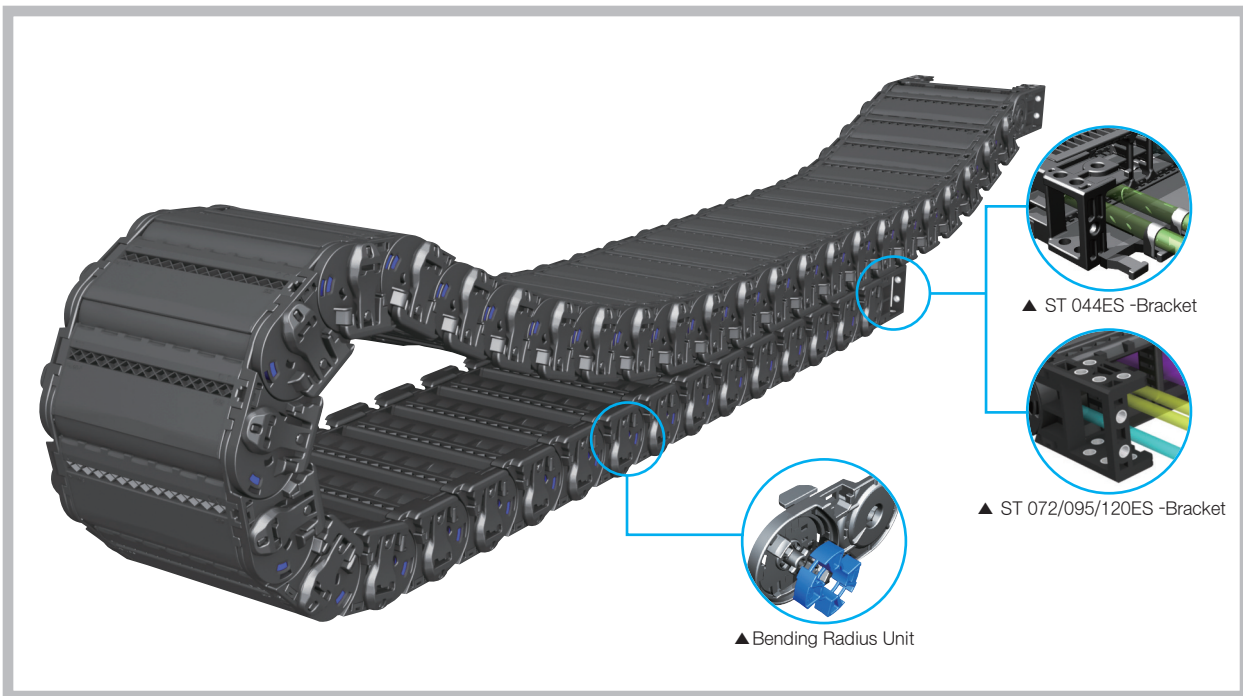


# Shift chain<sup>®</sup>

## ST - ES : ENCLOSED SKID TYPE

- |           |      |
|-----------|------|
| ■ ST044ES | 125p |
| ■ ST072ES | 130p |
| ■ ST095ES | 135p |
| ■ ST120ES | 140p |

## ST 044ES, 072ES, 095ES, 120ES | ENCLOSED SKID Type



- Chain material  
: CPS-amide, UL94-HB
- Temperature  
: -30°C ~ +130°C
- Speed  
: 3m / sec
- Acceleration  
: 10m / s<sup>2</sup>

### ■ Calculation of the chain length

$$\left[ L = \frac{L_s}{2} + L_p \right]$$

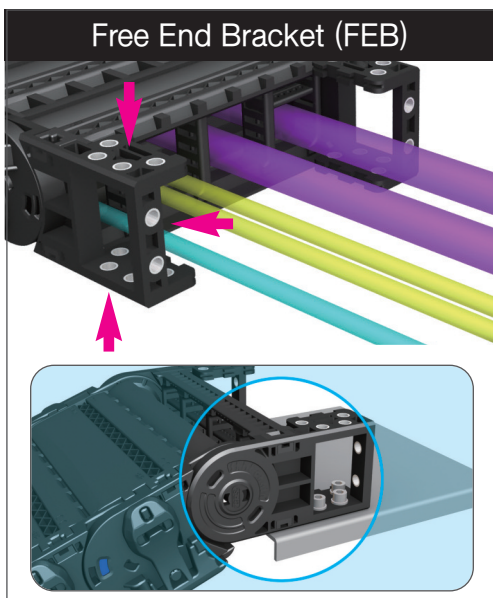
### ■ Coefficient of Friction

: 0.3 ~ 0.4μ

### ■ 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 in serted cables.

## 📌 BRACKET TYPE



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(ST072, 095, 120ES).

- ▶ 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.

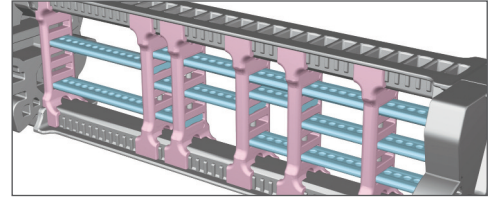
! Above products are patent registered item which can be protected by industrial property right.



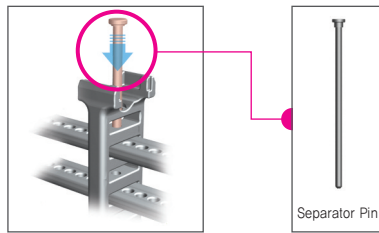
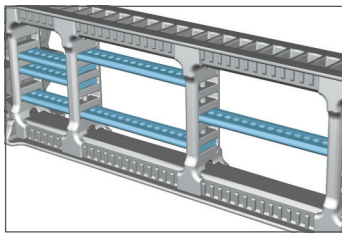


## ⇩ DIVIDERS

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 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.

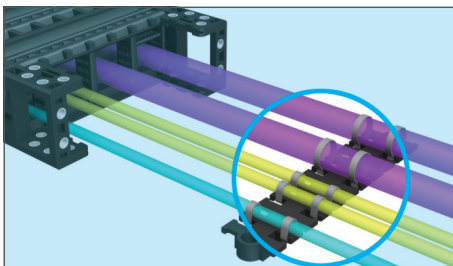


## ⇩ SEPARATORS



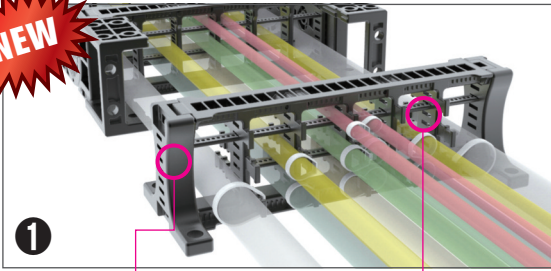
Separator is available in length from 20mm to 300mm and can be cut every 5mm for use. The combined use of divider and separator with the pin creates the most effective cable pattern and keep insertion space for cables safely, so it protects the inserted cables.

## ⇩ TIE WRAP

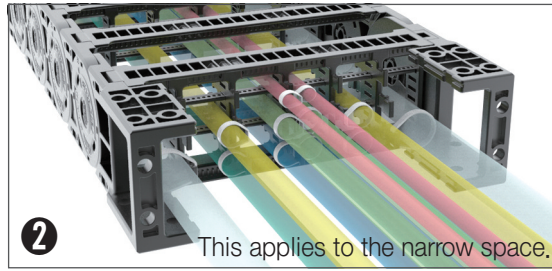


The Tie wrap separated from the Shift Chain bracket, when installed properly, protects the inserted cables from becoming entangled and twisted during operation. There are two types in the tie wrap; Attached & Unattached to the bracket.

## SYSTEM TIE WRAP



1

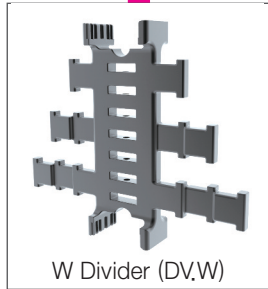


2

This applies to the narrow space.



End Bracket (STW,EB)

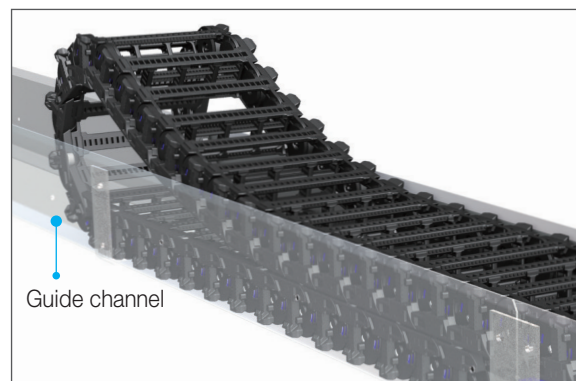


W Divider (DV,W)

System-Tie Wrap has to be assembled on fixing and moving point of bracket and can be assembled without any tie wrap plate. This tie wrap is used to stay the cables on several floors prevent the cables from being twisting and it can also be assemble without any tools or bolt. This tie wrap has two types, one is 1 outside the other one is 2 to assemble inside bracket.

