

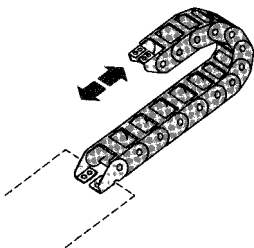
Plarail chain Series

Features

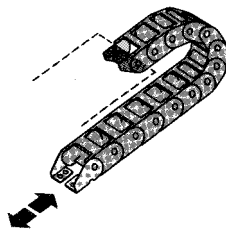
- Plarail chains are cable, hose protection, and guiding devices all made of plastic. They protect and guide cables and hoses without twists or turns in motion of industrial robots, machine tools, and conveying machines.
 - Strength, light weight, and smooth motion is realized by connecting to chains made of engineering plastic. Adjustment of length is easy.
- HPU, HPO series
- Flaps can be opened or closed either from right or left which is convenient for replacement of cables.
 - Smooth in motion, quiet in noise, excellent in safety and durability, handling is easy.
 - Following all the linear and complex motion of mobile parts of machines and tools, they protect and guide cable and hoses.
- HPO series
- They protect cables and hoses from dust particles.
- HPE series(R50~R200mm·R15.2~61.0in.)
- Cables can be separated according to their types. The right and left of the separated compartment has its own flap and, thus, only the necessary flap can be opened or closed. Bending radius can be selected from 5 types according to devices and cables.
- HPK series
- Single cable or hose can be protected or guided. This type is optimal for mass-produced low-cost and compact special purpose tools.
- HPM series
- This type is low-cost full-cover type and protect cables and hoses from dusts and foreign particles.
- HPC series
- This low-noise type does not require tools for replacement of cables. Low-noise is realized by the construction by small blocks and adoption of special engineering plastic.

Mounting Example

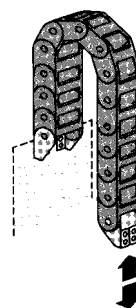
(a)Horizontal slide mounting 1
(Upper plane slide)



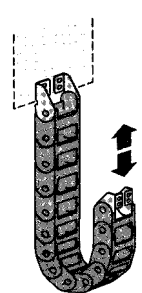
(b)Horizontal slide mounting 2
(Lower plane slide)



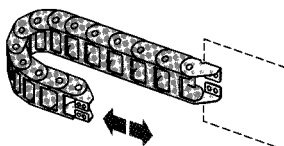
(c)Vertical slide mounting 1
(Reversed U shape)



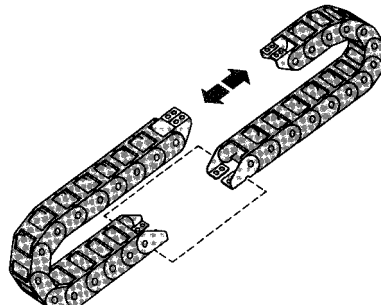
(d)Vertical slide mounting 2
(U shape)



