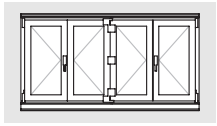
FS-PORTAL LM

Folding - sliding door hardware
for aluminium elements with Eurogroove



..... with these decisive advantages::

- Top or bottom running with the same profile set
- Stable running rail with favourable threshold height
- Wide range of adjustment possibilities
- Free running due to 4-roller, ball bearing rollers
- Integral stop

Size range

Sash width	(mm)	330[1] to 900
Sash height	(mm)	850 to 2400
Frame outside width	(mm)	Derived from the sash widths depending on the profile system and diagram
Sash weight	(kg)	**max. 80**
Over rebate height	(mm)	*10 to 16 [2]*

1) Access sashes very possibly larger than 600 mm!
2) 7- 9 mm over rebate heights with FS-PORTAL LM packers on enquiry

The size ranges stated above apply to the SIEGENIA FS-PORTAL LM hardware.

In addition to this, the details given by the profile manufacturer or system owner apply , **particularly** on possible limitations to sash dimensions, max. number of sashes per element, sash weight and locking spacing.
Where there are special manufacturing rules or working guidelines, these must be expressly observed.

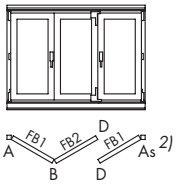
Assembly hint:
at the end of the folding package at 90° to the installation, a wider frame and an LM removable handle should be fitted.

Assembly Instructions
FSgb7004

FSgb7004_3_03.03/0

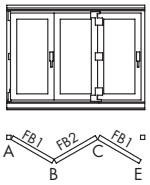
FS-PORTAL LM *Diagram summary*

Diagram 321



2 Folding sash
1 Access sash

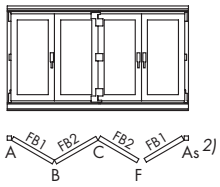
Diagram 330



3 Folding sash
0 Access sash[1)]

1) Access through 1st folding sash
2) As = Point A, opposite hand etc.

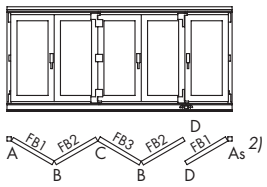
Diagram 431



3 Folding sash
1 Access sash

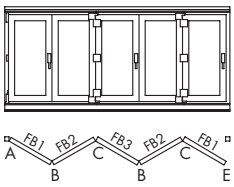
Note: All diagrams can also be used opposite hand.

Diagram 541



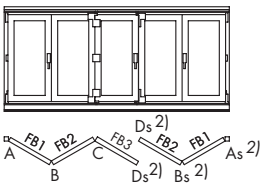
4 Folding sash
1 Access sash

Diagram 550



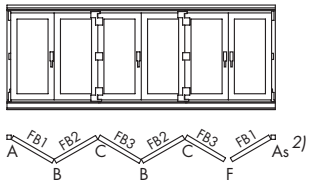
5 Folding sash
0 Access sash[1)]

Diagram 532



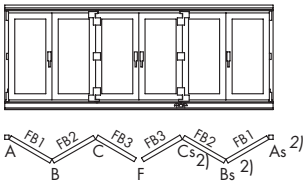
3+2 Folding sash
0 Access sash[1)]

Diagram 651



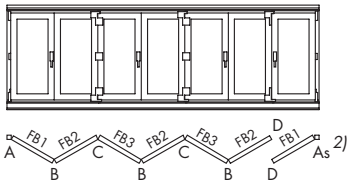
5 Folding sash
1 Access sash

Diagram 633



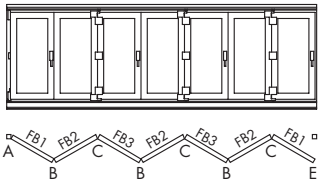
3+3 Folding sash
0 Access sash[1)]

Diagram 761



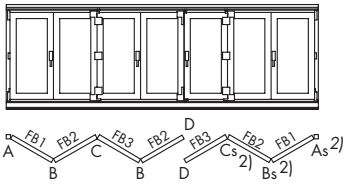
6 Folding sash
1 Access sash

Diagram 770



7 Folding sash
0 Access sash[1)]

Diagram 743



4+3 Folding sash
0 Access sash[1)]

Horizontal section
Scheme 431

* The gauges are set to 4 mm.
Depending on the profile system
stick on a spacer, max. 4 mm thick.

