




CABLE CARRIERS FOR ROUND CABLE

I-beam supported



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General

VAHLE Festoon systems support electric cables or hoses for mobile machinery.

The cable carriers contained in this catalog comply with VDE regulations and international safety requirements. Round cables and fittings per our catalog no. 8L.

Track profiles can be standard Γ -beams or flat flange beam sizes, some of which are shown in this catalog, however, actual dimensions of beams being utilized for track purposes should be specified with enquiries and orders.

Application

Cable carrier ride on an Γ -beam parallel to the traversing track of the equipment. This arrangement ensures that the total length of the machine (i. e. hoist, bridge trolley, etc.) is used as storage space. Where there is sufficient space for the storage distance, the cable carriers can also run on the hoist track.

All models have a lead clamp attached to an outrigger of the machinery.

The track clamp is the stationary fastening point of the cables and is bolted to the Γ -beam track at fixed position. The cable ends extending from the track clamp are terminated at a

junction box. The track clamp, together with the bumper, facing towards the last carrier, serves as a limit stop for the carriers. Tow ropes are optional depending on the cable arrangement, loop depth, speed, and acceleration. The strain relief ropes are slightly shorter than the electric cables in each loop.

Cable loop clamps are available and keep the cables together when the system is in operation.

Layout

When selecting a Festoon System please refer to pages 20 and 22 in this catalog.

Layout considerations for cable carriers are cable dimensions, storage space available, maximum loop depth allowable, over-all height and width which the system will occupy, Γ -beam selection, and maximum speed of travel.

After the type of carrier and the loop depth have been determined, please refer to the graphs on pages 23-25 for the number of loops required.

In case you desire a detailed quotation on VAHLE Festoon Systems please do not hesitate to contact our nearest local representative or mail the completed questionnaire on page 3 of this catalog.

Our cable carrier programm:

Catalog No. 8a: Cable Carriers on \square -Tracks

Catalog No. 8bF: Cable Carriers for flatform cable on Γ -Beam Tracks

Catalog No. 8bR: Cable Carriers for round cable on Γ -Beam Tracks

Catalog No. 8c: Cable Carriers on \diamond -Tracks

Catalog No. 8L: Conductor cables & Fittings



CABLE CARRIERS W 25 R, W 26 R, W 30 R

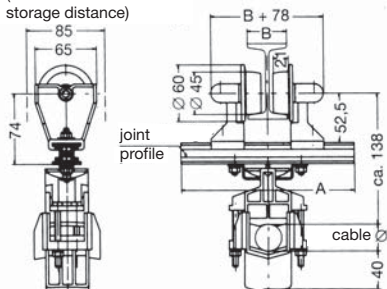
Normal- and europe profile



Engineering data

Type	W 25 R (2 wheels)	W 26 R (3 wheels)	W 30 R (4 wheels)
Carrying capacity	10 kg	10 kg	20 kg
Wheels	K	Flanged polyamid wheels Ø 45/60 mm on stainless steel bushed bearings	
	KL	Flanged polyamid wheels Ø 45/60 mm on sealed (2 RS) precision ball bearings	
Material	Polyamid carrierbody adjustable on light metal profile. Cable support saddles: polyamid Hardware: galvanized		
Temperature range	- 30° C to + 100° C		
Travelling speed	max. 60 m/min		

(for calculation of storage distance)

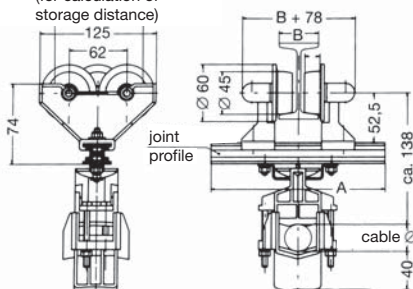


Cable carrier for round cable and hoses

Type W 25 R (2 wheels)

Type	Wheels	Cable ø mm	A mm	for Track-Profile		weight kg	Order-No.
				INP	IPE		
W 25 R/65 K -1	K	5 mm to 38 mm	185	80-220	80-200	0,550	346 665
W 25 R/65 K -2			235	240-380	220-300	0,580	346 666
W 25 R/65 KL-1	KL		185	80-220	80-200	0,630	346 667
W 25 R/65 KL-2			235	240-380	220-300	0,660	346 668

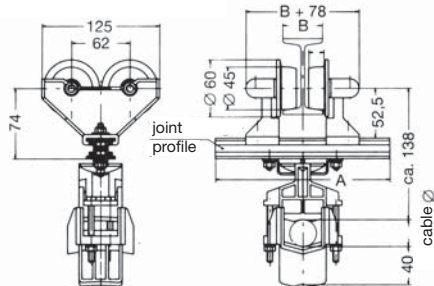
(for calculation of storage distance)



Cable carrier for round cable and hoses

Type W 26 R (3 wheels)

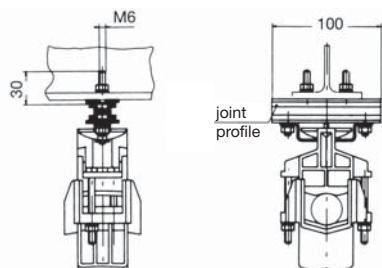
Type	Wheels	Cable ø mm	A mm	for Track-Profile		weight kg	Order-No.
				INP	IPE		
W 26 R/125 K -1	K	5 mm to 38 mm	185	80-220	80-200	0,620	346 669
W 26 R/125 K -2			235	240-380	220-300	0,650	346 670
W 26 R/125 KL-1	KL		185	80-220	80-200	0,740	346 671
W 26 R/125 KL-2			235	240-380	220-300	0,770	346 672



Cable carrier for round cable and hoses

Type W 30 R (4 wheels)

Type	Wheels	Cable ø mm	A mm	for Track-Profile		weight kg	Order-No.
				INP	IPE		
W 30 R/125 K -1	K	5 mm to 38 mm	185	80-220	80-200	0,690	346 673
W 30 R/125 K -2			235	240-380	220-300	0,720	346 674
W 30 R/125 KL-1	KL		185	80-220	80-200	0,850	346 675
W 30 R/125 KL-2			235	240-380	220-300	0,880	346 676



Track clamp for round cable and hoses

Type	for cable carrier	weight kg	Order-No.
E 25-30 R	W 25 R/ 65 ...	0,310	346 677
	W 26 R/125 ...		
	W 30 R/125 ...		



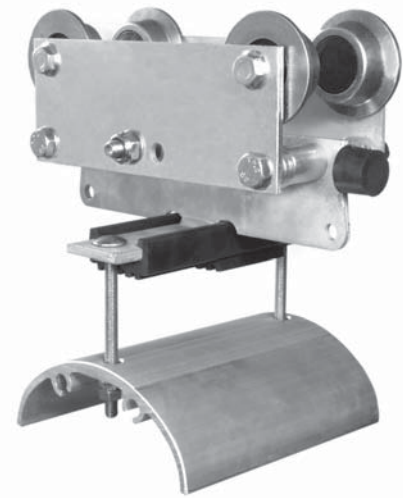
Support saddles for round cable and hoses for additional tiers

Type	for cable carrier	weight kg	Order-No.
LAR	all Types	0,110	312 500



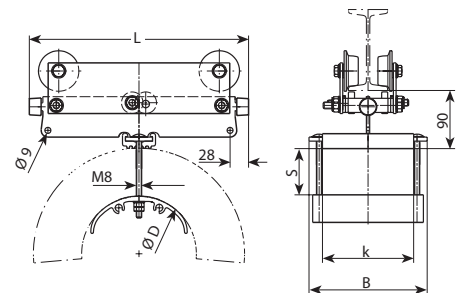
Engineering data

Type	W 45 FR on I-profil for flatform and round cable
Carrying capacity	50 kg (max. 80 kg - consult factory)
Travel speed	max. 120 m/min. when using appropriate cable tension relief
Wheel sets	for standard tracks INP 80 to INP 200 and for flat flange beams IPE 80 to IPE 200 other profiles on request on stainless steel bushed bearing
Wheels	flanged steel wheels \varnothing 45/60 mm, hardened and galvanized, steel kick-up rollers \varnothing 32 mm with bushed bearing and tread hardened and galvanized
Material	Carrier body: steel galvanized Support saddle: aluminium
Operating ambients	-30 °C to +100 °C

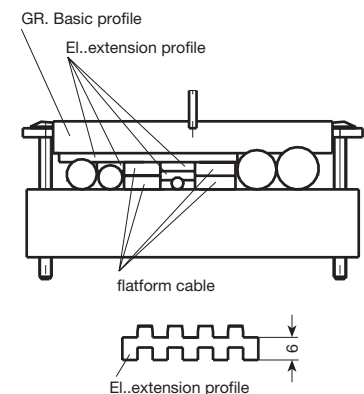


Cable carrier W 45 FR

Type	max. clamping capacity mm height x width (s x k)	L mm	B mm	D mm	weight kg	Order-no. w/o kick-up rollers	Order-no. w/kick-up rollers
W 45 FR/160- 80 B 175	35 x 135	160	175	80	2,750	348 663	348 685
W 45 FR/160- 80 B 225	35 x 185	160	225	80	2,880	348 664	348 686
W 45 FR/160-100 B 175	25 x 135	160	175	100	2,830	348 665	348 687
W 45 FR/160-100 B 225	25 x 185	160	225	100	3,000	348 666	348 688
W 45 FR/200- 80 B 175	55 x 135	200	175	80	3,050	348 667	348 689
W 45 FR/200- 80 B 225	55 x 185	200	225	80	3,180	348 668	348 690
W 45 FR/200-100 B 175	45 x 135	200	175	100	3,130	348 669	348 691
W 45 FR/200-100 B 225	45 x 185	200	225	100	3,300	348 670	348 692
W 45 FR/200-140 B 175	25 x 135	200	175	140	3,370	348 671	348 693
W 45 FR/200-140 B 225	25 x 185	200	225	140	3,610	348 672	348 694
W 45 FR/250-100 B 175	70 x 135	250	175	100	3,490	348 673	348 695
W 45 FR/250-100 B 225	70 x 185	250	225	100	3,660	348 674	348 696
W 45 FR/250-140 B 175	50 x 135	250	175	140	3,730	348 675	348 697
W 45 FR/250-140 B 225	50 x 185	250	225	140	3,970	348 676	348 698
W 45 FR/250-170 B 175	35 x 135	250	175	170	3,790	348 677	348 699
W 45 FR/250-170 B 225	35 x 185	250	225	170	4,040	348 678	348 700
W 45 FR/290-140 B 175	70 x 135	290	175	140	4,010	348 679	348 701
W 45 FR/290-140 B 225	70 x 185	290	225	140	4,250	348 680	348 702
W 45 FR/290-170 B 175	55 x 135	290	175	170	4,070	348 681	348 703
W 45 FR/290-170 B 225	55 x 185	290	225	170	4,230	348 682	348 704
W 45 FR/325-170 B 175	72 x 135	325	175	170	4,290	348 683	348 705
W 45 FR/325-170 B 225	72 x 185	325	225	170	4,540	348 684	348 706



Collecting clamp for round cables
Extension rubber profile can be ordered per meter (Order-no.: 348 845)

