CABLE CHAIN & BELLOWS

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SHINSUNG SHINSUNG ELECTRIC CO., LTD.

SHINSUNG CABLE CARRIER CHAIN

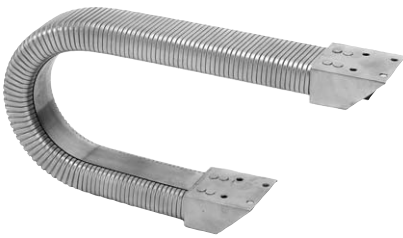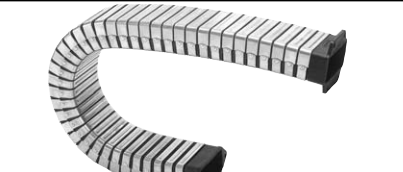| Chain Name	Product	Type	Pitch (mm)	Bending Radius KR	Clearance Length	Clearance High	Divider possible with frame		Divider possible with frame			Sag type	Temperature (℃)	Weight (kg/m)	Page
MINI CABLE CHAIN		SMI 0130.06 SMI 0130.10 SMI 0130.15 SMI 0130.20	13	20, 28, 37	6 10 15 20	10	○ ○ ○ ○					○ ○ ○ ○	−30 ~ +130	0.132 0.140 0.150 0.160	
		SMI 0180.06 SMI 0180.10 SMI 0180.15 SMI 0180.20	18	28, 37, 50	15 20 30 40	15	○ ○ ○ ○					○ ○ ○ ○		0.238 0.250 0.275 0.300	
MONO CABLE CHAIN		SMO 0320.20 SMO 0320.41 SMO 0320.42	32	37 37, 77 37, 47, 77, 100	13 24 24	19 16 19	○ ○ ○		○ ○	○		○ ○ ○	−30 ~ +130	0.320 0.380	
		SMO 0450.20 SMO 0450.21 SMO 0450.40 SMO 0450.41 SMO 0450.60 SMO 0450.61 SMO 0450.85	45	52, 94, 125, 150, 200 52, 94, 110, 125, 150 52, 94, 125, 150, 200 52, 94, 110, 125, 150, 200 52, 94, 125, 150, 200 52, 94, 110, 125, 150, 200 52, 94, 125, 150, 200	38 58 78 103	24	○ ○ ○ ○ ○ ○ ○		○ ○ ○ ○ ○	○ ○ ○		○ ○ ○ ○ ○ ○ ○	−30 ~ +130	0.650 0.750 0.740 0.850 0.930 1.100 1.200	
		SMO 0625.22 SMO 0625.23 SMO 0625.40 SMO 0625.42 SMO 0625.43	62.5	75, 115, 145, 175, 220, 300 130, 150, 190, 245, 300, 385 145, 180, 200, 250, 300, 350	65 108	34	○ ○ ○ ○ ○		○ ○ ○	○ ○		○ ○ ○ ○ ○		1.550 1.400 1.710	
BAND CABLE CHAIN		SBC 0650	65	90, 125, 200, 300		38 55	○	○			○ ○	○ ○	−30 ~ +130		
		SBC 0900	90	130, 150, 190, 245, 300, 385		58 76	○	○			○ ○	○ ○			
		SBC 0850	85	145, 180, 200, 250, 300, 350		84 105	○	○			○ ○				
SSK COVER CHAIN		SSK 0460	46	100, 125, 150, 175, 200	50 75 100 125	40	○ ○ ○ ○				○ ○ ○ ○	○ ○ ○ ○			
		SSK 0920	92	180, 200, 250, 300, 400, 500, 600	150 175 200		○ ○ ○				○ ○ ○	○ ○ ○			
SSB BAND CHAIN		SSK 0460	46	100, 125, 150, 175, 200	85 100 110 125 150 175	86	○ ○ ○ ○ ○ ○		○ ○ ○ ○ ○ ○			○ ○ ○ ○ ○ ○	−30 ~ +130		
		SSK 0920	92	180, 200, 250, 300, 400, 500, 600	200 250 300 350 400		○ ○ ○ ○ ○		○ ○ ○ ○ ○			○ ○ ○ ○ ○			
CRANE CABLE CHAIN		SCBC 1250	125	200, 250, 300, 400, 500	264 314 364 444 544	95	○ ○ ○ ○ ○		○ ○ ○ ○ ○			○ ○ ○ ○ ○	−30 ~ +130		
CIRCULAR ROBOT CHAIN		SCC 0070 SCC 0080 SCC 0085 SCC 0100 SCC 0150	68 80 85 100 150	100 100, 150 175 125 220	45 65 95 100 210	35 30 57 50 59	○ ○ ○ ○ ○		○ ○ ○ ○ ○				−30 ~ +130		

SHINSUNG CABLE CARRIER CHAIN

Chain Name	Product	Type	Pitch (mm)	Bending Radius KR	Clearance Length	Clearance High	Divider possible with frame			Divider possible with frame		Sag type	Temperature (℃)	Weight (kg/m)	Page
STEEL CABLE CHAIN		SSC 0650.1	65	75, 95, 115, 135, 155, 200		31 / 50		○	○	○ ○			−50 ~ +150		
		SSC 0950	95	95, 140, 170, 200, 260, 290, 320		46 / 68		○	○	○ ○					
		SSC 1250	125	145, 220, 260, 300, 340, 380		72 / 94		○	○	○ ○		○ ○			
		SSC 1800	180	265, 320, 375, 435, 490, 605		104 / 140		○	○	○					
		SSC 2500	250	365, 445, 600, 760, 920, 1075		220			○	○					
		SSC 3200	320	470, 670, 870, 1075, 1275, 1480		300			○	○					
OFFSHORE CABLE CHAIN		SPL 5000	200	500, 600, 800, 1000, 1200		150			○	○			−50 ~ +150		
		SPL 6000	320	700, 900, 1100, 1300, 1500		240			○	○					
		SPL 7000	450	1100, 1250, 1500, 1800, 2400		370			○	○					
COMPLETELY ENCOLSEEL STEEL CHAIN		SECC 0650.1	65	75, 95, 115, 135, 155, 200		31	○			○			−50 ~ +150		
		SECC 0950	95	140, 170, 200, 260, 290, 320		38	○			○					
		SECC 1250	125	145, 220, 260, 300, 340, 380		64	○			○					
		SECC 1800	180	265, 320, 375, 435, 490, 605		104	○			○					
STRIP COVERED CHAIN		SCSC 0650.1	65	75, 95, 115, 135, 155, 200		31		○		○			−50 ~ +150		
		SCSC 0950	95	140, 170, 200, 260, 290, 320		38		○		○					
		SCSC 1250	125	145, 220, 260, 300, 340, 380		64		○		○					
		SCSC 1800	180	265, 320, 375, 435, 490, 605		104		○		○					
SQUARE STEEL CABLE CHAIN		SFSC 38	38	50, 75, 90		20		○		○			−50 ~ +150		
		SFSC 60	60					○		○					
		SFSC 60H	60	75, 90, 125		27.5		○		○					
		SFSC 75	75			35		○		○					
		SFSC 75W	75	125, 145, 200, 250, 300		70		○		○					
		SFSC 100	100			75		○		○					
		SFSC 100-2	100	200, 250, 300, 400, 500, 600		75		○		○					
		SFSC 125-2	125	400, 500, 600, 700		95		○		○					
CABLE DUCT		030.1		80	26	24	○			○			−25 ~ +150	1,200	
		050.1		75, 100, 150			○			○				2,000	
		050.2		110, 150, 200		44	○			○				2,500	
		080.1		100, 150, 200	45	40	○			○				3,000	
		080.2		150, 200, 250		54	○			○				3,200	
		080.3		200	80	78	○			○				5,100	
		110.1		150, 200, 250		53	○			○				4,800	
		110.2		200, 250, 350		73	○			○				5,300	
		110.3		300	109	108	○			○				6,600	
		170.1		190, 250, 350		72	○			○				7,200	
		170.2		250, 300, 400		102	○			○				8,200	
		170.3		365	170	167	○			○				9,200	
CONDUFLEX		SCF 055		65, 100, 150	45	25	○			○			−20 ~ +130	1,250	
		SCF 060	20	100	36	40	○			○				1,600	
		SCF 085		100, 150, 200, 250	73	38	○			○				1,900	
		SCF 115	34	100, 140, 225, 300	102	52	○			○				2,600	
		SCF 120		155, 200	100	70	○			○				3,800	
		SCF 175	47	185, 250, 350	162	72	○			○				5,200	
SKC CHAIN		SKC 340		70, 100, 150	50 / 130	25		○		○			−20 ~ +130	1,500 / 2,100	
		SKC 470		100, 150, 200, 250	80 / 160	36		○		○				2,500 / 3,500	
		SKC 640	64	135, 200, 250, 300	90 / 110 / 220	53		○		○				3,800 / 4,000 / 5,000	
		SKC 850	85	180, 250, 350	80 / 150 / 200 / 300	72		○		○				4,600 / 5,700 / 6,500 / 8,000	

Enquiry form for cable carriers

● Please provide us with the concrete data for a system solution suitable for your application. We will be happy to submit a complete quotation to you.
● The fields marked "red" must be completed. (Your personal details will, of course, be treated confidentially and will not be passed on to any third parties.)

■ Machine data
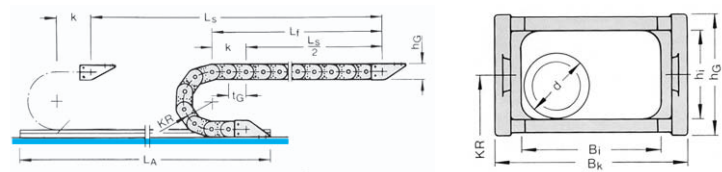
■ Application area:

- Environmental conditions;
- Ambient temperature _____ ℃
- Max. travel length: _____ mm
- Max. acceleration/deceleration: _____ m/s²
- Travel speed: _____ m/s
- Travel time: _____ times
- max. height H _____ mm
- max. width B: _____ mm

■ Installation variant:

☐ SEBV01   horizontal arrangement "self-supporting"

☐ SEBV03   horizontal arrangement "with permitted sag"

☐ SEBV05   horizontal arrangement "sliding in a guide channel"

☐ SEBV07   horizontal arrangement "turned through 90° – straight"

☐ SEBV09   horizontal arrangement "turned throug 90° – circular"

☐ SEBV10   vertical arrangement "standing"

☐ SEBV11   vertical arrangement "hanging"

■ Cables and hoses

- Cable/hose type _____
- Number of cables: _____ Pieces
- Number of cores × cable–cross section _____ ea
- Cable diameter _____ mm
- Weight _____ kg/m
- Minimum bend radius _____ mm
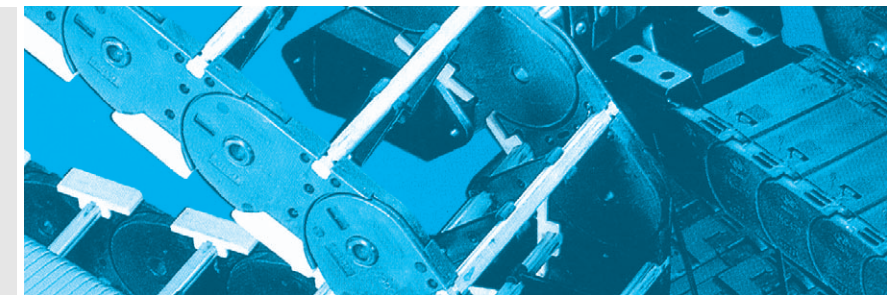
■ Design

- Carrier/stay cross–section   ☐ enclosed
                               ☐ openable
- Number of dividers _____ Pieces/Cross section

■ Your address data

- Company _____
- Sector _____
- Name _____
- Adress _____
          _____
- Country _____
- Phone _____
- Fax _____
- E-mail _____

176 · SHINSUNG ELECTRIC CO,, LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655   **177**

MINI Cable Carrier Chains

NEW!

Mini carrier chains type 0130 and 0180 are fitted to equipment in the following industrial sectors and many others:Measuring and inspection, installation and handling systems, medical equipment, textile–print–and packing, model construction, laboratory and computer techniques.
Their use ensures a safe and orderly guidance of supply lines and hereby increasing its life.
These carrier chains are made from a glass fibre reinforced plastic material an can be supplied in 4 band widths with 3 bending radius.

Type 0130 and 0180
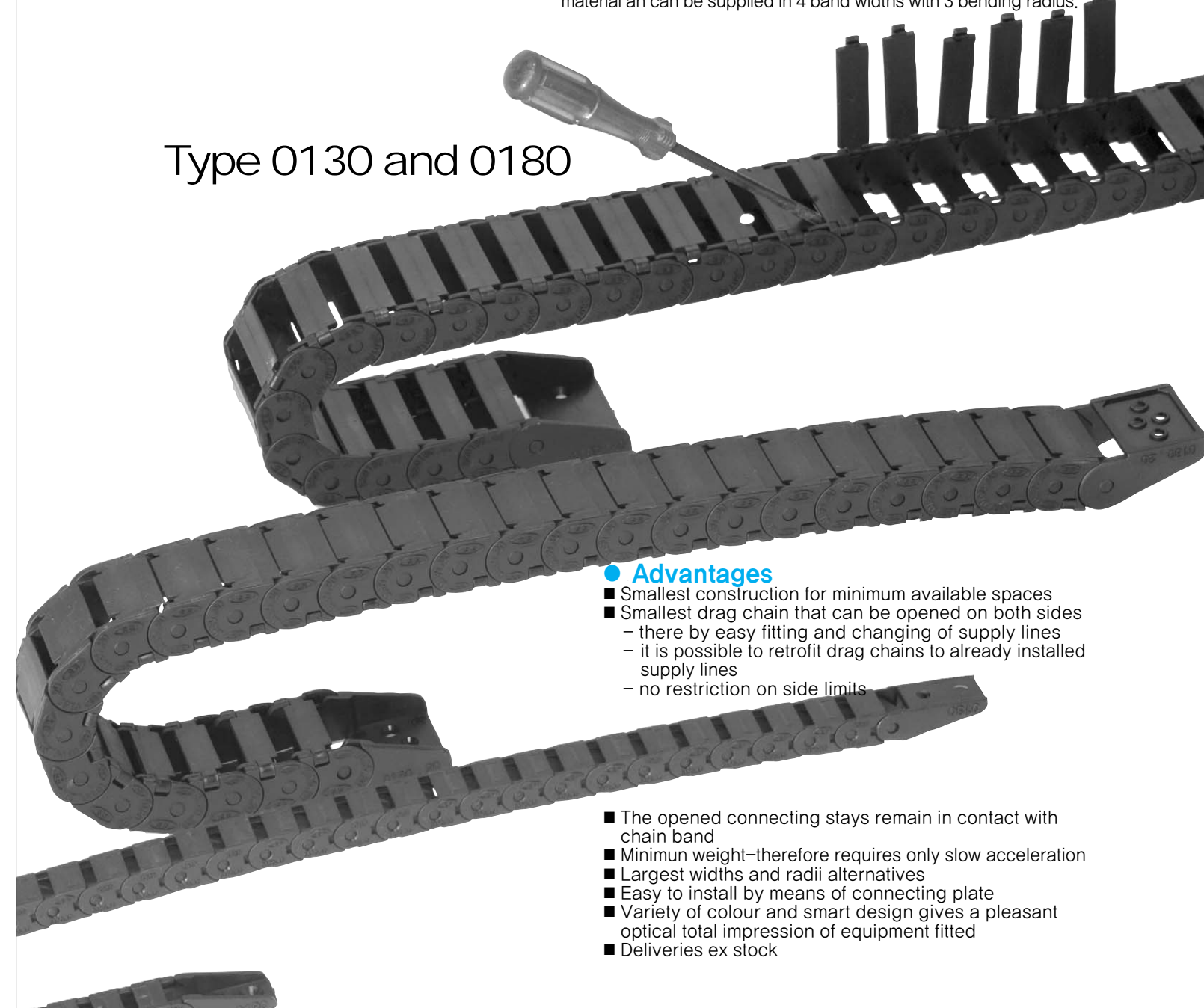
● **Advantages**
■ Smallest construction for minimum available spaces
■ Smallest drag chain that can be opened on both sides
  − there by easy fitting and changing of supply lines
  − it is possible to retrofit drag chains to already installed supply lines
  − no restriction on side limits

■ The opened connecting stays remain in contact with chain band
■ Minimun weight−therefore requires only slow acceleration
■ Largest widths and radii alternatives
■ Easy to install by means of connecting plate
■ Variety of colour and smart design gives a pleasant optical total impression of equipment fitted
■ Deliveries ex stock

SHINFLEX®

Mini Cable Carrier Chain–Type SMI 0130/SMI 0180

Dimensions in mm
- **Chain material : KS/PA** glass fibre reinforced
  Special materials are available where required.
- **Standard colour : black**
  Upon customer request:orange, grey, yellow,
  White, red, green, blue, yellow–black
- **Maximum temperatures : −20℃ + 135℃**
  Where continuous temperatures fall either below
  minimum or exceed maximum, please refer to us.

We reseve the right to make technical changes!

Driver

Fixed Point

$H_{min} = 2KR + h_G$

The chain must rest on an even surface, if not, chain must be located in a trough.

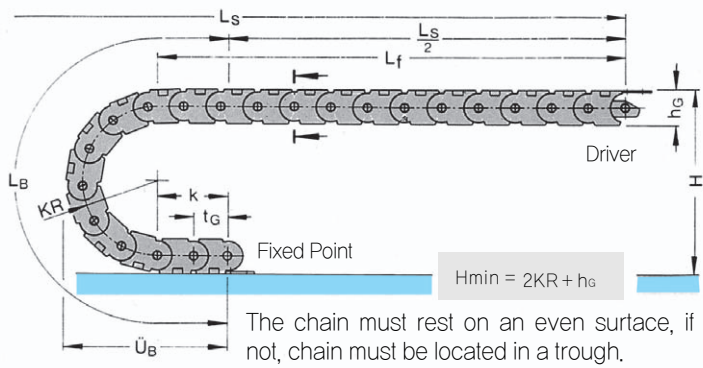- **Determination of chain length :**

$$L_K = \frac{L_S}{2} + \text{Arc lenght } L_B$$

Rounded off to chain division t_G

- **Self–supporting length :**

$$L_f = \frac{L_S}{2} + k \ (k = 2t_G)$$

Chain type	SMI–0130			SMI–0180		
Chain division t_G	13			18		
Chain link height h_G	12,5			18		
Bening radius KR	20	28	37	28	37	50
Arc length L_B	115	140	168	160	188	229
Arc overhang $Ü_B$	52	60	69	73	82	95
Connecting height H_{min}	52,5	68,5	86,5	74	92	118
Self–supporting length L_f (for maximum applied load)	0,5m (0,4kg/m)			0,7m (1kg/m)		

0130.06 0130.10 0130.15 0130.20

0180.15 0180.20
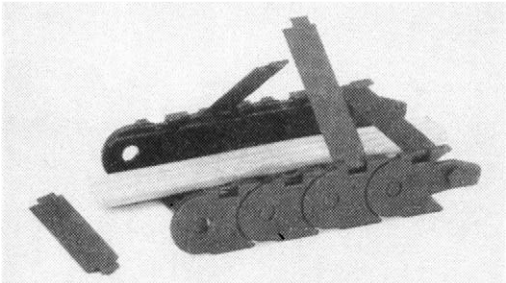
0180.30 0180.40

Chain type	Duction – Ø d_{max}	Weight in kg/m
0130.06	5	0,132
0130.10	8	0,140
0130.15	8	0,150
0130.20	8	0,160
0180.15	13	0,238
0180.20	13	0,250
0180.30	13	0,275
0180.40	13	0,300

- **Chain connections**

Chain type	I_F	I_M	b_{AP}
0130	18	15	B_k−3,5
0180	16	13	B_k−5,5

The static fixed point of the drag chain must be placed the centre of the travel length.
This ensures the shortest possible and most economical chain length between the fixed and moving points.
The chain must rest on an even surface, if not, chain must be located in a trough.

Connection of fixing point

Connection for driver
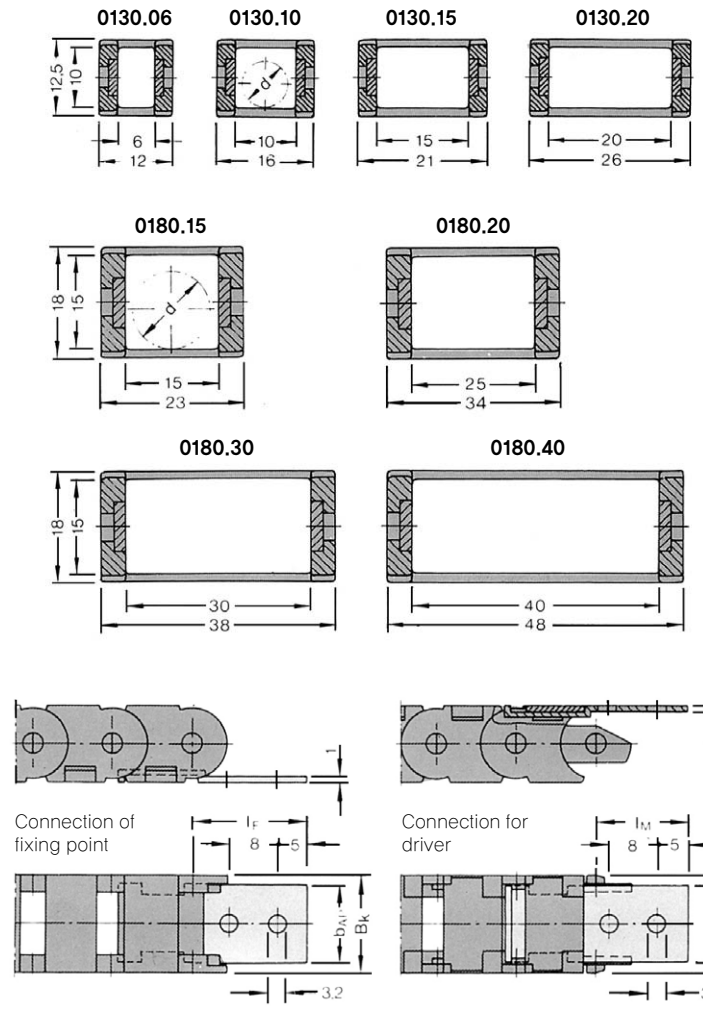
SHINFLEX®
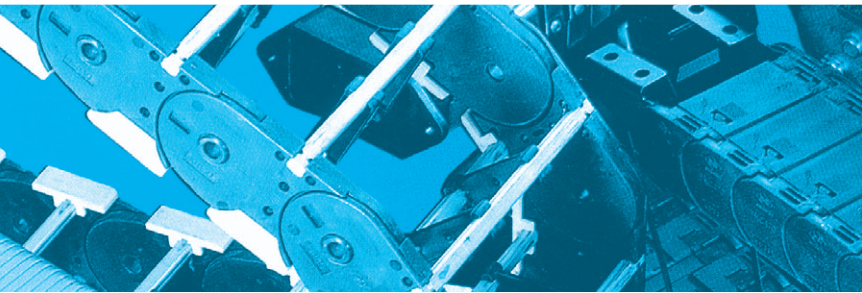
MONO Cable Chains

Mojor:
Machine tools, Automatic energy saving machinery and tools Wood working machine, Fiber Machine, All types of plant equipment automation industry, Industrial machine.
Apparatus related to Computer

–patent 105850

MONO Cable Chains

SHINFLEX®
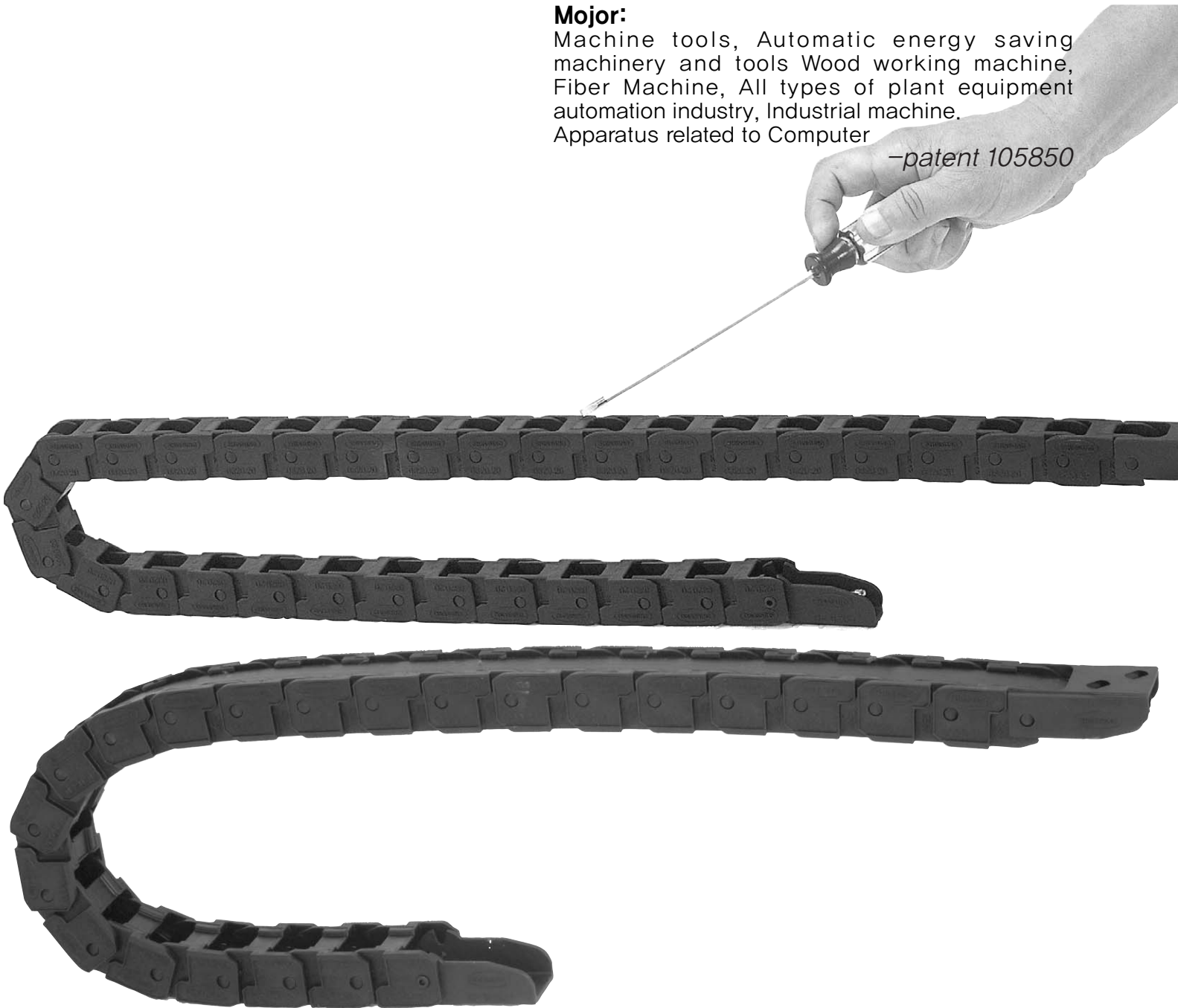
■ Application

The range of SHINSUNG moulded plastic cable and hose drag chains provides reliable system for the supply of services to moving equipment. They can be used whenever the cables/hoses are light, the travel is small and the operating environment permits the use of plastics.
SHINSUNG plastic drag chains have been in service for many years and they are used to supply robots, machine tools, computerised handling systems and measuring devices.

■ Structure
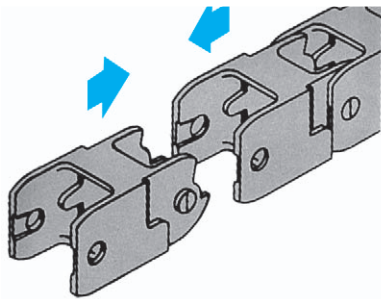
The chain is assembled using one–piece moulded units easily snap cnnected to form a chain of the required length. The design of the link provides the self–supporting feature of the chain. The unique design of the SHINSUNG plastic chain with hinged bars permits the easy installation of cable and hoses. This new design feature allows the chain to be replaced should accidental damage occur without disconnection of the cable and hoses from the supply.

Advantages of the SHINSUNG plastic drag chain:
• Low price
• Light in weight
 − High travel speeds
 − Acceleration and deceleration forces are small
• No maintenance   • easily installed

Cables and hoses can be readily installed without disconnection

• Wear on cables and hoses is eliminated
• Corrosion free
• Deliveries ex stock for standard components
• Varying travel lengths easily satisfied
 ※ The SHINSUNG moulded plastic drag chains are protected by international patents and trademarks and conform with safety standard requirements.
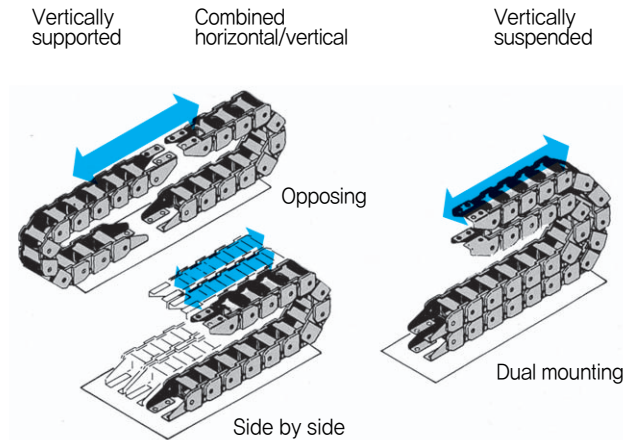
■ To specify a SHINSUNG moulded plastic cable drag chain please provide the following information:
• Length of travel of movable unit
• Number and outside diameter of the cable/hoses to be installed (with/without end fittings)
• Minimum bending radius of cable/hoses (acc. to manufacturer's specification)
• Weight of all cables and hoses(including hose contents)
• Available mounting width
• Type of application(drawing if possible)
• Maximum acceleration/deceleration)
• Speed of travel
• Frequency of travel
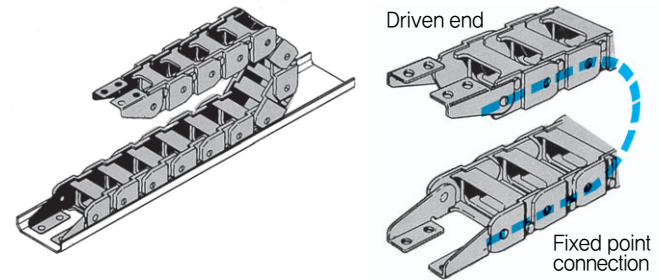• Working environment(temperature, radioactive etc.)

■ Typical Application

SHINSUNG

SHINSUNG Horizontal

Side mounted(type 210)

SHINSUNG

Vertically supported — Combined horizontal/vertical — Vertically suspended

Opposing

Side by side

Dual mounting

If the carrying capacity of a standard chain is too small, it is easy to use two or more chains as shown.

Driven end

Fixed point connection

Support Tray
An even support surface is necessary to ensure correct operation of the SHINSUNG drag chain. If this not availabel then a support tray in standard lengths of 2000mm can be supplied(special designs on request).

Installing the chain
The static fixed point of the drag chain should be placed in the centre of the travel length. This ensures the shortest possible length of chain between the fixed and moving points.

Connecting brackets of galvanised steel are provided as a standard feature and the brackets are normally pressed into place.

For longer lengths of travel and higher loads, the brackets are bolted to the chain.

Technical data

Dimensions in mm.
SHINSUNG reserve the right to modify or improve the chains without prior notice.
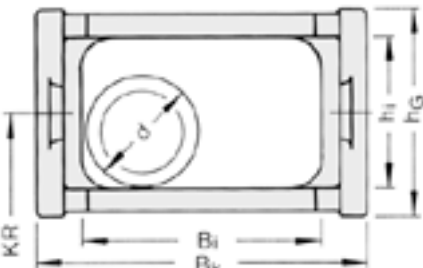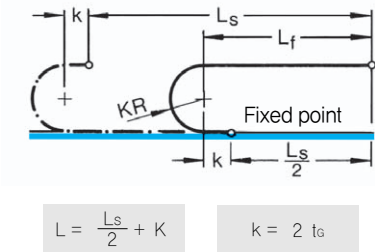
Definitions:
• B_K = chain width
• h_G = link height
• B_i = available width
• h_i = availabel height
• KR = cabel/hose diameter
• d = bending radius

■ Unsupported length and length of travel

dependent upon additional load

Travel $L_S \leqq 2(L_f - K)$

Fixed point

$$L = \frac{L_S}{2} + K \qquad k = 2t_G$$

Length of travel
where self–supporting length is exceeded

Note
When you have selected the chain type which meets your requirements, you will find further information on the following pages:

Chain type	B_k	h_G	B_i	h_i	d_{max}	Bending radius				design of chain section
TYPE : SMO−0320 chain pitch t_G = 32mm										
0320.20	24	25	13	19	11	37				closed section
0320.41	35	25	24	18	16	37	37			with cover strip
0320.42	35	27	24	19	16	37	47	77	100	closed section
TYPE : SMO−0450 chain pitch t_G = 45mm										
0450.20	54	34	38	24	22	52 94 125 150 200				closed section
0450.21	54	40	38	24	22	52 94 110 125 150				with hinged bar
0450.40	74	34	58	24	22	52 94 125 150 200				closed section
0450.41	74	40	58	24	22	52 94 110 125 150 200				with hinged bar
0450.60	94	34	78	24	22	52 94 125 150 200				closed section
0450.61	94	40	78	24	22	52 94 110 125 150 200				with hinged bar
0450.85	119	34	103	24	22	52 94 125 150 200				closed section
TYPE : SMO−0625 chain pitch t_G = 62.5mm										
0625.22	93	62	65	34	31	90 125 200 300				closed section
0625.23	93	62	65	34	31	90 125 200 300				with hinged bar
0625.40	126	56	108	34	31	75 90 125 200 300				closed section
0625.42	136	62	108	34	31	90 125 200 300				closed section
0625.43	136	62	108	34	31	90 125 200 300				with hinged bar
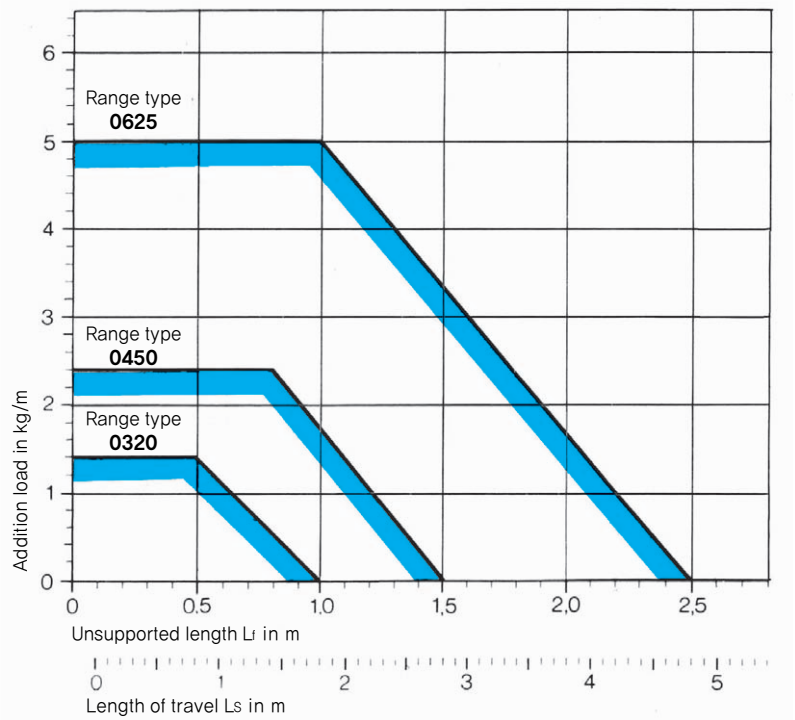
Addition load in kg/m

Range type **0625**

Range type **0450**

Range type **0320**

Unsupported length L_f in m
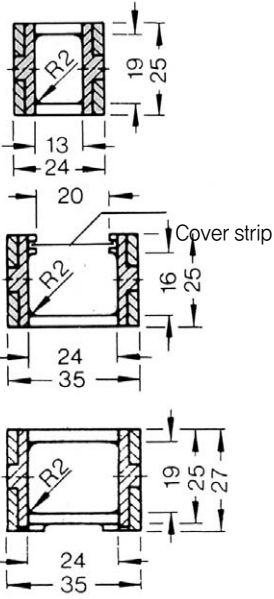
Length of travel L_S in m

Where the self–supporting length is exceeded, the upper section of the chain sags. This does not affect the operation of the drag chain. Additional support is not necessary.
For longer distances of travel, the moulded plastic drag chain is fitted whereas the upper chain section slides on the lower one. It is essential that it is guided in a trough(Page 17).

MONO Cable Chains

SHINFLEX®

TYPE : SMO - 0320   • Chain pitch t_G = 32mm

Arrangement

Driven connection

Fixed point   Driver

Fixed point connection

Support tray
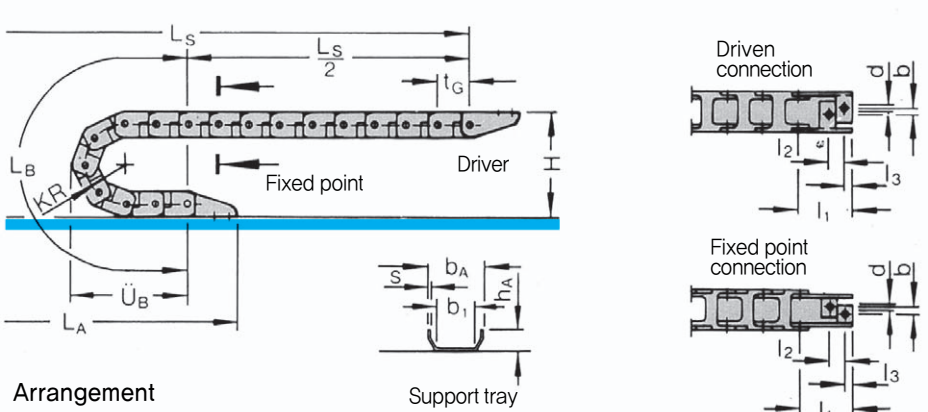
■ Chain sections

Cover strip

SMO − 0320.20
Closed frames
dmax = 11mm

SMO − 0320.41
closed frames with cover strip fixed at both ends
dmax = 16mm

SMO − 0320.42
Closed frames
dmax = 16mm

• To calculate chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to the nearest multiple of 32mm

• To calculate support tray length :

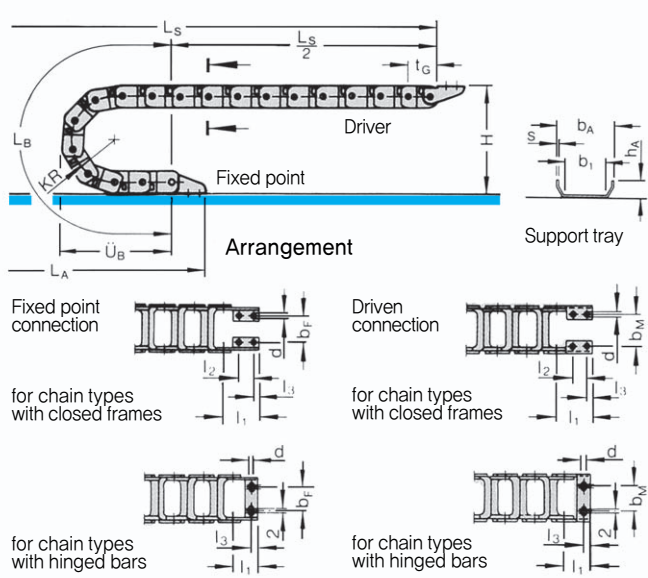$$L_A = \frac{L_S}{2} + U_B + l_1$$

Maximum section length = 2,000mm

■ Table of dimensions

• Dimensions in mm

Chain type		0320.20	0320.40		0320.41			
Bending radius KR		37	37	77	37	47	77	100
Loop length L_B		245	245		245			370
Loop projection $\ddot{U}_B$		114	114		114			154
Height H without tray		100	100		100			180
Connecting dimensions	l_1	50	50		50			
	l_2	15	15		15			
	l_3	7.5	7.5		7.5			
	b	–	–		11			
	d	Ø 7/M6	Ø 7/M6		7/M6			
Dimensions of support tray	b_1	30	40		40			
	b_A	45	55		55			
	h_A	20	20		20			
	S	1,5	1,5		1,5			
Chain weight in kg/m without connection	kg/m	0,320	0,380		0,380			

TYPE : SMO - 0450   • Chain pitch t_G = 45mm   • d_{max} = 22mm

Arrangement

Driver

Fixed point

Support tray

Fixed point connection

for chain types with closed frames

Driven connection

for chain types with closed frames

for chain types with hinged bars

for chain types with hinged bars

■ Chain sections

Standard section

SMO−0450.20
with closed frames

SMO−0450.21
with hinged bars

SMO−0450.40
with closed frames

SMO−0450.41
with hinged bows

SMO−0450.60
with closed frames

SMO−0450.61
with hinged bows

SMO−0450.85
with closed frames

• To calculate chain length :

$$L_k = \frac{L_S}{2} + L_B$$

rounded to the nearest multiple of 45mm

• To calculate support tray length :

$$L_A = \frac{L_S}{2} + \ddot{U}_B + l_1$$

Maximum section length = 2000mm

■ Order Code for the Cable Drag chains

0450.21 − KR 94 − 3,000L − 55EA : 5Sets

- Type
- Bending radius KR in mm
- Chain length LK in mm (Without Conection)
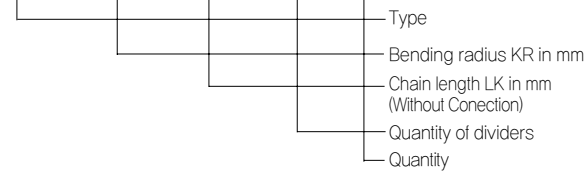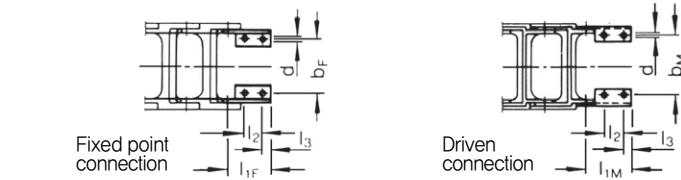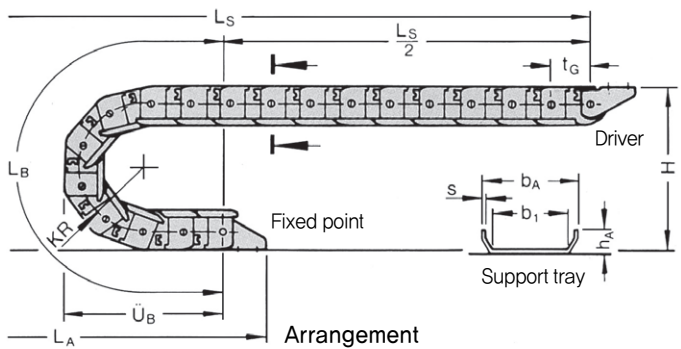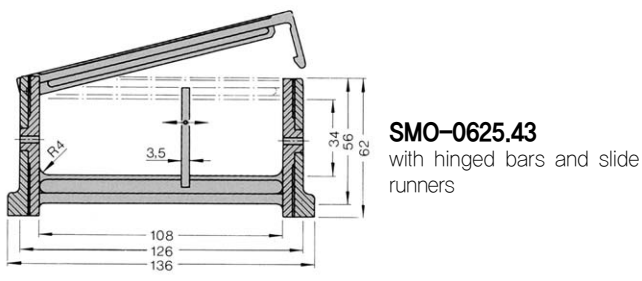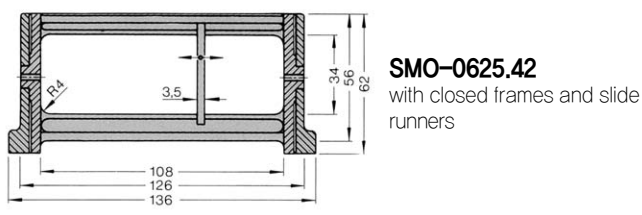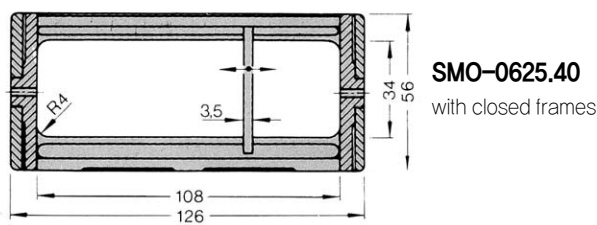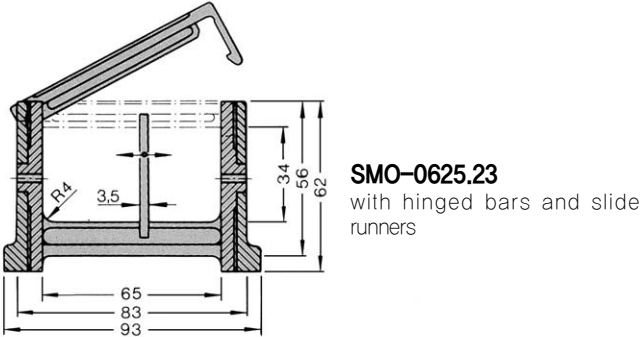- Quantity of dividers
- Quantity

■ Table of dimensions

All chain type can be supplied with sliding separating plates to divide the cables. Standard is fiting to each second chain link. When ordering, please state the number of separating plates per link required.

• Dimensions in mm

Chain type		0320.42					0450.21					0450.40					0450.41					0450.60					0450.61					0450.85				
Bending radius KR		52	94	125	150	200	52	94	110	125	150	200	52	94	125	150	200	52	94	110	125	150	200	52	94	125	150	200	52	94	110	125	150	200	52	94	125	150	200
Loop length L_B		345	475	575	650	810	345	475	525	575	650	810	345	475	575	650	810	345	475	525	575	650	810	345	475	575	650	810	345	475	525	575	650	810	345	475	575	650	810
Loop projection $\ddot{U}_B$		159	201	232	257	307	162	204	219	235	260	310	159	201	232	257	307	162	204	219	235	260	310	159	201	232	257	307	162	204	219	235	260	310	159	201	232	257	307
Height H without tray H		138	222	284	334	434	138	222	228	259	290	440	138	222	284	334	434	144	228	259	290	340	440	138	222	284	334	434	144	228	259	290	340	440	138	222	284	334	434
Connecting dimensions	l_1	53					40						53					40						53					40						53				
	l_2	24					–						24					–						24					–						24				
	l_3	8					10						8					10						8					10						8				
	b_F	22					22						42					42						62					62						87				
	b_M	25					25						45					45						65					65						90				
	d	Ø 7/M6					Ø 7/M6						Ø 7/M6					Ø 7/M6						Ø 7/M6					Ø 7/M6						Ø 7/M6				
Dimensions of support tray	b_1	65					65						85					85						100					100						135				
	b_A	80					80						100					100						115					115						150				
	h_A	20					20						20					20						20					20						20				
	S	1,5					1,5						1,5					1,5						1,5					1,5						1,5				
Chain weight in kg/m without connection		0,650					0,750						0,740					0,850						0,930					1,100						1,200				

MONO Cable Chains

SHINFLEX®

TYPE : SMO - 0625
• Chain pitch t_G = 62.5mm   • dmax = 31mm

Driver
Fixed point
Support tray
Arrangement

Fixed point connection

Driven connection

SMO−0625.23
with hinged bars and slide runners

SMO−0625.40
with closed frames

SMO−0625.42
with closed frames and slide runners

All chain types can be supplied with separating plates to segregate the cables. They are normally fitted to every second link.
When ordering, please state the number of separating plates required per link.

• To calculate chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to nearest multiple of 62.5mm

• To calculate support tray length :

$$L_A = \frac{L_S}{2} + U_B + l_1 F$$

Maximum section length = 2000mm

■ Chain sections

SMO−0625.22
with closed frames and slide runners

SMO−0625.43
with hinged bars and slide runners
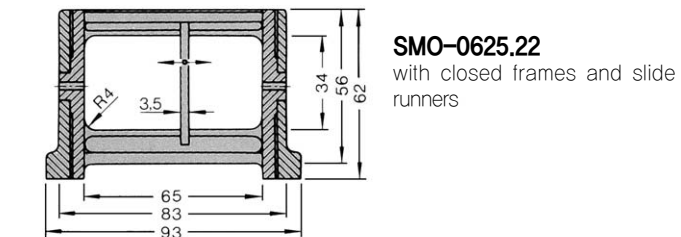
■ Table of dimensions   • Dimensions in mm

Chain type	0625.22 0625.23				0625.40					0625.42 0625.43			
Bending radius KR	90	125	200	300	75	90	125	200	300	90	125	200	300
Loop length L$_B$	535	645	880	1195	485	535	645	880	1195	535	645	880	1195
Loop projection Ü$_B$	243	278	353	453	228	243	278	353	453	243	278	353	453
Height H without tray H	236	306	456	656	206	236	306	456	656	236	306	456	656
Connecting dimensions l$_{1F}$	63				63					63			
l$_{1M}$	70				70					70			
l$_2$	30				30					30			
l$_3$	12.5				12.5					12.5			
b$_F$	49				92					92			
b$_M$	54				97					54			
d	Ø 9/M8				Ø 9/M8					Ø 9/M8			
Dimensions of support tray b$_1$	100				135					135			
b$_A$	115				150					150			
h$_A$	20				20					20			
S	1.5				1.5					1.5			
Chain weight in kg/m without connection	1.550				1.400					1.710			

Guide channels

SMO−0625.23
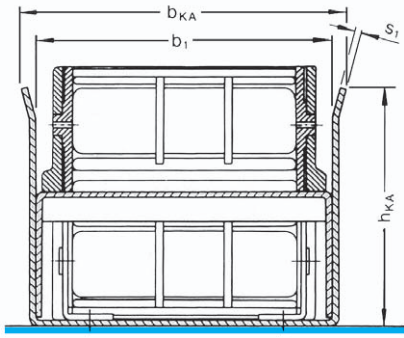
If the maximum allowable unsupported length of the chain is exceeded(see diagram page 13), the upper section of the chain will rest on the lower one due to the elastic properties of the plastic materal. The excellent anti−friction characteristics of the plastic material used ensure that this action does not impair the function of the chain.
It is essential, howerver, that a guide channel is fitted.
In a single chain design, the chain slides on a sheet metal plate on the opposite side of the fixed point.
In double chain design, this support is fitted to form a bridge between the fixed provided with a special sheet metal to reduce the sliding resistance.
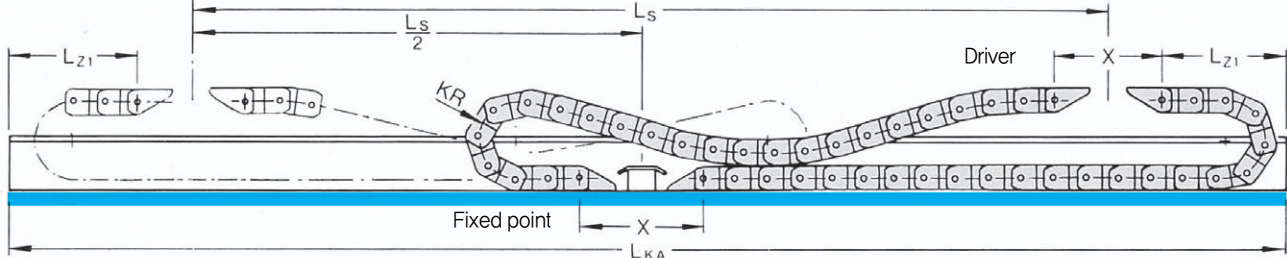
■ Single chain arrangement
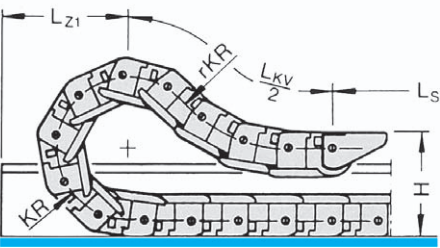
Channel length $L_{KA} = L_S + L_{Z1} + L_{Z2}$

Driver
Sliding plate
Fixed point
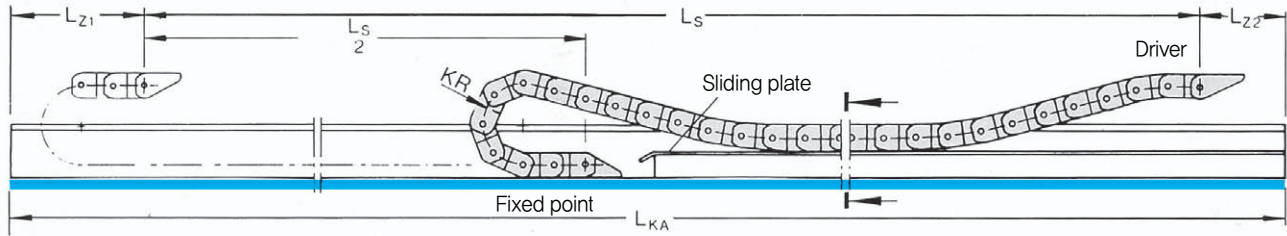
■ Double chain arrangement

Channel length $L_{KA} = L_S + X_{max} + 2L_{Z1}$

Driver
Fixed point

■ Design for greater lengths of travel and high speeds

For lengths of travel ≧ 30,000mm and/or travel speeds ofv ≧ 60m/min, the driven connection should be place lower(clearance height H´).
In order to reduce the distance between the loop and the driven connection, the links in this part of the chain can be supplied with a reverse bending radius rKR.
The calculated chain length must then be increased by the value LKV and the channel length by LKV/2(single chain design) or LKV(double chain design).

※ The design of this type of installation should be referred to our engineer.

Cable installation : To facilitate cable installation, apertures can be provided in the cannel wall or in the channel floor in the area of the fixed point to your requirements.

■ Table of dimensions−Guide channels

Chain type	0320.20	0320.40 0320.41		0450.20 0450.21					0450.40 0450.41				0450.60 0450.61					0625.22 0625.23				0625.42 0625.43			
Bending radius KR	37	37	77	52	94	125	150	200	52	94	125	150	52	94	125	150	200	90	125	200	300	90	125	200	300
Channel demension b$_1$	30	40		60					80				100					97				140			
b$_{KA}$	40	50		75					95				115					117				160			
h$_{KA}$	50	50	90	70	70	125	125	125	70	70	125	125	70	70	125	125	125	117	117	200	300	117	117	200	300
s$_1$	2	2		2					2				2					2				2			
Clearance Connected L$_{Z1}$	150	150	200	200	250	270	300	350	200	250	270	300	200	250	270	300	350	270	350	450	550	270	350	450	550
L$_{Z2}$	100	100		100					100				100					200				200			
Length X$_{min}$	150	150		250					300				350					500				500			

※ All other dimensions are to be taken from the table of dimensions of the selected chain type.

MONO Cable Chains

Material – specification

• Standard colour : black[1]
• Standard material : KS/PA[2] – glass fibre strengthened

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve maximum colour effect, several colours can be combined. In both cases, extra price for small quantities.

2) Moulded plastic cable drag chains for application in the range of radio–active radiation or for permanent temperatures below–20 require a material adaptation and can also be delivered by SHINSUNG. Please give us detailed information on your environment conditions.

Mechanical properties	Environment	Check value	unit
Tensile strength	dry	190	N/㎟
	air moist	120	
Tensile dilatation	dry	4	%
	air moist	6	
Elasticity– modulus traction test	dry	10000	N/㎟
	air moist	7000	
Resilience 23℃	dry	55	KJ/㎡
23℃	humid	80	
−40℃	dry	45	
Thermal properties			
Temperature limit of application Permissible temp. range		−25[2] to 125	℃
5000hours		to 135	
some hours		to 200	
Other properties			
Density	dry	1,4	g/㎤
Index sliding friction	ungreased	0,4	
Reaction upon burning as per VDE 0304 part 3	dry	11c	

■ Chemical constancy of the standard material   at 20℃

Please contact us for all materials not shown in this table.

Against	Constant	Conditional constant
Mineral grease oil and lubricants	×	
Benzine, petroleum, ammonina	×	
Water, sea–water	×	
Acids (inconstant against acids with ph<3)		×
Lyes	×	
Fertilizers	×	

BAND Cable Chains

Major use
Applied to Machine tools automatic energy saving machine, Wood Working machine, Food machine, Fiber machine. Automation industry Industrial machine, Industrial plant etc.
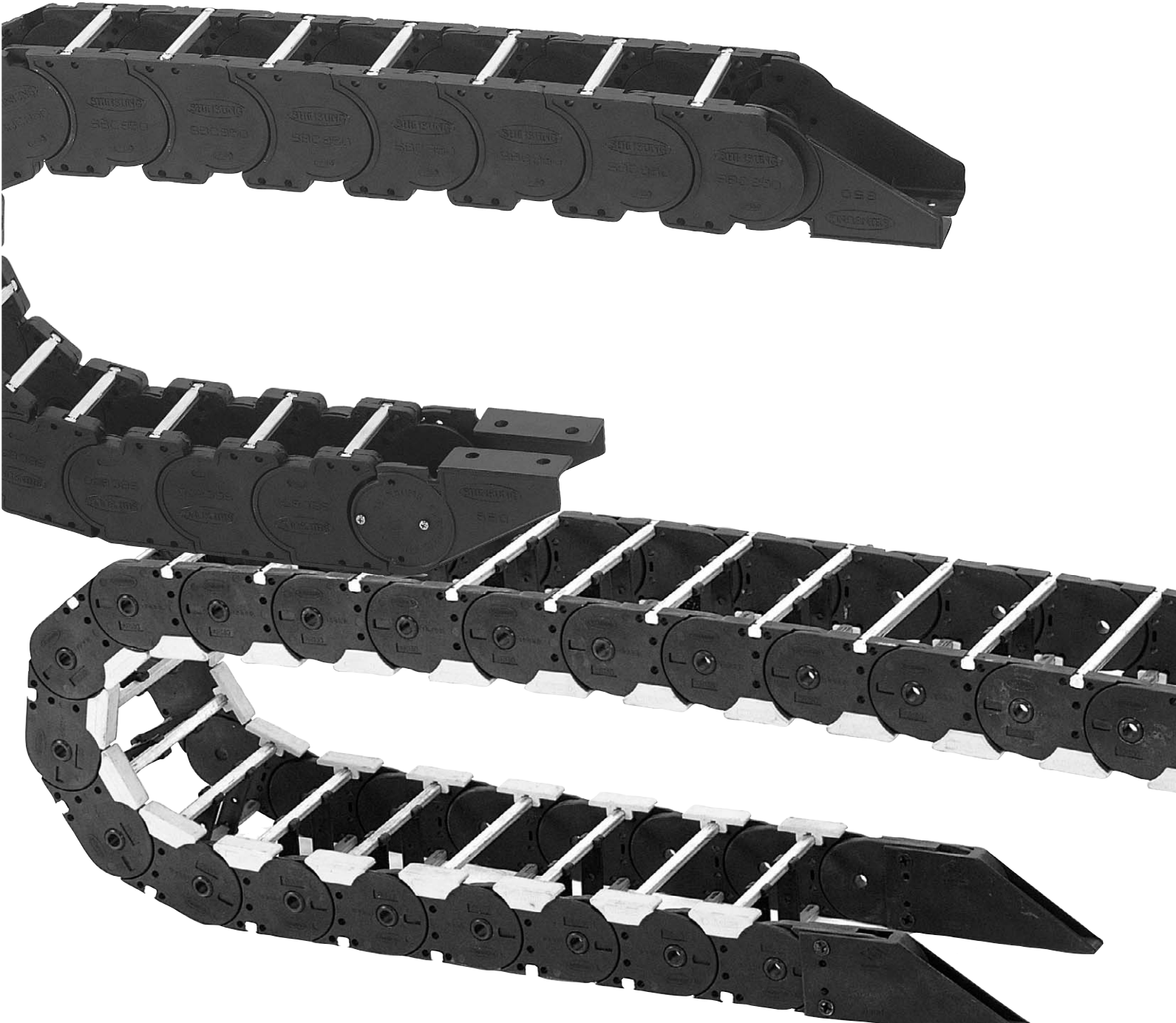
■ Application

SHINSUNG drag chains with plastic chain bands can be used whenever the cables/hoses are light, the travel is small and the operating environment permits the use of plastics. SHINSUNG drag chains are not only used for guiding cables, but also hoses which may be carrying different conveyants and may be laid side by side. SHINSUNG plastic drag chains have been in service for many years and are used to supply robots, machine tools, computerised handling systems and measuring devices.

■ Structure

The drag chains consist of two or more plastic chain bands which run parallel and are connected at intervals by stays. The stays, which are available in several types, support the cables/hoses in holes or openings. The chain bands are constructed in such a way that when they are travelling in the normal direction of operation they do not exceed a certain minimum bending it is very simple to connect the drag chain to moving equipment.

■ Advantages of the SHINSUNG drag chains with plastic chain bands.

- Wear on cables/hoses is eliminated
- Light in weight – Because the SHINSUNG drag chain with plastic chain bands are so light in weight, they are ideal for high travel speeds even where the length of travel is great.
- Easily installed – cables/hoses can be readily installed without disconnection.
- Corrosion free   • No maintenance
- Deliveries ex stock for standard components.
- Pleasing appearance   • Competitively priced

SHINSUNG moulded plastic drag chains are protected by international patents and trademarks and conform with safety standard requirements.

※ To specify a SHINSUNG moulded plastic cable drag chain please provide the following information:

▷ Number and outside diameter of the cable/hoses to be installed(with/without end fittings)
▷ Weight of all cables and hoses (including hose contents)
▷ Mini. bending radius of cable/hoses (acc.to manufacturer's specification)
▷ Length of travel of movable unit.
▷ Maximum acceleration/deceleration ▷ Speed of travel
▷ Frequency of travel   ▷ Available mounting width
▷ Type of application drawing if possible
▷ Working environment temperature, humidity, radiation, etc.

■ Order Code for the Cable Drag chains

0900 S – KR245 – BK300 – 5,000L : 5Sets

- Chain Type
- SAG Type
- Bending radius KR in mm
- Chain width KR in mm
- Chain length LK in mm(Without connetion)

■ Typical Applications

Horizontal

Side mounted(type 210)

Combined horizontal/vertical

Vertically supported

Vertically suspended

Side by side

Dual mounting

Opposing
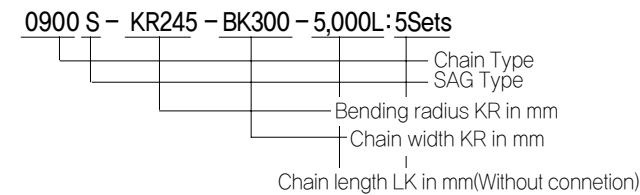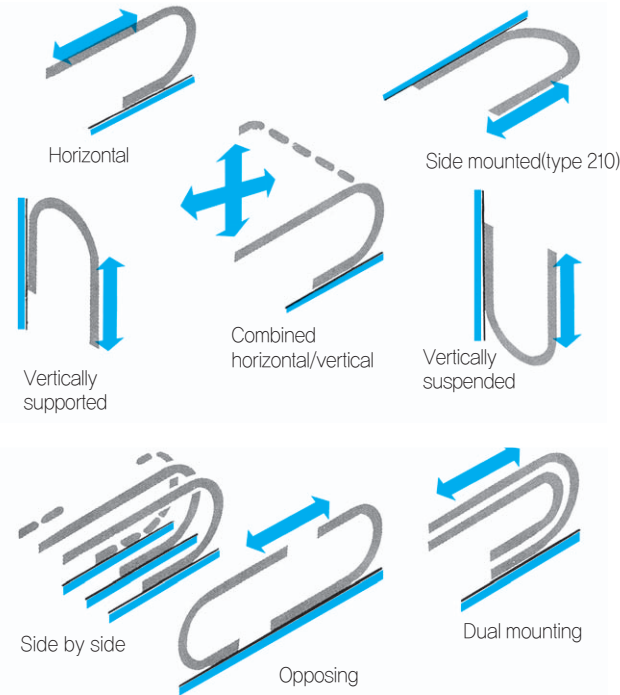
If the cross section of a stay in the drag chain is too small because of the maximum stay width permissible, the cables/hoses must be split into several stays.
Depending on the space available, it is easy to use two or more chains, running inside each other or in opposite directions.

Ls

$\frac{L_s}{2}$

KR

Fixed point
Centre of Travel
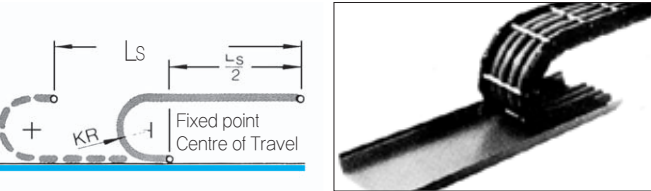
Installing the Chain

The static fixed point of the drag chain should be in the centre of the travel length. This ensures the shortest possible length of chain and cable between the fixed and moving points. Plastic connecting brackets are fixed to the ends of the chain with countersunk heed screws.

