Conductor Bar
Series 831
Installation Instruction
Program 831

1. Completeness of the delivered parts

Please check first, if the individual parts are completely delivered (see Photos on page 7 and 8), if they comply with the shipping papers and if they are free of damage.

<table>
<thead>
<tr>
<th>Dimensions of the conductor profiles</th>
<th>Conductor Rail Material</th>
<th>Order-Number</th>
<th>B [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel 32 Amps</td>
<td>083112-...</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Copper 60 Amps</td>
<td>083115-...</td>
<td>0,6</td>
<td></td>
</tr>
<tr>
<td>Copper 100 Amps</td>
<td>083116-...</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Copper 125 Amps</td>
<td>083117-...</td>
<td>1,4</td>
<td></td>
</tr>
<tr>
<td>Data metal 10 Amps</td>
<td>083118-...</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

2. Position of the end feed points

The cable tracking on site determines the position of the end and in-line feeds. The orientation of the power feed determines the position of the PE conductor. End feeds must be positioned always outside the range of the collector movement. Any tension forces on the terminal boxes of the power feeds must be avoided. A certain movement of the power feeds caused by the thermal expansion of the conductor rail system must be taken in consideration when installing the feeding cable. Please take care, that the screws to fix the cable lugs are tightened at maximum with a torque of 10 Nm for M6 and 25 Nm for M8 threats.

3. Installation of the hanger clamps and anchor clamp

**Hanger clamps:** The support distance is at maximum 1000 mm over the entire system length. The distance between hanger clamps and joint covers, power feeds, etc. must be at least 160 mm due to the thermal expansion of conductor rail systems. At vertical arrangement of the multi-pole conductor rail the hanger clamps must be installed so that the clip side is on top.

In case over lapping of hanger clamps and joints appear on the track, this is caused by a faulty mounting of the hanger clamps. The hanger clamp concerned must then be displaced.

**Anchor clamps:** The hanger clamps are designed as sliding supports. To ensure a defined and harmonic expansion to one or two sides, an anchor point must be set, preferable in the center of the conductor rail system. In the anchor clamp the conductor rail is fixed by an additional screw in the support piece.

**Remarks:**
Systems shorter than or equal to 200 m do not require expansion joints. Systems longer than 200 m must be configured in accordance to point 6 of this installation instruction.
Installation Instruction
Program 831

4. Installation of the conductor rail segments

Always start at one end of the system (left or right). The position of the PE conductor on the outside follows the arrangement of the power feed determined earlier. Systems with Data metal rails and for control come without PE marking.

The connector clamps are pre-mounted on both sides of a conductor rail segment. One side is additionally furnished with connector pins, connector springs and a joint cover. The pin must be inside the conductor clamp up to its stops on both sides of the pin. The connector clamp itself must be completely in the plastic housing up to its stop. Before a rail segment is installed it must be ensured that the connecting parts are in proper position and free of damage.

Than the rail segment must be clipped in the hanger clamp and positioned in accordance to point 3 of this installation instruction.

At next, the following rail segment must be put in the hanger clamp and moved inside the hanger clamps approximately 50 mm towards the prior rail segment.

Check the alignment of the connector pins before installation (see above photos). If the connector pins are in good condition the pins can be inserted carefully into the connector clamps. Slide in the connector pins in the connector cap with a little force and finally slide
Installation Instruction
Program 831

the rail segments together with a final forceful push. Please be aware that a small gap of 1 to 2 mm remains between the plastic housings. The joint cover is now in position over the holes in the plastic housing of the conductor rail. To get a fix connection the joint is locked by using the 2 screws supplied with the rail segment.

After the first two rail sections are mounted, position the rail end correctly then use the anchor clamp screw to temporarily anchor the rail at a rail hanger. This will hold the rails in position during installation. Please remember to remove this screw before commissioning the system. The entire system must be installed step by step to the end. At the end a pre-mounted end feed or an end cap completes the system. End caps are also fixed with 2 screws on the conductor rail end.

5. Systems with expansion joints

In systems longer than 200 m expansion joints are arranged as following, if the change of the ambient temperature ($\Delta T$) in operation is more than 20°C.

