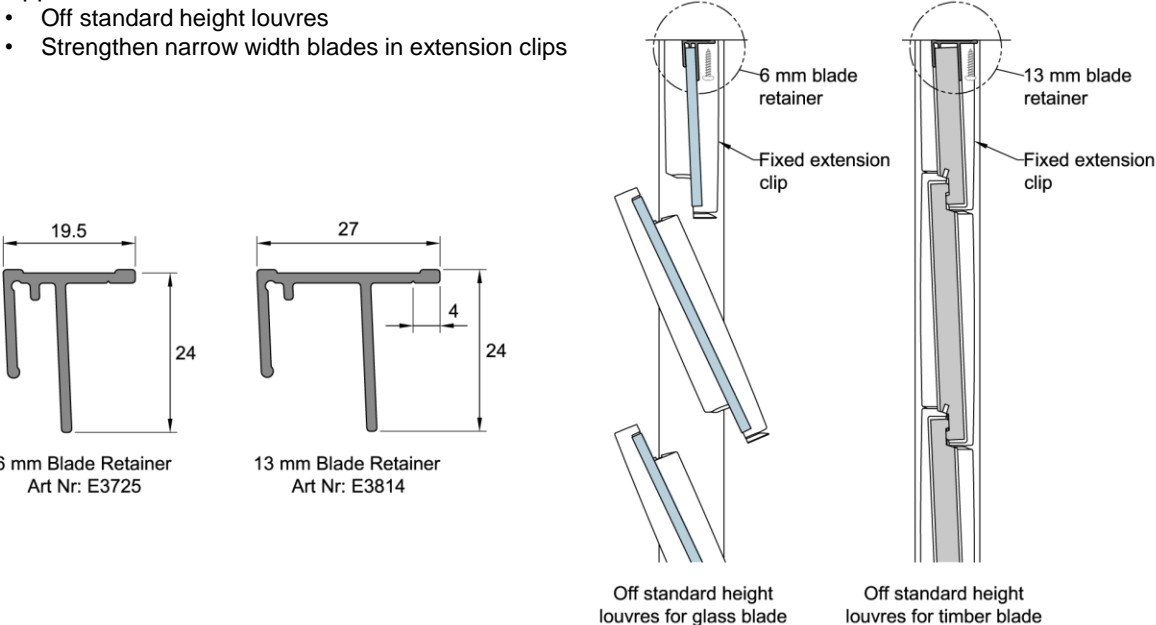
In extruded aluminium with Ø16 mm holes at 140 mm centre to centre



Blade Retainers in Extruded Aluminium Profile

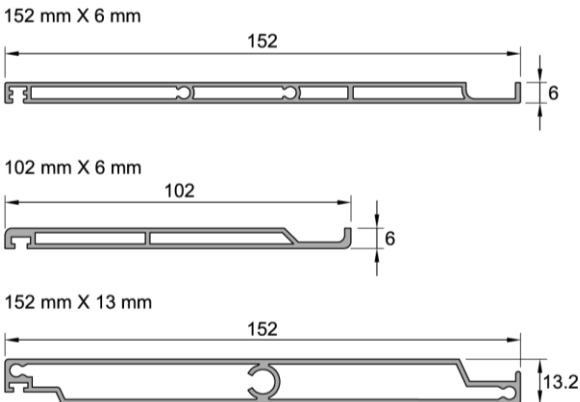
Applications

- Off standard height louvres
- Strengthen narrow width blades in extension clips