Support Tray

An even support surface is necessary to ensure correct operation of the SHINSUNG drag chain. If this is not available, then a support tray can be supplied. The trays, which are made from zinc coated steel, are supplied in standard lengths of 3000mm, Special designs on request.

Steel Band Cover

In order to protect the cables/hoses, the drag chains can be covered inside and out by a flat cover strip in hitgh quality spring steel. The steel band is guided through insertable holders inside the drag chain.
The steel bands are fixed to the connecting brackets by holders at the fixed point and driven end.

Technical data   Measurements in mm

Key:
- B_K = width drag chain
- B_{st} = stay width
  c = distance between openings in hole stays
  d = cable/hose diameter
  D = bore diameter in hole stays or compartment height in frame stays.
- h_G = height of chain link
- KR = bending radius
- L_f = self-supporting chain length
- L_K = length of drag chain
- L_s = travel distance of unit
- L_S = length of support tray
- t_G = chain pitch
- ST = thickness of divider

Subject to technical modifications!

Chain type	t_G	h_G	Bending radii	Stay types available	d_{max}
SBC–0650	65	55	75 115 145 175 220 300	Frame stays–with detachable bars	34
				Frame stays–with fixed bars	27
				Hole stay–split design	36
SBC–0900	90	76	130 150 190 245 300 385	Frame stays–with detachable bars	52
				Frame stays–with fixed bars	42
				Solid frame stay–with sliding insert	42
				Hole stay–split design	48

Stay Designs

● RS1 Frame stay –with detachable bars

Stays with detachable bars allow easy insertion, addition and replacements of cables and hoses which, from experience, is often preferable.
This type of stay is used mainly where the distance of travel is short and speed of travel slow.
There are no screw connections. Detach the bars by turning 90°.
Low priced and available ex stock in standard widths.

● RS2 Frame stay –with fixed bars

For medium lengths of travel and travel speeds.
Adjustable dividers in all types of frame stay enable the cables/hoses to be divided which prevents friction between them.
Available ex stock in standard widths.

● RM Solid frame stay–with sliding cleat

(only for chain type 0900K)
The solid frame stay is used where the maximum stay width of the above–mentioned frame stays is exceeded. The soft metal profile with the plastic profile cleat inserted to protect the cables/hoses guarantees a high stabikity level of the drag chain. Available ex stock in standard widths.

● LG Hole stay–split design

Hole stays ensure optimal laying of cables on the neutral axis of the drag chain.
The split design makes the insertion of cables simple even where hoses with fixed fittings/steel reinforcements are used.
Separate hole stay is designed for each requirement.

Arrangement of the drag chain (wehere Ls ≦ 2(LI–K)

Driven end

Support tray

Fixed point

$$L = \frac{L_s}{2} + K$$

$$k = 2 \, t_G$$
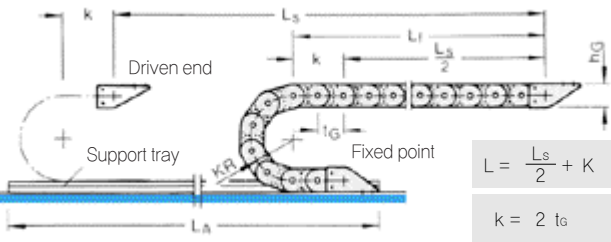
Self–supporting lengths and distances of travel for double chain arrangements (dependent upon the additional load)

Type 0900K

Type 0650K

Additional load in kg/m

Self–supporting length L_f in mm
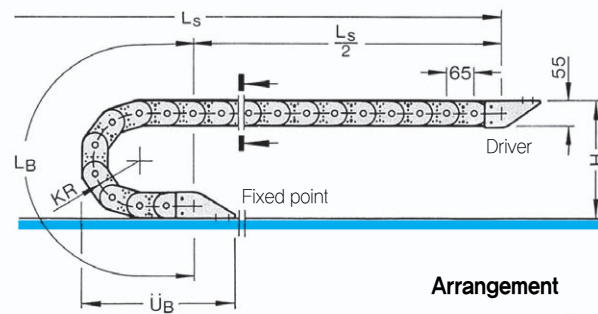
Length of travel L_s in mm
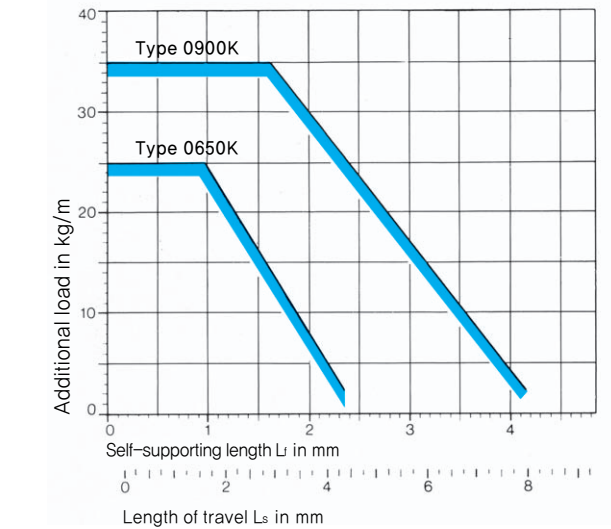
Length of travel (wehere self–supporting length is exceeded)

Where the self–supporting length is exceeded, the upper section of the chain sags.
This does not affect the operation of the drag chain. Additional support is not necessary.
For longer distances of travel, the drag chain where as the upper chain section slides on the lower one. It is essential that it is guided in a trough.

Choosing the drag chain

When deciding upon the drag chain the following aspects should be considered:
- Number and diameter of cables/hoses to be used.
- Choosing the stay type – bear in mind that the hole diameter or the clear heigth of the opening is D = 1.1d(diameter of cable).
- Determine the smallest permissible bending radius of cables/hoses according to manufacturer's specification and then choose the bending radius.
- Length of chain depending on distance of travel and bending radius chosen.
- Check whether a support tray is required for drag chain.

190 · SHINSUNG ELECTRIC CO., LTD.

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TYPE:SBC 0650
• Chain pitch t_G = 65mm

Arrangement

Driver

Fixed point

Bending radius:
• KR 75mm • KR 115mm • KR 145mm • KR 175mm
• KR 220mm • KR 300mm

Variable construction dimensions
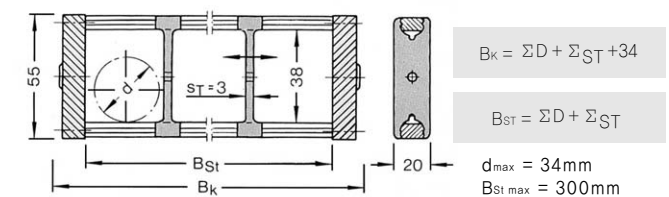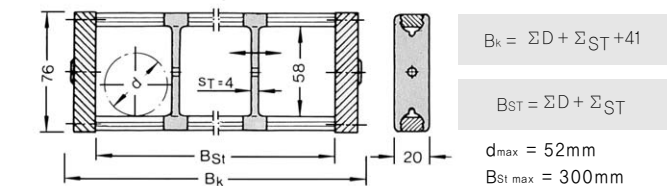• dependent on bending radius. (Dimensions in mm)

Bending radius KR	75	115	145	175	220	300
Length of curve L_B	495	620	715	810	950	1200
Proj. length of curve $Ü_B$	328	368	398	428	473	553
Mounting height H	205	285	345	405	495	655

• Calculation of chain length:

$$L_K = \frac{L_S}{2} + L_B$$ based on chain pitch 65mm

■ Stay designs (D = 1.1 cable diameter d)

RS2 Frame stay – with detachable bars

$B_K = \Sigma D + \Sigma_{ST} + 34$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 34mm$
$B_{St\ max} = 300mm$

RM Frame stay – with fixed bars

$B_K = \Sigma D + \Sigma_{ST} + 34$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 27mm$
$B_{St\ max} = 300mm$
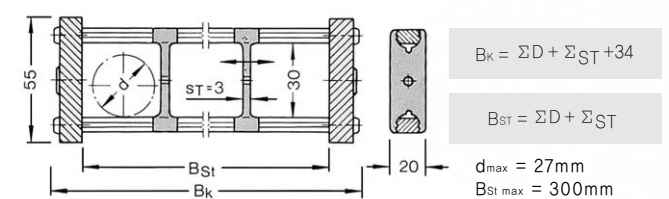
■ Standard widths for frame stays
(Dimensions in mm)

Chain width B_K	110	135	160	185	210	235	260	285	310
No.divider/stay	1	1	2	3	3	4	4	5	5
Stay width B_{St}	76	101	126	151	176	201	226	251	276

Individual stay widths and additional dividers/stays on request at additional cost.

■ LG Hole Stay–split design
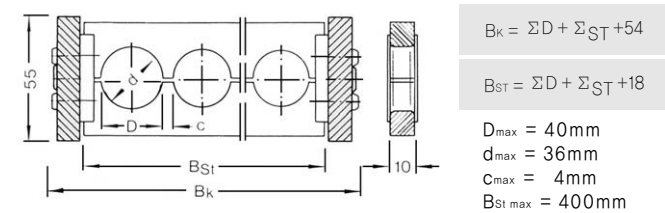
$B_K = \Sigma D + \Sigma_{ST} + 54$

$B_{ST} = \Sigma D + \Sigma_{ST} + 18$

$D_{max} = 40mm$
$d_{max} = 36mm$
$c_{max} = 4mm$
$B_{St\ max} = 400mm$

– Hole diagram produced as per customer details
– Hole stays–available unsplit on request!

※ Where the maximum stay width is exceeded, a multiple chain arrangement must be used or the drag chain must be split into several chains running opposite or inside each other. In border line cases please consult us.

■ Chain connection • dimensions

■ Support Tray

$b_1 = B_K + 15mm$
$b_A = B_K + 40mm$

Length of support tray:

$$L_k = \frac{L_S}{2} + Ü_B$$

Max. section length:3000mm
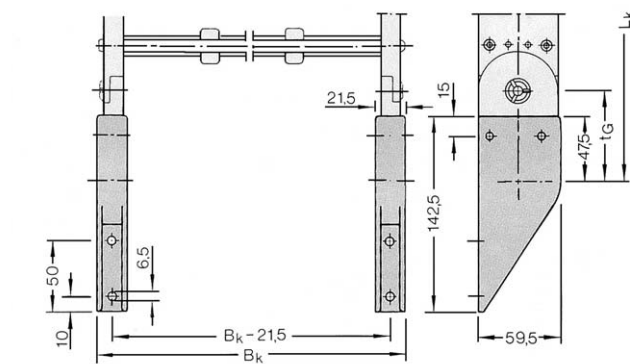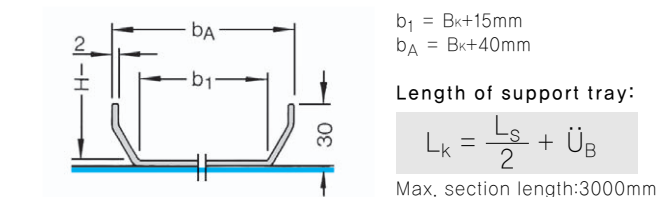
■ Chain weight for dual arrangement • dependenton chain width
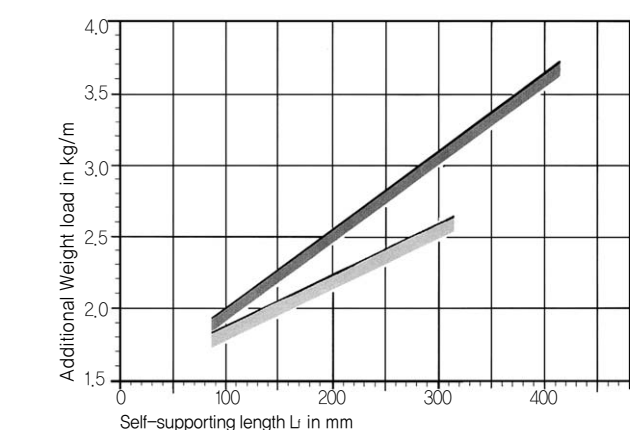
● Frame stays ● Hole stays with 50% holes

TYPE:SBC 0900
• Chain pitch t_G = 90mm

Arrangement

Driver

Fixed point
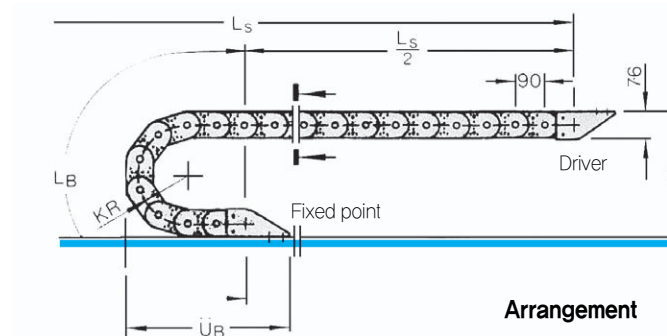
Bending radius:
• KR 130m • KR 150mm • KR 190mm • KR 245mm
• KR 300mm • KR 385mm

Variable construction dimensions (단위 : mm)
• dependent on bending radius

Bending radius KR	130	150	190	245	300	385
Length of curve L_B	770	830	960	1130	1300	1570
Proj. length of curve $Ü_B$	473	493	533	588	643	728
Mounting height H	336	376	456	566	676	846

• Calculation of chain length
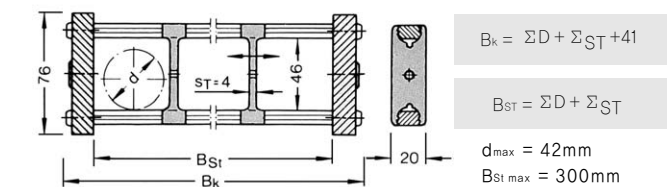
$$L_k = \frac{L_S}{2} + L_B$$ based on chain 90mm

■ Stay designs (D = 1.1 cable diameter d)

RS2 Frame stay – with detachable bars

$B_K = \Sigma D + \Sigma_{ST} + 41$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 52mm$
$B_{St\ max} = 300mm$

RS1 Frame stay – with fixed bars

$B_K = \Sigma D + \Sigma_{ST} + 41$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 42mm$
$B_{St\ max} = 300mm$

RM Solid frame stay – with sliding cleat

$B_K = \Sigma D + \Sigma_{ST} + 41$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 42mm$
$B_{St\ max} = 600mm$
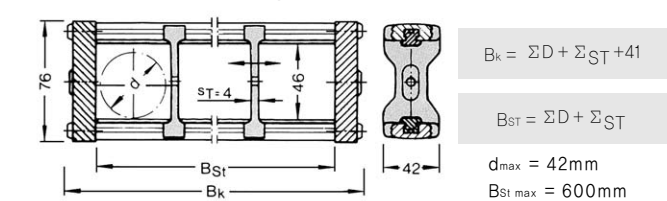
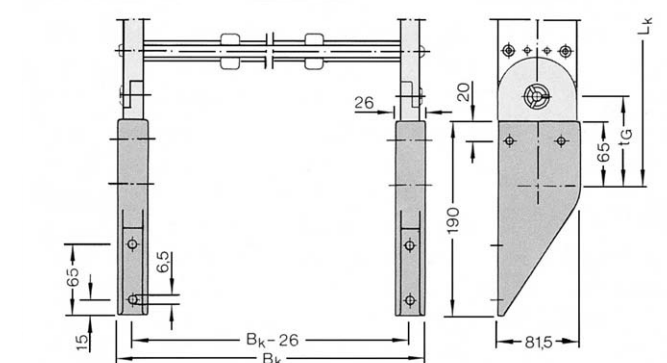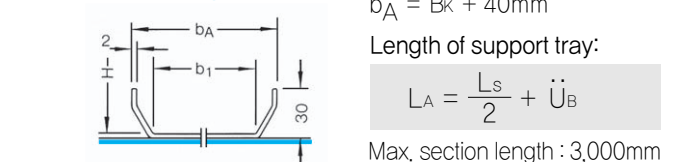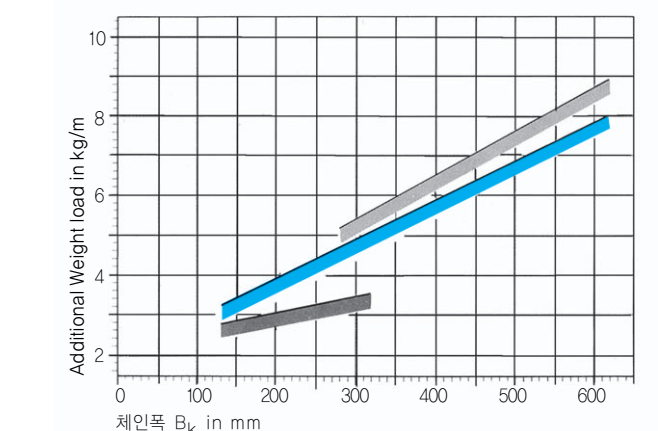### ■ Standard widths for frame stays
(Dimensions in mm)

Stay design	Frame Stay								Solid Frame Stay						
Chain width B_K	150	175	200	225	250	275	300	325	350	400	450	500	550	600
No.divider/stay	1	1	2	2	3	3	4	4	6	7	8	9	9	9
Stay width B_{St}	109	134	159	184	209	234	259	284	309	359	409	459	509	559

■ LG Hole Stay – split design
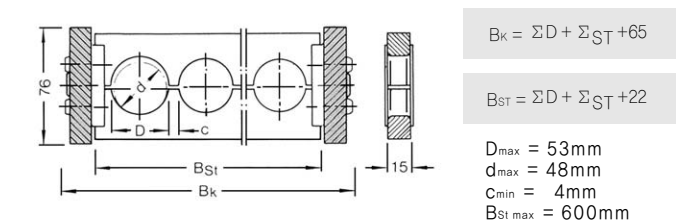
$B_K = \Sigma D + \Sigma_{ST} + 65$

$B_{ST} = \Sigma D + \Sigma_{ST} + 22$

$D_{max} = 53mm$
$d_{max} = 48mm$
$c_{min} = 4mm$
$B_{St\ max} = 600mm$

– Hole diagram produced as per customer details
– Hole stays available unsplit on request!

※ Where the maximum stay width is exceeded, a multiple chain arrangement must be used or the drag chain must be split into several chains running opposite or inside each other. In border line cases please consult us.

■ Chain connection dimensions

■ Support Tray

$b_1 = B_K + 15mm$
$b_A = B_K + 40mm$

Length of support tray:

$$L_A = \frac{L_S}{2} + Ü_B$$

Max. section length : 3,000mm

■ Chain weight • for dual arrangements • dependent on chain width

● Frame stays ● Solid stays ● Hole stays with 50% holes

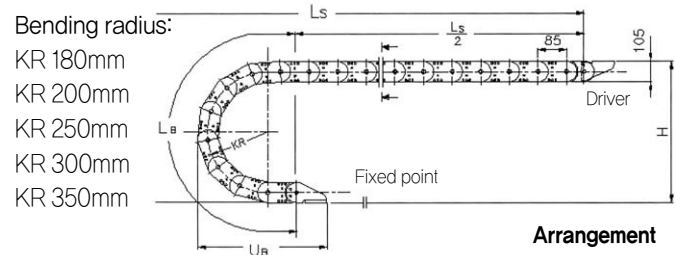**192** · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **193**

BAND Cable Chains

TYPE:SBC 0850 *NEW*

• Chain pitch t_G = 85mm

Bending radius:
KR 180mm
KR 200mm
KR 250mm
KR 300mm
KR 350mm

Arrangement

■ Stay designs (D=1,1 cable diameter d)

RS1 Frame stay
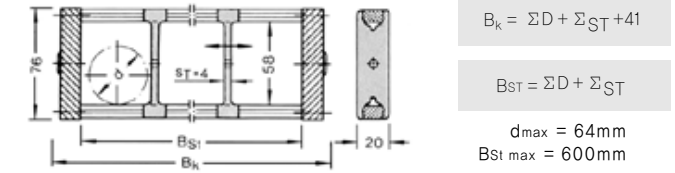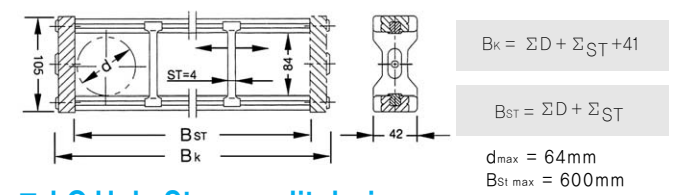
$B_K = \Sigma D + \Sigma_{ST} + 41$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 64mm$
$B_{St\ max} = 600mm$

RS2 Solid frame stay – with sliding cleat

$B_K = \Sigma D + \Sigma_{ST} + 41$

$B_{ST} = \Sigma D + \Sigma_{ST}$

$d_{max} = 64mm$
$B_{St\ max} = 600mm$

■ LG Hole Stay – split design

$B_K = \Sigma D + \Sigma_C + 65$

$B_{ST} = \Sigma D + \Sigma_C + 22$

$D_{max} = 53mm$
$d_{max} = 48mm$
$C_{max} = 4mm$
$B_{St\ max} = 600mm$
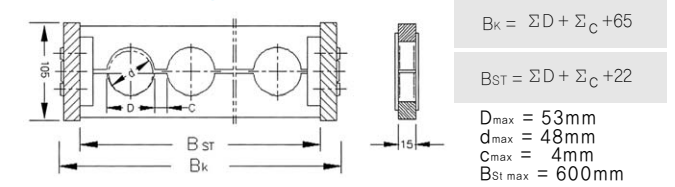
– Hole diagram produced as per customer details
– Hole stays available unsplit on request!

■ Chain connection dimensions

Fixed Point Connection   Driven Connection
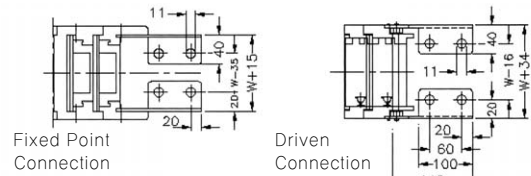
■ Standard widths for frame stays

(Dimensions in mm)

Stay design	Solid Frame Stay																		
Chain width B_K	150	175	200	225	250	275	300	325	350	400	450	500	550	600
No.divider/stay	1	1	2	2	3	3	4	4	6	7	8	9	9	9
Stay width B_{St}	109	134	159	184	209	234	259	284	309	359	409	459	509	559

■ Table of Dimensions – Guide channels:

Chain Type	SBC 650K						SBC 0900K					
Bending radius KR	75	115	145	175	220	300	130	150	190	245	300	385
Channel dimensions b_1	$B_K + 8$						$B_K + 8$					
b_{KA}	$B_K + 30$						$B_K + 30$					
h_{KA}	100	150	150	200	250	300	150	150	200	250	300	350
s_1	2,0						2,0					
Allowance dimensions L_{Z1}	300	350	380	400	450	550	450	475	500	550	620	700
L_{Z2}	250						300					
Connection distance X_{min}	2 B_K + 200						2 B_K + 250					

– All other dimensions are to be taken from the table of dimensions of the selected chain type.

Variable construction dimensions
• dependent on bending radius   (Dimensions in mm)

Bending radius KR	180	200	250	300	350
Length of curve L_B	905	970	1130	1280	1444
Proj. length of curve U_B	542	562	612	662	712
Mounting height H	465	505	605	705	805

• Calculation of chain length

$$L_K = \frac{L_S}{2} + L_B$$

based on chain 85mm

■ Details of Chain Band Material

• colour standard : black[1]   • Material standard : KS/PA[2] glass fibre strengthened

| Mechanical properties		Environmental conditions	Check value	Unit
Tensile strength		dry	190	N/㎟
		air moist	120	
Tensile dilation		dry	4	%
		air moist	6	
Elasticity modulus	Traction test	dry	10000	N/㎟
		air moist	7000	
Resilience	23℃	dry	55	KJ/㎡
	23℃	humid	80	
	−40℃	dry	45	
Thermal properties				
Temperature limit of application	Permissible temp. range		−25 [2] to 120	℃
	5,000hours		to 135	
	several hours		to 170	
Other properties				
Density		dry	1,4	g/㎤
Index sliding friction		ungreased	0,4	
Reaction upon burning as per VDE 0340 part 3		dry	11c	

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve max colour effect, several colours can be combined. In both cases, extra price for small quantities.
2) Moulded plastic cable drag chains for application in the range of radio–active radiation or for permanent temperatures below–20℃ require a material adaptation and can also be supplied by SHINSUNG. Please give us detailed information on your environmental conditions.

■ Chemical constancy of the standard material   at 20℃

Please contact us for all materials not shown in this table.

| Against	Constant	Conditionally constant
Mineral grease oil and lubricants	×	
Benzine, petroleum, ammonina	×	
Water, sea–water	×	
Acids (inconstant against acids with ph⟨3⟩		×
Alkali	×	
Fertilizers	×	
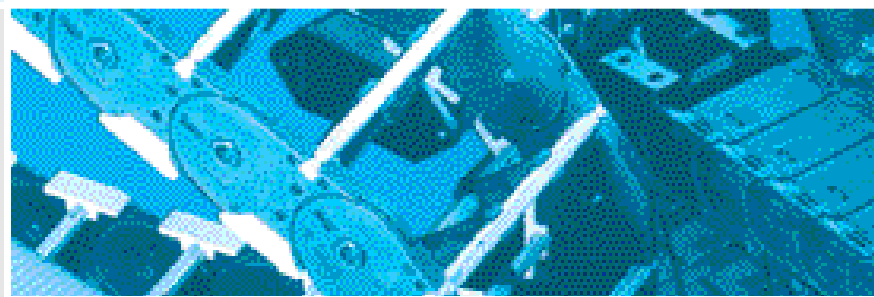
SSK Cover Cable Chain

Major use
Applied to Machine to automatic energy saving machine, Wood Working machine, Food machine, Fiber machine. Automation industry Industrial machine, Industrial plant etc.

NEW!
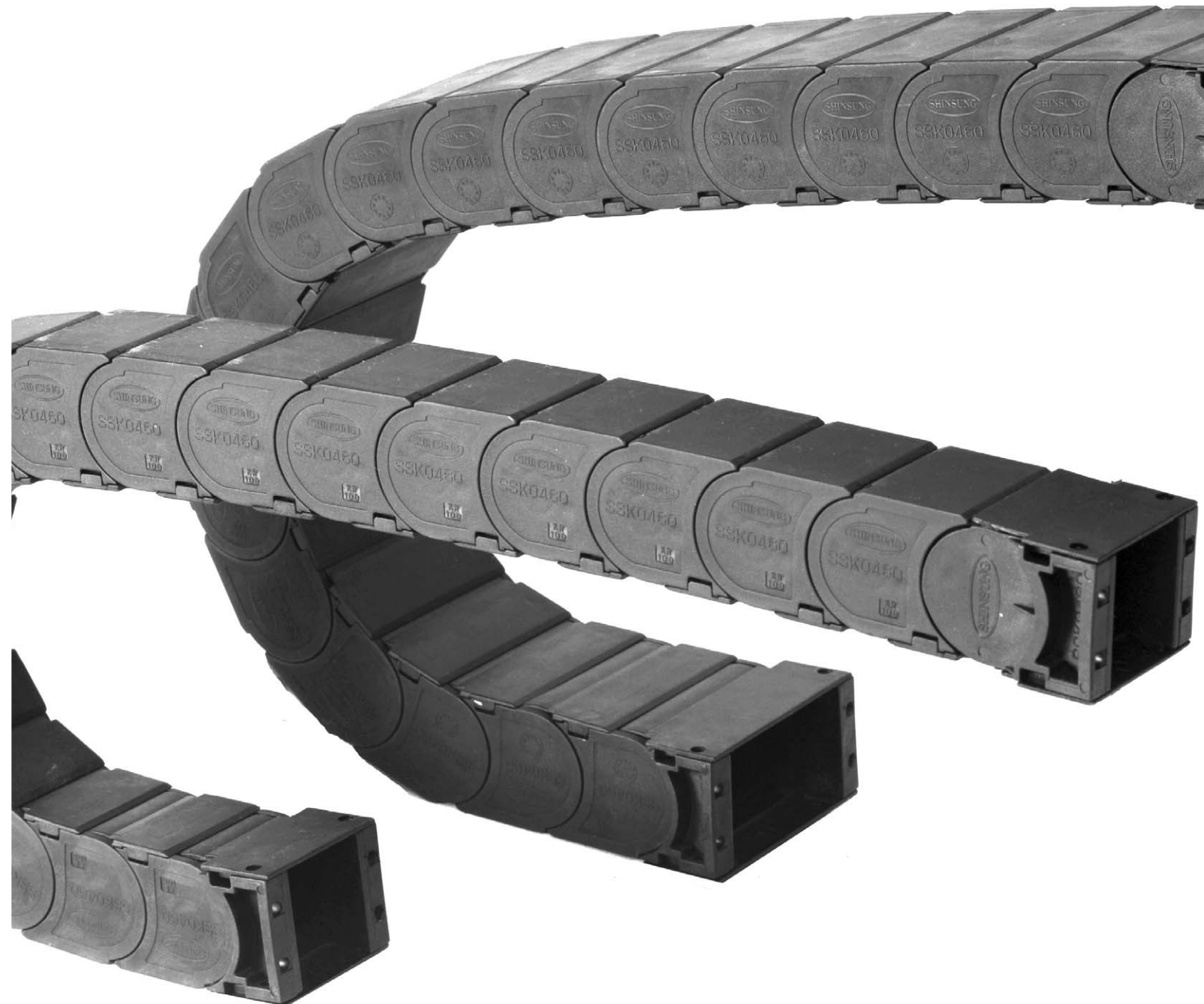
SSK Cover Cable Chain

SHINFLEX®

■ Special Feature

1. Efficiency of space increased, due to design of most-suited rate to both inner measure and outer measure
2. Simple assembly(Hinged, Snap-open type)
3. Low price
   SHINSUNG moulded plastic drag chains are protected by international patents and trademark and conform with safety standard requirements
4. Easily installed
   Cable/hoses can be readily installed without disconnection
5. Corrosion free
6. No maintenance
7. Good appearance

■ Material

- Standard colour : black[1]
- Standard material : KS/PA[2] – glass fibre strengthened

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve maximum colour effect, several colours can be combined. In both cases, extra price for small quantities.

2) Moulded plastic cable drag chains for application in the range of radio-active radiation or for permanent temperatures below-20 require a material adaptation and can also be delivered by SHINSUNG. Please give us detailed information on your environment conditions.

Mechanical properties		Environment al conditions	Check value	Unit
Tensile strength		dry	190	N/㎜²
		air moist	120	
Tensile dilation		dry	4	%
		air moist	6	
Elasticity modulus	Traction test	dry	10000	N/㎜²
		air moist	7000	
Resilience	23℃	dry	55	KJ/㎡
	23℃	humid	80	
	−40℃	dry	45	
Thermal properties				
Temperature limit of application	Permissible temp. range		−25 [2] to 120	℃
	5,000hours		to 135	
	several hours		to 170	
Other properties				
Density		dry	1.4	g/㎤
Index sliding friction		ungreased	0.4	
Reaction upon burning as per VDE 0340 part 3		dry	11c	

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(including hose contents)
3. Minimum bending radius of cable/hoses(acc, to manufacturer's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
7. Working environment temperature, humidity, radiation, etc

Technical data

(Dimensions in mm)

Definitions:

- B_K : Chain width
- B_{ST} : Stay Width
- h_G : Heigh of Chain Link
- h_I : Heigh of Stay
- KR : Bending Radius
- D : Straight Diameter
- D_{max} : Max Diameter
- L_S : Travel Lenght

Type	t_G	h_G	KR	h_I	D_{max}	B_K	B_{ST}
SSK 0460	46	50	100 125 150 175 200	40	37	66 91 116 141 166 191 216	50 75 100 125 150 175 200

- L_{ps} = Self supporting chain lenght
- L_{St} = Unit's travel lenght

SSK 0460

TYPE:SSK-0460

- Chain pitch t_G = 46mm

Bending radius:
- KR 100mm
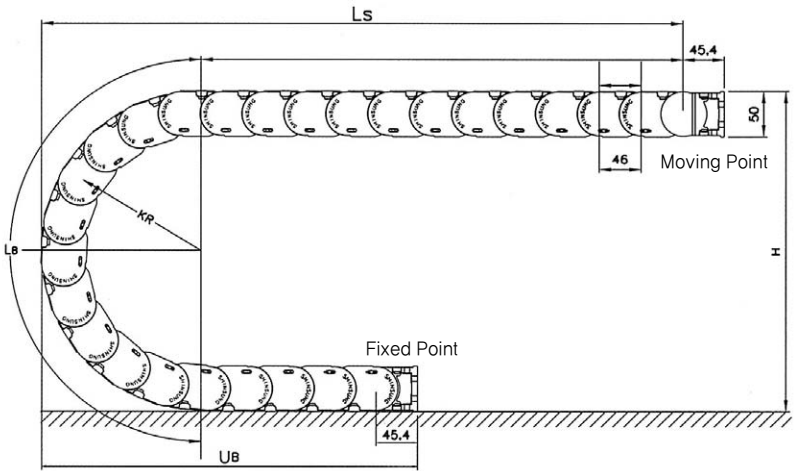- KR 125mm
- KR 150mm
- KR 175mm
- KR 200mm

Table of dimensions

(Dimensions in mm)

- L_B : Loop Lenght
- U_B : Loop Projection
- H_A : Chain Height
- H_Z : To Calculate Support Tray lenght

Bending radius KR	100	125	150	175	200
Length of curve L_B	410	485	565	645	725
Proj. length of curve $Ü_B$	175	200	225	250	275
Mounting height H	250	300	350	400	450

• To Calculate Chain Length
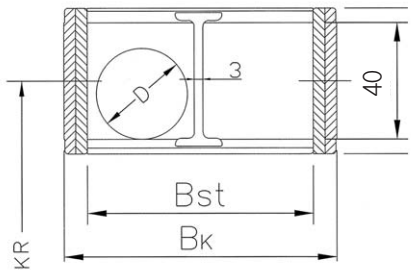
$$L_K = \frac{L_s}{2} + L_B$$

based on chain pitch 46mm

• To Calculate Support Tray Length

$$H_Z = H + Z$$
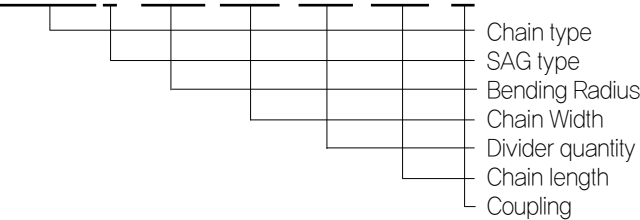
$Z \approx 10mm/m$ Chain length

■ Stay designs

D : 1,1d for cable diameter d
Cable − ϕD_{max} = 37mm
h_I : 40mm
h_G : 50mm
S_T : Divider thickmess 3mm

$$B_K = \Sigma D + \Sigma S_T + 16$$

$$B_{ST} = \Sigma D + \Sigma S_T$$

■ How to order

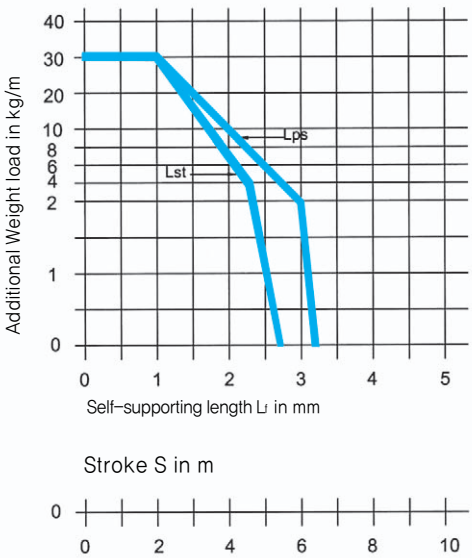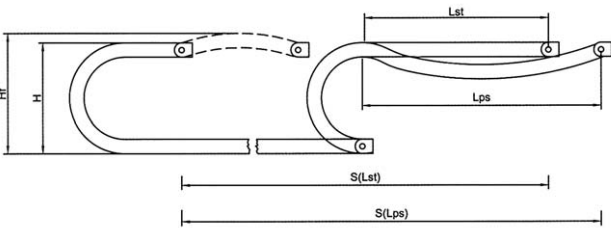- SSK 0460 S − KR100 − Bk125 − 30EA − L1840 − C

Chain type
SAG type
Bending Radius
Chain Width
Divider quantity
Chain length
Coupling

■ Standard widths for frame stays

(Dimensions in mm)

chain width B_K	66	91	116	141	166	191	216
no. of divider stays/stay	1	1	2	2	2	3	3
Stay width B_{ST}	50	75	100	125	150	175	200

■ Coupling Dimension

※ Easily installed – cable/hoses can be readily installed without disconnection
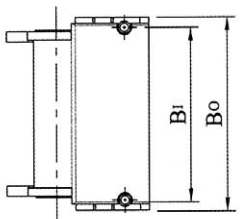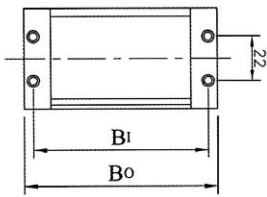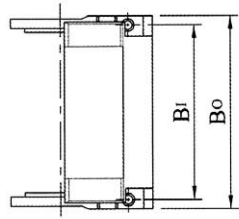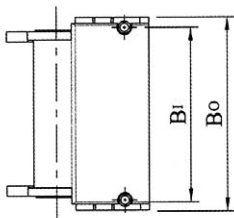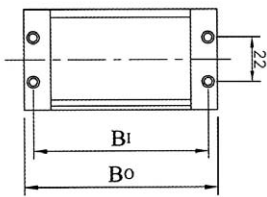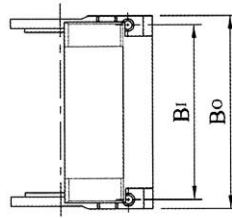
FIXED CONNECTION   MOVING CONNECTION

B_{st}	50	75	100	125	150	175	200
B_O	71	96	121	146	171	196	221
B_I	60	85	110	135	160	185	210

■ Special Feature

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2. Simple assembly(Hinged, Snap−open type)
3. Low price
   SHINSUNG moulded plastic drag chains are protected by international patents and trademark and conform with safety standard requirements
4. Easily installed
   Cable/hoses can be readily installed without disconnection
5. Corrosion free
6. No maintenance
7. Good appearance

■ Material − specification

• Standard colour : black[1]
• Standard material : KS/PA[2] − glass fibre strengthened

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve maximum colour effect, several colours can be combined. In both cases, extra price for small quantities.

2) Moulded plastic cable drag chains for application in the range of radio−active radiation or for permanent temperatures below−20 require a material adaptation and can also be delivered by SHINSUNG. Please give us detailed information on your environment conditions.

Mechanical properties		Environmental conditions	Check value	Unit
Tensile strength		dry	190	N/㎟
		air moist	120	
Tensile dilation		dry	4	%
		air moist	6	
Elasticity modulus	Traction test	dry	10000	N/㎟
		air moist	7000	
Resilience	23℃	dry	55	KJ/㎡
	23℃	humid	80	
	−40℃	dry	45	
Thermal properties				
Temperature limit of application	Permissible temp. range		−25 [2] to 120	℃
	5,000hours		to 135	
	several hours		to 170	
Other properties				
Density		dry	1,4	g/㎤
Index sliding friction		ungreased	0,4	
Reaction upon burning as per VDE 0340 part 3		dry	11c	

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(induding hose contents)
3. Minimum bending radius of cable/hoses(acc, to manufacturer's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
7. Working environment temperature, humidity, radiation, etc

Technical data

(Dimensions in mm)

Definitions:

• B$_K$: Chain width
• B$_{St}$: Stay Width
• h$_G$: Heigh of Chain Link
• h$_I$: Heigh of Stay
• KR : Bending Radius
• D : Straight Diameter
• D$_{max}$: Max Diameter
• L$_S$: Travel Lenght

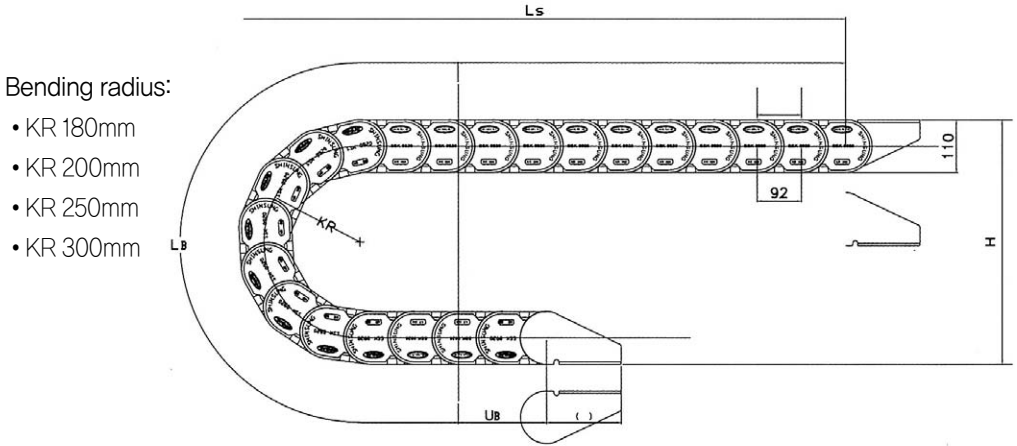| Type	t$_G$	h$_G$	KR	h$_I$	D$_{max}$	B$_K$	B$_{ST}$
SSK 0920	92	110	80 200 250 300 400 500 600	86	80	125 140 165 190 215 240 300 400 500 600	85 100 125 150 175 200 260 360 460 560

• L$_{ps}$ = Self supporting chain lenght
• L$_{St}$ = Unit's travel lenght

SSK 0920

TYPE:SSK-0920

• Chain pitch t$_G$: 92mm

Bending radius:
• KR 180mm
• KR 200mm
• KR 250mm
• KR 300mm

Table of dimensions

(Dimensions in mm)

• L$_B$: Loop Lenght   • U$_B$: Loop Projection
• H$_A$: Chain Height   • H$_Z$: To Calculate Support Tray lenght

Bending radius KR	180	200	250	300	400	500	600
Length of curve L$_B$	933	996	1153	1310	1624	1938	2252
Proj, length of curve Ü$_B$	419	439	489	539	639	739	839
Mounting height H	470	510	610	710	910	1110	1310

• **Calculation of chain length**

$$L_K = \frac{L_S}{2} + L_B$$

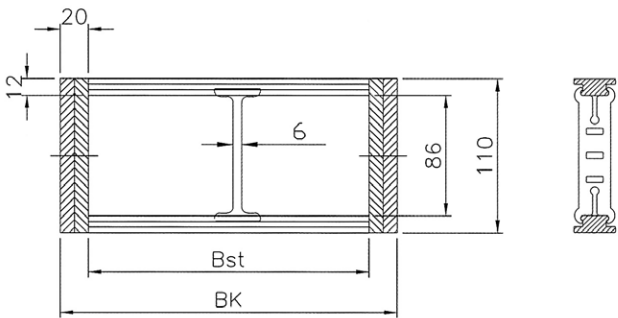based on chain pitch 92mm

• **Installation height：**

$$H_Z = H + Z$$

Z ≈ 10mm/m Chain length

■ Stay designs

Cable − ∅D$_{max}$ = 80mm
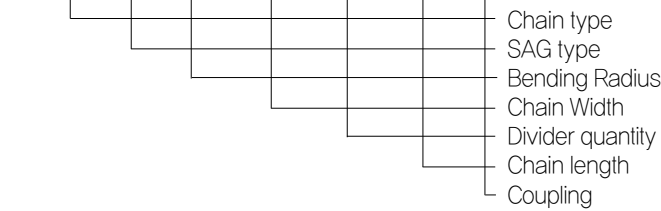ST : Divider thickmess 8mm
D : 1.1d for cable, hoses

$$B_K = ΣD + ΣS_T + 40$$

$$B_{ST} = ΣD + ΣS_T$$

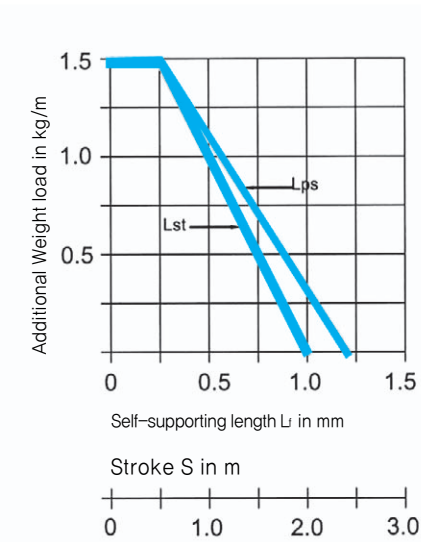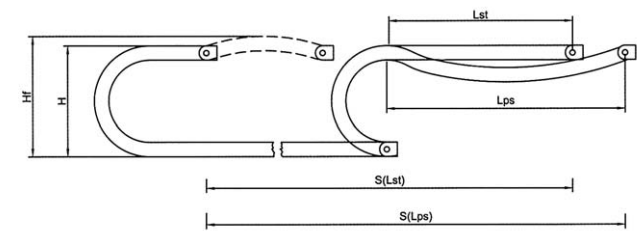## ■ How to order

• SSK 0920 S − KR180 − Bk125 − 50EA − L1840 − C

Chain type
SAG type
Bending Radius
Chain Width
Divider quantity
Chain length
Coupling

■ Standard widths for frame stays

chain width B$_k$	125	140	150	165	190	215	240	290	340	390	440
no. of divider stays/stay	2	2	2	2	3	3	3	4	4	5	5
Stay width B$_{St}$	85	100	110	125	150	175	200	250	300	350	400

■ Coupling Dimension

※ Easily installed − cable/hoses can be readily installed without disconnection

B$_K$	125	140	165	190	215	240	300	400	500	600
B$_{st}$	85	100	125	150	175	200	260	360	460	560
B$_l$	65	80	105	130	155	180	240	340	440	540

198 · SHINSUNG ELECTRIC CO., LTD.

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SHINFLEX®

SSB Band Cable Chain

NEW!

Major use
Applied to Machine tools automatic energy saving machine, Wood Working machine, Food machine,

SSB Band Cable Chain

SHINFLEX®

■ Special Feature

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2. Simple assembly(Hinged, Snap−open type)
3. Low price
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4. Easily installed
   Cable/hoses can be readily installed without disconnection
5. Corrosion free
6. No maintenance
7. Good appearance

■ Material − specification

- Standard colour : black[1]
- Standard material : KS/PA[2] − glass fibre strengthened

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve maximum colour effect, several colours can be combined. In both cases, extra price for small quantities.

2) Moulded plastic cable drag chains for application in the range of radio−active radiation or for permanent temperatures below−20 require a material adaptation and can also be delivered by SHINSUNG. Please give us detailed information on your environment conditions.

Mechanical properties		Environmental conditions	Check value	Unit
Tensile strength		dry	190	N/㎟
		air moist	120	
Tensile dilation		dry	4	%
		air moist	6	
Elasticity modulus	Traction test	dry	10000	N/㎟
		air moist	7000	
Resilience	23℃	dry	55	KJ/㎡
	23℃	humid	80	
	−40℃	dry	45	
Thermal properties				
Temperature limit of application	Permissible temp. range		−25[3] to 120	℃
	5,000hours		to 135	
	several hours		to 170	
Other properties				
Density		dry	1.4	g/㎤
Index sliding friction		ungreased	0.4	
Reaction upon burning as per VDE 0340 part 3		dry	11c	

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(including hose contents)
3. Minimum bending radius of cable/hoses(acc, to manufacturer's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
7. Working environment temperature, humidity, radiation, etc

Technical data

(Dimensions in mm)

Definitions:

- B_K : Chain width
- B_{St} : Stay Width
- h_G : Heigh of Chain Link
- h_I : Heigh of Stay
- KR : Bending Radius
- D : Straight Diameter
- D_{max} : Max Diameter
- L_S : Travel Lenght

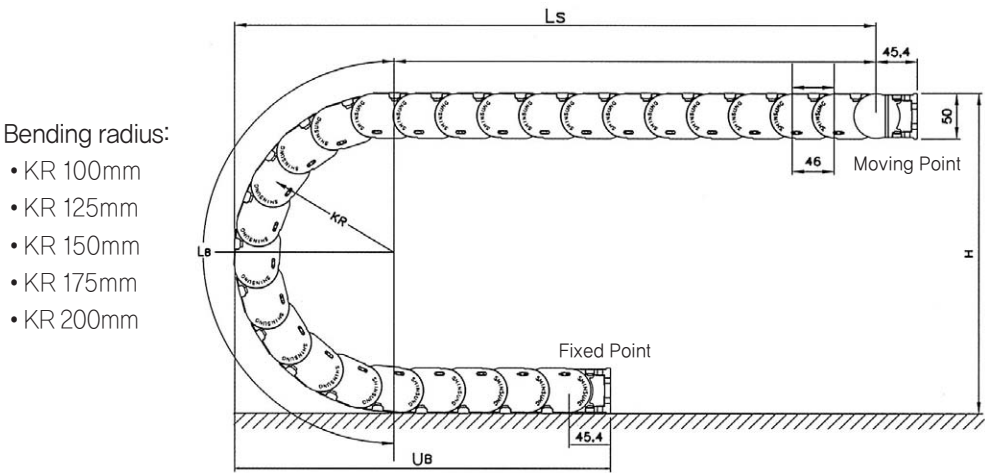| Type	t_G	h_G	KR	h_I	D_{max}	B_K	B_{ST}
SSB 0460	46	50	100 125 150 175 200	40	37	66 91 116 141 166 191 216	50 75 100 125 150 175 200

- L_{ps} = Self supporting chain lenght
- L_{St} = Unit's travel lenght

SSB 0460

TYPE:SSB-0460

- Chain pitch t_G = 46mm

Bending radius:
- KR 100mm
- KR 125mm
- KR 150mm
- KR 175mm
- KR 200mm

Table of dimensions

(Dimensions in mm)

- L_B : Loop Lenght
- U_B : Loop Projection
- H_A : Chain Height
- H_Z : To Calculate Support Tray lenght

Bending radius KR	100	125	150	175	200
Length of curve L_B	410	485	565	645	725
Proj. length of curve $Ü_B$	175	200	225	250	275
Mounting height H	250	300	350	400	450

- **Calculation of chain length**

$$L_K = \frac{L_s}{2} + L_B$$

based on chain pitch 46mm

- **Installation height：**

$$H_Z = H + Z$$

$Z ≈ 10mm/m$ Chain length

■ Stay designs
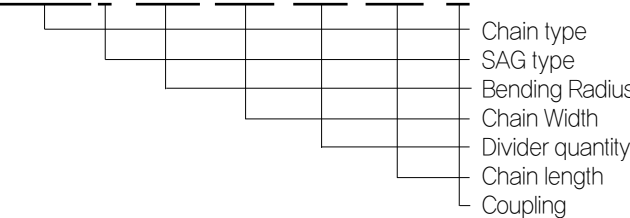

D : 1,1d for cable diameter d
Cable − ∅ D_{max} = 37mm
h_I : 40mm
h_G : 50mm
S_T : Divider thickmess 3mm

$$B_K = ΣD + ΣS_T + 16$$

$$B_{ST} = ΣD + ΣS_T$$

■ How to order

- SSB 0460 S − KR100 − Bk125 − 30EA − L1840 − C

- Chain type
- SAG type
- Bending Radius
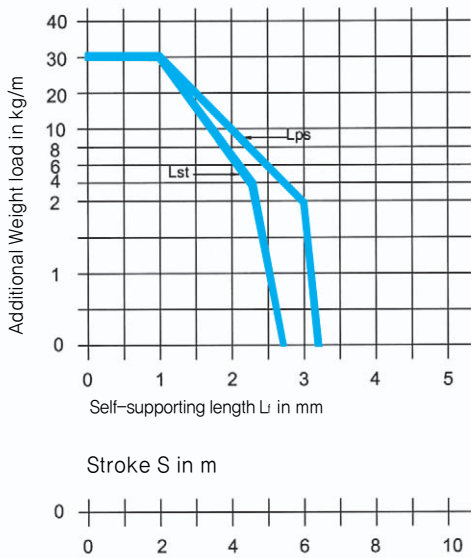- Chain Width
- Divider quantity
- Chain length
- Coupling

■ Standard widths for frame stays

chain width B_K	66	91	116	141	166	191	216
no. of divider stays/stay	1	1	2	2	2	3	3
Stay width B_{st}	50	75	100	125	150	175	200

■ Coupling Dimension

※ Easily installed − cable/hoses can be readily installed without disconnection

FIXED CONNECTION

MOVING CONNECTION

B_{st}	50	75	100	125	150	175	200
B_O	71	96	121	146	171	196	221
B_I	60	85	110	135	160	185	210

SSB Band Cable Chain

■ Special Feature

1. Efficiency of space increased, due to design of most−suited rate to both inner measure and outer measure
2. Simple assembly(Hinged, Snap−open type)
3. Low price
   SHINSUNG moulded plastic drag chains are protected by international patents and trademark and conform with safety standard requirements
4. Easily installed
   Cable/hoses can be readily installed without disconnection
5. Corrosion free
6. No maintenance
7. Good appearance

■ Material − specification

• Standard colour : black[1]
• Standard material : KS/PA[2] − glass fibre strengthened

1) Upon request moulded plastic cable drag chains can be supplied in the colours white, red, yellow, beige and on enquiry in further colours. In order to achieve maximum colour effect, several colours can be combined. In both cases, extra price for small quantities.

2) Moulded plastic cable drag chains for application in the range of radio−active radiation or for permanent temperatures below−20 require a material adaptation and can also be delivered by SHINSUNG. Please give us detailed information on your environment conditions.

Mechanical properties	Environmental conditions	Check value	Unit
Tensile strength	dry	190	N/㎜²
	air moist	120	
Tensile dilation	dry	4	%
	air moist	6	
Elasticity modulus	Traction test dry	10000	N/㎜²
	air moist	7000	
Resilience	23℃ dry	55	KJ/m²
	23℃ humid	80	
	−40℃ dry	45	
Thermal properties			
Temperature limit of application	Permissible temp. range	−25[2] to 120	℃
	5,000hours	to 135	
	several hours	to 170	
Other properties			
Density	dry	1.4	g/㎝³
Index sliding friction	ungreased	0.4	
Reaction upon burning as per VDE 0340 part 3	dry	11c	

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(including hose contents)
3. Minimum bending radius of cable/hoses(acc, to manufacturer's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
7. Working environment temperature, humidity, radiation, etc
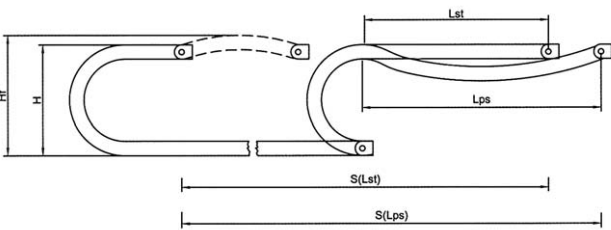

Technical data   (단위:mm)

Definitions:

• B$_K$: Chain width
• B$_{St}$: Stay Width
• h$_G$: Heigh of Chain Link
• h$_i$: Heigh of Stay
• KR : Bending Radius
• D : Straight Diameter
• D$_{max}$: Max Diameter
• L$_S$: Travel Lenght

Type	t$_G$	h$_G$	KR	h$_i$	D$_{max}$	B$_K$	B$_{ST}$
SSB 0920	92	110	180 200 250 300 400 500 600	86	80	125 140 165 190 215 240 300 400 500 600	85 100 125 150 175 200 260 360 460 560

• L$_{ps}$ = Self supporting chain lenght
• L$_{St}$ = Unit's travel lenght

SSB 0920

TYPE:SSB-0920   • Chain pitch t$_G$: 92mm

Bending radius:
• KR 180mm
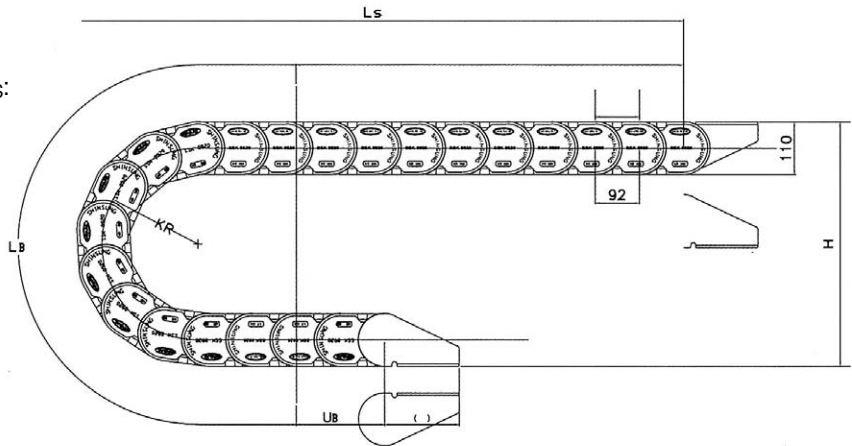• KR 200mm
• KR 250mm
• KR 300mm

Table of dimensions   (Dimensions in mm)

• L$_B$: Loop Lenght   • U$_B$: Loop Projection
• H$_A$: Chain Height   • H$_Z$: To Calculate Support Tray lenght

Bending radius KR	180	200	250	300	400	500	600
Length of curve L$_B$	933	996	1153	1310	1624	1938	2252
Proj, length of curve Ü$_B$	419	439	489	539	639	739	839
Mounting height H	470	510	610	710	910	1110	1310

• Calculation of chain length   • Installation height :

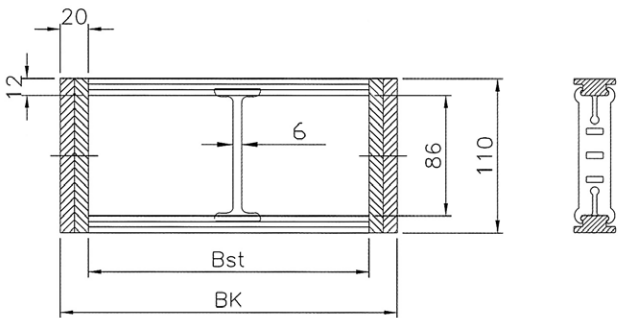$$L_K = \frac{L_S}{2} + L_B$$

based on chain pitch 92mm

$$H_Z = H + Z$$

Z ≈ 10mm/m Chain length

■ Stay designs

Cable − ⌀D$_{max}$ = 80mm
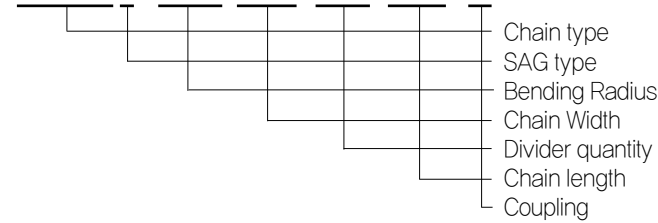ST : Divider thickmess 8mm
D : 1.1d for cable, hoses

$$B_K = \Sigma D + \Sigma S_T + 40$$

$$B_{ST} = \Sigma D + \Sigma S_T$$

■ How to order

• SSB 0920 S − KR180 − Bk125 − 50EA − L1840 − C

Chain type
SAG type
Bending Radius
Chain Width
Divider quantity
Chain length
Coupling

■ Standard widths for frame stays

chain width B$_K$	125	140	150	165	190	215	240	290	340	390	440
no. of divider stays/stay	2	2	2	2	3	3	3	4	4	5	5
Stay width B$_{St}$	85	100	110	125	150	175	200	250	300	350	400

■ Coupling Dimension

※ Easily installed − cable/hoses can be readily installed without disconnection
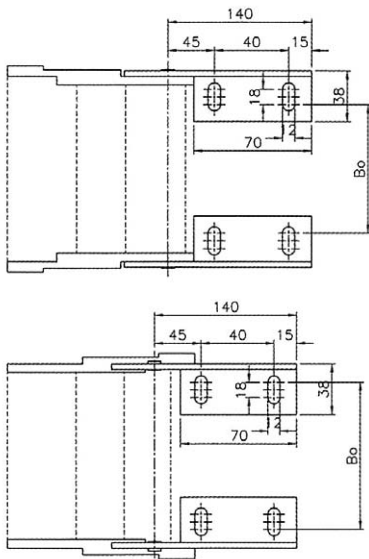
| B$_K$	125	140	165	190	215	240	300	400	500	600
B$_{st}$	85	100	125	150	175	200	260	360	460	560
B$_l$	65	80	105	130	155	180	240	340	440	540

SHINFLEX®

SCBC - CRANE
Cable Chain

NEW!

Use of structure
Domestically developed perfectly closed-up type Steel Cable Carrier Chain. Use of structure: As perfect closed-up type applied to Iron manufacturing equipment, conveyance equipment, machine tool, industrial machine, industrial plant equipment, automobile industry, ironworks, rolling equipments, harbor equipments, etc. this is a Perfect Steel Cable Carrier Chain.

Roller Bearing
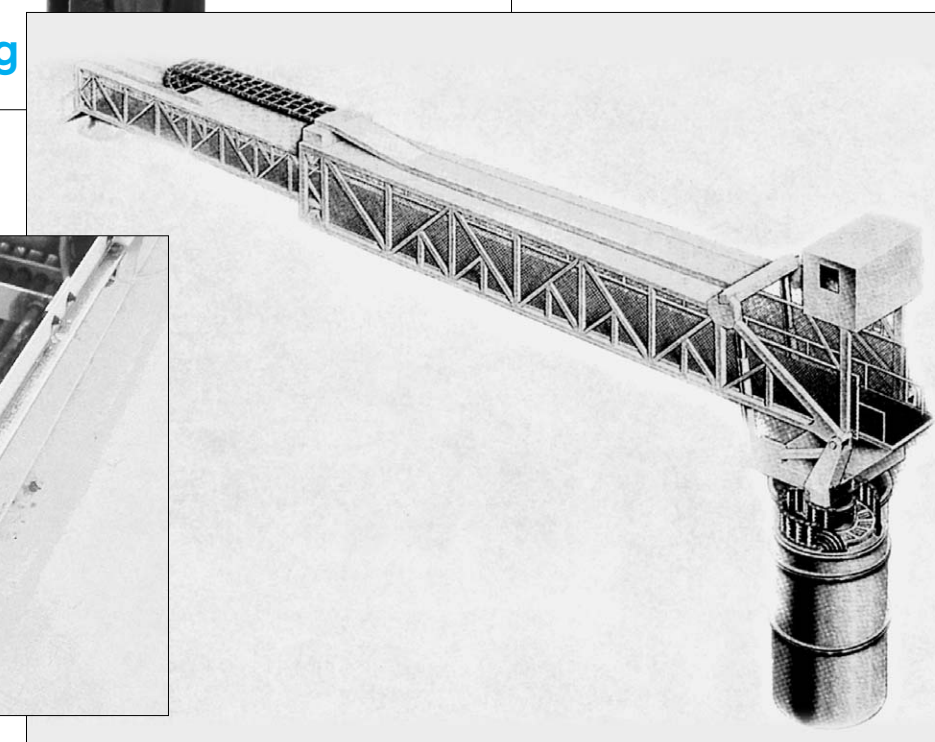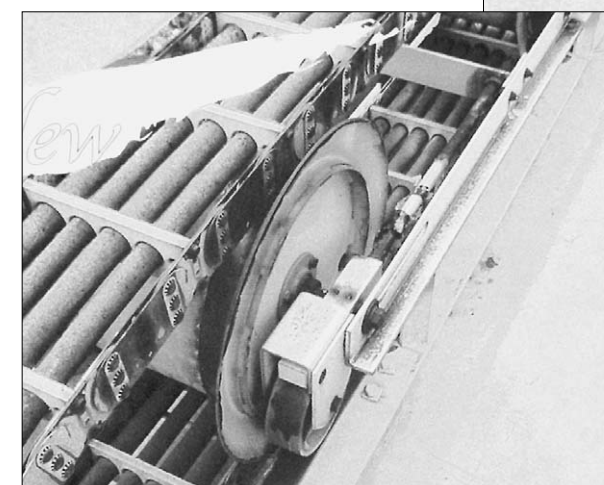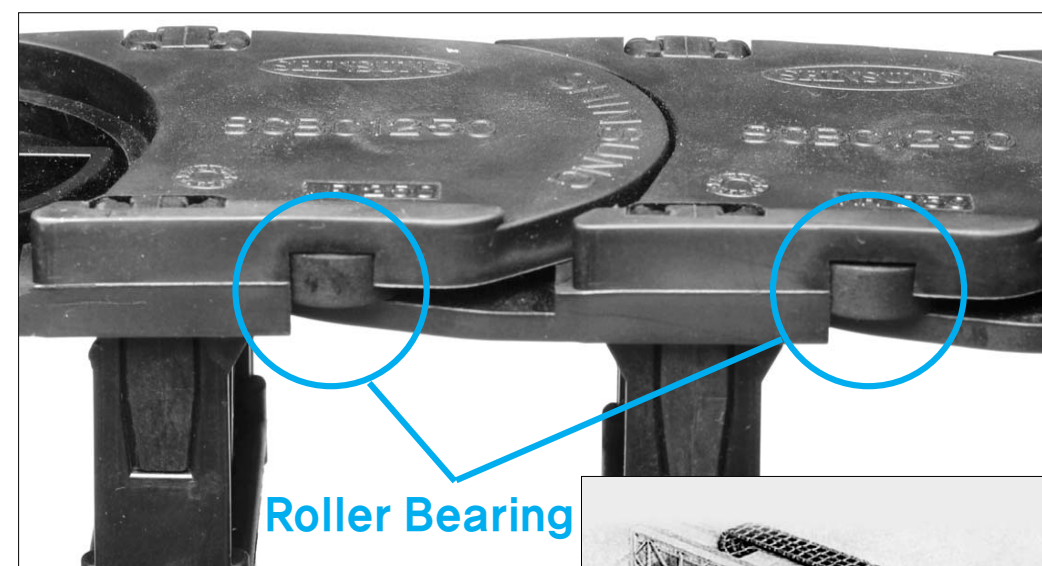
Application

1. Crane Chain is a new item developed to be used for container crane for the first in the country, by SHINSUNG ELECTRIC CO., LTD using for electric wire transfer of Container Crane, crane electric wire transfer equipment for industrial purpose.
2. Crane Chain, though cabel reel, feston system applied, but can work as their substitute, and can be applied to even in the circumstance where cable reel or festoon system is not applied.