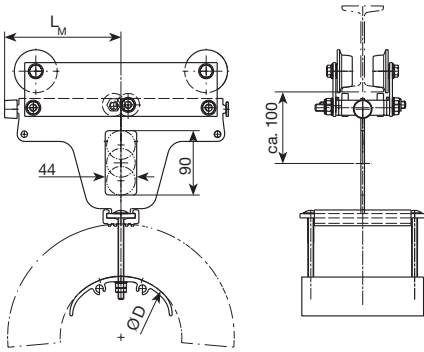




CABLE CARRIERS W 45 FR

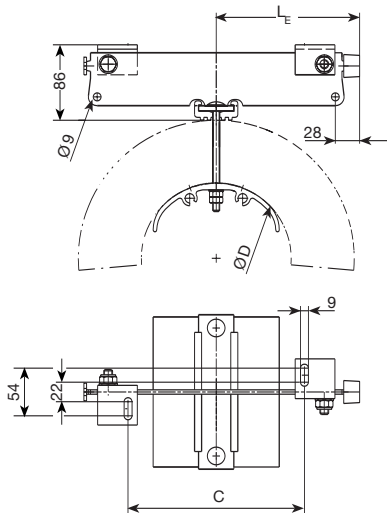


Lead clamp MW 45



Type	for Cable carrier	L _M mm	D mm	weight kg	Order-No.
MW 45 FR/200- 80 B 175	W 45 FR/160- 80 B 175 W 45 FR/200- 80 B 175	100	80	3,290	348 741
MW 45 FR/200- 80 B 225	W 45 FR/160- 80 B 225 W 45 FR/200- 80 B 225	100	80	3,430	348 742
MW 45 FR/200-100 B 175	W 45 FR/160-100 B 175 W 45 FR/200-100 B 175	100	100	3,370	348 743
MW 45 FR/200-100 B 225	W 45 FR/160- 100 B 225 W 45 FR/200- 100 B 225	100	100	3,550	348 744
MW 45 FR/200-140 B 175	W 45 FR/200-140 B 175	100	140	3,610	348 745
MW 45 FR/200-140 B 225	W 45 FR/200-140 B 225	100	140	3,860	348 746
MW 45 FR/325-100 B 175	W 45 FR/250-100 B 175	162	100	4,280	348 747
MW 45 FR/325-100 B 225	W 45 FR/250-100 B 225	162	100	4,450	348 748
MW 45 FR/325-140 B 175	W 45 FR/250-140 B 175 W 45 FR/290-140 B 175	162	140	4,510	348 749
MW 45 FR/325-140 B 225	W 45 FR/250-140 B 225 W 45 FR/290-140 B 225	162	140	4,760	348 750
MW 45 FR/325-170 B 175	W 45 FR/250-170 B 175 W 45 FR/290-170 B 175 W 45 FR/325-170 B 175	162	170	4,570	348 751
MW 45 FR/325-170 B 225	W 45 FR/250-170 B 225 W 45 FR/290-170 B 225 W 45 FR/325-170 B 225	162	170	4,830	348 752

Track clamp E 45



Type	for Cable carrier	L _E mm	D mm	C mm	weight kg	Order-No.
E 45 FR/160- 80 B 175	W 45 FR/160- 80 B 175	80	80	35	1,120	348 786
E 45 FR/160- 80 B 225	W 45 FR/160- 80 B 225	80	80	35	1,250	348 787
E 45 FR/160-100 B 175	W 45 FR/160-100 B 175	80	100	35	1,200	348 788
E 45 FR/160-100 B 225	W 45 FR/160-100 B 225	80	100	35	1,370	348 789
E 45 FR/200- 80 B 175	W 45 FR/200- 80 B 175	100	80	75	1,220	348 790
E 45 FR/200- 80 B 225	W 45 FR/200- 80 B 225	100	80	75	1,350	348 791
E 45 FR/200-100 B 175	W 45 FR/200-100 B 175	100	100	75	1,300	348 792
E 45 FR/200-100 B 225	W 45 FR/200-100 B 225	100	100	75	1,470	348 793
E 45 FR/200-140 B 175	W 45 FR/200-140 B 175	100	140	75	1,540	348 794
E 45 FR/200-140 B 225	W 45 FR/200-140 B 225	100	140	75	1,780	348 795
E 45 FR/250-100 B 175	W 45 FR/250-100 B 175	125	100	125	1,420	348 796
E 45 FR/250-100 B 225	W 45 FR/250-100 B 225	125	100	125	1,590	348 797
E 45 FR/250-140 B 175	W 45 FR/250-140 B 175	125	140	125	1,660	348 798
E 45 FR/250-140 B 225	W 45 FR/250-140 B 225	125	140	125	1,900	348 799
E 45 FR/250-170 B 175	W 45 FR/250-170 B 175	125	170	125	1,720	348 800
E 45 FR/250-170 B 225	W 45 FR/250-170 B 225	125	170	125	1,970	348 801
E 45 FR/290-140 B 175	W 45 FR/290-140 B 175	145	140	165	1,760	348 802
E 45 FR/290-140 B 225	W 45 FR/290-140 B 225	145	140	165	2,000	348 803
E 45 FR/290-170 B 175	W 45 FR/290-170 B 175	145	170	165	1,820	348 804
E 45 FR/290-170 B 225	W 45 FR/290-170 B 225	145	170	165	2,070	348 805
E 45 FR/325-170 B 175	W 45 FR/325-170 B 175	162	170	200	1,900	348 806
E 45 FR/325-170 B 225	W 45 FR/325-170 B 225	162	170	200	2,150	348 807



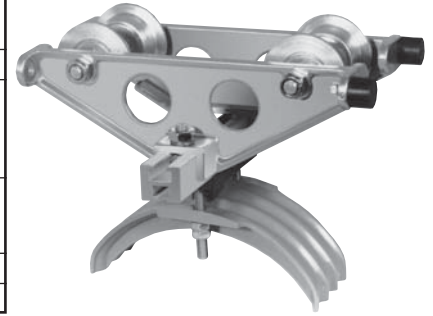
CABLE CARRIERS W 110

Normal- and europe profile



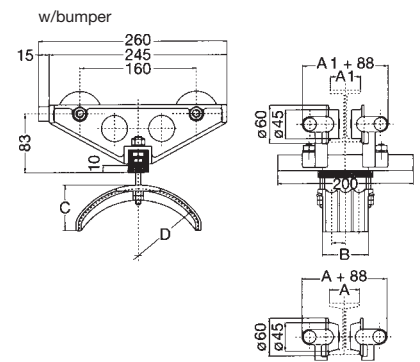
Engineering data

Type	WE 110 R ... (S) for beam - IPE 80 – 200 WN 110 R ... (S) for beam - INP 80 – 220
Carrying capacity	30 kg
Wheels	a) Flanged polyamid wheels on stainless steel bushed bearings b) Steel wheels hardened and galvanized with sealed ball bearings
Material	carrierbody: light metal - seawater resistant support saddles: polyamid hardware: galvanized
Temperature resistance for all materials	-30° C to +100° C
Travelling speed	max. 80 m/min



Cable carrier for round cable

Type ⁽¹⁾		wheels	max. cable Ø mm	B	C	D	weight kg	Order-No.	Order-No. with bumper
				mm					
Cable carrier standard beam	WN 110 R/200	a	3 x Ø 20	71	65	200	1,360	345 920	345 923
Cable carrier Fl. fl. beam	WE 110 R/200	a	3 x Ø 20	71	65	200	1,360	345 921	345 924
Cable carrier standard and Fl. fl. beam	W 110 R/200 S	b	3 x Ø 20	71	65	200	2,130	345 922	345 925



Standard beam

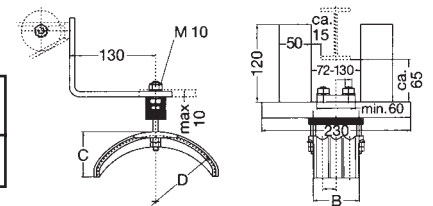
Beam INP	80	100	120	140	160	180	200	220
Dim. A	42	50	58	66	74	82	90	98

Flat flange beam

Beam IPE	80	100	120	140	160	180	200
Dim. A 1	46	55	64	73	82	91	100

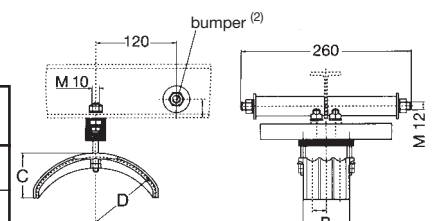
Lead clamp for round cable

Type	for cable carrier	B	C	D	weight kg	Order-No.
		mm				
Lead clamp	M 110 R/200	71	65	200	1,170	345 926



Track clamp for round cable and bumper

Type	for cable carrier	B	C	D	weight kg	Order-No.
		mm				
Track clamp	E 110 R/200⁽²⁾	71	65	200	0,450	345 927
Bumper	PS 3-4	-	-	-	0,410	340 100



⁽¹⁾ Use suffix-P for bumper version (example: W 110 R/200 S-P)

⁽²⁾ Bumper PS 3-4 to be ordered separately.



CABLE CARRIERS W 120 • HEAVY DUTY

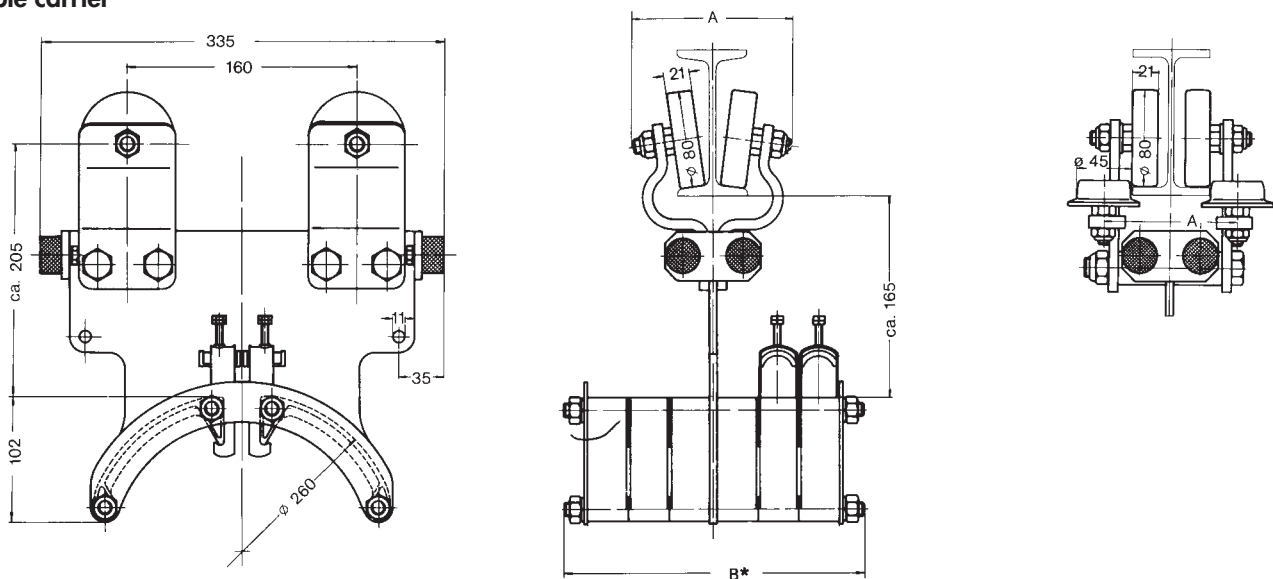
Normal- and europe profile



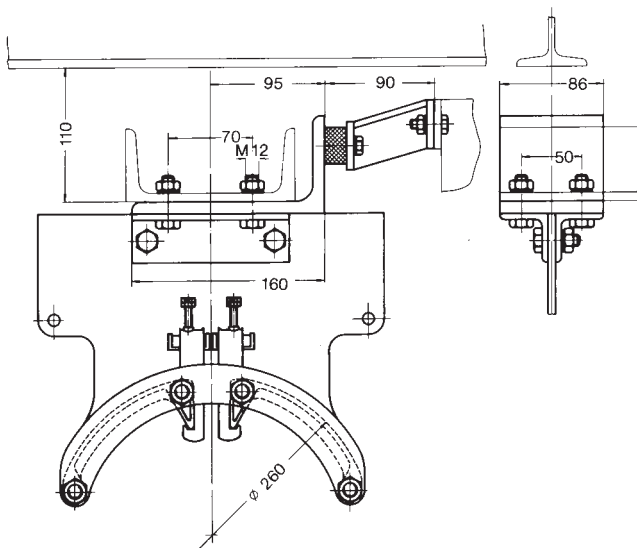
Engineering data

Type	WN 120 R/260 for beam I NP 100 – 160 WE 120 R/260 for beam I PE 100 – 160
Carrying capacity	350 kg
Wheels	steel wheels hardened and galvanized with sealed precision ball bearings; flanged steel guide rollers hardened and galvanized with sealed ball bearings for WE-series only
Guide rollers	(only at WE-type) roller with ball bearing, made of steel, hardened, galvanically zinc-plated;
Material	carrier body: steel galvanized support saddles: polyamid temperature resistance for all materials: $-30^{\circ}\text{C} - +100^{\circ}\text{C}$
Travelling speed	max. 160 m/min (525 ft/min) when using proper cable tension relief tow ropes

