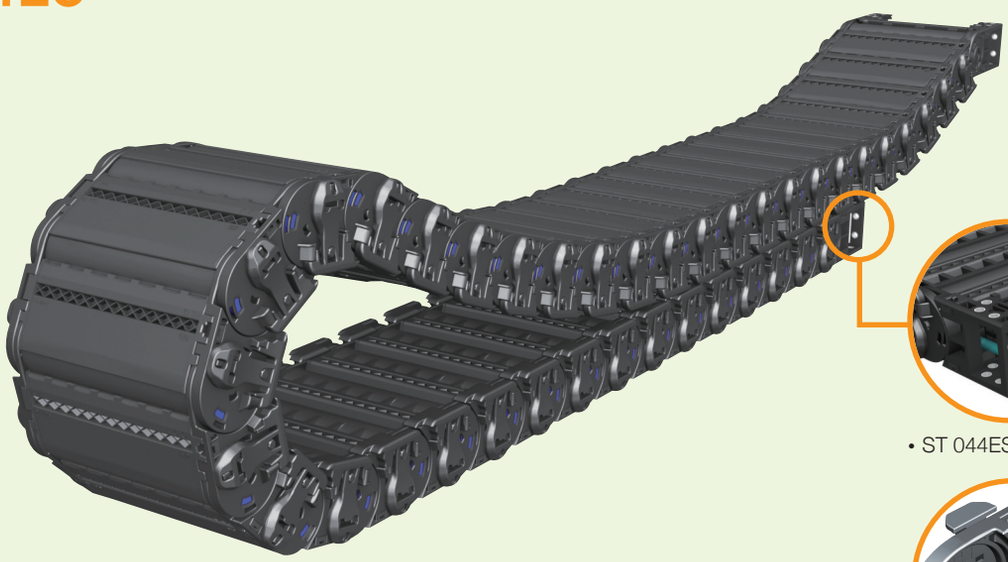
Shift chain®

SLIDING-ES TYPE : Enclosed Skid

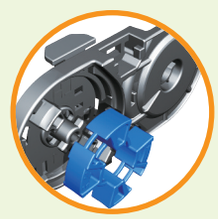
Min ●●●●●● Max

Shift chain®

ST 044ES Enclosed Skid Type



• ST 044ES - Bracket •



• Bending Radius Unit •

MATERIAL

- **Chain material:**
  CPS-amide with glass fiber reinforced UL94-HB
- **Low Noise & Low Mote**
- **Temperature :** -30°C ~ +130°C
- **Coefficient of Friction :**
  0.3 ~ 0.4 μ

Applications

- Facilities and equipments requiring a long travel distance as below; Gantry Robots, Robot Carriages, Automatic Welding Lines, Gantry Cranes, Gantry loder, etc.

Shift Chain ES-Type can be found on car manufacturer's welding line, where excess material can damage your inserted cables.

- **Calculation of the chain length**

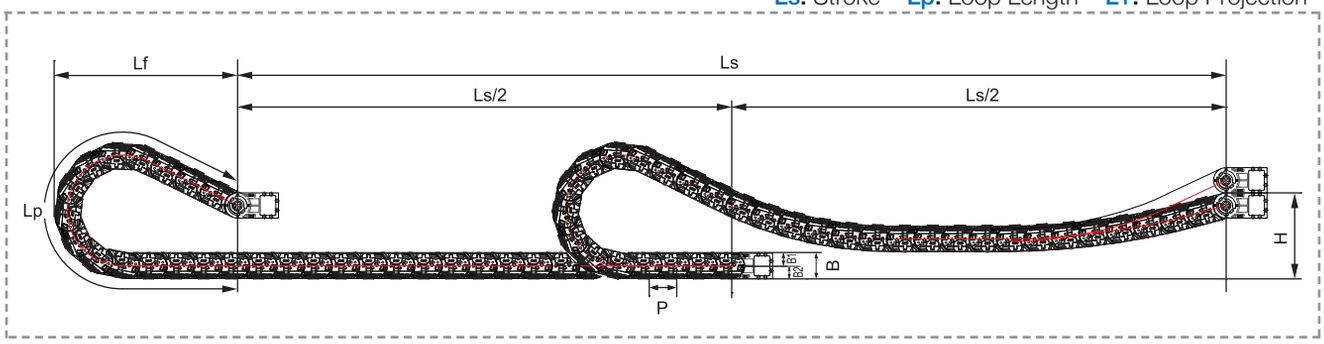
$$[\quad L = \frac{Ls}{2} + Lp \quad]$$

Affer enclosed frame of sliding type, it can protect cable perfectly from outside, substance for iong distance application.

Enclosed Skid Type ST 044ES

LAYOUT OF THE CHAIN

Ls: Stroke **Lp:** Loop Length **Lf:** Loop Projection



(Dimensions in mm)

Bending radius R	70	90	120	150
Lp	544	662	926	1,190
Lf	249	289	393	497
H	130	130	130	130

ST 044ES Type

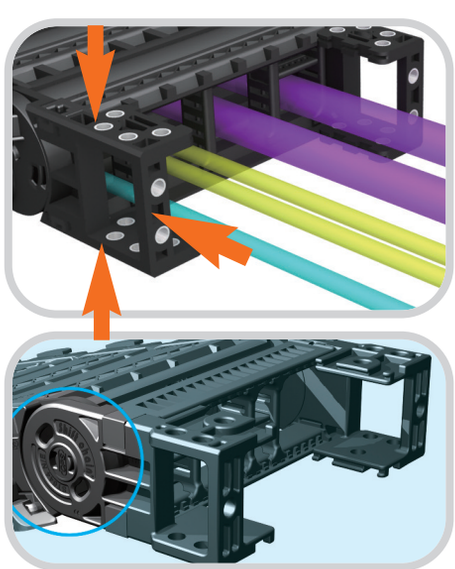
Pitch P: 44mm
Height B: 38.5mm
B1: 19.5mm
B2: 19mm

ORDERING

ST 044ES. 100. R120 / F - 1500L : 10ST

- Q'ty(set)
- Length(mm)
- Free End Bracket
- Bending Radius
- Inside Width
- Skid Type
- Shift Chain

BRACKET TYPE



FEB (Free End Bracket)

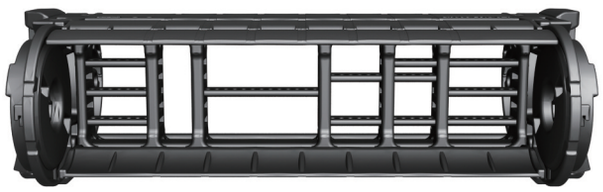
FEB Fixes the cable chain to the machinery or moving application. CPS has improved mounting efficiency by unifying the existing Easy End Bracket and Normal End Bracket.
The End Bracket is designed to move up and down as the cable chain or application requires.

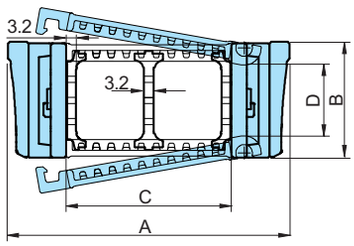
▶ BR should not be inserted in the joint of side band and Free End Bracket.

▶ Above products are patent registered item which can be protected by industrial property right.

Enclosed Skid Type ST 044ES

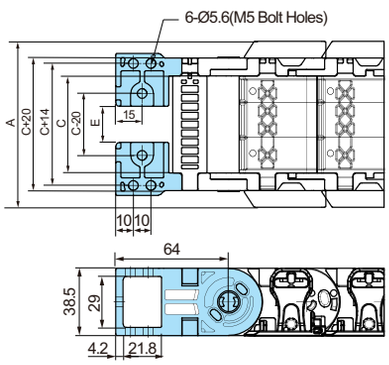
CHAIN CROSS SECTION



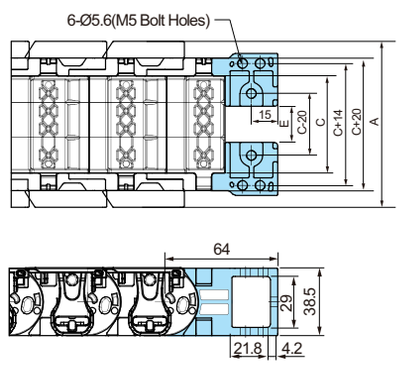


Chain Type	A	B	C	D	Bending Radius(R)	Weight in kg/m
ST 044ES.035	74		35			
ST 044ES.050	89		50			
ST 044ES.055	94		55			
ST 044ES.075	114		75			
ST 044ES.100	139	38.5	100	26	70, 90, 120, 150	-
ST 044ES.125	164		125			
ST 044ES.150	189		150			
ST 044ES.175	214		175			
ST 044ES.200	239		200			

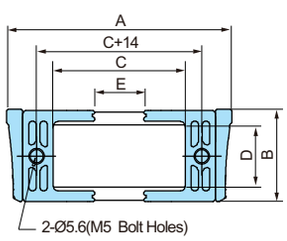
FREE END BRACKET



▲ Moving point



▲ Fixing point



▲ Front point

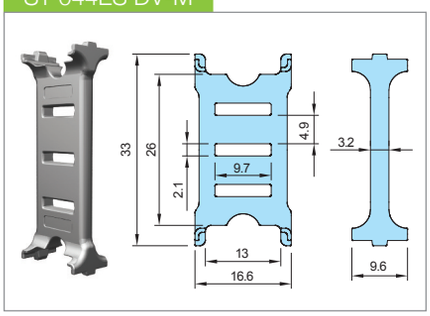
Chain Type	A	B	C	D	E	Hole Type
ST 044ES.035	74		35		0.4	
ST 044ES.050	89		50		15.4	
ST 044ES.055	94		55		20.4	
ST 044ES.075	114		75		40.4	
ST 044ES.100	139	38.5	100	26	65.4	M5 Bolt Holes
ST 044ES.125	164		125		90.4	
ST 044ES.150	189		150		115.4	
ST 044ES.175	214		175		140.4	
ST 044ES.200	239		200		165.4	

Enclosed Skid Type ST 044ES

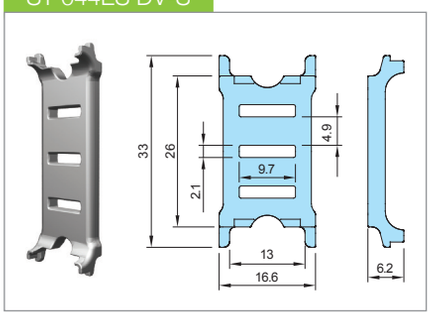
DIVIDERS & SEPARATORS

Dividers (Vertical) and Separators (Horizontal) divide the inner chamber of the cable chain to give each cable diameter its own center and keep the cables separated from each other. The use of a separator in some cases, can also reduce the width requirements as two or more levels can be made within the same chamber. To prevent twisting or damage to the cables, as a rule, there needs to be at least 10% space between the inserted cable and its enclosure.

