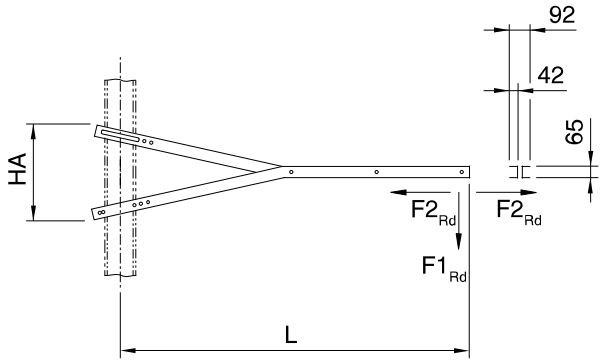
Mast range
HEB profiles 160-260

Type	L (m)	HA (mm)	Wt (kg)
20	2.0	620	32
25	2.5	730	40
30	3.0	840	47
35	3.5	950	54
40	4.0	1060	62
45	4.5	1170	69



Note
Upper member marked with hole.

Associated parts
Clamp for suspension 5311
Cross arm for feeder 2351 onw
Earth rope clamp for cantilever 6216

Fasteners
Supplied complete with U-bolts 2191

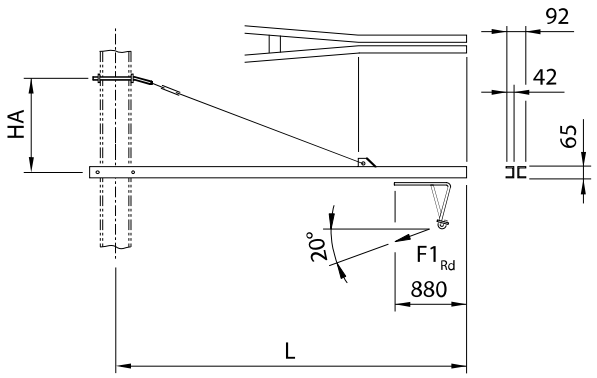
Other fasteners:
Hook bolt to HEB 3253
U-bolt for wooden pole 2192

Resistance
$F1_{Rd}$ (kN) = 2,5
$F2_{Rd}$ (kN) = 1,6

Drawing number
351.00045

Ordering information
Length 2,5 m, on HEB 180
2111.25.18 Cantilever spread for 1 track (type I)

Cantilever for inclined catenary, long (type II) 2112



Mast range
HEB profiles 160-220

Type	L (m)	HA (mm)	Wt (kg)
35	3.5	750	62
40	4.0	810	71
45	4.5	880	79
50	5.0	930	88
55	5.5	990	96
60	6.0	1040	105

Associated parts
Clamp for suspension
within the 880 dimension 5311
Clamp for suspension 5312
Suspension bracket
for 1,5 kV or 15 kV 5314
Earth rope clamp for cantilever 6216

Fasteners
Supplied complete with U-bolts and long shank bolts.

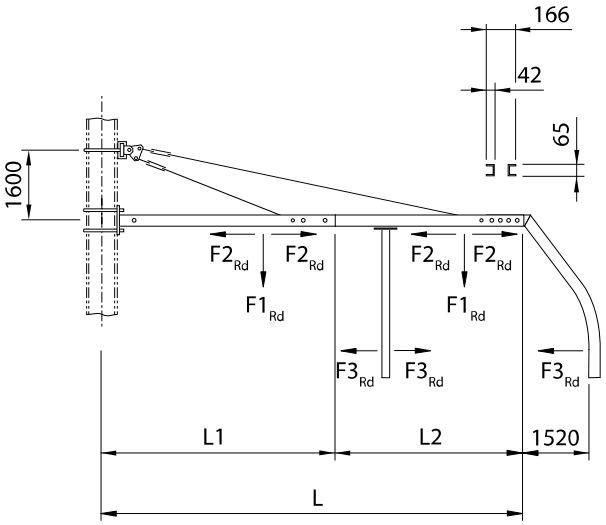
Fasteners to wooden pole:
Bracket for termination 3217
Compression clamp 2194

Resistance
$F1_{Rd}$ (kN) = 2,5

Drawing number
353.00002, .00038

Ordering information
Length 4,5 m, on HEB 220
2112.45.22 Cantilever for inclined catenary, long (type II)

Cantilever for 2 tracks (type III / UNP 65) 2113



Mast range
HEB profiles 200-260

Type	L (m)	L1 (m)	L2 (m)	Wt (kg)
50	5.0	3.75	1.25	98
55	5.5	3.75	1.75	106
60	6.0	3.75	2.25	114
65	6.5	3.75	2.75	121
70	7.0	3.75	3.25	129

Associated parts
Clamp for suspension 5313
Pull-off arm for cantilever 2141
Drop bracket 2143
Cross arm for feeder 2351 onw
Earth rope clamp for cantilever 6216

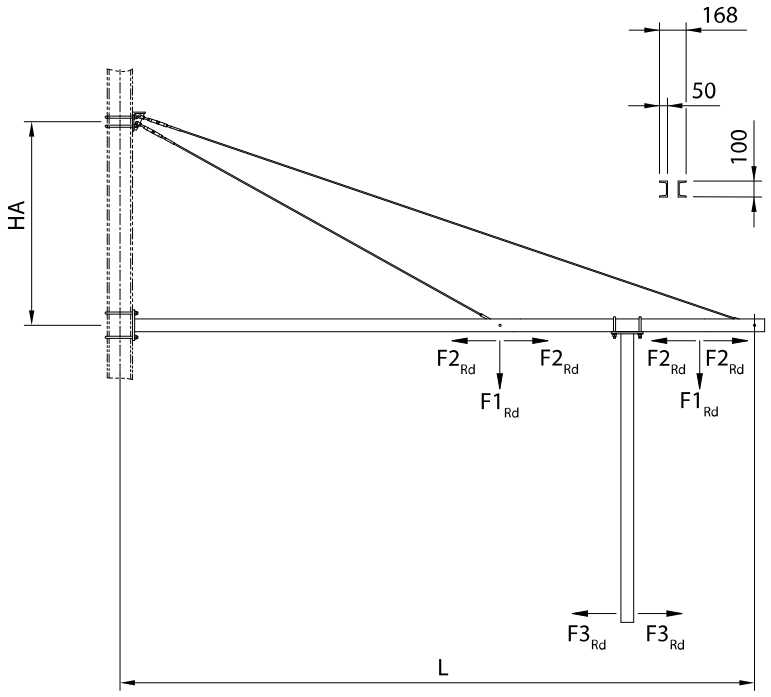
Fasteners
Supplied complete with U-bolts.

Resistance
$F1_{Rd}$ (kN) = 2,5
$F2_{Rd}$ (kN) = 1,6
$F3_{Rd}$ (kN) = 0,6

Ordering information
Length 7,0 m, on HEB 240
2113.70.24 Cantilever for 2 tracks (type III / UNP 65)

Mast range
HEB profiles 200-260

Type	L (m)	HA (m)	Wt (kg)	$F1_{Rd}$ (kN)	$F2_{Rd}$ (kN)	$F3_{Rd}$ (kN)
050	5.0	1.60	144	3.2	1.7	1.7
055	5.5	1.60	155	3.2	2.1	2.1
060	6.0	1.60	167	3.2	2.5	2.5
065	6.5	1.60	178	3.2	3.0	3.0
070	7.0	1.60	190	3.2	3.0	3.0
075	7.5	1.60	201	3.2	3.0	3.0
080	8.0	1.60	213	3.2	3.0	3.0
085	8.5	2.00	224	3.2	3.0	3.0
090	9.0	2.00	236	3.2	3.0	3.0
095	9.5	2.00	247	3.2	3.0	3.0
100	10.0	2.00	259	3.2	3.0	3.0



Note
Resistance
$F1_{Rd}$, $F2_{Rd}$, $F3_{Rd}$ see table
A separate calculation is required if the
geometries and/or loads deviate from the tabled values

Associated parts
Clamp for suspension 5313
Drop bracket 2143
Cross arm for feeder 2351 onw
Earth rope clamp for cantilever 6216

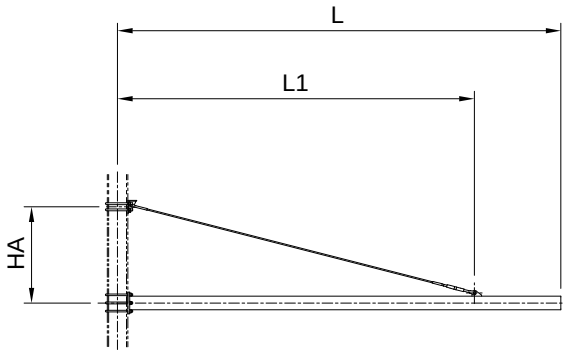
Fasteners
Supplied complete with U-bolts.

Drawing number
353.01079 - .01082

Ordering information
Length 8,5 m, on HEB 220
2113.1.85.22 Cantilever for 2 tracks
(type III / UNP 100)

Mast range
HEB profiles 220-260

Type	L (m)	L1 (m)	HA (mm)	Wt (kg)
050	5.0	4.00	1115	187
055	5.5	4.00	1115	202
060	6.0	4.50	1240	218
065	6.5	4.50	1240	233
070	7.0	5.00	1365	248
075	7.5	5.50	1490	263
080	8.0	6.00	1615	279
085	8.5	6.50	1740	294
090	9.0	7.00	1865	309
095	9.5	7.50	1990	325
100	10.0	8.00	2115	340
105	10.5	8.50	2240	356
110	11.0	9.00	2365	371
115	11.5	9.50	2490	386
120	12.0	10.00	2615	402
125	12.5	10.50	2740	417
130	13.0	11.00	2865	433



Note
Resistance
See system sheet 2113.3.S1 or 2113.3.S2
Lengths L vn 5.00-10.00 m in 0.5 m steps
from 10.50 m only for hn
Drawing number: 911.00408

Associated parts
See system sheet 2113.3.S1 or 2113.3.S2

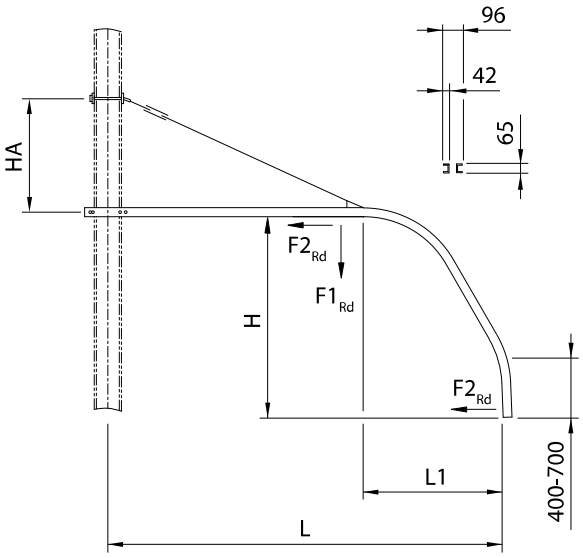
Fasteners
Order mounting aid and U-Bolt separately if required

Drawing number
353.01095, .01095-1, .01095-2

Ordering information
Length 8,5 m, on HEB 220
2113.3.085.22 Cantilever for 2 tracks
(type 160 x 160)

Mast range
HEB profiles 160-240

Type	L (m)	L1 (mm)	H (m)	HA (mm)	Wt (kg)	$F2_{Rd}$ (kN)
46.15	4.6	1200	1.5	1320	92	2.6
46.20	4.6	1200	2.0	1320	101	1.3
46.25	4.6	1200	2.5	1320	108	0.6
51.15	5.1	1224	1.5	1370	101	2.6
51.20	5.1	1224	2.0	1370	110	1.3
51.25	5.1	1224	2.5	1370	117	0.6
55.15	5.5	1200	1.5	1390	107	2.6
55.20	5.5	1200	2.0	1390	115	1.3
55.25	5.5	1200	2.5	1390	122	0.6
62.15						
62.20						
62.25						



Associated parts
Clamp for suspension 5311
Bracket for steady army Type 65 5413
Cross arm for feeder 2351 onw
Earth rope clamp for pull-off arm 6217

Fasteners
Supplied complete with U-bolts and long shank bolts.

Associated parts for wooden pole:
Bracket for termination 3217
Compression clamp 2194

Resistance
$F1_{Rd}$ (kN) = 3,0

Drawing number
351.00041 - .00043

Ordering information
Length 5,5 m, pull-off arm 2,0 m, on HEB 240
2114.55.20.24 Cantilever for 1 track with pull-off arm (type IV)

Mast range
HEB profiles 160-200 / 220-260

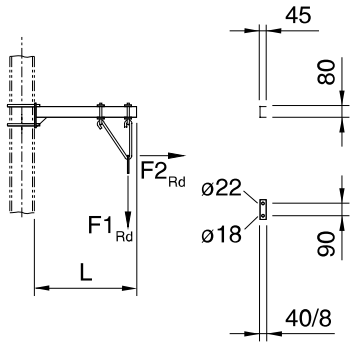
Type	L (m)	Wt (kg)
07	0.7	17
11	1.1	21

Fasteners
Supplied complete with U-bolts.

Resistance
$F1_{Rd}$ (kN) = 1,0
$F2_{Rd}$ (kN) = 4,5

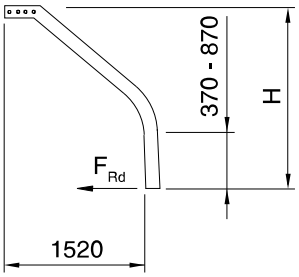
Drawing number
352.00002

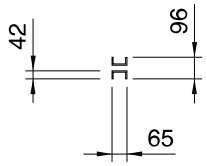
Ordering information
Length 0,7 m, on HEB 180
2117.07.18 Cantilever for inclined catenary, short



Pull-off arm for cantilever (type III / UNP 65) 2141

Type	H (mm)	Wt (kg)
20	2000	46
25	2500	53





Associated parts
Bracket for steady arm
Type 60, 65 5413
Earth rope clamp for cantilever 6216

Fasteners
Supplied complete with bolts.

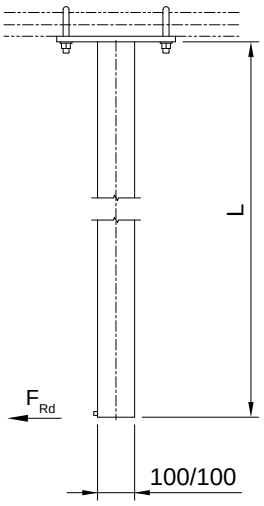
Resistance
F_{Rd} (kN) = 0,6

Drawing number
353.00343

Ordering information
Heigth 2000 mm
2141.20 Pull-off arm for cantilever (type III / UNP 65)

Drop tube for cantilever (type III) 2143

Type	L (mm)	F_{Rd} (kN)	Wt (kg)
2.16	1.60	3.0	29.8
2.18	1.80	3.0	33.3
2.20	2.00	3.0	34.5
2.22	2.20	3.0	36.9
2.24	2.40	3.0	39.3
2.26	2.60	3.0	41.7
2.28	2.80	3.0	44.0
2.30	3.00	2.6	46.4



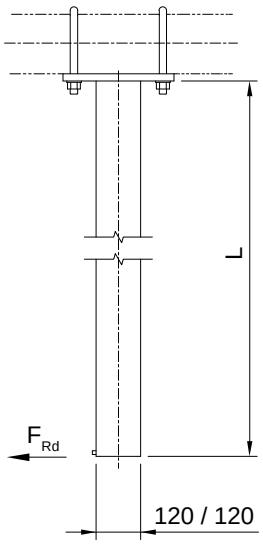
Associated parts
Bracket for steady arm 5411 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
357.00053

Ordering information
Cantilever III / UNP 65, length 2,8 m
2143.1.28 Drop tube for cantilever (type III)

Type	L (m)	Wt (kg)
100	1.0	32.40
120	1.2	36.00
140	1.4	39.50
160	1.6	43.00
180	1.8	46.50
200	2.0	50.10
220	2.2	53.60
240	2.4	57.10
260	2.6	60.60
280	2.8	64.10
300	3.0	67.70
320	3.2	71.20



Associated parts
Bracket for steady arm 5411 onw

Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 4,0

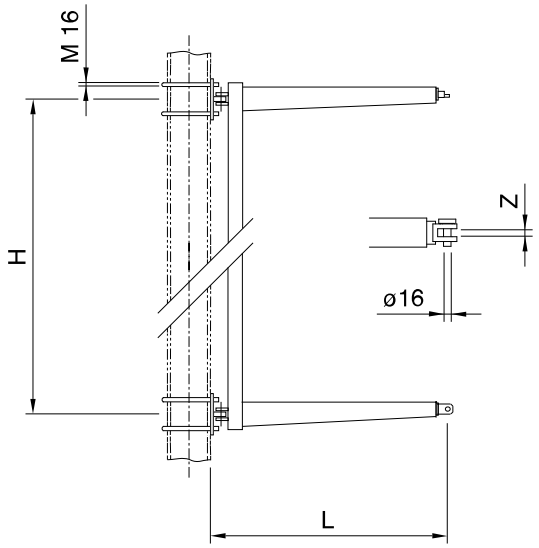
Drawing number
357.00150

Ordering information
Drop tube 120 x 120 for cantilever 160 x 160, length 2,8 m
2144.280 Drop tube 120 x 120 for cantilever 160 x 160

Stand-off bracket moveable for tubular cantilever FL200/260 — 2151

Mast range
HEB profiles 200-260

Type	Z (mm)	L (m)
1.04	14	0.38
1.06	14	0.58
1.08	14	0.78
1.10	14	0.98
1.12	14	1.18
2.04	23	0.38
2.06	23	0.58
2.08	23	0.78
2.10	23	0.98
2.12	23	1.18



Note
When ordering state height H.
Height min. 1,0 m
Height max. 2,2 m

Associated parts
Solid core insulator 5135 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
353.00138

Ordering information
Z = 14, length 0,98 m, height 2,0 m,
on HEB 220
2151.1.10.20.22 Stand-off bracket moveable for tubular cantilever FL 200/260

Mast bracket for tubular cantilever FL 200/260 — 2152

Mast range
HEB profiles 100-160 / 180-260

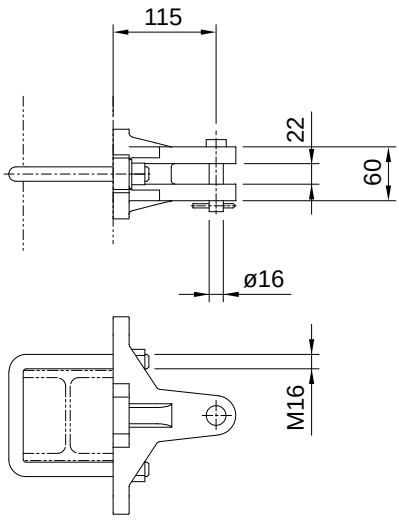
Material
Al-cast

Associated parts
Rod insulator 5135 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
353.00180, .00895

Ordering information
on HEB 200
2152.20 Mast bracket for tubular cantilever FL 200/260



Mast bracket for tubular cantilever FL 200/260 — 2153

Mast range
HEB profiles 100-160 / 180-260

Material
Al-cast

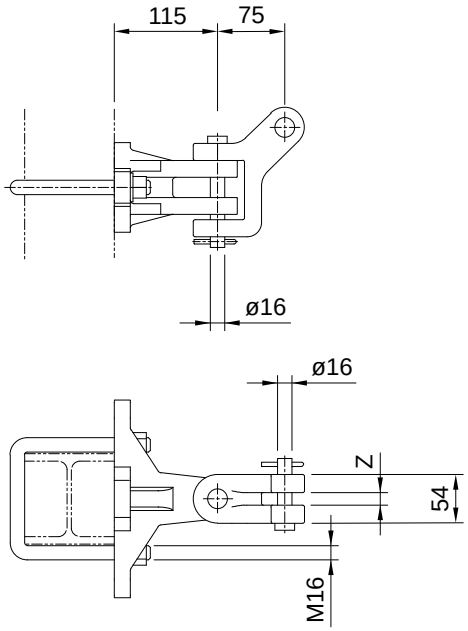
Type	Z (mm)
1	14
2	22

Associated parts
Rod insulator 5135 onw

Fasteners
Supplied complete with U-bolt.

Drawing number
353.00181, .00772 - .00774

Ordering information
on HEB 200
2152.20 Mast bracket for tubular cantilever FL 200/260



Pair of cross arms for 2 tubular cantilevers FL 200/260 — 2153.3

Mast range
HEB profiles 160 /180-260

Type	Z (mm)
1	14
2	22

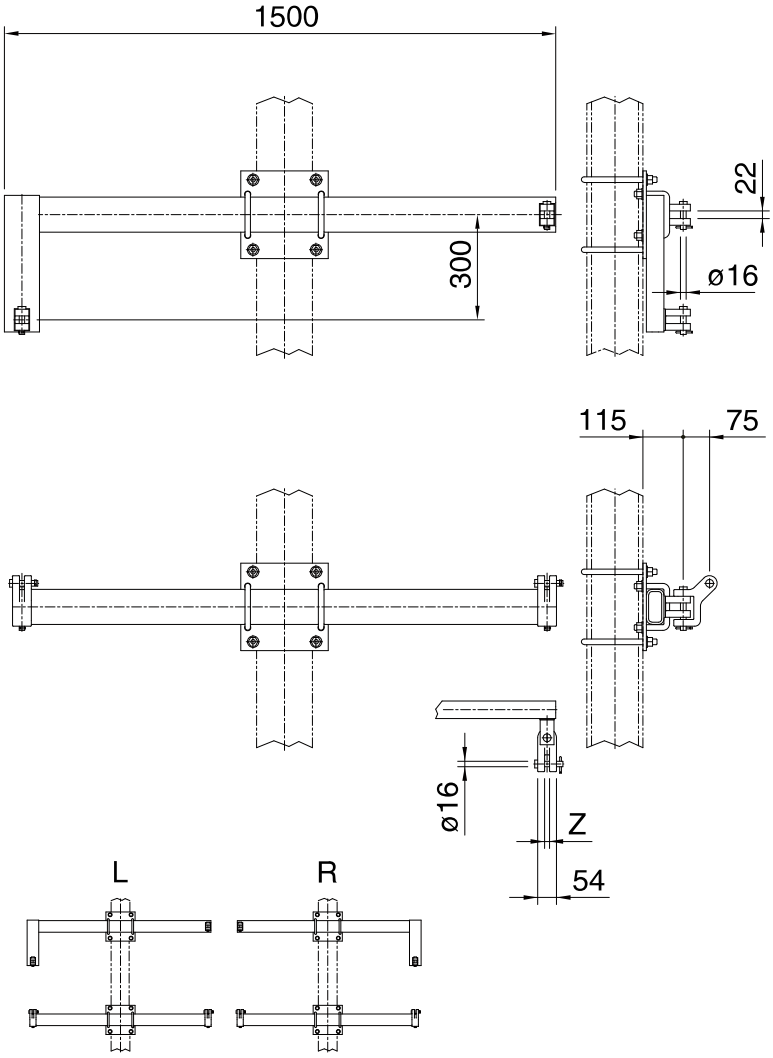
Note
L = left as seen from the track
R = right as seen from the track

Associated parts
Rod insulator 5135 onw

Fasteners
Supplied complete with U-bolts

Drawing number
451.00211, .00211-8 - .00211-10

Ordering information
Z 22 mm, Right, on HEB 240
2153.3.2.R.24 Pair of cross arms for 2 tubular cantilevers FL 200/260

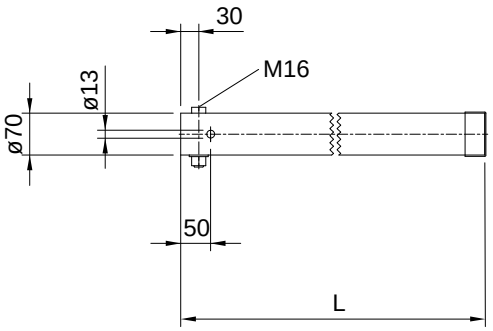


Top tube for tubular cantilever FL 200/260 — 2154

Material
Fe stainless

Type	Insulator
1.1	5139
1.2	5135

Note
Length L min. 2,0 m
Length L max. 3,5 m
Available in steps of 0,3 m
Other tube lengths available
on request.
x.2 = Supplied without bolt M 16 for insulator
Other material available



Associated parts
Bracket with clevis 2159
Rotatable support 5322 onw

Weight
Wt (kg/m) = 4.9

Drawing number
353.00103, .00746

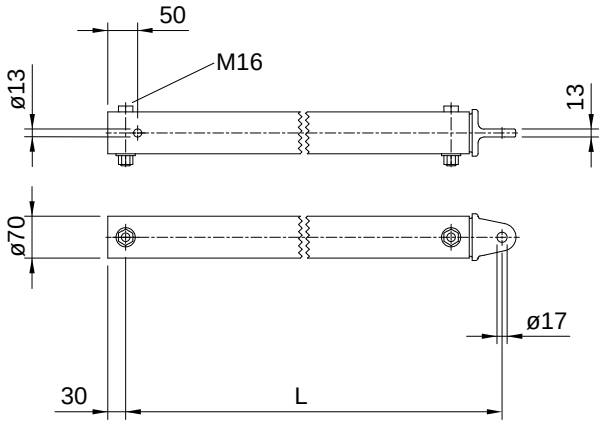
Ordering information
Cantilever top tube Fe stainless,
for insulator 5133, length 2,9 m
2154.1.1.29 Top tube
for tubular cantilever FL 200/260