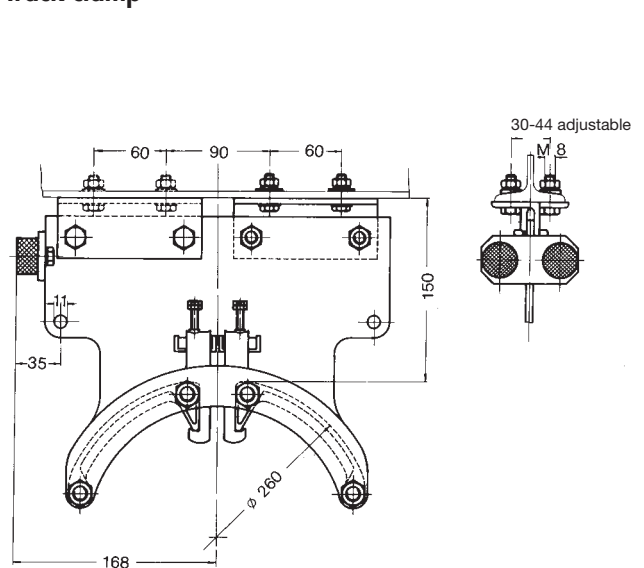
Cable carrier



Lead clamp



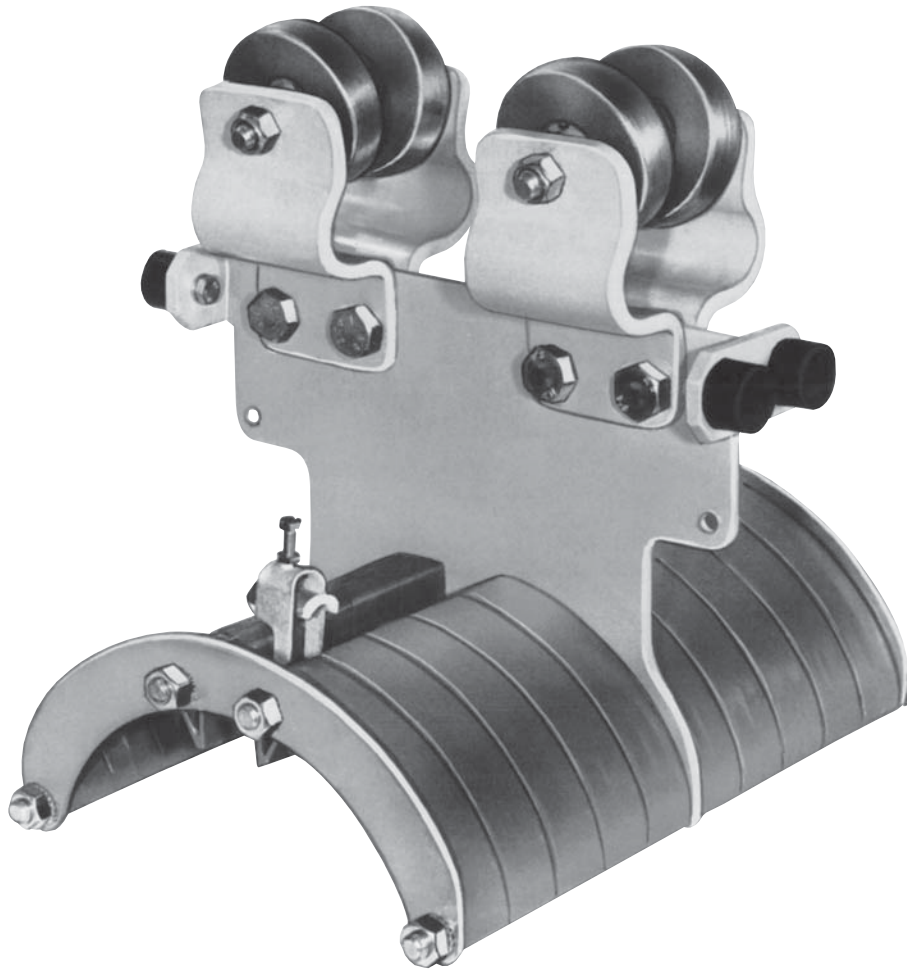
Track clamp





CABLE CARRIERS W 120 • HEAVY DUTY

Normal- and europe profile



Standard beam

INP	100	120	140	160
Dim A mm	130	130	130	130

Flat flange beam

IPE	100	120	140	160
Dim. A ₁ mm	103	112	121	130

Standard beam

Type		Number of tiers	max. cable ø mm	weight kg	Order-No.
Cable carrier	WN 120 R/260	1	26	10,100	341 410
Lead carrier ⁽¹⁾	M 120 R/260	1	26	6,300	341 420
Track clamp	E 120 R/260	1	26	3,800	341 430

Europaprofil

Type		Number of tiers	max. cable ø mm	weight kg	Order-No.
LCable carrier	WE 120 R/260	1	26	11,200	341 440
Lead carrier ⁽¹⁾	M 120 R/260	1	26	6,300	341 420
Track clamp	E 120 R/260	1	26	3,800	341 430

⁽¹⁾ incl.bumper extension.



CABLE CARRIERS W 130 • HEAVY DUTY

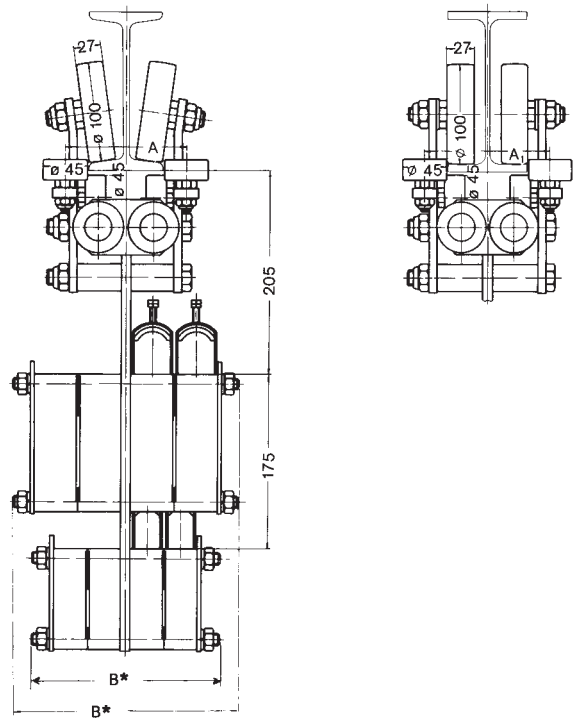
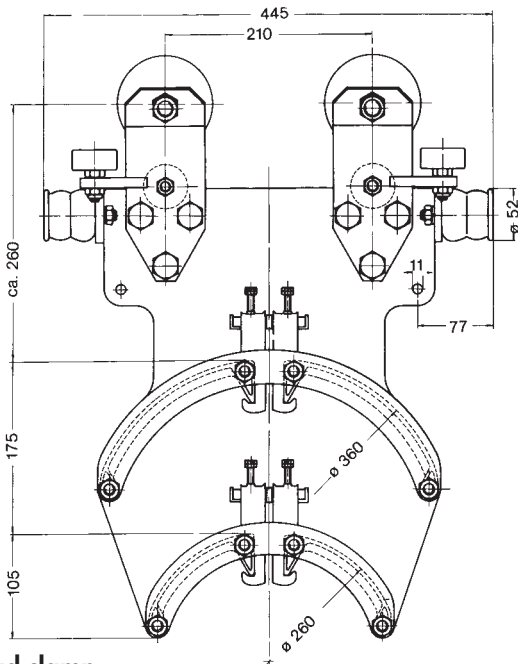
Normal- and europe profile



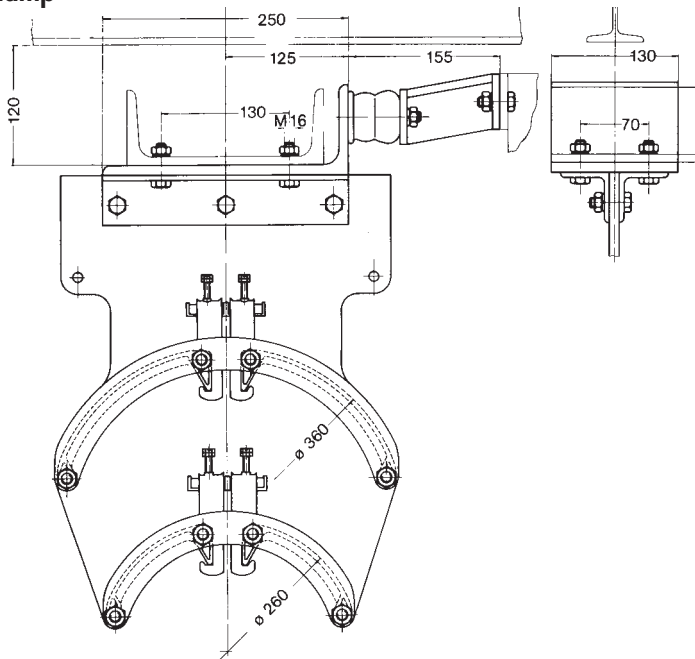
Engineering data

Type	WN 130 R/360 für INP 140–200 WN 130 R/360/260 für INP 140–200 WE 130 R/360 für IPE 140–200 WE 130 R/360/260 für IPE 140–200
Carrying capacity	550 kg
Wheels	steel wheels hardened and galvanized with sealed precision ball bearings; guide rollers hardened and galvanized with sealed ball bearings
Guide and support rollers	Cylindrical running rollers with ball bearing, made of steel, running surface hardened, galvanically zinc-plated
Material	carrierbody: steel galvanized support saddles: polyamid temperature resistance for all materials: -30° C to +100° C
Travelling speed	max. 160 m/min (525 ft/min) when using proper cable tension relief tow ropes

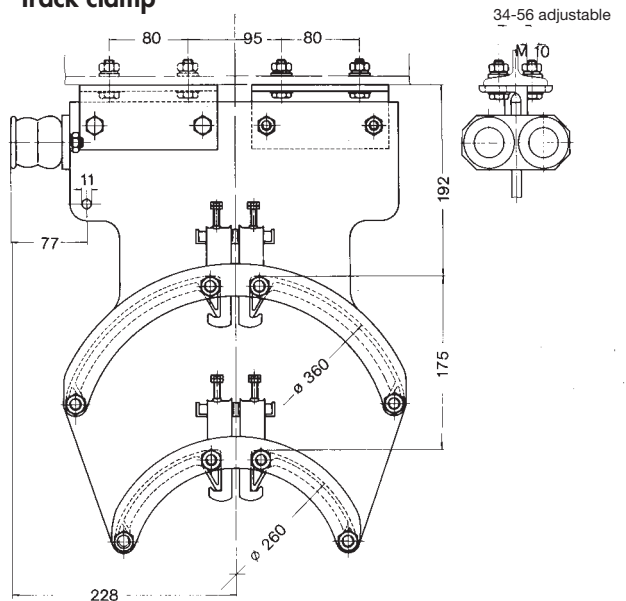
Cable carrier



Lead clamp



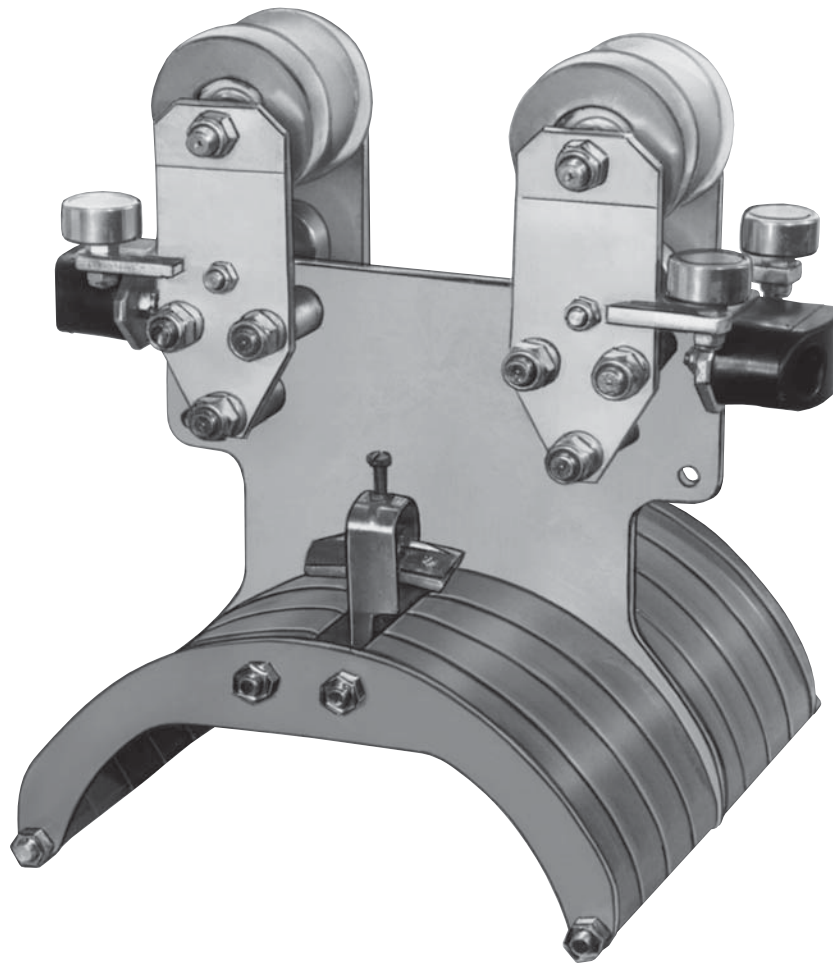
Track clamp





CABLE CARRIERS W 130 • HEAVY DUTY

Normal- and europe profile



Standard beam

INP	140	160	180	200
Dim. A mm	114	122	130	138

Flat flange beam

IPE	140	160	180	200
Dim. A ₁ mm	121	130	139	148

Standard beam

Type		Number of tiers	max. cable Ø mm	weight kg	Order-No.
Cable carrier	WN 130 R/360	1	36	21,700	341 470
	WN 130 R/360/260	2	36	25,200	341 480
Lead clamp including bumper extension	M 130 R/360	1	36	12,500	341 490
	M 130 R/360/260	2	36	16,000	341 500
Track clamp	E 130 R/360	1	36	8,000	341 510
	E 130 R/360/260	2	36	11,500	341 520

