

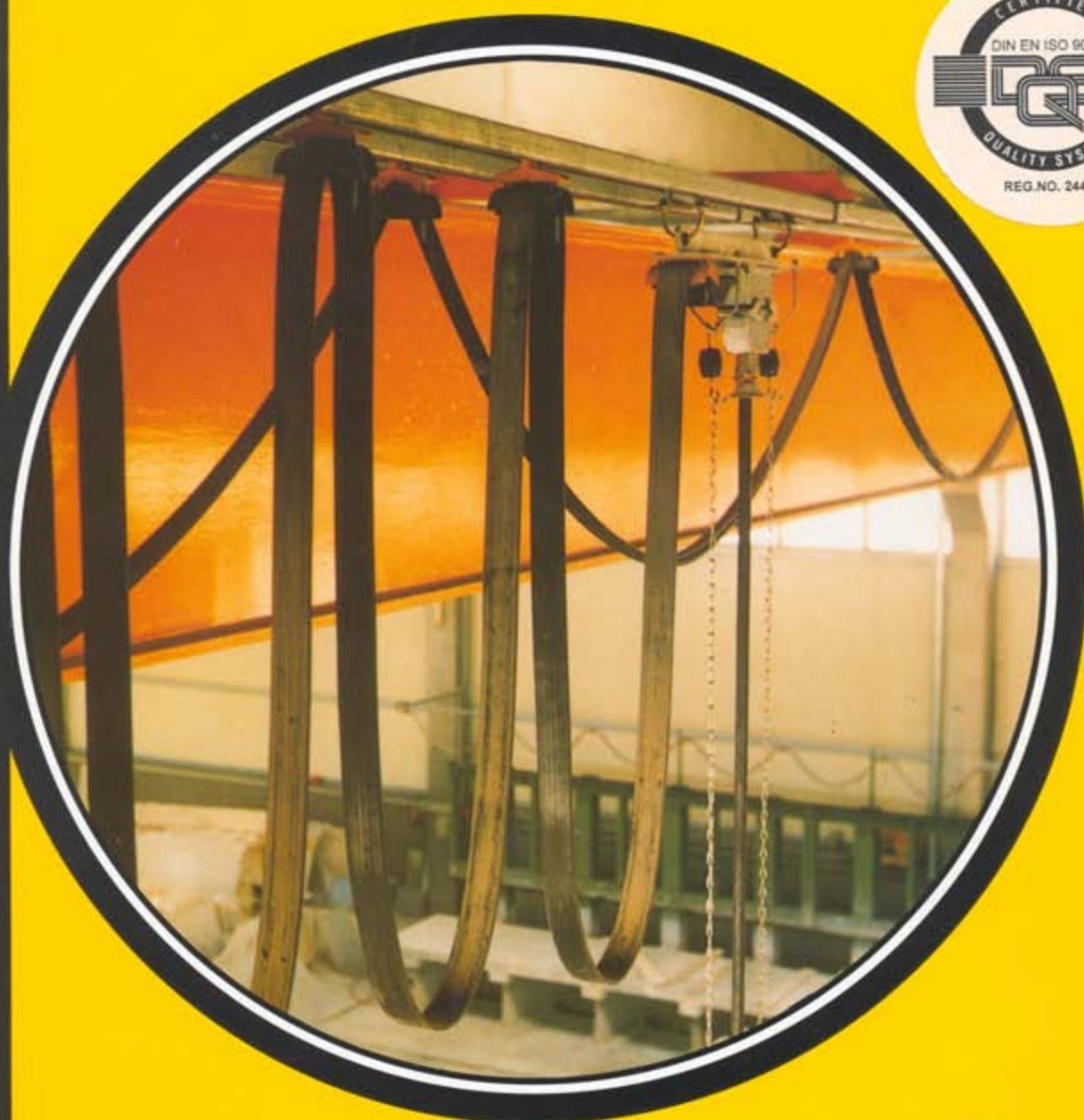
wampfler



CABLE TROLLEYS and ACCESSORIES

Programme 230

for C-rail 30 x 32



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SUMMARY OF PROGRAMMES for cable trolleys and accessories







	Track profile		Programme
		Flat cables, round cables, Pg-glands, terminal boxes, terminal clamps	130/ 200
		Cable trolleys running on steel rope \varnothing 6-12 mm	210/ 215
		Cable trolleys running on I-beam light construction	220
		Cable trolleys running in C-rail 30 x 32	230 230
		Cable trolleys running in C-rail 40 x 40	240
		Cable trolleys running in C-rail 50 x 50	250
		Cable trolleys running in C-rail 63 x 63	255
		Cable trolleys running in C-rail 80 x 80	260
		Cable trolleys for curved tracks running on square rail 30 x 30 and 40 x 40	270/ 280
		Variable height adjustment for control stations	HFS
		Cable trolleys running on I-beam	320
		Heavy duty cable trolleys and flexible cable systems for high storage ware houses	GLW
		NO-number index (Catalogue number summary)	NO

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VDE specifications

The remarks on the VDE specifications are valid at the revision of the catalogue at the end of 1986.

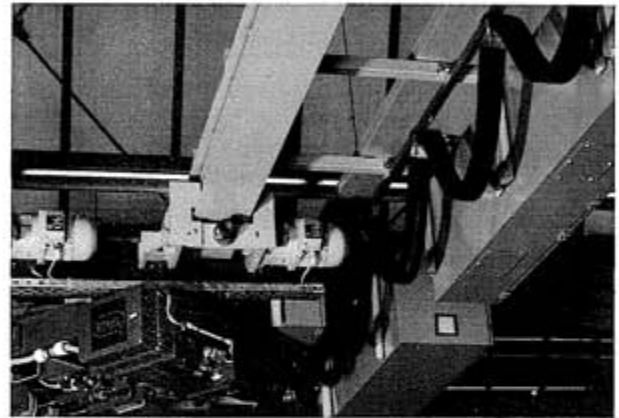
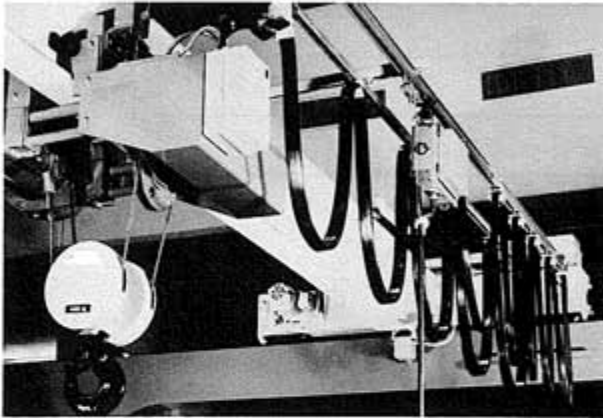
Changes occurring after that date have to be taken into consideration.

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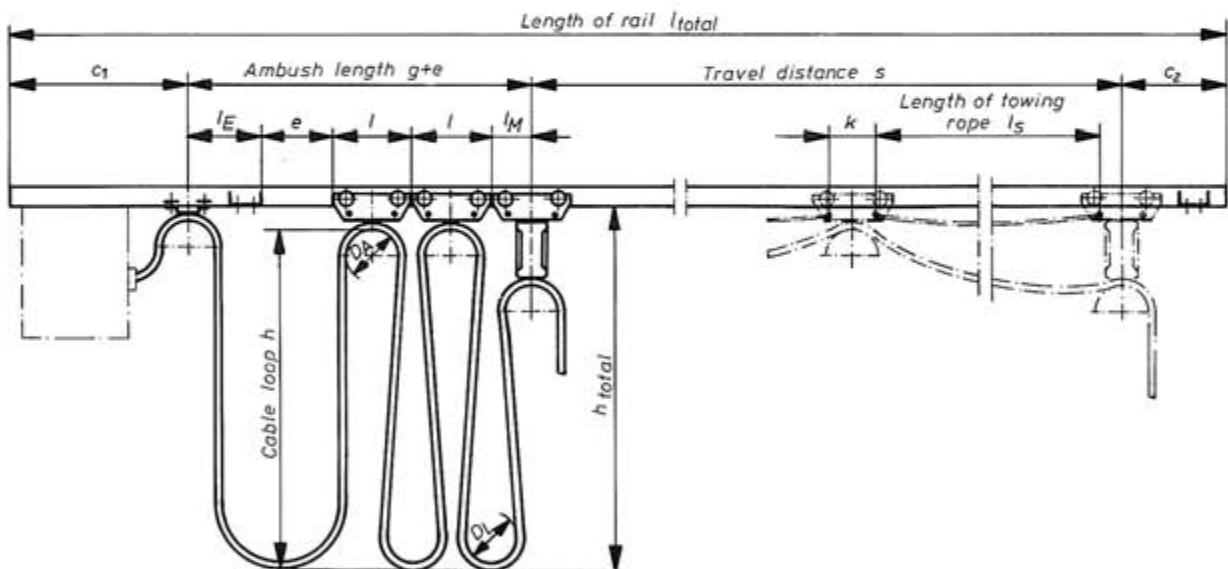
Subject to alteration of construction.

INTRODUCTION

The cable trolleys are suitable for carrying flat and round cables. When using hoses instead of round cables it is possible to transport all kinds of gaseous and liquid media using the same components. Pneumatic lifting gear, pneumatic tools and all kinds of transportable machines and equipment which operate with compressed air are readily supplied with power using these components. Gases such as oxygen, acetylene, propane and many other industrial gases can be very simply conveyed to gas cutting machines, welding machines, oxy-acetylene and similar equipment. An important field is the supply of water to washing plants and sprinkler or cooling systems. Even pest control liquids and fertilisers dissolved in water are reliably transported. There are also many uses in the field of hydraulics.



PROJECTION



Technical data

l_{total} = Length of rail [m]

s = Crab or crane travelling distance [m]

h = Cable loop [m] (measured from top face of cable carrier)

h_{total} = Cable loop [m] (measured from lower face of C-rail)

n = Number of loops

g = Ambush length from centre of end clamp to middle of towing arm [m]
 $g = l_E + (n-1)l + l_M$

l = Length of one cable trolley [m]

e = Tolerance [m]

D_A = Cable support diameter [m]

D_L = Bending diameter of cable loop [m]

d = min. cable diameter or min. cable thickness [m]

f = Factor for cable length addition

L_{total} = Total length of cable [m]

L_{loop} = Cable length of single loop from centre of support to centre of support [m]

L_S = Length of towing rope per loop

k = Mounting hole separation for towing rope holes [m]

Length addition

We recommend the following length addition factors f :

Application	h [m]		0.5–0.8	> 0.8–1.25	> 1.25–2	> 2
	v [m/min]					
Standard operation	Up to 32		1.10	1.10	1.10	1.10
	> 32–40		1.15	1.10	1.10	1.10
	> 40–50		1.15	1.15	1.10	1.10
	> 50–63		1.20	1.15	1.15	1.10
	> 63–80		On inquiry	1.20	1.15	1.15
	> 80–100		On inquiry	On inquiry	1.20	1.15
Ideal control units	Up to 63		1.10	1.15	1.20	1.25
Round-cables spiral mounted	Up to 63		1.25	1.20	1.20	1.15

Formula and graph, simplified calculation

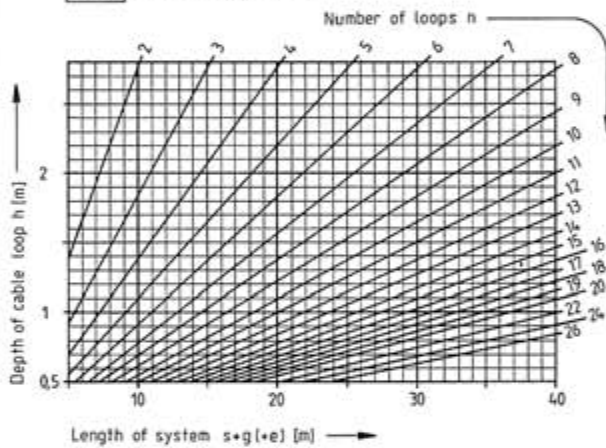
Number of loops

$$n = f \cdot \frac{s+g}{2h} \quad \text{or} \quad n = f \cdot \frac{s}{2h-f \cdot l}$$

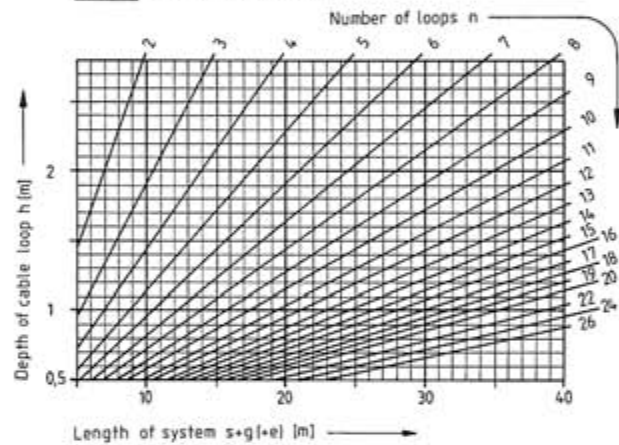
Depth of cable loop

$$h = f \cdot \frac{s+g}{2n} \quad \text{or} \quad h = \frac{f}{2} \left(\frac{s}{n} + l \right)$$

$f = 1.1$ = Length addition 10%



$f = 1.15$ = Length addition 15%



Formula, exact calculation

We recommend that systems using long trolleys, large support diameters and low conditions of installation are calculated using the exact formula.

Number of loops

$$n = f \cdot \frac{s+g+e}{2h+1.25 D_A} \quad \text{or} \quad n = f \cdot \frac{s+e}{2h+1.25 D_A - f \cdot l}$$

Depth of cable loop

$$h = f \cdot \frac{s+g+e}{2n} - 0.63 D_A \quad \text{or} \quad h = \frac{f}{2} \left(\frac{s+e}{n} + l \right) - 0.63 D_A$$

Total length of cable

$$L_{\text{total}} = f(s+g+e) + \Sigma J \quad [\text{m}]$$

ΣJ = Length addition for installation on both sides

Length of individual loop

h = constant

$$L_{\text{loop}} = f \cdot \frac{s+g+e}{n} \quad [\text{m}]$$

h = graduated

$$L_{\text{loop}} = 2h + 1.25 D_A \quad [\text{m}]$$

Control: $\Sigma L_{\text{loop}} = L_{\text{total}} - \Sigma J$

Towing ropes

For high travel speeds and long travel distances we recommend the use of towing ropes.

Length of towing ropes

h = constant

$$L_S = 0.95 f \left(\frac{s+g+e}{n} \right) - k \quad [\text{m}]$$

h = graduated

$$L_S = 0.95 (2h + 1.25 D_A) - k \quad [\text{m}]$$

PERMISSIBLE LOAD OF CABLE TROLLEYS

The permissible load of the cable trolleys depends on the travel speed, the average travel time per day and the construction of the rollers.

It is advisable not to exceed the listed values for cable trolleys with 4 rollers. For cable trolleys with 2 rollers 40-50% of the listed values have to be taken as a basis.

Rollers

The necessary construction of the rollers is determined by the intended use and by environmental factors. The rollers are divided into the groups A; B and C according to their operational possibilities and their range of use. The catalogue numbers of the various pairs of special and spare parts rollers can be found on pages 230/48 and 230/49.

Average load capacity

In the tables of dimensions in this catalogue you always find the average load capacity as P_{adm} . Thus improper use shall be avoided.

Group A; ball-bearing rollers

The ball-bearing rollers of this programme are of a high quality. Cover washers or sealing discs protect the balls in the cage against dust and humidity. The rollers are filled with a high quality brand name grease, sufficient for lifetime, and need no relubrication. A long working life is guaranteed by this construction.

Group	Roller	Average load capacity ¹⁾ P_{adm} [kg]	v_{max} [m/min]
A 1	Rollers standard design and all special rollers with inner and outer ring of galvanized steel.	20	80 (100) For 80-100 special rollers with ground outer ring should be used by preference.

Travel speed v [m/min]	Average travel time per day [h]				
	Up to 4	4-8	8-16		
Up to 16	Up to 4	4-8	8-16		
More than 16-32	Up to 2	2-4	4-8	8-16	
More than 32-63		Up to 2	2-4	4-8	8-16
More than 63-80			Up to 2	2-4	4-8
More than 80-100				Up to 2	2-4
Roller design	Permissible load/trolley [kg]				
Group A 1	32	25	20	16	12.5

Group	Roller	Average load capacity ¹⁾ P_{adm} [kg]	v_{max} [m/min]
A 2	Special rollers out of V4A-material stainless steel, or roller with Bronze outer ring.	10	63
A 3	Special rollers with plastic outer ring. These rollers are of low noise, but with restricted use for curved tracks.	6.3	63

Travel speed v [m/min]	Average travel time per day [h]				
	Up to 4	4-8	8-16		
Up to 16	Up to 4	4-8	8-16		
More than 16-32	Up to 2	2-4	4-8	8-16	
More than 32-63		Up to 2	2-4	4-8	8-16
Roller design	Permissible load/trolley [kg]				
Group A 2	16	12.5	10	8	6.3
Group A 3	10	8	6.3	5	4

Group B and C; rollers with friction bearing

For light duty, low travel speeds, and loads as well as normal environmental conditions cable trolleys with friction bearings are satisfactory. The advantage is lower price and a lower noise level.

These rollers are not suitable for curved tracks.

Group	Roller	Average load capacity ¹⁾ P_{adm} [kg]	v_{max} [m/min]
B	Rollers of Polyamide running on a stainless steel bushing.	8	50
C	Rollers of Polyamide or Bronze are fastened in pairs on a shaft. The shaft runs in a bronze socket in the centre of the trolley.	10	63

Travel speed v [m/min]	Average travel time per day [h]		
	Up to 4		
Up to 16	Up to 4		
More than 16-32	Up to 2	2-4	
More than 32-63 ²⁾		Up to 2	2-4
Roller design	Permissible load/trolley [kg]		
Group B	10	8	6.3
Group C	12.5	10	8

1) with 4 rollers

2) for rollers of group B is meant 32-50 m/min

DESCRIPTION AND LOADING CAPACITY OF C-RAIL TRACKS

In this programme of energy supply systems a C-rail is used as the track profile. The C-rail, which is only open at the bottom and which is made of galvanized steel, protects the chassis of the cable trolleys against moisture and dirt and is therefore suitable for indoor or outdoor use. In aggressive atmospheres stainless steel C-rails are recommended.

Technical data

The maximum permissible loading of C-rail tracks can be determined with the aid of the diagrams below. The calculation is based on the following assumptions:

1. The section is suspended from 2 supports and the load is spread over its length symmetrically from the middle
2. Bending strength $\sigma_b = 100 \text{ N/mm}^2$, no account being taken of lower flange stress
3. $\sigma_v \leq 160 \text{ N/mm}^2$, reference stress from bending stress and lower flange stress
4. $f = l_A / 250$ as permissible deflection of the track section due to loading plus its own weight
5. The loading is distributed symmetrically over the track supports along the loaded section of track

Example (red lines)

1. Given:

P = Load/trolley including own weight and weight of cable [kg] = 5 kg
 l_w = Length of cable trolley [mm] = 125 mm
 z = Number of cable trolleys = 5
 L = Block length of cable trolleys [m] = 0.625 m
 $= z \cdot l_w / 1000$

2. From diagram 1:

Required distance between track support bracket l_A = 1.95 m
 Required load capacity of track support bracket = 63 kg

3. From diagram 2:

Required distance between track support bracket l_A = 1.75 m
 Required load capacity of track support bracket = 63 kg

Diagram 1

for C-rail track NO 23 200/NO 23 204/NO 23 400/NO 23 404 (30x32x2)

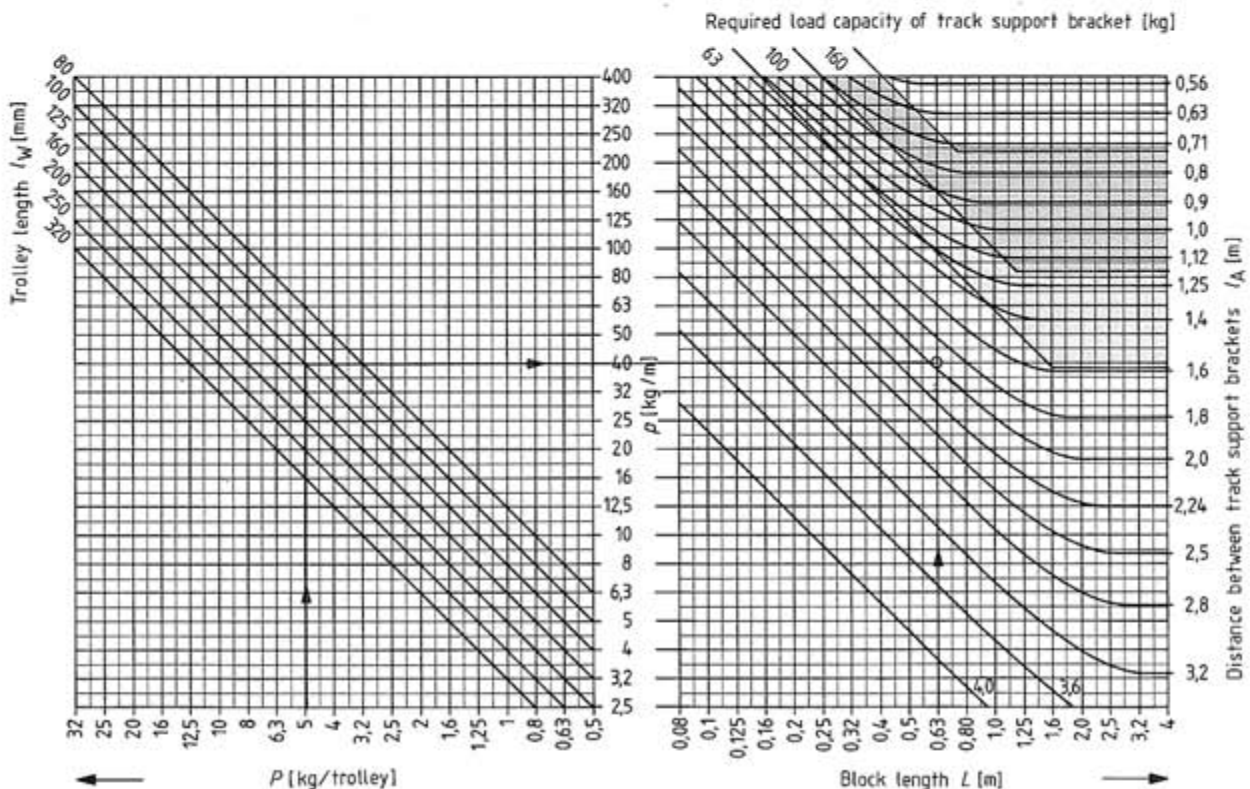
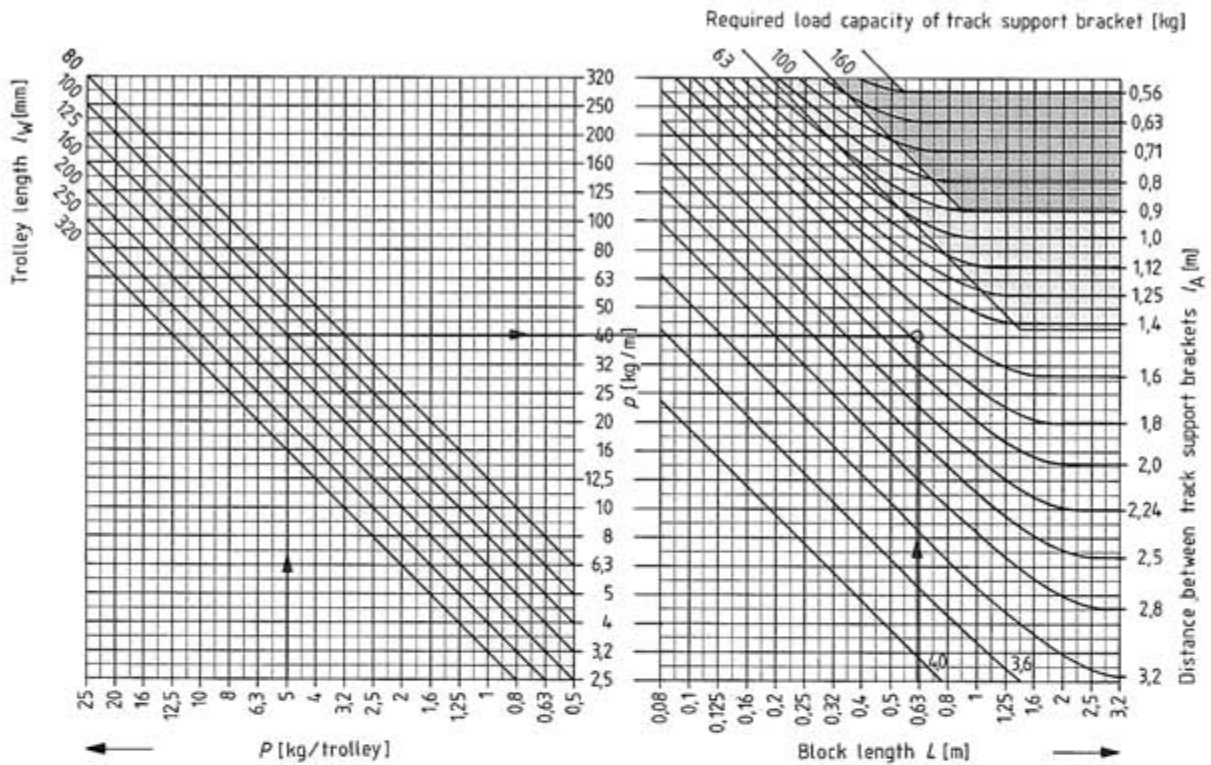


Diagram 2
for C-rail NO 23 201 (30x32x1.5)



VDE SPECIFICATIONS

According to VDE 0100 part 726 item 9.3 please note:

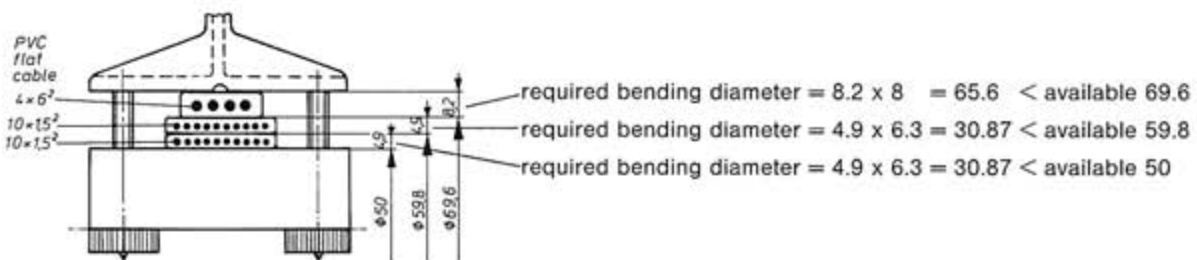
The following cables for cable trolleys may not have smaller interior bending diameters than those listed below:

up to 8.0 mm outer diameter, 6.3-times the cable diameter
 up to 12.5 mm outer diameter, 8-times the cable diameter
 more than 12.5 mm outer diameter, 10-times the cable diameter

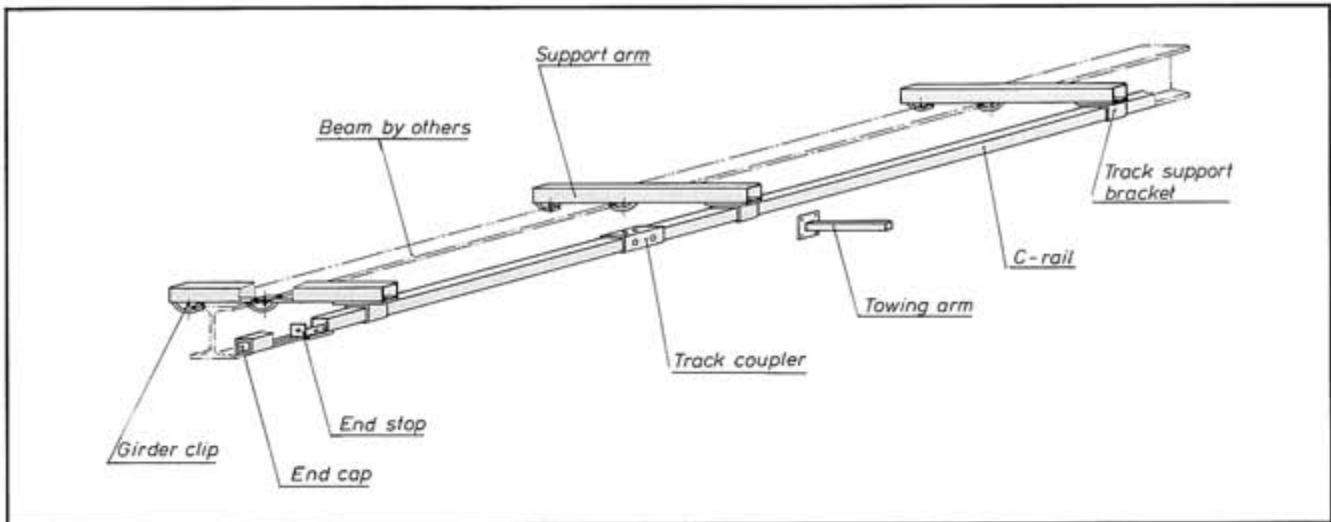
Note:

The flat cable thickness compares with the diameter of round cables.

When several flat cables are installed on a cable trolley, the flat cable with the greater thickness has to be installed at the top.

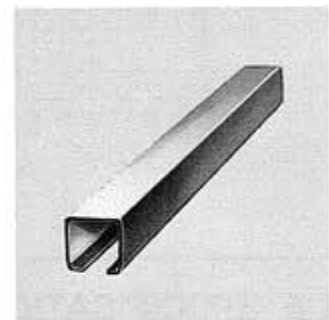
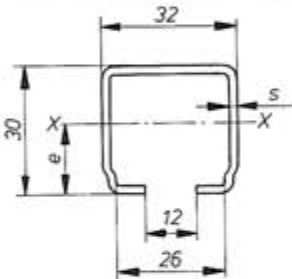


TRACKS AND MOUNTINGS



C-RAIL TRACKS AND CURVES

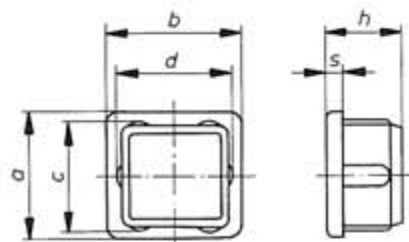
C-RAIL TRACK NO 23 200, NO 23 204, NO 23 201



Catalogue No.	Type	Length ¹⁾ [mm]	Length tolerance [mm]	Thickness s [mm]	Static values			Weight [kg/m]
					I x [cm ⁴]	W x [cm ³]	e [mm]	
6 NO 23 200	steel, galvanized	6000	+ 40	2	2.42	1.45	16.7	1.56
4 NO 23 200								
6 NO 23 204	Galv. steel and plastic coated: grey RAL 7001	6000	+ 40	2	2.42	1.45	16.7	1.56
4 NO 23 204								
6 NO 23 201	steel, galvanized	6000	+ 40	1.5	1.9	1.1	17.1	1.17
4 NO 23 201								

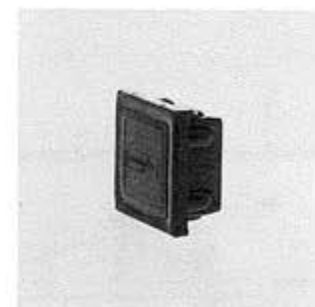
1) Intermediate sizes, e.g. 3 m or 4.8 m, see pricelist.

END CAP NO 20 662



Material: Plastic

Application:
Enclosing the rail ends.



Catalogue No.	For C-rail track	a	b	c	d	s	h	Weight [kg]
30 NO 20 662	NO 23 200, NO 23 204	30	32	27	29	4	18	0.005
31 NO 20 662	NO 23 201	30	30	28	28	5	16	0.004

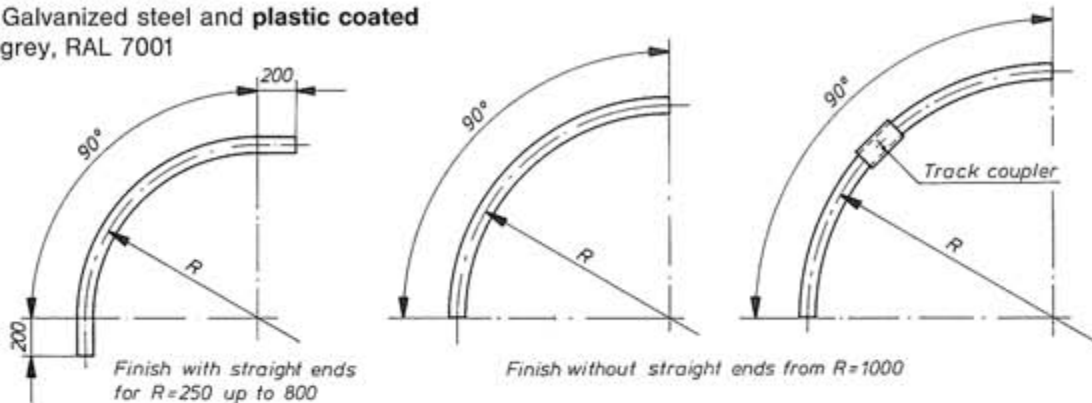
90°-CURVES NO 23 203

FINISH: Steel, galvanized

90°-CURVES NO 23 205

FINISH: Galvanized steel and plastic coated

Colour: grey, RAL 7001



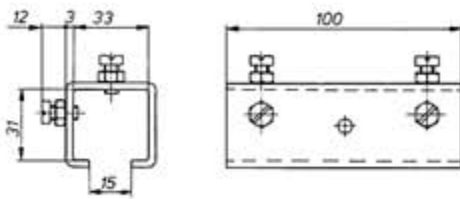
Catalogue No. (90°-curves from C-rail NO 23 200)	Catalogue No. (90°-curves from C-rail NO 23 204)	R [mm]	Developed length [mm]	Number of track coupler	Depth of loop max. 0.35 x R	For max. trolley length [mm]	Weight [kg]
250 NO 23 203	250 NO 23 205	250	793	-	-	-	1.2
400 NO 23 203	400 NO 23 205	400	1028	-	-	80	1.6
600 NO 23 203	600 NO 23 205	600	1342	-	-	100	2.1
800 NO 23 203	800 NO 23 205	800	1656	-	-	125	2.6
1000 NO 23 203	1000 NO 23 205	1000	1570	-	350	160	2.4
1200 NO 23 203	1200 NO 23 205	1200	1885	-	420	160	2.9
1400 NO 23 203	1400 NO 23 205	1400	2200	-	490	200	3.4
1600 NO 23 203	1600 NO 23 205	1600	2510	-	560	200	3.9
1800 NO 23 203	1800 NO 23 205	1800	2830	-	630	280	4.4
2000 NO 23 203	2000 NO 23 205	2000	3140	-	700	280	4.9
2200 NO 23 203	2200 NO 23 205	2200	3455	-	770	280	5.4
2400 NO 23 203	2400 NO 23 205	2400	3770	-	840	320	5.9
2600 NO 23 203	2600 NO 23 205	2600	4080	-	910	320	6.4
2800 NO 23 203	2800 NO 23 205	2800	4400	-	980	320	6.9
3000 NO 23 203	3000 NO 23 205	3000	4710	-	1050	320	7.3
3200 NO 23 203	3200 NO 23 205	3200	5025	-	1120	320	7.8
3400 NO 23 203	3400 NO 23 205	3400	5340	-	1190	320	8.3
3600 NO 23 203	3600 NO 23 205	3600	5650	1	1260	320	9.1
3800 NO 23 203	3800 NO 23 205	3800	5970	1	1330	320	9.6
4000 NO 23 203	4000 NO 23 205	4000	6280	1	1400	320	10.1
4200 NO 23 203	4200 NO 23 205	4200	6595	1	1470	320	10.6
4400 NO 23 203	4400 NO 23 205	4400	6910	1	1540	320	11.1
4600 NO 23 203	4600 NO 23 205	4600	7220	1	1610	320	11.6
4800 NO 23 203	4800 NO 23 205	4800	7540	1	1680	320	12.1
5000 NO 23 203	5000 NO 23 205	5000	7850	1	1750	320	12.5
5500 NO 23 203	5500 NO 23 205	5500	8635	1	1925	400	13.8
6000 NO 23 203	6000 NO 23 205	6000	9420	1	2100	400	15.0
6500 NO 23 203	6500 NO 23 205	6500	10205	1	2275	400	16.2
7000 NO 23 203	7000 NO 23 205	7000	10990	1	2450	400	17.4
7500 NO 23 203	7500 NO 23 205	7500	11775	2	2625	400	19.0
8000 NO 23 203	8000 NO 23 205	8000	12560	2	2800	400	20.2
8500 NO 23 203	8500 NO 23 205	8500	13345	2	2975	400	21.4
9000 NO 23 203	9000 NO 23 205	9000	14130	2	3150	400	22.6
9500 NO 23 203	9500 NO 23 205	9500	14915	2	3325	400	23.9
10000 NO 23 203	10000 NO 23 205	10000	15700	2	3500	400	25.1

Curves conforming to the above standards can be supplied short-dated. For intermediate sizes the price charged will be that of the next larger type. We can, of course, provide you with any required shape and size of curve. Please send a sketch. Price on enquiry.

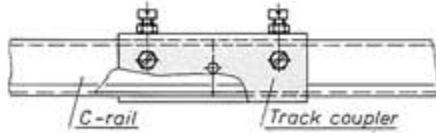
For curved track with U or S-shaped track, circular or other difficult types of track we recommend our flexible cable system for curves programme 270 and 280.

MOUNTINGS

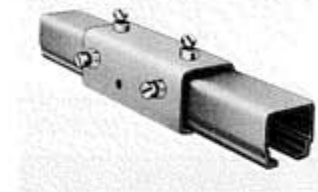
Catalogue No.: **TRACK COUPLER NO 23 210**



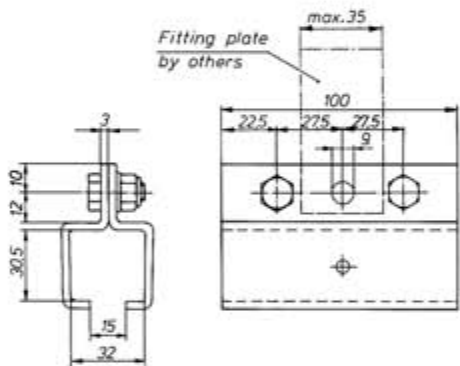
Material: steel, galvanized
Weight: 0.280 kg



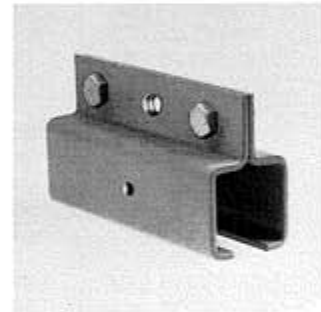
Application: A track coupler must be provided at each track joint.



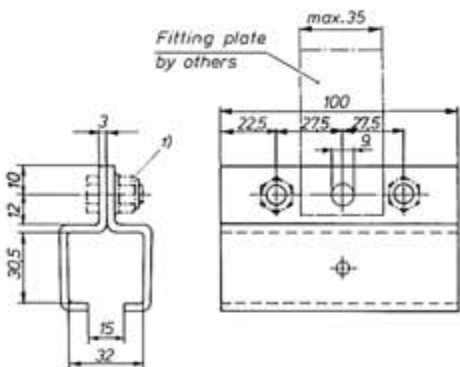
Catalogue No.: **TRACK COUPLER NO 23 211 (2-pieces)**



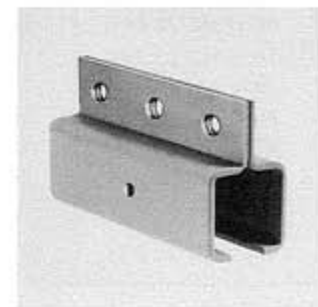
Material: steel, galvanized
Weight: 0.480 kg



Catalogue No.: **TRACK COUPLER NO 23 212 (2-pieces)**
without fasteners

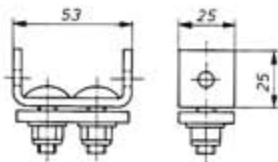


Material: steel, galvanized
Weight: 0.360 kg

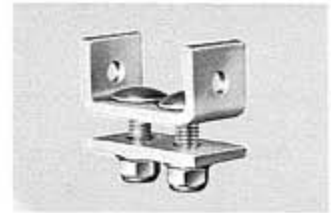


1) Screws, nuts and washers are required for fixing the two plates.

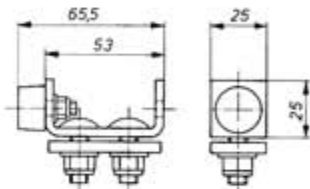
Catalogue No.: **END STOP NO 23 219**



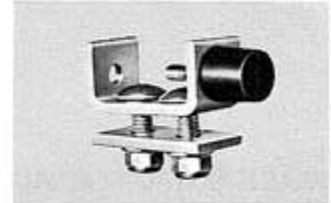
Material: steel, galvanized
Weight: 0.130 kg



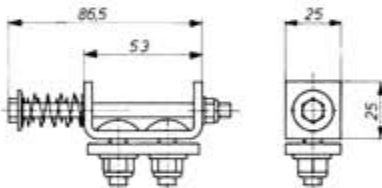
Catalogue No.: **END STOP NO 23 218**



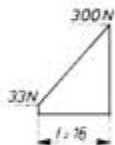
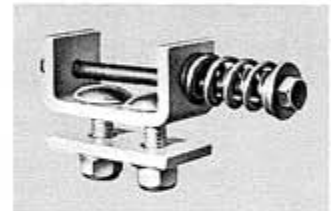
Material: bracket and clamping plate: steel, galvanized
buffer: rubber
fasteners: steel, galvanized
Weight: 0.160 kg



Catalogue No.: **END STOP NO 23 217**

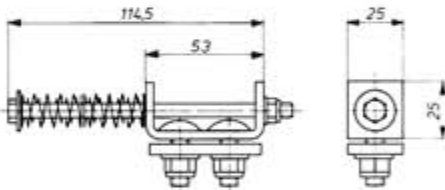


Material: bracket and clamping plate: steel, galvanized
spring: stainless spring steel
fasteners: steel, galvanized
Weight: 0.190 kg

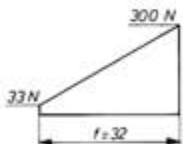
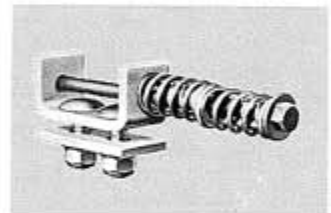


Spring characteristic
Energy absorption 2.65 Nm

Catalogue No.: **END STOP NO 23 216**

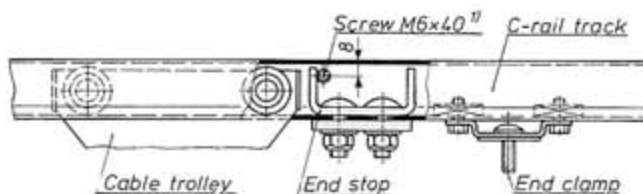


Material: bracket and clamping plate: steel, galvanized
spring: stainless spring steel
fasteners: steel, galvanized
Weight: 0.230 kg



Spring characteristic
Energy absorption 5.3 Nm

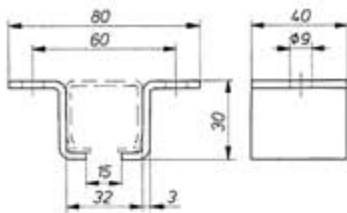
EXAMPLE OF APPLICATION



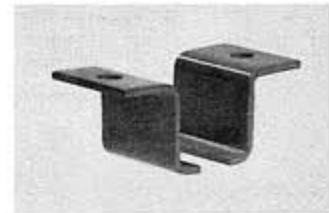
The end stop is installed into the C-rail track between the end clamp and the first cable trolley. So it prevents the cable trolleys from running into the end clamp.

1) To avoid system damage we recommend the fitting of a securing bolt (M 6 x 40) as illustrated.