Strut tube for tubular cantilever FL 200/260 — 2155

Material
Fe stainless

Type	Insulator
1.1	5139
1.2	5135

Note
Length L min. 2,0 m
Length L max. 3,2 m
Available in steps of 0,1 m
Other tube lengths available
on request.
x.2 = Supplied without bolt M 16 for insulator
Other material available



Associated parts
Clevis clamp 2159

Weight
Wt (kg/m) = 4.9

Drawing number
353.00104, .00754

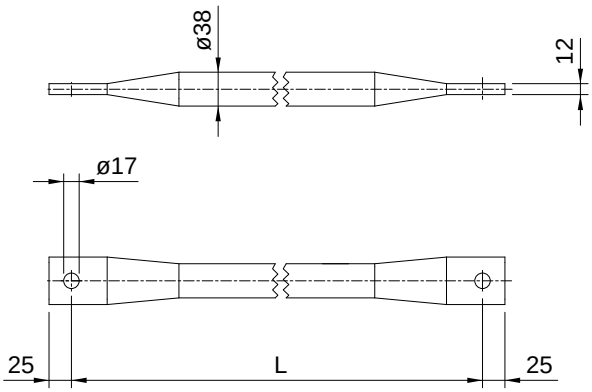
Ordering information
Strut tube Fe stainless,
for insulator 5135, length 2,6 m
2155.1.2.26 Strut tube
for tubular cantilever FL 200/260

Cantilever brace tube for tubular cantilever FL 200/260 — 2156

Material
Fe stainless

Type	Material
1	Fe stainless

Note
Length L min. 0,3 m
Length L max. 2,4 m
Available in steps of 0,1 m
Other tube lengths
available on request
Other materials available



Weight
Wt (kg/m) = 2.6

Drawing number
353.00105

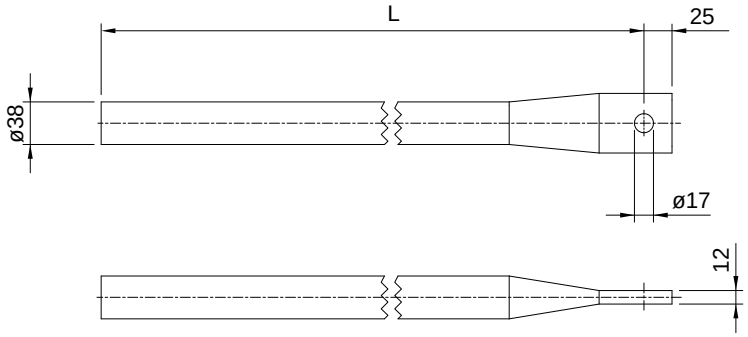
Ordering information
Brace tube Fe stainless, length 1,2 m
2156.1.12 Cantilever brace
tube for tubular cantilever FL 200/260

Steady arm tube for tubular cantilever FL 200/260 — 2157

Material
Fe stainless

Type	Material
1	Fe stainless

Note
Length L min. 0,8 m
Length L max. 4,2 m
Available in steps of 0,2 m
Other tube lengths
available on request
Other material available



Associated parts
Clevis clamp 2159
Drop bracket 5451

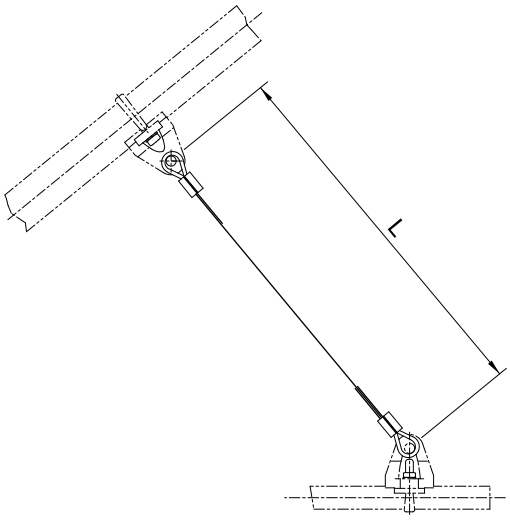
Drawing number
353.00106

Ordering information
Steady arm tube Fe stainless, length 3,4 m
2157.1.34 Steady arm tube
for tubular cantilever FL 200/260

Pull-off rope for tubular cantilever FL 200/260 — 2158

Material
Rope Fe stainless
Crimp connector Cu

Note
Length L min. 0,3 m
Length L max. 2,4 m
Available in steps of 0,1 m
Other rope lengths available on request.



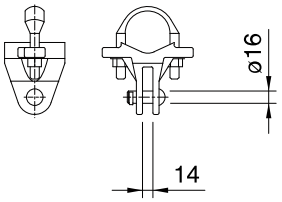
Drawing number
353.00161

Ordering information
Length 0,50 m
2158.05 pull of rope for tubular cantilever FL 200 / 260

Clevis clamp for tube ø 30 - 80 mm for tubular cantilever FL 200/260 — 2159

Material
G-AlSiMg

Note
State tube diameter when ordering.
Standard diameters: 38, 48, 55, 60, 70 and 76 mm.
Other diameters on request.



Fasteners
Supplied complete with U-bolt.

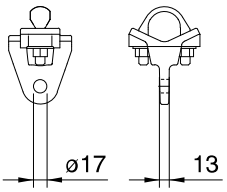
Drawing number
353.00107, .00108, .00882, .01087 - .01089

Ordering information
for tube ø 38 mm
2159.38 Clevis clamp for tube ø 30 - 80 mm for tubular cantilever FL 200/260

Tongue clamp for tube ø 30 - 80 mm for tubular cantilever FL 200/260 — 2159.1

Material
G-AlSiMg

Note
State tube diameter when ordering.
Standard diameters: 38, 48, 55, 60, 70 and 76 mm.
Other diameters on request.



Fasteners
Supplied complete with U-bolt.

Drawing number
353.00347, .00348, .00920, .00921, .01085, .01086

Ordering information
for tube ø 38 mm
2159.1.38 Tongue clamp for tube ø 30 - 80 mm for tubular cantilever FL 200/260

Mast bracket with hinge for fully insulated tubular cantilever 2161

Mast range
HEB profiles 160 / 180-240 / 260

Material
Bracket Fe hot dip galv
Fittings CuSn

Type	Model
1	with hinge
2	with double hinge

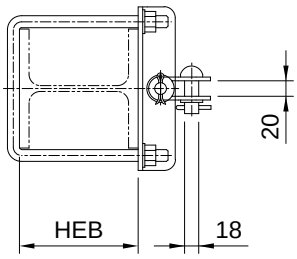
Associated parts
Support tube 2164

Fasteners
Supplied complete with U-bolt.

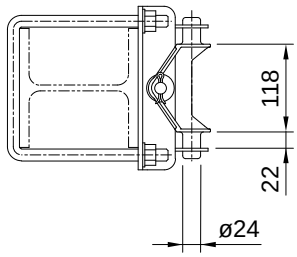
Drawing number
522.00087

Ordering information
with hinge, on HEB 200
2161.1.20 Mast bracket with hinge for fully insulated tubular cantilever

2161.1



2161.2



Termination bracket for fully insulated tubular cantilever 2162

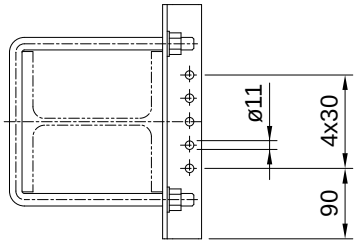
Mast range
HEB profiles 160 / 180-240 / 260

Associated parts
Universal hook 3344

Fasteners
Supplied complete with U-bolt.

Drawing number
522.00086

Ordering information
on HEB 180
2162.18 Termination bracket for fully insulated tubular cantilever



Strut tube, synthetic for fully insulated tubular cantilever 2164

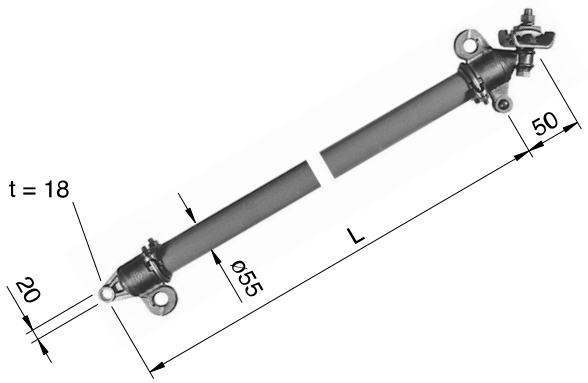
Material
Tube GF-EP
Fittings CuAl

Note
Clamp range 50-150 mm^2
State length L when ordering.
Max. length in stock 8,0 m.

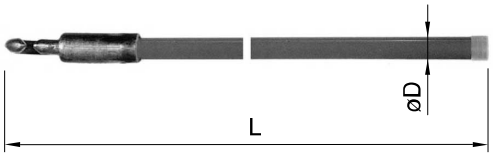
Associated parts
Steady arm tube 2165
Kevlar cable 4451

Weight
Wt (kg/m) = 2,4 (without fittings)

Ordering information
Length 3,25 m
2164.325 Strut tube, synthetic for fully insulated tubular cantilever



Steady arm tube, synthetic for fully insulated tubular cantilever 2165



Material
Tube GF-EP
Fittings CuAl

Type	D (mm)	Length in stock (m)
38	38	7.0
55	55	8.0

Note
State length L when ordering.

Associated parts
Eye clamp 2166
Double tube clamp 2167
Drop bracket 5452

Ordering information
Tube ø 38 mm, length 3,90 m
2165.38.390 Steady arm tube, synthetic for fully insulated tubular cantilever

Tube clamp drop suspension for fully insulated tubular cantilever 2166

Material
CuAl

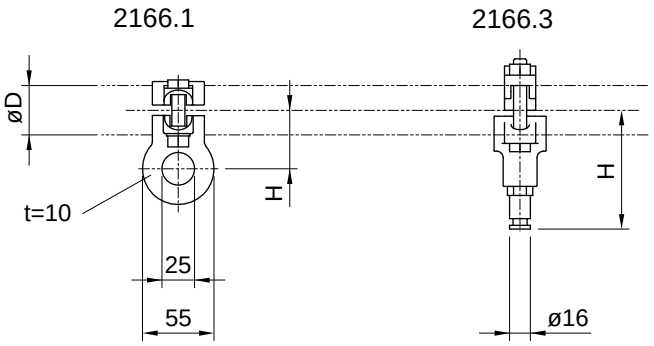
Type	Model	D (mm)	H (mm)
1.55	with eye	55	60
3.55	groove type	55	87

Note
t = thickness

Associated parts
Type 1
Shackle 3357
Steady arm 5583
Type 3
Contact wire swivel clip, groove type 5557

Drawing number
356.00097, .00098

Ordering information
groove type, on tube ø 55 mm
2166.3.55 Tube clamp drop suspension for fully insulated tubular cantilever



Double tube clamp for fully insulated tubular cantilever 2167

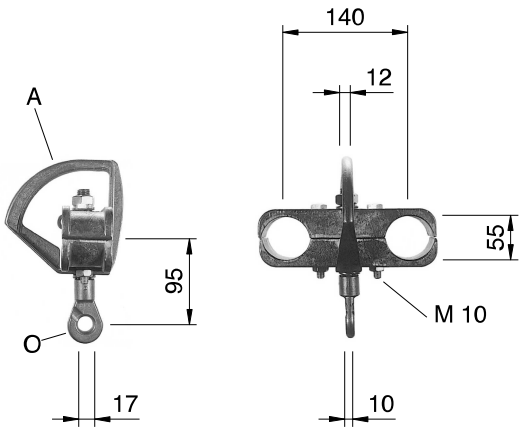
Material
CuAl

Type	Model
1	with suspension clip, with eye
2	with suspension clip, without eye
3	without suspension clip, with eye
4	without suspension clip, without eye

Note
For double tube cantilever over 2 tracks.
A = Suspension clip
O = Eye

Associated parts
Shackle 3357 onw
Pulley suspension 2168

Ordering information
with suspension clip, with eye
2167.1 Double tube clamp for fully insulated tubular cantilever

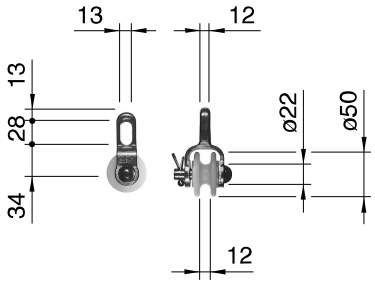


Pulley suspension for fully insulated tubular cantilever 2168

Material
Clevis CuAl
Pulley Polyamid

Associated parts
Shackle 3357

Ordering information
2168 Pulley suspension for fully insulated tubular cantilever



Mast bracket on HEB for GRP cantilever 2171

Mast range
HEB profiles 100-160 / 180-220 / 240-260

Material
Bracket Fe stainless
Eye fitting Al-cast

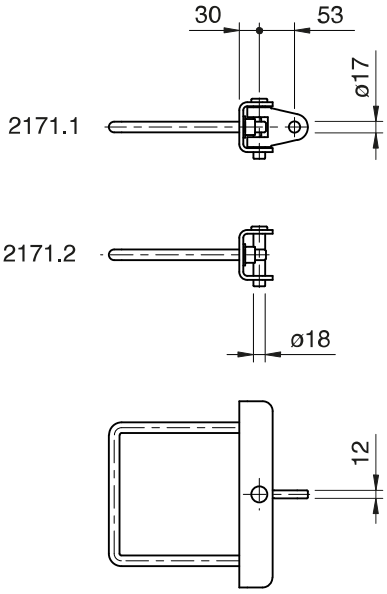
Type	Description
1	with eye fitting
2	without eye fitting

Associated parts
Top tube 2173
Strut tube 2174
Pull-off registration 2177

Fasteners
Supplied complete with U-bolts.

Drawing number
356.00045, .00120 - .00124

Ordering information
with eye fitting, on HEB 200
2171.1.20 Mast bracket on HEB for GRP cantilever

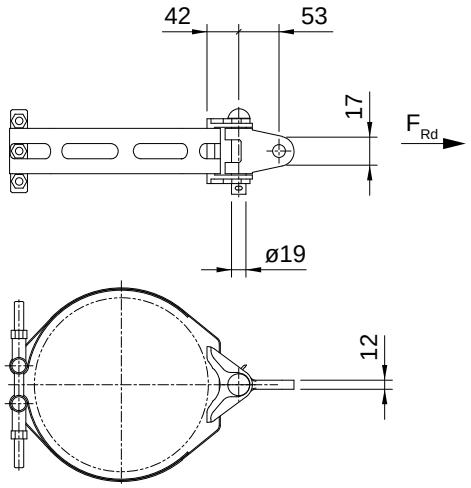


Mast bracket on round pole for GRP cantilever 2172

Material
Bracket Fe stainless
Eye fitting Al-cast

Type	Description	F_{Rd} (kN)
1	1 threaded bolt	3
3	3 threaded bolts	15

Pole range (mm)	d (mm)
180	180 - 260
260	260 - 300
300	300 - 440



Associated parts
Top tube 2173
Strut tube 2174
Pull-off registration 2177

Drawing number
356.00046, .00125 - .00129

Ordering information
1 threaded bolt,
on tubular mast ø 180 mm
2172.1.180 Mast bracket on round pole for GRP cantilever

Top tube for GRP cantilever 2173

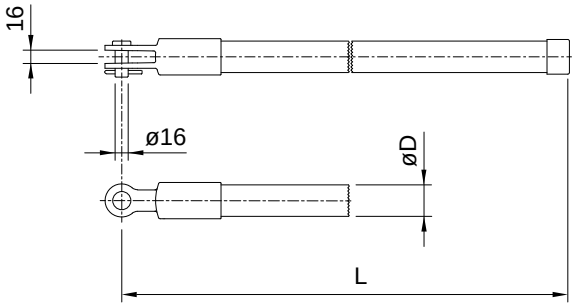
Material
Tube GRP
Fittings Alu-cast

Type	Fittings
1	Clevis type on one end
2	Clevis type on both ends

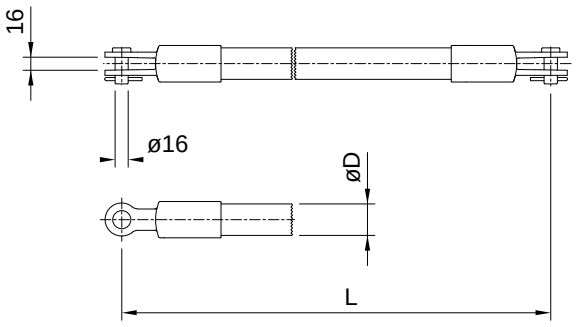
Tube	D (mm)	Wt (kg)
38	38	1.5
55	55	2.6

Note
Length L max. 4,20 m
Available in steps of 0,10 m.
Other tube lengths available
on request.

2173.1



2173.2



Associated parts
Tube clamp 2166.3.
Rotable support 5324

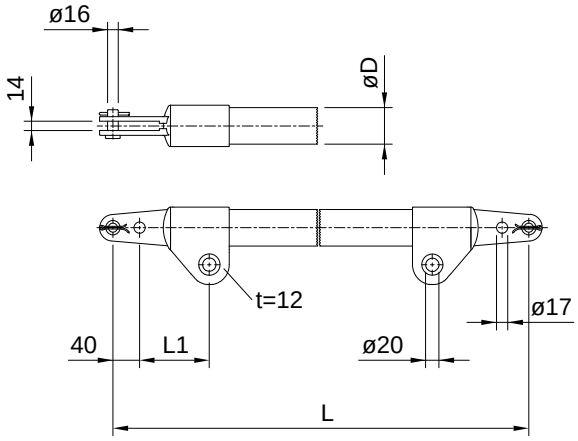
Drawing number
356.00034, .00035, .00068, .00069

Ordering information
Type 1, tube ø 38 mm, length 2,20 m
2173.1.38.220 Top tube for GRP cantilever

Strut tube for GRP cantilever 2174

Material
Tube GRP
Fittings Alu-cast

Type	D (mm)	L1 (mm)	Wt (kg)
55	55	105	2.6
70	70	110	3.9



Note
Length L max. 4,20 m
Available in steps of 0,10 m.
Other tube lengths available on request.

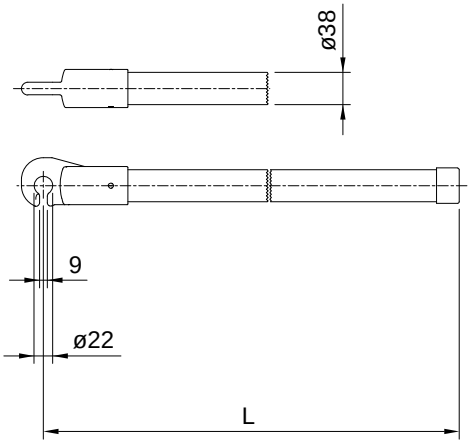
Associated parts
Pull-off registration 2177
Steady arm tube cable 2178

Drawing number
356.00038, .00039

Ordering information
Tube ø 55 mm, length 3,00 m
2174.55.300 Strut tube for GRP cantilever

Steady arm tube for GRP cantilever 2175

Material
Tube GRP
Fittings Al-cast



Note
Length L min. 1,00 m
Length L max. 5,25 m
Available in steps of 0,25 m.
Other tube lengths available on request.

Associated parts
Drop bracket 5453

Weight
Wt (kg) = 1,5

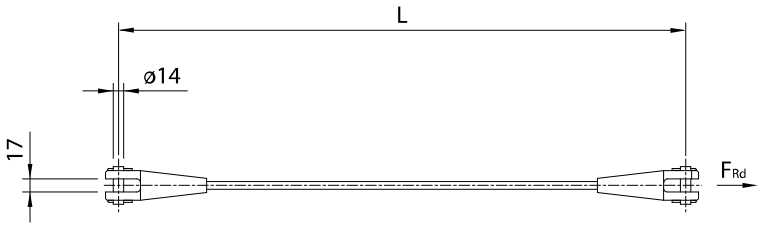
Drawing number
356.00036

Ordering information
Length 2,50 m
2175.38.250 Steady arm tube for GRP cantilever

Pull-off registration for GRP cantilever 2177

Material
Cable Kevlar
Fittings Al

Note
Length L min. 0,30 m
Length L max. 3,40 m
Available in steps of 0,05 m.
Other cable lengths available on request.



Resistance
F_{Rd} (kN) = 13

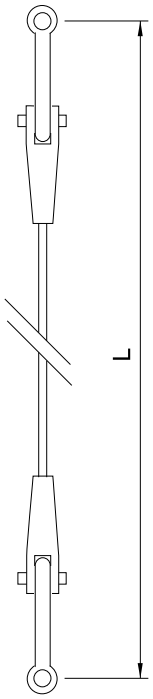
Drawing number
356.00048

Ordering information
Length 1,45 m
2177.145 Pull-off registration for GRP cantilever

Steady arm tube suspension cable for GRP cantilever 2178

Material
Cable Kevlar
Fittings Al

Note
Length L min. 0,50 m
Length L max. 2,40 m
Available in steps of 0,10 m.

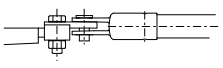


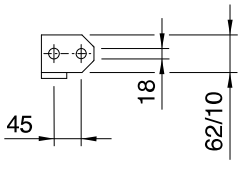
Drawing number
356.00049

Ordering information
Length 1,50 m
2178.150 Steady arm tube suspension cable for GRP cantilever

Adapter for GRP top tube on stand off brackets for steady arm 2179

Note
Adaptor for fitting
the top tube 2173
to bracket 5431





Drawing number
356.00071

Ordering information
2179 Adaptor for GRP top tube on stand off brackets for steady arm

Mast range
HEB profiles 160 / 180-240 / 260

Material
Bracket Fe stainless
Eye fitting Fe galvanized

Type	Used for
1	for cantilever tube
2	for 1 anchor cable
3	for 2 and 3 anchor cable

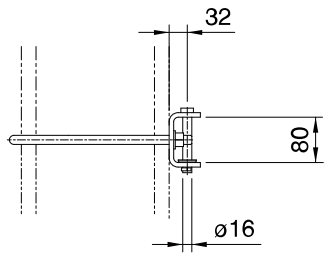
Associated parts
Cantilever tube 2185
Anchor cable 2186

Fasteners
Supplied complete with U-Bolt.

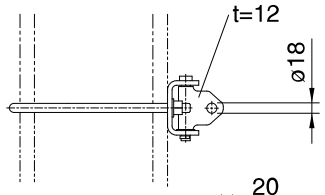
Drawing number
353.00368, .00386, .00768 - .00771,
353.00990, .00993, .00995

Ordering information
for cantilever on HEB 200
2181.1.20 Bracket for cantilever tube on mast HEB

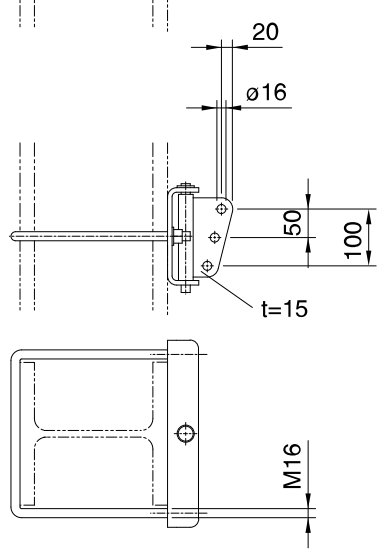
2181.1



2181.2



2181.3



Material
Bracket Fe stainless
Eye fitting Fe galvanized

Type	Used for
1	for cantilever tube
2	for 1 anchor cable
3	for 2 and 3 anchor cable

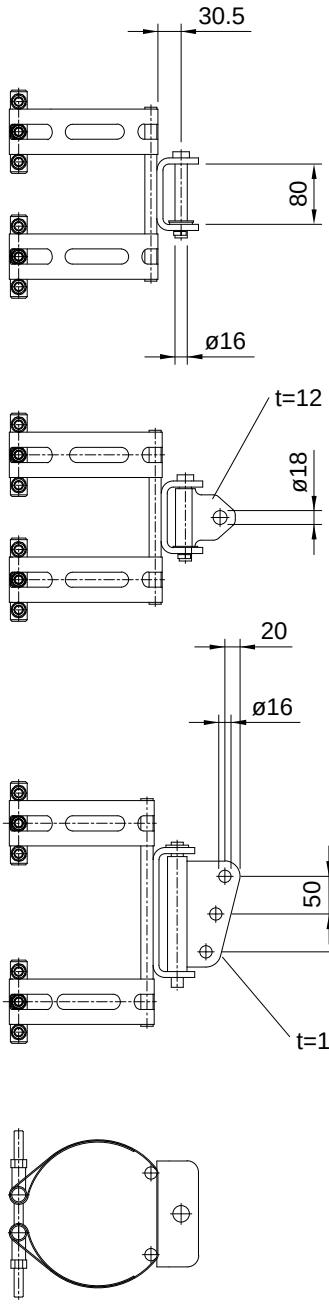
Pole range (mm)	d (mm)
180	180 - 260
260	260 - 300
300	300 - 440

Associated parts
Cantilever tube 2185
Anchor cable 2186

Fasteners
Supplied complete with band bracket.