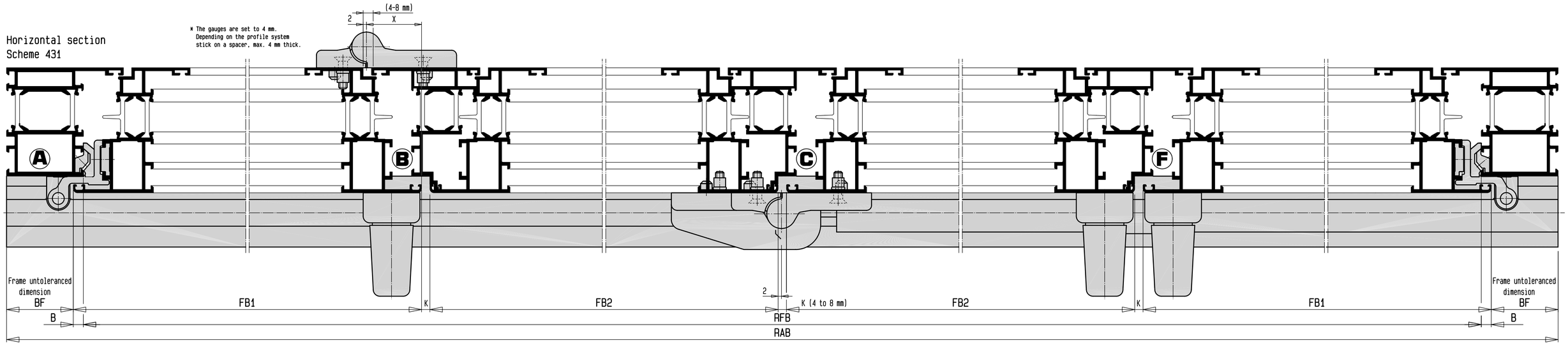
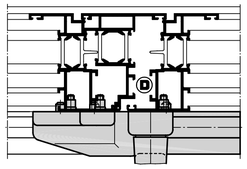


Table to determine the FB

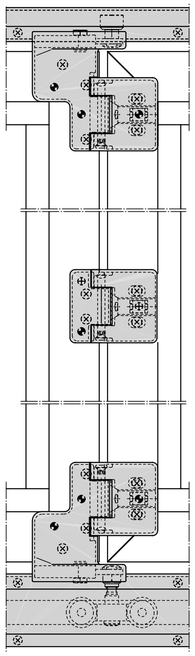
Schema	
321,330	FB1= $\frac{RFB+(2\cdot B)-(2\cdot K)+A}{3}$
431	FB1= $\frac{RFB+(2\cdot B)-(3\cdot K)+(2\cdot A)}{4}$
541,550,532	FB1=$\frac{RFB+(2\cdot B)-(4\cdot K)+(2\cdot A)+12}{5}$
651,633	FB1=$\frac{RFB+(2\cdot B)-(5\cdot K)+(2\cdot A)+24}{6}$
761,770,743	FB1=$\frac{RFB+(2\cdot B)-(6\cdot K)+(3\cdot A)+24}{7}$

BF = Frame untoleranced dimension
K = Sash spacing

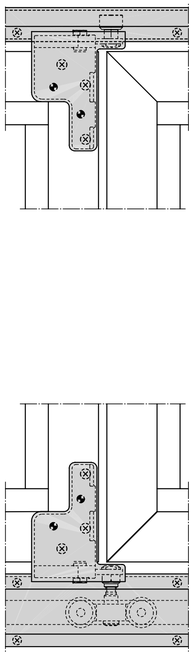
A = (2·X) + K + 12
FB2 = FB1 - A
FB3 = FB1 - 12