Flat flange beam

Type		Number of tiers	max. cable Ø mm	weight kg	Order-No.
Cable carrier	WE 130 R/360	1	36	21,700	341 530
	WE 130 R/360/260	2	36	25,200	341 540
Lead clamp including bumper extension	M 130 R/360	1	36	12,500	341 490
	M 130 R/360/260	2	36	16,000	341 500
Track clamp	E 130 R/360	1	36	8,000	341 510
	E 130 R/360/260	2	36	11,500	341 520



CABLE CARRIERS W 140 • HEAVY DUTY

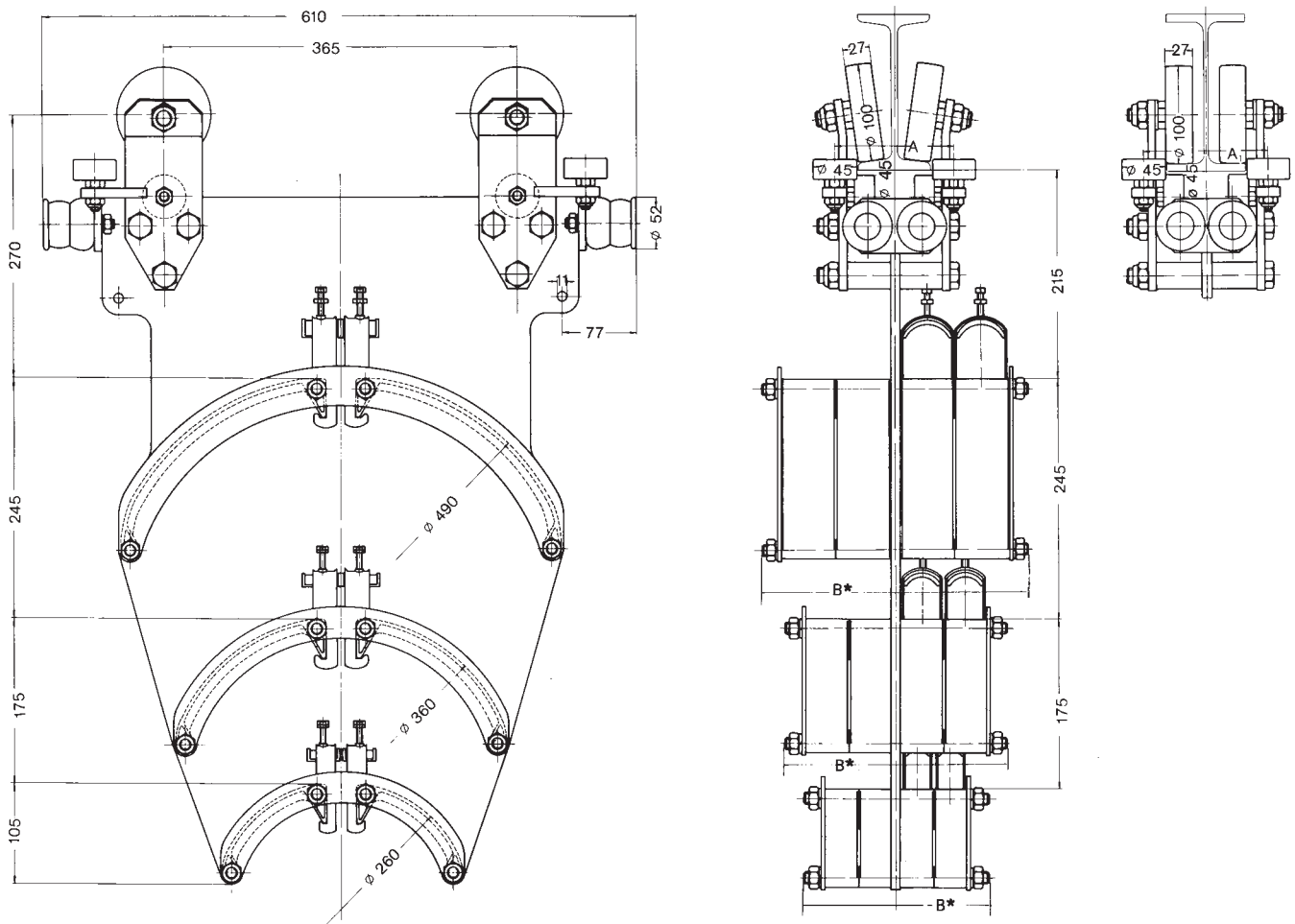
Normal- and europe profile



Engineering data

Type	WN 140 R/490 für INP 140-200 WN 140 R/490/360 für INP 140-200 WN 140 R/490/360/260 für INP 140-200 WE 140 R/490 für IPE 140-200 WE 140 R/490/360 für IPE 140-200 WE 140 R/490/360/260 für IPE 140-200
Carrying capacity	550 kg
Wheels	steel wheels hardened and galvanized with sealed precision ball bearings; guide rollers hardened and galvanized with sealed ball bearings
Guide and support rollers	Cylindrical running rollers with ball bearing, made of steel, running surface hardened, galvanically zinc-plated;
Material	carrierbody: steel galvanized; support saddles: polyamid temperature resistance for all materials: -30° C - +100° C
Travelling speed	max. 160 m/min (525 ft/min) when using proper cable tension relief tow ropes

Cable carrier



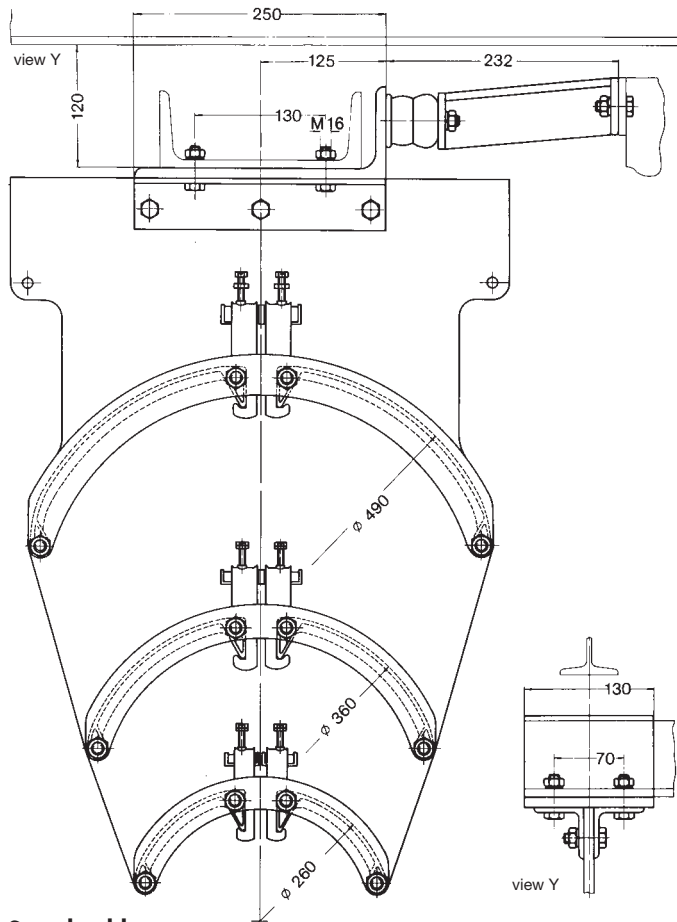


CABLE CARRIERS W 140 • HEAVY DUTY

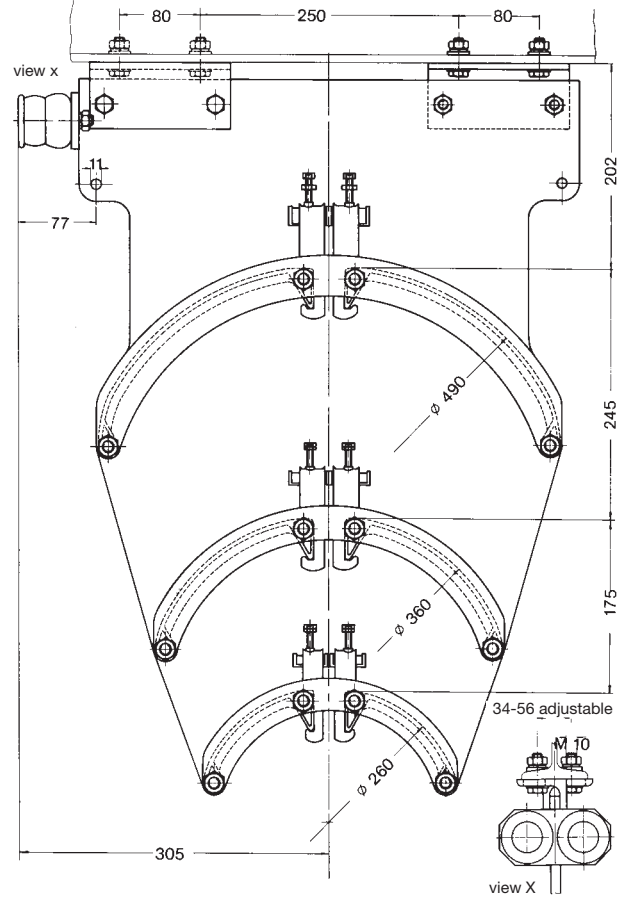
Normal- and europe profile



Lead clamp



Track clamp



Standard beam

INP	140	160	180	200
Dim. A mm	114	122	130	138

Flat flange beam

I PE	140	160	180	200
Dim. A ₁ mm	121	130	139	148

Normalprofil

Type		Number of tiers	max. cable Ø mm	weight kg	Order-No.
Cable carrier	WN 140 R/490	1	49	25,700	341 590
	WN 140 R/490/360	2	49	34,200	341 600
	WN 140 R/490/360/260	3	49	38,200	341 610
Lead clamp including bumper extension	M 140 R/490	1	49	16,800	341 620
	M 140 R/490/360	2	49	25,300	341 630
	M 140 R/490/360/260	3	49	29,300	341 640
Track clamp	E 140 R/490	1	49	12,000	341 650
	E 140 R/490/360	2	49	20,500	341 660
	E 140 R/490/360/260	3	49	24,500	341 670

Flat flange beam

Cable carrier	WE 140 R/490	1	49	25,700	341 680
	WE 140 R/490/360	2	49	34,200	341 690
	WE 140 R/490/360/260	3	49	38,200	341 700
Lead clamp including bumper extension	M 140 R/490	1	49	16,800	341 620
	M 140 R/490/360	2	49	25,300	341 630
	M 140 R/490/360/260	3	49	29,300	341 640
Track clamp	E 140 R/490	1	49	12,000	341 650
	E 140 R/490/360	2	49	20,500	341 660
	E 140 R/490/360/260	3	49	24,500	341 670



