**Turnbuckle for cross wire** 4111

Resistance:
\[ F_{\text{min}} \text{ (kN)} = 12 \]

Drawing number:
417.00121

Ordering information:
4111 Turnbuckle for cross wire

**Cross-wire tensioning device** 4112

Weight:
\[ Wt = \text{(kg) 4.48} \]

Note:
Tensile force 1-3 kN
Max. travel 100 mm

Ordering information:
4112 Cross wire tensioning device
Material:
CuNiSi

Resistance:
Stay wire ø 5,83 mm FeCu:
\[ F_{Rd} (kN) = 1.5 \] 5561
Wire ø 5,83 mm FeCu:
\[ F_{Rd} (kN) = 6 \] 4416.60
Wire ø 6 mm Cu:
\[ F_{Rd} (kN) = 3.5 \] 4413.60
Wire ø 8 mm Cu:
\[ F_{Rd} (kN) = 3.5 \] 4413.80
Rope ø 6 mm Fe stainless:
\[ F_{Rd} (kN) = 1.5 \] 4441.006
Rope 50 mm² FeCu (ø 9 mm):
\[ F_{Rd} (kN) = 5.5 \] 4424.050
Rope 70 mm² Bzll (ø 10.5 mm):
\[ F_{Rd} (kN) = 3 \]

Drawing number:
448.00036

Ordering information:
4121 Termination clamp for wire/rope

Cross wire clamp 4122

Note:
Clamp range ø 6-8 mm

Drawing number:
448.00005

Ordering information:
4122 Cross wire clamp

Clevis end fitting for kevlar rope 4123

Material:
Al

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>L (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
<th>Z (mm)</th>
<th>d (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>6</td>
<td>86.5</td>
<td>11</td>
<td>17</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>133.5</td>
<td>17</td>
<td>29</td>
<td>17</td>
<td>14</td>
</tr>
</tbody>
</table>

Note:
Other dimensions available on request.

Drawing number:
4411.00404, .00408

Ordering information:
For rope ø 10 mm
4123.10 Clevis end fitting for kevlar rope
### Dropper

**Material:**
CuMg

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>1200</td>
<td>920</td>
<td>170</td>
</tr>
<tr>
<td>22</td>
<td>2200</td>
<td>1520</td>
<td>170</td>
</tr>
<tr>
<td>32</td>
<td>3200</td>
<td>2420</td>
<td>170</td>
</tr>
</tbody>
</table>

**Note:**
Dropper clip 4221 o/w

**Drawing number:**
437.00014

**Ordering information:**
Length 1700 mm
4211.12 Dropper

**Material:**
Clips CuNiSi
Rope CuSnPb

### Flexible rope dropper, adjustable

**Material:**
Clips CuNiSi
Rope CuSnPb

<table>
<thead>
<tr>
<th>Type</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>170</td>
<td>920</td>
</tr>
<tr>
<td>16</td>
<td>170</td>
<td>1520</td>
</tr>
<tr>
<td>25</td>
<td>170</td>
<td>2420</td>
</tr>
<tr>
<td>30</td>
<td>170</td>
<td>2920</td>
</tr>
</tbody>
</table>

**Note:**
Dropper clip 4221 o/w

**Drawing number:**
437.00035

**Ordering information:**
Length max. 1520 mm
4212.16 Flexible rope dropper, adjustable
4214  Flexible rope dropper, pressed, adjustable

<table>
<thead>
<tr>
<th>Type</th>
<th>Type 10</th>
<th>Type 16</th>
<th>Type 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>L min (mm)</td>
<td>L max (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1050</td>
<td>1550</td>
<td>x</td>
</tr>
<tr>
<td>16</td>
<td>1350</td>
<td>1850</td>
<td>x</td>
</tr>
<tr>
<td>19</td>
<td>1650</td>
<td>2150</td>
<td>x</td>
</tr>
<tr>
<td>22</td>
<td>1950</td>
<td>2450</td>
<td>x</td>
</tr>
</tbody>
</table>

Note:
Dropper clip 4229

Ordering information:
Rope 16 mm², Length 1050 mm
4214.016.13 Flexible rope dropper, pressed, adjustable

Material:
Clips CuNiSi
Rope CuSnPb

---

4215  Flexible rope dropper, pressed

<table>
<thead>
<tr>
<th>Type</th>
<th>Type 10</th>
<th>Type 16</th>
<th>Type 25</th>
</tr>
</thead>
<tbody>
<tr>
<td>L min (mm)</td>
<td>L max (mm)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1050</td>
<td>1550</td>
<td>x</td>
</tr>
<tr>
<td>16</td>
<td>1350</td>
<td>1850</td>
<td>x</td>
</tr>
<tr>
<td>19</td>
<td>1650</td>
<td>2150</td>
<td>x</td>
</tr>
<tr>
<td>22</td>
<td>1950</td>
<td>2450</td>
<td>x</td>
</tr>
</tbody>
</table>

Note:
Dropper clip 4229
Rope 4443
Please state length L when ordering.
Length min. 800 mm.

Ordering information:
16 mm², Length 875 mm
4215.016.875 Flexible rope dropper, pressed

Material:
Clips CuNiSi
Rope CuSnPb

Drawing number:
437.00056 - 00058
Material:
CuNiSi

<table>
<thead>
<tr>
<th>Type</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>285</td>
<td>100</td>
<td>285</td>
</tr>
<tr>
<td>500</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>806</td>
<td>100</td>
<td>806</td>
</tr>
</tbody>
</table>

Note:
For ropes up to 150 mm²
1. For contact wire, groove 5,6 mm
2. For contact wire, groove 6 - 6,92 mm
For other contact wires and with rope protection on request.

Drawing number:
437.00047

Ordering information:
Length 285 mm
4216.285 Loop dropper, without height limitation, not current carrying
**Material:**
CuNiSi

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Contact wire (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>50 - 95</td>
<td>107 - 150</td>
</tr>
<tr>
<td>2</td>
<td>95 - 150</td>
<td>107 - 150</td>
</tr>
</tbody>
</table>

**Drawing number:**
444.00058, .00058-1

**Ordering information:**
Rope with 95 mm²

4221.1 Dropper clip with bolt M 10

---

**Material:**
Cu

**Note:**
For ropes 95 mm²
For contact wire up to 150 mm²

**Drawing number:**
444.00051

**Ordering information:**
4222 Dropper clip with bolt M 14

---

**Offset dropper clip for inclined catenary**

**Note:**
For contact wire up to 107 mm²

**Associated parts:**
Offset loop 4224

**Drawing number:**
444.00001

**Ordering information:**
4223 Offset dropper clip for inclined catenary
### 4224 Offset loop for inclined catenary dropper clip

- **Material:** FeCu
- **Type** L (mm)
  - 135 135
  - 195 195
  - 265 265
- **Drawing number:** 444.00041
- **Ordering information:**
  - Length 195 mm
  - 4224.195 Offset loop for inclined catenary dropper clip

### 4225 Pull-off pulley

- **Type** Material
  - 1 Synthetic
  - 2 Fe A2
- **Drawing number:** 448.00006, 0.00033
- **Ordering information:**
  - with synthetic pulley
  - 4225.1 Pull-off pulley

### 4226 Suspension pulley

- **Material:** FeA2
- **Note:**
  - For flexible suspension of the section insulators.
- **Associated parts:**
  - Flexible dropper 4212 o/w
- **Drawing number:** 448.00016
- **Ordering information:**
  - 4226 Suspension pulley
**Splice clamp short for contact wire**

Material:
CuNiSi

**Note:**
For contact wire up to 150 mm²

**Drawing number:**
446.00015

**Ordering information:**
4227 Splice clamp short for contact wire

---

**Splice clamp long for contact wire**

Material:
CuNiSi

**Note:**
For contact wire up to 150 mm²

**Drawing number:**
446.00014

**Ordering information:**
4228 Splice clamp long for contact wire

---

**Drop clamp for press connection**

Material:
CuNiSi

<table>
<thead>
<tr>
<th>Type</th>
<th>for rope (mm²)</th>
<th>D (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>5,4</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>6,5</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>8,0</td>
</tr>
</tbody>
</table>

**Note:**
For rope up to 95 mm²
For contact wire up to 150 mm²
Presser available on request.

**Associated parts:**
Rope 4443

**Ordering information:**
for rope 16 mm²
4229.16 Drop clamp for press connection
4230  Splice clamp adjustable for contact wire

Material:
Clamping plate: CuNiSi
Clamp: Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>169</th>
<th>169</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>217</td>
<td>217</td>
</tr>
</tbody>
</table>

Note:
For contact wire up to 150 mm²

Drawing number:
446.00017

Ordering information:
Length 169 mm
4230.169 Splice clamp adjustable for contact wire

4230.1  Splice clamp for 2 contact wires

Material:
CuNiSi

Note:
For contact wire up to 150 mm²

Drawing number:
446.00016

Ordering information:
4230.1 Splice clamp for 2 contact wires
**Anchor point clamp for contact wire**