Vertical section Ⓒ
bottom running

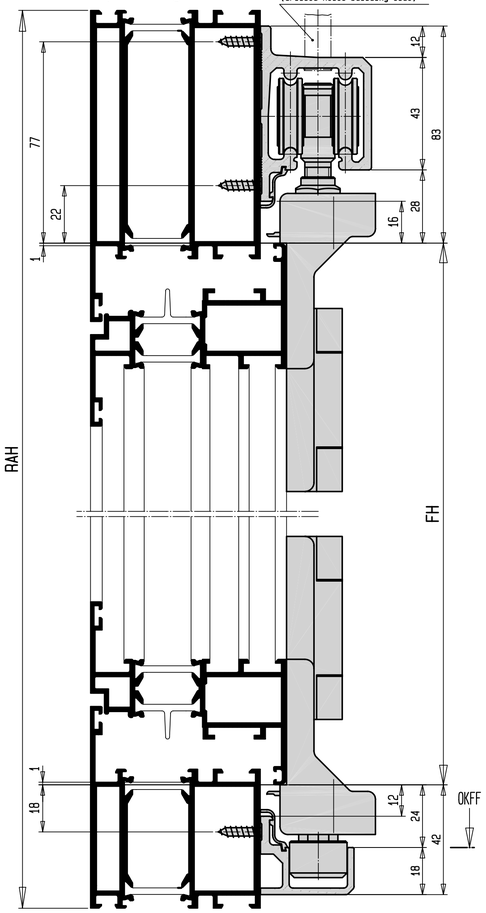


Vertical section Ⓓ
bottom running

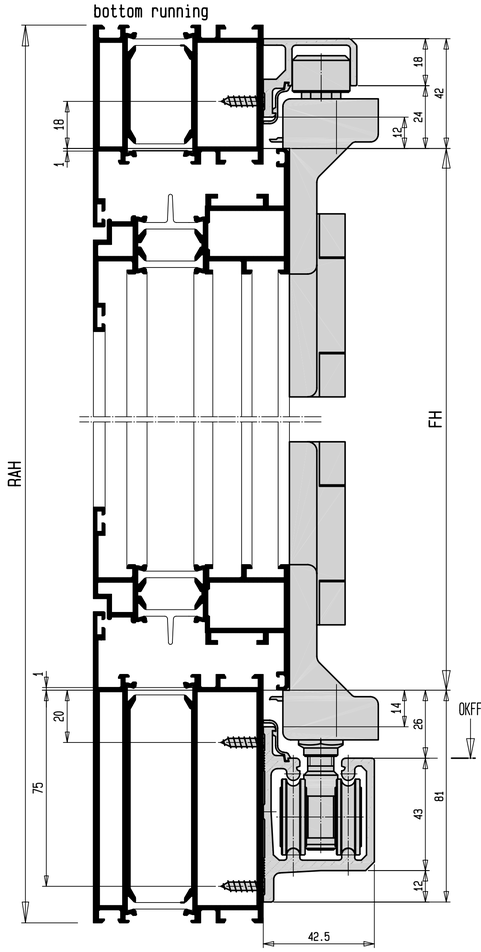


Vertical section
top running

Secure the running rail every
500 mm in the load bearing structure
(drilled holes building side)

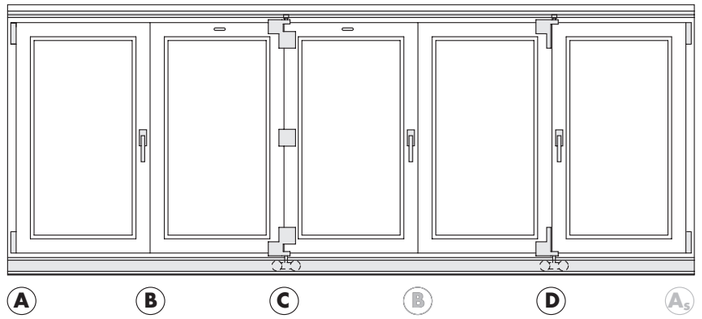


Vertical section
bottom running

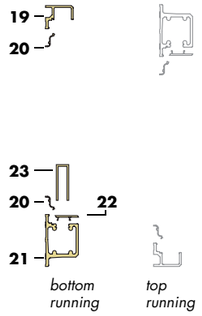


/zch/awt/a-anleit/fs/gb7004/vs_0

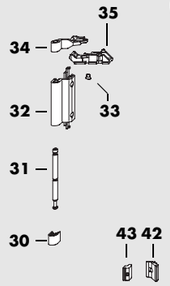
FS-PORTAL LM *Illustration of hardware (I)*