CABLE SUPPORT SADDLES



Cable arrangement		type of support saddle	Order-No.	type of support saddle	Order-No.	dimension B ⁽¹⁾ mm	weight kg
	●	LA 490/ 2	342 100	LK 490/ 2	342 980	162	1,810
	● ●	LA 490/ 4	342 110	LK 490/ 4	342 990	274	2,910
	● ● ● ●	LA 490/ 6	342 120	LK 490/ 6	343 000	386	4,010
	● ● ● ● ● ●	LA 490/ 8	342 130	LK 490/ 8	343 010	498	5,110
	● ● ● ● ● ● ● ●	LA 490/ 10	342 140	LK 490/ 10	343 020	610	6,210
	○ ●	LA 490/ 202	342 150	LK 490/ 202	343 030	274	2,690
	○ ○ ●	LA 490/ 204	342 160	LK 490/ 204	343 040	386	3,570
	○ ○ ○ ●	LA 490/ 206	342 170	LK 490/ 206	343 050	386	3,770
	○ ○ ○ ○ ●	LA 490/ 208	342 180	LK 490/ 208	343 060	498	4,650
	○ ○ ○ ○ ○ ●	LA 490/ 2010	342 190	LK 490/ 2010	343 070	498	4,850
○ ○ ○ ○ ○ ○ ●	LA 490/ 2012	342 200	LK 490/ 2012	343 080	610	5,730	
	○ ● ●	LA 490/ 402	342 210	LK 490/ 402	343 090	386	3,790
	○ ○ ● ●	LA 490/ 404	342 220	LK 490/ 404	343 100	498	4,670
	○ ○ ○ ● ●	LA 490/ 406	342 230	LK 490/ 406	343 110	498	4,870
	○ ○ ○ ○ ● ●	LA 490/ 408	342 240	LK 490/ 408	343 120	610	5,750
	○ ○ ○ ○ ○ ● ●	LA 490/ 4010	342 250	LK 490/ 4010	343 130	610	5,950
	○ ● ● ●	LA 490/ 602	342 260	LK 490/ 602	343 140	498	4,890
	○ ○ ● ● ●	LA 490/ 604	342 270	LK 490/ 604	343 150	610	5,770
	○ ○ ○ ● ● ●	LA 490/ 606	342 280	LK 490/ 606	343 160	610	5,970
	○ ● ● ● ●	LA 490/ 802	342 290	LK 490/ 802	343 170	610	5,990
	○ ○ ● ● ● ●	LA 490/ 804	342 300	LK 490/ 804	343 180	610	6,190
	○ ● ○	LA 490/ 22	342 310	LK 490/ 22	343 190	274	2,770
	○ ○ ● ○	LA 490/ 24	342 320	LK 490/ 24	343 200	386	3,730
	○ ○ ○ ● ○	LA 490/ 26	342 330	LK 490/ 26	343 210	498	4,690
	○ ○ ○ ○ ● ○	LA 490/ 28	342 340	LK 490/ 28	343 220	498	4,970
	○ ○ ○ ○ ○ ● ○	LA 490/ 210	342 350	LK 490/ 210	343 230	610	5,930
	○ ● ○ ○	LA 490/ 42	342 360	LK 490/ 42	343 240	386	3,970
	○ ○ ● ○ ○	LA 490/ 44	342 370	LK 490/ 44	343 250	498	4,930
	○ ○ ○ ● ○ ○	LA 490/ 46	342 380	LK 490/ 46	343 260	610	5,890
	○ ○ ○ ○ ● ○ ○	LA 490/ 48	342 390	LK 490/ 48	343 270	610	6,170
	○ ● ○ ○ ○	LA 490/ 62	342 400	LK 490/ 62	343 280	498	4,970
	○ ○ ● ○ ○ ○	LA 490/ 64	342 410	LK 490/ 64	343 290	610	5,930
	○ ○ ● ○ ○ ○ ○	LA 490/ 82	342 420	LK 490/ 82	343 300	610	6,070
	○ ● ○ ○ ○	LA 490/ 222	342 430	LK 490/ 222	343 310	386	3,650
	○ ○ ● ○ ○ ○	LA 490/ 224	342 440	LK 490/ 224	343 320	386	3,850
	○ ○ ○ ● ○ ○ ○	LA 490/ 226	342 450	LK 490/ 226	343 330	498	4,730
	○ ○ ○ ○ ● ○ ○ ○	LA 490/ 228	342 460	LK 490/ 228	343 340	610	5,610
	○ ○ ○ ○ ○ ● ○ ○ ○	LA 490/ 2210	342 470	LK 490/ 2210	343 350	610	5,810
	○ ● ○ ○ ○ ○	LA 490/ 242	342 480	LK 490/ 242	343 360	386	3,930
	○ ○ ● ○ ○ ○ ○	LA 490/ 244	342 490	LK 490/ 244	343 370	498	4,810
	○ ○ ○ ● ○ ○ ○ ○	LA 490/ 246	342 500	LK 490/ 246	343 380	610	5,690
	○ ○ ○ ○ ● ○ ○ ○ ○	LA 490/ 248	342 510	LK 490/ 248	343 390	610	5,890
	○ ● ○ ○ ○ ○ ○	LA 490/ 262	342 520	LK 490/ 262	343 400	498	4,890
	○ ○ ● ○ ○ ○ ○ ○	LA 490/ 264	342 530	LK 490/ 264	343 410	610	5,770
	○ ○ ○ ● ○ ○ ○ ○ ○	LA 490/ 266	342 540	LK 490/ 266	343 420	610	5,970
	○ ○ ○ ○ ● ○ ○ ○ ○	LA 490/ 282	342 550	LK 490/ 282	343 430	610	5,850
	○ ● ○ ○ ○ ○ ○	LA 490/ 422	342 560	LK 490/ 422	343 440	498	4,850
	○ ○ ● ○ ○ ○ ○ ○	LA 490/ 424	342 570	LK 490/ 424	343 450	498	5,050
	○ ○ ○ ● ○ ○ ○ ○ ○	LA 490/ 426	342 580	LK 490/ 426	343 460	610	5,930
	○ ○ ○ ○ ● ○ ○ ○ ○ ○	LA 490/ 428	342 590	LK 490/ 428	343 470	610	6,130
	○ ● ○ ○ ○ ○ ○ ○	LA 490/ 442	342 600	LK 490/ 442	343 480	498	5,130
	○ ○ ● ○ ○ ○ ○ ○ ○	LA 490/ 444	342 610	LK 490/ 444	343 490	610	6,010
	○ ○ ○ ● ○ ○ ○ ○ ○ ○	LA 490/ 462	342 620	LK 490/ 462	343 500	610	6,090
	○ ● ○ ○ ○ ○ ○ ○ ○	LA 490/ 622	342 630	LK 490/ 622	343 510	610	5,850
	○ ○ ● ○ ○ ○ ○ ○ ○ ○	LA 490/ 624	342 640	LK 490/ 624	343 520	610	6,050

Max. useable saddle in mm = $\text{twice } \frac{B - 50 \text{ mm}}{2}$

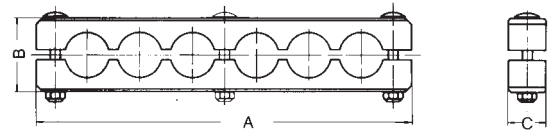
⁽¹⁾ Dimension B = max. width of support saddles, see pages 8-13.



CABLE LOOP CLAMPS FOR ROUND CABLE



The cable clamps shown on these pages should be installed to ensure that the cables do not separate while the system is in operation. The PVC mouldings will be individually prepared to match the cable diameter and arrangement. Choice of cable clamps depends upon model of carrier used.



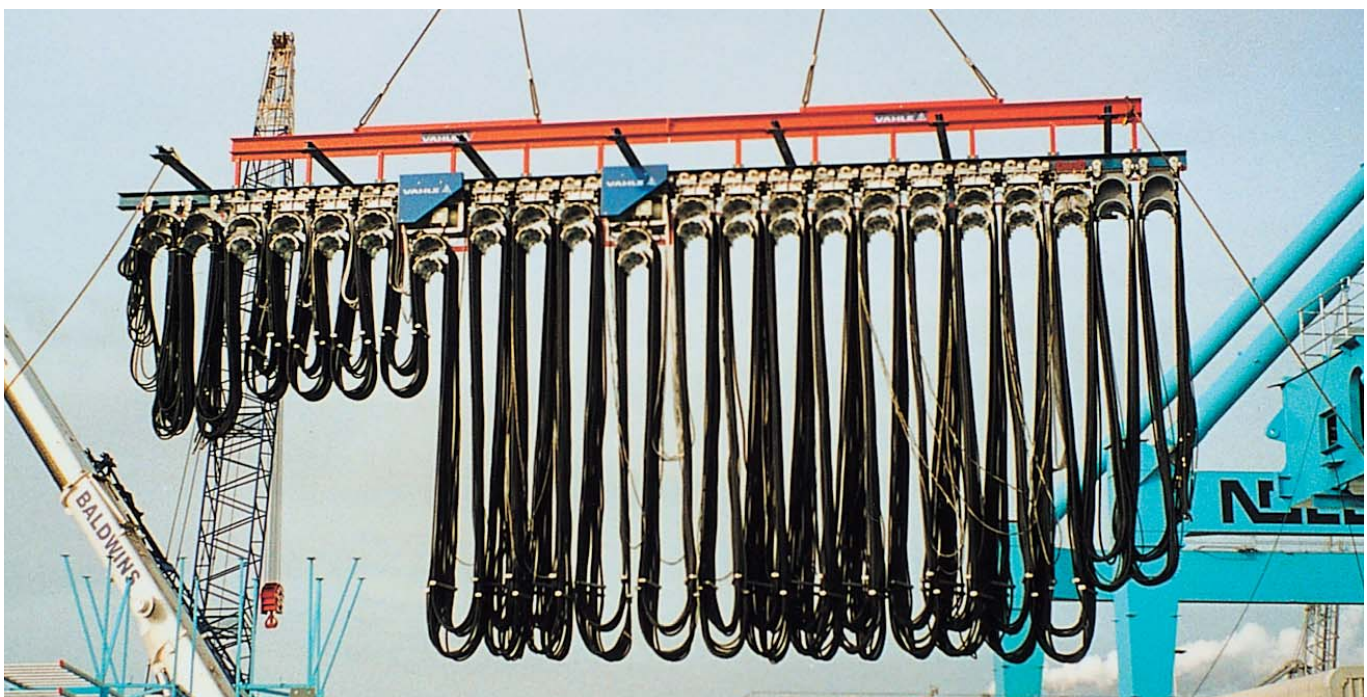
type of cable clamp	corresponding cable support saddle	dim. A mm	dim. B mm	dim. C mm	weight approx. kg	Order-No.
LS 260/ 2	LA (LK) 260/ 2	117	50	30	0,280	343 530
LS 260/ 4	LA (LK) 260/ 4	179			0,370	343 540
LS 260/ 6	LA (LK) 260/ 6	241			0,460	343 550
LS 260/ 8	LA (LK) 260/ 8	303			0,560	343 560
LS 260/ 10	LA (LK) 260/ 10	365			0,650	343 570
LS 260/ 12	LA (LK) 260/ 12	427			0,740	343 580
LS 260/ 14	LA (LK) 260/ 14	489			0,830	343 590
LS 260/ 16	LA (LK) 260/ 16	551			0,930	343 600
LS 360/ 2	LA (LK) 360/ 2	137	60	30	0,350	343 610
LS 360/ 4	LA (LK) 360/ 4	219			0,500	343 620
LS 360/ 6	LA (LK) 360/ 6	301			0,640	343 630
LS 360/ 8	LA (LK) 360/ 8	383			0,790	343 640
LS 360/ 10	LA (LK) 360/ 10	465			0,940	343 650
LS 360/ 12	LA (LK) 360/ 12	547			1,090	343 660
LS 360/ 22	LA (LK) 360/ 22	199	60	30	0,460	343 670
LS 360/ 24	LA (LK) 360/ 24	261			0,570	343 680
LS 360/ 26	LA (LK) 360/ 26	323			0,680	343 690
LS 360/ 28	LA (LK) 360/ 28	385			0,790	343 700
LS 360/ 210	LA (LK) 360/ 210	447			0,900	343 710
LS 360/ 212	LA (LK) 360/ 212	509			1,020	343 720
LS 360/ 42	LA (LK) 360/ 42	281	60	30	0,610	343 730
LS 360/ 44	LA (LK) 360/ 44	343			0,720	343 740
LS 360/ 46	LA (LK) 360/ 46	405			0,830	343 750
LS 360/ 48	LA (LK) 360/ 48	467			0,940	343 760
LS 360/ 410	LA (LK) 360/ 410	529			1,050	343 770
LS 360/ 62	LA (LK) 360/ 62	363	60	30	0,750	343 780
LS 360/ 64	LA (LK) 360/ 64	425			0,860	343 790
LS 360/ 66	LA (LK) 360/ 66	487			0,980	343 800
LS 360/ 68	LA (LK) 360/ 68	549			1,090	343 810
LS 360/ 82	LA (LK) 360/ 82	445	60	30	0,900	343 820
LS 360/ 84	LA (LK) 360/ 84	507			1,010	343 830
LS 360/ 86	LA (LK) 360/ 86	569			1,120	343 840
LS 360/ 102	LA (LK) 360/ 102	527	60	30	1,050	343 850
LS 490/ 2	LA (LK) 490/ 2	163	70	30	0,460	343 860
LS 490/ 4	LA (LK) 490/ 4	271			0,680	343 870
LS 490/ 6	LA (LK) 490/ 6	379			0,900	343 880
LS 490/ 8	LA (LK) 490/ 8	487			1,120	343 890
LS 490/ 10	LA (LK) 490/ 10	595			1,340	343 900
LS 490/ 202	LA (LK) 490/ 202	225	70	30	0,590	343 910
LS 490/ 204	LA (LK) 490/ 204	287			0,720	343 920
LS 490/ 206	LA (LK) 490/ 206	349			0,850	343 930
LS 490/ 208	LA (LK) 490/ 208	411			0,980	343 940
LS 490/2010	LA (LK) 490/ 2010	473			1,110	343 950
LS 490/2012	LA (LK) 490/ 2012	535			1,240	343 960
LS 490/ 402	LA (LK) 490/ 402	333	70	30	0,810	343 970
LS 490/ 404	LA (LK) 490/ 404	395			0,940	342 980
LS 490/ 406	LA (LK) 490/ 406	457			1,070	343 990
LS 490/ 408	LA (LK) 490/ 408	519			1,200	344 000
LS 490/4010	LA (LK) 490/ 4010	581			1,330	344 010
LS 490/ 602	LA (LK) 490/ 602	441	70	30	1,020	344 020
LS 490/ 604	LA (LK) 490/ 604	503			1,160	344 030
LS 490/ 606	LA (LK) 490/ 606	565			1,290	344 040
LS 490/ 802	LA (LK) 490/ 802	549	70	30	1,250	344 050
LS 490/ 804	LA (LK) 490/ 804	611			1,380	344 060



