

Cable and Hose Guiding and Protecting Device

# SILVEYER® Series General Catalog



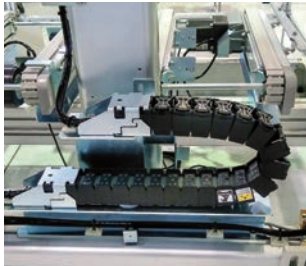
# Cable Chain: Its **Role** and **Function**

## What is a cable chain (cable and hose guiding and protecting device) ?

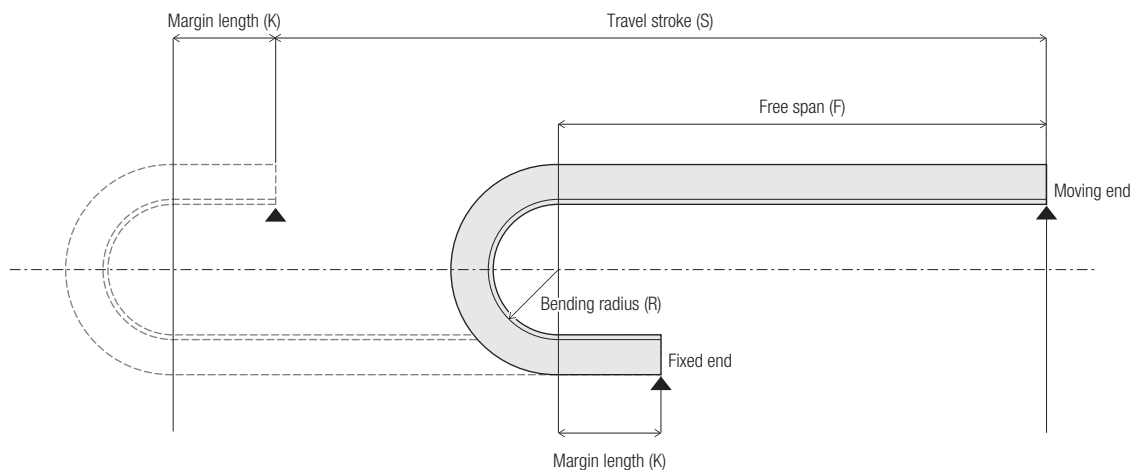
It refers to a device that collects, protects, and guides the cable wiring of moving parts, mainly in machine tools and industrial equipment.

Normally, when cables and hoses are connected to moving parts of equipment, the cables and hoses are subjected to twisting, pulling, and other loads as they move, preventing them from moving in a stable manner.

Cable chains, including SILVEYERS, are designed to protect such moving cables and hoses, and by storing them here, they can be supported and guided in an orderly manner and reciprocate their travel strokes without undue load.



## The function of cable chains



Name		Role
S	Travel stroke (mm)	Distance between two points where the moving part of the equipment (moving end of the cable chain) moves back and forth.
F	Free span (mm)	Distance between the fulcrums of the cable chain. The allowable length differs depending on the model number.
R	Bending radius (mm)	Radius at which the cable chain bends in a certain direction. There are variations depending on the model number.
K	Margin length (mm)	Cable chain allowance to absorb installation dimensional error.

※ The free span (F) can be obtained by the following equation: travel stroke (S)/2 + Margin length (K) ( $F = S/2 + K$ )

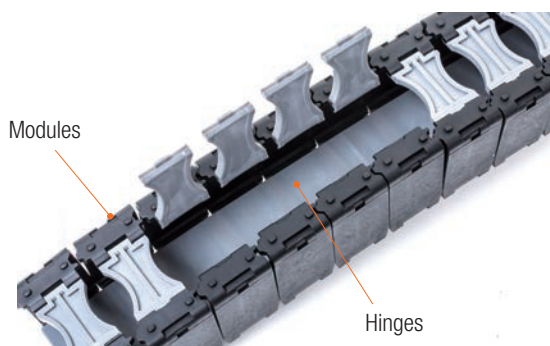
# What is SILVEYER?

SILVEYER is a cable chain that is **integrally molded** with our unique

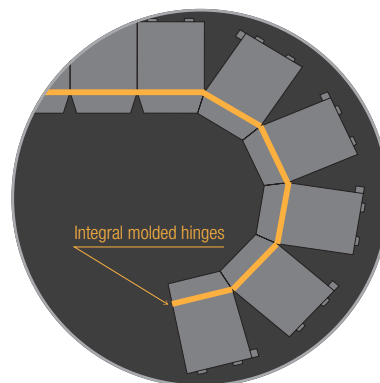
## What is SILVEYER ??

SILVEYER is a link-less cable chain made using our own complex continuous integral molding technology. Unlike the link type that is connected at the shaft and hole, the link-less structure is adopted in which the hinge part is connected. The absence of friction parts, low dust generation, and quiet operation make this product ideal for locations and equipment that require high environmental characteristics (low noise, low vibration, low dust generation, and low wear).

※ " SILVEYER " is a coined word combining the words "silent" and "conveyor."



< Complex Continuous Integral Molding > complex continuous integral molding

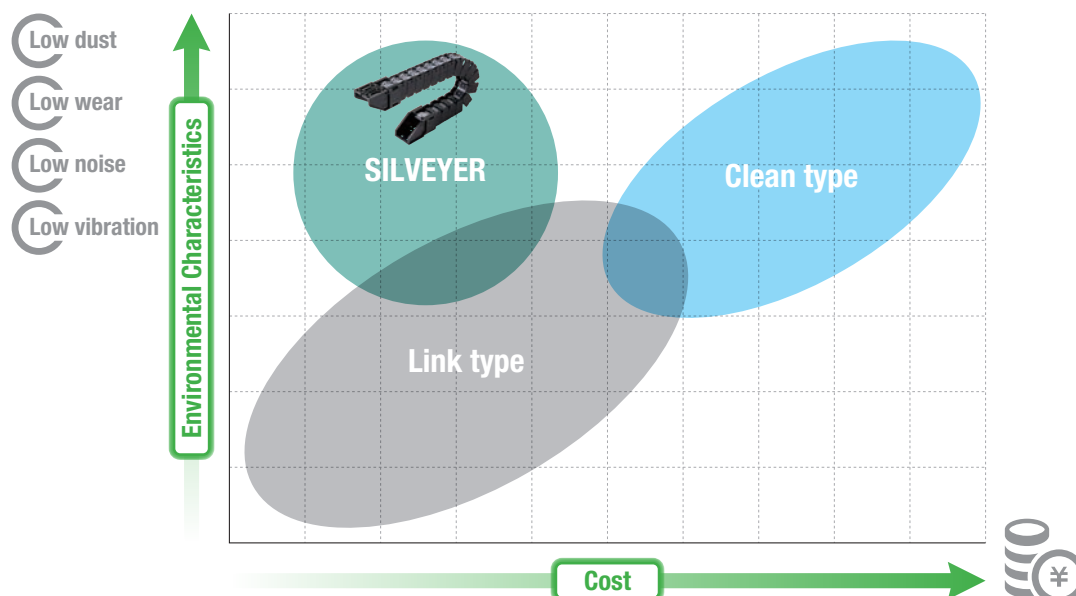


SILVEYER

## Responding to Environmental Characteristics

Cable chains are generally divided into link types and clean types.

The type is selected according to the application, but from a cost standpoint, the clean type is more expensive due to its structure. The SILVEYER is a revolutionary cable chain with a unique structure and original manufacturing method that offers high environmental characteristics at a low cost and can be used for all kinds of applications.





## Linear Motion Type

### High environmental characteristics

[ Applications ]

Semiconductor manufacturing equipment, Printing machines, Inspection and measurement equipment, Food manufacturing equipment, Conveying equipment, Machine tools, etc.

## Linear Motion Type

### For Economical and light-load equipment

[ Applications ]

ATMs, Inspection and measurement equipment, Ticket-vending machines, Amusement equipment, Packaging machines, etc.

## Flexible Type

### For three-dimensional orientation equipment

[ Applications ]

Articulated robots, etc.

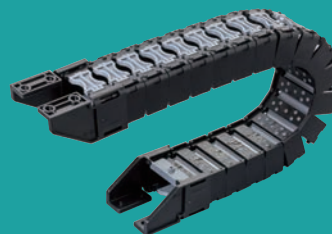


## Link-less Cable Chain

### SILVEYER®

Low noise Low wear Low dust Low vibration

High environmental characteristics are achieved by using a link-less structure using our own complex continuous integral molding technology.



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## High Rigidity Long Life Link-Less Cable Chain

### SILVEYER® Tough

Low noise Low wear Low dust Low vibration High rigidity Long life

Rigidity and service life have been improved while maintaining the smooth bending characteristics of the SILVEYER.

Equipped with a horizontal partition as standard, it allows wiring to be stored separately without any hassle.



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## Economical Cable Chain

### SILVEYER® Light

Ultra-light weight Light load

The main unit and cover are integrated into a single structure, allowing cables to be stored without the need for tools.

Lightweight material makes it ideal as a cable chain for light-load equipment.



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## Flexible Cable Chain

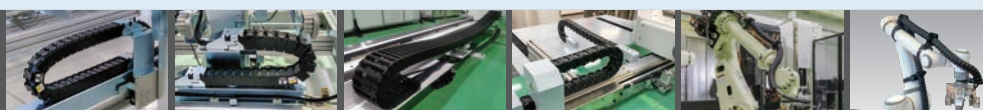
### SILVEYER® Flex

Three-dimensional

Our own complex continuous integral molding technology. (skeleton structure) is used for smooth and complex three-dimensional movement.



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The SILVEYER series uses plastic materials compliant with the RoHS Directive.



The SILVEYER series uses plastic materials equivalent to UL Standard: UL94HB.

## Introduction of Cable and Hose Guide Protection Devices



~ Cable and Hose Guide Protection Devices ~

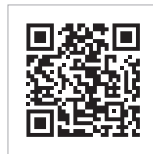


<https://www.stertec.co.jp/~kunimori/silveyer/>

## Video Site



Subscribe to our channel!



- The movements that are difficult to understand in the catalog are clearly shown at a glance!
- Please make use of the "Video Site" of the SILVEYER series.



[/ KUNIMORIKAGAKU](#)

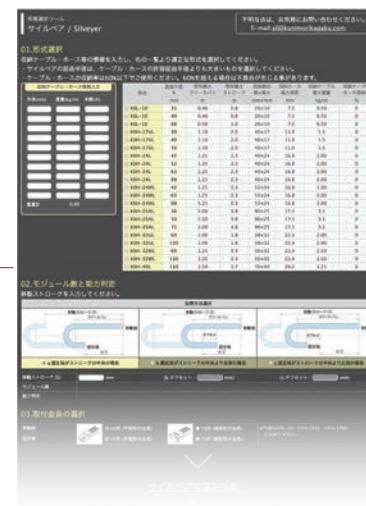
Search

## SILVEYER® Series Dedicated Site



### Model Number Selection Tool

- Quickly find out which model number to use!
- Please use the "Model Number Selection Tool".



SILVEYER



SILVEYER Tough



SILVEYER Light



### Drawing Download

- Drawings can be used for designing!
- Please utilize "Drawing Download".
- The data format is as follows.
- 2D : DXF  
3D : IGES / STEP / Parasolid / ACIS

## Link-less Cable Chain

## SILVEYER®

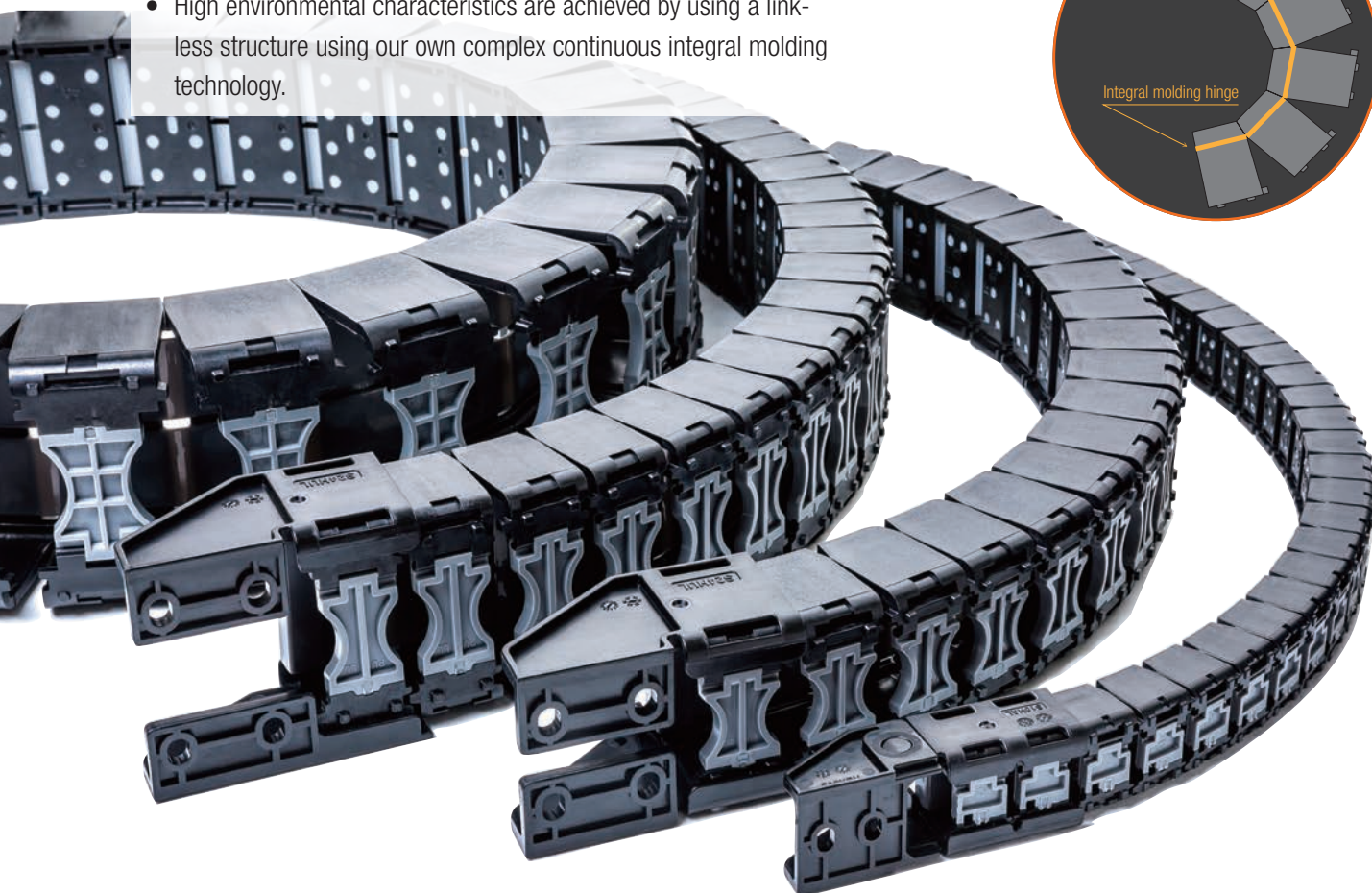
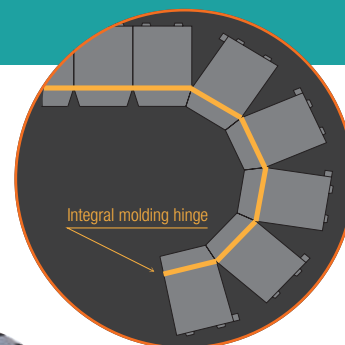
Low noise

Low wear

Low dust

Low vibration

- High environmental characteristics are achieved by using a link-less structure using our own complex continuous integral molding technology.



## Low noise and low vibration

Our product's unique structure eliminates the fluttering seen in link-type machines, resulting in smooth operation and a significant reduction in noise and vibration.

Vibration noise  
(compared to link type)

Approx.

25%

Reduction



[ In-house measured value ]

Vibration  
(compared to link type)

Approx.

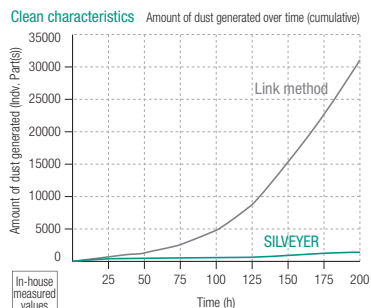
90%

Reduction



## Low dust generation

The link-less structure generates little dust, making it ideal for use in cable guidance systems in clean rooms.



[ Test conditions ]

Operating speed : 1 m/s

Measuring range : 0.5 μm to 5 μm

## Easy handling

The KSH type has a retractable cover for easy storage of cables and hoses.

When additional cables or hoses are required due to machine construction or other reasons, parallel joints (parallel fixtures) can be used to easily add additional SILVEYERs of the same height and bend radius.



## Excellent durability

The link-less structure has no parts that wear or slide, eliminating rattling due to abrasion.



# SILVEYER® | Specifications List

SILVEYER®	Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed
		(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)
	KSL-10	10	20	20	25	31	16.5	460	800	3
						40		460	800	
						68		560	1000	
	KSH-10T	10	20	20	25	31	16.5	460	800	3
						40		460	800	
						68		560	1000	
	KSH-17VL	17	40	30	46	30	20	1100	2000	3
						40				
						50				
	KSH-20UL	20	30	34	36	30	20	1100	2080	3
						40				
						65				
	KSH-20XL	20	65	34	71	30	20	1150	2180	3
						40				
						65				
	KSH-24L	24	40	36	46	42	24	1250	2300	3
						52				
						63				
						88				
	KSH-24WL	24	55	36	61	42	24	1250	2300	3
						52				
						63				
						88				
	KSH-25AL	25	90	42	97	36	23	2000	3800	3
						50				
						75				
	KSH-32UL	32	38	45.5	46.5	60	28	1000	1800	3
						110				
	KSH-32WL	32	50	45.5	58.5	60	28	1250	2300	3
						110				
	KSH-40L	40	70	54	77	110	40	1500	2700	3

## Resin bracket

### ■ Flat mounting



HS configuration | Outer mounting

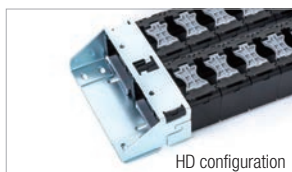
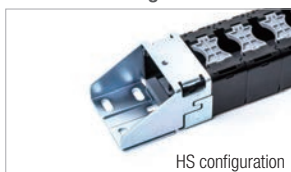


HS configuration | Inner mounting

Storage Cable/Hose		Weight of the SILVEYER (kg/m)	With/without retractable cover	Mounting bracket					Optional parts		
Maximum diameter	Maximum weight			Resin (Flat /HS configuration)	Metal (Flat /HS configuration)	Metal (Flat /HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)	Parallel joint	Separator (vertical partition)	M joint
(mm)	(kg/m)										
Ø 7.0	0.50	0.25	—	●	●	●	—	—	●	—	—
Ø 7.0	0.50	0.25	●	●	●	●	—	—	●	—	—
Ø 11.9	1.50	0.45	●	●	—	—	—	—	—	●	●
Ø 14.0	1.50	0.39	●	●	—	—	—	—	●	—	—
Ø 14.0	2.00	0.58	●	●	—	—	—	—	●	●	—
Ø 16.8	2.00	0.55	●	●	●	●	●	●	●	●	●
Ø 16.8	2.00	0.64	●	●	●	●	●	●	●	●	●
Ø 17.5	3.50	0.97	●	●	—	—	—	—	—	●	●
Ø 22.4	2.00	0.65	●	●	●	—	—	—	●	—	●
Ø 22.4	2.50	0.74	●	●	●	—	—	—	●	●	●
Ø 28.0	3.25	1.04	●	●	●	●	●	●	●	●	●

## Metal Bracket

### ■ Flat mounting



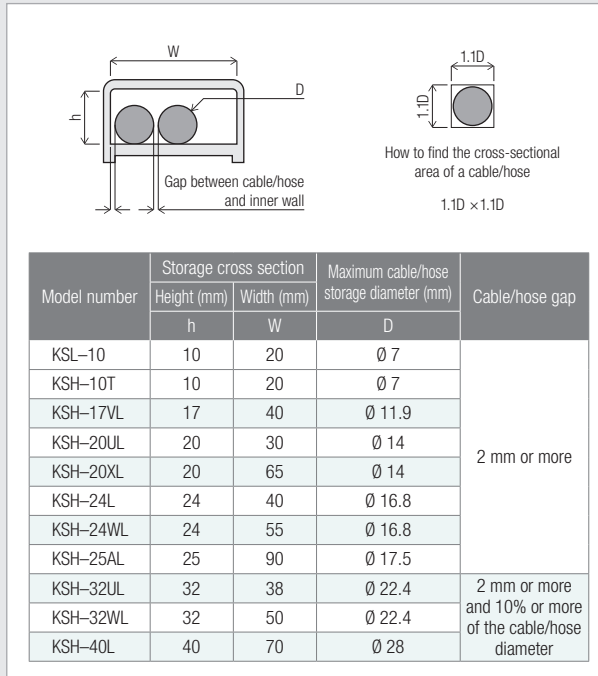
### ■ End mounting



## 01

### Storage cross section

■ The "outer diameter" and "number" of cables and hoses to be stored in the SILVEYER should be determined according to the following.



#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be set to **60% or less** of the cross-sectional area of the SILVEYER storage.

$$\text{Cross-sectional area for storage (h} \times \text{W)} \times 60\% \geq \text{Cross-sectional area of cable/hose (1.1D} \times \text{1.1D)}$$

#### [ How to find the cross-sectional area of cable/hose ]

Calculate the cross-sectional area as a square with an increase of 10% of the cable/hose diameter. Calculate the cross-sectional area of flat cables in the same way.

(e.g.) For a diameter D: Cross-sectional area of cable/hose = 1.1D × 1.1D

#### 2 Securing the gap between cables/hoses

Secure the gap between cable/hose and inner wall and between cable/hose under the following conditions.

The gap between cables/hoses	The gap between cables and hoses shall be at least <b>2mm</b> and at least <b>10%</b> of the diameter of the cable or hose.
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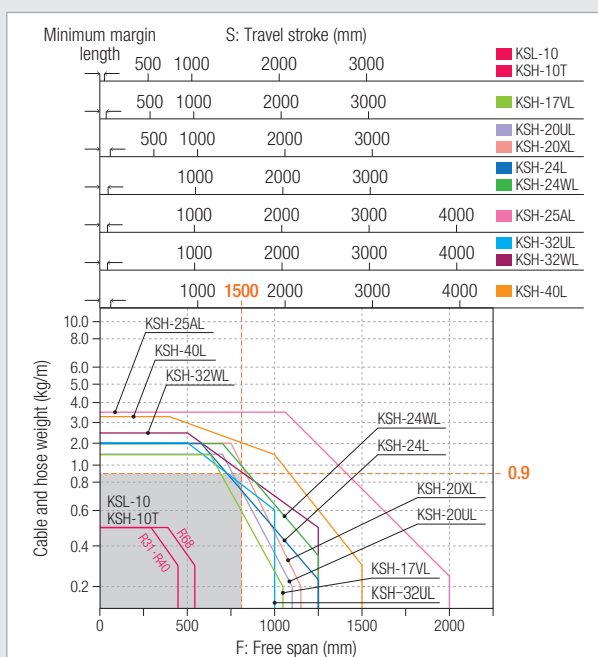
- ※ Use cables and hoses in parallel and do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

## 02

### Capacity Diagram

■ Always use the SILVEYER **within the range of the capacity diagram**.

Use of a SILVEYER beyond the range of the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



#### How to read the capability diagram

The following example shows how to read the capacity diagram.

Travel stroke: 1,500 mm  
Weight of cable hose: 0.9kg/m  
Cable hose bending radius: R50mm

- Select the model number from **the maximum weight of stored cables and hoses**. (P8, 9)
  - Select the model number from **the bending radius** of the SILVEYER. (P8, 9)
- ※ The allowable bending radius of cable and hose shall be smaller than the allowable bending radius of the SILVEYER.

$$\text{Allowable bending radius of SILVEYER} > \text{Cable and hose allowable bending radius}$$

- Draw a vertical line at the **1,500mm travel stroke position** on the capacity diagram.
- Draw a horizontal line at the position where **the cable/hose weight is 0.9 kg/m** on the capacity diagram.
- Select a model number within the range of the intersection. In this case, the following can be used.

KSH-24WL : R63 - R88      KSH-25AL : R75  
KSH-32WL : R60 - R110      KSH-40L : R110

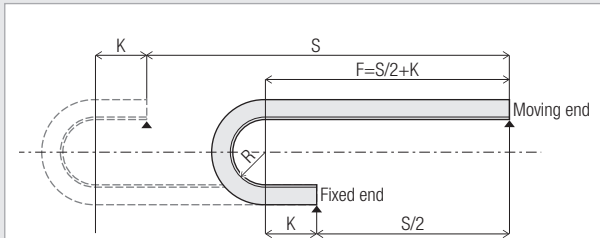
- Calculate the outer diameter and number of cables and hoses that can be accommodated in the model number selected in (5) from the storage cross section. If there is space in the equipment, select a larger model number.
- ※ Even if the travel stroke is 1,500 mm, the free span may vary depending on the installation position of the SILVEYER. If the fixed end is not in the center of the stroke, be sure to check that the free span is within the range shown in the capacity diagram.





## 03 Calculation of number of modules

■ The number of **modules (m)** should be calculated according to the following formula.



Model number	Pitch (mm)	Margin length (mm)
	P	K
KSL-10	16.5	64 or more
KSH-10T	16.5	64 or more
KSH-17VL	20	80 or more
KSH-20UL	20	60 or more
KSH-20XL	20	60 or more
KSH-24L	24	92 or more
KSH-24WL	24	92 or more
KSH-25AL	23	92 or more
KSH-32UL	28	84 or more
KSH-32WL	28	84 or more
KSH-40L	40	120 or more

□ Formula for calculating the number of modules

$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ When the fixed end is in the center of the stroke ]

m	Number of modules	The number of modules is rounded up to the nearest whole number.
S	Travel stroke (mm)	
P	Pitch (mm)	
F	Free span (mm)	
R	Bending radius (mm)	
K	Margin length (mm)	

(e.g.) Model Number KSH-24L (P: 24 mm, R: 42 mm)

Travel stroke (S: 1200mm)

$m = ((1200/2) + (\pi \times 42) + (2 \times 92)) / 24 = 38.16$

Required number of modules = 39

## 04 Nominal model number

■ Please order the selected SILVEYER according to the following nominal model number.

(e.g.) In the case of ordering a complete set of the following nominal model numbers ① to ④ ...

① SILVEYER KSH-24L / R42 / 40 module ... 1 Indv. part

② Flat mounting bracket / metal ... 1 Indv. Part

③ End mounting bracket / metal ... 1 Indv. Part

④ End caps ... 2 Indv. Parts (accessory)

**Ordering Example: 1- KSH - 24L - 42 - 40 - HS - TS**

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select the mounting bracket from HSP/HSUP/HSLP (resin) or HD/TD (metal).

Number of SILVEYER	Model number	Bending Radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-24L	42	40	HS	TS
1 Single-row	KSL-10	Selected from bending radius	Obtained from calculation	HSP Flat Resin Outer and inner side	HSP Flat Resin Outer and inner side
2 Parallel: 2 pcs (※)	KSH-10T	30 R30		HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
	KSH-17VL	31 R31		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
	⋮	40 R40		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side
	KSH-24L	42 R42		HD Parallel flat Metal Outer and inner side	HD Parallel flat Metal Outer and inner side
	⋮	⋮		TS End Metal End	TS End Metal End
	KSH-40L	110 R110		TD Parallel end Metal End	TD Parallel end Metal End
		See P8 and P9			

### When mounting brackets are not required

※ Please purchase parallel joints separately when using parallel specifications. (Optional accessory)

Model number	Bending Radius	Number of modules
KSH-24L	42	40
KSL-10	Selected from bending radius	Obtained from calculation
KSH-10T	30 R30	
KSH-17VL	31 R31	
⋮	40 R40	
KSH-24L	42 R42	
⋮	⋮	
KSH-40L	110 R110	
	See P8 and P9	

Example of model number configuration

## KSL-10 KSH-10T

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Mounting bracket (metal)	Iron (trivalent) chromate
	Parallel joint	Nylon
	Separator (vertical partition)	—
	M-joint	—
M-joint	M-joint	—
	Spring plate	—
	Additional SILVEYER	—
Operating temperature range		-20°C ~ +85°C
Constant length		1000 modules (total length of 16.5m)

※ Do not use in acidic or alkaline atmospheres.

Main unit and cover model

KSL-10

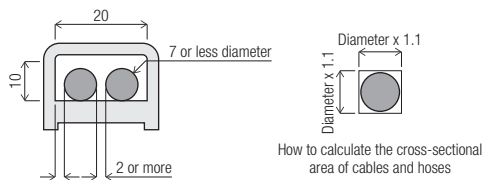
Cable storage open/close  
cover model

KSH-10T

Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/ without openable cover	Mounting bracket					Optional parts			
													Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)	Parallel joint	Separator (vertical partition)	M joint	
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)		(kg/m)								
KSL-10	10	20	20	25	31	16.5	460	800	3	Ø 7.0	0.50	0.25	-	●	●	●	-	-	●	-	-
					40		460	800													
					68		560	1000													
KSH-10T	10	20	20	25	31	16.5	460	800	3	Ø 7.0	0.50	0.25	●	●	●	●	-	-	●	-	-
					40		460	800													
					68		560	1000													

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (200mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

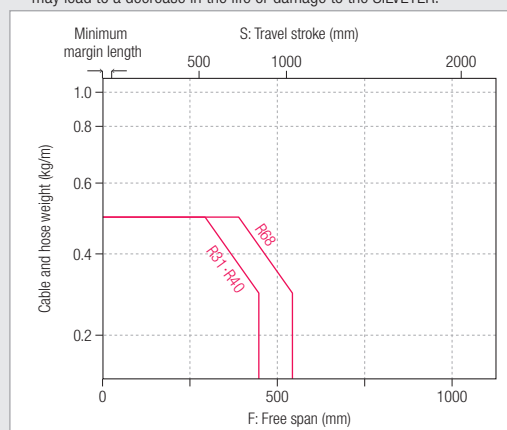
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

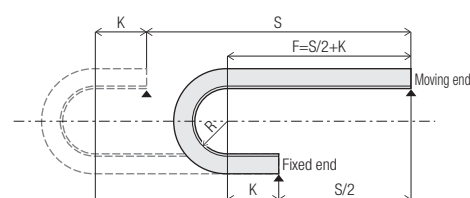
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



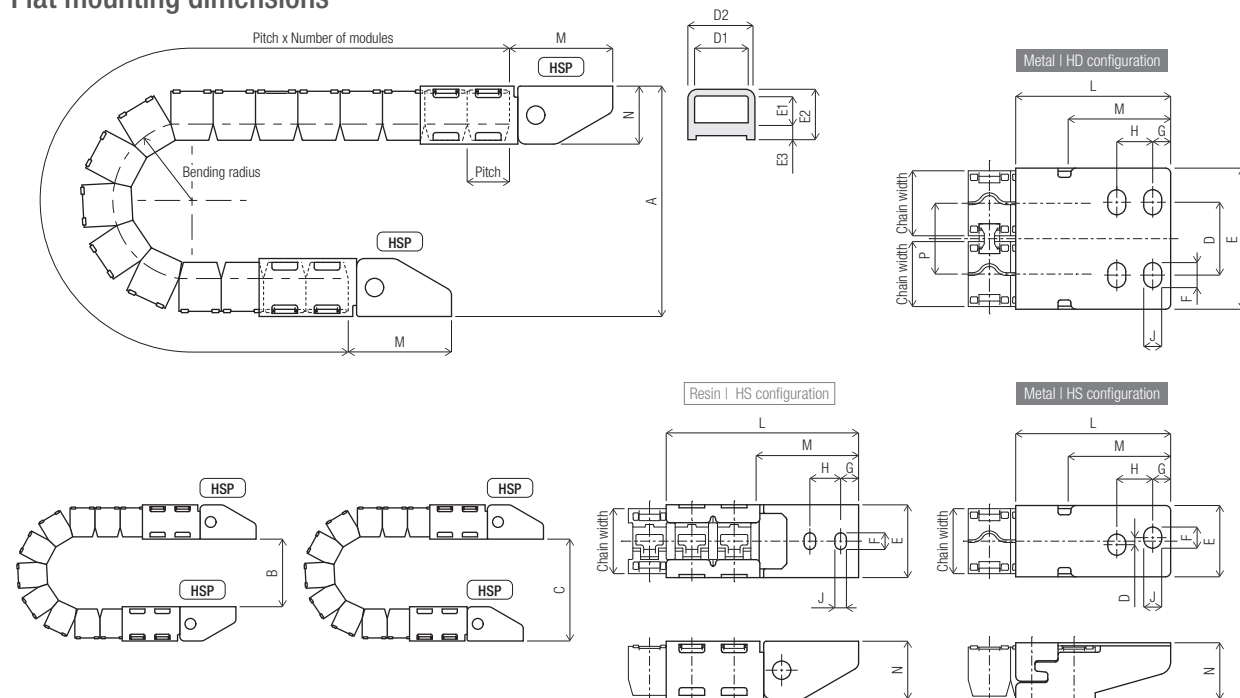
[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

$$m = \frac{S / 2 + \pi R + 2K}{P}$$

Pitch (mm)	Margin length (mm)
P	K
16.5	64 or more

## Flat mounting dimensions



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSL-10 KSH-10T	31	102 ~ 112	57 ~ 67	80 ~ 90	20	25	10	20	6.5	25	16.5
	40	120 ~ 130	75 ~ 85	98 ~ 108							
	68	176 ~ 186	131 ~ 141	154 ~ 164							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH10HSP	—	29	6.5	7	12	4.5	75	40	23	For both outer and inner side	10g



## Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH10HS	2.75	28	8	7	14	7	60	29	22	—	For both outer and inner side	44g
KSH10HD	28.4	55	10	7	14	7	60	29	22	28	For both outer and inner side	71g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSP (plastic) or HD (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSL-10	31	40	HSP	HSP
1 Single-row: 1	KSL-10	Selected from bending radius	Obtained from calculation	HSP Flat Resin Outer and inner side	HSP Flat Resin Outer and inner side
2 Parallel: 2 pcs (※)	KSH-10T	31 R31		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side
		40 R40		HD Parallel flat Metal Outer and inner side	HD Parallel flat Metal Outer and inner side
		68 R68			

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSL-10	31	40
KSL-10	Selected from bending radius	Obtained from calculation
KSH-10T	31 R31	
	40 R40	
	68 R68	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.



