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## GENERAL

Covered medium voltage lines (CCC) are a new alternative to bare overhead lines.

These lines have many advantages compared to the bare ones.

The system comprises of three separate covered conductors but is not designated to be a fully insulated system.

The conductor material is usually aluminium but also ACSR-conductors are used.

### The advantages compared to bare lines are:

- Spacing**
  - **Distance between phases** can be kept shorter because of the insulation.
- Way leave**
  - The **way leave** through wooden areas can be reduced and branches need not be removed immediately.
- Line safety**
  - The **line safety** is much higher as no short circuits occur due to falling branches or even trees. Immediate action is thus not necessary. Clashing of phases caused by wind or ice shedding is also not dangerous.
- Systems**
  - It is possible to erect **more than one system** additionally on existing poles.
- Icing**
  - **Icing** on covered lines is less.
- Costs**
  - **Costs** are a little higher but are more than compensated by very low service costs.
- Loads**
  - Due to lighter crossarms which are much shorter the **loads** on the poles are lower.

## Standards

The **connecting bolts** acc. DIN 48073/5.6 or 8.8.

**Split pins** are made of stainless steel or tinned copper.

**Clevis eye connections** acc. DIN 48074 resp. IEC 471 .

## Hot dip Galvanising

Steel hardware is hot dip galvanised in Mosdorfer's own plant.

Galvanising can be done in accordance to national and international standards.

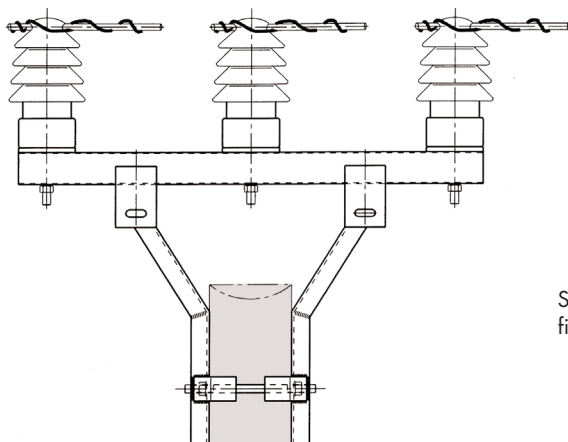
### abbreviation for bolts:

S = screw bolt

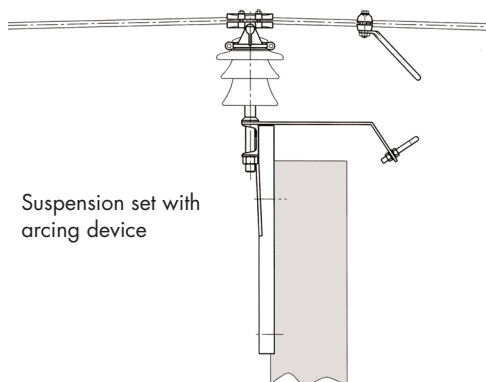
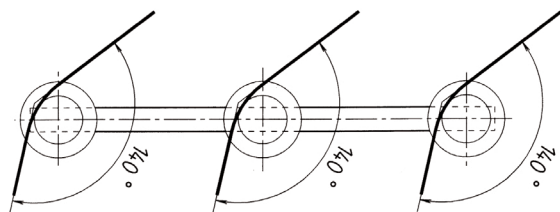
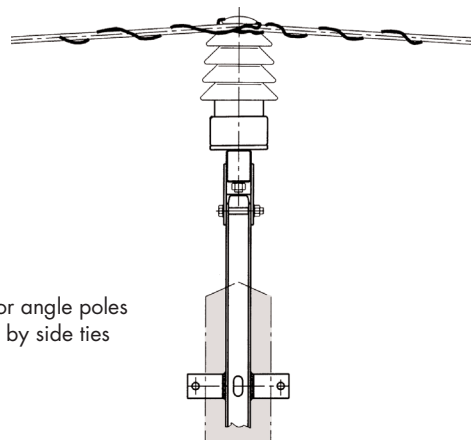
N = rivet bolt

For a more detailed description for suspension and tension clamps see catalogue parts 4 and 5.