Drawing number
353.00369, .00388, .01022

Ordering information
for 1 anchor cable on tubular pole ø 200 mm
2182.2.180 Bracket for cantilever tube, on tubular pole



Mast range
HEB profiles 160 / 180-240 / 260

Material
Bracket Fe stainless
Eye fitting Fe galvanized

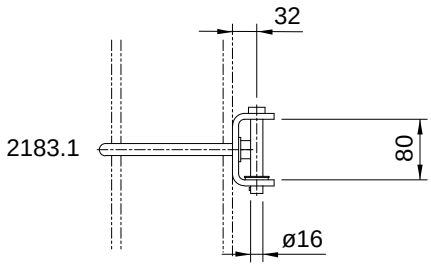
Type	Used for
1	for cantilever tube
2	for 1 anchor cable
3	for 2 and 3 anchor cable

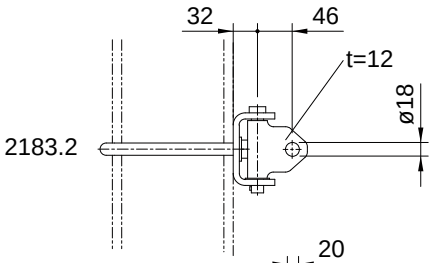
Associated parts
Cantilever tube 2185
Anchor cable 2186

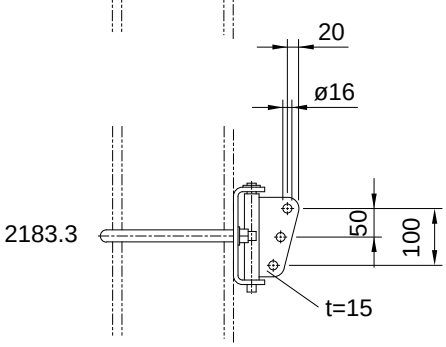
Fasteners
Supplied complete with U-Bolt.

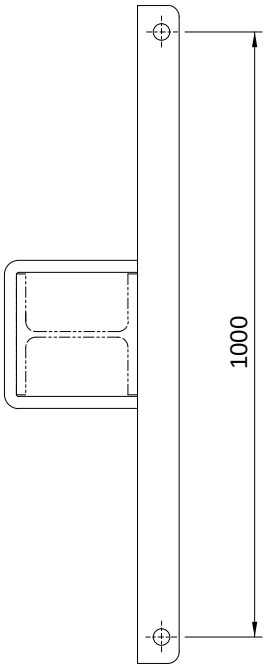
Drawing number
353.00996, .00999, .01001, .01003, .01004
353.01008, .01015, .01017, .01019

Ordering information
for 1 anchor cable on HEB 200
2183.2.20 Bracket for 2 cantilever tubes, on mast HEB









Material
Bracket Fe stainless
Eye fitting Fe galvanized

Type	Used for
1	for cantilever tube
2	for 1 anchor cable
3	for 2 and 3 anchor cable

Pole range (mm)	d (mm)
180	180 - 260
260	260 - 300
300	300 - 440

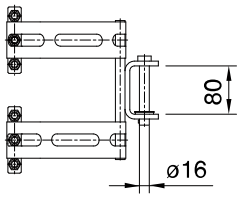
Associated parts
Cantilever tube 2185
Anchor cable 2186

Fasteners
Supplied complete with band bracket.

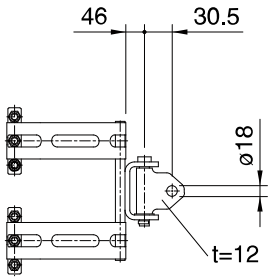
Drawing number
353.00983, .00986, .00988

Ordering information
for 2 anchor cables on tubular pole ø 200 mm
2184.3.180 Bracket for 2 cantilever tubes, on tubular pole

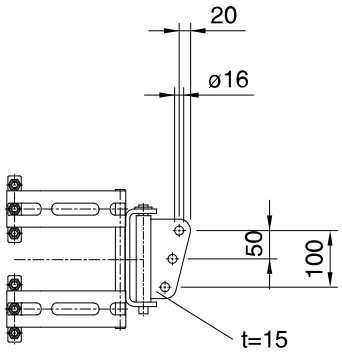
2184.4

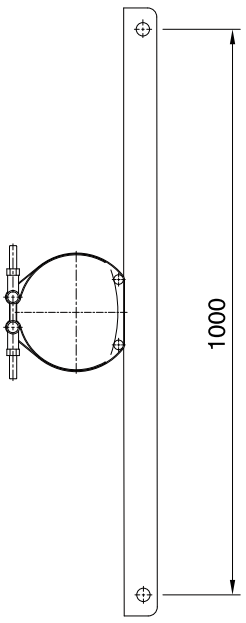


2184.2



2184.3

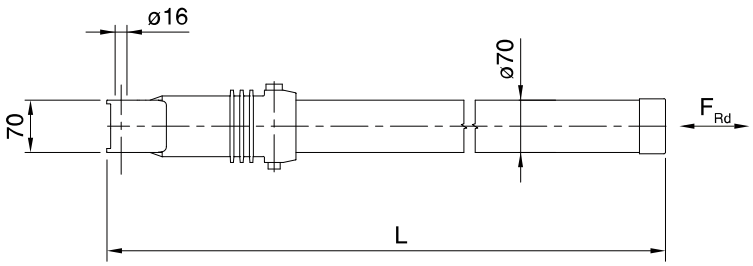




Cantilever tube with insulator to bracket, 1,5 kV — 2185

Material
Insulation Synthetic material
Tube Fe galvanized

Note
M_{Rd} (Nm) on Insulator fastening = 180
Length L min. 2,0 m
Length L max. 12,0 m
Available in steps of 0,5 m.
Other lengths available on request.
In case of double insulation (2187) 3 kV.



Associated parts
Insulating anchor cable 2186
Insulated suspension for tube 2187
Bracket for cantilever tube 2181 onw

Resistance
F_{Rd} (kN) = 5

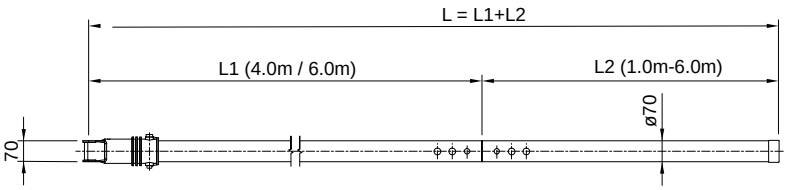
Drawing number
353.00365

Ordering information
Length L = 8,5 m
2185.085 Cantilever tube with insulator to bracket, 1,5 kV

Two-part cantilever tube with insulator to bracket, 1.5 kV — 2185.1

Material
Insulation Synthetic material
Tube Fe galvanized

Note
M_{Rd} (Nm) on Insulator fastening = 180
Length L min. 6,5 m
Length L max. 12,0 m
Available in steps of 0,5 m
In case of double insulation (2187) 3 kV



Associated parts
Insulating anchor cable 2186
Insulated suspension for tube 2187
Bracket for cantilever tube 2181 onw

Resistance
F_{Rd} (kN) = 5

Drawing number
353.01227

Ordering information
Length L1 = 4,0 m
L2 = 4,5 m
2185.1.400.450 Two-part cantilever tube with insulator to bracket, 1,5 kV

Material
Cable Kevlar
Fittings Al
Turnbuckle Fe galvanized

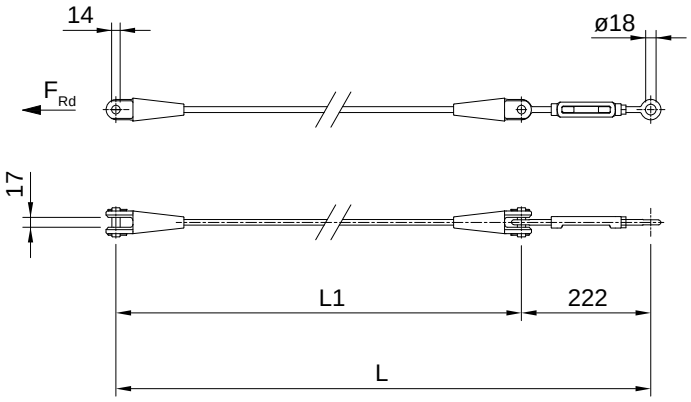
Type	Description
02	with turnbuckle

Note
Length L min. 1,0 m
Length L max. 15,0 m
Other cable lengths available on request.
Cable without turnbuckle see 2177

Resistance
F_{Rd} (kN) = 13

Drawing number
353.00394

Ordering information
Length L = 8,5 m
2186.02.08500 Insulating anchor cable with turnbuckle



Material
Insulation Synthetic material
Fittings Fe stainless

Type	Used for
1	with clamp for stitch wire for cable ø 6 mm
2.1	with pulley for stitch wire for cable ø 6 mm
2.2	with pulley for kevlar rope ø 10 mm
3	with hinged rope clamp
4	with contact wire swivel clip, groove type
5	for steady arm tube
6	with eyebolt for hinged suspension, suspension, delta cable
7	with feeder suspension clamp
8	with hold-down clamp, spring-loaded and movable

Note
When ordering state tube diameter.
Standard diameters 70 mm
Other diamteters on request

Associated parts
Hinged rope clamp 5351
Contact wire swivel clip 5557
Steady arm tube
with eye end fitting 5523
Delta cable 5565 onw
Feeder suspension clamp 5353
Flat laying steady arm 5571

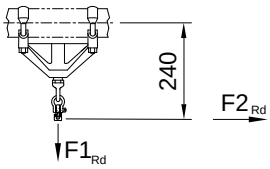
Fasteners
Supplied complete with U-Bolts.

Resistance
valid for all types, exclusive fot type 8
$F1_{Rd}$ (kN) = 2
$F2_{Rd}$ (kN) = 4

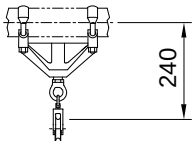
Drawing number
353.00351 - .00351-7

Ordering information
On tube ø 70 mm, with contact wire swivel clip, groove type
2187.70.4 Insulated suspension for tube 70 mm, 1.5 kV

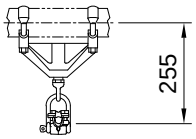
2187.xx.1



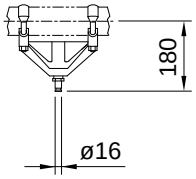
2187.xx.2.1/2187.xx.2.2



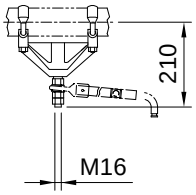
2187.xx.3



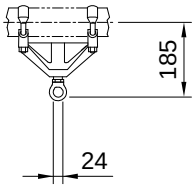
2187.xx.4



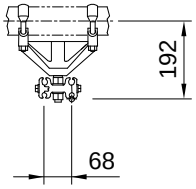
2187.xx.5



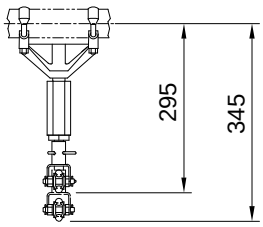
2187.xx.6



2187.xx.7



2187.xx.8



Material
Insulation Synthetic material
Fittings Fe stainless

Type	Used for
1	with delta cable clamp for cable ø 6 mm
2.1	with pulley for steel cable ø 6 mm
2.2	with pulley for Kevlar rope ø 10 mm
3	with hinged rope clamp
4	with contact wire swivel clip, groove type
5	for steady arm tube
6	with eyebolt for hinged suspension, suspension, delta cable
7	with feeder uspension clamp
8	with hold-down device, spring-loaded and movable

Note
on cross span ø 4,5 - 9 mm / 35 - 50 mm^2

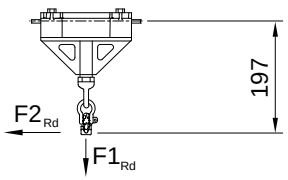
Associated parts
Hinged rope clamp 5351
Contact wire swivel clip 5557
Steady arm tube
with eye end fitting 5523
Delta cable 5565 onw
Feeder suspension clamp 5353
Flat laying steady arm 5571

Resistance
valid for all types, exclusive type 8
$F1_{Rd}$ (kN) = 1
$F2_{Rd}$ (kN) = 2

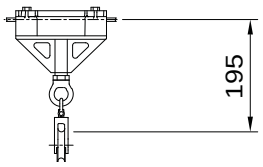
Drawing number
353.00353 - .00353-6, 451.00359

Ordering information
with hinged rope clamp
2188.3 Insulated suspension for cross span, short, 1.5 kV

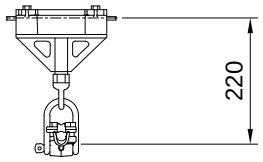
2188.1



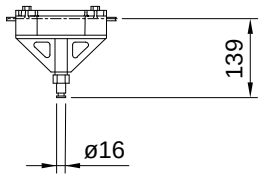
2188.2.1/2188.2.2



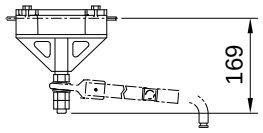
2188.3



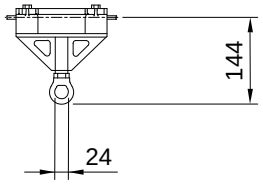
2188.4



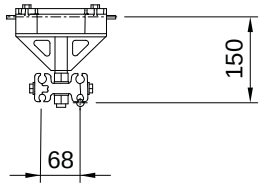
2188.5



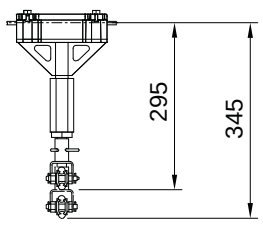
2188.6



2188.7



2188.8



Material
Insulation Synthetic material
Fittings Fe stainless

Type	Used for
1	with delta cable clamp for cable ø 6 mm
2.1	with pulley for steel cable ø 6 mm
2.2	with pulley for Kevlar rope ø 10 mm
3	with hinged rope clamp
4	with contact wire swivel clip, groove type
5	for steady arm tube
6	with eyebolt for hinged suspension, suspension, delta cable
7	with feeder uspension clamp
8	with hold-down device, spring-loaded and movable

Note
on cross span ø 4,5 - 9 mm / 35 - 50 mm^2

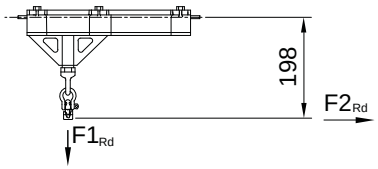
Associated parts
Hinged rope clamp 5351
Contact wire swivel clip 5557
Steady arm tube
with eye end fitting 5523
Delta cable 5565 onw
Feeder suspension clamp 5353
Flat laying steady arm 5571

Resistance
valid for all types, exclusive for type 8
$F1_{Rd}$ (kN) = 1
$F2_{Rd}$ (kN) = 4

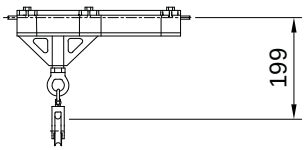
Drawing number
353.00352 - .00352-6, 451.00360

Ordering information
with pulley for Kevlar rope ø 10 mm
2189.2.2 Insulated suspension for cross span, long, 1.5 kV

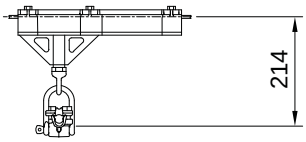
2189.1



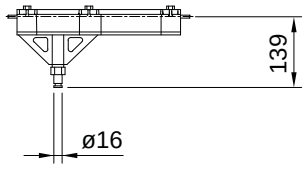
2189.2.1 / 2198.2.2



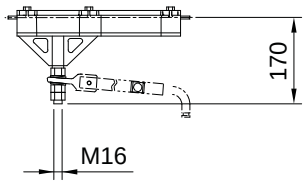
2189.3



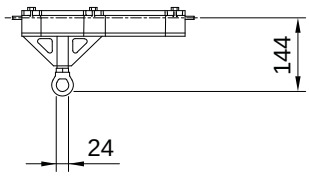
2189.4



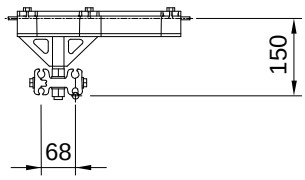
2189.5



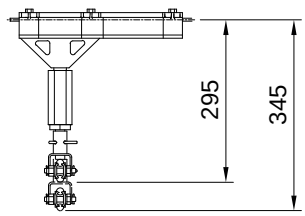
2189.6



2189.7



2189.8



Material
Insulation Synthetic material
Fittings Fe stainless

Type	Used for
1	with delta cable clamp for cable ø 6 mm
2.1	with pulley for steel cable ø 6 mm
2.2	with pulley for Kevlar rope ø 10 mm
3	with hinged rope clamp
4	with pin ø 10 mm

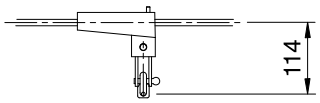
Note
for kevlar cross span ø 10 mm

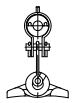
Associated parts
Hinged rope clamp 5351

Drawing number
353.00397, .00397-2, .00397-3, .00397-5

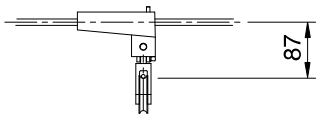
Ordering information
with pulley for Kevlar rope ø 10 mm
2190.2.2 Insulated suspension for Kevlar cross span

2190.1

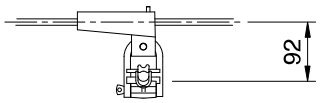




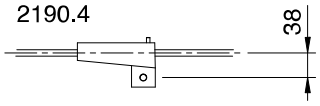
2190.2.1/2190.2.2

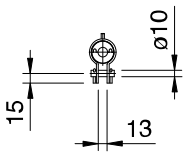


2190.3



2190.4



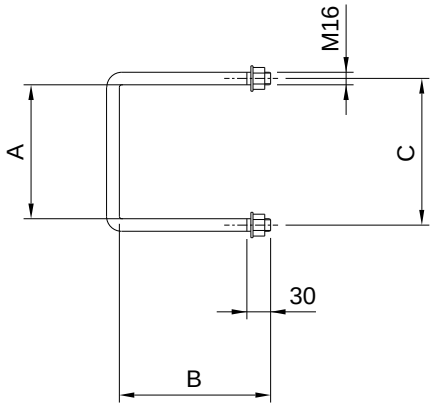


U-bolt for spread cantilever 2191

Type	Profile (mm)	A (mm)	B (mm)	C (mm)
16	160	170	192	186
18	180	191	212	207
20	200	211	232	227
22	220	232	252	248
24	240	253	272	269
26	260	274	292	290

Drawing number
359.00036

Ordering information
on HEB 220
2191.22 U-bolt for spread cantilever

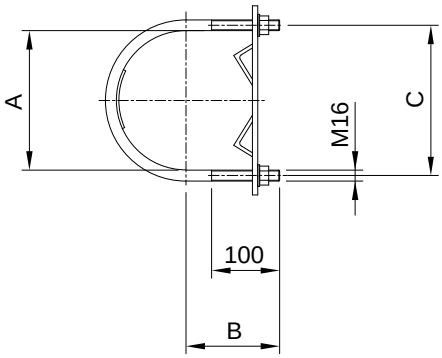


U-bolt for spread cantilever on wooden pole 2192

Type	Mast range (mm)	A (mm)	B (mm)	C (mm)
15	150 - 200	211	138	227
18	180 - 200	211	138	227
19	190 - 245	253	162	269
21	210 - 225	232	160	248

Drawing number
359.00025

Ordering information
on wooden pole ø 175 mm
2192.15 U-bolt for spread cantilever on wooden pole

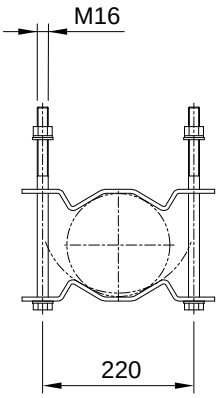


Compression clamp for horizontal cantilever on wooden pole 2194

Pole range
Wooden pole ø 150 - 255

Drawing number
359.00026

Ordering information
2194 Compression clamp for horizontal cantilever on wooden pole



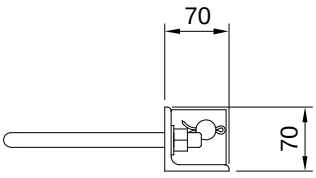
Mast bracket for tubular cantilever 2195

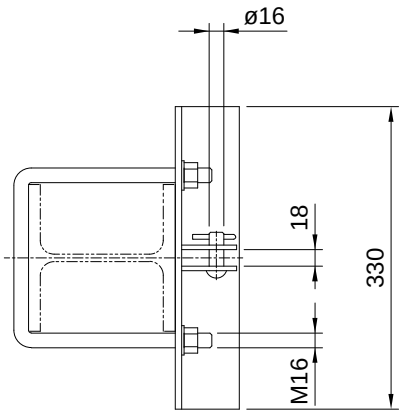
Mast range
HEB profiles 160-260

Fasteners
Supplied complete with U-bolt.

Drawing number
354.00022

Ordering information
on HEB 220
2195.22 Mast bracket for tubular cantilever





Hinged suspension in cross span 2196

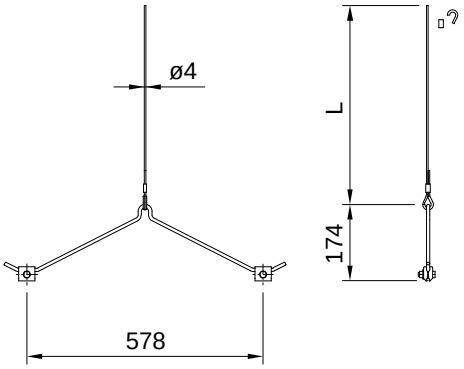
Material
Wire Fe A2
Fittings Fe A2

Type	L (mm)
04	500
05	650
06	950

Note
Supplied complete thimble and crimp connector
Other lengths on request.

Drawing number
413.00043-1

Ordering information
Length 950 mm
2196.06 Hinged suspension in cross span

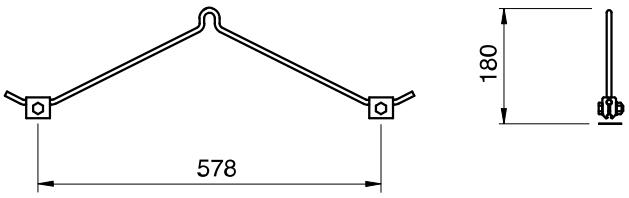


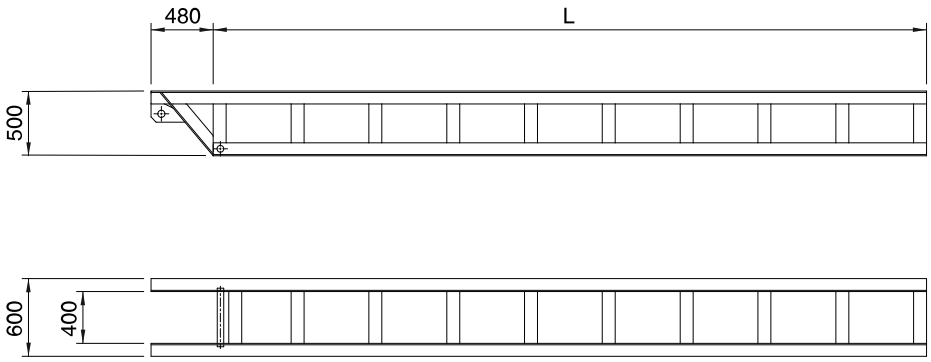
Contact wire support Delta 2197

Material
Fe A2

Drawing number
413.00043

Ordering information
2197 Contact wire support Delta



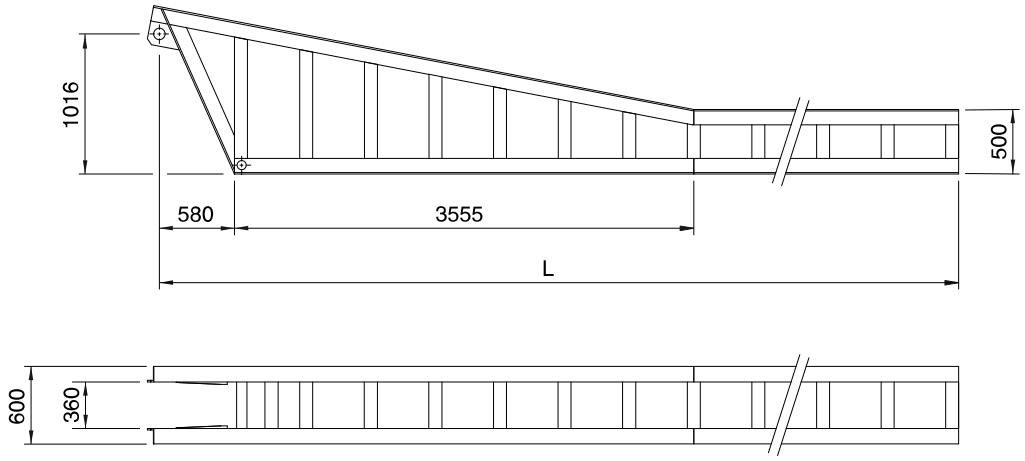


Type	L(mm)	Wt (kg)
030	3.0	304
035	3.5	345
040	4.0	386
045	4.5	427
050	5.0	468
055	5.5	509
060	6.0	550
065	6.5	591
070	7.0	632

Note
Order possible on request
Dimensioning by F+F

Associated parts
Drop tube 21103 onw

Drawing number
342.00201



Type	L(mm)	Wt (kg)
070	7.0	947
075	7.5	1002
080	8.0	1057
085	8.5	1112
090	9.0	1166
095	9.5	1221
100	10.0	1276
105	10.5	1331

Note
Order possible on request
Dimensioning by F+F

Associated parts
Drop tube 21103 o/w

Drawing number
342.00300

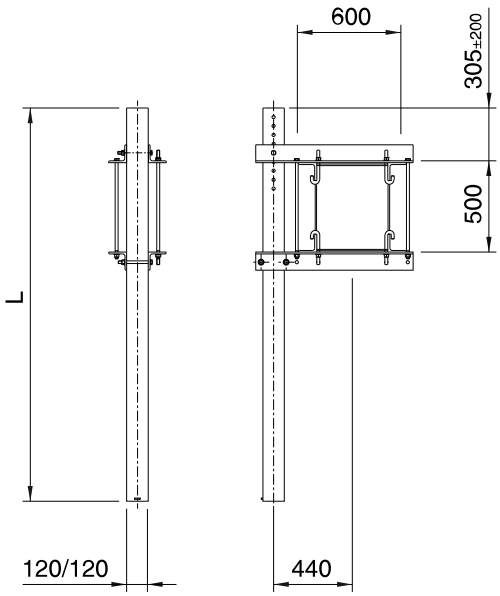
Drop tube on TTC 21103

Type	L (mm)
020	2000
024	2400
028	2800

Note
Order possible on request

Fasteners
Supplied complete with attachment brackets and hook bolts.