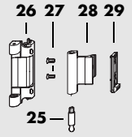


In the FS profile set



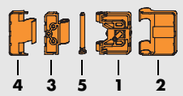
A

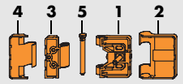


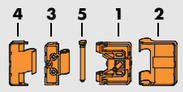


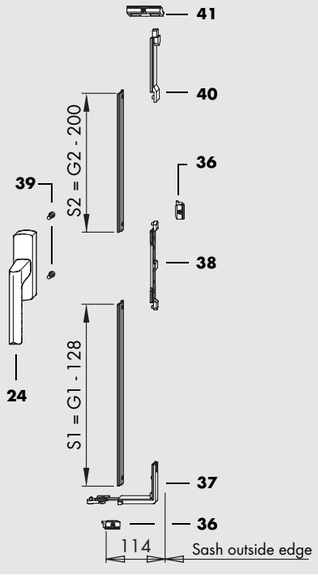
B

In the FS sash hinge carton



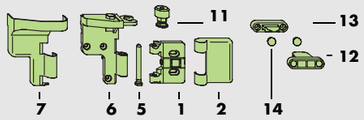


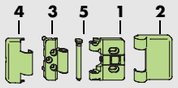


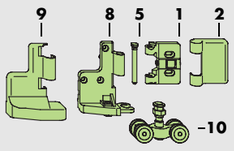


C

In the FS D roller carton

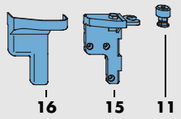


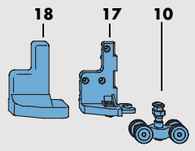


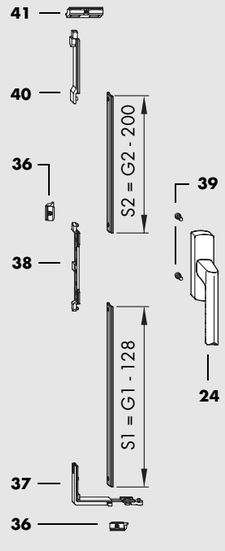


D

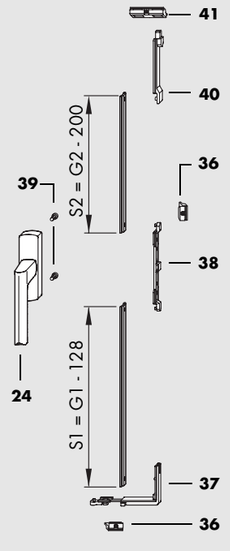
In the FS roller carton



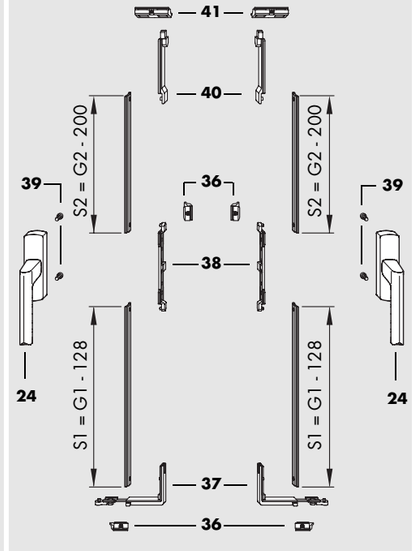




E



F



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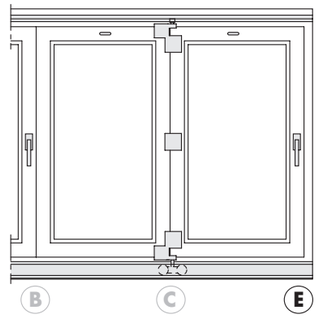
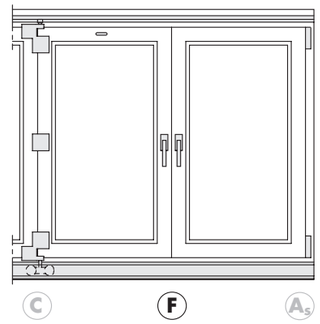
FS-PORTAL LM *Illustration of hardware (II)*





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FS-PORTAL LM *Hardware List (I)*

FS- PORTAL LM *Hardware List (II)*

Item.	Description			EAN 40 12453 silver	dark bronze	white	Items per diagram 321	330	431	541	550	532	651	633	761	770	743
FS-PORTAL components																	
1-5	**Carton - Sash hinge FS-LM**	Intersection point B		**120897**	**120903**	**120910**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**
1-14	**Carton - Rollers D FS-LM**	Intersection point C		**120958**	**120965**	**120972**	**-**	**1**	**1**	**1**	**2**	**1**	**2**	**2**	**2**	**3**	**2**
10,11 15-18	**Carton - Rollers FS-LM**	Intersection point D		**120927**	**120934**	**120941**	**1**	**-**	**-**	**1**	**-**	**1**	**-**	**-**	**1**	**-**	**1**
19-23	**Profile set FS**	*Size*	*RAB (mm)*														
		250	to 2500	**120989**	**120798**	**120804**											
		350	2501 to 3500	**120996**	**120811**	**120828**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
		450	3501 to 4500	**121009**	**120835**	**120842**											
		700	4501 to 6500	**121016**	**120859**	**120866**											
No illust.	**Bag of countersunk screws B4.2 x 19**		Contents: 25 off		**236802**							*Requirement depends on profile set size[1)]*					
Basic requirement	*Version: D = Access sash with turn sash hardware; DK = Access sash with turn & tilt hardware*						**D DK**		**D DK**	**D DK**			**D DK**		**D DK**		
24	**Handle - Si-line LM**			see LM handle summary Drawing No. LMde1147			**2**	**2**	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**
	BS LM 4200			**864944**	**864975**	**864951**	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**1**	**2**
25	Bottom hinge pin			837917	837917	837917	2	1	2	2	1	2	2	2	2	1	2
26	Bottom hinge			832257	832240	832226	2	1	2	2	1	2	2	2	2	1	2
27	Countersunk screw M5 x 8,5			833506	833506	833506	4	2	4	4	2	4	4	4	4	2	4
28	Corner hinge			859087	859117	859094	2	1	2	2	1	2	2	2	2	1	2
29	Clamping piece E			859124	859124	859124	2	1	2	2	1	2	2	2	2	1	2
30	Retainer			859568	859582	859575	2	1	2	2	1	2	2	2	2	1	2
31	Top hinge pin			859186	859186	859186	2	1	2	2	1	2	2	2	2	1	2
32	Top hinge			859193	859223	859209	2	1	2	2	1	2	2	2	2	1	2
33	Countersunk screw M5 x 7,5			859285	859285	859285	2	1	2	2	1	2	2	2	2	1	2
34	Stay hinge			859247	859278	859254	2	1	2	2	1	2	2	2	2	1	2
35	**Stay LM 4200-D**				**857106**		**2 1**	**1**	**2 1**	**2 1**	**1**	**2**	**2 1**	**2**	**2 1**	**1**	**2**
No illust	**Stay LM 4200-DK** Size 35				**857090**		**- 1**	**-**	**- 1**	**- 1**	**-**	**-**	**- 1**	**-**	**- 1**	**-**	**-**
No illust	**VS LM 4200-DK** or				**857007**												
	VS LM 4200-DK *A0102*				**862254**		**- 1**	**-**	**- 1**	**- 1**	**-**	**-**	**- 1**	**-**	**- 1**	**-**	**-**
	VS LM-D/FS			**820148**			**2 1**	**2**	**3 2**	**3 2**	**3**	**3**	**4 3**	**4**	**4 3**	**4**	**4**
36	Striker			819449			4 -	4	6 -	6 -	6	6	8 -	8	8 -	8	8
37	Corner drive VSO			819289			2 -	2	3 -	3 -	3	3	4 -	4	4 -	4	4
38	Coupling bracket			819494			2 -	2	3 -	3 -	3	3	4 -	4	4 -	4	4
39	Cheese head screw M5 x 12			800881			4 -	4	6 -	6 -	6	6	8 -	8	8 -	8	8
40	Locking bolt			820124			2 -	2	3 -	3 -	3	3	4 -	4	4 -	4	4
41	Striker DS			820247			2 -	2	3 -	3 -	3	3	4 -	4	4 -	4	4
Requirement depends on FH																	
No illust	**MV LM 4200-DK VSU/BSO**	*from FH 1250 mm*			**857045**		**- 1**	**-**	**- 1**	**- 1**	**-**	**-**	**- 1**	**-**	**- 1**	**-**	**-**
	MV LM 4200-D VS/BS	*from FH 1250 mm*			**857052**		**2 1**	**1**	**2 1**	**2 1**	**1**	**2**	**2 1**	**2**	**2 1**	**1**	**2**
42	Striker MV				859469		2 -	1	2 -	2 -	1	2	2 -	2	2 -	1	2
43	Locking bolt				859476		2 -	1	2 -	2 -	1	2	2 -	2	2 -	1	2