ST 044ES DV-M



ST 044ES DV-S

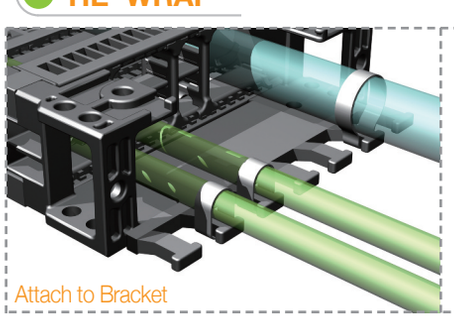


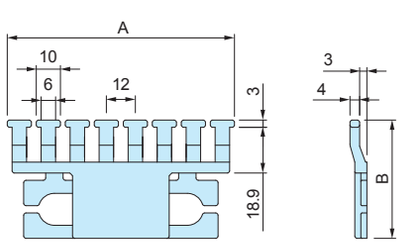
▶ Assemble divider every Two links.

ST044ES Separators (SP) (No. : S-SP/M)

Chain Type \ Separators	SP035	SP050	SP055	SP075	SP100	SP125	SP150	SP175	SP200
ST 044ES	○	○	○	○	○	○	○	○	○

TIE WRAP





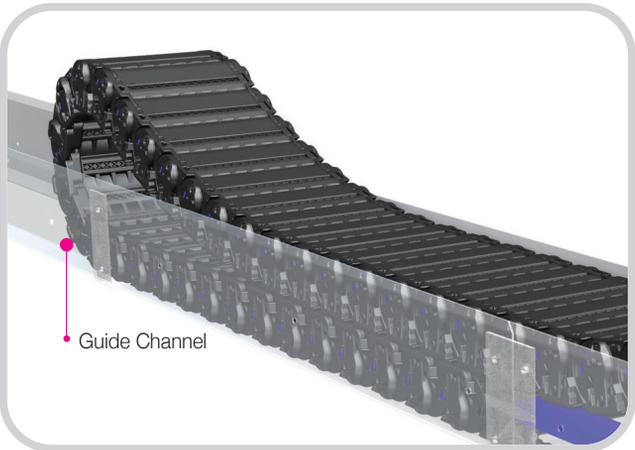
(Dimensions in mm)

Tie Wrap	035	050	055	075	100	125
A	46	69.4	70	94	118	142
B	35.4	48.9	48.9	48.9	48.9	48.9

The Tie Wrap separated from the Shift Chain bracket, when installed properly, protects the inserted cables from becoming entangled and twisted during operation.
There are two types in the tie wrap;Attached & Unattached to the bracket.

Enclosed Skid Type ST 044ES

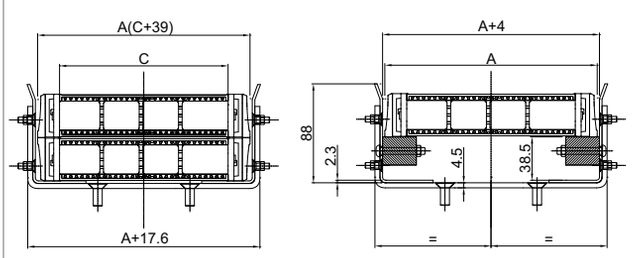
GUIDE CHANNEL



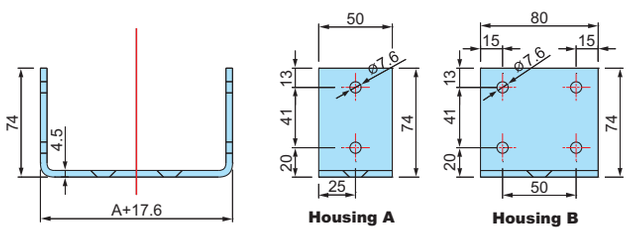
For long stroke applications the guide channel is applied to ensure that the Shift Chain Sliding Chain stays on track and to ensure safety during operation. With the application of a rubber pad on the channel floor, noise is reduced to a minimum. Guide Channels are made of Steel + Zn and can be customized with SUS material .

▶Thickness can be changed by the product standards of material.

ST 044ES Type

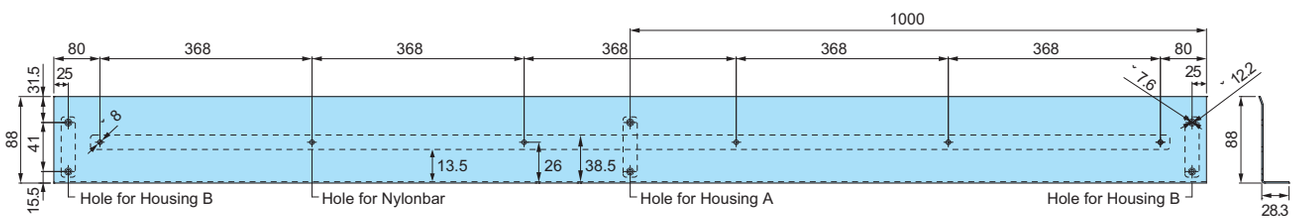


▲ A - zone ▲ C - zone



▲ Housing (U-shape)-ST 044S

ST 044ES Side Panel



ORDERING

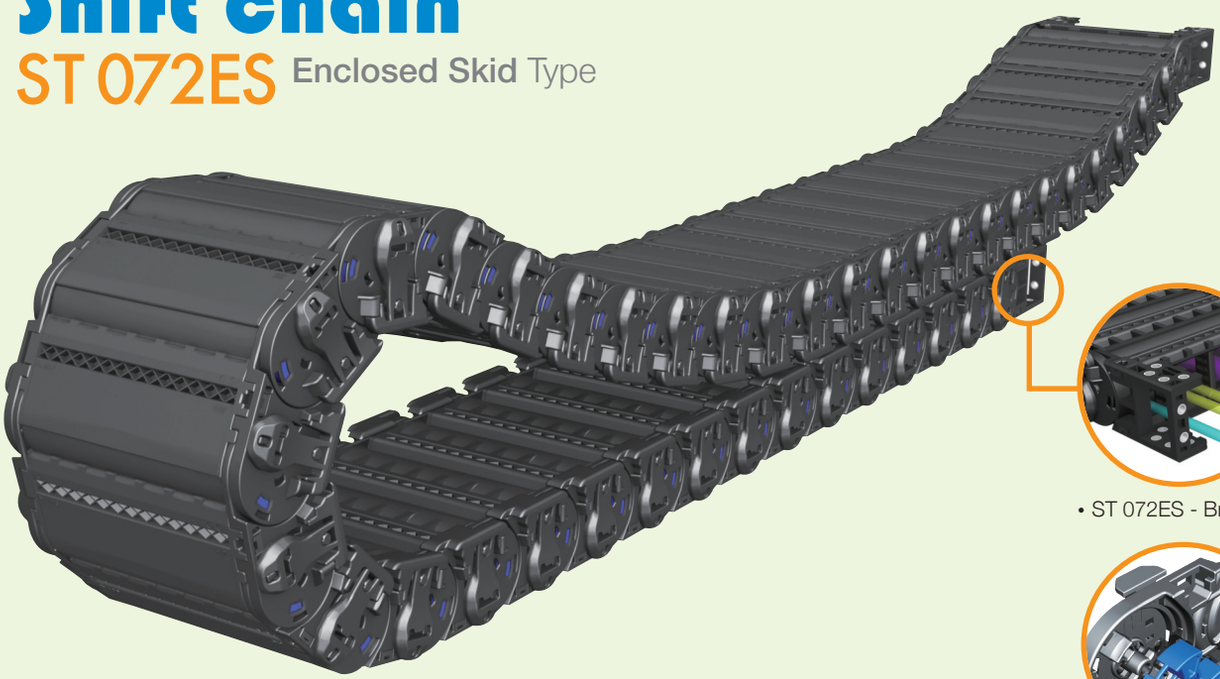
ST-GCS 044ES. 100 / A, B, C : 200M

- Length(mm)
- Panel A, B, C-Zone
- Inside Width
- Chain Type
- Steel Guide Channel
- Shift Chain

Min ●●●○○○ Max

Shift chain®

ST 072ES Enclosed Skid Type



• ST 072ES - Bracket •

• Bending Radius Unit •

MATERIAL

- **Chain material:**
  CPS-amide with glass fiber reinforced UL94-HB
- **Low Noise & Low Mote**
- **Temperature :** -30°C ~ +130°C
- **Coefficient of Friction :**
  0.3 ~ 0.4 μ
- **Applications**

  Facilities and equipments requiring a long travel distance as below; Gantry Robots, Robot Carriages, Automatic Welding Lines, Gantry Cranes, Gantry loader, etc.