**Material:**
CuNiSi

<table>
<thead>
<tr>
<th>Type</th>
<th>L (mm)</th>
<th>Rope (mm²)</th>
<th>Wire (Ø mm)</th>
<th>Contact wire (mm²)</th>
<th>Screws</th>
</tr>
</thead>
<tbody>
<tr>
<td>080</td>
<td>80</td>
<td>35</td>
<td>6</td>
<td>70-150</td>
<td>3</td>
</tr>
<tr>
<td>153</td>
<td>153</td>
<td>50</td>
<td>9</td>
<td>80-150</td>
<td>4</td>
</tr>
</tbody>
</table>

**Ordering information:**
Length 80 mm
4231.080 Anchor point clamp for contact wire

**Fixed point clamping plate for FL 200 / FL 260**

**Material:**
Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>38.2</td>
<td>38</td>
<td>2 ropes</td>
</tr>
<tr>
<td>38.3</td>
<td>38</td>
<td>3 ropes</td>
</tr>
<tr>
<td>70.2</td>
<td>70</td>
<td>2 ropes</td>
</tr>
<tr>
<td>70.3</td>
<td>70</td>
<td>3 ropes</td>
</tr>
</tbody>
</table>

**Note:**
Other tube diameter D on request.
State D1, D2 and D3 when ordering.

**Drawing number:**
353.00334, .00711

**Ordering information:**
on tube D = 38 mm, for 3 ropes,
D1 = 6 mm, D2 = 16 mm, D3 = 9 mm
4233.38.3.06.09 Anchor point clamp for FL 200 / FL 260
### Crossing clamp 4241

<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (Ø mm)</th>
<th>Rope (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>4-6</td>
<td>-</td>
</tr>
<tr>
<td>35</td>
<td>-</td>
<td>35-50</td>
</tr>
<tr>
<td>95</td>
<td>-</td>
<td>95-120</td>
</tr>
</tbody>
</table>

Note: Use type 04 for fixed point

**Drawing number:** 437.00022, .00029, .00030

**Ordering information:** for rope 35 mm²
4241.35 Crossing clamp

### Clamp for crossing rod 4242

**Material:** CuNiSi

**Drawing number:** 437.00033

**Ordering information:** 4242 Clamp for crossing rod

### Knuckle with groove 4243

**Material:** Fe stainless

**Associated parts:** Contact wire swivel clip, groove type 5557

**Drawing number:** 442.00028

**Ordering information:** 4243 Knuckle with groove
4244 Knuckle, long with groove

Material:
Fe stainless

Note:
With double cross switch frames.

Associated parts:
Contact wire swivel clip, groove type 5557

Drawing number:
442.00121

Ordering information:
4244 Knuckle, long with groove

4245 Knuckle with contact wire retaining bar and groove

Type | Z (mm) | Rod/Tube (Ø mm)
-----|--------|------------------
19   | 19     | 16 mm
25   | 25     | 22 mm
33   | 33     | 30 mm
37   | 37     | 1" G

Note:
Knuckle also available in bronze.

Associated parts:
Contact wire swivel clip, groove type 5557

Drawing number:
442.00020

Ordering information:
Gap 25 mm
4245.25 Knuckle with contact wire retaining bar and groove

4246 Anchor point clamp for 2 contact wires

Material:
CuNiSi

Type | Screws | L (mm)
-----|--------|--------
2    | 2      | 50
3    | 3      | 80

Note:
For contact wire up to 150 mm²

Ordering information:
with 3 bolts
4246.3 Anchor point clamp for 2 contact wires
Anchor point clamp for 3 contact wires

4247

Material:
CuNiSi

Note:
For contact wire up to 150 mm²

Ordering information:
4247 Anchor point clamp
for 3 contact wires

Contact wire dropper clip for turnouts

4248

Material:
CuNiSi

Note:
For contact wire up to 193 mm²

Associated parts:
Flexible rope dropper 4212 o/w

Drawing number:
444.00060

Ordering information:
4248 Contact wire dropper clip
for turnouts
Material:
Synthetic insulation

Weight:
Wt (kg) = 4,7

Note:
For contact wire 85 - 107 mm²

Drawing number:
551.00025

Ordering information:
Length 970 mm
4251 Section insulator 1,5 kV

---

Weight:
Wt (kg) = 12

Fasteners:
Flexible rope dropper 4212

Drawing number:
551.00013

Ordering information:
4252 Section insulator 15 kV

---

Weight:
Wt (kg) = 14

Fasteners:
Flexible rope dropper 4212

Drawing number:
551.00014

Ordering information:
4253 Section insulator 1,5 kV
4254  Section insulator 15 kV

Resistance:
\[ F_{\text{Rd}} (\text{kN}) = \text{max. } 15 \]

Weight:
\[ \text{Wt (kg)} = 14 \]

Fasteners:
Flexible rope dropper 4212

Ordering information:
4254 Section insulator 15 kV

4255  Section insulator 3 kV

Type | FRd | Wt | Used for |
-----|-----|-----|----------|
1    | 32  | 13,3| for 1 contact wire |
2    | 2x20| 19  | for 2 contact wires |

Fasteners:
Flexible rope dropper 4212

Ordering information:
4255 Section insulator 3 kV

4256  Contact wire insulators

Material:
CuNiSi, fiberglass rod PTFE coated

<table>
<thead>
<tr>
<th>Type</th>
<th>kV</th>
<th>FRd (kN)</th>
<th>L (mm)</th>
<th>creepdistance (mm)</th>
<th>d (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,5</td>
<td>1,5</td>
<td>15</td>
<td>1060</td>
<td>800</td>
<td>12,25</td>
<td>1,75</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>15</td>
<td>1460</td>
<td>1100</td>
<td>12,25</td>
<td>2,15</td>
</tr>
<tr>
<td>25</td>
<td>25</td>
<td>15</td>
<td>1860</td>
<td>1500</td>
<td>12,25</td>
<td>2,55</td>
</tr>
</tbody>
</table>

Associated parts:
Splice clamp long 4228
Splice clamp adjustable 4230

Ordering information:
1,5 kV
4256.1,5 Contact wire insulator
Material:
Stainless steel, fiberglass rod PTFE coated

<table>
<thead>
<tr>
<th>Type</th>
<th>kV</th>
<th>L (mm)</th>
<th>creep distance (mm)</th>
<th>Wt (kg)</th>
<th>Number of U-Bolts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1.5</td>
<td>1,5</td>
<td>850</td>
<td>600</td>
<td>1,4</td>
<td>without</td>
</tr>
<tr>
<td>2.1.5</td>
<td>1,5</td>
<td>850</td>
<td>600</td>
<td>1,4</td>
<td>with 4</td>
</tr>
<tr>
<td>1.15</td>
<td>15</td>
<td>1350</td>
<td>1100</td>
<td>1,8</td>
<td>without</td>
</tr>
<tr>
<td>2.15</td>
<td>15</td>
<td>1350</td>
<td>1100</td>
<td>1,8</td>
<td>with 4</td>
</tr>
<tr>
<td>1.25</td>
<td>25</td>
<td>2250</td>
<td>2000</td>
<td>2,5</td>
<td>without</td>
</tr>
<tr>
<td>2.25</td>
<td>25</td>
<td>2250</td>
<td>2000</td>
<td>2,5</td>
<td>with 4</td>
</tr>
</tbody>
</table>

Note:
Supplied complete with 4 U-bolts for fastening to section insulator.

Ordering information:
1,5 kV
4257.1.5 Catenary insulator with lug
Replacement runners for section insulator 1,5 kV for conductor rail CR4

Note:
The section insulator is no longer available.
The replacement runners can be ordered separately.

Drawing number:
962.00783

Ordering information:
4261 Replacement runners for section insulator 1,5 kV for conductor rail CR4

Replacement runners for section insulator 15 kV for conductor rail CR4

Note:
The section insulator is no longer available.
The replacement runners can be ordered separately.

Drawing number:
962.00206

Ordering information:
4262 Replacement runners for section insulator 15 kV for conductor rail CR4

Replacement runners for section insulator 25 kV for conductor rail CR4

Note:
The section insulator is no longer available.
The replacement runners can be ordered separately.

Drawing number:
962.01069, .01608

Ordering information:
4263 Replacement runners for section insulator 25 kV for conductor rail CR4
4264  Section insulator 15 kV for conductor rail CR4 (Strutting 150)

Weight:
Wt (kg) = 52

Note:
The interlocking joint pairs are included in the delivery.

Drawing number:
963.02760-1

Ordering information:
4264 Section insulator 15 kV for conductor rail CR4 (Strutting 150)

4265  Section insulator 25 kV for conductor rail CR4 (Strutting 270)

Weight:
Wt (kg) = 73,5

Note:
The interlocking joint pairs are included in the delivery.