TRACK SUPPORT BRACKET NO 23 221

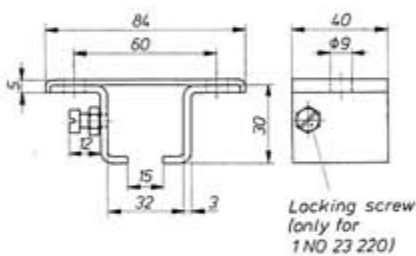


Material: steel, galvanized
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 221	Without locking screw	0.100

TRACK SUPPORT BRACKET NO 23 220 and 1 NO 23 220

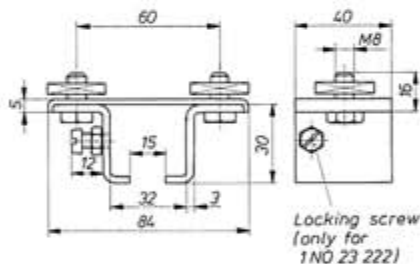


Material: steel, galvanized
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 220	Without locking screw	0.160
1 NO 23 220	With locking screw	0.170

TRACK SUPPORT BRACKET NO 23 222 and 1 NO 23 222 with square nut, to fit track support arm NO 20 185 and NO 20 186

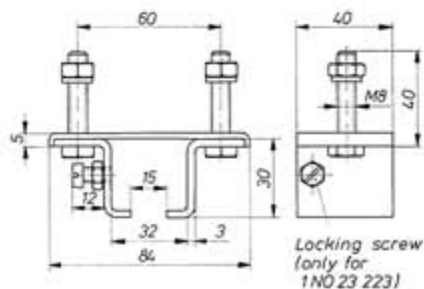


Material: steel, galvanized
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 222	Without locking screw	0.235
1 NO 23 222	With locking screw	0.245

TRACK SUPPORT BRACKET NO 23 223 and 1 NO 23 223

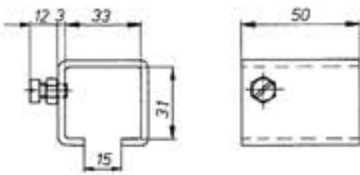


Material: steel, galvanized
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 223	Without locking screw	0.200
1 NO 23 223	With locking screw	0.210

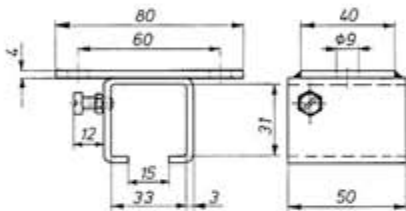
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 224**
for welding or for special suspension arrangements



Material: bracket: steel plate, bare
fasteners: steel, galvanized
Weight: 0.125 kg



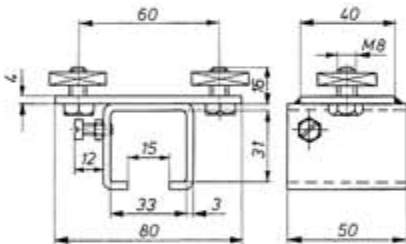
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 225**



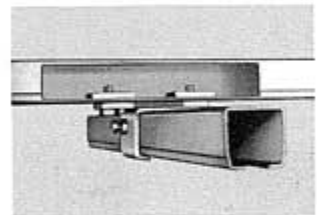
Material: steel, galvanized
Weight: 0.220 kg
Perm. load: 160 kg



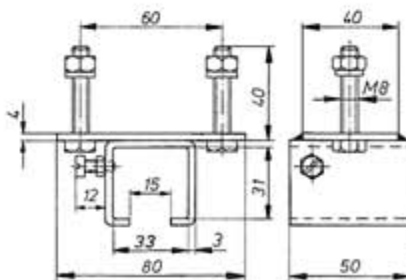
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 226**
with square nuts, to fit track support arm NO 20 185 and NO 20 186



Material: steel, galvanized
Weight: 0.295 kg
Perm. load: 160 kg



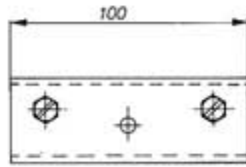
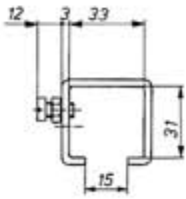
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 227**



Material: steel, galvanized
Weight: 0.260 kg
Perm. load: 160 kg



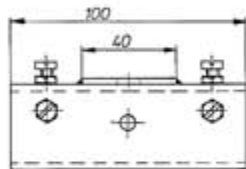
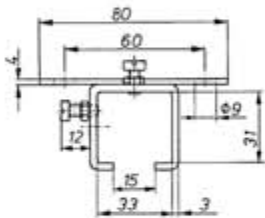
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 232**
for welding or for special suspension arrangements



Material: bracket: steel plate, bare
fasteners: steel, galv.
Weight: 0.260 kg



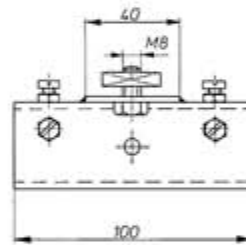
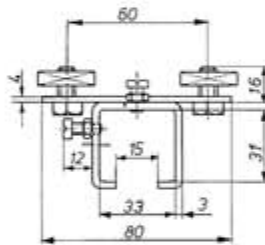
Catalogue No.: **TRACK SUPPORT BRACKET and JOINING BRACKET NO 23 228**



Material: steel, galvanized
Weight: 0.360 kg
Perm. load: 160 kg



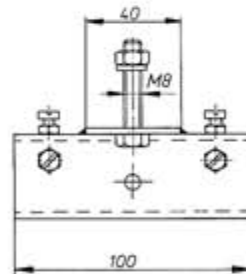
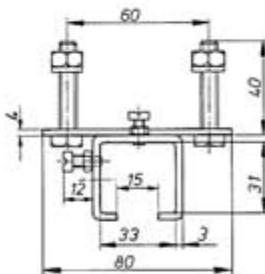
Catalogue No.: **TRACK SUPPORT BRACKET and JOINING BRACKET NO 23 229**
with square nuts, to fit support arm NO 20 185 and NO 20 186



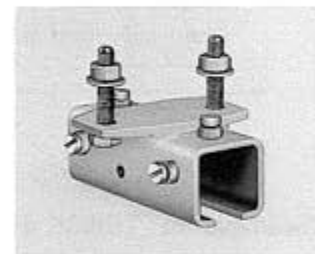
Material: steel, galvanized
Weight: 0.435 kg
Perm. load: 160 kg



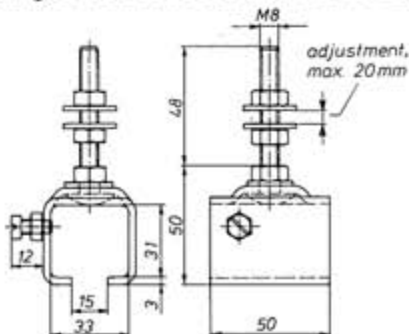
Catalogue No.: **TRACK SUPPORT BRACKET and JOINING BRACKET NO 23 230**



Material: steel, galvanized
Weight: 0.400 kg
Perm. load: 160 kg



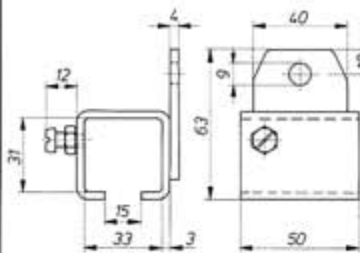
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 231**



Material: steel, galvanized
Weight: 0.270 kg
Perm. load: 63 kg

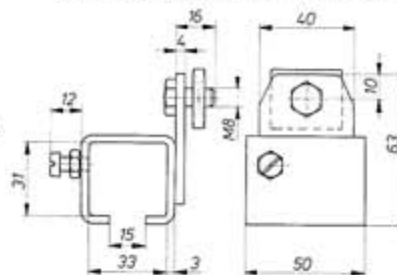


Catalogue No.:
TRACK SUPPORT BRACKET NO 23 240



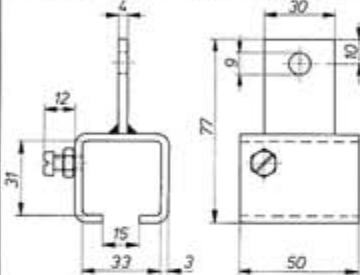
Material: steel, galv.
Weight: 0.200 kg
Perm. load: 100 kg

Catalogue No.:
TRACK SUPPORT BRACKET NO 23 248



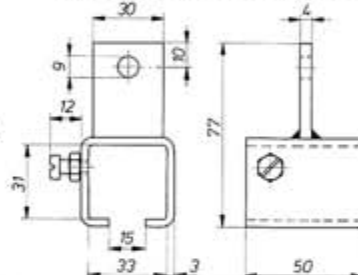
Material: steel, galv.
Weight: 0.220 kg
Perm. load: 100 kg

Catalogue No.:
TRACK SUPPORT BRACKET NO 23 241



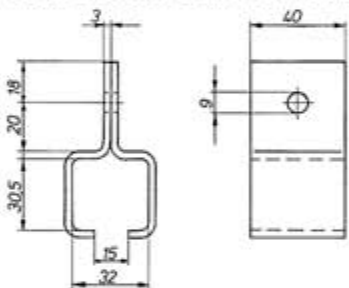
Material: steel, galv.
Weight: 0.175 kg
Perm. load: 100 kg

Catalogue No.:
TRACK SUPPORT BRACKET NO 23 242



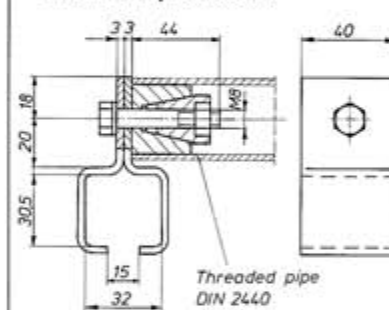
Material: steel, galv.
Weight: 0.175 kg
Perm. load: 100 kg

Catalogue No.:
TRACK SUPPORT BRACKET NO 23 245



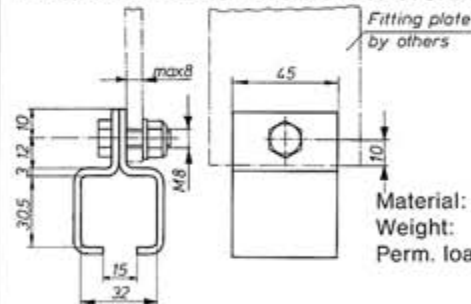
Material: steel, galv.
Weight: 0.200 kg
Perm. load: 63 kg

TRACK SUPPORT BRACKET NO 23 246
with clamp fastener



Material:
bracket: steel, galv.
clamp parts: plastic
fasteners: steel, galv.
Perm. load: 63 kg

Catalogue No.:
TRACK SUPPORT BRACKET NO 23 247

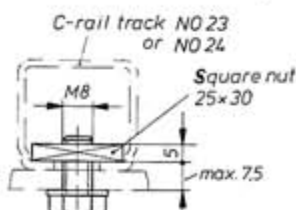


Material: steel, galv.
Weight: 0.180 kg
Perm. load: 100 kg

Application: For fastening support brackets to a 3/4" or 1" threaded pipe.

Catalogue No.	Pipe	Weight [kg]
1 NO 23 246	3/4"	0.220
2 NO 23 246	1"	0.225

Catalogue No.: **BOLT complete 8 x 16 NO 20 176**
with square nut



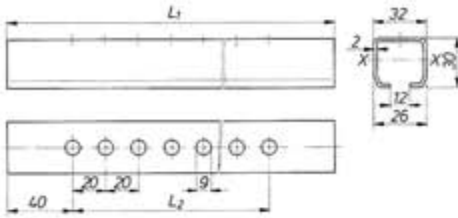
Material: steel, galv.
Weight: 0.038 kg

LIST OF APPLICATION

Standard part + Bolts	≅ Compl. part
NO 23 220 + 2 pieces 8 x 16 NO 20 176	≅ NO 23 222
1 NO 23 220 + 2 pieces 8 x 16 NO 20 176	≅ 1 NO 23 222
NO 23 225 + 2 pieces 8 x 16 NO 20 176	≅ NO 23 226
NO 23 228 + 2 pieces 8 x 16 NO 20 176	≅ NO 23 229
NO 23 240 + 1 piece 8 x 16 NO 20 176	≅ NO 23 248

The complete set will be supplied in component parts, preferably in packing units.

SUPPORT ARM NO 20 185 (30 x 32 x 2)



Material: steel, galvanized
 Static. data: $I_x = 2.11 \text{ cm}^4$, $W_x = 1.36 \text{ cm}^3$

Catalogue No.	L ₁	L ₂	Weight [kg]
Support arm 250 NO 20 185	250	200	0.390
Support arm 315 NO 20 185	315	260	0.500
Support arm 400 NO 20 185	400	340	0.625
Support arm 500 NO 20 185	500	340	0.780
Support arm 630 NO 20 185	630	340	0.980
Support arm 800 NO 20 185	800	340	1.245
Support arm 1000 NO 20 185	1000	340	1.550
Support arm 1250 NO 20 185	1250	340	1.945

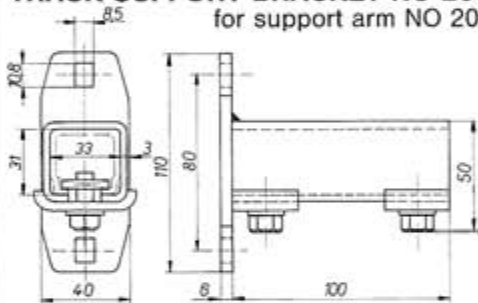
PERMISSIBLE LOADING



	l [m]						
	0.25	0.32	0.4	0.5	0.63	0.8	1.0
P [kg] ¹⁾	76	59.5	47.5	38.0	30.0	24.0	19.0
f [cm]	0.08	0.13	0.20	0.32	0.50	0.80	1.25

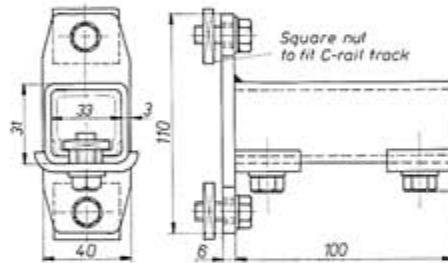
1) Calculated with $\sigma = 140 \text{ N/mm}^2$ tension;
 f = max. resulting deflection.

Catalogue No.: TRACK SUPPORT BRACKET NO 20 280 for support arm NO 20 185



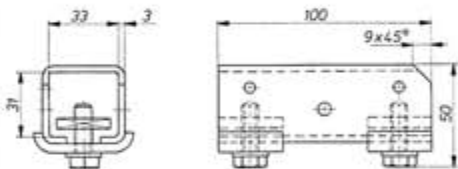
Material: steel, galv.
 Weight: 0.700 kg

Catalogue No.: TRACK SUPPORT BRACKET NO 20 281 for support arm NO 20 185



Material: steel, galv.
 Weight: 0.850 kg

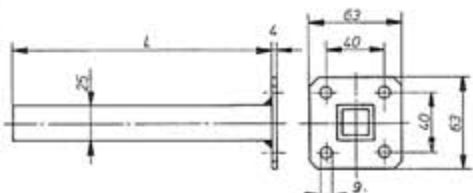
Catalogue No.: BRACKET FOR SUPPORT ARM NO 20 285 to be welded on, for support arm NO 20 185



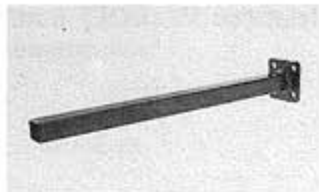
Material: bracket: steel, bare bottom
 guide plate: steel, galv.
 fasteners: steel, galv.
 Weight: 0.420 kg



TOWING ARM NO 20 195

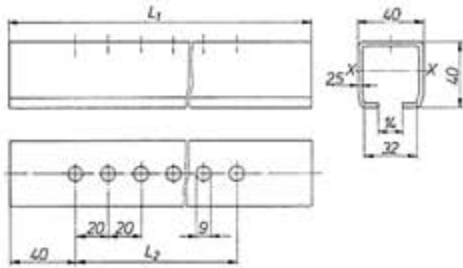


Material: steel, galvanized



Catalogue No.	L	Weight [kg]
Towing arm 400 NO 20 195	400	0.600
Towing arm 630 NO 20 195	630	1.000

SUPPORT ARM NO 20 186 (40 x 40 x 2.5)



Material: steel, galvanized
 Static. data: $I_x = 6.05 \text{ cm}^4$, $W_x = 2.94 \text{ cm}^3$

Catalogue No.	L ₁	L ₂	Weight [kg]
Support arm 250 NO 20 186	250	200	0.625
Support arm 315 NO 20 186	315	260	0.800
Support arm 400 NO 20 186	400	340	1.000
Support arm 500 NO 20 186	500	340	1.250
Support arm 630 NO 20 186	630	340	1.575
Support arm 800 NO 20 186	800	340	2.000
Support arm 1000 NO 20 186	1000	340	2.500
Support arm 1250 NO 20 186	1250	340	3.125

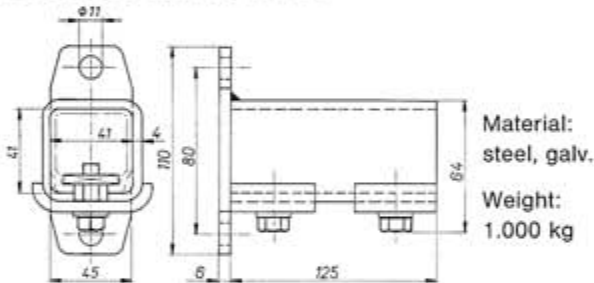
PERMISSIBLE LOADING



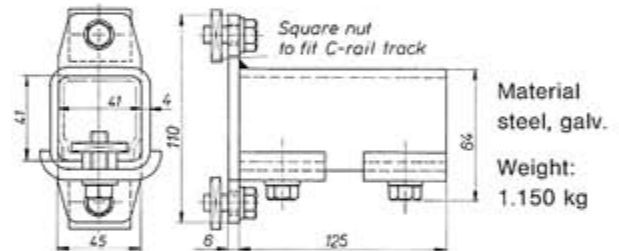
	l [m]						
	0.25	0.32	0.4	0.5	0.63	0.8	1.0
P [kg] ¹⁾	164.5	128.5	103.0	82.5	65.5	51.5	41.0
f [cm]	0.06	0.10	0.16	0.25	0.40	0.63	1.0

1) Calculated with $\sigma = 140 \text{ N/mm}^2$ tension;
 f = max. resulting deflection.

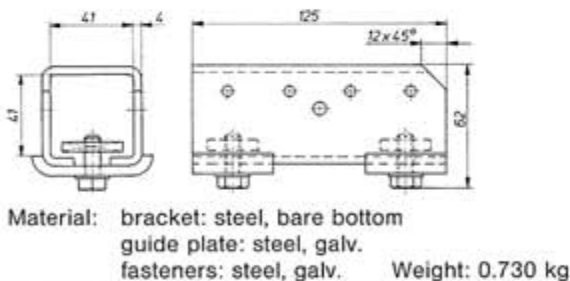
Catalogue No.:
TRACK SUPPORT BRACKET NO 20 282
 for support arm NO 20 186



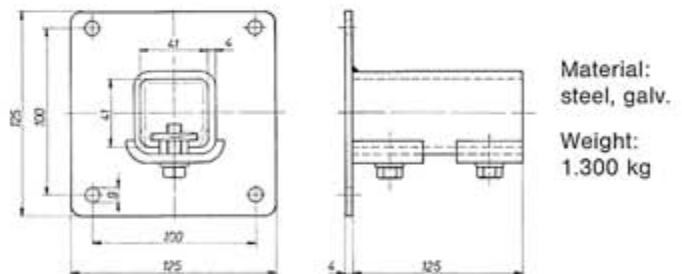
Catalogue No.:
TRACK SUPPORT BRACKET NO 20 283
 for support arm NO 20 186



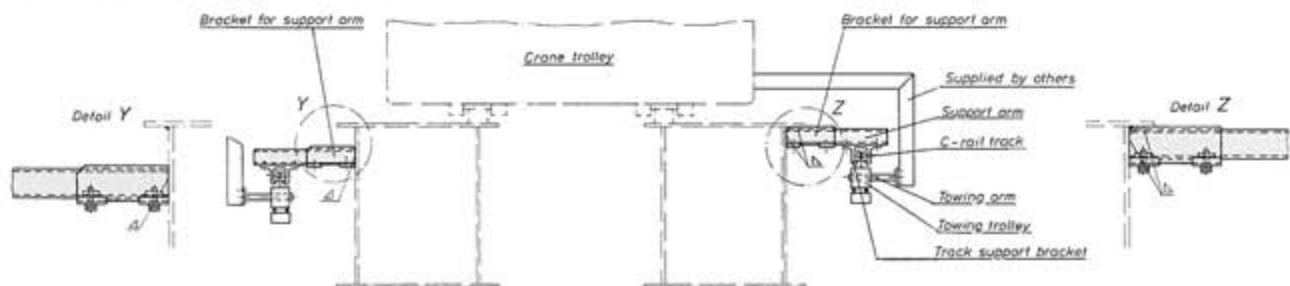
Catalogue No.:
BRACKET FOR SUPPORT ARM NO 20 286
 to be welded on, for support arm NO 20 186



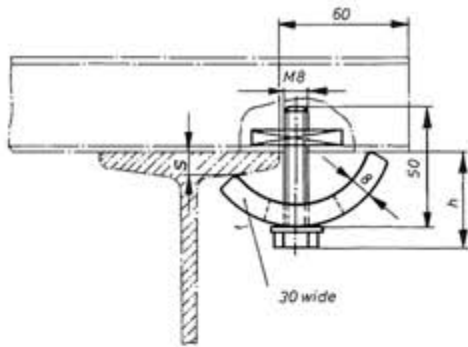
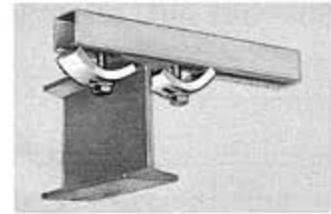
Catalogue No.:
TRACK SUPPORT BRACKET NO 20 284
 for support arm NO 20 186



EXAMPLE FOR APPLICATION



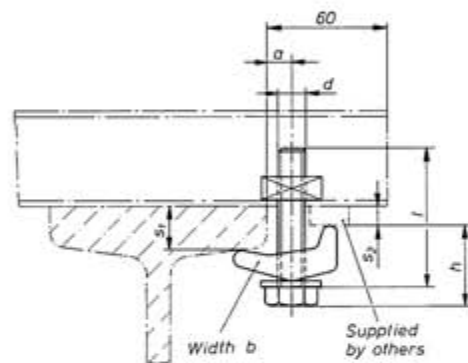
Catalogue No.: **GIRDER CLIP 8 NO 20 180**



Material: steel, galvanized
Weight: 0.150 kg

Clamping thickness »s«	4	6	8	10	12	16	20
Mounting height »h«	31	32	33	34	35	37	40

Catalogue No.: **GIRDER CLIP 10 NO 20 180 and 12 NO 20 180**

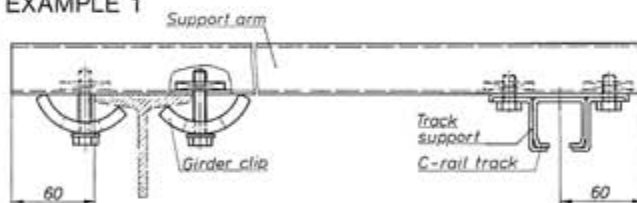


Catalogue No.	d	l	b	a	s ₁	s ₂	h	Weight [kg]
10 NO 20 180	M10	50	32	8	6-11	-	35-41	0.170
					11-16	5	41-46	
					16-21	10	46-51	
12 NO 20 180	M12	60	38	10	6-14	-	39-47	0.240
					14-22	8	47-55	
					22-30	16	55-63	

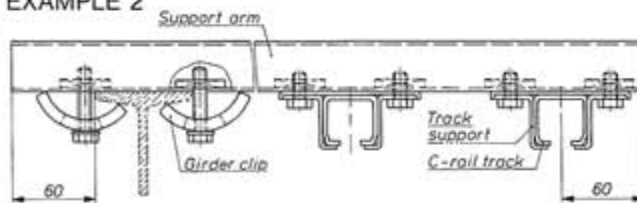
EXAMPLES FOR APPLICATION

An advantage of this arrangement is that no drilling or welding on site is necessary. This method also ensures a perfect alignment of the track and is recommended.

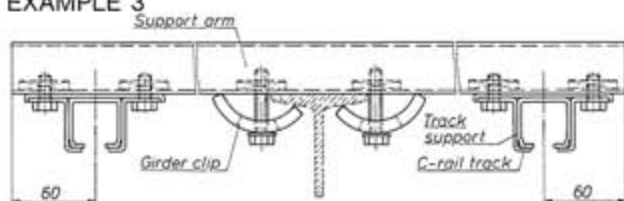
EXAMPLE 1



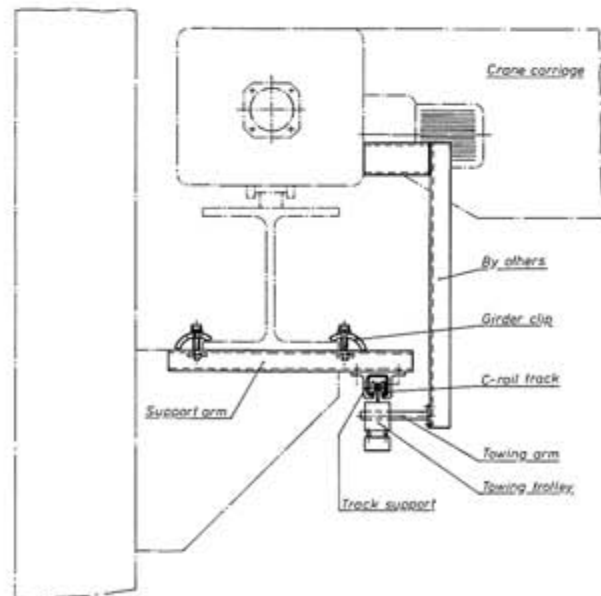
EXAMPLE 2



EXAMPLE 3

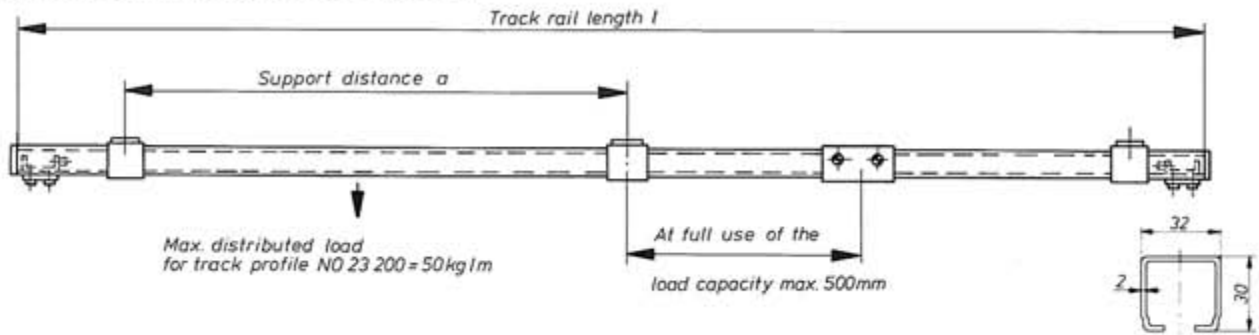


EXAMPLE 4



COMPLETE TRACK SYSTEMS

TRACK SYSTEM complete NO 23 081

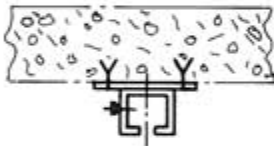


Catalogue No. ¹⁾	l [m]	Part list							a [m]	
		C-rail track NO 23 200			Track coupler NO 23 210	End stop NO 23 218 With screw M 6 x 40 nut and washer	Track support bracket ²⁾			
		2m	4m	6m			NO 23 220 Type A	NO 23 222 Type B		NO 23 223 Type C
2 NO 23 081 Type...	2	1	-	-	-	2	2	2	2	2
4 NO 23 081 Type...	4	-	1	-	-	2	3	3	3	2
6 NO 23 081 Type...	6	-	-	1	-	2	4	4	4	2
8 NO 23 081 Type...	8	-	2	-	1	2	5	5	5	2
10 NO 23 081 Type...	10	-	1	1	1	2	6	6	6	2
12 NO 23 081 Type...	12	-	-	2	1	2	7	7	7	2
16 NO 23 081 Type...	16	-	4	-	3	2	9	9	9	2
20 NO 23 081 Type...	20	-	5	-	4	2	11	11	11	2

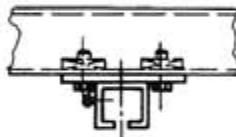
1) The Catalogue No. also incorporate 2 end caps 30 NO 20 662.

2) Delivery 1 track support bracket with locking screw must be used.

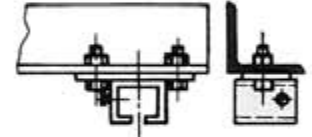
Application of track support types



Type A
Any desired fixing with plugs, screws, to roof girders, wooden beams etc.



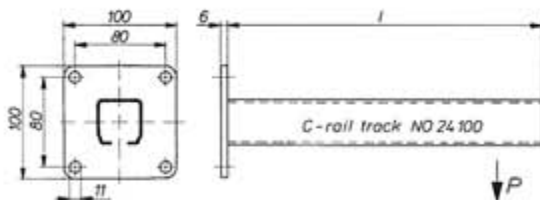
Type B
For fixing in C-rails, for example in support arms



Type C
For fixing to existing steel profiles for example U- or L-profiles

SUSPENSIONS for track systems

BRACKET NO 20 206



Material: steel, galvanized

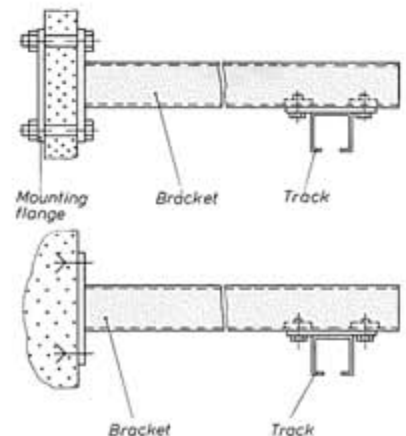
Catalogue No.	l [mm]	Pmax [kg]	Weight [kg]
500 NO 20 206	500	80	1.700
630 NO 20 206	630	63	2.000
800 NO 20 206	800	50	2.450
1000 NO 20 206	1000	40	2.800

Catalogue No.: MOUNTING FLANGE NO 20 295



Material: steel, galvanized
Weight: 0.470 kg

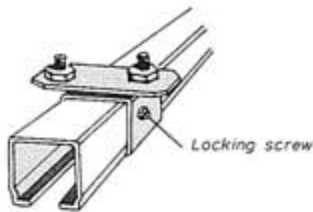
Possible fixing methods



INSTALLATION HINTS

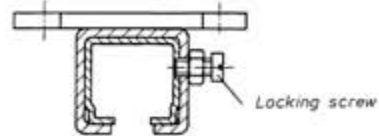
For C-rail fixing material and one example with round cable installation

1.



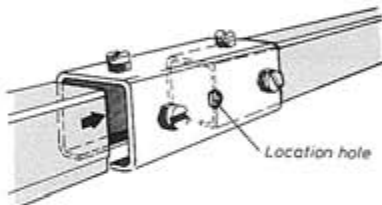
Slide the track support onto the C-rail and bolt together with the track onto the supporting structure. Tighten the locking screw to secure C-rail to the rack support.
Alternatively: Fix track support onto the supporting structure, then slide in C-rail track and tighten with locking screw.

2.



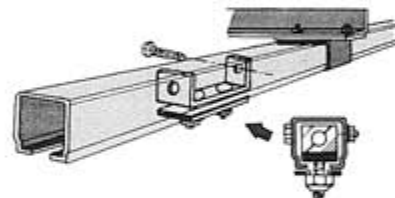
The C-rail track must be secured at each end. This can be achieved by drilling holes $\varnothing 6.2$ into the side of the C-rail track to locate the locking screws.
Care should be taken to prevent the screws on the inner side protruding into the C-rail as this would damage the cable trolleys.

3.



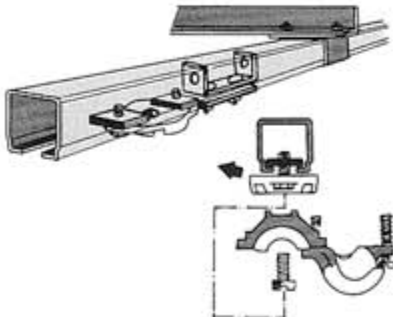
Fit half of the track coupler over the C-rail (using location hole) and tighten the screws. Place next C-rail in position and clamp it leaving no gap between the rails. To achieve this the C-rails have to be cut at right angles and deburred. The locking screws must be tightened equally to avoid misalignment or distortion of the C-rail.

4.



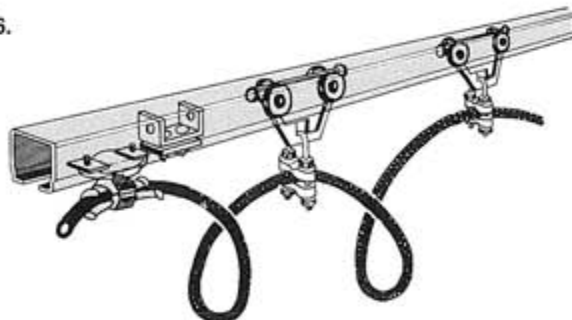
For limiting the travel distance of the trolleys the end stop must be slide into the C-rail and clamped tight. At the end space must be left for the clamp. According to the recommendations of the factory regulations the end stop should be also secured by a bolt M 6 x 40 fitted across the rail.

5.



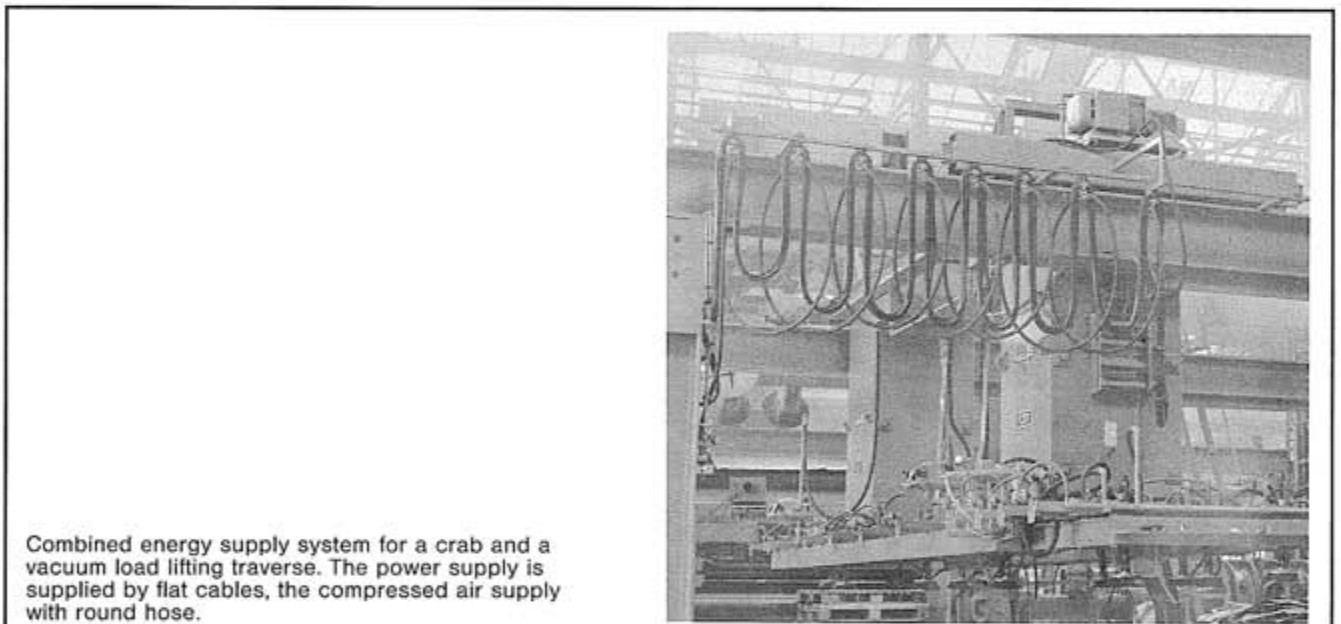
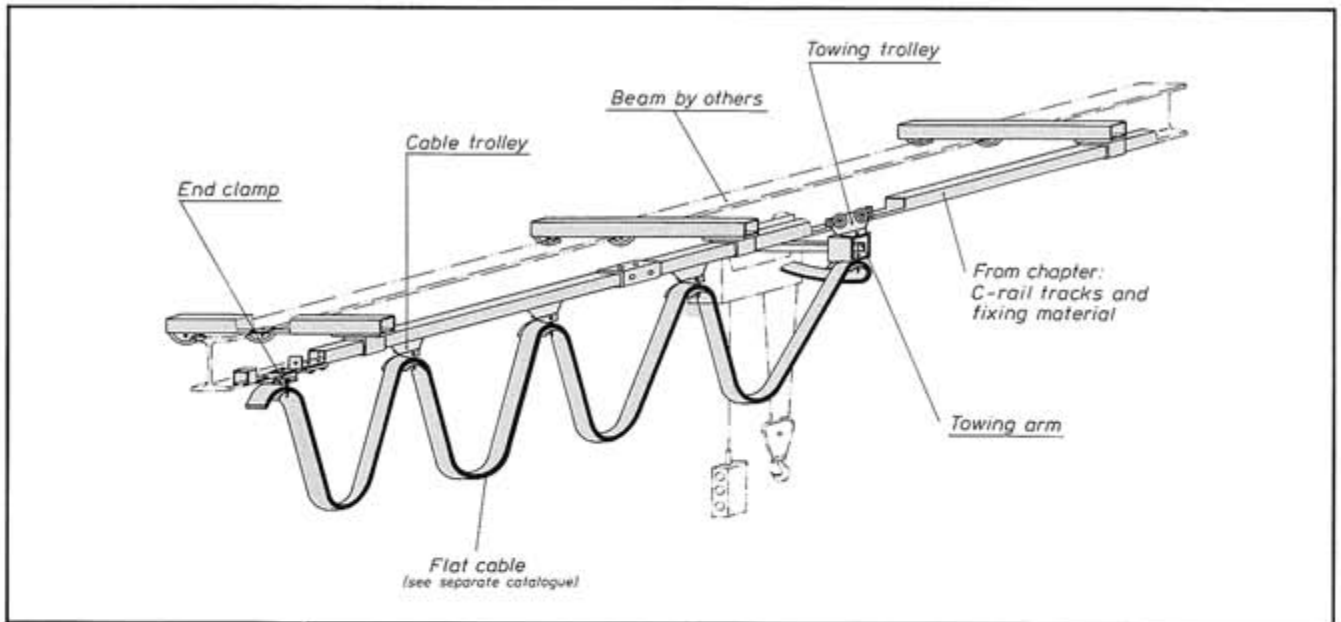
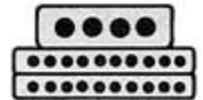
The end clamp fitted with the round cable clip to be pushed behind the end stop and clamped tight.

6.

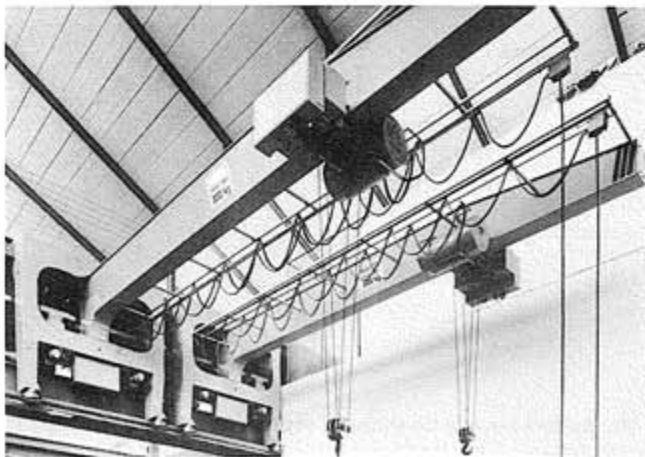


Cable trolleys to be slide into the C-rail in direction of the end clamp. Starting from the end clamp the round cable to be fed without twisting in a spiral form into the cable supports. Push all cable trolleys against the end stop and align the cable loops. Finally clamp the cables tight.

CABLE TROLLEYS AND ACCESSORIES for flat cables



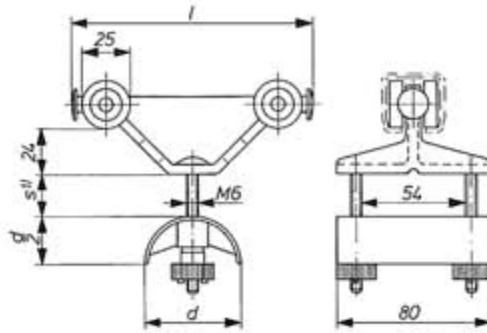
Combined energy supply system for a crab and a vacuum load lifting traverse. The power supply is supplied by flat cables, the compressed air supply with round hose.



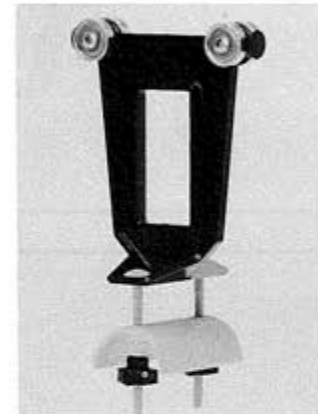
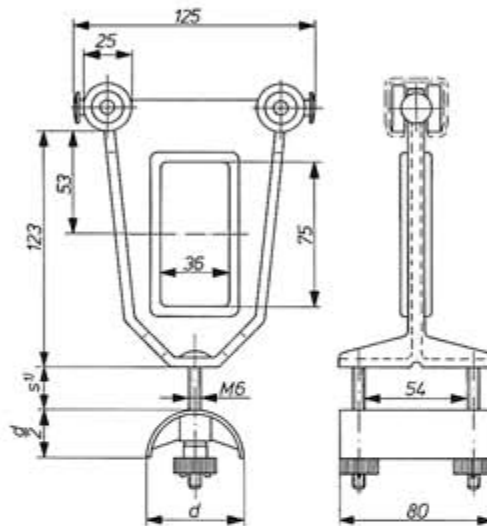
Wall mounted crane with flat flexible cable system and pendant control with ideal control trolley .

CABLE TROLLEY AND CABLE SUPPORT OF PLASTIC

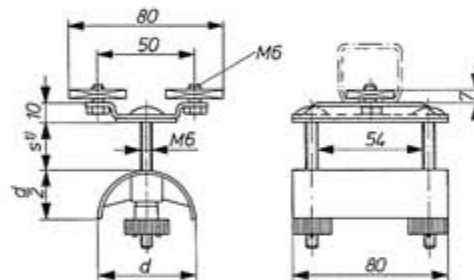
CABLE TROLLEY



TOWING TROLLEY

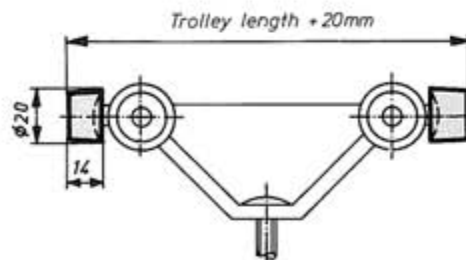


END CLAMP



Catalogue No.:
BUFFER NO 20 670
for cable trolley

Material: rubber
Weight: 0.005 kg



The cable trolleys listed in the tables can be fitted with buffers. The buffers have to be ordered separately and are supplied in packing units of 80 pieces.

CABLE TROLLEY OF PLASTIC; STEEL BALL BEARINGS

Technical data									
Type of roller		Load capacity P [kg]	Operating temperature [°C]	Material		Special pairs of rollers Group ²⁾			
Steel ball bearing, galvanized		20	-30 to +80	Main body: plastic, black Support: plastic, yellow Split nut: plastic Bolt: steel, galvanized Fasteners: steel, galvanized		A			

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS			
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	s ¹⁾	s max.
NO 23 941	0.190	Use next type size		Use next type size		50	80	15	26
NO 23 951	0.195	NO 23 956	0.230	NO 23 269	0.185		125	36	36
NO 23 971	0.230	NO 23 976	0.250	NO 23 279	0.220	80	125	22	28

1) Dimension «s» applies on the assumption that the cable trolley upper parts come together, not the flat cables. The bolts are, however, dimensioned to take cable bundles up to a maximum of «s max.».

2) For special pairs of rollers see chapter on pairs of rollers, page 230/48.

CABLE TROLLEY OF PLASTIC; PLASTIC ROLLERS WITH FRICTION BEARING

Technical data									
Type of roller		Load capacity P [kg]	Operating temperature [°C]	Material		Special pairs of rollers Group ²⁾			
Polyamide roller, yellow with central friction bearing		10	-30 to +60	Main body: plastic, black Support: plastic, yellow Split nut: plastic Bolt: steel, galvanized Fasteners: steel, galvanized		C			

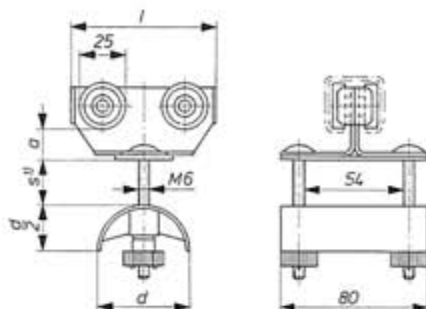
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS			
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	s ¹⁾	s max.
NO 23 943	0.125	Use next type size		Use next type size		50	80	15	26
NO 23 953	0.130	NO 23 958	0.165	NO 23 269	0.185		125	36	36
NO 23 973	0.150	NO 23 978	0.165	NO 23 279	0.220	80	125	22	28

1) Dimension «s» applies on the assumption that the cable trolley upper parts come together, not the flat cables. The bolts are, however, dimensioned to take cable bundles up to a maximum of «s max.».