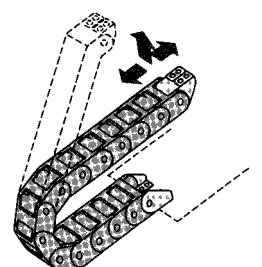
(e)Side slide mounting



(f)Counter slide mounting



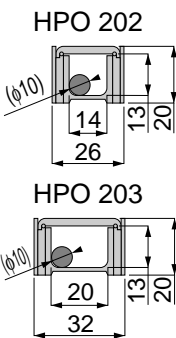
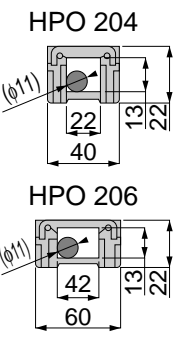
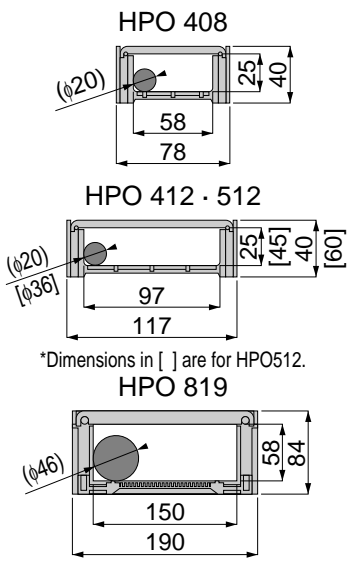
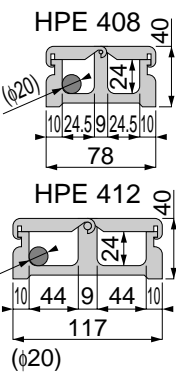
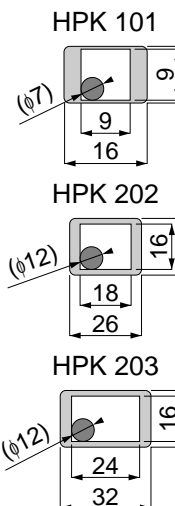
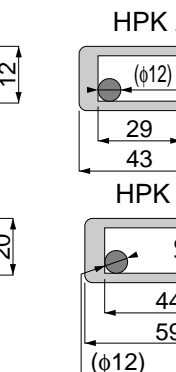
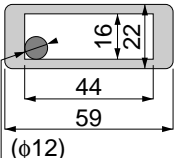
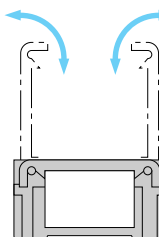
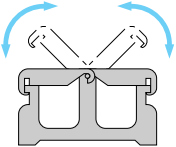
(g)Complex slide mounting



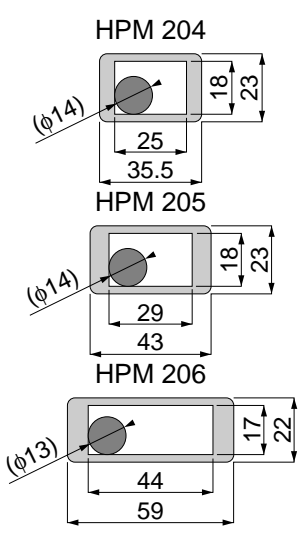
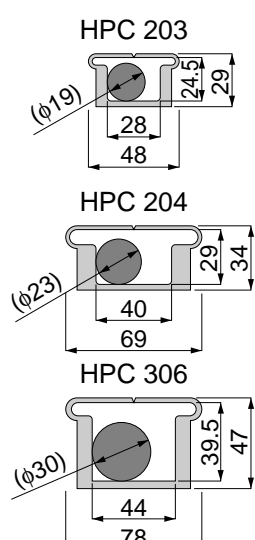
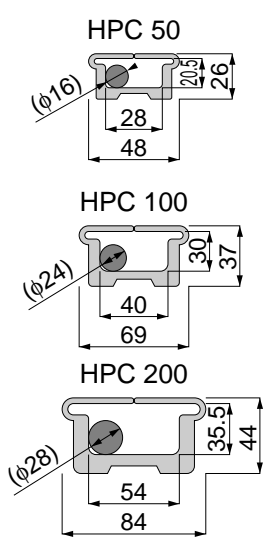
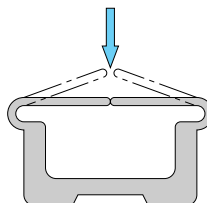
Specifications

		Flap open & close type							
Series	HPU series								
Type	HPU 102	HPU 202	HPU 203	HPU 204	HPU 206	HPU 306	HPU 408	HPU 412	HPU 615
Minimum bending radius R (mm)	19	25 30 45	30 45	38 50	50 100 150	50 100 150 200	50 75 100 150 200	75 100 150 200	
Size (mm) (Maximum cable dia · hose O.D.)									
Pitch (mm)	20	25		32		45		70	
No. of links (/m)	50	40		32		23		15	
*Maximum free span (m)	0.25	0.75		1		1.5		3	
Maximum stroke (m)	0.4	1.4		1.9		2.9		5.8	
Maximum cable and hose weight (N/m)	14.7	5.9		9.8		39.2	49.0		245.2
Maximum speed (m/s)	2.5								
Plarail chain weight (N/m)	1.18	2.45	2.55	4.90	5.49	6.28	10.8	12.7	24.1
Service temperature range (°C)	-10~80								
Service conditions	Avoid acidic or basic atmosphere or hot water.								
Opening and closing operation	<p>Open and close either from right or left.</p>								
Diaphragm ordering code	—			—		—	SB-4		SB-6
ordering code of Flap alone	HPU 102 Flap	HPU 202 Flap	HPU 203 Flap	HPU 204 Flap	HPU 206 Flap	HPU 306 Flap	HPU 408 Flap	HPU 412 Flap	HPU 615 Flap