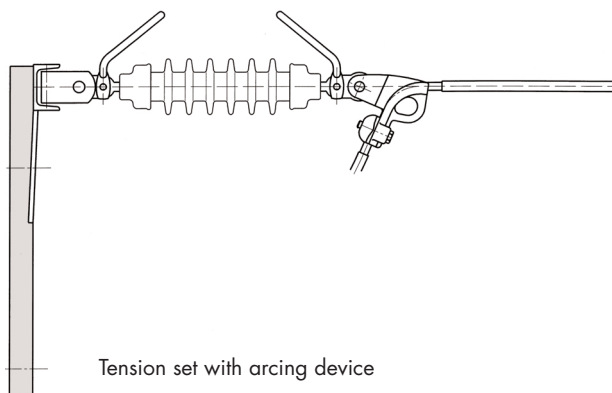
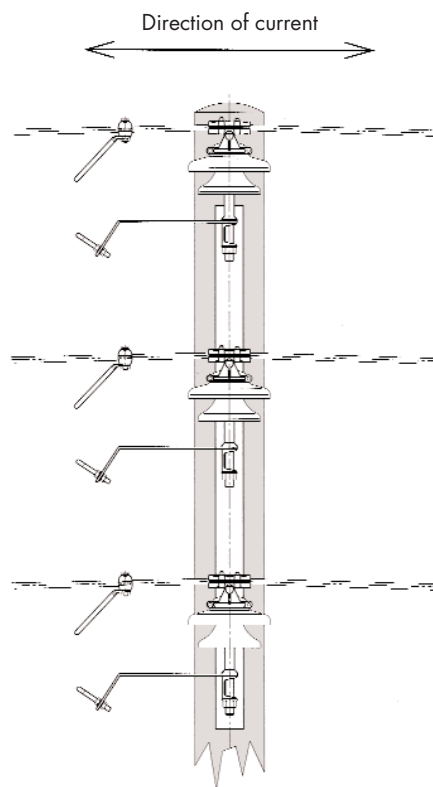
## Examples



Suspension points for angle poles  
fixing of conductors by side ties



Suspension set with  
arcing device



Tension set with arcing device

Suspension points with oscillating top clamps  
and including arcing horns.

## TENSION FITTINGS

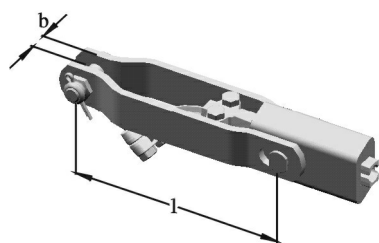
### Double wedge tension clamps

for aluminium-, al-alloy-, ACSR-, AACSR- and alumoweld conductors

To avoid damaging the conductor which might lead to notching effects the wedges are designed without serrated grooves.

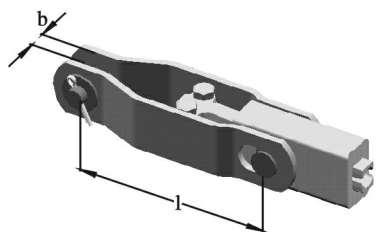
This has the advantage of permitting transfer of the clamp to another place if it is necessary.

### Double wedge tension clamps with jumper connections



| <b>Material:</b> Body and wedges: aluminium-alloy<br>Trunnion: steel, hot dip galvanised<br>Bolts and straps: steel, hot dip galvanised |                  |     |    |      |                          |           |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|----|------|--------------------------|-----------|
| L.-Nr.                                                                                                                                  | Dimensions in mm |     |    |      | Short circuit current kA | Weight kg |
|                                                                                                                                         | Conductor Ø      | l   | b  | Bolt |                          |           |
| 4440.52/3                                                                                                                               | 13,6–16,1        | 230 | 14 | N13  | 10                       | 2,40      |
| 4440.52/4                                                                                                                               | 13,6–16,1        | 230 | 14 | S 13 | 10                       | 2,40      |
| 4440.53/3                                                                                                                               | 13,6–16,1        | 230 | 20 | N19  | 22                       | 2,50      |
| 4440.53/4                                                                                                                               | 13,6–16,1        | 230 | 20 | S 19 | 22                       | 2,50      |