Drawing number:
963.02760-2

Ordering information:
4265 Section insulator 25 kV for conductor rail CR4 (Strutting 270)

4271  Section insulator 25 kV for conductor rail CR4 (Strutting 315)

Weight:
Wt (kg) = 70

Note:
The interlocking joint pairs are included in the delivery.

Drawing number:
967.00001

Ordering information:
4271 Section insulator 25 kV for conductor rail CR4 (Strutting 315)
Contact wire clamp for stitch-wire suspension

Material:
CuSn

Resistance:
$F_{Rd} \text{ (kN)} = 5$

Note:
For contact wire 107 - 150 mm

Associated parts:
Shackle 3355
Clevis end fitting 4123

Drawing number:
444.00056

Ordering information:
4291 Contact wire clamp for stitch-wire suspension

Contact wire clamp for stitch-wire suspension with groove

Material:
Fe inox

Resistance:
$F_{Rd} \text{ (kN)} = 5$

Associated parts:
Stitch wire 5565
Contact wire clip, groove type 5557

Drawing number:
442.00090

Ordering information:
4292 Contact wire clamp for stitch-wire suspension with groove
Counterweight tensioned contact wire

1 contact wire and 1 carrying cable counterweight tensioned

2 contact wires counterweight tensioned

Counterweight tensioned carrying cable
Hinged termination on mast, single

Mast range:
Section HEB 180 - 260

Note:
Supplied with counterweight wheels and clevis strap for counterweight wheels. The cable must be ordered separately (4441.009).

Weight guide, single 4371
Counterweight rope complete 4321
Counterweight rod 4322 o/w

Fasteners:
Supplied complete with U-bolts

Consisting of:
Hinged termination bracket 523.00199
Clevis trap for counterweight wheel 4331.355
Clevis strap for counterweight wheel 4331.215
Counterweight wheel 4332

Drawing number:
523.00186

Ordering information:
on HEB 200
4311.20 Hinged termination on mast, single

Hinged termination on mast, single, stand-off

Mast range:
Section HEB 180 - 260

Note:
Supplied with counterweight wheels and clevis strap for counterweight wheels. The cable must be ordered separately (4441.009).

Weight guide, stand-off 4373
Counterweight rope complete 4321
Counterweight rod 4322 o/w

Fasteners:
Supplied complete with U-bolts

Consisting of:
Hinged termination bracket 523.00200
Clevis strap for counterweight wheel 4331.355
Clevis strap for counterweight wheel 4331.215
Counterweight wheel 4332

Drawing number:
523.00187

Ordering information:
on HEB 220
4312.22 Hinged termination on mast, single, stand-off
**4313**  Hinged termination on mast, double

Mast range:
Section HEB       180 - 260

Note:
Supplied with counterweight wheels and clevis strap for counterweight wheels.
The cable must be ordered separately (4441.009).
Counterweight guide, double  4372
Counterweight rope, complete  4321
Counterweight rod  4322
Counterweight  4323 o/w

Fasteners:
Supplied complete with U-bolts

Consisting of:
Hinged termination bracket  523.00201
Clevis strap for counterweight wheel  4331.355
Clevis strap for counterweight wheel  4331.215
Counterweight wheel  4332

Drawing number:
523.00188

Ordering information:
on HEB 220
4313.22 Hinged termination on mast, double

**4314**  Counterweight wheel (1:3 ratio) on mast

Mast range:
Section HEB       180 - 260

Note:
Supplied complete with equalizing pulley and wedges for counterweight wheel.
The cable must be ordered separately.
Steel rope flexible, stainless  4441.009
Weight guide  4371 o/w
Counterweight rod  4322
Counterweights  4323 o/w

Fasteners:
Supplied complete with U-bolts

Drawing number:
523.00118

Ordering information:
on HEB 240
4314.24 Counterweight wheel (1:3 ratio) on mast
Mast range:
Section HEB 180 - 260

Note:
Supplied complete with equalizing pulley and wedges for counterweight wheel.
The cable must be ordered separately.
Steel rope flexible, stainless 4441.009
Weight guide 4373 o/w
Counterweight rod 4322
Counterweights 4323 o/w

Fasteners:
Supplied complete with U-bolts

Drawing number:
523.00119

Ordering information:
on HEB 240
4315.24 Counterweight wheel (1:3 ratio) on mast, with stand-off
Material:
Fe stainless

Note:
L = 4,60. Other lengths on request.
Fe fittings hot-dip galvanised.

Drawing number:
528.00042

Ordering information:
Length 4,60 m
4321.46 Counterweight rope complete

---

Counterweight rope

Type | L (mm)
---|---
10 | 1000
17 | 1700
23 | 2300
32 | 3200
36 | 3600

Drawing number:
522.00119

Ordering information:
Length 1700mm
4322.17 Counterweight rod

---

Counterweight round

Material:
Cast iron

Weight:
Wt (kg) = 25

Note:
Counterweight rod 4322

Drawing number:
527.00005

Ordering information:
Counterweight round
4323 Counterweight round
4325 Counterweight rectangular

Material:
Cast iron

Weight:
Wt (kg) = 25

Note:
Cast iron spray galvanised and painted.
Counterweight rod 4322

Drawing number:
527.00001

Ordering information:
4325 Counterweight rectangular

4326 Counterweight square, steel

Material:
Fe galvanized

Weight:
Wt (kg) = 25

Note:
Counterweight rod 4322

Drawing number:
527.00007

Ordering information:
4326 Counterweight square, steel
Clevis strap for counterweight wheel

4331

Type L

<table>
<thead>
<tr>
<th></th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>215</td>
<td>215</td>
</tr>
<tr>
<td>355</td>
<td>355</td>
</tr>
</tbody>
</table>

Note:
Counterweight wheel 4332

Drawing number:
522.00012, 523.00189

Ordering information:
Length 215 mm
4331.215 Clevis strap for counterweight wheel

Note:
Steel rope 4441

Drawing number:
528.00031

Ordering information:
4332 Counterweight wheel
### Turnbuckle with lock nut

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread M</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>( F_{\text{min}} ) (kN)</th>
<th>L mean (mm)</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>08</td>
<td>08</td>
<td>29</td>
<td>15</td>
<td>16</td>
<td>200</td>
<td>165</td>
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<td>10</td>
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<td>18</td>
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<td>12</td>
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<td>36</td>
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<td>16</td>
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<td>56</td>
<td>27</td>
<td>70</td>
<td>385</td>
<td>317</td>
<td>457</td>
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<tr>
<td>20</td>
<td>20</td>
<td>64</td>
<td>30</td>
<td>110</td>
<td>425</td>
<td>350</td>
<td>500</td>
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<tr>
<td>24</td>
<td>24</td>
<td>72</td>
<td>32</td>
<td>155</td>
<td>470</td>
<td>392</td>
<td>552</td>
</tr>
</tbody>
</table>

**Drawing number:**
417.00094, 417.00131 - .00135

**Ordering information:**
M 12
4341.12 Turnbuckle with lock nut

### Turnbuckle long, M 16

<table>
<thead>
<tr>
<th>Type</th>
<th>d (mm)</th>
<th>( F_{\text{Rd}} ) (kN)</th>
<th>L mean (mm)</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>18</td>
<td>21</td>
<td>800</td>
<td>600</td>
<td>1000</td>
</tr>
<tr>
<td>2</td>
<td>17</td>
<td>20</td>
<td>455</td>
<td>380</td>
<td>530</td>
</tr>
</tbody>
</table>

**Drawing number:**
417.00017, .00017-1

**Ordering information:**
4342.1 Turnbuckle long, M 16

### Turnbuckle with eye and left-hand thread

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread M</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>( F_{\text{min}} ) (kN)</th>
<th>L (mm)</th>
<th>L1 (mm)</th>
<th>L2 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>12</td>
<td>46</td>
<td>24</td>
<td>36</td>
<td>125</td>
<td>180</td>
<td>90</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>56</td>
<td>27</td>
<td>70</td>
<td>145</td>
<td>205</td>
<td>105</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>64</td>
<td>30</td>
<td>110</td>
<td>160</td>
<td>230</td>
<td>115</td>
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<tr>
<td>24</td>
<td>24</td>
<td>72</td>
<td>32</td>
<td>155</td>
<td>180</td>
<td>260</td>
<td>130</td>
</tr>
</tbody>
</table>

**Drawing number:**
417.00106 - .00109

**Ordering information:**
M 24
4343.24 Turnbuckle with eye and left-hand thread
### Turnbuckle eye bolt

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread M (mm)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>L (mm)</th>
<th>L2 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>35</td>
<td>18</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>46</td>
<td>24</td>
<td>125</td>
<td>90</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>56</td>
<td>27</td>
<td>145</td>
<td>105</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>64</td>
<td>30</td>
<td>160</td>
<td>115</td>
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<td>24</td>
<td>24</td>
<td>72</td>
<td>32</td>
<td>180</td>
<td>130</td>
</tr>
</tbody>
</table>