Specifications

Open & close full cover type								Separated open & close type		No flap type					
HPO series								HPE series		HPK series					
HPO 202	HPO 203	HPO 204	HPO 206	HPO 408	HPO 412	HPO 512	HPO 819	HPE 408	HPE 412	HPK 101	HPK 202	HPK 203	HPK 204	HPK 206	
30 45		38 50		70 100 150 200		100 150 200 300 400		50 75 100 150 200		19	30 45		38 50		
				 <p style="font-size: small;">*Dimensions in [] are for HPO512. HPO 819</p>											
20		26		45		60		45		20	25		32		
50		39		23		17		11		23	40		32		
0.75		1		1.5		4.5		2.5		0.37	0.75		1		
1.4		1.9		2.9		8.8		4.6		0.64	1.4		1.6		
2.9		12.2		49.0		300.0		343.2		24.5	1.6		44.1		
2.5								2.5		1		2.5			
2.74	3.04	4.90	5.88	13.3	16.7	21.1	43.1	10.8	12.7	1.03	2.18	2.35	4.41	5.00	
-10~80															
Avoid acidic or basic atmosphere or hot water.															
<p>Open and close either from right or left.</p> 								<p>Open and close independently in right or left of the separator.</p> 		<p>HPK comes without flaps.</p>					
—				SB-4		—		SB-8		—					
HPO 202	HPO 203	HPO 204	HPO 206	HPO 408	HPO 412	HPO 512	HPO 819	HPE 408	HPE 412	—					
Flap	Flap	Flap	Flap	Flap	Flap	Flap	Flap	Flap	Flap	—					

Specifications

	Full cover type			Low noise type						
Series	HPM Series			HPC Series						
Type	HPM 204	HPM 205	HPM 206	HPC 203	HPC 204	HPC 306	HPC 50	HPC 100	HPC 200	
Minimum bending radius R (mm)	28		38 50	30 45 60	50 90 150	50 100 150	60	90	105	
Size (mm) (Maximum cable dia · hose O.D.)	 <p>HPM 204: Cable dia $\phi 14$, width 25, height 18, total width 35.5, total height 23.</p> <p>HPM 205: Cable dia $\phi 14$, width 29, height 18, total width 43, total height 23.</p> <p>HPM 206: Cable dia $\phi 13$, width 44, height 17, total width 59, total height 22.</p>			 <p>HPC 203: Cable dia $\phi 19$, width 28, height 24.5, total width 48, total height 29.</p> <p>HPC 204: Cable dia $\phi 23$, width 40, height 29, total width 69, total height 34.</p> <p>HPC 306: Cable dia $\phi 30$, width 44, height 39.5, total width 78, total height 47.</p>			 <p>HPC 50: Cable dia $\phi 16$, width 28, height 20.5, total width 48, total height 26.</p> <p>HPC 100: Cable dia $\phi 24$, width 40, height 30, total width 69, total height 37.</p> <p>HPC 200: Cable dia $\phi 28$, width 54, height 35.5, total width 84, total height 44.</p>			
Pitch (mm)	15		22	25	32	45	25			
No. of links (/m)	67		46	40	32	23	40			
*Maximum free span (m)	1			0.75	1					
Maximum stroke (m)	0.9		1.2	1.4	1.7	1.8	1.9			
Maximum cable and hose weight (N/m)	24.5		34.3	24.5	39.2	68.6	9.8	4.9		
Maximum speed (m/s)	2.5									
Plarail chain weight (N/m)	3.33	3.82	4.51	3.63	5.78	7.65	3.51	5.96	10.4	
Service temperature range (°C)	-10~80			0~50		-10~80		0~50		
Service conditions	Avoid acidic or basic atmosphere or hot water.									
Opening and closing operation	HPM comes without flaps.			Cut the pointed place by knife or nipper. Flap can be opened or closed by finger tips. 						
Diaphragm ordering code	—			—	—	—	—	—	—	
ordering code of Flap alone	—			—	—	—	—	—	—	