1) for Size 250 max. 30
Size 350 max. 39
Size 450 max. 48
Size 700 max. 72

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FS-PORTAL LM *Packing Units Break Down*

Item	Quantity	Description			EAN 40 12453 silver	dark-bronze	white
	1	**Carton -Sash hinge FS-LM** *comprising:*	Intersection point B		**120897**	**120903**	**120910**
1	3	Sash hinge, wide			822449	822449	822449
2	3	Cover cap FB, wide			842065	822401	822395
3	3	Sash hinge, narrow			822456	822456	822456
4	3	Cover cap FB, narrow			842072	822425	822418
5	3	Top hinge pin			823996	823996	823996
No illust.	12	Countersunk screw M5 x 16	for item 1 and 3		801147	801147	801147
No illust.	12	Blind riveting nut	for csk. screw M5 x 16		841907	841907	841907
	1	**Carton -.Roller D FS-LM** *comprising:*	Intersection point C		**120958**	**120965**	**120972**
1	3	Sash hinge, wide			822449	822449	822449
2	3	Cover cap FB, wide			842065	822401	822395
3	1	Sash hinge, narrow			822456	822456	822456
4	1	Cover cap FB, narrow			842072	822425	822418
5	3	Top hinge pin			823996	823996	823996
6	1	Bottom hinge D, right hand			841990	841990	841990
7	1	Cover cap ED, right hand			842034	823521	841938
8	1	Bottom hinge D, left hand			842010	842010	842010
9	1	Cover cap ED, left hand			842058	823538	841969
10	1	Roller			823958	823958	823958
11	1	Guide			823965	823965	823965
No illust.	10	Countersunk screw M5 x 16	for item 1, 3 , 6 and 8		801147	801147	801147
No illust.	4	Countersunk screw M5 x 13	for item 1		800850	800850	800850
No illust.	10	Blind riveting nut	for csk. screw M5 x 16		841907	841907	841907
	1	Bag - Supports *comprising:*			151129	120873	120880
12	1	Support D			842584	824306	824696
13	1	Support F			842591	824313	824702
14	4	Closure cap			842607	824290	824580
No illust.	4	Countersunk screw M5 x 12	for item 12 and 13		801093	801093	801093
No illust.	4	Blind riveting nut	for csk. screw M5 x 12		841907	841907	841907
	1	**Carton -Roller FS-LM** *comprising:*	Intersection point D		**120927**	**120934**	**120941**
10	1	Roller			823958	823958	823958
11	1	Guide			823965	823965	823965
15	1	Bottom hinge, right hand			841983	841983	841983
16	1	Cover cap E, right hand			842027	841921	841914
17	1	Bottom hinge, left hand			842003	842003	842003
18	1	Cover cap E, left hand			842041	841952	841945
No illust.	6	Countersunk screw M5 x 16	for item 15 and 17		801147	801147	801147
No illust.	6	Blind riveting nut	for csk. screw M5 x 16		841907	841907	841907
	1	**Profile set FS**	*Size*	*RAB (mm)*			
			250	to 2500	**120989**	**120798**	**120804**
			350	2501 to 3500	**120996**	**120811**	**120828**
			450	3501 to 4500	**121009**	**120835**	**120842**
			700	4501 to 6500	**121016**	**120859**	**120866**
		Guide rail	*Size*	*Length (mm)*			
			250	2500	153796	151143	153796
19	1		350	3500	154724	151006	154724
			450	4500	155783	152744	155783
			700	7000	152607	155790	152607
		Cover rail F	*Size*	*Length (mm)*			
			250	2500	155844	154205	152768
20	2		350	3500	151259	152966	150979
			450	4500	155851	156070	155875
			700	7000	155868	151105	153703
		Running rail	*Size*	*Length (mm)*			
			250	2500	152751	155936	152751
21	1		350	3500	151242	155943	151242
			450	4500	151372	152546	151372
			700	7000	155998	156001	155998
22	1	Cover rail L	*Size*	*Length (mm)*			
			200	2000	151266	151211	153529
23	1...2	Cover strip	*Size*	*Length (mm)*			
			170	1700	156025	156025	156025

Installation Instructions

Preparation

For machining and installation of the sash, frame and operating rod profiles for the
- Hinge sides for intersection points A
- Locking sides for intersection points D, E and F

see Assembly Instructions for LM 4200-DK, LM 4200-D and LM 4200-DS.