## GUIDE CHANNEL

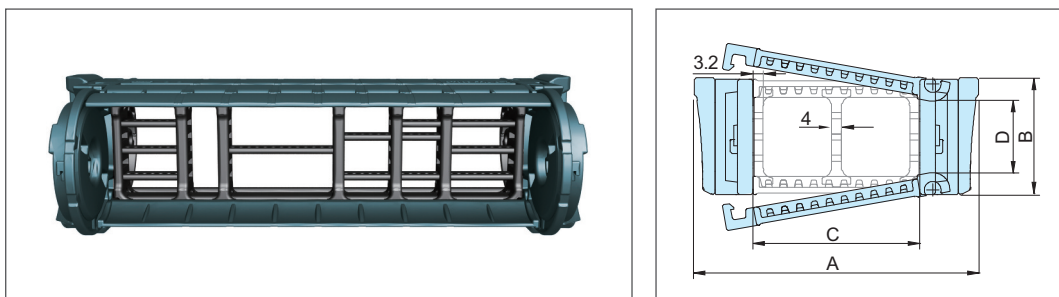
For long stroke applications the guide channel is applied to ensure that the nsb chain ES-Type stays on track and to ensure safety during operation. With the application of a rubber pad on the channel floor, noise is reduced to a minimum. Guide channels are made of Steel+Zn and can be customized with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



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

# ST 044ES | Enclosed Skid Type

## CHAIN CROSS SECTION

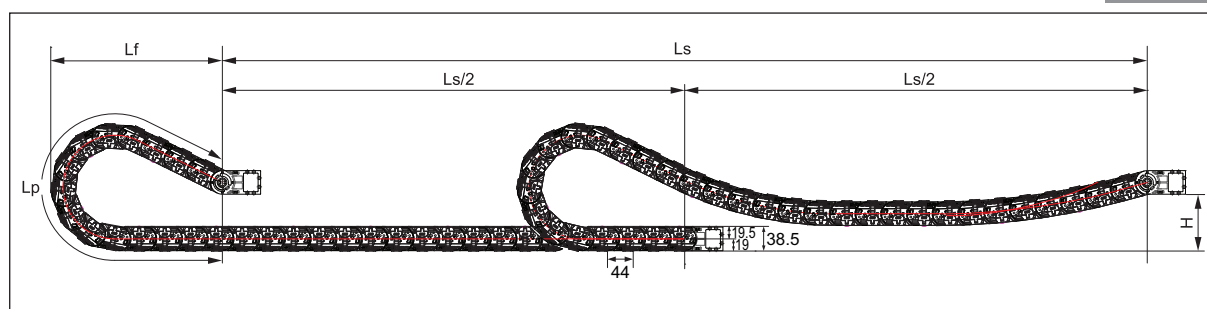


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 044ES	74	38,5	35	26	1,18
	94		55		1,37
	114		75		1,53
	139		100		1,74

(Dimensions in mm)

## LAYOUT OF THE CHAIN

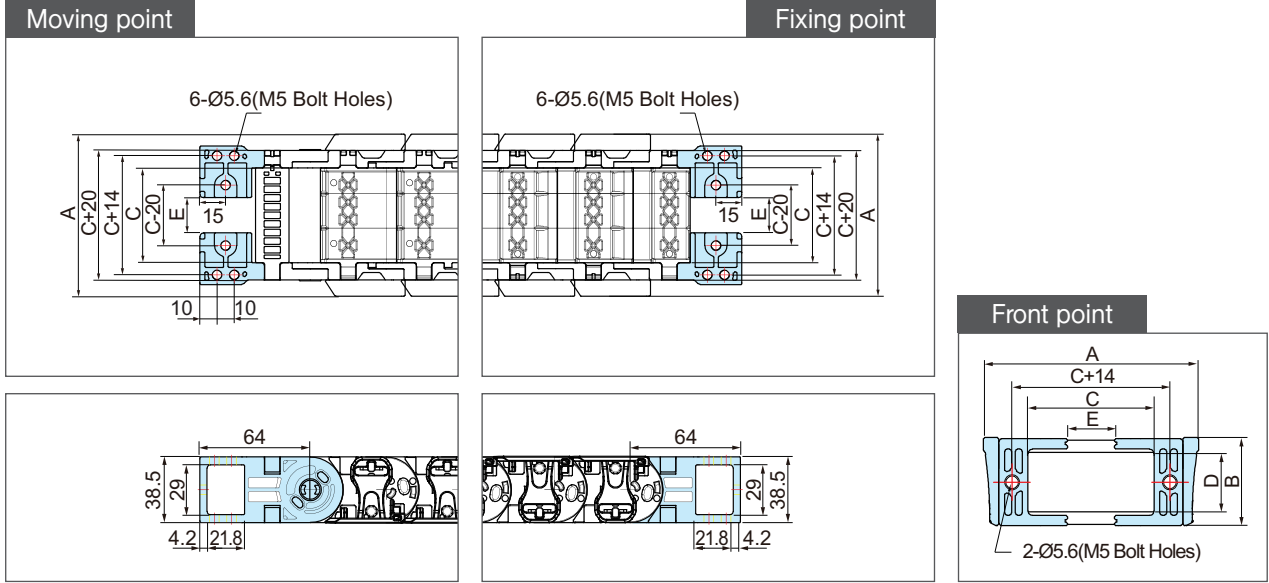
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
70	544	249	110
90	662	289	
120	926	393	
150	1,190	497	

(Dimensions in mm)

## FREE END BRACKET



Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	E M,EB Bolt hole width	Hole Type
ST 044ES	74	38.5	35	26	0.4	M5 Bolt Holes
	94		55		20.4	
	114		75		40.4	
	139		100		65.4	

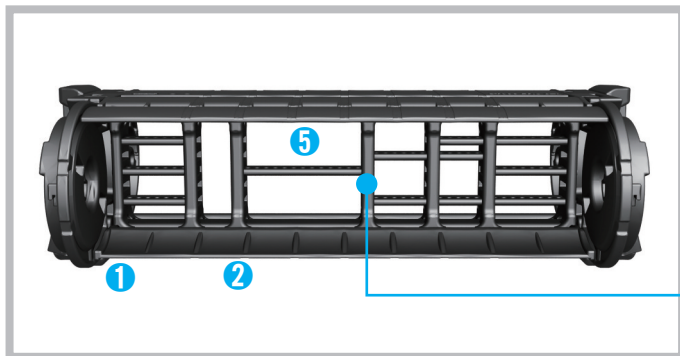
(Dimensions in mm)

## ORDERING

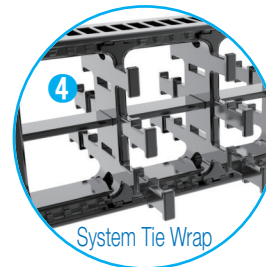
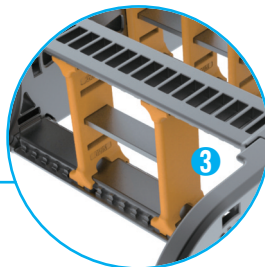
### ST 044ES. 100. R120 / F - 1500L : 10ST



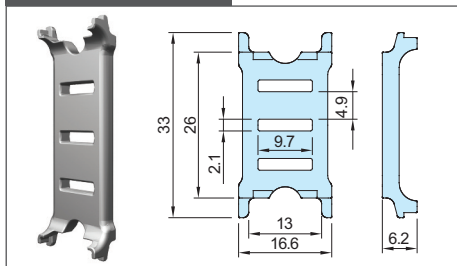
## ⇩ DIVIDERS (DV)



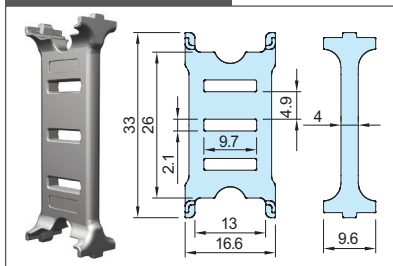
Assemble divider every Two links.  
 DV.M : Separated with open pin type and closed.  
 DV.W : Applicable to System Tie Wrap or FEB.



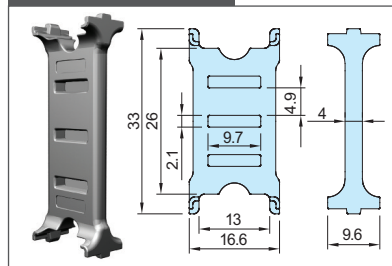
1 DV05.S



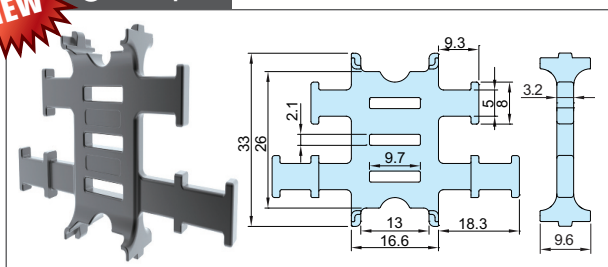
2 DV05.M1



3 DV05.M2

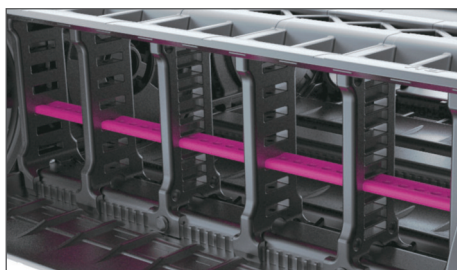


4 DV05.W

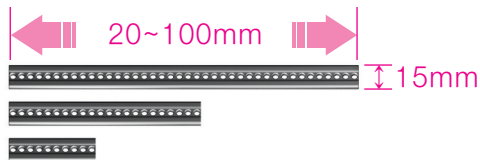


(Dimensions in mm)

## ⇩ SEPARATORS (SP)



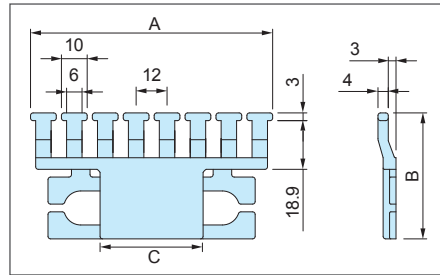
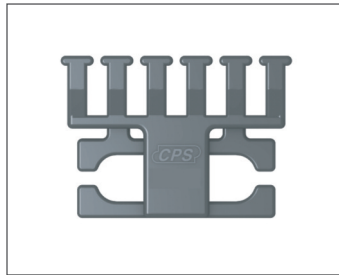
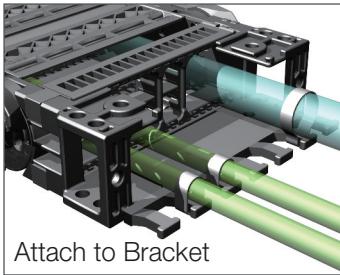
5 SP01 : Can order according to desired length of section.