Structure

1. As done with double locking equipment, no phenomenon happens that frame comes off or is broken away.
2. Made as double locking equipment, so there are no damage to frame nor breaking away in strong vibration of hydraulic hose and in putting in and out many electric wires.
3. With wide arca of the frame base, it moves smoothly without breaking away at friction part of both upper and lower part, in time of friction of both upper and lower part.

Advantages

1. It is light as production of Fiber Glass material, compared with the size of chain
2. No breaking away from frame, no damage with double roking equipment
3. With its own sliding structure, no special slide equipment is required.
4. With wide base of chain, it moves smoothly without breaking away in time of friction of both upper and lower part
5. Simple to instal cabel, hose, and also simple to assemble and disassemble
6. Easy to instal divider
7. Not to be corroded
8. Very suitable to long–distance transprot

Material

KR–PA Strengthens glass fibre, and standard Color basic is black

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(induding hose contents)
3. Minimum bending radius of cable/hoses(acc, to manufacturer's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
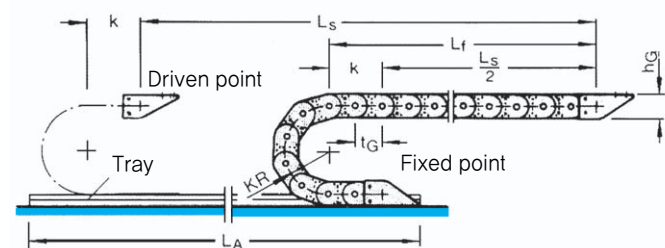7. Working environment temperature, humidity, radiation, etc

Technical data   (Dimensions in mm)

Definitions:
- L_S : Travel Lenght
- B_K : Chain width
- B_{ST} : Stay Width
- KR : Bending Radius
- h_I : Heigh of Stay
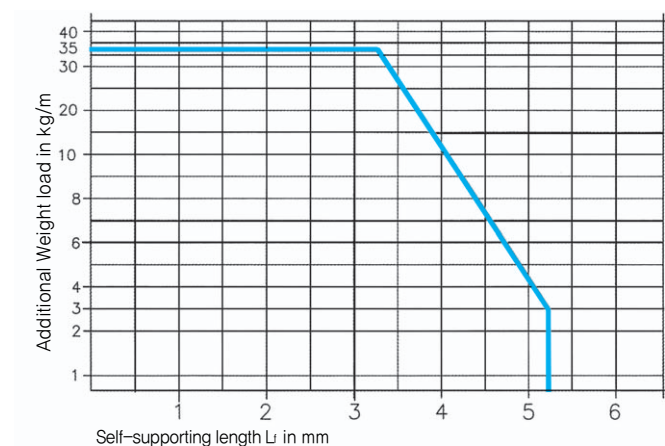- D : Straight Diameter
- D_{max} : Max Diameter

Type	t_G	h_G	KR	h_I	D_{max}	B_K	B_{ST}
SCBD 1250	125	131	200	95	90	320	264
			250			370	314
			300			420	364
			400			500	444
			500			600	544

■ Cable Carrier Arragement

$$L_K = \frac{L_S}{2} + K \qquad K = 2\,t_G$$

■ 자체지지 길이와 작업이동거리

TYPE:SCBC 1250   • Chain pitch t_G : 125mm

Bending radius:
- KR 200mm
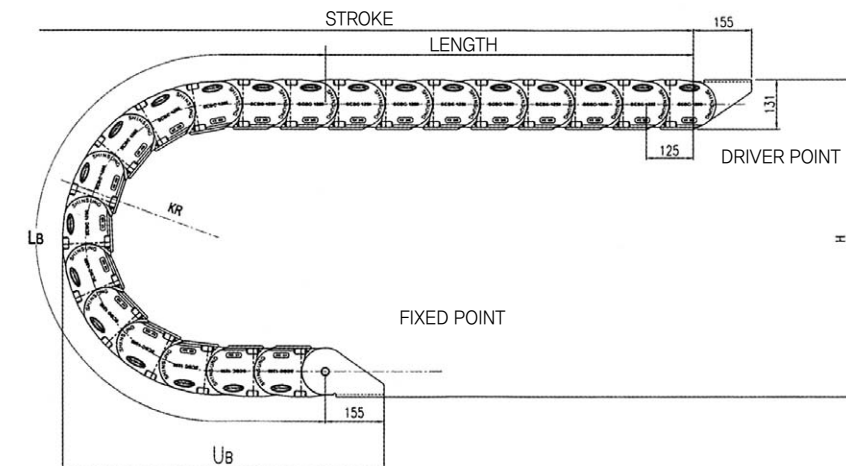- KR 250mm
- KR 300mm
- KR 400mm
- KR 500mm

Table of dimensions   (Dimensions in mm)

- L_B : Loop Lenght
- H_A : Chain Height
- U_B : Loop Projection
- H_Z : To Calculate Support Tray lenght

| Bending radius KR	200	250	300	400	500
Length of curve L_B	1259	1285	1442	1756	2070
Proj. length of curve $Ü_B$	670	720	770	870	970
Mounting height H	531	631	731	931	1131

• Calculation of chain length

$$L_K = \frac{L_S}{2} + L_B \qquad \text{based on chain pitch 125mm}$$

■ Standard widths for frame stays
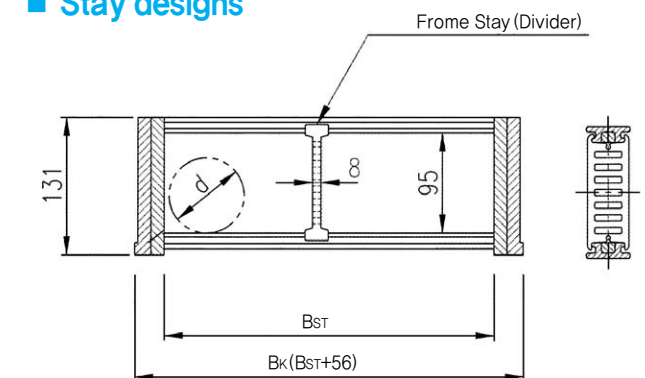
chain width B_K	320	370	420	500	600
no. of divider stays/stay	2	3	4	5	6
Stay width B_{ST}	264	314	364	444	544

■ Coupling Dimension   ※ Depend on other demension

FIXED CONNECTION   DRIVER CONNECTION
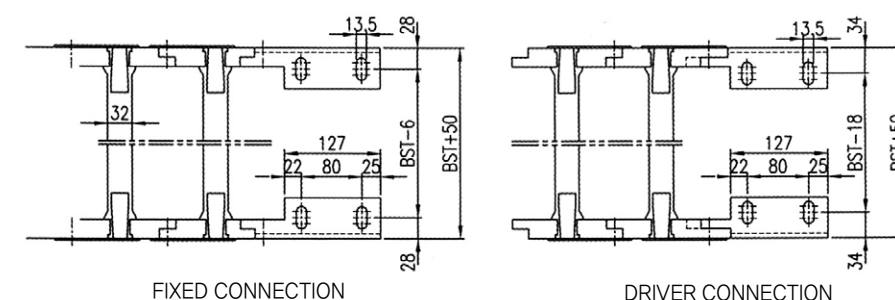
■ Stay designs

D = 1.1d for cable diameter d
d_{max} = 87mm
ST = Divider thickmess 8mm

$$B_K = \Sigma D + \Sigma S_T + 5.6$$

■ How to order

• SCBC1250 S − KR200 − Bk320 − D200 − L7000

- Chain type
- SAG type
- Bending Radius
- Chain Width
- Divider quantity
- Chain Lenght

208 · SHINSUNG ELECTRIC CO., LTD.

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SHINFLEX®

SCC - Circular Robot Chain

Use of structure

Domestically developed perfectly closed-up type Steel Cable Carrier Chain. Use of structure: As perfect closed-up type applied to Iron manufacturing equipment, conveyance equipment, machine tool, industrial machine, industrial plant equipment, automobile industry, ironworks, rolling equipments, harbor equipments, etc. this is a Perfect Steel Cable Carrier Chain.

SCC Circular Robot Chains

SHINFLEX®

■ Special Features

1. Applicable to use environment of both directions of cable or hose
2. Various sizes of installing support tray
3. Fixing two steel brackets (fixed by screw to end part of both side)
4. Can assemble without dismantling cable or hose (easy to install)
5. Corrosion free
6. Pleasing appreance
7. Above 200˚, special accessory is reqaired, white above 360˚ impossbible to install
8. Speed of transportation 180˚/sec

■ Material of duct parts

KS–PA strengthens glass fibre and standard color basic is black

■ Provide the following information

1. Number and outside diameter of the cable/hoses to be installed(with/without and fittings)
2. Weight of all cables and hoses(induding hose contents)
3. Minimum bending radius of cable/hoses (acc, to manufactures's specification)
4. Movable distance and radius of rotation
5. Max accelenition/deceleration
6. Available mounting width, height
7. Working environment temperature, humidity, radiation, etc

Technical data

(Dimensions in mm)

■ SCC Arrangement
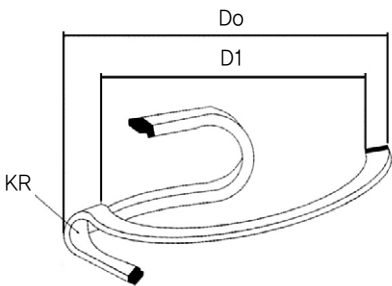
■ Chain–cross section
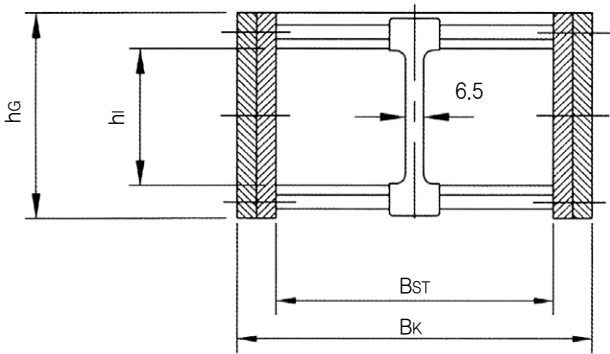
■ Technical Characteristics

- t_G : chain pitch
- D : height of stay
- D_o : outer diameter
- B_K : chain width
- h_G : height of chain link
- KR : bending radius
- D_I : inner diameter
- B_{ST} : stay width

Type	t_G	h_G	D	KR	D_o	D_I	B_K	B_{ST}	h_i
0070	68	45	35	100	755	600	69	45	35
0080	80	43	30	100 150	830	630	93	65	30
0085	85	77	57	175	1340	1060	132	95	57
0100	100	74	50	125	1184	954	128	100	50
0150	150	85	59	220	2000	1400	272	210	59

※ On special chracter of product, curvature was applied to body itself of SCC chain, it may not be exactly agreed with the measure of the abovementioned mark, so you are requested to refer to this, and you may requestus when you need on exact data.

■ To Calculate Chain Length

LK : Number of link = 3,14
R_O : Outer radius
A_R : Degree of installed
t_G : Chain pitch
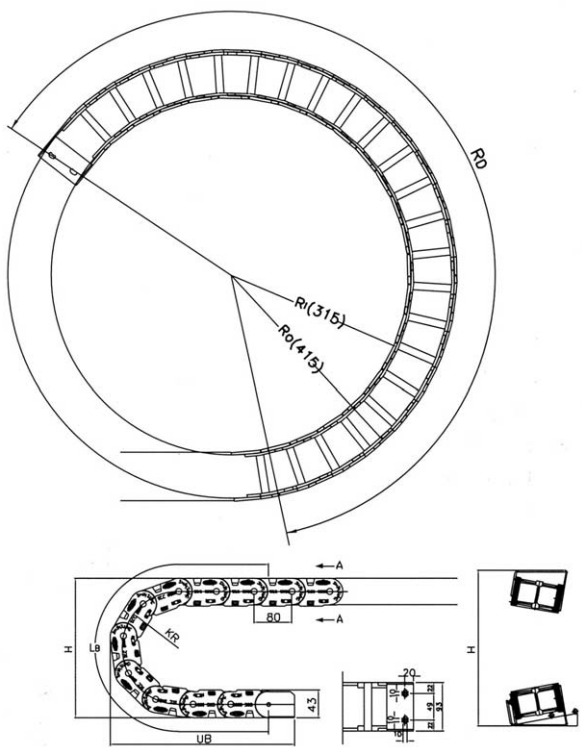L_B : Length of bending line

$$L_K = \frac{\pi \times R_O \times A_R}{360˚ \times t_G} + \frac{L_B}{t_G}$$
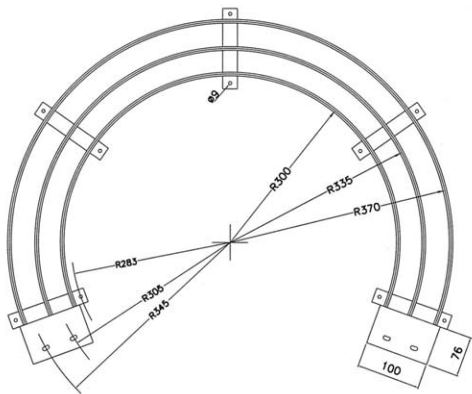
TYPE : SCC-0070
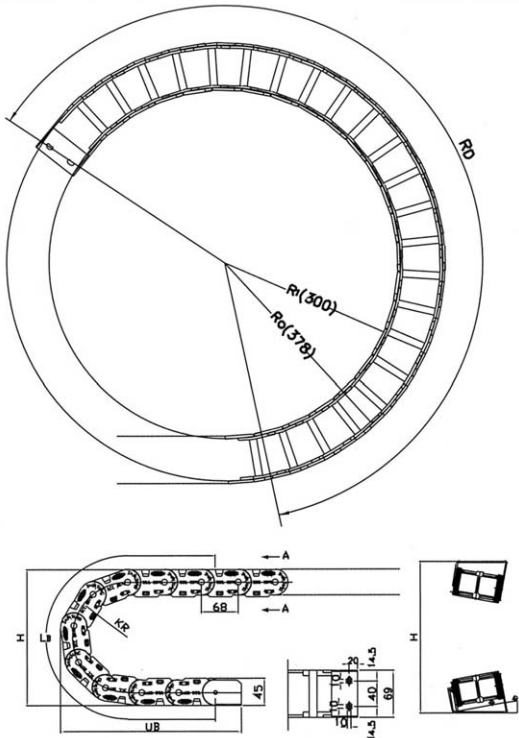
Definitions:
- KR: Bending radius
- L_B: Length of bending line
- L_S: Unit's travel length
- B_K: Width of chain
- U_B: Projecting part
- R_D: Degree of ratation
- B_{ST}: Stay width
- H: Height of connection
- h_G: Chain link height
- R_O: Outer radius
- h_I: Height of stay
- R_I: Inner Radius

TYPE : SCC-0080

■ Guide Tray

■ Technical Data

KR	H	L_B	U_B	B_K	B_{ST}	h_G	h_I
100	305	590	285	69	45	45	35

RD	90˚	180˚	270˚	360˚
LINK	13	18	22	26

■ Guide Tray
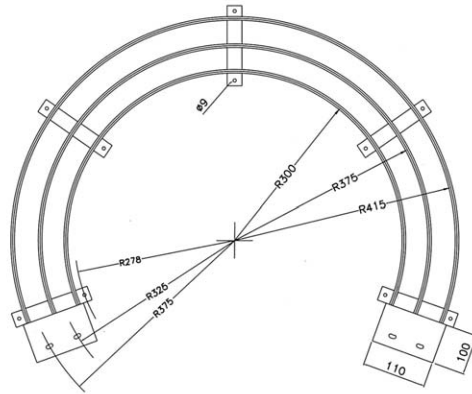
■ Technical Data

KR	H	L_B	U_B	B_K	B_{ST}	h_G	h_I
100	315	635	300	93	65	43	30
150	390	795	350				

RD	90˚	180˚	270˚	360˚
KR100	12	16	20	24
KR150	14	18	23	27

212 · SHINSUNG ELECTRIC CO,, LTD.

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TYPE : SCC-0085
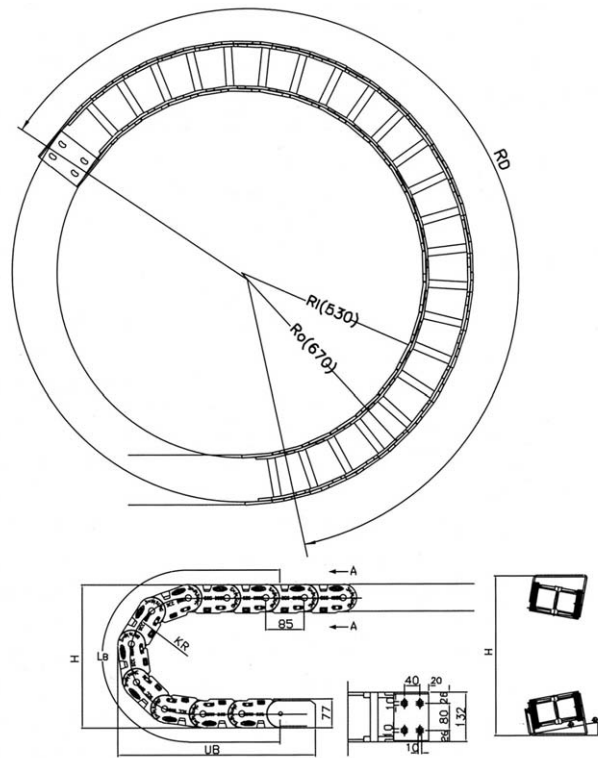
■ Guide Tray
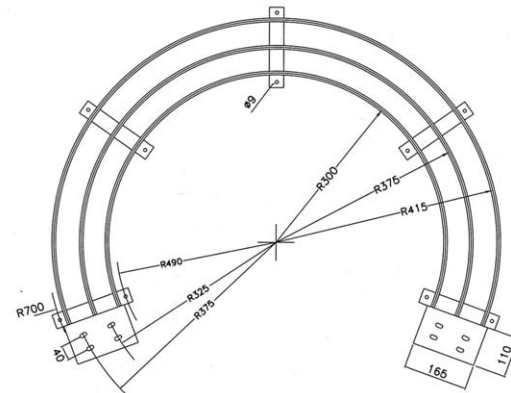
■ Technical Data

KR	H	LB	UB	BK	BST	hG	hI
175	465	890	490	132	88	77	57

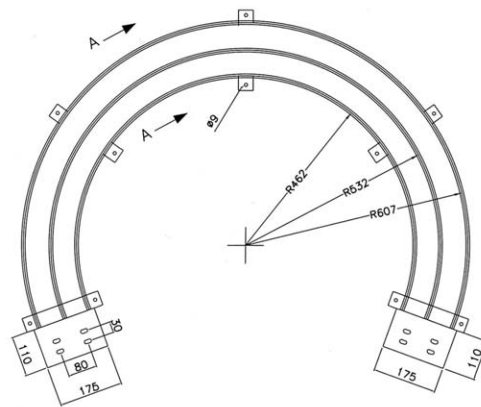| RD	90°	180°	270°	360°
LINK	17	23	29	35

Definitions:
• KR：Bending radius　　• BK：Width of chain　• BST：Stay width　　　• hG：Chain link height　• hI：Height of stay
• LB：Length of bending line • UB：Projecting part　• H：Height of connection • RO：Outer radius　　　• RI：Inner Radius
• LS：Unit's travel length　• RD：Degree of ratation

TYPE : SCC-0100
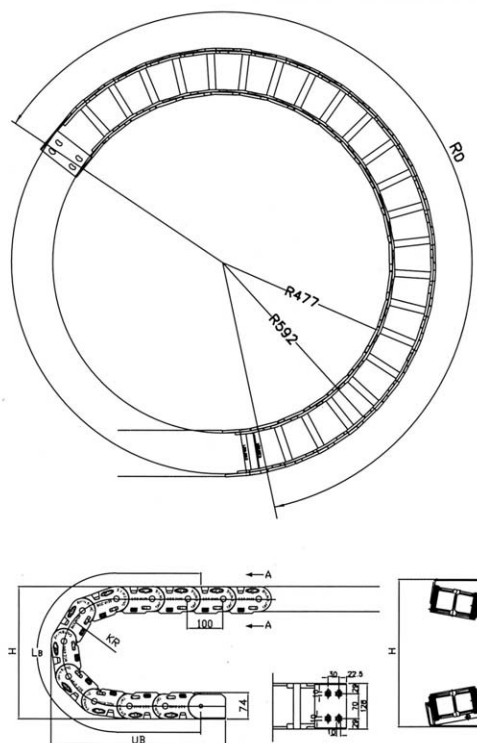
■ Guide Tray

■ Technical Data

KR	H	LB	UB	BK	BST	hG	hI
125	400	795	485	128	100	74	50

RD	90°	180°	270°	360°
LINK	13	17	22	27

TYPE : SCC-0150
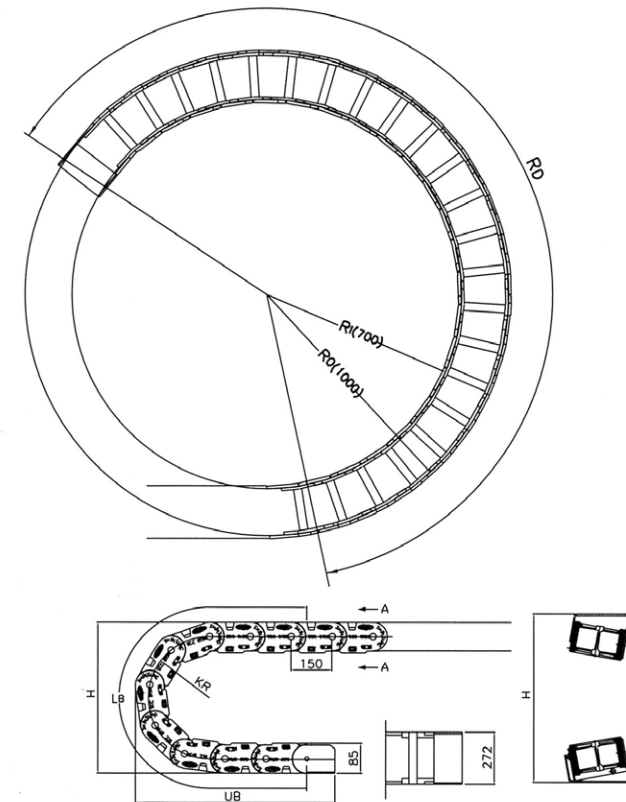
■ Guide Tray
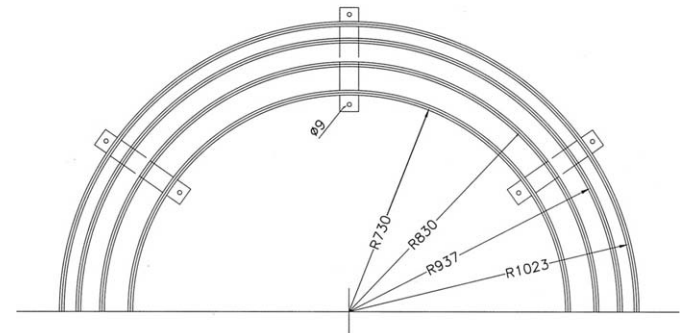
■ Technical Data

KR	H	LB	UB	BK	BST	hG	hI
220	610	1290	715	272	210	85	59

RD	90°	180°	270°	360°
LINK	14	19	23	28

Definitions:
• KR：Bending radius　　• BK：Width of chain　　• BST：Stay width　　　• hG：Chain link height　• hI：Height of stay
• LB：Length of bending line • UB：Projecting part　　• H：Height of connection • RO：Outer radius　　　• RI：Inner Radius
• LS：Unit's travel length　• RD：Degree of ratation

214 · SHINSUNG ELECTRIC CO,, LTD.

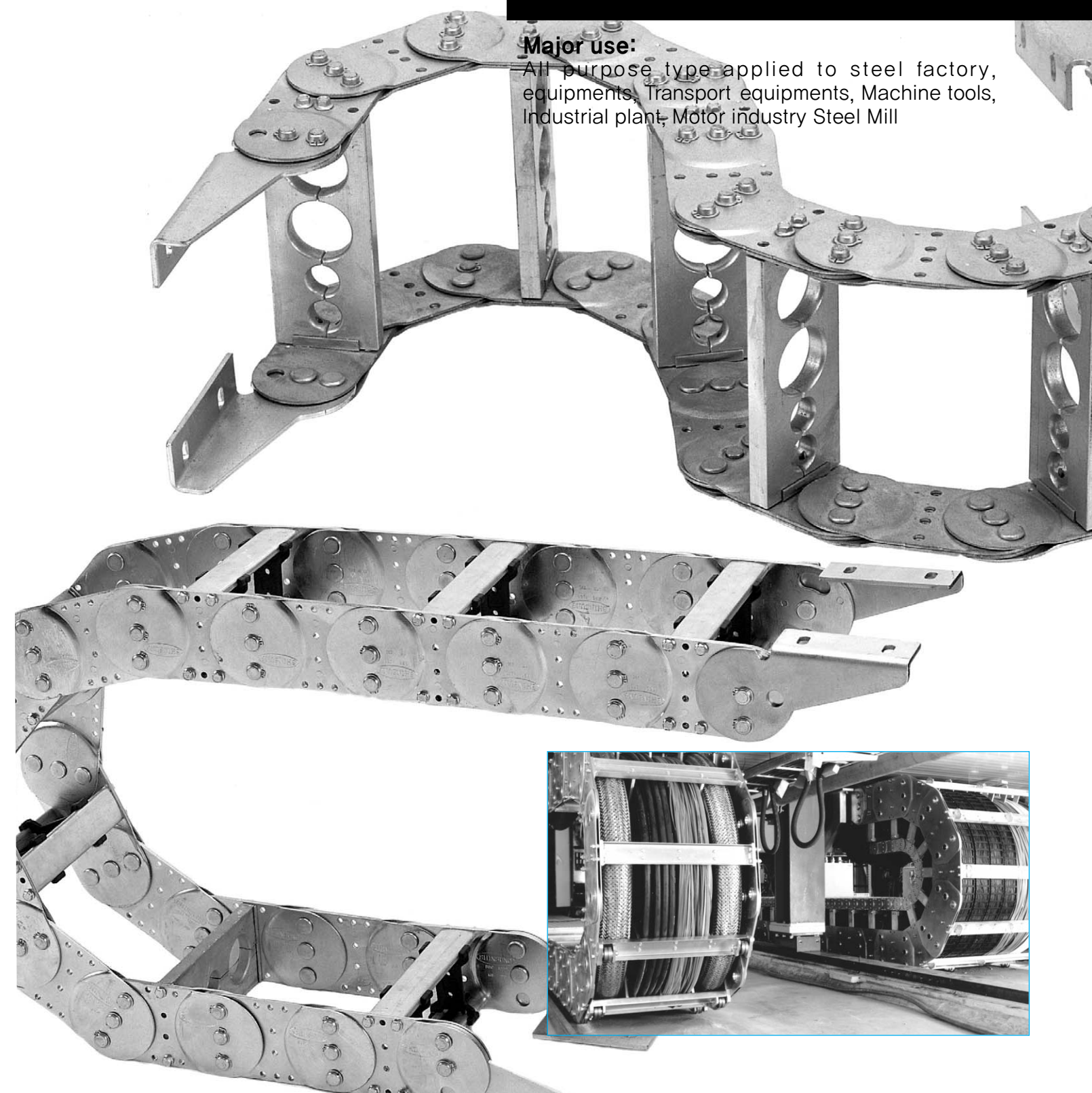SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · 215
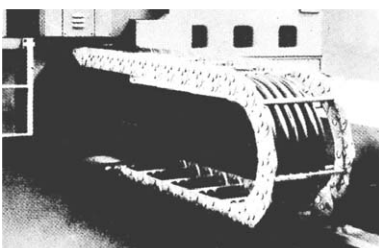
SHINFLEX®

STEEL Cable Chains

Major use:
All purpose type applied to steel factory, equipments, Transport equipments, Machine tools, Industrial plant, Motor industry Steel Mill

Application

SHINSUNG drag chains are used where energy has to be supplied to mobile machine parts or apparatus. The chain joint lock in the opposite direction.
In SHINSUNG drag chains, cables and hoses conveying varying substances can be carried alongside one another at the same time.
SHINSUNG drag chains have already been in use for many years in mechanical engineering, apparatus engineering, the automobile industry, in smelting plants and rolling mills, in materials-handing technology, in nuclear technology and in the offshore area, to name but a few branches:they have become a by-word in quality for optimalie careful-laying of supply lines.
SHINSUNG drag chains act as a carrying, leading and protective element at one and the same time for all supply cables and hoses.

Assembly

SHINSUNG drag chains consist of two or more chain bands, running paralle to one another, and made of high grade, surface galvanized sheet steel. **Chain bands of rust and acid resistant material available on request.**
The Chain bands are connected at intervals by stays. The stays, which can be supplied in various designs, take up the supply leads to be led in bore holes or opening. The drag chains are constructed in such a way that the curvature radius necessary in use is always guaranteed. The leads laid are thus not subject to any kind of mechanical stress. The chain joints block in the opposite direction.
There are hardly any special structural requirements for connecting a SHINSUNG drag chain to mobile machinery.

Reasons for using SHINSUNG drag chains

• No wear on cables and hoses
• Long life of lines assured by protection from mechanical stress
• Avoidance of periods of disturbance and down time
• Little space required   • Simple assembly
• Low maintenance requirements   • Good visual improession
• Short delivery times for standard measurements

※ To calculate a technical offer we need the following details:

• Number and outside diameter of the cables/hoses to be installed(with/without fittings)
• Weight of all cables and hoses including hose contents
• Mini. bending radius of cables/hoses acc. to manufacturer's specifications
• Length of travel mobile unit,
• Maximum acceleration/deceleration
• Speed of travel
• Frequency of travel
• Type of application drawing if possible
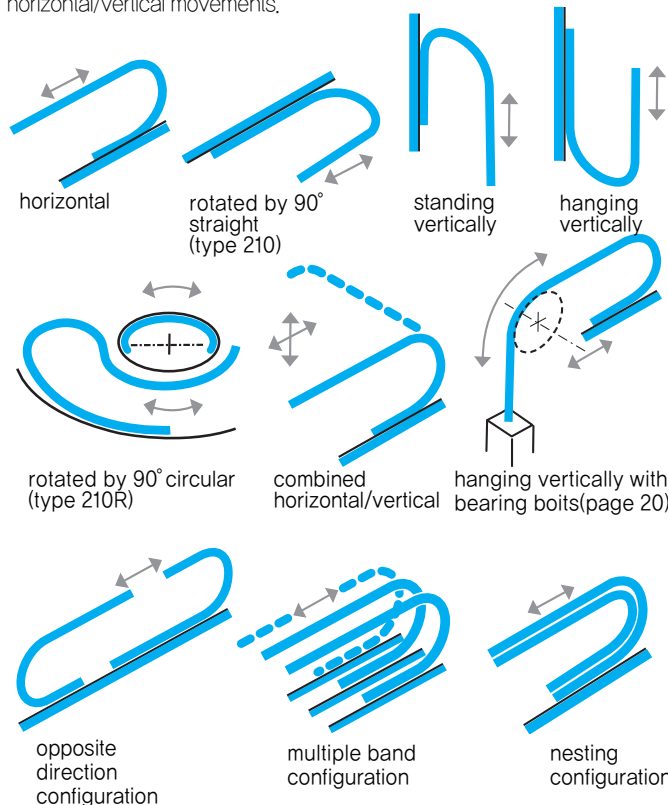• Working environment

Chain Connection
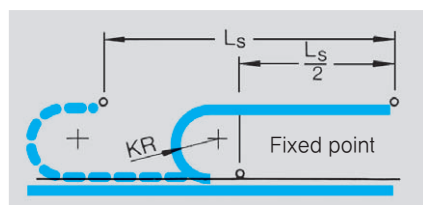
The fixed point connection should be laid in the middle of the travel length. This arrangement yields the shortest connection between the fixed point and the mobile unit, and thus also the most economic lengths of drag chain, cables and hoses. Connection is made by the connection angles which are fastened to the ends of the chain bands with bolts.

Installation Variations

SHINSUNG drag chains can, apart from for normal horizontal movements, also be used for vertical, circular and combined horizontal/vertical movements.

horizontal   rotated by 90° straight (type 210)   standing vertically   hanging vertically

rotated by 90° circular (type 210R)   combined horizontal/vertical   hanging vertically with bearing boits(page 20)

opposite direction configuration   multiple band configuration   nesting configuration

A flat surface is required to support the drag chain. This surface must be kept clear in the chains working area. Should the given conditions be insufficient, then a trough should be employed.
Should the stay cross-section of a cable drag chain prove inadequate because of the maximum permissible stay width, then the cables and hoses should be distributed over several stays.
Depending on the space availabel, the drag chains can be arranged to run as multiple band chains, within one another, or running in opposing directions.

Connection Variants

Conection variants 1~4 for all chain types!

For the chain types 0650.1, 0950, 1250 and 1800 the connecting angles at the fixed point and at the driver can also be fastened turned by 90° to the chain as flange connection(Variants 5 to 16).

standard
1   2   3   4
5   6   7   8
9   10   11   12
13   14   15   16
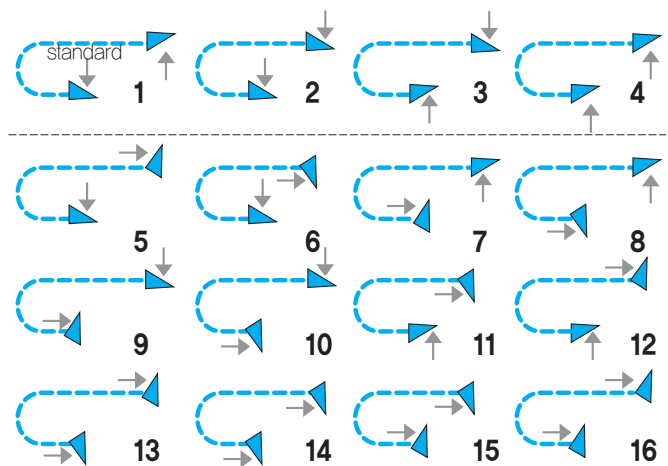
※ Please indicate the desired, connection variant on your order.

Overview of Types

(Measurement in mm)

Key:
• B$_k$ = width drag chain
• B$_{St}$ = width of stay
  c = distance between openings in hole stays
  d = diameter of bore hole stays, or clerance heightin frame stays
  D = 1,1 d for electric cables
  D = 1,2 d for hoses

  Minimum supplement = 2
• h$_G$ = chain link height
• KR = Bending radius
• L$_f$ = self-supporting chain length
• LS = Unit's travel length
• t$_G$ = chain pitch
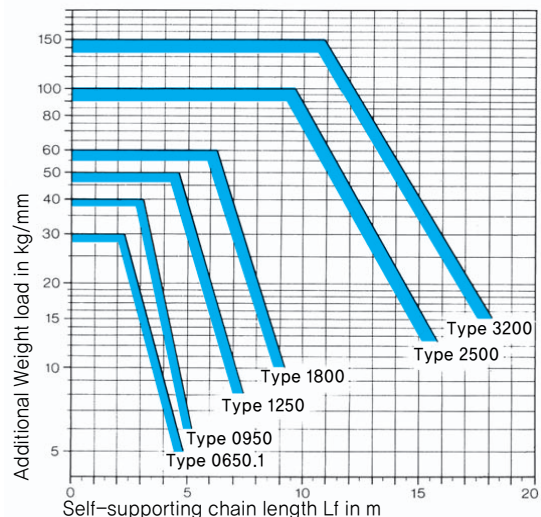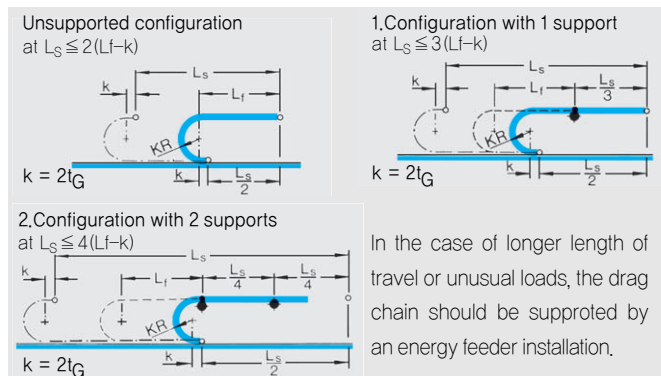• ST = thickness of divider stays

Futer bending radius on request.
We reserve the right to make technical improvement.

Chain type

Chain type	tG	hG	Bending radius		Available Stay forms	dmax
SSC-0650.1	65	50	75 95 115	135 155 200	Frame stay Hole Stay	28/25 36/32
SSC-0950	95	68	140 170 200	260 290 320	Frame stay Solid frame stay Hole stay	42/38 34/30 43/38
SSC-1250	125	94	145 220 260	300 340 380	Frame stay Solid frame stay Hole stay	65/58 58/52 67/60
SSC-1800	180	140	265 320 375	435 490 605	Solid frame stay Hole stay Special stay	95/86 100/90
SSC-2500	250	220	365 445 600	760 920 1075	Hole stay–Split model Special stay	164/150
SSC-3200	320	300	470 670 870	1075 1275 1480	Hole stay–Split model Special stay	200/180
SPL 5000 SPL 6000 SPL 7000			Energy feeder chains for offshore technology (pages 46–47)			

Overview of Types for dual-band chains

depending on additional load

Unsupported configuration
at L$_S$ ≦ 2(Lf−k)

1.Configuration with 1 support
at L$_S$ ≦ 3(Lf−k)

k = 2t$_G$

2.Configuration with 2 supports
at L$_S$ ≦ 4(Lf−k)

k = 2t$_G$

In the case of longer length of travel or unusual loads, the drag chain should be supproted by an energy feeder installation.

Additional Weight load in kg/mm

Type 3200
Type 2500
Type 1800
Type 1250
Type 0950
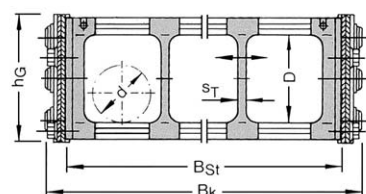Type 0650.1

Self-supporting chain length Lf in m

Stay Designs

● RS2 Frame stays – 나선식 측면바가 있는 프레임스테이
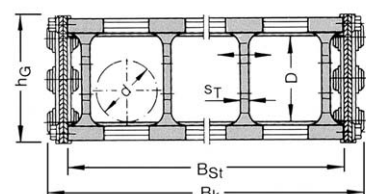with screwed profile bars (for chain types 06501, 0950 and 1250) Standard widths available from stock!
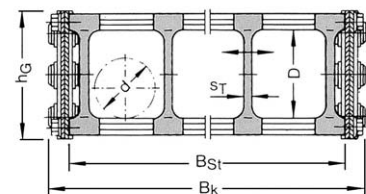
● RS1 Frame stay-with detachable profile bar
(for chain types 06501, 0950 and 1250)
Frame stays with detachable profile bars give you the paractical advantage of being able to lay, add and exchange cables and hoses quickly. Detach profile bar by turning 90°(no screw connection). Standard widths available form stock!

● RM Solid frame stay-with sliding rail
(for chain types 0950, 1250 and 1800)
The soild frame stay is used if the maximum width of the frame stay listed above is exceeded.
The light metal profile with the inserted synthetic profile rail for protecting the cables/hoses ensures high stability of the drag chain. Standard widths available form stock!!

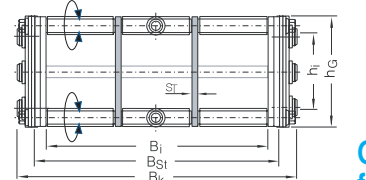● LG Hole stay-split model–(for chain types : All chain types)
Hole stays ensure optimal laying of cables/hoses in the drag chains neutral axis. The divided design simplifies cable laying, even for hoses with fixed fittings and cables with fixed plugs. Invidual aperture design for each case! Unsplit hole stays available on request.
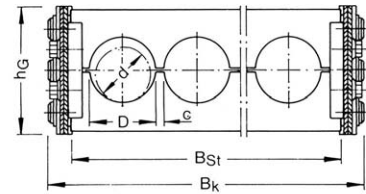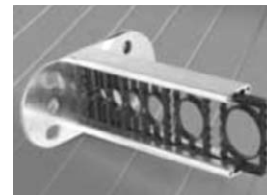
● RR Tubular stay–(for chain types : All chain types)
Gentle cable laying by means of means of rollers. Ldeal when using hydraulic "soft" sheaths.

● LGM Modular Hole stay
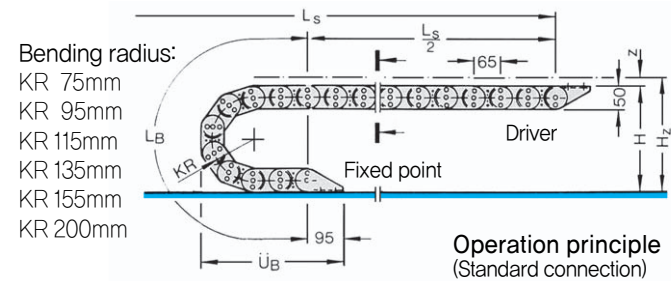(for chain types : All chain types)
The plastic modular hole stay system enables you to create your own customized holle stay quickly and easily. Hole stay inserts are available for series S 1250 and SX 1250. Available hole diameters: 10, 15, 20, 25, 30, 40 and 50mm. Please do get in touch which with us, we would be happy to advise you.

Choosing and energy feeder chain

Drag chains are designed with the following in mind:
• The number of cables and hoses to be laid, and their external diameters (n.b. : hose diameter at operational pressure).
• Chocie of stay design
taking into account the fact that the bore hole diameter or clearance height
D = 1,1d or 1,2 d(cable/hose diameter).
• Determine the smallest permissible bending radius
of the cables/hoses according to manufacturer's speification and then chose the bending radius.
• Calculate the chain length
according to the traverse and the bending radius selected.

218 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **219**

TYPE:SSC-0650.1   • Chain pitch t_G : 65mm

Bending radius:
KR 75mm
KR 95mm
KR 115mm
KR 135mm
KR 155mm
KR 200mm

Operation principle
(Standard connection)

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	75	95	115	135	155	200
Arc length L_B	496	558	621	684	747	888
Arc overhang $Ü_B$	325	345	365	385	405	450
Height H_{min}	200	240	280	320	360	450

• Calculation of chain length:

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 65mm

• Installation height:

$$H_Z = H + Z$$

(necessary clearance)
$Z \approx 10mm/m$ Chain length

■ Stay designs

D = 1.1 d for electric cables   D = 1.2 d for hoses

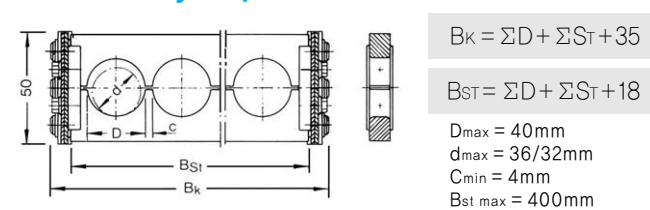### Frame stay – with detachable profile bar
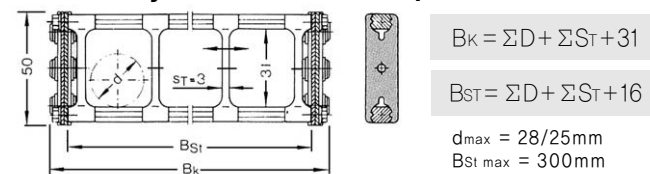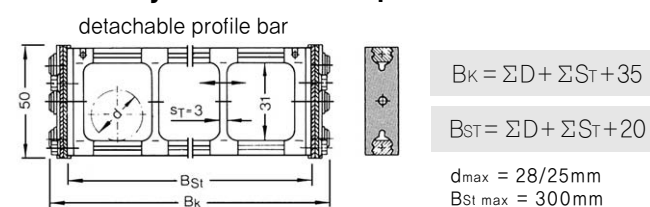
$$B_K = \Sigma D + \Sigma S_T + 31$$

$$B_{ST} = \Sigma D + \Sigma S_T + 16$$

d_{max} = 28/25mm
$B_{ST\ max}$ = 300mm

Frame stay – with screwed profile bars

detachable profile bar

$$B_K = \Sigma D + \Sigma S_T + 35$$

$$B_{ST} = \Sigma D + \Sigma S_T + 20$$

d_{max} = 28/25mm
$B_{ST\ max}$ = 300mm

■ Hole Stay – split model

$$B_K = \Sigma D + \Sigma S_T + 35$$

$$B_{ST} = \Sigma D + \Sigma S_T + 18$$

D_{max} = 40mm
d_{max} = 36/32mm
C_{min} = 4mm
$B_{ST\ max}$ = 400mm

– Hole pattern, made to order as per customer's details.
– Hole stays–unsplit model available on request!

※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other page 31 please consult us in borderline cases.
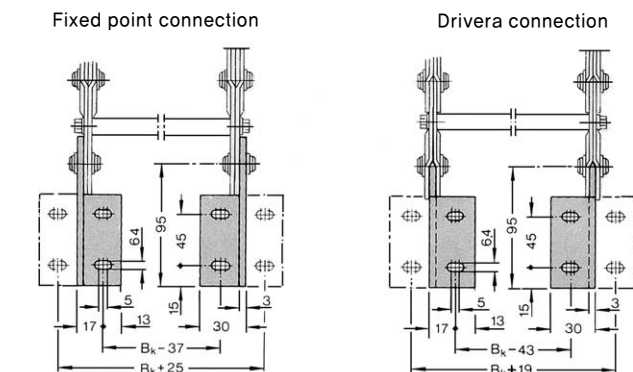
■ Standard widths for frame stays
   (Dimensions in mm)

| chain width B_k	100	125	150	175	200	225	250	275	300
no. of divider stays/stay	–	1	2	2	3	4	4	5	6
Stay width B_{St}	85	110	135	160	185	210	235	260	285

※ Individual stay widths and additional dividing stays availabel, on request, at extra cost.

■ Chain connection dimensions

Fixed point connection   Drivera connection

• The connection angles at the closed chain end always form the fixed point!
• In the standard method of fastening, the fastening bore holes of both connections are sithin the chain width. The screw–on surfaces may also be placed outwards.
• Details of connection type and variants should be given in the order.

■ Trough
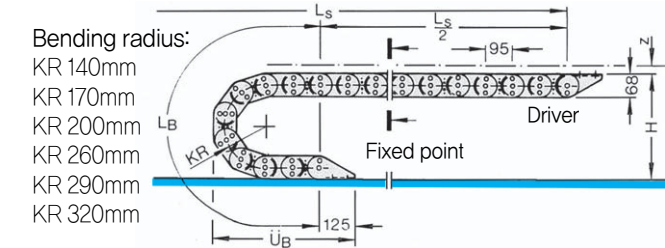

$$L_A = \frac{L_S}{2} + Ü_B$$

$b_1 = B_k + 15mm$
$b_A = B_k + 40mm$
max part length = 3,000mm
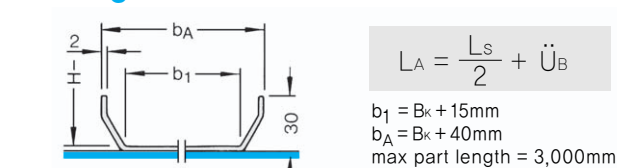
■ Chain dead weight – for dual band chains
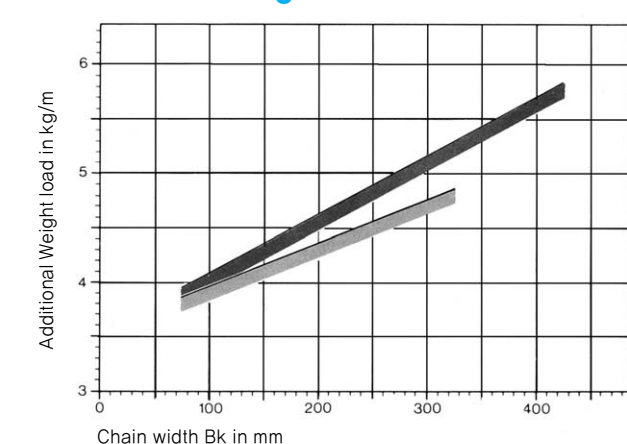
● Frame stays   ● Solid frame stays   ● Hole stays(50% bore hole proportion)

TYPE:SSC-0950   • Chain pitch t_G = 95mm

Bending radius:
KR 140mm
KR 170mm
KR 200mm
KR 260mm
KR 290mm
KR 320mm

Driver
Fixed point

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	95	140	170	200	260	290	320
Arc length L_B	711	820	914	1008	1197	1291	1385
Arc overhang $Ü_B$	445	490	520	550	610	640	670
Height H_{min}	303	348	408	468	588	648	708

• Calculation of chain length:

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 95mm

• Installation height:

$$H_Z = H + Z$$

(necessary clearance)
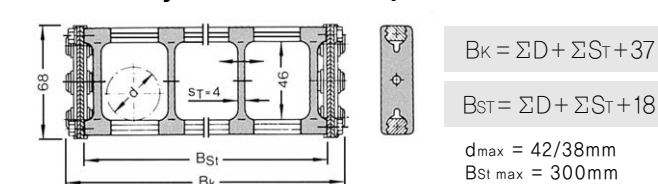$Z \approx 10mm/m$ Chain length

■ Stay designs

D = 1.1 d for electric cables   D = 1.2 d for hoses

Frame stay – with screwed profile bars
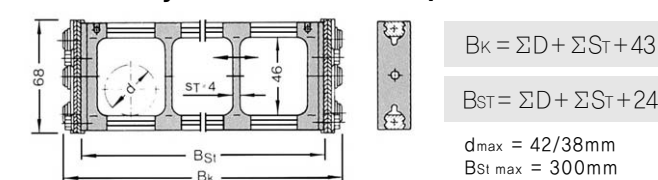
$$B_K = \Sigma D + \Sigma S_T + 37$$

$$B_{ST} = \Sigma D + \Sigma S_T + 18$$

d_{max} = 42/38mm
$B_{ST\ max}$ = 300mm

Frame stay – with detachable profile bar

$$B_K = \Sigma D + \Sigma S_T + 43$$

$$B_{ST} = \Sigma D + \Sigma S_T + 24$$

d_{max} = 42/38mm
$B_{ST\ max}$ = 300mm

Solid frame stay – with sliding rail

$$B_K = \Sigma D + \Sigma S_T + 37$$

$$B_{ST} = \Sigma D + \Sigma S_T + 18$$

d_{max} = 34/30mm
$B_{ST\ max}$ = 600mm
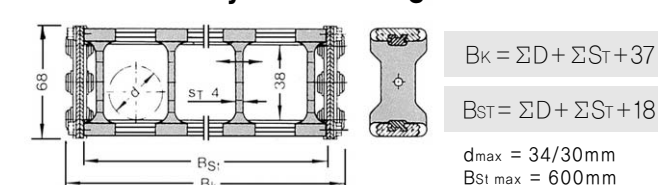
■ Standard widths for frame stays
   (Dimensions in mm)

Stay design	Frame stays							Solid Frame Stays					
chain width B_k	150	175	200	225	250	275	300	350	400	450	500	550	600
no. of divider stays/stay	1	1	2	2	3	3	4	5	6	7	8	9	10
Stay width B_{St}	131	156	81	206	231	256	281	331	381	431	481	531	581

Individual stay widths and additional dividing stays availabel, on request, at extra cost.

■ Hole Stay – split model

$$B_K = \Sigma D + \Sigma_C + 43$$

$$B_{ST} = \Sigma D + \Sigma_C + 22$$

D_{max} = 48mm
d_{max} = 43/38mm
C_{min} = 4mm
$B_{ST\ max}$ = 600mm
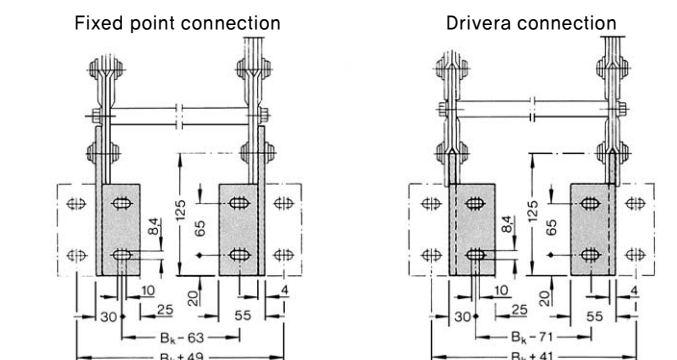
– Hole pattern, made to order as per customer's details.
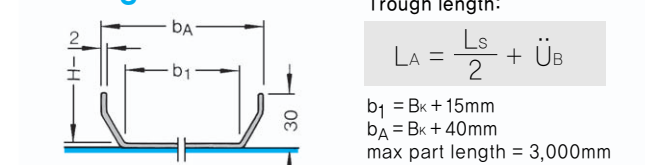– Hole stays–unsplit model available on request!

※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other(page 31). please consult us in borderline cases.

■ Chain connection dimensions (Standard connection)
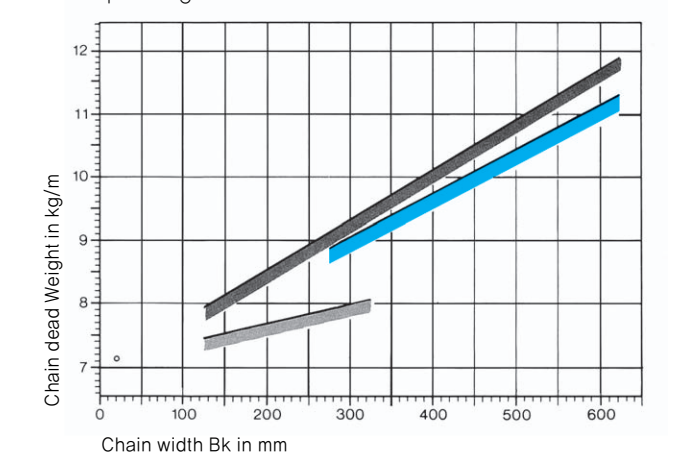
Fixed point connection   Drivera connection

• The connection angles at the closed chain end always form the fixed point!
• In the standard method of fastening, the fastening bore holes of both connections are within the chain width. The screw–on surfaces may also be placed outwards.
• Details of connection type and variants should be given in the order.

■ Trough

Trough length:

$$L_A = \frac{L_S}{2} + Ü_B$$

$b_1 = B_k + 15mm$
$b_A = B_k + 40mm$
max part length = 3,000mm

■ Chain dead weight – for dual band chains
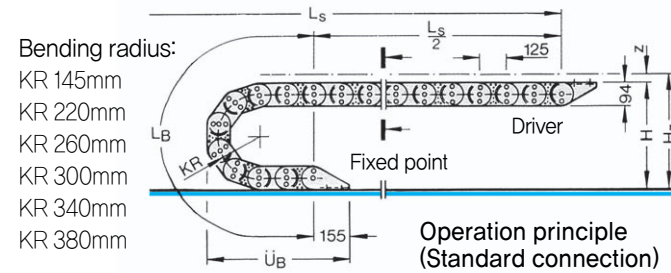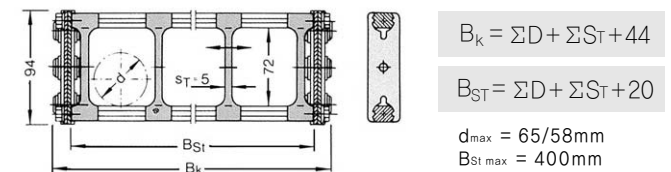• depending on the chain width

● Frame stays   ● Solid frame stays   ● Hole stays with 50% bore hole proportion

TYPE:SSC-1250
• Chain pitch tG : 125mm

Bending radius:
KR 145mm
KR 220mm
KR 260mm
KR 300mm
KR 340mm
KR 380mm

Driver
Fixed point

Operation principle
(Standard connection)

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	145	220	260	300	340	380
Arc length LB	955	1191	1317	1442	1568	1694
Arc overhang ÜB	597	672	712	752	792	832
Height Hmin	384	534	614	694	774	854

• Calculation of chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 125mm

• Installation height :

$$H_Z = H + Z$$

(necessary clearance)

$Z \approx 10mm/m$ Chain length

◼ Stay designs

D = 1,1 d for electric cables   D = 1,2 d for hoses

RS2 Frame stay – with screwed profile bars
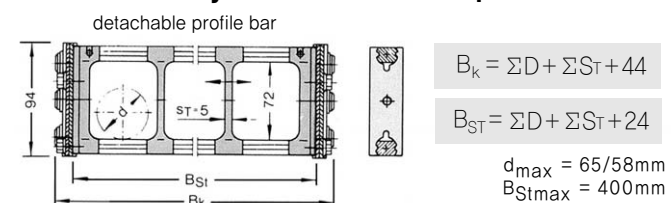
$$B_k = \Sigma D + \Sigma S_T + 44$$

$$B_{ST} = \Sigma D + \Sigma S_T + 20$$

d_{max} = 65/58mm
$B_{St\,max}$ = 400mm

RS1 Frame stay – with detachable profile bar

detachable profile bar

$$B_k = \Sigma D + \Sigma S_T + 44$$

$$B_{ST} = \Sigma D + \Sigma S_T + 24$$

d_{max} = 65/58mm
B_{Stmax} = 400mm

RM Solid frame stay – with sliding rail

detachable profile bar

$$B_k = \Sigma D + \Sigma S_T + 49$$

$$B_{ST} = \Sigma D + \Sigma S_T + 25$$

d_{max} = 58/52mm
B_{Stmax} = 800mm
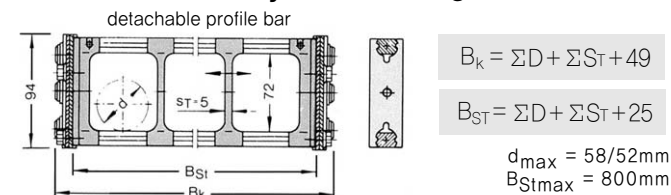
◼ Standard widths for frame stays   (Dimensions in mm)

Stay design	Frame stays					Solid Frame Stays						
chain width Bk	200	250	300	350	400	450	500	550	600	650	700	750	800
no. of divider stays/stay	1	2	3	4	5	5	6	7	8	9	9	10	10
Stay width BSt	176	226	276	326	376	426	476	526	576	626	676	726	776

※ Individual stay widths and additional dividing stays availabel, on request, at extra cost.

◼ LG Hole Stay−split model

$$B_k = \Sigma D + \Sigma S_T + 48$$

$$B_{ST} = \Sigma D + \Sigma S_T + 22$$

D_{max} = 74mm
d_{max} = 67/60mm
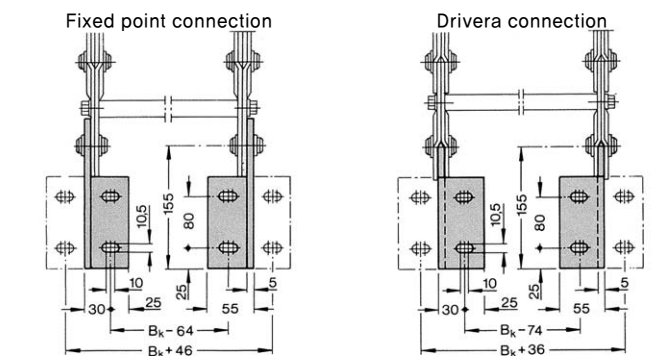C_{min} = 4mm
B_{Stmax} = 800mm

– Hole pattern, made to order as per customer's details.
– Hole stays−unsplit model available on request!

※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other(page 31), please consult us in borderline cases.
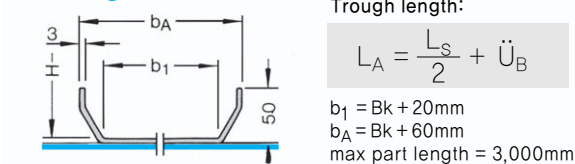
◼ Chain connection dimensions   (Standard connection)
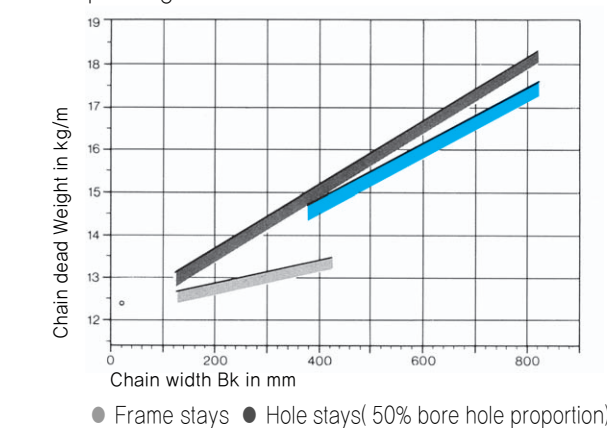
Fixed point connection   Drivera connection

• The connection angles at the closed chain end always form the fixed point!
• In the standard method of fastening, the fastening bore holes of both connections are within the chain width. The screw−on surfaces may also be placed outwards.
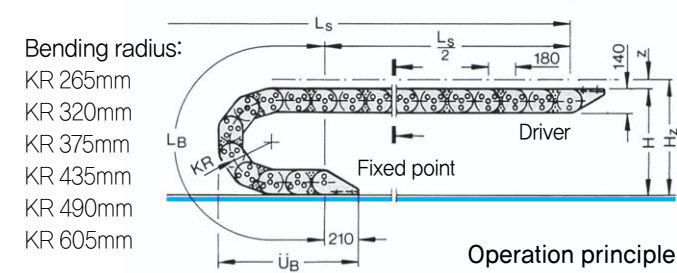• Details of connection type and variants should be given in the order.

◼ Trough

Trough length:

$$L_A = \frac{L_S}{2} + \ddot{U}_B$$

b_1 = Bk + 20mm
b_A = Bk + 60mm
max part length = 3,000mm

◼ Chain dead weight – for dual band chains
• depending on the chain width

● Frame stays ● Hole stays(50% bore hole proportion)

TYPE:SSC-1800
• Chain pitch tG : 180mm

Bending radius:
KR 265mm
KR 320mm
KR 375mm
KR 435mm
KR 490mm
KR 605mm

Driver
Fixed point

Operation principle

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	265	320	375	435	490	605
Arc length LB	1552	1725	1898	2086	2259	2620
Arc overhang ÜB	905	960	1015	1075	1130	1245
Height Hmin	670	780	890	1010	1120	1224

• Calculation of chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 180mm

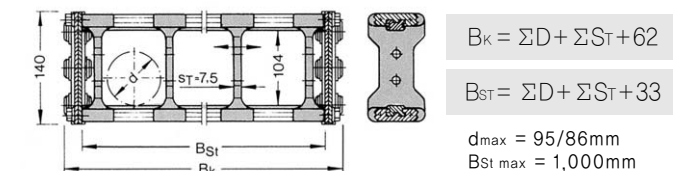• Installation height :

$$H_Z = H + Z$$

(necessary clearance)

$Z \approx 10mm/m$ Chain length

◼ Stay designs

D = 1,1 d for electric cables   D = 1,2 d for hoses
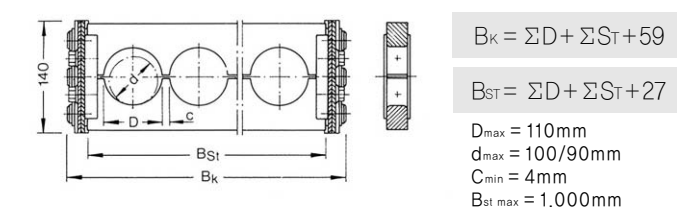
RM Solid frame stay – with sliding rail

$$B_k = \Sigma D + \Sigma S_T + 62$$

$$B_{ST} = \Sigma D + \Sigma S_T + 33$$

d_{max} = 95/86mm
$B_{St\,max}$ = 1,000mm

Standard widths – for frame stays   (Dimensions in mm)

chain width Bk	250	300	350	400	450	500	600	700	800	900	1000
no. of dividing stays	1	1	2	2	3	3	4	5	6	7	8
Stay width BSt	221	271	321	371	421	471	571	671	771	871	971

※ Individual stay widths and additional dividing stays availabel, on request, at extra cost.