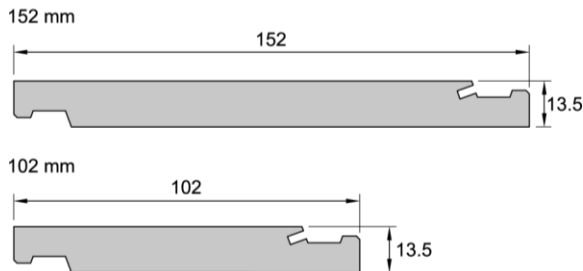


Blade Options

Extruded Aluminium Blade



Timber Blade

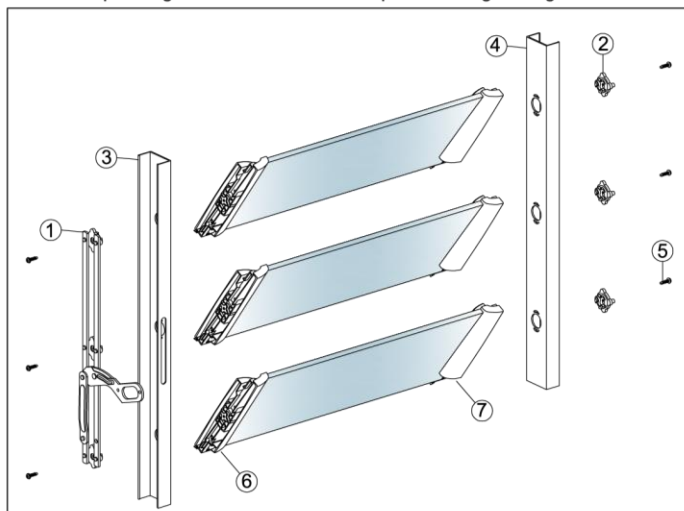


Configuration and Construction Options

A louvre window comprising of a left hand and right hand channels with corresponding mounting blade holders or clip, activate to rotation by a handle attached to an operating bar mechanism and bearings on either side channels.

A STANDARD

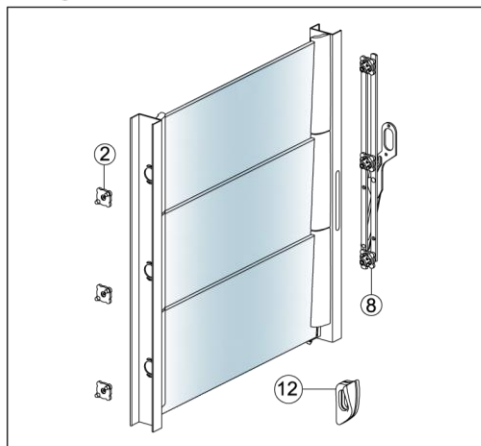
Left hand operating bar on left channel and plain bearings on right channel.



- ① Left Hand Operating Bar
- ② Plain Bearing
- ③ Left Channel
- ④ Right Channel
- ⑤ Hi-Low Screw
- ⑥ Left Clip
- ⑦ Right Clip
- ⑧ Right Hand Operating Bar
- ⑨ Left Linkage Bar
- ⑩ Right Linkage Bar
- ⑪ Left Handle Grip
- ⑫ Right Handle Grip

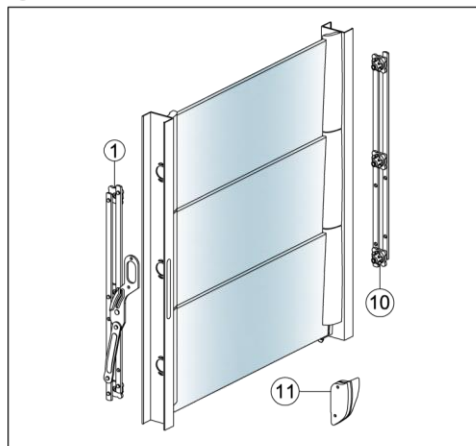
B RIGHT HAND CONTROL

Right hand operating bar on right channel and plain bearings on left channel.