Drawing number: 417.00110

Ordering information:
M 20
4344.20 Turnbuckle eye bolt

### Turnbuckle eye bolt with left-hand thread

<table>
<thead>
<tr>
<th>Type</th>
<th>Thread M (mm)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>L (mm)</th>
<th>L2 (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>10</td>
<td>35</td>
<td>18</td>
<td>90</td>
<td>60</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>46</td>
<td>24</td>
<td>125</td>
<td>90</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>56</td>
<td>27</td>
<td>145</td>
<td>105</td>
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<tr>
<td>20</td>
<td>20</td>
<td>64</td>
<td>30</td>
<td>160</td>
<td>115</td>
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<tr>
<td>24</td>
<td>24</td>
<td>72</td>
<td>32</td>
<td>180</td>
<td>130</td>
</tr>
</tbody>
</table>

Drawing number: 417.00111

Ordering information:
M 16
4345.16 Turnbuckle eye bolt with left-hand thread
<table>
<thead>
<tr>
<th>Type</th>
<th>Tension length (m)</th>
<th>L min (mm)</th>
<th>L max (mm)</th>
<th>D (mm)</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>060</td>
<td>0 - 60</td>
<td>650</td>
<td>740</td>
<td>110</td>
<td>12</td>
</tr>
<tr>
<td>120</td>
<td>60 - 120</td>
<td>1045</td>
<td>1205</td>
<td>110</td>
<td>21</td>
</tr>
<tr>
<td>180</td>
<td>120 - 180</td>
<td>1440</td>
<td>1670</td>
<td>110</td>
<td>31</td>
</tr>
</tbody>
</table>

Note:
Mean tensile force 8 kN

Drawing number:
525.00036

Ordering information:
for tension length 60 - 120 m
4351.120 Double spring for pull-off
<table>
<thead>
<tr>
<th>Type</th>
<th>Release force (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>100</td>
<td>2.5 - 8.0</td>
</tr>
<tr>
<td>200</td>
<td>3.0 - 15.0</td>
</tr>
</tbody>
</table>

**Note:**
Force spread of approx. 15 % possible.

**Drawing number:**
589.00014

**Ordering information:**
Release force 15 kN
4362.200 Suspension safety link with release mechanism, AW
Weight guide for one termination on mast

4371

Mast range:
Section HEB 180 - 260

Note:
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of 0,5 m

Fasteners:
Supplied complete with U-bolts.

Consisting of:
2 Cross arms 523.00195
1 Tube for
counterweight guide 4374
1 Spacer 4375

Drawing number:
523.00190, .00748 - .00751

Ordering information:
on HEB 200, Length L = 4,50 m
4371.20.45 Weight guide for one
termination on mast

Mast range:
Section HEB 180 - 260

Note:
Length L min. 3,00 m
Length L max. 5,00 m
Available in steps of 0,5 m

Fasteners:
Supplied complete with U-bolts.

Consisting of:
2 Cross arms 523.00196
1 Tube for
counterweight guide 4374
1 Spacer 4375

Drawing number:
523.00191

Ordering information:
on HEB 200, Length L = 4,50 m
4372.20.45 Weight guide for two
terminations on mast
### 4373  
**Weight guide for two terminations in line on mast**

**Mast range:**
- Section HEB 180 - 260

**Note:**
- Length L min. 3,00 m
- Length L max. 5,00 m
- Available in steps of 0,5 m

**Fasteners:**
- Supplied complete with U-bolts.

**Consisting of:**
- 1 Cross arm, top  523.00197
- 1 Cross arm, bottom  523.00198
- 2 Tubes for counterweight guide  4374
- 2 Spacers  4375

**Drawing number:**
- 523.00192

**Ordering information:**
- on HEB 200, Length L = 4,50 m
- 4373.20.45 Weight guide for two terminations in line on mast

### 4374  
**Tube for weight guide**

**Note:**
- Length L min. 2,50 m
- Length L max. 5,00 m
- Available in steps of 0,5 m

**Drawing number:**
- 523.00107

**Ordering information:**
- Length L = 4,50 m
- 4374.45 Tube for weight guide

### 4375  
**Spacer for counterweight rod**

**Drawing number:**
- 523.00102

**Ordering information:**
- 4375 Spacer for counterweight rod
System Sheet Tensioning Equipment on mast

max. 15°

43101

43102

max. 15°
Note:
Length of cable 2,1 m

Tensile force:
13 or 16,5 kN

Drawing number:
523.00791

Ordering information:
HEB 260
43101.26 Tensorex C+ on Mast

Mast range:
Section HEB 240 - 260

Mast range:
Profil HEB 240 - 260

Drawing number:
523.00626

Ordering information:
HEB 240
43102 Earthing bracket on Tensorex C+ bracket
### Steel wire 4411

**Material:** Fe

<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22</td>
<td>2,2</td>
<td>3,8</td>
<td>3,0</td>
</tr>
<tr>
<td>30</td>
<td>3,0</td>
<td>7,0</td>
<td>5,6</td>
</tr>
</tbody>
</table>

**Note:**
- Supplied in 5 kg rings
- Supplied in 25 kg bundles

**Ordering information:**
- ø 2,2 mm
- 4411.22 Steel wire

### Copper wire soft 4412

**Material:** Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>1,5</td>
<td>1,8</td>
<td>1,6</td>
<td>Binding wire</td>
</tr>
<tr>
<td>20</td>
<td>2,0</td>
<td>3,1</td>
<td>2,8</td>
<td>Binding wire</td>
</tr>
<tr>
<td>70</td>
<td>7,0</td>
<td>38,5</td>
<td>34,3</td>
<td>Earthing</td>
</tr>
<tr>
<td>80</td>
<td>8,0</td>
<td>50,3</td>
<td>44,7</td>
<td>Earthing</td>
</tr>
</tbody>
</table>

**Ordering information:**
- ø 7,0 mm
- 4412.70 Copper wire soft

### Copper wire rigid 4413

**Material:** Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>6,0</td>
<td>28,3</td>
<td>25,2</td>
</tr>
<tr>
<td>80</td>
<td>8,0</td>
<td>50,3</td>
<td>44,7</td>
</tr>
</tbody>
</table>

**Ordering information:**
- ø 8,0 mm
- 4413.80 Copper wire rigid
### 4414  Bronze wire

<table>
<thead>
<tr>
<th>Type (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40</td>
<td>4,0</td>
<td>12,6</td>
</tr>
</tbody>
</table>

**Material:** CuMg

**Note:** Used for droppers 4211

**Ordering information:** ø 4,0 mm 4414.40 Bronze wire

### 4415  Aluminium wire

<table>
<thead>
<tr>
<th>Type (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2,0</td>
<td>3,1</td>
</tr>
<tr>
<td>25</td>
<td>2,5</td>
<td>4,9</td>
</tr>
<tr>
<td>30</td>
<td>3,0</td>
<td>7,1</td>
</tr>
</tbody>
</table>

**Material:** Al

**Note:** Used as binding wire.

**Ordering information:** ø 2,5 mm 4415.25 Aluminium wire

### 4416  Copper-covered steel wire

<table>
<thead>
<tr>
<th>Type (Ø mm)</th>
<th>Wire (mm²)</th>
<th>Weight (kg/100m)</th>
<th>Fmin (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>6,0</td>
<td>28,3</td>
<td>23</td>
</tr>
</tbody>
</table>

**Material:** Fe, Cu coating 30%

**Note:** For cross-wire and fixed point.

**Ordering information:** ø 6,0 mm 4416.60 Copper-covered steel wire
### Steel rope

**Material:**
Fe hot dip galvanised

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>F_{min} (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035Q</td>
<td>35</td>
<td>7,5</td>
<td>28,0</td>
<td>7 x 2,50</td>
<td>25,8</td>
</tr>
<tr>
<td>035T</td>
<td>35</td>
<td>7,5</td>
<td>28,0</td>
<td>7 x 2,50</td>
<td>44,6</td>
</tr>
<tr>
<td>050Q</td>
<td>50</td>
<td>9,0</td>
<td>41,0</td>
<td>7 x 3,00</td>
<td>34,6</td>
</tr>
<tr>
<td>050T</td>
<td>50</td>
<td>9,0</td>
<td>41,0</td>
<td>7 x 3,00</td>
<td>64,3</td>
</tr>
</tbody>
</table>

**Note:**
Q = cross wire  
T = messenger wire

**Ordering information:**
for cross wire 35 mm²  
4421.035Q Steel rope

### Copper rope half hard

**Material:**
Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>F_{min} (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>46,0</td>
<td>7 x 3,02</td>
<td>19,8</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
<td>12,6</td>
<td>86,0</td>
<td>19 x 2,52</td>
<td>35,7</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
<td>15,9</td>
<td>135,0</td>
<td>37 x 2,27</td>
<td>56,5</td>
</tr>
<tr>
<td>240</td>
<td>240</td>
<td>20,2</td>
<td>222,4</td>
<td>61 x 2,25</td>
<td>97,2</td>
</tr>
</tbody>
</table>