Drawing number
523.00788



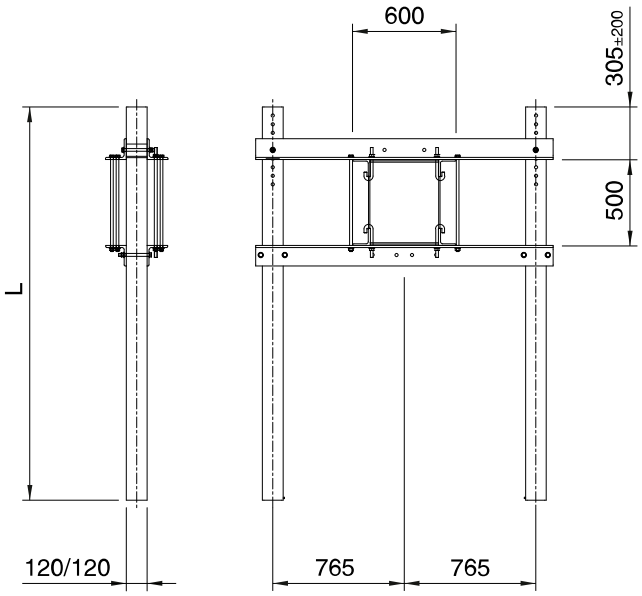
Double drop tube on TTC 21104

Type	L (mm)
020	2000
024	2400
028	2800

Note
Order possible on request

Fasteners
Supplied complete with attachment brackets and hook bolts.

Drawing number
523.00789



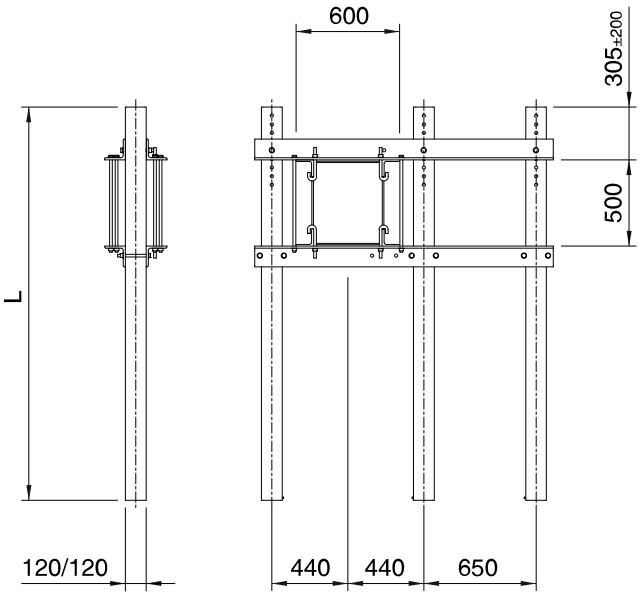
Triple drop tube on TTC 21105

Type	L (mm)
020	2000
024	2400
028	2800

Note
Order possible on request

Fasteners
Supplied complete with attachment brackets and hook bolts.

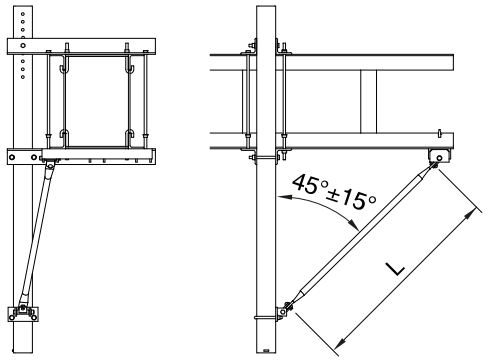
Drawing number
523.00790



Ties/Struts for drop tube 120 x 120 on TTC and TTC long 21106

Note
Order possible on request

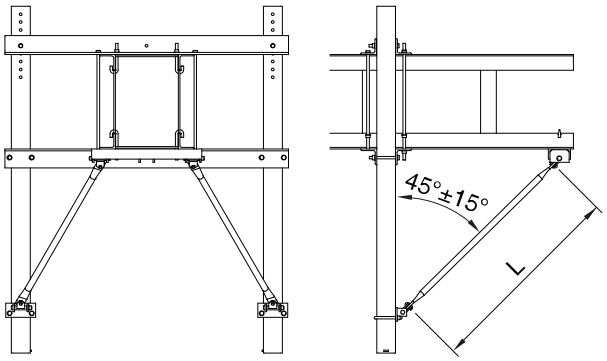
Drawing number
372.00588



Ties/Struts for double drop tube 120x120 on TTC + TTC long 21107

Note
Order possible on request

Drawing number
372.00589



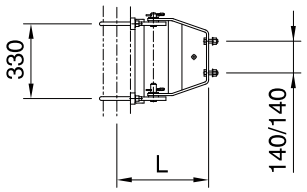
Type	L (mm)
04	405
06	625
08	815

Fasteners
Supplied with U-bolts

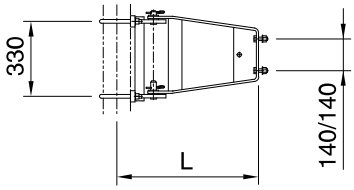
Drawing number
372.00390, .00393, .00395

Ordering information
Type 04, length 405 mm
21201.04 Hinged stand-off bracket on tube 120 x 120

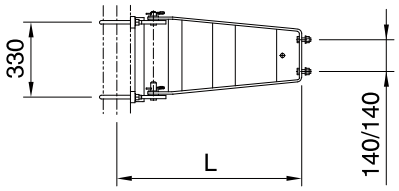
21201.04



21201.06



21201.08



Mast range
HEB profiles 200-260

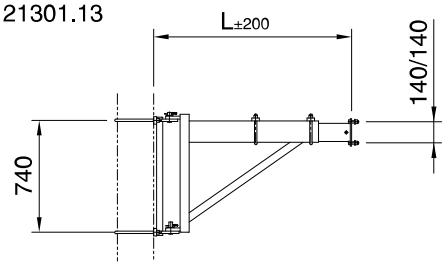
Type	L (mm)
13	1310
19	1900
24	2425
31	3125

Fasteners
Supplied complete with U-bolts

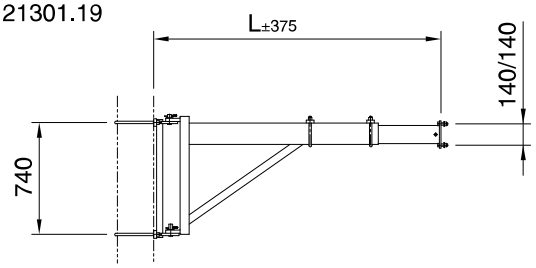
Drawing number
372.00474, .00476, .00479, .00480

Ordering information
Type 19, mast HEB 200
21301.19.20 SIC on mast

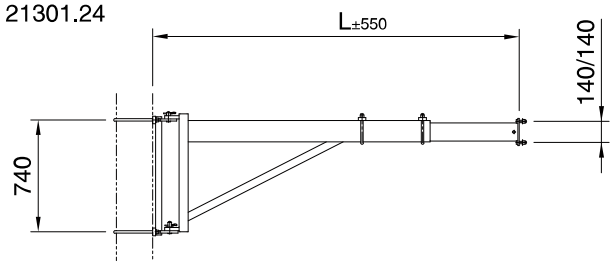
21301.13



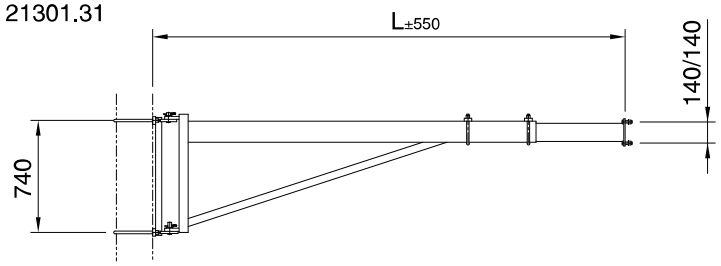
21301.19



21301.24



21301.31



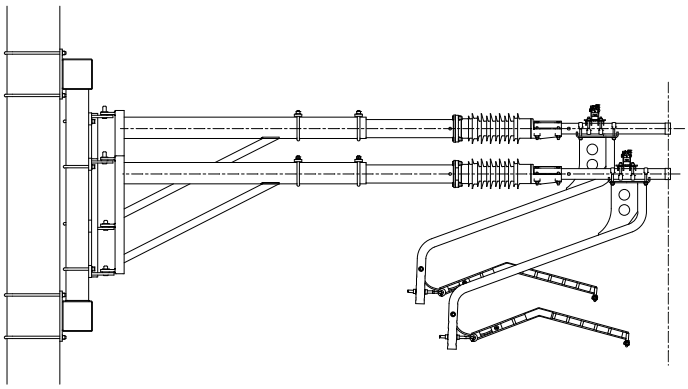
Double SIC on mast 21302

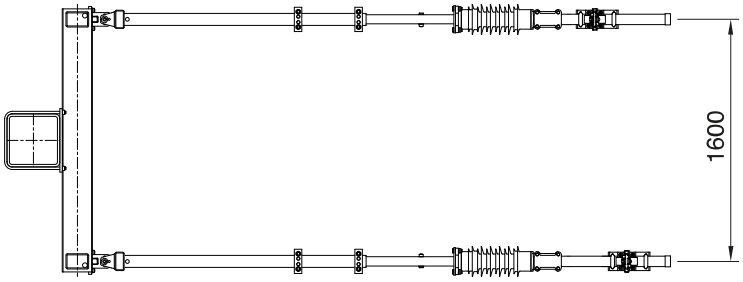
Mast range
HEB profiles 200-260

Fasteners
Supplied complete with U-bolts

Drawing number
372.00474, .00476, .00479, .00480

Ordering information
Mast HEB 240
21302.24 Double SIC on mast





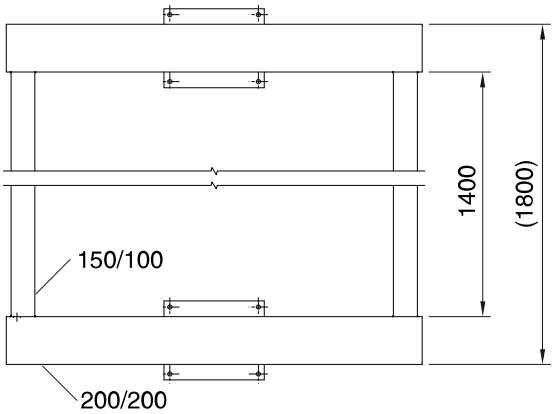
Frame for double SIC 21303

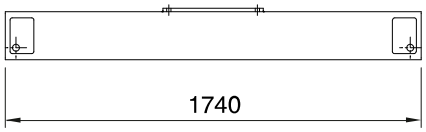
Associated parts
For double SIC on Mast 21302

Fasteners
Order U-bolts separately

Drawing number
329.00069

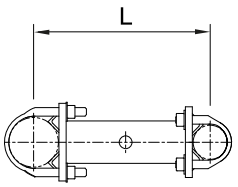
Ordering information
21303 Frame for double SIC

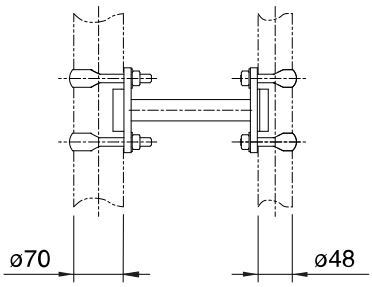




Spacer 21401

Type	L (mm)
025	250
030	300
035	350
040	400
045	450





Fasteners
Supplied complete with U-bolts

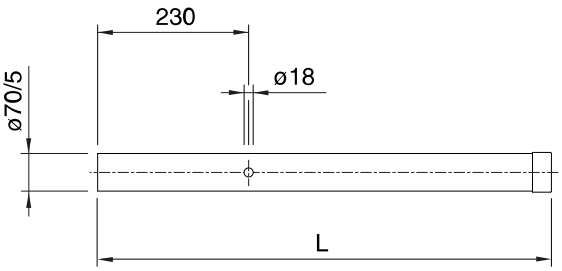
Drawing number
371.00162-3

Ordering information
Length 250 mm
21401.25 Spacer

Cantilever tube ø 70 21402

Material
Fe stainless

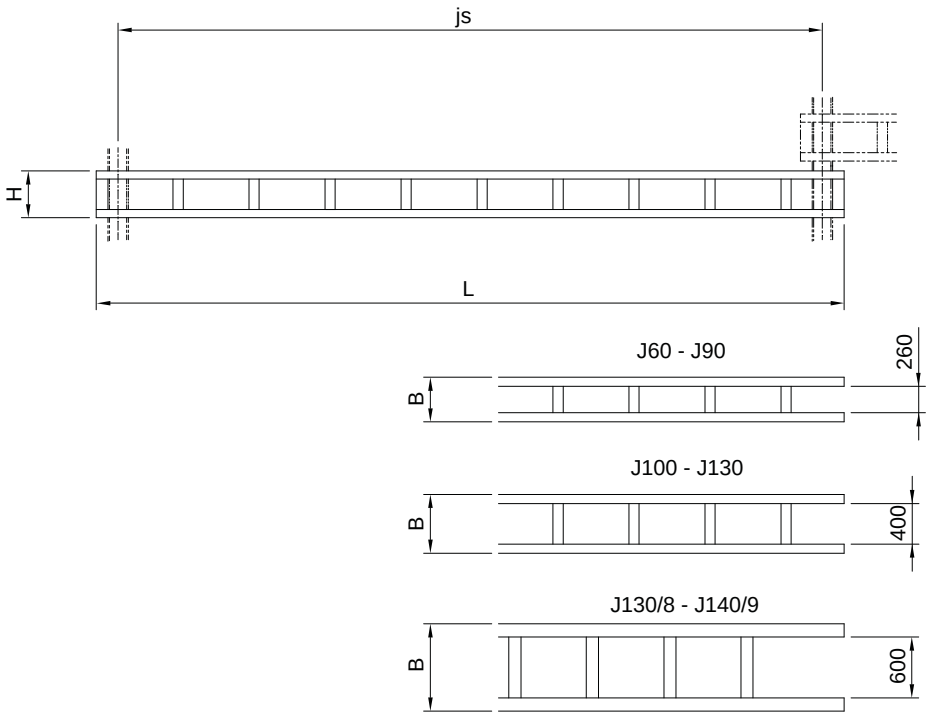
Type	L (mm)
09	900
11	1100
13	1300
15	1500
17	1700
19	1900



Note
For SIC on mast 21301

Drawing number
371.00293

Ordering information
Length 900 mm
21402.09 Cantilever tube ø 70



Type	Gantry	L (m)	B (mm)	H (mm)	Upper boom angle (mm)	Lower boom angle (mm)	Greatest part length (m)	Wt (kg/m)
60	J 60	8.0 - 16.0	380	400	60 / 6	60 / 6	-	29
70	J 70	12.5 - 20.0	400	400	70 / 7	70 / 7	-	38
80	J 80	16.0 - 23.5	420	400	80 / 8	80 / 8	14.3	49
90	J 90	20.0 - 26.5	440	500	90 / 9	90 / 9	18.8	62
100	J 100	20.0 - 29.5	600	600	100 / 10	80 / 8	19.5	73
120	J 120	23.0 - 32.0	640	600	120 / 12	100 / 10	20.2	97
130	J 130	27.0 - 34.5	660	700	130 / 12	120 / 80 / 10	19.9	114
130 / 8	J 130 / 8	32.0 - 37.0	860	800	130 / 12	120 / 80 / 12	14.2	128
140 / 9	J 140 / 9	36.0 - 40.0	880	900	140 / 13	120 / 12	17.2	152

Note
Dimensioning by F+F.
Beams are supplied ready assembled.

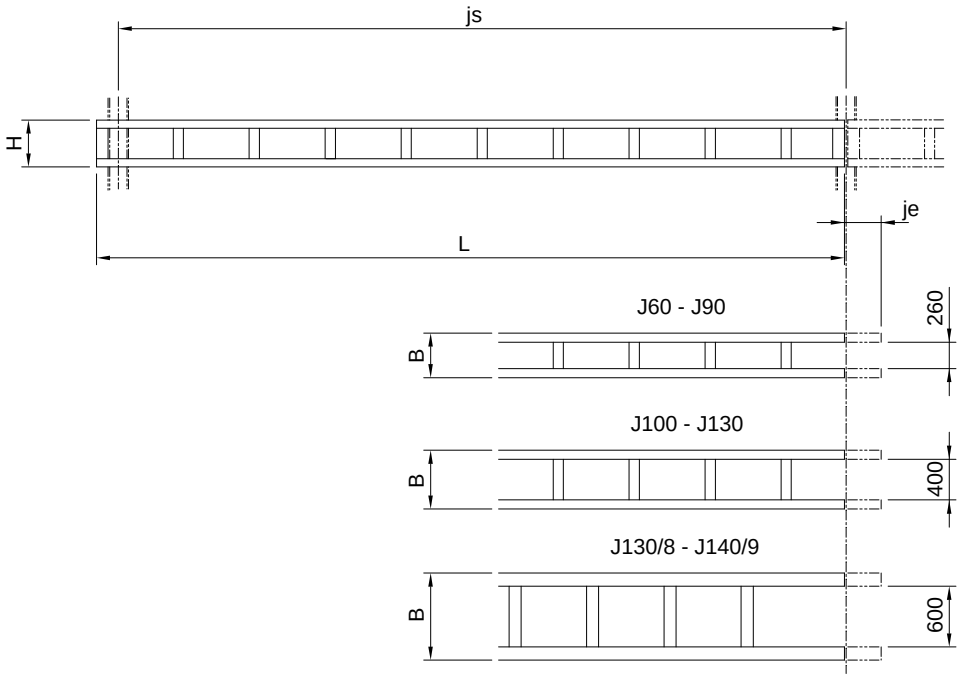
Joint type
J 80 - J 130 one spliced joints
J 130/8 - J 140/9 two HV joints

Length grading
Available in steps of 0,50 m.

Support
J 60 Upper and lower boom 2244
J 70 - J 90
Upper boom / Lower boom 2244 / 2245
J 100 - J 130
Upper and lower boom 2246
J 130/8 - J 140/9
according to local conditions.

Drawing number342.00093 - .00099, .00141 - .00143

Ordering informations
J 90 / Length 22,0 m
2221.090.220 Gantry beam with parallel ends, single beam



Type	Gantry	L (m)	B (mm)	H (mm)	Upper boom angle (mm)	Lower boom angle (mm)	Greatest part length (m)	Wt (kg/m)
60	J 60	8.0 - 16.0	380	400	60 / 6	60 / 6	-	29
70	J 70	12.5 - 20.0	400	400	70 / 7	70 / 7	-	38
80	J 80	16.0 - 23.5	420	400	80 / 8	80 / 8	14.3	49
90	J 90	20.0 - 26.5	440	500	90 / 9	90 / 9	18.8	62
100	J 100	20.0 - 29.5	600	600	100 / 10	80 / 8	19.5	73
120	J 120	23.0 - 32.0	640	600	120 / 12	100 / 10	20.2	97
130	J 130	27.0 - 34.5	660	700	130 / 12	120 / 80 / 10	19.9	114
130 / 8	J 130 / 8	32.0 - 37.0	860	800	130 / 12	120 / 80 / 12	14.2	128
140 / 9	J 140 / 9	36.0 - 40.0	880	900	140 / 13	120 / 12	17.2	152

Note
Dimensioning by F+F
Beams are supplied ready assembled.

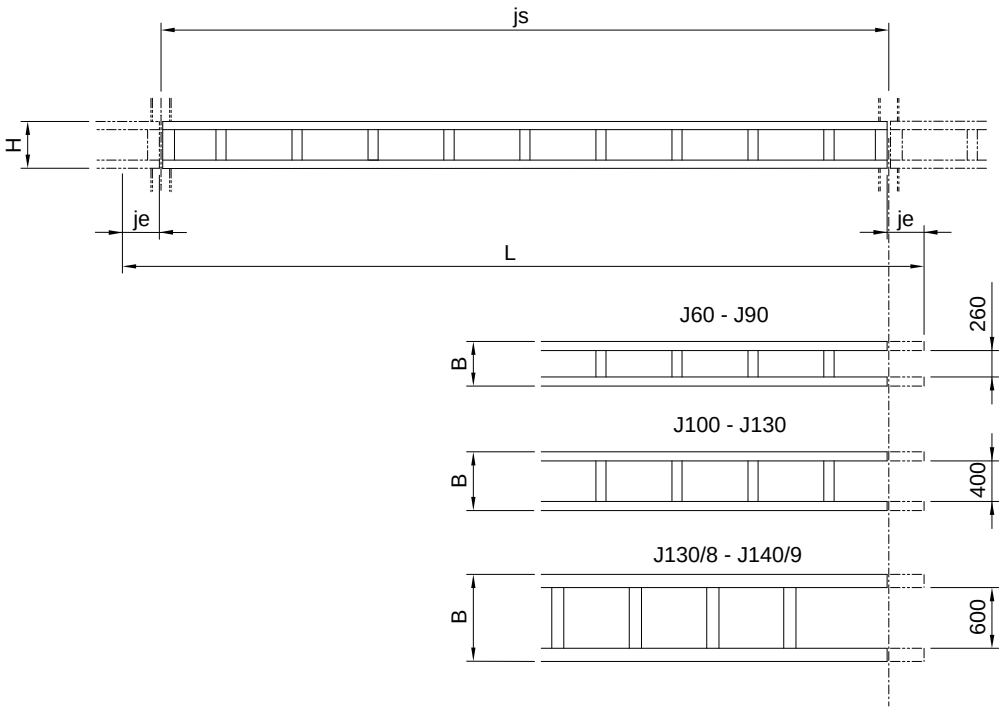
Joint type
J 80 - J 130 one spliced joints
J 130/8 - J 140/9 two HV joints

Length grading
Available in steps of 0,50 m.

Support
J 60
Upper and lower boom 2244
J 70 - J 90
Upper boom / Lower boom 2244 / 2245
J 100 - J 130
Upper and lower boom 2246
J 130/8 - J 140/9
according to local conditions

Drawing number
342.00093 - .00099, .00141 - .00143

Ordering information
J 120 / Length 32,0 m
2222.120.320 Gantry beam with parallel ends, outside beam



Type	Gantry	L (m)	B (mm)	H (mm)	Upper boom angle (mm)	Lower boom angle (mm)	Greatest part length (m)	Wt (kg/m)
60	J 60	8.0 - 16.0	380	400	60 / 6	60 / 6	-	29
70	J 70	12.5 - 20.0	400	400	70 / 7	70 / 7	-	38
80	J 80	16.0 - 23.5	420	400	80 / 8	80 / 8	14.3	49
90	J 90	20.0 - 26.5	440	500	90 / 9	90 / 9	18.8	62
100	J 100	20.0 - 29.5	600	600	100 / 10	80 / 8	19.5	73
120	J 120	23.0 - 32.0	640	600	120 / 12	100 / 10	20.2	97
130	J 130	27.0 - 34.5	660	700	130 / 12	120 / 80 / 10	19.9	114
130 / 8	J 130 / 8	32.0 - 37.0	860	800	130 / 12	120 / 80 / 12	14.2	128
140 / 9	J 140 / 9	36.0 - 40.0	880	900	140 / 13	120 / 12	17.2	152

Note
Dimensioning by F+F.
Beams are supplied ready assembled.