CABLE LOOP CLAMPS FOR ROUND CABLE



type of cable clamp	corresponding cable support saddle	dim. A mm	dim. B mm	dim. C mm	weight approx. kg	Order-No.
LS 490/ 22	LA (LK) 490/ 22	245			0,630	344 070
LS 490/ 24	LA (LK) 490/ 24	327			0,810	344 080
LS 490/ 26	LA (LK) 490/ 26	409	70	30	0,980	344 090
LS 490/ 28	LA (LK) 490/ 28	491			1,150	344 100
LS 490/ 210	LA (LK) 490/ 210	573			1,320	344 110
LS 490/ 42	LA (LK) 490/ 42	353			0,850	344 120
LS 490/ 44	LA (LK) 490/ 44	435	70	30	1,020	344 130
LS 490/ 46	LA (LK) 490/ 46	517			1,200	344 140
LS 490/ 48	LA (LK) 490/ 48	599			1,370	344 150
LS 490/ 62	LA (LK) 490/ 62	461	70	30	1,070	344 160
LS 490/ 64	LA (LK) 490/ 64	543			1,240	344 170
LS 490/ 82	LA (LK) 490/ 82	569	70	30	1,290	344 180
LS 490/ 222	LA (LK) 490/ 222	307			0,760	344 190
LS 490/ 224	LA (LK) 490/ 224	369	70	30	0,890	344 200
LS 490/ 226	LA (LK) 490/ 226	431			1,020	344 210
LS 490/ 228	LA (LK) 490/ 228	493			1,160	344 220
LS 490/2210	LA (LK) 490/ 2210	555			1,290	344 230
LS 490/ 242	LA (LK) 490/ 242	389			0,940	344 240
LS 490/ 244	LA (LK) 490/ 244	451	70	30	1,070	344 250
LS 490/ 246	LA (LK) 490/ 246	513			1,200	344 260
LS 490/ 248	LA (LK) 490/ 248	575			1,330	344 270
LS 490/ 262	LA (LK) 490/ 262	471	70	30	1,110	344 280
LS 490/ 264	LA (LK) 490/ 264	533			1,240	344 290
LS 490/ 266	LA (LK) 490/ 266	595			1,370	344 300
LS 490/ 282	LA (LK) 490/ 282	553	70	30	1,280	344 310
LS 490/ 422	LA (LK) 490/ 422	415			0,980	344 320
LS 490/ 424	LA (LK) 490/ 424	477	70	30	1,110	344 330
LS 490/ 426	LA (LK) 490/ 426	539			1,240	344 340
LS 490/ 428	LA (LK) 490/ 428	601			1,370	344 350
LS 490/ 442	LA (LK) 490/ 442	497	70	30	1,160	344 360
LS 490/ 444	LA (LK) 490/ 444	559			1,290	344 370
LS 490/ 462	LA (LK) 490/ 462	579	70	30	1,330	344 380
LS 490/ 622	LA (LK) 490/ 622	523	70	30	1,200	344 390
LS 490/ 624	LA (LK) 490/ 624	585			1,330	344 400



Installation of a cable carrier system in the harbour of Rotterdam



TOW ROPE ASSEMBLIES

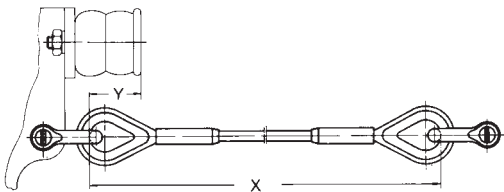
Type	Z 1	Z 2	Z 3
Rope diameter mm	6	8	10
for carriers	W 50 bis W 70	W 80 bis W 140 except W 110	
Material and finish	Stranded steel rope – galvanized, with fiberglass reinforcing		
Admissible tension force (6times safety factor)	3500 N	6100 N	9530 N
Scope of supply	Complete, cut to suit the application, incl. rope clamps, thimbles and shackles		

Choice of rope diameter for carriers W 80 – W 140 (except W 110) depends upon working travel and travelling speed

Travelling speed m/min.	working travel m			
	0–30	30–70	70–100	über 100
0– 80	–	8 mm	8 mm	10 mm
80–160	8 mm	8 mm	10 mm	10 mm

We recommend to use tow ropes of 6 mm dia for the carriers W 50 – W 70 and a working travel exceeding 30 m with a travelling speed of 80 m/min.

Length determination for tow ropes



$$x = \frac{(S \times 1,05) + Z}{n} + 2y$$

- x = Length of tow rope mm
- S = Working travel mm
- n = Number of cable loops
- y = Projecting bumper mm (see table)
- 1,05 = Safety factor
- Z = Open space
(min. one carrier length – see page 3)

Bumper projection

Carrier type	dimension y mm
W 50 bis W 70	6
W 80 bis W 100	42
W 120	0
W 130 und W 140	42

Length of tow rope mm	Z 1 (6 mm Ø) Order-No.	Z 2 (8 mm Ø) Order-No.	Z 3 (10 mm Ø) Order-No.
2 000 – 3 000	344 410	344 510	344 610
3 001 – 4 000	344 420	344 520	344 620
4 001 – 5 000	344 430	344 530	344 630
5 001 – 6 000	344 440	344 540	344 640
6 001 – 7 000	344 450	344 550	344 650
7 001 – 8 000	344 460	344 560	344 660
8 001 – 9 000	344 470	344 570	344 670
9 001 – 10 000	344 480	344 580	344 680
10 001 – 11 000	344 490	344 590	344 690
11 001 – 12 000	344 500	344 600	344 700

Note: tow rope assemblies of polyamid ribbon with lateral stability as well as brake carriers and locking devices are available on request.

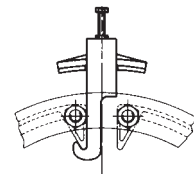
1. Rollen

wheel	side roller	kick-up roller	for cable carriers	dim. dia x width (mm)	flange wheel	cyl. wheel	wheel material	bush-bearing	ball-bearing	weight kg	Order-No.
x			W 25 K, W 26 K, W 30 K WN 110, WE 110	45/60 x 24,5	x		polyamid	x		0,027	346 731
x			W 25 KL, W 26 KL W 30 KL	45/60 x 22,5	x		polyamid		x	0,065	346 732
x with axle			W 45 FR	45/60 x 23	x		steel		x	0,230	348 708
		x with axle	W 45 FR	32 x 9		x	steel		x	0,110	348 709
x with axle			W 110 S	45/60 x 21	x		steel		x	0,250	344 750
	x with axle		WE 120								
	x with axle	x with axle	WN 130, WN 140 WE 130, WE 140	45 x 21		x	steel		x	0,200	344 850
x with axle			WN 120 WE 120	80 x 21		x	steel		x	0,810	346 744
x with axle			WN 130, WN 140 WE 130, WE 140	100 x 27		x	steel		x	1,500	346 746

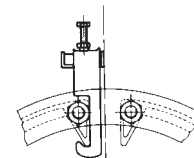
2. Bumpers incl. attachment hardware

dim. dia x length mm	for cable carriers	weight kg	Order-No.
Ø 26 x 18	W 45 FR	0,010	349 335
Ø 20 x 15 ⁽¹⁾	W 110	0,012	346 001
Ø 30 x 18 ⁽¹⁾	W 120	0,035	344 980
45 x 100 x 52 ⁽¹⁾	W 130, W 140	0,330	345 000

cable clamp LK



cable clamp LA



3. Cable clamps for round cable

Clamps, type LA for galvanized steel, compression insert of PVC, hardware galvanized.

clamp type	for Ø mm	dim. B mm	weight kg	Order-No.
K 12 LA	8-12	16	0,040	345 020
K 16 LA	12-16	21	0,044	345 030
K 20 LA	16-20	24	0,050	345 040
K 24 LA	20-24	29	0,055	345 050
K 28 LA	24-28	33	0,059	345 060
K 32 LA	28-32	37	0,082	345 070
K 36 LA	32-36	41	0,087	345 080
K 40 LA	36-40	46	0,094	345 090
K 44 LA	40-44	50	0,116	345 100
K 48 LA	44-49	54	0,119	345 110

Clamps, type LK for galvanized steel, compression insert of corrosion proof aluminium, hardware of stainless steel.

clamp type	for Ø mm	dim. B mm	weight kg	Order-No.
K 12 LK	8-12	17	0,102	345 120
K 16 LK	12-16	21	0,105	345 130
K 20 LK	16-20	25	0,132	345 140
K 24 LK	20-24	29	0,142	345 150
K 28 LK	24-28	33	0,152	345 160
K 32 LK	28-32	37	0,180	345 170
K 36 LK	32-36	41	0,185	345 180
K 40 LK	36-40	46	0,210	345 190
K 44 LK	40-44	50	0,230	345 200
K 48 LK	44-49	54	0,240	345 210

⁽¹⁾ Incl. fixing bolt



TYPICAL APPLICATION AND HOW TO ORDER



Festoon system for round cable

Application:

Electrification system for gantry crane trolley

Cable specification: (see cat. 8 L)

12 cables 1 x 120,0 mm ² , 28,5 mm Ø	rolley travel:	65 m
2 cables 4 x 35,0 mm ² , 42,0 mm Ø	ravelling speed:	60 m/min.
2 cables 4 x 25,0 mm ² , 37,5 mm Ø	I-beam track	INP 200
6 cables 24 x 2,5 mm ² , 38,0 mm Ø	loop depth:	4 m
2 cables 19 x 2,5 mm ² , 33,0 mm Ø	cable length	
5 cables 8 x 2,5 mm ² , 23,0 mm Ø	for termination:	1 x 2 m, 1 x 7 m
3 cables 4 x 2,5 mm ² , 15,5 mm Ø		

How to select the correct system:

1. Choose the correct carriers by considering diameters and weights of the cables per table on pages 14 and 15.

Result:

Tier 1 (upper level): LK 490/ 48 for	2 cables 4 x 35,0 mm ²	Tier 2 (center level): LK 360/12 for	12 cables 1 x 120 mm ²
	2 cables 4 x 25,0 mm ²		
	6 cables 24 x 2,5 mm ²	Tier 3 (lower level): LK 260/ 8 for	5 cables 8 x 2,5 mm ²
	2 cables 19 x 2,5 mm ²		3 cables 4 x 2,5 mm ²

2. The matching trolley chassis: type WN 140 R/490/360/260

3. Find out the quantity of cable loops required per diagram on page 22

Result: 10

4. Find out the storage distance per page 22

Result: 6100 mm + Z (one carrier of 600 mm) = 6700 mm

5. Tow ropes required? See page 18

Answer: Yes

6. Determine length of cable required:

(trolley travel + storage incl. open space Z) x 1.15

+ cable hookup lengths for termination, see page 22.

