KLIFTING INDUSTRY CO., LTD.

C-Rail Festoon Systems

C 30/40Series

Catalogue

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Catalogue

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General

Klifting Festoon Systems support conductor flat cables and hoses for delivering power and control to mobile equipment in a safe, efficient and maintenance free method.

The cable carriers are well guided inside their C-tracks and protected against humidity, dust and icing.

All box-tracks can be bent in accordance to the system layout, considering the minimum bending radii and the permissible cable loops.

Klifting cable carriers contained in this catalog comply with the VDE and most international regulations.

The use of flatform cable is highly recommended due to better bending properties compared to round cable.

The minimum bending radius permissible for round cable is 5 times the cable diameter – for flat cable it is 5 times the thickness of the cable. This formula allows considerably smaller bend radii for flat cable, minimizing the required Festoon System storage distance which is normally within the length of equipment.

Applications

C-rail systems applications: crane manufacturing, hoist units, transport systems, special engineering, stacking systems, conveyor system, etc. C-rails are available in zinc-coated and stainless steel version . Special versions are available for explosion-proof areas.

Product Description

➢ C-Rail

C-Track trolleys are designed to run in steel formed C-track sections. For curved track sections, please contact Klifting.

Type	Material	Weight (KG/M)	A	B	C	D	E
KH30010	Galvanized steel	1.22	30	32	12	29	1.6
KH30011	Galvanized steel	1.12	30	32	12	29	1.5
KT30010	Stainless steel	1.14	30	32	12	29	1.5
KH40010	Galvanized steel	2.06	40	41	14	39	2.0

➢ C-Track Support Bracket

This bracket mounts to Cross Arm Support Channels at two points to hang the C-Track.
The clamping action of the support bracket eliminates the need for a separate anchor.

Type	Material	Weight (KG)	A	B	C	D
KH30020	Galvanized steel	0.23	40	12	32	M8Screw
KT30020	Stainless steel	0.23	40	12	32	M8Screw
KH40020	Galvanized steel	0.31	40	24	41	M8Screw

➢ Track Joint

The bolted Track Joint securely connects track sections together end-to-end. One required at each track joint. Includes four bolts, lock washers, and nuts.

Type	Material	Weight (KG)	A	B	C	D	E
KH30040	Galvanized steel	0.3	38.5	19	33	M6 Screw	Center hole
KT30040	Stainless steel	0.3	38.5	19	33	M6 Screw	Center hole
KH40040	Galvanized steel	0.54	43	22	43	M6 Screw	Center hole

➢ Tow Cable Trolley

One Tow Trolley is required for each track run. The unit has an opening in the body to accommodate the Tow Bar . Stainless steel trolleys have stainless steel body/saddle and stainless steel sealed rollers and hardware.

Type	Material	Weight (KG)	A	B	C	D	E	F	G	H
KH30060	Galvanized steel	0.68	180	51	24	55	40	M8Screw	M8Screw	Rubber mat
KT30060	Stainless steel	0.68	180	51	24	55	40	M8Screw	M8Screw	Rubber mat
KH40060	Galvanized steel	1.5	220	130	32	60	49	M8Screw	M8Screw	Rubber mat

➢ Cable Trolley

A Cable Trolley is required for each flat cable loop between the End Clamp and Tow Trolley. Stainless steel trolleys have stainless steel body/saddle and stainless steel sealed rollers and hardware.

Type	Material	Weight (kg)	A	B	C	D	E	F
KH30050	Galvanized steel	0.34	24	39	55	51	M8 Screw	Rubber mat
KT30050	Stainless steel	0.34	24	39	55	51	M8 Screw	Rubber mat
KH40050	Galvanized steel	0.71	32	40	60	85	M8 Screw	Rubber mat

➢ End Clamp

One End Clamp is required at the fixed end of the system. Includes clamp and hardware to secure the cable.

Type	Material	Weight (KG)	A	B	C	D	E	F
KH40051	Galvanized steel	0.31	62	60	60	M8Screw	M8Screw	Rubber mat
KT40051	Stainless steel	0.31	62	60	60	M8Screw	M8Screw	Rubber mat
KH40052	Galvanized steel	0.52	60	55	60	M8Screw	M8Screw	Rubber mat

➢ Plastic C Rail Flat Cable Trolley

Type	Material	Weight (kg)
KH30051	Nylon	0.14

➢ GI-Plastic C Rail Flat Cable Trolley

Type	Material	Weight (kg)
KH30052	Galvanized steel and Nylon	0.26

➢ Plastic C Rail Round Cable Trolley

Type	Material	Weight (kg)
KH30053	Nylon	0.15

➢ GI-Plastic C Rail Round Cable Trolley

Type	Material	Weight (kg)
KH30054	Galvanized steel and Nylon	0.31

➢ Plastic Wire Rope Round Cable Trolley

Type	Material	Weight (kg)
KH30055	Nylon	0.14

➢ Plastic Wire Rope Flat Cable Trolley

Type	Material	Weight (kg)
KH30056	Nylon	0.16

➢ Quick Disconnect Control Unit Trolley

Push Button Pendants working in tough industrial environments could easily be damaged. Rewiring a replacement pendant adds downtime and risk to personnel. The solution is the "Quick Disconnect" Pin Connector set, which is included with this style of Control Unit Trolley.