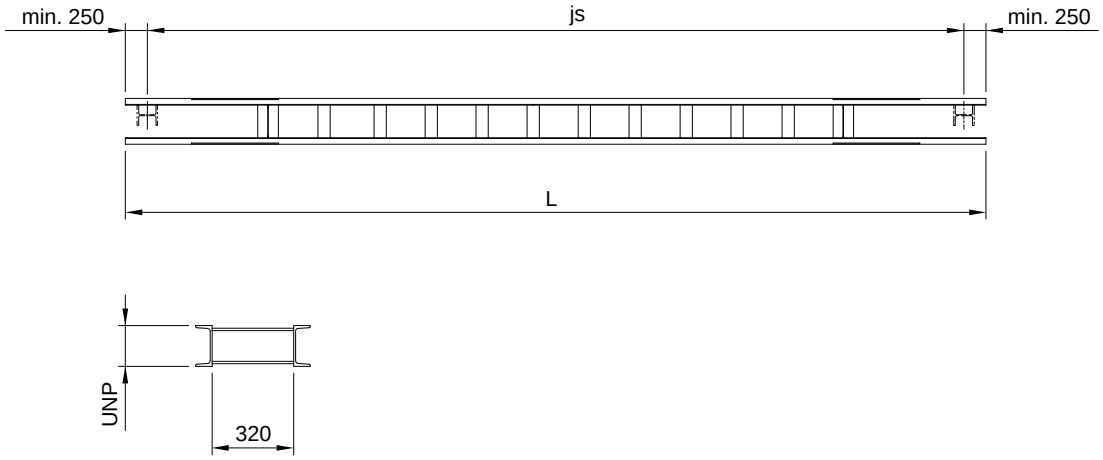
Joint type
J 80 - J 130 one spliced jointss
J 130/8 - J 140/9 two HV joints

Length grading
Available in steps of 0,50 m.

Support
J 60
Upper and lower boom 2244
J 70 - J 90
Upper boom / Lower boom 2244 / 2245
J 100 - J 130
Upper and lower boom 2246
J 130/8 - J 140/9
according to local conditions

Drawing number
342.00093 - .00099, .00141 - .00143

Ordering information
J 130 / Length 28,5 m
2223.130.285 Gantry beam with parallel ends, centre beam



Type	UNP (mm)	L (m)	G (kg/m)
16	160	5.50 - 12.50	52
20	200	6.00 - 17.00	65
24	240	8.00 - 19.50	82

Note
Dimensioning by F+F

Length grading
Available in steps of 0,50 m.
Other lengths available on request.

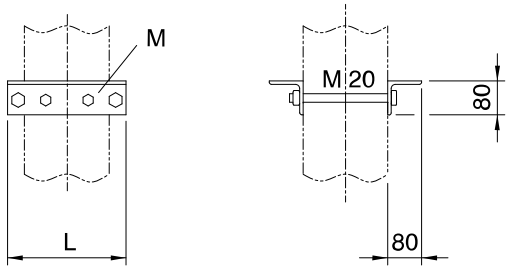
Associated parts
Support 2271 onw
Bracket for termination 3224 onw
Hinged termination bracket 2277
Counterweight wheel 2276

Drawing number
361.00694, .00695, .00696

Ordering information
UNP 160 mm, Length 7,5 m
2231.1.16.075 Termination beam

Double support bracket for gantry beam 2243

Type	HEB (mm)	L (mm)
16	160	240
18	180	260
20	200	280
22	220	300
24	240	320
26	260	340



Note
M = M16 crooted

Fasteners
Supplied complete with long shank bolts.

Drawing number
433.00008

Ordering information
on HEB 240
2243.24 Double support bracket for gantry beam

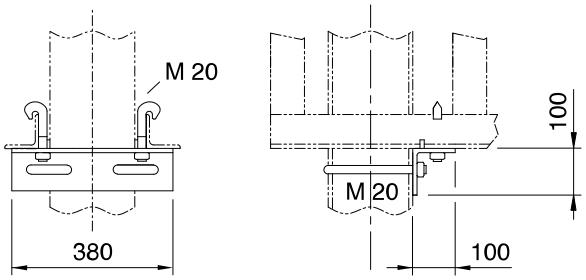
Support bracket for gantry beam J 60 - 90 with parallel ends 2244

Mast range
HEB profiles 160-260

Fasteners
Supplied complete with U-bolts.

Drawing number
433.00074

Ordering information
on HEB 240
2244.24 Support bracket for gantry beam J 60 - 90 parallel ends



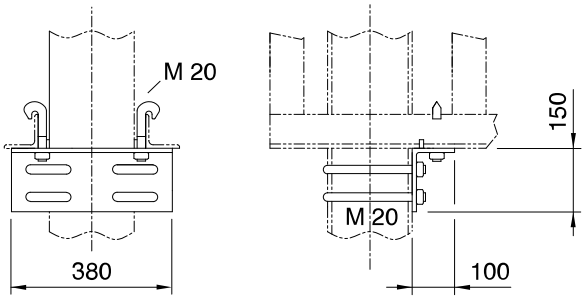
Support bracket for gantry beam J 70 - 90 with parallel ends 2245

Mast range
HEB profiles 160-260

Fasteners
Supplied complete with U-bolts.

Drawing number
433.00074

Ordering information
on HEB 200
2245.20 Support bracket for gantry beam J 70 - 90 with parallel ends



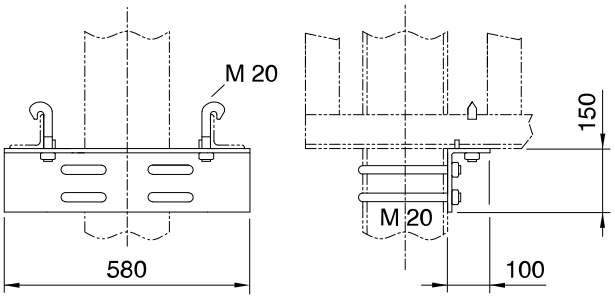
Support bracket for gantry beam J 100 - 130 with parallel ends 2246

Mast range
HEB profiles 160-260

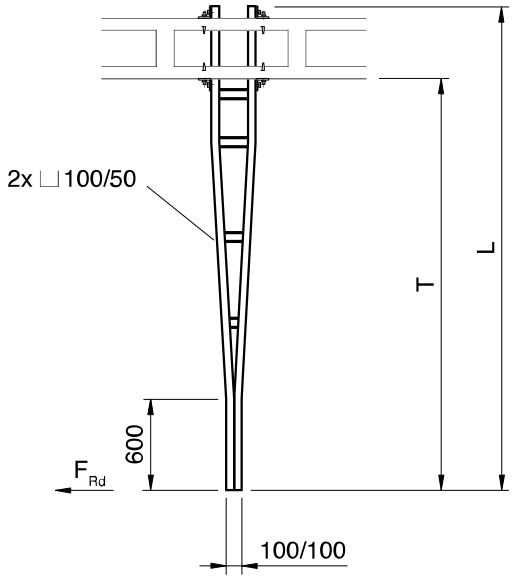
Fasteners
Supplied complete with U-bolts.

Drawing number
433.00075

Ordering information
on HEB 240
2246.24 Support bracket for gantry beam J 100 - 130 with parallel ends



Type	L (mm)	Gantry	T (mm)	Wt (kg)
27.1	2700	60 - 90	2115	56.3
27.2	2700	100 - 130	1915	63.2
29.1	2950	60 - 90	2365	60.1
29.2	2950	100 - 130	2165	67.0
32.1	3200	60 - 90	2615	64.3
32.2	3200	100 - 130	2415	71.3
34.1	3450	60 - 90	2865	68.2
34.2	3450	100 - 130	2665	75.1



Note
Gantry beam 2221 onw

Associated parts
Mast bracket
for steady arm 5411 onw
Earth rope clamp 6219

Fasteners
Supplied complete with carrying angles and hook bolts.

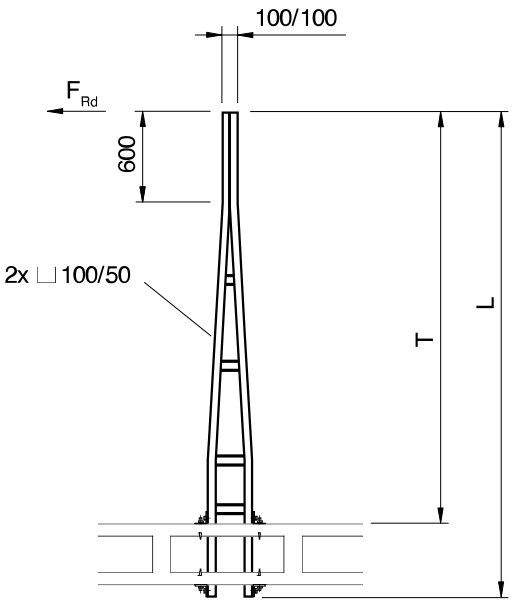
Resistance
F_{Rd} (kN) = 7,5

Drawing number
348.00122 - .00125

Ordering information
Length 3,45 m, on J 120
2251.34.2 Drop bracket for gantry beam

Upright on gantry beam 2252

Type	L (mm)	Gantry	T (mm)	Wt (kg)
27.1	2700	60 - 90	2115	56.3
27.2	2700	100 - 130	1915	63.2
29.1	2950	60 - 90	2365	60.1
29.2	2950	100 - 130	2165	67.0
32.1	3200	60 - 90	2615	64.3
32.2	3200	100 - 130	2415	71.3
34.1	3450	60 - 90	2865	68.2
34.2	3450	100 - 130	2665	75.1
37.1	3700	60 - 90	3115	72.1
37.2	3700	100 - 130	2915	79.0
39.1	3950	60 - 90	3365	76.6
39.2	3950	100 - 130	3165	83.5
42.1	4200	60 - 90	3615	80.6
42.2	4200	100 - 130	3415	87.5
46.1	4600	60 - 90	4015	86.8
46.2	4600	100 - 130	3815	93.7
52.1	5200	60 - 90	4615	97.2
52.2	5200	100 - 130	4415	104.2



Note
Gantry beam 2221 onw

Associated parts
Cross arm for upright 2253
Cross arm for suspension 2311 onw
Earth rope clamp 6211
Earth rope clamp 6219

Fasteners
Supplied complete with carrying angles and hook bolts.

Resistance
F_{Rd} (kN) = 7,5

Drawing number
348.00116 -.00120, 348.00122 -.00125

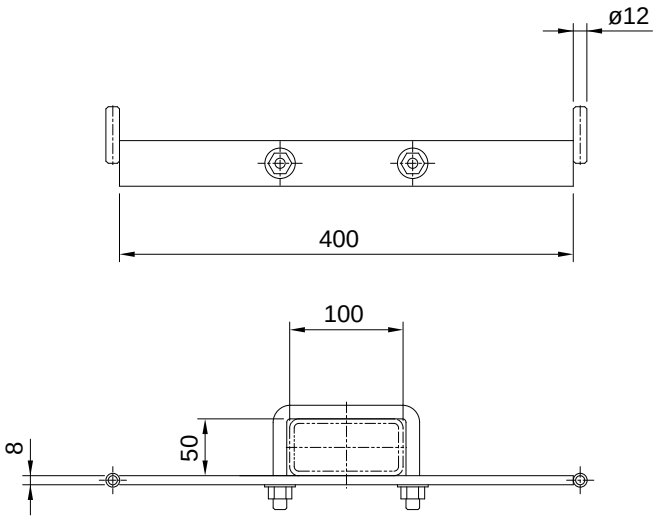
Ordering information
Length 3,20 m, on J 60
2252.32.1 Upright on gantry beam

Rung for upright on gantry 2253

Fasteners
Supplied complete with square U-bolts.

Drawing number
348.00012

Ordering information
2253 Rung for upright on gantry



Upright, strong, on gantry 2254

Note
Gantry beam 2221 onw

Weight:
272 kg

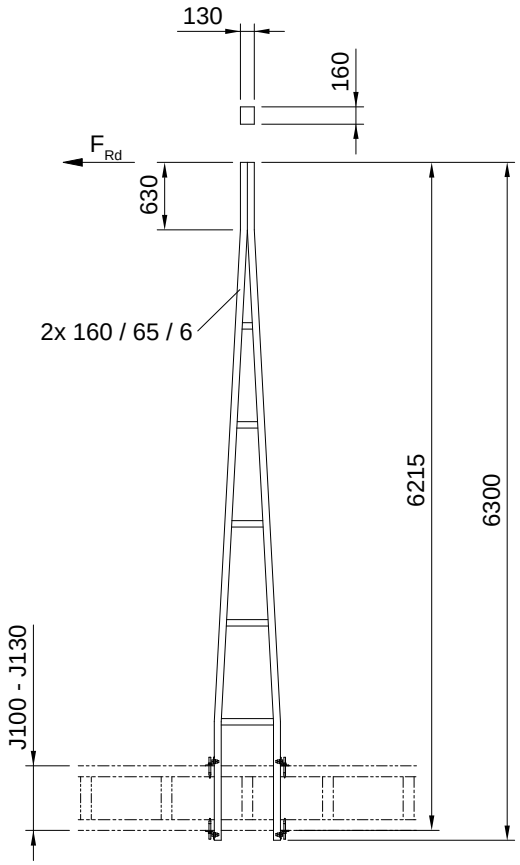
Associated parts
Cross arm for suspension on request

Fasteners
Supplied complete with carrying angles and hook bolts.

Resistance
F_{Rd} (kN) = 7,5

Drawing number
348.00055

Ordering information
L = 6300 mm, on gantry 100 - 130
2254.63.2 Upright, strong, on gantry



Upright on gantry beam 2255

Type	L (mm)	Gantry	Wt (kg)	T1 (mm)	T2 (mm)
37	3700	130/8, 140/9	90.5	2715	2815
46	4600	130/8, 140/9	104.5	3700	3800

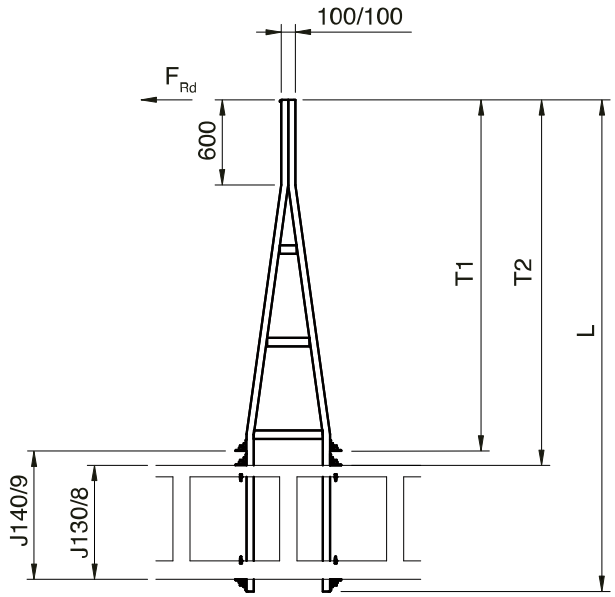
Note
Gantry beam 2221 onw

Fasteners
Supplied complete with carrying angles and hook bolts.

Resistance
F_{Rd} (kN) = 7,5

Drawing number
348.00121, .00126 - .00129

Ordering information
Length 5200 mm
2255.52 Upright on gantry beam



Note
Gantry beam 2221 onw

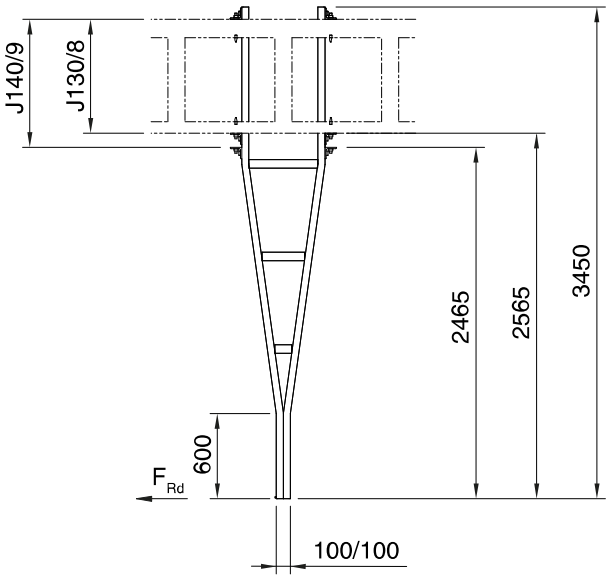
Weight
86.9 kg

Fasteners
Supplied complete with carrying angles and hook bolts.

Resistance
F_{Rd} (kN) = 7,5

Drawing number
348.00121

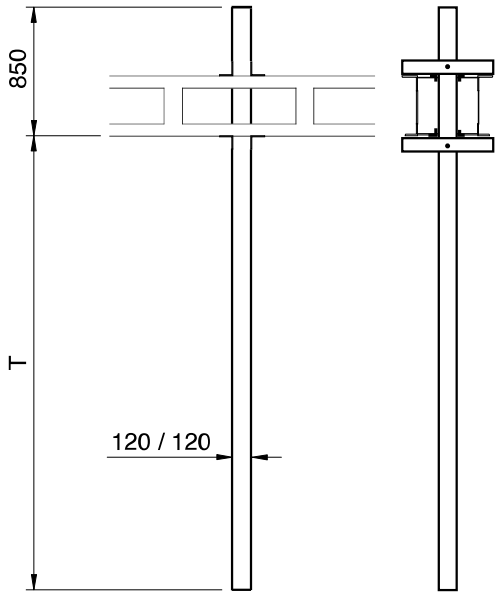
Ordering information
2256 Drop bracket for gantry beam



Drop tube for 1 tubular cantilever on gantry

2261

Type	Gantry
1	60 - 90
2	100 - 130



Note
When ordering state length T.
Lengths 1200 mm - 3800 mm in steps of 100 mm.

For larger loads, long lengths or additional occupancies, the statics must be clarified.

Associated parts
Mast bracket 2152
Hinged bracket 2153

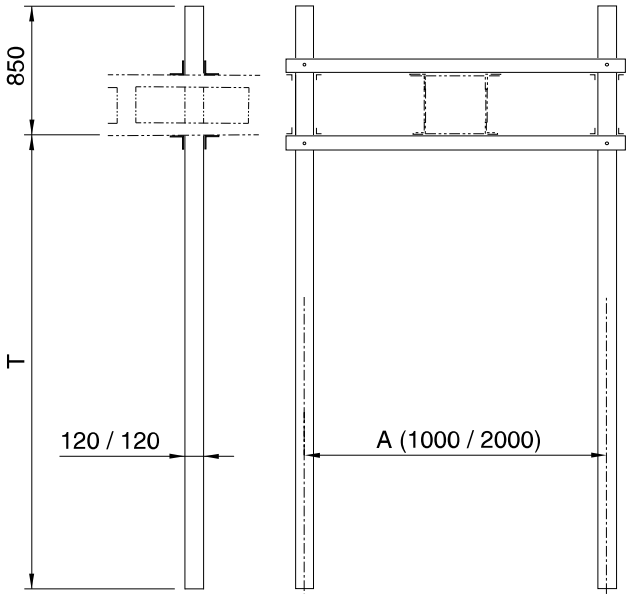
Fasteners
Supplied complete with attachment brackets and hook bolts.

Drawing number
353.00486, .00486-1

Ordering information
on J 80, length T 3,80 m
2261.1.380 Drop tube for 1 tubular cantilever on gantry

Drop tube for 2 tubular cantilevers on gantry

2262



Note
When ordering distance A
1000 mm or 2000 mm.
Lengths T 1200 mm - 3200 mm in steps of 100 mm.For larger loads or additional occupancies, the statics must be clarified.

Associated parts
Mast bracket 2152
Hinged bracket 2153
Anchor 2264

Fasteners
Supplied complete with attachment brackets and hook bolts.

Drawing number
353.00488, .00488-1

Ordering information
Length T 3,00 m, distance A 1,00 m
2262.300.100 Drop tube for 2 tubular cantilevers on gantry

Drop tube for 1 tubular cantilever on termination beam

2263

Support range
Profil UNP 120-240

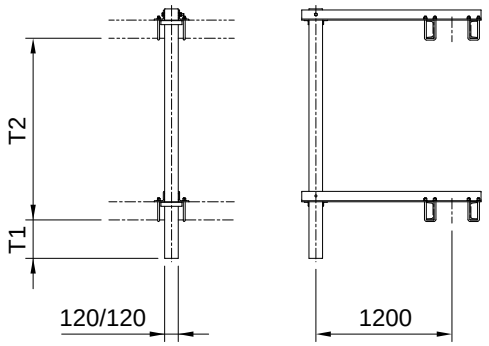
Note
When ordering state length T1 and T2.

Associated parts
Mast bracket 2152
Hinged bracket 2153

Fasteners
Supplied complete with attachment brackets and U-bolts.

Drawing number
353.00346

Ordering information
for UNP 200, T1 0,40m, T2 2,20 m
2263.200.040.220 Drop tuve for 1 tubular cantilever on termination beam



Anchor for 2 drop tubes on gantry

2264

Type	Gantry
1	60 - 90
2	100 - 130

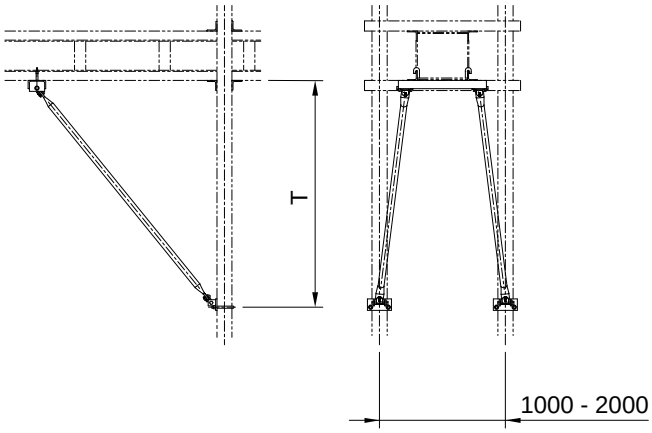
Note
When ordering state length T
Lengths 1300 mm - 2100 mm in steps of 100 mm
The dimension T may slightly change during assembly (due to collision with the tie plate)

The requirement of the bracing is determined by the statics and serves to reduce bending moments and tensions.

Fasteners
Supplied complete with hook bolts and U-bolts.

Drawing number
334.00190, .00190-1

Ordering information
for J 90, T 2,00 m
2264.1.200 Ancor for 2 drop tubes on gantry



Drop tube for 1 tunnel support on termination beam

2265

Support range
Profil UNP 120-240

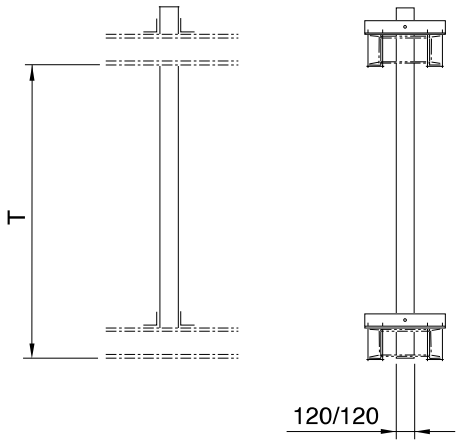
Note
When ordering state length T.

Associated parts
Tunnel support 2422

Fasteners
Supplied complete with attachment brackets and U-bolts.

Drawing number
353.00333

Ordering information
for UNP 200 mm, length T 2,20 m
2265.200.220 Drop tube for 1 tunnel support on termination beam



Support for termination beam 2271

Mast range
HEB profiles 180-260

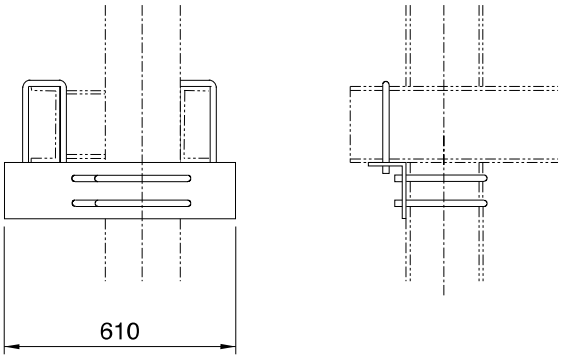
Note
G = Track axis
F = Pulling direction
L = left
R = right

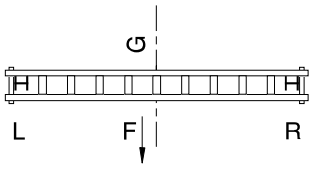
Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Drawing number
523.00099, 523.00616

Ordering information
for UNP 120, on HEB 240, left
2271.12.24.L Support for termination beam





Support for termination beam with one deviation and one weight guide 2272

Mast range
HEB profiles 180-260

Note
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right
Counterweight rod 4322
Counterweight 4323 onw

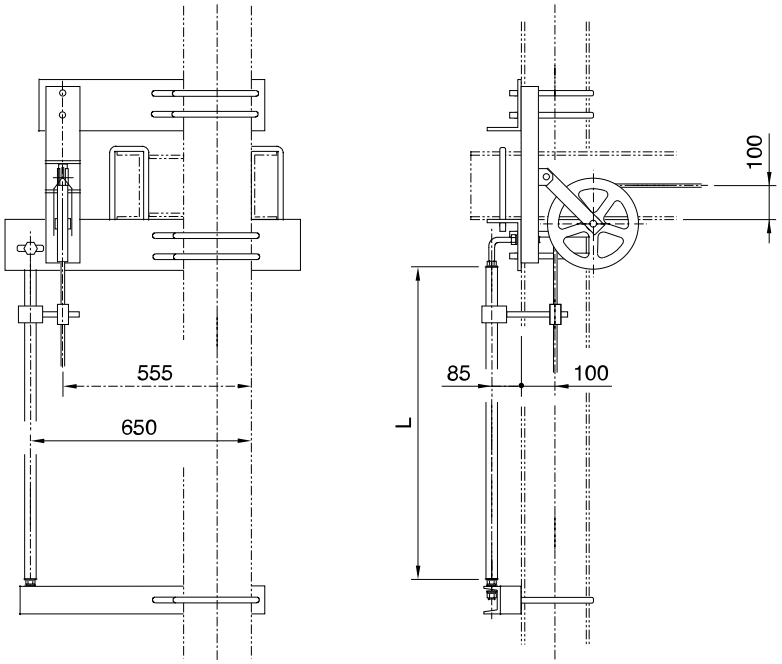
Termination beam
Profil UNP120-240

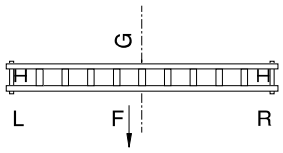
Fasteners
Supplied complete with U-bolts.