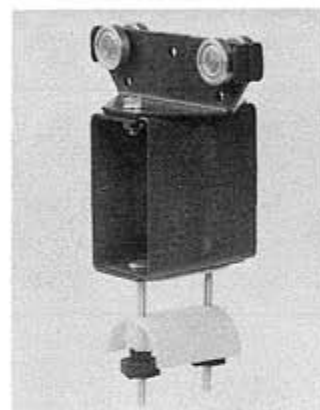
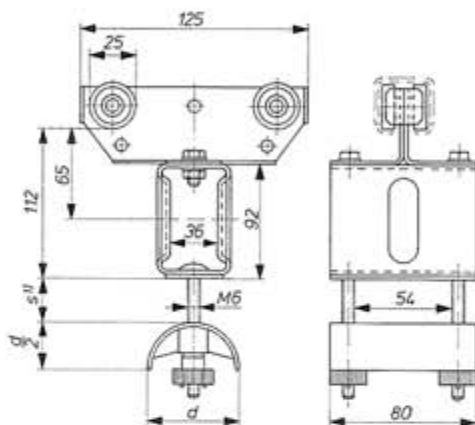
2) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY OF SHEET STEEL, CABLE SUPPORT OF PLASTIC

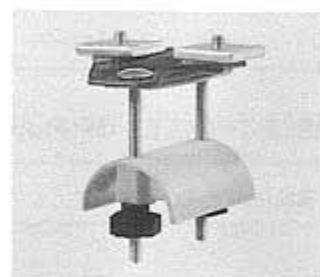
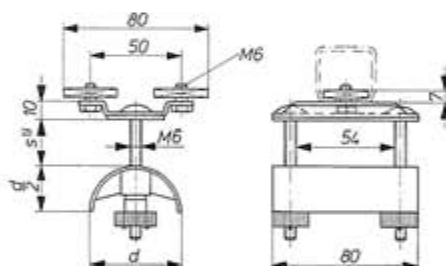
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galvanized Support: plastic Insulating plate: plastic Split nut: plastic Fasteners: steel, galvanized	A and B

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	a	s ¹⁾	s max.
NO 23 261	0.275	4)		4)		50	80	17	15	30
NO 23 263 ³⁾	0.360	NO 23 267	0.600	NO 23 269	0.185		125	22	36	42
NO 23 271	0.385	NO 23 277	0.645	NO 23 279	0.220	80	125	22	22	34

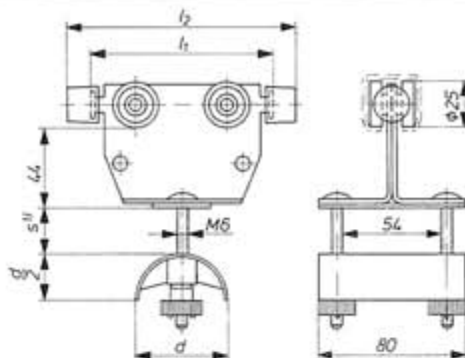
1) Dimension «s» applies on the assumption that the cable trolley upper parts come together, not the flat cables. The bolts are, however, dimensioned to take cable bundles up to a maximum of «s max.».

2) For special pairs of rollers refer to page 230/48.

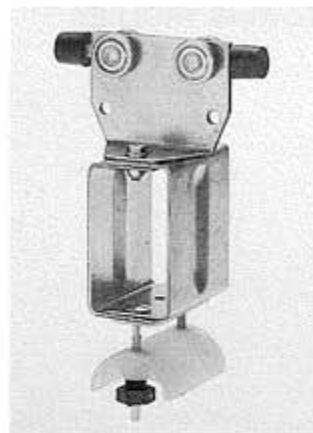
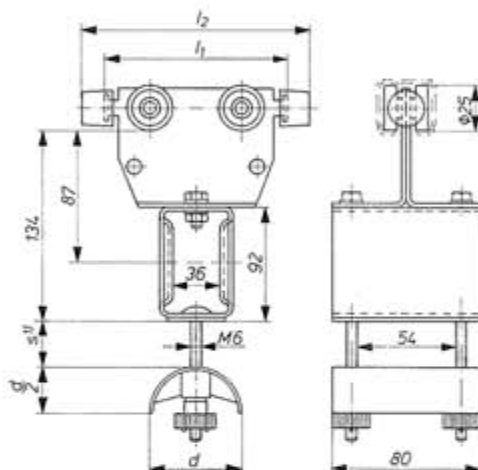
3) Type with holes for towing ropes as shown for towing trolley.

4) Use next type size.

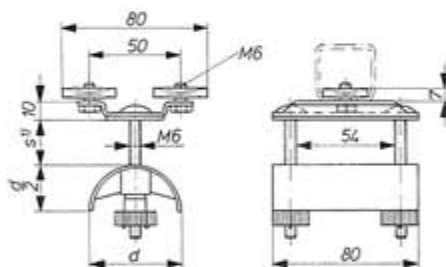
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

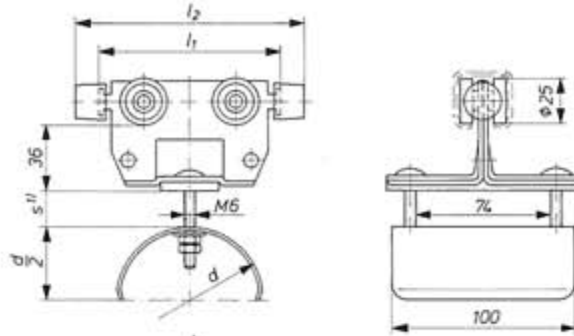
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ³⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galvanized Buffer: rubber Support: plastic Insulating plate: plastic Split nut: plastic Fasteners: steel, galvanized	A

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l ₁	l ₂	s ¹⁾	s _K ²⁾
100 NO 23 265	0.420	100 NO 23 268	0.660	NO 23 269	0.185	50	100	-	25	30
125 NO 23 265	0.440	125 NO 23 268	0.680				-	125	35	
100 NO 23 275	0.445	100 NO 23 278	0.705	NO 23 279	0.220	80	100	-	10	15
125 NO 23 275	0.465	125 NO 23 278	0.725				-	125	20	

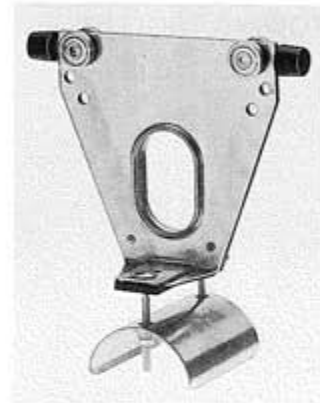
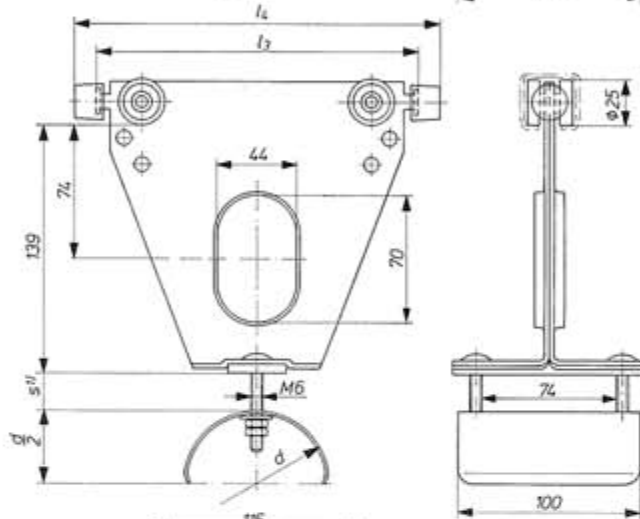
- 1) Dimension «s» applies on the assumption that the cable trolley-buffers come together, not the flat cables.
- 2) The cable trolleys can be combined, i.e. trolleys without buffers and trolleys with buffers can be arranged by turns. The permissible clamping thickness can then be used up to the value of s_K.
For examples of combined cable trolley arrangement refer to page 230/27.
- 3) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY AND CABLE SUPPORT OF SHEET STEEL

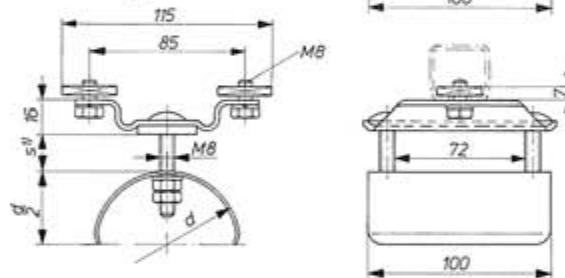
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

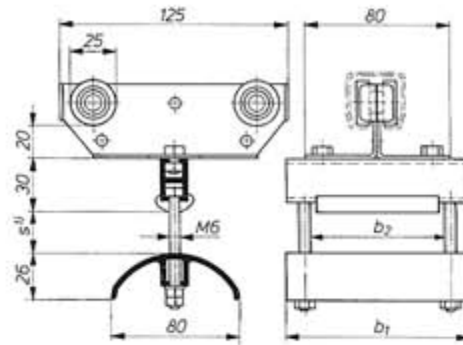
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ³⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galvanized Buffer: rubber Support: steel, galvanized Clamping piece: rubber Fasteners: steel, galvanized	A

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS						
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l ₁	l ₂	l ₃	l ₄	s ¹⁾	s _K ²⁾
100x100 NO 23 509	0.565	175x100 NO 23 519	0.765	100x38 NO 24 289	0.370	50	100	-	175	-	25	30
125x100 NO 23 509	0.585	200x100 NO 23 519	0.785				-	125	-	200	35	
100x100 NO 23 510	0.635	175x100 NO 23 520	0.835	100x38 NO 24 290	0.440	80	100	-	175	-	10	15
125x100 NO 23 510	0.655	200x100 NO 23 520	0.855				-	125	-	200	20	

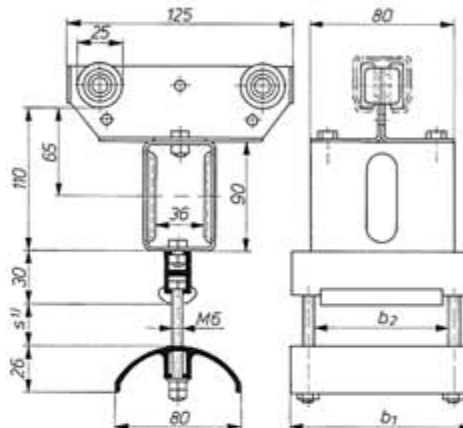
- 1) Dimension «s» applies on the assumption that the cable trolley-buffers come together, not the flat cables.
- 2) The cable trolleys can be combined, i.e. trolleys without buffers and trolleys with buffers can be arranged by turns. The permissible clamping thickness can then be used up to the value of s_K. For examples of combined cable trolley arrangement refer to page 230/27.
- 3) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY OF SHEET STEEL, CABLE SUPPORT OF ALUMINIUM

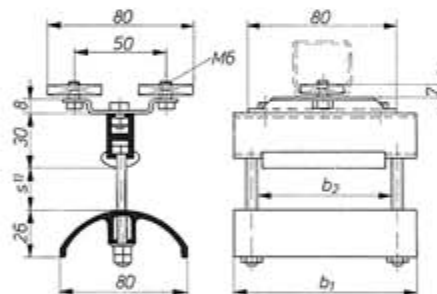
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galvanized Top clamping bar: alu Clamping pad: rubber Support: aluminium Fasteners: steel, galvanized	A and B

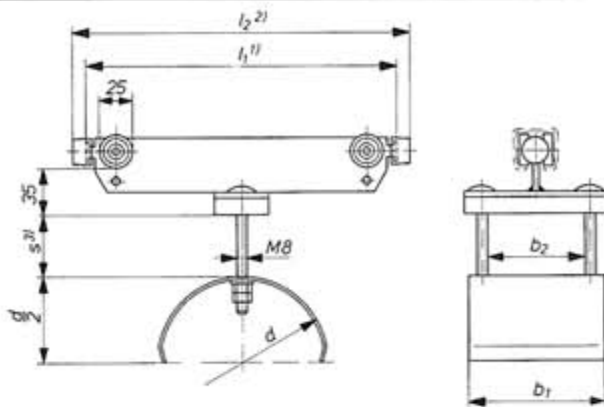
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS			
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	b ₁	b ₂ max.	s ¹⁾	s max.
100 NO 23 281	0.490	100 NO 23 287	0.745	100 NO 23 289	0.325	100	74	22	38
160 NO 23 281	0.580	160 NO 23 287	0.850	160 NO 23 289	0.400	160	134		

1) Dimension «s» applies on the assumption, that the cable trolley upper parts come together, not the flat cables. The bolts are, however, dimensioned to take cable bundles up to a maximum of «s max.».

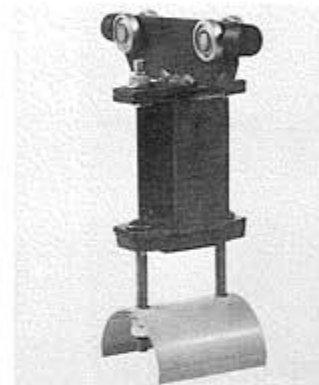
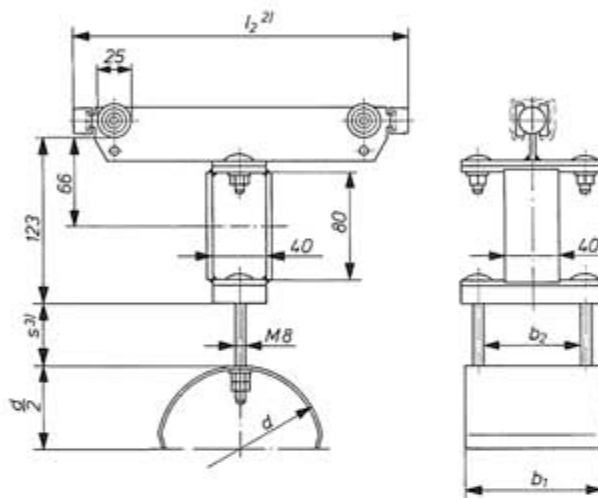
2) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY OF STEEL, CABLE SUPPORT OF SHEET STEEL

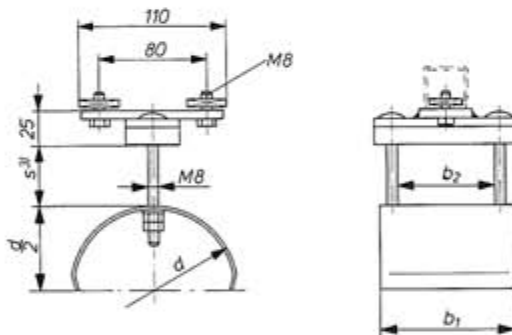
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ⁶⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galvanized Buffer: rubber Support: steel, galvanized Clamping piece: rubber Fasteners: steel galvanized	A (B restricted)

1) l_1 = cable trolleys without rubber buffers.

2) l_2 = cable trolleys with rubber buffers, towing trolleys are supplied only with rubber buffers.

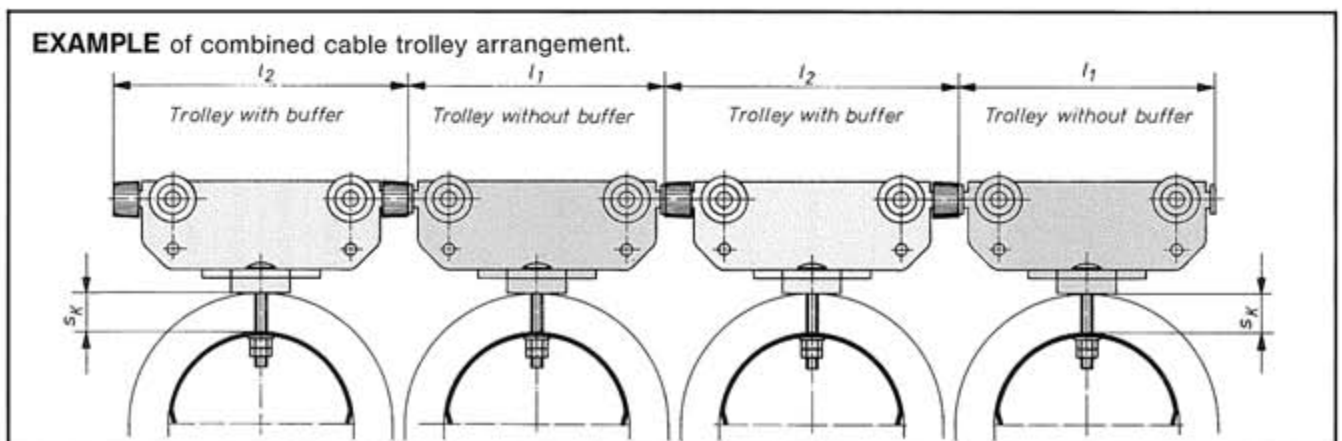
3) Dimension «s» applies on the assumption that the cable trolley buffers come together, not the flat cables.

4) The cable trolleys can be combined, i.e. trolleys without buffers and trolleys with buffers can be arranged by turns. The permissible clamping thickness can then be used up to a value of «s_K».
For examples of combined cable trolley arrangement refer to page 230/27.

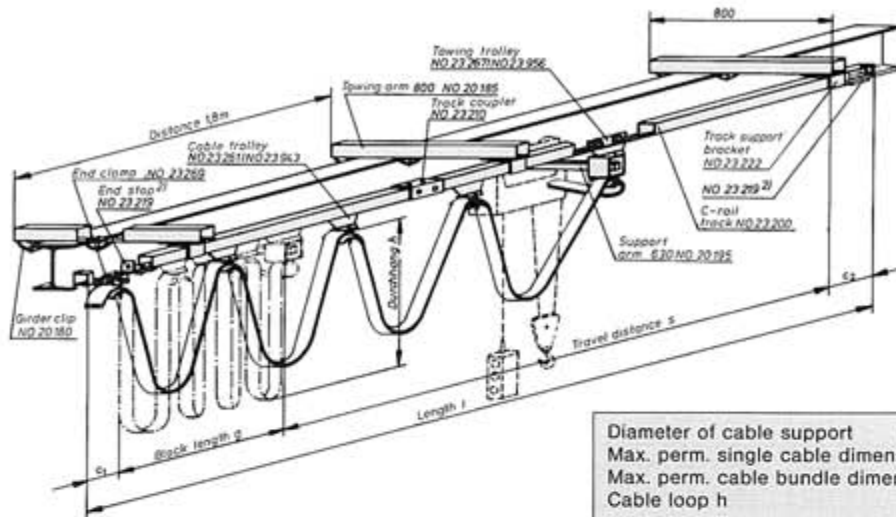
5) Length of towing trolley $l_2 = 125$ mm.

6) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS							
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	$l_1^{1)}$	$l_2^{2)}$	b_1	b_2 max.	$s^{3)}$ max.	$s_K^{4)}$	
100x100 NO 23 330	0.640	125x100 NO 23 335 ⁵⁾	1.190	100x68 NO 24 230	0.700	80	-	100	100	72	8	-	
105x100 NO 23 330 125x100 NO 23 330	0.640 0.650	125x100 NO 23 335	1.190	100x68 NO 24 230	0.700		105	-	100	72	12	20	16
105x160 NO 23 330 125x160 NO 23 330	0.850 0.860	125x160 NO 23 335	1.520	160x68 NO 24 230	0.940		105	-	160	132	12	20	16
140x100 NO 23 330 160x100 NO 23 330	0.690 0.700	160x100 NO 23 335	1.240	100x68 NO 24 230	0.700		140	-	100	72	30	38	34
140x160 NO 23 330 160x160 NO 23 330	0.890 0.900	160x160 NO 23 335	1.560	160x68 NO 24 230	0.940		140	-	160	132	30	38	34
180x100 NO 23 330 200x100 NO 23 330	0.760 0.770	200x100 NO 23 335	1.310	100x68 NO 24 230	0.700		180	-	100	72	50	58	54
180x160 NO 23 330 200x160 NO 23 330	0.960 0.970	200x160 NO 23 335	1.630	160x68 NO 24 230	0.940		180	-	160	132	50	58	54
160x100 NO 23 332	0.820	160x100 NO 23 337	1.360	100x48 NO 24 232	0.800	125	-	160	100	72	15	-	
160x160 NO 23 332	1.110	160x160 NO 23 337	1.770	160x48 NO 24 232	1.130		-	160	160	132	15	-	-
180x100 NO 23 332 200x100 NO 23 332	0.860 0.870	200x100 NO 23 337	1.410	100x48 NO 24 232	0.800		180	-	100	72	27	35	31
180x160 NO 23 332 200x160 NO 23 332	1.150 1.160	200x160 NO 23 337	1.820	160x48 NO 24 232	1.130		180	-	160	132	27	35	31
230x100 NO 23 332 250x100 NO 23 332	0.930 0.940	250x100 NO 23 337	1.480	100x68 NO 24 232	0.820		230	-	100	72	52	60	56
230x160 NO 23 332 250x160 NO 23 332	1.230 1.240	250x160 NO 23 337	1.900	160x68 NO 24 232	1.150		230	-	160	132	52	60	56
200x100 NO 23 333 200x160 NO 23 333	1.020 1.400	200x100 NO 23 338 200x160 NO 23 338	1.560 2.060	100x48 NO 24 233 160x48 NO 24 233	1.000 1.400		160	-	200	115	72	18	-
230x100 NO 23 333 250x100 NO 23 333	0.940 0.950	250x100 NO 23 338	1.490	100x48 NO 24 233	1.000	230		-	115	72	35	42	38
230x160 NO 23 333 250x160 NO 23 333	1.330 1.340	250x160 NO 23 338	2.000	160x48 NO 24 233	1.400	230		-	175	132	35	42	38
260x100 NO 23 333 280x100 NO 23 333	1.020 1.030	280x100 NO 23 338	1.570	100x68 NO 24 233	1.020	260		-	115	72	50	58	54
260x160 NO 23 333 280x160 NO 23 333	1.410 1.420	280x160 NO 23 338	2.080	160x68 NO 24 233	1.420	260		-	175	132	50	58	54
250x100 NO 23 334 250x160 NO 23 334	1.050 1.590	250x100 NO 23 339 250x160 NO 23 339	1.590 2.250	100x48 NO 24 234 160x48 NO 24 234	1.100 1.650	200		-	250	115	72	22	-
260x100 NO 23 334 280x100 NO 23 334	1.120 1.130	280x100 NO 23 339	1.670	100x48 NO 24 234	1.100			260	-	115	72	30	38
260x160 NO 23 334 280x160 NO 23 334	1.660 1.670	280x160 NO 23 339	2.330	160x48 NO 24 234	1.650		260	-	175	132	30	38	34
300x100 NO 23 334 320x100 NO 23 334	1.180 1.190	320x100 NO 23 339	1.730	100x68 NO 24 234	1.120		300	-	115	72	50	58	54
300x160 NO 23 334 320x160 NO 23 334	1.720 1.730	320x160 NO 23 339	2.390	160x68 NO 24 234	1.670		300	-	175	132	50	58	54



COMPLETE FLEXIBLE CABLE SYSTEMS for flat cables without cables



Cables and accessories must be ordered separately.
 Required cable length $L = (l - 0.5) \cdot 1.15 + 2$ m installation addition [m]
 Block length $g =$ dimension from middle of towing trolley to middle of end clamp (without tolerance)

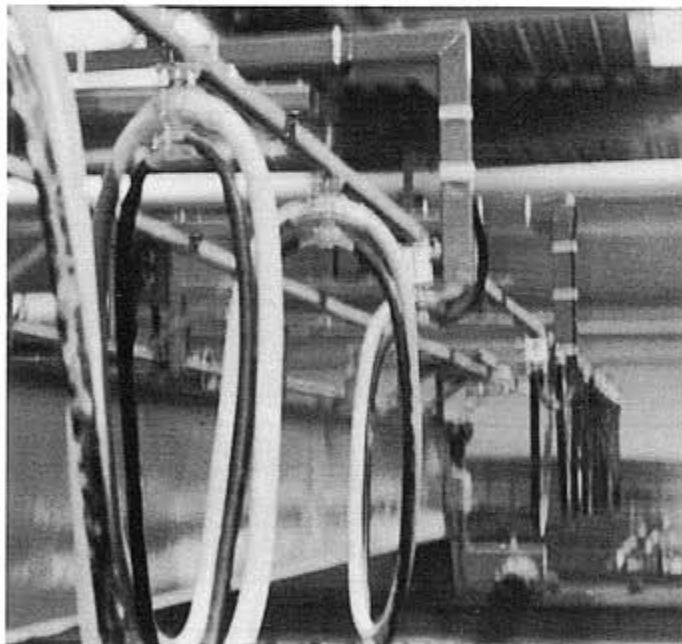
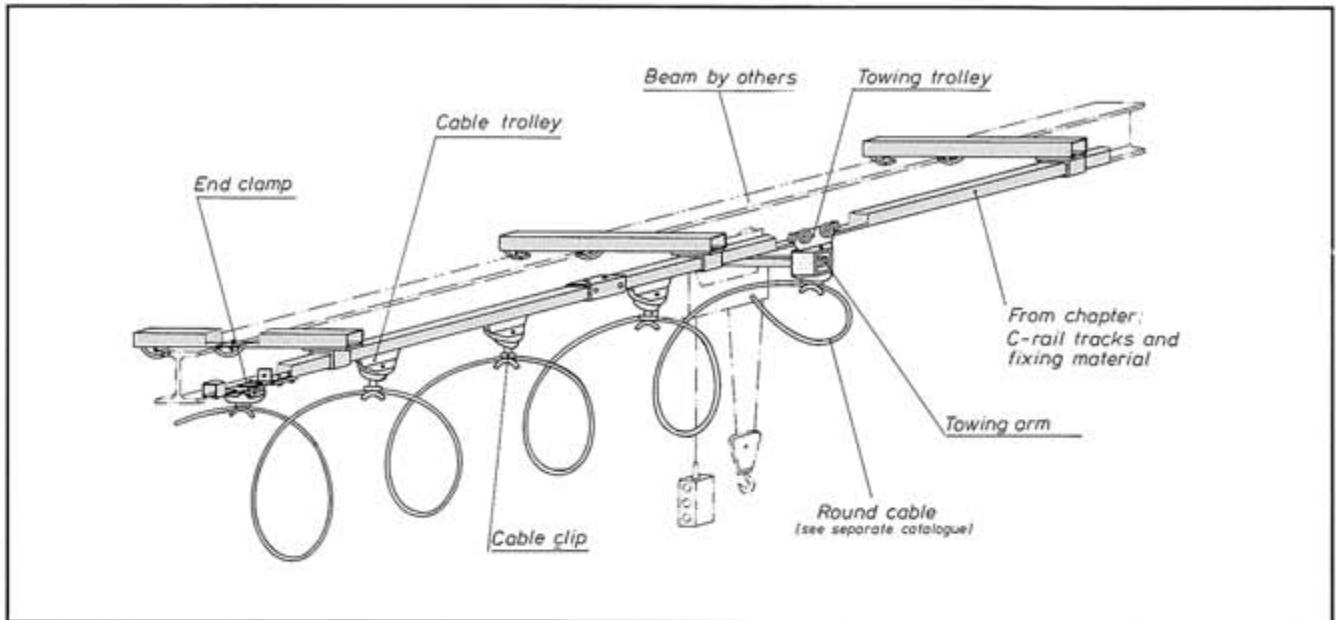
Diameter of cable support	= 50 mm
Max. perm. single cable dimension	= 8x54 mm
Max. perm. cable bundle dimension	= 15x54 mm
Cable loop h	= 0.8 m resp. 1.25 m
Free track length up to middle of end clamp c1	= 350 mm
Free track length up to middle of towing trolley c2	= 150 mm

l [m]	Catalogue No. for complete flexible cable system				g [m]		Max. perm. travel distance s [m]	
	Type steel trolley with ball bearings, steel galvanized. Cable trolley NO 23 261		Type plastic trolley with rollers of PA and friction bearing. Cable trolley NO 23 943					
	for h = 0.8 m	for h = 1.25 m	for h = 0.8 m	for h = 1.25 m	for h = 0.8 m	for h = 1.25 m	for h = 0.8 m	for h = 1.25 m
6	6x0.8NO 23 011	6x1.25NO 23 011	6x0.8NO 23 017	6x1.25NO 23 017	0.40	0.32	5.10	5.18
7	7x0.8NO 23 011	7x1.25NO 23 011	7x0.8NO 23 017	7x1.25NO 23 017	0.48	0.32	6.02	6.18
8	8x0.8NO 23 011	8x1.25NO 23 011	8x0.8NO 23 017	8x1.25NO 23 017	0.56	0.40	6.94	7.10
9	9x0.8NO 23 011	9x1.25NO 23 011	9x0.8NO 23 017	9x1.25NO 23 017	0.64	0.40	7.86	8.10
10	10x0.8NO 23 011	10x1.25NO 23 011	10x0.8NO 23 017	10x1.25NO 23 017	0.64	0.48	8.86	9.02
12	12x0.8NO 23 011	12x1.25NO 23 011	12x0.8NO 23 017	12x1.25NO 23 017	0.80	0.56	10.70	10.94
14	14x0.8NO 23 011	14x1.25NO 23 011	14x0.8NO 23 017	14x1.25NO 23 017	0.88	0.64	12.62	12.86
16	16x0.8NO 23 011	16x1.25NO 23 011	16x0.8NO 23 017	16x1.25NO 23 017	0.96	0.72	14.54	14.78
18	18x0.8NO 23 011	18x1.25NO 23 011	18x0.8NO 23 017	18x1.25NO 23 017	1.12	0.72	16.38	16.78
20	20x0.8NO 23 011	20x1.25NO 23 011	20x0.8NO 23 017	20x1.25NO 23 017	1.20	0.80	18.30	18.70
22	22x0.8NO 23 011	22x1.25NO 23 011	22x0.8NO 23 017	22x1.25NO 23 017	1.28	0.88	20.22	20.62
24	24x0.8NO 23 011	24x1.25NO 23 011	24x0.8NO 23 017	24x1.25NO 23 017	1.44	0.96	21.06	22.54

l [m]	C-rail track NO 23 200 m required	Quantities				Constant quantities					
		Support arm 800 NO 20 185	Girder clip NO 20 180	Track coupler NO 23 211	Track support bracket NO 23 222	Cable trolley ¹⁾		For installations NO 23 011		For installations NO 23 017	
						for h = 0.8 m	for h = 1.25 m				
6	1x6	4	8	-	4	3	2				
7	1x4 + 1x3	5	10	1	5	4	2				
8	2x4	6	12	1	6	5	3				
9	1x6 + 1x3	6	12	1	6	6	3				
10	1x6 + 1x4	7	14	1	7	6	4				
12	2x6	8	16	1	8	8	5				
14	1x6 + 2x4	9	18	2	9	9	6				
16	2x6 + 1x4	10	20	2	10	10	7				
18	3x6	11	22	2	11	12	7				
20	2x6 + 2x4	12	24	3	12	13	8				
22	3x6 + 1x4	14	28	3	14	14	9				
24	4x6	15	30	3	15	16	10				

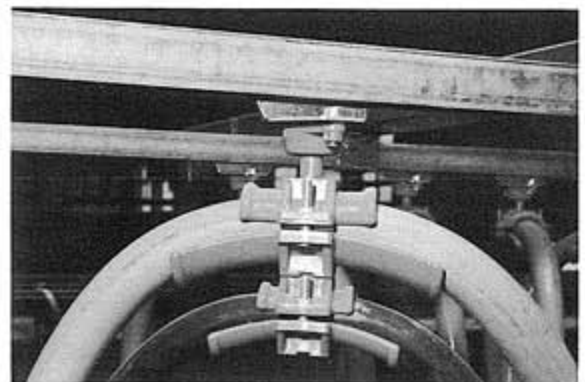
1) Using flat cables the number of trolleys required has been calculated out on the basis of 15% surplus cable.
 2) For securing the end stops we supply two bolts M6 x 40 and two washers.

CABLE TROLLEYS AND ACCESSORIES for round cables and hoses

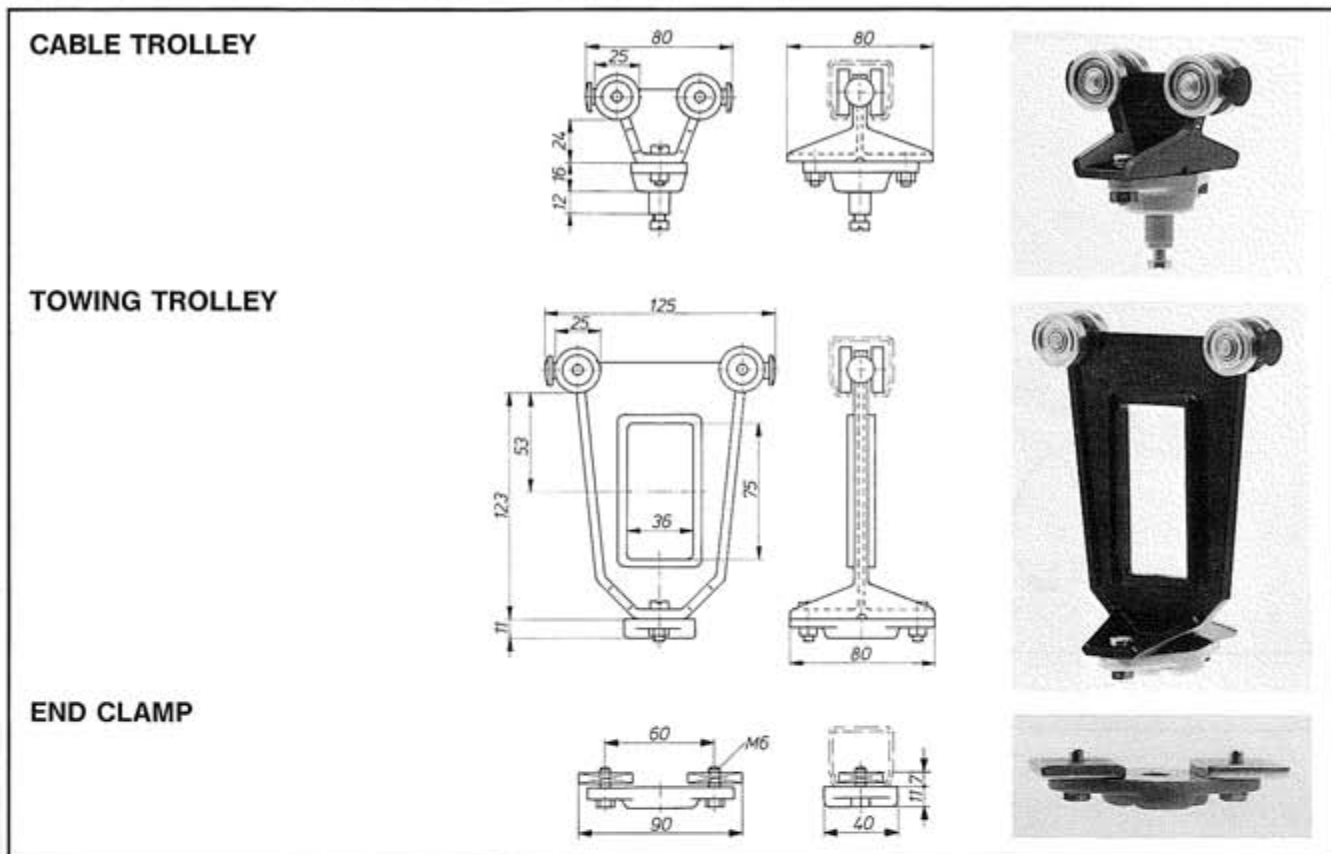


Flexible cable system with round cables

Detail of a flexible cable system with round cables:
cable trolley NO 23 291 with
cable clip 25 NO 20 131 and 16 NO 20 131



CABLE TROLLEY OF PLASTIC for round cable clips



CABLE TROLLEY OF PLASTIC; STEEL BALL BEARINGS

Technical data							
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material		Special pairs of rollers Group ¹⁾		
Steel ball bearing, galvanized	20	-30 to +60	Main body: plastic, black Ball point: plastic, yellow Connecting plate: plastic Fasteners: steel, galvanized		A		
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENT PARTS	
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips	Rubber buffer
NO 23 991	0.160	NO 23 996	0.195	NO 23 299	0.090	16.25,(36) NO 20 131 36=restricted use	NO 20 670

1) For special pairs of rollers refer to page 230/48.

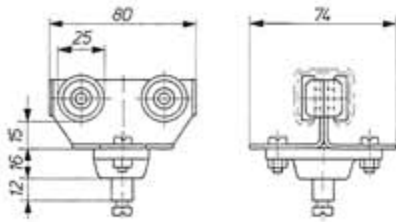
CABLE TROLLEY OF PLASTIC; PLASTIC ROLLERS WITH FRICTION BEARING

Technical data							
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material		Special pairs of rollers Group ¹⁾		
Polyamide roller, yellow with central friction bearing	10	-30 to +60	Main body: plastic, black Ball joint: plastic, yellow Connecting plate: plastic Fasteners: steel, galvanized		C		
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENT PARTS	
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips	Rubber buffer
NO 23 993	0.095	NO 23 998	0.130	NO 23 299	0.090	16.25,(36) NO 20 131 36=restricted use	NO 20 670

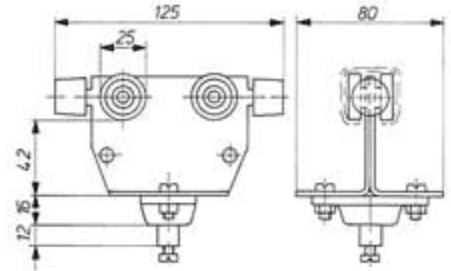
1) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY OF SHEET STEEL for round cable clips

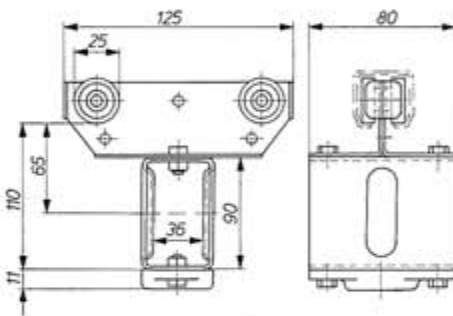
CABLE TROLLEY NO 23 291



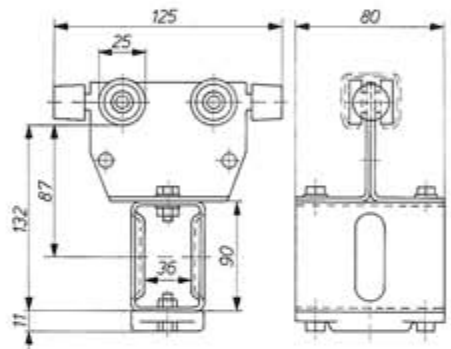
CABLE TROLLEY 125 NO 23 291



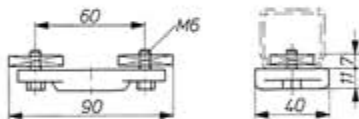
TOWING TROLLEY NO 23 297



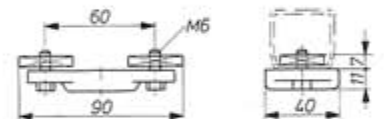
TOWING TROLLEY 125 NO 23 300



END CLAMP NO 23 299



END CLAMP NO 23 299



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾	
Steel ball bearing, galvanized	20	-30 to +60	Main body: steel, galvanized Buffer: rubber Ball joint: plastic Connecting plate: plastic Fasteners: steel, galvanized	A + B	A
				NO 23 291	125
				NO 23 297	NO 23 291
					125
					NO 23 330

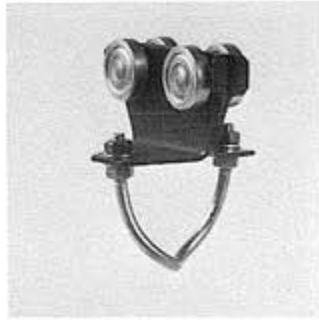
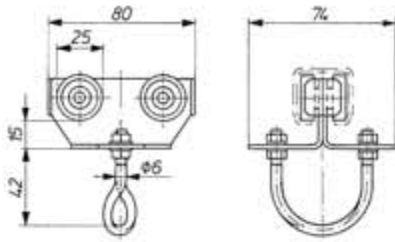
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENT PARTS
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips
NO 23 291 ²⁾	0.260	NO 23 297	0.570	NO 23 299	0.090	16, 25, (36) NO 20 131 Size 36=restricted use only
125 NO 23 291	0.320	125 NO 23 300	0.650			16, 25, 36 NO 20 131

1) For special pairs of rollers refer to page 230/48.

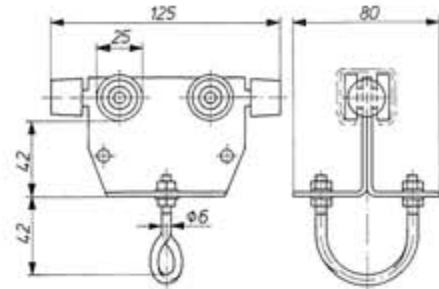
2) Towing ropes can be attached to these trolleys, if the plate NO 20 141 is fitted, refer to page 230/51.

CABLE TROLLEY OF SHEET STEEL for round cable clips

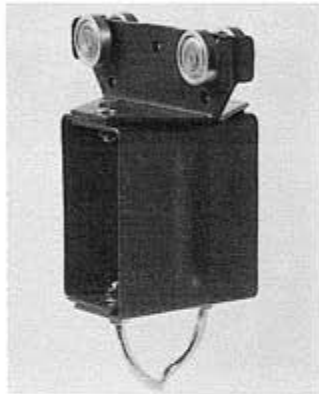
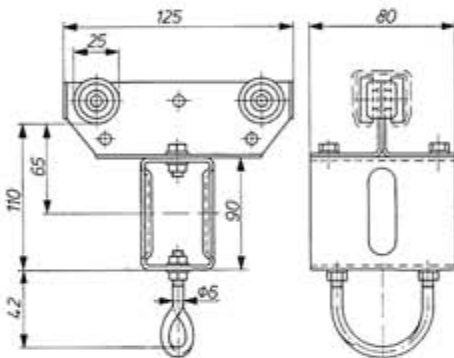
CABLE TROLLEY NO 23 293



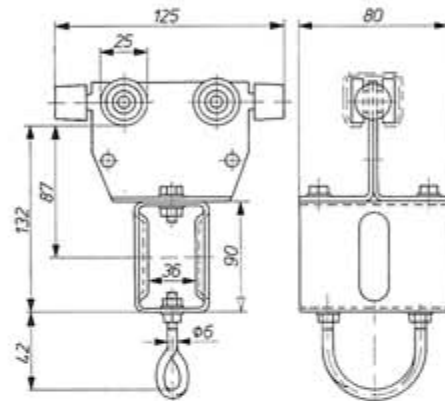
CABLE TROLLEY 125 NO 23 293



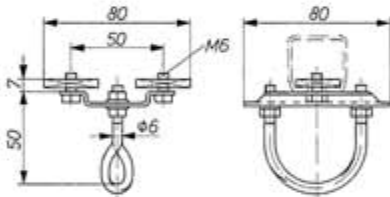
TOWING TROLLEY NO 23 295



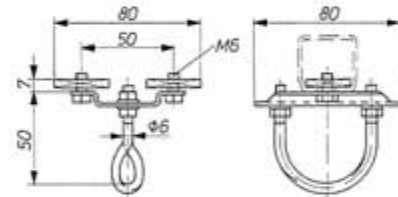
TOWING TROLLEY 125 NO 23 296



END CLAMP NO 23 298



END CLAMP NO 23 298



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾	
Steel ball bearings, galvanized	20	trolleys without buffers -30 to +100	Main body: steel, galv. Buffer: rubber	A + B	A
		trolleys with buffers -30 to +80	U-bracket: steel, galv. Fasteners: steel, galv.	NO 23 293 NO 23 295	125 NO 23 293 125 NO 23 296

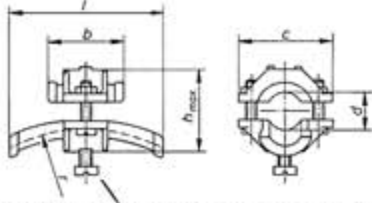
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENT PARTS
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips
NO 23 293 ²⁾	0.250	NO 23 295	0.600	NO 23 298	0.200	16, 25, (36) NO 20 133 Size 36=restricted use only
125 NO 23 293	0.310	125 NO 23 296	0.660			16, 25, 36, 50 NO 20 133

1) For special pairs of rollers refer to page 230/48.