  Shift Chain ES-Type can be found on car manufacturer's welding line, where excess material can damage your inserted cables.

- **Calculation of the chain length**

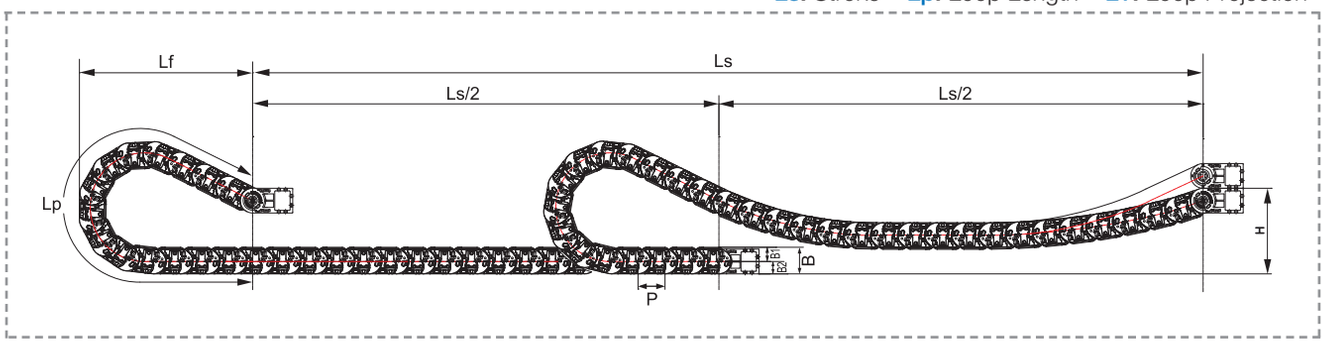
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Affer enclosed frame of sliding type, it can protect cable perfectly from outside, substance for iong distance application.

Enclosed Skid Type ST 072ES

LAYOUT OF THE CHAIN

Ls: Stroke **Lp:** Loop Length **Lf:** Loop Projection



(Dimensions in mm)

Bending radius R	120	145	200	250	300
Lp	917	1,063	1,400	1,840	2,280
Lf	420	470	580	752	924
H	230	230	230	230	230

ST 072ES Type

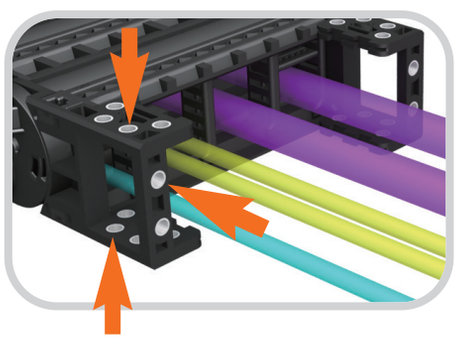
Pitch P: 72mm
Height B: 71mm
B1: 38mm
B2: 33mm

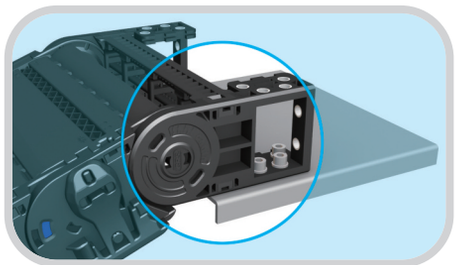
ORDERING

ST 072ES.150.R200 / F-10000L:10ST

- Q'ty(set)
- Length(mm)
- Free End Bracket
- Bending Radius
- Inside Width
- Enclosed Skid Type
- Shift Chain

BRACKET TYPE (브라켓타입)





FEB (Free End Bracket)

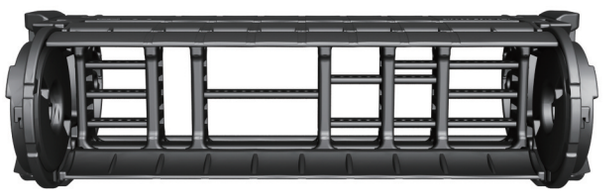
FEB Fixes the cable chain to the machinery or moving application. CPS has improved mounting efficiency by unifying the existing Easy End Bracket and Normal End Bracket.
The End Bracket is designed to move up and down as the cable chain or application requires. To add strength, steel washers are inserted into the fixing holes of each Free End Bracket.

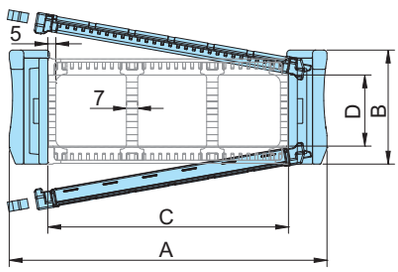
- BR should not be inserted in the joint of side band and Free End Bracket
- Normal Frame, not FRU/FRD, is inserted into M.FEB.

- Above products are patent registered item which can be protected by industrial property right.

Enclosed Skid Type ST 072ES

CHAIN CROSS SECTION

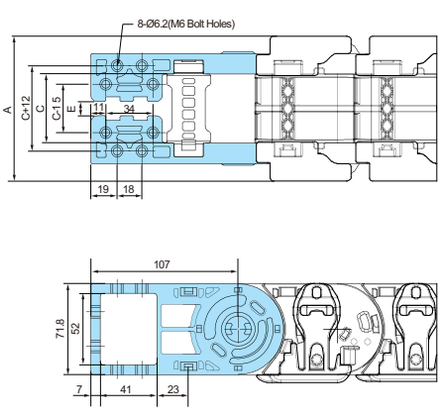




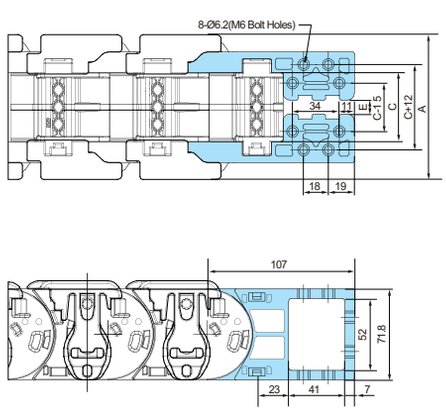
Chain Type	A	B	C	D	Bending Radius(R)	Weight in kg/m
ST 072ES.050	105	71.8	50	44	120,145, 200, 250, 300	2.77
ST 072ES.075	130		75			3.01
ST 072ES.100	155		100			3.25
ST 072ES.125	180		125			3.49
ST 072ES.150	205		150			3.73

▲ Application of special frame. (C:140,165,190,240)

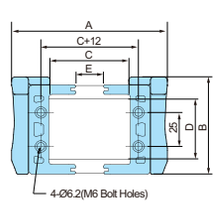
FREE END BRACKET



▲ Moving point



▲ Fixing point



▲ Front point

Chain Type	A	B	C	D	E	Hole Type
ST 072ES.050	105	71.8	50	44	10	M6 Bolt Holes
ST 072ES.075	130		75		35	
ST 072ES.100	155		100		60	
ST 072ES.125	180		125		85	
ST 072ES.150	205		150		110	

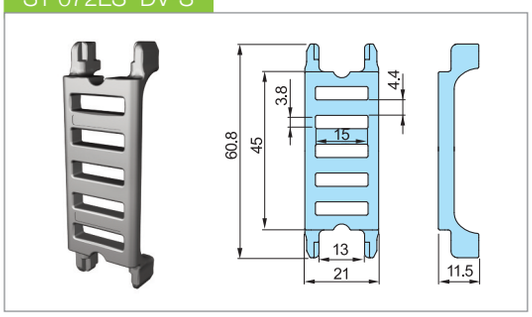
▲ Application of special frame. (C:140,165,190,240)

Enclosed Skid Type ST 072ES

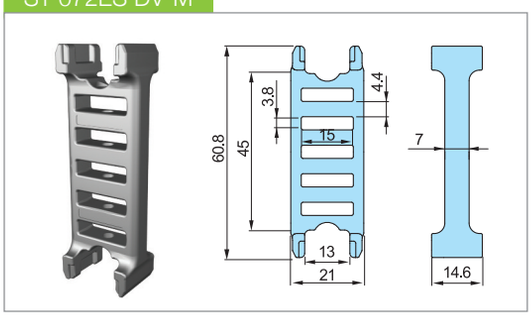
DIVIDERS

Dividers (Vertical) and Separators (Horizontal) divide the inner chamber of the cable chain to give each cable diameter its own center and keep the cables separated from each other. The use of separator in some cases, can also reduce the width requirements as two or more levels can be made within the same chamber. To prevent twisting or damage to the cables, as a rule, there needs to be at least 10% space between the inserted cable and its enclosure.

ST 072ES DV-S

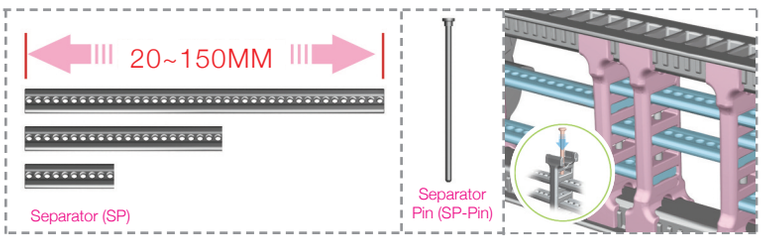


ST 072ES DV-M



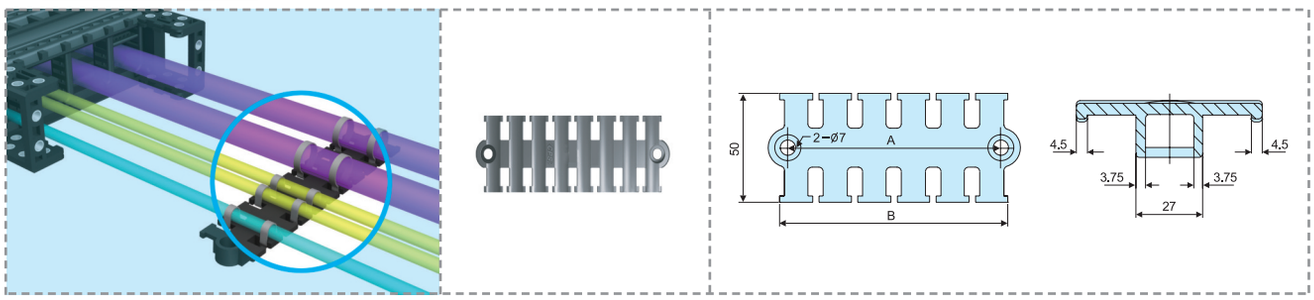
*Assemble divider every Two links.