Consisting of
Support for termination beam, complete 523.00111
Lower cross arm 523.00193
Tube for weight guide 4374
Spacer 4375

Drawing number
523.00183

Ordering information
for UNP 120, on HEB 240
L = 4,50 m, right
2272.12.24.45.R Support for termination beam with one deviation and one weight guide





Support for termination beam with one deviation and two weight guides

2273

Mast range
HEB profiles 180-260

Note
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right
Counterweight rod 4322
Counterweight 4323 onw

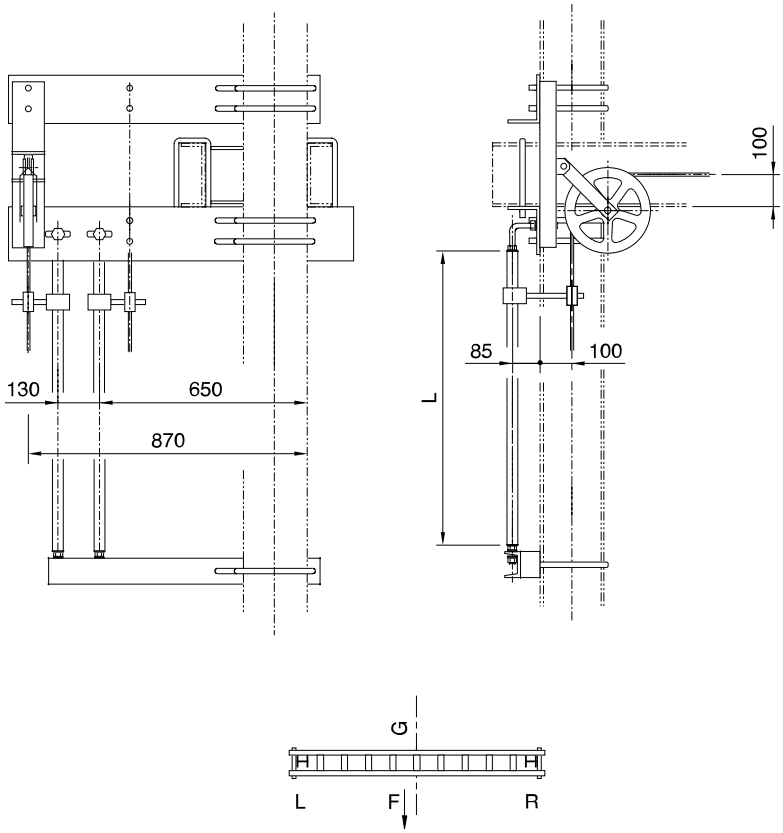
Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Bestehend aus
Support for termination beam, complete 523.00112
Lower cross arm 523.00194
Tube for weight guide 4374
Spacer 4375

Drawing number
523.00184

Ordering information
for UNP 200, on HEB 260
L = 4,50 m, right
2273.20.26.45.R Support for termination beam with one deviation and two weight guides



Support for termination beam with one deviation

2274

Mast range
HEB profiles 180-260

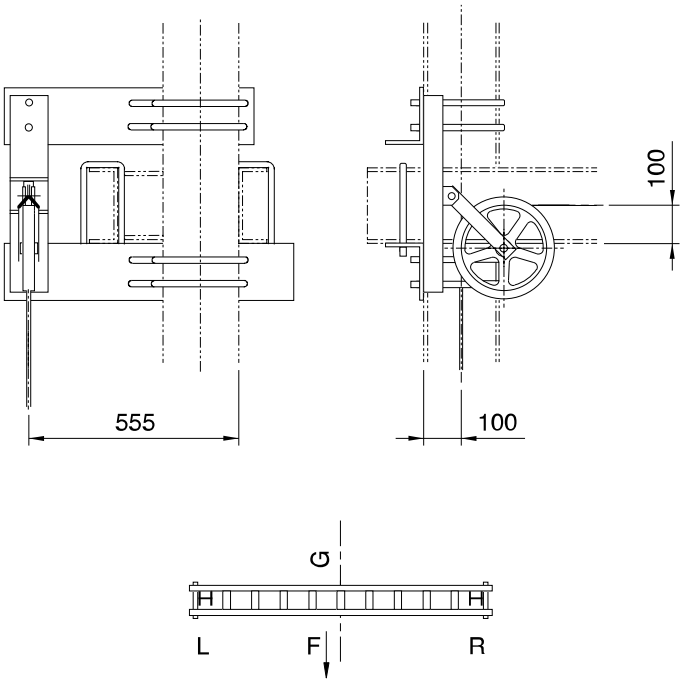
Note
G = Track axis
F = Pulling direction
L = left
R = right

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Drawing number
523.00113

Ordering information
for UNP 220, on HEB 240, left
2274.22.24.L Support for termination beam with one deviation



Support for termination beam for one weight guides

2275

Mast range
HEB profiles 180-260

Note
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of de 0,5 m.
G = Track axis
F = Pulling direction
L = left
R = right
Counterweight rod 4322
Counterweight 4323 onw

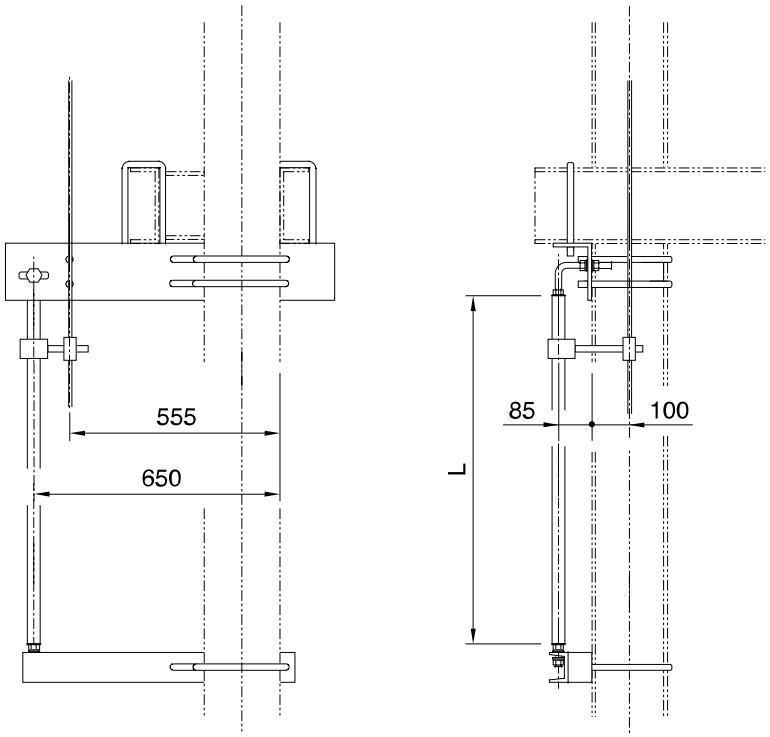
Termination beam
Profil UNP120-240

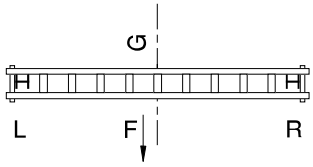
Fasteners
Supplied complete with U-bolts.

Bestehend aus
Support for termination beam, complete 523.00094
Lower cross arm 523.00193
Tube for weight guide 4374
Spacer 4375

Drawing number
523.00185

Ordering information
for UNP 120, on HEB 240
L = 4,50 m, left
2275.12.24.45.L Support for termination beam with one deviation and two weight guides





Conterweight wheel (1:3 ratio) on termination beam

2276

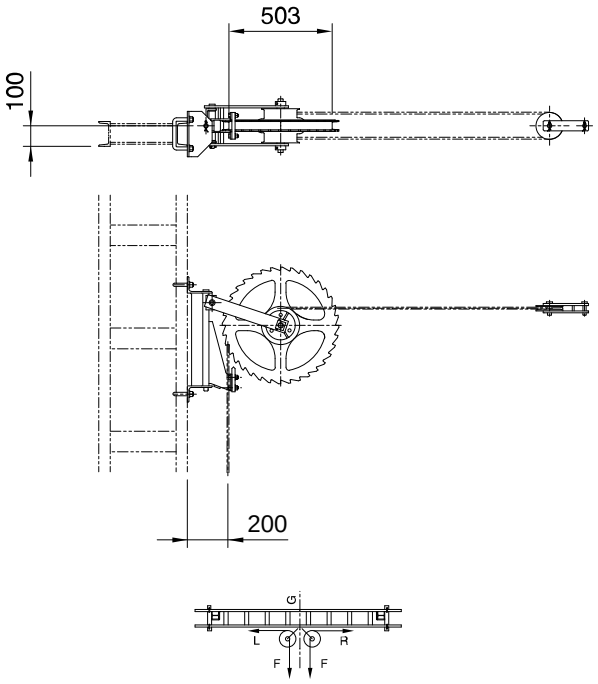
Note
Supplied complete with equalizing pulley and wedges for counterweight wheel.
G = Track axis
F = Pulling direction
L = left
R = right
Order the rope separately
Steel rope flexible, stainless 4441.009

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Drawing number
523.00116

Ordering information
on UNP 140, right
2276.14.R Counterweight wheel (1:3 ratio) on termination beam



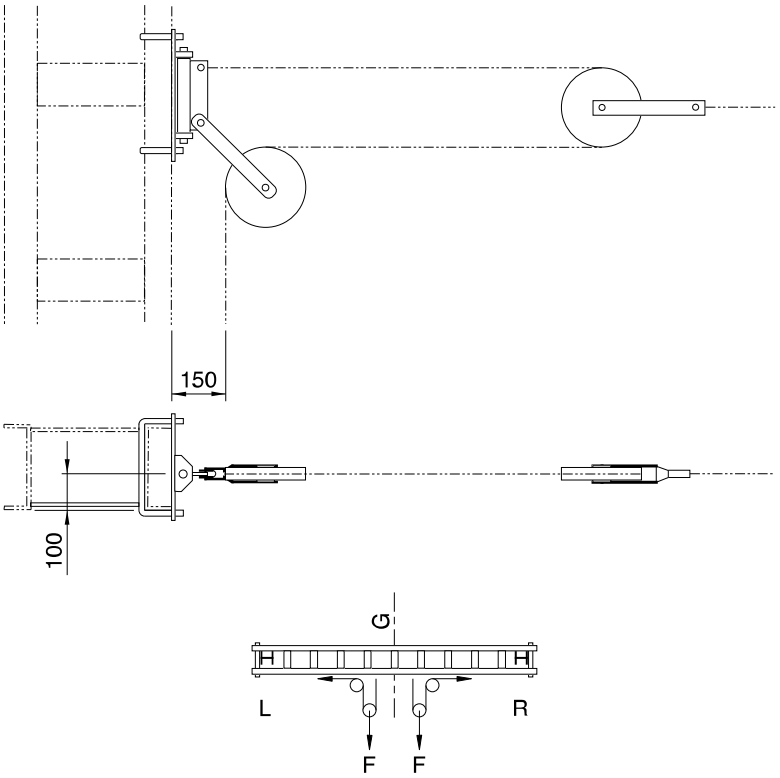
Note
Supplied complete with pulleys
and clevis straps. Order the cable seperately.
G = Track axis
F = Pulling direction
L = left
R = right

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Drawing number
523.00117

Ordering information
for UNP 120, right
2277.12.R Counterweight tensioning device on termination beam

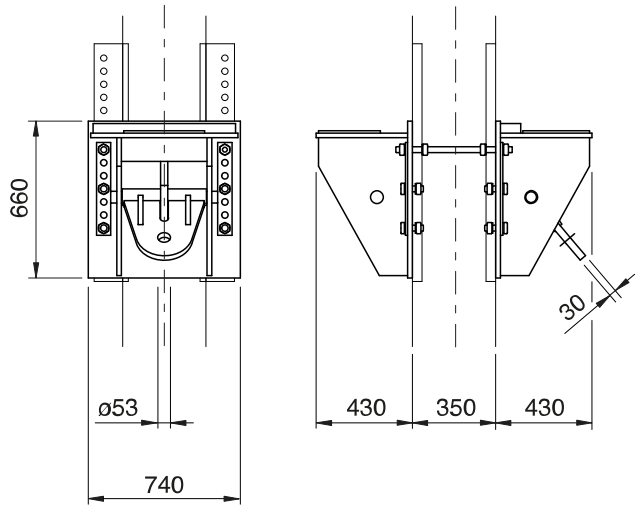


Support Bracket for Mono Anchor Boom WPE 450 — 22701

Note
Order possible on request
With anchor tongue
for Mono Anchor Boom WPE 450 22704
on Tubular mast 300 x 500 RHS 1282

Drawing number
334.00118

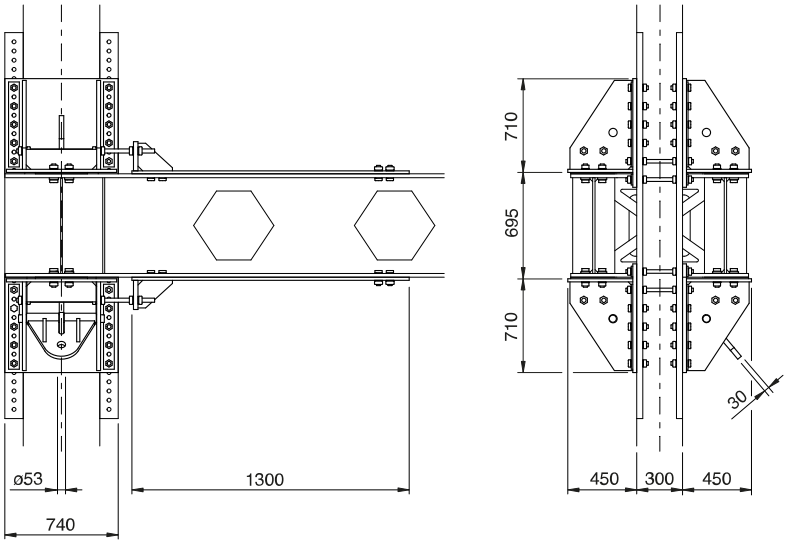
Ordering information
22701 Support Bracket for
Mono Anchor Boom WPE 450



Support Bracket for Mono Anchor Boom WEB 450 — 22702

Note
Order possible on request
with anchor tongue
for Mono Anchor Boom WEB 450 22705
on Tubular mast 300 x 500 WEB 450 1283

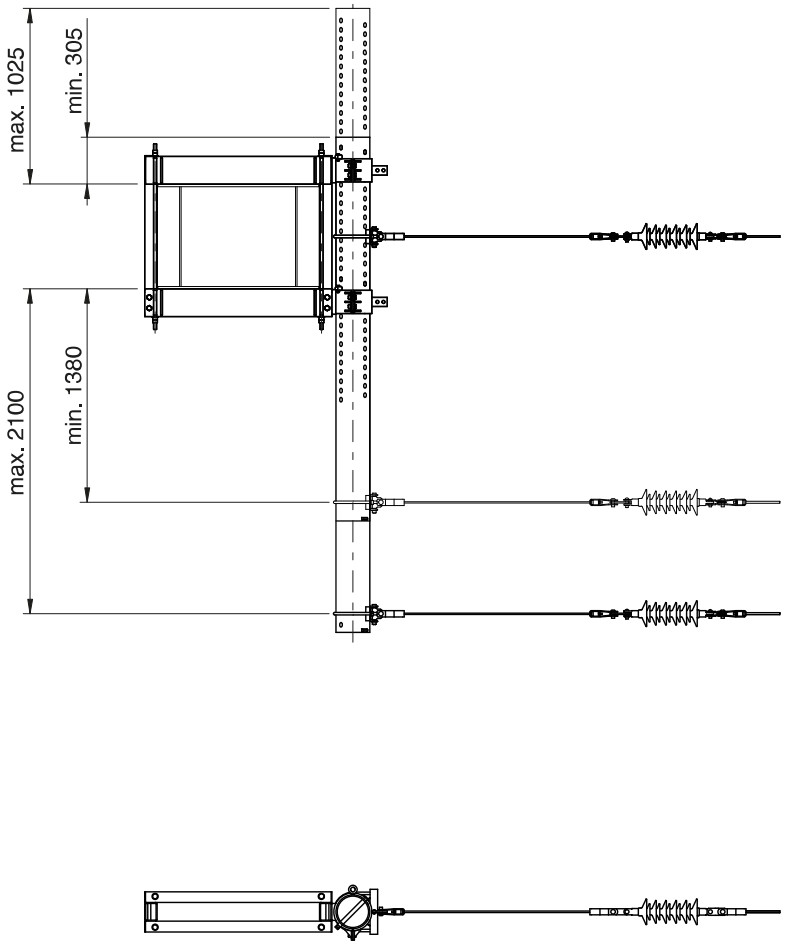
Drawing number
334.00137

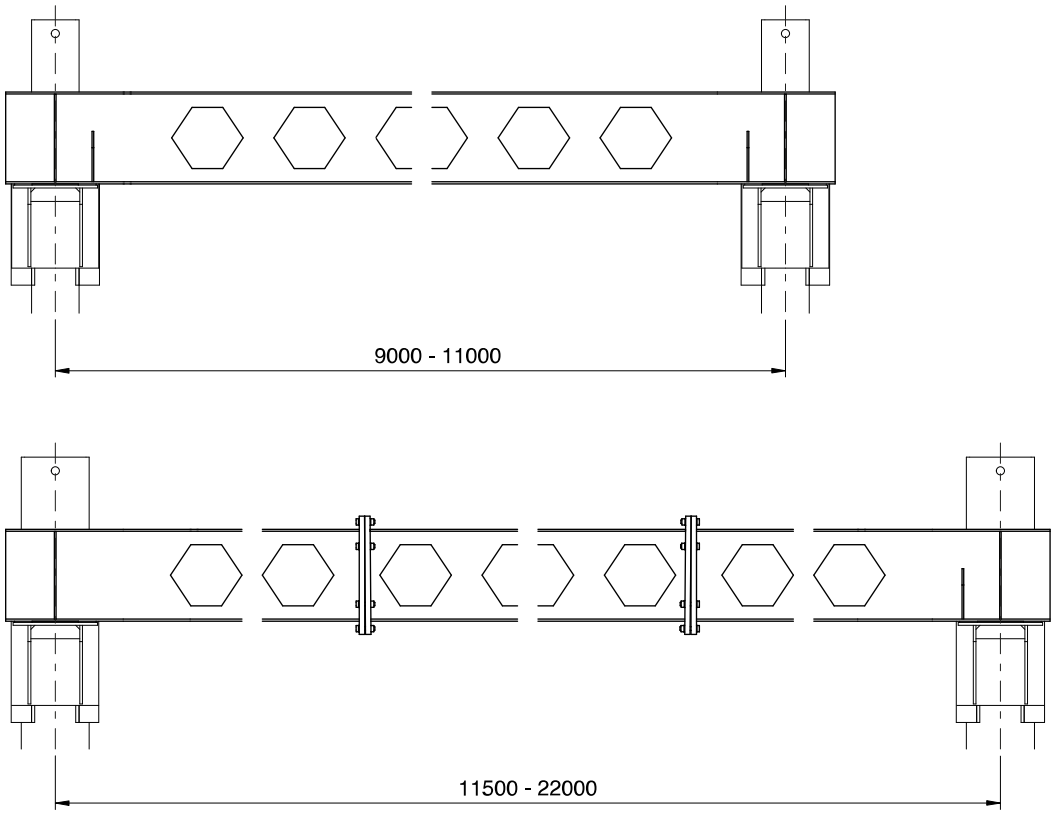


Type	Used for
1	WPE 450
2	WEB 450

Note
Order possible on request

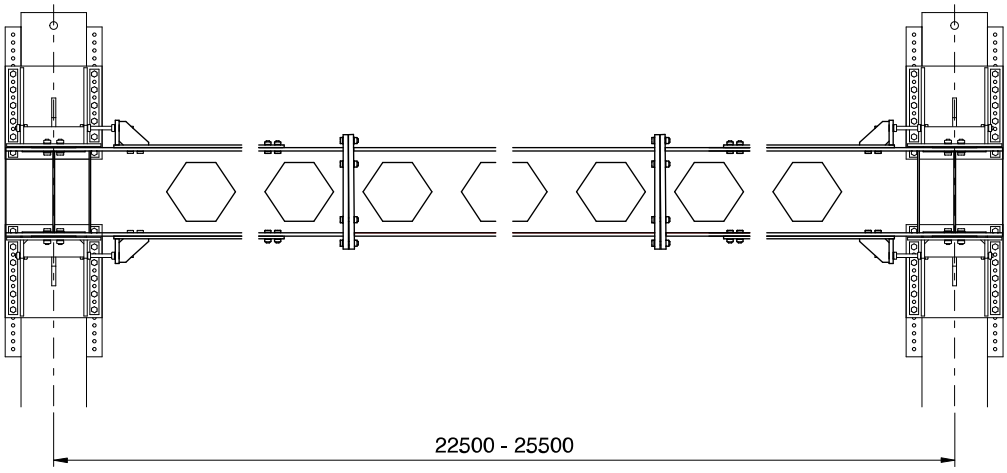
Drawing number
523.00772, .00773





Note
Order possible on request

Drawing number
361.00366 - .00370,
.00397 - .00399, .00451 - .00453



Note
Order possible on request

Drawing number
361.00529 - .00531

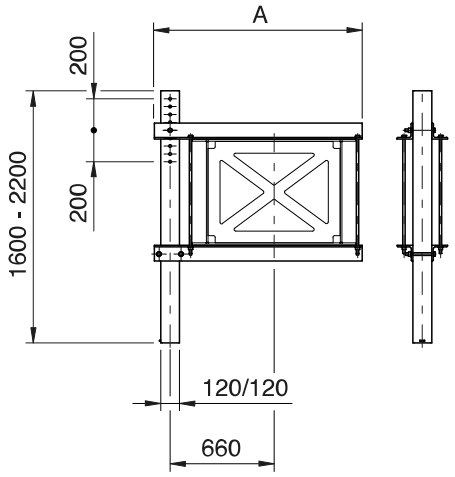
Bracket on Mono Anchor Boom, onesided 22711

Type	Used for	A (mm)
1	WPE 450	1320
2	WEB 450	1450

Note
Order possible on request

Associated parts
Mono Anchor Boom WPE 450 22704
Mono Anchor Boom WEB 450 22705

Drawing number
523.00774, .00778



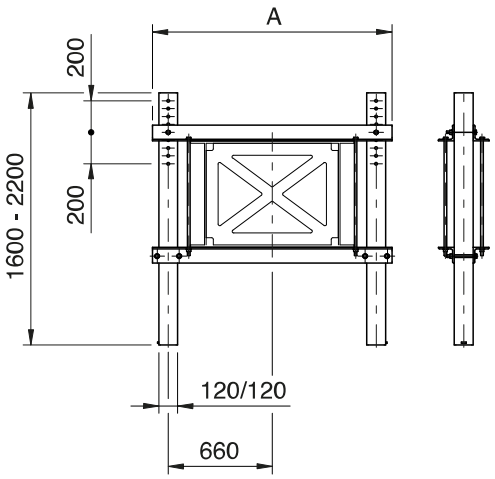
Bracket on Mono Anchor Boom, double sided 22712

Type	Used for	A (mm)
1	WPE 450	1520
2	WEB 450	1650

Note
Order possible on request

Associated parts
Mono Anchor Boom WPE 450 22704
Mono Anchor Boom WPE 450 22705

Drawing number
523.00776, .00780



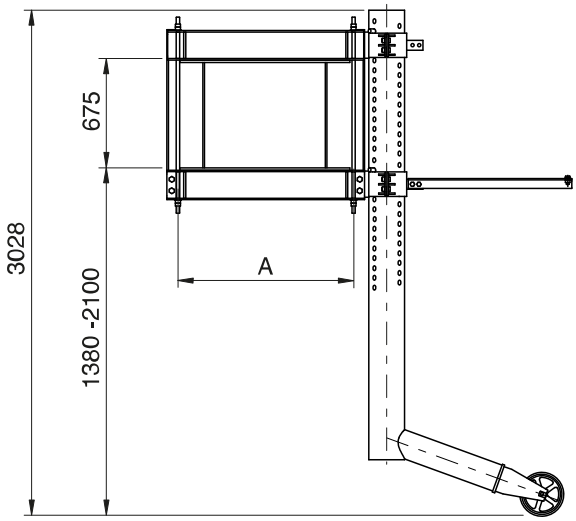
Tensioning Equipment on Mono Anchor Boom

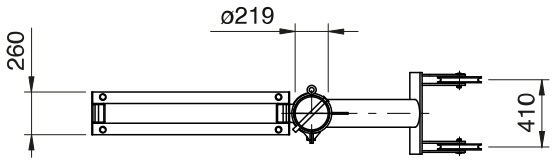
22721

Type	Used for	A (mm)
1	WPE 450	1050
2	WEB 450	1170

Note
Order possible on request

Drawing number
523.00547, .00555, .00558, .00665, .00710, .00713





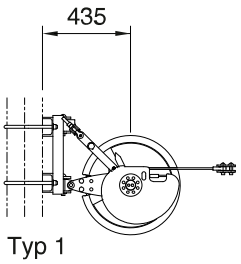
Tensorex C+ on tensioning equipment

22722

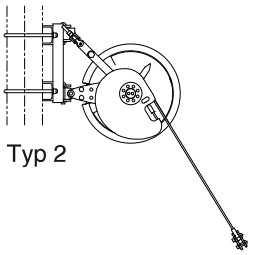
Type	Used for	Wt (kg)	L (m)
1	for carrying cable	120 - 180	2.1 - 2.7
2	for contact wire	165 - 230	3.8 - 3.6

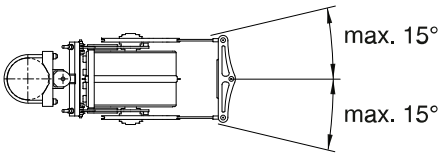
Note
Order possible on request
Post-tensioning length 450, 750, 1000 mm
Connecting parts are supplied

Drawing number
523.00612, 525.00039, .00040



Typ 1


Typ 2



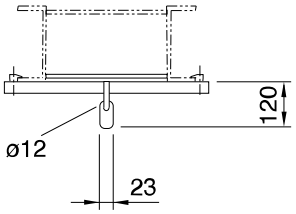
Cross arm for suspension on termination beam 2281

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with Lindapter.