2) Towing ropes can be attached to these trolleys, if the plate NO 20 141 is fitted, refer to page 230/51.

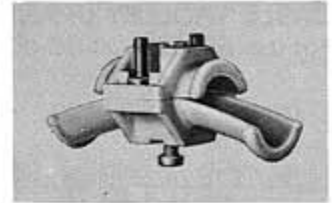
CABLE CLIPS for round cables and hoses

CABLE CLIP NO 20 133



Operating temperature: -30°C to +80°C

Material: cable clip
size 16, 25, 36: plastic
size 50: aluminium
fasteners: steel, galvanized



NOTE: This screw is not for clamping round cables but for fixing further cable clips. If there is no additional cable clip, the screw is removed.

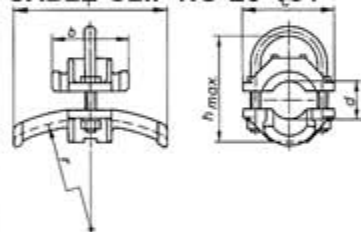
Catalogue No.	d Cable-ø	r	l	h max.	b	c	Weight [kg]	Cable trolleys	Towing trolleys	Suitable end clamp
16 NO 20 131	10-16	80	70	38	35	42	0.040	NO 23 291	NO 23 297	NO 23 299
25 NO 20 131	17-25	125	100	47	50	50	0.060	125 NO 23 291 NO 23 991	125 NO 23 300 NO 23 996	
36 NO 20 131	26-36	180	140	58	70	64	0.120	NO 23 993	NO 23 998	
50 NO 20 131	37-50	250	200	80	100	90	0.260	Only fits below cable clip 50 NO 20 133		

Application: The cable clips are designed to support round cables and hoses.

If required, it is possible to fit two or more similar, or different sized cable clips to a trolley or end clamp. When fitting different sized cable clips, the largest cable clip must be fitted on top.

The cable clips can also be fitted under the cable clips with U suspension bracket NO 20 133.

CABLE CLIP NO 20 131



Operating temperature: -30°C to +80°C

Material: cable clip
size 16, 25, 36: plastic
size 50: aluminium
fasteners: steel, galvanized

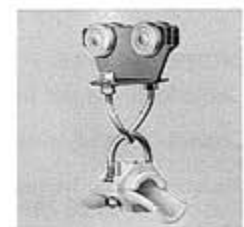
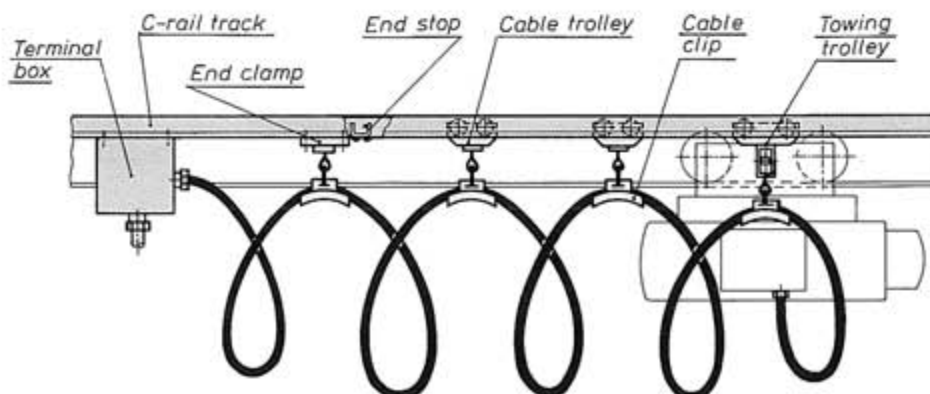


Catalogue No.	d Cable-ø	r	l	h max.	b	c	Weight [kg]	Cable trolleys	Towing trolleys	Suitable end clamp
16 NO 20 133	10-16	80	70	48	35	42	0.050	NO 23 293 125 NO 23 293	NO 23 295	NO 23 298
25 NO 20 133	17-25	125	100	60	50	50	0.070		125 NO 23 296	
36 NO 20 133	26-36	180	140	78	70	64	0.140	125 NO 23 293	125 NO 23 296	NO 23 298
50 NO 20 133	37-50	250	200	100	100	90	0.280		125 NO 23 296	

EXAMPLE OF APPLICATION

Cable trolley NO 23 991 with cable clip 25 and 16 NO 20 131.

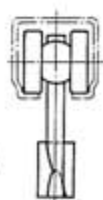
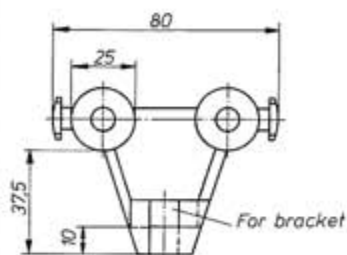
Cable trolley NO 23 293 with cable clip 25 NO 20 133.



CABLE TROLLEY WITH BRACKET

CABLE TROLLEY UPPER PART NO 23 252 and NO 23 254

For use with bracket NO 20 137



Material: main body: plastic, black
roller: see table

Attachment: bracket NO 20 137

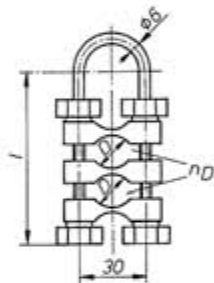


Catalogue No.	Type of roller	Load capacity P [kg]	Operating temperature [°C]	Weight [kg]	Special pairs of rollers Group ¹⁾
Trolley upper part NO 23 252	Steel ball bearing, galvanized	20	-30 to +80	0.110	A
Trolley upper part NO 23 254	Polyamide roller, yellow with central friction bearing	10	-30 to +50	0.035	C

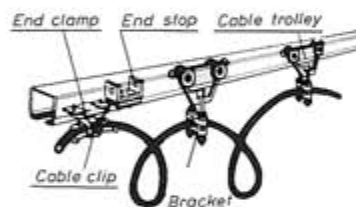
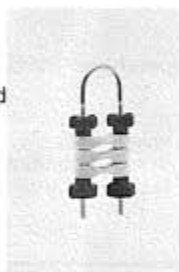
1) For special pairs of rollers refer to page 230/48.

BRACKET NO 20 137

For cable trolley upper parts NO 23 252 and NO 23 254



Material:
bracket: steel, galvanized
clamping pieces: plastic
split nut: plastic



Catalogue No.	Number of loops n _D	Permissible single diam. D	Sum of all single diameters	Length l	Weight [kg]
Bracket 1 x 18 NO 20 137	1	8-18	18	63	0.055
Bracket 1 x 22 NO 20 137		8-22	22	80	0.060
Bracket 2 x 32 NO 20 137	2	8-22	32	80	0.065
Bracket 2 x 44 NO 20 137		8-22	44	100	0.070
Bracket 3 x 30 NO 20 137	3	8-22	30	80	0.070
Bracket 3 x 50 NO 20 137		8-22	50	100	0.080
Bracket 3 x 66 NO 20 137		8-22	66	125	0.090
Bracket 4 x 48 NO 20 137	4	8-22	48	100	0.085
Bracket 4 x 72 NO 20 137		8-22	72	125	0.090
Bracket 5 x 45 NO 20 137	5	8-22	45	100	0.090
Bracket 5 x 70 NO 20 137		8-22	70	125	0.095
Bracket 6 x 68 NO 20 137	6	8-22	68	125	0.100

ORDER EXAMPLE

Cable trolley upper part NO 23 252 fitted with U-bracket 2 x 32 NO 20 137.

ORDER DETAILS: Cable trolley upper part NO 23 252 with bracket 2 x 32 NO 20 137.

Remark: Cable trolley upper parts are supplied complete with U-brackets.

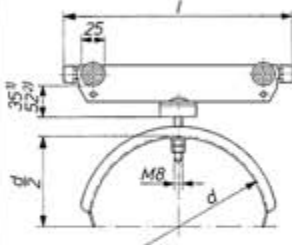
End clamp NO 23 299 to be used in conjunction with these trolleys. Cable supports NO 20 131 are to be fitted under the end clamp.

CABLE TROLLEY OF STEEL

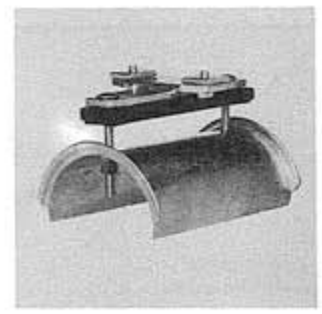
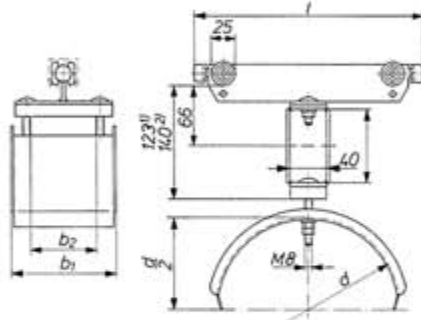
For clamping of round cables with a max. Ø-difference of 2 mm and 6 mm



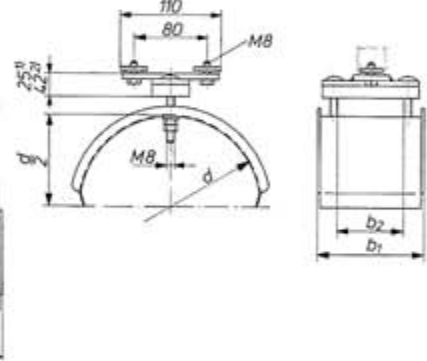
CABLE TROLLEY



TOWING TROLLEY



END CLAMP



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ³⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galv. Buffer: rubber Support: steel, galv. Clamping piece: rubber Fasteners: steel, galv.	A (B restricted)

CABLE TROLLEY for clamping round cables with a max. Ø-difference of 2 mm

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	b ₁	b ₂ max.	max. cable ø
200x100 NO 23 333	1.020	200x100 NO 23 338	1.560	100x48 NO 24 233	1.000	160	200	115	72	16
200x160 NO 23 333	1.400	200x160 NO 23 338	2.060	160x48 NO 24 233	1.400					
250x100 NO 23 334	1.050	250x100 NO 23 339	1.590	100x48 NO 24 234	1.100	200	250	115	72	20
250x160 NO 23 334	1.590	250x160 NO 23 339	2.250	160x48 NO 24 234	1.650					

CABLE TROLLEY for clamping round cables with a max. Ø-difference of 6 mm

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	b ₁	b ₂ max.	max. cable ø
200x100 NO 23 345	1.200	200x100 NO 23 347	1.680	100 NO 24 463	1.200	160	200	115	72	16
200x160 NO 23 345	1.590	200x160 NO 23 347	2.140	160 NO 24 463	1.600					
200x200 NO 23 345	1.800	200x200 NO 23 347	2.400	200 NO 24 463	1.840					
250x100 NO 23 345	1.350	250x100 NO 23 347	1.830	100 NO 24 464	1.300	200	250	115	72	20
250x160 NO 23 345	1.880	250x160 NO 23 347	2.430	160 NO 24 464	1.850					
250x200 NO 23 345	2.260	250x200 NO 23 347	2.860	200 NO 24 464	2.250					
320x100 NO 23 345	1.770	320x100 NO 23 347	2.250	100 NO 24 465	1.600	250	320	115	72	25
320x160 NO 23 345	2.250	320x160 NO 23 347	2.800	160 NO 24 465	2.100					
320x200 NO 23 345	2.630	320x200 NO 23 347	3.230	200 NO 24 465	2.500					
400x100 NO 23 345	2.230	400x100 NO 23 347	2.710	100 NO 24 467	1.950	320	400	115	72	32
400x160 NO 23 345	2.970	400x160 NO 23 347	3.520	160 NO 24 467	2.700					
400x200 NO 23 345	3.340	400x200 NO 23 347	3.940	200 NO 24 467	3.100					

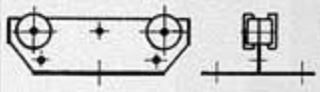
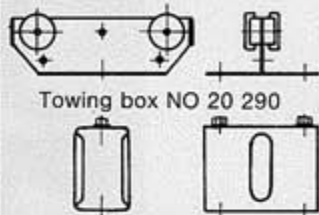
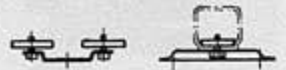
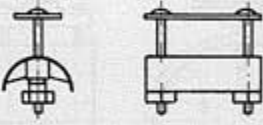
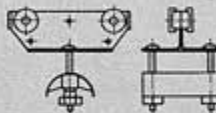
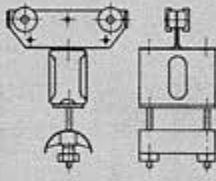
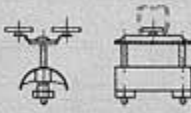

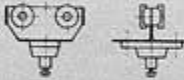


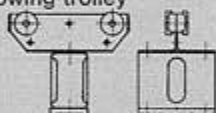

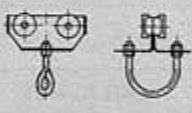
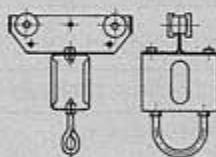
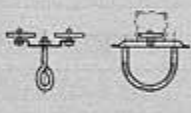
1) The dimension applies for clamping round cables with a max. Ø-difference of 2 mm.

2) The dimension applies for clamping round cables with a max. Ø-difference of 6 mm.

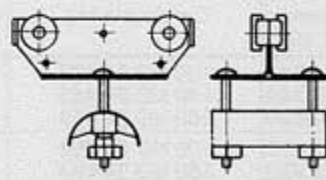
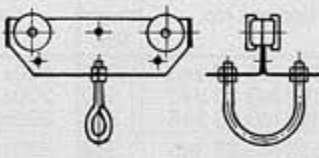
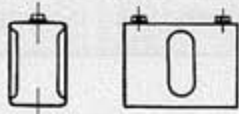
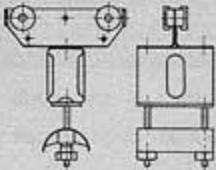
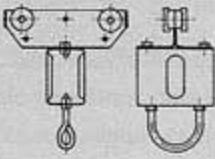
3) For special pairs of rollers refer to page 230/48.

COMPONENTS AND PARTS

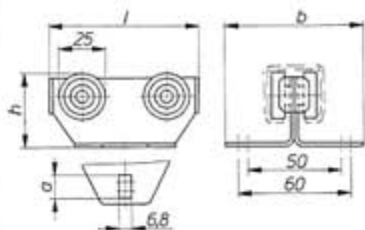
PARTS COMBINATION for cable trolleys, towing trolleys and end clamps

<p>Upper parts Catalogue No.</p> <p>Lower parts Catalogue-No.</p>	<p>Cable trolley upper part NO 23 258, NO 23 259</p> 	<p>Cable trolley upper part NO 23 259</p> <p>Towing box NO 20 290</p> 	<p>End clamp upper part NO 20 142</p> 
<p>Flat cable support NO 20 168, NO 20 170, NO 20 169</p> 	<p>Cable trolley</p> 	<p>Towing trolley</p> 	<p>End clamp</p> 
<p>Ball joint NO 20 166</p> 	<p>Cable trolley</p> 		<p>End clamp NO 23 299</p> <p>(Already completely in the programme)</p> 
<p>End clamp NO 20 160 Mount on the towing box</p> 		<p>Towing trolley</p> 	
<p>Bracket 50 x 6 NO 20 147</p> 	<p>Cable trolley</p> 	<p>Towing trolley</p> 	<p>End clamp</p> 

COMBINATION OF CABLE TROLLEY AND TOWING BOX for towing trolley

<p>Cable trolley</p> <p>Mounting part Catalogue No.</p>	<p>Cable trolley with support</p> 	<p>Cable trolley with bracket</p> 
<p>Towing box NO 20 290</p> 	<p>Towing trolley</p> 	<p>Towing trolley</p> 

CABLE TROLLEY UPPER PART NO 23 258 and NO 23 259



Technical data

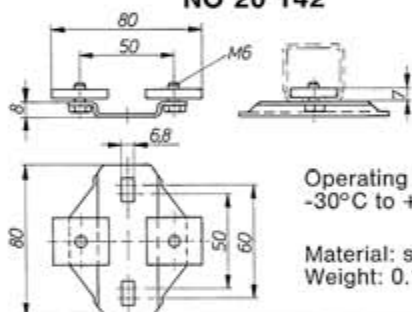
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel ball bearing, galvanized	20	-30 to +100	Main body: steel, galvanized	A and B

Catalogue No.	l	b	h	a	Weight [kg]
Cable trolley upper part NO 23 258 ²⁾	80	74	40	12.6	0.210
Cable trolley upper part NO 23 259	125	80	45	13.0	0.300

1) For special pairs of rollers refer to page 230/48.

2) No towing ropes can be fitted to these trolleys.

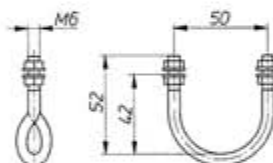
Catalogue No.: END CLAMP UPPER PART NO 20 142



Operating temperature:
-30°C to +100°C

Material: steel, galvanized
Weight: 0.122 kg

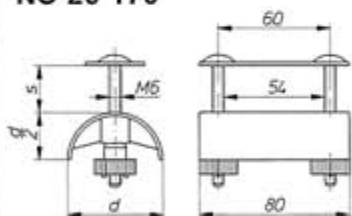
Catalogue No.: BRACKET 50 x 6 NO 20 147



Operating temperature:
-30°C to +100°C

Material: steel, galv.
Weight: 0.038 kg

FLAT CABLE SUPPORT NO 20 168, NO 20 169, NO 20 170

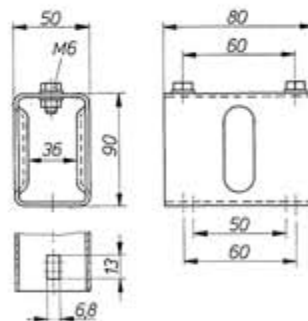


Operating temperature:
-30°C to +80°C

Material:
support: plastic
insulating plate: plastic
split nut: plastic
bolt: steel, galvanized

Catalogue No.	d	s max.	Weight [kg]
Flat cable support NO 20 168	50	30	0.060
Flat cable support NO 20 170		45	0.066
Flat cable support NO 20 169	80	36	0.095

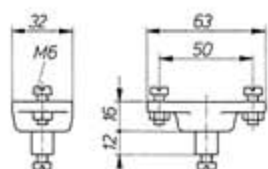
Catalogue No.: TOWING BOX NO 20 290



Operating temperature:
-30°C to +100°C

Material: steel, galv.
Weight: 0.385 kg

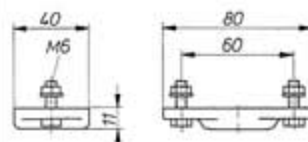
Catalogue No.: BALL JOINT NO 20 166



Operating temperature:
-30°C to +60°C

Material:
ball joint: plastic
fasteners: steel, galv.
Weight: 0.035 kg

Catalogue No.: END CLAMP NO 20 160 for installation on towing box

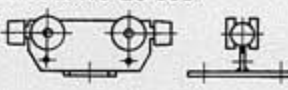
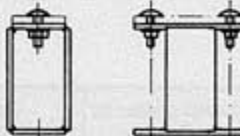

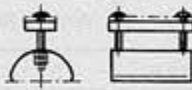
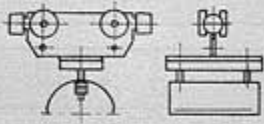
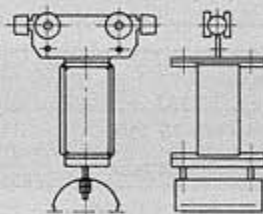
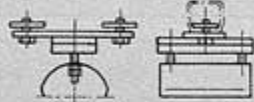

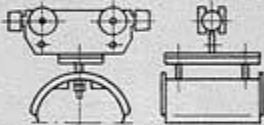
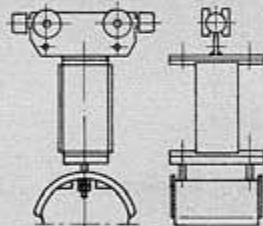
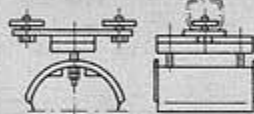


Operating temperature:
-30°C to +80°C

Material:
connection plate: plastic
fasteners: steel, galvanized
Weight: 0.035 kg

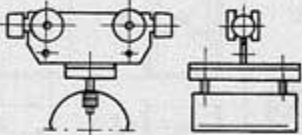
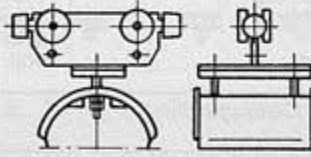
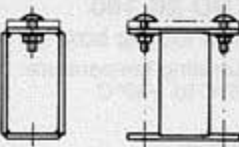
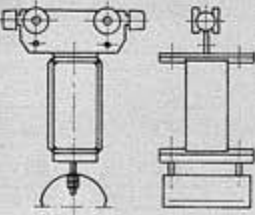
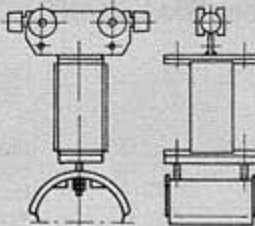
PARTS COMBINATION for cable trolleys, towing trolleys and end clamps

Only parts with the same corresponding dimensions can be combined.

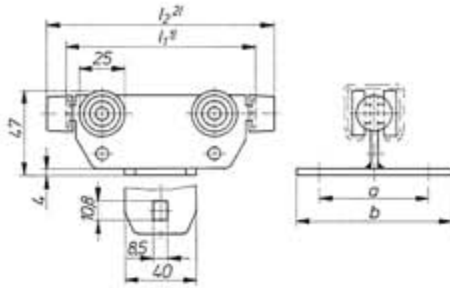
<p>Upper parts Catalogue No.</p> <p>Lower parts Catalogue No.</p>	<p>Cable trolley upper part ... x ... NO 23 308</p> 	<p>Cable trolley upper part ... x ... NO 23 308</p> <p>Towing box ... NO 20 292</p> 	<p>End clamp upper part ... NO 20 297</p> 
<p>Cable support for flat cables ... x ... NO 20 510; ... x ... NO 20 512</p> 	<p>Cable trolley for flat cables</p> 	<p>Towing trolley for flat cables</p> 	<p>End clamp for flat cables</p> 
<p>Cable support for flat or round cables ... x ... NO 20 513; ... x ... NO 20 514</p> 	<p>Cable trolley for flat or round cables</p> 	<p>Towing trolley for flat or round cables</p> 	<p>End clamp for flat or round cables</p> 

COMBINATION of CABLE TROLLEYS and TOWING BOXES for towing trolleys

Only parts with the same corresponding dimensions can be combined.

<p>Cable trolley</p> <p>Mounting part Catalogue No.</p>	<p>Cable trolley for flat cables</p> 	<p>Cable trolley for flat or round cables</p> 
<p>Towing box ... NO 20 292</p> 	<p>Towing trolley for flat cables</p> 	<p>Towing trolley for flat or round cables</p> 

CABLE TROLLEY UPPER PART NO 23 308



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]		Material	Special pairs of rollers Group ³⁾
		Cable trolley upper part without buffer	with buffer		
Steel ball bearing, galvanized	20	-30 to +100	-30 to +80	Main body: steel, galv. Buffer: rubber	A and B

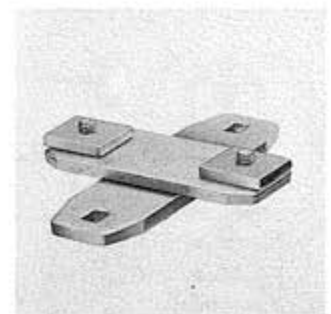
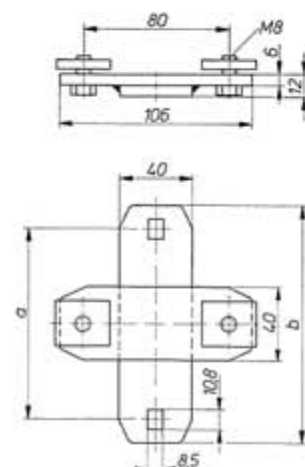
Catalogue No.	$l_1^{1)}$	$l_2^{2)}$	a	b	Weight [kg]
Cable trolley upper part 100 x 100 NO 23 308	-	100	80	106	0.340
Cable trolley upper part 105 x 100 NO 23 308	105	-	80	106	0.370
Cable trolley upper part 125 x 100 NO 23 308	-	125	80	106	0.380
Cable trolley upper part 105 x 160 NO 23 308	105	-	140	166	0.440
Cable trolley upper part 125 x 160 NO 23 308	-	125	140	166	0.450
Cable trolley upper part 140 x 100 NO 23 308	140	-	80	106	0.410
Cable trolley upper part 160 x 100 NO 23 308	-	160	80	106	0.420
Cable trolley upper part 140 x 160 NO 23 308	140	-	140	166	0.490
Cable trolley upper part 160 x 160 NO 23 308	-	160	140	166	0.500
Cable trolley upper part 180 x 100 NO 23 308	180	-	80	106	0.470
Cable trolley upper part 200 x 100 NO 23 308	-	200	80	106	0.480
Cable trolley upper part 180 x 160 NO 23 308	180	-	140	166	0.530
Cable trolley upper part 200 x 160 NO 23 308	-	200	140	166	0.540
Cable trolley upper part 230 x 100 NO 23 308	230	-	80	106	0.540
Cable trolley upper part 250 x 100 NO 23 308	-	250	80	106	0.550
Cable trolley upper part 230 x 160 NO 23 308	230	-	140	166	0.610
Cable trolley upper part 250 x 160 NO 23 308	-	250	140	166	0.620

1) l_1 = Cable trolley upper part without rubber buffer

2) l_2 = Cable trolley upper part with rubber buffer

3) For special pairs of rollers refer to page 230/48.

END CLAMP UPPER PART NO 20 297



Operating temperature: -30°C to +100°C

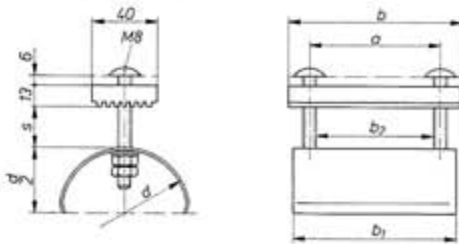
Material: steel, galvanized

Catalogue No.	a	b	Weight [kg]
End clamp upper part 100 NO 20 297	80	106	0.445
End clamp upper part 160 NO 20 297	140	166	0.560

CABLE SUPPORT NO 20 510 and NO 20 512
for flat cables

CABLE SUPPORT NO 20 513 and NO 20514
for flat or round cables ¹⁾

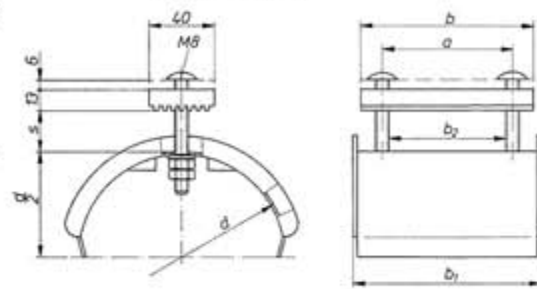
Type $d \leq 125$



Operating temperature:
-30°C to +80°C

Material:
support: steel, galv.
clamping piece: rubber
fasteners: steel, galv.

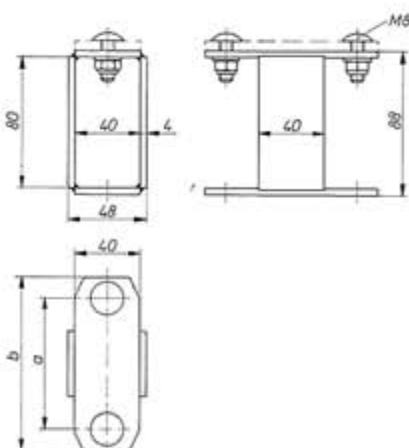
Type $d \geq 160$



Catalogue No.	d	a	b	b ₁	b ₂	s max.	max. round cable ø	Weight [kg]	Fitting trolley length	
									l ₁	l ₂
Cable support 100 x 22 NO 20 510	80	80	106	100	72	22	-	0.330	-	100
-									125	
Cable support 160 x 22 NO 20 510		140	166	160	132	42	-	0.480	105	-
-									125	
Cable support 100 x 42 NO 20 510	80	106	100	72	22	-	0.340	140	-	
-								160		
Cable support 160 x 42 NO 20 510	140	166	160	132	42	-	0.490	140	-	
-								160		
Cable support 100 x 22 NO 20 512	125	80	106	100	72	22	-	0.440	-	160
Cable support 160 x 22 NO 20 512									140	166
Cable support 100 x 42 NO 20 512		80	106	100	72	22	-	0.450		
Cable support 160 x 42 NO 20 512									140	166
-	-	200								
Cable support 100 x 22 NO 20 513	160	80	106	115	72	22	16	0.660	-	200
Cable support 160 x 22 NO 20 513									140	166
Cable support 100 x 42 NO 20 513		80	106	115	72	22	-	0.670		
Cable support 160 x 42 NO 20 513									140	166
-	-	250								
Cable support 100 x 22 NO 20 514	200	80	106	115	72	22	20	0.780	-	250
Cable support 160 x 22 NO 20 514									140	166

1) Cable support for clamping round cables with a max. ø-difference of 2 mm.

TOWING BOX NO 20 292



Operating temperature: -30°C to +100°C

Material: steel, galvanized



Catalogue No.	a	b	Weight [kg]
Towing box 100 NO 20 292	80	106	0.530
Towing box 160 NO 20 292	140	166	0.700

OBSOLETE CATALOGUE NUMBERS

COMPARISON: Obsolete Catalogue No. and new Catalogue No.

On account of a standardization the complete cable trolleys with polyamide rollers, running on a stainless steel socket, are no longer part of the catalogue. The polyamide rollers (special pair of rollers group B) can be installed to all steel trolleys.

The cable trolleys of plastic with ball bearing rollers and Delrin outer ring are discontinued. Instead of this, the designation for the plastic trolley with the special pair of rollers „ball bearing roller with plastic outer ring“ of group A3.

Cable trolleys with polyamide rollers, with friction bearing on stainless sockets

Obsolute Catalogue No. Cable trolley	New Catalogue No. for cable trolleys with special pair of rollers	Group
NO 23 257	NO 23 258	B
NO 23 260	NO 23 259	
NO 23 262	NO 23 261	
NO 23 292	NO 23 291	
NO 23 294	NO 23 293	
NO 23 352	NO 23 351	
NO 23 354	NO 23 353	
NO 23 356	NO 23 355	
with 2 off special pair of rollers 11 NO 23 303		

Cable trolley with ball bearing rollers and plastic (Delrin) outer ring

Obsolute Catalogue No. Cable trolley	New Catalogue No. for cable trolleys with special pair of rollers	Group
NO 23 370	NO 23 361	A 3
NO 23 371	NO 23 363	
NO 23 372	NO 23 365	
NO 23 251	NO 23 252	
NO 23 940	NO 23 941	
NO 23 950	NO 23 951	
NO 23 970	NO 23 971	
NO 23 990	NO 23 991	
with 1 off special pair of rollers 11 NO 23 324		
with 2 off special pair of rollers 11 NO 23 324		

Discontinued Catalogue items available for limited period.

ENERGY SUPPLY SYSTEMS FOR AREAS CONTAINING EXPLOSIVE MIXTURES



Please ask for our Ex-catalogue.

The TECHNISCHE ÜBERWACHUNGSVEREIN has passed the following judgement on our Ex-energy supply system:

ENERGY SUPPLY SYSTEMS
for flat cables type Ex NO 23 008

JUDGEMENT:

There are no objections from our part against an application of the energy supply systems type NO 23 008 in areas containing explosive mixtures (according to VDE 0165/09.83) for the installation of mobile explosion-proof electrical material.

The energy supply systems are in agreement with the requirements of the European Standard EN 50014.20 and VDE 0170/0171/05.78.

TECHNISCHER ÜBERWACHUNGS-VEREIN BADEN E.V.
special field electrical engineering

Expert
Signature

December 3rd, 1985

ENERGY SUPPLY SYSTEMS
for round cables type Ex NO 23 009

JUDGEMENT

There are no objections from our part against an application of the energy supply systems type NO 23 009 in areas containing explosive mixtures (according to VDE 0165/09.83) for the installation of mobile explosion-proof electrical material.

The energy supply systems are in agreement with the requirements of the European Standard EN 50014.20 and VDE 0170/0171/05.78.

TECHNISCHER ÜBERWACHUNGS-VEREIN BADEN E.V.
special field electrical engineering

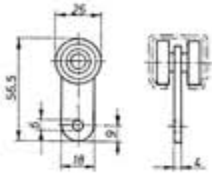
Expert
Signature

March 19th, 1984

CABLE TROLLEYS, END CLAMPS and ACCESSOIRES for special purposes

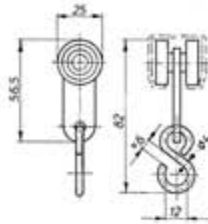
CABLE TROLLEY with 2 rollers

NO 23 361 with ball bearing
NO 23 362 with friction bearing



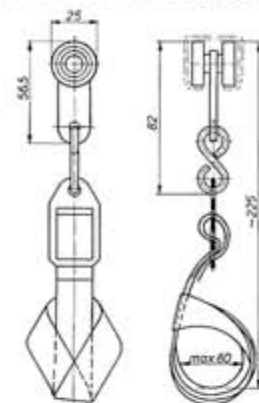
CABLE TROLLEY with 2 rollers

with S-hook
NO 23 363 with ball bearing
NO 23 364 with friction bearing



CABLE TROLLEY

with 2 rollers, with thong
NO 23 365 with ball bearing
NO 23 366 with friction bearing



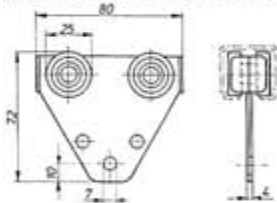
Technical data

Catalogue No.	Type of roller	Load capacity P [kg]	Operating temperature [°C]	Weight [kg]	Material	Special pairs of rollers Group ¹⁾
NO 23 361 NO 23 363 NO 23 365	Steel ball bearing, galvanized	8	-30 to +60	0.040 0.050 0.070	Main body: plastic Hook: steel, galv. Buckle: steel, galvanized Thong: Diolen	A
NO 23 362 NO 23 364 NO 23 366	Polyam. roller, yellow, with central friction bearing	4	-30 to +50	0.015 0.025 0.045	Main body: plastic Hook: steel, galv. Buckle: steel, galvanized Thong: Diolen	C

1) For special pairs of rollers refer to page 230/48.

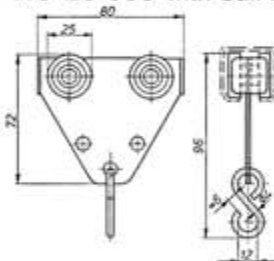
CABLE TROLLEY with 4 rollers

NO 23 351 with ball bearing



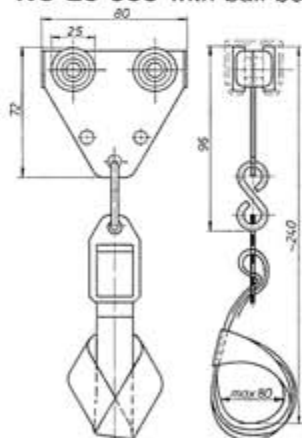
CABLE TROLLEY with 4 rollers

with S-hook
NO 23 353 with ball bearing



CABLE TROLLEY

with 4 rollers, with thong
NO 23 355 with ball bearing

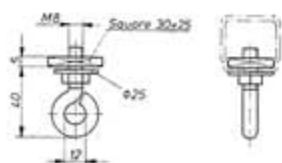


Technical data

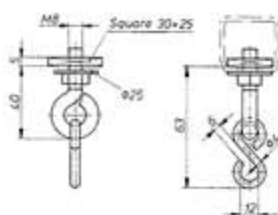
Catalogue No.	Type of roller	Load capacity P [kg]	Operating temperature [°C]	Weight [kg]	Material	Special pairs of rollers Group ¹⁾
NO 23 351 NO 23 353 NO 23 355	Steel ball bearing, galvanized	20	-30 to +100 -30 to +100 -30 to + 60	0.210 0.220 0.240	Main body: steel, galv. Hook: steel, galv. Buckle: steel, galv. Thong: Diolen	A and B

1) For special pairs of rollers refer to page 230/48.

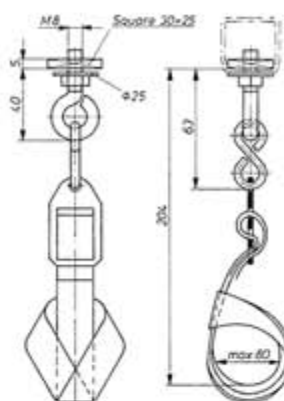
END CLAMP NO 20 218
(Rope eye)



END CLAMP NO 20 219
with S-hook



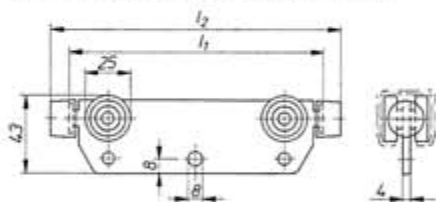
END CLAMP 80 NO 20 220
with thong



Technical data

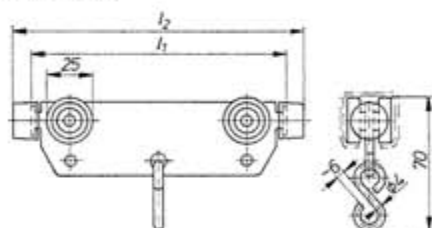
Catalogue No.	Operating temperature [°C]	Weight [kg]	Material	Fitting cable trolleys
NO 20 218	-30 to +100	0.070	Main body: steel, galv.	NO 23 351 NO 23 361 NO 23 362
NO 20 219	-30 to +100	0.090	Hook: steel, galvanized	NO 23 353 NO 23 363 NO 23 364
80 NO 23 220	-30 to + 60	0.110	Buckle: steel, galvanized Thong: Diolen	NO 23 355 NO 23 365 NO 23 366

CABLE TROLLEY NO 23 357



Catalogue No.	l ₁	l ₂	Weight [kg]
Cable trolley 80 NO 23 357	80	-	0.180
Cable trolley 100 NO 23 357	-	100	0.190
Cable trolley 180 NO 23 357	180	-	0.310
Cable trolley 200 NO 23 357	-	200	0.320

CABLE TROLLEY NO 23 358
with S-hook



Catalogue No.	l ₁	l ₂	Weight [kg]
Cable trolley 80 NO 23 358	80	-	0.190
Cable trolley 100 NO 23 358	-	100	0.200
Cable trolley 180 NO 23 358	180	-	0.320
Cable trolley 200 NO 23 358	-	200	0.330

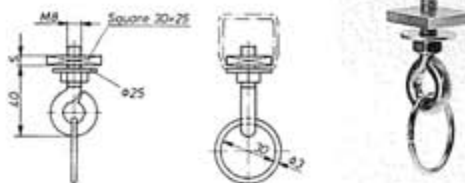
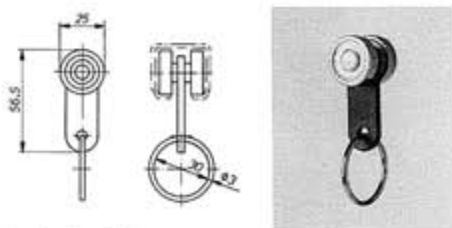
Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]		Material	Special pairs of rollers Group ¹⁾
		Cable trolley without buffer	Cable trolley with buffer		
Steel ball bearing, galvanized	20	-30 to +100	-30 to +80	Main body: steel galv. Buffer: rubber Hook: steel, galvanized	A and B

1) For special pairs of rollers refer to page 230/48.

CABLE TROLLEY NO 23 367 with ball bearing
CABLE TROLLEY NO 23 368 with friction bearing

ROPE EYE with RING NO 20 217
 (End clamp)

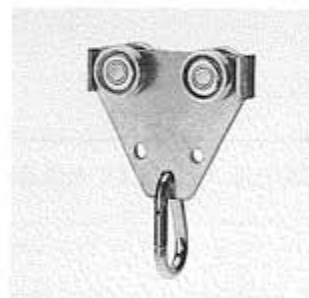
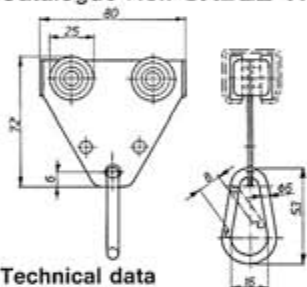


Technical data

Catalogue No.	Type of roller	Load capacity P [kg]	Operating temperature [°C]	Weight [kg]	Material	Special pairs of rollers Group ¹⁾
Cable trolley NO 23 367	Steel ball bearing, galvanized	8	-30 to +60	0.055	Main body: plastic Ring: steel, galv.	A
Cable trolley NO 23 368	Polyamide roller, yellow, with central friction bearing	4	-30 to +50	0.030	Main body: plastic Ring: steel, galv.	C
Rope eye with ring (End clamp) NO 20 217	-	8	-30 to +100	0.075	Main body: steel Ring: steel, galv.	-

1) For special pairs of rollers refer to page 230/48.

Catalogue No.: **CABLE TROLLEY NO 23 373** with ball bearing



Technical data

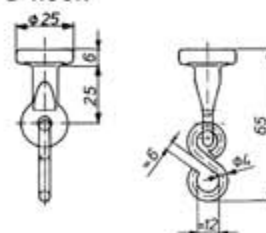
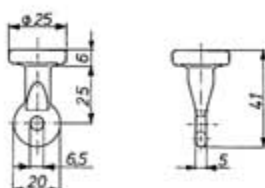
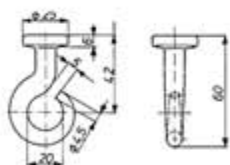
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Weight [kg]	Material	Special pairs of rollers Group ¹⁾
Steel ball bearing, galvanized	20	-30 to +100	0.235	Main body: steel, galv. Snap hook: steel, galv.	A and B

1) For special pairs of rollers refer to page Seite 230/48.

GLIDER NO 20 250

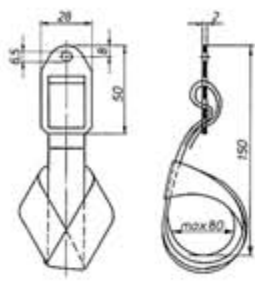

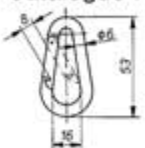
GLIDER NO 20 260

GLIDER NO 20 261
with S-hook

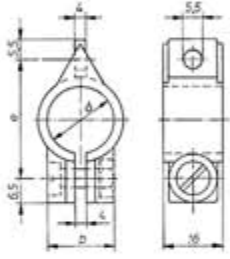


Catalogue No.	Operating temperature [°C]	Weight [kg]	Material
Glider NO 20 250 Glider NO 20 260 Glider NO 20 261	-30 to +60	0.010 0.005 0.015	Main body: plastic Hook: steel, galvanized

COMPONENT PARTS for mounting onto cable trolleys, end clamp and gliders


<p>Catalogue No.: THONG 80 NO 20 117</p>  <p>Operating temperature: -30°C to +60°C</p> <p>Material: buckle: steel, galvanized thong: Diolen</p> <p>Weight: 0.020 kg</p>	<p>Catalogue No.: HOOK 35 x 4 NO 20 118</p>  <p>Material: steel, galvanized Weight: 0.010 kg</p> <p>Catalogue No.: SNAP HOOK 53 x 6 NO 20 215</p>  <p>Material: steel, galvanized Weight: 0.025 kg</p>
---	--

CABLE COLLAR NO 20 111
for round cable




Operating temperature: -30°C to +60°C

Material: collar: plastic
screw: steel, galvanized
nut: steel, galvanized

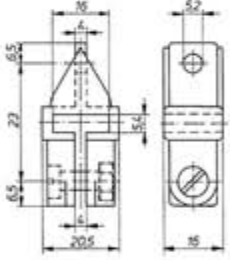


Catalogue No.	d	b	e	Weight kg/ 1000
10 NO 20 111	10	18	24.5	7.7
11 NO 20 111	11		25.5	7.7
12.5 NO 20 111	12.5		27.0	8.1
14 NO 20 111	14		28.5	8.4
16 NO 20 111	16		30.5	8.5
18 NO 20 111	18		32.5	8.5

Catalogue No.	d	b	e	Weight kg/ 1000
20 NO 20 111	20	23	34.5	10.0
22 NO 20 111	22		36.5	10.0
25 NO 20 111	25		39.5	11.0
28 NO 20 111	28		42.5	12.0
32 NO 20 111	32		46.5	13.0
36 NO 20 111	36		50.5	14.0




CABLE COLLAR NO 20 114
for flat cable H07 VVH2-F 4G1,5



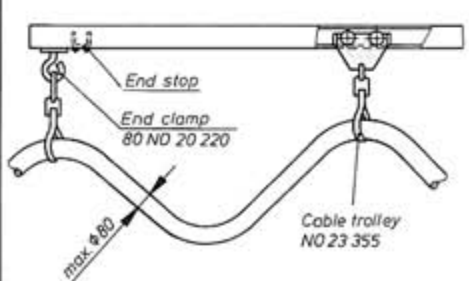
Operating temperature: -30°C to +60°C

Material: collar: plastic
screw: steel, galvanized
nut: steel, galvanized

Weight: 0.008 kg



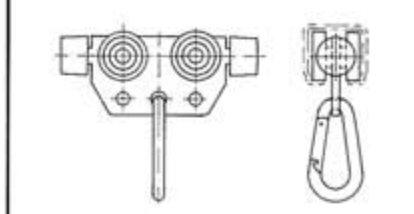
EXAMPLES OF APPLICATION



Energy supply with cable resp.
cable bundle diameter up to 80 mm



Cable trolley NO 23 353 with
cable collar 14 NO 20 111
and round cable



Cable trolley 100 NO 23 357
with snap hook
53 x 6 NO 20 215

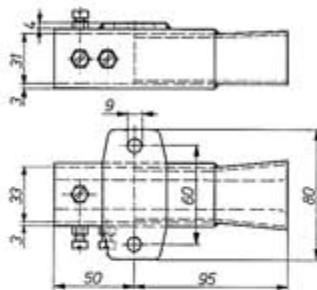
CABLE TROLLEYS and ACCESSORIES for TRACK JUNCTIONS

When our power cable equipment is used with overhead conveyors, travelling cranes, overhead travelling stacking cranes, etc. overrun on to track is easily accomplished.