Fitting the sash frames

A Put together the folding sashes in appropriate pairs and drill the holes for sash hinges (**1** and **3**), bottom hinge D (**6** and **8**) and bottom hinges (**15** and **17**). For this see front page and FS-PORTAL LM assembly aids.

B For elements with a loose folding sash (intersection point F) drill the holes for support D (**12**) and support F (**13**).

C Screw on sash hinges (**1** and **3**) plus bottom hinge D (**6** and **8**) and bottom hinges (**15** and **17**).
For sash hinge, wide (**1**) ensure vertical alignment.

D For elements with a loose folding sashes (intersection point F) screw on support D (**12**) and support F (**13**).
Lightly grease support D (**12**) and support F (**13**).

Fitting on the frame

A Cut guide rail (**19**), two cover rails F (**20**) and running rail (**21**) to length (length = RAB).
N.B.: Cut off the running rail (**21**) on the opposite side to the access sash.

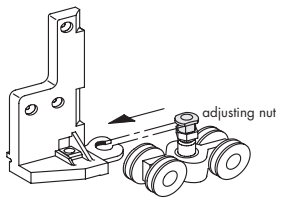
B Screw on guide rail (**19**) and running rail (**21**).
Note: In the area of the folded element (approx. 500 mm) all the screws, after this only every 2nd screw, or for the running rail alternately top and bottom.

Final fitting

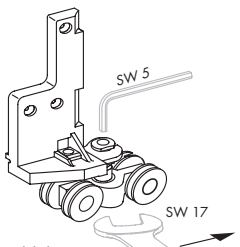
A Push the roller (**10**) into the running rail.

B Fit the folding sashes in order, beginning with the frame side sash.
To fit the roller(**10**) lay spacer strips (customer to provide) in the rebate groove as a fitting aid. Push roller (**10**) into the supporting plate on bottom hinge D (**8**) and bottom hinge (**17**). For this bring the adjusting nut into the right position, see Picture 1. Hold the top hinge pin L of the roller (**10**) with 5 mm A/F socket head wrench and tighten the clamping nut with 17 mm open ended spanner, see Picture 2.

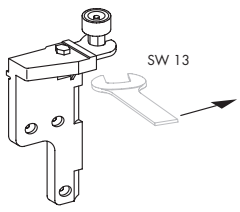
C Push the guide(**11**) into the supporting plate of both bottom hinge D (**6**) and bottom hinge (**15**) and tighten with 13 mm open ended spanner, see Picture 3.



Picture 1 Bring the adjusting nut into the right position and push in the roller



Picture 2 Hold the top hinge pin L with 5 mm A/F socket head wrench and tighten the clamping nut with 17 mm open ended spanner



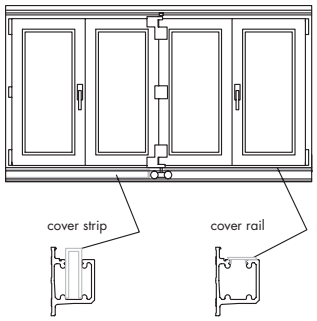
Picture 3 Push the guide into the supporting plate and tighten with 13 mm open ended spanner

Final fitting *(continued)*

A Clip on all cover caps. Cut cover rails F (**20**) to length and clip on.

B Cut cover rail L (**22**) to length (Length = Roller to outer edge of frame). Clip cover rail L (**22**) onto running rail, see Picture 4.

C To protect against contamination during the construction period, e.g. when plastering in the element, fit cover strips (**23**) between the individual folding elements, see Picture 4.



Picture 4 Inserting cover strip and cover rail L

Fixing the hardware components

Sash hinges (**1** and **3**): ..... Countersunk screw M5 x 16[1)]
Bottom hinge D (**6** and **8**): ..... Countersunk screw M5 x 16
Support D (**12**) and Support F (**13**):..... Countersunk screw M5 x 12
Bottom hinge (**15** and **17**): ..... Countersunk screw M5 x 16
Guide rail (**19**) ..... Countersunk self tapping screw B4.2 x 19
Running rail (**21**) ..... Countersunk self tapping screw B4.2 x 19

Fixing screws are included in the delivery specification.