Chain Type	Ordering NO.	Frame
ST 044ES	SP01.035	35
	SP01.055	55
	SP01.075	75
	SP01.100	100

(Dimensions in mm)

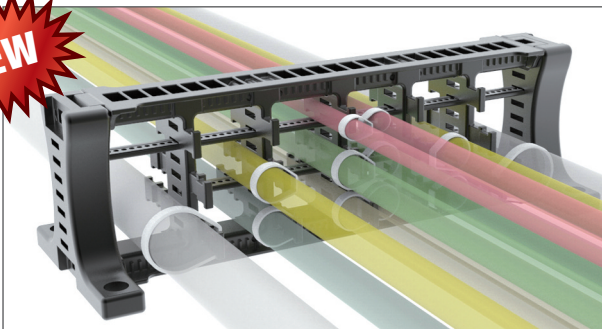
## ⇩ TIE WRAP (TW)



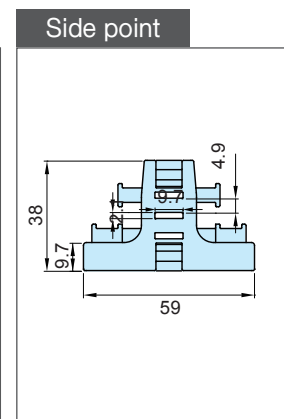
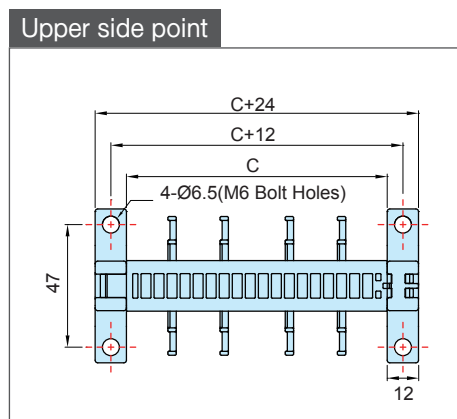
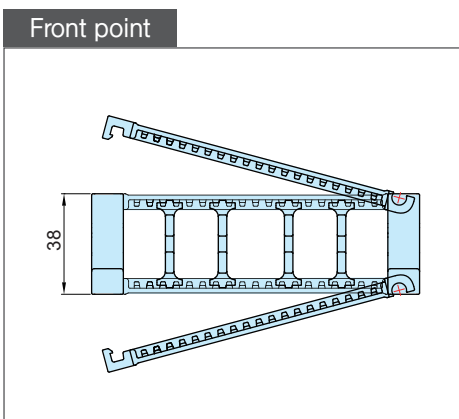
Chain Type	Ordering NO.	A	B	C
ST 044ES	TW03.035	46	35.4	-
	TW03.055	70	48.9	20
	TW03.075	94	48.9	40
	TW03.100	118	48.9	65

(Dimensions in mm)

## ⇩ SYSTEM TIE WRAP (STW)



Size of separator and divider will change according to the size of frame and cables(hose).

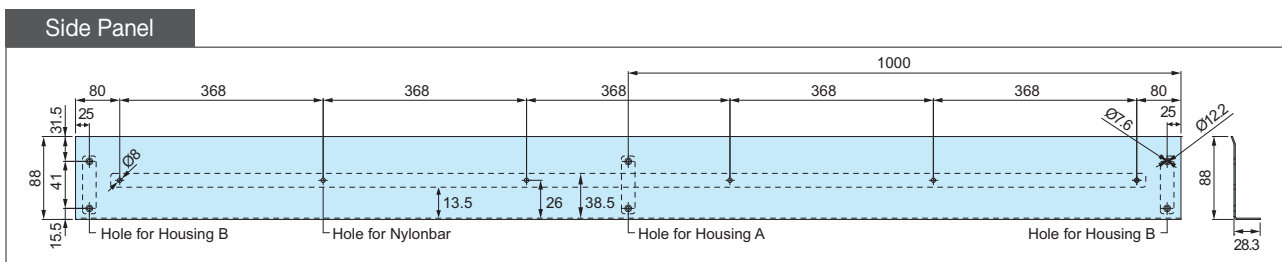
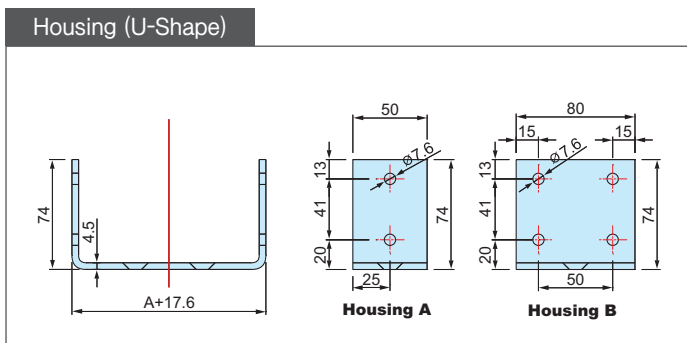
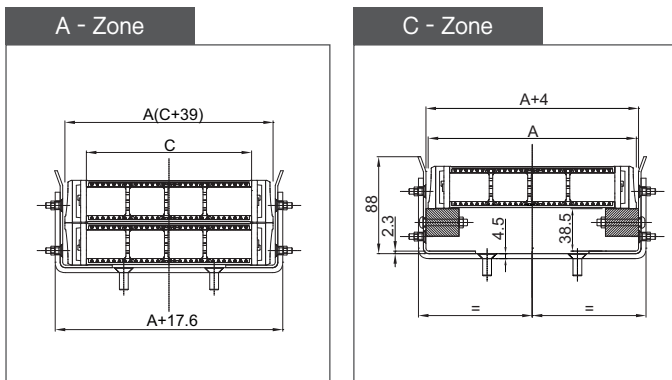


Chain Type	Ordering NO.	C Frame	Hole Type
ST 044ES	STW01.035	35	M6 Bolt Holes
	STW01.055	55	
	STW01.075	75	
	STW01.100	100	

(Dimensions in mm)



## GUIDE CHANNEL



(Dimensions in mm)

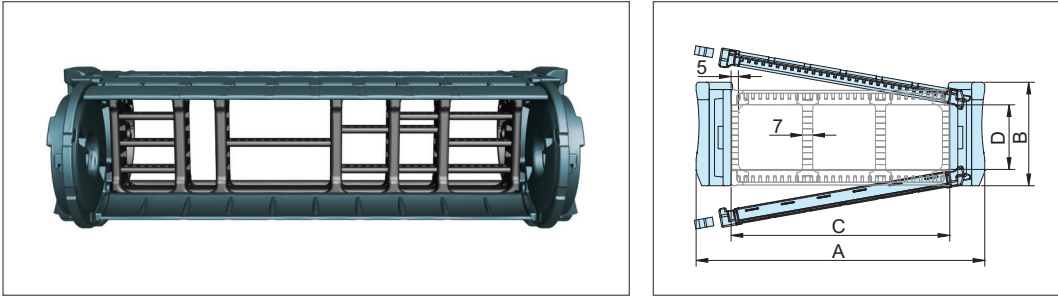
## GUIDE CHANNEL ORDERING

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



## ST 072ES | Enclosed Skid Type

### CHAIN CROSS SECTION

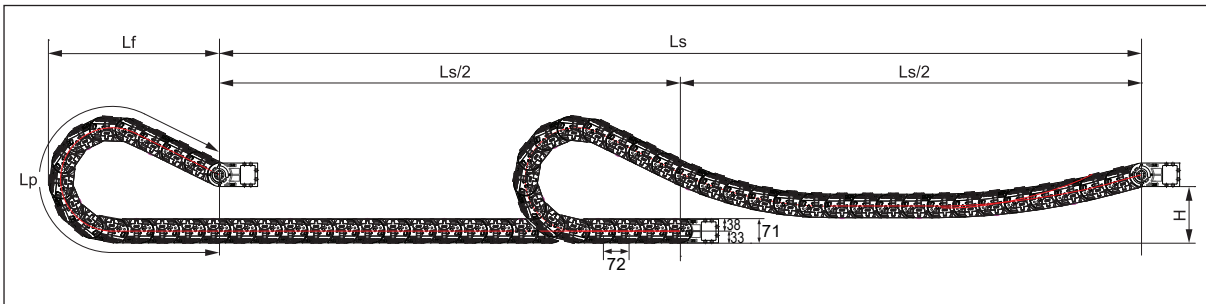


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 072ES	105	71.8	50	44	2.77
	130		75		3.01
	155		100		3.25
	180		125		3.49
	205		150		3.73

(Dimensions in mm)