The following points should be noted:

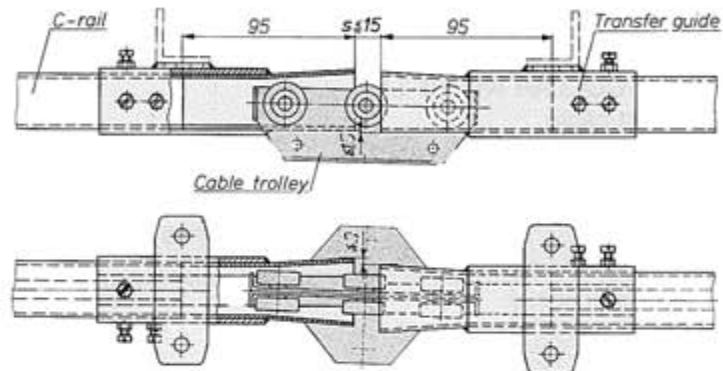
1. Two transfer guides NO 23 311 are mounted at the junction with the run-in openings opposite to each other.
2. The distance »s« should not exceed 15 mm.
3. All cable trolleys which run past the junction have 3 pairs of runners and the towing trolley has 4 pairs.
4. Cable trolleys which do not run beyond the junction, and all components such as C-rail track NO 23 200, track coupler and support brackets etc., are of standard design. C-rail track NO 23 201 cannot be used.
5. For heavy installations, or where the distance »s« is greater than 15 mm, we recommend programme 240.

TRANSFER GUIDE NO 23 311



Material: steel, galvanized
Weight: 0.500 kg

EXAMPLE of APPLICATION

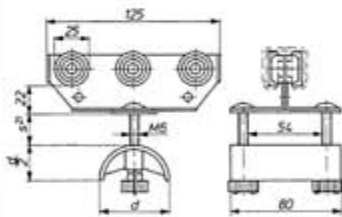


CABLE TROLLEY for flat cables

Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galv. Support: plastic Insulating plate: plastic Split nut: plastic Fasteners: steel, galvanized	A

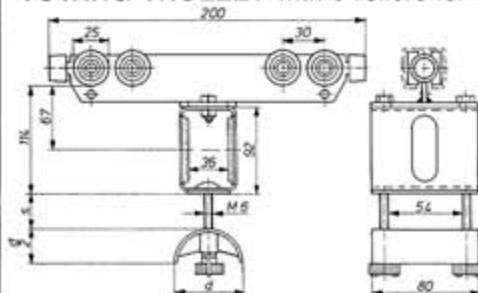
CABLE TROLLEY with 6 rollers for track junctions



Catalogue No.	d	s ²⁾	s max.	Weight [kg]	Fitting end clamp
Cable trolley NO 23 315	50	36	42	0.410	NO 23 269
Cable trolley NO 23 317	80	22	34	0.435	NO 23 279

All cable trolleys which do not pass over a track junction are of standard type.

TOWING TROLLEY with 8 rollers for track junctions



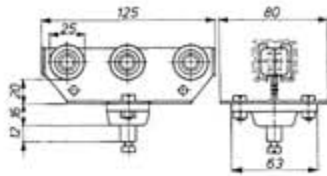
Catalogue No.	d	s max.	Weight [kg]
Towing trolley NO 23 316	50	42	0.860
Towing trolley NO 23 318	80	34	0.900

1) For special pairs of rollers refer to page 230/48.

2) Dimension »s« applies on the assumption, that the cable trolleys come together, not the flat cables. The bolts are, however, dimensioned to take cable bundles up to »s max.«.

CABLE TROLLEYS for round cables

Catalogue No.: **CABLE TROLLEY NO 23 319** with 6 rollers for track junctions with ball bearing rollers¹⁾



Load capacity: max. 20 kg
Operating temperature: -30°C to +60°C

Material: Main body: steel, galvanized
roller (ball bear.): steel, galv.
ball joint: plastic
fasteners: steel, galvanized

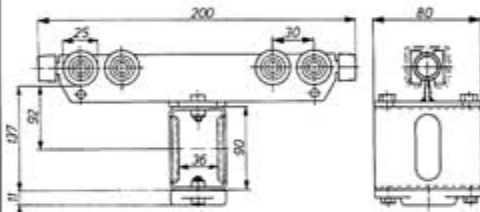
Weight: 0.410 kg

The cable clips NO 20 131 must be ordered separately.
Suitable end clamp NO 23 299.

All cable trolleys which do not pass junctions, are of standard type NO 23 291.



Catalogue No.: **TOWING TROLLEY NO 23 320** with 8 rollers for track junctions with ball bearing rollers¹⁾

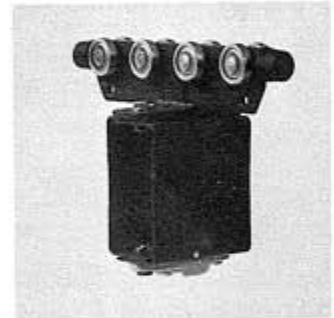


Load capacity: max. 20 kg
Operating temperature: -30°C to +60°C

Material: Main body: steel, galvanized
roller (ball bear.): steel, galv.
connecting plate: plastic
fasteners: steel, galvanized

Weight: 0.840 kg

The cable clips NO 20 131 must be ordered separately.



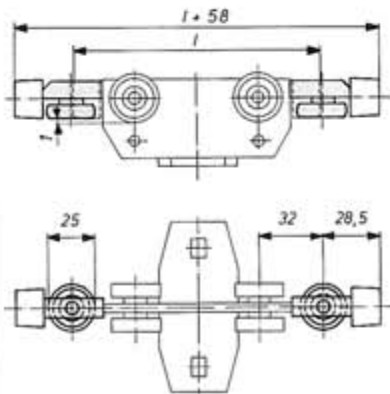
1) For special pairs of rollers refer to page 230/48 (Group A).

Further cable trolleys for track junctions on inquiry.

CABLE TROLLEYS with horizontal guide rollers

If cable trolleys are subject to horizontal forces, it is advisable, to equip the trolleys with lateral guide rollers. This occurs, when the trolley is taken along by a laterally deflected towing rope or a deflected cable.

Catalogue No.: **HORIZONTAL GUIDE ROLLERS NO 23 305**
complete for a trolley



Operating temperature: -30°C to +80°C

Material: roller (ball bear.): steel, galv.
axle: steel, galvanized
other parts: like cable trolley

Weight: 0.090 kg

The set of horizontal guide rollers must be ordered separately.

ORDER EXAMPLE

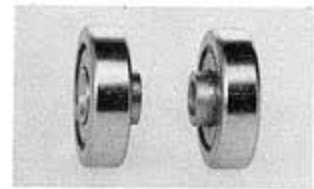
The cable trolley 125 x 100 NO 23 330 must be equipped with horizontal guide rollers.

ORDER DETAILS: 1 off cable trolley 125 x 100 NO 23 330 with
1 off set of horizontal rollers NO 23 305

PAIRS OF ROLLERS AND SETS OF SCREWS for cable trolleys

SPECIAL PAIRS OF ROLLERS

The pairs of rollers are installed instead of the standard rollers. In the tables of the individual cable trolleys you can see, which special rollers (groups) may be installed. The requested number of the pairs of rollers must be ordered separately. The cable trolley with 4 rollers requires 2 pairs of rollers. You will find details on permissible loads on the first few pages of this programme. Pairs of rollers for C-rails with dimensions different from those of the Wampfler C-rails can be ordered on inquiry.



GROUP A: Ball bearing

Group	Catalogue No. Special pair of rollers	Quantity		Type		Operating ¹⁾ temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Roller	Sealing			
A 1	11 NO 23 327 with seal rings	-	2	steel, galv.	2 RS	+100°C - 30°C	80 m/min (100 m/min)	
A 1	11 NO 23 322 ground	-	2	steel, galv.	2 Z	+100°C - 30°C	100 m/min	
A 1	11 NO 23 321 ground, seal rings	-	2	steel, galv.	2 RS	+100°C - 30°C	100 m/min	
A 1	11 NO 23 325 cold-resisting	-	2	steel, galv.	2 Z	+130°C - 60°C	80 m/min (100 m/min)	
A 1	11 NO 23 326 heat-resisting	-	2	steel, galv.	2 Z	+200°C 0°C	80 m/min (100 m/min)	
A 2	11 NO 23 427 stainless, seal rings	1	2	V4A stainless steel	2 RS	+ 80°C - 10°C	63 m/min	axle V2 A stainless steel
A 2	11 NO 23 428 stainless	1	2	V4A stainless steel	2 Z	+ 80°C - 10°C	63 m/min	axle V2 A stainless steel
A 2	11 NO 23 430 bronze outer ring	-	2	steel, galv. with bronze outer ring	2 Z	+100°C - 30°C	63 m/min	
A 3	11 NO 23 324 plastic outer ring	-	2	steel, galv. with plastic outer ring	-	+ 60°C - 20°C	63 m/min	low noise run

GROUP B: Friction bearing on stainless sockets

Group	Catalogue No. Special pair of rollers	Quantity		Type			Operating ¹⁾ temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Axle	Socket	Roller			
B	11 NO 23 303 Polyamide-rollers	1	2	steel, galv.	stainless steel	Polyamide	+60°C - 30°C	50 m/min	

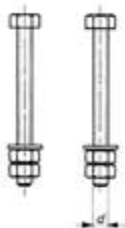
GROUP C: Friction bearing in the centre of the trolley

Group	Catalogue No. Special pair of rollers	Quantity		Type		Operating ¹⁾ temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Axle	Roller			
C	11 NO 23 304 Bronze-rollers	1	2	stainless steel	Bronze	+80°C	63 m/min	

1) For cable trolleys with rubber and plastic parts please note the operating temperature of the corresponding trolleys.
2) For cable trolleys with 4 rollers.

SETS OF SCREWS

SET OF SCREW NO 20 675; stainless steel



Material: steel, V4 A

Catalogue No.	d
Set of screw 6 NO 20 675	M6
Set of screw 8 NO 20 675	M8



Stainless steel pairs of screws can be used on all cable trolleys, towing trolleys and end clamps, instead of the standard fixing screws. Use in conjunction with stainless steel rollers. The set of screws must be ordered separately.

SPARE PARTS – PAIRS of ROLLERS

The requested number of pairs of rollers must be ordered separately. The cable trolley with 4 rollers requires 2 pairs of rollers. You will find details on permissible loads on the first few pages of this programme.



GROUP A: Ball bearing

Group	Catalogue No. Spare parts – pair of rollers	Quantity		Type		Operating ¹⁾ temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Roller	Sealing			
A 1	21 NO 23 328 standard type	1	2	steel, galv.	2 Z	+100°C - 30°C	80 m/min (100 m/min)	
A 1	21 NO 23 327 with seal rings	1	2	steel, galv.	2 RS	+100°C - 30°C	80 m/min (100 m/min)	
A 1	21 NO 23 322 ground	1	2	steel, galv.	2 Z	+100°C - 30°C	100 m/min	
A 1	21 NO 23 321 ground, seal rings	1	2	steel, galv.	2 RS	+100°C - 30°C	100 m/min	
A 1	21 NO 23 325 cold-resisting	1	2	steel, galv.	2 Z	+130°C - 60°C	80 m/min (100 m/min)	
A 1	21 NO 23 326 heat-resisting	1	2	steel, galv.	2 Z	+200°C 0°C	80 m/min (100 m/min)	
A 2	21 NO 23 427 stainless, seal rings	1	2	V4 A stainless steel	2 RS	+ 80°C - 10°C	63 m/min	axle V2 A stainless steel
A 2	21 NO 23 428 stainless	1	2	V4 A stainless steel	2 Z	+ 80°C - 10°C	63 m/min	axle V2 A stainless steel
A 2	21 NO 23 430 bronze outer ring	1	2	steel, galv. with bronze outer ring	2 Z	+100°C - 30°C	63 m/min	
A 3	21 NO 23 324 plastic outer ring	1	2	steel, galv. with plastic outer ring	-	+ 60°C - 20°C	63 m/min	low noise run

GROUP B: Friction bearing on stainless sockets

Group	Catalogue No. Spare parts – pair of rollers	Quantity		Type			Operating temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Axle	Socket	Roller			
B	21 NO 23 303 Polyamide-rollers	1	2	steel galv.	stainless steel	Polyamide	+60°C -30°C	50 m/min	

GROUP C: Friction bearing in the centre of the trolley

Group	Catalogue No. spare parts – pair of rollers	Quantity		Type		Operating temperature	Max. ²⁾ travel speed	Remark
		Axle	Roller	Axle	Roller			
C	21 NO 23 304 Bronze-rollers	1	2	stainless steel	Bronze	+80°C	63 m/min	
C	21 NO 23 302 standard type	1	2	stainless steel	Polyamide	+60°C -30°C	63 m/min	

- 1) For cable trolleys with rubber and plastic parts please note the operating temperature of the corresponding trolleys.
2) For cable trolleys with 4 rollers.

ORDER EXAMPLES

ORDER EXAMPLE 1

Cable trolley NO 23 261 (standard type = ball bearing roller with 2 sealing discs) to be supplied with special ball bearing rollers with 2 sealing discs (2RS).

ORDER DETAILS: 1 off cable trolley NO 23 261 with
2 off special pair of rollers 11 NO 23 327

ORDER EXAMPLE 2

Cable trolley 125 x 100 NO 23 330 to be supplied with stainless steel rollers, type 2 Z and stainless steel screws and nuts.

ORDER DETAILS: 1 off cable trolley 125 x 100 NO 23 330 with
2 off special pair of rollers 11 NO 23 428 and
1 off set of screws 8 NO 20 675

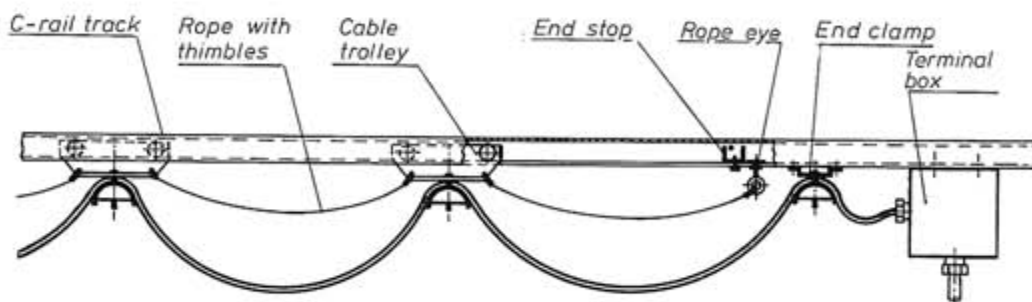
ACCESSORIES for flexible cable systems

TOWING LINES

APPLICATION EXAMPLE

Only for cable trolleys in all steel design

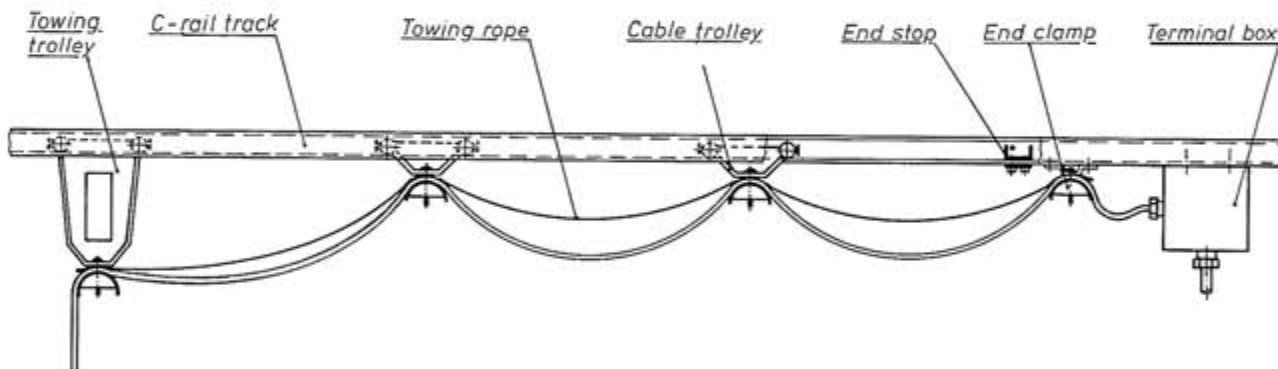
Flexible cable system with towing ropes in sections



APPLICATION EXAMPLE and INSTALLATION INSTRUCTION

Only for cable trolley in all plastic design

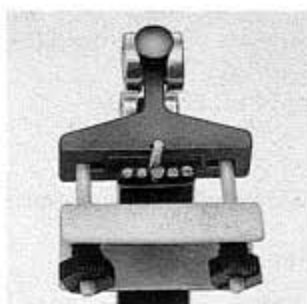
Flexible cable system with continuous towing rope



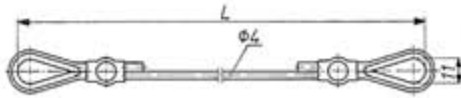
The towing rope mounted in one piece from the end clamp via the cable trolleys to the towing trolley has the advantage, that you do not have to mount individual tension relief parts, which would be more expensive.

The towing rope is mounted as one piece from the end clamp via the cable trolleys to the towing trolley. This eliminates the expensive mounting of many single towing rope sections between the trolleys.

After the cables have been placed in position and are lined up, the towing rope is pressed into the groove, provided in the cross members of the trolleys and the end clamp. The groove itself has some pins moulded into it. Next, the nuts below the cable supports are tightened up to point, where the cables and the towing rope are clamped tight against the cross member of the cable trolley. The towing ropes are to be fitted in such a way, that in the fully extended position there must be a length reserve of 5%.



ROPE 4 x ... NO 20 314
for towing ropes in sections



Permissible load:
40 kg
Operating temperatur.:
-30°C to +80°C

Material:
rope ø 4: Polyamide
thimble: steel, galv.
clamp: steel, galv.

Catalogue No. ø 4 x L	L	Weight [kg]
Rope 4 x 500 NO 20 314	500	0.040
Rope 4 x 630 NO 20 314	630	0.041
Rope 4 x 800 NO 20 314	800	0.042
Rope 4 x 1000 NO 20 314	1000	0.044
Rope 4 x 1250 NO 20 314	1250	0.046
Rope 4 x 1600 NO 20 314	1600	0.049
Rope 4 x 2000 NO 20 314	2000	0.052
Rope 4 x 2500 NO 20 314	2500	0.056
Rope 4 x 3200 NO 20 314	3200	0.062
Rope 4 x 4000 NO 20 314	4000	0.068
Rope 4 x 5000 NO 20 314	5000	0.076

ROPE 4 NO 20 302
for continuous towing ropes

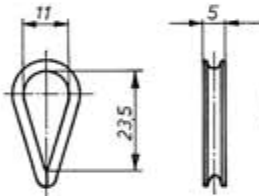


Operating temperatur.:
-30°C to +80°C

Material:
rope ø 4: Polyamide

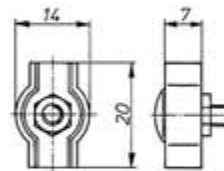
Catalogue No.	Length	Weight kg/100 m
Rope 4 NO 20 302 T	500 m on roll	0.800
Rope 4 NO 20 302	running metre	

Catalogue No.: **ROPE THIMBLE 3 NO 20 120**



Material: steel, galvanized
Weight: 0.008 kg

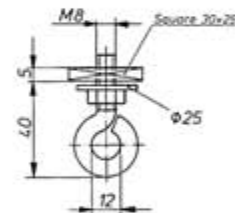
Catalogue No.: **SIMPLEX ROPE CLIP 3 NO 20 122**



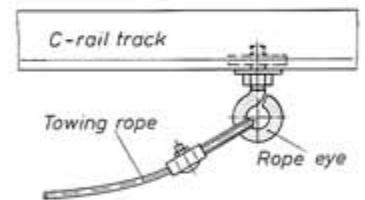
Material: steel, galvanized
Weight: 0.010 kg

Catalogue No.: **ROPE EYE 8 NO 20 218**

The rope eye is used with the first towing rope NO 20 314

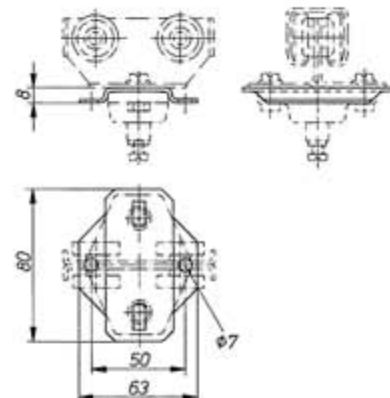


Material: steel, galvanized
Weight: 0.070 kg

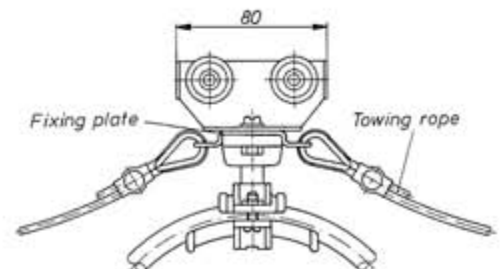


Catalogue No.: **FIXING PLATE NO 20 141**

used with towing ropes NO 20 314



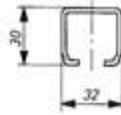
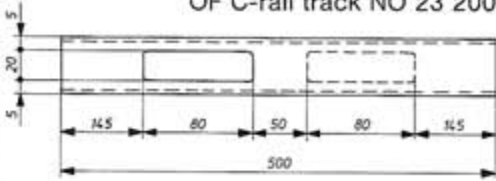
Material: steel, galvanized
Weight: 0.080 kg



Application:
This plate can be fitted below the cable trolleys NO 23 291 and NO 23 293 for fastening towing ropes NO 20 314.

INSPECTION AND ASSEMBLY HINTS

Catalogue No.: **INSPECTION PIECE NO 23 208**
OF C-rail track NO 23 200

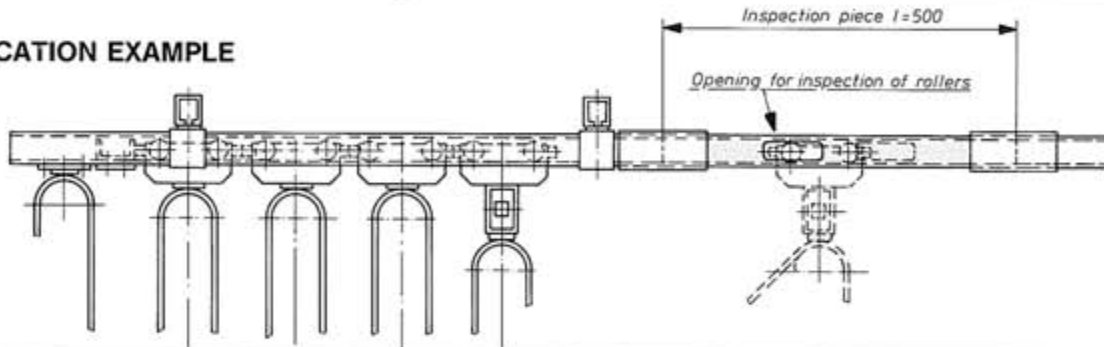


Material:
steel, galvanized

Weight: 0.700 kg



APPLICATION EXAMPLE



Catalogue No.: **SOCKET WRENCH NO 20 104**

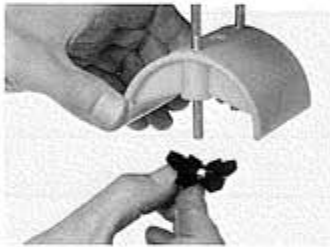
Material: Polyamide

Weight: 0.008 kg



ASSEMBLY INSTRUCTION for socket wrench and split nut

The socket wrench makes it easy to tighten the plastic split nuts on the various trolleys. Please note that nuts are only tightened with this wrench. Tightening of the self-locking nut „with force“ can damage the screw connection and the cables.



NO 23 790

PLUG AND SOCKET CONNECTIONS



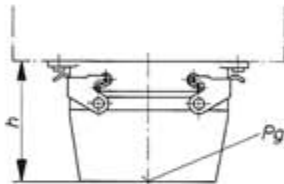
With the use of plug and socket connections complete flexible cable systems, consisting of cable trolleys and cables or control units including suspensions can be kept in stock as component parts. The plug and socket connections are suitable for flat and round cables, using the appropriate Pg glands.

Technical data

Nominal voltage	Nominal current	Protection	Screw connections	Material
415 V	16 A	IP 55 to DIN 40 050	2.5 mm ²	Case: aluminium connecting plate and small parts: steel, galv.

PLUG and SOCKET CONNECTION NO 20 600 for installation to terminal box of sheet steel

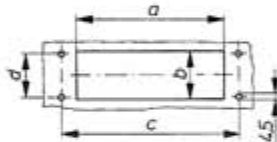
With the use of a plug and socket connection installed to the terminal box, it is very easy to separate the terminal box and cable for repair, assembly or transport.



Catalogue No.	Terminal	h	Threaded connection Pg	Weight [kg]
6 NO 20 600	6 + E	75	13.5	0.270
10 NO 20 600	10 + E	80	16	0.380
16 NO 20 600	16 + E	88	21	0.450
24 NO 20 600	24 + E	98	29	0.540

We can supply the terminal boxes with cutouts for the installation of plug and socket connections on request.

CUTOUT NO 20 071 for plug and socket connection



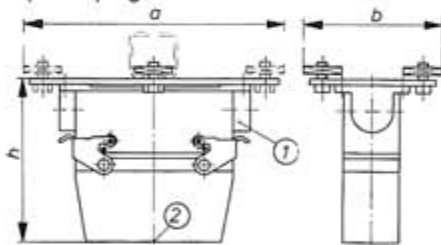
ORDER EXAMPLE:

Terminal box 200x200 NO 20 695
 left: Pg 21 + Pg 29
 right: without boring
 below: 16 NO 20 071

Catalogue No.	a	b	c	d	Fitting plug and socket connection
6 NO 20 071	48	35	70	32	6 NO 20 600
10 NO 20 071	60		83		10 NO 20 600
16 NO 20 071	82		103		16 NO 20 600
24 NO 20 071	108		130		24 NO 20 600

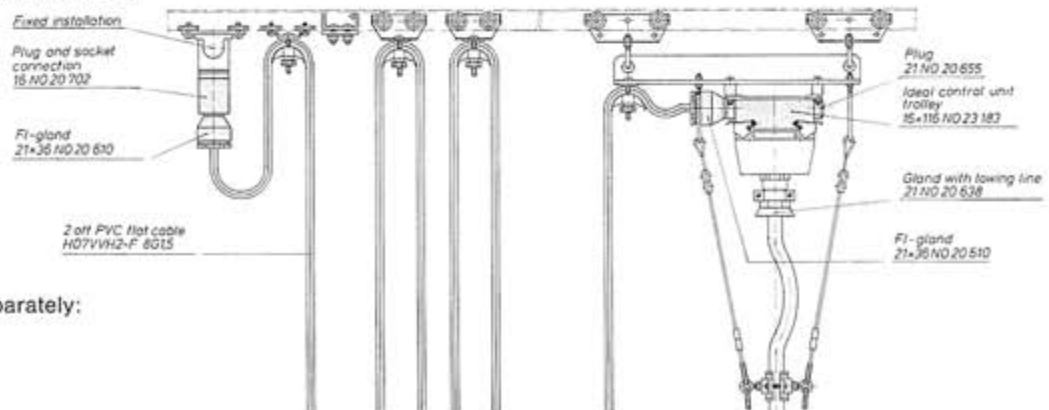
PLUG and SOCKET CONNECTION NO 20 702 with mounting plate for installation to C-rail track or support arm

In this application there is no transition from the flexible cable system to the fixed installation across a terminal box equipped with a plug and socket connection, but directly via a plug and socket connection fastened to the C-rail track (or the support arm). The plug and socket connection can be installed parallel or at right angles to the track.



Catalogue No.	Terminal	a	b	h	Threaded connect.		Weight [kg]
					① Pg	② Pg	
6 NO 20 702	6 + E	130	100	115	16	13.5	0.700
10 NO 20 702	10 + E	140	100	121	16	16	0.840
16 NO 20 702	16 + E	170	105	129	21	21	1.070
24 NO 20 702	24 + E	196	105	140	21	29	1.350

APPLICATION EXAMPLE



To be ordered separately:

- Glands
- Lock Nuts
- Enlargement rings
- Plugs

TERMINAL BOXES for line up terminals

We recommend to install a terminal box between the flexible supply cable and the fixed supply line. The advantage of this construction is, that in case of damage the flexible cable can be exchanged irrespective of the fixed installation. Our terminal boxes can be fixed direct to the track beam or if space is limited to the last track support beam or onto the wall.

TERMINAL BOXES OF SHEET STEEL

The terminal boxes are fitted with a mounting bar according to DIN 46 277 and end clips. The mounting bar is for the installation of the line up terminals.

Valid for all terminal boxes:

Protection class: IP 65

Material: case: sheet steel phosphate and stove-enamelled

Operating temperature: -30°C to +80°C

Weight: case size 200 x 200 = approx. 2.6 kg
case size 300 x 200 = approx. 3.5 kg

The terminal boxes can be fitted with cable glands of brass or plastic.

Furthermore holes for cable glands are drilled into the box side walls left, right and bottom according to instructions. The specification of the Pg holes are always from top to bottom respectively from left to right. The following holes can be drilled into the terminal box side:

Through hole for Pg	Number of holes	
	Side 200 mm	Side 300 mm
11	10	16
13.5	8	14
16	8	12
21	6	10
29	4	6
36	2	4
42	2	3
48	2	3

For example the following specification is required for a terminal box:

ORDER EXAMPLE:

terminal box 200 x 200 NO 20 695

left: Pg 16 + Pg 29

right: Pg 21 + Pg 29

bottom: without holes

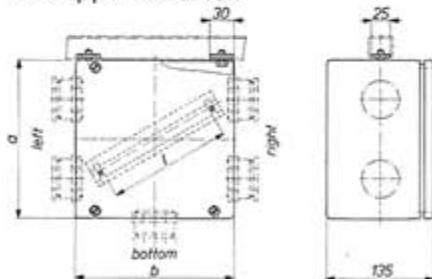
To be ordered separately:

1. Cable glands of brass for flat cable NO 20 610, NO 20 611 for round cable NO 20 630, NO 20 631, NO 20 638
2. Locknuts of brass NO 20 650
3. Cable glands of impact resistant plastic for flat cable NO 20 626 for round cable NO 20 646, NO 20 648
4. Locknuts of impact resistant plastic NO 20 657
5. Terminal clamps NO 20 605
6. Earth conductor terminal clamps NO 20 607
7. PVC- or rubber-flat cables
8. PVC- or rubber-round cables

On request we fit the terminal boxes with cable glands, terminal clamps and accessories, according to your instructions.

TERMINAL BOX NO 20 695

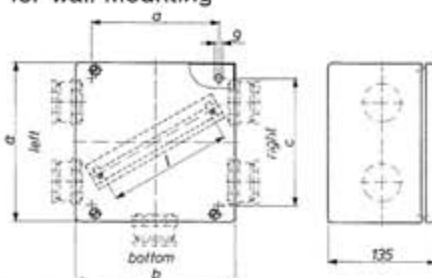
for support in C-rail



Catalogue No.	a	b	l
Terminal box 200 x 200 NO 20 695	200	200	155
Terminal box 300 x 200 NO 20 695	300	200	255

TERMINAL BOX NO 20 696

for wall mounting



Catalogue No.	a	b	c	d	l
Terminal box 200 x 200 NO 20 696	200	200	160	160	155
Terminal box 300 x 200 NO 20 696	300	200	260	160	255

TERMINAL BOXES OF PLASTIC

The terminal boxes are fitted with a mounting bar according to DIN 46 277 and two end clips. The mounting bar is for the installation of the line up terminals. Line up terminals can be installed over a maximum length of 152 mm. The mounting bar can be installed diagonal or straight.

For all terminal boxes valid:
 Protection class: IP 54
 Material: case: plastic Noryl
 support and small parts: steel, galvanized
 Operating temperature: -30°C to +80°C
 Weight: approx. 0.8 kg

For example the following specification is required for a terminal box:

ORDER EXAMPLE:
 Terminal box 11 NO 20 690
 left: Pg 36 + Pg 48
 right: without holes
 bottom: Pg 29

We recommend fitting to these terminal boxes preferably cable glands made out of impact resistant plastic. Fitting of metal glands should be avoided because voltage can leak to the outside and additional earthing is required.

- To be ordered separately:
1. Cable glands of impact resistant plastic for flat cable NO 20 626 for round cable NO 20 646, NO 20 648
 2. Locknuts of impact resistant plastic NO 20 657
 3. Terminal clamps NO 20 605
 4. Earth conductor terminal clamp NO 20 607
 5. PVC- or rubber-flat cables
 6. PVC- or rubber-round cables

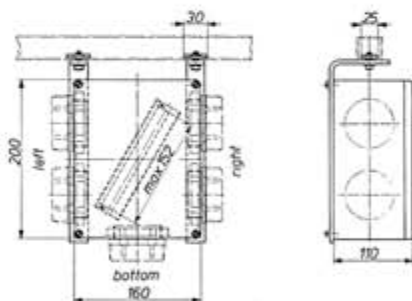
Furthermore holes for cable glands are drilled into the box side walls left, right and bottom according to instructions. The specification of the Pg holes are always from top to bottom respectively from left to right. The following holes can be drilled into the terminal box sides.

On request we fit the terminal boxes with cable glands, terminal clamps and accessories according to your instructions.

Through hole for Pg	Number of holes	
	Side 160 mm	Side 200 mm
11	6	8
13.5	6	8
16	6	8
21	3	5
29	2	3
36	1	2
42	1	2
48	1	2

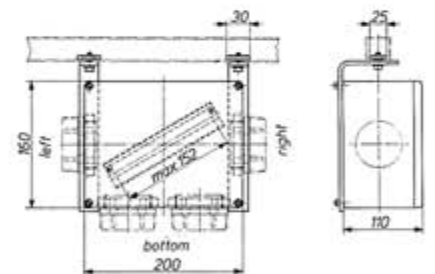
Catalogue No.: **TERMINAL BOX 11 NO 20 690**

Support by means of bracket
 Box position vertical



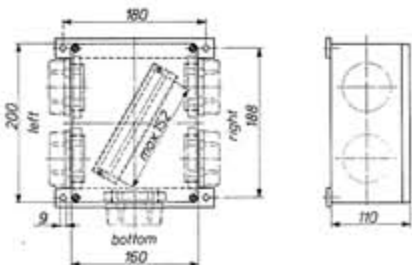
Catalogue No.: **TERMINAL BOX 12 NO 20 690**

Support by means of bracket
 Box position horizontal



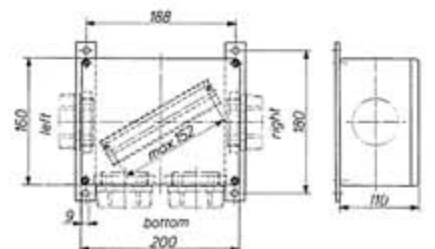
Catalogue No.: **TERMINAL BOX 21 NO 20 690**

Wallmounted
 Box position vertical



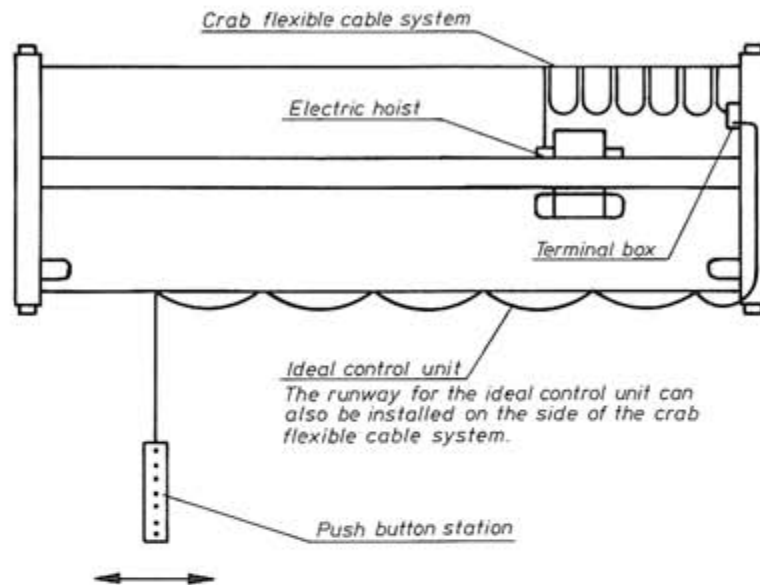
Catalogue No.: **TERMINAL BOX 22 NO 20 690**

Wallmounted
 Box position horizontal



IDEAL CONTROL UNIT TROLLEY AND ACCESSORIES

for mobile control equipment



Operating possibilities

The purpose of the mobile control equipment is to be able to operate the electrical lifting gear independently of its location. This is an advantage when bulky material has to be transported or where goods must be traversed above hatches, large containers etc. This arrangement is indispensable for the transport of molten metals. Mobile control units are now standard equipment on modern crane, monorail or conveyor installations. For such equipment a separate runway is provided, which usually runs parallel to the hoisting equipment rail.

The **ideal control unit trolleys** consist of the following sub assemblies:

1. Cable trolley upper parts
2. Flexible suspensions, which eliminate diagonal forces being transmitted onto the rail.
3. Main body for installation of end clamp and terminal box or plug and socket connections.
4. Terminal box or plug and socket connection

Brake systems:

On long tracks it is possible that the ideal control unit trolley in the extended position is pulled back by the force of the cable. This can be eliminated by the installation of one of the following brake systems:

1. Brake glider, operating in both directions
2. Hand operated brake trolley
The brake works self-locking in the direction of the end clamp. When running in this direction the brake must be released by hand by means of a towing rope. No operation of a towing rope is necessary in the opposite direction.
3. Brake trolley with electromagnetic brake release
The release of the brake is done by an electromagnet, which is operated preferably by the push-button switchboard. Operation of the brake release as on hand operated type.

The brake is essential in outdoor installations to prevent the control unit trolley from being blown along by the wind.

VDE 0100

For installation of power plants with nominal voltage up to 1000 V, which includes the ideal control unit trolleys, it is generally valid according to VDE 0100 part 520 paragr. 11.7:

Connector plugs and cable joints have to be free of mechanical stress.

The tension reliefs must be that way to avoid any mechanical damage of the relieved cables.

It is not permissible to tie the cables up or to fasten them to the machinery instead of using tension relief.

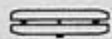

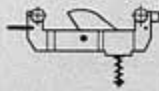
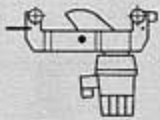
Cable glands and cable lead-ins must not be used as devices for tension relief.

The earth conductors of connection cables of mobile machinery have to be so long, that, in case of a breakdown of the tension relief, they do not get stress before the current-conveying conductors.




On ideal control unit trolley the cable tension relief is provided by installing an end clamp.

SURVEY: IDEAL CONTROL UNIT TROLLEY AND POSSIBLE ATTACHMENTS

If required please state the catalogue number of the ideal control unit trolley and the attachment.

Attachments Catalogue No.	Brake glider		Brake trolley	
	without joining bracket NO 23 184	with joining bracket NO 23 199	hand operated NO 23 185	with electromagnetic brake release NO 23187
 (Installation within rail between both cable trolley upper parts)				
Ideal control unit trolley Catalogue No.				

Ideal control unit trolley for round cables

NO 23 101 		Ideal control unit trolley NO 23 101 with brake glider NO 23 199	Ideal control unit trolley NO 23 101 with brake trolley NO 23 185	
NO 23 111 		Ideal control unit trolley NO 23 111 with brake glider NO 23 199	Ideal control unit trolley NO 23 111 with brake trolley NO 23 185	
NO 23 192 		Ideal control unit trolley NO 23 192 with brake glider NO 23 199	Ideal control unit trolley NO 23 192 with brake trolley NO 23 185	

Ideal control unit trolley for flat and round cables with terminal box of plastic

NO 23 180 	Ideal control unit trolley NO 23 180 with brake glider NO 23 184		Ideal control unit trolley NO 23 180 with brake trolley NO 23 185	Ideal control unit trolley NO 23 180 with brake trolley NO 23 187
--	---	--	--	--

Ideal control unit trolley for flat and round cables with terminal box of sheet steel

NO 23 181 	Ideal control unit trolley NO 23 181 with brake glider NO 23 184		Ideal control unit trolley NO 23 181 with brake trolley NO 23 185	Ideal control unit trolley NO 23 181 with brake trolley NO 23 187
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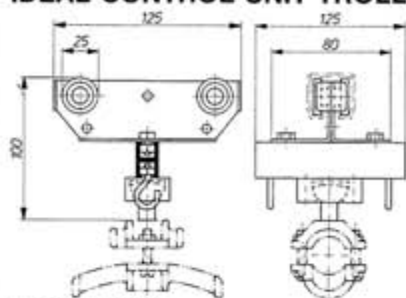
Ideal control unit trolley with multipole plug and socket connection

NO 23 183 	Ideal control unit trolley NO 23 183 with brake glider NO 23 184		Ideal control unit trolley NO 23 183 with brake trolley NO 23 185	Ideal control unit trolley NO 23 183 with brake trolley NO 23 187
--	---	--	--	--

IDEAL CONTROL UNIT TROLLEYS for round cables
 installed in one piece without a terminal box from the supply source



IDEAL CONTROL UNIT TROLLEY NO 23 101



Technical data

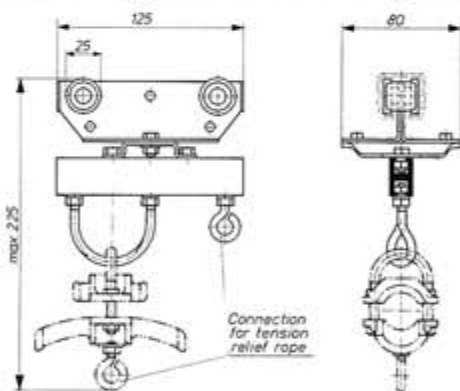
Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	20	-30 to +60	Main body: steel, galv. Rail track: aluminium Cable clip: plastic Fasteners: steel, galv.	A (B restricted)

Catalogue No.	for cable ø	Weight [kg]	Type	Attachments
Ideal control unit trolley NO 23 101		0.440	Without cable clip	Brake glider NO 23 199 or Brake trolley NO 23 185
Ideal control unit trolley 16 NO 23 101	10-16	0.480	With 1 cable clip 16 NO 20 131	
Ideal control unit trolley 25 NO 23 101	17-25	0.500	With 1 cable clip 25 NO 20 131	
Ideal control unit trolley 36 NO 23 101	26-36	0.560	With 1 cable clip 36 NO 20 131	

1) Total weight of control cable and push button station.

2) For special pairs of rollers refer to page 230/48.

IDEAL CONTROL UNIT TROLLEY NO 23 111



Technical data

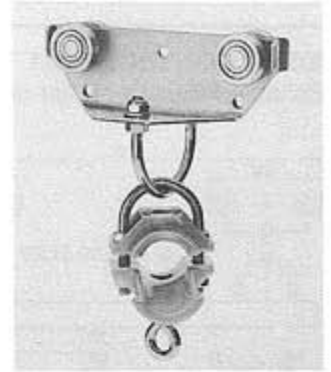
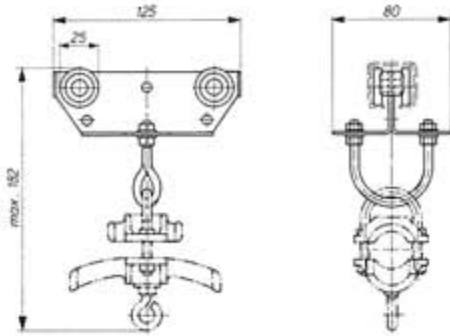
Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galv. Rail track: aluminium Cable clip: plastic Fasteners: steel, galv.	A (B restricted)

Catalogue No.	for cable ø	Weight [kg]	Type	Attachments
Ideal control unit trolley NO 23 111		0.500	Without cable clip	Brake glider NO 23 199 or Brake trolley NO 23 185
Ideal control unit trolley 16 NO 23 111	10-16	0.570	With 1 cable clip 16 NO 20 134	
Ideal control unit trolley 25 NO 23 111	17-25	0.600	With 1 cable clip 25 NO 20 134	
Ideal control unit trolley 36 NO 23 111	26-36	0.660	With 1 cable clip 36 NO 20 134	

1) Total weight of control cable and push button station.