**Ordering information:**
95 mm²  
4422.095 Copper rope half hard

### Aluminium rope (Al 3)

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>F_{min} (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>120</td>
<td>120,4</td>
<td>14,2</td>
<td>33,4</td>
<td>19 x 2,84</td>
<td>35,51</td>
</tr>
<tr>
<td>150</td>
<td>149,7</td>
<td>15,5</td>
<td>41,25</td>
<td>37 x 2,27</td>
<td>44,17</td>
</tr>
<tr>
<td>300</td>
<td>301,3</td>
<td>22,5</td>
<td>83,00</td>
<td>37 x 3,22</td>
<td>88,88</td>
</tr>
</tbody>
</table>

**Note:**
Various rope constructions and alloys are available on request.

**Ordering information:**
120mm<sup>2</sup>  
4423.120 Alu-/AL3
Material:
FeCu

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction</th>
<th>Fmin (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
<td>29,0</td>
<td>7 x 2,52</td>
<td>33,9</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>40,9</td>
<td>7 x 3,00</td>
<td>45,6</td>
</tr>
<tr>
<td>092</td>
<td>92</td>
<td>12,3</td>
<td>82,7</td>
<td>7 x 4,10</td>
<td>42,4</td>
</tr>
</tbody>
</table>

Ordering information:
92 mm²
4424.092 Copper-covered steel rope
<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (mm²)</th>
<th>D (mm)</th>
<th>Weight min. (kg/100m)</th>
<th>Weight max. (kg/100m)</th>
<th>Firmness (N/mm²)</th>
<th>F_{min} (kN)</th>
<th>Resistivity (Ω/km)</th>
<th>Resistance at 20° C (10^{-8}Ω/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.100</td>
<td>100</td>
<td>12.00</td>
<td>86.2</td>
<td>91.6</td>
<td>355</td>
<td>27.50</td>
<td>1.777</td>
<td>0.183</td>
</tr>
<tr>
<td>1.107</td>
<td>107</td>
<td>12.30</td>
<td>92.3</td>
<td>98.0</td>
<td>350</td>
<td>34.40</td>
<td>1.777</td>
<td>0.171</td>
</tr>
<tr>
<td>1.120</td>
<td>120</td>
<td>13.20</td>
<td>103.5</td>
<td>109.9</td>
<td>330</td>
<td>36.30</td>
<td>1.777</td>
<td>0.153</td>
</tr>
<tr>
<td>1.150</td>
<td>150</td>
<td>14.80</td>
<td>129.3</td>
<td>137.4</td>
<td>310</td>
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<td>1.777</td>
<td>0.122</td>
</tr>
<tr>
<td>2.100</td>
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<td>1.777</td>
<td>0.171</td>
</tr>
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<td>2.120</td>
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<td>109.9</td>
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<td>41.70</td>
<td>1.777</td>
<td>0.153</td>
</tr>
<tr>
<td>2.150</td>
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<td>14.80</td>
<td>129.3</td>
<td>137.4</td>
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<td>52.10</td>
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<td>0.122</td>
</tr>
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<td>12.00</td>
<td>86.2</td>
<td>91.6</td>
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<td>34.90</td>
<td>1.777</td>
<td>0.183</td>
</tr>
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<td>3.107</td>
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<td>98.0</td>
<td>350</td>
<td>36.30</td>
<td>1.777</td>
<td>0.171</td>
</tr>
<tr>
<td>3.120</td>
<td>120</td>
<td>13.20</td>
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<td>109.9</td>
<td>350</td>
<td>40.70</td>
<td>1.777</td>
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<td>150</td>
<td>14.80</td>
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<td>137.4</td>
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<td>4.100</td>
<td>100</td>
<td>12.00</td>
<td>86.2</td>
<td>91.6</td>
<td>510</td>
<td>49.50</td>
<td>2.778</td>
<td>0.286</td>
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<td>4.107</td>
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<td>12.30</td>
<td>92.3</td>
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<td>57.00</td>
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<td>100</td>
<td>12.00</td>
<td>86.5</td>
<td>91.8</td>
<td>450</td>
<td>43.60</td>
<td>2.155</td>
<td>0.222</td>
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<td>44.60</td>
<td>2.155</td>
<td>0.208</td>
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<tr>
<td>5.120</td>
<td>120</td>
<td>13.20</td>
<td>103.8</td>
<td>110.2</td>
<td>420</td>
<td>48.90</td>
<td>2.155</td>
<td>0.185</td>
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<td>150</td>
<td>14.80</td>
<td>129.8</td>
<td>137.7</td>
<td>420</td>
<td>61.10</td>
<td>2.155</td>
<td>0.148</td>
</tr>
</tbody>
</table>

Material:
Fig. 1: normal strength Copper; Cu-ETP, Cu-FRHC, Cu-HCP, Cu-OF
Fig. 2: High strength Copper; Cu-ETP, Cu-FRHC, Cu-HCP, Cu-OF
Fig. 3: Silver Copper; CuAg 0.1
Fig. 4: Magnesium Copper; CuMg 0.1, CuMg 0.5
Fig. 5: Tin Copper; CuSn 0.4
Fig. 6: Valthermo; CuSn 0.1

Material:
Fig. 1: normal strength Copper; Cu-ETP, Cu-FRHC, Cu-HCP, Cu-OF
Fig. 2: High strength Copper; Cu-ETP, Cu-FRHC, Cu-HCP, Cu-OF
Fig. 3: Silver Copper; CuAg 0.1
Fig. 4: Magnesium Copper; CuMg 0.1, CuMg 0.5
Fig. 5: Tin Copper; CuSn 0.4
Fig. 6: Valthermo; CuSn 0.1

Ordering information:
Silver Copper, 107 mm², Profile A
4431.3.107.A Contact wire
Material:
Fig. 1: Normal strength Copper; Cu-ETP, Cu-FRHC, Cu-HCP, Cu-OF

<table>
<thead>
<tr>
<th>Type</th>
<th>Wire (mm²)</th>
<th>D (mm)</th>
<th>Weight min. (kg/100m)</th>
<th>Weight max. (kg/100m)</th>
<th>Firmness (N/mm²)</th>
<th>Fmin (kN)</th>
<th>Resistivity (Ω/km)</th>
<th>Resistance at 20° C (10⁻⁶Ω/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.107</td>
<td>107</td>
<td>12.30</td>
<td>92.3</td>
<td>98.0</td>
<td>350</td>
<td>34.40</td>
<td>1.777</td>
<td>0.171</td>
</tr>
</tbody>
</table>

Note:
Normal length 6.00 m

Ordering information:
Normal strength copper, 107 mm²,
Profile A, Length 6,00 m
4432.1.107.A.60 Contact wire
### Steel rope flexible, stainless

**Material:**
Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>F_min (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>005</td>
<td>8,0</td>
<td>5</td>
<td>8,0</td>
<td>6 x 19 x 0,3</td>
<td>13,6</td>
</tr>
<tr>
<td>006</td>
<td>14,3</td>
<td>6</td>
<td>14,0</td>
<td>6 x 19 x 0,4</td>
<td>24,0</td>
</tr>
<tr>
<td>009</td>
<td>31,7</td>
<td>9</td>
<td>29,0</td>
<td>6 x 36 + FC</td>
<td>45,0</td>
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</table>

**Ordering information:**
ø 9 mm
4441.009 Steel rope flexible, stainless

### Copper rope flexible

**Material:**
Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>Used for</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>8,5</td>
<td>32,9</td>
<td>7 x 5 x 1,08 + 7 x 0,77</td>
<td>General, stitch-wire</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>10,5</td>
<td>47,9</td>
<td>396 x 0,4</td>
<td>General, earthing</td>
</tr>
<tr>
<td>070</td>
<td>70</td>
<td>13,0</td>
<td>68,5</td>
<td>189 x 0,7</td>
<td>EL-connections</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
<td>14,5</td>
<td>90,0</td>
<td>475 x 0,5</td>
<td>General</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
<td>17,8</td>
<td>130,0</td>
<td>729 x 0,5</td>
<td>General, EL-connections</td>
</tr>
</tbody>
</table>

**Ordering information:**
50 mm²
4442.050 Copper rope flexible

### Bronze rope flexible

**Material:**
CuSn

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (mm²)</th>
<th>F_min (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>10</td>
<td>4,5</td>
<td>8,9</td>
<td>49 x 0,50</td>
<td>4,25</td>
</tr>
<tr>
<td>016</td>
<td>16</td>
<td>5,9</td>
<td>15,2</td>
<td>49 x 0,65</td>
<td>9,60</td>
</tr>
<tr>
<td>025</td>
<td>25</td>
<td>7,5</td>
<td>24,6</td>
<td>133 x 0,50</td>
<td>15,30</td>
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</tbody>
</table>

**Ordering information:**
16 mm²
4443.016 Bronze rope flexible
Material:
Aramid fibres
Polyurethane casing

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (Ø mm)</th>
<th>$F_{Rd}$ (kN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>13</td>
</tr>
</tbody>
</table>

Note:
Other dimensions available on request.