LG Hole Stay−split model

$$B_k = \Sigma D + \Sigma S_T + 59$$

$$B_{ST} = \Sigma D + \Sigma S_T + 27$$

D_{max} = 110mm
d_{max} = 100/90mm
C_{min} = 4mm
$B_{st\,max}$ = 1,000mm

– Hole pattern, made to order as per customer's details.
– Hole stays−unsplit model available on request!
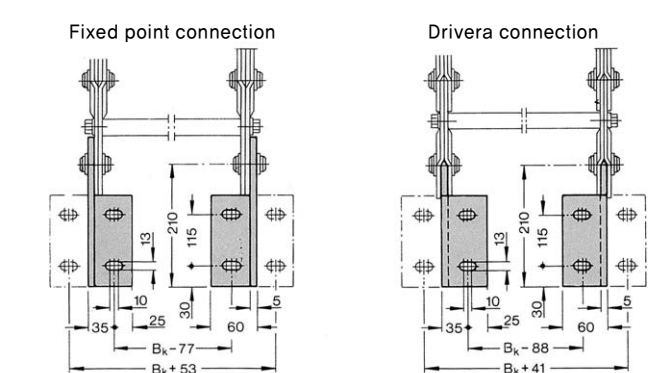
Special stay

Special stay
Apart form the stay designs shown here, special stays can, according to construction and material, be manufactured as needed according to your technical specifications.

※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other(page 31), please consult us in borderline cases.

◼ Chain connection dimensions   (Standard connection)

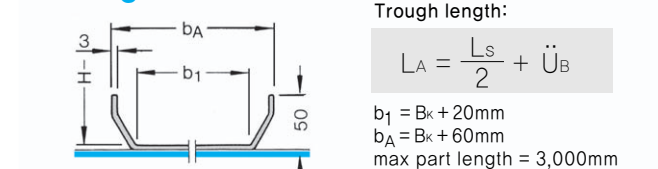Fixed point connection   Drivera connection

B_k – 77
B_k – 88

• The connection angles at the closed chain end always form the fixed point!
In the standard method of fastening, the fastening bore holes of both connections are within the chain width.
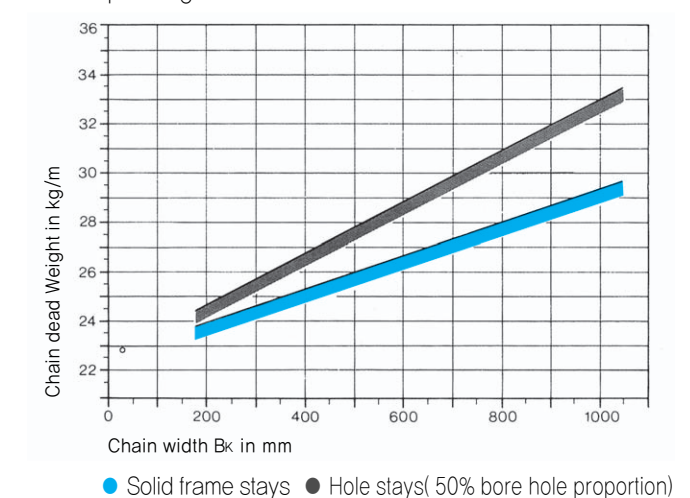The screw−on surfaces may also be placed outwards.
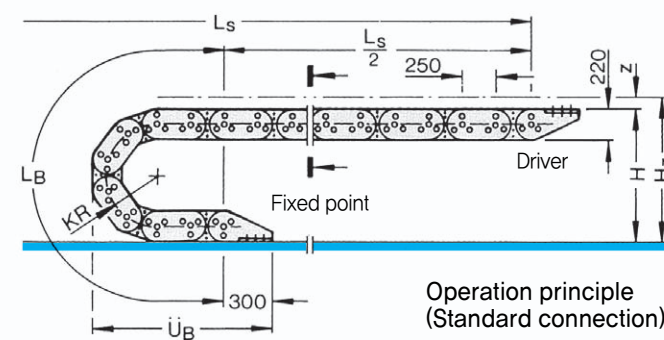Details of connection type and variants should be given in the order.

◼ Trough

Trough length:

$$L_A = \frac{L_S}{2} + \ddot{U}_B$$

b_1 = Bk + 20mm
b_A = Bk + 60mm
max part length = 3,000mm

◼ Chain dead weight – for dual band chains
• depending on the chain width

● Solid frame stays ● Hole stays(50% bore hole proportion)

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STEEL Cable Chains

SHINFLEX®

TYPE:SSC-2500
• Chain pitch tG : 250mm

Driver
Fixed point

Operation principle
(Standard connection)

Bending radius:
KR 365mm
KR 445mm
KR 600mm
KR 760mm
KR 920mm
KR 1075mm

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	365	445	600	760	920	1075
Arc length L$_B$	2146	2398	2885	3388	3890	4377
Arc overhang Ü$_B$	1275	1355	1510	1670	1830	1985
Height H$_{min}$	950	1110	1420	1740	2060	2370

• Calculation of chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 250mm

• Installation height :

$$H_Z = H + Z$$

(necessary clearance)

$Z \approx 3...15mm/m$ chain length

■ Stay designs
D = 1.1 d for electric cables   D = 1.2 d for hoses

LG Hole stay – split model

D$_{max}$ = 180mm
d$_{max}$ = 164/150mm
C$_{min}$ = 4mm
B$_{st\ max}$ = 1,000mm
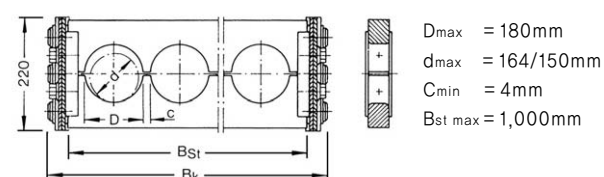
– Hole pattern, made to order as per customer's details.

• Chain width:

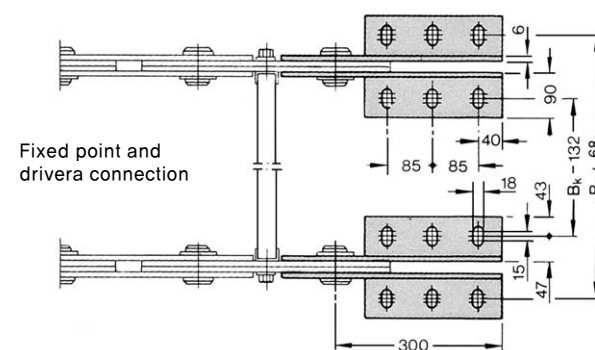$$B_K = \Sigma D + \Sigma C + 78$$

• Stay width:

$$B_{ST} = \Sigma D + \Sigma C + 40$$

Special stay

Apart form the stay designs shown here, special stays can, according to construction and material, be manufactured as needed according to your technical specifications.
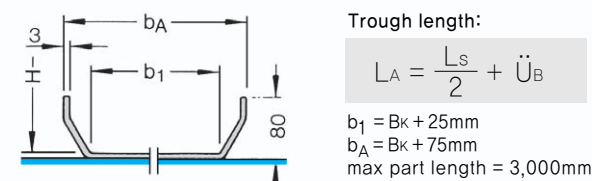
※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other(page 31), please consult us in borderline cases.

■ Chain connection dimensions (Standard connection)


Fixed point and drivera connection

• The fixed point and driver connection of the drag chain are identical and are achieved by double connection angles!
• Please indicate connections variants on your order.

■ Trough

Trough length:

$$L_A = \frac{L_S}{2} + Ü_B$$

b$_1$ = B$_K$ + 25mm
b$_A$ = B$_K$ + 75mm
max part length = 3,000mm

■ Chain dead weight – for dual band chains
• depending on the chain width

Chain dead Weight in kg/m
Chain width B$_K$ in mm
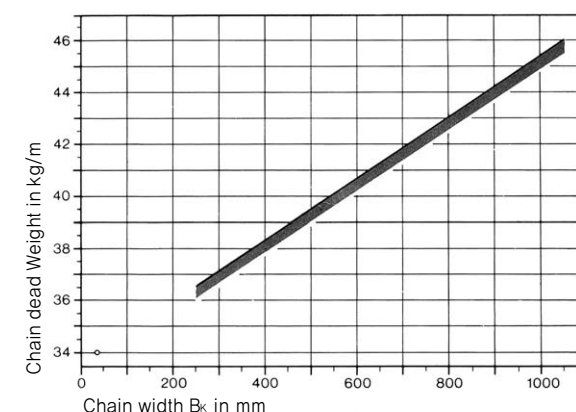
● Hole stays(50% bore hole proportion)

TYPE:SSC-3200
• Chain pitch tG : 320mm

Driver
Fixed point

Operation principle
(Standard connection)
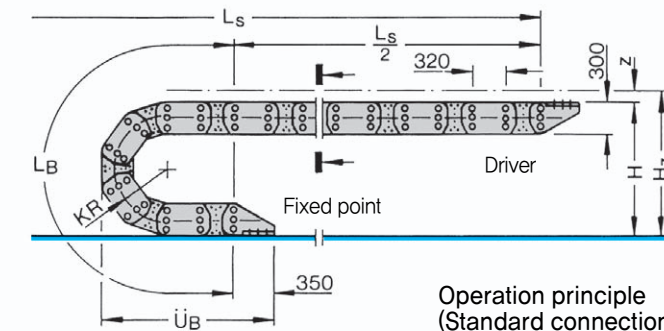
Bending radius:
KR 470mm
KR 670mm
KR 870mm
KR 1075mm
KR 1275mm
KR 1480mm

Variable stuctural dimensions
• depending on bending radius   (Dimensions in mm)

Bending Radius KR	470	670	870	1075	1275	1480
Arc length L$_B$	2757	3385	4013	4657	5286	5930
Arc overhang Ü$_B$	1610	1810	2010	2215	2415	2620
Height H$_{min}$	1240	1640	2040	2450	2850	3260

• Calculation of chain length :

$$L_K = \frac{L_S}{2} + L_B$$

rounded to pitch 320mm

• Installation height :

$$H_Z = H + Z$$

(necessary clearance)

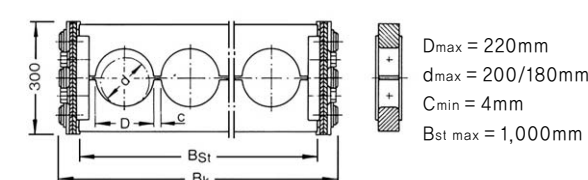$Z \approx 3...15mm/m$ chain length

■ Stay designs
D = 1.1 d for electric cables   D = 1.2 d for hoses

LG Hole stay – split model
– Hole pattern, made to order to customer's specification.

D$_{max}$ = 220mm
d$_{max}$ = 200/180mm
C$_{min}$ = 4mm
B$_{st\ max}$ = 1,000mm
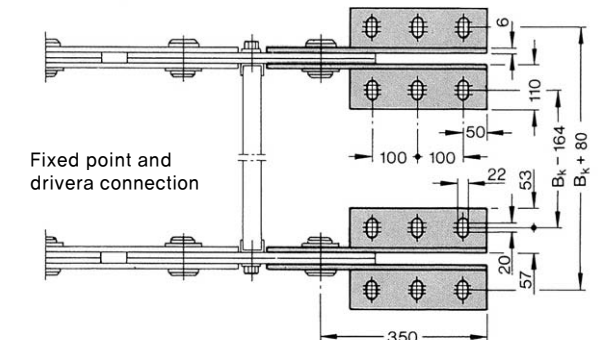
• Chain width:

$$B_K = \Sigma D + \Sigma c + 90$$

• Stay width:

$$B_{ST} = \Sigma D + \Sigma c + 40$$

Special stay

Apart form the stay designs shown here, special stays can, according to construction and material, be manufactured as needed according to your technical specifications.
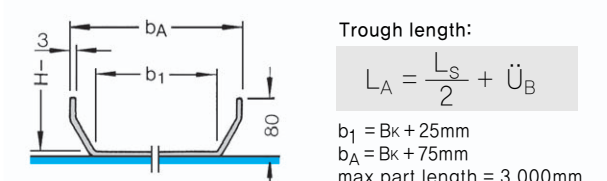
※ Where the maximum stay width is exceeded, the drag chain should be configured as a multiple band chain, or distributed over several chains running in opposite directions or inside each other(page 31), please consult us in borderline cases.

■ Chain connection dimensions (Standard connection)

Fixed point and drivera connection

• The fixed point and driver connection of the drag chain are identical and are achieved by double connection angles!
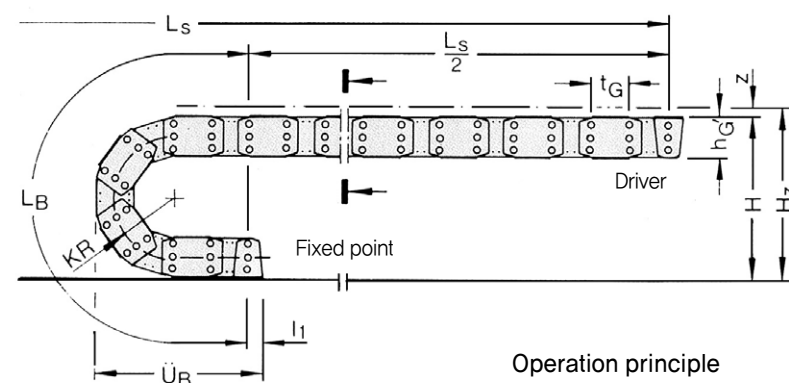• Please indicate connections variants(page 31) on your order.

■ Trough

Trough length:

$$L_A = \frac{L_S}{2} + Ü_B$$

b$_1$ = B$_K$ + 25mm
b$_A$ = B$_K$ + 75mm
max part length = 3,000mm

■ Chain dead weight – for dual band chains
• depending on the chain width

Chain dead Weight in kg/m
Chain width B$_K$ in mm
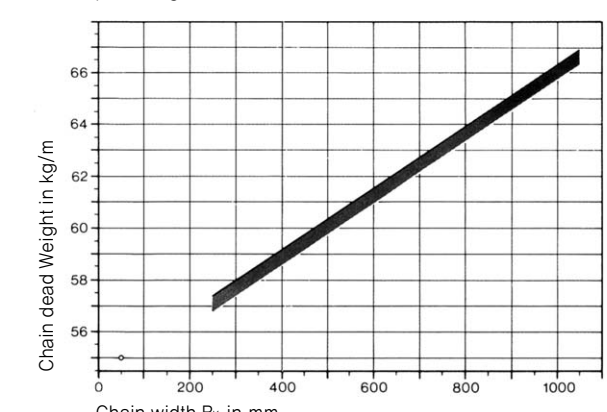
● Hole stays(50% bore hole proportion)

Drag chains for offshore technolgy

Driver

Fixed point

Operation principle

Technical data

Chain type SPL 5,000
pitch $t_G = 200mm$
link height $h_G' = 206mm$

Chain type SPL 6,000
pitch $t_G = 320mm$
link height $h_G' = 306mm$

Chain type SPL 7,000
pitch $t_G = 450mm$
link height $h_G' = 458mm$

• These drag chains were specially developed to ensure the stae convevance of flexible cables and hoses in order to supply energy to mobile units on driling platforms.
This mode of energy supply avoids the tangling of cables/hoses which can occur there as a result of high wind speeds.
Energy supply can be catered for on a made–to–measure basis for each case, using standard components.
The chain bands and the stays which take up the supply cables are made of stainless steel which is adapted to requirements.

Unsupported chain lenghts – depending on bending radius.

• Further bending radii on request

Chain type	SPL5000					SPL6000					SPL7000				
Bending radius KR	500	600	800	1000	1200	700	900	1100	1300	1500	1100	1250	1500	1800	2400
Arc length L$_B$	2370	2685	3315	3940	4570	3480	4110	4735	5365	5995	5255	5725	6510	7450	9335
Arc overhang Ü$_B$	1075	1175	1375	1575	1775	1615	1815	2015	2215	2415	2425	2575	2825	3125	3725
Hight min	1250	1450	1850	2250	2650	1750	2150	2550	2950	3350	2750	3050	3550	4150	5350

• **Calculation of chain length:**

$$L_K = \frac{L_S}{2} + L_B$$

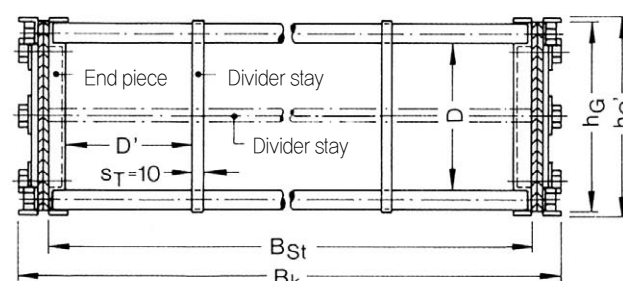rounded to pitch 320mm

• **Installation height:**

$$H_Z = H + Z$$

$Z \approx 3...15mm/m$ chain length
(necessary clearance)

Unsupported chain lenghts
• depending on additional load

additional load in kg/m

Type SPL 7000
Type SPL 6000
Type SPL 5000

Unsupported chain lengths L$_f$ in mm

$$Travel\ LS=2(L_f-2t_G)$$

• In the case of longer length of travel and heavier loads, the drag chain can be supported by a trolley system.

■ Stay Design

A tubular construction with dividers(if reguired) to separate the various types of hose/cable is used to carry the supply cable/hoses.
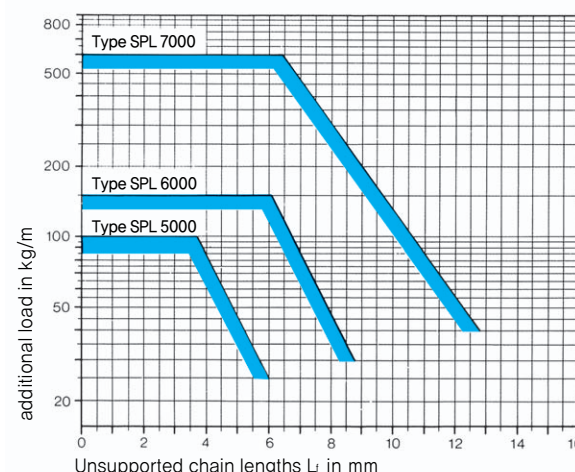Special stays on request.
Please note the guidelines for laying cables/hoses in drag chains.

End piece   Divider stay
D'
Divider stay
s$_T$ =10
B$_{St}$
B$_k$
h$_G$'
h$_G$'

Chain type	B$_K$	B$_{St}$	D	h$_G$'	h$_G$'
SPL 5000	$\Sigma D'+\Sigma s_T+117$	$\Sigma D'+\Sigma s_T+38$	150	200	206
SPL 6000	$\Sigma D'+\Sigma s_T+123$	$\Sigma D'+\Sigma s_T+38$	240	300	306
SPL 7000	$\Sigma D'+\Sigma s_T+150$	$\Sigma D'+\Sigma s_T+60$	370	450	458

■ Chain connection   (Standard connection)

The screw–on surfaces of the connection angles can be positioned to the inside, the outside, or both sides(as shown) on the chain band.
Connection brackets and usually located between the outer plates.
Connection type and variant should be indicated on the order.
Special construction chain connection angles on request.

Fixed point and drivera connection
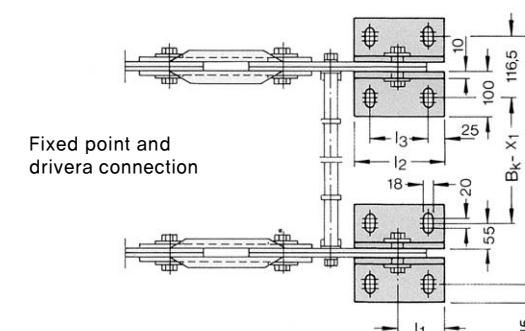
Chain type	l$_1$	l$_2$	l$_3$	x$_1$	x$_2$
SPL 5000	75	150	100	189	44
SPL 6000	125	250	200	195	38
SPL 7000	200	280	175	200	38

■ Trough

• Guide troughs and usually specially constructed for thiese types of chain.
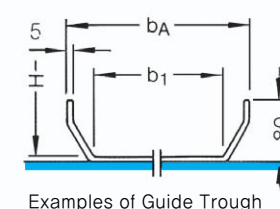
Examples of Guide Trough

Trough length:

$$L_A = \frac{L_S}{2} + \ddot{U}_B$$

$b_1 = B_k + 25mm$
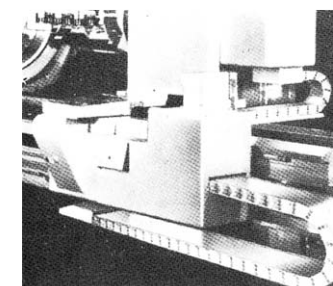$b_A = B_k + 75mm$
max part length = 3,000mm

■ Chain dead weight – for dual band chains

• a depending on additional load

Chain dead weight in kg/m
Chain width B$_k$ in mm
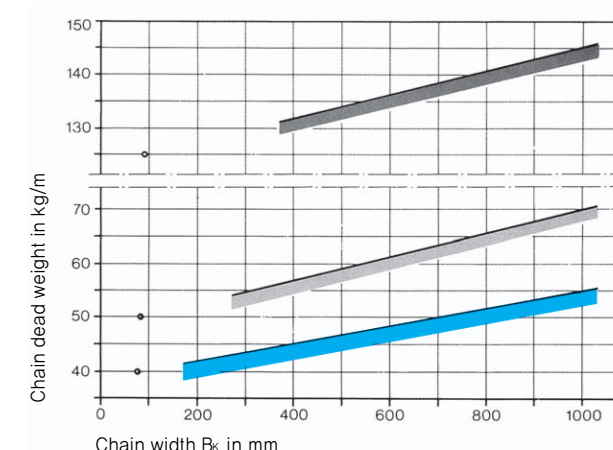
● Type SPL 5000   ● Type SPL 6000   ● Type SPL 7000

■ Accessories – Steel strip covering

In order to protect the supply cables/hoses from hot shavings and heavy dirt, the drag chains can be supplied with a stainless steel acid–proof spring band steel cover(thickness:0.4 0r 0.5mm, according to use).
Maximum steel strip width : 625mm

Fastening the inner sttel strip:
with steel strip holder to connecting angles

Fastening the outer steel strip:
with the fixing screws, to the connecting angles

Outer steel strip
Inner steel strip
Steel strip holder
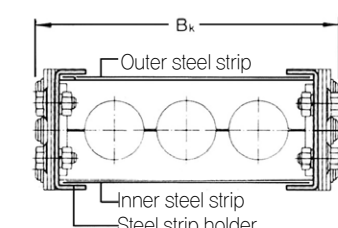
Dimension table
※ Steel strip cover for chain types 2500 and 3200 on request.

| Chain type	Steel strip length		Steel strip width
	Outer steel strip	Inner steel strip	
0650.1	L$_K$ + 280	L$_K$ + 130	B$_K$ − 20
0950	L$_K$ + 360	L$_K$ + 150	B$_K$ − 25
1250	L$_K$ + 470	L$_K$ + 170	B$_K$ − 32
1800	L$_K$ + 640	L$_K$ + 200	B$_K$ − 40

Drag chains with supporting struts
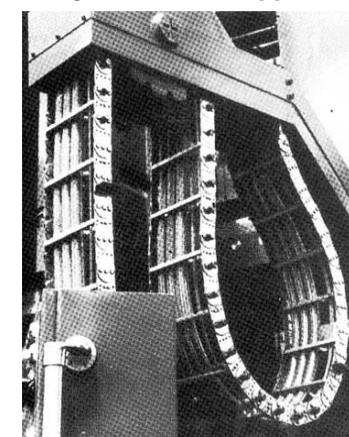
• Drag chains are used as vertically suspended chains with supporting struts in, for example, the machine industry in order to supply energy from control panels of adjustable height.
The drag chain is run over gearwheels whose toothing corresponds to the chain pitch, and whose reference circle diameter is greater than or equal to the selected bending radius.
It is driven by a separate geared motor or by a counterweight.

The arrangement of this drag chain depends on the unit weight, and should be carried out by our technicans.

Drive arms
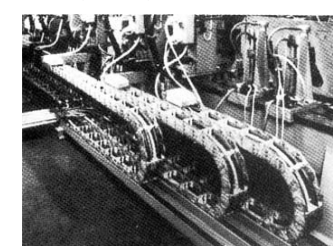
• The drag chain is pulled by the connecting angles fastened to the chain bands.
A simple steel constrution, which in most cases is made by the customer, is all that is needed to connect the drag chain and the mobile unit.
Specially manufactured parts for higher speeds or a large amount of lateral play on request.

226 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **227**

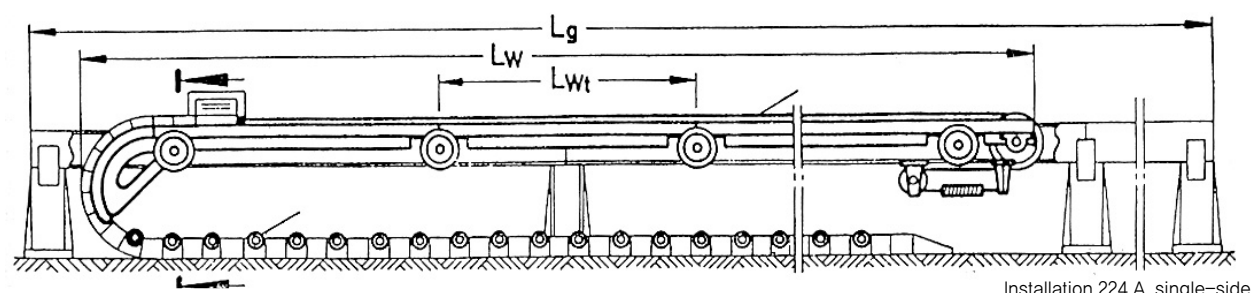# STEEL Cable Chains

SHINFLEX®

■ To equip special system

With respect to the cable chain which has presently been developed, what is becoming the biggest point of problem was that it was very difficult to instal cable chain in the narrow space, along with prevention of phenomenon being drooped when long cable chain is installed. As result of installing expcriences obtained from installation and undertaking for several years, such point of problems has completely been settled. How to support Supporting Roller enumerated in the following, single ciroumference equipment, double circumference system, circular cable chain, etc. are our special know-how, and such special system instal1ing, undertaking requires technical consultation in advance, so you are asked to consult us with our technical part or business part in advance.
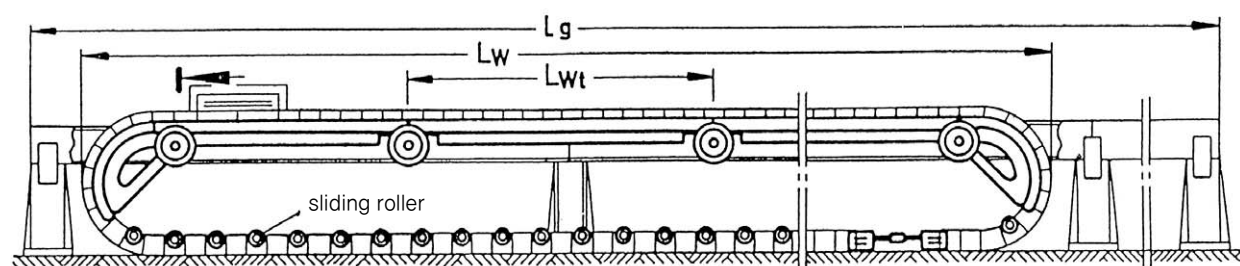
■ Supporting Roller
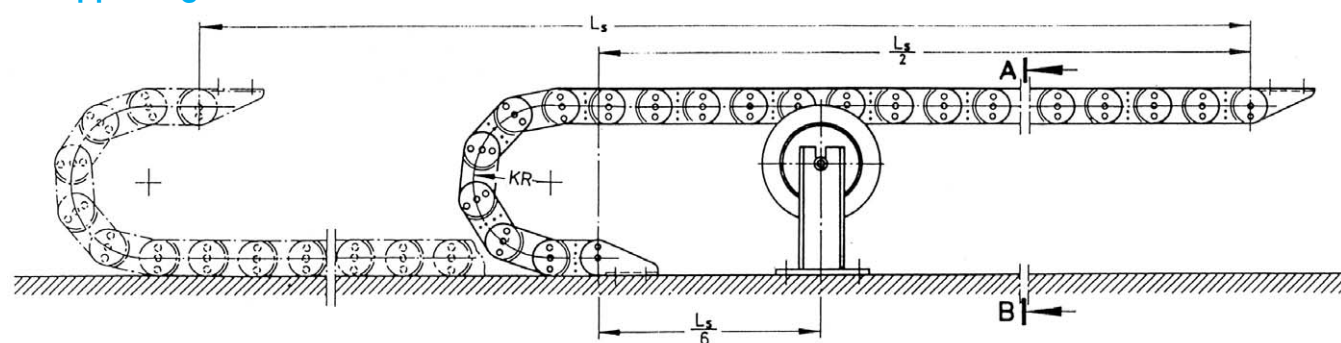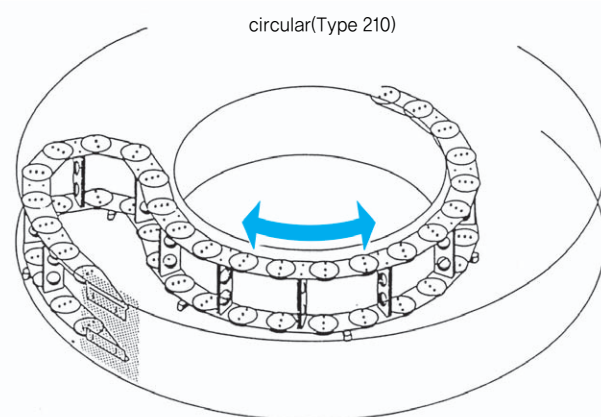

■ Installation Single Side

Installation 224 A, single-side

■ Installation Double Side

sliding roller

Installation 224 A, double-side

■ Circular Cable Chain

circular(Type 210)

Completely Enclosed Steel Chain

SECC Cable Chains

NEW!

PATENT

Use of structure

Domestically developed perfectly closed-up type Steel Cable Carrier Chain. Use of structure: As perfect closed-up type applied to Iron manufacturing equipment, conveyance equipment, machine tool, industrial machine, industrial plant equipment, automobile industry, ironworks, rolling equipments, harbor equipments, etc. this is a Perfect Steel Cable Carrier Chain.

Completely enclosed design to protect chain contents from steel and wood chips, dust, etc.

Openable and removable cover frames

Special tough construction with double spring washer, antifriction plates and rivet fixing

Large selection of chain-frames:
-aluminum draw plates cut to size;
-aluminum drilled frames, according to customer drawings

SECC Steel Cable Chain Completely Enclosed Steel Chain

■ Character

Steel Chain of Perfect–closed type developed domestically for the first time!
Major Use:Absotute perfect Steel Drag Chain of perfect closed–type applied to etectrical machines including iron equipments, movement equipment, machine tool, industrial plant, motor industry, iron works, and rolling equipments etc.
Outline:As perfect closed–type made by cover type applying Solide frame Stay. it can be protected from oil, cutting oil and chip, etc, possible for

■ Technical Data

- B_K : Chain width
- B_{ST} : Stay width
- t_G : Chain pitch
- h_G : Chain height
- KR : Bending radius
- S_T : Divide thickness
- D : Cable diameter(d1/d2)
  – d1 : 1.1d for electric cables – d2 : 1.2d for hoses

TYPE	t_G	h_G	KR		STAY TYPE	ST	Dmax
SECC–0650.1	65	50	75 95 115	135 155 200	Solid Frame Stay	4	27/25
SECC–0950	95	68	140 170 200	260 290 320	Solid Frame Stay	4	40/37
SECC–1250	125	94	145 220 260	300 340 380	Solid Frame Stay	5	63/58
SECC–1800	180	140	265 320 375	435 490 605	Solid Frame Stay	7.5	95/87

※ Other specification is same with SSC Steel chain

■ Stay Design
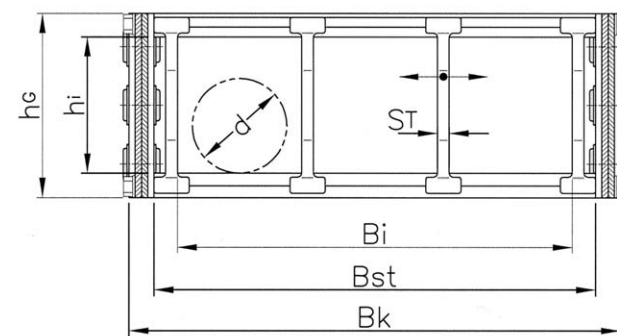
TYPE	$B_{K\ min}$	$B_{K\ max}$	$B_{K\ max}$	B_i
SECC–0650.1	100	500	B_K–15	B_K–35
SECC–0650.1	125	600	B_K–19	B_K–37
SECC–0650.1	150	800	B_K–24	B_K–49
SECC–0650.1	250	1000	B_K–25	B_K–49

## SCSC Steel Cable Chain Strip Coverered Steel Chain

■ Character

This protdcts electric wire and hose inside the chain, by inserting steel or SUS plate(Strip) in both the upper and lower of steel drag chain. Steel or SUS plate are installed in both the upper and lower parts, it can protect cutting oil, oil, filth and chip from and chip from outside.
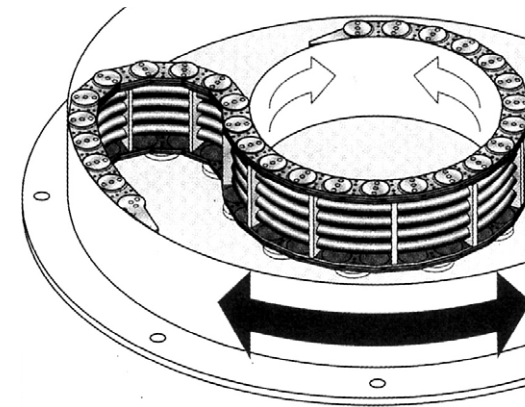
■ Stay Design
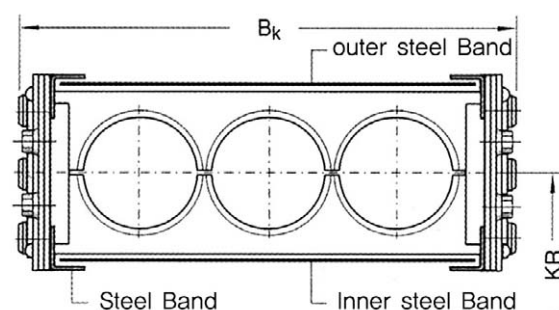
■ Strip cover chain
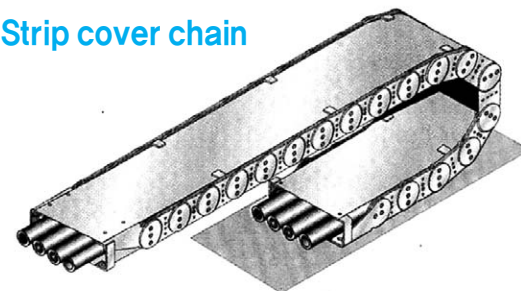
TYPE	Striper length		Striper width
	Inner length	outer length	
SCSC 0650.1	L_K+280	L_K+130	B_K–22
SCSC 0950	L_K+360	L_K+150	B_K–27
SCSC 1250	L_K+470	L_K+170	B_K–34
SCSC 1800	L_K+640	L_K+200	B_K–40
SCSC 2500	L_K+945	L_K+255	B_K–48

STEEL CIRCULAR CABLE CARRIER CHAIN

### ■ Horizontal–type 60 Circular Rotation Transform–instalment EBV09

This arrangment works by moving smoothly forming circular by turning 90 attached to the machine.

Generally in this case, this help operate by instaling cable carrier equipments, they are, supporting equipment,cable carrier, bolster,etc.which can move freely.

■ ROTATION CABLE CHAIN PICTURE TURNING ANGLE UP TO 600

Explanation of term

- $α$: Fixed Viewpoint Angle
- $β$: Treating course
- BE : Chain movement
- bKA : Pipe of narrow space
- BKA : 관가로
- KR : Radius of Curvature
- RKR : Radius outside of Curvature
- rKA : Radius inside of pipe
- RKA : Radius outside of pipe
- F : Fixed point
- M1 : Chain end spot/place 1
- M2 : Chain end spot/place 2
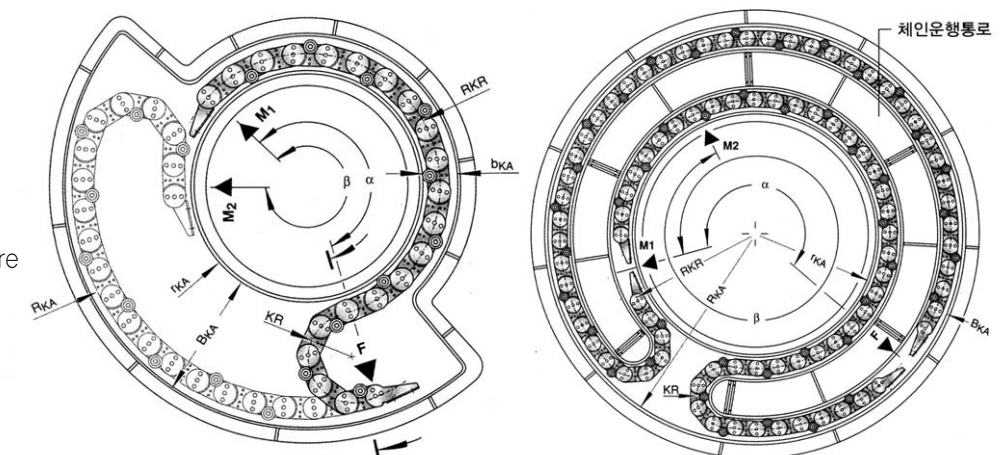
■ CHAIN CONVEYANCE EQUIPMENT AND CHAIN PROGRESS PICTURE

Rotating angle up to 500
For safety operation taking size and height of chain,etc into consideration, chain is safely operated on the chain conveyance equipment.
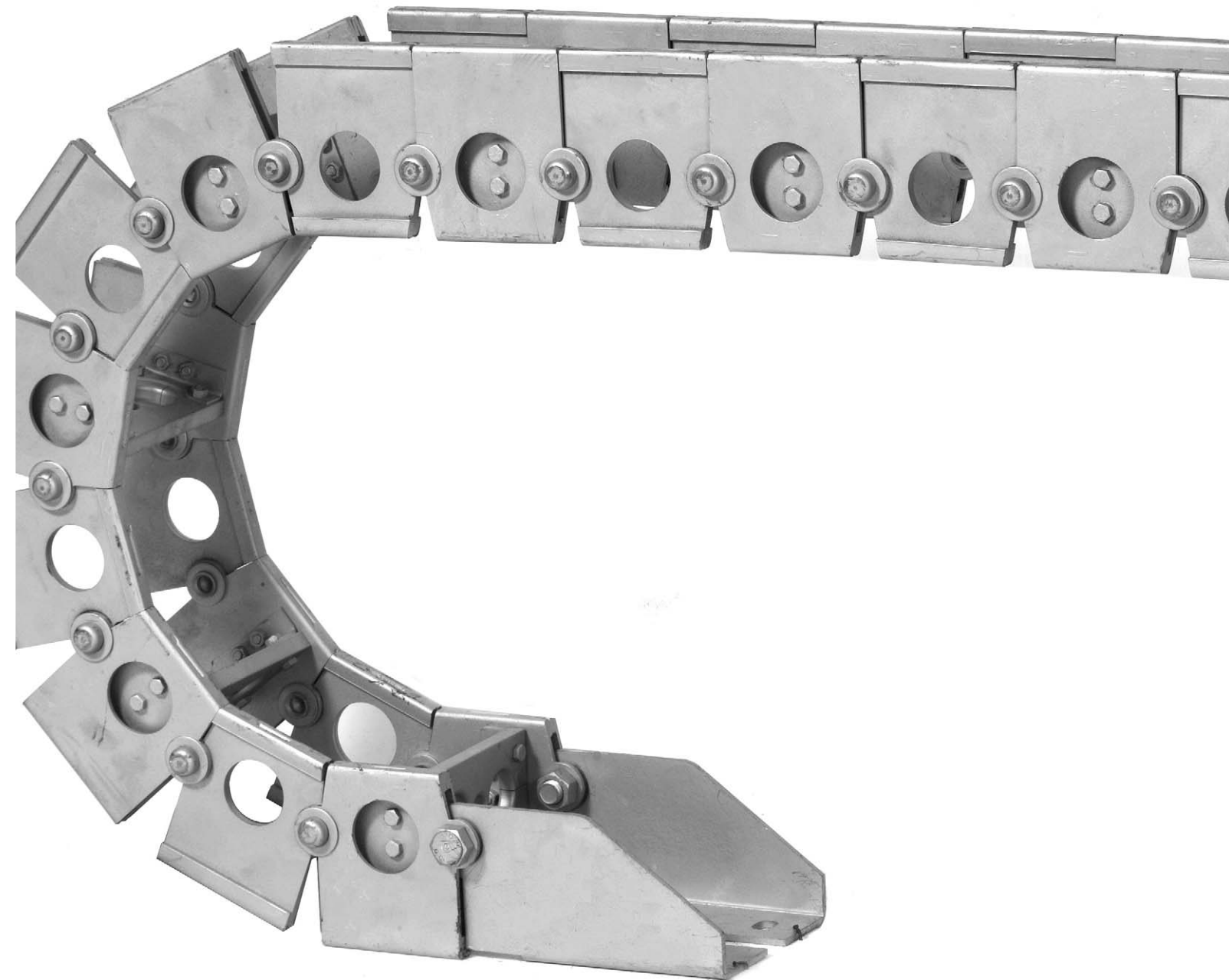
230 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **231**
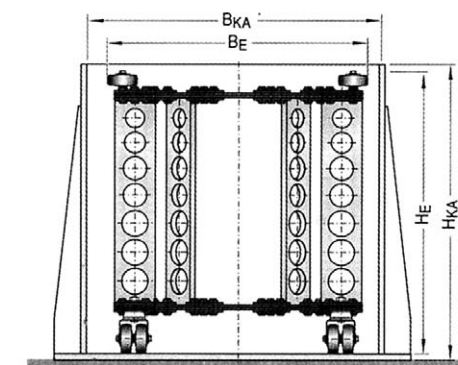
SHINFLEX®

SFSC Cable Chains

SFSC Cable Chain is excellent in intensity and durability, and is widely used in all industrial circles of machine tool, industrial machine, transport machine, woodworking machine and steel machine,etc.where accuracy and safety are required.

■ Characteristics

SFSC Cable Chain has four parts of link plate to assemble and disassemble stay. Stay by these parts can surely be preserved. When stay is small, It can support fully as one link plate, and & nab! pin case of division-type, it can simply be fixed with two bolts, without connecting a special bolt and division stay.
Rink plate is strong against abrasion,and there is no drooping, even when it is used for long time. Also, upon actual user's demand, safety cover of chain is made and provided.

■ Principle of Operation

The following sketch is a sketch of operation principle of general way to use the square steel chain. The moving part of chain is attached to machine moving part, fixed part to entrance part of cable, hose,etc. the perimeter side of rink plate of chain is supported as rectangular shape and between A and B is supported at contact face, it becomes horizontal state, as the chain become straight line without a support.
At between bent B and bent C,inside perimeter side of link plate is done as trapezoid shape, angle(O) is always maintaining certain curvature radius(R). Reaching the movement part of machine operation part, we can notice the chain state refering to sign of P1,P2—— before and after moving. Likewise, chain moves freely within certain moving distance according to operation part.

支持物
체인
프레임(Frame)
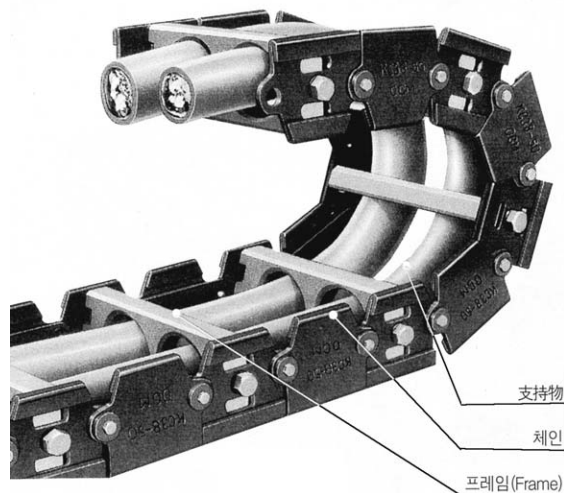
■ Structure

Cable Chain is formed with stay which two series chain and two rinks are mutually connected as regular curvature radius. Support structure of Cable Hose is supported by hole of the stay.

移動距離
直線部
機械可動部
屈曲部
曲率半径
체인
固定部
A 移動環
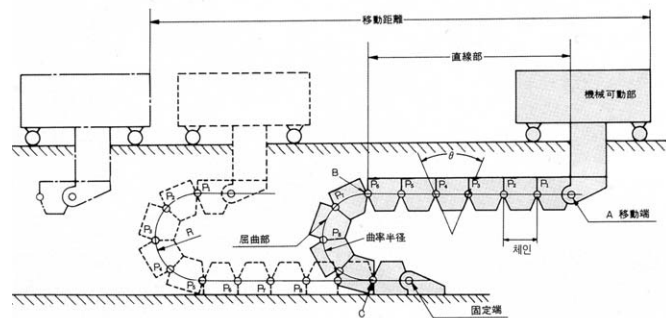
■ Selection of Square Steel Chain

Selection is drawn up based on the following conditions. Also, in case of excepting the catalogue descriptions, or in case where it is difficult to select, the moving distance is too long, you are requested to contact the technical Dept. of our company for consultation.

1. Installation : Chain should be installed in the central position horizontally
2. Fixed part : Should be installed in the central postion of moving distance.
3. Moving speed : under 60m/mm
4. Surroundings should be good
5. Should use stain fitted to chain.

Required item	Unit	Description
Out diameter-nos of support	mm	Necessary in deciding stay specification
Weight of support	kgf/m	Total weight of support
Allowable curvature radius of support	mm	Decided by charateristic of support
Required Moving distance	mm	Decided by the stroke of machine

■ How to select

1. Stay No.and applied chain No.(Temporary selection)
It shall be decided from the support biggest outside diameter of standard stay size table. from chain no.and marking where is applied selecting stay no.
2. How to select Chain Number
Using simple selection diagram, please select chain which meets the weight of support and the required moving distance from the allowable curvature radius of support Also, in case where the selected chain is smaller in size than the applied chain number of 1 item, please decide a chain in the least size from the applied chain.
3. How to select stay
If the stay selected by 2item is in chain number applied by 1 item, the stay selected by 1 item is better, and in case of bigger size than it, on the contrary, please select the stay size number applied to the chain from standard stay diagram.
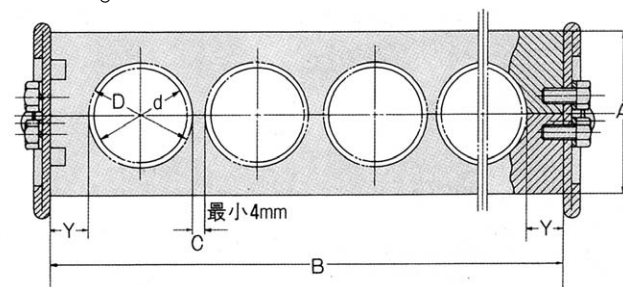**4. How to decide stay hole**
Stay hole is decided by the following diagram

Biggest outside diameter of support	Stay Hole diameter D
Under 20	d+1~2
Under 20, above 40	d+2~3
Above 40	d+3~4

5. How to decide standard stay size(AXB)
A decides Stay Number, please decide, after getting the least required width(b) of stay for B according to the following

D d
最小4mm
Y   C   Y
B
A

Stay width, least required width, diameter total of stay hole space total of stay hole, distance to link plate inner wall from stay hole wall.(see the following diagram)

(Notice) Though the space O of Stay Hole is 4mm to the least, please do with spare in case of hydraulic hose, etc.

Stay Number	Numerical value of Y
SFSC 38	10
SFSC 60	10
SFSC 60H	10
SFSC 75	10
SFSC 75W	10
SFSC 100	10
SFSC 100-2	10
SFSC 125-2	10

Link Number of Cable Chain and Necessary Number of Stay

■ Calculation of Chain Link Number

When chain selection is made, the required least number of chain is gained by the following expression.

$$Lmin : \frac{S}{2} + \pi R + 2A1$$

(In case where the fixed part is in the center of moving distance)

Here, Lmin = required least length mm
S = required moving distance
R = Curvature radius of chain mm
A1 = Coupling length of cable chain to spare mm

For decision of link number, it is gained by the following expression.

$$\ell 1 = \frac{Lmin}{P} = \frac{\frac{S}{2} + \pi R + 2A1}{P}$$

Here, $\ell 1$ = link number
P = chain pitch mm

Single number under the decimal point of L1 numerical value gained from the above expression is rounded off and in case where the numerical value becomes an even number link, cardinal number with 1 link added(both ends link on formal way) is necessary. When corrected above, both the length of proper chain and length of chain link are changed, it is necessary to calculate again.
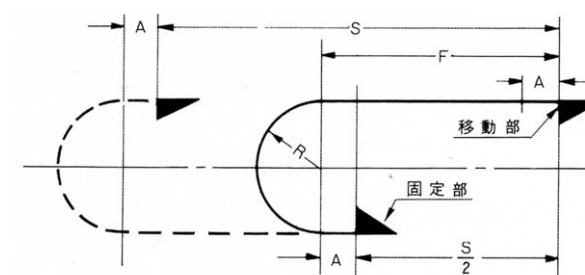
$$Lmin : P \times \ell \qquad A = \frac{L(\frac{S}{2} + \pi R)}{2} \qquad F = \frac{S}{2} + A$$

Here, L = Chain length after corrected, mm
I = Link number after corrected
A =Length to spare after corrected mm
F =Free Span of Chain mm

A   S   F
A
移動部
R
固定部
A   S/2

6. How to select Stay Shape

There are one boy type and division type in Stay, and division type is convenient to use in the following cases, as it is easy to put support to it and take off. The way to get the size is same to both one body type and division type.
• In case where the moving distance is long,
• In case where one uses electric wire attached by coupling.electric wire,etc. or hydraulic hose,
• In case where number of support is many.

As for chain selection from the former moving distance, please re-confirm if Free Span gained by chain length after corrected, is more than the allowable numerical value from the support weight to spare, in the simple selection diagram.

■ Calculation of Stay

Stay of our SFSC Cable Chain to put and take off can be gained wholly by the following expression regardless of size.

$$N = \frac{\ell - 1}{2}$$

Here, N =Stay number ℓ = Link number after corrected

[Calculation instance]
(Question) How do SFSC75 Cable chain link nos, stay nos and chain free span become in the following conditions ?

• Required moving distance: 8,000mm
• Length to spare: A1 = 70mm
• Curvature radius R = 200mm (support roller is installed in two places)

(Answer) Calculation of Link nos.

$$\ell 1 = \frac{\frac{S}{2} + \pi R + 2A1}{P} = \frac{\frac{800}{2} + 3.14 \times 200 + 2 \times 70}{75} \fallingdotseq 63.57mm$$

In such case, When rounding off from below decimal point, it becomes 64. Here, when changed to odd number again, it becomes 65 links.

Required number of Stay is as follows; $N = \frac{\ell - 1}{2} = \frac{65-1}{2} = 32$

So, the number after correcting becomes as follows.

Chain length after correcting=P x I =75 x 65 = 4,875mm

Length to spare after correcting A =

$$A = \frac{L - (\frac{S}{2} + \pi R)}{2} = \frac{4875 - (\frac{800}{2} + 3.14 \times 200)}{75}$$

Free Span of Chain F= $\frac{S}{2} + A = \frac{800}{2} + 123.5 = 4123.5mm$

234 · SHINSUNG ELECTRIC CO., LTD.

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With respect to 4,123mm, in case of chain free, as calculated by being installed with support rollers in two places, it is necessary to multiply 1/2 of this numerical value.

$$4,123.5 \times \frac{1}{2} = 2,061.75mm$$

Above calculation becomes Free Span which is actually used, and the allowable weight of support becomes about 40kgf/m, from simple selection diagram, so they can be used within this. Also in case of support roller 1 place, it is good to multiply 2/3 in accordance with suppor roller two places.

(Remarks)

Length of support and hose, is proper when it expresses, [(pitch x link number0+take–in length] x 1.02, so when hose of high voltage is used, the length is contracted, so please decide by seeing the catalogue of hose maker.

RELATIONSHIP BETWEEN MOVING DISTANCE OF CABLE CHAIN AND SUPPORT ROLLER

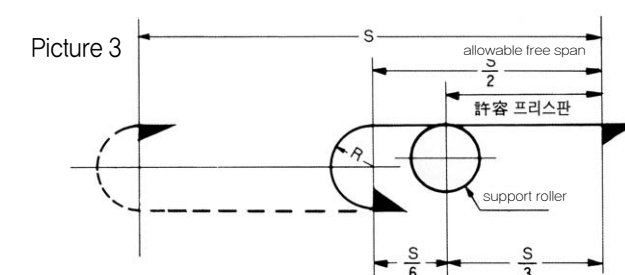### ■ Free Span, allowable Free Span

The length of straight line part of chain afroat in the air, required to the certain moving distance of machine is called " Free Span ".
Like the picture 1, when there is no support, Free Span becomes 1/2 of certain moving distance(S). In the same time, chain has long moving distance, so it is supported with support roller, In this case, Free Span becomes like picture 2. Next, with size of cable chain and weight of support, for allowable numerical value of Free Span, the maximum numerical value allowed hereafter is called " Allowable Free Span"
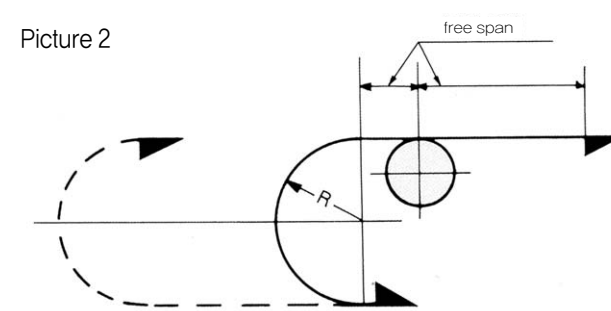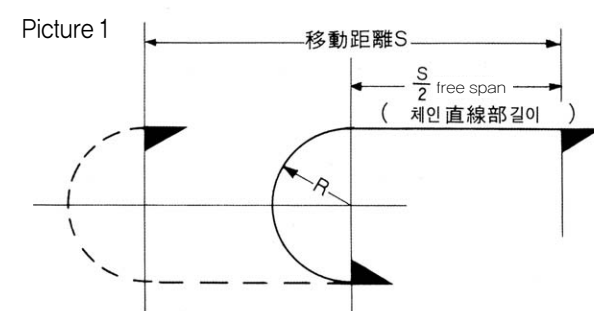
### ■ INSTALATION OF SUPPORT ROLLER

1. In case of Support Roller one place
When installed in the position of picture 3 for support roller one place, the moving distance becomes like the following.
Moving distance = allowable free span x 3

2. In case of Support Roller two places
When support roller two places are installed in the position of picture 4, the moving distance becomes like the following.
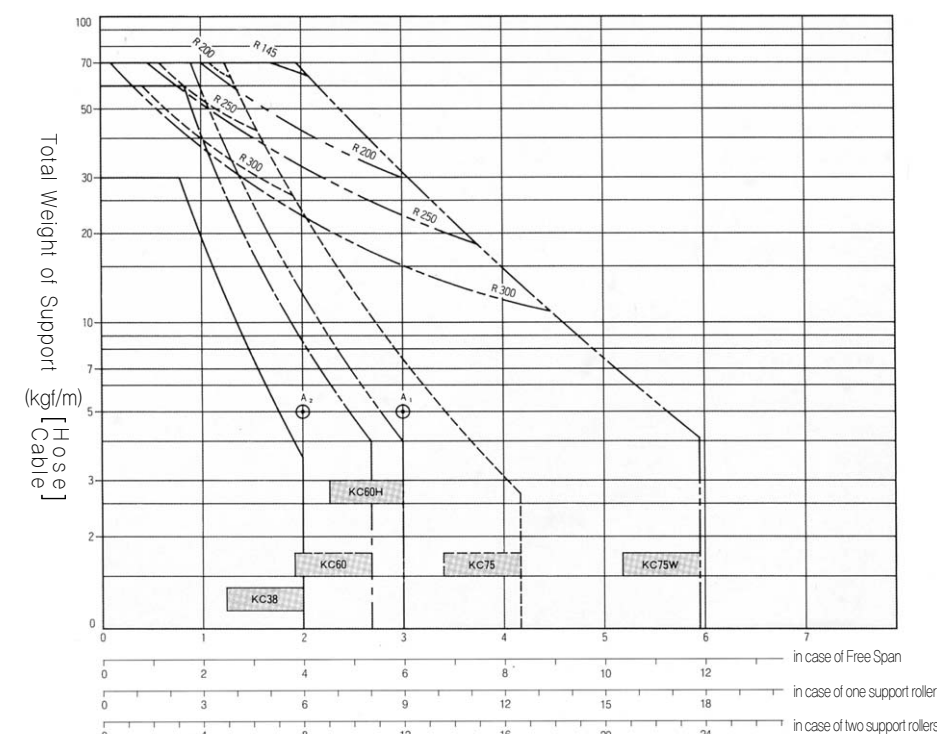Moving distance = allowable Free Span x 4
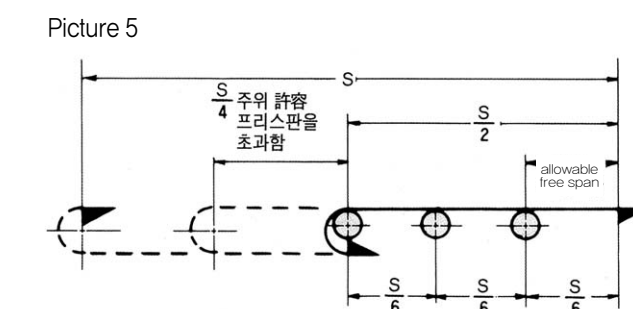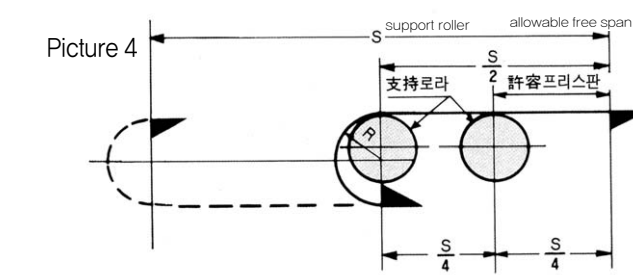
(Notices)
Support Roller can't be installed more than three places.
When roller space is done with allowable free span (see picture 5), it becomes part of Free Span which exceeds the allowable free span within the certain moving distance.

SIMPLE ELECTION DIAGRAM(1)
■ SFSC 38, SFSC 60, SFSC 60H, SFSC 75, SFSC 75W

(Notice) 1. For SFSC 38, don't use support roller. Also, don't use SFSC 60, if possible.
2. For SFSC 38, SFSC 60, SFSC 60H, capacity is decided regardless of curvature radius.

■ How to see Diagram. how to select the specification

By Gaining the intersectional point between the whole weight(avertical shaft)of Support and certain moving distance(horizonal shaft), and decides after seeing to which chain number the area belongs. When the intersectional points become more than two kinds, please select smaller size.
(Instance 1) (Question) With total weifht of support–5kgf/m, when the allowable curvature radius of support is 280mm,and the certain moving distance is 6m, which is better, in selecting cable chain ?

(Answer) First of all, please review the case which is free with support roller not used. When we gain the intersectional point A1of both the whole weight 5kgf/mof support and moving distance 6m(horizontal shaft), the point is in the area of both SFSC 75 and SFSC 75W.In such case, there are two kinds of chains which meet with the conditions, but as aforementioned, it becomes SFSC 75 selecting the smaller size. Next, when we select the least radius, bigger than the allowable curvature radius, for curvature radius, above A1 fitted to 300mm becomes R 300.

(Notice) When one support roller is installed, it becomes intersectional point A2 by selecting with same way,and SFSC 60 also meets the condition, but it is above ordinary chain size, so it is economical not to use support roller.

SIMPLE ELECTION DIAGRAM(2)
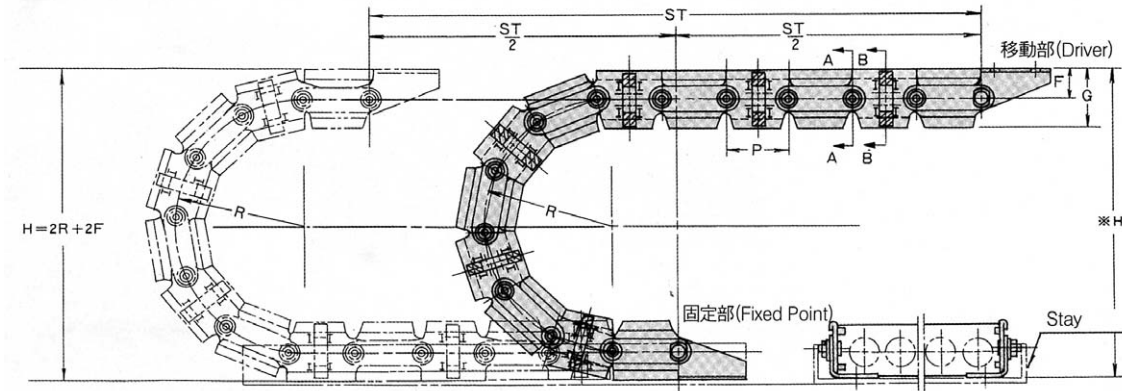### ■ SFSC 100, SFSC 100–2, SFSC 125–2
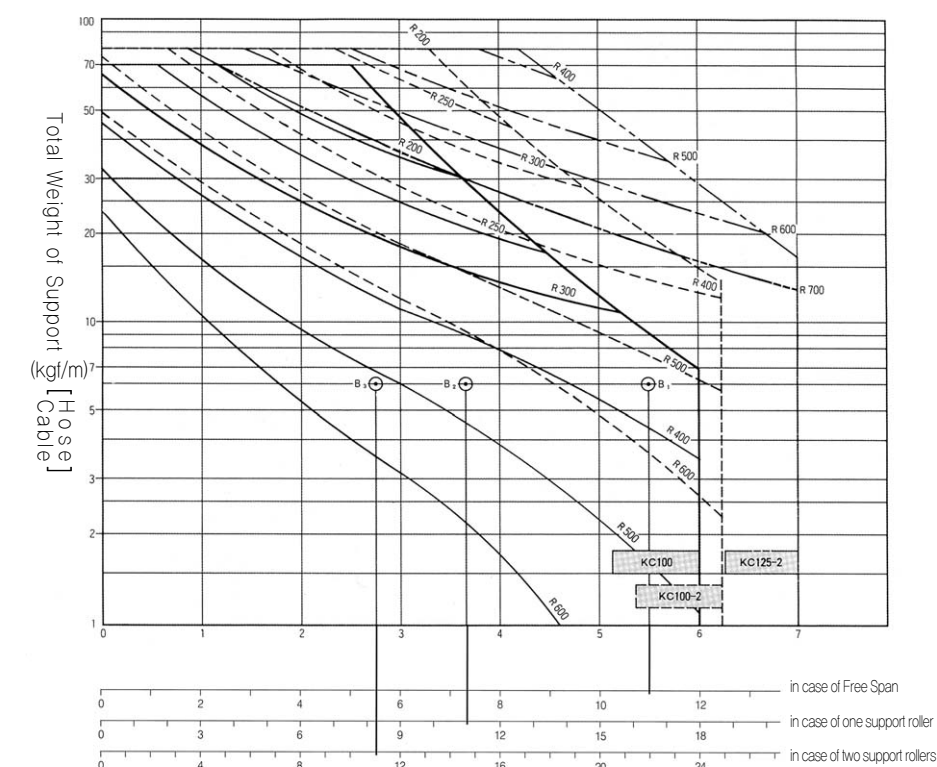
(Notice) 1. SFSC 100–2, SFSC 125–2 is a structure which two rink plate two shyeets were united and the curvature radius becomes bigger, so for SFSC 100, like less than DFSC 75, rink plate is formed with one shect, so as for the curvature radius above R 500, please let it become as lower as possible

■ How to see Diagram. how to select specification

In case where the allowed curvature radius 450mm of support and the required movement distance 11m, with total weight6kgf/m of support, which is narrow in selecting cable chain?

(Answer) For curvature radius, the least radius, bigger than the allowable curvature radius 450mm is used. So 500mm is selected. As for chain selected item, in the same way, like (example 1) intersecting point is gained, when reviewing the case of free, so SFSC 100–2 is used. In the case where support roller is installed to one place, it becomes interseeting pointB3, and can't use SFSC 100. On the case where roller are installed to two places, it becomes intersecting B, and can use SFSC 100 as well. As marked in the simple selection diagram, it becomes the curvature radius R500, and in such case, it such case, it is decided as SFSC 100–2 R500.