2) For special pairs of rollers refer to page 230/48.

IDEAL CONTROL UNIT TROLLEY NO 23 192



Technical data

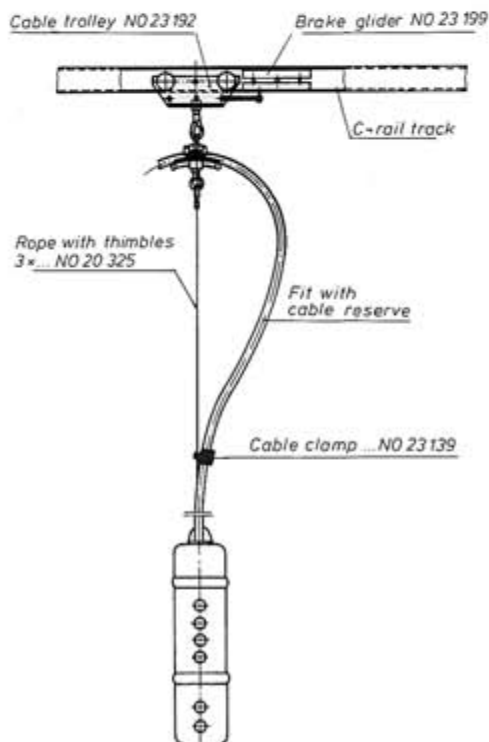
Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	20	-30 to +80	Main body: steel, galv. Bracket: steel, galv. Cable clip: plastic Fasteners: steel, galv.	A (B restricted)

Catalogue No.	for cable ø	Weight [kg]	Type	Attachments
Ideal control unit trolley NO 23 192		0.300	Without cable clip	Brake glider NO 23 199 or Brake trolley NO 23 185
Ideal control unit trolley 16 NO 23 192	10 – 16	0.370	With 1 cable clip 16 NO 20 134	
Ideal control unit trolley 25 NO 23 192	17 – 25	0.400	With 1 cable clip 25 NO 20 134	
Ideal control unit trolley 36 NO 23 192	26 – 36	0.460	With 1 cable clip 36 NO 20 134	

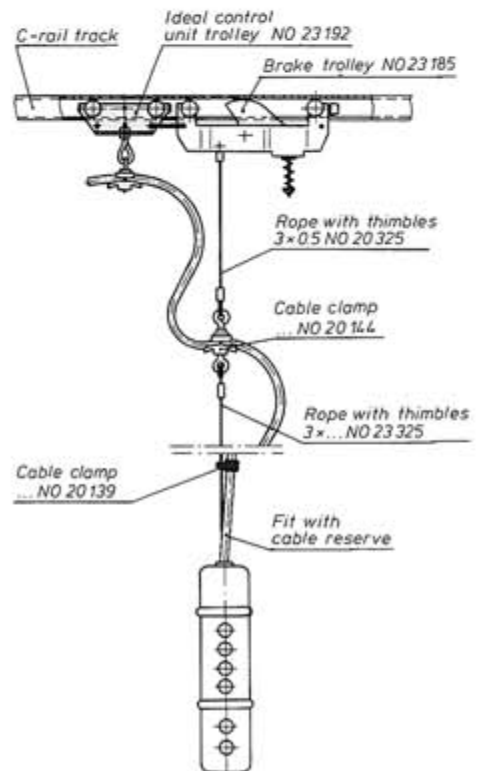
- 1) Total weight of control cable and push button station.
2) For special pairs of rollers refer to page 230/48.

EXAMPLES OF APPLICATION

IDEAL CONTROL UNIT TROLLEY
with control station.
Light duty.



IDEAL CONTROL UNIT TROLLEY
with control station suspended on the brake
trolley. Light duty.
Attention: Max. perm. suspended load 8 kg
of control station and control cable.

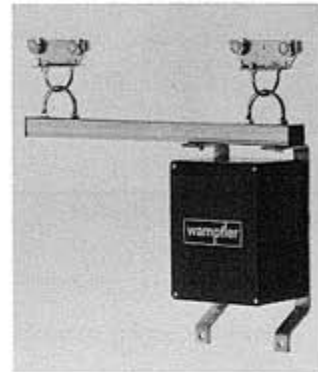
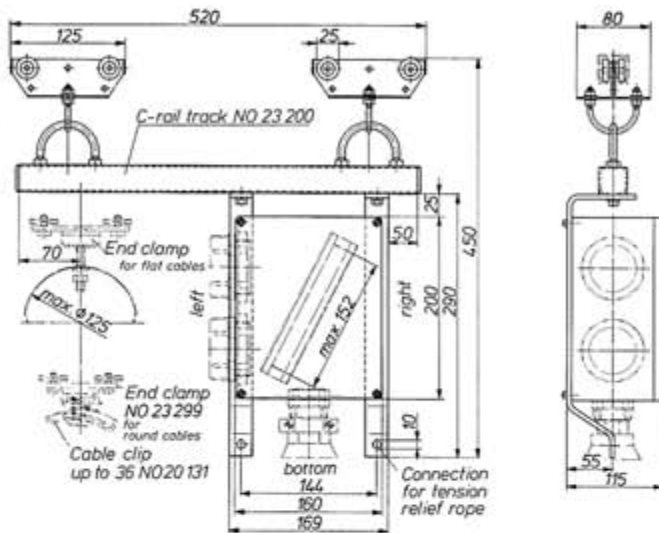


IDEAL CONTROL UNIT TROLLEY for flat and round cables



IDEAL CONTROL UNIT TROLLEY NO 23 180 with TERMINAL BOX of PLASTIC

Suitable for use with flat or round cable end clamps



Technical data

Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	32	-30 to +80	Trolley: steel, galv. Main body: steel, galv. Terminal box: plastic Small parts: steel, galv.	A (B restricted)

Catalogue No.	Weight [kg]	Attachments
Ideal control unit trolley NO 23 180	4.0	Brake glider NO 23 184 or Brake trolley NO 23 185 or Brake trolley NO 23 187

- 1) Total weight of control cable and push button station.
2) For special pairs of rollers refer to page 230/48.

The terminal boxes used for the ideal control unit trolleys, protection class IP 54, are fitted with a mounting bar according to DIN 46 277 and two end clips. The mounting bar is for the installation of the line up terminals. Line up terminals can be installed over a maximum length of 152 mm. The mounting bar can be installed diagonally or straight.

Additionally the terminal box is equipped with a screw tag around which the tension relief cord of a suitable control cable can be fixed.

On request entry holes for cable glands can be provided in the side walls left, right and bottom. The specification of the Pg holes is always from top to bottom respectively from left to right.
The following holes for plastic glands can be provided:

Through hole for Pg gland	Number of holes	
	Side 160 mm	Side 200 mm
11	4	8
13.5	4	8
16	4	8
21	3	5
29	2	3
36	1	2
42	1	2
48	1	2

ORDER EXAMPLE: Ideal control unit trolley NO 23 180 with holes
left: Pg 42 + Pg 42 right: without hole bottom: Pg 29

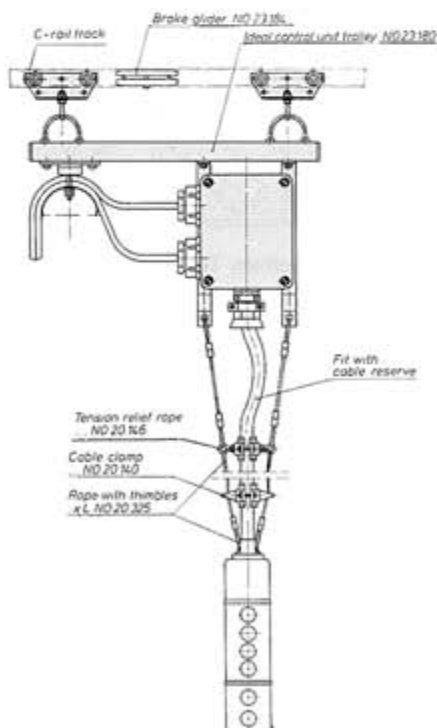
The following item must be ordered separately:

1. Cable glands out of impact resisting plastic for flat cables NO 20 626, for round cables NO 20 646
2. Cable glands with shaped entry out of impact resisting plastic NO 20 648
3. Locknuts out of impact resisting plastic NO 20 657
4. Terminal clamps NO 20 605
5. Earth conductor terminal clamps NO 20 607
6. End clamp for flat cables up to max. $d = 125$ mm and max. $b = 100$ mm, types NO 23 269, NO 23 279, NO 24 230, NO 24 232, NO 24 289, NO 24 290
7. End clamp for round cables NO 23 299
8. Cable support for round cables NO 20 131 up to size 36
9. Tension relief for control cable NO 20 146
10. Ropes with thimbles NO 20 325
11. Cable clamps NO 20 140
12. PVC or rubber flat cables
13. PVC or rubber round cables
14. Brake glider NO 23 184 or brake trolley with hand operated brake NO 23 185 or brake trolley with electromagnetic operated brake NO 23 187
15. Tension relief rope for brake operation NO 20 315

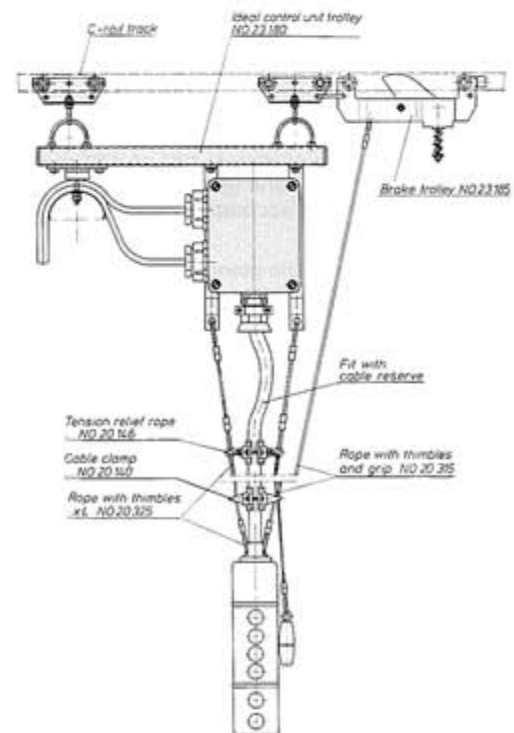
We can supply ideal control unit trolleys for flat or round cables, terminal clamps and accessories to your specifications.

EXAMPLES OF APPLICATION

IDEAL CONTROL UNIT TROLLEY with control station and brake glider

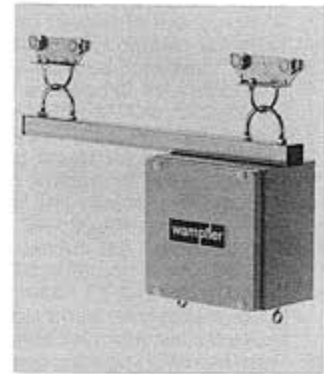
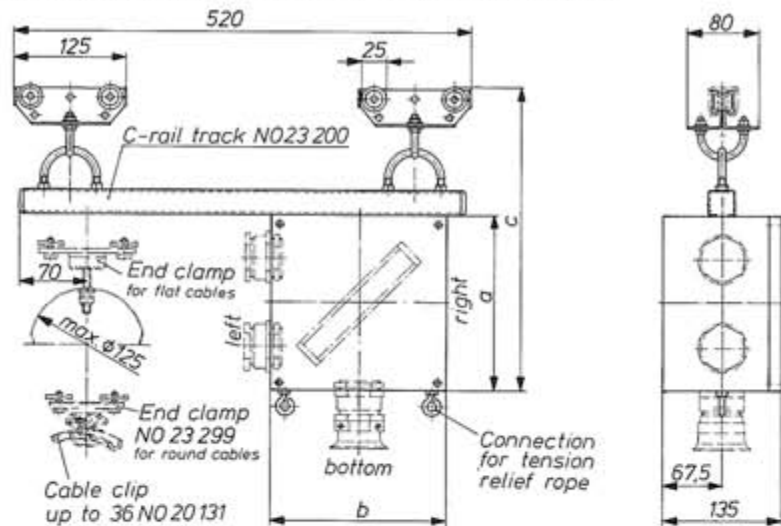


IDEAL CONTROL UNIT TROLLEY with control station and brake trolley



IDEAL CONTROL UNIT TROLLEY NO 23 181 with TERMINAL BOX of SHEET STEEL

suitable for use with flat or round cable end clamps



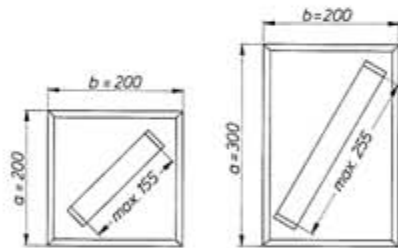
Technical data

Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	32	-30 to +80	Trolley: steel, galv. Main body: steel, galv. Terminal box: sheet steel Small parts: steel, galv.	A (B restricted)

Catalogue No.	a	b	c	Weight [kg]	Attachments
Ideal control unit trolley 200 x 200 NO 23 181	200	200	350	5.0	Brake glider NO 23 184 or Brake trolley NO 23 185 or Brake trolley NO 23 187
Ideal control unit trolley 300 x 200 NO 23 181	300	200	450	6.0	

- 1) Total weight of control cable and push button station.
2) For special pairs of rollers refer to page 230/48.

The terminal boxes used for these ideal control unit trolleys, protection class IP 65, are fitted with a mounting bar according to DIN 46 277 and 2 end clamps. The mounting bar is for the installation of the line up terminals. The maximum usable length for the line up terminals given in the accompanying illustration.



On request entry holes for cable glands can be provided in the side walls left, right and bottom. The specification for the Pg holes is always from top to bottom respectively from left to right.

The following holes for plastic glands can be provided:

Through hole for Pg gland	Number of holes	
	Side 200 mm	Side 300 mm
11	6	9
13,5	6	9
16	5	8
21	4	6
29	3	5
36	2	4
42	2	3
48	2	3

ORDER EXAMPLE: Ideal control unit trolley 200 x 200 NO 23 181 with holes
left: Pg 42 + Pg 42 right: without hole bottom: Pg 29

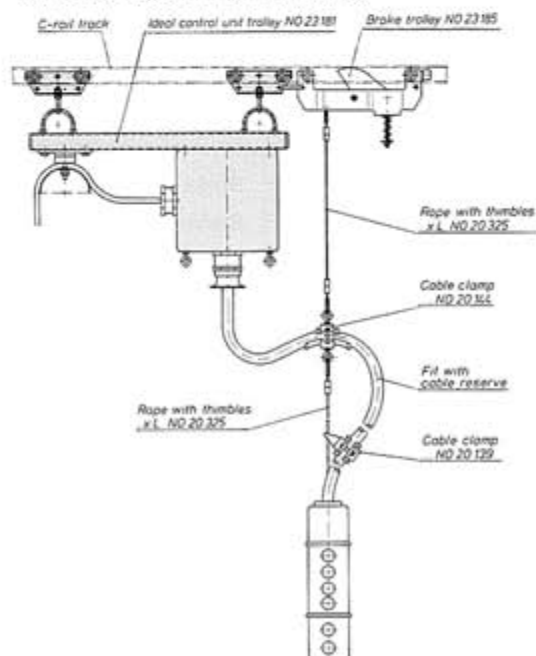
The following items must be ordered separately:

1. Cable glands for flat cables NO 20 610, NO 20 611 or NO 20 626,
for round cables NO 20 630 or NO 20 646
2. Cable glands with shaped entry for control cable NO 20 638 or NO 23 648
3. Locknuts NO 20 650 or NO 20 657
4. Terminal clamps NO 20 605
5. Earth conductor terminal clamps NO 20 607
6. End clamp for flat cables up to max. $d = 125$ mm and max. $b = 100$ mm,
types NO 23 269, NO 23 279, NO 24 230, NO 24 232, NO 24 289, NO 24 290
7. End clamp for round cables NO 23 299
8. Cable support for round cables NO 20 131 up to size 36
9. Tension relief for control cable NO 20 146
10. Ropes with thimbles NO 20 325
11. Cable clamp NO 20 140
12. PVC or rubber flat cables
13. PVC or rubber round cables
14. Brake glider NO 23 184 or
brake trolley with hand operated brake NO 23 185 or
brake trolley with electromagnetic operated brake NO 23 187
15. Tension relief rope for brake operation NO 20 315

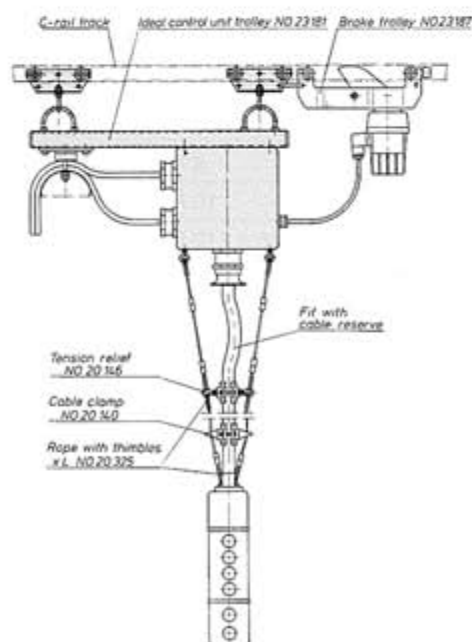
We can supply ideal control unit trolleys for flat or round cables, terminal clamps and accessories to your specifications.

EXAMPLES OF APPLICATION

**IDEAL CONTROL UNIT TROLLEY
with control station. Light duty.**
Control station suspended on the brake trolley
Attention: Maximum permissible
suspended load of 8 kg of
control cable and control station.

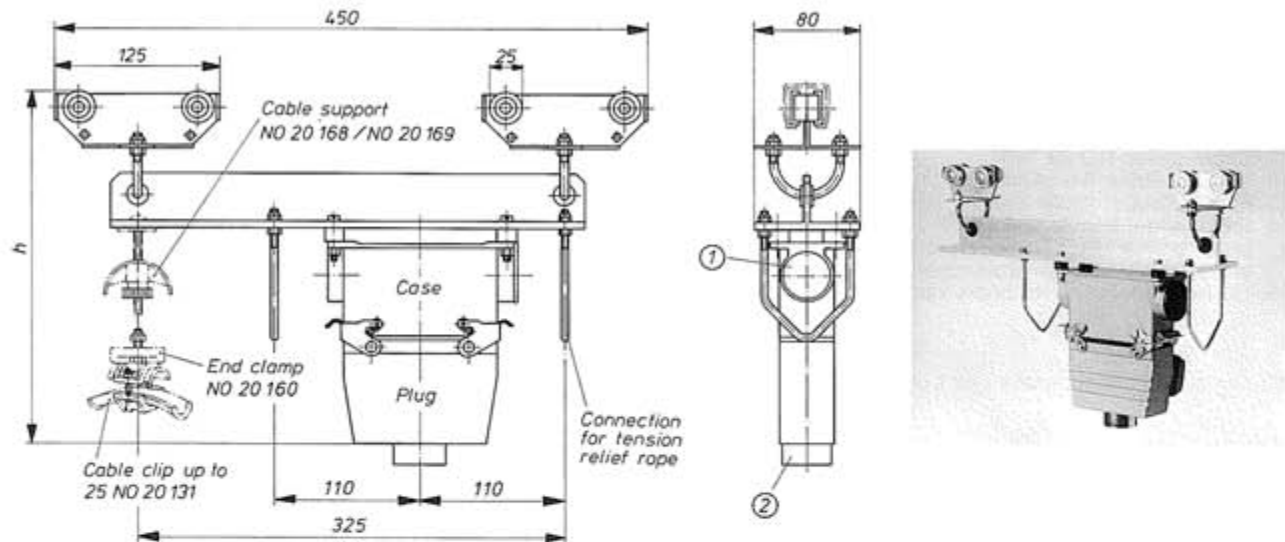


**IDEAL CONTROL UNIT TROLLEY
with control station and brake trolley.**



IDEAL CONTROL UNIT TROLLEY NO 23 183 with multipole plug and socket connection
suitable for use with flat or round cable clamps

The control unit and control cable are the most frequent sources of trouble with floor control lifting gear. As a result of the introduction of the plug and socket connection a complete control unit with control cable and plug can be held in reserve and if a fault develops it can be interchanged in a very short time.



Technical data

Type of roller	Permissible load capacity ¹⁾ [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel ball bearing, galvanized	32	-30 to +80	Trolley: steel, galv. Main body: aluminium Case: aluminium Small parts: steel, galv.	A (B restricted)

Plug and socket connections			
Nominal voltage	Nominal current	Protection class	Screw connections
415 V	16 A	IP 55 accord. to DIN 40 050	2.5 mm ²

Ideal control unit trolley with plug and socket connection, standard type

Catalogue No.	Terminal	h	Threaded connection		Weight [kg]	Attachments
			① Pg	② Pg		
Ideal control unit trolley 6 NO 23 183	6 + E	215	16	13.5	1.790	Brake glider NO 23 184 or Brake trolley NO 23 185 or Brake trolley NO 23 187
Ideal control unit trolley 10 NO 23 183	10 + E	221	16	16	1.910	
Ideal control unit trolley 16 x 116 NO 23 183	16 + E	229	21	21	2.060	
Ideal control unit trolley 24 x 127 NO 23 183	24 + E	240	21	29	2.280	

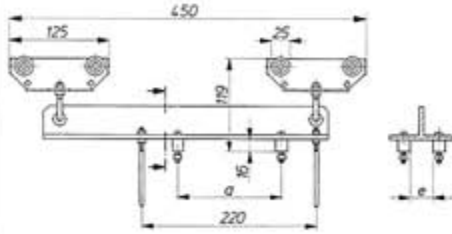
Ideal control unit trolley with plug and socket connection, high construction

Catalogue No.	Terminal	h	Threaded connection		Weight [kg]	Attachments
			① Pg	② Pg		
Ideal control unit trolley 16 NO 23 183	16	266	29	29	2.190	Brake glider NO 23 184 or Brake trolley NO 23 185 or Brake trolley NO 23 187
Ideal control unit trolley 24 NO 23 183	24	269	29	29	2.355	

- 1) Total weight of control cable and control station.
2) For special pairs of rollers refer to page 230/48.
3) The bolt of the 6-pole construction is not on the plug but on the case.

COMPONENT PARTS

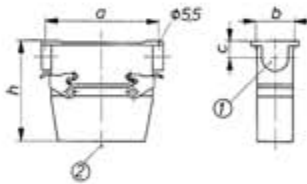
IDEAL CONTROL UNIT TROLLEY UPPER PART NO 23 170



Catalogue No.	d	e	Weight [kg]	Plug and socket connection
10 NO 23 170	70 82	30	1.370	6 NO 20 701 10 NO 20 701
24 NO 23 170	105 132	35	1.370	16 NO 20 701 16 NO 20 709 24 NO 20 701 24 NO 20 709

PLUG AND SOCKET CONNECTION NO 20 701

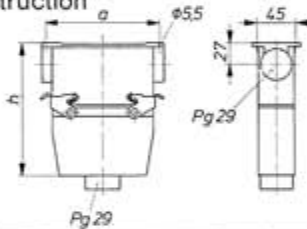
Standard type



Catalogue No.	Terminal	a	b	c	h	Threaded connection		Weight [kg]
						① Pg	② Pg	
6 NO 20 701	6+E	70	40	17	102	16	13.5	0.420
10 NO 20 701	10+E	82	40	17	108	16	16	0.540
16 NO 20 701	16+E	105	45	20	116	21	21	0.690
24 NO 20 701	24+E	132	45	20	127	21	29	0.910

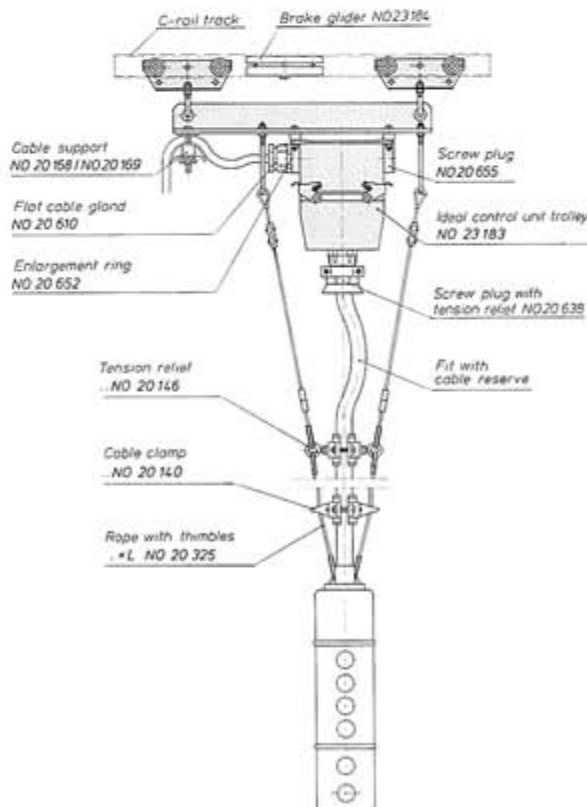
PLUG AND SOCKET CONNECTION NO 20 709

High construction



Catalogue No.	Terminal	a	h	Weight [kg]
16 NO 20 709	16+E	105	153	0.820
24 NO 20 709	24+E	132	156	0.985

EXAMPLE OF APPLICATION



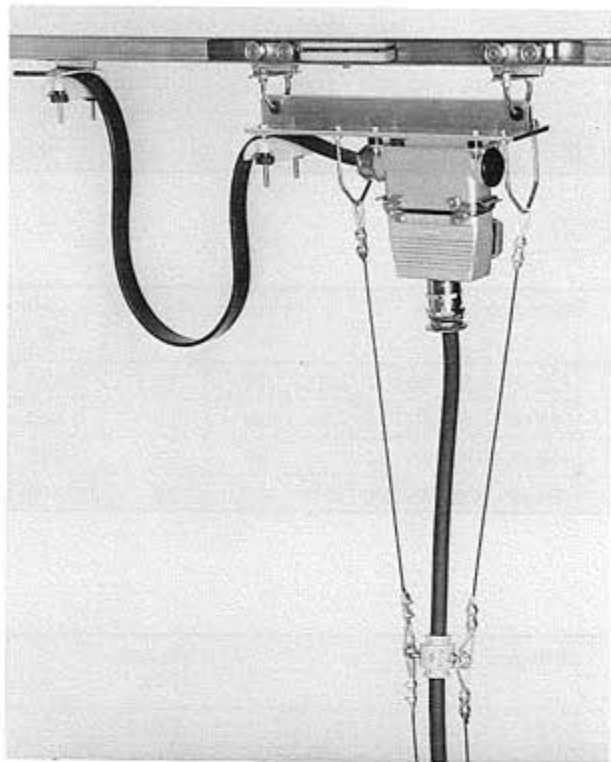
The following items must be ordered separately:

- Cable support for flat cable
support \varnothing 50 mm NO 20 168
support \varnothing 80 mm NO 20 169
- End clamp NO 20 160
- Cable clip for round cable NO 20 131
- Flat cable glands NO 20 610
- Round cable glands NO 20 630
- Enlargements rings NO 20 652
- Screw plug NO 20 655
- Round cable gland with tension relief for control cable NO 20 638
- Tension relief for control cable NO 20 146
- Ropes for tension relief of control cable NO 20 325
- Cable clamps NO 20 140
- Brake glider NO 23 184
- Brake trolley with hand operated brake NO 23 185
- Brake trolley with electromagnetic operated brake NO 23 187
- Brake pull rope NO 20 315
- Control cable MTGöu

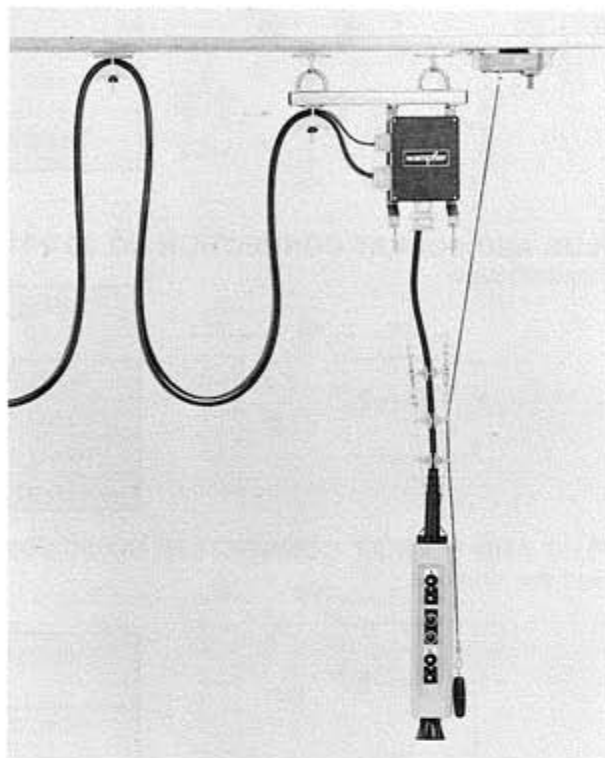
BRAKE GLIDERS and BRAKE TROLLEYS for installation to ideal control unit trolleys

EXAMPLES OF APPLICATION

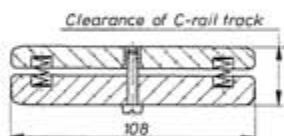
IDEAL CONTROL UNIT TROLLEY with brake glider



IDEAL CONTROL UNIT TROLLEY with brake trolley



Catalogue No.: **BRAKE GLIDER NO 23 184**



Braking force: 10 N – 20 N

Operating temperature: -30°C to +80°C

Material: glider: plastic
fasteners: steel, galvanized

Weight: 0.100 kg

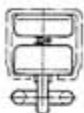
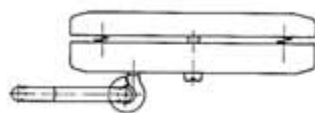


Application:

The brake glider is mounted between the two traveling trolleys of the ideal control unit trolleys NO 23 180, NO 23 181 and NO 23 183. It avoids any unintentional travel in either direction.

Catalogue No.: **BRAKE GLIDER NO 23 199**

with connection part

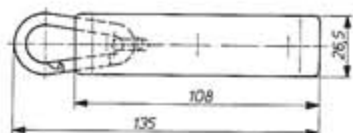


Braking force: 10 N – 20 N

Operating temperature: -30°C to +80°C

Material: glider: plastic
fasteners: steel, galvanized

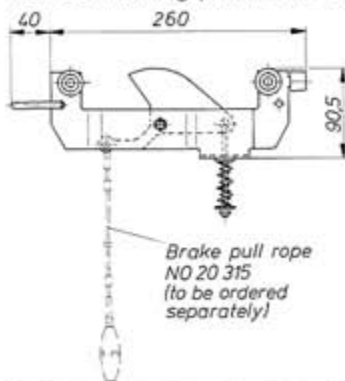
Weight: 0.140 kg



Application:

The brake glider with connection part is connected to the ideal control unit trolleys NO 23 101, NO 23 111 and NO 23 192. It avoids any unintentional travel in either direction.

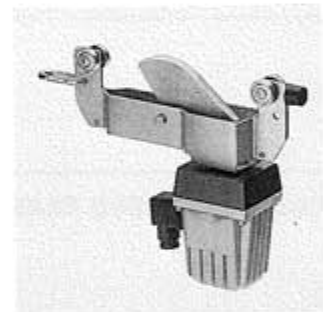
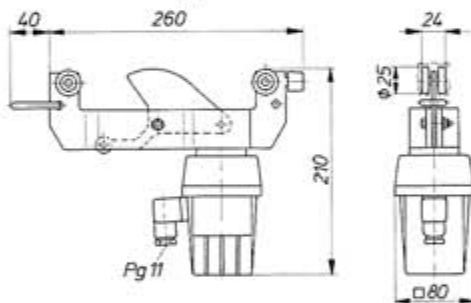
BRAKE TROLLEY NO 23 185 with hand operated brake
with connecting part for installation to ideal control unit trolley



Catalogue No.	Type of roller	Operating temperature [°C]	Max. permissible horizontal pull [N] (in direction of end clamp)	Weight [kg]	Material	Special pairs of rollers Group ¹⁾
Brake trolley NO 23 185	Steel ball bearing, galvanized	-30 to +80	160	1.4	Main body: steel, galv. Buffer: rubber Brake: cast iron Fasteners: steel, galv.	A

1) For special pairs of rollers refer to page 230/48.

BRAKE TROLLEY NO 23 187 with electromagnetic operated brake
with connecting part for installation to ideal control unit trolley



The magnet is equipped with a detachable plug and socket connection and a connection gland Pg 11. The magnets are supplied as dc or ac magnets as detailed below.

The solenoid is fitted with a plug and socket connection and a Pg 11 cable gland. The solenoids can be supplied in accordance with the table below suitable for direct or alternating currents for the specified supply voltages.

If an actuating solenoid is fitted a further cable gland Pg 11 must be provided on the terminal boxes of the control trolley.

In addition a switch has to be provided in addition for the operating of the brake.

The cable between solenoid and terminal box is not supplied.

Technical data

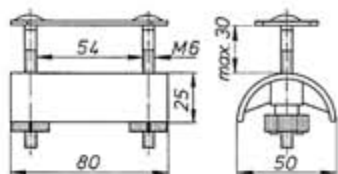
Type of roller	Operating temperature [°C]	Max. permissible horizontal pull [N] (in direction of end clamp)	Material	Special pairs of rollers Group ¹⁾
Steel ball bearing, galvanized	-30 to +80	160	Main body: steel, galv. Buffer: rubber Brake: cast iron Case: aluminium Fasteners: steel, galv.	A

Catalogue No.	Coil voltage	Supply voltage U [V]	Switch of current I _E [A]	Nominal current I _N [A]	ED %	Weight [kg]
Brake trolley 1 NO 23 187	~	~ 220	1.71	0,29	100	2.7
Brake trolley 2 NO 23 187	=	~ 220	0.23	0.23	100	2.7
Brake trolley 3 NO 23 187	~	~ 36	10.50	1.78	100	2.7
Brake trolley 4 NO 23 187	~	~ 42	8.95	1.52	100	2.7

1) For special pairs of rollers refer to page 230/48.

ACCESSORIES for ideal control unit trolleys and brake trolleys

Catalogue No.: **CABLE SUPPORT NO 20 168**



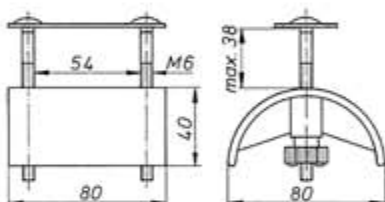
Operating temperature: -30°C to $+80^{\circ}\text{C}$

Material: support: plastic
split nut: plastic
bolt: steel, galvanized

Weight: 0.065 kg



Catalogue No.: **CABLE SUPPORT NO 20 169**



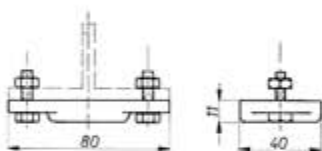
Operating temperature: -30°C to $+80^{\circ}\text{C}$

Material: support: plastic
split nut: plastic
bolt: steel, galvanized

Weight: 0.095 kg



Catalogue No.: **END CLAMP NO 20 160**



Operating temperature: -30°C to $+80^{\circ}\text{C}$

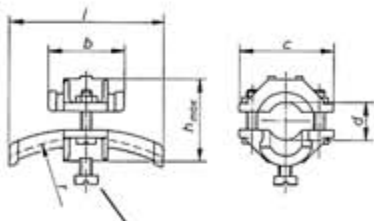
Material: connecting plate: plastic
fasteners: steel, galvanized

Weight: 0.035 kg

Attachments: cable clip NO 20 131
only size 16 and 25

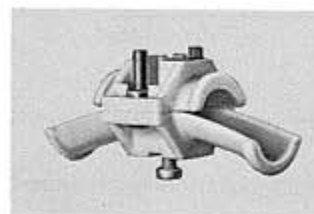


CABLE CLIP NO 20 131



Operating temperature: -30°C to $+80^{\circ}\text{C}$

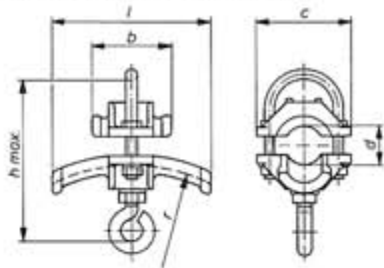
Material: cable clip: plastic
fasteners: steel, galvanized



NOTE: This screw is not for clamping the round cable, but for fastening another cable clip.
If an additional cable clip is fitted, the screw has to be removed.

Catalogue No.	d Cable ϕ	r	l	h max.	b	c	Weight [kg]
Cable clip 16 NO 20 131	10-16	80	70	38	35	42	0.040
Cable clip 25 NO 20 131	17-25	125	100	47	50	50	0.060
Cable clip 36 NO 20 131	26-36	180	140	58	70	64	0.120

CABLE CLIP NO 20 134



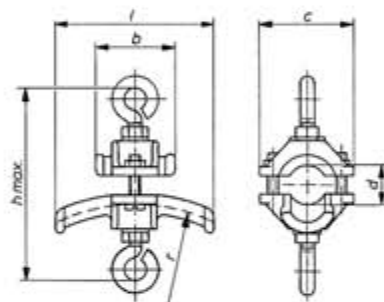
Operating temperature: -30°C to +80°C

Material: cable clip: plastic
fasteners: steel, galvanized



Catalogue No.	d Cable ø	r	l	h max.	b	c	Weight [kg]
Cable clip 16 NO 20 134	10-16	80	70	75	35	42	0.070
Cable clip 25 NO 20 134	17-25	125	100	90	50	50	0.090
Cable clip 36 NO 20 134	26-36	180	140	105	70	64	0.150

CABLE CLIP NO 20 144



Operating temperature: -30°C to +80°C

Material: cable clip: plastic
fasteners: steel, galvanized



Catalogue No.	d Cable ø	r	l	h max.	b	c	Weight [kg]
Cable clip 16 NO 20 144	10-16	80	70	90	35	42	0.070
Cable clip 25 NO 20 144	17-25	125	100	98	50	50	0.090
Cable clip 36 NO 20 144	26-36	180	140	110	70	64	0.150

ROPE 4 x ... NO 20 315

Towing rope for brake operation



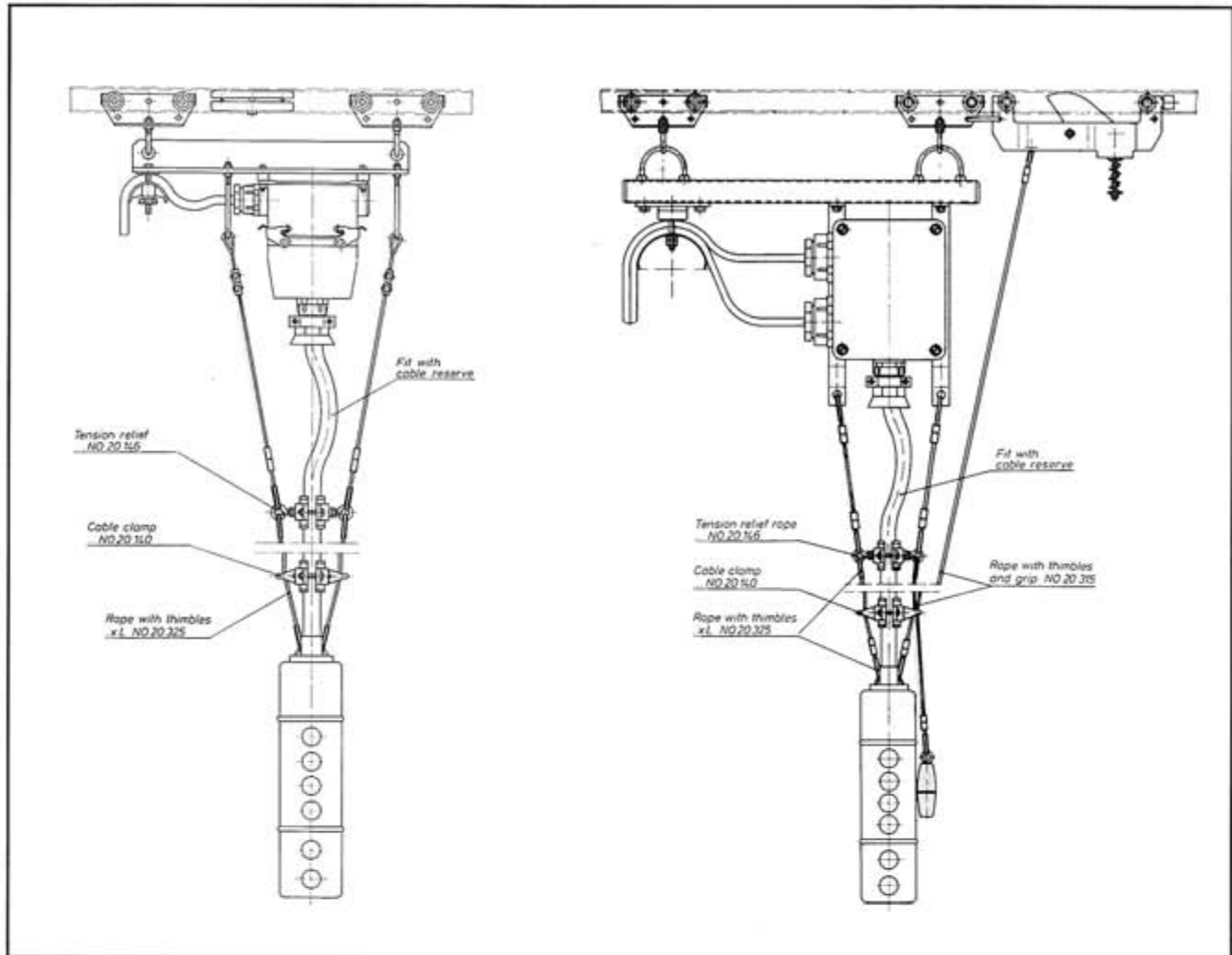
Perm. load: 40 kg

Operating temperature: -30°C to +80°C

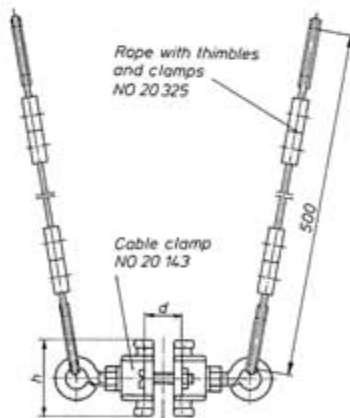
Material: Rope ø 4: Polyamide
thimble: steel, galvanized
clamp: steel, galvanized
handle: plastic

Catalogue No. ø 4 x L	L [m]	Weight [kg]
Rope 4 x 2,5 NO 20 315	2.5	0.150
Rope 4 x 3,2 NO 20 315	3.2	0.156
Rope 4 x 4,0 NO 20 315	4.0	0.162
Rope 4 x 5,0 NO 20 315	5.0	0.170
Rope 4 x 6,3 NO 20 315	6.3	0.180
Rope 4 x 8,0 NO 20 315	8.0	0.194
Rope 4 x 10,0 NO 20 315	10.0	0.210
Rope 4 x 12,5 NO 20 315	12.5	0.230
Rope 4 x 16,0 NO 20 315	16.0	0.258
Rope 4 x 20,0 NO 20 315	20.0	0.290

TENSION RELIEF PARTS for suspension cables



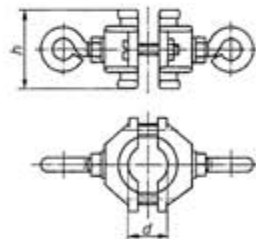
CONNECTION FOR TENSION RELIEF ROPE NO 20 146



Operating temperature:
-30°C to +80°C

Material:
cable clamp: plastic
rope: steel,
plastic covered
fasteners: steel, galv.