Capacity chart

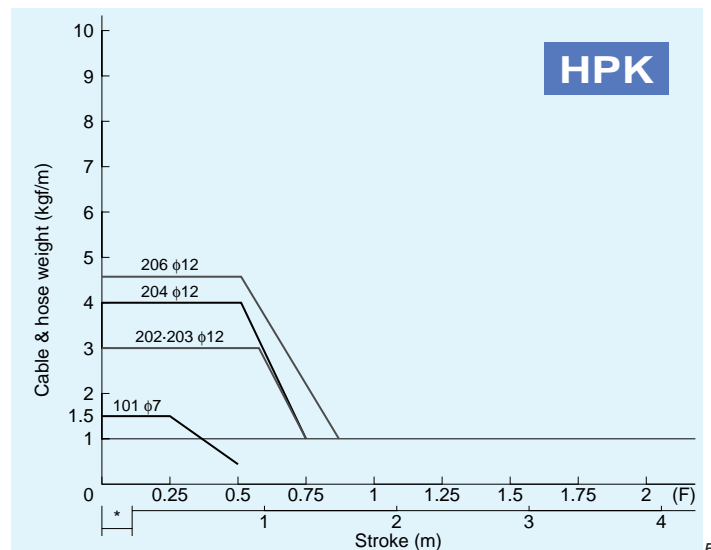
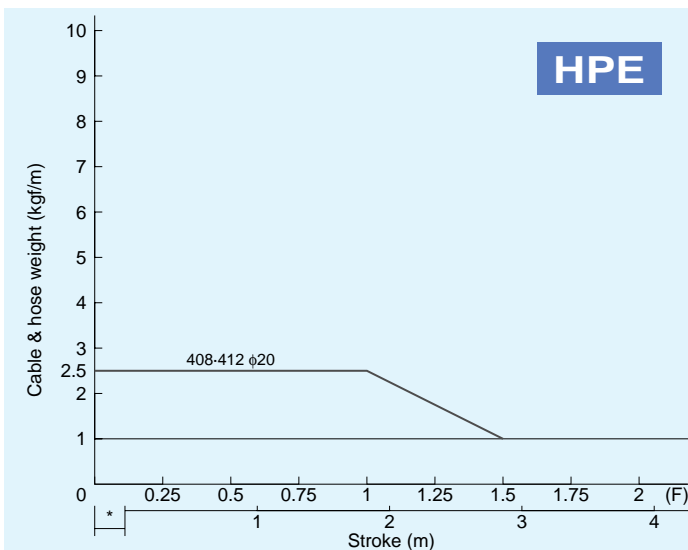
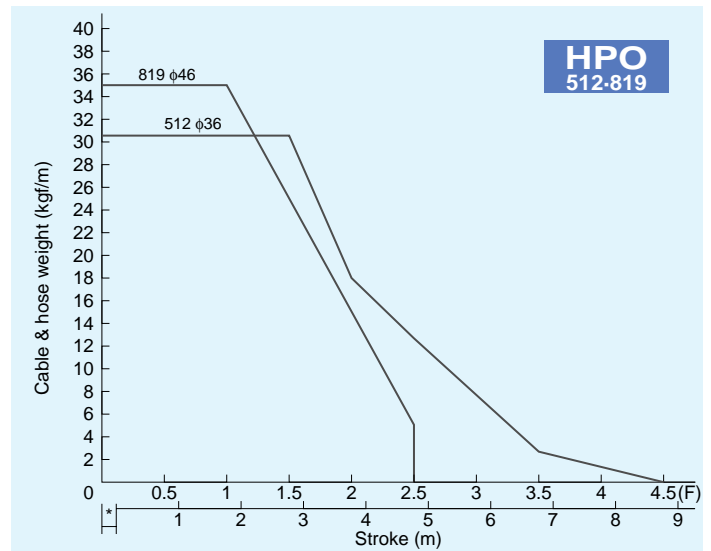
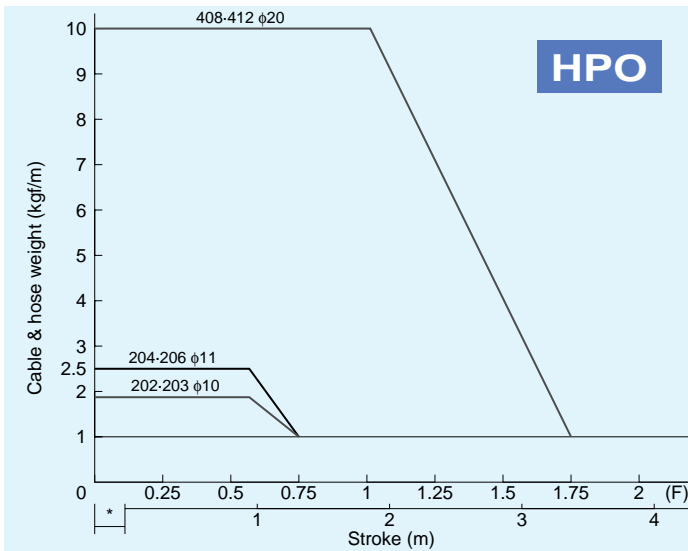
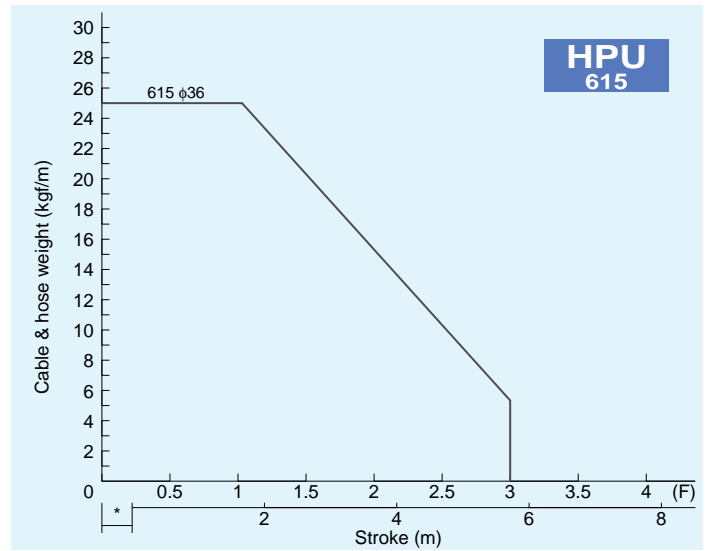
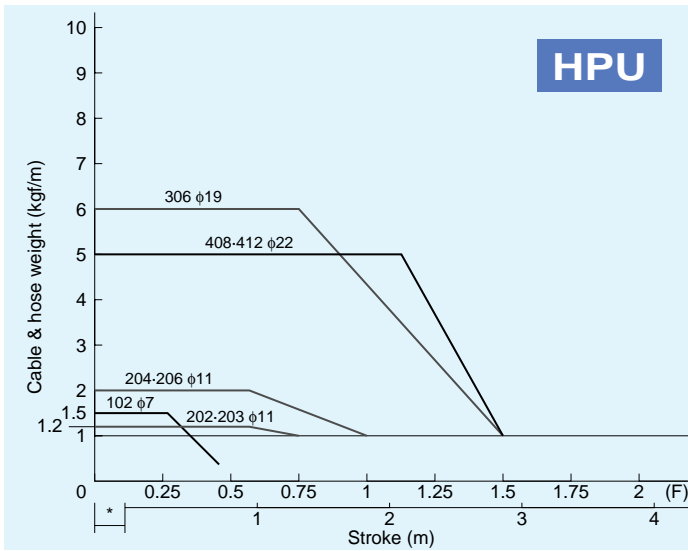
Select the optimal parail chain from capacity chart provided below once total weight of cable and hose, the maximum O.D. , and stroke are determined. Please make sure that the bending radius of parail chain is larger than bending radius of cable and hose.