236 · SHINSUNG ELECTRIC CO., LTD.

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SQUARE STEEL CABLE CHIN STANDARD

• Chain Stay (please use Stay just shown in the following diagram)
• Please make H become a little higher than H by about 10mm, than H, height at attaching side of machine movement part.

■ Standard Curvature radius

CHAIN TYPE	Pitch P	Standard Curvature Radius R						
SFSC 38	38	50	75	90				
SFSC 60	60		75	90	125			
SFSC 60H	60		75	90	125			
SFSC 75	75			125	145	200	250	300
SFSC 75W	75			125	145	200	250	300
SFSC 100	100				200	250	300	400	500	600
SFSC 100-2	100				200	250	300	400	500	600
SFSC 125-2	125					400	500	600	700

■ Each part Dimension Diagram

CHAIN TYPE	P	F	G	U	E	Y最小	T	체인개락중량 (kgf/m)
SFSC 38	38	20	38	10	B+13.6 (+16.0)	10	2.0	2.0
SFSC 60	60	27.5	55	10	B +15.8 (+18.2)	10	2.3	3.0
SFSC 60H	60	27.5	55	10	B+19.4 (+21.8)	10	3.2	3.9
SFSC 75	75	35	70	15	B+22.4 (+25)	10	3.2	6.4
SFSC 75W	75	70	105	15	B+22.4 (+26.6)	10	3.2	8.5
SFSC 100	100	75	115	20	B+28.6 (+32.8)	18	4.5	10.3
SFSC 100-2	100	75	115	20	B+47.0 (+51.2)	18	4.5	19.7
SFSC 125-2	125	95	150	20	B+47.0 (+51.2)	18	4.5	28.1

(Notice) 1. SFSC 100-2, SFSC 125-2 are structure united by two sheets if Rink plate, and it can be a little different from the shape of the chart, so be care about it.
2. ( ) dimension of E indicates the case where safe cover is sticked, For indication of cable chain sticked by safe cover, please fill SF in the next to Chain Type.(example SFSC 75, SF-R200)

〈Stay〉   〈Coupling〉

最小 4 mm   最小 4 mm

分割形   一体形
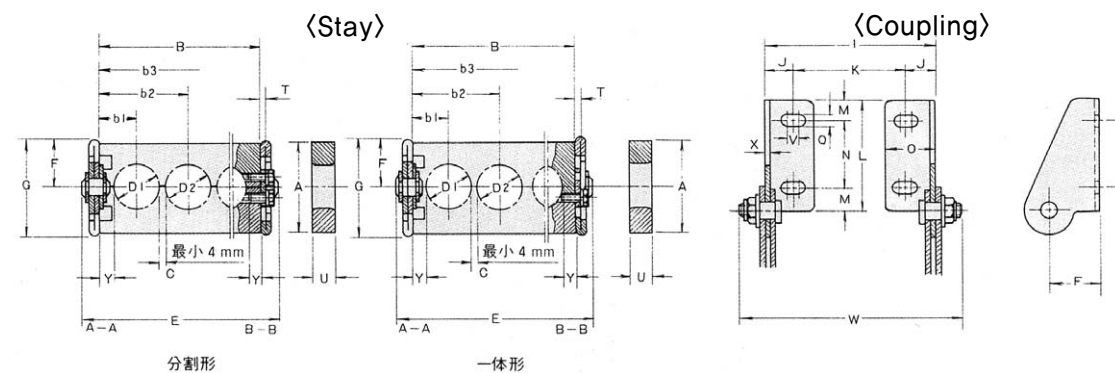
■ Coupling Size Table

CHAIN TYPE	I	J	K	L	M	N	O	Q	V	X	W
SFSC 38	B+4.0	14	B-24	50	10	30	25	6.4	4	2.0	B+23
SFSC 60	B+4.6	13.3	B-22	60	15	30	28	8.8	5	2.3	B+27
SFSC 60H	B+6.4	14.7	B-23	60	15	30	29.3	8.8	5	3.2	B+31
SFSC 75	B+6.4	24.2	B-42	80	15	50	40	8.8	10	3.2	B+39
SFSC 75W	B+6.4	24.2	B-42	80	15	50	40	8.8	10	3.2	B+39
SFSC 100	B+9.0	25	B-41	100	20	60	47	14	10	4.5	B+48
SFSC 100-2	B+39	35	B-31	100	20	60	65	14	10	6.0	B+68
SFSC 125-2	B+39	40	B-41	125	25	75	75	18	10	6.0	B+68

(Notice) 1. For coupling of SFSC 100, SFSC 100-2, it is necessary to be attached toward outside direction.
2. There is no division type in SFSC 38.
3. SFSC is omitted in the Type blank of applied chain.
(example SFSC 38 = 38)

■ Standard Stay Size Table

CHAIN TYPE	max.outside diameter of support	Standard stay size A×B												Applied Chain Type
SFSA 35	Ø18以下	35×60	35×80	35×100	35×150	35×150	35×200	35×250	35×300					38, 60, 60H
SFSA 45	Ø27以下	45×60	45×80	35×100	35×125	45×150	45×200	45×250	45×300	45×350				60, 60H
SFSA 50	Ø32以下		50×80	50×105	50×125	50×150	50×200	50×250	50×300	50×350	50×400			75, 75W
SFSA 65	Ø46以下		*65×80	65×105	65×125	65×150	65×200	65×250	65×300	65×350	65×400	65×450	65×500	75,75W 100,100-2
SFSA 75	Ø55以下			75×105	75×125	75×150	75×200	75×250	75×300	75×350	75×400	75×450	75×500	75,100 100-2
SFSA 90	Ø60以下				90×150	90×200	90×250	90×300	90×350	90×400	90×450	90×500	90×550	90×600	125-2
SFSA 110	Ø80以下			110×150	110×200	110×250	110×300	110×400	110×450	110×500	110×550	110×600		100,100-2 125-2

스탠드   스탠드   체인 / 支持로라 / 베어링유니트 / 체인Stay / 체인

■ Support Roller Standard Table

| CHAIN TYPE	Dimension	V	W	E	Chain Curvature radius	F	H	S	D	G	K	Z
SFSC 75	80	B+45	B+115	B+153	125	35	2R-82.5	2R+70	165	45	205	B+40
SFSC 75W	80	B+45	B+115	B+153	125	70	2R-47.5	2R+140	165	45	205	B+40
SFSC 100 / SFSC 100-2	100	B+66	B+144	B+182	200	75	2R-75	2R+150	216	50	270	B+60
SFSC 125-2	100	B+66	B+144	B+182	300	95	2R-70	2R+190	216	50	270	B+60

■ Chain & Stay

1. Chain type indication
   Indicates both chain type and curvature radius.

2. Stay indicatuon
   Indicates Stay, Stay Number and length. Division type
   In case of Stay, S is attached to the end of Stay B dimension.
   Stay type x Stay B dimension(example SFSA 50x 100S0

■ Tension reductions for electric cables

NEW!
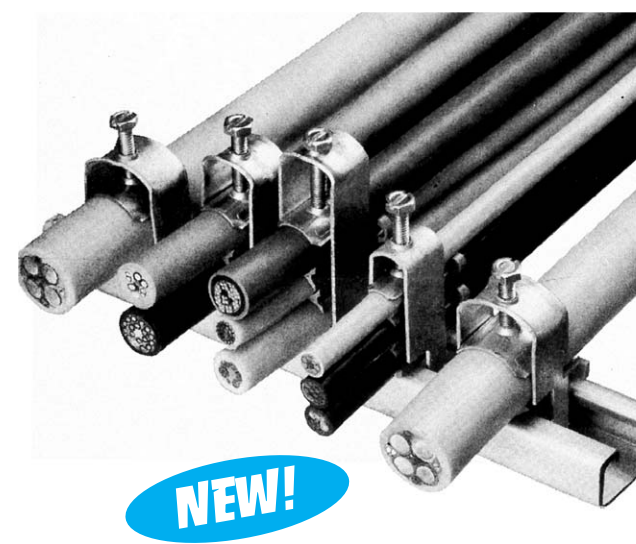
The professional cabel tension reduction belongs to completing the reliable cable carrier system.

The diameter adapted cables and hoses have to be clamped at the end points of the cable carrier system.
The clamping surface should be lacated in a distance of ≥30×largest single diameter with regard to the last movable hinge of the cable carrier system, in order to achieve tension compenstation between them movable and unmovable cable sections.

Principally the SHINSUNG instructions for installing the cables/hoses into cable carrier systems have to be considered!

Tension reduction on both sides:
As per standard both sides should be tension reducted.
The forces acting with cable carrier systems should not be transmitted to cables/hoses!

One-side tension reduction:
In som cases the one-side tension reduction of cables/hoses can be necessary or significant.

■ Limitation of applications:

This tension reduction device has always to be installed at the driver, i.e. at the movable end of the cable carrier system.
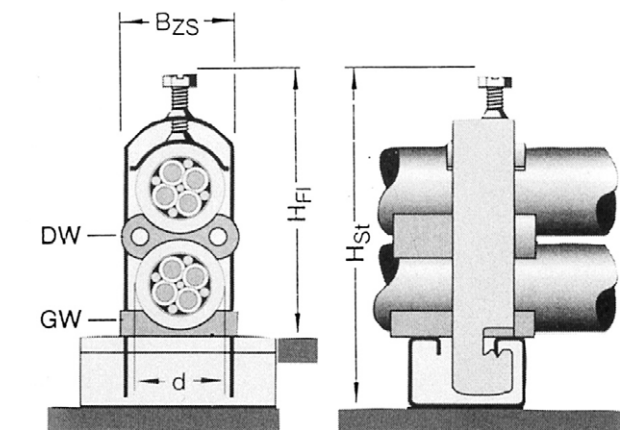
A dimension of at least △ H 10mm should be respected between screw head and top edge of the cable carrier system in case of a cable carrier system sliding with the upper part on the lower part!

≥ 30 d

standard fixing   flange fixing
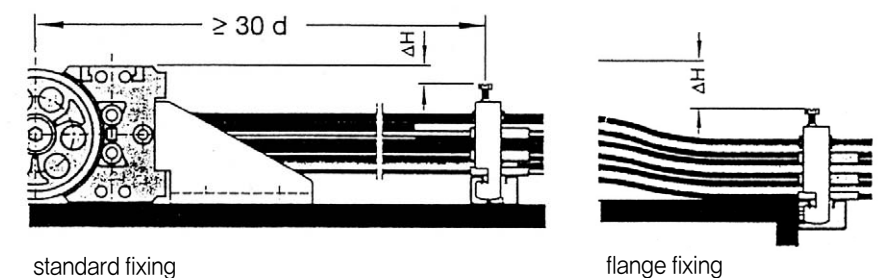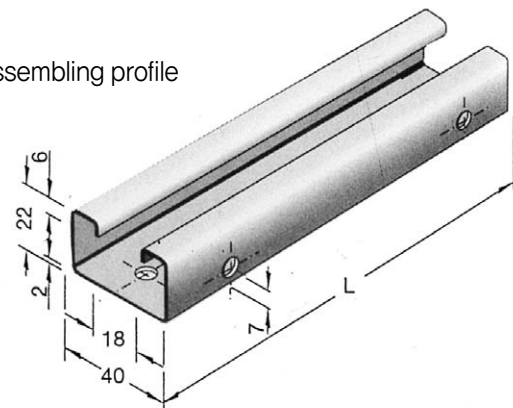
SFSC Cable Chains

■ Total tension reduction

Countertrough SGW

Double trough SDW

Assembling profile

Assembling profile for tension reduction clamps

− for standard and flange fixing
− solid design, galvanized
− suitable for one−, double−and triple clamps
− clamp to be fixed laterally and from above
− assembling profile to be screwed at the ends fixing holes to be drilled during assembling, max. hole Ø8.5mm(for bolts M8)
• Available length L : as per order
• Weight : 1,650kg/m

■ Tension reduction elements

Further sizes and types on request!

Definitions:
d = outer diameter of cables/hoses
B_{ZS} = width of the tension
reduction clamp
H_{st} = installing height with standard fixing
H_{Fl} = installing height with flange fixing

※suitable for diameter range 6–8mm only with sufficient rigid coating

SZS−1−single clamp for one cable/hose

type	for cable/hose diameter d	installing height in mm		width B_{ZS} in mm	article no.
		H_{st}	H_{Fl}		
K 12 AC	6* − 12mm	58 − 64	36 − 42	18	17500
K 16 AC	＞ 12 − 16mm	65 − 68	42 − 46	22	17507
K 20 AC	＞ 16 − 20mm	69 − 72	46 − 50	26	17508
K 24 AC	＞ 20 − 24mm	73 − 76	50 − 54	31	17509
K 28 AC	＞ 24 − 28mm	77 − 80	54 − 58	35	17511

SZS−2−double clamp for two cables/hoses above each other

type	for cable/hose diameter d	installing height in mm		width B_{ZS} in mm	article no.
		H_{st}	H_{Fl}		
K 12/2 AC	6* − 12mm	68 − 80	46 − 58	18	17512
K 16/2 AC	＞ 12 − 16mm	81 − 88	58 − 66	22	17513
K 20/2 AC	＞ 16 − 20mm	91 − 98	68 − 76	26	17514
K 24/2 AC	＞ 20 − 24mm	101 − 108	78 − 86	31	17515
K 28/2 AC	＞ 24 − 28mm	109 − 116	86 − 94	35	17516

SZS−2−trple clamp for three cables/hoses above each other

type	for cable/hose diameter d	installing height in mm		width B_{ZS} in mm	article no.
		H_{st}	H_{Fl}		
K 12/3 AC	6* − 12mm	82 − 94	50−72	18	17517
K 16/3 AC	＞ 12 − 16mm	96 − 108	74−86	22	17518
K 20/3 AC	＞ 16 − 20mm	110 − 120	86−98	26	17519
K 24/3 AC	＞ 20 − 24mm	122 − 134	100−112	31	17521
K 28/3 AC	＞ 24 − 28mm	136 − 146	112−124	35	17522

### SGW−counter trough for constant clamping pressure reception

type	clamping range for cable/hose outer diameter	article no.
GW 6−12	6* − 12mm	17523
GW 12−16	＞ 12 − 16mm	17524
GW 16−20	＞ 16 − 20mm	17526
GW 20−24	＞ 20 − 24mm	17527
GW 24−28	＞ 24 − 28mm	17528

SDW−double trough for clamping pressure reception on both sides

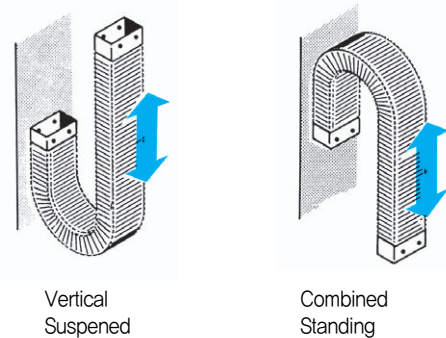| type	clamping range for cable/hose outer diameter	article no.
GW 6−14	6* − 12mm	17529
GW 14−22	＞16−22mm	17532
GW 22−30	＞22−30mm	17533
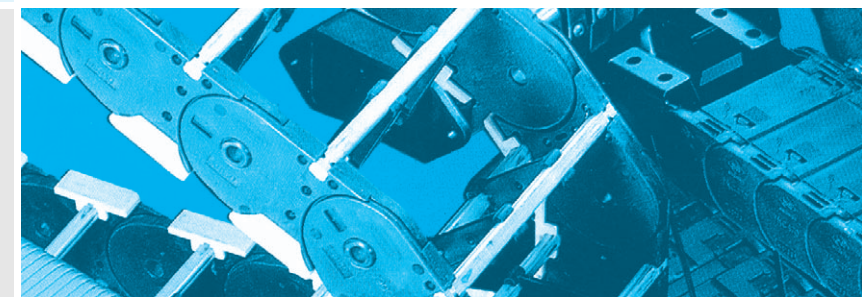
Cable Duct

Mojor
machine tools, industrail machine, robot industrail purpose
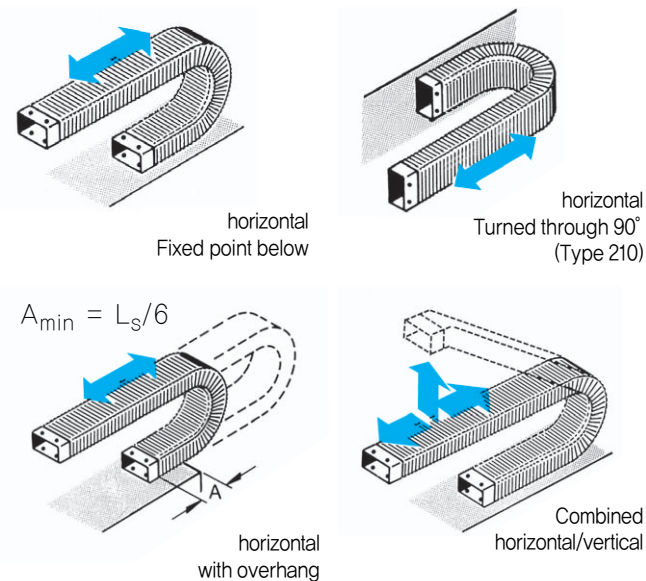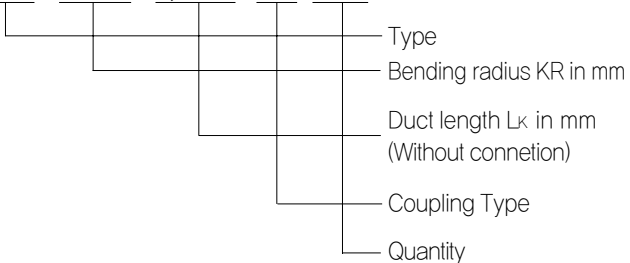
■ Character

The SHINSUNG Cable Duct are used for the guide of cables and hoses to movable consumers.
Cable Duct guide hoses consist of flexible metal spiral tubes which are cantilevered in certain lengths by inserted, Pretensioned special steel bands. Energy guide hoses Cable Duct can be used for horizontal, for vertical and for combined horizontal–vertical motions.
The use at a movable consumer requires scarcely constructive preconditions.


Vertical Suspened

Combined Standing

■ Order code for the cable duct

080.1 – KR 150 – 2, 500L – F/F : 2Sets

- Type
- Bending radius KR in mm
- Duct length L_K in mm (Without connetion)
- Coupling Type
- Quantity

Technical data

$$L_f = \frac{L_S + KR}{2}$$

horizontal
Fixed point below

horizontal
Turned through 90°
(Type 210)

$A_{min} = L_S/6$

horizontal
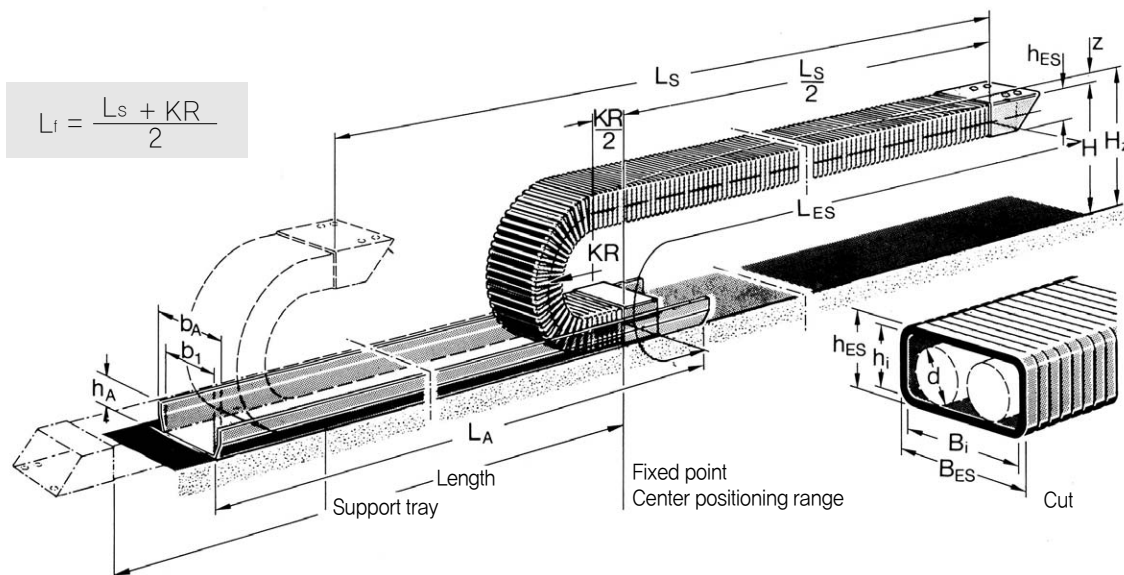with overhang

Combined
horizontal/vertical

Should the section of an energy guide hose be in-sufficient for the installation of cables/hoses, the lines may be divided among several Cable Duct energy guide hoses

Opposite
Cach other

into each other

Side by side
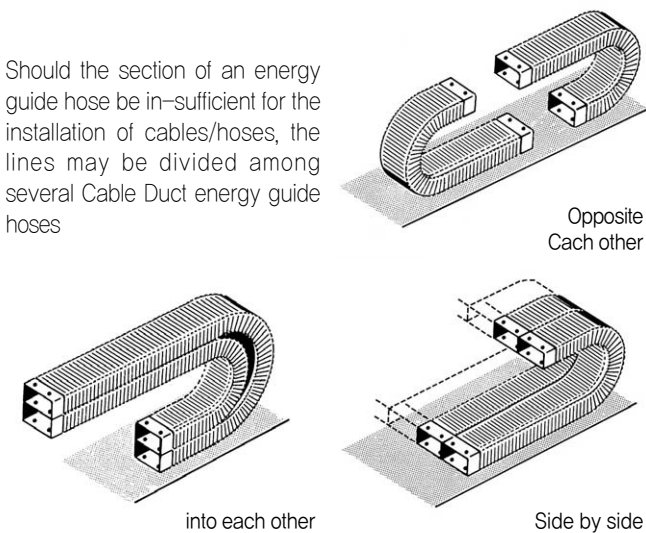
■ Cable Duct connection

The fixed point connection should be ensued in the centre of the travel stroke as this produces the shortest connection between fixed point and movable consumer and thus the most economic length of energy guide hose and line.

Straight-line length of energy guide Cable Duct

$$L_{es} = \frac{L_s}{2} + L_B$$

Circular dim. LB(table of dimensions)

■ Support tray

For the support of the Cable Duct energy guide Cable, an even surface or possibly a support tray will be required.

Purchase-order length of energy guide Cable Duct

$$Length = L_{es} - LVK$$

Cable shortening LvK(table of dimensions)

Required clear height :

$$H_z = 2KR + hes + Z$$

Prestress z = 50mm

Legth of support tray :

$$L_A = \frac{L_s}{2} + ZA$$

Length allowance Za(table of dimensions)
sheet thickness : 1,5mm
Max,part length : 3000mm

■ Table of Dimensions:Further dimensions available upon request

• Subject to alternation!

TYPE SCD		030,1	050,1		050,2		080,1		080,2		080,3	110,1			110,2		110,3	170,1			170,2		170,3
Cable duct width	mm	30	50		50		85		85		85	115			115		115	175			175		175
Cable duct height	mm	30	30		50		45		60		85	60			80		115	80			110		175
Cable inside width	mm	26	45		45		80		80		80	109			109		109	170			170		170
Cable duct inside height	mm	24	24		44		40		54		78	53			73		108	72			102		167
Bending rading KR	mm	80	75	100	150	110	150	200	100	150	200	150	200	250	200	150	200	250	200	250	350	300	190	250	350	250	300	400	365
Circular dim Lₑ	mm	330	310	415	620	455	620	830	415	620	830	620	830	103	830	620	830	1035	830	1035	1450	1245	790	1035	1450	1035	1245	1660	1510
Built-in height H	mm	190	180	230	330	270	350	450	245	345	445	360	460	54	485	360	460	560	480	580	780	715	460	580	780	610	710	910	905
Permissible unsupported hose Length L₂	mm		1000 − 1500									1500 − 2000							1500 − 2500					
							depending on Loading																	
Cable duct shortening LVK	mm	45	45		80		70		95		135	95			125		180	125			175		245
Cable duct weight without joining pieces	kg/m	1,2	2,0		2,5		3,0		3,5		5,1	4,8			5,3		6,6	7,2			8,2		9,2
Length all owance for support tray	mm	220	215	250	325	275	335	410	280	350	425	355	430	505	445	375	450	525	460	535	685	630	445	535	685	550	625	775	755
Tray inside width b1	mm	40	65		65		100		100		100	135			135		135	200			200		200
Tray total width	mm	55	80		80		115		115		115	150			150		150	215			215		215
Tray height hA	mm	20	20		20		20		20		20	20			20		20	20			20		20

1) Bending radius:

The bending radius depends in general on the engineering conditions. For its determination attend to the minimum required bending radius specitied by the manufactures of the service lines. specified bending radius = KR max
Prodation Conditioned allowancesi – 20 – 30mm

2) Permissible unsupported Cable length Lfi

Cable Duct energy guide hoses can be used in horizontal applications within the stated permissible unsupported lengths without additional supports.
If the permissible unsupported length of the energy guide hose is exceeded, the required stroke can possibly be reached by a support, this does reduce, however, the permissible unsupported length L1 by abt. 20%!
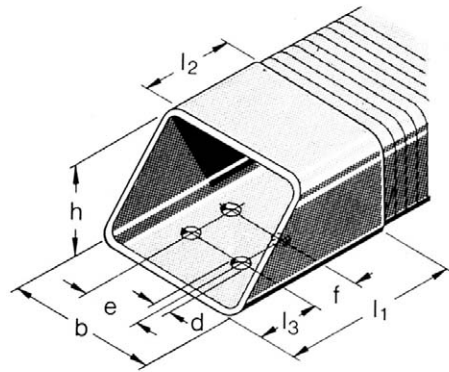
Number and outside diamter of the cables/hoses to be insalled(attend to fixed armatures)
Weight of cables or hoses including of hose content
Required minimum bending radius of cables or hoses as per manufacturer's statement.

- ☐ Travel of the consumer
- ☐ Max, acceleration or deceleration
- ☐ Speed of travel
- ☐ Frequency of travel
- ☐ Available mounting width
- ☐ Installation variant dwg if possible
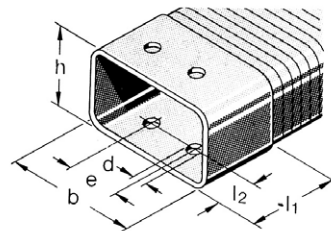- ☐ Type of connection
- ☐ Working environment

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CABLE Duct

■ Fitting dimension for Energy guide Cable Duct Diagonal connector Demensions

Type SCD	b	h	e	f	d	l1	l2	l3
030.1	34	34	0	40	9	120	60	10
050.1	54	34	20	40	9	120	60	10
050.2	54	54	20	40	9	120	60	10
080.1	90	50	50	40	9	120	60	10
080.2	90	65	50	40	9	120	60	10
080.3	90	90	50	40	9	120	60	10
110.1	120	65	80	40	9	120	60	10
110.2	120	85	80	40	9	120	60	10
110.3	120	120	80	40	9	120	60	10
170.1	180	85	140	40	9	120	60	10
170.2	180	115	140	40	9	120	60	10
170.3	180	180	140	40	9	120	60	10

■ Diagnal Connector

Applications with diagonal connectors

The Connectors can be changed and, if necessary, can be changed at a later stage. Type of connection required should be given when ordering!

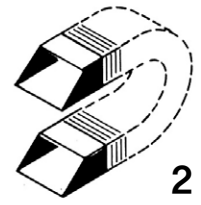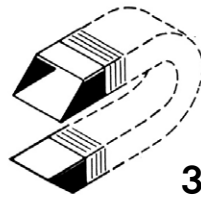Standard Connector

Cross flange Connector
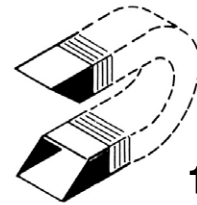
High Flange

**1** out/out   **2** in/out   **3** in/in

Variants for oblique joining piece

■ Standard Connector, Cross flange Connector, High Flange Connector

Type SCD	b	h	e	eb	eh	d	l1	l2	bw	b1	b2
030.1	34	34	–	56	56	9	60	20	20	74	74
050.1	54	34	20	76	56	9	60	20	20	94	74
050.2	54	54	20	76	76	9	60	20	20	94	94
080.1	89	49	50	111	71	9	75	20	20	129	89
080.2	89	64	50	111	86	9	75	20	20	129	104
080.3	89	89	50	111	111	9	75	20	20	129	129
110.1	119	64	80	141	86	9	95	20	20	159	104
110.2	119	84	80	141	106	9	95	20	20	159	124
110.3	119	119	80	141	141	9	95	20	20	159	159
170.1	179	84	140	201	106	9	95	20	20	219	124
170.2	179	114	140	201	136	9	95	20	20	219	154
170.3	179	179	140	201	201	9	95	20	20	219	219

※ Front−flange joining Connector as per customers' designation are also available. Those pieces can be combined. The requested type of connection and its variant is to be stated with the order.
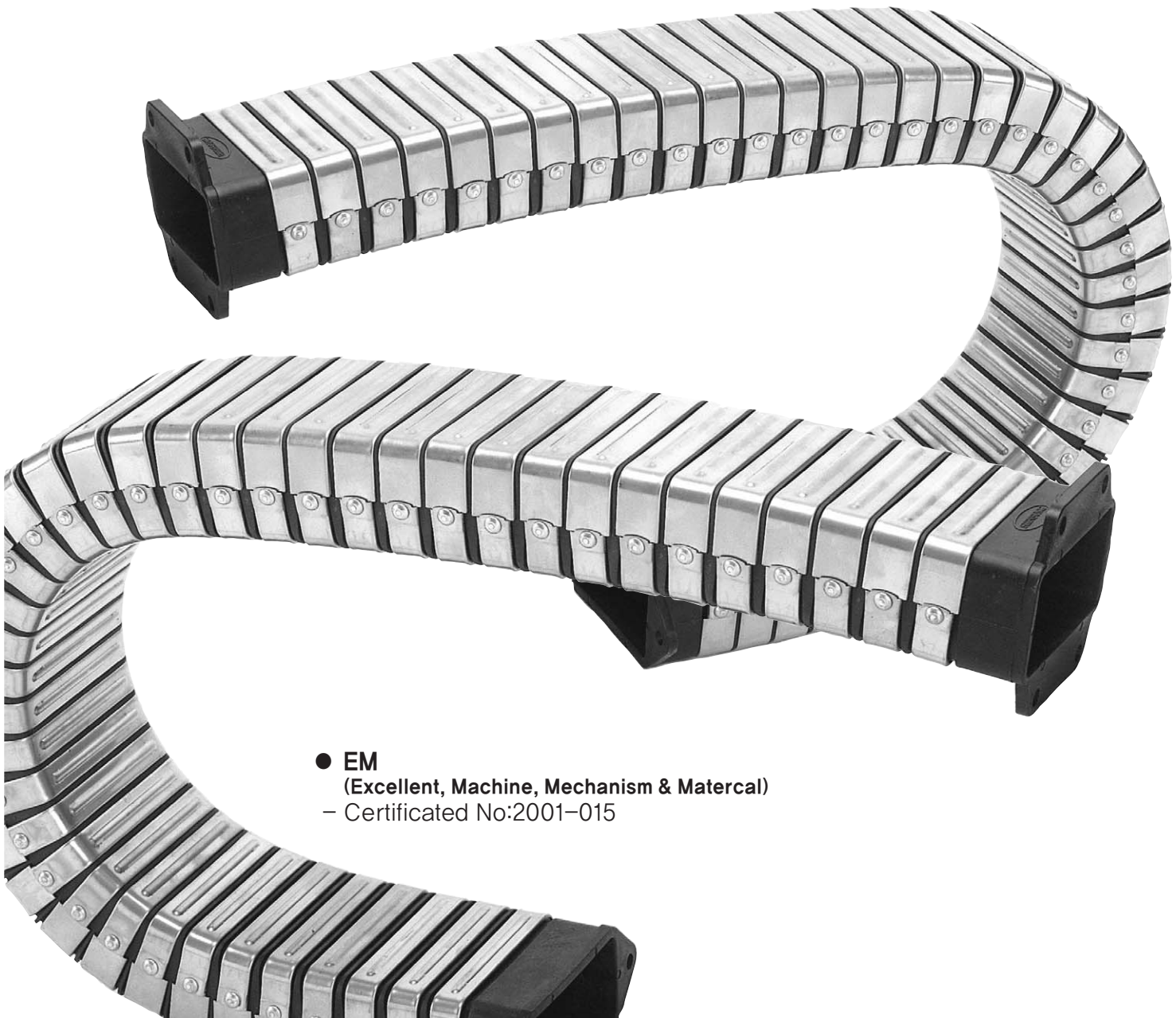
SHINFLEX®
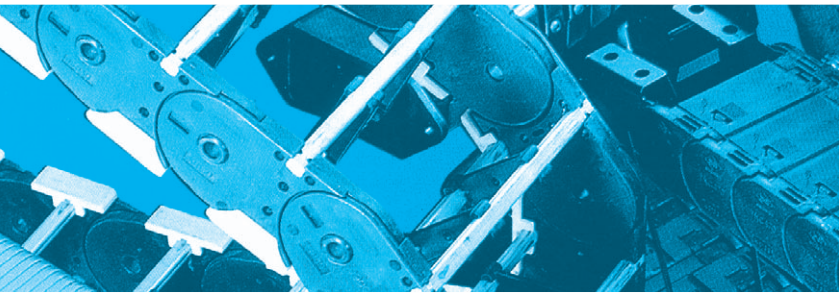
SCF Energy Conduits

Mojor use
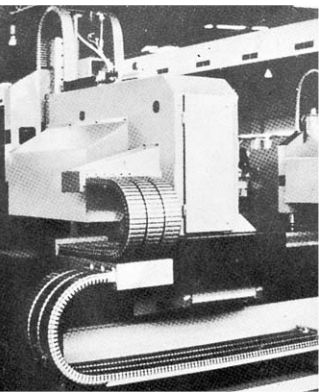Appled to machine tools, Industrial machine. Robot for industrial purpose.

● EM
(Excellent, Machine, Mechanism & Matercal)
− Certificated No:2001−015

SCF Energy Conduits

■ Application

SHINSUNG flexible conduit, SCF is an extension of our range of energy supply products based on many years of experience in this field.
SCF flexible conduit is used to guide flexible cables/hoses and has proved successful in machine and apparatus construction, handing systems and robots.

SHINSUNG flexible conduit, SCF consists of stainless steel segments and frames made rom polyamide reinforced with glass fibres.
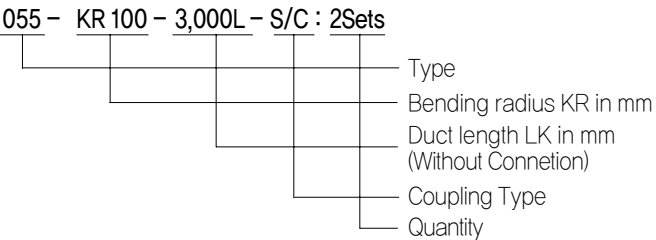
The segments and frames are assembled to the required length which therefore eliminates the need to order to every individual requirement and therefore allows stock holding.

Partly damaged flexible conduit does not need to be replaced but can easily be repaired!

SCF is available with different bending radius. The bending line lies along the neutral axis of the flexible cnduit so that the movement of the cables and hoses relative to the SCF is minimal. The cables/hoses which are housed within the SCF are protected by the plastic frames.

● The use of offers the following advantages :
• Cables/hoses protected from dirt and chips
• Long life of cables/hoses due to protection within plastic frames
• Space required is minimal
• Low noise factor
• Safe
• Easy essembling
• Maintenance free
• Good appearance
• Ordering to contract unnecessary due to ability to hold stock

● The following details are required to prepare a technical quotation :
• Number and external diameter of cables/hoses to be housed (not fittings)
• Weight of cableks and hoses(incl, hose contents)
• Smallest permissible bending rad, of cables/hoses (as, manufacturers' specif,)
• Length of travel
• Maximum acceleration/deceleration
• operating speed   • Duty cycle
• Width available for installation
• Type of application(drawing if possible)
• Type of connectors   • Working environment

■ Order Code for the SCF

055 – KR 100 – 3,000L – S/C : 2Sets

- Type
- Bending radius KR in mm
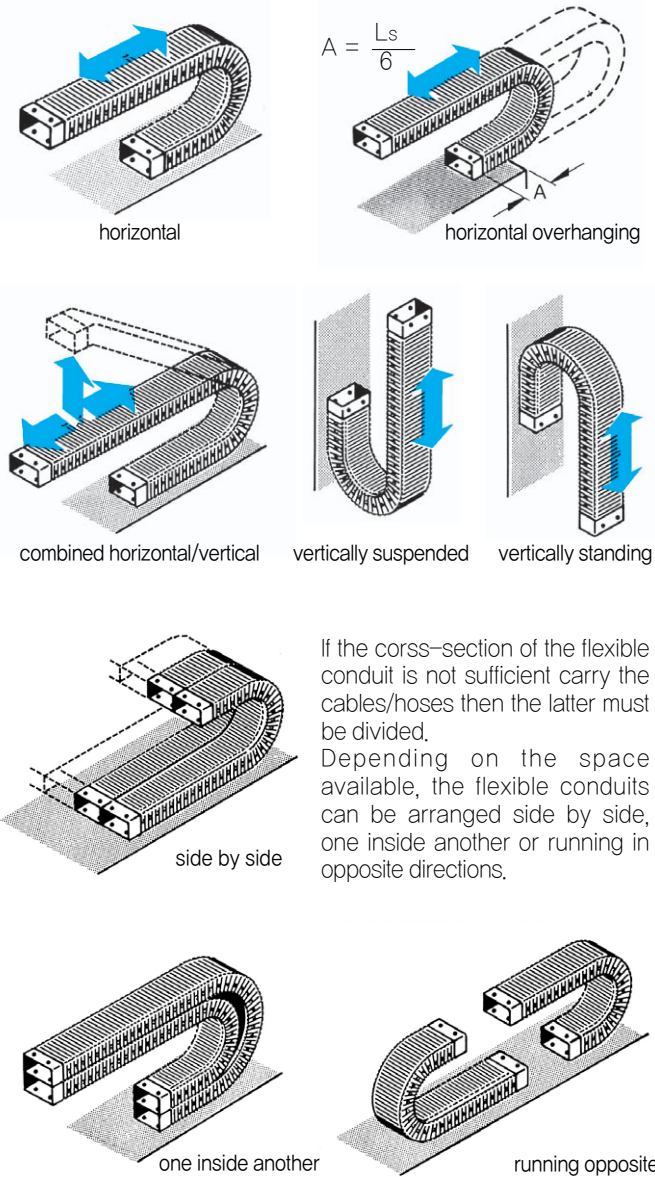- Duct length LK in mm (Without Connetion)
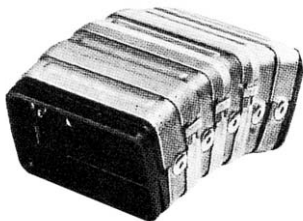- Coupling Type
- Quantity

■ Typical applications

Energy flexible conduit can be used for horizontal, vertical and combined horizontal/vertical movements.

It can easily be applied on moving units.

horizontal

$$A = \frac{L_s}{6}$$

horizontal overhanging

combined horizontal/vertical   vertically suspended   vertically standing

side by side

If the corss–section of the flexible conduit is not sufficient carry the cables/hoses then the latter must be divided.
Depending on the space available, the flexible conduits can be arranged side by side, one inside another or running in opposite directions.

one inside another   running opposite

EM patent No.2001–015
Energy Flexible conduit with protective guards

SHINSUNG type 055, 085 and 115 SCF which are used in applications where there is an accumuation of chippings, can be fitted with protective guards made in stainless steel.
The connecting slots of the plastic frames are protected from dirt by the guards.

Technical data

$$L_f = \frac{L_s}{2} + 5_t$$

Trough   Fixed point   Centre of traverse
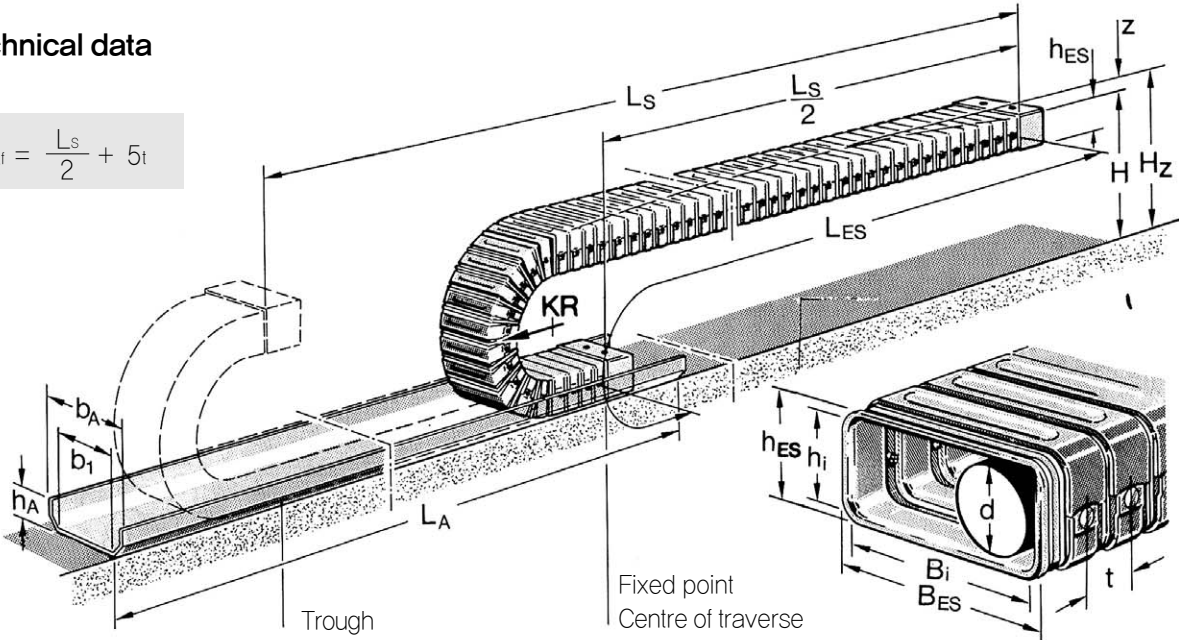
To guarantee optimum operation of the SCF flexible conduit, a clean flat surface should be provided. If this is not possible than a trough is required.

The fixed point should be at the centre of the traverse thereby giving the shortest connection between the fixed point and the moving unit.

• Length of the flexible energy conduit :

$$L_{ES} = \frac{L_s}{2} + L_B$$ based pitch t

• Length af trough :

$$L_A = \frac{L_s}{2} + Z_A$$

Plate thickness : 1.5mm
Max. setion length : 3000mm

• Connection height :

$$H = 2KR_{max} + h_{ES}$$ KR_{max} = nom.KR · 1.10

• Connection height :

$$H_z = H + Z$$

(clear height required)
Pre–tension Z = 30mm

■ Table of Dimensions

We reserve the right to make technical alterations!

SCF Type		055	060	085				115			120		175	
Overall width B$_{ES}$	mm	62	60	92				123			127		190	
Overall height h$_{ES}$	mm	38	52	52				67			86		94	
Overall width B$_i$	mm	45	36	73				102			100		162	
Inside height h$_i$	mm	25	40	38				52			70		72	
max. cable/hose Φd $_{max}$	mm	20	32	34				47			64		65	
Conduit pitch t	mm	20	20	20				25			25		30	
Bending radius KR	mm	65	100	150	100	100	150	200	250	140	225	300	155	200	185	250	350
Curve dimension L$_3$	mm	405	515	675	515	515	675	830	985	690	960	1200	740	880	830	1035	1400
Connection height H	mm	181	258	368	272	272	382	492	602	375	562	727	427	526	501	644	864
Permissible self–supporting conduit length L$_f$	mm	1,2...1,5		1,5...2,0				2,0...2,5			2,0...3,0				
				Dependent on additional load										
Weight	kg/m	1,25	1,6	1,9				2,6			3,8		5,2	
Trough Dimensions	Z$_A$ mm	230	265	315	270	300	350	390	450	385	475	545	410	455	485	550	650
	b$_1$ mm	65	65	100				135			135		200	
	b$_A$ mm	80	80	115				150			150		215	
	h$_A$ mm	20	20	20				20			20		20	

When constructing the SCF conduit, please note the "Guidelines for laying cables/hoses in flexible conduit"
SCF flexible conduit can be used for horizontal installations without extra fittings wihin the range of permissible unsupported lengths.
If these are exceeded or for other types of installation, please consult our Engineering Department.

246 · SHINSUNG ELECTRIC CO,, LTD,

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SCF Energy Conduits

SHINFLEX®

■ Connector Dimensions for SCF flexible Conduit

Diagonal Connectors
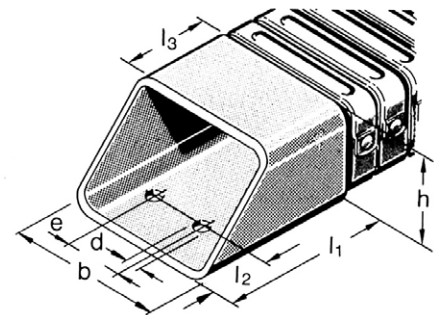
Diagonal Connectors

Type	b	h	e	d	l_1	l_2	l_3
SCF-055	55	36	22	6.5	44	12.5	20
SCF-060	55	52	22	6.5	44	12.5	20
SCF-085	85	50	50	6.5	70	15.0	32
SCF-115	117	66	70	8.5	84	17.5	34
SCF-120	120	84	70	8.5	82	17.5	48
SCF-175	182	92	100	10.5	100	22.5	45

1 Screw-on surface outside/outside

2 Screw-on surface inside/outside
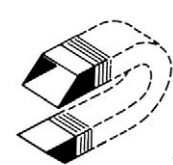
3 Screw-on surface inside/inside

Applications with diagonal connectors

The connectors can be combined and, if necessary, can be changed at a later stage. Type of connection required should be given when ordering!

Standard Connector
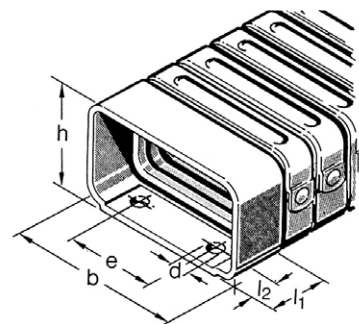
standard Couplings

Type	b	h	e	d	l_1	l_2
SCF-055	55	36	22	6.5	20	8.5
SCF-060	55.5	50	22	6.5	20	10.0
SCF-085	85	52	50	6.5	25	10.0
SCF-115	116	68	65 – 70	8.5	35	10.0
SCF-120	120	84	70	8.5	35	12.5
SCF-175	182	92	100	10.5	40	15.0

Cross flange Conector
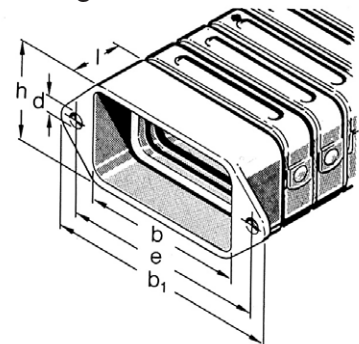
Cross Couplings

Type	b	h	b_1	e	d	l
SCF-055	55	35	90	75	6.5	20
SCF-060	52	52	90	76	6.5	18
SCF-085	85	50	120	105	6.5	25
SCF-115	110	64	160	140	8.5	35
SCF-120	120	92	160	140	8.5	35
SCF-175	182	90	226	200	10.5	40

High flange Connector
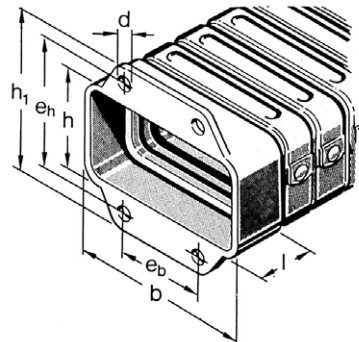
High Couplings

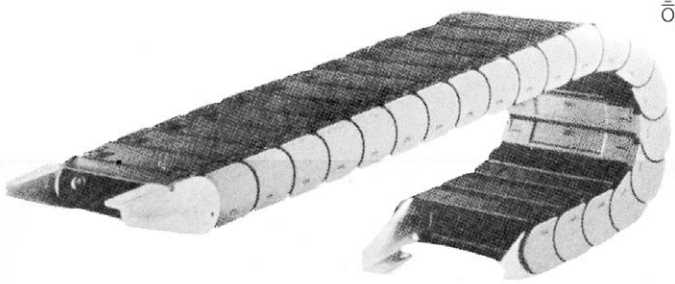| Type	b	h	h_1	e_b	e_h	d	l
SCF-055	55	35	70	18	55	6.5	20
SCF-060	55	50	85	18	68	6.5	18
SCF-085	85	50	85	45	70	6.5	25
SCF-115	116	64	110	60	90	8.5	35
SCF-120	120	82	123	70	103	8.5	35
SCF-175	182	90	136	95	110	10.5	40

SKC Chain

MAJOR USE

Applied to Machine tool, industrial machine, all kinds of plant works, motor industry, assembled machine and robot, etc.

SKC Cable Chain Glass Fiber

■ TYPE SKC

SHINSUNG SKC in installed for machine manufacturing, plant works, motor industry, assembly machine, robot and other field done with openable crossbar(bolt), it is fully closed up, so it protects connected electric wire, from becoming dirty and popplued, as in the past.
Openble crossbar helps electric wire to be easily inserted and exchanged and even help the connected electric wires be installed without disjointing.
Electric wire protective Conduit, G. Flex can be installed to the direction that horizontal dir ection and horizon & vertical are combined.
With respect to movable distance, preliminary knowledge on structure in case of installing a almost not necessary.

Special features
- To protect connected electric wire from being polluted,
- To protect electric wire from being easily damaged,
- With Ablage to protect crossbar, the life span of E/W is high,
- Good appearance,
- High stability
- Easy to control
- Stable against corrosion and chemicals,
- Simple installing-connected with nut.
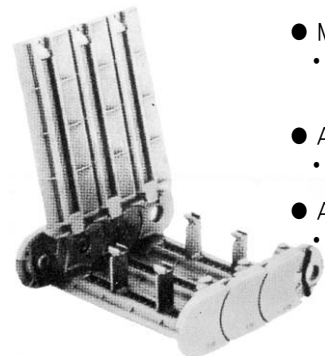
- ● Materials of duct parts
  - Ks-P strengthens glass fibre, and standard color basic is black.
- ● Allowable scope of temperature
  - -10~+80℃
- ● Allowable speed of transportation
  - 120.m/min when arranged without support 80m/min when arranged with supprot

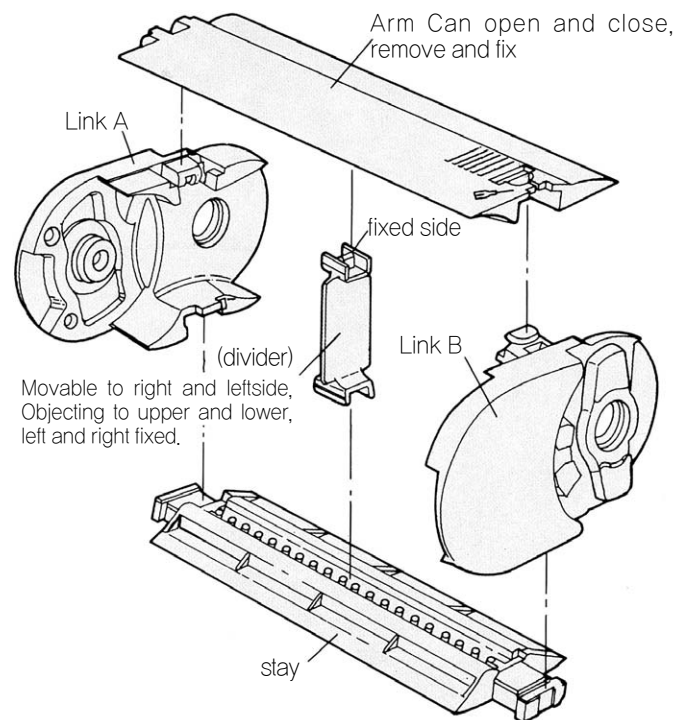Following instructions(matters) are required, to supply technique fully.

- To connect, pcs of E/W and outer dia to come next.
- All cable E/W and weight fo Conduit including contents of Conduit
- Minimum allowable curvature of radius of E/W (by order-giver's instruction)
- Movable distance
- Speed of transportation
- Max. acceleration delay
- Frequent moving
- Wide installing at option
- Transformation of equipment/transformation of connection equipment chart
- Influence of circumerence(temperature, air humidity, etc)
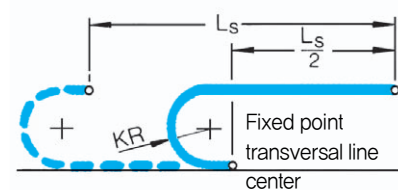
■ Structure

This constituted with Five parts such as ARM, Link(A), Link(B), Stay, Divider. It can easily assembled without separate tool. ARM can be easily opened in the indicated place with a dirver using the principle of lever.

Outer crossbar of open able arm connection
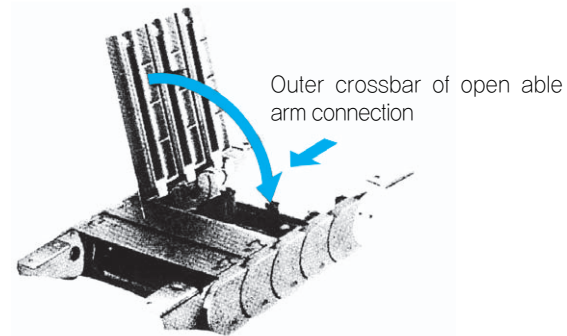
Divider used for separation(decomposition) of E/W can be movable, or can be fixed or assembled by simple replacing.

Arm Can open and close, remove and fix
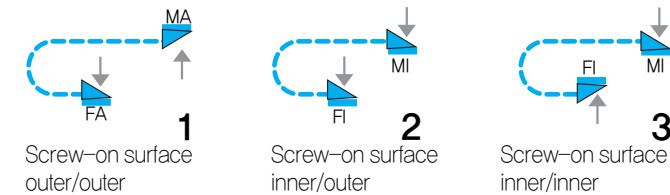
Link A

fixed side

(divider)
Movable to right and leftside, Objecting to upper and lower, left and right fixed.

Link B

stay

■ Duct Connection

L_s

$\frac{L_s}{2}$

KR

Fixed point transversal line center

For vertex connection, it should be done in the center of move-route.
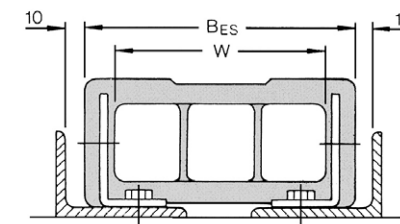By arranging such way, the vertex and moving transfer distance are connected to the shortest, so the length of duct and length of E/W also becomes the most economical.
Connection can be done by connection coupling made with thin steel plate.
In coupling, the edge is pressed into the hole of side-joining plate with outer blot, and in the vertex, it is pushed in the part of hole.
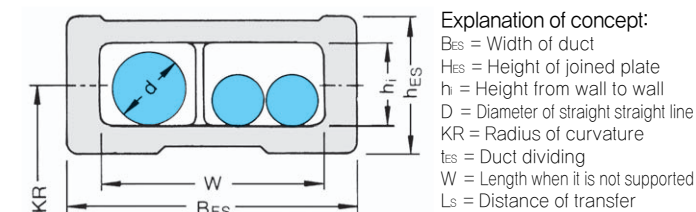
1
Screw-on surface outer/outer

2
Screw-on surface inner/outer

3
Screw-on surface inner/inner

■ Connected transformation
※ Connected type desired can be directed when or der is place

10   B_{ES} 10
W

■ TYPE SKC

Explanation of concept:
B_{ES} = Width of duct
H_{ES} = Height of joined plate
h = Height from wall to wall
D = Diameter of straight straight line
KR = Radius of curvature
t_{ES} = Duct dividing
W = Length when it is not supported
L_s = Distance of transfer

h_i h_{ES} KR d W B_{ES}
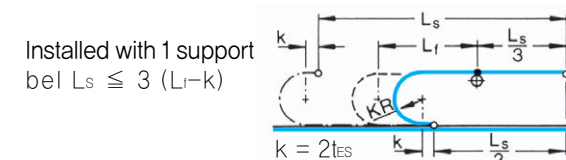
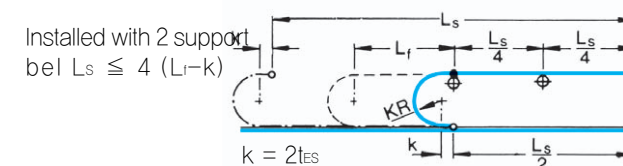- Be sure to preserve change of technipue
- Length when it is not supported depends on added weight
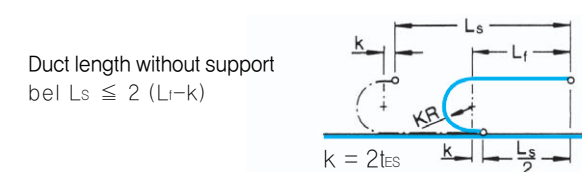
Duct length without support
bel $L_s \leqq 2\,(L_I-k)$
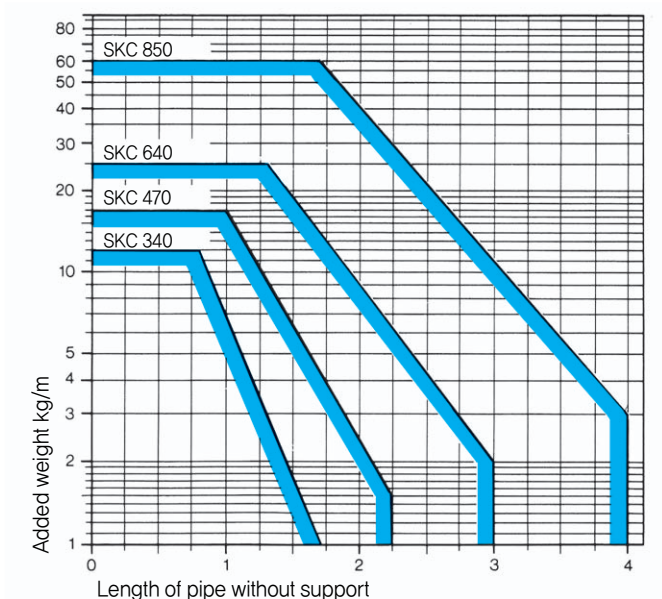
$k = 2t_{ES}$

Installed with 1 support
bel $L_s \leqq 3\,(L_I-k)$

$k = 2t_{ES}$

Installed with 2 support
bel $L_s \leqq 4\,(L_I-k)$

$k = 2t_{ES}$

Type	Radius of Curvature	duct size							WEIGHT in kg/m
		t_{ES}	h_{es}	h_i	d_{max}	B_{ES}	W		
SKC 340	70 100 150	34	40	25	22	70	50		1.5
						150	130		2.1
SKC 470	100 150 200 250	47	55	36	32	106	80		2.5
						186	160		3.5
SKC 640	135 200 250 300	64	75	50	44	140	110		4.0
						250	220		5.0
SKC 850	180	85	100	68	60	186	150		5.7
	250					236	200		6.5
	350					336	300		8.0

Principle to install Cable Duct

- Be sure to check if single cross section for connected E/W is enough or not.
- 100% of duct cross section should be existed as vacant space.
- If cross section of E/W protective duct is not enough in connection E/W, cable and duct should be dismantled totally.
- Be sure to confirm if the radius of curvature allowed by E/W a-cording to order-giver's instruction is smaller than radius of curved line of same as it.
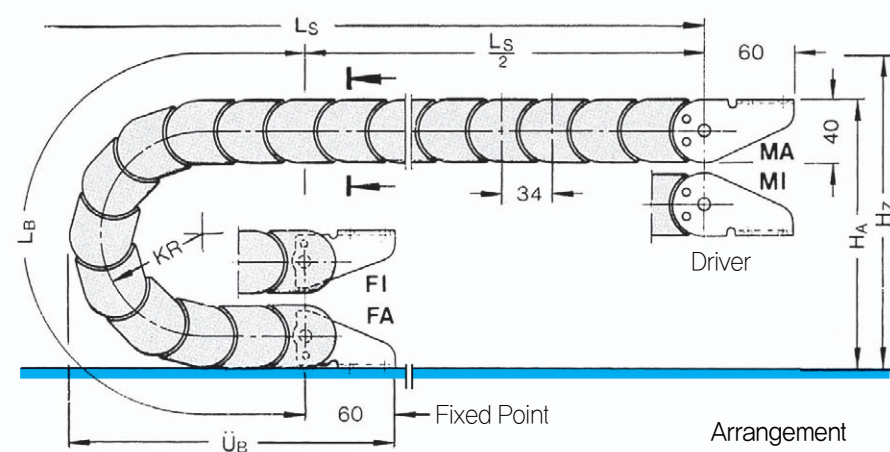- Please inspet if duct loading by loading chart of duct is within per-mitted elicacy.

SKC 850
SKC 640
SKC 470
SKC 340

Added weight kg/m

Length of pipe without support

■ How to indicate when ordered.
- Please fill out the following items.

SKC 340-KR 100-W 130-2, 000L-MA/FA-30EA : 2Sets

Duct Type
Bending radius
Duct width
Length(mm)
Type of coupling
Quantity of divider
Quantity

250 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **251**

TYPE : SKC - 340

Arrangement

Connected transformation(body) :

- Coupling connecting MA = Outside nut fixing side(standard)
- Coupling connecting MI = Inside nut fixing side(standard)
- Vertex connecting F1 = Inside nut fixing side

Explanation of concept :

- L_B : Length of bending Line
- U_B : Projecting part
- H_A : Height of connection
- H_Z : Height of extra path required

Forming dimension changed depends on radius of bending

KR	L_B	$Ü_B$	H_A	$H_{z\ min}$
70	356	218	210	280
100	450	248	270	340
150	607	298	370	440

Cable Duct Length $L_{ES} = \dfrac{L_S}{2} + L_B$ Becomes round at 34mm part

■ Duct–Cross section

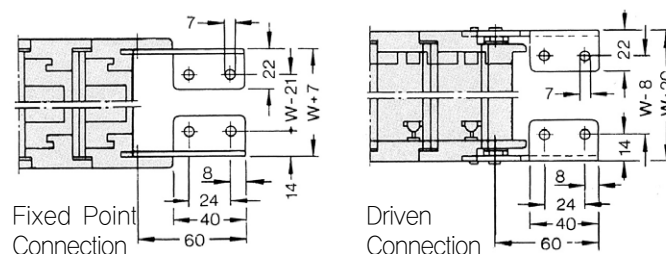Electric Wire – Ø dmx = 22mm
$a_{0\ min}$ = 20mm

Divider inside the width, it is fixed to height of 5mm or is arranged in a movable state without layer by replacing. Nos of divider cross section can be instructed upon ordering. Divider is installed generally each 4th duct piece part.
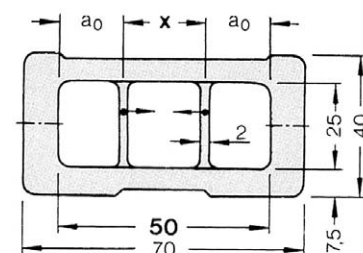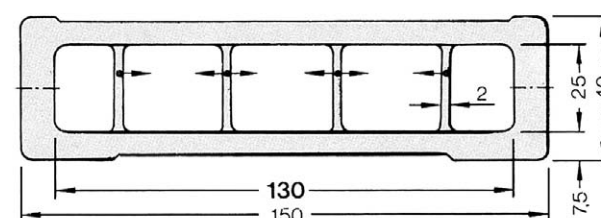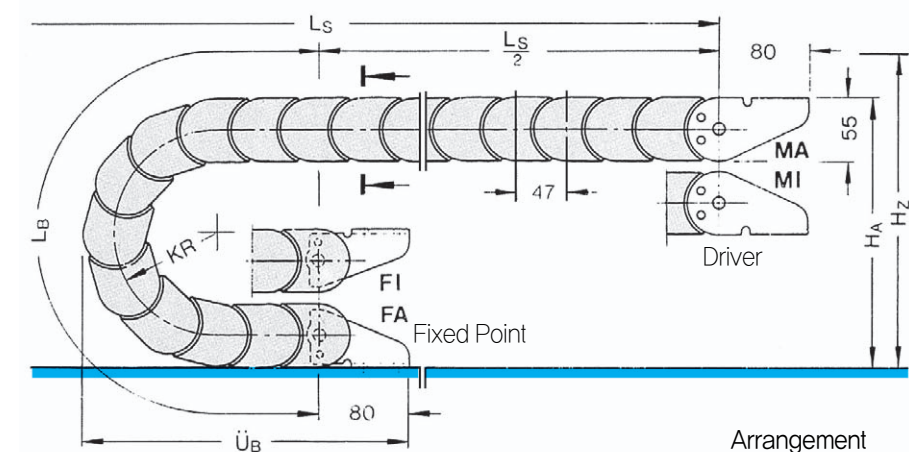

SKC 340 – W 50

■ Connecting Measurement

Fixed Point Connection   Driven Connection

SKC 340 – W 130

※ Type of connection desired can be instructed upon ordering.