CABLE CLAMP NO 20 143



Operating temperature:
-30°C to +80°C

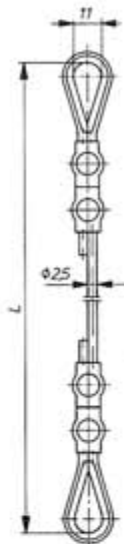
Material:
cable clamp: plastic
fasteners: steel, galvanized

Catalogue No.	d Cable ϕ	h	Weight [kg]
16 NO 20 146	10-16	35	0.180
25 NO 20 146	17-25	50	0.200
36 NO 20 146	26-36	70	0.260

Catalogue No.	d Cable ϕ	h	Weight [kg]
16 NO 20 143	10-16	35	0.060
25 NO 20 143	17-25	50	0.080
36 NO 20 143	26-36	70	0.140

ROPE 2.5 x ... NO 20 325

with thimbles and clips



Perm. load: 20 kg

Operating temperature: -30°C to +80°C

Material: rope ϕ 2.5: steel,
plastic covered
thimble: steel, galvanized
clamp: steel, galvanized

Catalogue No. ϕ 2.5 x L	L [m]	Weight [kg]
Rope 2.5 x 0.5 NO 20 325	0.5	0.060
Rope 2.5 x 2.5 NO 20 325	2.5	0.086
Rope 2.5 x 3.2 NO 20 325	3.2	0.094
Rope 2.5 x 4.0 NO 20 325	4.0	0.104
Rope 2.5 x 5.0 NO 20 325	5.0	0.116
Rope 2.5 x 6.3 NO 20 325	6.3	0.132
Rope 2.5 x 8.0 NO 20 325	8.0	0.152
Rope 2.5 x 10.0 NO 20 325	10.0	0.176
Rope 2.5 x 12.5 NO 20 325	12.5	0.206
Rope 2.5 x 16.0 NO 20 325	16.0	0.248
Rope 2.5 x 20.0 NO 20 325	20.0	0.296

ROPE 2.5 NO 20 305

Operating temperature: -30°C to +80°C

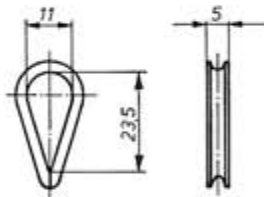
Material: rope ϕ 2.5: steel,
plastic covered



Catalogue No.	Length	Weight kg/100 m
Rope 2.5 NO 20 305 T	500 m on roller	1.2
Rope 2.5 NO 20 305	running metre	

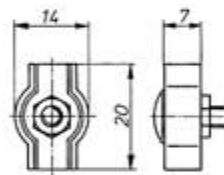
Catalogue No.: **ROPE THIMBLE 3 NO 20 120**

Catalogue No.: **SIMPLEX ROPE CLIP 3 NO 20 122**



Material: steel, galvanized

Weight: 0.008 kg

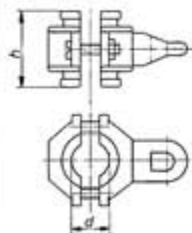


Material: steel, galvanized

Weight: 0.010 kg

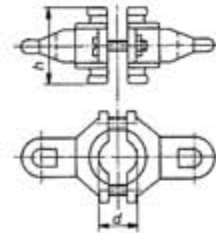
CABLE CLAMP NO 20 139

CABLE CLAMP NO 20 140



Operating temperature:
-30°C to +80°C

Material:
cable clamp: plastic
fasteners: steel, galvanized



Operating temperature:
-30°C to +80°C

Material:
cable clamp: plastic
fasteners: steel, galvanized

Catalogue No.	d Cable ϕ	h	Weight [kg]
16 NO 20 139	10-16	35	0.040
25 NO 20 139	17-25	50	0.060
36 NO 20 139	26-36	70	0.120

Catalogue No.	d Cable ϕ	h	Weight [kg]
16 NO 20 140	10-16	35	0.050
25 NO 20 140	17-25	50	0.070
36 NO 20 140	26-36	70	0.130

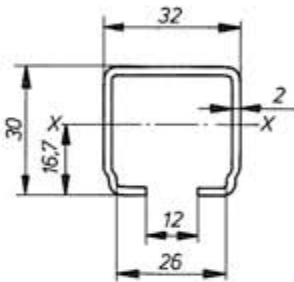
STAINLESS STEEL AND ACID RESISTANT PARTS FOR FLEXIBLE CABLE SYSTEMS

TRACKS AND MOUNTINGS

C-RAIL TRACKS AND CURVES

C-RAIL TRACK NO 23 400; stainless steel V 4 A
C-RAIL TRACK NO 23 404; stainless steel V 2 A

Wall thickness: 2 mm
 Weight: 1.56 kg/m
 Static. values: $I_x = 2.42 \text{ cm}^4$
 $W_x = 1.45 \text{ cm}^3$

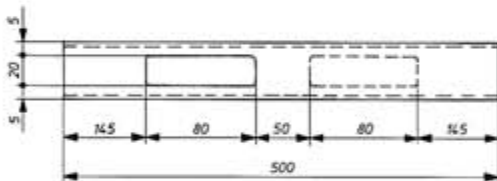


Catalogue No.	Catalogue No.	Length ¹⁾ [mm]	Length tolerance [mm]
Material: V 4 A	Material: V 2 A		
6 NO 23 400	6 NO 23 404	6000	+ 40
4 NO 23 400	4 NO 23 404	4000	

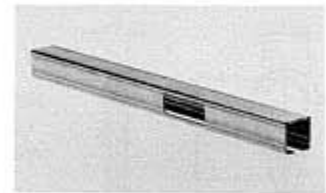
1) Intermediate sizes, e.g. 3 m or 4.8 m, see pricelist.

Catalogue No.: **INSPECTION PIECE NO 23 408;** stainless steel V 4 A
 of C-rail track NO 23 400

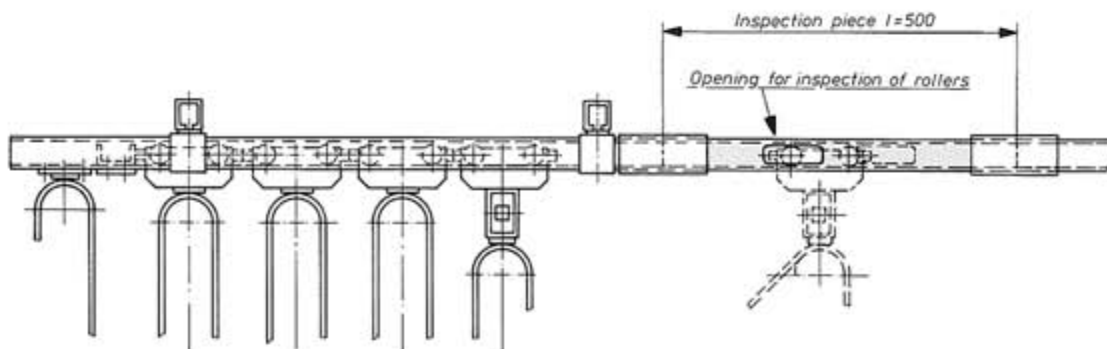
Catalogue No.: **INSPECTION PIECE NO 23 409;** stainless steel V 2 A
 of C-rail track NO 23 404



Weight: 0.700 kg

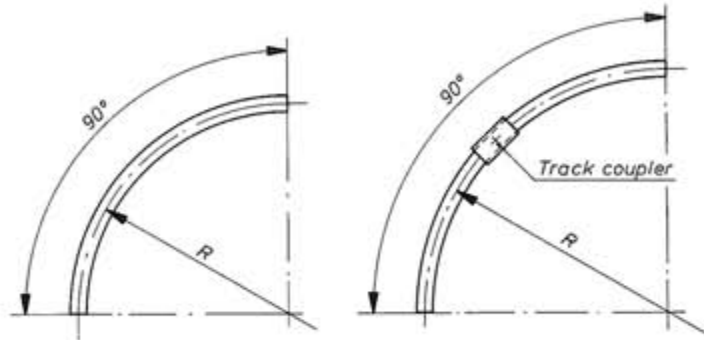


EXAMPLE OF APPLICATION



90°-CURVE NO 23 403; stainless steel V 4 A
of C-rail track NO 23 400

90°-CURVE NO 23 405; stainless steel V 2 A
of C-rail track NO 23 404

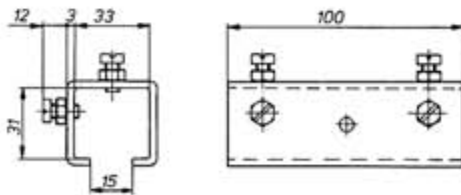


Catalogue No. Material: V 4 A	Catalogue No. Material: V 2 A	R [mm]	Developed length [mm]	Number of track coupler	Depth of loop max. 0.35 x R	For max. trolley length [mm]	Weight [kg]
1000 NO 23 403	1000 NO 23 405	1000	1570	-	350	160	2.4
1200 NO 23 403	1200 NO 23 405	1200	1885	-	420	160	2.9
1400 NO 23 403	1400 NO 23 405	1400	2200	-	490	200	3.4
1600 NO 23 403	1600 NO 23 405	1600	2510	-	560	200	3.9
1800 NO 23 403	1800 NO 23 405	1800	2830	-	630	280	4.4
2000 NO 23 403	2000 NO 23 405	2000	3140	-	700	280	4.9
2200 NO 23 403	2200 NO 23 405	2200	3455	-	770	280	5.4
2400 NO 23 403	2400 NO 23 405	2400	3770	-	840	320	5.9
2600 NO 23 403	2600 NO 23 405	2600	4080	-	910	320	6.4
2800 NO 23 403	2800 NO 23 405	2800	4400	-	980	320	6.9
3000 NO 23 403	3000 NO 23 405	3000	4710	-	1050	320	7.3
3200 NO 23 403	3200 NO 23 405	3200	5025	-	1120	320	7.8
3400 NO 23 403	3400 NO 23 405	3400	5340	-	1190	320	8.3
3600 NO 23 403	3600 NO 23 405	3600	5650	1	1260	320	9.1
3800 NO 23 403	3800 NO 23 405	3800	5970	1	1330	320	9.6
4000 NO 23 403	4000 NO 23 405	4000	6280	1	1400	320	10.1
4200 NO 23 403	4200 NO 23 405	4200	6595	1	1470	320	10.6
4400 NO 23 403	4400 NO 23 405	4400	6910	1	1540	320	11.1
4600 NO 23 403	4600 NO 23 405	4600	7220	1	1610	320	11.6
4800 NO 23 403	4800 NO 23 405	4800	7540	1	1680	320	12.1
5000 NO 23 403	5000 NO 23 405	5000	7850	1	1750	320	12.5
5500 NO 23 403	5500 NO 23 405	5500	8635	1	1925	400	13.8
6000 NO 23 403	6000 NO 23 405	6000	9420	1	2100	400	15.0
6500 NO 23 403	6500 NO 23 405	6500	10205	1	2275	400	16.2
7000 NO 23 403	7000 NO 23 405	7000	10990	1	2450	400	17.4
7500 NO 23 403	7500 NO 23 405	7500	11775	2	2625	400	19.0
8000 NO 23 403	8000 NO 23 405	8000	12560	2	2800	400	20.2
8500 NO 23 403	8500 NO 23 405	8500	13345	2	2975	400	21.4
9000 NO 23 403	9000 NO 23 405	9000	14130	2	3150	400	22.6
9500 NO 23 403	9500 NO 23 405	9500	14915	2	3325	400	23.9
10000 NO 23 403	10000 NO 23 405	10000	15700	2	3500	400	25.1

For intermediate sizes we charge the price of the next larger type. Of course we can produce any curve track for you. Please give us a sketch. Price on inquiry.

MOUNTINGS

Catalogue No.: **TRACK COUPLER NO 23 410**; stainless steel

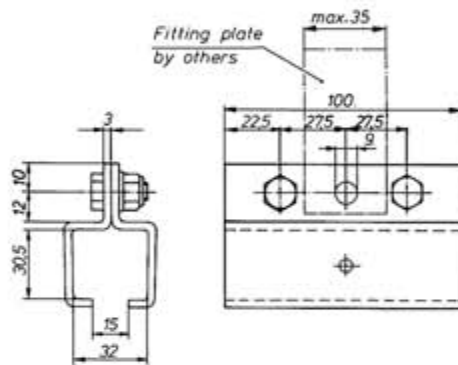


Material: steel, V 4 A
Weight: 0.280 kg

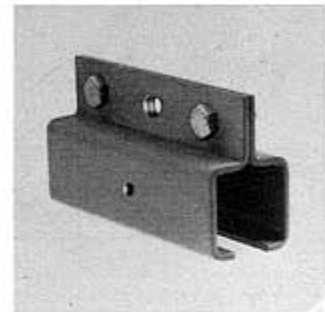
Application: A track coupler must be provided at each track joint.



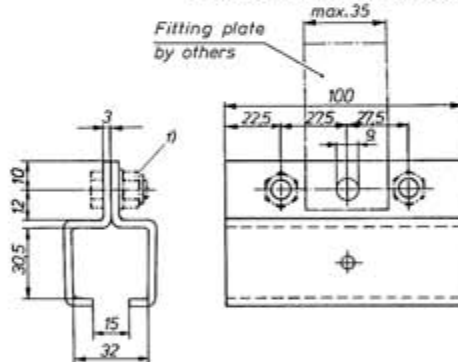
Catalogue No.: **TRACK SUPPORT BRACKET and TRACK COUPLER NO 23 411**;
stainless steel (2-pieces)



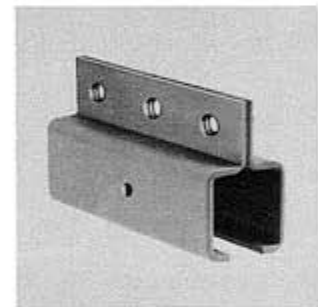
Material: steel, V 4 A
Weight: 0.480 kg



Catalogue No.: **TRACK SUPPORT BRACKET and TRACK COUPLER NO 23 412**;
stainless steel (2-pieces)

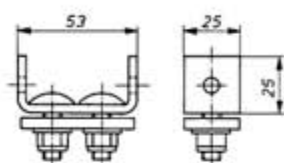


Material: steel, V 4 A
Weight: 0.360 kg

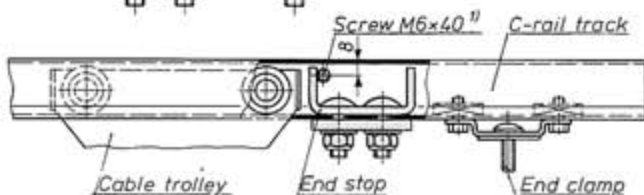


1) Screws, nuts and washers of stainless steel are required for fixing the two plates.

Catalogue No.: **END STOP NO 23 419**; stainless steel



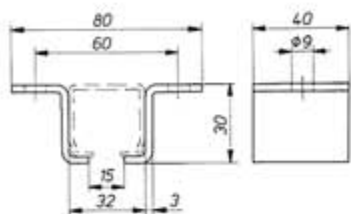
Material: steel, V 4 A
Weight: 0.130 kg



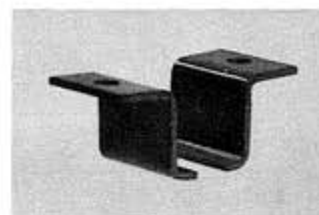
The end stop is fitted into the C-rail track between the end clamp and the first cable trolley. Its function is to prevent the cable trolley from running against the end clamp.

1) To avoid damages due to incorrect fitting we recommend that the end stop NO 23 419 be secured by an additional bolt M6 x 40 (material: V 4 A) fitted at right angles to the track.

TRACK SUPPORT BRACKET NO 23 421; stainless steel

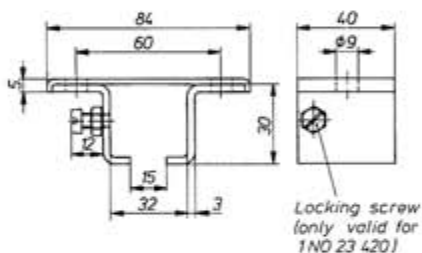


Material: steel, V 4 A
Perm. load: 63 kg

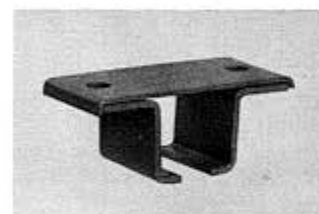


Catalogue No.	Type	Weight [kg]
NO 23 421	Without fixing screw	0.100

TRACK SUPPORT BRACKET NO 23 420 and 1 NO 23 420; stainless steel

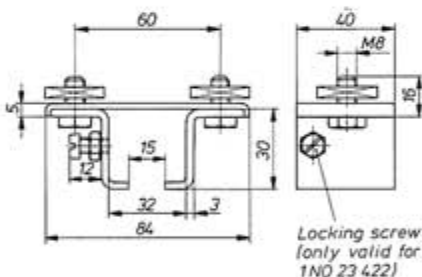


Material: steel, V 4 A
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 420	Without fixing screw	0.160
1 NO 23 420	With fixing screw	0.170

TRACK SUPPORT BRACKET NO 23 422 and 1 NO 23 422; stainless steel with square nuts, to fit support arm NO 20 485 and NO 20 488

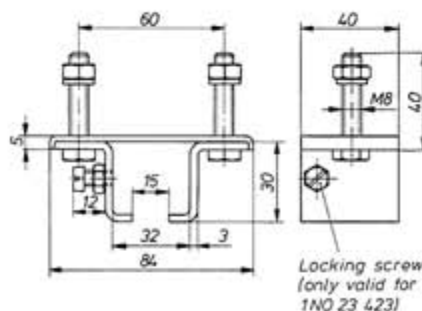


Material: steel, V 4 A
Perm. load: 63 kg



Catalogue No.	Type	Weight [kg]
NO 23 422	Without fixing screw	0.235
1 NO 23 422	With fixing screw	0.245

TRACK SUPPORT BRACKET NO 23 423 and 1 NO 23 423; stainless steel

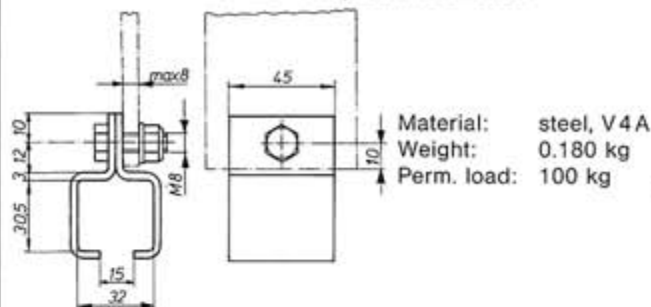


Material: steel, V 4 A
Perm. load: 63 kg

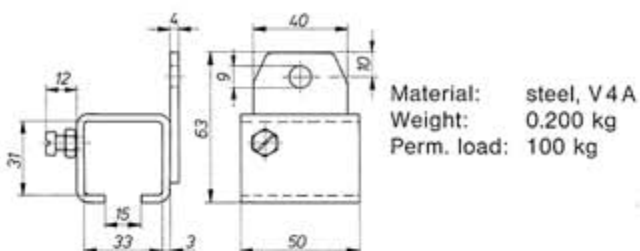


Catalogue No.	Type	Weight [kg]
NO 23 423	Without fixing screw	0.200
1 NO 23 423	With fixing screw	0.210

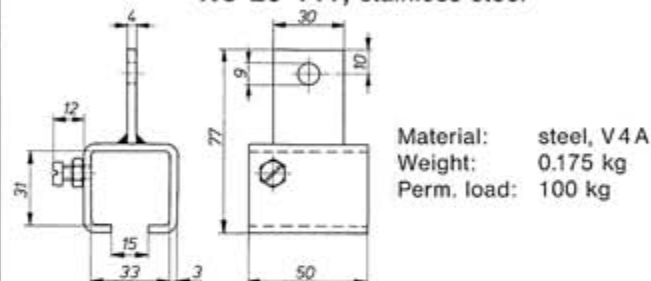
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 447**; stainless steel



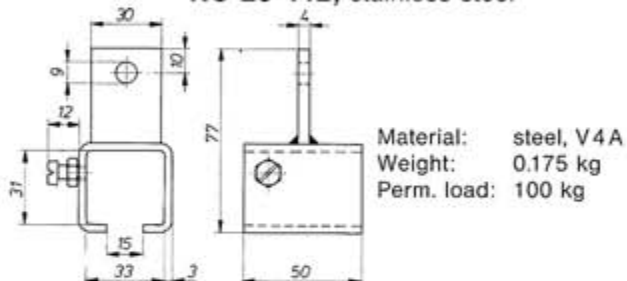
Catalogue No.: **TRACK SUPPORT BRACKET NO 23 440**; stainless steel



Catalogue No.: **TRACK SUPPORT BRACKET NO 23 441**; stainless steel

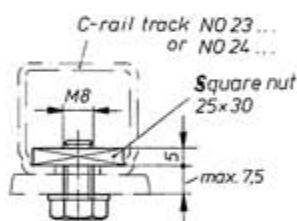


Catalogue No.: **TRACK SUPPORT BRACKET NO 23 442**; stainless steel



Catalogue No.: **BOLT complete 8 x 16 NO 20 476**; stainless steel with square nut

Material: steel, V4 A
Weight: 0.038 kg

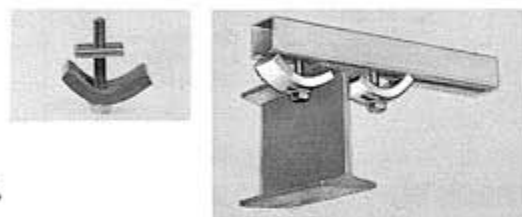
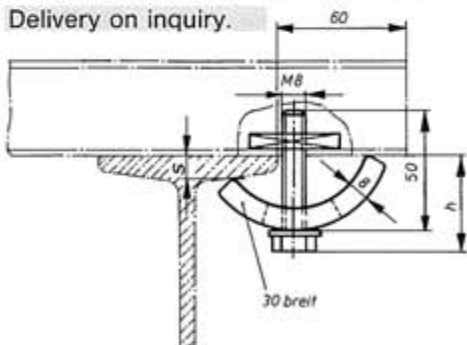


LIST OF APPLICATION

Standard part +	Bolts	≅ Complete part
NO 23 420 + 2 pieces 8 x 16 NO 20 476		≅ NO 23 422
1 NO 23 420 + 2 pieces 8 x 16 NO 20 476		≅ 1 NO 23 422
NO 23 440 + 1 piece 8 x 16 NO 20 476		= no complete part

The complete set will be supplied in component parts, preferably in packing units.

Catalogue No.: **GIRDER CLIP 8 NO 20 480**; complete stainless steel
Delivery on inquiry.



Material: clamping plate: steel, V4 A
bolt and nut: steel, V4 A
Weight: 0.150 kg

Clamping thickness «s»	4	6	8	10	12	16	20
Mounting height «h»	31	32	33	34	35	37	40

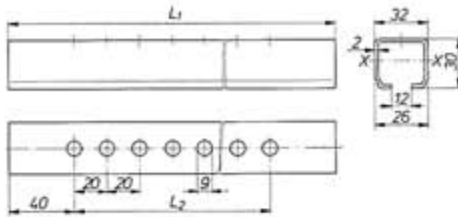
Catalogue No.: **GIRDER CLIP 8 NO 20 481**; with stainless steel bolt and nut

Dimensions as girder clip 8 NO 20 480.

Material: clamping plate: steel, galvanized
bolt and nut: steel, V4 A

SUPPORT ARM NO 20 485 (30 x 32 x 2); stainless steel V 4 A
SUPPORT ARM NO 20 487 (30 x 32 x 2); stainless steel V 2 A

Static. data: $I_x = 2.11 \text{ cm}^4$, $W_x = 1.36 \text{ cm}^3$



Catalogue No. Material: V 4 A	Catalogue No. Material: V 2 A	L ₁	L ₂	Weight [kg]
250 NO 20 485	250 NO 20 487	250	200	0.390
315 NO 20 485	315 NO 20 487	315	260	0.500
400 NO 20 485	400 NO 20 487	400	340	0.625
500 NO 20 485	500 NO 20 487	500	340	0.780
630 NO 20 485	630 NO 20 487	630	340	0.980
800 NO 20 485	800 NO 20 487	800	340	1.245
1000 NO 20 485	1000 NO 20 487	1000	340	1.550
1250 NO 20 485	1250 NO 20 487	1250	340	1.945

PERMISSIBLE LOADING

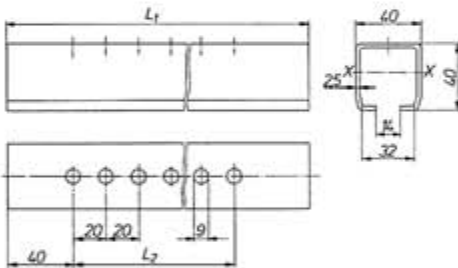


	l [m]						
	0.25	0.32	0.4	0.5	0.63	0.8	1.0
P [kg] ¹⁾	76	59.5	47.5	38.0	30.0	24.0	19.0
f [cm]	0.08	0.13	0.20	0.32	0.50	0.80	1.25

1) Calculated with $\sigma = 140 \text{ N/mm}^2$ tension;
 f = max. resulting deflection.

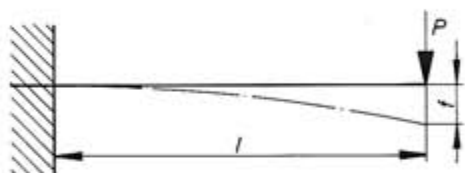
SUPPORT ARM NO 20 486 (40 x 40 x 2.5); stainless steel V 2 A
SUPPORT ARM NO 20 488 (40 x 40 x 2.5); stainless steel V 4 A

Static. data: $I_x = 6.05 \text{ cm}^4$, $W_x = 2.94 \text{ cm}^3$



Catalogue No. Material: V 2 A	Catalogue No. Material: V 4 A	L ₁	L ₂	Weight [kg]
250 NO 20 486	250 NO 20 488	250	200	0.625
315 NO 20 486	315 NO 20 488	315	260	0.800
400 NO 20 486	400 NO 20 488	400	340	1.000
500 NO 20 486	500 NO 20 488	500	340	1.250
630 NO 20 486	630 NO 20 488	630	340	1.575
800 NO 20 486	800 NO 20 488	800	340	2.000
1000 NO 20 486	1000 NO 20 488	1000	340	2.500
1250 NO 20 486	1250 NO 20 488	1250	340	3.125

PERMISSIBLE LOADING

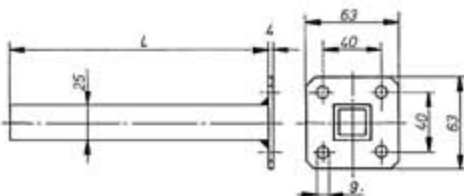


	l [m]						
	0.25	0.32	0.4	0.5	0.63	0.8	1.0
P [kg] ¹⁾	164.5	128.5	103.0	82.5	65.5	51.5	41.0
f [cm]	0.06	0.10	0.16	0.25	0.40	0.63	1.0

1) Calculated with $\sigma = 140 \text{ N/mm}^2$ tension;
 f = max. resulting deflection.

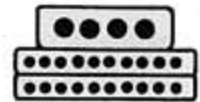
TOWING ARM NO 20 495; stainless steel

Material: steel, V 4 A



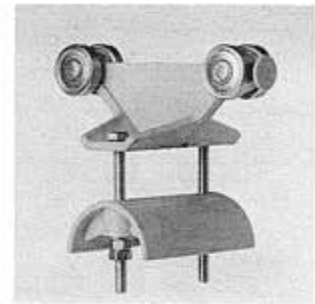
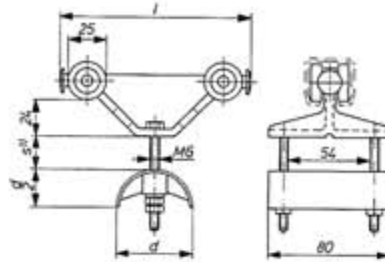
Catalogue No.	L	Weight [kg]
Towing arm 400 NO 20 495	400	0.600
Towing arm 630 NO 20 495	630	1.000

CABLE TROLLEYS AND ACCESSORIES for flat cables

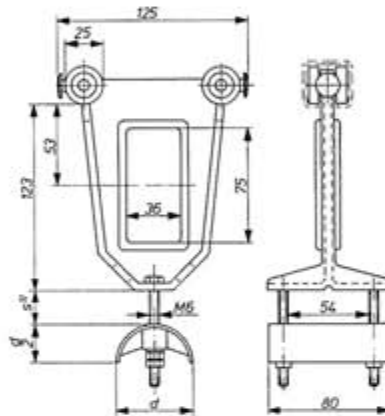


CABLE TROLLEY AND CABLE SUPPORT OF PLASTIC

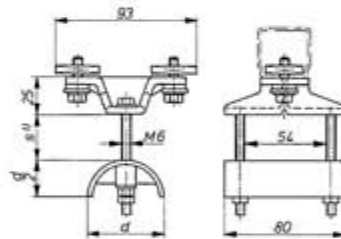
CABLE TROLLEY; acid resistant



TOWING TROLLEY; acid resistant



END CLAMP; acid resistant



Technical data

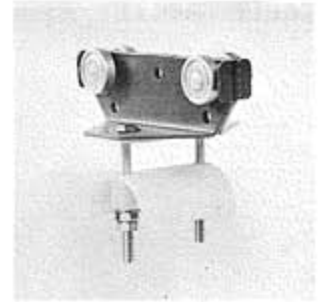
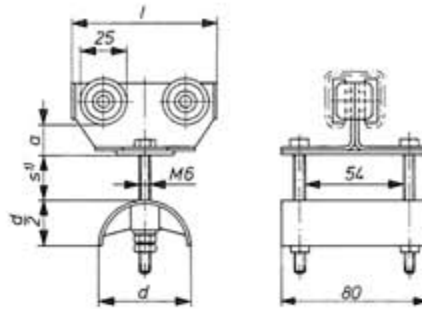
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel, V 4 A Ball bearing	10	-10 to +70	Main body: plastic, grey Support: plastic, grey Bolt: steel, V 4 A Fasteners: steel, V 4 A	A Stainless steel

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS			
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	s ¹⁾	s max.
NO 23 464	0.190	3)		3)		50	80	15	26
NO 23 465	0.195	NO 23 466	0.230	NO 23 468	0.100		125	36	36
NO 23 475	0.230	NO 23 476	0.250	NO 23 478	0.120	80	125	22	28

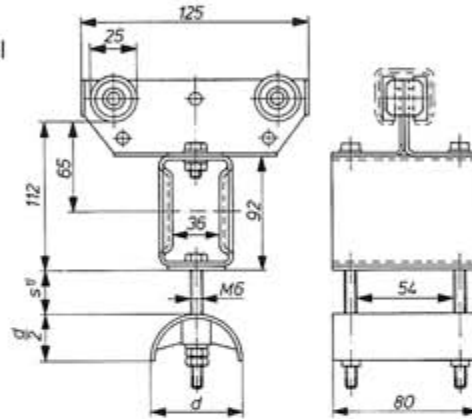
1) Dimension «s» applies on the assumption that the cable trolleys come together and not the flat cables. The bolts are, however, dimensioned to take cable bundles up to «s max.».
 2) For special pairs of rollers refer to page 230/48.
 3) Use next type size.

CABLE TROLLEY OF SHEET STEEL, CABLE SUPPORT OF PLASTIC

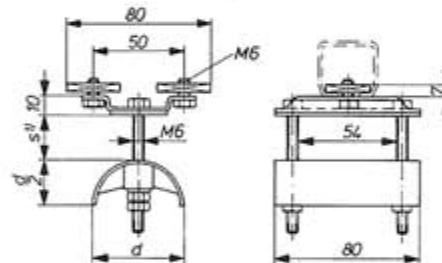
CABLE TROLLEY; stainless steel



TOWING TROLLEY; stainless steel



END CLAMP; stainless steel



Technical data

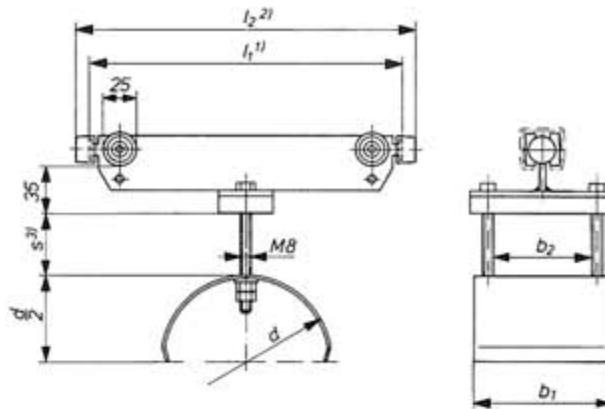
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ²⁾
Steel, V4 A Ball bearing	10	-10 to +80	Main body: steel, V4 A Support: plastic, grey Insulating plate: plastic, grey Bolt: steel, V4 A Fasteners: steel, V4 A	A Stainless steel

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	d	l	a	s ¹⁾	s max.
NO 23 461	0.275	4)		4)		50	80	17	15	30
NO 23 463 ³⁾	0.360	NO 23 467	0.600	NO 23 469	0.185		125	22	36	42
NO 23 471	0.385	NO 23 477	0.645	NO 23 479	0.220	80	125	22	22	34

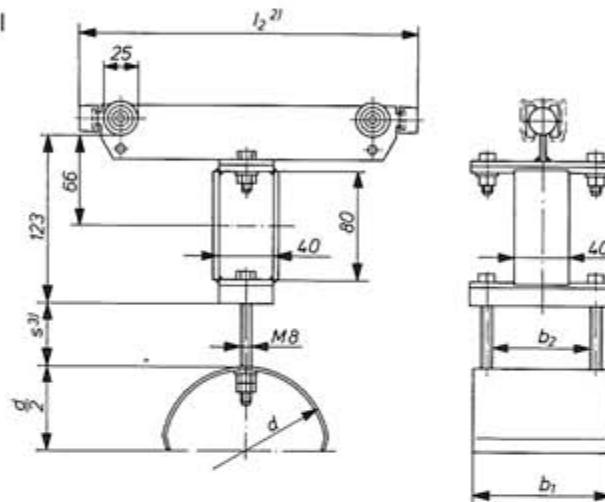
- 1) Dimension «s» applies on the assumption that the cable trolleys come together and not the flat cables. The bolts are, however, dimensioned to take cable bundles up to «s max.».
- 2) For special pairs of rollers refer to page 230/48.
- 3) Type with holes for towing ropes as shown for towing trolley.
- 4) Use next type size.

CABLE TROLLEY OF STEEL, CABLE SUPPORT OF SHEET STEEL

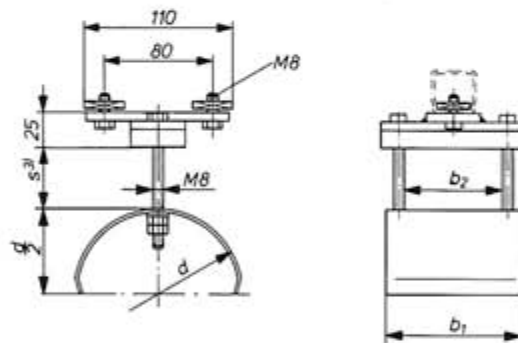
CABLE TROLLEY; stainless steel



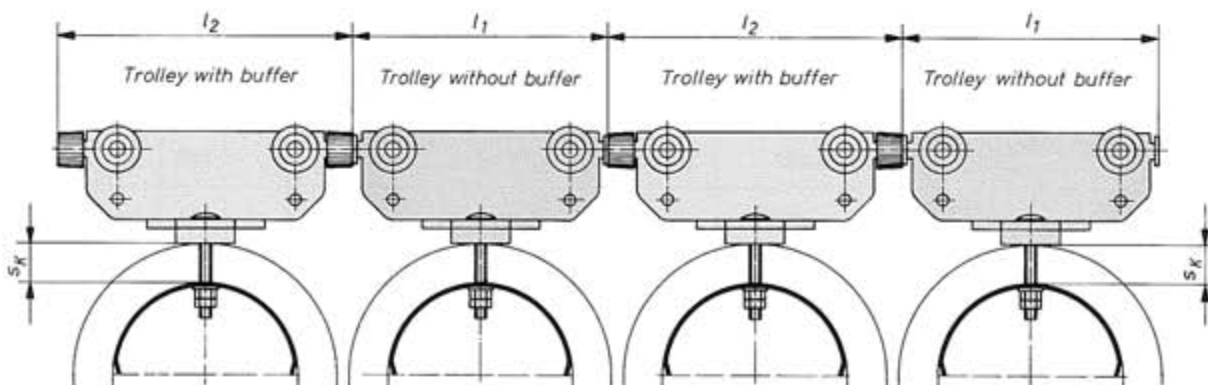
TOWING TROLLEY; stainless steel



END CLAMP; stainless steel



EXAMPLE of combined cable trolley arrangement



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ⁵⁾
Steel, V 4 A Ball bearing	10	-10 to +80	Main body: steel, V 4 A Buffer: rubber Support: steel, V 4 A Clamping piece: rubber Bolt: steel, V 4 A Fasteners: steel, V 4 A	A Stainless steel

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS							
Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	d	l ₁ ¹⁾	l ₂ ²⁾	b ₁	b ₂ _{max.}	s _{max.} ³⁾	s _K ⁴⁾	
105 x 100 NO 23 830 125 x 100 NO 23 830	0.640 0.650	125 x 100 NO 23 835	1.190	100 x 68 NO 24 830	0.700	80	105	-	100	72	12	16	
								125			20		
140 x 100 NO 23 830 160 x 100 NO 23 830	0.690 0.700	160 x 100 NO 23 835	1.240	100 x 68 NO 24 830	0.700			140	-	100	72	30	34
								160			38		
180 x 100 NO 23 830 200 x 100 NO 23 830	0.760 0.770	200 x 100 NO 23 835	1.310	100 x 68 NO 24 830	0.700	125	180	-	100	72	50	54	
									200			58	
180 x 100 NO 23 832 200 x 100 NO 23 832	0.860 0.870	200 x 100 NO 23 837	1.410	100 x 48 NO 24 832	0.800			180	-	100	72	27	31
								200			35		
180 x 160 NO 23 832 200 x 160 NO 23 832	1.150 1.160	200 x 160 NO 23 837	1.820	160 x 48 NO 24 832	1.130		180	-	160	132	27	31	
								200			35		
230 x 100 NO 23 832 250 x 100 NO 23 832	0.930 0.940	250 x 100 NO 23 837	1.480	100 x 68 NO 24 832	0.820	160	230	-	100	72	52	56	
									250			60	
230 x 160 NO 23 832 250 x 160 NO 23 832	1.230 1.240	250 x 160 NO 23 837	1.900	160 x 68 NO 24 832	1.150		230	-	160	132	52	56	
								250			60		
200 x 100 NO 23 833	1.020	200 x 100 NO 23 838	1.560	100 x 48 NO 24 833	1.000	160	-	200	115	72	18	-	
200 x 160 NO 23 833	1.400	200 x 160 NO 23 838	2.060	160 x 48 NO 24 833	1.400				200	175	132	18	-
230 x 100 NO 23 833 250 x 100 NO 23 833	0.940 0.950	250 x 100 NO 23 838	1.490	100 x 48 NO 24 833	1.000	200	230	-	115	72	35	38	
									250			42	
230 x 160 NO 23 833 250 x 160 NO 23 833	1.330 1.340	250 x 160 NO 23 838	2.000	160 x 48 NO 24 833	1.400		230	-	175	132	35	38	
								250			42		
250 x 100 NO 23 834	1.050	250 x 100 NO 23 839	1.590	100 x 48 NO 24 834	1.100	200	-	250	115	72	22	-	
250 x 160 NO 23 834	1.590	250 x 160 NO 23 839	2.250	160 x 48 NO 24 834	1.650				250	175	132	22	-

1) l₁ = cable trolley without rubber buffer.

2) l₂ = cable trolley with rubber buffer, towing trolleys are only supplied with rubber buffers.

3) Dimension «s» applies on the assumption that the cable trolley buffers come together and not the flat cables.

4) The cable trolleys can be combined, i.e. trolleys without buffers and trolleys with buffers can be used alternatively. The max. clamping thickness can then be used up to the value of «s_K».

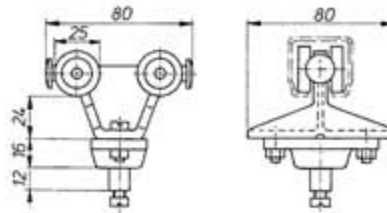
5) For special pairs of rollers refer to page 230/48.

CABLE TROLLEYS AND ACCESSORIES for round cables and hoses

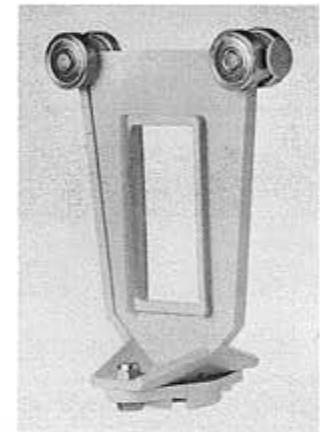
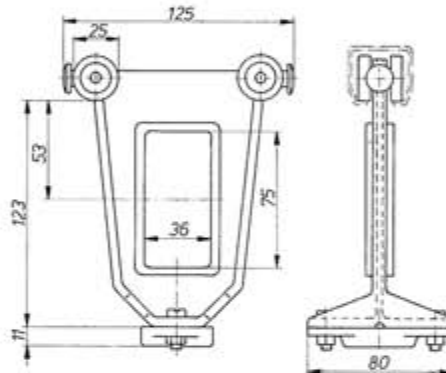


CABLE TROLLEY OF PLASTIC for round cable clips

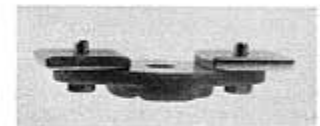
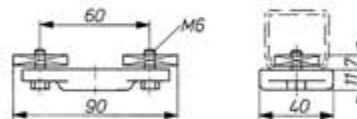
CABLE TROLLEY; acid resistant



TOWING TROLLEY; acid resistant



END CLAMP; acid resistant



Technical data

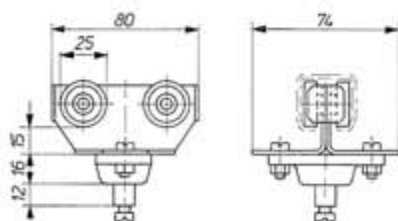
Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel, V 4 A Ball bearing	10	-10 to +60	Main body: plastic, grey Ball joint: plastic, grey Connecting plate: plastic Fasteners: steel, V 4 A	A Stainless steel

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENTS
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips
NO 23 494	0.160	NO 23 496	0.195	NO 23 499	0.090	16, 25, (36) NO 20 131 36 = for restricted use

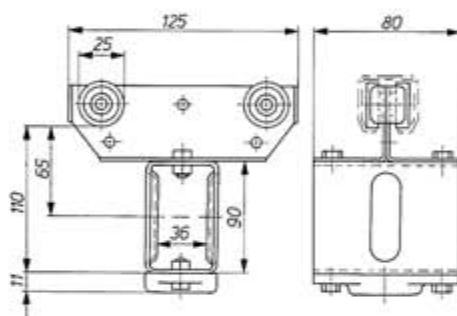
1) Special pairs of rollers refer to page 230/48.

CABLE TROLLEY OF SHEET STEEL for round cable clips

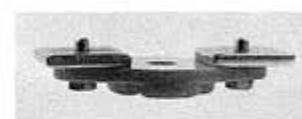
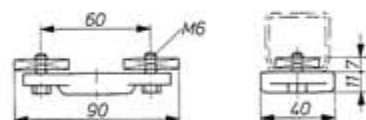
CABLE TROLLEY; stainless steel



TOWING TROLLEY; stainless steel



END CLAMP; acid resistant



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel, V4A Ball bearing	10	-10 to +60	Main body: steel, V4A Ball joint: plastic, grey Connecting plate: plastic Fasteners: steel, V4A	A Stainless steel

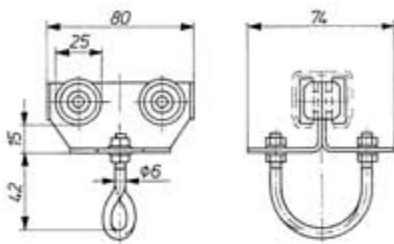
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENTS
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips
NO 23 491 ²⁾	0.260	NO 23 497	0.570	NO 23 499	0.090	16, 25, (36) NO 20 131 36 = for restricted use

1) For special pairs of rollers refer to page 230/48.

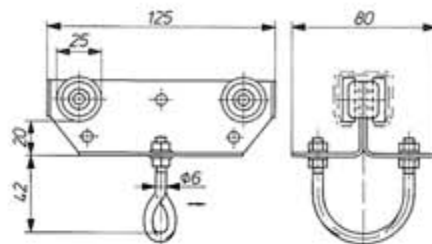
2) Tension relief ropes can be fixed to these trolleys, if the plate NO 20 441 is mounted in addition.
See page 230/87.