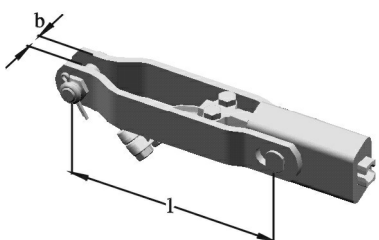
### Double wedge tension clamps without jumper connections



| <b>Material:</b> Body and wedges: aluminium-alloy<br>Trunnion: steel, hot dip galvanised<br>Bolts and straps: steel, hot dip galvanised |                  |     |       |      |                          |           |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|-------|------|--------------------------|-----------|
| L.-Nr.                                                                                                                                  | Dimensions in mm |     |       |      | Short circuit current kA | Weight kg |
|                                                                                                                                         | Conductor Ø      | l   | b     | Bolt |                          |           |
| 4440.50                                                                                                                                 | 7,5– 9,6         | 150 | 14/20 | N13  | 10                       | 1,06      |
| 4440.50/4                                                                                                                               | 7,5–10,0         | 150 | 20    | S 19 | 10                       | 1,12      |
| 4440.51                                                                                                                                 | 10,5–12,5        | 150 | 14/20 | N13  | 10                       | 1,04      |
| 4440.51/3                                                                                                                               | 10,5–12,5        | 150 | 20    | S 19 | 10                       | 1,11      |
| 4440.52/1                                                                                                                               | 13,6–16,1        | 230 | 14    | N13  | 10                       | 2,25      |
| 4440.52/2                                                                                                                               | 13,6–16,1        | 230 | 14    | S 13 | 10                       | 2,25      |
| 4440.53/1                                                                                                                               | 13,6–16,1        | 230 | 20    | N19  | 22                       | 2,35      |
| 4440.53/2                                                                                                                               | 13,6–16,1        | 230 | 20    | S 19 | 22                       | 2,35      |

### Double wedge tension clamps with jumper connections for watertight cables.

**Clamps to be mounted over the insulation.**



| <b>Material:</b> Body and wedges: aluminium-alloy<br>Trunnion: steel, hot dip galvanised<br>Bolts and straps: steel, hot dip galvanised |                  |     |    |      |           |
|-----------------------------------------------------------------------------------------------------------------------------------------|------------------|-----|----|------|-----------|
| L.-Nr.                                                                                                                                  | Dimensions in mm |     |    |      | Weight kg |
|                                                                                                                                         | Conductor Ø      | l   | b  | Bolt |           |
| 4440.53/3                                                                                                                               | 13,1–16,1        | 230 | 20 | N19  | 2,50      |
| 4440.53/3A                                                                                                                              | 17,3–18,8        | 230 | 20 | N19  | 2,50      |
| 4440.54/3N                                                                                                                              | 13,1–16,1        | 230 | 20 | N16  | 2,50      |
| 4440.53/3N-A                                                                                                                            | 17,3–18,8        | 230 | 20 | N16  | 2,50      |

Other dimensions on request.

## Bolted type tension clamps

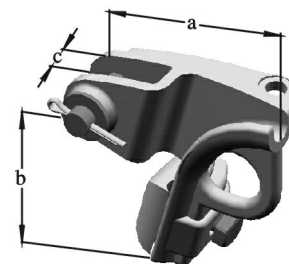
to be mounted after removal of the insulation of aluminium and ACSR conductors.

This type was developed for covered conductors. The keeper is suitable for two ranges (25-62 and 63-132 mm<sup>2</sup>).