### LAYOUT OF THE CHAIN

Ls: Stroke

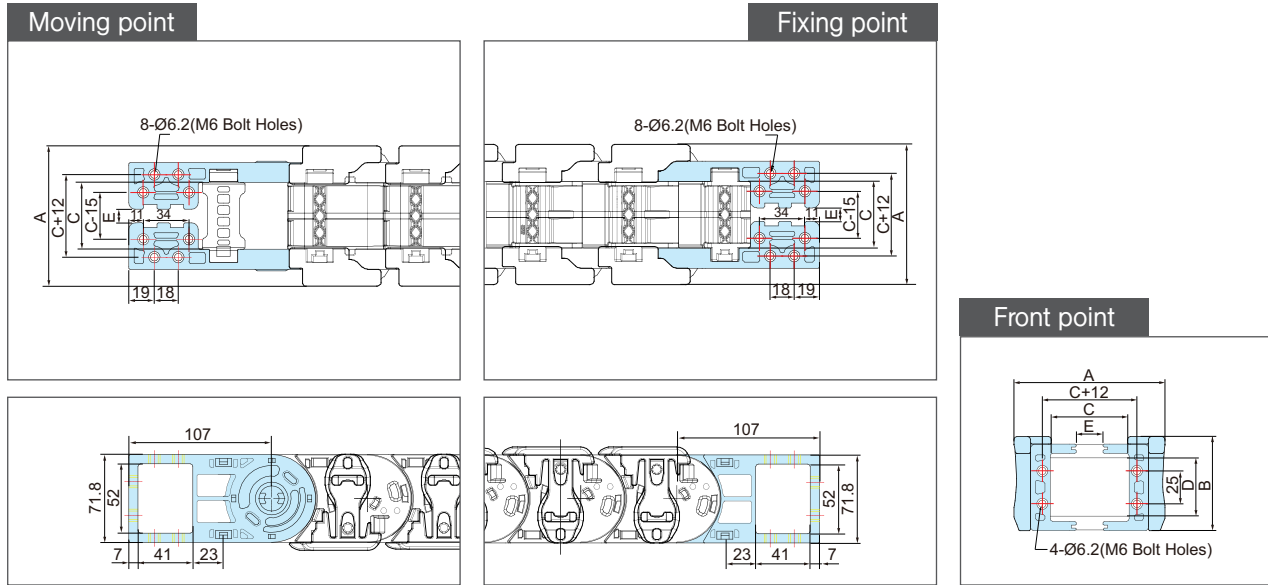


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
120	917	420	180
145	1,063	470	
200	1,400	580	
250	1,840	752	
300	2,280	924	

(Dimensions in mm)



## FREE END BRACKET



Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	E M,EB Bolt hole width	Hole Type
ST 072ES	105	71.8	50	44	10	M6 Bolt Holes
	130		75		35	
	155		100		60	
	180		125		85	
	205		150		110	

(Dimensions in mm)

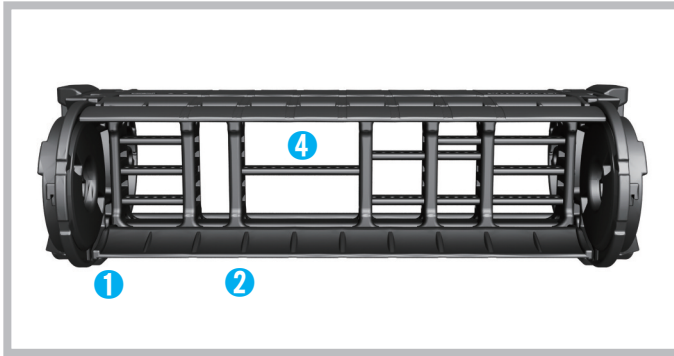
## ORDERING

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

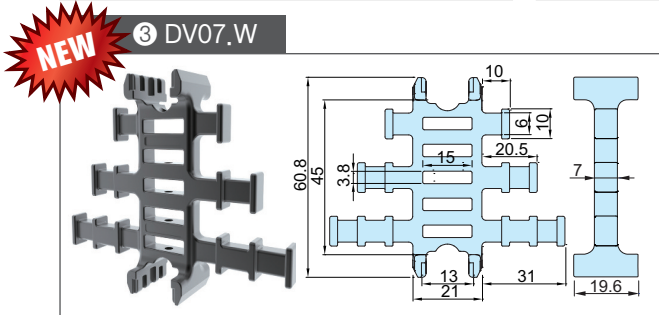
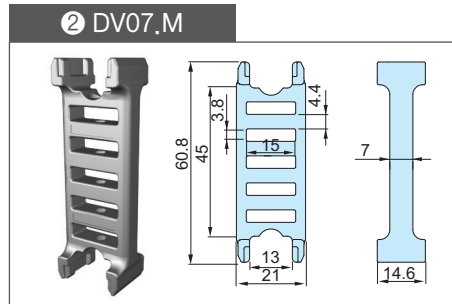
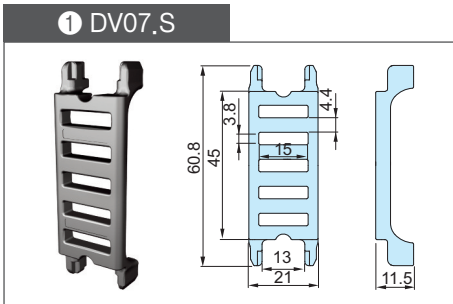
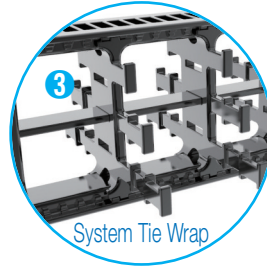


- Q'ty(set)
- Length(mm)
- Bracket Type
- F : Free End Bracket
- T : Tie Wrap
- S : System Tie Wrap
- Bending Radius
- Inside Width
- Skid Type (S)
- Shift Chain

## ⇩ DIVIDERS (DV)

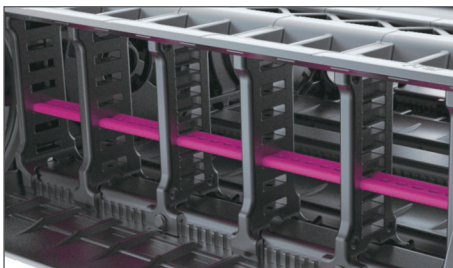


Assemble divider every Two links.  
DV,W : Applicable to System Tie Wrap or FEB.

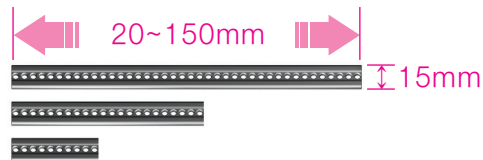


(Dimensions in mm)

## ⇩ SEPARATORS (SP)

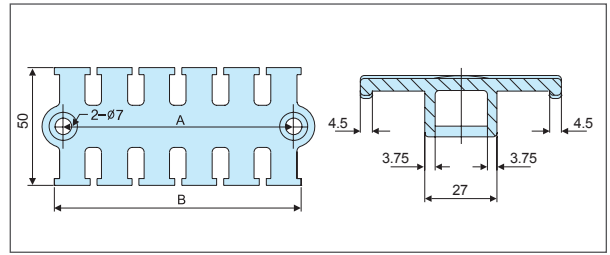
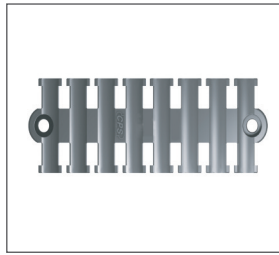
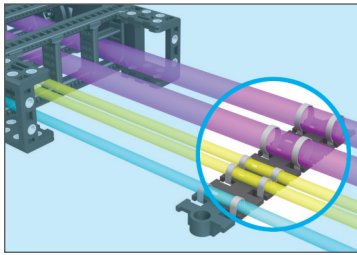


**4 SP02** : Can order according to desired length of section.





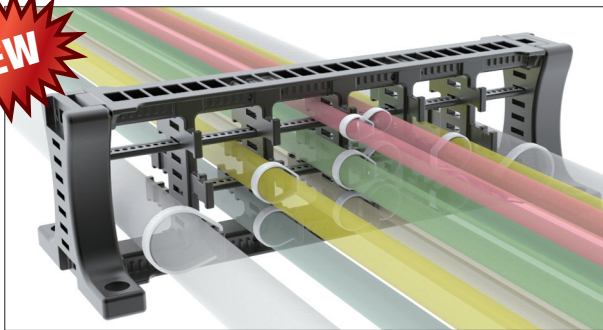
## TIE WRAP (TW)



Chain Type	Ordering NO.	A	B
ST 072ES	TW05.050	58	65
	TW05.075	75	82
	TW05.100	98	105
	TW05.125	122	129
	TW05.150	141	148

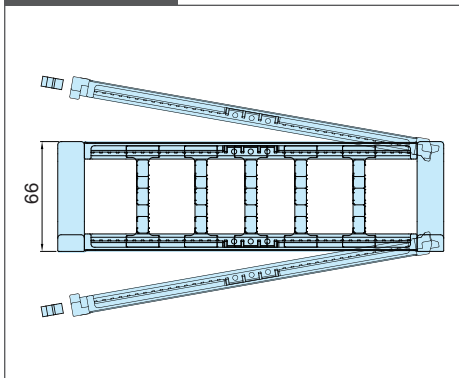
(Dimensions in mm)

## SYSTEM TIE WRAP (STW)

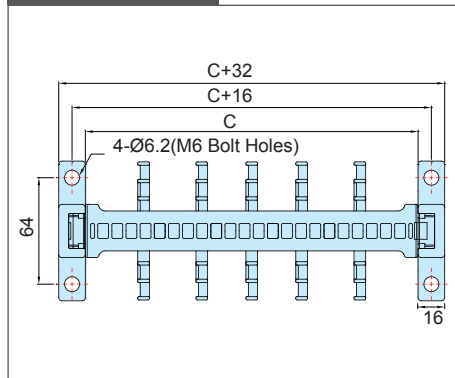


Size of separator and divider will change according to the size of frame and cables (hose).