## KSH-17VL

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Mounting bracket (metal)	—
	Parallel joint	—
	Separator (vertical partition)	—
	M-joint	Nylon
M-joint	Spring plate	SUS
	Additional SILVEYER	Nylon
Operating temperature range		-20°C ~ +85°C
Constant length		920 modules (total length of 18.4m)

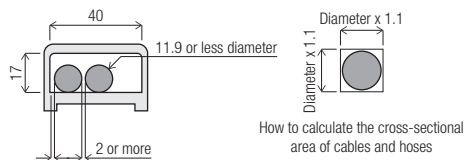
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Maximum diameter	Maximum weight	Weight of the SILVEYER	With/ without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)		Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)	Parallel joint	Separator (vertical partition)	M joint	
KSH-17VL	17	40	30	46	30	20	1100	2000	3	Ø 11.9	1.50	0.45	●	●	-	-	-	-	-	●	●	
					40																	
					50																	

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (680mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

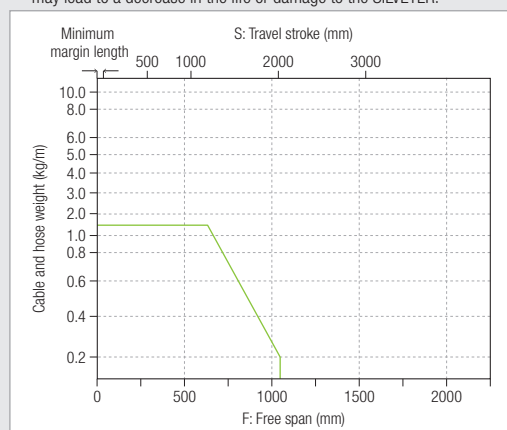
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

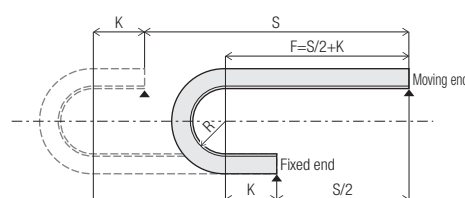
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



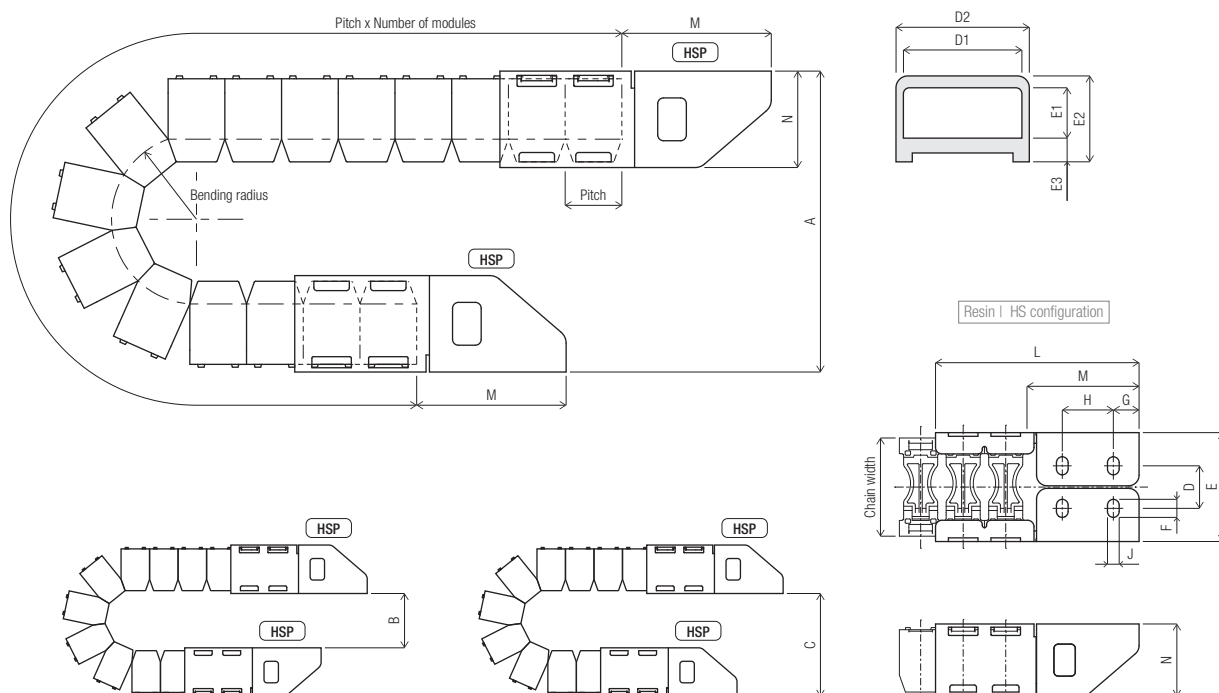
$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
20	80 or more

## Flat mounting dimensions



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-17VL	30	116 ~ 126	48 ~ 58	82 ~ 92	40	46	17	30	8	46	20
	40	136 ~ 146	68 ~ 78	102 ~ 112							
	50	156 ~ 166	88 ~ 98	122 ~ 132							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH17HSP	20	51	8.5	12	24	5.5	96	53	34	For both outer and inner side	33g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-17VL	30	40	HSP	HSP
1 Single-row: 1	KSH-17VL	Selected from bending radius 30 R30 40 R40 50 R50	Obtained from calculation	HSP Flat Resin Outer and inner side	HSP Flat Resin Outer and inner side

### When mounting bracket is not required

Model number	Bending radius	Number of modules
KSH-17VL	30	40
KSH-17VL	Selected from bending radius 30 R30 40 R40 50 R50	Obtained from calculation

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-20UL

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		—
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	—
		Spring plate	—
Additional SILVEYER		—	
Operating temperature range			−20°C ~ +85°C
Constant length			920 modules (total length of 18.4m)

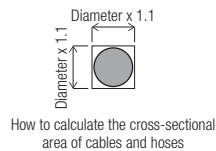
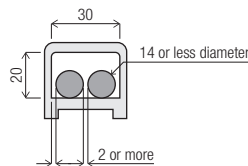
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End/TS configuration)	Metal (End/TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-20UL	20	30	34	36	30	20	1100	2080	3	Ø 14	1.50	0.39	●	●	—	—	—	●	—	—
					40															
					65															

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (600mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

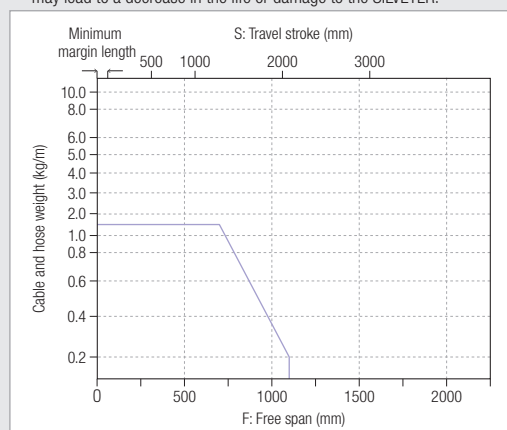
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

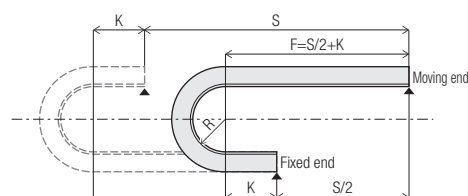
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



$$m = \frac{S / 2 + \pi R + 2K}{P}$$

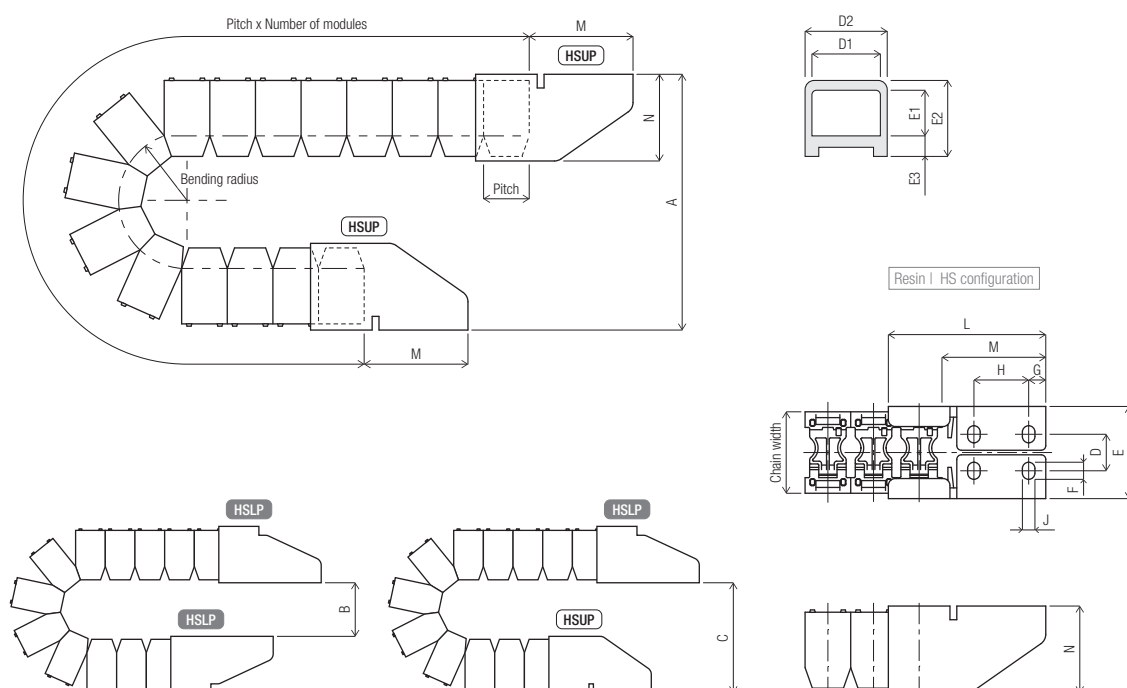
[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
20	60 or more



## Flat mounting dimensions



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-20UL	30	124 ~ 134	48 ~ 58	86 ~ 96	30	36	20	34	9	36	20
	40	144 ~ 154	68 ~ 78	106 ~ 116							
	65	194 ~ 204	118 ~ 128	156 ~ 166							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH20HSUP	16	41	7.5	7.5	24	5.5	69	45.5	38	Outer side	19g
KSH20HSLP	16	41	7.5	7.5	24	5.5	69	45.5	38	Inner side	19g



HS configuration | Outer side

HS configuration | Inner side

## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are **required**

※ In case of parallel specifications, parallel joints are included.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-20UL	30	40	HSUP	HSUP
1 Single-row: 1	KSH-20UL	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		30 R30		HSUP Flat Resin Inner side	HSUP Flat Resin Inner side
		40 R40			
		65 R65			

### When mounting bracket is **not required**

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-20UL	30	40
KSH-20UL	Selected from bending radius	Obtained from calculation
	30 R30	
	40 R40	
	65 R65	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-20XL

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Mounting bracket (metal)	—
	Parallel joint	Nylon
	Separator (vertical partition)	Nylon
	M-joint	—
M-joint	Spring plate	—
	Additional SILVEYER	—
	Operating temperature range	−20°C ~ +85°C
Constant length		920 modules (total length of 18.4m)

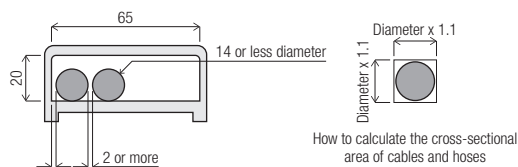
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End/TS configuration)	Metal (End/TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-20XL	20	65	34	71	30	20	1150	2180	3	Ø 14	2.00	0.58	●	●	—	—	—	●	●	—
					40															
					65															

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (1300mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

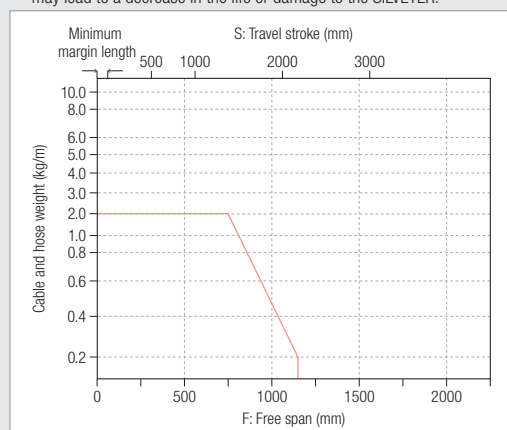
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

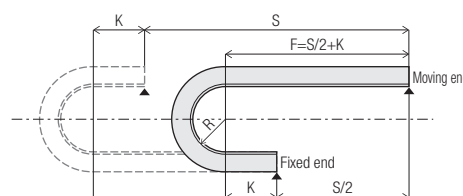
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



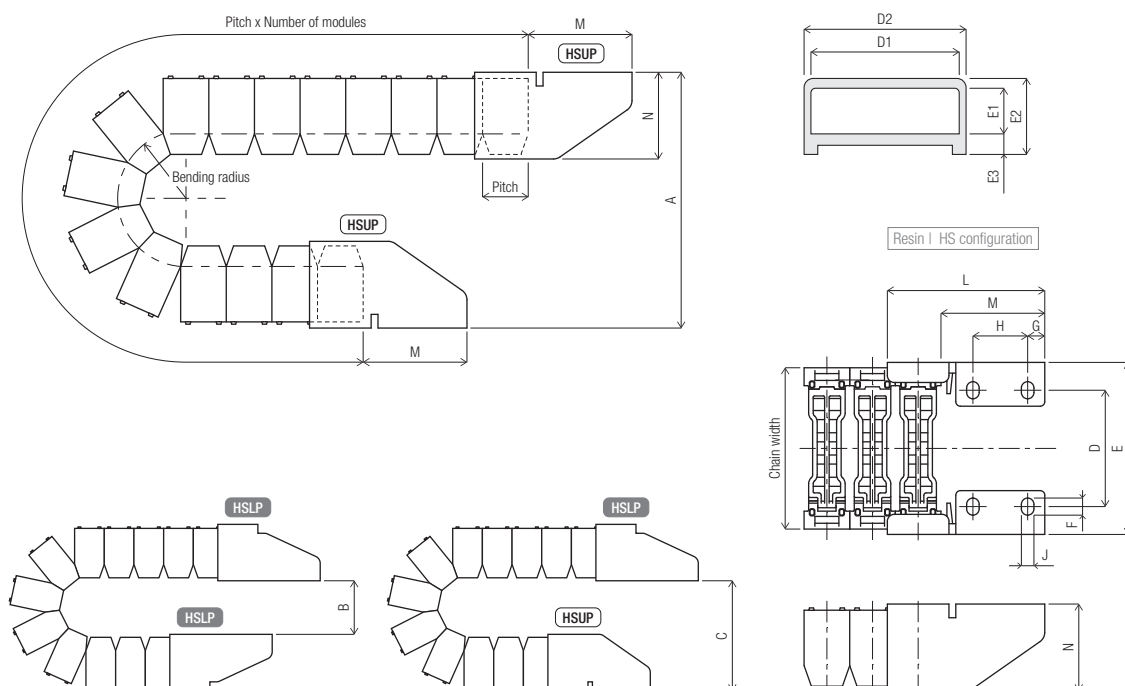
$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
20	60 or more

## Flat mounting dimensions



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-20XL	30	124 ~ 134	48 ~ 58	86 ~ 96	65	71	20	34	9	71	20
	40	144 ~ 154	68 ~ 78	106 ~ 116							
	65	194 ~ 204	118 ~ 128	156 ~ 166							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH20HSUP	51	76	7.5	7.5	24	5.5	69	45.5	38	Outer side	19g
KSH20HSLP	51	76	7.5	7.5	24	5.5	69	45.5	38	Inner side	19g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are **required**

※ In case of parallel specifications, parallel joints are included.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-20XL	30	40	HSUP	HSUP
1 Single-row: 1	KSH-20XL	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		30 R30		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
		40 R40			
		65 R65			

### When mounting bracket is **not required**

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-20XL	30	40
KSH-20XL	Selected from bending radius	Obtained from calculation
	30 R30	
	40 R40	
	65 R65	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-24L

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		Iron (trivalent) chromate
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	Nylon
		Spring plate	SUS
Additional SILVEYER		Nylon	
Operating temperature range			-20°C ~ +85°C
Constant length			840 modules (total length of 20.2m)

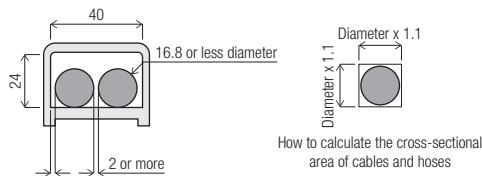
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End/TS configuration)	Metal (End/TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-24L	24	40	36	46	42	24	1250	2300	3	Ø 16.8	2.00	0.55	●	●	●	●	●	●	●	●
					52															
					63															
					88															

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (960mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

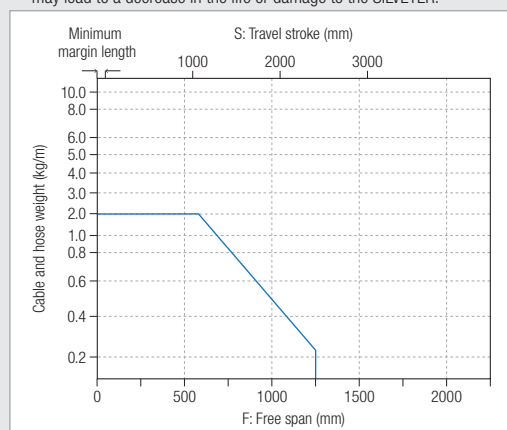
#### 2 Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

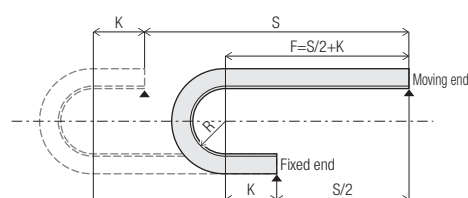
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



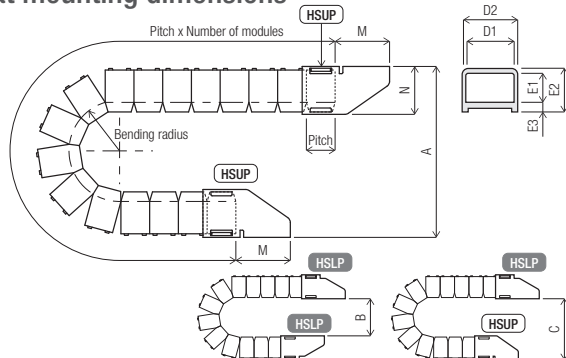
$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
20	92 or more

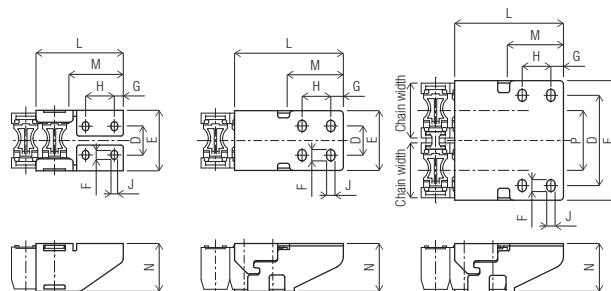
## Flat mounting dimensions



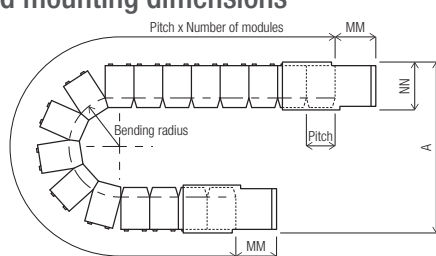
Resin | HS configuration

Metal | HS configuration

Metal | HD configuration

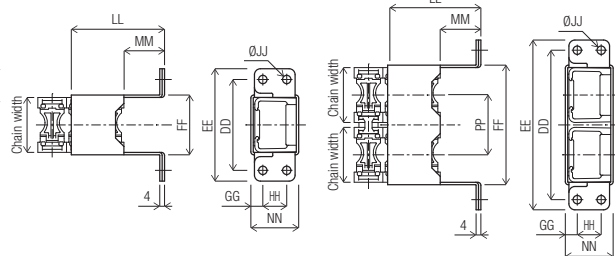


## End mounting dimensions



Metal | TS configuration

Metal | TD configuration



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-24L	42	153 ~ 163	74 ~ 84	113 ~ 123	40	46	24	36	8	46	24
	52	173 ~ 183	94 ~ 104	133 ~ 143							
	63	195 ~ 205	116 ~ 126	155 ~ 165							
	88	245 ~ 255	166 ~ 176	205 ~ 215							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH24HSUP	23	51	7.5	7.5	24	5.5	73	46	40	Outer side	23g
KSH24HSLP	23	51	7.5	7.5	24	5.5	73	46	40	Inner side	22g



## Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH24HS	24.5	50	9.5	10.5	24	7	91	47	40	—	For both outer and inner side	186g
KSH24HD	75.5	100	10	10.5	24	7	91	47	40	50	For both outer and inner side	297g



## End mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	DD	EE	FF	GG	HH	JJ	LL	MM	NN	PP	Mounting	Weight
KSH24TS	76	94	50	10	20	7	78	34	40	—	End	179g
KSH24TD	125	142	100	10	20	7	78	34	40	50	End	236g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSUP/HSLP (plastic) or HD/TD (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-24L	42	40	HSUP	HSUP
1 Single-row: 1	KSH-24L	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)	KSH-24L	42 R42		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
		52 R52		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side
		63 R63		HD Parallel flat Metal Outer and inner side	HD Parallel flat Metal Outer and inner side
		88 R88		TS End Metal End	TS End Metal End
				TD Parallel flat Metal End	TD Parallel flat Metal End

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-24L	42	40
KSH-24L	Selected from bending radius	Obtained from calculation
	42 R42	
	52 R52	
	63 R63	
	88 R88	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.



## KSH-24WL

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		Iron (trivalent) chromate
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	Nylon
		Spring plate	SUS
Additional SILVEYER		Nylon	
Operating temperature range			-20°C ~ +85°C
Constant length			840 modules (total length of 20.2m)

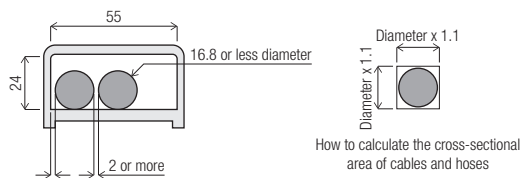
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End/TS configuration)	Metal (End/TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-24WL	24	55	36	61	42	24	1250	2300	3	Ø 16.8	2.00	0.64	●	●	●	●	●	●	●	●
					52															
					63															
					88															

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (1320mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

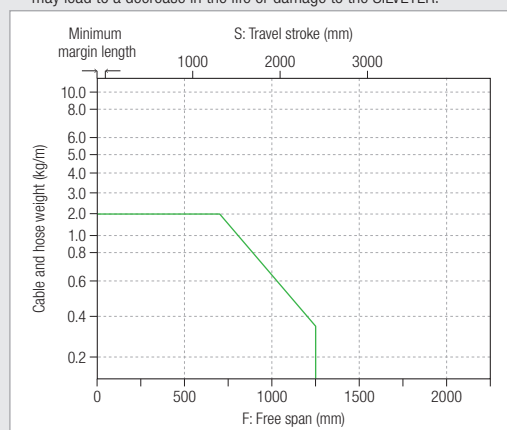
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

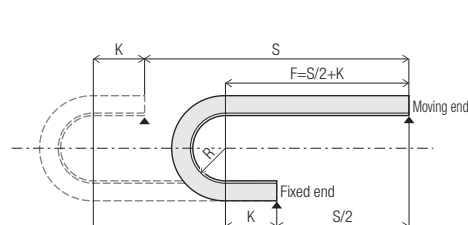
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



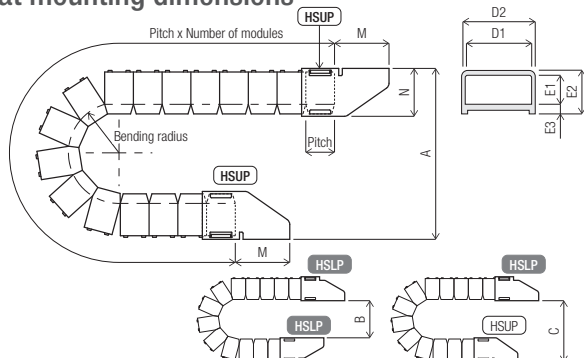
$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
24	92 or more

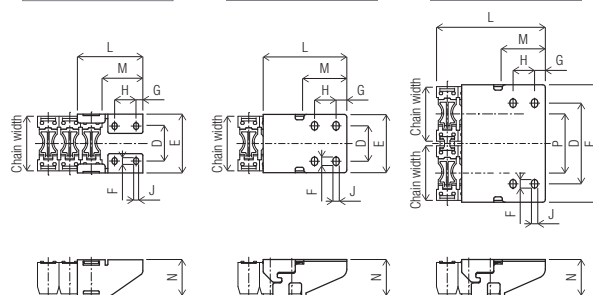
## Flat mounting dimensions



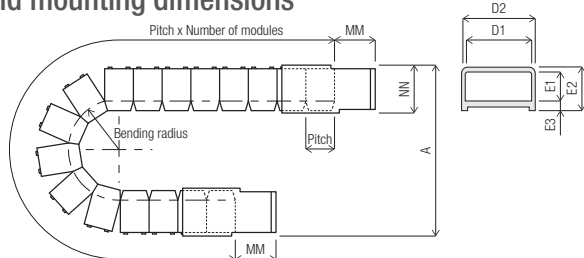
Resin | HS configuration

Metal | HS configuration

Metal | HD configuration

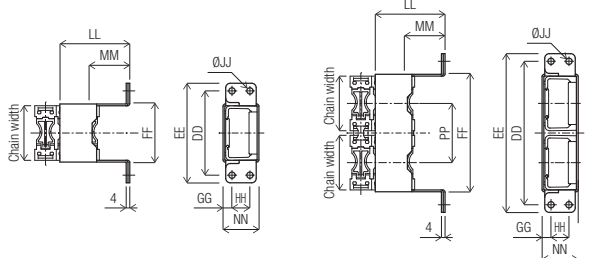


## End mounting dimensions



Metal | TS configuration

Metal | TD configuration



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-24WL	42	153 ~ 163	74 ~ 84	113 ~ 123	55	61	24	36	8	61	24
	52	173 ~ 183	94 ~ 104	133 ~ 143							
	63	195 ~ 205	116 ~ 126	155 ~ 165							
	88	245 ~ 255	166 ~ 176	205 ~ 215							

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH24HSUP	38	66	7.5	7.5	24	5.5	73	46	40	—	Outer side	23g
KSH24HSLP	38	66	7.5	7.5	24	5.5	73	46	40	—	Inner side	22g



## Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH24WHS	39.5	65	9.5	12	24	7	93	50	40	—	For both outer and inner side	245g
KSH24WHD	90	131	9.5	12	24	7	93	50	40	66	For both outer and inner side	387g



## End mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	DD	EE	FF	GG	HH	JJ	LL	MM	NN	PP	Mounting	Weight
KSH24WTS	94	111	65	10	20	7	78	34	40	—	End	196g
KSH24WTD	160	177	131	10	20	7	78	34	40	66	End	277g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSUP/HSLP (plastic) or HD/TD (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-24WL	42	40	HSUP	HSUP
1 Single-row: 1	KSH-24WL	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		42 R42		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
		52 R52		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side
		63 R63		HD Parallel flat Metal Outer and inner side	HD Parallel flat Metal Outer and inner side
		88 R88		TS End Metal End	TS End Metal End
				TD Parallel flat Metal End	TD Parallel flat Metal End

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-24WL	42	40
KSH-24WL	Selected from bending radius	Obtained from calculation
	42 R42	
	52 R52	
	63 R63	
	88 R88	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-25AL

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Mounting bracket (metal)	—
	Parallel joint	—
	Separator (vertical partition)	Nylon
	M-joint	Nylon
M-joint	Spring plate	SUS
	Additional SILVEYER	Nylon
Operating temperature range		-20°C ~ +85°C
Constant length		600 modules (total length of 13.8m)

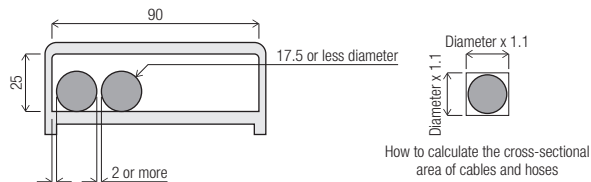
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose	Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	(mm)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End/TS configuration)	Metal (End/TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-25AL	25	90	42	97	36	23	2000	3800	3	Ø 17.5	3.50	0.97	●	●	-	-	-	-	●	●
					50															
					75															

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (2250mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

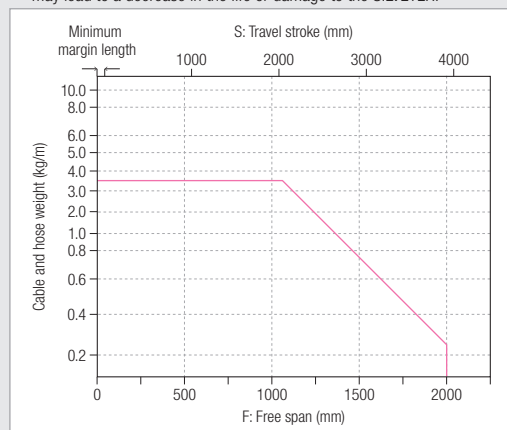
#### 2 Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

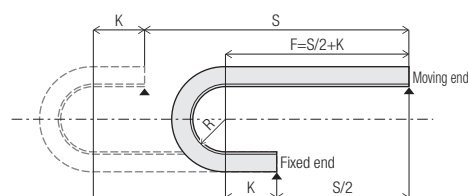
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.

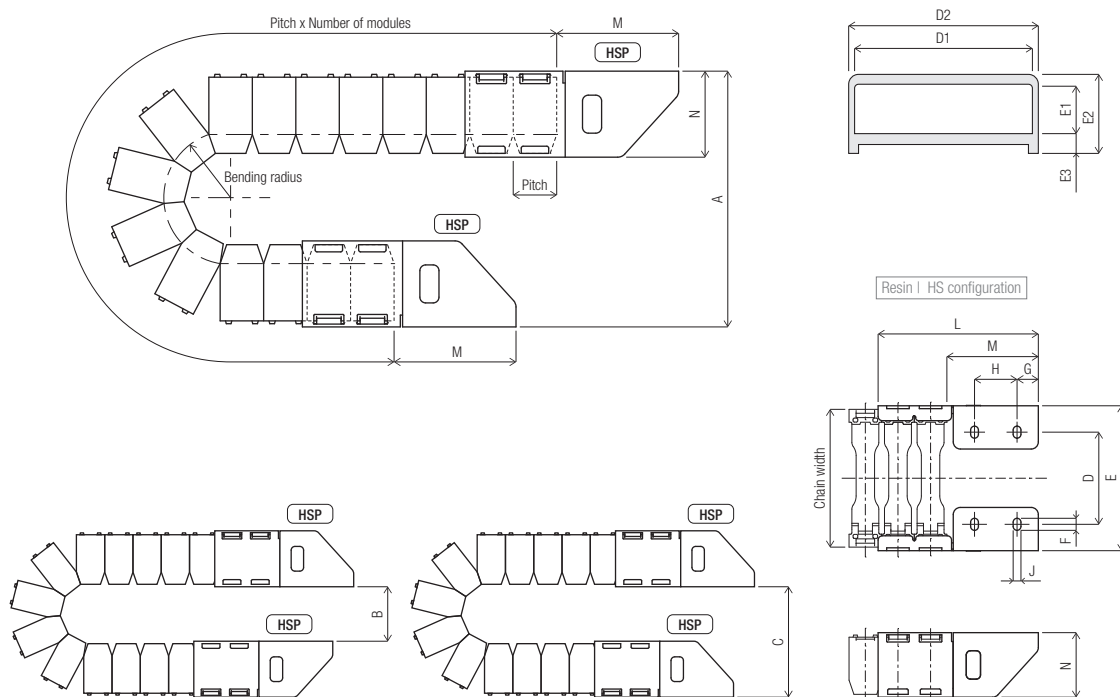


[ If the fixed end is in the center of the stroke ]

m	Number of modules
	※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
23	92 or more

## Flat mounting dimensions



### SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-25AL	36	147 ~ 157	56 ~ 66	102 ~ 112	90	97	25	42	10	97	23
	50	175 ~ 185	84 ~ 94	130 ~ 140							
	75	225 ~ 235	134 ~ 144	180 ~ 190							

### Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH25HSP	65	102	8.5	15	30	5.5	113	64.5	45.5	—	For both outer and inner side	54g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-25AL	36	40	HSP	HSP
1 Single-row: 1	KSH-25AL	Selected from bending radius 36 R36 50 R50 75 R75	Obtained from calculation	HSP Flat Resin Outer and inner side	HSP Flat Resin Outer and inner side

### When mounting bracket is not required

Model number	Bending radius	Number of modules
KSH-25AL	36	40
KSH-25AL	Selected from bending radius 36 R36 50 R50 75 R75	Obtained from calculation

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-32UL

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		Iron (trivalent) chromate
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	Nylon
		Spring plate	SUS
Additional SILVEYER		Nylon	
Operating temperature range			−20°C ~ +85°C
Constant length			500 modules (total length of 14.0m)

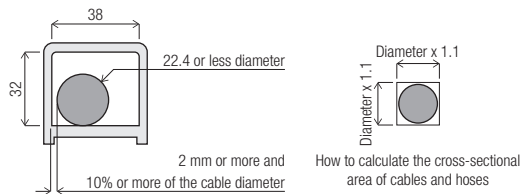
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose		Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts					
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum diameter	Maximum weight			(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)	Parallel joint
KSH-32UL	32	38	45.5	46.5	60	28	1000	1800	3	Ø 22.4	2.00	0.65	●	●	●	-	-	-	●	-	●			
					110																			

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (2250mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

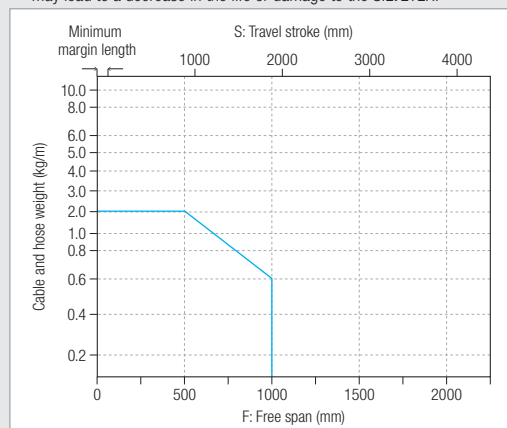
#### 2 Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2 \text{ mm or more and } 10\% \text{ or more of the cable/hose diameter}$$

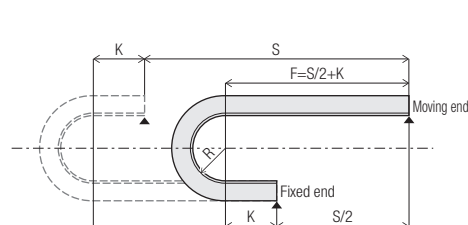
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



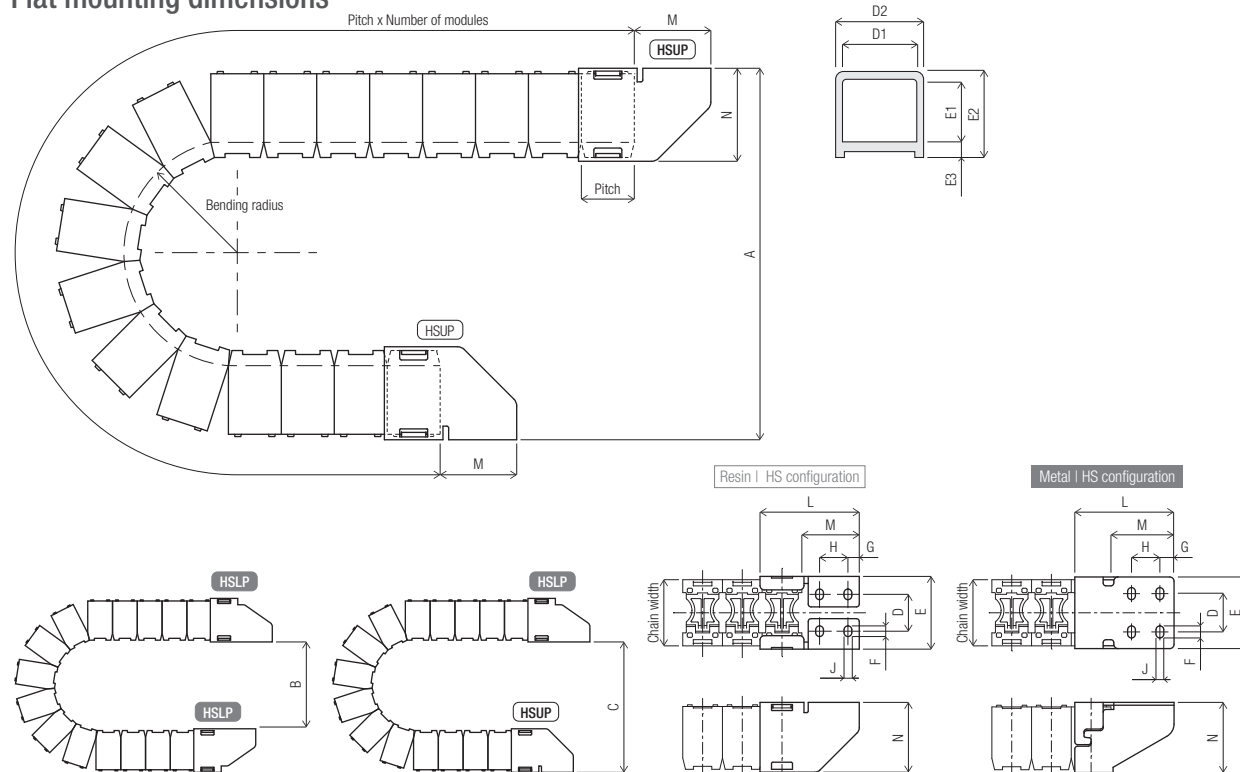
[ If the fixed end is in the center of the stroke ]

m	Number of modules
	※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
28	84 or more



## Flat mounting dimensions



### SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-32UL	60	210 ~ 220	110 ~ 120	160 ~ 170	38	46.5	32	45.5	8	46.5	28
	110	310 ~ 320	210 ~ 220	260 ~ 270							

### Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH32HSUP	25	52	7.5	8	20	5.5	70	41	50	Outer side	25g
KSH32HSLP	25	52	7.5	8	20	5.5	70	41	50	Inner side	24g



### Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH32UHS	27	51	8.5	10	20	5.5	70	44.5	49.5	—	For both outer and inner side	159g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSUP/HSLP (plastic) or HS (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-32UL	60	40	HSUP	HSUP
1 Single-row: 1	KSH-32UL	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		60 R60		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
		110 R110		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-32UL	60	40
KSH-32UL	Selected from bending radius	Obtained from calculation
	60 R60	
	110 R110	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-32WL

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		Iron (trivalent) chromate
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	Nylon
		Spring plate	SUS
Additional SILVEYER		Nylon	
Operating temperature range			-20°C ~ +85°C
Constant length			500 modules (total length of 14.0m)

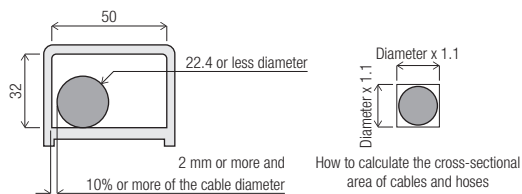
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose		Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts				
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum diameter	Maximum weight			(kg/m)	(kg/m)	(kg/m)	(kg/m)	(kg/m)	Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)
KSH-32WL	32	50	45.5	58.5	60	28	1250	2300	3	Ø 22.4	2.50	0.74	●	●	●	-	-	-	●	●	●		
					110																		

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (2250mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

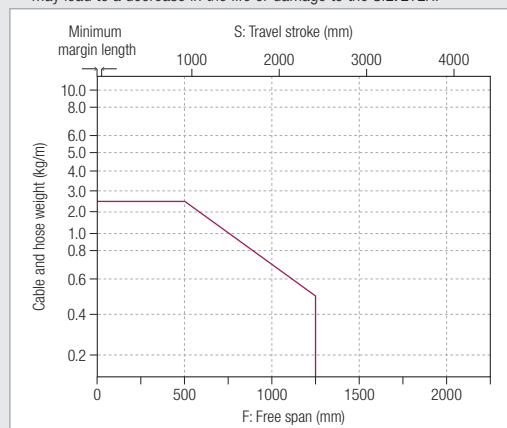
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2 \text{ mm or more and } 10\% \text{ or more of the cable/hose diameter}$$

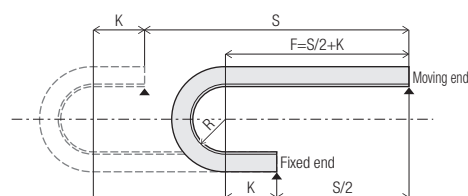
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.