Drawing number
433.00129

Ordering information
on UNP 120
2281.12 Cross arm for suspension on termination beam



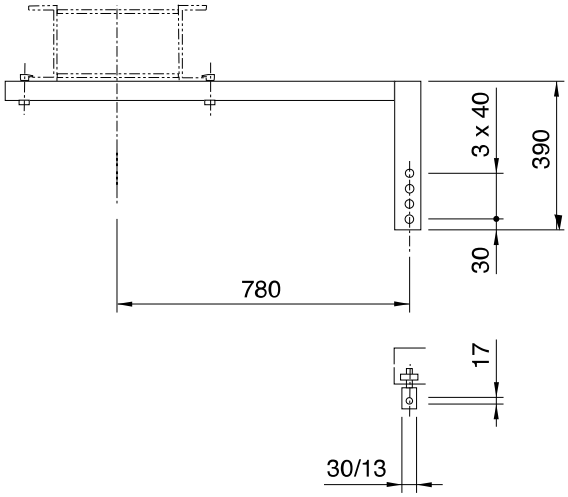
Steady arm bracket on termination beam 2282

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with Lindapter.

Drawing number
442.00065

Ordering information
on UNP 140
2282.14 Steady arm bracket on termination beam



Cross arm for feeder on termination beam 2283

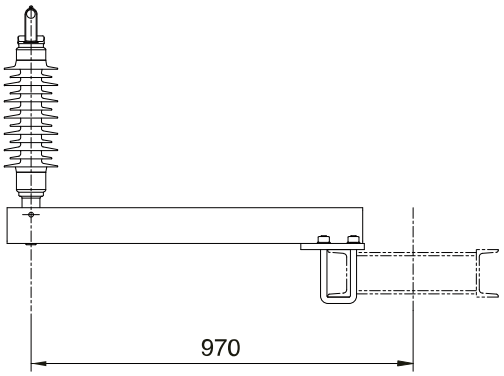
Note
Insulator 5151

Termination beam
Profil UNP 120-240

Fasteners
Supplied complete with U-bolts.

Drawing number
451.00177

Ordering information
on UNP 140
2283.14 Cross arm for feeder on termination beam



Cross arm for suspension one-sided, straight 2311

Mast range
HEB profiles 100-140 / 160 / 180-260

Note
Arm can be moved sidewards on back plate.

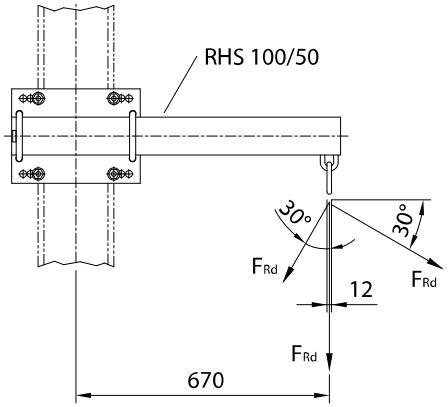
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 3,5

Weight
Wt (kg) = 17

Drawing number
451.00072, .00074, .00264

Ordering information
on HEB 180
2311.18 Cross arm for suspension one-sided, straight



Cross arm for suspension one-sided, angled 2312

Mast range
HEB profiles 100-140 / 160 / 180-260

Note
Arm can be moved sidewards on back plate.

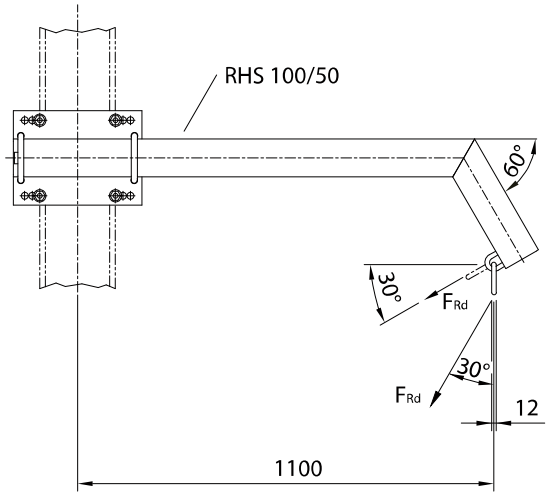
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 2,3

Weight
Wt (kg) = 20

Drawing number
451.00075, .00077, .00162

Ordering information
on HEB 240
2312.24 Cross arm for suspension one-sided, angled



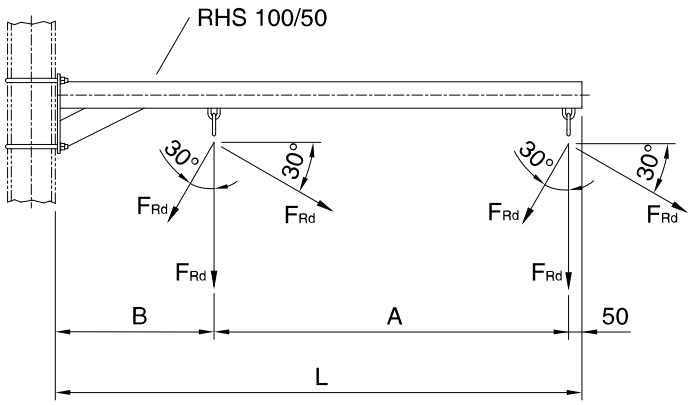
Mast range
HEB profiles 160 / 180-240 / 260

Type	L (mm)	A (mm)	B (mm)	F_{Rd} (kN)	Wt (kg)
18	1810	900	860	2.0	29.5
19	1950	1340	560	2.2	30.7

Fasteners
Supplied complete with U-bolts.

Drawing number
451.00196, .00267

Ordering information
Length 1950 mm, on HEB 240
2313.19.24 Cross arm for suspension one-sided, straight, for two conductors



Cross arm for suspension two-sided, straight

2321

Mast range
HEB profiles 100-140 / 160 / 180-260

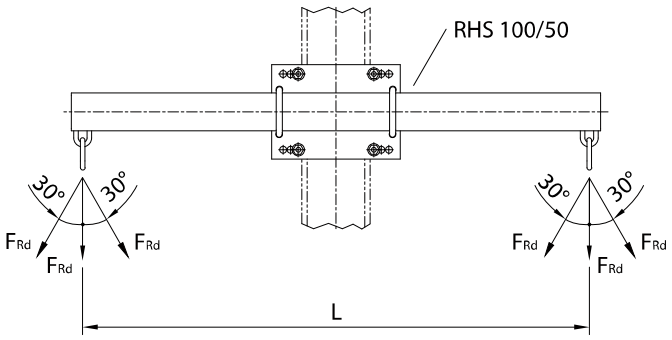
Type	L (mm)	F_{Rd} (kN)	Wt (kg)
13	1340	9.5	18.5
18	1800	8.0	23.0

Note
Arm can be moved sidewards on back plate.

Fasteners
Supplied complete with U-bolts.

Drawing number
451.00066, .00068, .00299

Ordering information
Length 1340 mm, on HEB 240
2321.13.24 Cross arm for suspension two-sided, straight



Cross arm for suspension two-sided, angled

2322

Mast range
HEB profiles 100-140 / 160 / 180-260

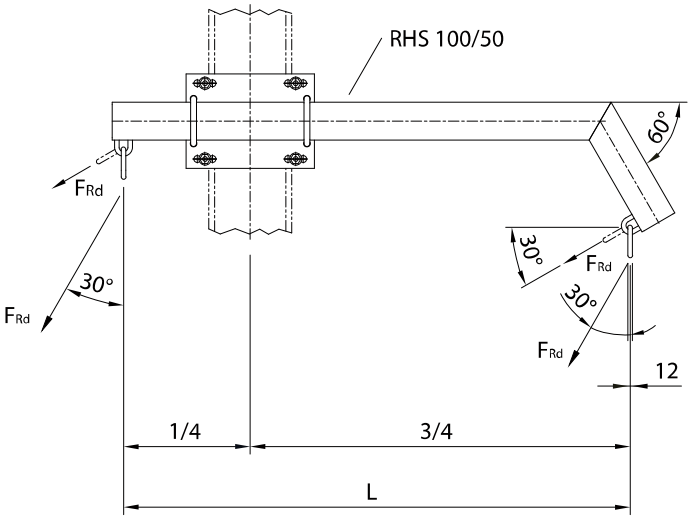
Type	L (mm)	F_{Rd} (kN)	Wt (kg)
13	1340	3.0	21.0
18	1800	2.3	25.5

Note
Arm can be moved sidewards on back plate.

Fasteners
Supplied complete with U-bolts.

Drawing number
451.00070, .00071, .00268

Ordering information
Length 1800 mm, on HEB 220
2322.18.22 Cross arm for suspension two-sided, angled



Cross arm for pin insulator, one-sided 2331

Mast range
HEB profiles 100 / 160 / 180-260

Note
Arm can be moved sidewards
on back plate.
Insulator pins 5213 onw

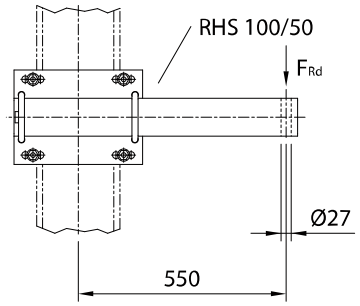
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 3,6

Weight
Wt (kg) = 16

Drawing number
451.00078, .00187, .00329

Ordering information
on HEB 240
2331.24 Cross arm for pin insulator, one-sided



Cross arm for pin insulator, two-sided 2332

Mast range
HEB profiles 100 / 160 / 180-260

Note
Arm can be moved sidewards
on back plate.
Insulator pins 5213

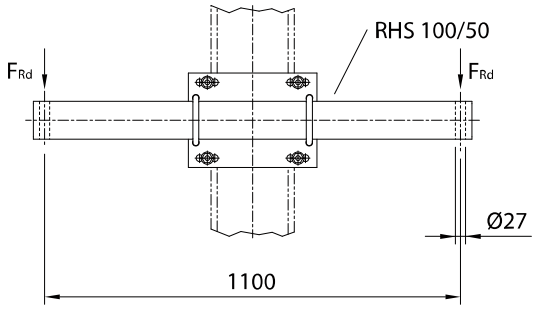
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 12

Weight
Wt (kg) = 19,5

Drawing number
451.00080, .00188, .00330

Ordering information
on HEB 220
2332.22 Cross arm for pin insulator, two-sided



Cross arm for feeder one-sided, on wide-flange mast

2341

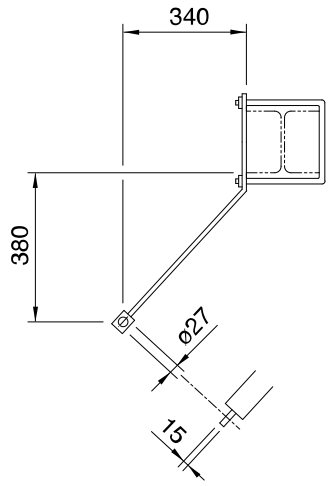
Mast range
HEB profiles 160-200 / 220-260

Note
Insulator pins 5213 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
567.00183

Ordering information
on HEB 220
2341.22 Cross arm for feeder one-sided, on wide-flange mast



Cross arm for feeder two-sided, on wide-flange mast

2342

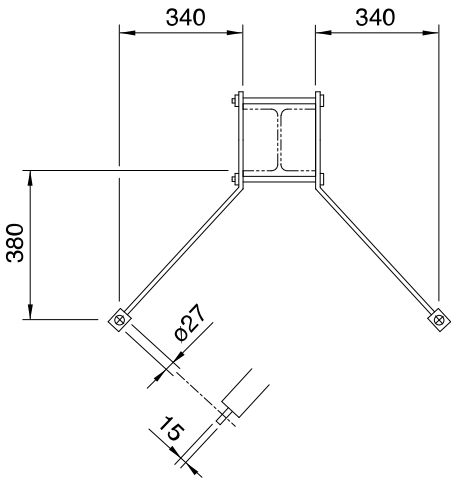
Mast range
HEB profiles 160-200 / 220-260

Note
Insulator pins 5213

Fasteners
Supplied complete with long shank bolts.

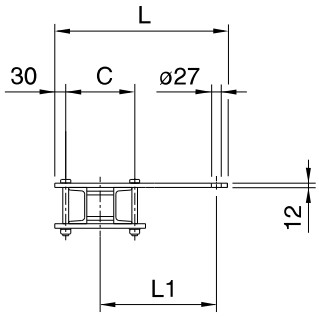
Drawing number
567.00184

Ordering information
on HEB 220
2342.22 Cross arm for feeder two-sided, on wide-flange mast



Cross arm for feeder one-sided, on cantilever 2351

Type	Cantilever	L (mm)	L1 (mm)	C (mm)
1	2111	530	415	110
2	2112	600	408	var
3	2113	530	375	190
4	2113.1	530	375	190
5	2114	530	410	120



Note
Insulator pins 5213 onw

When using insulator 5154,
order washer ø 17 / 50 x 3 A2
additionally.

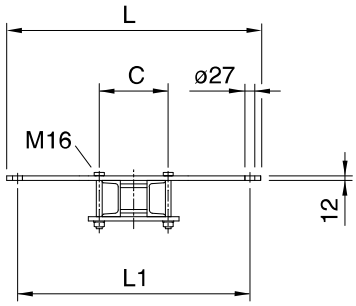
Fasteners
Supplied complete with long shank bolts.

Drawing number
567.00187, .00191

Ordering information
on cantilever 2113.1
2351.4 Cross arm for feeder one-sided, on cantilever

Cross arm for feeder two-sided, on cantilever 2352

Type	Cantilever	L (mm)	L1 (mm)	C (mm)
1	2111	800	740	110
2	2112	875	815	var
3	2113	800	140	190
4	2113.1	800	740	190
5	2114	800	740	120



Note
Insulator pins 5213 onw

When using insulator 5154,
order washer ø 17 / 50 x 3 A2
additionally.

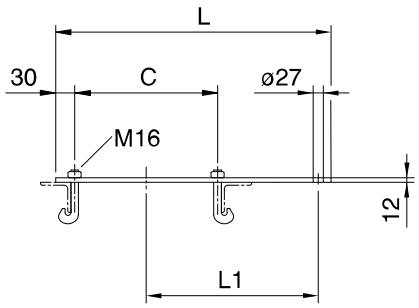
Fasteners
Supplied complete with long shank bolts.

Drawing number
567.00188, .00194

Ordering information
on cantilever 2114
2352.5 Cross arm for feeder two-sided, on cantilever

Cross arm for feeder one-sided, on gantry beam 2353

Type	Gantry	L (mm)	L1 (mm)	C (mm)
1	60 - 90	530	351	238
2	100 - 130	720	471	378



Note
Insulator pins 5213 onw

When using insulator 5154,
order washer ø 17 / 50 x 3 A2
additionally.

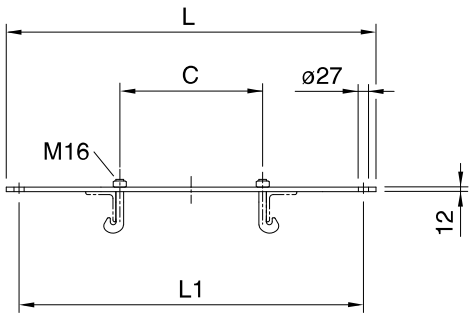
Fasteners
Supplied complete with hook bolts.

Drawing number
567.00189, .00189-1

Ordering information
on gantry J 80
2353.1 Cross arm for feeder one-sided, on gantry beam

Cross arm for feeder two-sided, on gantry beam 2354

Type	Gantry	L (mm)	L1 (mm)	C (mm)
1	60 - 90	800	740	238
2	100 - 130	1000	940	378



Note
Insulator pins 5213 onw

When using insulator 5154,
order washer ø 17 / 50 x 3 A2
additionally.

Fasteners
Supplied complete with hook bolts.

Drawing number
567.00190, .00190-1

Ordering information
on gantry J 120
2354.2 Cross arm for feeder two-sided, on gantry beam

Cross arm for cantilever FL 200/260 2355

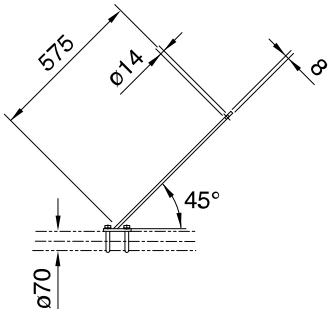
Material
Fe stainless

Note
Retaining clamp 3424

Fasteners
Supplied complete with U-bolts.

Drawing number
567.00154

Ordering information
2355 Cross arm for cantilever FL 200/260



Termination cross arm with 2 fixed termination brackets

2361

Mast range
HEB profiles 200-260

Type	Description	L (mm)
1.13	-	1340
1.18	-	1800
2.13	for post insulator	1340
2.18	for post insulator	1800

Note
Post insulator 5151

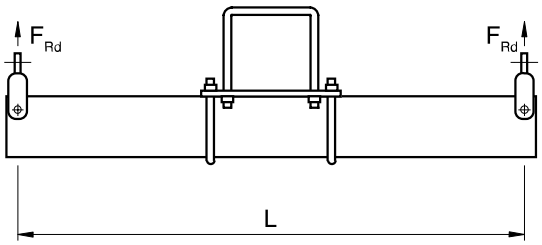
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 20

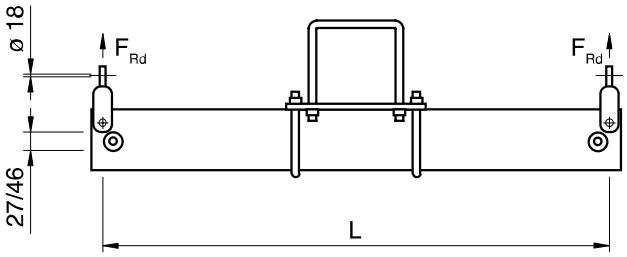
Drawing number
451.00219, .00220

Ordering information
Length 1340 mm, on HEB 220
2361.1.13.22 Termination cross arm with 2 fixed termination brackets

2361.1



2361.2



Termination cross arm with 4 fixed termination brackets

2362

Mast range
HEB profiles 200-260

Type	Description	L (mm)
1.13	-	1340
1.18	-	1800
2.13	for post insulator	1340
2.18	for post insulator	1800

Note
Post insulator 5151

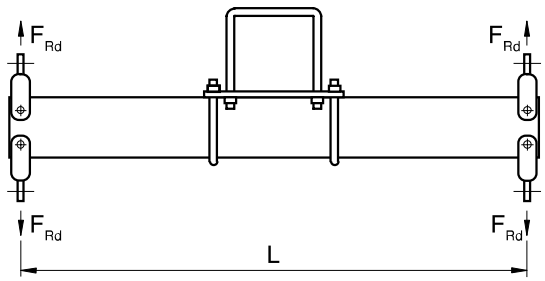
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 20

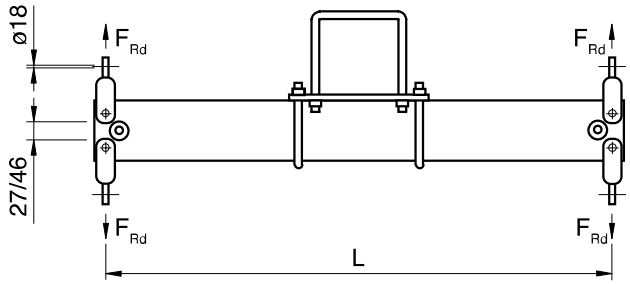
Drawing number
451.00221, .00222

Ordering information
Length 1800 mm, on HEB 240
2362.1.18.24 Termination cross arm with 4 fixed termination brackets

2362.1



2362.2



Termination cross arm with 2 fixed and 2 adjustable termination brackets

2363

Mast range
HEB profiles 200-260

Type	Description	L (mm)
1.13	-	1340
1.18	-	1800
2.13	for post insulator	1340
2.18	for post insulator	1800

Note
Post insulator 5151

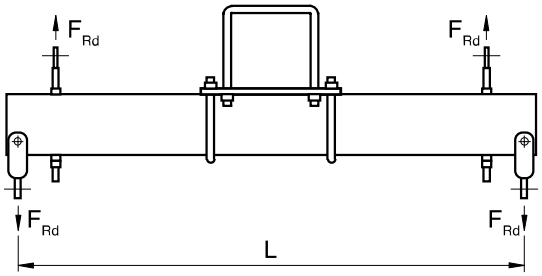
Fasteners
Supplied complete with U-bolts.

Resistance
F_{Rd} (kN) = 20

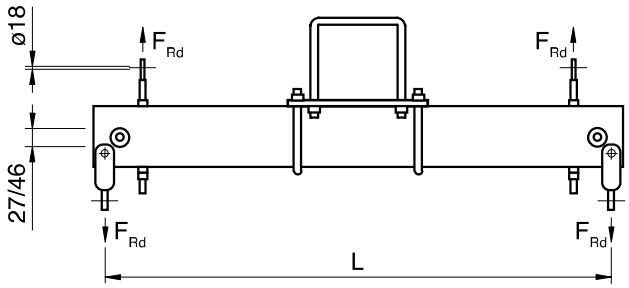
Drawing number
451.00223, .00224

Ordering information
Length 1180 mm, on HEB 260
2363.1.18.26 Termination cross arm with 2 fixed and 2 adjustable termination brackets

2363.1



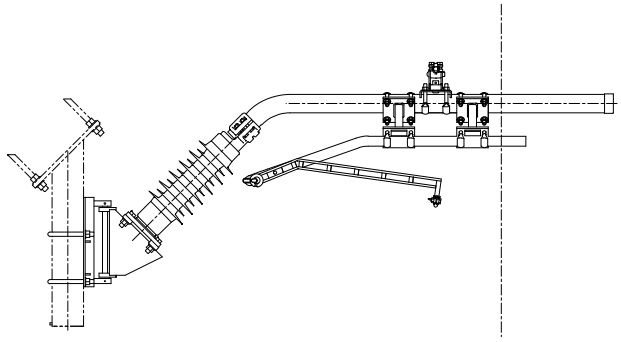
2363.2



Tunnel support, 15-25 kV 2421

Note
Order after consultation with the design department
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.

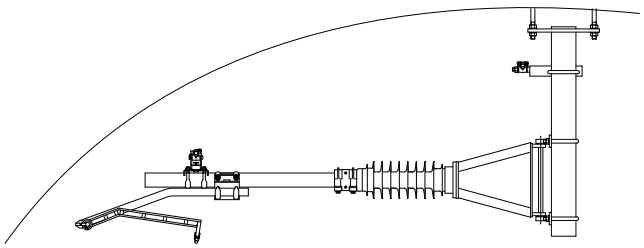
Drawing number
371.00203-2, .00203-3, .00203-4, .00203-5



Tunnel support, 15-25 kV 2422

Note
Order after consultation with the design departmen
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.

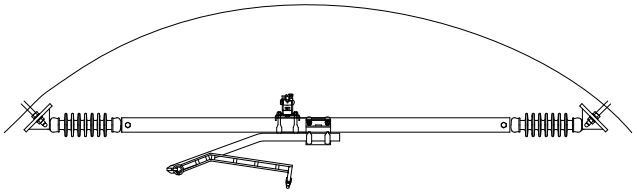
Drawing number
371.00204



Tunnel support, 1,5-15 kV 2423

Note
Order after consultation with the design departmen
Fixed messenger wire
Suspension tube adjustable
System height variable
Use and fastening according to local conditions.