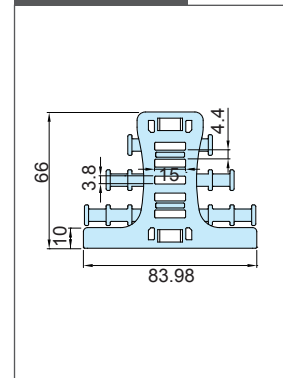
Front point



Upper side point



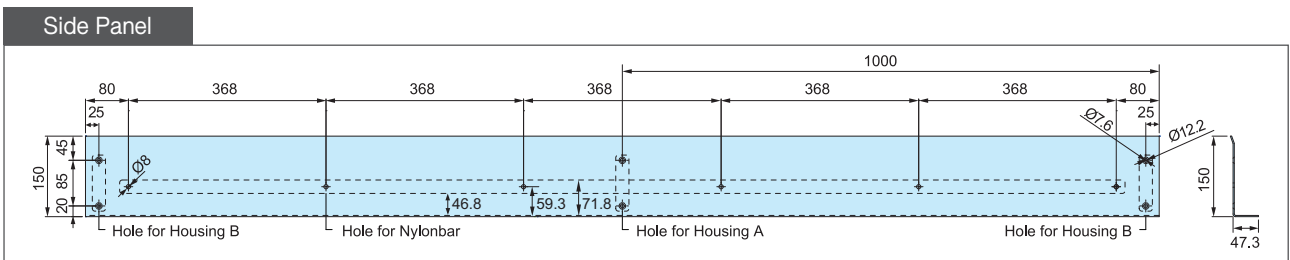
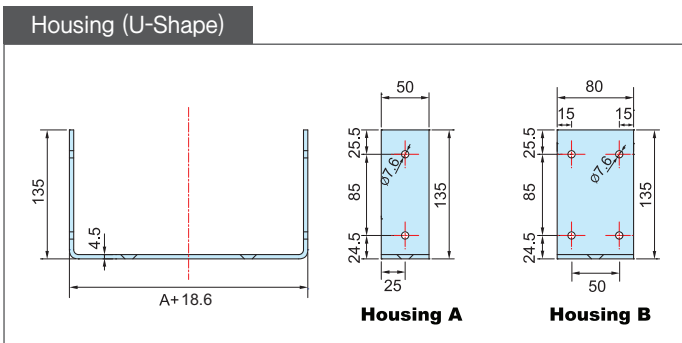
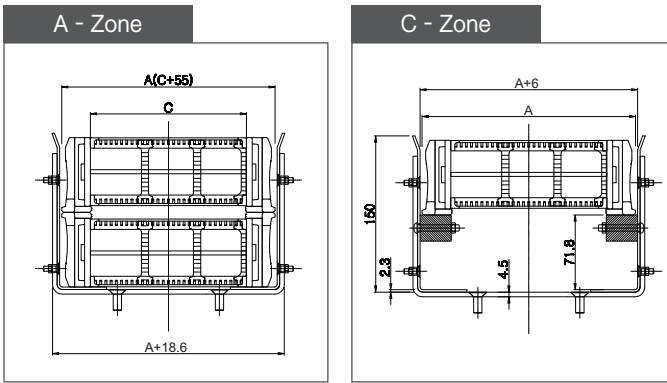
Side point



Chain Type	Ordering NO.	C Frame	Hole Type
ST 072ES	STW03.050	50	M6 Bolt Holes
	STW03.075	75	
	STW03.100	100	
	STW03.125	125	
	STW03.150	150	

(Dimensions in mm)

## GUIDE CHANNEL



(Dimensions in mm)

## GUIDE CHANNEL ORDERING

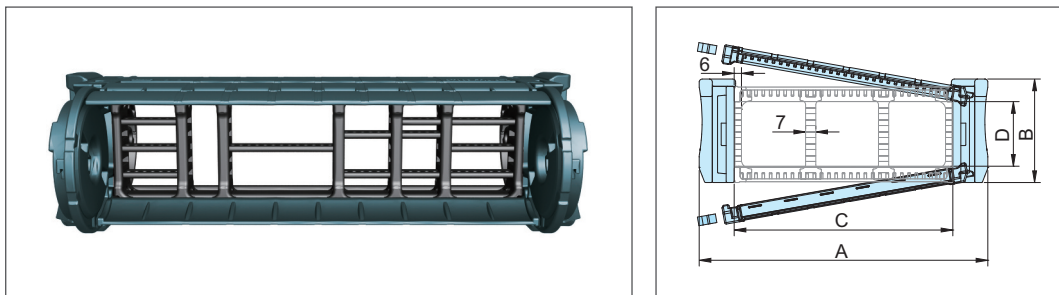
### ST-GCS 072ES. 150 / A,C : 200M





# ST 095ES | Enclosed Skid Type

## CHAIN CROSS SECTION

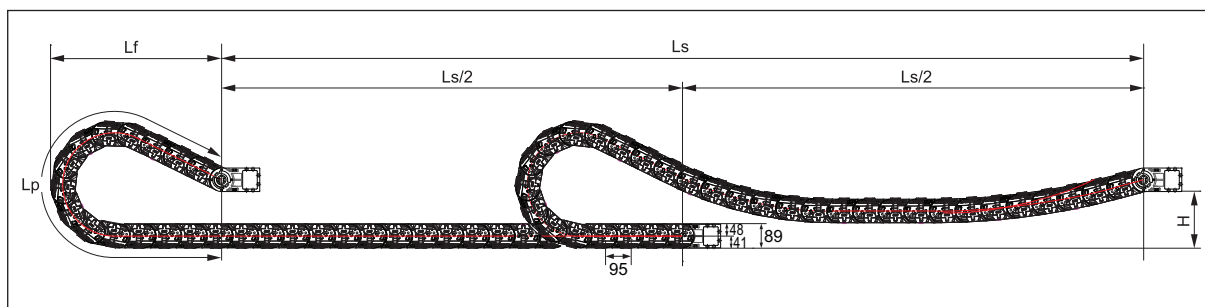


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 095ES	162	89	100	55	4,16
	187		125		4,41
	212		150		4,65
	237		175		4,90
	262		200		5,15

(Dimensions in mm)

## LAYOUT OF THE CHAIN

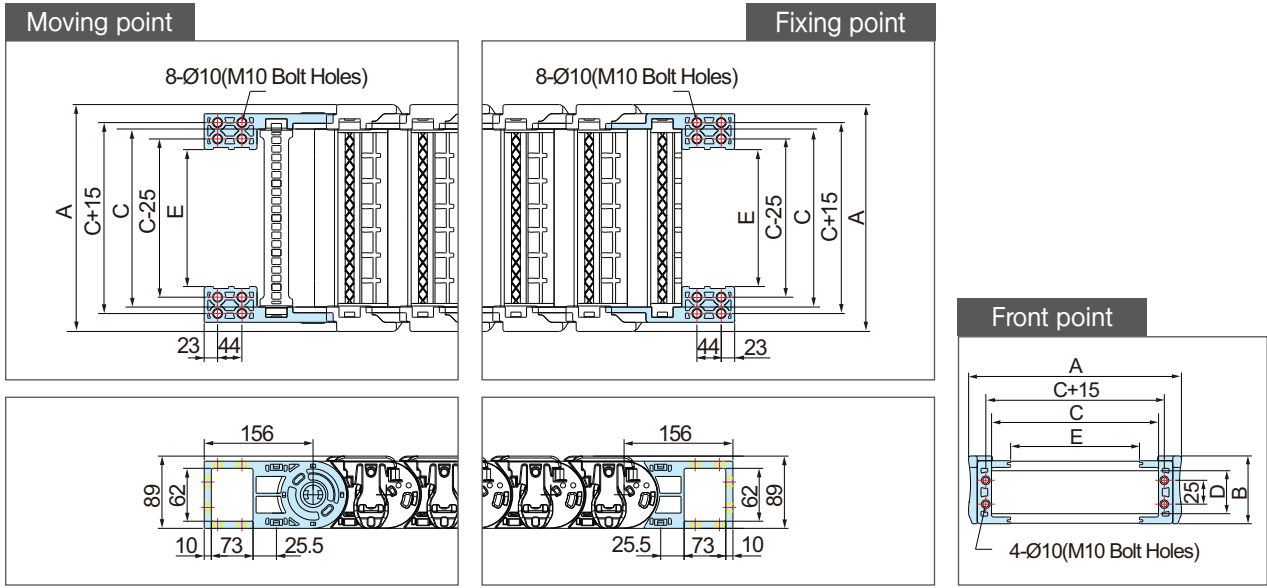
Ls: Stroke



Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
150	1,178	534	210
200	1,479	634	
230	1,666	694	
280	2,146	889	
400	3,232	1,319	

(Dimensions in mm)

## FREE END BRACKET



Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	E M,EB Bolt hole width	Hole Type
ST 095ES	162	89	100	55	49	M10 Bolt Holes
	187		125		74	
	212		150		99	
	237		175		124	
	262		200		149	

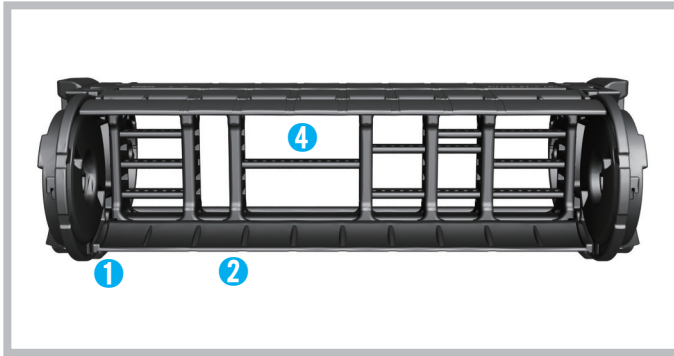
(Dimensions in mm)

## ORDERING

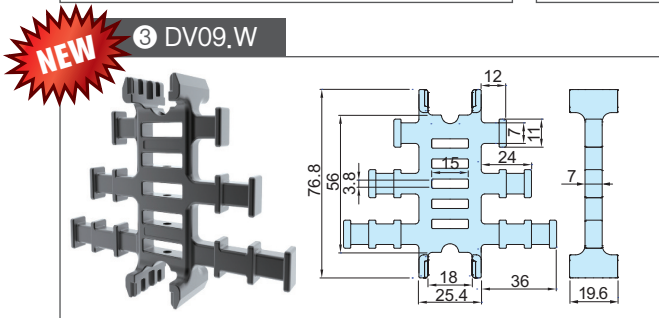
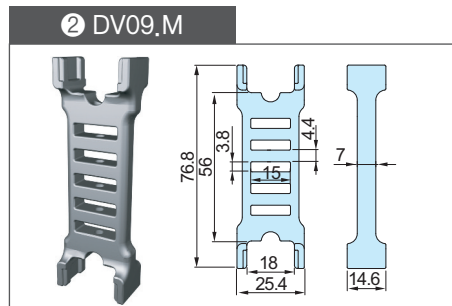
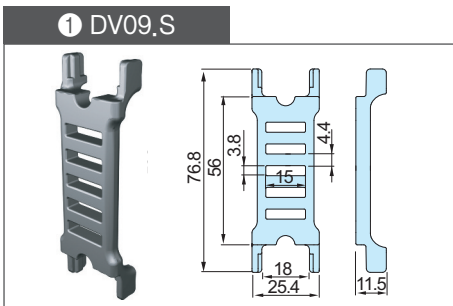
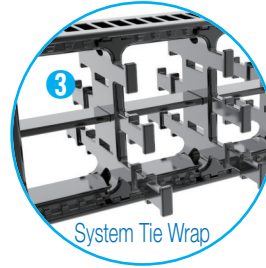
### ST 095ES. 200. R200 / F - 10000L : 10ST