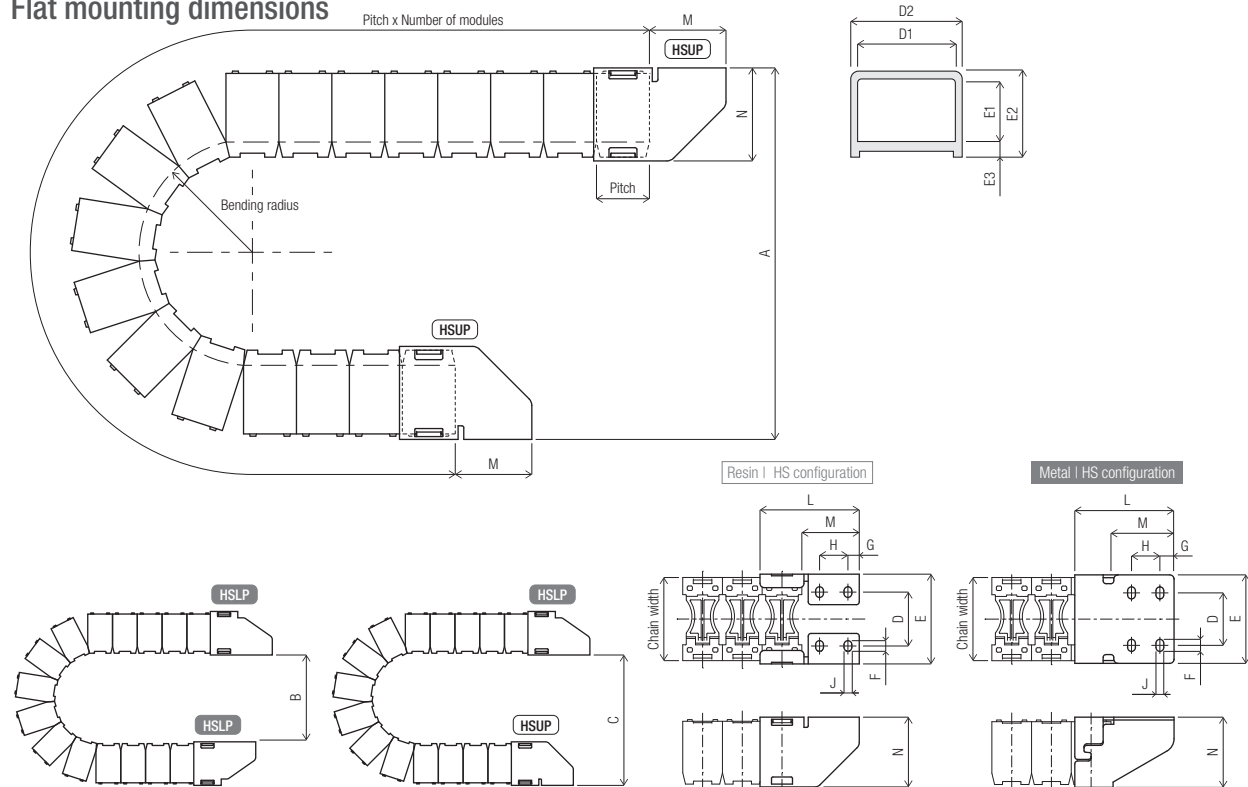


[ If the fixed end is in the center of the stroke ]

m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
28	84 or more

## Flat mounting dimensions



### SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-32WL	60	210 ~ 220	110 ~ 120	160 ~ 170	50	58.5	32	45.5	8	58.5	28
	110	310 ~ 320	210 ~ 220	260 ~ 270							

### Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH32HSUP	37	64	7.5	8	20	5.5	70	41	50	Outer side	25g
KSH32HSLP	37	64	7.5	8	20	5.5	70	41	50	Inner side	24g



### Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH32WHS	37	63	8.5	10	20	5.5	70	44.5	49.5	—	For both outer and inner side	179g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSUP/HSLP (plastic) or HS (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-32WL	60	40	HSUP	HSUP
1 Single-row: 1	KSH-32WL	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		60 R60		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
		110 R110		HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-32WL	60	40
KSH-32WL	Selected from bending radius	Obtained from calculation
	60 R60	
	110 R110	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.

## KSH-40L

### Basic Specifications

Material	Main unit		Nylon
	Mounting bracket (resin)		Nylon
	Mounting bracket (metal)		Iron (trivalent) chromate
	Parallel joint		Nylon
	Separator (vertical partition)		—
	M-joint	M-joint	Nylon
		Spring plate	SUS
Additional SILVEYER		Nylon	
Operating temperature range			-20°C ~ +85°C
Constant length			280 modules (total length of 11.2m)

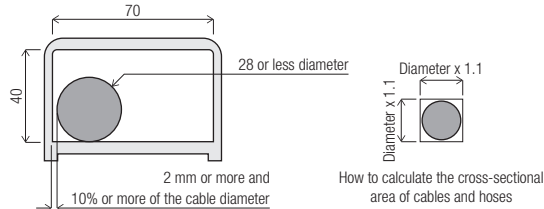
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cable and hose		Weight of the SILVEYER	With/without openable cover	Mounting bracket					Optional parts		
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum diameter	Maximum weight			Resin (Flat/HS configuration)	Metal (Flat/HS configuration)	Metal (Flat/HD configuration)	Metal (End /TS configuration)	Metal (End /TD configuration)	Parallel joint	Separator (vertical partition)	M joint
KSH-40L	40	70	54	77	110	40	1500	2700	3	Ø 28.0	3.25	1.04	●	●	●	●	●	●	●	●	

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER should be less than 60% of the cross-sectional area of the SILVEYER.

$$\text{Cross-sectional area of storage (2250mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

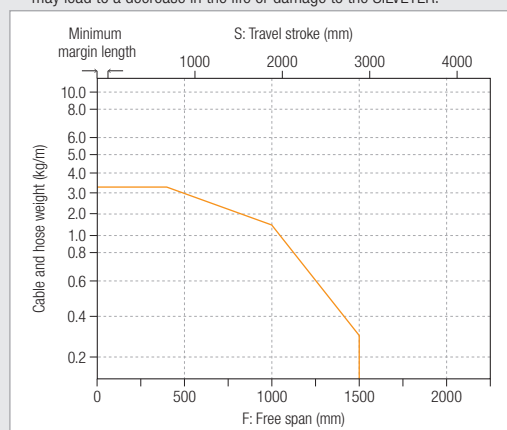
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

Gaps between cables/hoses	2 mm or more and 10% or more of the cable/hose diameter
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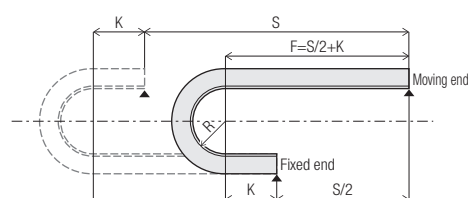
### Capacity Diagram

■ Always use the SILVEYER within the range of the capacity diagram. Use of the SILVEYER beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER.



### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



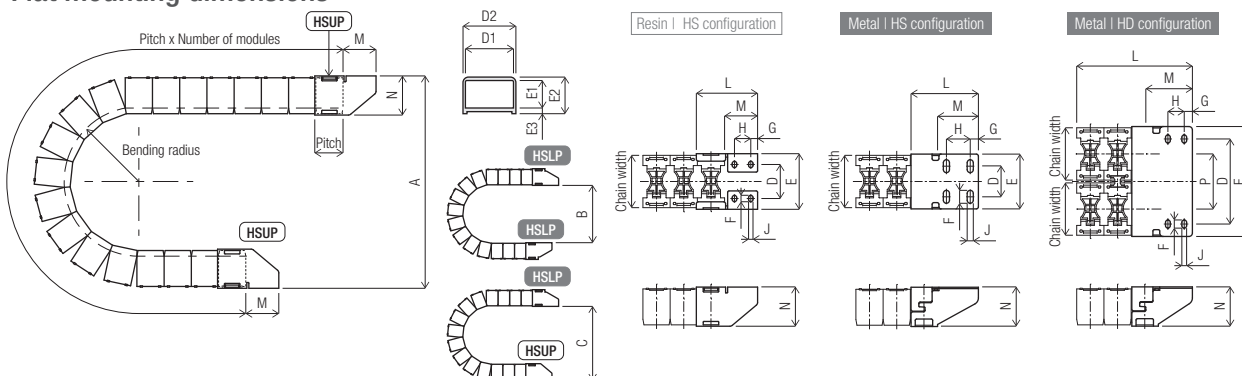
$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

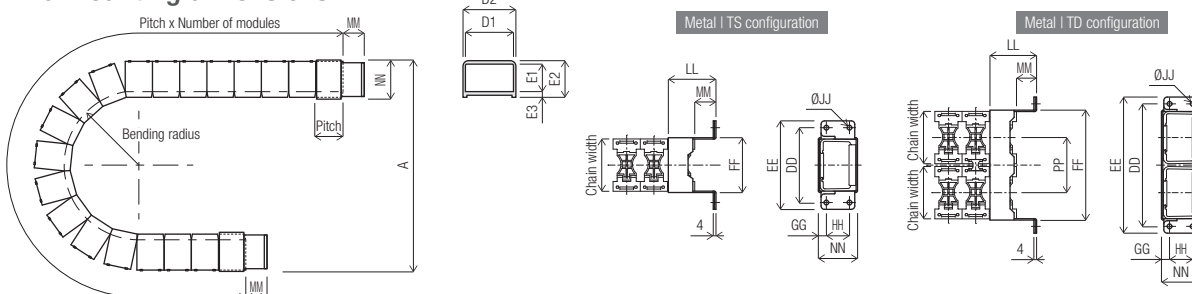
m	Number of modules ※ Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
40	120 or more

## Flat mounting dimensions



## End mounting dimensions



## SILVEYER main unit dimensions

Unit of measurement : mm

Model number	Bending Radius	A	B	C	D1	D2	E1	E2	E3	Chain width	Pitch
KSH-40L	110	325 ~ 335	209 ~ 219	267 ~ 277	70	77	40	54	8.5	77	40

## Flat mounting bracket dimensions

Resin

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	Mounting	Weight
KSH40HSUP	49	82	9.5	10	24	6.5	90	49	58	Outer side	40g
KSH40HSLP	49	82	9.5	10	24	6.5	90	49	58	Inner side	38g



## Flat mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	D	E	F	G	H	J	L	M	N	P	Mounting	Weight
KSH40HS	45	81	19	12	35	9	99	60	58	—	For both outer and inner side	319g
KSH40HD	125	162	12	12	24	7	89	50	58	81	For both outer and inner side	445g



## End mounting bracket dimensions

Metal

Unit of measurement : mm

Model number	DD	EE	FF	GG	HH	JJ	LL	MM	NN	PP	Mounting	Weight
KSH40TS	110	130	81	12	34	7	70	31	58	—	End	254g
KSH40TD	180	200	162	12	34	7	69	30	58	81	End	312g



## SILVEYER nominal model number

- Please order the selected SILVEYER according to the following nominal model number.

### When mounting brackets are required

※ In case of parallel specifications, parallel joints are included. Select either HSUP/HSLP (plastic) or HD/TD (metal) mounting bracket.

Number of SILVEYER	Model number	Bending radius	Number of modules	Mounting bracket 1	Mounting bracket 2
1	KSH-40L	110	40	HSUP	HSUP
1 Single-row: 1	KSH-40L	Selected from bending radius	Obtained from calculation	HSUP Flat Resin Outer side	HSUP Flat Resin Outer side
2 Parallel: 2 pcs (※)		110 R110		HSLP Flat Resin Inner side	HSLP Flat Resin Inner side
				HS Flat Metal Outer and inner side	HS Flat Metal Outer and inner side
				HD Parallel flat Metal Outer and inner side	HD Parallel flat Metal Outer and inner side
				TS End Metal End	TS End Metal End
				TD Parallel flat Metal End	TD Parallel flat Metal End

### When mounting bracket is not required

※ When using parallel specifications, parallel joints must be purchased separately. (Optional parts)

Model number	Bending radius	Number of modules
KSH-40L	110	40
KSH-40L	Selected from bending radius	Obtained from calculation
	110 R110	

Example of model number configuration

Refer to P32-34 for specifications of optional parts and for ordering separately.



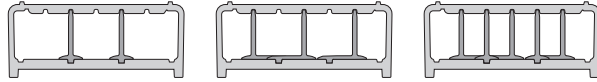
## Separator (Vertical Partition)



## KSH-20XL / 25AL

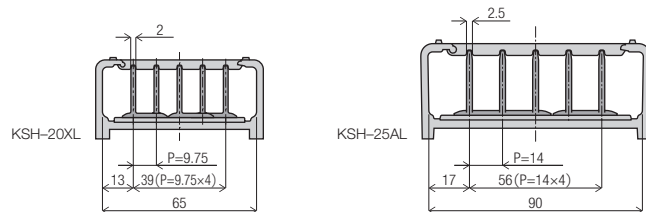
- Cables and hoses can be stored in up to six segments using a combination of the I and L-type separators.

Applicable Model Number



Applicable Model Number	Type	Order Part Number		Order Part Name	Quantity Sold (Products/Bag)	Weight (g/Indv. Part)	Material
		Part Number when ordering Indv. Part(s)	Part Number when included with products				
KSH-20XL	I Type	<b>KSH20SPI -50</b>	<b>KSH20SPI -50+</b>	Separator	50 Indv. Parts	1g	Nylon
	L Type	<b>KSH20SPL-50</b>	<b>KSH20SPL-50+</b>	Separator	50 Indv. Parts	1g	Nylon
KSH-25AL	I Type	<b>KSH25SPI -50</b>	<b>KSH25SPI -50+</b>	Separator	50 Indv. Parts	1g	Nylon
	L Type	<b>KSH25SPL-50</b>	<b>KSH25SPL-50+</b>	Separator	50 Indv. Parts	1g	Nylon

Separator (Vertical Partition) Dimensions



## Parallel Joint

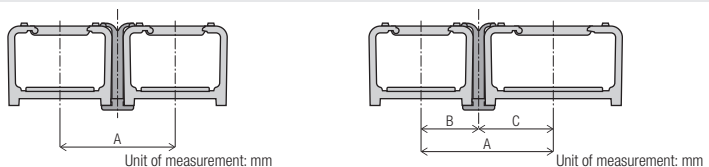


- The Parallel Joint is used when running the SILVEYER parallel. (SILVEYERs of the same height and bend radius can be connected in parallel.)
- Using the Parallel Joint can help reduce dust from two SILVEYERs coming into contact with each other.
- Install one joint one or two modules away from the module to which the mounting bracket will be mounted. Install each joint approximately 400 mm from one another, starting from where it was first installed as mentioned above.

Applicable Model Number	Order Part Number		Order Part Name	Quantity Sold (Products/Bag)	Weight (g/Indv. Part)	Material
	Part Number when ordering Indv. Part(s)	Part Number when included with products				
KSL-10	<b>KSH10PJ-10</b>	<b>KSH10PJ-10+</b>	Parallel Joint	10 Indv. Parts	1g	Nylon
KSH-10T						
KSH-20UL						
KSH-20XL	<b>KSH20PJ-10</b>	<b>KSH20PJ-10+</b>	Parallel Joint	10 Indv. Parts	3g	Nylon
KSH-24L						
KSH-24WL						
KSH-32UL	<b>KSH32PJ-10</b>	<b>KSH32PJ-10+</b>	Parallel Joint	10 Indv. Parts	3g	Nylon
KSH-32WL						
KSH-40L	<b>KSH40PJ-10</b>	<b>KSH40PJ-10+</b>	Parallel Joint	10 Indv. Parts	4g	Nylon

※ KSH-17VL, KSH-25AL cannot be connected in parallel.

Pitch dimension when Parallel Joints are connected

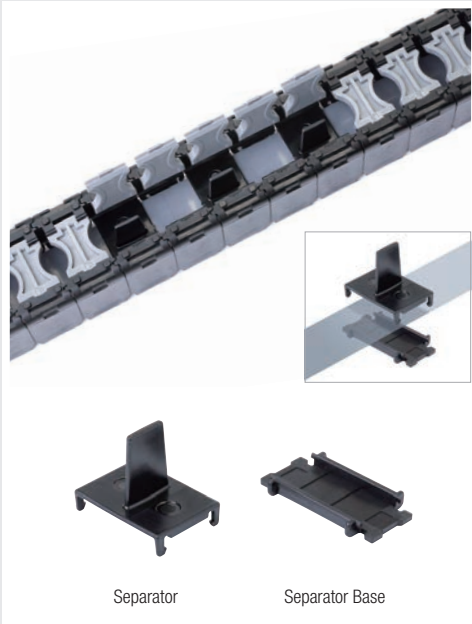


Parallel connection with Model Numbers that have equal height and width	
Model Number	A
KSL-10 · KSH-10T	28
KSH-20UL	41.7
KSH-20XL	76.7
KSH-24L	50
KSH-24WL	66
KSH-32UL	51.4
KSH-32WL	63.4
KSH-40L	81

Parallel connection with Model Numbers that have equal height but differing width (※ Narrower Model Number used in dimension B)			
Model Number	A	B	C
KSH-20UL · KSH-20XL	59.2	20.85	38.35
KSH-24L · KSH-24WL	58	25	33
KSH-32UL · KSH-32WL	57.4	25.7	31.7

※ Bracket dimensions are shown as "P" or "PP" dimensions except for KSH-32UL and KSH-32WL.

## Separator (Vertical Partition)

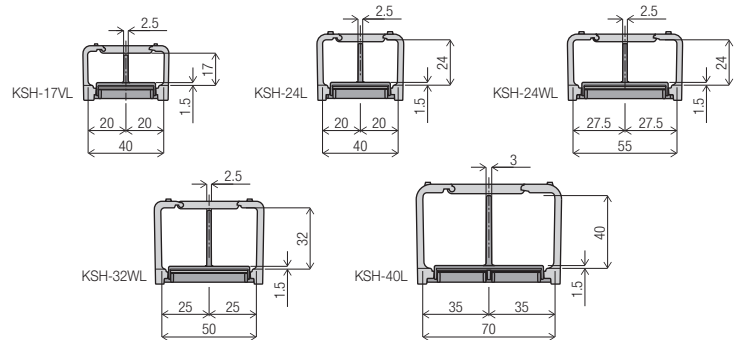


## KSH-17VL / 24L / 24WL / 32WL / 40L

- Cables and hoses can be stored in two divided segments

Applicable Model Number	Type	Order Part Number		Order Part Name	Quantity Sold (Products/Bag)	Weight (g/Indv. Part)	Material
		Part Number when ordering Indv. Part(s)	Part Number when included with products				
KSH-17VL	2 Pieces	<b>KSH17VSP-10</b>	<b>KSH-17VSP-10+</b>	Separator	10 Indv. Parts	4g	Nylon
KSH-24L	2 Pieces	<b>KSH24SP-10</b>	<b>KSH24SP-10+</b>	Separator	10 Indv. Parts	5g	Nylon
KSH-24WL	2 Pieces	<b>KSH24WSP-10</b>	<b>KSH24WSP-10+</b>	Separator	10 Indv. Parts	6g	Nylon
KSH-32WL	2 Pieces	<b>KSH32WSP-10</b>	<b>KSH32WSP-10+</b>	Separator	10 Indv. Parts	7g	Nylon
KSH-40L	2 Pieces	<b>KSH40SP-10</b>	<b>KSH40SP-10+</b>	Separator	10 Indv. Parts	14g	Nylon

### Separator (Vertical Partition) Dimensions



## M Joint (Connecting part for the SILVEYER)



- Additional modules can be added to the SILVEYER if there are not enough. (up to 3 modules)
- M Joints can be connected to each other through easy installation. (can be added without tools and disconnected with a screwdriver)
- Connected areas have the same cleaning characteristics even if bent.
- Use M Joints on horizontally affixed ends.
- M Joints will be less durable and rigid than the SILVEYER.
- M Joints used on areas that frequently bend, on areas that do not have receivers, or on areas that are not horizontal might negatively affect the operation of the SILVEYER.
- See P 39, 40, Handling Method, or the user manual that came with your purchased product for more information on how to install M Joints.

### Installation Example



※ KSH24HG is used in the photo.

Applicable Model Number (※ 1)	Order Part Number (※ 1)	Order Part Name	Quantity Sold (Set(s)/Box(es))	Weight (g/Set)	Note	Contained in Set
KSH-17VL-R30	<b>KSH17VHG R30</b>	M Joint	1 Set	33g	—	■ M Joint Quantity : 1 Indv. Part Material : Nylon
KSH-17VL-R40	<b>KSH17VHG R40</b>					
KSH-17VL-R50	<b>KSH17VHG R50</b>					
KSH-24L-R42	<b>KSH24HG R42</b>	M Joint	1 Set	48g	※ 3	■ Spring Plate Quantity : 4 Indv. Parts Material : SUS
KSH-24L-R52	<b>KSH24HG R52</b>					
KSH-24L-R63	<b>KSH24HG R63</b>					
KSH-24L-R88	<b>KSH24HG R88</b>					
KSH-24WL-R42	<b>KSH24WHG R42</b>	M Joint	1 Set	58g	※ 2 ※ 3	■ Additional SILVEYER Quantity : 1 Indv. Part (3 Modules) Material : Nylon
KSH-24WL-R52	<b>KSH24WHG R52</b>					
KSH-24WL-R63	<b>KSH24WHG R63</b>					
KSH-24WL-R88	<b>KSH24WHG R88</b>					
KSH-25AL-R36	<b>KSH25AHG R36</b>	M Joint	1 Set	81g	—	
KSH-25AL-R50	<b>KSH25AHG R50</b>					
KSH-25AL-R75	<b>KSH25AHG R75</b>					
KSH-32UL-R60	<b>KSH32UHG R60</b>	M Joint	1 Set	66.5g	※ 3	
KSH-32UL-R110	<b>KSH32UHG R110</b>					
KSH-32WL-R60	<b>KSH32WHG R60</b>	M Joint	1 Set	76g	※ 3	
KSH-32WL-R110	<b>KSH32WHG R110</b>					
KSH-40L-R110	<b>KSH40HG R110</b>	M Joint	1 Set	148g	※ 3	

※ 1 Additional connections cannot be added to SILVEYER KSL-10, KSH-10T, KSH-20UL, KSH-20XL

※ 2 Additional connections cannot be added to KSH-24WL if older SILVEYER models are used

※ 3 Additional connections cannot be added to older SILVEYER models that have R configurations on the connecting parts (Belt part on the back : gray color)

## End Cap



- Protects stored cables and hoses from damage.
- End caps are installed on both ends of the SILVEYER.

Applicable Model Number	Order Part Number	Order Part Name	Quantity Sold	Weight	Material
			(Products/Bag)	(g/Indv. Part)	
KSL-10 KSH-10T	<b>KSH10EC-10</b>	End Cap	10 Indv. Parts	1g	Nylon
KSH-17VL	<b>KSH17VEC-10</b>	End Cap	10 Indv. Parts	2g	Nylon
KSH-20UL	<b>KSH20UEC-10</b>	End Cap	10 Indv. Parts	1g	Nylon
KSH-20XL	<b>KSH20XEC-10</b>	End Cap	10 Indv. Parts	3g	Nylon
KSH-24L	<b>KSH24EC-10</b>	End Cap	10 Indv. Parts	2g	Nylon
KSH-24WL	<b>KSH24WEC-10</b>	End Cap	10 Indv. Parts	3g	Nylon
KSH-25AL	<b>KSH25AEC-10</b>	End Cap	10 Indv. Parts	5g	Nylon
KSH-32UL	<b>KSH32UEC-10</b>	End Cap	10 Indv. Parts	2g	Nylon
KSH-32WL	<b>KSH32WEC-10</b>	End Cap	10 Indv. Parts	3g	Nylon
KSH-40L	<b>KSH40EC-10</b>	End Cap	10 Indv. Parts	4g	Nylon

## Mounting Bracket



Materia	Applicable Model Number	Type		Order Part Number	Order Part Name	Quantity Sold (Set(s)/Box(es))	Weight (g/Indv. part)
Resin Nylon	KSL-10 KSH-10T	Flat mounting	HS configuration	<b>KSH10HSP-1</b>	Mounting Bracket	1 Set	10g
	KSH-17VL		HS configuration	<b>KSH17HSP-1</b>	Mounting Bracket	1 Set	33g
	KSH-20UL KSH-20XL	Flat mounting	HS configuration: Outer Side	<b>KSH20HSUP-1</b>	Mounting Bracket	1 Set	19g
			HS configuration: Inner Side	<b>KSH20HSLP-1</b>		1 Set	19g
	KSH-24L KSH-24WL	Flat mounting	HS configuration: Outer Side	<b>KSH24HSUP-1</b>	Mounting Bracket	1 Set	23g
			HS configuration: Inner Side	<b>KSH24HSLP-1</b>		1 Set	22g
	KSH-25AL	Flat mounting	HS configuration	<b>KSH25HSP-1</b>	Mounting Bracket	1 Set	54g
	KSH-32UL KSH-32WL	Flat mounting	HS configuration: Outer Side	<b>KSH32HSUP-1</b>	Mounting Bracket	1 Set	25g
			HS configuration: Inner Side	<b>KSH32HSLP-1</b>		1 Set	24g
	KSH-40L	Flat mounting	HS configuration: Outer Side	<b>KSH40HSUP-1</b>	Mounting Bracket	1 Set	40g
			HS configuration: Inner Side	<b>KSH40HSLP-1</b>		1 Set	38g
Metal Trivalent Iron Chromate	KSL-10 KSH-10T	Flat mounting	HS configuration	<b>KSH10HS-1</b>	Mounting Bracket	1 Set	44g
			HD configuration	<b>KSH10HD-1</b>		1 Set	71g
	KSH-24L	Flat mounting	HS configuration	<b>KSH24HS-1</b>	Mounting Bracket	1 Set	186g
			HD configuration	<b>KSH24HD-1</b>		1 Set	297g
		End mounting	TS configuration	<b>KSH24TS-1</b>		1 Set	179g
			TD configuration	<b>KSH24TD-1</b>		1 Set	236g
	KSH-24WL	Flat mounting	HS configuration	<b>KSH24WHS-1</b>	Mounting Bracket	1 Set	245g
			HD configuration	<b>KSH24WHD-1</b>		1 Set	387g
		End mounting	TS configuration	<b>KSH24WTS-1</b>		1 Set	196g
			TD configuration	<b>KSH24WTD-1</b>		1 Set	277g
	KSH-32UL	Flat mounting	HS configuration	<b>KSH32UHS-1</b>	Mounting Bracket	1 Set	159g
	KSH-32WL	Flat mounting	HS configuration	<b>KSH32WHS-1</b>	Mounting Bracket	1 Set	179g
	KSH-40L	Flat mounting	HS configuration	<b>KSH40HS-1</b>	Mounting Bracket	1 Set	319g
			HD configuration	<b>KSH40HD-1</b>		1 Set	445g
		End mounting	TS configuration	<b>KSH40TS-1</b>		1 Set	254g
			TD configuration	<b>KSH40TD-1</b>		1 Set	312g

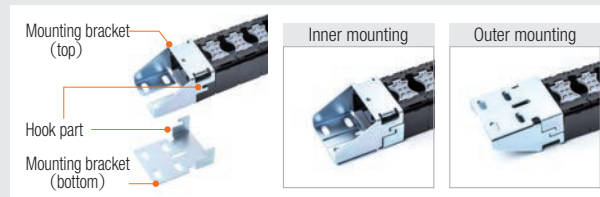
## Method used for installing end caps



- End caps are installed on both ends of the SILVEYER.

## Method used for installing metal brackets

Can be installed upside down

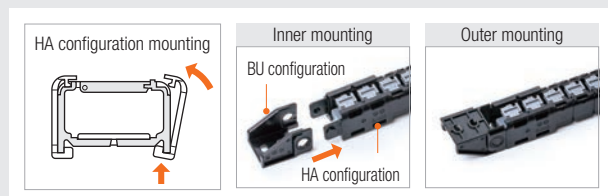


- First install the mounting bracket (top), then slide the mounting bracket (bottom) forward while pressing it against the SILVEYER.
- Make sure that the hook parts are interlocked at this time.

## Method used for installing resin brackets

### ■ KSL-10 / KSH-10T

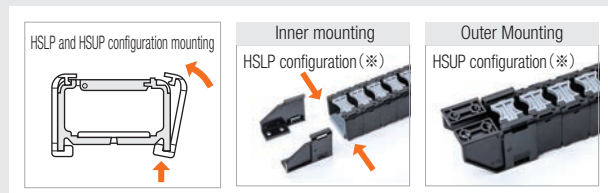
Can be installed upside down



- Insert the underside hook of the HA configuration into the groove on the back of the SILVEYER, then push the side of the bracket so that the holders on top of it fit into the SILVEYER. (left and right)
- Next, fit the BU configuration into the shaft of the HA configuration.

### ■ KSH-20UL / 20XL / 24L / 24WL / 32UL / 32WL / 40L

Cannot be installed upside down

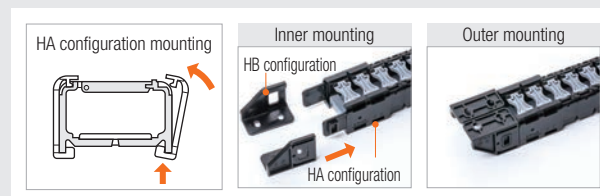


- Insert the underside hook of the HSLP and HSUP configuration into the groove on the back of the SILVEYER, then push the side of the bracket so that the holders on top of it fit into the SILVEYER. (left and right)

※ Special brackets are needed for outer and inner mountings. They cannot be installed upside down.

### ■ KSH-17VL / 25AL

Can be installed upside down



- Insert the underside hook of the HA configuration into the groove on the back of the SILVEYER, then push the side of the bracket so that the holders on top of it fit into the SILVEYER. (left and right)
- Next, fit the bracket of the HB configuration into the HA configuration from the side

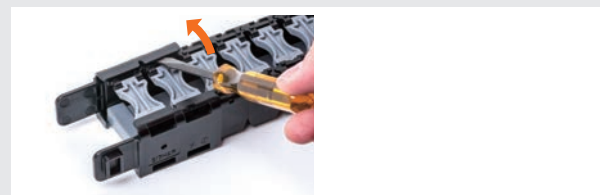
## Removal Method of Resin Brackets

### ■ BU configuration



- Insert a screwdriver between the BU and HA configurations and remove the BU configuration by tilting the screwdriver downward.

### ■ HA configuration / HSLP configuration / HSUP configuration



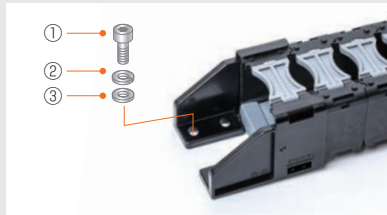
- Insert a screwdriver in the gap between the outside of the SILVEYER (cover side) and the bracket and remove the bracket by tilting the screwdriver upward.



