Manual

Junction boxes
control boxes
THU 93.1 – THU 93.6
THU 94.1 – THU 94.9

PTB 98 ATEX 3116

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Junction boxes and control boxes

Type Series THU 93.1 to THU 93.6 and THU 94.1 to THU 94.9

Target group:
Experienced electricians as defined by ElexV and trained personnel.

Contents:
1. Safety instructions
2. Conformity with standards
3. Technical data
4. Installation
5. Maintenance

1. Safety instructions

Type THU 93.1 to 93.6 and THU 94.1 to 94.9 junction boxes and control boxes are not suitable for duty in Zone 0.

Never leave this Instruction Manual or other objects in the enclosure while the equipment is in operation.

Operate the junction boxes in undamaged and clean condition, only for their intended purpose, and only in conditions which the enclosure material is capable of withstanding.

Incorrectly assembled boxes may no longer meet the requirements of protection type IP 54 as defined by EN 60 529: 1991.

Do not make any modifications to the junction boxes that are not expressly mentioned in this Instruction Manual.

Whenever work is done on the junction boxes, be sure to observe the national safety and accident prevention regulations and the safety instructions given in this Instruction Manual, which are stated in italics (like this paragraph)!
2. Conformity with standards

The explosionproof junction boxes meet the requirements of EN 50 014:1997, EN 50 018:1994, EN 50 019:1994, EN 50 020:1994, and EN 50 028:1987. They were developed, manufactured and tested in accordance with state-of-the-art engineering practice and EN 29 001.

3. Technical data

Type designation

![CE Ex II 2 G]

Type code
Junction boxes and control boxes

Typ THU 9 . . .

Enclosure size (numbers 1 – 9)

0 – Junction box (only terminals fitted)
1 – Control box

3 – Empty enclosure with Part Certificate PTB No. Ex-93.C.3103 U

Type series
Because of the specific differences between junction boxes and control boxes, they will be dealt with separately in the following.

### 3.1 Technical data of the junction boxes

**Explosion protection**
- EEx e II T6 and/or
- EEx e [ia] IIC T6 and/or
- EEx ia IIC T6

**EC Conformity Certificate**
- PTB 98 ATEX 3116

**Enclosure material**
- Stainless steel 1.4301 and 1.4435

**Rated voltage**
- e.g. max. 750 V (see rating plate)

**Max. conductor cross-section**
- e.g. 35 mm² (see rating plate)

**Enclosure protection**
- IP 54

**Admissible ambient temperature range**
- −20°C to +40°C

### 3.2 Technical data of the control boxes

**Explosion protection**
- EEx ed IIC T6 or
- EEx ed ia/ib IIC T6 or
- EEx ed [ia/ib] IIC T6 or
- EEx em IIC T6 or
- EEx em ia/ib IIC T6 or
- EEx em [ia/ib] IIC T6

**EC Conformity Certificate**
- PTB 98 ATEX 3116

**Enclosure material**
- Polyester

**Rated voltage**
- e.g. max. 750 V (AC or DC) (see rating plate)
Rated current

e.g. max. 63 A (varies depending on the version)

Nominal connection conductor cross-section:
- internal components max. 16 mm²
- terminal blocks and terminals max. 35 mm²

Enclosure protection type

IP 54

Admissible ambient temperature range

-20°C to +40°C

Maximum figures for internal components

<table>
<thead>
<tr>
<th>Control and selector switches/pushbuttons</th>
<th>Rated voltage</th>
<th>Rated current</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature controller</td>
<td>250 V</td>
<td>16 A</td>
</tr>
<tr>
<td>Potentiometers, indicator lights</td>
<td>500 V</td>
<td>10 A</td>
</tr>
<tr>
<td>Switches and motor starters,</td>
<td>690 V</td>
<td>20 A</td>
</tr>
<tr>
<td>contactors, flanged receptacles,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>fuses, measuring instruments, transformers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Installation

For installation/operation, always observe the provisions of ElexV and the Equipment Safety Law, the rules of generally accepted engineering practice (EN 60079-14), and the instructions stated in this Manual.