SEPARATORS (SP)



Separator is available in length from 20mm to 150mm and can be cut every 5mm for use. The combined use of divider and sepatator with the pin creates the most effective cable pattern and keep insertion space for cables safely, so it protects the inserted cables.

TIE WRAP



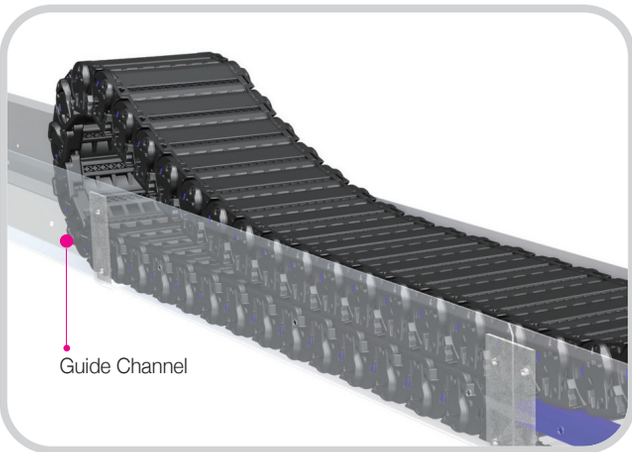
(Dimensions in mm)

Tie Wrap	050	075	100	125	150
A	58	75	98	122	141
B	65	82	105	129	148

The Tie Wrap separated from the Shift Chain bracket, when installed properly, protects the inserted cables from becoming entangled and twisted during operation.

Enclosed Skid Type ST 072ES

GUIDE CHANNEL



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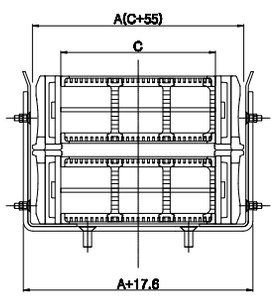
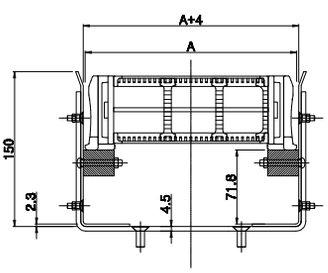
▶ Thickness can be changed by the product standards of material.

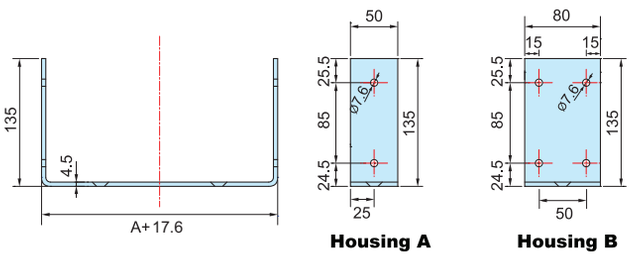
ST 072ES Type



▲ A - zone

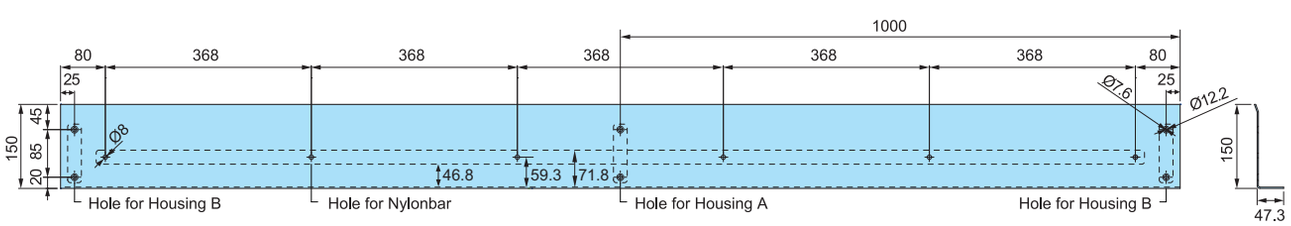


▲ C - zone



▲ Housing (U-shape) - ST 072ES

ST 072ES Side Panel



ORDERING

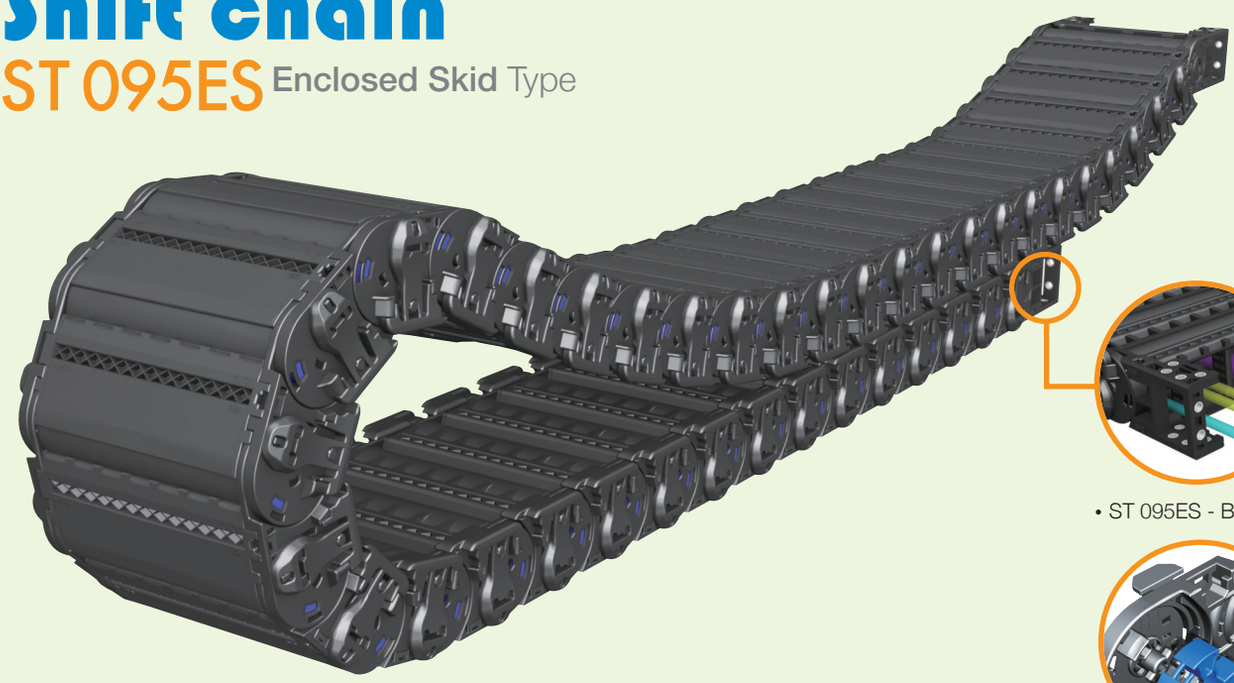
ST-GCS 072ES.150 / A, B, C : 200M

- Length(mm)
- Panel A, B, C-Zone
- Inside Width
- Chain Type
- Steel Guide Channel
- Shift Chain

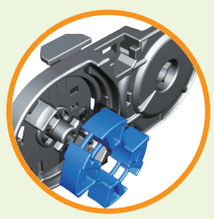
Min ●●●●○○ Max

Shift chain®

ST 095ES Enclosed Skid Type



• ST 095ES - Bracket •



• Bending Radius Unit •

MATERIAL

- **Chain material:**
  CPS-amide with glass fiber reinforced UL94-HB
- **Low Noise & Low Mote**
- **Temperature :** -30°C ~ +130°C
- **Coefficient of Friction :**
  0.3 ~ 0.4 μ
- **Applications**

  Facilities and equipments requiring a long travel distance as below; Gantry Robots, Robot Carriages, Automatic Welding Lines, Gantry Cranes, Gantry loader, etc.

  Shift Chain ES-Type can be found on car manufacturer's welding line, where excess material can damage your inserted cables.

- **Calculation of the chain length**

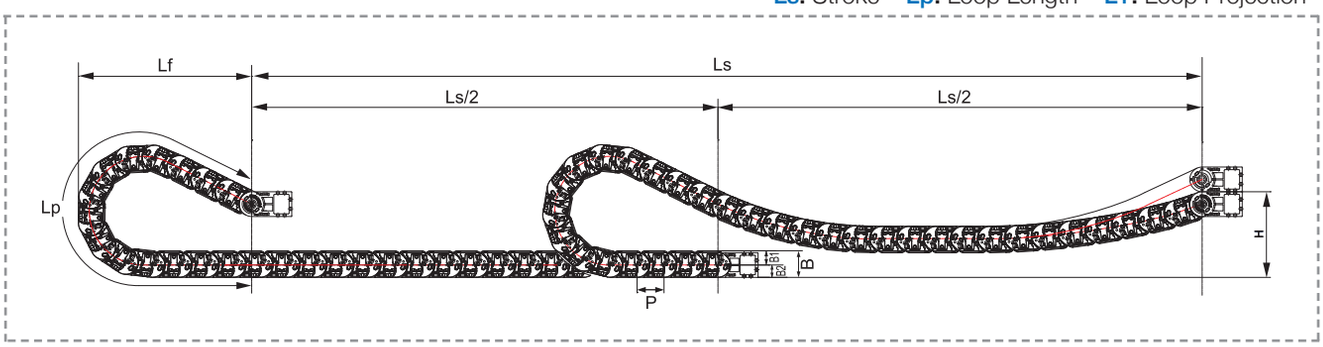
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Affer enclosed frame of sliding type, it can protect cable perfectly from outside, substance for iong distance application.