## ⇩ DIVIDERS (DV)

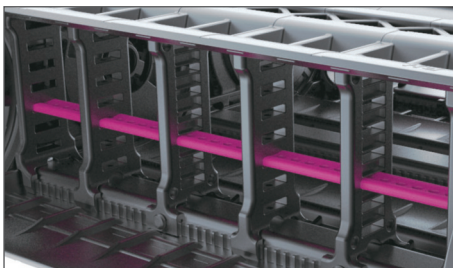


Assemble divider every Two links.  
DV,W : Applicable to System Tie Wrap or FEB.

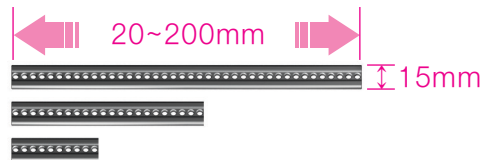


(Dimensions in mm)

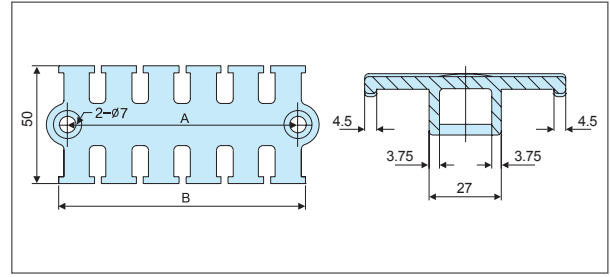
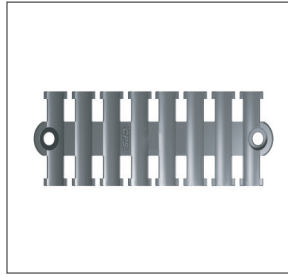
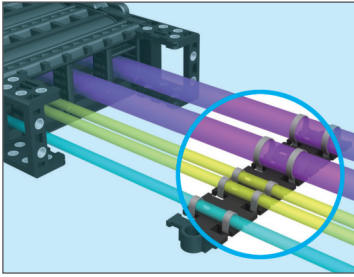
## ⇩ SEPARATORS (SP)



**4 SP02** : Can order according to desired length of section.



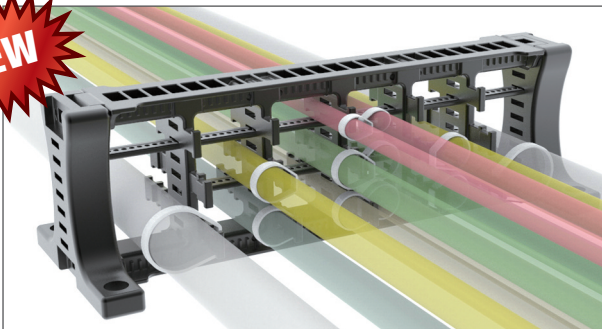
## TIE WRAP (TW)



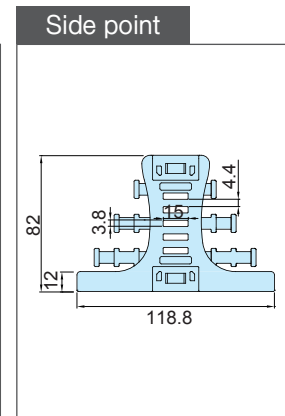
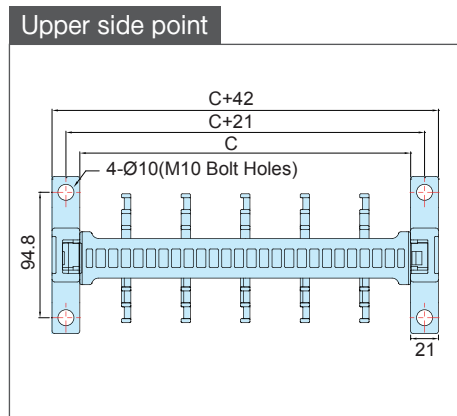
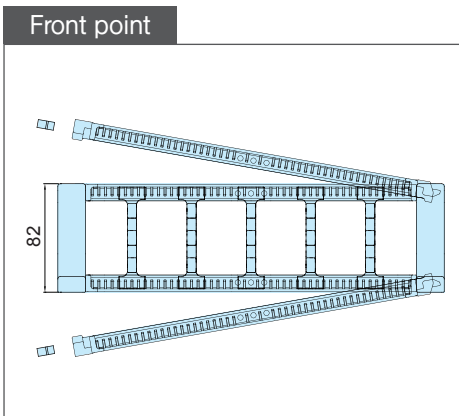
Chain Type	Ordering NO.	A	B
ST 095ES	TW05.050	58	65
	TW05.075	75	82
	TW05.100	98	105
	TW05.125	122	129
	TW05.150	141	148

(Dimensions in mm)

## SYSTEM TIE WRAP (STW)



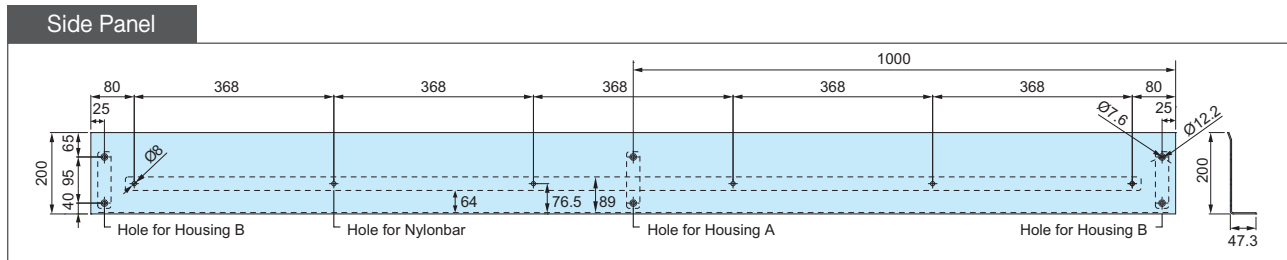
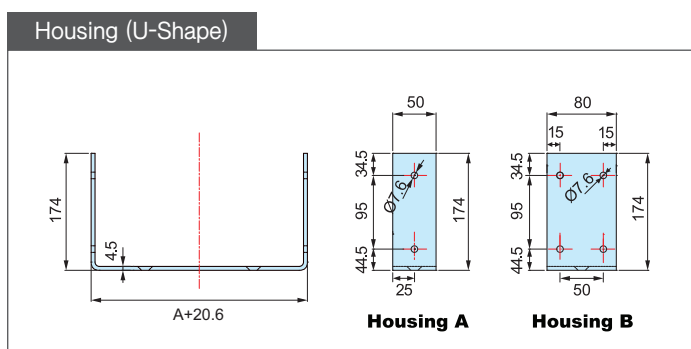
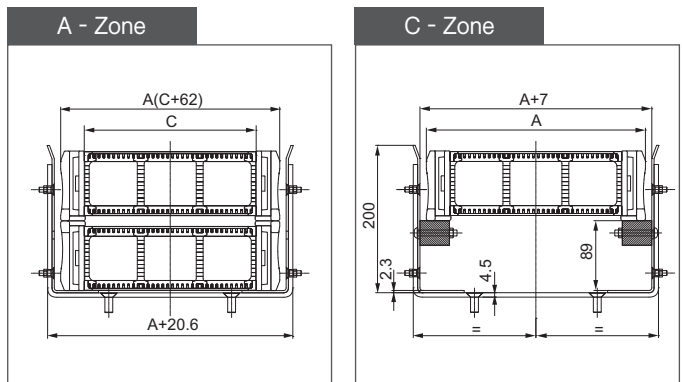
Size of separator and divider will change according to the size of frame and cables(hose).