Associated parts:
Clevis end fitting 4123

Ordering information:
ø 6 mm
4451.06 Kevlar rope, with protective covering
**Connecting cable 95 mm²**

**4461**

- **Material:**
  - Cu

- **Type L (mm):**
  - 06 600
  - 08 800
  - 10 1000

- **Drawing number:**
  - 453.00002

- **Ordering information:**
  - Length 800 mm
  - 4461.08 Connecting cable 95 mm²

**Connecting cable 150 mm²**

**4462**

- **Material:**
  - Cu

- **Type L (mm):**
  - 06 600
  - 08 800
  - 10 1000

- **Drawing number:**
  - 453.00002

- **Ordering information:**
  - Length 1000 mm
  - 4462.10 Connecting cable 150 mm²

**Earth strap 50 mm², M 12 / M 12**

**4463**

- **Material:**
  - Cu

- **Note:**
  - for M 12 / M 16

- **Drawing number:**
  - 923.00013, 00020

- **Ordering information:**
  - Length 250 mm
  - 4463.25 Earth strap 50 mm², M 12 / M 12
4464 Earth strap 50 mm², M 12 / M 16

Material:
Cu

Drawing number:
923.00009, .00014

Ordering information:
Length 450 mm
4464 Earth strap 50 mm², M 12 / M 16

4465 Earth strap 50 mm², M 16 / M 16

Material:
Cu

Drawing number:
923.00010

Ordering information:
4465 Earth strap 50 mm², M 16 / M 16
### Line splice, steel 4471

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
<td>960</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>1140</td>
</tr>
</tbody>
</table>

**Note:**
For right-hand lay ropes use overhead line quality.

**Ordering information:**
for rope 50 mm²
4471.050 Line splice, steel

### Line splice, copper 4472

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>1120</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
<td>12,6</td>
<td>1520</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
<td>15,9</td>
<td>1900</td>
</tr>
</tbody>
</table>

**Note:**
For right-hand lay ropes use overhead line quality.

**Ordering information:**
for rope 150 mm²
4472.150 Line splice, copper

### Line splice, copper covered steel 4473

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
<td>740</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>920</td>
</tr>
<tr>
<td>092</td>
<td>92</td>
<td>12,3</td>
<td>1400</td>
</tr>
</tbody>
</table>

**Note:**
For right-hand lay ropes use overhead line quality.

**Ordering information:**
for rope 92 mm²
4473.092 Line splice, copper covered steel
### Repair sleeve, steel

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
<td>360</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>390</td>
</tr>
</tbody>
</table>

**Note:**
- For right-hand lay ropes.
- Use only if the external wires up to a max. 25 % or ¼ of individual wires have been damaged.
- Otherwise, a line splice should be fitted.
- Repair sleeves can also be used as conductor protection against abrasion or arcing.

**Ordering information:**
- for rope 50 mm²
- 4481.050 Repair sleeve, steel

### Repair sleeve, copper

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>410</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
<td>12,6</td>
<td>560</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
<td>15,9</td>
<td>660</td>
</tr>
</tbody>
</table>

**Note:**
- For right-hand lay ropes.
- Use only if the external wires up to a max. 25 % or ¼ of individual wires have been damaged.
- Otherwise, a line splice should be fitted.
- Repair sleeves can also be used as conductor protection against abrasion or arcing.

**Ordering information:**
- for rope 95 mm²
- 4482.095 Repair sleeve, copper
Repair sleeve, copper-covered steel

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Rope (Ø mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
<td>410</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
<td>560</td>
</tr>
<tr>
<td>092</td>
<td>92</td>
<td>12,3</td>
<td>660</td>
</tr>
</tbody>
</table>

Note:
For right-hand lay ropes. Use only if the external wires up to a max. 25 % or ¼ of individual wires have been damaged. Otherwise a line splice should be fitted. Repair sleeves can also be used as conductor protection against abrasion or arcing.

Ordering information:
for rope 92 mm²
4483.092 Repair sleeve, copper covered steel
### Dead end grip, steel 4491

<table>
<thead>
<tr>
<th>Type (mm²)</th>
<th>Rope Ø (mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
</tr>
</tbody>
</table>

**Note:**
For right-hand lay ropes.

**Ordering information:**
for rope 50 mm²
4491.050 Dead end grip, steel

### Dead end grip, copper-covered steel 4492

<table>
<thead>
<tr>
<th>Type (mm²)</th>
<th>Rope Ø (mm)</th>
<th>L (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>7,5</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>9,0</td>
</tr>
</tbody>
</table>

**Note:**
For right-hand lay ropes.

**Ordering information:**
for rope 35 mm²
4492.035 Dead end grip, copper covered steel
Material:
Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>Wire (Ø mm)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>T (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>010</td>
<td>10 - 35</td>
<td>3.5 - 7.5</td>
<td>30</td>
<td>10.5</td>
<td>6</td>
</tr>
<tr>
<td>035</td>
<td>35 - 70</td>
<td>7.5 - 10.5</td>
<td>30</td>
<td>10.5</td>
<td>7</td>
</tr>
<tr>
<td>070</td>
<td>70 - 120</td>
<td>10.5 - 14.0</td>
<td>40</td>
<td>17.0</td>
<td>7</td>
</tr>
</tbody>
</table>

Drawing number:
449.00022

Ordering information:
for cable cross-section 10-35 mm² or
wire diameters 3.5-7.5 mm
4511.010 Cable lug with 1 clamp
### Cable lug for press connection