![Diagram for the determination of the air gap distance](image)

<table>
<thead>
<tr>
<th>$\Delta T$ [°C]</th>
<th>$a$ [m]</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>11</td>
</tr>
<tr>
<td>60</td>
<td>12</td>
</tr>
<tr>
<td>55</td>
<td>14</td>
</tr>
<tr>
<td>50</td>
<td>15</td>
</tr>
<tr>
<td>45</td>
<td>17</td>
</tr>
<tr>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>35</td>
<td>24</td>
</tr>
<tr>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td>20</td>
<td>60</td>
</tr>
</tbody>
</table>

$\Delta T=40$°C Temp. during installation: 15°C

Minimum temperature in operation 5°C

Example:
Installation Instruction
Program 831

6. **Adaption of lengths**

The conductor rails are supplied in lengths of 4, 3, 2 and 1m, thus allowing the realisation of all lengths of installation, under normal conditions. However, should an adaption of the lengths become necessary, this must always be performed at the end of the installation!

When cutting the rail sections into lengths, please proceed as follows:

a) Cut the section into the desired lengths.

b) Make the grooves by giving a cut with the saw, according to the sketch.

c) Clean the cutting end and the grooves by a fine smooth-cut file. Clean off burrs at the rail ends.

d) Put on the end cap and rebore the insulation cover trough the bores in the end cap (drill dia. 4 mm).

For end cap fixing see Point 4 in this Installation instruction.

**Hint:**
Should it become necessary, to shorten the track length of the rail, the original condition of the joint must be restored.

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Maximum temperature during operation

\[ 45^\circ C = \Delta T_1 \]

Air gap taken from the diagram:

\[ \approx 38 \text{ mm} \]

Air gap calculated:

\[ s = 50 \cdot \frac{\Delta T_1}{\Delta T} = 37.5 \text{ mm} \]
7. **Installation of the current collectors**

Current collectors must be installed in accordance to the following sketch.

<table>
<thead>
<tr>
<th>Order-No.</th>
<th>A [mm]</th>
<th>B [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>083102-...</td>
<td>130</td>
<td>80</td>
</tr>
<tr>
<td>083103-...</td>
<td>130</td>
<td>80</td>
</tr>
<tr>
<td>083104-...</td>
<td>133</td>
<td>80</td>
</tr>
<tr>
<td>083106-...</td>
<td>175</td>
<td>100</td>
</tr>
<tr>
<td>083107-...</td>
<td>175</td>
<td>100</td>
</tr>
</tbody>
</table>

Sketch shows the horizontal arrangement / vertical operation

At **horizontal arrangement**, vertical operation, the middle axis of the collector in the middle of the collector unit must be aligned with the middle axis of the corresponding conductor. At **vertical arrangement**, horizontal operation, the lowest collector of the unit must be positioned in one axis with the centre line of the lowest conductor. All other collectors are sitting than with the corresponding pole distance higher.

The given distance (see table above) between support axis and sliding surface must be ensured at any circumstances.

The connection cables must be highly flexible and fixed on the cable ring of the collector unit by a cable strap so that the full functionality of the collectors is guaranteed. No tension or torque forces shall have influence on the collector head.

8. **Hints**

When the installation is done, the system must be checked electrically and for possible installation faults.

9. **Torque for screws**

<table>
<thead>
<tr>
<th></th>
<th>Screws M6 [Nm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Feed</td>
<td>max. 10</td>
</tr>
<tr>
<td>Hanger clamp</td>
<td>4.5</td>
</tr>
</tbody>
</table>
Installation Instruction
Program 831

| Anchor clamp | 4,5 |

10. Photos of relevant system parts

- **Anchor clamp**: 083133-...; Anchor clamp with steel nut
- **Hanger clamp**: 083145-...; Hanger clamp for support arm installation
- **Hanger clamp with universal steel clamp fastener for vertical installation**: 083146-...;
- **Anchor clamp for support arm installation**: 083135-...; Anchor clamp for support arm installation
- **Anchor clamp with shims and universal steel clamp fastener**: 083136-...;
- **End cap**: 083171-...; End cap
- **End cap for transfer points**: 083172-...;
- **Air gap insulating section**: 083195-...;
Installation Instruction
Program 831

0831XX-...; Conductor rail with pre-mounted rail connector

083181-...; Pick-up guide for transfer points

083151-...; In-line feed (max. 10 mm²)

083154-...; In-line feed (max. 35 mm²)

083152-...; In-line feed (max. 35 mm²)

083153-...; End feed (max. 35 mm²)

083161-...; Expansion joint

083106-...; Current collector for 80 Amps

083103-...; Current collector unit for 55 Amps for each pole

081050-...; Collector support bracket

081001-...; Collector shoe for 80 Amps (spare part)

083103-...; Current collector unit for 55 Amps for each pole with terminal box