Result: 92 m

(see page 22)

Material to order:

	Type	Order-No.
9 cable carriers, 3-tier, c/w	WN 140 R/490/360/260	341 610
cable support saddles	LK 490/48	343 270
cable support saddles	LK 360/12	342 780
cable support saddles	LK 260/ 8	342 680
1 lead clamp, 3-tier c/w cable support saddles	M 140 R/490/360/260 (LK as before)	341 640
1 track clamp, 3-tier c/w cable support saddles	E 140 R/490/360/260 (LKas before)	341 670
20 cable loop clamps for upper tier	LS 490/48	344 150
20 cable loop clamps for center tier	LS 360/12	343 660
20 cable loop clamps for lower tier	LS 260/ 8	343 560
10 tow rope assemblies, 8 mm dia, 6970 mm long, with hardware	Z 2	344 560
12 x 92 m 92 m Rubber sheated round cable	H 07 RN-F 1 x 120	332 300
2 x 92 m 92 m Rubber sheated round cable	H 07 RN-F 4 G 35	330 320
2 x 92 m 92 m Rubber sheated round cable	H 07 RN-F 4 G 25	330 310
6 x 92 m 92 m Rubber sheated round cable	A 07 RN-F 24 G 2,5	330 370
2 x 92 m 92 m Rubber sheated round cable	A 07 RN-F 18 G 2,5	330 360
5 x 92 m 92 m Rubber sheated round cable	A 07 RN-F 8 G 2,5	330 340
3 x 92 m 92 m Rubber sheated round cable	H 07 RN-F 4 G 2,5	330 260
24 cable glands	Pg 36 for 1 x 120	331 150
4 cable glands	Pg 48 for 4 G 35	331 170
4 cable glands	Pg 48 for 4 G 25	331 170
12 cable glands	Pg 48 for 24 G 2,5	331 170
4 cable glands	Pg 42 for 19 G 2,5	331 160
10 cable glands	Pg 29 for 8 G 2,5	331 140
6 cable glands	Pg 21 for 4 G 2,5	331 130



I-Beam Track

1. Install I-beam track parallel with runway of equipment; the side clearance to be sufficient to avoid interference with swinging cables.
2. The support structure for the I-beam must be adequately designed for the anticipated loads. Smooth out welded joints to ensure smooth traversing of cable carriers.

The support of the I-profile has to take place according to the occurring load. The joints have to be carried out aligned. At the tread the welding seams have to be smoothed.

Cable Carrier

The system must be installed in the following order:

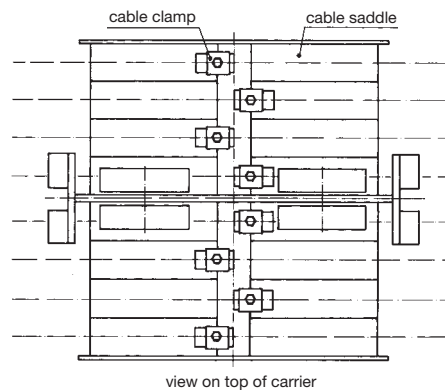
1. Cable carriers: adjusted per chosen I-beam
2. Bolt track clamp: to the lower flange of the I-beam
3. Connect lead clamp: DThe lead carrier of the types W 120 upto W 140 are not carried out as carriers, this units are moving free under the I-profile and will be connected fix with an arm (e. g. U-profile) to the consumer. The arrangement of the arm is apparent in the dimension illustrations of the respective cable carrier types. The cable carriers of the types W 120 upto W 140 are in addition to the absorption of bigger travel inaccuracies equipped with a bumper extension. This bumper extension has to be installed at the first cable carrier behind the lead carrier.

Cables

During installation of the cables please note that the cable length [L] between end clamp and lead carrier is distributed with equally loop depth on the carriers.

$L = (\text{storage length incl. clearance} + \text{travel distance}) \times 1,1 \text{ upto } 1,2$.
During use of tow rope assemblies 1,15 upto 1,25.

The cables will be fixed with single clamps at the cable saddles. They have to be arranged alternating, as shown on the top view of the cable carrier. The locking takes place with counternuts.



Tow Ropes

Tow ropes (see page 18) are to be installed on the cable carriers by means of shackles. Secure shackle screws by using a galvanized steel wire.

Cable Loop Clamps

with cable loops of approx. 2 m it is recommended to use one cable clamp at the lower vertex of each loop. Use two cable clamps in the lower third (one each side of the loop) when the loop depth exceeds 2 m.

Make test runs



HOW TO DETERMINE:

Storage Distance, Cable Length, Number of Carriers

Cable Safety Length Directions

travelling speed	cable loop	safety factor
up 35 m/min	more than 0.3 m	f = 1,1
up 50 m/min	up to 0.8 m	f = 1,15
up 50 m/min	more than 0.8 m	f = 1,1
up 80 m/min	up to 0.8 m	f = 1,2
up 80 m/min	more than 0.8 m	f = 1,15
for spiral looped round cable		f = 1,2

For higher speed factors (> 80 m/min) please consult factory.

Storage distance

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

Cable length

(c/c track clamp – lead clamp without hookup on both ends)

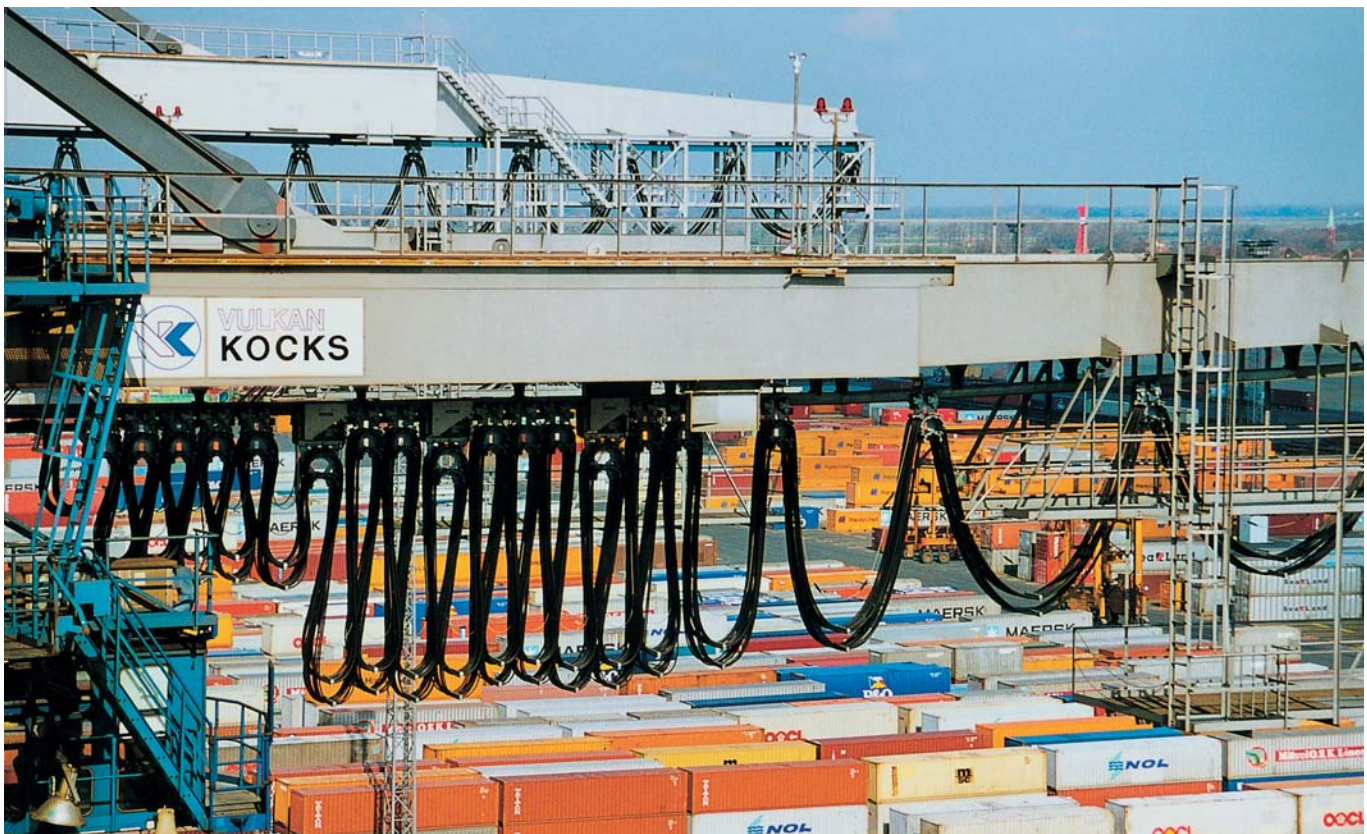
$$L = (S + SP) \times f$$

Number of Carriers

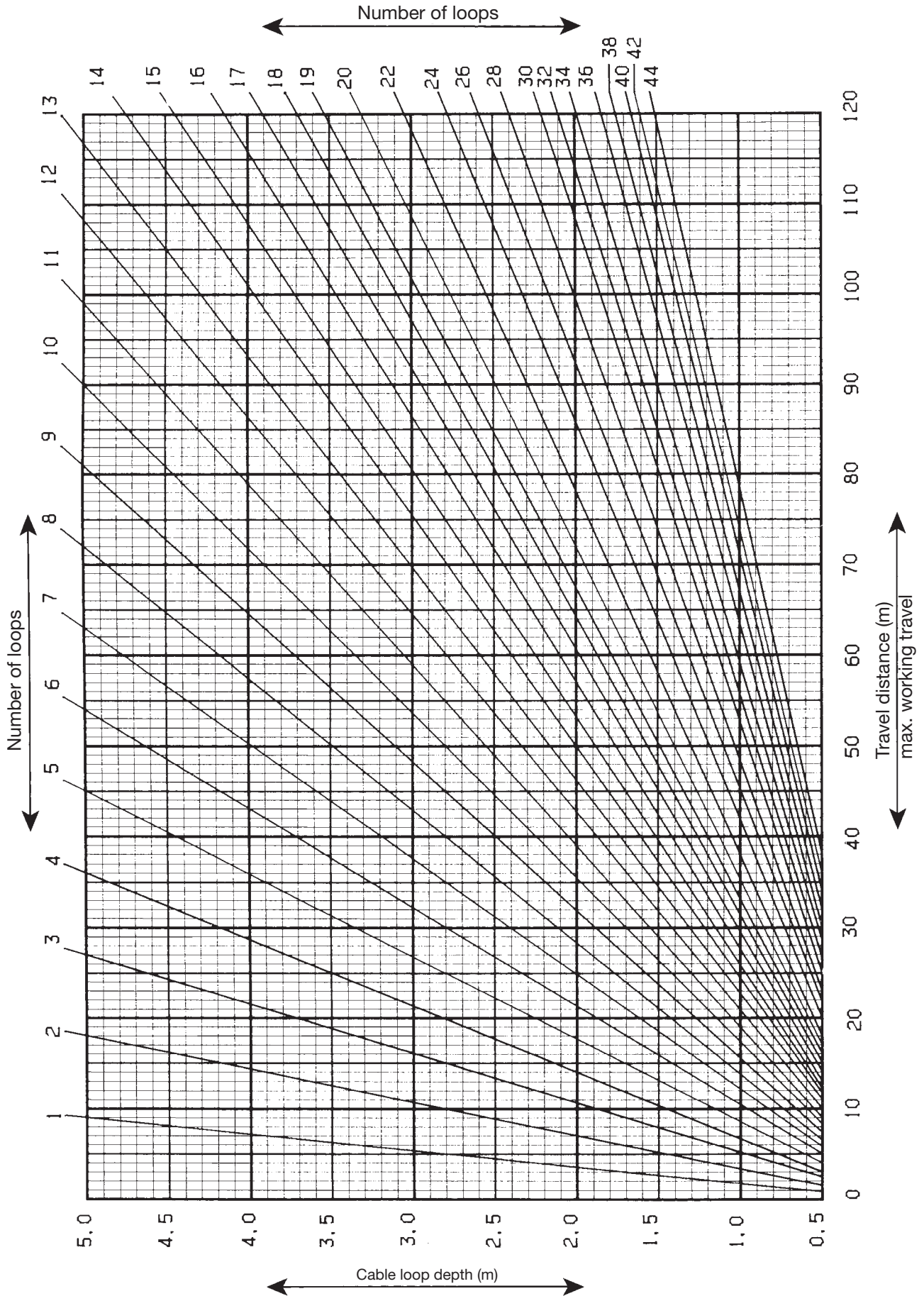
(without lead clamp and track clamp)

$$= n - 1$$

- S = travel distance (m)
- SP = storage distance (m)
- Z = open space (m)
(min. one carrier)
- n = number of loops
- l = length of carrier (m)
- f = cable safety factor