**Material:** Clamp: aluminium-alloy  
Other parts: steel, hot dip galvanised

| L.-Nr.    | Cross section<br>mm <sup>2</sup> | Dimensions in mm |    |    |      | Torque<br>Nm | Weight<br>kg |
|-----------|----------------------------------|------------------|----|----|------|--------------|--------------|
|           |                                  | a                | b  | c  | Bolt |              |              |
| 4435.01/1 | 25-132                           | 140              | 85 | 20 | N16  | 60           | 0,90         |

On ordering please state type of conductor.



## Compression dead end clamps watertight

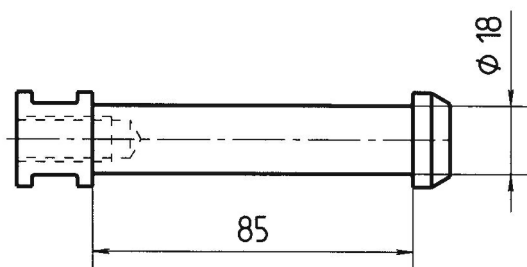
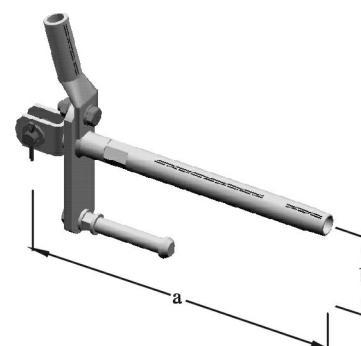
Available for all cross sections.

This watertight variation is very suitable in polluted areas to prevent corrosion of the cable.

**Material:** Clamp and cable lug: aluminium-alloy  
Other parts: steel, hot dip galvanised

| L.-Nr.    | Cross section<br>mm <sup>2</sup> | Dimensions in mm |     |          | Weight<br>kg |
|-----------|----------------------------------|------------------|-----|----------|--------------|
|           |                                  | a                | b   | Screws   |              |
| 4455.75/1 | 50                               | 265              | 105 | 1 x M 12 | 1,10         |
| 4455.76/1 | 95                               | 315              | 105 | 1 x M 12 | 1,30         |
| 4455.77/1 | 150                              | 375              | 105 | 1 x M 12 | 1,50         |

Other types and dimensions on request.



Earthing connection

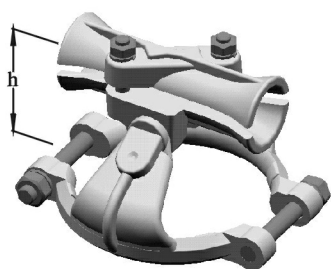
## SUSPENSION FITTINGS

### Oscillating top clamps

for aluminium-, al-alloy-, ACSR-, AACSR- and alumoweld conductors

These clamps are to be mounted onto bare cables (removal of insulation).

Mounting directly onto the insulation is possible but depending upon the insulator type, special precautions are to be taken against corona.