# SILVEYER® | Handling Method

## Method used for securing to devices

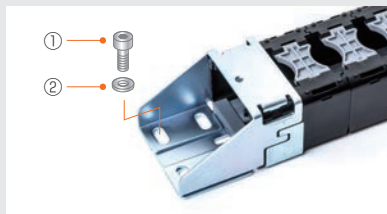
### ■ Resin Brackets



- Fasten it together with the device with a screw.
- Always use a washer or spring washer with resin brackets to prevent the bracket from being damaged and the screw from being loosened.

	KSL-10 KSH-10T	KSH-17VL KSH-20UL KSH-20XL	KSH-24L KSH-24WL	KSH-25AL	KSH-32UL KSH-32WL	KSH-40L
①						
M4 bolt	●					
M5 bolt		●	●	●	●	
M6 bolt						●
②						
M4 spring washer	●					
M5 spring washer		●	●	●	●	
M6 spring washer						●
③						
M4 washer	●					
M5 washer		●	●	●	●	
M6 washer						●

### ■ Metal brackets



- Fasten it together with the device with a screw.

	KSL-10 KSH-10T	KSH-17VL KSH-20UL KSH-20XL	KSH-24L KSH-24WL	KSH-25AL	KSH-32UL KSH-32WL	KSH-40L
①						
M5 bolt					●	
M6 bolt	●		●			●
M8 bolt						● (HS configuration only)
②						
M5 washer					●	
M6 washer	●		●			●
M8 washer						● (HS configuration only)

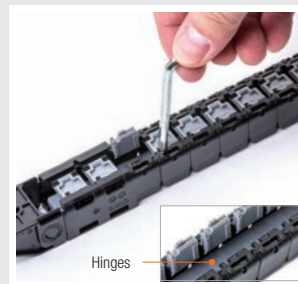
## Method Used for Opening and Closing Covers

### ■ KSH-17VL / 20UL / 20XL / 24L / 24WL / 25AL / 32UL / 32WL / 40L



- The covers can be opened and closed by hand.
- Opening the sides of the SILVEYER slightly outward will make it easier to open the covers.
- Tools like screwdrivers are not needed.
- If you are struggling to open and close the covers of 20UL by hand, you can also use a tool as described in the method used for opening and closing the covers of KSH-10T in the next section.

### ■ KSH-10T



- Only the KSH-10T requires a tool to open its covers.
- Insert a bar-like tool (hex wrench, precision screwdriver, etc.) into the hexagonal hole on top of the SILVEYER and push the cover upward by bringing the tool down to remove it.
- Be careful not to damage the hinges with the tool.
- The covers can be closed by hand, like with other SILVEYERs.

## Handling Method of Parallel Joints

### ■ How to Install



- Insert the hook under the Parallel Joint into the SILVEYER and push on the side of the Parallel Joint to fit it into the top hook.
- Install the other SILVEYER in the same manner.

Spacing in between installations: within 400 mm

### ■ How to Remove

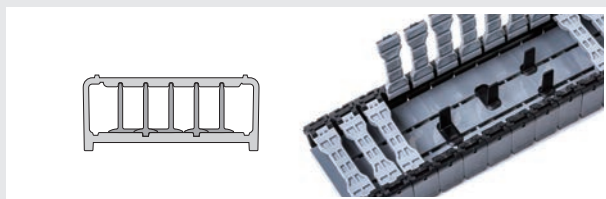


- Remove it by inserting a screwdriver in between the SILVEYER and the Parallel Joint and using leverage. Turning the screwdriver while doing this will make it easier to remove the Parallel Joint.



## Method used for installing separators (vertical partition)

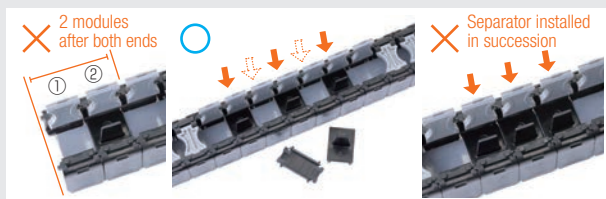
### ■ KSH-20XL / 25AL



- Insert the Separator (Vertical Partition) into the hole inside of the SILVEYER and tuck it in using the cover. (There is a hole after every 1 module)
- There can be up to six segments using a combination of the I and L-type separators.

### ■ KSH-17VL / 24L / 24WL / 32WL / 40L

#### ① Regarding installation of Separators



- Cannot be installed on the two modules from both ends.
- Leave one or more module(s) open after each installation.
- ※ Separators cannot be installed in succession on the module next to them.

#### ② Parts to prepare and preparing the SILVEYER



- Prepare the necessary number of Separators and Separator Bases that are compatible with the SILVEYER's Model Number.
- Assemble the Separators before assembling the SILVEYER and before storing cables.
- Open the covers of the areas on which the Separators will be installed and for the first or second module before and after them.

#### ③ How to install the Separator



- Make the Separator face the direction you want it to, and while tilting it, insert it into the cable storage part from the opening of the SILVEYER's cover.
- After inserting the Separator into the cable storage part, turn the Separator 90 degrees. Some Model Numbers make it difficult to turn the Separator because the inner wall of the SILVEYER gets in the way of it. Tilt the Separator while turning it if you are experiencing this.



- Assemble the Separator Base behind the module to which the Separator will be installed (SILVEYER).
- While holding the Separator Base, push the Separator in and fit the holder onto it. Push and fit the flat part of the Separator in (the ↓ part of the above illustration) until you hear a "click."

#### ④ How to remove the separator



- Insert a screwdriver in the gap between the separator Base and the SILVEYER and remove the separator base.  
Remove the separator by opening the cover of the SILVEYER.
- Do not reuse the removed separator.

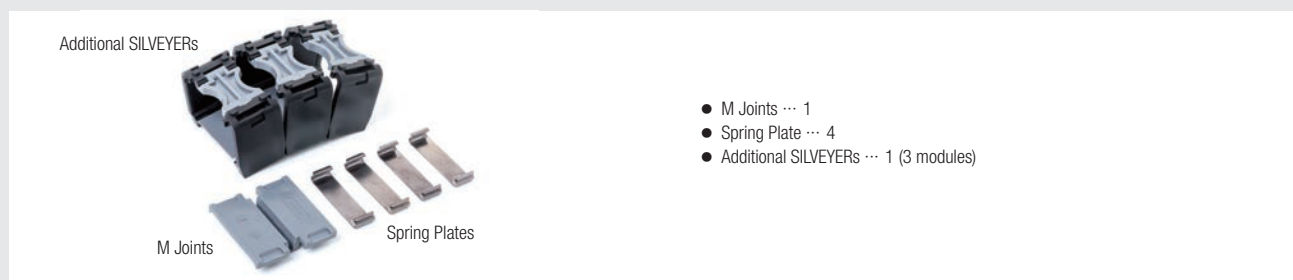
# SILVEYER® | Handling Method

## Handling Method of M Joints

### ■ Make sure to read this before doing anything

- Connecting parts are parts of which up to 3 can be used to extend the modules when there are not enough SILVEYER modules for the travel stroke.
- **Be sure to use connecting parts on horizontally affixed ends.**  
Connecting parts require receivers.
- Connecting parts will be less durable and rigid than the SILVEYER.
- Connecting parts used on areas that frequently bend, on areas that do not have receivers, or on areas that are not horizontal might negatively affect the operation of the SILVEYER. Be sure to also check for any signs of deterioration (tears, cracks, etc.) and replace any deteriorated parts in a timely manner.
- Be sure to wear clothing and protective gear (protective glasses, gloves, etc.) appropriate for the work you are doing and have safety measures for it.
- Do not do any work to anything while it is installed.  
Be sure to work on the SILVEYER on its own in an appropriate area.

### ① Checking parts



### ② Disconnecting the original SILVEYER (Number of Module Extensions)

Extending with two modules

Extending with one module

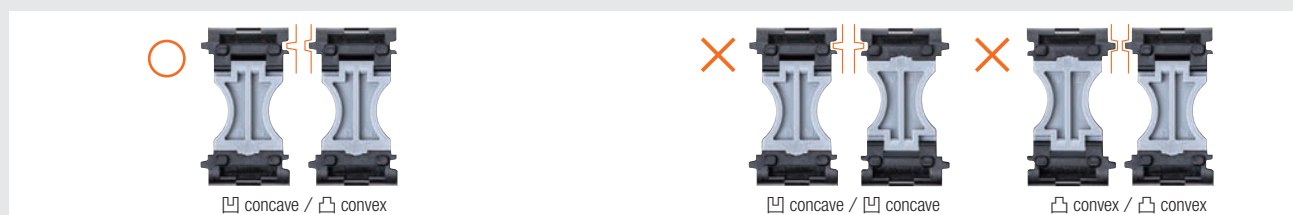
Number of modules to extend with (A)	Length adjustment (B)
3	No disconnecting required
2	Disconnect 1 module
1	Disconnect 2 modules

- **Be sure to disconnect the original SILVEYER.**
- Do not make length adjustments (disconnections) at additional SILVEYERs.  
Some models will make any extensions impossible.

✗ Additional SILVEYERs cannot be disconnected

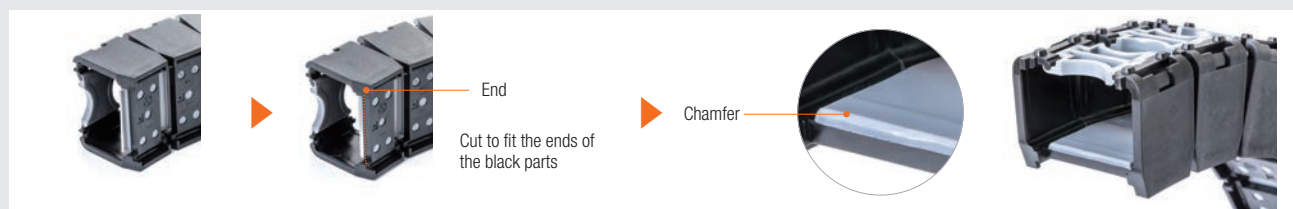
- Make length adjustment (B) after disconnecting the hinges (gray belt part) of the original SILVEYER according to the number of modules to extend with (A).

### ③ Direction of connection



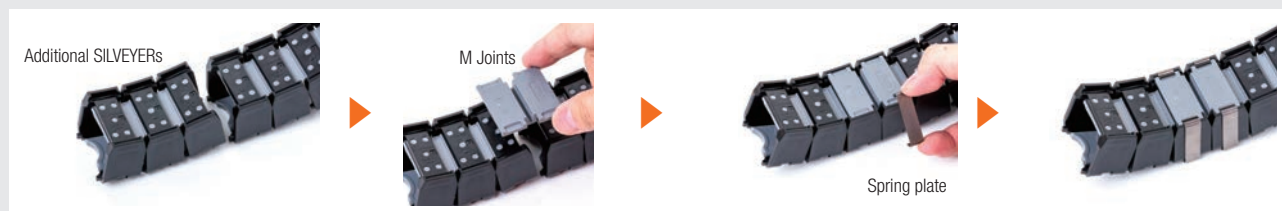
- The connections of the SILVEYER have directions.
- Check the direction in which the original or additional SILVEYER(s) are connected so that the convex/concave areas on both sides on top of the SILVEYER fit, or so that it matches the same direction of the SILVEYER's cover.

### ④ Work done on hinges



- Disconnect the hinges (gray belt part) of the original or additional SILVEYER parts that have been fitted at convex and concave areas with a cutter.
- Chamfer the upper part of the disconnected hinge to protect cables from damage.

## ⑤ How to install



- Fit the M Joint into the part where the hinge has been worked on.

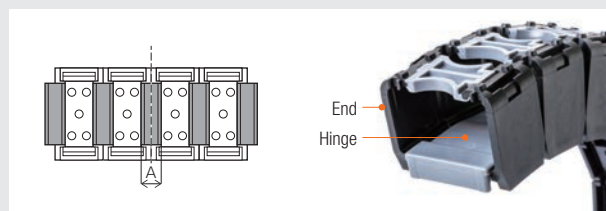
- Hook the Spring Plate to the bottom of the SILVEYER and fit it into the upper concave area of the SILVEYER by pushing on the top side of the Spring Plate.
- Do this on four areas and it is complete.

## ⑥ How to remove



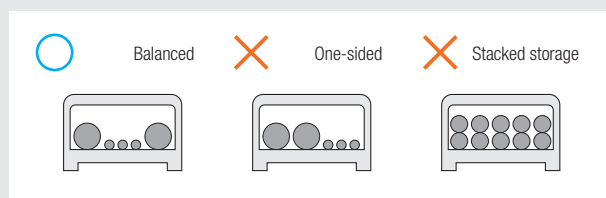
- Remove it by inserting a screwdriver in between the concave area on top of the SILVEYER and the spring plate and using leverage.
- The fitting of the spring plate can be negatively affected by the removal. Bend it toward the two-dot chain in the illustration if you are experiencing this.

## Shortening the Length

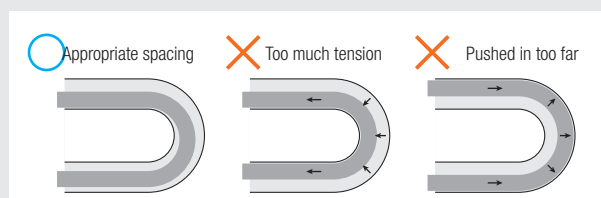


- Cut A straight through the middle with a cutter knife, etc.
- ※ If the hinge is sticking further out than the end of the product, cut it to match it with the end.  
It may be impossible to install end caps if the hinge is sticking further out.

## Method used for storing cables



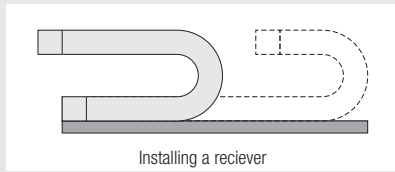
- Store the cables in a single horizontal line while keeping in mind the balance of weight on the left and right sides.
- Do not store the cables in a way that makes their weight one-sided or stack them on one another, as it may cause them to tilt, twist, or twist the way they are laid out. If there is a chance that the cables next to each other might do so due to the height and dimensions of the storage cross section, install a separator (KSH-20XL · 25AL only) to make sure that the cables do not go over each other.



- Do not put more tension on the cables than is required and lay them out in such a way that they can move freely around bends. Adjust the length and tension of the cables while checking during operation.
- Secure the cables near the outlets of moving and fixed ends.

# SILVEYER® | Handling Method

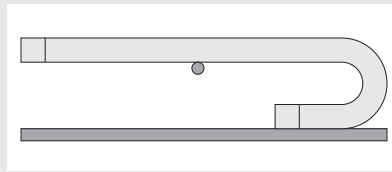
## Installation of receivers



Installing a receiver

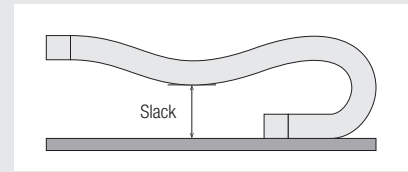
- For horizontal use, install a receiver in the range of motion and make sure that the SILVEYER does not hang down.

## Long free span



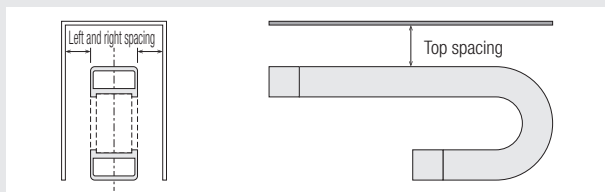
- Depending on the specifications, there may be slacker due to changes over time. It is recommended to use a guide beforehand that will minimize slack when you want to use a receiver close to its limits, as shown on its capacity diagram.
- ※ However, this will cause sound and abrasion dust due to the guide and SILVEYER coming into contact when moving.

## Regarding Slack



- The SILVEYER cannot run with big slacks in the free span or slides abutting other SILVEYERS.
- If there is slacker over time or from too much weight from the cables, free span, or stroke, stop it and install a receiver to reduce the slack or replace the SILVEYER with a new one.

## Space setting



- Make sure there is enough space. If there is any equipment at the top of the SILVEYER.
- ※ If there isn't enough space, the SILVEYER might come into contact with something during operation and get damaged.

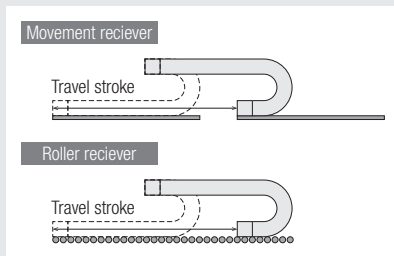
Model Number	Top spacing (mm)	Left and right spacing (mm)
KSL-10	50 or more	50 or more
KSH-10T	50 or more	50 or more
KSH-17VL	100 or more	50 or more
KSH-20UL	100 or more	50 or more
KSH-20XL	100 or more	50 or more
KSH-24L	100 or more	50 or more
KSH-24WL	100 or more	50 or more

Model Number	Top spacing (mm)	Left and right spacing (mm)
KSH-25AL	100 or more	50 or more
KSH-32UL	100 or more	50 or more
KSH-32WL	100 or more	50 or more
KSH-40L	100 or more	50 or more

※ These figures may be different because of things like there being slacker due to the passage of time or due to operating conditions. (speed, acceleration, length, weight, type of cables being used, etc.) Be sure to check the spacing and for any slacking during test runs and daily or regular inspections.

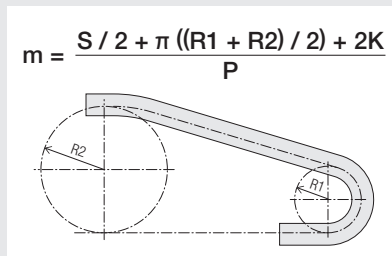
## Methods for use in special positions

### ① Use with installations to ceilings (moving horizontally upside down)



- To prevent the SILVEYER from hanging down, a movement receiver is required for the lower side.
- Install a roller conveyor, etc., if you cannot install a movement receiver.

### ② If the SILVEYER does move parallel and the location where the moving end bracket is installed is high.



- Weight will be more easily applied to the bracket area. Adjust the bracket and the SILVEYER itself without using too much force.
- An extra number of modules will be required compared to the parallel movement.

### ③ Use with Vertical installations (U shape and reversed U shape)

- There may be bulging at bends depending on the conditions. If there is a risk of it touching the device, reduce the bulging by installing a receiver. You can also make sure there is enough space between the bulge and the device.

## Parts that require regular inspection



- The SILVEYER has a link-less structure using the hinge consolidation method. This means that the hinges can be bent for a definite amount of time and will break over time.
- Inspect the SILVEYER along with the device during regular inspections.
- Replace the hinges if there are signs of any cracks (including small ones) on them, that indicate they are worn out.

- Have regular maintenance and inspections that include the following.

- ☐ Checking whether hinges are damaged or cracked
- ☐ Checking whether covers are out of place
- ☐ Checking for damages on every part.
- ☐ Checking whether any screws are loose at installations.
- ☐ Checking whether any brackets are damaged.
- ☐ Checking whether there is any wear, twisting, etc., for cables.
- ☐ Checking the amount of slack due to the passage of time.

Promptly replace the relevant parts when any irregularities are found during inspections.



## High Rigidity Long Life Link-Less Cable Chain

# SILVEYER® Tough

Low noise

Low wear

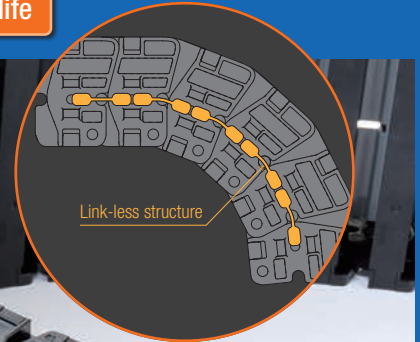
Low dust

Low vibration

High rigidity

Long life

- Rigidity and service life have been improved while maintaining the smooth bending characteristics of the SILVEYER.
- Equipped with a horizontal partition as standard, it allows wiring to be stored separately without any hassle.



### Standard Horizontal Partition Equipment

Divides intermediate joint hinges horizontally, making it possible to divide cables into upper and lower cables. Therefore, power and signal lines can be stored separately.



### Low-wear design, great for cables

Make your cables "greener" with smooth cables that reduce wear and dust from coming into contact with other cables.



### Disconnecting and connecting modules made easy

Its new structure makes disconnecting and connecting modules easy, something that could not be done with older SILVEYER models.





# SILVEYER® Tough | Specifications List

SILVEYER® Tough	Representative Model Number	Model Number	Inner height	Inner width	Storage cross section (height x width)		Outer width
					Outer side	Inner side	
			(mm)	(mm)	(mm)	(mm)	
	KST-25	KST-25040	25	40	15×40	10×40	36
		KST-25050		50	15×50	10×50	
		KST-25060		60	15×60	10×60	
		KST-25080		80	15×80	10×80	
		KST-25100		100	15×100	10×100	
	KST-30	KST-30040	30	40	18×40	12×40	41
		KST-30050		50	18×50	12×50	
		KST-30060		60	18×60	12×60	
		KST-30080		80	18×80	12×80	
		KST-30100		100	18×100	12×100	
	KST-40	KST-40050	40	50	24×50	16×50	54
		KST-40075		75	24×75	16×75	
		KST-40100		100	24×100	16×100	
		KST-40125		125	24×125	16×125	
		KST-40150		150	24×150	16×150	
	KST-50	KST-50050	50	50	30×50	20×50	64
		KST-50075		75	30×75	20×75	
		KST-50100		100	30×100	20×100	
		KST-50125		125	30×125	20×125	
		KST-50150		150	30×150	20×150	

Outer width (mm)	Bending radius (mm)	Pitch (mm)	Maximum usable free span (mm)	Maximum usable stroke (mm)	Maximum usable speed (m/sec)	Storage cables and hoses			SILVEYER Tough weight (average) (kg/m)	Optional parts	
						Maximum radius (mm)	Maximum weight (kg/m)			Separator (vertical partition)	Cable crank
55	55 75 100 150	20	1000	1920	3	Ø12	Ø8	2.50	0.67	●	●
65									0.72		
75									0.78		
95									0.89		
115									1.01		
55	55 75 100 150	20	1200	2320	3	Ø15	Ø9	3.00	0.71	●	●
65									0.76		
75									0.82		
95									0.93		
115									1.05		
70	75 100 125 150	27.5	1700	3290	3	Ø20	Ø13	6.00	1.20	●	●
95									1.38		
120									1.58		
145									1.77		
170									1.93		
70	75 100 125 150	27.5	1800	3490	3	Ø26	Ø16	8.00	1.32	●	●
95									1.50		
120									1.70		
145									1.89		
170									2.05		

## 01 Storage cross section

■ The "outer diameter" and "number" of cables and hoses to be stored in the SILVEYER Tough should be determined according to the following.

How to find the cross-sectional area of a cable/hose

Representative model number	Model number	Storage cross section		Width (mm)	Cables and hoses		Gap between cables and hoses		
		Height (mm)			Maximum storage radius (mm)				
		Outer side	Inner side		Outer side	Inner side			
		h1	h2	W2	d1	d2			
KST-25	KST-25040	15	10	40	Ø 12	Ø 8	2mm or more		
	KST-25050			50					
	KST-25060			60					
	KST-25080			80					
	KST-25100			100					
KST-30	KST-30040	18	12	40	Ø 15	Ø 9	2mm or more		
	KST-30050			50					
	KST-30060			60					
	KST-30080			80					
	KST-30100			100					
KST-40	KST-40050	24	16	50	Ø 20	Ø 13	2mm or more		
	KST-40075			75					
	KST-40100			100					
	KST-40125			125					
	KST-40150			150					
KST-50	KST-50050	30	20	50	Ø 26	Ø 16	2 mm or more and 10% or more of the cable/hose diameter		
	KST-50075			75					
	KST-50100			100					
	KST-50125			125					
	KST-50150			150					

### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Tough should be set to **60% or less** of the cross-sectional area of the SILVEYER Tough storage.

$$\text{Cross-sectional area for storage} \times 60\% \geq \text{Cross-sectional area of cable/hose (1.1D} \times 1.1\text{D)}$$

#### [ How to find the cross-sectional area of cable/hose ]

Calculate the cross-sectional area as a square with an increase of 10% of the cable/hose diameter. Calculate the cross-sectional area of flat cables in the same way.

(e.g.) For a diameter D: Cross-sectional area of cable/hose = 1.1D×1.1D

### 2 Securing the gap between cables/hoses

Secure the gap between cable/hose and inner wall and between cable/hose under the following conditions.

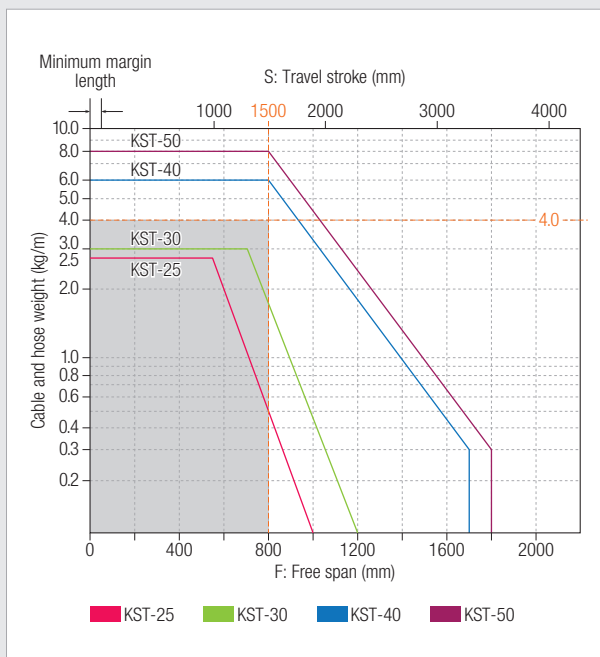
The gap between cables/hoses	The gap between cables and hoses shall be at least 2mm and at least 10% of the diameter of the cable or hose.
------------------------------	---

- ※ Use cables and hoses in parallel and do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER and the cables and hoses.

## 02 Capacity Diagram

■ Always use the SILVEYER Tough **within the range of the capacity diagram**.

Use of a SILVEYER Tough beyond the range of the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Tough.



### How to read the capability diagram

The following example shows how to read the capacity diagram.

Travel stroke: 1,500 mm  
Weight of cable hose: 4.0kg/m  
Cable hose bending radius: R50mm

- Select the model number from **the maximum weight of stored cables and hoses**. (P42, 43)
  - Select the model number from **the bending radius** of the SILVEYER Tough. (P42, 43)
- ※ The allowable bending radius of cable and hose shall be smaller than the allowable bending radius of the SILVEYER Tough.

$$\text{Allowable bending radius of SILVEYER Tough} > \text{Cable and hose allowable bending radius}$$

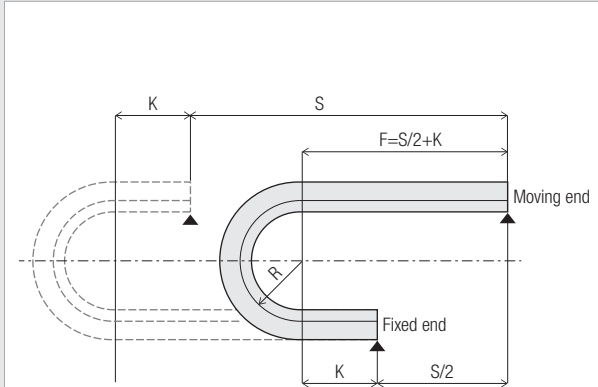
- Draw a vertical line at the **1,500mm travel stroke position** on the capacity diagram.
- Draw a horizontal line at the position where **the cable/hose weight is 4.0 kg/m** on the capacity diagram.
- Select a model number within the range of the intersection. In this case, the following can be used.  
KST-40 : R75 · R100 · R125 · R150  
KST-50 : R75 · R100 · R125 · R150

- Calculate the outer diameter and number of cables and hoses that can be accommodated in the model number selected in (5) from the storage cross section. If there is space in the equipment, select a larger model number.
- Even if the travel stroke is 1,500 mm, the free span may vary depending on the installation position of the SILVEYER Tough. If the fixed end is not in the center of the stroke, be sure to check that the free span is within the range shown in the capacity diagram.



## 03 Calculation of number of modules

■ The number of **modules (m)** should be calculated according to the following formula.



Representative model number	Pitch (mm)	Margin length (mm)
	P	K
KST-25	20	40 or more
KST-30	20	40 or more
KST-40	27.5	55 or more
KST-50	27.5	55 or more

□ Formula for calculating the number of modules

$$m = \frac{S / 2 + \pi R + 2K}{P}$$

[ When the fixed end is in the center of the stroke ]

m	Number of modules	The number of modules is rounded up to the nearest whole number.
S	Travel stroke (mm)	
P	Pitch (mm)	
F	Free span (mm)	
R	Bending radius (mm)	
K	Margin length (mm)	

(e.g.) Model KST-25 (P: 20 mm, R: 55mm)

Travel stroke (S: 1200mm)

$$m = ((1200/2) + (\pi \times 55) + (2 \times 40)) / 20 = 42.635 \dots$$

Required number of modules = 43

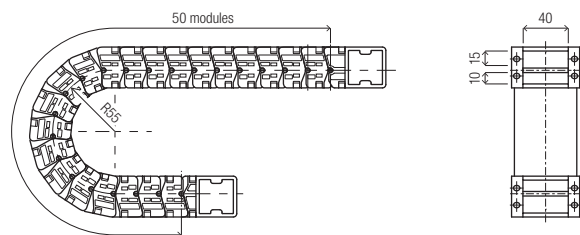
※ The number of modules is the number of side plates (L or R) plus 1.

## 04 Nominal model number

■ Please **order** the selected SILVEYER Tough according to the following nominal model number.

(e.g.) If you ordered with the following four details...

- ① Inner height: 25 mm  
(Inner height: 10 mm, outer height: 15 mm)
- ② Inner width: 40 mm
- ③ Bending radius: R55
- ④ 50 modules



**Ordering Example: KST - 25040 - 055 - 050**

Model number	Inner height	Inner width	Bending radius	Number of modules
<b>KST</b>	<b>25</b>	<b>040</b>	<b>055</b>	<b>050</b>
<b>KST</b> サイルベアタフ	<b>25</b> 25mm	<b>040</b> 40mm	<b>055</b> R55	<b>Obtained from calculation</b>
	<b>30</b> 30mm	<b>050</b> 50mm	<b>075</b> R75	
	<b>40</b> 40mm	<b>060</b> 60mm	<b>100</b> R100	
	<b>50</b> 50mm	<b>075</b> 75mm	<b>125</b> R125	
		<b>080</b> 80mm	<b>150</b> R150	
		<b>100</b> 100mm		
		<b>125</b> 125mm		
		<b>150</b> 150mm		

※ The main unit is standardly equipped with the mounting bracket(s).

※ Add the order part number, order part name, and quantity (in boxes) of separators (vertical partition) and cable clamps if needed.

※ Separators (vertical partition) and cable clamps are included with the main unit if they are ordered together with it.

※ The number of modules is the number of side plates (L or R) plus 1.

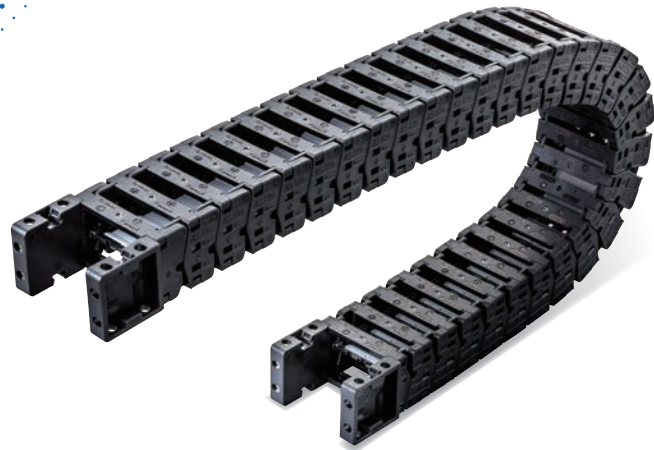
Example of model number configuration

## KST-25

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Separator (vertical partition)	Nylon
	Cable clamp	Nylon
Operating temperature range		-20°C ~ +85°C

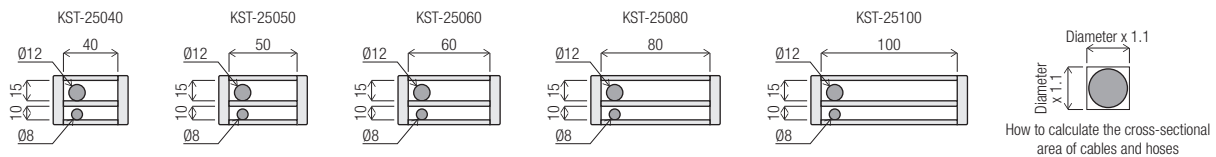
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height (mm)	Inner width (mm)	Storage cross section (height x width)		Outer height (mm)	Outer width (mm)	Bending radius R (mm)	Pitch (mm)	Maximum usable free span (mm)	Maximum usable stroke (mm)	Maximum usable speed (m/sec)	Storage cables and hoses		SILVEYER Tough weight (average) (kg/m)	Optional parts	
			Outer side (mm)	Inner side (mm)								Maximum radius (mm)	Maximum weight (kg/m)		Separator (vertical partition)	Cable clamp
KST-25040	25	40	15×40	10×40	36	55	55 75 100 150	20	1000	1920	3	Ø 12   Ø 8	2.50	0.67	●	●
KST-25050		50	15×50	10×50		65								0.72		
KST-25060		60	15×60	10×60		75								0.78		
KST-25080		80	15×80	10×80		95								0.89		
KST-25100		100	15×100	10×100		115								1.01		

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Tough according to the following.



#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Tough should be less than 60% of the cross-sectional area of the SILVEYER Tough.

$$\text{Cross-sectional area of storage} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

#### 2 Securing the gap between cables/hoses

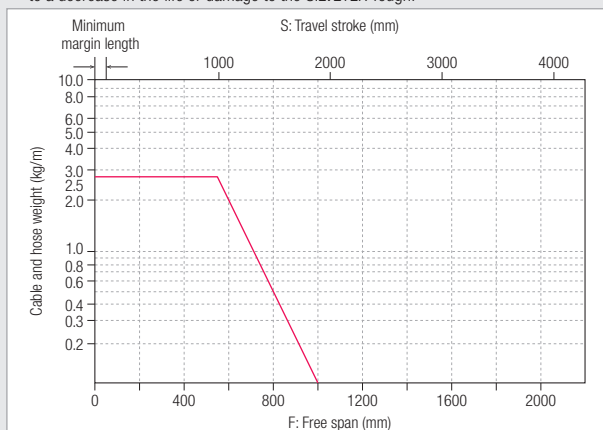
Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

### Capacity Diagram

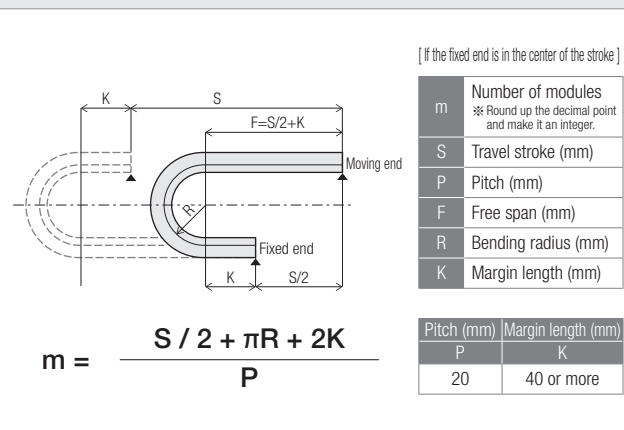
■ Always use the SILVEYER Tough within the range of the capacity diagram.