CABLE TROLLEY OF SHEET STEEL for round cable clips

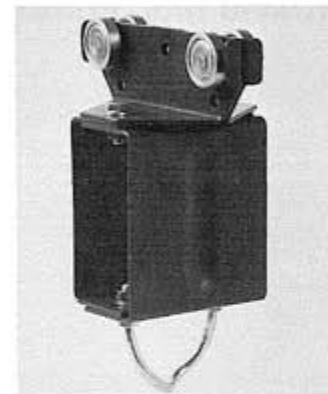
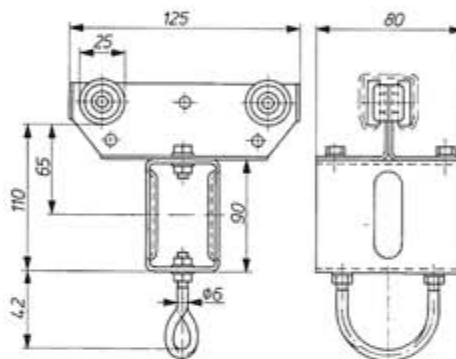
CABLE TROLLEY NO 23 493;
stainless steel



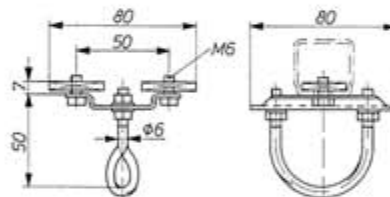
CABLE TROLLEY NO 23 492;
stainless steel



TOWING TROLLEY NO 23 495; stainless steel



END CLAMP NO 23 498; stainless steel



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel, V 4 A Ball bearing	10	-10 to +80	Main body: steel, V 4 A Bracket: steel, V 4 A Fasteners: steel, V 4 A	A Stainless steel

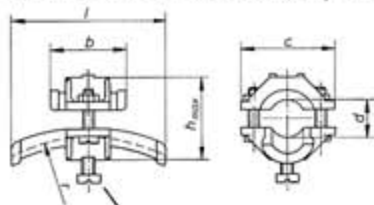
CABLE TROLLEY		TOWING TROLLEY		END CLAMP		ATTACHMENTS
Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Catalogue No.	Weight [kg]	Suitable cable clips
NO 23 493 ²⁾	0.250	NO 23 495	0.600	NO 23 498	0.200	16, 25, (36) NO 20 133 36 = for restricted use
NO 23 492	0.300					16, 25, 36 NO 20 133

1) For special pairs of rollers refer to page 230/48.

2) Tension relief ropes can be fixed to these trolleys, if the plate NO 20 441 is mounted in addition.
See page 230/87.

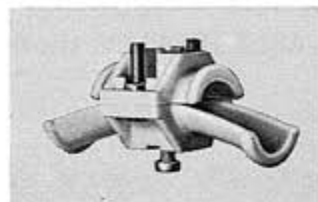
CABLE CLIPS for round cables and hoses

CABLE CLIP NO 20 431; acid resistant



Operating temperature: -10°C to +80°C

Material:
cable clip: plastic, grey
fasteners: steel, V 4 A

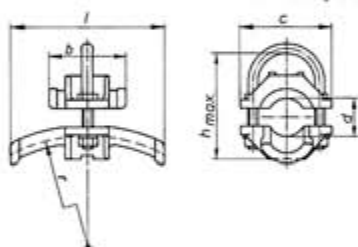


NOTE: This screw is not for clamping round cables but for fixing further cable clips. If there is no additional cable clip, the screw is removed.

Catalogue No.	d Cable ø	r	l	h max.	b	c	Weight [kg]	Suitable cable trolleys	Suitable towing trolleys	Suitable end clamp
16 NO 20 431	10-16	80	70	38	35	42	0.040	NO 23 494 NO 23 491	NO 23 496 NO 23 497	NO 23 499
25 NO 20 431	17-25	125	100	47	50	50	0.060			
36 NO 20 431	26-36	180	140	58	70	64	0.120			

APPLICATION: The cable clips are designed to support round cables and hoses.
If required, it is possible to fit two or more similar, or different sized cable clips to a trolley or end clamp.
When fitting different sized cable clips, the largest cable clip must be fitted on top.
The cable clip can also be fitted under the cable clips with U suspension bracket NO 20 433.

CABLE CLIP NO 20 433; acid resistant



Operating temperature: -10°C to +80°C

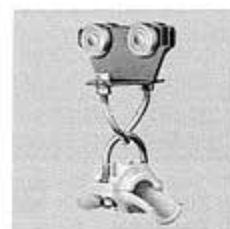
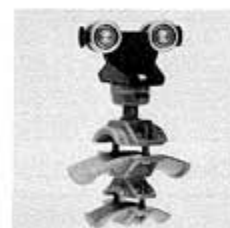
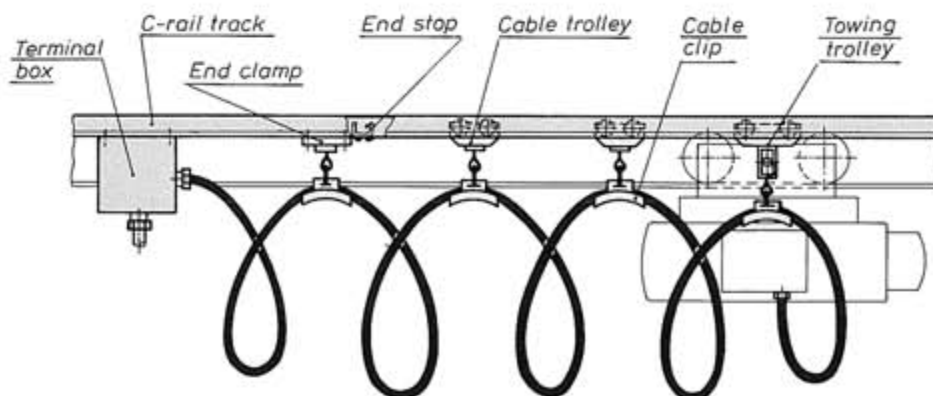
Material:
cable clip: plastic, grey
fasteners: steel, V 4 A



Catalogue No.	d Cable ø	r	l	h max.	b	c	Weight [kg]	Suitable cable trolleys	Suitable towing trolleys	Suitable end clamp
16 NO 20 433	10-16	80	70	48	35	42	0.050	NO 23 492 NO 23 493	NO 23 495	NO 23 498
25 NO 20 433	17-25	125	100	60	50	50	0.070			
36 NO 20 433	26-36	180	140	78	70	64	0.140			

EXAMPLE OF APPLICATION

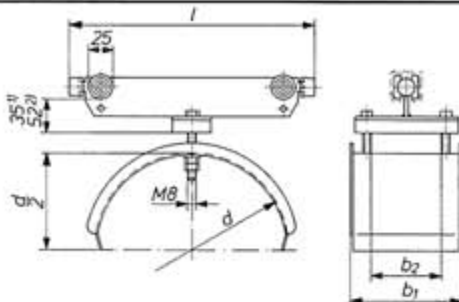
Cable trolley NO 23 494 with cable clip 25 and 16 NO 20 431.
Cable trolley NO 23 493 with cable clip 25 NO 20 433.



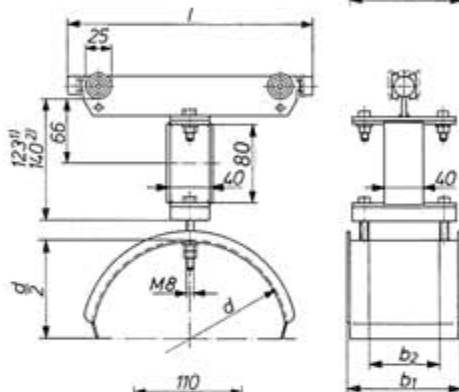
CABLE TROLLEY OF STEEL

For clamping of round cables with a max. \varnothing -difference of 2 mm and 6 mm

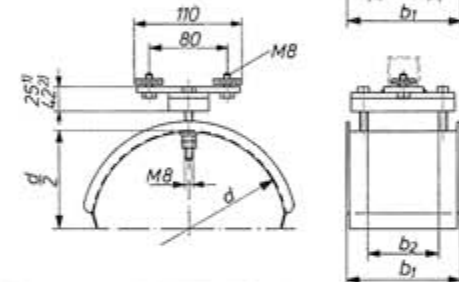
CABLE TROLLEY; stainless steel



TOWING TROLLEY; stainless steel



END CLAMP; stainless steel



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ³⁾
Steel, V 4 A Ball bearing	10	-10 to +80	Main body: steel, V 4 A Buffer: rubber Support: steel, V 4 A Clamping piece: rubber Bolt: steel, V 4 A Fasteners: steel, V 4 A	A Stainless steel

CABLE TROLLEY for clamping round cables with a max. \varnothing -difference of 2 mm

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	d	l	b ₁	b ₂ max.	max. cable \varnothing
200x100 NO 23 833	1.020	200x100 NO 23 838	1.560	100x48 NO 24 833	1.000	160	200	115	72	16
200x160 NO 23 833	1.400	200x160 NO 23 838	2.060	160x48 NO 24 833	1.400					
250x100 NO 23 834	1.050	250x100 NO 23 839	1.590	100x48 NO 24 834	1.100	200	250	115	72	20
250x160 NO 23 834	1.590	250x160 NO 23 839	2.250	160x48 NO 24 834	1.650					

CABLE TROLLEY for clamping round cables with a max. \varnothing -difference of 6 mm


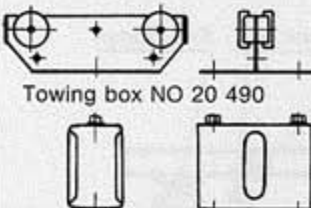
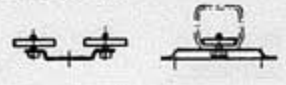
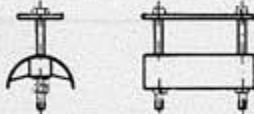
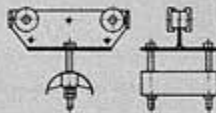
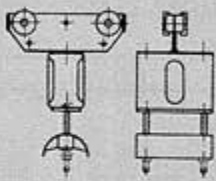
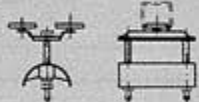

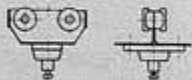


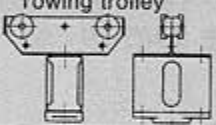

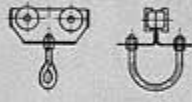
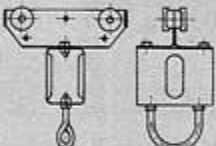

CABLE TROLLEY		TOWING TROLLEY		END CLAMP		DIMENSIONS				
Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	Catalogue No.	Wt. [kg]	d	l	b ₁	b ₂ max.	max. cable \varnothing
200x100 NO 23 845	1.200	200x100 NO 23 847	1.680	100 NO 24 963	1.200	160	200	115	72	16
200x160 NO 23 845	1.590	200x160 NO 23 847	2.140	160 NO 24 963	1.600					
250x100 NO 23 845	1.350	250x100 NO 23 847	1.830	100 NO 24 964	1.300	200	250	115	72	20
250x160 NO 23 845	1.880	250x160 NO 23 847	2.430	160 NO 24 964	1.850					

- 1) The dimension applies for clamping round cables with a max. \varnothing -difference of 2 mm.
- 2) The dimension applies for clamping round cables with a max. \varnothing -difference of 6 mm.
- 3) For special pairs of rollers refer to page 230/48.

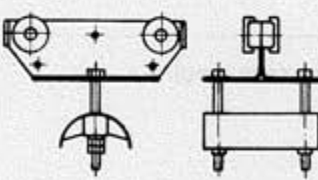
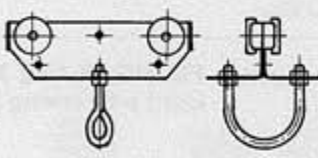
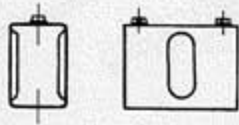
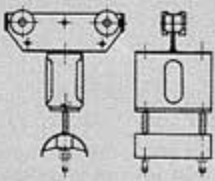
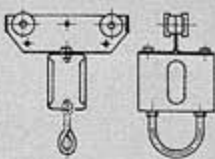


COMPONENTS AND PARTS

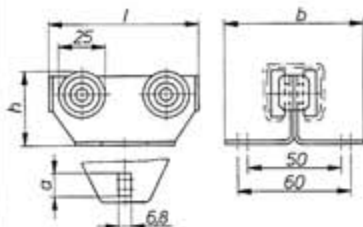
PARTS COMBINATION for cable trolleys, towing trolleys and end clamps

<p>Upper parts Catalogue No.</p> <p>Lower parts Catalogue No.</p>	<p>Cable trolley upper part NO 23 458, NO 23 459</p> 	<p>Cable trolley upper part NO 23 459</p> <p>Towing box NO 20 490</p> 	<p>End clamp upper part NO 20 442</p> 
<p>Flat cable support NO 20 421, NO 20 423, NO 20 422</p> 	<p>Cable trolley</p> 	<p>Towing trolley</p> 	<p>End clamp</p> 
<p>Ball joint NO 20 466</p> 	<p>Cable trolley</p> 		<p>End clamp NO 23 499 (Already completely in the programme)</p> 
<p>End clamp NO 20 460 Mount on the towing box</p> 		<p>Towing trolley</p> 	
<p>Bracket 50 x 6 NO 20 447</p> 	<p>Cable trolley</p> 	<p>Towing trolley</p> 	<p>End clamp</p> 

COMBINATION OF CABLE TROLLEY AND TOWING BOX for towing trolley

<p>Cable trolley</p> <p>Mounting part Catalogue No.</p>	<p>Cable trolley with support</p> 	<p>Cable trolley with bracket</p> 
<p>Towing box NO 20 490</p> 	<p>Towing trolley</p> 	<p>Towing trolley</p> 

CABLE TROLLEY UPPER PART NO 23 458 and NO 23 459; stainless steel



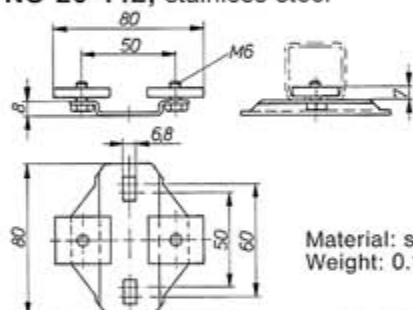
Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ¹⁾
Steel, V 4 A Ball bearing	10	-10 to +80	Main body: steel, V 4 A	A Stainless steel

Catalogue No.	l	b	h	a	Weight [kg]
Cable trolley upper part NO 23 458 ²⁾	80	74	40	12.6	0.210
Cable trolley upper part NO 23 459	125	80	45	13.0	0.300

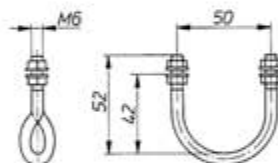
- 1) For special pairs of rollers refer to page 230/48.
2) No towing lines can be fitted to these trolleys.

Catalogue No.: END CLAMP UPPER PART NO 20 442; stainless steel



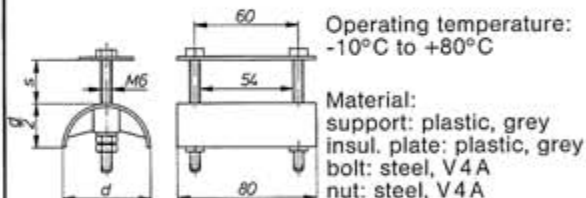
Material: steel, V 4 A
Weight: 0.122 kg

Catalogue No.: BRACKET 50 x 6 NO 20 447; stainless steel



Material: steel, V 4 A
Weight: 0.038 kg

FLAT CABLE SUPPORT NO 20 421, NO 20 422, NO 20 423 acid resistant

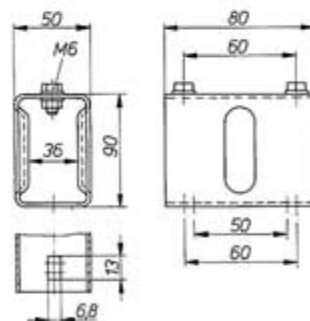


Operating temperature: -10°C to +80°C

Material:
support: plastic, grey
insul. plate: plastic, grey
bolt: steel, V 4 A
nut: steel, V 4 A

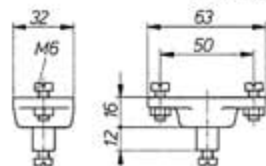
Catalogue No.	d	s max.	Weight [kg]
Flat cable support NO 20 421	50	30	0.060
Flat cable support NO 20 423		45	0.066
Flat cable support NO 20 422	80	36	0.095

Catalogue No.: TOWING BOX NO 20 490; stainless steel



Material: steel, V 4 A
Weight: 0.385 kg

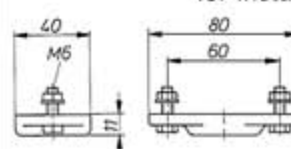
Catalogue No.: BALL JOINT NO 20 466; acid resistant



Operating temperature: -10°C to +60°C

Material:
ball joint: plastic, grey
fasteners: steel, V 4 A
Weight: 0.035 kg


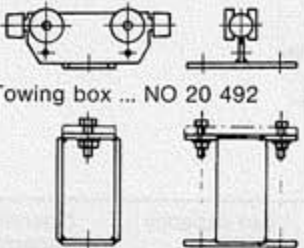
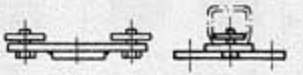

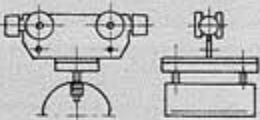
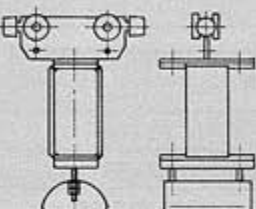
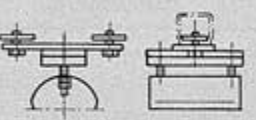
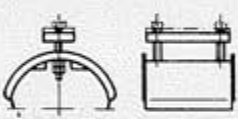
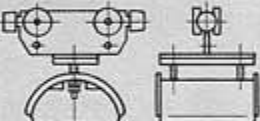
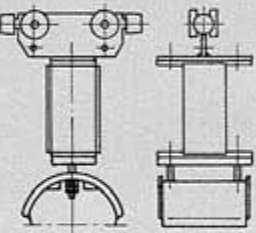
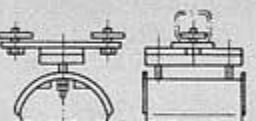
Catalogue No.: END CLAMP NO 20 460; stainless steel for installation on towing box



Operating temperature: -10°C to +80°C
Material:
connect. plate: plastic, grey
fasteners: steel, V 4 A
Weight: 0.035 kg

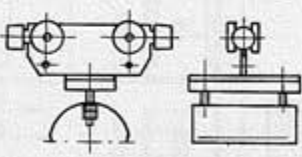
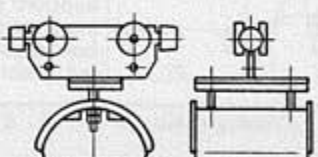
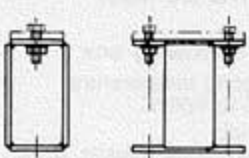
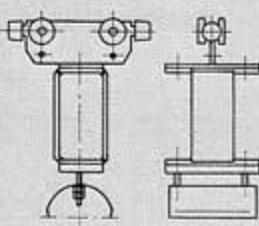
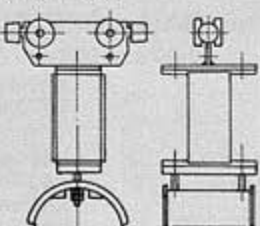
PARTS COMBINATION for cable trolleys, towing trolleys and end clamps

Only parts with the same corresponding dimensions can be combined.

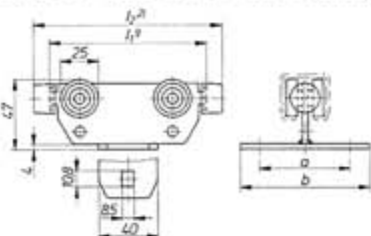
<p>Upper parts Catalogue No.</p> <p>Lower parts Catalogue No.</p>	<p>Cable trolley upper part ... x ... NO 23 808</p> 	<p>Cable trolley upper part ... x ... NO 23 808</p> <p>Towing box ... NO 20 492</p> 	<p>End clamp upper part ... NO 20 497</p> 
<p>Cable support for flat cables ... x ... NO 20 540; ... x ... NO 20 542</p> 	<p>Cable trolley for flat cables</p> 	<p>Towing trolley for flat cables</p> 	<p>End clamp for flat cables</p> 
<p>Cable support for flat or round cables ... x ... NO 20 543; ... x ... NO 20 544</p> 	<p>Cable trolley for flat or round cables</p> 	<p>Towing trolley for flat or round cables</p> 	<p>End clamp for flat or round cables</p> 

COMBINATION of CABLE TROLLEYS and TOWING BOXES to towing trolleys

Only parts with the same corresponding dimensions can be combined.

<p>Cable trolley</p> <p>Mounting part Catalogue No.</p>	<p>Cable trolley for flat cables</p> 	<p>Cable trolley for flat or round cables</p> 
<p>Towing box ... NO 20 492</p> 	<p>Towing trolley for flat cables</p> 	<p>Towing trolley for flat or round cables</p> 

CABLE TROLLEY UPPER PART NO 23 808; stainless steel



Technical data

Type of roller	Load capacity P [kg]	Operating temperature [°C]	Material	Special pairs of rollers Group ³⁾
Steel, V 4 A Ball bearing	10	-10 to +80	Main body: steel, V4A Buffer: rubber	A Stainless steel

Catalogue No.	l_1 ¹⁾	l_2 ²⁾	a	b	Weight [kg]
Cable trolley upper part 105 x 100 NO 23 808	105	-	80	106	0.370
Cable trolley upper part 125 x 100 NO 23 808	-	125	80	106	0.380
Cable trolley upper part 140 x 100 NO 23 808	140	-	80	106	0.410
Cable trolley upper part 160 x 100 NO 23 808	-	160	80	106	0.420
Cable trolley upper part 180 x 100 NO 23 808	180	-	80	106	0.470
Cable trolley upper part 200 x 100 NO 23 808	-	200	80	106	0.480
Cable trolley upper part 180 x 160 NO 23 808	180	-	140	166	0.530
Cable trolley upper part 200 x 160 NO 23 808	-	200	140	166	0.540
Cable trolley upper part 230 x 100 NO 23 808	230	-	80	106	0.540
Cable trolley upper part 250 x 100 NO 23 808	-	250	80	106	0.550
Cable trolley upper part 230 x 160 NO 23 808	230	-	140	166	0.610
Cable trolley upper part 250 x 160 NO 23 808	-	250	140	166	0.620

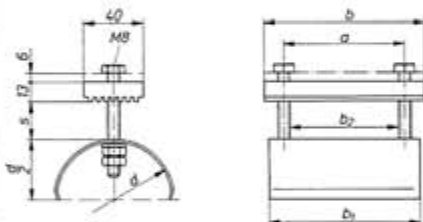
- 1) l_1 = Cable trolley upper part without rubber buffer
 2) l_2 = Cable trolley upper part with rubber buffer
 3) For special pairs of rollers refer to page 230/48.

CABLE SUPPORT NO 20 540 and NO 20 542

for flat cables

stainless steel

Type $d \geq 125$



Operating temperature:
-10°C to +80°C

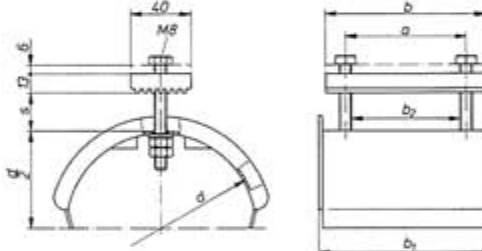
Material:
support: steel, V 4 A
clamping piece: rubber
fasteners: steel, V 4 A

CABLE SUPPORT NO 20 543 and NO 20 544

for flat or round cables¹⁾

stainless steel

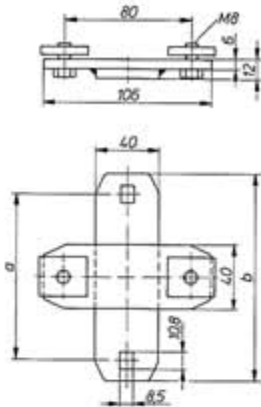
Type $d \geq 160$



Catalogue No.	d	a	b	b_1	b_2	s max.	Max. round cable ϕ	Weight [kg]	Suitable trolley length l_1	l_2
Cable support 100 x 22 NO 20 540	80	80	106	100	72	22	-	0.330	105	125
Cable support 100 x 42 NO 20 540		80	106	100	72	42	-	0.340	140	160
Cable support 100 x 62 NO 20 540		80	106	100	72	62	-	0.350	180	200
Cable support 100 x 22 NO 20 542	125	80	106	100	72	22	-	0.440	-	160
Cable support 100 x 42 NO 20 542		80	106	100	72	42	-	0.450	180	200
Cable support 160 x 42 NO 20 542		140	166	160	132	42	-	0.690	180	200
Cable support 100 x 62 NO 20 542		80	106	100	72	62	-	0.460	230	250
Cable support 160 x 62 NO 20 542	140	166	160	132	62	-	0.700	230	250	
Cable support 100 x 22 NO 20 543	160	80	106	115	72	22	16	0.660	-	200
Cable support 160 x 22 NO 20 543		140	166	175	132			0.940	-	200
Cable support 100 x 42 NO 20 543		80	106	115	72	42	-	0.670	230	250
Cable support 160 x 42 NO 20 543		140	166	175	132	42	-	0.950	230	250
Cable support 100 x 22 NO 20 544	200	80	106	115	72	22	20	0.780	-	250
Cable support 160 x 22 NO 20 544		140	166	175	132			1.150	-	250

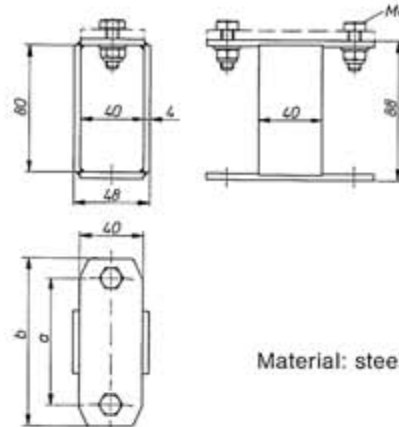
- 1) Cable support for clamping round cables with a max. ϕ -difference of 2 mm.

END CLAMP UPPER PART NO 20 497; stainless steel TOWING BOX NO 20 492; stainless steel



Material: steel, V4A

Catalogue No.	a	b	Weight [kg]
100 NO 20 497	80	106	0.445
160 NO 20 497	140	166	0.560



Material: steel, V4A

Catalogue No.	a	b	Weight [kg]
100 NO 20 492	80	106	0.530
160 NO 20 492	140	166	0.700

CONTROL UNIT TROLLEY AND BRAKE GLIDER

IDEAL CONTROL UNIT TROLLEY NO 23 481; stainless steel

On request we can supply ideal control unit trolleys similar to our type NO 23 181 in stainless steel construction. Different from the standard type the terminal box of stainless steel has a depth of 100 mm and the DIN-Rails for the terminal clamps are arranged horizontally or vertically by choice.

Comparison of catalogue numbers

Designation	Type stainless steel; V2 A Catalogue No.	Similar standard type Catalogue No.
Ideal control unit trolley	200x200 NO 23 481	200x200 NO 23 181
Ideal control unit trolley	300x200 NO 23 481	300x200 NO 23 181

BRAKE GLIDER NO 23 484; glider acid resistant, fasteners stainless steel

Material: glider: plastic
fasteners: steel, V2 A

Comparison of catalogue numbers

Designation	Type stainless steel Catalogue No.	Similar standard type Catalogue No.
Brake glider	NO 23 484	NO 23 184

Further accessories for the ideal control unit trolley, such as acid resistant flat and round cable glands etc., on inquiry.

CABLE GLANDS AND ACCESSORIES

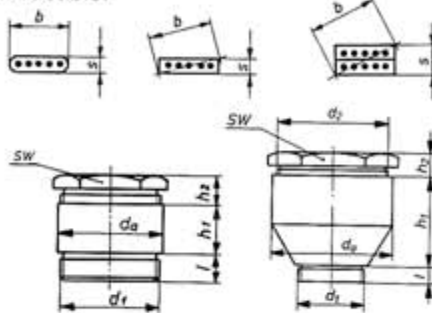
for flat and round cables

Selection of programme 130/200 for sheet steel terminal boxes and plug and socket connections.



FLAT CABLE GLAND NO 20 610

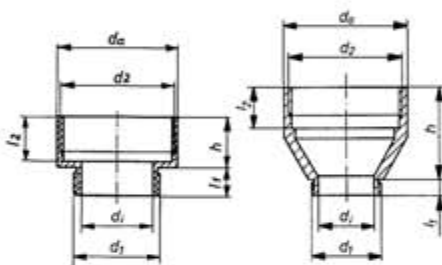
Flat cable:



Material: case: brass, nickel-plated or aluminium

Catalogue No.	d ₁	d ₂	b		s		d _a	l	h ₁	h ₂ ca.	SW
			min	max	min	max					
16 NO 20 610	Pg 16		13	15	4.0	5.5	24	6.5	13.5	6	22
21 NO 20 610	Pg 21		14	22	4.5	7.5	30	7	15	8	28
29 NO 20 610	Pg 29		19	30	4.5	9.5	40	8	16.5	9	37
36 NO 20 610	Pg 36		29	39	4.5	13.5	50	9	19.5	10	47
42 NO 20 610	Pg 42		38	45	4.5	14.5	57	10	22	11	54
48 NO 20 610	Pg 48		44	52	5.5	19.5	64	10	23	12	60
21x36 NO 20610	Pg 21	Pg 36	29	39	4.5	13.5	50	7	38	10	47
21x42 NO 20610	Pg 21	Pg 42	38	45	4.5	14.5	57	7	58	11	54
29x42 NO 20610	Pg 29	Pg 42	38	45	4.5	14.5	57	8	42	11	54

ENLARGEMENT RING NO 20 652



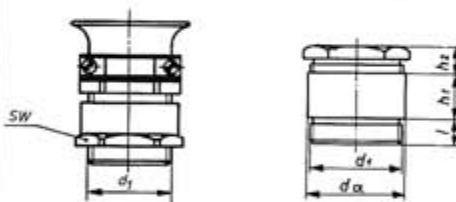
Material: brass, nickel-plated or aluminium

Catalogue No.	d ₁	d ₂	d ₁	d _a	l ₁	l ₂	h
13.5x16 NO 20 652	Pg 13.5	Pg 16	17	24	6.5	11.5	12.5
16 x21 NO 20 652	Pg 16	Pg 21	18.5	30	6.5	13	14.5
21 x29 NO 20 652	Pg 21	Pg 29	24	39	7	14.5	16
29 x36 NO 20 652	Pg 29	Pg 36	32	50	8	17.5	19.5
36 x42 NO 20 652	Pg 36	Pg 42	42	57	9	20	22
42 x48 NO 20 652	Pg 42	Pg 48	48	64	10	21	23
21 x36 NO 20 652	Pg 21	Pg 36	24	50	7	17.5	38
21 x42 NO 20 652	Pg 21	Pg 42	24	50	7	20	58
29 x42 NO 20 652	Pg 29	Pg 42	32	57	8	20	42

ROUND CABLE GLAND NO 20 638 with tension relief and bending protection ROUND CABLE GLAND NO 20 630

NO 20 638

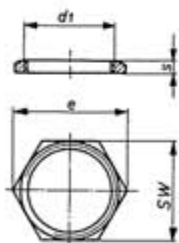
NO 20 630



Material: brass

Catalogue No.	Catalogue No.	for cable ø from-to	d ₁	d _a	l	h ₁	h ₂ ca.	SW
11 NO 20 638	11 NO 20 630	6-13	Pg 11	20	6	11	5	20
13.5 NO 20 638	13.5 NO 20 630	10-14	Pg 13.5	22	6.5	12.5	6	24
16 NO 20 638	16 NO 20 630	10-16	Pg 16	24	6.5	13.5	6	24
21 NO 20 638	21 NO 20 630	14-21	Pg 21	30	7	15	8	30
29 NO 20 638	29 NO 20 630	19-28	Pg 29	40	8	16.5	9	40
36 NO 20 638	36 NO 20 630	30-38	Pg 36	50	9	19.5	10	50
-	42 NO 20 630	35-42	Pg 42	57	10	22	11	-
-	48 NO 20 630	40-49	Pg 48	64	10	23	12	-

LOCK NUT NO 20 650

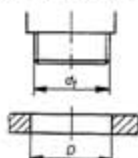


Material: brass, nickel-plated

Catalogue No.	d ₁	s	e	SW
13.5 NO 20 650	Pg 13.5	3	25.5	23
16 NO 20 650	Pg 16	3	29	26
21 NO 20 650	Pg 21	3.5	35.5	32
29 NO 20 650	Pg 29	4	45	41
36 NO 20 650	Pg 36	5	56	51
42 NO 20 650	Pg 42	5	65	60
48 NO 20 650	Pg 48	5.5	69	64

For plastic glands and accessories see programme 130/200.

DIMENSION TABLE for Pg-thread and entry hole



Thread	Pg 11	Pg 13.5	Pg 16	Pg 21	Pg 29	Pg 36	Pg 42	Pg 48
d ₁ [mm]	18.6	20.4	22.5	28.3	37.0	47.0	54.0	59.3
D [mm]	19	21	23	29	37.5	47.5	54.5	60

NO - NUMBER-INDEX (Catalogue numbers)

NO	Item	Page	NO	Item	Page	NO	Item	Page
200			23 111	Ideal control unit trolley	58	23 361	Cable trolley	42
20 071	Cutout	53	23 170	Ideal control trolley upper part	65	23 362	Cable trolley	42
20 104	Socket wrench	52	23 180	Ideal control unit trolley	60	23 363	Cable trolley	42
20 111	Cable collar	45	23 181	Ideal control unit trolley	62	23 364	Cable trolley	42
20 114	Cable collar	45	23 183	Ideal control unit trolley	64	23 365	Cable trolley	42
20 117	Thong	45	23 184	Brake glider	66	23 366	Cable trolley	42
20 118	Hook	45	23 185	Brake trolley	67	23 367	Cable trolley	44
20 120	Rope thimble	51; 71	23 187	Brake trolley	67	23 368	Cable trolley	44
20 122	Simplex rope	51; 71	23 192	Ideal control unit trolley	59	23 370	Cable trolley	41
20 131	Cable clip	33; 68	23 199	Brake glider	66	23 371	Cable trolley	41
20 133	Cable clip	33	23 200	C-rail track 30x32x2	6	23 372	Cable trolley	41
20 134	Cable clip	69	23 201	C-rail track 30x32x1,5	6	23 373	Cable trolley	44
20 137	Bracket	34	23 203	90° Curve	7	23 400	C-rail track, stainless steel	72
20 139	Cable clamp	71	23 204	90° Curve	6	23 403	90° Curve, stainless steel	72
20 140	Cable clamp	71	23 205	90° Curve	7	23 404	C-rail track, stainless steel	73
20 141	Fixing plate	51	23 208	Inspection piece	52	23 405	90° Curve, stainless steel	73
20 142	End clamp upper part	37	23 210	Track coupler	8	23 408	Inspection piece, stainless steel	72
20 143	Cable clamp	70	23 211	Track coupler	8	23 409	Inspection piece, stainless steel	72
20 144	Cable clamp	69	23 212	Track coupler	8	23 410	Track coupler, stainless steel	74
20 146	Rope	70	23 216	End stop	9	23 411	Track coupler, stainless steel	74
20 147	Bracket	37	23 217	End stop	9	23 412	Track coupler, stainless steel	74
20 160	End clamp	37; 68	23 218	End stop	9	23 419	End stop, stainless steel	74
20 166	Ball joint	37	23 219	End stop	9	23 420	Track support bracket, stainl. steel	75
20 168	Flat cable support	37; 68	23 220	Track support bracket	10	23 421	Track support bracket, stainl. steel	75
20 169	Flat cable support	37; 68	23 221	Track support bracket	10	23 422	Track support bracket, stainl. steel	75
20 170	Flat cable support	37	23 222	Track support bracket	10	23 423	Track support bracket, stainl. steel	75
20 176	Bolt, complete	13	23 223	Track support bracket	10	23 427	Pair of rollers	48; 49
20 180	Girder clip	16	23 224	Track support bracket	11	23 428	Pair of rollers	48; 49
20 185	Support arm	14	23 225	Track support bracket	11	23 430	Pair of rollers	48; 49
20 186	Support arm	15	23 226	Track support bracket	11	23 440	Track support bracket, stainl. steel	76
20 195	Towing arm	14	23 227	Track support bracket	11	23 441	Track support bracket, stainl. steel	76
20 206	Bracket	17	23 228	Track support and joining bracket	12	23 442	Track support bracket, stainl. steel	76
20 215	Snap hook	45	23 229	Track support and joining bracket	12	23 447	Track support bracket, stainl. steel	76
20 217	Rope eye with ring	44	23 230	Track support and joining bracket	12	23 458	Cable trolley, stainless steel	89
20 218	End clamp	43; 51	23 231	Track support bracket	12	23 459	Cable trolley, stainless steel	89
20 219	End clamp	43	23 232	Track support bracket	12	23 461	Cable trolley, stainless steel	79
20 220	End clamp	43	23 240	Track support bracket	13	23 463	Cable trolley, stainless steel	79
20 250	Glider	44	23 241	Track support bracket	13	23 464	Cable trolley, acid resistant	78
20 260	Glider	44	23 242	Track support bracket	13	23 465	Cable trolley, acid resistant	78
20 261	Glider	44	23 245	Track support bracket	13	23 466	Towing trolley, acid resistant	78
20 280	Track support bracket	14	23 246	Track support bracket	13	23 467	Towing trolley, stainless steel	79
20 281	Track support bracket	14	23 247	Track support bracket	13	23 468	End clamp, acid resistant	78
20 282	Track support bracket	15	23 248	Track support bracket	13	23 469	End clamp, stainless steel	79
20 283	Track support bracket	15	23 251	Cable trolley upper part	41	23 471	Cable trolley, stainless steel	79
20 284	Track support bracket	15	23 252	Cable trolley upper part	34	23 475	Cable trolley, acid resistant	78
20 285	Bracket for support arm	14	23 254	Cable trolley upper part	34	23 476	Towing trolley, acid resistant	78
20 286	Bracket for support arm	15	23 257	Cable trolley upper part	41	23 477	Towing trolley, stainless steel	79
20 290	Towing box	37	23 258	Cable trolley upper part	37	23 478	End clamp, acid resistant	78
20 292	Towing box	40	23 259	Cable trolley upper part	37	23 479	End clamp, stainless steel	79
20 295	Mounting flange	17	23 260	Cable trolley upper part	41	23 481	Ideal control unit trolley, stainl. steel	92
20 297	End clamp upper part	39	23 261	Cable trolley	22	23 484	Brake glider, acid resistant	92
20 301	Rope; acid resistant	87	23 262	Cable trolley	41	23 491	Cable trolley, stainless steel	83
20 305	Rope	71	23 263	Cable trolley	22	23 492	Cable trolley, stainless steel	84
20 314	Rope, complete	51	23 265	Cable trolley	23	23 493	Cable trolley, stainless steel	84
20 315	Rope, complete	69	23 267	Towing trolley	22	23 494	Cable trolley, acid resistant	82
20 325	Rope, complete	71	23 268	Towing trolley	23	23 495	Towing trolley, stainless steel	84
20 421	Cable support, acid resistant	89	23 269	End clamp	22; 23	23 496	Towing trolley, acid resistant	82
20 422	Cable support, acid resistant	89	23 271	Cable trolley	22	23 497	Towing trolley, stainless steel	83
20 423	Cable support, acid resistant	89	23 275	Cable trolley	23	23 498	End clamp, stainless steel	84
20 431	Cable clip, acid resistant	85	23 277	Towing trolley	22	23 499	End clamp, acid resistant	82; 83
20 433	Cable clip, acid resistant	85	23 278	Towing trolley	23	23 509	Cable trolley	24
20 441	Fixing plate, stainless steel	87	23 279	End clamp	21; 22; 23	23 510	Cable trolley	24
20 442	End clamp upper part, stainl. steel	89	23 281	Cable trolley	25	23 519	Towing trolley	24
20 447	Bracket, stainless steel	89	23 287	Towing trolley	25	23 520	Towing trolley	24
20 450	Rope thimble, stainless steel	87	23 289	End clamp	25	23 790	Clamp	52
20 452	Rope thimble, stainless steel	87	23 291	Cable trolley	31	23 808	Cable trolley, stainless steel	91
20 458	Rope eye, stainless steel	87	23 292	Cable trolley	41	23 830	Cable trolley, stainless steel	81
20 460	End clamp, acid resistant	89	23 293	Cable trolley	32	23 832	Cable trolley, stainless steel	81
20 466	Ball joint, acid resistant	89	23 294	Cable trolley	41	23 833	Cable trolley, stainless steel	86
20 476	Bolt complete, stainless steel	76	23 295	Towing trolley	32	23 834	Cable trolley, stainless steel	81; 86
20 480	Girder clip, stainless steel	76	23 296	Towing trolley	32	23 835	Towing trolley, stainless steel	81
20 481	Girder clip, stainless steel	76	23 297	Towing trolley	31	23 837	Towing trolley, stainless steel	81
20 485	Support arm, stainless steel	77	23 298	End clamp	32	23 838	Towing trolley, stainless steel	81; 86
20 486	Support arm, stainless steel	77	23 299	End clamp	30; 31	23 839	Towing trolley, stainless steel	81; 86
20 487	Support arm, stainless steel	77	23 300	Towing trolley	31	23 845	Cable trolley, stainless steel	86
20 488	Support arm, stainless steel	77	23 302	Pair of rollers	49	23 847	Towing trolley, stainless steel	86
20 490	Towing box, stainless steel	89	23 303	Pair of rollers	48; 49	23 940	Cable trolley	41
20 492	Towing box, stainless steel	92	23 304	Pair of rollers	48; 49	23 941	Cable trolley	21
20 495	Towing box, stainless steel	77	23 305	Set of guide rollers	47	23 943	Cable trolley	21
20 497	End clamp upper part, stainl. steel	92	23 308	Cable trolley upper part	39	23 950	Cable trolley	41
20 510	Cable support	40	23 311	Transfer guide	46	23 951	Cable trolley	21
20 512	Cable support	40	23 315	Cable trolley	46	23 953	Cable trolley	21
20 513	Cable support	40	23 316	Towing trolley	46	23 956	Towing trolley	21
20 514	Cable support	40	23 317	Cable trolley	46	23 958	Towing trolley	21
20 540	Cable support, stainless steel	91	23 318	Towing trolley	46	23 970	Cable trolley	41
20 542	Cable support, stainless steel	91	23 319	Cable trolley	47	23 971	Cable trolley	21
20 543	Cable support, stainless steel	91	23 320	Towing trolley	47	23 973	Cable trolley	21
20 544	Cable support, stainless steel	91	23 321	Pair of rollers	48; 49	23 976	Towing trolley	21
20 600	Plug and socket connection	53	23 322	Pair of rollers	48; 49	23 978	Towing trolley	21
20 610	Flat cable gland	93	23 324	Pair of rollers	48; 49	23 990	Cable trolley	41
20 630	Round cable gland	93	23 325	Pair of rollers	48; 49	23 991	Cable trolley	30
20 638	Round cable gland	93	23 326	Pair of rollers	48; 49	23 993	Cable trolley	30
20 650	Lock nut	93	23 327	Pair of rollers	48; 49	23 996	Cable trolley	30
20 652	Enlargement ring	93	23 328	Pair of rollers	49	23 998	Towing trolley	30
20 662	End cap	6	23 330	Cable trolley	27			
20 670	Buffer	20	23 332	Cable trolley	27			
20 675	Set of screws, stainless steel	48	23 333	Cable trolley	27; 35	24 230	End clamp	27
20 690	Terminal box	55	23 334	Cable trolley	27; 35	24 232	End clamp	27
20 695	Terminal box	54	23 335	Towing trolley	27	24 233	End clamp	27; 35
20 696	Terminal box	54	23 337	Towing trolley	27	24 234	End clamp	27; 35
20 701	Plug and socket connection	65	23 338	Towing trolley	27; 35	24 289	End clamp	24
20 702	Plug and socket connection	53	23 339	Towing trolley	27; 35	24 290	End clamp	24
20 709	Plug and socket connection	65	23 345	Cable trolley	35	24 463	End clamp	35
			23 347	Towing trolley	35	24 464	End clamp	35
			23 351	Cable trolley	42	24 465	End clamp	35
			23 352	Cable trolley	41	24 467	End clamp	35
230			23 353	Cable trolley	42	24 830	End clamp, stainless steel	81
23 008	Ex-flexible cable system	41	23 354	Cable trolley	41	24 832	End clamp, stainless steel	81
23 009	Ex-flexible cable system	41	23 355	Cable trolley	42	24 833	End clamp, stainless steel	81; 86
23 011	Complete flexible cable systems	28	23 356	Cable trolley	41	24 834	End clamp, stainless steel	81; 86
23 017	Complete flexible cable systems	28	23 357	Cable trolley	43	24 963	End clamp, stainless steel	86
23 081	Complete track system	17	23 358	Cable trolley	43	24 964	End clamp, stainless steel	86
23 101	Ideal control unit trolley	58						

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