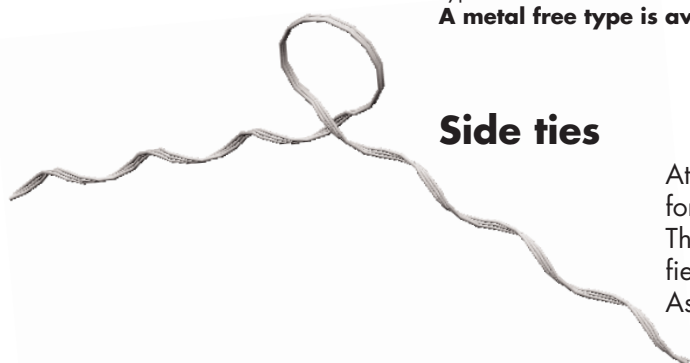


| <b>Material:</b> Clamp: cast-aluminium<br>Bolts: steel, hot dip galvanised |            |                |                  |      |           |
|----------------------------------------------------------------------------|------------|----------------|------------------|------|-----------|
| L.-Nr.                                                                     | Type       | for Insulators | Dimensions in mm |      | Weight kg |
|                                                                            |            |                | Cond. Ø          | h    |           |
| 2300.60                                                                    | PK 10/II   | VHD 10         | 9-16             | 57,5 | 0,49      |
| 2300.62                                                                    | PK 20/II   | VHD 20         | 9-16             | 62,5 | 0,53      |
| 2300.63                                                                    | PK 25/II   | VHD 25         | 9-16             | 67,5 | 0,56      |
| 2300.64                                                                    | PK 30/II   | VHD 30         | 9-16             | 67,5 | 0,56      |
| 2300.65                                                                    | PK 35/II   | VHD 35         | 9-16             | 70,5 | 0,60      |
| 2300.70                                                                    | PK 10/III  | VHD 10         | 15-20            | 60,0 | 0,59      |
| 2300.72                                                                    | PK 20/III  | VHD 20         | 15-20            | 65,0 | 0,63      |
| 2300.73                                                                    | PK 25/III  | VHD 25         | 15-20            | 70,0 | 0,66      |
| 2300.74                                                                    | PK 30/III  | VHD 30         | 15-20            | 70,0 | 0,66      |
| 2300.75                                                                    | PK 35/III  | VHD 35         | 15-20            | 73,0 | 0,70      |
| 2300.80                                                                    | PKV 20/II  | VKS 20/25      | 9-16             | 62,5 | 0,47      |
| 2300.81                                                                    | PKV 30/II  | VKS 30/35      | 9-16             | 67,5 | 0,51      |
| 2300.90                                                                    | PKV 20/III | VKS 20/25      | 15-20            | 65,0 | 0,47      |
| 2300.91                                                                    | PKV 30/III | VKS 30/35      | 15-20            | 70,0 | 0,50      |

For conductors with diameters less than 9 mm aluminium-binding tape band shall be used.

Types for other insulators on request.

**A metal free type is available on request.**



### Side ties

At angle towers with small angles one should use side ties for fixing.

These side ties can be manufactured from plastic or plastified Al-alloy.

Assembling directly onto the insulation.

| <b>Material:</b> Aluminium-alloy |            |                    |           |           |
|----------------------------------|------------|--------------------|-----------|-----------|
| L.-Nr.                           | Type       | Conductor range mm | Insulator | Weight kg |
| 4772.651                         | plastified | 14,10–15,00        | VHD 20    | 0,15      |
| 4772.661                         | plastified | 14,10–15,10        | VHD 25    | 0,15      |

Other types on request.

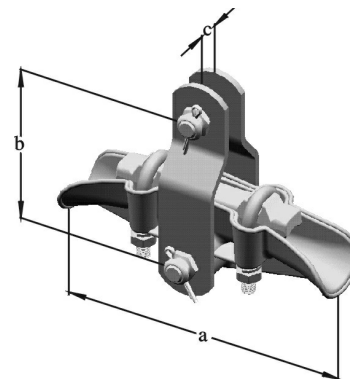
## Suspension clamps

Suspension clamps are used on angle towers with larger angles. They are available in various types and can be adapted to suit requirements.

**Material:** Body and keeper: cast aluminium  
Other parts: steel, hot dip galvanised

| L.-Nr.  | Dimensions in mm |     |     |    | Connecting bolt | Breaking strength kN | Short circuit current kA | Weight kg |
|---------|------------------|-----|-----|----|-----------------|----------------------|--------------------------|-----------|
|         | Cond. Ø          | a   | b   | c  |                 |                      |                          |           |
| 4335.04 | 9,0–16,5         | 210 | 115 | 14 | S 13            | 80                   | 10                       | 1,75      |

Other types see cat.-part 4.



## ACCESSORIES

### Piercing connectors standard type

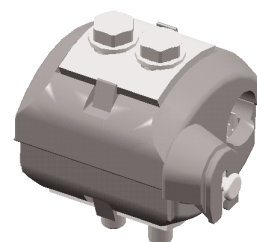
The standard type of Mosdorfer-piercing connector consists of two glassfibre reinforced polyamide case halves with penetrating teeth.