Type	Material	Weight (KG)	A	B	C	D	E	F	G	H	I
KH30057	Galvanized steel	0.36	75	24	85	M6	46	22	65	83	4
KT30057	Stainless steel	0.36	75	24	85	M6	46	22	65	83	4

➢ Locomotive Trolley

Type	Weight (KG)	A (mm)	B (mm)	C (mm)	D (mm)
KH30058 (16P)	2.00	130	40	305	40
KH30059 (24P)	2.10	130	40	305	40

➢ Track Clip

This clamp attaches Cross Arm Support Channels to the I-beam flange.Two required per Cross Arm Support Channel.

Type	Material	Weight (KG)	A	B	C	D	E	F
KH00001	Galvanized steel	0.16	50	25	4	6	32	M10
KT00003	Stainless steel	0.16	50	25	4	6	32	M10
KH00002	Galvanized steel	0.16	50	30	4	6	32	M10

➢ End Stop

Type	Material	Weight (kg)
KH30080	Galvanized steel	0.083

➢ End Cap

Type	Weight (KG)	A	B	C	D
KH30090	0.016	31	33	2	35
KH40090	0.02	42.5	41.5	2	38

Helpful Calculate Hints

Engineering Data & Cable Specification

Travel distance	S = m	Number of cables	Cable type	Dimension	Weight kg/m	Total weight kg/m
Travel speed	V = m/min					
Acceleration	A = m/s2					
Loop depth	H = m					
Storage distance	SP = m					
Open space	Z = m					
Cable safety factor	F =					
Number of loops	N =					
Cable carrier	Typ					
Length of carrier	L = m					
Diameter of support	D = m					
Weight of carrier	Gw = kg					
Track	Typ					
Weight of track	Gs = kg/m	Total Weight of all cables per meter GL				

Layout of the system

1. Number of loops (see diagram or formula) (At Z = 0)

$n = \frac{f \times S}{2h - f \times l + 1{,}254\,D} = \frac{\quad \times \quad}{2 \times \quad - \quad \times \quad + 1{,}254 \times \quad} =$		determined

2. Loop depth (see diagram or formula)

$h = \frac{f}{2}\left(\frac{S}{n} + l\right) - 0{,}627 \times D = \frac{\quad}{2}\left(\frac{\quad}{\quad} + \quad\right) - 0{,}627 \times \quad =$		m

3. Storage distance (center track clamp to center lead carrier)

$SP = n \times l + Z = \quad \times \quad + \quad =$		m

4. Cable length

Cable length w/o hookup endsen $L = (S + SP) \times f = (\quad + \quad) \times \quad =$		m
Hookup length – track clamp side	L_E =	m
Hookup length – lead carrier side	L_M =	m
Total cable length	$L_{ges.}$ =	m

5. Cable weight per carrier

$G_{LW} = \frac{L}{n} \times G_L = \frac{\quad}{\quad} \times \quad =$		kg

6. Load on track per meter

$G_M = \frac{G_{LW} + G_W}{l} + G_S = \frac{\quad + \quad}{\quad} + \quad =$		kg/m

7. Support spacing for track

see diagram page 47	Support spacing l_A =	m

S3
S2 (S2-E)
S1 (S1-E)
S1A
200 175 150 140 130 120 110 100 90 85 80 75 70 65 60 55 50 45 40 35 30 25 20 15 10 5
350 300 250 200 150 100 50
0 0.5 1.0 1.5 2.0 2.5 3.0 3.5 4.0 4.5 5.0

Cable Safety Length Directions

Travel Speed	cable loop depth	safety factor
up to 35 m/min	more than 0,3 m	f = 1,1
up to 50 m/min	up to 0,8 m	f = 1,15
up to 50 m/min	more than 0,8 m	f = 1,1
up to 80 m/min	up to 0,8 m	f = 1,2
up to 80 m/min	more than 0,8 m	f = 1,15
for spiral looped round cable		f = 1,2

For higher speed factors please consult factory.

Number of loops

$$n = \frac{f \times S}{2h - f \times l + 1{,}254\,D}$$

Cable loop depth

$$h = \frac{f}{2}\left(\frac{S}{n} + l\right) - 0{,}627 \times D$$

Storage distance

$$SP = n \times l + Z$$

Cable length

(c/c track clamp – lead carrier without hookup ends)

$$L = (S + SP) \times f$$

Number of Carriers

(without lead carrier and track clamp)

$$= n - 1$$

S = Travel distance (m)
h = Cable loop depth (m)
SP = Storage distance (m)
Z = Open space (min. one carrier length)
n = Number of loops
l = Length of carrier (m)
D = Diameter of support saddle (m)
f = Cable length safety factor

Number of Loops
14
15
16
17
18
19
20
22
24
26
28
30
32
34
36
38
40
42
44
13
12
11
10
9
8
7
6
5
4
3
2
1
Number of Loops
5.0
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
Cable Loop Depth (m)
0
10
20
30
40
50
60
70
80
90
100
110
120
Travel distance (m)
(max. working travel)
The diagram considers a cable length safety factor of f = 1.1

Contact

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For further information of KH - C rail festoon system, please contact us in the above ways.

We commit ourselves to constant improvement of our design and processing of the products.

We keep the right of perfecting the instruction book and the product design to achieve the goal.

It's important to select the suit Safe Conductor Bar for each application. Otherwise it will cause serious consequences , such as property damage or personal injury.