Enclosed Skid Type ST 095ES

LAYOUT OF THE CHAIN

Ls: Stroke **Lp:** Loop Length **Lf:** Loop Projection



(Dimensions in mm)

Bending radius R	150	200	230	280	400
Lp	1,178	1,479	1,666	2,146	3,232
L f	534	634	694	889	1,319
H	250	250	250	250	250

ST 095ES Type

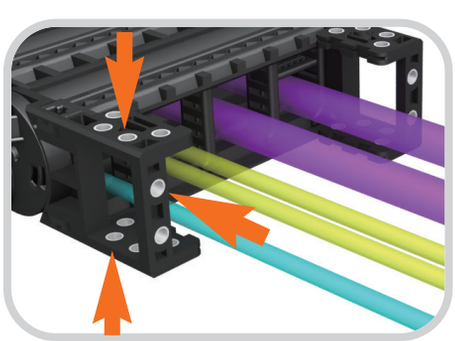
Pitch P: 95mm
Height B: 89mm
B1: 48mm
B2: 41mm

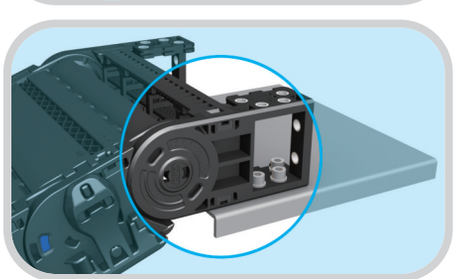
ORDERING

ST 095ES.200.R200 / F-10000L:10ST

- Q'ty(set)
- Length(mm)
- Free End Bracket
- Bending Radius
- Inside Width
- Enclosed Skid Type
- Shift Chain

BRACKET TYPE





FEB (Free End Bracket)

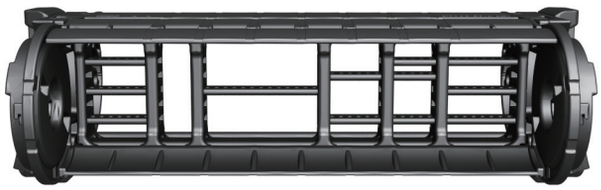
FEB Fixes the cable chain to the machinery or moving application. CPS has improved mounting efficiency by unifying the existing Easy End Bracket and Normal End Bracket.
The End Bracket is designed to move up and down as the cable chain or application requires. To add strength, steel washers are inserted into the fixing holes of each Free End Bracket.

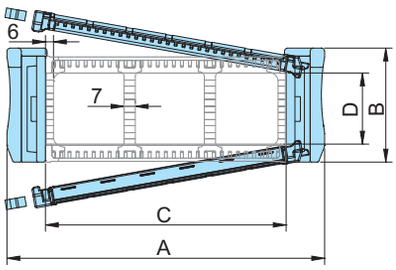
- BR should not be inserted in the joint of side band and Free End Bracket
- Normal Frame, not FRU/FRD, is inserted into M.FEB.

- Above products are patent registered item which can be protected by industrial property right.

Enclosed Skid Type ST 095ES

CHAIN CROSS SECTION

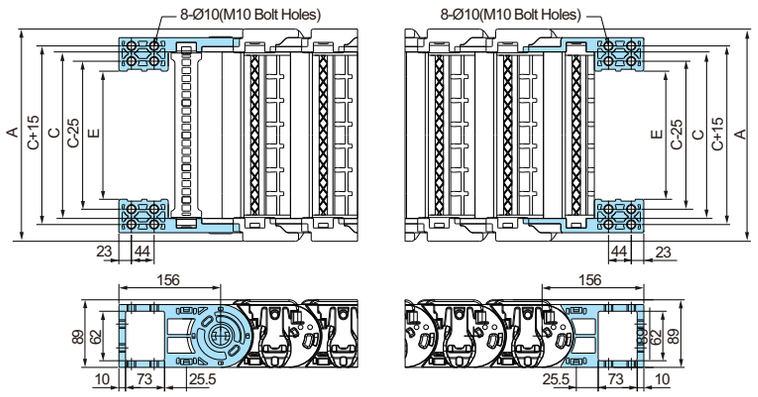




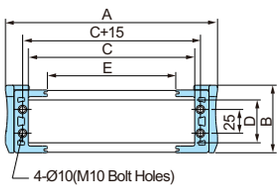
Chain Type	A	B	C	D	Bending Radius(R)	Weight in kg/m
ST 095ES.100	162	89	100	55	150, 200, 230, 280, 400	4.16
ST 095ES.125	187		125			4.41
ST 095ES.150	212		150			4.65
ST 095ES.175	237		175			4.90
ST 095ES.200	262		200			5.15

▲ Application of special frame. (C:190,240)

FREE END BRACKET



▲ Moving point ▲ Fixing point



▲ Front point

Chain Type	A	B	C	D	E	Hole Type
ST 095ES.100	162	89	100	55	49	M10 Bolt Holes
ST 095ES.125	187		125		74	
ST 095ES.150	212		150		99	
ST 095ES.175	237		175		124	
ST 095ES.200	262		200		149	

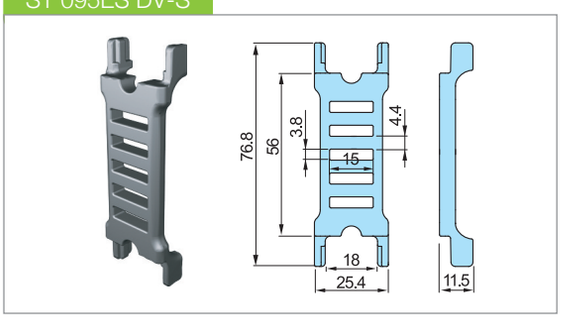
▲ Application of special frame. (C:190,240)

Enclosed Skid Type ST 095ES

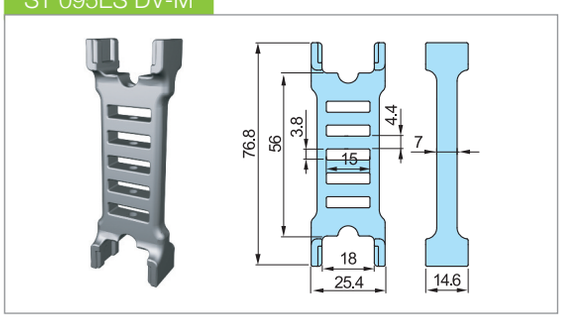
DIVIDERS

Dividers (Vertical) and Separators (Horizontal) divide the inner chamber of the cable chain to give each cable diameter its own center and keep the cables separated from each other. The use of separator in some cases, can also reduce the width requirements as two or more levels can be made within the same chamber. To prevent twisting or damage to the cables, as a rule, there needs to be at least 10% space between the inserted cable and its enclosure.

ST 095ES DV-S

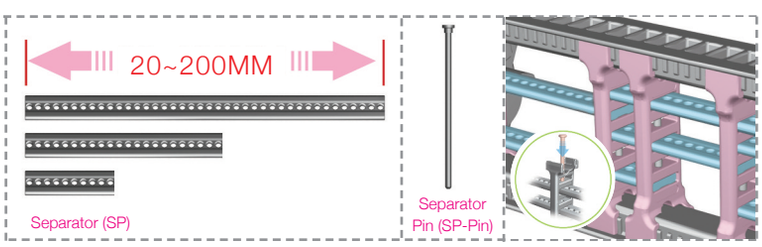


ST 095ES DV-M



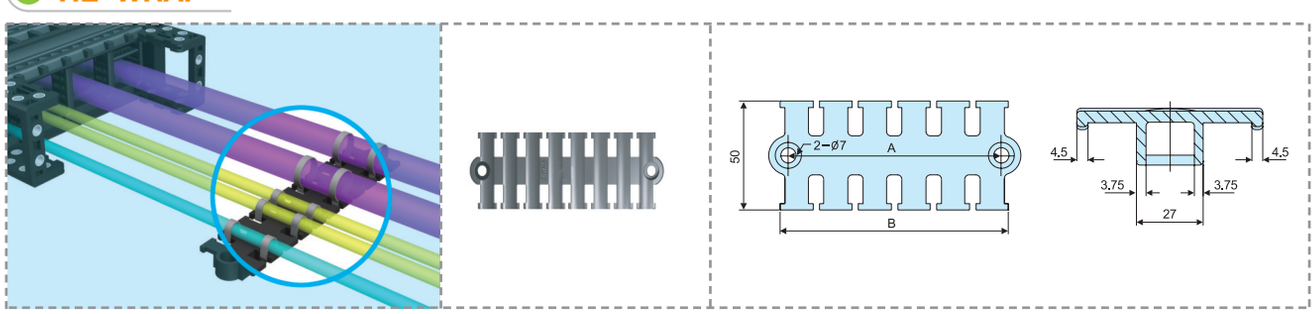
*Assemble divider every Two links.

SEPARATORS (SP)



Separator is available in length from 20mm to 200mm and can be cut every 5mm for use. The combined use of divider and sepatator with the pin creates the most effective cable pattern and keep insertion space for cables safely, so it protects the inserted cables.