note 1) F=Free span

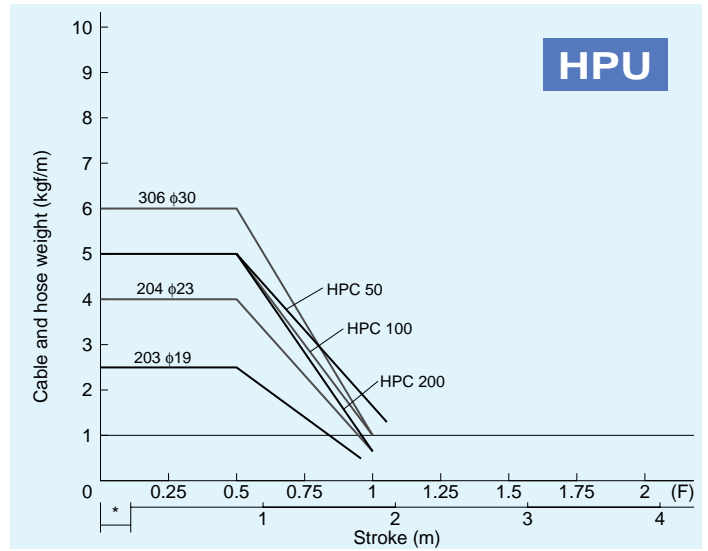
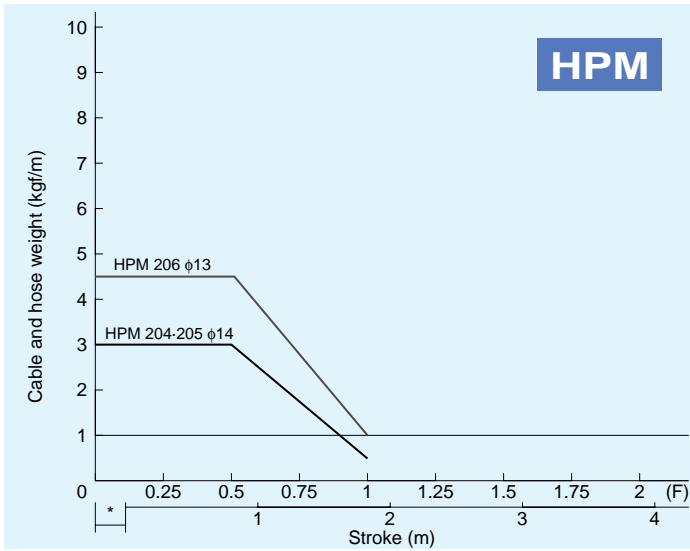
Horizontal motion length

note 2) Dimensions marked with * include safety length

note 3) The chart was plotted while the fixed end locates in the center of stroke



Capacity chart



Calculation of Number of Links

Number of links is to be calculated by the following equation:

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

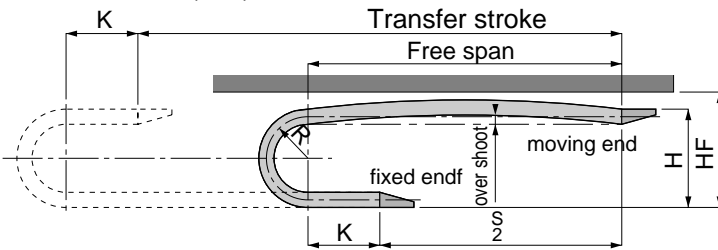
n : No. of links (Figures below decimal point raised to one positive number)

S : Transfer stroke (mm)

R : Bending radius (mm)

K : Play (mm)

P : Pitch (mm)



*HF in the chart above is the height which Parailchains are able to pass through using under the length of free span with allowable expansion without load such as cables, hoses, etc.