Use of the SILVEYER Tough beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Tough.



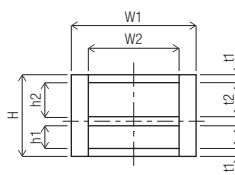
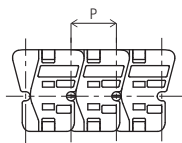
### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.



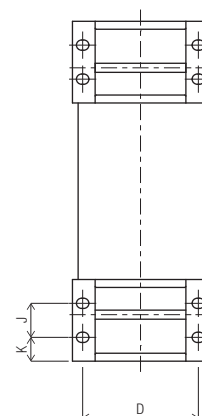
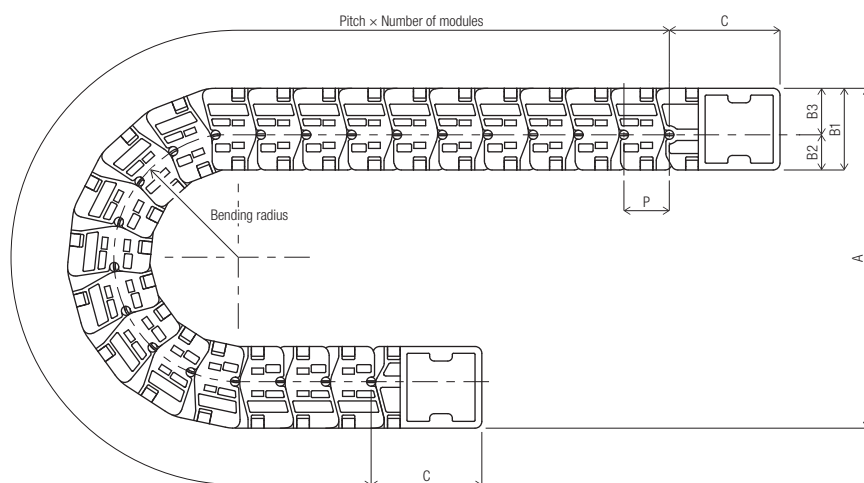
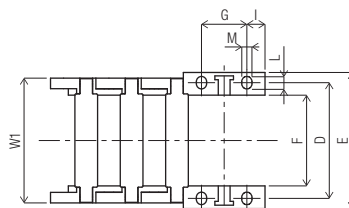


## Basic dimensions



Model number	P (mm)	W1 (mm)	W2 (mm)	H (mm)	h1 (inner height) (mm)	h2 (outer height) (mm)	t1 (mm)	t2 (mm)
KST-25040	20	55	40	36	10	15	3.5	4
KST-25050		65	50					
KST-25060		75	60					
KST-25080		95	80					
KST-25100		115	100					

## Mounting dimensions



## Mounting height dimensions

Unit of measurement : mm

Representative model number	Bending radius	A
KST-25	55	181 ~ 201
	75	221 ~ 241
	100	271 ~ 291
	150	371 ~ 391

## Mounting bracket part dimensions

Unit of measurement : mm

Model number	B1	B2	B3	C	D	E	F	G	I	J	K	L	M	Weight
KST-25040	36	15.5	20.5	49	51	60	40	20	8	15	10.5	5.5	4.5	36g
KST-25050					61	70	50							
KST-25060					71	80	60							
KST-25080					91	100	80							
KST-25100					111	120	100							

## SILVEYER Tough nominal model number

- Order the SILVEYER Tough you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Bending radius		Number of modules	
	KST		25		040		055		050	
	KST		SILVEYER Tough						Obtained from calculation	
			25	25mm	040	40mm	055	R55		
			25	25mm	050	50mm	075	R75		
			25	25mm	060	60mm	100	R100		
			25	25mm	080	80mm	150	R150		
			25	25mm	100	100mm				

- ※ The main unit is standardly equipped with the mounting bracket(s).
- ※ Add the order part number, order part name, and quantity (in boxes) of separators (vertical partition) and cable clamps if needed.
- ※ Separators (vertical partition) and cable clamps are included with the main unit if they are ordered together with it.
- ※ The number of modules is the number of side plates (L or R) plus 1.

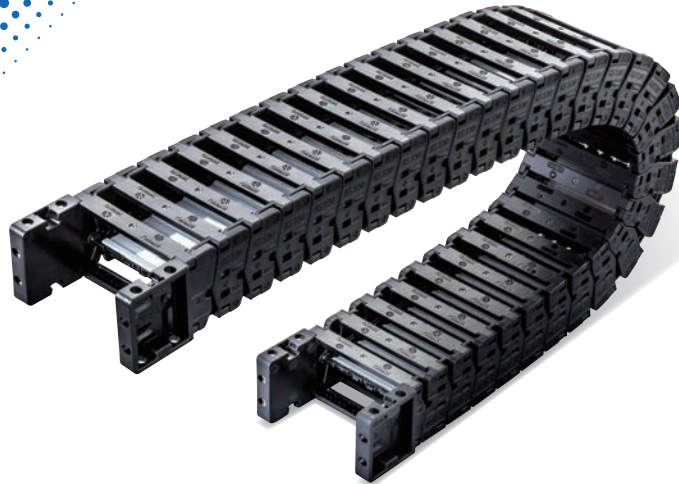
Refer to P54-58 for specifications of optional parts and for ordering separately.

## KST-30

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Separator (vertical partition)	Nylon
	Cable clamp	Nylon
Operating temperature range		-20°C ~ +85°C

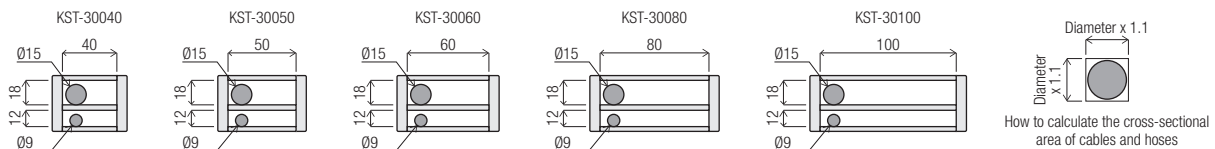
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Storage cross section (height x width)		Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cables and hoses			SILVEYER Tough weight (average)	Optional parts	
			Outer side	Inner side								Maximum radius (mm)		Maximum weight		Separator (vertical partition)	Cable clamp
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Outer side	Inner side	(kg/m)	(kg/m)		
KST-30040	30	40	18×40	12×40	41	55	55 75 100 150	20	1200	2320	3	Ø 15	Ø 9	3.00	0.71	●	●
KST-30050		50	18×50	12×50		65									0.76		
KST-30060		60	18×60	12×60		75									0.82		
KST-30080		80	18×80	12×80		95									0.93		
KST-30100		100	18×100	12×100		115									1.05		

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Tough according to the following.



#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Tough should be less than 60% of the cross-sectional area of the SILVEYER Tough.

$$\text{Cross-sectional area of storage} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

#### 2 Securing the gap between cables/hoses

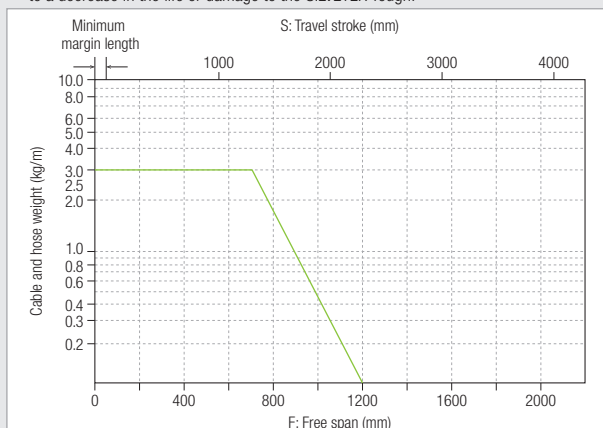
Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

### Capacity Diagram

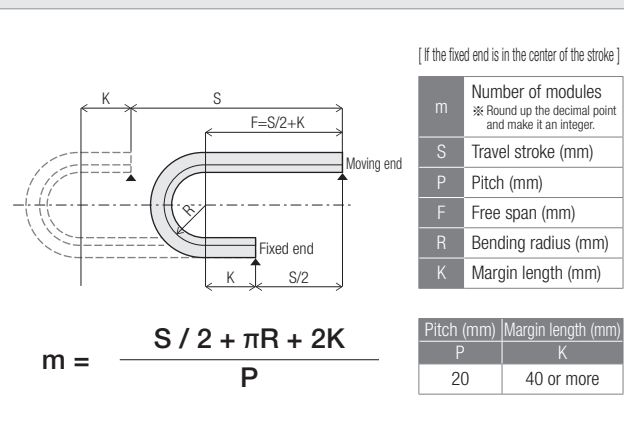
■ Always use the SILVEYER Tough within the range of the capacity diagram.

Use of the SILVEYER Tough beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Tough.

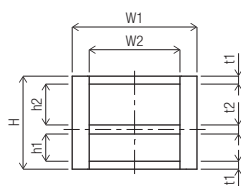
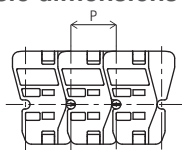


### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.

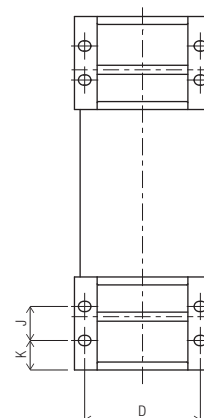
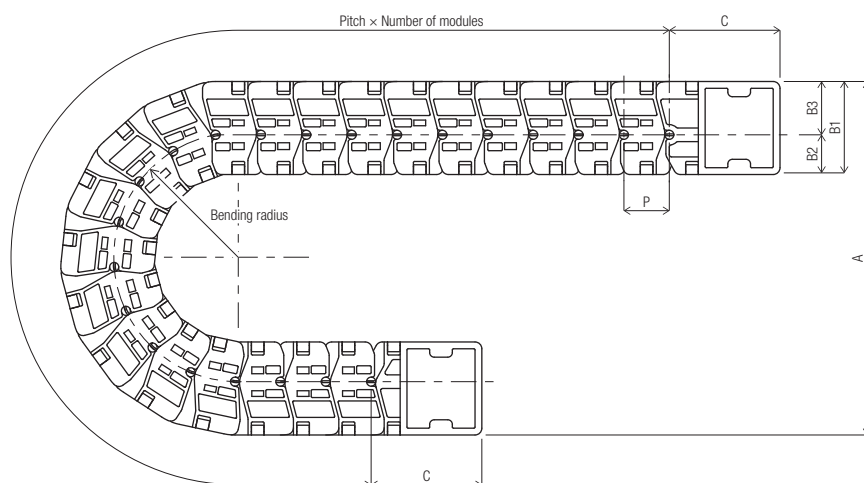
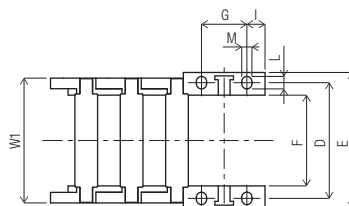


## Basic dimensions



Model number	P (mm)	W1 (mm)	W2 (mm)	H (mm)	h1 (inner height) (mm)	h2 (outer height) (mm)	t1 (mm)	t2 (mm)
<b>KST-30040</b>	20	55	40	41	12	18	3.5	4
<b>KST-30050</b>		65	50					
<b>KST-30060</b>		75	60					
<b>KST-30080</b>		95	80					
<b>KST-30100</b>		115	100					

## Mounting dimensions



### Mounting height dimensions Unit of measurement : mm

Representative model number	Bending radius	A
<b>KST-30</b>	55	187 ~ 207
	75	227 ~ 247
	100	277 ~ 297
	150	377 ~ 397

### Mounting bracket part dimensions Unit of measurement : mm

Model number	B1	B2	B3	C	D	E	F	G	I	J	K	L	M	Weight
<b>KST-30040</b>	41	17.5	23.5	49	51	60	40	20	8	15	13	5.5	4.5	40g
<b>KST-30050</b>					61	70	50							
<b>KST-30060</b>					71	80	60							
<b>KST-30080</b>					91	100	80							
<b>KST-30100</b>					111	120	100							

## SILVEYER Tough nominal model number

- Order the SILVEYER Tough you selected with the following nominal model numbers.

Example of model number configuration	Model number	Inner height		Inner width		Bending radius		Number of modules	
	<b>KST</b>	<b>30</b>		<b>040</b>		<b>055</b>		<b>050</b>	
	<b>KST</b>	SILVEYER Tough						Obtained from calculation	
		<b>30</b>	30mm	<b>040</b>	40mm	<b>055</b>	R55		
		<b>30</b>	30mm	<b>050</b>	50mm	<b>075</b>	R75		
		<b>30</b>	30mm	<b>060</b>	60mm	<b>100</b>	R100		
		<b>30</b>	30mm	<b>080</b>	80mm	<b>150</b>	R150		
		<b>30</b>	30mm	<b>100</b>	100mm				

- ※ The main unit is standardly equipped with the mounting bracket(s).
- ※ Add the order part number, order part name, and quantity (in boxes) of separators (vertical partition) and cable clamps if needed.
- ※ Separators (vertical partition) and cable clamps are included with the main unit if they are ordered together with it.
- ※ The number of modules is the number of side plates (L or R) plus 1.

Refer to P54-58 for specifications of optional parts and for ordering separately.

## KST-40

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Separator (vertical partition)	Nylon
	Cable clamp	Nylon
Operating temperature range		-20°C ~ +85°C

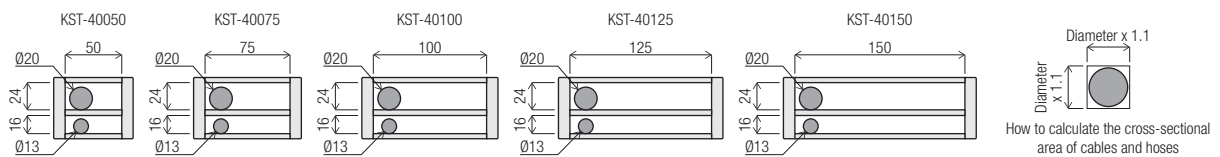
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height (mm)	Inner width (mm)	Storage cross section (height x width)		Outer height (mm)	Outer width (mm)	Bending radius R (mm)	Pitch (mm)	Maximum usable free span (mm)	Maximum usable stroke (mm)	Maximum usable speed (m/sec)	Storage cables and hoses		SILVEYER Tough weight (average) (kg/m)	Optional parts	
			Outer side (mm)	Inner side (mm)								Maximum radius (mm)	Maximum weight (kg/m)		Separator (vertical partition)	Cable clamp
KST-40050	40	50	24×50	16×50	54	70	75 100 125 150	27.5	1700	3290	3	Ø 20 Ø 13	6.00	1.20	●	●
KST-40075		75	24×75	16×75		95								1.38		
KST-40100		100	24×100	16×100		120								1.58		
KST-40125		125	24×125	16×125		145								1.77		
KST-40150		150	24×150	16×150		170								1.93		

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Tough according to the following.



#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Tough should be less than 60% of the cross-sectional area of the SILVEYER Tough.

$$\text{Cross-sectional area of storage} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

#### 2 Securing the gap between cables/hoses

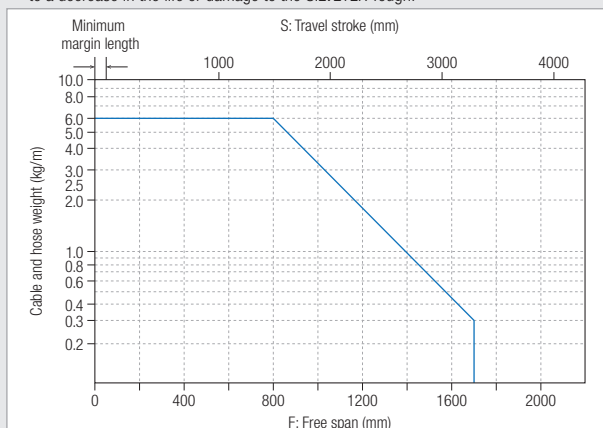
Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

### Capacity Diagram

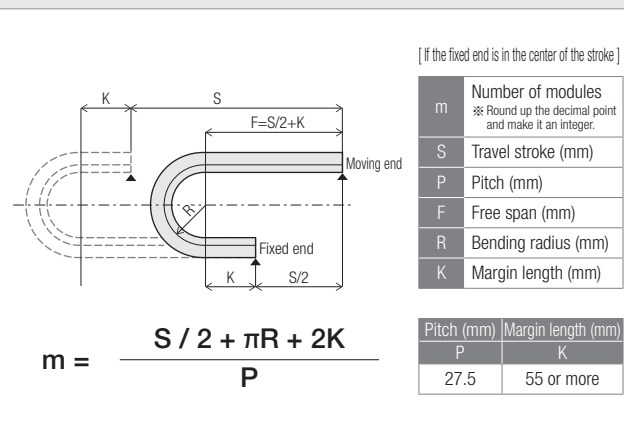
■ Always use the SILVEYER Tough within the range of the capacity diagram.

Use of the SILVEYER Tough beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Tough.

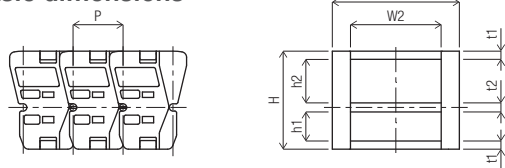


### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.

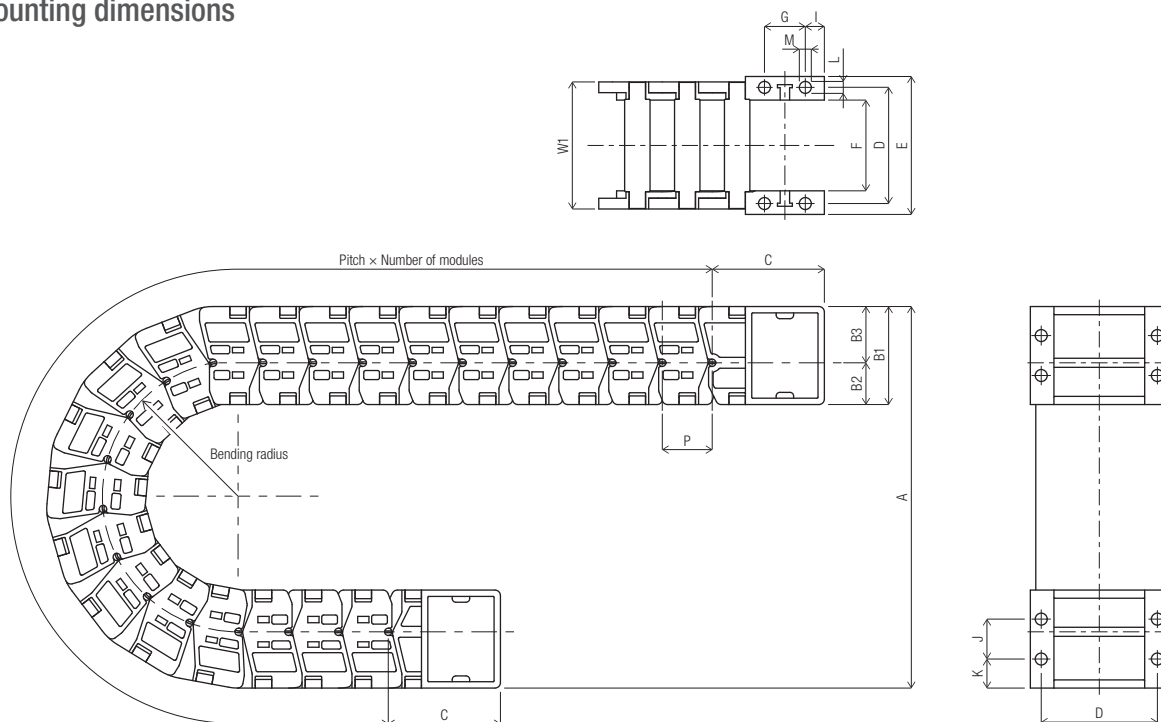


## Basic dimensions



Model number	P (mm)	W1 (mm)	W2 (mm)	H (mm)	h1 (inner height) (mm)	h2 (outer height) (mm)	t1 (mm)	t2 (mm)
<b>KST-40050</b>	27.5	70	50	54	16	24	4.5	5
<b>KST-40075</b>		95	75					
<b>KST-40100</b>		120	100					
<b>KST-40125</b>		145	125					
<b>KST-40150</b>		170	150					

## Mounting dimensions



### Mounting height dimensions Unit of measurement : mm

Representative model number	Bending radius	A
<b>KST-40</b>	75	251 ~ 271
	100	301 ~ 321
	125	351 ~ 371
	150	401 ~ 421

### Mounting bracket part dimensions Unit of measurement : mm

Model number	B1	B2	B3	C	D	E	F	G	I	J	K	L	M	Weight
<b>KST-40050</b>	54	23	31	62	64	76	50	22.5	10.5	22	16	6.6	6.6	76g
<b>KST-40075</b>					89	101	75							
<b>KST-40100</b>					114	126	100							
<b>KST-40125</b>					139	151	125							
<b>KST-40150</b>					164	176	150							

## SILVEYER Tough nominal model number

- Order the SILVEYER Tough you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Bending radius		Number of modules	
	<b>KST</b>		<b>40</b>		<b>050</b>		<b>075</b>		<b>050</b>	
	<b>KST</b>	SILVEYER Tough	<b>40</b>	40mm	<b>050</b>	50mm	<b>075</b>	R75	<b>Obtained from calculation</b>	
			<b>40</b>	40mm	<b>075</b>	75mm	<b>100</b>	R100		
			<b>40</b>	40mm	<b>100</b>	100mm	<b>125</b>	R125		
			<b>40</b>	40mm	<b>125</b>	125mm	<b>150</b>	R150		

- ※ The main unit is standardly equipped with the mounting bracket(s).
- ※ Add the order part number, order part name, and quantity (in boxes) of separators (vertical partition) and cable clamps if needed.
- ※ Separators (vertical partition) and cable clamps are included with the main unit if they are ordered together with it.
- ※ The number of modules is the number of side plates (L or R) plus 1.

Refer to P54-58 for specifications of optional parts and for ordering separately.



## KST-50

### Basic Specifications

Material	Main unit	Nylon
	Mounting bracket (resin)	Nylon
	Separator (vertical partition)	Nylon
	Cable clamp	Nylon
Operating temperature range		-20°C ~ +85°C

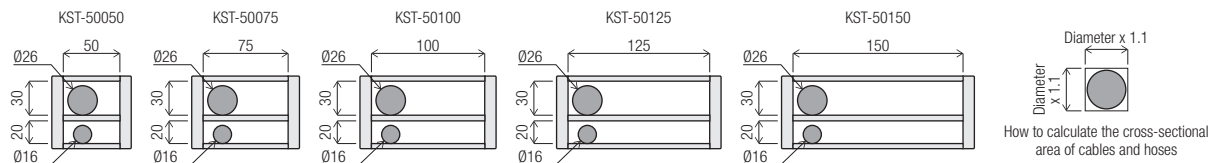
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height (mm)	Inner width (mm)	Storage cross section (height x width)		Outer height (mm)	Outer width (mm)	Bending radius R (mm)	Pitch (mm)	Maximum usable free span (mm)	Maximum usable stroke (mm)	Maximum usable speed (m/sec)	Storage cables and hoses		SILVEYER Tough weight (average) (kg/m)	Optional parts	
			Outer side (mm)	Inner side (mm)								Maximum radius (mm)	Maximum weight (kg/m)		Separator (vertical partition)	Cable clamp
KST-50050	50	50	30×50	20×50	64	70	75 100 125 150	27.5	1800	3490	3	Ø 26	Ø 16	8.00	●	●
KST-50075		75	30×75	20×75		95										
KST-50100		100	30×100	20×100		120										
KST-50125		125	30×125	20×125		145										
KST-50150		150	30×150	20×150		170										

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Tough according to the following.



#### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Tough should be less than 60% of the cross-sectional area of the SILVEYER Tough.

$$\text{Cross-sectional area of storage} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

#### 2 Securing the gap between cables/hoses

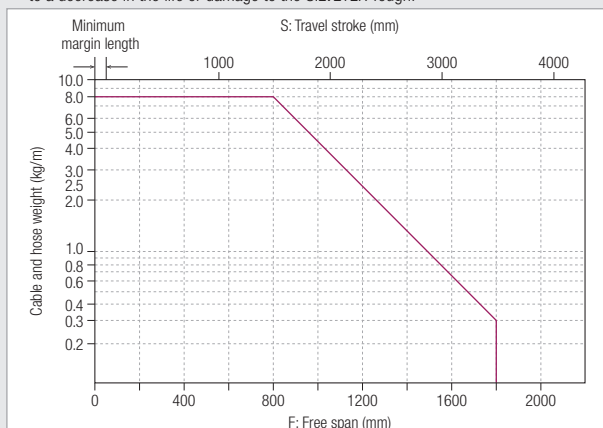
Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2 \text{ mm or more and } 10\% \text{ or more of the cable/hose diameter}$$

### Capacity Diagram

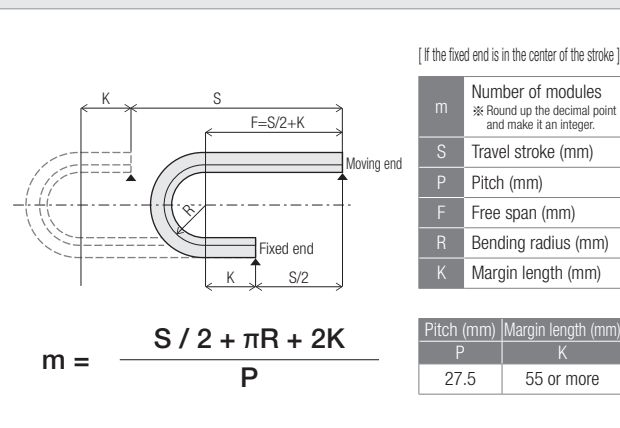
■ Always use the SILVEYER Tough within the range of the capacity diagram.

Use of the SILVEYER Tough beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Tough.

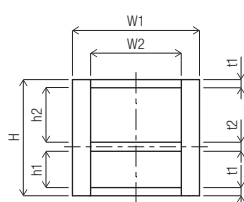
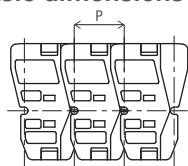


### Calculation of the number of modules

■ The number of modules (m) should be calculated according to the following formula.

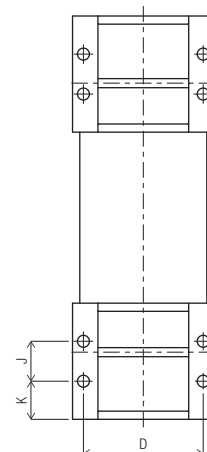
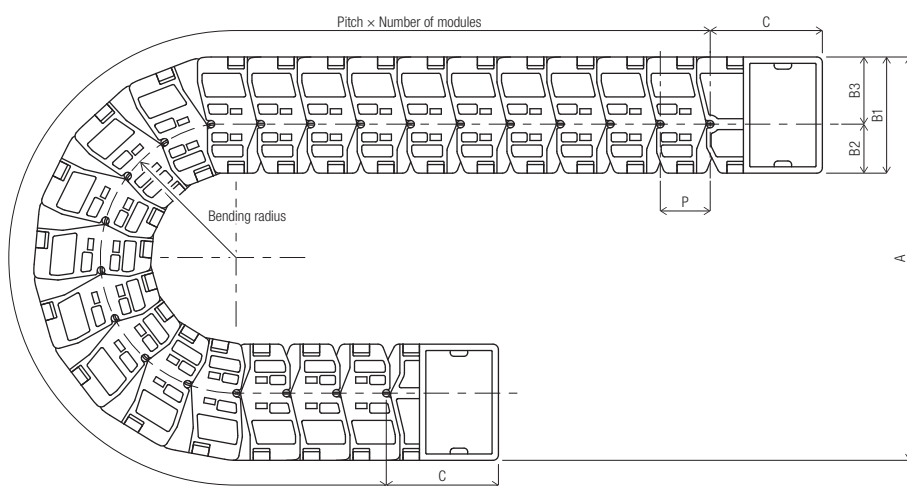
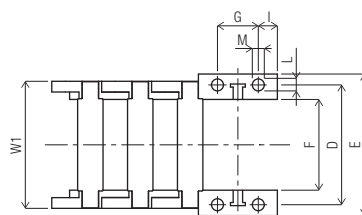


## Basic dimensions



Model number	P (mm)	W1 (mm)	W2 (mm)	H (mm)	h1 (inner height) (mm)	h2 (outer height) (mm)	t1 (mm)	t2 (mm)
KST-50050	27.5	70	50	64	20	30	4.5	5
KST-50075		95	75					
KST-50100		120	100					
KST-50125		145	125					
KST-50150		170	150					

## Mounting dimensions



## Mounting height dimensions Unit of measurement : mm

Representative model number	Bending radius	A
KST-50	75	264 ~ 284
	100	314 ~ 334
	125	364 ~ 384
	150	414 ~ 434

## Mounting bracket part dimensions Unit of measurement : mm

Model number	B1	B2	B3	C	D	E	F	G	I	J	K	L	M	Weight
KST-50050	64	27	37	62	66	78	50	22.5	10.5	22	21	6.6	6.6	94g
KST-50075					91	103	75							
KST-50100					116	128	100							
KST-50125					141	153	125							
KST-50150					166	178	150							

## SILVEYER Tough nominal model number

- Order the SILVEYER Tough you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Bending radius		Number of modules	
	KST		50		050		075		050	
	KST		SILVEYER Tough						Obtained from calculation	
			50	50mm	050	50mm	075	R75		
			50	50mm	075	75mm	100	R100		
			50	50mm	100	100mm	125	R125		
			50	50mm	125	125mm	150	R150		
			50	50mm	150	150mm				

- ※ The main unit is standardly equipped with the mounting bracket(s).
- ※ Add the order part number, order part name, and quantity (in boxes) of separators (vertical partition) and cable clamps if needed.
- ※ Separators (vertical partition) and cable clamps are included with the main unit if they are ordered together with it.
- ※ The number of modules is the number of side plates (L or R) plus 1.

Refer to P54-58 for specifications of optional parts and for ordering separately.

# SILVEYER® Tough | Optional Parts

## Module set

### ■ KST-25



### ■ KST-30



Applicable Model Number		Order Part Number	Order Part Name	Quantity Sold (Set(s)/Box(es))	Weight (g/Set(s))	Contained in Set
KST-25040	R55	KST25040-055-(MS)	Module set	1 set	75g	<div>■ Joint hinges Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Side plate R Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Side plate L Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Cover Quantity: 10 Indv. parts Material: Nylon</div>
	R75	KST25040-075-(MS)				
	R100	KST25040-100-(MS)				
	R150	KST25040-150-(MS)				
KST-25050	R55	KST25050-055-(MS)	Module set	1 set	75g	
	R75	KST25050-075-(MS)				
	R100	KST25050-100-(MS)				
	R150	KST25050-150-(MS)				
KST-25060	R55	KST25060-055-(MS)	Module set	1 set	90g	
	R75	KST25060-075-(MS)				
	R100	KST25060-100-(MS)				
	R150	KST25060-150-(MS)				
KST-25080	R55	KST25080-055-(MS)	Module set	1 set	95g	
	R75	KST25080-075-(MS)				
	R100	KST25080-100-(MS)				
	R150	KST25080-150-(MS)				
KST-25100	R55	KST25100-055-(MS)	Module set	1 set	110g	
	R75	KST25100-075-(MS)				
	R100	KST25100-100-(MS)				
	R150	KST25100-150-(MS)				
KST-30040	R55	KST30040-055-(MS)	Module set	1 set	85g	
	R75	KST30040-075-(MS)				
	R100	KST30040-100-(MS)				
	R150	KST30040-150-(MS)				
KST-30050	R55	KST30050-055-(MS)	Module set	1 set	85g	
	R75	KST30050-075-(MS)				
	R100	KST30050-100-(MS)				
	R150	KST30050-150-(MS)				
KST-30060	R55	KST30060-055-(MS)	Module set	1 set	100g	
	R75	KST30060-075-(MS)				
	R100	KST30060-100-(MS)				
	R150	KST30060-150-(MS)				
KST-30080	R55	KST30080-055-(MS)	Module set	1 set	105g	
	R75	KST30080-075-(MS)				
	R100	KST30080-100-(MS)				
	R150	KST30080-150-(MS)				
KST-30100	R55	KST30100-055-(MS)	Module set	1 set	120g	
	R75	KST30100-075-(MS)				
	R100	KST30100-100-(MS)				
	R150	KST30100-150-(MS)				

## Module set

## ■ KST-40



Side plate R



Side plate L



Joint hinge



Cover

## ■ KST-50



Side plate R



Side plate L



Joint hinge

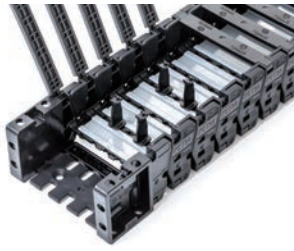


Cover

Applicable Model Number		Order Part Number	Order Part Name	Quantity Sold	Weight	Contained in Set
				(Set(s)/Box(es))	(g/Set(s))	
KST-40050	R75	KST40050-075-(MS)	Module set	1 set	180g	<div>■ Joint hinges Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Side plate R Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Side plate L Quantity: 5 Indv. parts Material: Nylon</div> <div>■ Cover Quantity: 10 Indv. parts Material: Nylon</div>
	R100	KST40050-100-(MS)				
	R125	KST40050-125-(MS)				
	R150	KST40050-150-(MS)				
KST-40075	R75	KST40075-075-(MS)	Module set	1 set	200g	
	R100	KST40075-100-(MS)				
	R125	KST40075-125-(MS)				
	R150	KST40075-150-(MS)				
KST-40100	R75	KST40100-075-(MS)	Module set	1 set	220g	
	R100	KST40100-100-(MS)				
	R125	KST40100-125-(MS)				
	R150	KST40100-150-(MS)				
KST-40125	R75	KST40125-075-(MS)	Module set	1 set	255g	
	R100	KST40125-100-(MS)				
	R125	KST40125-125-(MS)				
	R150	KST40125-150-(MS)				
KST-40150	R75	KST40150-075-(MS)	Module set	1 set	275g	
	R100	KST40150-100-(MS)				
	R125	KST40150-125-(MS)				
	R150	KST40150-150-(MS)				
KST-50050	R75	KST50050-075-(MS)	Module set	1 set	190g	
	R100	KST50050-100-(MS)			200g	
	R125	KST50050-125-(MS)				
	R150	KST50050-150-(MS)				
KST-50075	R75	KST50075-075-(MS)	Module set	1 set	210g	
	R100	KST50075-100-(MS)			220g	
	R125	KST50075-125-(MS)				
	R150	KST50075-150-(MS)				
KST-50100	R75	KST50100-075-(MS)	Module set	1 set	230g	
	R100	KST50100-100-(MS)			240g	
	R125	KST50100-125-(MS)				
	R150	KST50100-150-(MS)				
KST-50125	R75	KST50125-075-(MS)	Module set	1 set	265g	
	R100	KST50125-100-(MS)			275g	
	R125	KST50125-125-(MS)				
	R150	KST50125-150-(MS)				
KST-50150	R75	KST50150-075-(MS)	Module set	1 set	285g	
	R100	KST50150-100-(MS)			295g	
	R125	KST50150-125-(MS)				
	R150	KST50150-150-(MS)				

# SILVEYER® Tough | Optional Parts

## Separators (vertical partition)



KST10SP-50



KST12SP-50



KST15SP-50



KST16SP-50



KST18SP-50



KST20SP-50



KST24SP-50



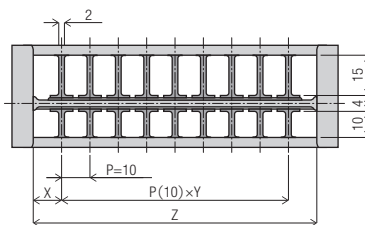
KST30SP-50

- Note that each model number differs at their upper and lower sections.
- The upper and lower sections cannot be installed in the same position. Install them after offsetting their positions.