TYPE:SKC - 470

Arrangement

Connected transformation(body) :

- Coupling connecting MA = Outside nut fixing side(standard)
- Coupling connecting MI=Inside nut fixing side(standard)
- Vertex connecting F1=Inside nut fixing side

Explanation of concept :

- L_B : Length of bending Line
- U_B : Projecting part
- H_A : Height of connection
- H_Z : Height of extra path required

Forming dimension changed depends on radius of bending

KR	L_B	$Ü_B$	H_A	$H_{z\ min}$
100	502	302	285	355
150	660	352	385	455
200	816	402	485	555
250	973	452	585	655

Cable Duct Length $L_{ES} = \dfrac{L_S}{2} + L_B$ Duct pitch is based on 47mm

■ Duct–Cross section
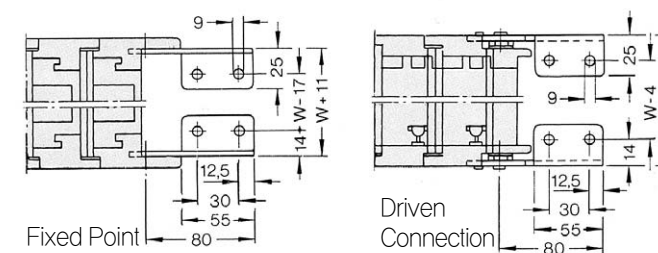
Electric Wire – Ø dmx = 32mm
$a_{0\ min}$ = 22.5mm

Divider inside the width, it is fixed to height of 5mm or is arranged in a movable state without layer by replacing. Nos of divider cross section can be instructed upon ordering. Divider is installed generally each 4th duct piece part.
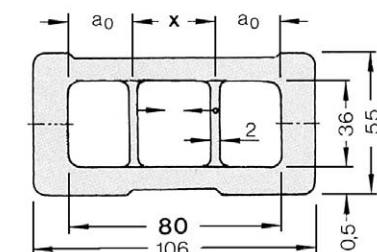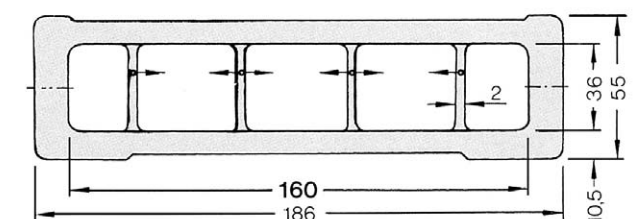

SKC 470 – W 80

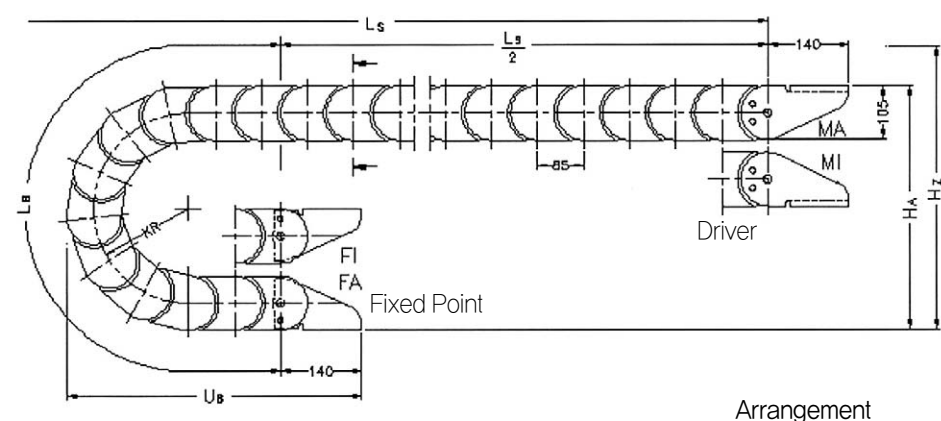### ■ Connecting Measurement

Fixed Point   Driven Connection

SKC 470 – W 160

※ Type of connection desired can be instructed upon ordering.

252 · SHINSUNG ELECTRIC CO,, LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **253**

SKC Chain

TYPE : SKC - 640

Driver

MA
MI

Fixed Point
FI
FA

Arrangement

Connected transformation(body) :

• Coupling connecting MA = Outside nut fixing side(standard)
• Coupling connecting MI = Inside nut fixing side(standard)
• Vertex connecting F1 = Inside nut fixing side

Explanation of concept :

• L_B : Length of bending Line
• U_B : Projecting part
• H_A : Height of connection
• H_Z : Height of extra path required

Forming dimension changed depends on radius of bending

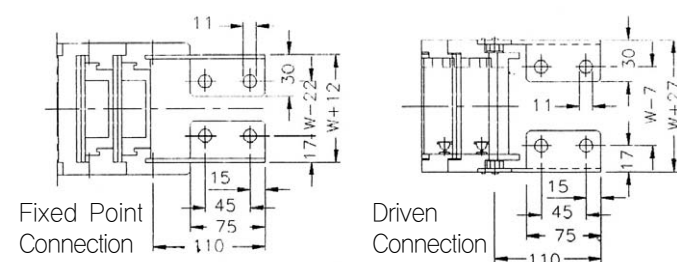| KR	L_B	U_B	H_A	H_Z min
135	680	413	378	448
200	885	478	508	578
250	1042	528	608	678
300	1200	578	708	778

Cable Duct Length $$L_{ES} = \frac{L_S}{2} + L_B$$ Duct Pitch is based on 64mm
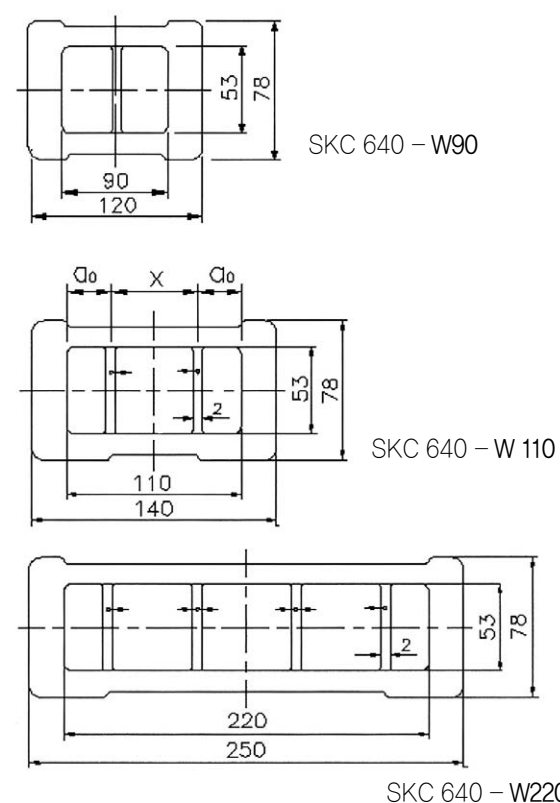
■ Duct–Cross section

Electric Wire – Ø dmx = 47mm
a_0 min = 30mm

Divider inside the width, it is fixed to height of 5mm or is arranged in a mov able state without layer by replacing. Nos of divider cross section can be instructed upon or dering. Divider is installed generally each 4th duct piece part.
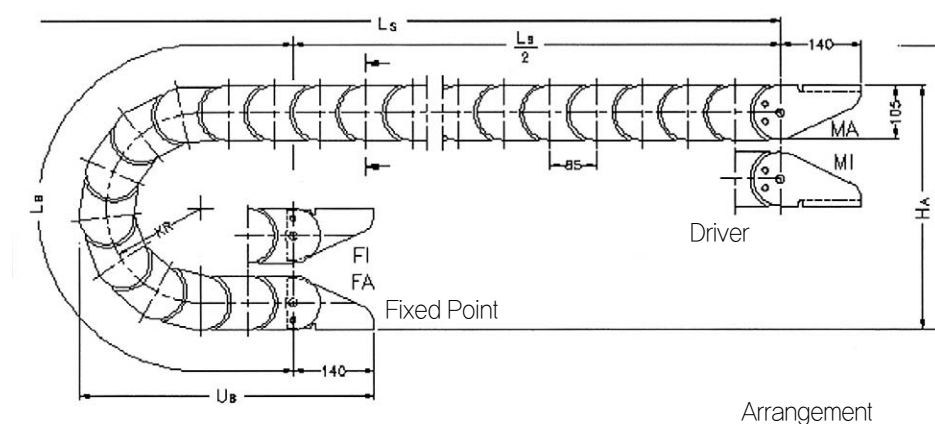
■ Connecting Measurement

Fixed Point Connection

Driven Connection

※ Type of connection desired can be instructed upon ordering.

SKC 640 – W90

SKC 640 – W 110

SKC 640 – W220

TYPE : SKC - 850

Driver

MA
MI

Fixed Point
FI
FA

Arrangement

Connected transformation(body) :

• Coupling connecting MA = Outside nut fixing side(standard)
• Coupling connecting MI =I nside nut fixing side(standard)
• Vertex connecting F1 = Inside nut fixing side

Explanation of concept :

• L_B : Length of bending Line
• U_B : Projecting part
• H_A : Height of connection
• H_Z : Height of extra path required

Forming dimension changed depends on radius of bending

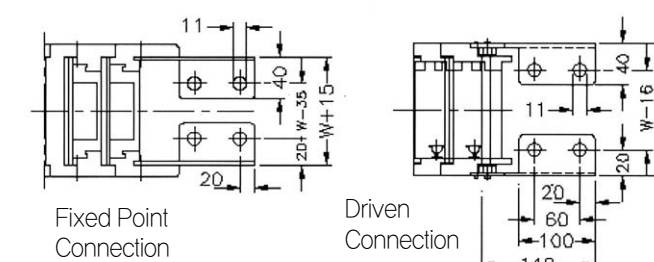| KR	L_B	U_B	H_A	H_Z min
180	906	542	495	565
250	1126	612	635	705
350	1440	712	835	905

Cable Duct Lengt $$L_{ES} = \frac{L_S}{2} + L_B$$ Duct Pitch is based on 85mm
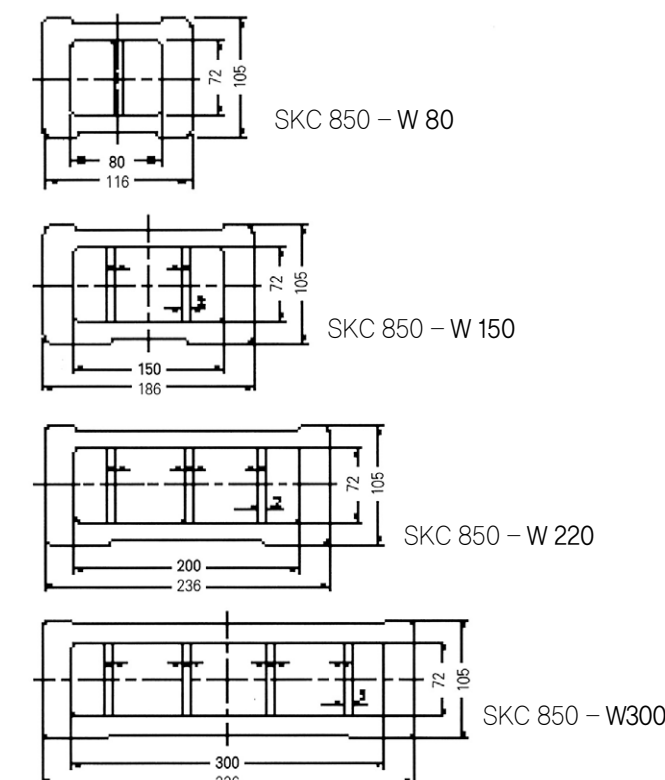
■ Duct–Cross section

Electric Wire – Ø dmx = 64mm
a_0 min = 44mm

Divider inside the width, it is fixed to height of 5mm or is arranged in a mov able state without layer by replacing. Nos of divider cross section can be instructed upon or dering. Divider is installed generally each 4th duct piece part.

■ Connecting Measurement

Fixed Point Connection

Driven Connection

※ Type of connection desired can be instructed upon ordering.

SKC 850 – W 80

SKC 850 – W 150

SKC 850 – W 220

SKC 850 – W300

SHINFLEX®
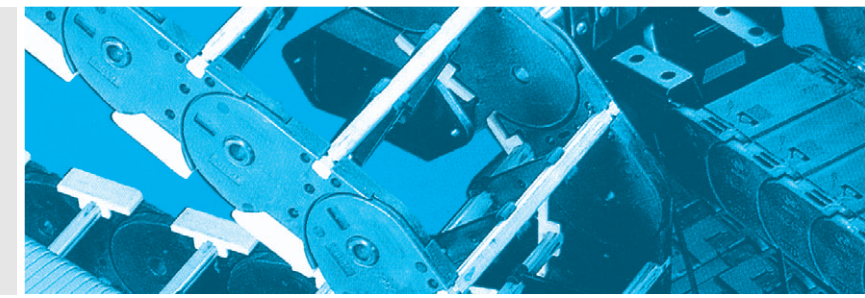
SHINSUNG
Ball Screw Covers

Mojor use
Machine tools, industrial machine, Wood working machine, Robot, all Kinds of plant and ball screw and cylinder protection of automation machine.

Centry Covers Protect...

■ Operating Personnel ■Machine ■Machine Productivity

Centry Covers protect skilled operating personnel form exposure to machiney hazards, reduce operating housekeeping, guard the accuracy of precision equipmentand eliminate potential for damaged machinery and costly downtime.

Easily installed, Centry Covers automatically expand to protect precision equipmentand controlling sufaces form the debris, chips and contaminants often found in the working environment.

Available in a variety of resilient metals including corrosion resistant materals, Centry Covers are manu-factured in a complete range of sizes to meet any OEM specification.
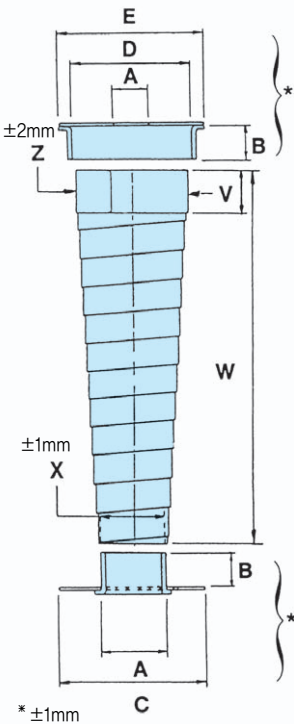Centry Covers are made to specific sizes and must be used as such, without modification.

They are made as integral units and cannot be cut to length, as coil springs might.

Unless otherwise specified, Centry Covers are constructed for the large
end to travel and must be allowed to rotate
freely during operation.

Standard Centry covers are con-structed for over end shaft installation. Special open wound Centry Covers are available, upon request, for installation, without dismantling of equipment.

Use the Metric or Imperial sections below.
Determine your size require-ments, then select your part unmber using pages 72 and 73 for metric or page 73 for imperial.

■ METRIC

How to determine size requirements...

Cover
X   Inside Diameter = shaft 0+8mm
     if no flanges are used. X = shaft ∅ + 4mm min.
W   Extended Length = max. exposed length of shaft s
V   Comperessed Length = min. exposed length of shaft
Y   Stroke = W–v
Z   Outside Diameter = max.allowable area
Tolerances : "X" ± 1mm, "Z" ± 2mm

Flanges(required for use over–vertical shafts)
A = X – 4mm
B = V x .75
C = Z
D = Z + 5mm
E = Z + 12mm
F = X – 5mm

■ IMPERIAL

How to determine size requirements...

Cover
X   Inside Diameter = shaft 0+.250
     if no flanges are used. X = shaft ∅ + 4mm min.
W   Extended Length = max. exposed length of shaft
V   Comperessed Length = min. exposed length of shaft
Y   Stroke = W–V
Z   Outside Diameter=max.allowable area
Tolerances : "X"+094 – 000, "Z"+ 000, – 125

Flanges(required for use over–vertical shafts)
A = X – 125
B = V x 75
C = Z
D = Z + 125
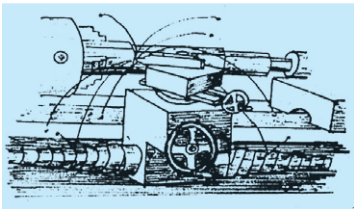E = Z + 375
F = X – 188

Metric Part Number System

CC   **XXX**. **XXXX** . **XXX** **X** **X** **X**

- X = inside Diameter
- W = Extended Length
- V = Compressed Length
- **MATERIALS**
  - A = 1095 Scaleless Blue
  - D = 301 Stainless
  - (Other materials available upon request.)
- **TRAVEL**
  - A = Horizontal/Vertical Large End Travels
  - B = Horizontal/Vertical Small End Travels
  - D = Diagonal Large End Travels
  - E = Diagonal Small End Travels
  - H = Horizontal Only Large End Travels
  - I = Horizontal Only Small End Travels
  - V = Vertical Only Large End Travels
  - W = Vertical Only Small End Travels
- **INSTALLATION/DUTY/OD**
  - E = Over End OD per catalog
  - W = Open Wound OD per catalog
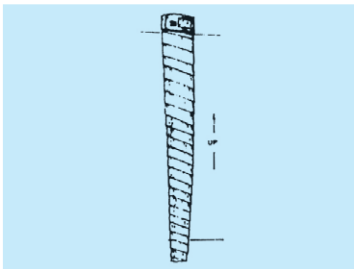 - (light & heavy duty plus various OD's avail)

CC designates helical wound metal Centry Cover.
Consult factory for additional sizes:
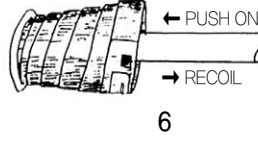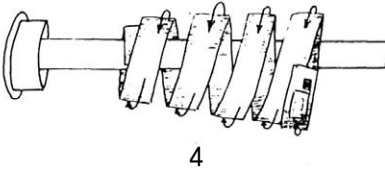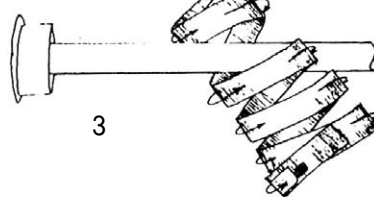materials, extra or light duty or special OD requirements.
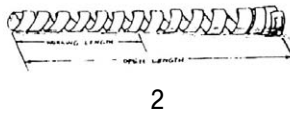
1. OVER END

① Horizental

② Vertical

2. OPEN WOUND
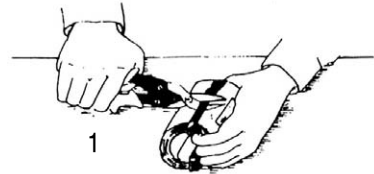
Centry® Covers *Metric Sizes*

PART NO.				PART NO.				PART NO.				PART NO.				PART NO.				PART NO.				PART NO.			
X	W	V	Z	X	W	V	Z	X	W	V	Z	X	W	V	Z	X	W	V	Z	X	W	V	Z	X	W	V	Z
010	0100	013	17	030	0350	050	55	040	0450	060	56	050	0250	050	62	055	0750	075	83	060	1000	100	89	065	1700	120	105
013	0050	013	19		0750		57		0550		60		0300		71		0900		90		1100		92		1900		111
	0100		23	030	0900	060	61		0650		64		0350		66		1100		94		1200		96		2100		116
017	0350	025	28	030	1000	075	59		0750		66		0450		70						1300		100		2300		120
									0900		65		0550		74	055	0900	100	84		1400		102		2500		124
020	0150	020	28	032	0100	020	49	040	0650	075	63	050	0400	060	52		1100		86		1500		104		2800		128
	0200		30		0150		55		0750		66		0600		72		1200		89		1800		106				
	0250		33	032	0350	035	53		0900		72		0750		78		1300		90					065	2000	150	109
	0300		36	032	0150	060	43		1100		78						1500		96	060	1700	120	103		2400		120
									1300		82	050	0330	075	58		1700		96		1900		108		2800		136
020	0300	030	37	035	0150	030	46		1500		90		0750		78		1800		98		2100		113		3000		142
	0400		45	035	0350	035	52	040	1000	100	67		0900		84		1900		100		2300		117		3500		138
					0450		54		1200		70		1100		87		2000		103		2500		121				
022	0100	020	31	035	0750	075	55		1500		74		1200		88		2100		100		2800		126	065	3000	200	131
					0850		58		1800		82						2300		112						3300		138
025	0100	020	35		0900		58	040	1800	120	82	050	1000	100	78		2500		113	060	1200	150	93		3500		148
	0150		36		1000		60		2000		86		1200		84		2800		120		2200		109				
	0200		41						2200		90		1350		84		3000		125		2600		116	070	0275	025	93
	0250		41	035	1500	100	63	045	0200	035	55		1500		87						2800		121		0300		94
	0330		44	038	0085	020	42	045	0450	050	65		1800		97	055	2600	150	111		300		126				
				040	0100	020	54		0600		66						2800		116		3500		138	070	0150	030	85
025	0150	025	37					045	0400	060	65	050	1700	120	92		3000		121						0250		90
	0250		42	040	0150	030	52		0600		68		1900		100		3500		126	060	3250	200	130				
					0250		58		0750		71		2100		103						3500		137	070	0250	050	88
025	0400	030	43		0350		58	045	0800	075	78		2300		104	055	2500	200	119		3750		158		0350		91
	0500		49		0500		69		0900		68		2500		109		3250		128						0450		94
	0650		58						1200		84		2800		116		3500		135	065	0150	030	81				
				040	0250	050	54	045	1500	100	87						3600		119		0250		85	070	0550	060	95
025	0330	050	44		0300		56		1800		93	050	2800	150	118										0650		97
	0600		48		0350		55						3000		123	060	0100	020	81	065	0150	030	81		0700		103
	0750		52		0400		56	045	1400	120	82		3600		122						0250		87		0750		105
					0450		58									060	0150	030	75		0500		112				
025	0500	035	49		0550		65	045	0850	150	68	050	1100	200	79		0250		82					070	0750	075	98
					0600		62		1000		69		2700		100					065	0250	050	80		0900		106
025	0750	075	49		0650		67		1250		84		3250		128	060	0250	050	76		0350		85		1100		115
					0700		67		1800		81		3500		134		0350		80		0450		90				
030	0050	013	42		0750		67		1400		87						0500		82					070	0700	100	94
	0150		55		0900		79		2800		103	055	0150	030	68		0750		106	065	0550	060	91		0800		98
					1000		86						0250		75						0600		97		0900		100
030	0100	020	41					050	0150	025	65					060	0550	060	82		0650		94		1000		103
									0250		68	055	0150	035	71		0700		86		0750		97		1100		106
030	0150	030	42										0250		86		0800		89		0900		100		1300		114
	0250		50										0400		77		0900		100						1500		118
	0350		51																	065	0760	075	100		1800		125
												055	0350	050	70	060	0750	075	90		0900		109				
													0450		90		0900		95					070	1500	120	115
													0550		76		1100		102	065	1100	100	95		1800		123
																					1200		100		2000		128
												055	0550	060	76						1300		103		2200		135
													0650		79						1500		109		2400		145
													0750		84						1800		119		2800		155
													0760		96												

258 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **259**

Ball Screw Covers

SHINFLEX®

PART NO.			
X	W	V	Z
070	2000	150	130
	2400		142
	2800		155
	3000		161
070	3250	200	144
	3500		155
070	0150	035	100
	0250		109
075	0250	050	89
	0350		108
	0450		114
075	0550	060	103
	0650		105
	0700		107
	0750		110
075	0600	075	106
	0750		109
	0900		112
075	0900	100	108
	1100		108
	1200		124
	1300		114
	1500		127
	1700		126
075	1500	120	115
	1800		119
	2000		128
	2200		133
075	2000	150	136
	2400		142
	2800		150
	3050		147
075	3250	200	148
	3500		156
080	0050	030	90
	0150		101
	0200		115
080	0250	050	97
	0350		105
	0450		122
	0550		118
080	0450	060	102
	0550		106
	0650		110
080	0550	075	99
	0650		105
	0750		108
	0900		114
080	0900	100	112
	1000		125
	1300		125
	1500		128
080	1300	120	116
	1500		120
	2000		134
	2200		138
	2400		142
080	2000	150	140
	2400		146
	2800		154
	4000		165
080	3000	200	154
	3250		160
	3500		163

PART NO.			
X	W	V	Z
085	0530	060	131
085	0750	100	107
	1050		125
090	0700	020	112
090	0150	025	112
090	0200	035	115
090	0150	050	112
	0250		109
	0350		112
090	0350	060	115
	0450		120
090	0450	075	119
	0550		120
	0650		125
	0750		130
090	0600	100	123
	0750		117
	0900		119
	1000		123
	1100		126
	1200		125
	1300		132
	1800		162
	2000		174
090	1300	120	125
	1500		130
	1800		138
	2000		144
090	1000	150	122
	1300		119
	1500		131
	2000		135
	2300		154
	2400		156
	2800		162
	3000		166

PART NO.			
X	W	V	Z
090	2400	200	141
	2700		144
	3000		169
	3250		166
	3500		169
090	2700	250	160
	3000		144
	3500		150
095	1450	200	125
095	4000	250	173
100	0150	050	111
	0400		136
100	0250	075	125
	0350		128
	0450		131
	0600		130
	0800		138
100	0600	100	131
	0900		135
	1000		135
	1370		141
	1500		146
	1800		162
100	1100	120	132
	1300		136
	1650		157
	1800		163
	2400		163
100	1500	150	144
	1800		150
	2000		160
	2500		163
	2900		166
100	2800	200	155
	3000		161
	4000		191
100	3000	250	160

PART NO.			
X	W	V	Z
105	0125	035	131
105	0400	075	128
	0650		135
110	0250	060	131
	0350		135
	0450		139
110	0350	075	132
	0450		137
	0600		144
110	0600	100	130
	0750		135
	0900		140
110	1100	120	140
	1300		151
110	1500	150	152
	1800		157
	2000		160
110	1200	200	146
	2000		144
	2400		158
	2600		167
	2800		171
115	0150	050	131
115	0450	100	144
	0600		150
	0900		157
	1000		165
	1370		179
	1800		195
115	1500	120	157
115	1800	150	166
	2400		176
	3650		211
115	2300	200	169
	3400		192

PART NO.			
X	W	V	Z
115	2200	250	163
	3550		174
120	0250	060	143
	0350		147
	0450		149
120	0350	075	140
	0450		145
	0600		152
120	0650	100	142
	0750		145
	0900		150
120	0900	120	150
	1100		154
	1300		158
	2050		189
120	1300	150	156
	1500		160
	1800		168
	2400		176
120	2200	200	162
	2400		168
	2600		174
125	0250	060	142
125	0350	075	145
125	0450	100	153
	0600		161
	0900		166
	1200		171
125	0700	120	155
	0900		163
125	0700	150	163
	1400		179
	2100		185
125	2100	200	185
125	1200	250	163

PART NO.			
X	W	V	Z
130	0200	050	166
130	2800	200	192
	2900		208
135	0750	100	169
135	0350	120	157
135	1000	150	160
	1250		163
135	1600	200	168
140	0150	075	157
	0250		163
	0500		173
140	0800	100	182
140	2000	150	192
140	2000	200	176
	2800		239
145	0600	075	179
145	1000	100	182
145	0900	150	169
145	1300	200	182
150	0450	100	189
150	1400	200	185
155	0450	100	184
160	0900	100	189
160	1750	150	214
165	0200	050	198
165	0300	075	192
	0500		216

PART NO.			
X	W	V	Z
165	0750	100	228
170	0300	200	201
	1450		211
175	1150	250	218
180	0300	075	223
	0400		227
180	1500	200	227
	2200		270
185	0400	075	228
190	0500	075	246
200	0500	100	239
205	0900	150	252
210	1400	200	265
220	1100	150	316
220	1600	250	300
230	0450	120	249
240	0950	250	296
255	1300	200	331
285	1250	260	341
335	1400	260	408

Consult Your Representative For Additional Sizes To Meet Your Requirements

Centry Covers *Imperial sizes*

Cat. No.	X ins	X mm	W ins	W mm	V ins	V mm	Z ins	Z mm
052	½	12,7	2	50,8	½	12,7	13/16	20,5
054	½	12,7	4	101,6	½	12,7	1	25,4
0756	¾	19,05	6	152,4	¾	19,05	1 3/16	30
0758	¾	19,05	8	203,2	¾	19,05	1 ¼	32
07510	¾	19,05	10	254	¾	19,05	1 3/8	35
14	1	25,4	4	101,6	¾	19,05	1 7/16	36,5
16	1	25,4	6	152,4	¾	19,05	1 ½	38
18	1	25,4	8	203,2	¾	19,05	1 11/16	43
110	1	25,4	10	254	1	25,4	1 ¾	44,5
156	1 1/8	28,575	6	152,4	1 1/8	28,575	1 ¾	44,5
1510	1 1/8	28,575	10	254	1 3/8	28,575	2 1/16	52
1514	1 ¼	31,75	14	355,6	1 3/8	34,925	2 3/16	52
26	1 ½	38,10	6	152,4	1 3/8	28,575	2 1/8	54
210	1 ½	38,10	10	254	1 3/8	34,925	2 ¼	57
214	1 ½	38,10	14	355,6	2	50,8	2 ¼	57
218	1 ½	38,10	18	457,2	2	50,8	2 3/8	60
224	1 ½	38,10	24	609,6	2	50,8	2 ½	63,5
230	1 ½	38,10	30	762	2	50,8	2 5/8	67
256	2 3/16	57,15	6	152,4	1 3/8	34,925	3 1/8	79,5
2510	2 3/16	53,975	10	254	1 3/8	34,925	3 1/8	79,5
2514	2	50,8	14	355,6	2	50,8	2 7/8	73
2518	1 ¾	44,45	18	457,2	2	50,8	2 3/8	67
2524	1 ¾	44,45	24	609,6	2 ½	63,5	2 ¾	70
2530	1 ¾	44,45	30	762	2 ½	63,5	2 7/8	73
2536	1 ¾	44,45	36	914,4	3	76,2	2 ¾	70
2548	1 ¾	44,45	48	1219,2	3	76,2	3 3/8	86
2560	1 ¾	44,45	60	1524	4	101,6	3 ½	89
2572	1 ¾	44,45	72	1828,8	4	101,6	3 ¾	95
36	2 ½	63,5	6	152,4	1 3/8	34,925	3 3/8	86
310	2 ¼	57,15	10	254	1 3/8	34,925	3 3/8	86
314	2 ¼	57,15	14	355,6	2	50,8	3 3/8	86
318	2 ¼	57,15	18	457,2	2	50,8	3 3/8	92
324	2 ¼	57,15	24	609,2	2 ½	63,5	3 ½	95
330	2 ¼	57,15	30	762	2 ½	63,5	3 7/8	98,5
336	2 ¼	57,15	36	914,4	3	76,2	3 5/8	92
348	2 ¼	57,15	48	1219,2	4	101,6	3 9/16	90,5
360	2 ¼	57,15	60	1524	4	101,6	3 7/8	98,5
372	2 ¼	57,15	72	1828,8	4	101,6	4 3/16	106

Cat. No.	X ins	X mm	W ins	W mm	V ins	V mm	Z ins	Z mm
356	3	76,2	6	152,4	13/8	34,925	4	101,5
3510	3	76,2	10	254	13/8	34,925	4 3/8	
3514	3	76,2	14	355,6	2	50,8	4 3/16	109,5
3518	3	76,2	18	457,2	2	50,8	4 3/16	
3524	2 ½	63,5	24	609,6	21/2	63,5	3 13/16	97
3530	2 ½	63,5	30	762	3	76,2	4	
3536	2 ½	63,5	36	914,4	3	76,2	4 3/8	111
3548	2 ½	63,5	48	1219,2	4	101,6	4	
3560	2 ½	63,5	60	1524	4	101,6	4 3/8	111
3572	2 ½	63,5	72	1828,8	4	101,6	4 ¾	
410	3 ½	90	10	254	2	50	4 ½	114,5
414	3 ¼	82,55	14	355,6	2	50,8	4 ½	
424	3	76,2	24	609,6	3	76,2	4 ¾	108
430	3	76,2	30	762	3	76,2	4 3/8	
436	3	76,2	36	914,4	4	101,6	4 3/8	111
448	3	76,2	48	1219,2	4	101,6	5	
460	3	76,2	60	1524	4	101,6	5 1/8	130
4510	3 ½	88,9	10	254	2	50,8	4 3/8	
4518	3 ½	88,9	18	457,2	3	76,2	4 ¾	120,5
4524	3 ½	88,9	24	609,6	4	101,6	4 7/8	
4536	3 ½	88,9	36	914,4	4	101,6	4 ¾	120,5
56	4 ½	114,3	6	152,4	2	50,8	5 ¾	
510	4	101,6	10	254	3	76,2	5	127
514	4	101,6	14	355,6	3	76,2	5 1/8	
518	4	101,6	18	457,2	3	76,2	5 ¼	133
524	4	101,6	24	609,6	4	101,6	5 ¼	
536	4	101,6	36	914,4	4	101,6	5 ¼	137
5510	5	127	10	254	21/2	63,5	5 ¾	
5514	5	127	14	355,6	3	76,2	5 7/8	149
5518	4 ½	114,3	18	457,2	4	101,6	5 ¾	
5524	4 ½	114,3	24	609,6	4	101,6	6	152,5
5536	4 ½	114,3	36	914,4	4	101,6	6 ¼	
66	5 ½	139,7	6	152,4	3	76,2	6 ¼	159
610	5 ½	139,7	10	254	3	76,2	6 ½	
614	5	127	14	355,6	3	76,2	6 7/16	157
618	5	127	18	457,2	4	101,6	6 7/16	
624	5	127	24	609,6	4	101,6	6 ½	165

SHINFLEX®

# Way Wipers

Guide Way Protections
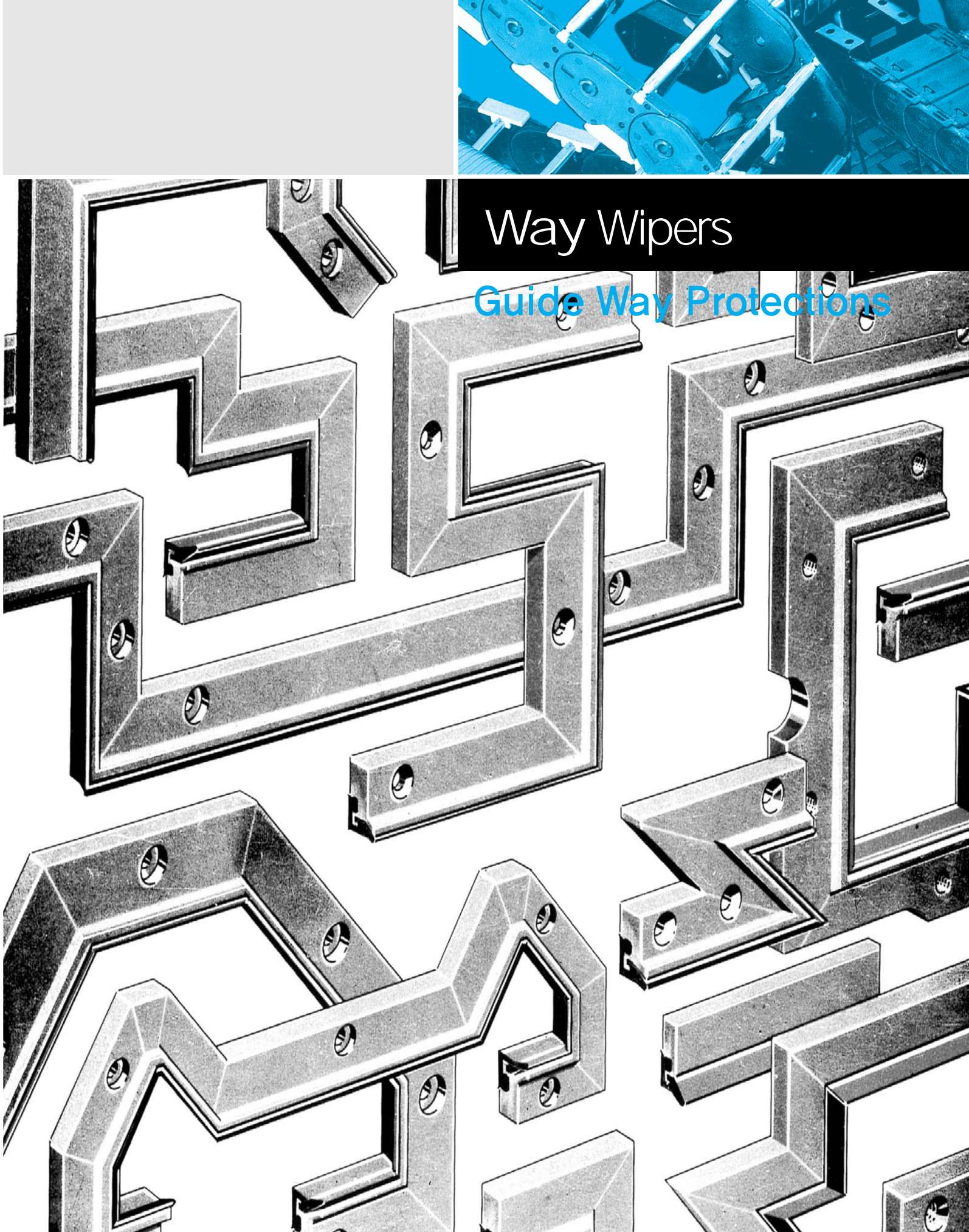
■ Way Wipers

SHINSUNG slideway wipers have been developed in cooperation with the leading machine–tool builders for the protection of slide and guide ways against dirt and for the preservation of machine accuracy.
SHINSUNG slideway wipers meet the high demands of machine builders, both for conventional and hydrostatic lubrication systems.

■ Type Ranges BA and BAS

This wiper range programme offers the following benefits :
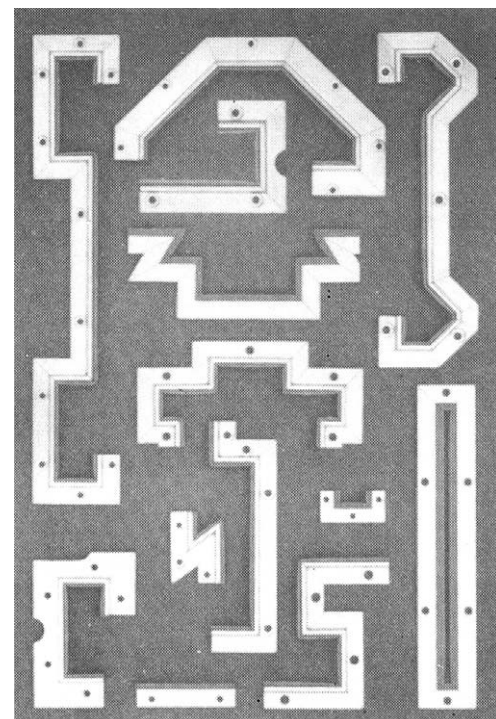
■ Solid aluminium casing
No distortion of the wiper lip on fitting to machine.

■ Varying heights of casing
Can be used to replace all other types on the market.

■ Fixing holes located only in aluminium casing
– No countersunk holes required.
– To fit wipers up to M6 screws are needed.

■ Easily replaceable wiper lip
– Only in case of staight parts.

■ Sealing of the wiper backface
– The special design of the wiper lip has a bead on its backface ensuring a water/oilproof seal between the wiper and machine fitting face.

■ It is possible for customers to make up their own wipers.
■ Fabricated wipers
– Wipers can be made to your drawings.
– For this we need:
  details of max. available space, the precise slideway dimensions, and the positioning of the fixing holes in relation to the slideway.
– Wipers of similar types can be used in combination.
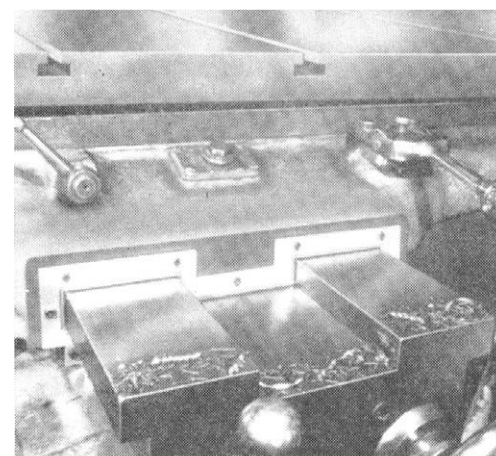
■ Technical data of the wiper lip

• Material : Polyurethane
• Resilient with high abrasion resistance
• Will operate effectively in ambient temperatures of up to+100
• High flexbility in temperatures of up to −40 (No material embrittlement)
• Resistant to oil, grease, emulsions and watery
• Limited resistance to Alkali, Amine, Acid and Petrol
• High hydrolysis resistance as well as outstanding resistance to Oxygen, Ozone und UV rays

■ Fixing Instruction

– A flat surface installation space($\geq$H–$h_{x max}$) is necessary, otherwise and additional fixing plate is required.
– BA type wipers are primarily used for restricted fitting conditions or where a telescopic cover, a folded cover or an amoured apron provides the main protection.

Type Range BA
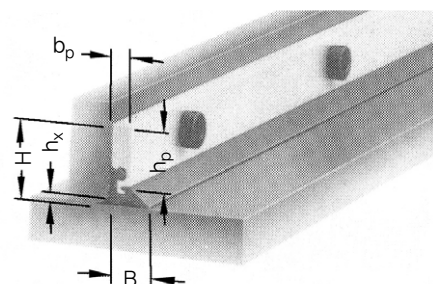
Dimensional Table — Dimensions in mm

Type	Fitted dimension H	h_p	$h_{x max}$	B	b_p
BA 18	17,5	13,0	3,5	7,5	4,5
BA 25	23,5	19,0	3,5	7,5	4,5

Standard length : 1,000mm

Type Range BAS

Dimensional Table — Dimensions in mm

Type	Fitted dimension H	h_p	$h_{x max}$	B	b_p
BAS 18	17,5	11,4	3,5	10	7
BAS 25	23,5	17,4	3,5	10	7
BAS 40	39,5	33,4	3,5	10	7

Standard length : 1,000mm
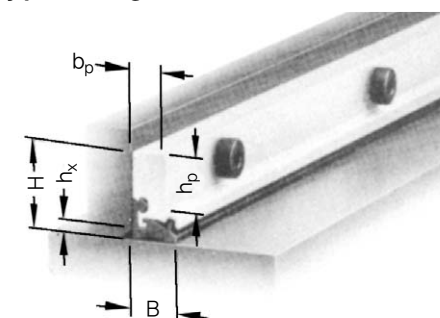
The aluminium casing for the BAS type range incorporates an additional protection of the lip.
These wipers are preferred where direct contact with chips is involved.(Not hot chips)

Pre Wiping
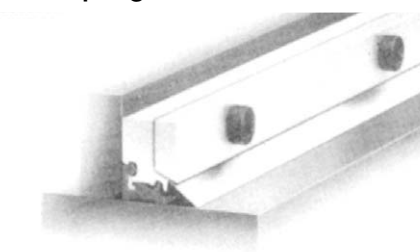
To protect the wiper lip from hot chips and to clean the slideway of rust and solid dirt the wipers must be fitted with an additional flexible protective lip(made from rust free spring steel or CUS alloy).

This protective strip and the associated clamping piece are fitted to the machine by means of the wiper flxing screws.

For straight way wipers with suitable fixing hole arrangements(hole distances $\leq$ 80mm) the clamping piece is not required.

Type Range MA

Various types of fitting
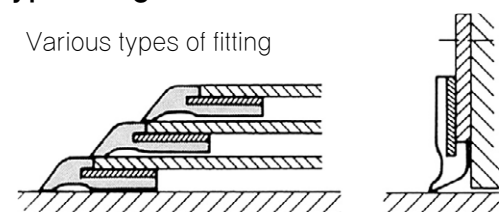
MA type wipers mainly operate square to the slideway on telescopic covers provding a wiping and also a pulling element to open the boxes. Where there is insufficient room for BA/BAS type wipers the MA type can be fitted vertically for use as a slideway wiper.

Steel plate vulcanized with high abraison resistant polyurethane wiper lip.

Resistant against mineral oils and coolants.
Standard length:500mm

Wipers in the MA range with fixing plate can also be made according to your drawings.
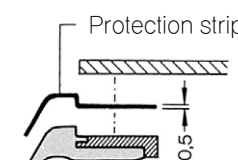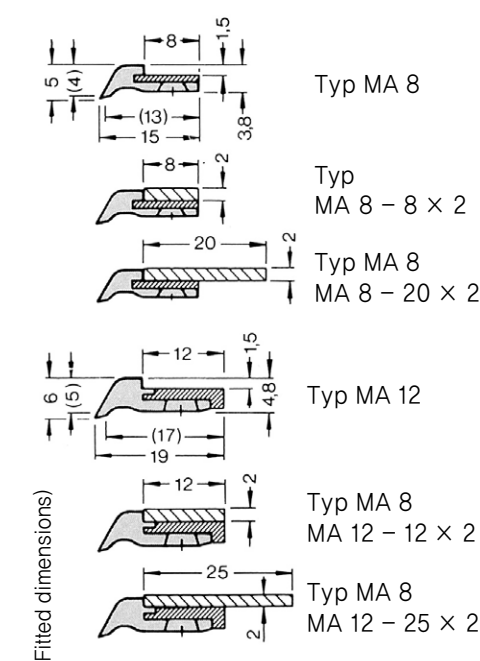
Protection strip

In addition, this wiper can also be protected from hot chips with a stainless steel protection strip, however in this case the wiper can only be fitted square to the slideway!

Specification :

Typ MA 8

Typ MA 8 – 8 × 2

Typ MA 8 MA 8 – 20 × 2

Typ MA 12

Typ MA 8 MA 12 – 12 × 2

Typ MA 8 MA 12 – 25 × 2

(Fitted dimensions)

Pulling Wiper
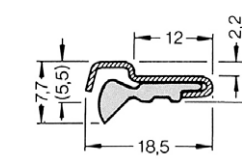
with exchangeable lip
Standard lengths:3000mm(can also be supplied in divisible lengths)
This wiper can only be fitted square to the slideway.

Type MA 12.1

262 · SHINSUNG ELECTRIC CO., LTD.

SHINSUNG **SHINSUNG** Sale Line. Tel.82-51-728-6666 Fax. 82-51-728-5655 · **263**

Way Wipers

■ Type Rnage S

Type S wipers are available as strip material(standard length:3000mm). This range comprises of a metal carrier plate on which is vulcanized a sharp edge wiper lip of highest quality.

● Available Types :
   Type SS − Carrier plate in steel
                 wiper lip made from synthetic rubber
   Type SSH − material as Type SS
   Type SH − carrier plate in brass
                 wiper lip made from synthetic rubber
   Type SHS − material as Type SH, however with bronze
                   protection strip
   Type SG − Carrier plate in brass, wiper lip polyurethane
   Type SGS − material as Type SG, however with bronze
                   protection strip

■ Cast Wipers for Series − production
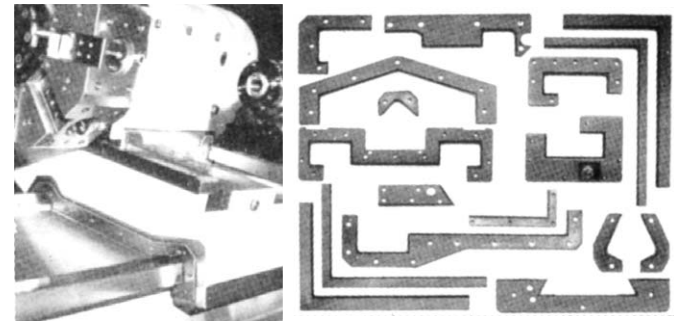
The complete wipers are specially manufactured to your requirements synthetic rubber with a backing plate.
Complicated profilles for series−production can be supplied economically and to tight tolerances.

● Way Wipers cross sections and dimensions

Type SS	Type SSH	Type SH	Type SHS	Type SG	Type SGS

Dimensions in mm

Type	Heights		Heights		T°
	H	h_p	B	b_p	admissible
SS−0	18,0	12,7	5,0	2,0	
SS−4	30,0	23,5	6,0	2,6	120℃
SS−6	40,0	33,4	6,0	2,6	
SSH−0	18,0	−	5,0	5,0	120℃
SSH−3	25,0	−	6,0	6,0	
SH−0	18,0	−	5,0	5,0	120℃
SH−3	25,0	−	6,0	6,0	
SHS−0	18,0	−	10,0	5,2	120℃
SHS−3	25,0	−	10,0	6,2	
SG−0	18,0	−	5,0	5,0	80℃
SG−3	25,0	−	6,0	6,0	
SGS−0	18,0	−	10,0	5,2	80℃
SGS−3	25,0	−	10,0	6,2	
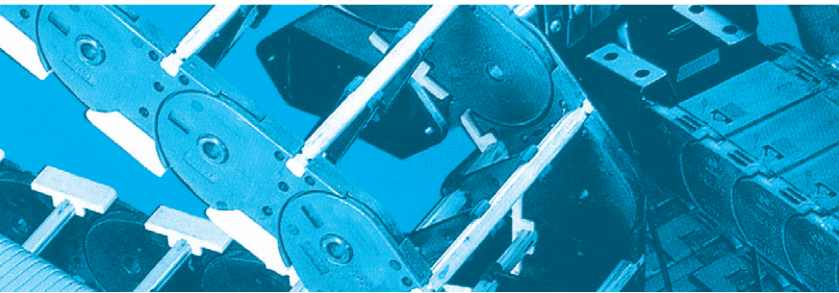
Link Apron Covers

Guide Way Protections
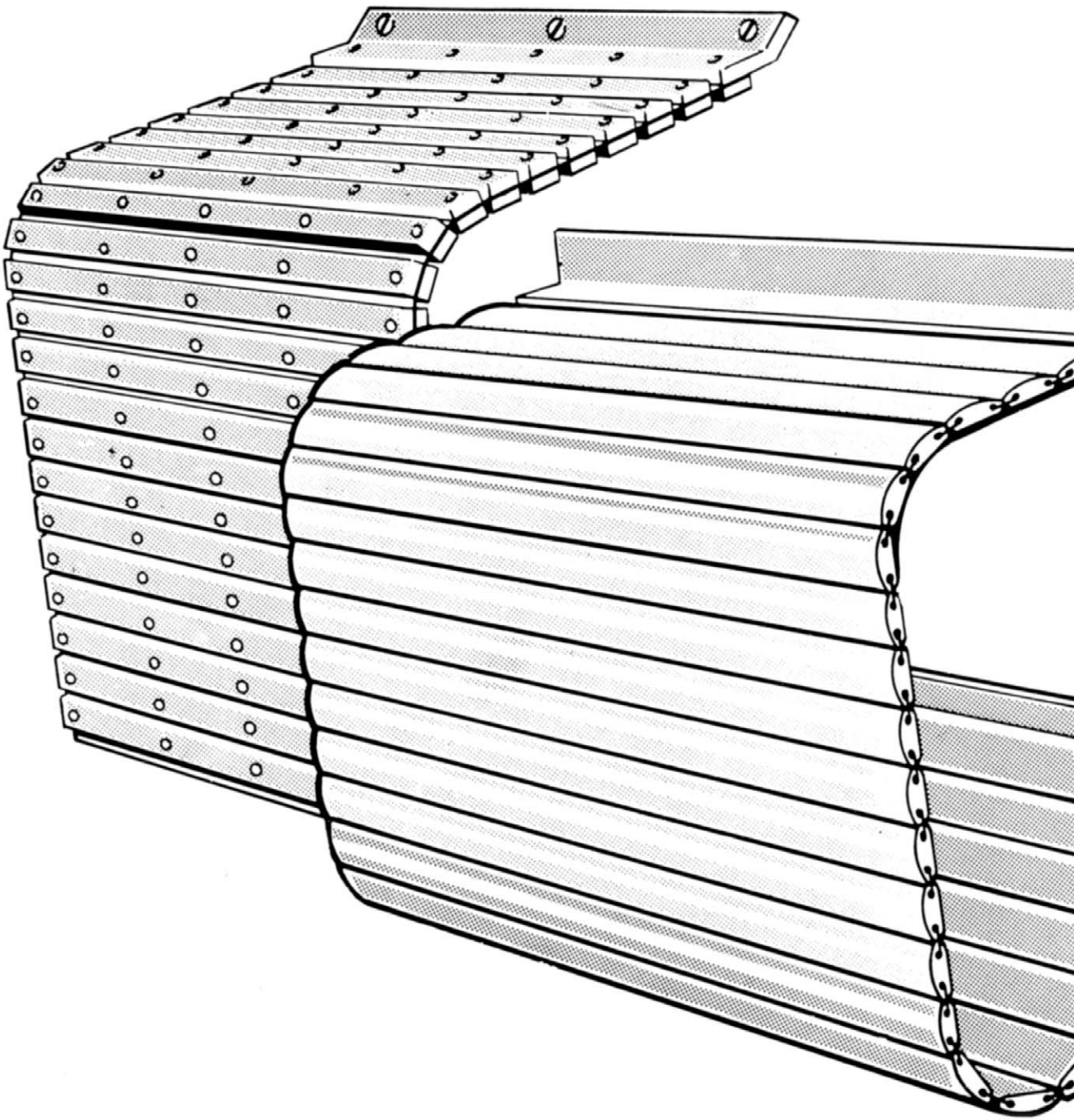
Link Apron Cover

SHINSUNG
aluminium link apron covers
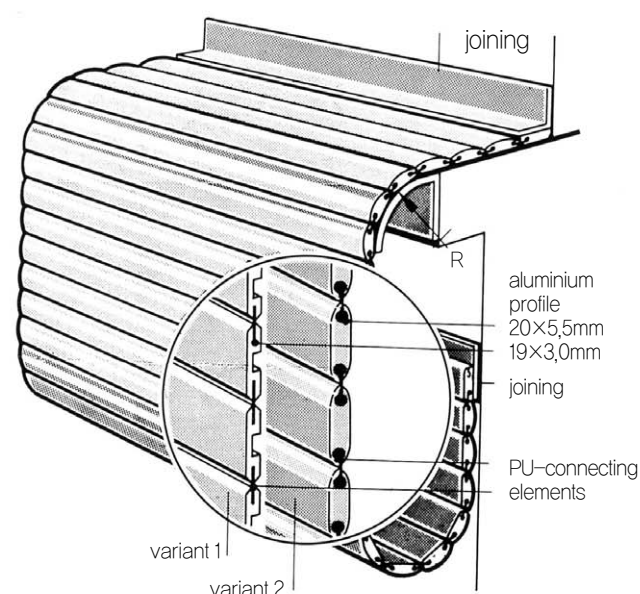
SHINSUNG
steel/steel and steel/brass link apron covers

SHINFLEX®

Telescopic Covers

Guide Way Protections

joining

aluminium
profile
20×5,5mm
19×3,0mm

joining

PU–connecting
elements

variant 1

variant 2

joining

steel/brass profiles
14×2mm

ribbon tissue

steel profiles
14×2mm

thickness ca. 5mm

Telescopic Covers for guideways on a milling machine
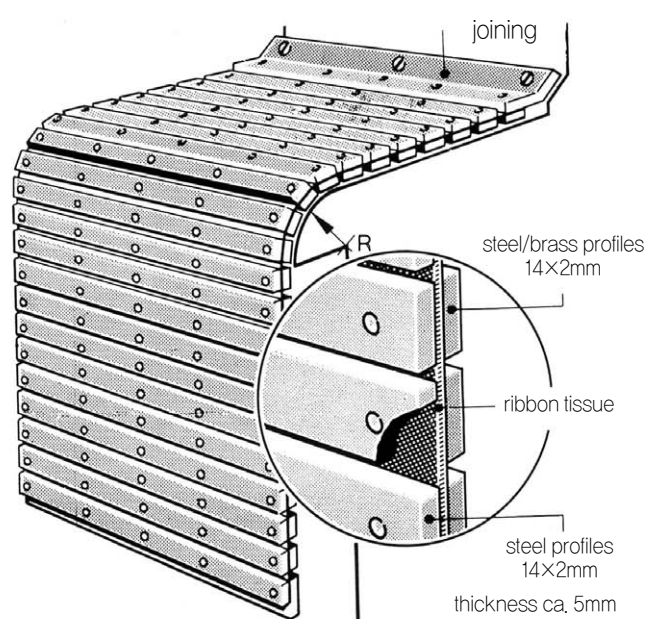
If telescoping covers can't be used for protection of guide ways due to limited mounting possibility, we commend the application of apron covers, which can be executed in accordance with the condition of applications in steel/steel, steel/brass or aluminium segments.
The SHINSUNG apron covers can slide directly on the guide ways and can hang down without extra guide at the end of the guide ways, screwed up or rolled up, if necessary.

■ Advantage of SHINSUNG apron covers:
- small space requirement
- simple mounting
- perfect protection against hot chips and industrial coolants and lubricants
- short delivery time

※The SHINSUNG apron covers proffers additionally the advantage of non corrosion, favourable weight and application with lateral displacement too.

■ Bult–on aluminium apron covers

The aluminium apron covers are made with single segments, which are provided with slits on both side and fitted with appropiate Polyurethan joints. The Polyurethan joints are fitted tightly in the slits of the aluminium segments, becoming to a form–closed unity.

The aluminium apron covers are extremely resisting as the field which might be damaged by hot chips, industrial coolants and lubricants, or other negative influences is reduced to aluminium.

■ Manufacturing Dimensions:

Aluminium apron covers can be manufactured in two variants.
min. roll radius R : variant 1 = 25mm
variant 2 = 50mm
Length/Width : as per customer requirement
Fastening : Standard final segment
Bracket
Flange or
as per customer requirement

■ Bult–on aluminium apron covers

On a high tensile strength coated ribbon tissue are riveted steel/steel, steel/brass flat profiles to a form–closed unity.

A special coating on the upper side of the ribbon tissue allows the application of this apron covers also in the immediate proximity of hot chips.

■ Manufacturing Dimensions:

Aluminium apron covers can be manufactured in two variants.
min. roll radius R : variant 1 = 25mm
variant 2 = 50mm
Lengh/Width : as per customer requirement
Fastening : Standard final segment
Bracket
Flange or
as per customer requirement
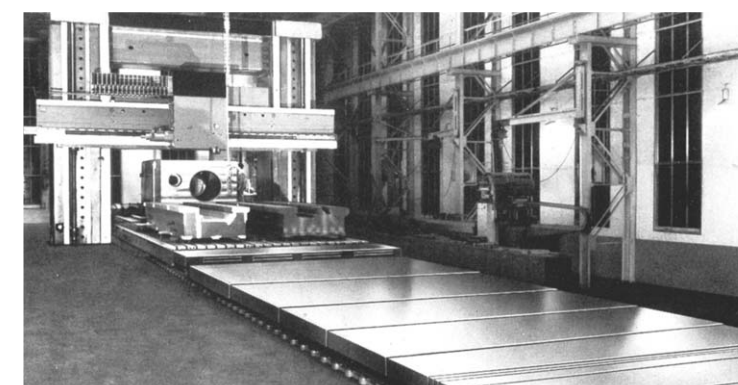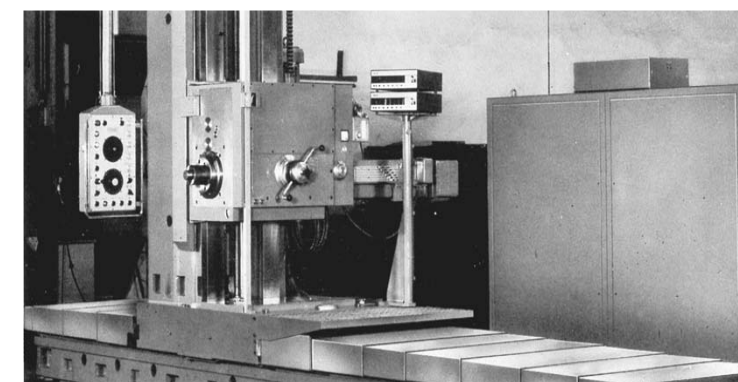
Telescopic Covers for guideways on. plate boring machine
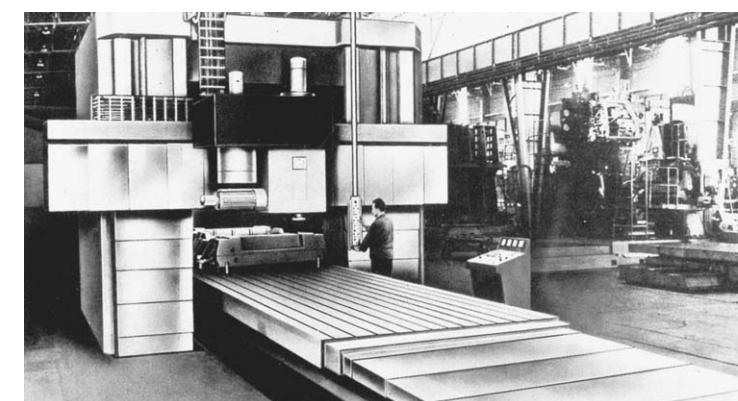
Telescopic Covers for guideways on cross slide and uprights of a milling machine

THE TELESCOPE COVER

The use of the telescope cover has become very important in coping with the rapid increase in technology and automation of the machine tool industry in recent years.

This rapid development requires such things as rational business practices, expanded productivity, and good factory, management. SHINSUNG has for a long time been cooperating with various machine tool makers to improve our products. The telescope cover is a result of this. This telescope cover has, with the use of advanced technology, been produced to conform to many types of machines.

Below is a detailed explanation of the telescope cover.

1. SPECIAL FEATURES :
   We will produce to fit any machine.
2. APPROVED SPEED : We produce on the premise of 10m to 12m.
   If you need to go over this, we will consult with you directly.
3. MATERIALS :
   We produce in both iron and stainless steel.
4. FINISHED SURFACE : Buff, black finish and zinc plating.

■ Below are the different shapes of the telescope cover.

① ②
③ ④
⑤ ⑥
⑦ ⑧
⑨

※ We can produve shapes outside of these, so please consult with us.
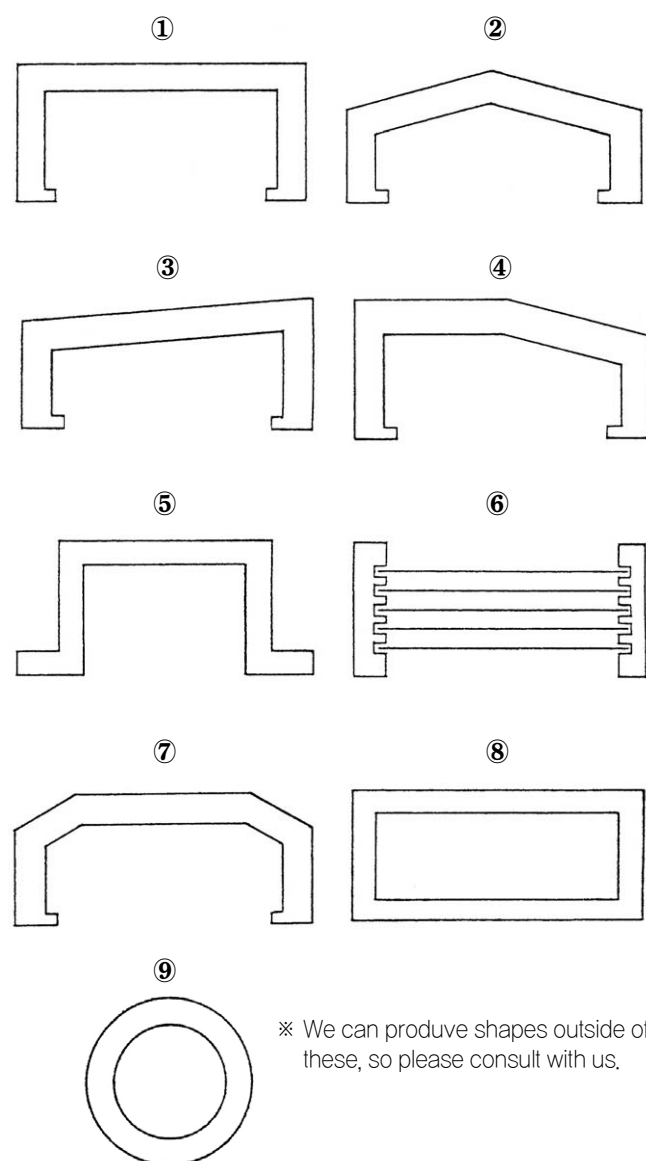
■ Struction

1. COVER BOX
We use a special kind of steel plate for the cover box. There are 4 standards for the thickness of the plate:1.2mm, 1.6mm, 2.3mm and 3.2mm.
The thickness is decided based on the cover measurements and the necessary intensity.

2. WIPER
This special wiper is used on the cover but it can also be used on the side according to the design. (made of polyurethane) The heat resistance of the wiper is the standard 40 degrees to 100 degrees celsius.
It is also durable enough to protect against water and oil. We can also make the telescope cover without wipesr.