Chain Type	Ordering NO.	C Frame	Hole Type
ST 095ES	STW04.100	100	M10 Bolt Holes
	STW04.125	125	
	STW04.150	150	
	STW04.175	175	
	STW04.200	200	

(Dimensions in mm)

## GUIDE CHANNEL



(단위 : mm)

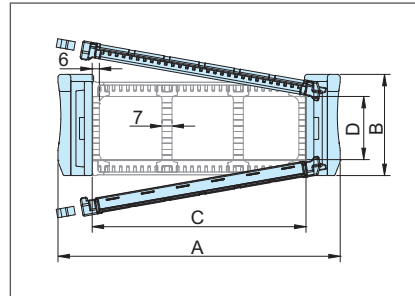
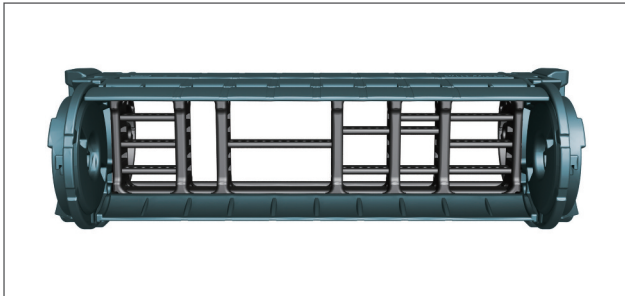
## GUIDE CHANNEL ORDERING

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



## ST 120ES | Enclosed Skid Type

### CHAIN CROSS SECTION

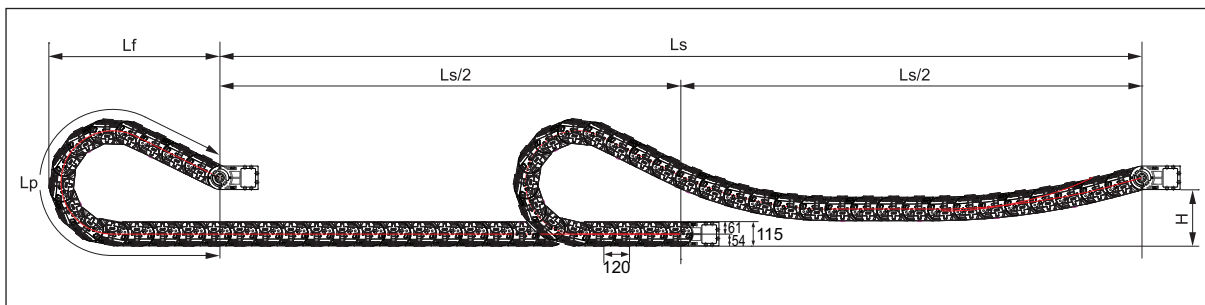


Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	Weight kg/m
ST 120ES	218	115	150	76	6.28
	268		200		6.92
	318		250		7.56
	368		300		8.20

(Dimensions in mm)

### LAYOUT OF THE CHAIN

Ls: Stroke

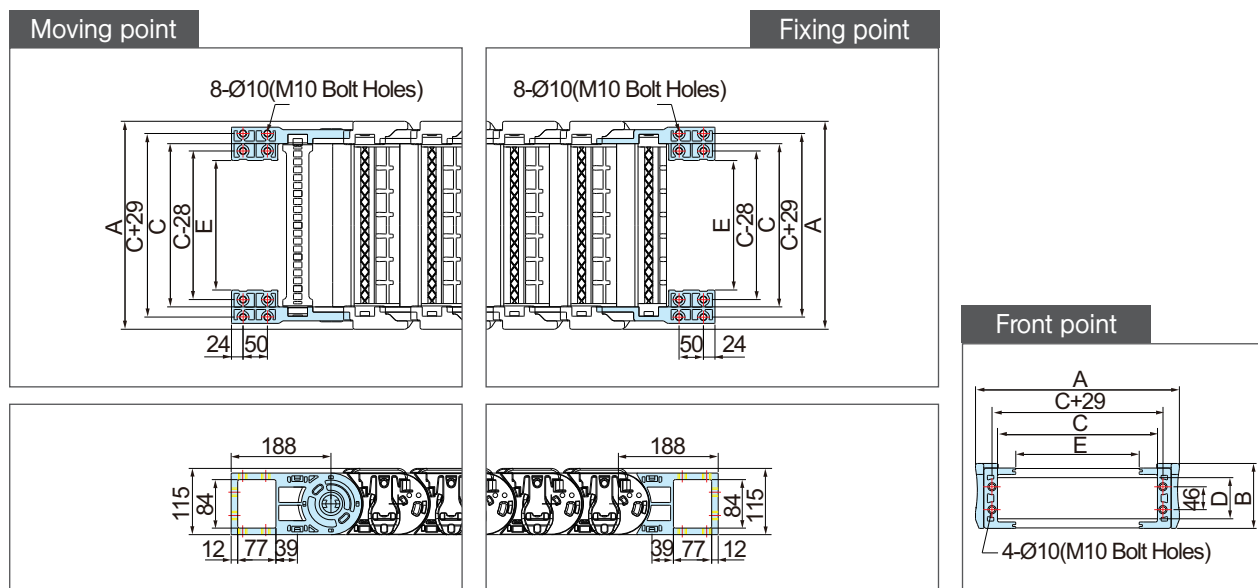


Bending Radius (R)	Lp Loop Length	Lf Loof Projection	H Moving Height
200	1,559	694	260
250	1,864	794	
300	2,178	894	
350	2,701	1,114	
400	3,225	1,334	
500	4,062	1,654	

(Dimensions in mm)



## FREE END BRACKET



Chain Type	A Width (Outer)	B Height (Outer)	C Frame	D Height (Inner)	E M,EB Bolt hole width	Hole Type
ST 120ES	218	115	150	76	90	M10 Bolt Holes
	268		200		140	
	318		250		190	
	368		300		240	

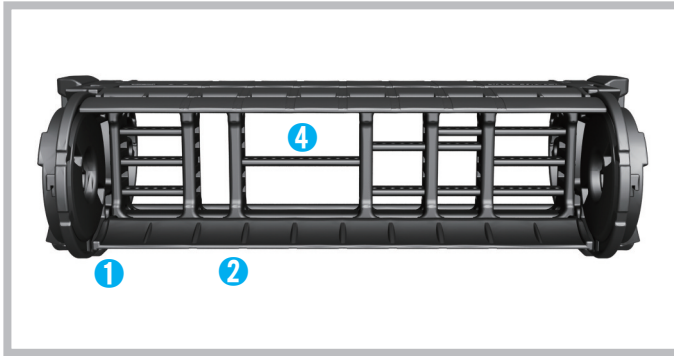
(Dimensions in mm)

## ORDERING

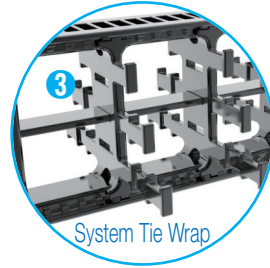
### ST 120ES. 300. R200 / F - 10000L : 10ST



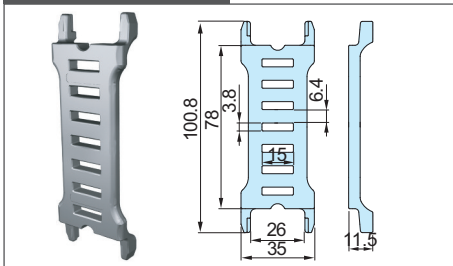
## ⇩ DIVIDERS (DV)



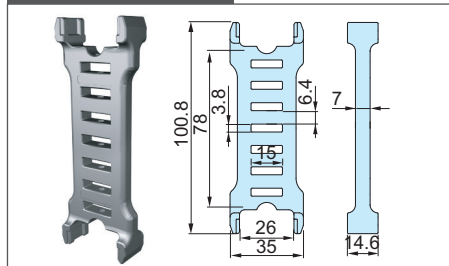
Assemble divider every Two links.  
DV.W : Applicable to System Tie Wrap or FEB.



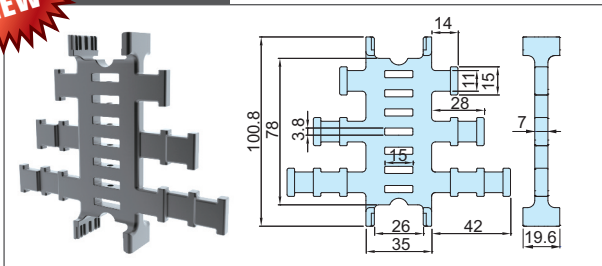
① DV10.S



② DV10.M

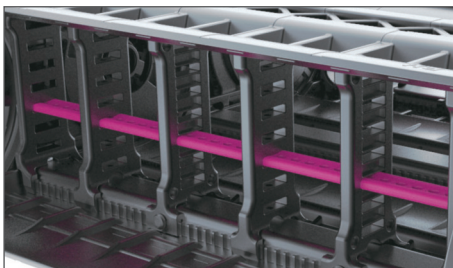


③ DV10.W

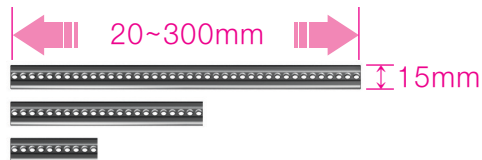


(Dimensions in mm)

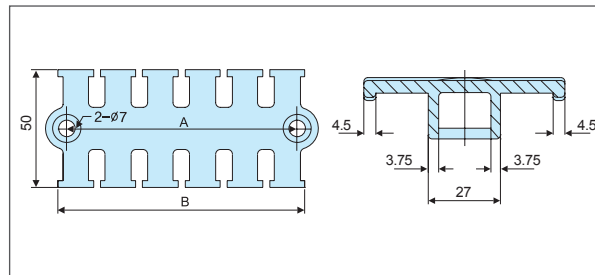
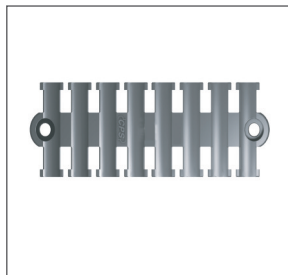
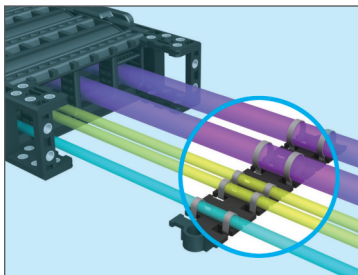
## ⇩ SEPARATORS (SP)



④ SP02 : Can order according to desired length of section.