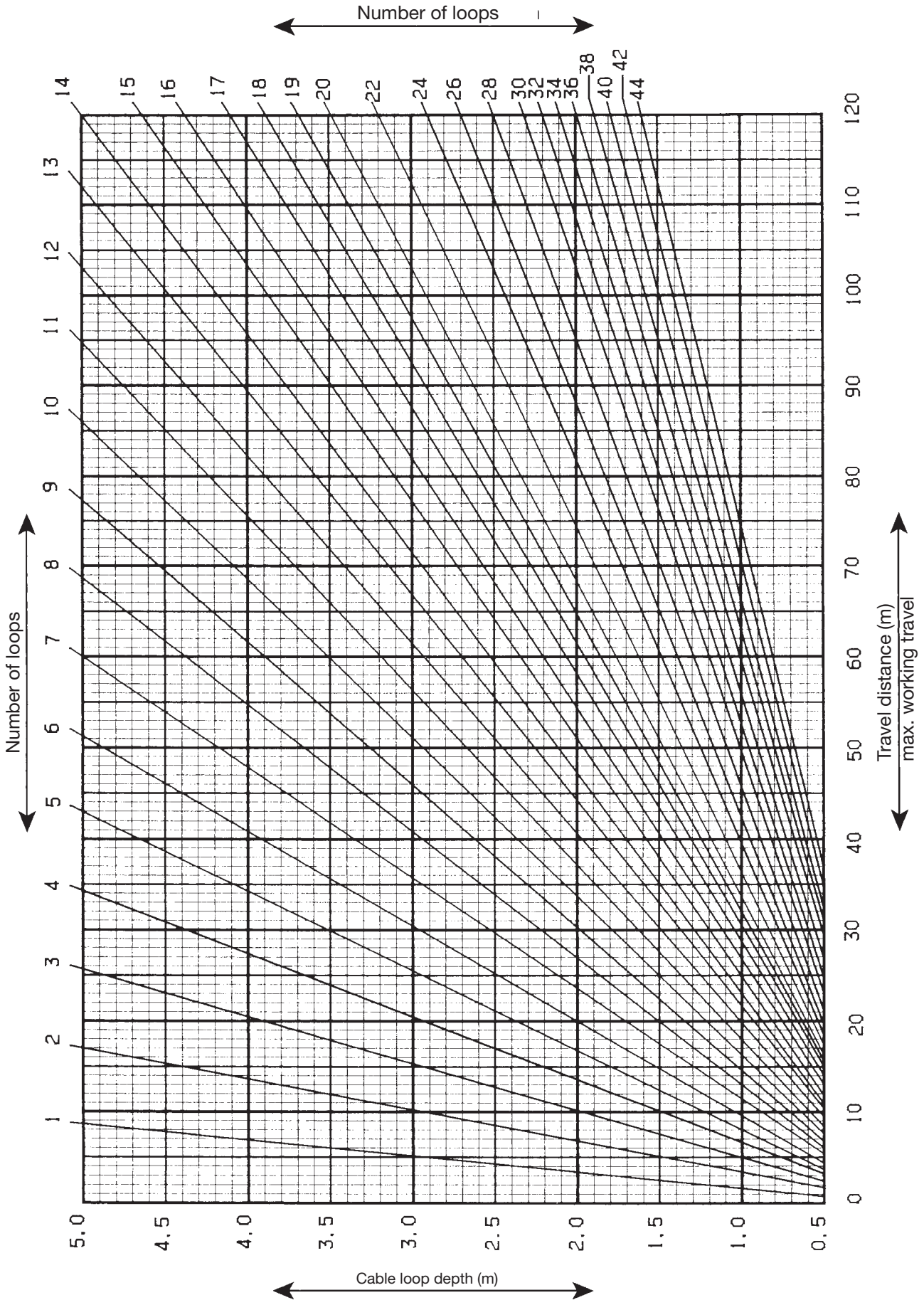
VAHLE cable carriers in Bremerhaven



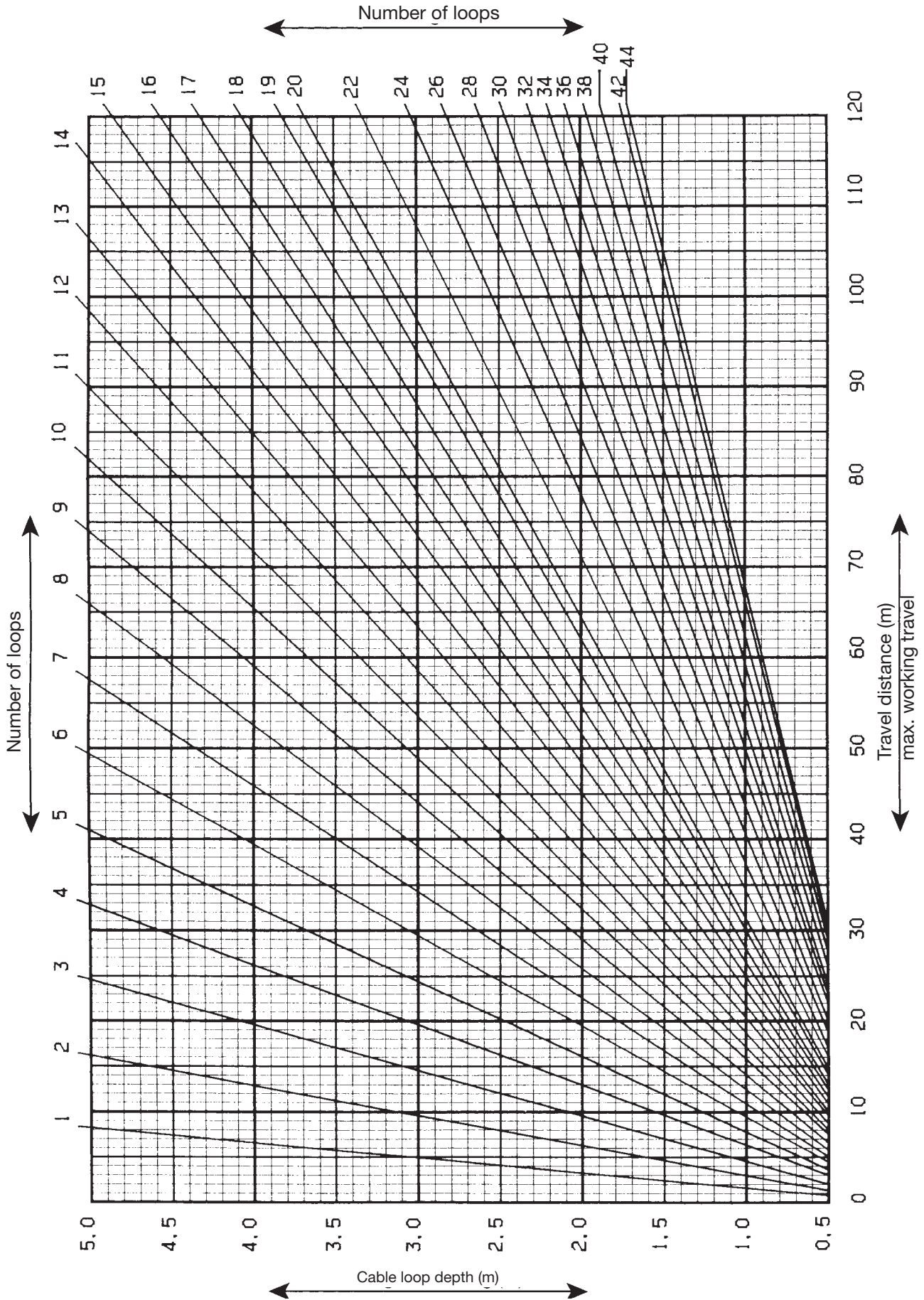
The diagram considers a cable safety length factor of $f=1.10$



CABLE LOOPS



The diagram considers a cable safety length factor of $f=1.15$



The diagram considers a cable safety length factor of $f=1.20$



APPLICATION PHOTOS



VAHLE cable carriers at Hamburg harbour







Products and Service

	Catalog no.
Powerails	1 a
Battery Charging Systems	1 b
Insulated Powerails U 10	2 a
Insulated Powerails U 20 - U 30 - U 40	2 b
Insulated Powerails U 15 - U 25 - U 35	2 c
Aluminum Enclosed Conductor Systems LSV - LSVG	3 a
Powerail Enclosed Conductor Systems KBSL - KSL - KSLT	4 a
Powerail Enclosed Conductor Systems VKS - VKL	4 b
Powerail Enclosed Conductor Systems MKLD - MKLF - MKLS	4 c
Powerail Enclosed Conductor Systems VKS 10	4 d
Powerail Enclosed Conductor Systems KBH	4 e
Heavy Enclosed Conductor Systems	5
Trolley Wire and Accessories	6
Cable Tenders	7
Cable Carriers for □ tracks	8 a
Cable Carriers for Platform Cables on I beams	8 bF
Cable Carriers for Round Cables on I beams	8 bR
Cable Carriers and Accessories for ◇ tracks	8 c
Conductor Cables and Fittings	8 L
Spring Operated Cable Reels	9 a
VAHLE POWERCOM® Digital Transmission Systems	9 c
CPS® Contactless Power Supply	9 d
SMG - Slotted Microwave Guide	9 e
Position Encoding Systems	9 f
Motor Powered Cable Reels	10
Installations/Commissioning	
Spare Parts/Maintenance Service	





Products and Service

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Powerail Enclosed Conductor Systems KBSL - KSL - KSLT	4 a
Powerail Enclosed Conductor Systems VKS - VKL	4 b
Powerail Enclosed Conductor Systems MKLD - MKLF - MKLS	4 c
Powerail Enclosed Conductor Systems VKS 10	4 d
Powerail Enclosed Conductor Systems KBH	4 e
Heavy Enclosed Conductor Systems	5
Trolley Wire and Accessories	6
Cable Tenders	7
Cable Carriers for □ tracks	8 a
Cable Carriers for Platform Cables on I beams	8 bF
Cable Carriers for Round Cables on I beams	8 bR
Cable Carriers and Accessories for ◇ tracks	8 c
Conductor Cables and Fittings	8 L
Spring Operated Cable Reels	9 a
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POWERAIL LTD.

WORKING FOR THE FUTURE WITH



Powerail Ltd. High Road, Finchley, London, N12 8PT,
Phone 020 8446 0350/1246 • Fax 020 8446 7054
E-mail: enquiries@powerailtd.com



Products and Service

Catalog no.

Copperhead Conductor Systems	1 a
Battery Charging Systems	1 b
Insulated Powerails U 10	2 a
Insulated Powerails U 20 - U 30 - U 40	2 b
Insulated Powerails U 15 - U 25 - U 35	2 c
Aluminum Enclosed Conductor Systems LSV - LSVG	3 a
Powerail Enclosed Conductor Systems KBSL - KSL - KSLT	4 a
Powerail Enclosed Conductor Systems VKS - VKL	4 b
Powerail Enclosed Conductor Systems MKLD - MKLF - MKLS	4 c
Powerail Enclosed Conductor Systems VKS 10	4 d
Powerail Enclosed Conductor Systems KBH	4 e
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Cable Tenders	7
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Cable Carriers for Flatarm Cables on I beams	8 bF
Cable Carriers for Round Cables on I beams	8 bR
Cable Carriers and Accessories for ◇ tracks	8 c
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