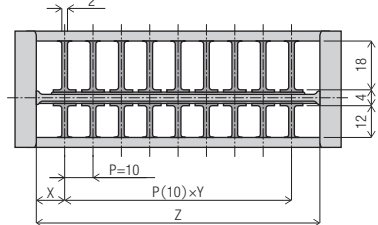
Applicable model number	Type	Order part number		Order Part Name	Quantity Sold (Products/Bag)	Weight (g/Indv. Part)	Material
		Part number when ordering Indv. Part(s)	Part number when included with products				
KST-25	Outer side (upper section) use	KST15SP-50	KST15SP-50+	Separators	50 Indv. Parts	1g	Nylon
	Inner side (lower section) use	KST10SP-50	KST10SP-50+	Separators	50 Indv. Parts	1g	Nylon
KST-30	Outer side (upper section) use	KST18SP-50	KST18SP-50+	Separators	50 Indv. Parts	1g	Nylon
	Inner side (lower section) use	KST12SP-50	KST12SP-50+	Separators	50 Indv. Parts	1g	Nylon
KST-40	Outer side (upper section) use	KST24SP-50	KST24SP-50+	Separators	50 Indv. Parts	1g	Nylon
	Inner side (lower section) use	KST16SP-50	KST16SP-50+	Separators	50 Indv. Parts	1g	Nylon
KST-50	Outer side (upper section) use	KST30SP-50	KST30SP-50+	Separators	50 Indv. Parts	2g	Nylon
	Inner side (lower section) use	KST20SP-50	KST20SP-50+	Separators	50 Indv. Parts	1g	Nylon

### Separator (vertical partition) Dimensions

KST-25

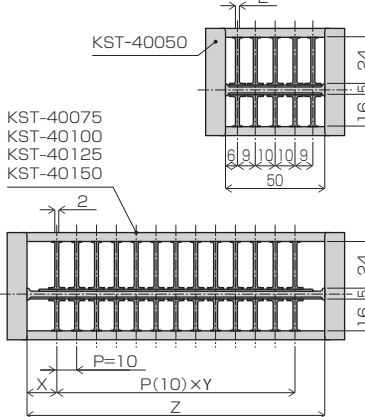


KST-30

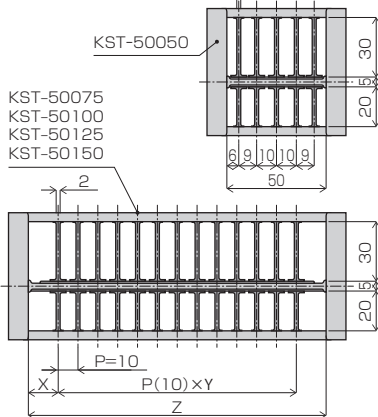


Model Number	X (mm)	Y (mm)	Z (mm)	Maximum number of installable separators	
				Outer Side	Inner Side
KST-25040 · KST-30040	10	2	40	3	3
KST-25050 · KST-30050	6	4	50	5	5
KST-25060 · KST-30060	10	4	60	5	5
KST-25080 · KST-30080	10	6	80	7	7
KST-25100 · KST-30100	10	8	100	9	9

KST-40



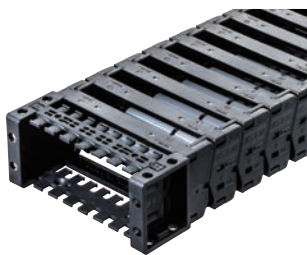
KST-50



Model Number	X (mm)	Y (mm)	Z (mm)	Maximum number of installable separators	
				Outer Side	Inner Side
KST-40050 · KST-50050	the above illustration	the above illustration	50	5	5
KST-40075 · KST-50075	7.5	6	75	7	7
KST-40100 · KST-50100	10	8	100	9	9
KST-40125 · KST-50125	12.5	10	125	11	11
KST-40150 · KST-50150	10	12	150	13	13



## Cable clamps



KST040CL-4



KST050CL-4



KST060CL-4



KST075CL-4



KST080CL-4



KST100CL-4



KST125CL-4

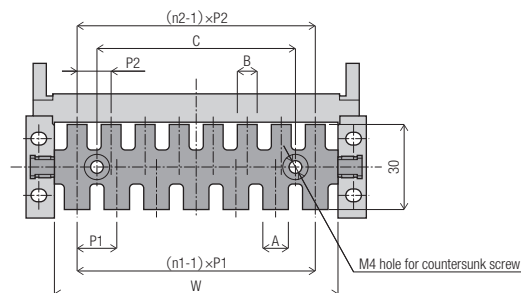


KST150CL-4

- Use cable clamps to secure and thereby align and tidy up cables and hoses at the ends of the SILVEYER tough.

Applicable model number	Storage cross-sectional width (mm)	Order part number		Order Part Name	Quantity Sold (Products/ Bag)	Weight (g/Indv. Part)	Material
		Part number when ordering Indv. Part(s)	Part number when included with products				
KST-25 · KST-30	40	KST040CL-4	KST040CL-4+	Cable clamps	4 Indv. Parts	4g	Nylon
KST-25 · KST-30 KST-40 · KST-50	50	KST050CL-4	KST050CL-4+	Cable clamps	4 Indv. Parts	5g	Nylon
KST-25 · KST-30	60	KST060CL-4	KST060CL-4+	Cable clamps	4 Indv. Parts	6g	Nylon
KST-40 · KST-50	75	KST075CL-4	KST075CL-4+	Cable clamps	4 Indv. Parts	7g	Nylon
KST-25 · KST-30	80	KST080CL-4	KST080CL-4+	Cable clamps	4 Indv. Parts	7g	Nylon
KST-25 · KST-30 KST-40 · KST-50	100	KST100CL-4	KST100CL-4+	Cable clamps	4 Indv. Parts	9g	Nylon
KST-40 · KST-50	125	KST125CL-4	KST125CL-4+	Cable clamps	4 Indv. Parts	11g	Nylon
KST-40 · KST-50	150	KST150CL-4	KST150CL-4+	Cable clamps	4 Indv. Parts	13g	Nylon

Cable clamp dimensions



Order Part Number	Inner Width (mm)	Comb teeth			Comb teeth			Fixing screw pitch (mm)	Applicable model number
		Number	Pitch (mm)	Width (mm)	Number	Pitch (mm)	Width (mm)		
		W	n1	P1	A	n2	P2	B	C
KST040CL-4	40	3	13	8	4	10	6	20	KST-25040 KST-30040
KST050CL-4	50	3	15	9	4	12	7	30	KST-25050 KST-30050 KST-40050 KST-50050
KST060CL-4	60	4	15	9	5	12	7	35	KST-25060 KST-30060
KST075CL-4	75	5	15	9	6	12	7	50	KST-40075 KST-50075
KST080CL-4	80	5	15	9	6	13	7	50	KST-25080 KST-30080
KST100CL-4	100	7	14	9	8	12	7	70	KST-25100 KST-30100 KST-40100 KST-50100
KST125CL-4	125	8	15	9	10	12	7	85	KST-40125 KST-50125
KST150CL-4	150	10	15	9	12	12	7	100	KST-40150 KST-50150

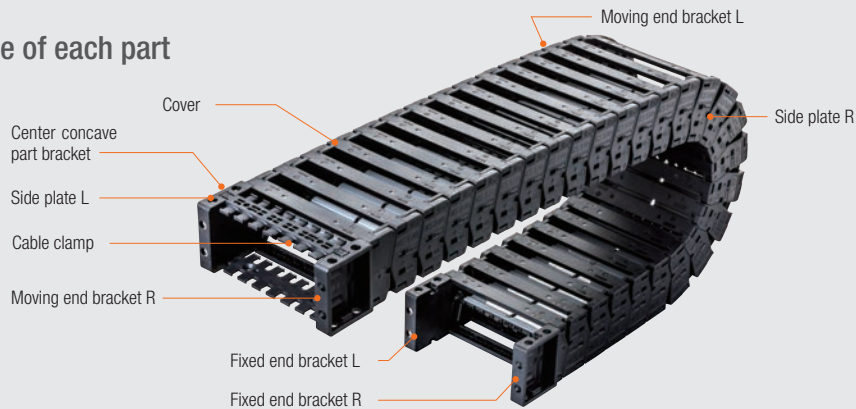
## Mounting brackets



Applicable model number	Type	Order part number	Order part name	Quantity sold (Set(s)/Box(es))	Weight (g/Set)	Contained in Set
KST-25	Moving end	<b>KST25-MBR/L (BS)</b>	Mounting brackets	1 set	18g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
	Fixed end	<b>KST25-FBR/L (BS)</b>	Mounting brackets	1 set	18g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
KST-30	Moving end	<b>KST30-MBR/L (BS)</b>	Mounting brackets	1 set	20g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
	Fixed end	<b>KST30-FBR/L (BS)</b>	Mounting brackets	1 set	20g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
KST-40	Moving end	<b>KST40-MBR/L (BS)</b>	Mounting brackets	1 set	38g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
	Fixed end	<b>KST40-FBR/L (BS)</b>	Mounting brackets	1 set	38g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
KST-50	Moving end	<b>KST50-MBR/L (BS)</b>	Mounting brackets	1 set	47g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>
	Fixed end	<b>KST50-FBR/L (BS)</b>	Mounting brackets	1 set	47g	<ul style="list-style-type: none"> <li>■ Moving end bracket R Quantity: 1 Indv. Part Material: Nylon</li> <li>■ Moving end bracket L Quantity: 1 Indv. Part Material: Nylon</li> </ul>

# SILVEYER® Tough | Handling Method

## Name of each part



### Outer side

Separator  
(vertical partition)

Joint hinge

### Inner side

Separator  
(vertical partition)

Joint hinge

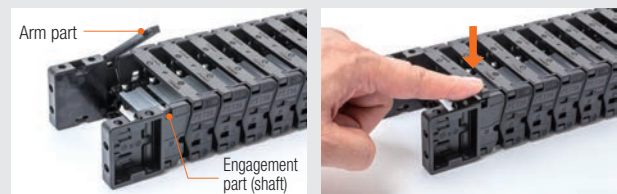
## Handling Method of Covers

### How to remove



- Insert a screwdriver into the gap between the side plate and the cover and remove the cover by lifting it upward.
- The cover can also be removed from the upper or lower sections from either left or right (L side and R side).

### How to fit it in



- Apply the side plate to the engagement section (shaft) and push it in.
- ※ Be sure to check that the cover is properly closed and not lifted.

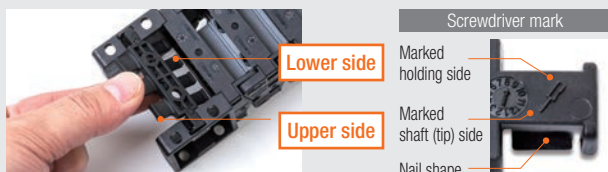
## Method used for installing separators (vertical partition)



- Insert the separator into the hole of the joint hinge while the cover is open.
- ※ The upper and lower sections can be installed, but not in the same positions, so install them after offsetting their positions.
- ※ Note that the sizes of separators used for the upper and lower sections differ.

## Handling Method of Cable Clamps

### How to install



- Fit the cable clamp into the center concave part of the bracket while tilting it (mark on the holding side downward).
- Install the cable clamp by pushing its upper side on both ends (marked shaft (tip) side).
- ※ They can be installed in a different direction than that shown in the illustration, according to the number of comb teeth selected. Fit it after making sure the marked holding side is facing down.

### How to remove



- Insert a screwdriver into the gap between the bracket and the cable clamp (※) and remove the cable clamp by pushing down on the down side.
- ※ Insert a screwdriver into the shaft (tip) side of the screwdriver mark.
- ※ It cannot be removed if inserted into the gap of the screwdriver mark's holding side.

# SILVEYER® Tough | Handling Method

## Removal Method of Moving End Brackets (MBR/MBL)

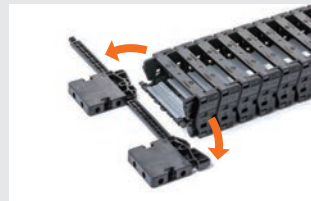


Inscriptions

- Check the inscription.  
MBR: Moving Bracket R  
MBL: Moving Bracket L



- Remove the mounted cover.  
(Refer to Removal Method of Covers.)



- Remove the MBL and MBR brackets one at a time.  
※ Install them using the opposite guidelines for removal.

## Removal Method of Fixed End Brackets (FBR/FBL)

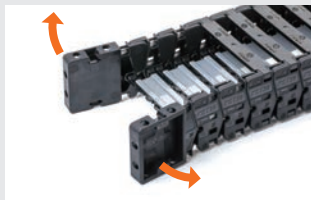


Inscriptions

- Check the inscriptions.  
FBR: Fixed Bracket R  
FBL: Fixed Bracket L



- Remove the upper and lower section covers mounted on fixed end brackets and side plates three at a time.  
(Refer to Removal Method of Covers.)



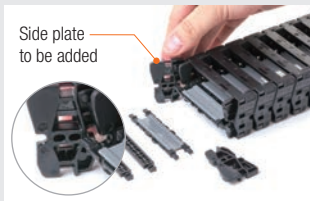
- Remove it from the shaft of the joint hinge while broadening the fixed end bracket and side plate little by little outward and only setting off the fixed end bracket further outward.



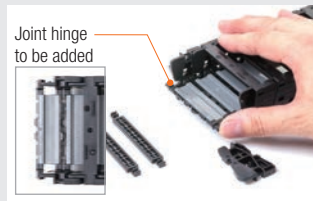
- ※ Only remove the FBR or FBL when they need to be replaced, as they are difficult to remove since they are located on the innermost side of the assembly and removing them by force may cause damage.
- ※ Install them using the opposite guidelines for removal.

## Method Used for Extending and Reducing Modules

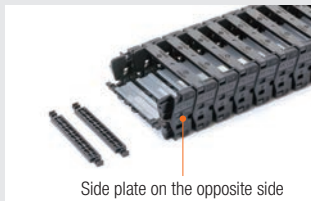
Modules can only be extended and reduced from the **sides of moving end brackets**



Side plate to be added



Joint hinge to be added



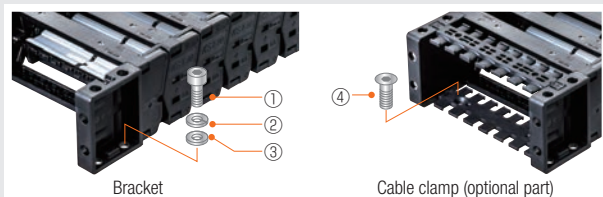
Side plate on the opposite side



Cover to be added

- ① Fit one of the side plates to be added (R or L) into the shaft of the joint hinge on one side while the moving end brackets (MBR/MBL) are removed.
- ② Insert the joint hinge to be added into the hole of the added side plate in ① (R or L).  
※ Pay attention to the joint hinges to make sure they are interlocked at this time.
- ③ Fit the added side plate in ① (R or L) and the side plate on the opposite side (R or L) into the shaft of the joint hinge.
- ④ Install the covers to be added to the upper and lower sections. (Refer to the method for fitting in covers.)  
※ Repeat ① ~ ④ as needed for the number of modules to extend.  
※ Use the opposite guidelines used when extending modules for reducing modules (removal method).

## Method used for securing to devices



Bracket

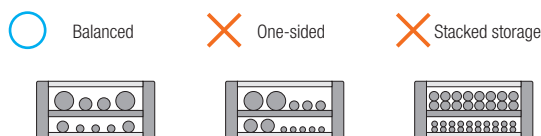
Cable clamp (optional part)

- It can be mounted in 3 directions.
- Be sure to use spring washers and washers to prevent brackets from deforming, damage, and screws from becoming loose.
- Cable clamps (optional parts) must be securely tightened with screws after installation, as there is a risk of them coming off due to tension from cables.

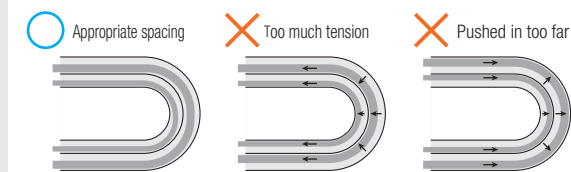
		KST25/30	KST40/50	Cable clamp
①	M4 bolt M6 bolt	●	●	
②	M4 spring washer M6 spring washer	●	●	
③	M4 small round washer M6 washer	●	●	
④	M4 countersunk screw			●



## Method used for storing cables

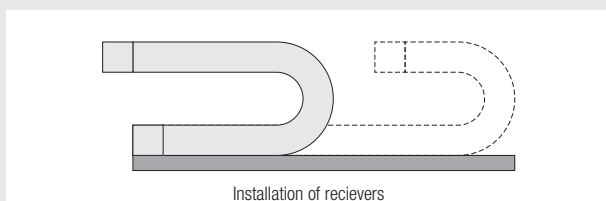


- Store the cables in a single horizontal line while keeping in mind the balance of weight on the left and right side.
- Do not store the cables in a way that makes their weight one-sided or stack them on one another, as it may cause them to tilt, twist, or twist the way they are laid out. If there is a chance that the cables next to each other might do so due to the height and dimensions of the storage cross section, install a separator to make sure that the cables do not go over each other.



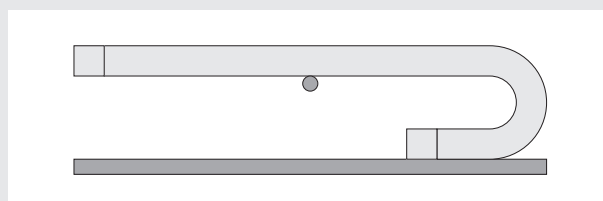
- Do not put more tension on the cables than is required and lay them out in such a way that they can move freely around bends. Adjust the length and tension of the cables while checking during operation.
- Secure the cables near the outlets of moving and fixed ends.

## Installation of receivers



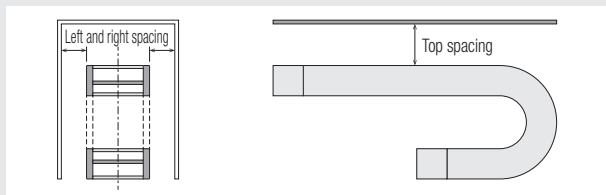
- For horizontal use, install a receiver in the range of motion and make sure that the SILVEYER does not hang down.

## Long free span



- Depending on the specifications, there may be slacker due to changes over time. It is recommended to use a guide beforehand that will minimize slack when you want to use a receiver close to its limits, as shown on its capacity diagram.
- ※ However, this will cause sound and abrasion dust due to the guide and SILVEYER coming into contact when moving.

## Space setting

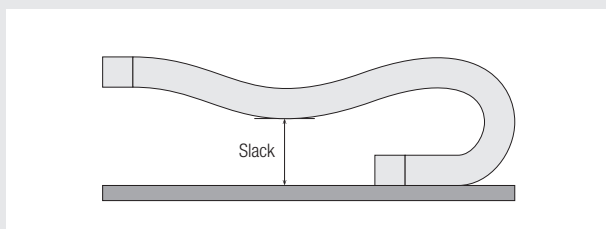


- Make sure there is enough space. If there is any equipment at the top of the SILVEYER Tough.
- ※ If there isn't enough space, the SILVEYER might come into contact with something during operation and get damaged.

Model number	Top spacing (mm)	Left and right spacing (mm)
	100 or more	50 or more
KST-25	100 or more	50 or more
KST-30		
KST-40		
KST-50		

- ※ These figures may be different because of things like there being slacker due to the passage of time or due to operating conditions. (speed, acceleration, length, weight, type of cables being used, etc.) Be sure to check the spacing and for any slacking during test runs and daily or regular inspections.

## Regarding slack



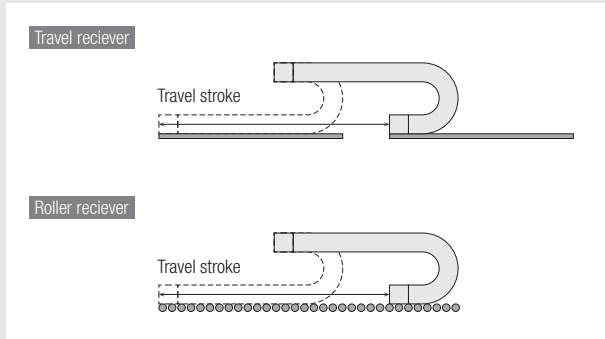
- The SILVEYER Tough is not compatible with free-span parts that run with a lot of slack or if it slides with another SILVEYER Tough after coming into contact with each other.
- If there is slacker over time or from too much weight from the cables, free span, or stroke, stop it and install a receiver to reduce the slack or replace the SILVEYER Tough with a new one.



# SILVEYER® Tough | Handling Method

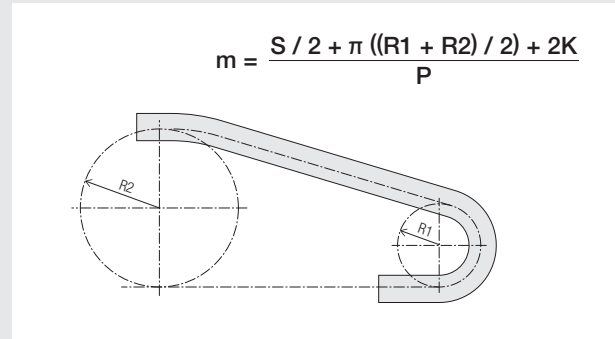
## Methods for use in special positions

### ① Use with installations to ceilings (moving horizontally upside down)



- To prevent the SILVEYER Tough from hanging down, a movement receiver is required for the lower side.
- Install a roller conveyor, etc., if you cannot install a movement receiver.

### ② If the SILVEYER Tough does move parallel and the location where the moving end bracket is installed is high.



- Weight will be more easily applied to the bracket area.  
Adjust the bracket and the SILVEYER Tough itself without using too much force.
- An extra number of modules will be required compared to the parallel movement.

### ③ Use with Vertical installations (U shape and reversed U shape)

- There may be bulging at bends depending on the conditions.  
If there is a risk of it touching the device, reduce the bulging by installing a receiver.  
You can also make sure there is enough space between the bulge and the device.

## Parts that require regular inspection



- The SILVEYER Tough has a link-less structure using the hinge consolidation method.  
This means that the hinges can be bent for a definite amount of time and will break over time.
- Inspect the SILVEYER Tough along with the device during regular inspections.
- Replace the hinges if there are signs of any cracks (including small ones) on them, that indicate they are worn out.

- Have regular maintenance and inspections that include the following.
    - ☐ Checking whether hinges are damaged or cracked
    - ☐ Checking whether covers are out of place
    - ☐ Checking for damages on every part.
    - ☐ Checking whether any screws are loose at installations.
    - ☐ Checking whether any brackets are damaged.
    - ☐ Checking whether there is any wear, twisting, etc., for cables.
    - ☐ Checking the amount of slack due to the passage of time.
- Promptly replace the relevant parts when any irregularities are found during inspections.

Economical Cable Chain

# SILVEYER® Light

Ultra-light weight

Light load

- The main unit and cover are integrated into a single structure, allowing cables to be stored without the need for tools.
- Lightweight material makes it ideal as a cable chain for light-load equipment.



Simple shape



## Easy cable storage

Storing cables is easy thanks to the product's cover, which is integrally retractable with the product itself.



## Adjusting the length is simple

Simple structure makes for simple length adjustment (change); no tools are required.



# SILVEYER® Light | Specifications List

SILVEYER® Light		Representative model number	Model number	Inner height	Inner width	Outer length	Outer width
				(mm)	(mm)	(mm)	(mm)
		KSE-1015Sa	<b>KSE-1015Sa-018</b>	10	15	16.5	22
		KSE-2727Fa	KSE-2727Fa-045	27	27	35.5	36
			KSE-2727Fa-055				
			KSE-2727Fa-075				
		KSE-2727Fb	KSE-2727Fb-045	27	27	35.5	36
			KSE-2727Fb-055				
			KSE-2727Fb-075				
		KSE-2727Sa	KSE-2727Sa-045	27	27	35.5	36
			KSE-2727Sa-055				
			KSE-2727Sa-075				
		KSE-2727Sb	KSE-2727Sb-045	27	27	35.5	36
			KSE-2727Sb-055				
			KSE-2727Sb-075				
		KSE-2913Sa	<b>KSE-2913Sa-037</b>	29	13	37.5	22

## Mounting bracket

### ■ For fixed end mounting



FBL configuration / Outer mounting



FBU configuration / Inner mounting

### ■ For moving end mounting



MBL configuration / Inner mounting



MBU configuration / Outer mounting

Bending radius R (mm)	Pitch (mm)	Maximum usable free span (mm)	Maximum usable stroke (mm)	Maximum usable speed (m/sec)	Storage cables and hoses		SILVEYER Light weight (kg/m)	Retractable cover		Optional parts Separator (vertical partition)
					Maximum radius (mm)	Maximum weight (kg/m)		Full cover	Short cover	
18	18	500	928	3	Ø 7.0	0.50	0.12	—	●	—
45	35	700	1260	3	Ø 18.9	1.50	0.25	●	—	—
55								●	—	—
75								●	—	—
45	35	700	1260	3	Ø 18.9	1.50	0.25	●	—	●
55								●	—	●
75								●	—	●
45	35	700	1260	3	Ø 18.9	1.50	0.25	—	●	—
55								—	●	—
75								—	●	—
45	35	700	1260	3	Ø 18.9	1.50	0.25	—	●	●
55								—	●	●
75								—	●	●
37	35	700	1260	3	Ø 9.1	1.00	0.22	—	●	—

### Optional parts Separator (vertical partition)

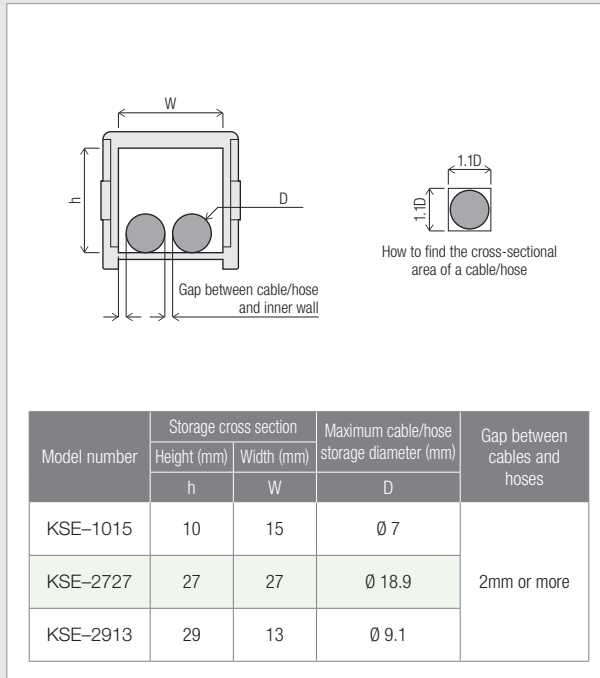
■ For KSE-2727Fb and KSE-2727Sb





## 01 Storage cross section

■ The "outer diameter" and "number" of cables and hoses to be stored in the SILVEYER Light should be determined according to the following.



### 1 Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Light should be set to **60% or less** of the cross-sectional area of the SILVEYER Light storage.

$$\text{Cross-sectional area for storage (h} \times \text{W)} \times 60\% \geq \text{Cross-sectional area of cable/hose (1.1D} \times \text{1.1D)}$$

#### [ How to find the cross-sectional area of cable/hose ]

Calculate the cross-sectional area as a square with an increase of 10% of the cable/hose diameter. Calculate the cross-sectional area of flat cables in the same way.

(e.g.) For a diameter D: Cross-sectional area of cable/hose = 1.1D × 1.1D

### 2 Securing the gap between cables/hoses

Secure the gap between cable/hose and inner wall and between cable/hose under the following conditions.

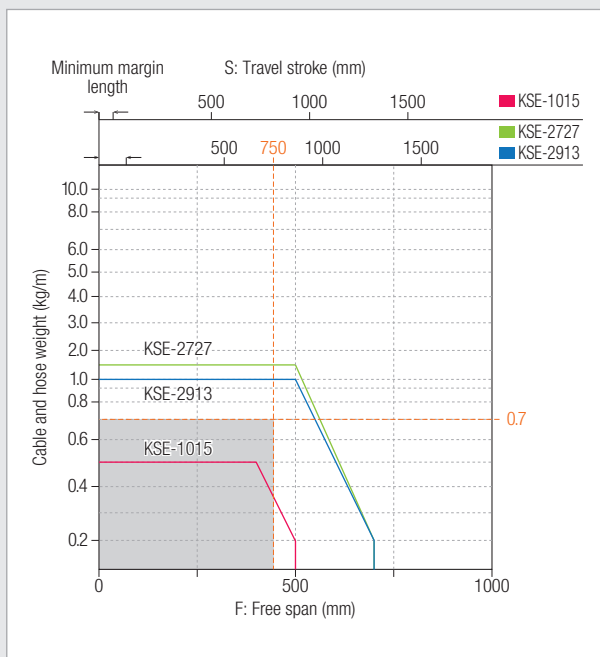
The gap between cables/hoses	2mm or more
------------------------------	-------------

- ※ Use cables and hoses in parallel and do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER Light and the cables and hoses.

## 02 Capacity Diagram

■ Always use the SILVEYER Light **within the range of the capacity diagram**.

Use of a SILVEYER Light beyond the range of the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Light.



### How to read the capability diagram

The following example shows how to read the capacity diagram.

Travel stroke: 750 mm  
Weight of cable hose: 0.7kg/m  
Cable hose bending radius: R50mm

- Select the model number from **the maximum weight of stored cables and hoses**. (P64, 65)
- Select the model number from **the bending radius** of the SILVEYER Light. (P64, 65)

※ The allowable bending radius of cable and hose shall be smaller than the allowable bending radius of the SILVEYER Light.

$$\text{Allowable bending radius of SILVEYER Light} > \text{Cable and hose allowable bending radius}$$

- Draw a vertical line at the **750mm travel stroke position** on the capacity diagram.
- Draw a horizontal line at the position where **the cable/hose weight is 0.7 kg/m** on the capacity diagram.
- Select a model number within the range of the intersection. In this case, the following can be used.  
**KSE-2727 : R55 - R75**
- Calculate the outer diameter and number of cables and hoses that can be accommodated in the model number selected in ③ from the storage cross section. If there is space in the equipment, select a larger model number.

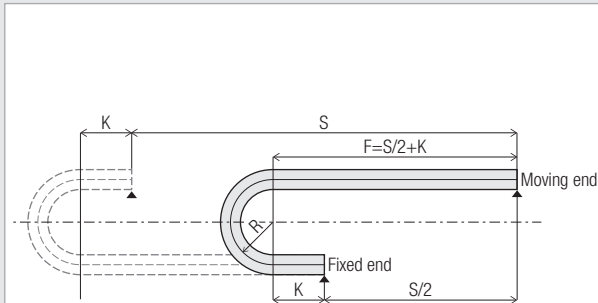
※ Even if the travel stroke is 750 mm, the free span may vary depending on the installation position of the SILVEYER Light. If the fixed end is not in the center of the stroke, be sure to check that the free span is within the range shown in the capacity diagram.





## 03 Calculation of number of Links

■ The number of **Links (L)** should be calculated according to the following formula.



Model number	Pitch (mm)	Margin length (mm)
	P	K
KSE-1015	18	36 or more
KSE-2727	35	70 or more
KSE-2913	35	70 or more

□ Formula for calculating the number of Links

$$L = \frac{S / 2 + \pi R + 2K}{P}$$

[ When the fixed end is in the center of the stroke ]

m	Number of Links	The number of modules is rounded up to the nearest whole number.
S	Travel stroke (mm)	
P	Pitch (mm)	
F	Free span (mm)	
R	Bending radius (mm)	
K	Margin length (mm)	

(e.g.) Model KSE-2727 (P: 35mm, R: 45mm)  
Travel stroke (S: 700mm)  
 $L = ((700/2) + (\pi \times 45) + (2 \times 70)) / 35 = 18.03$   
Required number of Links = 19

## 04 Nominal model number

■ **Please order** the selected SILVEYER Light according to the following nominal model number.

(e.g.) If you order the model numbers ① – ④ below

① Inner height: 27mm ② Inner width ③ Cover: Fa (Full cover, No partition holes) ④ Bending radius: R45 ⑤ 60 Links

**Ordering Example: KSE - 2727Fa - 045 - 10 × 6**

Example of model number configuration

Model number	Inner height	Inner width	Cover	Bending radius	Number of Links
KSE	10	15	Sa	018	20×6
KSE	10 10mm	15 15mm	Sa Short cover No partition holes	018 R18	20×6 20 Links/ product x 6 products ※ The unit of measure when ordering is 120 Links (20 Links x 6 products).
Model number	Inner height	Inner width	Cover	Bending radius	Number of Links
KSE	27	27	Fa	045	10×6
KSE	27 27mm	27 27mm	Fa Full cover No partition holes Fb Full cover Partition holes Sa Short cover No partition holes Sb Short cover Partition holes	045 R45 055 R55 075 R75	10×6 10 Links/ product x 6 products ※ The unit of measure when ordering is 60 Links (10 Links x 6 products).
Model number	Inner height	Inner width	Cover	Bending radius	Number of Links
KSE	29	13	Sa	037	10×6
KSE	29 29mm	13 13mm	Sa Short cover No partition holes	037 R37	10×6 10 Links/ product x 6 products ※ The unit of measure when ordering is 60 Links (10 Links x 6 products).

※ Select the mounting brackets from fixed ends (outer/ inner) and moving ends (outer/ inner)  
※ Separators can be installed on the KSE-2727. If needed, order them with the order part number and quantity (1 bag/10 Indv. parts included).  
※ Mounting brackets and separators are included with the main unit when ordered together and packed separately when ordered individually.