A terminal diagram is provided with each control box. The terminal diagram, which provides information on contact assignments and the pertinent type testing and conformity certificates, should be followed to the letter. The control boxes are equipped for the external connection of certain terminals and additional components such as control and indicating devices, instrumentation, potentiometers, control and selector switches, flanged receptacles, fuse elements, miniature breakers, contactors, motor protection switches,
transformers and temperature controllers. In the case of junction boxes, observe points 4.1 and 4.2 of this Manual.

4.1 Terminals
Taking the respective Data Sheet into account, use only terminals suitable for mounting on top-hat rails, G-profile rails, or PE busbars. Block terminals can also be used on the mounting plate. For circuits in "increased safety" protection, use only terminals with an EC Conformity Certificate issued by a recognized European testing laboratory in accordance with European standards EN 50 014:1997 and EN 50 019:1994. It is also permissible to use suitable terminals with a "B" or later generation Conformity Certificate issued by a recognized European testing laboratory, provided the manufacturer can document its quality assurance measures and provided that compliance with the relevant requirements of European standards EN 50 014:1997 and EN 50 019:1994 has been verified.

The terminals for circuits in "increased safety" protection must be installed in such a way that the leakage paths and clearances called for by EN 50 019:1994 Table 1 as a function of the operating voltage are met.

The terminals used for the intrinsically safe circuits do not require certification. But the terminals used must be properly marked, e.g. with light-blue paint. The terminals must be arranged in such a way that at least 50 mm clearance exists between the bare connection parts and between blank parts of the connected conductors of the intrinsically safe and non-intrinsically safe circuits. This clearance is achieved with partition plates or by using suitable end clamps for installation. The clearance between the connection parts of the intrinsically safe circuits and earthed metallic parts must be at least 3 mm, unless the connection parts are used for earthing. Finally, suitable terminals or partition plates must be used to ensure a clearance of at least 6 mm between the connection parts of different intrinsically safe circuits.

In the case of mixed components (designation EEx e [ia] IIC T6), the terminals for the circuits in "increased safety" protection must be covered with guards of insulating material to prevent accidental contact. Only guards provided for this purpose by the
terminal manufacturer are admissible. The guard must be provided with a permanent warning notice. These covers and warning notices may be omitted in the case of junction boxes whose rating plates state that the box should never be opened under voltage.

The number of terminal positions provided for the earth conductors must at least equal the number of circuits. The maximum admissible cross-section of the individual earthing conductor terminals as a function of the maximum admissible cross-section of the associated phase and neutral conductor terminals must comply with the following table.

<table>
<thead>
<tr>
<th>Maximum admissible cross-section of the phase and neutral conductor terminal S [mm²]</th>
<th>Minimum admissible cross-section of the associated earthing conductor terminal Sp [mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>16 to 35</td>
<td>16</td>
</tr>
<tr>
<td>over 35</td>
<td>0.5</td>
</tr>
</tbody>
</table>

For neat arrangement of the conductors and secure connection of the conductors to the terminal blocks, observe the table 2.

In the case of parallel terminal blocks, clearances at least 1.5 times greater than those listed in table 2 must be maintained. For versions with a mounting plate, where the conductors cannot be brought in under the terminals, clearances at least 2 times greater than those listed in table 2 must be maintained.

### 4.2 Cable and conductor entries

Install cable and conductor entries only in predrilled holes in which blind plugs are inserted.

Install the cable and conductor entries in such a way that accidental loosening is prevented and permanent sealing of the entry points is ensured. Intrinsically safe circuits must be brought in and out through separate entries, which should be clearly identified (e.g. with light-blue paint). Only cable and conductor entries of plastic may be used. Wherever cable and conductor entries are not needed, the holes must be closed off with blind plugs.