**Material:**
Cu tinned

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
<th>No. Bolts (mm)</th>
<th>d (mm)</th>
<th>D (mm)</th>
<th>d1 (mm)</th>
<th>L (mm)</th>
<th>B (mm)</th>
<th>T (mm)</th>
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<tbody>
<tr>
<td>016.06</td>
<td>16</td>
<td>6</td>
<td>5,5</td>
<td>8,5</td>
<td>6,4</td>
<td>36</td>
<td>13</td>
<td>2,5</td>
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<td>016.08</td>
<td>16</td>
<td>8</td>
<td>5,5</td>
<td>8,5</td>
<td>8,4</td>
<td>36</td>
<td>13</td>
<td>2,5</td>
</tr>
<tr>
<td>025.08</td>
<td>25</td>
<td>8</td>
<td>7,0</td>
<td>10,0</td>
<td>8,4</td>
<td>38</td>
<td>16</td>
<td>3,0</td>
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<td>25</td>
<td>12</td>
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<td>10,0</td>
<td>13,0</td>
<td>38</td>
<td>19</td>
<td>3,0</td>
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<tr>
<td>035.08</td>
<td>35 / 35 flex</td>
<td>8</td>
<td>8,2</td>
<td>12,5</td>
<td>8,4</td>
<td>42</td>
<td>17</td>
<td>2,5</td>
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<td>35 / 35 flex</td>
<td>10</td>
<td>8,2</td>
<td>12,5</td>
<td>10,5</td>
<td>42</td>
<td>19</td>
<td>2,5</td>
</tr>
<tr>
<td>035.12</td>
<td>35 / 35 flex</td>
<td>12</td>
<td>8,5</td>
<td>12,0</td>
<td>13,0</td>
<td>38</td>
<td>21</td>
<td>2,5</td>
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<tr>
<td>035.16</td>
<td>35 / 35 flex</td>
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<td>8,2</td>
<td>12,5</td>
<td>17,0</td>
<td>42</td>
<td>28</td>
<td>2,5</td>
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<td>10,0</td>
<td>14,5</td>
<td>10,5</td>
<td>52</td>
<td>22</td>
<td>4,0</td>
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<tr>
<td>050.12</td>
<td>50</td>
<td>12</td>
<td>10,0</td>
<td>14,5</td>
<td>13,0</td>
<td>52</td>
<td>24</td>
<td>4,0</td>
</tr>
<tr>
<td>050.16</td>
<td>50</td>
<td>16</td>
<td>10,0</td>
<td>14,5</td>
<td>17,0</td>
<td>52</td>
<td>28</td>
<td>4,0</td>
</tr>
<tr>
<td>070.10</td>
<td>70 / 50 flex</td>
<td>10</td>
<td>11,5</td>
<td>16,5</td>
<td>10,5</td>
<td>55</td>
<td>24</td>
<td>4,5</td>
</tr>
<tr>
<td>070.12</td>
<td>70 / 50 flex</td>
<td>12</td>
<td>11,5</td>
<td>16,5</td>
<td>13,0</td>
<td>55</td>
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<td>4,5</td>
</tr>
<tr>
<td>070.16</td>
<td>70 / 50 flex</td>
<td>16</td>
<td>11,5</td>
<td>16,5</td>
<td>17,0</td>
<td>55</td>
<td>30</td>
<td>4,5</td>
</tr>
<tr>
<td>095.12</td>
<td>95</td>
<td>12</td>
<td>13,5</td>
<td>19,0</td>
<td>13,0</td>
<td>65</td>
<td>28</td>
<td>5,0</td>
</tr>
<tr>
<td>095.14</td>
<td>95</td>
<td>14</td>
<td>13,5</td>
<td>19,0</td>
<td>15,0</td>
<td>65</td>
<td>28</td>
<td>5,0</td>
</tr>
<tr>
<td>095.16</td>
<td>95</td>
<td>16</td>
<td>13,5</td>
<td>19,0</td>
<td>17,0</td>
<td>65</td>
<td>32</td>
<td>5,0</td>
</tr>
<tr>
<td>120.10</td>
<td>120 / 95 flex</td>
<td>10</td>
<td>15,5</td>
<td>21,0</td>
<td>10,5</td>
<td>70</td>
<td>32</td>
<td>5,5</td>
</tr>
<tr>
<td>120.12</td>
<td>120 / 95 flex</td>
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<td>15,5</td>
<td>21,0</td>
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<td>70</td>
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<td>5,5</td>
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<tr>
<td>120.14</td>
<td>120 / 95 flex</td>
<td>14</td>
<td>15,5</td>
<td>21,0</td>
<td>15,0</td>
<td>70</td>
<td>32</td>
<td>5,5</td>
</tr>
<tr>
<td>120.16</td>
<td>120 / 95 flex</td>
<td>16</td>
<td>15,5</td>
<td>21,0</td>
<td>17,0</td>
<td>70</td>
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<td>5,5</td>
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<tr>
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<td>150</td>
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<td>17,0</td>
<td>23,5</td>
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<td>78</td>
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</tr>
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<td>150</td>
<td>16</td>
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<td>78</td>
<td>34</td>
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</tr>
<tr>
<td>185.10</td>
<td>185 / 150 flex</td>
<td>10</td>
<td>19,0</td>
<td>25,5</td>
<td>10,5</td>
<td>82</td>
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<td>6,0</td>
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<tr>
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<td>185 / 150 flex</td>
<td>12</td>
<td>19,0</td>
<td>25,5</td>
<td>13,0</td>
<td>82</td>
<td>37</td>
<td>6,0</td>
</tr>
<tr>
<td>185.14</td>
<td>185 / 150 flex</td>
<td>14</td>
<td>19,0</td>
<td>25,5</td>
<td>15,0</td>
<td>82</td>
<td>37</td>
<td>6,0</td>
</tr>
<tr>
<td>185.16</td>
<td>185 / 150 flex</td>
<td>16</td>
<td>19,0</td>
<td>25,5</td>
<td>17,0</td>
<td>82</td>
<td>37</td>
<td>6,0</td>
</tr>
<tr>
<td>240.12</td>
<td>240</td>
<td>12</td>
<td>21,5</td>
<td>29,0</td>
<td>13,0</td>
<td>92</td>
<td>42</td>
<td>6,5</td>
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<tr>
<td>240.16</td>
<td>240</td>
<td>16</td>
<td>21,5</td>
<td>29,0</td>
<td>17,0</td>
<td>92</td>
<td>42</td>
<td>6,5</td>
</tr>
<tr>
<td>300.16</td>
<td>300</td>
<td>16</td>
<td>24,5</td>
<td>32,0</td>
<td>17,0</td>
<td>100</td>
<td>48</td>
<td>7,0</td>
</tr>
</tbody>
</table>

**Note:**
Circular form with viewing hole

**Use for:**
Overhead line, flexible cable and round wire

**Drawing number:**
449.00024

**Ordering information:**
with nominal 95 mm² cross-section,
for connecting bolts M 16

4513.095.16 Cable lug for press connection
Material:
Cu

<table>
<thead>
<tr>
<th>Type</th>
<th>Rope (mm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>050</td>
<td>50</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
</tr>
<tr>
<td>150</td>
<td>150</td>
</tr>
</tbody>
</table>

Drawing number:
431.00070 - .00072

Ordering information:
For rope 150 mm²
4521.150 Rope spacer
Material:
Al

Weight:
Wt (kg/m) = 6.17

Note:
L = 11.9 m
Other lengths available on request.
Cross-section of the rigid bar:
1343 mm<sup>2</sup> copper equivalent.
For radii less than 100 m the rigid bar
must be mechanically pre-formed.
Greasing sleeve 4632
Protective grease 4633

Associated parts:
Conductor rail support 2613 o/w
Feeder clamp 3441
Section insulator 4261 o/w
Interlocking joint (pair) 4612 o/w
Conductor rail expansion joint 4622

Drawing number:
963.01535, .01536

Ordering information:
4611 Overhead conductor rail CR4

---

Material:
Al

Drawing number:
963.00719

Ordering information:
4612 Interlocking joint pair for conductor rail CR4

---

Material:
Al

Weight:
Wt (kg) = 6.36

Patent:
US Pat. 6,938,742, and others

Drawing number:
962.00826

Ordering information:
4612.1 Interlocking joint for conductor rail
**4612.2** Interlocking joint pair for conductor rail CR2 with CR3HS/CR4

Material:
Al

Note:
The profiles CR2 and CR3HS/CR4 can be connected with the interlocking joint (pair).

Drawing number:
962.00385-3

Ordering information:
4612.2 Interlocking joint pair for conductor rail CR2 with CR3HS/CR4

**4613** Transition bar for conductor rail CR4

Material:
Al

<table>
<thead>
<tr>
<th>Type</th>
<th>Wt (kg)</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>29</td>
<td>&lt; 160 km/h</td>
</tr>
<tr>
<td>2</td>
<td>28</td>
<td>&gt; 160 km/h</td>
</tr>
<tr>
<td>3</td>
<td>29</td>
<td>Depots</td>
</tr>
<tr>
<td>4</td>
<td>36</td>
<td>2 contact wires</td>
</tr>
</tbody>
</table>
Protecting plastic cover for conductor rail CR4 4614

Material:
Synthetic, flame resistant

Note:
L max. 5000 mm
Other lengths available on request.

Drawing number:
962.00127-2

Ordering information:
Length 3500 mm
4614 .3500 Protecting plastic cover for conductor rail CR4

---

Protecting plastic cover for conductor rail CR4, closed on one side 4614.1

Material:
Synthetic, flame resistant

Drawing number:
963.00546

Ordering information:
4614.1 Protecting plastic cover for conductor rail CR4, closed on one side

---

Conductor rail end section CR4 4615

Material:
Al

Associated parts:
Interlocking joint pair 4612 o/w

Drawing number:
962.02017-2

Ordering information:
4615 Conductor rail end section CR4
**4616**  
Anchor bar for conductor rail CR4

Material:  
AI

Associated parts:  
Anchor plate  4617 o/w  
Interlocking joint pair  4612 o/w

Drawing number:  
962.02033-1

Ordering information:  
4616 Anchor bar  
for conductor rail CR4

---

**4617**  
Anchor plate for conductor rail

Material:  
Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>D (mm)</th>
<th>Connecting link</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>H.1.17</td>
<td>17</td>
<td>horizontal</td>
<td>general</td>
</tr>
<tr>
<td>H.1.20</td>
<td>20</td>
<td>horizontal</td>
<td>general</td>
</tr>
<tr>
<td>H.2.17</td>
<td>17</td>
<td>horizontal</td>
<td>on swivel head inclinable</td>
</tr>
<tr>
<td>H.2.20</td>
<td>20</td>
<td>horizontal</td>
<td>on swivel head inclinable</td>
</tr>
<tr>
<td>V.1.17</td>
<td>17</td>
<td>vertical</td>
<td>general</td>
</tr>
<tr>
<td>V.1.20</td>
<td>20</td>
<td>vertical</td>
<td>general</td>
</tr>
<tr>
<td>V.2.17</td>
<td>17</td>
<td>vertical</td>
<td>on swivel head inclinable</td>
</tr>
<tr>
<td>V.2.20</td>
<td>20</td>
<td>vertical</td>
<td>on swivel head inclinable</td>
</tr>
</tbody>
</table>

Note:  
X = Swivel head  
XX = Connection clamp

Drawing number:  
962.00344-1, .00344-9, .01082-1, .01082-2

Ordering information:  
Hole ø 17 mm, connecting link vertical  
4617.V.1.17 Anchor plate for conductor rail
Material:
Fe stainless

<table>
<thead>
<tr>
<th>Type (D)</th>
<th>Utilization</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.17</td>
<td>17 general</td>
</tr>
<tr>
<td>1.20</td>
<td>20 general</td>
</tr>
<tr>
<td>2.17</td>
<td>17 on swivel head inclinable</td>
</tr>
<tr>
<td>2.20</td>
<td>20 on swivel head inclinable</td>
</tr>
</tbody>
</table>

Note:
X = Rope

Drawing number:
962.00345-4

Ordering information:
Hole ø 17 mm, utilization general
4618.1.17 Fixed point plate for conductor rail