TIE WRAP



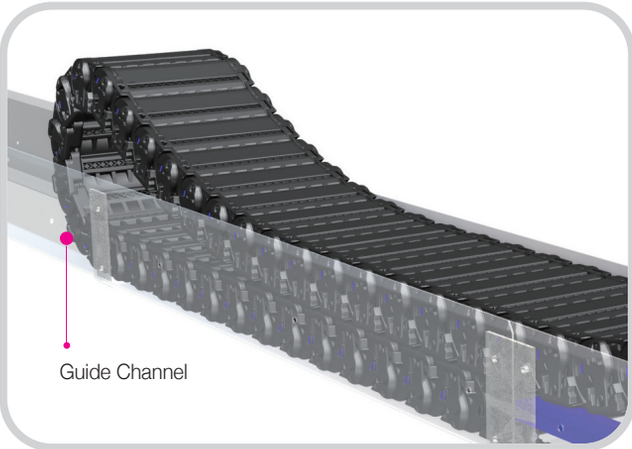
(Dimensions in mm)

Tie Wrap	050	075	100	125	150
A	58	75	98	122	141
B	65	82	105	129	148

The Tie Wrap separated from the Shift Chain bracket, when installed properly, protects the inserted cables from becoming entangled and twisted during operation

Enclosed Skid Type ST 095ES

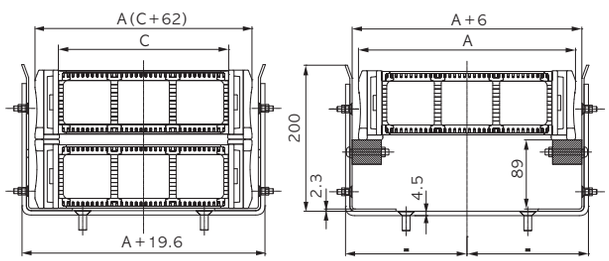
GUIDE CHANNEL



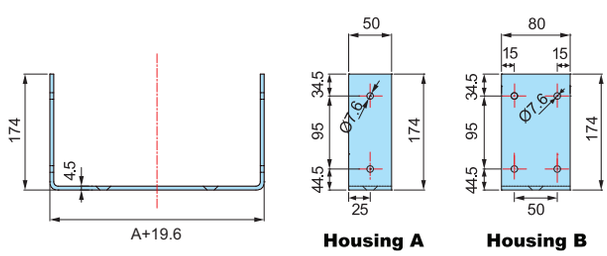
For long stroke applications the guide channel is applied to ensure that the Shift Chain Sliding Chain stays on track and to ensure safety during operation. With the application of a rubber pad on the channel floor, noise is reduced to a minimum. Guide Channels are made of Steel + Zn and can be customized with SUS material .

▶ Thickness can be changed by the product standards of material.

ST 095ES Type

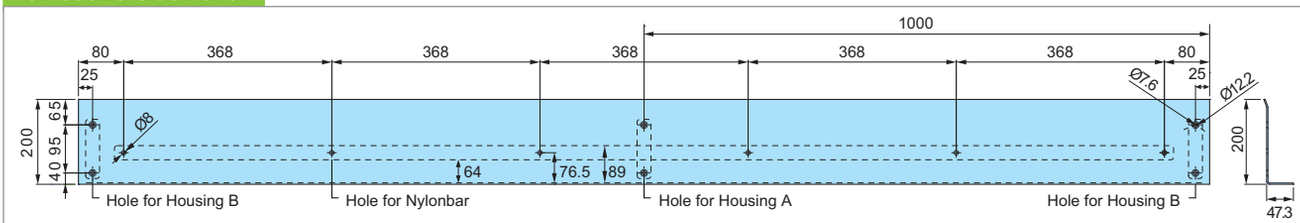


▲ A - zone ▲ C - zone



▲ Housing (U-shape) - ST 095ES

ST 095ES Side Panel



ORDERING

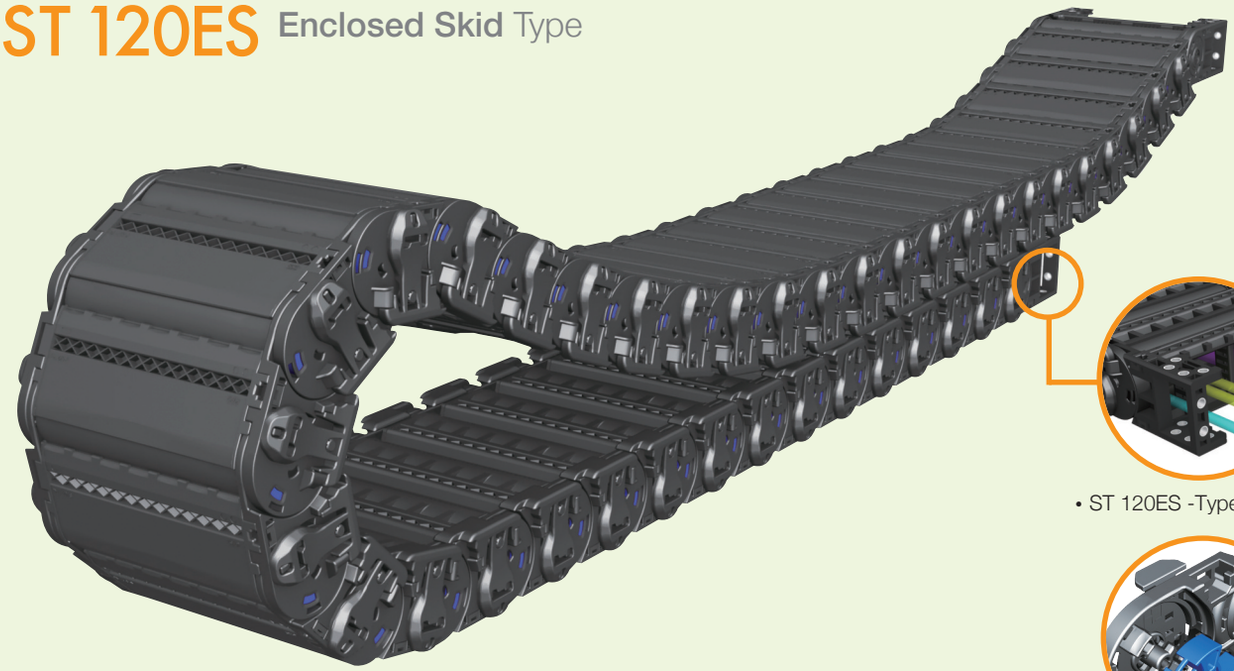
ST-GCS 095ES.175 / A, B, C : 200M

- Length(mm)
- Panel A, B, C-Zone
- Inside Width
- Chain Type
- Steel Guide Channel
- Shift Chain

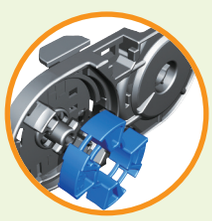
Min ●●●●●○ Max

Shift chain®

ST 120ES Enclosed Skid Type



• ST 120ES -Type Bracket •



• Bending Radius Unit •

MATERIAL

- **Chain material:**
  CPS-amide with glass fiber reinforced UL94-HB
- **Low Noise & Low Mote**
- **Temperature :** -30°C ~ +130°C
- **Coefficient of Friction :**
  0.3 ~ 0.4 μ
- **Applications**

  Facilities and equipments requiring a long travel distance as below; Gantry Robots, Robot Carriages, Automatic Welding Lines, Gantry Cranes, Gantry loader, etc.

  Shift Chain ES-Type can be found on car manufacturer's welding line, where excess material can damage your inserted cables.

- **Calculation of the chain length**

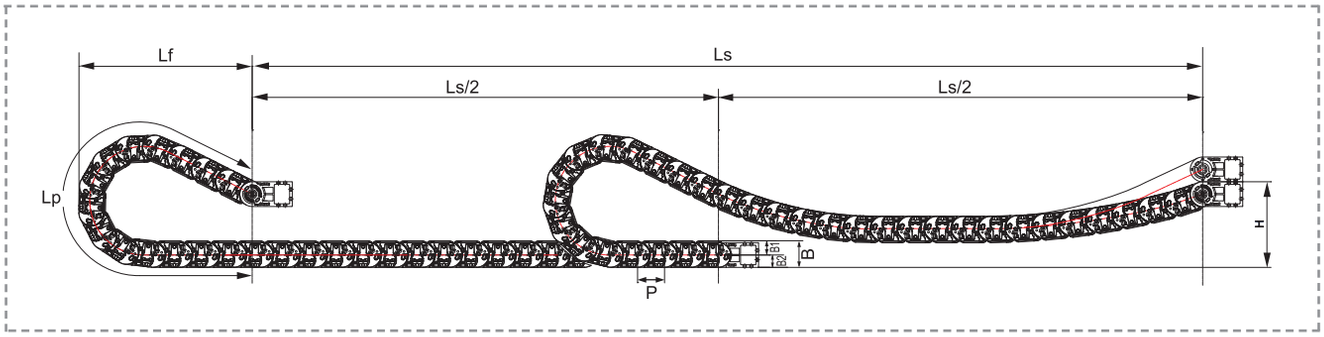
$$[\ L = \frac{Ls}{2} + Lp\ ]$$

Affer enclosed frame of sliding type, it can protect cable perfectly from outside, substance for iong distance application.