For junction boxes in "increased safety" protection and mixed components, use only cable and conductor entries with an EC Conformity Certificate issued by a recognized European testing
laboratory in accordance with European standards EN 50 014:1997 and EN 50 019:1994. It is also permissible to use suitable terminals with a "B" or later generation Conformity Certificate issued by a recognized European testing laboratory, provided the manufacturer can document its quality assurance measures and provided that compliance with the relevant requirements of European standards EN 50 014:1997 and EN 50 019:1994 has been verified.

5. Maintenance

The provisions of ElexV §9, ElexV §13 and EN 60079-17 pertaining to servicing, maintenance and testing must be complied with. During servicing, it is particularly important to check those components upon which the type of protection depends.
### Junction boxes and control boxes

<table>
<thead>
<tr>
<th>Type</th>
<th>Nr./ N°</th>
<th>Length [mm]</th>
<th>Width [mm]</th>
<th>Height [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>THU 93.1</td>
<td>1</td>
<td>150</td>
<td>150</td>
<td>80</td>
</tr>
<tr>
<td>THU 93.2</td>
<td>2</td>
<td>300</td>
<td>150</td>
<td>80</td>
</tr>
<tr>
<td>THU 93.3</td>
<td>3</td>
<td>200</td>
<td>200</td>
<td>80</td>
</tr>
<tr>
<td>THU 93.4</td>
<td>4</td>
<td>300</td>
<td>200</td>
<td>80</td>
</tr>
<tr>
<td>THU 93.5</td>
<td>5</td>
<td>400</td>
<td>200</td>
<td>120</td>
</tr>
<tr>
<td>THU 93.6</td>
<td>6</td>
<td>300</td>
<td>300</td>
<td>120</td>
</tr>
<tr>
<td>THU 94.1</td>
<td>7</td>
<td>200</td>
<td>300</td>
<td>155</td>
</tr>
<tr>
<td>THU 94.2</td>
<td>8</td>
<td>380</td>
<td>300</td>
<td>155</td>
</tr>
<tr>
<td>THU 94.3</td>
<td>9</td>
<td>380</td>
<td>380</td>
<td>210</td>
</tr>
<tr>
<td>THU 94.4</td>
<td>10</td>
<td>380</td>
<td>600</td>
<td>210</td>
</tr>
<tr>
<td>THU 94.5</td>
<td>11</td>
<td>600</td>
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<td>210</td>
</tr>
<tr>
<td>THU 94.6</td>
<td>12</td>
<td>600</td>
<td>760</td>
<td>210</td>
</tr>
<tr>
<td>THU 94.7</td>
<td>13</td>
<td>760</td>
<td>760</td>
<td>300</td>
</tr>
<tr>
<td>THU 94.8</td>
<td>14</td>
<td>800</td>
<td>1000</td>
<td>300</td>
</tr>
<tr>
<td>THU 94.9</td>
<td>15</td>
<td>300</td>
<td>380</td>
<td>210</td>
</tr>
</tbody>
</table>

Table 1: Sizes

<table>
<thead>
<tr>
<th>Conductor cross section [mm²]</th>
<th>Number of single- or multicore conductors brought in; minimum distance of terminal blocks from enclosure wall for 1 conductor</th>
<th>2 conductor</th>
<th>3 or more conductors or 2 side-by-side</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>20 mm</td>
<td>20 mm</td>
<td>20 mm</td>
</tr>
<tr>
<td>2.5</td>
<td>20 mm</td>
<td>20 mm</td>
<td>20 mm</td>
</tr>
<tr>
<td>4</td>
<td>20 mm</td>
<td>20 mm</td>
<td>25 mm</td>
</tr>
<tr>
<td>6</td>
<td>20 mm</td>
<td>25 mm</td>
<td>30 mm</td>
</tr>
<tr>
<td>10</td>
<td>25 mm</td>
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<td>16</td>
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<td>50 mm</td>
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<td>25</td>
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<td>60 mm</td>
</tr>
<tr>
<td>35</td>
<td>50 mm</td>
<td>60 mm</td>
<td>75 mm</td>
</tr>
</tbody>
</table>

Table 2