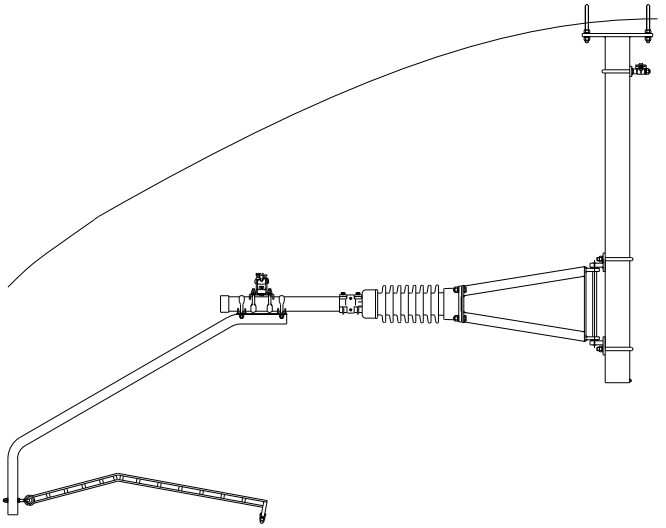
Drawing number
371.00228



Tunnel support FL200T, 15 kV 2424

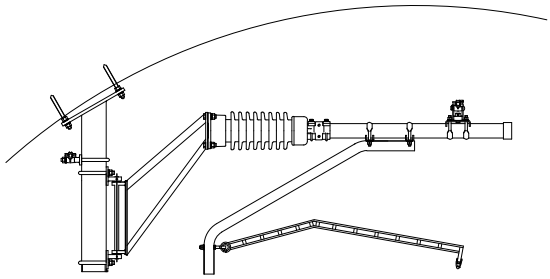
Note
Order after consultation with the design department
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.

Drawing number
371.00205



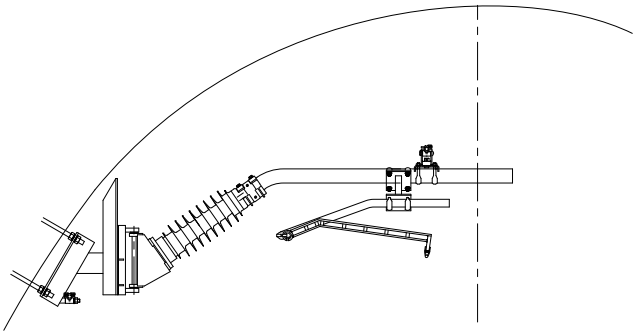
Note
Order after consultation with the design department
Hinged cantilever
Catenary system height variable
Use and fastening according to local conditions.

Drawing number
371.00206



Note
Order after consultation with the design department
Hinged cantilever
System height variable
Use and fastening according to local conditions.

Drawing number
371.00221



Spring support for single contact wire, 15 kV

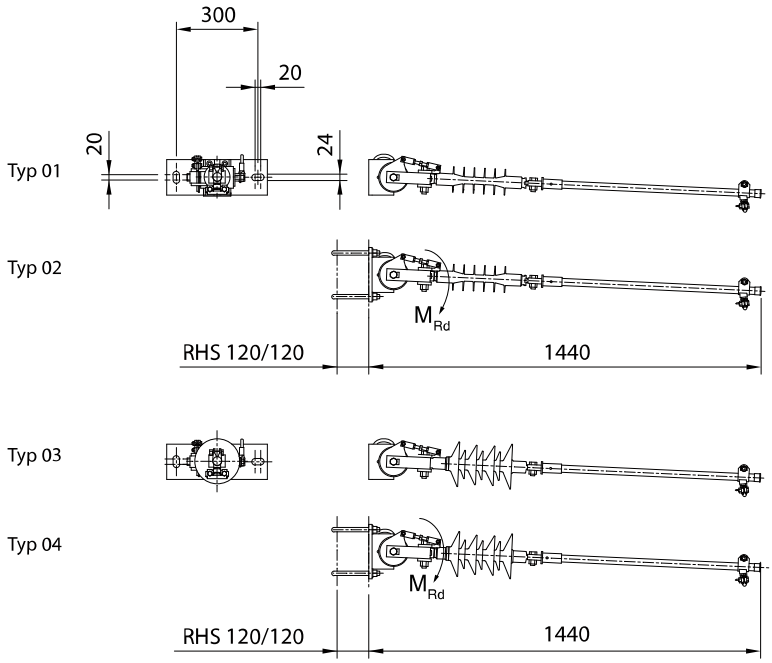
2441

Type	Description	Insulator	M_{Rd} (kNm)
01	Vault	5118	0.10
02	RHS120	5118	0.10
03	Vault	5119	0.40
04	RHS120	5119	0.40

Note
Synthetic insulator spring support
Use and fastening according to local conditions.

Drawing number
372.00793

Ordering information
Use on vault
2441.01 Spring support for single contact wire, 15 kV

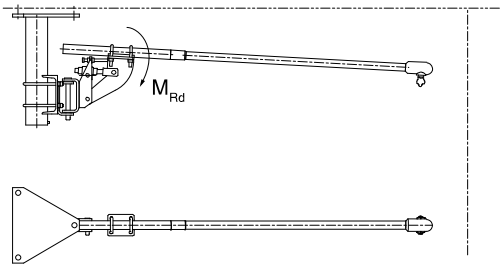


Underbridge Arm for Drop Tube ø 101

2442

Note
Order after consultation with the design department
Use and fastening according to local conditions.
M_{Rd} = 0.54 kNm

Drawing number
372.00149, .00150-3

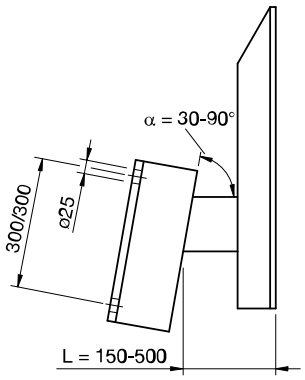


Note
Length Lmin. 150 mm
Length Lmax. 500 mm

Associated parts
Hinged bracket 2523

Drawing number
371.00145

Ordering information
Length 400 mm, angle 35°
2513.400.35 Support bracket on tunnel wall



Type	Model	d (mm)
01	no insulated	20
02	insulated	23

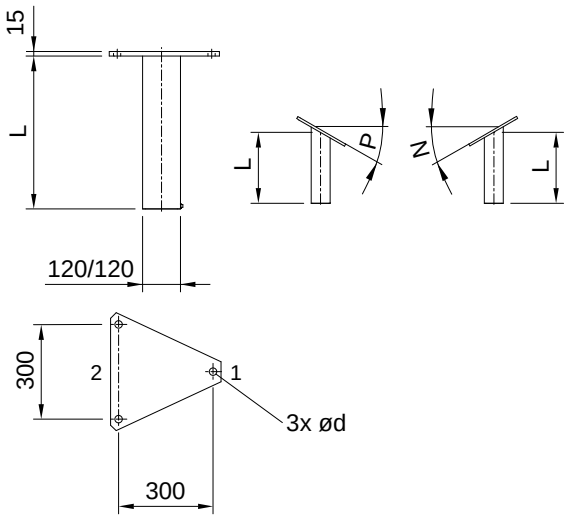
Note
Anchor bolt, adhesive cartridge and insulation set must be ordered separately.
Angle 0°-30° in steps of 5°.
Specify length in steps of 50 mm when ordering.
ATTENTION:
"L" greater than 1.6 m MUST be statically checked.

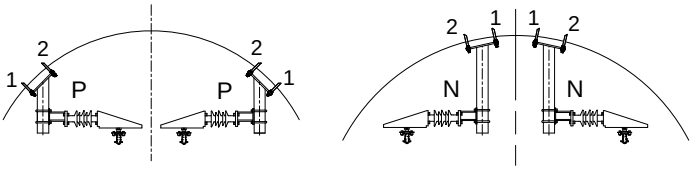
Inclination positive (P) max. 30°
Inclination negative (N) max. 30°

Fastening set
Anchor bolt 1444
Adhesive cartridge 6311
Insulating set 6311

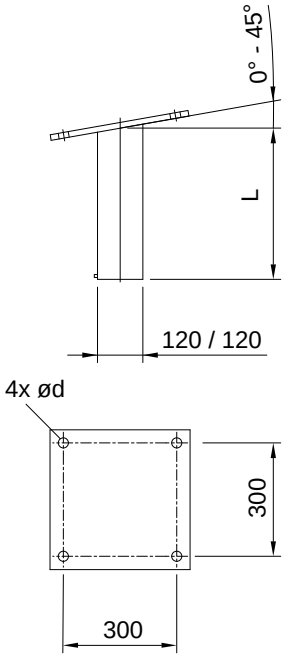
Drawing number
372.00416, .00417-2, .00417-4, .00697

Ordering information
Drop tube with 3 mounting holes, not insulated, inclination positive 20°, length 350 mm
2514.01.035.P20 Drop tube with 3 mounting holes





Furrer+Frey
Overhead contact lines



Type	Model	d (mm)	M (mm)
01	not insulated	20	16
02	insulated	23	16
03	not insulated	24	20
04	insulated	27	20

Note
Anchor bolt, adhesive cartridge and insulation set must be ordered separately.
Angle 0°-45° in 5° increments.
Specify length when ordering in steps of 50 mm.
ATTENTION:
"L" greater than 1.6 m MUST be statically checked!

Fastening set
Anchor bolt 1444
Adhesive cartridge 6311
Insulating set 6311

Drawing number
372.00516, .00653-1, .00655, .00655-1

Ordering information
Drop tube with 4 mounting holes, not insulated, M16, Inclination 20°, Length 350 mm
2515.01.035.20 Drop tube with 4 mounting holes

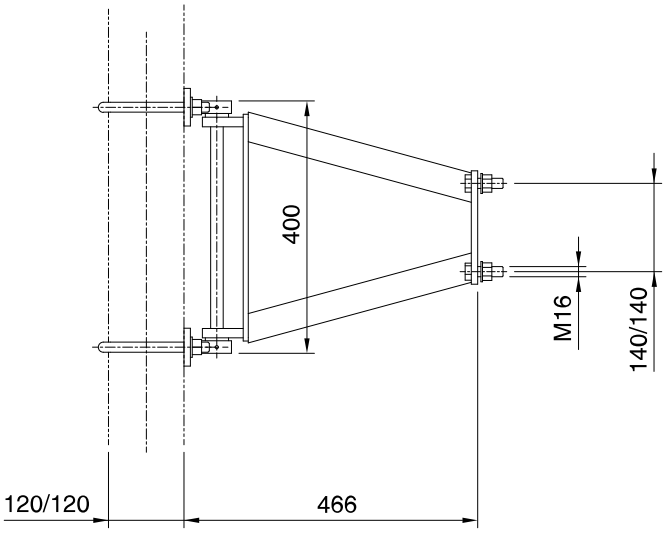
Bracket for hinged tunnel support, straight on dop tube 120/120 — 2521

Associated parts
Insulator 5153 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
371.00147

Ordering information
2521 Bracket for hinged tunnel support, straight on dop tube 120/120



Bracket for hinged tunnel support, inclined on drop tube 120/120 — 2522

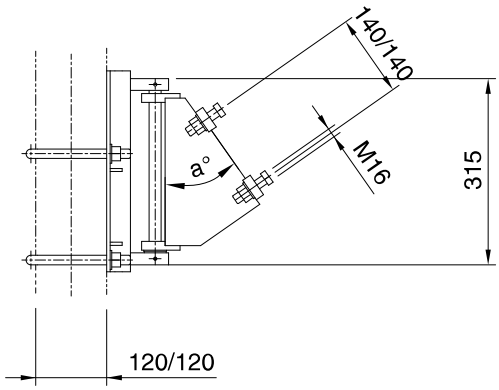
Type	a
35	35°
45	45°

Associated parts
Insulator 5153 onw

Fasteners
Supplied complete with U-bolts.

Drawing number
371.00146, .00294

Ordering information
Angle 35°
2522.35 Bracket for hinged tunnel support, inclined à Armature de suspension 120/120



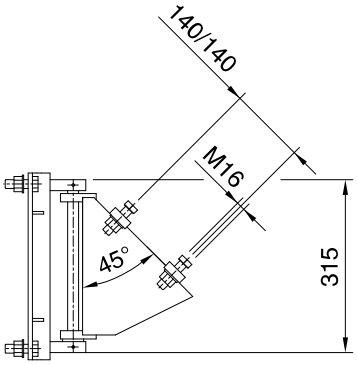
Bracket for hinged tunnel support single track — 2523

Associated parts
Insulator 5153 onw

Fasteners
Supplied complete with bolts

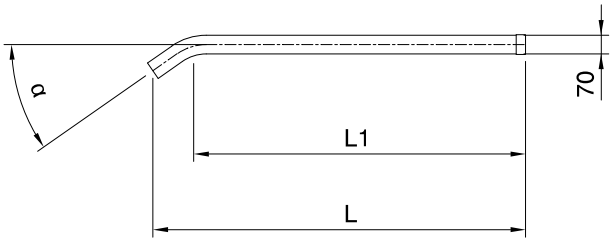
Drawing number
371.00148

Ordering information
2523 Hinged bracket for tunnel support single track



Cantilever tube for tunnel support, angled 2531

Type	L (mm)	L1 (mm)	a (°)
11.35	1390	1190	35°
11.45	1390	1190	45°
16.35	1840	1640	35°
16.45	1840	1640	45°

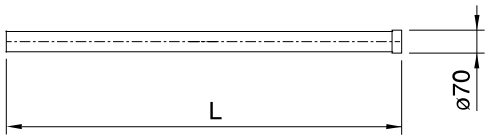


Drawing number
371.00143

Ordering information
Length 1840 mm, angle 35°
2531.16.35 Cantilever tube for tunnel support, angled

Cantilever tube for tunnel support, straight 2532

Type	L (mm)
08	800
10	1000
12	1200
14	1400
16	1600

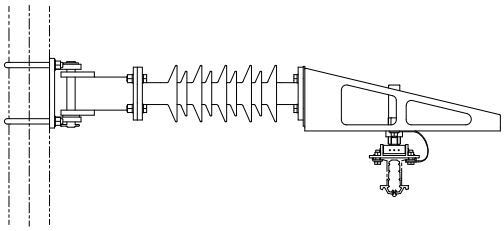


Drawing number
371.00144

Ordering information
Length 1200 mm
2532.12 Cantilever tube for tunnel support, straight

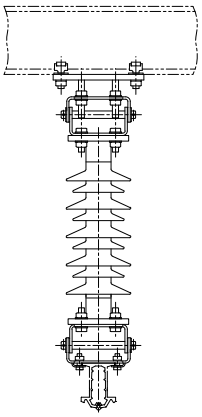
Conductor rail support, lateral 2613

Note
Use and attachment in accordance
with local conditions.
Available for 1,5 kV, 15 kV or 25 kV
Order after consultation with the OCR/ROCS technology



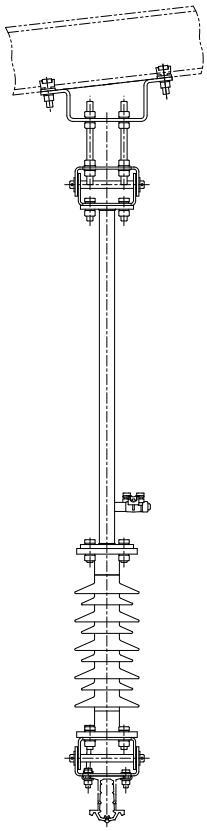
Conductor rail support, hinged 2614

Note
Use and attachment in accordance
with local conditions.
Available for 1,5 kV, 15 kV or 25 kV
Order after consultation with the OCR/ROCS technology

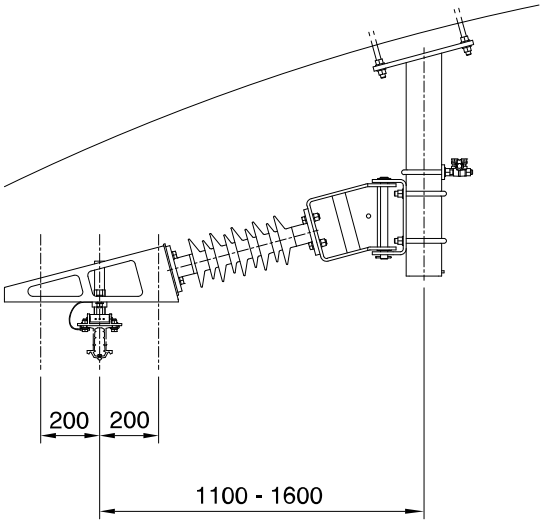


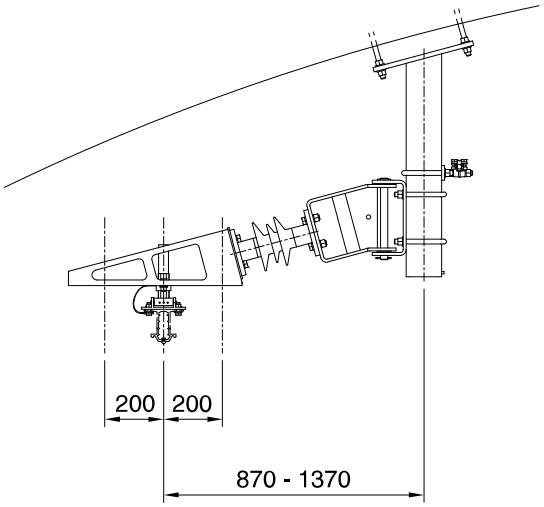
Conductor rail support, hinged, long 2615

Note
Use and fastening according
to local conditions.
Available for 1,5 kV, 15 kV or 25 kV
Order after consultation with the OCR/ROCS technology



Note
Use and attachment in accordance
with local conditions.
Available for 3 kV, 15 kV or 25 kV
Order after consultation with the OCR/ROCS technology

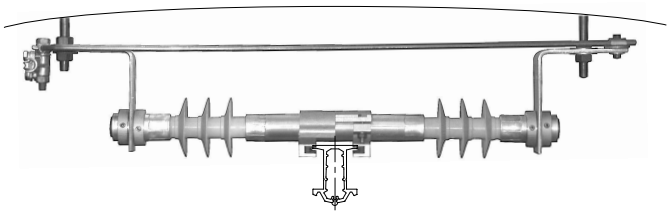




Conductor rail support 3 kV, with sliding element 2626

Note
Use and attachment in accordance
with local conditions.
Order after consultation with the OCR/ROCS technology

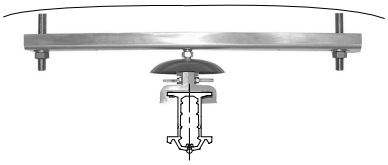
Drawing number
963.00723



Conductor rail support 3 kV, with sliding suspension 2627

Note
Use and attachment in accordance
with local conditions.
Order after consultation with the OCR/ROCS technology

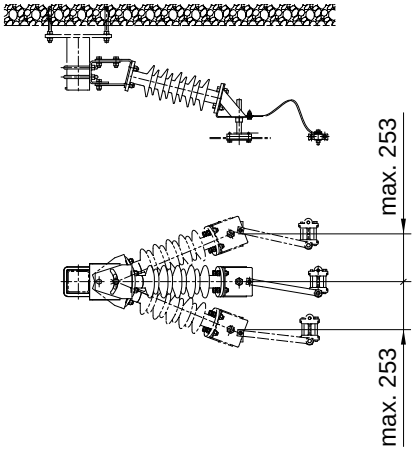
Drawing number
963.00898



Conductor rail support with sliding suspension, mounted in centre of the track 2628

Note
Use and fastening with drop tube according
to local conditions.
Order after consultation with the OCR/ROCS
technology

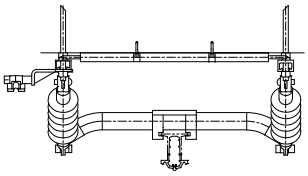
Drawing number
962.01729-4

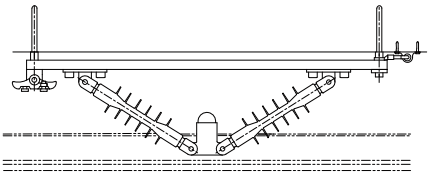


Conductor rail support 15 kV, with sliding element 2629

Note
Use and attachment in accordance
with local conditions.
Order after consultation with the OCR/ROCS technology
Ersatzteile: Plastic insert for Conductor rail support,
with sliding element 4651

Drawing number
962.00920-4

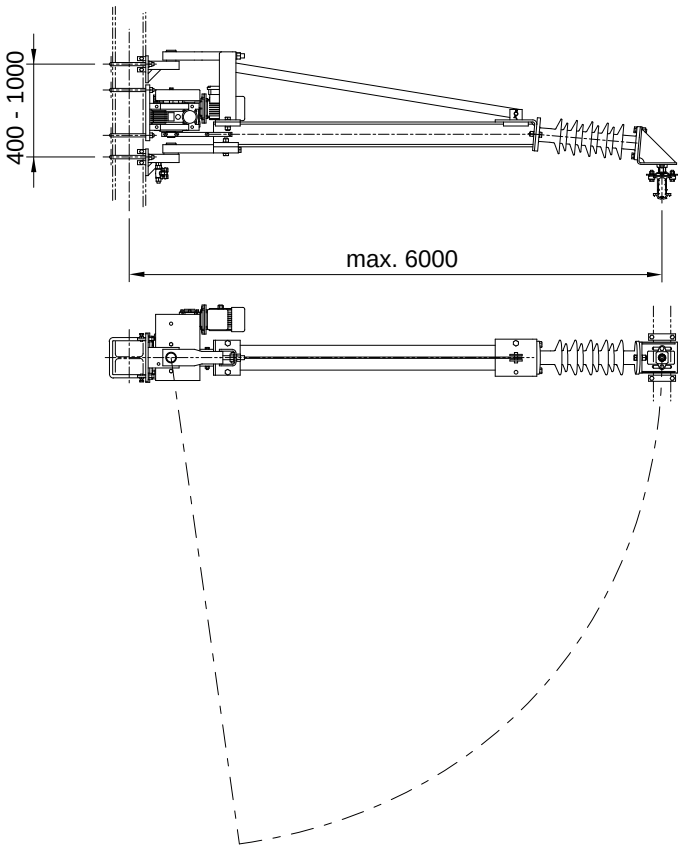




Conductor rail support, retractable, motorized

2713

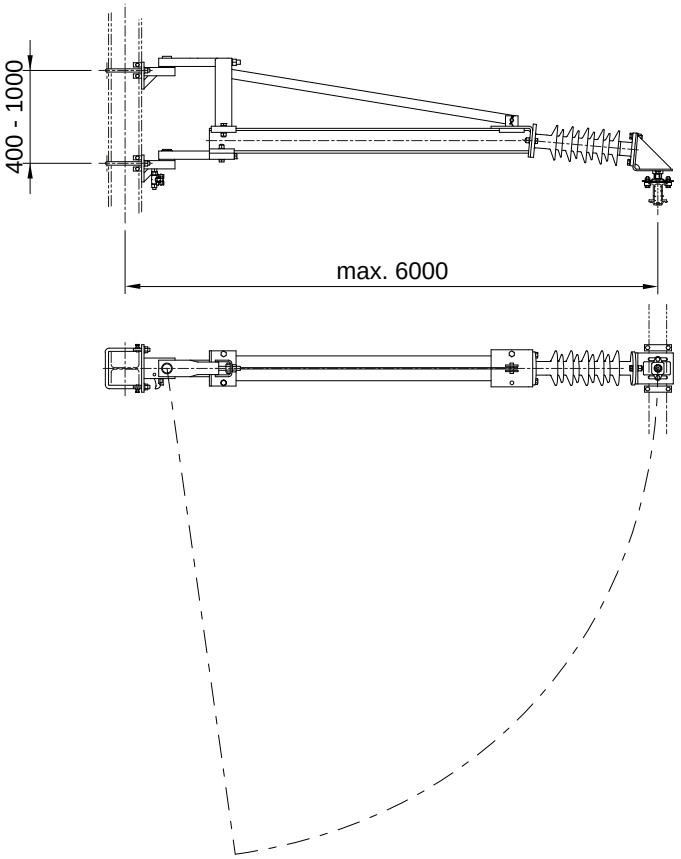
Note
Use and attachment in accordance
with local conditions.
Available for 3 kV, 15 kV or 25 kV.
Order after consultation with the OCR/ROCS technology

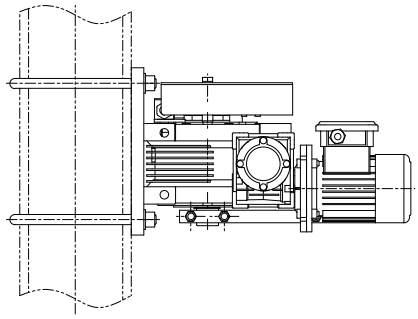
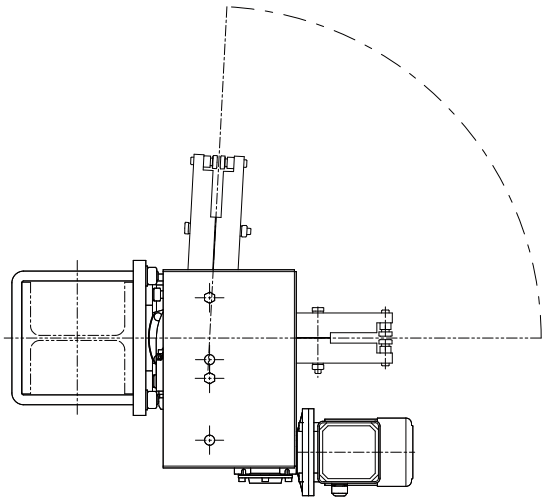


Conductor rail support, retractable, follower bracket

2714

Note
Use and attachment in accordance
with local conditions.
Available for 3 kV, 15 kV or 25 kV.
Order after consultation with the OCR/ROCS technology



Note
Order after consultation with the OCR/ROCS technology

Associated parts
Conductor rail support,
retractable, follower bracket 2714