Enclosed Skid Type ST 120ES

LAYOUT OF THE CHAIN

Ls: Stroke **Lp:** Loop Length **Lf:** Loop Projection



(Dimensions in mm)

Bending radius R	200	250	300	350	400	500
Lp	1,559	1,864	2,178	2,701	3,225	4,062
L f	694	794	894	1,114	1,334	1,654
H	300	300	300	300	300	300

ST 120ES Type

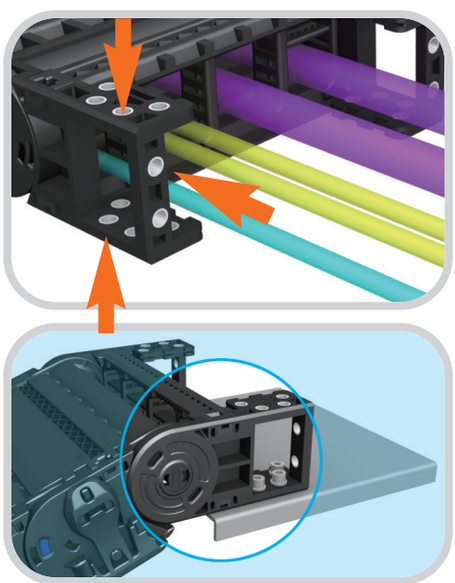
Pitch P: 120mm
Height B: 115mm
B1: 61mm
B2: 54mm

ORDERING

ST 120ES.300.R200 / F-10000L:10ST

- Q'ty(set)
- Length(mm)
- Free End Bracket
- Bending Radius
- Inside Width
- Enclosed Skid Type
- Shift Chain

BRACKET TYPE



FEB (Free End Bracket)

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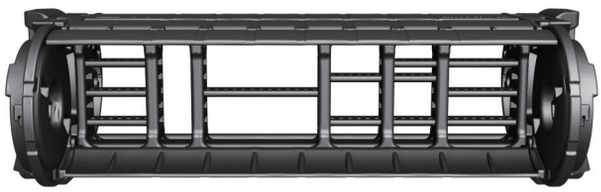
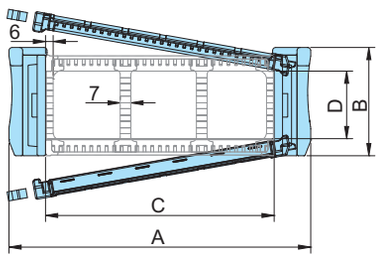
Enclosed Skid Type ST 120ES

CHAIN CROSS SECTION

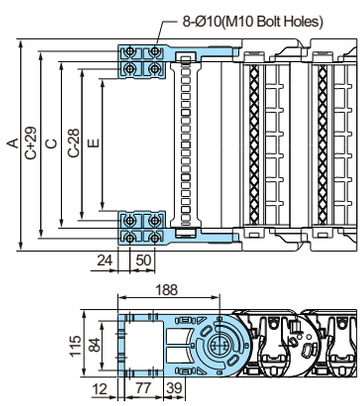




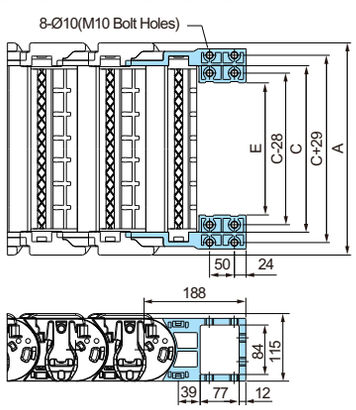
Chain Type	A	B	C	D	Bending Radius(R)	Weight in kg/m
ST 120ES.150	218	115	150	76	200, 250, 300, 350, 400, 500	6.28
ST 120ES.200	268		200			6.92
ST 120ES.250	318		250			7.56
ST 120ES.300	368		300			8.20

▲ Application of special frame. (C:115,240,290)

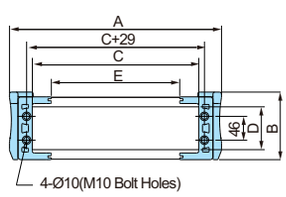
FREE END BRACKET



▲ Moving point



▲ Fixing point



▲ Front point

Chain Type	A	B	C	D	E	Hole Type
ST 120ES.150	218	115	150	76	90	M10 Bolt Holes
ST 120ES.200	268		200		140	
ST 120ES.250	318		250		190	
ST 120ES.300	368		300		240	

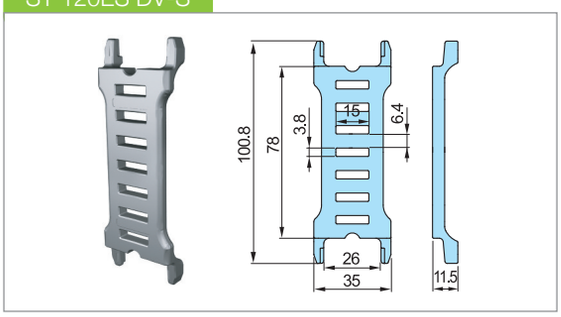
▲ Application of special frame. (C:115,240,290)

Enclosed Skid Type ST 120ES

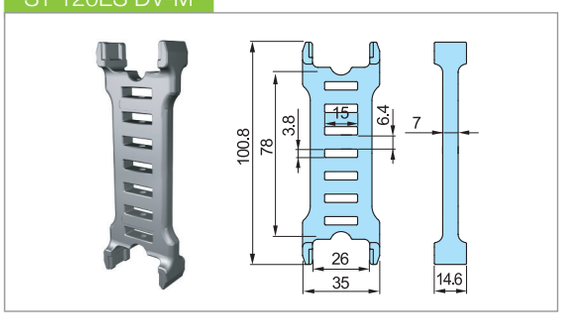
DIVIDERS

Dividers (Vertical) and Separators (Horizontal) divide the inner chamber of the cable chain to give each cable diameter its own center and keep the cables separated from each other. The use of separator in some cases, can also reduce the width requirements as two or more levels can be made within the same chamber. To prevent twisting or damage to the cables, as a rule, there needs to be at least 10% space between the inserted cable and its enclosure.

ST 120ES DV-S

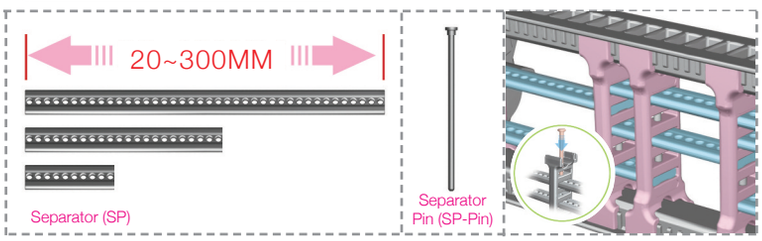


ST 120ES DV-M



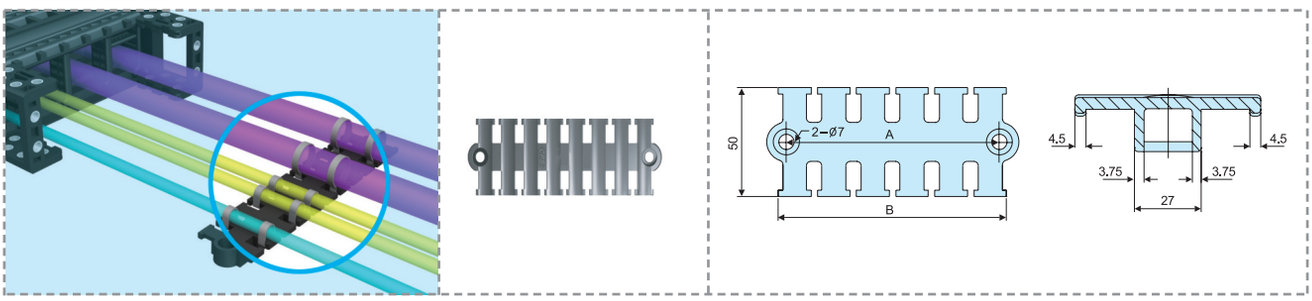
*Assemble divider every Two links.

SEPARATORS (SP)



Separator is available in length from 20mm to 300mm and can be cut every 5mm for use. The combined use of divider and sepatator with the pin creates the most effective cable pattern and keep insertion space for cables safely, so it protects the inserted cables.

TIE WRAP



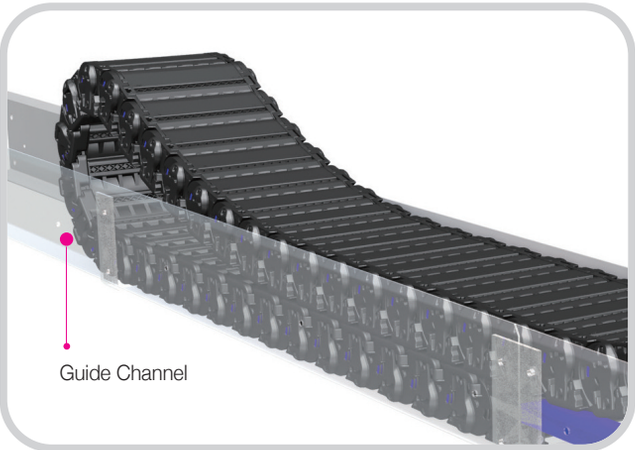
(Dimensions in mm)

Tie Wrap	050	075	100	125	150
A	58	75	98	122	141
B	65	82	105	129	148

The Tie Wrap separated from the Shift Chain bracket, when installed properly, protects the inserted cables from becoming entangled and twisted during operation

Enclosed Skid Type ST 120ES

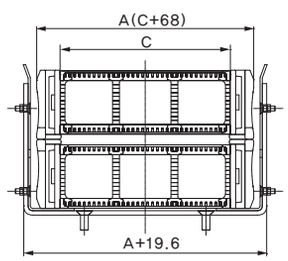
GUIDE CHANNEL



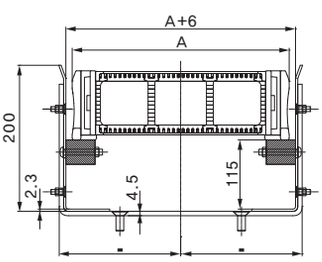
For long stroke applications the guide channel is applied to ensure that the Shift Chain Sliding Chain stays on track and to ensure safety during operation. With the application of a rubber pad on the channel floor, noise is reduced to a minimum. Guide Channels are made of Steel + Zn and can be customized with SUS material .

▶ Thickness can be changed by the product standards of material.