Material:
AI

Note:
G = straight
L = bent to the left
R = bent to the right

Patent:
US Pat. 6,206,156 and others

Drawing number:
962.00555, 963.00795-1

Ordering information:
Bent to the left
4619.L Inline horn for conductor rail CR4
### Material:
Al, Fe stainless

<table>
<thead>
<tr>
<th>Type</th>
<th>Wt (kg)</th>
<th>L (mm)</th>
<th>Electric load</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>55</td>
<td>1515</td>
<td>&lt; 2000 A</td>
</tr>
<tr>
<td>2</td>
<td>55</td>
<td>1515</td>
<td>&gt; 2000 A</td>
</tr>
</tbody>
</table>

**Note:**
- Expansion movement +/- 500 mm
- A = fix part
- B = movable part
- 4622.1, 4622.2 = for installation in conductor rail profile CR4

**Drawing number:**
962.00892, .00919

**Ordering information:**
- Electric load > 2000 A
- 4622.2 Conductor rail expansion joint
Contact wire insertion device for conductor rail 4631

Note:
For conductor rail 4611
Drawing number:
911.00140
Ordering information:
4631 Contact wire insertion device for conductor rail

Greasing sleeve for contact wire 4632

Material:
CuSn

Note:
A pump for application of grease can be supplied on rental basis.
Drawing number:
962.00424
Ordering information:
4632 Greasing sleeve for contact wire

Protective grease for contact wire in conductor rail 4633

<table>
<thead>
<tr>
<th>Type</th>
<th>Wt (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>05</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

Note:
Delivered in units of 5 or 30 kg.
Ordering information:
Unit of 30 kg
4633.30 Protective grease for contact wire in conductor rail
Note:
Supplied complete with two swivel heads

Drawing number:
963.01524

Ordering information:
4641 Balance beam

---

Note:
V max. \( \geq 200 \text{ km/h} \)
Tightening torque: Bolt M12 MA = 22 Nm

Drawing number:
963.01890-1

Ordering information:
4642 Swivel head spring borne, inclinable lengthwise

---

Note:
Tightening torque: Bolt M10 MA = 25 Nm

Drawing number:
963.01853-2

Ordering information:
4643 Contact wire reinforcement, basis
Contact wire reinforcement, enlargement

Note:
Tightening torque: Bolt M 10 MA = 25 Nm

Drawing number:
963.01854-2

Ordering information:
4644 Contact wire reinforcement, enlargement
Material: AI

Mast range:
Section HEB 160 - 200  
220 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>Number of cable fast.</th>
<th>Number of mast fast.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2.0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3.0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4.0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>5.0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>6.0</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>70</td>
<td>7.0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>80</td>
<td>8.0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>90</td>
<td>9.0</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

Note:
Cable fastening to mast 4731
Cable fastening device 4732

Fasteners:
Supplied complete with cable fastening and U-bolts.

Drawing number:
561.00106, .00106-1

Ordering information:
Length 6.0 m, on HEB 220
4711.60.22 Riser cable duct narrow, straight
Riser cable duct narrow, angled

Material:
Al

Mast range:
Section HEB 160 - 200
220 - 260

<table>
<thead>
<tr>
<th>Type (m)</th>
<th>L</th>
<th>Number of cable fast.</th>
<th>Number of mast fast.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2,0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3,0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4,0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>5,0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>6,0</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>70</td>
<td>7,0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>80</td>
<td>8,0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>90</td>
<td>9,0</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

Note:
When ordering, state dimensions a+b (cm).
Cable fastening to mast  4731
Cable fastening device  4732

Fasteners:
Supplied complete with cable fastening and U-bolts.

Drawing number:
561.00106-2

Ordering information:
Length 7,0 m, on HEB 200 a=220 mm, b=1000 mm
4712.70.20.220.1000
Riser cable duct narrow, angled
Material:
AI

Mast range:
Section HEB 160 - 200
220 - 260

<table>
<thead>
<tr>
<th>Type</th>
<th>L (m)</th>
<th>Number of cable fast.</th>
<th>Number of mast fast.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2.0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3.0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4.0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>5.0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>6.0</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>70</td>
<td>7.0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>80</td>
<td>8.0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>90</td>
<td>9.0</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

Note:
Cable fastening to mast 4731
Cable fastening device 4732

Fasteners:
Supplied complete with cable fastening and U-bolts.

Drawing number:
561.00107, 561.00107-1

Ordering information:
Length 8,0 m, on HEB 240
4721.80.24 Riser cable duct wide, straight
### Riser cable duct wide, angled

**Material:**
- Al

**Mast range:**
- Section HEB
  - 160 - 200
  - 220 - 260

<table>
<thead>
<tr>
<th>Type (m)</th>
<th>L</th>
<th>Number of cable fast.</th>
<th>Number of mast fast.</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>2,0</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3,0</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4,0</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>50</td>
<td>5,0</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>60</td>
<td>6,0</td>
<td>8</td>
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</tr>
<tr>
<td>70</td>
<td>7,0</td>
<td>9</td>
<td>5</td>
</tr>
<tr>
<td>80</td>
<td>8,0</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>90</td>
<td>9,0</td>
<td>11</td>
<td>7</td>
</tr>
</tbody>
</table>

**Note:**
- When ordering, state dimensions a+b (cm).
- Cable fastening to mast 4731
- Cable fastening device 4732

**Fasteners:**
- Supplied complete with cable fastening and U-bolts.

**Drawing number:**
- 561.00107-2

**Ordering information:**
- Length 5.0 m, on HEB 220, a=220 mm, b=1000 mm
  - 4722.50.22.220.1000
- Riser cable duct wide, angled
Mast range:
Section HEB 160 - 200 L = 260 mm
220 - 260 L = 320 mm

Note:
To be used above the cable riser
Cable fastening device 4732

Fasteners:
Supplied complete with U-bolt.

Drawing number:
561.00117

Ordering information:
on HEB 220
4731.22 Cable fastening to mast

Material:
Al

Type | Cable (Ø mm)
---|---
12 | 8 - 12
20 | 16 - 20
25 | 20 - 25
32 | 25 - 32
40 | 32 - 40
48 | 40 - 48
56 | 48 - 56
64 | 56 - 64

Ordering information:
for cable ø 22 mm
4732.25 Quick cable fastening device

Mast range:
Section HEB 160 - 180 L = 113 mm
200 - 220 L = 149 mm
240 - 260 L = 185 mm

Fasteners:
Supplied complete with U-bolt.

Associated parts:
Quick cable fastening device 4732

Drawing number:
561.00141

Ordering information:
on HEB 200
4733.20 Anchor bracket for cable fastening to mast
### T - wiring cable yellow

**Material:**
Cu conductor  
PVC covered

<table>
<thead>
<tr>
<th>Type</th>
<th>Cable (mm²)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (Ø mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>035</td>
<td>35</td>
<td>9,6</td>
<td>7,4</td>
<td>36,0</td>
<td>7 x 2,54</td>
</tr>
<tr>
<td>050</td>
<td>50</td>
<td>11,1</td>
<td>8,5</td>
<td>50,0</td>
<td>19 x 1,80</td>
</tr>
<tr>
<td>095</td>
<td>95</td>
<td>15,1</td>
<td>12,0</td>
<td>95,0</td>
<td>19 x 2,52</td>
</tr>
</tbody>
</table>

**Note:**
Non-halogen cable on demand.

**Ordering information:**
Cable 95 mm²  
4811.095 T-wiring cable yellow

### TT (Tdc)-wiring cable grey

**Material:**
Cu conductor  
PVC covered

<table>
<thead>
<tr>
<th>Type</th>
<th>Cable (mm²)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (Ø mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>095</td>
<td>95</td>
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<td>12,0</td>
<td>109,0</td>
<td>19 x 2,52</td>
</tr>
<tr>
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<td>150</td>
<td>22,8</td>
<td>15,6</td>
<td>166,0</td>
<td>37 x 2,25</td>
</tr>
<tr>
<td>240</td>
<td>240</td>
<td>28,4</td>
<td>20,0</td>
<td>269,0</td>
<td>61 x 2,25</td>
</tr>
<tr>
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<td>300</td>
<td>32,5</td>
<td>26,3</td>
<td>345,0</td>
<td>61 x 2,52</td>
</tr>
</tbody>
</table>

**Ordering information:**
Cable 150 mm²  
4813.150 TT(Tdc)-wiring cable grey

### GN - CLCuN - BETA low-voltage cable black

**Material:**
Cu conductor  
PVC covered

<table>
<thead>
<tr>
<th>Type</th>
<th>Cable (mm²)</th>
<th>D (mm)</th>
<th>d (mm)</th>
<th>Weight (kg/100m)</th>
<th>Construction (Ø mm)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>27,2</td>
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<tr>
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<td>388,0</td>
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</tbody>
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**Ordering information:**
Cable 300 mm²  
4814.300 GN - CLCuN - BETA  
low-voltage cable black