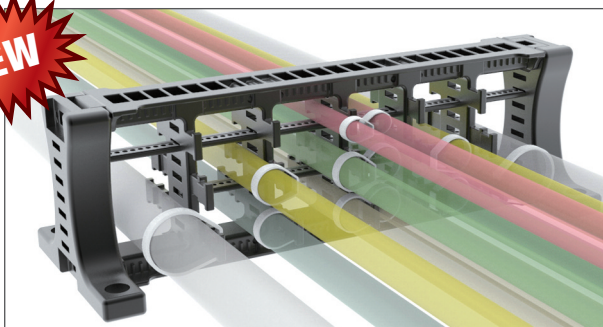
## TIE WRAP (TW)



Chain Type	Ordering NO.	A	B
ST 120ES	TW05.050	58	65
	TW05.075	75	82
	TW05.100	98	105
	TW05.125	122	129
	TW05.150	141	148

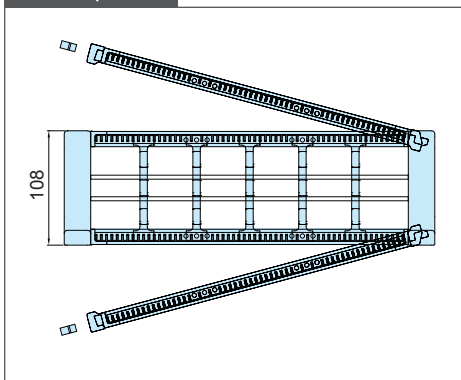
(Dimensions in mm)

## SYSTEM TIE WRAP (STW)

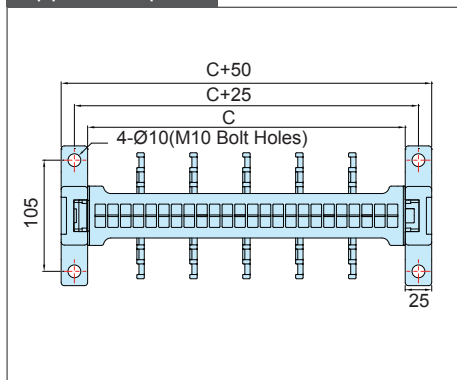


Size of separator and divider will change according to the size of frame and cables (hose).

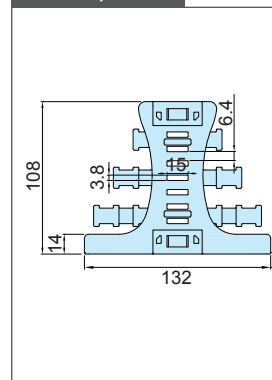
Front point



Upper side point



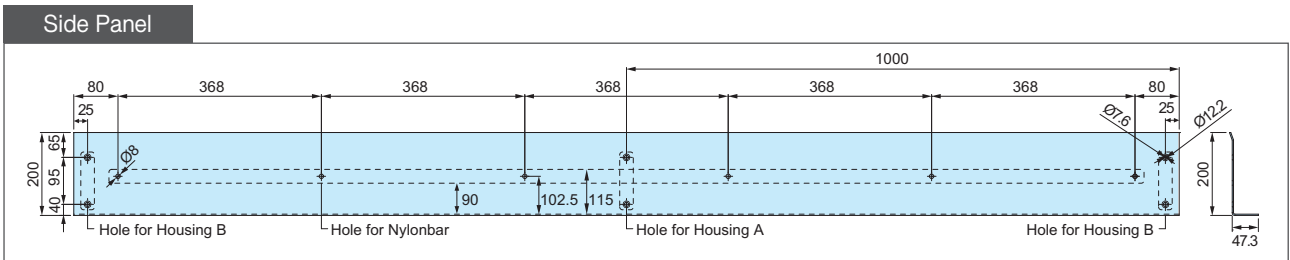
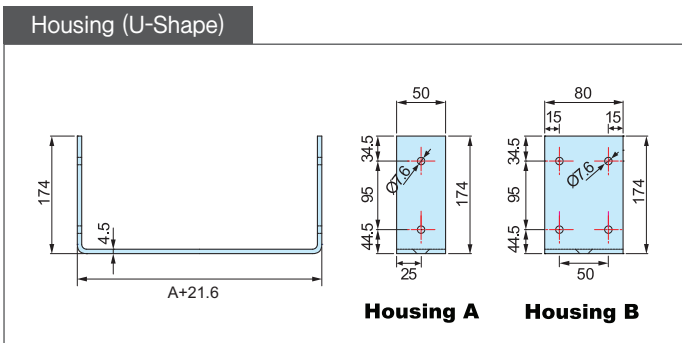
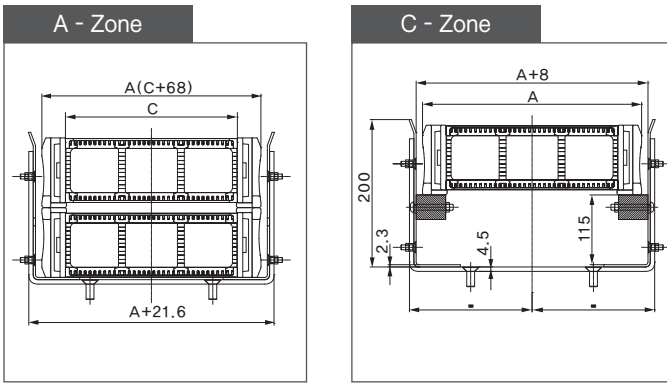
Side point



Chain Type	Ordering NO.	C Frame	Hole Type
ST 120ES	STW05.150	150	M10 Bolt Holes
	STW05.200	200	
	STW05.250	250	
	STW05.300	300	

(Dimensions in mm)

## GUIDE CHANNEL



(Dimensions in mm)

## GUIDE CHANNEL ORDERING

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





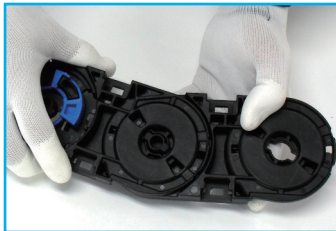
## ASSEMBLY PROCEDURE / ST Enclosed Skid Type

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)



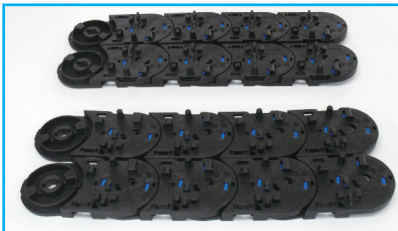
### 1

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.



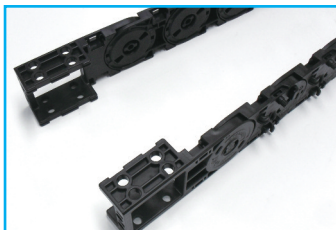
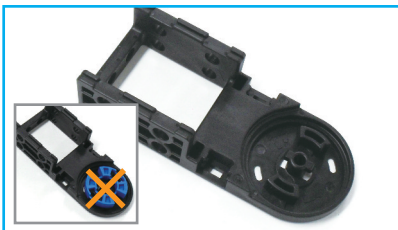
### 3

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



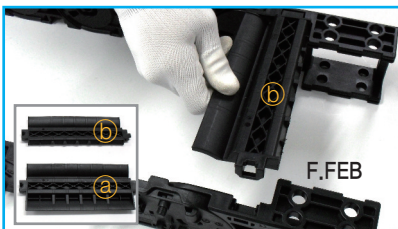
### 4

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)



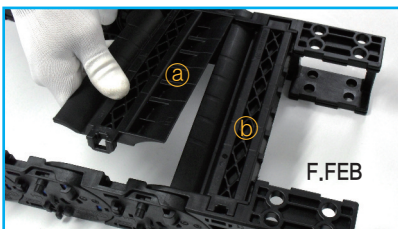
### 5

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

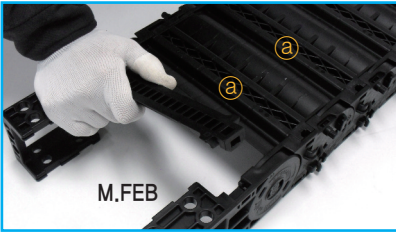
Insert one ⑥ Shaped-FRD into F.FEB.  
[ ⑥: Normal FRD ⑦: Built-up only for F.FEB]  
-Find one ⑥ shaped-FRD and insert it with the hinge facing RH direction, as above.



### 7

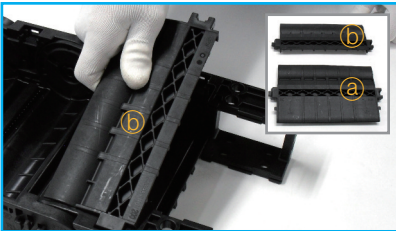
Continue to insert the FRD(⑥ -Normal FRD) with the hinge facing RH direction,  
-Assemble the from F.FEB to M.FEB in order.





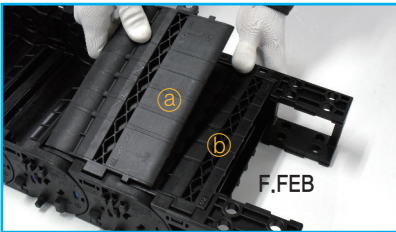
## 8

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)



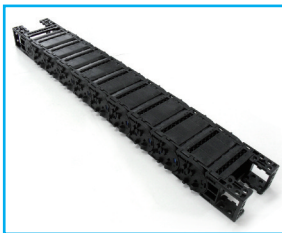
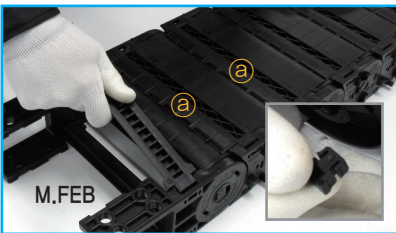
## 9

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



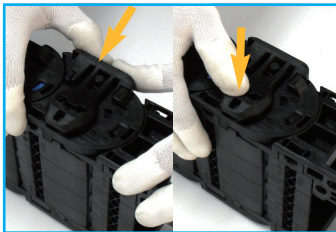
## 10

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.



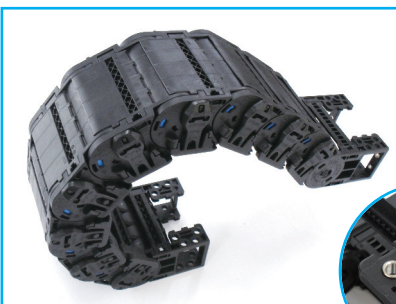
## 12

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.