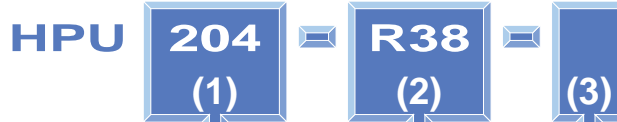
unit:mm

Series	R	H	HF	K	πR	$\pi R + 2K$
HPU 102	19	50	65	20 or more	59.7	99.7 or more
HPU 202, 203	25	70	85	25 or more	78.5	128.5 or more
HPO 202, 203	30	80	95		94.2	144.2 or more
HPK 202, 203	45	110	125		141.3	191.3 or more
HPU 204, 206	38	98	118	30 or more	119.3	179.3 or more
HPO 204, 206	50	122	142		157.0	217.0 or more
HPK 204, 206						
HPU 306	50	134	160	50 or more	157.0	257.0 or more
	100	234	260		314.0	414.0 or more
	150	334	360		471.0	571.0 or more
HPU 408, 412 (HPO 408, 412)	50	140	170	50 or more	157.0	257.0 or more
	75	190	220		235.0	335.5 or more
	100	240	270		314.0	414.0 or more
	150	340	370		471.0	571.0 or more
	200	440	470		628.0	728.0 or more
	(70)	(180)	(210)		(219.8)	(319.8 or more)
HPU 615	75	214	275	70 or more	235.5	375.5 or more
	100	246	325		314.0	454.0 or more
	150	364	425		471.0	611.0 or more
	200	464	525		628.0	768.0 or more
HPE 408, 412	50	140	180	50 or more	157.0	257.0 or more
	75	190	230		235.0	385.0 or more
	100	240	280		314.0	414.0 or more
	150	340	380		417.0	571.0 or more
	200	440	480		628.0	728.0 or more
HPO 512	100	260	320	60 or more	314.0	434.0 or more
HPO 819	150	384	445	90 or more	471.0	651.0 or more
	200	484	545		628.0	808.0 or more
	250	584	645		785.0	965.0 or more
	300	684	745		942.0	1,122.0 or more
	400	884	945		1,256.0	1,436.0 or more
HPK 101	19	50	62	25 or more	59.7	109.7 or more
HPM 204, 205	28	79	100	15 or more	87.9	117.9 or more
HPM 206	38	98	118	25 or more	119.3	169.3 or more
	50	122	142		157.0	207.0 or more
HPC 203	30	98	120	25 or more	94.2	144.2 or more
	45	128	150		141.3	191.3 or more
	60	158	180		188.4	238.4 or more
HPC 204	50	146	165	30 or more	157.0	271.0 or more
	90	226	245		282.6	342.6 or more
	150	346	365		471.0	531.0 or more
HPC 306	50	160	177	50 or more	157.0	257.0 or more
	100	260	277		314.0	414.0 or more
	150	360	377		471.0	571.0 or more
HPC 50, 100, 200	60	152	206	90 or more	188.4	368.4 or more
	90	227	257		282.6	462.6 or more
	105	260	295		329.7	509.7 or more

Notice

- The total volume of contents (tubes, cables, and etc.) in Parailchains should be arranged not to exceed 60% of the Inside capacity of each model.
- Contents should be lined up without crossing each other when they are stored into Parailchains.
- Contents should be stored well-balanced in right and left in Parailchains.
- Please avoid applying excessive forces to Metal Brackets by Keeping proper Bendings, max. Free Span, Max. Transfer Stroke, max. Cable/Hose Weight, and max. Transfer Speed. and etc.
- In case of different contents such as air tubes, water tubes, cables, and/or etc. are stored into the same body, please select Bending Radius of Parailchains according to the largest Bending Radius among the contents.

HPU Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

Code	102	202	203	204	206
size(mm)	12×27	20×26	20×32	22×40	22×60
size(inch)	0.47×1.06	0.79×1.02	0.79×1.26	0.87×1.57	0.87×2.36
Code	306	408	412	615	
size(mm)	34×60	40×78	40×117	64×146	
size(inch)	1.34×2.36	1.57×3.07	1.57×4.61	2.52×5.75	

(2)Bending radius

	R19	R25	R30	R38	R45	R50	R75	R100	R150	R200
102	○									
202		○	○		○					
203			○		○					
204,206				○		○				
306						○		○	○	
408,412						○	○	○	○	○
615							○	○	○	○

(3)Color

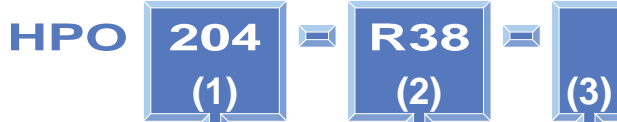
No color : Black

W : Ivory (102, 202, 203, 204, 206 only)

*Two kinds of brackets, one for fixed end and the other for movable end, are required.

Select a designation code for the bracket from page 614.

HPO Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

Code	202	203	204	206
size(mm)	20×26	20×32	22×40	22×60
size(inch)	0.79×1.02	0.79×1.26	0.87×1.57	0.87×2.36
Code	408	412	512	819
size(mm)	40×78	40×117	60×117	84×190
size(inch)	1.57×3.07	1.57×4.61	2.36×4.61	3.31×7.45

(2)Bending radius

	R30	R38	R45	R50	R70	R100	R150	R200	R250	R300	R400
202, 203	○		○								
204, 206		○		○							
408, 412					○	○	○	○			
512						○					
819							○	○	○	○	○

(3)Color

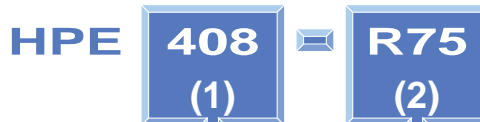
No color : Black

W : Ivory (202, 203, 204, 206 only)

*Two kinds of brackets, one for fixed end and the other for movable end, are required.