## KSE-1015

### Basic Specifications

Material	Main unit	polypropylene
	Mounting bracket (resin)	polypropylene
Operating temperature range		-10°C ~ +60°C

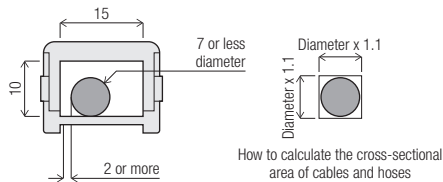
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cables and hoses		SILVEYER Light weight
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum radius	Maximum weight	
KSE-1015	10	15	16.5	22	18	18	500	928	3	Ø 7.0	0.50	0.12

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Light according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER Light and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Light should be less than 60% of the cross-sectional area of the SILVEYER Light.

$$\text{Cross-sectional area of storage (150mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

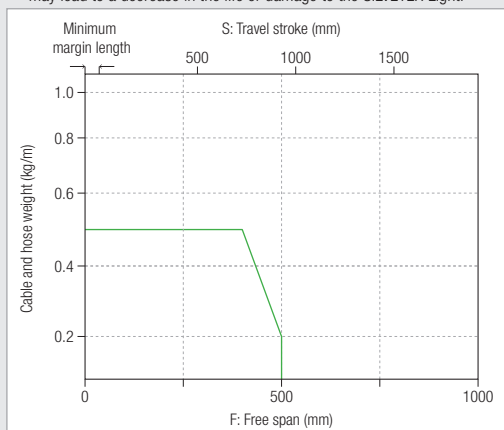
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

Gaps between cables/hoses	2mm or more
---------------------------	-------------

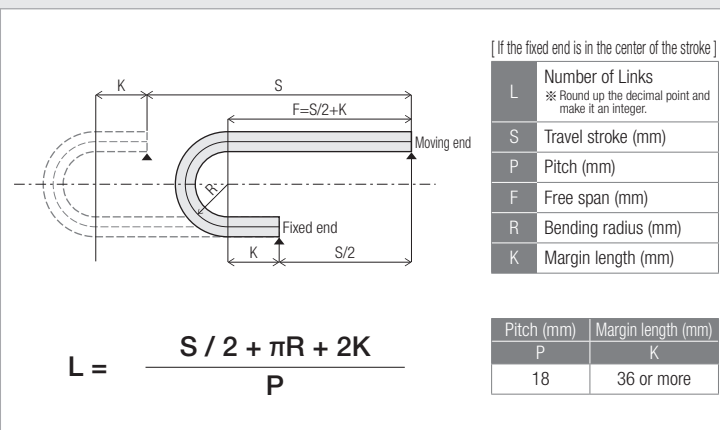
### Capacity Diagram

■ Always use the SILVEYER Light within the range of the capacity diagram. Use of the SILVEYER Light beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Light.

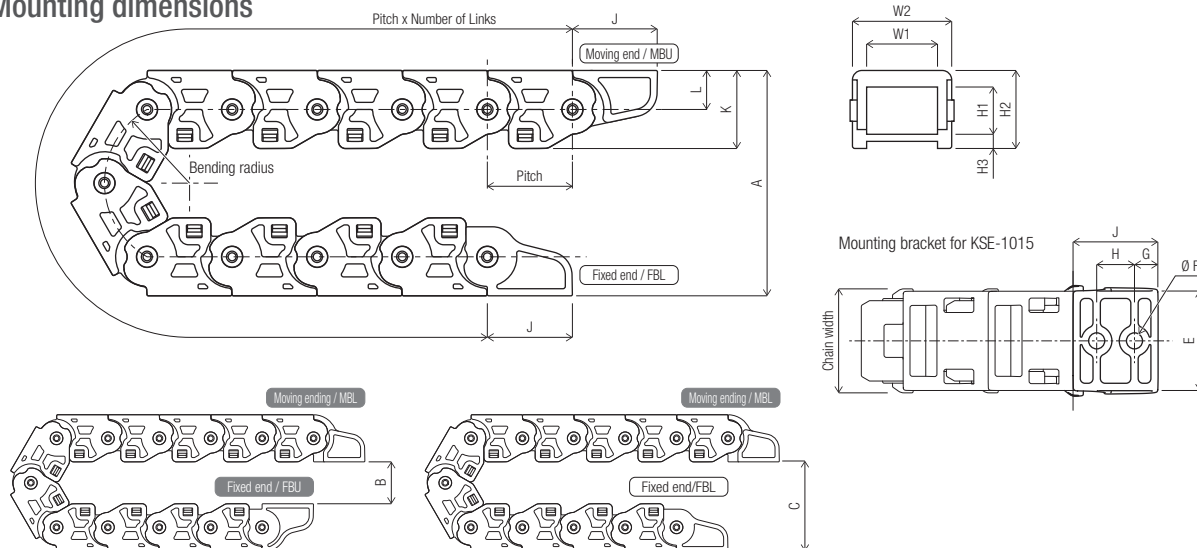


### Calculation of the number of Links

■ The number of Links (L) should be calculated according to the following formula.



## Mounting dimensions



### SILVEYER Light main unit dimensions

Unit of measurement: mm

Model number	Bending radius	A	B	C	W1	W2	H1	H2	H3	Chain width	Pitch
<b>KSE-1015</b>	18	52.5 ~ 62.5	19.5 ~ 29.5	36 ~ 46	15	22	10	16.5	3	22	18

### Mounting Bracket Dimensions

Resin

Unit of measurement: mm

Model number	Type		D	E	F	G	H	J	K	L	Weight
KSE-1015FBL	Fixed end	Outer side	—	22	3.4	5	8	18	16.5	8.3	2g
KSE-1015FBU		Inner side									2g
KSE-1015MBL	Moving end	Inner side									2g
KSE-1015MBU		Outer side									2g

### SILVEYER Light nominal model number

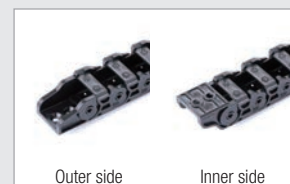
● Order the SILVEYER Light you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Cover		Bending radius		Number of Links	
	<b>KSE</b>		<b>10</b>		<b>15</b>		<b>Sa</b>		<b>018</b>		<b>20×6</b>	
	<b>KSE</b>	SILVEYER Light	<b>10</b>	10mm	<b>15</b>	15mm	<b>Sa</b>	Short cover No partition holes	<b>018</b>	R18	<b>20×6</b>	20 Links/ product x 6 products

※ The unit of measurement for orders is 120 Links (20 Links x 6 products).

### Mounting brackets

Applicable model number	Type		Order part number		Order part name	Quantity sold	Weight	Material
			Part number when ordering Indv. Part(s)	Part number when included with products		(Indv. Part(s)/ Box(es))	(g/Indv. Part)	
KSE-1015	Fixed end	Outer side	KSE1015FBL-1	KSE1015FBL-1+	Mounting bracket (Outer fixed end bracket)	1	2g	polypropylene
		Outer side	KSE1015FBU-1	KSE1015FBU-1+	Mounting bracket (fixed end inner)	1	2g	polypropylene
	Moving end	Outer side	KSE1015MBL-1	KSE1015MBL-1+	Mounting bracket (moving end inner)	1	2g	polypropylene
		Outer side	KSE1015MBU-1	KSE1015MBU-1+	Mounting bracket (moving end outer)	1	2g	polypropylene



Outer side

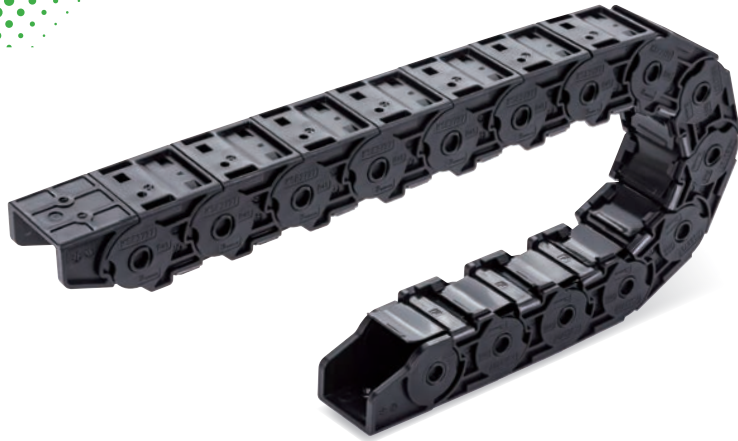
Inner side

## KSE-2727

### Basic Specifications

Material	Main unit	polypropylene
	Mounting bracket (resin)	polypropylene
	Separator (vertical partition)	polypropylene
Operating temperature range		-10°C ~ +60°C

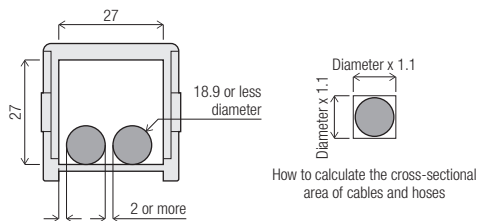
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cables and hoses		SILVEYER Light weight
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum radius	Maximum weight	
KSE-2727	27	27	35.5	36	45	35	700	1260	3	Ø 18.9	1.50	0.25
					55							
					75							

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Light according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER Light and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Light should be less than 60% of the cross-sectional area of the SILVEYER Light.

$$\text{Cross-sectional area of storage (150mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

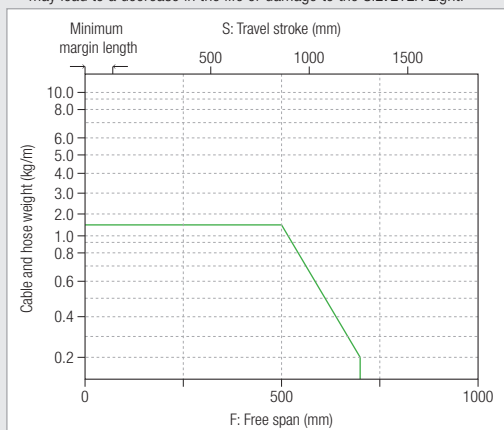
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

$$\text{Gaps between cables/hoses} \geq 2\text{mm or more}$$

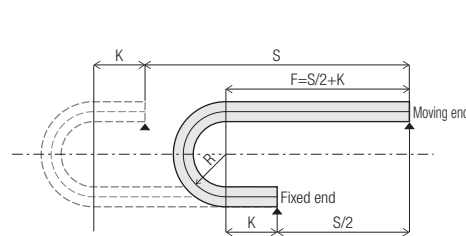
### Capacity Diagram

■ Always use the SILVEYER Light within the range of the capacity diagram. Use of the SILVEYER Light beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Light.



### Calculation of the number of Links

■ The number of Links (L) should be calculated according to the following formula.



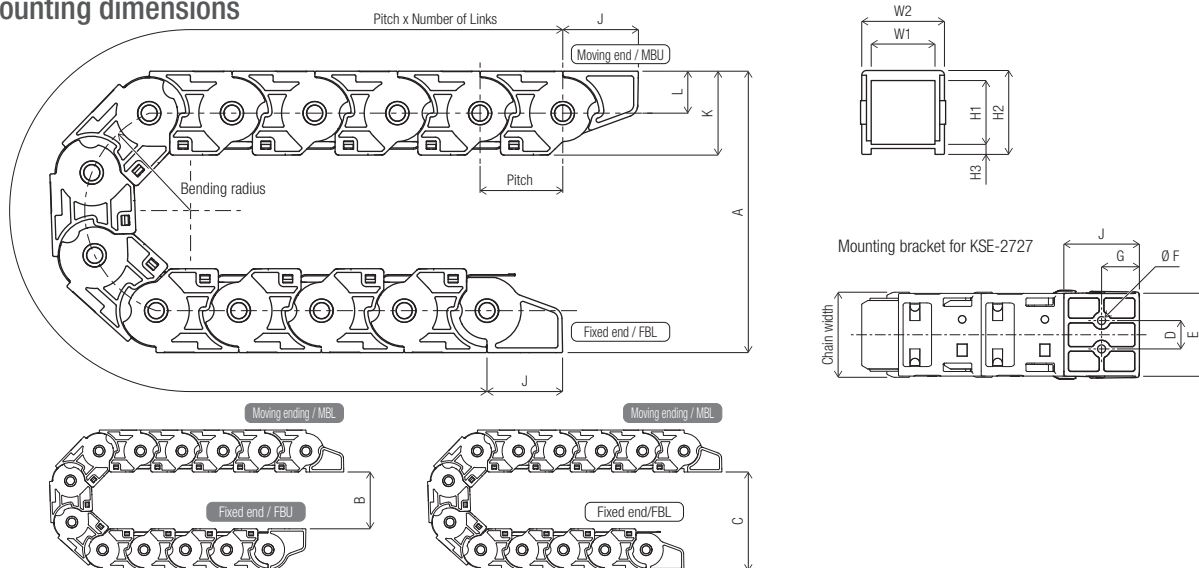
$$L = \frac{S / 2 + \pi R + 2K}{P}$$

[ If the fixed end is in the center of the stroke ]

L	Number of Links
※	Round up the decimal point and make it an integer.
S	Travel stroke (mm)
P	Pitch (mm)
F	Free span (mm)
R	Bending radius (mm)
K	Margin length (mm)

Pitch (mm)	Margin length (mm)
P	K
35	70 or more

## Mounting dimensions



### SILVEYER Light main unit dimensions

Unit of measurement: mm

Model number	Bending radius	A	B	C	W1	W2	H1	H2	H3	Chain width	Pitch
KSE-2727	45	130 ~ 140	60 ~ 70	95 ~ 105	27	36	27	35.5	4.5	36	35
	55	150 ~ 160	80 ~ 90	115 ~ 125							
	75	190 ~ 200	120 ~ 130	155 ~ 165							

### Mounting Bracket Dimensions

Resin

Unit of measurement: mm

Model number	Type	D	E	F	G	H	J	K	L	Weight
KSE-2727FBL	Fixed end	12	36	3.4	16	—	32	35.5	17.8	6g
KSE-2727FBU										6g
KSE-2727MBL	Moving end	12	36	3.4	16	—	32	35.5	17.8	6g
KSE-2727MBU										6g

### SILVEYER Light nominal model number

● Order the SILVEYER Light you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Cover			Bending radius		Number of Links	
	KSE		27		27		Fa			045		10×6	
	KSE	SILVEYER Light	27	27mm	27	27mm	Fa	Full cover	No partition holes	045	R45	10×6	10 Links/ product x 6 products
							Fb	Full cover	Partition holes	055	R55		
							Sa	Short cover	No partition holes	075	R75		
							Sb	Short cover	Partition holes				
※ The unit of measurement for orders 60 Links (10 Links x 6 products).													

※ The unit of measurement for orders is 60 Links (10 Links x 6 products).

### Mounting brackets

Applicable model number	Type		Order part number		Order part name	Quantity sold	Weight	Material
			Part number when ordering Indv. Part(s)	Part number when included with products		(Indv. Part(s)/ Box(es))	(g/Indv. Part)	
KSE-2727	Fixed end	Outer side	KSE2727FBL-1	KSE2727FBL-1+	Mounting bracket (Outer fixed end bracket)	1 Indv. Parts	6g	polypropylene
		Outer side	KSE2727FBU-1	KSE2727FBU-1+	Mounting bracket (fixed end inner)	1 Indv. Parts	6g	polypropylene
	Moving end	Outer side	KSE2727MBL-1	KSE2727MBL-1+	Mounting bracket (moving end inner)	1 Indv. Parts	6g	polypropylene
		Outer side	KSE2727MBU-1	KSE2727MBU-1+	Mounting bracket (moving end outer)	1 Indv. Parts	6g	polypropylene



### Separator (vertical partition)

Applicable model number	Type	Order part number		Order part name	Quantity sold (Products/ Bag)	Weight (g/Indv. Part)	Material
		Part number when ordering Indv. Part(s)	Part number when included with products				
KSE-2727	I Type	KSE27SP-10	KSE27SP-10+	Separator	10 Indv. Parts	1g	polypropylene



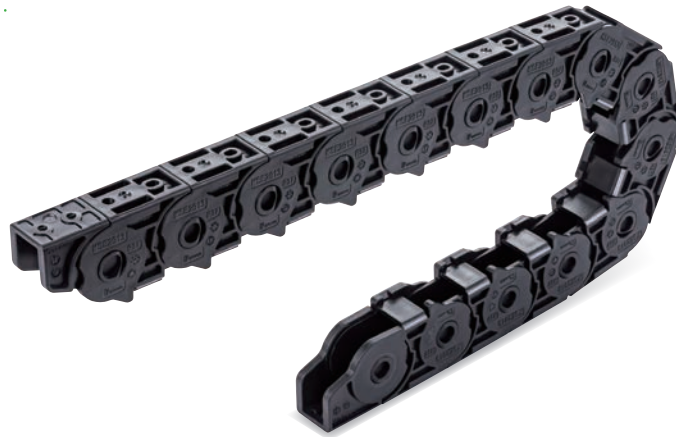


## KSE-2913

### Basic Specifications

Material	Main unit	polypropylene
	Mounting bracket (resin)	polypropylene
Operating temperature range		-10°C ~ +60°C

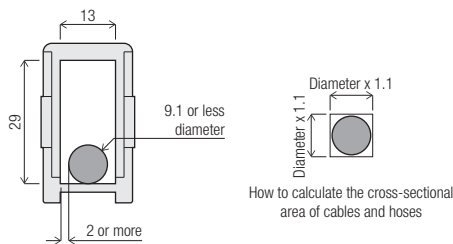
※ Do not use in acidic or alkaline atmospheres.



Model number	Inner height	Inner width	Outer height	Outer width	Bending radius R	Pitch	Maximum usable free span	Maximum usable stroke	Maximum usable speed	Storage cables and hoses		SILVEYER Light weight
	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(mm)	(m/sec)	Maximum radius	Maximum weight	
KSE-2913	29	13	37.5	22	37	35	700	1260	3	Ø 9.1	1.00	0.22

### Storage cross section

■ Determine the "outside diameter" and "number" of cables and hoses to be stored in the SILVEYER Light according to the following.



- ※ Use cables and hoses in parallel so that they do not cross each other.
- ※ If more cables and hoses are stored than the capacity, the cables and hoses will be subjected to excessive force, which will significantly reduce the service life of the SILVEYER Light and the cables and hoses.

#### ① Capacity of cables and hoses

The capacity of cables and hoses to be stored in the SILVEYER Light should be less than 60% of the cross-sectional area of the SILVEYER Light.

$$\text{Cross-sectional area of storage (377mm}^2\text{)} \times 60\% \geq \text{Cross-sectional area of cable/hose}$$

※ Calculate the cross-sectional area as a square of 10% larger than the cable/hose diameter.

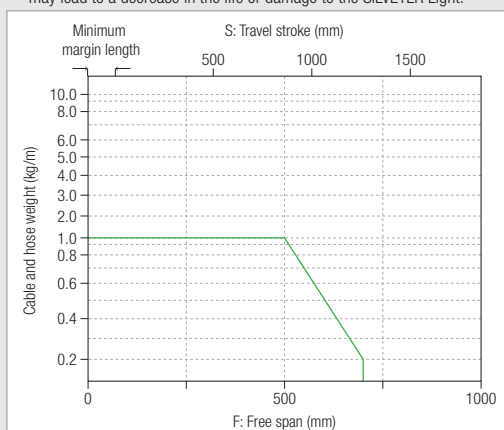
#### ② Securing the gap between cables/hoses

Gaps between cables/hoses and inner walls and between cables/hoses shall be secured under the following conditions.

Gaps between cables/hoses	2mm or more
---------------------------	-------------

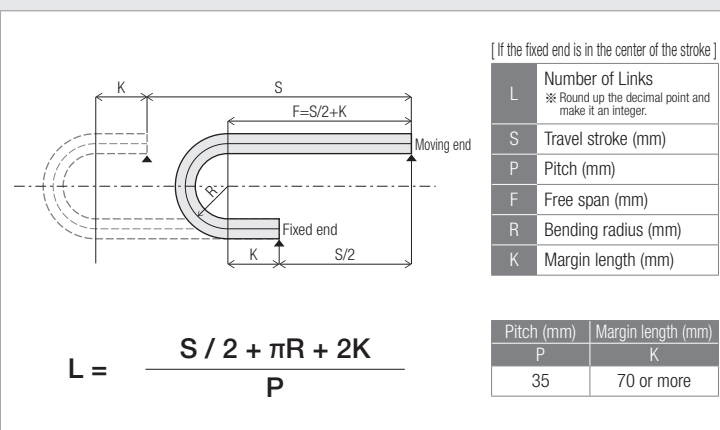
### Capacity Diagram

■ Always use the SILVEYER Light within the range of the capacity diagram. Use of the SILVEYER Light beyond the range shown in the capacity diagram may lead to a decrease in the life or damage to the SILVEYER Light.

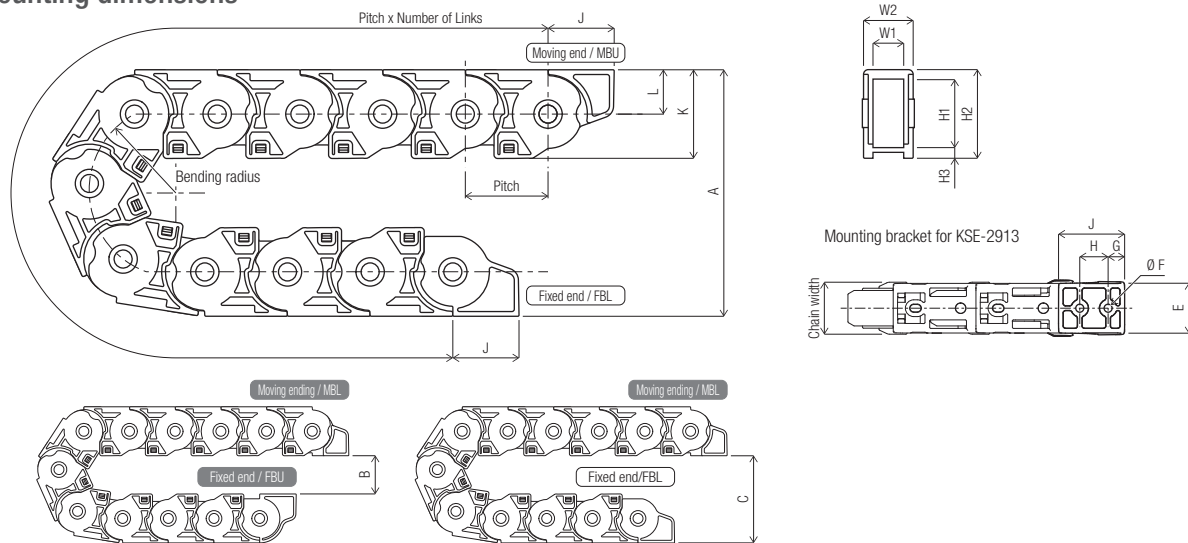


### Calculation of the number of Links

■ The number of Links (L) should be calculated according to the following formula.



## Mounting dimensions



### SILVEYER Light main unit dimensions

Unit of measurement: mm

Model number	Bending radius	A	B	C	W1	W2	H1	H2	H3	Chain width	Pitch
<b>KSE-2913</b>	37	110 ~ 120	36 ~ 46	73 ~ 83	13	22	29	37.5	4.5	22	35

### Mounting Bracket Dimensions

Resin

Unit of measurement: mm

Model number	Type		D	E	F	G	H	J	K	L	Weight
KSE-2913FBL	Fixed end	Outer side	—	22	3.4	7	12	28	37.5	18.8	5g
KSE-2913FBU		Inner side									5g
KSE-2913MBL	Moving end	Inner side									5g
KSE-2913MBU		Outer side									5g

### SILVEYER Light nominal model number

● Order the SILVEYER Light you selected with the following nominal model numbers.

Example of model number configuration	Model number		Inner height		Inner width		Cover		Bending radius		Number of Links	
	<b>KSE</b>		<b>29</b>		<b>13</b>		<b>Sa</b>		<b>037</b>		<b>10×6</b>	
	<b>KSE</b>	SILVEYER Light	<b>29</b>	29mm	<b>13</b>	13mm	<b>Sa</b>	Short cover No partition holes	<b>037</b>	R37	<b>10×6</b>	10 Links/ product x 6 products

※ The unit of measurement for orders is 60 Links (10 Links x 6 products).

### Mounting brackets

Applicable model number	Type		Order part number		Order part name	Quantity sold (Indv. Part(s)/ Box(es))	Weight (g/Indv. Part)	Material
			Part number when ordering Indv. Part(s)	Part number when included with products				
KSE-2913	Fixed end	Outer side	<b>KSE2913FBL-1</b>	<b>KSE2913FBL-1+</b>	Mounting bracket (Outer fixed end bracket)	1 Indv. Parts	5g	polypropylene
		Outer side	<b>KSE2913FBU-1</b>	<b>KSE2913FBU-1+</b>	Mounting bracket (fixed end inner)	1 Indv. Parts	5g	polypropylene
	Moving end	Outer side	<b>KSE2913MBL-1</b>	<b>KSE2913MBL-1+</b>	Mounting bracket (moving end inner)	1 Indv. Parts	5g	polypropylene
		Outer side	<b>KSE2913MBU-1</b>	<b>KSE2913MBU-1+</b>	Mounting bracket (moving end outer)	1 Indv. Parts	5g	polypropylene



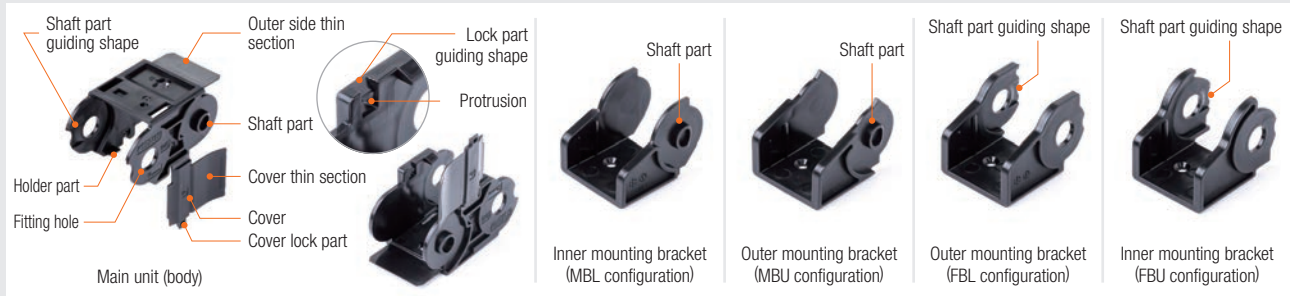
Outer side

Inner side

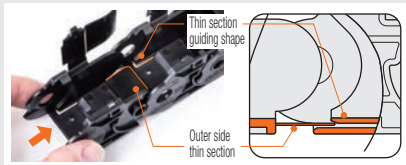
# SILVEYER® Light | Handling Method

※ The following illustrations is the KSE-2727Fa type.

## Name of each part



## How to connect and add Links (method of extending Links)



- Apply the shaft part of the main unit to the shaft part guiding shape of the main unit it will be connected and added to and then push straight and insert the shaft part until it fits into the fitting hole.



- ※ Check whether the thin section guiding part of the other main unit is inserted into the outer side thin section when connecting and adding modules.

## How to remove Links (method of reducing Links)



- To remove modules, remove the shaft part from the fitting hole by pitching and pushing the side of the main unit into the inside while the cover is open and then remove the Links while pulling.

## Method used for installing fixed end brackets

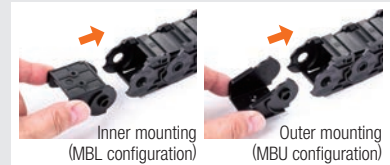


- The outer side thin section on the main unit's end needs to be cut when the fixed end brackets are installed. Use a cutter knife, etc., to cut the thin sections.
- ※ Be sure to make the remaining cut ends are protruding 0.5 mm or less from the ends.



- Apply the shaft part of the main unit to the shaft part guiding shape of the fixed end bracket and then push the shaft part in until it fits into the fitting hole.
- ※ For the inner mounting, make sure that the cover thin section leads into the inside of the bracket.
- ※ Special brackets will be used for outer and inner mountings.
- ※ They cannot be installed upside down.

## Method used for installing moving brackets



- Apply the shaft part of the moving end bracket to the shaft part guiding shape of the main unit and then push the shaft part in until it fits into the fitting hole.
- ※ Special brackets will be used for outer and inner mountings.
- ※ They cannot be installed upside down.

## How to close the cover



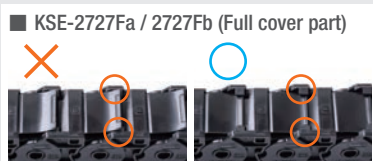
- The cover can be closed by hand. A screwdriver or any other tool is not required.
- Push into the outside of the cover to lock it when closing the cover.
- ※ Check whether the protrusion on the lock part guiding shape and the indentation on the cover lock part are hooked.

## How to open the cover



- The cover can be opened by hand. A screwdriver or any other tool is not required.
- When opening the cover, unlock and open it by opening the main unit side toward the outside while pushing in the lock part of the outside cover in.

## Things to note when closing the cover



- After closing the cover, push into the cover's thin section part and check whether it is hooked to the holder of the other part's fitting hole.

## Method used for securing to devices



- Secure to the device using a countersunk screw.

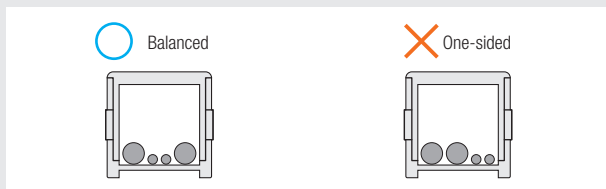
	KSE-2727	KSE-2913	KSE-1015
M3 countersunk screw	●	●	●

## Method used for installing separators

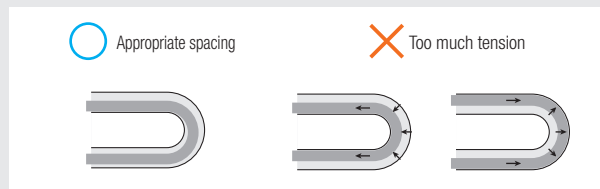


- Depending on the model number, separators can be installed.
- Separators are locked by turning them after they are inserted into the inner side of the SILVEYER Light.

## Method used for storing cables

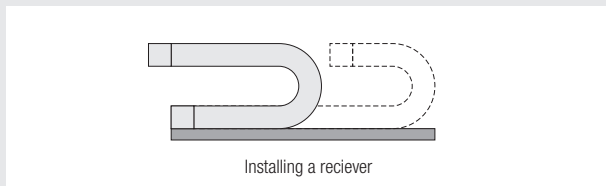


- Store the cables while keeping in mind the balance of weight on the left and right sides.
- Do not store the cables in a way that makes their weight one-sided or stack them on one another, as it may cause them to tilt, twist, or twist the way they are laid out. If there is a chance that the cables next to each other might do so due to the height and dimensions of the storage cross section, install a separator (KSH-2727 only) to make sure that the cables do not go over each other.



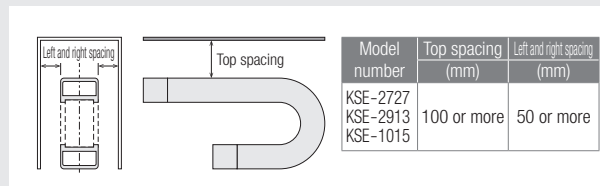
- Do not put more tension on the cables than is required and lay them out in such a way that they can move freely around bends.
- Adjust the length and tension of the cables while checking during operation.
- Secure the cables near the outlets of moving and fixed ends.

## Installation of receivers



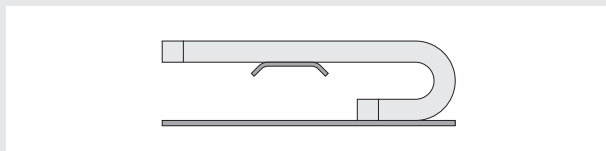
- For horizontal use, install a receiver in the range of motion and make sure that the SILVEYER Light does not hang down.

## Space setting



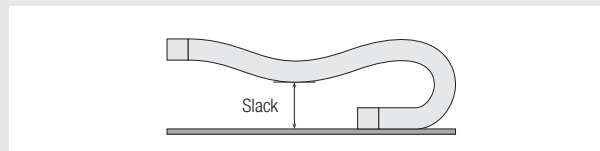
- Make sure there is enough space. If there is any equipment at the top of the SILVEYER Light.
- ※ If there isn't enough space, the SILVEYER Light might come into contact with something during operation and get damaged.
- ※ These figures may be different because of things like there being more slack due to the passage of time or due to operating conditions. (speed, acceleration, length, weight, type of cables being used, etc.) Be sure to check the spacing and for any slacking during test runs and daily or regular inspections.

## Long free span



- Depending on the specifications, there may be slacker due to changes over time. It is recommended to use a guide beforehand that will minimize slack when you want to use a receiver close to its limits, as shown on its capacity diagram.
- Install a guide that supports the SILVEYER Light's flat side, as its inner is not symmetrical and bumpy.
- ※ However, this will cause sound and abrasion dust due to the guide and SILVEYER Light coming into contact when moving.

## Regarding slack

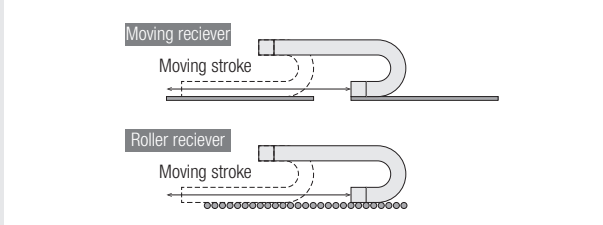


- The SILVEYER Light is not compatible with free-span parts that run with a lot of slack or if it slides with another SILVEYER Light after coming into contact with each other.
- If there is slacker over time or from too much weight from the cables, free span, or stroke, stop it and install a receiver to reduce the slack or replace the SILVEYER Light with a new one.

# SILVEYER® Light | Handling Method

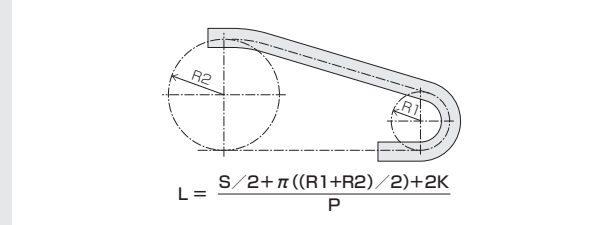
## Methods for use in special Positions

### ① Use with installations to ceilings (moving horizontally upside down)



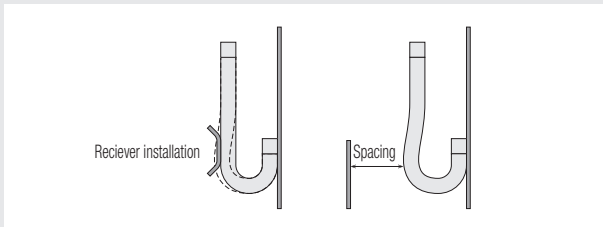
- To prevent the SILVEYER Light from hanging down, a movement receiver is required for the lower side.
- Install a roller conveyor, etc., if you cannot install a movement receiver.

### ② If the SILVEYER Light does move parallel and the location where the moving end bracket is installed is high



- Weight will be more easily applied to the bracket area.  
Adjust the bracket and the SILVEYER Light itself without using too much force.
- An extra number of Links will be required compared to the parallel movement.

### ③ Use with Vertical installations (U shape and reversed U shape)



- There may be bulging at bends depending on the conditions.  
If there is a risk of it touching the device, reduce the bulging by installing a receiver.  
You can also make sure there is enough space between the bulge and the device.

## Parts that require regular inspection

- The SILVEYER Light has a link-less structure using the hinge consolidation method.
- This means that when used over time, wear will cause it to rattle, which can negatively affect its function and cause it to perform below its capability diagram. Replace the SILVEYER if you use it stably or if the cables and hoses are not protective.
- Inspect the SILVEYER Light along with the device during regular inspections.
- Replace the thin sections if there are signs of any cracks (including small ones) on them, that indicate they are worn out.

- Have regular maintenance and inspections that include the following.

- ☐ Checking whether shaft parts rattle.
- ☐ Checking whether thin sections are damaged or cracked.
- ☐ Checking whether covers are out of place.
- ☐ Checking whether any screws are loose at installations.
- ☐ Checking for damages on every part.
- ☐ Checking whether there is any wear, twisting, etc., for cables.
- ☐ Checking whether any brackets are damaged.
- ☐ Checking the amount of slack caused from wear due to the passage of time.