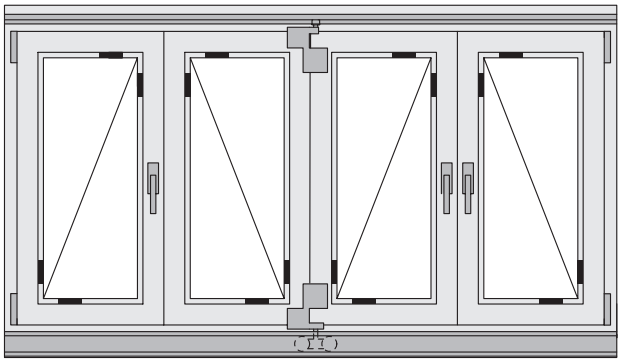
Note: For narrow profiles on which the blind riveting nuts cannot be used at intersection point B (sash hinges, external), the fixing can alternatively be done using self cutting-screws M5 x 13. For this modify the jigs EB 645-2 by fitting suitable ∅ 4.2 drilling bushes.

Order Ref. No. for ∅ 4.2 drilling bush 151334
Order Ref. No.. for self cutting countersunk screw M5 x 13 .800850

1) For Intersection point C, top and bottom with M5 x 13 countersunk screw

Wedging using 431 as an example

Note: Always wedge to the load bearing side, see illustration on right



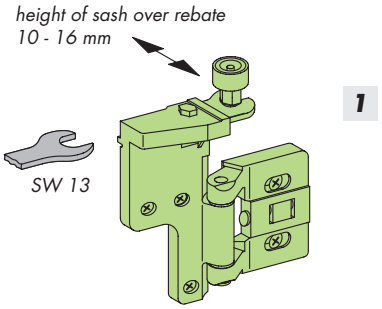
Access sash with turn & tilt hardware
possible with diagrams

Intersection point Ⓓ	**Intersection point** Ⓕ
321, 541 and 761	431 and 651

Adjustment possibilities

If necessary the adjustment possibilities listed below can be used.
For proper adjustment the following is recommended:

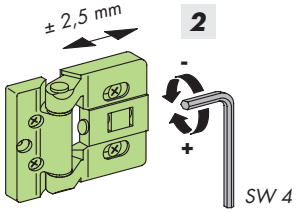
- Do not adjust until after the glass panes are fitted
- Clamp the folding - sliding element firmly horizontally and vertically or only adjust after building into the brickwork



1

Setting the sash contact pressure of the bottom hinge

- ***A*** Release the A/F 13 clamp screw on the bottom hinge.
- ***B*** Push the sash firmly into contact
- ***C*** Tighten the clamping screw.

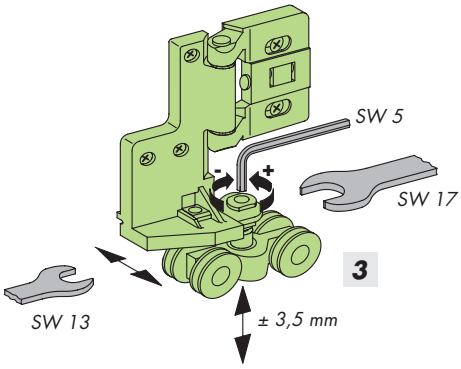


2

Setting the width of the sash hinges

Note: Release sash hinges one after another, adjust and screw on again.

- ***A*** Loosen both fixing screws slightly.
- ***B*** Adjust the gap width with 4 mm hex. socket wrench.
- ***C*** Retighten the fixing screws.



3

Setting the roller height

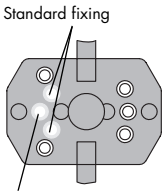
- ***A*** Loosen the 17 mm clamping nut on the roller slightly.
- ***B*** Fit packing under the sash in the rebate to give the precise dimension and adjust the height with a 5 mm socket wrench, holding the clamping nut steady with a 17 mm open ended spanner.
- ***C*** Retighten the 17 mm A/F clamping nut, holding the pin with the 5 mm socket wrench.

Adjustment possibilities for the LM components

- Side adjustment: through stay LM 4200 D(**35**)
- Height adjustment: after removing the top pressure piece from the bottom hinge (**26**), through the 4-mm socket head screw in the corner hinge (**28**) +1.5 / –1 mm
- Contact pressure: through the eccentric locking cam

see Maintenance Instructions LM.

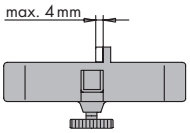
FS-PORTAL LM *Assembly Aids*

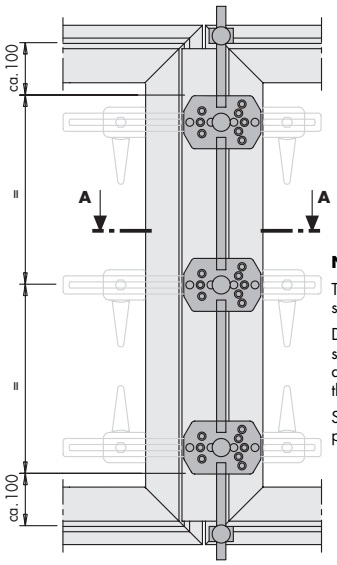


Alternative fixing
if standard not possible due to profile.

Remove unwanted drilling bushes.