Select a designation code for the bracket from page 614.

HPE Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

Code	408	412
size(mm)	40×78	40×117
size(inch)	1.57×3.07	1.57×4.61

(2)Bending radius

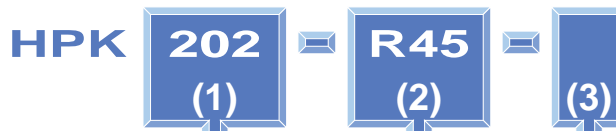
	R50	R75	R100	R150	R200
408	○	○	○	○	○
412	○	○	○	○	○

*Color is black only

*Two kinds of brackets, one for fixed end and the other for movable end, are required.

Select a designation code for the bracket from page 614.

HPK Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

Code	101	202	203	204	206
size(mm)	12×16	20×26	20×32	22×43	22×59
size(inch)	0.47×0.63	0.79×1.02	0.79×1.26	0.87×1.69	0.87×2.32

(2)Bending radius

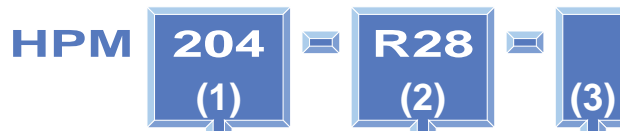
	R19	R30	R38	R45	R50
101	○				
202,203		○		○	
204,206			○		○

(3)Color

No color : Black
W : Ivory

*Two kinds of brackets, one for fixed end and the other for movable end, are required. Select a designation code for the bracket from page 614.

HPM Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

Code	204	205	206
size(mm)	23×35.5	23×43	22×59
size(inch)	0.91×1.40	0.91×1.69	0.87×2.32

(2)Bending radius

	R28	R38	R50
204,205	○		
206		○	○

(3)Color

No color : Black
W : Ivory

*Two kinds of brackets, one for fixed end and the other for movable end, are required. Select a designation code for the bracket from page 614.

HPC (New size) Model Dsignation (Example)



(1)Size (Bulk Dimensions-Height×Width)

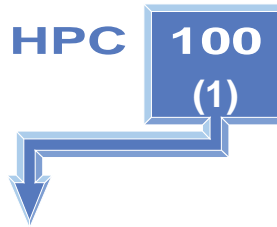
Code	203	204	306
size(mm)	29×48	34×69	47×78
size(inch)	1.14×1.89	1.34×2.72	1.85×3.07

(2)Bending radius

	R30	R45	R50	R60	R90	R100	R150
203	○	○		○			
204			○		○		○
306			○			○	○

*Two kinds of brackets, one for fixed end and the other for movable end, are required. Select a designation code for the bracket from page 614.

HPC Model Designation(Example)



(1)Size(Bulk Dimensions-Height×Width)

Code	50	100	200
Size(mm)	26×48	37×69	43×84
Size(inch)	1.02×1.89	1.46×2.72	1.73×3.31
Bending radius(mm)	60	90	105
Bending radius(inch)	2.36	3.54	4.13

⚠ Detailed Safety Instructions

Before using the PISCO device, be sure to read the "Safety Instructions", "Common Safety Instructions for Products Listed in This Manual" on pages 23~24.

⚠ Warning

1. Never step on Plarailchain. Otherwise the chain may break and you will fall down.
2. When connecting, disconnecting, opening, closing, or carrying out maintenance and checks, hold the Plarailchain motionless. Otherwise the Plarailchain may run or fall under its own weight, thus doing injuries to you.
3. Pay attention to the flexing areas of the Plarailchain. You can get injured with your hand caught in the flexing area.
4. Before conducting maintenance or checks of Plarailchain, be sure to turn off power supply to the equipment for your safety.
5. The Plarailchains should only be used within stated specifications and conditions.
6. Never perform disassembly or remodeling that can affect the basic structure, performance or function of the equipment.
7. In applications where operation is frequently done or subject to vibration, tighten up all the brackets. Looseness of them can cause a breakdown of the whole system.

⚠ Caution

1. Carefully read the "Safety Instructions" section in this catalogue before use.
2. Examine the Plarailchains Performance Curve Chart in manual to select suitable type. Remember to test the Plarailchains before use since other factors may affect performance.
3. Cables and hoses to be stored must be flexible and wear-resistant, do not use wire-braided ones which are prone to damage.
4. For use under special circumstances, contact PISCO for guidance.