Promptly replace the relevant parts when any irregularities are found during inspections.



Flexible Cable Chain

# SILVEYER® Flex

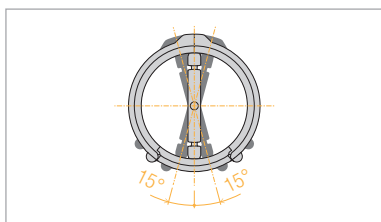
Three-dimensional

- Our own complex continuous integral molding technology. (skeleton structure) is used for smooth and complex three-dimensional movement.



## Angle restriction

Can be turned approximately  $\pm 15^\circ$  per module.  
Prevent cables from disconnecting by stopping excessive cables from getting twisted, which usually happens locally.



## Inner structure that safely accommodates cables

The inside where cables are inserted is smooth, which reduces wear from cables coming into contact with each other.



## Retractable full cover structure

Prevents foreign objects from being inserted and makes cable storage easier.





# SILVEYER® Flex | Specifications List



SILVEYER® Flex	Model number	Inner dimension	Minimum inner width	Standard outer radius	Maximum outer radius
		(mm)	(mm)	(mm)	(mm)
	KSF-25-060	11.5	Ø 27.5	Ø 36	Ø 39.8
	KSF-35-070	16	Ø 37	Ø 46	Ø 50
	KSF-50-110	24.25	Ø 53.5	Ø 62.5	Ø 66.5

## Mounting bracket

■ Fixed bracket

■ Middle bracket

Bending radius R (mm)	Pitch (mm)	Maximum turn per module (mm)	Maximum radius for storage cables and hoses (mm)	Storage range for cables and hoses (mm)	SILVEYER Flex weight (m/sec)	Optional parts		
						Fixed bracket	Middle bracket	Joint cover
60	16.5	±15	Ø 9	Ø 22	0.31	●	●	●
70	20	±15	Ø 13	Ø 31	0.42	●	●	●
110	20	±15	Ø 21	Ø 47.5	0.60	●	●	●

## KSF-25-060

### Basic Specifications

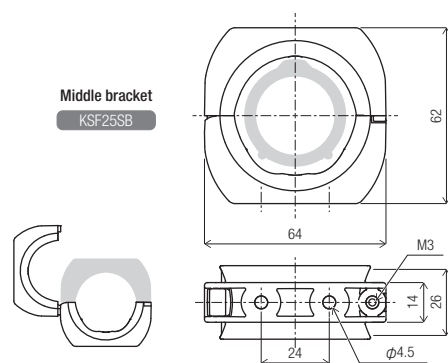
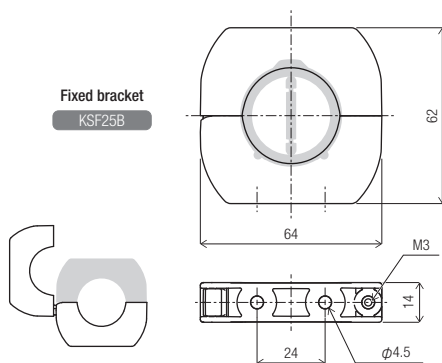
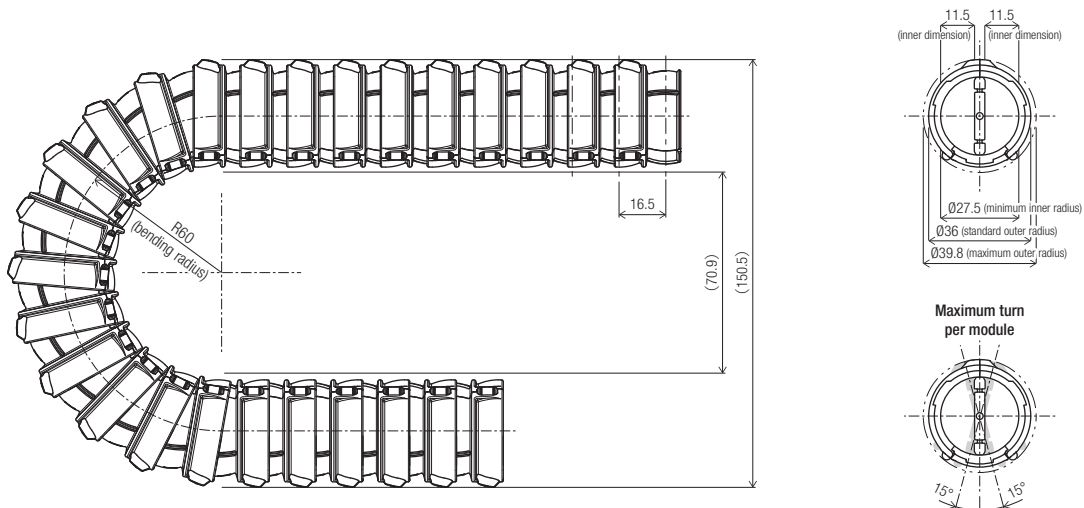
Material	Main unit		Nylon
	Mounting bracket	For fixed	Nylon
		For middle	Nylon
		Bit insert	Brass
	Joint cover		Nylon
Operating temperature range			-20°C ~ +85°C

※ Do not use in acidic or alkaline atmospheres.

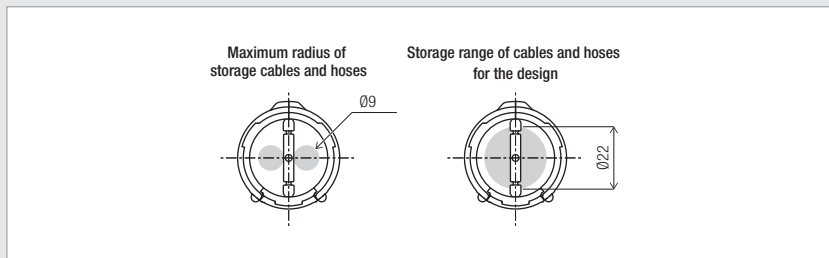


Model number	Inner dimension (mm)	Minimum radius (mm)	Standard outer radius (mm)	Maximum outer radius (mm)	Bending radius R (mm)	Pitch (mm)	Maximum turn per module (degrees)	Maximum radius of storage cables and hoses (mm)	SILVEYER Flex weight (kg/m)
KSF-25-060	11.5	Ø 27.5	Ø 36	Ø 39.8	60	16.5	±15	Ø 9	0.31

### Mounting dimensions



## Storage range of cables and hoses for the design



Model number	Storage cross section		Maximum radius of storage cables and hoses	Storage range of cables and hoses
	Inner dimension (mm)	Minimum inner radius (mm)		
KSF-25-060	11.5	Ø 27.5	Ø 9	Ø 22

- Be sure that the weight of the cables and hoses to be stored in the SILVEYER Flex is set within the storage range of cables and hoses.



## SILVEYER Flex nominal model number

- Order the SILVEYER Flex you selected with the following nominal model numbers.

Example of model number configuration	Model number		—	Number of modules	
	KSF-25-060			030	
	KSF-25-060	SILVEYER Flex		030	30 modules/ product (495mm) x 1 product
				060	60 modules/ product (990mm) x 1 product
				120	120 modules/ product (1980mm) x 1 product
				180~	※

- Fixed brackets (2 Indv. parts) is included with one main unit.

※ Modules can be ordered from 30/60/120 modules. Contact us if you want to use the product with a longer line of modules.

## Mounting bracket (optional part)

Applicable model number	Type	Order part number	Order part name	Quantity sold	Weight	Material	
				(Indv. Part(s)/Box(es))	(g/Indv. Part)	Bracket	Bit insert
KSF-25-060	For fixed	KSF25B	Fixed bracket	2 Indv. parts	23 g	Nylon	Brass
	For middle	KSF25SB	Middle bracket	2 Indv. parts	25 g	Nylon	Brass

Fixed bracket



Middle bracket



## Joint cover (connecting part for SILVEYER Flex) [optional part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Products/Bag)	(g/Indv. Part)	
KSF-25-060	KSF25CJ	Joint cover	1 Indv. parts	9 g	Nylon

Joint cover



## Cover [spare part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Indv. Part(s)/Box(es))	(g/Indv. Part)	
KSF-25-060	KSF25C-5	Cover	5 Indv. parts	5 g	Nylon

Cover (set of 5)





## KSF-35-070

### Basic Specifications

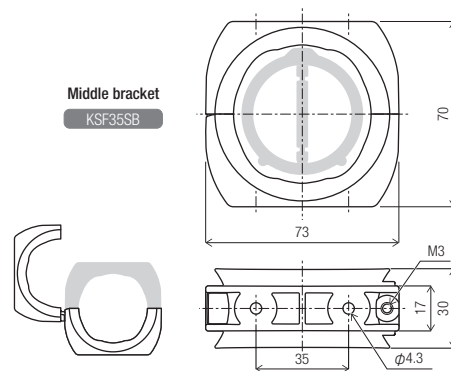
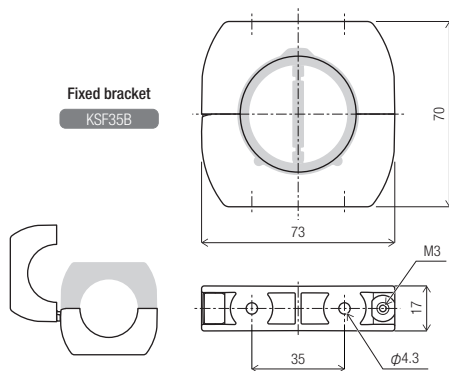
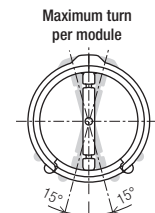
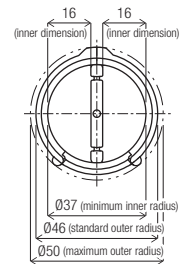
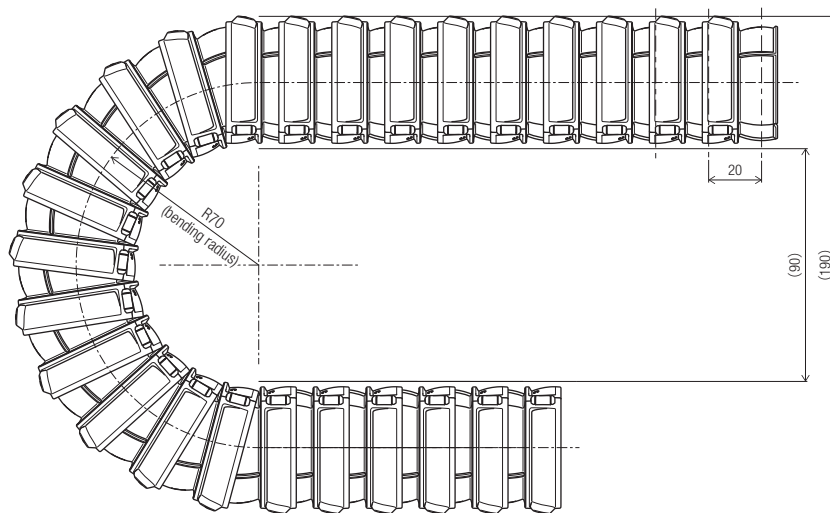
Material	Main unit		Nylon
	Mounting bracket	For fixed	Nylon
		For middle	Nylon
		Bit insert	Brass
	Joint cover		Nylon
Operating temperature range			-20°C ~ +85°C

※ Do not use in acidic or alkaline atmospheres.

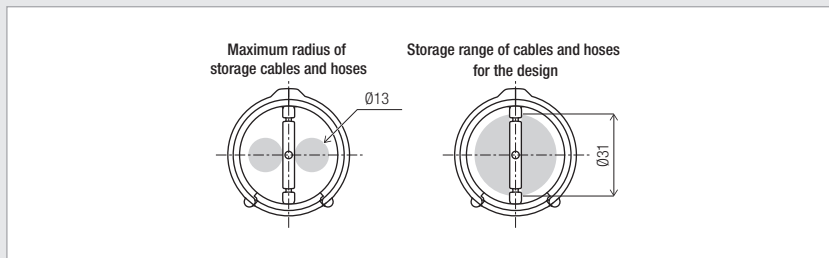


Model number	Inner dimension (mm)	Minimum radius (mm)	Standard outer radius (mm)	Maximum outer radius (mm)	Bending radius R (mm)	Pitch (mm)	Maximum turn per module (degrees)	Maximum radius of storage cables and hoses (mm)	SILVEYER Flex weight (kg/m)
KSF-35-070	16	Ø 37	Ø 46	Ø 50	70	20	±15	Ø 13	0.42

### Mounting dimensions



## Storage range of cables and hoses for the design



Model number	Storage cross section		Maximum radius of storage cables and hoses	Storage range of cables and hoses
	Inner dimension (mm)	Minimum inner radius (mm)		
KSF-35-070	16	Ø 37	Ø 13	Ø 31

- Be sure that the weight of the cables and hoses to be stored in the SILVEYER Flex is set within the storage range of cables and hoses.



## SILVEYER Flex nominal model number

- Order the SILVEYER Flex you selected with the following nominal model numbers.

Example of model number configuration	Model number		Number of modules	
	<b>KSF-35-070</b>		<b>050</b>	
	<b>KSF-35-070</b>	SILVEYER Flex	<b>050</b>	50 modules/ product (1m) x 1 product
			<b>100</b>	100 modules/ product (2m) x 1 product
			<b>150</b>	150 modules/ product (3m) x 1 product
			<b>200~</b>	※

- Fixed brackets (2 Indv. parts) is included with one main unit.

※ The number of modules ordered is in multiples of 50, up to 150 modules with a total length of 3 meters. Contact us if you want to use the product with a longer line of modules.

## Mounting bracket (optional part)

Applicable model number	Type	Order part number	Order part name	Quantity sold	Weight	Material	
				(Indv. Part(s)/Box(es))	(g/Indv. Part)	Bracket	Bit insert
KSF-35-070	For fixed	<b>KSF35B</b>	Fixed bracket	2 Indv. parts	34 g	Nylon	Brass
	For middle	<b>KSF35SB</b>	Middle bracket	2 Indv. parts	36 g	Nylon	Brass



## Joint cover (connecting part for SILVEYER Flex) [optional part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Products/Bag)	(g/Indv. Part)	
KSF-35-070	<b>KSF35CJ</b>	Joint cover	1 Indv. parts	14 g	Nylon



## Cover [spare part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Indv. Part(s)/Box(es))	(g/Indv. Part)	
KSF-35-070	<b>KSF35C-5</b>	Cover	5 Indv. parts	7 g	Nylon



## KSF-50-110

### Basic Specifications

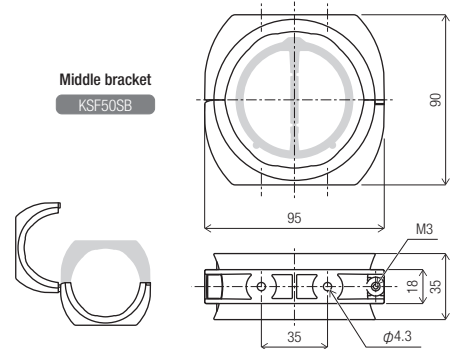
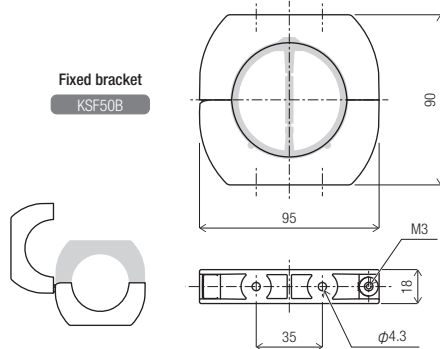
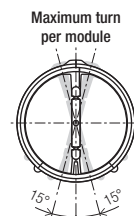
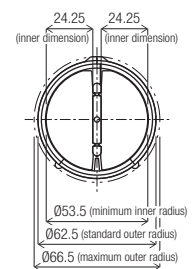
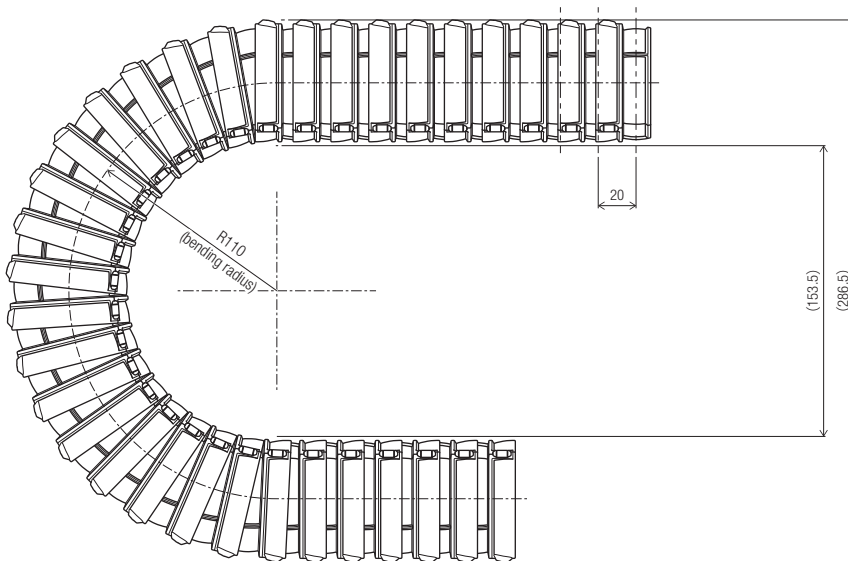
Material	Main unit		Nylon
	Mounting bracket	For fixed	Nylon
		For middle	Nylon
		Bit insert	Brass
	Joint cover		Nylon
Operating temperature range			-20°C ~ +85°C

※ Do not use in acidic or alkaline atmospheres.

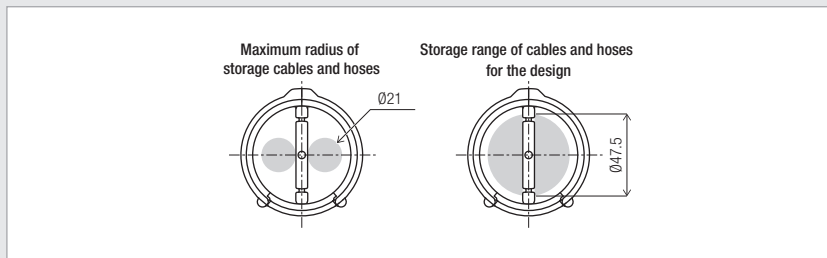


Model number	Inner dimension (mm)	Minimum radius (mm)	Standard outer radius (mm)	Maximum outer radius (mm)	Bending radius R (mm)	Pitch (mm)	Maximum turn per module (degrees)	Maximum radius of storage cables and hoses (mm)	SILVEYER Flex weight (kg/m)
KSF-50-110	24.25	Ø 53.5	Ø 62.5	Ø 66.5	110	20	±15	Ø 21	0.60

### Mounting dimensions



## Storage range of cables and hoses for the design



Model number	Storage cross section		Maximum radius of storage cables and hoses	Storage range of cables and hoses
	Inner dimension (mm)	Minimum inner radius (mm)		
<b>KSF-50-110</b>	24.25	Ø 53.5	Ø 21	Ø 47.5

- Be sure that the weight of the cables and hoses to be stored in the SILVEYER Flex is set within the storage range of cables and hoses.



## SILVEYER Flex nominal model number

- Order the SILVEYER Flex you selected with the following nominal model numbers.

Example of model number configuration	Model number		—	Number of modules	
	KSF-50-110			050	
	KSF-50-110	SILVEYER Flex		050	50 modules/ product (1m) x 1 product
				100	100 modules/ product (2m) x 1 product
				150	150 modules/ product (3m) x 1 product
				200~	※

- Fixed brackets (2 Indv. parts) is included with one main unit.

※ The number of modules ordered is in multiples of 50, up to 150 modules with a total length of 3 meters. Contact us if you want to use the product with a longer line of modules.

## Mounting bracket (optional part)

Applicable model number	Type	Order part number	Order part name	Quantity sold	Weight	Material	
				(Indv. Part(s)/Box(es))	(g/Indv. Part)	Bracket	Bit insert
KSF-50-110	For fixed	<b>KSF50B</b>	Fixed bracket	2 Indv. parts	47 g	Nylon	Brass
	For middle	<b>KSF50SB</b>	Middle bracket	2 Indv. parts	49 g	Nylon	Brass



## Joint cover (connecting part for SILVEYER Flex) [optional part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Products/Bag)	(g/Indv. Part)	
KSF-50-110	<b>KSF50CJ</b>	Joint cover	1 Indv. parts	22 g	Nylon



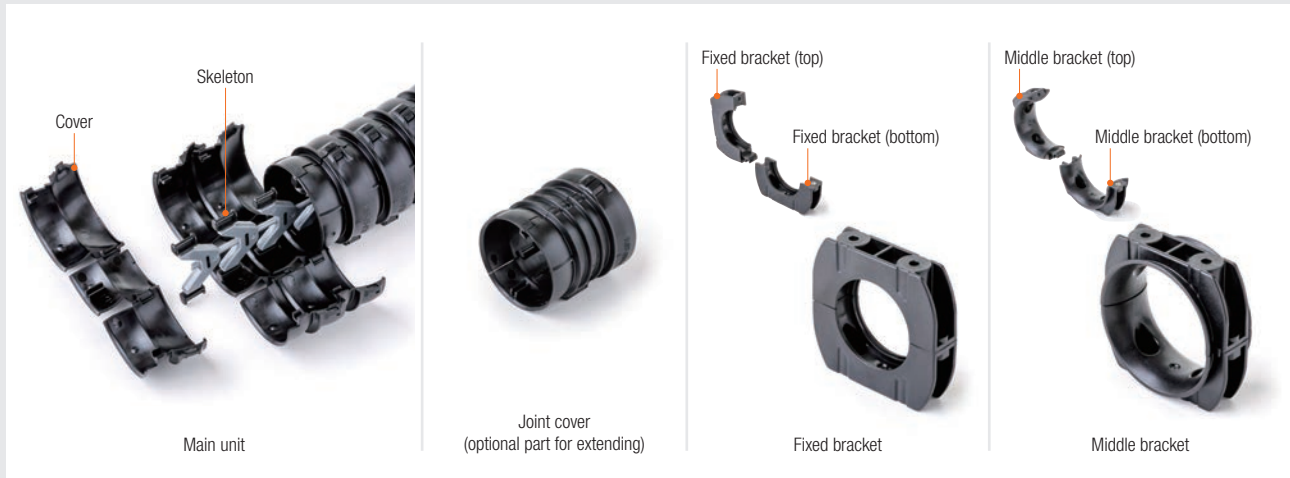
## Cover [spare part]

Applicable model number	Order part number	Order part name	Quantity sold	Weight	Material
			(Indv. Part(s)/Box(es))	(g/Indv. Part)	
KSF-50-110	<b>KSF50C-4</b>	Cover	4 Indv. parts	10 g	Nylon



# SILVEYER® Flex | Handling Method

## Name of each part



## Open and close direction of the cover



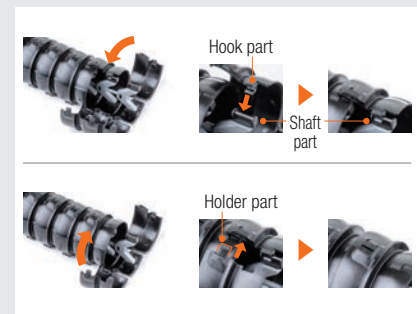
- Can only be opened from either an open or close direction, as the covers next to each other are structured to be stacked. (The open and close directions will be opposite of each other.)
- Open direction: The cover of the end is covered on the outside
- Close direction: The cover of the end is covered on the inside
- Be sure to check the direction when opening closing the cover.

## How to open the cover



- The cover can be opened and closed by hand. (Opening the cover by inserting your thumbs into the spaces on the left and right of the skeleton will make it easier to open.)
- If you are having difficulty opening the cover, remove the holder by inserting a screwdriver into the recess of the  $\triangle$  mark.

## How to close the cover



- When closing one side of the cover, be sure to check that the hook part of the cover is fitted into the skeleton's shaft part.
- It will not function normally if it is not fitted in.
- Next, close the other side of the cover and fit the holder. Repeat the above.

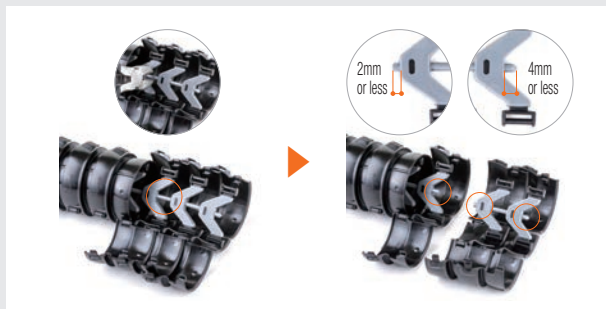
## Method used for securing brackets



- Secure one side of the bracket to the device with M4 bolts (SW, flat washer use).
- If the top/bottom bracket has come off, assemble it by fitting the shaft part and hoof part together while keeping the bracket on the side that was not securely fastened 90°.
- The same goes for fixed/middle brackets.
- For fixed brackets, fit the main unit to the bracket secured to the device.
- Fit the other side of the bracket into the main unit while turning it and fasten the top and bottom brackets with M3 bolts (SW, flat washer use). (L = 12 mm is recommended.)
- For middle brackets, set the main unit in black with the top and bottom brackets and fasten it with M3 bolts.



## Shortening



- When shortening the length, open the cover of modules equal to the number to shorten +1 and disconnect the skeleton with a nipper.
- Adjust the disconnected part so that it is equal to or less than the illustrated dimensions.

## Extending (joint cover from optional parts required)



- Line up the front and back and top and bottom so they are facing the same direction after preparing the original product and the one to be used for extension.
  - Remove the cover from the skeleton after opening the cover at the end of the original product.
  - For products used to extend, remove the cover at the end of the connecting side from the skeleton after opening all the covers.
  - Assemble the joint cover to the skeleton of the product used to extend. Line up the direction of the mark on the joint cover and the shape of the skeleton.
  - A joint cover must be placed inside the cover of ends, so assemble it to a joint cover while holding and lifting the skeleton.
  - Next, assemble the skeleton of the original product side to the joint cover.
  - Close the covers, starting from the joint cover side and toward the end.
  - Close the cover after checking whether the hook part is fitted into the shaft part of the skeleton, as described in "How to close the cover."
  - Joint covers have hook parts in two parts, so be sure to check whether the hook parts on both sides are fitted in.
- ※ For hooks that have long legs, fit them properly in, pinching the hook part with your fingers after closing the cover.

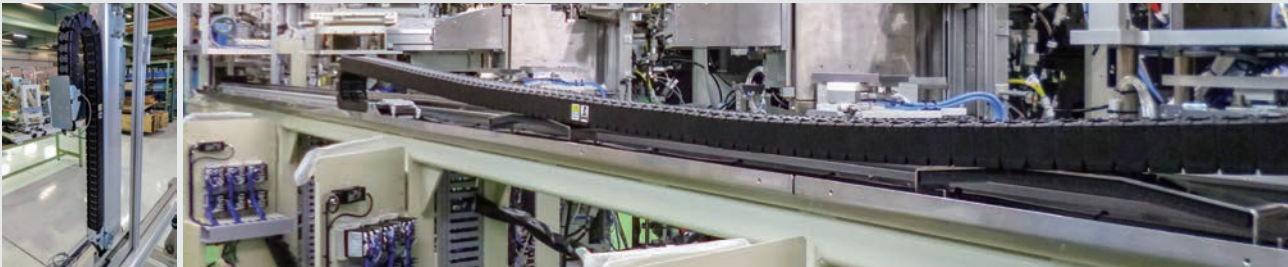
## Parts that require regular inspection

- The SILVEYER Flex has a connected skeletal structure called a skeleton on the inside. The skeleton will break as it has a bending lifespan, which will end over time.
- Inspect the SILVEYER Flex along with the device during regular inspections.
- Replace the skeleton if there are signs of any cracks (including small ones) on it that indicate it is worn out.
- Have regular maintenance and inspections that include the following.
  - ☐ Checking whether covers are out of place.
  - ☐ Checking whether any screws are loose at installations.
  - ☐ Checking for damages on every part.
  - ☐ Checking whether there is any wear, twisting, etc., for cables.

Promptly replace the relevant parts when any irregularities are found during inspections.

# Application Examples

## SILVEYER® · SILVEYER® Tough



SILVEYER

SILVEYER



SILVEYER



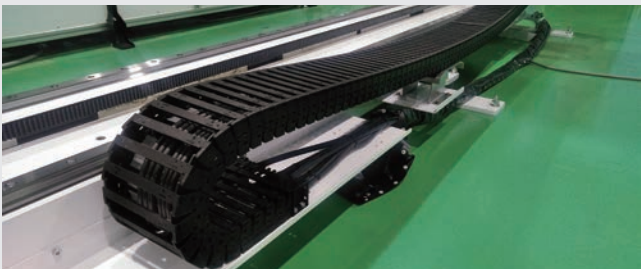
SILVEYER



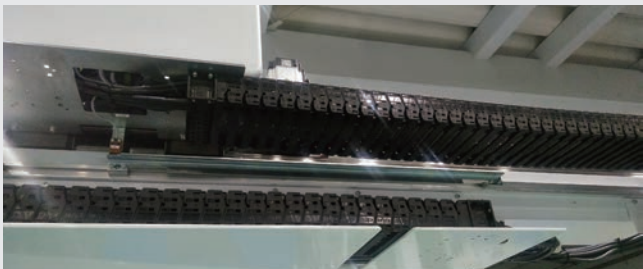
SILVEYER



SILVEYER



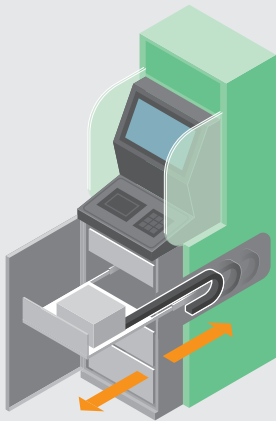
SILVEYER Tough



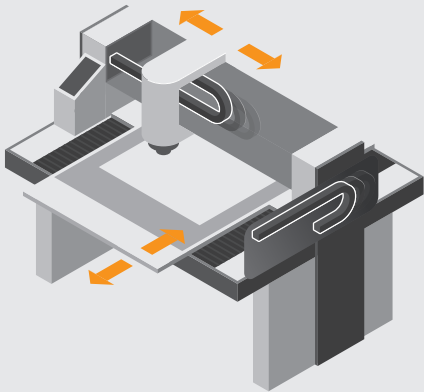
SILVEYER Tough



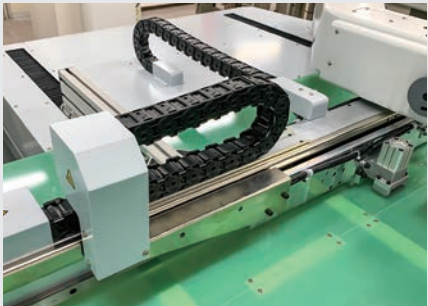
SILVEYER® Light



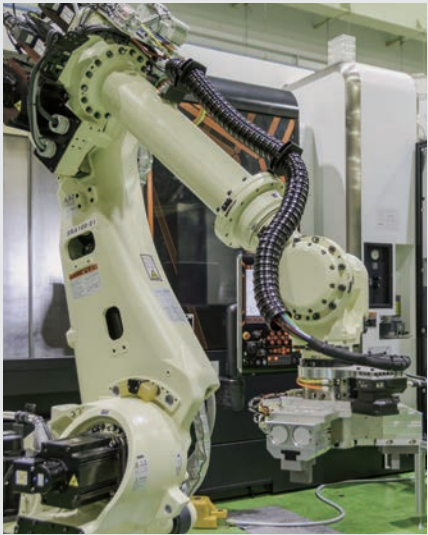
ATM machine



Industrial sewing machine



SILVEYER® Flex



# Precautions for use

## For safe use

- Please read the following precautions carefully before use and use the product properly.
- Customers are requested to implement safety management measures in accordance with laws, regulations, and various standards and criteria for safe operation and maintenance.

### ⚠ Precautions for use

- Do not pull or ride on the SILVEYER, SILVEYER Tough, SILVEYER Light, or SILVEYER Flex (hereinafter referred to as "the Product") during or after installation on the equipment. It may cause the Product to fall or topple over due to damage.
- Observe the general standards in Part II, Section 1 of the Industrial Safety and Health Regulations.
- Precautions for installation, removal, maintenance, inspection, etc.

#### 【The following applies to the SILVEYER, SILVEYER Tough, SILVEYER Light, and SILVEYER Flex】

- Always turn off the main power to the equipment before performing any work and ensure that the power is not turned on accidentally.
- Do not enter the movable range of the product during machine commissioning or operation.
- Secure and hold the Product and its components so that they cannot move freely. This product may run or fall over due to its own weight. Falling of the product may cause accidents.
- Be careful not to get your hands caught in the bending parts of the product.
- Wear suitable work clothes and appropriate protective equipment (safety glasses, gloves, safety shoes, helmet, etc.).
- Work in accordance with the instructions for use, and catalogs, etc.

#### 【SILVEYER】

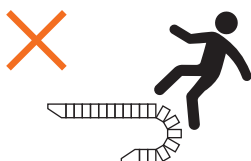
- Always install end caps on the ends of the SILVEYER. End caps are intended to protect cables and hoses.
- When cutting the SILVEYER or removing the parallel joint, be very careful not to injure yourself with tools such as cutters or screwdrivers.
- If the parallel joint is repeatedly removed, it may be deformed or cracked, and it will not be able to maintain sufficient fixing strength. Please check the installation position before proceeding.

- Handle this product with an understanding of its structure and specifications.
- Before installing this product, inspect it for damage during transportation.
- Be sure to perform a test run to check operation and safety.
- This product is a consumable product. Be sure to perform maintenance and inspections on the "Periodic Inspection Points" items on a regular basis.

If any abnormality is found during the inspection, replace the product immediately.

### ⚠ Warning

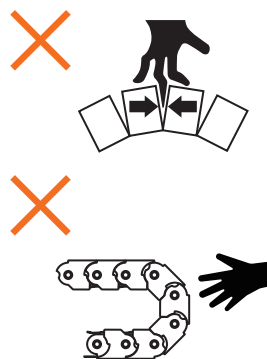
Do not get on



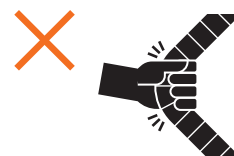
Do not enter the movable range



Do not get your hands caught



Do not pull



# Product Warranty/Disclaimer

## Product Warranty / Disclaimer

### ● Warranty Coverage

In the event that a defect occurs due to our responsibility and is confirmed by us, we will promptly take one of the following measures, provided that the correct installation, usage, maintenance and management in accordance with the catalog, instruction manuals, etc. have been performed by the customer.

1. Provide a substitute product for this product free of charge.
2. Repair this product at our factory free of charge.

### ● Disclaimer

The warranty does not cover the following cases.

- ① When the product is used beyond the scope of the specifications described in the user manual, etc., or when the product is used in a manner other than that described.
- ② When the product has been disassembled or modified, or its structure, specifications, or performance has been altered without our involvement, or due to the customer's intentional or negligent act, etc.
- ③ When the defect is caused by illegal acts of a third party.
- ④ When the failure is caused by force majeure such as natural disasters.
- ⑤ When the failure is caused by a malfunction of the customer's equipment.







● For inquiries and consultation...

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