The contact is achieved by tightening the bolts. Grease is used for protecting the contact points against ingress of moisture.

The standard type is sufficient for all normal purposes. In polluted areas it is preferable to use the watertight version.

**Material:** Case halves: polyamide, glasfiber reinforced  
Penetrating teeth: copper tinned  
Pressure plates: steel, hot dip galvanised  
Bolts: steel, hot dip galvanised

| L.-Nr. | Main cable cross section mm <sup>2</sup> | Tap off cable cross section mm <sup>2</sup> | number of bolts | Weight kg |
|--------|------------------------------------------|---------------------------------------------|-----------------|-----------|
| 5212/. | 25 – 120                                 | 25 – 120                                    | 2 x M 8         | 0,27      |
| 5220/. | 95 – 240                                 | 16 – 95                                     | 2 x M10         | 0,50      |
| 5223/. | 95 – 240                                 | 50 – 150                                    | 2 x M 8         | 0,60      |



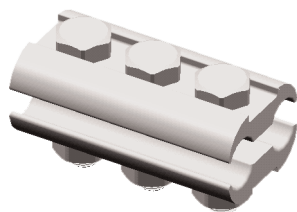
#### Types:

L.-Nr. .../1 1 groove open  
.../3 3 grooves open  
.../4 4 grooves open  
.../K with shear head nut Al – 20 Nm

Watertight piercing connectors and associated items see Cat.-part. 19

## Parallel groove clamps

The PG-Clamps are to be fixed onto the bare conductor.



**Material:** Clamp: extruded aluminium-alloy  
Bolts: steel 8.8, hot dip galvanised

| L.-Nr.  | Dimensions in mm |        | Bolts   | Weight kg |
|---------|------------------|--------|---------|-----------|
|         | Conductor Ø      | Length |         |           |
| 4502.10 | 5.1– 8.1         | 64     | 3 x M 8 | 0.12      |
| 4502.11 | 8.2–11.7         | 80     | 3 x M10 | 0.24      |
| 4502.12 | 11.8–15.8        | 95     | 3 x M12 | 0.44      |
| 4502.13 | 15.8–19.2        | 97     | 3 x M12 | 0.51      |
| 4502.14 | 19.3–24.3        | 112    | 3 x M14 | 0.90      |

Clamps with reduction tubes on request.

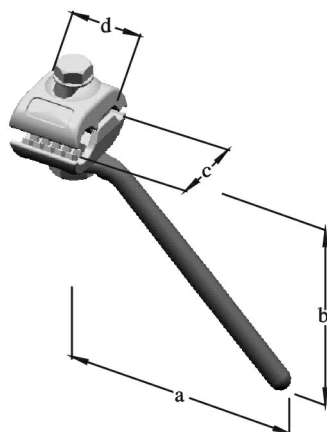
These parallel groove clamps are also available with one or two screws.

The length is then reduced to 1/3 or 2/3.

Parallel groove clamps for fibre optic cables see catalogue part 18.

## Piercing connectors with arcing-horn

patented



Fixing of arcing horns is done by means of a piercing connector which is forged out of a corrosion resistant al-alloy.

The contact is provided through the teeth which penetrate the insulation.

The second groove can carry an al-wire if necessary for connection to the fixing clamps.

The arcing horn and tap off wire is connected separately by means of a separate nut.

The advantages are:

- Changing of the arcing horn after a high short circuit current is possible without disassembling the clamp.
- The short circuit current is 10 kA 1 s.
- The function is secured in all possible cases which has been proved through many tests.
- Simple assembly through guiding the two halves into parallel movement. Upon request an insulating cover is available.