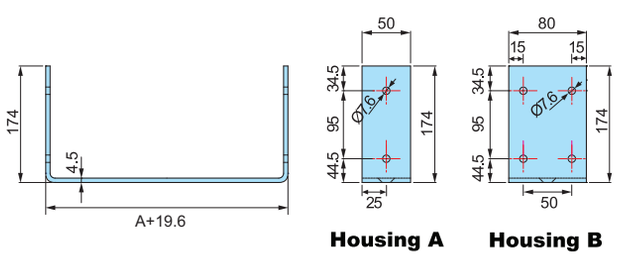
ST 120ES Type



▲ A - zone

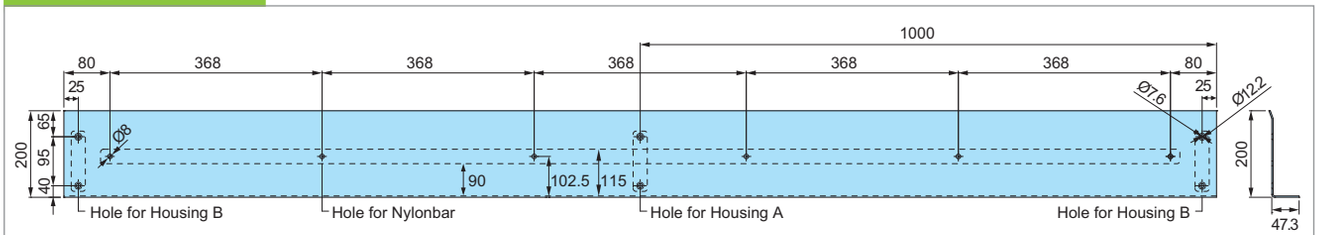


▲ C - zone



▲ Housing (U-shape) - ST 120ES

ST 120ES Side Panel



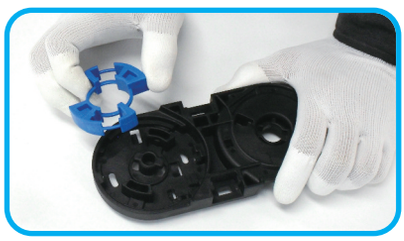
ORDERING

ST-GCS 120ES.200 / A, B, C : 200M

- Length(mm)
- Panel A, B, C-Zone
- Inside Width
- Chain Type
- Steel Guide Channel
- Shift Chain

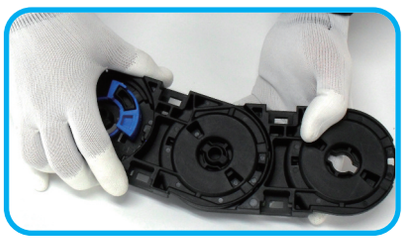
ASSEMBLY PROCEDURE / ENCLOSED SKID Type

Assembly procedure of Shift chain ES-type is as follows. The assembling process of shift Chain ES Type is like below and you must use rubber hammer with careful combination of Divider and Separator.
(Disassembly process for repair and replacement are in reverse order)



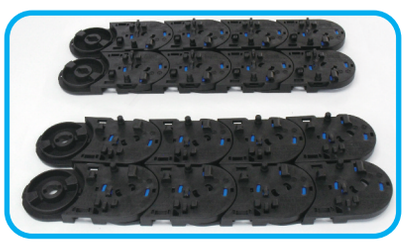
1.

Insert BR Unit into each Side Band.
(Side Band is divided into right and left side according to the direction.)



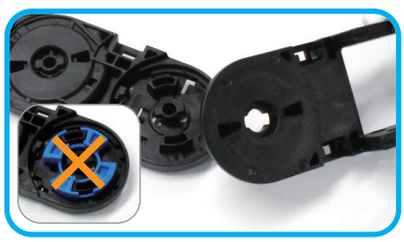
2.

Continue to insert BR Unit into Side Band as you want to make it. Assemble Side Band which is inserted BR Unit as above.



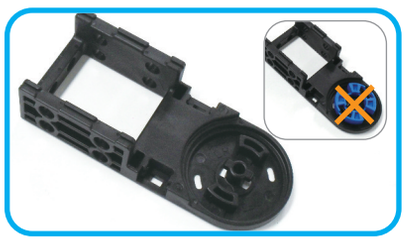
3.

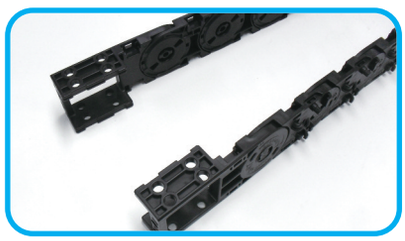
Continue to connect each Side Band as long as you want to make it.
Connect the Side Band as many as you need.



4.

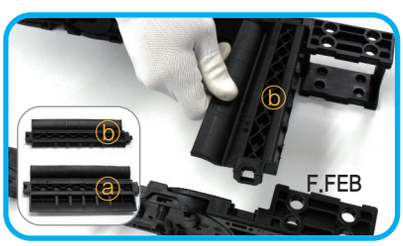
Assemble the F.FEB according to the direction of right and left side.
-Do not insert the BR Unit to Side Band connected to F.FEB (Side of F.FEB is not enclosed.)





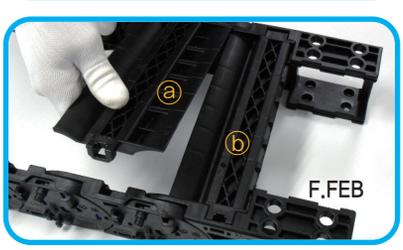
5.

Do not insert a BR to M.FEB. (M.FEB will be making a turn to up and down) Assemble the M.FEB according to the direction of right and left side. (Side of M.FEB is not enclosed)



6.

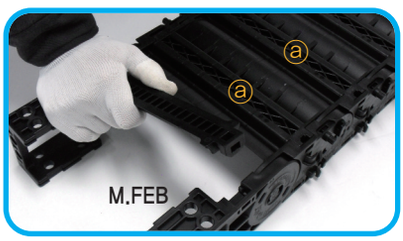
Insert one ⓑ Shaped-FRD into F.FEB.
[ⓐ: Normal FRD ⓑ: Built-up only for F.FEB]
-Find one ⓑ shaped-FRD and insert it with the hinge facing RH direction, as above.



7.

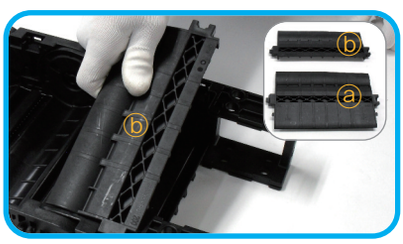
Continue to insert the FRD(ⓐ -Normal FRD)with the hinge facing RH direction,
-Assemble the from F.FEB to M.FEB in order.

ASSEMBLY PROCEDURE / ENCLOSED SKID Type



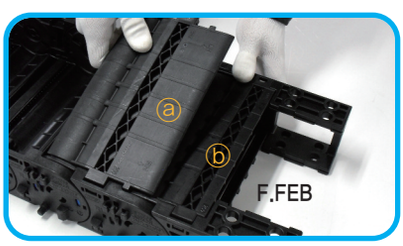
8.

Insert the frame as many as you need and insert them one by one with the hinge facing RH direction, as above.(M.FEB is not turned to up and down when FRD assembling))



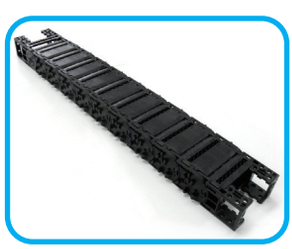
9.

Insert the ⓑ shaped-FRD inserted to F.FEB and insert it with the hinge facing RH direction, as above. (ⓐ: Normal FRD ⓑ: Built-up only for F.FEB) Insert the divider with separator to divide the inside of chain.



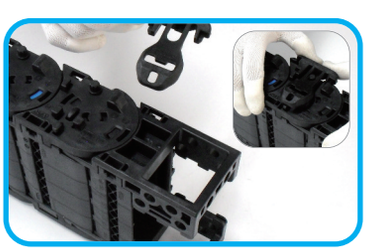
10.

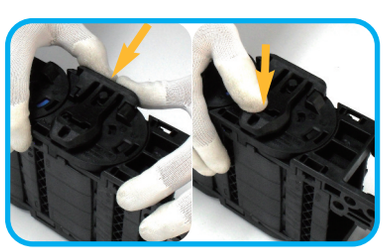
Continue to insert the FRU(ⓐ: Normal FRU)with the hinge facing RH direction,
-Assemble the from F.FEB to M.FEB in order.



11.

Insert ⓐNormal FRU as many as you need and insert them one by one with the hinge facing RH direction, as above. Insert Frame-pin into the hole which is seen where the end of FRU and Side Band meet. (M.FEB is not turning to up and down) when FRU assembling) Check that FRU and FRD are assembled correctly.



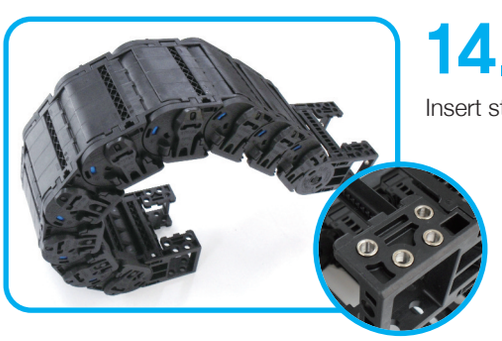


12.

Insert Skid into mounted Side Band.
Insert Skid into groove of Side Band until you hear the"click".
(Skid is also divided into LH and RH)

13.

Insert the Skid to all Side band in same way.
Insert the Skid to opposite side of each Side Band in the same way.



14.

Insert steel washers into M.FEB and F.FEB.