A - A
only jig EB645-2 shown





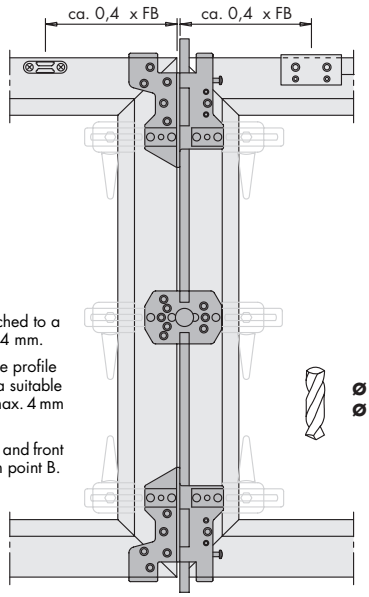
Intersection point
External view
B

N.B.

The jigs are matched to a sash distance of 4 mm.

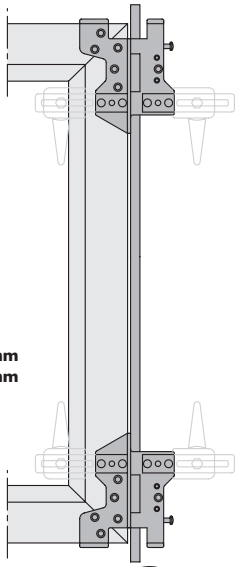
Depending on the profile system, stick on a suitable distance piece, max. 4 mm thick.

See Section A - A and front page intersection point B.

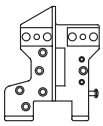


Intersection point
Internal view
C

Ø 7,1 mm
Ø 4,2 mm



Intersection point
Internal view
D



Jig EB 645-1 for bottom hinge **EAN 40 12453**

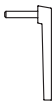
Requirement: 2 off
Drill: *Ø 7.1*
Ø 4.2
143124

Jig EB 645-2 for sash hinge

Requirement: 4 off
Drill: *Ø 7.1*
143131

Jig EB 644-3 for support

Requirement: 1 off
Drill: *Ø 7.1*
143087



Jig EB 644-4 for drill location for guide and running rail

Requirement: 1 off
Drill: *Ø 3.5*
143094

Adjusting rod for EB 645-1 and EB 645-2

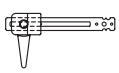
Requirement: 2 off
143117

Stop for adjusting rod

Requirement: 2 off
143100

Clamping fixture for EB 645-1 and EB 645-2

Requirement: 9 off
139202



Clamping fixture A0089 for EB 645-2 (outside)

Requirement: 3 off
139219

Countersunk screw M5 x 16 for fixing the clamping fixture

Requirement: 24 off
801147

No illustration

Important Notes

- The size ranges specified on the front page must never be exceeded.
- For the SIEGENIA-AUBI FS-PORTAL LM hardware, the size ranges specified on Page 1 apply. In addition to this the details given by the profile manufacturer or the system owner, **particularly** on possible limitations to sash dimensions, maximum number of sashes per element, sash weight and the spacing of locking elements also apply.
  Where specific manufacturing regulations or working guidelines exist, these are to be expressly observed.
- It is possible that bearing components can break due to excessive strain. This could cause the window to drop out of the frame and potentially cause serious injuries. If due to special circumstances (use in schools, nurseries etc.) excessive strain on bearing components can be expected, fatigue of these components must be prevented **e.g.** by fitting a lockable handle to prevent unauthorised use. In the event of doubt please consult your SIEGENIA-AUBI representative.
- The hardware components described in these Assembly Instructions are made of non-rusting material or have been galvanised and yellow chromatised to DIN 50 961. They must not be installed for use in aggressive, corrosion promoting air. In such cases please consult your SIEGENIA-AUBI representative.
- We can accept no liability in respect of any damages or defects arising where the hardware assembly incorporates products not made by SIEGENIA-AUBI.
- Install all the hardware components correctly as described in these Assembly Instructions.
- The surface treatment of folding - sliding elements must be performed **before** the hardware is assembled on the window. Post treatment could adversely affect the effective functioning of the components, in which case we are not obliged to provide any warranty.
- Please follow the standard techniques for packing and wedge the sealed glazing units within the sash/frame.
- Keep all grooves and rebates free from dirt and debris - especially residues of cement or plaster. Avoid the direct effect of moisture on the hardware and contact of the hardware with cleaning agents.
- Affix a clearly visible operating sticker (sliding direction DIN left or DIN right) onto the fitted folding - sliding sash. The operating sticker can be found in the „FS-LM Roller or D FS-LM Roller “ carton.

Liability exclusions

We accept no liability in respect of any damages or malfunctions caused by the hardware or the folding - sliding elements fitted with them, as a result of incorrect or inappropriate specifications or other information provided by the customer, failure to follow these instructions, wilful damage or negligence or misuse or alteration or repair of or an exertion of excessive force to the hardware by the user or customer.

Abbreviations

The following abbreviations are used in these Assembly Instructions:

Btl.	Bag	F	Folding sash	RAB	Frame outer width
BF	Frame clearance dimension	FB	Sash width	RAH	Frame outer height
D	Turn sash	FH	Sash height	RFB	Frame rebate width
EB	Drill jig	MV	Centre lock	VSO	Locking side top
E/EL	Bottom hinge	OKFF	Upper surface of finished floor	VSU	Locking side bottom
ED	Bottom hinge - turn sash				