**Material:** Clamp: aluminium-alloy, forged  
Other parts: steel, hot dip galvanised

| L.-Nr.    | Cross section mm <sup>2</sup> | Dimensions in mm |     |    |    | Torque Nm | Weight kg |
|-----------|-------------------------------|------------------|-----|----|----|-----------|-----------|
|           |                               | a                | b   | c  | d  |           |           |
| 3500.01   | 50-150                        | 150              | 145 | 50 | 40 | 46        | 0,40      |
| 3500.01/1 | 50-150                        | 150              | 145 | 50 | 40 | 46        | 0,20*     |
| 3520.01   |                               | 150              | 145 |    |    |           | 0,20**    |

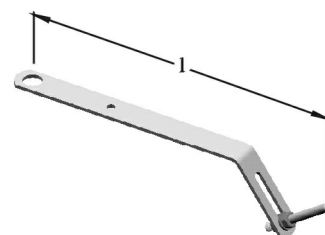
\*clamp without arcing-horn.

\*\*arcing horn only.



## Lower counter horn

| <b>Material:</b> Steel, hot dip galvanised |                  |      |                          |           |
|--------------------------------------------|------------------|------|--------------------------|-----------|
| L.-Nr.                                     | Dimensions in mm |      | Short circuit current kA | Weight kg |
|                                            | L                | Hole |                          |           |
| 3520.05                                    | 470              | 26   | 10                       | 0,90      |
| 3520.05/1                                  | 470              | 32   | 10                       | 0,90      |

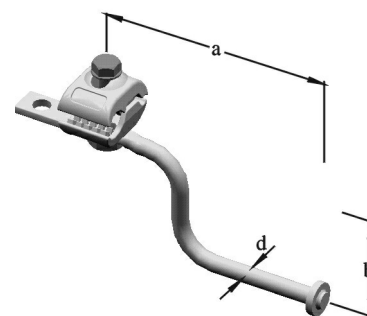


## IN SERVICE EARTHING CLAMPS

### Earthing device single fixing

| <b>Material:</b> Clamp: aluminium-alloy, forged<br>Other parts: steel, hot dip galvanised |                               |                  |     |    |           |           |
|-------------------------------------------------------------------------------------------|-------------------------------|------------------|-----|----|-----------|-----------|
| L.-Nr.                                                                                    | Cross section mm <sup>2</sup> | Dimensions in mm |     |    | Torque Nm | Weight kg |
|                                                                                           |                               | a                | b   | d  |           |           |
| 3550.10                                                                                   | 50–150                        | 170              | 100 | 14 | 46        | 0,70      |
| 3550.10/1                                                                                 | 50–150                        | 170              | 100 | 14 |           | 0,30*     |

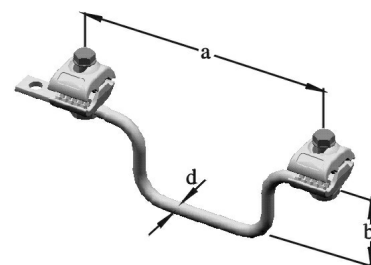
\*Earthing device only.



### Earthing device double fixing

| <b>Material:</b> Clamp: aluminium-alloy, forged<br>Other parts: steel, hot dip galvanised |                               |                  |     |    |           |           |
|-------------------------------------------------------------------------------------------|-------------------------------|------------------|-----|----|-----------|-----------|
| L.-Nr.                                                                                    | Cross section mm <sup>2</sup> | Dimensions in mm |     |    | Torque Nm | Weight kg |
|                                                                                           |                               | a                | b   | d  |           |           |
| 3550.11                                                                                   | 50–150                        | 250              | 100 | 14 | 46        | 1,00      |
| 3550.11/1                                                                                 | 50–150                        | 250              | 100 | 14 |           | 0,60*     |

\*Earthing device only.



**String hardware** and  
**arcing device** for tensions strings see cat.-parts 3 and 7

## BIRD DIVERTERS

### Bird protection cap

| <b>Material:</b> plastic |                              |           |
|--------------------------|------------------------------|-----------|
| L.-Nr.                   | used for                     | Weight kg |
| 3540.01                  | Piercing connector 3500.01/1 | 0,04      |

Other bird protection devices on request.