3. WIPER COVER
We can install a steel cover on the wiper in case you need to protect the wiper form high temperature industrial dust.

4. ROLL UP STRUCTURE
In principle, both ends of the cover roll up. This is the so called box of each of the covers can match perfectly. This can also put tension on the wiper accurately. Of course, we can design a cover which goes up step by step. In order to avoid the cover itself lifting up, each wiper should be suppressed by adequate tension.

5. NON SKID PLATE
There are many advantages in putting a non stick plate to the cover box.
For example, there is a column inside which is in the foothold. We have introduced this as a place for tools.

6 & 7. THE SUPPORT ROLLERS GUIDE SHOE
In the small size and medium size cover, we use a synthetic resin guide shoe. In the big size covers, in order to reduce the friction resistance, the roller itself uses a ball bearing roller. (7) When the guide system uses a roller and when the metal of movable parts isn't strong, to provide a special support rail parallel to the movable part.

8. SUSPENDED METAL FITTINGS
With the heavy cover, there is a removable suspended fitting, it is easy to use.

9. INSPECTION HOLE
An inspection hole has been put on the top of the box in order to inspect the parts which are necessary for, the maintance, such as the spindle and the movable part etc. Please be careful because will be longer than you expented. If you hole or make it transparent.

10. BRACKET
For the movable part to move, when there is no margin to move because of the design of the machine tool, we use the bracket in the diagram. The point is a bracker joint that does not restrict the movement of the cover.

11. SUPPORT RAIL
When the movable part is not strong anough, you need a supprot rail accompany the roller guide.
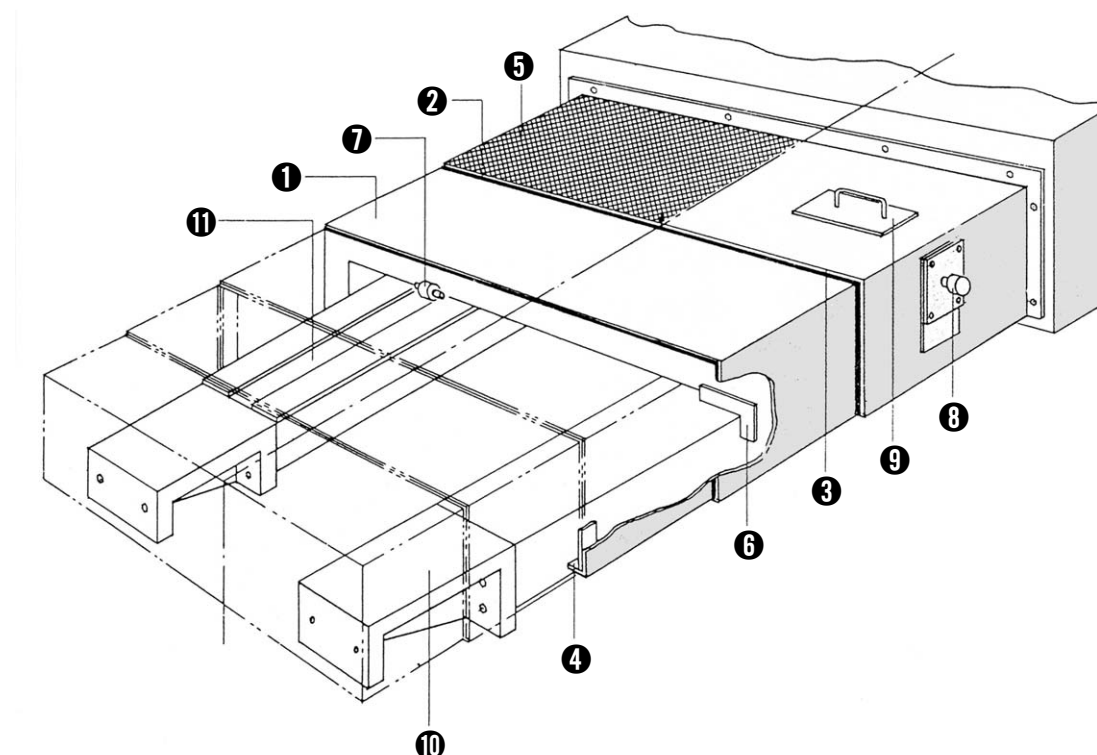
■ COST AND DESIGN OF THE TELESCOPE COVER

(please consult with us from beginning)
We think an important point for the machine tool maker is how small the telescope cover becomes when it contracts. Looking from the point of view of the cost of the cover, it is better for the box unit to be bigger and there be less units than for the cover to be made up of a lot of small box units. This will lower the cost. So please consult with us from the early stage of your plan in order to have the most cost effective design.

When you need to design the minimum size cover, you have to make it very small. So it is difficult for each part to have balance. Terefore our company adopts a rail guide system.

A   B   C

■ THE SHAPES OF THE COVER WHEN CONTRACTING

a. step series (diagram A)
b. stepless series (diagram B)
c. stopper serices (diagram C)

No#100
16
4.5 1.5 10
6.3 2.0
3.5

No#50
15
2.5 2.5 10
5.3 1.4
3.2

No#200
18
8 10
8.4 8 2.8
2.2
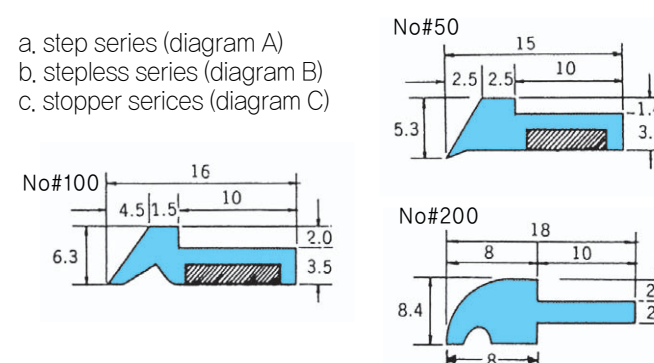
■ How to attach and repair

In case of attaching COVER, be sure to attach in a state contracted(Min) by optional deciding. STEEL SLIDE COVER should be cleaned once a week at least and oil is supplied.

■ Matter to be clarified at order time.

F
K S G
P O
Q

M
H
E
J
C L
D B
A I

268 · SHINSUNG ELECTRIC CO., LTD.

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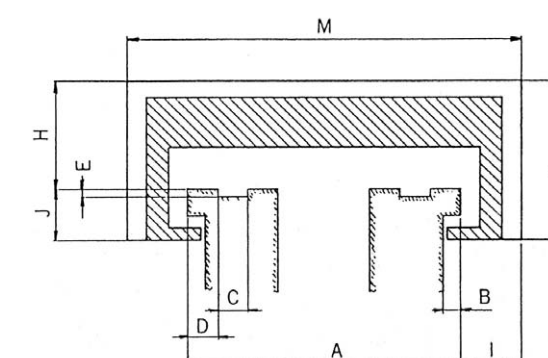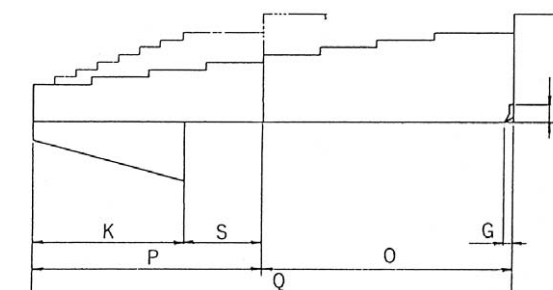
■ GUIDE WAY MEASUREMENTS

- Guide way width .... Amm
- Tail end measurement .... Bmm
- Width of guide slot .... Cmm
- The guide slot from the side of the guide ... Dmm
- Depth of guide slot E .... mm
- Height of wiper F .... mm
- Depth of wiper G .... mm

■ TELESCOPE MEASUREMENTS

- Height of the movable part .... Hmm under mm
- Side measurement of the movable part .. Imm up to
- under side .... Jmm up to
- Width of the cover .... Mmm under
- Overhang of the cover .... Kmm
- Stroke .... Omm
- Smallest contraction point .... Pmm
- Length of cover .... Lmm
- Biggest contraction point .... Qmm
- Stopping distance of the table .... Smm

● THE SURFACE MATERIAL(please choose one)
  - Buff   • Black stain   • Zinc plating
● CONDITIONS
  Speed m seconds/m minutes Position(horizontal vertical perpendicular). Frequency hours/days
  (if there are obstructions such as the, limit switch, please inform us)
● SPECIAL WANTS
  − TELESCOPE COVER : Please tell us the number corresponding to the shape on page one. NUMBER
  − POSITION OF THE ROLLER : Leave it up to us or let us know yourself.
  − OTHER

■ Square-shaped Bellows

● Characteristics

  − Possible to manufacture any shape.
  − Material quality is simple to any use.
  − Anti-stagnant, anti-abrasion and dur ability are excellent.
  − Transporting fee is small due to light weight, so this is economical.

■ Test Analysis of NTP Sheet

Heat-resisting Test		Bending Test		Oil-resisting Test
Machine	Lathe	Testing M/C Bending Testing M/C		To dissolve ASTM No.1 in container for testing and put SHEET, and conduct deposition of 48 hourse.
Cuttings	Bar steel(SS41)	Bending degree	180℃	
CHIP Momnet temperature	700℃	Frequency of bending	80,000times	
Distnace	160mm	Time	1year	
Time	120sec			
Nothing abnormal		Nothing abnormal		Nothing abnormal

■ Type of square-shaped Bellows

A type

A-1 type
A-2 type

AB type

AB-1 type

AC type

AC-1 type

AC-2 type

AD type

AD-1 type

AE type

AE-1 type

AE-8 type
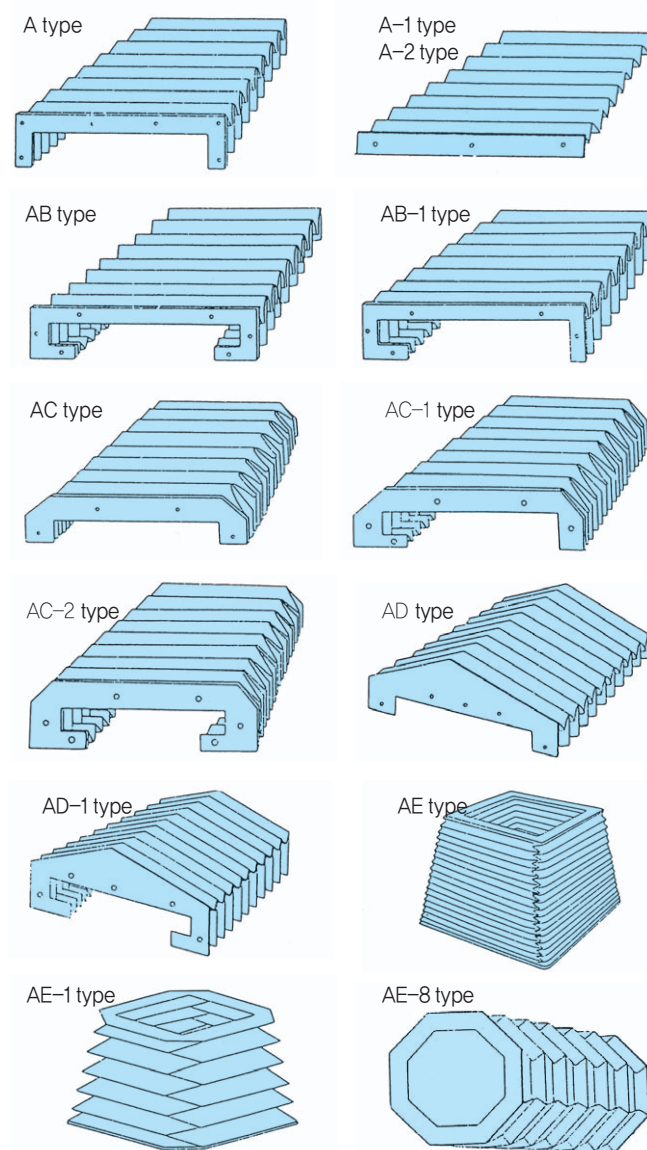
※ Any type outside of the above can be manufactured, so contact us for negotiation!

■ Major material quality

As material used for body of square-shaped bellows, there is NTP Sheet. NTP is the best sheet with excellent intensity, including heat-resisting, oil-resistings, weather-resisting, anti-abrasion and crookedness as mechanical material of Bellows. Special care/attention should be given to similar type on appearance, and it is necessary to bear in mind that the difference of value is big. Indifference for material quality would drop the quality of product.

■ Structure:

1. Bellows body is used. The thickness of Sheet is respectively 0.6mm, 0.7mm, 0.9mm and 1.2mm as standard ones, and for selection of SHEET, it is decided by bellows width, pitch standard and required intensity.

⑦ CHAIN STRUCTURE

Thickness of SHEET is roughly 0.35mm~1.2mm
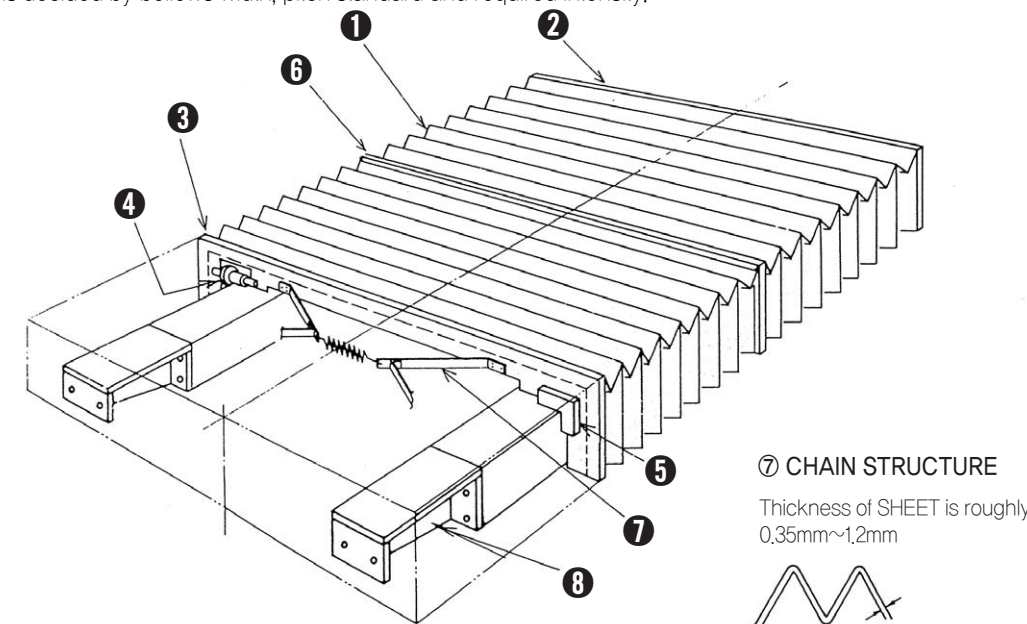
2. END PLATE
   Steel plate is used and thickness of steel plate is 1.2mm, 1.6mm, 2.3mm and 3.2mm as standard types.

3. Intermediate Support Plate(Slide Plate)
   Using steel plate, strong vinyl chloride and veneer board and keeping the body of Bellows from touching directly the SLIDE surgace and for convenience of manufacture, it also include connecting role of bellows body by setting each SLIDE PLATE to Bellows number 7~10.

4. ROLLER
   ROLLER is fixed to SLIDE part so that Bellow can reciprocate smoothly. Mainly Nylon resin is used as material The shape can be changeable according to type in addition to the picture seen.

SLIDE PLATE

WASHER   SHAFT   ROLLER
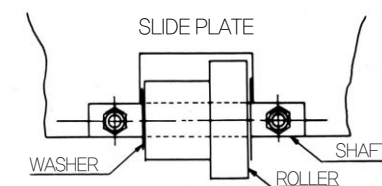
5. SLIDE SHOE
   In small and middle-typed BELLOWS, SLIDE SHOE consisted of brass(BSP) or synthetic resin is used instead of ROLLER

6. SEATPLATE
   It functions as connecting BELLOWS body to intermediate supprot plate.

7. CHAIN TOOL
   Please refer to the following item.

8. BRACKET
   When BELLOWS is shrinked, like the picture, BRACKET is set, if there is nos spare on SLIDE surface of machine tool. This time, it is important to establish that connecting point between SLIDE surface and BRACKET would not restrict the reciprocation of BELLOWS.

■ Chain Tool

This is mainly installed to which stroke of bellow is long or to which bellows width is broad, helping Bellow have smooth reciprocation.

1. TOGGLE method

ROLLER   SEAL PLATE
TOGGLE PLATE   SLIDE PLATE SPRING

SPRING
TOGGLE PLATE   END PLATE
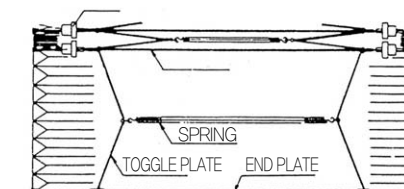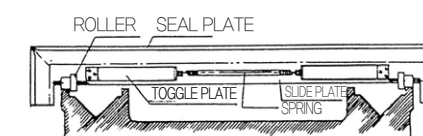
2. PANTGRAPH method (applied to machine with speed under 6m/sec)
   This method is not limited to BED purpose of horizontal use and it is also installed to CLOSS RASIL use upon necessary.

SLIDE PLATE   PANTOGRAPH   END PLATE

PANTOGRAPH

SLIDE PLATE
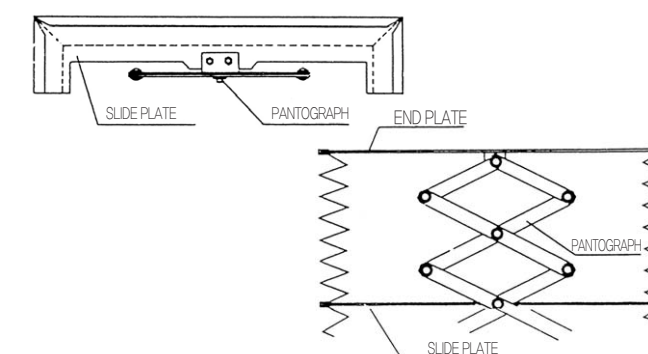
3. Other method :
   There are BELT method, Limited TAPE method, etc.

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■ Outline Design Standard of BELLOWS

1. How to decide PITCH of BELLOWS

Considering SPACE to install such as Roller and TOGGLE PLATE, etc. in limited measurement of H3, W3, W4 in the picture or PANTOGRAPH, etc. the remained SPACE becomes PITCH of BELLOWS, provieded, however, that you should avoid SPACE occupied by Wiper, such case where there is Wiper at both sides of table. Please pay attention to this point.
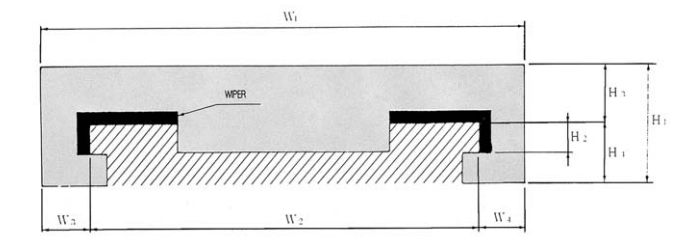
2. BELLOWS width and pitch

If we refer to P brank of the attached table after Pitch of Bellows is decided, there is L. MIN standard for necessary STROKE.

Height to Mt. from gully	Open Pitch between Mt and Mt.	Bellows width W1	Width of SLIDE surface W2	Standard when it is shrinked at the least	
				Extended contracter speed under 10m/min	Extended & contracter speed under 10m/min
15	15~18	200	W1–50		
20	20~24	300	W1–60	1/3ST	
25	25~30	400	W1–70	1/4ST	
30	30~36	500	W1–90	1/4.5ST	
35	35~42	600	W1–100	1/5.5ST	
40	40~48	800	(110) W1–150	1/6.5ST	1/4.3
45	45~54	1000	(120) W1–160	1/7.5ST	1/5.3
50	50~60	1200	(130) W1–170	1/8.3ST	1/6.3
55	55~66	1400	(140) W1–180	1/9.3ST	1/7.3
60	60~72	1600	(150) W1–190	1/10.3ST	1/8.3
65	65~78	1800	(160) W1–200	1/11.3ST	1/9.3
70	77~84	2000	(170) W1–210	1/12.3ST	1/10.3

O.P = P 1.2 MIN
measuredment chart
of above table
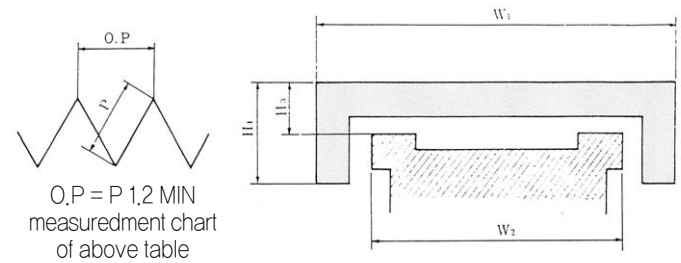
3. L.MAX(Developed length of Bellows)

Like the picture, L.MAX of Bellows becomes L.MIN of STROKE + BELLOWS of TABLE. AS for L.MAX, please think of Open Pitch=Mt. number. This time, L.MIN is important element along with L.MAX for Bellows. It may be proper to catch L.MIN as the least, if possible, there is a limit by pitch of bellows. Such case where SPACE of L.MIN is limited, L.MIN of Bellows can be reduced if we re-duce Mt. number while making pitch bigger. L.MIN of Bellows has a small difference according to PITCH, but you may take it as about 60mm of 10Mt.
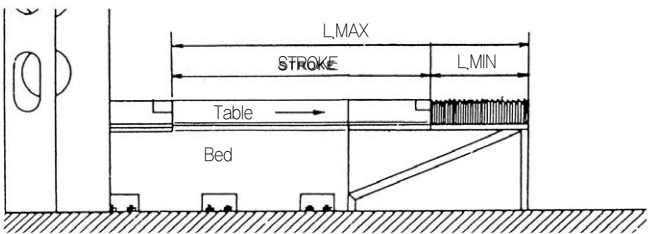
4. Example of Take–up

① When MIN of Bellows(length when shrinked) is 600m/m and OVERHANG of TABLE is 500m/m, BELLOWS is taken up and 600m/m=1, 100m/m, that is, BED extension of 1,100m/m should be done.

② Take–up plate of BELLOWS taken up to A part and B part Bellows body should be fully made horizon with SLIDE surface of BED, you should be mindful of this.
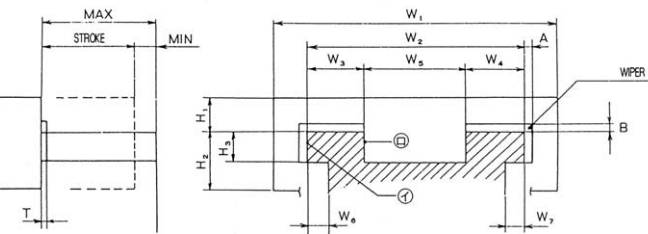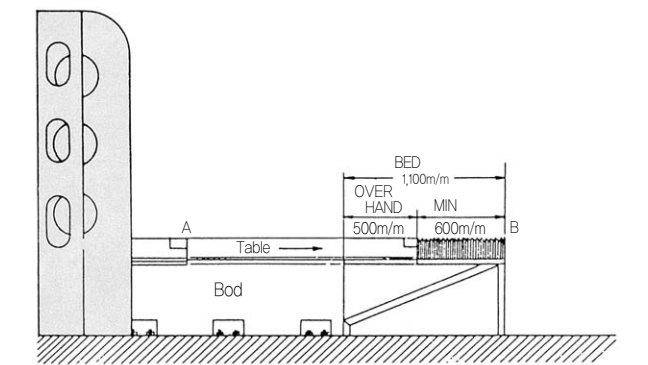
■ BED Dimension

Table Width						
W1		mm	W2	mm	W3	mm
W4		mm	W5	mm	W6	mm
W7		mm	H1	mm	H2	mm
H3		mm	A	mm	B	mm

Finish degree ∠ | □

MAX _____ mm   BRACKET   (Yes.   No)

STROKE _____ mm

Width of Wiper T _____ mm

When shrinkled to the least MIN _____ mm   BRACKET _____ mm

■ Condition

Speed _____ m/min · mm/sec   Position(Horizon, vertical, slant)

Frequency _____ Time/day   Heat–resisting environment _____ ℃

Oil–resisting, water–proofing(necessary, yes, no) Degree(in details) Besides, such case where there are obstacles such as limit switch, etc. please indicate the position correctly.

■ How to order

BELLOWS type _____ (See catalogue page 84)

Roller position:please indicate the position at option or when designated.

■ Cylinder–type BELLOWS

Shape
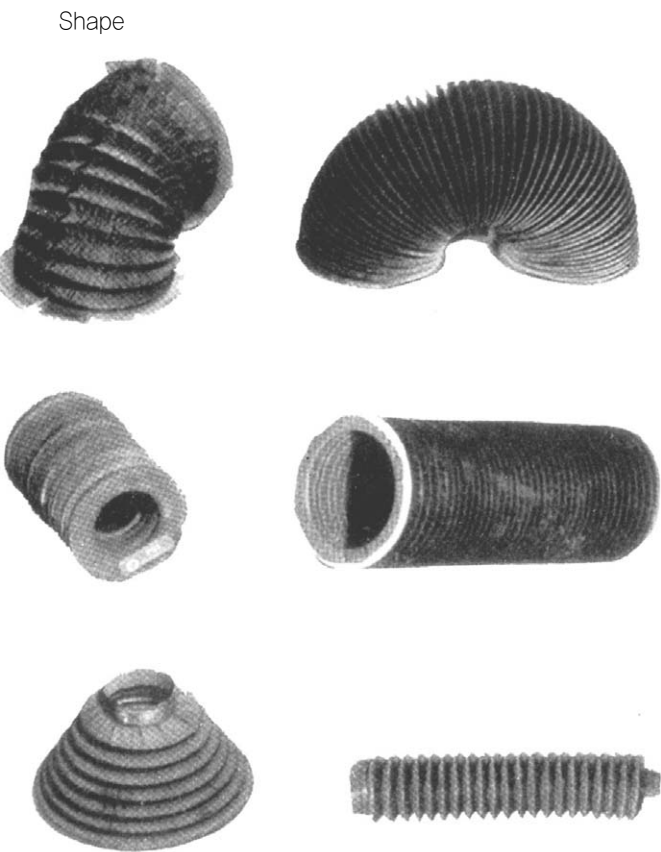
■ Major Materials

Nylon Tarpaulin is mainly used to cylinder–type BELLOWS, as coating and processing vynil chloride resin to both sides of Nylon fiber.
With respect to water–resisting degree, tension–resisting, tensile elasticity, tensile strength, it is excellent, while the heat–resisting is about 60℃ and such case where BELLOWS requires of heat–resisting, separately NTP sheet is useed.

■ Structure

Constituted with Nylon Tarpaulin and steel line(SWP).
By using tension–resisting of Tarpaulin, steel line RING is inserted for manufacturing and the line diameter of RING becomes thicker, as the outer diameter of BELLOWS becomes larger, Available scope of manufacturing.

272 · SHINSUNG ELECTRIC CO., LTD.

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SHINFLEX®
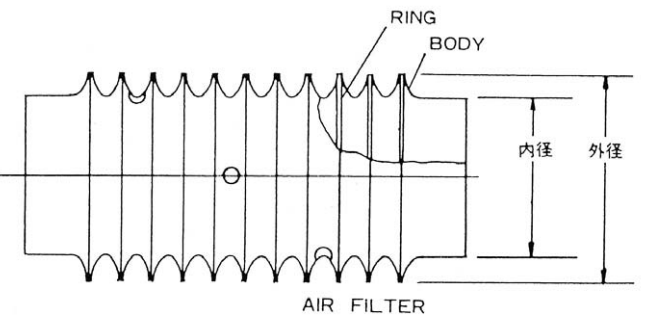
■ Supporting Stucturerials:

If cylinder BELLOWS grows longer or operated by being installed horizontally, the midways part of BELLOWS hands down, so in order to help smooth operation of BELLOWS, supporting structure like the picture(made from PVC plate and PVC pipe or gun metal) is installed at each proper interval.
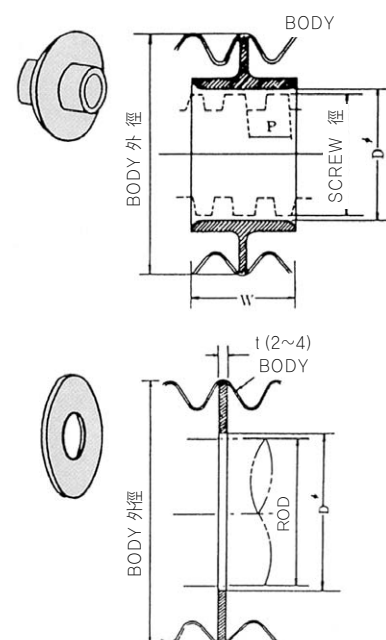
■ Calculation standard of dimension

Length when developed

Compressed Length

$$\frac{\text{required by Belows}}{} \quad \frac{\text{PITCH agreeabel with outside with outside diameter of Bellows}}{} = \text{Nos of Mt}$$

MAX = MIN + STROKE

MIN = Pitch × thickness of pitch
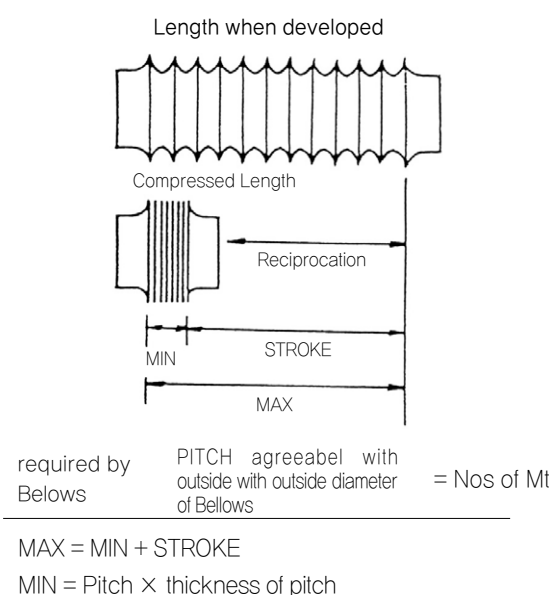
1. Making the inside diameter of BELLOWS as standard, the inside diameter of BELLOWS is decided giving consideration to CLEARANCE of 8mm rather than SHAFT(ROD) diameter and outside diameter of BELLOWS is decided as bigger than the inside diameter according to chart.

2. Making set–caliber as standard, However, when limited by length of shrinkage(MIN), it becomes bigger that chart PIT(as outside diameter of BELLOWS becomes bigger) and this time, wrinkles happens at gully part of BELLOWS, somewhat appearance of product is bad, but there is no trouble in using.

■ BELLOWS Dimension Standard table

BELLOWS inside diameter	BELLOWS outside diameter	PITCH	Thickness of ne
40	60	9	≒ 2,6mm
80	100	12	
120	145	15	
145	175	18	≒ 2,8mm
190	230	24	≒ 3,2mm
235	280	27	
290	340	30	≒ 3,9mm
380	440	36	
480	550	42	≒ 4,4mm

■ Open–type BELLOWS

By opening and closing the open–part with FASTNER or MAGIC Tape like picture, not dissolving the already assembled machine, it can easily install BELLOWS. However, be mindful of BELLOWS outside diameter growing bigger compared to general BELLOWS.(and MIN)
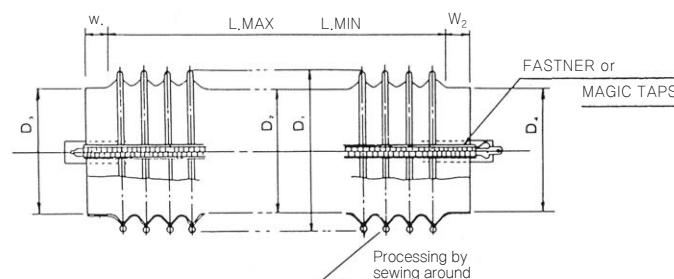
■ How to install

Both section fo cylined–type BELLOWS can be installed with FLANGE of BAND like picture below.
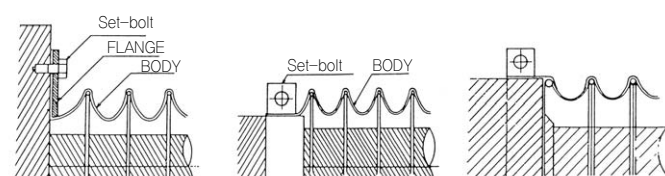
■ Matters clarified when ordering

1. L,MIN   2. STROKE   3. SHAFT or ROD diameter
4. Condition of use (heat–resisting, oil–resisting, pressure)
5. Position of use (Horizon, vertical, others)   6. Speed of reciprocation
7. Diameter of the part taken up. (inside & outside diameter of FLANGE when it is FLANGE)
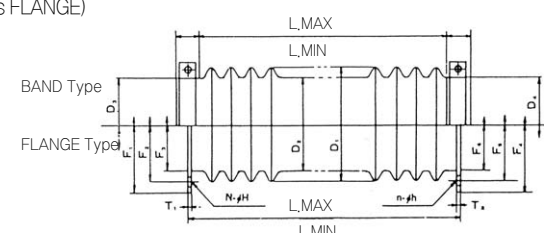
SHINFLEX®

ROLL Covers

Guide Way Protections

Mojor use:
machine tool, industrail machine machine center part of automation machine
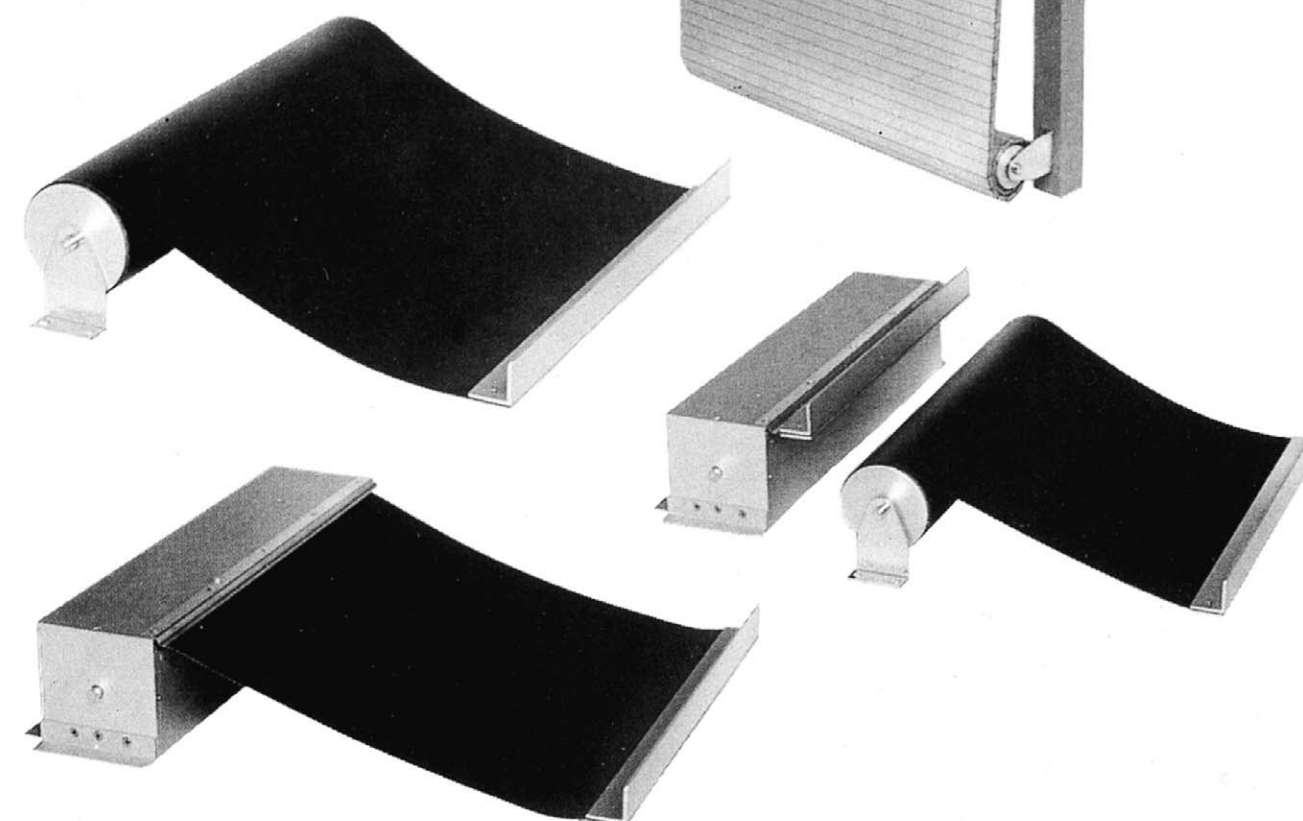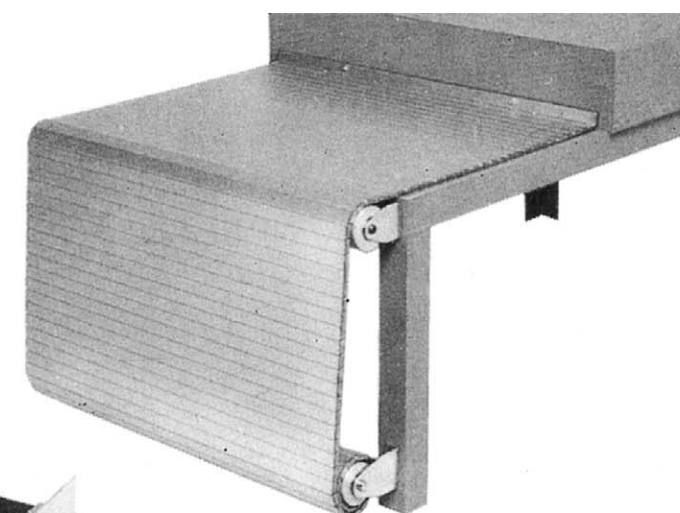
Roll-Away Covers Without Housing

All SHINSUNG roll-away covers are supplied with multiple return springs(patented in various countries) and offer decisive advantages over conventional systems:

- Reliabel powerful mechanism, tailored to the application on hand
- Standard take-up diameter can be reduced, if necessary
- One million movements guaranteed
- Optimum selection of materials

■ Roll-away covers without housing-the best value for money

Dimensions of roll-away covers without housing

Type	R 30	R 40	R 50	R 60	R 70	R 80	R 90
BB (Band width) up to (mm)	AZ(max.extension) up to(mm)						
150	300	400	450	500	550	700	750
250	500	600	700	1000	1100	1300	1400
350	650	900	1050	1600	1750	2000	2150
500	800	1200	1350	1900	2050	2350	2500
750	1000	1500	1650	2200	2350	2700	2850
1000	1200	1800	2000	2500	2600	3100	3200
1250	1350	2000	2250	2750	2900	3400	3650
1500	1500	2200	2450	3000	3150	3700	3850

AZ extension up to(mm)	2Y
400	4
600	5
800	6
1200	8
1600	10
2400	14
3000	18
3850	22
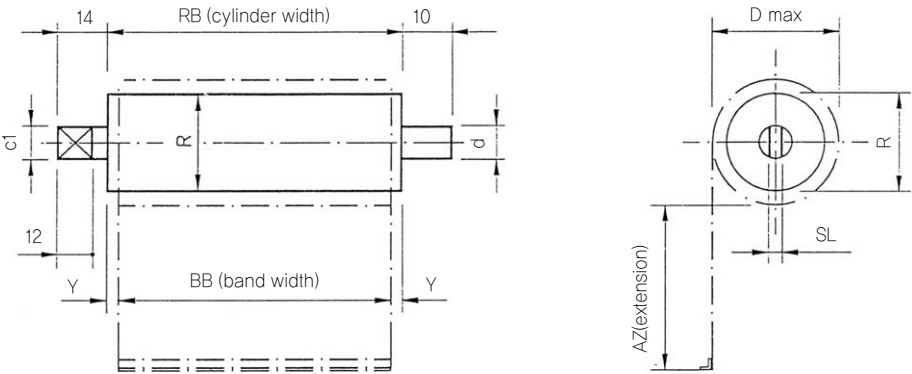
Type	d1	SL	d	A	B	C	D	E	F	G	H	R	NO.of standard angle
R 30	10	4	10	33	45	16.5	40	11	18	1.5	59	30	033
R 40	10	4	10	50	62	16.5	40	11	18	1.5	93	40	050
R 50	10	4	10	50	62	16.5	40	11	18	1.5	93	50	050
R 60	10	4	10	50	62	16.5	40	11	18	1.5	93	60	050
R 70	15	6	15	60	72	26.5	50	15	22	2.0	112	70	060
R 80	15	6	15	60	72	26.5	50	15	22	2.0	112	80	060
R 90	15	6	15	60	96	32.5	60	17	26	2.5	151	90	080

Standard angle Galvanized steel
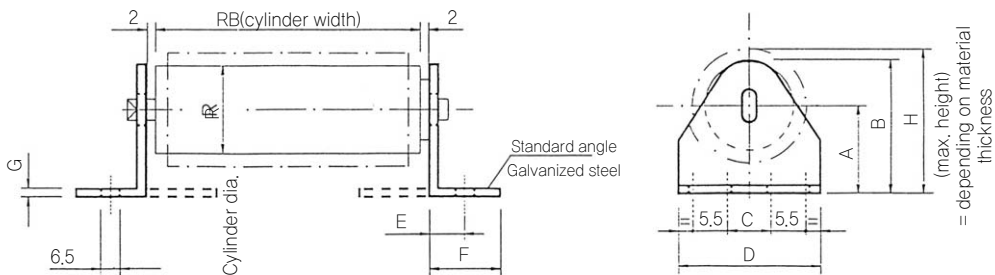
● Formula for D max.

$$D_{max} = 2 \times \sqrt{\frac{L \times S \times 1.05}{\pi} + r^2}$$

- r = R (cylinder dia.) : 2
- L = AZ + 2Rπ
- s = band thickness (see page 19)

Roll-way Covers With Housing

The versatile, completely enclosed models

The winding mechanism is contained in a suitably dimensioned aluminum or steel housing. Standard equipment includes wipers. To reduce cost, it is advisable to choose the standard sizes given below wherever possible.
Special versions can, of course, be made to customer's specifications.

GB(width of housing) = BB + 2Y + 21

BB(band width)

$$D_{max.} = L - 8mm$$

Note:
For calculation of D max and dimension 2Y–see tables on page 6
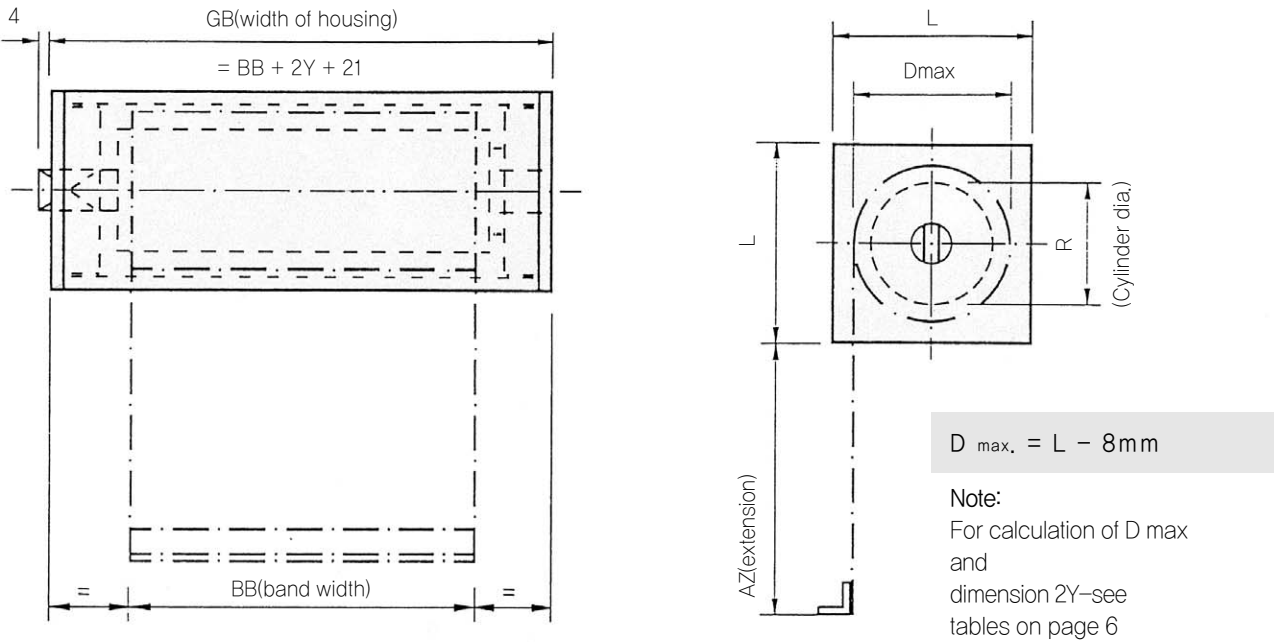
Material : Aluminum, natural color, anodized on request. Larger dimensions or intermediate sizes made of corrosion-proofed steel sheet, painted black. Other colors on request.

■ Dimensions of standard housings L×L mm :

L × L = 50×50   60×60   70×70   80×80   90×90   100×100   110×110   120×120   130×130   140×140

■ Dimension of roll-away covers with housing

Type	RG 30		RG 40		RG 50		RG 60		RG 70		RG 80		RG 90	
BB band width up to(mm)	AZ	L×L	AZ	L×L	AZ	L×L	AZ	L×L	AZ	L×L	AZ	L×L	AZ	L×L
150	300	50×50	400	60×60	450	70×70	500	80×80	550	90×90	700	100×100	750	110×110
250	500	60×60	600	70×70	700	80×80	1000	90×90	1100	110×110	1300	110×110	1400	120×120
350	650	60×60	900	70×70	1050	80×80	1600	100×100	1750	110×110	2000	120×120	2150	130×130
500	800	60×60	1200	80×80	1350	90×90	1900	100×100	2050	110×110	2350	120×120	2500	130×130
750	1000	70×70	1500	80×80	1650	90×90	2200	100×100	2350	110×110	2700	120×120	2850	130×130
1,000	1200	70×70	1800	80×80	2000	90×90	2500	100×100	2600	110×110	3100	130×130	3200	130×130
1,250	1350	70×70	2000	90×90	2250	100×100	2750	110×110	2900	120×120	3400	130×130	3650	140×140
1,500	1500	70×70	2200	90×90	2450	100×100	3000	110×110	3150	120×120	3700	130×130	3850	140×140

※ The housing dimensions apply to maximum band thickness. In confined spaces, try to choose thinner material to arrive at a smaller housing. Please call if you need assistance.

276 · SHINSUNG ELECTRIC CO., LTD.

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MOUNTING OF ROLL COVERS

■ Working positions and band mounts

The versions shown below apply to covers with or without a housing. The sketches indicate both the type and position of the band mounts as well as the motion direction of the band and the two shaft ends.
Please state desired version in your inquiry or order.

Horizontal and frontal position

F1 F2 F3 F4
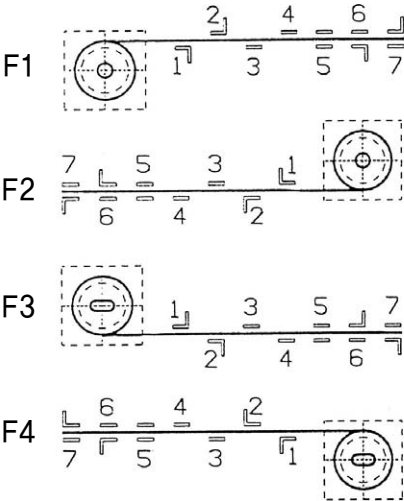
Vertical position TICAL

V1 V2 V3 V4
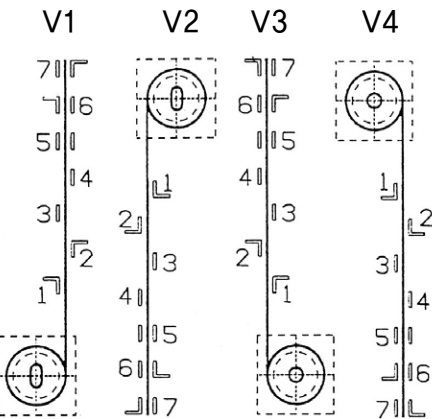
Band mount—end piece or angle
Material : Aluminum(steel on request)

B × H
15 × 3
20 × 3
30 × 3

L × L × S
15 × 15 × 3
20 × 20 × 3
30 × 30 × 3
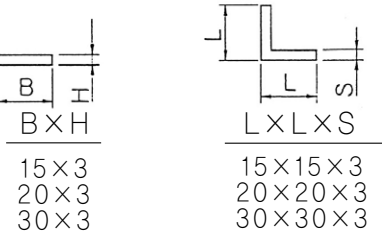
■ Housing mounts

Please indicate desired type of mount in your inquiry or order.
Mounting angles 15×15×3mm to 50×50×5mm (depending on size of cover)

P1 P2 P3
P4 T1 T2
T3 T4 T5
T6 T7 T8
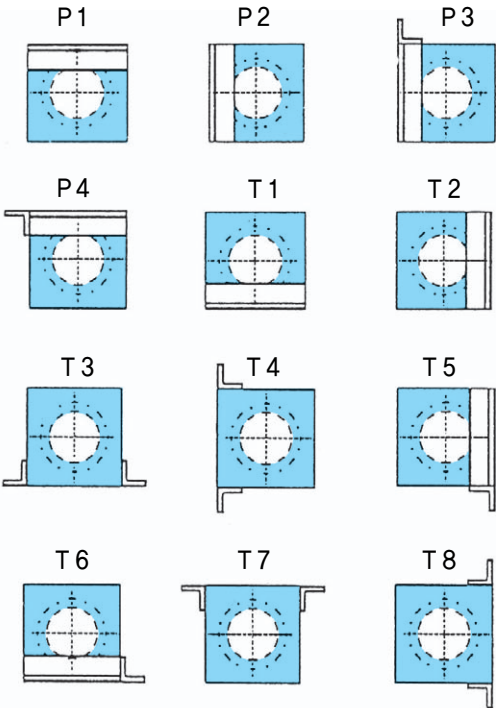
■ Wipers

Wipers are mounted on exposed side of cover band on either side, if desired.

R1   exposed side

R2   exposed side

exposed side

F1 / 2 / T5 / R2
Working position
Band mount
Housing mount
Wiper mount

■ EXAMPLES

A — F1/4
B — F1/2/T5/R2
C — F2/3/P4/R1
D — F4/2/P2/R2
E — F3/7/P2/R1

F — V1/1/P3/R1
G — V4/1/P1/R1
H — V4/4/P1/R1
I — V2/2/T6/R2
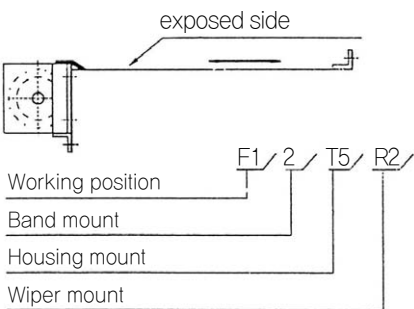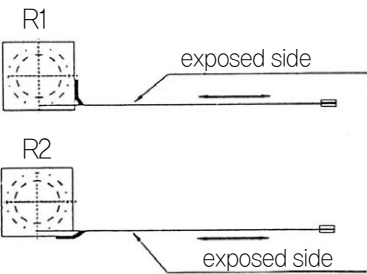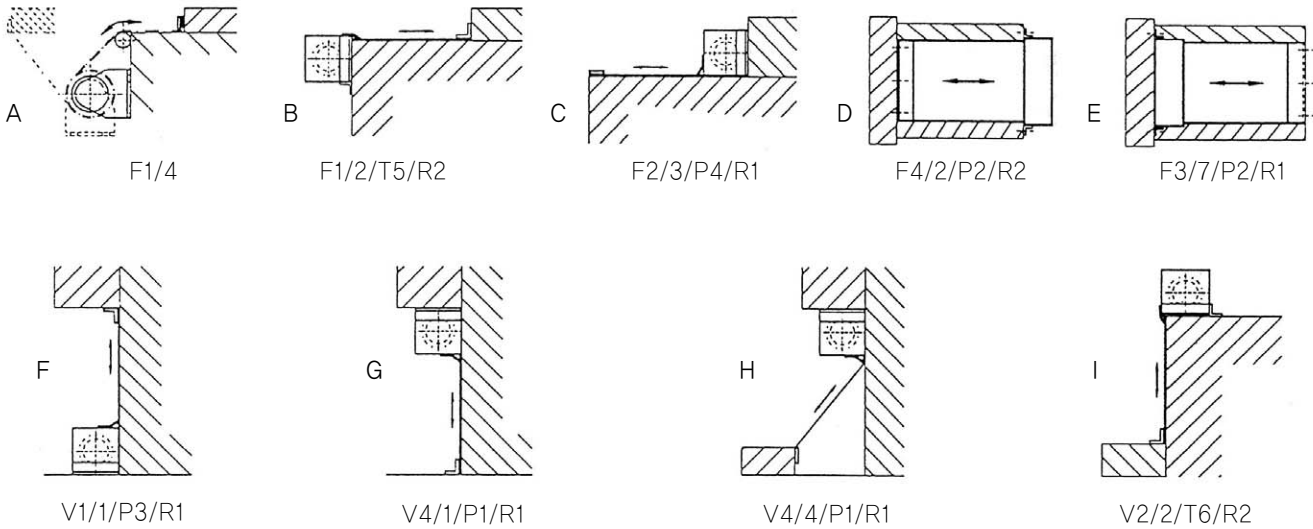
■ Materials List for Roll-Away Covers and Bellows

Material NO.	Description of material			Material thickness (mm)	Temperature-resistant			Material properties	Roll-away covers		Thermwelded bellows	Round bellows	
	Top-coated (exposed side with)	Base material	Bottom coated with		briefly ℃	continuously min(℃)	max(℃)		without housing	with housing		stitched	hot-formed
Mat.01	Neoprene	Polyamid	Neoprene	0,30	+250	−20	+120	Excellent weathering and ozone resistance, good resistance to mineral oil, coolants, grease and water	●	●	○	●	●
Mat.02	Neoprene	Polyester	Hypalon	0,50	+250	−20	+120		●	●	○	●	●
Mat.03	Neoprene + Hypalon	Polyester	Neoprene,Hypalon	0,60	+250	−20	+120		●	●	○	●	●
Mat.04	Neoprene	Polyester	Hypalon	0,80	+250	−20	+120		●	●	○	●	●
Mat.06	Neoprene	Polyester	Hypalon	1,30	+250	−20	+120		●	●	○	●	○
Mat.07	Hypalon	Kevlar	Hypalon	1,15	+350	−20	+180		●	●	○	●	●
Mat.08	Neoprene+NBR	Polyester	Neoprene+NBR	0,40	+200	−20	+120	Same as above, but also approved for food	●	●	○	●	●
Mat.09	Silicone	Fiber glass	Neoprene	0,50	+350	−60	+250	Specially well suited for high and low temperatures, resistant to oil and light.	●	●	○	●	○
Mat.09/1	PVC	Fiber glass	PVC	0,50	+100	−30	+70		●	●	●	○	○
Mat.09/2	Neoprene	Fiber glass	Neoprene	0,60	+250	−60	+120		●	●	○	●	○
Mat.10	Teflon			0,50	+500	−200	+260		○	●	○	○	○
Mat.11	Aluminum-coated carbon-fiber fabric			0,70	+2500	−100	+260		●	●	○	●	○
Mat.11/1	Aluminum-coated fiberglass fabric			1,20	+600	−30	+250		●	●	○	●	○
Mat.12	Stainless steel ✴			0,20	+1200	−250	+400		○	●	○	○	○
Mat.13	Stainless steel ✴			0,30	+1200	−250	+400		○	●	○	○	○
Mat.14	Stainless steel ✴			0,40	+1200	−250	+400		○	●	○	○	○
Mat.15	Polyurethane	Polyester	Polyurethane	0,25	+200	−30	+150	Resistant to petroleum-based oil and grease;highly resistant to abrasion, tension and tear propagation	●	●	●	●	○
Mat.15/1	Polyurethane	Polyester	Polyurethane	0,35	+200	−30	+150		●	●	●	●	○
Mat.16/1	Polyurethane	Polyester	Polyurethane	0,80	+200	−30	+150		●	●	○	●	○
Mat.16/2	Polyurethane	Polyester	Polyester	1,40	+200	−30	+150		●	●	○	●	○
Mat.17	PVC	Polyester	PVC	0,36	+100	−30	+70	Suited for acidic media.	●	●	●	●	●
Mat.18	PVC	Polyester	PVC	0,70	+100	−30	+70		●	●	●	●	●
Mat.19	PVC	Polyester	PVC	0,50	+100	−30	+70		●	●	●	●	●
Mat.20	PVC	Polyester	PVC	0,25	+100	−30	+70		●	●	●	●	○

● Suitablee   ○ Unsuitable

278 · SHINSUNG ELECTRIC CO,, LTD.

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SHINFLEX®
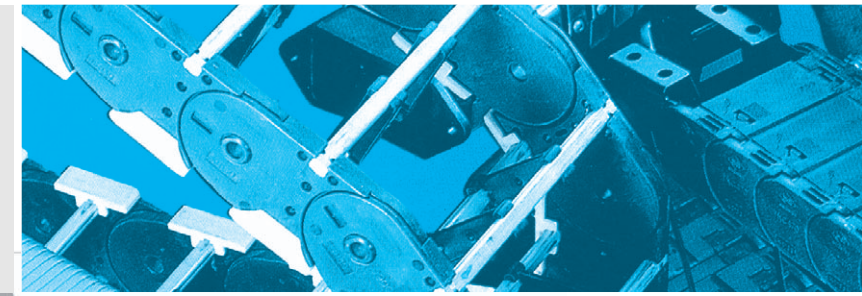
CHIP CONVEYOR

CONVEYOR SYSTEMS

SHINFLEX®
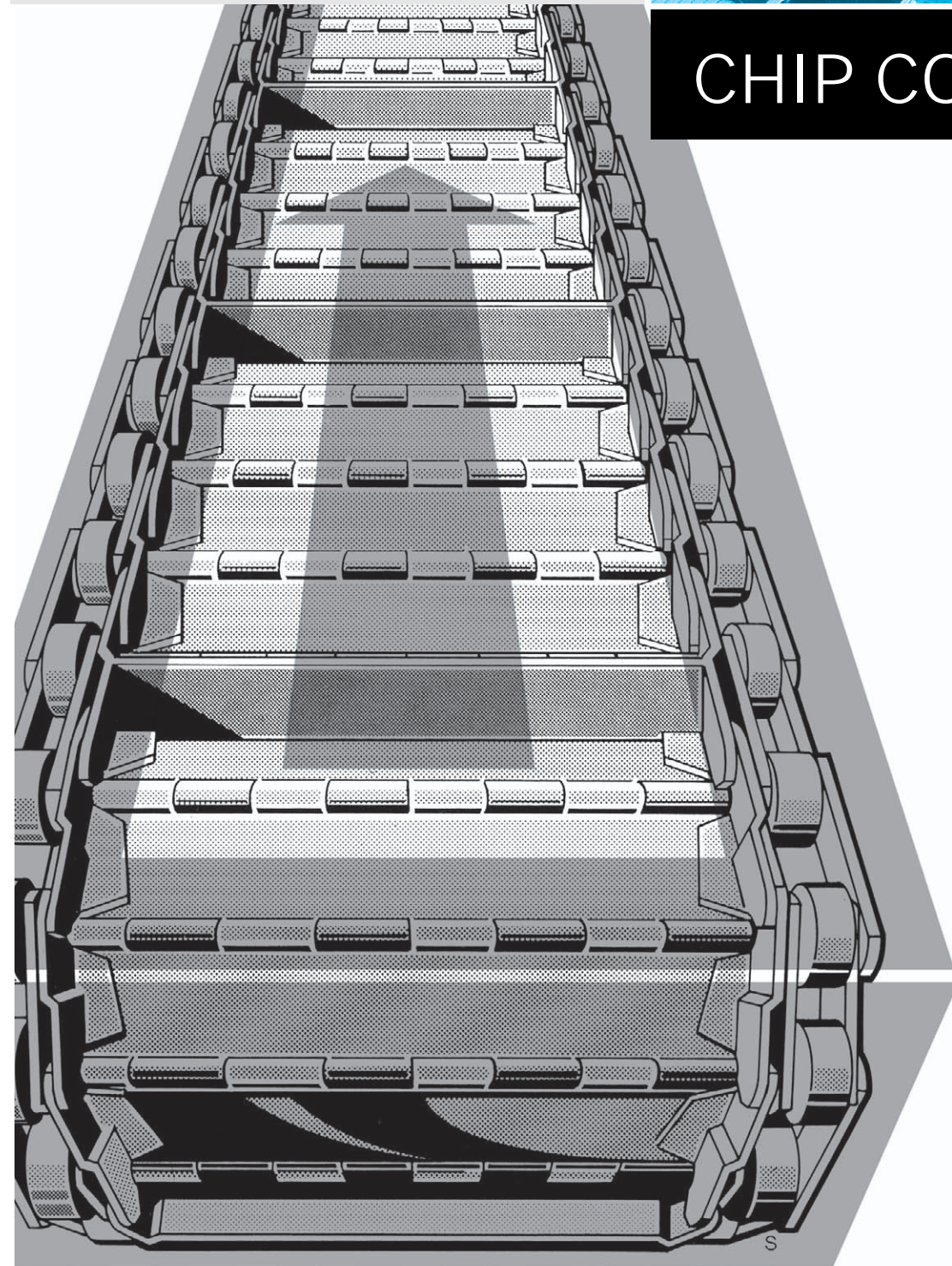
CONVEYOR SYSTEMS

Intelligent Conveying Systems
We provide complete specialized services from technique, consulting and design to manufacture.
Our outstandingly convenient conveying systems are available in various models to meet all your chip conveyance needs.
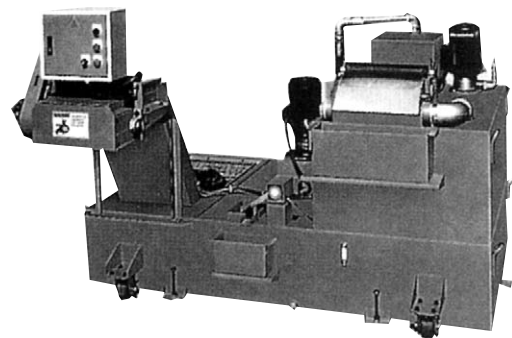
■ **SFCE Scraper-Type**
 – for fine chip conveyance
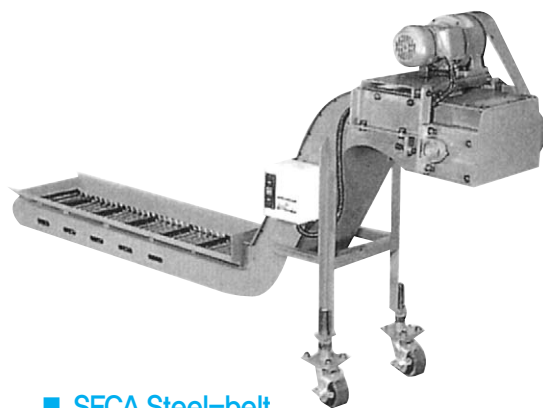
■ **SFCA Steel-belt**
 – chip conveyors for common working machines
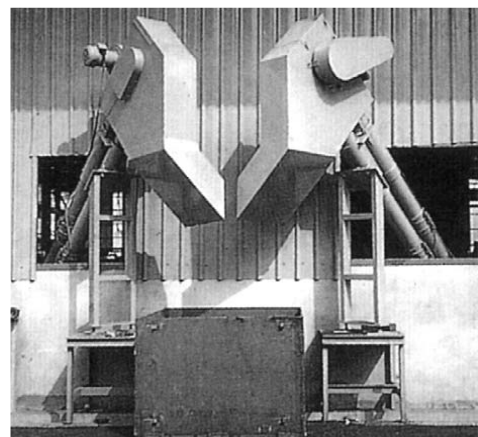
■ **SFCG pipe conveyor**
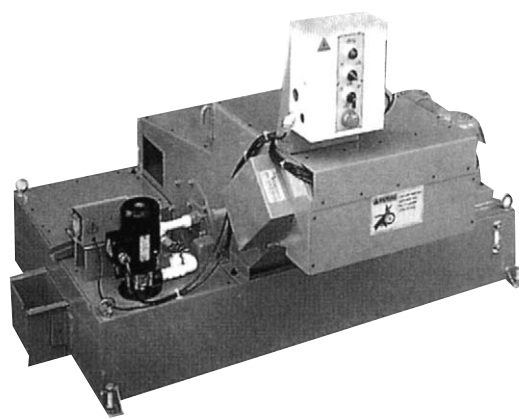
■ **SFCK Aluminum chip conveyor**
 – for conveying aluminum chips and fine chips, this unit can also spparate fine chips from cutting flud.
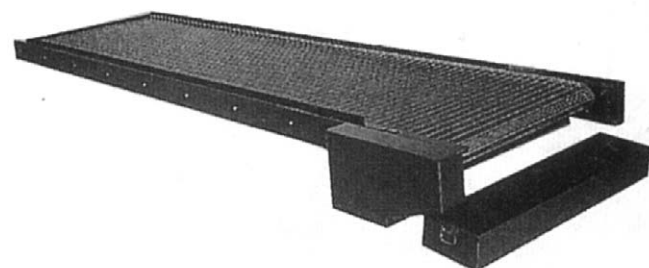
■ **SFCH To be used for laser processing machines**
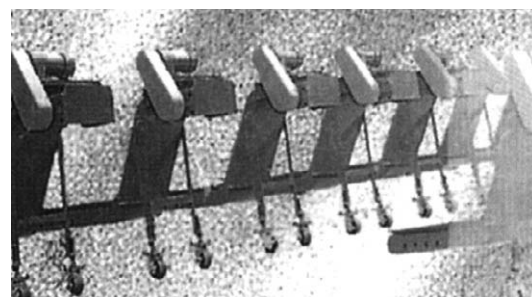
■ **SFCA Steel-belt**
 – chip conveyors for common working machines

CHIP CONVEYORS

SFCE
– Scraper type for powder or very small chips, such as copper or cast iron chips.
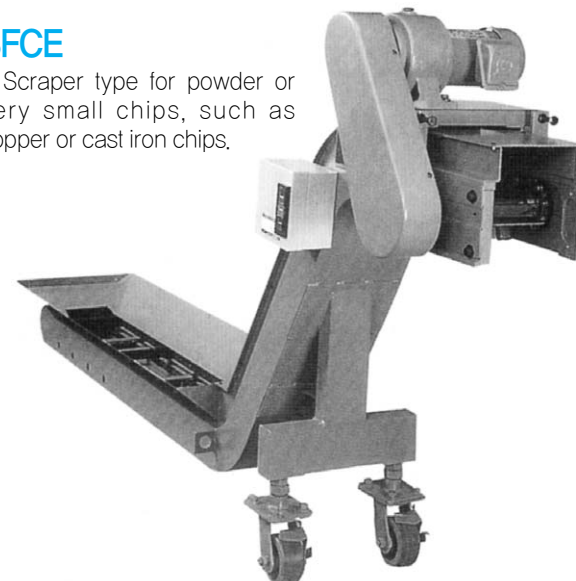
SFCD
– Belt pitch 50.8mm, for aluminum or silicon plate chipa.