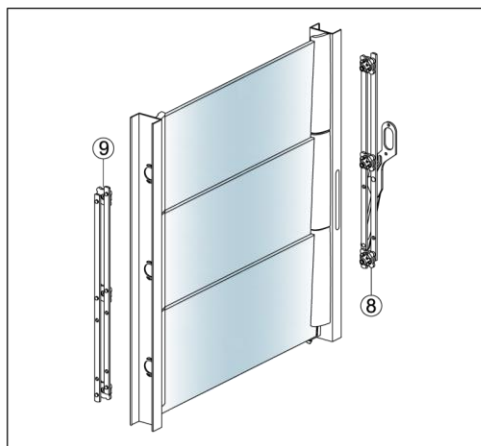
C LEFT HAND CONTROL WITH LINKAGE BAR

Left hand operating bar on left channel and linkage bar on right channel.



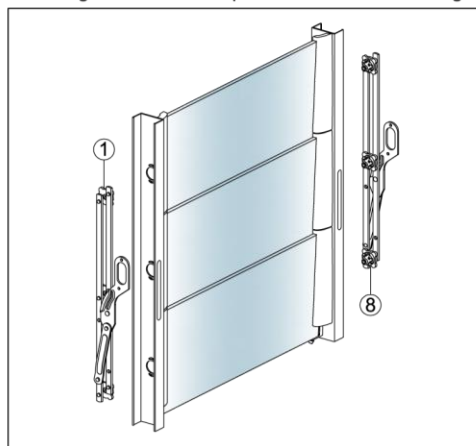
D RIGHT HAND CONTROL WITH LINKAGE BAR

Right hand operating bar on right channel and linkage bar on left channel.



E LEFT AND RIGHT HAND CONTROL

Left hand operating bar on left channel and right hand operating bar on right channel and option to receive connecting torsion bar.



* All illustrations are viewed from INSIDE

fresAir Crystal Louvres Specifications

- Louvres windows shall be fresAir Crystal as supplied by PMM International Pte Ltd .
- Louvre channel frame shall be in extruded architectural grade 6063 T5 with drainage apertures.
- Blade holding clips are moulded from high impact polypropylene with low melt index, UV stabilized and enhanced with light stabilizer.
- Preferably the clips will have sweep seals to resist water ingress.
- Clips when closed shall be aligned without protruded ledges.
- Drainage system shall incorporate localized drainage at every clips and a common drainage along the back of channel frame.
- Pivoting bearings shall be cold forged aluminium; forged to form extended studs for riveting to aluminium pantograph operating bars and with a sunken cavity tight fitted to the clip.
- Handles shall be high tensile strength aluminium , crimped for added strength and attached to the toggle bars and operating bars with stainless steel rivets using precision pressed radial spokes technique which bite into the operating bar, ensuring the rivets remain firmly fixed while the other connecting members rotates.
- All operating parts assembly to be in fully precision stamp-riveted construction on metal parts.
- Louvre window system shall comply with AS2047 for water and air infiltration and SS 215 cyclic test for 20,000 lock and unlock cycles.
- Height of louvres and handles positions shall be as per fresAir standard tables unless otherwise specified.
- When required, push lock shall be fitted to the handle with key removable function when in locked position.
- Glass blades shall be 102 mm wide x 6mm thick and 152 mm x 6 mm thick suited for 102mm glass clip and 152 mm glass clip respectively.
- Timber blades shall be 102 mm wide x13 mm thick and 152 mm wide x 13mm thick suited for 102 mm timber blade adaptor and 152 mm timber blade adaptor respectively.
- Length of blades must conform to AS1288 , industry practice or manufacturer's recommendation.
- All profile framing surrounds systems such as mullions, transoms, beadings, weather bars, gaskets must facilitate the louvre system to fit-in so as to achieve the required performance of the window system.



Due to the company's policy of continuous product development and enhancement, the specifications and details contained in this brochure are subject to alteration without prior notice.

The dimensions, details, specifications and statements made herein or by our representatives arising out of any enquiries are given for information purposes only. They are not intended to have any legal effect and the company will not be bound thereby. The company will only accept obligations which are expressly negotiated for, and agreed and incorporated into written agreements made specifically with its respective customers.

fresAir Crystal Louvre Window

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