SFCA
– Belt pitch 31.75mm for general machine tools chip removal, such as CNC lathe or machining centers.

SFCB
– Belt pitch 63.5mm, for bigger workpieces or chips, such as workpieces of forging or punching.
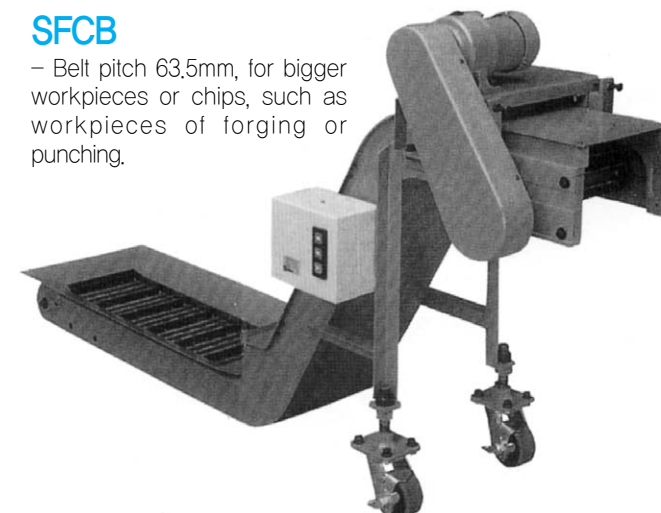
SFCH
– For widest workpieces, such as workpieces of laser cutting.

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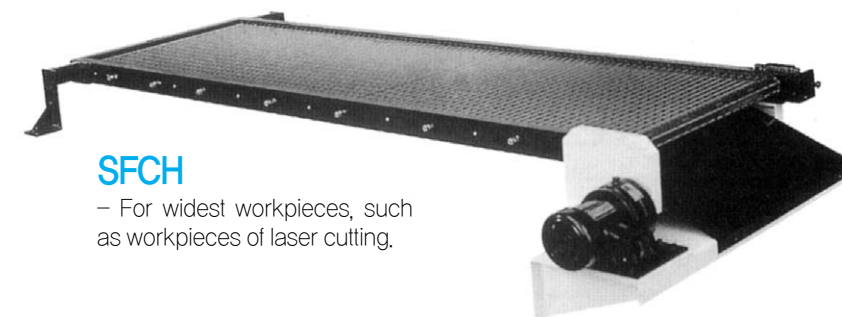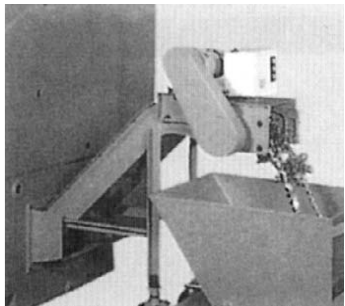
• Compact design, high stiffness reliability and easy installation, which can serve even the most compact and smallest machine tools.
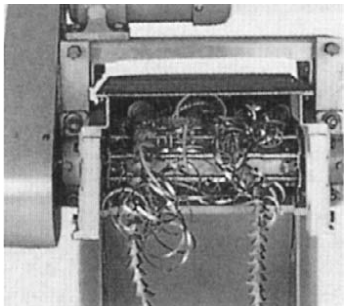
Can remove various metal chips smoothy from the machine bed without manual labor and interruption of the production process.
High transprotation volume and low energy consumption.
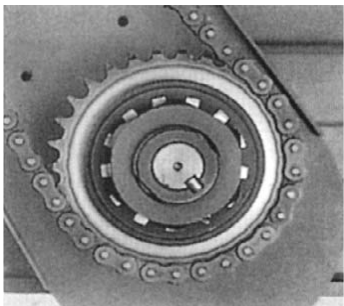
Preset torque clutch will prevent any damage in the event of overload or a jam.
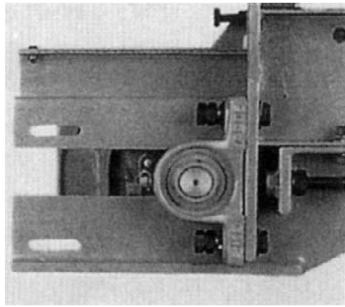
• Having take-up device for adjusting belt tension to keep running smoothly.
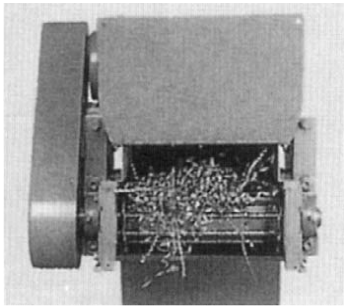
Protection cover fully meets safety directive
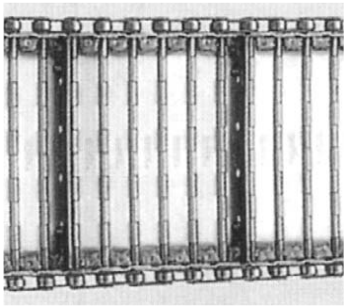
Thick beltplates with weled interlocking sidewings and labyrinthic seals for chain protection.
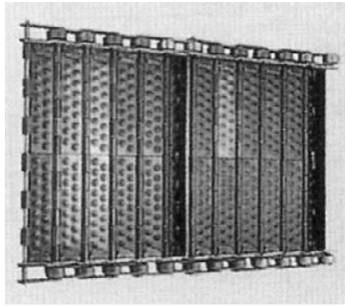
Dimpled Belt.
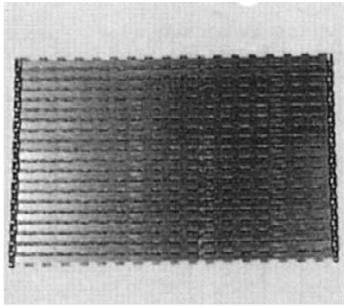
Wider belt may fit customer requirements.
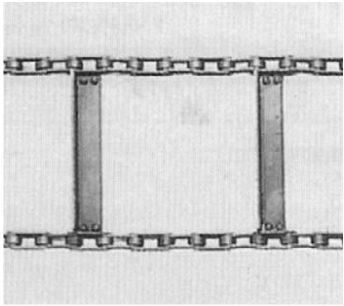
Scraper type belt for transportation of copper, power transportation
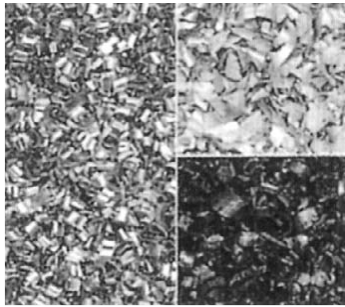
Scraper type belt for transportation of copper, aluminum, cast iron chips etc.
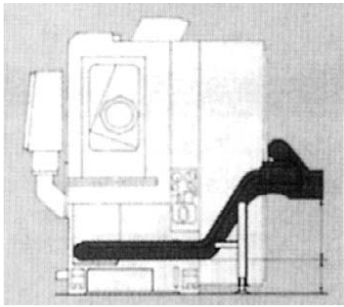
For CNC Lathes
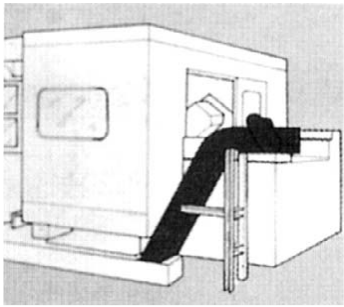
For Machining Centers

CHIP CONVEYOR Dimension standard Table

W = 100, 150, 175, 200, 250(mm)
a = 0° 15° 30° 45° 60°
Belt pitch = 31.75(mm)
Frame = 2(mm)

F–F SECTION   E–E SECTION

PARAMETERS / MODEL	W	PITCH	A	B	C	D	K	T	α	H	M	S	HP	MOTOR TRNASPORT(kg/hr) 220/380V VOLUME OF TRNASPORT(kg/hr)
SFCA	250	31.75	1080	1810	2000	585	145	160	60	165	260	60	1/4	300

W = 230, 460, 690(mm)
a = 0° 15° 30° 45° 60°
Belt pitch = 63.5(mm)
Frame = 3(mm)

F–F SECTION   E–E SECTION

PARAMETERS / MODEL	W	PITCH	A	B	C	D	K	T	α	H	M	S	HP	MOTOR TRNASPORT(kg/hr) 220/380V VOLUME OF TRNASPORT(kg/hr)
SFCB	230	63.5	2980	3161	3496	966	200	215	60	245	615	85	1/4	500

We can also furnish special steelbelt chip conveyors to fit your requirements. Please advise the technical parameters.

284 · SHINSUNG ELECTRIC CO., LTD.

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CHIP CONVEYOR Dimension standard Table

W = 240(mm)
a = 0° 15° 30° 45° 60°
Belt pitch = 50,8(mm)
Frame = 2,3(mm)

F-F SECTION   E-E SECTION

MOTOR TRNASPORT(kg/hr)
220/380V

PARAMETERS MODEL	W	PITCH	A	B	C	D	K	T	α	H	M	S	HP	VOLUME OF TRNASPORT(kg/hr)
SFCD	240	50,8	1813	107	3150	990	300	250	60	280	500	75	1/4	500

MOTOR TRNASPORT(kg/hr)
220/380V

PARAMETERS MODEL	W	PITCH	A	B	C	D	M	HP	VOLUME OF TRNASPORT(kg/hr)
SFCH	875	31,75	380	2106	2496	100	1075,1	1/4	500
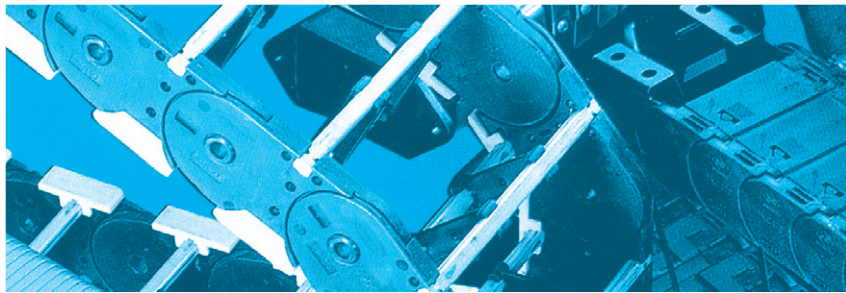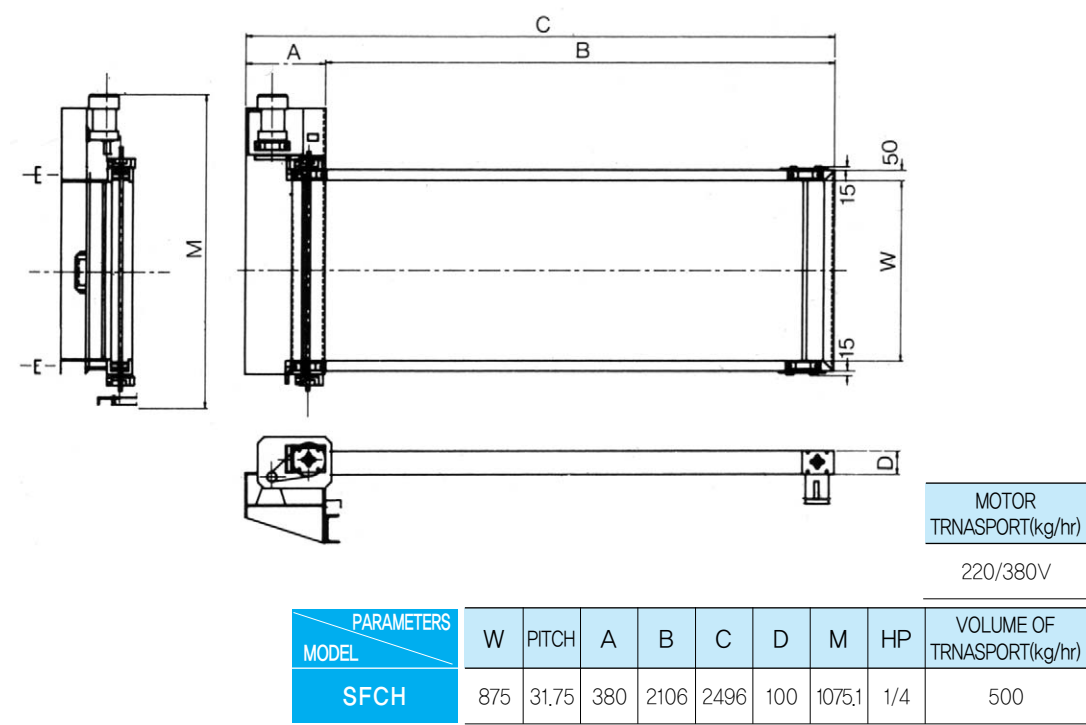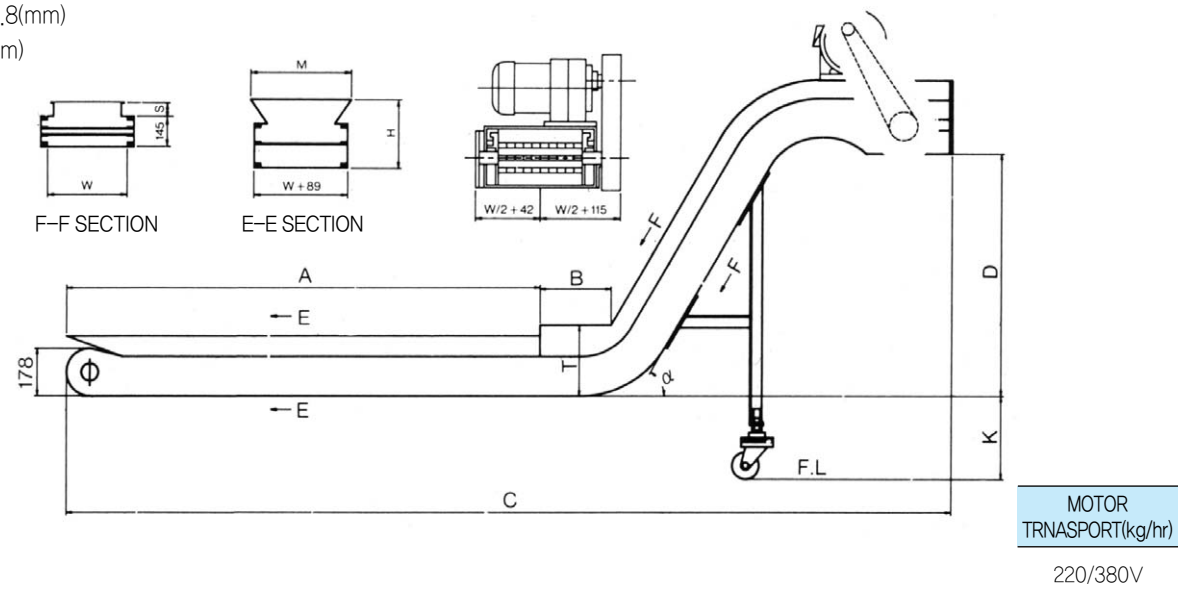
EXAMPLE

We are pleased to present some examples of SHINSUNG Cable carrier system aplications.
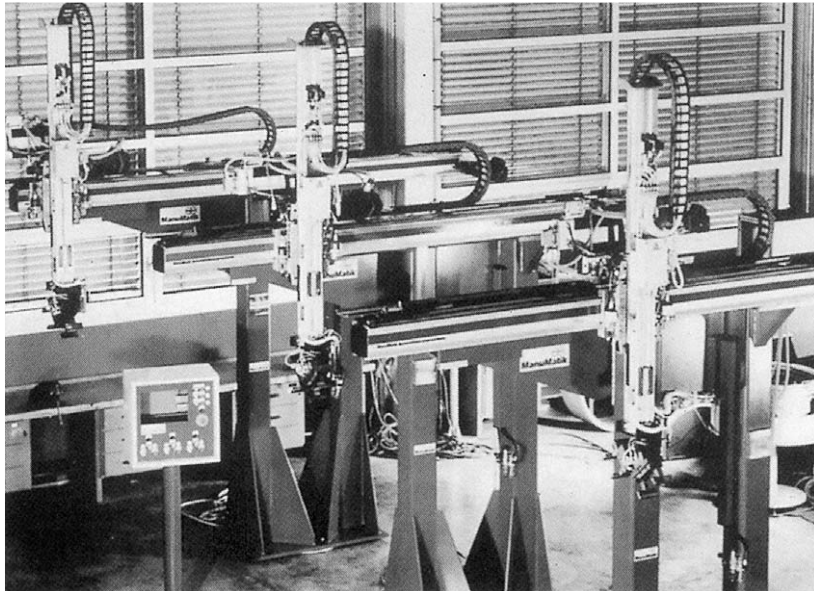
■ Cable Chains : Type SMO−0450
 − Portal robot
 • Installing variants: horizontal self−
  supporting−with admissible sagging and
  vertical−upright

■ Cable Chains : Type SMO−0625
 • Installing variants : horizontal−rotated by
  90˚ − winded up
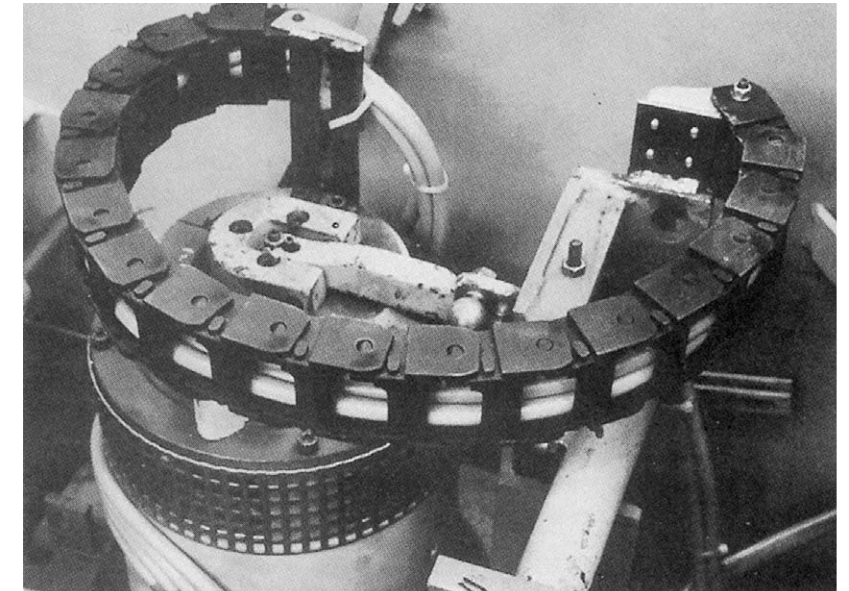
■ Cable Chains : Type SMO−0450
 − on a rotor spinner
 • Installing variants : horizontal sliding in a
 guiding channel
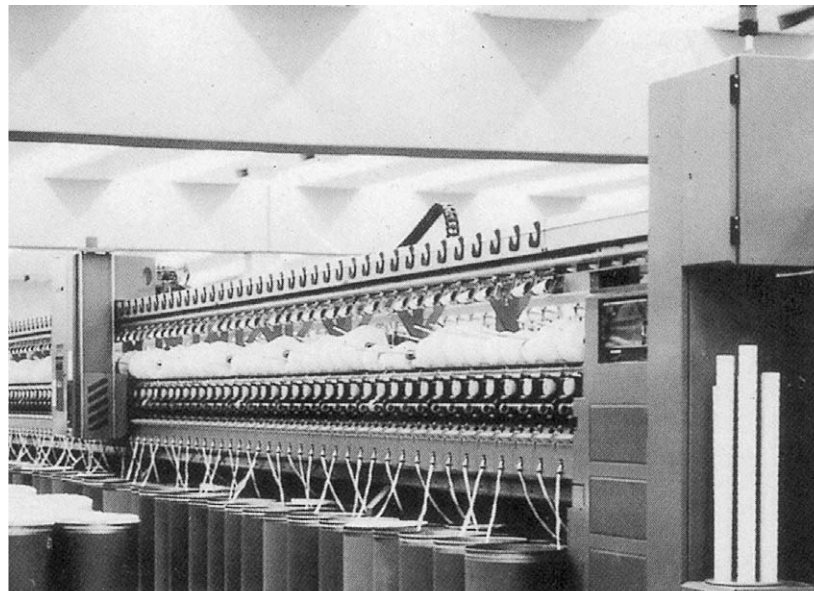
■ Cable Chains : Type SMO−0625
 − on a machining center
 • Installing variant : horizontal rotated by
  90˚ −staight
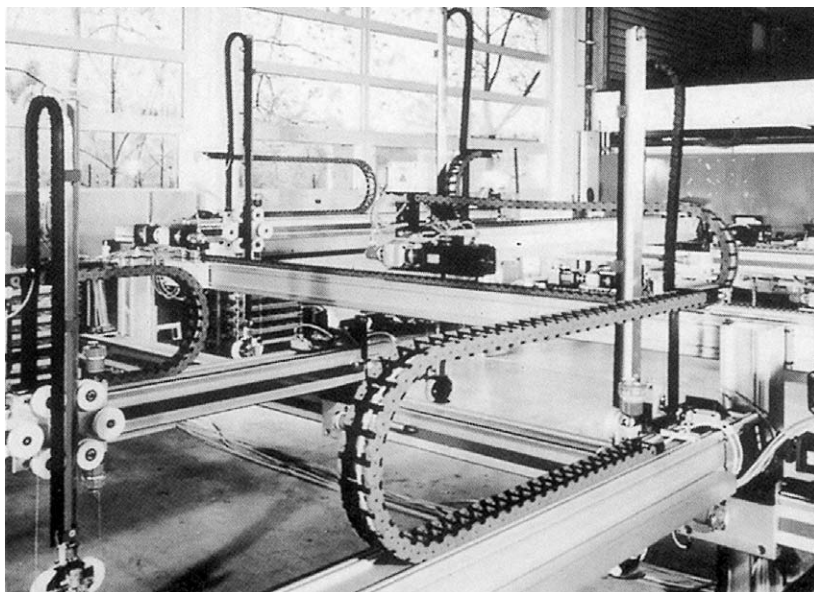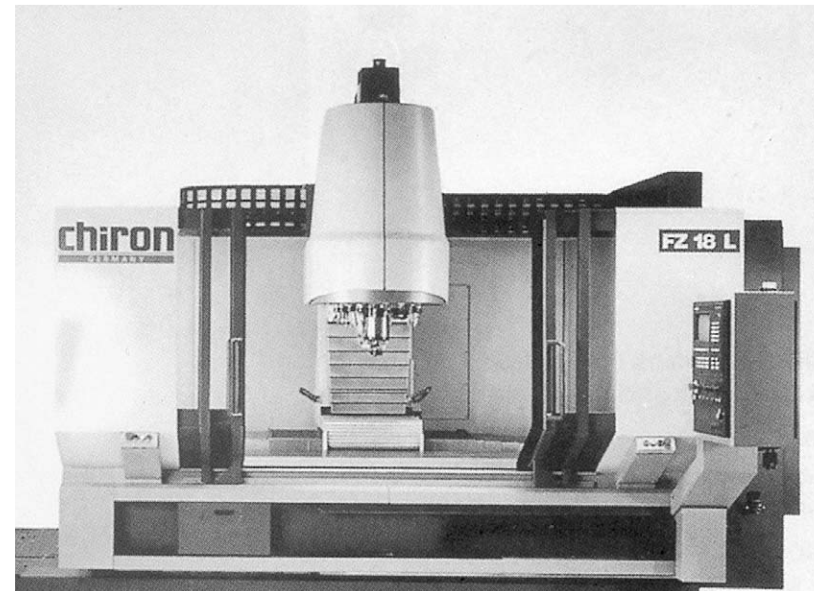
■ Cable Chains : Type SMO−0450
 − on 3−axes−portal with special Z zxis
 • Installing variants: horizontal self−
  supporting and vertical−upright

■ Cable Chains : Type SMO−0450
 Type SSC−3200 for the separtation of
 Cable/hoses in a steel cable drag chain
 type 3200 on a ZEUS detector
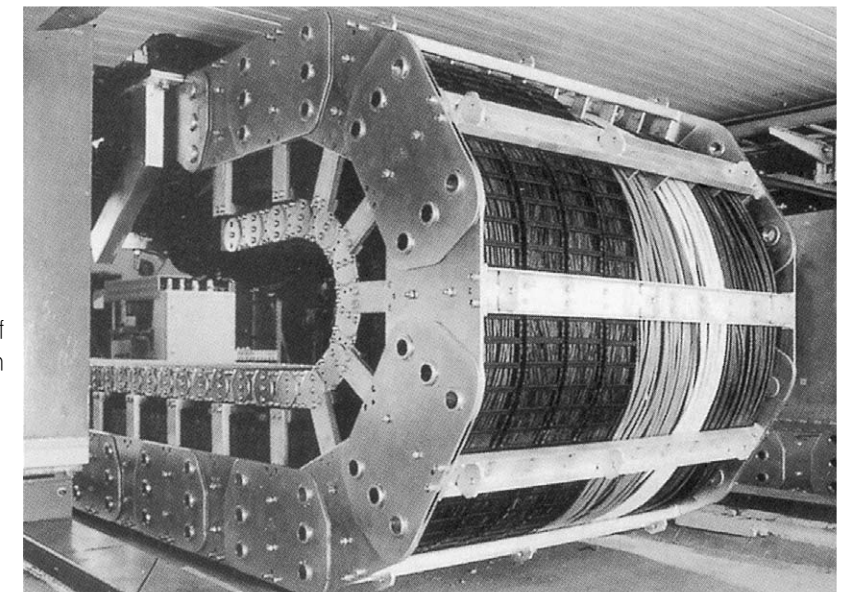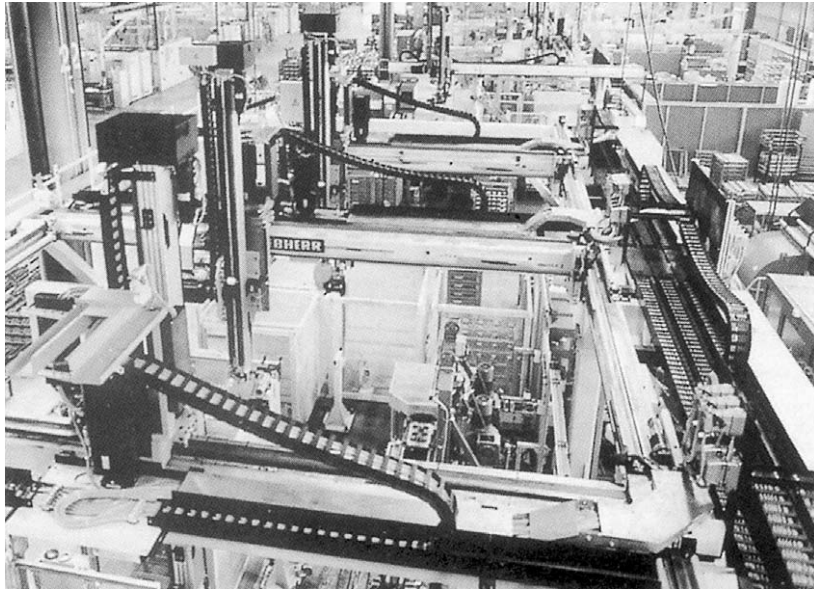
■ Cable Chains : Type SMO−0450
　　　　　　　　　Type SMO−0625
　− Type SMO−0625 on an automatic
　• Installing variants : horizontal sliding in a
　　guiding channel vertical/horizontal−
　　combined and vertical−suspended

■ Cable Chains : Type SMO−0625
　− flexible energy conduits SMO and
a steel cable drag chain on a machining
center Installing variants of cable drag
chains vertical−upright
Installing variant of the steel cabel drag
chain horizontal−self−supporting
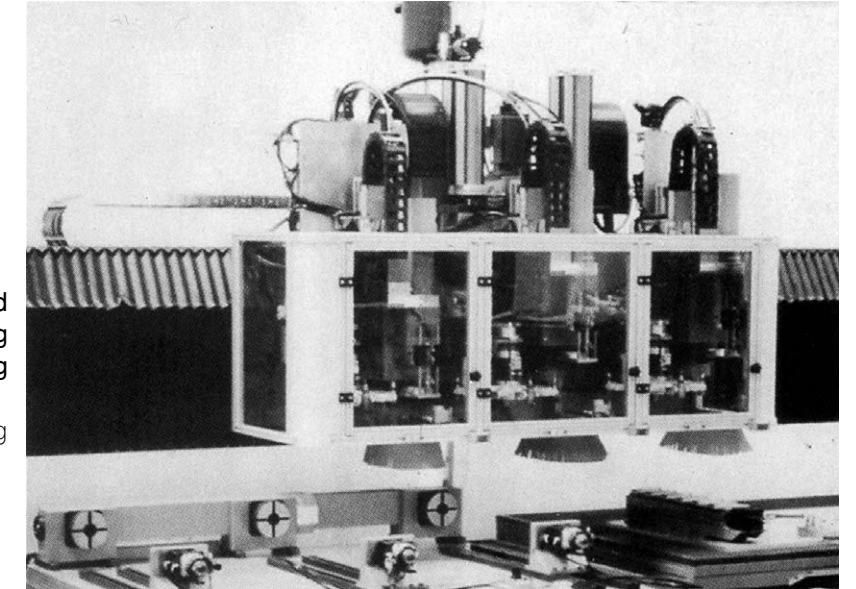
■ Cs Cable Chains : Type SMO−0625
　− on a tendem profile milling
machine
　• Installing variant : horizontal self−
　　supporting running inside each other
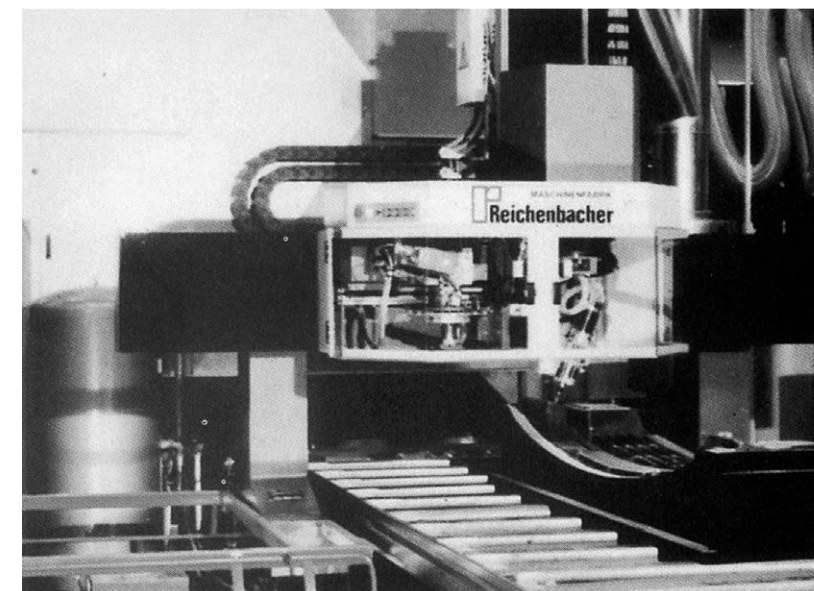
■ Cable Chains : Type SMO−0625
　− on a five−axes milling machine
　• Installing variant : horizontal self−
　supporting running inside each other and
　vertical−upright
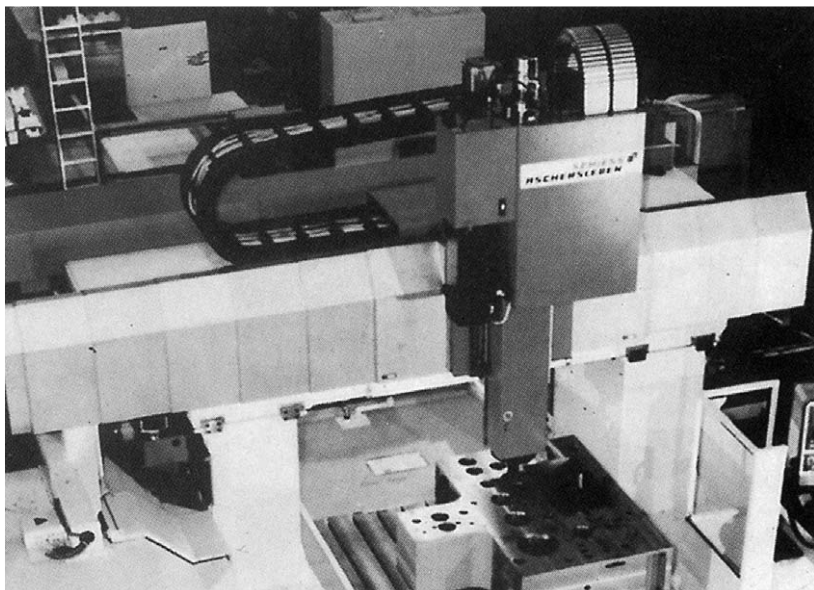
■ Cable Chains : Type SBC−0900 and
　　　　　　flexible energy conduits
　− SCF on NC milling machine
　• Installing variant : Cable drag chains
　horizontal self−supporting

■ Cable Chains : Type SMO−0625
　− on a wood working machine
　• Installing variants : vertical−sliding in a
　　guiding channel

SHINFLEX®
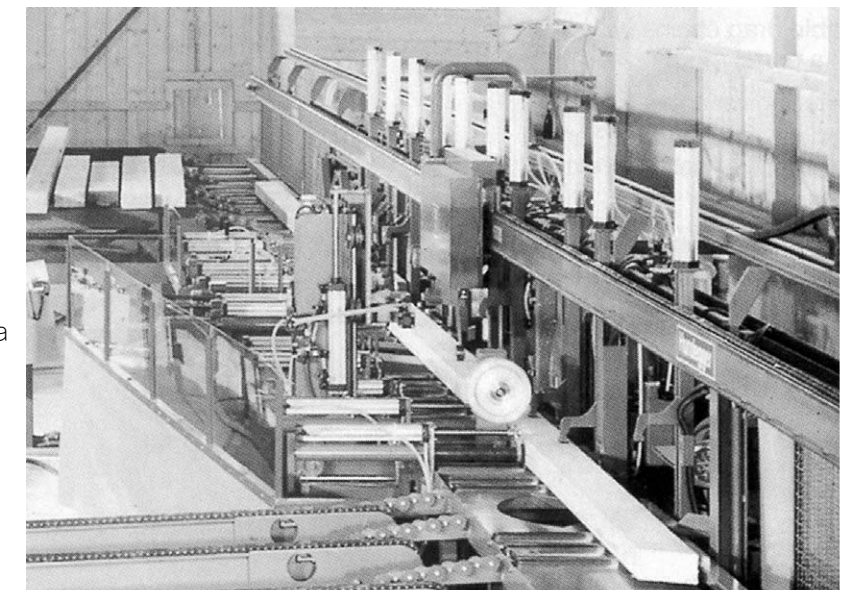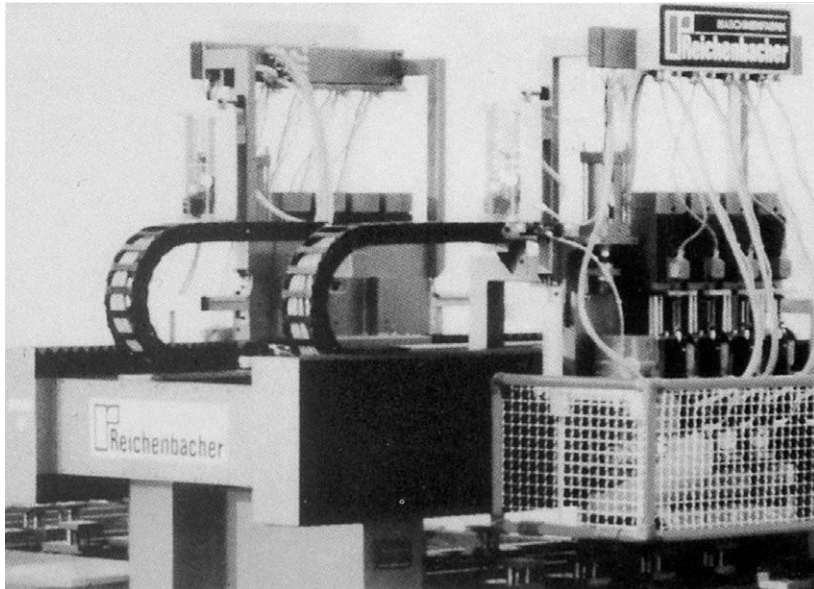
■ Cable Chains : Type SMO-0625
  - on a wood working machine
  • Installing variants : vertical - self -
    supporting

■ Cable Chains : Type SMO-0450,
              Type SMO-0625
  - on a portal robot
  • Installing variant : horizontal-sliding in a
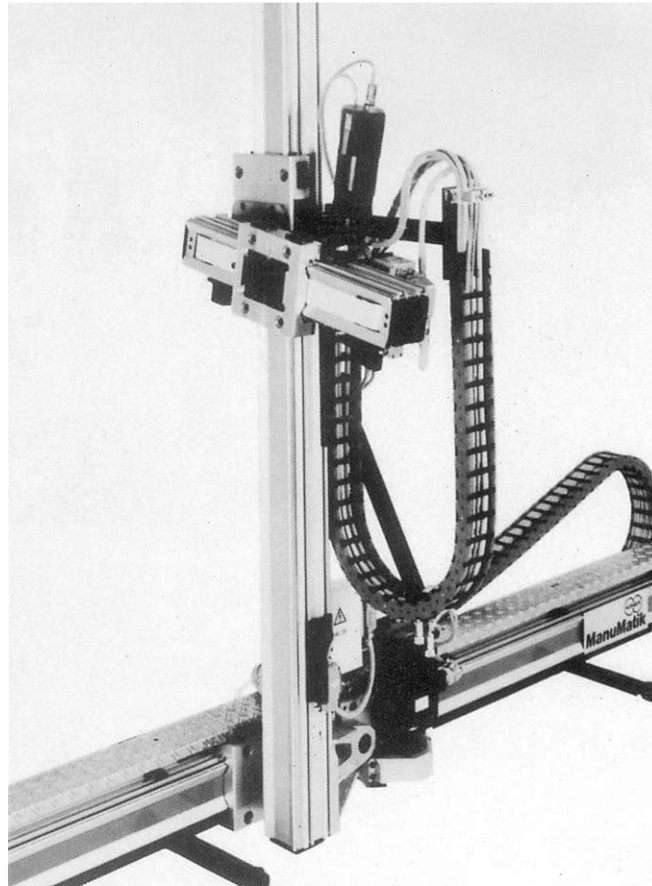   guiding channel and vertical-suspended
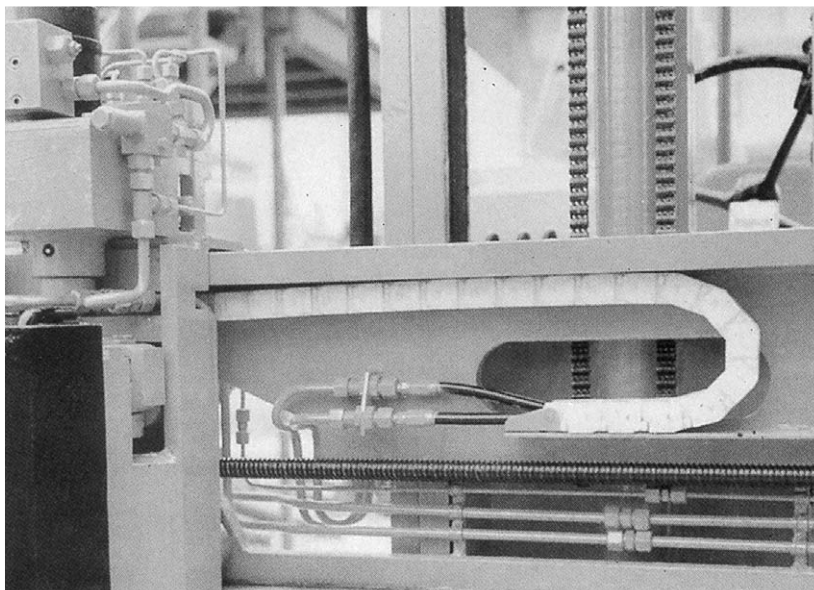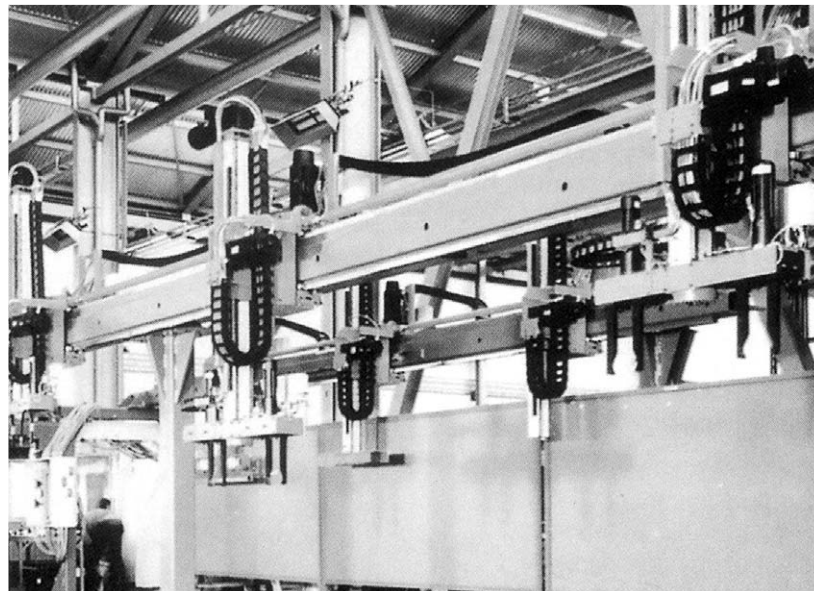
■ Cable Chains:Type SMO-0450
  - on a shelf operating device
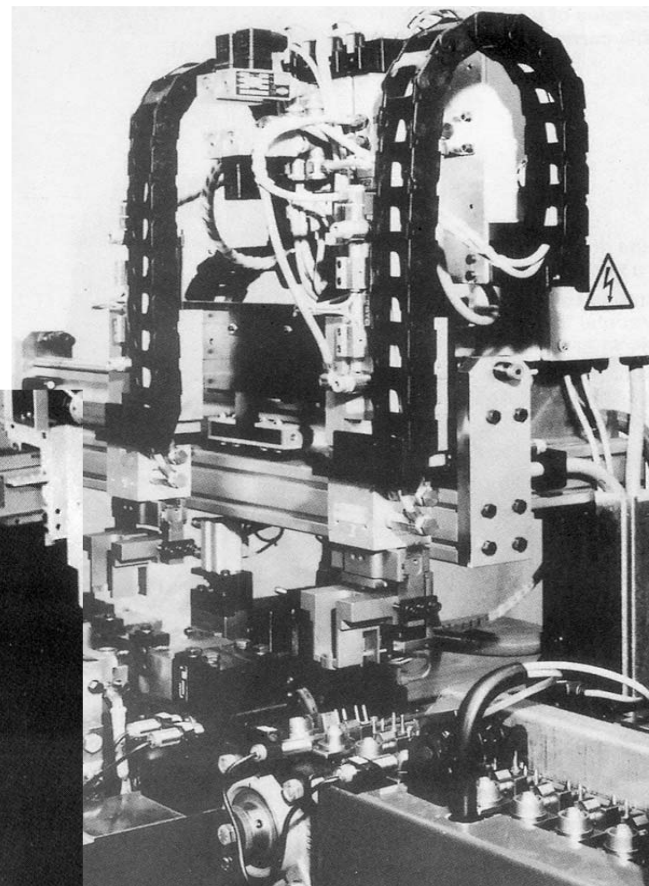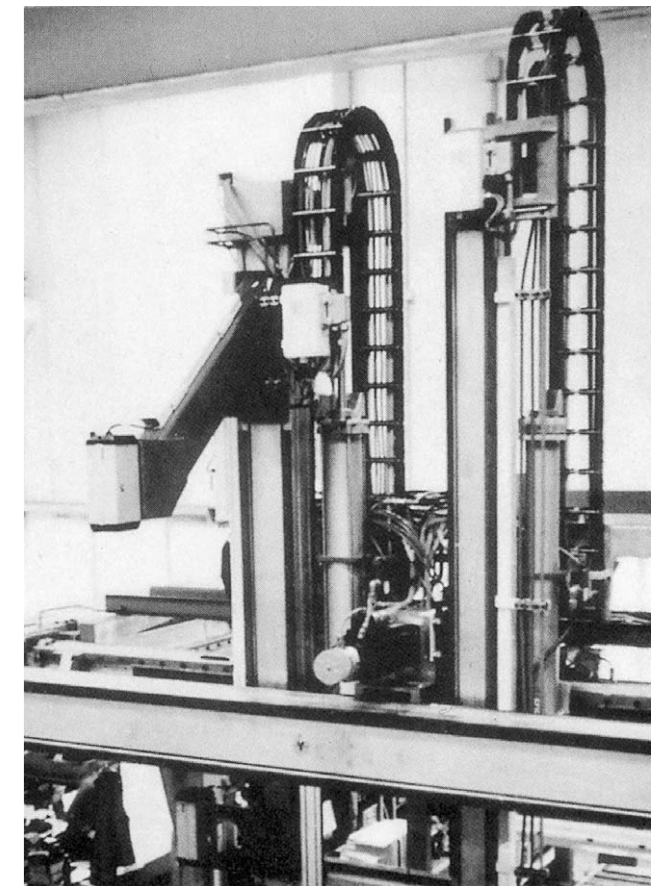 • Installing variant : vertical-self-supporting

■ Cable Drag Chains:Type SMO-0625
  - on a handing system
  • Installing variant : vertical-upright running side by side
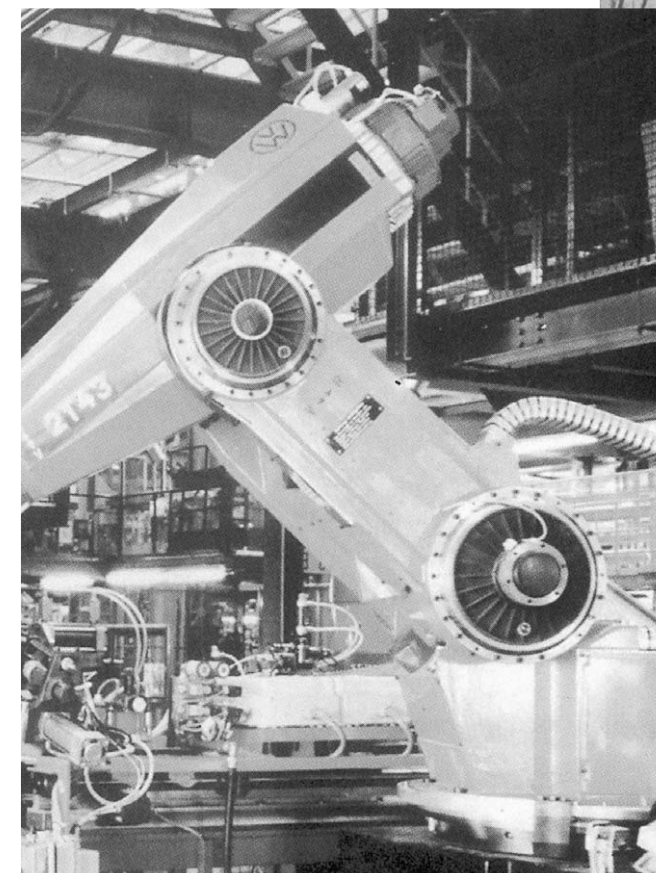
■ Cable Chains : Type SBC-0650
  - on a automatic stocking device
  • Installing variants : ertical-suspended
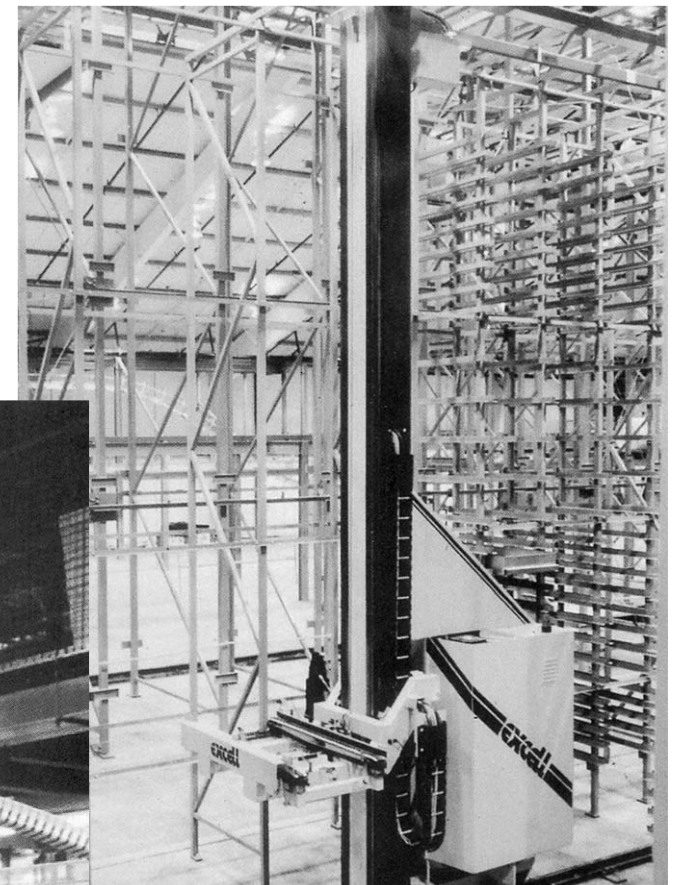
■ Flexible energy conduits SCF
  - on a assembling robot
  • Installing variant : horizontal vertical-
    combined

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■ Cable Chains : Type SMO-0450
 – on a test plant
 • Installing variants : horizontal sliding in a
  guiding channel and vertical-suspended

■ Cable Chains:Type SBC-0650
 – on a portal robot
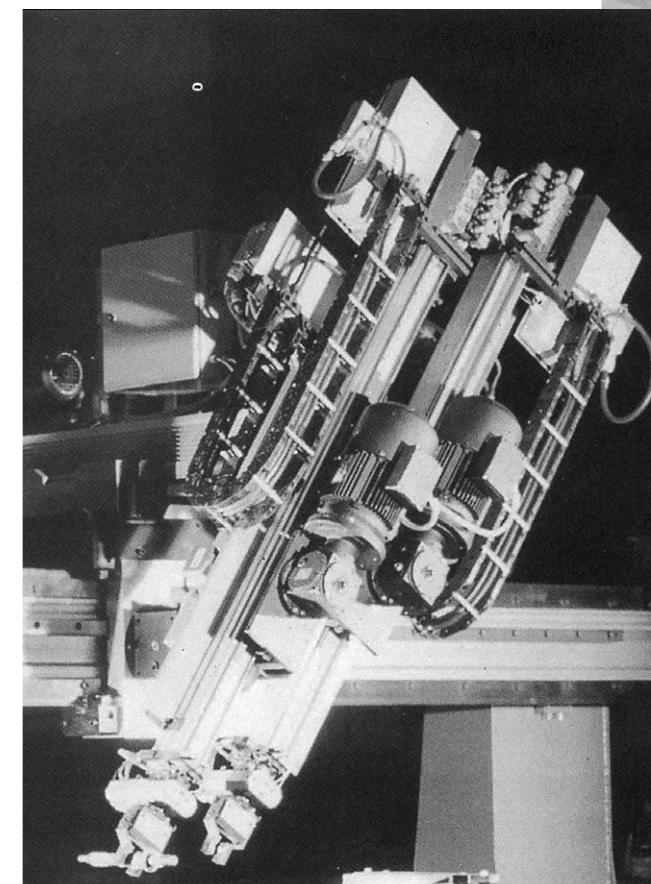 • Installing variants : upright horizontal

■ Cable Chains : Type SMO-0450
 – on a buckle welding machine for the
  manufacture of vehicle parto by means
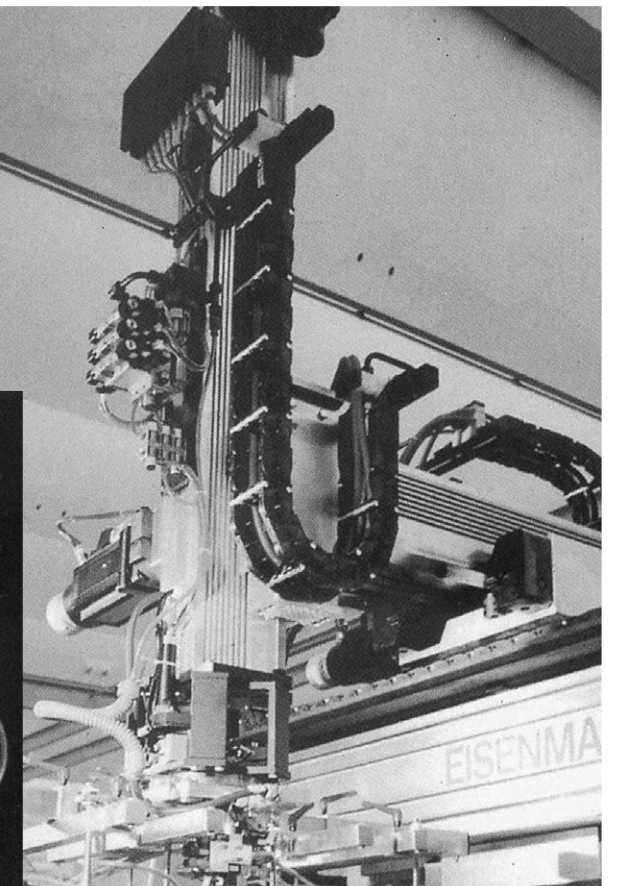 of movable transport pliers
 • Installing variant : vertical-upright
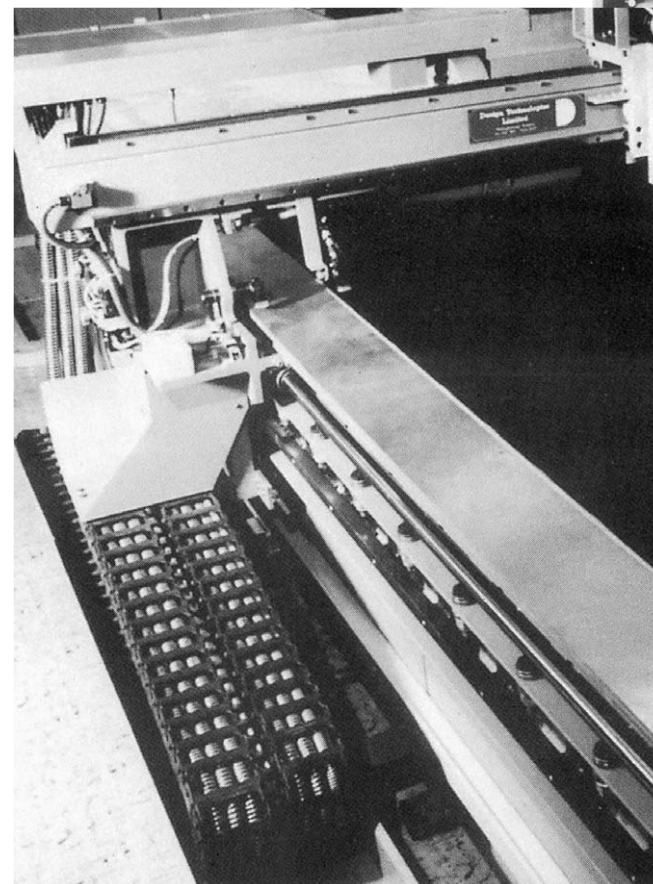
■ Cable Chains : Type SMO-0625
 – on a optical device
 • Installing variant: horizontal self-supporting
 running side by side

■ Cable Chains : Type SBC-0900
 –on a portal robot
 • Installing variant : vertical-suspended and
  horizontal self-supporting

■ Cable Chains : Type SBC-650
 – on a portal robot
 • Installing variants : vertical-suspended

■ **Flexible energy conduits SCF and plastic cable drag chains on the manufacturing center Tauro system**

• Installing variant : SCF in special desing and cable drag chains horizontal–sliding in a guiding channel
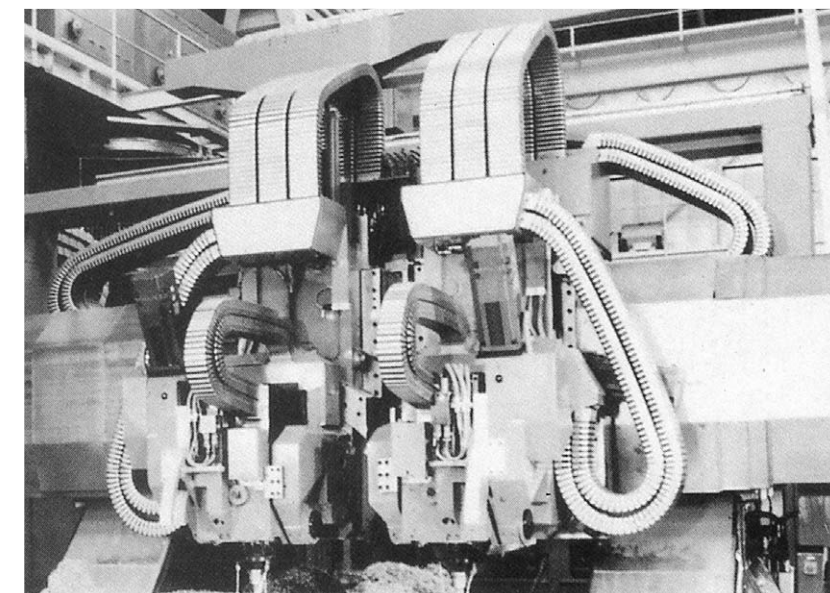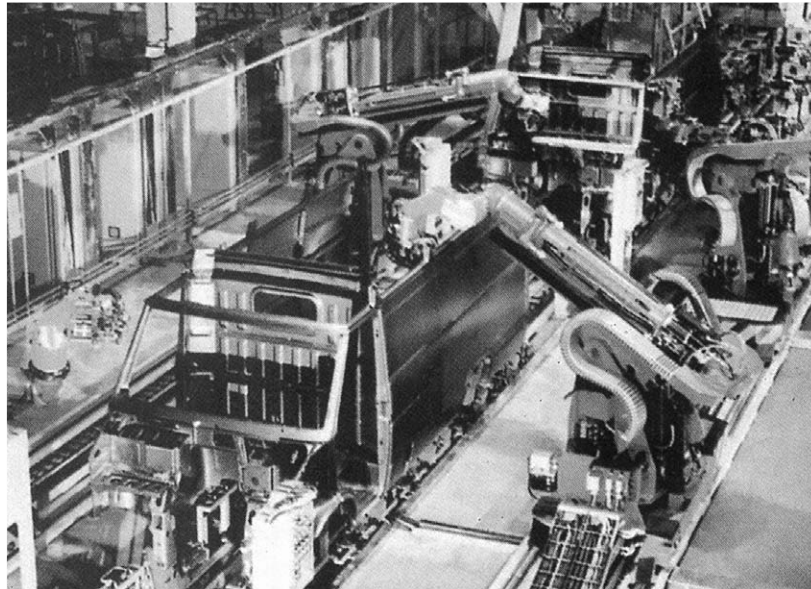
■ **Flexible energy conduits SCF and steel cable drag chains on a give axes milling machine**

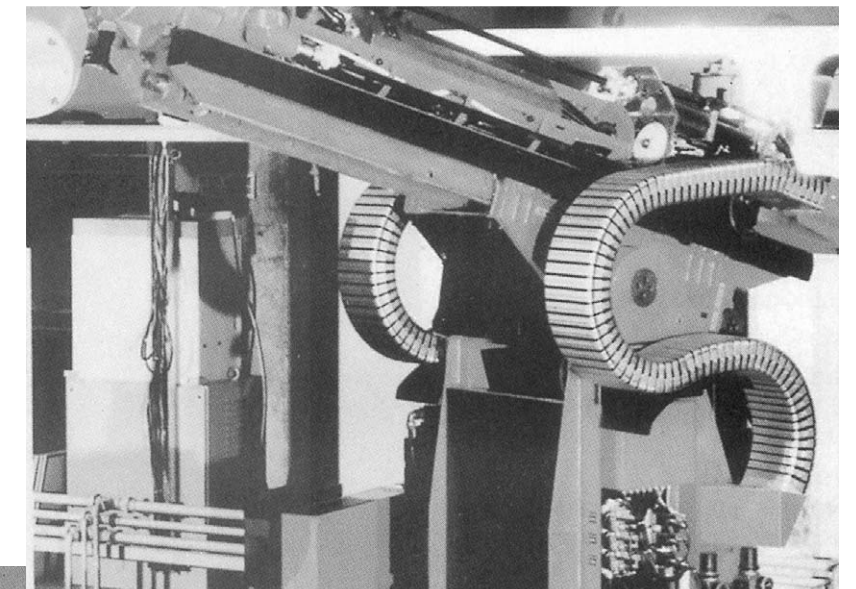• Installing variant : SCF vertical–upright vertical–suspended and vertical horizontal–combined

■ **Flexible energy conduits SCF on a system robot**

• Installing variant : special design horizontal vertical–combined
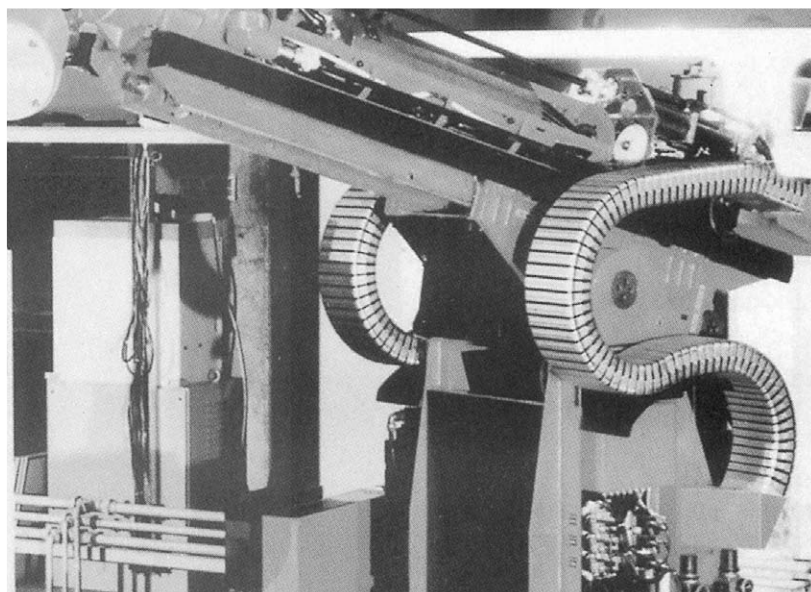
■ **Cable Drag Chains :**
• Type SMO–0320 for the energy supply to an operating automatic machine for textile machine Installing variants : horizontal self–supporting–overhanging

■ **Flexible energy conduits SCF** – on a full automatical binding tape remover
• Installing varian t: horizontal self–supporting and vertical–upright running side by side

■ **Flexible energy conduits SCF** – on a fives–axes milling machine
• Installing variant : vertical horizontal–combined